DA Form 1 – Development application details

Approved form (version 1.1 effective 22 JUNE 2018) 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 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)*	Port Douglas Land Developments Pty Ltd
Contact name *(only applicable for companies)*	c/- Cardno
Postal address *(P.O. Box or street address)*	PO Box 1619
Suburb	Parramatta Park
State	QLD
Postcode	4870
Country	Australia
Contact number	07 4034 0522
Email address *(non-mandatory)*	maurice.sheehan@cardno.com.au
Mobile number *(non-mandatory)*	-
Fax number *(non-mandatory)*	-
Applicant's reference number(s) *(if applicable)*	Q184103

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 (*all lots must be listed*), ***or***

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

a)	Unit No.	Street No.	Street Name and Type	Suburb
			Wabul St,	Craiglie
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4877	2	SR 431	Douglas Shire Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

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. Only one set of coordinates is required for this part.*

☐ 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)*
337014	8170516	☐ 54 ☒ 55 ☐ 56	☐ WGS84 ☒ GDA94 ☐ Other:	

3.3) Additional premises

☐ Additional premises are relevant to this development application and their details have been attached in a schedule to this 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)*:

Port Douglas Estate consists of 18 lots in State 1A and 14 lots in Stage 1B with the ultimate stage of the development consisting of 280 residential lots and a commercial lot.

Access to the site is from Wabul Street, Craiglie, with future connection to be made at the Captain Cook Highway north of Andreassen Road.

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)*~~

~~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 construction 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:	32
☐ No	

14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*
$4,000,000

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 ☐ Local government is taken to have agreed to the superseded planning scheme request – relevant documents attached ☒ No

PART 5 – REFERRAL DETAILS

17) Do any aspects of the proposed development require referral for 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 Regulation 2017:**

☐ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*
☐ Environmentally relevant activities (ERA) *(only if the ERA have not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☒ Fisheries – waterway barrier works
☐ Hazardous chemical facilities
☐ Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure – designated premises
☐ Infrastructure – state transport infrastructure
☐ Infrastructure – state transport corridors and future state transport corridors
☐ Infrastructure – state-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure – near a state-controlled road intersection
☐ On Brisbane core port land near a State transport corridor or future State transport corridor
☐ On Brisbane core port land – ERA
☐ On Brisbane core port land – tidal works or work in a coastal management district
☐ On Brisbane core port land – hazardous chemical facility
☐ On Brisbane core port land – taking or interfering with water
☐ On Brisbane core port land – referable dams
☐ On Brisbane core port land - fisheries
☐ Land within Port of Brisbane's port limits
☐ 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 – construction of new levees or modification of existing 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 have been devolved to local government)*
☐ Local heritage places

Matters requiring referral to the **chief executive of the distribution entity or transmission entity:** ☐ 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 ☐ Oil and gas infrastructure
Matters requiring referral to **the Brisbane City Council:** ☐ Brisbane core port land
Matters requiring referral to the **Minister under the *Transport Infrastructure Act 1994*:** ☐ Brisbane core port land (inconsistent with Brisbane port LUP for transport reasons) ☐ Strategic port land
Matters requiring referral to the **relevant port operator:** ☐ Land within Port of Brisbane's port limits (below high-water mark)
Matters requiring referral to the **Chief Executive of the relevant port authority:** ☐ 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 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 the development application the subject of this form, or include details in a schedule to this development application *(if applicable).*		
Pre Lodgement advice was sought from SARA in relation to the referral requirements. The response is attached as Appendix M.		

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	2966/2018	28 May 2019	Paul Hoye
☐ 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
$		

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 conservation

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

☐ Yes

☒ No

***Note**: See 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

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 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 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	
Date receipted form sighted by assessment manager	
Name of officer who sighted the form	

Template 4 – Waterway barrier works

(version 1.1)

This template must be completed and submitted with *DA Form 1 – Development application details* for all development applications operational works involving waterway barrier works.

It is mandatory to complete the details in all applicable parts in this form and provide any supporting information that is required to accompany your development application, unless stated otherwise.

Additional pages may be attached if there is insufficient space on this template for any questions.

Note: All terms used within this template have the meaning given under the Planning Act 2016, the Planning Regulation 2017, or the *Development Assessment Rules (DA Rules), Fisheries Act 1994 and Fisheries Regulation 2008.*

Part 1 – DEVELOPMENT DETAILS

1) Has a Fish Movement Exemption Notice been issued for the proposed works?	☐ Yes – a copy of the Fish Movement Exemption Notice for the proposed work is attached ☒ No – details of how the proposed work provides for adequate fish movement is attached

2) What is the nature of the proposed waterway barrier(s)? *(tick all applicable boxes)*	☒ New construction	☐ Raise existing
	☐ Temporary	☒ Permanent
	☐ Partial	☒ Bank to bank

3) What type is the proposed work? *(tick all applicable boxes)* *Note: An individual section must be completed for each barrier relevant to this development application. Also ensure that the relevant plans that accompany the development application identify the location of existing works and proposed works.*	Type	Number of barriers	Parts to complete
	☐ Dam, weir or a barrage		2 only
	☒ Culvert		3 only
	☐ Causeway		4 only
	☐ Bridge pylon (abutments or pile foundations)		4 only
	☐ Flow-control structure such as a floodgate		4 only
	☐ Pollution-control device (e.g. trash rack or boom gate)		4 only
	☐ Levee bank across a waterway		4 only
	☐ Other – specify below (e.g. groyne, construction platform, sediment curtain, causeway)		4 only

~~Part 2 – CONSTRUCTING A NEW OR RAISING/MODIFYING AN EXISTING DAM, WEIR, BARRAGE, BUND WALL, COFFER DAM OR OTHER SIMILAR STRUCTURES~~

~~*Note: If the development application involves more than one barrier relating to this part, generate another part 2 and attach to the application.*~~

~~4) What is the proposed development application seeking approval for?~~	~~☐ New barrier~~	~~☐ Raising/modifying an existing barrier~~

~~5) Briefly describe the type of barrier proposed~~ ~~*(i.e. dam, weir, tidal barrage)*~~	

Queensland Government

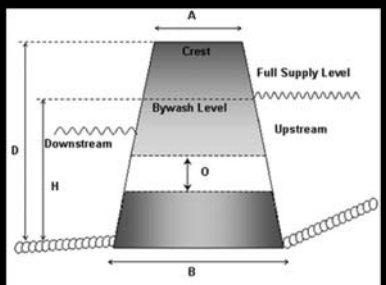
6) If the barrier is temporary *(in place less than 12 months)* how many days will the barrier be in place?	

7) Will the barrier extend across the waterway from bank to bank?	☐ Yes, go to question 8 ☐ No	
7.1) What is the length of the proposed barrier? *(across the waterway)*		metres
7.2) What is the width of the waterway? *(bank to bank)*		metres

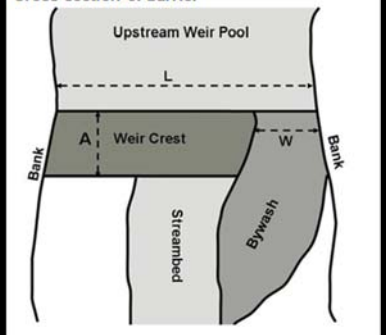
8) What is the purpose of the proposed barrier? *(e.g. creating a new or increasing the capacity of the existing water storage, maintenance work)*	

9) What are the details of the proposed construction materials? *(e.g. earth, concrete, rock fill, steel, timber, sand)*	

10) Provide the following details of the proposed barrier in reference to the diagrams below.



Cross section of barrier



Aerial view of waterway

Total crest height (D)		metres
Thickness (A) of crest		metres
Height of spillway/bywash (H)		metres
Width of spillway/bywash inlet (W)		metres
Base width (B)		metres
Internal diameter (O) of outlet pipe/works and discharge capacity		millimetres
Length of wall (L)		metres
Distance of backup from barrier wall at full supply level		metres
Volume of storage		megalitres
If raising an existing waterway barrier, additional height above existing crest		metres
If raising an existing waterway barrier, method of raising (e.g. capping crest, inflatable bag, gates etc.).		

Part 3 – CONSTRUCTING A NEW OR MODIFYING (INCLUDING MAINTENANCE AND REPLACEMENT OF) AN EXISTING CULVERT

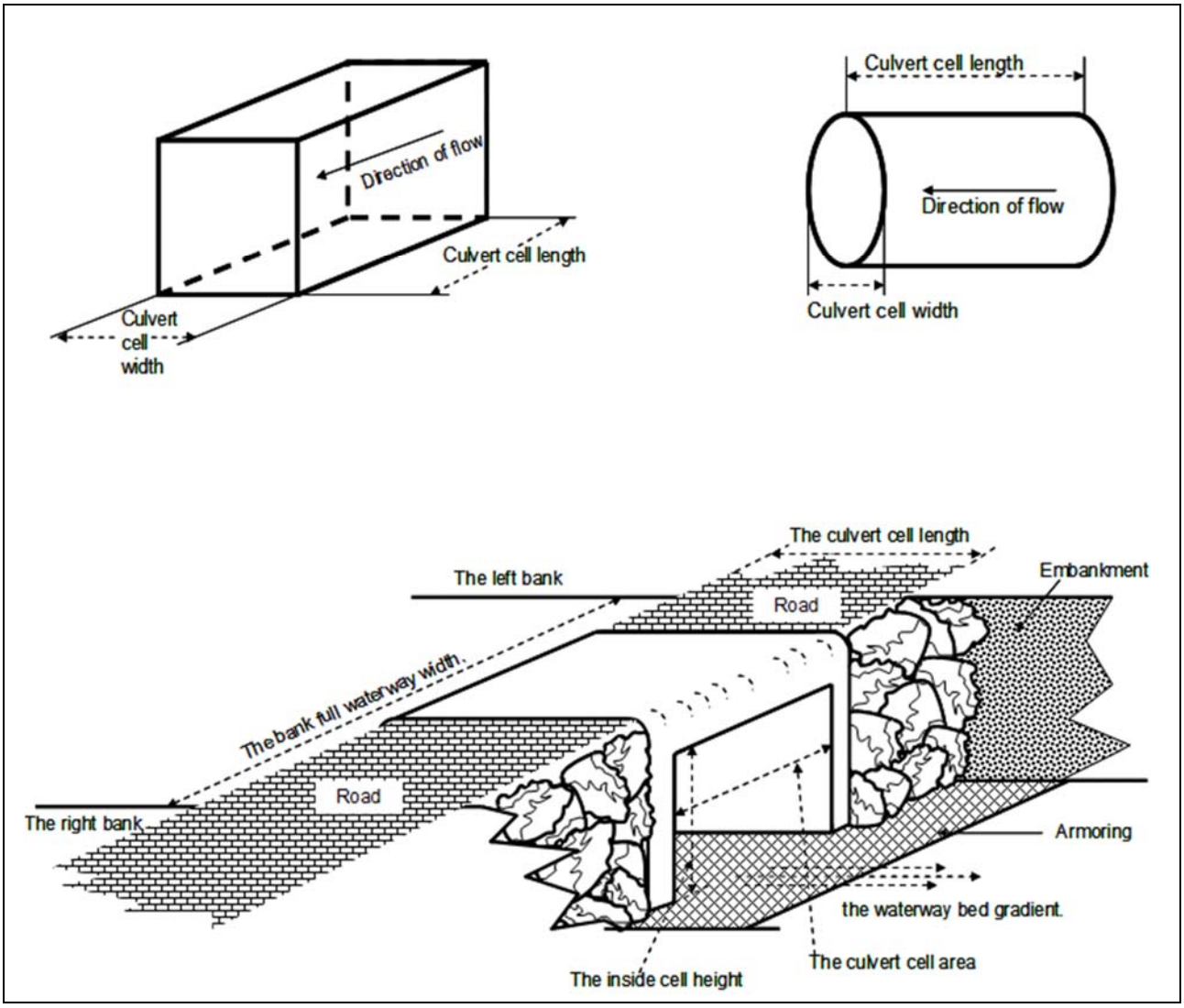
Note: If the development application involves more than one culvert relating to this part, please generate another part 3 and attach to the application.

11) What is the nature of the proposed work?	☒ Construction of a new culvert ☐ Maintenance of an existing culvert ☐ Replacement of an existing culvert
12) What is the purpose of the proposed culvert?	Extension of Wabul St further south for the purpose of servicing a proposed subdivision
13) If the culvert is temporary *(in place less than 12 months)* how many days will the culvert be in place?	

14) Will the culvert extend across the waterway from bank to bank?	☒ Yes, go to question 15 ☐ No	
14.1) What is the length of the proposed culvert? *(across the waterway)*		metres
14.2) What is the width of the waterway? *(bank to bank)*		metres

15) What type of culvert is proposed? *(Tick all applicable boxes)*	☒ Box culvert	☐ Arch culvert	☐ Pipe culvert
	☐ Combination culvert	☐ Other – please specify	

16) In reference to the diagrams below, provide the following details of the proposed culvert.	How many culvert cells are there?	7	
	What is the upstream downstream culvert cell length?	16.8m	metres
	What is the inside cell width of each culvert (or diameter of pipe culvert)?	2.7m	metres
	What is the internal height within the culvert cell?	0.9m	metres


Direction of flow
Culvert cell length
Culvert
cell
width
Culvert cell length
Direction of flow
Culvert cell width
The culvert cell length
Embankment
The left bank
Road
The bank full waterway width.
Road
The right bank
Armoring
the waterway bed gradient.
The culvert cell area
The inside cell height

Part 4 – CONSTRUCTING NEW OR MODIFYING (INCLUDING MAINTENANCE AND REPLACEMENT) AN EXISTING WATERWAY BARRIER EXCEPT THOSE LISTED IN PARTS 2 AND 3

Note: If the development application involves more than one barrier relating to this part, please generate another part 4 and attach to the application.

17) What is the nature of the proposed work?	☐ Construction of a new barrier ☐ Maintenance of an existing barrier ☐ Replacement of an existing barrier	
18) Briefly describe the proposed barrier.		
19) If the barrier is temporary *(in place less than 12 months)* how many days will the barrier be in place?		
20) Will the barrier extend across the waterway from bank to bank?	☐ Yes, complete question 20.1 and 20.2 ☐ No	
20.1) What is the length of proposed barrier? *(across the waterway)*		metres
20.2) What is the width of the waterway? *(bank to bank)*		metres
21) What is the purpose of the proposed barrier?		
22) What is the maximum height of the proposed barrier above the existing bed level?		metres
23) What are the proposed construction materials? *(e.g. earth, concrete, rock fill, timber, sand)*		
24) Does the barrier follow the natural gradient of the bed level?	☐ Yes ☐ No	

Design Report for Operational Works for Port Douglas Estate, Craiglie – Stage 1A & 1B

Lot 2 on SR431

Q184103

Prepared for

Port Douglas Land Developments Pty Ltd

8 November 2019

Cardno

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Document History

Version	Effective Date	Description of Revision	Prepared by	Reviewed by
01	08 / 11 / 2019	Original Issue	Jarred Doyle	Maurice Sheehan

Table of Contents

Appendices

Tables

1 Introduction

1.1 The Purpose of this Design Report

This Design Report accompanies a Development Application for Operational Works for the Civil Subdivision Works for Port Douglas Estate – Stage 1A and 1B residential development Captain Cook Highway, Craiglie.

1.2 Location of the Site

The Port Douglas Estate – Stage 1A and 1B residential development site Lot 2 on SR431 in Craiglie.

The site is located to the east of the Captain Cook Highway, south of an existing residential subdivision on Millman Drive and north of Andreassen Road. Stage 1A and Stage 1B residential lots will be located to the north-west of the site, with the balance of the land to be further developed in the future.

1.3 Background

The site is currently used as farmland for sugarcane. Stages 1A & 1B are proposed to be developed with the majority of the balanced land to remain as farmland. A section to the north east will be filled with the cut material won from the works to bring the levels for future stages in the north east above the Q100 level.

1.4 Pre-Submission Discussions or Correspondence with Council

Discussions with Council regarding the proposed operational works and ROL Decision Notice have been undertaken, wherein the following matters were discussed:

Table 1-1 Pre-Submission Discussions or Correspondence with Council

Item	Description	Date
1	Cardno Request for Sewer and Water Network Models	19/03/2019
2	Cardno query re DSC preference for Packaged Pump Stations	20/03/2019
3	DSC supply of Information re DSC Water and Sewer network	20/03/2019
4	DSC supply of Further Information re DSC Water and Sewer network	24/03/2019
5	Cardno Request for Sewer and Water Network Models	26/03/2019
6	DSC supply of Information re DSC Water and Sewer network and referral to Stantec	02/04/2019
7	Cardno Advice re Wabul St Culverts	02/07/2019
8	DSC Request for Information re Wabul St Culverts	08/07/2019
9	Cardno Advice re Traffic Impact Assessment and Road Safety Audit	08/07/2019
10	Cardno Further Advice re Wabul St Culverts	15/07/2019
11	DSC Meeting Request re Wabul St Culverts	17/07/2019
12	DSC Meeting Acceptance re Wabul St Culverts	17/07/2019
13	Cardno Further Advice re Traffic Impact Assessment and Road Safety Audit	30/07/2019
14	Cardno Further Advice re Wabul St Culverts following Meeting	02/08/2019
15	Cardno follow up re Wabul St Culverts Advice	22/08/2019
16	DSC Prelim Advice re Wabul St Culverts	22/08/2019

See Appendix D for the full Correspondence with Council.

2 Development Approvals

2.1 Local Authority and Queensland State Government Development Approvals

A copy of the Decision Notice for Reconfiguration of a Lot dated 28th May 2019 (Council Ref: ROL 2966/2018) is provided in Appendix A.

A report addressing the ROL conditions and responses is located in Appendix B.

3 The Proposed Stages Civil Subdivision Works

3.1 General

Port Douglas Estate consists of 18 lots in State 1A and 14 lots in Stage 1B with the ultimate stage of the development consisting of 280 residential lots and a commercial lot.

Access to the site is from Wabul Street, Craiglie, with future connection to be made at the Captain Cook Highway north of Andreassen Road.

3.2 The Proposed Scope of the Civil Subdivision Works

The proposed scope of the Civil Subdivision Works is as follows:

- Site clearing only to the extend necessary to permit construction of the Civil Subdivision Works
- Stripping of topsoil from areas to be excavated or filled. Stockpiling topsoil for reuse.
- Cutting, filling and compaction of earthworks to the required levels.
- Construction of stormwater drainage pipes, pits, manholes and drains.
- Construction of water reticulation.
- Construction of sewer pipes, manholes and pump station.
- Installation of Telstra and Ergon Energy conduits and associated works.
- Modification of existing services including Sewer, Water, Stormwater, Telstra and Electrical.
- Construction of buffer mound, culvert crossing, road pavements, bituminous surfacing and concrete kerb and channel.
- Grassing and general landscaping.
- Channel Improvement work upstream and downstream of the proposed Wabul St Culvert Crossing
- Installation of erosion and sediment control works for the duration of the construction and maintenance period.

3.3 Operational Works Drawings

A set of Operational Works drawings for the proposed Civil Subdivision Works is provided at Appendix C of this report.

3.4 Operational Works Specification

The FNQROC specifications are proposed to be used for this project.

Additional specifications of the works are provided in the form of notes on the Operational Works drawings.

3.5 Compliance of Operational Works Design With Conditions of the Decision Notice

A completed Statement of Compliance – Operational Works Design is provided at Appendix E.

4 Adjoining Properties

4.1 Works on and Discharges to Adjoining Properties

- Drain north-west corner of site, drainage improvements inside TMR road reserve.
- Wabul St Road reconstruction to suit proposed culvert crossing road level.
- Watermain Upgrades at:
    - Beor St / Captain Cook Highway Intersection
    - Port Douglas Rd / Sanderling Close / Ribbon Avenue
- Sewer rising main in TMR reserve to Beor St / Captain Cook Highway Intersection

5 Geotechnical Investigation

5.1 Allotment Investigation and Acid Sulphate Soils

ETS have been engaged by Port Douglas Land Developments Pty Ltd to conduct a geotechnical investigation of the site. A copy of their report is attached in Appendix H.

The ROLrequested an Acid Sulphate Soils investigation. This has been undertaken by ETS with details regarding their findings included in the attached report. Acid Sulphate soils were not identified in the Geotechnical Investigations.

6 Flooding & Stormwater Drainage

6.1 Drainage Study

The ROL requires the preparation of a local drainage study of the site. The ROL sets out various requirements of the study and these have been addressed in the Flood Impact Assessment attached in Appendix F.

6.2 Stormwater Catchment Plan

A stormwater catchment plan for the existing catchments is included in the Operational Works Drawings in Appendix C.1.

6.3 Stormwater Drainage Calculations

Stormwater drainage calculations are presented in the Operational Works Drawings in Appendix C.1 and the Flood Impact Assessment in Appendix F.

7 Water & Sewerage Reticulation

7.1 Development Permit Conditions

The Council development permit requires the preparation of water supply and sewerage master plans of the development. This has been included in the Water and G.

7.2 Water Demand and Design Criteria

A Water and Sewer Network Analysis has been undertaken for the development. A copy of the network analysis results is included in Appendix G.

The FNQROC Regional Development Manual requirements for water demand and design criteria have been assessed based on the requirements outlined in the Water and Sewerage Services report in Appendix G

7.3 Existing and Proposed Water Works

Connection to the existing external water network for Stage 1A and Stage 1B will be made to the DN63 and DN100 pipes located at Wabul Street, north of the proposed development. The water reticulation network in Stages 1A and 1B will consist of DN100 and DN63 mains.

Hydrants and Valves will be installed as required in order to comply with FNQROC Regional Development Manual.

Two augmentations to the existing external network will be required during the development of Stages 1A and 1B to maintain the residual pressure and fire flow requirements. These augmentations include:

- A short DN150 augmentation (nominated CW_295 in the attached Water and Sewerage Services report) is recommended at Beor Street / Captain Cook Highway to improve the flow to the industrial area (west of the Captain Cook Highway and north-west of the development site). The upgrades required are nominated in Appendix C.2, Dwg Q184103-CI-008
- A sixty-three meter (63m) long DN100 augmentation (nominated CW_609 in the attached Water and Sewerage Services report) is recommended to improve the fire flow pressure in the area around Sanderling Close, south of Port Douglas Road (north-west of the development site). The upgrades required are nominated in Appendix C.2, Dwg Q184103-CI-009

For the future development, once a total of 209 lots have been constructed, a second water connection will be made to the DN150 main running on the western side of the Captain Cook Highway.

7.4 Sewerage Generation

The FNQROC Regional Development Manual requires that the Average Dry Weather Flow (ADWF) of sewerage to be calculated using an allowance of 270 litres per EP per day.

The average numbers of Equivalent Persons (EP) per Equivalent Domestic Connection (EDC) for residential lots is 2.8 for lot sizes between 401 and 900 m^2.

On the above basis the average dry weather flow (ADWF) and peak wet weather flow (PWWF) of sewage likely to be generated by the proposed development when completed is as follows:

- 32 lots
- 2.8 EP per lot (Area 401- 900m^2)
- Population = 89.6 EP for the development
- ADWF = 24,192 Litres per day (0.28 L/s), where ADWF = 270 litres per EP per day
- $C_1 = 7.34$, where $C_1 = 15 \times (EP)^{-0.1587}$
- PWWF = 177,569 Litres per day (2.06 L/s), at C1 x ADWF

See the Water and Sewer Network Report included in Appendix G for detailed information.

7.5 Internal Sewerage Reticulation and Connection to Existing Network

The sewerage generated from the development area will flow via a gravity network to a sewerage pump station located within the Stage 1A and 1B development area. The sewerage will then be pumped into the existing DN300 rising main at the Beor Street / Captain Cook Highway Intersection

A DN150 rising main is recommended to maintain reasonable pumping head which varies between 10.7m and 65.8m depending on whether other external existing pumps are running or not. Hence, a variable frequency drive pumps are preferred.

8 Road Safety Assessment

8.1 Development Permit Conditions

The ROL requires the preparation of a Road Safety Audit and Traffic Impact Assessment for the Millman Drive and Wabul Drive road link extending from the proposed new southern drain crossing to, and including, the intersection with the Captain Cook Highway. These have been included as Appendices I (Road Safety Audit) and J (Traffic Impact Assessment).

The Traffic Impact Assessment determined:

- The proposed internal road network for Stage 1A and 1B meets the requirements of the FNQROC for the catchment sizes and road hierarchy classifications.
- The external road network utilised by the development (Milman Drive) is classified as a minor collector with a maximum catchment size of 300 lots as outlined in the FNQROC. When the Stage 1 development is constructed, Milman Drive will provide access for 94 lots which is within the maximum catchment size.
- However, when the ultimate development of 282 lots is developed, Milman Drive will provide access to 344 lots which exceeds the maximum catchment size for a Minor Collector
- As it is unlikely that Milman Drive can be upgraded to a higher order road, it is recommended that the southern Andreassen Drive access is constructed to alleviate the demand on Milman Drive and subsequently the Captain Cook Highway / Milman Drive intersection. These works are recommended to be undertaken prior to the construction of 238 lots in the ultimate design.

There are 22 existing issues noted in Table 4-2 the Road Safety Audit. The majority of these are minor in nature.

Issue #21 indicated the street lighting at the Beor St Intersection should be reviewed. SPA have undertaken a further lighting assessment and have prepared a report included in Appendix K.

SPA have recommended a new OPTISPAN MKII 250W HPS Aeroscreen on a 10.5m steel base mounted pole with a 4.5m outreach be installed on the south eastern corner of the Beor St & Captain Cook Highway intersection.

9 Electrical Design

SPA Consulting Engineers have undertaken the Electrical Design of the Works. The Design Drawings are attached in Appendix C.3.

10 Landscape Design

10.1 Landscape Design Drawings

A Landscaping Design Plan for the proposed subdivision has been completed and is attached in Appendix C.4.

11 Erosion & Sediment Control Strategy

11.1 Erosion and Sediment Control Strategy Plan

An erosion and sediment control strategy plan is included in the Operational Works Drawings, Appendix C.1.

It is intended that the future Contractor's Environmental Management Plan will incorporate the sediment control strategy plan and that the erosion and sediment control strategies will be implemented during the construction of the works.

11.2 Erosion and Sediment Control Strategy During Construction

The following erosion and sediment control strategies during construction of the Civil Subdivision Works are proposed:

- The areas of the site which are not to be subject to disturbance by excavation, filling or stockpiling of excavated material and access requirements are to remain undisturbed.
- Silt fences will be provided at any location at which runoff from disturbed terrain could discharge toward the site boundary.
- Sediment control devices will be installed at stormwater pits.
- Footpaths will have final trim and kerb line turf strips will be installed as soon as practicable.

12 Other Preliminaries

12.1 Portable Long Service Leave Levy

Port Douglas Land Developments Pty Ltd acknowledges that the Portable Long Service Leave Levy must be paid prior to issue of a development permit for operational works.

12.2 Negotiations Entered into with Ergon and Telstra

Negotiations with Ergon and Telstra have been entered into for the Estate. Further negotiations and formal applications will be required with these authorities to provide final design requirements in due course.

The NBN Agreement is attached. The Communications Drawings are provided in Appendix C.3.

An Ergon Agreement will be forwarded following Ergon review and acceptance of the Design Drawings provided in Appendix C.3.

APPENDIX

A

DEVELOPMENT APPLICATION DECISION NOTICE - ROL

APPENDIX B

REPORT ADDRESSING ROL CONDITIONS

APPENDIX C

OPERATIONAL WORKS DRAWINGS

APPENDIX	CONSULTANT	PROJECT WORKS
C.1	**Cardno**	**Civil Works**
C.2	**Cardno**	**Trunk Infrastructure**
C.3	**SPA**	**Electrical**
C.4	**LandPlan**	**Landscaping**

Appendix C.1
Civil Works

Appendix C.2
Trunk Infrastructure

Appendix C.3
Electrical

Appendix C.4
Landscaping

APPENDIX

D

CORRESPONDENCE WITH DOUGLAS SHIRE COUNCIL

APPENDIX

E

STATEMENT OF COMPLIANCE & OPERATIONAL WORKS CHECKLIST

APPENDIX

F

FLOOD IMPACT ASSESSMENT

APPENDIX

G

WATER AND SEWER NETWORK ANALYSIS

APPENDIX

H

GEOTECHNICAL INVESTIGATION REPORT

APPENDIX

I

ROAD SAFETY AUDIT

APPENDIX

J

TRAFFIC IMPACT ASSESSMENT

APPENDIX

K

ELECTRICAL REPORT

APPENDIX

L

UTILITY SERVICE AGREEMENTS

APPENDIX

M

SARA – PRE LODGEMENT ADVICE

APPENDIX

N

ADJACENT LANDOWNERS PERMISSIONS

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

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Report Addressing ROL Conditions

Title	**Craiglie Subdivision – Stage 1A and 1B**		
Client	Port Douglas Land Developments Pty Ltd	**Project No**	Q184103
Date	06/09/2019	**Version**	01
Author	Jarred Doyle	**Title**	Civil Engineer
Reviewer	Maurice Sheehan	**Title**	Senior Civil Engineer

Assessment Manager Conditions

1. Carry out the approved development generally in accordance with the approved drawing(s) and/or document(s), and in accordance with:
    a. The specifications, facts and circumstances as set out in the application submitted to Council; and
    b. The following conditions of approval and the requirements of Council's Planning Scheme and the FNQROC Development Manual.

    Except where modified by these conditions of approval

    This Operational Works Submission is Generally in Accordance with the above.

Timing of Effect

2. The conditions of the Development Permit must be effected prior to the approval of the Plan of Survey, except where specified otherwise in these conditions of approval.

    Noted.

Lot Layout

3. The lot layout plan must be revised and provided to the satisfaction of the Chief Executive Officer prior to the lodgement of the application for operational work, generally in accordance with the Cardno Plan No. Q184103-MP02A, dated 18 December 2018, and amended to detail:

    a. All residential lots to have a minimum site area of 600m2, a minimum road frontage of 15 metres and to be able to contain a rectangle of minimum dimensions 20 metres x 15 metres;

        Done

    b. Replace the 'Park" at the rear of proposed Lots 16 to 20 with the description "Drainage Reserve";

        Done

    c. Extend the road in Stage 1 B, adjacent to proposed lots 19 and 20, to the new Drainage Reserve (as outlined under condition part b above) and include a ramped profile to enable suitable access by Council vehicles to service the drainage reserve; and

        Access crossover provided at the end of road adjacent to lots 19 and 20.

    d. Provide a ramp access and vehicle access gate to the east of the new road for access to the existing drainage easement.

        S9010 Park access gate provided at the edge of the drainage reserve and earthworks graded to allow vehicular access.

The lot yield may change as a result of the above requirements.

Filling Lots

4. Each lot must be filled to achieve a Q100 plus hydraulic modelling flood immunity and storm tide inundation (having regard to sea level rise for the year 2100).

   Done.

Developer Credits for the Construction of Trunk Infrastructure

5. The Infrastructure Agreement must detail the circumstances on which the monies will be reimbursed or alternatively the agreed costs of the infrastructure can be claimed against applicable adopted charges generated by the development. For any residual monies owed after the completion of the development, the Infrastructure Agreement must detail the circumstances on which the monies will be reimbursed and the timing of any such reimbursement.

   The cost of constructing Trunk Infrastructure, as identified under Council's Local Government Infrastructure Plan (LGIP) must be agreed to by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works to construct the infrastructure.

   The developer proposes to issue a draft Infrastructure Agreement to Council for review following receipt of tender pricing.

Road Safety Assessment

6. Provide a Road Safety Assessment by an accredited Road Safety Auditor for the Milman Drive and Wabul Drive road link extending from the proposed new southern drain crossing through to, and including, the intersection with the Captain Cook Highway.

   The intersection analysis for the Captain Cook Highway/Milman Drive intersection is to be undertaken in an approved modelling package (SIDRA or equivalent). All upgrades identified in the Road Safety Audit or the intersection analysis will need to be identified in engineering design plans and associated reports.

   a. Where the intersection analysis demonstrates that the additional Stage 1 lots create an unacceptable level of service for the intersection operation, the applicant must identify and provide the upgrades necessary to ensure the intersection operates with an acceptable level of service.

      The plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works. The agreed traffic improvement works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

      There is to be no cost to Council for these associated works.

   And

   b. Where the intersection analysis demonstrates there is a component of existing use that contributes to an unacceptable standard of service, then the applicant must obtain an agreement in writing from the Department of Main Roads and Council regarding the timing, costs and responsibility for the necessary works. All works are to be at no cost to Council. The agreement must be to the satisfaction of the Chief Executive Officer and achieved prior to the lodgement of the application for operational work for the subdivision.

   A Road Safety Audit has been undertaken and is included in Appendix I of the Design Report for Operational Works.

   A Traffic Impact Assessment has also been undertaken and is included in Appendix J of the Design Report for Operational Works.

   The Road Safety Audit outlines various existing road safety issues. See Table 4-2 of the Road Safety Audit. The majority of these issues are minor in nature and are unrelated to the proposed

development. Item 21 related to the Lighting Assessment at the Beor St / Captain Cook Highway Intersection has been reviewed and Addressed by The Electrical Consultants, SPA. See Appendix K of the Design Report for Operational Works.

Acid Sulfate Soils

7. Undertake an Acid Sulfate Soil investigation in the area to be affected by this development. Soil sampling and analysis must be undertaken in accordance with procedures specified in, 'Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland' (1998) or updated version of document produced by the Department of Natural Resources, Mines and Energy (Previously DNRW - QASSIT), and State Planning Policy 2/02 - 'Planning and Managing Development involving Acid Sulfate Soils'. The results of this investigation must be submitted to Council for approval prior to any earthworks or clearing being commenced on the site.

   Identification of soils with a pyrite content in excess of the action levels nominated in the latest version of DNRME - QASSIT: 'Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland' (1998) will trigger the requirement for preparation of an Acid Sulfate Soil Environmental Management Plan in accordance with the most recent requirements of the DNRME: 'Queensland Acid Sulfate Soil Technical Manual' (2002) including Soil Management Guidelines (updated Feb. 2003) which must be prepared to the satisfaction of the Chief Executive Officer and form part of the application for a Development Permit for Operational Work.

   A Preliminary Acid Sulfate Soils Assessment has been undertaken by ETS Geotechnical for the site. The findings are detailed in Appendix H of the Design Report for Operational Works Document. Refer Section 7.5 of the ETS Report, Appendix H.

   Based on the results of the Preliminary ASS assessment, an Acid Sulphate Soil Management Plan is not required for the earthworks associated with this project.

Water Supply and Sewerage Master Plan

8. Individual Master Plans for the provision of Water Supply and Sewerage for the development must be prepared and accompanied by supporting calculations to demonstrates how the development can be serviced.

   The Development Application for Operational Work must include these Master Plans with supporting information (including Hydraulic Network Analysis) to demonstrate how Stage 1 and the ultimate development will be connected to and serviced by Council's Infrastructure.

   In particular:

   a. For sewerage the sizing, location and services corridor is to be identified for the new sewage pump station and the pressure main. The pressure main is to be connected to Council's system at a location where sufficient capacity exists. The applicant is to meet with Council's Sewerage Officers to confirm known capacity issues and determine a suitable point of connection. The Master Plan must document the considerations on the selection of the connection point, pressure main corridor and any relevant inputs from Council Officers, (this should include Minutes of Meetings and formal correspondence at a minimum);

   Appendix G of the Design Report for Operational Works Document contains the Water and Sewer Network analysis report.

   The Upgrades proposed are documented in Appendix C.2 – Trunk Infrastructure.

   The Report recommends the construction of a new pump station and approx. 720m of rising main to discharge to an existing 300mm gravity Sewer Main on the NE side of the Beor St / Captain Cook Highway Intersection.

   b. The location of the pump station is to be confirmed with detailed design to maximise the separation distance from existing and proposed residences. The FNQROC separation distances are to be achieved and may require the future drainage corridor to be considered to optimise the separation available to existing development, Stage 1 lots and future proposed lots. The supporting information must include plans showing the

separation distances achieved to the nearest lots for the above development locations; and

The pump station location has been determined based on FNQROC separation distances. The proposed location is detailed in Operational Works Drawings provided in Appendix C.2 of the Design Report for Operational Works Document.

c. The Water Supply must include a new main along the Captain Cook Highway and not rely on water supply from the adjacent development to the north, (Wabul Drive). Suitable valving and connectivity is to be provided to the existing system to enable proper operation and management of the water network, however, the development must obtain water connection external to the adjoining estate at a point where sufficient capacity exists.

Appendix G of the Design Report for Operational Works Document contains the Water and Sewer Network Analysis report which details the proposed connection point for Stage 1.

There are two watermain upgrades required to service Stage 1 lots generally described as follows:

- Provision of a new DN100 Watermain Connection at Sanderling Close
  (See Appendix C.2, Dwg Q184103-CI-009)
- Provision of a new DN 150 Watermain Connection at Beor St / Captain Cook Highway Intersection
  (See Appendix C.2, Dwg Q184103-CI-008)

In addition, the Master Plans must identify how water supply and sewerage infrastructure capacity will be provided in an orderly and sequential manner having regard to the overall development size and demands. The Master Plans must set out the proposed infrastructure delivery matched to the timing and staging of the development.

In the event that the Master Plan identifies upgrades to the existing Council infrastructure to service the ultimate development, the Master Plan must detail any interim servicing arrangements for the development and identify thresholds (lot yield and timing) associated with those interim and ultimate servicing arrangements.

The Master Plans must also identify any external catchments that will be connected to and/or serviced by the internal water supply and sewer networks.

The plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Su *Ney* Plan with Council for endorsement.

No further sewer rising main or pump station upgrades are required to service the future stages of the development.

For the ultimate state, as further stages are developed, a further watermain connection will be required to existing DN150 main running on Captain Cook Highway in the vicinity of the Andreasson Road Intersection. This second connection will be required when the development EP exceeds 585 EP (209 lots).

Water Supply and Sewerage Infrastructure Plan

9. Water supply and sewerage infrastructure plans for Stage 1 with supporting information including hydraulic network analysis must· be submitted demonstrating how the development will be serviced by Council's Infrastructure. In particular the plan must:

   a. Identify external catchments that will be connected to the internal sewer or water networks; and
   b. Identify any trunk infrastructure external to the subdivision that may require upgrading to accommodate the development.

The water supply and sewerage infrastructure plan must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

As described in the responses to the "Water Supply and Sewerage Master Plan" conditions above.

The Upgrades proposed are documented in Appendix C.2 – Trunk Infrastructure.

Water Supply and Sewerage Works

10. The extent of Water Supply and Sewerage Works external to the site to connect the site to existing water supply and sewerage infrastructure will be determined by the Master Plans to be prepared for consideration and approval by Council. The following minimum infrastructure elements are required:

    a. Extend the water main from the existing services at the corner of Milman Drive and the Captain Cook Highway so that each allotment can be provided with a water service connection to the lot frontage and the trunk main extension is sufficient for the further development of the whole of the balance land (estimated as a total of 300 residential lots) for Lot 2 on SR 431;

    b. Provide an appropriate pump station, generally in the indicative location on the balance lot as per the Applicant's submission to Council on the 12 · April 2019 (Council document reference ID 898733, ensuring such location meets at least the minimum separating distance from residential lots (as required under FNQROC standard) and is sufficiently accompanied by a paved concrete access and pad area for inspection and seNicing by Council vehicles, including a crane);

    c. Provide district meters at locations nominated by Council; and

    d. Provide a single internal water and sewer connection to each lot in accordance with the FNQROC Development Manual.

Refer the Operational Works Drawing provided in Appendix C.1 and C.2 of the Design Report for the upgrades required to service the development.

Construction of the sewerage pump station will require full design drawings and a commissioning plan in accordance with FNQROC Development Manual submitted with the plan of works and will be subject to compliance with the Council's Purchasing Policy for competitive tendering.

Three (3) copies of a plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

Noted

Inspection of Sewers and Stormwater

11. CCTV inspections of all constructed sewers and stormwater piped systems must be undertaken for all infrastructure that will become an asset of Council. An assessment of the CCTV records will be undertaken and any identified defects are to be rectified to the satisfaction of the Chief Executive Officer at no cost to Council.

Noted

General External Works

12. Undertake the following external works:

    a. Provide a full detail design and costing for the proposed culvert crossing, as detailed in Council's Local Government infrastructure plan (LGIP). The culvert size, alignment within the drainage corridor and height of the road surface above are to be confirmed with

Council and supported by updated stormwater modelling prior to the lodgement of the application for Operational Works;

b. Construct the culvert crossing connecting to the existing road alignment in the neighbouring residential estate; and

c. For Milman Drive/Wabul Drive link, provide a full detail design complete with costing and undertake the upgrades identified for the road system and intersection in accordance with the findings of the Road Safety Audit and Intersection Analysis.

Three (3) copies of a plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

All works must be carried out to the satisfaction of the Chief Executive Officer prior to the lodgement of the Survey Plan with Council for endorsement.

Refer the Operational Works Drawing provided in Appendix C.1 the Design Report for the upgrades required to service the development.

No upgrades to the Milman Drive/Wabul Drive link were identified in the Road Safety Audit / Traffic Impact Assessment provided in Appendix I & J of the Design Report.

Further Drainage Study

13. The applicant is to update the stormwater modelling and reporting in accordance with the following requirements:

    a. Provide further information on the model input parameters for review by its external stormwater reviewers;
    b. Provide a further assessment of the check flow assessed using the rational method based on alternative time of concentration methods and provide commentary on any variance between the methods;
    c. Undertake a sensitivity analysis for the peak flows in the model based on the upper bound assessment from the above check (or 15% increase in peak flows whichever is the greater). Note the assessment of peak flow rates is to enable assessment of the implications for the drain and culvert (and the flood level relative to existing housing);
    d. It is unclear how the ground levels for the existing lots have been entered into the flood model and whether the current model set up excludes flow from entering existing lots. In order to properly understand the proposed drain and culverts operation and impacts, cross sections of the drain profile at regular intervals upstream and downstream from the culverts are required. The sections should show:
        i. the proposed drain profile, including the need for a finish to stabilise the drain banks, such as rock lining;
        ii. existing lot levels on the north side and proposed development levels on the south;
        iii. the modelled peak flood level for the 5, 10- and 100-year ARI events, and
        iv. the resulting freeboard;
    e. In addition to the colour coding of the flood modelling outputs, flood levels are to be reported with 100mm contours or spot levels at maximum 50m intervals. This requirement is only for the 1 % AEP model outputs but applies to both the existing and developed cases; and
    f. The proposed culvert design concept is not supported as there is no capacity for overtopping within the drainage corridor. The flood modelling is to be revised for a culvert concept that has a road surface level a minimum of 250mm below the existing road level on the northern side.

       Any ramping of the road levels is to occur outside the alignment of the drainage corridor. Modelling of the blockage scenarios is to be confirmed.

       Because the culvert will not be able to achieve significant overtopping capacity, the modelling and reporting needs to clearly address blockage scenarios, sensitivity analysis and assessments of the severe storm impact as set out in QUDM Sections 7.23, &.24 and &.25.

The updated flood model and report together with an amended culvert design must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works. All works must be carried out in accordance with the approved plan prior to the lodgement of the Survey Plan with Council for endorsement.

The Flood Impact Assessment is provided in Appendix F of the Design Report. Previous Correspondence with Council regarding the Options Analysis of the Culvert Crossing is included in the Flood Impact Assessment.

Drainage Construction

14. The applicant / owner must undertake the development of the land in accordance with the findings of the updated Drainage Study.

    Associated earthworks and landscaping must be completed in accordance with the approved plans prior to the lodgement of the Survey Plan with Council for endorsement.

    Noted

Reserves Over Drain

15. A Drainage Reserve containing all land below the top of the high bank and the area of additional drainage reserve (as outlined in Condition 3 above) adjacent to the top of the bank or the limit of the Q100 ARI event, whichever is the greater must be transferred to the Crown for Drainage Purposes. The land (reserve) must be transferred in conjunction with registration of the Plan of Survey for any lot release under Stage 1 B. The existing drainage easement, over the part of the stormwater drain that is to be within the new Drainage Reserve, is to be rescinded at no cost to Council.

    Noted

Southern Diversion Drain

16. Where drainage channel improvements are identified in the flood study and or as a result of performance issues identified with the current drain, these works are to be identified on engineering drawings and included in the application for Operational Works.

    Existing scouring\ring of the drain batters and banks is to be investigated and advice is to be provided on the soil type, lining and upgrades necessary to address the long-term stability of the channel. It is expected that a revised flatter batter profile will need to be considered. Information on the selected batter profile, lining type or vegetation stabilisation and soil types together with advice on the stream flow velocities will be required to support the proposed drain design.

    Access ramps suitable for maintenance plant and equipment are to be provided on each side of the culvert structure to enable maintenance access the drain and culverts.

    A plan of the drain improvement works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

    All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

    Refer the Operational Works Drawing provided in Appendix C.1 the Design Report for the upgrades required to the existing Diversion Drain.

    Further upgrades are proposed to the existing TMR drain downstream of the existing 5 x 1.5m x 1m RCBCs crossing the Captain Cook Highway to the west of the proposed Wabul St Culvert Crossing. These upgrades are also described on the drawings.

Lawful Point of Discharge

17. All stormwater from the property must be directed to a lawful point of discharge such that it does not adversely affect surrounding properties or properties downstream from the development to the requirements and satisfaction of the Chief Executive Officer.

    Noted

Plan of Drainage Works

18. The subject land must be drained to the satisfaction of the Chief Executive Officer. In particular,

    a. Drainage infrastructure in accordance with the FNQROC Development Manual
    b. The drainage system from the development must incorporate a gross pollutant trap(s) or equivalent measure(s), meeting the following Council specifications for stormwater quality improvement devices (SQID), namely:
        i. End-of-line- stormwater quality improvement devices (SQID) shall be of a proprietary design and construction and shall carry manufacturer's performance guarantees as to removal of foreign matter from stormwater and structural adequacy of the unit.
        ii. SQIDs shall remove at least ninety-five per cent of all foreign matter with a minimum dimension of three (3) mm and shall be configured to prevent re-injection of captured contaminants. The SQID treat all first flush runoff, which shall be defined as that volume of water equivalent to the runoff from the three (3) month ARI storm event. The location of SQIDs within the drainage system shall be planned to ensure that the first flush waters from all parts of the (developed) catchment are treated.
        iii. The design of the SQID shall not compromise the hydraulic performance of the overall drainage system.
        iv. SQIDs shall be positioned so as to provide appropriate access for maintenance equipment.
    c. All new allotments shall have immunity from flooding associated with an ARI 100 year rainfall event; and
    d. Where practical, all new allotments must be drained to the road frontages, drainage easements or drainage reserves and discharged to the existing drainage system via storm water quality device(s).

Refer the Operational Works Drawing provided in Appendix C.1 the Design Report for the proposed underground stormwater Network for Stage 1 works.

Two gross pollutant traps are proposed. One is located on the upstream side of the Wabul St Culvert crossing at the end of Stormwater Line 16. The second is located to the north of the proposed Sewer Pump Station at the end of Line 1.

Due to the low level of the Wabul St Crossing the Kerb Inlet Pits located on the southern side of the crossing will not outlet to Gross Pollutant Traps.

Sediment and Erosion Control

19. A sediment and erosion control plan must be submitted prior the issue of a Development Permit for Operational Works. Such plans must be installed *I* implemented prior to discharge of waterfrom the site, such that no external stormwater flow from the site adversely affects surrounding or downstream properties (in accordance with the requirements of the *Environmental Protection Act 1994*, and the FNQROC Development Manual).

    An Erosion and Sediment Control Strategy has been prepared. Refer the Operational Works Drawing provided in Appendix C.1 the Design Report for the proposed underground stormwater Network for Stage 1 works.

Landscape Plan and Provision of Park

20. Undertake landscaping of the site, including the Park, and street frontages of new roads in accordance with *FNQROC Development Manual* and in accordance with a landscape plan. The landscape plan must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Work. In particular, the plan must show:

    a. Planting of the footpath with trees, using appropriate species with consideration to be given to creating an individual sense of place and character to the estate;
    b. Provision of an earth mound, landscaping and appropriate fencin·g along the western boundary;
    c. The provision of suitable shade trees, especially in parks;
    d. Species to have regard to the Planning Scheme Policy No.SC6.7 Landscaping;
    e. Park and road verges to be seeded and grassed; and
    f. Bollards around the perimeter to prevent vehicle access with the exception of gates that enables Council vehicle access.

    Permanent irrigation or any other embellishments are not permitted.

    Inclusion of all requirements as detailed in other relevant conditions included in this Approval, with a copy of this Development Approval to be given to the applicant's Landscape Architect/ Designer.

    The applicant is to provide park in accordance with the approved plan in Stage 1 B. This area of park must be to the requirements and satisfaction of the Chief Executive Officer. The land and embellishments must be established at no cost to Council. The land must be transferred at the same time as registering the Plan of Survey for any lot for Stage 1 B with the Department of Natural Resources and Mines.

    Two (2) A 1 copies and one (1) A3 copy of the landscape plan must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works. Areas to be landscaped must be established prior to the lodgement of the Survey Plan with Council for endorsement and must be maintained for the duration of the on-maintenance period to the satisfaction of the Chief Executive Officer.

    Landscaping plans have been prepared. Refer the Operational Works Drawings provided in Appendix C.4 of the Design Report.

Electricity Supply

21. Written evidence from Ergon Energy advising if distribution substation/s are required within the development must be provided. If required, details regarding the location of these facilities must be submitted to the Chief Executive Officer accompanied by written confirmation from Ergon Energy. Details regarding electricity supply must be provided prior to the issue of a Development Permit for Operational Works.

    An Ergon Substation and easement is to be provided between Lot 15 and the Park area.

Electricity and Telecommunications

22. Written evidence of negotiations with Ergon Energy and the telecommunication authority must be submitted to Council stating that both an underground electricity supply and telecommunications service will be provided to the development prior to the lodgement of the Survey Plan with Council for endorsement.

    These agreements are included in Appendix L of the Design Report.

Street Lighting

23. The following arrangements for the installation of street lighting within the proposed subdivision must be provided prior to the lodgement of the Plan of Survey for signing and dating:

    a. Prior to the approval and dating of the Plan of Survey, a Rate 2 lighting scheme is to be prepared by Ergon Energy or its approved consultant and submitted to the Chief

Executive Officer for approval. The Rate 2 lighting scheme is to be designed in accordance with the relevant Road Lighting Standard AS/NZS 1158 and the FNQROC Development Manual. The applicable lighting category is to be determined from the Road Hierarchy Table D1 .1and the corresponding applicable Lighting Categories Table D8.1 as identified in the FNQROC Development Manual.

The design must provide the applicable illumination level specified in the Road Lighting Standard AS/NZS 1158 at the following road elements:

i. Intersections;
ii. Pedestrian Refuges;
iii. Cul-de~sacs; and
iv. LATM Devices (Including Roundabouts)

LATM Devices are to be shown on the civil layout design, the electrical services and street lighting design must be submitted in accordance with Ergon Energy's latest Distribution Design Drafting Standard;

b. Prior to the lodgement of the Survey Plan with Council for endorsement written confirmation that the relevant capital contribution required by Ergon Energy has been paid must be submitted, to ensure that the street lighting will be constructed;

c. Where a new intersection is formed on an existing roadway for the purpose of accessing a new subdivision development, the intersection and existing road approaches must be provided with street lighting for a distance equivalent to at least two (2) spans either side of the intersection to the relevant Lighting Category; and

d. Where an existing intersection is required to be upgraded as part of a development approval, the intersection and existing road approaches must be. provided with street lighting for a distance equivalent to at least two (2) spans either side of the intersection to the relevant Lighting Category.

Refer the Operational Works Drawings provided in Appendix C.3 for the Electrical and Communications Upgrades.

Stock Piling and Transportation of Fill Material

24. Soil used for filling or spoil from the excavation is not to be stockpiled in locations that can be viewed from adjoining premises or a road frontage for any longer than one (1) month from the commencement of works unless the mounded earth is grassed, maintained and does not detrimentally impact on stormwater. A drainage plan demonstrating the sufficiency for stormwater approved by an RPEQ must be provided to the satisfaction of the Chief Executive Officer where filling or spoil is stockpiled for more than one (1) month. Transportation of fill or spoil to and from the site must not occur within:

    a. peak traffic times; or
    b. before 7:00 am or after 6:00 pm Monday to Friday; or
    c. before 7:00 am or after 1 :00 pm Saturdays; or
    d. on Sundays or Public Holidays.

    Cut material from Stage 1 will be placed in the north-eastern area of the lot. The future stages need considerable fill to bring them above the Q100 levels.

    Designated fill areas have been identified in the Hydraulic Modelling as not having any impact on the Q100 overland flow paths. These areas will be filled to the level required for a future north-eastern stage of the development. These areas are shown on drawing Q184103-CI-1101.

25. Dust emissions or other air pollutants must not extend beyond the boundary of the site and cause a nuisance to surrounding properties.

    Noted

Storage of Machinery and Plant

26. The storage of any machinery, material and vehicles must not cause a nuisance to surrounding properties, to the satisfaction of the Chief Executive Officer.

Noted

Construction Access

27. Vehicular access to the site for construction purposes of the reconfiguration of a lot approval must only be provided from Andreassen Road unless authorised by the Chief Executive Officer.

Noted

Fencing

28. Lots backing the Drainage Reserve (as required under Condition 3 above) are to be fenced to the satisfaction of the Chief Executive Officer.

Noted

Fencing and continued agricultural use of balance land.

29. a. Where the continued agricultural use of the balance land abuts new lots, the lots adjacent to this activity must be provided with a standard timber paling fence of 1.8 metres (approximate) height together with a grassed setback of a further 20 metres (minimum) beyond the fencing.

    b. Where the continued agricultural use of the balance of the land occurs adjacent to the existing of Wabul Street a grassed buffer separation of 20 metres (minimum is to be provide on the balance land, beyond the road). Works occurring in this buffer area may include trunk infrastructure.

Noted

Damage to Council Infrastructure

30. In the event that any part of Council's existing sewer/ water or road infrastructure is damaged as a result of construction activities occurring on the site, including, but not limited to, mobilisation of heavy construction equipment, stripping and grubbing, the applicant/owner must notify Council immediately of the affected infrastructure and have it repaired or replaced at the developer's/owner's/builder's cost prior to the lodgement of the Survey Plan with Council for endorsement.

Noted

DOUGLAS
SHIRE COUNCIL

PO Box 723 Mossman Qld 4873
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ABN 71 241 237 800

28 May 2019

Administration Office
64 - 66 Front St Mossman
P 07 4099 9444
F 07 4098 2902

Enquiries: Jenny Elphinstone
Our Ref: ROL 2966/2018 (Doc ID 903690)
Your Ref: Q184103

Port Douglas Land Developments Pty Ltd
C/ Cardno (Qld) Pty Ltd
PO Box 1619
PARRAMATTA PARK QLD 4870

Attention Mr Daniel Favier

Dear Sir

DEVELOPMENT APPLICATION ROL 2966/2018
STAGES 1A AND 1B
LOT 2 CAPTAIN COOK HIGHWAY CRAIGLIE
DEVELOPMENT ON LOT 2 SR 431
DECISION NOTICE

Decision

Council refers to the above Development Application that was properly made on the 16 January 2019 pursuant to section 51(5) of the *Planning Act 2016*. Council determined the application at the ordinary meeting held on Tuesday 28 May 2019.

Please find attached the Decision Notice for the above-mentioned development application.

Future Development of Balance Lot

Council also provides the following separate advice regarding the future development of the balance area of the land, as depicted in the Master Plan Port Douglas Estate, Captain Cook Highway, Craiglie, prepared by Cardno Plan Q184103-MP01B dated 5 April 2019, as follows:

1. The Planning Scheme supports appropriate residential development of the remaining balance of the land;

2. Council anticipates further development of the balance of the land is complimented by: the upgrade of the intersection of the Captain Cook Highway and Andreassen Road; the construction of an internal, connecting road; and an appropriate sound mound and landscaping to ensure the visual amenity of the Highway and the entrance to Port Douglas and Craiglie is of a high standard; and

3. The future development of the balance lot must consider and have due regard to projected storm tide inundation and coastal erosion for the year 2100. To this extent the applicant is encourage to seek particular expertise in this matter.

Other

Please quote Council's application number: ROL 2966/2018 in all subsequent correspondence relating to this development application. Should you require any clarification regarding this, please contact Jenny Elphinstone on 07 4099 9482.

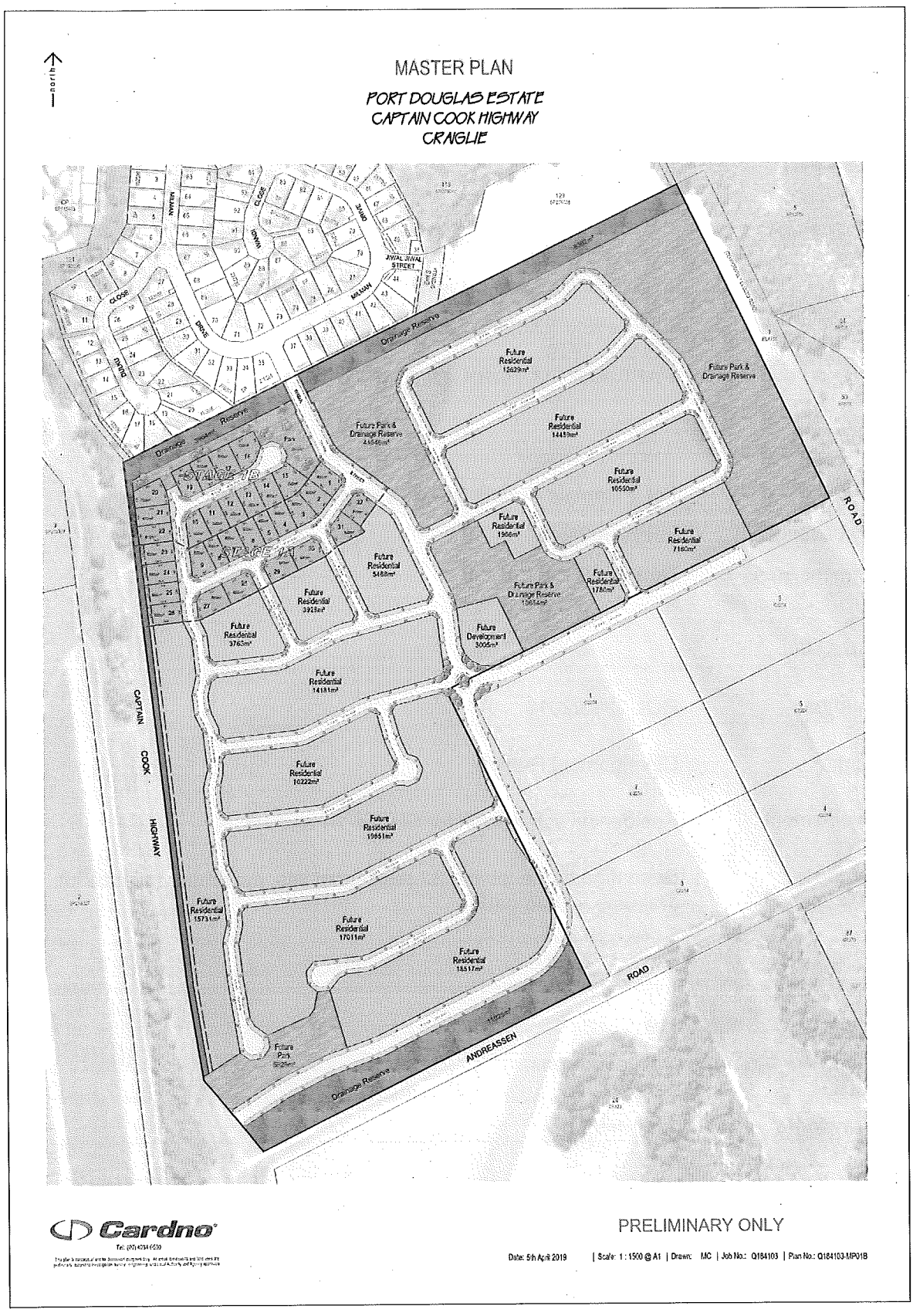
Yours faithfully

PAUL HOYE
Manager Environment and Planning

encl.

- Proposed Master Plan: Cardno Plan Q184103-MP01B dated 5 April 2019.
- Decision Notice
- Approved Plans
- Adopted Infrastructure Charges Notice
- Advice For Making Representations and Appeals

Proposed Master Plan



DOUGLAS SHIRE COUNCIL
DECISION NOTICE —
APPROVAL (WITH CONDITIONS)
(GIVEN UNDER SECTION 63 OF *THE PLANNING ACT 2016*)

Council refers to your development application detailed below which was properly made on the 16 January 2019. Please be aware that Douglas Shire Council has assessed your application and decided it as follows.

Application's details

Name:	Port Douglas Land Developments Pty Ltd
Postal Address:	C/o Cardno (Qld) Pty Ltd PO Box 1619 PARRAMATTA PARK QLD 4870

Location details

Street address:	Lot 2 Captain Cook Highway Craiglie
Real property description:	Lot 2 on SR431
Local Government Area	Douglas Shire Council

Application details

Application number:	ROL 2966/2018
Approval sought:	Development Permit
Nature of development proposed:	Residential subdivision for Stages 1A and 1B.
Description of the development proposed:	Reconfigure one lot into 32 residential lots, new road, balance lot, drainage lot and park.

Decision

Date of decision:	28 May 2019
Decision details:	Approved with conditions.

Approved drawing(s) and /or document(s)

Approved Drawing(s) and / or Document(s) as to be amended by Condition 3 of the Assessment Manager's conditions. Copies of the following plans, specifications and/or drawings are enclosed in Schedule 2.

The term 'approved drawing(s) and / or document(s)' or other similar expressions means:

Drawing or Document	Reference	Date
Stages 1A & 1B, Port Douglas Estate, Captain Cook Highway Craiglie	Cardno Plan No. Q184103-MP02A, dated 18 December 2018 and as to be amended by Condition 3.	To be confirmed.
Concept Stormwater Culvert Details	Cardno Drawing Q184103-005-SK-01, Revision 2, dated 19 February 2019 and as to be amended by Conditions 14 and 15.	To be confirmed
General Culvert Construction Notes	Cardno Drawing Q184103-005-CI-001, Revision 1, dated 26 February 2019, and as to be amended by Conditions 14 and 15.	To be confirmed
Plan and Sections	Cardno Drawing Q184103-005-CI-002, Revision 1, dated 26 February 2019, and as to be amended by Conditions 14 and 15.	To be confirmed.

Conditions

This approval is subject to the conditions in Schedule 1.

Further development permits

The following Development Permits are required to be obtained before the development can be carried out:

a. Development Permit for Operational Work.

Properly made submissions

Not applicable — No part of the application required public notification.

Reasons for Decision

The reasons for this decision are:

1. Sections 60, 62 and 63 of the *Planning Act 2016*:
   a. the approved plan(s) and document(s)as per A above;
   b. the Conditions and Advices as per B above;
   c. to ensure the development satisfies the benchmarks of the 2018 Douglas Shire Planning Scheme; and
   d. to ensure compliance with the *Planning Act 2016*.
2. Findings on material questions of fact:
   a. the development application was properly lodged to the Douglas Shire Council on 16 January 2019 under section 51 of the *Planning Act 2016* and Part 1 of the *Development Assessment Rules*;

b. the development application contained information from the applicant which Council reviewed together with Council's own investigation of assessment against the State Planning Policy and the 2018 Douglas Shire Planning Scheme in making its assessment manager decision.

3. Evidence or other material on which findings were based:

a. the development triggered assessable development under the Assessment Table associated with the Zone Code;

b. Council undertook an assessment in accordance with the provisions of sections 60, 62 and 63 of the *Planning Act 2016*; and

c. the applicant's reasons have been considered and the following findings are made:

i. Subject to conditions the development satisfactorily meets the Planning Scheme requirements.

Concurrence Agency Conditions & Requirements

Concurrence Agency	Concurrence Agency Reference	Date	Council Electronic Reference
State Department Manufacturing, Infrastructure and Planning	1901-9940 SRA	12 April 2019	898767

Refer to Schedule 3: Concurrence Agency Requirements. (Please note that these conditions / requirements may be superseded by subsequent negotiations with the relevant referral agencies).

Currency period for the approval

This approval, granted under the provisions of the *Planning Act 2016*, shall lapse four (4) years from the day the approval takes effect in accordance with the provisions of section 85 *Planning Act 2016*.

Rights of appeal

The rights of applicants to appeal to a tribunal or the Planning and Environment Court against decisions about a development application are set out in chapter 6, part 1 of the *Planning Act 2016*. For particular applications, there may also be a right to make an application for a declaration by a tribunal (see chapter 6, part 2 of the *Planning Act 2016*).

A copy of the relevant appeal provisions are included in Schedule 5.

SCHEDULE 1 – ASSESSMENT CONDITIONS AND ADVICE

CONDITIONS & ADVICE IMPOSED BY THE ASSESSMENT MANAGER

The approval is subject to the following conditions and advices

Assessment Manager Conditions

1. Carry out the approved development generally in accordance with the approved drawing(s) and/or document(s), and in accordance with:

   a. The specifications, facts and circumstances as set out in the application submitted to Council; and

   b. The following conditions of approval and the requirements of Council's Planning Scheme and the FNQROC Development Manual.

   Except where modified by these conditions of approval

Timing of Effect

2. The conditions of the Development Permit must be effected prior to the approval of the Plan of Survey, except where specified otherwise in these conditions of approval.

Lot Layout

3. The lot layout plan must be revised and provided to the satisfaction of the Chief Executive Officer prior to the lodgement of the application for operational work, generally in accordance with the Cardno Plan No. Q184103-MP02A, dated 18 December 2018, and amended to detail:

   a. All residential lots to have a minimum site area of 600m^2, a minimum road frontage of 15 metres and to be able to contain a rectangle of minimum dimensions 20 metres x 15 metres;

   b. Replace the 'Park" at the rear of proposed Lots 16 to 20 with the description "Drainage Reserve";

   c. Extend the road in Stage 1B, adjacent to proposed lots 19 and 20, to the new Drainage Reserve (as outlined under condition part b above) and include a ramped profile to enable suitable access by Council vehicles to service the drainage reserve; and

   d. Provide a ramp access and vehicle access gate to the east of the new road for access to the existing drainage easement.

   The lot yield may change as a result of the above requirements.

Filling Lots

4. Each lot must be filled to achieve a Q100 plus hydraulic modelling flood immunity and storm tide inundation (having regard to sea level rise for the year 2100).

Developer Credits for the Construction of Trunk Infrastructure

5. The Infrastructure Agreement must detail the circumstances on which the monies will be reimbursed or alternatively the agreed costs of the infrastructure can be claimed against applicable adopted charges generated by the development. For any residual monies owed after the completion of the development, the Infrastructure Agreement must detail the circumstances on which the monies will be reimbursed and the timing of any such reimbursement.

   The cost of constructing Trunk Infrastructure, as identified under Council's Local Government Infrastructure Plan (LGIP) must be agreed to by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works to construct the infrastructure.

Road Safety Assessment

6. Provide a Road Safety Assessment by an accredited Road Safety Auditor for the Milman Drive and Wabul Drive road link extending from the proposed new southern drain crossing through to, and including, the intersection with the Captain Cook Highway.

   The intersection analysis for the Captain Cook Highway/Milman Drive intersection is to be undertaken in an approved modelling package (SIDRA or equivalent). All upgrades identified in the Road Safety Audit or the intersection analysis will need to be identified in engineering design plans and associated reports.

   a. Where the intersection analysis demonstrates that the additional Stage 1 lots create an unacceptable level of service for the intersection operation, the applicant must identify and provide the upgrades necessary to ensure the intersection operates with an acceptable level of service.

      The plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works. The agreed traffic improvement works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

      There is to be no cost to Council for these associated works.

   And

   b. Where the intersection analysis demonstrates there is a component of existing use that contributes to an unacceptable standard of service, then the applicant must obtain an agreement in writing from the Department of Main Roads and Council regarding the timing, costs and responsibility for the necessary works. All works are to be at no cost to Council. The agreement must be to the satisfaction of the Chief Executive Officer and achieved prior to the lodgement of the application for operational work for the subdivision.

Acid Sulfate Soils

7. Undertake an Acid Sulfate Soil investigation in the area to be affected by this development. Soil sampling and analysis must be undertaken in accordance with procedures specified in, 'Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland' (1998) or updated version of document produced by the Department of Natural Resources, Mines and Energy (Previously DNRW – QASSIT), and State Planning Policy 2/02 – 'Planning and Managing Development involving Acid Sulfate Soils'. The results of this investigation must be submitted to Council for approval prior to any earthworks or clearing being commenced on the site.

   Identification of soils with a pyrite content in excess of the action levels nominated in the latest version of DNRME – QASSIT: 'Guidelines for Sampling and Analysis of Lowland Acid Sulfate Soils in Queensland' (1998) will trigger the requirement for preparation of an Acid Sulfate Soil Environmental Management Plan in accordance with the most recent requirements of the DNRME: 'Queensland Acid Sulfate Soil Technical Manual' (2002) including Soil Management Guidelines (updated Feb. 2003) which must be prepared to the satisfaction of the Chief Executive Officer and form part of the application for a Development Permit for Operational Work.

Water Supply and Sewerage Master Plan

8. Individual Master Plans for the provision of Water Supply and Sewerage for the development must be prepared and accompanied by supporting calculations to demonstrates how the development can be serviced.

   The Development Application for Operational Work must include these Master Plans with supporting information (including Hydraulic Network Analysis) to demonstrate how Stage 1 and the ultimate development will be connected to and serviced by Council's Infrastructure.

   In particular:

   a. For sewerage the sizing, location and services corridor is to be identified for the new sewage pump station and the pressure main. The pressure main is to be connected to Council's system at a location where sufficient capacity exists. The applicant is to meet with Council's Sewerage Officers to confirm known capacity issues and determine a suitable point of connection. The Master Plan must document the considerations on the selection of the connection point, pressure main corridor and any relevant inputs from Council Officers, (this should include Minutes of Meetings and formal correspondence at a minimum);

   b. The location of the pump station is to be confirmed with detailed design to maximise the separation distance from existing and proposed residences. The FNQROC separation distances are to be achieved and may require the future drainage corridor to be considered to optimise the separation available to existing development, Stage 1 lots and future proposed lots. The supporting information must include plans showing the separation distances achieved to the nearest lots for the above development locations; and

   c. The Water Supply must include a new main along the Captain Cook Highway and not rely on water supply from the adjacent development to the north, (Wabul Drive). Suitable valving and connectivity is to be provided to the existing system to enable proper operation and management of the water network, however, the development must obtain water connection external to the adjoining estate at a point where sufficient capacity exists.

   In addition, the Master Plans must identify how water supply and sewerage infrastructure capacity will be provided in an orderly and sequential manner having regard to the overall development size and demands. The Master Plans must set out the proposed infrastructure delivery matched to the timing and staging of the development.

In the event that the Master Plan identifies upgrades to the existing Council infrastructure to service the ultimate development, the Master Plan must detail any interim servicing arrangements for the development and identify thresholds (lot yield and timing) associated with those interim and ultimate servicing arrangements.

The Master Plans must also identify any external catchments that will be connected to and/or serviced by the internal water supply and sewer networks.

The plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

Water Supply and Sewerage Infrastructure Plan

9. Water supply and sewerage infrastructure plans for Stage 1 with supporting information including hydraulic network analysis must be submitted demonstrating how the development will be serviced by Council's Infrastructure. In particular the plan must:

   a. Identify external catchments that will be connected to the internal sewer or water networks; and

   b. Identify any trunk infrastructure external to the subdivision that may require upgrading to accommodate the development.

   The water supply and sewerage infrastructure plan must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

Water Supply and Sewerage Works

10. The extent of Water Supply and Sewerage Works external to the site to connect the site to existing water supply and sewerage infrastructure will be determined by the Master Plans to be prepared for consideration and approval by Council. The following minimum infrastructure elements are required:

    a. Extend the water main from the existing services at the corner of Milman Drive and the Captain Cook Highway so that each allotment can be provided with a water service connection to the lot frontage and the trunk main extension is sufficient for the further development of the whole of the balance land (estimated as a total of 300 residential lots) for Lot 2 on SR 431;

    b. Provide an appropriate pump station, generally in the indicative location on the balance lot as per the Applicant's submission to Council on the 12 April 2019 (Council document reference ID 898733, ensuring such location meets at least the minimum separating distance from residential lots (as required under FNQROC standard) and is sufficiently accompanied by a paved concrete access and pad area for inspection and servicing by Council vehicles, including a crane);

    c. Provide district meters at locations nominated by Council; and

    d. Provide a single internal water and sewer connection to each lot in accordance with the FNQROC Development Manual.

    Construction of the sewerage pump station will require full design drawings and a commissioning plan in accordance with FNQROC Development Manual submitted with the plan of works and will be subject to compliance with the Council's Purchasing Policy for competitive tendering.

    Three (3) copies of a plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

    All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

Inspection of Sewers and Stormwater

11. CCTV inspections of all constructed sewers and stormwater piped systems must be undertaken for all infrastructure that will become an asset of Council. An assessment of the CCTV records will be undertaken and any identified defects are to be rectified to the satisfaction of the Chief Executive Officer at no cost to Council.

General External Works

12. Undertake the following external works:

    a. Provide a full detail design and costing for the proposed culvert crossing, as detailed in Council's Local Government infrastructure plan (LGIP). The culvert size, alignment within the drainage corridor and height of the road surface above are to be confirmed with Council and supported by updated stormwater modelling prior to the lodgement of the application for Operational Works;

    b. Construct the culvert crossing connecting to the existing road alignment in the neighbouring residential estate; and

    c. For Milman Drive/Wabul Drive link, provide a full detail design complete with costing and undertake the upgrades identified for the road system and intersection in accordance with the findings of the Road Safety Audit and Intersection Analysis.

    Three (3) copies of a plan of the works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

    All works must be carried out to the satisfaction of the Chief Executive Officer prior to the lodgement of the Survey Plan with Council for endorsement.

Further Drainage Study

13. The applicant is to update the stormwater modelling and reporting in accordance with the following requirements:

    a. Provide further information on the model input parameters for review by its external stormwater reviewers;

    b. Provide a further assessment of the check flow assessed using the rational method based on alternative time of concentration methods and provide commentary on any variance between the methods;

    c. Undertake a sensitivity analysis for the peak flows in the model based on the upper bound assessment from the above check (or 15% increase in peak flows whichever is the greater). Note the assessment of peak flow rates is to enable assessment of the implications for the drain and culvert (and the flood level relative to existing housing);

    d. It is unclear how the ground levels for the existing lots have been entered into the flood model and whether the current model set up excludes flow from entering existing lots. In order to properly understand the proposed drain and culverts operation and impacts, cross sections of the drain profile at regular intervals upstream and downstream from the culverts are required. The sections should show:

        i. the proposed drain profile, including the need for a finish to stabilise the drain banks, such as rock lining;

        ii. existing lot levels on the north side and proposed development levels on the south;

        iii. the modelled peak flood level for the 5, 10- and 100-year ARI events, and

        iv. the resulting freeboard;

    e. In addition to the colour coding of the flood modelling outputs, flood levels are to be reported with 100mm contours or spot levels at maximum 50m intervals. This requirement is only for the 1% AEP model outputs but applies to both the existing and developed cases; and

f. The proposed culvert design concept is not supported as there is no capacity for overtopping within the drainage corridor. The flood modelling is to be revised for a culvert concept that has a road surface level a minimum of 250mm below the existing road level on the northern side.

Any ramping of the road levels is to occur outside the alignment of the drainage corridor. Modelling of the blockage scenarios is to be confirmed.

Because the culvert will not be able to achieve significant overtopping capacity, the modelling and reporting needs to clearly address blockage scenarios, sensitivity analysis and assessments of the severe storm impact as set out in QUDM Sections 7.23, &.24 and &.25.

The updated flood model and report together with an amended culvert design must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works. All works must be carried out in accordance with the approved plan prior to the lodgement of the Survey Plan with Council for endorsement.

Drainage Construction

14. The applicant / owner must undertake the development of the land in accordance with the findings of the updated Drainage Study.

Associated earthworks and landscaping must be completed in accordance with the approved plans prior to the lodgement of the Survey Plan with Council for endorsement.

Reserves Over Drain

15. A Drainage Reserve containing all land below the top of the high bank and the area of additional drainage reserve (as outlined in Condition 3 above) adjacent to the top of the bank or the limit of the Q100 ARI event, whichever is the greater must be transferred to the Crown for Drainage Purposes. The land (reserve) must be transferred in conjunction with registration of the Plan of Survey for any lot release under Stage 1B. The existing drainage easement, over the part of the stormwater drain that is to be within the new Drainage Reserve, is to be rescinded at no cost to Council.

Southern Diversion Drain

16. Where drainage channel improvements are identified in the flood study and or as a result of performance issues identified with the current drain, these works are to be identified on engineering drawings and included in the application for Operational Works.

Existing scouring\ring of the drain batters and banks is to be investigated and advice is to be provided on the soil type, lining and upgrades necessary to address the long-term stability of the channel. It is expected that a revised flatter batter profile will need to be considered. Information on the selected batter profile, lining type or vegetation stabilisation and soil types together with advice on the stream flow velocities will be required to support the proposed drain design.

Access ramps suitable for maintenance plant and equipment are to be provided on each side of the culvert structure to enable maintenance access the drain and culverts.

A plan of the drain improvement works must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works.

All works must be carried out in accordance with the approved plans, to the requirements and satisfaction of the Chief Executive Officer, prior to the lodgement of the Survey Plan with Council for endorsement.

Lawful Point of Discharge

17. All stormwater from the property must be directed to a lawful point of discharge such that it does not adversely affect surrounding properties or properties downstream from the development to the requirements and satisfaction of the Chief Executive Officer.

Plan of Drainage Works

18. The subject land must be drained to the satisfaction of the Chief Executive Officer. In particular,

    a. Drainage infrastructure in accordance with the FNQROC Development Manual

    b. The drainage system from the development must incorporate a gross pollutant trap(s) or equivalent measure(s), meeting the following Council specifications for stormwater quality improvement devices (SQID), namely:

        i. End-of-line stormwater quality improvement devices (SQID) shall be of a proprietary design and construction and shall carry manufacturer's performance guarantees as to removal of foreign matter from stormwater and structural adequacy of the unit.

        ii. SQIDs shall remove at least ninety-five per cent of all foreign matter with a minimum dimension of three (3) mm and shall be configured to prevent re-injection of captured contaminants. The SQID treat all first flush runoff, which shall be defined as that volume of water equivalent to the runoff from the three (3) month ARI storm event. The location of SQIDs within the drainage system shall be planned to ensure that the first flush waters from all parts of the (developed) catchment are treated.

        iii. The design of the SQID shall not compromise the hydraulic performance of the overall drainage system.

        iv. SQIDs shall be positioned so as to provide appropriate access for maintenance equipment.

    c. All new allotments shall have immunity from flooding associated with an ARI 100 year rainfall event; and

    d. Where practical, all new allotments must be drained to the road frontages, drainage easements or drainage reserves and discharged to the existing drainage system via storm water quality device(s).

Sediment and Erosion Control

19. A sediment and erosion control plan must be submitted prior the issue of a Development Permit for Operational Works. Such plans must be installed / implemented prior to discharge of water from the site, such that no external stormwater flow from the site adversely affects surrounding or downstream properties (in accordance with the requirements of the *Environmental Protection Act 1994,* and the FNQROC Development Manual).

Landscape Plan and Provision of Park

20. Undertake landscaping of the site, including the Park, and street frontages of new roads in accordance with *FNQROC Development Manual* and in accordance with a landscape plan. The landscape plan must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Work. In particular, the plan must show:

    a. Planting of the footpath with trees, using appropriate species with consideration to be given to creating an individual sense of place and character to the estate;

    b. Provision of an earth mound, landscaping and appropriate fencing along the western boundary;

    c. The provision of suitable shade trees, especially in parks;

    d. Species to have regard to the Planning Scheme Policy No.SC6.7 Landscaping;

    e. Park and road verges to be seeded and grassed; and

    f. Bollards around the perimeter to prevent vehicle access with the exception of gates that enables Council vehicle access.

    Permanent irrigation or any other embellishments are not permitted.

Inclusion of all requirements as detailed in other relevant conditions included in this Approval, with a copy of this Development Approval to be given to the applicant's Landscape Architect / Designer.

The applicant is to provide park in accordance with the approved plan in Stage 1B. This area of park must be to the requirements and satisfaction of the Chief Executive Officer. The land and embellishments must be established at no cost to Council. The land must be transferred at the same time as registering the Plan of Survey for any lot for Stage 1B with the Department of Natural Resources and Mines.

Two (2) A1 copies and one (1) A3 copy of the landscape plan must be endorsed by the Chief Executive Officer prior to the issue of a Development Permit for Operational Works. Areas to be landscaped must be established prior to the lodgement of the Survey Plan with Council for endorsement and must be maintained for the duration of the on-maintenance period to the satisfaction of the Chief Executive Officer.

Electricity Supply

21. Written evidence from Ergon Energy advising if distribution substation/s are required within the development must be provided. If required, details regarding the location of these facilities must be submitted to the Chief Executive Officer accompanied by written confirmation from Ergon Energy. Details regarding electricity supply must be provided prior to the issue of a Development Permit for Operational Works.

Electricity and Telecommunications

22. Written evidence of negotiations with Ergon Energy and the telecommunication authority must be submitted to Council stating that both an underground electricity supply and telecommunications service will be provided to the development prior to the lodgement of the Survey Plan with Council for endorsement.

