DOUGLAS SHIRE COUNCIL

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YOUR REF:
OUR REF: WO3046 – Noah Creek Bridge

13 March 2020

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

Attention: Mr. Daniel Lamond

RE: DEVELOPMENT APPLICATION FOR THE CONSTRUCTION OF A DUAL LANE REPLACEMENT BRIDGE POSITIONED UPSTREAM OF THE EXISTING SINGLE LANE BRIDGE OVER NOAH CREEK, CAPE TRIBULATION, INCLUDING:

1. OPERATIONAL WORK FOR THE REMOVAL, DESTRUCTION OR DAMAGE OF MARINE PLANTS;
2. OPERATIONAL WORK FOR WATERWAY BARRIER WORKS,
3. OPERATIONAL WORKS THAT IS TIDAL WORKS OR WORKS IN A COASTAL MANAGEMENT DISTRICT; AND
4. OPERATIONAL WORK IN A WETLAND PROTECTION AREA,

OVER LAND ADJACENT THE NOAH CREEK BRIDGE, CAPE TRIBULATION ROAD, THORTON BEACH AND ADJOINING LOT 20 ON NPW695

The Douglas Shire Council (DSC) Project Office is proposing to replace the existing bridge over Noah Creek on the Cape Tribulation Road, Thorton Beach, located approximately 25km north of the Daintree River. The existing wooden bridge (approximately 24 m long, excluding abutments) and abutments are in poor condition and have been subject to a number of remedial efforts over the recent years. Load limitations on the bridge are regularly exceeded and a structural inspection in 2016 have identified that the bridge is nearing end of life and needs replacing.

In support of the above, described Development Application, please refer to enclosed:

- Attachment 1: DA Form 1 duly completed by Douglas Shire Council;
- Attachment 2: Lands Owners Consent provided by the Department of Natural Resources, Mines and Energy on the 6 March 2020;
- Attachment 3: Relevant Purpose Determination under the Vegetation Management Act 1999 provided by the Department of Natural Resources Mines and Energy on 12 February 2020;

- Attachment 4: Project Design Plans (Civil and Structural Drawings) prepared by Premise;
- Attachment 5: Hydraulic Assessment provided by Premise Water on 28 November 2018;
- Attachment 6: Ecological Assessment provided by GHD in August 2018;
- Attachment 7: Environmental Management Plan (Construction Phase) prepared by environmentPACIFIC in February 2020; and
- Attachment 8: State Assessment Codes 8, 9, 11 and 18 prepared by Environment Pacific.

Other Approval Requirements

En*vironment Protection and Biodiversity Conservation Act 1999*

The project area is located within the Wet Tropics World Heritage Area and the ecological surveys in support of the project identified the potential for impacts on the Southern Cassowary, Spotted Tail Quoll, Common Mist Frog and Australian Lace-lid Frog. Based on this, a referral for determination as to whether the project constitutes a Controlled Action under the provisions of the En*vironment Protection and Biodiversity Conservation Act 1999* was submitted with the Commonwealth Department of Agriculture, Water and the Environment on the 27 September 2018 (Reference no: 2018/8302).

On the 23rd October 2018 (EPBC reference 2018/8302), Douglas Shire Council were issued a Request for Information (RFI). Subtle changes to the bridge design and other land tenure matters precluded a response to the RFI.

Bridge construction planning aspects, including land revocation details for the approaches were finalised in January 2020 and a formal response to the RFI prepared by environmentPACIFIC was lodged in February 2020. Douglas Shire Council is awaiting the assessment outcome.

Wet Tropics World Heritage Protection and Management Act 1993

Although there have been discussions at length with WTMA officers the formal Permit application was only submitted on the 10 March 2020.

We trust the attached information satisfies Douglas Shire Council's requirements, however should you wish to discuss further or require further information please do not hesitate to contact the undersigned either via telephone 07 4099 9526 or email daniel.favier@douglas.qld.gov.au.

Yours faithfully

Daniel Favier
Project Manager (Open Spaces)

Attachment 1

DA Form 1 duly completed by Douglas Shire Council

DA Form 1 – Development application details

Approved form (version 1.2 effective 7 February 2020) made under section 282 of the Planning Act 2016.

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

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

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

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

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

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

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

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	Douglas Shire Council
Contact name *(only applicable for companies)*	Daniel Favier
Postal address *(P.O. Box or street address)*	PO Box 723
Suburb	Mossman
State	QLD
Postcode	4873
Country	Australia
Contact number	07 4099 9526
Email address *(non-mandatory)*	daniel.favier@douglas.qld.gov.au
Mobile number *(non-mandatory)*	0436 424 717
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	WO3046 – Noah Creek Bridge

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
			Noah Creek Bridge, Cape Tribulation Road	Thornton beach
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4873	20	NPW6985	Douglas Shire
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.*

☐ Coordinates of premises by longitude and latitude

Longitude(s)	Latitude(s)	Datum	Local Government Area(s) *(if applicable)*
		☐ WGS84 ☐ GDA94 ☐ Other:	

☐ Coordinates of premises by easting and northing

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

3.3) Additional premises

☐ Additional premises are relevant to this development application and the details of these premises have been attached in a schedule to this development application

☐ Not required

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

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

Name of water body, watercourse or aquifer:	Noah Creek

☐ 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)*:	Douglas Shire Council
Name of port authority for tidal area *(if applicable)*:	n/a

☐ 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)*:

Construction of a dual lane replacement bridge upstream of the existing single lane bridge over Noah Creek, Cape Tribulation.

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 constructed road *(complete 13))*

10) Subdivision				
10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
Number of lots created				

10.2) Will the subdivision be staged?	
☐ Yes – provide additional details below ☐ No	
How many stages will the works include?	
What stage(s) will this development application apply to?	

11) Dividing land into parts by agreement – how many parts are being created and what is the intended use of the parts?				
Intended use of parts created	Residential	Commercial	Industrial	Other, please specify:
Number of parts created				

12) Boundary realignment			
12.1) What are the current and proposed areas for each lot comprising the premises?			
Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)
12.2) What is the reason for the boundary realignment?			

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

Division 3 – Operational work

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

14.1) What is the nature of the operational work?		
☒ Road work	☒ Stormwater	☐ Water infrastructure
☒ Drainage work	☒ Earthworks	☐ Sewage infrastructure
☐ Landscaping	☒ Signage	☒ Clearing vegetation
☐ Other – please specify:		
14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*		
☐ Yes – specify number of new lots:		
☒ No		
14.3) What is the monetary value of the proposed operational work? *(include GST, materials and labour)*		
$1,500,000.00		

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application
Douglas Shire Council
16) Has the local government agreed to apply a superseded planning scheme for this development application?
☐ Yes – a copy of the decision notice is attached to this development application
☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☒ No

PART 5 – REFERRAL DETAILS

17) Does this development application include any aspects that have any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

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

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

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

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

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

☐ Heritage places – Local heritage places

Matters requiring referral to the **Chief Executive of the distribution entity or transmission entity:**
☐ Infrastructure-related referrals – Electricity infrastructure

Matters requiring referral to:
- The **Chief Executive of the holder of the licence**, if not an individual
- The **holder of the licence**, if the holder of the licence is an individual

☐ Infrastructure-related referrals – Oil and gas infrastructure

Matters requiring referral to the **Brisbane City Council:**
☐ Ports – Brisbane core port land

Matters requiring referral to the **Minister responsible for administering the *Transport Infrastructure Act 1994*:**
☐ Ports – Brisbane core port land *(where inconsistent with the Brisbane port LUP for transport reasons)*
☐ Ports – Strategic port land

Matters requiring referral to the **relevant port operator**, if applicant is not port operator**:**
☐ Ports – Land within Port of Brisbane's port limits *(below high-water mark)*

Matters requiring referral to the **Chief Executive of the relevant port authority:**
☐ Ports – Land within limits of another port *(below high-water mark)*

Matters requiring referral to the **Gold Coast Waterways Authority:**
☐ Tidal works or work in a coastal management district *(in Gold Coast waters)*

Matters requiring referral to the **Queensland Fire and Emergency Service:**
☐ Tidal works or work in a coastal management district *(involving a marina (more than six vessel berths))*

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

☐ Yes – referral response(s) received and listed below are attached to this development application
☒ No

Referral requirement	Referral agency	Date of referral response

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

PART 6 – INFORMATION REQUEST

19) Information request under Part 3 of the DA Rules

☒ I agree to receive an information request if determined necessary for this development application
☐ I do not agree to accept an information request for this development application

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

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

Further advice about information requests is contained in the DA Forms Guide.

PART 7 – FURTHER DETAILS

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

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

List of approval/development application references	Reference number	Date	Assessment manager
☐ Approval ☐ Development application			
☐ Approval ☐ Development application			

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

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

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

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

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

23) Further legislative requirements

Environmentally relevant activities

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

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

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

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

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

Hazardous chemical facilities

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

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

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

Clearing native vegetation

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

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

☐ No

***Note**: 1. Where a development application for operational work or material change of use requires a s22A determination and this is not included, the development application is prohibited development.*

2. See https://www.qld.gov.au/environment/land/vegetation/applying for further information on how to obtain a s22A determination.

Environmental offsets

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

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

☒ No

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

Koala habitat in SEQ Region

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

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

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

☒ No

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

Water resources

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

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

☒ No

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

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

- *Taking or interfering with underground water through an artesian or subartesian bore: complete DA Form 1 Template 1*
- *Taking or interfering with water in a watercourse, lake or spring: complete DA Form1 Template 2*
- *Taking overland flow water: complete DA Form 1 Template 3.*

Waterway barrier works

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

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

☐ No

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

Marine activities

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

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

☐ No

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

Quarry materials from a watercourse or lake

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

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

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

Quarry materials from land under tidal waters

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

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

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

Referable dams

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

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

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

Tidal work or development within a coastal management district

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

☒ Yes – the following is included with this development application:
- ☒ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☐ No

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

Queensland and local heritage places

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

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

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

Name of the heritage place:		Place ID:	

Brothels

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

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

Decision under section 62 of the *Transport Infrastructure Act 1994*

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

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

PART 8 – CHECKLIST AND APPLICANT DECLARATION

24) Development application checklist	
I have identified the assessment manager in question 15 and all relevant referral requirement(s) in question 17 ***Note**: See the Planning Regulation 2017 for referral requirements*	☒ Yes
If building work is associated with the proposed development, Parts 4 to 6 of *DA Form 2 – Building work details* have been completed and attached to this development application	☐ Yes ☒ Not applicable
Supporting information addressing any applicable assessment benchmarks is with the development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	☒ Yes
Relevant plans of the development are attached to this development application ***Note**: Relevant plans are required to be submitted for all aspects of this development application. For further information, see DA Forms Guide: Relevant plans.*	☒ Yes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued (*see 21*)	☒ Yes ☐ Not applicable

25) Applicant declaration
☒ By making this development application, I declare that all information in this development application is true and correct ☒ Where an email address is provided in Part 1 of this form, I consent to receive future electronic communications from the assessment manager and any referral agency for the development application where written information is required or permitted pursuant to sections 11 and 12 of the *Electronic Transactions Act 2001* ***Note**: It is unlawful to intentionally provide false or misleading information.*
Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application. All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website. Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where: • such disclosure is in accordance with the provisions about public access to documents contained in the *Planning Act 2016* and the Planning Regulation 2017, and the access rules made under the *Planning Act 2016* and Planning Regulation 2017; or • required by other legislation (including the *Right to Information Act 2009*); or • otherwise required by law. This information may be stored in relevant databases. The information collected will be retained as required by the *Public Records Act 2002.*

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

Date received: | | Reference number(s): | |

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

QLeave notification and payment *Note: For completion by assessment manager if applicable*			
Description of the work			
QLeave project number			
Amount paid ($)		Date paid (dd/mm/yy)	
Date receipted form sighted by assessment manager			
Name of officer who sighted the form			

Attachment 2

Lands Owners Consent provided by the Department of Natural Resources, Mines and Energy on the 6 March 2020

Author: Tanya Murphy
File / Ref number: 2020/010238
Directorate / Unit: State Land Asset Management
Phone: (07) 4794 8910

Queensland Government

Department of Natural Resources, Mines and Energy

6 March 2020

Attention: Daniel Favier
Douglas Shire Council
PO Box 723
Mossman QLD 4873

Dear Sir

Application for Owners Consent for the replacement of the existing single lane bridge over Noah's Creek

Reference is made to the request for owners consent required to accompany the development application for Operational Work for the replacement of the existing single lane bridge over Noah's Creek with a new dual lane bridge upstream.

The department hereby gives owner's consent as the owner to accompany the development application for the purpose of Operational Work for the replacement of the existing single lane bridge over Noah's Creek with a new dual lane bridge upstream.

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

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

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

Further, please note that the above consent will expire on **3 September 2020**. Should the development application not be lodged with the assessment manager prior to this date, you will be required again to lodge the DA Form 1 and any attachments with this Department with a further request for owner's consent - any further request will need to be reconsidered by the Department.

Postal :
DNRME Cloncurry
PO Box 5318
Townsville
4810 QLD

Telephone : (07) 4794 8910
Fax: (07) 4742 0214

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

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

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

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

If you wish to discuss this matter please contact Tanya Murphy on (07) 4794 8910.

Please quote reference number 2020/010238 in any future correspondence.

Yours sincerely

Deborah Eaton
Senior Land Officer
A duly authorised delegate of the Minister
under the current Land Act (Ministerial) Delegation

Attachment 3

Relevant Purpose Determination under the Vegetation Management Act 1999 provided by the Department of Natural Resources Mines and Energy on 12 February 2020

Author : Reneta Pope
Ref number : 2020/010329

Queensland Government

Department of
Natural Resources, Mines and Energy

12 February 2020

Andrew Small

Environment Pacific Pty Ltd

Andrew.small@environmentpacific.com

Dear Mr Small,

Application for a Relevant Purpose determination under section 22A of the *Vegetation Management Act 1999* for the clearing of native vegetation on lot/s 20 NPW695 & 62 SP311525 - Douglas Shire Council

I refer to your application submitted to the Department of Natural Resources, Mines and Energy (the department) on 12 February 2020.

Reviewing the information supplied, it has been determined the proposed development to replace Noah Creek Bridge does not require a relevant purpose determination as the clearing of native vegetation for the proposal is considered exempt clearing work under the Planning Regulation 2017.

Clearing of native vegetation for the construction or maintenance of infrastructure stated in schedule 5 of the Regulation where the infrastructure is government supported transport infrastructure is made exempt clearing work under Schedule 21, Part 1, Item 14(b).

Government supported transport infrastructure means infrastructure for transport that is for public use and is—

(a) funded, wholly or partly, by the State or Commonwealth; or,
(b) provided by a person, other than under a development approval or infrastructure agreement, on conditions that—
    (i) are agreed to by the Government; and,
    (ii) are intended to support the commercial viability of the infrastructure.

If you consider the proposal does not meet the definition of government supported transport infrastructure and does require referral for the clearing of native vegetation or other aspects of the development relating to native vegetation clearing have changed, please contact the department to continue assessment of your relevant purpose determination application.

Level 9, Verde Tower
445 Flinders Street
Townsville QLD 4810

PO Box 5318
Townsville
4810 QLD

Telephone: 13 58 34 or 135 VEG
Email: vegetation@dnrme,qld.gov.au
Web: www.drnme.qld.gov.au

ABN 59 020 847 551

The Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) issued pre-application advice for the proposal to Douglas Shire Council dated 7 February 2020. This advice included DNRME technical advice to say the clearing of native vegetation was considered exempt clearing work. To obtain a copy of this advice, please contact DSDMIP on 4037 3205 or via email CairnsSARA@dsdmip.qld.gov.au reference 2001-15224 SPL.

Other relevant Commonwealth or State approvals may also be required to undertake vegetation clearing. An indicative list of other legislation is provided in Attachment 1.

Should you have any enquiries or require assistance regarding this request, please do not hesitate to contact Reneta Pope, Natural Resource Management Officer, North Region of the department on telephone 07 4447 9160 quoting the above reference number.

Yours sincerely

Andrew Date
Senior Natural Resource Management Officer

Attachment 1 - Legislation and Acts

Activity	Legislation	Agency	Contact details
Interference with overland flow Earthworks, significant disturbance	*Water Act 2000* *Soil Conservation Act 1986*	Department of Natural Resources, Mines and Energy (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph. 13 QGOV (13 74 68) www.datsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues Protected plants and protected areas[1]	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992* *Nature Conservation Act 1992*	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forest activities	*Fisheries Act 1994* *Forestry Act 1959*[2]	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 25 23 www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species & ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of the Environment, (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Department of State Development, Manufacturing, Infrastructure and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Department of Local Government, Racing and Multicultural Affairs (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office

[1] In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992,* which endeavours to ensure that protected plants (whether whole plants or protected plants parts) are not illegally removed from the wild, or illegally traded. Prior to ***clearing***, you should check the flora survey trigger map to determine if the ***clearing*** is within a high-risk area by visiting For further information or assistance on the protected plants flora survey trigger map for your property, contact the Department of Environment and Science on 13QGOV (13 74 68) or email palm@des.qld.gov.au

[2] Contact the Department of Agriculture and Fisheries before ***clearing:***

- Any sandalwood on state-owned land (including leasehold land)
- On freehold land in a 'forest consent area'
- More than five hectares on state-owned land (including leasehold land) containing commercial timber species listed in parts 2 or 3 of Schedule 6 of the Vegetation Management Regulation 2012 and located within any of the following local government management areas–Banana, Bundaberg Regional, Fraser Coast Regional, Gladstone Regional, Isaac Regional, North Burnett Regional, Somerset Regional, South Burnett Regional, Southern Downs Regional, Tablelands Regional, Toowoomba Regional, Western Downs Regional.

Attachment 4

Project Design Plans (Civil and Structural Drawings) prepared by Premise

REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT

NOAH CREEK, CAPE TRIBULATION

FOR NQ CIVIL CONTRACTORS PTY LTD

LOCALITY PLAN

0 50 100 150m

SCALE 1:2500 (A1)

Civil Drawings List	
Sheet Number	Sheet Title
C001	COVER SHEET
C002	SAFETY IN DESIGN REPORT
C003	TYPICAL CROSS SECTIONS
C004	ROAD GEOMETRY PLAN
C005	ROADWORKS AND LONGITUDINAL SECTION PLAN
C006	ROADWORKS DETAILS, PAVEMENT AND DRAINAGE PLAN
C007	CULVERT DETAILS PLAN
C008	SIGNAGE AND LINEMARKING PLAN
C009	ROAD CROSS SECTIONS - SHEET 1 OF 2
C010	ROAD CROSS SECTIONS - SHEET 2 OF 2
C011	ACCESS DETAILS PLAN
C012	RESUMPTION PLAN

Structural Drawing List	
Sheet Number	Sheet Title
S001	STRUCTURAL NOTES
S100	GENERAL ARRANGEMENT - PLAN
S101	GENERAL ARRANGEMENT - LONG SECTION
S102	GENERAL ARRANGEMENT - 3D PERSPECTIVES & ABUTMENT ASSEMBLY
S103	GENERAL ARRANGEMENT - DECK CROSS SECTION
S104	GENERAL ARRANGEMENT - ABUTMENT & HEADSTOCK ELEVATION
S105	GENERAL ARRANGEMENT - WINGWALL & RELIEVING SLAB ELEVATION
S106	GENERAL ARRANGEMENT - ANCHORAGE DETAILS
S110	PILES - LAYOUT
S120	GENERAL ARRANGEMENT - ABUTMENT HEADSTOCK A & B - SHEET 1
S121	GENERAL ARRANGEMENT - ABUTMENT HEADSTOCK A & B - SHEET 2
S122	GENERAL ARRANGEMENT - PIER HEADSTOCK 1 & 2 - SHEET 1
S123	GENERAL ARRANGEMENT - PIER HEADSTOCK 1 & 2 - SHEET 2
S124	GENERAL ARRANGEMENT - PRECAST WINGWALL - SHEET 1
S125	GENERAL ARRANGEMENT - PRECAST WINGWALL - SHEET 2
S126	GENERAL ARRANGEMENT - PRECAST RELIEVING SLAB
S130	PSC DECK UNITS - LAYOUT AND ARTICULATION
S135	CAST IN-SITU KERB & TRAFFIC BARRIER POST SETOUT PLAN
S136	TRAFFIC BARRIER SETOUT AND DETAILS

Premise

ISSUED FOR CONSTRUCTION

PROJECT MANAGER	ENGINEERING CERTIFICATION	JOB CODE	SHEET NUMBER	REVISION
C.MATHESON	R.PERKINS RPEQ 2319	NQC-0023	C001	A

SURVEY ORIGIN

TBM - PSM ?????
R.L - ?.??m A.H.D

SITE AREA

3700m²

DESIGN HAZARD SCHEDULE

ITEM	DESIGN HAZARD	POTENTIAL HAZARD	RISK	ELIMINATION / MINIMISATION OF HAZARD / RISK	RESIDUAL RISK
D1	ROAD DESIGN HAZARD	INCREASED SPEED OF TRAFFIC ON CAPE TRIBULATION ROAD WILL INCREASE THE RISK OF REAR END COLLISIONS AT FOREST STAY ECO HUTS ACCESS AND DRIVEWAYS ON SOUTH EASTERN SIDE OF BRIDGE.	HIGH	A BAL/BAR INTERSECTION FOR VEHICLE EGRESS AND INGRESS WAS RECOMMENDED. THIS HOWEVER IS OUTSIDE THE CURRENT SCOPE OF WORKS FOR THIS PROJECT AND THEREFORE ONLY MINIMUM STANDARD DRIVEWAY ACCESS AND SHOULDER WIDTHS HAVE BEEN ADOPTED.	HIGH
D2	ROAD DESIGN HAZARD	DRIVEWAYS ON SOUTH EASTERN SIDE OF BRIDGE DO NOT MEET STANDARD SAFE INTERSECTION SIGHT DISTANCE INCREASING THE RISK OF COLLISIONS. SAFETY BARRIER ON BRIDGE APPROACH DOES NOT MEET MINIMUM LENGTH IN ACCORDANCE WITH TMR STANDARD DRAWINGS DUE TO DRIVEWAY LOCATION.	HIGH	PROVIDING A SINGLE ACCESS TO BOTH DRIVEWAYS TO ACHIEVE SAFE INTERSECTION SIGHT DISTANCE AND MINIMUM LENGTH SAFETY BARRIER TO BRIDGE APPROACH RECOMMENDED BY PREMISE TO REDUCE THE RISK OF COLLISIONS. THIS HOWEVER IS OUTSIDE THE CURRENT SCOPE OF WORKS FOR THIS PROJECT AND THE CURRENT ACCESS ARRANGEMENT HAS BEEN MAINTAINED. THE SAFETY BARRIER HAS BEEN SHORTENED TO SUIT THE DRIVEWAY ACCESS.	HIGH
D3	ROAD DESIGN HAZARD	HORIZONTAL RADII ON NORTH SIDE ARE AT MINIMUM RADIUS TO SUIT ADVERSE CROSSFALL INCREASING RISK OF UNDER STEERING RESULTING IN A POTENTIAL INCREASE IN SINGLE VEHICLE ACCIDENTS.	LOW	LARGER RADII TO SUIT RURAL ROAD DESIGN WAS CONSIDERED, HOWEVER MINIMUM RADII WAS ADOPTED TO REDUCE ENVIRONMENTAL IMPACTS. DUE TO A SPEED ENVIRONMENT OF LESS THAN 70km/hr AND EXISTING ROAD CONDITIONS DRIVERS WILL BE MORE ALERT AND MAKE THE STEERING CORRECTIONS TO COMPENSATE.	LOW
D4	ROAD EMBANKMENT AND STORMWATER ATTENUATION	TABLE DRAIN DESIGNED TO REDUCE LAND RESUMPTIONS TO ADJACENT PROPERTY INCREASING RISK OF DRAINAGE IMPACTS TO ROAD AND PROPERTY.	HIGH	IN CONSULTATION WITH COUNCIL A V-DRAIN WAS CONSIDERED AND ADOPTED. HOWEVER A TRAPEZOIDAL DRAIN WAS ADOPTED FROM 56.000 - CH278.733 ON LEFT HAND SIDE TO MAINTAIN EXISTING DRAINAGE CAPACITY.	MODERATE

CONSTRUCTION HAZARD SCHEDULE

ITEM	POTENTIAL HAZARD	POSSIBLE PREVENTATIVE ACTION
C1	DEEP EXCAVATION HAZARD	ALL STEPS MUST BE TAKEN TO OBTAIN CURRENT UNDERGROUND SERVICES INFORMATION BEFORE EXCAVATION WORKS COMMENCE. EXCAVATION WORK MUST BE UNDERTAKEN BY APPROPRIATELY EXPERIENCED AND QUALIFIED PERSONNEL. EXCAVATIONS SHALL BE ADEQUATELY SHORED AND APPROPRIATE BARRICADES AND SIGNAGE ERECTED, IF REQUIRED.
C2	UNDERGROUND ELECTRICAL, TELECOMMUNICATION, GAS AND WATER MAIN HAZARD	WARNING SIGNS AND MARKERS SHALL BE ERECTED ADVISING OF THE PRESENCE OF THE EXISTING SERVICE. THE SERVICE SHALL BE IDENTIFIED AND MARKED BY THE SUPPLY AUTHORITY PRIOR TO THE COMMENCEMENT OF EXCAVATION. A REPRESENTATIVE OF THE SUPPLY AUTHORITY SHALL REMAIN ON SITE DURING THE EXCAVATION WORK, IF REQUIRED.
C3	WORKS NEAR RAIL, AIRPORTS AND ROADS HAZARD	ALL REQUIRED PERMITS, APPROVALS AND SAFETY REQUIREMENTS FROM THE RELEVANT AUTHORITY SHOULD BE OBTAINED PRIOR TO COMMENCING WORK. A REPRESENTATIVE OF THE RELEVANT AUTHORITY SHALL REMAIN ON SITE DURING CONSTRUCTION WHILE THE HAZARD REMAINS.
C4	POTENTIAL VEHICLE HAZARD	SITE PERSONNEL SHALL BE ADVISED OF THE POTENTIAL HAZARDS AND THE APPROPRIATE PROCEDURES FOR WORKING ADJACENT TO OPERATING PUBLIC ROADS. APPROPRIATE SAFETY CLOTHING SHALL BE WORN AND THE REQUIRED SIGNAGE SHALL BE ERECTED. THE WORKS SHALL BE UNDERTAKEN IN A MANNER WHICH DOES NOT COMPROMISE THE SAFETY OF THE VEHICLE OCCUPANTS OR THE SITE PERSONNEL.
C5	DEMOLITION AND CLEARING HAZARD	SUITABLE QUALIFIED AND EXPERIENCED PERSONNEL SHALL BE RESPONSIBLE FOR THE DEMOLITION AND CLEARING WORKS FOR THE PROJECT AT ALL TIMES. THE CONTRACTORS WORK METHOD STATEMENT SHALL ALSO GIVE CONSIDERATION TO FALLING DEBRIS, COLLAPSE AND DANGEROUS AIRBORNE AGENTS.
C6	TRAFFIC MANAGEMENT HAZARD	SUITABLE QUALIFIED AND EXPERIENCED PERSONNEL SHALL BE RESPONSIBLE FOR THE SAFE AND ORDERLY PASSAGE OF VEHICULAR AND PEDESTRIAN TRAFFIC THROUGH THE PROJECT AT ALL TIMES. THE CONTRACTOR SHALL DEVELOP A TRAFFIC MANAGEMENT PLAN (TMP) FOR THE PROJECT TO ESTABLISH APPROPRIATE CONTROLS IN ACCORDANCE WITH THE MANUAL FOR UNIFORM TRAFFIC CONTROL.

DESIGN HAZARD NOTES:

1. PREMISE AUSTRALIA PTY LTD (PREMISE), HAVING BEEN COMMISSIONED TO CARRY OUT DETAILED DESIGN AND DOCUMENTATION OF THESE WORKS, CONFIRM THAT THE PREMISE DRAWING SET HAS BEEN INTERNALLY REVIEWED FOR DESIGN SAFETY IN ACCORDANCE WITH SECTION 22 OF THE WORK HEALTH AND SAFETY ACT 2011 QLD.
2. THIS REPORT SUMMARISES AN INTERNAL REVIEW OF THE PREMISE DETAILED DESIGN DRAWINGS FOR DESIGN SAFETY.
3. THIS REPORT IN NO WAY RELIEVES THE PRINCIPAL, CONTRACTOR OR ANY OTHER PARTY OF THEIR OWN OBLIGATIONS AND RESPONSIBILITIES UNDER THE WORK HEALTH AND SAFETY ACT 2011 QLD, INCLUDING (BUT NOT LIMITED TO) CONSULTATION WITH THE DESIGNER UNDER SECTION 294 OF THE ACT, THE PREPARATION OF SATISFACTORY SAFE WORK METHOD STATEMENTS AND DUTIES OF CARE.
4. IT IS A REQUIREMENT UNDER SECTION 296 OF THE WORK HEALTH AND SAFETY ACT 2011 QLD, THAT A COPY OF THIS REPORT BE PROVIDED TO THE CONTRACTOR BY THE ENTITY COMMISSIONING THE WORK SHOWN ON THE PREMISE DRAWINGS.
5. AS PER THE DEPARTMENT OF JUSTICE AND THE ATTORNEY-GENERAL- WORKPLACE HEALTH AND SAFETY QUEENSLAND, A WRITTEN REPORT IS NOT REQUIRED FOR DESIGNS THAT HAVE TYPICAL FEATURES.

CONSTRUCTION HAZARD NOTES:

1. UNDER THE QUEENSLAND WORK HEALTH AND SAFETY ACT 2011, THE WORK HEALTH AND SAFETY REGULATION 2011 AND OTHER LEGISLATION AND GUIDELINES, THE PRINCIPAL CONTRACTOR HAS SPECIFIC OBLIGATIONS IN RELATION TO THE SAFE OPERATION OF THE SITE AND OF THE WORKS. TO ASSIST THE PRINCIPAL CONTRACTOR IN COMPLYING WITH THESE OBLIGATIONS THE PROJECT DESIGNERS HAVE IDENTIFIED BY DRAWING NOTES, AREAS WHERE POTENTIAL HAZARDS MAY ARISE. THESE NOTES OR ADVICE, SHALL NOT NECESSARILY BE CONSIDERED COMPLETE AND ARE BASED UPON THE DESIGNERS' UNDERSTANDING OF THE SAFETY RISKS ASSOCIATED WITH THE WORKS.
   THESE NOTES OR ADVICE SHALL NOT RELIEVE THE PRINCIPAL CONTRACTOR OF ANY OBLIGATION UNDER THE RELEVANT LEGISLATION OR GUIDELINE. THE PRINCIPAL CONTRACTOR SHALL REMAIN RESPONSIBLE FOR THE PREPARATION OF AN APPROPRIATE WORK HEALTH SAFETY MANAGEMENT PLAN AND SAFE WORK METHOD STATEMENTS FOR THE SITE.
2. PURSUANT TO THE WORK HEALTH AND SAFETY ACT 2011 WE HEREBY ADVISE THAT OUR DESIGN SAFETY REVIEW HAS IDENTIFIED UNUSUAL OR ATYPICAL DESIGN FEATURES THAT MAY PRESENT ADDITIONAL HAZARDS OR RISKS DURING THE CONSTRUCTION PHASE AND THESE ARE LISTED IN THE CONSTRUCTION HAZARD SCHEDULE.

CONSEQUENCE TABLE

LEVEL	CONSEQUENCE	COST/TIME
5 - CATASTROPHIC	FATALITY OR MULTIPLE PERSONS ONSITE WITH LIFE THREATENING HEALTH EFFECTS OR INABILITY TO CONTINUE	HUGE FINANCIAL OR TIME LOSS
4 - MAJOR	EXTENSIVE INJURIES, OR ONSET OF SEVERE OR LIFE THREATENING HEALTH EFFECTS TO SINGLE PERSON ONSITE. MULTIPLE PERSONS WITH ONSET OF IRREVERSIBLE HEALTH EFFECTS. PERMANENT INJURY TO PERSON ONSITE.	MAJOR FINANCIAL OR TIME LOSS
3 - MODERATE	MEDICAL TREATMENT REQUIRED. IRREVERSIBLE HEALTH EFFECT TO A SINGLE PERSON. MULTIPLE PERSONS ONSITE WITH REVERSIBLE HEALTH EFFECTS.	HIGH FINANCIAL OR TIME LOSS
2 - MINOR	FIRST AID, SINGLE OR MULTIPLE INJURIES AMONGST PERSONS ONSITE. SINGLE PERSON ONSITE WITH MODERATE SHORT TERM REVERSIBLE HEALTH EFFECTS.	MEDIUM FINANCIAL OR TIME LOSS
1 - INSIGNIFICANT	NO INJURIES. OVER EXPOSURE TO A SINGLE PERSON ONSITE, BUT NO REPORTED HEALTH EFFECTS.	LOW FINANCIAL OR TIME LOSS

LIKELIHOOD TABLE

LEVEL	DESCRIPTION	QUANTIFICATION GUIDE
A - ALMOST CERTAIN	THE EVENT IS EXPECTED TO OCCUR IN MOST CERTAIN CIRCUMSTANCES	MORE THAN ONCE PER YEAR
B - LIKELY	THE EVENT WILL PROBABLY OCCUR IN MOST CIRCUMSTANCES	AT LEAST ONCE IN 5 YEARS
C - POSSIBLE	THE EVENT SHOULD OCCUR AT SOME TIME	AT LEAST ONCE IN 10 YEARS
D - UNLIKELY	THE EVENT COULD OCCUR AT SOME TIME	AT LEAST ONCE IN 30 YEARS
E - RARE	THE EVENT MAY OCCUR IN EXCEPTIONAL CIRCUMSTANCES	LESS THAN ONCE IN 30 YEARS

RISK ANALYSIS MATRIX

LIKELIHOOD	CONSEQUENCE				
	1 - INSIGNIFICANT	2 - MINOR	3 - MODERATE	4 - MAJOR	5 - CATASTROPHIC
A - ALMOST CERTAIN	MODERATE	HIGH	EXTREME	EXTREME	EXTREME
B - LIKELY	MODERATE	HIGH	HIGH	EXTREME	EXTREME
C - POSSIBLE	LOW	MODERATE	HIGH	EXTREME	EXTREME
D - UNLIKELY	LOW	LOW	MODERATE	HIGH	EXTREME
E - RARE	LOW	LOW	MODERATE	HIGH	HIGH

RISK EVALUATION TABLE

RISK LEVEL	ACTION REQUIRED
EXTREME	UNACCEPTABLE RISK. RE-DESIGN REQUIRED. DO NOT PROCEED WITHOUT ADDITIONAL CONTROLS.
HIGH	UNACCEPTABLE RISK. ADDITIONAL CONTROLS NEEDED. CONSIDER FURTHER REVIEW AND CONSIDER RE-DESIGN
MODERATE	RISK MAY BE ACCEPTABLE. MANAGEMENT TO DETERMINE ACTIONS REQUIRED
LOW	ACCEPTABLE. MANAGE RISK THROUGH ROUTINE PROCEDURES AND OTHER ADMINISTRATIVE CONTROLS

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
18/03/19	2	VERTICAL GEOMETRY AMENDED TO SUIT RAISED BRIDGE LEVEL		
19/12/18	1	PRELIMINARY ISSUE		

REVISIONS

Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED B.CORLIS
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE

ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE SAFETY IN DESIGN REPORT

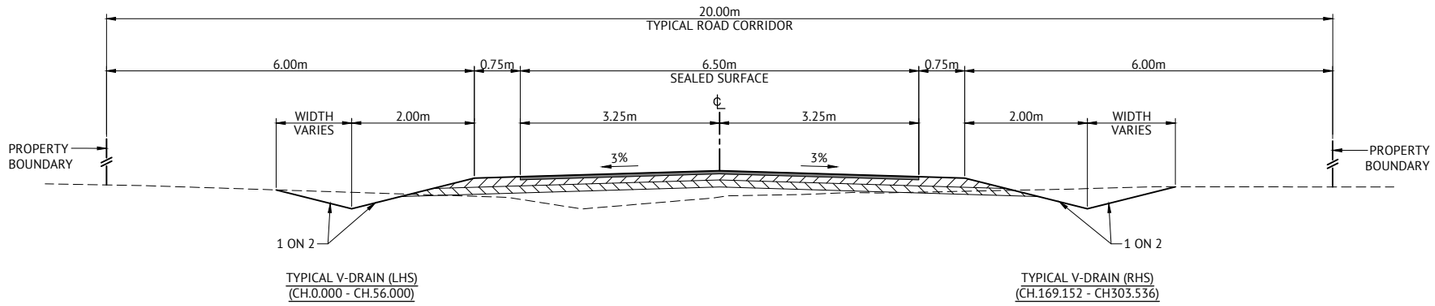
JOB CODE NQC-0023
SHEET NUMBER C002
REV A

PAVEMENT DESIGN (ROADWORKS)
PAVEMENT TYPE A

07mm FULL SERVICE PRIMERSEAL, GRADE AMC5
16/10mm FULL SERVICE, C170 SEAL
100mm BASE COURSE (DMR TYPE 2.1)
115mm SUB BASE COURSE (DMR TYPE 2.3)

PAVEMENT DESIGN (BRIDGE DECK)
PAVEMENT TYPE B

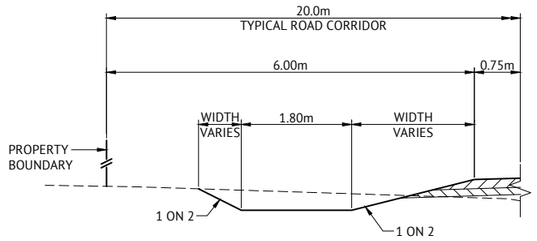
10mm WATERPROOF MEMBRANE, TYPE A, SEAL C170
SPRAY COAT EMULPRIME TO PAVEMENT
CORRECTION COURSE DENSE GRADE ASPHALT, GRADE AC10 C230
50mm DENSE GRADE ASPHALT, GRADE AC14 C320



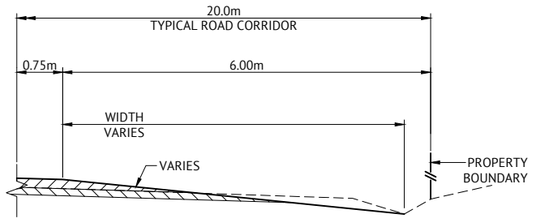
TYPICAL V-DRAIN (LHS)
(CH.0.000 - CH.56.000)

TYPICAL V-DRAIN (RHS)
(CH.169.152 - CH303.536)

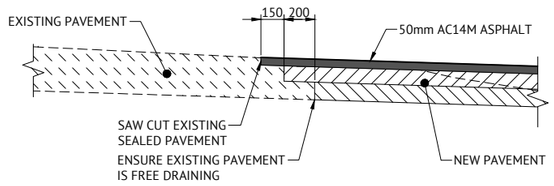
TYPICAL CROSS SECTION (CH.0.000 - CH.303.536)
SCALE 1:50



TYPICAL TABLE DRAIN (LHS)
(CH.56.000 - CH278.733)



TYPICAL BATTER TO EXISTING (RHS)
(CH.0.000 - CH126.951)



PAVEMENT CUTBACK DETAIL
SCALE 1:20

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
18/03/19	2	VERTICAL GEOMETRY AMENDED TO SUIT RAISED BRIDGE LEVEL		
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REVISIONS

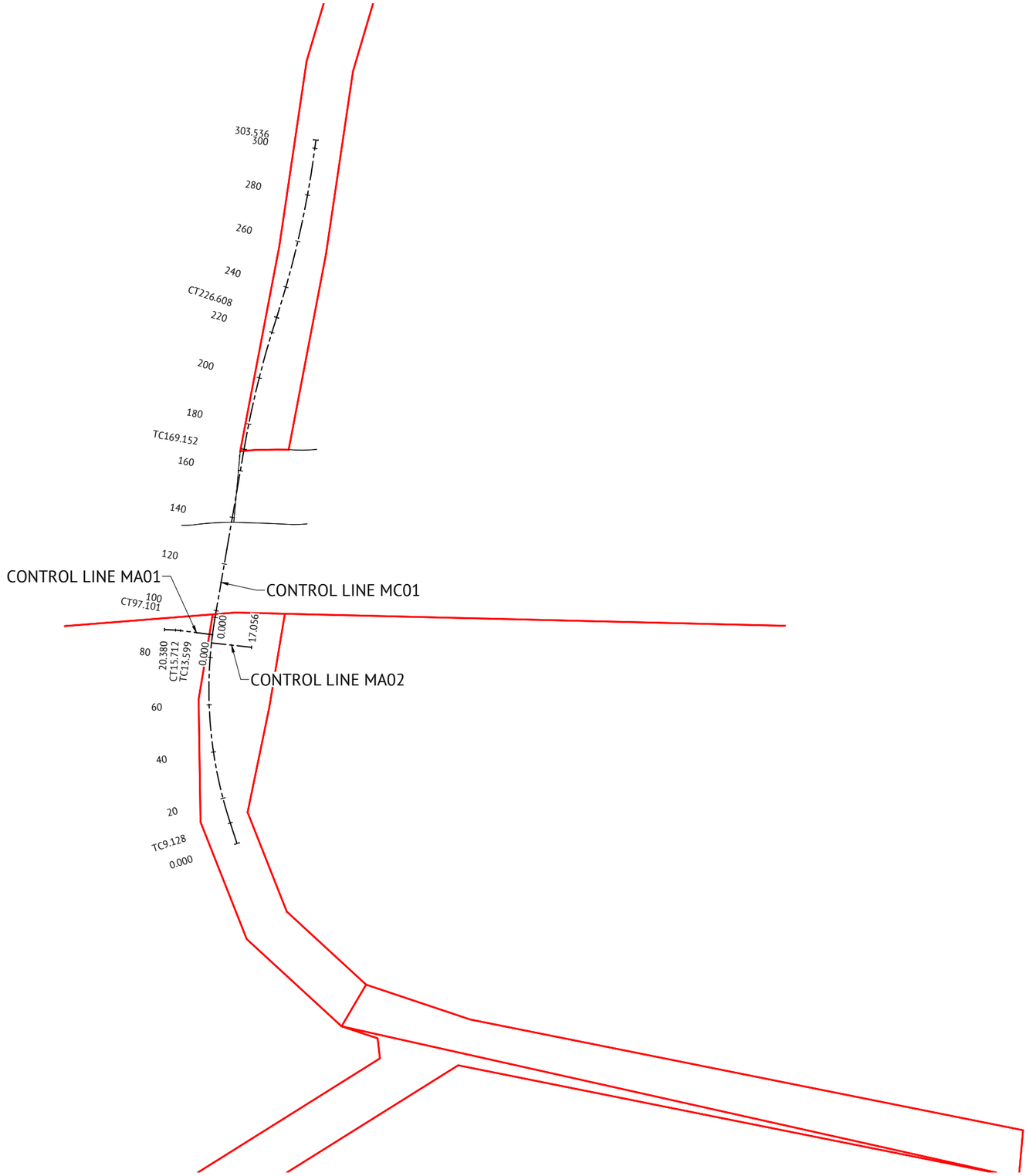
Premise
TOWNSVILLE OFFICE
84 DENHAM STREET
PO BOX 1110
TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

DESIGNED: B.CORLIS
CHECKED: R.PERKINS
PROJECT MANAGER: C.MATHESON
ENGINEERING CERTIFICATION: R.PERKINS RPEQ 2319

SCALE
0 0.4 0.8 1.2m
SCALE 1:20 (A1)
0 1 2 3m
SCALE 1:50 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: NQ CIVIL CONTRACTORS PTY LTD
PROJECT: REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION: NOAH CREEK, CAPE TRIBULATION
SHEET TITLE: TYPICAL CROSS SECTIONS

JOB CODE: NQC-0023
SHEET NUMBER: C003
REV: A



N

CONTROL LINE MC01 SETOUT

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	6837.271	729620.847	7664869.738	4.873	7°24'07.62"			
IP 2	7204.271	729668.129	7665233.679	4.910				
TC	7359.054	729687.812	7665387.205	4.961	7°18'21.61"			
IP 3	7403.706	729693.495	7665431.529	4.970		R = 925.000	89.303	5°31'53.64"
CT	7448.357	729703.424	7665475.098	4.950	12°50'15.25"			
IP 4	7499.859	729714.867	7665525.313	4.929	12°50'15.25"			

CONTROL LINE MCA01 SETOUT

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	332169.517	8214857.996	4.836	277°25'39.08"			
TC	13.599	332156.032	8214859.754	4.356	277°25'39.08"			
IP 2	14.656	332154.984	8214859.890	4.264		R = -25.000	2.113	4°50'33.33"
CT	15.712	332153.927	8214859.938	4.176	272°35'05.75"			
IP 3	20.380	332149.264	8214860.149		272°35'05.75"			

CONTROL LINE MCA02 SETOUT

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING
IP 1	0.000	332169.099	8214854.533	4.866	96°19'01.86"
IP 2	17.056	332186.051	8214852.656	3.252	96°19'01.86"

SURVEY CONTROL POINTS

STN NO.	EASTING	NORTHING	R.L	MARK TYPE
116040	730159.831	7665150.303	5.600	PERMANENT SURVEY MARKER

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
18/03/19	2	VERTICAL GEOMETRY AMENDED TO SUIT RAISED BRIDGE LEVEL		
19/12/18	1	PRELIMINARY ISSUE		

REVISIONS

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DESIGNED B.CORLIS
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE
0 20 40 60m
SCALE 1:1000 (A1)
ORIGINAL SHEET SIZE A1

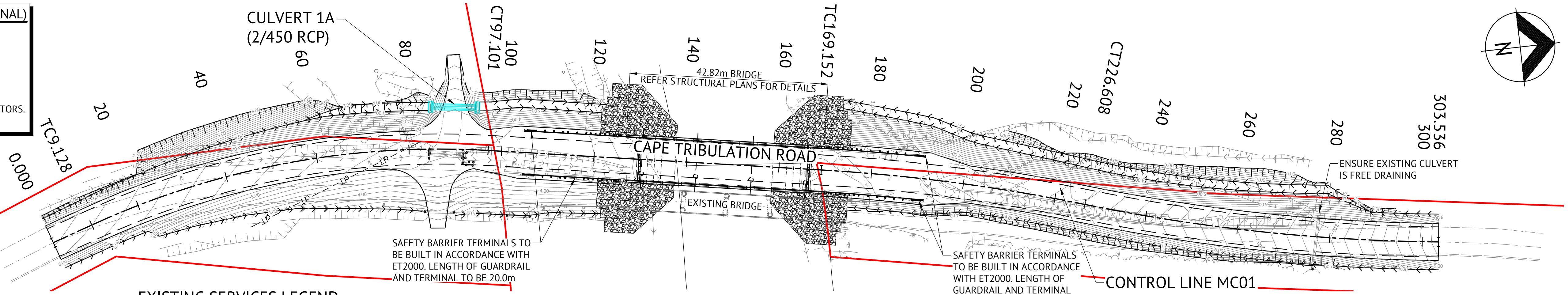
CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE ROAD GEOMETRY PLAN

JOB CODE NQC-0023
SHEET NUMBER C004
REV A

EARTHWORKS VOLUMES (PROVISIONAL)
NOAH CREEK ROADWORKS

CUT = -1945m³
FILL = 3740m³
BALANCE = -1795m³
("-" EXPORT, "+" IMPORT)

NOTES
1. EXCLUDES BULKING AND COMPACTION FACTORS.
2. ROAD BOX INCLUDED IN VOLUMES.



PLAN VIEW
SCALE 1:500

ROADWORKS LEGEND:

- DESIGN SURFACE CONTOURS
- EDGE OF ROAD
- TOP OF BATTER
- BOTTOM OF BATTER

ROADWORKS NOTES:

1. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT LATEST ISSUE FNQROC STANDARD DRAWINGS AND SPECIFICATIONS, UNLESS NOTED OTHERWISE.
2. FOR ROAD GRADING, LEVELS AND TYPICAL SECTIONS, REFER ROAD LONGITUDINAL/CROSS SECTION AND ROADWORKS DETAILS DRAWINGS.

EXISTING SERVICES LEGEND

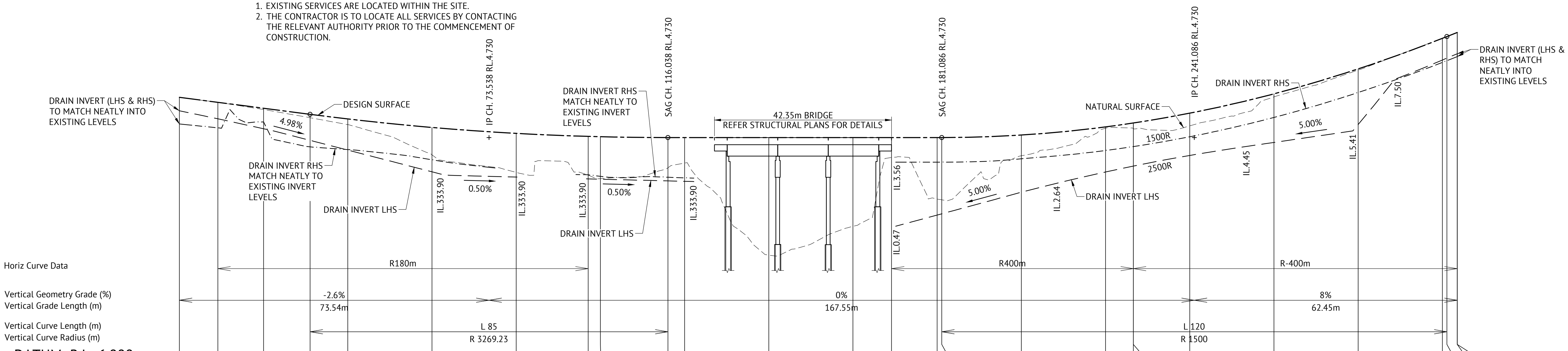
- EXISTING PROPERTY BOUNDARY
- EXISTING UNDERGROUND ELECTRICAL
- EXISTING TOP OF BATTER
- EXISTING CHANGE IN GRADE
- EXISTING BOTTOM OF BATTER
- EXISTING CULVERT

EXISTING SERVICES NOTES:

1. EXISTING SERVICES ARE LOCATED WITHIN THE SITE.
2. THE CONTRACTOR IS TO LOCATE ALL SERVICES BY CONTACTING THE RELEVANT AUTHORITY PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

EXISTING SERVICES

ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR THROUGH CONTACTING THE RELEVANT SERVICE AUTHORITY PRIOR TO THE COMMENCEMENT OF ANY WORK



DATUM R.L.-6.000

CHAINAGE	CUT (-)/FILL DEPTH	DESIGN SURFACE	NATURAL SURFACE
0.000	0.000	6.642	6.642
9.128	-0.000	6.405	6.405
20.000	0.060	6.122	6.062
31.038	0.159	5.835	5.676
40.000	0.269	5.614	5.345
60.000	1.301	5.210	3.909
80.000	1.854	4.929	3.074
97.101	1.839	4.785	2.945
100.000	1.993	4.769	2.776
116.038	1.440	4.730	3.290
120.000	1.214	4.730	3.516
140.000	5.586	4.730	-0.856
160.000	4.218	4.730	0.512
169.152	0.945	4.730	3.785
180.000	2.922	4.730	1.808
181.086	2.961	4.730	1.769
200.000	0.986	4.849	3.864
220.000	0.060	5.235	5.175
226.608	0.262	5.421	5.159
226.609	0.262	5.421	5.158
240.000	0.601	5.887	5.286
260.000	0.144	6.806	6.662
280.000	0.055	7.991	7.937
300.000	-0.011	9.444	9.454
301.086	-0.008	9.530	9.538
303.536	0.000	9.726	9.726
303.536	-0.000	9.726	9.726

SUPER ELEVATION: LHS 4.86% / RHS -6.65% (0.000); LHS 3% / RHS -3% (25.000); 87.101; 126.951 / 127.101 LHS -2.98%; LHS & RHS -3%; 283.536; LHS & RHS -3% (303.536)

LONGITUDINAL SECTION MC01
SCALE 1:500H, 1:50V

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
18/03/19	2	VERTICAL GEOMETRY AMENDED TO SUIT RAISED BRIDGE LEVEL		
19/12/18	1	PRELIMINARY ISSUE		

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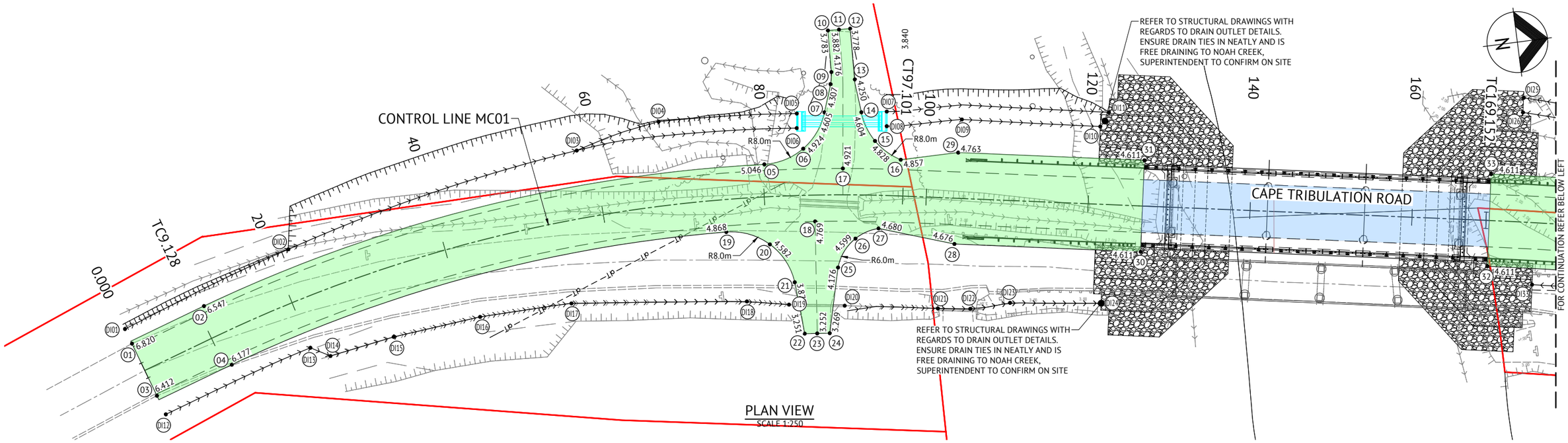
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE 0 10 20 30m
SCALE 1:500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE ROADWORKS AND LONGITUDINAL SECTION PLAN

JOB CODE NQC-0023
SHEET NUMBER C005
REV A



PLAN VIEW
SCALE 1:250

DRAIN SETOUT DETAILS

POINT	EASTING	NORTHING
DI01	332174.505	8214768.000
DI02	332167.364	8214789.271
DI03	332159.872	8214826.125
DI04	332157.645	8214836.605
DI05	332158.847	8214853.643
DI06	332160.632	8214853.404
DI07	332160.044	8214864.689
DI08	332161.829	8214864.456
DI09	332162.201	8214873.759
DI10	332165.266	8214890.584
DI11	332163.669	8214891.874

DRAIN SETOUT DETAILS

POINT	EASTING	NORTHING
DI12	332185.586	8214771.648
DI13	332179.749	8214790.394
DI14	332181.072	8214792.721
DI15	332179.744	8214800.760
DI16	332178.671	8214811.657
DI17	332178.477	8214823.056
DI18	332181.027	8214844.559
DI19	332182.086	8214849.660
DI20	332183.100	8214856.459
DI21	332184.923	8214867.812
DI22	332185.475	8214871.776

DRAIN SETOUT DETAILS

POINT	EASTING	NORTHING
DI23	332185.376	8214876.742
DI24	332186.881	8214887.872
DI25	332168.486	8214942.847
DI26	332170.261	8214942.541
DI27	332176.146	8214961.303
DI28	332181.000	8214970.675
DI30	332200.127	8215044.258
DI33	332191.455	8214940.916
DI34	332194.820	8214956.982
DI35	332195.563	8214966.919
DI36	332219.179	8215066.309

ROAD SETOUT DETAILS

POINT	EASTING	NORTHING
01	332176.402	8214768.625
02	332172.957	8214778.039
03	332183.179	8214770.856
04	332180.567	8214780.504
05	332164.550	8214848.859
06	332163.250	8214853.880
07	332159.144	8214857.049
08	332155.806	8214858.250
09	332154.329	8214858.540
10	332149.202	8214858.771
11	332149.264	8214860.144

ROAD SETOUT DETAILS

POINT	EASTING	NORTHING
12	332149.327	8214861.526
13	332155.605	8214861.289
14	332159.718	8214861.568
15	332163.449	8214862.786
16	332166.152	8214865.631
17	332166.294	8214858.416
18	332172.330	8214854.175
19	332172.207	8214843.135
20	332174.413	8214848.279
21	332179.450	8214850.718
22	332185.883	8214851.121

ROAD SETOUT DETAILS

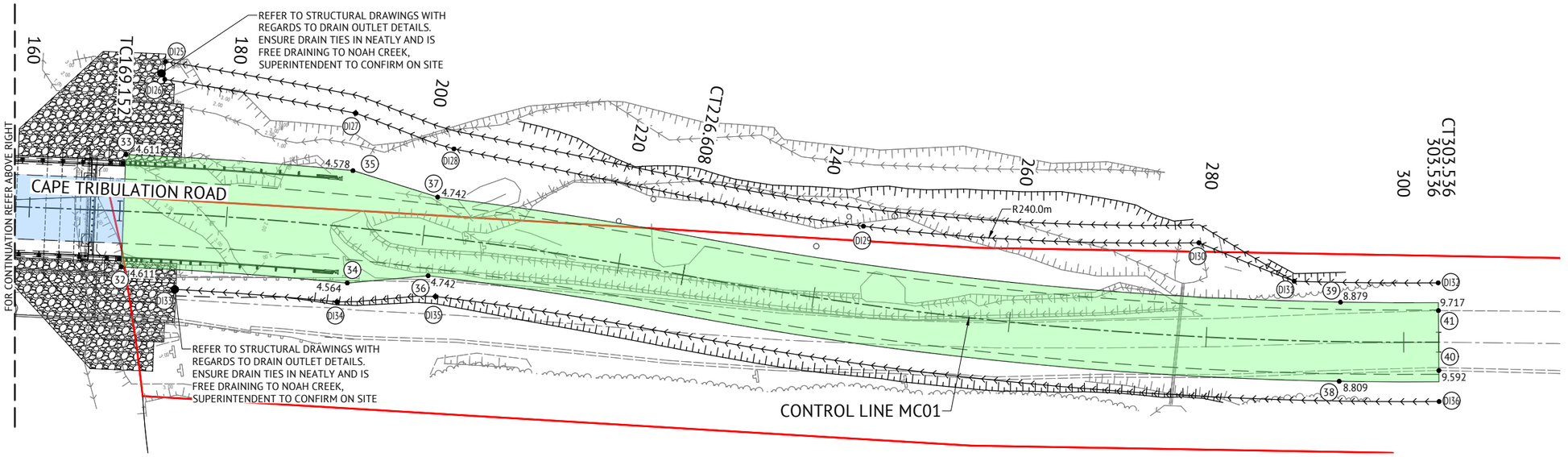
POINT	EASTING	NORTHING
23	332186.051	8214852.656
24	332186.220	8214854.192
25	332178.324	8214856.255
26	332175.073	8214858.839
27	332174.194	8214861.827
28	332177.305	8214870.866
29	332166.188	8214872.782
30	332181.212	8214893.532
31	332170.096	8214895.449
32	332188.486	8214935.731
33	332177.289	8214937.661

ROAD SETOUT DETAILS

POINT	EASTING	NORTHING
34	332193.053	8214958.212
35	332181.861	8214960.249
36	332193.372	8214966.430
37	332185.621	8214968.408
38	332215.843	8215056.542
39	332207.929	8215057.711
40	332216.065	8215066.690
41	332210.048	8215067.426

ROADWORKS LEGEND:

- 2.3 — DESIGN SURFACE CONTOURS
- EDGE OF ROAD
- EDGE OF SHOULDER
- TOP OF BATTER
- INVERT OF DRAIN
- 5.270 — FINISHED SURFACE LEVEL
- PAVEMENT TYPE A (2440m²) REFER TO SHEET C003 FOR DETAILS
- PAVEMENT TYPE B (280m²) REFER TO SHEET C003 FOR DETAILS



PLAN VIEW
SCALE 1:250

ROADWORKS NOTES:

1. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT LATEST ISSUE TMR STANDARD DRAWINGS AND SPECIFICATIONS, UNLESS NOTED OTHERWISE.
2. ALL RADII AND LEVEL INFORMATION IS TO EDGE OF ROAD OR INVERT OF DRAIN UNLESS NOTED OTHERWISE.
3. THE PRINCIPLE CONTRACTOR IS TO CONFIRM ALL LEVELS PRIOR TO CONSTRUCTION AND REPORT ANY INDESCREPENCIES TO SUPERINTENDENT.

EXISTING SERVICES

ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR THROUGH CONTACTING THE RELEVANT SERVICE AUTHORITY PRIOR TO THE COMMENCEMENT OF ANY WORK

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
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DESIGNED B.CORLIS
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE
0 5 10 15m
SCALE 1:250 (A1)
ORIGINAL SHEET SIZE A1

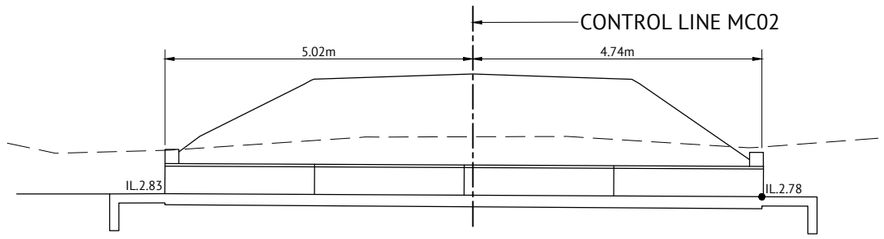
CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE ROADWORKS DETAILS, PAVEMENT AND DRAINAGE PLAN

JOB CODE NQC-0023
SHEET NUMBER C006
REV A

DRAINAGE SCHEDULE

Culvert No.	Culvert Chainage	Drainage Structure	Wingwalls Skew	Wingwalls Type	Wingwalls Lengths W1 (m)	Wingwalls Lengths W2 (m)	EndWalls / Wingwalls (U)Conc. (m3) 2309	EndWalls / Wingwalls (R)Conc. (m3) 2308	EndWalls / Wingwalls Reinforcing (m2)	EndWalls / Wingwalls Reinforcing (fabric)	Concrete Bases Conc. (m3) 2302	Concrete Bases Reinforcing RL1218 (m2)	Concrete Bases Reinforcing N12 (m)	Concrete Bases Reinforcing Nibs (m)	Aprons Rock Area (m2) 2315	Aprons Wire Matt. Area (m2) 2316	Aprons Wire Matt. Thick (mm)	Aprons Reinforced Conc. (m3) 2313	Aprons Reinforced Reinforcing (m2)	Aprons Reinforced Reinforcing (fabric)	Aprons Mass Conc. (m3) 2314	Cut Off Walls (m3)	Excavation (m3) Culv.	Excavation (m3) Ends	Excavation (m3) Inlet Outlet	Fill / Backfill OLM (m3)	Fill / Backfill FBM (m3)	Fill / Backfill BHM (m3)	Fill / Backfill BSP (m3)	No Fines Conc. Block	Reo. Bar Mass (kg)	Remarks
1A	9.050	2/450 RCP (8/2.44)	0				1.0											0.4	4.8	SL62		0.3	18.9	3.3		9.5		3.7				
Total Quantities							1.0											0.4				0.3	18	3		9		3				Fabric quantities are net only
Total Fabric							4.8 / SL62																									No allowances made for laps etc.

OLM = Overlay Material
FBM = Fill / Backfill /Side Material
BHM = Bedding / Haunch Material
BSP = Bedding Steel Pipes



CULVERT 1A 2/450 RCP
2/450 RCP (8/2.44) (9.76 OVERALL LENGTH) MA02 CH.9.05

NOTE:
FOR CULVERT DETAILS REFER TO TMR STANDARD DRAWINGS - 1305, 1306, 1359.

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
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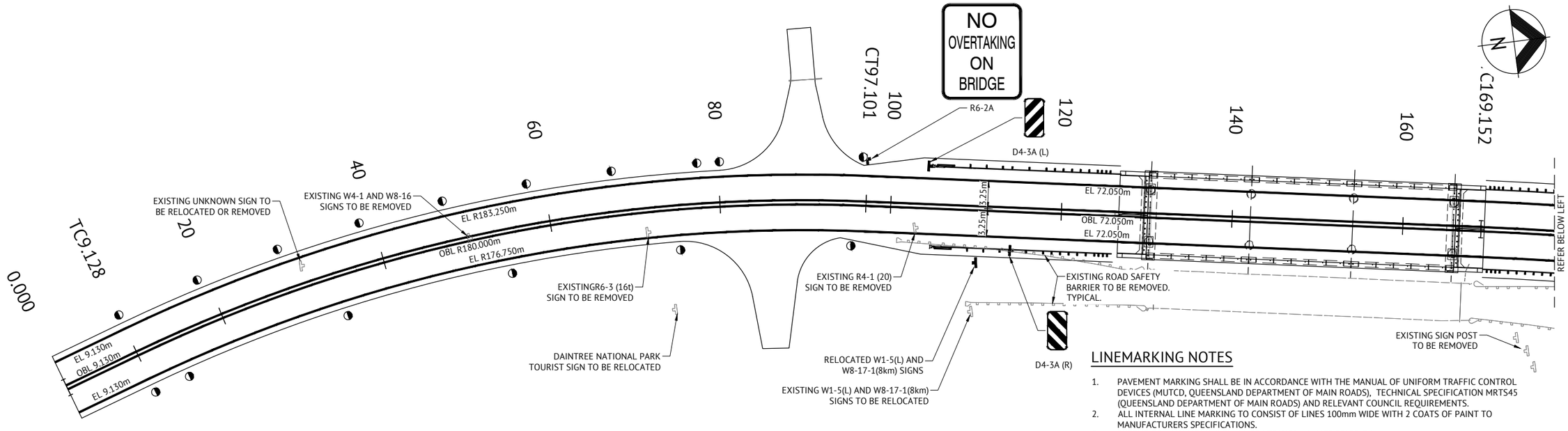
DESIGNED B.CORLIS
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE
0 1 2 3m
SCALE 1:50 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE CULVERT DETAILS PLAN

JOB CODE NQC-0023
SHEET NUMBER C007
REV A



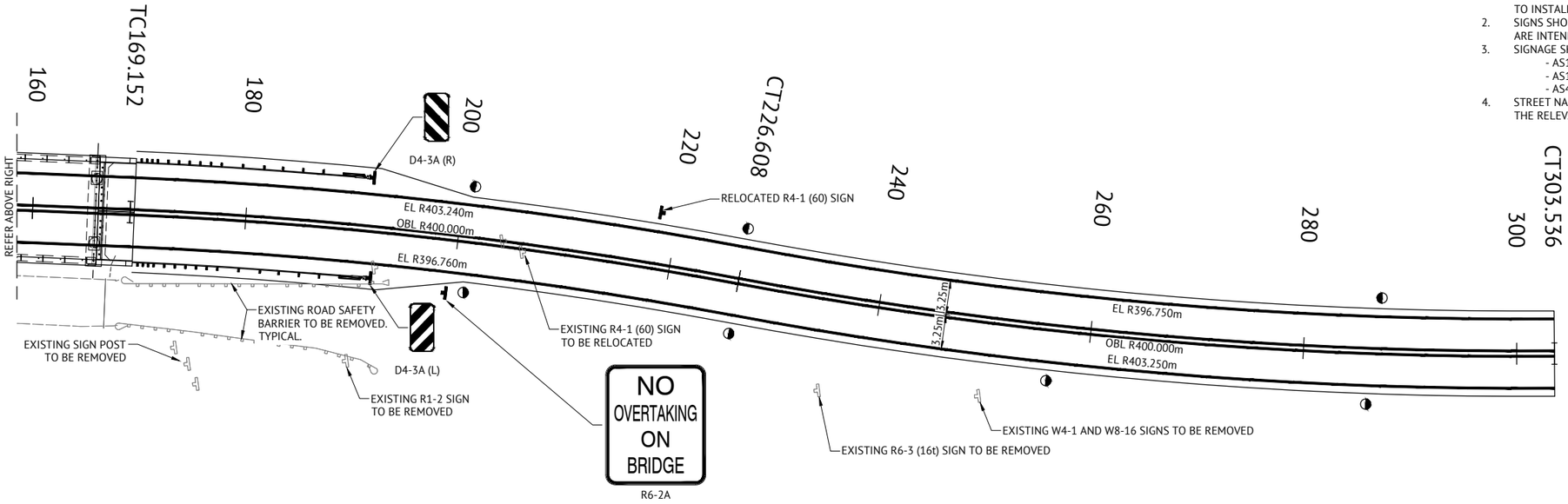
LINEMARKING PLAN
SCALE 1:250

LINEMARKING NOTES

1. PAVEMENT MARKING SHALL BE IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD, QUEENSLAND DEPARTMENT OF MAIN ROADS), TECHNICAL SPECIFICATION MRTS45 (QUEENSLAND DEPARTMENT OF MAIN ROADS) AND RELEVANT COUNCIL REQUIREMENTS.
2. ALL INTERNAL LINE MARKING TO CONSIST OF LINES 100mm WIDE WITH 2 COATS OF PAINT TO MANUFACTURERS SPECIFICATIONS.
3. EXTENT OF LINEMARKING SHALL BE VERIFIED ON SITE PRIOR TO INSTALLATION.
4. ALL PAINTED MARKINGS SHALL BE APPROVED REFLECTORISED U.N.O.
5. ANY EXISTING LINE MARKINGS DAMAGED BY THE PROPOSED WORKS ARE TO BE REINSTATED.
6. EXISTING CONFLICTING LINE MARKINGS ARE TO BE PERMANENTLY REMOVED BY METHODS APPROVED BY THE DISTRICT ENGINEER.
7. RETRO-REFLECTIVE RAISED PAVEMENT MARKERS (RRPM's) SHALL BE PLACED 25mm TO 50mm FROM THE PAINTED LINEMARKING AND ORIENTATED SO THAT FULL REFLECTIVE EFFECT IS ACHIEVED BY AIMING THE REFLECTIVE FACE IN THE DIRECTION OF APPROACHING TRAFFIC.
8. GENERALLY THE NORMAL SPACING BETWEEN RRPM's IS TO BE 12.0m U.N.O.
9. ANY EXISTING LINEMARKING NOT SHOWN ON THIS PLAN WHICH CONFLICTS OR IS INCOMPATIBLE WITH THE PROPOSED LINEMARKING SHALL BE REMOVED BY THE CONTRACTOR.

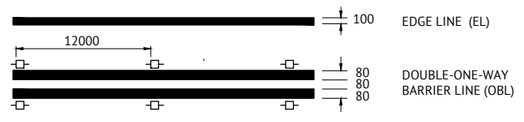
SIGNAGE NOTES

1. LOCATION OF SIGNS SHOWN ON THIS PLAN ARE INDICATIVE ONLY. CARE AND CONSIDERATION IS TO BE GIVEN TO ON SITE CONDITIONS TO AVOID ANY VISUAL OBSTRUCTION OF THE SIGN ALONG THE INTENDED COURSE OF APPROACHING TRAFFIC. EXACT LOCATION OF ALL SIGNS SHALL BE CONFIRMED ON SITE PRIOR TO INSTALLATION.
2. SIGNS SHOULD BE ORIENTATED AT APPROXIMATELY RIGHT ANGLES TO, AND FACING THE TRAFFIC THEY ARE INTENDED TO SERVE.
3. SIGNAGE SHALL BE IN ACCORDANCE WITH:
   - AS1742 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
   - AS1743 ROAD SIGNS SPECIFICATION
   - AS4049.1 PAVEMENT MARKING MATERIALS
4. STREET NAME SIGNS ARE TO BE INSTALLED WITH THE RELEVANT HOUSE NUMBERS IN ACCORDANCE WITH THE RELEVANT LOCAL COUNCIL STANDARD DRAWINGS.



