KFB Engineers
Civil & Structural
ABN 73 618 014 261
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Our Ref: K-9168-LTR-002
Your Ref: DA4310:D22/4374
Date: 10/02/2023

The Chief Executive Officer,
Cook Shire Council,
10 Furneaux Street,
COOKTOWN QLD 4895
By email: mail@cook.qld.gov.au

Attention: Planning and Environment Department
Dear Sir,

Re: MTC Tower Pty Ltd
Reconfiguration of a Lot – one (1) into twelve (12) lots
2 Hope Street, Cooktown Qld 4895
Lot 23 on SP219110 and Lot 7 on SP219110

APPLICATION FOR OPERATIONAL WORKS PERMIT

On behalf of MTC Tower Pty Ltd (Mathew Carey) we are forwarding an Application for Operational Works Permit for twelve (12) residential lots at 2 Hope Street, Cooktown.
Our Operational Works Application will consist of three (3) emails as follows:

EMAIL NO 1

ITEM	DETAIL
1.0	Letter to Cook Shire Council K-9168-LTR-002
2.0	DA Form 1 Development application details
3.0	FNQROC Operational Works Receipting Checklist
4.0	FNQROC Statement of Compliance – Operational Works Design
5.0	Summary of Operational Works Costs
6.0	FNQROC Appendix E – Security Lodgement Form

EMAIL NO 2

ITEM	DETAIL
7.0	Letter to Cook Shire Council K-9168-LTR-002
8.0	DA/4310:D22/4374 Decision Notice 24 February 2022
9.0	Design Report
10.0	K-9168 Specification
11.0	Project Drawings Job No K-9168 Sheets C01A to C13A (inclusive) and SK1 A

EMAIL NO 3

ITEM	DETAIL	
12.0	Letter to Cook Shire Council	K-9168-LTR-002
13.0	Design Report Addendum No 1	
14.0	Design Report Addendum No 2	

We have assessed the Application fee as $11,320 (1.25% x $905,632).

Yours faithfully

Euan Bruce RPEQ No 00491

DA Form 1 – Development application details

Approved form (version 1.1 effective 22 JUNE 2018) made under section 282 of the Planning Act 2016.

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

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

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

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

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

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

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

PART 1 – APPLICANT DETAILS

1) Applicant details	
Applicant name(s) (*individual or company full name*)	MTC Tower Pty Ltd
Contact name *(only applicable for companies)*	KFB Engineers
Postal address *(P.O. Box or street address)*	PO Box 927
Suburb	Cairns
State	Queensland
Postcode	4870
Country	Australia
Contact number	07 4032 0492
Email address *(non-mandatory)*	euan@kfbeng.com.au
Mobile number *(non-mandatory)*	0408 772 105
Fax number *(non-mandatory)*	07 4032 0092
Applicant's reference number(s) *(if applicable)*	K-9168

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 XNo – 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

X 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
		2	Hope Street	Cooktown
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4895	23	SP219110	Cook Shire Council
b)	Unit No.	Street No.	Street Name and Type	Suburb
		2	Hope Street	Cooktown
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
	4895	7	SP219110	Cook Shire Council

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

***Note**: Place each set of coordinates in a separate row. Only one set of coordinates is required for this part.*

☐ Coordinates of premises by longitude and latitude

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

☐ Coordinates of premises by easting and northing

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

3.3) Additional premises

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

X Not required

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

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

Name of water body, watercourse or aquifer:

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

Lot on plan description of strategic port land:

Name of port authority for the lot:

☐ In a tidal area

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

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

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

Name of airport:

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

5) Are there any existing easements over the premises?

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

X 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 X Operational Work ☐ Building work

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

X Development permit ☐ Preliminary approval ☐ Preliminary approval that includes a variation approval

c) What is the level of assessment?

X 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)*:

Reconfiguration of a Lot – one (1) into thirteen (13) 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.*

X 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	X Yes – complete division 2
Operational work	X 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?	
Two 2)	
9.2) What is the nature of the lot reconfiguration? *(tick all applicable boxes)*	
X Subdivision *(complete 10))*	☐ Dividing land into parts by agreement *(complete 11))*
☐ Boundary realignment *(complete 12))*	☐ Creating or changing an easement giving access to a lot from a construction road *(complete 13))*

10) Subdivision 10.1) For this development, how many lots are being created and what is the intended use of those lots:				
Intended use of lots created	Residential	Commercial	Industrial	Other, please specify:
				Water reserve
Number of lots created	12			1

10.2) Will the subdivision be staged?	
X Yes – provide additional details below ☐ No	
How many stages will the works include?	Three (3)
What stage(s) will this development application apply to?	Three (3)

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
Refer project drawings				

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

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*	
X Yes – specify number of new lots:	13 new lots
☐ No	

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

PART 4 – ASSESSMENT MANAGER DETAILS

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

PART 5 – REFERRAL DETAILS

17) Do any aspects of the proposed development require referral for any referral requirements?
***Note**: A development application will require referral if prescribed by the* Planning Regulation 2017.