Street Lighting

23. The following arrangements for the installation of street lighting within the proposed subdivision must be provided prior to the lodgement of the Plan of Survey for signing and dating:

    a. Prior to the approval and dating of the Plan of Survey, a Rate 2 lighting scheme is to be prepared by Ergon Energy or its approved consultant and submitted to the Chief Executive Officer for approval. The Rate 2 lighting scheme is to be designed in accordance with the relevant Road Lighting Standard AS/NZS 1158 and the FNQROC Development Manual. The applicable lighting category is to be determined from the Road Hierarchy Table D1.1 and the corresponding applicable Lighting Categories Table D8.1 as identified in the FNQROC Development Manual.

    The design must provide the applicable illumination level specified in the Road Lighting Standard AS/NZS 1158 at the following road elements:

    i Intersections;

    ii Pedestrian Refuges;

    iii Cul-de-sacs; and

    iv LATM Devices (Including Roundabouts)

    LATM Devices are to be shown on the civil layout design, the electrical services and street lighting design must be submitted in accordance with Ergon Energy's latest Distribution Design Drafting Standard;

    b. Prior to the lodgement of the Survey Plan with Council for endorsement written confirmation that the relevant capital contribution required by Ergon Energy has been paid must be submitted, to ensure that the street lighting will be constructed;

c. Where a new intersection is formed on an existing roadway for the purpose of accessing a new subdivision development, the intersection and existing road approaches must be provided with street lighting for a distance equivalent to at least two (2) spans either side of the intersection to the relevant Lighting Category; and

d. Where an existing intersection is required to be upgraded as part of a development approval, the intersection and existing road approaches must be provided with street lighting for a distance equivalent to at least two (2) spans either side of the intersection to the relevant Lighting Category.

Stock Piling and Transportation of Fill Material

24. Soil used for filling or spoil from the excavation is not to be stockpiled in locations that can be viewed from adjoining premises or a road frontage for any longer than one (1) month from the commencement of works unless the mounded earth is grassed, maintained and does not detrimentally impact on stormwater. A drainage plan demonstrating the sufficiency for stormwater approved by an RPEQ must be provided to the satisfaction of the Chief Executive Officer where filling or spoil is stockpiled for more than one (1) month.

    Transportation of fill or spoil to and from the site must not occur within:

    a. peak traffic times; or

    b. before 7:00 am or after 6:00 pm Monday to Friday; or

    c. before 7:00 am or after 1:00 pm Saturdays; or

    d. on Sundays or Public Holidays.

25. Dust emissions or other air pollutants must not extend beyond the boundary of the site and cause a nuisance to surrounding properties.

Storage of Machinery and Plant

26. The storage of any machinery, material and vehicles must not cause a nuisance to surrounding properties, to the satisfaction of the Chief Executive Officer.

Construction Access

27. Vehicular access to the site for construction purposes of the reconfiguration of a lot approval must only be provided from Andreassen Road unless authorised by the Chief Executive Officer.

Fencing

28. Lots backing the Drainage Reserve (as required under Condition 3 above) are to be fenced to the satisfaction of the Chief Executive Officer.

Fencing and continued agricultural use of balance land.

29. a. Where the continued agricultural use of the balance land abuts new lots, the lots adjacent to this activity must be provided with a standard timber paling fence of 1.8 metres (approximate) height together with a grassed setback of a further 20 metres (minimum) beyond the fencing.

    b. Where the continued agricultural use of the balance of the land occurs adjacent to the existing of Wabul Street a grassed buffer separation of 20 metres (minimum is to be provide on the balance land, beyond the road). Works occurring in this buffer area may include trunk infrastructure.

Damage to Council Infrastructure

30. In the event that any part of Council's existing sewer / water or road infrastructure is damaged as a result of construction activities occurring on the site, including, but not limited to, mobilisation of heavy construction equipment, stripping and grubbing, the applicant/owner must notify Council immediately of the affected infrastructure and have it repaired or replaced at the developer's/owner's/builder's cost, prior to the lodgement of the Survey Plan with Council for endorsement.

Advices

1. This approval, granted under the provisions of the *Planning Act 2016*, shall lapse four (4) years from the day the approval takes effect in accordance with sections 85(1)(b) and 71 of the *Planning Act 2016*.

2. This approval does not negate the requirement for compliance with all relevant Local Laws and statutory requirements.

3. For information relating to the *Planning Act 2016*, log on to www.dsd.qld.gov.au . To access the FNQROC Development Manual, Local Laws and other applicable Policies log on to *www.douglas.qld.gov.au*.

Infrastructure Charges Notice

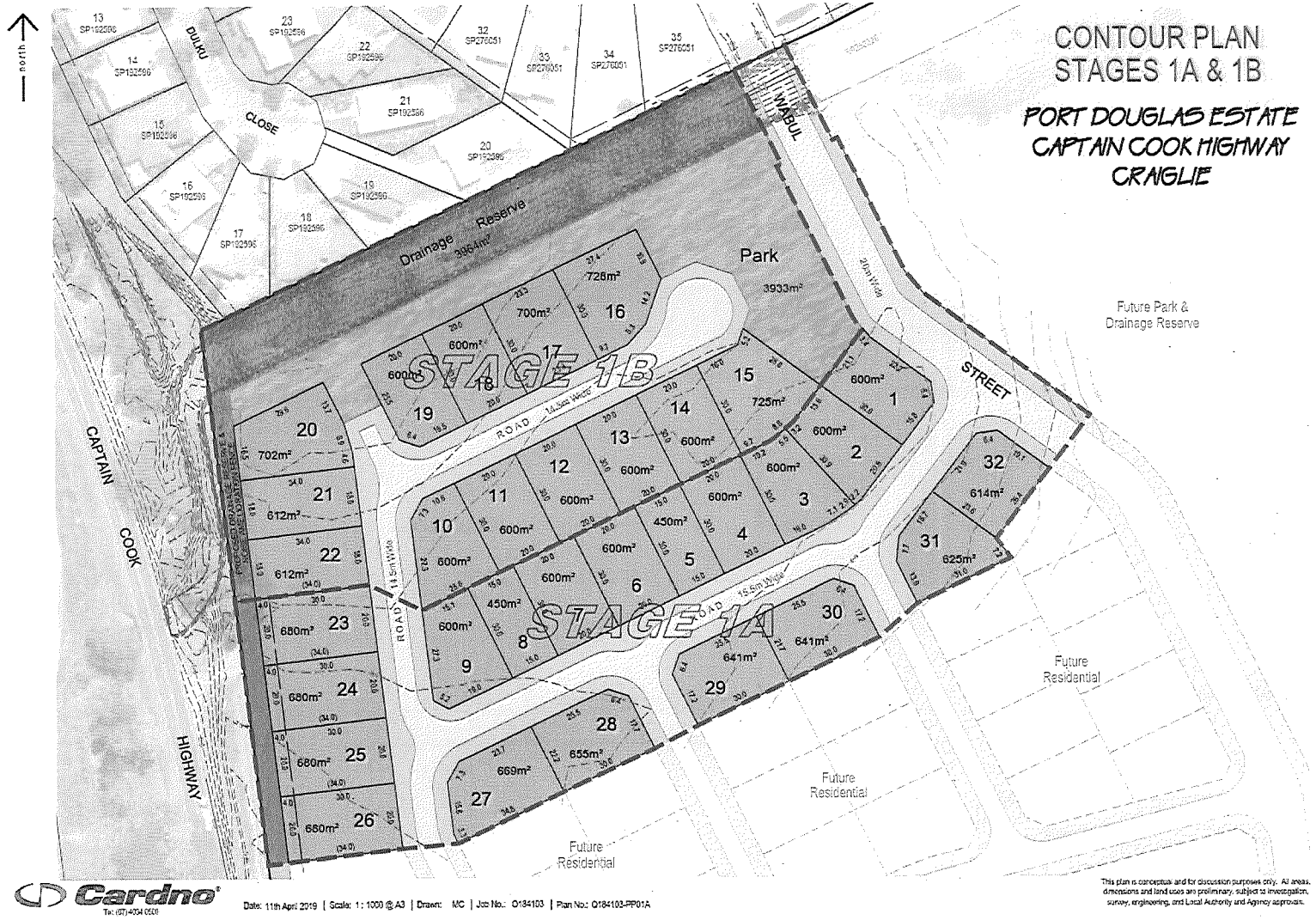
4. A charge levied for the supply of trunk infrastructure is payable to Council towards the provision of trunk infrastructure in accordance with the Infrastructure Charges Notice, refer to Schedule 5. The original Infrastructure Charges Notice will be provided under cover of a separate letter. The amount in the Infrastructure Charges Notice has been calculated according to Council's Infrastructure Charges Resolution. Please note that this Decision Notice and the Infrastructure Charges Notice are stand-alone documents. The *Planning Act 2016* confers rights to make representations and appeal in relation to a Decision Notice and an Infrastructure Charges Notice separately.

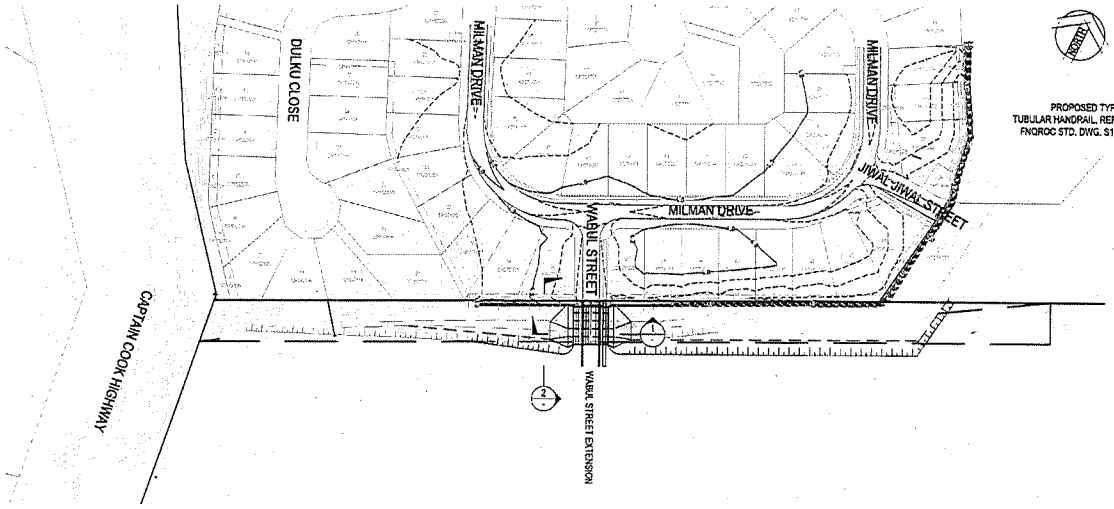
5. The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* applies to action that has, will have or is likely to have a significant impact on matters of national environmental significance.

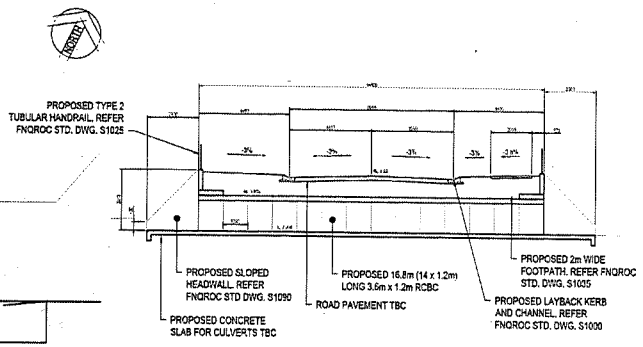
   Further information on the *EPBC Act* can be obtained from the Department of the Environment, Water, Heritage and the Arts website www.environment.gov.au/epbc EPBC Act Policy Statement 1.1 Significant Impact Guidelines Matters of National Environmental Significance (Oct. 2009).

SCHEDULE 2

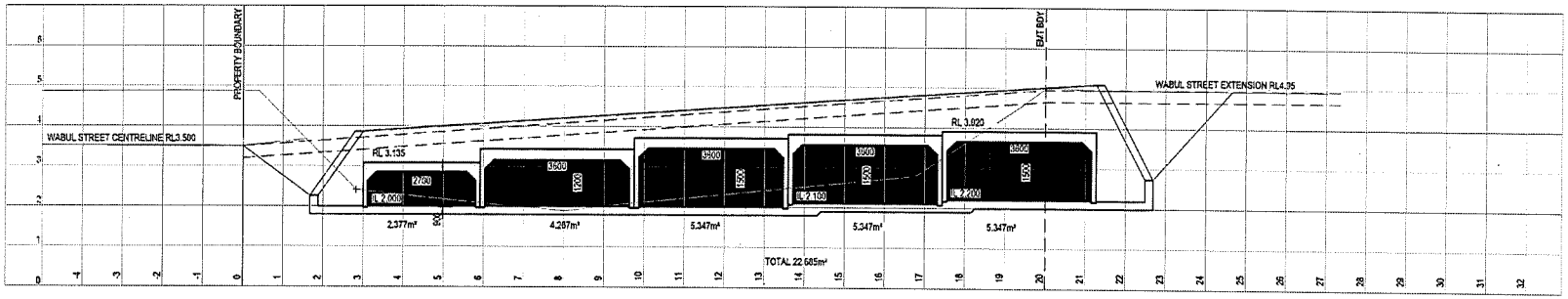
APPROVED DRAWING(S) AND / OR DOCUMENT(S) AS TO BE AMENDED BY CONDITION 3 OF THE ASSESSMENT MANAGER'S CONDITIONS.







TYPICAL CROSS SECTION - WABUL STREET EXTENSION WITH CULVERT 1
SCALE 1:100



ELEVATION - WABUL STREET EXTENSION WITH CULVERT 2
SCALE 1:50

Cardno

Cairns Tel: 07 4034 0500

This plan is conceptual and for discussion purposes only. All areas, dimensions and grades are preliminary, subject to investigation, survey, engineering and Local Authority and Agency approvals.

SCALE 1:1000 @A1

SCALE 1:50 @A1

SCALE 1:100 @A1

PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
PORT PACIFIC ESTATE
LOT 2 ON SR431

Date 19/03/2019 | Scale AS SHOWN | Size A1

CONCEPT STORMWATER CULVERT DETAILS

Drawing Number Q184103-005-SK-01

Revision 02

GENERAL

G1 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL AND OTHER DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT

G2 THE INFORMATION CONTAINED ON THESE DRAWINGS IS FOR STRUCTURAL ENGINEERING PURPOSES ONLY. ALL DISCREPANCIES THAT COULD RESULT IN CHANGES TO THE STRUCTURAL DETAILS SHALL BE REFERRED TO THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

IF IN DOUBT - ASK.

G3 CONSTRUCTION FROM THESE DRAWINGS AND ASSOCIATED CONSULTANTS' DRAWINGS SHALL NOT COMMENCE UNTIL APPROVED BY THE LOCAL AUTHORITIES.

G4 ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT AUSTRALIAN STANDARDS AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.

G5 ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ENGINEERS' DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.

G6 DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP WORKS AND EXCAVATIONS STABLE AT ALL TIMES.

G7 THE BUILDER SHALL GIVE 48 HOURS NOTICE FOR ALL ENGINEERING INSPECTIONS.

G8 UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.

G9 THE STRUCTURAL COMPONENTS DETAILED ON THESE DRAWINGS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS AND LOCAL GOVERNMENT ORDINANCES FOR THE FOLLOWING LOADINGS :

DESIGN LOADS		
AREA	LIVE LOAD kPa	SUPERIMPOSED DEADLOAD kPa
GENERAL	?	NIL

SAFETY IN DESIGN AND CONSTRUCTION

D1 CONSTRUCTION WORK UNDERTAKEN BY THE BUILDER/CONTRACTOR IS TO COMPLY WITH THE REQUIREMENTS OF THE WORK PLACE HEALTH AND SAFETY ACT

D2 CONSTRUCTION ACTIVITY CAN BE HAZARDOUS. POTENTIAL SAFETY HAZARDS CONSIDERED BY THE DESIGNERS TO HAVE A HIGHER RISK THAN NORMAL CONSTRUCTION ACTIVITY ARE IDENTIFIED WITH APPROPRIATE NOTES ON THESE DRAWINGS. IT SHOULD BE NOTED THAT DESIGNERS HAVE A LOWER LEVEL OF UNDERSTANDING OF THE RISKS INVOLVED IN CONSTRUCTION COMPARED TO THAT OF A COMPETENT CONTRACTOR. IT IS THEREFORE ESSENTIAL THAT AN ADEQUATE SAFETY PLAN IS PREPARED BY THE CONTRACTOR FOR THE WORKS. SAFETY PLANS ARE TO BE PREPARED IN COMPLIANCE WITH THE STATUTORY REQUIREMENTS. THE DESIGNERS MAY NOT BE AWARE OF ALL SAFETY RISKS AND HAZARDS INVOLVED IN THIS PROJECT AND THE ABSENCE OF COMMENT DOES NOT IMPLY THAT THERE ARE ONLY LOW LEVEL RISKS OR HAZARDS INVOLVED IN THIS PROJECT. APPROPRIATE WORK METHOD STATEMENTS ARE TO BE PREPARED FOR ANY HIGH RISK ACTIVITY BY THE CONTRACTOR. THE DESIGNERS ARE AVAILABLE TO BE CONSULTED WHEN REQUIRED CONCERNING THEIR AREA OF CONTROL WITH REGARD TO SAFETY PLANS.

D3 PRIOR TO FABRICATION OF STEELWORK THE CONTRACTOR SHALL AGREE WITH THE ENGINEER ON AREAS OF RISK WHICH HAVE BEEN ADDRESSED BY THE DESIGN WHERE POSSIBLE AND AGREE ON SUITABLE CONSTRUCTION PROCEDURES WHERE AREAS OF RISK STILL EXIST.

D4 PRIOR TO ANY FABRICATION THE CONTRACTOR SHALL HAVE COMPLETED A RISK ASSESSMENT OF ALL CONSTRUCTION PROCEDURES AND ENSURED THAT WHERE POSSIBLE, ALL RISKS HAVE BEEN ELIMINATED AND WHERE NOT POSSIBLE THEIR SAFETY PLAN HAS ADDRESSED THOSE ISSUES AND IT HAS BEEN FORMULATED AND DOCUMENTED FOR STRICT ADHERENCE DURING THE CONSTRUCTION WORKS.

D5 PRIOR TO THE USE OF THE PROJECT AS DESIGNED, THE OWNER SHALL HAVE COMPLETED A RISK ASSESSMENT OF ALL WORK PRACTICES AND ENSURED THAT WHERE POSSIBLE ALL RISKS HAVE BEEN ELIMINATED AND WHERE NOT POSSIBLE THEIR SAFETY PLAN HAS ADDRESSED THOSE ISSUES AND IT HAS BEEN FORMULATED AND DOCUMENTED FOR STRICT ADHERENCE AFTER COMMISSIONING.

FORMWORK

CF1 THE DESIGN, CONSTRUCTION AND PERFORMANCE OF THE FORMWORK AND FALSEWORK IS THE RESPONSIBILITY OF THE BUILDER. INSTALLATION OF STEEL FORMWORK SHALL BE STRICTLY IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

CF2 DESIGN AND CONSTRUCTION AND STRIPPING TIMES SHALL COMPLY WITH AS 3610 AND AS 3600 UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CF3 DURING CONSTRUCTION, SUPPORT PROPPING SHALL BE PROVIDED WHERE LOADS FROM STACKED MATERIALS, FORMWORK AND OTHER SUPPORTED SLABS INDUCE LOADS IN A SLAB OR BEAM WHICH EXCEED THE DESIGN LOAD FOR STRENGTH OR SERVICEABILITY AT THAT AGE ONCE THE NOMINATED 28 DAY STRENGTH HAS BEEN ATTAINED. THESE LOADS SHALL NOT EXCEED THE DESIGN SUPERIMPOSED LOADS SET OUT IN THE GENERAL NOTES.

CF4 THE FORMWORK SHALL BE DESIGNED TO RELY ON NO RESTRAINT OR SUPPORT FROM THE PERMANENT STRUCTURE WITHOUT PRIOR APPROVAL FROM THE PROJECT DESIGN ENGINEER.

CF5 WHERE NECESSARY SPECIAL REQUIREMENTS FOR SEQUENCE OF CONCRETE PLACEMENT AND STRIPPING ARE SET OUT ON DRAWINGS.

CF6 DESIGN INFORMATION CONCERNING THE FOUNDATION FORMWORK SHALL BE DETERMINED FROM THE CONDITIONS EXISTING ON SITE AT THE TIME OF CONSTRUCTION. REFER ALSO TO THE GEOTECHNICAL REPORT WHERE AVAILABLE.

CF7 UNLESS NOTED OTHERWISE PROVIDE UPWARD CAMBER TO FORMWORK OF CANTILEVERS OF L/120, WHERE L IS THE SHORTEST PROJECTION BEYOND COLUMN OR WALL FACE, AND TO FORMWORK OF SLABS WHERE NOTED ON PLAN. MAINTAIN THE SLAB AND BEAM DEPTHS SHOWN.

REINFORCEMENT

R1 ALL REINFORCING BARS SHALL BE GRADE D500N TO AS 4671 UNLESS NOTED OTHERWISE. IT SHALL BE CUT AND BENT IN ACCORDANCE WITH AS3600. ACCEPTABLE MANUFACTURERS AND PROCESSORS OF STEEL REINFORCEMENT MUST HOLD A VALID CERTIFICATE OF APPROVAL ISSUED BY THE AUSTRALIAN CERTIFICATION AUTHORITY FOR REINFORCING STEELS (ACRS), OR TO SUCH AN EQUIVALENT CERTIFICATION SYSTEM AS MAY BE APPROVED IN WRITING BY THE SPECIFIER. EVIDENCE OF COMPLIANCE WITH THIS CLAUSE MUST BE OBTAINED WHEN CONTRACT BIDS ARE RECEIVED. ALL MESH SHALL BE GRADE 500L TO AS4671 AND SHALL BE SUPPLIED IN FLAT SHEETS.

REINFORCEMENT NOTATION SHALL BE AS FOLLOWS IN THE FOLLOWING

NUMBER OF BARS IN GROUP

BAR GRADE AND TYPE

17-N20-250

SPACING IN mm

NOMINAL BAR SIZE IN mm

THE FIGURES FOLLOWING THE FABRIC SYMBOLS RL, SL, L, TM IS THE REFERENCE NUMBER FOR FABRIC TO AS 4671.

R2 REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.

R3 SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN POSITIONS SHOWN OR OTHERWISE APPROVED IN WRITING BY THE ENGINEER. LAPS SHALL BE IN ACCORDANCE WITH AS 3600 AND NOT LESS THAN THE DEVELOPMENT LENGTH FOR EACH BAR, AS SHOWN IN THE TABLE BELOW.

BAR LAPS (mm) FOR BEAMS & SLABS		
BAR SIZE	TOP BAR	BOTTOM BAR
N12	500	500
N16	600	500
N20	800	600
N24	1200	1000
N28	1500	1200
N32	1700	1500
N36	2300	1900

MINIMUM LAP FOR ALL REINFORCING FABRIC SHALL BE ONE MESH SQUARE PLUS 30mm.

R4 WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED UNLESS SHOWN ON THE STRUCTURAL DRAWINGS OR APPROVED BY THE ENGINEER. WHERE APPROVED, WELDING MUST COMPLY WITH AS1554.3 STANDARD STEEL WELDING, PART 3 "WELDING OF REINFORCING STEEL. NO WELDING IS ALLOWED WITHIN 120mm OF BENDS.

R5 FABRIC SHALL BE LAPPED TWO TRANSVERSE WIRES PLUS 25mm. BUNDLED BARS SHALL BE TIED TOGETHER AT 30 BAR DIAMETER CENTRES WITH 3 WRAPS OF TIE WIRE.

R6 WHERE TRANSVERSE TIE BARS ARE NOT SHOWN PROVIDE N12-300 SPLICED WHERE NECESSARY AND LAP WITH MAIN BARS 400 mm UNLESS NOTED.

R7 JOGGLES TO BARS SHALL COMPRISE A LENGTH OF 12 BAR DIAMETERS BETWEEN BEGINNING AND END OF AN OFFSET OF 1 BAR DIAMETER.

R8 ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1 METRE CENTRES BOTH WAYS, AND 800 EACH WAY FOR FABRIC. WHEN POURED ON GROUND AS FORMWORK PROVIDE PLATES UNDER ALL BAR CHAIRS. PLASTIC TIPPED STEEL CHAIRS SHALL NOT BE USED ON EXPOSED FACES IN EXPOSURE CLASSIFICATION B1, B2 AND C ONLY PLASTIC OR CONCRETE CHAIRS.

R9 SITE BENDING OF REINFORCEMENT SHALL BE AVOIDED IF POSSIBLE. WHERE SITE BENDING IS UNAVOIDABLE IT SHALL BE CARRIED OUT COLD, WITHOUT THE APPLICATION OF HEAT, AND IN ACCORDANCE WITH THE PRACTICE NOTE RPN1 OF THE STEEL REINFORCEMENT INSTITUTE OF AUSTRALIA. REINFORCEMENT SHALL NOT BE REBENT WITHOUT APPROVAL OF THE SUPERINTENDENT.

R10 THE STRUCTURAL ENGINEER SHALL BE GIVEN 48 HOURS NOTICE FOR REINFORCEMENT INSPECTION AND CONCRETE SHALL NOT BE DELIVERED UNTIL FINAL APPROVAL HAS BEEN OBTAINED FROM THE STRUCTURAL ENGINEER.

CONCRETE

C1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600, AS 1379 & AS 3610 CURRENT EDITIONS WITH AMENDMENTS EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.

TABLE 1 - CONCRETE QUALITY			
ELEMENT	STRENGTH GRADE	SLUMP (mm)	MAXIMUM AGGREGATE SIZE (mm)
BASE SLAB	N40	80±15	20
WING WALLS	N20	80±15	20
RETAINING WALL FTG	N20	230±15	10
RETAINING WALL	S32	80±15	20

EXPOSURE CLASSIFICATION	
INTERNAL	A1
EXTERNAL	B1

TABLE 2 - CLEAR COVER TO REINFORCEMENT (UNO)			
ELEMENT	TOP (mm)	BTM (mm)	SIDE (mm)
BASE SLAB	50	50	50
WING WALL / HEAD WALL	25	40	40
RETAINING WALL FOOTING	40	40	40
RETAINING WALL	40	40	40

PROJECT ASSESSMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379, EXCEPT THAT SAMPLING FREQUENCY SHALL BE AS FOLLOWS. ONE SAMPLE SHALL CONSIST OF 3 CYLINDERS

NUMBER OF TRUCKS	NUMBER OF SAMPLES
1	1
2 - 10	2
11 - 20	3
FOR EACH ADDITIONAL 10 TRUCKS	1 EACH

C2 NO ADMIXTURES OTHER THAN LOW RANGE WRA SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING.

C3 CLEAR CONCRETE COVER TO ALL REINFORCEMENT SHALL BE AS SHOWN ON PLANS.

C4 CONCRETE SIZES SHOWN DO NOT INCLUDE THICKNESS OF APPLIED FINISHES. NO FINISH WHICH DECREASES COVER IS ALLOWED WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER

C5 NO HOLES, CHASES, BLOCKOUTS, DUCTS OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE PRIOR WRITTEN APPROVAL OF THE ENGINEER.

C6 CONSTRUCTION JOINTS WHERE NOT SHOWN SHALL BE LOCATED TO THE APPROVAL OF THE ENGINEER.

C7 THE FINISHED CONCRETE SHALL BE MECHANICALLY VIBRATED TO ACHIEVE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE INCLUDING SLABS ON GROUND AND FOOTINGS SHALL BE COMPACTED WITH MECHANICAL VIBRATORS.

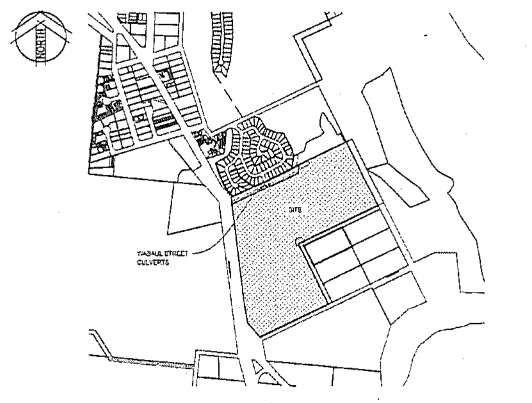
C8 USE EVAPORATIVE RETARDANT DURING CONCRETE PLACING AND IMMEDIATELY AFTER BULL FLOATING.

C9 CURING OF ALL CONCRETE IS TO BE ACHIEVED BY KEEPING SURFACES CONTINUOUSLY WET FOR A PERIOD OF THREE DAYS, AND THE PREVENTION OF LOSS OF MOISTURE FOR A TOTAL OF 7 DAYS FOLLOWED BY A GRADUAL DRYING OUT. APPROVED SPRAYED ON CURING COMPOUNDS THAT COMPLY WITH AS 3799 MAY BE USED WHERE FLOOR FINISHES WILL NOT BE AFFECTED (REFER MANUFACTURERS SPECIFICATIONS). POLYTHENE SHEETING OR WET HESSIAN MAY BE USED IF PROTECTED FROM WIND AND TRAFFIC.

C10 CONSTRUCTION SUPPORT PROPPING IS TO BE LEFT IN PLACE WHERE NEEDED TO AVOID OVERSTRESSING THE STRUCTURE DUE TO CONSTRUCTION LOADING.

C11 REPAIRS TO CONCRETE SHALL NOT BE ATTEMPTED WITHOUT THE PERMISSION OF THE ENGINEER

C12 CAST-IN FIXINGS, BOLTS ETC. SHALL NOT BE ALTERED WITHOUT THE PERMISSION OF THE ENGINEER.



LOCALITY PLAN

NTS

Rev	Date	Description	Des	Verif	Appr
1	11.04.2018	PRELIMINARY ISSUE	ML	LB	

Cardno

Cardno (QLD) Pty Ltd | ABN 57 051 074 992
15 Scott Street, Parramatta Park
Cairns QLD 4870
Tel: 07 4034 0500
Web: www.cardno.com.au

Drawn: LB — Date: 26/03/2018
Checked: ML — Date: 10/04/2018
Designed: ML — Date: 29/03/2018
Verified: ML — Date:
Approved:

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

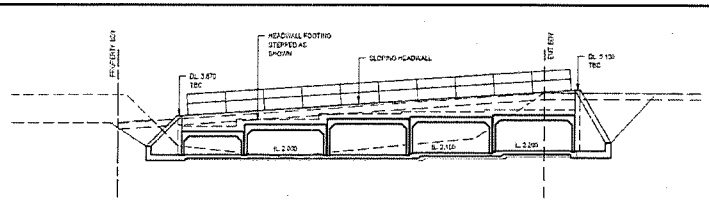
Project: PORT DOUGLAS ESTATE
LOT 2 ON SR431
WABAUL STREET CULVERTS

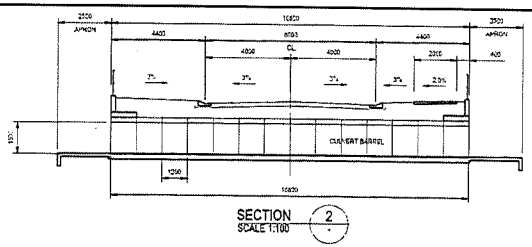
Title: GENERAL CULVERT CONSTRUCTION NOTES

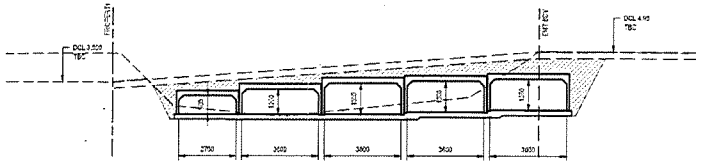
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Scale: — Size: A1

Drawing Number: Q184103-005-CI-001 — Revision: 1

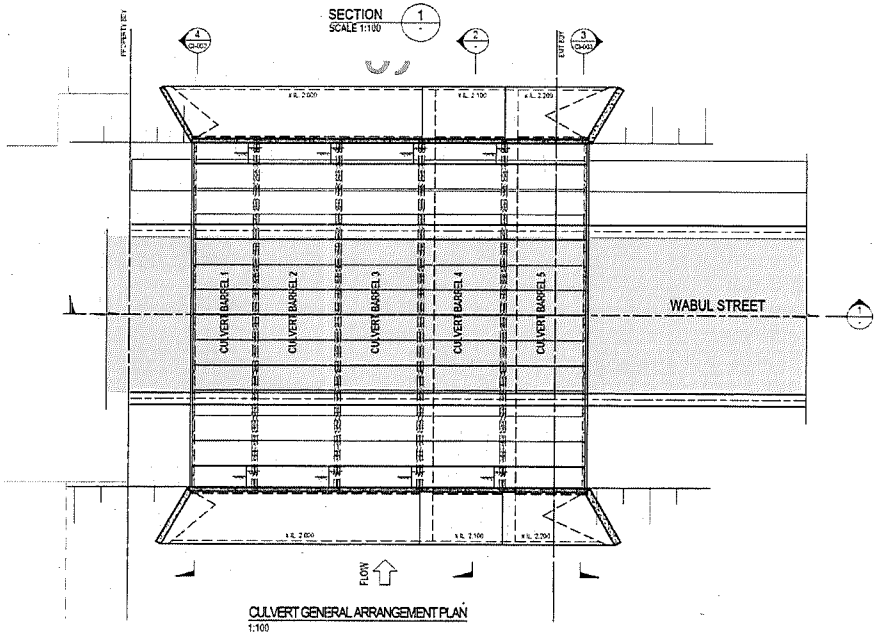


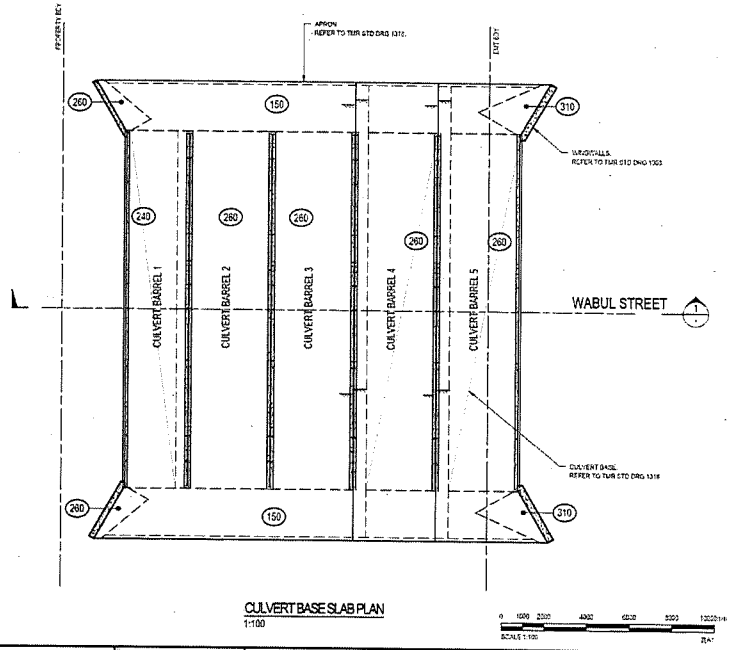




SLAB LEGEND

200 — DENOTES CONCRETE SLAB THICKNESS
DENOTES STEP TOP OF SLAB





Rev	Date	Description	Drn	Chkd	Appd
1	11/04/2018	PRELIMINARY ISSUE	ML	MB	

Cardno

Cardno (Qld) Pty Ltd | ABN 57 051 074 992
15 Scott Street Parkwood Park
Cairns QLD 4870
Tel: 07 4034 0200
Web: www.cardno.com.au

		Date
Drawn	MB	26/02/2018
Checked	ML	10/04/2018
Designed	ML	26/02/2018
Verified	RC	Date
Approved		Date

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT PACIFIC ESTATE
LOT 2 ON SR431
WABAUL STREET CULVERTS
Title: PLAN AND SECTIONS

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Scale: AS A1
Drawing Number: Q184103-005-CI-002
Revision: 1

SCHEDULE 3

CONCURRENCE AGENCY REQUIREMENTS

RA6-N

Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Our reference: 1901-9440 SRA
Your reference: ROL2966/2018

12 April 2019

Chief Executive Officer
Douglas Shire Council
PO Box 723
Mossman QLD 4873
enquiries@douglas.qld.gov.au

Attention: Jenny Elphinstone

Dear Sir/Madam

Referral agency response—with conditions
(Given under section 56 of the *Planning Act 2016*)

The development application described below was properly referred to the Department of State Development, Manufacturing, Infrastructure and Planning (the department) on 1 February 2019.

Applicant details

Applicant name:	Port Douglas Land Developments Pty Ltd
Applicant contact details:	C/- Cardno (QLD) Pty Ltd 15 Scott Street Parramatta Park QLD 4870 daniel.favier@cardno.com.au

Location details

Street address:	Captain Cook Highway, Craiglie QLD 4877
Real property description:	Lot 2 on SR431
Local government area:	Douglas Shire Council

Application details

Development permit	Reconfiguring a lot (1 lot into 32 lots plus new road, balance lot, drainage lot and park)

Referral triggers

The development application was referred to the department under the following provisions of the

Far North Queensland regional office
Ground Floor, Cnr Grafton and Hartley Street, Cairns
PO Box 2358, Cairns QLD 4870

Planning Regulation 2017:

- Schedule 10, Part 9, Division 4, Subdivision 2, Table 1, Item 1 - State transport corridors and future State transport corridors
- Schedule 10, Part 17, Division 3, Table 5, Item 1 - Tidal works or work in a coastal management district

Conditions
Under section 56(1)(b)(i) of the *Planning Act 2016* (the Act), the conditions set out in Attachment 1 must be attached to any development approval.

Reasons for decision to impose conditions
The department must provide reasons for the decision to impose conditions. These reasons are set out in Attachment 2.

Advice to the applicant
Under section 56(3) of the Act, the department offers advice about the application to the assessment manager—see Attachment 3.

Approved plans and specifications
The department requires that the plans and specifications set out below and enclosed must be attached to any development approval.

Drawing/report title	Prepared by	Date	Reference no.	Version/issue
Aspect of development: Reconfiguring a lot				
Figure 6-2 Modelled Noise Barrier Location, Noise Impact Assessment Report	Cardno Pty Ltd	March 2019	I019_Q184013	-

A copy of this response has been sent to the applicant for their information.

For further information please contact Jenny Sapuppo, Senior Planning Officer, Program Improvement Office on (07) 5644 3220 or via email CairnsSARA@dsdmip.qld.gov.au who will be pleased to assist.

Yours sincerely

Brett Nancarrow
Manager (Planning)

cc Port Douglas Land Developments Pty Ltd, C/- Cardno Pty Ltd, daniel.favier@cardno.com.au

enc Attachment 1—Conditions to be imposed
Attachment 2—Reasons for decision to impose conditions
Attachment 3—Advice to the applicant
Approved plans and specifications

Attachment 1—Conditions to be imposed

No.	Conditions	Condition timing
Reconfiguring a lot		
Schedule 10, Part 9, Division 4, Subdivision 2, Table 1, Item 1 - State transport corridors and future State transport corridors—The chief executive administering the *Planning Act 2016* nominates the Director-General of the Department of Transport and Main Roads to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following conditions:		
1.	(a) A 2.4 - 2.6 metre noise barrier must be constructed in the location shown in Figure 6-2 Modelled Noise Barrier Location of the Noise Impact Assessment Report, prepared by Cardno, dated 25 March 2019, reference I019_Q184013 (b) The noise barrier must be designed in accordance with: i. the Department of Transport and Main Roads' Road Traffic Noise Management Code of Practice, Volume 1, Chapter 6 and 7; ii. Specification MRTS15 Noise Fences (March 2019); and iii. Standard Drawing Road Manual, Part 13, Number 1606. (c) RPEQ certification must be provided to Corridor Management Unit, Department of Transport and Main Roads, Far North Queensland Region at Far.North.Queensland.IDAS@tmr.qld.gov.au, confirming that the development has been constructed in accordance with parts (a) and (b) of this condition.	Prior to submitting the Plan of Survey to the local government for approval and to be maintained at all times.
2.	(a) Stormwater management of the development must ensure no worsening or actionable nuisance to the state-controlled road. (b) Any works on the land must not: i. create any new discharge points for stormwater runoff onto the state-controlled road; ii. interfere with and/or cause damage to the existing stormwater drainage on the state-controlled road; iii. surcharge any existing culvert or drain on the state-controlled road; iv. reduce the quality of stormwater discharge onto the state-controlled road.	(a) & (b) At all times.
3.	Direct access is not permitted between the Captain Cook Highway and the subject site.	At all times.
Schedule 10, Part 17, Division 3, Table 5, Item 1 – Tidal works or work in a coastal management district—The chief executive administering the *Planning Act 2016* nominates the Director-General of the Department of Environment and Science to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following conditions:		
4.	The residential allotments must be located outside erosion prone areas.	At the time of registration of the Plan of Survey

5.	Erosion and sediment control measures which are in accordance with the Best Practice Erosion and Sediment Control (BPESC) guidelines for Australia (International Erosion Control Association), are to be installed and maintained to prevent the release of sediment to tidal waters.	For the duration of the works associated with the reconfiguration of a lot
6.	(a) In the event that the works cause disturbance or oxidisation of acid sulfate soil, the affected soil must be treated and thereafter managed (until the affected soil has been neutralised or contained) in accordance with the current Queensland Acid Sulfate Soil Technical Manual: Soil management guidelines, prepared by the Department of Science, Information Technology, Innovation and the Arts, 2014. (b) Certification by an appropriately qualified person, confirming that the affected soil has been neutralised or contained, in accordance with (a) above is to be provided to palm@des.qld.gov.au or mailed to: Department of Environment and Science Permit and License Management Implementation and Support Unit GPO Box 2454 Brisbane Qld 4001	(a) Upon disturbance or oxidisation until the affected soil has been neutralised or contained. (b) At the time the soils have been neutralised or contained.

Attachment 2—Reasons for decision to impose conditions

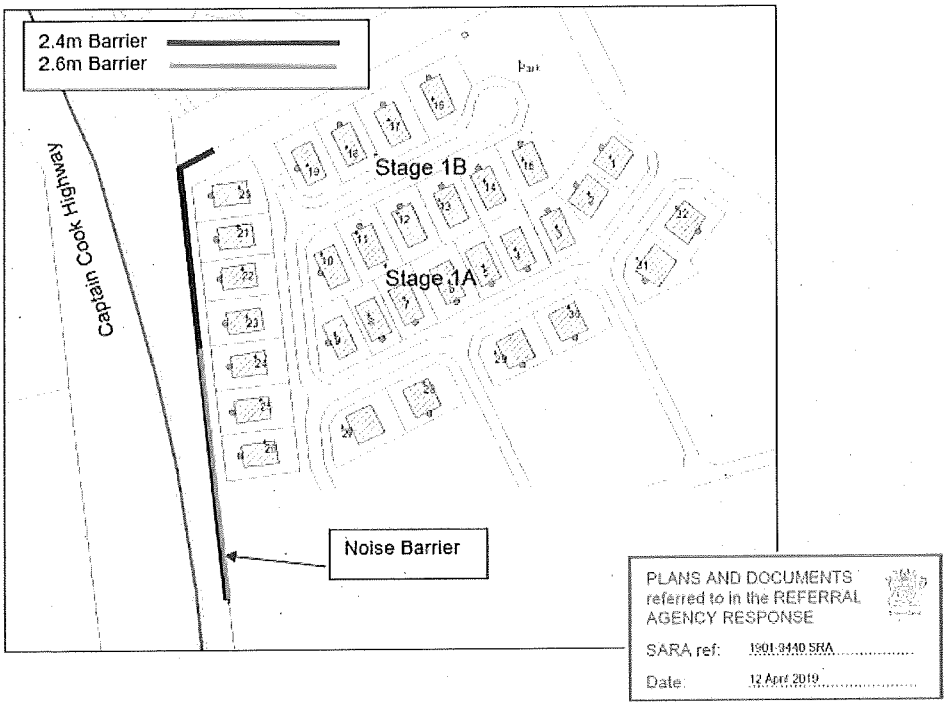
The reasons for this decision are:

- To minimise noise intrusions on a development from a state-controlled transport corridor.
- To ensure that the impacts of stormwater events associated with development are minimised and managed to avoid creating any adverse impacts on the state transport corridor.
- To ensure access to the state-controlled road from the site does not compromise the safety and efficiency of the state-controlled road.
- To ensure the development is located to minimise impacts of natural hazards (erosion).
- To ensure the development avoids or minimises adverse impacts on coastal resources and their values.
- To ensure any disturbance to acid sulfate soils is managed to prevent impacts to coastal environments.

Attachment 3—Advice to the applicant

General advice	
Advertising devices	
1.	Advice should be obtained from the Department of Transport and Main Roads (DTMR) if you intend to erect, alter or operate an advertising sign or another advertising device that would be visible from a state-controlled road, and beyond the boundaries of the state-controlled road, and reasonably likely to create a traffic hazard for the state-controlled road. DTMR has powers under section 139 of the Transport Operations (Road Use Management - Accreditation and Other Provisions) Regulation 2015 to require removal or modification of an advertising sign and/or a device which is deemed that it creates a danger to traffic. DTMR can be contacted on 4045 7144 or via email cairns.office@tmr.qld.gov.au.
Operational works (waterway barrier works)	
2.	Any waterway barrier works that are required at the operational works stage of the development (such as culvert crossings) must be undertaken in accordance with the relevant accepted development requirements for waterway barrier works or under a development approval (assessable development). Once any waterway barriers have been designed, you may wish to seek pre-lodgement advice from the department prior to lodging a development application for operational work with the assessment manager.

Figure 6-2 Modelled Noise Barrier Location



SCHEDULE 4

ADOPTED INFRASTRUCTURE CHARGES

DOUGLAS SHIRE COUNCIL

2008 Douglas Shire Planning Schemes Applications

ADOPTED INFRASTRUCTURE CHARGES NOTICE

Port Douglas Land Developments Pty Ltd (DEVELOPERS NAME)		0 (ESTATE NAME)	1A & 1B (STAGE)
L2 Captain Cook Hwy (STREET No. & NAME)	Port Douglas and (SUBURB)	L2 SR431 (LOT & RP No.s)	4913 (PARCEL No.)
ROL 32 lots plus balance (DEVELOPMENT TYPE)		ROL 2966/2018 (COUNCIL FILE NO.)	4 (VALIDITY PERIOD (year))
Doc ID: 902976 (DSC Reference Doc . No.)	1 (VERSION No.)	Payment prior to lodgmentof survey plan for endorsement	

Adopted Charges as resolved by Council at the Ordinary Meeting held on 5 June 2018, Local Government Infrastructure Plan, Planning Scheme Amendment (effect on and from 2 July 2018)

Locality		Charge per Use	rate	Floor area/No.	Amount	Amount Paid	Receipt Code & GL Code
Port Douglas and Environs							
Proposed Demand							
Residential Lots	Separate house	Per House lot	19,491.00	33	643,203.00		
	Total Demand				**643,203.00**		
Existing Credit							
Residential Lot	Vacant Lot	Per House lot	19,491.00	1	19,491.00		
	Total Credit				**19,491.00**		**Code 895 GL 07500.0135.0825**
	Required Payment or Credit		TOTAL		**$623,712.00**		

Prepared by	J Elphinstone	21-May-19	Amount Paid	
Checked by	Nell Beck	21-May-19	Date Paid	
Date Payable	Prior to endorsement of survey plan		Receipt No.	
Amendments		Date	Cashier	

Note:

The Infrastructure Charges in this Notice are payable in accordance with Sections 119 and 120 of the *Planning Act 2016* *as from Council's resolution from the Ordinary Meeting held on 5 June 2018.*

Charge rates under the current Policy are not currently subject to indexing.
The Infrastructure Agreement for trunk works must be determined and agreed to prior to issue of Development Permit for Operational Work.

Charges are payable to: Douglas Shire Council. You can make payment at any of Council's Business Offices or by mail with your cheque or money order to Douglas Shire Council, PO Box 723, Mossman QLD 4873. Cheques must be made payable to Douglas Shire Council and marked 'Not Negotiable.' Acceptance of a cheque is subject to collection of the proceeds. Post dated cheques will not be accepted

Any enquiries regarding Infrastructure Charges can be directed to the Development & Environment, Douglas Shire Council on 07 4099 9444 or by email on enquiries@douglas.qld.gov.au

DOUGLAS SHIRE COUNCIL

INFRASTRUCTURE CHARGES SUMMARY

2018 Douglas Shire Planning Scheme

Preliminaries

Developer	Port Douglas Land Developments Pty Ltd		ROL 32 lots plus balance
Estate Name	0		
Stage	1A & 1B		
Street No. and Name	L2 Captain Cook Hwy	MagicQ Doc ID;	902976
Suburb	Port Douglas and Environs	Version No.	1
Parcel No.	4913		
Lot and RP No.	L2 SR431		
Development Permit No.	ROL 2966/2018	Validity Period	4 years

Adopted Charges as resolved by Council at the Ordinary Meeting held on 5 June 2018, Local Government Infrastructure Plan, Planning Scheme Amendment (effect on and from 2 July 2018)

Locality Port Douglas and Environs

Proposed Demand				
Residential Lots	Separate house		$	643,203.00
Total demand			$	643,203.00
Existing land use				
Residential Lot		Vacant Lot	$	19,491.00
Nominal use credit				19,491.00
Historical amount				$0.00
Date of payment				
Credit for previous payment				0.00
Credit for Works External				
Opening balance of works external				$0.00
Opening balance of credits				$0.00
Credit claimed			$0.00	0.00
				0.00
Contributions				**$623,712.00**
Time of payment:				Prior to the commencement of use

Notes: The infrastructure Agreement for trunk works must be determined and agreed to prior to issue of Development Permit for Operational Work.

Amendments

0

0

Prepared	J Elphinstone	21-May-19
Checked	Neil Beck	21-May-19
TOTAL		**$623,712.00**

SCHEDULE 5

PLANNING ACT 2016 – DECISION NOTICE: EXTRACTS ON MAKING REPRESENTATIONS AND APPEAL RIGHTS

Planning Act 2016 Making Representations – Decision Notice

Division 2 Changing development approvals

Subdivision 1 Changes during appeal period

74 What this subdivision is about

(1) This subdivision is about changing a development approval before the applicant's appeal period for the approval ends.

(2) This subdivision also applies to an approval of a change application, other than a change application for a minor change to a development approval.

(3) For subsection (2), sections 75 and 76 apply—

(a) as if a reference in section 75 to a development approval were a reference to an approval of a change application; and

(b) as if a reference in the sections to the assessment manager were a reference to the responsible entity; and

(c) as if a reference in section 76 to a development application were a reference to a change application; and

(d) as if the reference in section 76(3)(b) to section 63(2) and (3) were a reference to section 83(4); and

(e) with any other necessary changes.

75 Making change representations

(1) The applicant may make representations (***change representations***) to the assessment manager, during the applicant's appeal period for the development approval, about changing—

(a) a matter in the development approval, other than—

(i) a matter stated because of a referral agency's response; or

(ii) a development condition imposed under a direction made by the Minister under chapter 3, part 6, division 2; or

(b) if the development approval is a deemed approval—the standard conditions taken to be included in the deemed approval under section 64(8)(c).

(2) If the applicant needs more time to make the change representations, the applicant may, during the applicant's appeal period for the approval, suspend the appeal period by a notice given to the assessment manager.

(3) Only 1 notice may be given.

(4) If a notice is given, the appeal period is suspended—

(a) if the change representations are not made within a period of 20 business days after the notice is given to the assessment manager—until the end of that period; or

(b) if the change representations are made within 20 business days after the notice is given to the assessment manager, until—

(i) the applicant withdraws the notice, by giving another notice to the assessment manager; or

(ii) the applicant receives notice that the assessment manager does not agree with the change representations; or

(iii) the end of 20 business days after the change representations are made, or a longer period agreed in writing between the applicant and the assessment manager.

(5) However, if the assessment manager gives the applicant a negotiated decision notice, the appeal period starts again on the day after the negotiated decision notice is given.

76 Deciding change representations

(1) The assessment manager must assess the change representations against and having regard to the matters that

must be considered when assessing a development application, to the extent those matters are relevant.

(2) The assessment manager must, within 5 business days after deciding the change representations, give a decision notice to—

(a) the applicant; and

(b) if the assessment manager agrees with any of the change representations—

(i) each principal submitter; and

(ii) each referral agency; and

(iii) if the assessment manager is not a local government and the development is in a local government area—the relevant local government; and

(iv) if the assessment manager is a chosen assessment manager—the prescribed assessment manager; and

(v) another person prescribed by regulation.

(3) A decision notice (a ***negotiated decision notice***) that states the assessment manager agrees with a change representation must—

(a) state the nature of the change agreed to; and

(b) comply with section 63(2) and (3).

(4) A negotiated decision notice replaces the decision notice for the development application.

(5) Only 1 negotiated decision notice may be given.

(6) If a negotiated decision notice is given to an applicant, a local government may give a replacement infrastructure charges notice to the applicant.

(2) The person is taken to have engaged in the representative's conduct, unless the person proves the person could not have prevented the conduct by exercising reasonable diligence.

(3) In this section—

conduct means an act or omission.

representative means—

(a) of a corporation—an executive officer, employee or agent of the corporation; or

(b) of an individual—an employee or agent of the individual.

state of mind, of a person, includes the person's—

(a) knowledge, intention, opinion, belief or purpose; and

(b) reasons for the intention, opinion, belief or purpose.

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

(1) Schedule 1 states—

(a) matters that may be appealed to—

(i) either a tribunal or the P&E Court; or

(ii) only a tribunal; or

(iii) only the P&E Court; and

(b) the person—

(i) who may appeal a matter (the ***appellant***); and

(ii) who is a respondent in an appeal of the matter; and

(iii) who is a co-respondent in an appeal of the matter; and

(iv) who may elect to be a co-respondent in an appeal of the matter.

(2) An appellant may start an appeal within the appeal period.

(3) The ***appeal period*** is—

(a) for an appeal by a building advisory agency—10 business days after a decision notice for the decision is given to the agency; or

(b) for an appeal against a deemed refusal—at any time after the deemed refusal happens; or

(c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises—20 business days after a notice is published under section 269(3)(a) or (4); or

(d) for an appeal against an infrastructure charges notice—20 business days after the infrastructure charges notice is given to the person; or

(e) for an appeal about a deemed approval of a development application for which a decision notice has not been given—30 business days after the applicant gives the deemed approval notice to the assessment manager; or

(f) for any other appeal—20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note—

See the P&E Court Act for the court's power to extend the appeal period.

(4) Each respondent and co-respondent for an appeal may be heard in the appeal.

(5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.

(6) To remove any doubt, it is declared that an appeal against an infrastructure charges notice must not be about—

(a) the adopted charge itself; or

(b) for a decision about an offset or refund—

(i) the establishment cost of trunk infrastructure identified in a LGIP; or

(ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

(1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that—

(a) is in the approved form; and

(b) succinctly states the grounds of the appeal.

(2) The notice of appeal must be accompanied by the required fee.

(3) The appellant or, for an appeal to a tribunal, the registrar, must, within the service period, give a copy of the notice of appeal to—

(a) the respondent for the appeal; and

(b) each co-respondent for the appeal; and

(c) for an appeal about a development application under schedule 1, section 1, table 1, item 1—each principal submitter for the application whose submission has not been withdrawn; and

(d) for an appeal about a change application under schedule 1, section 1, table 1, item 2—each principal submitter for the application whose submission has not been withdrawn; and

(e) each person who may elect to be a co-respondent for the appeal other than an eligible submitter for a

development application or change application the subject of the appeal; and

(f) for an appeal to the P&E Court—the chief executive; and

(g) for an appeal to a tribunal under another Act—any other person who the registrar considers appropriate.

(4) The ***service period*** is—

(a) if a submitter or advice agency started the appeal in the P&E Court—2 business days after the appeal is started; or

(b) otherwise—10 business days after the appeal is started.

(5) A notice of appeal given to a person who may elect to be a co-respondent must state the effect of subsection (6).

(6) A person elects to be a co-respondent to an appeal by filing a notice of election in the approved form—

(a) if a copy of the notice of appeal is given to the person—within 10 business days after the copy is given to the person; or

(b) otherwise—within 15 business days after the notice of appeal is lodged with the registrar of the tribunal or the P&E Court.

(7) Despite any other Act or rules of court to the contrary, a copy of a notice of appeal may be given to the chief executive by emailing the copy to the chief executive at the email address stated on the department's website for this purpose.

231 Non-appealable decisions and matters

(1) Subject to this chapter, schedule 1 and the P&E Court Act, unless the Supreme Court decides a decision or other matter under this Act is affected by jurisdictional error, the decision or matter is non-appealable.

(2) The *Judicial Review Act 1991*, part 5 applies to the decision or matter to the extent it is affected by jurisdictional error.

(3) A person who, but for subsection (1) could have made an application under the *Judicial Review Act 1991* in relation to the decision or matter, may apply under part 4 of that Act for a statement of reasons in relation to the decision or matter.

(4) In this section—

decision includes—

(a) conduct engaged in for the purpose of making a decision; and

(b) other conduct that relates to the making of a decision; and

(c) the making of a decision or the failure to make a decision; and

(d) a purported decision; and

(e) a deemed refusal.

non-appealable, for a decision or matter, means the decision or matter—

(a) is final and conclusive; and

(b) may not be challenged, appealed against, reviewed, quashed, set aside or called into question in any other way under the *Judicial Review Act 1991* or otherwise, whether by the Supreme Court, another court, any tribunal or another entity; and

(c) is not subject to any declaratory, injunctive or other order of the Supreme Court, another court, any tribunal or another entity on any ground.

232 Rules of the P&E Court

(1) A person who is appealing to the P&E Court must comply with the rules of the court that apply to the appeal.

(2) However, the P&E Court may hear and decide an appeal even if the person has not complied with rules of the P&E Court.

DOUGLAS
SHIRE COUNCIL

PO Box 723 Mossman Qld 4873
www.douglas.qld.gov.au
enquiries@douglas.qld.gov.au
ABN 71 241 237 800

Administration Office
64 - 66 Front St Mossman
P 07 4099 9444
F 07 4098 2902

28 May 2019

Enquiries: Jenny Elphinstone
Our Ref: ROL 2966/2018 (Doc ID 903690)
Your Ref: Q184103

Port Douglas Land Developments Pty Ltd
C/ Cardno (Qld) Pty Ltd
PO Box 1619
PARRAMATTA PARK QLD 4870

Attention Mr Daniel Favier

Dear Sir

ADOPTED INFRASTRUCTURE CHARGES NOTICE
FOR DEVELOPMENT APPLICATION LOT 2 CAPTAIN COOK HIGHWAY CRAIGLIE
DEVELOPMENT ON LOT 2 SR 431

Council refers to the Decision Notice issued for the above Development Application with Council on the 28 May 2019.

Please find attached an Adopted Infrastructure Charges Notice issued in accordance with section 119 of the *Planning Act 2016* (the Act). The amount in the Adopted Infrastructure Charges Notice has been calculated according to Council's Adopted Infrastructure Charges Resolution and is a credit that remains applicable to the land.

Please also find attached extracts from the Act regarding the following:

- your right to make representations to Council about the Adopted Infrastructure Charges Notice; and
- your Appeal rights with respect to the Adopted Infrastructure Charges Notice.

Please quote Council's application number: ROL 2966/2018 in all subsequent correspondence relating to this matter. Should you have any enquiries in relation to this Adopted Infrastructure Charges Notice, please contact Jenny Elphinstone of Development Assessment and Coordination, Sustainable Communities on telephone number (07) 4099 9482.

Yours faithfully

PAUL HOYE
Manager Environment and Planning

encl.

- Adopted Infrastructure Charges Notice
- Rights to Make Representations and Appeals Regarding Infrastructure Charges

ADOPTED INFRASTRUCTURE CHARGES NOTICE

DOUGLAS SHIRE COUNCIL

2008 Douglas Shire Planning Schemes Applications

ADOPTED INFRASTRUCTURE CHARGES NOTICE

Port Douglas Land Developments Pty Ltd		**0**	**1A & 1B**
DEVELOPERS NAME		ESTATE NAME	STAGE
L2 Captain Cook Hwy	**Port Douglas and**	**L2 SR431**	**4913**
STREET No. & NAME	**SUBURB**	LOT & RP No.s	PARCEL No.
ROL 32 lots plus balance		**ROL 2966/2018**	**4**
DEVELOPMENT TYPE		COUNCIL FILE NO.	VALIDITY PERIOD (year)
Doc ID: 902976	**1**	**Payment prior to lodgmentof survey plan for endorsement**	
DSC Reference Doc . No.	VERSION No.		

Adopted Charges as resolved by Council at the Ordinary Meeting held on 5 June 2018, Local Government Infrastructure Plan, Planning Scheme Amendment (effect on and from 2 July 2018)

		Charge per Use	rate	Floor area/No.	Amount	Amount Paid	Receipt Code & GL Code
Locality							
Port Douglas and Environs							
Proposed Demand							
Residential Lots	Separate house	Per House lot	19,491.00	33	643,203.00		
	Total Demand				**643,203.00**		
Existing Credit							
Residential Lot	Vacant Lot	Per House lot	19,491.00	1	19,491.00		
	Total Credit				**19,491.00**		**Code 895 GL 07500.0135.0825**
	Required Payment or Credit		**TOTAL**		**$623,712.00**		

Prepared by	**J Elphinstone**	**21-May-19**	**Amount Paid**	
Checked by	**Neil Beck**	**21-May-19**	**Date Paid**	
Date Payable	Prior to endorsement of survey plan		**Receipt No.**	
Amendments		**Date**	**Cashier**	

Note:

The Infrastructure Charges in this Notice are payable in accordance with Sections 119 and 120 of the *Planning Act 2016* *as from Council's resolution from the Ordinary Meeting held on 5 June 2018.*

Charge rates under the current Policy are not currently subject to indexing.
The Infrastructure Agreement for trunk works must be determined and agreed to prior to issue of Development Permit for Operational Work.

Charges are payable to: Douglas Shire Council. You can make payment at any of Council's Business Offices or by mail with your cheque or money order to Douglas Shire Council, PO Box 723, Mossman QLD 4873. Cheques must be made payable to Douglas Shire Council and marked 'Not Negotiable.' Acceptance of a cheque is subject to collection of the proceeds. Post dated cheques will not be accepted

Any enquiries regarding Infrastructure Charges can be directed to the Development & Environment, Douglas Shire Council on 07 4099 9444 or by email on enquiries@douglas.qld.gov.au

DOUGLAS SHIRE COUNCIL

INFRASTRUCTURE CHARGES SUMMARY

2018 Douglas Shire Planning Scheme

Preliminaries

Developer	Port Douglas Land Developments Pty Ltd		ROL 32 lots plus balance
Estate Name	0		
Stage	1A & 1B		
Street No. and Name	L2 Captain Cook Hwy	MagicQ Doc ID;	902976
Suburb	Port Douglas and Environs	Version No.	1
Parcel No.	4913		
Lot and RP No.	L2 SR431		
Development Permit No.	ROL 2966/2018	Validity Period	4 years

Adopted Charges as resolved by Council at the Ordinary Meeting held on 5 June 2018, Local Government Infrastructure Plan, Planning Scheme Amendment (effect on and from 2 July 2018)

Locality Port Douglas and Environs

Proposed Demand				
Residential Lots	Separate house		$	643,203.00
Total demand			$	643,203.00
Existing land use				
Residential Lot		Vacant Lot	$	19,491.00
Nominal use credit				19,491.00
Historical amount				$0.00
Date of payment				
Credit for previous payment				0.00
Credit for Works External				
Opening balance of works external				$0.00
Opening balance of credits				$0.00
Credit claimed			$0.00	0.00
				0.00
Contributions				**$623,712.00**
Time of payment:				Prior to the commencement of use

Notes: The Infrastructure Agreement for trunk works must be determined and agreed to prior to issue of Development Permit for Operational Work.

Amendments

0

0

Prepared	J Elphinstone	21-May-19
Checked	Neil Beck	21-May-19
TOTAL		**$623,712.00**

Subdivision 5 Changing charges during relevant appeal period

124 Application of this subdivision

This subdivision applies to the recipient of an infrastructure charges notice given by a local government.

125 Representations about infrastructure charges notice

(1) During the appeal period for the infrastructure charges notice, the recipient may make representations to the local government about the infrastructure charges notice.

(2) The local government must consider the representations.

(3) If the local government—

(a) agrees with a representation; and

(b) decides to change the infrastructure charges notice;

the local government must, within 10 business days after making the decision, give a new infrastructure charges notice (a ***negotiated notice***) to the recipient.

(4) The local government may give only 1 negotiated notice.

(5) A negotiated notice—

(a) must be in the same form as the infrastructure charges notice; and

(b) must state the nature of the changes; and

(c) replaces the infrastructure charges notice.

(6) If the local government does not agree with any of the representations, the local government must, within 10 business days after making the decision, give a decision notice about the decision to the recipient.

(7) The appeal period for the infrastructure charges notice starts again when the local government gives the decision notice to the recipient.

126 Suspending relevant appeal period

(1) If the recipient needs more time to make representations, the recipient may give a notice suspending the relevant appeal period to the local government.

(2) The recipient may give only 1 notice.

(3) If the representations are not made within 20 business days after the notice is given, the balance of the relevant appeal period restarts.

(4) If representations are made within the 20 business days and the recipient gives the local government a notice withdrawing the notice of suspension, the balance of the relevant appeal period restarts the day after the local government receives the notice of withdrawal.

Division 3 Development approval conditions about trunk infrastructure

Subdivision 1 Conditions for necessary trunk infrastructure

127 Application and operation of subdivision

(1) This subdivision applies if—

(a) trunk infrastructure—

(i) has not been provided; or

(ii) has been provided but is not adequate; and

(b) the trunk infrastructure is or will be located on—

(i) premises (the ***subject premises***) that are the subject of a development application, whether or not the infrastructure is necessary to service the subject premises; or

(ii) other premises, but is necessary to service the subject premises.

(2) The person is taken to have engaged in the representative's conduct, unless the person proves the person could not have prevented the conduct by exercising reasonable diligence.

(3) In this section—

conduct means an act or omission.

representative means—

(a) of a corporation—an executive officer, employee or agent of the corporation; or

(b) of an individual—an employee or agent of the individual.

state of mind, of a person, includes the person's—

(a) knowledge, intention, opinion, belief or purpose; and

(b) reasons for the intention, opinion, belief or purpose.

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

(1) Schedule 1 states—

(a) matters that may be appealed to—

(i) either a tribunal or the P&E Court; or

(ii) only a tribunal; or

(iii) only the P&E Court; and

(b) the person—

(i) who may appeal a matter (the ***appellant***); and

(ii) who is a respondent in an appeal of the matter; and

(iii) who is a co-respondent in an appeal of the matter; and

(iv) who may elect to be a co-respondent in an appeal of the matter.

(2) An appellant may start an appeal within the appeal period.

(3) The ***appeal period*** is—

(a) for an appeal by a building advisory agency—10 business days after a decision notice for the decision is given to the agency; or

(b) for an appeal against a deemed refusal—at any time after the deemed refusal happens; or

(c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises—20 business days after a notice is published under section 269(3)(a) or (4); or

(d) for an appeal against an infrastructure charges notice—20 business days after the infrastructure charges notice is given to the person; or

(e) for an appeal about a deemed approval of a development application for which a decision notice has not been given—30 business days after the applicant gives the deemed approval notice to the assessment manager; or

(f) for any other appeal—20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note—

See the P&E Court Act for the court's power to extend the appeal period.

(4) Each respondent and co-respondent for an appeal may be heard in the appeal.

(5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.

(6) To remove any doubt, it is declared that an appeal against an infrastructure charges notice must not be about—

(a) the adopted charge itself; or

(b) for a decision about an offset or refund—

(i) the establishment cost of trunk infrastructure identified in a LGIP; or

(ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

(1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that—

(a) is in the approved form; and

(b) succinctly states the grounds of the appeal.

(2) The notice of appeal must be accompanied by the required fee.

(3) The appellant or, for an appeal to a tribunal, the registrar, must, within the service period, give a copy of the notice of appeal to—

(a) the respondent for the appeal; and

(b) each co-respondent for the appeal; and

(c) for an appeal about a development application under schedule 1, section 1, table 1, item 1—each principal submitter for the application whose submission has not been withdrawn; and

(d) for an appeal about a change application under schedule 1, section 1, table 1, item 2—each principal submitter for the application whose submission has not been withdrawn; and

(e) each person who may elect to be a co-respondent for the appeal other than an eligible submitter for a

development application or change application the subject of the appeal; and

(f) for an appeal to the P&E Court—the chief executive; and

(g) for an appeal to a tribunal under another Act—any other person who the registrar considers appropriate.

(4) The ***service period*** is—

(a) if a submitter or advice agency started the appeal in the P&E Court—2 business days after the appeal is started; or

(b) otherwise—10 business days after the appeal is started.

(5) A notice of appeal given to a person who may elect to be a co-respondent must state the effect of subsection (6).

(6) A person elects to be a co-respondent to an appeal by filing a notice of election in the approved form—

(a) if a copy of the notice of appeal is given to the person—within 10 business days after the copy is given to the person; or

(b) otherwise—within 15 business days after the notice of appeal is lodged with the registrar of the tribunal or the P&E Court.

(7) Despite any other Act or rules of court to the contrary, a copy of a notice of appeal may be given to the chief executive by emailing the copy to the chief executive at the email address stated on the department's website for this purpose.

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(1) Subject to this chapter, schedule 1 and the P&E Court Act, unless the Supreme Court decides a decision or other matter under this Act is affected by jurisdictional error, the decision or matter is non-appealable.

(2) The *Judicial Review Act 1991*, part 5 applies to the decision or matter to the extent it is affected by jurisdictional error.

(3) A person who, but for subsection (1) could have made an application under the *Judicial Review Act 1991* in relation to the decision or matter, may apply under part 4 of that Act for a statement of reasons in relation to the decision or matter.

(4) In this section—

decision includes—

(a) conduct engaged in for the purpose of making a decision; and

(b) other conduct that relates to the making of a decision; and

(c) the making of a decision or the failure to make a decision; and

(d) a purported decision; and

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non-appealable, for a decision or matter, means the decision or matter—

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(b) may not be challenged, appealed against, reviewed, quashed, set aside or called into question in any other way under the *Judicial Review Act 1991* or otherwise, whether by the Supreme Court, another court, any tribunal or another entity; and

(c) is not subject to any declaratory, injunctive or other order of the Supreme Court, another court, any tribunal or another entity on any ground.

232 Rules of the P&E Court

(1) A person who is appealing to the P&E Court must comply with the rules of the court that apply to the appeal.

(2) However, the P&E Court may hear and decide an appeal even if the person has not complied with rules of the P&E Court.

Cardno (QLD) Pty Ltd | ABN 57 051 074 992
15 Scott Street, Parramatta Park
Cairns QLD 4870
Tel: 07 4034 0500
Web: www.cardno.com.au

PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

COVER SHEET

DATE PLOTTED: 11 October 2019 8:18 AM BY: - JACK JONES
CAD File: Q:\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1000.dwg

Q184103-CI-1000
Drawing Number

A
Revision

SCHEDULE OF DRAWINGS

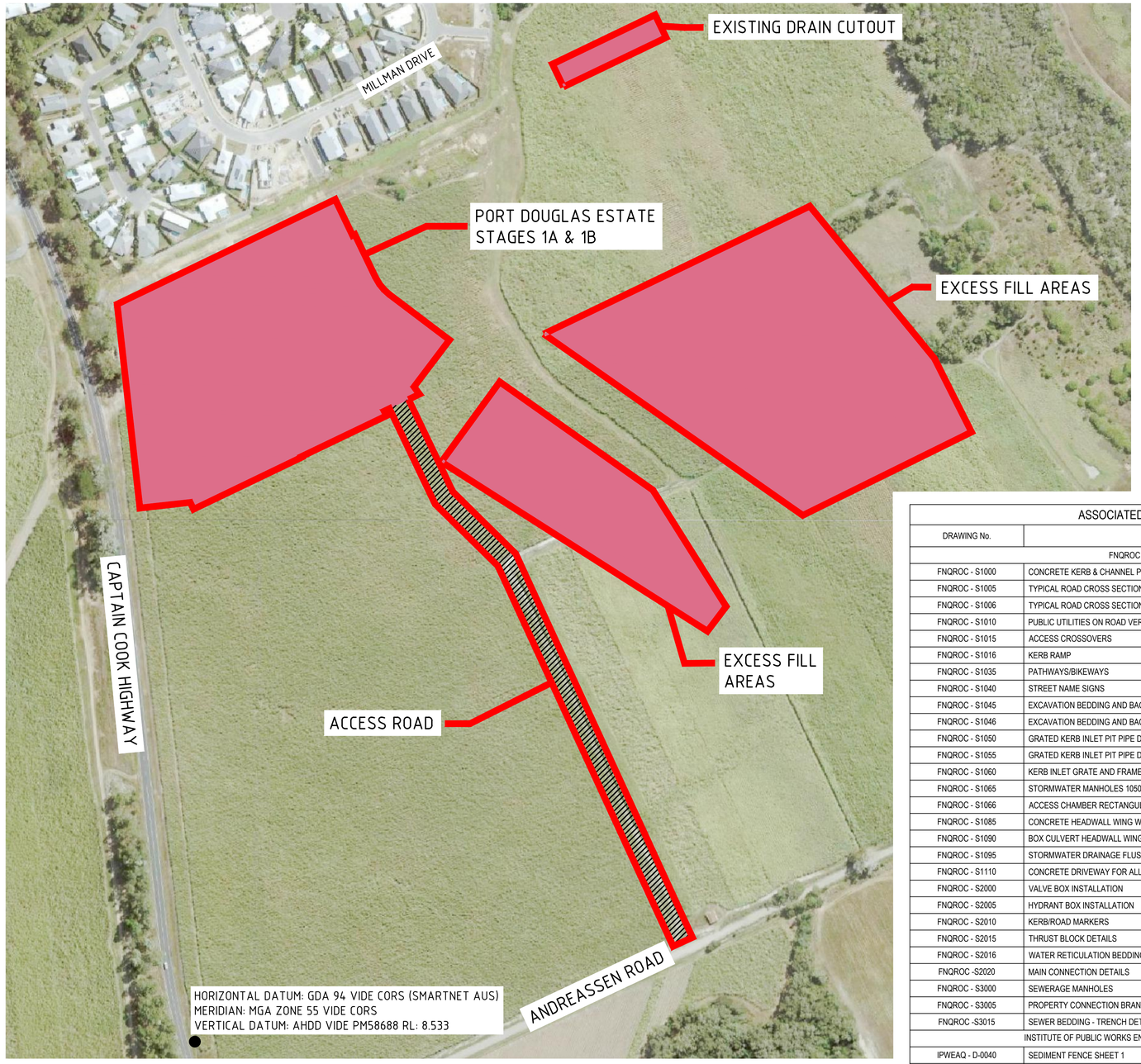
DRAWING No.	DESCRIPTION
Q184103-CI-1000	COVER SHEET
Q184103-CI-1001	DRAWING SCHEDULE AND LOCALITY PLAN
Q184103-CI-1002	NOTES
Q184103-CI-1003	OVERALL SITE PLAN - SHEET 1 OF 2
Q184103-CI-1004	OVERALL SITE PLAN - SHEET 2 OF 2
Q184103-CI-1005	SEDIMENT CONTROL DETAILS - SHEET 1 OF 2
Q184103-CI-1006	SEDIMENT CONTROL DETAILS - SHEET 2 OF 2
EARTHWORKS	
Q184103-CI-1100	BULK EARTHWORKS PLAN
Q184103-CI-1101	EXCESS CUT STOCKPILING PLAN
Q184103-CI-1102	SITE CROSS SECTIONS
ROADWORKS	
Q184103-CI-1200	ROADWORKS PLAN
Q184103-CI-1201	ROADWORKS - TYPICAL CROSS SECTIONS
Q184103-CI-1202	WABUL STREET LONGITUDINAL SECTION & CROSS SECTIONS
Q184103-CI-1203	WABUL STREET CROSS SECTIONS
Q184103-CI-1204	ROAD 2 LONGITUDINAL SECTION
Q184103-CI-1205	ROAD 2 CROSS SECTIONS SHEET 1 OF 2
Q184103-CI-1206	ROAD 2 CROSS SECTIONS SHEET 2 OF 2
Q184103-CI-1207	ROAD 3 LONGITUDINAL SECTION & CROSS SECTIONS
Q184103-CI-1208	ROAD 4 LONGITUDINAL SECTION & CROSS SECTIONS
Q184103-CI-1209	ROAD 5 LONGITUDINAL SECTION
Q184103-CI-1210	ROAD 5 CROSS SECTIONS
Q184103-CI-1211	INTERSECTION PLAN SHEET 1 OF 6
Q184103-CI-1212	INTERSECTION PLAN SHEET 2 OF 6
Q184103-CI-1213	INTERSECTION PLAN SHEET 3 OF 6
Q184103-CI-1214	INTERSECTION PLAN SHEET 4 OF 6
Q184103-CI-1215	INTERSECTION PLAN SHEET 5 OF 6
Q184103-CI-1216	INTERSECTION PLAN SHEET 6 OF 6
DRAINAGE	
Q184103-CI-1250	STORMWATER LAYOUT PLAN
Q184103-CI-1251	STORMWATER CATCHMENT PLAN
Q184103-CI-1252	STORMWATER LONGITUDINAL SECTIONS SHEET 1 OF 2
Q184103-CI-1253	STORMWATER LONGITUDINAL SECTIONS SHEET 2 OF 2
Q184103-CI-1260	STORMWATER CALCULATION TABLES SHEET 1 OF 2
Q184103-CI-1261	STORMWATER CALCULATION TABLES SHEET 2 OF 2
Q184103-CI-1262	CULVERT DETAILS PLAN SHEET 1 OF 2
Q184103-CI-1263	CULVERT DETAILS PLAN SHEET 2 OF 2
Q184103-CI-1264	DRAIN DESIGN - SHEET 1 OF 2
Q184103-CI-1265	DRAIN DESIGN - SHEET 2 OF 2
Q184103-CI-1266	SOUTHERN DIVERSION DRAIN
Q184103-CI-1267	EASTERN DIVERSION DRAIN
SEWERAGE	
Q184103-CI-1300	SEWER LAYOUT PLAN
Q184103-CI-1301	SEWER LONGITUDINAL SECTIONS SHEET 1 OF 2
Q184103-CI-1302	SEWER LONGITUDINAL SECTIONS SHEET 2 OF 2
WATER	
Q184103-CI-1350	WATER LAYOUT PLAN
MISCELLANEOUS	
Q184103-CI-1400	EROSION AND SEDIMENT CONTROL STRATEGY
Q184103-CI-1401	VEGETATION MANAGEMENT PLAN
Q184103-CI-1402	MISCELLANEOUS DETAILS PLAN
Q184103-CI-1403	COMBINED SERVICES PLAN
Q184103-CI-1404	RETAINING WALL DETAILS

LEGEND:

EXTENT OF WORKS

SITE ACCESS

NORTH



LOCALITY PLAN
SCALE 1:3000m

ASSOCIATED DRAWINGS SCHEDULE

DRAWING No.	DESCRIPTION
	FNQROC DEVELOPMENT MANUAL
FNQROC - S1000	CONCRETE KERB & CHANNEL PROFILES & DIMENSIONS
FNQROC - S1005	TYPICAL ROAD CROSS SECTIONS SHEET 1
FNQROC - S1006	TYPICAL ROAD CROSS SECTIONS SHEET 2
FNQROC - S1010	PUBLIC UTILITIES ON ROAD VERGES
FNQROC - S1015	ACCESS CROSSOVERS
FNQROC - S1016	KERB RAMP
FNQROC - S1035	PATHWAYS/BIKEWAYS
FNQROC - S1040	STREET NAME SIGNS
FNQROC - S1045	EXCAVATION BEDDING AND BACKFILLING OF PRECAST BOX CULVERTS
FNQROC - S1046	EXCAVATION BEDDING AND BACKFILLING OF CONCRETE PIPES
FNQROC - S1050	GRATED KERB INLET PIT PIPE DIA. LESS THAN 600mm
FNQROC - S1055	GRATED KERB INLET PIT PIPE DIA. GREATER THAN 600mm
FNQROC - S1060	KERB INLET GRATE AND FRAME
FNQROC - S1065	STORMWATER MANHOLES 1050 TO 1500
FNQROC - S1066	ACCESS CHAMBER RECTANGULAR ROOF SLAB
FNQROC - S1085	CONCRETE HEADWALL WING WALLS AND APRON
FNQROC - S1090	BOX CULVERT HEADWALL WINGWALLS AND APRON
FNQROC - S1095	STORMWATER DRAINAGE FLUSHING POINTS OUTLET
FNQROC - S1110	CONCRETE DRIVEWAY FOR ALLOTMENT ACCESS
FNQROC - S2000	VALVE BOX INSTALLATION
FNQROC - S2005	HYDRANT BOX INSTALLATION
FNQROC - S2010	KERB/ROAD MARKERS
FNQROC - S2015	THRUST BLOCK DETAILS
FNQROC - S2016	WATER RETICULATION BEDDING DETAILS
FNQROC -S2020	MAIN CONNECTION DETAILS
FNQROC - S3000	SEWERAGE MANHOLES
FNQROC - S3005	PROPERTY CONNECTION BRANCHES
FNQROC -S3015	SEWER BEDDING - TRENCH DETAILS
	INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA QUEENSLAND (IPWEAQ)
IPWEAQ - D-0040	SEDIMENT FENCE SHEET 1
IPWEAQ - D-0041	SEDIMENT CONTROL DEVICES SHEET 2
	MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)
	DEPARTMENT OF TRANSPORT AND MAIN ROADS
SD1250	RC BOX BULVERTS & SLAB LINK CULVERTS - CULVERT HEIGHTS > 600

Rev.	Date	Description	Des.	Verif.	Appd.
B	22.10.2019	EXCESS FILL AREA REVISED	MS	MS	MB
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 50 100 200 300m
SCALE 1:3000 @A1

Cardno®
Shaping the Future
Cardno (QLD) Pty Ltd | ABN 57 051 074 992
15 Scott Street, Parramatta Park
Cairns QLD 4870
Tel: 07 4034 0500 Fax: 07 4051 0133
Web: www.cardno.com.au

		Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	JJ	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: DRAWING SCHEDULE AND LOCALITY PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1001
Revision: B

GENERAL

G1 IF IN DOUBT ASK.
G2 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATIONS INCLUDING FNQROC AND ALL INFORMATION ISSUED BY THE SUPERINTENDENT DURING THE COURSE OF THE CONTRACT AND INCLUDES THE DOUGLAS SHIRE COUNCIL DECISION NOTICE.
G3 ALL LEVELS ARE TO AHD.
G4 ALL CO-ORDINATES ARE TO MGA ZONE 55.
G5 ALL SET OUT SHALL BE RELATED TO ROAD CENTRE LINES.
G6 ALL DIMENSIONS AND RADII ARE EXPRESSED IN METRES (UNO).
G7 DRAWINGS SHALL NOT BE SCALED.
G8 EXISTING CONTOURS, LEVELS AND FEATURES SHOWN ON THE DRAWINGS ARE INDICATIVE ONLY AND ARE BASED ON SURVEY DRAWINGS AND DATA PROVIDED BY CARDNO (QLD) PTY LTD CONSULTING SURVEYORS.
G9 ALL DIMENSIONS RELEVANT TO SETTING OUT, SURFACE LEVELS AND INVERT LEVELS SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO THE SUPERINTENDENT.
G10 THE CONTRACTOR SHALL ENSURE THAT ALL WORKS ARE MAINTAINED IN A SAFE AND STABLE CONDITION AND THAT ADEQUATE PROTECTION AGAINST EROSION AND SILTATION IS IN PLACE.
G11 WORKMANSHIP AND MATERIALS ARE TO BE IN ACCORDANCE WITH THE RELEVANT STANDARDS AND THE REQUIREMENTS OF DOUGLAS SHIRE COUNCIL AND OTHER AUTHORITIES SHALL BE MAINTAINED.
G12 GRADE EVENLY BETWEEN LEVELS SHOWN EXCEPT WHERE LEVELS INDICATE VERTICAL CURVES.
G13 THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION PROTECTION AND SEDIMENT CONTROL FOR THE WORKS AS SPECIFIED AND TO THE SATISFACTION OF DOUGLAS SHIRE COUNCIL.
G14 REFER FNQROC DEVELOPMENT MANUAL

SITE CLEARANCE

C1 THE SITE SHALL BE CLEARED ONLY TO THE EXTENT NECESSARY TO PERMIT CONSTRUCTION OF THE PERMANENT WORKS U.N.O.
C2 AREAS TO BE USED FOR STOCKPILING EXCESS EXCAVATED MATERIALS SHALL BE CLEARED AND STRIPPED OF TOPSOIL AND OTHER UNSUITABLE MATERIAL.
C3 ALL ITEMS NOMINATED ON THE DRAWINGS TO BE REMOVED ARE TO BE DISPOSED OF OFF SITE. REMOVED VEGETATION IS TO HAVE ALL ROOTS GRUBBED OUT AND DISPOSED OF OFF SITE. ALL OFFSITE DISPOSAL IS AT CONTRACTORS EXPENSE.