LINEMARKING PLAN
SCALE 1:250

LINEMARKING LEGEND



SIGNAGE LEGEND

- EXISTING SIGN
- NEW SIGN
- GUIDE POST

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
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19/12/18	1	PRELIMINARY ISSUE		

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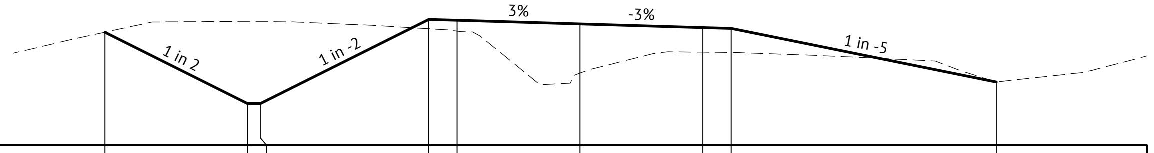
DESIGNED: B.CORLIS
CHECKED: R.PERKINS
PROJECT MANAGER: C.MATHESON
ENGINEERING CERTIFICATION: R.PERKINS RPEQ 2319

SCALE: 0 5 10 15m
SCALE 1:250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: NQ CIVIL CONTRACTORS PTY LTD
PROJECT: REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION: NOAH CREEK, CAPE TRIBULATION
SHEET TITLE: SIGNAGE AND LINEMARKING PLAN

JOB CODE: NQC-0023
SHEET NUMBER: C008
REV: A

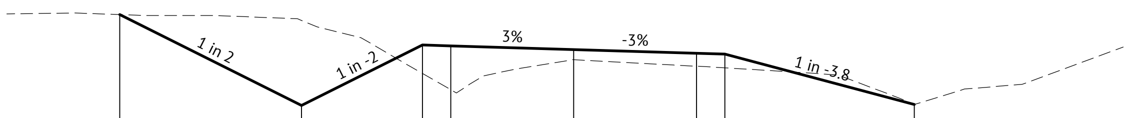
Centreline Data
X = 332168.119
Y = 8214828.556
Z = 5.210
Datum 2



DESIGN HEIGHT	4.99	3.10	3.10	5.33	5.31	5.21	5.11	5.09	3.67
EXISTING SURFACE	4.99	5.27	5.27	5.08	5.02	3.91	4.46	4.46	3.67
DESIGN OFFSET	-12.57	-8.79	-8.46	-4.00	-3.25	0.00	3.25	4.00	11.01

CHAINAGE 60.000

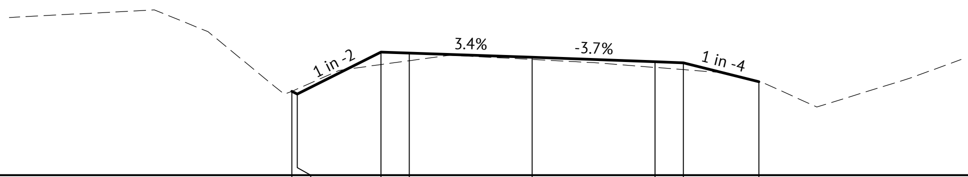
Centreline Data
X = 332169.935
Y = 8214808.448
Z = 5.614
Datum 3



DESIGN HEIGHT	6.54	4.13	5.73	5.71	5.61	5.52	5.49	4.16
EXISTING SURFACE	6.54	6.38	4.98	4.55	5.35	5.17	5.13	4.16
DESIGN OFFSET	-12.01	-7.20	-4.00	-3.25	0.00	3.25	4.00	9.01

CHAINAGE 40.000

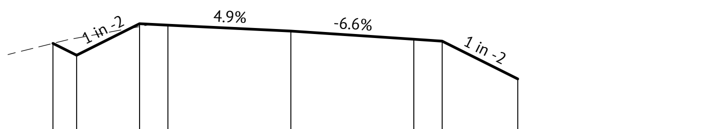
Centreline Data
X = 332173.947
Y = 8214788.865
Z = 6.122
Datum 3



DESIGN HEIGHT	5.22	5.15	6.26	6.23	6.12	6.00	5.97	5.47
EXISTING SURFACE	5.22	5.28	5.93	6.03	6.06	5.85	5.79	5.47
DESIGN OFFSET	-6.36	-6.22	-4.00	-3.25	0.00	3.25	4.00	6.00

CHAINAGE 20.000

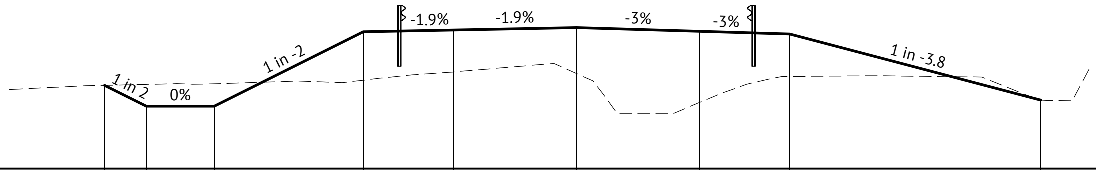
Centreline Data
X = 332179.887
Y = 8214769.772
Z = 6.642
Datum 4



DESIGN HEIGHT	6.32	6.00	6.84	6.80	6.64	6.43	6.38	5.38
EXISTING SURFACE	6.32	6.46	6.76	6.80	6.64	6.43		
DESIGN OFFSET	-6.29	-5.67	-4.00	-3.25	0.00	3.25	4.00	6.00

CHAINAGE 0.000

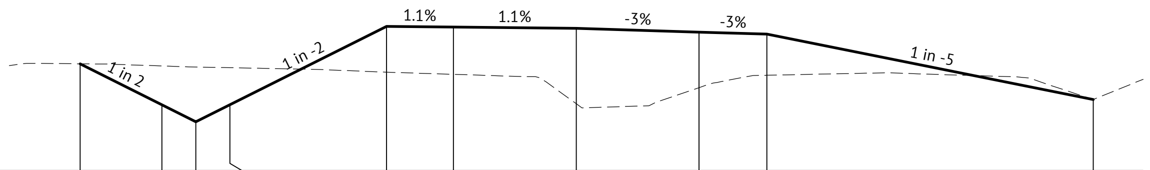
Centreline Data
X = 332174.513
Y = 8214887.872
Z = 4.730
Datum 1



DESIGN HEIGHT	3.20	2.65	2.65	4.62	4.67	4.73	4.63	4.56	2.81
EXISTING SURFACE	3.20	3.23	3.24	3.34	3.56	3.52	2.75	3.44	2.81
DESIGN OFFSET	-12.49	-11.38	-9.58	-5.64	-3.25	0.00	3.25	5.64	12.28

CHAINAGE 120.000

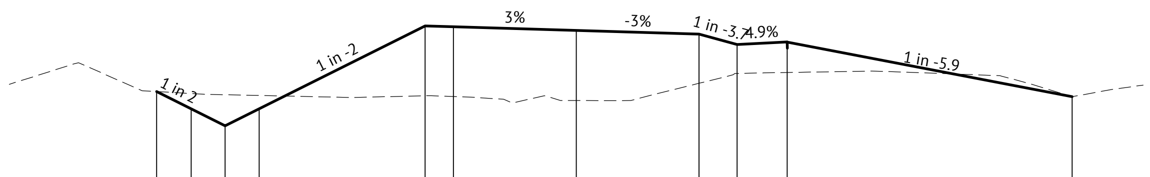
Centreline Data
X = 332171.115
Y = 8214868.163
Z = 4.769
Datum 1



DESIGN HEIGHT	3.83	2.75	2.30	2.75	4.82	4.80	4.77	4.67	4.62	2.89
EXISTING SURFACE	3.83	3.78	3.73	3.73	3.61	3.55	2.78	3.20	3.53	2.89
DESIGN OFFSET	-13.13	-10.96	-9.33	-9.16	-5.02	-3.25	0.00	3.25	5.04	13.68

CHAINAGE 100.000

Centreline Data
X = 332168.522
Y = 8214848.341
Z = 4.929
Datum 1



DESIGN HEIGHT	3.31	2.85	2.40	2.85	5.05	5.03	4.93	4.83	4.56	4.62	3.17
EXISTING SURFACE	3.31	3.26	3.23	3.21	3.20	3.18	3.07	3.53	3.79	3.82	3.17
DESIGN OFFSET	-11.10	-10.19	-9.33	-8.39	-4.00	-3.25	0.00	3.25	4.26	5.58	13.12

CHAINAGE 80.000

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
18/03/19	2	VERTICAL GEOMETRY AMENDED TO SUIT RAISED BRIDGE LEVEL		
19/12/18	1	PRELIMINARY ISSUE		

REVISIONS

Premise

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WEB: www.premise.com.au

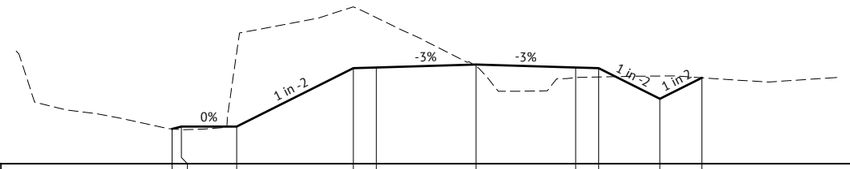
DESIGNED B.CORLIS
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE
0 2 4 6m
SCALE 1:100 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE ROAD CROSS SECTIONS - SHEET 1 OF 2

JOB CODE NQC-0023
SHEET NUMBER C009
REV A

Centreline Data
X = 332194.639
Y = 8214985.740
Z = 5.235

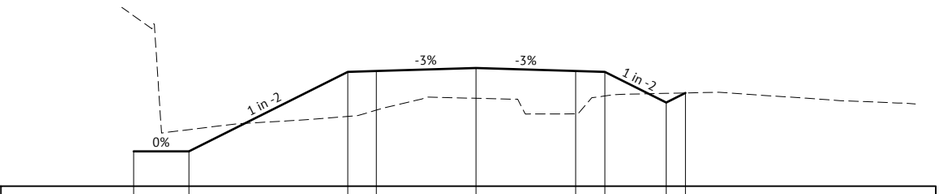


Datum 2

DESIGN HEIGHT	3.13	3.21	3.21	5.11	5.14	5.23	5.14	5.11	4.11	4.80
EXISTING SURFACE	3.13	3.11	5.62	7.11	6.76	5.17	4.81	4.83	4.86	4.80
DESIGN OFFSET	-9.92	-9.61	-7.81	-4.00	-3.25	0.00	3.25	4.00	6.00	7.37

CHAINAGE 220.000

Centreline Data
X = 332189.258
Y = 8214966.480
Z = 4.849

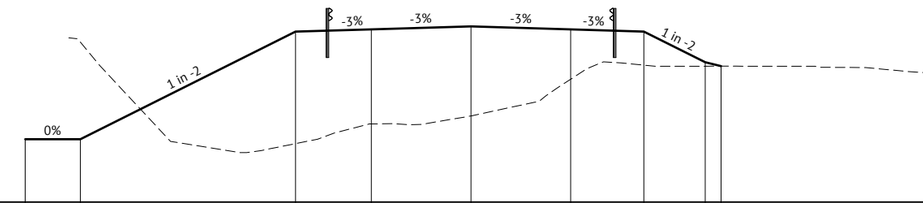


Datum 1

DESIGN HEIGHT	2.13	2.13	4.72	4.75	4.85	4.75	4.72	3.72	4.04	
EXISTING SURFACE	6.55	2.84	3.27	3.48	3.86	3.35	3.94	4.02	4.04	
DESIGN OFFSET	-11.17	-9.37	-4.18	-3.25	0.00	3.25	4.20	6.20	6.83	

CHAINAGE 200.000

Centreline Data
X = 332184.847
Y = 8214946.975
Z = 4.730

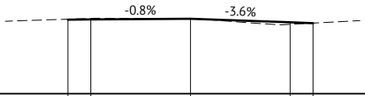


Datum -1

DESIGN HEIGHT	1.05	1.05	4.56	4.63	4.73	4.63	4.56	3.56	3.43	
EXISTING SURFACE		4.22	0.91	1.55	1.81	3.00	3.46	3.43	3.43	
DESIGN OFFSET	-14.54	-12.74	-5.72	-3.25	0.00	3.25	5.64	7.64	8.16	

CHAINAGE 180.000

Centreline Data
X = 332212.779
Y = 8215063.529
Z = 9.444

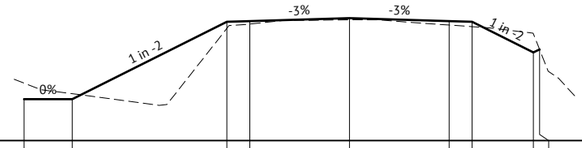


Datum 7

DESIGN HEIGHT	9.41	9.42	9.44	9.33	9.30					
EXISTING SURFACE	9.43	9.45	9.45	9.26	9.30					
DESIGN OFFSET	-4.00	-3.25	0.00	3.25	4.00					

CHAINAGE 300.000

Centreline Data
X = 332209.682
Y = 8215043.772
Z = 7.991

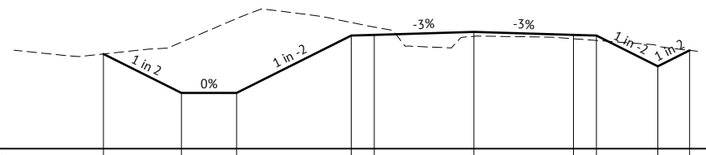


Datum 4

DESIGN HEIGHT	5.35	5.35	7.87	7.89	7.99	7.89	7.87	6.87	6.97	
EXISTING SURFACE	5.87	5.53	7.65	7.80	7.94	7.77	7.71	7.48	6.97	
DESIGN OFFSET	-10.62	-9.04	-4.00	-3.25	0.00	3.25	4.00	6.00	6.20	

CHAINAGE 280.000

Centreline Data
X = 332205.602
Y = 8215024.195
Z = 6.806

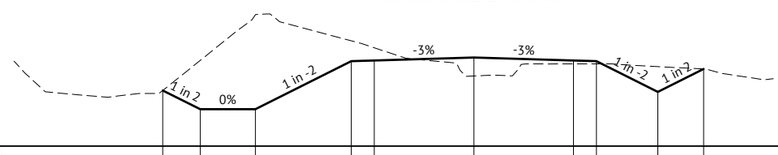


Datum 3

DESIGN HEIGHT	6.09	4.82	4.82	6.69	6.71	6.81	6.71	6.69	5.69	6.20
EXISTING SURFACE	6.09	6.47	7.24	7.11	6.96	6.66	6.58	6.53	6.35	6.20
DESIGN OFFSET	-12.08	-9.54	-7.74	-4.00	-3.25	0.00	3.25	4.00	6.00	7.04

CHAINAGE 260.000

Centreline Data
X = 332200.549
Y = 8215004.846
Z = 5.887



Datum 3

DESIGN HEIGHT	4.81	4.20	4.20	5.77	5.79	5.89	5.79	5.77	4.77	5.51
EXISTING SURFACE	4.81	5.79	7.28	6.43	6.21	5.29	5.68	5.68	5.59	5.51
DESIGN OFFSET	-10.15	-8.93	-7.13	-4.00	-3.25	0.00	3.25	4.00	6.00	7.49

CHAINAGE 240.000

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTUCTION ISSUE		
18/03/19	2	VERTICAL GEOMETRY AMENDED TO SUIT RAISED BRIDGE LEVEL		
19/12/18	1	PRELIMINARY ISSUE		

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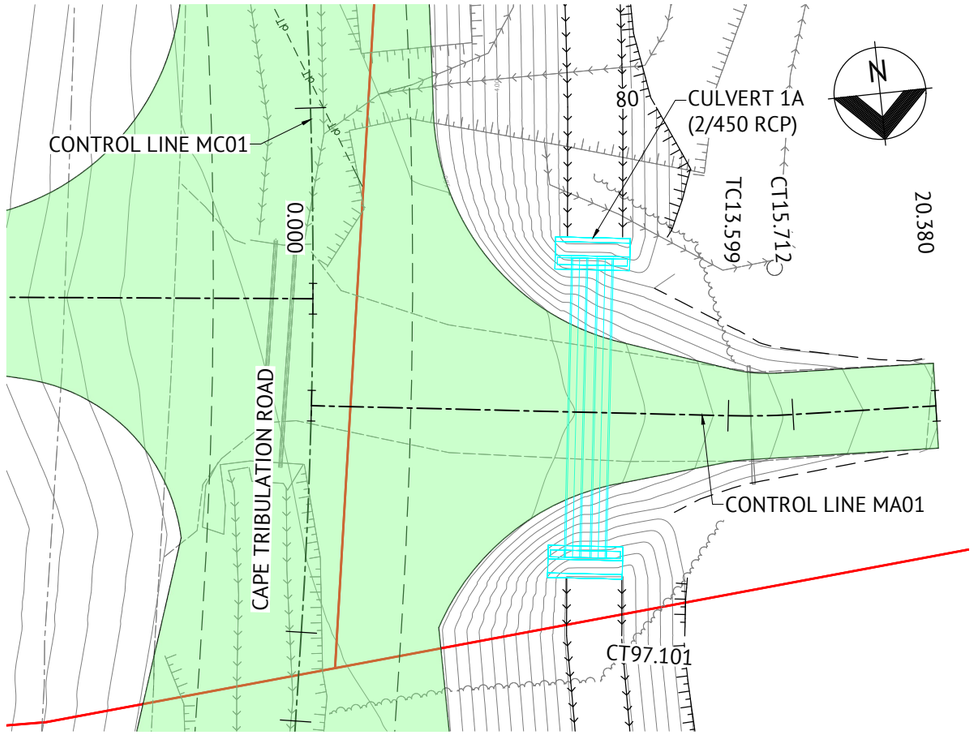
DESIGNED B.CORLIS
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

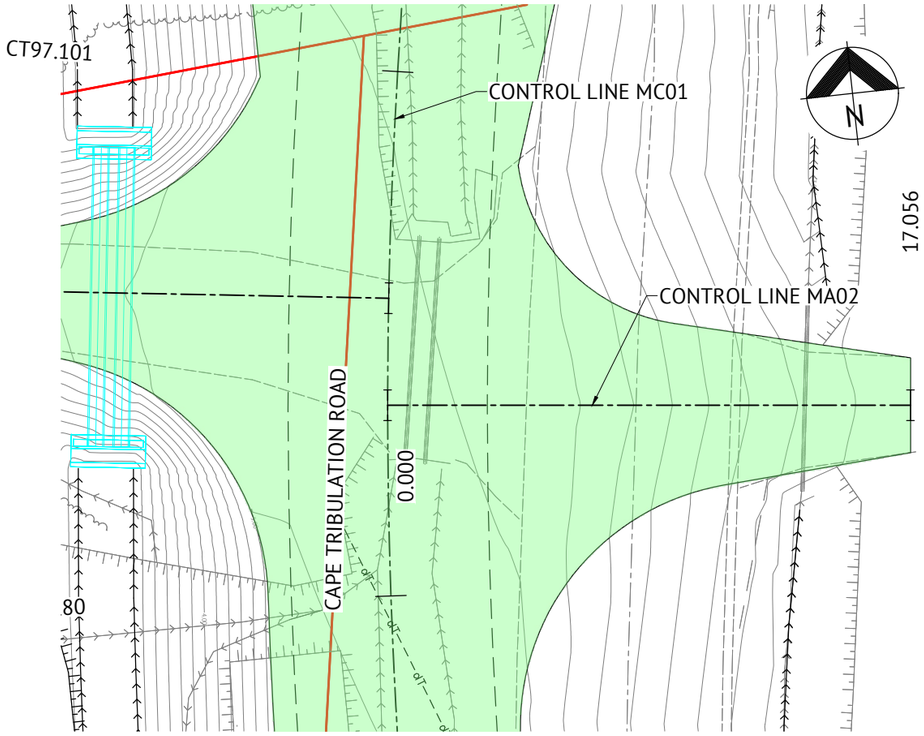
SCALE
0 2 4 6m
SCALE 1:100 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE ROAD CROSS SECTIONS - SHEET 2 OF 2

JOB CODE NQC-0023
SHEET NUMBER C010
REV A



PLAN VIEW
SCALE 1:250



PLAN VIEW
SCALE 1:250

ROADWORKS LEGEND:

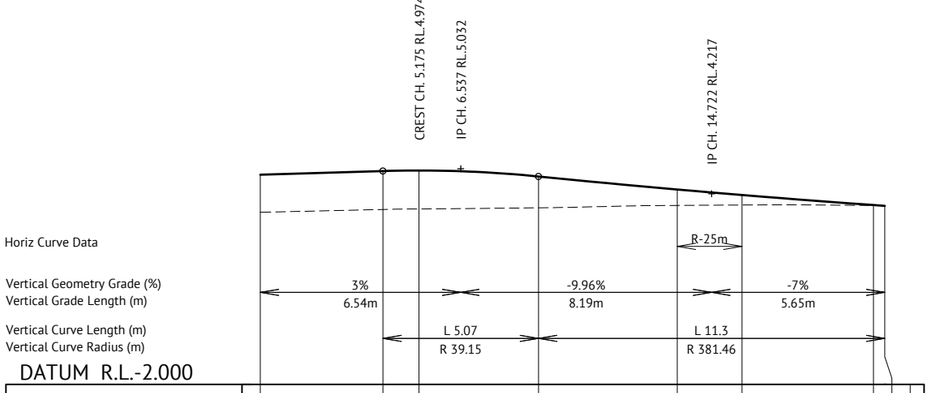
- 2.3 — DESIGN SURFACE CONTOURS
- EDGE OF ROAD
- EDGE OF SHOULDER
- TOP OF BATTER
- INVERT OF DRAIN
- PAVEMENT TYPE A
  REFER TO SHEET C003 FOR DETAILS

ROADWORKS NOTES:

1. ALL WORKS TO BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT LATEST ISSUE TMR STANDARD DRAWINGS AND SPECIFICATIONS, UNLESS NOTED OTHERWISE.

EXISTING SERVICES

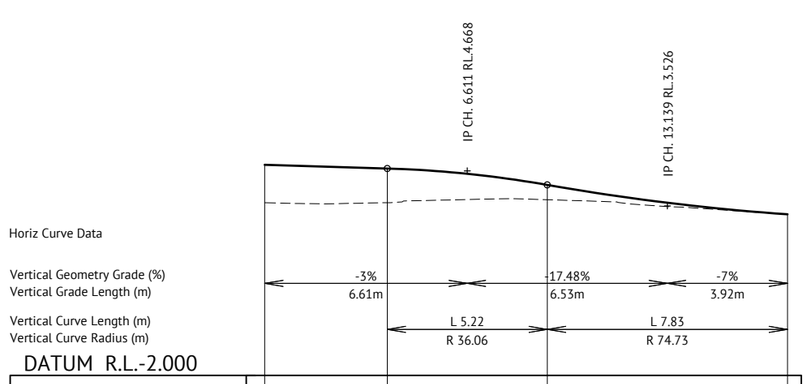
ALL EXISTING SERVICES ARE TO BE LOCATED BY THE CONTRACTOR THROUGH CONTACTING THE RELEVANT SERVICE AUTHORITY PRIOR TO THE COMMENCEMENT OF ANY WORK



DATUM R.L.-2.000

CUT (-)/FILL DEPTH	1.223	1.252	1.253	1.021	0.520	0.327	0.013		
DESIGN SURFACE	4.836	4.956	4.974	4.779	4.356	4.176	3.848	3.821	
NATURAL SURFACE	3.613	3.704	3.720	3.758	3.835	3.849	3.835		
CHAINAGE	0.000	4.000	5.175	9.075	13.599	15.712	20.000	20.370	20.380

CONTROL LINE MA01 LONGITUDINAL SECTION
SCALE 1:100H, 1:10V



DATUM R.L.-2.000

CUT (-)/FILL DEPTH	1.235	1.115	0.482		
DESIGN SURFACE	4.866	4.746	4.211	3.252	
NATURAL SURFACE	3.631	3.631	3.729		
CHAINAGE	0.000	4.000	9.222	17.056	

CONTROL LINE MA02 LONGITUDINAL SECTION
SCALE 1:100H, 1:10V

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	A	CONSTRUCTION ISSUE		

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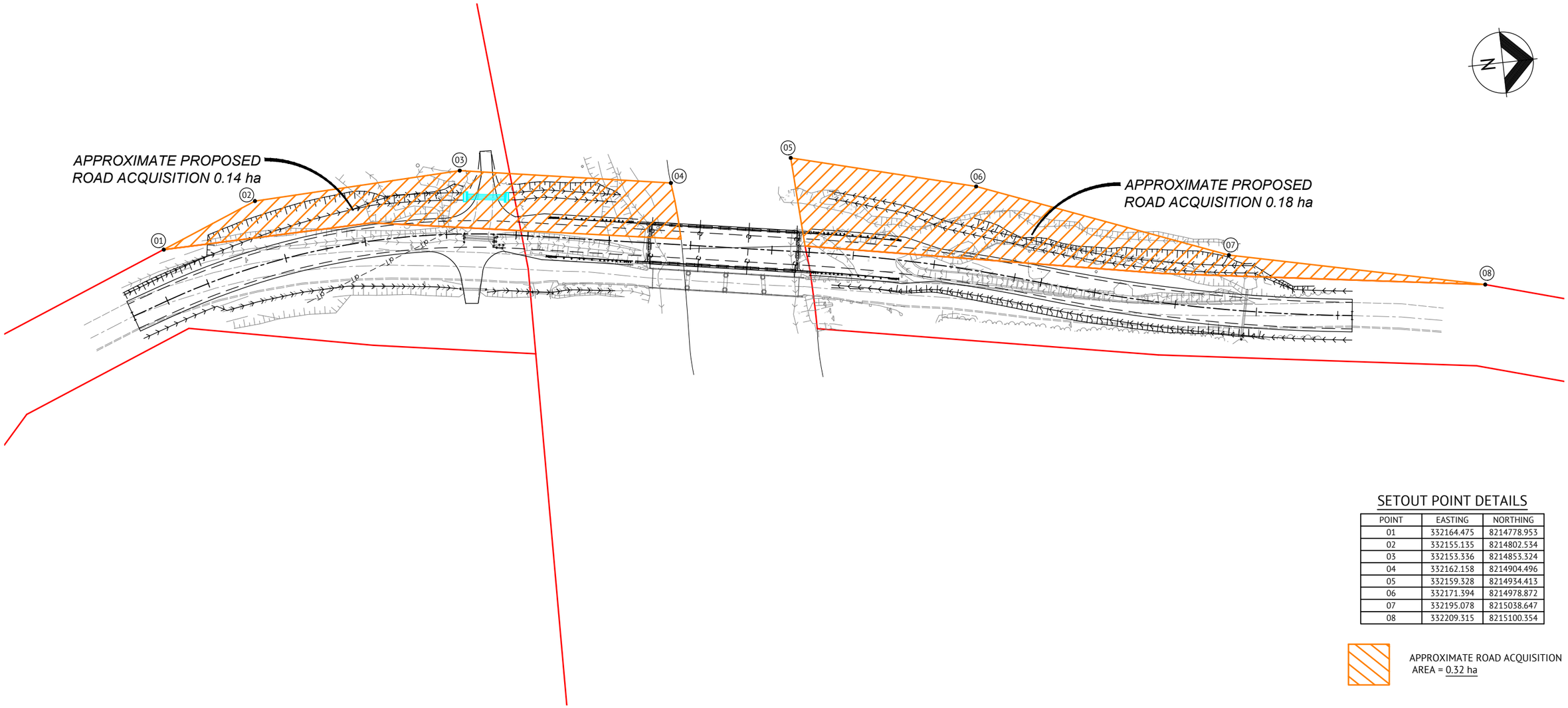
CHECKED R.PERKINS
PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE
0 2 4 6m
SCALE 1:100 (A1)
0 0.2 0.4 0.6m
SCALE 1:10 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE ACCESS DETAILS PLAN

JOB CODE NQC-0023
SHEET NUMBER C011
REV A



PLAN VIEW
SCALE 1:500

SETOUT POINT DETAILS

POINT	EASTING	NORTHING
01	332164.475	8214778.953
02	332155.135	8214802.534
03	332153.336	8214853.324
04	332162.158	8214904.496
05	332159.328	8214934.413
06	332171.394	8214978.872
07	332195.078	8215038.647
08	332209.315	8215100.354

APPROXIMATE ROAD ACQUISITION
AREA = 0.32 ha

NOTE:
SETOUT AND AREAS ARE APPROXIMATE ONLY AND ARE SUBJECT TO CADASTRAL SURVEY

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
12/04/19	1	PRELIMINARY ISSUE		

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PROJECT MANAGER C.MATHESON
ENGINEERING CERTIFICATION
R.PERKINS RPEQ 2319

SCALE
0 10 20 30m
SCALE 1:500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE RESUMPTION PLAN

JOB CODE NQC-0023
SHEET NUMBER C012
REV 1

GENERAL

G.1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE BRIDGE SPECIFICATION, PROJECT SPECIFICATION, AND AMENDMENTS, CIVIL DRAWINGS AND OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE PROJECT.
G.2. ALL DIMENSIONS ARE IN MILLIMETRES, EXCEPT FOR CHAINAGES AND HT'S, WHICH ARE MEASURED IN METRES.
G.3. DO NOT OBTAIN DIMENSIONS BY SCALING FROM DRAWINGS.
G.4. SET-OUT COORDINATES ARE TO GEOCENTRIC DATUM OF AUSTRALIA 94.
G.5. ALL LEVELS AND DIMENSIONS RELEVANT TO SETTING OUT AND OFFSITE FABRICATION SHALL BE CONFIRMED BY THE CONTRACTOR PRIOR TO COMMENCING WORK. ANY DISCREPANCIES MUST BE BROUGHT TO THE ATTENTION OF THE SUPERINTENDENT.
G.6. THE LOCATIONS OF UNDERGROUND SERVICES HAVE BEEN OBTAINED FROM EXISTING RECORDS FOR WHICH ACCURACY CANNOT BE GUARANTEED. ALL SERVICE LOCATIONS SHALL BE CONFIRMED ON SITE BEFORE COMMENCING WORK.
G.7. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE CONSTRUCTOR SHALL CONTACT THE RELEVANT AUTHORITIES TO ASCERTAIN THE POSSIBLE LOCATION OF ADDITIONAL SERVICES AND THE DETAILED LOCATION AND DEPTH OF ALL SERVICES AND ARRANGE FOR THEIR RELOCATION WHERE NECESSARY.
G.8. THE CONTRACTOR SHALL MAINTAIN ALL WORK SITES IN A SAFE AND STABLE CONDITION.
G.9. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE AUSTRALIAN STANDARDS (AS) AND TMR STANDARDS EXCEPT WHERE VARIED BY THE SPECIFICATIONS.
G.10. NOMINATION OF PROPRIETARY ITEMS DOES NOT INDICATE EXCLUSIVE PREFERENCE BUT INDICATES THE REQUIRED PROPERTIES OF THE ITEM. ALTERNATIVES HAVING THE REQUIRED PROPERTIES MAY BE USED, SUBJECT TO THE APPROVAL OF THE DESIGNER. PROPRIETY ITEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND THE APPROPRIATE TECHNICAL SPECIFICATION.
G.11. BOREHOLE LOCATION SHOWN THUS: BH1
G.12. A DATE PLATE IS TO BE CAST INTO THE OUTSIDE FACE OF THE LEFT HAND WING WALL AT ABUTMENT A FOR EACH BRIDGE.
G.13. A PERMANENT SURVEY MARK IS TO BE CAST INTO THE TOP OF THE LEFT HAND WING WALL AT ABUTMENT A FOR EACH BRIDGE.
G.14. ALL CROSS REFERENCES BETWEEN DRAWINGS REFER TO THE 'SERIES NUMBER' OF THE ASSOCIATED DRAWINGS AND NOT THE 'DRAWING No.'

DESIGN DATA

L.1. BRIDGE DESIGNED IN ACCORDANCE WITH AS5100-2017
L.2. DESIGN LOADS:

LIVE LOADS:	2 DESIGN LANE SM1600 LOADING
DESIGN SPEED M1600:	70KM/HR (POSTED 60KM/HR) FOR TWO-LANE CARRIAGEWAY INTERIM CONFIGURATION
EARTHQUAKE LOADS:	BRIDGE EARTHQUAKE DESIGN CATEGORY = BEDC 2
FLOOD LOADS:	DESIGN FLOOD LEVEL Q10 = RL 3.07 Q20 = RL 3.56 Q100 = RL 4.17 Q200 = RL 4.54 Q2000 = RL 5.17 DESIGN FLOOD VELOCITY Q20 = 3.16 m/s Q100 = 3.74 m/s Q200 = 4.38 m/s Q2000 = 4.20 m/s
WIND LOADS:	Vr = 77 m/s (ULS), 47 m/s (SLS)
THERMAL LOADS:	TEMPERATURE DIFFERENTIAL = +23°C / -27°C
MINIMUM LATERAL LOAD:	500kN
BARRIER PERFORMANCE LEVEL:	REGULAR

L.3. CONSTRUCTION LOADS TO BE LIMITED TO LESS THAN DESIGN LOADS.

CONCRETE

C.1. ALL CONCRETE WORK INCLUDING COMPACTION OPERATIONS, CURING AND FINISHES SHALL BE IN ACCORDANCE WITH AS5100.5 & MRTS70.
C.2. ALL EXPOSED EDGES (INSITU AND PRECAST, EXCEPT DECK UNITS) TO HAVE 19x19 CHAMFERS UNLESS SHOWN OTHERWISE.
C.3. CONCRETE CLASS (FOR DURABILITY) AND MINIMUM COVER TO ALL REINFORCEMENT FOR VARIOUS ELEMENTS SHALL BE AS FOLLOWS :-

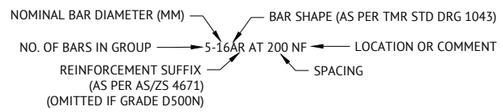
ELEMENT	EXPOSURE CLASS	CLASS	MIN. COVER (mm)	REMARKS
BLINDING CONCRETE		N20/20		
CONCRETE BORED PILES	C2	S55/20	80	CAST AGAINST FORMWORK
PIER HEADSTOCKS	B2	S50/20	50	RIGID FORMWORK AND INTENSE COMPACTION
ABUTMENT HEADSTOCKS, BALLAST WALLS, AND WING WALLS	B2	S50/20	50	RIGID FORMWORK AND INTENSE COMPACTION
PRECAST BEAMS	B2	S50/20	40	RIGID FORMWORK AND INTENSE COMPACTION
RELIEVING SLABS	B2	S40/20	50	RIGID FORMWORK AND INTENSE COMPACTION

C.4. NO HOLES, CHASES, OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT PRIOR APPROVAL OF THE SUPERINTENDENT.
C.5. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND USED ONLY WHERE SHOWN ON THE DRAWINGS OR APPROVED BY THE SUPERINTENDENT.
C.6. THE CONTRACTOR IS TO TAKE SPECIAL PRECAUTIONS TO IMPROVE THE LONG TERM PERFORMANCE OF THE EXPOSED FACES OF CONCRETE. IN PARTICULAR, NO METAL INSERTS, METAL BAR CHAIRS OR METAL SPACERS OR ANY KIND ARE TO BE PLACED ON THE COVER ZONES.
C.7. DETAILS OF CONCRETE MIX, AGGREGATE SIZE AND COLOUR, METHOD OF CURING AND FINISH ARE TO BE SUBMITTED FOR APPROVAL BY THE DESIGNER AT LEAST (6) WEEKS PRIOR TO COMMENCING CONCRETE WORKS.

REINFORCEMENT

R.4. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION.
R.5. REINFORCING STEEL SHALL BE IN ACCORDANCE WITH MRTS71, AS/NZS4671 AND AS 5100.5
R.6. ALL HOOKS, BENDS AND COGS ARE STANDARD AND SHALL BE IN ACCORDANCE WITH MRTS71 AND AS5100.5.
R.7. SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN OR AS OTHERWISE APPROVED BY THE DESIGNER. ALL LAPS SHALL BE FULL STRENGTH SPLICES COMPLYING WITH AS5100 UNO.
WELDING OF THE REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT APPROVAL BY THE DESIGNER. TACK WELDING FOR LOCATION PURPOSES IS TO CONFORM TO AS/NZS 1554.3 CLAUSES 3.3.1 AND 3.3.2 WELDING CONSUMABLES TO BE CONTROLLED HYDROGEN TYPE: G493 TO AS/NZS ISO 14341-B OR T493 TO AS/NZS ISO 17632-B UNLESS NOTED OTHERWISE.
R.8. ALL REINFORCEMENT SHALL BE SECURELY SUPPORTED IN ITS CORRECT POSITION DURING CONCRETING BY APPROVED BAR CHAIRS COMPLYING MRTS70, SPACERS OR SUPPORT BARS.
R.9. REINFORCEMENT SUFFIXES:
N GRADE D500N DEFORMED BARS TO AS/NZS 4671
R GRADE R250N PLAIN ROUND BARS AS/NZS 4671
W GRADE D500L HARD-DRAWN REINFORCING WIRE TO AS/NZS 4671
RL AND SL GRADE D500L WELDED WIRE REINFORCING FABRIC TO AS/NZS 4671

REINFORCING NOMENCLATURE SHOWN ON THE DRAWINGS IS AS FOLLOWS



R.10. SPACING OF REINFORCEMENT SHALL BE TAKEN AS EQUAL UNO.
R.11. THE LAPPED SPLICE LENGTH SHALL BE AS FOLLOWS UNO:

HORIZ BARS > 300mm CAST BELOW	
BAR	MINIMUM LAP LENGTH
N12	600
N16	800
N20	1000
N24	1250
N28	1550
N32	1900
N36	2300
FABRIC	2 TRANSVERSE BARS + 25mm

ALL OTHER BARS	
BAR	MINIMUM LAP LENGTH
N12	500
N16	650
N20	800
N24	1000
N28	1150
N32	1450
N36	1750
FABRIC	2 TRANSVERSE BARS + 25mm

R.12. LENGTHS SHOWN IN THE ABOVE TABLES ARE BASED ON AS3600 FOR D500N REINFORCEMENT IN TENSION OR COMPRESSION, USING 40 MPa CONCRETE WITH MINIMUM 55mm COVER, MINIMUM 150 CENTRES AND INCLUDES THE UPLIFT FACTOR FOR LAPPING REINFORCEMENT AT MAXIMUM STRESS WITHOUT STAGGERS. IF THE CONTRACTOR REQUIRES A DEVELOPMENT LENGTH AND/OR A LAP LENGTH FOR A DIFFERENT SCENARIO, THEN THE CONTRACTOR SHALL SUBMIT A REQUEST TO THE DESIGNER. LAPS IN REINFORCEMENT SHALL BE STAGGERED SO THAT NO MORE THAN 50% OF BARS ARE LAPPED IN ANY ONE CROSS SECTION AND THAT NO TWO ADJACENT BARS ARE LAPPED AT THE SAME LOCATION. WHERE THIS IS NOT POSSIBLE, THEN THE MINIMUM LAP LENGTH SHALL BE INCREASED BY A FACTOR OF 1.3. ALL REINFORCEMENT SHALL BE ACRS CERTIFIED AND THE SUPPLIER SHALL PROVIDE EVIDENCE OF COMPLIANCE PRIOR TO ANY REINFORCEMENT BEING SUPPLIED TO THE PROJECT.

PILES

P.1. PILES DESIGNED BASED ON GEOTECHNICAL REPORT 90737.00.R.001 REV 0 BY DOUGLAS PARTNERS
P.2. TOP OF PILES SHALL BE SCABBLED AND CLEANED PRIOR TO CASTING CONCRETE.

STEELWORK

S.1. SUPPLY AND FABRICATION OF STEELWORK TO BE IN ACCORDANCE WITH MRTS78
S.2. STRUCTURAL STEEL GRADES ARE AS FOLLOWS, UNO:-
A) UB, UC, PFC, EA AND CT TO BE GRADE 300 TO AS/NZS3679.1.
B) PLATES TO BE GRADE 250 TO AS3678.
C) CHS TO BE GRADE C350L0 TO AS/NZS1163.
D) UC TO BE GRADE 350 TO AS/NZS 3679.1
E) RHS AND SHS TO BE GRADE C450LO TO AS/NZS1163.
S.1. STAINLESS STEEL TO BE GRADE 316:-
A) PIPE AND TUBE TO ASTM A312
B) BAR TO ASTM 276
C) COIL, SHEET, AND PLATE TO ASTM S210
S.1. WELDING
WELDING SYMBOLS CONFORM TO AS1101.3
A) STRUCTURAL STEEL
ALL WELDING TO CONFORM TO AS/NZS 1554.1
ALL WELDS TO BE SP CATEGORY.
WELDING CONSUMABLES FOR GRADE 350LO TO BE CONTROLLED HYDROGEN TYPE: G493 TO AS/NZS ISO 14341-B
OR T493 TO AS/NZS ISO 17632-B UNLESS NOTED OTHERWISE.
WELDING CONSUMABLES FOR ALL OTHER STRUCTURAL STEEL SHALL BE CONTROLLED HYDROGEN TYPE: G493 T
AS/NZS ISO 14341-B OR T493 TO AS/NZS ISO 17632-B UNLESS NOTED OTHERWISE.
B) BUTT WELDS SHALL BE PREQUALIFIED FULL PENETRATION.
C) ALL WELDS SHALL BE BE 6 CFW UNO.
S.1. BOLT ASSEMBLIES SHALL BE COMPRISE OF CLASS 8.8 BOLTS, CLASS 8.8 WASHERS AND CLASS 8 NUTS TO AS/NZS 1252 UNO.
S.6. ALL ANCHORS, BOLTS, NUTS AND WASHERS TO BE HOT DIP GALVANISED TO AS1214. ALL STEELWORK TO BE HOT DIP GALVANISED TO AS/NZS 4680 UNO.
S.7. ALL STEELWORK TO HAVE WELD SPLATTER AND WELDING SLAG REMOVED PRIOR TO HOT DIP GALVANISING.
S.8. ANY DAMAGED GALVANISED COATINGS SHALL BE RE[AORED IN ACCORDANCE WITH PROJECT SPECIFICATION.
S.9. MEMBERS TO BE BRANDED WITH AN APPROPRIATE MARK AFTER FABRICATION.
S.10. ALL FABRICATED COMPONENTS MUST BE SHOP DETAILED BEFORE FABRICATION AND DRAWINGS SUBMITTED TO THE DESIGNER FOR REVIEW MIN. FOURTEEN (14 DAYS) PRIOR TO FABRICATION. THE REVIEW DOES NOT INCLUDE CHECKING OF DIMENSIONS.
S.11. BEFORE FABRICATION OF ANY STEELWORK (SAFETY RAILS AND PROTECTION SCREENS) FABRICATOR SHALL CONFIRM LOCATION AND LEVEL OF ALL BOLT SETS CAST INTO CONCRETE BARRIERS/KERBS BY USE A SITE SURVEY.
S.12. DETAILS OF LIFTING LUGS, TEMPORARY BRACING AND METHOD STATEMENT FOR LIFTING, TRANSPORTATION AND ERECTION SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR APPROVAL.
S.13. CONTACT SURFACES BETWEEN DISSIMILAR METALS (e.g. STAINLESS STEEL AND GALVANISED STEEL) SHALL BE INSULATED WITH SEPARATOR TAPE OR FIBRE WASHERS, UNO.

ABBREVIATIONS

NF - NEAR FACE
DN - NOMINAL DIAMETER
RC - REINFORCED CONCRETE
DWS - DECK WEARING SURFACE
PSC - PRE-STRESSED CONCRETE
FF - FAR FACE
RC - REINFORCED CONCRETE
HD - HOLD DOWN
UNO - UNLESS NOTED OTHERWISE
SS - STAINLESS STEEL

STANDARD DRAWINGS

TMR STD DRG No.	TITLE
1043 SHEETS 1, 2 & 3	REINFORCING STEEL - STANDARD BAR SHAPES
1044	REINFORCING STEEL - STD HOOK, LAP AND BEND DETAILS AND GENERAL STEEL REINFORCING INFO.
1063	STANDARD DATE PLATE - GENERAL ARRANGEMENT
2045	BRIDGE KERBS - STANDARD DETAILS OF CAST INSITU KERBS FOR TRANSVERSELY STRESSED PSC UNITS
2052 SHEETS 1 TO 6	PRECAST UNITS - 12m PSC DECK UNIT
2200 SHEETS 1 TO 5	BRIDGE TRAFFIC BARRIERS - POST AND RAIL TRAFFIC BARRIERS REGULAR PERFORMANCE LEVEL
2233	ABUTMENT PROTECTION - TYPE 1 - ROCK SPILLTHROUGH - GREATER THAN 1700 CLEARANCE
2255	BRIDGE APPROACHES - RELIEVING SLAB 3 METRE SPAN

CONSTRUCTION SEQUENCE

CS.1. TO ENSURE THE STRUCTURAL ADEQUACY OF THE PROPOSED BRIDGE, PREMISE ADVISE THE FOLLOWING CONSTRUCTION SEQUENCE SHALL BE ADOPTED BY THE CONTRACTOR. SHOULD ANY MODIFICATION TO THE BELOW MENTIONED SEQUENCE BE REQUIRED PRIOR APPROVAL BY THE PROJECT SUPERINTENDENT SHALL BE SOUGHT:
PHASE 1. DRIVE STEEL LINER FOR ABUTMENT AND PIER BORED PILES TO REQUIRED DEPTH, EXCAVATE AND CASE BORED PILES.
PHASE 2. CONSTRUCT ABUTMENT AND PIER HEADSTOCKS AND WINGWALLS
PHASE 3. BACKFILL BEHIND ABUTMENTS WITH COMPACTED FILL AND RAISE EMBANKMENT TO PAVEMENT LEVEL.
PHASE 4. CONSTRUCTED GABION ABUTMENT AND APPROACH EMBANKMENT PROTECTION.
PHASE 5. INSTALL PRECAST CONCRETE DECK UNITS AND ANCHOR TO ABUTMENT AND PIER HEADSTOCKS.
PHASE 6. GROUT BETWEEN DECK UNITS NOT LESS THAN 48 HOURS BEFORE TRANSVERSE STRESSING.
PHASE 7. INSTALL TRANSVERSE STRESS BARS AND STRESS BRIDGE SUPERSTRUCTURES.
PHASE 8. CONSTRUCT BRIDGE, DECK WEARING SURFACE, JOINTS, AND FINISHES AT LEAST 100 DAYS AFTER PRECAST DECK UNIT MANUFACTURE.
PHASE 9. CONSTRUCT BRIDGE APPROACH AND COMPLETE LINEMARKING.
PHASE 10. REMOVAL OF SIDE TRACK AND STEEL PIPES.
PHASE 11. UNDERTAKE DEMOLITION WORKS OF EXISTING BRIDGE STRUCTURE.

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
03.06.19	B	AMENDMENT REV CLOUDED	TH	CM
12.04.19	A	CONSTRUCTION ISSUE	TH	CM
09.04.19	2	PRELIMINARY ISSUE	TH	CM
17.12.18	1	PRELIMINARY ISSUE	TH	CM

REVISIONS

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TOWNSVILLE, QLD 4810
PH: (07) 4772 0666
WEB: www.premise.com.au

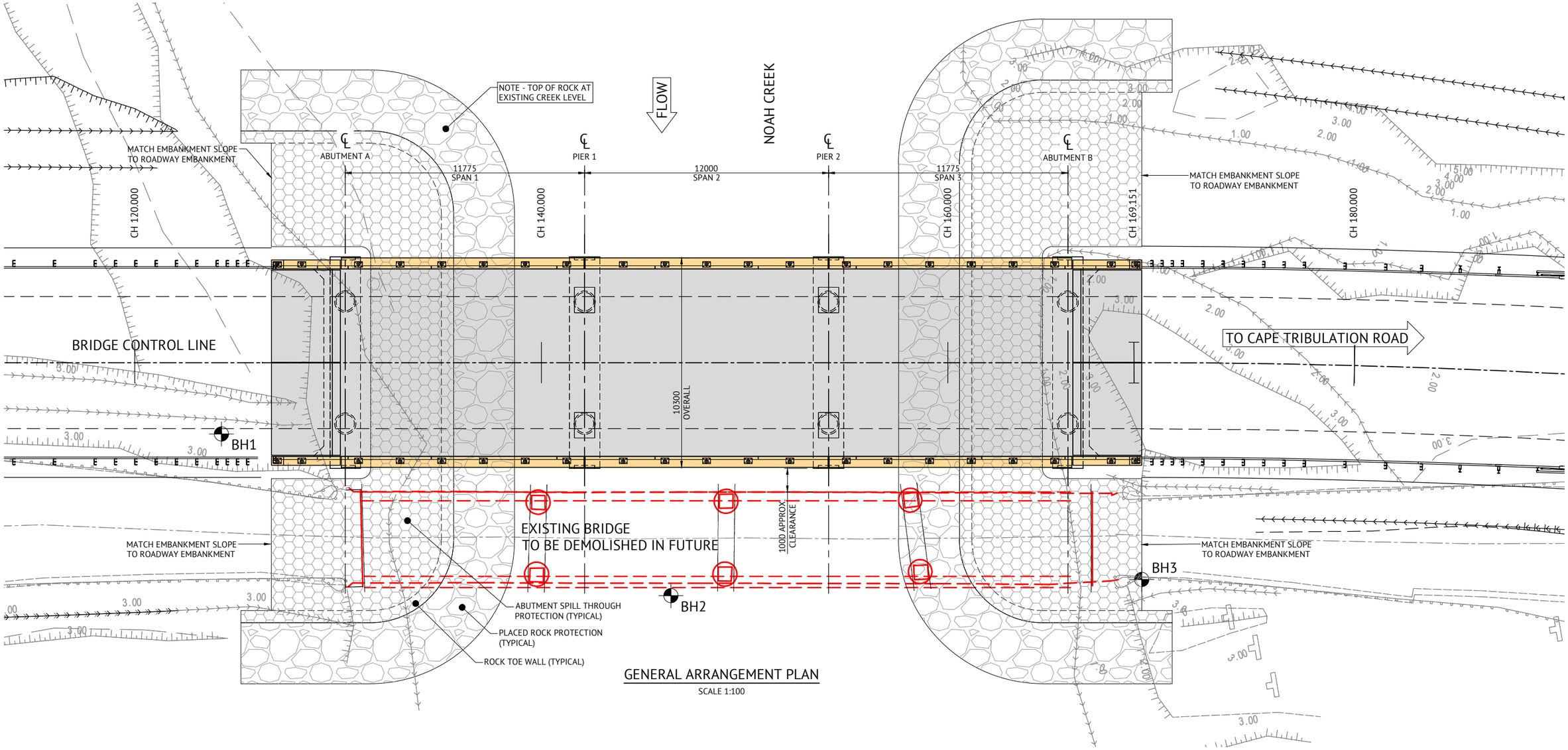
DESIGNED: L. MCGINNITY
CHECKED: C. MATHESON
PROJECT MANAGER: C. MATHESON
ENGINEERING CERTIFICATION: C. MATHESON RPEQ 15504
SCALE
ORIGINAL SHEET SIZE A1

CLIENT: NQ CIVIL CONTRACTORS PTY LTD
PROJECT: REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION: NOAH CREEK, CAPE TRIBULATION
SHEET TITLE: STRUCTURAL NOTES

JOB CODE: NQC-0023
SHEET NUMBER: S001
REV: B

LEGEND

BH# — DENOTES BORE HOLE LOCATION IN ACCORDANCE WITH DOUGLAS PARTNERS REPORT 90737.00-1 DATED JUNE 2018
TEST LOCATIONS ARE APPROXIMATE ONLY AND ARE SHOWN WITH REFERENCE TO EXISTING SITE FEATURES



GENERAL ARRANGEMENT PLAN
SCALE 1:100

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
05.06.19	C	AMENDED ABUTMENT PROTECTION	TH	CM
03.06.19	B	AMENDED SCOUR PROTECTION METHOD	TH	CM
12.04.19	A	CONSTRUCTION ISSUE	TH	CM
09.04.19	3	PRELIMINARY ISSUE	TH	CM
17.12.18	2	PRELIMINARY ISSUE	TH	CM
03.08.18	1	25% PRELIMINARY ISSUE	DS	CM

REVISIONS

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DESIGNED: L. MCGINNITY
CHECKED: C. MATHESON
PROJECT MANAGER: C. MATHESON
ENGINEERING CERTIFICATION: C. MATHESON RPEQ 15504

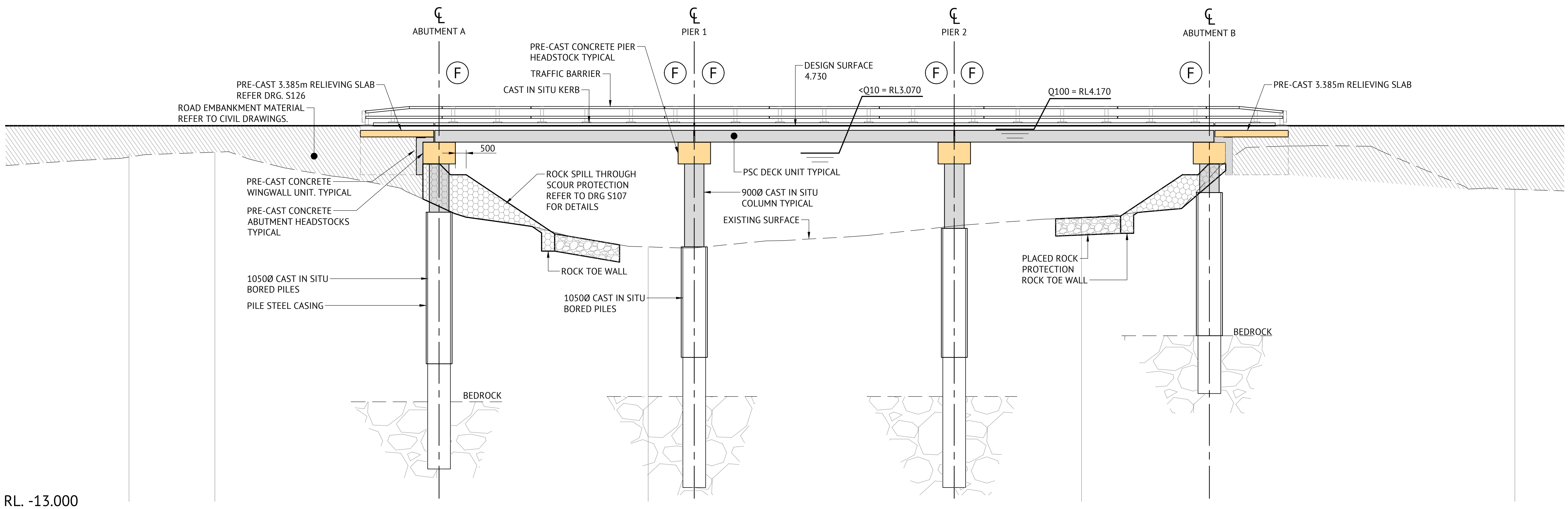
SCALE
0 2 4 6m
SCALE 1:100 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: NQ CIVIL CONTRACTORS PTY LTD
PROJECT: REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION: NOAH CREEK, CAPE TRIBULATION
SHEET TITLE: GENERAL ARRANGEMENT - PLAN

JOB CODE: NQC-0023
SHEET NUMBER: S100
REV: C

LEGEND

(F) DENOTES FIXED JOINT ARTICULATION



DATUM RL. -13.000

VERTICAL ALIGNMENT	L = 64.644m G = 0%								
DESIGN SURFACE LEVEL	4.730	4.730	4.730	4.730	4.730	4.730	4.730	4.730	4.730
EXISTING SURFACE LEVEL	3.290	3.516	1.013	-0.856	-0.904	0.107	0.512	2.337	1.803
CHAINAGE	116.038	120.000	130.351	140.000	142.126	154.126	160.000	165.901	180.000

LONG SECTION ALONG BRIDGE CONTROL LINE

SCALE 1:100

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
05.06.19	C	AMENDED ABUTMENT PROTECTION	TH	CM
03.06.19	B	AMENDED SCOUR PROTECTION METHOD	TH	CM
12.04.19	A	CONSTRUCTION ISSUE	TH	CM
09.04.19	3	PRELIMINARY ISSUE	TH	CM
17.12.18	2	PRELIMINARY ISSUE	TH	CM
03.08.18	1	25% PRELIMINARY ISSUE	DS	CM

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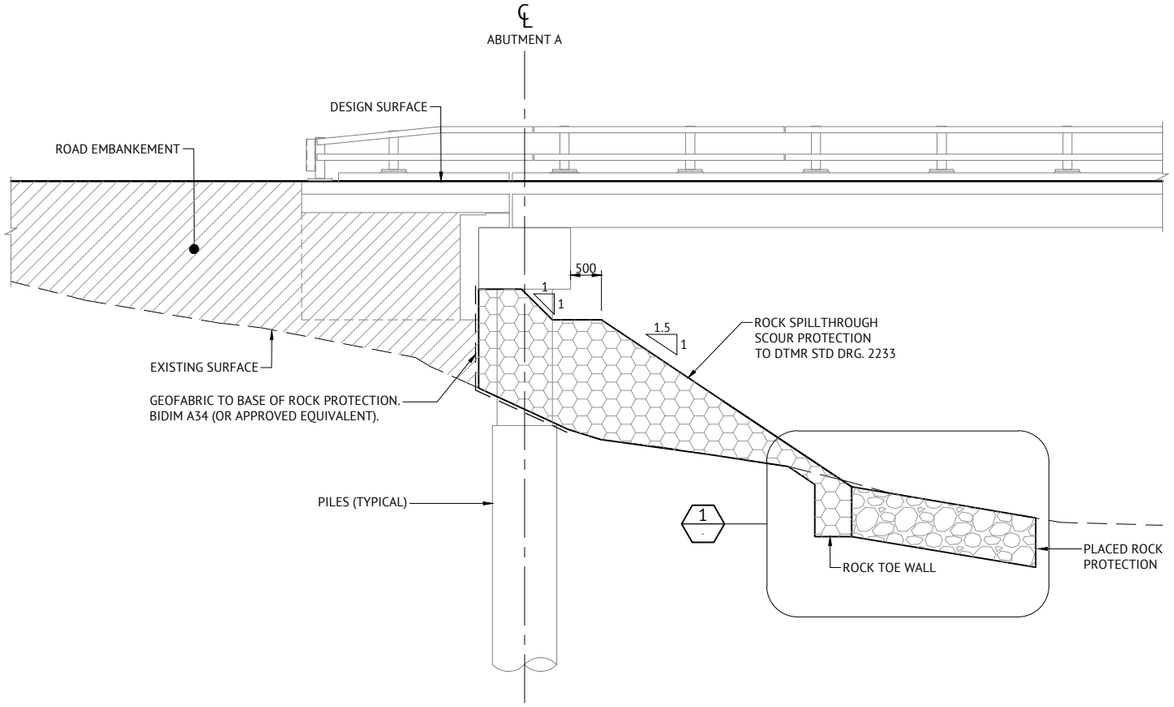
CHECKED: C. MATHESON
PROJECT MANAGER: C. MATHESON
ENGINEERING CERTIFICATION: C. MATHESON RPEQ 15504

SCALE: 0 2 4 6m — SCALE 1:100 (A1)
ORIGINAL SHEET SIZE A1

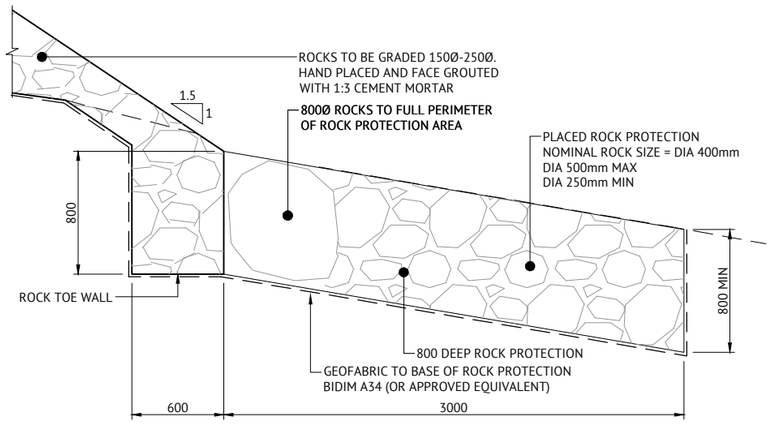
CLIENT: **NQ CIVIL CONTRACTORS PTY LTD**
PROJECT: **REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT**
LOCATION: **NOAH CREEK, CAPE TRIBULATION**
SHEET TITLE: **GENERAL ARRANGEMENT - LONG SECTION**

JOB CODE: NQC-0023
SHEET NUMBER: S101
REV: C



TYPICAL ABUTMENT ROCK PROTECTION DETAIL

SCALE 1:50



1 DETAIL

SCALE 1:20

ISSUED FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
05.06.19	B	AMENDED DETAIL	TH	CM
03.06.19	A	CONSTRUCTION ISSUE	TH	CM

REVISIONS

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DESIGNED L. MCGINNITY
CHECKED C. MATHESON
PROJECT MANAGER C. MATHESON
ENGINEERING CERTIFICATION

C. MATHESON RPEQ 15504

SCALE
0 0.4 0.8 1.2m
SCALE 1:20 (A1)
0 1 2 3m
SCALE 1:50 (A1)
ORIGINAL SHEET SIZE A1

CLIENT **NQ CIVIL CONTRACTORS PTY LTD**
PROJECT **REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT**
LOCATION **NOAH CREEK, CAPE TRIBULATION**
SHEET TITLE **GENERAL ARRANGEMENT - SCOUR PROTECTION DETAILS**

JOB CODE NQC-0023
SHEET NUMBER S107
REV B

Attachment 5

Hydraulic Assessment provided by Premise Water on 28 November 2018

Premise WATER

1300 017 736
mail@premise.com.au
premise.com.au

Our Ref: NQC-0023-L01-YY
Contact: Yan Yan/Daniel Niven

28 November 2018

Christian Matheson
Christian.matheson@premise.com.au

NOAH CREEK BRIDGE REPLACEMENT – TECHNICAL SUMMARY - FLOOD ASSESSMENT

Dear Christian,

We provide the following technical summary of the flood assessment works completed to provide the relevant flood data inputs to the structural design of the Noah Creek bridge crossing.

The key aims of the flood assessment are to:

- Confirm the hydraulic capacity of the existing Noah Creek bridge;
- Propose a bridge configuration to ensure the hydraulic capacity of the proposed Noah Creek bridge is no less than the existing structure;
- Provide flow velocities and flood levels for a range of Annual Exceedance Probabilities (AEPs) for the structural assessment;
- Estimate of scour at piers and abutments and provide scour protection recommendation; and
- Demonstrate that the proposed bridge does not cause adverse flood impacts to the neighbouring properties.

Hydrological Assessment

Noah Creek originates from the Thornton Range and flows east for approximately 10 km prior to ultimately discharging into the Coral Sea. Catchment mapping was developed based on the 1 m resolution 2009 aerial LiDAR data and the 1 second shuttle radar topography mission (SRTM) Digital Elevation Model Version 1.0, downloaded from Geoscience Australia's ELVIS data base. The catchment plan is shown in **Figure 1**, included in the next page.

The total catchment areas upstream and downstream of the Noah Creek bridge are approximately 2367 ha and 1002 ha respectively. The 1% AEP discharge estimated from *Australian Rainfall & Runoff 2016's (ARR 2016)* Regional Flood Frequency Estimation technique (RFFE) is in the order of 460 m^3/s. Flow estimation for the upstream catchment was also carried out using the historical estimation technique, Rational Method. The 1% AEP discharge estimated from the Rational Method approach was in the order of 350 m^3/s.

Hydrologic modelling was undertaken to estimate the volumetric fluxes for the contributing catchments. A WBNM hydrologic model was developed in accordance with ARR 2016. The peak discharges for the upstream catchment was estimated to be 413 m^3/s. The hydrologic model is producing results within an acceptable range of the RFFE and Rational Method calculations and is

therefore considered appropriate for use in this analysis. The adopted flows are presented in **Table 1** below.

Table 1 - Hydrologic Peak Flow Rates

AEP	Peak Discharge (m^3/s)				
	C05_Total	C06_Local	C08_Total	C09_Total	C07_C10_Total
18%	202	42	19	64	40
10%	242	49	22	76	45
5%	283	56	25	88	52
1%	363	67	29	105	61
0.5%	422	74	31	120	65
0.05%	632	110	47	178	100

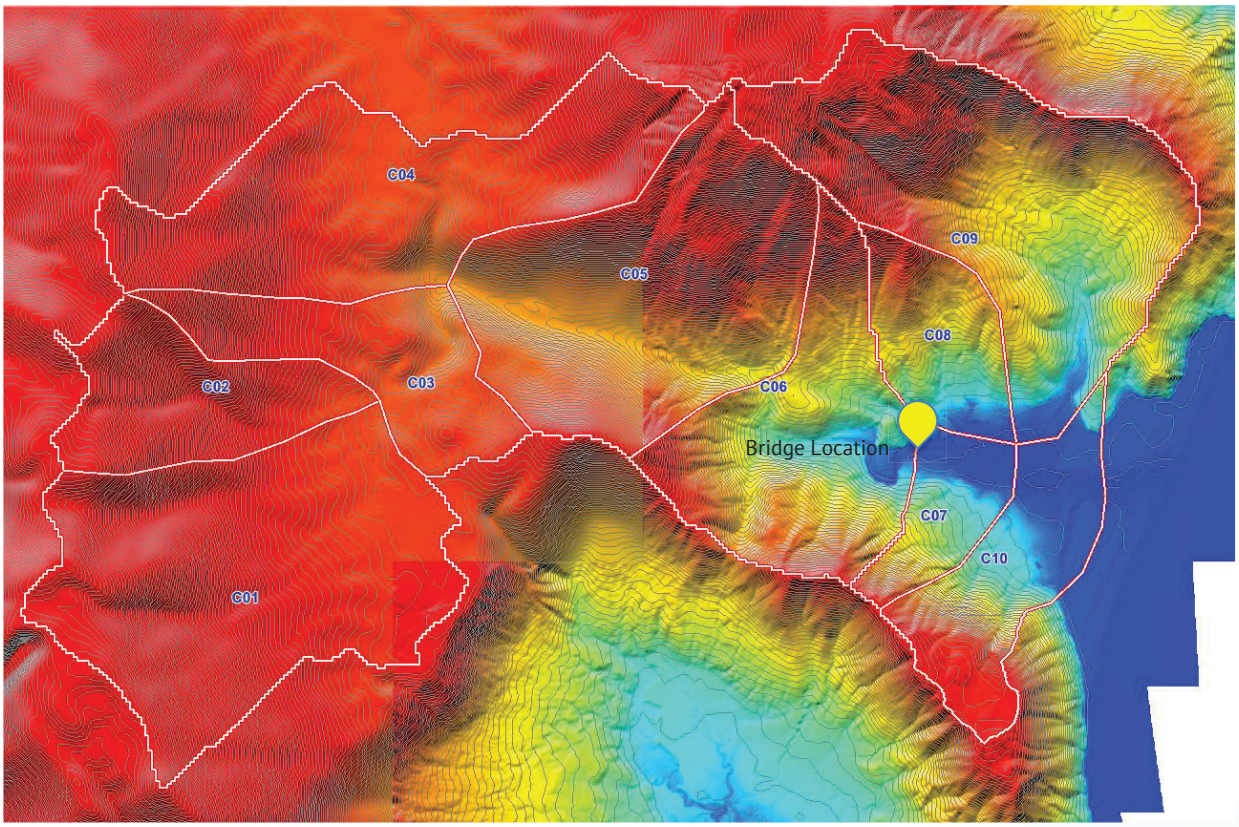


Figure 1: Catchment Plan

Hydraulic Assessment (TUFLOW)

Hydraulic modelling was undertaken using a combination of HECRAS and TUFLOW to assess the flooding characteristics of the hydraulic structure and potential floodplain impacts.

Upon review of the cross-section survey conducted at upstream and downstream of the existing Noah Creek bridge, it was noticed that the difference between the 1 m resolution LiDAR and the detailed creek survey is quite significant (refer to **Figure 2** below). It appears that the 1 m resolution LiDAR has picked up the water surface level within the creek at the time the LiDAR was taken, whilst the creek survey has depicted the invert of the creek. To facilitate the flood modelling, the

creek invert represented by the 1 m resolution LiDAR has been dropped by the level difference observed from the comparison of the creek survey and the LiDAR.

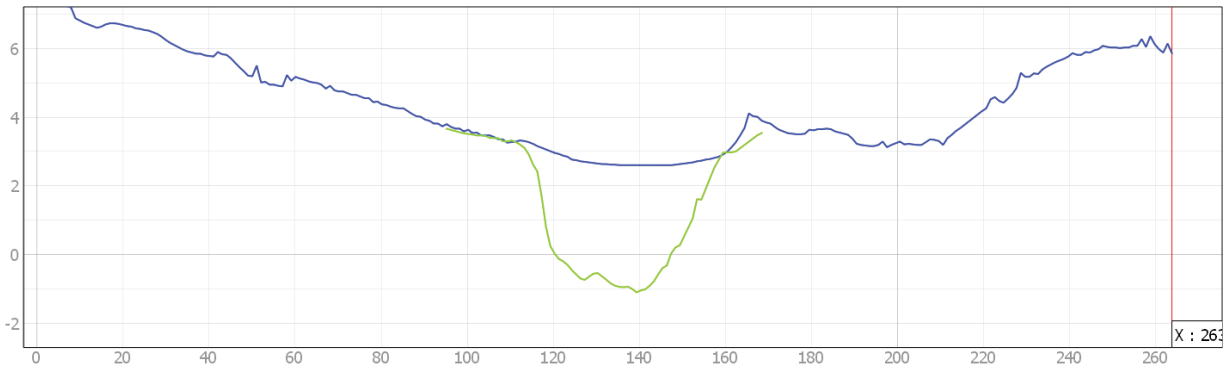


Figure 2: 2009 LiDAR vs. Detailed Creek Survey (downstream of the bridge)

The existing and the proposed bridge structures were modelled using TUFLOW's "layer flow constrictions" approach. Energy loss of the bridge structures applied in TUFLOW was determined from *Hydraulics of Bridge Waterways (Bradley 1978)* based on the pier shape and fraction of the waterway blocked. The head drop across the structures during different flow regimes were validated against a 1D steady state HECRAS model.

The TUFLOW model was used to:

- Gain a general understanding of the flood behaviour near the area of interest;
- Provide tailwater assumptions for the 1D steady state HECRAS model; and
- Demonstrate that the proposed bridge does not cause adverse flood impacts to the neighbouring properties.

The TUFLOW model extends from approximately 2.5 km upstream of the Noah Creek bridge to the mouth of the creek. The Mean High Water Spring (0.909 mAHD) was adopted as the tailwater condition for the TUFLOW model. Extent of the TUFLOW model is shown in **Figure 3** below. Inflow hydrographs derived from the WBNM model was adopted as the inflow boundary conditions for the TUFLOW model.

General flood behaviour of Noah Creek near the area of interest during a 1% AEP event is shown in **Figure 4** below. Flow breakout is predicted at the bend upstream of the bridge. A couple of minor tributaries join Noah Creek near the downstream end of the existing bridge. Downstream of the bridge, flood extent becomes wider as the flow moves towards the mouth of the creek.

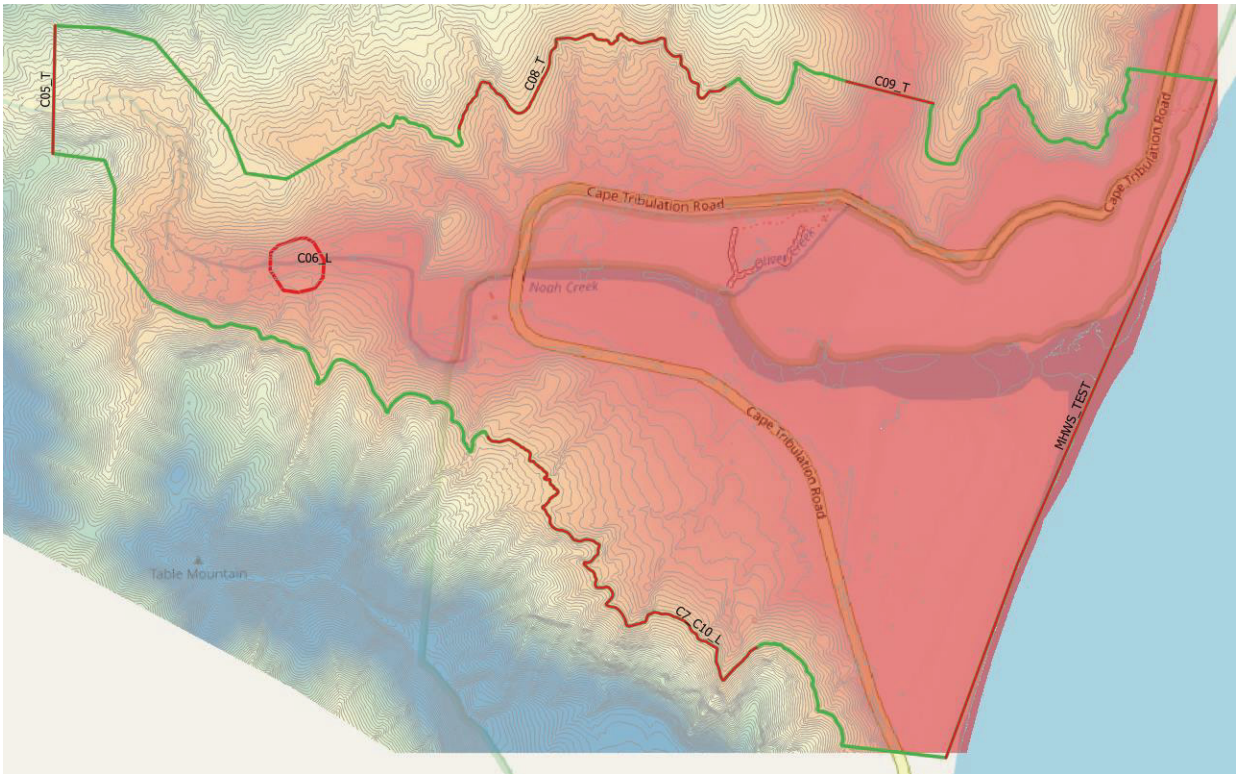


Figure 3: TUFLOW Model Extent & Boundary Conditions

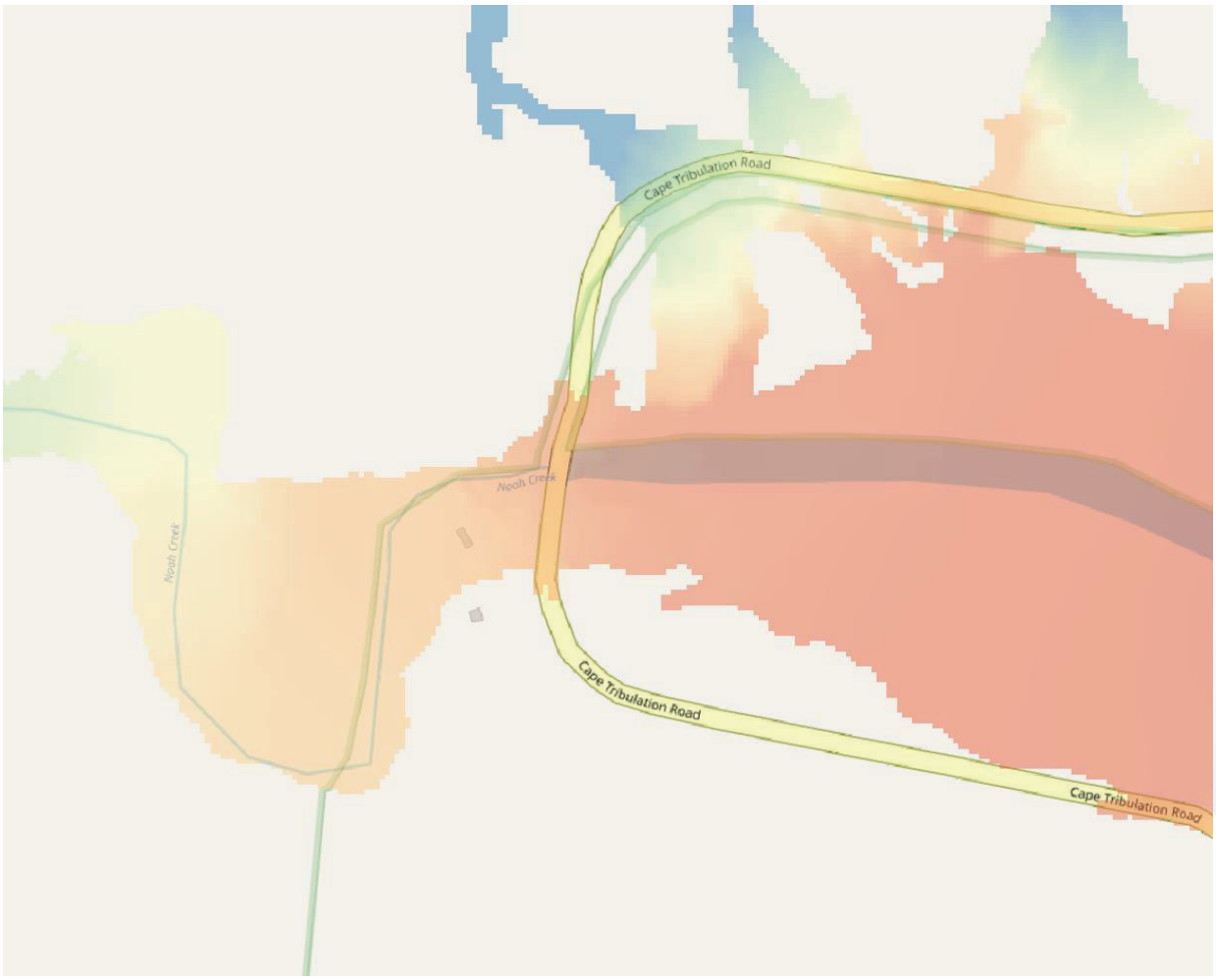


Figure 4: TUFLOW Model – 1% AEP Water Surface Level

Figure 5: TUFLOW Model – 1% AEP Afflux Map

As indicate in **Figure 5**, the proposed Noah Creek bridge is not predicted to cause actionable adverse flood impacts to its neighboring properties.