EARTHWORKS

E1 DRY DENSITY RATIO AS REFERRED TO IN THESE NOTES IS THE RATIO DETERMINED IN ACCORDANCE WITH AS1289.5.4.1 OF COMPACTED DRY DENSITY IN ACCORDANCE WITH AS1289.5.3.1 OR AS1289.5.8.1 TO THE STANDARD MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH AS1259.5.1.11 (STANDARD COMPACTION).
E2 STRIP ALL VEGETAL MATTER, TOPSOIL AND OTHER UNSUITABLE MATERIAL FROM AREAS TO BE EXCAVATED OR FILLED. STOCKPILE SUITABLE TOPSOIL MATERIAL IN APPROVED LOCATIONS FOR SUBSEQUENT RE-USE.
E3 EXCAVATE AS REQUIRED AND DEPOSIT EXCAVATED MATERIAL AS NECESSARY. COMPACT SURFACES EXPOSED BY STRIPPING OR EXCAVATION TO 98% DRY DENSITY RATIO TO A DEPTH OF AT LEAST 250mm, SHOULD ANY SOFT OR UNSUITABLE MATERIAL BE IDENTIFIED SEEK THE ADVICE OF THE SUPERINTENDENT.
E4 COMPACT FILL TO 98% DRY DENSITY RATIO IN LAYERS OF THICKNESS APPROPRIATE TO THE COMPACTION PLANT EMPLOYED BUT NOT EXCEEDING 200mm.
E5 ALL MATERIALS WITHIN 300mm BELOW ROAD PAVEMENT/SUBGRADE INTERFACE SHALL BE COMPACTED TO 98% DRY DENSITY RATIO.
E6 IN PLACING FILL IN AND AROUND ROAD FOOTPATHS AND BATTERS ALLOW FOR TOPSOIL THICKNESS AS DETERMINED ON BASIS OF ACTUAL TOPSOIL MATERIALS BALANCE.
E7 ALL AREAS EXPOSED BY EARTHWORKS SHALL BE TOPSOILED AND GRASSED BY DRILL SEEDING EXCEPT THAT HYDROMULCHING IS REQUIRED ON BATTERS STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL. ALL AREAS TO BE GRASSED WILL HAVE 80% ROOT MAT AT THE END OF DEFECTS LIABILITY PERIOD AND SHALL BE FREE OF ROCK AND LOOSE STONE WHEN WORKS ARE TAKEN "ON MAINTENANCE".

ROADWORKS

R1 PAVEMENT DESIGN IS BASED ON SUBGRADE RESULTS AS PER GEOTECHNICAL REPORT AND IS SUBJECT TO REVISION ON THE BASIS OF CONFIRMATORY CBR TESTS OF THE SUBGRADE AT TIME OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE 7 No. CONFIRMATORY SUBGRADE SOAKED CBR TESTING TO THE SUPERINTENDENT AS SOON AS POSSIBLE LOCATIONS TO BE AGREED WITH THE SUPERINTENDENT.
R2 EXCAVATE OR FILL AS NECESSARY TO PAVEMENT/SUBGRADE INTERFACE AS DESCRIBED IN THE SPECIFICATION AND EARTHWORKS NOTES.
R3 PRIOR TO PLACING ROAD PAVEMENT MATERIAL THE SUBGRADE SHALL BE TESTED AND PROOF ROLLED IN THE PRESENCE OF THE SUPERINTENDENT AND DOUGLAS SHIRE COUNCIL'S INSPECTING OFFICER.
R4 PAVEMENT DESIGN SHALL BE AS SHOWN ON DRAWINGS

DRAINAGE

D1 STORMWATER DRAINAGE PIPE SHALL BE RCP FJ CLASS 2 PIPE UNO. JOINTS TO HAVE MANUFACTURER APPROVED BANDS AT ALL JOINTS TO PREVENT MOVEMENT OF FINE MATERIAL THROUGH JOINT e.g. ROCLA SAND BANDS
D2 BEDDING SHALL BE TYPE HS2 AS SPECIFIED IN AS3725.
D3 PIPE LAYING SHALL COMMENCE AT THE DOWNSTREAM END OF THE WORKS AT ALL TIMES.
D4 STORMWATER HEADWALLS TO BE CONSTRUCTED AS DETAILED ON FNQROC STANDARD DRAWING S1080. SEEK SUPERINTENDENTS APPROVAL OF VARIATION PRIOR TO CONSTRUCTION. LIDS SHALL BE CAST AFTER COMPLETION OF ALL EARTHWORKS
D5 STORMWATER KERB INLET PITS TO BE CONSTRUCTED AS DETAILED ON FNQROC STANDARD DRAWINGS S1050, S1055 AND S1060 U.N.O.
D6 ALL "FINISHED SURFACE LEVELS" ON STORMWATER LONG SECTIONS ARE BASED ON A PROJECTION OF THE KERB INVERT AT THE SETOUT CO-ORDINATE
D7 SUBSOIL DRAIN MIN GRADE 0.5%. REFER FNQROC STD DWG S1095 FOR DETAILS
D8 ALL STORMWATER DRAINAGE LINES SHALL HAVE CCTV SURVEY COMPLETED IN ACCORDANCE WITH THE FNQROC DEVELOPMENT MANUAL.
D9 ALL TOP OF PIT, INLETS AND GPT UNITS TO BE CONFIRMED BY CONTRACTOR ON SITE PRIOR TO ORDERING. ANY VARIATION IN LEVELS FROM THE DESIGN PLANS TO BE REPORTED TO THE SUPERINTENDENT
D10 ALL TOP OF PIT, INLETS AND GPT UNITS TO BE CONFIRMED BY CONTRACTOR ON SITE PRIOR TO ORDERING. ANY VARIATION IN LEVELS FROM THE DESIGN PLANS TO BE REPORTED TO THE SUPERINTENDENT

WATER

W1 CONTRACTOR SHALL ADVISE DOUGLAS SHIRE COUNCIL PRIOR TO UNDERTAKING ANY SEWERAGE AND WATER RELATED WORK.
W2 COMPLY WITH FNQROC - STANDARD DRAWINGS S2000 TO S2020
W3 POTABLE WATER MAINS TO BE INSTALLED 2.80m FROM PROPERTY BOUNDARY U.N.O. GENERALLY IN ACCORDANCE WITH FNQROC STD. DWG S1010.
W4 CONNECTION TO EXISTING MAINS TO BE CARRIED OUT BY DOUGLAS SHIRE COUNCIL AT THE CONTRACTOR'S EXPENSE.
W5 ALL PVC WATER MAINS SHALL BE CLASS 16 PVC-M RUBBER RING JOINTED U.N.O. ALL DICL WATER MAINS SHALL BE PN35 DICL RUBBER RING JOINTED U.N.O. ALL 63Ø POLY PIPES SHALL BE MDPE CLASS 16.
W6 WATER MAINS 225Ø OR GREATER SHALL HAVE 900mm MINIMUM COVER.
W7 BEDDING AND SURROUND TO PIPES AND FITTINGS SHALL BE IN IN ACCORDANCE WITH FNQROC STANDARD DRAWING S2016
W8 HYDRANTS AND VALVES ARE TO BE NYLON POWDER COATED OR EQUIVALENT AND HYDRANTS ARE TO BE OF THE MAXI-FLOW TYPE.
W9 HYDRANTS TO BE IDENTIFIED BY KERB MARKER PLATE AND BLUE RETRO-REFLECTIVE MARKER IN ACCORDANCE WITH FNQROC STANDARD DRAWING S2010 & S2005
W10 VALVES TO BE IDENTIFIED BY KERB MARKER PLATE AND YELLOW RETRO-REFLECTIVE MARKER IN ACCORDANCE WITH FNQROC STANDARD DRAWING S2010
W11 WATER MAINS CROSSING ROADS SHALL BE PN35 DICL FOR THE FULL ROAD CROSSING WIDTH, FINISHING 100mm BEHIND THE BACK OF KERB AND CHANNEL AT A MINIMUM AND AS SHOWN ON THE DRAWINGS.
W12 MINIMUM TEST PRESSURE OF WATER MAINS SHALL BE 1200kPa. IN ACCORDANCE WITH DOUGLAS SHIRE COUNCIL AND FNQROC SPECIFICATIONS.
W13 EXISTING HYDRANTS OR VALVES SHALL BE PROVIDED WITH NEW COVER BOXES AND SURROUNDS AS PER FNQROC STD. DWGS. S2000 AND S2005.
W14 WHERE VALVE SURROUNDS ARE TO BE SET IN CONCRETE, A COMPRESSIBLE LAYER IS TO BE PROVIDED TO ALLOW FOR MAINTENANCE
W15 LOWER WATER MAIN UNDER ROADS AS NECESSARY TO AVOID SUBGRADE IMPROVEMENT LAYER IF APPLICABLE

SEWER NOTES

1. PROPERTY CONNECTION BRANCHES SHALL BE 100 DIA. AND TERMINATE AT THE INLET END OF THE INSPECTION PIPE. THE END SHALL BE SEALED WITH PLUG AND CLIP AND THE INVERT LEVEL OF THE BEND SHALL BE AS DIRECTED BY THE SUPERINTENDENT.
2. ALL SEWER MAINS SHALL BE 150 DIA. UPVC CLASS DWV SN10 R.R.J. UNLESS NOTED OTHERWISE.
3. MANHOLE LIDS TO BE CONSTRUCTED 50mm ABOVE GROUND LEVEL. OR FLUSH WITH PATHWAYS, ROADWAYS AND PAVED SURFACES
4. ENSURE MANHOLES ARE 1.5m CLEAR ON 3 SIDES FROM BATTERS. STEEPEN BATTERS LOCALLY IF REQUIRED. MEASUREMENT TAKEN AS A RADIUS AROUND THE CENTRE OF LID.
5. ENSURE MANHOLES ARE MIN 0.1m CLEAR FROM PROPERTY BOUNDARIES
6. ENSURE HCBs ARE MIN 0.5m CLEAR FROM PROPERTY BOUNDARIES
7. WHERE SEWER IS IN VERGE, E2 HCB's SHALL EXTEND PAST TOP OF BATTER MIN 1.0m

GEOTECHNICAL

GT1 DOUGLAS PARTNERS HAVE PREPARED A GEOTECHNICAL INVESTIGATION REPORT DATED JULY 2019. THE CONTRACTOR IS TO COMPLY WITH THE REPORT OR NOTIFY THE ENGINEER.
GT2 ALL EARTHWORKS SHALL BE SUPERVISED IN ACCORDANCE WITH L1 OF AS3798. THE CONTRACTOR SHALL EMPLOY AN RPEQ GEOTECHNICAL CONSULTANT WHO SHALL PROVIDE A CERTIFICATE THAT THE WORKS HAVE BEEN COMPLETED SATISFACTORY IN ACCORDANCE WITH THE SPECIFICATION AND TO LEVEL 1 OF AS 3798.
GT3 ALL BATTERS STEEPER THAN 1 IN 2 AND HIGHER THAN 1.5m ARE TO BE CHECKED BY A GEOTECHNICAL ENGINEER AND CERTIFIED AS TO THEIR STABILITY TO SATISFY DOUGLAS SHIRE COUNCIL.
GT4 ALL STRUCTURE DESIGN CRITERIA SHALL BE CONFIRMED ONCE A GEOTECHNICAL INVESTIGATION HAS BEEN COMPLETED. THIS INCLUDES PAVEMENT DESIGN
GT5 ALL BATTERS TO BE CONFIRMED BY GEOTECHNICAL INVESTIGATION RECOMMENDATIONS

EARTHWORKS NOTES

1. CONTROL TESTING OF BULK EARTHWORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH A.S.3798 - 2007.
2. ALL EARTHWORKS ARE TO BE CONTROLLED BY LEVEL 1 INSPECTION AND TESTING BY A QUALIFIED GEOTECHNICAL, TESTING AND INSPECTION AUTHORITY.
3. COMPACTION TEST FREQUENCY FOR EARTHWORKS ARE TO BE IN ACCORDANCE WITH TABLE 8.1 OF AS3798-2007.
4. MINIMUM RELATIVE COMPACTION STANDARDS FOR EARTHWORKS ARE TO BE IN ACCORDANCE WITH TABLE 5.1 OF AS3798-2007.
5. FOR SETTING OUT DETAILS OF ROADS AND KERB REFER TO TYPICAL CROSS SECTIONS, ROAD SETTING OUT DETAILS AND INTERSECTION DETAILS.
6. LOTS ARE TO BE GRADED EVENLY BETWEEN FINISHED SURFACE LEVELS SHOWN UNLESS OTHERWISE NOTED.
7. EXCESS MATERIAL FROM EXCAVATION IS TO BE MOVED TO FUTURE STAGE.
8. REFER VEGETATION MANAGEMENT PLAN FOR CLEARING DETAILS
9. ALL EXISTING SERVICES SHALL BE CHECKED FOR CLEARANCE PRIOR TO CONSTRUCTION.
10. FINISHED SURFACE LEVELS SHOWN ON ALLOTMENTS (EXCLUDING VERGES) ARE AT COMPLETION OF EARTHWORKS AND TOPSOILING.
11. ALL AREAS EXPOSED BY EARTHWORKS SHALL BE TOPSOILED AND GRASSED BY DRILL SEEDING EXCEPT THAT HYDROMULCHING IS REQUIRED ON BATTERS STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL. ALL AREAS TO BE GRASSED WILL HAVE 80% ROOT MAT AT THE END OF DEFECTS LIABILITY PERIOD AND SHALL BE FREE OF ROCK AND LOOSE STONE WHEN WORKS ARE TAKEN "ON MAINTENANCE".
12. WHERE BATTERS FRONT A ROAD, ENSURE THERE IS AN EXTENSION OF VERGE GRADE INTO LOT WITH GRADE TO MATCH. REFER FNQROC STD. DWG. S1005 FOR DETAILS

SAFETY IN CONSTRUCTION

CONSTRUCTION ACTIVITY CAN BE HAZARDOUS. POTENTIAL SAFETY HAZARDS CONSIDERED BY THE DESIGNERS TO HAVE A HIGHER RISK THAN NORMAL CONSTRUCTION ACTIVITY ARE IDENTIFIED WITH APPROPRIATE NOTES ON THESE DRAWINGS. IT SHOULD BE NOTED THAT DESIGNERS HAVE A LOWER UNDERSTANDING OF THE RISKS INVOLVED IN CONSTRUCTION COMPARED WITH THAT OF A COMPETENT CONTRACTOR. IT IS THEREFORE ESSENTIAL THAT AN ADEQUATE SAFETY PLAN FOR THE WORKS IS PREPARED BY THE CONTRACTOR. SAFETY PLANS ARE TO BE PREPARED IN COMPLIANCE WITH THE STATUTORY REQUIREMENTS. THE DESIGNERS MAY NOT BE AWARE OF ALL SAFETY RISKS AND HAZARDS INVOLVED IN THIS PROJECT AND THE ABSENCE OF COMMENT DOES NOT IMPLY THAT THERE ARE ONLY LOW LEVEL RISKS OF HAZARDS INVOLVED IN THE PROJECT. APPROPRIATE WORK METHOD STATEMENTS ARE TO BE PREPARED FOR ANY HIGH RISK ACTIVITY BY THE CONTRACTOR. THE DESIGNERS ARE AVAILABLE TO BE CONSULTED WHEN REQUIRED CONCERNING THEIR AREA OF CONTROL WITH REGARD TO SAFETY PLANS.

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

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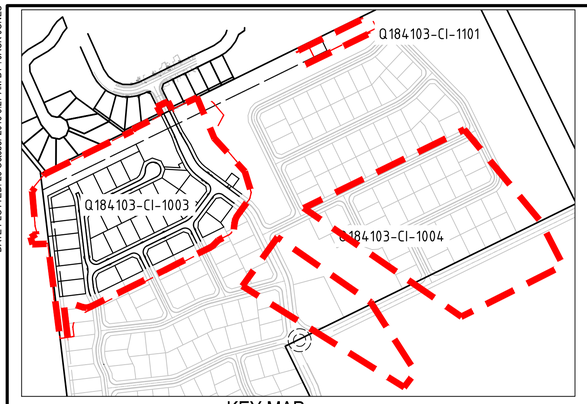
		Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	JJ	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: NOTES

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-1002 | Revision: A



KEY MAP
SCALE 1:4000m

LEGEND:

- STAGE BOUNDARY
- LIMIT OF WORKS
- DRAINAGE RESERVE
- 3.50 NATURAL SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- 1.8m HIGH TIMBER PACING FENCE
- 1.8m HIGH NOISE MOUND FENCE

5 EXISTING 1.54x1.1m CULVERTS

NORTH

RETAIN EXISTING CHANNEL AND ROCK PROTECTION

REFER Q184103-CI-1262 & 1263 FOR ROCK PROTECTION DETAILS

REFER Q184103-CI-1264 & 1265 FOR ROCK PROTECTION DETAILS

17 SP192596 | 18 SP192596 | 19 SP192596 | 20 SP192596 | 21 SP192596 | 33 SP276051 | 34 SP276051 | 35 SP276051 | 37 SP276051 | 38 SP276051

DRAIN 1

PARK

EASEMENT

ROAD 5 — STAGE 1B

STAGE 1A

ROAD 2

ROAD 3

ROAD 4

WABUL STREET

CAPTAIN COOK HIGHWAY

SEWER PUMP STATION

Lot	Area
1	700m²
2	702m²
3	601m²
4	600m²
5	600m²
6	600m²
7	600m²
8	700m²
9	600m²
10	600m²
11	600m²
12	600m²
13	600m²
14	600m²
15	607m²
16	700m²
17	600m²
18	600m²
19	700m²
20	702m²
21	612m²
22	612m²
23	681m²
24	681m²
25	681m²
26	681m²
27	700m²
28	658m²
29	641m²
30	641m²
31	625m²
32	614m²

Rev.	Date	Description	Des.	Verif.	Appd.
B	22.10.2019	EXCESS FILL AREA REVISED	MS	MS	MB
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 10 20 30 40 50m
SCALE 1:500 @A1

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		Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	JJ	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

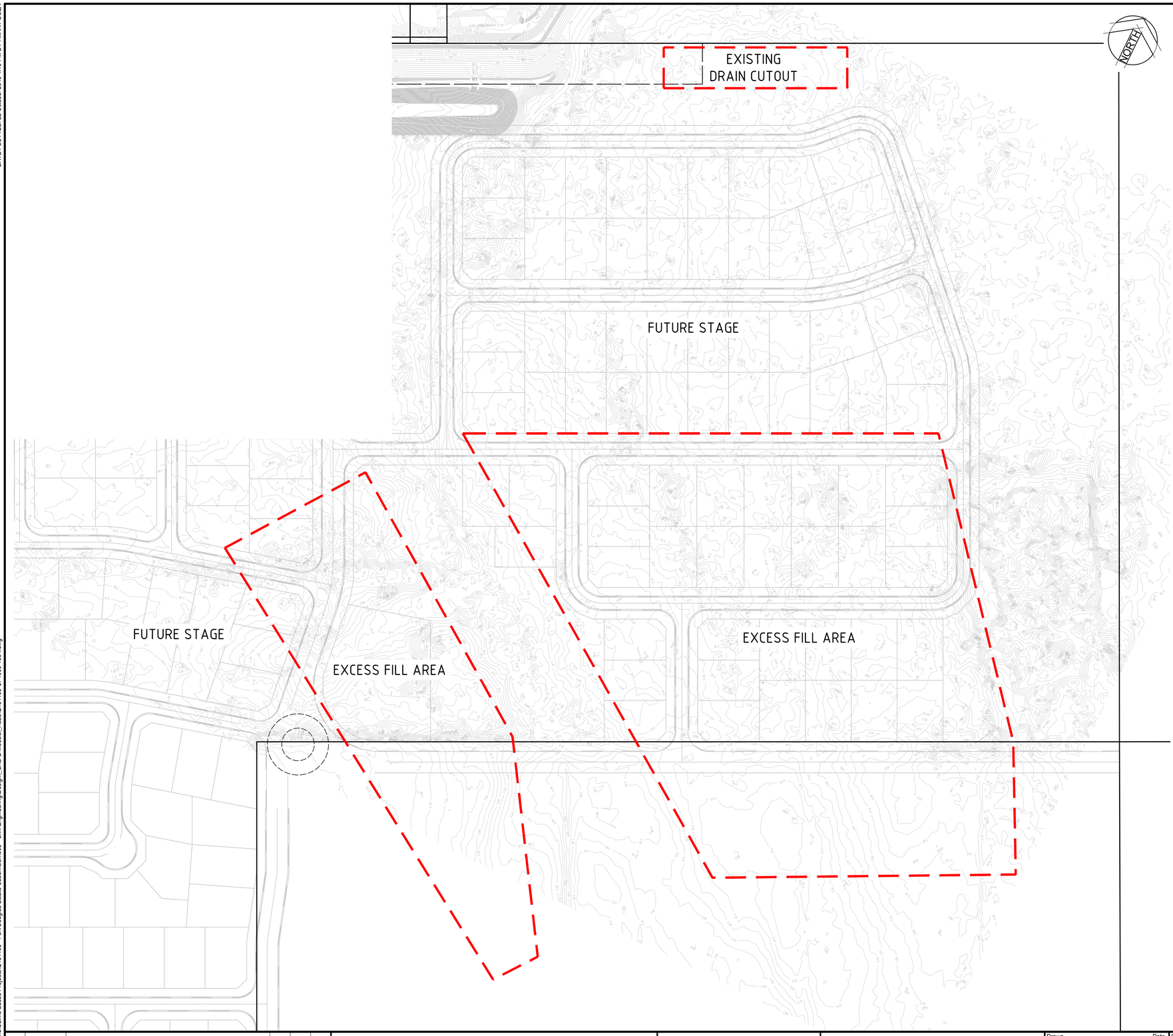
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

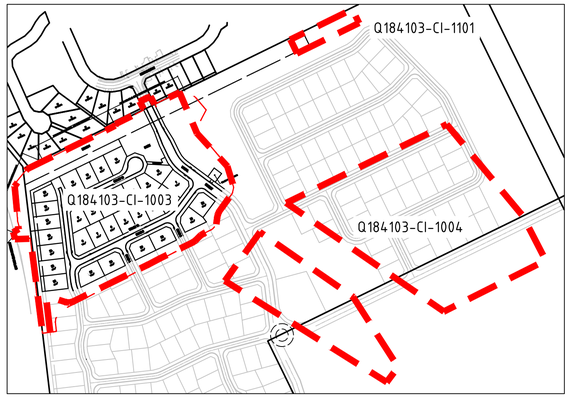
Title: OVERALL SITE PLAN
SHEET 1 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1003
Revision: B





KEY MAP
SCALE 1:4000m

LEGEND:

- SITE BOUNDARY
- LIMIT OF WORKS
- 3.50 NATURAL SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)

Rev.	Date	Description	Des.	Verif.	Appd.
B	22.10.2019	EXCESS FILL AREA REVISED	MS	MS	MB
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 20 40 60 80 100m
SCALE 1:1000 @A1

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Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

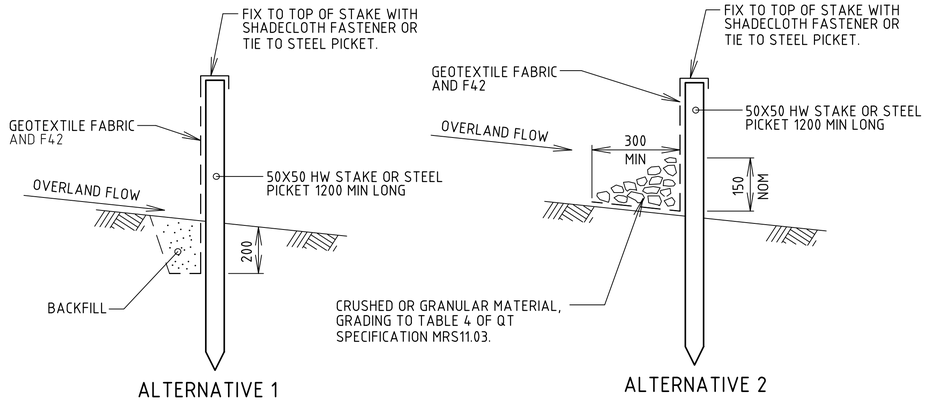
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: OVERALL SITE PLAN
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

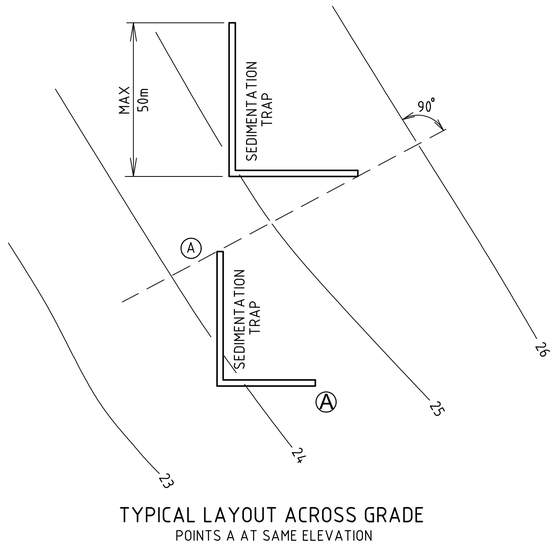
Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1004
Revision: B

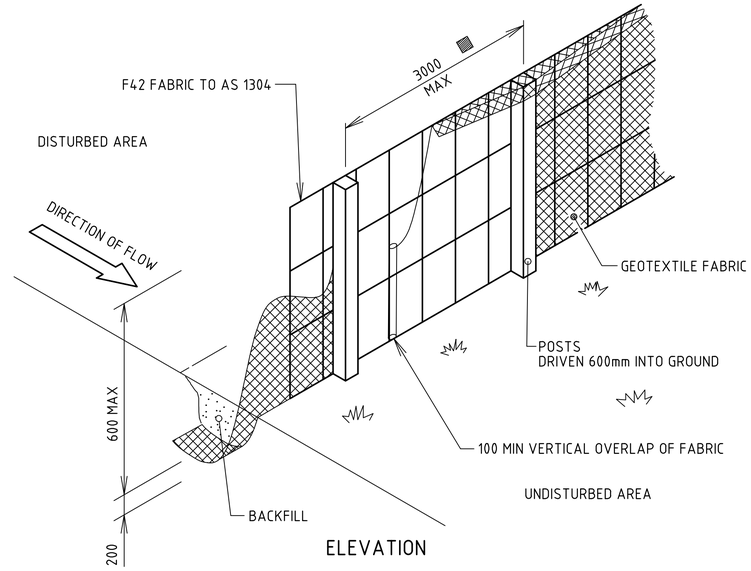


ALTERNATIVE 1

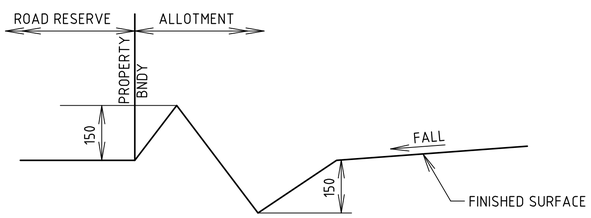
ALTERNATIVE 2



TYPICAL LAYOUT ACROSS GRADE
POINTS A AT SAME ELEVATION

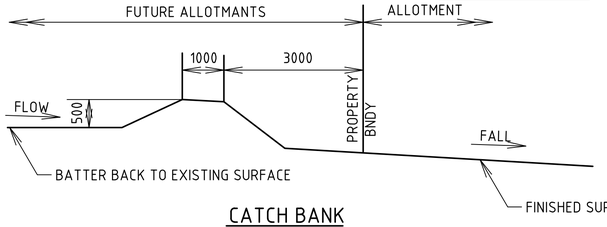


ELEVATION

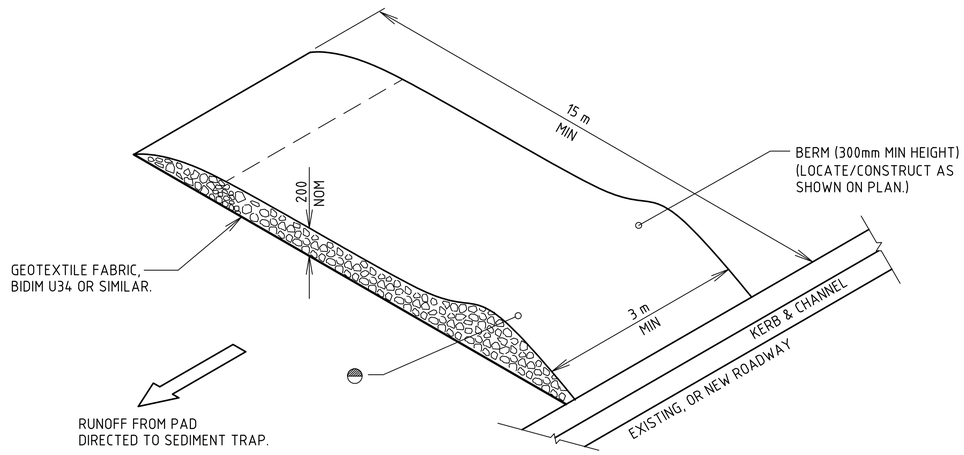


SILT TRAP TRENCH

SEDIMENT FENCE



CATCH BANK



TEMPORARY CONSTRUCTION ENTRY / EXIT
SEDIMENT TRAP

LEGEND

- UNBOUND PAVEMENT MATERIAL (GRAVEL) TO GRADING B, TABLE 9 OF TMR SPECIFICATION MRS11.05, EXCLUDE MATERIAL FINER THAN AS SIEVE 2.36mm.
- WITHOUT F42 FABRIC, 2000 MAX C\C

NOTES

1. GENERAL
   - (A) TEMPORARY DRAINAGE CONTROL. FLOW SHOULD BE DIVERTED AROUND THE WORK SITE WHERE POSSIBLE.
   - (B) ALL DRAINAGE, EROSION AND SEDIMENT CONTROLS TO BE INSTALLED AND BE OPERATIONAL BEFORE COMMENCING UP-SLOPE EARTHWORKS.
   - (C) ALL CONTROL MEASURES TO BE INSPECTED AT LEAST WEEKLY AND AFTER SIGNIFICANT RUNOFF PRODUCING STORMS.
   - (D) CONTROL MEASURES MAY BE REMOVED WHEN ON-SITE EROSION IS CONTROLLED AND 70% PERMANENT SOIL COVERAGE IS OBTAINED OVER ALL UPSTREAM DISTURBED LAND.
   - (E) IN AREAS WHERE RUNOFF TURBIDITY IS TO BE CONTROLLED, EXPOSED SURFACES TO BE EITHER MULCHED, COVERED WITH EROSION CONTROL BLANKETS OR TURFED IF EARTHWORKS ARE EXPECTED TO BE DELAYED FOR MORE THAN 14 DAYS.
2. SEDIMENT FENCE
   - (A) NORMALLY LOCATED ALONG THE CONTOUR WITH A MAXIMUM CATCHMENT AREA 0.6 ha PER 100m LENGTH OF FENCE.
   - (B) WOVEN FABRICS ARE PREFERRED, I.E. OPERATIONAL PERIOD LESS THAN 6 MONTHS OR ON SITES WHERE SIGNIFICANT SEDIMENT RUNOFF IS NOT EXPECTED.
   - (C) WHERE FENCES NEED TO BE LOCATED ACROSS THE CONTOUR THE LAYOUT SHALL CONFORM TO 'TYPICAL LAYOUT ACROSS GRADE'.
   - (D) FENCES ARE REQUIRED 2m MIN FROM TOE OF CUT OR FILL BATTERS, WHERE NOT PRACTICAL ONE FENCE CAN BE AT THE TOE WITH A SECOND FENCE 1m MIN AWAY. FENCE SHOULD NOT BE LOCATED PARALLEL WITH TOE IF CONCENTRATION OF FLOW WILL OCCUR BEHIND THE FENCE.
3. TEMP CONSTRUCTION ENTRY/EXIT SEDIMENT TRAP.
   - (A) ADJACENT STORMWATER RUNOFF TO BE DIVERTED AWAY FROM ENTRY/EXIT.
   - (B) WHEEL - WASH OR SPRAY UNIT MAY BE REQUIRED DURING WET WEATHER.
4. SAFETY ISSUES MUST BE CONSIDERED AT ALL TIMES, INCORPORATE TRAFFIC CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT.
5. ALL DIMENSIONS IN MILLIMETRES UNLESS INDICATED OTHERWISE.

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Verified	MS	Date 10.10.2019
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Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

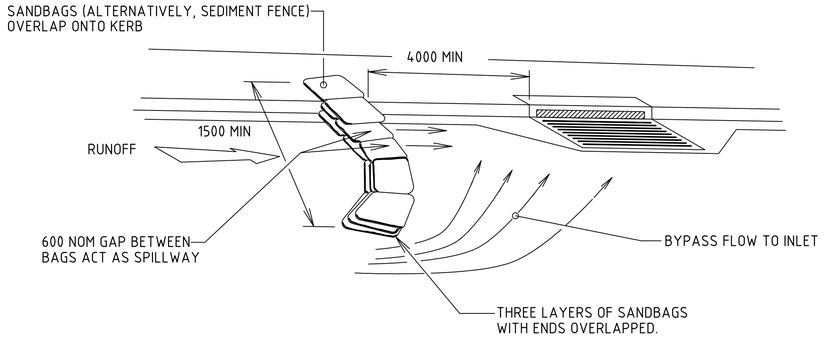
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: SEDIMENT CONTROL DETAILS
SHEET 1 OF 2

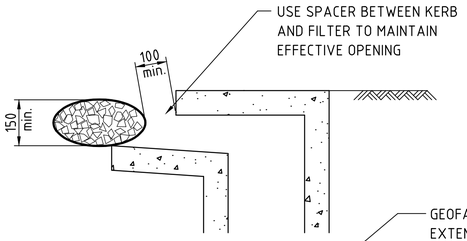
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

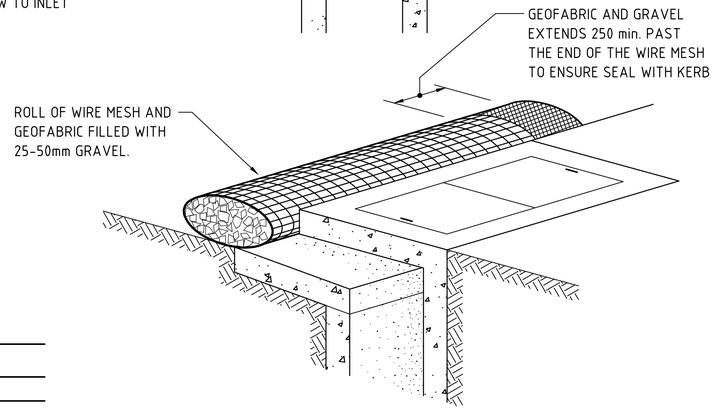
Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1005
Revision: A



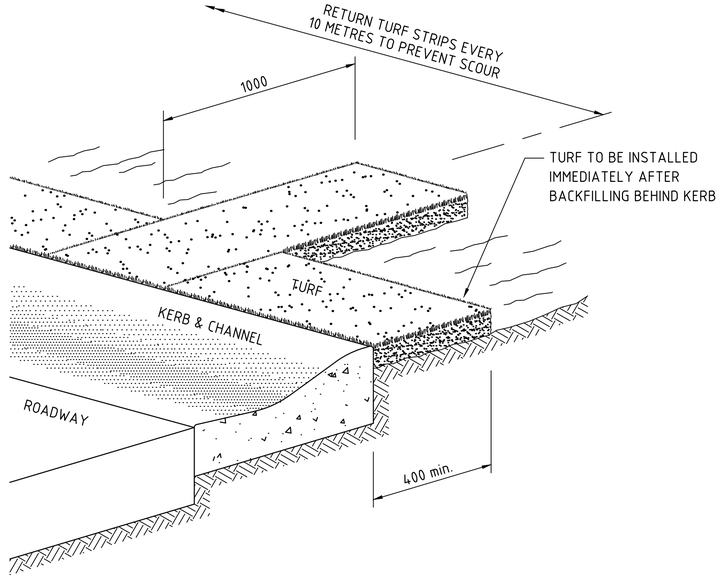
ON GRADE KERB INLET SEDIMENT TRAP





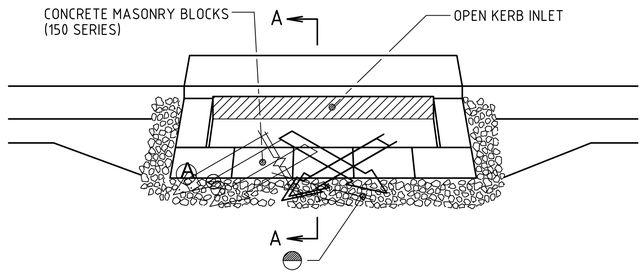
FILTER TO SIDE INLET GULLY PIT

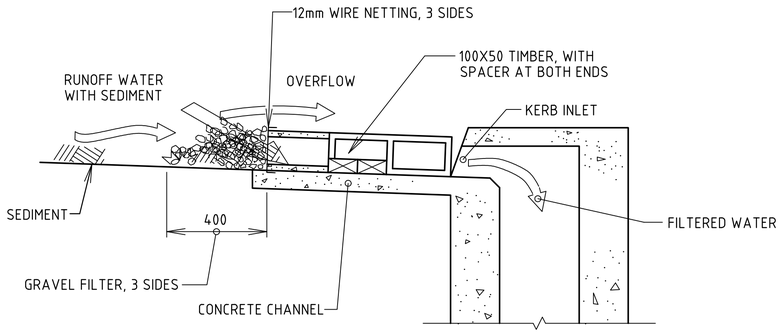
NOT TO SCALE



TURF STRIPS TO KERBLINE

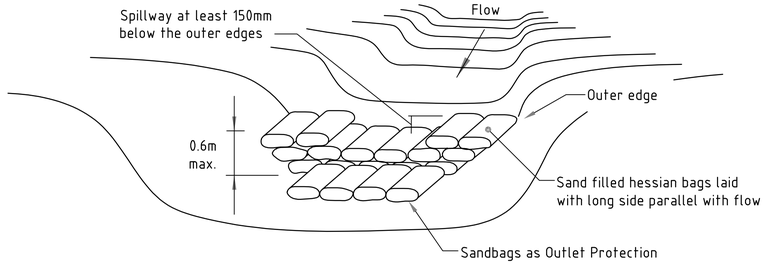
NOT TO SCALE





SECTION A-A
SAG INLET SEDIMENT TRAP, ST-1

A STABILISED BYPASS 'OVERLAND FLOW PATH' SHOULD EXIST ADJACENT TO INLET IN GENUINE SAGS.



SAND BAG CHECK DAM SECTION DETAIL

NOT TO SCALE

LEGEND

GRAVEL FILTER, REFER GRADING B, TABLE 9 OF QT SPECIFICATION MRS11.05, EXCLUDE MATERIAL FINER THEN AS SIEVE 2.36mm.

NOTES

1. FIELD INLET
   - A) A STABILISED BYPASS OVERLAND FLOW PATH SHOULD EXIST ADJACENT TO THE FIELD INLET.
   - B) WATER LEVEL CONTROL PERIMETER BANKS MAY BE REQUIRED.
   - C) BLOCKS TO BE RESTRAINED BY A HORIZONTAL TIMBER RAIL AT BLOCK JOINT HEIGHT FIXED TO TIMBER STAKES AT CORNERS.
2. CHECK DAMS
   - A) CATCHMENT AREA LIMITED TO 4 ha
   - B) USE IN MINOR OPEN DRAINS ONLY, (VELOCITY CONTROL), SEDIMENT COLLECTION IS A SECONDARY PURPOSE.
3. STRAW BALE BANKS
   - A) BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR,IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
   - B) EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 100mm ON THE DOWNSTREAM SIDE AND PLACED SO THE BINDINGS ARE HORIZONTAL.
   - C) BALES SHALL BE SECURELY ANCHORED IN PLACE WITH EITHER TWO STAKES OR STEEL PICKETS DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER.
   - D) INSPECTIONS SHALL BE FREQUENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED. REPLACE AT LEAST 3 monthly.
4. SAFETY ISSUES MUST BE CONSIDERED AT ALL TIMES, INCORPORATE TRAFFIC CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT.
5. ALL DIMENSIONS IN MILLIMETRES UNLESS INDICATED OTHERWISE.

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

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Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	JJ	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

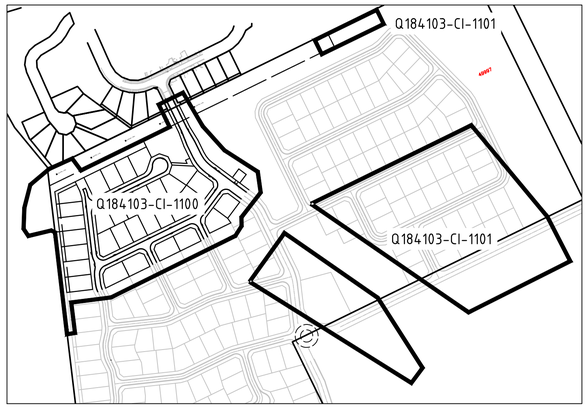
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: SEDIMENT CONTROL DETAILS
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1006
Revision: A



KEY MAP
SCALE 1:4000m

GENERAL NOTES

1. DESIGN CONTOURS SHOWN ON ROADS ARE FINISHED SURFACE DESIGN LEVELS. BOXING CONTOURS CAN BE PROVIDED AT CONTRACTOR'S REQUEST
2. ALL RUBBISH IS TO BE REMOVED FROM SITE AND DISPOSED.

CUT AND FILL LEGEND

CUT > 1.5m	FILL 0m - 0.25m
CUT 1.5m - 1.25m	FILL 0.25m - 0.5m
CUT 1.25m - 1.0m	FILL 0.5m - 0.75m
CUT 1.0m - 0.75m	FILL 0.75m - 1.0m
CUT 0.75m - 0.5m	FILL 1.0m - 1.25m
CUT 0.5m - 0.25m	FILL 1.25m - 1.5m
CUT 0.25m - 0m	FILL > 1.5m

LEGEND

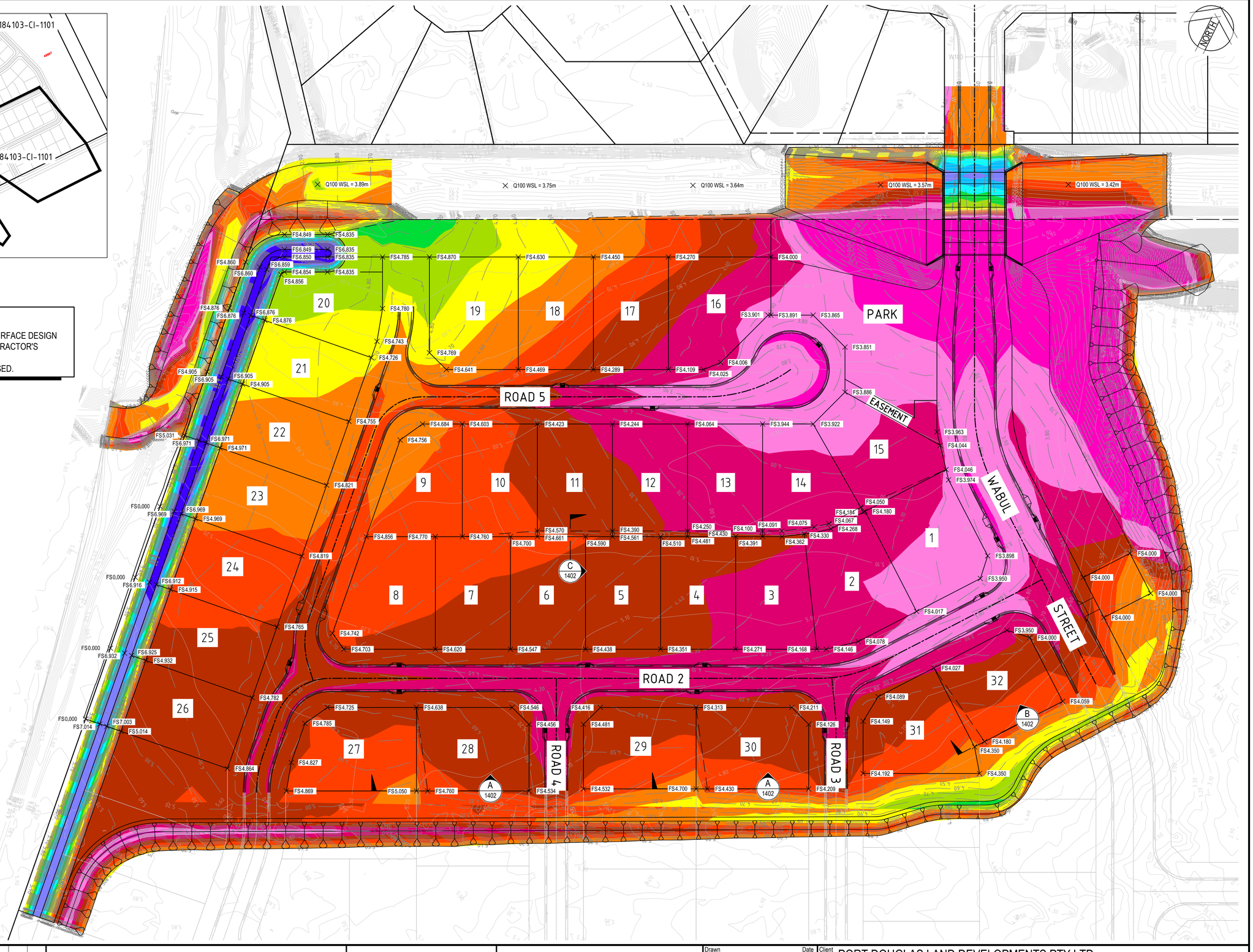
- 3.50 — NATURAL SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- 3.50 — FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- TOP OF BATTER
- FS0.000 — FINISHED SURFACE LEVEL

NOTE

VOLUMES NOMINATED ARE PRELIMINARY ONLY & REFLECT THE DIFFERENCES BETWEEN EXISTING & FINISHED SURFACES.

VOLUMES (ESTIMATED)

CUT = 33,388m^3
FILL = 2,865m^3
BALANCE TO PADDOCK FILL AREAS = 30,523m^2



Rev.	Date	Description	Des.	Verif.	Appd.
B	22.10.2019	EXCESS FILL AREA REVISED	MS	MS	MB
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 5 10 15 20 25m
SCALE 1:250 @A1

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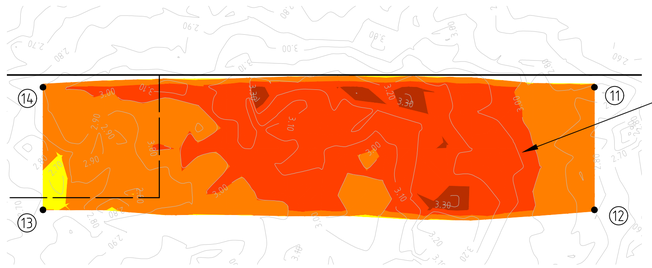
Checked	MS	Date 10.10.2019
Designed	JJ	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: BULK EARTHWORKS PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1100
Revision: B



DRAIN REQUIRES EXCAVATION TO IL 2.75m FOR Q100 FLOW AS PER FLOOD IMPACT ASSESSMENT.

EXISTING DRAIN CUTOUT
SCALE 1:500m

NOTE

VOLUMES NOMINATED ARE PRELIMINARY ONLY & REFLECT THE DIFFERENCES BETWEEN EXISTING & FINISHED SURFACES.

VOLUMES (ESTIMATED)

CUT FOR DRAIN CUT-OUT AT IL 2.75m = 530m^3

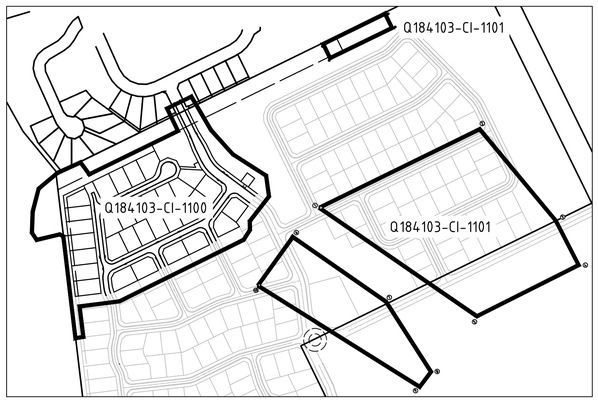
FILL AREA 1 = 31,724m^3
FILL AREA 2 = 4,667m^3
CUT VOLUMES NOT PRESENTED FOR FILL AREA 1 OR 2.
NO CUT REQUIRED IN THESE AREAS.
RETAIN EXISTING LEVELS WHERE CUT IS NOMINATED.

NORTH

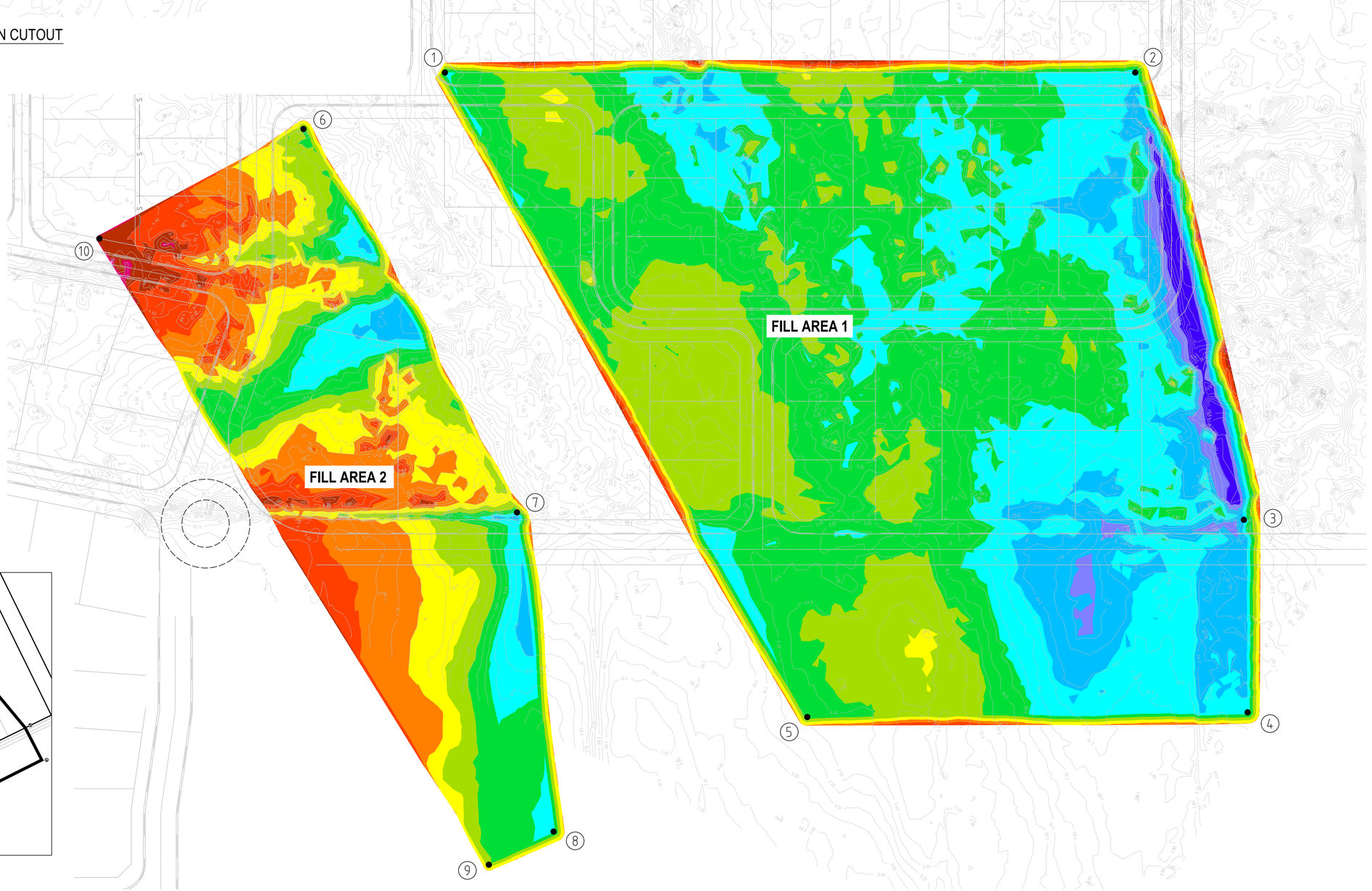
SETOUT POINTS			
PT No.	EASTING	NORTHING	RL.
1	337225.354	8170509.058	4.000
2	337434.819	8170611.564	3.400
3	337534.251	8170491.941	3.400
4	337563.977	8170434.044	3.400
5	337431.078	8170367.222	4.000
6	337190.844	8170470.874	4.200
7	337312.602	8170386.204	4.200
8	337371.132	8170294.766	4.200
9	337356.408	8170275.089	4.200
10	337145.199	8170407.285	4.200
11	337311.429	8170761.872	2.750
12	337320.224	8170743.909	2.750
13	337239.393	8170704.331	2.750
14	337230.598	8170722.293	2.750

CUT AND FILL LEGEND

CUT > 1.5m		FILL 0m – 0.25m	
CUT 1.5m – 1.25m		FILL 0.25m – 0.5m	
CUT 1.25m – 1.0m		FILL 0.5m – 0.75m	
CUT 1.0m – 0.75m		FILL 0.75m – 1.0m	
CUT 0.75m – 0.5m		FILL 1.0m – 1.25m	
CUT 0.5m – 0.25m		FILL 1.25m – 1.5m	
CUT 0.25m – 0m		FILL > 1.5m	



KEY MAP
SCALE 1:4000m



Rev.	Date	Description	Des.	Verif.	Appd.
B	22.10.2019	EXCESS FILL AREA REVISED	MS	MS	MB
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 10 20 30 40 50m
SCALE 1:500 @A1

0 15 30 45 60 75m
SCALE 1:750 @A1

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Designed	JJ	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	MB	RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

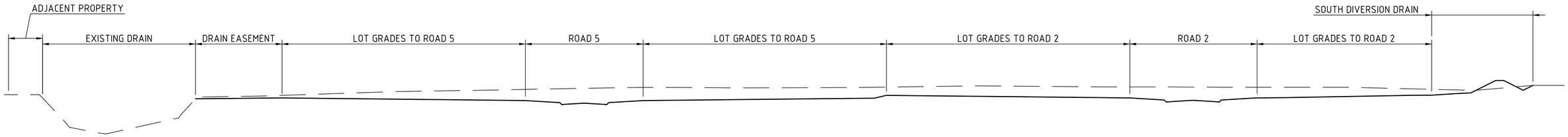
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: EXCESS CUT STOCKPILING PLAN

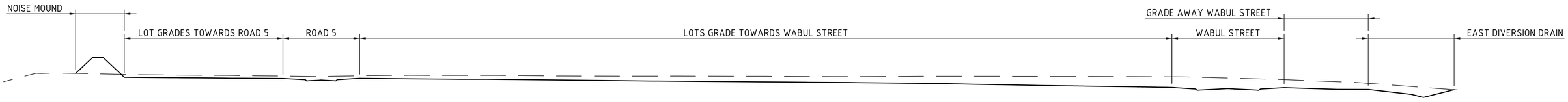
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1101
Revision: B



SECTION 1 / 1102
SCALE 1:250m



SECTION 2 / 1102
SCALE 1:400m

LOCALITY PLAN
SCALE 1:2000m

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 5 10 15 20 25m
SCALE 1:250 @A1

0 10 20 30 40m
SCALE 1:400 @A1

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Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: SITE CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1102
Revision: A

DATE PLOTTED: 11 October 2019 9:11 AM BY: JACK JONES
XREFs: XR-Q184103-CI-BASE
CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1102.dwg

DATE PLOTTED: 23 October 2019 9:06 AM BY: JACK JONES

WABUL STREET

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	337027.151	8170672.714	3.801	153°54'44.48"			
TC	112.977	337076.833	8170571.247	3.846	153°54'44.48"			
IP 2	123.680	337081.630	8170561.449	3.910		R = -45.000	21.405	27°15'14.83"
CT	134.383	337090.381	8170554.936	3.874	126°39'29.65"			
IP 3	194.179	337183.373	8170519.218	4.014	126°39'29.65"			

ROAD 2

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	337113.187	8170537.963	3.895	216°39'29.65"			
TC	49.020	337083.920	8170498.639	3.925	216°39'29.65"			
IP 2	57.344	337078.854	8170491.832	3.966		R = 35.000	16.648	27°15'11.83"
CT	65.668	337071.234	8170488.101	4.020	243°54'41.48"			
TC	195.817	336954.346	8170430.867	4.576	243°54'41.48"			
IP 3	205.074	336944.786	8170426.187	4.610		R = -15.000	18.514	70°43'00.00"
CT	214.330	336946.048	8170415.618	4.645	173°11'41.48"			
TC	225.459	336947.366	8170404.568	4.684	173°11'41.48"			
IP 4	230.507	336947.970	8170399.507	4.702		R = -30.000	10.097	19°17'00.00"
CT	235.555	336950.211	8170394.930	4.719	153°54'41.48"			

ROAD 3

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	337074.354	8170489.831		148°04'11.98"			
TC	9.427	337079.340	8170481.830	3.973	148°04'11.98"			
IP 2	10.957	337080.149	8170480.531	3.969		R = 30.000	3.059	5°50'29.50"
CT	12.486	337080.822	8170479.156	3.965	153°54'41.48"			
IP 3	29.682	337088.385	8170463.712	4.050	153°54'41.48"			

ROAD 4

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING
IP 1	0.000	337008.526	8170457.396	4.335	153°54'41.48"
IP 2	30.012	337021.724	8170430.442	4.375	153°54'41.48"

ROAD 5

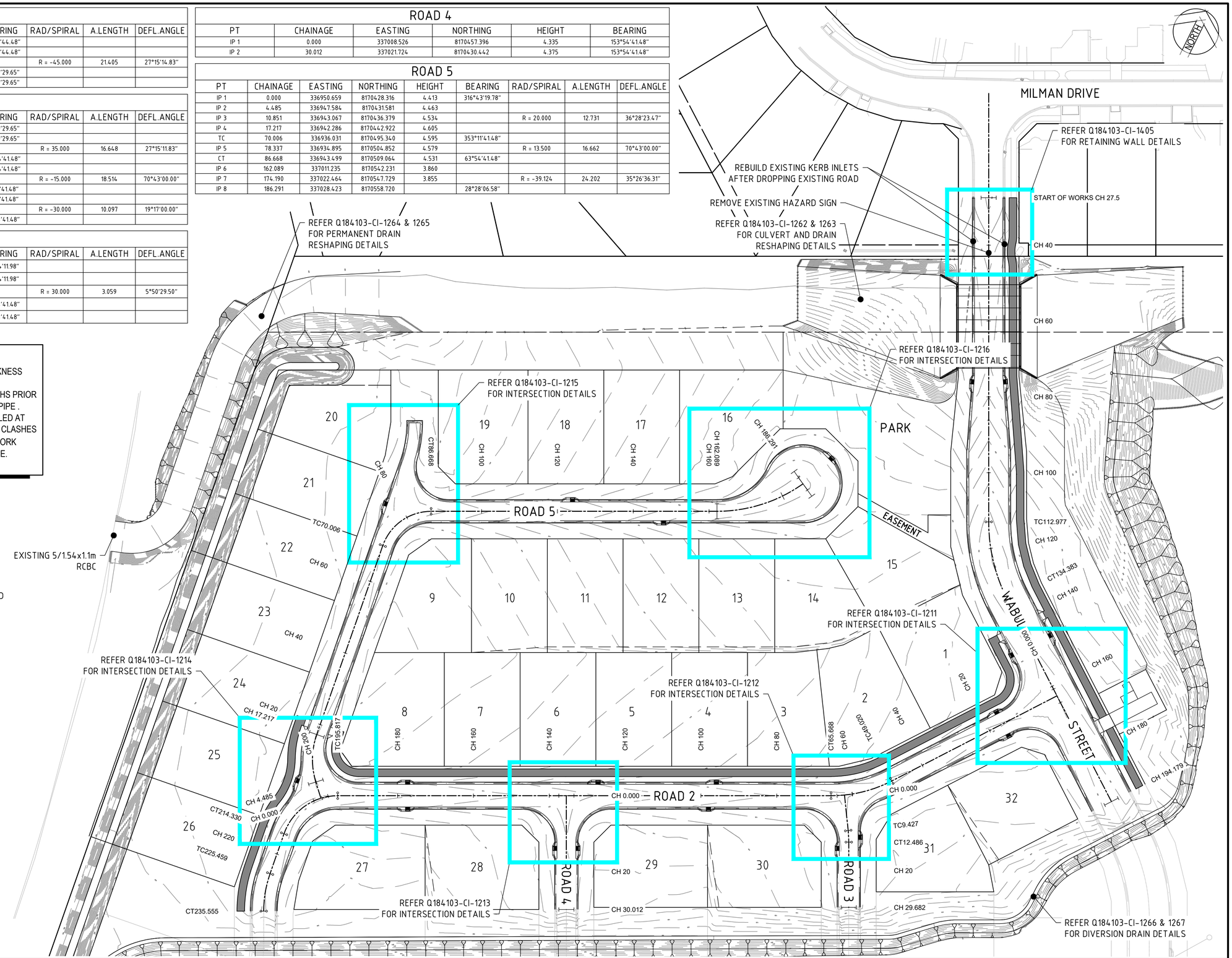
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	336950.659	8170428.316	4.413	316°43'19.78"			
IP 2	4.485	336947.584	8170431.581	4.463				
IP 3	10.851	336943.067	8170436.379	4.534		R = 20.000	12.731	36°28'23.47"
IP 4	17.217	336942.286	8170442.922	4.605				
TC	70.006	336936.031	8170495.340	4.595	353°11'41.48"			
IP 5	78.337	336934.895	8170504.852	4.579		R = 13.500	16.662	70°43'00.00"
CT	86.668	336943.499	8170509.064	4.531	63°54'41.48"			
IP 6	162.089	337011.235	8170542.231	3.860				
IP 7	174.190	337022.464	8170547.729	3.855		R = -39.124	24.202	35°26'36.31"
IP 8	186.291	337028.423	8170558.720		28°28'06.58"			

NOTES

1. AT INTERSECTIONS, CUL-DE-SACS AND ROUNDABOUTS, THE THICKNESS OF AC SURFACE SHALL INCREASE TO 50mm
2. DN100 PVC PIPES ARE TO BE PLACED UNDERNEATH THE FOOTPATHS PRIOR TO POUR OF THE FOOTPATHS TO SERVICE FUTURE HOUSE DOWNPIPE . DISCHARGES TO KERB. TWO (2) PIPES PER LOT ARE TO BE INSTALLED AT SUITABLE LOCATIONS FOR THE BUILDERS AND TO AVOID SERVICE CLASHES
3. SAWCUT AC SEAL & STRIP BACK TO BASE COURSE ALONG ROADWORK INTERFACE WITH EXISTING INCLUDING CROWN WHERE APPLICABLE. TIE IN NEATLY AND EVENLY TO EXISTING.

LEGEND

- 3.50 — FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- TOP OF BATTER
- LAYBACK KERB (REFER FNQROC STD DWD 1000 FOR DETAILS)
- 2.0m WIDE FOOTPATH (REFER FNQROC STD DWG S1035 FOR DETAILS)



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 10 20 30 40 50m
SCALE 1:500 @A1

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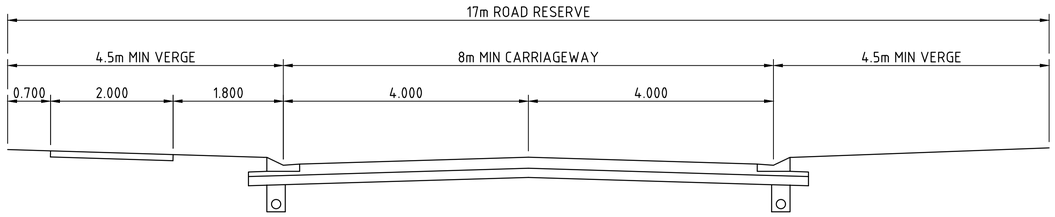
Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: ROADWORKS PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

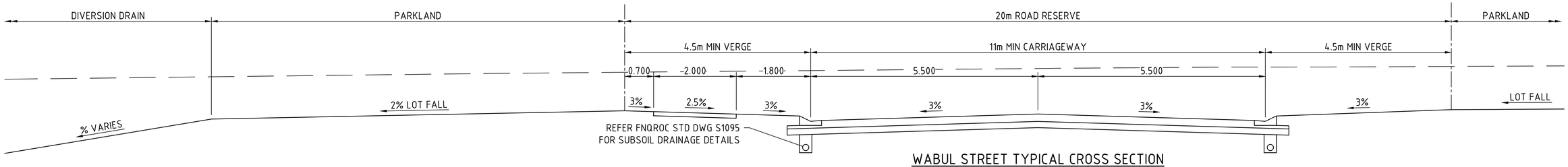
Drawing Number: Q184103-CI-1200
Revision: A

XREFs: XR-Q184103-CI-BASE; XR-Q184103-SURV; XR-Q184103-DSGN-CNTRS; XR-Q184103-CI-CL; XR-Q184103-CI-TABLE; XR-Q184103-CI-GRADE STRINGS
CAD File: Q:\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1200.dwg



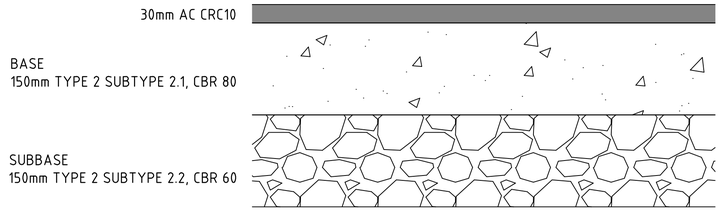
WABUL STREET TYPICAL CROSS SECTION

CH 27.5 - CH 74.426
TRANSITION IN CARRIAGEWAY WIDTH FROM CH 74.426 - CH 86.95 (8m WIDTH TO 11m WIDTH)
SCALE 1:50m



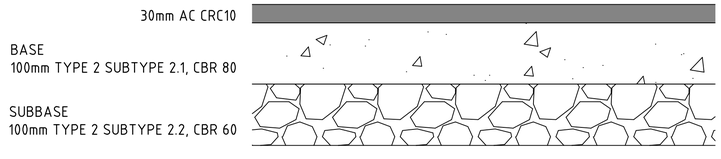
WABUL STREET TYPICAL CROSS SECTION

CH 86.95 - CH 194.5
SCALE 1:50m



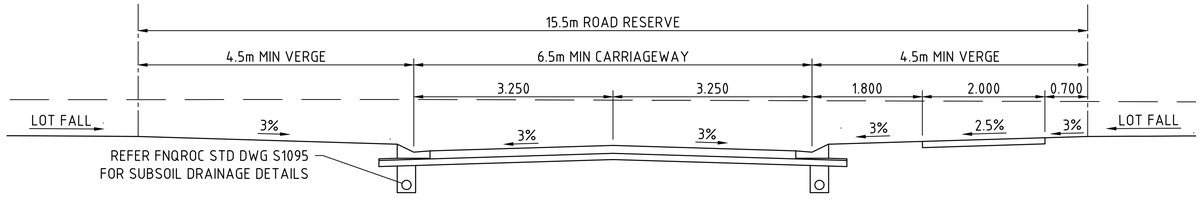
WABUL STREET PAVEMENT DESIGN

BASED ON CBR = 8



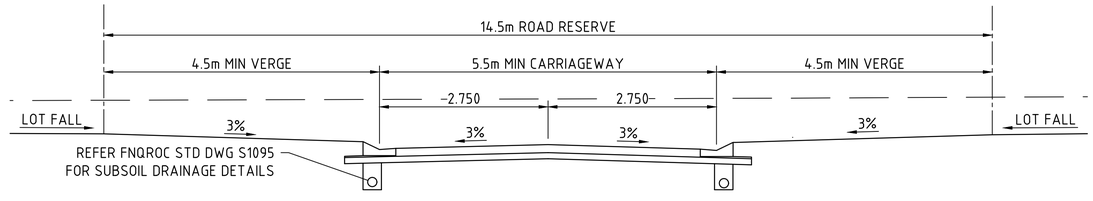
ROAD 2, 3, 4 & 5 PAVEMENT DESIGN

BASED ON CBR = 8



ROAD 2 TYPICAL CROSS SECTION

CH 14.5 - CH 235.555
SCALE 1:50m



ROAD 3 TYPICAL CROSS SECTION

CH 12.486 - CH 29.682

ROAD 4 TYPICAL CROSS SECTION

CH 12.25 - CH 30.012

ROAD 5 TYPICAL CROSS SECTION

CH 17.217 - CH 162.089

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 3 4 5m
SCALE 1:50 @A1

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Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: ROADWORKS - TYPICAL CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

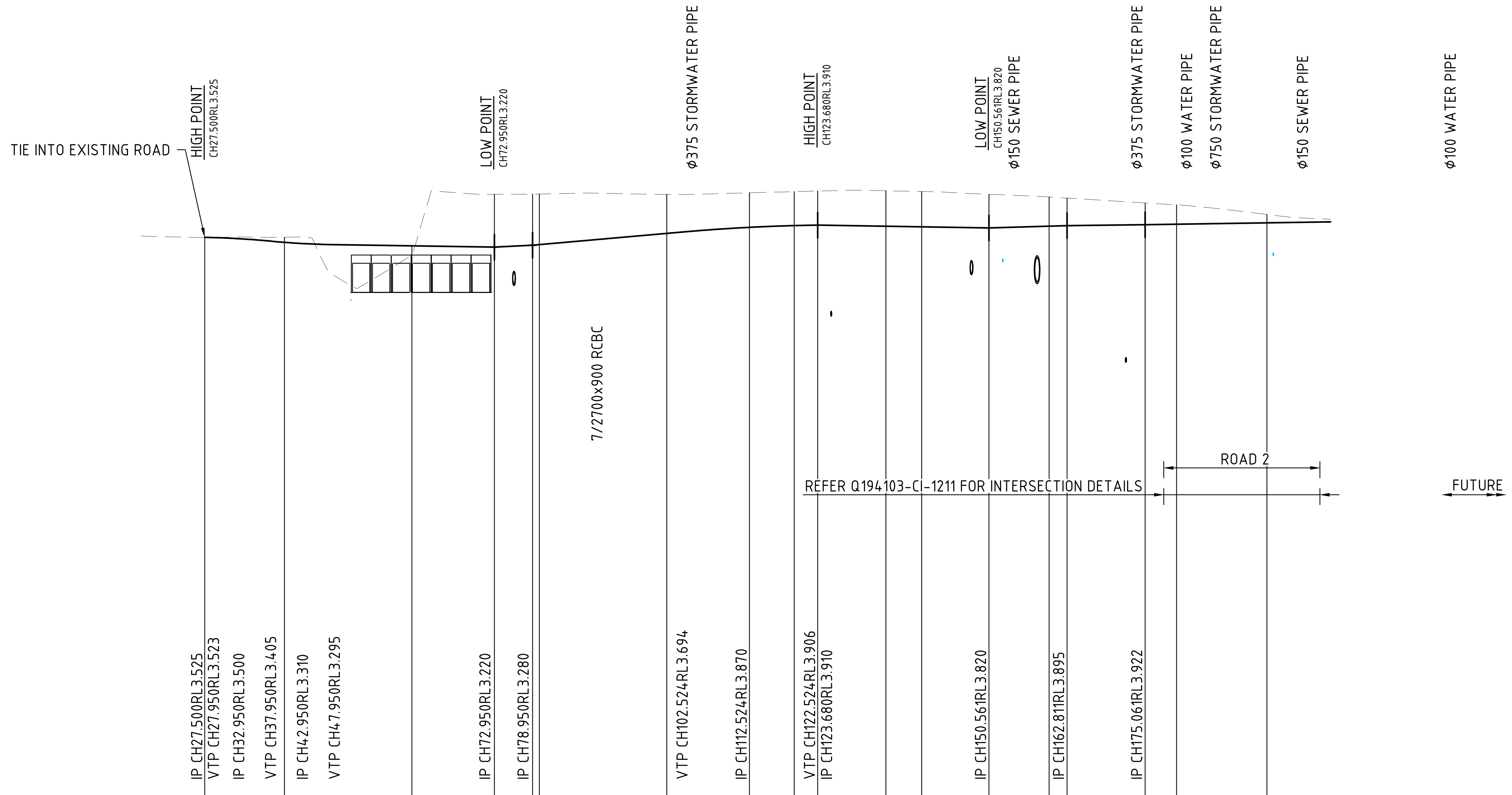
Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1201
Revision: A

DATE PLOTTED: 11 October 2019 9:33 AM BY : JACK JONES

XREF's: XR-Q184103-CI-LS-WABUL1; XR-Q184103-CI-XS-WABUL01; XR-Q184103-CI-LS-ROAD 201; XR-Q184103-CI-XS-ROAD 21; XR-Q184103-CI-LS-RA0401; XR-Q184103-CI-XS-RS041; XR-Q184103-CI-LS-RS0201; XR-Q184103-CI-XS-RS021; XR-Q184103-CI-LS-RS0301; XR-Q184103-CI-XS-RS031

CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1202-1210.dwg



VERT. CURVE LENGTH (m) / VERT. CURVE RADIUS (m): 10.000m R697.4m; 10.000m R625.0m; 20.000m R1429.8m

VERT. GEOMETRY GRADE (%) / VERT. GEOMETRY LENGTH(m): 0.217% 1.205m; -0.466% 5.450m; -1.900% 10.000m; -0.300% 30.000m; 1.000% 6.000m; 1.757% 33.574m; 0.359% 11.156m; -0.335% 26.881m; 0.612% 12.250m; 0.220% 12.250m; 0.307% 44.939m

DATUM RL -21

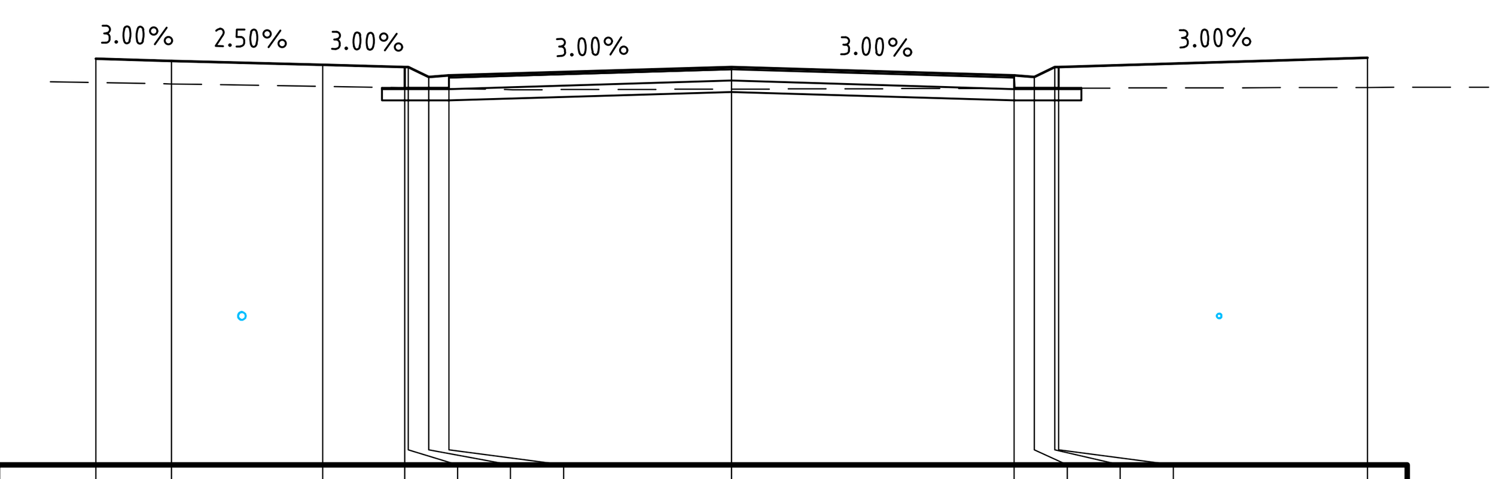
HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m): 21.405m R-45.000m

EXISTING SURFACE LEVELS ROAD CENTRELINE	3.525	3.529	2.966	4.876	4.882	4.883	4.873	4.925	4.960	4.979	4.988	4.965	4.877	4.792	4.759	4.604	4.546	4.244
CUT/FILL DEPTH TO EXISTING SURFACE	0.000	-0.160	0.293	-1.656	-1.602	-1.585	-1.224	-1.085	-1.065	-1.069	-1.114	-1.109	-1.057	-0.914	-0.864	-0.682	-0.609	-0.264
DESIGN LEVELS ROAD CENTRELINE	3.525	3.369	3.259	3.220	3.280	3.298	3.650	3.840	3.895	3.910	3.874	3.855	3.820	3.878	3.895	3.922	3.937	3.981
CONTROL LINE CHAINAGE ROAD CENTRELINE	27.500	40.000	60.000	72.950	78.950	80.000	100.000	112.977	120.000	123.680	134.383	140.000	150.561	160.000	162.811	175.061	180.000	194.179