Hydraulic Assessment (HECRAS – Existing Noah Creek Bridge)

1D steady state hydraulic modelling was undertaken in HECRAS, using the peak discharges summarised in **Table 1**.

The HECRAS model was developed based on the detailed creek survey near the existing bridge and the 1 m resolution 2009 aerial LiDAR data. As discussed earlier, the LiDAR was adjusted to better represent the creek invert. 1D cross sections were defined to simulate the flow transitions (i.e. expansion and contraction) through the bridge crossing. HECRAS cross sections are shown below in **Figure 6**.

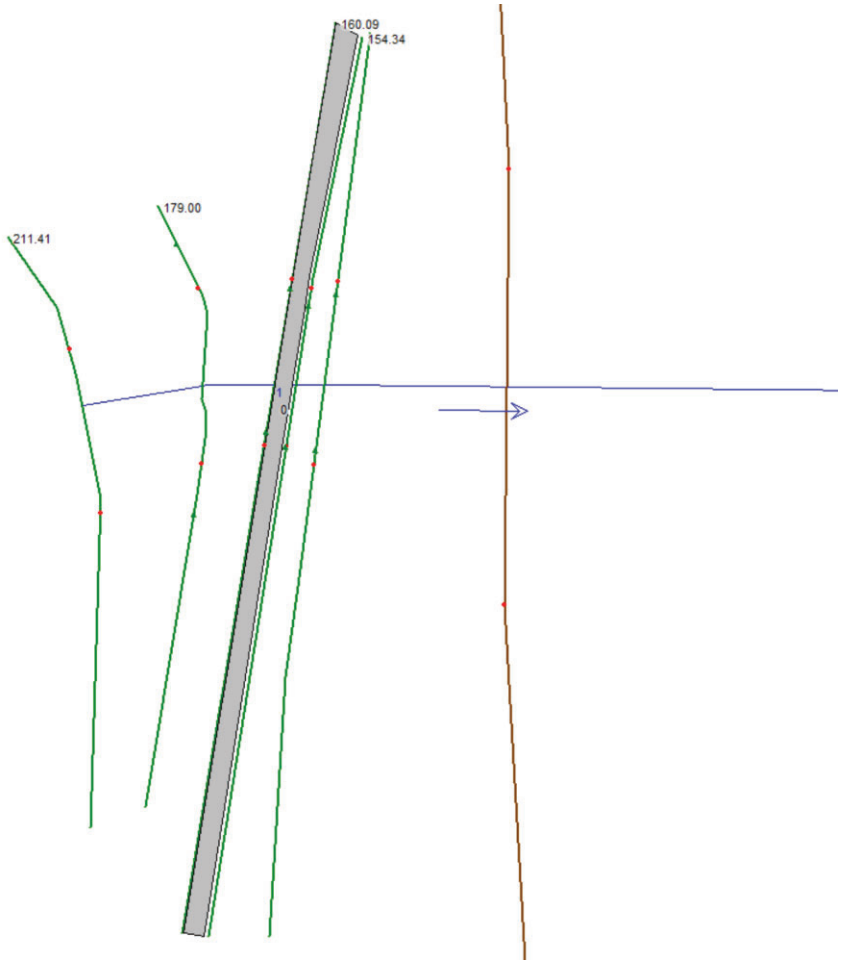


Figure 6: HECRAS Cross Section

Tailwater conditions for the HECRAS model are summarised in **Table 2** below, these values were extracted from the TUFLOW flood level results.

Table 2 – HECRAS Tailwater Assumption

AEP (ARI)	Adopted TWL (mAHD)
18% (5 year)	2.6
10% (10 year)	2.9
5% (20 year)	3.2
1% (100 year)	3.5
0.5% (200 year)	3.7
0.05% (2000 year)	4.6

Manning's 'n' roughness values adopted in the HECRAS model are as follows:

- Channel 0.05
- Bank 0.15

Based on the HECRAS modelling, the 10% AEP flood level at the existing Noah Creek bridge was predicted to be 3.36 mAHD. The top of the existing bridge deck is at 3.35 mAHD. Therefore, the existing Noah Creek bridge has a flood immunity just less than the 10% AEP.

Hydraulic Assessment (HECRAS – Proposed Noah Creek Bridge)

The pre-development scenario HECRAS model was modified to incorporate the proposed Noah Creek bridge. The proposed bridge plan is included as a reference of this letter report.

Predicted flood levels upstream the proposed Noah Creek bridge are summarised in **Table 3**. The top of the proposed bridge deck is at 3.40 mAHD and the 10% AEP flood level at the bridge is predicted to be 3.07 mAHD. Therefore, the proposed Noah Creek bridge has a flood immunity of at least 10% AEP.

Table 3 – Predicted Flood Level Upstream of the Proposed Bridge

AEP (ARI)	Flood Level (mAHD)
10% (10 year)	3.07
5% (20 year)	3.56
1% (100 year)	4.17
0.5% (200 year)	4.54
0.05% (2000 year)	5.17

Predicted velocities through the proposed bridge are summarised in **Table 4** below.

Table 4 – Predicted Velocity through the Proposed Bridge

AEP (ARI)	Average Velocity (m/s)		
	Left OB	Channel	Right OB
5% (20 year)	-	3.16	-
1% (100 year)	0.13	3.74	0.23
0.5% (200 year)	0.43	4.38	0.72
0.05% (2000 year)	0.96	4.20	1.11

Scour Estimation

Ausroads' *Waterway Design – A Guide to the Hydraulic Design of Bridges, Culverts and Floodways* 1994 and Department of Transport and Main Roads' *Bridge Scour Manual* 2013 were used to estimate the constriction scour and local pier scour at the proposed Noah Creek bridge. Ausroads' Guidelines are based on the procedures outlined in *US Hydraulic Engineering Circular No. 18, 1993* and *Hydraulic Engineering Circular No 11, 1989*.

According to the Department of Transport and Main Roads' *Bridge Scour Manual* 2013, design of scour protection should consider the flood event that produces the highest velocity and greatest bed shear. As summarised in **Table 4**, the 0.5% AEP event produces the highest velocity through the proposed bridge. Therefore, the 0.5% AEP event was selected as the design event for the scour analysis.

Constriction scour at the proposed bridge location was estimated using the Laursen's Method detailed in Section 6.4.3 of Ausroads' guidelines. Local scour at piers was estimated using the

Colorado State University Equation detailed in Section 6.4.4 of Ausroads' guidelines. The estimated scour depths are summarised in **Table 5**.

Table 5 – Predicted Scour Depth

Type of Scour	Estimated Scour Depth (m)
Constriction Scour	0.25
Pier Scour	1.35
TOTAL	Main channel pier scour + contraction scour = 1.60

Ausroads' guidelines suggest *"properly designed protective measures provide adequate protection to abutments and make the estimation of the depts of scour at abutments less critical."* Rock protection requirements for the abutments were calculated based on Section 6.3.7 of Ausroads' guidelines and summarised in **Table 6** below.

Table 6 – Abutment Rock Protection

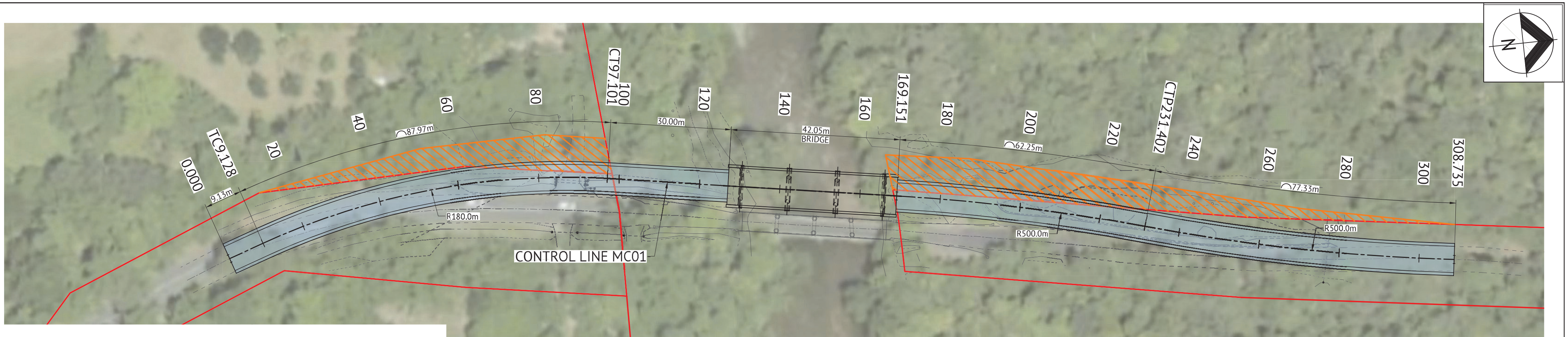
Rock Size (m)	Rock Mass (kg)	Minimum Percentage of Rock Larger than	Section Thickness (m)
0.9	1000	0	1.25
0.7	450	50	
0.4	100	90	

If you require any other further information, please do not hesitate to get in contact with personnel from the Water Team or the undersigned.

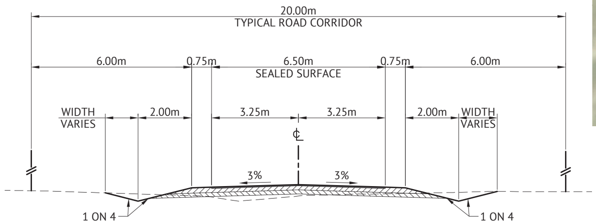
Yours faithfully

Daniel Niven
Senior Principal Water Engineer

Enc: Proposed Bridge Arrangement



PLAN VIEW
SCALE 1:500

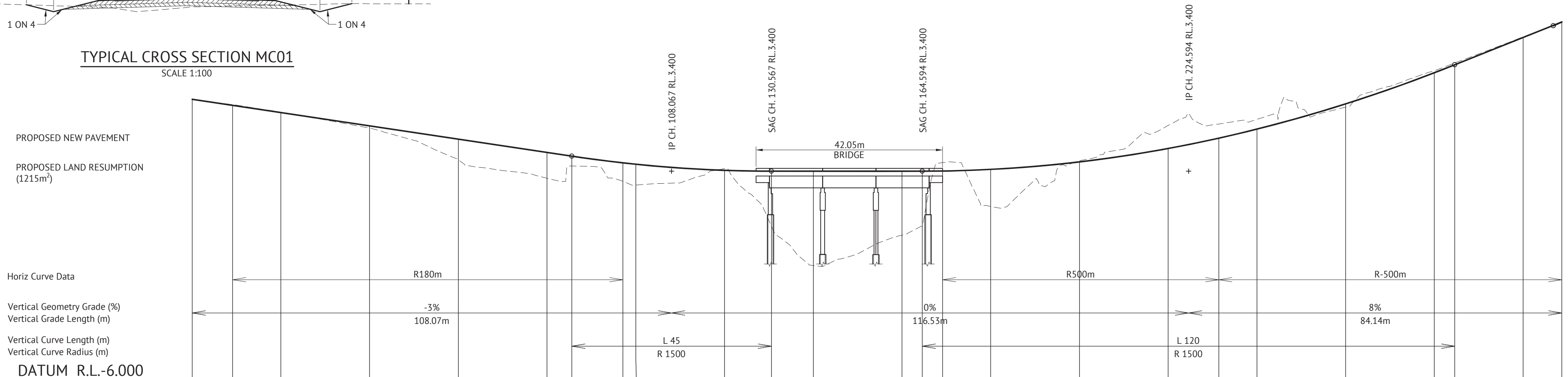


TYPICAL CROSS SECTION MC01
SCALE 1:100

LEGEND

PROPOSED NEW PAVEMENT

PROPOSED LAND RESUMPTION (1215m²)



CUT (-)/FILL DEPTH	0.000	-0.037	-0.020	0.097	0.933	1.168	0.442	0.828	0.935	-0.079	2.487	4.256	2.888	2.481	-0.378	1.676	-0.051	-1.041	-0.641	-0.440	0.144	-0.094	-0.081	-0.027	0.000
DESIGN SURFACE	6.642	6.368	6.042	5.442	4.842	4.242	4.075	3.773	3.711	3.437	3.400	3.400	3.400	3.400	3.407	3.479	3.818	4.423	4.888	5.295	6.434	7.840	8.200	9.432	10.131
NATURAL SURFACE	6.642	6.405	6.062	5.345	3.909	3.074	3.633	2.945	2.776	3.516	0.913	-0.856	0.512	0.919	3.785	1.803	3.869	5.465	5.529	5.735	6.290	7.933	8.281	9.460	10.131
CHAINAGE	0.000	9.128	20.000	40.000	60.000	80.000	85.567	97.101	100.000	120.000	130.567	140.000	160.000	164.594	169.151	180.000	200.000	220.000	231.402	240.000	260.000	280.000	284.594	300.000	308.735

LONGITUDINAL SECTION MC01
SCALE 1:500H, 1:50V

24/10/18

DATE	REV	DESCRIPTION	REC	APP
	1	PRELIMINARY ISSUE NOT FOR CONSTRUCTION		

REVISIONS

Premise

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PROJECT MANAGER H.FRACCHIA
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H.FRACCHIA RPEQ 4693

SCALE
SCALE 1:100 (A1)
HORIZONTAL 1:500 (A1)
VERTICAL 1:50 (A1)
ORIGINAL SHEET SIZE A1

CLIENT NQ CIVIL CONTRACTORS PTY LTD
PROJECT REPLACEMENT BRIDGE AND PROPOSED ROAD ALIGNMENT
LOCATION NOAH CREEK, CAPE TRIBULATION
SHEET TITLE PROPOSED ROAD ALIGNMENT AND LONGITUDINAL SECTION

JOB CODE NQC-0023
SHEET NUMBER SKC001
REV 1

Attachment 6

Ecological Assessment provided by GHD in August 2018

Douglas Shire Council

Noah Creek Bridge Replacement

Ecological Values Assessment

August 2018

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Appendices

1. Introduction

1.1 Purpose of this report

This Ecological Values Assessment has been prepared to support the Commonwealth and State legislative approvals and permits required for the proposed Noah Creek Bridge Replacement project. This report identifies and assesses the environmental issues associated with the construction and operation of the new dual lane Noah Creek Bridge and decommissioning of the existing single lane bridge.

GHD has been engaged by Trinity Engineering and Consulting (Trinity Engineering) to prepare this Ecological Values Assessment on behalf of Douglas Shire Council (DSC) to assess the ecological impacts associated with the proposed bridge replacement works, against Commonwealth and Queensland legislation.

The purpose of this report is to:

- Identify species of conservation significance at the site that may be impacted by these projects.
- Detail the vegetation integrity, floristic composition and structure of the proposed bridge replacement site.
- Identify faunal habitats present, their likely resource opportunities and utilisation (including any breeding places).
- Assess the direct and indirect impacts of the proposed project.
- Identify mitigation and management measures that could be used as elements within the Environment Management Plan that will be required for the project.

1.2 Scope and limitations

This report has been prepared by GHD for Trinity Engineering on behalf of DSC and may only be used and relied on by Trinity Engineering and DSC for the purpose agreed between GHD and Trinity Engineering as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than Trinity Engineering arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Trinity Engineering and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The information presented in this report is based on preliminary design plans prepared by Trinity Engineering for the preferred option that identifies construction of a new dual carriageway bridge parallel to and immediately upstream of the existing Noah Creek bridge. This option has been identified by the Wet Tropics Management Agency (WTMA) and various regulatory authorities as having more acceptable construction impacts than other alternatives which involved construction of an all tide vehicle side track. The information in this report is therefore based on the preferred option with the following limitations:

- A final design is not yet available. The level of detail for documentation to support may depend on the final design and construction methodologies proposed by the successful tenderer.
- Should the final design and methodology proposed by the successful tenderer vary in scope, the range of approvals required may vary and require review or be subject to requests for further information to ensure the proposed project is in compliance with Commonwealth and State Government legislation. Subsequently, information in this report will require review and assessment of risks relating to the proposed development/project modifications.
- Under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the Commonwealth has the right to request further information based on the responses in the initial EPBC referral application. Further information, in addition to that covered in this report, may be requested if the proposed project is deemed a 'controlled action" as defined under the EPBC Act.
- The field surveys completed for this report were limited to aquatic surveys, flora surveys, observational fauna surveys and searches for protected species and potential animal breeding places including obvious structures such as bird nests and tree hollows, as well as more cryptic places such as amphibian or reptile habitat where breeding takes place.

1.3 Proposed Project Overview

Noah Creek currently has a single lane bridge which is considered a vital transport link connecting residents north of the Daintree River to services, jobs and education whilst supporting tourism for the area. The existing bridge is in poor condition and has been subject to a number of remedial efforts over the recent years. In addition, structural inspections in 2016 identified that the bridge is nearing end of life and needs replacing. DSC is proposing to replace the existing bridge over Noah Creek on the Cape Tribulation Road. The preferred option is to replace the single lane, 24 m bridge, with a new dual carriageway bridge to be constructed parallel and immediately upstream, thereby utilising the existing bridge for traffic during construction.

1.3.1 Site Description

The bridge site is located seven kilometres south of Cape Tribulation's main centre, linking the township and surrounding residents to far north Queensland's coastal road. Cape Tribulation is a popular tourist destination and is considered a vital contributor to Queensland's Eco-Tourism sector. At the proposed bridge site, land use of the northern bank is the Daintree National Park, with this area comprising remnant complex rainforest communities. The southern bank of Noah Creek has been historically cleared for pastural and horticultural purposes and is dominated by fruit orchards on the eastern side of the road reserve, and by the Noah Creek Forest Stay Eco-Huts (a commercial eco-lodge) on the western side of the road reserve. Remnant riparian vegetation within the project on the both sides of Cape Tribulation Road varies between 25 m and 35 m in width. The riparian vegetation of the esplanade adjacent the cleared areas retains

high integrity excepting for the small gaps of the original road access to the ford crossing. On the southern bank the vegetation about the original road access to the ford has a high representation of introduced species, including coconuts, introduced Zingerberaceae and various other horticultural escapees.

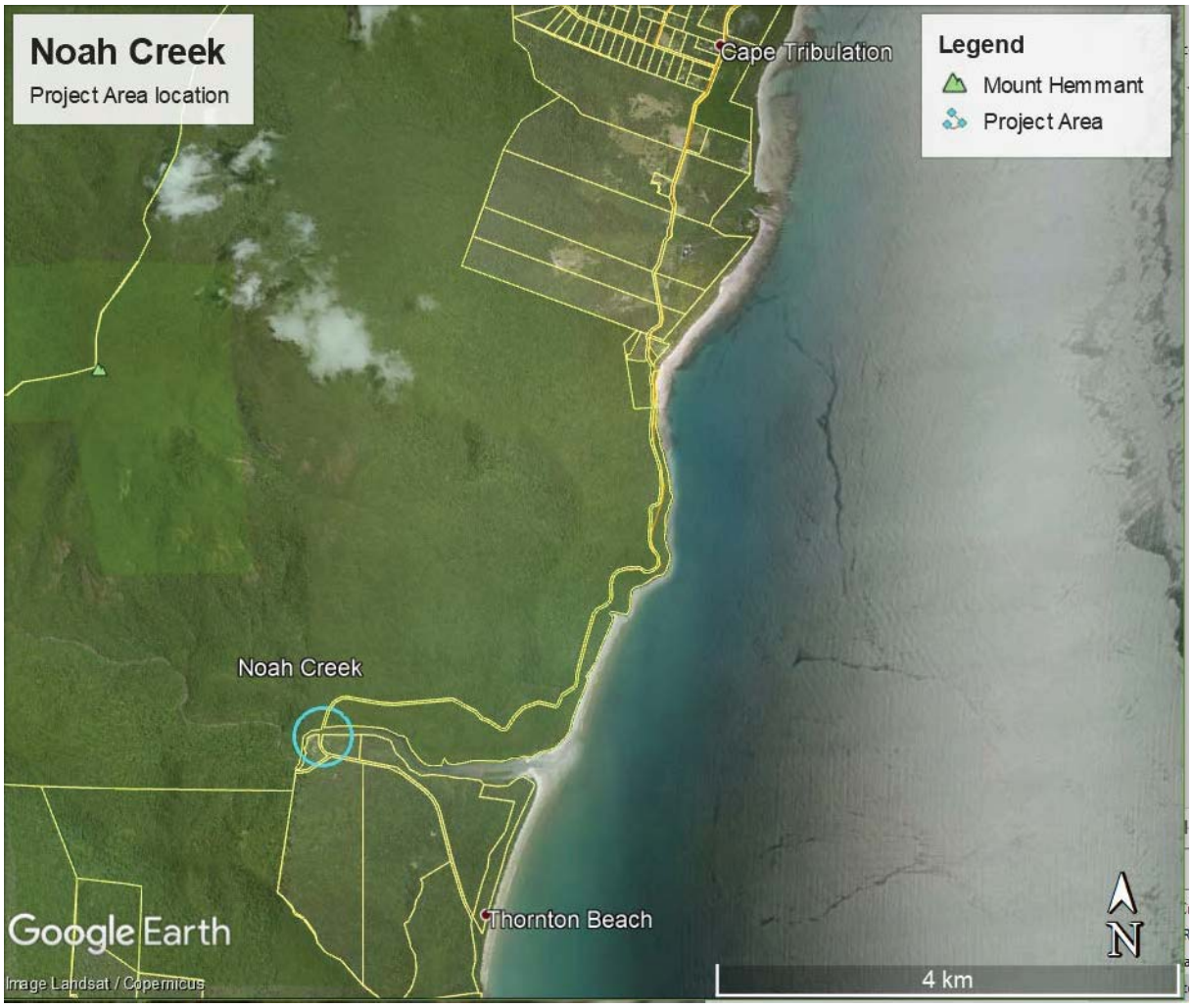


Figure 1 Noah Creek Bridge Replacement Location

1.3.2 Key Components of the proposed project

There are multiple components involved in the construction phase of the proposed project. The key activities of the preferred bridge replacement design include:

- Construction of a new dual lane concrete bridge including pylons and abutments.
- Scour protection for the abutments located on the banks of Noah Creek
- Realigning the northern and southern approach roads and adjacent stormwater drainage lines
- Laydown area for machinery and materials during construction
- Decommissioning the old wooden bridge and approach roads including removal of materials from site.
- Rehabilitating decommissioned bridge and old approach road footprints back to their natural state.

1.3.3 Zoning and Tenure

The northern approach is within the Daintree National Park (Lot 20 NPW695) and an Indigenous Land Use Agreement (ILUA QI2006/026). The southern bank of the proposed project is freehold land (Lot 62 SP146421). The entirety of the project is within the Wet Tropics of Queensland World Heritage Area. The current Wet Tropics Management Plan identifies four broad management zones (A, B, C, and D) with the Wet Tropics. These zones are based on disturbance levels and ecological integrity, capacity of the area to be rehabilitated to a higher ecological state, existing infrastructure and services, and distance from existing disturbance.

- Zone A are areas of highest ecological integrity and furthest from anthropogenic disturbance;
- Zone B are areas with a high degree of ecological integrity and are in a natural state but are not necessarily remote from disturbance. There is a reasonable expectation that areas in Zone B could be restored to a high/very high degree of integrity which would qualify for inclusion in Zone A.
- Zone C areas include areas of disturbance, primarily associated with existing infrastructure such as roads, power lines, pipe lines etc., but also includes cleared areas with existing use firths such as farming/residential. Zone C areas are primarily in a natural state with infrastructure managed to minimise adverse impacts on these areas.
- Zone D includes lands where there are, or proposed to be, visitor facilities of a well-developed type. This is primarily for more intensive visitor use and presentation. Zone D includes land in a mostly natural state and managed to minimise the adverse impacts of activities and facilities and to protect and rehabilitate this zone.

The *Wet Tropics Management Plan 1998* ('WTP') zoning identifies that the proposed bridge site is within Zone C under the current WTP mapping. Zone C allows disturbances associated with infrastructure provided that all other regulatory and legislative requirements are addressed.

2. Methodology

2.1 Desktop and External Data Reviews

A desktop assessment was undertaken by GHD in June 2018 to review relevant documents, databases, maps and legislation applicable to the proposed project and to identify the ecological values that have the potential to occur within the study area. The results of the desktop assessment were then used to inform and refine field assessment.

The external database collation and review provided the necessary background for deriving survey methodologies and targeted species. The following reference materials where used in the desktop assessment:

- Protected Matters Search Tool: Department of the Environment and Energy (http://environment.gov.au/epbc/protected-matters-search-tool).
- Wildlife Online: Department of Environment and Science (https://environment.ehp.qld.gov.au/report-request/species-list/)
- Protected Plants Flora Survey Trigger Map: Department of Environment and Science (https://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php)
- Environmental Reports Online Regional Ecosystems: Department of Environment and Science (https://environment.ehp.qld.gov.au/report-request/environment/)
- Regulated Vegetation Management Map: Department of Natural Resources, Mines and Energy (https://www.dnrm.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form)
- James Cook University library, research papers and reports: where publicly available.

2.1.1 Protected Matters Search Tool

The Commonwealth Protected Matters Search Tool (PMST) is based on a combination of actual records with bio-climatic (BioClim) habitat modelling extrapolated to predict the likely occurrence of a species on site.

The PMST is based on a number of resources including:

- actual records obtained from museums, herbariums, reputable sources (research institutions), and
- species population modelling that provides a predictive approach to assessing the presence/occurrence of a species based on habitat factors for that species being present (considering a wide range of variables).

Species records are listed as:

- ‘known to occur’. Definitive confirmed records of that species indicating occupation of habitat in the search area.
- ‘likely to occur’. Comprising anecdotal records and/or species habitat modelling indicates that the majority of essential habitat factors for that species occur on site.
- ‘may occur’. No records of the species are known, and species habitat modelling identifies that only partial habitat factors for the species are present within the search area.

The Protected Matters Search Tool identified the Great Barrier Reef Marine Park (GBRMP) to be within the 5 km buffer of Noah Creek Bridge. It should be noted the proposed bridge development footprint is not within the GBRMP zone, however due to its close proximity to the marine park, potential downstream effects were identified during the surveys.

A very high number of records were generated by the PMST and are presented in Appendix A. It should be noted that the five-kilometre search radius buffer included many species with ranges and known records restricted to mountain peaks in the vicinity. Thornton Peak, within three kilometres of the Noah Creek project area, is a noted area with high numbers of altitudinally restricted flora and fauna species that are not found within the Noah Creek area (almost at sea level) but were included as part of the generated PMST outputs. Only those species with known records and confirmed observations are included within the results for this report.

2.1.2 Wildlife Online

Wildlife Online provides a geographic location search tool using data from the WildNet database. This database contains records of wildlife sightings and listing of plants, mammals, birds, amphibians, reptiles, freshwater fish, sharks and rays, butterflies and other priority invertebrates in Queensland. The report from Wildlife Online also provides information on the Queensland conservation status and the Commonwealth EPBC conservation status for each species recorded. There are however some limitations to utilising the WildNet database. The wildlife data is constantly being collated and vetted, so if a species is not on a list, it does not necessarily mean it doesn't occur there, only that the records of that quality are not in the WildNet database. Also, as the database contains collections of data from as far back as the 1700s, it does not mean a particular species still inhabits the area (Queensland Government, 2018).

A report using co-ordinates of the proposed bridge location (-16.1402 latitude, 145.4306 longitude) with a 1 km buffer was used to capture representative habitats in the locality and to determine the actual formal recorded data for any protected fauna species in the area. These results are presented in Appendix A.

In summary;

- One endangered frog species, *Litoria rheocola,* is known to occur in or adjacent Noah Creek. However, surveys have confirmed that the endangered species *Litoria dayi* also occurs and both are now known to occur adjacent the project footprint. None of these frogs were observed within Noah Creek itself, as the tidal conditions preclude eggs and tadpole establishment and observations were restricted to the ephemeral drainage path (previously the road access to the creek ford crossing) and small tributary 210 m to the north of Noah Creek.
- Four birds, of which one is endangered (Southern Cassowary) and one vulnerable (Macleays fig-parrot) with the others (Spectacled monarch and Rufous fantail) listed as Special Least Concern by virtue of their migratory status. Cassowaries are known to regularly walk along the Noah Creek Bridge and utilise resources both within the Daintree National Park and the previous orchard area on the southern side of the creek. A male Cassowary with sub adult dependent chicks was noted during field surveys. The Spectacled monarch and Rufous fantail are both known to seasonally visit the lowland Daintree but as the species do not breed in North Queensland, habitat utilisation is only for opportunistic foraging.
- Three mammals, including the endangered Spotted-tail quoll and near-threatened Bennett''s tree-kangaroo and Diadem bat. The Spotted tail-quoll is regularly sighted in the nearby Noah Creek Forest Stay Eco-lodge. One species, the spectacled flying-fox

(listed as vulnerable) has not been identified in the Wildlife Online database but is known to utilise the orchard adjacent Noah Creek.

- Three fish species, one (neon goby) of which is listed as critically endangered under the Commonwealth EPBC Act (but not listed under the Qld NC Act owing to very recent taxonomic determination) and two listed as vulnerable (both gobies). None of these were identified within the project footprint, however all three are known to occur immediately upstream. All three have life cycles that require access to the ocean and therefor this project has the potential for direct impacts on all three goby species.
- One reptile, the estuarine crocodile which is listed as vulnerable, is known to occur and has been observed at Noah Creek at the bridge and immediately upstream (and downstream) of the project area. Records however are not documented in the Wildlife Online database.
- A wide diversity of listed flora, including eight species listed as near-threatened, seven species listed as vulnerable, and three as endangered. Four species were identified as being vulnerable to potential disturbance (either cleared or trimmed for construction access).

2.1.3 Regulated Vegetation Management Mapping

The Queensland Department of Natural Resources and Mines (DNRM) regulated vegetation management supporting mapping identifies Essential Habitat (EH) for flora/fauna species of conservation significance. DNRM uses these EH maps to help determine the habitat status of the vegetation when assessing applications to clear. This enables DNRM to fulfil obligations under the Queensland *Vegetation Management Act 1999* (VMA) to regulate vegetation clearing in such a way as to prevent the loss of biodiversity. Essential Habitat mapping identifies sites and locations considered to contain important habitat for flora and fauna species of conservation significance (Environmental Protection Agency, Biodiversity Planning Unit, 2002). It is only mapped over either remnant or regrowth vegetation, and is based on:

- Confirmed sightings or records of a species of conservation significance breeding or utilising major habitat resources in that location (e.g. for shelter or feeding resources);
- Known suitable habitat or resources for a species of conservation significance occurring at a location;
- Habitat that forms part of a potentially important corridor for a species of conservation significance.

Additionally, Essential Habitat areas are further refined through the application of species specific habitat models e.g. BIOMAP, BIOCLIM, and/or include research undertaken in support of Species Recovery Plans (both Commonwealth and State) and some are derived from the application of the Queensland Biodiversity Planning Assessment (BPA).

Where EH mapping is based on confirmed sightings of listed species, the usual practice is to buffer the sighting point (by up to two kilometres), and include as EH all remnant vegetation within the buffer that meets the requirements of that species.

Areas mapped as EH are considered to represent localities within the landscape that are important to preserve. In order to assist in the process of ground truthing EH mapping, EH factors have been developed for all species for whom EH has been mapped. EH factors outline the main indications used by DNRM to confirm that EH mapping is justified.

Essential Habitat factors can include but are not limited to the following:

- Vegetation – The species or types of vegetation with which the species is associated;

- Regional ecosystem – The regional ecosystem(s) with which the species is most commonly associated;
- Land zone – The underlying geology and land form associated with a regional ecosystem;
- Altitude – The range of altitudes at which the species is found;
- Soils – The type of soil on which a species is most commonly found; and
- Landscape position - Landscape features the species is commonly associated with (e.g. creek bank, levees, lower slopes, hillsides and ridges).

The DES recognises Essential Habitat in Queensland as: "Vegetation in which a species that is 'Endangered', 'Vulnerable', 'Rare' or 'Near Threatened' has been known to occur". Vegetation is identified as Essential Habitat under the VMA for a species where at least three of the Essential Habitat factors listed above are present.

The proposed bridge site is mapped as 'Essential Habitat' by DES under the Nature Conservation Act 1994 (NC Act). The likelihood of occurrence of any listed species present or likely habitat utilisation and occurrence was noted during the field surveys.

Research Papers and Reports

Research papers and reports on the cling goby were accessed for the assessment. These were reviewed to help determine if the proposed project would affect any of these conservation significant species at any stage during their life cycle, and if so, how to mitigate these impacts.

2.2 Field Surveys

2.2.1 Terrestrial and Aquatic Fauna

Within the limited period available for the surveys (May/June 2018) it was not possible to assess the faunal components of the site entirely within the framework of the *Terrestrial Vertebrate Fauna Survey Guidelines* (DES 2016). A number of the guidelines nominate seasonal surveys based on wet season/dry season sampling that was not possible for this project, however data from other sources (see below) included surveys undertaken during the wet season and enabled a comparative wet season/dry season survey. Notwithstanding these limitations fieldwork was targeted to assess the integrity of the fauna habitats available, noting particularly the presence/status of habitats for particular guilds of species of conservation significance (e.g. amphibians). The Fauna Survey Guidelines acknowledge that habitat assessment may be used as a suitable surrogate for species assessment and utilisation when combined with detailed understanding of the target species ecology and assessment of other external data (e.g. known records within similar habitats).

Despite project specific time survey restrictions, data has previously been collected for Noah Creek via a number of institutions, including the Australian Tropical Research Foundation (based at Cape Tribulation) and was able to be accessed for this project.

Fauna habitat assessment at Noah Creek comprised:

- Assessment of potential breeding areas of fauna within the project area, including an assessment of the likelihood of occurrence of colonial species of conservation significance – noting that interference with breeding places of listed species will require a Damage Mitigation Permit under the provisions of the NC Act. Breeding places for example may include trees with hollows, burrows, drainage lines.
- Opportunistic searches within the project area, e.g. leaf litter searches, low level vegetation, decorticating bark, rock/log inspections etc., for smaller fauna species (e.g. reptiles, frogs).

- Presence/absence of feral animals impacting on the respective sites.
- Any actual physical evidence of protected fauna species utilising the sites, e.g. Cassowary scats.
- Evening spotlighting within the project footprint.
- Timed birdcall transects (and direct observation).
- Frog call playbacks of listed species during the wet season (February 2018).
- Aquatic surveys were conducted in Noah Creek at several locations including the project footprint, as well as upstream and downstream from the proposed bridge site. Surveys comprised observation using both spotlighting and daytime snorkelling and bank observation (2018), and data from other sources included also used netting (cast nets, fyke traps, seine nets) and line fishing.

No fauna trapping was directly undertaken by GHD for this project, and no ANABAT or Song Meters were deployed for remote recording of bat calls.

Terrestrial and aquatic field studies were undertaken with the following specific aims:

- Determine the significance status of fauna listed under the *Nature Conservation Act 1992* (NC Act 1992) and under the *Nature Conservation (Wildlife) Regulation 2006*
- Identify the potential presence of any Matters of National Significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999)*.
- Describe habitats that may be directly or indirectly affected by the proposed bridge and assess the value of habitats available to listed fauna species within the inundation area.
- Identify and describe the commonly occurring and listed species and communities known or likely to be present in the study area, and assess which species or communities may be affected by the proposed bridge.
- Describe the local, regional and state-wide conservation status, the key threatening processes, habitat requirements and any recovery plans or threat abatement plans applying to species or communities likely to be affected by the proposed infrastructure.
- Describe the type, location, size and condition of the habitat of affected species and communities and provide details of the distribution and condition of similar habitats in the region.

2.2.2 Flora Assessment

Flora field surveys were undertaken concurrent with opportunistic fauna and fauna habitat surveys. Flora assessment was undertaken in accordance with the *Guidelines for Flora Survey & Assessment in Northern Queensland* (Bruce Wannan, DES 2013). These guidelines are particular to north Queensland. It should be noted that the northern approaches sites are within Daintree National Park, and therefore were not required to be surveyed in accordance with the provisions of the NC Act *High Risk Protected Flora Survey guidelines* (DES 2016). Surveys consisted primarily of the wandering transects as described in the *Guidelines for Flora Survey & Assessment in Northern Queensland* noting:

- Vegetation community descriptions as they matched the Queensland Herbarium (DES) regional ecosystem framework.
- Presence/absence of any ecosystems listed as threatened under the provisions of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

- Occurrence of species of conservation significance listed under the schedules of the Nature Conservation (Wildlife) Regulation 2006.
- Forest structure and general floristic composition, noting particularly that both sites have been subject to previous cyclone damage and are in various stages of succession.
- Presence of introduced and declared weed species and potential to expand into newly cleared areas post construction.

2.2.3 Physical Site Assessment

An overview of the physical characteristics of the surrounding area was undertaken. This included:

- General observations on geology and soil type
- General observations on hydrology of Noah Creek
- Land uses and disturbance
- A visual assessment of soil erosive potential
- General identification of landform/topographical features
- Any particular physical features that would pose a limitation to construction and use of the proposed infrastructure.

2.2.4 Survey Permits

GHD is authorised to conduct ecological surveys under the Queensland Scientific Purposes Permit (Permit Number WISP06498409 and WISP11392912), Queensland Scientific Users Registration Certificate (Registration Number 132). Survey techniques have been approved by the Department of Agriculture, Fisheries and Forestry (currently known as the Department of Agriculture and Fisheries (DAF))-accredited GHD Animal Ethics Committee.

3. Site Descriptions

3.1 Biophysical Features

3.1.1 Soil and Geography

Site investigations found that soils on the existing bridge abutments comprise compacted imported material in the upper horizons and at depth are most likely clay soils derived from mixed alluvium and Hodgkinson formation metamorphics. Within the creek bed upper layers of the stratum are coarse alluvium/cobbles and at depth are expected to be similar to that of the abutments i.e. clays derived from alluvium and metamorphics.

Soils in the project area include alluvial soils derived from a mixture of metamorphic and granite substrates positioned on alluvial terraces or flats and hillslopes to the northeast and southwest of the project site. Loam soils derived from granite, basalt or metamorphic substrates are located on hill slopes and alluvial terraces to the south of Noah Creek Bridge on Freehold land.

To the immediate north of the project site is shallow rocky soil or alluvium derived from metamorphic and granite substrates on alluvial terraces or flats and hillslopes. Across the bridge on the northern side, (immediately south of the shallow rocky alluvium) is very wet quaternary alluvium derived from basic and acidic rock, quaternary beach sand and clay loam located on alluvial terraces and flats, hillslopes and coastal flats. The northern section of the old Cape Tribulation road ford has been subject to erosion over the past 50 years since it's decommission, exposing medium to large granite boulders. Upstream of Noah Creek Bridge, (to the west) is shallow soil derived from granitic substrates on mountain summits, open rocky areas on or adjacent to Noah Creek and other creek bank tributaries in hilly to mountainous terrain.

The southern road ford has previously been stabilised with gravel material from Noah Creek and provides a firm foundation with limited vulnerability to erosion.

Plate 1	Description
	Granite boulders located on the northern banks of the old Cape Tribulation road ford. This now is a prominent ephemeral drainage line and two species of endangered frogs were identified within this area.

Plate 2	Description
	Old Cape Tribulation road ford southern access.

3.1.2 Hydrology

Noah Creek is classed as a short, steep, coastal stream which typically occur in steep, high rainfall areas close to the coast. The creek consists of a relatively wide cobble bed rock channel with a large riffle run located immediately upstream of the Noah Creek Bridge with large pools located upstream and downstream. The proposed bridge site is in the upper tidal zone, with an average range of 60 cm between high and low tide. Peak flows for Noah Creek occur during the monsoon season, typically experienced in the region from December through to March. Noah Creek Bridge is currently in a medium storm tide inundation area (less than 1 metre depth).

The mouth of Noah creek, two kilometres downstream from the proposed bridge site, is part of the Great Barrier Reef Coast Marine Park. A small fringing reef is located directly adjacent to the mouth of Noah Creek. The presence of a smaller feeder creek that flows under the northern approach of Cape Tribulation Road via a culvert was noted during the surveys. Existing stormwater drainage lines adjacent to cape tribulation approach roads will also need realignment within the constrained footprint area.

Plate 3	Description
	The old Cape Tribulation Road ford crossing Noah Creek directly upstream of proposed bridge site.

Potential changes in hydrology that result in adverse impacts to aquatic habitat, fish passage, channel stability and riparian ecosystems are key risks that need to be carefully managed and mitigated during design, construction and post construction works.

3.1.3 Land use and disturbance

Under the *Wet Tropics Management Plan 1998*, the project site lies within Zone C, allowing disturbances associated with bridge construction provided they are managed appropriately to minimise disturbance. It is intended by the Wet Tropics Management Authority that the majority of new and existing infrastructure and facilities will be included in this Zone and Zone D. Areas such as roads, quarries, dams, paddocks, car parks, orchards and plantations are examples of such facilities and infrastructure

Prior to the current bridge construction on Cape Tribulation Road, an old road ford, only accessible during periods of low flow, was used to cross Noah Creek. This track was decommissioned after the single lane wooden bridge was constructed in the 1960s. The southern bank section of the old road ford has still been maintained. If a side track is deemed necessary in the final bridge construction design, the southern old road ford is the preferred access point due to its stable bank and already cleared vegetation.

The section of freehold land lot 62 SP146421 that lies between Cape Tribulation road and Noah Creek was previously used as an orchard for growing exotic fruit trees. The orchard is no longer used for commercial purposes and would require minimal clearing (only exotic species) to be used as an additional construction site. A section of the orchard outside a 50 metre buffer zone from Noah Creek has been identified as the preferred location for a laydown yard.

Plate 4	Description
	Orchard on south eastern side of the proposed bridge location (freehold land lot 62 SP146421).

3.2 Ecological Overview

3.2.1 Bioregional Context

Landscape scale planning and assessment in Australia is broadly based on commonality of themes that include climate, geology, landform, native vegetation and species information. This approach has been formalised with the adoption of the Interim Biogeographic Regionalisation for Australia (IBRA) which has been endorsed by all levels of government as a key tool in planning and assessment across large tracts of land.

IBRA classifies Australia's landscapes into 89 large geographically distinct bioregions. These are further refined into 419 subregions which represent more homogenous geomorphological areas within the broader bioregion.

The Noah Creek project site is located within the IBRA mapped Wet Tropics Bioregion. More specifically the proposed works are within the Daintree-Bloomfield biogeographic subregion (WET09). The subregion is located on the eastern fall of the Great Dividing Range, and encompass the headwater catchments of watercourses that flow eastwards to the Coral Sea including the Daintree and Bloomfield Rivers, as well as numerous perennial creek systems, including Noah Creek. The location of these bioregions ensures a high diversity in landform and geomorphology which in turn has given rise to a mosaic of geological, soil, drainage and vegetation conditions across the project site footprint.

3.2.2 Wet Tropics World Heritage Values

Under the World Heritage Convention (Article 11) nominated World Heritage areas are required to meet one or more Criterion demonstrating outstanding universal values, i.e. values that of significance on an international scale. The Wet Tropics fulfils four key criterion in this regard:

- Exhibits exceptional natural beauty, with superlative scenic features (Criterion 7);
- Includes records of the Earths main evolutionary processes, with one of the most complete and diverse living record of the evolution of land plants in the world (Criterion 8).

- Provides outstanding examples of significant ongoing ecological process and biological evolution (Criterion 9).
- Has a largely intact flora and fauna with a high representation of endemic, rare/threatened species and/or species with restricted distribution (Criterion 10).

Some of the matters above (e.g. Criterion 7, natural beauty and scenic features) are intrinsic to the Noah Creek locations and this report simply acknowledges that this site fulfils this criterion.

In relation to other criterion, there are a number of plant families that are representative of these values are represented across both the project site Typically these include representatives of all of the above, with the families Lauraceae, Proteaceae, Monimiaceae all with representatives of angiosperms with primitive flowering characteristics and are common within the project area. Flora with links to the original Gondwana flora, such as Zamiaceae were also evident Noah Creek (e.g. *Bowenia spectabilis*), and many of the rainforest species noted at both sites are endemic to either the Wet Tropics (including being limited to Noah Creek and local catchments only) or Australia. From a faunal perspective, the Noah Creek area is representative of habitats for fauna that in many cases are restricted, endemic/threatened, representative of primitive lineages, and in themselves are of high intrinsic value.

Plate 5	Description
	*Bowenia spectabilis* (Zamiaceae). An example of one of the flora species illustrating the links between the Wet Tropics flora and the Gondwanan ancestral line. This species is common at Noah Creek.

In all aspects, the Noah Creek project area illustrates fulfilment of all criterion of the general universal Wet Tropics World Heritage values.

3.3 Terrestrial Fauna Survey

Table 1 lists all confirmed terrestrial species that either have known records within one kilometre of the project area (as obtained from WildNet databases) or were observed to occur within the project site during field surveys. Listed species of conservation significance are highlighted.

Table 1 Fauna Records and Observations within the Project Footprint

Confirmed Species	Common Name	EPBC	NCA	Wildlife Online Database Records	
Amphibians					
Litoria rheocola	common mistfrog	E	E	4	Observed at bridge site

Confirmed Species	Common Name	EPBC	NCA	Wildlife Online Database Records	
Litoria dayi	Australian lacelid	E	E	1	Observed at bridge site
*Rhinella marina****	cane toad	-	-	1	Observed at bridge site
Birds					
Gerygone levigaster	mangrove greygone	-	C	1	Observed at bridge site
Gerygone muoki	brown greygone	-	C	1	
Haliaeetus leucogasterer	white-bellied sea eagle	-	C	1	
Accipiter novaehollandiae	grey goshawk	-	C	1	Observed at bridge site
Ceyx azureus	azure kingfisher	-	C	3	
Butorides striata	striated heron	-	C	1	
Egretta novaehollandiae	white faced heron	-	C	1	
Cracticus quoyi	black butcherbird	-	C	26	Observed at bridge site
Cacatua galerita	sulphur-crested cockatoo	-	C	15	Observed at bridge site
Casuarius casurius johnsonii	southern cassowary	E	E	10	Observed at bridge site
Ducula bicolor	pied imperial-pigeon	-	C	4	Observed at bridge site
Ptilinopus regina	rose-crowned fruit dove	-	C	1	
Lopholaimus antarcticus	topknot pigeon	-	C	1	
Ptilinopus superbus	superb fruit-dove	-	C	1	
Dicrurus bracteatus	spangled drongo	-	C	16	Observed at bridge site
Tanysiptera Sylvia	buff-breasted paradise-kingfisher	-	C	2	Observed at bridge site
Megapodius reinwardt	orange-footed scrubfowl	-	C	20	Observed at bridge site
Xanthotis macleayanus	Macleay's honeyeater	-	C	3	
Meliphaga notate	yellow spotted honeyeater	-	C	27	Observed at bridge site
Symposiachrus trivirgatus	spectacled monarch	-	SL	19	Observed at bridge site
Myiagra rubecula	Leaden flycatcher	-	C	1	
Oriolus flavocinctus	yellow oriole	-	C	2	Observed at bridge site
Colluricincla harmonica	grey strike-thrush	-	C	1	
Pachycephala simplex peninsulae	grey whistler	-	C	1	
Ptiloris victoriae	Victoria's riflebird	-	C	8	Observed at bridge site
Trichoglossus haematodus moluccanus	rainbow lorikeet	-	C	12	Observed at bridge site
Cyclopsitta diophthalma macleayana	Macleay's fig-parrot	-	V	4	
Ailuroedus maculosus	spotted catbird	-	C	5	Observed at bridge site
Ninox rufa queenslandica	rufous owl	-	C	11	
Aplonis metallica	metallic starling	-	C	9	Observed at bridge site

Confirmed Species	Common Name	EPBC	NCA	Wildlife Online Database Records	
Mammals					
Canis lupus dingo	Dingo	-	-	3	
Dasyurus maculatus gracilis	spotted-tailed quoll	E	E	2	Observed at bridge site
Hypsiprymnodon moschatus	musky rat-kangaroo	-	C	1	
Thylogale stigmatica	red-legged pademelon	-	C	1	Observed at bridge site
Dendrolagus bennettianus	Bennett's tree-kangaroo	-	NT	3	
Hydromys chrysogaster	water rat	-	C	3	
Uromys caudimaculatus	giant white-tailed rat	-	C	4	Observed at bridge site
Pogonomys sp.	tree mouse	-	C	2	
Melomys cervinipes	fawn-footed melomys	-	C	2	
Melomys burtoni	grassland melomys	-	C	1	
Rattus fuscipes	bush rat	-	C	1	
Rattus leucopus	Cape York rat	-	C	1	
Isoodon macrourus	northern brown bandicoot	-	C	2	Observed at bridge site
Perameles pallescens	northern long-nosed bandicoot	-	C	1	
*Sus scrofa**	Pig	-	-	2	Observed at bridge site
Reptiles					
Lophosaurus boydii	Boyd's forest dragon	-	C	1	Observed at bridge site
Intellagama lesueurii	eastern water dragon	-	C	1	
Morelia spilota	carpet python	-	C	2	
Simalia kinghorni	amethystine python	-	C	1	Observed at bridge site
Dendrelaphis calligastra	northern tree snake	-	C	1	
Boiga irregularis	brown tree snake	-	C	1	Observed at bridge site
Crocodylus porosus	estuarine crocodile	-	V	1	Observed at bridge site
Carlia rubrigularis	red-throated rainbow-skin	-	C	3	Observed at bridge site
Saproscincus basiliscus	basilisk shade-skink	-	C	1	
Carlia munda	shaded-litter rainbow-skink	-	C	1	Observed at bridge site
Varanus varius	lace monitor	-	C	1	Observed at bridge site

Codes – (C) Least Concern, (V) Vulnerable. * denotes introduced species

3.3.1 Terrestrial Fauna of Conservation Significance

Confirmed sightings of listed fauna species of conservation significance within the project footprint include the Southern Cassowary, Spotted-tail Quoll, Estuarine crocodile, Common Mistfrog and the Australian Lace-lid.

Other species known to occur in the locality (but not observed) include the spotted-tail quoll, Macleay's fig parrot and Bennett's tree-kangaroo.

Southern Cassowary, *Casuarius casuarius johnsonii*

While the southern cassowary *Casuarius casuarius* is found in New Guinea and surrounding islands, one subspecies, *Casuarius casuarius johnsonii,* lives in Australia, mostly in dense tropical rainforests. Cassowaries are omnivores, but primarily this large, flightless ratite feeds on the fruits of rainforest plants, many of which rely on the Cassowary for seed dispersal and germination.

Cassowaries are territorial, and the male bird known to occupy the Noah Creek orchard and surrounding forest has been resident in excess of ten years. His range extends north of Noah Creek to Oliver Creek, and southwards to Thornton Beach, but his key occupation area is centred on the south bank of Noah Creek, predictably within the fruit orchard and neighbouring forest. At the time of field inspections, he was observed with two chicks. An unusual occurrence and one reflecting the quality of supporting habitat and lack of disturbance from external factors e.g. residents and dogs. Also contributing is the slow speed vehicle approach to Noah Creek. The relatively blind corner on the southern approach to the narrow bridge results in a speed environment (i.e., very slow) that does not overly represent a high risk to Cassowaries crossing the road. The potential for this aspect (speed environment) to impact on Cassowaries is discussed further in this report.

Plate 6	Description
	A male southern cassowary with 2 sub-adults was spotted on a sidetrack in the project area.

Spotted tailed quoll, *Dasyurus maculatus gracilis*

The spotted tail quoll is a large carnivorous marsupial with reddish-brown fur and distinctive white spots of various sizes over its back and tail. This northern sub species is mostly found in relatively cool, elevated rainforests (mostly above 900 m altitude), although individuals are known to inhabit lower altitude notophyll, mesophyll and wet sclerophyll forests (Maxwell, 1996). The spotted tail quoll utilises dens for resting and raising young. Dens are known occur in tree hollows, logs and rock crevasses. It is well known in the Noah Creek area, and has been regularly observed by residents and guests at the Noah Creek Forest Eco-lodge adjacent to the project area. It was noted during the surveys that no dens were found in the construction footprint.

Common Mistfrog, *Litoria rheocola,*

The common mistfrog is a moderate sized frog with a brown dorsal surface and irregular darker markings. The species is usually found on rocks, debris and vegetation near fast flowing streams. Tadpoles are found in swiftly flowing rainforest streams, clinging to rocks in riffles, torrents, and highly oxygenated pools.

This species was recorded in the old ford road approach (now a highly eroded drainage line) on the northern side of the creek immediately parallel to the existing road. Realignment of the

northern road approach to the new bridge may require earthworks that could impact on the drainage line parallel to the existing road in which they were located.

While it is unlikely the species occurs in riparian vegetation on the main banks of Noah Creek (owing to the tidal influence), the removal of riparian vegetation for abutments on the main Noah Creek banks may reduce marginal habitat of the Common Mistfrog. However, the area taken up by the abutments is considered negligible long term, as the original bridge is to be decommissioned allowing riparian vegetation to grow back in this originally cleared area. Subsequently no cumulative impacts are anticipated. The bridge construction location is within the upper intertidal zone. This area is not considered a tadpole habitat zone due to the tadpoles' inability to cope with saline water. It is not expected the project will affect the Common mistfrog during the tadpole phase of their life-cycle.

Australian lace-lid*, Litoria dayi,*

The Australian lace-lid is highly variable in colour, and may be dark or light brown, grey or creamish above, with or without irregular light markings. The readily distinguishing feature of the frog is the presence of large and prominent eyes with a vertical pupil and reticulated venation of the lower eyelid. The Australian lace-lid is found in the wet tropics and is restricted to rainforest and rainforest margins. The frog prefers fast flowing rocky streams, but slower watercourses are also used. Adults are generally located on rocks and vegetation adjacent to the stream. Tadpoles are found clinging to, or sheltering under rocks in torrents of fast flowing rainforest streams.

The species was also observed only in the same locality as the Common Mistfrog, i.e. on the northern bank of Noah Creek within the now highly eroded original road approach to the historical ford over the creek. This eroded road now acts as a significant ephemeral drainage line. Earthworks parallel to the existing road to realign the northern approaches to the bridge have the potential to impact on habitat for this species. Noah Creek itself is tidal in the vicinity of the abutment works and represents marginal habitat for the species.

Plate 7	Description
	Original northern approach to the Noah Creek ford is now highly eroded and forms an ephemeral drainage line. Two species of endangered frogs were located within this drainage line.

Estuarine Crocodile *Crocodylus porosus*

Saltwater crocodiles are known and have been commonly observed in Noah Creek at the bridge and further upstream. A resident 3 m male is known to regularly penetrate upstream from the bridge to a popular swimming hole, and another crocodile has been responsible for an attack at the mouth of Noah Creek. Crocodiles access the bridge area primarily at high tide during the

night, but may be found in deep pools at any time. Construction activity and general noise and vibration will likely deter most movement during the day, but works elsewhere in the Wet Tropics have demonstrated that they are territorial and curious, and will investigate activity within their range, albeit in conditions and at a time that suits them. Construction of the project will have no long term or cumulative impact on habitat factors for the estuarine crocodile.

3.4 Aquatic Surveys

Observation aquatic surveys were conducted in Noah Creek at several sites including the proposed bridge footprint, as well as upstream and downstream from the project site. Other survey data were obtained from local residents, Australian Tropical Research Foundation (AUSTROP) surveys as well as published research papers.

Table 2 below lists aquatic species observed during surveys as well as those listed on the WildNet database occurring in the proposed bridge area and obtained from external published scientific papers.

Table 2 Fish Records for Noah Creek Project Area

Family / Scientific Name	Common Name	EPBC	NCA	Observations / Wildlife Online Database
Ambassidae				
Ambassis gymnocephalus	bald glassy	-	-	Observed on site / no records
Ambassis miops	flagtail glassfish	-	-	Observed on site / 3 known records
Anguillidae				
Anguilla reinhardtii	longfin eel	-	-	Observed on site / 5 known records
Anguilla mormorata	giant mottled eel	-	-	Observed on site / 2 known records
Anguilla obscura	pacific shortfin eel	-	-	Not observed on site / 1 known record
Apogonidae				
Apogon hyalosoma	mangrove cardinal fish	-	-	Observed on site / no records
Atherinidae				
Atherinomorus lacunosus	wide-banded hardyhead	-	-	Observed on site / no records
Carangidae				
Caranx sexfasciatus	bigeye trevally	-	-	Not observed on site / 2 known records
Carcharhinidae				
Carcharhinus leucas	bull shark	-	-	Observed on site / no records
Carcharhinus fitzroyensis	creek shark	-	-	Observed on site / no records
Clupeidae				
Nematolosa come	bony brim	-	-	Observed on site / no records
Chandidae				
Ambassia agassizi	Agassiz's glass perchlet	-	-	Observed upstream from site only / no records
Ambassia gymnocephalus	glass perchlet	-	-	
Cynoglossidae				
Cynoglossus bilineatus	fourlined tonguesole	-	-	Observed on site / no records

Family / Scientific Name	Common Name	EPBC	NCA	Observations / Wildlife Online Database
Eleotridae				
Hypseleotris compressa	empire gudgeon	-	-	Not observed on site / 5 known records
Giuris margaritacea	snakehead gudgeon	-	-	Observed on site / 2 known records
Bunaka gyrinoides	greenback gudgeon	-	-	Not observed on site / 2 known records
Eleotris fusca	brown spine-cheeked gudgeon	-	-	Not observed on site/ 2 known records
Gobiidae				
Awaous acritosus	roman-nose goby	-	-	Not observed on site / 5 known records
Awaous ocellaris	-	-	-	Not observed on site / 1 known record
Bunaka gymnoides	greenback gauvina	-	-	Observed upstream from site only
Ctenogobius sp.	-	-	-	Observed on site / no records
Glossogobius circumspectus	circumspect goby	-	-	Observed on site / no records
Glossogobius giuris	tank goby	-	-	Observed on site / no records
Eleotris fusca	brown gudeon	-	-	Observed upstream from site only / no records
Glossogobius illimis	False celebes goby	-	-	Not observed on site / 5 known records
Mogurnda adspersa	purple spotted gudgeon	-	-	Observed upstream from site only / no records
Ophiocara porocepohala	spangled gudeon	-	-	Observed upstream from site only / no records
Periophthalmus argentilineatus	common mudskipper	-	-	Observed on site / no records
Psammogobius biocellatus	sleep goby	-	-	Observed on site / no records
Stiphodon atratus	-	-	V	Observed upstream from site only / no records
Stiphodon pelewensis	-	-	V	Not observed on site / 3 known records
Stiphodon semoni	neon goby	CE	-	Observed upstream from site only / 4 known records
Stiphodon rutilaureus	-	-	V	Not observed on site / 4 known records
Sicyopus discordipinnis	-	-	-	Not observed on site / 2 known records
Redigobius bikolanus	speckled goby	-	-	Not observed on site / 4 known records
Redigobius chrysosoma	spotfin goby	-	-	Not observed on site / 2 known records
Haemulidae				
Pomadasys kaakan	javelin grunter	-	-	Observed on site / no records
Hemiramphidae				
Arrhamphus sclerolepis	northern snubnose garfish	-	-	Observed on site / no records
Hyporhampus affinis	tropical garfish	-	-	Observed on site / no records
Zenarchopterus buffonis	buffon's river garfish	-	-	Observed on site / no records
Kuhliidae				
Kuhlia marginata	spotted flagtail	-	-	Observed on site / 5 known records
Kuhlia rupestris	jungle perch	-	-	Observed upstream from site only / 6 known records

Family / Scientific Name	Common Name	EPBC	NCA	Observations / Wildlife Online Database
Latidae				
Lates calcarifer	barramundi	-	-	Observed on site / no records
Leiognathidae				
Leiognathus berbis	berber ponyfish	-	-	Observed on site / no records
Equulites novaehollandiae	whipfin ponyfish	-	-	Observed on site / no records
Leiognathus equulus	common ponyfish	-	-	Observed on site / no records
Lutjanidae				
Lutjanus argentimaculatus	mangrove jack	-	-	Observed on site / 4 known records
Megalopidae				
Megalops cyprinoides	oxeye herring	-	-	Not observed on site / 3 known records
Melanotaenia				
Melanotaenia splendida	eastern rainbowfish	-	-	Observed upstream from site only / 3 known records
Melanotaeniidae				
Melanotaenia trifasciata	banded rainbowfish	-	-	Not observed on site / 3 known records
Cairnsichthys rhombosomoides	Cairns rainbowfish	-	-	Not observed on site / 2 known records
Mugilidae				
Moolgarda seheli	blue spot mullet	-	-	Observed on site / no records
Mugil cephalus	sea mullet	-	-	Observed on site / no records
Myxus elongatus	sand mullet	-	-	Observed on site / no records
Muraenidae				
Gynothorax polyuranidon	freshwater moray	-	-	Observed on site / 2 known records
Platycephalidae				
Platycephalus indicus	bartail flathead	-	-	Observed on site / no records
Plotosidae				
Tandanus tropicanus	-	-	-	3 known records / no records
Psedomugilidae				
Pseudomugil signifer	Pacific blue eye	-	-	5 known records / no records
Scatophagidae				
Scatophagus argus	spotted scat	-	-	Observed on site / 1 known record
Selenotoca multifasciata	striped scat	-	-	Observed on site / no records
Scorpaenidae				
Notesthes robusta	bullrout	-	-	Observed on site / 1 known record
Sparidae				
Acanthopagrus berda	pikey bream	-	-	Observed on site / no records
Terapontidae				
Mesopristes argentus	silver grunter	-	-	Not observed on site / 3 known records

Family / Scientific Name	Common Name	EPBC	NCA	Observations / Wildlife Online Database
Tetraodontidae				
Chelonodon patoca	milk-spotted toadfish	-	-	Observed on site / no records
Arothron immaculatus	narrow–lined toadfish	-	-	Observed on site / no records
Toxotidae				
Toxotes chatareus	spotted archerfish	-	-	Observed on site / no records
Toxotes jaculatrix	banded archerfish	-	-	Observed on site / no records

Codes – (CE) Critically Endangered, (V) Vulnerable

3.4.1 Conservation Significant Species

Four Gobiidae species, *Stiphodon atratus, Stiphodon pelewensis, Stiphodon rutilaureus, and Stiphodon semoni* (neon goby) are of high conservation significance owing to the high level of endemicity displayed by these species, all of which are restricted to limited coastal catchments which have short reaches of steep, high quality freshwater streams descending directly to the ocean.

Stiphodon atratus, *Stiphodon pelewensis, Stiphodon rutilaureus* and *Stiphodon semoni* all belong to the subfamily Sicydiinae, a group commonly known as cling gobies. Members of Sicydiinae use a suction cap which is actually two fused pelvic fins, to cling to rocks (Ebner *et al.* 2016). Cling gobies typically live in short, steep, coastal streams which occur in steep, high rainfall areas close to the coast. Cling gobies have an amphidromous life history, meaning that as adults they live in freshwater where they lay and guard eggs which then hatch and drift through the streams and rivers to the ocean (Pusey *et al.* 2004). The larvae spend time in marine waters where they develop into juveniles before migrating back into freshwater environments where they remain (Ebner *et al.* 2016). Adults inhabit clear freshwater creeks with cobbles and occasionally sandy substrate reaches up-stream of high tide influence.

There are three existing records of *Stiphodon pelewensis* and four existing records of *Stiphodon rutilaurus* within Noah Creek (Wildlife Online), however no individuals were observed during the field surveys within the project footprint (i.e. in the immediate construction area). *Stiphodon atratus* and *Stiphodon semoni* individuals were observed during the survey at sites upstream of the project, the closest observation being approximately 150 m upstream. The presence of these species was initially identified by formal academic research (Ebner *et al.* 2016) in the area upstream of the existing bridge beyond the tidal zone.

During the estimated six-month construction phase, the project will have construction elements that constitute waterway barriers (temporary) that may obstruct larvae and juvenile phase (creek to ocean), and also adult recruitment post juvenile phase (back upstream). These construction elements include silt curtains, coffer dams and raised access tracks for machinery to the base of the bridge. The potential for impact is discussed further in this report. These barriers may prevent access to and from the ocean for cling gobies during their larvae and early juvenile phase. Currently, the existing Noah Creek Bridge does not constitute any quantifiable impacts on the habitat or life cycle of the gobies. If construction methods vary from the preferred method assessed in this document, further studies may be warranted or trigger additional approvals.

Plate 8	Description
	Mangrove fern growing adjacent to the current bridge, within the proposed project footprint. Species constitutes a marine plant under the provisions of the *Fisheries Act 1994.*

3.5 Site Flora

3.5.1 General Description

Noah Creek valley is well known in scientific literature as having a unique ecology typified by very high levels of endemism, and representation by flora species with highly disjunct distributions, both latitudinally and in altitude. Many species typically found only in higher altitudes are found at Noah Creek at almost sea level, and the valley is widely regarded as a botanical 'refugium'; an area where changing historical climatic conditions have been largely ameliorated by local site specific climatic and edaphic factors. This has enabled the persistence of species otherwise restricted to mountain peaks (e.g. nearby Thornton Peak and Mount Hemmant) and other high-altitude environments, e.g. Atherton Tablelands to altitudes almost at sea level.

The lower valley has been subject historically to a number of pressures. It was a centre of intensive logging for valuable rainforest timbers pre WW I up to the late 1970s, and south of Noah Creek was partially cleared for pastoral activities *circa* 1966. With the cessation of pastoral industry in the Cape Tribulation area generally in the 1980s most of the cleared areas were converted to exotic orchard crops, including rambutan, lychee, abiu, durian, breadfruit, etc. These orchards were maintained as a commercially viable industry up to the last decade, but have now only constitute a general minor source of income. The area west of the Cape Tribulation road on the southern approaches now includes the Noah Creek Forest Eco-lodge, and eco-tourism is now the primary economic income for the local area.

North of Noah Creek the entirety of the land is within the Daintree National Park. Whilst logging has previously taken place, the primary cause of much of the observed regeneration and regrowth occurring about the project area is the result of a series of cyclones passing over or near the coast in recent decades. This has not affected the extremely high levels of biodiversity not diminished habitat quality for a very large variety of species (flora and fauna) of conservation significance in the project area.

3.5.2 Site Vegetation

Approximately up to 450 m^2 of vegetation will be disturbed/cleared for construction. Exact area will depend on final design and construction methodologies but will areas potentially affected include:

- **New bridge abutments.** These will be constructed adjacent and immediately upstream of the existing bridge abutments. Species to be impacted are primarily riparian species with the most notable species being *Xanthostemon chrysanthus,* a large riparian species, and Lindsayomyrtus racemoides. The marine mangrove fern, *Acrostichum speciosum*, is also found within the abutment disturbance footprint.
- **Temporary construction access track.** This track is located on the southern side of Noah Creek, and is the approach to the original low tide ford crossing of Noah Creek. It is located on the western side of the southern approach and has been maintained clear of vegetation for the purposes of accessing the base of the existing bridge for maintenance and repair by Douglas Shire Council. Some vegetation will have to be either removed or trimmed back to allow construction vehicle access. Larger tree species to be removed/impacted include *Endiandra compressa, Lindsayomyrtus racemoides, Fagraea gracilipes*. There are a number of introduced species within and adjoining the access track owing to proximity to the Noah Creek Forest Stay Eco-lodge and horticultural plantings. No construction access is proposed from the northern bank of Noah Creek at this juncture.
- **Southern road approach realignment**. This is a narrow band of vegetation, previously cleared, that is now dominated by successional vegetation (Macaranga, Mallotus genera) and by introduced vegetation, notable being the well-established coconut palms. A variety of horticultural escapees are also present, as are introduced pasture grasses (guinea grass, *Megathyrsus maximus*).
- **Northern road approach realignment**. This is potentially the largest area of vegetation to be affected. The original ford crossing construction resulted in the excavation of a cutting to the creek with the excavated material, including large boulders, being mounded as a small ridge parallel to and on the eastern side of the cutting. Following the construction of the Noah Creek Bridge and new road alignment to avoid the ford, the same area was used to dispose of waste soil and rock. Subsequently a low ridge up to five metres wide and to three metres high was created on the western side of the current Noah Creek bridge approach. This low ridge extends from the northern bank of Noah Creek to the southern bank of a small tributary crossing the road 210 m to the north. This ridge is now heavily vegetated, dominated by the species Lindsayomyrtus racemoides, and a variety of successional species. The majority of the flora species of conservation significance with the potential to be directly impacted (cleared or trimmed) were located on this ridge of regrowth and included the following:
    - *Endiandra microneura***:** seedings and saplings. Mature canopy trees are within the adjacent (non-disturbed) National Park areas.
    - *Samadera baileyana.* A small mature tree immediately beside the existing bridge
    - *Euodia hylandia;* A number of saplings occur.
    - *Archidendropsis xanthoxylon;* A mature tree and saplings occur on the ridge.

3.5.3 Vegetation Structure and Integrity

Vegetation within the footprint of the project has been modified through a number of events, including a series of cyclones though the 1990s and 2000s that have had significant impacts on

the structure of local forest communities. However, the most significant events affecting the vegetation structure and composition are associated with anthropogenic factors. These include the following.

1. General historical track/road construction and maintenance. The Cape Tribulation road originally was a cedar cutters track connecting Cow Bay to Cape Tribulation constructed in the 1880s. This track fell into disrepair prior to WWI and was reconstructed as a formal road by Douglas Shire Council in 1960, when the Council took over control of the Daintree River ferry from a private entrepreneur. The crossing of Noah Creek was via a ford approximately 30 m upstream of the existing bridge, and was a low tide crossing only. This ford crossing was replaced by the existing timber bridge in the 1970s, however the ford crossing was maintained for emergency purposes and for bridge access and repairs until the main Cape Tribulation road was sealed and bitumened in 2002. Since this time the ford crossing has not been maintained and severe erosion on the northern bank of the approaches is evident, and has become \an ephemeral drainage tributary. The southern approach to the ford crossing is on private property, and continues to be maintained clear of vegetation to provide DSC with access to the bridge for inspection and maintenance purposes.

   The construction of the original ford crossing entailed a cutting through the bank of the creek on both sides of the road. On the northern approach this resulted in the spoil material being heaped parallel to the cutting on the eastern side of the road. Following the construction of the bridge and realignment of the approaches, further earthworks spoil material was added to this original stockpile (approximately 200 m long) and has since revegetated with a complex successional community.

2. Pastural clearing and orchard development. The area south of the Noah Creek Bridge was cleared in the 1960s for pastural activities, and following cessation of that activity has been replanted with a tropical fruit orchard. Subsequently a riparian verge of between 25 to 35 m of remains in the project area. This verge has a number of introduced species and in the immediate area of the project footprint consists primarily of a number of larger individuals of the species *Xanthostemon chrysanthus* (black penda: syn golden penda) with more complex species associations higher on the bank.

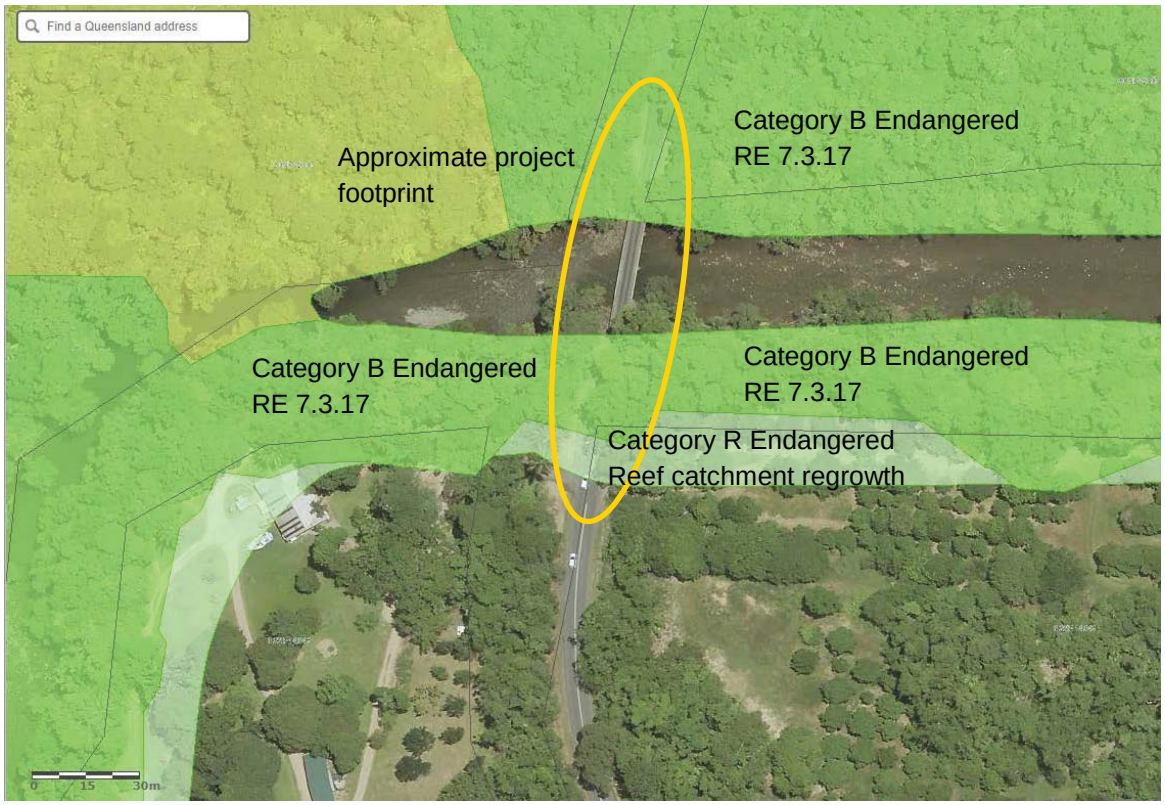
   Numerous horticultural escapees are present in the riparian vegetation on the southern side of Noah Creek.