WABUL STREET

SCALE: H 1:500
V 1:100

WABUL STREET
X = 337053.536
Y = 8170618.827

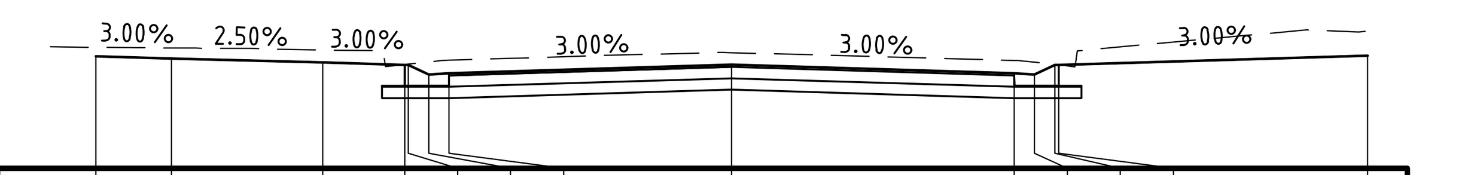


Datum -2.00

DESIGN HEIGHT	3.369	3.339	3.289	3.257	3.257	3.127	3.147	3.259	3.147	3.127	3.257	3.257	3.379
EXISTING SURFACE	3.051	3.034	3.000	2.982	2.981	2.976	2.972	2.966	2.976	2.977	2.978	2.978	2.989
OFFSETS	-8.400	-7.400	-5.400	-4.320	-4.270	-4.000	-3.735	0.000	3.735	4.000	4.270	4.320	8.400

CHAINAGE 60.000

WABUL STREET
X = 337044.741
Y = 8170636.790

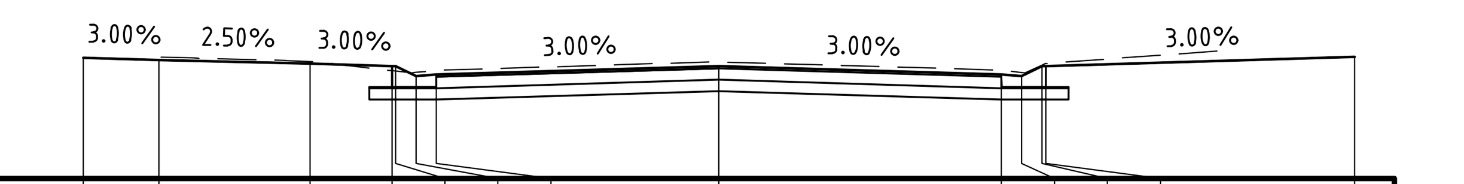


Datum 2.00

DESIGN HEIGHT	3.480	3.450	3.400	3.367	3.367	3.237	3.257	3.369	3.257	3.237	3.367	3.367	3.490
EXISTING SURFACE	3.599	3.591	3.561	3.373	3.378	3.407	3.429	3.529	3.426	3.404	3.375	3.369	
OFFSETS	-8.400	-7.400	-5.400	-4.320	-4.270	-4.000	-3.735	0.000	3.735	4.000	4.270	4.320	8.400

CHAINAGE 40.000

WABUL STREET
X = 337041.641
Y = 8170643.121



Datum 2.00

DESIGN HEIGHT	3.594	3.564	3.514	3.482	3.482	3.352	3.372	3.484	3.372	3.352	3.482	3.482	3.604
EXISTING SURFACE			3.542	3.423	3.417	3.400	3.427	3.537	3.430	3.398	3.495	3.516	
OFFSETS	-8.400	-7.400	-5.400	-4.320	-4.270	-4.000	-3.735	0.000	3.735	4.000	4.270	4.320	8.400

CHAINAGE 32.950

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m SCALE 1:100 @A1
0 5 10 15 20m SCALE 1:200 @A1
0 10 20 30 40 50m SCALE 1:500 @A1

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Cairns QLD 4870
Tel: 07 4034 0500
Web: www.cardno.com.au

Drawn JJ Date 10.10.2019
Checked MS Date 10.10.2019
Designed MC Date 10.10.2019
Verified MS Date 10.10.2019
Approved RPEQ No. 10801 MB Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: WABUL STREET LONGITUDINAL SECTION & CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum: AHD | Scale: AS SHOWN | Size: A1

Drawing Number: Q184103-CI-1202 | Revision: A

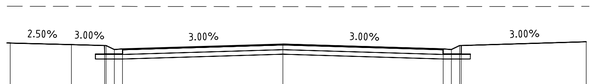
WABUL STREET
X = 337110.932
Y = 8170539.641

Datum 2.00

DESIGN HEIGHT	3.812	3.812	3.682	3.702	3.878
EXISTING SURFACE	4.719	4.720	4.723	4.726	4.792
OFFSETS	-5.820	-5.770	-5.500	-5.235	0.000

CHAINAGE 160.000

WABUL STREET
X = 337071.126
Y = 8170582.902

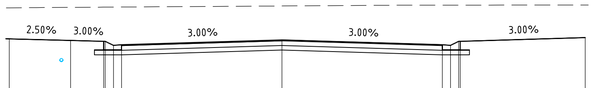


Datum -2.00

DESIGN HEIGHT	3.685	3.635	3.603	3.603	3.473	3.493	3.650	3.493	3.473	3.603	3.603	3.725
EXISTING SURFACE	4.885	4.883	4.881	4.881	4.881	4.880	4.873	4.875	4.875	4.876	4.876	4.882
OFFSETS	-8.900	-6.900	-5.820	-5.770	-5.500	-5.235	0.000	5.235	5.500	5.770	5.820	9.900

CHAINAGE 100.000

WABUL STREET
X = 337094.888
Y = 8170551.582

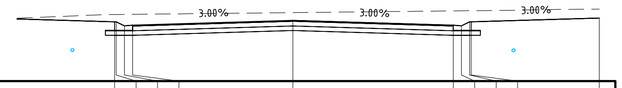


Datum -2.00

DESIGN HEIGHT	3.891	3.841	3.808	3.808	3.678	3.698	3.855	3.698	3.678	3.808	3.808	3.931
EXISTING SURFACE	4.903	4.918	4.925	4.926	4.928	4.929	4.965	4.991	4.991	4.991	4.991	4.996
OFFSETS	-8.900	-6.900	-5.820	-5.770	-5.500	-5.235	0.000	5.235	5.500	5.770	5.820	9.900

CHAINAGE 140.000

WABUL STREET
X = 337138.608
Y = 8170519.044

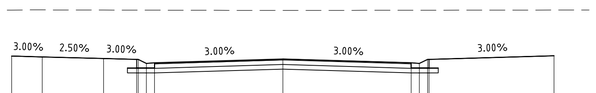


Datum 2.00

DESIGN HEIGHT	3.935	3.935	3.805	3.825	3.982	3.825	3.805	3.935	3.935	4.060	
EXISTING SURFACE	4.174	4.175	4.177	4.180	4.236	4.293	4.296	4.298	4.299	4.350	
OFFSETS	-5.820	-5.770	-5.500	-5.235	0.000	5.235	5.500	5.770	5.820	10.000	

CHAINAGE 194.500

WABUL STREET
X = 337062.331
Y = 8170600.865

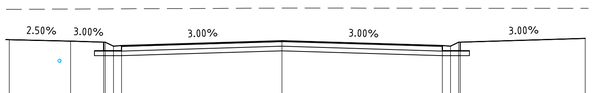


Datum -2.00

DESIGN HEIGHT	3.395	3.365	3.315	3.283	3.283	3.153	3.173	3.298	3.173	3.153	3.283	3.283	3.405
EXISTING SURFACE	4.894	4.900	4.896	4.893	4.893	4.893	4.892	4.883	4.889	4.890	4.890	4.890	4.896
OFFSETS	-8.854	-7.854	-5.854	-4.774	-4.724	-4.454	-4.189	0.000	4.189	4.454	4.724	4.774	8.854

CHAINAGE 80.000

WABUL STREET
X = 337080.400
Y = 8170565.206

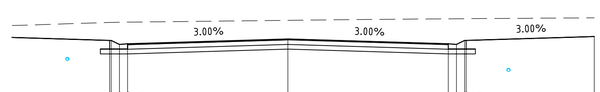


Datum -2.00

DESIGN HEIGHT	3.930	3.880	3.848	3.848	3.718	3.738	3.895	3.738	3.718	3.848	3.848	3.970
EXISTING SURFACE	4.919	4.928	4.933	4.933	4.934	4.936	4.960	4.955	4.954	4.954	4.954	4.951
OFFSETS	-8.900	-6.900	-5.820	-5.770	-5.500	-5.235	0.000	5.235	5.500	5.770	5.820	9.900

CHAINAGE 120.000

WABUL STREET
X = 337126.976
Y = 8170527.701



Datum 2.00

DESIGN HEIGHT	3.890	3.890	3.760	3.780	3.937	3.780	3.760	3.890	3.890	4.016	
EXISTING SURFACE	4.477	4.479	4.482	4.485	4.546	4.594	4.596	4.598	4.598	4.627	
OFFSETS	-5.820	-5.770	-5.500	-5.235	0.000	5.235	5.500	5.770	5.820	10.000	

CHAINAGE 180.000

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

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Drawn	JJ	Date 10.10.2019
Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

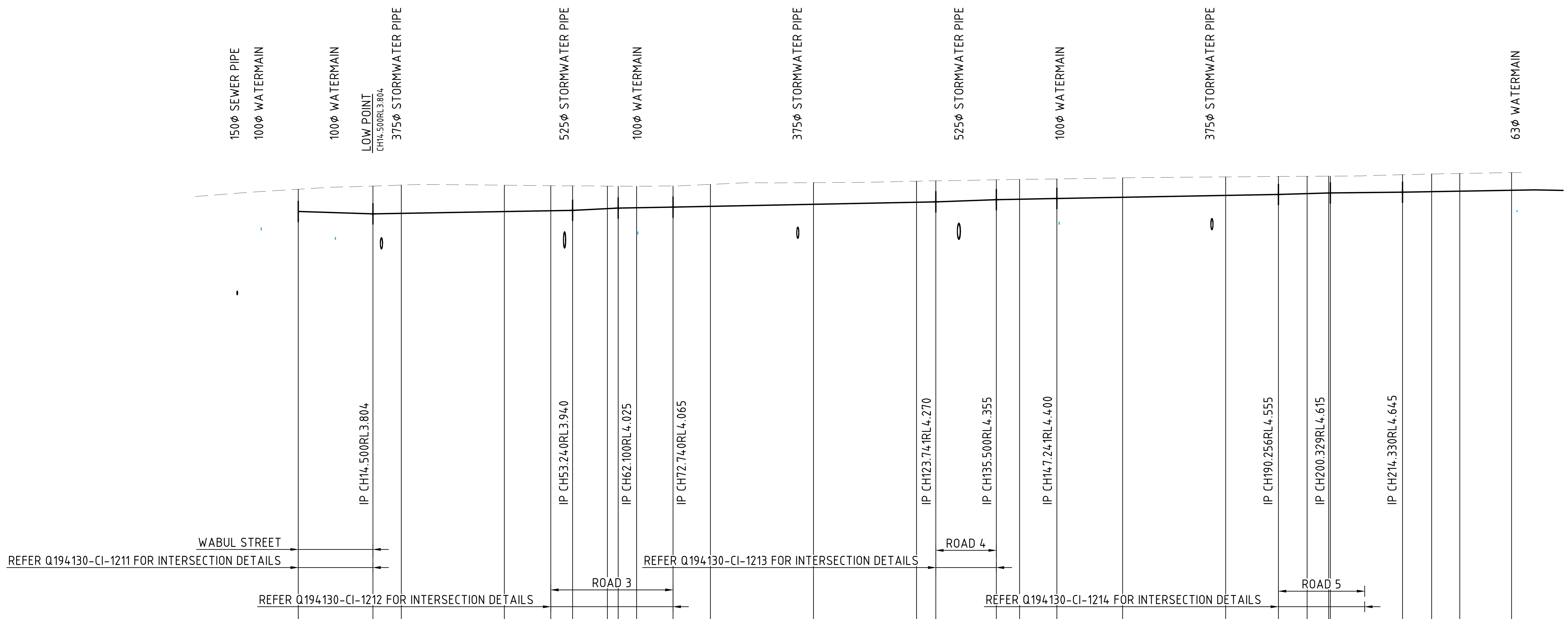
Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: WABUL STREET CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1203
Revision: A

DATE PLOTTED: 11 October 2019 9:43 AM BY : JACK JONES



VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)

VERT. GEOMETRY GRADE (%)	VERT. GEOMETRY LENGTH(m)
-0.628%	14.500m
0.351%	38.740m
0.959%	8.860m
0.376%	10.640m
0.402%	51.001m
0.723%	11.759m
0.383%	11.741m
0.360%	43.015m
0.596%	10.073m
0.214%	14.001m
0.351%	25.670m

DATUM RL -20

HORZ. CURVE LENGTH (m)	HORZ. CURVE RADIUS (m)
16.648m	R35.000m
18.514m	R-15.000m
10.097m	R-30.000m

CONTROL LINE CHAINAGE ROAD CENTRELINE	EXISTING SURFACE LEVELS ROAD CENTRELINE	CUT/FILL DEPTH TO EXISTING SURFACE	DESIGN LEVELS ROAD CENTRELINE
0.000	4.759	-0.864	3.895
14.500	4.884	-1.080	3.804
20.000	4.920	-1.097	3.823
40.000	4.918	-1.024	3.894
49.020	4.895	-0.970	3.925
53.240	4.888	-0.948	3.940
60.000	4.878	-0.873	4.005
62.100	4.875	-0.850	4.025
65.668	4.875	-0.837	4.038
72.740	4.886	-0.821	4.065
80.000	4.947	-0.853	4.094
100.000	5.016	-0.841	4.175
120.000	5.071	-0.816	4.255
123.741	5.087	-0.817	4.270
135.500	5.125	-0.770	4.355
140.000	5.142	-0.770	4.372
147.241	5.159	-0.759	4.400
160.000	5.201	-0.755	4.446
180.000	5.238	-0.720	4.518
190.256	5.255	-0.700	4.555
195.817	5.261	-0.672	4.588
200.000	5.266	-0.653	4.613
200.329	5.266	-0.651	4.615
214.330	5.323	-0.678	4.645
220.000	5.350	-0.685	4.665
225.459	5.371	-0.687	4.684
235.500	5.404	-0.685	4.719

ROAD 2

SCALE: H 1:500
V 1:100

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

SCALE 1:100 (0 1 2 4 6 8 10m) @A1
SCALE 1:500 (0 10 20 30 40 50m) @A1

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Designed MC Date 10.10.2019
Verified MS Date 10.10.2019
Approved MB RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: ROAD 2 LONGITUDINAL SECTION

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-1204 | Revision: A

XREF's: XR-Q184103-CI-LS-WABUL01; XR-Q184103-CI-XS-WABUL1; XR-Q184103-CI-LS-ROAD 201; XR-Q184103-CI-XS-ROAD 21; XR-Q184103-CI-LS-RA0401; XR-Q184103-CI-XS-RS041; XR-Q184103-CI-LS-RS0201; XR-Q184103-CI-XS-RS021; XR-Q184103-CI-LS-RS0301; XR-Q184103-CI-XS-RS031
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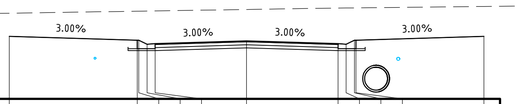
ROAD 2
X = 337089.305
Y = 8170505.875

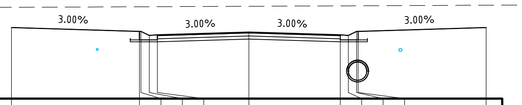


Datum 2.00

DESIGN HEIGHT	4.039		3.914	3.914	3.784	3.804		3.894		3.804	3.784	3.914	3.914		4.039
EXISTING SURFACE	4.796		4.862	4.862	4.867	4.871		4.918		4.964	4.967	4.970	4.970		5.015
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 40.000

ROAD 2
X = 337040.400
Y = 8170473.003

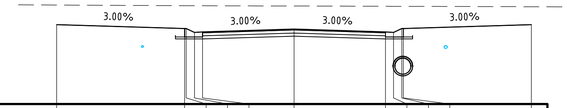


Datum 2.00

DESIGN HEIGHT	4.320		4.195	4.195	4.065	4.085		4.175		4.085	4.065	4.195	4.195		4.320
EXISTING SURFACE	4.982		4.999	5.000	5.001	5.002		5.016		5.029	5.030	5.031	5.032		5.050
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 100.000

ROAD 2
X = 336986.513
Y = 8170446.618

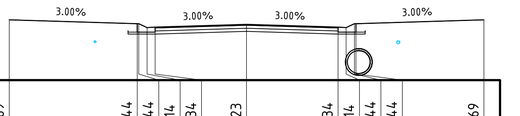


Datum 2.00

DESIGN HEIGHT	4.592		4.466	4.466	4.336	4.356		4.446		4.356	4.336	4.466	4.466		4.592
EXISTING SURFACE	5.232		5.210	5.209	5.209	5.208		5.201		5.191	5.191	5.190	5.190		5.177
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 160.000

ROAD 2
X = 337101.246
Y = 8170521.919

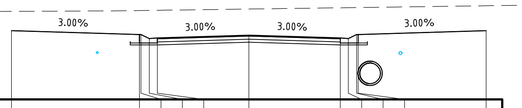


Datum 2.00

DESIGN HEIGHT	3.969		3.844	3.844	3.714	3.734		3.823		3.734	3.714	3.844	3.844		3.969
EXISTING SURFACE	4.814		4.865	4.866	4.870	4.874		4.920		4.966	4.971	4.975	4.975		5.040
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 20.000

ROAD 2
X = 337058.362
Y = 8170481.799

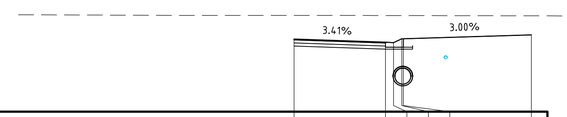


Datum 2.00

DESIGN HEIGHT	4.240		4.115	4.115	3.985	4.005		4.094		4.005	3.985	4.115	4.115		4.240
EXISTING SURFACE	4.870		4.898	4.898	4.902	4.906		4.947		4.988	4.992	4.995	4.996		5.054
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 80.000

ROAD 2
X = 337004.475
Y = 8170455.413

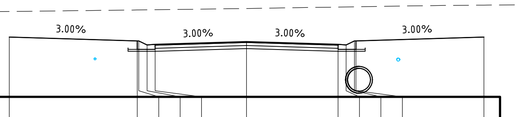


Datum 2.00

DESIGN HEIGHT			4.372			4.270		4.250		4.380					4.506
EXISTING SURFACE			5.142			5.138		5.137		5.137					5.128
OFFSETS			0.000			2.985		3.250		3.520		3.570			7.750

CHAINAGE 140.000

ROAD 2
X = 337104.530
Y = 8170526.331

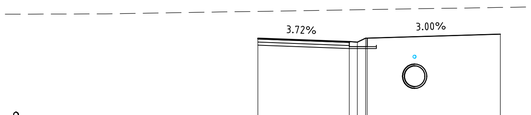


Datum 2.00

DESIGN HEIGHT	3.950		3.824	3.824	3.694	3.714		3.804		3.714	3.694	3.824	3.824		3.950
EXISTING SURFACE	4.785		4.835	4.836	4.839	4.842		4.884		4.930	4.934	4.938	4.939		4.994
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 14.500

ROAD 2
X = 337076.101
Y = 8170490.994

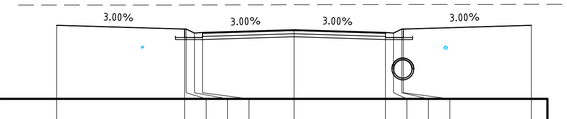


Datum 0.00

DESIGN HEIGHT						4.005		3.894	3.874	4.004	4.004	4.134			
EXISTING SURFACE						4.878		4.926	4.931	4.935	4.936	5.007			
OFFSETS						0.000		2.985	3.250	3.520	3.570	7.917			

CHAINAGE 60.000

ROAD 2
X = 337022.438
Y = 8170464.208



Datum 2.00

DESIGN HEIGHT	4.401		4.275	4.275	4.145	4.165		4.255		4.165	4.145	4.275	4.275		4.401
EXISTING SURFACE	5.060		5.062	5.062	5.063	5.063		5.071		5.079	5.080	5.081	5.081		5.083
OFFSETS	-7.750		-3.570	-3.520	-3.250	-2.985		0.000		2.985	3.250	3.520	3.570		7.750

CHAINAGE 120.000

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

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Drawn	JJ	Date 10.10.2019
Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

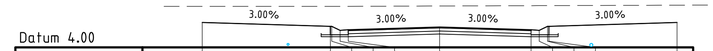
Title: ROAD 2 CROSS SECTIONS
SHEET 1 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1205
Revision: A

ROAD 2
X = 336946.719
Y = 8170409.988

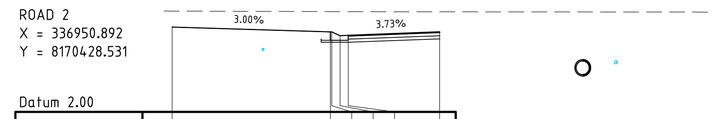


Datum 4.00

DESIGN HEIGHT	4.811	4.685	4.685	4.555	4.575	4.665	4.575	4.555	4.685	4.685	4.811
EXISTING SURFACE	5.336	5.337	5.337	5.337	5.338	5.350	5.360	5.361	5.362	5.362	5.376
OFFSETS	-7.750	-3.570	-3.520	-3.250	-2.985	0.000	2.985	3.250	3.520	3.570	7.750

CHAINAGE 220.000

ROAD 2
X = 336950.892
Y = 8170428.531

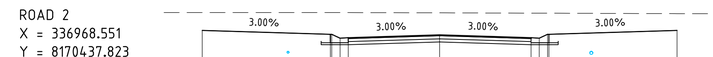


Datum 2.00

DESIGN HEIGHT	4.767	4.612	4.612	4.482	4.502	4.613
EXISTING SURFACE	5.289	5.272	5.272	5.271	5.270	5.266
OFFSETS	-8.732	-3.570	-3.520	-3.250	-2.985	0.000

CHAINAGE 200.000

ROAD 2
X = 336968.551
Y = 8170437.823



Datum 2.00

DESIGN HEIGHT	4.664	4.538	4.538	4.408	4.428	4.518	4.428	4.408	4.538	4.538	4.664
EXISTING SURFACE	5.246	5.248	5.248	5.248	5.247	5.238	5.228	5.227	5.226	5.226	5.212
OFFSETS	-7.750	-3.570	-3.520	-3.250	-2.985	0.000	2.985	3.250	3.520	3.570	7.750

CHAINAGE 180.000

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

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		Date
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Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

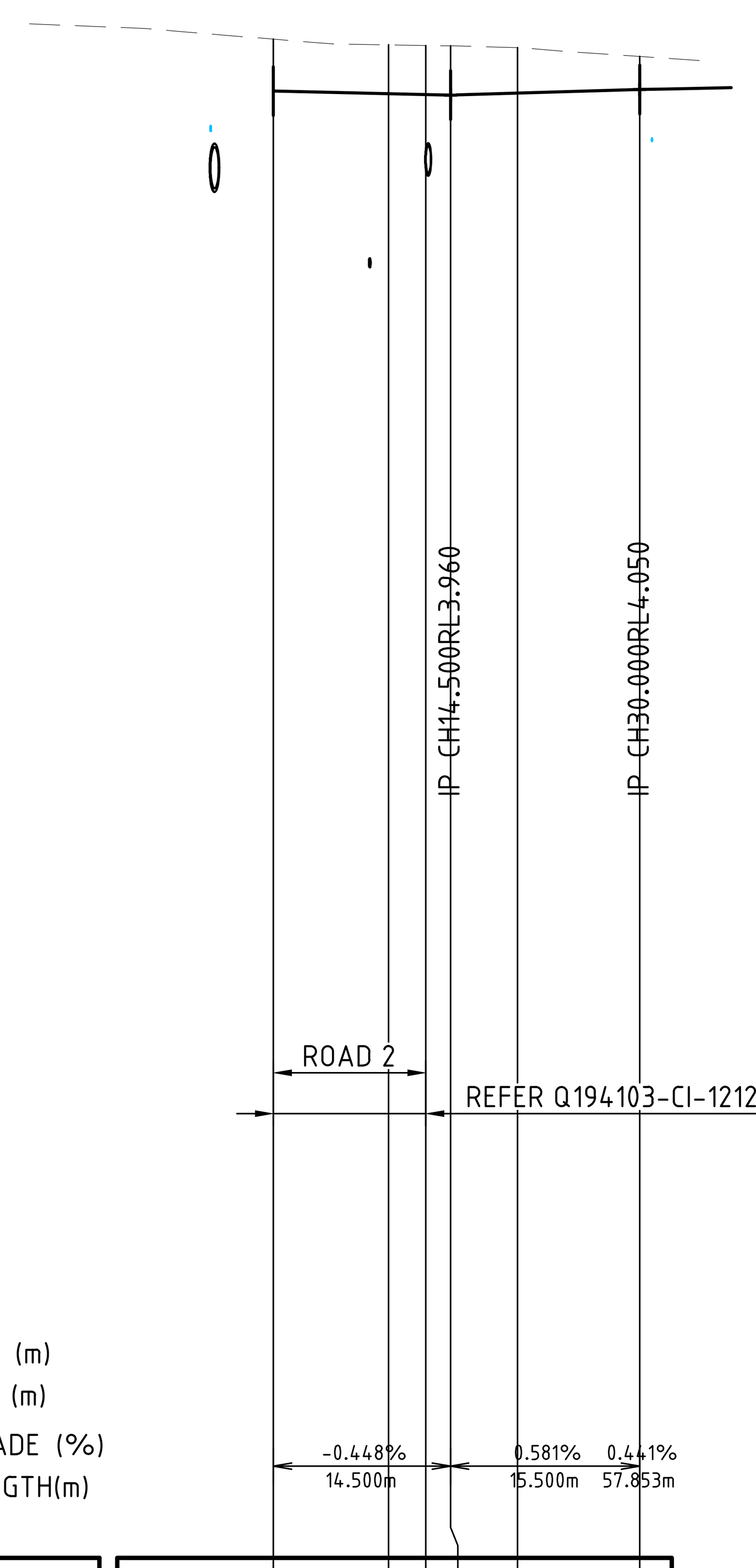
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: ROAD 2 CROSS SECTIONS
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

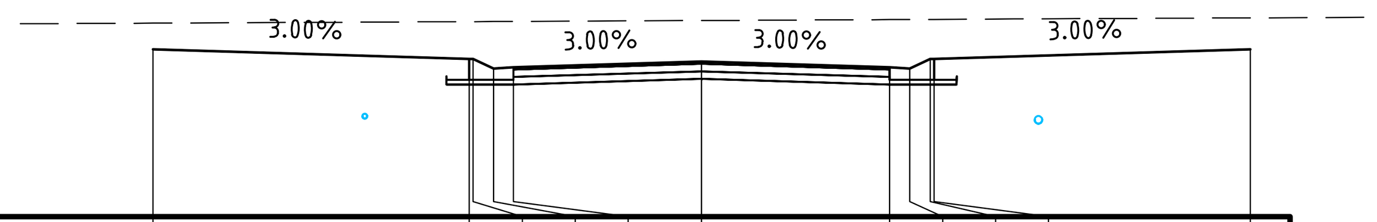
Drawing Number: Q184103-CI-1206
Revision: A



VERT. CURVE LENGTH (m)						
VERT. CURVE RADIUS (m)						
VERT. GEOMETRY GRADE (%)	-0.448%				0.581%	0.441%
VERT. GEOMETRY LENGTH(m)	14.500m				15.500m	57.853m
DATUM RL -20						
HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m)		3.059m R30.000m				
EXISTING SURFACE LEVELS ROAD CENTRELINE	4.875	4.783	4.772	4.765	4.737	4.592
CUT/FILL DEPTH TO EXISTING SURFACE	-0.850	-0.800	-0.803	-0.805	-0.745	-0.542
DESIGN LEVELS ROAD CENTRELINE	4.025	3.983	3.969	3.960	3.992	4.050
CONTROL LINE CHAINAGE ROAD CENTRELINE	0.000	9.427	12.486	14.500	20.000	30.000

ROAD 3
SCALE: H 1:500
V 1:100

ROAD 3
X = 337088.524
Y = 8170463.427

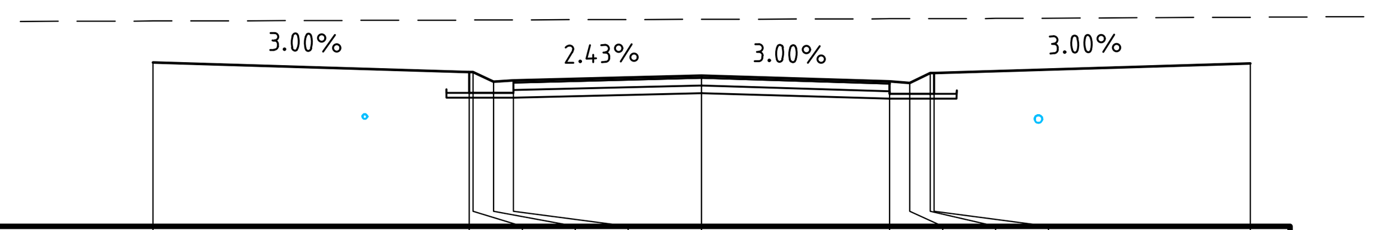


Datum 2.00

DESIGN HEIGHT	4.211	4.085	4.085	3.955	3.975	4.050	3.975	3.955	4.085	4.085	4.211
EXISTING SURFACE	4.556	4.577	4.577	4.578	4.580	4.592	4.604	4.605	4.606	4.607	4.627
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 30.000

ROAD 3
X = 337084.127
Y = 8170472.408

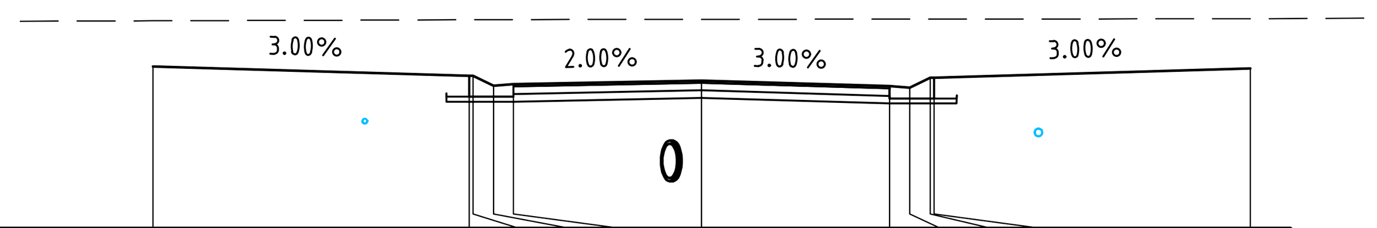


Datum 2.00

DESIGN HEIGHT	4.167	4.042	4.042	3.912	3.932	3.992	3.917	3.897	4.027	4.027	4.153
EXISTING SURFACE	4.715	4.728	4.728	4.729	4.730	4.737	4.745	4.746	4.746	4.747	4.766
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 20.000

ROAD 3
X = 337080.822
Y = 8170479.156



Datum 2.00

DESIGN HEIGHT	4.151	4.025	4.025	3.895	3.915	3.965	3.891	3.871	4.001	4.001	4.126
EXISTING SURFACE	4.753	4.766	4.766	4.767	4.768	4.772	4.775	4.775	4.775	4.775	4.780
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 12.486

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

0 10 20 30 40 50m
SCALE 1:500 @A1

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Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	MB	RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

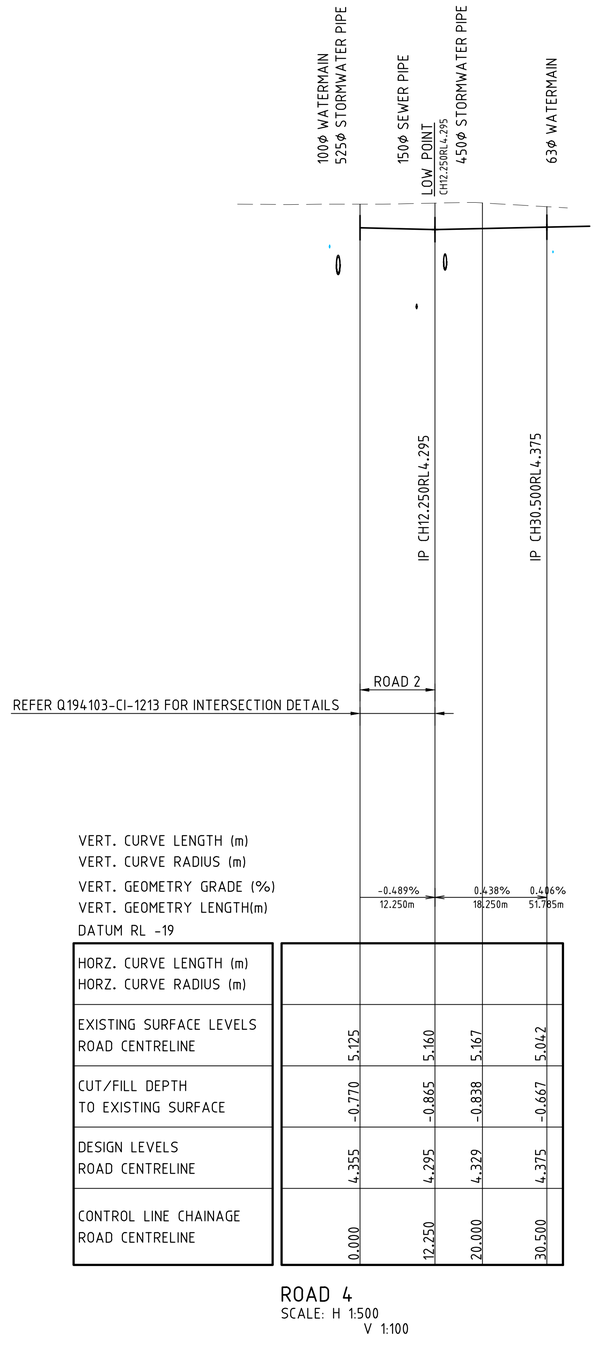
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: ROAD 3 LONGITUDINAL SECTION & CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

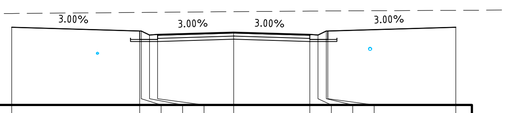
Drawing Number	Revision
Q184103-CI-1207	A



VERT. CURVE LENGTH (m)				
VERT. CURVE RADIUS (m)				
VERT. GEOMETRY GRADE (%)				
VERT. GEOMETRY LENGTH(m)				
DATUM RL -19				
HORZ. CURVE LENGTH (m)				
HORZ. CURVE RADIUS (m)				
EXISTING SURFACE LEVELS ROAD CENTRELINE	5.125	5.160	5.167	5.042
CUT/FILL DEPTH TO EXISTING SURFACE	-0.770	-0.865	-0.838	-0.667
DESIGN LEVELS ROAD CENTRELINE	4.355	4.295	4.329	4.375
CONTROL LINE CHAINAGE ROAD CENTRELINE	0.000	12.250	20.000	30.500

ROAD 4
SCALE: H 1:500
V 1:100

ROAD 4
X = 337021.938
Y = 8170430.004

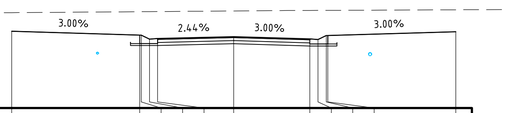


Datum 2.00

DESIGN HEIGHT	4.536	4.410	4.410	4.280	4.300	4.375	4.300	4.280	4.410	4.410	4.536
EXISTING SURFACE	4.984	5.018	5.018	5.020	5.022	5.042	5.063	5.065	5.067	5.067	5.086
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 30.500

ROAD 4
X = 337017.321
Y = 8170439.434

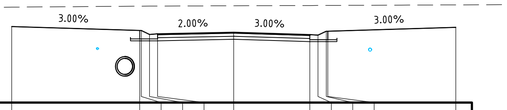


Datum 2.00

DESIGN HEIGHT	4.504	4.378	4.378	4.248	4.268	4.329	4.254	4.234	4.364	4.364	4.490
EXISTING SURFACE	5.111	5.143	5.144	5.146	5.148	5.167	5.184	5.185	5.186	5.187	5.205
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 20.000

ROAD 4
X = 337013.913
Y = 8170446.394



Datum 2.00

DESIGN HEIGHT	4.481	4.355	4.355	4.225	4.245	4.295	4.220	4.200	4.330	4.330	4.456
EXISTING SURFACE	5.115	5.148	5.148	5.149	5.150	5.160	5.169	5.170	5.171	5.171	5.189
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 12.250

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

0 10 20 30 40 50m
SCALE 1:500 @A1

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Drawn	JJ	Date 10.10.2019
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Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

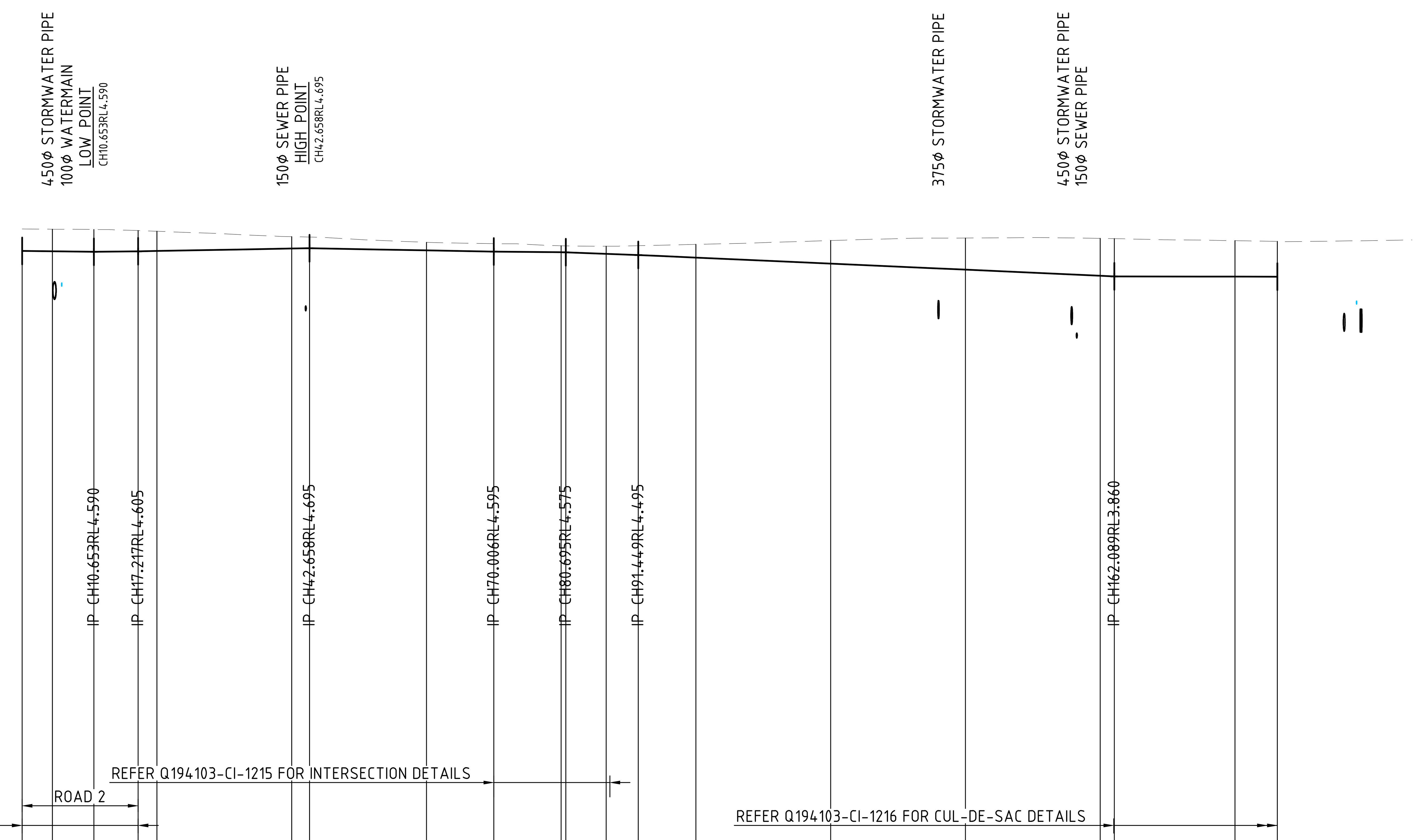
Title: ROAD 4 LONGITUDINAL SECTION & CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1208
Revision: A

DATE PLOTTED: 11 October 2019 9:45 AM BY : JACK JONES



VERT. CURVE LENGTH (m) / VERT. CURVE RADIUS (m) / VERT. GEOMETRY GRADE (%) / VERT. GEOMETRY LENGTH(m)								
Grade	-0.238%	0.234%	0.354%	-0.366%	-0.187%	-0.744%	-0.899%	-0.041%
Length	10.653m	6.564m	25.441m	27.348m	10.689m	10.754m	70.640m	24.202m

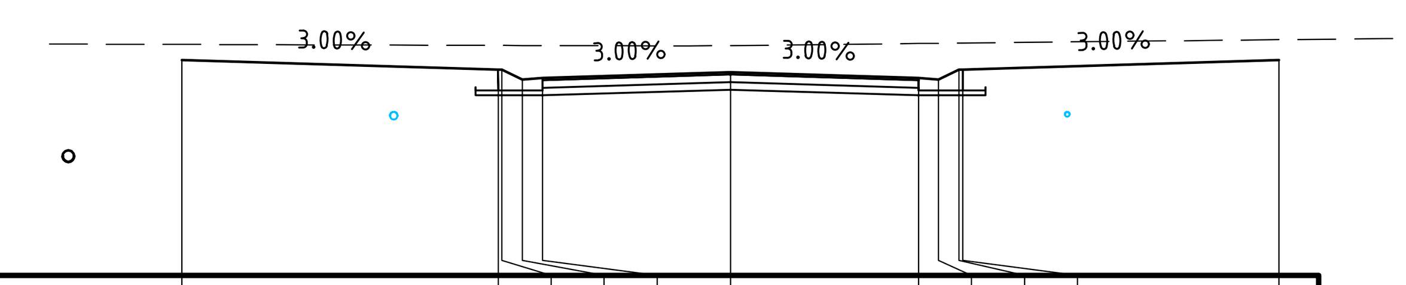
DATUM RL -19

HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m)			
	12.731m R20.000m	16.662m R13.500m	24.202m R-39.124m

CONTROL LINE CHAINAGE ROAD CENTRELINE	EXISTING SURFACE LEVELS ROAD CENTRELINE	CUT/FILL DEPTH TO EXISTING SURFACE	DESIGN LEVELS ROAD CENTRELINE
-0.000			4.615
4.485	5.261	-0.657	4.604
10.653	5.253	-0.663	4.590
17.217	5.220	-0.615	4.605
20.000	5.199	-0.584	4.615
40.000	5.040	-0.354	4.686
42.658	5.027	-0.332	4.695
60.000	4.870	-0.238	4.632
70.006	4.831	-0.236	4.595
80.000	4.770	-0.193	4.576
80.695	4.766	-0.191	4.575
86.668	4.755	-0.225	4.531
91.449	4.771	-0.276	4.495
100.000	4.810	-0.392	4.418
120.000	4.924	-0.685	4.238
140.000	4.999	-0.940	4.059
160.000	4.989	-1.111	3.879
162.089	4.982	-1.122	3.860
180.000	4.921	-1.068	3.853
186.291	4.897	-1.047	3.850

ROAD 5
SCALE: H 1:500
V 1:100

ROAD 5
X = 336939.586
Y = 8170465.545

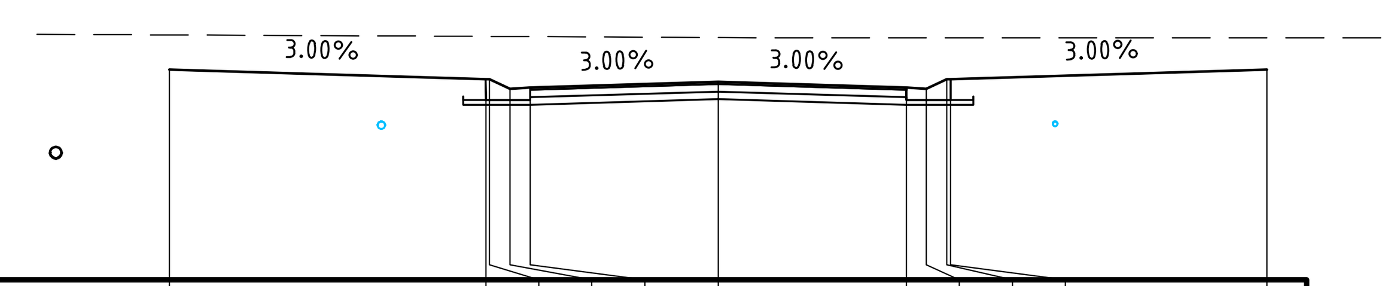


Datum 2.00

DESIGN HEIGHT	4.846	4.721	4.721	4.591	4.611	4.686	4.611	4.591	4.721	4.721	4.846
EXISTING SURFACE	5.054	5.042	5.041	5.041	5.040	5.040	5.066	5.069	5.072	5.072	5.117
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 40.000

ROAD 5
X = 336941.956
Y = 8170445.686

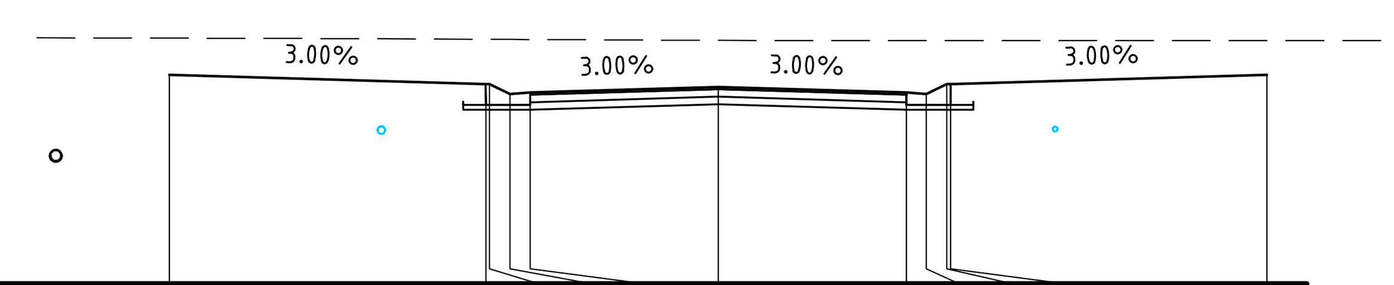


Datum 2.00

DESIGN HEIGHT	4.776	4.650	4.650	4.520	4.540	4.615	4.540	4.520	4.650	4.650	4.776
EXISTING SURFACE	5.234	5.214	5.214	5.212	5.211	5.199	5.193	5.193	5.193	5.193	5.194
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 20.000

ROAD 5
X = 336942.286
Y = 8170442.922



Datum 2.00

DESIGN HEIGHT	4.766	4.640	4.640	4.510	4.530	4.605	4.530	4.510	4.640	4.640	4.766
EXISTING SURFACE	5.249	5.234	5.234	5.233	5.232	5.220	5.216	5.216	5.216	5.216	5.216
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 17.217

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

0 10 20 30 40 50m
SCALE 1:500 @A1

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Drawn JJ	Date 10.10.2019
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Designed MC	Date 10.10.2019
Verified MS	Date 10.10.2019
Approved MB	RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: ROAD 5 LONGITUDINAL SECTION

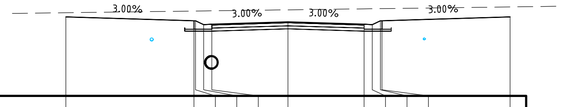
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum: AHD | Scale: AS SHOWN | Size: A1

Drawing Number: Q184103-CI-1209 | Revision: A

XREF's: XR-Q184103-CI-LS-WABUL01; XR-Q184103-CI-XS-WABUL1; XR-Q184103-CI-LS-ROAD 201; XR-Q184103-CI-XS-ROAD 21; XR-Q184103-CI-LS-RA0401; XR-Q184103-CI-XS-RS041; XR-Q184103-CI-LS-RS0201; XR-Q184103-CI-XS-RS021; XR-Q184103-CI-LS-RS0301; XR-Q184103-CI-XS-RS031
CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1202-1210.dwg

ROAD 5
X = 336955.472
Y = 8170514.927

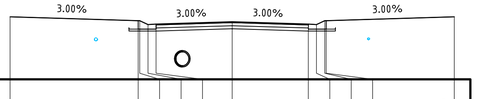


Datum 2.00

DESIGN HEIGHT	4.579	4.454	4.454	4.324	4.344	4.418	4.344	4.324	4.454	4.579
EXISTING SURFACE	4.715	4.770	4.771	4.774	4.778	4.810	4.842	4.846	4.849	4.850	4.904
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 100.000

ROAD 5
X = 337009.359
Y = 8170541.312

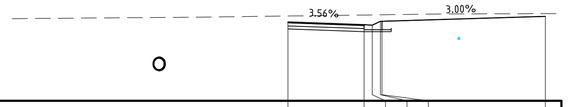


Datum 2.00

DESIGN HEIGHT	4.040	3.914	3.914	3.784	3.804	3.879	3.804	3.784	3.914	3.914	4.040
EXISTING SURFACE	4.958	4.977	4.977	4.978	4.980	4.989	4.999	5.000	5.001	5.001	5.015
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 160.000

ROAD 5
X = 336938.460
Y = 8170504.800

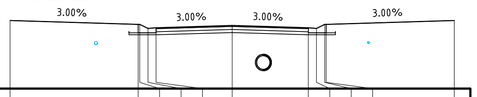


Datum 2.00

DESIGN HEIGHT	4.576	4.488	4.468	4.598	4.598	4.758
EXISTING SURFACE	4.770	4.802	4.806	4.809	4.810	4.847
OFFSETS	0.000	2.485	2.750	3.020	3.070	8.402

CHAINAGE 80.000

ROAD 5
X = 336991.397
Y = 8170532.517

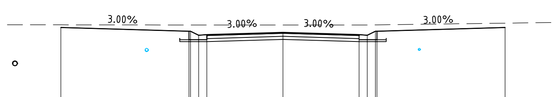


Datum 2.00

DESIGN HEIGHT	4.219	4.094	4.094	3.964	3.984	4.059	3.984	3.964	4.094	4.094	4.219
EXISTING SURFACE	4.939	4.973	4.974	4.976	4.978	4.999	5.019	5.021	5.023	5.024	5.053
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 140.000

ROAD 5
X = 336937.216
Y = 8170485.404

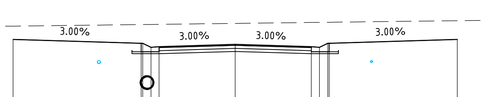


Datum 2.00

DESIGN HEIGHT	4.792	4.667	4.667	4.537	4.557	4.632	4.557	4.537	4.667	4.667	4.792
EXISTING SURFACE	4.877	4.871	4.871	4.871	4.870	4.870	4.870	4.872	4.876	4.877	4.932
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 60.000

ROAD 5
X = 336973.434
Y = 8170523.722



Datum 2.00

DESIGN HEIGHT	4.399	4.274	4.274	4.144	4.164	4.238	4.164	4.144	4.274	4.274	4.399
EXISTING SURFACE	4.835	4.886	4.886	4.890	4.893	4.924	4.954	4.957	4.961	4.961	5.011
OFFSETS	-7.250	-3.070	-3.020	-2.750	-2.485	0.000	2.485	2.750	3.020	3.070	7.250

CHAINAGE 120.000

Rev.	Date	Description	Des.	Verif.	Appd.
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0 1 2 4 6 8 10m
SCALE 1:100 @A1

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Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: ROAD 5 CROSS SECTIONS

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1210
Revision: A

LEGEND

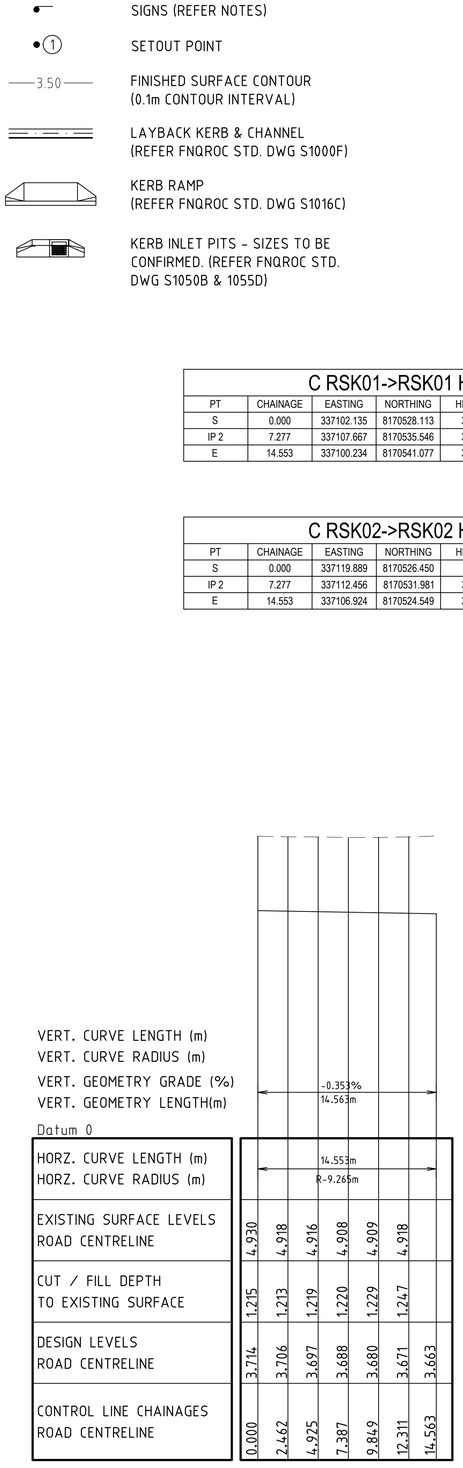
- SIGNS (REFER NOTES)
- ① SETOUT POINT
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS – SIZES TO BE CONFIRMED. (REFER FNQROC STD. DWG S1050B & 1055D)

C RSK01->RSK01 HORIZONTAL POINTS

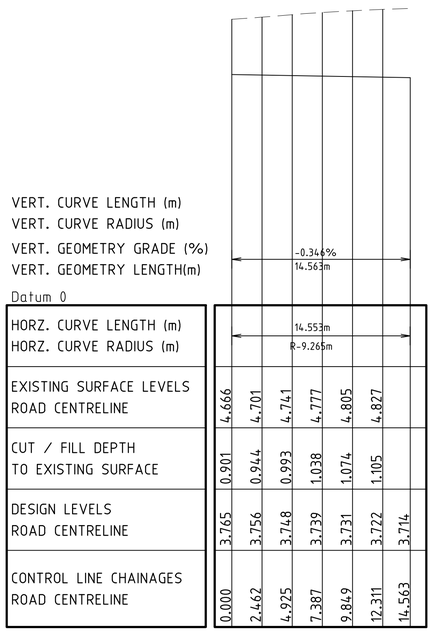
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337102.135	8170528.113	3.714	36°39'29.65"			
IP 2	7.277	337107.667	8170535.546	3.689		R = -9.265	14.553	90°00'00.00"
E	14.553	337100.234	8170541.077	3.663	306°39'29.65"			

C RSK02->RSK02 HORIZONTAL POINTS

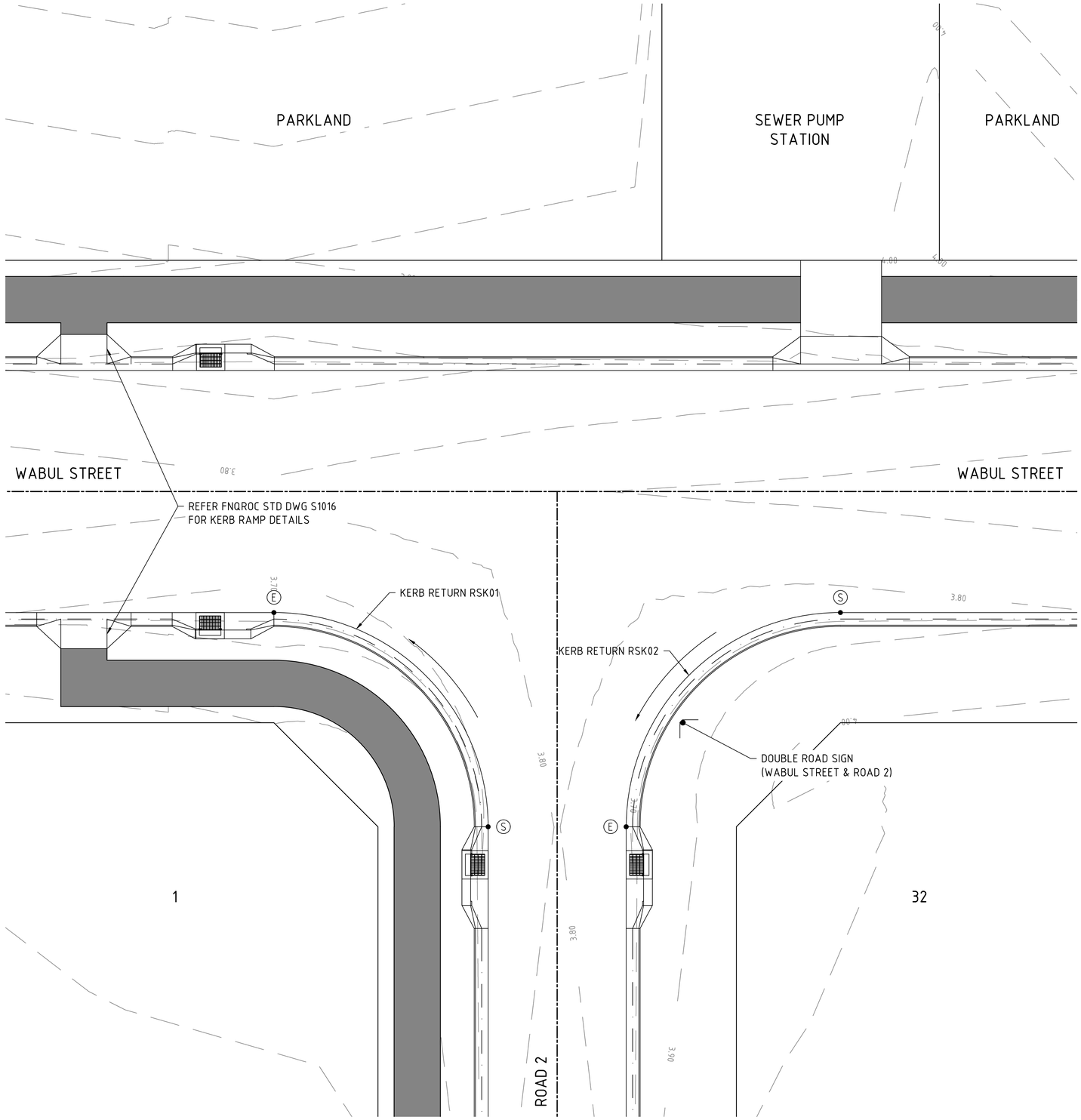
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337119.889	8170526.450		306°39'29.65"			
IP 2	7.277	337112.456	8170531.981	3.740		R = -9.265	14.553	90°00'00.00"
E	14.553	337106.924	8170524.549	3.715	216°39'29.65"			



KERB RETURN RSK01



KERB RETURN RSK02



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 PLAN @A1

H: 0 5 10 15 20 25m
V: 0 1 2 3 4 5m
SCALE: H:1:250 V:1:50

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Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: INTERSECTION PLAN
SHEET 1 OF 6

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1211
Revision: A

LEGEND

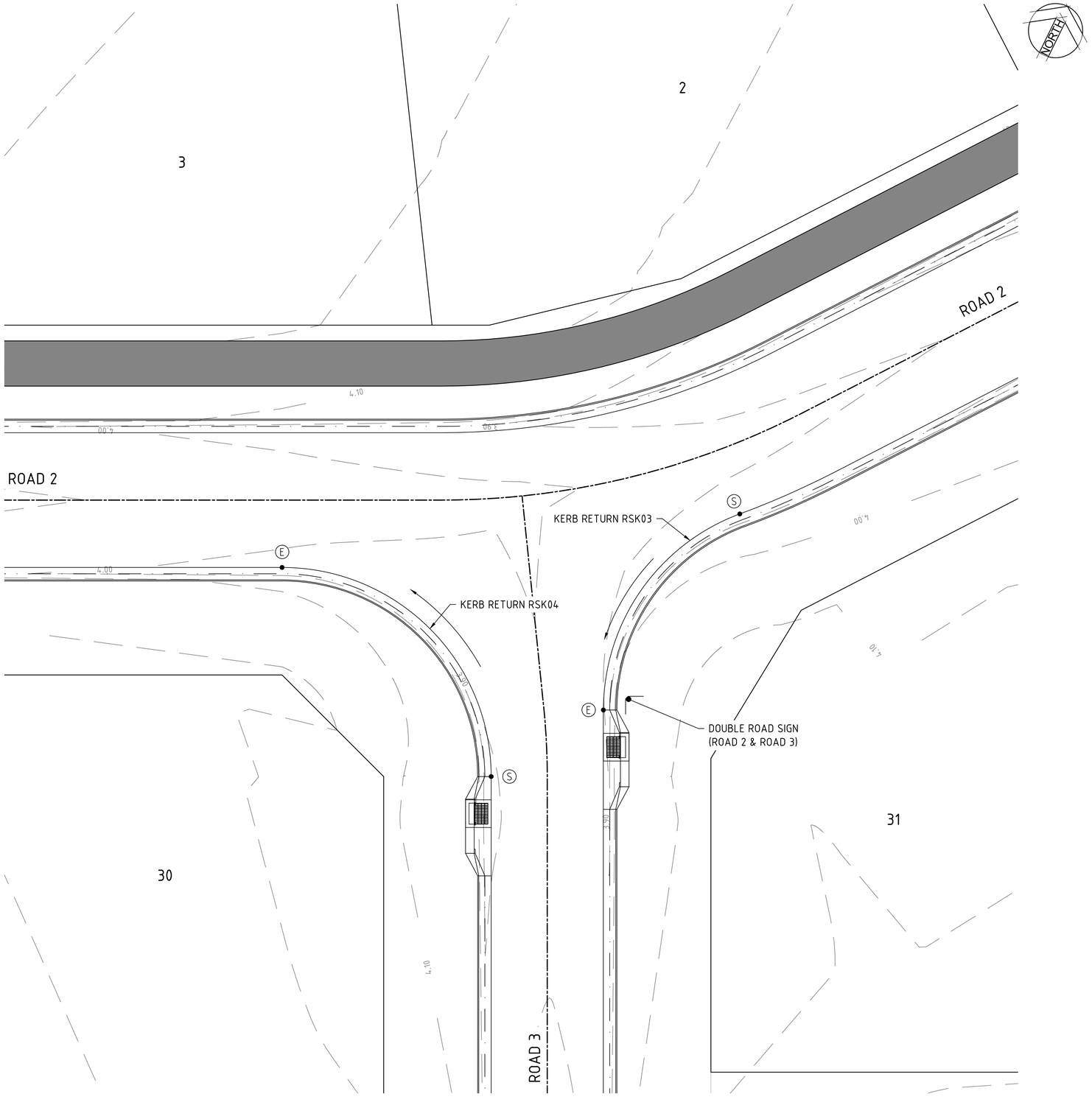
- SIGNS (REFER NOTES)
- ① SETOUT POINT
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS – SIZES TO BE CONFIRMED. (REFER FNQROC STD. DWG S1050B & 1055D)

C RSK03->RSK03 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337083.366	8170493.356	3.850	223°33'59.10"			
IP 2	5.632	337078.923	8170488.686	3.877		R = -9.265	11.264	69°39'17.62"
CT	11.264	337081.758	8170482.896	3.903	153°54'41.48"			
E	14.211	337083.054	8170480.249	3.917	153°54'41.48"			

C RSK04->RSK04 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337078.590	8170478.063	3.891	333°54'41.48"			
IP 2	7.277	337074.516	8170486.385	3.929		R = -9.265	14.553	90°00'00.00"
E	14.553	337066.195	8170482.310	3.975	243°54'41.48"			



VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%)
VERT. GEOMETRY LENGTH(m)

0.468%
14.221m

Datum 0

HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m)								
								11.264m / R-9.265m
EXISTING SURFACE LEVELS ROAD CENTRELINE			4.835	4.811	4.792	4.784	4.776	
CUT / FILL DEPTH TO EXISTING SURFACE		0.973	0.937	0.907	0.888	0.868		
DESIGN LEVELS ROAD CENTRELINE	3.850	3.862	3.874	3.885	3.897	3.908	3.917	
CONTROL LINE CHAINAGES ROAD CENTRELINE	-0.000	2.462	4.925	7.387	9.849	12.311	14.221	

KERB RETURN RSK03

VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%)
VERT. GEOMETRY LENGTH(m)

0.530% 0.646%
8.023m 6.566m

IP CH7.997RL3.933

HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m)								
								14.553m / R-9.265m
EXISTING SURFACE LEVELS ROAD CENTRELINE			4.775	4.783	4.792	4.800	4.802	4.810	4.826	
CUT / FILL DEPTH TO EXISTING SURFACE		0.884	0.880	0.875	0.870	0.869	0.865	0.866	
DESIGN LEVELS ROAD CENTRELINE	3.890	3.891	3.904	3.917	3.930	3.933	3.945	3.961	3.975	
CONTROL LINE CHAINAGES ROAD CENTRELINE	-0.026	0.000	2.462	4.925	7.387	7.997	9.849	12.311	14.563	

KERB RETURN RSK04

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 PLAN @A1

H: 0 5 10 15 20 25m
V: 0 1 2 3 4 5m
SCALE: H:1:250 V:1:50

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Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: INTERSECTION PLAN
SHEET 2 OF 6

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

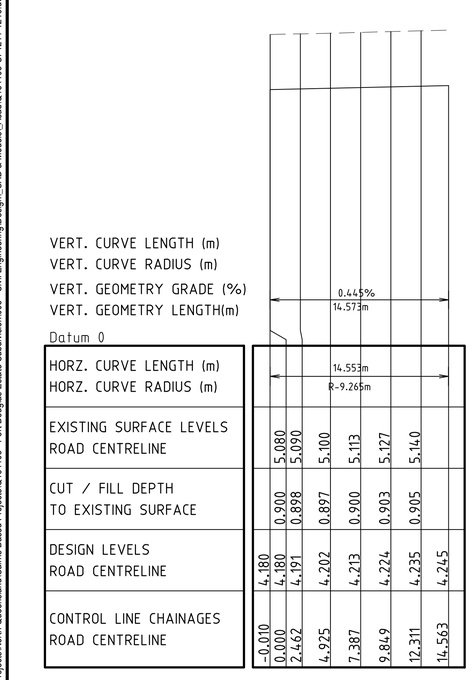
Drawing Number: Q184103-CI-1212
Revision: A

LEGEND

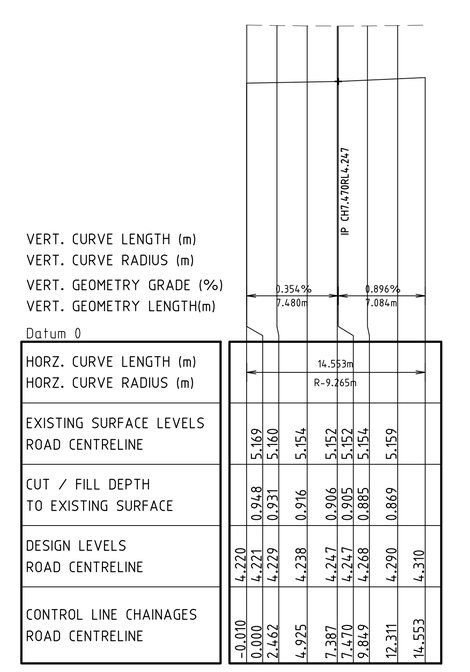
- SIGNS (REFER NOTES)
- ① SETOUT POINT
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS - SIZES TO BE CONFIRMED. (REFER FNQROC STD. DWG S1050B & 1055D)

C RSK05->RSK05 HORIZONTAL POINTS								
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337020.391	8170459.882	4.180	243°54'41.48"			
IP 2	7.277	337012.070	8170455.808	4.213		R = -9.265	14.553	90°00'00.00"
E	14.553	337016.144	8170447.487	4.245	153°54'41.48"			

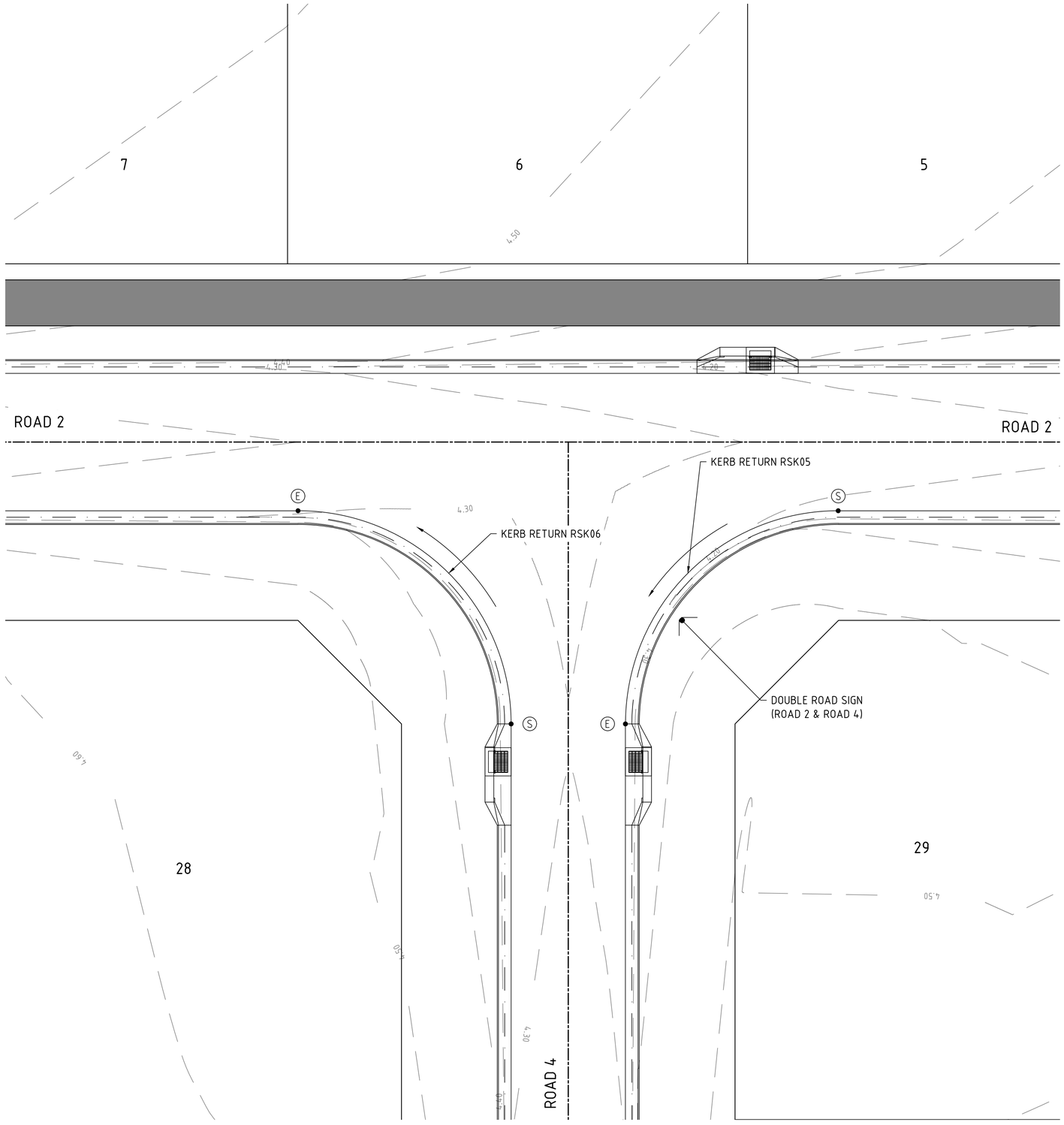
C RSK06->RSK06 HORIZONTAL POINTS								
PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337011.681	8170445.301	4.221	333°54'41.48"			
IP 2	7.277	337007.606	8170453.623	4.246		R = -9.265	14.553	90°00'00.00"
E	14.553	336999.285	8170449.548	4.310	243°54'41.48"			



KERB RETURN RSK05



KERB RETURN RSK06



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

SCALE 1:100 PLAN @A1
0 1 2 4 6 8 10m
H: 0 5 10 15 20 25m
V: 0 1 2 3 4 5m
SCALE: H:1:250 V:1:50

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Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: INTERSECTION PLAN
SHEET 3 OF 6

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1213
Revision: A

LEGEND

- SIGNS (REFER NOTES)
- (1) SETOUT POINT
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS - SIZES TO BE CONFIRMED. (REFER FNQROC STD. DWG S1050B & 1055D)

C RSK07->RSK07 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	336944.753	8170443.217		173°11'41.48"			
IP 2	8.836	336946.300	8170430.252	4.498		R = -9.265	17.672	109°17'00.00"
E	17.672	336958.027	8170435.994	4.465	63°54'41.48"			

C RSK08->RSK08 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	336943.084	8170415.264		353°11'41.48"			
IP 2	3.689	336942.643	8170418.961	4.532		R = 22.485	7.379	18°48'10.07"
CC	7.379	336943.416	8170422.603	4.509	11°59'51.54"			
IP 3	14.029	336944.851	8170429.352	4.481		R = -20.265	13.301	37°36'20.13"
CC	20.680	336941.868	8170435.574	4.504	334°23'31.41"			
IP 4	24.369	336940.259	8170438.931	4.517		R = 22.485	7.379	18°48'10.07"
E	28.059	336939.818	8170442.628	4.530	353°11'41.48"			

VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%) -0.368%
VERT. GEOMETRY LENGTH(m) 17.679m

Datum 0

HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m)																		
							17.672m R-9.265m											
EXISTING SURFACE LEVELS ROAD CENTRELINE		5.216	5.235	5.247	5.251	5.253	5.253	5.253	5.251									
CUT / FILL DEPTH TO EXISTING SURFACE		0.685	0.714	0.734	0.748	0.759	0.768	0.776	0.784									
DESIGN LEVELS ROAD CENTRELINE		4.530	4.521	4.512	4.503	4.494	4.485	4.476	4.467	4.465								
CONTROL LINE CHAINAGES ROAD CENTRELINE	0.000	2.462	4.925	7.387	9.849	12.311	14.774	17.236	17.679									

KERB RETURN RSK07

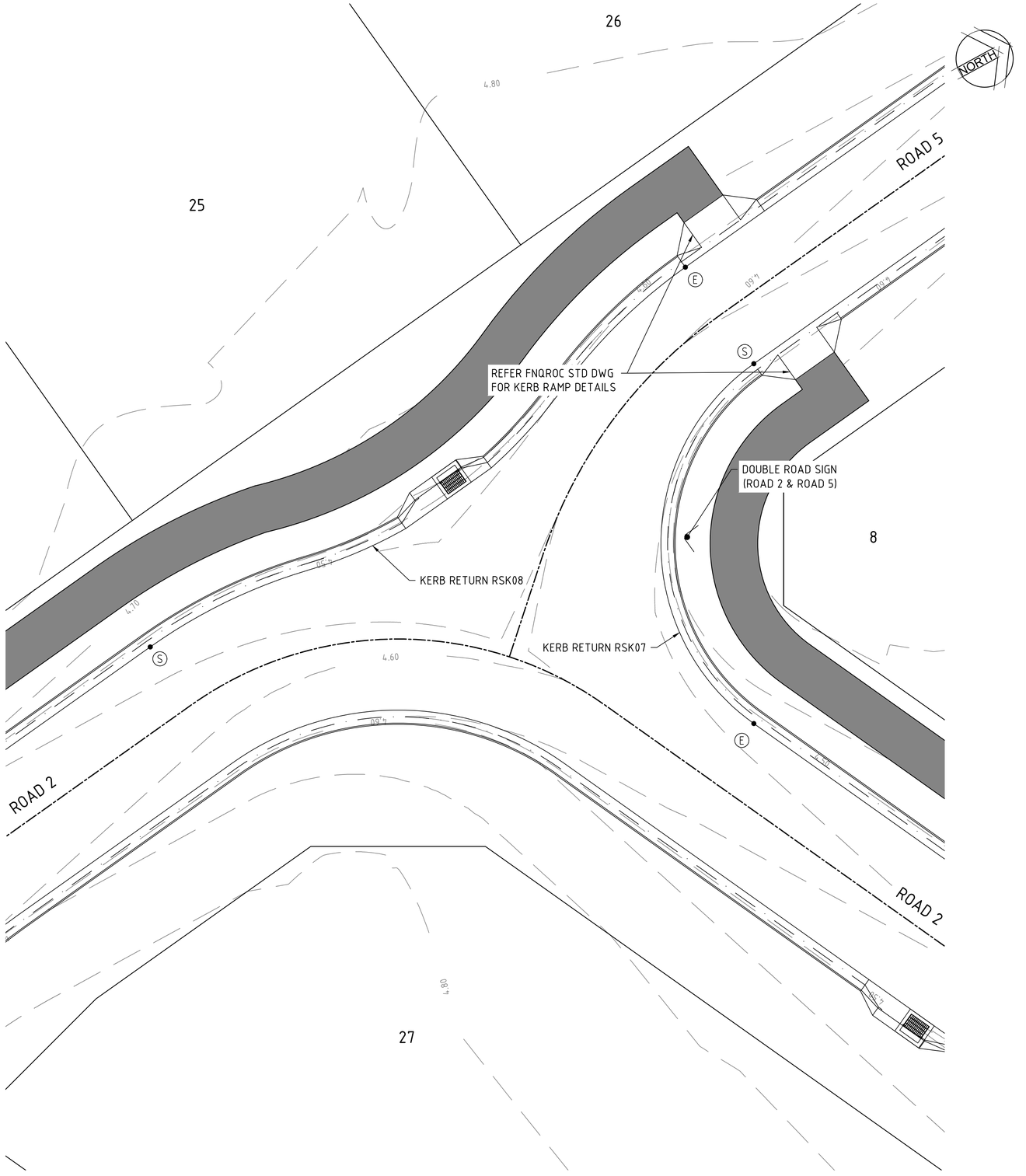
LOW POINT CH12.745RL4.476
IP CH12.745RL4.476

VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%) -0.623% 0.356%
VERT. GEOMETRY LENGTH(m) 12.745m 15.324m

Datum 0

HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m)																		
							7.379m R22.485m					13.301m R-20.265m					7.379m R22.485m	
EXISTING SURFACE LEVELS ROAD CENTRELINE		5.335	5.322	5.309	5.295	5.284	5.277	5.276	5.271	5.266	5.263	5.260	5.252	5.239				
CUT / FILL DEPTH TO EXISTING SURFACE		0.779	0.782	0.784	0.786	0.789	0.798	0.800	0.788	0.774	0.762	0.750	0.734	0.712				
DESIGN LEVELS ROAD CENTRELINE		4.555	4.540	4.525	4.509	4.494	4.479	4.476	4.483	4.492	4.501	4.509	4.518	4.527	4.530			
CONTROL LINE CHAINAGES ROAD CENTRELINE	0.000	2.462	4.925	7.387	9.849	12.311	12.745	14.774	17.236	19.698	22.161	24.623	27.085	28.069				

KERB RETURN RSK08



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

SCALE 1:100 PLAN @A1
0 1 2 4 6 8 10m
H: 0 5 10 15 20 25m
V: 0 1 2 3 4 5m
SCALE: H:1:250 V:1:50

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		Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: INTERSECTION PLAN
SHEET 4 OF 6
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-1214 | Revision: A

XREF's: XR-Q184103-CI-BASE; XR-Q184103-DSGN-CNTRS; XR-Q184103-CI-LS-RSK01; XR-Q184103-CI-LS-RSK02; XR-Q184103-CI-LS-RSK03; XR-Q184103-CI-LS-RSK04; XR-Q184103-CI-LS-RSK05; XR-Q184103-CI-LS-RSK06; XR-Q184103-CI-LS-RSK07; XR-Q184103-CI-LS-RSK08; XR-Q184103-CI-LS-RSK09; XR-Q184103-CI-LS-RSK11; XR-Q184103-CI-LS-RSK10; XR-Q184103-CI-KR-TABLE
CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1211-1216.dwg
DATE PLOTTED: 11 October 2019 9:47 AM BY: JACK JONES

XREF's: XR-Q184103-CI-BASE; XR-Q184103-DSGN-CNTRS; XR-Q184103-CI-LS-RSK01; XR-Q184103-CI-LS-RSK02; XR-Q184103-CI-LS-RSK03; XR-Q184103-CI-LS-RSK04; XR-Q184103-CI-LS-RSK05; XR-Q184103-CI-LS-RSK06; XR-Q184103-CI-LS-RSK07; XR-Q184103-CI-LS-RSK08; XR-Q184103-CI-LS-RSK09; XR-Q184103-CI-LS-RSK11; XR-Q184103-CI-LS-RSK10; XR-Q184103-CI-KR-TABLE
CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1211-1216.dwg
DATE PLOTTED: 11 October 2019 9:48 AM BY : JACK JONES

LEGEND

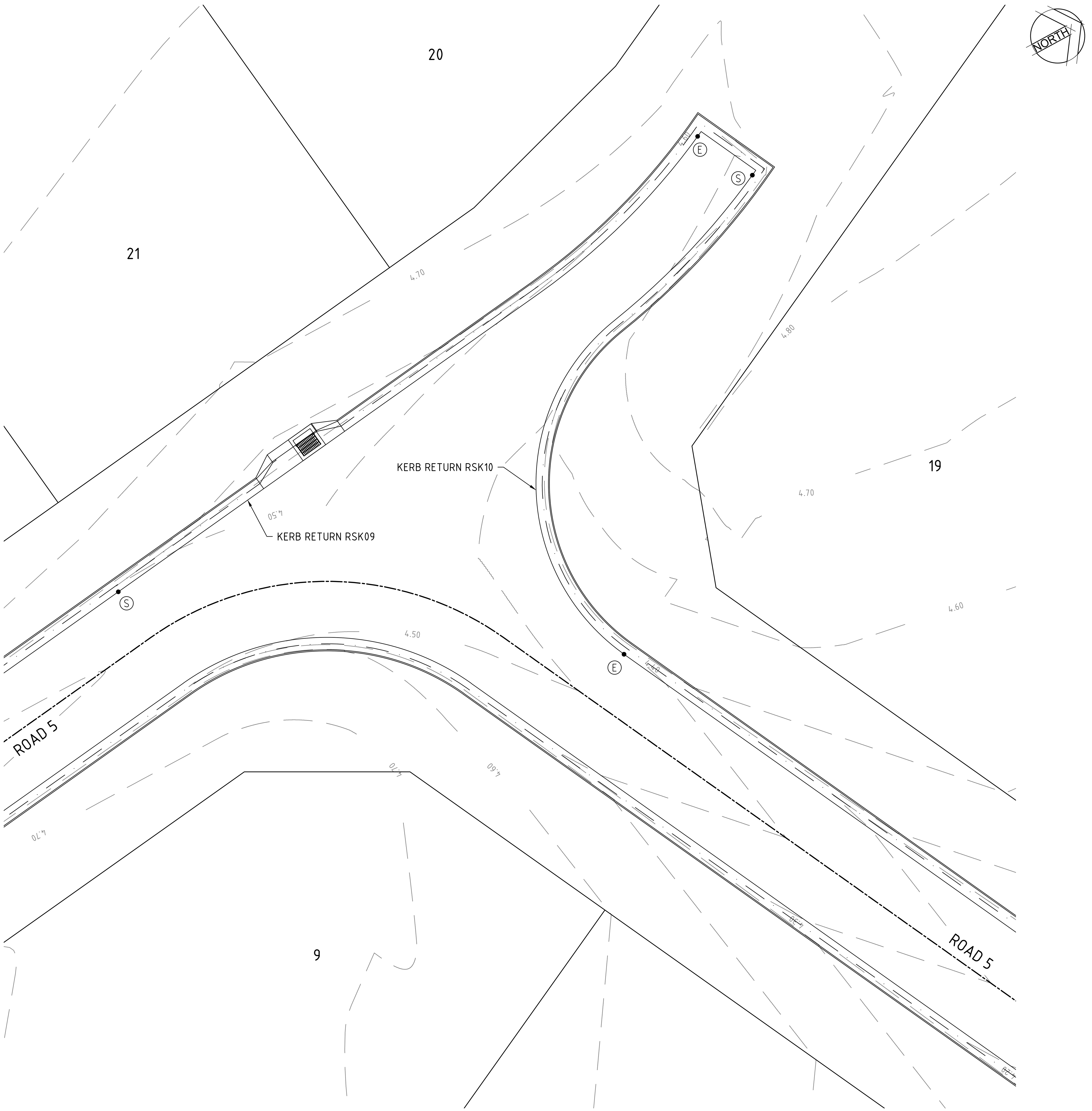
- SIGNS (REFER NOTES)
- SETOUT POINT
- 3.50 — FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS - SIZES TO BE CONFIRMED. (REFER FNQROC STD. DWG S1050B & 1055D)

C RSK09->RSK09 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	336933.563	8170495.046		353°11'41.48"			
TC	22.863	336930.854	8170517.747	4.508	353°11'41.48"			
IP 2	27.956	336930.245	8170522.853	4.527		R = -30.265	10.186	19°17'00.00"
E	33.049	336927.984	8170527.470	4.545	333°54'41.48"			

C RSK10->RSK10 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	336930.651	8170528.777	4.635	153°54'41.48"			
IP 2	4.595	336932.685	8170524.623	4.608		R = 33.235	9.191	15°50'40.83"
CC	9.191	336933.507	8170520.072	4.580	169°45'22.31"			
IP 3	17.749	336935.688	8170508.007	4.465		R = -9.265	17.116	105°50'40.83"
E	26.306	336946.699	8170513.398		63°54'41.48"			



LOW POINT CH9.605RL4.460
IP CH9.605RL4.460

VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%): -0.629% | 0.363%
VERT. GEOMETRY LENGTH(m): 9.605m | 23.443m
Datum 0

HORZ. CURVE LENGTH (m): 10.186m
HORZ. CURVE RADIUS (m): R-30.265m

EXISTING SURFACE LEVELS ROAD CENTRELINE	4.833	4.795	4.745	4.741	4.686	4.634	4.590	4.545	
CUT / FILL DEPTH TO EXISTING SURFACE	0.312	0.306	0.285	0.279	0.206	0.137	0.074	0.011	
DESIGN LEVELS ROAD CENTRELINE	4.520	4.489	4.460	4.461	4.480	4.498	4.516	4.534	4.545
CONTROL LINE CHAINAGES ROAD CENTRELINE	0.000	5.000	9.605	10.000	15.000	20.000	25.000	30.000	33.049

KERB RETURN RSK09

IP CH9.191RL4.580
IP CH16.926RL4.470
IP CH20.003RL4.450

VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%): -0.598% | -1.422% | 0.650% | 0.469%
VERT. GEOMETRY LENGTH(m): 9.191m | 7.735m | 3.077m | 6.304m
Datum 0

HORZ. CURVE LENGTH (m): 9.191m | 17.116m
HORZ. CURVE RADIUS (m): R33.235m | R-9.265m

EXISTING SURFACE LEVELS ROAD CENTRELINE	4.510	4.554	4.591	4.598	4.640	4.656	4.690	4.690	4.731	4.738
CUT / FILL DEPTH TO EXISTING SURFACE	-0.125	-0.051	0.011	0.030	0.143	0.186	0.240	0.240	0.305	0.318
DESIGN LEVELS ROAD CENTRELINE	4.635	4.605	4.580	4.568	4.497	4.470	4.450	4.450	4.427	4.420
CONTROL LINE CHAINAGES ROAD CENTRELINE	0.000	5.000	9.191	10.000	15.000	16.926	20.000	20.003	25.000	26.306

KERB RETURN RSK10

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 PLAN @A1
H: 0 5 10 15 20 25m
V: 0 1 2 3 4 5m
SCALE: H:1:250 V:1:50

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Role	Name	Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	MB	RPEQ No. 10801 Date 10.10.2019

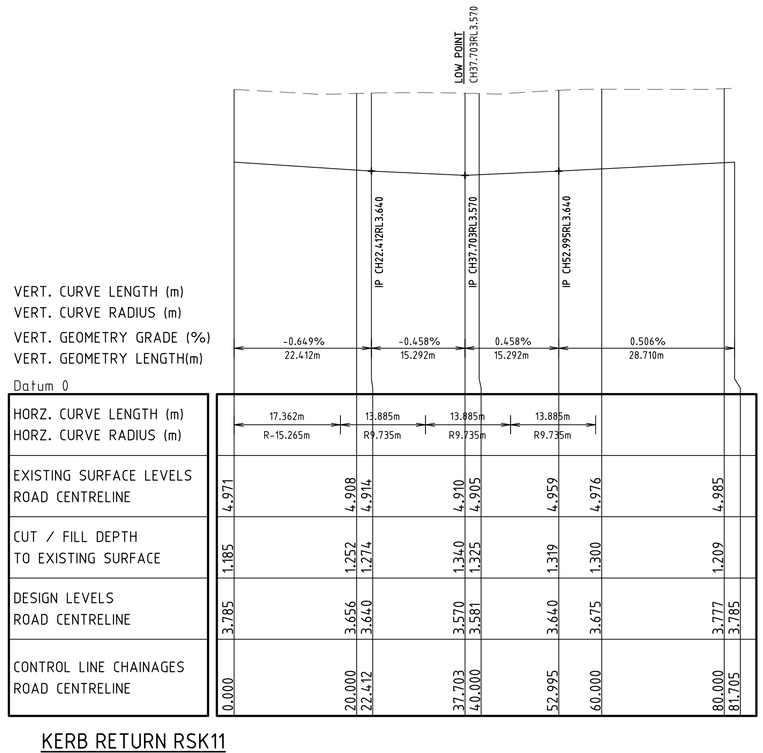
Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: INTERSECTION PLAN
SHEET 5 OF 6
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-1215 | Revision: A

LEGEND

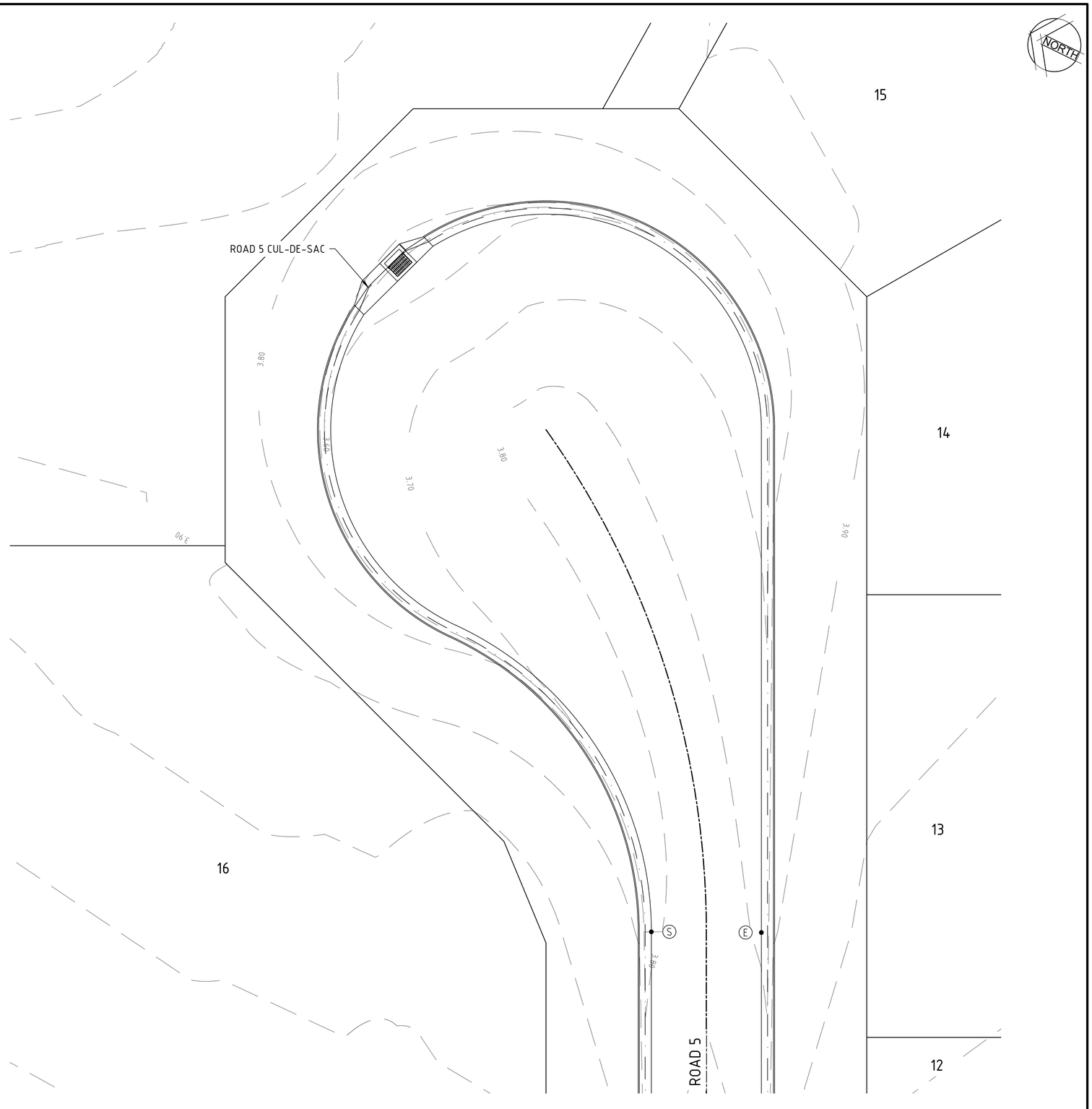
- SIGNS (REFER NOTES)
- ① SETOUT POINT
- 3.50 FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS - SIZES TO BE CONFIRMED. (REFER FNQROC STD. DWG S1050B & 1055D)

C RSK11->RSK11 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
S	0.000	337010.142	8170544.463	3.785	63°54'41.48"			
IP 2	8.681	337018.904	8170548.753	3.729		R = -15.265	17.362	65°09'55.49"
CC	17.362	337018.691	8170558.507	3.673	358°44'45.99"			
IP 3	24.304	337018.506	8170566.926	3.631		R = 9.735	13.885	81°43'18.50"
CC	31.247	337026.811	8170568.320	3.600	80°28'04.49"			
IP 4	38.189	337035.116	8170569.715	3.572		R = 9.735	13.885	81°43'18.50"
CC	45.132	337037.692	8170561.697	3.604	162°11'22.98"			
IP 5	52.075	337040.268	8170553.680	3.636		R = 9.735	13.885	81°43'18.50"
CT	59.017	337032.704	8170549.977	3.670	243°54'41.48"			
E	81.705	337012.328	8170539.999	3.785	243°54'41.48"			



KERB RETURN RSK11



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

SCALE 1:100 PLAN @A1
0 1 2 4 6 8 10m
H: 0 5 10 15 20 25m
V: 0 1 2 3 4 5m
SCALE: H:1:250 V:1:50

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Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: INTERSECTION PLAN
SHEET 6 OF 6

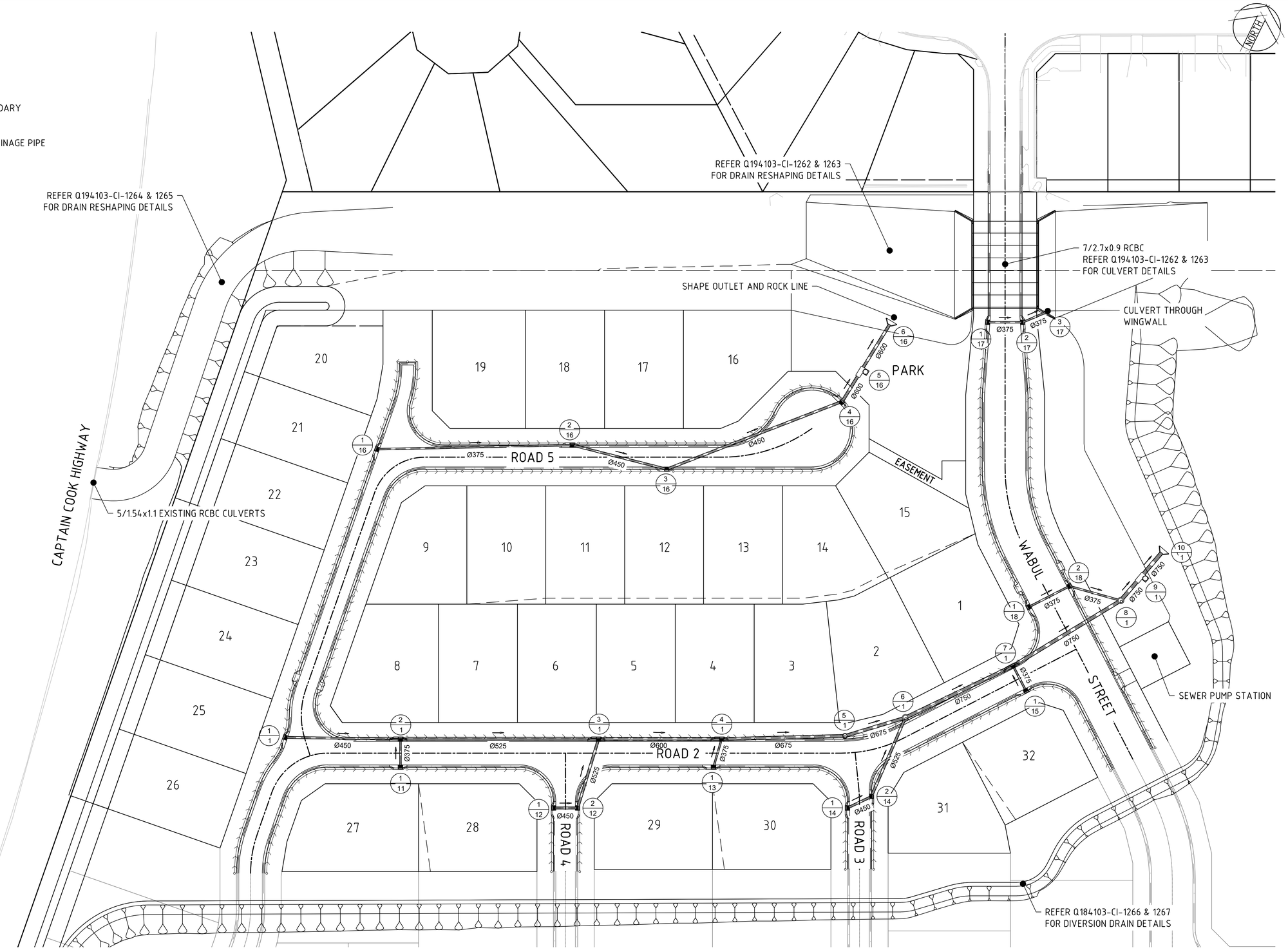
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1216
Revision: A

LEGEND

- LOT BOUNDARY
- FUTURE LOT BOUNDARY
- STORMWATER DRAINAGE PIPE



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

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SCALE 1:500 @A1

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Drawn	JJ	Date 10.10.2019
Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: STORMWATER LAYOUT PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

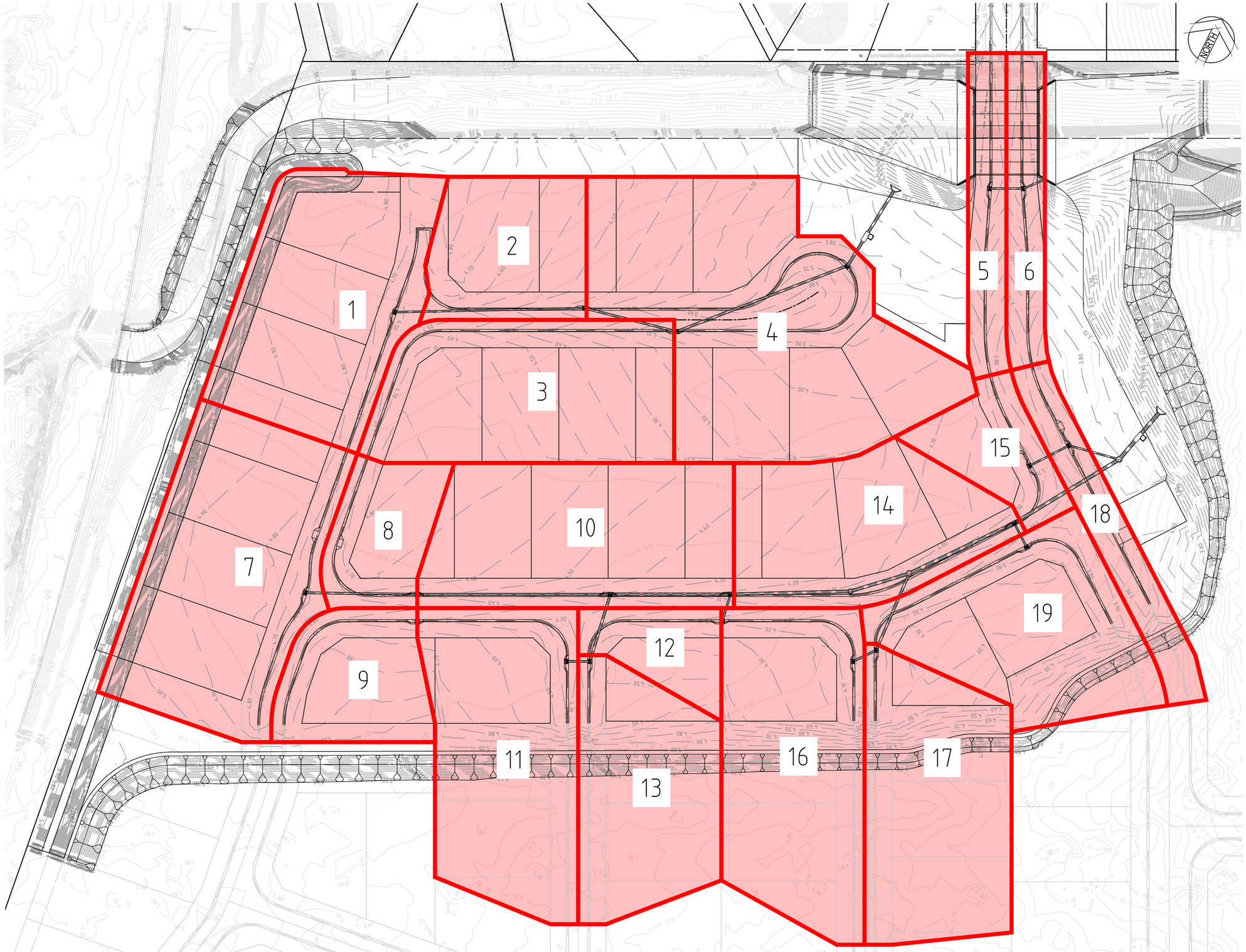
Drawing Number: Q184103-CI-1250
Revision: A

DATE PLOTTED: 23 October 2019 9:28 AM BY: - JACK JONES

CATCHMENT AREAS	
CATCHMENT	AREA (Ha)
1	0.307
2	0.149
3	0.283
4	0.489
5	0.084
6	0.082
7	0.359
8	0.089
9	0.126
10	0.296
11	0.297
12	0.071
13	0.218
14	0.242
15	0.087
16	0.301
17	0.266
18	0.097
19	0.256

LEGEND:

- CATCHMENT BOUNDARY
- CATCHMENT AREA
- 1 — CATCHMENT NUMBER
- 3.50 — DESIGN CONTOURS
- 3.50 — EXISTING CONTOURS



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

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SCALE 1:500 @A1

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Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: STORMWATER CATCHMENT PLAN

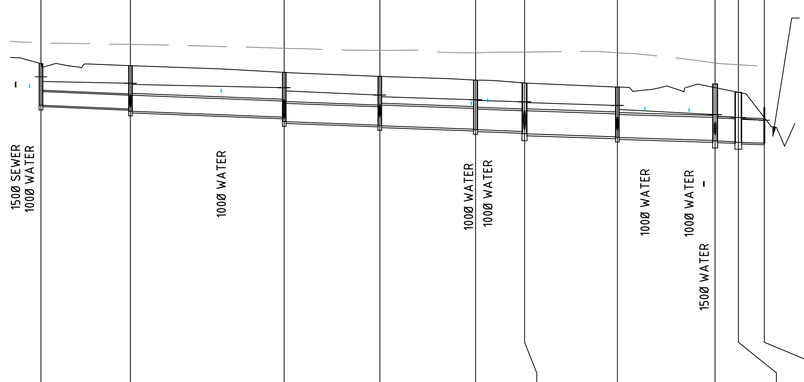
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1251
Revision: A

XREF's: XR-Q184103-CI-BASE; XR-Q184103-SURV; XR-Q184103-DSGN-CNTRS; XR-Q184103-EXST-CNTRS
CAD File: Q:\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1251.dwg

STRUCTURE NAME	1/1	2/1	3/1	4/1	5/1	6/1	7/1	8/1	9/1	10/1	1/11	2/1	1/12	2/12	3/1	1/13	4/1	1/14	2/14	6/1	1/15	7/1
STRUCTURE DESCRIPTION	SAG LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ACCESS CHAMBER 1200mm DIA	ACCESS CHAMBER 1200mm DIA	SAG LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ACCESS CHAMBER 1200mm DIA	GPT ROCLA CleansAll 600	HEADWALL	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	SAG LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	SAG LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	ACCESS CHAMBER 1200mm DIA	SAG LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C	SAG LIP IN LINE GULLY 2.4m LINTEL: MOUNTABLE K&C
PIPE SIZE mm	450	525	600	675	675	750	750	750	750		375		450	525		375		450	525		375	
PIPE CLASS	(4)	(4)	(4)	(4)	(4)	(4)	(4)	(2)	(2)		(4)		(4)	(4)		(4)		(4)	(4)		(4)	
PIPE GRADE (%)	0.40%	0.38%	0.36%	0.35%	0.36%	0.33%	0.30%	0.30%	0.31%		0.70%		0.49%	0.41%		0.41%		0.45%	0.41%		0.56%	
PIPE SLOPE (1 in X)	249.63	262.83	276.33	284.02	280.88	303.00	332.24	330.44	326.21		142.10		203.50	243.12		246.82		222.64	242.26		177.62	
FULL PIPE VELOCITY (m/s)	0.80	0.91	1.43	1.30	1.29	1.40	1.80	1.94	1.94		0.37		0.61	0.71		0.26		0.61	0.75		0.89	
PART FULL VELOCITY (m/s)	1.23	1.34	1.43	1.58	1.59	1.65	1.80	1.94	1.94		1.14		1.25	1.31		0.85		1.21	1.33		1.31	
DATUM RL	-11.0										-10.0		-10.0			-10.0		-11.0			-11.0	
W.S.E IN STRUCTURE HYDRAULIC GRADE LINE	4.165	4.013	3.955	3.915	3.809	3.704	3.568	3.514	3.418	3.397	3.349	3.324	3.231	3.098	2.936	2.884	2.838	2.800	2.750	2.750	3.992	3.959	3.955	3.915	3.982	3.896	3.889	3.898	3.832	3.809	3.704	3.589	3.570	3.568	3.514	3.541	3.440	3.433	3.380	3.349	3.324	3.409	3.253	3.231	3.098
PIPE FLOW (CUMECS) PIPE CAPACITY AT GRADE (CUMECS)		0.127 0.181		0.197 0.265		0.405 0.370		0.467 0.499		0.460 0.502		0.616 0.640		0.795 0.611		0.859 0.613		0.856 0.617				0.040 0.147			0.097 0.200		0.154 0.276			0.029 0.112			0.097 0.191		0.163 0.276			0.098 0.132			
DEPTH TO INVERT	1.36	1.41	1.49	1.46	1.61	1.59	1.61	1.60	1.62	1.58	1.66	1.63	1.65	1.85	1.87	1.61	1.63	1.16	1.16		1.29	1.34	1.49		1.31	1.36	1.44	1.46	1.61		1.29	1.31	1.61		1.30	1.34	1.41	1.46	1.66		1.34	1.38	1.65
INVERT LEVELS	3.233	3.116	3.041	2.850	2.700	2.587	2.567	2.457	2.437	2.380	2.305	2.205	2.185	2.089	2.069	2.046	2.026	2.000	2.000		3.240	3.190	3.041		3.030	3.000	2.925	2.850	2.700		2.897	2.867	2.567		2.695	2.665	2.590	2.500	2.305		2.490	2.450	2.185
DESIGN SURFACE LEVELS	4.596	4.529		4.309		4.179		4.056		3.962		3.830		3.935		3.659		3.162			4.529	4.529			4.338	4.360		4.309			4.187	4.179			3.996	4.001		3.962			3.830	3.830	
STRUCTURE EASTING NORTHING	E336942.957 N8170429.735	E336969.378 N8170442.183		E337014.463 N8170464.259		E337042.507 N8170477.990		E337070.205 N8170492.442		E337081.927 N8170503.347		E337100.698 N8170527.132		E337117.892 N8170553.995		E337119.793 N8170561.354		E337121.914 N8170569.566			E336972.502 N8170435.802	E336969.378 N8170442.183			E337011.895 N8170443.575	E337017.378 N8170446.259		E337014.463 N8170464.259			E337043.759 N8170470.692	E337042.507 N8170477.990			E337078.804 N8170476.337	E337082.957 N8170481.568		E337081.927 N8170503.347			E337106.398 N8170522.891	E337100.698 N8170527.132	
RUNNING CHAINAGE	0.000	29.206	29.206	50.200	79.406	31.225	110.631	31.242	141.873	16.010	157.883	30.300	188.183	31.895	220.078	7.600	227.678	8.481	236.160		0.000	7.105	7.105		0.000	6.105	6.105	18.234	24.339		0.000	7.405	7.405		0.000	6.679	6.679	21.803	28.483		0.000	7.105	7.105	



LINE 1 11 12 13 14 15

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

XREFs:
CAD File: Q:\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1252-1253.dwg

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		Date
Drawn	JJ	10.10.2019
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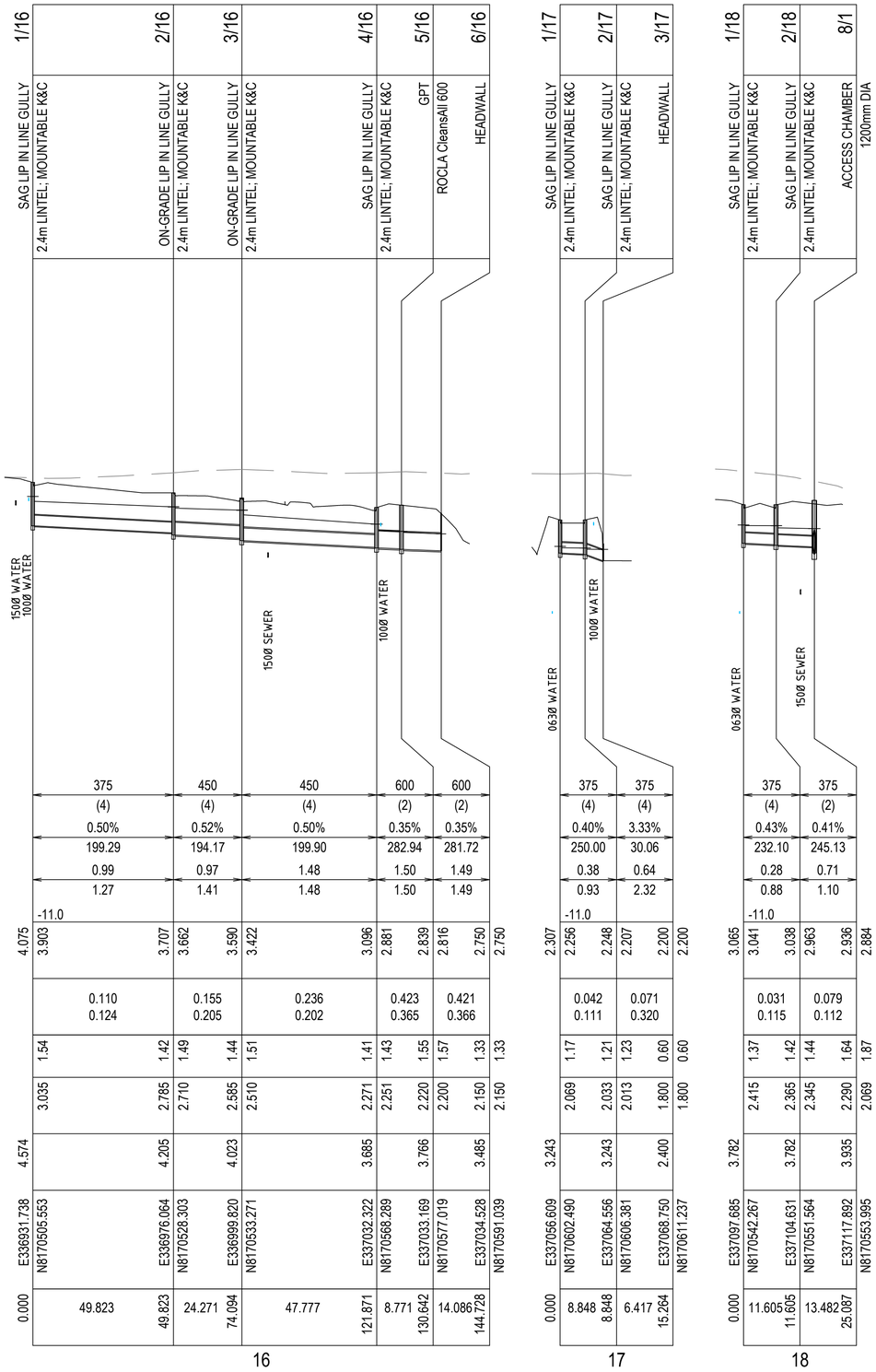
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: STORMWATER LONGITUDINAL SECTIONS
SHEET 1 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1252
Revision: A



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

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		Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: STORMWATER LONGITUDINAL SECTIONS
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1253

Revision: A

DATE PLOTTED: 11 October 2019 9:52 AM BY : JACK JONES

	LOCATION			TIME		SUB-CATCHMENT RUNOFF					INLET DESIGN							
				Tc	I	fi	C	A	CxA	Qc	Qa			Qrc		dg	Vg	dg.Vg
DESIGN ARI	STRUCTURE No	DS STRUCTURE No.	SUB-CATCHMENTS CONTIBUTING	SUB-CATCHMENT TIME OF CONCENTRATION	RAINFALL INTENSITY	FRACTION IMPERVIOUS	COEFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT IMPERVIOUS AREA	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD LONGITUDINAL GRADE AT INLET	ROAD XFALL AT INLET	HALF ROAD CAPACITY (AT INLET)	FLOW WIDTH	FLOW DEPTH	FLOW VELOCITY	Velocity-Depth
yrs				min	mm/h	%		ha	ha	l/s	l/s	%	%	l/s	m	m	m/s	
Q5 Q100	1/1	2/1	; 1/1	15.0	138.9 220.5	50	0.88 0.98	0.239	0.225 0.237	127 216	127 216			224		0.059 0.088		
Q5 Q100	2/1	3/1	1/11; 1/1; 2/1	15.0	138.9 220.5	50	0.88 0.98	0.066	0.062 0.065	35 60	35 60	0.35	3.00	94	2.39 2.93	0.079 0.095	0.42 0.48	0.03 0.05
Q5 Q100	3/1	4/1	1/12; 2/12; 1/11; 1/1; 2/1; 3/1	15.0	138.9 220.5	50	0.88 0.98	0.115	0.108 0.114	61 104	61 104			128	2.64 3.23	0.090 0.108	0.58 0.66	0.05 0.07
Q5 Q100	4/1	5/1	1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1	15.0	138.9 220.5	50	0.88 0.98	0.078	0.073 0.077	41 70	45 93	0.45	3.00	99	2.58 3.40	0.084 0.108	0.47 0.56	0.04 0.06
Q5 Q100	5/1	6/1	1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1															
Q5 Q100	6/1	7/1	1/14; 2/14; 1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1															
Q5 Q100	7/1	8/1	1/15; 1/14; 2/14; 1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1; 7/1	15.0	138.9 220.5	50	0.88 0.98	0.166	0.156 0.164	88 150	93 312			224		0.039 0.090		
Q5 Q100	8/1	9/1	1/18; 2/18; 1/15; 1/14; 2/14; 1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1; 7/1															
Q5 Q100	9/1	10/1	1/18; 2/18; 1/15; 1/14; 2/14; 1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1; 7/1															
Q5 Q100	10/1	0	1/18; 2/18; 1/15; 1/14; 2/14; 1/13; 1/12; 2/12; 1/11; 1/1; 2/1; 3/1; 4/1; 7/1															
Q5 Q100	1/11	2/1	; 1/11	15.0	138.9 220.5	50	0.88 0.98	0.084	0.079 0.083	45 76	45 76	0.40	3.00	94	2.63 3.22	0.086 0.103	0.45 0.51	0.04 0.05
Q5 Q100	1/12	2/12	; 1/12	15.0	138.9 220.5	50	0.88 0.98	0.174	0.163 0.172	93 157	97 232			167		0.042 0.075		

STRUCTURE No	INLET DESIGN				DRAIN DESIGN													HEAD LOSSES	
	STRUCTURE	Qg	Qb		Tc	I	+CA	Qt	Qp	L	S			Vf	Vcap	T			
	TYPE AND DESCRIPTION	FLOW INTO INLET [+ = in] [- = surcharge]	BYPASS FLOW	BYPASS STRUCTURE	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	TOTAL (C x A)	MAJOR TOTAL FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE SIZE	PIPE CLASS	FLOW VELOCITY FULL (With Downstream Restrictions)	CAPACITY VELOCITY (No Downstream restrictions)	TIME OF FLOW IN REACH (t = L/<Assumed pipe velocity>)	12D KU Method	12D KU/KW CHART IDENTIFIER	
		l/s	l/s		min	mm/hr	ha	l/s	l/s	m	%	mm		m/s	m/s	sec			
1/1	SAG LIP IN LINE GULLY - 2.4m LINTEL; MOUNTABLE K&C	127 216			5.00	138.9 220.5	0.316 0.351	127 216	127 216	29.21	0.40	450	4	0.80 1.36	1.14	14.6	Ku,Kw - Missouri/Hare Charts	G1 G1	
2/1	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL; MOUNTABLE K&C	32 37	4 23	4/1	5.00	138.9 220.5	0.514 0.573	205 349	197 252	50.20	0.38	525	4	0.91 1.16	1.23	25.1	Ku,Kw - Missouri/Hare Charts	T2 T1/T2	
3/1	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL; MOUNTABLE K&C	61 104			5.00	138.9 220.5	1.053 1.173	415 710	405 557	31.22	0.36	600	4	1.43 1.97	1.31	15.6	Ku,Kw - Missouri/Hare Charts	T2/T4 T2/T4	
4/1	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL; MOUNTABLE K&C	40 -69	5 162	7/1	5.00	138.9 220.5	1.219 1.357	474 817	467 506	31.24	0.35	675	4	1.30 1.41	1.39	15.6	Ku,Kw - Missouri/Hare Charts	T1/T2 T1/T2	
5/1	ACCESS CHAMBER 1050mm DIA						1.219 1.357	468 812	460 500	16.01	0.36	675	4	1.29 1.40	1.40	8.0	Ku,Kw - Missouri/Hare Charts	T1/T2 T1/T2	
6/1	ACCESS CHAMBER 1200mm DIA						1.635 1.821	628 1,090	616 740	30.30	0.33	750	4	1.40 1.67	1.45	15.2	Ku,Kw - Missouri/Hare Charts	T1/T2 T1/T2	
7/1	SAG LIP IN LINE GULLY - 2.4m LINTEL; MOUNTABLE K&C	93 23	289	1/18	5.00	138.9 220.5	2.079 2.315	795 1,382	795 1,093	31.89	0.30	750	4	1.80 2.47	1.38	15.9	Ku,Kw - Missouri/Hare Charts	T1/T2 T2/T4	
8/1	ACCESS CHAMBER 1200mm DIA						2.241 2.495	859 1,481	859 1,481	7.60	0.30	750	2	1.94 3.35	1.39	3.8	Ku,Kw - Missouri/Hare Charts	T2 T2/T4	
9/1	ACCESS CHAMBER 1800mm DIA.						2.241 2.495	856 1,479	856 1,479	8.48	0.31	750	2	1.94 3.35	1.40	4.2	Ku,Kw - Missouri/Hare Charts	T1 T1	
10/1	OUTFALL															0.0			
1/11	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL; MOUNTABLE K&C	40 2	4 75	1/12	5.00	138.9 220.5	0.111 0.124	45 76	40 2	7.11	0.70	375	4	0.37 0.01	1.33	3.6	Ku,Kw - Missouri/Hare Charts	G1 G1	
1/12	SAG LIP IN LINE GULLY - 2.4m LINTEL; MOUNTABLE K&C	97 3	228	2/12	5.00	138.9 220.5	0.229 0.255	93 157	97 3	6.11	0.49	450	4	0.61 0.02	1.26	3.1	Ku,Kw - Missouri/Hare Charts	G1 G1	

STRUCTURE No	HEAD LOSSES								PART FULL		DESIGN LEVELS							
	S / DO	V2/2g	Ku	hu	Kw	hw	Sf	hf		Vp								
	SUBMERGENCE RATIO	VELOCITY HEAD	U/S HEAD LOSS COEFFICIENT	U/S HEAD LOSS	W.S.E COEFFICIENT (Kw = Ku where blank)	CHANGE IN W.S.E	PIPE FRICTION SLOPE (HGL grade)	PIPE FRICTION HEAD LOSS - (L x Sf)	PARTIAL DEPTH	PARTIAL DEPTH VELOCITY	PIPE U/S I.L	PIPE D/S I.L	PIPE U/S H.G.L	PIPE D/S H.G.L	UPSTREAM STRUCTURE W.S.E	GRATE LEVEL	FREEBOARD	STRUCTURE No
		m		m		m	%	m	m	m/s	m	m	m	m	m	m	m	
1/1	2.07 3.03	0.033 0.014	4.650 3.130	0.152 0.045		0.152 0.045	0.20 0.09	0.06 0.03	0.279	1.23	3.23	3.12	4.013 4.551	3.955 4.525	4.165 4.596	4.60	0.43 0.00	1/1
2/1	1.74 2.83	0.042 0.069	0.956 0.637	0.040 0.044		0.040 0.044	0.21 0.34	0.11 0.17	0.337 0.408	1.34 1.39	3.04	2.85	3.915 4.481	3.809 4.309	3.955 4.525	4.53	0.57 0.00	2/1
3/1	1.85 2.68	0.105 0.057	1.005 0.987	0.105 0.056		0.105 0.056	0.43 0.24	0.14 0.07			2.70	2.59	3.704 4.253	3.568 4.179	3.809 4.309	4.31	0.50 0.00	3/1
4/1	1.48 2.39	0.087 0.102	0.626 0.214	0.054 0.022		0.054 0.022	0.31 0.36	0.10 0.11	0.518 0.562	1.58 1.59	2.57	2.46	3.514 4.156	3.418 4.043	3.568 4.178	4.18	0.61 0.00	4/1
5/1	1.45 2.38	0.084 0.100	0.248 0.248	0.021 0.025		0.021 0.025	0.30 0.35	0.05 0.06	0.509 0.551	1.59 1.60	2.44	2.38	3.397 4.018	3.349 3.962	3.418 4.043	4.06	0.64 0.01	5/1
6/1	1.39 2.21	0.099 0.111	0.254 0.260	0.025 0.029		0.025 0.029	0.31 0.34	0.09 0.10	0.592	1.65	2.31	2.21	3.324 3.933	3.231 3.829	3.349 3.962	3.96	0.61 0.00	6/1
7/1	1.39 2.19	0.165 0.312	0.802 0.471	0.133 0.147		0.133 0.147	0.51 0.96	0.16 0.31			2.19	2.09	3.098 3.682	2.936 3.375	3.231 3.829	3.83	0.60 0.00	7/1
8/1	1.16 1.74	0.193 0.574	0.270 0.396	0.052 0.227		0.052 0.227	0.59 1.77	0.05 0.13			2.07	2.05	2.884 3.148	2.838 3.014	2.936 3.375	3.93	1.00 0.56	8/1
9/1	1.08 1.32	0.192 0.572	0.200 0.200	0.038 0.114		0.038 0.114	0.59 1.76	0.05 0.15			2.03	2.00	2.800 2.900	2.750 2.750	2.838 3.014	3.66	0.82 0.65	9/1
10/1															2.750 2.750	3.16		10/1
1/11	2.00 3.43	0.007 0.000	4.791 2.851	0.033		0.033	0.05 0.00	0.00 0.00	0.134 0.028	1.14 0.44	3.24	3.19	3.959 4.525	3.955 4.525	3.992 4.525	4.53	0.54 0.00	1/11
1/12	2.12 2.91	0.019 0.000	4.556 3.263	0.086		0.086	0.12 0.00	0.01 0.00	0.221 0.040	1.25 0.47	3.03	3.00	3.896 4.338	3.889 4.338	3.982 4.338	4.34	0.36 0.00	1/12

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

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Drawn JJ Date 10.10.2019
Checked MS Date 10.10.2019
Designed MC Date 10.10.2019
Verified MS Date 10.10.2019
Approved MB RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: STORMWATER CALCULATION TABLES
SHEET 1 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum: AHD | Scale: AS SHOWN | Size: A1

Drawing Number: Q184103-CI-1260 | Revision: A

XREF's:
CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1260-1261.dwg

DATE PLOTTED: 11 October 2019 9:52 AM BY: JACK JONES

DESIGN ARI	LOCATION			TIME		SUB-CATCHMENT RUNOFF					INLET DESIGN											DRAIN DESIGN												HEAD LOSSES										PART FULL		DESIGN LEVELS							
	STRUCTURE No	DS STRUCTURE No.	SUB-CATCHMENTS CONTIBUTING	Tc	I	fi	C	A	CxA	Qc	Qa			Qrc		dg	Vg	dg.Vg	STRUCTURE	Qg	Qb		Tc	I	+CA	Qt	Qp	L	S			Vf	Vcap	T			S / DO	V2/2g	Ku	hu	Kw	hw	Sf	hf		Vp								
				SUB-CATCHMENT TIME OF CONCENTRATION	RAINFALL INTENSITY	FRACTION IMPERVIOUS	COEFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT IMPERVIOUS AREA	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD LONGITUDINAL GRADE AT INLET	ROAD XFALL AT INLET	HALF ROAD CAPACITY (AT INLET)	FLOW WIDTH	FLOW DEPTH	FLOW VELOCITY	Velocity-Depth	TYPE AND DESCRIPTION	FLOW INTO INLET [+ = in'] [- = surcharge]	BYPASS FLOW	BYPASS STRUCTURE	CRITICAL TIME OF CONCENTRATION	RAINFALL INTENSITY	TOTAL (C x A)	MAJOR TOTAL FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE SIZE	PIPE CLASS	FLOW VELOCITY FULL (With Downstream Restrictions)	CAPACITY VELOCITY (No Downstream restrictions)	TIME OF FLOW IN REACH (t = L'<Assumed pipe velocity>)	12D KU Method	12D KU/KW CHART IDENTIFIER	SUBMERGENCE RATIO	VELOCITY HEAD	U/S HEAD LOSS COEFFICIENT	U/S HEAD LOSS	W.S.E COEFFICIENT (Kw = Ku where blank)	CHANGE IN W.S.E	PIPE FRICTION SLOPE (HGL grade)	PIPE FRICTION HEAD LOSS - (L x Sf)	PARTIAL DEPTH	PARTIAL DEPTH VELOCITY	PIPE U/S I.L	PIPE D/S I.L	PIPE U/S H.G.L	PIPE D/S H.G.L	UPSTREAM STRUCTURE W.S.E	GRATE LEVEL	FREEBOARD	STRUCTURE No
yrs				min	mm/hr	%		ha	ha	l/s	l/s	%	%	l/s	m	m	m/s			l/s	l/s		min	mm/hr	ha	l/s	l/s	m	%	mm		m/s	m/s	sec				m		m		m	%	m	m	m/s	m	m	m	m	m	m	m	
Q5 Q100	2/12	3/1	1/12; 2/12	15.0	138.9 220.5	50	0.88 0.98	0.120	0.112 0.118	64 108	64 336	0.40	3.00	1,682	5.81 6.17	0.082 0.133	0.43 0.76	0.04 0.10	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL; MOUNTABLE K&C	57 205	6 131	1/13	5.00	138.9 220.5	0.387 0.431	156 265	154 208	18.23	0.41	525	4	0.71 0.96	1.27	9.1	Ku,Kw - Missouri/Hare Charts	T9/T10 G1/T9 /T10	1.85 2.69	0.026 0.006	2.178 3.470	0.056 0.023	2.52	0.065 0.023	0.13 0.03	0.02 0.01	0.280 0.341	1.31 1.40	2.93	2.85	3.832 4.315	3.809 4.309	3.898 4.338	4.36	0.46 0.02	2/12
Q5 Q100	1/13	4/1	; 1/13	15.0	138.9 220.5	50	0.88 0.98	0.048	0.045 0.047	25 43	32 174	0.40	3.00	99	2.26 3.48	0.075 0.110	0.43 1.01	0.03 0.11	ON-GRADE LIP IN LINE GULLY 2.4m LINTEL; MOUNTABLE K&C	29 24	3 150	1/14	5.00	138.9 220.5	0.063 0.070	25 43	29 24	7.40	0.41	375	4	0.26 0.22	1.01	3.7	Ku,Kw - Missouri/Hare Charts	G1 G1	1.85 3.44	0.003 0.002	5.480 2.842	0.019 0.007		0.019 0.007	0.03 0.02	0.00 0.00	0.129 0.119	0.85 0.81	2.90	2.87	3.570 4.180	3.568 4.179	3.589 4.187	4.19	0.60 0.00	1/13
Q5 Q100	1/14	2/14	; 1/14	15.0	138.9 220.5	50	0.88 0.98	0.176	0.165 0.174	94 159	97 309			151		0.042 0.070			SAG LIP IN LINE GULLY - 2.4m LINTEL; MOUNTABLE K&C	97 3	306	2/14	5.00	138.9 220.5	0.232 0.258	94 159	97 3	6.68	0.45	450	4	0.61 0.02	1.20	3.3	Ku,Kw>0 - Missouri/Hare Charts	G1 G1	1.88 2.89	0.019 0.000	5.328 3.280	0.101		0.101	0.12 0.00	0.01 0.00	0.227 0.039	1.21 0.44	2.70	2.67	3.440 3.996	3.433 3.996	3.541 3.996	4.00	0.46 0.00	1/14

XREF's:
CAD File: \\cardno.com\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1260-1261.dwg

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A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

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Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

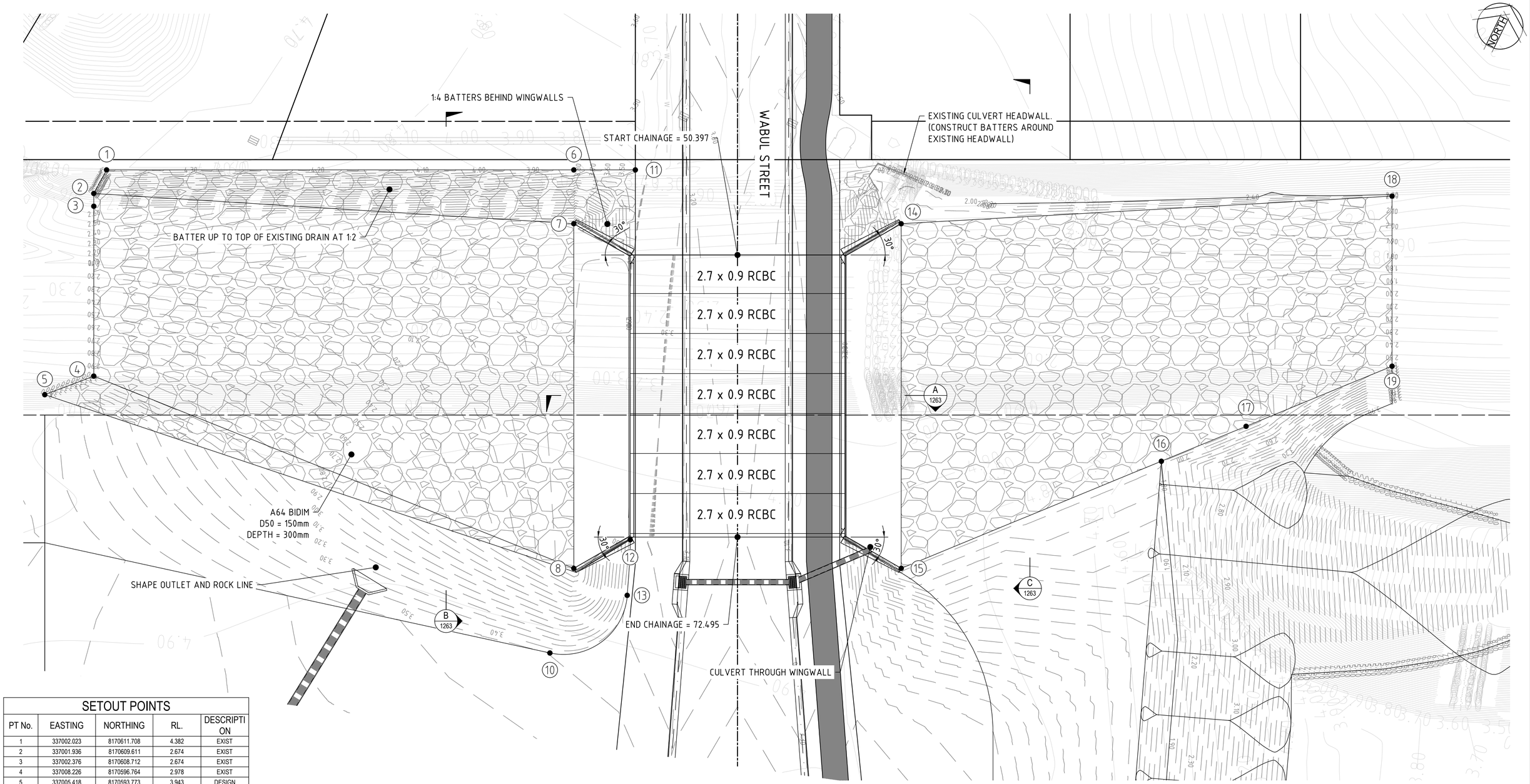
Title: STORMWATER CALCULATION TABLES
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1261

Revision: A



SETOUT POINTS

PT No.	EASTING	NORTHING	RL.	DESCRIPTION
1	337002.023	8170611.708	4.382	EXIST
2	337001.936	8170609.611	2.674	EXIST
3	337002.376	8170608.712	2.674	EXIST
4	337008.226	8170596.764	2.978	EXIST
5	337005.418	8170593.773	3.943	DESIGN
6	337034.875	8170627.795	3.824	DESIGN
7	337036.729	8170624.009	1.800	EXIST
8	337048.598	8170599.769	1.800	DESIGN
10	337049.831	8170592.994	3.497	DESIGN
11	337039.201	8170629.913	3.430	DESIGN
12	337051.579	8170603.723	3.341	DESIGN
13	337053.282	8170599.708	3.374	DESIGN
14	337059.747	8170635.277	1.800	DESIGN
15	337071.619	8170611.041	1.800	DESIGN
16	337086.222	8170627.529	1.783	DESIGN
17	337090.976	8170632.905	1.775	DESIGN
18	337093.311	8170654.123	2.204	EXIST
19	337099.169	8170642.159	2.578	EXIST

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

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Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

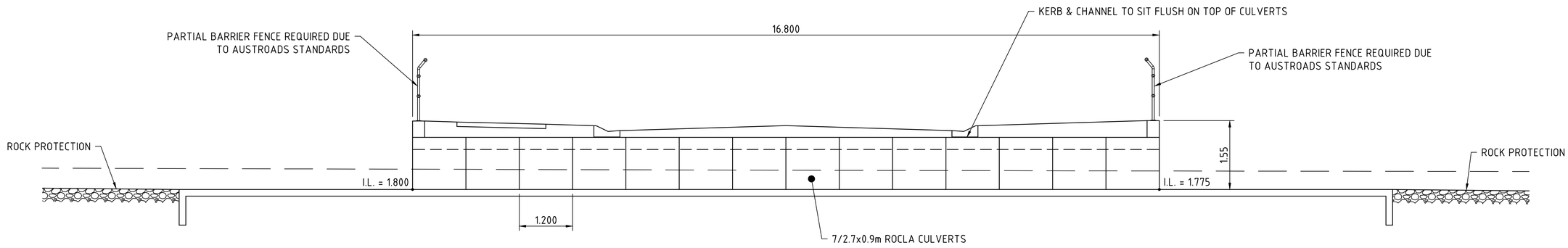
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: CULVERT DETAILS PLAN
SHEET 1 OF 2

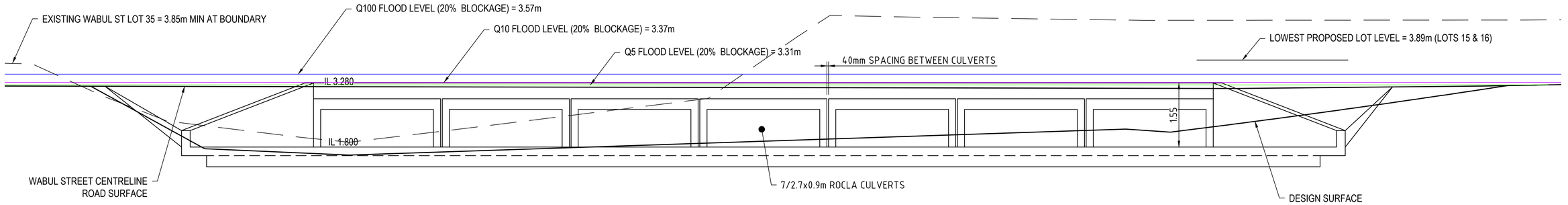
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

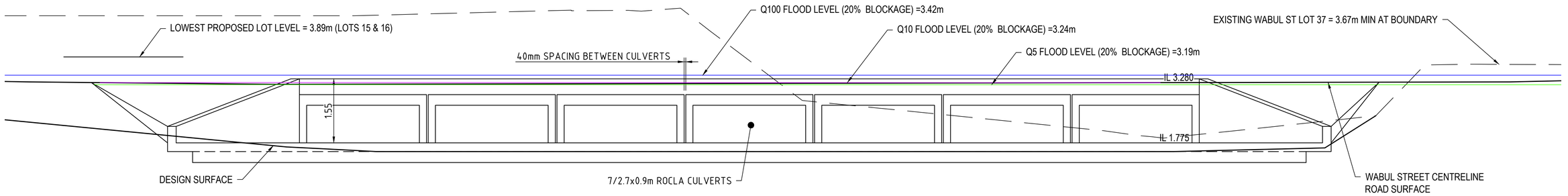
Drawing Number: Q184103-CI-1262
Revision: A



SECTION A
SCALE 1:50m
1262



SECTION B
SCALE 1:50m
1262



SECTION C
SCALE 1:50m
1262

NOTES:

1. TO BE INSTALLED AS PER DTMR STANDARD DRAWING 1250.
2. EXPOSURE CLASS B2.

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 3 4 5m
SCALE 1:50 @A1

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		Date
Drawn	JJ	10.10.2019
Checked	MS	10.10.2019
Designed	MC	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

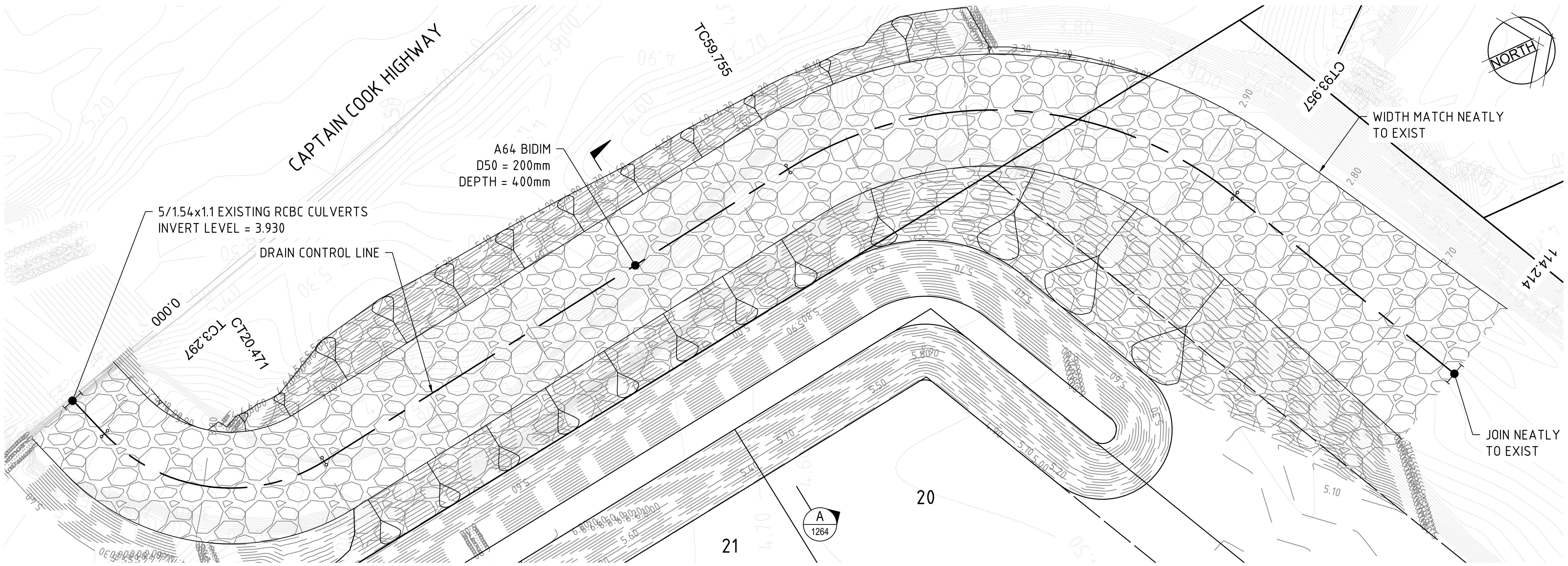
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: CULVERT DETAILS PLAN
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1263
Revision: A



DRAIN LAYOUT PLAN
SCALE 1:200m

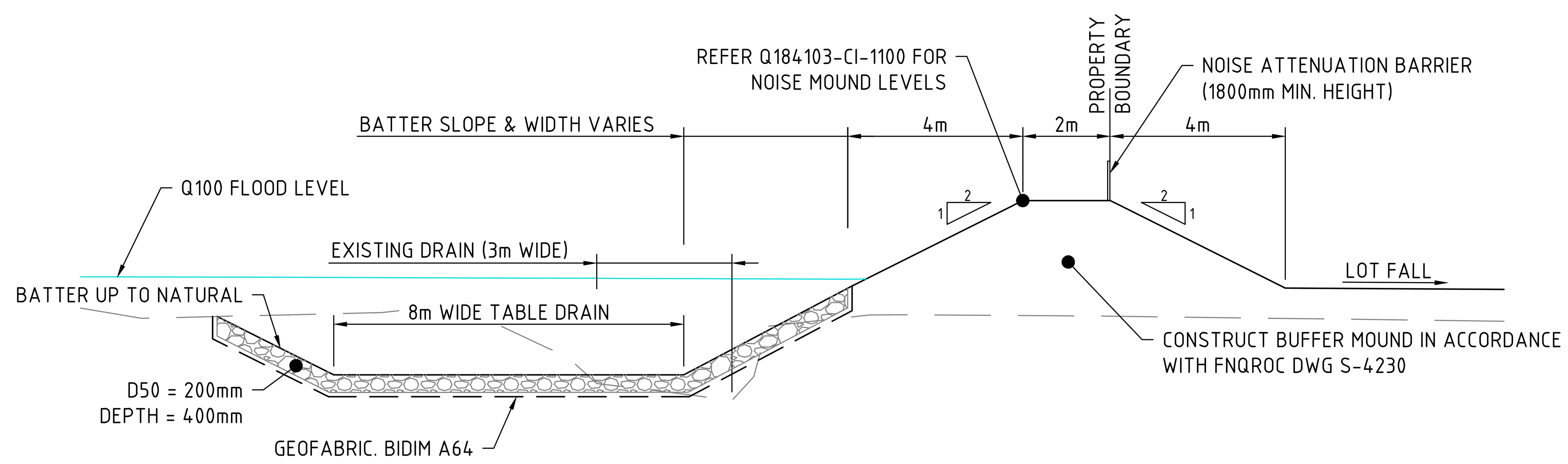
DATUM RL 0

HORZ. CURVE LENGTH (m) HORZ. CURVE RADIUS (m)		17.173m R-12.500m				34.202m R27.500m						
EXISTING SURFACE LEVELS ROAD CENTRELINE	5.654	4.204	3.558	3.930	4.565	3.505	3.494	3.206	2.606	2.662	2.637	
CUT/FILL DEPTH TO EXISTING SURFACE	-1.724	-0.311	0.146	-0.232	-1.088	-0.251	-0.244	-0.181	0.260	0.136	0.000	
DESIGN LEVELS ROAD CENTRELINE	3.930	3.893	3.704	3.698	3.477	3.253	3.251	3.024	2.866	2.798	2.637	2.637
CONTROL LINE CHAINAGE ROAD CENTRELINE	0.000	3.297	20.000	20.471	40.000	59.755	60.000	80.000	93.957	100.000	114.214	114.215

WABUL STREET
SCALE: H 1:200
V 1:200

DRAIN CONTROL LINE

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	336871.085	8170466.294	3.930	71°22'04.62"			
TC	3.297	336874.209	8170467.348	3.893	71°22'04.62"			
IP 2	11.884	336883.924	8170470.623	3.795		R = -12.500	17.173	78°43'00.00"
CT	20.471	336882.613	8170480.791	3.698	352°39'04.62"			
TC	59.755	336877.588	8170519.753	3.253	352°39'04.62"			
IP 3	76.856	336875.067	8170539.301	3.060		R = 27.500	34.202	71°15'36.94"
CT	93.957	336892.769	8170547.969	2.866	63°54'41.56"			
IP 4	114.214	336910.962	8170556.877	2.637	63°54'41.56"			



SECTION A 1264
SCALE 1:100m

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 3 4 5m
SCALE 1:50 @A1

H: 0 5 10 15 20m
V: 0 5 10 15 20m
SCALE: H:1:200 V:1:200 @A1

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Drawn	JJ	Date 10.10.2019
Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	MB	RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: DRAIN DESIGN
SHEET 1 OF 2

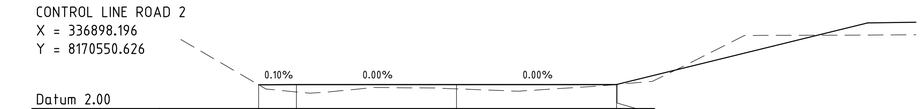
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum: AHD | Scale: AS SHOWN | Size: A1

Drawing Number: Q184103-CI-1264 | Revision: A

DATE PLOTTED: 11 October 2019 2:23 PM BY : MAURICE SHEEHAN
XREF's: XR-Q184103-CI-BASE; XR-Q184103-SURV; XR-Q184103-DSGN-CNTRS; XR-Q184103-CI-LS-DRAIN1; XR-Q184103-CI-XS-DRAIN1; XR-Q184103-EXST-CNTRS
CAD File: Q:\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1264-1265.dwg

CONTROL LINE ROAD 2
X = 336898.196
Y = 8170550.626

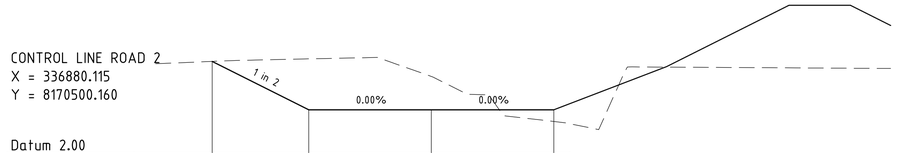


Datum 2.00

DESIGN HEIGHT	2.797	2.798	2.798	2.798	2.808
EXISTING SURFACE	2.797	2.558	2.662	2.806	2.808
OFFSETS	-6.461	-5.226	0.000	5.226	5.245

CHAINAGE 100.000

CONTROL LINE ROAD 2
X = 336880.115
Y = 8170500.160

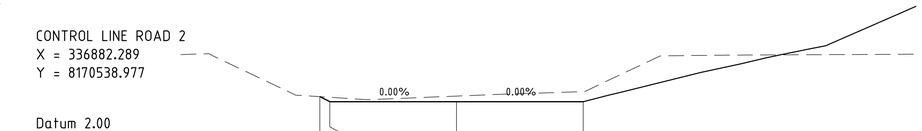


Datum 2.00

DESIGN HEIGHT	5.055	3.477	3.477	3.477
EXISTING SURFACE	5.055	5.138	4.565	3.095
OFFSETS	-7.155	-4.000	0.000	4.000

CHAINAGE 40.000

CONTROL LINE ROAD 2
X = 336882.289
Y = 8170538.977

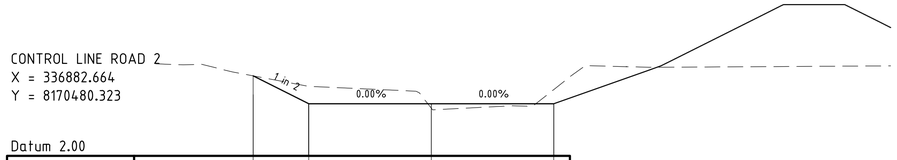


Datum 2.00

DESIGN HEIGHT	3.186	3.024	3.024	3.024
EXISTING SURFACE	3.186	3.165	3.206	3.349
OFFSETS	-4.460	-4.136	0.000	4.136

CHAINAGE 80.000

CONTROL LINE ROAD 2
X = 336882.664
Y = 8170480.323

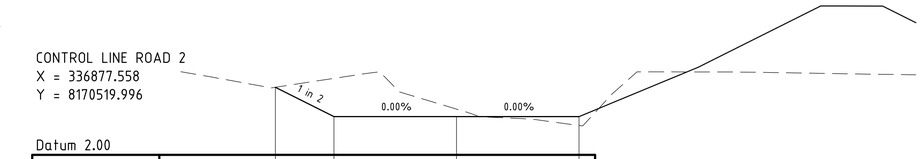


Datum 2.00

DESIGN HEIGHT	4.612	3.704	3.704	3.704
EXISTING SURFACE	4.612	4.269	3.558	4.165
OFFSETS	-5.817	-4.000	0.000	4.000

CHAINAGE 20.000

CONTROL LINE ROAD 2
X = 336877.558
Y = 8170519.996

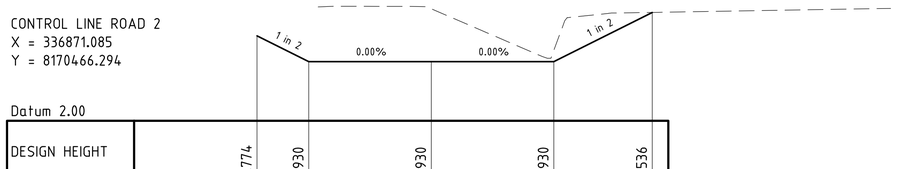


Datum 2.00

DESIGN HEIGHT	4.207	3.251	3.251	3.251
EXISTING SURFACE	4.207	4.498	3.494	2.960
OFFSETS	-5.913	-4.000	0.000	4.000

CHAINAGE 60.000

CONTROL LINE ROAD 2
X = 336871.085
Y = 8170466.294

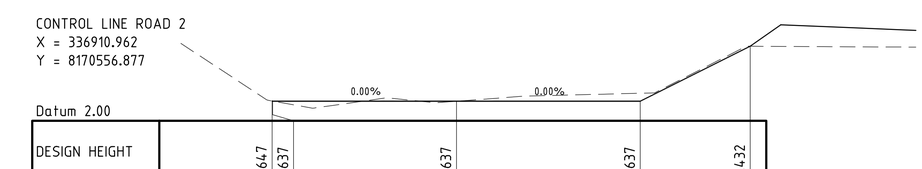


Datum 2.00

DESIGN HEIGHT	4.774	3.930	3.930	3.930	5.536
EXISTING SURFACE			5.654	4.294	5.536
OFFSETS	-5.688	-4.000	0.000	4.000	7.212

CHAINAGE 0.000

CONTROL LINE ROAD 2
X = 336910.962
Y = 8170556.877



Datum 2.00

DESIGN HEIGHT	2.647	2.637	2.637	2.637	4.432
EXISTING SURFACE	2.647	2.643	2.637	2.899	4.432
OFFSETS	-6.020	-6.000	0.000	6.000	9.590

CHAINAGE 114.214

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

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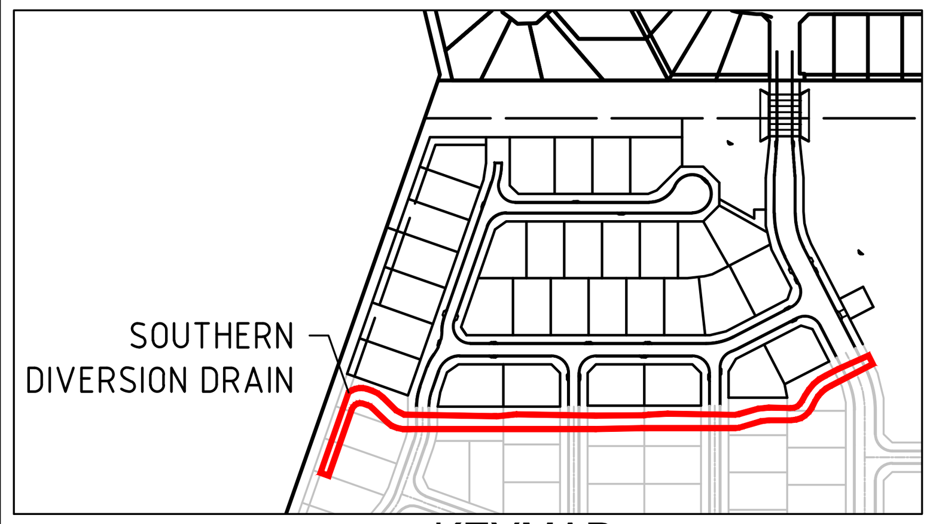
Checked	MS	Date 10.10.2019
Designed	MC	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: DRAIN DESIGN
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

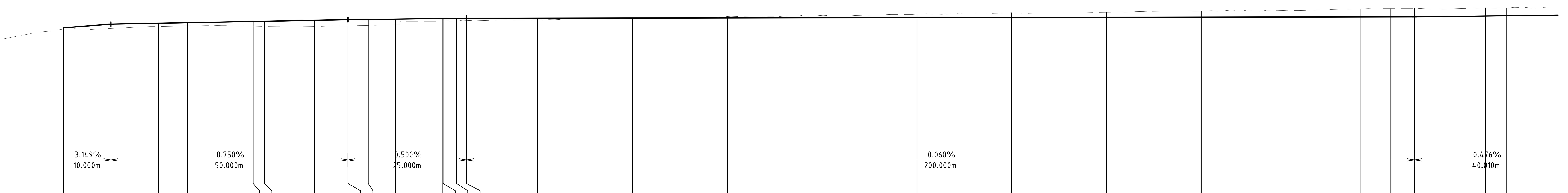
Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1265
Revision: A



KEYMAP
SCALE 1:4000m

SOUTHERN DIVERSION DRAIN
SCALE 1:400m



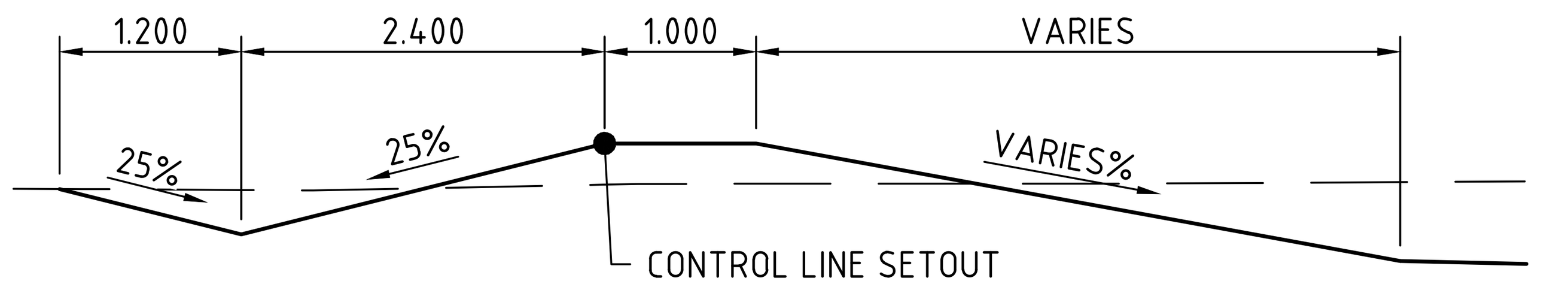
VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%)
VERT. GEOMETRY LENGTH(m)
DATUM RL -10

VERT. GEOMETRY GRADE (%)	VERT. GEOMETRY LENGTH(m)
3.149%	10.000m
0.750%	50.000m
0.500%	25.000m
0.060%	200.000m
0.476%	40.010m

HORZ. CURVE LENGTH (m)	HORZ. CURVE RADIUS (m)
12.565m	R-20.000m
10.487m	R9.500m
5.776m	R-20.000m
2.855m	R10.000m
30.762m	R-25.000m

CONTROL LINE CHAINAGE ROAD CENTRELINE	EXISTING SURFACE LEVELS ROAD CENTRELINE	CUT/FILL DEPTH TO EXISTING SURFACE	DESIGN LEVELS ROAD CENTRELINE
0.000	4.054	0.105	4.159
9.990	4.109	0.365	4.474
20.000	4.277	0.272	4.549
26.117	4.318	0.276	4.595
38.682	4.311	0.378	4.689
40.000	4.299	0.400	4.699
42.432	4.277	0.440	4.717
52.919	4.275	0.521	4.796
59.990	4.335	0.514	4.849
60.000	4.335	0.514	4.849
64.276	4.365	0.505	4.870
70.052	4.393	0.506	4.899
80.000	4.724	0.224	4.949
80.065	4.725	0.224	4.949
82.920	4.768	0.195	4.963
84.990	4.791	0.182	4.974
100.000	4.819	0.164	4.983
120.000	4.939	0.055	4.995
140.000	5.109	-0.103	5.007
160.000	5.216	-0.197	5.019
180.000	5.315	-0.285	5.031
200.000	5.437	-0.394	5.043
220.000	5.475	-0.420	5.055
240.000	5.591	-0.524	5.067
260.000	5.612	-0.534	5.079
273.677	5.774	-0.688	5.087
280.000	5.780	-0.690	5.091
284.990	5.785	-0.691	5.094
300.000	5.844	-0.678	5.165
304.439	5.811	-0.625	5.186
315.261	5.904	-0.666	5.238

SOUTH DIVERSION DRAIN
SCALE: H 1:500
V 1:200



TYPICAL SECTION
SCALE 1:50m

SOUTHERN DIVERSION DRAIN CONTROL LINE TABLE

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	337151.059	8170522.242	4.159	216°39'29.44"			
TC	26.117	337135.467	8170501.291	4.595	216°39'29.44"			
IP 2	32.399	337131.587	8170496.079	4.642		R = -20.000	12.565	35°59'45.89"
CT	38.682	337131.512	8170489.581	4.689	180°39'43.55"			
TC	42.432	337131.469	8170485.831	4.717	180°39'43.55"			
IP 3	47.676	337131.401	8170479.982	4.756		R = 9.500	10.487	63°14'59.15"
CT	52.919	337126.147	8170477.409	4.796	243°54'42.70"			
TC	64.276	337115.948	8170472.415	4.870	243°54'42.70"			
IP 4	67.164	337113.336	8170471.136	4.884		R = -20.000	5.776	16°32'48.58"

SOUTHERN DIVERSION DRAIN CONTROL LINE TABLE

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
CT	70.052	337111.196	8170469.166	4.899	227°21'54.12"			
TC	80.065	337103.830	8170462.384	4.949	227°21'54.12"			
IP 5	81.493	337102.772	8170461.411	4.956		R = 10.000	2.855	16°21'33.24"
CT	82.920	337101.483	8170460.774	4.963	243°43'27.36"			
TC	273.677	336930.437	8170376.328	5.087	243°43'27.36"			
IP 6	289.058	336914.594	8170368.506	5.113		R = -25.000	30.762	70°30'05.58"
CT	304.439	336916.679	8170350.961	5.186	173°13'21.79"			
IP 7	315.261	336917.956	8170340.214	5.238	173°13'21.79"			

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

SCALE 1:50 (0 1 2 3 4 5m @A1)
SCALE 1:400 (0 10 20 30 40m @A1)
H: 0 10 20 30 40 50m
V: 0 4 8 12 16 20m
SCALE: H:1:500 V:1:200 @A1

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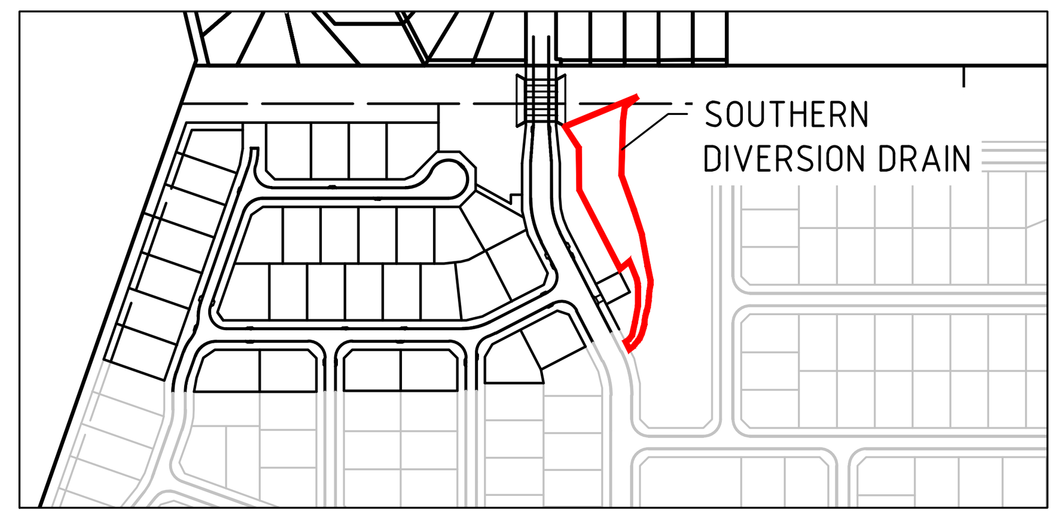
Drawn JJ Date 10.10.2019
Checked MS Date 10.10.2019
Designed MC Date 10.10.2019
Verified MS Date 10.10.2019
Approved RPEQ No. 10801 MB Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: SOUTHERN DIVERSION DRAIN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-1266 | Revision: A