Regulated Vegetation:

Vegetation regulated under the *Vegetation Management Act 1999* (VM Act) has been mapped by the Queensland Herbarium over the project area.

Vegetation mapping undertaken by the Queensland Herbarium identifies the vegetation within the project footprint as Category B remnant regulated vegetation. Supporting vegetation regional ecosystem mapping further classifies the remnant vegetation as Regional Ecosystem RE 7.3.17, an endangered vegetation community under the VM Act. This regional ecosystem comprises a complex mesophyll vine forest mosaic represented on well-drained alluviums of the coast in very wet and wet rainfall zones of the Wet Tropics. It is characteristically typified by a very high diversity of species and a complex stratum.

Figure 2 Regulated Vegetation Mapping



Source: https://spp.dsdip.esriaustraliaonline.com.au/geoviewer/map/planmaking

Within the project footprint (shown above approximately) the anthropogenic disturbances identified have resulted in a more simplistic structure, both floristically and stratum-wise, than is found in adjoining less disturbed forest. Typically, there is no single dominating tree species through the project footprint, however *Lindsayomyrtus racemoides* is common throughout and *Xanthostemon chrysanthus* is the most frequently encountered riparian species. The subcanopy and understorey area have a relatively complex species association, and on the southern banks of Noah Creek introduced species including coconut palms, firespike (*Odontonema turbaeforme*), various Zingerberaceae and orchard species escapees are commonly represented in the remnant vegetation.

Plate 9	Description
	Riparian vegetation within the project footprint on the southern bank Noah Creek. *Xanthostemon chrysanthus* is the most frequent large tree species.
	Coconut palms, successional species and introduced ornamentals prevalent on southern approach to bridge within project footprint.

3.5.1 Species of Conservation Significance

Surveys undertaken of the project footprint area and adjacent potentially affected habitats identified ten species of flora listed as of conservation significance, i.e. listed under the schedules of the *Nature Conservation (Wildlife) Regulation 2006* as occurring within or adjacent the project footprint. One plant species, *Acrostichum speciosum* (mangrove fern) listed as a marine plant under the Fisheries Act 1994 was observed growing beneath the abutments. No listed Commonwealth species were identified.

The flora surveys conducted identified species of state and commonwealth significance in the area. Table 3 provides a summary of the listed species known to occur in the preferred bridge replacement footprint.

Table 3 Flora of Conservation Significance Observed within Noah Creek Bridge Project Footprint during Surveys

Species	Common Name	EPBC	NCA	Presence / Wildlife Online
Archidendropsis xanthoxylon	yellow siris	-	NT	Present in project footprint. 4 records
Austromuellera trinervia	Muellers silky-oak	-	NT	Present in project footprint. 10 records
Euodia hylandii	-	-	V	Present in project footprint. 18 records
Acronychia acuminata	-	-	NT	Present in wider project buffer area. 3 records
Samadera baileyana	-	-	NT	Present in project footprint. 12 known records
Endiandra microneura	Noahs walnut	-	NT	Present in project footprint. 1 known record
Noahdendron nicholasii			En	Present in project footprint. 1 known record
Ceratopetalum macrophyllum	-	-	NT	Present in project footprint
Dissiliaria tuckeri	-	-	V	Present in project footprint
Paramapania parvibractea	-	-	V	Present in project footprint
Acrostichum speciosum	Mangrove fern			In project footprint: listed marine species under the *Fisheries Act 1994*

Codes – (V) Vulnerable, (NT) Near Threatened, (C) Least Concern under the Queensland *Nature Conservation (Wildlife) Regulation 2006.*

Plate 10	Description
	*Samadera baileyana,* Simaroubaceae. Listed as Near Threatened. Located beside the existing bridge on the northern approaches.

Plate 10	Description
	*Endiandra microneura,* Lauraceae. Listed as Near Threatened. Common saplings and seedlings throughout northern approaches.

4. Impact Management and Mitigation

4.1 Fauna of Conservation Significance

4.1.1 Southern Cassowary

Construction of the project has two primary and one secondary elements that may result in disturbance to this bird on a local scale.

In the first instance construction may exceed six months. The proposed laydown area is within the orchard on the western side of the southern approaches. The presence of machinery, equipment and construction offices/facilities will alienate most of the orchard area from this birds' range. While though this does impact on foraging, it should be noted that the orchard also includes holdings on the western side of the southern approach to the bridge and cumulatively does not realistically impact on any essential habitat factors. The bird (and chicks) can continue to access the balance of the orchard on the western side without obstruction.

Of higher impact will be ongoing noise, vibration and general disturbance associated with construction activities and the presence of humans over the approximate six-month period. Interactions between humans and Cassowaries are inevitable and generally do not result in favourable outcomes for either. In the longer term the orchard is not permanently alienated, as post construction and removal of all laydown materials and temporary offices will again be available as a foraging area.

Of most concern, and the primary impact, will be the changed traffic speed environment as a result of realignment of the approaches to the bridge and the increased bridge width. The current blind approaches to Noah Creek, and the narrow bridge result in a slow to very slow approach and crossing of the bridge. As noted, this low speed vehicle environment represents a very minor threat to Cassowaries crossing the road. The realigned approaches and two lane new bridge will improve line of sight visibility for motorists approaching the bridge, and inevitably will result in an increased speed environment. Road fatalities are one of the major contributing factors identified in the Wet Tropics as a threatening process to Cassowary populations, and as

opposed to construction (which represents a temporary and reversible impact), an altered speed environment represents a cumulative and ongoing threat to the survival of the local population.

Of minor threat to habitat values is the removal of some riparian vegetation for the construction of new bridge abutments, and for realigning the northern and southern approaches. Most of the vegetation present in these alignments represents recruitment following the original construction of the road (which had a low tide only ford crossing), and only the riparian vegetation on the southern bank could be said to be original remnant vegetation with large examples of riparian *Xanthostemon chrysanthus* present. Whilst there are some Cassowary food plants present (notably in the Lauraceae, Arecaceae and Myrtaceae families) in the vegetation to be removed, these represent only a very minor contribution to habitat values for Cassowaries in the local project area.

The proposed development will not fragment or isolate Southern Cassowary habitat or populations as it will be adjacent to the existing bridge within the road corridor. The total area of habitat which is proposed to be modified throughout the construction phase is less than 450 m^2 comprising entirely regenerated areas following historical clearing. Following the decommissioning and rehabilitation of the original bridge and road approach alignments, there will be no net loss of habitat for this species as a result of the project. Subsequently construction aspects of the project will have no long-term cumulative impacts on habitat quality for Southern Cassowaries.

4.1.2 Spotted tailed quoll, *Dasyurus maculatus gracilis*

The key primary impacts will be those associated with construction, notably noise and human disturbance. These are expected to be of an intense, short term duration, with these impacts temporary and reversible. Spotted tailed quolls will resume utilisation of the area with the cessation of construction activities. Being primarily a nocturnal species, an increased speed environment for the new bridge and road increases the risk of road-kill as a result of traffic. However this may be partially offset by the low traffic count in the evenings as the Daintree River ferry operations limit traffic movement, and local traffic movement in the evening for local residents is expected to be low. Road kill/injury as a result of changed (increased) speed environments is a universal general risk for any terrestrial species arising from this project.

The loss of vegetation (approximately 450 m^2) for construction will be offset by rehabilitation of the previous bridge abutments and approaches and no net loss of habitat is anticipated.

4.1.3 Common Mistfrog, *Litoria rheocola,*

The species was not recorded in Noah Creek and extremely unlikely to occur owing to the tidal influence. This species was recorded in the old ford road approach (now a highly eroded drainage line) on the northern side of the creek immediately parallel to the existing road. Realignment of the northern road approach to the new bridge may require earthworks that could impact on the drainage line parallel to the existing road in which they were located.

While it is unlikely the species occurs in riparian vegetation on the main banks of Noah Creek (owing to the tidal influence), the removal of riparian vegetation for abutments on the main Noah Creek banks may reduce marginal habitat. However, the area taken up by the abutments is considered negligible long term, as the original bridge is to be decommissioned allowing riparian vegetation to grow back in this originally cleared area. Subsequently no cumulative impacts are anticipated. The bridge construction location is within the upper intertidal zone. This area is not considered a tadpole habitat zone due to the tadpoles' inability to cope with saline water. It is not expected the project will affect the Common mistfrog during the tadpole phase of their life-cycle.

4.1.4 Australian lace-lid, *Litoria dayi,*

The species was also observed only in the same locality as the Common Mistfrog, i.e. on the northern bank of Noah Creek within the now highly eroded original road approach to the historical ford over the creek. This eroded road now acts as a significant ephemeral drainage line. Earthworks parallel to the existing road to realign the northern approaches to the bridge have the potential to impact on habitat for this species as for the Common Mistfrog. Noah Creek itself is tidal in the vicinity of the abutment works and represents marginal habitat for the species and it is extremely unlikely that works on the Noah Creek bank have any impact on resource and habitat availability for this species.

4.1.5 Estuarine Crocodile *Crocodylus porosus*

Saltwater crocodiles are known and have been commonly observed in Noah Creek at the bridge and further upstream. Construction activity and general noise and vibration will likely deter most movement during the day, but works elsewhere in the Wet Tropics have demonstrated that they are territorial and curious, and will investigate activity within their range, albeit in conditions and at a time that suits them. Construction of the project will have no long term or cumulative impact on habitat factors for the estuarine crocodile.

4.1.6 Gobiidae fish species

Three species of protected Gobiidae are known to occur upstream of the project footprint. These species are amphidromous, with life cycles requiring eggs and larvae to reach the estuarine/ocean area and return as adults. Primary risks for impacts on these species will be during the breeding cycle with interruption of larvae distribution to the sea and subsequent recruitment back to Noah Creek owing to instream works e.g. silt curtains, coffer dams, raised access tracks for vehicle access etc. blocking this amphidromous cycle. These impacts may be tidally dependent, e.g. if tidal range overtops the waterway barriers (‘drown-out’ on high tides) then impacts on the movement of fish and interruptions to recruitment/breeding cycle may not occur except during low tide. This temporary obstruction also presents its own impact risks, primary amongst these is the potential for fish/larvae to be trapped against the barriers and be potentially at high risk to predation by aquatic species (such as grunter, jungle perch) and birds including herons/bitterns, kingfishers etc.

Erosion and sedimentation of upstream resident adult habitats will not occur. The nearest known adult occupation areas are approximately 150 m upstream of the project footprint and suspended sediment from the works will not travel upstream with tide as tidal limit is approximately 30 m above the bridge (old ford crossing). Sediments of the instream environment areas within the project footprint will pose a risk to survival larval fish/eggs and potential migration of these to the ocean and return of adults.

4.2 Environmental Management Plan

The purpose of the EMP is to implement and monitor measures appropriate to mitigating the impact of the construction on environmental values of the site, and to minimise the potential for offsite cumulative impacts. The EMP will also include a framework Erosion and Sediment Control Plan (ESCP) which is to include considerations and construction methodologies specific to the Noah Creek Bridge site.

A preliminary EMP associated with this Ecological Values Report is to provide the environmental management framework and associated management procedures to avoid or minimise the actual environmental impacts associated with the Noah Creek Bridge replacement. It is recommended that an execution phase Construction Environmental Management Plan (CEMP) is developed by the successful tenderer (contractor) which meet the conditions of

approval placed on the works by relevant regulatory authorities and includes the detailed construction methodologies to be utilised by the contractor.

Typically, the EMP will identify environmental elements which are to be addressed during construction, and nominate the roles and responsibilities of the various parties involved in the construction, including reporting structures and frequencies.

For bridge construction the elements that would be expected to be addressed include:

- Air quality,
- Noise and Vibration
- Invasive Species, Weeds, Plant Pathogens and Pests
- Cultural Heritage
- Wildlife
- Vegetation
- Erosion and Sediment Control
- Stormwater management
- Waste Management
- Hazardous Materials
- Site Management

For the duration of the project works (tender through to construction), the Contractors CEMP shall be reviewed and updated as required to ensure that it is current and addressing any changes including:

- Information or discoveries occurring after the preparation of the original Contractors CEMP
- Site conditions or requirements
- Statutory requirements or community expectations
- Construction and/or operational activities, technology or equipment
- Contractor guidelines, policies or procedures

Review and update of the Contractors CEMP shall also be triggered where any project activities have potential for environmental impact which is not sufficiently controlled through existing management practices.

4.3 Specific Mitigation Measures

The design and construction of the proposed bridge has the potential to impact on key ecological values identified in this report if proper precautionary measures are not taken. Below is an outline of provisional management measures to mitigate the impacts on key ecological values within the project area.

4.3.1 Erosion and Sediment Control Plan

An Erosion and Sediment Control Plan is fundamental to controlling off site impacts arising from vegetation clearing and earthworks during road realignment and bridge construction. Erosion and sediment control methods shall be implemented with the International Erosion Control Association *Best Practice & Erosion Control Guidelines*. Monitoring throughout the construction is critical to ensuring successful erosion and sediment control for the project. Routine visual

inspections are to be done on a daily basis to ensure current erosion and sediment control installations are effective and identify any areas requiring additional control measures. The ESCP will include:

- Installing erosion control protection measures in the form of sediment fences where required to minimise the transport of sediment into adjacent terrestrial habitats and Noah Creek.
- Installing a sediment curtain to minimise downstream transport of sediments released during vegetation clearing and earthworks into the Great Barrier Reef Marine Park. Placement of sediment curtains to be decided pending on final construction design.
- Minimising erosion potential through scour protection treatments at abutments
- Minimising vegetation clearing and the area of bare ground required for construction to only that which is necessary
- Appropriately managing and protecting stock piles. Stockpiles will be a maximum of 1.5 m high and shall be set back at least 50 m from Noah Creek
- Where practical, vegetation root stock should be retained in the ground after clearing
- Cleared vegetation is to be mulched and spread on exposed areas for additional exposed earth protection.

The construction phase is to be carried out during a period of low rain, minimising the potential of heavy rainfall to impact earthworks by accelerated erosion and sedimentation. The monsoon season for the region generally lasts from December through to March. The proposed construction phase is currently scheduled to start in May 2019 and have works complete by November 2019.

4.3.2 Vegetation

Impacts of vegetation clearing required by the proposed bridge construction will be minimised by taking the following precautionary measures:

- Clearing of riparian vegetation will be restricted to the minimum requirement to facilitate approach road realignment and bridge construction.
- Clearly marking vegetation clearing areas on construction plans and in the field. Areas that must not be cleared or damaged must also be identified.
- Weed management activities are to be undertaken to avoid the spread of weeds or the introduction of new weed species.
- Side road access proposed to be via the southern old road ford for minimal clearing. The Old Cape Tribulation road ford is approximately 4 metres wide and would only require trimming branches to allow machinery side access to Noah Creek Bridge.
- Locating any additional construction sites (laydown yard, stockpiles) within already existing cleared areas. The disused orchid immediately opposite the construction footprint on the southern bank is the preferred area for addition construction sites. The orchid has been previously cleared and currently consists of exotic species.

4.3.3 Fauna

Without suitable management, the project has the potential to adversely impact habitat for a number of fauna species of conservation significance. However, by applying mitigation and management measures appropriately, potential risks to these species and their habitat will be

managed, such that the project is not considered likely to have a significant impact on the population of these threatened species.

Locating the project construction footprint as close as practically possible to the existing infrastructure during the design phase will minimise the loss of essential habitat. Terrestrial habitat to be cleared has previously been fragmented as a result of the current road and is subject to existing degradation from edge effects. Rehabilitation and revegetation of exposed surfaces and redundant road sections are to be undertaken on completion of construction activities or progressively where possible. Bank morphology will be restored to existing conditions.

One of the main causes of Cassowary deaths is from vehicle strikes. During the project, increased human traffic may result in increased traffic incidents involving Cassowaries. It is understood that during the construction phase a lower speed limit will be imposed over the area. This means that it is unlikely that increased Cassowary mortality will occur due to traffic incidents during the construction phase. The highest risk of impact after the construction phase will be an increase in traffic speed on the dual lane bridge and approach roads. Implementation of lower speed limits and speed reduction devices such as corrugated speed bumps (currently in use at multiple locations in the Daintree National Park) are to be reviewed by the DSC during the project to mitigate this increased risk.

4.3.4 Contaminated Land, Fuel and Hazardous Substances

Bridge construction activities within and around Noah Creek have the potential to result in the introduction of wastes and hazardous materials, such as fuels and lubricants. Construction workers operating equipment on site shall be appropriately trained and licenced, so that these vehicles are operated in a safe and appropriate manner. Pre-inspections must be carried out before start-up of machinery and visual inspections to ensure no oil leaks, hydraulic fluid leakages and fuel leakages during use. An oil/ fuel spill kit and marine spill kit are to be kept on site at all times to respond to any emergency spills on land or water. No fuel and hazardous substances are to be stored on site.

4.3.5 Noise and Vibration

Noise and vibration, including that of chainsaws, machinery, vehicles and humans all contribute to localised impacts on habitat quality to the adjacent sites. This is an unavoidable consequence of the construction process, but should be managed through the restricting works to daylight hours and making sure all exhaust and muffler systems are functioning in accordance with manufacturer's specifications. It has been noted the northern bank consists of some exposed granite boulders. A hydraulic excavator with breaker attachment will be used where necessary to break up larger granite boulders in the construction footprint. Blasting will not be used on site.

4.3.6 Temporary Waterway Barrier Works

According to the Department of DAF (2013) the following aspects are to be considered and incorporated where temporary waterway barrier works are identified in detailed design and construction plans:

- The dimensions of the temporary barrier are limited to the minimum practicable for the site and purpose
- Impacts on water quality are to be minimised by undertaking works to the standards set out in the *Best Practice Erosion and Sediment Control* guidelines
- Sites are to be open for inspection by DAF staff
- Works must not commence during times of elevated flows

- Excavation work in un-bunded tidal areas is to be scheduled to occur two hours either side of low tide

The temporary waterway barriers must meet all accepted development requirements including a maximum working timeframe of 180 calendar days. At the end of the working timeframe, the temporary waterway barrier must be removed and the area restored back to natural flow conditions. Temporary waterway barrier restoration requirements as stated by Witherage (2014) include:

- All waterway barrier material must be removed from within the waterway and disposed of at least 50 m away from the waterway
- The profiles of the bed and banks are re-instated to natural stream profiles stability with 5 business days
- The waterway bed is retained with natural substrate or reconstructed with substrate comparable to the natural substrate size and consistency
- Bed and bank vegetation community is rapidly re-established with native species.

It is recommended that the above aspects are incorporated into tender documentation to ensure the successful tenderer can meet the statutory requirements and guidelines in relation to waterway barrier works and are appropriately considered and incorporated into detailed design and construction documentation.

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https://projects.ghd.com/oc/nqoc1/noahcreekbridgeappro/Delivery/Documents/Final Review Noah Creek Ecological Assessment.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	T.Moeser	A Small		Jim Greatorex		17/8/2018

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Appendices

Appendix A - External Databases

Protected Matters Search Tool

Wildlife Online

Matters of State Environmental Significance

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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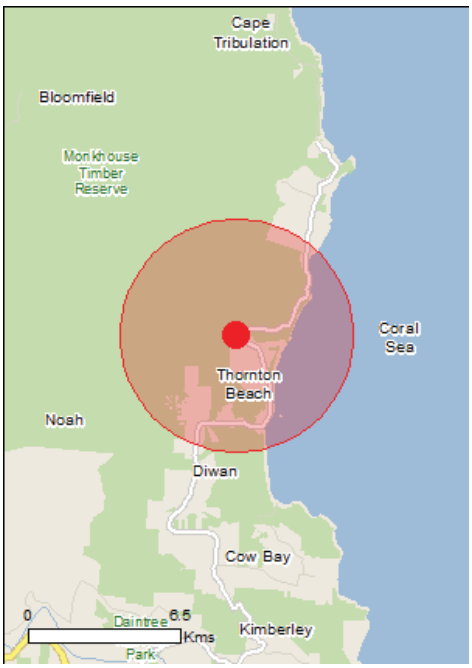

Coordinates
Buffer: 5.0Km

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	2
National Heritage Places:	3
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	2
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	64
Listed Migratory Species:	45

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	98
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	6
Regional Forest Agreements:	None
Invasive Species:	20
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties [Resource Information]

Name	State	Status
Great Barrier Reef	QLD	Declared property
Wet Tropics of Queensland	QLD	Declared property

National Heritage Properties [Resource Information]

Name	State	Status
Natural		
Great Barrier Reef	QLD	Listed place
Wet Tropics of Queensland	QLD	Listed place
Indigenous		
Wet Tropics World Heritage Area (Indigenous Values)	QLD	Within listed place

Great Barrier Reef Marine Park [Resource Information]

Type	Zone	IUCN
Conservation Park	CP-16-4028	IV
General Use	GU-16-6004	VI

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Broad leaf tea-tree (Melaleuca viridiflora) woodlands in high rainfall coastal north Queensland	Endangered	Community may occur within area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Casuarius casuarius johnsonii Southern Cassowary, Australian Cassowary, Double-wattled Cassowary [25986]	Endangered	Species or species habitat known to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed	Critically Endangered	Species or species

Name	Status	Type of Presence
Godwit (menzbieri) [86432]		habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Tyto novaehollandiae kimberli		
Masked Owl (northern) [26048]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria dayi		
Australian Lace-lid, Lace-eyed Tree Frog [86707]	Endangered	Species or species habitat known to occur within area
Litoria nannotis		
Waterfall Frog, Torrent Tree Frog [1817]	Endangered	Species or species habitat known to occur within area
Litoria nyakalensis		
Mountain Mistfrog [1820]	Critically Endangered	Species or species habitat likely to occur within area
Litoria rheocola		
Common Mistfrog [1802]	Endangered	Species or species habitat known to occur within area
Mammals		
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat may occur within area
Dasyurus hallucatus		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area
Dasyurus maculatus gracilis		
Spotted-tailed Quoll (North Queensland), Yarri [64475]	Endangered	Species or species habitat likely to occur within area
Hipposideros semoni		
Semon's Leaf-nosed Bat, Greater Wart-nosed Horseshoe-bat [180]	Vulnerable	Species or species habitat may occur within area
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Mesembriomys gouldii rattoides		
Black-footed Tree-rat (north Queensland), Shaggy Rabbit-rat [87620]	Vulnerable	Species or species habitat may occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pteropus conspicillatus		
Spectacled Flying-fox [185]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Rhinolophus robertsi Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat likely to occur within area
Saccolaimus saccolaimus nudicluniatus Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat likely to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area
Plants		
Acriopsis emarginata Pale Chandelier Orchid [83928]	Vulnerable	Species or species habitat likely to occur within area
Actephila foetida [12078]	Vulnerable	Species or species habitat known to occur within area
Asplenium wildii [19154]	Vulnerable	Species or species habitat known to occur within area
Cajanus mareebensis [8635]	Endangered	Species or species habitat may occur within area
Carronia pedicellata [24178]	Endangered	Species or species habitat known to occur within area
Cepobaculum carronii an orchid [78700]	Vulnerable	Species or species habitat may occur within area
Chingia australis [24603]	Endangered	Species or species habitat known to occur within area
Cyclophyllum costatum a shrub [82770]	Vulnerable	Species or species habitat likely to occur within area
Dendrobium mirbelianum Dark-stemmed Antler Orchid, Mangrove Orchid [14310]	Endangered	Species or species habitat known to occur within area
Dendrobium nindii an orchid [11289]	Endangered	Species or species habitat likely to occur within area
Drosera prolifera [9940]	Vulnerable	Species or species habitat known to occur within area
Endiandra cooperana [52889]	Endangered	Species or species habitat known to occur within area
Gardenia actinocarpa [3580]	Endangered	Species or species habitat known to occur within area
Myrmecodia beccarii Ant Plant [11852]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Phaius pictus [22564]	Vulnerable	Species or species habitat likely to occur within area
Phalaenopsis amabilis subsp. rosenstromii Native Moth Orchid [87535]	Endangered	Species or species habitat may occur within area
Phaleria biflora [82049]	Vulnerable	Species or species habitat likely to occur within area
Phlegmariurus dalhousieanus BlueTassel-fern [86550]	Endangered	Species or species habitat likely to occur within area
Phlegmariurus squarrosus Rock Tassel-fern, Water Tassel-fern [86556]	Critically Endangered	Species or species habitat likely to occur within area
Polyphlebium endlicherianum Middle Filmy Fern [87494]	Endangered	Species or species habitat known to occur within area
Ristantia gouldii [18776]	Vulnerable	Species or species habitat likely to occur within area
Tropilis callitrophilis Thin Feather Orchid [82771]	Vulnerable	Species or species habitat likely to occur within area
Vappodes phalaenopsis Cooktown Orchid [78894]	Vulnerable	Species or species habitat likely to occur within area
Xanthostemon formosus [21816]	Endangered	Species or species habitat likely to occur within area
Zeuxine polygonoides Velvet Jewel Orchid [46794]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within

Name	Status	Type of Presence
		area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Foraging, feeding or related behaviour likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Foraging, feeding or related behaviour known to occur within area
Migratory Terrestrial Species		
Cecropis daurica Red-rumped Swallow [80610]		Species or species habitat known to occur within area
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat likely to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat likely to occur within area
Monarcha frater Black-winged Monarch [607]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Foraging, feeding or related behaviour likely to occur within area

Name	Threatened	Type of Presence
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat likely to occur within area
Hirundo daurica Red-rumped Swallow [59480]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Monarcha frater Black-winged Monarch [607]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Bulbonaricus davaoensis Davao Pughead Pipefish [66190]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys sculptus Sculptured Pipefish [66197]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Corythoichthys paxtoni Paxton's Pipefish [66204]		Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area
Cosmocampus maxweberi Maxweber's Pipefish [66209]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Festucalex gibbsi Gibbs' Pipefish [66215]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus macrorhynchus Whiskered Pipefish, Ornate Pipefish [66222]		Species or species habitat may occur within area
Halicampus mataafae Samoan Pipefish [66223]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Hippichthys spicifer Belly-barred Pipefish, Banded Freshwater Pipefish [66232]		Species or species habitat may occur within area
Hippocampus bargibanti Pygmy Seahorse [66721]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus zebra Zebra Seahorse [66241]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis brachyurus Short-tail Pipefish, Short-tailed River Pipefish [66257]		Species or species habitat may occur within area
Nannocampus pictus Painted Pipefish, Reef Pipefish [66263]		Species or species habitat may occur within area
Phoxocampus diacanthus Pale-blotched Pipefish, Spined Pipefish [66266]		Species or species habitat may occur within area
Siokunichthys breviceps Softcoral Pipefish, Soft-coral Pipefish [66270]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat likely to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus duboisii Dubois' Seasnake [1116]		Species or species habitat may occur within area
Aipysurus eydouxii Spine-tailed Seasnake [1117]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Enhydrina schistosa Beaked Seasnake [1126]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Hydrophis mcdowelli null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Lapemis hardwickii Spine-bellied Seasnake [1113]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Laticauda colubrina a sea krait [1092]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Foraging, feeding or related behaviour known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Daintree	QLD
Daintree Rainforest	QLD
Eastern Kuku Yalanji	QLD
Hope Islands	QLD
Kijokaby	QLD
Manani	QLD

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Plants		
Annona glabra Pond Apple, Pond-apple Tree, Alligator Apple, Bullock's Heart, Cherimoya, Monkey Apple, Bobwood, Corkwood [6311]		Species or species habitat likely to occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Alexandra Bay	QLD
Great Barrier Reef Marine Park	QLD

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-16.14023 145.43062

Acknowledgements

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

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

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

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

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Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -16.1402
Longitude: 145.4306
Distance: 1
Email: Tim.Moeser@ghd.com
Date submitted: Thursday 28 Jun 2018 15:03:46
Date extracted: Thursday 28 Jun 2018 15:10:02

The number of records retrieved = 163

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Hylidae	*Litoria rheocola*	common mistfrog		E	E	5/5
animals	amphibians	Hylidae	*Litoria lesueuri sensu lato*	stony creek frog		C		2/2
animals	birds	Acanthizidae	*Gerygone magnirostris*	large-billed gerygone		C		3
animals	birds	Acanthizidae	*Gerygone palpebrosa*	fairy gerygone		C		2
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		1
animals	birds	Alcedinidae	*Ceyx azureus*	azure kingfisher		C		1
animals	birds	Apodidae	*Aerodramus terraereginae*	Australian swiftlet		C		1
animals	birds	Ardeidae	*Ardea sumatrana*	great-billed heron		C		1
animals	birds	Artamidae	*Cracticus quoyi*	black butcherbird		C		3
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		5
animals	birds	Campephagidae	*Lalage leucomela*	varied triller		C		2
animals	birds	Casuariidae	*Casuarius casuarius johnsonii (southern population)*	southern cassowary (southern population)		E	E	2
animals	birds	Columbidae	*Ptilinopus magnificus*	wompoo fruit-dove		C		4
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		4
animals	birds	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher		C		3
animals	birds	Halcyonidae	*Todiramphus macleayii*	forest kingfisher		C		2
animals	birds	Megapodiidae	*Megapodius reinwardt*	orange-footed scrubfowl		C		4
animals	birds	Megapodiidae	*Alectura lathami*	Australian brush-turkey		C		1
animals	birds	Meliphagidae	*Meliphaga notata*	yellow-spotted honeyeater		C		2
animals	birds	Meliphagidae	*Xanthotis macleayanus*	Macleay's honeyeater		C		1
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		1
animals	birds	Meliphagidae	*Bolemoreus frenatus*	bridled honeyeater		C		2
animals	birds	Meliphagidae	*Meliphaga gracilis*	graceful honeyeater		C		2
animals	birds	Meliphagidae	*Myzomela obscura*	dusky honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		1
animals	birds	Monarchidae	*Myiagra alecto*	shining flycatcher		C		1
animals	birds	Monarchidae	*Machaerirhynchus flaviventer*	yellow-breasted boatbill		C		1
animals	birds	Monarchidae	*Myiagra ruficollis*	broad-billed flycatcher		C		1
animals	birds	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch		SL		4
animals	birds	Nectariniidae	*Nectarinia jugularis*	olive-backed sunbird		C		1
animals	birds	Pachycephalidae	*Pachycephala simplex peninsulae*	grey whistler		C		1
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		1
animals	birds	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush		C		4
animals	birds	Paradisaeidae	*Ptiloris victoriae*	Victoria's riflebird		C		3
animals	birds	Pittidae	*Pitta versicolor*	noisy pitta		C		1
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		4
animals	birds	Psittacidae	*Cyclopsitta diophthalma macleayana*	Macleay's fig-parrot		V		1
animals	birds	Ptilonorhynchidae	*Ailuroedus maculosus*	spotted catbird		C		1
animals	birds	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail		SL		2
animals	birds	Strigidae	*Ninox rufa queenslandica*	rufous owl (southern subspecies)		C		1
animals	birds	Sturnidae	*Aplonis metallica*	metallic starling		C		2
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		1
animals	birds	Timaliidae	*Zosterops lateralis*	silvereye		C		3
animals	mammals	Canidae	*Canis lupus dingo*	dingo				1
animals	mammals	Dasyuridae	*Phascogale tapoatafa tapoatafa*	brush-tailed phascogale		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Dasyuridae	*Dasyurus maculatus gracilis*	spotted-tailed quoll (northern subspecies)		E	E	1
animals	mammals	Hipposideridae	*Hipposideros diadema reginae*	diadem leaf-nosed bat		NT		1
animals	mammals	Macropodidae	*Dendrolagus bennettianus*	Bennett's tree-kangaroo		NT		1
animals	mammals	Muridae	*Melomys cervinipes*	fawn-footed melomys		C		1
animals	mammals	Muridae	*Uromys caudimaculatus*	giant white-tailed rat		C		1
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		2/1
animals	mammals	Muridae	*Rattus fuscipes*	bush rat		C		1
animals	mammals	Pteropodidae	*Pteropus alecto*	black flying-fox		C		1
animals	mammals	Suidae	*Sus scrofa*	pig	Y			1
animals	ray-finned fishes	Ambassidae	*Ambassis miops*	flagtail glassfish				1
animals	ray-finned fishes	Anguillidae	*Anguilla marmorata*	giant mottled eel				1
animals	ray-finned fishes	Anguillidae	*Anguilla reinhardtii*	longfin eel				1
animals	ray-finned fishes	Carangidae	*Caranx sexfasciatus*	bigeye trevally				1
animals	ray-finned fishes	Eleotridae	*Hypseleotris compressa*	empire gudgeon				1
animals	ray-finned fishes	Eleotridae	*Eleotris fusca*	brown spine-cheek gudgeon				1
animals	ray-finned fishes	Gobiidae	*Sicyopterus cf. lagocephalus*	cling-goby				1
animals	ray-finned fishes	Gobiidae	*Awaous acritosus*	roman-nose goby				1
animals	ray-finned fishes	Gobiidae	*Stiphodon semoni*	neon goby			CE	1
animals	ray-finned fishes	Gobiidae	*Glossogobius illimis*	false celebes goby				1
animals	ray-finned fishes	Gobiidae	*Redigobius bikolanus*	speckled goby				1
animals	ray-finned fishes	Gobiidae	*Stiphodon pelewensis*			V		1
animals	ray-finned fishes	Gobiidae	*Redigobius chrysosoma*	spotfin goby				1
animals	ray-finned fishes	Gobiidae	*Stiphodon rutilaureus*			V		1
animals	ray-finned fishes	Gobiidae	*Sicyopus discordipinnis*					1
animals	ray-finned fishes	Kuhliidae	*Kuhlia marginata*	spotted flagtail				1
animals	ray-finned fishes	Kuhliidae	*Kuhlia rupestris*	jungle perch				1
animals	ray-finned fishes	Lutjanidae	*Lutjanus argentimaculatus*	mangrove jack				1
animals	ray-finned fishes	Megalopidae	*Megalops cyprinoides*	oxeye herring				1
animals	ray-finned fishes	Muraenidae	*Gymnothorax polyuranodon*	freshwater moray				1
animals	ray-finned fishes	Pseudomugilidae	*Pseudomugil signifer*	Pacific blue eye				1
animals	ray-finned fishes	Terapontidae	*Mesopristes argenteus*	silver grunter				1
animals	reptiles	Scincidae	*Carlia munda*	shaded-litter rainbow-skink		C		1
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		1
fungi		Basidiomycota	*Mycena*			C		2/2
fungi		Basidiomycota	*Stereum*			C		2/2
fungi		Basidiomycota	*Clavaria*			C		1/1
fungi		Basidiomycota	*Lentinus*			C		2/2
fungi		Basidiomycota	*Ganoderma*			C		1/1
fungi		Basidiomycota	*Polyporus*			C		3/3
fungi		Basidiomycota	*Lycoperdon*			C		1/1
fungi		Basidiomycota	*Microporus*			C		1/1
fungi		Basidiomycota	*Stereopsis*			C		1/1
fungi		Basidiomycota	*Basidiomycota*			C		3/3
fungi		Basidiomycota	*Hexagonia tenuis*			C		1/1
fungi		Basidiomycota	*Microporus xanthopus*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
fungi		Basidiomycota	*Pycnoporus coccineus*			C		1/1
fungi		Basidiomycota	*Ganoderma steyaertanum*			C		2/2
plants	conifers	Podocarpaceae	*Podocarpus grayae*			C		1/1
plants	ferns	Pteridaceae	*Acrostichum speciosum*	mangrove fern		C		1/1
plants	higher dicots	Araliaceae	*Polyscias australiana*	ivory basswood		C		1/1
plants	higher dicots	Araliaceae	*Polyscias elegans*	celery wood		C		1/1
plants	higher dicots	Caesalpiniaceae	*Storckiella australiensis*			C		6/6
plants	higher dicots	Caesalpiniaceae	*Mezoneuron scortechinii*			C		1/1
plants	higher dicots	Casuarinaceae	*Gymnostoma australianum*			V		14/14
plants	higher dicots	Celastraceae	*Hypsophila dielsiana*			C		3/3
plants	higher dicots	Celastraceae	*Dinghoua globularis*			C		1/1
plants	higher dicots	Clusiaceae	*Mesua sp. (Boonjie A.K.Irvine 1218)*			C		1/1
plants	higher dicots	Cunoniaceae	*Ceratopetalum macrophyllum*			NT		5/5
plants	higher dicots	Cunoniaceae	*Ceratopetalum iugumensis*			C		1/1
plants	higher dicots	Dilleniaceae	*Hibbertia dentata*	trailing guinea flower		C		1/1
plants	higher dicots	Droseraceae	*Drosera prolifera*	trailing sundew		V	V	2/2
plants	higher dicots	Elaeocarpaceae	*Elaeocarpus bancroftii*			C		2/2
plants	higher dicots	Elaeocarpaceae	*Aceratium megalospermum*			C		1/1
plants	higher dicots	Euphorbiaceae	*Baloghia parviflora*			C		1/1
plants	higher dicots	Hamamelidaceae	*Noahdendron nicholasii*			E		8/8
plants	higher dicots	Loranthaceae	*Amyema conspicua subsp. conspicua*			C		1
plants	higher dicots	Melastomataceae	*Tristemma mauritianum var. mauritianum*		Y			2/2
plants	higher dicots	Myrsinaceae	*Ardisia brevipedata*			C		2/2
plants	higher dicots	Myrsinaceae	*Ardisia pachyrrhachis*			C		1/1
plants	higher dicots	Myrtaceae	*Acmena graveolens*			C		1/1
plants	higher dicots	Myrtaceae	*Syzygium monospermum*			C		1/1
plants	higher dicots	Myrtaceae	*Lindsayomyrtus racemoides*			C		4/4
plants	higher dicots	Phyllanthaceae	*Phyllanthus hypospodius*			C		3/3
plants	higher dicots	Picrodendraceae	*Choriceras majus*			C		7/7
plants	higher dicots	Picrodendraceae	*Dissiliaria tuckeri*			V		1/1
plants	higher dicots	Pittosporaceae	*Pittosporum rubiginosum*			C		2/2
plants	higher dicots	Proteaceae	*Austromuellera trinervia*			NT		2/2
plants	higher dicots	Proteaceae	*Helicia nortoniana*			C		1/1
plants	higher dicots	Proteaceae	*Cardwellia sublimis*			C		1/1
plants	higher dicots	Proteaceae	*Grevillea baileyana*			C		1/1
plants	higher dicots	Proteaceae	*Stenocarpus cryptocarpus*	giant-leaved stenocarpus		NT		1/1
plants	higher dicots	Proteaceae	*Megahertzia amplexicaulis*			NT		3/3
plants	higher dicots	Proteaceae	*Buckinghamia ferruginiflora*			V		3/3
plants	higher dicots	Rubiaceae	*Gardenia actinocarpa*			E	E	2/2
plants	higher dicots	Rubiaceae	*Spermacoce latifolia*		Y			1/1
plants	higher dicots	Rubiaceae	*Lasianthus strigosus*					1/1
plants	higher dicots	Rubiaceae	*Psychotria dallachiana*			C		3/3
plants	higher dicots	Rutaceae	*Euodia pubifolia*			V		5/5
plants	higher dicots	Rutaceae	*Medicosma fareana*			C		1/1
plants	higher dicots	Rutaceae	*Medicosma sessiliflora*			C		4/4
plants	higher dicots	Rutaceae	*Euodia hylandii*			V		7/7

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	higher dicots	Sapindaceae	*Lepiderema hirsuta*			NT		1/1
plants	higher dicots	Sapindaceae	*Harpullia rhyticarpa*			C		2/1
plants	higher dicots	Sapindaceae	*Sarcopteryx reticulata*			C		1/1
plants	higher dicots	Simaroubaceae	*Samadera baileyana*			NT		6/6
plants	higher dicots	Symplocaceae	*Symplocos glabra*			C		1/1
plants	higher dicots	Ulmaceae	*Trema tomentosa var. aspera*			C		1/1
plants	higher dicots	Vitaceae	*Cissus vinosa*			C		1/1
plants	lower dicots	Annonaceae	*Annonaceae*			C		1
plants	lower dicots	Annonaceae	*Xylopia maccreae*			C		1/1
plants	lower dicots	Annonaceae	*Polyalthia xanthocarpa*			C		1/1
plants	lower dicots	Apocynaceae	*Alyxia orophila*	mountain alyxia		C		1/1
plants	lower dicots	Apocynaceae	*Dischidia major*	pitcher plant		C		1/1
plants	lower dicots	Gentianaceae	*Fagraea cambagei*			C		1/1
plants	lower dicots	Hernandiaceae	*Hernandia albiflora*			C		3/3
plants	lower dicots	Lauraceae	*Beilschmiedia tooram*			C		1/1
plants	lower dicots	Lauraceae	*Endiandra grayi*			V		2/2
plants	lower dicots	Lauraceae	*Endiandra microneura*			NT		6/6
plants	lower dicots	Lauraceae	*Beilschmiedia bancroftii*			C		1/1
plants	lower dicots	Loganiaceae	*Strychnos minor*			C		1/1
plants	lower dicots	Menispermaceae	*Parapachygone longifolia*			C		1/1
plants	lower dicots	Menispermaceae	*Carronia pedicellata*			E	E	1/1
plants	lower dicots	Monimiaceae	*Palmeria scandens*	anchor vine		C		1/1
plants	lower dicots	Piperaceae	*Piper caninum*	peppervine		C		1/1
plants	monocots	Arecaceae	*Linospadix minor*			C		1/1
plants	mosses	Sematophyllaceae	*Radulina hamata*			C		1/1
plants		Achariaceae	*Ryparosa kurrangii*			NT		10/10
plants		Calycanthaceae	*Idiospermum australiense*			C		9/9

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Queensland Government

Department of Environment and Heritage Protection

Environmental Reports

Matters of State Environmental Significance

Area of Interest: Longitude: 145.430622 Latitude: -16.140232

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@ehp.qld.gov.au

Disclaimer

Whilst every care is taken to ensure the accuracy of the information provided in this report, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness, or suitability, for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which the user may incur as a consequence of the information being inaccurate or incomplete in any way and for any reason.

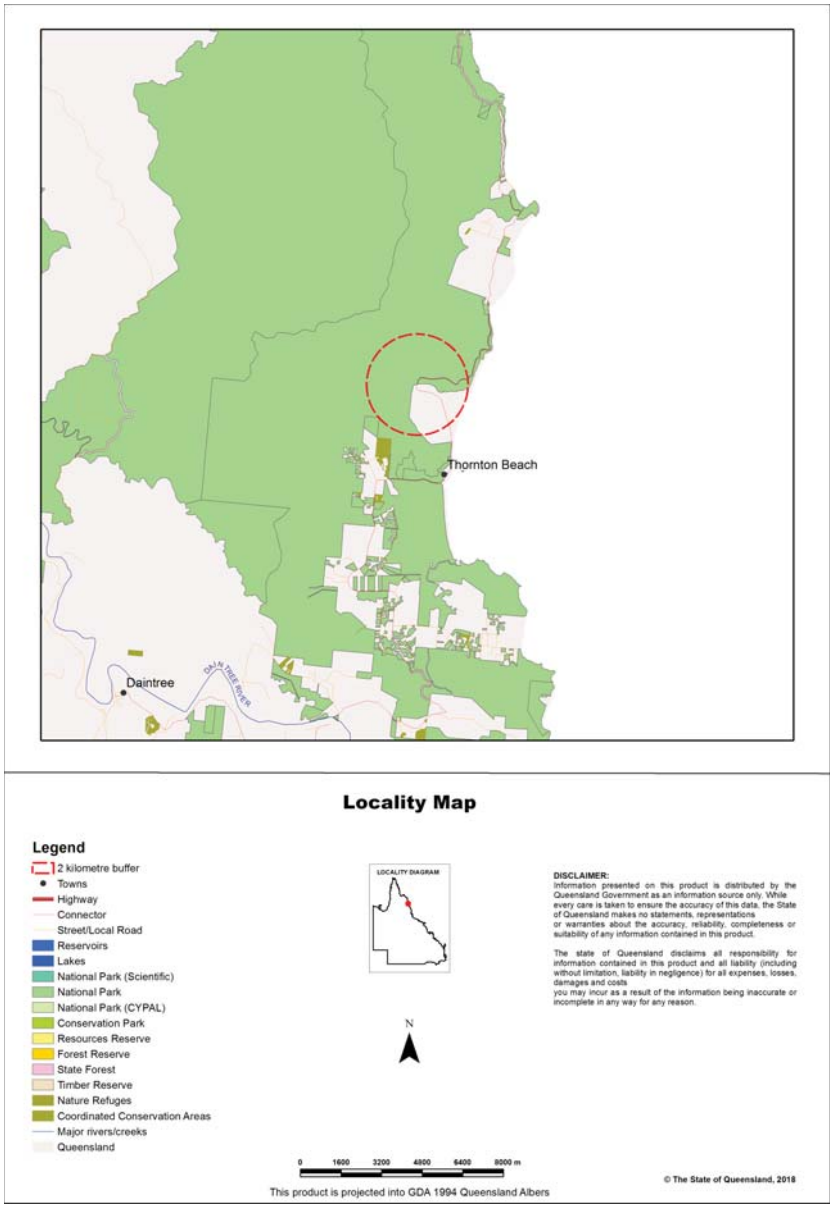
Table of Contents

Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI Longitude: 145.430622 Latitude: -16.140232

Size (ha)	1,256.55
Local Government(s)	Douglas Shire
Bioregion(s)	Wet Tropics
Subregion(s)	Daintree - Bloomfield
Catchment(s)	Daintree



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992* ;

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the *Marine Parks Act 2004* ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- Threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

    • Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;

    • Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;

    • Category R areas on the regulated vegetation management map;

    • Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;

    • Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Referable Wetlands under the Environmental Protection Regulation 2008;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;

- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	931.25 ha	74.1%
1b Protected Areas- nature refuges	0.0 ha	0.0 %
2 State Marine Parks- highly protected zones	15.14 ha	1.2%
3 Fish habitat areas (A and B areas)	0.0 ha	0.0 %
4 Strategic Environmental Areas (SEA)	0.0 ha	0.0 %
5 High Ecological Significance wetlands on the map of Referable Wetlands	15.81 ha	1.3%
6a High Ecological Value (HEV) wetlands	45.83 ha	3.6%
6b High Ecological Value (HEV) waterways **	51.4 km	Not applicable
7 Threatened species and Iconic species	1209.7 ha	96.3%
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	325.62 ha	25.9%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	0.0 ha	0.0 %
8c Regulated Vegetation - Category R (GBR riverine regrowth)	19.83 ha	1.6%
8d Regulated Vegetation - Essential habitat	1209.7 ha	96.3%
8e Regulated Vegetation - intersecting a watercourse **	74.6 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	75.33 ha	6.0%
9a Legally secured offset areas- offset register areas	0.0 ha	0.0 %
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0.0 ha	0.0 %

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

LOTPLAN	Estate name
20NPW695	Daintree National Park
5USL8841	Daintree National Park

1b. Protected Areas - nature refuges

(no results)

2. State Marine Parks - highly protected zones

Marine Park Name	Zone
Great Barrier Reef Coast Marine Park	Conservation Park Zone

3. Fish habitat areas (A and B areas)

(no results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(no results)

5. High Ecological Significance wetlands on the Map of Referable Wetlands

Natural wetlands that are 'High Ecological Significance' (HES) on the Map of Referable Wetlands are present.

6a. High Ecological Value (HEV) waters - wetlands

Natural wetlands that occur in HEV (maintain) freshwater and estuarine areas under the Environmental Protection (water) Policy are present.

6b. High Ecological Value (HEV) waters - waterways

Natural waterways that occur in HEV (maintain) freshwater and estuarine areas under the Environmental Protection (water) Policy are present.

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7. Threatened wildlife and special least concern animal

Threatened species and iconic species	Act	Species least concern animal	Koala Bushland Habitat	Dugong Protection	VMA Essential 2014 Habitat
Threat wildlife & Spec LeastC animals	NCA, VMA	None	None	None	Essential
Threat wildlife & Spec LeastC animals	NCA	None	None	None	None

Threatened and special least concern species records

Scientific name	Common name	NCA status	EPBC status
Gymnostoma australianum	None	V	None

Note: The Threatened and Special Least Concern Animal (7) layer originates from the previous MSES version (4.1, dated at 2014). The layer does not represent all currently listed species and is subject to review.

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3 - MSES - Species** for an overview of the relevant MSES.

MSES - Regulated Vegetation

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
7.2.1e	E-dom	rem_end
7.2.1g	E-dom	rem_end
7.12.2b	O-dom	rem_oc
7.12.40b	O-dom	rem_oc
7.12.39a	O-dom	rem_oc
7.2.1a	E-dom	rem_end
7.2.1i	E-dom	rem_end
7.3.30	E-dom	rem_end
7.11.23b	O-dom	rem_oc
7.3.17	E-dom	rem_end
7.11.24c	O-dom	rem_oc
7.12.37i	O-dom	rem_oc
7.3.28d	O-dom	rem_oc
7.12.37a	O-dom	rem_oc
7.2.7a	O-dom	rem_oc
7.2.3b	O-dom	rem_oc
7.2.3c	O-dom	rem_oc

Regional ecosystem	Vegetation management polygon	Vegetation management status
7.11.24e	O-dom	rem_oc
7.2.8	O-dom	rem_oc
7.2.11a	O-dom	rem_oc
7.1.3a	O-dom	rem_oc
7.2.9a	O-dom	rem_oc
7.3.25a	O-dom	rem_oc
7.3.25b	O-dom	rem_oc
7.2.4d	O-dom	rem_oc
7.2.4f	O-dom	rem_oc
7.3.10a	O-dom	rem_oc
7.11.28	O-dom	rem_oc
7.11.24f	O-dom	rem_oc
7.11.23a	O-dom	rem_oc
7.3.49a	O-dom	rem_oc

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Not applicable

For further information relating to regional ecosystems in general, go to:
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/
For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:
https://environment.ehp.qld.gov.au/regional-ecosystems/

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number	RVM rule
R	7965	None

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Regulated vegetation map category	Map number	RVM rule
R	7965	4
B	7965	2

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

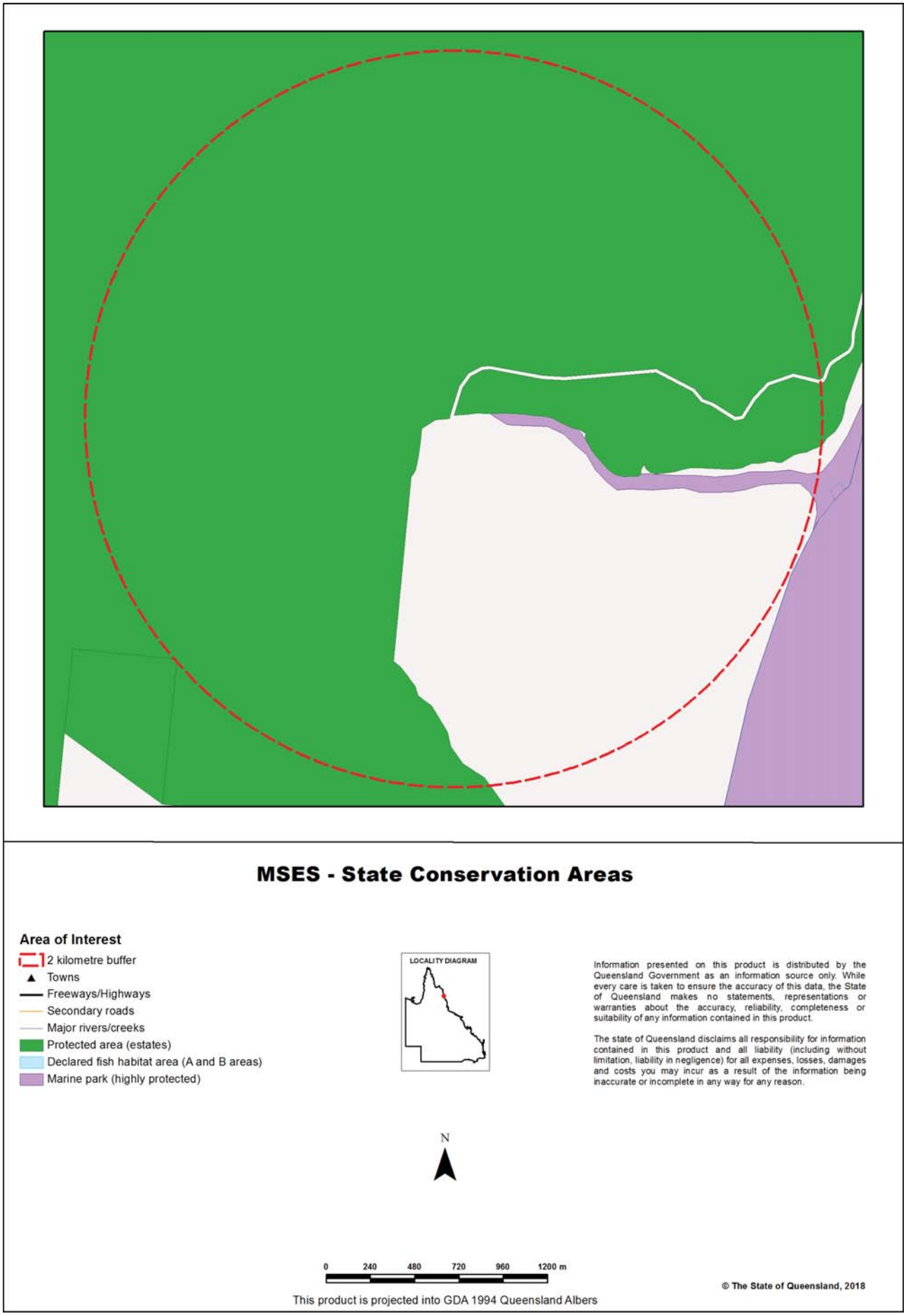
(no results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

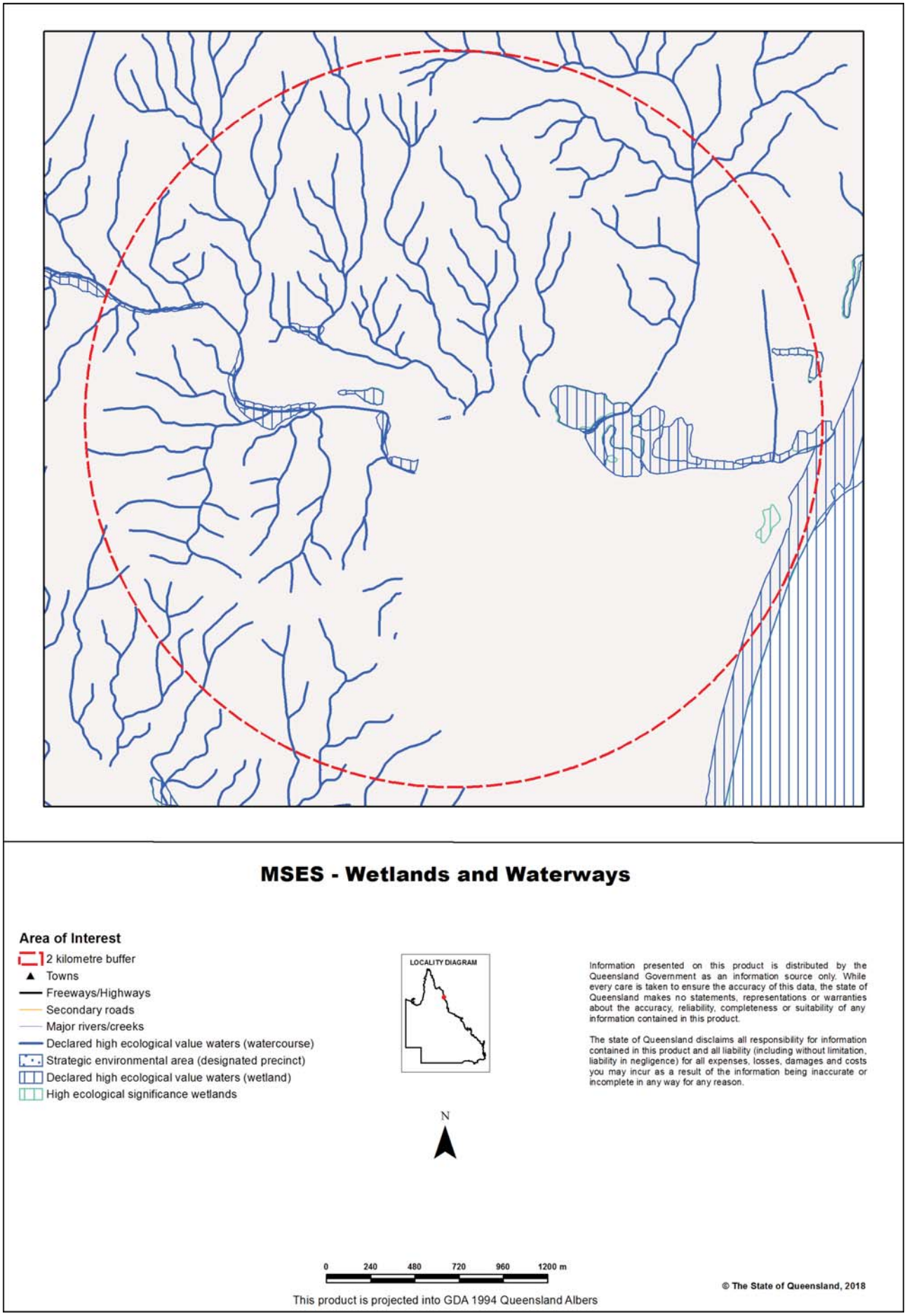
(no results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

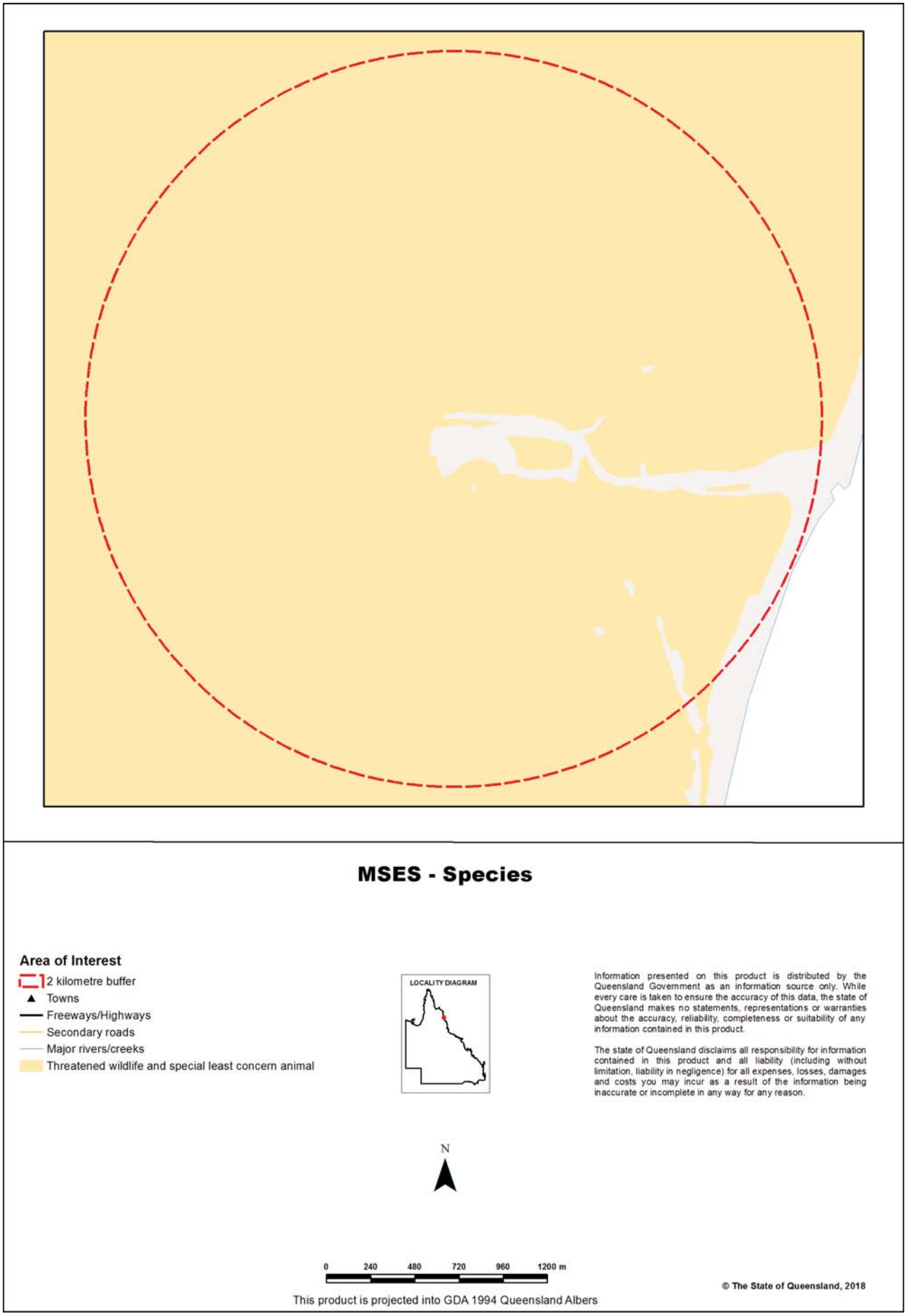
Map 1 - MSES - State Conservation Areas



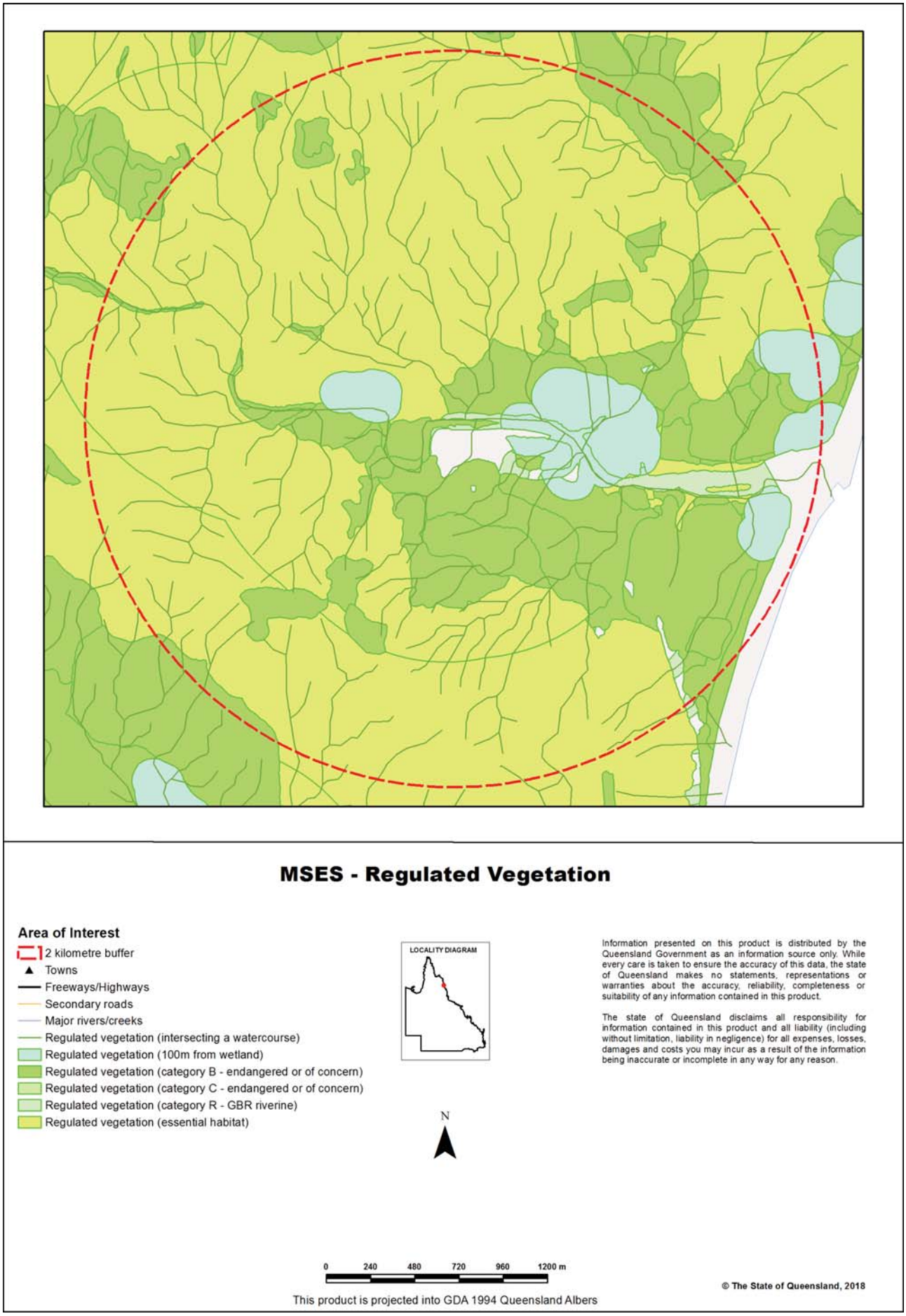
Map 2 - MSES - Wetlands and Waterways



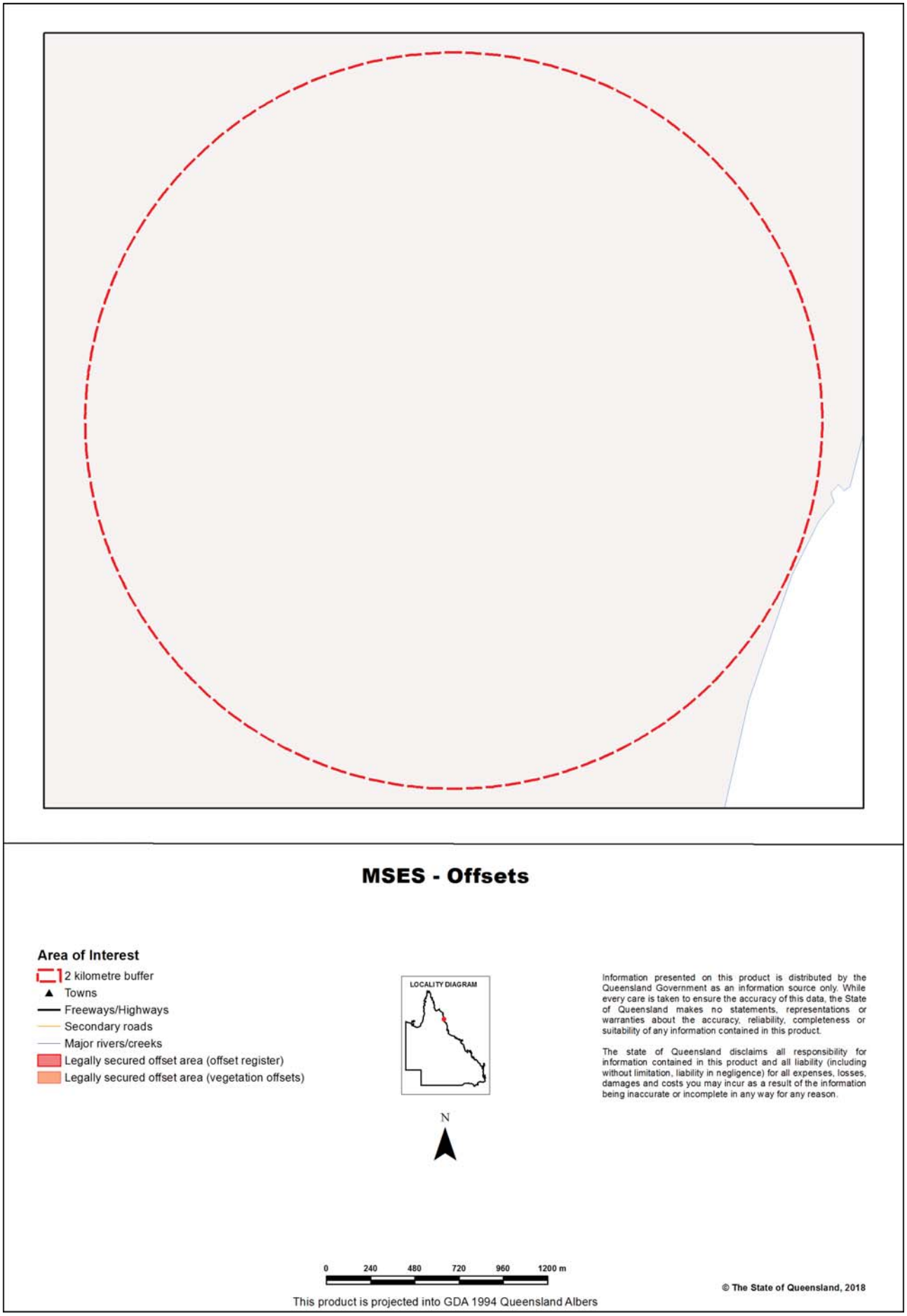
Map 3 - MSES - Species



Map 4 - MSES - Regulated Vegetation



Map 5 - MSES - Offset Areas



Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). The compiled MSES mapping product is a guide to assist planning and development assessment decision-making. Its primary purpose is to support implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations. Similarly, the SPP biodiversity policy does not override or replace specific requirements of other Acts or regulations.

The Queensland Government's "Method for mapping - matters of state environmental significance for use in land use planning and development assessment" can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.ingormation.qld.gov.au)**
Protected Areas-Estates and Nature Refuges	- Protected areas of Queensland - Nature Refuges - Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Referable Wetland - wetland layers: - Wetland management area wetlands - Wetland protection area wetlands
wetlands in HEV waters	HEV waters: - EPP Water (multiple locations) intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 4, 2015) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000) - latest version 1.4
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various)
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map - latest version 8.0
VMA Essential Habitat	Vegetation management - essential habitat map - latest version 4.41
VMA Wetlands	Vegetation management wetlands map - latest version 2.41
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact EHP
Regulated Vegetation Map	Vegetation management - regulated vegetation management map - latest version 1.41

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
EHP	- Department of Environment and Heritage Protection
EP Act	- *Environmental Protection Act 1994*
EPP	- Environmental Protection Policy
GDA94	- Geocentric Datum of Australia 1994
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- *Nature Conservation Act 1992*
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- *Vegetation Management Act 1999*

Appendix B – Preliminary EMP

Preliminary Environmental Management Plan

Douglas Shire Council

Noah Creek Bridge Replacement

Preliminary Environmental Management Plan

August 2018

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1. Introduction

1.1 Background Information

Douglas Shire Council (DSC) proposes to replace the existing single lane bridge at Noah Creek with a new dual carriageway bridge supported with funding through the Commonwealth Government's Building Better Regions Fund. The bridge replacement is required as the existing bridge has been structurally assessed to be nearing the end of its serviceable life and new infrastructure is required to maintain access for Daintree communities, emergency services and local businesses.

1.2 Purpose of this Preliminary CEMP

The purpose of this preliminary CEMP is to provide an environmental management framework and associated management procedures to avoid or minimise the actual and potential environmental impacts associated with the Noah Creek Bridge Replacement Project.

The CEMP has been developed to assist Douglas Shire Council obtain the necessary approvals for the construction works to commence.

An execution phase CEMP shall be developed by the successful tenderer (hereafter referred to as the Contractor) once detailed design and methodology has been finalised. The execution phase CEMP shall as a minimum:

- Meet the requirements of this CEMP
- Meet the conditions of any approvals or advice by authorities applicable to project
- Include detailed construction methodologies to be utilised by the Contractor.

1.3 Reviews and Update

This CEMP may be reviewed and/or updated to incorporate relevant requirements on successfully obtaining third party approvals.

For the duration of project works (i.e. tender through to completion), the Contractors CEMP shall be reviewed and updated as required to ensure that it is current and addresses any changes, including:

- Information or discoveries occurring after the preparation of the original Contractors CEMP
- Site conditions or requirements
- Statutory requirements or community expectations
- Construction and/or operational activities, technology or equipment
- Contractor guidelines, policies or procedures.

Review and update of the Contractors CEMP shall also be triggered where any project activities have potential for environmental impact which is not sufficiently controlled through existing management practices.

1.4 Limitations

This report has been prepared by GHD for Trinity Engineering on behalf of DSC and may only be used and relied on by Trinity Engineering and DSC for the purpose agreed between GHD and Trinity Engineering as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Trinity Engineering arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Trinity Engineering and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The information presented in this report is based on preliminary design plans prepared by Trinity Engineering for the preferred option that identifies construction of a new dual carriageway bridge parallel to and immediately upstream of the existing Noah Creek bridge. This option has been identified by the Wet Tropics Management Agency (WTMA) and various regulatory authorities as having more acceptable construction impacts than other alternatives which involved construction of an all tide vehicle side track. The information in this report is therefore based on the preferred option with the following limitations:

- A final design is not yet available. The level of detail for documentation to support may depend on the final design and construction methodologies proposed by the successful tenderer.
- Should the final design and methodology proposed by the successful tenderer vary in scope, the range of approvals required may vary and require review or be subject to requests for further information to ensure the proposed project is in compliance with Commonwealth and State Government legislation. Subsequently, information in this report will require review and assessment of risks relating to the proposed development/project modifications. .

2. Project Description

2.1 Existing Use

Noah Creek currently has a single lane bridge which is considered a vital transport link connecting residents north of the Daintree River to services, jobs and education whilst supporting tourism for the area. The existing bridge (approximately 24 m long, excluding abutments) is in poor condition and has been subject to a number of remedial efforts over the recent years. In addition, a structural inspection in 2016 identified that the bridge is nearing its end of serviceable life and needs replacing.

2.2 Proposed Works

Douglas Shire Council (DSC) is proposing to replace the existing bridge over Noah Creek on the Cape Tribulation Road. DSC has appointed Trinity Engineering and Consulting (Trinity

Engineering) to design the bridge in consultation with relevant government regulators and Native Title holders in the region. The preferred option is to replace the single lane, 24 m bridge, (excluding abutments) with a new dual carriageway bridge to be constructed parallel and immediately upstream, thereby utilising the existing bridge for traffic during construction. The design will include site access, approach road re-alignment, bridge construction and decommissioning the old bridge on the banks and within Noah Creek. Final design and construction will be undertaken by a contractor sourced through a competitive tendering process.

2.2.1 Construction Activities and Footprint

Construction activities/footprint (based on preliminary concept plans) include:

- Staging area establishment within private property on the southern side of the Noah Creek, within an old disused orchard >50 meters from the banks of Noah Creek.
- Construction of temporary side track to aid construction of the new bridge and enable the existing Noah Creek bridge to remain open to traffic 24/7 during construction works.
- Minor realignment of Cape Tribulation Road and drainage lines immediately upstream but as close as possible to the existing bridge alignment.
- Construction of the new dual carriage bridge over Noah Creek
- Old bridge and temporary side track decommissioning
- Site remediation works to stabilise and rehabilitate disturbance areas as soon as practicable post construction

2.2.2 Site Access

Site access shall be required from the northern and southern banks of Noah Creek. Any temporary access, such as the temporary side track will require review and assessment once final design details are available. Any constructed temporary access is to be removed at the completion of construction works

2.2.3 Laydown and Temporary Works Location

Temporary works associated with laydown areas, vehicle/machinery parking, spoil stockpiling are to be outside of the Noah Creek riparian area and greater than 50 m from the banks of Noah Creek. The current proposal indicates that a potential laydown area may be established within private property on the southern side of the Noah Creek, within an old disused orchard >50 meters from the banks of Noah Creek. The location of any such areas is to be confirmed with Douglas Shire Council prior to starting works as there may be requirements for land owner's consent/permission and or conditions in relation to traffic management for access across Cape Tribulation Road or impacts to private property access.

Figure 1 Proposed Bridge Replacement

2.3 Site Location and Tenure

The entirety of the local area is within the Wet Tropics of Queensland World Heritage Area (WTWHA). The bridge and the southern approaches are within the Cape Tribulation Road reserve and the Noah Creek esplanade. The northern approach is within the Daintree National Park (Lot 20 NPW695) which begins on the northern bank of Noah Creek. The southern bank of Noah Creek (beyond the esplanade) is freehold land lot 62 SP146421. The northern bank is within an Indigenous Land Use Agreement (ILUA QI2006/026).

2.3.1 Wet Tropics Zoning

The current Wet Tropics Management Plan identifies four broad management zones (A, B, C, D) with the Wet Tropics. These zones are based on disturbance levels and ecological integrity, capacity of the area to be rehabilitated to a higher ecological state, existing infrastructure and services, and distance from existing disturbance.

- Zone A are areas of highest ecological integrity and furthest from anthropogenic disturbance;
- Zone B are areas with a high degree of ecological integrity and are in a natural state but are not necessarily remote from disturbance. There is a reasonable expectation that areas in Zone B could be restored to a high/very high degree of integrity which would qualify for inclusion in Zone A.
- Zone C areas include areas of disturbance, primarily associated with existing infrastructure such as roads, power lines, pipe lines etc., but also includes cleared areas with existing use firths such as farming/residential. Zone C areas are primarily in a natural state with infrastructure managed to minimise adverse impacts on these areas.
- Zone D includes lands where there are, or proposed to be, visitor facilities of a well-developed type. This is primarily for more intensive visitor use and presentation. Zone D includes land in a mostly natural state and managed to minimise the adverse impacts of activities and facilities and to protect and rehabilitate this zone.

Figure 2 Wet Tropics Plan Zoning Map WTP1 SH5 Thornton Peak (www.wettropics.gov.au/zoning-mapsheets)

The *Wet Tropics Management Plan 1998* (WTMP) zoning (Figure 2) identifies that the proposed bridge site is within Zone C under the current WTMP mapping. Zone C allows disturbances associated with infrastructure.

3. Environmental Management Plan (EMP) Implementation

This EMP has been developed in accordance with information provided by Trinity Engineering and Douglas Shire Council. The environmental issues for the project have been identified and assessed based on the provided concept design plans, ecological assessment and information provided by relevant regulatory authorities. This EMP must not be implemented or amended in any way that contravenes any conditions of any approval, permit or licence. The effective implementation of this EMP is the responsibility of the construction contractor and Douglas Shire Council. This EMP is to be reviewed at key project milestones to ensure risks and mitigation measures continue to be monitored and revised as necessary to prevent adverse environmental impacts.

3.1 Training, Awareness and Competence

All personnel involved in the construction phase will be required to be formally briefed before commencing any work at the site. The environmental component of the brief shall include (but not be limited to) the following items:

- All staff to be made aware of their GED and Duty to Notify responsibilities as per the *Environmental Protection (EP) Act 1994* and the implications of failing to fulfil these duties
- All staff to be made aware of their environmental responsibilities under this EMP in relation to implementing mitigation measures, reporting environmental incidents and complaints and implementing corrective actions
- All staff to be given instructions on environmental emergency response procedures (i.e. spill kit locations and usage).
- All tasks are to be reviewed with consideration given to changes during the construction phase, such as the weather, which may cause the proposed activities to impact on the environment.

3.2 Records

All records shall be retained as a hard copy and electronically by the contractor and include the following:

- Briefing notes, inductions, and any specific environmental training records
- All records pertaining to any conditions on the approval from WTMA, including this EMP
- Monitoring records and external environmental reports
- Environmental incidents, complaints and non-conformances, and corrective action reports.

Records shall be made available to the WTMA and/or DSC as requested. All records shall be kept for a minimum of five years or as required by relevant third party approval conditions.

3.3 Incident Reporting

The EP Act states that everyone has a general environmental duty, responsible for the actions we take that affect the environment. Under the EP Act there is also a legal requirement that incidents that may have caused or threaten serious or material environmental harm is reported to the administering authority and landholder or occupier (Duty to Notify). All environmental incidents from site activities must be reported to DSC. Examples of environmental incidents include, but are not limited to the following:

- Fuel, oil and/or hydraulic oil leakages/spills.
- Fire and/or explosions
- Unearthing of historical or indigenous cultural heritage
- Significant erosion and sediment control failure.
- Vegetation clearing/fauna interactions (cassowaries, crocodiles)

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

4. Legislation

4.1 Regulatory Requirements

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

The Wet Tropics World Heritage Protection and Management (WTWHPM) Act 1993 provides the principal mechanism to achieve WTWHA protection goals. It focuses primarily on preventing activities, which could damage World Heritage values. A wide range of other Australian and Queensland legislation also applies to the area's management. However, legislation alone cannot achieve positive management to protect and enhance the values of the Area. The WTMA works to ensure that the area is managed in partnership with a broad range of community interests and responsibilities.

The Australian and Queensland Governments agreed to manage the Wet Tropics World Heritage Area under Queensland legislation, which establishes the Wet Tropics Management Authority and authorises the development of a management plan for the Area. The World Heritage Area is also subject to numerous other Australian and Queensland laws. In particular, the *Australian Environmental Protection and Biodiversity Conservation Act 1999* and *the Wet Tropics Management Plan 1998* regulates significant impacts on World Heritage properties and other Australian interests such as endangered species and nationally important areas. The *Queensland Nature Conservation Act 1992* regulates National Parks, other conservation tenures and wildlife.

4.1.1 Policies Strategies and Permits

In addition to the *Wet Tropics Management Plan 1998* (the Plan), the WTMA has developed numerous policies and strategies to help conserve and protect the Area and meet the aims of the Primary Goal. These provide a wealth of information about conservation and management of the Area, including the Wet Tropics' commitment to ensure that visitors can use and enjoy the Area and learn about its many special qualities.

4.1.2 Codes of Practice

Codes of practice are formalised agreements between the WTMA and other government agencies for managing infrastructure or other aspects of the WTWHA, which normally become conditions to a permit.

4.1.3 Best Practice Guidelines

Road Maintenance code of practice for the Wet Tropics World Heritage Area 2017 outlines best workplace practices for road maintenance activities (including bridge works) that minimises negative environmental impacts on the WTWHA. Key elements in this guideline are:

- Avoid disturbance
- Rehabilitate disturbed areas
- Maintain animal corridors and habitat
- Prevent contamination
- Prevent weed spread

- Minimise visual impact
- Identify potential problems

The Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA), the Queensland Government, James Cook University (JCU) and Reef and Rainforest Research Centre have produced two publications based on scientific evidence to provide best practice guidelines that may also be referred to when fulfilling the obligations of this EMP. The two publications include:

- *Roads in Rainforest: Best Practice Guidelines for planning, design and management* (April 2010).

  This publication provides a framework for understanding the primary ecological issues to be addressed in the planning, design and management of roads in rainforest environments and should be used as an additional resource to improve the best practice approach for minimizing and mitigating impacts of roads in tropical forests in Queensland.

- *Roads in Rainforest: Science Behind the Guidelines (April 2010).*

  This publication summarises scientific findings which support the above mentioned best practice guideline.

4.2 Wet Tropics Management Plan

Noah Creek is located within the WTWHA. *The Wet Tropics Management Plan 1998* WTM Plan is a legislation subordinate to the *Wet Tropics World Heritage Protection and Management Act 1993* (WTWHPM Act) and regulates activities that have the potential to affect the environmental values of the WTWHA.

The Plan divides the WTWHA into four management zones where activities which may have a detrimental impact on the area's natural heritage values are prohibited, allowed or allowed under permit. These zones are named A, B, C and D and ranked from the highest to the lowest levels of protection. The Plan specifies that, in making permit decisions, the most important consideration is the impact of the proposed activity on the integrity of the natural heritage of the area. The Plan also requires that decision-makers take into account social, economic and cultural effects and the needs of the community for the proposed activity.

The location of the proposed bridge works is within Zone C which allows disturbances associated with infrastructure. However, it should be noted the proposed bridge location is in close proximity to Zone B. The intention of Zone B is for land "undergoing recovery or rehabilitation towards its natural state or becoming remote from disturbance by activities associated with modern technological society". Zone B has a high degree of ecological integrity and it is in a natural state but is not necessarily remote from disturbance. There is a reasonable expectation that it could be restored to a condition which would qualify for inclusion in Zone A (WTMA, 2017).

Under Division 2, Section 26 Other Prohibited activities of the WTM Plan, "A person must not, without a reasonable excuse, carry out any of the following activities in the wet tropics area, except so far as the activity is lawfully carried out…" namely under a permit. Activities include " excavating, grading, quarrying or otherwise interfering with earth", " interfering with a watercourse by extracting or diverting water, damming the watercourse or carrying out another activity interfering with its natural flow", "building or maintaining a structure" and "building or maintaining a road", " disposing of waste, other than in an appropriate receptacle".

A permit may be issued to a person to carry out these activities, which are outlined as follows in the WTM Plan. Under Division 4 Activities allowed under permit, Section 33 Activities permitted

in all zones include “maintaining a structure”, “maintaining a road” and “clearing vegetation around a structure or road existing immediately before the commencement day, or was lawfully built under this plan, to the extent necessary for its appropriate use”.

4.3 Environmental Protection and Biodiversity Conservation Act

The *Environmental Protection and Biodiversity Conservation (EPBC) Act 1999* is the Commonwealth’s central piece of environmental legislation. It has established a Commonwealth process for assessment of proposed actions that are likely to have significant impacts on Matters of National Environmental Significance (MNES) or on Commonwealth Land. The EPBC Act enables the Commonwealth to join with the States and Territories in providing a national scheme of environment and heritage protection and biodiversity conservation.

The EPBC Act comes into effect when a proposal is assessed as having the potential to have a significant impact on a MNES. MNES are identified in the EPBC Act as triggers for referral to the Commonwealth for further assessment and include when or if the following nine MNES to which the EPBC Act applies are affected:

- world heritage properties
- national heritage places
- wetlands of international importance (listed under the Ramsar Convention)
- listed threatened species and ecological communities
- migratory species protected under international agreements
- Commonwealth marine areas
- Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development.

The Commonwealth has released the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (2013), to allow a proponent a self-determination as to whether a project will have significant impacts on MNES. If it is determined that one or more of these MNES may be impacted and that these impacts have a “…*likelihood to have a significant impact on a matter of national environmental significance*”, a referral would need to be made to the Department of Environment and Energy, so it can determine whether the proposal triggers further Commonwealth impact assessment.

Databases searches were undertaken using the Commonwealth EPBC Protected Matters Search Tool. A summary of MNES within a 5 km buffer zone of Noah Creek is shown in Table 1. Subsequently the Noah Creek bridge replacement has the potential to have a significant impact on a MNES and a referral to the Commonwealth under the provisions of the EPBC Act is required.

Table 1 Noah Creek Bridge MNES Summary

EPBC Act controlling provision	Noah Creek (5km buffer)
World Heritage properties	2 - Great Barrier Reef, Wet Tropics of Queensland
National Heritage places	3 - Great Barrier Reef, Wet Tropics of Queensland, Wet Tropics World Heritage Area (Indigenous Values)

EPBC Act controlling provision	Noah Creek (5km buffer)
Wetlands of international importance	None
Great Barrier Reef Marine Park	2 – Conservation Park Zone, General Use Zone
Commonwealth Marine Area	None
Listed threatened ecological communities	2
Listed threatened species	64
Listed migratory species	45
Commonwealth land	None
Commonwealth Heritage Places	None
Listed Marine Species	98
Whales and other Cetaceans	12
Critical habitats	None
Commonwealth Reserves Terrestrial	None
Commonwealth Reserves Marine	None
State and Territory Reserves	6
Regional Forest Agreements	None
Invasive Species	20
Nationally Important wetlands	2
Key Ecological Features (marine)	None

Ecological surveys were conducted in support of this desktop survey to determine if any MNES were within the works footprint of the proposed bridge and/or vulnerable to any potential cumulative/indirect impacts (e.g. downstream sedimentation). These are identified in detail in the *Ecological Assessment of Noah Creek* (GHD, 2018).

4.4 Aboriginal Cultural Heritage Act

In Queensland, both Commonwealth and State legislation protect indigenous cultural heritage. Three pieces of legislations serve to protect Australia's heritage. These are the EPBC Act, the *Aboriginal Cultural Heritage Act 2003* (ACH Act) and the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act). The primary piece of Queensland legislation protecting aboriginal cultural heritage sites is the *Aboriginal Cultural Heritage Act 2003* (Queensland). WTWHPM Act and the WTM Plan also applies for this project with respect to the Rainforest Aboriginal people.

Measures are required to be put in place to comply with the duty of care under the ACH Act and the WTM Plan. If at any time during the works, Trinity Engineering, or their contractors, excavate, relocate, remove or harm a cultural heritage find, Trinity Engineering will notify the Eastern Kuku Yalanji (Native Title holders), or a Department of Aboriginal and Torres Strait Islander Partnerships (DATSIP) representative immediately and seek their advice on how best to proceed. Refer also to Section 5.4 Environmental Element for Cultural Heritage within this EMP document.

4.5 Environmental Protection Act

The primary requirements for environmental protection in Queensland are covered in the Environmental Protection Act 1994 (EP Act). One of the key principles is the general environmental duty.

The General Environmental Duty is defined in Section 319 of the EP Act as:

"1) a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm (the general environmental duty)

2) in deciding the measures required to be taken under subsection (1), regard must be had to, for example:

   a. the nature of the harm or potential harm, and

   b. the sensitivity of the receiving environment; and

   c. (c) the current state of technical knowledge for the activity; and

   d. (d) the likelihood of successful application of the different measures that might be taken; and

   e. (e) the financial implications of the different measures as they would relate to the type of activity"

The EP Act also requires that a person with knowledge of environmental harm have a duty to report the harm to their employer or DEHP. The practical interpretation of the legislative requirement to meet the general environmental duty is usually for proponents to develop and implement EMPs (this document), undertake an Environmental Impact Statement (EIS) or an Environmental Risk Management Plan (ERMP). These plans and strategies provide practical, site-specific techniques and management strategies that identify the measures to be implemented. Appropriately developed and implemented EMPs provide evidence that the general environmental duty has been or is being expressed.

The proposed Noah Creek bridge replacement works are not environmentally relevant activities under EP Act and hence approvals are not required to conduct these works from EHP perspective. However, all works are to be conducted by Trinity Engineering in an environmentally responsible manner.

4.6 Nature Conservation Act

The Nature Conservation Act 1992 (NC Act) and associated Nature Conservation (Wildlife Management) Regulation 2006 (NC Wildlife Reg) provide a framework for the conservation of nature in Queensland. One of the primary mechanisms by which this objective is to be achieved is through the declaration and specification of management principles and intents for wildlife species of particular conservation significance.

Under the NC Act, all native wildlife are protected. The NC Wildlife Reg lists the conservation status of protected wildlife and the principals governing its taking and use.

The NC Wildlife Reg regulates the clearing, growing, harvesting and trade of protected plants in Queensland. Protected plants includes those identified as endangered, vulnerable or near threatened (EVNT). Recent legislation amendments have altered the process of surveys and permits for clearing protected plants where, if clearing is proposed in a high risk area, a flora survey is required and a clearing permit or exemption notification is required. A flora survey has been conducted for the site and a clearing permit is required.

Under the NC Act all native wildlife are protected. The NC Wildlife Reg lists the conservation status of protected wildlife, and the principles governing its taking and use. Under Section 332 of the NC Wildlife Reg, any activity that will tamper with (i.e. remove, damage, impair or degrade) the confirmed breeding place of a native animal (i.e. EVNT and Least Concern wildlife) requires a Species Management Program (SMP) or Damage Mitigation Permit (DMP) in order for clearing of animal breeding places to occur. Ecological surveys undertaken for this project have identified a number of threatened or endangered flora and fauna occur within the project footprint.

4.7 Water Act

The Department of Natural Resources and Mines (DNRM) is responsible for the administration of the Water Act 2000 (Water Act). The Water Act regulates the control and management of the State's water resources and associated issues, including water conservation and protection, irrigation, water supply, drainage, flood control and prevention, flow improvement, changes to watercourses, protecting and improving the physical integrity and the safety and surveillance of referable dams.

The Water Act regulates destruction of vegetation (Part 4 Division 3 Section 225), excavation or placing of fill in a watercourse, (Part 4 Division 1 Section 218) and taking or interfering with water flow with respect to riverine protection (Part 3 Division 1 Subdivision 1 Section 98 and 99). The Water Act also regulates ownership of quarry materials (Part 5 Division 1 Section 226). A number of exemptions may apply where entities (e.g. including local governments) are undertaking works within a watercourse.

Noah Creek is mapped watercourses traversed by the project. Clearing riverbank for bridge structure and riverbank stabilisation for erosion control and bank stabilisation are required for the project.

4.8 Fisheries Act

The *Fisheries Act 1994* (Fisheries Act), administered by Department of Agriculture and Fisheries (DAF) protects fish habitat, which includes marine plants and intertidal habitat. The Fisheries Act requires approvals for certain works in declared fish habitats, for the construction and raising of waterway barriers and for the damage, removal, pruning or trimming of marine plants. A flora survey has identified mangrove ferns to be within the project footprint. Any works involving the removal, destruction or damage of marine plants must be undertaken in accordance with DAF's relevant accepted development requirements or under a development approval (assessable development).

The bridge structure including pylons, abutments and scour protection require a waterway barrier works permit under the DAF. The construction phase comes under temporary waterway barrier works and complies with the self-assessable codes for work entities within a watercourse. The Department of State Development Manufacturing, Infrastructure and Planning (SDMIP) Development Application mapping system has identified Noah Creek Bridge to be in a major impact zone (purple) for waterway barrier works. Temporary waterway barrier works within a major impact zone are to meet the following requirements for it to be considered as an acceptable development:

- Works must commence and finish within a maximum time of 180 calendar days,
- Instream sediment control measures associated with the works must be removed within these periods,
- Waterway barrier work construction and design,

- The dimensions of the temporary barrier are limited to the minimum practicable for the site and purpose,
- Removal of temporary waterway barrier ,
- If there is more than one temporary waterway barrier in the location, the most downstream waterway barrier must be removed first, and
- All waterway barrier material must be removed from within the waterway and disposed of at least 50 m away from the waterway.

4.9 Vegetation Management Act and Land

The DNRM is the lead agency for the management of native vegetation in Queensland. DNRM administers the regulations and policies applying to freehold and leasehold land ensuing from both the *Land Act 1994* (Land Act) and *Vegetation Management Act 1999* (VM Act). Owners consent for work on land below high-water is required to lodge a development application to the DNRM. It is the Land Act that governs vegetation management on leasehold and other State land.

The VM Act regulates vegetation clearing and applies to all tenures. The VM Act seeks to regulate the clearing of native vegetation to preserve remnant 'endangered' and 'of concern' regional ecosystems, vegetation in areas of high nature conservation values and areas vulnerable to land degradation.

The appointed contractor is exempt from these Acts, as authorisation for removal of vegetation will been obtained through other legislation i.e. WTM Plan under permit.

4.10 Coastal Management and Protection Act

The *Coastal Management and Protection Act 1995* provides for the protection, conservation, rehabilitation and management of the coastal zone, including its resources and biological diversity. The Act requires certain approvals to be sought for activities that are coastal in nature. Works on land subject to CMD are assessable development.

The proposed works are mapped as being within the CMD, in tidal water, involving operational work that are prescribed tidal works and operational work for removing quarry material or extraction of quarry material on State Land.

Under the *Planning Regulation 2017, Schedule 10, Part 17, Section 28 (1) operational work is assessable development, if the work is a) tidal works; or b) any of the following carried out completely or partly in a coastal management district – (i)interfering with quarry material, as defined under the Coastal Act , on State coastal land above high-water mark; (ii)disposing of dredge spoil, or other solid waste material, in tidal water; (iii)constructing an artificial waterway.*

5. Environmental Impact Assessment Register

5.1 Purpose of the Environmental Impact Register

An environmental risk assessment is presented in the form of an environmental impacts assessment register and in summary covers the following:

a) An assessment of the likely risk of failure of the proposed mitigation measures causing an environmental incident.

- Identifying worse case scenarios e.g. erosion of banks following works, destruction to protected flora and fauna, introduction of new weed species or pest animals.
- Emergency situations, e.g. fire
- Contractor awareness of cassowaries, snakes and crocodiles whilst completing all construction works.

b) Identifies the mitigation and management measures to avoid or reduce the environmental risk.

c) Nominates procedures for contingency plans based on the finding of the risk assessment.

5.2 Risk Assessment Methodology

The environmental impact register is a tool to identify the impacts that have the potential to occur as a result of the Noah Creek bridge works and to identify those management and mitigation measures that a Trinity Engineering contractor will implement to reduce the overall risk to the environment.

5.2.1 Residual impacts

Residual impacts on the environment are evaluated at the following scale, depending on area affected:

- Very Limited (score of 1): immediate surrounds of impact site and extending to a radius of less than 200 m.
- Limited (score of 2): immediate surrounds of impact site and extending to a radius of between 200 m to 2 km.
- Local (score of 3): generally occurring within a radius of between 2 km to 10 km of the impact site.
- Regional (score of 4): generally occurring over a large portion of the project area that extends to a radius of more than 10 km from the impact location, and
- Widespread (score of 5): generally occurring over a large area that extends to the national scale

The significance of each impact is categorised as follows:

- Very Severe (V) Effect. Likely to have very large negative impact on population or ecosystem survival or health, possible even leading to extinctions or system collapse.
- Severe (S) Effect. Likely to have severe negative impact on population, community or ecosystem survival or health.
- Moderate (M) Effect will be detectable but not severe. Populations or communities may be reduced but unlikely to lead to major changes to population, community or ecosystem survival or health.
- Low (L) Effect may be detectable but is small and very unlikely to be of significance. Negligible (I) Impact unlikely to be detectable

5.2.2 Risk Rating

This generates a scoring matrix of effects as follows:

			EXTENT		

SEVERITY	Very Limited (1)	Limited (2)	Local (3)	Regional (4)	Widespread (5)
Very Severe (V)	V1	V2	V3	V4	V5
Severe (S)	S1	S2	S3	S4	S5
Moderate (M)	M1	M2	M3	M4	M5
Low (L)	L1	L2	L3	L4	L5
Negligible (N)	I	I	I	I	I

5.2.3 Duration of Impact

Impacts on the receiving environment have been evaluated at the following three temporal scales: -

Short term: impacts lasting less than 7 years.

Medium term: impacts lasting between 7 years and 25 years

Long term: impacts lasting more than 25 years.

Table 2 Environmental Impact Assessment Register

Project Activity	Nature of Impact	Raw Risk Rating		Residual Risk Rating		Possible Mitigation
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Land Clearing and Earthworks	Soil erosion due to exposure of soil through clearance of vegetation etc. allowing various types of erosion to occur. Site is on the banks and within Noah Creek. Erosion and sedimentation are highly likely. Noah Creek is considered a Short Steep Coastal Stream which typically occur in steep, high rainfall areas close to the coast	M2	M3	L1	L2	Construction phase to take place outside monsoon season for the region (Dec-Mar). Use of appropriate erosion and sediment control measures, such as berms, whoa boys and surface runoff diversionary drains (e.g. sediment fence, geo logs), are to be implemented to reduce water flow velocities for exposed areas during road realignment and bridge construction. Site location is in the upper tidal zone of Noah creek. Silt curtains are to be installed in the creek directly upstream and downstream of bridge site to help contain silt generated from the banks and in-water works during construction. A comprehensive Erosion and Sediment Control Plan (ESCP) specific to the site project will be developed.
Fuels, oils, other hydrocarbon based substances	Spills by potential contaminants from machinery or storage. Potential contaminants used to operate machinery or stored on site include fuels, oils, etc. These materials may be spilled by accidents, which could impact soil and water quality (both groundwater and surface water).	M1	S2	L1	M1	Fuel, oils and other contaminants to be stored within bunded storage areas with spill capacity equal to 110% volume of the largest container stored. Bunded area and laydown yard to be at least 50m from the creek in a non-flood prone area. Vehicle and machinery refuelling only to occur within designated areas bunded for that purpose.
Bridge construction access road	Access to creek is via old Cape Tribulation road ford.	M1	M2	L1	L2	Access road to follow the existing old Cape Tribulation road ford on the southern bank of the creek to keep vegetation clearing to a minimum.

Project Activity	Nature of Impact	Raw Risk Rating		Residual Risk Rating		Possible Mitigation
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Transport, handling and storage of fuel, oils and other hazardous materials	Spillage of materials during transport of materials to Noah Creek may have adverse impacts. Storage and handling of fuel on site could result in hydrocarbons and chemical spills could enter watercourses affecting aquatic invertebrates, fish, turtles & crocodiles. Extent of impact will depend on volume & nature of material & duration of spill. Major impacts would result from tanker accidents, loss of fuel from storage, refuelling and vehicle wash-down near streams.	L1	S3	L1	M2	Adhere to AS1940-2004 - the storage and handling of flammable and combustible liquids. Develop & implement emergency spill response plan. No refuelling or maintenance to occur within 50 metres of Noah creek. These operations are restricted to designated bunded areas.
Removal of streamside Vegetation	Removal of vegetation could have a negative impact on species of fauna that prefer or depend on this habitat. Lack of vegetation will increase erosion and sediment entering streams.	L1	M2	L1	M1	Limit clearing of streamside vegetation to road realignment and bridge construction only. Scour protection around bridge abutments to be installed to reduce erosion and sediment entering creek. Riparian vegetation to be cleared during construction will be cut at the base leaving the root systems intact underground to provide bank stability.

Project Activity	Nature of Impact	Raw Risk Rating		Residual Risk Rating		Possible Mitigation
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Use of diesel-powered Plant & Machinery	Contamination from spills or leakages of hydrocarbons (fuels etc.) and hazardous chemicals.	M1	S2	L1	M1	Adhere to AS1940-2004 - the storage and handling of flammable and combustible liquids. Fuel, oils and other contaminants to be stored within bunded storage areas with spill capacity equal to the volume of contaminants stored. Bunded storage area to have emergency overflow to alternative recovery area. Vehicle and machinery refuelling only to occur within designated areas bunded for that purpose. No vehicle and machinery refuelling within 50 m of the high point of the bank of Noah Creek.
Disposal of Construction Wastes	Contamination from liquid and solid wastes owing to leaching of waste disposal sites and presence of hazardous waste such as batteries, fuel/oil containers.	M1	M1	L1	L1	A waste management plan will be developed. All solid wastes will be disposed of in approved DSC landfill sites and will be dealt with according to type, i.e. inert, hazardous or organic.
Destruction of Protected Plant or Animal Species	Protected, vulnerable, endangered or near endangered species habitat loss.	M1	M3	L1	L2	Contractor to comply with WTMA permitting requirements and this EMP and associated policies, codes of practice, best practice guidelines outlined in Section 3 Legislation of this document.
Introduction of new Weeds and Pest Animals	Introduction or spread of new weed or pest animal species.	L2	L2	L1	L1	Contractor to comply with WTMA permitting requirements and this EMP and associated policies, codes of practice and best practice guidelines outlined in Section 3 Legislation of this document.

Project Activity	Nature of Impact	Raw Risk Rating		Residual Risk Rating		Possible Mitigation
		Terrestrial	Aquatic	Terrestrial	Aquatic	
Storage of chemicals, fuels or oils and container disposal	Leakages from storage area and equipment use.	L2	M3	L1	M1	Adhere to AS1940-2004 - the storage and handling of flammable and combustible liquids. All fluids to be stored in bunded and secured storage areas in accordance with the recommendation of the safety data sheet for the substance. Hazardous substance storage containers are not to be burnt, but are disposed of in a DSC landfill site, which limits potential for leachate escaping the landfill.
Wildlife Awareness	Awareness of cassowaries, crocodiles and snakes to avoid injury from snake bite or cassowary/ crocodile attack. Saltwater Crocodile sightings are quite common in Noah Creek. The presence of crocodiles within close proximity of Noah Creek bridge during the 6 month construction phase is considered likely. A Southern Cassowary is also known to take up residence in the project area.	M1	S1	L1	L1	A spotter catcher is to be present with all works for the presence of crocodiles, cassowaries or snakes. A snake bite and first aid kit is to be available on-site at all times. Emergency Evacuation Procedures are to be understood by all staff working on site and a phone / 2- way radio is available at all times to contact Emergency Services.

6. Environmental Elements

6.1 Identification of Environmental Elements

The Queensland Government Guideline – Preparing Environmental Management Plans identifies likely environmental elements that should be addressed in an EMP. Relevant environmental elements as identified in the QLD Guideline are summarised in Table 3.

Table 3: Environmental Element Assessment

Issue	Applicable	Why not applicable	Reference Section
Air quality	✓		Air Quality
Cultural heritage	✓		Cultural Heritage
Complaint recording and reporting	✓		All CEMP elements
Dust	✓		Air Quality
Emergency response	✓		Emergency Response
Erosion and sedimentation	✓		Erosion and Sediment Control
Flora and fauna	✓		Flora
Fauna	✓		Fauna
Fire management	✓		Emergency Response
Land contamination	✓		Contaminated Land, Fuel and Hazardous Substances
Management of Natural and World Heritage values	✓		Natural and World Heritage Values
Noise	✓		Noise and Vibration
Rehabilitation	✓		Flora and Fauna
Social disruption	×	The scale and nature of the project is not expected to create social disruptions that cannot be managed through traffic management. The existing bridge will be used for traffic during construction phase of the new bridge.	
Traffic	✓		Noise and Vibration Air Quality Flora and Fauna
Vibration	✓		Noise and Vibration
Visual amenity	✓		All CEMP elements
Waste and site clean-up	✓		Waste
Water quality	✓		Erosion and Sediment Control
Weed and pest management	✓		Weed and Pest Management

6.2 CEMP Elements

This CEMP consists of the following elements to address the activities outlined in Table 2 with potential to impact on environmental values of the construction or surrounding areas:

- Natural and World Heritage Values
- Cultural Heritage
- Erosion and Sediment Control
- Contaminated Land, Fuel and Hazardous Substances
- Waste
- Flora and Fauna
- Weed and Pest Management
- Air Quality
- Noise and Vibration
- Emergency Response

6.3 Natural and World Heritage Values

6.3.1 Aspect

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

The Wet Tropics World Heritage Protection and Management Act 1993 provides for the protection and management of the WTWHA. The Wet Tropics Management Plan 1998 creates a zoning system where various types of activities are allowed or prohibited. The WTMA is charged with managing the WTWHA according to Australia's obligations under the World Heritage Convention.

The Noah Creek bridge is located within the WTWHA along the Cape Tribulation Road and is located within Zone C of the WTM Plan. Zone C allows disturbances associated with infrastructure.

This environmental element also links to Flora and Fauna and Weed and Pest Management.

6.3.2 Management Plan

Environmental Objective
To minimise impacts to WTWHA.
Performance Criteria
• All works managed in accordance with the *Wet Tropics World Heritage Protection and Management Act 1993* and the *Wet Tropics Management Plan 1998 Plan.* • All works to comply with conditions of the WTMA permit. • No complaints are received from regulatory authorities or the community in relation to the handling of WTWHA heritage items/places/values. • No unauthorised disturbance to and/or removal or destruction to WTWHA heritage items/places/values within the WTWHA.

Mitigation Measures	Responsibility	Timing
All personnel must exercise a duty of care, that is, they must take all reasonable and practical measures to ensure their activity does not harm WTWHA heritage items/ places/ values.	All personnel	At all times
If at any time during the activity it is necessary to excavate, relocate, remove or harm a WTWHA heritage find, the activity should cease immediately and the Site Supervisor and Project Manager notified.	All personnel	Immediately on discovery
Upon discovery of a WTWHA heritage find the WTMA and DSC shall be contacted and their advice and agreement sought as to how best to manage the find, to avoid or minimise harm to WTWHA heritage find.	Project Manager	Immediately after notification
Any WTWHA heritage finds are to be managed in accordance with any agreement reached with the WTMA delegate or member and their advice sought as to how best to manage the find to avoid or minimise harm to the WTWHA heritage find. Any agreement reached with WTMA and DSC shall be recorded and documented.	Project Manager	As required
Monitoring	**Responsibility**	**Timing**
Any discovery of WTWHA heritage, will be recorded on an Environment Incident Report Form.	Site Supervisor	Upon identification
Monitor excavations for potential signs of WTWHA heritage.	Site Supervisor	During excavation
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Following identification
Inform the WTMA and DSC as soon as is practically possible in the event of any WTWHA heritage find or management issue.	Project Manager	Following incident
Inform the WTMA and DSC as soon as practically possible in the event of any WTWHA heritage find or management issue.	Project Manager	Following incident
Corrective Action	**Responsibility**	**Timing**
All complaints relating to WTWHA heritage management issues will be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Where investigations identify issues with WTWHA heritage management actions, revision to management plans will be undertaken and further controls implemented, as necessary.	Project Manager	Following investigation
Corrective action will be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

6.4 Cultural Heritage

6.4.1 Aspect

In accordance with the Aboriginal and Cultural Heritage Duty of Care Guidelines, the works are likely to be classified as Category 3 Developed Areas involving use and maintenance of existing roads. The new bridge will be directly adjacent to the old bridge, with the road realignment to be within the existing infrastructure footprint. In the absence of further information, it is considered that an accidental finds procedure will be adequate to meet Duty of Care Guidelines for Cultural Heritage.

6.4.2 Management Plan

Environmental Objective		
To minimise impacts to cultural heritage.		
Performance Criteria		
• All works managed in accordance with the *Aboriginal Cultural Heritage Act 2002* and the *Aboriginal and Cultural Heritage Duty of Care Guidelines 2004*. • No complaints are received from regulatory authorities or the community in relation to the handling of cultural heritage items/places/values. • No unauthorised disturbance to and/or removal or destruction to cultural heritage items/places/values within the WTWHA.		
Mitigation Measures	**Responsibility**	**Timing**
All personnel must exercise a duty of care, that is, they must take all reasonable and practical measures to ensure their activity does not harm Cultural Heritage items/ places/ values.	All personnel	At all times
If at any time during the activity it is necessary to excavate, relocate, remove or harm a Cultural Heritage find, the activity should cease immediately and the Site Supervisor and Project Manager notified.	All personnel	Immediately on discovery
Upon discovery of a Cultural Heritage find, the local Aboriginal Party for the area shall be contacted and their advice and agreement sought as to how best to manage the find to avoid or minimise harm to the Aboriginal Cultural Heritage.	Trinity Engineering	Immediately after notification
Any Cultural Heritage finds are to be managed in accordance with any agreement reached with the local Aboriginal Party. Any agreement reached with the Aboriginal Party for the area shall be recorded and documented.	Trinity Engineering	As required
Monitoring	**Responsibility**	**Timing**
Any discovery of Aboriginal Cultural Heritage, will be recorded on an Environment Incident Report Form.	Site Supervisor	Upon identification
Monitor excavations for potential signs of Aboriginal Cultural Heritage.	Site Supervisor	During excavation
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Trinity Engineering	Following identification
Inform the DATSIP as soon as is practically possible in the event of any Cultural Heritage find or management issue.	Trinity Engineering	Following incident
Corrective Action	Responsibility	Timing
All complaints relating to Cultural Heritage management issues will be investigated promptly and appropriate actions taken.	Trinity Engineering	Upon receipt of complaint
Where investigations identify issues with Cultural Heritage management actions, revision to management plans will be undertaken and further controls implemented, as necessary.	Trinity Engineering	Following investigation
Corrective action will be implemented to meet required outcomes of Administering Authorities.	Trinity Engineering	Where required

6.5 Erosion and Sediment Control

6.5.1 Aspect

Soils on the abutments comprise compacted imported material in the upper horizons and at depth are most likely clay soils derived from mixed alluvium and Hodgkinson formation metamorphics. Within the creek bed upper layers of the stratum are coarse alluvium/cobbles and at depth are expected to be similar to that of the abutments i.e. clays derived from alluvium and metamorphics.

6.5.2 Management Plan

Environmental Objective		
Minimise off site impacts of sediment transport through implementing erosion control measures. Minimise potential for sediment to adversely impact on habitats of endangered frog species.		
Performance Criteria		
• All works are managed in accordance with the International Erosion Control Association *Best Practice Erosion & Sediment Control Guidelines*, the *Environmental Protection (Water) Policy 2009* and any other relevant approval and statutory requirement as per the WTM Plan. • No complaints are received from regulatory authorities or the community in relation to erosion and sediment control issues.		
Mitigation Measures	**Responsibility**	**Timing**
Erosion and sediment control methods shall be implemented in accordance with the International Erosion Control Association's "Best Practice Erosion and Sediment Control Guidelines" prior to commencing earthworks onsite.	Project Manager	As required during construction
A site specific Erosion and Sediment Control Plan (ESCP) shall be developed prior to disturbance works occurring.	Project Manager	As required during construction
Sufficient materials shall be available to enable implementation of erosion and sediment controls as required.	Project Manager	Before commencing earthworks
Work shall be scheduled to ensure that temporary erosion control works are in place by the end of work each day, especially before weekends, if rain is imminent, or when permanent erosion control works are not in place or feasible.	Project Manager	Before commencing earthworks
In the event of extreme weather conditions (e.g. storm events) construction work will cease and the need for additional erosion and sediment control shall be assessed and implemented where required.	Project Manager	Throughout construction
Soil and surface stability shall be maintained at all times.	Project Manager	Throughout construction
Stockpiles will not exceed 1.5 m in height and shall be covered with geofabric or similar material if not proposed to be utilised within one week.	Project Manager	Throughout construction
Keep the area of cleared land and the period of time areas remain exposed to a minimum.	Project Manager	Throughout construction
Keep vehicles to defined access routes.	Project Manager	Throughout construction
Rehabilitate cleared areas promptly and progressively wherever possible.	Project Manager	Throughout construction

Where practical, vegetation root stock shall be retained in the ground after clearing. Trunks of large trees are to be placed off site in a manner that mitigates further erosion. Other cleared vegetation shall be mulched and the mulch spread on exposed areas for additional exposed earth protection.	Project Manager	Throughout construction
Monitoring	Responsibility	Timing
Undertake routine visual inspections to ensure erosion and sediment control measures are implemented where required.	Site Supervisor	Daily
Undertake ongoing monitoring of weather conditions (including extreme weather) and alerts relevant to the construction area.	Site Supervisor	Daily
Undertake inspections of the effectiveness of erosion and sediment control measures after significant rainfall events until rehabilitation is deemed satisfactory by the Project Manager.	Site Supervisor	Where necessary
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Throughout construction
Inform the Administering Authority in a timely manner in the event of a significant erosion and sediment control issue.	Project Manager	Following identification
Corrective Action	Responsibility	Timing
Appropriate control measures shall be implemented in a timely manner where sedimentation or erosion issues are identified or have the potential to occur in the future.	Project Manager	Following identification
Restore eroded areas as soon as is practical following event and repair/install sediment control mechanism. (e.g. rock aggregate, geo-textile and concrete).	Project Manager	Following identification
All complaints in relation to erosion and sediment control shall be investigated, and as required, legitimate problems shall be rectified.	Project Manager	Upon receipt of complaint
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

6.6 Contaminated Land, Fuel and Hazardous Substances

6.6.1 Aspect

Machinery operating on site presents a risk to the environment through potential for oils, grease, fuels and other contaminants to be accidentally released during construction. Management and mitigation of these risks are addressed in this section.

6.6.2 Management Plan

Environmental Objective		
Safely manage the risks to the existing environmental values, including surrounding National Park and associated access that involve the operation of machinery and use of fuel and hazardous materials during construction.		
Performance Criteria		
• Fuel and hazardous substances used on site are used in accordance with AS1940. The storage and handling of flammable and combustible liquids. • No leakages of hydraulic fluids into the environment • No spills of fuels, oils or other hydrocarbons • No complaints are received from regulatory authorities or the community in relation to the spillage/leakage from the drilling operations into the environment • No disturbance to and/or disposal of hazardous waste within the WTWHA..		
Mitigation Measures	**Responsibility**	**Timing**
Where possible, minimum quantities of hazardous substances necessary for the project shall be used on site.	Project Manager	Where possible throughout construction
Where practical all mobile equipment shall be refuelled and maintained off-site.	Site Supervisor	As required
An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at the site.	Project Manager	At all times
Records shall be kept on chemicals and dangerous goods used during construction.	Project Manager	Throughout construction
First aid and firefighting equipment (hand held extinguishers and fire hoses) shall be available at the construction site.	Project Manager	At all times
Construction workers operating vehicles on-site shall be appropriately trained and licensed, so that these vehicles are operated in a safe and appropriate manner.	Project Manager	During induction
All relevant staff shall be trained in appropriate handling, storage and containment practices for chemicals and dangerous goods to be utilised during construction.	Project Manager	During induction
No fuel or hazardous substances are to be stored on site. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including: • *Dangerous Goods Safety Management Act 2001* • Regulatory requirements • Safety Data Sheets (SDS) requirements. SDS for products kept on site shall be readily available.	Project Manager	At all times
Ensure that the appropriate personnel undertake adequate environmental awareness training covering the requirements of this CEMP, regarding safe working procedures around hazardous materials and identification of contaminated land indicators.	Project Manager Site Supervisor	During induction

Any disposal to ensure potential contamination does not occur onsite, including wastewater. Appropriate legal waste disposal offsite.	Site supervisor	Throughout construction
Monitoring	Responsibility	Timing
Visual inspections of site to ensure no oil leaks, hydraulic fluid leakages or fuel leakages/spills of any other hazardous material.	Site Supervisor	Throughout construction
An incident register shall be maintained which includes corrective actions undertaken and persons notified.	Project Manager	Throughout construction
Reporting	Responsibility	Timing
Any environmental incidents involving spills shall be recorded including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel	Following incident
Inform the Project Manager immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Where warranted DES Pollution Hotline (1300 130 372) or the local office shall be contacted as soon as practicable after becoming aware of any release of contaminants.	Project Manager	When required
Corrective Action	Responsibility	Timing
All complaints relating to fuels, chemicals or hazardous material use shall be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Disposal of contaminated soil (small or large quantities) shall be disposed of in accordance with relevant regulations.	Project Manager	Following incident response
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required
Spills to be remediated depending on nature of product (Site Supervisor to advise correct procedure). Immediate action should include: • Small hydrocarbon spill: apply absorbent material. • Large hydrocarbon spill: install containment (e.g. surround with sandbags, dig earthen bund) and apply absorbent material. • Chemical spill: application of appropriate absorbent material and containment.	Project Manager/Site Supervisor	Following incident
In the event of a spill of dangerous goods, work procedures and control measures shall be reviewed to ensure they are fit for purpose and revised where necessary.	Project Manager	Following incident where required
In the event of an environmental incident, corrective or remedial action shall be taken as is required to render the area safe and avoid or minimise environmental harm.	Project Manager	Following incident where required

6.7 Vegetation

6.7.1 Aspect

A search of the Regulated Vegetation Management Map identifies the site within Category B remnant vegetation. This includes both banks of Noah Creek, however the majority of the freehold areas of the property on the southern bank are mapped as Category X. The vegetation on the bank of the creek is classified as an 'endangered' regional ecosystem type, comprising complex mesophyll vine forest 1a (using the Webb and Tracey 1981 designations) on alluvium.

A search of the Regulated Vegetation Management Map identifies the site within Category B remnant vegetation. This includes both banks of Noah Creek, however the majority of the

freehold areas of the property on the southern bank are mapped as Category X. The vegetation on the bank of the creek is classified as an 'endangered' regional ecosystem type, comprising complex mesophyll vine forest 1a (using the Webb and Tracey 1981 designations) on alluvium.

The project area is within a mapped high risk protected flora survey trigger area, and a preliminary botanical survey has identified a number of protected flora species in the immediate area. No marine plants are present within the development proposal footprint.

6.7.2 Management Plan

Environmental Objective		
To minimise disturbance to vegetation and surrounding ecosystems in order to maintain environmental quality and natural values of the surrounding areas.		
Performance Criteria		
• No complaints are received from regulatory authorities or the community in relation to flora and fauna management. • All works are managed in accordance with the *Wet Tropics Plan, Nature Conservation Act 1992* and any other relevant legislation. • All works to comply with conditions on s35 authority/WTMA permit • Vegetation clearing is restricted to only the minimum as required for the safe construction and operation of the reservoir.		
Mitigation Measures	**Responsibility**	**Timing**
Stockpiles shall be located away from any drainage areas and are not be placed against trees.	Site Supervisor	Site clearing
The area of vegetation to be removed shall be demarcated by bunting/site tape and restricted to the minimum area required for the safe construction and operation of the bridge.	Project Manager	Prior to works commending on site
Trees are not to be cleared by bulldozer, but are to directionally hand-felled by chainsaw keeping root stock intact.	Site Supervisor	Site clearing
Waste vegetation is not be burnt. Smaller vegetation to be mulched and used as additional cover for exposed soil post clearing as an aid providing erosion protection.	Site Supervisor	Site clearing
All machinery generally to be washed down prior to clearing operations. This extends to chainsaws and small vehicles accessing the site for the first time.	Project Manager	Prior to works commending on site
Monitoring	**Responsibility**	**Timing**
Ensure delineation bunting is maintained and vegetation beyond this bunting is not disturbed.	Site Supervisor	Daily
Undertake routine visual inspections of all erosion and sediment control measures.	Site Supervisor	Daily
Ensure that disposal and distribution of waste vegetation material does no adversely impact on the National Park.	Site Supervisor	During clearing
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Inform the Administering Authority in a timely manner in the event of a significant environmental management issue.	Project Manager	Following identification
Corrective Action	**Responsibility**	**Timing**

All complaints shall be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Where investigations identify clearing exceeding that approved for construction, revision to management plans shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

6.8 Fauna

6.8.1 Aspect

The endangered Southern Cassowary is known to utilise the area, with confirmed sightings in the immediate vicinity of the project. The primary impact on this species during construction will be increased noise and activity from machinery, increased traffic movement and human presence deterring cassowaries (and most other fauna) from the area. Noise and human disturbance are expected to be of an intense, short term duration, with these impacts temporary and reversible (i.e. humans and machinery will leave site after construction). Cassowaries will resume utilisation of the area with the cessation of construction activities.

The highest risk of impact after the construction phase will be an increase in traffic speed on the dual lane bridge and approach roads. One of the main causes of cassowary deaths is from vehicle strikes. Implementation of lower speed limits and speed reduction devices are to be reviewed by the DSC during the project to mitigate this increased risk.

There are confirmed records of two threatened frog species, the common mist frog and the Australian lace lid, occurring within or immediately in the riparian zone of Noah Creek. The actions identified to pose a significant impact on the common mistfrog and Australian lace lid include pollution, land clearing, vibration, and sedimentation. Provided erosion and sediment control, contaminated land, fuel and hazardous substances, and noise and vibration plans stated in this EMP are implemented and checked throughout the construction phase, the Noah Creek bridge project would be deemed to have no significant impact on these two threatened species.

Four species of the EPBC listed Cling Goby (subfamily *Sicydiinae*).are known to occur upstream of the project footprint. These species are amphidromous, with life cycles requiring eggs and larvae to reach the estuarine/ocean area and return as adults. Primary risks to these species will be interruption of the breeding cycle by instream works e.g. silt curtains, coffer dams, raised access tracks for vehicles. Additionally increased turbidity and vibrations in Noah Creek during construction will potentially also impact these species. A s the final design and construction methodology is unavailable, assessment of impacts to Cling Goby species may require review to ensure impacts are appropriately managed in accordance with regulatory conditions and approvals.

Environmental Objective
To minimise disturbance to vegetation and surrounding ecosystems in order to maintain environmental quality and natural values of the surrounding areas. To ensure no adverse impacts on Noah Creek, a known habitat for endangered frog, cling goby and freshwater eel species. To minimise risk to fauna during the construction phase.
Performance Criteria

- No complaints are received from regulatory authorities or the community in relation to fauna management.
- All works are managed in accordance with the *Wet Tropics Plan, Nature Conservation Act 1992* and any other relevant legislation.
- All works to comply with conditions on WTMA permit
- Habitat disturbance is minimised to only the minimum as required for the safe construction and operation of the reservoir.
- Sediment from clearing and earthworks entering Noah Creek is minimised.

Mitigation Measures	Responsibility	Timing
Venomous snakes and Cassowaries may be encountered. Staff are not to handle snakes and are to be removed to a safe location away from construction only by a qualified snake handler. All staff shall be inducted into strategies for dealing with the local Cassowaries by Project Manager or delegate.	All project staff	At all times
Feeding of animals or interfering with animals shall not be permitted.	All project staff	At all times
Prohibit domestic pests and animals on the site during construction.	Project Manager	Throughout construction
Ensure that all erosion and sediment control mechanisms are in place that reduce the risk of off site transport of sediment into roadside spoon drains.	Site Supervisor	Throughout construction
Do not leave food waste scraps or any other waste that is likely to attract wildlife. All putrescible waste is to be placed in bins that are sealable.	Site Supervisor	Throughout construction
Delineation bunting to be used to demarcate habitat areas that are not to be disturbed and is to be placed prior to work commencing on site.	Site Supervisor	Prior to works commencing on site
Should any large tree with obvious hollows (usually trees with a trunk diameter >40cm) be cleared, then these will be investigated by a fauna spotter/catcher to determine whether they are being used as roost/breeding sites by possums, colonial species (such as microchiropteran bats) or nest sites by parrots or owls	Project Manager	Prior to works commending on site and during clearing.
In the event that breeding animals are located during clearing operations, clearing will cease until QPWS/DES are notified and further direction received from these regulatory authorities.	Site Supervisor Project Manager	Prior to works commending on site and during clearing.
Should any animals be encountered, injured or nests discovered, works shall cease and the Site Supervisor be notified immediately.	Site supervisor	As required
In the event that injury to native fauna occurs, where practicable, it shall be transported to a local veterinary clinic, wildlife carer or reported to local Queensland Parks and Wildlife Services (QPWS) for advice/action.	Project Manager	As required
Where practical barbed wire is not to be used for any aspect of construction owing to lethality to bats, glider possums, and some bird species.	Project Manager	Throughout construction

Monitoring	Responsibility	Timing
Ensure vegetation clearing delineation bunting is maintained and vegetation beyond this bunting is not disturbed.	Site Supervisor	Daily
Undertake routine visual inspections of all erosion and sediment control measures.	Site Supervisor	Daily
Ensure that disposal and distribution of waste vegetation material does no adversely impact on adjacent National Park.	Site Supervisor	During clearing

Each fallen tree should be monitored immediately on felling for any evidence of fauna present.	Site Supervisor Project Manager	Daily

Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Record and manage all wildlife interactions in a register and corrective actions taken. This will include spotter catcher reports documenting any wildlife identified during clearing, (if required) and measures deployed to minimise impacts.	Project Manager	Throughout construction
Any injured native wildlife shall be reported to local QPWS.	Site Supervisor	Following incident
Inform the Administering Authority in a timely manner in the event of a significant environmental management issue.	Project Manager	Following identification
Corrective Action	**Responsibility**	**Timing**
All complaints shall be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Where investigations identify environmental nuisance or potential to harm fauna, revision to management plans shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

6.9 Weed and Pest Management

6.9.1 Aspect

The spread of weeds and pests can impact the environment, land productivity and land use. Weeds onsite are observed to be at a minimum. Fire ants and yellow crazy ants are a biosecurity risk in North Queensland. All machinery and construction equipment must be inspected prior to arrival on site for evidence of fire ants or yellow crazy ants.

6.9.2 Management Plan

Environmental Objective
Avoid and effectively manage potential impacts associated with weeds and pests.
Performance Criteria
• No introduction or spread of new (declared) weeds and pests. • No fire ants or yellow crazy ants become established on site • No complaints are received from regulatory authorities or the community. • Works undertaken in accordance with the DSC Pest Management Plan and *Biosecurity Act 2014.* All requirements of the WTM Plan to be enacted as well. • All machinery to have a certified weed hygiene certificate issued by an authorised person/department.

Mitigation Measures	Responsibility	Timing
Minimise water ponding or build up on-site to reduce the likelihood of providing suitable environments for mosquito breeding.	Project Manager	At all times
All vehicles, construction machinery and materials are to examined for fire ants or yellow crazy ants prior to arrival at site.	Project Manager	At all times
Food scraps to be disposed of into bins with closed lids and removed from site regularly to minimise vermin infestations.	All personnel	At all times

Where appropriate, use clean imported fill with a weed-free certificate.	Project Manager	Where appropriate
Vehicles arriving on site from known and potential weed infested areas must, prior to arriving at site, undergo vehicle checks or wash down procedures where appropriate.	Project Manager	At all times
Any weed infestation shall be treated at earliest stage while small and manageable. If chemical treatment is required, chemicals may be used only in accordance with manufacturer's specifications.	Project Manager	At all times
Monitoring	Responsibility	Timing
Weeds – Weekly site inspection of site to identify any Queensland weed Classes 1 to 3 under the *Biosecurity Act 2014.*	Site Supervisor	Throughout construction
Fire ants– Weekly site inspection of the site including ant nests, random vehicles and equipment to locate any fire ants.	Site Supervisor	Throughout construction
Yellow crazy ants – Weekly site inspection of the site including ant nests, random vehicles and equipment to locate any crazy ants.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Throughout construction
Corrective Action	Responsibility	Timing
All complaints relating to weeds or pest issues shall be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Where investigations show restricted/declared weeds, and pests present, revision to management plans shall be undertaken and further controls implemented, as necessary. Controls may include use of contracted licensed weed eradicator or pest exterminator.	Project Manager	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

6.10 Air Quality

The surrounding land uses include roads, national park and private land. Dust generated from construction activities may be a hazard to road users and land users. Endangered rainforest flora occur in the immediate vicinity of the project. These species are considered susceptible to dust exposure. Dust management will play an important role in preserving the value of the area. Exhaust fumes, plant and equipment have a low potential to be a nuisance, however efficient use of resources shall be promoted.

6.10.1 Aspect

Environmental Objective
To prevent dust and other atmospheric emissions generated by construction activities from causing a hazard or nuisance.
Performance Criteria
• All works are managed in accordance with the EP Act and the Environmental Protection (Air) Policy 2008. • No complaints are received from regulatory authorities or surrounding land uses in relation to air quality issues.

Mitigation Measures	Responsibility	Timing
Ensure equipment is properly serviced, with records provided. If excessive exhaust fumes are observed to be emitted, vehicles shall be shut down and maintenance check undertaken offsite.	Site Supervisor	Throughout construction
Burning or incineration of waste is not permitted onsite.	Project Manager	At all times
When not in use vehicles and other onsite equipment are to be turned off, when practical and safe.	Site Supervisor	Throughout construction
Ensure water trucks are used if necessary along site access roads and laydown areas.	Project Manager	Where necessary
Disturbed areas, including working areas and site compounds shall be stabilised as soon as possible.	Project Manager	Throughout construction
Monitoring	**Responsibility**	**Timing**
Undertake visual inspections / observations of site during day to day works to identify problem areas and where corrective action is needed.	Site Supervisor	Daily
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Throughout construction
Corrective Action	**Responsibility**	**Timing**
Appropriate control measures as suggested in this document shall be implemented in a timely manner where nuisance dust and other air quality issues are identified.	Project Manager	Following identification

6.11 Noise and Vibration

6.11.1 Aspect

There is potential for noise and vibration from construction activities to be of nuisance to the nearby landholder and wildlife.

6.11.2 Management Plan

Environmental Objective		
To minimise noise impacts and vibration from construction activities to surrounding activities near the project.		
Performance Criteria		
• All works are managed in accordance with the EP Act and the Environmental Protection (Noise) Policy 2008. • No complaints are received from regulatory authorities or the community in relation to noise and vibration issues.		
Mitigation Measures	**Responsibility**	**Timing**
Where possible, plant with the lowest noise rating which meets the requirements of the task shall be selected.	Project Manager	Throughout construction
Most construction activities are to be undertaken during normal construction hours, (e.g. 6.30 am to 5.30 pm, Monday to Friday).	Project Manager	Throughout construction

If construction work is required to be undertaken outside of the normal construction hours, (refer above) notification including details of time, date and duration of works shall be provided to stakeholders.	Project Manager	As required during construction
Equipment will be switched off when not in use if safe to do so.	Site Supervisor	When not in use
Provide appropriate hearing protection to all workers if noise levels exceed the 85 dBA limit for protection of workers health.	Project Manager	As required during construction
Where possible, select transport routes that minimise noise impacts at noise sensitive areas.	Project Manager	Throughout construction
All vehicles and equipment to be maintained in good working order and serviced according to manufacturer's recommendations to avoid unnecessary nuisance.	Site Supervisor	Throughout construction
Site induction training to advise personnel of requirements to limit unnecessary revving of engines, engine braking and to exercise due courtesy of local residents, accommodation premises and other workers.	Project Manager Site Supervisor	During induction
Monitoring	Responsibility	Timing
Records of plant maintenance shall be kept on-site and/or with plant.	Project Manager	Throughout construction
Operators shall undertake and log daily pre-start checks to ensure equipment is well maintained.	Operators and Site Supervisor	Daily
Undertake daily observations during construction as to the effectiveness of noise control measures and the control of excessive noise.	Site Supervisor	Daily
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Throughout construction
Corrective Action	Responsibility	Timing
All complaints shall be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of a complaint
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

6.12 Emergency Response

6.12.1 Aspect

On any project there is potential for an emergency situation to occur, such as fire, chemical release, spill, leak, snake bite, equipment failure or any other likely emergency. It is important protocols are in place to minimise damage/injury/impact to personnel and environment.

6.12.2 Management Plan

Environmental Objective
For project personnel to respond effectively and efficiently in the event of an emergency associated with the construction of Noah Creek replacement bridge.

Performance Criteria		
• Emergency plans for construction developed prior to commencement of works on site. • All personnel familiar with emergency procedures and their role in the event of an emergency.		
Mitigation Measures	**Responsibility**	**Timing**
First aid, snake bite kit and firefighting equipment, (hand held extinguishers and fire hoses) shall be available at the construction site.	Project Manager	At all times
Spill kits shall be available at the construction site.	Project Manager	Throughout construction
Important contact numbers and names available on site e.g. 000 for fire, ambulance, police.	Project Management	At all times
Ensure that personnel undertake adequate environmental awareness and training covering the requirements of this CEMP and other management plans regarding emergency response.	Site Supervisor Project Manager	During induction
An emergency response plan shall be prepared which includes consideration of the following – • Response procedure in the event of a fire, chemical release, spill, leak, explosion, natural disaster, equipment failure, snake bite or any other likely emergency • Communication arrangements and contact details • Roles and responsibilities of project personnel • Emergency controls and alarms • Evacuation procedures • Training requirements • Site security.	Project Manager	Prior to commencement of works on site
Monitoring	**Responsibility**	**Timing**
Undertake review of the emergency response plan to identify any issues and check information is up to date.	Site Supervisor	Throughout construction
Conduct drills if necessary.	Site Supervisor	Throughout construction
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Corrective Action	**Responsibility**	**Timing**
Where investigations identify inefficient or ineffective procedures, revision to management plan shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification

7. References

- Wet Tropics Management Authority (2017). *Road Maintenance code of practice for the Wet Tropics World Heritage Area*. Available from: https://www.wettropics.gov.au/site/userassets/docs/Info%20Sheets%20/Guideline%209c-%20Field%20Guide%20Road%20Maintenance%20COP3.pdf
- Department of the Environment, Water, Heritage and the Arts, Queensland Government, JCU and Reef and Rainforest Research Centre (2010*). Roads in Rainforest: Best Practice Guidelines for Planning, Design and Management*. Available from: http://eprints.jcu.edu.au/12113/1/goosem_guidelines.pdf

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Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft A	Tim Moeser	Belinda Hodges		Jim Greatorex		17/8/2018

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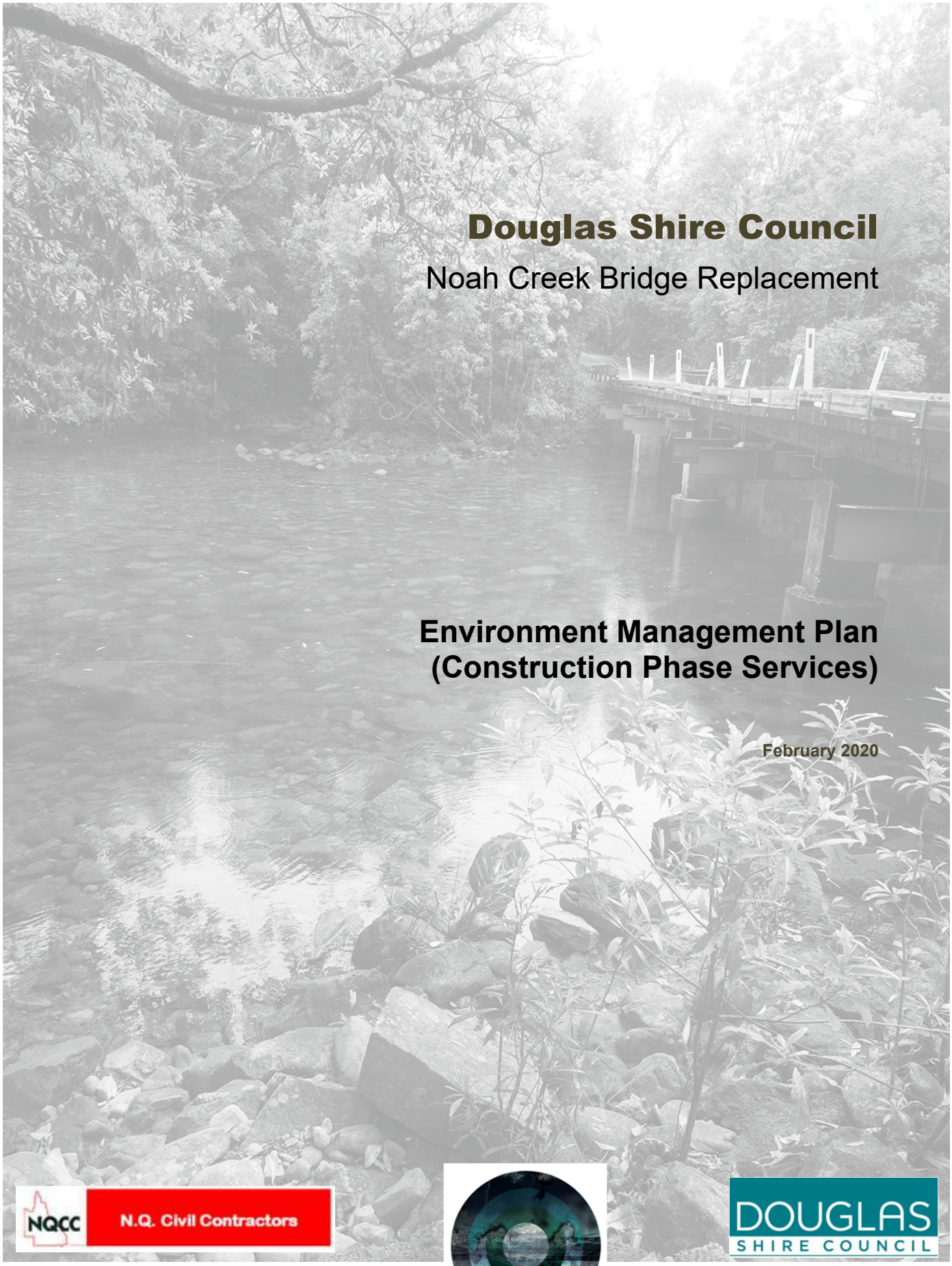
Attachment 7

Environmental Management Plan (Construction Phase) prepared by environmentPACIFIC in February 2020



Douglas Shire Council

Noah Creek Bridge Replacement

Environment Management Plan (Construction Phase Services)

February 2020

NQCC N.Q. Civil Contractors

environment PACIFIC

DOUGLAS SHIRE COUNCIL

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2019 NQCC– Environment Management Plan, Noah Creek Bridge Replacement

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1. Introduction

1.1 Project Background

Douglas Shire Council (DSC) is proposing to replace the existing bridge over Noah Creek on the Cape Tribulation Road, approximately 25km north of the Daintree River. The existing wooden bridge (approximately 24 m long, excluding abutments) and abutments are in poor condition and have been subject to a number of remedial efforts over the recent years. Load limitations on the bridge are regularly exceeded and a structural inspection in 2016 have identified that the bridge is nearing end of life and needs replacing.

The replacement of the existing bridge is problematic from a number of viewpoints:

- The existing bridge is a critical transport link to/from the village of Cape Tribulation and is vital to 24hr emergency services access as there is no airstrip, or boat landing at Cape Tribulation. There is also no formal helipad at Cape Tribulation although helicopters may land in open areas in emergency situations. The bridge supports the economic tourism base of the local region enabling visitors to access Cape Tribulation from the south. The northern route via the Cape Tribulation - Bloomfield Road is not readily accessible by normal vehicles and is impractical for day use to access Cape Tribulation.
- Subsequently closing the existing bridge to construct a new bridge fully or partially on the existing alignment is not possible from a transport access perspective.
- From physical geotechnical and hydrological aspects, the location of the Noah Creek bridge is technically challenging for design and construction. Geotechnical reports have identified the substrate as primarily large colluvium aggregate that is subject to movement, and hence substantial foundations are required.
- The Noah Creek catchment originates in the foothills and uplands of Thornton Peak, an area that receives in excess of 9m of rainfall annually. Noah Creek flow is subject to extreme high velocity and high-volume discharges over short periods of time.
- The Noah Creek works area is located within the Wet Tropics World Heritage Area (WTWHA) and the northern bank and road reserve is within the Daintree National Park. The Great Barrier Reef Marine Park (GBRMP) and Great Barrier Reef World Heritage Area begins 200m downstream from the works area. The locality is within a nexus of internationally recognised biodiversity values, and there is a very high level of regulatory requirement that is being addressed throughout the planning and construction for this project. This has imposed limitations and adoptions of alternate approaches in both the design and construction phase that increase complexity and costs for the project.
- While some parts of the works area will include access to and use of freehold land, in order to construct the replacement bridge on a new alignment DSC have applied for a revocation of a section of the National Park to accommodate a widening of the Cape Tribulation Road reserve. This is on the northern approaches to Noah Creek, with an extension of the western verge of the road reserve being requested.
- DSC has appointed North Queensland Civil Contractors (NQCC) as the principal Construction Manager and Premise providing engineering support to the project. Environment Pacific ('EnPac') have been engaged by NQCC to provide services in relation to the planning and regulatory approval requirements for this project.

1.2 Project Elements

The replacement of the Noah Creek Bridge has three project elements:

1. Construction of the replacement Noah Creek Bridge. This approximately 36m long steel/concrete structure will require new abutments, bank scour protection, new road approach alignment (see below), new bridge piles, decking and other bridge infrastructure.
2. Realignment of the existing Cape Tribulation Road to provide new approaches to the replacement bridge. The new bridge cannot be constructed in the preferred location west and adjacent to the existing bridge without realignments of the existing approaches. The realignment on the northern approach to the new bridge site will require the road reserve to be extended on the western side into the Daintree National park. Douglas Shire Council have applied for a revocation of part of the Daintree National Park immediately adjacent Noah Creek to accommodate the northern approach road reserve extension. DSC will similarly be extending the width of the road reserve on the western side of the southern approaches to Noah Creek.
3. Decommissioning/removal of the old Noah Creek Bridge and rehabilitation of the banks/previous road alignment. Decommissioning will involve removal of all bridge structures, and will include removing the existing wooden bridge piles (to be cut off at bed level), abutments, and bituminous pavement of the previous approaches. These areas will be revegetated with native provenance plant species.

1.3 Purpose

The entirety of the Noah Creek bridge replacement area (including the laydown, stockpile and on-site administrative area) is within the WTWHA. DSC are subsequently applying for a permit under s45 of the *Wet Tropics Management Plan 1998* to construct the replacement Noah Creek bridge within the Wet Tropics World Heritage Area.

The purpose of this EMP is to enable DSC, and subsequently the Construction Manager (NQCC), to fulfil their environmental requirements for the construction of the new bridge, the decommissioning and removal of the old bridge, and subsequent site rehabilitation. This EMP addresses environmental obligations for the bridge construction which will be located within road and esplanade for which DSC is trustee. As previously noted, DSC have applied for a revocation of part of the Daintree National Park to be included within a widened road reserve to accommodate the new construction.

This document will outline how activities at the Noah Creek bridge replacement works site will be managed, to minimise potential harm to surrounding and receiving environments.

The aim of this EMP document is to implement:

- Effective and efficient environmental management throughout the construction/removal and rehabilitation phases for DSC and NQCC.
- Compliance with all regulatory requirements, including those for fulfilling agreements under the NC Act, and conditions on an approval under the Wet Tropics Plan 1998 and Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- Identify practical and achievable Environmental Management Strategies for implementation in this project, to have comprehensive monitoring, auditing, reporting and control of site impacts during construction of the replacement bridge. removal of the extant bridge and site rehabilitation.

This EMP contains:

- Background and details of the works to be undertaken

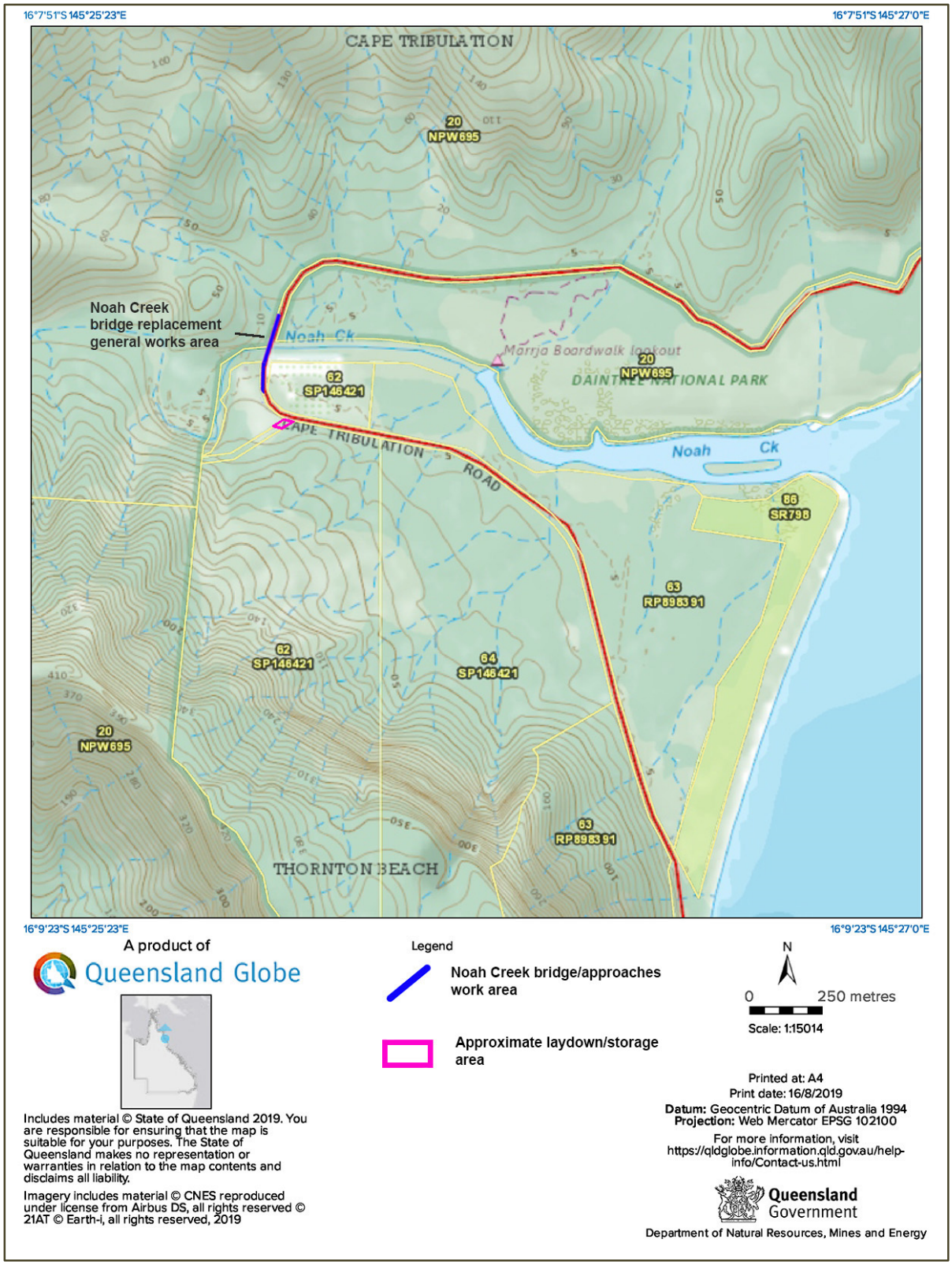
- Requirements and compliance measures as identified for WTMA requirements
- NQCC and DSC's Environmental Obligations
- Environmental Elements to be included in the final Construction EMP for the project.