DATE PLOTTED: 11 October 2019 9:59 AM BY : JACK JONES

EASTERN DIVERSION DRAIN
SCALE 1:200m



KEYMAP
SCALE 1:4000m

VERT. CURVE LENGTH (m)
VERT. CURVE RADIUS (m)
VERT. GEOMETRY GRADE (%) / VERT. GEOMETRY LENGTH(m): -3.149% 33.625m; -2.000% 30.502m; -0.100% 51.927m; -4.762% 20.000m
DATUM RL -10

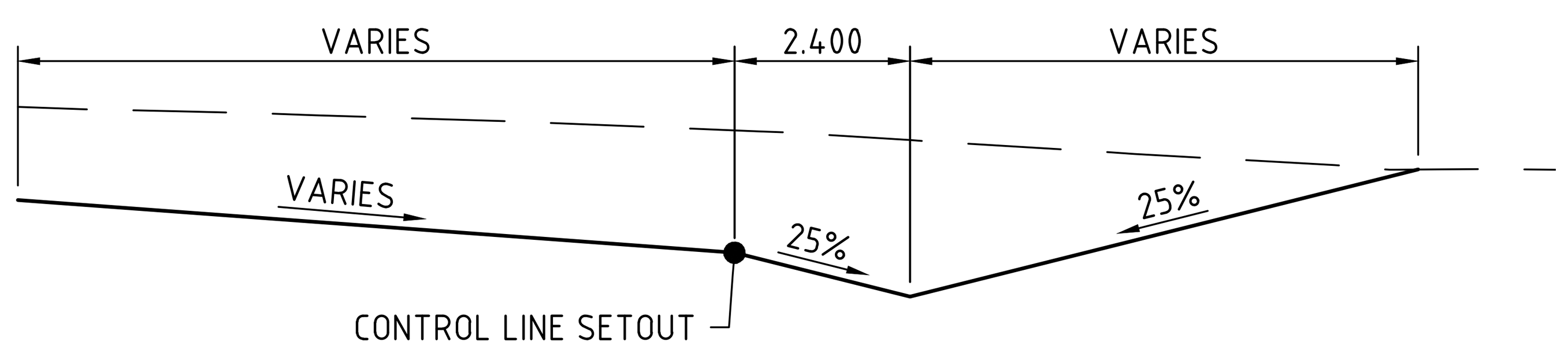
HORZ. CURVE LENGTH (m) / HORZ. CURVE RADIUS (m): 9.145m R-10.000m; 2.838m R-15.000m; 5.665m R-15.000m; 7.312m R15.000m

CONTROL LINE CHAINAGE ROAD CENTRELINE	EXISTING SURFACE LEVELS ROAD CENTRELINE	CUT/FILL DEPTH TO EXISTING SURFACE	DESIGN LEVELS ROAD CENTRELINE
0.000	4.054	0.105	4.159
0.080	4.051	0.105	4.156
9.224	3.828	0.040	3.868
20.000	3.446	0.083	3.529
20.948	3.431	0.069	3.499
23.786	3.468	-0.058	3.410
32.304	3.584	-0.443	3.142
33.625	3.622	-0.522	3.100
37.969	3.797	-0.784	3.013
40.000	3.875	-0.902	2.973
60.000	4.534	-1.961	2.573
60.226	4.540	-1.972	2.568
64.127	4.614	-2.124	2.490
80.000	4.778	-2.304	2.474
89.370	4.650	-2.185	2.465
96.682	4.682	-2.225	2.457
100.000	4.657	-2.203	2.454
116.054	4.528	-2.090	2.438
120.000	4.390	-2.140	2.250
136.051	3.273	-1.490	1.783

EAST DIVERSION DRAIN
SCALE: H 1:400
V 1:400

EASTERN DIVERSION DRAIN CONTROL LINE TABLE

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	337151.059	8170522.242	4.159	36°39'33.38"			
TC	0.080	337151.107	8170522.306	4.156	36°39'33.38"			
IP 2	4.652	337154.045	8170526.253	4.012		R = -10.000	9.145	52°23'41.40"
CT	9.224	337152.710	8170530.989	3.868	344°15'51.98"			
TC	20.948	337149.531	8170542.273	3.499	344°15'51.98"			
IP 3	22.367	337149.145	8170543.643	3.455		R = -15.000	2.838	10°50'27.94"
CT	23.786	337148.508	8170544.916	3.410	333°25'24.04"			
TC	32.304	337144.697	8170552.534	3.142	333°25'24.04"			
IP 4	35.136	337143.415	8170555.097	3.070		R = -15.000	5.665	21°38'15.60"
CT	37.969	337141.278	8170557.007	3.013	311°47'08.44"			
IP 5	60.226	337124.682	8170571.838	2.568				
TC	89.370	337102.551	8170590.802	2.465	310°35'34.44"			
IP 6	93.026	337099.719	8170593.229	2.461		R = 15.000	7.312	27°55'45.99"
CT	96.682	337098.353	8170596.700	2.457	338°31'20.43"			
IP 7	136.051	337083.938	8170633.336	1.783	338°31'20.43"			



TYPICAL SECTION
SCALE 1:100m

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	MC	MS	MB

SCALE 1:100 (0 1 2 4 6 8 10m) @A1
SCALE 1:400 (0 10 20 30 40m) @A1

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Web: www.cardno.com.au

Drawn JJ Date 10.10.2019
Checked MS Date 10.10.2019
Designed MC Date 10.10.2019
Verified MS Date 10.10.2019
Approved MB RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: EASTERN DIVERSION DRAIN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES
Datum: AHD | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-1267 | Revision: A

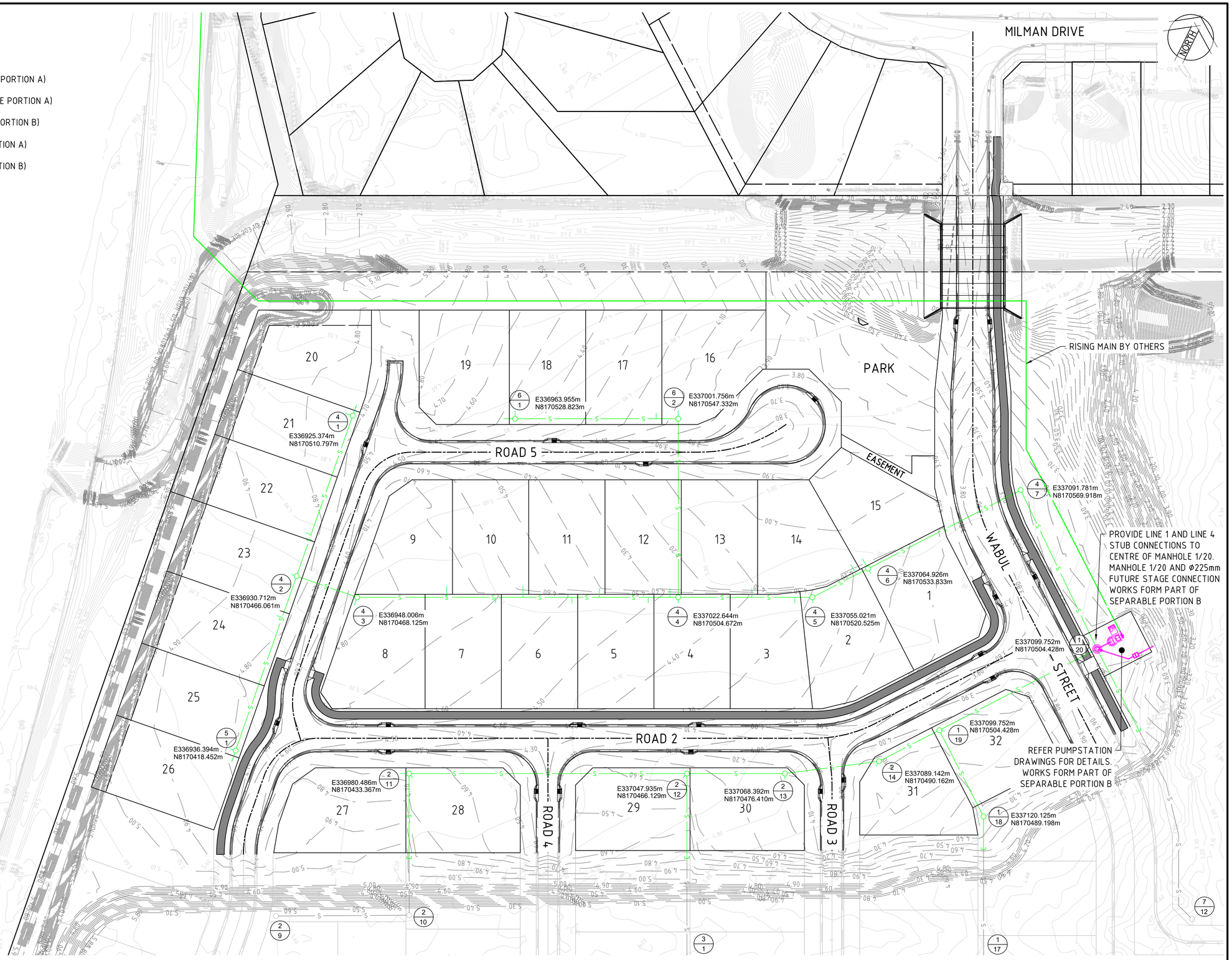
XREF's: XR-Q184103-CI-BASE; XR-Q184103-CI-STH DRAIN CH; XR-Q184103-CI-LS-SOUTH DRAIN1; XR-Q184103-CI-STH DRAIN TABLE; XR-Q184103-CI-EAST DRAIN CH; XR-Q184103-DSGN-CNTRS; XR-Q184103-CI-LS-EAST DRAIN1; XR-Q184103-CI-EAST DRAIN TABLE
CAD File: \\cardno.corp\apac_collab\Regional_QLD\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1266-1267.dwg

DATE PLOTTED: 11 October 2019 2:03 PM BY: - MAURICE SHEEHAN

XREFs: XR-Q184103-CI-BASE, XR-Q184103-SURV, XR-Q184103-DSGN-CNTRS, XR-Q184103-EXST-CNTRS
CAD File: Q:\Projects\North Queensland\Claims Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1300.dwg

LEGEND

- 8/1 — MANHOLE NUMBER/SEWER LINE NUMBER
- NEW SEWER AND MANHOLE - (SEPARABLE PORTION A)
- HOUSE CONNECTIONS (HCB'S) - (SEPARABLE PORTION A)
- NEW SEWER AND ENDCAP - (SEPARABLE PORTION B)
- NEW SEWER MANHOLE - (SEPARABLE PORTION A)
- NEW SEWER MANHOLE - (SEPARABLE PORTION B)
- END CAP SEWER
- 3.50 — FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 10 20 30 40 50m
SCALE 1:500 @A1

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Checked	MS	10.10.2019
Designed	JJ	10.10.2019
Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

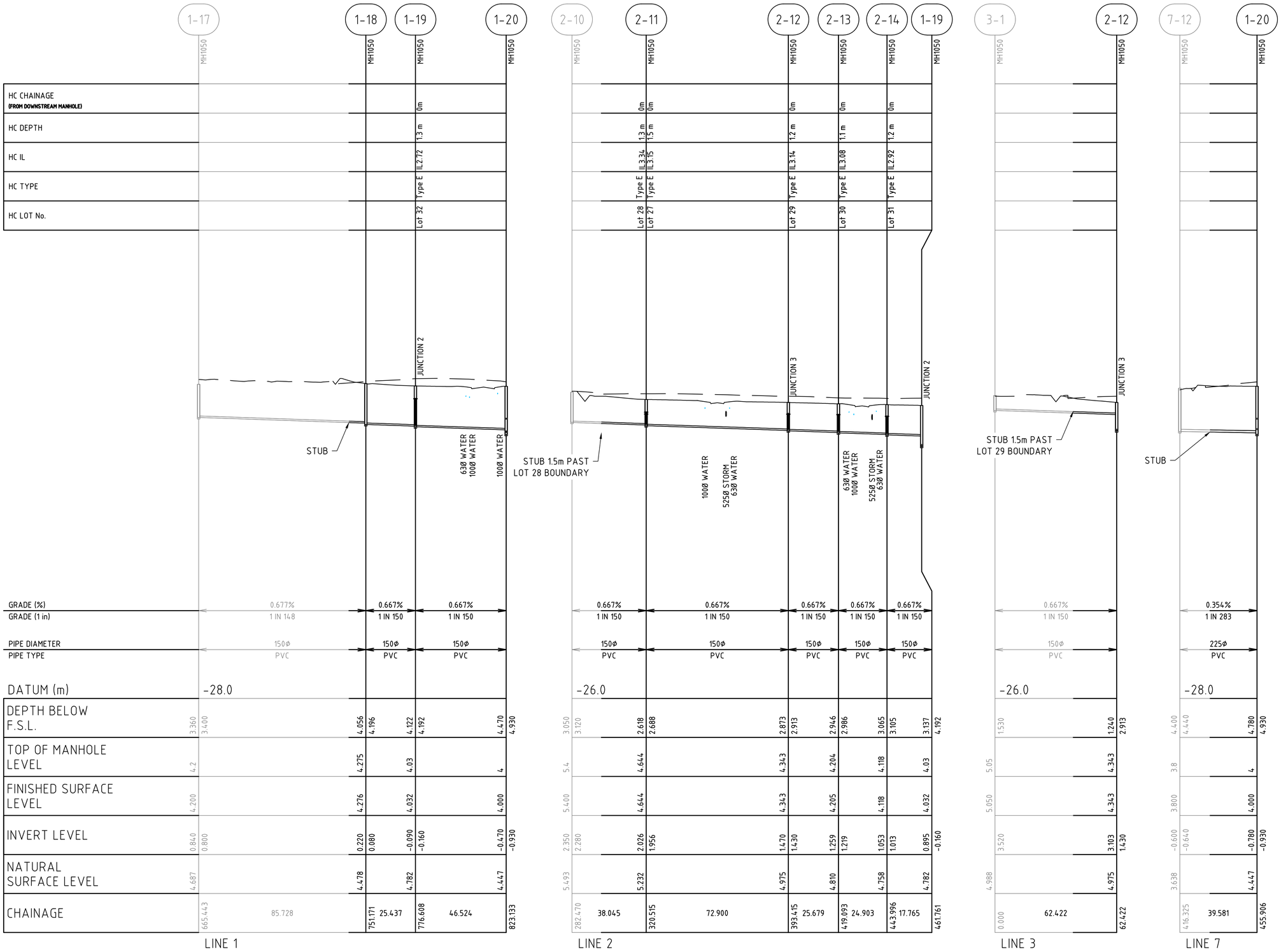
Title: SEWER LAYOUT PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1300

Revision: A



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

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SCALE 1:100 @A1

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Checked	MS	Date 10.10.2019
Designed	JJ	Date 10.10.2019
Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: SEWER LONGITUDINAL SECTIONS
SHEET 1 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

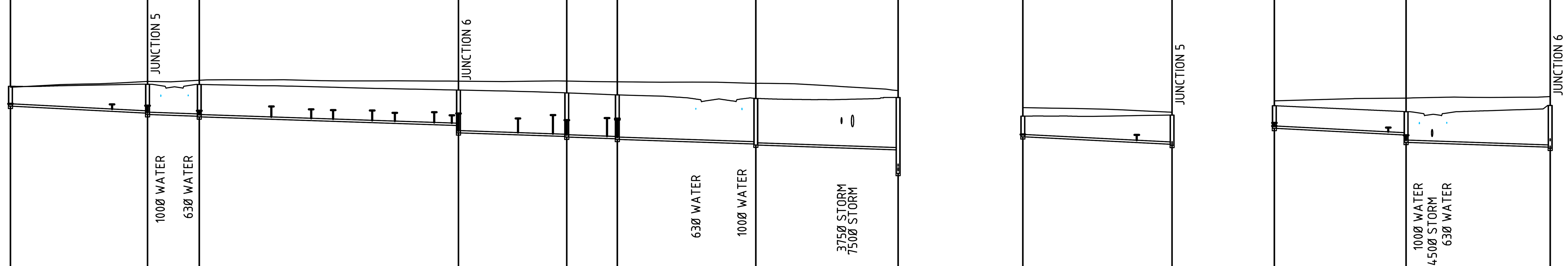
Drawing Number: Q184103-CI-1301
Revision: A

DATE PLOTTED: 11 October 2019 2:56 PM BY : MAURICE SHEEHAN

LINE 4

Manholes: 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 1-20 (all MH1050)

HC CHAINAGE (FROM DOWNSTREAM MANHOLE)	HC DEPTH	HC IL	HC TYPE	HC LOT No.
44.5m	1.1 m	IL3.58	Type A1	Lot 20
44.5m	1.1 m	IL3.58	Type A2	Lot 21
11.5m	1.3 m	IL3.55	Type A	Lot 22
0m	1.4 m	IL3.47	Type A1	Lot 23
0m	1.7 m	IL3.14	Type E	Lot 8
60.8m	1.3 m	IL3.42	Type E2	Lot 9
47.9m	1.5 m	IL3.23	Type E1	Lot 7
40.7m	1.5 m	IL3.18	Type E2	Lot 10
28m	1.4 m	IL3.15	Type E1	Lot 6
20.7m	1.6 m	IL3.00	Type E2	Lot 11
7.9m	1.5 m	IL3.05	Type E1	Lot 5
3.2m	1.6 m	IL2.94	Type E2	Lot 12
[illegible]	1.5 m	IL2.96	Type E	Lot 4
15.9m	1.8 m	IL2.64	Type E2	Lot 13
4.5m	1.5 m	IL2.85	Type E1	Lot 3
0m	1.8 m	IL2.53	Type E	Lot 2
3.4m	1.5 m	IL2.66	Type E2	Lot 14
0m	1.6 m	IL2.68	Type E2	Lot 15



Segment	4-1 to 4-2	4-2 to 4-3	4-3 to 4-4	4-4 to 4-5	4-5 to 4-6	4-6 to 4-7	4-7 to 1-20
GRADE (%)	1%	0.667%	0.667%	0.667%	0.667%	0.667%	0.667%
GRADE (1 in)	1 IN 100	1 IN 150	1 IN 150	1 IN 150	1 IN 150	1 IN 150	1 IN 150
PIPE DIAMETER	150ϕ	150ϕ	150ϕ	150ϕ	150ϕ	150ϕ	150ϕ
PIPE TYPE	PVC	PVC	PVC	PVC	PVC	PVC	PVC
Length	44.527	16.800	84.214	35.179	16.420	44.982	46.217

DATUM (m) -27.0

	4-1	4-2	4-3	4-4	4-5	4-6	4-7	1-20
DEPTH BELOW F.S.L.	1.298	1.873 / 1.968	2.071 / 2.111	2.303 / 2.781	2.828 / 2.868	2.852 / 2.892	2.959 / 3.029	3.402 / 4.930
TOP OF MANHOLE LEVEL	4.728	4.857	4.848	4.48	4.293	4.167	3.935	4
FINISHED SURFACE LEVEL	4.728	4.858	4.849	4.480	4.293	4.167	3.935	4.000
INVERT LEVEL	3.430	2.985 / 2.890	2.778 / 2.738	2.177 / 1.699	1.465 / 1.425	1.316 / 1.276	0.976 / 0.906	0.598 / -0.930
NATURAL SURFACE LEVEL	4.664	5.040	5.116	5.058	5.069	5.015	4.916	4.447
CHAINAGE	0.000	44.527	61.327	145.541	180.720	197.140	242.122	288.339

LINE 4

LINE 5

Manholes: 5-1, 4-2 (MH1050)

HC CHAINAGE	HC DEPTH	HC IL	HC TYPE	HC LOT No.
48.5m	1.2 m	IL3.60	Type A1 / A2	Lot 25 / 26
11.5m	1.3 m	IL3.57	Type A	Lot 24

Segment	5-1 to 4-2
GRADE (%)	1%
GRADE (1 in)	1 IN 100.00
PIPE DIAMETER	150ϕ
PIPE TYPE	PVC
Length	48.473

DATUM (m) -25.0

	5-1	4-2
DEPTH BELOW F.S.L.	1.342	1.898 / 1.968
TOP OF MANHOLE LEVEL	4.786	4.857
FINISHED SURFACE LEVEL	4.787	4.858
INVERT LEVEL	3.445	2.960 / 2.890
NATURAL SURFACE LEVEL	5.341	5.040
CHAINAGE	0.000	48.473

LINE 5

LINE 6

Manholes: 6-1, 6-2, 4-4 (MH1050)

HC CHAINAGE	HC DEPTH	HC IL	HC TYPE	HC LOT No.
42.8m	1.3 m	IL3.35 / 3.34	Type A1 / A2	Lot 18 / 19
5.8m	1.1 m	IL3.05	Type A	Lot 17
0m	1.5 m	IL2.55	Type E	Lot 16

Segment	6-1 to 6-2	6-2 to 4-4
GRADE (%)	1%	0.667%
GRADE (1 in)	1 IN 100	1 IN 150
PIPE DIAMETER	150ϕ	150ϕ
PIPE TYPE	PVC	PVC
Length	42.789	46.800

DATUM (m) -26.0

	6-1	6-2	4-4
DEPTH BELOW F.S.L.	1.472	1.515 / 1.997	2.711 / 2.781
TOP OF MANHOLE LEVEL	4.463	4.078	4.48
FINISHED SURFACE LEVEL	4.464	4.079	4.480
INVERT LEVEL	2.992	2.564 / 2.082	1.770 / 1.699
NATURAL SURFACE LEVEL	4.776	4.957	5.058
CHAINAGE	0.000	42.789	89.589

LINE 6

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

SCALE 1:100 (0 1 2 4 6 8 10m) @A1

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Checked MS Date 10.10.2019
Designed JJ Date 10.10.2019
Verified MS Date 10.10.2019
Approved MB RPEQ No. 10801 Date 10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: SEWER LONGITUDINAL SECTIONS
SHEET 2 OF 2

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum: AHD | Scale: AS SHOWN | Size: A1

Drawing Number: Q184103-CI-1302 | Revision: A

XREF's:
CAD File: Q:\Projects\North Queensland\Cairns Based Projects\Q184103 - Port Douglas Estate Subdivision\005 - Civil Engineering\Design_CAD & Models_Acad\Q184103-CI-1301-1302.dwg

NOTES

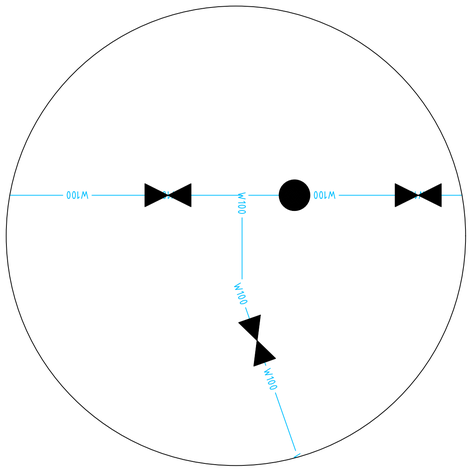
1. WHERE POSSIBLE, HYDRANTS ARE TO BE LOCATED IN LINE WITH ALLOTMENT BOUNDARIES
2. EXISTING HYDRANTS OR VALVES SHALL BE PROVIDED WITH NEW COVER BOXES AND SURROUNDS AS PER FNQROC STD. DWGS. S2000 AND S2005.
3. WHERE VALVE SURROUNDS ARE TO BE SET IN CONCRETE, A COMPRESSIBLE LAYER IS TO BE PROVIDED TO ALLOW FOR MAINTENANCE
4. LOWER WATER MAIN UNDER ROAD TO AVOID SUBGRADE IMPROVEMENT IF APPLICABLE
5. REFER FNQROC STANDARD DRAWING S2016 FOR TRENCH WIDTH & BEDDING DETAILS.

NOTES

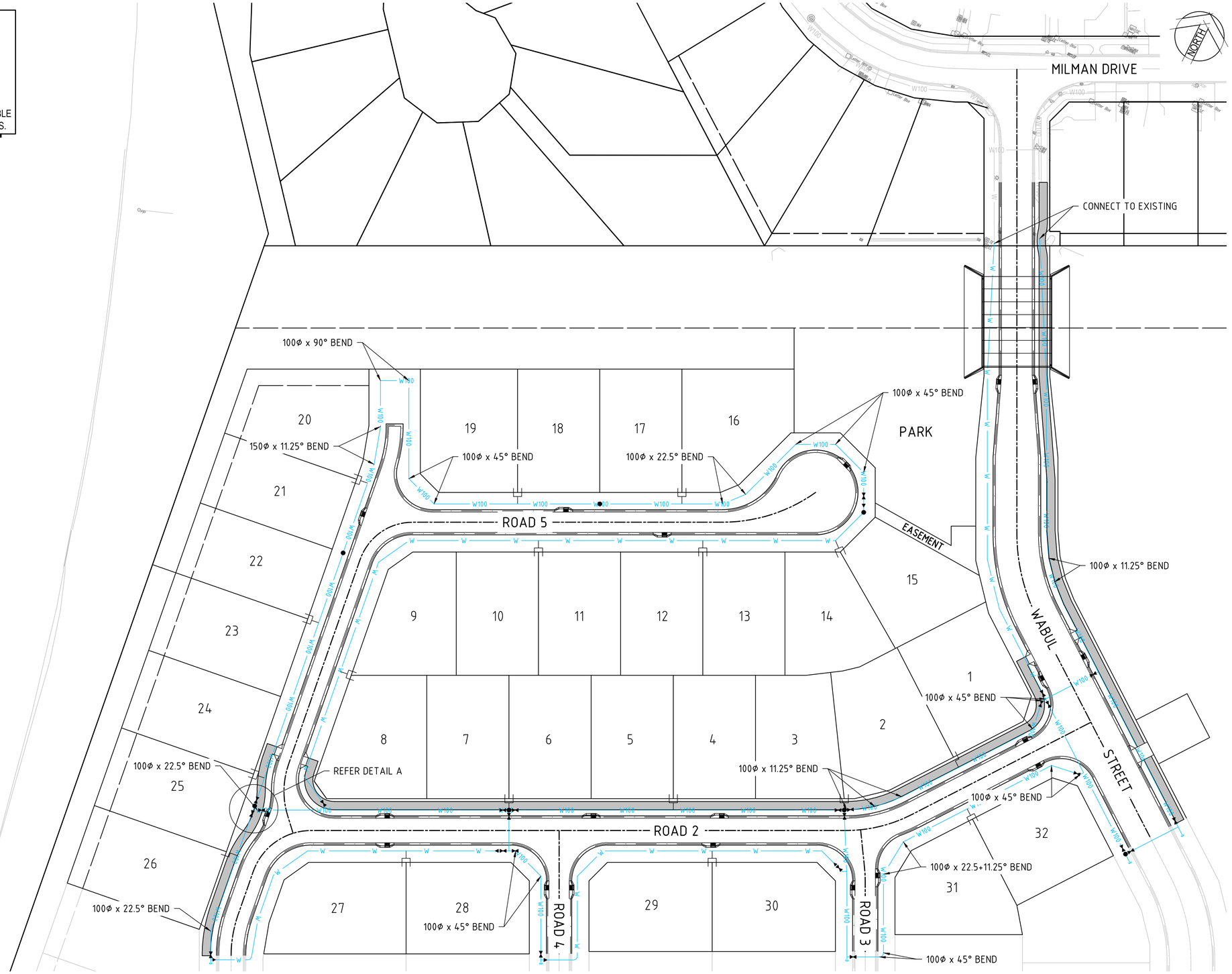
1. LOCATION OF EXISTING WATER MAIN TO BE LOCATED USING GROUND PENETRATING RADAR PRIOR TO EXCAVATION. ALIGNMENT SHOWN PLOTTED FROM COUNCIL RECORD.

LEGEND

- W — 63Ø WATERMAIN (MDPE RN16)
- W100 — 100Ø WATERMAIN (PVC-U PN16)
- FIRE HYDRANT
- VALVE
- REDUCER
- END CAP
- HOUSE CONNECTION (REFER FNNQROC STD DWG 2038)



DETAIL A
SCALE 1:30m 1350



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 10 20 30 40 50m
SCALE 1:500 @A1

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Verified	MS	10.10.2019
Approved	RPEQ No. 10801	
	MB	10.10.2019

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: WATER LAYOUT PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1350
Revision: A

DUST CONTROL

1. TOPSOIL STOCKPILES ARE TO BE WATERED AND LIGHTLY COMPACTED TO ENSURE MINIMAL DUST DISTURBANCE PRIOR TO RESPREADING.
2. SITE TO BE KEEP MOIST AT ALL TIMES TO ENSURE DUST CONTROL.
3. UNCOMPLETED WORKS ARE TO BE WATERED AND ROLLED AT THE END OF EACH WORKING DAY TO ENSURE A FIRM SEALED SURFACE TO CONTROL DUST.
4. HYDROSEEDING IS REQUIRED TO BE MAINTAINED THROUGH THE REMAINDER OF THE CONSTRUCTION PERIOD TO ENSURE DUST AND EROSION CONTROL.
5. ALL OPEN DRAINS TO BE FULLY TURFED IMMEDIATELY UPON COMPLETION.

SEDIMENT CONTROL

1. CONTROL WILL BE VIA THE INSTALLATION OF SILT FENCING, CATCH DRAINS, HAYBALE BARRIERS AND SEDIMENT PONDS.
2. TOPSOIL STOCK-PILES ARE TO BE LOCATED IN AREAS CLEAR OF SERVICING, WATERCOURSES, ROAD AND DRAINAGE WORKS AND PROVIDED WITH SILT FENCING ON THEIR DOWNSTREAM SIDE.
3. DURING THE PROJECTS CONSTRUCTION, ALL PITS ARE TO BE BLOCKED OFF AT THE SURFACE AND RUNOFF FLOWS ARE TO BE DIRECTED TO THE SEDIMENT PONDS WHERE CONTAMINATED WATERS CAN BE TREATED UNTIL THE SURROUNDING LANDSCAPE HAS BEEN STABLISIED TO THE SATISFACTION OF THE SITE SUPERINTENDENT. ONLY ON THE COMPLETION OF WORKS ARE THE SEDIMENT PONDS ARE TO BE REMOVED,
4. REFER TO IPWEAQ STD DWG No. D-0040 AND D-0041 FOR FURTHER DETAILS.
5. ALL BATTERS TO BE STABILISED WITHIN 10 DAYS OF COMPLETION OF BULK EARTHWORKS (eg. HYDROMULCHING, TURFING etc.).
6. SURROUNDING CARRIAGEWAYS TO BE KEPT CLEAN OF ANY MATERIAL CARRIED ONTO ROADWAY BY CONSTRUCTION VEHCILES FROM SITE.

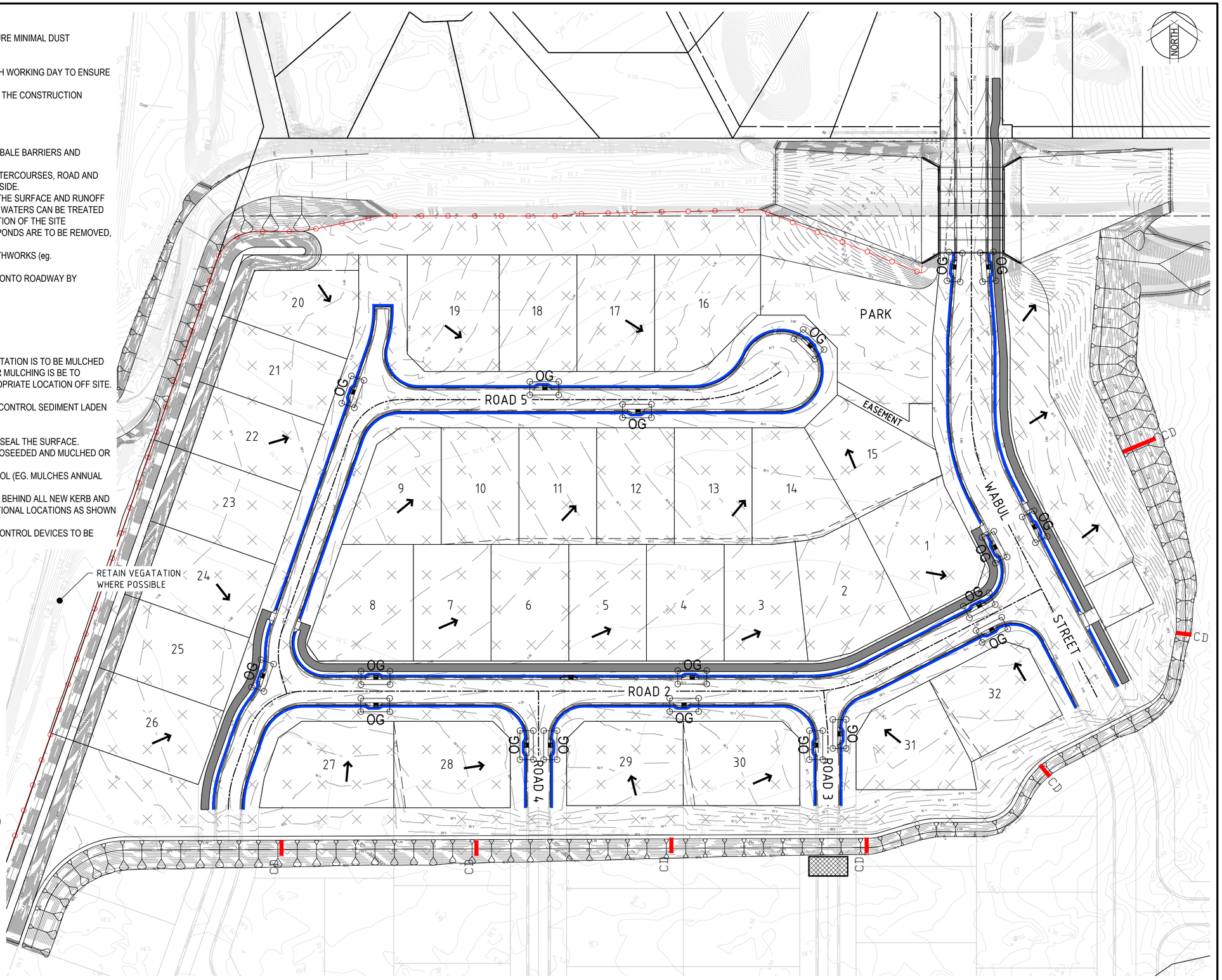
PHASING OF WORKS

1. INSTALL TRUCK SHAKER RAMP AND WASHDOWN AT ENTRY TO NEW WORK AREA.
2. INSTALL ALL BARRIER AND SILT FENCING.
3. INSTALL ALL CATCH DRAINS AND DIVERSION BANKS.
4. CARRY OUT CLEANING FROM ALL DRIVE AND SITE REGRADING AREAS. ALL VEGETATION IS TO BE MULCHED AND STOCKPILED FOR LATER USE. ONLY RUBBISH AND TIMBER UNSUITABLE FOR MULCHING IS BE TO STOCKPILED FOR LATER USE. ONLY MULCHING IS BE DISPOSED OF TO AN APPROPRIATE LOCATION OFF SITE.
5. STRIP SITE AND STOCKPILE TOPSOIL.
6. FORM SEDIMENT BASINS AND EXCAVATE DIVERSION DRAINS TO THE BASINS TO CONTROL SEDIMENT LADEN FLOWS IF REQURED.
7. UNDERTAKE SITE WORKS, COMPACT AND REVEGETATE DISTURBED AREAS.
8. UNCOMPLETED EARTHWORKS ARE TO BE ROLLED AT THE END OF EACH DAY TO SEAL THE SURFACE.
9. AS EARTHWORKS ARE COMPLETED THOSE AREAS ARE TO BE TOPSOILED, HYDROSEEDED AND MUCLHED OR PAVED IMMEDIATELY ON COMPLETION OF WORKS IN THAT AREA.
10. IN AREAS WHERE WORKS BY WET SEASON RAINS, TEMPORARY EROSION CONTROL (EG. MULCHES ANNUAL ETC.) ARE TO BE INSTALLED.
11. ON COMPLETION OF REGRADING STRIPS OF TURF 0.8m WIDE ARE TO BE PLACED BEHIND ALL NEW KERB AND GUTTER IN EACH ROAD, TOP AND BOTTOM OF ALL BATTER SLOPES AND IN ADDITIONAL LOCATIONS AS SHOWN ON THE PLAN OR AS DIRECTED BY THE SITE SUPERVISOR.
12. ONLY AT THE COMPLETION AND STABLISATION OF AREAS UPSTREAM ARE ANY CONTROL DEVICES TO BE REMOVED.

NOTE:
REFER IPWEAQ STANDARD DRAWINGS D-0040 AND D-0041 FOR TYPICAL DETAILS

LEGEND

- 3.50 — NATURAL SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- 3.50 — FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- TOP OF BATTER
- OG — SEDIMENT TRAP
- 0.6m WIDE TURF STRIPS
- PROPOSED AREA OF CLEAR AND STRIP
- CD — ROCK CHECK DAM (EVERY 50m OF DIVERSION DRAINS)
- LOT FLOW PATH
- SEDIMENT FENCE
- ENTRY / EXIT PAD



Rev.	Date	Description	Des.	Verif.	Appd.
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SCALE 1:500 @A1

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Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
Title: EROSION AND SEDIMENT CONTROL STRATEGY

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

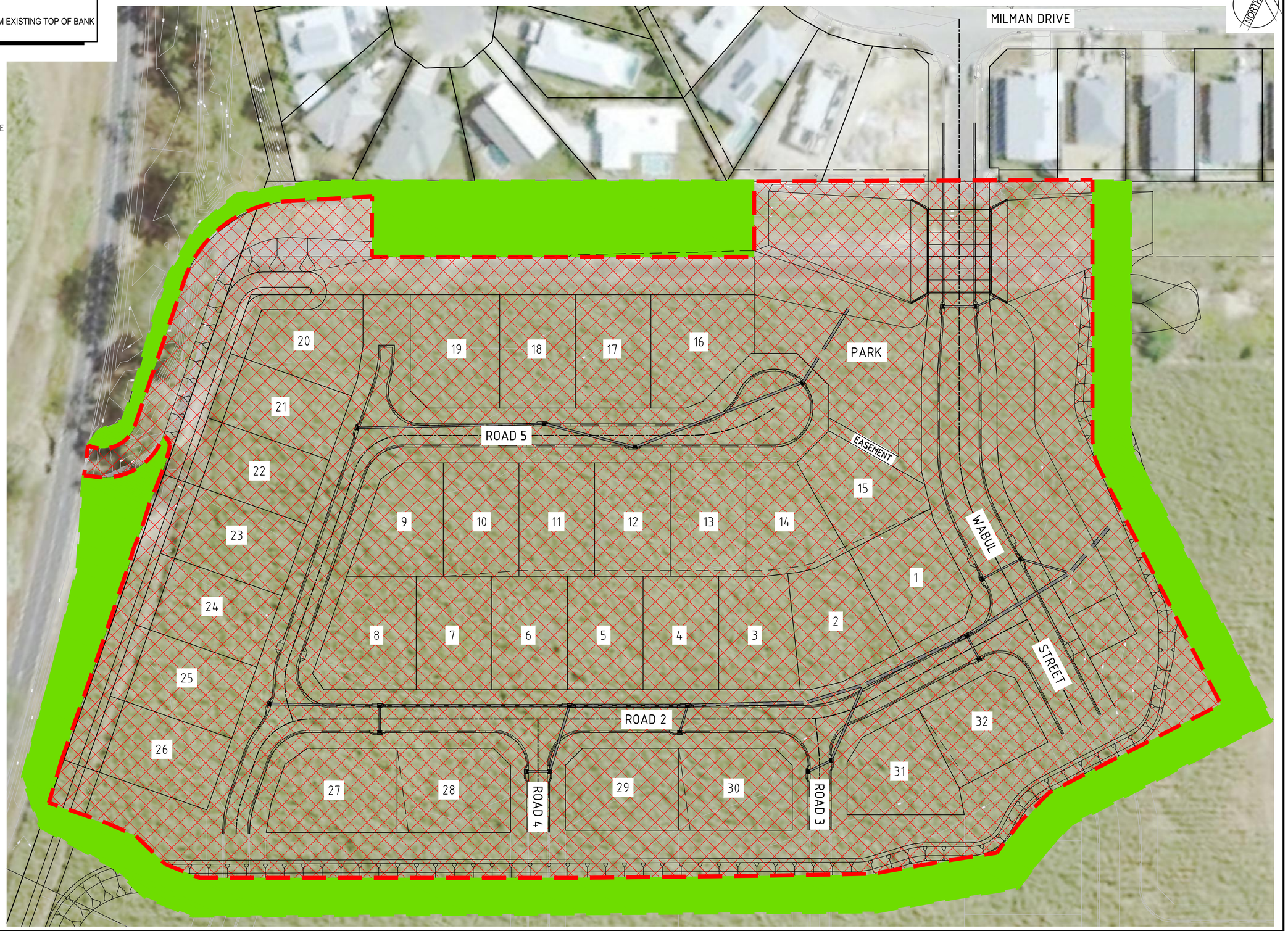
Drawing Number: Q184103-CI-1400
Revision: A

NOTES

1. INTERFACE WITH EXISTING SURFACE 1m BACK FROM EXISTING TOP OF BANK

LEGEND:

- 3.50 — EXISTING CONTOURS
- TOP OF BATTER
- AREAS OF VEGETATION TO BE CLEARED
- AREA OF VEGETATION TO BE RETAINED WHERE POSSIBLE



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0 10 20 30 40 50m

SCALE 1:500 @A1

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Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

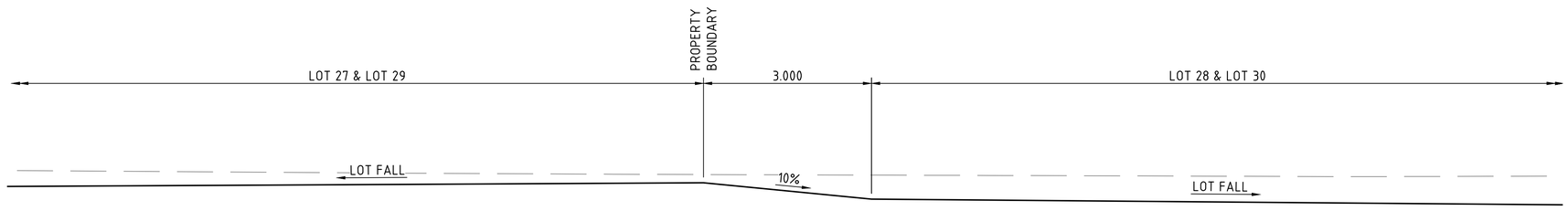
Title: VEGETATION MANAGEMENT PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

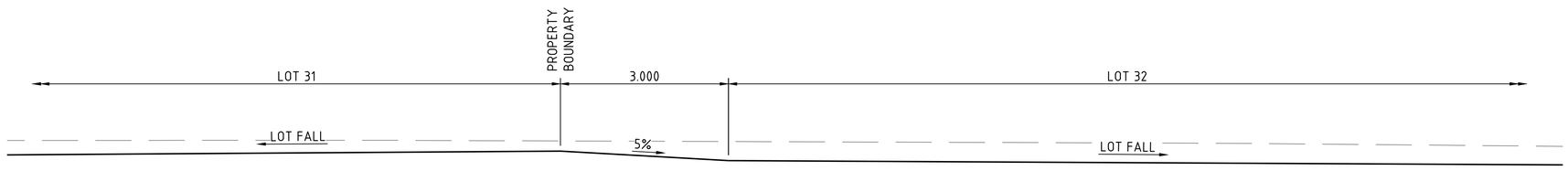
Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1401

Revision: A



SECTION A
SCALE 1:50m 1100



SECTION B
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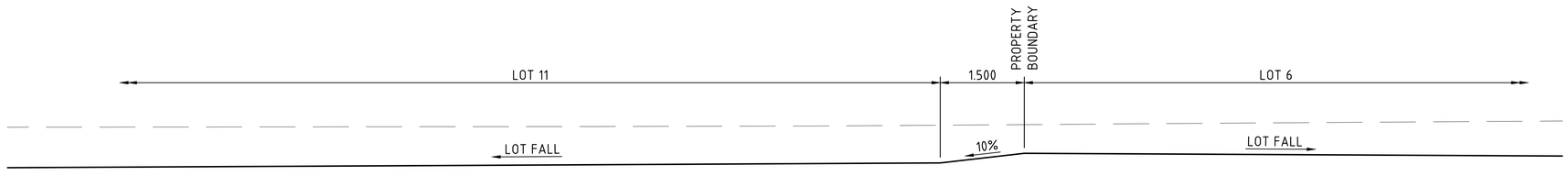

SECTION C
SCALE 1:50m 1100

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 1 2 3 4 5m
SCALE 1:50 @A1

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	MB	10.10.2019

Client PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title MISCELLANEOUS DETAILS PLAN

Status FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number Q184103-CI-1402

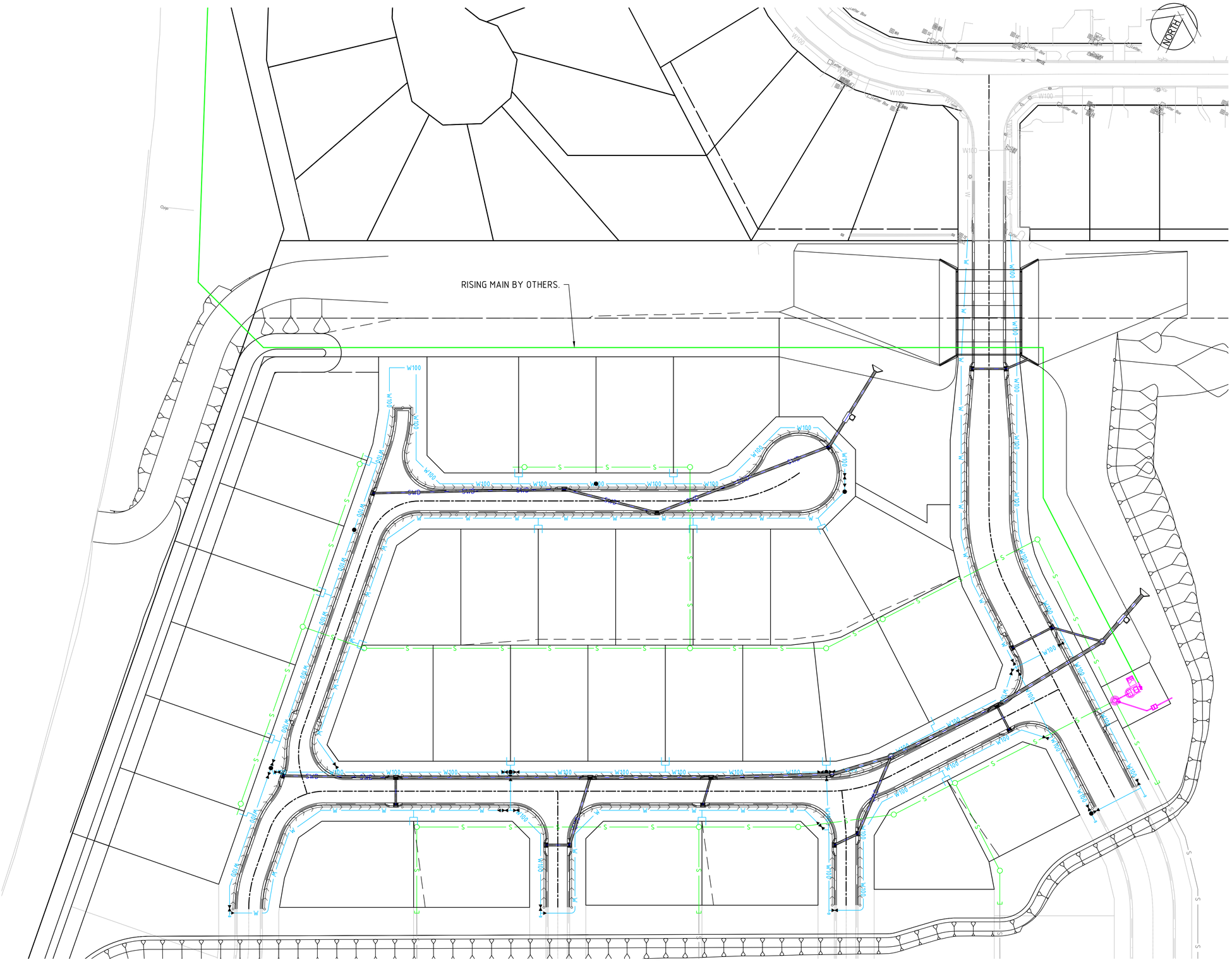
Revision A

NOTE

*** - CONTRACTOR TO LIASE WITH SPA AND ELECTRICAL CONTRACTOR TO ENSURE ADEQUATE CLEARANCE BETWEEN SERVICES

LEGEND

- 3.50 — FINISHED SURFACE CONTOUR (0.1m CONTOUR INTERVAL)
- TOP OF BATTER
- LAYBACK KERB & CHANNEL (REFER FNQROC STD. DWG S1000F)
- KERB RAMP (REFER FNQROC STD. DWG S1016C)
- KERB INLET PITS (REFER FNQROC STD. DWG S1050B & 1055D)
- S — NEW SEWER AND MANHOLE
- S — HOUSE CONNECTIONS (HCB'S)
- NEW SEWER MANHOLE
- END CAP SEWER
- W — 63Ø WATERMAIN
- W100 — 100Ø WATERMAIN
- FIRE HYDRANT
- VALVE
- END CAP WATER
- WATER SERVICE



Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

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SCALE 1:500 @A1

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Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

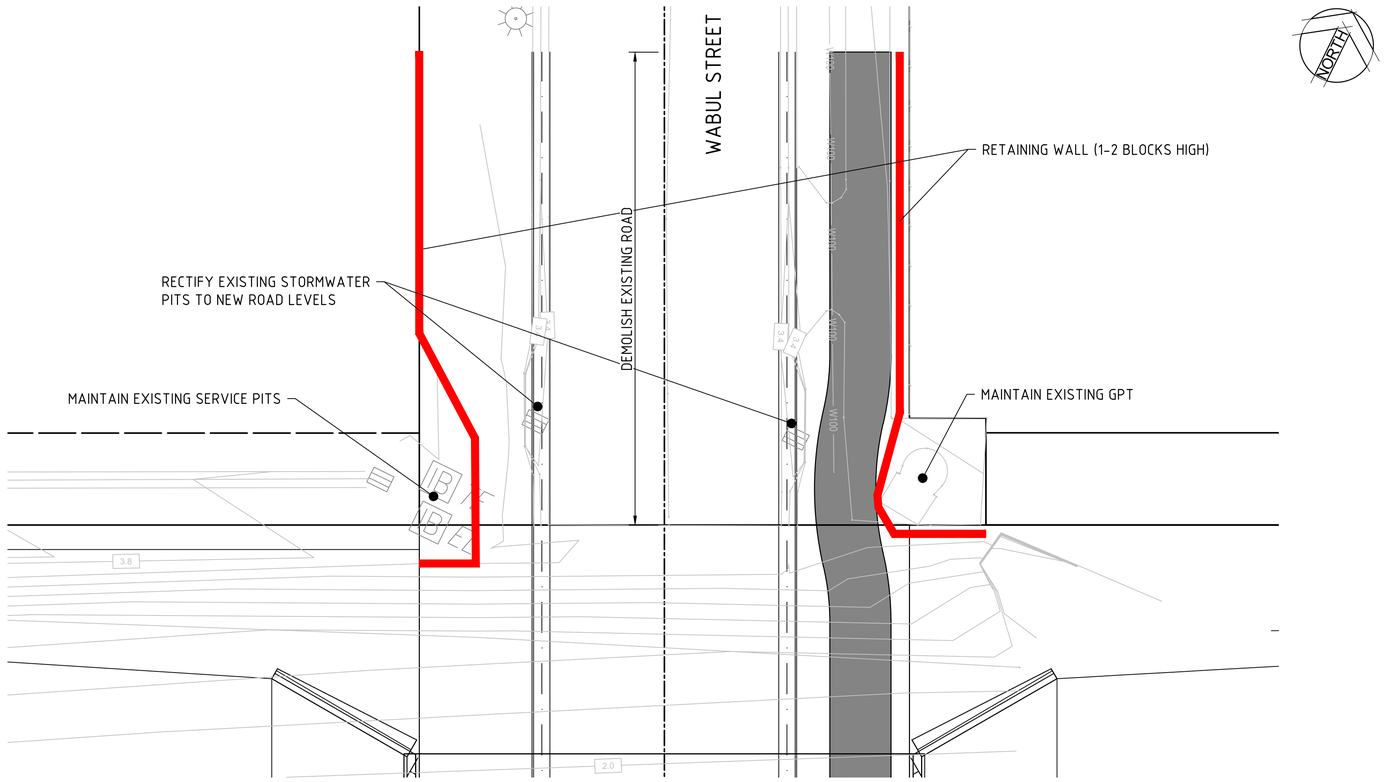
Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

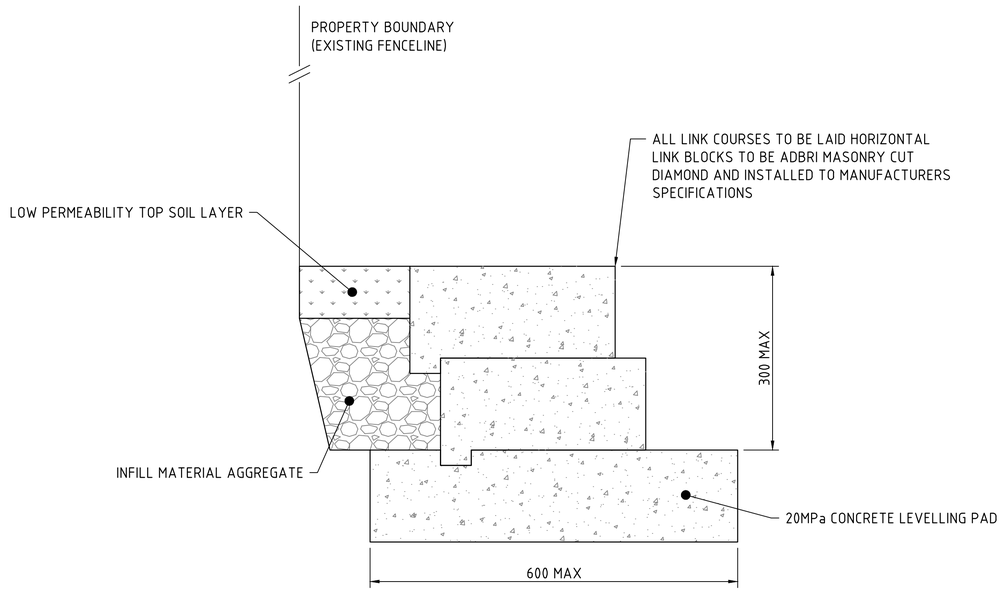
Title: COMBINED SERVICES PLAN

Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum	Scale	Size
AHD	AS SHOWN	A1

Drawing Number: Q184103-CI-1403
Revision: A





TYPICAL RETAINING WALL DETAIL

Rev.	Date	Description	Des.	Verif.	Appd.
A	10.10.2019	FOR OPERATIONAL WORKS APPROVAL	JJ	MS	MB

0 1 2 4 6 8 10m
SCALE 1:100 @A1

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Verified	MS	Date 10.10.2019
Approved	RPEQ No. 10801	Date 10.10.2019
	MB	

Client: PORT DOUGLAS LAND DEVELOPMENTS PTY LTD

Project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

Title: RETAINING WALL DETAILS PLAN

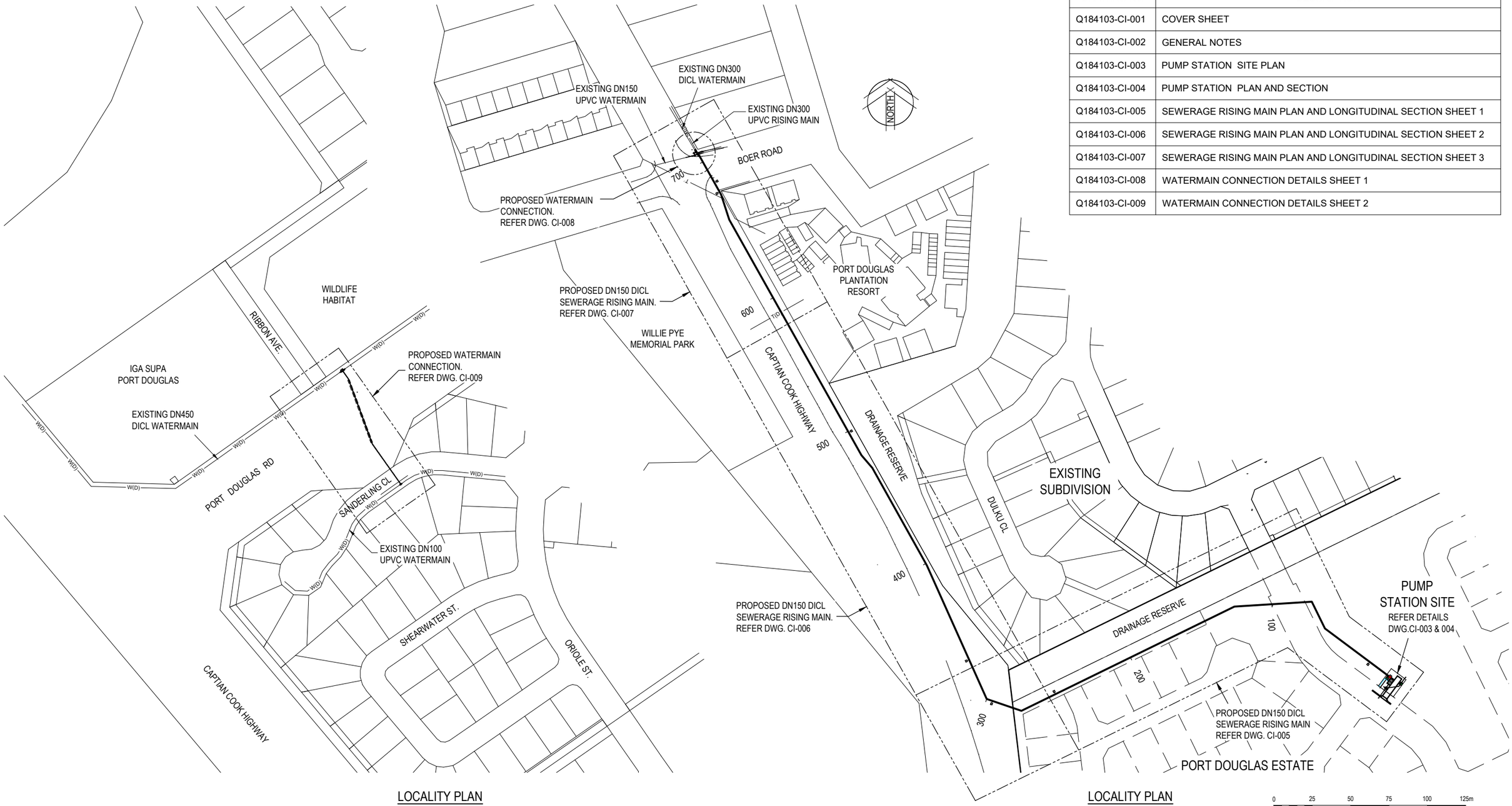
Status: FOR APPROVAL
NOT TO BE USED FOR CONSTRUCTION PURPOSES

Datum		Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-1404
Revision: A

PORT DOUGLAS ESTATE CRAIGLIE
WATER AND SEWERAGE SERVICES

SCHEDULE OF DRAWINGS	
DRAWING No.	DESCRIPTION
Q184103-CI-001	COVER SHEET
Q184103-CI-002	GENERAL NOTES
Q184103-CI-003	PUMP STATION SITE PLAN
Q184103-CI-004	PUMP STATION PLAN AND SECTION
Q184103-CI-005	SEWERAGE RISING MAIN PLAN AND LONGITUDINAL SECTION SHEET 1
Q184103-CI-006	SEWERAGE RISING MAIN PLAN AND LONGITUDINAL SECTION SHEET 2
Q184103-CI-007	SEWERAGE RISING MAIN PLAN AND LONGITUDINAL SECTION SHEET 3
Q184103-CI-008	WATERMAIN CONNECTION DETAILS SHEET 1
Q184103-CI-009	WATERMAIN CONNECTION DETAILS SHEET 2



LOCALITY PLAN
SCALE 1:1250

LOCALITY PLAN
SCALE 1:1250

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SCALE 1:1250 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
3	30/09/2019	PRELIMINARY ISSUE	D.G.	G.P	
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Verified		Date
Approved		

Client: PORT DOUGLAS SHIRE COUNCIL

Project: PORT DOUGLAS ESTATE CRAIGLIE
WATER AND SEWERAGE SERVICES

Title: COVER SHEET

Status: PRELIMINARY
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DATUM	MGA	Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-001
Revision: 3

GENERAL NOTES

G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE LATEST REVISION OF THE FOLLOWING.
- A) PROJECT SPECIFIC SCOPE OF WORKS DOCUMENT, REFER TO PROJECT SPECIFIC DRAWING FOR DOCUMENT NUMBER.
- B) FNQROC DEVELOPMENT MANUAL DESIGN MANUAL D7 SEWERAGE SYSTEM 03/17
- C) FNQROC DEVELOPMENT MANUAL SPECIFICATION S5 WATER RETICULATION 03/17 AND S6 SEWERAGE RETICULATION 03/17
- D) DOUGLAS SHIRE COUNCIL #4235832 LOCAL AUTHORITY SPECIFIC REQUIREMENTS DESIGN GUIDELINE D7, D25 TELEMETRY SYSTEMS AND SPECIFICATION S6 SEWERAGE RETICULATION S6.23 PUMP STATIONS
- E) WATER SERVICES ASSOCIATION OF AUSTRALIA(WSAA), SEWAGE PUMPING STATION CODE OF AUSTRALIA (WSA04-2005 V2.1)
- F) WSAA WATER SUPPLY CODE OF AUSTRALIA (WSA03-2011 V3.1 , WSA02-2002 V2.3 & WSA04-20052.1)
- G) DEPARTMENT OF TRANSPORT AND MAIN ROADS TECHNICAL NOTE 163 THIRD PARTY UTILITY INFRASTRUCTURE INSTALLATION IN STATE CONTROLLED ROADS TECHNICAL GUIDELINES.
- H) OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE SUPERINTENDENT PRIOR TO UNDERTAKING THE WORK.

G2. UNLESS NOTED OTHERWISE:
- A) ALL DIMENSIONS ARE IN MILLIMETRES.
- B) ALL CHAINAGES ARE SHOWN IN METRES.
- C) ALL CO-ORDINATES ARE BASED ON GDA 94 ZONE 56.
- D) ALL LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
- E) OFFSET DIMENSIONS ARE TO THE PIPE CENTRE LINE UNO.

G3. ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE CONTRACTOR ON SITE. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS.

G4. THE CONTRACTOR SHALL SATISFY THEM SELVES AS TO THE PREVAILING GROUND CONDITIONS. THE CONTRACTOR SHALL ARRANGE FOR ANY ADDITIONAL INVESTIGATIONS IF DEEMED NECESSARY AT HIS OWN COST.

G5. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE DOCUMENTS NOTED IN NOTE G1 AND RELEVANT AND CURRENT AUSTRALIAN STANDARDS.

G6. ALL EXISTING FEATURES (EG. ROADS, FENCES, DRIVEWAYS, GARDENS, PATH ETC) SHALL BE PROTECTED. IF DISTURBED, CONTRACTOR SHALL REINSTATED WORK TO THE SATISFACTION OF THE SUPERINTENDENT. INFRASTRUCTURE SHALL BE REINSTALLED IN ACCORDANCE LATEST STANDARD. DISTURBED SURFACES SHALL BE REINSTATED TO A CONDITION EQUAL TO OR BETTER THAN PRIOR TO THE WORKS.

G7. ALL TREES ADJACENT TO THE WORKS MUST BE PROTECTED FROM DAMAGE BY MACHINERY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLAIMS FOR LOSS AND DAMAGE RESULTING FROM THE UNAPPROVED REMOVAL OR DAMAGE TO TREES AND FLORA.

G8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION AND DEPTH OF EXISTING SERVICES WITH RELEVANT REGULATORY AUTHORITIES / DIAL BEFORE YOU DIG PRIOR TO COMMENCING WORKS.

G9. THE CONTRACTOR SHALL NOTE THE PRESENCE OF EXISTING SERVICES ASSOCIATED WITH THE WORKS. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR IN THE VICINITY OF ALL SERVICES. DAMAGED SERVICES SHALL BE REPAIRED BY THE SERVICE PROVIDER AT THE EXPENSE OF THE CONTRACTOR.

G10. ALL CONSTRUCTION WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST REVISION OF THE QUEENSLAND WORK HEALTH AND SAFETY ACT 2011. CONTACT THE DIVISION OF WORKPLACE HEALTH AND SAFETY FOR INFORMATION. TELEPHONE: 1300 362 128.

G11. THE CONSTRUCTION OF THE WORKS SHALL BE SUPERVISED BY A REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND (RPEQ) OR BY ANOTHER WHO HAS BEEN DIRECTLY APPOINTED BY AN RPEQ.

SURVEY NOTES

SN1. THE CONTRACTOR IS TO MAKE DUE ALLOWANCE TO VERIFY THE ACCURACY AND COMPLETENESS OF THE INFORMATION SUPPLIED AND ADVISE THE SUPERINTENDENT OF ANY AND ALL DISCREPANCIES. THIS VERIFICATION PROCESS IS REQUIRED PRIOR TO THE COMMENCEMENT OF INSTALLATION AND/OR MODIFICATION OF THE WORKS OR THE PROCUREMENT OF PIPES/FITTINGS THAT ARE NON-STANDARD SUPPLY ITEMS.

SN2. EXISTING SERVICES INFORMATION SHOWN ON THE PLANS, SECTIONS AND DETAILS FOLLOW THE GUIDELINES AS SET OUT IN AS 5488 "CLASSIFICATION OF SUBSURFACE UTILITY INFORMATION". EXISTING SERVICES ARE THEREFORE LABELLED IN ACCORDANCE TO THE QUALITY LEVELS (A, B, C OR D) AND TOLERANCES AS SPECIFIED IN THE AUSTRALIAN STANDARD. PLEASE REFER TABLE BELOW FOR DETAILS:

AS5488 QUALITY LEVEL	INFORMATION SOURCES/SURVEY REQUIREMENTS	X/Y TOLERANCE	Z TOLERANCE
D	EXISTING RECORD, CURSORY SITE INSPECTION, ANECDOTAL EVIDENCE	N/A	N/A
C	AS FOR D PLUS SITE SURVEY OF VISIBLE EVIDENCE THAT MAY USE RELATIVE OR ABSOLUTE POSITIONING	±300mm	N/A
B	AS FOR C, BUT MUST INCLUDE A SURVEY OF BOTH THE SURFACE AND BURIED FEATURES. BURIED FEATURES OF EXISTING INFRASTRUCTURE MAY BE CARRIED OUT BY NO-DIG SURVEY TECHNIQUES.	±300mm	±500mm
A	POSITIVE IDENTIFICATION OF ATTRIBUTES AND THE ABSOLUTE LOCATION OF SUBSURFACE AND SURFACE FEATURES IN 3 DIMENSIONS.	±50mm	±50mm

SN3. THE SHAPES DEPICTING SERVICES ARE SYMBOLIC REPRESENTATIONS AND THEY ARE NOT TO SCALE. NOT ALL SERVICES ARE ACCURATELY POSITIONED.

SN4. EXISTING PIPE SIZE, DIAMETER AND MATERIAL ARE BASED ON GIS DATA AND AS CONSTRUCTED DRAWINGS. SUBCONTRACTOR TO CONFIRM ON SITE.

PIPEWORK NOTES

P1. FOR ALL DUCTILE IRON PIPEWORK:
- A) ALL DICL PIPES & FITTINGS MUST BE IN ACCORDANCE WITH F FNQROC SPECIFICATION S6.
- B) FUSION BONDED PIPES AND FITTINGS SHALL COMPLY WITH AS/NZS 4158.
  1) FLANGED PIPES - FUSION BONDED COATING AND LININGS TO BE RILSAN T BLUE 7443 MAC THERMOPLASTIC POLYAMIDE II (NYLON) POWDER.
  2) FITTINGS - COATED WITH CORRO-COAT FBE (EP-F-5001) FOR FITTING UP TO DN250, COATED WITH RILSAN T BLUE 7443 MAC FOR FITTINGS GREATER THAN DN250.
  3) REPAIR - FUSION COATED PIPES THAT ARE CUT TO SUIT SHALL BE REPAIRED WITH ALTRA-SHIELD 2000 (HIGH BUILT HIGH SOLIDS EPOXY) TO MANUFACTURES SPECIFICATION.
- C) BURIED PIPES TO BE BITUMEN COATED AND COVERED WITH POLYETHYLENE SLEEVING/WRAPPER AS PER THE MANUFACTURER'S RECOMMENDATION AND AS 3680.

P2. FOR ALL POLYETHYLENE (PE) PIPEWORK:
- A. PIPE TO BE MANUFACTURED IN ACCORDANCE WITH AS 4130 .
- B. POLYETHYLENE FITTINGS TO BE MANUFACTURED IN ACCORDANCE WITH AS 4129.
- C. POLYETHYLENE PIPE AND FITTINGS SHALL BE MINIMUM SDR11.
- D. ONLY FULLY RATED MOULDED FITTINGS ARE ACCEPTABLE.
- E. PIPE TO BE INSTALLED IN ACCORDANCE WITH AS 2033, WSA01-2004 CODE.
- F. POLYETHYLENE PIPE MAY BE CURVED ON SITE TO A MINIMUM RADIUS OF 33 TIMES THE PIPE OUTSIDE DIAMETER (UNO) PROVIDED THE AMBIENT TEMPERATURE IS ABOVE 15°c. PIPES MUST NOT BE BENT AROUND STAKES. SANDBAGS MAY BE USED TO BEND THE PIPES.
- G. FOR WELDING OF POLYETHYLENE PIPEWORK:
  1. PE WELDING MUST BE CARRIED OUT ONLY BY CERTIFIED PERSONS:
     - G.A. IN ACCORDANCE WITH PARTEC REQUIREMENTS.
     - G.B. WHO HAS SUCCESSFULLY CARRIED OUT PREVIOUS PRESSURE PIPELINE WELDING PROJECTS.
  2. FUSION BUTT-WELDED JOINTS SHALL BE MADE IN ACCORDANCE WITH WSA01-2004, AS2033, AS2566.2 AND THE PIPE MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS.
  3. JOINTS SHALL ONLY BE MADE BETWEEN PIPE MATERIALS OF THE SAME GRADE AS DEFINED IN AS4130. PILOT WELDS SHALL BE MADE AND TESTED FOR ANY PROPOSED JOINTS BETWEEN PIPES FROM DIFFERENT MANUFACTURERS.
  4. FUSION BUTT-WELDED JOINTS SHALL ACHIEVE AT LEAST 90% OF THE TENSILE STRENGTH OF THE PARENT PIPE. INTERNAL WELD BEADS SHALL BE REMOVED.
  5. ALL WELDING SHALL BE PERFORMED UNDER CONTROLLED ENVIRONMENTAL CONDITIONS. FIELD WELDING SHALL BE CARRIED OUT IN SHELTERS TO PREVENT DUST AND WATER CONTAMINATION. THE SHELTERS SHALL REMAIN IN PLACE UNTIL COMPLETION OF THE JOINT COOLING PERIOD. PIPE ENDS SHALL BE BLOCKED OFF TO PREVENT WIND CHILL AND DIRT CONTAMINATION.
  6. WELDING MACHINES USING HAND WOUND CARRIAGES WITHOUT PRESSURE GAUGES SHALL NOT BE USED. AT ALL TIMES DURING WELDING, THE WELDER SHALL HAVE A HAND-HELD TEMPERATURE SENSING DEVICE CAPABLE OF CHECKING THE TEMPERATURE OF THE HEATER PLATE AT THE CIRCUMFERENCE OF THE WELD.
  7. PILOT WELDING TRAILS SHALL BE COMPLETED AND APPROVED BY THE SUPERVISOR BEFORE THE FIELD WELDING IS CARRIED OUT.
  8. THE PILOT WELDS SHALL BE SUBJECTED TO TENSILE STRENGTH TESTING, TENSILE FRACTURE TESTING AND FLEXURAL BEAM TESTING BY A THIRD PARTY
  9. ACCEPTANCE CRITERIA FOR THE PILOT WELDS SHALL INCLUDE:
  10. AT LEAST 90% TENSILE STRENGTH OF THE PARENT PIPE SELECTION.
  11. TENSILE FRACTURES ONLY IN DUCTILE MANNER WITH NO EVIDENCE OF CONTAMINATION OR DISLOCATIONS ON THE WELD FRACTURE SURFACE.
  12. NO FRACTURE OF THE WELD IN FLEXURAL BEAM TESTING.

P3. FOR ALL PVC-U DWV GRAVITY SEWER :
- A) ALL PIPES AND FITTINGS ≥ DN150 SHALL BE MINIMUM SN8 AND SN6 ≤ DN100 MANUFACTURED IN
- B) ACCORDANCE WITH AS 1260.

P4. UNRESTRAINED DISMANTLING JOINT TO SPECIFICATION WSA PS - 311 MECHANICAL COUPLINGS, UNRESTRAINED. PRESSURE CLASS SHALL BE PN16. COUPLING LENGTH SHALL BE LONG SERIES WITH BOLTS IN ACCORDANCE WITH P5C.

P5. FOR ALL FLANGES:
- A. ALL FLANGES MUST BE IN ACCORDANCE WITH AS 4087 UNO. ALL VALVES AND FITTINGS SHALL BE DRILLED TO:
  13. FIGURE B5 PN16 - DICL PN16.
  14. FIGURE B7 PN16 - STEEL PN16.
- B. RAISED FACE FLANGES MAY BE MATED WITH RAISED FACE FLANGES. FLAT FACED FLANGES SHALL BE MATED WITH FLAT FACED FLANGES.
- C. ALL BOLTED CONNECTIONS SHALL BE SS316 CLASS 70 BOLTS, NUTS AND WASHERS AND SHALL BE IN ACCORDANCE WITH AS 1110. ALL WASHERS SHALL BE 3mm THICK. PROVIDE INSULATING WASHERS FOR DISSIMILAR METALS AS REQUIRED.
- D. GASKETS TO BE IN ACCORDANCE WITH WSA 109-2002 (INDUSTRY STANDARD FOR FLANGE GASKETS AND O-RINGS).ALL BOLTS SHALL BE IN ACCORDANCE WITH AS 1110 AND BE SUITABLE FOR AS 4087 FLANGES.
- E. ALL BURIED FLANGED JOINTS SHALL HAVE BOLTS, WASHERS AND NUTS. APPLY ANTI-SEIZE PASTE (BREAKAWAY PLUS OR APPROVED EQUIVALENT) TO ALL THREADS, AND WRAP ASSEMBLED JOINT WITH PETROLATUM TAPE TO MANUFACTURE'S RECOMMENDATIONS. TAKE CARE DURING BACKFILL TO ENSURE PETROLATUM TAPE IS NOT DAMAGED OR DISLODGED. SPECIAL REQUIREMENTS MAY BE REQUIRED IN ACID SULFATE SOILS.

P6. FOR ALL VALVES
- A. ALL FLANGED VALVES SHALL BE COMPATIBLE TO AS 4087, FIGURE B5.
- B. NON RETURN VALVES SHALL BE PN16 IN ACCORDANCE WITH WSA PURCHASE SPECIFICATION PS-264.
- C. RESILIENT SEATED GATE VALVES SHALL BE PN16 IN ACCORDANCE WITH WSA PURCHASE SPECIFICATION PS260.
- D. BURIED VALVES SHALL BE INSTALLED COMPLETE WITH A SURFACE BOX, MARGIN SETT, MARKER S2000 AND S2010..
- E. ALL VALVE COVERS SHALL BE TRAFFICABLE (CLASS D) WITH DROP-IN LID AND KEY UNLESS OTHERWISE INDICATED ON DRAWINGS.

P7. FOR ALL POTABLE WATER SERVICE CONNECTIONS:
- A) ALL POTABLE WATER SERVICE CONNECTIONS SHALL BE CONNENCTED TO EXISTING RETICULATION SYSTEM IN ACCORDANCE WITH FNQROC STANDARD DRAWING S2038 BY A REGISTERED PLUMBER.

P8. GENERAL PIPE CONSTRUCTION:
- A) HANDLING AND STORAGE OF PIPE SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURERS REQUIREMENTS. (CONTRACTOR SHALL PROVIDE PROTECTION FOR THE PIPES AND FITTINGS FROM UV LIGHT AND DAMAGE).
- B) PIPELINE CONSTRUCTION SHALL BE IN ACCORDANCE FNQROC DEVELOPMENT MANUAL CP1 CONSTRUCTION PROCEDURES, SPECIFICATION D6 AND PIPE MANUFACTURERS REQUIREMENTS. CHANGES OF HORIZONTAL AND VERTICAL ALIGNMENT SHALL BE MADE BY DEFLECTING THE PIPE AT A SINGLE JOINT UNO. THE MAXIMUM PERMISSIBLE DEFLECTION SHALL BE 80% OF THE MANUFACTURER'S RECOMMENDATION. DEFLECTIONS SHALL BE CARRIED OUT ONLY AFTER THE JOINT HAS BEEN MADE. WHERE DEFLECTIONS OCCUR OVER MORE THAN ONE PIPE JOINT, THE DEFLECTION SHALL BE SPREAD EQUALLY OVER THE NUMBER OF JOINTS REQUIRED.
- C) PIPES CAST INTO CONCRETE SHALL BE POWER-TOOL CLEANED TO AS 1627.
- D) THE SUBCONTRACTOR IS TO CONFIRM TRENCH CONSTRUCTION TYPE WITH THE SUPERINTENDENT FOLLOWING INSPECTION OF TRENCH CONDITIONS.
- E) FOR METAL/PLASTIC SP-SC JOINTS REQUIREMENTS DO NOT INSERT A METAL SPIGOT INTO THE SOCKET OF A PLASTIC PIPE.

P9. PIPE EMBEDMENT AND BACKFILL REQUIREMENTS SHALL BE IN ACCORDANCE FNQROC STANDARD DRAWING S3015.

P10. CONSTRUCTION TOLERANCES SHALL BE IN ACCORDANCE WITH WATER SUPPLY CODE OF AUSTRALIA (WSA03-2011 V3.1) CLAUSE 21 AND SUB-CLAUSES.

P11. THE HYDROSTATIC TEST PRESSURE FOR SEWAGE RISING MAINS SHALL BE 780kPa AND FOR WATER MAIN 1200kPa.

P12. WATER MAINS SHALL BE FLUSHED AND DISINFECTED IN ACCORDANCE WITH SPECIFICATION S5.

P13. KERB AND ROAD MARKERS TO BE PROVIDED AT ALL VALVES, SCOURS AND AIR VALVES. REFER FNQROC STANDARD DRAWING S2010.

TRAFFIC MANAGEMENT NOTES

TM1. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS AND PERMITS FROM COUNCIL AND OTHER AUTHORITIES FOR ALL CONSTRUCTION ACTIVITIES.

PUMP STATION NOTES

PS1. ONLY PACKAGE PUMP STATIONS APPROVED BY DOUGLAS SHIRE COUNCIL SHALL BE ACCEPTABLE.

PS2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF PACKAGE PUMP STATIONS, ASSOCIATED ELECTRICAL, CONTROLS AND TELEMETRY.

PS3. THE ELECTRICAL POINT OF CONNECTION SHALL BE PROVIDED BY THE DEVELOPER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FOR PAYMENT OF CONNECTION FEES, CONDUITS AND CABLING FROM THE PILLAR BOX TO THE SWITCHBOARD.

PS4. PUMP CONTROLS TO BET SET AS FOLLOWS:
1. PUMP DISCHARGE SHALL BE CONTROLLED BY VSD
2. PUMP SPEED TO VARY TO MAINTAIN DISCHARGE FLOW RATE OF 13l/S
3. PUMP START SPEED SHALL BE SET TO 40Hz AND ADJUST TO MAINTAIN DISCHARGE RATE

THRUST BLOCK NOTES

T1. THRUST BLOCKS SHALL BE CONSTRUCTED IN ACCORDANCE DRAWINGS SEQ-WAT-1205 AND SEQ-WAT-1206.

T2. THE BEARING FACE OF THE TRUST BLOCKS MUST BE CAST AGAINST UNDISTURBED GROUND.

T3. CONCRETE MUST NOT OVERSPILL SOCKET JOINTS.

T4. VERTICAL THRUST BLOCKS MUST BE EMBEDDED INTO UNDISTURBED GROUND.

T5. CONCRETE MUST BE CURED FOR 48HRS (MINIMUM) PRIOR TO CHARGING THE PIPELINE.

T6. MINIMUM BEARING AREA ON DRAWING SEQ-WAT-1205 AND 1206 SHALL BE ADJUSTED TO SUIT TEST HYDROSTATIC TEST PRESSURE FOR RISING MAIN.

T7. CONTRACTOR TO CONFIRM SOIL BEARING CAPACITY AT ALL THRUST/ANCHOR BLOCK LOCATIONS PRIOR TO CONSTRUCTING TO CONFIRM BLOCK DIMENSIONS.