1.4 Environmental Management Plan Finalisation

This current EMP document is to be updated prior to construction with the following:

- Conditions on approval from the Commonwealth under the EPBC Act.
- Conditions on approval from the WTMA under the *Wet Tropics Plan 1998.*
- In accordance with the Impact Management Plan and offsets potentially required by Department of Environment and Science (DES) Permit and Licence Management (PALM) associated with a protected flora vegetation clearing approval under the *Nature Conservation Act 1992* (NC Act)
- Conditions of the Development Application approvals including:
    - Biodiversity offset requirements (which will encompass any such requirements from the Commonwealth, WTMA and DES).
    - Marine plant disturbance - Department of Agriculture and Fisheries (DAF).
    - Waterway barrier (fishway movement) requirements – DAF.
    - Clearing of vegetation containing endangered Regional Ecosystems (RE) – Department of Natural Resources Mines and Energy (DNRME).
    - Works in a coastal management district.
    - Conditions related to Cultural Heritage Management under the Daintree Plan of Management and Indigenous Land Use Agreement (ILUA) with the Eastern Kuku Yalanji and Jabalbina Aboriginal Corporation.
- Detailed Erosion and Sediment Control Plan (ESCP) that incorporates final construction methodologies and approval condition requirements.
- Water quality monitoring program for the construction phase, identifying threshold and trigger values with respect to maintenance of aquatic ecosystem health.

Figure 1 Noah Creek Bridge Replacement Location



2. Site Description

2.1 Site Location

The proposed bridge replacement works on the Cape Tribulation Road are to be undertaken at Noah Creek, approximately 25 km north of the Daintree River. The bridge location is at the interface of the salt/freshwater environment, approximately two kilometres upstream from the estuary of the creek. The location is tidally influenced, with a mean daily tidal variation of approximately 70 cm. Refer Figure 1.

The entire site area including the bridge approaches and road realignment, Noah Creek esplanade, and the proposed laydown/stockpile and administration area is within the Wet Tropics World Heritage Area (WTWHA) covering multiple tenures covering esplanade and road reserve, National Park and freehold. At its closest point, the Great Barrier Reef Coast Marine Park – Noah Heads Section (part of the Great Barrier Reef World Heritage Area) begins 200m downstream from the works site area.

The existing bridge and the southern approaches are within the Cape Tribulation Road reserve and the Noah Creek esplanade. The northern approaches to the new bridge will require a partial widening of the road reserve to the west. Subsequently a revocation of part of the Daintree National Park (Lot 20 NPW695) which begins on the northern bank of Noah Creek, has been sought by DSC. The total area of revocation sought is approximately 0.18ha. Similarly, a widening of the road reserve is required on the southern approaches on the western side, requiring a resumption of approximately 0.10 ha of freehold lot 62 SP146421. Refer Appendix A for proposed revocation and resumption boundaries.

The southern side of Noah Creek (beyond the esplanade) is freehold land lot 62 SP146421, spanning both east and west of the Cape Tribulation Road. With the exception of the resumed section of this property no other parts of the is property will be impacted by the works. A parcel of the Cape Tribulation Road reserve, approximately 200m south of the bridge works area, will be utilised as a laydown area for equipment and materials, stockpile area and for administrative purposes.

2.2 Proposed Works

The proposed works to construct the replacement bridge will adopt the following methodology. Some parts of this methodology may be amended following review and incorporation of final approval conditions of permits and authorities.

2.2.1 Access to Noah Creek

- The bridge will be constructed upstream from the existing bridge (western side) with access tracks to the creek commencing approximately 15m from the existing bridge abutments on the southern and northern ends.
- The access tracks will be approximately 15m wide to allow storage of mobile plant (crane, excavator), piling equipment and bridge components.
- Clearing and grubbing of vegetation will be kept to a minimum as possible, however some trees will need to be removed. Trees will be felled directionally by chainsaw into the construction area away from surrounding vegetation (e.g. Cape Tribulation National Park). Vegetation will be mulched and removed to an approved site. Larger logs will be sawn to

manageable lengths and moved off site to an approved location. Grubbing will be required of rootstock in earthworks areas.

- Rocks that are to be removed will be broken up by machinery and utilised on site where possible as fill base or removed to an approved site. No blasting will occur
- access ramp to the piling work area will be constructed from the southern side to the northern side utilising suitable rock and gravel to form a stabilised pad to enable the piling rig to operate from a height of 500mm above water level. The pad size would be approximately 6m x 5m. The rock and gravel will be relocated to the next pile location allowing 300-500mm water to flow over the previous piling location. Culverts sized to accommodate flow of Noah Creek will be installed under the access ramp in low flow areas of Noah Creek to enable fish passageway. A geo fabric silt curtain will be installed across the existing bridge piles to control silt disturbed during construction of the access ramp. The silt curtain will only be applied to that area immediately opposite the access ramp construction site and will not obstruct the entire creek.
- The access ramp (rock and gravel) will be removed on completion of installation of the pre cast concrete decks and reinstated to pre project creek depth. A geo fabric silt curtain will be installed to control silt disturbed during reinstatement of the creek bed.
- Revegetation and site rehabilitation using local provenance species will take place on a progressive basis during construction.

2.2.2 Instream Piling Works

- A 4m pre bore hole will be drilled to enable the 6m liners to be placed and stabilised in position
- The piling rig will drive the liner to a depth of 10m or until refusal (when liner reaches solid rock)
- The liners will be fitted with reinforced steel and concrete will be poured from a portable kibble attached to a 30t excavator into a tremmie funnel significantly reducing the risk of spillage
- An 8m x 180 degree geo fabric silt curtain will be in place during the drilling, driving and concrete operation for each of the 8 pile liners being driven.

2.2.3 Bridge

- Pre cast abutments will be placed on top of the bored piers by 100t crawler crane from the existing access ramp
- Pre cast columns will be placed onto the bored piers at water level to the underside of the headstock by the crawler crane
- Pre cast headstocks will be placed onto the columns by the crawler crane
- Pre cast abutments, columns and headstocks will be constructed in the NQCC yard in Townsville and transported to site
- Pre cast concrete decks will be constructed by Rocla in Cairns and transported to site by NQCC and placed on the abutments and headstocks utilising the 100t crawler crane. Traffic control will restrict access to the existing site during lifting of the decks to prevent interaction between public vehicles and mobile plant and loads.
- Decks will be stressed and grouted

- Kerb and scuppers to be installed
- Weatherproof membrane and asphalt to be applied by Boral of Cairns
- Traffic barrier to be installed
- Revegetation and site rehabilitation using local provenance species will take place on a progressive basis during construction.

2.2.4 Approaches

- Earthworks will be conducted on approaches from the following locations:
    - o Southern side – Chainage 0 to 125
    - o Northern side – Chainage 170 to 305
- Earthworks will consist of removal of existing pavement and base material to design levels
- Approaches will be constructed within the typical 20m road corridor external to property boundaries
- V drains at a ratio of 1 on 2 will be constructed along the edge of the road shoulder from chainage 0 to 56 on the western southern side and chainage 169.152 to 303.536 on the eastern northern side.
- Table drains will be constructed along the edge of the road shoulder from chainage 56.0 to 278 on the western side
- The road shoulder will be battered on the eastern side from chainage 0.00 to 127
- Approach design will consist of the following:
    - 115mm sub base course material to DMR Type 2.3 specification
    - 100mm base course material to DMR Type 2.1 specification
    - 10mm primerseal grade AMCS
    - 50mm dense asphalt
- Road furniture and traffic barriers to be installed
- Revegetation and site rehabilitation using local provenance species will take place on a progressive basis during construction.

2.2.5 Demolition of old bridge

- Asphalt and built up wearing surface material will be removed from bridge deck by excavator to approved site
- Remove deck plywood sheeting with excavator to approved site
- Nuts and bolts will be removed from steel work under bridge
- Remove timber girders by 100t crane to approved site
- Remove steel components and deliver to DSC depot
- Remove piers from creek bed to approach of old bridge and pulverise and load onto truck and remove to approved site. A geo fabric silt curtain will be in place during the removal of the piers.
- demolition of the existing Noah's Creek Crossing bridge will occur once construction of the new bridge is completed and bridge is in commission

- All demolished materials shall be removed to an approved site with steel components being delivered to the Douglas Shire Council Depot in Mossman.
- Silt curtains will be in place during the removal of the existing piers

2.2.6 General Information

Construction has been scheduled to be completed in approximately 200 days from commencement. Construction will avoid the monsoon period December to April, with construction expected to occur in the mid/latter half of the year subject to environmental approvals and monsoon activity.

The temporary access track across Noah's Creek would be in place for a period of approximately 120 days. During this period water flow would be continuous as the pad height would be adjusted to work locations and reduced to between 300-500mm to enable mobile equipment to access work locations.

Silt curtains and booms will be in place at all times during the construction phase of the access, piling and bridge construction components of the project.

2.3 Man-made Features

2.3.1 Access Arrangements

General access for transport of machinery, materials and personnel will be via the Cape Tribulation Road to the Noah Creek work site. Access to the Noah Creek replacement works site will be from the northern and southern approaches to the creek. To access the creek bed, construction requires a 15m wide access west of the existing abutments on the northern and southern side of the bridge. The northern side approaches include the original ford crossing, now a highly eroded gully some 3m deep and up to 5m wide. The southern approaches include predominately previously disturbed vegetation, with established coconut trees and other introduced species present.

2.3.2 Infrastructure Present

The bridge replacement site is immediately to the west of, and adjacent to, the existing Noah Creek bridge. This bridge is on the Cape Tribulation Road, juxtaposed between freehold lot 62 SP146421 and the Daintree National Park. Excluding the road and associated infrastructure (concrete drains, culverts, signage and safety rails) there is no other infrastructure on the northern bank of Noah Creek.

The remnants of an old ford crossing through Noah Creek are evident on the northern approach (western side) of Noah Creek. This is now a deeply incised and heavily eroded drainage line parallel to the existing road. This ford is on the edge of, and partially within the Daintree National Park. On the southern approach, the ford access is a maintained feature that has previously provided access for bridge structure inspections and repairs. This access is entirely through road/esplanade reserve.

The Noah Creek Forest EcoStay is located on freehold land to the south of the Noah Creek bridge, adjacent the esplanade reserve. This large property includes commercial accommodation via lodges and camp sites, day use tourism facilities, and a commercial orchard on the eastern side of the road. The closest infrastructure to the bridge works area is the Noah Creek Forest Eco-Stay administration centre and car park, approximately 60m from the bridge site works area.

2.4 Natural Features

2.4.1 Regional Ecosystems

Vegetation regulated under the *Vegetation Management Act 1999* (VM Act) has been mapped by the Queensland Herbarium over the project area.

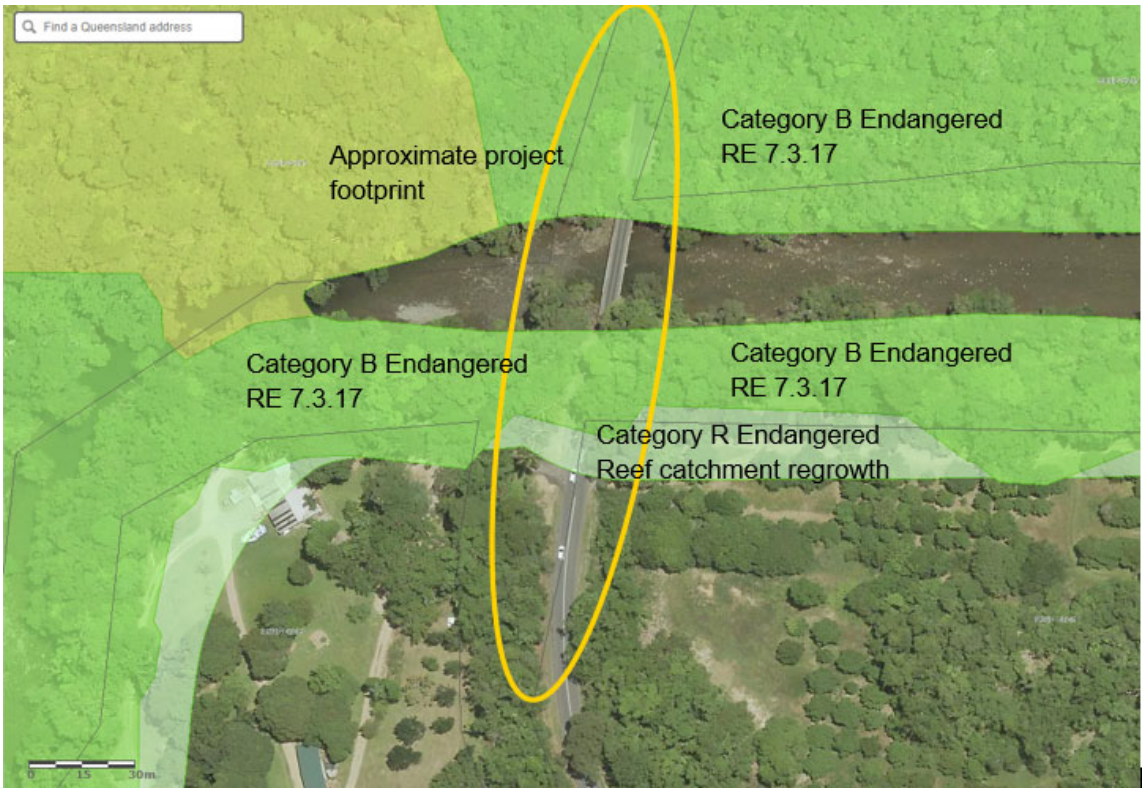
Vegetation mapping undertaken by the Queensland Herbarium identifies the vegetation within the bridge works footprint as Category B remnant regulated vegetation and Category R Endangered Reef catchment regrowth. Supporting vegetation regional ecosystem mapping further classifies the remnant vegetation as Regional Ecosystem RE 7.3.17, an endangered vegetation community under the *Vegetation Management Act 1999.* It is characteristically typified by a very high diversity of species, including many endemic rare and threatened species as part of a complex stratum.

Flora field surveys were undertaken in accordance with the *Flora Survey Guidelines – Protected Plants* (DEHP 2016), for the section of the project within the high risk protected flora survey trigger area, and in accordance with the *Guidelines for Flora Survey & Assessment in Northern Queensland* (Bruce Wannan, DEHP 2013) outside of the mapped high-risk area. The flora field surveys identified the mapped RE generally conformed with the RE designations for the vegetation mapped within the bridge construction area with the following exceptions:

- The RE mapping includes areas currently cleared including the Cape Tribulation Road, ford crossing access and parts of the Noah Creek Forest Eco-stay lodge and orchard areas.
- The RE mapping is incorrect in that it includes characteristic introduced species (coconut palms, African tulip and many ornamental plants) within the proposed southern approach access to the construction site.

Specific requirements for clearing, mulching and salvage of plants are identified in the relevant EMP sections in this document.

Figure 2 Noah Creek Bridge Regional Ecosystems



2.4.2 Flora of Conservation Significance

Flora surveys have identified a number of protected flora species listed under the schedules of the *Nature Conservation (Wildlife) Regulation 2006* and/or the Commonwealth Protected Matters Search Tool as occurring within the bridge works area. Some of these (e.g. *Noahdendron nicholasii)* are extremely range limited endemic species with small populations.

A list of the impacted species, their characteristics for management impact mitigation during construction, and general location within the project footprint is provided below.

Table 1 Protected flora within bridge works area

Species	Life form	Conservation status*	Location and management implications
Noahdendron nicholasi	Small trees	Endangered	Two small trees(to 6m) on bank of creek, largest near centre line survey marker closest to bank, other in revocation area near bank. Cannot be salvaged owing to size. However species grows well from cuttings and cuttings to be taken and propagated prior to clearing
Archidendropsis xanthoxylon Yellow siris	Sub canopy tree and sapling	Near threatened	Too large to be salvaged. Two individuals located in road reserve and revocation area on northern approach on the western side. Noted.
Austromuellera trinervia Mueller's silky-oak	Saplings	Near threatened	Present in revocation area as two large saplings. Too large to salvage or transplant.
Euodia hylandii	Shrubs to 4m tall	Vulnerable	19 individuals located, primarily in road reserve and revocation area on northern approaches. Too large to salvage.
Acronychia acuminata	Shrub	Near threatened	3 records, however in NP outside works footprint on eastern side of northern approach. Unlikely to be impacted.
Samadera baileyana	Small tree	Near threatened	One small tree and a sapling. Tree located behind crocodile warning side within road reserve on northern approach to bridge. Too large to salvage
Endiandra microneura Noah's walnut	Canopy tree, subcanopy and many saplings and seedlings	Near threatened	Many present (>30) in the bridge works area, both on the northern and southern approaches. Canopy tree in revocation area in excess of 20m tall and too large to salvage. Seedlings up to 0.50m tall throughout the works area may be transplanted to the local community nursery in Diwan. Anything above a seedling will not survive transplanting.
Ceratopetalum macrophyllum	Shrub	Near threatened	Present in project footprint, two plants on northern approaches in rock pile. Too large to salvage.
Acrostichum speciosum	Mangrove fern	Protected marine species	In project footprint: listed marine species under the *Fisheries Act 1994. To be transplanted*

*Conservation status as listed under the Schedules of the Queensland *Nature Conservation (Wildlife) Regulation 2006*

Biodiversity offsets and the requirements of the Protected Flora Survey Impact Mitigation Plan (IMP) (when approved by DES/PALM) are to be implemented. The draft IMP elements have been included in the relevant EMP sections.

2.4.3 Fauna

General Habitat

The Noah Creek area provides complex habitats for a number of endemic , threatened or species otherwise of WTWHA values. These habitats include pristine waterways, endangered complex rainforest, perennial and ephemeral watercourses/drainage lines, riparian communities and anthropogenic resources in the form of an exotic fruit orchard.

The proposed road realignment has specialised niche habitat resources primarily restricted to sheltered gullies and drainage lines that offer key frog habitats, but does offer a broad range of generalist foraging, and roosting opportunities for fauna.

Noah Creek catchment includes a regionally significant population of Southern cassowaries, with at least five adults known to occur in the area. One bird, known by local residents as “Mischka”, has adopted the orchard on the southern approaches as his personal territory and has been seen on every site survey visit, most recently with three chicks.

The creek itself is regarded as one of the highest value waterways in Australia, and two threatened fish species, both gobies, occupy pools immediately upstream of the bridge location. During the estimated six-month construction phase, the project will have construction elements that constitute waterway barriers (temporary) that may obstruct larvae and juvenile phase (creek to ocean), and also adult recruitment post juvenile phase (back upstream). These construction elements include silt curtains, coffer dams and raised access tracks for machinery to the base of the bridge. The potential for impact of these measures has been largely ameliorated by two conditions.

1. 1 While the exact breeding cycle of these gobies is unknown, published information on other tropical gobies indicates that spawning and larval dispersion and juvenile return typically occurs between the onset of the wet (Dec/Jan) and cessation of the wet (April/May). The construction period has been nominated for the dry period June 2020 to December 2020.
2. Construction methodologies at all times retain fishway passage, and all the construction elements above occupy only part of Noah Creek at any point in time, and at no time offer complete waterway barriers to fish passage.

Protected Fauna Occurrence

Surveys and records have identified the following fauna species as occurring within the project construction area.

Table 2 Protected fauna known to occur on site

Scientific Name	Common name	NC Act Status	EPBC Act Status	Habitat and likely occurrence notes
Amphibians				
Litoria nannotis	Torrent frog	Endangered	Endangered	Known to occur in immediate area upstream of Noah Creek and was recorded upslope of the road
Litoria dayi	Australian lace-lid frog	Endangered	Vulnerable	Known to occur and observed in upper sections of drainage line (previous ford) on northern approaches. Likely to occur in rainforest adjacent to or within any tributary/drainage line with water.
Litoria rheocola	Common mist-frog	Endangered	Endangered	Known to occur and observed in upper sections of drainage line (previous ford) on northern approaches. Likely to occur in rainforest adjacent to or within any tributary/drainage line with water.

Scientific Name	Common name	NC Act Status	EPBC Act Status	Habitat and likely occurrence notes
Birds				
Casuarius casuarius johnsonii	Southern Cassowary	Endangered	Endangered	Known to occur and observed multiple times while undertaking surveys in the area.
Cyclopsitta diophthalma macleayana	Macleay's fig parrot	Vulnerable	Not listed	Known to occur. Was observed on in riparian vegetation on southern approaches to bridge site.
Symposiachrus trivirgatus	spectacled monarch	Special least concern	Migratory	Present, known to occur. Recorded within Noah Creek Forest EcoStay grounds and observed on site.
Mammals				
Pteropus conspicillatus	Spectacled flying-fox	Vulnerable	Endangered	Present. Observed along in fruit orchard immediately adjacent work area.
Dasyurus maculatus gracilis	Spotted-tail quoll	Endangered	Endangered	Present, known to occur. Regularly sighted in Noah Creek Forest EcoStay grounds by guests.
Dendrolagus bennettianus	Bennett's tree-kangaroo		Near threatened	Present, known to occur. Regularly sighted in Noah Creek Forest EcoStay grounds by guests.
Reptiles				
Crocodylus porosus	Estuarine crocodile	-	Vulnerable	Present, known to occur. Two individuals (one 3m the other 4.3m) have territories upstream and downstream of bridge and both have been observed in works area.
Fish				
Stiphodon pelewensis	Riffle goby	Vulnerable	-	Present, known to occur and confirmed records immediately upstream of bridge.
Stiphodon semoni	Opal cling goby	Critically endangered	Endangered	Present, known to occur and observed upstream from site.

Fauna Breeding Areas

No nests, tree hollows or other actual evidence of breeding was observed within the works area specifically during the survey period. There are however numerous trees with hollows, canopy species and dense undergrowth areas that could provide nesting/roosting or sheltering opportunities for numerous fauna species. The dense understorey, particularly groves of Calamus palms (rattan palms or wait-or-while) would offer opportunities for shelter/breeding for small mammals (such as rodents and reptiles).

While no fauna was observed in these vegetation clumps, given the seasonal nature of fauna breeding it is possible that fauna may move into the area or be more active following the period of the original ecological surveys. It is recommended that a fauna spotter/catcher be on site when removing vegetation to verify that no breeding animals are present, and to relocate these if required.

As noted, Noah Creek provides habitat to two amphidromous fish species, both requiring uninterrupted access to the estuary as part of their breeding life cycle.

In summary (confirmed threatened species in works area);

- Three threatened frog species have a high probability of occurring along drainage lines and watercourses and adjacent habitats during the wet season.
- Two listed bird species, the most significant being the Southern cassowary, are resident within the works areas. Many other listed bird species are highly likely to utilise resources within the works areas. Cassowaries regularly cross the existing Noah Creek bridge and frequent the orchard on a regular basis. (Southern cassowary and Macleays fig-parrot) were identified during field surveys.
- Three protected mammals, of which one is a bat, are regularly sighted in the adjoining property. A number of other protected bat species are also expected to occur in the area on at least an opportunistic foraging manner.
- Two endemic fish species are known to occur immediately upstream of the works area and have life cycles that require access to the ocean.
- Nine protected plant species recorded in the area (one being a marine plant), are within areas that will be subject to potential clearing for works. Not all of these are salvageable.

2.4.4 Declared Weeds and Introduced Species

One priority weed listed under the DSC *Biosecurity Plan 2017 - 2021* was identified adjacent the site. Thunbergia (*Thunbergia laurifolia*) is a ubiquitous weed in the Wet Tropics. Under the *Queensland Biosecurity Act 2014* listed species (Schedule 2 – Restricted Matter, Part 2), two species were identified; African tulip (*Spathodea campanulata*), and lantana (*Lantana camara*). Weeds within the works area, apart from the above, are extremely limited. The Noah Creek Forest EcoStay grounds and fruit orchard have a very wide variety of introduced species present as both horticultural and landscape species. There is a very high potential for these to be introduced into the works area following earthworks and soil disturbance and creation of conditions favourable to their introduction.

Electric ants are known to occur in Douglas Shire, with Wonga Beach immediately south of the Daintree River being a declared biosecurity management area for this species. Electric ants and yellow crazy ants present a high biosecurity risk to the environment and their potential introduction via machinery or materials needs to be monitored at all times through construction.

2.5 Geophysical Features

2.5.1 Geomorphology and Soils

Site investigations identified soils on the existing bridge abutments comprise compacted imported material in the upper horizons and at depth are most likely clay soils derived from mixed alluvium and Hodgkinson formation metamorphics. Geotechnical investigations within the creek bed upper have identified deep stratum layers of coarse alluvium/cobbles with clays derived from alluvium and metamorphics with bedrock at depth 6-10m below the creek bed.

Soils in the project area include alluvial soils derived from a mixture of metamorphic and granite substrates positioned on alluvial terraces or flats and hillslopes to the northeast and southwest of the project site. Loam soils derived from granite and metamorphic substrates are located on hill slopes and alluvial terraces to the south of Noah Creek bridge

To the immediate north of the bridge are shallow rocky soils derived from metamorphic and granite substrates on alluvial terraces or flats and hillslopes. On the banks of Noah Creek itself, soils are quaternary alluvium derived from basic and acidic rock, and include quaternary beach sand and clay

loams. The northern section of the old Cape Tribulation road ford has been subject to erosion over the past 50 years since it's decommission, exposing medium to large granite boulders.

The soils generally do not exhibit any dispersive properties, and are vulnerable to erosion only when disturb. The bed substrate of Noah Creek provides a firm foundation for access tracks to piling rig pads, and owing to the coarse nature of the material, is generally no mobile except under high flow conditions.

2.5.2 Surface Hydrology

Noah Creek is classed as a short, steep, coastal stream which typically originate in mountainous catchments with high rainfall areas to the coast. The creek is of varying width, with a flow channel varying upon the tidal state. At high tide the creek is up to approximately 24m, reducing to <14m at low tide. The low flow channel of Noah Creek is located close to the southern bank, up to approximately 6m wide and to 1.5m deep on a low tide. The entire bed consists of a cobble bed rock channel with a large riffle run located immediately upstream of the Noah Creek Bridge with large pools located upstream and downstream. The proposed bridge site is in the upper tidal zone, with an average tidal plane of 70 cm between high and low tide. Peak flows for Noah Creek occur during the monsoon season, typically experienced in the region from December through to March. Noah Creek Bridge is currently in a medium storm tide inundation area (less than 1 metre depth).

Great Barrier Reef Coast Marine Park – Noah Heads Section, commences approximately 200m downstream of the existing bridge, with the mouth of Noah creek two kilometres downstream. A small fringing reef is located directly adjacent to the mouth of Noah Creek. At the northern end of the road alignment approach works is a permanent watercourse which crosses the Cape Tribulation road via culverts, and enters Noah Creek on the northern bank downstream of the northern abutments. The presence of a smaller feeder creek that flows under the northern approach of Cape Tribulation Road via a culvert was noted during the surveys. Existing stormwater drainage lines adjacent to the Cape Tribulation road include concrete formed drains on the northern approaches and earth drains on the southern approaches with concrete formed drains immediately adjacent the bridge abutments.

3. Roles and Responsibilities

3.1 Responsibility Hierarchy

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

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

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

3.2 Project Manager

Douglas Shire Council are the Project Manager for the Noah Creek bridge replacement project. DSC are trustees for the road reserve within which the bridge is to be constructed, and are the project proponents and applicants for all regulatory requirements.

- DSC are an authorised entity under the *Local Government Act 2009* and subsequently hold ultimate responsibility for the performance of the environmental outcomes of the project as holders of the relevant permits/approvals.
- As project proponents and holders of the permits/approvals, DSC are responsible for providing annual return information on permits and approval conditions, including notification of incidents, mitigation/remedial measures employed and any other regulatory information required by permit conditions.
- DSC are the primary point of contact for any regulatory requirement, including notification to agencies, of any environmental aspect that has, or has the potential, to have significant adverse impacts on the environmental values of the WTWHA.
- DSC are a signatory to an ILUA (QI2006/026) over the Daintree National Park and subsequently are required to comply with all notification and cultural heritage engagement requirements under the Daintree National Park Management Plan 2019.
- DSC are responsibility for negotiation, identification and settlement of offsets as may be required under approval conditions for the project as may be set by the Commonwealth and/or Queensland Government regulatory agencies.
- DSC will review and approve the final Construction Environmental Management Plan in accordance with approval conditions for the project as may be set by the Commonwealth and/or Queensland Government regulatory agencies.

3.3 Project Construction Manager

North Queensland Civil Contractors (NQCC) has been appointed by Douglas Shire Council as the overall Project Construction Manager. NQCC shall maintain ultimate responsibility for the provision of suitable resources (e.g. financial, personnel, etc.) to ensure that construction works comply with all applicable legal requirements and best practice. NQCC shall support all project personnel in the development and implementation of this EMP. NQCC may delegate responsibilities to appropriately qualified personnel where appropriate.

NQCC responsibilities include (but are not limited to):

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

3.4 Project Site Supervisor

The Project Supervisor may be NQCC or a suitably qualified nominated Contractor. The Project Site Supervisor is responsible for

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

3.5 All Staff and Subcontractors

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

3.5.1 General Environmental Duty

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

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

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

3.5.2 Duty to Notify

Section 320 of the EP Act requires that on becoming aware of serious or material environmental harm being caused by an activity that they are involved in, a person has a duty to report that harm, unless the harm is authorised by the Administering Authority (i.e. is undertaken in accordance with an approval or condition of a permit/licence). This is the duty to notify environmental harm. For the Noah Creek bridge replacement project, the Administering Authority is the Wet Tropics Management Authority and/or those agencies that may be identified on conditions of the Development Approval. Failure to fulfil this duty is an offence and can lead to prosecution.

3.6 Key Contact Information

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

- Douglas Shire Council: (07) 4099 9444
- Trinity Engineering and Consulting:
- Environment Pacific: (+61) 409 494 183
- Wet Tropics Management Authority: (07) 4241 0500
- Department of Environmental and Science (DES) pollution hotline: 1300 130 372
- Queensland National Parks and Wildlife (Mossman): (07) 4098 2188
- Jabalbina Yalanji Aboriginal Corporation (representing Eastern Kuku Yalanji): (07) 4098 3552
- RSPCA Queensland: 1300 264 625 (for reporting injured or orphaned wildlife)
- Daintree Wildlife Rescue: (07) 40980 7284 (for reporting injured or orphaned wildlife).
- Rainforest Rescue: plant salvage and revegetation following construction: (02) 6684 4360

4. EMP Implementation

4.1 Environmental Obligations

Douglas Shire Council and North Queensland Civil Contractors Pty Ltd will implement and foster environmentally responsible management of their activities and will comply with all relevant regulatory requirements, policies and permit approval conditions. NQCC, as the principal Construction Manager, are responsible for ensuring all subcontractors and employees similarly comply with all aspects of their environmental management obligations.

4.1.1 Environmental Policy

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

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

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

4.1.2 Environmental Objectives

Environmental objectives of this project are to:

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

DSC and NQCC's Policies are set out in Appendix D to this EMP.

4.2 EMP Requirements

4.2.1 Training, Awareness and Competence

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

- All staff to be made aware of their General Environmental Duty and Duty to Notify responsibilities as per the EP Act and the implications of failing to fulfil these duties.
- All staff to be made aware of their environmental responsibilities under this EMP in relation to implementing mitigation measures, reporting environmental incidents and complaints and implementing corrective actions.
- All staff to be given instructions on environmental emergency response procedures (i.e. spill kit locations and usage).
- All tasks are to be reviewed with consideration given to changes to construction works, such as the weather, which may cause the proposed activities to impact on the environment.
- All staff to be aware of requirements for working in a tidal waterway with known large crocodiles.
- All staff to be aware of protocols of interactions with crocodiles and cassowaries present on the site.

4.2.2 Records

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

- Briefing notes, inductions, and any specific environmental training records
- All records pertaining to any conditions under the NCA and approval from WTMA, including this EMP, and any conditions with QPWS/DES, DNRM and any other regulatory agency conditions on approvals.
- Monitoring records and external environmental reports, in particular the results of the Water Quality Management Plan which can be audited and/or requested by regulatory agencies at any time.
- Environmental incidents, complaints and non-conformances, and corrective action reports.

  Records shall also be made available to DSC as requested. All records shall be kept for a minimum of five years or as required by relevant third-party approval conditions.

4.2.3 Incident Reporting

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

- Fuel, oil and/or hydraulic oil leakages/spills (minor only and non-notifiable)
- Fire and/or explosions
- Unearthing of historical or indigenous cultural heritage
- Significant erosion and sediment control failure.
- Vegetation clearing/fauna interactions (snakes, crocodiles, cassowaries).

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

4.2.4 Complaints

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

4.2.5 Non-conformance and Preventative/Corrective Actions

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

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

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

4.2.6 Audit and Inspections

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

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

4.2.7 Reporting

Reporting by NQCC shall be undertaken in accordance with applicable approval/authority conditions or as requested by DSC and regulatory agencies as conditions on approvals. Reporting shall include all relevant information pertaining to environmental matters (e.g. records, monitoring results, incidents, complaints, audits and inspections, etc.) as required under the approval/authority. NQCC shall be ultimately responsible for reporting with support from suitably experienced and qualified staff as required.

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

4.3 Legislative Requirements

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

Douglas Shire Council is the regulatory applicant and the owner of the infrastructure under construction, however the obligation for implementing the requirements of various permits and approvals rests with NQCC in accordance with contractual requirements with DSC and General Environmental Duty responsibilities under the EP Act. A summary of the regulatory requirements that are to be addressed as part of this bridge construction project are presented in the following. Note that final conditions on many of the approvals are not yet available. When issued, any

conditions that are additions to, or are variations to the elements in this EMP will be incorporated and approved by DSC (as permit holders) prior to commencement of construction.

Table 3 Summary of Applicable Legislation

Legislation	Responsible Authority	Activity	License / Permit / Approval
Environment Protection and Biodiversity Conservation Act 1999	Commonwealth Department of the Environment and Energy	Construction with potential for impact on Matters of National Environmental Significance.	**Applicable** Commonwealth interest MNES including: - Southern cassowary - Two endangered frog species - Two World Heritage Areas (Wet Tropics and Great Barrier Reef) - Endangered fish (gobies) All have the potential to be adversely impacted during the construction phase. Conditions of the final Controlled Action determination and approval will be added to this EMP prior to construction.
Nature Conservation Act 1992	Department of Environment and Science	Vegetation disturbance in a high risk protected flora survey trigger area	**Applicable:** Protected flora clearing approval sought for 8 species and in excess of 30 plants. An Impact Management Plan will be approved by DES prior to construction in accordance with the elements in this EMP. Any additional conditions of the approval will be added to this EMP prior to construction.
Nature Conservation Act 1992	DES	Interference with fauna breeding areas for listed species	**Applicable:** No approvals triggered. Duty of Care and Duty to Notify. Surveys have determined that breeding areas for listed fauna will not be impacted by the project. Damage Mitigation Permit and/or Species Management Plan are not required.
Wet Tropics Management Plan	Wet Tropics Management Authority	Construction and operation of infrastructure within the WTWHA	**Applicable:** Works for construction of the new bridge is subject to permit application and approval from WTMA. This will be concurrently assessed by QPWS and Commonwealth DEE. Conditions from final approval will be added to this EMP
Planning Act 20106	Department of Local Government, Racing and Multi-cultural Affairs	Development Application for the entirety of the project required to the State Assessment Referral Agent.	**Applicable:** Controls overarching development approval for the project under Qld legislation. As an integrated approval it will include the conditions from various agencies on those matters under their own jurisdiction affected by the project. The conditions from the various agencies will be included within the final EMP.
Fisheries Act 1994	Department of Agriculture and Fisheries	Removal of protected marine plants	**Applicable** Protected marine plants are present in the works footprint. Conditions on the removal/salvage of these will be determined as an outcome of the Development Application. Final conditions will be incorporated into this EMP.
Fisheries Act 1994	Department of Agriculture and Fisheries	Use of waterway barriers in a regulated high impact waterway	**Applicable** Waterway barriers are required for the project. Approvals and conditions on these will be part of the Development Application. Conditions to be incorporated into this EMP.
Aboriginal Cultural Heritage Act 2003	Department of Aboriginal and Torres Strait	Require those conducting disturbance	**Applicable** Aboriginal cultural heritage values are present in the project footprint

Legislation	Responsible Authority	Activity	License / Permit / Approval
	Islander Partnerships	activities in areas of significance to take all reasonable and practical measures to avoid harming cultural heritage.	In order to meet Duty of Care Guidelines an accidental discovery procedure (minimum) is required.
Biosecurity Act 2014	Department of Agriculture and Fisheries (DAF)	Working in a mapped biosecurity zone.	**Applicable (compliance)** The general biosecurity obligation (GBO) requires everyone to manage biosecurity risks and threats under their control. Invasive species elements is included in this EMP.
Environmental Protection Act 1994	DES	Where 'serious and material environmental harm' is caused or threatened.	**Applicable (compliance)** No approvals triggered. Duty of Care and Duty to Notify.
Vegetation Management Act 1999	DNRME	Clearing of regulated vegetation	**Applicable** Clearing of endangered vegetation will be approved with relevant conditions by DNRME via Development Application. Final conditions are to be incorporated into this EMP prior to construction.

4.3.1 Codes of Practice

Codes of practice are formalised agreements between the WTMA and other government agencies for managing infrastructure or other aspects of the WTWHA. These codes of practice may be used as the basis for conditions attached to permit applications approved by the WTMA and Commonwealth DEE. Those Codes of Practice applicable to this project are presented in Guideline 9a: "Roads in Rainforest - Best Practice Guidelines for Planning, Design and Management[1]" are to be incorporated into construction aspects.

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[1] https://www.wettropics.gov.au/section-62-guidelines

5. Environmental Elements

5.1 Identification of Relevant Environmental Elements

The Queensland Government Guideline - *Preparing Environmental Management Plans* outlines likely environmental elements that should be addressed in an EMP. Relevant environmental elements to the replacement Noah Creek bridge construction as identified in the QLD Guideline are summarised in the following.

Table 4 Environmental Element Assessment

Issue	Applicable	Why not applicable	Reference Section
Air quality	✓		Air Quality
Cultural heritage	✓		Cultural Heritage
Complaint recording and reporting	✓		All CEMP elements
Dust	✓		Air Quality
Emergency response	✓		Emergency Response
Erosion and sedimentation	✓		Erosion and Sediment Control
Flora and fauna	✓		Flora and Fauna
Fire management	✓		Emergency Response
Land contamination	✓		Contaminated Land, Fuel and Hazardous Substances
Management of Natural and World Heritage values	✓		Natural and World Heritage Values
Noise	✓		Noise and Vibration
Rehabilitation	✓		Flora and Fauna
Social disruption	✓		Noise and Vibration Air Quality
Traffic (construction)	✓		Noise and Vibration Air Quality Flora and Fauna
Vibration	✓		Noise and Vibration
Visual amenity	✓		All CEMP elements
Waste and site clean-up	✓		Waste
Water quality	✓		Erosion and Sediment Control/Water Quality Management
Weed and pest management	✓		Weed and Pest Management

5.1.1 Environment Management Plan (Construction) Elements

This CEMP consists of the following elements to address the activities outlined in Table 4 with potential to impact on environmental values of the construction or surrounding areas:

- Natural and World Heritage Values
- Cultural Heritage

- Erosion and Sediment Control
- Contaminated Land, Fuel and Hazardous Substances
- Waste
- Flora
- Fauna
- Water Quality Management
- Weed and Pest Management
- Air Quality
- Noise and Vibration
- Emergency Response.

This EMP does not specifically address traffic management. NQCC and DSC will be responsible for developing and implementing a traffic management plan during construction independent of this EMP

5.2 Natural and World Heritage Values

5.2.1 Aspect

The WTWHA is a diverse set of natural ecosystems with a variety of existing uses and tenures. It has been formerly assessed according to its outstanding universal values or world heritage values. This incorporates wet tropics rainforests and ancient ancestry with many unique plants and animals, scenic natural beauty, community benefits and rainforest aboriginal country. The WTMA is charged with managing the WTWHA according to Australia's obligations under the World Heritage Convention. The Noah Creek bridge and all work areas (including stockpile and laydown areas approximately 200m to the south of the bridge) are located within the WTWHA. The Daintree National Park borders the northern approaches to the bridge and the Great Barrier Reef Coast Marine Park – Noah Heads Section boundary is approximately 200m downstream of the bridge.

The *Wet Tropics World Heritage Protection and Management Act 1993* provides for the protection and management of the WTWHA. The *Wet Tropics Management Plan 1998* (WT Plan) creates a zoning system where various types of activities are allowed or prohibited. Including the proposed revocation area, the entirety of the works area is with Zone C, a zone which allows for the construction and maintenance of infrastructure, subject to WTMA assessment, and where required, a permit authorising the activity proposed.

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

- Integrity of the Daintree National Park.
- Maintenance of water quality of Noah Creek and subsequent downstream integrity of the Great Barrier Reef Coast Marine Park – Noah Heads Section.
- Amenity of the story places of the Eastern Kuku Yalanji upstream and adjacent to the bridge works area.
- Protected and iconic flora and fauna and habitats of the Wet Tropics World Heritage Area.

5.2.2 Management Plan

Environmental Objective		
To minimise the potential for impacts to the WTWHA, Daintree National Park and Great Barrier Reef Coast Marine Park – Noah Heads Section		
Performance Criteria		
• All works managed in accordance with the *Wet Tropics World Heritage Protection and Management Act 1993* and the *Wet Tropics Management Plan 1998 Plan.* • All works managed in accordance with the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* • All works to comply with conditions of agreements / approvals from any other regulatory authority. • All works to comply with conditions of the WTMA permit. • All works to comply with conditions of the EPBC approval. • No complaints are received from regulatory authorities or the community in relation to the site management of WTWHA heritage items/places/values. • No unauthorised disturbance to and/or removal or destruction to WTWHA heritage items/places/values within the WTWHA.		
Mitigation Measures	**Responsibility**	**Timing**
All personnel must exercise a duty of care, that is, they must take all reasonable and practical measures to ensure their activity does not harm WTWHA heritage items/ places/ values. This includes	All personnel	At all times
If at any time during the activity it is necessary to excavate, relocate, remove or harm a WTWHA heritage find, the activity should cease immediately and the Site Supervisor and Project Manager notified.	All personnel	Immediately on discovery
Upon discovery of a WTWHA heritage find the WTMA and DSC shall be contacted and their advice and agreement sought as to how best to manage the find, to avoid or minimise harm to WTWHA heritage find.	Project Manager	Immediately after notification
Any WTWHA heritage finds are to be managed in accordance with any agreement reached with the QPWS/WTMA delegate or member and their advice sought as to how best to manage the find to avoid or minimise harm to the heritage find. Any agreement reached with QPWS/ WTMA and DSC shall be recorded and documented.	Project Manager	As required
Monitoring	**Responsibility**	**Timing**
Any discovery of WTWHA heritage, will be recorded on an Environment Incident Report Form.	Site Supervisor	Upon identification
Monitor excavations for potential signs of WTWHA heritage.	Site Supervisor	During excavation
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	Project Manager	Following identification
Inform the WTMA and MSC as soon as is practically possible in the event of any WTWHA heritage find or management issue.	Project Manager	Following incident
Inform the WTMA and MSC as soon as practically possible in the event of any WTWHA heritage find or management issue.	Project Manager	Following incident
Corrective Action	**Responsibility**	**Timing**
All complaints relating to WTWHA heritage management issues will be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint

Where investigations identify issues with WTWHA heritage management actions, revision to management plans will be undertaken and further controls implemented, as necessary.	Project Manager	Following investigation
Corrective action will be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

5.3 Cultural Heritage

5.3.1 Aspect

Based on the location of the construction location of replacement bridge alignment on the previous ford crossing, level of existing vegetation disturbance and proposed minimal disturbance of vegetation, it is unlikely that cultural heritage items/places/values will be disturbed. Notwithstanding, the proposed National Park revocation area and riparian verge includes rainforest that will be cleared for the project. In accordance with the Aboriginal and Cultural Heritage Duty of Care Guidelines (currently under review), the works are likely to be classified as Category 5, *Activities causing additional surface disturbance,* as greenfield vegetation clearing will be undertaken in areas not previously subject to surface disturbance. It is therefore likely that Cultural Heritage assessment by appropriately qualified personnel (i.e. representatives of the Eastern Kuku Yalanji will be required during greenfield site clearing of the revocation area, and areas of creek bank.

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

A desktop Cultural Heritage search identified Cultural Heritage site points within a 2 km radius recorded of the project area, the most significant being Noah Creek. However, there are no cultural heritage management plans, designated landscape areas or registered cultural heritage study areas/ sites in the immediate construction locality of the Noah Creek Bridge excepting for the Daintree National Park itself.

5.3.2 Management Plan

Environmental Objective		
To minimise impacts to cultural heritage values, places or items.		
Performance Criteria		
• All works managed in accordance with the *Aboriginal Cultural Heritage Act 2002* and the *Aboriginal and Cultural Heritage Duty of Care Guidelines 2004*. • Works will not compromise the management objectives of the Daintree national Park Management Plan or the Eastern Kuku Yalanji IPA Management Plan • No complaints are received from regulatory authorities or the community in relation to the handling of cultural heritage items/places/values. • No unauthorised disturbance to and/or removal or destruction to cultural heritage items/places/values within the WTWHA.		
Mitigation Measures	**Responsibility**	**Timing**
Site is classified as Category 5 under the current Cultural Heritage Duty of Care guidelines. A suitable qualified person should undertake a cultural heritage assessment of the site	DSC	Prior to construction

All personnel must exercise a duty of care, that is, they must take all reasonable and practical measures to ensure their activity does not harm Cultural Heritage items/ places/ values.	All personnel	At all times
If at any time during the activity it is necessary to excavate, relocate, remove or harm a Cultural Heritage find, the activity should cease immediately and the Site Supervisor and NQCC notified.	All personnel	Immediately on discovery
Vegetation clearing is stop immediately on observance of cultural heritage elements, either by Eastern Kuku Yalanji observers, or by site workers. The affected area is to be immediately flagged, and no further disturbance undertaken until significance of the find has been assessed and a management approach agreed with the relevant party	Site supervisors NQCC	Site clearing
Upon discovery of a Cultural Heritage find, the representative for the local Aboriginal Party for the area shall be contacted and their advice and agreement sought as to how best to manage the find to avoid or minimise harm to the Aboriginal Cultural Heritage.	NQCC Site Supervisor	Immediately after notification
Any Cultural Heritage finds are to be managed in accordance with any agreement reached with the local Aboriginal Party. Any agreement reached with the Aboriginal Party for the area (Eastern Kuku Yalanji) shall be recorded and documented.	NQCC Site Supervisor	As required
Monitoring	**Responsibility**	**Timing**
Any discovery of Aboriginal Cultural Heritage, will be recorded on an Environment Incident Report Form.	Site Supervisor	Upon identification
Monitor excavations for potential signs of Aboriginal Cultural Heritage.	Site Supervisor	During excavation
Reporting	**Responsibility**	**Timing**
All personnel to report incidents to Site Supervisor.	All personnel	At all times
Site Supervisor to notify Project Manager (NQCC) and DSC immediately in in the event of any Cultural Heritage find or management issue.	Site Supervisor	Following incident
NQCC to notify the relevant Eastern Kuku Yalanji representative immediately in the event of any Cultural Heritage find or management issue.	NQCC	Following incident
Inform the DATSIP as soon as is practically possible in the event of any Cultural Heritage find or management issue.	NQCC	Following incident
Record and manage all complaints in a register and corrective actions taken.	NQCC	Following identification
Corrective Action	**Responsibility**	**Timing**
All complaints relating to Cultural Heritage management issues will be investigated promptly and appropriate actions taken.	DSC/NQCC	Upon receipt of complaint
Where investigations identify issues with Cultural Heritage management actions, revision to management plans will be undertaken and further controls implemented, as necessary.	DSC/NQCC	Following investigation
Corrective action will be implemented to meet required outcomes of Administering Authorities.	DSC/NQCC	Where required

5.4 Erosion and Sediment Control

5.4.1 Aspect and Impacts

Soils in the Noah Creek work area varying according to location. Soils on the abutments comprise compacted imported material in the upper horizons and at depth are clay soils derived from mixed alluvium. Within the creek bed upper layers of the stratum are coarse alluvium/cobbles with a geotechnical survey confirming unconsolidated granite derived cobbles to bedrock at approximately 6m below the creek bed. Soils on the northern approach comprise mixed alluvium with a very high degree of exposed granite rock substrate. On the southern side soils are deep alluvium with limited surface rock.

These soils are not dispersive and generally are only vulnerable to erosion when disturbed , e.g. when vegetation is cleared or unconsolidated drainage lines (e.g. previous ford crossing on northern approach).

The coarse pebbly alluvium of the Noah Creek bed is not prone to suspension, with the heavy particles resilient to most creek and tidal flows and is only mobilised during high flow events. Subsequently the instream component of the surface substrates is not considered a high sedimentation risk for construction of access tracks and pads instream. However, the amount of the clay particles in the creek substrate increases with depth, and in deeper horizons pile driving and drilling activities have the potential to generate significant release of finer particles into the creek. An ESCP is fundamental to controlling off site impacts from four construction aspects:

- Vegetation clearing of abutments, of new road approaches, and of the revoked National Park area on the northern approaches in particular.
- Pile driving/foundation activities for the instream piles.
- General vehicle and traffic movement at;
    a) The laydown and machinery storage area approximately 200m south of the works area
    b) Along the new road approach alignments.
    c) Any area off the existing sealed road.
- General construction works on abutments, road alignments etc.

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

It should be noted that proposed construction works instream are within a tidal environment, and that sediment has the potential to be carried *upstream* on an incoming tide. Works and sediment release on an incoming tide has the potential to carried into endangered fish and frog habitats, and into water ways of high cultural significance.

Note that this element also relates to Water Quality Management element of this EMP.

Noah Creek crossing is an extremely high-profile public viewpoint. Any and all ESCP measures will be on public display and open to public scrutiny. Visual amenity is a key WTWHA value and the WTMA will routinely undertake inspections to ensure that as far as is practical within a construction site, that WTWHA values are not compromised.

5.4.2 Management Plan

Environmental Objective
Minimise general off-site impacts of sediment transport from construction and laydown/storage areas through implementing erosion control measures appropriate to the scale and intensity of works, sensitivity of receiving environment and conditions of permits/approvals. Minimise potential for sediment to adversely impact on aquatic environments, including the downstream Great Barrier Reef Coastal Marine Park -Noah Heads Section, and upstream culturally and ecologically significant waterway sections of Noah Creek. Water quality of offsite works area within Noah Creek remains compliant with Water Quality Objectives (WOQ) of the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP Water) with specific reference to: *Daintree and Mossman River Basins Environmental Values and Water Quality Objectives,*
Performance Criteria
• All works are managed in accordance with the International Erosion Control Association *Best Practice Erosion & Sediment Control Guidelines*, the *Environmental Protection (Water) Policy 2019* and any other relevant approval and statutory requirement as per conditions on permits and approvals. • Reference is made to the "Road Maintenance Code of Practice for the Wet Tropics World Heritage Area (2017)"as a guideline for the selection, establishment and maintenance of erosion and sediment control structure. • Water quality objectives as identified under the EPP (Water) are compliant with the maintenance of Environmental Values (EV) as per the *Daintree and Mossman River Basins Environmental Values and Water Quality Objectives (2014)* • No complaints are received from regulatory authorities or the community in relation to erosion and sediment control issues.

Mitigation Measures	Responsibility	Timing
Erosion and sediment control methods shall be implemented in accordance with the International Erosion Control Association's "Best Practice Erosion and Sediment Control Guidelines" prior to commencing earthworks onsite, and then maintained for duration of construction or until site is stabilised to satisfaction of auditing/monitoring requirements. .	NQCC	As required during construction
Specific requirements of the *Wet Tropics Plan 1989* and the "Code of Practice for Maintenance of Roads in the Wet Tropics World Heritage Area" as relevant to all aspects of construction.	NQCC	As required during construction
A site and works specific Erosion and Sediment Control Plan (ESCP) shall be developed prior to disturbance works (e.g. vegetation clearing) occurring. The ESCP shall address (at a minimum): - Laydown and storage areas approximately 200m south of the bridge area. - Any areas off the sealed Cape Tribulation Road utilised for machinery or vehicle movement or as temporary laydown - Vegetation clearing areas of the revocation area, all riparian areas including construction (abutments) and side track access for machinery access to creek bed. - Instream side track, working pad for drilling rig and other temporary water way barrier works.	NQCC	Before commencing earthworks
Sufficient materials shall be available to enable implementation of erosion and sediment controls as required.	NQCC	Before commencing earthworks
Work shall be scheduled to ensure that temporary erosion control works are in place by the end of work each day, especially before weekends, if rain is imminent, or when permanent erosion control works are not in place or feasible.	NQCC	Throughout construction
In the event of extreme weather conditions (e.g. storm events) construction work will cease and the need for additional erosion and sediment control shall be assessed and implemented where required.	NQCC	Throughout construction

Soil and surface stability shall be maintained at all times.	NQCC	Throughout construction
Stockpiles of surfacing material or removed soil, will not exceed 1.5 m in height and shall be covered with geofabric or similar material if not proposed to be utilised within one week.	NQCC	Throughout construction
Stockpiles of soil/rock must not remain in the riparian area of the creek (i.e. within 10m of the high point of the bank) for more than 24hours.	NQCC	Throughout construction
Stockpile of road surface material may only be stored at the designated storage area approximately 200m south of the bridge works area.	NQCC	Throughout construction
Keep the area of cleared land and the period of time areas remain exposed to a minimum.	NQCC	Throughout construction
Keep vehicles to defined access routes. These are to include existing Cape Tribulation Road, and any formed construction access road to the abutment work areas. Access through private property is only by agreement with the relevant landholder.	NQCC	Throughout construction
Rehabilitate cleared areas promptly and progressively wherever possible.	NQCC	Throughout construction
Vegetation is not to be cleared by pushing with machinery. All vegetation within the works area to be cleared (including where clearing is required within the revocation area) will be via chainsaw. Where practical, vegetation root stock shall be retained in the ground after clearing. Where root stock is to be removed it may be grubbed by machinery. Trunks of large trees are to be placed off site in a manner that mitigates further erosion e.g. within adjoining undisturbed vegetation. Other cleared vegetation, is to be mulched and stockpiled for use on exposed areas for additional exposed earth protection and/or for rehabilitation purposes.	NQCC	Throughout construction
Monitoring	**Responsibility**	**Timing**
Undertake routine visual inspections to ensure erosion and sediment control measures are implemented where required.	Site Supervisor	Daily
Undertake ongoing monitoring of weather conditions (including extreme weather) and alerts relevant to the construction area.	Site Supervisor	Daily
Undertake inspections of the effectiveness of erosion and sediment control measures after significant rainfall events.	Site Supervisor	Where necessary
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	NQCC	Throughout construction
Inform firstly DSC, and then the Administering Authority in a timely manner i.e. as soon as practical, in the event of a significant erosion and sediment control issue. A significant issue is one which in which monitored turbidity levels are: a) visually above the surrounding water as a result of obvious point source failure in the ESCP measures, b) natural mass earth movement, e.g. bank slumping, brought by flood events	NQCC/Site Supervisor	Following identification
Corrective Action	**Responsibility**	**Timing**
Appropriate control measures shall be implemented in a timely manner where sedimentation or erosion issues are identified or have the potential to occur in the future.	NQCC	Following identification
Restore eroded areas as soon as is practical following event and repair/install sediment control mechanism. (e.g. rock aggregate, geo-textile and concrete).	NQCC	Following identification
All complaints in relation to erosion and sediment control shall be investigated, and as required, legitimate problems shall be rectified.	NQCC	Upon receipt of complaint

Corrective action shall be implemented to meet required outcomes of Administering Authorities.	NQCC	Where required

5.5 Contaminated Land, Fuel and Hazardous Substances

5.5.1 Aspect

Noah Creek is a pristine Wet Tropics waterway, with an undisturbed upstream catchment, and is critical habitat to endangered fish species relying on migration downstream for annual breeding. Additionally, the Great Barrier Reef Coastal Marine Park – Noah Heads Section, begins approximately 200m downstream of the works area. Further downstream the Noah Creek estuary is at the interface with fringing coral reef and vulnerable to any water contamination. Machinery operating on site presents a risk to the environment through potential for oils, grease, fuels and other contaminants to be accidentally released during construction.

A search of the Environmental Management Register and the Contaminated Land Register (EMR/CLR) was undertaken the locality. There are no sites included on the EMR or CLR register.

This may occur as the result of fuel/oil or other contaminant spills within the riparian area, or in areas with drainage lines discharging directly (or indirectly) into Noah Creek. An additional risk is posed by pile drilling equipment on pads within Noah Creek, with the potential for accidental direct discharge into the creek.

Management and mitigation of these risks are addressed in this section.

This section also relates to Water Quality Management.

5.5.2 Management Plan

Environmental Objective		
Safely manage the potential risks to existing WTWHA values, including adjacent Daintree National Park and downstream Great Barrier Reef Marine Park, from activities that involve the operation of machinery and use and storage of fuel and hazardous materials during construction.		
Performance Criteria		
• Fuel and hazardous substances used on site are used in accordance with AS1940 -the storage and handling of flammable and combustible liquids. • No leakages of hydraulic fluids into the aquatic or terrestrial environment. • No spills of fuels, oils or other hydrocarbons into the aquatic or terrestrial environment. • No complaints are received from regulatory authorities or the community in relation to the spillage/leakage from the drilling operations into the environment. • No disturbance to and/or disposal of hazardous waste within the WTWHA. • Water quality monitoring identifies no evidence of hydrocarbons or other contaminants at any time during the construction in any part of Noah Creek.		
Mitigation Measures	**Responsibility**	**Timing**
Where possible, minimum quantities of hazardous substances necessary for the project shall be used on site. Bitumen/asphalt/road surfacing material can only be stored in the designated area approximately 200m south of the bridge.	NQCC	Where possible throughout construction
All mobile equipment shall be refuelled and maintained off-site.	NQCC/Site Supervisor	As required

An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at the site. This includes a spill kit that is to include air boom and fuel and oil absorbent boom to be available on the drill rig pad instream at all times.	NQCC/Site Supervisor	At all times
Records shall be kept on chemicals and dangerous goods used during construction.	NQCC	Throughout construction
First aid and firefighting equipment (hand held extinguishers and fire hoses) shall be available at the construction site.	NQCC	At all times
Construction workers operating vehicles on-site to be appropriately trained and licensed, so that these vehicles are operated in a safe and appropriate manner. All vehicle operators to be briefed on locations of maintenance, storage and refuelling areas.	NQCC	During induction
All relevant staff shall be trained in appropriate handling, storage and containment practices for chemicals and dangerous goods to be utilised during construction.	NQCC	During induction
No fuel or hazardous substances are to be stored within riparian areas or within 10m of the high point of any drainage line. All such substances are only to be stored at the designated area approximately 200m south of Noah Creek. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including: • *Dangerous Goods Safety Management Act 2001* • Regulatory requirements • Safety Data Sheets (SDS) requirements. SDS for products kept on site shall be readily available.	NQCC	At all times
Ensure that the appropriate personnel undertake adequate environmental awareness training covering the requirements of this CEMP, regarding safe working procedures around hazardous materials and identification of contaminated land indicators.	NQCC Site Supervisor	During induction
Any disposal to ensure potential contamination does not occur onsite, including wastewater. Appropriate legal waste disposal offsite.	NQCC Site supervisor	Throughout construction
Monitoring	**Responsibility**	**Timing**
Visual inspections of site to ensure no oil leaks, hydraulic fluid leakages or fuel leakages/spills of any other hazardous material.	Site Supervisor	Throughout construction
An incident register shall be maintained which includes corrective actions undertaken and persons notified.	NQCC Site Supervisor	Throughout construction
Reporting	**Responsibility**	**Timing**
Any environmental incidents involving spills shall be reported by all personnel, and recorded by Site Supervisor including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel Site Supervisor	Following incident
Inform the Project Manager (NQCC) immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Project Manager (NQCC) to inform DSC immediately of receipt of report of any notifiable incidents of potential or actual environmental harm.	NQCC	Following incident
Where warranted DES Pollution Hotline (1300 130 372) or the local office shall be contacted as soon as practicable after becoming aware of any release of contaminants.	NQCC	When required
Corrective Action	**Responsibility**	**Timing**
All complaints relating to fuels, chemicals or hazardous material use shall be investigated promptly and appropriate actions taken.	NQCC	Upon receipt of complaint

Disposal of contaminated soil (small or large quantities) shall be disposed of in accordance with relevant regulations.	NQCC	Following incident response
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	NQCC	Where required
Spills to be remediated depending on nature of product (Site Supervisor to advise correct procedure). Immediate action should include: • Small hydrocarbon spill (terrestrial): apply absorbent material. • Large hydrocarbon spill: install containment (e.g. block drains, surround with sandbags, dig earthen bund) and apply absorbent material. • Chemical spill: application of appropriate absorbent material and containment. • Aquatic spills: implement spill kit with appropriate air boom and oil and fuel absorbent boom immediately.	NQCC/Site Supervisor	Following incident
In the event of a spill of dangerous goods, work procedures and control measures shall be reviewed to ensure they are fit for purpose and revised where necessary.	NQCC	Following incident where required
In the event of an environmental incident, corrective or remedial action shall be taken as is required to render the area safe and avoid or minimise environmental harm.	NQCC	Following incident where required

5.6 Waste

5.6.1 Aspect and Impacts

Waste will be generated on site as a result of construction activities. This includes construction waste (steel, packaging, plastics, etc.) and personnel waste (sewerage, general rubbish). Waste materials are to be managed and disposed of in such a way as to avoid land contamination, maintain visual amenity and to reduce the proclivity of waste from attracting fauna and pest species animals.

5.6.2 Management Plan

Environmental Objective		
To prevent or minimise the generation of wastes and to appropriately contain, control and dispose of all waste generated.		
Performance Criteria		
• No complaints are received from regulatory authorities or the community in relation to waste issues. • All works are managed in accordance with the *Waste Reduction and Recycling Act 2011* and *Environmental Protection Act 1994*. • No uncontrolled waste or litter observed on site. • Appropriate storage and disposal of waste evident on site.		
Mitigation Measures	**Responsibility**	**Timing**
Adopt the waste management hierarchy (i.e. avoid, re-use, recycle, energy recover and disposal).	NQCC	Where practicable
Waste materials shall be contained on site in appropriate containers. Organic and general domestic waste containers are to be sealable and the waste storage/collection is to be fenced and secured from wildlife accessing the organic waste.	Site Supervisor	At all times
General housekeeping shall be undertaken on an ongoing basis to keep site clean.	Site Supervisor	Daily

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

5.7 Vegetation

5.7.1 Aspect and Impacts

The vegetation with the construction area is mapped as Category B regulated vegetation with a conservation and biodiversity management status as ”endangered” under the provisions of the *Vegetation Management Act 1999*. The vegetation to be cleared represents a vegetation type (complex mesophyll vine forest) which has less than 10% of the original pre-clearing extent of this vegetation type remaining in the Wet Tropics. Clearing of endangered vegetation for the Noah Creek bridge replacement works is considered to be ‘development ’under the provisions of the *Planning Act 2016* and is subject to a range of Development Approval conditions. Vegetation clearing is also

subject to conditions by the Wet Tropics Management Authority, Department of Environment and Science, and Department of Natural Resources and Mines, and Department of Fisheries (marine plants).

All remnant native vegetation within the bridge works construction area is identified as "essential habitat" for a variety of protected flora and fauna, including endangered frogs, birds and provides resources to a number of known and recorded threatened flora species. Vegetation clearing will impact on eight protected flora species, with more than 50 individuals (of all species) within the proposed road and bridge alignment footprints. An additional species is classified as a protected marine plant. Refer Table 1. Salvage for protected species is, in most instances, not able to be achieved owing to the size of the plants involved. Salvage may be possible for three species as identified in the following Management Plan Element.

This EMP management element will be updated prior to construction when final conditions on approvals from all agencies are available. This EMP management element also relates to Fauna and Water Quality and World Heritage Values

5.7.2 Management Plan

Environmental Objective		
To minimise disturbance to vegetation and surrounding ecosystems in order to maintain environmental quality and natural values of the surrounding areas.		
Performance Criteria		
• No complaints are received from regulatory authorities or the community in relation to flora and fauna management. • All works are managed in accordance with the *Wet Tropics Plan 1998, Nature Conservation Act 1992, Vegetation Management Act 1999, Fisheries Act 1994* and any other relevant legislation and regulatory requirements. • Salvage of protected flora species, where practical, has been undertaken prior to construction. • All works to comply with conditions on WTMA permit and any other regulatory approval or agreement. • Vegetation clearing is restricted to only the minimum as required for the safe construction and operation of the bridge and associated infrastructure.		
Mitigation Measures	**Responsibility**	**Timing**
NQCC to engage the local Rainforest Rescue Nursery (https://www.rainforestrescue.org.au/page/90/daintree-rainforest-plant-nursery) to undertake salvage of the following: • *Noahdendron nicholasii.* Cuttings to be taken of new growth and shoots of both small trees to be removed on northern abutments. • *Endiandra microneura.* Seedlings and fruit (if present), to be removed from clearing areas where seedlings are small enough to survive transplanting. • *Acrostichum speciosum:* Mangrove ferns on the bed and banks of the works area of Noah Creek to be removed from clearing areas. • Any other fallen fruit, seeds or seedlings deemed to be salvageable by Rainforest Rescue to be collected and propagated at their community nursery for future revegetation. • Orchids on a large tree of *Xanthostemon chrysanthus* on the southern abutments to be recovered following clearing and removed to a suitable location within the riparian zone of Noah Creek. Options: • Cuttings and seedlings can be taken to the Rainforest Rescue Nursery for propagation and replanting as part of the revegetation program. • Seedlings and whole plants may be relocated directly from the clearing to a suitable location nearby, mangrove ferns may be relocated immediately downstream on the banks of Noah Creek. Orchids to be relocated to	NQCC	Prior to clearing.

riparian areas adjacent bridge works.		
The area of vegetation to be removed shall be demarcated by bunting/site tape and restricted to the minimum area required for the safe construction of the bridge and road works.	NQCC	Prior to works commending on site
Vegetation on the northern abutments/approaches is within the Eastern Kuku Yalanji ILUA. The relevant Aboriginal Party is to be engaged to provide cultural heritage observers for any clearing within riparian areas of Noah Creek, and for all vegetation on the northern bank and new road alignments.	DSC NQCC	Prior to works commending on site
Vegetation is not to be cleared by pushing or excavation with machinery e.g. using excavators. Taller vegetation is to be directionally hand felled by chainsaw into the construction areas to avoid damage to vegetation in the Daintree National Park and elsewhere in the WTWHA. It is acknowledged that rootstock in the ground where earthworks and foundations are to occur may be grubbed by machinery with appropriate erosion control measures in place.	NQCC	Site clearing
Larger vegetation is to be sawn to manageable lengths and placed away from the construction area but in the locality of the road/bridge works and allowed to naturally decompose. If the vegetation is in a locality that is readily accessible to commercial mulchers, then the vegetation may be mulched and the woodchips used on the construction site in a manner that provides additional erosion and sediment transport mitigation properties.	NQCC Site supervisor	Site clearing
Waste vegetation is not be burnt and is to be disposed of in the manner above. This excludes non-native species, which are to be mulched and removed and disposed of off-site in accordance with DSC green waste disposal procedure. Mulched non-native species may contain propagules that could germinate if returned to the environment.	NQCC Site supervisor	Site clearing
Vegetation clearing is to stop immediately on observance of cultural heritage elements, either by Eastern Kuku Yalanji observers, or by site workers. The affected area is to be immediately flagged, and no further disturbance undertaken until significance of the find has been assessed and a management approach agreed with the relevant party.	Site supervisor, NQCC	Site clearing
Vegetation waste or any type is not to be left within Noah Creek or drainage lines. Fallen trees, branches, shrubs are to be removed from all waterways and to be disposed of in similar manner to other cleared vegetation.	Site supervisor,	Site clearing
Machinery that has recently been used in earthworks/vegetation clearing in a biosecurity restricted zone is to have an approved biosecurity/weed hygiene certificate.	Site supervisor, NQCC	Site clearing
Stockpiles of mulch/fallen material shall be located away from any drainage areas in existing cleared areas and are not to be placed against trees adjacent the works area. Stockpiles are to be temporary only within the riparian areas (i.e. within 10m of the high point of the bank of any waterway), and are to removed to the accepted laydown/storage area if to be retained for future revegetation works within 48hrs of mulching.	Site Supervisor	Site clearing
All machinery generally to be washed down prior to clearing operations. This extends to chainsaws and small vehicles (bobcats, dingos and similar vehicles) accessing the site for the first time. Washdowns are to occur prior to mobilising to Noah Creek, south of the Daintree River, and will not be undertaken within the works site or laydown/storage area.	Site Supervisor NQCC	Prior to works commending on site
A revegetation program is to implemented following the demolition and removal of the old bridge. NQCC will engage Rainforest Rescue and the local community nursery in the revegetation of all works area post construction of the new bridge and the removal of the old bridge.		

Monitoring	Responsibility	Timing
Ensure delineation bunting is maintained and vegetation beyond this bunting is not disturbed.	Site supervisor	Daily
Ensure no vegetation remains in the creek during clearing operations.	Site supervisor	Daily
Undertake routine visual inspections of all erosion and sediment control measures.	Site supervisor	Daily
Ensure that disposal and distribution of waste vegetation material does not adversely impact on adjacent Daintree National Park.	Site supervisor	During clearing
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Any large tree fall during clearing operations into the National Park or vegetation areas outside the demarcated works area that result in significant damage, e.g. broken canopy trees, to be reported to the site supervisor and	All personnel	During clearing
Inform the Administering Authority (WTMA/DES) in a timely manner in the event of a significant environmental management issue, e.g. vegetation clearing operations impact on the Daintree National Park.	Site Supervisor, DSC, NQCC	Following identification
Corrective Action	**Responsibility**	**Timing**
All complaints shall be investigated promptly and appropriate actions taken.	NQCC	Upon receipt of complaint
Where investigations identify clearing exceeding that approved for construction, or damage to the adjacent NP as a result of clearing, revision to management plans shall be undertaken and further controls implemented, as necessary.	NQCC	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	NQCC	Where required

5.8 Fauna

5.8.1 Aspect and Impacts

There are confirmed records for three threatened frog species occurring within or immediately adjacent the Noah Creek bridge works area. Two species (*Litoria dayii* and *Litoria rheocola*) were recorded in studies for this project as occurring in the section of the eroded ford approximately 100m to the north of Noah Creek, in the road footprint realignment. A third species, *Litoria nannotis,* has been identified within the permanent creek crossing the road approximately 110m to the north of Noah Creek and immediately adjacent the road realignment area (but was not observed in the actual works footprint). These species have a high likelihood of occurrence elsewhere in sheltered gullies and drainage lines, particular the larger eroded ford approach on the northern side of Noah Creek that has a persistent ephemeral flow during the wet season or after rainfall. This gully is within the altered road alignment to the northern approach of the new bridge.

Two threatened bird species: MacLeay's fig-parrot and Southern cassowary occur within the works area and at least two threatened mammal species (Spotted-tail quoll and spectacled flying fox) are also known to occur. Instream aquatic fauna are particularly vulnerable to potential impacts. Estuarine crocodiles are known both upstream (an approximate 3m male) and downstream of the Noah Creek bridge (approximate 4.3m female), and both are regularly sighted either side and under the bridge. Noise is likely to deter them during the day, however with the cessation of activity they will investigate the works area. They have previously done so during bridge reinforcement works.

The key instream aquatic fauna at risk are two threatened goby (fish) species that require access to the sea as part of their breeding life cycle. Both these gobies are resident in pools immediately upstream of Noah Creek, and construction works, including temporary waterway barriers, have the potential to interrupt their annual movement cycle which begins with spawning during the drier months September to December and larval dispersal at the onset of the wet season (Dec/January). A number of other fish species recorded, while not listed as threatened, also have marine life cycles and will require access through the bridge construction area as either juveniles or adults at different stages of their life cycles.

The highest risk of impact for all species is during the construction phase, with noise from vegetation clearing, machinery, traffic movement and human presence deterring Cassowaries (and most other fauna) from utilising this area.

This element relates to all other elements in this EMP.

5.8.2 Management Plan

Environmental Objective
To minimise disturbance to vegetation and surrounding ecosystems in order to maintain environmental quality and natural values of the surrounding areas. To ensure no adverse impacts on watercourses traversing the northern road approach, known habitat for three endangered frog species. To ensure water quality of Noah Creek and tributaries remains commensurate with the maintenance of habitat requirements for aquatic fauna species. To ensure that breeding cycles of threatened aquatic fauna are not adversely impacted by waterway barrier works during construction. To minimise risk to fauna generally during the construction of the bridge and road approaches.
Performance Criteria
• No complaints are received from regulatory authorities or the community in relation to flora and fauna management. • No more than 50% of the low flow bed of Noah Creek is at any one time occupied by water way barriers. • All works are managed in accordance with the *Wet Tropics Plan, Nature Conservation Act 1992, EPBC Act,* and any other relevant legislation. • All works to comply with conditions on WTMA permit and any other regulatory requirements. • Habitat disturbance is minimised to only the minimum as required for the safe construction and operation of the bridge replacement project. • Water quality monitoring results are commensurate with the Water Quality Objectives of the EPP (Water) 2009 for the Daintree/Mossman River Catchments for the maintenance of listed Environmental Values. • No adverse impact is noted on any waterways/drainage line traversing the road approaches north and south of Noah Creek. • No sediment from clearing and earthworks enters Noah Creek or tributaries or is carried off the construction site by overland flow. • No fauna deaths or injuries occur at any stage during the construction project.