Rev.	Date	Description	Des.	Verif.	Appd.
2	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	
1	21/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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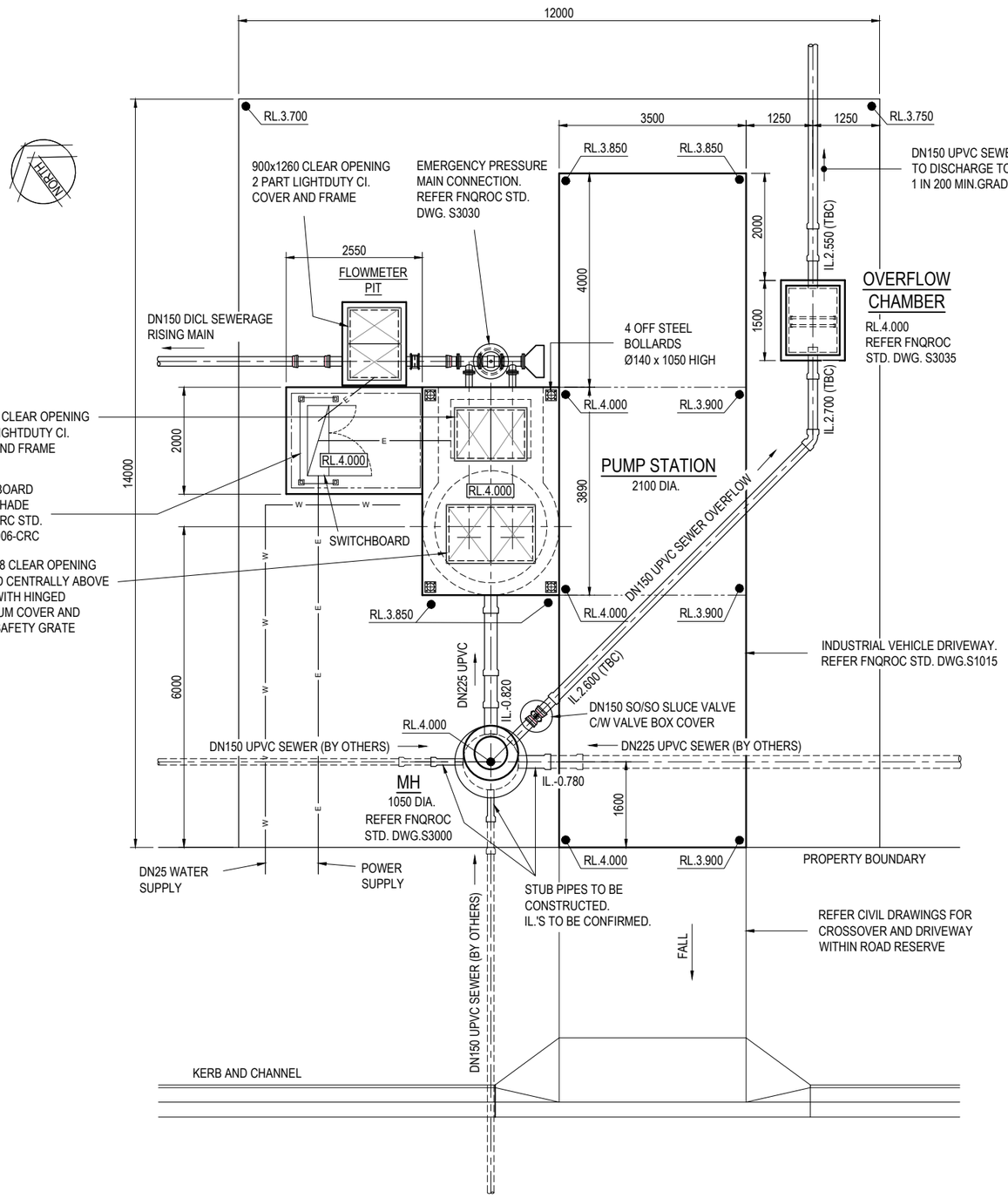
		Date
Drawn	D.G.	20/08/2019
Checked	G.P.	20/08/2019
Designed	D.G.	20/08/2019
Verified		Date
Approved		

Client: PORT DOUGLAS SHIRE COUNCIL
Project: PORT DOUGLAS ESTATE CRAIGLIE WATER AND SEWERAGE SERVICES
Title: GENERAL NOTES

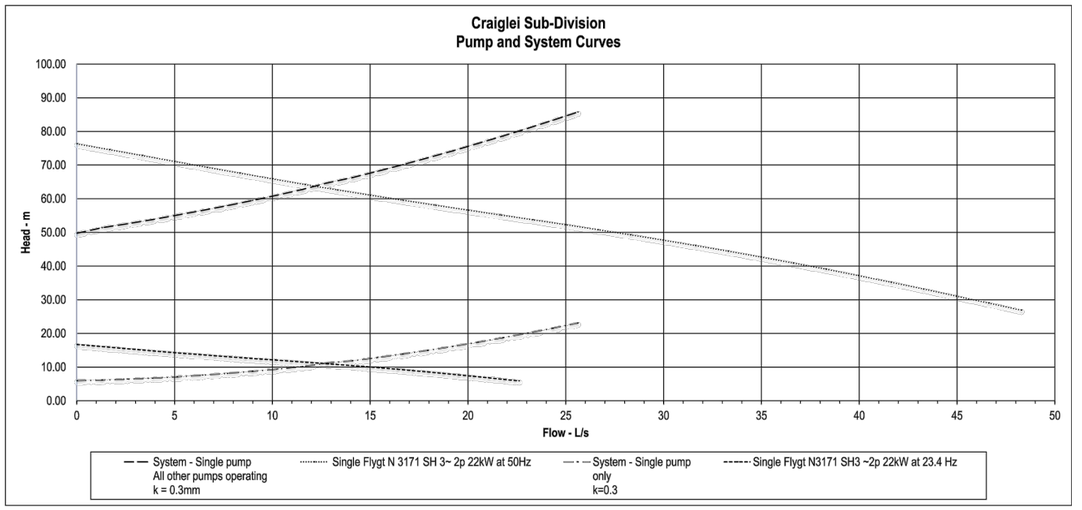
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

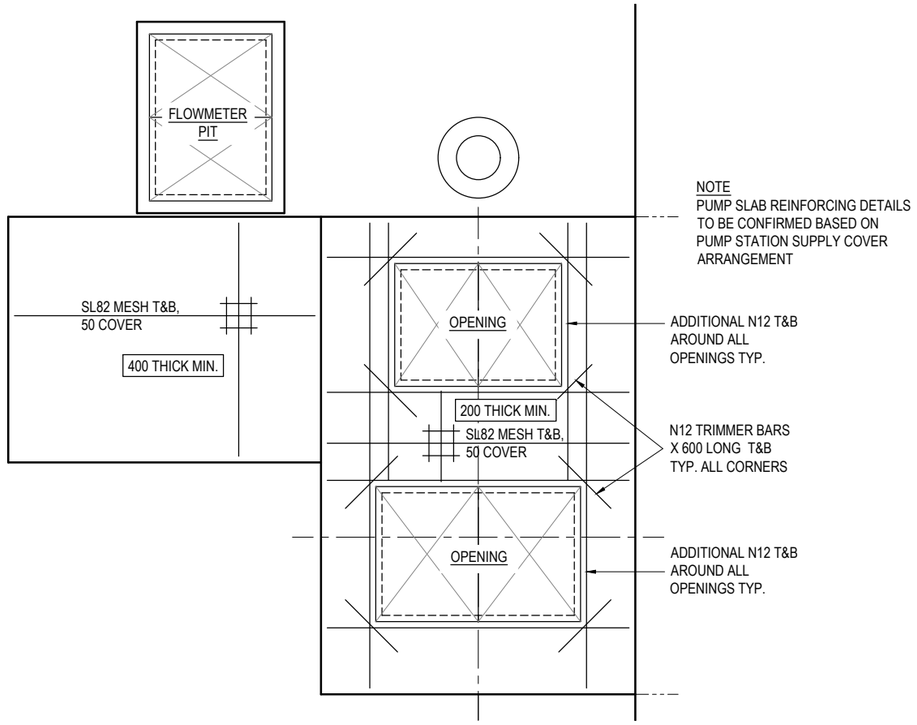
DATUM	MGA	Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-002
Revision: 2



SITE PLAN
SCALE 1:50





REINFORCEMENT DETAIL
SCALE 1:25

NOTE
1. ALL CONCRETE TO BE N32 MIN. IN ACCORDANCE WITH AS1379 AND AS360
2. 50 MIN. COVER TO REINFORCEMENT.
3. ALL CONCRETE TO BE BROOM FINISHED
4. ALL CONCRETE TO BE LAID ON 0.2mm WATERPROOF MEMBRANE WITH 50 BLINDING LAYER OVER 95% COMPACTED SUBGRADE.

0 500 1000 1500 2000 2500mm
SCALE 1:25 @A1

0 1000 2000 3000 4000 5000mm
SCALE 1:50 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
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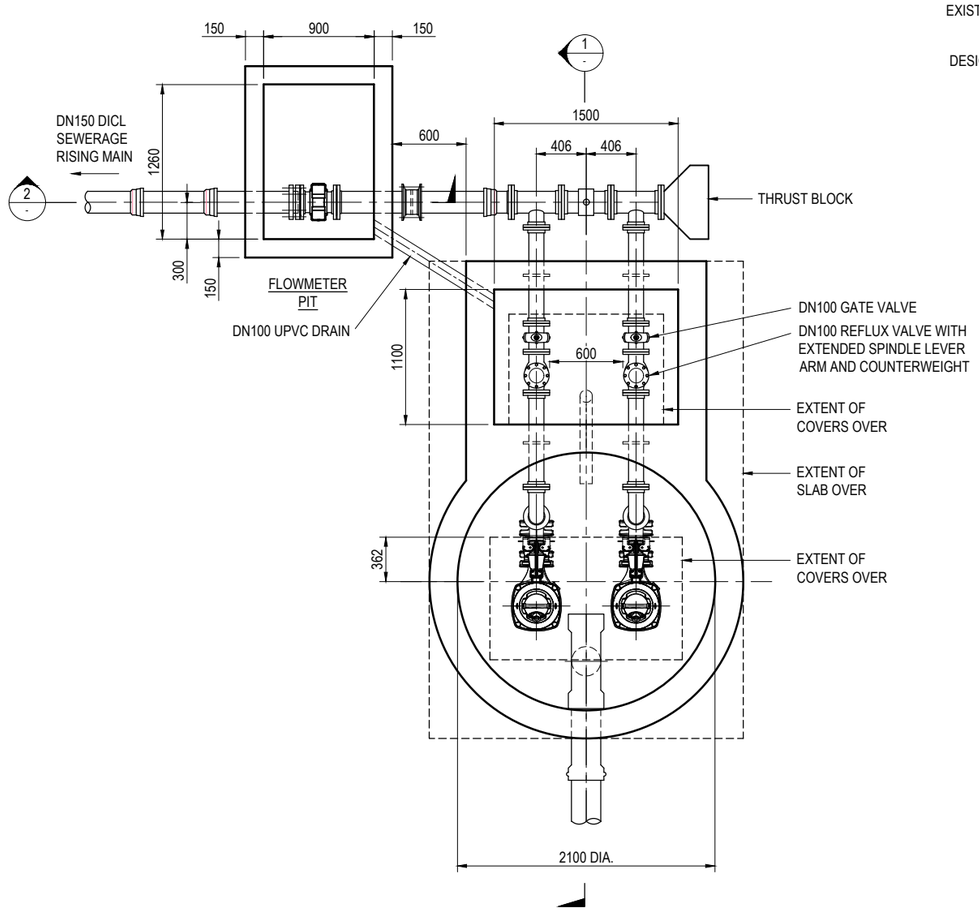
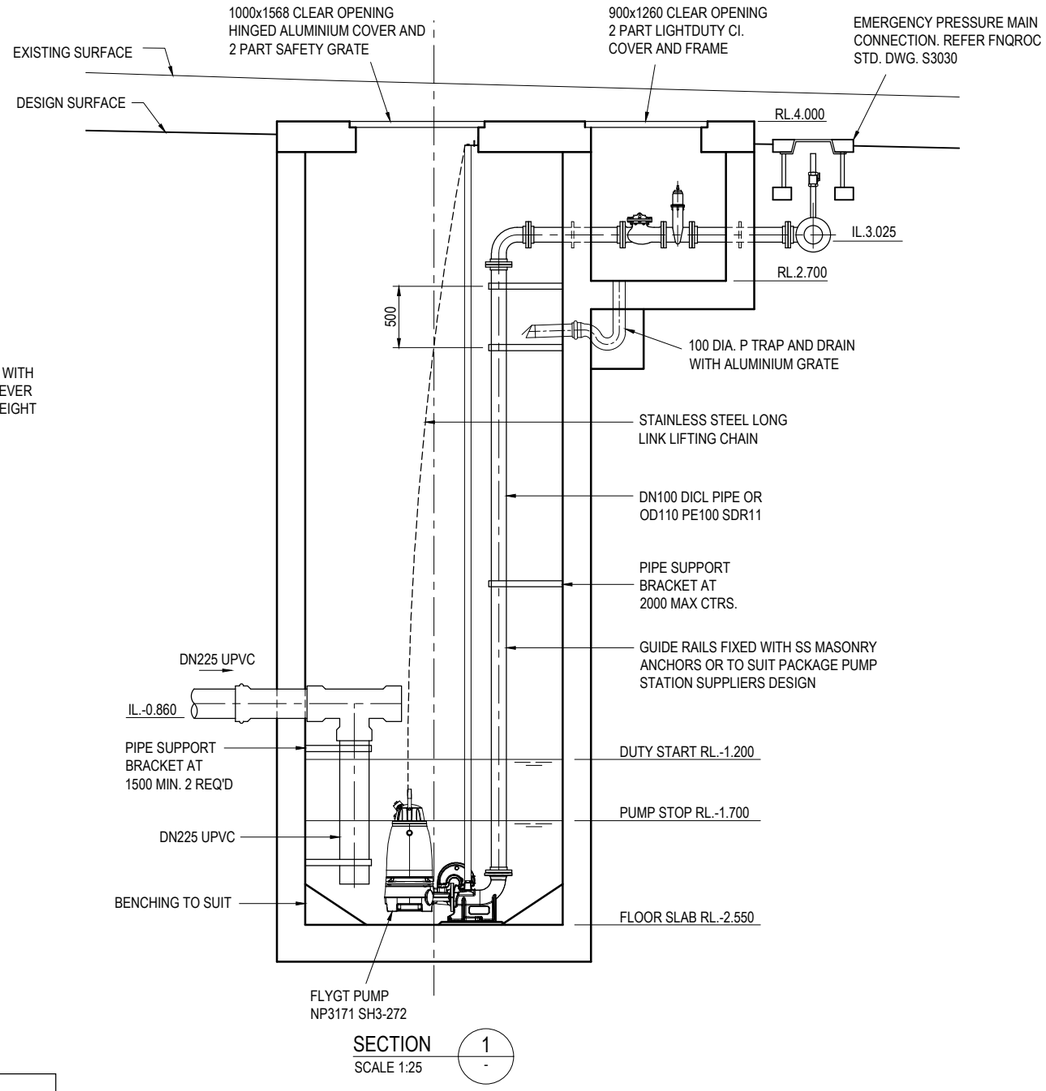
Verified		Date
Approved		

Client: PORT DOUGLAS SHIRE COUNCIL
Project: PORT DOUGLAS ESTATE CRAIGLIE WATER AND SEWERAGE SERVICES
Title: PUMP STATION SITE PLAN
Status: PRELIMINARY — NOT TO BE USED FOR CONSTRUCTION PURPOSES
DATUM: AHD | MGA | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-003
Revision: 3



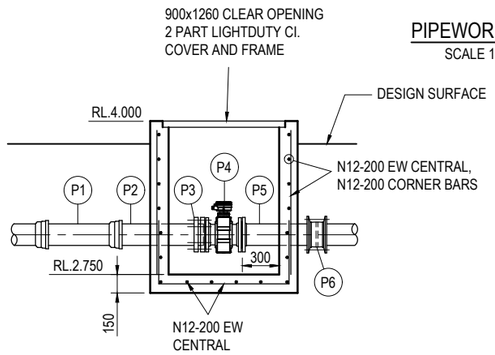
PIPEWORK PLAN
SCALE 1:25



SECTION 1 / -
SCALE 1:25

PUMP DUTY		
	FLOW (L/s)	HEAD (m)
1	12.8	65.8
2	12.8	10.7

NOTES
1. PUMP WELL AND VALVE CHAMBER TYPICAL ONLY.
2. FINAL DETAILS OF WETWELL AND VALVE CHAMBER TO BE DETERMINED BY PACKAGE PUMP STATION DESIGNER/SUPPLIER
3. PACKAGE PUMP STATION TO COMPLY WITH PORT DOUGLAS SHIRE COUNCIL APPROVED SUPPLIERS LIST. OTHER SUPPLIERS ARE NOT ACCEPTABLE. REFER NOTES ON CI-002.



SECTION 2 / -
SCALE 1:25

FLOWMETER PIPE SCHEDULE		
ITEM	DESCRIPTION	DIA.
P1	SP/SO DICL PIPE X 600 LONG	DN150
P2	SP/SP DICL PIPE X 750 LONG	DN150
P3	NON TRUST TYPE DISMANTLING JOINT	DN150
P4	ELECTROMAGNETIC FLOWMETER	DN150
P5	FL/SP DICL PIPE X 600 LONG	DN150
P6	GIBAULT JOINT	DN150

0 500 1000 1500 2000 2500mm
SCALE 1:25 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
2	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	
1	21/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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Drawn	D.G.	Date 20/08/2019
Checked	G.P.	Date 20/08/2019
Designed	D.G.	Date 20/08/2019
Verified		Date
Approved		

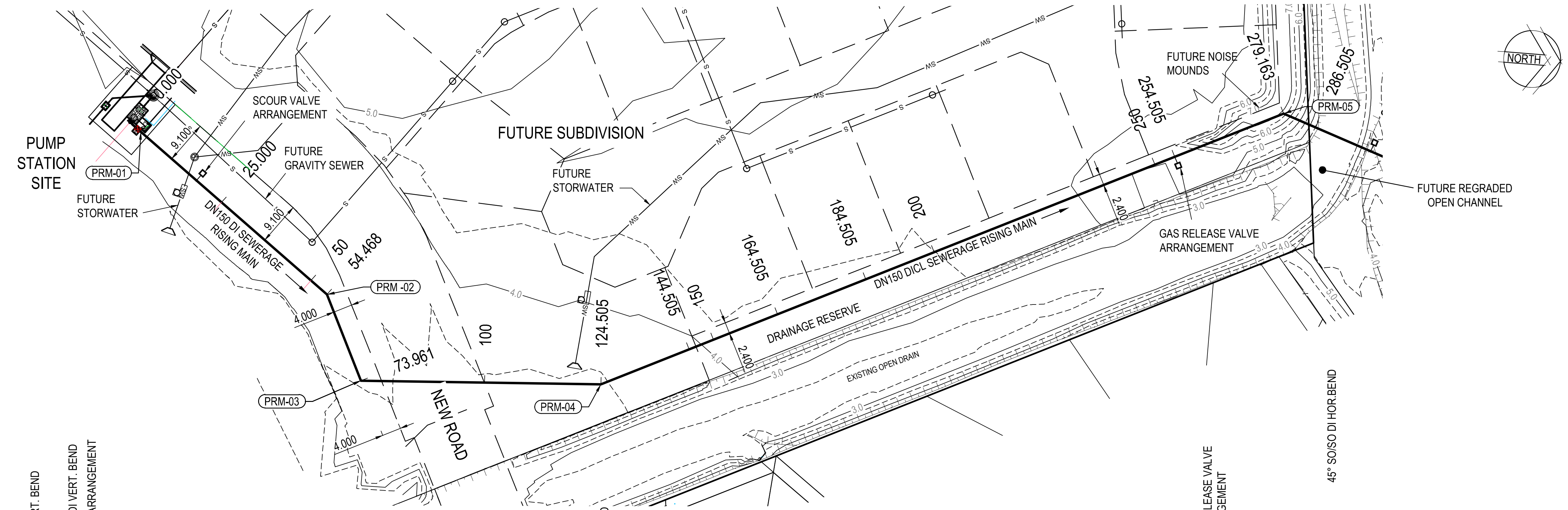
Client: PORT DOUGLAS SHIRE COUNCIL
Project: PORT DOUGLAS ESTATE CRAIGLIE
WATER AND SEWERAGE SERVICES
Title: PUMP STATION
PLAN AND SECTION

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DATUM	MGA	Scale	Size
AHD		AS SHOWN	A1

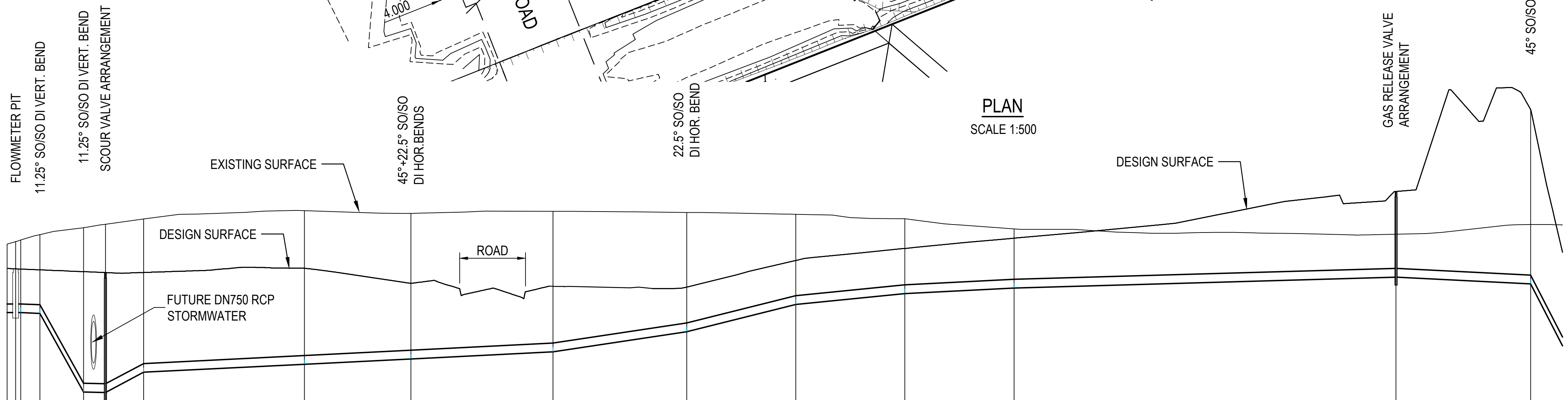
Drawing Number: Q184103-CI-004
Revision: 2

DATE PLOTTED: 30 September 2019 5:20 PM BY : DAVID GRAY



PLAN

SCALE 1:500



DATUM: 1.000

DIA & CLASS: DN150 DICL PN35

TRENCH TYPE: TYPE 1

GRADE	LENGTH
0.42% 1:238	3.519
18.00% 1:6	8.000
0.20% 1:500	4.000
5.29% 1:19	7.000
0.50% 1:200	29.468
0.50% 1:200	19.493
0.50% 1:200	26.039
1.50% 1:67	24.505
2.50% 1:40	20.000
1.00% 1:100	20.000
0.50% 1:200	20.000
0.29% 1:350	70.000
0.50% 1:200	24.658

CHAINAGE	DESIGN SURFACE	EXIST. SURFACE	COVER TO DESIGN SURFACE	INVERT LEVEL
0.000				
2.481	3.793	4.324		
6.000	3.779	4.424	0.638	2.985
14.000	3.745	4.550	2.045	1.545
18.000	3.729	4.614	2.037	1.537
25.000	3.730	4.709	1.668 / 1.668	1.907 / 1.907
54.468	3.808	4.865	1.598 / 1.598	2.055 / 2.055
73.961	3.531	4.802	1.224 / 1.224	2.152 / 2.152
100.000	3.477	4.859	1.040 / 1.040	2.282 / 2.282
124.505	3.461	4.830	0.656 / 0.656	2.650 / 2.650
144.505	3.951	4.797	0.646 / 0.646	3.150 / 3.150
164.505	4.171	4.716	0.666 / 0.666	3.350 / 3.350
184.505	4.358	4.553	0.753 / 0.753	3.450 / 3.450
254.505	5.214	4.433	1.409 / 1.409	3.650 / 3.650
279.163	6.719	4.607	3.037	3.527

LONGITUDINAL SECTION - PR-RISING MAIN

LONGITUDINAL SECTION

SCALE HOR. 1:500, VERT. 1:50

LEGEND

- T(D) — EXISTING TELSTRA/NBN
- W(C) — EXISTING WATER
- SR(C) — EXISTING SEWERAGE RISING MAIN
- V — EXISTING OVERHEAD ELECTRICITY / STAYWIRE
- SW — FUTURE STORMWATER
- S — FUTURE SEWER
- (thick line) — PROPOSED SEWERAGE RISING MAIN

NOTES

1. FOR SCOUR ARRANGEMENT REFER WSA DWG. SPS-1602
2. FOR GAS RELEASE ARRANGEMENT REFER WSA DWG. SPS-1602 EXCEPT SCOUR INVERT TEE INVERTED.
3. REFER CI-007 FOR SETOUT.

H: 0 10 20 30 40 50m
V: 0 1 2 3 4 5m
SCALE: H:1:500 V:1:50 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
3	30/09/2019	PRELIMINARY ISSUE	D.G.	G.P	
2	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	
1	21/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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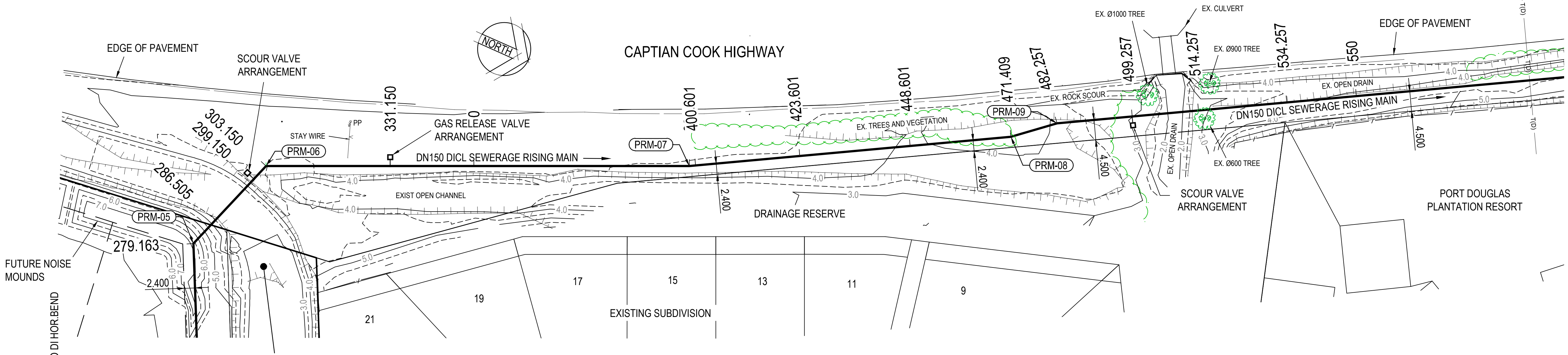
Checked G.P. Date 20/08/2019
Designed D.G. Date 20/08/2019
Verified Date
Approved

Client: PORT DOUGLAS SHIRE COUNCIL
Project: PORT DOUGLAS ESTATE CRAIGLIE WATER AND SEWERAGE SERVICES
Title: SEWERAGE RISING MAIN PLAN AND LONGITUDINAL SECTION SHEET 1

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

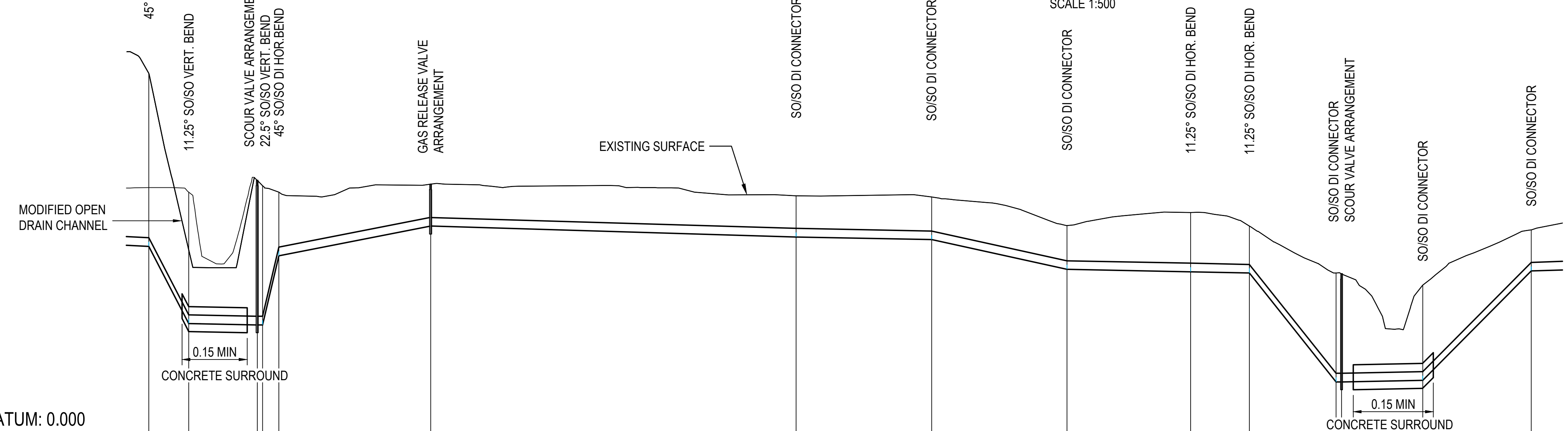
DATUM: AHD | MGA | Scale: AS SHOWN | Size: A1
Drawing Number: Q184103-CI-005 | Revision: 3

XREF's: X- Q184103-Cadastre; X- Q184108_PR LOTS; XR-Q184103-C3D-BASE; XR-Q184103-CI-BASE
CAD File: M:\Q184103 - Craiglea Water and Sewerage Design_Project material\ACAD\Q184103-CI-005-007.dwg



PLAN

SCALE 1:500



DATUM: 0.000

DIA & CLASS: DN150 DICL PN35

TRENCH TYPE: TYPE 1

GRADE	LENGTH
19.43% 1:5	7.342
0.20% 1:500	12.645
42.51% 1:2	3.000
1.96% 1:51	28.000
0.30% 1:337	67.451
0.20% 1:500	25.000
2.20% 1:45	25.000
0.20% 1:500	22.808
0.20% 1:490	10.848
12.58% 1:8	16.000
0.20% 1:500	15.000
10.10% 1:10	20.000

CHAINAGE	DESIGN SURFACE	EXIST. SURFACE	COVER TO DESIGN SURFACE	INVERT LEVEL
279.163	6.719	4.608	3.037	3.527
286.505	3.458	4.523	1.203 / 1.203	2.100 / 2.100
299.150		4.739	2.513	2.075
303.150		4.523	1.018	3.350
331.150		4.671	0.616 / 0.616	3.900 / 3.900
398.601		4.456	0.601 / 0.601	3.700 / 3.700
423.601		4.432	0.627 / 0.627	3.650 / 3.650
448.601		3.904	0.649 / 0.649	3.100 / 3.100
471.409		4.146	0.936 / 0.936	3.054 / 3.054
482.257		3.897	0.709 / 0.709	3.032 / 3.032
498.257		3.031	1.856 / 1.838	1.020 / 1.020
514.257		2.805	1.600 / 1.600	1.050 / 1.050
534.257		3.825	0.600	3.070

LONGITUDINAL SECTION - PR-RISING MAIN

LONGITUDINAL SECTION

SCALE HOR. 1:500, VERT. 1:50

LEGEND

- T(D) — EXISTING TELSTRA/NBN
- W(C) — EXISTING WATER
- SR(C) — EXISTING SEWERAGE RISING MAIN
- V — EXISTING OVERHEAD ELECTRICITY / STAYWIRE
- SW — FUTURE STORMWATER
- S — FUTURE SEWER
- PROPOSED SEWERAGE RISING MAIN

NOTES

1. FOR SCOUR ARRANGEMENT REFER WSA DWG. SPS-1602
2. FOR GAS RELEASE ARRANGEMENT REFER WSA DWG. SPS-1602 EXCEPT SCOUR INVERT TEE INVERTED.
3. REFER CI-007 FOR SETOUT.

H: 0 10 20 30 40 50m
V: 0 1 2 3 4 5m
SCALE: H:1:500 V:1:50 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
3	30/09/2019	PRELIMINARY ISSUE	D.G.	G.P	
2	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	
1	21/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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Checked	G.P.	Date 20/08/2019
Designed	D.G.	Date 20/08/2019
Verified		Date
Approved		

Client: PORT DOUGLAS SHIRE COUNCIL

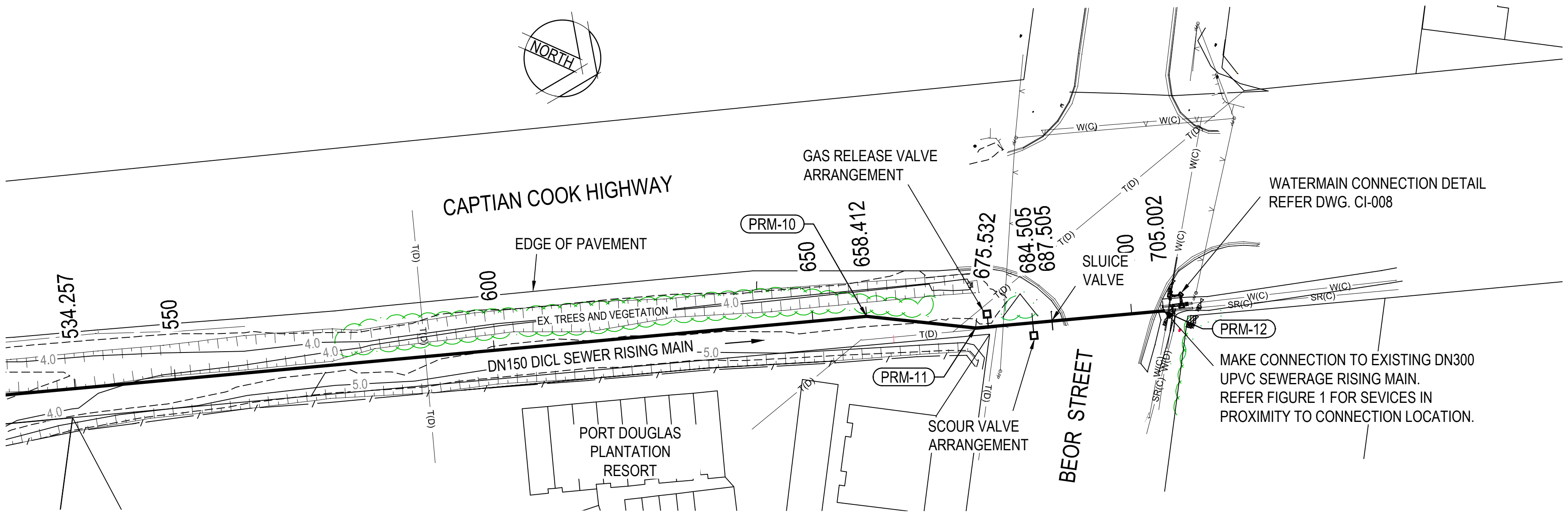
Project: PORT DOUGLAS ESTATE CRAIGLIE WATER AND SEWERAGE SERVICES

Title: SEWERAGE RISING MAIN PLAN AND LONGITUDINAL SECTION SHEET 2

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DATUM	MGA	Scale	Size
AHD		AS SHOWN	A1

Drawing Number	Revision
Q184103-CI-006	3



PLAN

SCALE 1:500

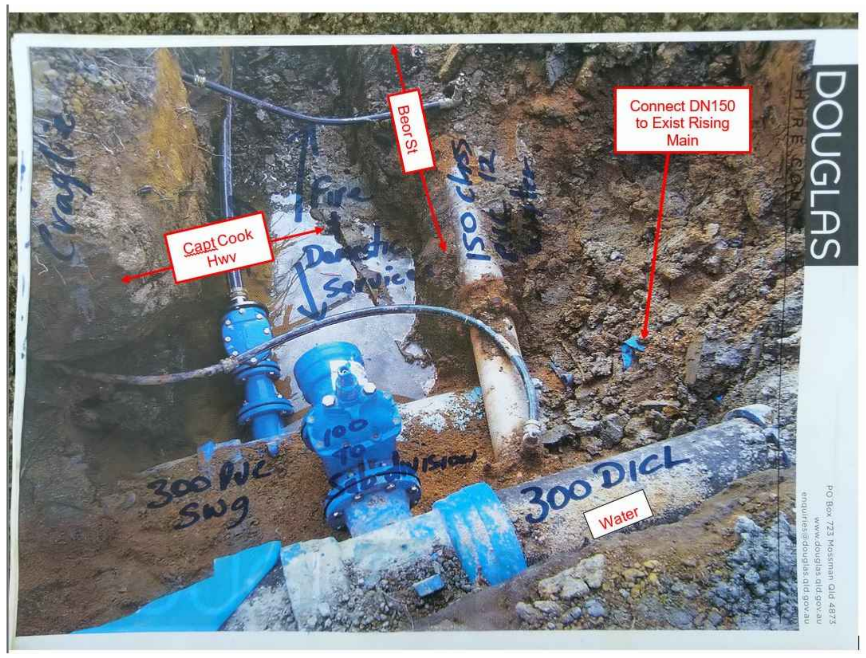
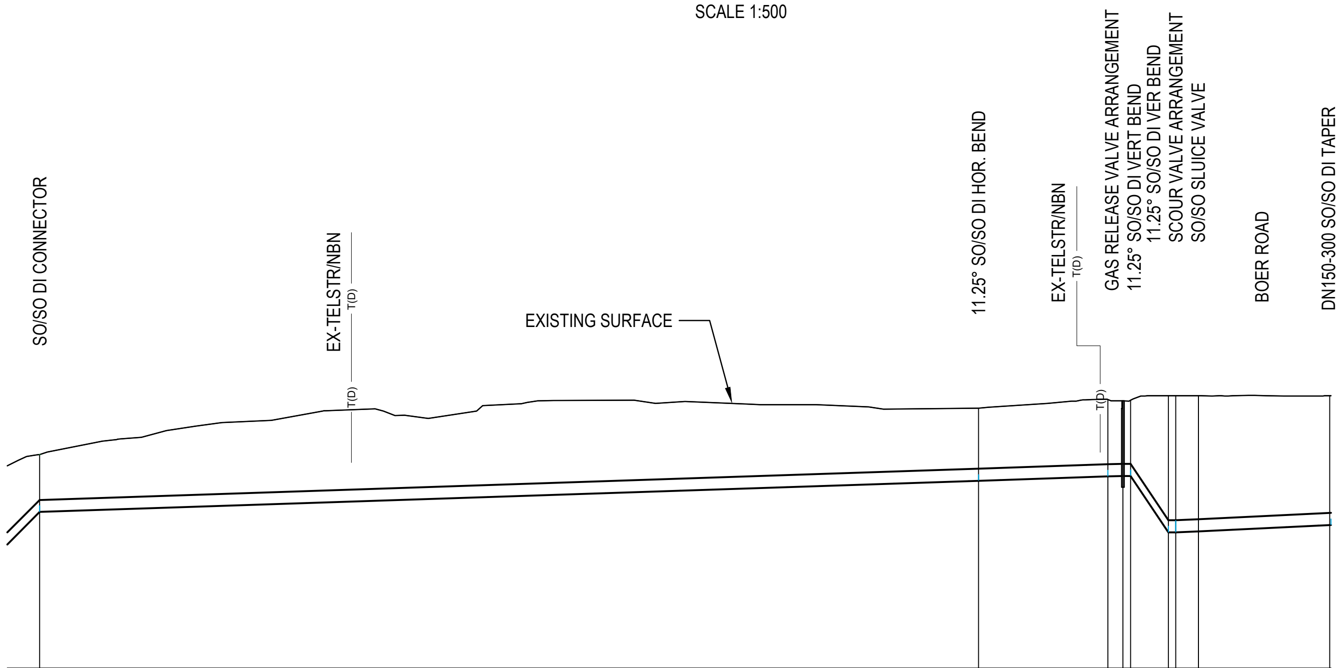


FIGURE 1

SETOUT-PR-RISING MAIN				
POINT	EASTING	NORTHING	CHAINAGE	DESCRIPTION
PRM-01	337129.527	8170549.600	2.481	FLOW METER PIT STUB
PRM -02	337087.823	8170580.638	54.468	22.5° SO/SO DI HOR. BEND
PRM-03	337079.250	8170598.146	73.961	45°+22.5° SO/SO DI HOR.BENDS
PRM-04	337028.806	8170594.982	124.505	22.5° SO/SO DI HOR. BEND
PRM-05	336889.904	8170526.970	279.163	45° SO/SO DI HOR.BEND
PRM-06	336867.212	8170534.744	303.150	45° SO/SO DI HOR.BEND
PRM-07	336828.217	8170621.866	398.601	SO/SO DI CONNECTOR
PRM-08	336792.571	8170685.352	471.409	11.25° SO/SO DI HOR. BEND
PRM-09	336785.529	8170693.604	482.257	11.25° SO/SO DI HOR. BEND
PRM-10	336699.286	8170847.202	658.412	11.25° SO/SO DI HOR. BEND
PRM-11	336693.978	8170863.479	675.532	11.25° SO/SO DI HOR. BEND
PRM-12	336679.550	8170889.175	705.002	DN300/150 SO/SO DI TAPER REMOVE EXISTING DEAD END AND MAKE CONNECTION



DATUM: 1.000

DIA & CLASS: DN150 DICL PN35

TRENCH TYPE: TYPE 1

GRADE: 0.33% 1:300 | 0.33% 1:300 | 0.33% 1:300 | 14.94% 1:7 | 0.49% 1:205 | 0.48% 1:208

LENGTH: 124.155 | 17.120 | 1.973 | 3.000 | 17.497

EXIST. SURFACE: 3.825 | 4.436 | 4.553 | 4.541 | 4.601 | 4.601 | 4.602

COVER TO DESIGN SURFACE: 0.600 | 0.797 | 0.798 | 0.858 | 0.839 | 1.646 | 1.631 | 1.548

INVERT LEVEL: 3.070 | 3.483 | 3.483 | 3.540 | 3.547 | 2.800 | 2.815 | 2.899

CHAINAGE: 534.257 | 658.412 | 675.532 | 678.505 | 683.505 | 687.505 | 705.002

LONGITUDINAL SECTION - PR-RISING MAIN

LONGITUDINAL SECTION

SCALE HOR. 1:500, VERT. 1:50

LEGEND

- T(D) — EXISTING TELSTRA/NBN
- W(C) — EXISTING WATER
- SR(C) — EXISTING SEWERAGE RISING MAIN
- V — EXISTING OVERHEAD ELECTRICITY / STAYWIRE
- SW — FUTURE STORMWATER
- S — FUTURE SEWER
- PROPOSED SEWERAGE RISING MAIN

NOTES

1. FOR SCOUR ARRANGEMENT REFER WSA DWG. SPS-1602
2. FOR GAS RELEASE ARRANGEMENT REFER WSA DWG. SPS-1602 EXCEPT SCOUR INVERT TEE INVERTED.

H: 0 10 20 30 40 50m
V: 0 1 2 3 4 5m
SCALE: H:1:500 V:1:50 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
3	30/09/2019	PRELIMINARY ISSUE	D.G.	G.P	
2	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	
1	21/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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Drawn D.G. Date 20/08/2019
Checked G.P. Date 20/08/2019
Designed D.G. Date 20/08/2019
Verified Date
Approved

Client: PORT DOUGLAS SHIRE COUNCIL

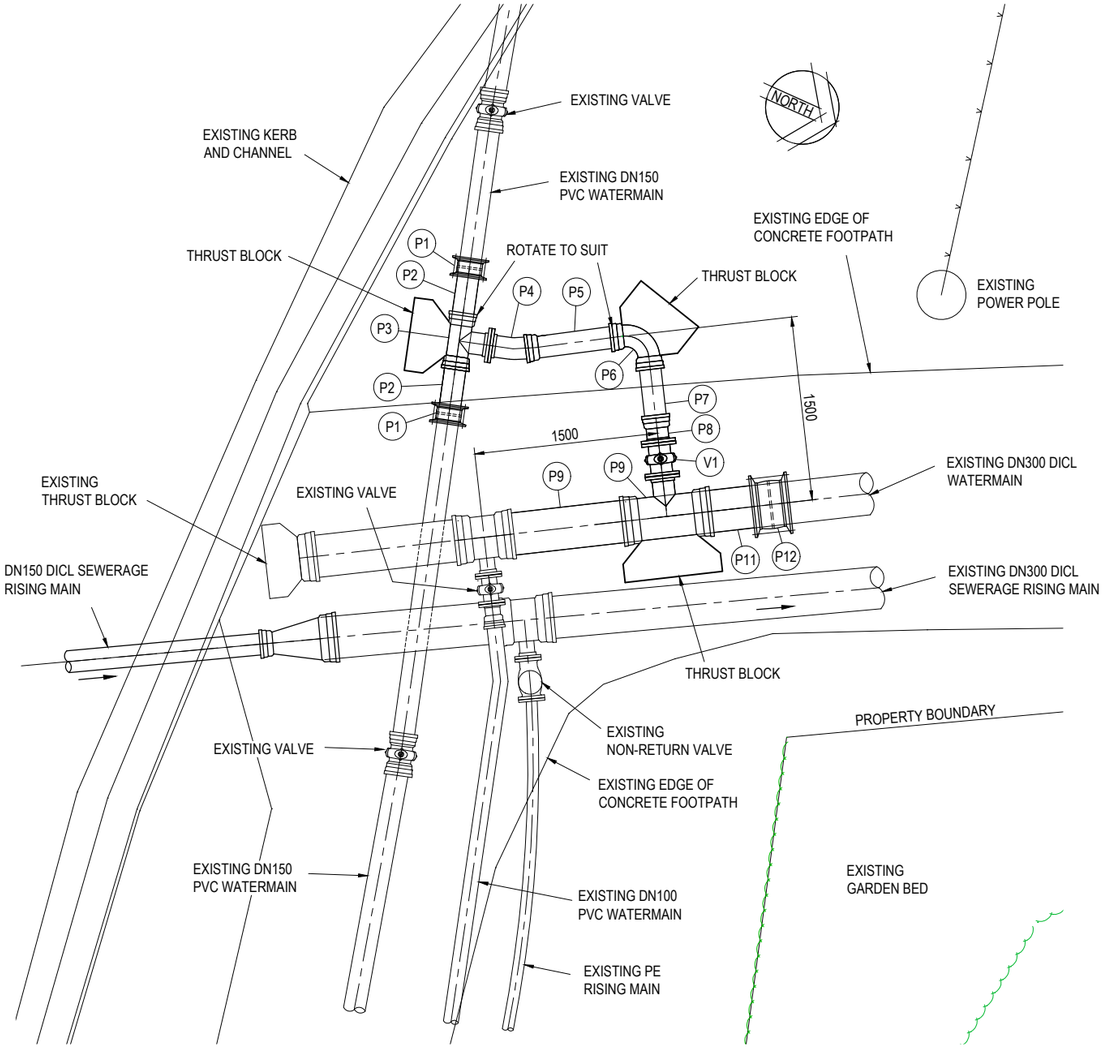
Project: PORT DOUGLAS ESTATE CRAIGLIE WATER AND SEWERAGE SERVICES

Title: SEWERAGE RISING MAIN PLAN AND LONGITUDINAL SECTION SHEET 3

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DATUM: AHD | MGA | Scale: AS SHOWN | Size: A1

Drawing Number: Q184103-CI-007 | Revision: 3



PLAN
SCALE 1:25

PIPE SCHEDULE			
ITEM	DESCRIPTION	DIA.	No.
P1	GIBAULT JOINT	DN150	2
P2	SP/SP DICL PIPE X 450 LONG	DN150	2
P3	SO/SO/FL DI TEE	DN150	1
P4	SO/SP 11.25° DI BEND	DN150	1
P5	SO/SP PIPE X 1000 LONG CTS.	DN150	1
P6	SO/SO 90° DI BEND	DN150	1
P7	SP/SP DICL PIPE X 750 LONG CTS.	DN150	1
P8	FL/SO DI CONNECTOR	DN150	1
P9	SO/SO/FL DI TEE	DN300/150	1
P10	SP/SP DICL PIPE X 1150 LONG	DN300	1
P11	SP/SP DICL PIPE X 600 LONG	DN300	1
P12	GIBAULT JOINT	DN300	1
V1	FLANGED SLUICE VALVE	DN150	1

0 500 1000 1500 2000 2500mm
SCALE 1:25 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
1	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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Checked	G.P.	Date 20/08/2019
Designed	D.G.	Date 20/08/2019
Verified		Date
Approved		

Client: PORT DOUGLAS SHIRE COUNCIL
Project: PORT DOUGLAS ESTATE CRAIGLIE
WATER AND SEWERAGE SERVICES
Title: WATERMAIN CONNECTION DETAILS
SHEET 1

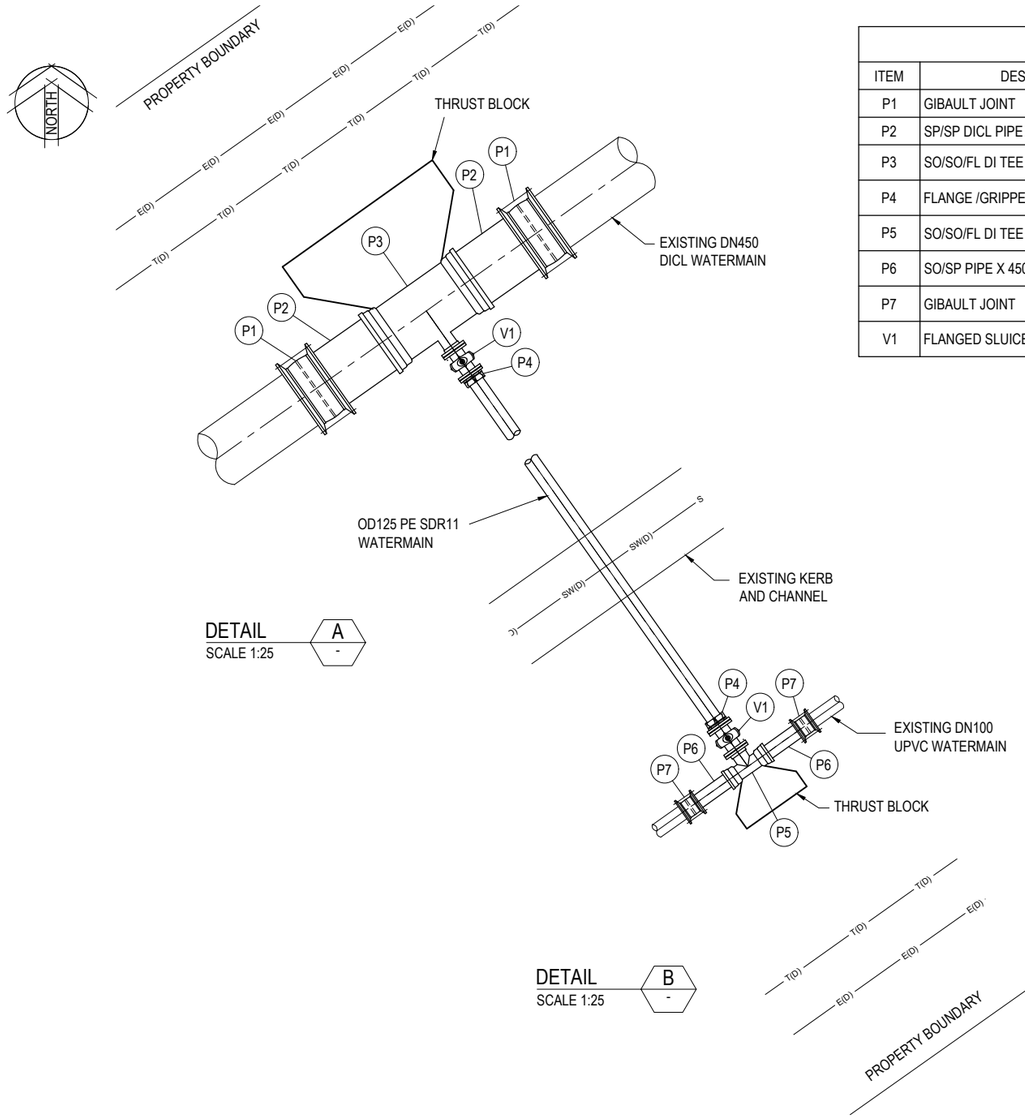
Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DATUM	MGA	Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-008
Revision: 1

PLAN

SCALE 1:250



PIPE SCHEDULE			
ITEM	DESCRIPTION	DIA.	No.
P1	GIBAULT JOINT	DN450	2
P2	SP/SP DICL PIPE X 750 LONG	DN450	2
P3	SO/SO/FL DI TEE	DN450/100	1
P4	FLANGE /GRIPPER ADAPTOR	OD125/100	2
P5	SO/SO/FL DI TEE	DN100	1
P6	SO/SP PIPE X 450 LONG CTS.	DN100	2
P7	GIBAULT JOINT	DN100	2
V1	FLANGED SLUICE VALVE	DN100	2

SETOUT-PR-DN100 WATER MAIN				
POINT	EASTING	NORTHING	CHAINAGE	DESCRIPTION
PRWM-01	335965.997	8172144.651	0.000	TIE INTO EXIST DN450 DICL
PRWM-02	335969.720	8172139.379	6.454	BEND
PRWM-03	335985.391	8172096.915	51.717	BEND
PRWM-04	336003.979	8172070.619	83.920	TIE INTO EXIST DN100 UPVC

LEGEND

- T(D) — EXISTING TELSTRA/NBN
- W(D) — EXISTING WATER
- E(D) — EXISTING UNDERGROUND ELECTRICITY
- SW(D) — EXISTING STORMWATER
- PROPOSED WATERMAIN

0 500 1000 1500 2000 2500mm
SCALE 1:25 @A1

0 5 10 15 20 25m
SCALE 1:250 @A1

Rev.	Date	Description	Des.	Verif.	Appd.
1	28/08/2019	PRELIMINARY ISSUE	D.G.	G.P	

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Checked	G.P.	Date 20/08/2019
Designed	D.G.	Date 20/08/2019
Verified		Date
Approved		

Client: PORT DOUGLAS SHIRE COUNCIL

Project: PORT DOUGLAS ESTATE CRAIGLIE
WATER AND SEWERAGE SERVICES

Title: WATERMAIN CONNECTION DETAILS
SHEET 2

Status: PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION PURPOSES

DATUM	MGA	Scale	Size
AHD		AS SHOWN	A1

Drawing Number: Q184103-CI-009

Revision: 1

PORT DOUGLAS ESTATE - STAGE 1A & 1B

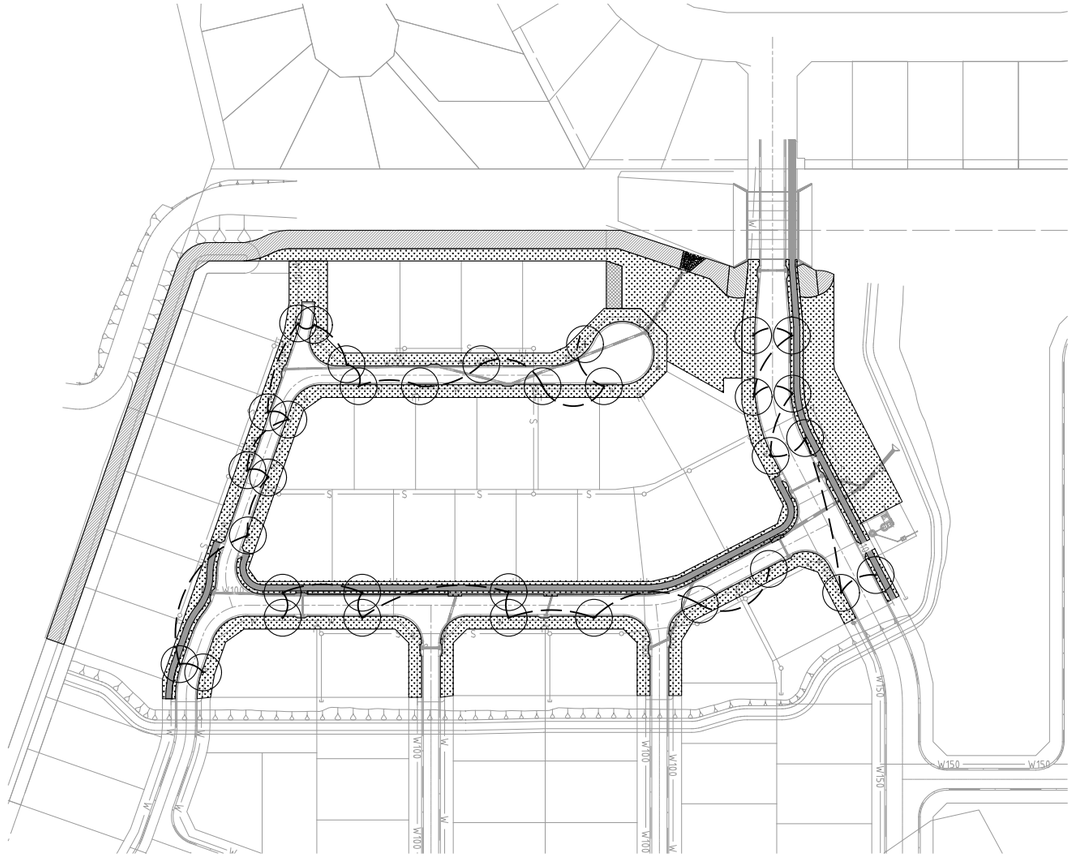
SUBDIVISION OF LOT 2 ON SR431ADDRESS
CAPTAIN COOK HIGHWAY, CRAIGLIE

LANDSCAPE DOCUMENTATION

Issue: OPERATIONAL WORKS

Date: 08-11-2019

SHEET PLAN 1:1000@A1



DRAWING SCHEDULE

DRAWING NUMBER	TITLE	REVISION
1902-016/CD/L0.01	COVER SHEET	03
1902-016/CD/L1.01	LANDSCAPE PLAN	02
1902-016/CD/L2.01	STANDARD DETAILS	02
1902-016/CD/L3.01	STANDARD SPECIFICATIONS	03

PLANT SCHEDULE

CODE	SPECIES	COMMON NAME	POTSIZE	MAT HT	MAT SP	STAKE	QTY PER MODULE	TOTAL
SHADE TREES								
BAR acu	BARRINGTONIA acutangula	Stream Barringtonia	45L					16
BAR asi	BARRINGTONIA asiatica	Asian Barringtonia	45L					8
BAR cal	BARRINGTONIA calyptrata	Cassowary Pine	45L					9
PT1								
LOM hys	LOMANDRA hystrix	creek Mat-rush	140mm		3m²			382
PT2								
SHADE TREES - S								
DIL ala	DILLENIA alata	Red Beech	140mm	15m	8m	No	1	30
LARGE TREES / SHRUBS - C								
PHY cus	PHYLLANTHUS cuscutiflorus	Pink Phyllanthus	140mm	4m	3m	No	4	120
MEL rub	MELICOPE rubra	Little Evodia	140mm	6m	4m	No	2	60
ACM hem	ACMENA hemilampra	Broad Leaf Lilly Pilly	140mm	8m	4m	No	2	60
GRE bai	GREVILLEA baileyana	White Oak	140mm	10m	8m	No	Max 2	48
SYZ aus	SYZYGIUM australe	Scrub Cherry	200mm	10m	8m	No	Max 2	6
SYZ res	SYZYGIUM resilience	Resilience Lilly Pilly	140mm	4m	2m	No	Max 2	6
MEDIUM SHRUBS - B								
LEE ind	LEEA indica	Bandicoot Berry	140mm	4m	3m	No	4	120
CAL end	CALLISTEMON "endeavour"	Bottlebrush	140mm	3m	3m	No	Max 2	9
CAL d.r.	CALLISTEMON "dawson river"	Dawson River Weeper	140mm	3m	3m	No	Max 2	9
CAL c.p.	CALLISTEMON "candy pink"	Bottlebrush	140mm	3m	3m	No	Max 2	9
CAL w.f.	CALLISTEMON "wild fire"	Bottlebrush	140mm	3m	3m	No	Max 2	62
CAL w.w.	CALLISTEMON "wilderness white"	Bottlebrush	140mm	3m	3m	No	3	90
SMALL SHRUBS - A								
LOM hys	LOMANDRA hystrix	Mat Rush	140mm	1m	1m	No	10	300
LAP fa	LEPTOSPERMUM flavescens "Cardwell"	Leptospermum	140mm	2.5m	2m	No	4	120
PHY lam	PHYLLANTHUS lamprophyllus	Pascoe River	140mm	1.5m	2m	No	4	120
XAN ver	XANTHOSTEMON verticillatus	Little Penda	140mm	2m	1m	No	2	60
PT3								
LOM hys	LOMANDRA hystrix	Creek Mat-rush	140mm		3m²			108
PHY cus	PHYLLANTHUS cuscutiflorus	Pink Phyllanthus	300mm					12
CUP ana	CUPANIOPSIS anacardioides	Tuckeroo	45L					3

The Contractor shall review the plant schedule to ensure that drawings and schedules concur. Where insufficient detail or discrepancies may exist on either the plans or the schedule, it is the Contractors responsibility to resolve immediately with the Landscape Architect and prior to providing Tender pricing, signing work contracts or commencement of works.

IMPORTANT NOTE

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b. any inaccuracies or other faults with information or data sourced from a Third Party;
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d. the Client or any Third Party not verifying information in this plan where recommended by Landplan LA;
e. lodgement of this plan with any local authority against the recommendation of Landplan LA
f. the accuracy, reliability, suitability or completeness of any estimates or approximations made or referred to by Landplan LA in this plan.

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Refer to - Civil Engineer's drawings for service locations. All services are to be verified on site prior to any excavation / construction. Trees to be located minimum 1m from services. All services are indicative only

Final set-out for all landscape treatments to be confirmed on site by the Landscape Architect.
Unless shown on the landscape drawings, refer to Structural Engineer's drawings for jointing, reinforcement, structural fixings etc for all walls and pavements.
All trees marked within / adjacent to vehicle sightlines are to be set out on site prior to installation and approved by the Landscape Architect and Traffic Engineer.
For Lighting requirements refer Electrical Engineers drawings.
The contractor shall review the plant schedule to ensure that drawings and schedules concur. Where insufficient detail or discrepancies may exist on either the plans or the schedule, it is the contractors responsibility to resolve immediately with the Landscape Architect and prior to providing tender pricing, signing work contracts or commencement of works.

GENERAL NOTES:

1. Refer to Engineers' drawings for finished surface levels unless shown on Landscape drawings. Retain existing levels to buildings and adjacent surfaces except where instructed by the superintendent. All new finished surfaces are to align flush with existing surface levels.
2. Refer to Engineers' drawings for path and kerb crossover setting out, service locations, jointing and conduiting in pavement, all structural fixings and reinforcements to pavements and walls etc., lighting and hydraulic elements.
3. Final setout for all landscape treatments to be confirmed on site by the superintendent.

UNDERGROUND SERVICES:
The locations of underground services are approximate only and their exact location should be determined on site. No guarantee is given that all existing services are shown.

TREE SETTING OUT PRINCIPLES:
Trees are to be planted in accordance with FNQROC Design Guidelines D9 - Landscaping, at the following spacings:

- 4.0m min. from electricity or telecommunications poles or pillars
- 7.5m min. from streetlights
- 4.0m radius from high voltage transmission lines
- 2.0m from stormwater pits
- 0.8 - 1.0m from back of kerb
- 3.0m min. from driveway
- 10m min. from the face of the kerb of the adjoining street

NOTE
PLANS HAVE BEEN PREPARED WITHOUT ELECTRICAL DESIGN. TREES MAY NEED TO BE SITE LOCATED TO MEET FNQROC REQUIREMENTS REGARDING LIGHT POLES.

rev. no	description	date	drawn
01	PRELIMINARY	27/09/2019	DE
02	OPERATIONAL WORKS	09/10/2019	SM
03	OPERATIONAL WORKS	08/11/2019	SM

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p 0439 005 294 | e simon@landplanla.com.au | PO Box 781 Bungalow 4870

drawn	approved	date
D.E.	S.M.	08/11/2019

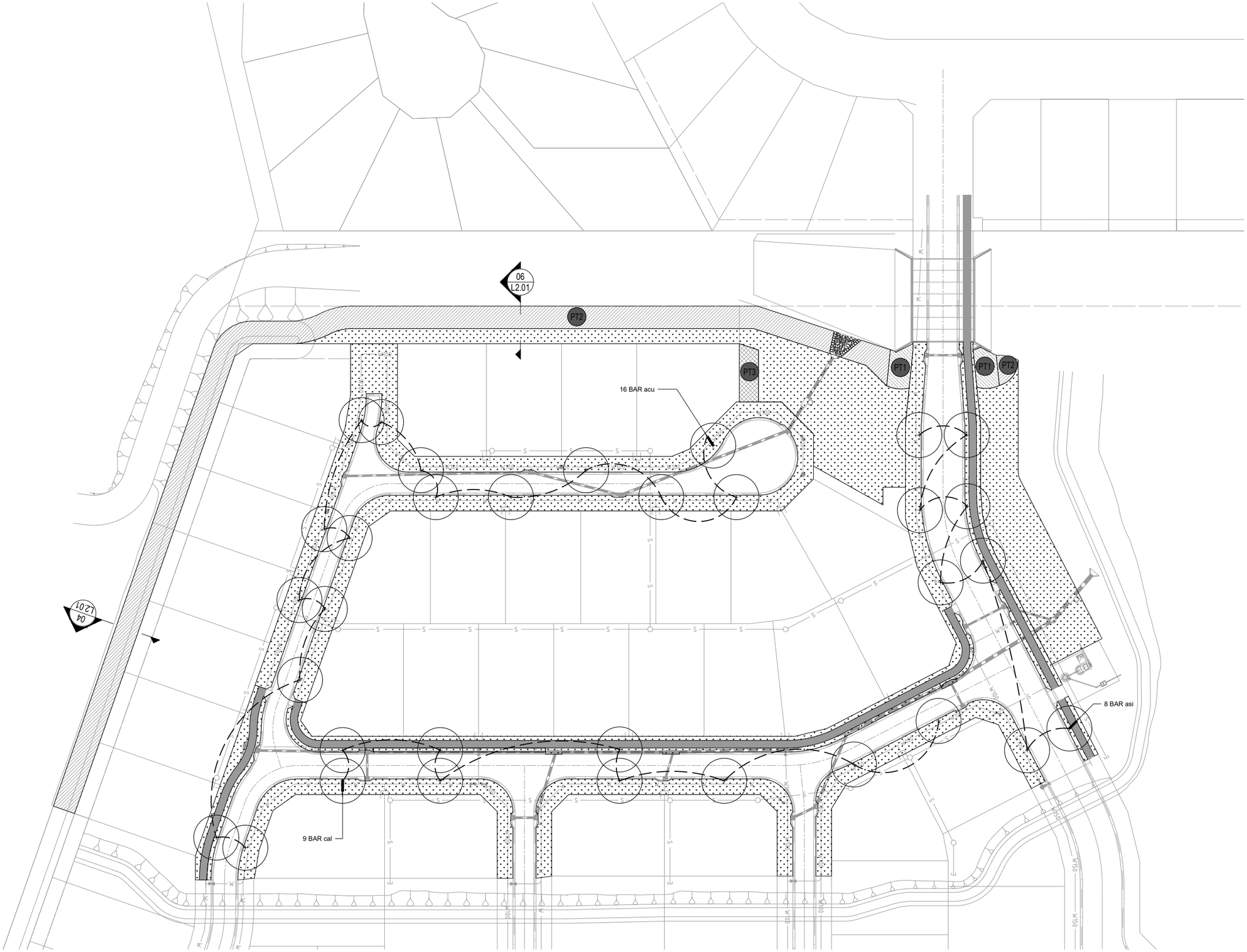
scale (AT A1 SIZE SHEET) 0

client: PORT DOUGLAS LAND DEVELOPMENT PTY LTD
project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
title: COVER SHEET

project number: 1902-016/CD
drawing number: L0.01
rev: 03
northpoint

LEGEND

- PROPOSED TREE. REFER PLANT SCHEDULE
- NEW TURF OVER TOPSOIL & CULTIVATED SUBGRADE AS SPECIFIED
- PLANTING TYPE 1 (PT1)
- PLANTING TYPE 2 (PT2)
- PLANTING TYPE 3 (PT3)



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01	PRELIMINARY	27/09/2019	DE
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client: PORT DOUGLAS LAND DEVELOPMENT PTY LTD

project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

title: LANDSCAPE PLAN

project number: 1902-016/CD

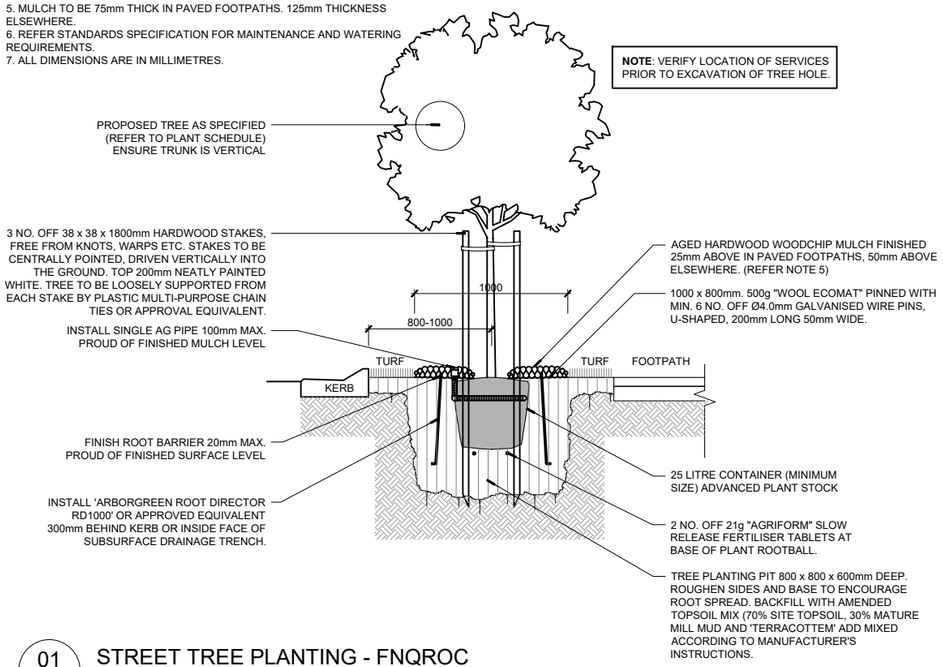
drawing number: L1.01

rev: 02

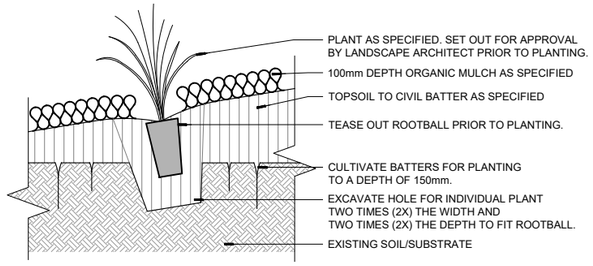
northpoint

NOTES:

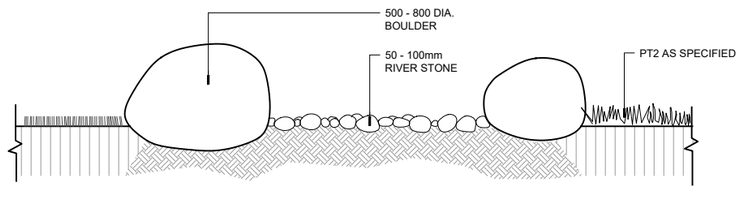
1. FOR LOCATION AND SPECIES OF TREES REFER PROJECT DRAWINGS.
2. PRIOR TO PLANTING ALL WEEDS SHALL BE KILLED BY SPRAYING A SUITABLE GLYPHOSATE BASED HERBICIDE. SPRAYED AREA SHALL REMAIN UNDISTURBED FOR TWO WEEKS.
3. EXCAVATED PLANTING HOLE SHALL ALLOW FOR A MINIMUM 100mm CLEARANCE AROUND THE ROOTBALL. BASE OF HOLE TO BE RIPPED TO 150mm DEPTH TO PROMOTE DRAINAGE.
4. TOP OF ROOTBALL TO BE FINISHED FLUSH WITH EXISTING GROUND LEVEL.
5. MULCH TO BE 75mm THICK IN PAVED FOOTPATHS. 125mm THICKNESS ELSEWHERE.
6. REFER STANDARDS SPECIFICATION FOR MAINTENANCE AND WATERING REQUIREMENTS.
7. ALL DIMENSIONS ARE IN MILLIMETRES.



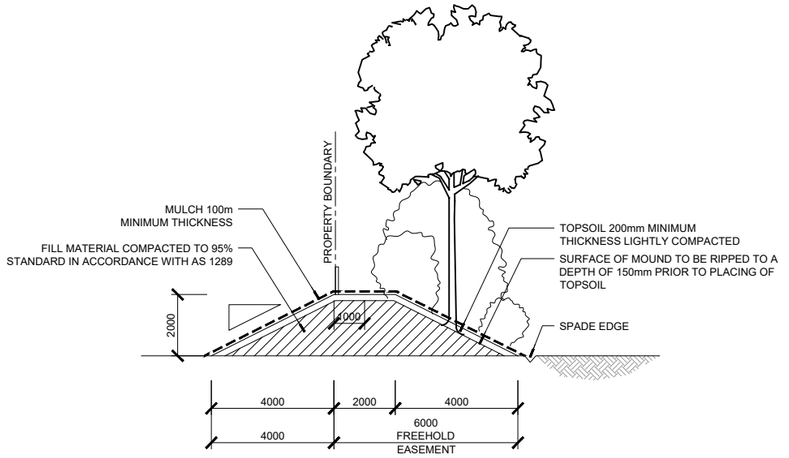
01 STREET TREE PLANTING - FNQROC
SCALE 1:20



02 PT2 PLANTING - BATTER PLANTING
SCALE 1:10

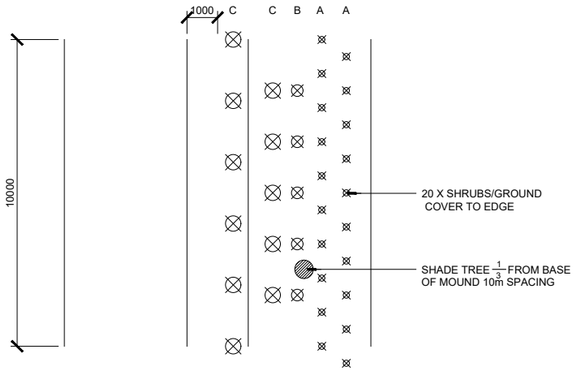


03 STORM WATER - OUTLET DETAIL
SCALE 1:10

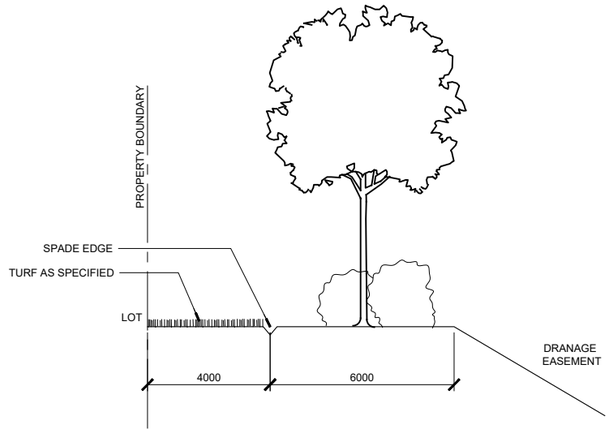


04 BUFFER MOUND - SECTION 1
SCALE 1:100

07 PLANTING DETAIL - PT3
SCALE 1:100



05 PT 2 - PLANTING LAYOUT
SCALE 1:100



06 SECTION - 2
SCALE 1:100

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D.E.	S.M.	09/10/2019

scale (AT A1 SIZE SHEET) 0

client: PORT DOUGLAS LAND DEVELOPMENT PTY LTD
project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
title: STANDARD DETAILS

project number: 1902-016/CD
drawing number: L2.01
rev: 02
northpoint

SPECIFICATIONS

SCOPE OF WORK

The work includes the organisation for and supply of all relevant labour, materials, plant and equipment as required to execute the works.

The scope of work includes but is not limited to the following:

- Trimming of areas to be landscaped;
- Removal of deleterious material;
- Cultivation;
- Supply and spreading of additives;
- Supply and installation of imported topsoil;
- Supply and installation of mulch;
- Planting; and
- Maintenance.

WORKS BY OTHERS

- All hard pavement
- Retaining walls
- All fencing types
- Subsoil drainage

EARTHWORKS

Earthworks shall involve the removal of existing compacted material, the cultivation of subsoil, the supply and mixing in of additives, the supply and spreading of topsoil and the fine grading of such soil and existing soil profiles to all landscaped areas to form the finished levels and profiles.

Finished surfaces shall finish flush with adjacent surfaces.

Preparation

Eradicate all weeds using environmentally acceptable methods, such as non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Maintain all areas in a weed free state for the duration of the contract and Plant Establishment periods.

Cultivation

Excavate and remove from site compacted fill resulting from the building works. Cultivate all planting and turf areas to a depth of 150mm and place 100g/m2 of Blood and Bone and 100g/m2 of Gypsum.

IMPORTED TOPSOIL (FOR PLANTING)

Import and spread premium topsoil mix . Soil shall be free of weeds, sticks, rocks and other deleterious matter. Imported topsoil is to comply with AS4419.

MULCH

Mulch to be spread evenly across all planting areas. Mulch to planting areas shall be approved rainforest mulch free of soil, stones, weeds, rubbish or any other deleterious materials. Spread mulch to garden bed areas to a depth of 75mm, to finish 20mm below adjacent surfaces. Keep mulch clear of plant stems. Spread mulch following planting and watering in. Avoid mixing of soil and mulch materials. Do not use recycled garden mulch. Mulch to comply with AS4454.

PLANTING AREAS

Finished soil depth to all garden areas shall be 300mm crowned towards centre of beds ensuring positive falls to drainage structures. Use 'Agriform' 10g fertilizer tablets (or approved equivalent) to base of all plant root balls at manufacturer's recommended rate.

PLANTS

Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage;
- Vigorous well-established stock free from pests and diseases, of good form consistent with the pot size, species or variety;
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Label at least one plant from each species in a batch with a durable, readable tag. Plant stock immediately after it is delivered to site. For all plant stock excavate a hole twice the diameter of the rootball and at least 200mm deeper than the rootball. Loosen compacted sides and base of holes to prevent confinement of root growth. Fill all holes to half deep with water in advance of planting, allowing time for water to soak away. After planting, fill hole with amended/imported soils.

STAKES AND TIES

All 45L stock and larger are to be staked and tied.

TIMBER EDGE

To be located in ALL areas between turfed areas and PT3 planting beds. Supply and install in accordance with the details and the drawings.

Installation:

Set edging's flush with adjoining surfaces to define planting to turf or turf/reinforced turf junctions. Fix to pegs with galvanized nails, two per fixing. Drive pegs into the ground at 1500mm max centres on both sides of joints between boards, with peg tops 15mm below the top of the edging. Refer to details.

CONDUITS

The contractor is responsible for co-ordination with the building contractor to ensure that conduits under proposed paved or concreted areas have been installed. Conduits for irrigation purposes shall be 90mm PVC pipe - top min. 250mm below finished surface levels.

CONCRETE EDGING

To be located in areas between turfed/garden areas and gravel (PT1), as indicated on the drawings. Supply and install in accordance with the details and the drawings.

Installation:

Set top of edge strip to be flush with the surface level of surrounding turf. Install 100mm x 100mm depth concrete edging strip as detailed.

TURF AREAS

Spread 50mm layer of imported topsoil to all nominated turf areas.

Install an A-grade green couch that is weed free.

PLANTING ESTABLISHMENT

Establish and maintain the works for a period of thirteen (13) weeks from the Date of Practical Completion.

Establishment shall include the care of the contract areas by accepted horticultural practices, as well as rectifying any defects that become apparent in the works under normal 'use'. This shall include, but not be limited to, the following works:

- Repair and/or replace any defects due to failure and/or inferior quality materials and/or workmanship;
- Replace plants that have failed and/or have been damaged or died;
- Weed and pest control;
- Maintain all landscape areas in a neat and tidy condition at all times;
- Maintain fertilising and pruning as required;
- Check and adjust levels to attain those specified by addition or removal of mulch and/or topsoil.

All planted beds are to be weeded to maintain same in a grass and weed free environment. Carry out any other work that is specified or is necessary to establish the landscape works in a first class condition.