Mitigation Measures	Responsibility	Timing
Waterway barrier works are to comply with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works, October 2018,* Department of Agriculture and Fisheries Operational Guidelines.	NQCC	At all times
Waterway barrier works, including side tracks, drilling pads access and scour protection, are not to occupy more than 50% of the low flow channel of Noah Creek at any time.	NQCC	At all times

Where access ramps to the piling rig pad are constructed through the low flow channel, culverts must be installed in accordance with the requirements of the *Accepted development requirements for operational work that is constructing or raising waterway barrier works, October 2018* in order not to obstruct fishway passage at any time through the low flow channel.	NQCC	At all times the access ramp is in place.
Permanent tributaries of Noah Creek on the northern approaches adjacent to the works area are to have appropriate erosion and sediment controls that will mitigate the risk for sediment impacts on these waterways.	NQCC	Prior to vegetation clearing and earthworks.
Venomous snakes and Cassowaries will be encountered. Staff are not to handle snakes and are to be removed to a safe location away from construction only by a qualified snake handler. All staff shall be inducted into strategies for dealing with the local cassowaries by NQCC/Site Supervisor or delegate.	All project staff	At all times
There is to be no construction traffic using local roads between the hours of 6 pm and 6 am to avoid risk of road kill/injury.	Site Supervisor	At all times
Feeding of animals or interfering with animals shall not be permitted.	All project staff	At all times
Prohibit domestic pests and animals on the site during construction.	NQCC Site Supervisor	Throughout construction
Blasting of hard rock material (granitic boulders) will not be undertaken and percussive drilling or similar machine rock breaking only will be permitted.	NQCC	Throughout construction
Ensure that all erosion and sediment control mechanisms are in place that reduce the risk of off-site transport of sediment into gullies and drainage lines.	Site Supervisor	Throughout construction
Any excavation pits are not be left open overnight, but are to be covered at the end of each to ensure wildlife is not trapped in any pit. For pits over 50cm deep a fauna ladder (e.g. tree branch) should be left in the pit as a means of escape for any fauna that enters a covered pit.	Site Supervisor	Throughout construction
Do not leave food waste scraps or any other waste that is likely to attract wildlife. All putrescible waste is to be placed in bins that are sealable and removed from site as soon as practical.	Site Supervisor	Throughout construction
Delineation bunting to be used to demarcate habitat areas that are not to be disturbed (i.e. vegetation that is not be cleared) and is to be placed prior to work commencing on site.	NQCC Site Supervisor	Prior to works commencing on site
Groves of dense vegetation, e.g. Calamus (wait-a-while) clumps, may provide shelter and resources to small mammals, birds and other fauna. Prior to removing these an accredited fauna spotter/catcher should examine these for any fauna present, and relocate fauna as appropriate. Similarly, any taller trees with a potential as nesting/roosting for fauna should be examined by an accredited fauna spotter/catcher prior to clearing.	NQCC Site Supervisor	Prior to works commending on site and during clearing.
Waterways and drainage lines are known habitat to endangered frogs. Prior to vegetation clearing and earthworks in these areas an accredited fauna spotter/catcher should survey these locations and relocate individuals to a secure location.	NQCC Site Supervisor	
In the event that breeding animals are located during clearing operations, clearing will cease until QPWS/DES are notified and further direction received from the regulatory authority.	Site Supervisor NQCC	Prior to works commending on site and during clearing.
Should any animals be encountered, injured or nests discovered, works shall cease and the Site Supervisor be notified immediately.	Site Supervisor	As required
In the event that any fish kill or aquatic life is noted as injured or dead, then any instream works will cease until the cause of the injury or mortality is located (where possible).	Site Supervisor	On identification

In the event that injury to native fauna occurs, where practicable, it shall be transported to a local veterinary clinic, wildlife carer or reported to local Queensland Parks and Wildlife Services (QPWS) for advice/action. Contact numbers are: • RSPCA Queensland: 1300 264 625 (for reporting injured or orphaned wildlife) • Daintree Wildlife Rescue: (07) 40980 7284 (for reporting injured or orphaned wildlife).	Site Supervisor	As required
Monitoring	**Responsibility**	**Timing**
Ensure vegetation clearing delineation bunting is maintained and vegetation beyond this bunting is not disturbed.	Site Supervisor	Daily
Undertake routine visual inspections of all erosion and sediment control measures.	Site Supervisor	Daily
Undertake routine inspection of all riparian and instream areas during construction in these areas for any obvious signs of aquatic impacts, e.g. sedimentation, contaminants, fish kill/injury, vegetation in the water etc.	Site Supervisor	Daily
Ensure that disposal and distribution of waste vegetation material does no adversely impact on adjacent National Park.	Site Supervisor	During clearing
Water quality monitoring and reporting is undertaken in accordance with the Water Quality Monitoring program.	Site Supervisor	At all times
Check any excavated pits for presence of fauna each morning	Site Supervisor	Daily
Fauna/spotter catcher to be responsible for fauna site clearance prior to construction of vegetated habitats and drainage lines/gullies.	Site Supervisor NQCC	Daily
Reporting	**Responsibility**	**Timing**
All personnel to report incidents involving wildlife interactions where the animal is observed to be injured, distressed, trapped or deceased. This includes observations on instream fauna (e.g. fish, reptiles).	All personnel	At all times
Any vegetation clearing during construction resulting in significant damage, outside the demarcated area e.g. tree falls into the adjoining National Park to be reported to DSC and NQCC.	Site Supervisor	During clearing
Record and manage all wildlife interactions in a register and corrective actions taken. This will include spotter catcher reports documenting any wildlife identified during clearing, (if required) and measures deployed to minimise impacts.	Site Supervisor	Throughout construction
Inform the relevant Administering Authority immediately in the event of any contravention of a condition on an approval/permit issued by that Administering Authority.	NQCC DSC	Following identification
In the event of any environmental incidence arising from conditions not as a result of construction works (storm events, floods, vehicle accidents in works area), these are to be reported to the DSC as Project Manager. Where these impact on WTWHA then DSC is responsible as permit holder to report to WTMA and any other regulatory authority.	Site Supervisor NQCC DSC	Following identification
Corrective Action	**Responsibility**	**Timing**
All complaints shall be investigated promptly and appropriate actions taken.	NQCC	Upon receipt of complaint
Where significant mortality or injury to fauna has occurred to fauna of conservation significance, e.g. Cassowary, fire gobies, then activity in the affected area resulting in the incident will cease until actions agreed with regulatory agencies and DSC have been implemented.	NQCC	Following identification

Where investigations identify environmental nuisance or potential to harm fauna, revision to management plans shall be undertaken and further controls implemented, as necessary.	NQCC	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities generally in the event of any report on injury/mortality to fauna, or impact on their habitats outside of the demarcated disturbance area.	NQCC DSC	Where required

5.9 Weed and Pest Management

5.9.1 Aspect and Impacts

The private freeholding on the southern bank of Noah Creek is an existing major vector for non-native species (previously being a grazing area and an exotic fruit orchard) and it is considered likely that the bridge replacement and road realignment works could introduce additional exotic species or create favourable habitat conditions for weeds and pests.

There is a high potential for the introduction of major environmental weeds (e.g Miconia/Mikania) or fauna pests (electric ants/yellow crazy ants) with machinery or equipment that may have been in contact with problematic infested areas elsewhere in North Queensland. Electric ants and yellow crazy ants are a biosecurity risk in North Queensland. All machinery and construction equipment must be inspected prior to arrival on site for evidence of electric ants or yellow crazy ants.

It is necessary to implement a weed and pest hygiene management plan that includes washdown of earthworks vehicles prior to accessing the electric ants work site and a pest (weed and fauna) monitoring and eradication program (for invasive species) in the construction EMP. Site rehabilitation is an important element in the management of weeds post construction.

Sites suitable for rehabilitation (e.g. riparian abutment works area) are to be identified and a site rehabilitation plan that includes active and passive revegetation/rehabilitation is to be developed prior to construction and implemented on a staged basis during construction. This EMP includes a list of species that are considered to be representative of the bridge and road realignment areas suitable for use in rehabilitation/revegetation. This includes species that may be salvaged pre-clearing.

5.9.2 Management Plan

Environmental Objective		
Avoid and effectively manage potential impacts associated with weeds and pests.		
Performance Criteria		
• No introduction or spread of new (declared) weeds and pests. • No electric ants or yellow crazy ants become established on site • No complaints are received from regulatory authorities or the community. • Works undertaken in accordance with the DSC Biosecurity Management Plan and *Biosecurity Act 2014.* All requirements of the WT Plan and supplementary guidelines to be enacted • All earth moving machinery (including tip trucks) to have a certified weed hygiene certificate issued by an authorised person/department.		
Mitigation Measures	**Responsibility**	**Timing**
Minimise water ponding or build up on-site to reduce the likelihood of providing suitable environments for mosquito breeding.	Site Supervisor	At all times
All vehicles, construction machinery and materials are to examined for electric ants or yellow crazy ants prior to arrival at site, preferably before crossing the Daintree River or at an inspection site nominated by DSC/Biosecurity Australia.	NQCC	At all times

Mulched vegetation material containing propagules (seeds/stems/fruit) of introduced species is not to be used as mulch for soil stabilisation or revegetation purposes but removed to a location where it will no impact on the Daintree National Park and WTWHA.	Site Supervisor	During clearing operations
Food scraps to be disposed of into bins with closed lids and removed from site regularly to minimise vermin infestations.	All personnel	At all times
If fill is required to imported, only clean imported fill with a weed-free certificate can be used on site.	NQCC	Where appropriate
Vehicles arriving on site from known and potential weed infested areas must, prior to arriving at site, undergo vehicle checks or wash down procedures preferably before crossing the Daintree River or at a weed washdown site nominated by DSC/ Biosecurity Australia.	NQCC	At all times
Any weed infestation shall be treated at earliest stage while small and manageable. If chemical treatment is required, chemicals may be used only in accordance with manufacturer's specifications.	Site Supervisor	At all times
Monitoring	Responsibility	Timing
Weeds – Weekly site inspection of site to identify any Queensland weed Classes 1 to 3 under the *Biosecurity Act 2014.*	Site Supervisor	Throughout construction
Electric ants– Weekly site inspection of the site including ant nests, random vehicles and equipment to locate any electric ants.	Site Supervisor	Throughout construction
Yellow crazy ants – Weekly site inspection of the site including ant nests, random vehicles and equipment to locate any crazy ants.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents	All personnel	At all times
All infestations of biosecurity matters, including yellow crazy ants, electric ants and weed pests in Classes 1 – 3, are to be reported to NQCC, DSC and DAF on 13 25 23.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	NQCC	Throughout construction
Corrective Action	Responsibility	Timing
All complaints relating to weeds or pest issues shall be investigated promptly and appropriate actions taken.	Project Manager	Upon receipt of complaint
Where investigations show restricted/declared weeds, and pests present, revision to management plans shall be undertaken and further controls implemented, as necessary. Controls may include use of contracted licensed weed eradicator or pest exterminator.	Project Manager	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities permit and approval conditions, or as a result of direction received following notification.	Project Manager	Where required

5.10 Air Quality

5.10.1 Aspect and Impacts

Dust and fumes are an aspect of the project with the potential to impact on key receptors adjacent to and within the works area. The Noah Creek Forest EcoStay is located on freehold land to the south of the Noah Creek bridge, adjacent the esplanade reserve. This large property includes commercial accommodation via lodges and camp sites, day use tourism facilities, and a commercial orchard on the eastern side of the road. The closest infrastructure to the bridge works area is the Noah Creek

Forest Eco-Stay administration centre and car park, approximately 60m from the bridge site works area. Air quality has the potential to be adversely impacted by construction activity expected to extend over at least a 180 day period.

A number of sensitive native plants e.g. filmy ferns, seedlings and groundcovers, are vulnerable to smothering by dust.

5.10.2 Management Plan

Environmental Objective		
To prevent fumes and other atmospheric emissions generated by construction activities (including traffic movement) from causing a hazard or nuisance to the environment and sensitive receptors adjacent the works, particularly visitors and residents of the Noah Creek Forest EcoStay. To prevent degradation of environmental values within the WTWHA, notably smothering of vulnerable flora species adjacent works area.		
Performance Criteria		
All works are managed in accordance with the *EP Act* and the *Environmental Protection (Air) Policy 2008.* No complaints are received from regulatory authorities or adjacent landholders in relation to dust and fumes impacts No dieback of understorey/ground cover species noted in adjoining vegetated areas, including the Daintree National Park. No visible dust accumulation in pools of Noah Creek, watercourses or other drainage features.		
Mitigation Measures	**Responsibility**	**Timing**
Ensure equipment is properly serviced, with records provided. If excessive exhaust fumes are observed to be emitted, vehicles to be shut down and maintenance check undertaken offsite.	Site Supervisor	Throughout construction
Burning or incineration of waste is not permitted onsite.	Site Supervisor	At all times
When not in use, vehicles and other onsite equipment are to be turned off.	Site Supervisor	Throughout construction
The speed of vehicles on access roads to comply with all speed limits, and off site limited to speeds set by the Construction Managers.	NQCC Site Supervisor	Throughout construction
Ensure water trucks are used, if necessary, along access roads, laydown areas and within construction areas.	NQCC Site Supervisor	Where necessary
Disturbed areas, including working areas shall be stabilised as soon as possible.	NQCC Site Supervisor	Throughout construction
Monitoring	**Responsibility**	**Timing**
Undertake visual inspections / observations of site during day to day works, to identify problem areas and where corrective action is needed. This includes watercourses, drainage lines and adjacent vegetation.	Site Supervisor	Daily
Dust monitoring recorders to be implemented adjacent residence on Intake Access road and records to be kept and maintained of all dust emissions in this locality.	Site Supervisor	Daily
Reporting	**Responsibility**	**Timing**
All personnel to report incidents.	All personnel	At all times
Record and manage all complaints in a register and corrective actions taken.	NQCC	Throughout construction

Corrective Action	Responsibility	Timing
Appropriate control measures as identified in this EMP shall be implemented in a timely manner where nuisance dust and other air quality issues are identified.	NQCC	Following identification
Dust accumulation on groundcovers and adjoining vegetation is to be washed down within the Daintree National Park.	NQCC Site Supervisor	Following identification

5.11 Noise and Vibration

5.11.1 Aspect and Impacts

Noise and vibration are likely to be an issue to the Noah Creek Forest EcoStay located on freehold land to the south of the Noah Creek bridge, adjacent the esplanade reserve. This large property includes commercial accommodation via lodges and camp sites, day use tourism facilities, and a commercial orchard on the eastern side of the road. The closest infrastructure to the bridge works area is the administration centre and car park, approximately 60m from the bridge site works area. Noise and vibrations from construction will arise from the following:

- General earthmoving and construction machinery activity.
- Pile driving works within Noah Creek.
- Percussive drilling to break down large rock material.
- General construction personnel movement and noise.

The above activities will impact on the Noah Creek Forest EcoStay with varying intensities at different times during construction. Noise and associated vibration, particularly from percussive drilling and pile driving foundation works, will impact on terrestrial wildlife and on local aquatic fauna. Noise from vegetation clearing, machinery, traffic movement and human presence will deter Cassowaries (and most other fauna) from utilising the work area during construction.

5.11.2 Management Plan

Environmental Objective		
To minimise noise impacts and vibration from construction activities on the Noah Creek Forest EcoStay Lodge. To limit the adverse impact of noise and vibration from construction, particularly percussive drilling and pile driving, on wildlife around the construction area and instream.		
Performance Criteria		
• All works are managed in accordance with the EP Act and the Environmental Protection (Noise) Policy 2008. • No complaints are received from regulatory authorities or the community in relation to noise and vibration issues. • Noise limits, timing and duration are within • Noah Creek Forest EcoStay Lodge remain informed at all times of works program.		
Mitigation Measures	**Responsibility**	**Timing**
Management of the Noah Creek Forest EcoStay Lodge are to be provided with a work program with the timing, extent/location and duration of construction activities. NQCC as Construction Manager are to ensure construction is compliant with the work program. Any deviation to the work schedule/program is to be communicated immediately to the management of the Lodge as affected adjoining landholders.	NQCC DSC	Prior to construction and as required when work program is amended.
Where possible, plant with the lowest noise rating which meets the requirements of the task shall be selected.	NQCC	Throughout construction

Construction activities are to be undertaken during normal construction hours, (e.g. 6.30 am to 5.30 pm, Monday to Friday).	NQCC	Throughout construction
Equipment will be switched off when not in use if safe to do so.	Site Supervisor	When not in use
Provide appropriate hearing protection to all workers if noise levels exceed the 85 dBA limit for protection of workers health.	NQCC	As required during construction
Where possible, time obtrusive construction activities such as percussive drilling, to times that minimise noise impacts to Noah Creek Forest EcoStay. E.g. at times of commercial visitation by lunch groups to the lodge.	NQCC Site Supervisor	Throughout construction
All vehicles and equipment to be maintained in good working order and serviced according to manufacturer's recommendations to avoid unnecessary nuisance.	Site Supervisor	Throughout construction
Site induction training to advise personnel of requirements to limit unnecessary revving of engines, engine braking and to exercise due courtesy of local residents, accommodation premises and other workers.	NQCC Site Supervisor	During induction
Monitoring	Responsibility	Timing
Records of plant maintenance shall be kept on-site and/or with plant.	Site Supervisor	Throughout construction
Operators shall undertake and log daily pre-start checks to ensure equipment is well maintained.	Operators and Site Supervisor	Daily
Undertake daily observations during construction as to the effectiveness of noise control measures and the control of excessive noise.	Site Supervisor	Daily
In the event of any complaint, noise monitoring equipment to be installed as per installation	NQCC	As required
Reporting	Responsibility	Timing
All personnel to report complaints received and any obvious noise effectss.	All personnel	At all times
Noise monitoring results (if required to be undertaken) is be reported by NQCC to DSC	NQCC DSC	
Record and manage all complaints in a register and corrective actions taken.	Site Supervisor NQCC	Throughout construction
Corrective Action	Responsibility	Timing
All complaints shall be investigated promptly and appropriate actions taken.	NQCC	Upon receipt of a complaint
If noise monitoring found to be excess of Environmental Protection (Noise) Policy 2008, then corrective action to remedy source problem to be undertaken	NQCC DSC	Where required
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	Project Manager	Where required

5.12 Emergency Response

5.12.1 Aspect and Impacts

On any construction project there is potential for an emergency situation to occur, such as fire, chemical release, spill, leak, snake bite, equipment failure or any other likely emergency. The Noah Creek bridge project also has the potential for wildlife interactions (snakes, Cassowaries and

crocodiles) that may require an emergency response. All emergency situations have the potential to cause damage/injury/impact to personnel and environment.

5.12.2 Management Plan

Environmental Objective		
For project personnel to respond effectively and efficiently in the event of an emergency associated with the construction of the Noah Creek replacement bridge and road realignment.		
Performance Criteria		
• Emergency plans for construction developed prior to commencement of works on site. • All personnel familiar with emergency procedures and their role in the event of an emergency.		
Mitigation Measures	**Responsibility**	**Timing**
An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at the site. This includes a spill kit that is to include air boom and fuel and oil absorbent boom to be available on the drill rig pad instream at all times.	NQCC/Site Supervisor	At all times
Records shall be kept on chemicals and dangerous goods used during construction.	NQCC	Throughout construction
First aid and firefighting equipment (hand held extinguishers and fire hoses) shall be available at the construction site.	NQCC	At all times
Construction workers operating vehicles on-site to be appropriately trained and licensed, so that these vehicles are operated in a safe and appropriate manner. All vehicle operators to be briefed on locations of maintenance, storage and refuelling areas.	NQCC	During induction
All relevant staff shall be trained in appropriate handling, storage and containment practices for chemicals and dangerous goods to be utilised during construction.	NQCC	During induction
No fuel or hazardous substances are to be stored within riparian areas or within 10m of the high point of any drainage line. All such substances are only to be stored at the designated area approximately 200m south of Noah Creek. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including: • *Dangerous Goods Safety Management Act 2001* • Regulatory requirements • Safety Data Sheets (SDS) requirements. SDS for products kept on site shall be readily available.	NQCC	At all times
Important contact numbers and names to be available on site e.g. 000 for fire, ambulance, police, DES Pollution Hotline	NQCC	At all times
Personnel to undertake adequate environmental awareness and training covering the requirements of this EMP and other management plans regarding emergency response.	Site Supervisor Project Manager	During induction

An emergency response plan shall be prepared which includes consideration of the following – • Response procedure in the event of a fire, chemical release, spill, leak, explosion, natural disaster, equipment failure, wildlife or any other likely emergency • Communication arrangements and contact details • Roles and responsibilities of project personnel • Emergency controls and alarms • Evacuation procedures • Training requirements • Site security.	Project Manager	Prior to commencement of works on site
Monitoring	Responsibility	Timing
Undertake review of the emergency response plan to identify any issues and check information is up to date.	Site Supervisor	Throughout construction
Review all potential work areas and activities that have the potential to create emergency situation prior to commencement of work	Site Supervisor	Throughout construction
Conduct drills if necessary.	Site Supervisor	Throughout construction
Reporting	Responsibility	Timing
All personnel to report incidents.	All personnel	At all times
Any personnel or environmental emergencies can be reported by all personnel, and recorded by Site Supervisor including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel Site Supervisor	Following incident
Inform the Project Manager (NQCC) immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Project Manager (NQCC) to inform DSC immediately of receipt of report of any notifiable emergencies of potential or actual harm to personnel or environment.	NQCC	Following incident
Corrective Action	Responsibility	Timing
Where investigations identify inefficient or ineffective procedures, revision to management plan shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification

5.13 Water Quality Management Plan

5.13.1 Aspect and Impacts

Minimising the potential for project impacts on water quality is critical to instream habitat values both in the bridge works area, and to the downstream Great Barrier Reef Coastal Marine Park – Noah Heads Section. Maintenance of water quality is a key aspect in maintaining World Heritage values, both for the WTWHA and GPRMP. Noah Creek has a pristine upland catchment, and is regarded as one of the highest environmental value waterways in Australia, supporting endangered vegetation communities, providing habitat to endemic and threatened flora and fauna and having important cultural heritage values to the Eastern Kuku Yalanji traditional owners.

Implementation of a Water Quality Monitoring Program is critical to ensuring that DSC, NQCC and subcontractors are able to address their obligations under various regulatory requirements. A preliminary *in-situ* program for this project has identified that the water parameters as identified in

Tables 2.1, 2.2 and 2.3 (as relevant to High Ecological Values waters HEV 3001) in the *Daintree and Mossman Rivers Basins Environmental Values and Water Quality Objectives, Basins Nos. 108 and 109 and adjacent coastal waters* are relevant, and are to be adopted for this construction project. *(*https://environment.des.qld.gov.au/water/policy/pdf/plans/daintree-mossman-evs-wqos.pdf *)*

A detailed Water Quality Monitoring Program will be included in the final EMP, incorporating recommendations for parameters, frequency and locations as required in the final conditions on permit/authority approvals.

The following management plan is a summary of all those aspects and requirements from other elements in this EMP as relevant to the maintenance of aquatic environmental values and to meet the WOQ of the EPP (Water) 2009.

5.13.2 Management Plan

Environmental Objective		
To minimise the potential for impacts to the WTWHA, Daintree National Park and Great Barrier Reef Coast Marine Park – Noah Heads Section. To ensure that the EV of Noah Creek and downstream estuarine and reef systems are maintained through construction activities achieving the WQO of the EPP (Water) 2009 as relevant to these areas.		
Performance Criteria		
• The WOQ parameters under Tables 2.1, 2.2 and 2.3 of the *Daintree and Mossman Rivers Basins Environmental Values and Water Quality Objectives, Basins Nos. 108 and 109 and adjacent coastal waters* relevant to HEV 3001 are not exceeded by any construction activity. • There is no diminution of any WTWHA values within the construction site, or within Noah Creek (upstream and downstream). • All works are managed in accordance with the International Erosion Control Association Best Practice Erosion & Sediment Control Guidelines, the Environmental Protection (Water) Policy 2019 and any other relevant approval and statutory requirement as per conditions on permits and approvals.		
Mitigation Measures	**Responsibility**	**Timing**
A water quality monitoring program is to be developed and incorporated into the final Construction EMP on receipt of approval conditions from regulatory/Administrating Authorities	NQCC	Prior to construction
Where parameters exceeding the levels identified in the WQO relevant to Noah Creek are recorded, then an investigation into activities potentially influencing these results is to occur and results documented. Actions in relation to these exceedances will be set by conditions on permits/approvals from the regulatory/Administrating Authorities	NQCC Site Supervisor	At all times
An appropriate spill kit, personal protective equipment and relevant operator instructions and emergency procedures for the management of wastes and chemicals associated with construction must be kept at the site. This includes a spill kit that is to include air boom and fuel and oil absorbent boom to be available on the drill rig pad instream at all times.	NQCC Site Supervisor	At all times
A site and works specific Erosion and Sediment Control Plan (ESCP) shall be developed prior to disturbance works (e.g. vegetation clearing) occurring. The ESCP shall address (at a minimum): • Laydown and storage areas approximately 200m south of the bridge area. • Any areas off the sealed Cape Tribulation Road utilised for machinery or vehicle movement or as temporary laydown • Vegetation clearing areas of the revocation area, all riparian areas including construction (abutments) and side track access for machinery access to creek bed. Instream side track, working pad for drilling rig and other temporary water way barrier works.	NQCC	Before commencing earthworks

Vegetation is not to be cleared by pushing with machinery. All vegetation within the works area to be cleared (including where clearing is required within the revocation area) will be via chainsaw. Where practical, vegetation root stock shall be retained in the ground after clearing. Where root stock is to be removed it may be grubbed by machinery. Trunks of large trees are to be placed off site in a manner that mitigates further erosion e.g. within adjoining undisturbed vegetation. Other cleared vegetation, is to be mulched and stockpiled for use on exposed areas for additional exposed earth protection and/or for rehabilitation purposes.	NQCC	Throughout construction
Visual inspections of site to ensure no oil leaks, hydraulic fluid leakages or fuel leakages/spills of any other hazardous material.	Site Supervisor	Throughout construction
Vegetation waste or any type is not to be left within Noah Creek or drainage lines. Fallen trees, branches, shrubs are to be removed from all waterways and to be disposed of in similar manner to other cleared vegetation.	Site supervisor,	Site clearing
No fuel or hazardous substances are to be stored within riparian areas or within 10m of the high point of any drainage line. All such substances are only to be stored at the designated area approximately 200m south of Noah Creek. Transport and use of any of these materials shall be undertaken in accordance with relevant Australian standards (AS), guidelines and legislation, including: • *Dangerous Goods Safety Management Act 2001* • Regulatory requirements • Safety Data Sheets (SDS) requirements. SDS for products kept on site shall be readily available.	NQCC	At all times
Waterway barrier works are to comply with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works, October 2018,* Department of Agriculture and Fisheries Operational Guidelines.	NQCC	At all times
Waterway barrier works, including side tracks, drilling pads access and scour protection, are not to occupy more than 50% of the low flow channel of Noah Creek at any time.	NQCC	At all times
Where access ramps to the piling rig pad are constructed through the low flow channel, culverts must be installed in accordance with the requirements of the *Accepted development requirements for operational work that is constructing or raising waterway barrier works, October 2018* in order not to obstruct fishway passage at any time through the low flow channel.	NQCC	At all times the access ramp is in place.
Permanent tributary of Noah Creek on the northern approaches adjacent to the works area are to have appropriate erosion and sediment controls that will mitigate the risk for sediment impacts on these waterways.	NQCC	Prior to vegetation clearing and earthworks.
In the event that any fish kill or aquatic life is noted as injured or dead, then any instream works will cease until the cause of the injury or mortality is located (where possible).	Site Supervisor	On identification
Monitoring	**Responsibility**	**Timing**
Undertake routine visual inspections of all erosion and sediment control measures.	Site Supervisor	Daily
Undertake routine inspection of all riparian and instream areas during construction in these areas for any obvious signs of aquatic impacts, e.g. sedimentation, contaminants, fish kill/injury, vegetation in the water etc.	Site Supervisor	Daily
Water quality monitoring and reporting is undertaken in accordance with the Water Quality Monitoring Program.	Site Supervisor	At all times
Reporting	**Responsibility**	**Timing**
Water quality data is to be compiled weekly with the results available for external audits at any time.	NQCC Site Supervisor	At all times

Reporting of monitoring to external agencies will be subject to conditions of approvals from the regulatory/Administrating Authorities.	NQCC Site Supervisor	At all times
Any personal or environmental emergencies can be reported by all personnel, and recorded by Site Supervisor including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence.	All personnel Site Supervisor	Following incident
Inform the Project Manager (NQCC) immediately of any incidents resulting in potential or actual environmental harm.	Site Supervisor	Following incident
Appropriate control measures shall be implemented in a timely manner where sedimentation or erosion issues are identified or have the potential to occur in the future.	NQCC	Following identification
Restore eroded areas as soon as is practical following event and repair/install sediment control mechanism. (e.g. rock aggregate, geo-textile and concrete).	NQCC	Following identification
Corrective action shall be implemented to meet required outcomes of Administering Authorities.	NQCC	Where required
Project Manager (NQCC) to inform DSC immediately of receipt of report of any notifiable emergencies of potential or actual harm to personnel or environment.	NQCC	Following incident
Corrective Action	Responsibility	Timing
In the event that WOQ objective parameters are identified as being exceeded than investigations to determine the likely cause of the source are to be undertaken and a review of the activity to take place.	NQCC	Following identification
Where significant environmental incidences or exceedance of WOQ has occurred as a result of construction activities, then all activity will cease until a management approach has been agreed with the relevant regulatory authority.	NQCC	Following identification
Where investigations identify inefficient or ineffective procedures, revision to management plan shall be undertaken and further controls implemented, as necessary.	Project Manager	Following identification

Attachment 8

State Assessment Codes 8, 9, 11 and 18 prepared by Environment Pacific

State code 8: Coastal development and tidal works

8.1 Purpose statement

The purpose of this code is to ensure that development is designed and located to:

1. protect life, buildings and infrastructure from the impacts of **coastal erosion**
2. maintain **coastal processes**
3. conserve **coastal resources**
4. maintain appropriate public use of, and access to and along, **state coastal land**
5. account for the projected impacts of climate change; and
6. avoid impacts on **matters of state environmental significance** and, where avoidance is not reasonably possible, minimise and mitigate impacts, and provide an **offset** for **significant residual impacts** where appropriate.

In addition to the above, the purpose of this code is to ensure that development involving operational works which is not assessed by local government is designed and located to protect life and property from the impacts of **storm tide inundation**.

Note: Guidance on achieving compliance with the performance outcomes and acceptable outcomes in the code is provided in the Guideline – SDAP State code 8: Coastal development and tidal works, Department of Environment and Heritage Protection, 2017. Guidance for determining if development will have a significant residual impact on a matter of state environmental significance is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014.

8.2 Performance outcomes and acceptable outcomes

All development should demonstrate compliance with the relevant provisions of table 8.2.1. Development involving operational work should also demonstrate compliance with the relevant provisions of table 8.2.2. Development involving operational work which is not assessed by local government should demonstrate compliance with the relevant provisions of table 8.2.1, table 8.2.2 and table 8.2.3.

Table 8.2.1: All development

Performance outcomes	Acceptable outcomes	Response
Development in the erosion prone area		
PO1 Development does not occur in the **erosion prone area** unless the development: 1. is one of the following types of development: a. **coastal-dependent development**; or b. **temporary, readily relocatable or able to be abandoned**; or c. **essential community infrastructure**; or d. **redevelopment** of an existing permanent building or structure that cannot be relocated or abandoned; and 2. cannot feasibly be located elsewhere.	No acceptable outcome is prescribed.	**Complies with PO1** The construction of the new bridge has specific functional requirements
PO2 Development other than **coastal protection work**: 1. avoids impacting on **coastal processes**; and 2. ensures that the protective function of landforms and vegetation is maintained. Note: In considering reconfiguring a lot applications, the state may require land in the **erosion prone area** to be surrendered to the State for coastal management purposes under the *Coastal Protection and Management Act 1995*. Where the planning chief executive receives a copy of a land surrender requirement or proposed land surrender notice under the *Coastal Protection and Management Act 1995*, this must be considered in assessing the application.	No acceptable outcome is prescribed.	**Complies with PO2** The proposed works are approximately 2km upstream from the coast and will not impact on coastal processes. Vegetation clearing is required for the abutments and scour protection of the new bridge. However following construction and demolition of the old bridge all access tracks and the and the previous abutments/scour protection and banks will be reprofiled to the original riparian landform and will be revegetated.
PO3 Development is located, designed and constructed to minimise the impacts from **coastal erosion** by: 1. locating the development as far landward as practicable; or 2. where it is demonstrated that 1 is not feasible, mitigate or otherwise accommodate the risks posed by **coastal erosion**.	No acceptable outcome is prescribed.	**Complies with PO3** The proposed works are approximately 2km upstream from the coast and will not be impacted by coastal erosion processes.
PO4 Development does not significantly increase the risk or impacts to people and property from **coastal erosion**.	No acceptable outcome is prescribed.	**Complies with PO4** The new bridge deck height is equivalent to the Q100 flood event. This is significantly higher than the existing bridge which is approximately at a Q10 level. The new bridge is double lane, replacing the current single lane wooden bridge, with improved approach visibility as a result of slight road widening and realignment. The new bridge will significantly improve

		public road access and safety.
PO5 Development other than **coastal protection work** avoids directly or indirectly increasing the severity of **coastal erosion** either on or off the site.	No acceptable outcome is prescribed.	**Complies with PO5** The works are approximately 2km from the sea and will avoid direct and indirect impacts on coastal erosion severity.
PO6 In areas where a **coastal building line** is present, building work is located landward of the **coastal building line** unless **coastal protection work** has been constructed to protect the development.	No acceptable outcome is prescribed.	**N/A** There is no coastal building present for the bridge construction locality.
Artificial waterways		
PO7 Development of **artificial waterways**, canals and **dry-land marinas** minimises impacts on **coastal resources** by: 1. maintaining the **tidal prism volume** of the natural waterway to which it is connected 2. demonstrating a whole-of-life strategy for the disposal of **dredged material**.	No acceptable outcome is prescribed.	**N/A** Works are not for artificial waterways.
Coastal protection work		
PO8 Works for **beach nourishment** minimise adverse impacts on **coastal processes** and avoid any increase in the severity of erosion on adjacent land by: 1. sourcing sand from an area that does not adversely impact on the active beach system 2. ensuring imported sand is compatible with natural beach sediments and **coastal processes** of the receiving beach.	No acceptable outcome is prescribed.	**NA** Development is not beach nourishment works or coastal projection works
PO9 Erosion control structures are only constructed where: there is an imminent threat to buildings or infrastructure of value, and there is no feasible option for either: 1. **beach nourishment**; or 2. relocation or abandonment of structures. Statutory note: The monetary value of buildings or infrastructure should be more than the cost of associated erosion control structures.	No acceptable outcome is prescribed.	**N/A** Works do not involve construction of erosion control structures and are not coastal protection works.
PO10 Erosion control structures minimise interference with **coastal processes**, or any increase to the severity of erosion on adjacent land by:	No acceptable outcome is prescribed.	**N/A** Works do not involve construction of erosion control structures and are not coastal protection works.

1. locating the **erosion control structure** as far landward as practicable and directly adjacent to the structure it is intended to protect 2. where required and feasible, importing sand to the site to mitigate any increase in the severity of erosion 3. the design of the structure.		
Water quality		
PO11 Development: **1.** maintains or enhances **environmental values** of receiving waters 2. achieves the **water quality objectives** of Queensland waters 3. avoids the release of **prescribed water contaminants** to **tidal waters**. Note: See Environmental Protection (Water) Policy 2009 for the relevant **water quality objectives**.	No acceptable outcome is prescribed.	**Complies with PO11** A water quality management plan is included in the construction EMP (see attached). The EMP identifies the WOQ applicable to the project area. It identifies monitoring requirements, locations, and has elements in the EMP related to hazardous material and contaminant management.
Category C and R areas of vegetation		
PO12 Development: 1. avoids impacts on **category C areas** of vegetation and **category R areas** of vegetation; or 2. minimises and mitigates impacts on **category C areas** of vegetation and **category R areas** of vegetation after demonstrating avoidance is not reasonably possible.	No acceptable outcome is prescribed.	**Complies with PO12** An area of approximately 90m^2 of category R (GBR riverine vegetation) will be removed for the project. Avoiding clearing this vegetation is not possible as it is in the existing Cape Tribulation road reserve on the alignment of the southern approach for the new bridge (refer attached Vegetation Determination documentation). This vegetation was verified in the field as comprising primarily exotic horticultural and ornamental species on the adjacent private property. DNRME has determined that removal of this vegetation is not subject to SDAP and no development approval is needed to clear this vegetation. Refer attached letter from DNRME.
Public use of and access to state coastal land		
PO13 Development maintains or enhances public use of and access to and along **state coastal land** (except where this is contrary to the protection of **coastal resources** or public safety).	No acceptable outcome is prescribed.	**N/A** The project area is not in an area where the public can use or access state coastal land.
PO14 Private marine development ensures that works: 1. are used for **marine access purposes** only **2.** minimise the use of **state coastal land** 3. do not interfere with access between **navigable waterways** and adjacent properties.	No acceptable outcome is prescribed.	**N/A** The project is not private marine development

PO15 Development ensures **erosion control structures** are located within the premises they are intended to protect unless there is no feasible alternative.	No acceptable outcome is prescribed.	**N/A** No coastal erosion control structures are proposed.
Matters of state environmental significance		
PO16 Development: 1. avoids impacts on **matters of state environmental significance**; or 2. minimises and mitigates impacts on **matters of state environmental significance** after demonstrating avoidance is not reasonably possible; and 3. provides an **offset** if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable **significant residual impact** on a **matter of state environmental significance**. Statutory note: For Brisbane core port land, an offset may only be applied to development on land identified as E1 Conservation/Buffer, E2 Open Space or Buffer/Investigation in the Brisbane Port LUP precinct plan. For the Brisbane Port LUP, see www.portbris.com.au. Note: Guidance for determining if the development will have a **significant residual impact** on the **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. Where the **significant residual impact** is considered an acceptable impact on **the matter of state environmental significance** and an **offset** is considered appropriate, the **offset** should be delivered in accordance with the *Environmental Offsets Act 2004*.	No acceptable outcome is prescribed.	**Complies with PO16** Bridge replacement works will potentially impact on the following MSES: - Regulated vegetation category B (endangered) - Regulated vegetation category R (GBR riverine) - Regulated vegetation (defined watercourse) - Wildlife habitat (endangered/vulnerable) - Regulated vegetation (essential habitat). A determination has been made by DNRME that the vegetation clearing for the project is for suitable necessary development and is exempt from the requirements of the SDAP provisions for vegetation clearing. See attached. Works for the replacement bridge will be managed in accordance with project conditions on a permit from the Wet Tropics Management Authority and Commonwealth under the provisions of the EPBC referral determination. A project construction EMP (see attached) has been prepared for this project to manage potential project impacts on MSES. The small footprint of disturbance, and the proposed mitigation will result in the project having no significant residual impacts on any MSES.

Table 8.2.2: All operational work

Performance outcomes	Acceptable outcomes	
Private marine development		
PO17 Private marine development does not require the construction of **coastal protection work**, shoreline or riverbank hardening or **dredging** for **marine access purposes**.	No acceptable outcome is prescribed.	**N/A** The development is not private marine development.
Disposal of solid waste or dredged material from artificial waterways		
PO18 Solid waste from land and **dredged material** from **artificial waterways** is not disposed of in **tidal water** unless it is for **beneficial reuse**.	No acceptable outcome is prescribed.	**N/A** The development is not for the construction of an artificial waterway.
Disposal of dredged material other than from artificial waterways		

PO19 Dredged material is returned to **tidal water** where this is needed to maintain **coastal processes** and sediment volume.	No acceptable outcome is prescribed.	**N/A** Dredging is not required for this project
PO20 Where it is not needed to maintain **coastal processes** and sediment volume, the quantity of **dredged material** disposed to **tidal water** is minimised through **beneficial reuse** or disposal on land.	No acceptable outcome is prescribed.	**N/A** Dredging is not required for this project
All dredging and any disposal of dredged material in tidal water		
PO21 All **dredging** and any disposal of **dredged material** in **tidal water** is: 1. demonstrated to be safe with regard to protection of the marine environment and by meeting the National Assessment Guidelines for Dredging 2009, Department of Environment and Energy, 2009, or later version; and 2. supported by a monitoring and management plan that protects the marine environment and that complies with the National Assessment Guidelines for Dredging 2009, Department of Environment and Energy, 2009, or later version.	No acceptable outcome is prescribed.	**N/A** Dredging is not required within tidal waters for this project.
Reclamation		
PO22 Development does not involve **reclamation** of land below **tidal water**, other than for the purposes of: 1. **coastal-dependent development**, **public marine development** or community infrastructure; or 2. strategic ports, priority ports, boat harbours or strategic airports and aviation facilities, in accordance with a statutory land use plan or master plan, where there is a demonstrated net benefit for the state or region and no feasible alternative exists; or	No acceptable outcome is prescribed.	**N/A** Reclamation is not required for land below tidal water.
3. **coastal protection work** or work necessary to protect **coastal resources** or **coastal processes**.		**N/A** Reclamation is not required for land below tidal water

Table 8.2.3: Operational work which is not assessed by local government

Performance outcomes	Acceptable outcomes	
PO23 Works are located and designed such that they continue to operate safely during and following a **defined storm tide event**.	**AO23.1** Tidal work is designed and located in accordance with the Guideline: Building and engineering standards for tidal works, Department of Environment and Heritage Protection, 2017.	**Complies with PO23** Works have been designed in accordance with the appropriate standards in accordance with AS5100-2017. Construction plans are attached.

8.3 Reference documents

Department of Environment and Energy 2009, National Assessment Guidelines for Dredging 2009

Department of Environment and Heritage Protection 2016, Environmental offsets framework documents

Department of Environment and Heritage Protection 2017, Guideline – SDAP State code 8: Coastal development and tidal works

Department of Environment and Heritage Protection 2017, Guideline: Building and engineering standards for tidal works

Department of State Development, Infrastructure and Planning 2014, Significant Residual Impact Guideline

8.4 Glossary of terms

Artificial waterway see section 8 of the *Coastal Protection and Management Act 1995*.
Note: **Artificial waterway** means an artificial channel, lake or other body of water. An **artificial waterway** includes:
1. an access channel
2. an artificial channel that is formed because land has been reclaimed from **tidal water** and is intended to allow boating access to allotments on subdivided land
3. other artificial channels subject to the ebb and flow of the tide
4. any additions or alterations to an **artificial waterway**.

However, an **artificial waterway** does not include the following:
1. a swimming pool
2. an ornamental pond of no more than 5 000 square metres in area
3. a pond for aquaculture or for treating effluent
4. a freshwater storage reservoir for domestic water supply
5. a water storage facility situated on a natural watercourse and used for irrigation or other agricultural purposes
6. a part of a river, creek or stream in which water flows in a natural channel, whether artificially improved or not
7. a drain for carrying stormwater or other material
8. any of the following used for accessing port infrastructure if constructed in the area of a port for which a port authority or port operator is responsible:
   a. a navigation channel
   b. a harbour swing basin
   c. a berth pocket
   d. a berth approach or departure path.

Beach nourishment means the replenishment of a beach system using imported sediment to balance erosion losses or to re-establish a wider beach and dune system. It does not include the creation of a new beach.

Beneficial reuse means using **dredged material** for a purpose that provides social, economic or environmental benefits (or a combination of these). It includes **beach nourishment**, **reclamation**, environmental restoration purposes (such as restoring wetlands or nesting islands) and use on land for fill or construction purposes.

Category C areas means areas of high value regrowth vegetation classed as 'endangered' or 'of concern' under the *Vegetation Management Act 1999* that are shown on the regulated vegetation management map as **category C areas**.

Category R areas means regrowth watercourse and drainage feature areas under the *Vegetation Management Act 1999* that are shown on the regulated vegetation management map as **category R areas**.

Coastal building line see the *Coastal Protection and Management Act 1995*.
Note: **Coastal building line** means a line declared as a **coastal building line** under the *Coastal Protection and Management Act 1995*.

Coastal-dependent development:
1. means development that in order to function must be located in **tidal waters** or be able to access **tidal water**; and
2. may include, but is not limited to:
   a. industrial and commercial facilities such as ports, harbours and navigation channels and facilities, aquaculture involving marine species, desalination plants, tidal generators, **coastal protection works**, **erosion control structures, public marine development** and **beach nourishment**
   b. tourism facilities for marine (boating) purposes

c. community facilities and sporting facilities which require access to **tidal water** in order to function, such as surf clubs, marine rescue, rowing and sailing clubs; or
d. co-located residential and tourist uses that are part of an integrated development proposal (e.g. mixed use development) incorporating a marina, if these uses are located directly landward of the marina and appropriately protected from natural hazards; but

3. does not include:
   a. residential development, including canal development, as the primary use
   b. waste management facilities, such as landfills, sewerage treatment plants; or
   c. transport infrastructure, other than for access to the coast.

Coastal erosion means the loss of land or the removal of beach or dune sediments by wave action, wind action, tidal currents or water flows or by permanent inundation due to **sea level rise**.

Coastal management district see the Planning Regulation 2017.
Note: **Coastal management district** means a **coastal management district** under the *Coastal Protection and Management Act 1995*, other than an area declared under section 54(2) of that Act.

Coastal processes means the natural processes of the coast, including:
1. sediment transport to and along the coast
2. wind, waves, tides and currents which transfer energy to the coast and drive sediment transport
3. fluctuations in the location and form of landforms and the foreshore and associated ecosystems from sediment transport (erosion and land building); and
4. changes in sea level; ecological processes (including growth and spread of native plants); and the natural water cycle (for example coastal wetlands' role in filtration and flood mitigation).

Coastal protection work means any permanent or periodic work undertaken primarily to manage the impacts of **coastal erosion** or **storm tide inundation**, including the use of **erosion control structures** and altering **coastal processes** such as sediment transport.

Coastal resources means the natural resources of the coastal zone. It includes natural and physical features and landforms, **coastal processes**, vegetation, wildlife, the marine environment, quarry material, soil, water and air.

DA mapping system means the mapping system containing the Geographic Information System mapping layers kept, prepared or sourced by the state that relate to development assessment and matters of interest to the state in assessing development applications.
Note: The **DA mapping system** is available on the department's website.

Defined storm tide event (DSTE) means the event, measured in terms of likelihood of reoccurrence, and associated inundation level adopted to manage the development of a particular area. The DSTE is equivalent to a one in 100 year average recurrence interval storm event incorporating:
1. **sea level rise**; and
2. an increase in cyclone intensity by 10 percent relative to maximum potential intensity.

Note: Where **storm tide inundation** levels have not been determined by a local study, the **defined storm tide event level** can be determined by reference to default **storm tide inundation** area mapping, as depicted in the **DA mapping system**. In these mapping layers, **storm tide inundation** is based on default values of 1.5 metres above highest astronomical tide (HAT) for South East Queensland and 2.0 metres above HAT for the remainder of the state. Where required, the storm tide level can be related back to Australian Height Datum by reference to the Queensland Tide Tables

Defined storm tide event level means the peak water level reached during a **defined storm tide event**.

Dredged material means mud, sand, coral, shingle, gravel, clay, earth and other material removed by **dredging** from the bed in **tidal water**. Dredged material includes **dredge spoil**, quarry material where it is removed from **tidal water** as a commercial product and sand dredged for **beach nourishment**.

Dredging means the mechanical removal of **dredged material** from below **tidal water**. It excludes minor adjustments to the bed surface to level troughs and peaks and where bed material is only redistributed locally (bed levelling).

Dry-land marina means a marina created by the excavation of land above the high water mark.

Environmental value see the *Environmental Protection Act 1994*.
Note: **Environmental value** means:
1. a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
2. another quality of the environment identified and declared to be an **environmental value** under an environmental protection policy

or regulation.

The Environmental Protection (Water) Policy 2009 states the **environmental values** of waters.

Erosion control structure means a structure designed to protect land or to permanently alter sediment transport processes and includes a structure such as a seawall or revetment (rock walls), groyne, artificial reef, or breakwater.

Erosion prone area means an area declared to be an **erosion prone area** under section 70(1) of the *Coastal Protection and Management Act 1995*.
Note: The **erosion prone area** is indicatively shown on the **DA mapping system**.
Erosion prone areas are identified in accordance with the methodology set out in the Coastal Hazard Technical Guide, Department of Environment and Heritage Protection, 2013 and use the following factors to account for the projected impacts of climate change by the year 2100:
1. a **sea level rise** factor of 0.8 metres
2. an increase in the maximum cyclone intensity by 10 percent.

Essential community infrastructure includes:
1. emergency services infrastructure
2. emergency shelters
3. police facilities
4. hospitals and associated facilities
5. stores of valuable records or heritage items
6. infrastructure forming part of the electricity transmission grid or supply network
7. communications facilities
8. sewerage treatment plants
9. water treatment plants.

Marine access purpose means a structure in **tidal water** used to facilitate vessel access for people between land and a **navigable waterway**. This includes jetties, pontoons and boat ramps but excludes decks and boardwalks.

Matters of state environmental significance see schedule 2 of the Environmental Offsets Regulation 2014.

Note: **Matters of state environmental significance** are **prescribed environmental matters** under the Environmental Offsets Regulation 2014 that require an **offset** when a prescribed activity will have a **significant residual impact** on the matter. A **matter of state environmental significance** is any of the following matters:
1. regional ecosystems under the *Vegetation Management Act 1999* that:
    a. are endangered regional ecosystems
    b. are of concern regional ecosystems
    c. intersect with a wetland shown on the vegetation management wetlands map
    d. contain areas of essential habitat shown on the essential habitat map for an animal that is endangered wildlife or vulnerable wildlife or a plant that is endangered wildlife or vulnerable wildlife
    e. are located within the defined distances stated in the Environmental Offsets Policy 2014 from the defining banks of a relevant watercourse or drainage feature as shown on the vegetation management watercourse and drainage feature map
    f. contain remnant vegetation and are areas of land determined to be required for ecosystem functioning ('connectivity areas')

2. wetlands in a wetland protection area or wetlands of high ecological significance shown on the Map of referable wetlands under the Environmental Protection Regulation 2008
3. wetlands and watercourses in high ecological value waters as defined in schedule 2 of the Environmental Protection (Water) Policy 2009
4. designated precincts in strategic environmental areas under the Regional Planning Interests Regulation 2014
5. threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006
6. protected areas under the *Nature Conservation Act 1992* excluding coordinated conservation areas
7. highly protected zones of state marine parks under the *Marine Parks Act 2004*
8. declared fish habitat areas under the *Fisheries Act 1994*
9. waterways that provide for fish passage under the *Fisheries Act 1994* if the construction, installation or modification of waterway barrier works carried will limit the passage of fish along the waterway
10. marine plants under the *Fisheries Act 1994*
11. legally secured **offset** areas.

Navigable waterway means waters with a sufficient depth and width to allow safe passage by all vessel sizes and types that frequently use the area.

Offset means environmental **offset** under the *Environmental Offsets Act 2014*.
Note: Environmental **offset** means an activity undertaken to counterbalance a **significant residual impact** of a prescribed activity on a **prescribed environmental matter**, delivered in accordance with the Environmental offsets framework, Department of Environment and Heritage Protection, 2016. The **prescribed environmental matters** assessed under the SDAP are **matters of state environmental significance**.

Prescribed environmental matters see the Environmental Offsets Regulation 2014.
Note: A **prescribed environmental matter** is any species, ecosystem or other similar matter protected under Queensland legislation for which an environmental **offset** may be provided. A **prescribed environmental matter** may be a matter of national, state or local environmental significance, however, assessment criteria in the SDAP only relate to **matters of state environmental significance**. Each of the **prescribed environmental matters** are listed under the Environmental Offsets Regulation 2014.

Prescribed water contaminants see the *Environmental Protection Act 1994*.
Note: See schedule 9 of the Environmental Protection Regulation 2008 for a list of **prescribed water contaminants**.

Private marine development means a work for a non-commercial purpose attached to private land and extending over abutting **tidal water**.

Public marine development means development for public use that requires location in or adjacent to **tidal water** to function.

Reclamation see the *Coastal Protection and Management Act 1995*.
Note: **Reclamation** of land under **tidal water** means raising the land above the high water mark, whether gradually and imperceptibly or otherwise, by carrying out works, including **dredging** and the depositing of solid material.

Redevelopment means development that affects permanent built structures on an already developed site. Redevelopment includes the expansion of a building footprint or addition of a structure, reconstruction or remodelling an exterior, demolition and replacement of existing structures.

Sea level rise means an increase in sea level caused by global warming due to climate change. Sea level rise is projected to be 0.8 metres from the present day to 2100.
Note: **Sea level rise** projections based on the best available science are prepared by the Intergovernmental Panel on Climate Change.

Significant residual impact see the *Environmental Offsets Act 2014.*
Note: **Significant residual impact** is an impact, whether direct or indirect, of a prescribed activity on all or part of a **prescribed environmental matter** that:
1. remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity
2. is, or will or is likely to be, significant.

Guidance for determining if a prescribed activity will have a **significant residual impact** on a **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department State Development, Infrastructure and Planning, 2014.

State coastal land see the *Coastal Protection and Management Act 1995*.
Note: **State coastal land** means land in a **coastal management district** other than land that is:
1. freehold land, or land contracted to be granted in fee simple by the state; or
2. a state forest or timber reserve under the *Forestry Act 1959*; or
3. in a watercourse or lake as defined under the *Water Act 2000*; or
4. subject to a lease or licence issued by the state.

State coastal land includes land that is, or is at any time, covered by **tidal water**.

Storm tide inundation means temporary inundation of land by abnormally high ocean levels caused by cyclones and severe storms.

Temporary, readily relocatable or able to be abandoned means a structure that, if threatened by **coastal erosion**, will be relocated, removed or allowed to be lost rather than protected from the impacts because it is:
1. of low economic value; and
2. is capable of being disassembled, is easily removed, or loss by erosion is of low consequence; and
3. is not an intrinsic part of infrastructure or will have high social value or need; or
4. intended to remain in place for only a short period and then removed, whether or not it is threatened by **coastal erosion**.

Tidal prism volume means the volume of water for a specified area between the mean high water springs and mean low water springs tidal planes, or the volume of water leaving an estuary during the ebb tide.

Tidal water see the *Coastal Protection and Management Act 1995*.
Note: **Tidal water** means:
1. the sea and any part of a harbour or watercourse ordinarily within the ebb and flow of the tide at spring tides; or
2. the water downstream from a downstream limit as defined under the *Water Act 2000*.

Water quality objectives means the numerical concentration limits, mass or volume limits per unit of time or narrative statements of indicators established for waters to enhance or protection the **environmental values** for those waters set out in:
1. schedule 1 of the Environmental Protection (Water) Policy 2009, for water mentioned in the policy; or
2. otherwise, the Queensland Water Quality Guidelines 2009.

State code 9: Great Barrier Reef wetland protection areas

9.1 Purpose statement

The purpose of this code is to ensure that development involving **high impact earthworks** in a **wetland protection area** is located outside of a **wetland** and:

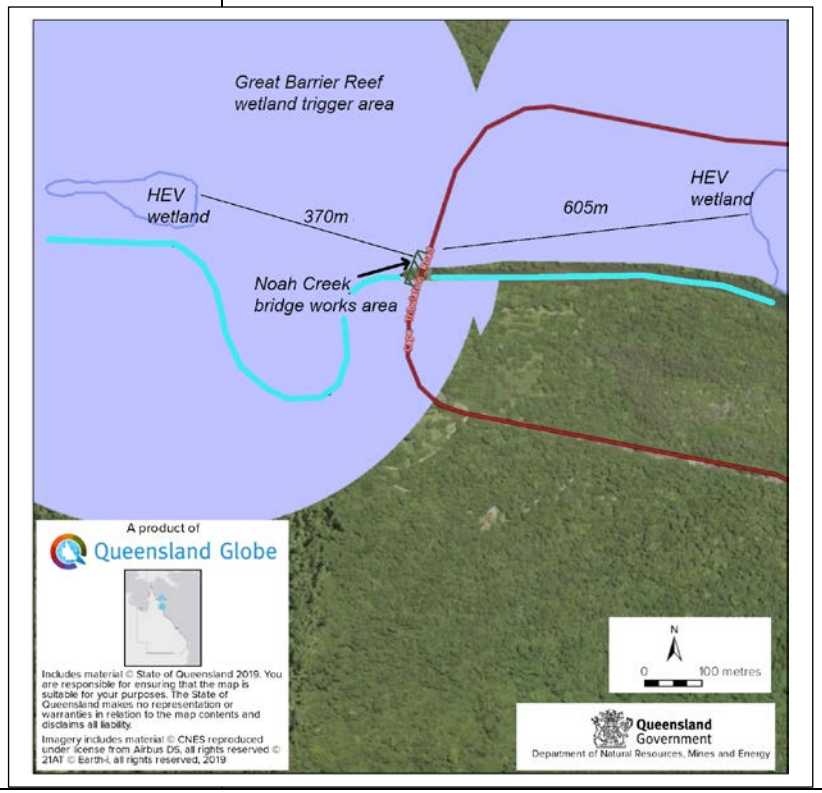
1. is designed, constructed and operated to enhance or protect **wetland environmental values**; or
2. is designed, constructed and operated to avoid or mitigate adverse impacts on **wetland environmental values**; or
3. demonstrates that after all reasonable impact avoidance measures have been, or will be, undertaken, the development constitutes an acceptable impact on **wetland environmental values**; or
4. avoids impacts on **matters of state environmental significance**, and where avoidance is not reasonably possible, minimises and mitigates impacts, and provides an **offset** for **significant residual impacts** where appropriate.

Note: Guidance on achieving compliance with the performance outcomes in the code is provided in the Guideline - State Code 9: Great Barrier Reef wetland protection areas. Guidance for determining if development will have a **significant residual impact** on a **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014.

9.2 Performance outcomes and acceptable outcomes

Development that is operational works, a material change of use or reconfiguration of a lot involving **high impact earthworks** in a **wetland protection area** should demonstrate compliance with the relevant provisions in table 9.2.1.

Table 9.2.1: All development

Performance outcomes	Acceptable outcomes	Response
General		
PO1 Development is not carried out in a **wetland** in a **wetland protection area**.	No acceptable outcome is prescribed.	**Complies with PO1** The replacement bridge over Noah Creek is approximately 370m downstream of a mapped wetland of high ecological significance, and approximately 605m upstream of a HES mapped area over a tributary of Noah Creek.
PO2 Development provides an adequate **buffer** surrounding a **wetland** to: 1. maintain and protect **wetland environmental values**; and 2. avoid adverse impacts on native vegetation within the **wetland** and the **buffer**.	**AO2.1** The **buffer** surrounding a wetland has a minimum width of: 1. 200 metres, where the **wetland** is located outside a **prescribed urban area**; or 2. 50 metres, where the **wetland** is located within a **prescribed urban area**.	**Complies with PO2** As above**.** The replacement bridge over Noah Creek is approximately 370m downstream of a mapped wetland of high ecological significance, and approximately 605m upstream of a HES mapped area over a tributary of Noah Creek. The development thereby maintains a minimum buffer of 370m from the nearest HEV wetland. 

Performance outcomes	Acceptable outcomes	Response
Hydrology		
PO3 Development enhances or avoids adverse impacts on the existing surface and groundwater hydrology in a **wetland protection area**, and, where adverse impacts cannot be reasonably avoided, impacts are mitigated.	No acceptable outcome is prescribed.	**Complies with PO3** The proposed bridge replacement works will not impact on existing surface and groundwater hydrology in the wetland protection area. The new bridge will have two piles less in the creek flow than the existing bridge.
Water quality		
PO4 Development avoids adverse impacts to the water quality of the **wetland** in the **wetland protection a**rea and in the **wetland buffer** and where adverse impacts cannot be reasonably avoided, impacts are mitigated.	No acceptable outcome is prescribed.	**Complies with PO4** Potential impacts arising from the development on water quality will occur only during the construction period. These impacts are temporary and reversible, and will be avoided and/or mitigated in the manner described for managing water quality in the attached construction EMP. There will be no ongoing residual or cumulative impact on water quality post construction.
PO5 Development does not use the **wetland** in the **wetland protection area** for stormwater treatment.	No acceptable outcome is prescribed.	**Complies with PO5** The development will not use the HEV wetlands for any purpose
Land degradation		
PO6 Development avoids **land degradation** in the **wetland protection area** and**,** where **land degradation** cannot be reasonably avoided, it is mitigated.	No acceptable outcome is prescribed.	**Complies with PO6.** Works for the replacement bridge will be managed in accordance with project conditions on a permit from the Wet Tropics Management Authority and Commonwealth under the provisions of the EPBC referral determination. A project construction EMP (see attached) has been prepared for this project to avoid land degradation, and where construction impacts are predicted, management measures are to place to ensure such potential impacts are mitigated.
Vegetation		
PO7 Development outside the **wetland** and its **buffer**: 1. avoids impacts on **category C areas** of **vegetation** and **category R areas** of **vegetation**; or 2. minimises and mitigates impacts on **category C areas** of **vegetation** and **category R areas** of **vegetation** after demonstrating avoidance is not reasonably possible.	No acceptable outcome is prescribed.	**Complies with PO7** The new bridge has specific functional requirements regarding its siting. The new bridge must be located immediately upstream and parallel to the existing bridge. Refurbishment of the existing bridge on the current alignment is not possible and impacts cannot be avoided on category R vegetation (a very small area). A determination has been made by DNRME that the vegetation clearing for the project is for suitable necessary development and is exempt from the

Performance outcomes	Acceptable outcomes	Response
		requirements of the SDAP provisions for vegetation clearing. See attached.
Fauna management		
PO8 Development: **1.** protects **wetland fauna** from any impacts associated with noise, light or **visual disturbance** 2. protects the movement of **wetland fauna** within and through a **wetland protection area**; and 3. does not introduce pest plants, pest animals or exotic species into a **wetland** and its **buffer**.	No acceptable outcome is prescribed.	**Complies with PO8** Works for the replacement bridge will be managed in accordance with project conditions on a permit from the Wet Tropics Management Authority and Commonwealth under the provisions of the EPBC referral determination. A project construction EMP (see attached) has been prepared for this project to manage potential project impacts on fauna/flora and pest species.
Matters of state environmental significance		
PO9 Development outside the **wetland**: 1. avoids impacts on **matters of state environmental significance**; or 2. minimises and mitigates impacts on **matters of state environmental significance** after demonstrating avoidance is not reasonably possible; and 3. provides an **offset** if, after demonstrating all reasonable avoidance minimisation and mitigation measures are undertaken, the development results in an acceptable **significant residual impact** on a **matter of state environmental significance**. Note: Guidance for determining if the development will have a **significant residual impact** on the **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. Where **the significant residual impact** is considered an acceptable impact on the **matter of state environmental significance** and an offset it considered appropriate, the **offset** should be delivered in accordance with the *Environmental Offsets Act 2004*.	No acceptable outcome is prescribed.	**Complies with PO9** Bridge replacement works will potentially impact on the following MSES: - Regulated vegetation category B (endangered) - Regulated vegetation category R (GBR riverine) - Regulated vegetation (defined watercourse) - Wildlife habitat (endangered/vulnerable) - Regulated vegetation (essential habitat**).** A determination has been made by DNRME that the vegetation clearing for the project is for suitable necessary development and is exempt from the requirements of the SDAP provisions for vegetation clearing. See attached. Works for the replacement bridge will be managed in accordance with project conditions on a permit from the Wet Tropics Management Authority and Commonwealth under the provisions of the EPBC referral determination. A project construction EMP (see attached) has been prepared for this project to manage potential project impacts on MSES. The small footprint of disturbance, and the proposed mitigation will result in the project having no significant residual impacts on any MSES.

9.3 Reference documents

Department of Environment and Heritage Protection 2016, Environmental offsets framework documents

Department of Environment and Heritage Protection 2017, State Development Assessment Provisions Guideline: State code 9: Wetland protection areas

Department of State Development, Infrastructure and Planning 2016, State Planning Policy

Department of State Development, Infrastructure and Planning 2014, Significant Residual Impact Guideline

9.4 Glossary of terms

Buffer means the transition zone between a **wetland** and any surrounding land use that supports thevalues and processes of the **wetland** and protects it from external threats.

Category C areas means areas of high value regrowth **vegetation** classed as 'endangered' or 'of concern' under the *Vegetation Management Act 1999* that are shown on the regulated **vegetation** management map as **category C areas**.

Category R areas means regrowth watercourse and drainage feature areas under the *Vegetation Management Act 1999* that are shown on the regulated **vegetation** management map as **category R areas**.

Environmental values, for **wetlands**, means values declared under section 81A of the Environmental Protection Regulation 2008 to be the **environmental values** for **wetlands**.

Note: From the *Environmental Protection Act 1994*, **environmental value** means:

1. a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
2. another quality of the environment identified and declared to be an **environmental value** under an environmental protection policy or regulation.

Exotic species means all non-native and non-endemic flora and fauna, including domestic pets.

High impact earthworks see schedule 24 of the Planning Regulation 2017.

Note: **High impact earthworks** means operational work that:

1. changes the form of land, or involves placing a structure on land, in a way that diverts water to or from a **wetland** in a **wetland protection area**; and
2. involves excavating or filling:
   a. if the work is carried out in the **wetland** or within 200 metres of the **wetland** – more than 100m^3; or
   b. otherwise – more than 1000m^3.

However**, high impact earthworks** does not include operational work that is:

1. excavating to establish underground infrastructure, other than infrastructure for drainage or stormwater flows, if the excavated land is to be restored, as far as practicable, to its original contours after the infrastructure is established; or
2. carried out for the maintenance of dams, fences, helipads, roads, stockyards, vehicular tracks or watering facilities; or
3. carried out for any of the following in relation to government supported transport infrastructure:
   a. the maintenance, servicing or repair of the infrastructure
   b. the replacement, rehabilitation, removal or alteration of the infrastructure
   c. the taking of preventative or remedial action
   d. the maintenance of systems and services associated with the infrastructure; or
4. carried out:
   a. in tidal water; or

b. for a forest practice; or
c. to reinstate earthworks destroyed by floods or landslides; or
d. to restore or conserve the ecological processes or hydrological functions of a **wetland protection area**; or
e. to laser level land without change to the previously levelled contours or slopes; or
f. for government supported transport infrastructure for which the funding and construction arrangements were approved by the state or Commonwealth before 31 October 2011; or

5. carried out under:
   a. the *Electricity Act 1994*, section 101 or 112A; or
   b. the Fire and Emergency Services Act 1990, section 53, 68 or 69; or
   c. a geothermal exploration permit under the *Geothermal Energy Act 2010*; or
6. assessable development under schedule 12 [Operational work that is assessable development] if the work is:
   a. carried out completely or partly in a declared fish habitat area; or
   b. constructing or raising waterway barrier works.

Land degradation means:

1. soil erosion; or
2. rising water tables; or
3. the expression of salinity; or
4. stream bank instability; or
5. a process that results in declining water quality, including acid sulfate soil disturbance.

Map of referable wetlands see schedule 12 of the Environmental Protection Regulation 2008.

Note: **Map of referable wetlands** means a document approved by the chief executive [Environment] on 4 November 2011 and published by the Department of Environment and Heritage Protection, as amended from time to time by the chief executive [Environment] under section 144D of the Environmental Protection Regulation 2008.

Matters of state environmental significance see schedule 2 of the Environmental Offsets Regulation 2014.

Note: **Matters of state environmental significance** are **prescribed environmental matters** under the Environmental
Offsets Regulation 2014 that require an **offset** when a prescribed activity will have a **significant residual impact** on the matter. A **matter of state environmental significance** is any of the following matters:

1. regional ecosystems under the *Vegetation Management Act 1999* that:
   a. are endangered regional ecosystems
   b. are of concern regional ecosystems
   c. intersect with a **wetland** shown on the vegetation management wetlands map
   d. contain areas of essential habitat shown on the essential habitat map for an animal that is endangered wildlife or vulnerable wildlife or a plant that is endangered wildlife or vulnerable wildlife
   e. are located within the defined distances stated in the Environmental Offsets Policy, Department of Environment and Heritage Protection, 2014 from the defining banks of a relevant watercourse or drainage feature as shown on the vegetation management watercourse and drainage feature map
   f. are areas of land determined to be required for ecosystem functioning ('connectivity areas')
2. **wetlands** in a **wetland protection area** or **wetlands** of high ecological significance shown on the **map of referable wetlands** under the Environmental Protection Regulation 2008
3. **wetlands** and watercourses in high ecological value waters as defined in schedule 2 of the Environmental Protection (Water) Policy 2009
4. designated precincts in strategic environmental areas under the Regional Planning Interests Regulation 2014
5. threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006
6. protected areas under the *Nature Conservation Act 1992,* excluding coordinated conservation areas
7. highly protected zones of state marine parks under the *Marine Parks Act 2004*
8. declared fish habitat areas under the *Fisheries Act 1994*
9. waterways that provide for fish passage under the *Fisheries Act 1994* if the construction, installation or modification of waterway barrier works carried will limit the passage of fish along the waterway
10. marine plants under the *Fisheries Act 1994*; or
11. legally secured offset areas.

Offset means environmental **offset** under the *Environmental Offsets Act 2014*.

Note: Environmental **offset** means an activity undertaken to counterbalance a **significant residual impact** of a prescribed activity on a **prescribed environmental matter**, delivered in

accordance with the Environmental offsets framework, Department of Environment and Heritage Protection, 2016. The **prescribed environmental matters** assessed under the State Development Assessment Provisions are **matters of state environmental significance**.

Prescribed environmental matter see the Environmental Offsets Regulation 2014.
Note: A **prescribed environmental matter** is any species, ecosystem or other similar matter protected under Queensland legislation for which an **offset** may be provided. A **prescribed environmental matter** may be a matter of national, state or local environmental significance, however, assessment criteria in the State Development Assessment Provisions only relate to **matters of state environmental significance**.
Each of the **prescribed environmental matters** are listed under the Environmental Offsets Regulation 2014.

Prescribed urban area
Note: **Prescribed urban area** for clearing native **vegetation** means:
1. an area identified in a gazette notice by the chief executive as an urban area; or
2. if no gazette notice has been published – an area identified as an area intended specifically for urban purposes, including future urban purposes (but not rural residential or future rural residential purposes) on a map in a planning scheme that:
   a. identifies the areas using cadastral boundaries
   b. is used exclusively or primarily to assess development applications.

Significant residual impact see the *Environmental Offsets Act 2014.*
Note: **Significant residual impact** is an impact, whether direct or indirect, of a prescribed activity on all or part of a **prescribed environmental matter** that:
1. remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity
2. is, or will or is likely to be, significant.

Guidance for determining if a prescribed activity will have a **significant residual impact** on a **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014.

Vegetation includes all native **vegetation**, including:
1. **vegetation** as defined under the *Vegetation Management Act 1999*; or
2. grass and non-woody herbage; or
3. a plant within a grassland regional ecosystem prescribed under a regulation; or
4. a mangrove.

Visual disturbance means the disturbance of fauna by visual intrusions that could lead to a loss or diminishment of key life cycle functions or changes to usage patterns of a **wetland** by mobile fauna (such as birds). This term include disturbance by people, pets or vehicles

Note: Loss or diminishment of key life cycle may include, but is not limited to, nest abandonment or modified feeding patterns.

Wetland means an area shown as a **wetland** on the **map of referable wetlands** as defined within the Environmental Protection Regulation 2008.

Wetland environmental values means **environmental values** for **wetlands** described under section 81A of the Environmental Protection Regulation 2008. For section 9(b) of the *Environmental Protection Act 1994*, the qualities of a **wetland** that support and maintain the following are **environmental values**:
1. the health and biodiversity of the **wetland**'s ecosystems
2. the **wetland's** natural state and biological integrity
3. the presence of distinct or unique features, plants or animals and their habitats, including threatened wildlife, near threatened wildlife and rare wildlife under the *Nature Conservation Act 1992*
4. the **wetland's** natural hydrological cycle
5. the natural interaction of the **wetland** with other ecosystems, including other **wetlands**.

Wetland fauna means species that have adapted to living in **wetlands** and are dependent on them for:

1. all of their life cycle; or
2. a major part of their life; or
3. critical stages of their life cycle, such as breeding and larval development.

Wetland protection area means an area shown as a **wetland** protection area on the **map of referable wetlands** as defined within the Environmental Protection Regulation 2008.

State code 11: Removal, destruction or damage of marine plants

11.1 Purpose statement

The purpose of the code is to ensure that development which involves the removal, destruction or damage of **marine plants**:

1. maintains the extent, distribution, diversity and condition of **marine plant** communities and protects the ecological functions to which they contribute
2. maintains the health and productivity of **fisheries resources** and **fish habitat**
3. minimises impacts on the management, use, development and protection of **fisheries resources** and **fish habitat**
4. avoids impacts on **marine plants** that are **matters of state environmental significance**, and where avoidance is not reasonably possible, minimises and mitigates impacts, and provides an **offset** for **significant residual impacts** where appropriate.

Note: **Marine plant** protection under the *Fisheries Act 1994* applies irrespective of the tenure.

Further information will be provided in the forthcoming guideline: State code 11: Removal, destruction or damage of marine plants, Department of Agriculture and Fisheries, 2017.

11.2 Performance outcomes and acceptable outcomes

Development that is a material change of use, reconfiguring of a lot or operational work which involves the removal, destruction or damage of a **marine plant** should demonstrate compliance with the relevant provisions of table 11.2.2. For further details of the specific performance outcomes to be addressed, please refer to table 11.2.1.

Note: Some development will be accepted development and will not require a development application and assessment against this code.

Table 11.2.1: Development type and relevant provisions of the code

Development	Relevant provisions of code
All development	Table 11.2.2 – PO1 – PO15
Private maritime infrastructure	Table 11.2.2 – PO16
Erosion control structures and beach replenishment	Table 11.2.2 – PO17 – PO22
Dredging	Table 11.2.2 – PO23 – PO25
Temporary works	Table 11.2.2 – PO26 – PO28
Restoration	Table 11.2.2 – PO29 – PO30
Matters of state environmental significance	Table 11.2.2 – PO31

Table 11.2.2: Operational works

Performance outcomes	Acceptable outcomes	Response
All development		
PO1 There is a demonstrated need for the development, and alternatives (locations and designs) which do not involve removal, destruction or damage of **marine plants** and impacts to **fisheries resources** and **fish habitats** are not viable.	*For development associated with a public health or safety purpose:* **AO1.1** Development is for: 1. signage or aids to warn the public of a safety hazard (for example, within a **waterway** to warn of submerged rocks, crocodiles, marine stingers); or 2. prevention of an impending public safety issue; or 3. the mitigation of a hazard to public safety that has resulted from a specific unforeseen event (for example, a fallen tree that is a danger to safe navigation); or 4. placement of a cyclone mooring identified under a cyclone contingency plan by the **harbour master** or controlling port authority, and is located in accordance with the plan; or 5. a public health purpose that has been endorsed in writing by Queensland Health or the relevant local government. *For any other development, no acceptable outcome is prescribed.* Note: The application should identify and document the impacts of alternative proposals.	**Complies with PO1** The existing wooden one-lane bridge on the Cape Tribulation Road over Noah Creek has been inspected by engineers' and deemed to require replacement. It is not practical to close the bridge to traffic to refurbish the old bridge as it is the only all-weather road access to Cape Tribulation. Therefore, a new bridge is required to be constructed prior to the old bridge being decommissioned and demolished. The replacement bridge two lane bridge will be constructed immediately upstream, parallel and adjacent to the existing bridge. In order to keep the works within the Cape Tribulation road reserve there are no alternative viable locations available for relocating the bridge. All other locations similarly involve impacts on marine plants. Refer attached drawings and supporting information for bridge location.

Performance outcomes	Acceptable outcomes	Response
PO2 Only those aspects of a development that have a functional requirement to be located on **tidal land** create the requirement to remove, destroy or damage **marine plants**. Ancillary elements (for example: car and trailer parks, rest rooms, offices) occur outside of **tidal land**. Note: **Tidal land** within the development site should be accurately identified on plans provided with the application, together with the location of **highest astronomical tide**, mean high water spring and mean low water spring tide heights. The extent, location, species and condition of **marine plants** that are proposed for removal, damage or destruction and retained have been clearly and accurately identified and mapped to enable risks and impacts to be properly assessed.	No acceptable outcome is prescribed.	**Complies with PO2** Only functional aspects, that is, the scour protection for the bridge abutments, are in tidal areas that require removal of marine plants.
PO3 Development impacting **marine plants**: 1. directly abuts **land** that has full riparian access rights; or 2. provides a public facility. Note: Further guidance on rights in context of **fisheries resources** and **fish habitats** is provided in the operational policy provisions of Management and protection of marine plants and other tidal fish habitats (FHMOP 001), Department of Primary Industries and Fisheries, 2007. The provision of owner's consent to lodge the development application does not confer rights.	No acceptable outcome is prescribed.	**Complies with PO3** The scour protectios for the bridge abutments is within the Noah Creek esplanade/road reserve area and directly abuts land with full riparian access rights. Landholder consent (DNRME) has been given for the use of the esplanade/road reserve. Refer attached letter from DNRME.

Performance outcomes	Acceptable outcomes	Response
PO4 The spatial extent of disturbance to **marine plants** is minimised. Note: For more information, refer to relevant **fish habitat** management operational policies and **fish habitat** guidelines: 1. Management and protection of marine plants and other tidal fish habitats (FHMOP 001), Department of Primary Industries and Fisheries, 2007 2. Tidal fish habitats, erosion control and beach replenishment (FHMOP 010), Department of Primary Industries and Fisheries, 2007 3. Dredging, extraction and spoil disposal activities (FHMOP 004), Department of Primary Industries, 1998 4. Departmental procedures for permit applications assessment and approvals for insect pest control in wetlands (FHMOP 003), Department of Primary Industries, 1996 5. Fisheries guidelines for fish-friendly structures (FHG 006), Department of Primary Industries and Fisheries, 2006.	*For work associated with private development that is a jetty, pontoon or boat ramp only:* **AO4.1** Only one structure adjoins the property. Note: A structure includes boat ramps, jetties and pontoons. AND **AO4.2** The extent of **marine plants** removed, damaged or destroyed does not exceed 2 metres along the **waterway** frontage (width). AND **AO4.3** The long-term use and and operability of the development will not result in ongoing adverse impacts or new adverse impacts or additional development. For example, a proposed jetty will not result in the need to dredge navigation access to the development in the future. AND one of the following acceptable outcomes apply **AO4.4** The extent of **marine plant** removal, damage or destruction for a jetty or pontoon development has a maximum: area of 30 square metres; and width of 2 metres along the shoreline (**highest astronomical tide**); and length of 15 metres from **highest astronomical tide** (measured perpendicular to the shore). OR **AO4.5** The boat ramp development has a maximum development footprint of 45 square metres. *For any other development, no acceptable outcome is prescribed.*	**Complies with PO4** The marine plants to be removed comprise individuals of the species *Acrostichum speciosum.* These are scattered plants in the works area, with a total footprint for all plants being less than $10m^2$.  Scattered individuals (11) of *Acrostichum speciosum* are located within the works footprint area (bridge abutments).
PO5 The timing of works avoids **marine plant** flowering, **fish** spawning and **fish** migration	No acceptable outcome is prescribed.	**Complies with PO5**

Performance outcomes	Acceptable outcomes	Response
periods.		The timing of works will be approximately 6 months, and will occur during periods of fish spawning and fish migrations owing to the time scale for construction. However, the removal of 11 individuals of the mangrove fern *Acrostichum speciosum* will not have any quantifiable impacts on an aspect of PO5
PO6 Development of, or adjacent to, **fish habitats** avoids the unnecessary loss, degradation or fragmentation of **fish habitats** and their values and the loss of **fish** movement. Note: For more information, refer to relevant **fish habitat** management operational policies and **fish habitat** guidelines: 1. Management and protection of marine plants and other tidal fish habitats (FHMOP 001), Department of Primary Industries and Fisheries, 2007 2. Tidal fish habitats, erosion control and beach replenishment (FHMOP 010), Department of Primary Industries and Fisheries, 2007 3. Dredging, extraction and spoil disposal activities (FHMOP 004), Department of Primary Industries, 1998 4. Departmental procedures for permit applications assessment and approvals for insect pest control in wetlands (FHMOP 003), Department of Primary Industries, 1996 5. Fisheries guidelines for fish-friendly structures (FHG 006), Department of Primary Industries and Fisheries, 2006.	No acceptable outcome is prescribed.	**Complies with PO6** No mapped fish habitat areas, or general fish habitat will be adversely impacted by the removal of the marine plants identified. The removal of approximately 10m^2 of marine plants (11 scattered individuals of mangrove fern) does not provide a significant contribution to fish habitat values. The removal of these plants for the bridge abutment scour protection will not result in unnecessary loss/degradation or fragmentation of fish habitat. General fish movement associated with tidal movement and breeding cycles will not be adversely impacted. Most fish movement occurs during in the leadup to and the post monsoon season, which the works period will avoid. To assist during movement during the construction period (May to November) a temporary water barrier (causeway and construction platform) will have culverts installed at low bed level to enable all tidal access. The temporary causeway access will only partially block Noah Creek, and will not be constructed across the entirety of the creek.

Performance outcomes	Acceptable outcomes	Response
PO7 Development does not increase the risk of mortality, disease or injury, or compromise the health, productivity, marketability or suitability for human consumption of **fisheries resources**, having regard to (but not limited to): 1. biotic and abiotic conditions, such as water and sediment quality **2.** substances that are toxic to plants or toxic to or cumulative within **fish** 3. design of structures 4. impacts on reproductive success 5. effect on **fish** energy reserves 6. whether **fish** may be physically damaged, killed, trapped or stranded 7. **fish** passage and access to habitats generally; and 8. the impacts of pest **fish** and other relevant pest species. Note: A **fish** salvage plan may be required to demonstrate compliance with the performance outcome and may form a condition of any approval. Permits or other authorities may be required under the *Fisheries Act 1994* for the use of regulated **fishing** apparatus and to possess **fisheries resources**.	No acceptable outcome is prescribed.	**N/A** The removal of 11 individuals of mangrove ferns (approximately 10m^2 of total disturbance) will not impact on human consumption of fisheries resources.
PO8 Works are undertaken to encourage **fish habitats** and **fisheries resource** values to naturally regenerate. Note: Substitution of **fish habitats** is not supported. A condition of approval for any **marine plant** restoration is likely to require a post-works monitoring and maintenance program appropriate for the scale of the restoration works.	No acceptable outcome is prescribed.	**Complies with PO8** No active regeneration of marine plants will be undertaken. Terrestrial vegetation above the banks will be replanted in disturbed areas for the road approaches and abutments. After completion of works all river bed and banks will be restored to natural pre-existing profile to allow natural regeneration of marine plants.
PO9 Development likely to cause drainage or disturbance to acid sulfate soils, prevents the release of contaminants and impacts on **fisheries resources** and **fish habitats**. Note: Management of acid sulfate soil is consistent with the current Queensland acid sulfate soil technical manual: Soil Management Guidelines v4.0, Department of Science, Information Technology, Innovation and the Arts, 2014.	No acceptable outcome is prescribed.	**Complies with PO9** Geotechnical investigations (refer attached) have identified that potential or actual acid sulfate soil (PASS & ASS) conditions do not exist at the bridge site. Conditions amenable to PASS/ASS e.g. quaternary alluvium, are not present.

Performance outcomes	Acceptable outcomes	Response
PO10 Tidal and freshwater inundation and drainage patterns, extent and timing are maintained or restored such that ecological processes continue and associated **fish habitat** values and condition are maintained.	*For bridges:* **AO10.1** Bridges are designed with abutments above the **highest astronomical tide**. AND *For water, sewer or stormwater infrastructure:* **AO10.2** Infrastructure is placed below the existing natural substrate surface level, and natural substrate, surface levels and habitat condition and values are reinstated. *For any other development, no acceptable outcome is prescribed.*	**Complies with PO10** Ecological processes associated with tidal and freshwater inundation, extent and timing, drainage patterns, will not be adversely impacted by the development. The bridge abutments are above highest astronomical tide. Refer attached drawing NQC-0023-S101, NQC-0023-C005 and Hydraulic Assessment report.
PO11 Development: 1. maintains natural processes of erosion and accretion unless there is an immediate and significant threat; and **2.** does not result in increased risk of **waterway** bed or bank scour or erosion or shoreline or **foreshore** erosion.	No acceptable outcome is prescribed.	**Complies with PO11** The bridge is a direct replacement for the existing Noah Creek bridge. The new bridge has two less piles in the stream flow than the existing bridge and subsequently less impact on stream bed erosion and accretion. The scour protection has been designed to protect the abutments from flood flows that exceed $3m^3/s$, thereby reducing risk of water bed and bank scour or erosion in the areas of the works. Refer attached drawing NQC-0023-S100,
PO12 The development is designed, sited and constructed to ensure its long-term use and operability will not result in ongoing adverse impacts or new adverse impacts or additional development including: 1. dredging to maintain access **2.** trimming of **marine plants** 3. warning signs or protective structures.	No acceptable outcome is prescribed.	**Complies with PO12** The new bridge is designed to Q100 flood level. It is located within the Cape Tribulation Road reserve and does not require any ongoing maintenance or additional development that would impact on marine plants,.
PO13 Development does not restrict or reduce **public use** of or access to **tidal land** and **waterways** (areas host to **fisheries resources**).	*For development for a material change of use or reconfiguration of a lot:* **AO13.1 Tidal land** and **fish habitats** are separated from development and are available for **public use**. *For any other development, no acceptable outcome is prescribed.*	**N/A** Project is replacement of an existing bridge and is not development requiring a material change of use or reconfiguration of a lot

Performance outcomes	Acceptable outcomes	Response
PO14 Development does not adversely impact on community access to **fisheries resources** and **fish habitats** including recreational and indigenous **fishing** access. Note: In some cases, compensation for impact on **fisheries** access, operations and/or productivity may be necessary. The Guideline on fisheries adjustment provides advice for proponents on relevant **fisheries** adjustment processes and is available by request from the Department of Agriculture and Fisheries.	**AO14.1** The development does not alter existing infrastructure or existing community access arrangements.	**Complies with PO14** The replacement bridge will not adversely impact on community access to fisheries resources and fish habitats and will not impact on recreation and indigenous fishing access.
PO15 Development does not adversely impact on commercial **fishing** access and linkages between a commercial **fishery** and infrastructure, services and facilities. Note: In some cases, compensation for impact on **fisheries** access, operations and/or productivity may be necessary. The Guideline on fisheries adjustment provides advice for proponents on relevant **fisheries** adjustment processes and is available by request from the Department of Agriculture and Fisheries.	No acceptable outcome is prescribed.	**Complies with PO15** The replacement bridge will not adversely impact on commercial fishing access, fisheries infrastructure services and facilities.
Private maritime infrastructure		
PO16 Evidence of a relevant development approval for the removal, damage or destruction or **marine plants** is required if a material change of use or reconfiguration of a lot occurred since 1 March 2005.	No acceptable outcome is prescribed.	**N/A** Development is not private maritime construction
Erosion control structures and beach replenishment		
PO17 Removal, destruction or damage to **marine plants** as a result of erosion control structures or beach replenishment only occurs where there is an immediate and significant threat of erosion to: 1. the use of the **land** for its existing or approved purpose; and 2. infrastructure, structures or buildings are not expendable or not able to be relocated. Note: Further detail on erosion control is provided in Tidal fish habitats, erosion control and beach replenishment (FHMOP 010), Department of Primary Industries and Fisheries, 2007.	No acceptable outcome is prescribed.	**N/A** Development is not for erosion control structures or beach replenishment.

Performance outcomes	Acceptable outcomes	Response
PO18 The area that the beach replenishment is to be carried out on is a high-energy, sandy sediment shoreline with biological communities adapted to mobile sediments.	No acceptable outcome is prescribed.	**N/A** Development is not for erosion control structures or beach replenishment
PO19 Erosion control structures including beach replenishment does not create terrestrial **land**, unless it is a sacrificial dune or beach which forms an integral part of the erosion control design.	No acceptable outcome is prescribed.	**N/A** Development is not for erosion control structures or beach replenishment new bridge abutments will no create terrestrial land.
PO20 The beach replenishment work is undertaken in a way that minimises the need for other erosion control activities or works.	No acceptable outcome is prescribed.	**N/A** Development is not for erosion control structures or beach replenishment
PO21 The beach replenishment work is undertaken in a way that minimises the frequency of any ongoing replenishment requirements.	**AO21.1** Beach replenishment will not require maintenance more often than every two years. AND **AO21.2** A source of replenishment material for future maintenance is identified and secured.	**N/A** Development is not for erosion control structures or beach replenishment
PO22 Erosion control structures are located parallel to the shoreline and as far landward as possible to avoid impacts to **tidal land** and **marine plants**.	No acceptable outcome is prescribed.	**N/A** Development is not for erosion control structures or beach replenishment
Dredging		
PO23 Capital dredging is to create or provide access to **public infrastructure**. Note: 1. Privately owned marina facilities or maritime infrastructure development that is open to the general public and facilitates unrestricted **public use** for **fishing** purposes may be considered **public infrastructure**. 2. Dredging for access to private structures that do not provide unrestricted **public use** is not supported.	No acceptable outcome is prescribed.	**N/A** Works are not dredging.
PO24 Maintenance dredging is consistent with an existing development approval for dredging; and within approved profiles for navigational purposes.	No acceptable outcome is prescribed.	**N/A** Works are not dredging.
PO25 Disposal of dredge spoil avoids adverse	**AO25.1** Dredge spoil is not deposited on **tidal**	**N/A**

Performance outcomes	Acceptable outcomes	Response
impacts on **marine plants**.	**land**.	Works are not dredging.
Temporary works		
PO26 Fish habitats and the **fisheries resources** they support are restored to pre-existing or improved condition and extent when the temporary works has ceased.	No acceptable outcome is prescribed.	**Complies with PO26** Temporary works are associated with the construction phase and include construction of causeway (with culverts) to a temporary instream pad for the pile driver, instream pad base for driver, silt curtains and other instream erosion sediment control mechanism as temporarily required.
PO27 Temporary works will be in place or are undertaken for a specified period and for the shortest possible time.	No acceptable outcome is prescribed.	**Complies with PO26** Temporary works are associated with construction phase only between May and November 2020, for a maximum period of six months. Instream temporary works will not be continuous for this period, but only for the actual access period for pile driving within the approximately first 8 weeks of construction.
PO28 A temporary structure is in place for a specified period and is designed to be completely removed.	No acceptable outcome is prescribed.	**Complies with PO26** All temporary structures are for the purposes of allowing access to the river bed for the driving of piles (which cannot be done from the existing bridge). On the cessation of pile driving works (approximately 8 weeks), all instream construction pads and causeway access, silt screen curtains and other measures will be removed and the creek bed and banks restored to the natural profile with the revegetation of the creek banks to be undertaken.

Performance outcomes	Acceptable outcomes	Response
Restoration		
PO29 Restoration does not: 1. compromise condition of **fish habitats** or **fisheries** productivity; or 2. substitute a particular **fish habitat** for another type of habitat, for example, creation of mangrove communities from other tidal **fish habitats**; or 3. substitute a natural **fish habitat** for artificial **fish habitat**; or 4. deliver **fish habitats** that are likely to be regularly disturbed, such as through predictable sediment removal or maintenance dredging; or 5. deliver **fish habitats** that will predictably be at a high risk of contamination and/or further disturbance. Note: For further guidance refer to Restoration of fish habitats: Fisheries guidelines for marine areas (FHG 002), Department of Primary Industries, 1998. Restoration works authorised through an endorsed restoration plan under the code for self-assessable development MP06 – Minor impact works in a declared fish habitat area or involving the removal, destruction or damage of marine plants, Department of Agriculture, Fisheries and Forestry, 2013, do not require a development permit.	No acceptable outcome is prescribed.	**N/A** Development works are not for the purpose of fish habitat restoration
PO30 Marine plants to be used for revegetation purposes have local provenance.	**PO30.1 Marine plants** used in restoration works are collected within a 100 kilometre radius of the site.	**N/A** Development works are not for the purpose of fish habitat restoration. Marine plants will not be used for revegetation works.
Matters of state environmental significance		

Performance outcomes	Acceptable outcomes	Response
PO31 Development: 1. avoids impacts on **matters of state environmental significance**; or 2. minimises and mitigates impacts on **matters of state environmental significance** after demonstrating avoidance is not reasonably possible; and 3. provides an **offset** if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable **significant residual impact** on a **matter of state environmental significance**. Statutory note: For Brisbane core port land, an offset may only be applied to development on land identified as E1 Conservation/Buffer, E2 Open Space or Buffer/Investigation in the Brisbane Port LUP precinct plan. For the Brisbane Port LUP, see www.portbris.com.au. Note: For the purpose of this code, the **matter of state environmental significance** assessed is **marine plants** under the *Fisheries Act 1994*. Guidance for determining if the development will have a **significant residual impact** on the **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. Where the **significant residual impact** is considered an acceptable impact on the **matter of state environmental significance** under the Environmental Offsets framework and an **offset** is considered appropriate, the **offset** should be delivered in accordance with the *Environmental Offsets Act 2014*.	No acceptable outcome is prescribed.	**Complies with PO31** Up to 11 individual plants of the mangrove fern *Acrostichum speciosum* will be removed with a total area of less than $10m^2$ to be disturbed. The removal of these is unavoidable as they are located within the bridge abutments scour protection areas. Their removal does not present a significant impact as these species will rapidly recolonise the works area post completion. The demolition and rehabilitation of the old bridge will offset the habitat affected for the construction of the new bridge. Subsequently no significant residual impact is expected on marine plants as a matter of state environmental significance.

11.3 Reference documents

Department of Environment and Heritage Protection 2016, Environmental offsets framework documents

Department of Primary Industries 1998, Restoration of fish habitats: Fisheries guidelines for marine areas FHG 002

Department of National Parks, Sport and Racing 2005, Fish habitat area code of practice: The lawful use of physical, pesticide and biological controls in a declared fish habitat area

Department of Primary Industries 2000, Fisheries guidelines for fish habitat buffer zones FHG 003

Department of Primary Industries and Fisheries 2006, Fisheries guidelines for fish-friendly structures FHG

006 Department of State Development, Infrastructure and Planning 2014, Significant residual impact

guideline Local Government Association of Queensland 2012, Mosquito management code of practice

Policies

Department of National Parks, Sport and Racing 2013, Marine resource management: Fish habitat area selection, assessment, declaration and review

Department of National Parks, Sport and Racing 2015, Marine resource management: Management of declared fish habitat areas

Department of Primary Industries 1998, Departmental procedures for provision of fisheries comments: Dredging, Extraction and Spoil Disposal Activities (FHMOP 004)

Department of Primary Industries and Fisheries 2007, Management and protection of marine plants and other tidal fish habitats (FHMOP001)

Department of Primary Industries and Fisheries 2007, Tidal fish habitats, erosion control and beach replenishment (FHMOP010)

Department of Agriculture and Fisheries 2015, Oyster Industry Management Plan for Moreton Bay Marine Park

Ministerial Council on Forestry, Fisheries and Aquaculture 1999, National Policy for the Translocation of Live Aquatic Organisms – Issues, Principles and Guidelines for Implementation

Queensland Department of Primary Industries 1996, Departmental Procedures for Permit Applications Assessment and Approvals for Insect Pest Control in Coastal Wetlands (FHMOP 003)

Accepted Development
Department of Agriculture and Fisheries 2017, Accepted development requirements for operational work that is the removal, destruction or damage of marine plants

Other references
Department of Agriculture, Fisheries and Forestry 2013, Declared fish habitat area network assessment report 2012

Department of Agriculture, Fisheries and Forestry 2013, Guideline on fisheries adjustment as a result of development

Department of Agriculture and Fisheries website What is a waterway?

Department of Agriculture and Fisheries website What is a waterway barrier work?

Department of Agriculture and Fisheries website What is not a waterway barrier

work?

Department of Employment, Economic Development and Innovation 2010, Declared fish habitat area network strategy 2009-14: Planning for the future of Queensland's declared fish habitat area network

Department of Environment and Heritage Protection 2014, Environmental offsets framework

Department of Environment and Resource Management 2011, Queensland Wetland Buffer Planning Guideline

Department of National Parks, Recreation, Sport and Racing 2013, Declared fish habitat area network progress report – June 2013

Department of National Parks, Recreation, Sport and Racing website Fish habitat area summaries

Department of Natural Resources and Mines 2002, Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines

International Ecohydraulics Symposium 2012, From Sea to Source: International guidance for the restoration of fish migration highways

International Erosion Control Association Australasia 2008, Best practice erosion and sediment control document

SEQ Catchments website

11.4 Glossary of terms

Declared fish habitat area see the *Fisheries Act 1994.*
Note: **Declared fish habitat area** means an area that is declared under the *Fisheries Act 1994* to be a **fish habitat** area. Section 120 of the *Fisheries Act 1994* deals with declaration of **fish habitat** areas.

Fish see section 5 of the *Fisheries Act 1994*.
Note: **Fish**:

1. means an animal (whether living or dead) of a species that throughout its life cycle usually lives:
a. in water (whether freshwater or saltwater); or
b. in or on **foreshores**; or
c. in or on **land** under water
2. includes:
a. prawns, crayfish, rock lobsters, crabs and other crustaceans
b. scallops, oysters, pearl oysters and other molluscs
c. sponges, annelid worms, bêche-de-mer and other holothurians
d. trochus and green snails
3. does not include:
a. crocodiles, or
b. protected animals under the *Nature Conservation Act 1992*; or
c. pests under the *Pest Management Act 2001*; or
d. animals prescribed under a regulation not to be **fish**
4. also includes:
a. the spat, spawn and eggs of **fish**
b. any part of **fish** or spat, spawn or eggs of **fish**
c. treated **fish**, including treated spat, spawn and eggs of **fish**
d. coral, coral limestone, shell grit or star sand
e. freshwater or saltwater products declared under a regulation to be **fish**.

Fish habitat see the *Fisheries Act 1994.*
Note: **Fish habitat** includes **land**, waters and plants associated with the life cycle of **fish**, and includes **land** and waters not presently occupied by **fisheries resources**.

Fisheries resources see the *Fisheries Act 1994.*
Note: **Fisheries resources** includes **fish** and **marine plants**.

Fishery see section 7 of the *Fisheries Act 1994*.
Note: **Fishery** means activity by way of **fishing**, for example, activities specified by reference to all or any of the following:

1. a species of **fish**
2. a type of **fish** by reference to sex, size or age or another characteristic
3. an area
4. a way of **fishing**
5. a type of boat
6. a class of person

7. the purpose of an activity
8. the effect of the activity on a **fish habitat**, whether or not the activity involves **fishing**
9. anything else prescribed under a regulation.

Fishing see the *Fisheries Act 1994.*
Note: **Fishing** includes:
1. searching for, or taking, **fish**
2. attempting to search for, or take, **fish**
3. engaging in other activities that can reasonably be expected to result in the locating, or taking, of **fish**
4. landing **fish** (from a boat or in another way), bringing **fish** ashore or transhipping **fish**.

Foreshore see the *Fisheries Act 1994.*
Note: **Foreshore** means parts of the banks, beds, reefs, shoals, shore and other **land** between high water and low water.

Harbour master see the *Transport Operations (Maritime Safety) Act 1994.*
Note: **Harbour master** means a person who is appointed under the *Transport Operations (Marine Safety) Act 1994* as a **harbour master**.

Highest astronomical tide means the highest level of the tides that can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions.

Land includes **foreshores** and tidal and non-tidal land.

Legally secured offset area see the *Environmental Offsets Act 2014.*
Note: An area of **land** is a **legally secured offset area** if:
1. the area is:
   a. an environmental **offset** protection area; or
   b. an area declared as an area of high nature conservation value under section 19F of the *Vegetation Management Act 1999*; or
   c. another area prescribed under a regulation; and
2. under the *Environmental Offsets Act 2014* or another Act, the area is subject to a delivery or management plan or agreement (however described in this Act or the other Act) to achieve a conservation outcome for a **prescribed environmental matter**.

Marine plant see section 8 of the *Fisheries Act 1994*.
Note: **Marine plant** includes the following:
1. a plant (a tidal plant) that usually grows on, or adjacent to, **tidal land**, whether it is living, dead, standing or fallen
2. material of a tidal plant, or other plant material on **tidal land**
3. a plant, or material of a plant, prescribed under a regulation or management plan to be a **marine plant**.

A **marine plant** does not include a plant that is a declared pest under the *Land Protection (Pest and Stock Route Management) Act 2002*.

Matters of state environmental significance see schedule 2 of the Environmental Offsets Regulation 2014.
Note: **Matters of state environmental significance** are **prescribed environmental matters** under the Environmental Offsets Regulation 2014 that require an **offset** when a prescribed activity will have a **significant residual impact** on the matter. A **matter of state environmental significance** is any of the following matters:
1. regional ecosystems under the *Vegetation Management Act 1999* that:
   a. are endangered regional ecosystems
   b. are of concern regional ecosystems
   c. intersect with a wetland shown on the vegetation management wetlands map
   d. contain areas of essential habitat shown on the essential habitat map for an animal that is endangered wildlife or vulnerable wildlife or a plant that is endangered wildlife or vulnerable wildlife
   e. are located within the defined distances stated in the Environmental Offsets Policy, Department of Environment and Heritage Protection 2014 from the defining banks of a relevant watercourse or drainage feature as shown on the vegetation management watercourse and drainage feature map; or
   f. are areas of **land** determined to be required for ecosystem functioning ('connectivity areas'); or
2. wetlands in a wetland protection area or wetlands of high ecological significance shown on the map of referable wetlands under the Environmental Protection Regulation 2008
3. wetlands and watercourses in high ecological value waters as defined in schedule 2 of the Environmental Protection (Water) Policy 2009
4. designated precincts in strategic environmental areas under the Regional Planning Interests Regulation 2014
5. threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006
6. protected areas under the *Nature Conservation Act 1992,* excluding coordinated conservation areas
7. highly protected zones of state marine parks under the *Marine Parks Act 2004*
8. **declared fish habitat** areas under the *Fisheries Act 1994*
9. **waterways** that provide for **fish** passage under the *Fisheries Act 1994* if the construction, installation or modification of **waterway** barrier works carried will limit the passage of **fish** along the **waterway**
10. **marine plants** under the *Fisheries Act 1994*; or
11. **legally secured offset areas**.

Offset means environmental **offset** under the *Environmental Offsets Act 2014*.
Note: Environmental **offset** means an activity undertaken to counterbalance a **significant residual impact** of a prescribed activity on a **prescribed environmental matter**, delivered in accordance with the Environmental offsets framework, Department of Environment and Heritage Protection, 2014. The **prescribed environmental matters** assessed under the State Development

Assessment Provisions are **matters of state environmental significance**.

Prescribed environmental matters see the *Environmental Offsets Act 2014*.
Note: A **prescribed environmental matter** is any species, ecosystem or other similar matter protected under Queensland legislation for which an **offset** may be provided. A **prescribed environmental matter** may be a matter of national, state or local environmental significance, however, assessment criteria in the State Development Assessment Provisions only relate to **matters of state environmental significance**. Each of the **prescribed environmental matters** are listed under the Environmental Offsets Regulation 2014.

Public infrastructure means infrastructure constructed, owned and maintained by or on behalf of a **public sector entity**.

Public sector entity see the *Planning Act 2016.*
Note: A **public sector entity** means:
1. a department or part of a department; or
2. other than in chapter 4 (of the *Planning Act 2016*) – a distributor-retailer; or

3. an agency, authority, commission, committee, corporation (including a government owned corporation), instrumentality, office, or other entity, established under an Act for a public or state purpose (for example: a local government, a government owned corporation or a rail government entity under the *Transport Infrastructure Act 1994*).

Public use means available for free use by any member of the public without prior permission.

Significant residual impact see the *Environmental Offsets Act 2014*.
Note: **Significant residual impact** is an impact, whether direct or indirect, of a prescribed activity on all or part of a **prescribed environmental matter** that:

1. remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity
2. is, or will or is likely to be, significant.

Guidance for determining if a prescribed activity will have a **significant residual impact** on a **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014.

Tidal land see the *Fisheries Act 1994.*
Note: **Tidal land** includes reefs, shoals and other **land** permanently or periodically submerged by waters subject to tidal influence.

Waterway see the *Fisheries Act 1994.*
Note: **Waterway** includes a river, creek, stream, watercourse or inlet of the sea. For further guidance see fact sheet Maintaining Fish Passage in Queensland: What is a waterway?, Department of Agriculture, Fisheries and Forestry, 2014.

State code 18: Constructing or raising **waterway barrier works in fish habitats**

18.1 Purpose statement

The purpose of the code is to ensure that development involving the constructing or raising of **waterway barrier works** in a **fish habitat**:

1. maintains **fish** movement and connectivity throughout **waterways** and within and between **fish habitats**
2. maintains the health and productivity of **fisheries resources** and **fish habitat**
3. maintains the community and **fishing** sectors' use of the area and access to **fisheries resources**
4. only occurs only where there is a need for the development and no other reasonable alternative exists
5. provides adequate **fish** passage including a **fish way,** if necessary
6. avoids impacts on **marine plants**, **waterways** that provide for **fish** passage and **declared fish habitat areas** that are **matters of state environmental significance**, and where avoidance is not reasonably possible, minimises and mitigates impacts, and provides an **offset** for **significant residual impacts** where appropriate.

Note: For guidance on how to determine whether this code applies to development, see fact sheets:

1. Maintaining Fish Passage in Queensland: What is a waterway, Department of Agriculture, Fisheries and Forestry, 2014
2. Maintaining Fish Passage in Queensland: What is a waterway barrier work, Department of Agriculture, Fisheries and Forestry, 2014
3. Maintaining Fish Passage in Queensland: What is not a waterway barrier work, Department of Agriculture, Fisheries and Forestry, 2014.

18.2 Performance outcomes and acceptable outcomes

Development that is operational work for constructing or raising **waterway barrier works** in **fish habitats** should demonstrate compliance with the relevant provisions of table 18.2.2. For further details of the specific performance outcomes to be addressed, please refer to table 18.2.1.

Table 18.2.1: Development type and relevant provisions of the code

Development	Relevant provisions of code
All development	Table 18.2.2 – PO1 – PO18
Development involving **fish ways**	Table 18.2.2 – PO19 – PO28
Development involving floodgates	Table 18.2.2 – PO29 – PO31
Temporary **waterway barrier works**	Table 18.2.2 – PO32 – PO35
Matters of state environmental significance	Table 18.2.2 – PO36

Table 18.2.2: Operational work

Performance outcomes	Acceptable outcomes	Response
All development		
PO1 There is a demonstrated need for the development and alternatives (locations and designs) which do not involve constructing or raising **waterway barrier works** are not viable.	No acceptable outcome is prescribed.	**Complies with PO1** An engineering assessment has determined that the existing Noah Creek bridge is nearing end of life and needs to be replaced. The current bridge is a single lane wooden bridge structure and is the only all weather access for emergency vehicles, local traffic and tourist/business traffic to Cape Tribulation. The existing bridge cannot be refurbished or repaired being an old wooden structure. As a single lane structure, it also cannot be used as the basis for the instream pile driving activities necessary for the new bridge as the pile driving machinery exceeds the load carrying capacity of the bridge. Pile driving can only be done from a pad within the creek that will be accessed by a temporary causeway from the southern bank a period of approximately 8 weeks. Therefore, there are no alternatives to the instream activities which do not require temporary water barrier works. It should be noted (refer Drawing NQC-0023-S100), that the new bridge has two less piles within the creek bed than the old bridge. At the cessation of works with the demolition and removal of the old bridge (including removing the piles at bed level and restoring the natural profile) there will be less waterway barrier works in Noah Creek than currently exists.
PO2 Development has a functional requirement to be located within a **waterway**. Ancillary elements of development occur outside the **waterway**. Note: Bed and banks of the **waterway** and any associated wetlands and riparian areas within the development site should be accurately identified on plans provided with the application, together with the location of highest astronomical tide, mean high water spring and mean low water spring tide heights if the **waterway** is tidal.	No acceptable outcome is prescribed.	**Complies with PO2** Development is a new bridge that has functional requirements for new piles within the Noah Creek to support the bridge decking infrastructure, abutments and scour protection. Noah Creek is a high flow, high velocity creek during the wet season with flows in excess of $3m^3/s$ modelled. Refer attached hydraulic report. By necessity to protect the bridge abutments from flood flow and scouring the scour protection has necessarily being placed within the waterway.

Performance outcomes	Acceptable outcomes	Response
PO3 The number and extent of **waterway barrier works** and the spatial and temporal extent of their impacts on **waterways** providing for **fish** passage are minimised.	No acceptable outcome is prescribed.	**Complies with PO3** Permanent waterway barrier works include abutment scour protection and four new piles in the creek channel. This will be offset by the removal of the old bridge (which has six piles in the creek channel), abutments and scour protection, and subsequent reprofiling of previous to natural creek bank. The old piles will be removed at bed level, and the banks of the creek revegetated. Temporary waterway barrier works including instream silt screens around the pile driving activity areas, a raised working pad for the pile driver instream, and a temporary causeway between the southern bank and approximately mid stream. No more than ½ of Noah Creek will be intercepted by the temporary access causeway, i.e. it will not extend across Noah Creek. The access causeway will have culverts that will allow for the full flow Noah Creek through the causeway and will not provide fishway passage obstruction. The estimated period of the pile driving activities and instream temporary waterway barriers is eight weeks. This proposed to be undertaken during the dry period June to August and avoid the known fish breeding movements i.e. pre-wet season and post wet season.

Performance outcomes	Acceptable outcomes	Response
PO4 For the life of the barrier, adequate **fish** passage must be provided and maintained at all **waterway barrier works** through: 1. **fish way(s)** that adequately provide for the movement of **fish**; or 2. the movement of **fish** is adequately provided for in another way.	*For all crossings:* **AO4.1** Hydraulic conditions (depth, velocities and turbulence) from the downstream to the upstream limit of the structure allow for **fish** passage of all **fish** attempting to move through the crossing at all flows up to the **drownout** of the structure. AND **AO4.2** For the life of the crossing, the relative levels of: 1. a bed level crossing or a culvert invert 2. bed erosion protection 3. apron scour protection; and 4. the stream bed are maintained to avoid drops in elevation at their joins. AND **AO4.3** The crossing and associated erosion protection structures are installed at no steeper gradient than the **waterway** bed gradient. AND **AO4.4** The crossing and associated erosion protection structures are roughened throughout to approximately simulate natural bed conditions. AND **AO4.5** Design and maintenance measures are in place for the life of the crossing to keep crossings clear	**AO4.1 –** hydraulic conditions arising from the new bridge will improve fish passage. The new bridge will have four instream piles by comparison with the original bridge six. There is no limitation to fish passage during drownout of the scour protection. **AO4.2 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.2 is required. **AO4.3 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.3 is required. **AO4.4 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.4 is required. **AO4.5 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.5 is required.

	of blockages through a regular inspection program in order to retain **fish** passage through the crossing. AND *For **waterway** crossings other than bridges and culverts:* **AO4.6** The crossing is built at or below bed level so that the surface of the crossing is no higher than the stream bed at the site. AND **AO4.7** The lowest point of the crossing is installed at the level of the lowest point of the natural stream bed (pre-construction), within the footprint of the proposed crossing. AND **AO4.8** There is a height difference between the lowest point of the crossing and the edges of the low flow section of the crossing so that water is channelled into the low flow section of the crossing. AND **AO4.9** The level of the remainder of the crossing is no higher than the lowest point of the natural stream bed outside of the low flow channel. AND *For bridges:* **AO4.10** Bridge support piles are not constructed within the low-flow	**AO4.6 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.6 is required. **AO4.7 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.7 is required. **AO4.8 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.8 is required. **AO4.8 –** Development works comprise bridge construction with instream piles, abutments and scour protection. No other instream construction identified by AO4.8 is required. **AO4.10 –** The number of instream piles for the new bridge (4 instream) has been minimized by comparison with the existing bridge (6 instream). Refer drawing NQC-0023-S100 and NQC-0023 – C0055.

	channel and do not constrict the edges of the low-flow channel, and the number of piles in-stream are minimised. AND	The existing bridge piles are located within the lowest part of the low flow channel. Scouring around the base of these existing piles and scour protection has created an artificial bed profile (as shown on NQC-0023 – C005) not withstanding, the new bridge piles have been moved approximately 2m to the north, away from the lowest point of the flow channel .Refer drawing NQC-0023-S100.
	AO4.11 Bridge abutments and bank revetment works do not extend into the **waterway** beyond the toes of the banks. AND	**AO4.11** The Noah Creek catchment originates in the foothills of the Thornton Peak range, which annually receives over 6m of rainfall. Flood flows are high volume, high velocity with a hydraulic report (see attached) identifying high flow events in excess of $3m^3/s$ at the bridge site. For bridge security and safety purposes the abutments and scour protection have been designed with these flood/flow parameters as a key design measure. Owing the bank topography and desire to retain as much of the riparian characteristics as practical, it has not been possible to avoid scour protection encroaching on the low flow protection.
	AO4.12 Suitable **fish habitats** are maintained within the low-flow channel. AND *For culverts:*	**AO4.12** The new bridge design has moved the location of piles impacting on the lowest point of the low flow channel (Refer drawing NQC-0023-S100) by comparison with the existing bridge, thereby improving fish passageway within the lowest flow section of the creek by comparison with the existing structure. The scour protection encroaching on the low flow channel has been altered from rock-filled gabions to placed rock to replicate and maintain suitable habitats along the encroached areas of the low flow channel.
	AO4.13 Culverts are only installed where the site conditions do not allow for a bridge. AND	**AO4.13** The project does not require the construction of any permanent culverts.
	AO4.14 The combined width of the culvert cell apertures are equal to 100 percent of the **main channel** width. AND	**AO4.13** The project does not require the construction of any permanent culverts.
	AO4.15 The base of the culvert incorporates a low flow channel consistent with the natural low flow channel and:	**AO4.13** The project does not require the construction of any permanent culverts.

	1. is buried a minimum of 300 millimetres to allow bed material to deposit and reform the natural bed on top of the culvert base; or 2. the base of the culvert is the stream bed; or 3. the base of the culvert cell and any instream scour protection is roughened throughout to approximately simulate natural bed conditions. AND **AO4.16** The outermost culvert cells incorporate roughening elements such as baffles on their bankside sidewalls. AND **AO4.17** Roughening elements are installed on the upstream wingwalls on both banks to the height of the upstream obvert or the full height of the wingwall. AND **AO4.18** Roughening elements provide a contiguous lower velocity zone (no greater than 0.3 metres/second) for at least 100 millimetres width from the wall through the length of the culvert and wingwalls. AND **AO4.19** Culvert alignment to the stream flow minimises water turbulence.	**AO4.16** The project does not require the construction of any permanent culverts. **AO4.17** The project does not require the construction of any permanent culverts. **AO4.18** The project does not require the construction of any permanent culverts. **AO4.19** The project does not require the construction of any permanent culverts.

Performance outcomes	Acceptable outcomes	Response
	AND **AO4.20** There is sufficient light at the entrance to and through the culvert so that **fish** are not discouraged by a sudden darkness. AND **AO4.21** The depth of cover above the culvert is as low as structurally possible, except where culverts have an average recurrence interval (ARI) greater than 50 years. AND **AO4.22** For culvert crossings designed with a flood immunity ARI greater than 50 years, **fish** passage is provided up to culvert capacity. *For all other development no acceptable outcome is prescribed.*	**AO4.20** The project does not require the construction of any permanent culverts. **AO4.21** The project does not require the construction of any permanent culverts. **AO4.22** The project does not require the construction of any permanent culverts.

Performance outcomes	Acceptable outcomes	Response
PO5 Waterway barrier works are designed, constructed, operated and maintained to provide lateral and longitudinal **fish** passage for all members of the **fish** community, regardless of size, species, life-stage or swimming ability, and accommodating future and seasonal increases in **fish** biomass. Note: In order to demonstrate compliance with this performance outcome, the seasonal and flow related biomass of the **fish** community at the location of the proposed **waterway barrier works** will need to be surveyed and addressed in the design of the **fish way** by a person suitably qualified and experienced in **fish** passage biology. In addition, any future increases in **fish** biomass should be quantified and catered for. Longitudinal **fish** passage refers to the movement into both permanent and temporary offstream systems, including wetlands, lagoons, floodplain etc. Fragmentation of connectivity into and out of these systems must be mitigated via adequate **fish** passage.	No acceptable outcome is prescribed.	**Complies with PO5** The new bridge design has moved the location of piles impacting on the lowest point of the low flow channel (Refer drawing NQC-0023-S100) by comparison with the existing bridge, thereby improving fish passageway within the lowest flow section of the creek by comparison with the existing structure. The proposed scour protection design will allow passage for all members of the fish community.The scour protection encroaching on the low flow channel has been altered from rock-filled gabions to placed rock to replicate and maintain suitable habitats along the encroached areas of the low flow channel.
PO6 Development is designed and operated so that all components of **waterway barrier works** (for example scour protection, intake and outlet structures, spillway, stilling basin, apron and dissipation structures) and all pathways of potential **fish** movement provide safe **fish** passage. Stepped spillways (including sheet pile weirs) are not acceptable. Note: Stepped spillway (including sheet pile weirs) have been associated with high mortalities and injuries to **fish**. Assessment of this performance outcome will include consideration of adequate tailwater depth at the toe of the spillway (for example: stilling basin) at commencement to spill (for example: 30 percent of the head difference).	No acceptable outcome is prescribed.	**Complies with PO6** The new bridge design has moved the location of piles impacting on the lowest point of the low flow channel (Refer drawing NQC-0023-S100) by comparison with the existing bridge, thereby improving fish passageway within the lowest flow section of the creek by comparison with the existing structure. The scour protection encroaching on the low flow channel has been altered from rock-filled gabions to placed rock to replicate and maintain suitable habitats along the encroached areas of the low flow channel.
PO7 The **drownout** characteristics of the **waterway barrier works** and the frequency, timing and duration of **drownout** conditions will provide adequate **fish** passage for the **fish** community and biomass moving past the barrier. Note: Determining adequacy of **fish** passage will involve consideration of passage achieved during **drownout** and during other hydraulic conditions and the relative frequencies of these conditions among other things.	No acceptable outcome is prescribed.	**Complies with PO7** The development does not include weirs, dams or similar obstructions. The instream components include piles for the bridge decking and scour protection for the bridge abutments. None of these features

Performance outcomes	Acceptable outcomes	Response
PO8 Development does not increase the risk of mortality, **disease** or injury, or compromise the health, productivity, marketability or suitability for human consumption of **fisheries resources**, having regard to (but not limited to): 1. biotic and abiotic conditions, such as water and sediment quality **2.** substances that are toxic to plants or toxic to or cumulative within **fish** 3. design of structures 4. impacts on reproductive success 5. effect on **fish** energy reserves 6. whether **fish** may be physically damaged, injured, killed, trapped or stranded 7. **fish** passage and access to habitat generally; and 8. the impacts of pest **fish** and other relevant pest species. Note: A **fish** salvage plan may be required to demonstrate compliance with the performance outcome and may form a condition of any approval. Permits or other authorities may be required under the *Fisheries Act 1994* for the use of regulated **fishing** apparatus and to posess **fisheries resources**.	No acceptable outcome is prescribed.	**Complies with PO8** The bridge replacement project will have no impact on fisheries resources. It will provide for less instream obstructions than present (4 piles instream compared with 6 of existing bridge). The existing piles, scour protection and abutments will be removed and natural bed and bank profiles reinstated. No direct, indirect or cumulative impact on any aspect of fisheries resources are anticipated.
PO9 Development: **1.** avoids non-essential hardening or unnatural modification of the **main channel** of the **waterway** 2. retains natural **fish habitat** and features such as rock outcrops and boulders, wherever possible 3. avoids channelisation (i.e. straightening) of meandering **waterways** or where channels need to be significantly modified, simulates natural watercourses and habitat features (for example, by including meanders, pools, riffles, shaded and open sections, deep and shallow sections and different types of substrata); and 4. avoids construction during times of elevated flows.	No acceptable outcome is prescribed.	**Complies with PO9** The proposed works comprise four instream piles, abutments and scour protection. The scour protection is very necessary hardening of the bank for the protection of the bridge abutments from flood flows that are estimated to exceed $3m^3/s$ during peak flows (see supporting hydraulic report). The scour protection will consist of placed rough rock about the toe of the abutments to replicate natural fish habitat and provide a more aesthetic approach than typical rock filled gabions. The works do not require any channelization and is timed to occur in the drier part of the year between May and November.

Performance outcomes	Acceptable outcomes	Response
PO10 Where **waterway barrier works** will modify water levels or flow characteristics of the **waterway**, existing up and downstream structures are upgraded to provide adequate **fish** passage in accordance with the new levels or flow characteristics.	No acceptable outcome is prescribed.	**Complies with PO10** The new bridge is a direct replacement for the existing bridge and will improve flow characteristics by comparison with the existing bridge. The existing bridge has six instream piles. These piles and the bridge abutments/scour protection will be removed after commissioning of the new bridge. The piles will be cut off at bed level and the natural profile of the creek bed and bank reinstated. The new bridge has less-instream piles (4 compared with 6). The new bridge works will not change the overall flow characteristics (after the old bridge is demolished and piles removed). There will be no cumulative impact on waterway barrier works subsequently.
PO11 Sufficient water exchange and flow is maintained and provided to sustain and where necessary restore, water quality and the health and condition of **fisheries resources,** ecological functions and **fish** passage.	No acceptable outcome is prescribed.	**Complies with PO11** The new bridge is direct replacement for the existing bridge, and water exchange and flow generally will improve as the new bridge has less piles (4) in the stream bed than the existing bridge (6) refer drawing NQC-0023-S100. There will be no changes to water quality, heal and condition of fisheries resources, ecological function and fish passage post completion of all works, which includes demolition of old bridge and removal of instream infrastructure, and reinstatement of bed and bank profiles.
PO12 Development likely to cause drainage or disturbance to acid sulfate soils, prevents the release of contaminants and impacts on **fisheries resources** and **fish habitats**. Note: Management of acid sulfate soil is consistent with the current Queensland acid sulfate soil technical manual: Soil Management Guidelines V4.0, Department of Science, Information Technology, Innovation and the Arts, 2014.	No acceptable outcome is prescribed.	**Complies with PO12** Geotechnical investigations (refer attached supporting information), did not identify potential or actual acid sulfate soils on site. There are no predisposing geological/soil factors, such as quaternary alluvium/marine silts or muds, present at the works area. General bed and bank comprises coarse cobbles and stones which are not conducive to PASS/ASS presence.
PO13 Construction avoids direct and indirect disturbance, or where avoidance is not possible, minimises direct and indirect disturbance to beds, banks and vegetation adjacent to the permanent development footprint.	No acceptable outcome is prescribed.	**Complies with PO13** The new Noah Creek bridge has specific functional location requirements. The bridge will be located with the Cape Tribulation road reserve, parallel to and immediately adjacent the existing bridge. Vegetation will be permanently cleared to provide for the realignment of the road approaches to the new bridge. Regulated vegetation has been determined by DNRME (see attached) to be exempt development from requiring approval. The new bridge design has two less piles in the creek bed than the existing bridge. Refer drawing NQC-0023-S100

Performance outcomes	Acceptable outcomes	Response
PO14 After completion of in-stream works, disturbed areas of the bed and banks of the **waterway** outside the permanent development footprint are returned to their original profile and stabilised to promote regeneration of natural **fish habitats**. Note: Monitoring of the success of **fish habitat** regeneration, within and adjacent to the work site, is likely to be conditioned as part of any development approval.	No acceptable outcome is prescribed.	**Complies with PO33** Instream temporary waterway barriers will be in place for approximately 8 weeks, and timed to occur in the dry season sometime between June to September. Post requirements for pile driving and abutment/scour protection works, all instream temporary barriers will be removed, the working pad and causeway/culverts removed and the creek bed and bank reinstated to their natural profile and stability. Refer to EMP (attached). For demolition of the old bridge, all abutments, scour protection will be removed and the banks/approaches of the old bridge will be restored to natural slope and stability, and actively revegetated. The 6 previous instream piles will be removed at bed level. Only four piles will be instream with the new bridge, representing a lesser instream barrier than the previous bridge. **R**efer drawing NQC-0023-S100
PO15 The natural substrate of the **waterway** bed is retained or reconstructed so that the post-construction substrate is comparable to the natural substrate; for example in terms of size and consistency.	No acceptable outcome is prescribed.	**Complies with PO15** No impacts on the natural substrate of Noah Creek are anticipated. Permanent instream works comprise the four new piles (to be drilled/driven) and scour protection for the bridge abutments. All natural substrate will be retained during the project. Any substrate brought in for temporary waterway barrier works, e.g. work platform and access causeway, will be removed post their function requirement to the natural substrate level and profile of the creek bed.
PO16 Development does not adversely impact on community access to **tidal land** and **waterways**.	No acceptable outcome is prescribed.	**Complies with PO16** The new Noah Creek bridge is within road reserve and will not impact on community access to tidal land and waterways**.**
PO17 Development does not adversely impact on community access to **fisheries resources** and **fish habitats** including recreational and indigenous **fishing** access. Note: In some cases, compensation for impact on **fisheries** access, operations and/or productivity may be necessary. The Guideline on fisheries adjustment provides advice for proponents on relevant **fisheries** adjustment processes and is available by request from the Department of Agriculture and Fisheries.	No acceptable outcome is prescribed.	**Complies with PO17** The new Noah Creek bridge is within road reserve and will not impact on community access to fisheries resources and fish habitats.

Performance outcomes	Acceptable outcomes	Response
PO18 Development does not adversely impact on commercial **fishing** access and linkages between a commercial **fishery** and infrastructure, services and facilities. Note: In some cases, compensation for impact on **fisheries** access, operations and/or productivity may be necessary. The Guideline on fisheries adjustment provides advice for proponents on relevant **fisheries** adjustment processes and is available by request from the Department of Agriculture and Fisheries.	No acceptable outcome is prescribed.	**N/A** There is no commercial fishing or fisheries that will be impacted by the development.
Development involving fish ways		
PO19 Having regard to the hydrology of the site and **fish** movement characteristics, the **fish way** is capable of operating, and will operate: 1. for as long as the **waterway barrier work** is in position; and 2. whenever there are inflows into the impoundment or **waterway**, release out of the impoundment and during overtopping events; and 3. when the impoundment is above dead storage level.	**AO19.1** For the life of the **waterway barrier works**, the lower operational range of the **fish way** is at least: 1. 0.5 metres below minimum headwater drawdown level; and 2. 0.5 metres below minimum tail water level at the site.	**N/A** Development does not involve fishway construction
PO20 For the life of the **waterway barrier works**, the hydrology of the development allows for adequate **fish** movement.	**AO20.1** The lower operational range of the **fish way** is at least: 1. 0.5 metres below minimum headwater drawdown level; and 2. 0.5 metres below minimum tail water level at the site.	**N/A** Development does not involve fishway construction

Performance outcomes	Acceptable outcomes	Response
PO21 Fish way maximises **fish** movement by providing: 1. continuous attraction flows at the **fish way** entrance under all flow conditions within the **fish way's** operating range 2. additional means of **fish** attraction are included in the **fish way** design if appropriate 3. attraction flow velocities are sufficient and variable to attract the whole **fish** community, and expected future and seasonal biomass **4.** adequate holding chamber capacity for the expected **fish** biomass in any lock, lift, trap and transfer type **fish ways** **5.** adequate exit conditions for downstream **fish** passage; and 6. for future adjustments in capacity or operation that may be needed once in place.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction
PO22 Fish ways are designed so that: **1.** water intakes, outlets, screens and other structures do not cause entrainment, injury or mortality to **fish** **2.** appropriate light levels are maintained at entrances, exits and throughout the **fish way** to ensure successful use by **fish** 3. **fish** attracted to the spillway or outlet flows are able to access the **fish way** without having to swim back downstream 4. **fish** are able to exit upstream and downstream **fish ways** at a water levels over the full range of tailwater and headwater levels 5. exits are located to avoid **fish** being washed back over the spillway during overtopping	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction

Performance outcomes	Acceptable outcomes	Response
6. adequate hydraulic conditions and minimum water depth for **fish** passage is maintained throughout the **fish way** 7. predation on **fish** using the **fish way** is avoided **8.** rubbish and debris do not impede **fish** passage or cause blockages or damage the **fish way** 9. delays in **fish** movement are avoided when **fish** are undertaking upstream spawning migrations; and 10. delays in **fish** movement are avoided immediately after times when there have been flows in the system but no **fish** passage in the rising hydrograph.		**N/A** Development does not involve fishway construction
PO23 All water releases are directed through the **fish way** as a priority over the outlet works.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction
PO24 All flows and releases initiate and terminate adjacent to the **fish way** or are directed parallel to the **fish way** entrance and all flows are transferred to the **fish way** as soon as possible during a flow recession. Note: Flows and releases include but are not limited to spillway overtopping and outlet flows. Such flows must not compete with **fish way** attraction flows or reduce the operation of a **fish way**.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction
PO25 Mechanisms are in place to ensure that operational issues in **fish ways** are promptly rectified for the life of the **fish way** including but not limited to: 1. all components are designed to be durable, reliable and adequately protected from damage during high flow and flood events 2. all components can be replaced; and 3. a contingency plan ensures provision of alternate adequate **fish** passage during the **fish way** re-instatement process. Note: **Fish way** downtime greater than 14 consecutive calendar days is likely to have a significant impact to **fisheries resources**.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction
PO26 Development provides for: 1. installation of monitoring equipment (such as traps and lifting equipment); and 2. access for monitoring, maintenance and operational purposes.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction

Performance outcomes	Acceptable outcomes	Response
PO27 Water supply for the **fish ways** and attraction flows are sourced from surface quality water or equivalent water quality.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction
PO28 Tailwater control structures such as a gauging weir, rock bar or stream crossings are fitted with a **fish way** or designed to provide **fish** passage.	No acceptable outcome is prescribed.	**N/A** Development does not involve fishway construction
Development involving floodgates		
PO29 Floodgates are designed and operated: 1. to provide hydraulic conditions adequate for **fish** passage over an adequate duration of the tidal cycle; and 2. as tidally activated, automatic floodgates.	No acceptable outcome is prescribed.	**N/A** Development does not involve floodgate construction
PO30 The invert of the floodgate is at bed level.	No acceptable outcome is prescribed.	**N/A** Development does not involve floodgate construction
PO31 The operation of the floodgate will not result in adverse impacts on water quality that may harm **fish** or **fish habitat**.	No acceptable outcome is prescribed.	**N/A** Development does not involve floodgate construction
Temporary waterway barrier works		
PO32 The temporary **waterway barrier works** will exist only for a specified temporary period and provide for adequate **fish** movement.	**AO32.1** The temporary **waterway barrier work**: 1. is a partial barrier, or 2. does not constrict the area or flows of a low flow channel. AND one of the following acceptable outcomes apply **AO32.2** The temporary structure is only in place outside of known **fish** spawning or migration periods. OR **AO32.3** The barrier is opened periodically every five days for at least 48 hours to allow **fish** movement and water exchange. OR **AO32.4 Fish** movement is provided for via a stream diversion.	**Complies with PO32** Instream temporary waterway barriers will be in place for approximately 8 weeks, and timed to occur in the dry season sometime between June to September. The purpose of timing is to avoid a) downstream migration of fry post spawning at the onset of the wet season (from December onwards) and b) avoids species migrating upstream at the end of the wet season (April/May). The temporary barriers comprise instream silt curtains around the pile driving/scour protection work areas, a raised work platform approximately central in the creek for the pile driver machinery, and a temporary causeway from the southern bank to the work platform for machinery and worker access. The causeway will not extend across the creek, with only ever a maximum of half the creek being obstructed. The causeway however will be constructed with multiple culverts with the bottom level of the culverts buried below bed level to allow natural sediments to accrete in the culverts and replicate the surrounding creek substrate within the culvert. Water flow and tidal fluxes will be able to occur naturally throughout the temporary barrier installation period. The width of the temporary causeway will be approximately 5m. Provisions of culverts and allowing half the creek to remain unobstructed during construction will allow fish species movement.

Performance outcomes	Acceptable outcomes	Response
PO33 Temporary barriers are removed at the end of their design life, so that full movement for **fish** is reinstated and the bed and banks are returned to their original profile and stability.	No acceptable outcome is prescribed.	**Complies with PO33** Instream temporary waterway barriers will be in place for approximately 8 weeks, and timed to occur in the dry season sometime between June to September. Post requirements for pile driving and abutment/scour protection works, all instream temporary barriers will be removed, the working pad and causeway/culverts removed and the creek bed and bank reinstated to their natural profile and stability. Refer to EMP (attached).
PO34 Where there are species, at the site of the temporary **waterway barrier works** that require downstream movement during works, provisions are made to allow those species to move downstream.	No acceptable outcome is prescribed.	**Complies with PO34** Instream temporary waterway barriers will be in place for approximately 8 weeks, and timed to occur in the dry season sometime between June to September. The purpose of timing is to avoid a) downstream migration of fry post spawning at the onset of the wet season (from December onwards) and b) avoids species migrating upstream at the end of the wet season (April/May). The temporary barriers comprise instream silt curtains around the pile driving/scour protection work areas, a raised work platform approximately central in the creek for the pile driver machinery, and a temporary causeway from the southern bank to the work platform for machinery and worker access. The causeway will not extend across the creek, with only ever a maximum of half the creek being obstructed. The causeway however will be constructed with multiple culverts with the bottom level of the culverts buried below bed level to allow natural sediments to accrete in the culverts and replicate the surrounding creek substrate within the culvert. Water flow and tidal fluxes will be able to occur naturally throughout the temporary barrier installation period. The width of the temporary causeway will be approximately 5m. Provisions of culverts and allowing half the creek to remain unobstructed during construction will allow fish species movement.
PO35 The condition and value of aquatic macrophytes and other **fish habitats** is maintained.	No acceptable outcome is prescribed.	**Complies with PO35** Works for the replacement bridge will be managed in accordance with project conditions on a permit from the Wet Tropics Management Authority and Commonwealth under the provisions of the EPBC referral determination. A project construction EMP (see attached) has been prepared for this project to manage potential project impacts on MSES. The small footprint of disturbance, and the proposed mitigation will result in the project having no significant residual impacts on any MSES.

Performance outcomes	Acceptable outcomes	Response
Matters of state environmental significance		
PO36 Development: 1. avoids impacts on **matters of state environmental significance**; or 2. minimises and mitigates impacts on **matters of state environmental significance** after demonstrating avoidance is not reasonably possible; and 3. provides an **offset** if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable **significant residual impact** on a **matter of state environmental significance**. Statutory note: For Brisbane core port land, an offset may only be applied to development on land identified as E1 Conservation/Buffer, E2 Open Space or Buffer/Investigation in the Brisbane Port LUP precinct plan. For the Brisbane Port LUP, see www.portbris.com.au. Note: For the purpose of this code, the **matters of state environmental significance** assessed are **marine plants**, **waterways** that provide for **fish** passage and **declared fish habitat areas**. Guidance for determining if the development will have a **significant residual impact** on the **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department of State Development, Infrastructure and Planning, 2014. Where the **significant residual impact** is considered an acceptable impact on the **matter of state environmental significance** under the Environmental Offsets framework and an **offset** is considered appropriate, the **offset** should be delivered in accordance with the *Environmental Offsets Act 2014.*	No acceptable outcome is prescribed.	**Complies with PO36** Bridge replacement works will potentially impact on the following MSES: - Regulated vegetation category B (endangered) - Regulated vegetation category R (GBR riverine) - Regulated vegetation (defined watercourse) - Wildlife habitat (endangered/vulnerable) - Regulated vegetation (essential habitat**).** A determination has been made by DNRME that the vegetation clearing for the project is for suitable necessary development and is exempt from the requirements of the SDAP provisions for vegetation clearing. See attached. Works for the replacement bridge will be managed in accordance with project conditions on a permit from the Wet Tropics Management Authority and Commonwealth under the provisions of the EPBC referral determination. A project construction EMP (see attached) has been prepared for this project to manage potential project impacts on MSES. The small footprint of disturbance, and the proposed mitigation will result in the project having no significant residual impacts on any MSES.

18.3 Reference documents

Department of Agriculture and Fisheries website, What is a waterway?

Department of Agriculture and Fisheries website, What is a waterway barrier work?

Department of Agriculture and Fisheries website, What is not a waterway barrier work?

Department of Environment and Science 2018, Queensland environmental offsets framework documents

Department of Environment and Science 2018, Fish habitat area code of practice: The lawful use of physical, pesticide and biological controls in a declared fish habitat area.

Department of Primary Industries 1998, Restoration of fish habitats: Fisheries guidelines for marine areas FHG 002

Department of Primary Industries 2000, Fisheries guidelines for fish habitat buffer zones FHG 003

Department of Primary Industries and Fisheries 2006, Fisheries guidelines for fish-friendly structures FHG 006

Department of State Development, Infrastructure and Planning 2014, Significant residual impact guideline

Local Government Association of Queensland 2012, Mosquito management code of practice

Policies

Department of National Parks, Sport and Racing 2013, Marine resource management: Fish habitat Area selection, assessment, declaration and review

Department of National Parks, Sport and Racing 2015, Marine resource management: Management of declared fish habitat areas

Department of Primary Industries 1998, Departmental procedures for provision of fisheries comments: Dredging, Extraction and Spoil Disposal Activities (FHMOP 004)

Department of Primary Industries and Fisheries 2007, Management and protection of marine plants and other tidal fish habitats (FHMOP001)

Department of Primary Industries and Fisheries 2007, Tidal fish habitats, erosion control and beach replenishment (FHMOP010)

Department of Agriculture and Fisheries 2015, Oyster industry Management Plan for Moreton Bay Marine Park

Ministerial Council on Forestry, Fisheries and Aquaculture 1999, National Policy for the Translocation of Live Aquatic Organisms – Issues, Principles and Guidelines for Implementation

Queensland Department of Primary Industries 1996, Departmental Procedures for Permit Applications Assessment and Approvals for Insect Pest Control in Coastal Wetlands (FHMOP 003)

Accepted development

Department of Agriculture and Fisheries 2017, Accepted development requirements for operational work that is constructing or raising waterway barrier works

Department of Environment and Science 2018, Fish habitat area code of practice: The lawful use of physical, pesticide and biological controls in a declared fish habitat area

Other references

Department of Agriculture, Fisheries and Forestry 2012, Declared Fish Habitat Area Network Assessment Report 2012

Department of Agriculture, Fisheries and Forestry 2013, Guideline on fisheries adjustment as a result of development

Department of Employment, Economic Development and Innovation 2010, Declared fish habitat area network strategy 2009-14: Planning for the future of Queensland's declared fish habitat area network

Department of Environment and Resource Management 2011, Queensland Wetland Buffer Planning Guideline

Department of National Parks, Recreation, Sport and Racing 2013, Declared fish habitat area network progress report – June 2013

Department of National Parks, Recreation, Sport and Racing website, Declared fish habitat area plans

Department of Natural Resources and Mines 2002, Queensland Acid Sulfate Soil Technical Manual: Soil Management Guidelines

International Ecohydraulics Symposium 2012, From Sea to Source: International guidance for the restoration of fish migration highways

International Erosion Control Association Australasia 2008, Best practice erosion and sediment control document

SEQ Catchments website

18.4 Glossary of terms

Declared fish habitat area see the *Fisheries Act 1994.*
Note: **Declared fish habitat area** means an area that is declared under the *Fisheries Act 1994* to be a **fish habitat** area. Section 120 of the *Fisheries Act 1994* deals with declaration of **fish habitat** areas.

Disease see section 94 of the *Fisheries Act 1994*.
Note: **Disease** means:

1. a **disease**, parasite, pest, plant or other thing (the **disease**) that has, or may have, the effect (directly or indirectly) of killing or causing illness in **fisheries resources**, or in humans or animals that eat **fisheries resources** infected with or containing the **disease**
2. a chemical or antibiotic residue
3. a **fish** or plant species that may compete against **fisheries resources** or other **fisheries resources** to the detriment of the **fisheries resources** or other **fisheries resources**.

Drownout means when the tailwater and headwater levels across a weir are essentially equal, velocities are sufficiently low at, or close to, the edge of the spillway crest and the weir is fully submerged to a sufficient depth to allow for **fish** passage and for the species and size-classes of **fish** moving through the site to cross the weir.

Fish see section 5 of the *Fisheries Act 1994*.
Note: **Fish**:

1. means an animal (whether living or dead) of a species that throughout its life cycle usually lives:
   a. in water (whether freshwater or saltwater); or
   b. in or on **foreshores**; or
   c. in or on **land** under water
2. includes:
   a. prawns, crayfish, rock lobsters, crabs and other crustaceans

b. scallops, oysters, pearl oysters and other molluscs
c. sponges, annelid worms, beche-de-mer and other holothurians
d. trochus and green snails

3. does not include:
   a. crocodiles; or
   b. protected animals under the *Nature Conservation Act 1992*; or
   c. pests under the *Pest Management Act 2001*; or
   d. animals prescribed under a regulation not to be **fish**
4. also includes:
   a. the spat, spawn and eggs of **fish**
   b. any part of **fish** or spat, spawn or eggs of **fish**
   c. treated **fish**, including treated spat, spawn and eggs of **fish**
   d. coral, coral limestone, shell grit or star sand
   e. freshwater or saltwater products declared under a regulation to be **fish**.

Fish habitat see the *Fisheries Act 1994.*
Note: **Fish habitat** includes land, waters and plants associated with the life cycle of **fish**, and includes land and waters not presently occupied by **fisheries resources**.

Fish way see the *Fisheries Act 1994*.
Note: **Fish way** means a **fish** ladder or another structure or device by which **fish** can pass through, by or over **waterway barrier works**.

Fisheries resources see the *Fisheries Act 1994.*
Note: **Fisheries resources** includes **fish** and **marine plants**.

Fishery see section 7 of the *Fisheries Act 1994*.
Note: **Fishery** means activity by way of **fishing**, for example, activities specified by reference to all or any of the following:
1. a species of **fish**
2. a type of **fish** by reference to sex, size or age or another characteristic
3. an area
4. a way of **fishing**
5. a type of boat
6. a class of person
7. the purpose of an activity
8. the effect of the activity on a **fish habitat**, whether or not the activity involves **fishing**
9. anything else prescribed under a regulation.

Fishing see the *Fisheries Act 1994*.
Note: **Fishing** includes:
1. searching for, or taking, **fish**
2. attempting to search for, or take, **fish**
3. engaging in other activities that can reasonably be expected to result in the locating, or taking, of **fish**
4. landing **fish** (from a boat or in another way), bringing **fish** ashore or transhipping **fish**.

Foreshore see the *Fisheries Act 1994*.
Note: **Foreshore** means parts of the banks, beds, reefs, shoals, shore and other land between high water and low water.

Legally secured offset area see the *Environmental Offsets Act 2014.*
Note: An area of land is a **legally secured offset area** if:
1. the area is:
   a. an environmental **offset** protection area; or
   b. an area declared as an area of high nature conservation value under section 19F of the *Vegetation Management Act 1999*; or
   c. another area prescribed under a regulation; and
2. under the *Environmental Offsets Act 2014* or another Act, the area is subject to a delivery or management plan or agreement (however described in this Act or the other Act) to achieve a conservation outcome for a **prescribed environmental matter**.

Main channel means the active component of the flow channel of a **waterway** characterised by a distinct change in appearance or structure at the upper limit of the channel (refer to accepted development requirements for examples).

Marine plant see section 8 of the *Fisheries Act 1994*.
Note: **Marine plant** includes the following:
1. a plant (a tidal plant) that usually grows on, or adjacent to, **tidal land**, whether it is living, dead, standing or fallen
2. material of a tidal plant, or other plant material on **tidal land**
3. a plant, or material of a plant, prescribed under a regulation or management plan to be a **marine plant**.

A **marine plant** does not include a plant that is a declared pest under the *Land Protection (Pest and Stock Route Management) Act 2002*.

Matters of state environmental significance (MSES) see schedule 2 of the Environmental Offsets Regulation 2014.

Note: **Matters of state environmental significance** are **prescribed environmental matters** under the Environmental Offsets Regulation 2014 that require an **offset** when a prescribed activity will have a **significant residual impact** on the matter. A **matter of state environmental significance** is any of the following matters:

1. regional ecosystems under the *Vegetation Management Act 1999* that:
   a. are endangered regional ecosystems
   b. are of concern regional ecosystems
   c. intersect with a wetland shown on the vegetation management wetlands map
   d. contain areas of essential habitat shown on the essential habitat map for an animal that is endangered wildlife or vulnerable wildlife or a plant that is endangered wildlife or vulnerable wildlife
   e. are located within the defined distances stated in the Environmental Offsets Policy 2014 from the defining banks of a relevant watercourse or drainage feature as shown on the vegetation management watercourse and drainage feature map; or
   f. are areas of land determined to be required for ecosystem functioning ('connectivity areas')
2. wetlands in a wetland protection area or wetlands of high ecological significance shown on the map of referable wetlands under the Environmental Protection Regulation 2008
3. wetlands and watercourses in high ecological value waters as defined in schedule 2 of the Environmental Protection (Water) Policy 2009
4. designated precincts in **strategic environmental areas** under the Regional Planning Interests Regulation 2014
5. threatened wildlife under the *Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006
6. protected areas under the *Nature Conservation Act 1992* excluding coordinated conservation areas
7. highly protected zones of state marine parks under the *Marine Parks Act 2004*
8. **declared fish habitat area**s under the *Fisheries Act 1994*
9. **waterways** that provide for **fish** passage under the *Fisheries Act 1994* if the construction, installation or modification of **waterway barrier works** carried will limit the passage of **fish** along the **waterway**
10. **marine plants** under the *Fisheries Act 1994*; or
11. **legally secured offset areas**.

Offset means environmental **offset** under the *Environmental Offsets Act 2014*.
Note: Environmental **offset** means an activity undertaken to counterbalance a **significant residual impact** of a prescribed activity on a **prescribed environmental matter**, delivered in accordance with the Environmental offsets framework, Department of Environment and Heritage Protection, 2014. The **prescribed environmental matters** assessed under the State Development Assessment Provisions are **matters of state environmental significance**.

Prescribed environmental matters see the *Environmental Offsets Act 2014*.
Note: A **prescribed environmental matter** is any species, ecosystem or other similar matter protected under Queensland legislation for which an **offset** may be provided. A **prescribed environmental matter** may be a matter of national, state or local environmental significance, however, assessment criteria in the State Development Assessment Provisions only relate to **matters of state environmental significance**. Each of the **prescribed environmental matters** are listed under the Environmental Offsets Regulation 2014.

Significant residual impact see the *Environmental offsets Act 2014*.
Note: **Significant residual impact** is an impact, whether direct or indirect, of a prescribed activity on all or part of a **prescribed environmental matter** that:

1. remains, or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity
2. is, or will or is likely to be, significant.

Guidance for determining if a prescribed activity will have a **significant residual impact** on a **matter of state environmental significance** is provided in the Significant Residual Impact Guideline, Department State Development, Infrastructure and Planning, 2014.

Strategic environmental area see the *Regional Planning Interests Act 2014.*
Note: A **strategic environmental area** is an area that:

1. contains one or more environmental attributes for the area
2. is either:
   a. shown on a map in a regional plan as a **strategic environmental area**; or
   b. prescribed under a regulation.

Tidal land see the *Fisheries Act 1994*.
Note: **Tidal land** includes reefs, shoals and other land permanently or periodically submerged by waters subject to tidal influence.

Waterway see the *Fisheries Act 1994*.
Note: **Waterway** includes a river, creek, stream, watercourse or inlet of the sea. For further guidance see the fact sheet Maintaining Fish Passage in Queensland: What is a waterway? Department of Agriculture, Fisheries and Forestry, 2014.

Waterway barrier works see the *Fisheries Act 1994*.
Note: **Waterway barrier works** means a dam, weir, or other barrier across a **waterway** if the barrier limits **fish** stock access and movement along a **waterway**. For further guidance see the factsheets Maintaining Fish Passage in Queensland: What is a waterway barrier work?, Department of Agriculture, Fisheries and Forestry, 2014 and Maintaining Fish Passage in Queensland: What is not a waterway barrier work?, Department of Agriculture, Fisheries and Forestry, 2014.

18.5 Abbreviations

ARI – Average Recurrence Interval