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drawn	approved	date
D.E.	S.M.	08/11/2019

scale (AT A1 SIZE SHEET) 0

client: PORT DOUGLAS LAND DEVELOPMENT PTY LTD

project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

title: STANDARD SPECIFICATIONS

project number: 1902-016/CD

drawing number: L3.01

rev: 03

northpoint

From:	Maurice Sheehan
To:	jenny.elphinstone@douglas.qld.gov.au
Cc:	Daniel Favier; Rob Wheeler; Jarred Doyle; Zac McCosker
Subject:	Proposed Craiglie Sudivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Date:	Tuesday, 2 July 2019 12:49:00 PM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png Blocked Mit N DEV 100yr CC Impacts.pdf Decision Notice.pdf

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Good Afternoon Jenny,

We have undertaken further flood modelling as requested in Condition #13 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

We note the following:

- Please see the attached flood modelling plan for a culvert crossing arrangement of 7 x 2.7m wide x 900mm RCBC in a 50% blocked scenario.
  The 100% blocked scenario has an increased flood depth on Dulku Close of approx. 10mm higher and has similar extents.
  This scenarios afflux affects the tailwater levels of the existing Q100 underground stormwater drainage which outlets to the west of the proposed culvert crossing.
  This in turn backs up onto Dulku Close increasing the water level for Q100cc by 27 mm approx.
- Alternatively, for 1.2m+ high boxes (previously modelled), for a 100% blockage scenario the affects to Dulku Close are worse than 900mm high boxes of similar aperture area due to the higher road level required.
- An arrangement of RCBC's wider than 7 x 2700mm x 900mm high boxes would result in excessive channel works to accommodate additional boxes & wingwalls etc.
- Boxes less than 900mm high result in low trafficable flood immunity.
  For the 900mm high RCBC arrangement, Q2 goes over by about 50mm, Q5 by 100 mm and Q10 by 180 mm.
  For RCBC's less than 900mm high the traffic immunity would be Q5 or less.
- We note the culverts under the Captain Cook Highway immediately upstream are 5 x 1.5 m wide x 1 m high RCBC's.
  As such, we suggest modelling the culverts with a 100% blockage factor, as suggested in QUDM, is overly conservative.

Based on the above, if Council require 100% blockage scenarios for the culvert arrangements, a bridge should be considered as there is no reasonable arrangement of RCBC's which can meet 100% blockage factor requirement due to the existing constraints of the site.

With consideration of the above information, and particularly noting:

- the culverts crossing the Captain Cook Highway immediately upstream (approx. 250m to the west) are much smaller arrangement of 5 x 1.5 m x 1 m high RCBC's
- the proposed drainage reserve will be regularly mowed and maintained;

We request Councils advice regarding possibly reducing the blockage factor requirements for a new culvert arrangement utilising 7 x 2.7m wide x 900mm high RCBCs
We suggest a blockage factor of 0% would be reasonable based on the above information.

- If this is not acceptable, a bridge would need to be considered.
  - If a bridge is Councils preference, we request Councils advice regarding acceptable blockage factors for modelling a new bridge with the following specifications:
    - Span = 15m
    - Depth to invert = 1m+

The construction cost of these options are estimated as follows:

- 7 x 2.7m wide x 900mm high RCBCs and associated channel works **– $500,000 to $600,000** (Source – Similar arrangement of boxes in construction in Cairns - 4 x 2.7m x 900mm high)
- 15m span bridge **– $1.2m - $1.5m** (Source – Contractor costings for a proposed bridge in Ingham)

The design of the Stage 1 subdivision is nearing completion and the civil designers are awaiting advice regarding this crossing configuration.
Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
SENIOR CIVIL ENGINEER
CARDNO

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Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

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CONNECT WITH CARDNO

From: Maurice Sheehan
To: jenny.elphinstone@douglas.qld.gov.au
Cc: Jarred Doyle; Rob Wheeler; Zac McCosker
Subject: FW: RE: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Date: Friday, 2 August 2019 4:08:00 PM
Attachments: Ex_Nth_Fill-Ex.pdf
D02-E01 20% Blockage.pdf
Transverse Trafficability.png
O144033_001 (Signed).pdf
image001.jpg
image002.png
image003.png
image004.png
image005.png

Hi Jenny,

Please see the following information in relation to Councils request for additional information related to the Flood Modelling undertaken for the proposed Craiglie Subdivision.

- The rear of lot levels along the northern side of the existing drain south of Dulku Close were picked up during the detailed survey undertaken recently.
  Further information regarding the lot levels along Wabul St were taken from an "as constructed" survey of Wabul St works in 2015(attached). This surface information has been included in the flood modelling.
- As requested, we have updated the model to include an assumed "fully developed site (by others)" at the proposed extension of the Jiwal Jiwal St stub (Lot X) to the NE of the proposed Craiglie Subdivision.
  See PDF attached "Ex Nth Fill-Ex". This is the existing case assuming the existing channel is maintained and Lot X has been fully developed.
  As can be seen from the plan, the development of Lot X (by others) results in significant impacts to the properties both North and South of Lot X.
  Due to backwater affects, the development of Lot X also increases the flood depth at the proposed Wabul St culvert crossing by approx. 180mm and also results in impacts to Dulku Close.
  As such, it is reasonable to assume any development of Lot X would require additional flood mitigation measures in the channel adjacent Lot X.
  It should be noted that there are no adverse effects shown at the rear of the existing lots along Milman Drive in the flood modelling for the fully developed case.
- We have undertaken further modelling as discussed at the meeting on Tuesday, 23rd July at Council Mossman Offices.
  The PDF attached (D02-E01 - 20% Blockage) describes the difference in the existing case (incl developed Lot X.) and the fully developed Craigle Subdision with a 20% blockage factor applied to the culver crossing.
  For a culvert configuration of 7 x 2.7m x 0.9m high RCBC's, the following table describes the difference in the ultimate state fully developed Craiglie Subdivision and the Existing Scenario (including fully developed Lot X).

Dulku Close Impacts - Increase in WSE (mm)							
	Event						
Blockage Factor (%)	Q100CC	Q100	Q50	Q20	Q10	Q5	Q2
100	110	206	200	189	205	192	165
70	66	45	49	43	45	7	0
50	46	0	0	0	0	0	0
30	36	0	0	0	0	0	0
20	33	0	0	0	0	0	0

  It should be noted that, due to the increased backwater affects caused by the filling of lot X (assumed existing case), the impacts on Dulku Close have changed (compared to undeveloped Lot X scenario previously presented).
  As can be seen in the table, there are minimal affects to Dulku Close when blockage factors less than 50% are applied to the proposed Wabul St Culvert Crossing.
- Generally, the current culvert configuration (7 x 2.7m x 0.9m RCBCs), provides the optimum solution in terms of road serviceability and impacts on Dulku Cl.
  The table below describes the trafficability of the road as with the parameters advised in QDUM , Table 7.4.5 (snippet attached).

	Blockage Factor	Event					
		Q100CC	**Q100**	**Q050**	**Q020**	**Q10**	**Q2**
Flow Depth over the Road (m)	20%	0.361	0.241	0.211	0.197	0.166	0.013
Velocity (m/s)	20%	1.367	1.139	1.007	0.952	0.433	0.311
Depth Velocity Product (m2/s)	20%	0.4935	0.274499	0.212477	0.187544	0.071878	0.004043

The impacts recorded as shown in the table above can potentially be reduced via additional drainage improvements downstream of the culvert location which would be considered necessary as part of the development of Lot X (by others).

It should be noted that the above parameters relate to standard vehicle trafficability. Emergency vehicles and higher clearance vehicles would still be able to safely traverse the culvert in the larger events.

It should also be noted that the modelling provided is considered conservative for the following reasons:

- We have included a fully developed Lot X in the existing scenario model without any channel improvements that would be needed for the appropriate development of that lot.

- We have assumed all of the flow from the ultimate Craiglie Subdivsion will flow to the northern drain. It is expected at least 50% of the ultimate Craiglie development could outlet to the southern drain or alternatively to the south east of Lot X.

With regard to the culvert sizes and appropriate blockage factors we note the following:

- Boxes 1200mm high will cause flood water to flow down Milman Dr in a 100% blocked scenario due to the higher road crossing level required compared to lower culverts.
- 600mm boxes will be hard to maintain (sedimentation etc) and more prone to blockage. They will also result in significantly reduced trafficability of the culvert crossing.
- The culverts under the Captain Cook Highway immediately upstream are 5 x 1.5 m wide x 1 m high RCBC's
    - the total aperture area is approx. 7.5m^2
    - the individual cell aperture is approx 1.5m^2

  As such, the proposed culvert arrangement would have a significantly less likelihood of blockages due to:
    - the larger overall aperture area (proposed 17m^2 vs existing culverts immediately upstream = 7.5m^2).
    - the individual cell aperture area (proposed 2.43m^2 vs existing culverts immediately upstream = 1.5m^2).

Please give me a call to discuss if you have any further queries regarding the above information.
The client is eager to progress the design of the subdivision.
We request Councils advice regarding our proposed culvert Configuration in order to finalise our Flood Modelling and Reporting in a timely manner.

Maurice Sheehan
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CONNECT WITH CARDNO

From:	Maurice Sheehan
To:	jenny.elphinstone@douglas.qld.gov.au
Cc:	Rob Wheeler; Harj Singh; Daniel Favier; Jarred Doyle
Subject:	Proposed Craiglie Sudivision - Stage 1A and 1B - Road Safety Audit and Traffic Impact Assessment - Condition 6 of Councils Decision Notice ROL 2966/2018
Date:	Monday, 8 July 2019 10:48:00 AM
Attachments:	image001.png image002.jpg image003.png image004.png image005.png image006.png Q184103 Existing Road - Road Safety Audit.pdf Q184103-Traffic Engineering Report.pdf Decision Notice.pdf

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Good Morning Jenny,

We have undertaken the Road Safety Audit and associated Traffic Impact Assessment as requested in Condition #6 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

The Road Safety Audit has identified various issues with the existing road network in the vicinity of the Captain Cook Highway / Beor St Intersection.
Recommendations for remedial action and prioritisation of the works are also included.

The Traffic Impact Assessment has determined the proposed Stage 1A and 1B can be constructed without requiring upgrades to the existing Milman Drive or the Beor St / Captain Cook Highway Intersection.
However, upon construction of 238 new lots accessing Milman Drive, the following would be required:

- Construction of a new intersection onto the Captain Cook Highway from the southern end of the site
  OR
- Upgrade the Milman Drive carriageway to a higher order collector road.

Additionally, upon construction of 270 new lots accessing Milman Drive, the following would be required:

- Construction of a new intersection onto the Captain Cook Highway from the southern end of the site
  OR
- Upgrade the Beor St Intersection with the Captain Cook Highway generally as described in the report.

We note the Decision Notice states the following related to the Beor St / Captain Cook Highway Intersection (Condition 6b):

As the Road Safety Audit has determined the existing road has various safety issues unrelated to the proposed Stage 1A & Stage 1B, we suggest it is unreasonable for the developer to bear the cost of the design and construction of these upgrades.
Further, there have been no additional external road upgrades identified as required due to the construction of Stage 1A & 1B works.

Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
SENIOR CIVIL ENGINEER

CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO    

From:	Maurice Sheehan
To:	Jenny Elphinstone
Cc:	Rob Wheeler; Zac McCosker; Jarred Doyle; Daniel Favier
Subject:	RE: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Date:	Monday, 15 July 2019 11:49:00 AM
Attachments:	O184103-005-SK-01.pdf image001.jpg image002.png image003.png image004.png image005.png

Hi Jenny,

As discussed on Friday afternoon, please see attached the updated sketch of the culvert crossing. The sketch shows the configuration of the 7 x 2.7m wide x 0.9m high RCBC's with flood level depths for a 100% blocked scenario.

As discussed in the original email, for a 100% blocked culvert scenario, this arrangement results in an increased water level in Dulku Close for a Q100cc event of 27 mm approx.
There is no reasonable alternative culvert arrangement which results in improved flood levels at Dulku Close.

To improve the results to Dulku Close for a 100% blocked culvert scenario, we would have to bring the road deck level down to increase the flow capacity over the road, thereby reducing the culvert leg height.
This scenario would actually result in an increased likelihood of blockage due to the reduced culvert height. In addition, this arrangement has a reduced trafficable flood immunity.

As advised in the previous email, we recommend, based on the extensive flood modelling completed to date, the optimal arrangement is 7 x 2.7m wide x 0.9m high RCBC's with no blockage factor which is considered reasonable based on the information provided in the original email.

As discussed on Friday last, I confirm our availability for a meeting on Thursday (18th July) to discuss this in more detail.

Please let me know if you would like to discuss further.

Maurice Sheehan
SENIOR CIVIL ENGINEER
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Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Sent: Monday, 8 July 2019 8:29 AM

To: Maurice Sheehan <maurice.sheehan@cardno.com.au>
Cc: Rob Wheeler <robert.wheeler@cardno.com.au>; Daniel Favier <daniel.favier@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Morning Maurice,

Council acknowledges receipt of the email dated 2 July and advice regarding the culvert on Wabul Drive extension.
The discussion of results does not have sufficient supporting information for Council to consider the advice provided.

With reference to the Development Approval Conditions 13.a. to 13.e; the information sought in these conditions is considered relevant to the current considerations.
Specifically, the information on the proposed channel profile and culvert configuration (including road surface level) is required to understand the solution and show that it represents an acceptable outcome in terms flooding risk to existing and future properties. That is, Council is unable to Assess and therefore support a crossing configuration without the information requested in Condition 13, items a. to e.

Council Officers are willing to meet to discuss the proposed 7/2700x900 RCBC Option to expedite the review process.

To inform a meeting with Council Officers the following information is required.

1. A plan and cross section drawings of the proposed 7/2700x900 RCBC option showing the proposed arrangement. That is, revision to the previous culvert arrangement plan provided to Council (Drawing No. Q184103-005-SK-01 Revision 2). The revised arrangement plan should show:
   - Proposed road deck level and wingwall top level relative to the channel invert;
   - Ramping of the road level outside of the alignment of the drainage corridor as per Council's previous request (Condition 13. f.);
   - Existing lot levels on the north side and proposed development levels on the south in the immediate vicinity of the culvert. (Advice on how the model DEM levels compare to constructed levels is also required);
   - Extent of channel widening required proposed either side of the culvert; and
   - Extent of rock scour protection required.
2. The geometry data used for the recently provided flood modelling plan (attached) as per the information requested in Development Approval Condition 13.d. The cross sections should show the peak flood level relative to existing lot levels on the north side and proposed development levels on the south.
3. Advice on the path of culvert overflows, e.g. do overflows re-enter the downstream channel or do they enter the existing development to the north or proposed development to the south?

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Tuesday, 2 July 2019 12:51 PM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Cc: Daniel Favier <daniel.favier@cardno.com.au>; Rob Wheeler <robert.wheeler@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Doc 909075 Proposed Craiglie Sudivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Afternoon Jenny,

We have undertaken further flood modelling as requested in Condition #13 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

We note the following:

- Please see the attached flood modelling plan for a culvert crossing arrangement of 7 x 2.7m wide x 900mm RCBC in a 50% blocked scenario.
  The 100% blocked scenario has an increased flood depth on Dulku Close of approx. 10mm higher and has similar extents.
  This scenarios afflux affects the tailwater levels of the existing Q100 underground stormwater drainage which outlets to the west of the proposed culvert crossing.
  This in turn backs up onto Dulku Close increasing the water level for Q100cc by 27 mm approx.
- Alternatively, for 1.2m+ high boxes (previously modelled), for a 100% blockage scenario the affects to Dulku Close are worse than 900mm high boxes of similar aperture area due to the higher road level required.
- An arrangement of RCBC's wider than 7 x 2700mm x 900mm high boxes would result in excessive channel works to accommodate additional boxes & wingwalls etc.
- Boxes less than 900mm high result in low trafficable flood immunity.
  For the 900mm high RCBC arrangement, Q2 goes over by about 50mm, Q5 by 100 mm and Q10 by 180 mm.
  For RCBC's less than 900mm high the traffic immunity would be Q5 or less.
- We note the culverts under the Captain Cook Highway immediately upstream are 5 x 1.5 m wide x 1 m high RCBC's.
  As such, we suggest modelling the culverts with a 100% blockage factor, as suggested in QUDM, is overly conservative.

Based on the above, if Council require 100% blockage scenarios for the culvert arrangements, a bridge should be considered as there is no reasonable arrangement of RCBC's which can meet 100% blockage factor requirement due to the existing constraints of the site.

With consideration of the above information, and particularly noting:

- the culverts crossing the Captain Cook Highway immediately upstream (approx. 250m to the west) are much smaller arrangement of 5 x 1.5 m x 1 m high RCBC's
- the proposed drainage reserve will be regularly mowed and maintained;

We request Councils advice regarding possibly reducing the blockage factor requirements for a new culvert arrangement utilising 7 x 2.7m wide x 900mm high RCBCs

We suggest a blockage factor of 0% would be reasonable based on the above information.

- If this is not acceptable, a bridge would need to be considered.
    - If a bridge is Councils preference, we request Councils advice regarding acceptable blockage factors for modelling a new bridge with the following specifications:
        - Span = 15m
        - Depth to invert = 1m+

The construction cost of these options are estimated as follows:

- 7 x 2.7m wide x 900mm high RCBCs and associated channel works **– $500,000 to $600,000** (Source – Similar arrangement of boxes in construction in Cairns - 4 x 2.7m x 900mm high)
- 15m span bridge **– $1.2m - $1.5m** (Source – Contractor costings for a proposed bridge in Ingham)

The design of the Stage 1 subdivision is nearing completion and the civil designers are awaiting advice regarding this crossing configuration.
Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
SENIOR CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From:	Maurice Sheehan
To:	Jenny Elphinstone
Cc:	Rob Wheeler; Jarred Doyle; Harj Singh; Zac McCosker
Subject:	RE: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Date:	Wednesday, 17 July 2019 10:57:00 AM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png

Thanks Jenny,

I'm available.

See you then.

Maurice Sheehan
SENIOR CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Sent: Wednesday, 17 July 2019 10:54 AM
To: Maurice Sheehan <maurice.sheehan@cardno.com.au>
Subject: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Importance: High

Hi Maurice,
Please advise of your availability to meet next Tuesday 23 July at 10.00 at Council's Mossman Office to further discuss and clarify issues related to the proposed subdivision.
Council will have Paul Steele attending the meeting.

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council

P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Monday, 15 July 2019 11:49 AM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Cc: Rob Wheeler <robert.wheeler@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Daniel Favier <daniel.favier@cardno.com.au>
Subject: Doc 910488 RE: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Hi Jenny,

As discussed on Friday afternoon, please see attached the updated sketch of the culvert crossing. The sketch shows the configuration of the 7 x 2.7m wide x 0.9m high RCBC's with flood level depths for a 100% blocked scenario.

As discussed in the original email, for a 100% blocked culvert scenario, this arrangement results in an increased water level in Dulku Close for a Q100cc event of 27 mm approx.
There is no reasonable alternative culvert arrangement which results in improved flood levels at Dulku Close.

To improve the results to Dulku Close for a 100% blocked culvert scenario, we would have to bring the road deck level down to increase the flow capacity over the road, thereby reducing the culvert leg height.
This scenario would actually result in an increased likelihood of blockage due to the reduced culvert height. In addition, this arrangement has a reduced trafficable flood immunity.

As advised in the previous email, we recommend, based on the extensive flood modelling completed to date, the optimal arrangement is 7 x 2.7m wide x 0.9m high RCBC's with no blockage factor which is considered reasonable based on the information provided in the original email.

As discussed on Friday last, I confirm our availability for a meeting on Thursday (18th July) to discuss this in more detail.

Please let me know if you would like to discuss further.

Maurice Sheehan
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CONNECT WITH CARDNO

From: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Sent: Monday, 8 July 2019 8:29 AM
To: Maurice Sheehan <maurice.sheehan@cardno.com.au>
Cc: Rob Wheeler <robert.wheeler@cardno.com.au>; Daniel Favier <daniel.favier@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Morning Maurice,

Council acknowledges receipt of the email dated 2 July and advice regarding the culvert on Wabul Drive extension.
The discussion of results does not have sufficient supporting information for Council to consider the advice provided.

With reference to the Development Approval Conditions 13.a. to 13.e; the information sought in these conditions is considered relevant to the current considerations.
Specifically, the information on the proposed channel profile and culvert configuration (including road surface level) is required to understand the solution and show that it represents an acceptable outcome in terms flooding risk to existing and future properties. That is, Council is unable to Assess and therefore support a crossing configuration without the information requested in Condition 13, items a. to e.

Council Officers are willing to meet to discuss the proposed 7/2700x900 RCBC Option to expedite the review process.

To inform a meeting with Council Officers the following information is required.

1. A plan and cross section drawings of the proposed 7/2700x900 RCBC option showing the proposed arrangement. That is, revision to the previous culvert arrangement plan provided to Council (Drawing No. Q184103-005-SK-01 Revision 2). The revised arrangement plan should show:
   - Proposed road deck level and wingwall top level relative to the channel invert;
   - Ramping of the road level outside of the alignment of the drainage corridor as per Council's previous request (Condition 13. f.);
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3. Advice on the path of culvert overflows, e.g. do overflows re-enter the downstream channel or do they enter the existing development to the north or proposed development to the south?

Should you require further assistance please do not hesitate to call or email via the contacts

below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Tuesday, 2 July 2019 12:51 PM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Cc: Daniel Favier <daniel.favier@cardno.com.au>; Rob Wheeler <robert.wheeler@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Doc 909075 Proposed Craiglie Sudivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Afternoon Jenny,

We have undertaken further flood modelling as requested in Condition #13 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

We note the following:

- Please see the attached flood modelling plan for a culvert crossing arrangement of 7 x 2.7m wide x 900mm RCBC in a 50% blocked scenario.
  The 100% blocked scenario has an increased flood depth on Dulku Close of approx. 10mm higher and has similar extents.
  This scenarios afflux affects the tailwater levels of the existing Q100 underground stormwater drainage which outlets to the west of the proposed culvert crossing.
  This in turn backs up onto Dulku Close increasing the water level for Q100cc by 27 mm approx.
- Alternatively, for 1.2m+ high boxes (previously modelled), for a 100% blockage scenario the affects to Dulku Close are worse than 900mm high boxes of similar aperture area due to the higher road level required.
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  As such, we suggest modelling the culverts with a 100% blockage factor, as suggested in QUDM, is overly conservative.

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With consideration of the above information, and particularly noting:

- the culverts crossing the Captain Cook Highway immediately upstream (approx. 250m to the west) are much smaller arrangement of 5 x 1.5 m x 1 m high RCBC's
- the proposed drainage reserve will be regularly mowed and maintained;

We request Councils advice regarding possibly reducing the blockage factor requirements for a new culvert arrangement utilising 7 x 2.7m wide x 900mm high RCBCs
We suggest a blockage factor of 0% would be reasonable based on the above information.

- If this is not acceptable, a bridge would need to be considered.
    - If a bridge is Councils preference, we request Councils advice regarding acceptable blockage factors for modelling a new bridge with the following specifications:
        - Span = 15m
        - Depth to invert = 1m+

The construction cost of these options are estimated as follows:

- 7 x 2.7m wide x 900mm high RCBCs and associated channel works **– $500,000 to $600,000** (Source – Similar arrangement of boxes in construction in Cairns - 4 x 2.7m x 900mm high)
- 15m span bridge **– $1.2m - $1.5m** (Source – Contractor costings for a proposed bridge in Ingham)

The design of the Stage 1 subdivision is nearing completion and the civil designers are awaiting advice regarding this crossing configuration.
Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
SENIOR CIVIL ENGINEER
CARDNO

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Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From:	Maurice Sheehan
To:	"jenny.elphinstone@douglas.qld.gov.au"
Cc:	Daniel Favier; Rob Wheeler
Subject:	Water and Sewer Network Model
Date:	Tuesday, 19 March 2019 11:05:00 AM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png

---

Hi Jenny,

As discussed on the phone, our water modellers have requested some information in order to respond to the RFIs received from Council (dated 6 February 2019) related to:

Development Application 2966/2018
Lot 2 Captain Cook Highway, Craiglie
Development on Lot 2 SR 431
Document ID: 887795

Do Council have a Sewer and Water network model which can be provided to our water team?

Maurice Sheehan
CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Maurice Sheehan
To: "jenny.elphinstone@douglas.qld.gov.au"
Subject: Water and Sewer Network Model
Date: Wednesday, 20 March 2019 10:02:00 AM
Attachments: image001.jpg
image002.png
image003.png
image004.png
image005.png

Hi Jenny,

Further to yesterdays query, do Council accept package pump stations? i.e Design and Construct Contracts.

Maurice Sheehan
CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Maurice Sheehan
Sent: Tuesday, 19 March 2019 11:05 AM
To: 'jenny.elphinstone@douglas.qld.gov.au' <jenny.elphinstone@douglas.qld.gov.au>
Cc: Daniel Favier <daniel.favier@cardno.com.au>; Rob Wheeler <robert.wheeler@cardno.com.au>
Subject: Water and Sewer Network Model

Hi Jenny,

As discussed on the phone, our water modellers have requested some information in order to respond to the RFIs received from Council (dated 6 February 2019) related to:

Development Application 2966/2018
Lot 2 Captain Cook Highway, Craiglie
Development on Lot 2 SR 431
Document ID: 887795

Do Council have a Sewer and Water network model which can be provided to our water team?

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Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Maurice Sheehan
To: jenny.elphinstone@douglas.qld.gov.au
Subject: Craiglie Subdivision
Date: Thursday, 22 August 2019 10:57:00 AM
Attachments: image001.jpg
image002.png
image003.png
image004.png
image005.png

Hi Jenny,

Just checking if we have any updates from Council regarding the proposed culvert configuration for the Wabul St Crossing?

Maurice Sheehan
SENIOR CIVIL ENGINEER
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Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From:	Maurice Sheehan
To:	"jenny.elphinstone@douglas.qld.gov.au"
Subject:	RE: Douglas Shire Council Advice ROL 2966/2018 Your Ref: Q184103, L2 Captain Cook Hwy, Craiglie
Date:	Tuesday, 26 March 2019 2:49:00 PM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png

Hi Jenny,

As discussed, the GHD reports do mention network models which GHD prepared.
Do Council have these models (or other Council models) on file in the form of a network model we can import into our modelling software?
We can accept a variety of formats.

The water engineers have advised it would be better to work with an accepted / calibrated version of Councils Water / Sewer system rather than starting from scratch with new assumptions etc.

Please let me know if you have any queries.

Maurice Sheehan
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Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Maurice Sheehan
Sent: Sunday, 24 March 2019 2:49 PM
To: 'Enquiries' <Enquiries@douglas.qld.gov.au>
Subject: RE: Douglas Shire Council Advice ROL 2966/2018 Your Ref: Q184103, L2 Captain Cook Hwy, Craiglie

Thanks Jenny!

Maurice Sheehan
CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com

From: Enquiries <Enquiries@douglas.qld.gov.au>
Sent: Sunday, 24 March 2019 1:30 PM
To: Maurice Sheehan <maurice.sheehan@cardno.com.au>
Subject: Douglas Shire Council Advice ROL 2966/2018 Your Ref: Q184103, L2 Captain Cook Hwy, Craiglie

Hi Maurice,

As previously advice please see the drop box link to Council doc 880014 & 864253 re: water information

https://www.dropbox.com/sh/cfurdam3y2hin8k/AACauUgHvFNbjH_eGl0CLBdha?dl=0

Please note this link will be removed in 10 working days.

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From:	Maurice Sheehan
To:	jenny.elphinstone@douglas.qld.gov.au
Cc:	Rob Wheeler; Harj Singh; Jarred Doyle
Subject:	RE: Proposed Craiglie Sudivision - Stage 1A and 1B - Road Safety Audit and Traffic Impact Assessment - Condition 6 of Councils Decision Notice ROL 2966/2018
Date:	Tuesday, 30 July 2019 10:42:00 AM
Attachments:	image007.jpg image008.jpg image009.jpg image015.png image001.jpg image002.png image003.png image004.png image005.png

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Hi Jenny,

Please find below our comments in relation to Councils request for additional information related to the Road Safety Audit / Traffic Impact Assessment undertaken for the proposed Craiglie Subdivision.

Query 1 – Existing Driveways @ Downing St / Milman Drive / Beor St Intersection

Both driveways (Plantation Resort access and Downing Street west of the Beor Street intersection) are currently operating on sections of road that are encountering very low traffic volumes. Sight distance is considered adequate. We will amend the Traffic Impact Assessment report to include a recommendation that, with the traffic increasing on the section of Beor St connecting to Captain Cook Highway, the Downing Street “driveway” should be formalised as a “Give Way” intersection and signed accordingly. This ‘driveway’ is actually a beginning section of the proposed Downing Street, which is supposed to be extended to the north.

Query 2 – Existing Milman Drive Issues

We have re-visited the video taken during the RSA visit and identified only one location where vehicles were parked on the Milman Drive (see photo below). Douglas Shire Council can apply their own residential parking rules in order to limit on-street parking on local roads. Otherwise, Queensland Road Rules apply which allows parking on local roads under certain conditions.

Please advise if Council have any further queries regarding these items.
We will amend and re-submit the Road Safety Audit and Traffic Impact Assessments as per the above amendments.

Maurice Sheehan
SENIOR CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Maurice Sheehan
Sent: Monday, 8 July 2019 10:51 AM
To: jenny.elphinstone@douglas.qld.gov.au
Cc: Rob Wheeler <robert.wheeler@cardno.com.au>; Harj Singh <harj.singh@cardno.com.au>; Daniel Favier <daniel.favier@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>
Subject: Proposed Craiglie Sudivision - Stage 1A and 1B - Road Safety Audit and Traffic Impact Assessment - Condition 6 of Councils Decision Notice ROL 2966/2018

Good Morning Jenny,

We have undertaken the Road Safety Audit and associated Traffic Impact Assessment as requested in Condition #6 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

The Road Safety Audit has identified various issues with the existing road network in the vicinity of the Captain Cook Highway / Beor St Intersection.
Recommendations for remedial action and prioritisation of the works are also included.

The Traffic Impact Assessment has determined the proposed Stage 1A and 1B can be constructed without requiring upgrades to the existing Milman Drive or the Beor St / Captain Cook Highway Intersection.
However, upon construction of 238 new lots accessing Milman Drive, the following would be required:

- Construction of a new intersection onto the Captain Cook Highway from the southern end of the site OR
- Upgrade the Milman Drive carriageway to a higher order collector road.

Additionally, upon construction of 270 new lots accessing Milman Drive, the following would be required:

- Construction of a new intersection onto the Captain Cook Highway from the southern end of the site OR
- Upgrade the Beor St Intersection with the Captain Cook Highway generally as described in the report.

We note the Decision Notice states the following related to the Beor St / Captain Cook Highway Intersection (Condition 6b):

As the Road Safety Audit has determined the existing road has various safety issues unrelated to the proposed Stage 1A & Stage 1B, we suggest it is unreasonable for the developer to bear the cost of the design and construction of these upgrades.
Further, there have been no additional external road upgrades identified as required due to the construction of Stage 1A & 1B works.

Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
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CONNECT WITH CARDNO

From:	Water & Wastewater
To:	Maurice Sheehan
Cc:	Jenny Elphinstone
Subject:	Whyanbeel and Mossman fire flow assessment from Stantec
Date:	Tuesday, 2 April 2019 4:12:50 PM
Attachments:	Whyanbeel and Mossman Fire Flow Assessment from Stantec.pdf

Hi Maurice,

Please see attached document.

If you require the model, you will need to approach Stantec.

Any other questions please do not hesitate to contact me at Douglas Shire Council.

Kind Regards

Peter White | **Water & Wastewater**
Operations | Douglas Shire Council
P: 07 4099 9466
M:04 2714 9966
E: Peter.White@douglas.qld.gov.au| **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front Street, Mossman Q

From:	Jenny Elphinstone
To:	Maurice Sheehan
Cc:	Rob Wheeler; Daniel Favier; Jarred Doyle; Zac McCosker
Subject:	Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Date:	Monday, 8 July 2019 8:30:07 AM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png Blocked Mit N DEV 100yr CC Impacts.pdf

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Good Morning Maurice,

Council acknowledges receipt of the email dated 2 July and advice regarding the culvert on Wabul Drive extension.
The discussion of results does not have sufficient supporting information for Council to consider the advice provided.

With reference to the Development Approval Conditions 13.a. to 13.e; the information sought in these conditions is considered relevant to the current considerations.
Specifically, the information on the proposed channel profile and culvert configuration (including road surface level) is required to understand the solution and show that it represents an acceptable outcome in terms flooding risk to existing and future properties. That is, Council is unable to Assess and therefore support a crossing configuration without the information requested in Condition 13, items a. to e.

Council Officers are willing to meet to discuss the proposed 7/2700x900 RCBC Option to expedite the review process.

To inform a meeting with Council Officers the following information is required.

1. A plan and cross section drawings of the proposed 7/2700x900 RCBC option showing the proposed arrangement. That is, revision to the previous culvert arrangement plan provided to Council (Drawing No. Q184103-005-SK-01 Revision 2). The revised arrangement plan should show:
   - Proposed road deck level and wingwall top level relative to the channel invert;
   - Ramping of the road level outside of the alignment of the drainage corridor as per Council's previous request (Condition 13. f.);
   - Existing lot levels on the north side and proposed development levels on the south in the immediate vicinity of the culvert. (Advice on how the model DEM levels compare to constructed levels is also required);
   - Extent of channel widening required proposed either side of the culvert; and
   - Extent of rock scour protection required.
2. The geometry data used for the recently provided flood modelling plan (attached) as per the information requested in Development Approval Condition 13.d. The cross sections should show the peak flood level relative to existing lot levels on the north side and proposed development levels on the south.
3. Advice on the path of culvert overflows, e.g. do overflows re-enter the downstream channel or do they enter the existing development to the north or proposed development to the south?

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Tuesday, 2 July 2019 12:51 PM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Cc: Daniel Favier <daniel.favier@cardno.com.au>; Rob Wheeler <robert.wheeler@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Doc 909075 Proposed Craiglie Sudivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Afternoon Jenny,

We have undertaken further flood modelling as requested in Condition #13 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

We note the following:

- Please see the attached flood modelling plan for a culvert crossing arrangement of 7 x 2.7m wide x 900mm RCBC in a 50% blocked scenario.
  The 100% blocked scenario has an increased flood depth on Dulku Close of approx. 10mm higher and has similar extents.
  This scenarios afflux affects the tailwater levels of the existing Q100 underground stormwater drainage which outlets to the west of the proposed culvert crossing.
  This in turn backs up onto Dulku Close increasing the water level for Q100cc by 27 mm approx.
- Alternatively, for 1.2m+ high boxes (previously modelled), for a 100% blockage scenario the affects to Dulku Close are worse than 900mm high boxes of similar aperture area due to the higher road level required.
- An arrangement of RCBC's wider than 7 x 2700mm x 900mm high boxes would result in excessive channel works to accommodate additional boxes & wingwalls etc.
- Boxes less than 900mm high result in low trafficable flood immunity.
  For the 900mm high RCBC arrangement, Q2 goes over by about 50mm, Q5 by 100 mm and Q10 by 180 mm.
  For RCBC's less than 900mm high the traffic immunity would be Q5 or less.
- We note the culverts under the Captain Cook Highway immediately upstream are 5 x 1.5 m wide x 1 m high RCBC's.
  As such, we suggest modelling the culverts with a 100% blockage factor, as suggested in QUDM, is overly conservative.

Based on the above, if Council require 100% blockage scenarios for the culvert arrangements, a bridge should be considered as there is no reasonable arrangement of RCBC's which can meet 100% blockage factor requirement due to the existing constraints of the site.

With consideration of the above information, and particularly noting:

- the culverts crossing the Captain Cook Highway immediately upstream (approx. 250m to the west) are much smaller arrangement of 5 x 1.5 m x 1 m high RCBC's

- the proposed drainage reserve will be regularly mowed and maintained;

We request Councils advice regarding possibly reducing the blockage factor requirements for a new culvert arrangement utilising 7 x 2.7m wide x 900mm high RCBCs
We suggest a blockage factor of 0% would be reasonable based on the above information.

- If this is not acceptable, a bridge would need to be considered.
    - If a bridge is Councils preference, we request Councils advice regarding acceptable blockage factors for modelling a new bridge with the following specifications:
        - Span = 15m
        - Depth to invert = 1m+

The construction cost of these options are estimated as follows:

- 7 x 2.7m wide x 900mm high RCBCs and associated channel works **– $500,000 to $600,000** (Source – Similar arrangement of boxes in construction in Cairns - 4 x 2.7m x 900mm high)
- 15m span bridge **– $1.2m - $1.5m** (Source – Contractor costings for a proposed bridge in Ingham)

The design of the Stage 1 subdivision is nearing completion and the civil designers are awaiting advice regarding this crossing configuration.
Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
SENIOR CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From:	Jenny Elphinstone
To:	Maurice Sheehan
Subject:	Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018
Date:	Wednesday, 17 July 2019 10:56:02 AM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png
Importance:	High

Hi Maurice,
Please advise of your availability to meet next Tuesday 23 July at 10.00 at Council's Mossman Office to further discuss and clarify issues related to the proposed subdivision.
Council will have Paul Steele attending the meeting.

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Monday, 15 July 2019 11:49 AM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Cc: Rob Wheeler <robert.wheeler@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Daniel Favier <daniel.favier@cardno.com.au>
Subject: Doc 910488 RE: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Hi Jenny,

As discussed on Friday afternoon, please see attached the updated sketch of the culvert crossing. The sketch shows the configuration of the 7 x 2.7m wide x 0.9m high RCBC's with flood level depths for a 100% blocked scenario.

As discussed in the original email, for a 100% blocked culvert scenario, this arrangement results in an increased water level in Dulku Close for a Q100cc event of 27 mm approx.
There is no reasonable alternative culvert arrangement which results in improved flood levels at Dulku Close.

To improve the results to Dulku Close for a 100% blocked culvert scenario, we would have to bring the road deck level down to increase the flow capacity over the road, thereby reducing the culvert leg height.
This scenario would actually result in an increased likelihood of blockage due to the reduced culvert height. In addition, this arrangement has a reduced trafficable flood immunity.

As advised in the previous email, we recommend, based on the extensive flood modelling completed to date, the optimal arrangement is 7 x 2.7m wide x 0.9m high RCBC's with no blockage factor which

is considered reasonable based on the information provided in the original email.

As discussed on Friday last, I confirm our availability for a meeting on Thursday (18th July) to discuss this in more detail.

Please let me know if you would like to discuss further.

Maurice Sheehan
SENIOR CIVIL ENGINEER
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Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Sent: Monday, 8 July 2019 8:29 AM
To: Maurice Sheehan <maurice.sheehan@cardno.com.au>
Cc: Rob Wheeler <robert.wheeler@cardno.com.au>; Daniel Favier <daniel.favier@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Douglas Shire Advice RE: Proposed Craiglie Subdivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Morning Maurice,

Council acknowledges receipt of the email dated 2 July and advice regarding the culvert on Wabul Drive extension.
The discussion of results does not have sufficient supporting information for Council to consider the advice provided.

With reference to the Development Approval Conditions 13.a. to 13.e; the information sought in these conditions is considered relevant to the current considerations.
Specifically, the information on the proposed channel profile and culvert configuration (including road surface level) is required to understand the solution and show that it represents an acceptable outcome in terms flooding risk to existing and future properties. That is, Council is unable to Assess and therefore support a crossing configuration without the information requested in Condition 13, items a. to e.

Council Officers are willing to meet to discuss the proposed 7/2700x900 RCBC Option to expedite the review process.

To inform a meeting with Council Officers the following information is required.

1. A plan and cross section drawings of the proposed 7/2700x900 RCBC option showing the proposed arrangement. That is, revision to the previous culvert arrangement plan provided to Council (Drawing No. Q184103-005-SK-01 Revision 2). The revised arrangement plan should show:
   - Proposed road deck level and wingwall top level relative to the channel invert;
   - Ramping of the road level outside of the alignment of the drainage corridor as per Council's previous request (Condition 13. f.);
   - Existing lot levels on the north side and proposed development levels on the south in the immediate vicinity of the culvert. (Advice on how the model DEM levels compare to constructed levels is also required);
   - Extent of channel widening required proposed either side of the culvert; and
   - Extent of rock scour protection required.
2. The geometry data used for the recently provided flood modelling plan (attached) as per the information requested in Development Approval Condition 13.d. The cross sections should show the peak flood level relative to existing lot levels on the north side and proposed development levels on the south.
3. Advice on the path of culvert overflows, e.g. do overflows re-enter the downstream channel or do they enter the existing development to the north or proposed development to the south?

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Tuesday, 2 July 2019 12:51 PM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Cc: Daniel Favier <daniel.favier@cardno.com.au>; Rob Wheeler <robert.wheeler@cardno.com.au>; Jarred Doyle <Jarred.Doyle@cardno.com.au>; Zac McCosker <zac.mccosker@cardno.com.au>
Subject: Doc 909075 Proposed Craiglie Sudivision - Stage 1A and 1B - Further Flood Modelling - Condition 13 of Councils Decision Notice ROL 2966/2018

Good Afternoon Jenny,

We have undertaken further flood modelling as requested in Condition #13 of Councils Decision Notice ROL 2966/2018 (Doc ID 903690, attached).

We note the following:

- Please see the attached flood modelling plan for a culvert crossing arrangement of 7 x 2.7m wide x 900mm RCBC in a 50% blocked scenario.
  The 100% blocked scenario has an increased flood depth on Dulku Close of approx. 10mm higher and has similar extents.

This scenarios afflux affects the tailwater levels of the existing Q100 underground stormwater drainage which outlets to the west of the proposed culvert crossing.
This in turn backs up onto Dulku Close increasing the water level for Q100cc by 27 mm approx.

- Alternatively, for 1.2m+ high boxes (previously modelled), for a 100% blockage scenario the affects to Dulku Close are worse than 900mm high boxes of similar aperture area due to the higher road level required.
- An arrangement of RCBC's wider than 7 x 2700mm x 900mm high boxes would result in excessive channel works to accommodate additional boxes & wingwalls etc.
- Boxes less than 900mm high result in low trafficable flood immunity.
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  For RCBC's less than 900mm high the traffic immunity would be Q5 or less.
- We note the culverts under the Captain Cook Highway immediately upstream are 5 x 1.5 m wide x 1 m high RCBC's.
  As such, we suggest modelling the culverts with a 100% blockage factor, as suggested in QUDM, is overly conservative.

Based on the above, if Council require 100% blockage scenarios for the culvert arrangements, a bridge should be considered as there is no reasonable arrangement of RCBC's which can meet 100% blockage factor requirement due to the existing constraints of the site.

With consideration of the above information, and particularly noting:

- the culverts crossing the Captain Cook Highway immediately upstream (approx. 250m to the west) are much smaller arrangement of 5 x 1.5 m x 1 m high RCBC's
- the proposed drainage reserve will be regularly mowed and maintained;

We request Councils advice regarding possibly reducing the blockage factor requirements for a new culvert arrangement utilising 7 x 2.7m wide x 900mm high RCBCs
We suggest a blockage factor of 0% would be reasonable based on the above information.

- If this is not acceptable, a bridge would need to be considered.
  - If a bridge is Councils preference, we request Councils advice regarding acceptable blockage factors for modelling a new bridge with the following specifications:
    - Span = 15m
    - Depth to invert = 1m+

The construction cost of these options are estimated as follows:

- 7 x 2.7m wide x 900mm high RCBCs and associated channel works **– $500,000 to $600,000** (Source – Similar arrangement of boxes in construction in Cairns - 4 x 2.7m x 900mm high)
- 15m span bridge **– $1.2m - $1.5m** (Source – Contractor costings for a proposed bridge in Ingham)

The design of the Stage 1 subdivision is nearing completion and the civil designers are awaiting advice regarding this crossing configuration.
Can you please advise if there is a council nominated engineer we can liaise with on this issue?

Please give me a call to discuss if you have any queries.

Maurice Sheehan
SENIOR CIVIL ENGINEER
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Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com

CONNECT WITH CARDNO 

From:	Jenny Elphinstone
To:	Maurice Sheehan
Subject:	Douglas Shire Council Advice Re Request for Water and Sewer Network Model ROL 2966/2018 Your Ref Q184103
Date:	Wednesday, 20 March 2019 4:50:29 PM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png PSC-2012-004_A GA-OceanBreezeEstate CooyaBchQLD N00804.pdf S3020 Rev C - Sewerage Pump Station Cast Insitu 2012.pdf 0730_001.pdf

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Hi Maurice,
Having regard to the sewer and water infrastructure the following documents are attached.

- Council are currently reviewing the Port Douglas WWTP operational treatment plant capacity, Consultant undertaken this task is GHD Doc # 864253 Port Douglas STP - Draft Report further work is to be undertaken
- Maturing the Infrastructure Pipeline(MIP) DSC second water intake options Doc # 880014

(Note - these documents are too large to email and I will get this document drop boxed tomorrow.)

For the pump station –
Council have allowed packaged pump station in developments, currently one is been installed at the Gorge & Cooya Beach development (Mullay packaged pump station), as long as they are approved by RPEQ.
The attached example is for Cooya Beach - but note the markup plan of concerns and the further details required.

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan [mailto:maurice.sheehan@cardno.com.au]
Sent: Tuesday, 19 March 2019 11:05 AM
To: Jenny Elphinstone
Cc: Daniel Favier; Rob Wheeler
Subject: Doc 895354 Water and Sewer Network Model

Hi Jenny,

As discussed on the phone, our water modellers have requested some information in order to respond to the RFIs received from Council (dated 6 February 2019) related to:

Development Application 2966/2018
Lot 2 Captain Cook Highway, Craiglie
Development on Lot 2 SR 431
Document ID: 887795

Do Council have a Sewer and Water network model which can be provided to our water team?

Maurice Sheehan
CIVIL ENGINEER
CARDNO

Phone +61 7 4034 0500 Direct +61 7 4034 0522
Address 15 Scott Street, Parramatta Park, Cairns, Queensland 4870 Australia

Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From:	Jenny Elphinstone
To:	Maurice Sheehan
Subject:	Douglas Shire Council Advice RE: Craiglie Subdivision ROL 2966/2018
Date:	Thursday, 22 August 2019 2:07:53 PM
Attachments:	image001.jpg image002.png image003.png image004.png image005.png

---

Hi Maurice,

Based on Cardno's modelling outputs and advices to date, Council Officers accept that the proposed 900mm high box culverts represents the preferred solution for the extension of Wabul Drive.
Council notes that the above statement is subject to Council's review of the final report and design drawings as part to the Operational Works approval process.

Advice statement:
Council has been provided with provided selected model outputs and has not had the opportunity to review the model inputs (particularly the channel geometry data).
Accordingly, Council notes that it has not fully assessed the modelling process. Until the final report is provided, Council officers can only comment on the information presented.

Additional commentary:

- Council Officers understand that the 900mm high box culvert array is Cardno's preferred scenario and that lower (600mm high) boxes or higher (1200mm high) boxes do not improved the flooding impacts;
- Cardno's advice is that the 900mm high boxes are an appropriate design response and the advice backs this up with overtopping scenarios for various recurrence interval events;
- Council Officers understand that for a 20% culvert blockage, the operation of the network road for events up to and including the 10 year ARI appear to be consistent with the FNQROC requirements.
- From Cardno's table of results, (20 % culvert blockage), the crossing would generally be considered trafficable to all vehicles during the peak flows of the 20 year event. Trafficability to larger vehicles – trucks/SES vehicles - would appear to be possible during the 100 year ARI event (non-climate change). Note, higher blockage factors would impact the advised trafficability during the peak depth and flow scenario. Council notes and accepts Cardno's representations regarding the operational factors with the upstream DTMR culvert array;
- Council notes Cardno's advice that its updated model shows the existing lots on the north side of the drain are not inundated (even after the future development of Lot X);
- The preliminary model outputs provided to date show the "Impacts" and do not currently report actual water levels. Council understands that this additional information will be provided in the final report and will confirm flow depths;
- The model inputs for channel sections must be included in the final report so Council

Officers can assess whether the model appropriately reflects the final drain profiles;

It is appropriate for Cardno to finalise its reporting and documentation of the culvert design for the purposes of the operational works application.

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
E: enquiries@douglas.qld.gov.au | **W:** www.douglas.qld.gov.au
Mail: PO Box 723, Mossman Q 4873 | **Office:** 64-66 Front St, Mossman Q 4873

From: Maurice Sheehan <maurice.sheehan@cardno.com.au>
Sent: Thursday, 22 August 2019 10:58 AM
To: Jenny Elphinstone <Jenny.Elphinstone@douglas.qld.gov.au>
Subject: Craiglie Subdivision

Hi Jenny,

Just checking if we have any updates from Council regarding the proposed culvert configuration for the Wabul St Crossing?

Maurice Sheehan
SENIOR CIVIL ENGINEER
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Email maurice.sheehan@cardno.com.au Web www.cardno.com
CONNECT WITH CARDNO

From:	Enquiries
To:	Maurice Sheehan
Subject:	Douglas Shire Council Advice ROL 2966/2018 Your Ref: Q184103, L2 Captain Cook Hwy, Craiglie
Date:	Sunday, 24 March 2019 1:30:05 PM

Hi Maurice,

As previously advice please see the drop box link to Council doc 880014 & 864253 re: water information

https://www.dropbox.com/sh/cfurdam3y2hin8k/AACauUgHvFNbjH_eGl0CLBdha?dl=0

Please note this link will be removed in 10 working days.

Should you require further assistance please do not hesitate to call or email via the contacts below.

Kind Regards

Jenny Elphinstone | Senior Planning Officer

Environment & Planning | Douglas Shire Council
P: 07 4099 9482 | **F:** 07 4098 2902
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PORT DOUGLAS ESTATE - STAGE 1A & 1B

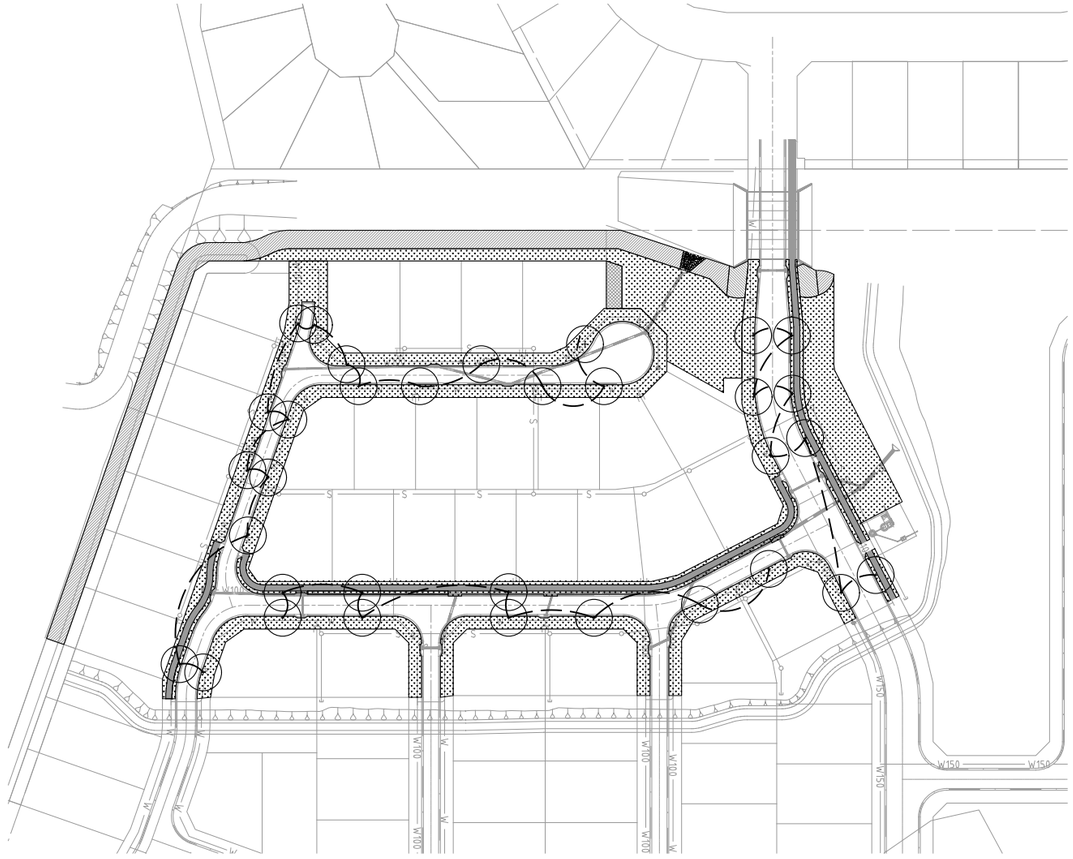
SUBDIVISION OF LOT 2 ON SR431ADDRESS
CAPTAIN COOK HIGHWAY, CRAIGLIE

LANDSCAPE DOCUMENTATION

Issue: OPERATIONAL WORKS

Date: 08-11-2019

SHEET PLAN 1:1000@A1



DRAWING SCHEDULE

DRAWING NUMBER	TITLE	REVISION
1902-016/CD/L0.01	COVER SHEET	03
1902-016/CD/L1.01	LANDSCAPE PLAN	02
1902-016/CD/L2.01	STANDARD DETAILS	02
1902-016/CD/L3.01	STANDARD SPECIFICATIONS	03

PLANT SCHEDULE

CODE	SPECIES	COMMON NAME	POTSIZE	MAT HT	MAT SP	STAKE	QTY PER MODULE	TOTAL
SHADE TREES								
BAR acu	BARRINGTONIA acutangula	Stream Barringtonia	45L					16
BAR asi	BARRINGTONIA asiatica	Asian Barringtonia	45L					8
BAR cal	BARRINGTONIA calyptrata	Cassowary Pine	45L					9
PT1								
LOM hys	LOMANDRA hystrix	creek Mat-rush	140mm		3m²			382
PT2								
SHADE TREES - S								
DIL ala	DILLENIA alata	Red Beech	140mm	15m	8m	No	1	30
LARGE TREES / SHRUBS - C								
PHY cus	PHYLLANTHUS cuscutiflorus	Pink Phyllanthus	140mm	4m	3m	No	4	120
MEL rub	MELICOPE rubra	Little Evodia	140mm	6m	4m	No	2	60
ACM hem	ACMENA hemilampra	Broad Leaf Lilly Pilly	140mm	8m	4m	No	2	60
GRE bai	GREVILLEA baileyana	White Oak	140mm	10m	8m	No	Max 2	48
SYZ aus	SYZYGIUM australe	Scrub Cherry	200mm	10m	8m	No	Max 2	6
SYZ res	SYZYGIUM resilience	Resilience Lilly Pilly	140mm	4m	2m	No	Max 2	6
MEDIUM SHRUBS - B								
LEE ind	LEEA indica	Bandicoot Berry	140mm	4m	3m	No	4	120
CAL end	CALLISTEMON "endeavour"	Bottlebrush	140mm	3m	3m	No	Max 2	9
CAL d.r.	CALLISTEMON "dawson river"	Dawson River Weeper	140mm	3m	3m	No	Max 2	9
CAL c.p.	CALLISTEMON "candy pink"	Bottlebrush	140mm	3m	3m	No	Max 2	9
CAL w.f.	CALLISTEMON "wild fire"	Bottlebrush	140mm	3m	3m	No	Max 2	62
CAL w.w.	CALLISTEMON "wilderness white"	Bottlebrush	140mm	3m	3m	No	3	90
SMALL SHRUBS - A								
LOM hys	LOMANDRA hystrix	Mat Rush	140mm	1m	1m	No	10	300
LAP fa	LEPTOSPERMUM flavescens "Cardwell"	Leptospermum	140mm	2.5m	2m	No	4	120
PHY lam	PHYLLANTHUS lamprophyllus	Pascoe River	140mm	1.5m	2m	No	4	120
XAN ver	XANTHOSTEMON verticillatus	Little Penda	140mm	2m	1m	No	2	60
PT3								
LOM hys	LOMANDRA hystrix	Creek Mat-rush	140mm		3m²			108
PHY cus	PHYLLANTHUS cuscutiflorus	Pink Phyllanthus	300mm					12
CUP ana	CUPANIOPSIS anacardioides	Tuckeroo	45L					3

The Contractor shall review the plant schedule to ensure that drawings and schedules concur. Where insufficient detail or discrepancies may exist on either the plans or the schedule, it is the Contractors responsibility to resolve immediately with the Landscape Architect and prior to providing Tender pricing, signing work contracts or commencement of works.

IMPORTANT NOTE

This plan was prepared for the sole purposes of - PORT DOUGLAS LAND DEVELOPMENT PTY LTD ("Client") for the specific purpose of OPERATIONAL WORKS ("Purpose"). This plan is strictly limited to the Purpose and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The plan is presented without the assumption of a duty of care to any other person (other than the Client) ("Third Party") and may not be relied on by Third Party.
Landplan LA will not be liable (in negligence or otherwise) for any direct or indirect loss, damage, liability or claim arising out of or incidental to:

a. Third Party publishing, using or relying on the plan; Landplan LA relying on base and services information provided to it by the Client or a Third Party where the base and services information is incorrect, incomplete, inaccurate, out-of-date or unreasonable;
b. any inaccuracies or other faults with information or data sourced from a Third Party;
c. Landplan LA relying on surface indicators that are incorrect or inaccurate;
d. the Client or any Third Party not verifying information in this plan where recommended by Landplan LA;
e. lodgement of this plan with any local authority against the recommendation of Landplan LA
f. the accuracy, reliability, suitability or completeness of any estimates or approximations made or referred to by Landplan LA in this plan.

Without limiting paragraph 1 or 2 above, this plan may not be copied, distributed, or reproduced by any process unless this note is clearly displayed on the plan. The dimensions, area, size and location of improvements and number of lots shown on this plan are approximate only and may vary. Scale shown is correct for the original plan and any copies of this plan should be verified by checking against the bar scale. Cadastral boundaries are obtained by title dimensions and digitising from existing cadastral maps. These boundaries have not been verified and are approximate only. Landplan LA will not be liable (in negligence or otherwise) for any direct or indirect loss, damage, liability or claim arising out of or incidental to Landplan LA relying on base information provided to it by - where the base information is incorrect, incomplete, inaccurate, out-of-date or unreasonable. Landplan LA will not be liable (in negligence or otherwise) for any direct or indirect loss, damage, liability or claim arising out of or incidental to Landplan LA relying on building information provided to it by - where the building information is incorrect, incomplete, inaccurate, out-of-date or unreasonable. Refer to - Civil Engineer's drawings for finished surface levels unless shown on Landscape drawings. Retain existing levels to buildings and adjacent surfaces except where instructed by the Landscape Architect. All new finished surfaces are to align flush with existing surface levels. Refer to - Civil Engineer's drawings for path and kerb crossover setting out.

Refer to - Civil Engineer's drawings for service locations. All services are to be verified on site prior to any excavation / construction. Trees to be located minimum 1m from services. All services are indicative only

Final set-out for all landscape treatments to be confirmed on site by the Landscape Architect.
Unless shown on the landscape drawings, refer to Structural Engineer's drawings for jointing, reinforcement, structural fixings etc for all walls and pavements.
All trees marked within / adjacent to vehicle sightlines are to be set out on site prior to installation and approved by the Landscape Architect and Traffic Engineer.
For Lighting requirements refer Electrical Engineers drawings.
The contractor shall review the plant schedule to ensure that drawings and schedules concur. Where insufficient detail or discrepancies may exist on either the plans or the schedule, it is the contractors responsibility to resolve immediately with the Landscape Architect and prior to providing tender pricing, signing work contracts or commencement of works.

GENERAL NOTES:

1. Refer to Engineers' drawings for finished surface levels unless shown on Landscape drawings. Retain existing levels to buildings and adjacent surfaces except where instructed by the superintendent. All new finished surfaces are to align flush with existing surface levels.
2. Refer to Engineers' drawings for path and kerb crossover setting out, service locations, jointing and conduiting in pavement, all structural fixings and reinforcements to pavements and walls etc., lighting and hydraulic elements.
3. Final setout for all landscape treatments to be confirmed on site by the superintendent.

UNDERGROUND SERVICES:
The locations of underground services are approximate only and their exact location should be determined on site. No guarantee is given that all existing services are shown.

TREE SETTING OUT PRINCIPLES:
Trees are to be planted in accordance with FNQROC Design Guidelines D9 - Landscaping, at the following spacings:

- 4.0m min. from electricity or telecommunications poles or pillars
- 7.5m min. from streetlights
- 4.0m radius from high voltage transmission lines
- 2.0m from stormwater pits
- 0.8 - 1.0m from back of kerb
- 3.0m min. from driveway
- 10m min. from the face of the kerb of the adjoining street

NOTE
PLANS HAVE BEEN PREPARED WITHOUT ELECTRICAL DESIGN. TREES MAY NEED TO BE SITE LOCATED TO MEET FNQROC REQUIREMENTS REGARDING LIGHT POLES.

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01	PRELIMINARY	27/09/2019	DE
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03	OPERATIONAL WORKS	08/11/2019	SM

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drawn	approved	date
D.E.	S.M.	08/11/2019

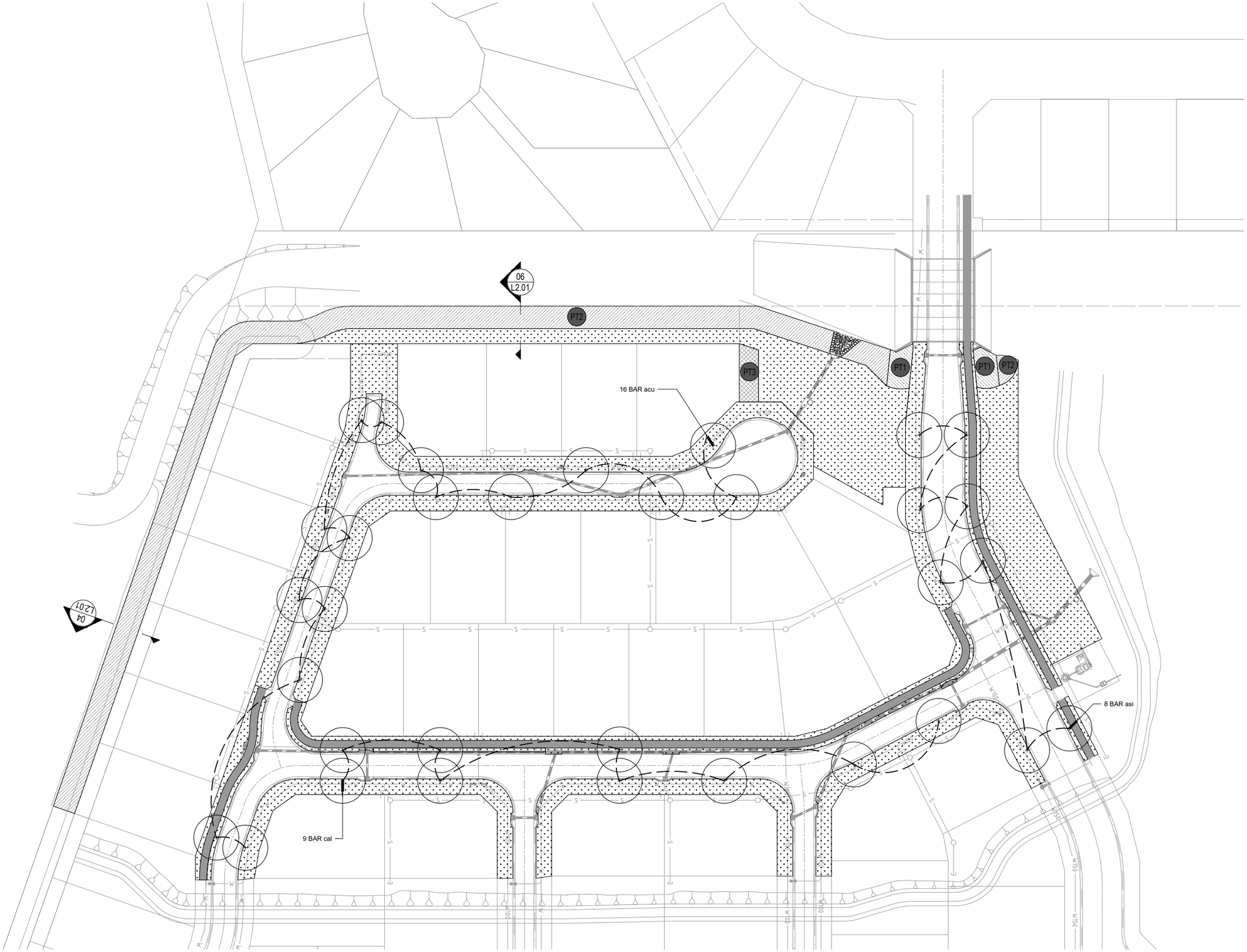
scale (AT A1 SIZE SHEET) 0

client: PORT DOUGLAS LAND DEVELOPMENT PTY LTD
project: PORT DOUGLAS ESTATE - STAGE 1A & 1B
SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
title: COVER SHEET

project number: 1902-016/CD
drawing number: L0.01
rev: 03
northpoint

LEGEND

- PROPOSED TREE. REFER PLANT SCHEDULE
- NEW TURF OVER TOPSOIL & CULTIVATED SUBGRADE AS SPECIFIED
- PLANTING TYPE 1 (PT1)
- PLANTING TYPE 2 (PT2)
- PLANTING TYPE 3 (PT3)



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SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

title: LANDSCAPE PLAN

project number: 1902-016/CD

drawing number: L1.01

rev: 02

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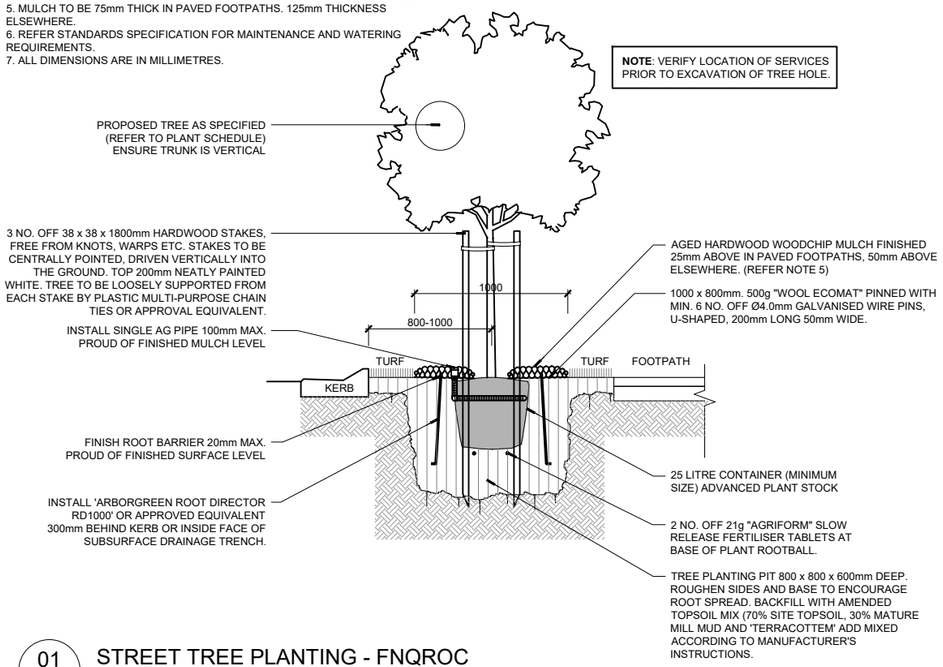
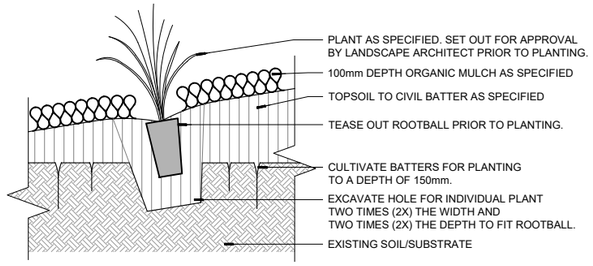
NOTES:

1. FOR LOCATION AND SPECIES OF TREES REFER PROJECT DRAWINGS.
2. PRIOR TO PLANTING ALL WEEDS SHALL BE KILLED BY SPRAYING A SUITABLE GLYPHOSATE BASED HERBICIDE. SPRAYED AREA SHALL REMAIN UNDISTURBED FOR TWO WEEKS.
3. EXCAVATED PLANTING HOLE SHALL ALLOW FOR A MINIMUM 100mm CLEARANCE AROUND THE ROOTBALL. BASE OF HOLE TO BE RIPPED TO 150mm DEPTH TO PROMOTE DRAINAGE.
4. TOP OF ROOTBALL TO BE FINISHED FLUSH WITH EXISTING GROUND LEVEL.
5. MULCH TO BE 75mm THICK IN PAVED FOOTPATHS. 125mm THICKNESS ELSEWHERE.
6. REFER STANDARDS SPECIFICATION FOR MAINTENANCE AND WATERING REQUIREMENTS.
7. ALL DIMENSIONS ARE IN MILLIMETRES.



01 STREET TREE PLANTING - FNQROC
SCALE 1:20



02 PT2 PLANTING - BATTER PLANTING
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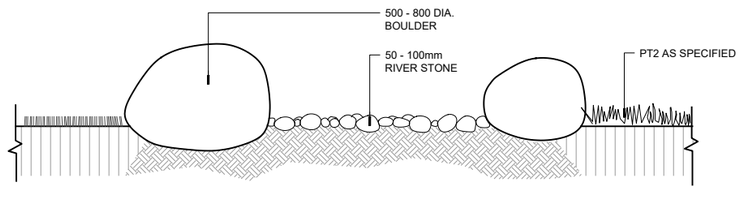
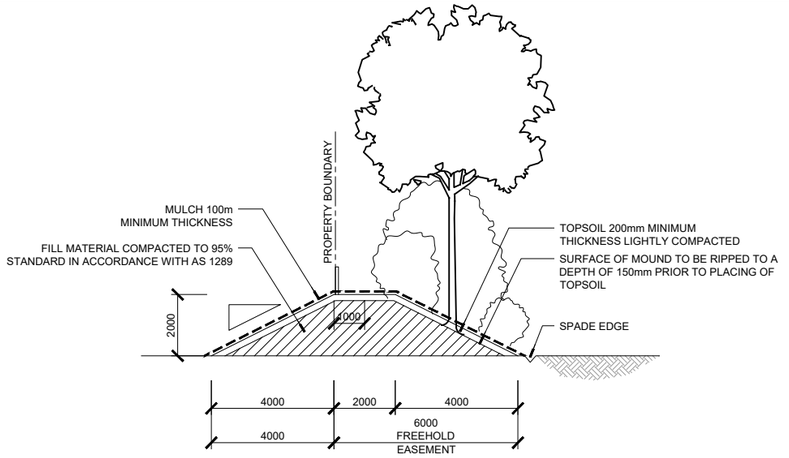
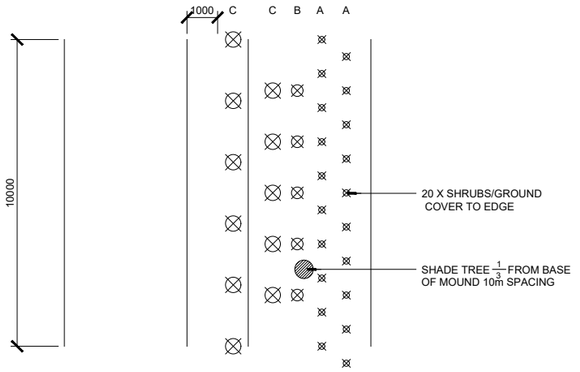


03 STORM WATER - OUTLET DETAIL
SCALE 1:10

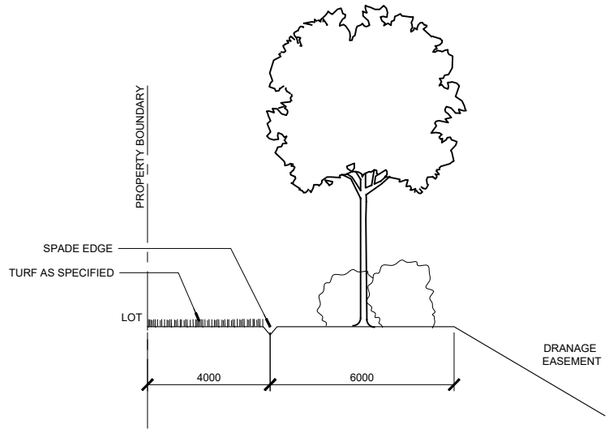


04 BUFFER MOUND - SECTION 1
SCALE 1:100

07 PLANTING DETAIL - PT3
SCALE 1:100



05 PT 2 - PLANTING LAYOUT
SCALE 1:100



06 SECTION - 2
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SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE
title: STANDARD DETAILS

project number: 1902-016/CD
drawing number: L2.01
rev: 02
northpoint

SPECIFICATIONS

SCOPE OF WORK

The work includes the organisation for and supply of all relevant labour, materials, plant and equipment as required to execute the works.

The scope of work includes but is not limited to the following:

- Trimming of areas to be landscaped;
- Removal of deleterious material;
- Cultivation;
- Supply and spreading of additives;
- Supply and installation of imported topsoil;
- Supply and installation of mulch;
- Planting; and
- Maintenance.

WORKS BY OTHERS

- All hard pavement
- Retaining walls
- All fencing types
- Subsoil drainage

EARTHWORKS

Earthworks shall involve the removal of existing compacted material, the cultivation of subsoil, the supply and mixing in of additives, the supply and spreading of topsoil and the fine grading of such soil and existing soil profiles to all landscaped areas to form the finished levels and profiles.

Finished surfaces shall finish flush with adjacent surfaces.

Preparation

Eradicate all weeds using environmentally acceptable methods, such as non-residual glyphosate herbicide in any of its registered formulae, at the recommended maximum rate.

Maintain all areas in a weed free state for the duration of the contract and Plant Establishment periods.

Cultivation

Excavate and remove from site compacted fill resulting from the building works. Cultivate all planting and turf areas to a depth of 150mm and place 100g/m2 of Blood and Bone and 100g/m2 of Gypsum.

IMPORTED TOPSOIL (FOR PLANTING)

Import and spread premium topsoil mix . Soil shall be free of weeds, sticks, rocks and other deleterious matter. Imported topsoil is to comply with AS4419.

MULCH

Mulch to be spread evenly across all planting areas. Mulch to planting areas shall be approved rainforest mulch free of soil, stones, weeds, rubbish or any other deleterious materials. Spread mulch to garden bed areas to a depth of 75mm, to finish 20mm below adjacent surfaces. Keep mulch clear of plant stems. Spread mulch following planting and watering in. Avoid mixing of soil and mulch materials. Do not use recycled garden mulch. Mulch to comply with AS4454.

PLANTING AREAS

Finished soil depth to all garden areas shall be 300mm crowned towards centre of beds ensuring positive falls to drainage structures. Use 'Agriform' 10g fertilizer tablets (or approved equivalent) to base of all plant root balls at manufacturer's recommended rate.

PLANTS

Provide plants with the following characteristics:

- Large healthy root systems, with no evidence of root curl, restriction or damage;
- Vigorous well-established stock free from pests and diseases, of good form consistent with the pot size, species or variety;
- Hardened off, not soft or forced, and suitable for planting in the natural climatic conditions prevailing at the site.

Label at least one plant from each species in a batch with a durable, readable tag. Plant stock immediately after it is delivered to site. For all plant stock excavate a hole twice the diameter of the rootball and at least 200mm deeper than the rootball. Loosen compacted sides and base of holes to prevent confinement of root growth. Fill all holes to half deep with water in advance of planting, allowing time for water to soak away. After planting, fill hole with amended/imported soils.

STAKES AND TIES

All 45L stock and larger are to be staked and tied.

TIMBER EDGE

To be located in ALL areas between turfed areas and PT3 planting beds. Supply and install in accordance with the details and the drawings.

Installation:

Set edging's flush with adjoining surfaces to define planting to turf or turf/reinforced turf junctions. Fix to pegs with galvanized nails, two per fixing. Drive pegs into the ground at 1500mm max centres on both sides of joints between boards, with peg tops 15mm below the top of the edging. Refer to details.

CONDUITS

The contractor is responsible for co-ordination with the building contractor to ensure that conduits under proposed paved or concreted areas have been installed. Conduits for irrigation purposes shall be 90mm PVC pipe - top min. 250mm below finished surface levels.

CONCRETE EDGING

To be located in areas between turfed/garden areas and gravel (PT1), as indicated on the drawings. Supply and install in accordance with the details and the drawings.

Installation:

Set top of edge strip to be flush with the surface level of surrounding turf. Install 100mm x 100mm depth concrete edging strip as detailed.

TURF AREAS

Spread 50mm layer of imported topsoil to all nominated turf areas.

Install an A-grade green couch that is weed free.

PLANTING ESTABLISHMENT

Establish and maintain the works for a period of thirteen (13) weeks from the Date of Practical Completion.

Establishment shall include the care of the contract areas by accepted horticultural practices, as well as rectifying any defects that become apparent in the works under normal 'use'. This shall include, but not be limited to, the following works:

- Repair and/or replace any defects due to failure and/or inferior quality materials and/or workmanship;
- Replace plants that have failed and/or have been damaged or died;
- Weed and pest control;
- Maintain all landscape areas in a neat and tidy condition at all times;
- Maintain fertilising and pruning as required;
- Check and adjust levels to attain those specified by addition or removal of mulch and/or topsoil.

All planted beds are to be weeded to maintain same in a grass and weed free environment. Carry out any other work that is specified or is necessary to establish the landscape works in a first class condition.

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SUBDIVISION OF LOT 2 ON SR431
CAPTAIN COOK HIGHWAY, CRAIGLIE

title: STANDARD SPECIFICATIONS

project number: 1902-016/CD

drawing number: L3.01

rev: 03

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Operational Works Receipting Checklist

(To be completed by Consulting engineer making the application)

Name of Council: Douglas Shire Council

Development: Port Douglas Estate **Location: Craiglie**

Planning Permit No/Council File No: ROL 2966/2018

DESIGN SUBMISSION	CHECK	COMMENT
1. Completed 'Statement of Compliance' form. (FNQROC - AP1 – Appendix A)	Y	
2. IDAS Forms A ,E & IDAS Assessment Checklist (Available from www.ipa.qld.gov.au)	Y	IDAS Form 1
3. Payment of Engineering Application Fees (Copy of receipt to be attached)	Y	
4. Copy of Decision Notice for Development Application Conditions, inc. explanation of how each condition is to be addressed (Statement of Compliance)	Y	
5. Engineering Design drawings - Complete sets (1 x A1 set, 2 x A3 sets and 1 x electronic copy on compact disc in 'PDF' format)	Y	
6. One copy of Design and Standard Specifications (Unbound Copy Preferable)	Y	Generally as per FNQROC. Additional specs in Drawing Notes where required.
7. Written consent from adjoining property owners authorising any works on their property	Y	TMR Approval provided
8. Water reticulation network in electronic format (Engineer to confirm system requirements and compatibility with Cairns Water)	Y	Available for Issue. Council to advise format and addressee
9. Landscape drawings - Complete set (1 x A1 set, 2 x A3 sets and 1 x electronic copy on compact disc in 'PDF' format). These must be accompanied by elements of the stormwater & street ltg. layout design, to avoid conflicts.	Y	

DESIGN SUBMISSION	CHECK	COMMENT
10. Overall network drawings (for staged development) for:		
• Water	Y	
• Stormwater	n/a	
• Sewer	Y	
• Pathways and roads	n/a	
• Street Lighting	n/a	
• Electrical	n/a	
• Gas	n/a	
• Public Transport	n/a	
• Park Reserves	n/a	
• Drainage Reserves	n/a	
11. Pavement design criteria	Y	Pavement Design included in Drawings
12. Geotechnical reports for proposed earthworks	Y	
13. Structural and geotechnical certificates for retaining walls etc.	n/a	
14. Water supply/sewerage pump station design parameters	Y	
15. Stormwater drainage calculations	Y	
16. Erosion and Sediment Control Strategy (ESCS)	Y	
17. Declared Pest Management Plan (if applicable)	n/a	
18. The approval of any other Authorities & concurrence agencies likely to be affected by the works.	Y	

19. Contact details of the Consulting Engineer who is submitting the Application:

Name of Engineer	Michael Bancroft	
Name of Company	Cardno (QLD Pty Ltd)	
Telephone Number (s)	Office: 4034 0500	Mobile:
Email address	Michael.Bancroft@cardno.com.au	
RPEQ No.	10801	

20. Date of submission of application 16 / 10 / 2019

(For further information on all of the above refer to the FNQROC Development Manual Section AP1)

FNQROC DEVELOPMENT MANUAL

Council Douglas Shire Council

(INSERT COUNCIL NAME)

STATEMENT OF COMPLIANCE
OPERATIONAL WORKS DESIGN

This form duly completed and signed by an authorised agent of the Designer shall be submitted with the Operational Works Application for Council Approval.

Name of Development Port Douglas Estate

Location of Development Craiglie

Applicant Port Douglas Land Developments Pty Ltd

Designer Cardno (Qld) Pty Ltd

It is hereby certified that the Calculations, Drawings, Specifications and related documents submitted herewith have been prepared, checked and amended in accordance with the requirements of the FNQROC Development Manual and that the completed works comply with the requirements therein, **except** as noted below.

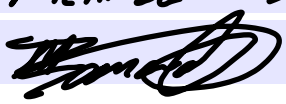
Compliance with the requirements of the Operational Works Design Guidelines	Non-Compliance refer to non-compliance report / drawing number
Plan Presentation	
Geotechnical requirements	
Geometric Road Design	Longitudinal grades less than minimum 0.5% in places. Absolute minimum grade provided in K&C is 0.35%.
Pavements	
Structures / Bridges	
Subsurface Drainage	
Stormwater Drainage	Two stormwater pits (1/17 and 2/17) at the Wabul St Crossing sag outlet directly to the channel without treatment through GPTs.
Site Re-grading	
Erosion Control and Stormwater Management	
Pest Plant Management	
Cycleway / Pathways	

Landscaping	
Water Source and Disinfection/Treatment Infrastructure (if applicable)	
Water Reticulation, Pump Stations and water storages	
Sewer Reticulation and Pump Stations	
Electrical Reticulation and Street Lighting	
Public Transport	
Associated Documentation/ Specification	
Priced Schedule of Quantities	
Referral Agency Conditions	
Supporting Information (AP1.08)	
Other	

Conscientiously believing the above statements to be true and correct, signed on behalf of:

Designer Cardno (Qld) Pty Ltd **RPEQ No** 10801

Name in Full MICHAEL BANCROFT

Signature  **Date** 15/10/19