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

Matters requiring referral to the **Chief Executive of the Planning Regulation 2017:**

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

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

- ☐ Airport land
- ☐ Environmentally relevant activities (ERA) (*only if the ERA have been devolved to local government)*
- ☐ Local heritage places

Matters requiring referral to the **chief executive of the distribution entity or transmission entity:** ☐ Electricity infrastructure
Matters requiring referral to: • The **Chief executive of the holder of the licence**, if not an individual • The **holder of the licence**, if the holder of the licence is an individual ☐ Oil and gas infrastructure
Matters requiring referral to **the Brisbane City Council:** ☐ Brisbane core port land
Matters requiring referral to the **Minister under the *Transport Infrastructure Act 1994*:** ☐ Brisbane core port land (inconsistent with Brisbane port LUP for transport reasons) ☐ Strategic port land
Matters requiring referral to the **relevant port operator:** ☐ Land within Port of Brisbane's port limits (below high-water mark)
Matters requiring referral to the **Chief Executive of the relevant port authority:** ☐ Land within limits of another port (below high-water mark)
Matters requiring referral to the **Gold Coast Waterways Authority:** ☐ Tidal works, or work in a coastal management district in Gold Coast waters
Matters requiring referral to the **Queensland Fire and Emergency Service:**
☐ Tidal works marina *(more than six vessel berths)*

18) Has any referral agency provided a referral response for this development application?		
☐ Yes – referral response(s) received and listed below are attached to this development application XNo		
Referral requirement	Referral agency	Date of referral response
Identify and describe any changes made to the proposed development application that was the subject of the referral response and the development application the subject of this form, or include details in a schedule to this development application *(if applicable).*		

PART 6 – INFORMATION REQUEST

19) Information request under Part 3 of the DA Rules
XI 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

X 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

X No – I, the applicant will provide evidence that the portable long service leave levy has been paid before the assessment manager decides the development application. I acknowledge that the assessment manager may give a development approval only if I provide evidence that the portable long service leave levy has been paid

☐ Not applicable *(e.g. building and construction work is less than $150,000 excluding GST)*

Amount paid	Date paid (dd/mm/yy)	QLeave levy number
$		

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

☐ Yes – show cause or enforcement notice is attached

XNo

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

X 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

X 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)

X 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

XNo

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

Koala conservation

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

☐ Yes

XNo

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

Water resources

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

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

X 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

XNo

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*

XNo

***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

X 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

X 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

X 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

X 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

XNo

***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*

X 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)

X 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*	XYes
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 X Not applicable
Supporting information addressing any applicable assessment benchmarks is with development application ***Note**: This is a mandatory requirement and includes any relevant templates under question 23, a planning report and any technical reports required by the relevant categorising instruments (e.g. local government planning schemes, State Planning Policy, State Development Assessment Provisions). For further information, see DA Forms Guide: Planning Report Template.*	X 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.*	XYes
The portable long service leave levy for QLeave has been paid, or will be paid before a development permit is issued *(see 21))*	XYes ☐ Not applicable

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

PART 9 – FOR OFFICE USE ONLY

Date received: | Reference number(s):

Notification of engagement of alternative assessment manager	
Prescribed assessment manager	
Name of chosen assessment manager	
Date chosen assessment manager engaged	
Contact number of chosen assessment manager	

Relevant licence number(s) of chosen assessment manager	

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

FNQROC DEVELOPMENT MANUAL

Council Cook Shire Council
(INSERT COUNCIL NAME)

STATEMENT OF COMPLIANCE
OPERATIONAL WORKS DESIGN

This form duly completed and signed by an authorised agent of the Designer shall be submitted with the Operational Works Application for Council Approval.

Name of Development 12 Lot Residential Development

Location of Development 2 Hope Street, Cooktown

Applicant MTC Tower Pty Ltd

Designer KFB Engineers

It is hereby certified that the Calculations, Drawings, Specifications and related documents submitted herewith have been prepared, checked and amended in accordance with the requirements of the FNQROC Development Manual and that the completed works comply with the requirements therein, **except** as noted below.

Compliance with the requirements of the Operational Works Design Guidelines	Non-Compliance refer to non-compliance report / drawing number
Plan Presentation	Y
Geotechnical requirements	Y
Geometric Road Design	Y
Pavements	Y
Structures / Bridges	N.A.
Subsurface Drainage	Y
Stormwater Drainage	Y
Site Re-grading	Y
Erosion Control and Stormwater Management	Y
Pest Plant Management	Y
Cycleway / Pathways	Y

Landscaping	Y
Water Source and Disinfection/Treatment Infrastructure (if applicable)	N.A.
Water Reticulation, Pump Stations and water storages	Y
Sewer Reticulation and Pump Stations	Y
Electrical Reticulation and Street Lighting	By others
Public Transport	N.A.
Associated Documentation/ Specification	Y
Priced Schedule of Quantities	Y
Referral Agency Conditions	Y
Supporting Information (AP1.08)	Y
Other	

Conscientiously believing the above statements to be true and correct, signed on behalf of:

Designer KFB Engineers ..... **RPEQ No** 00491

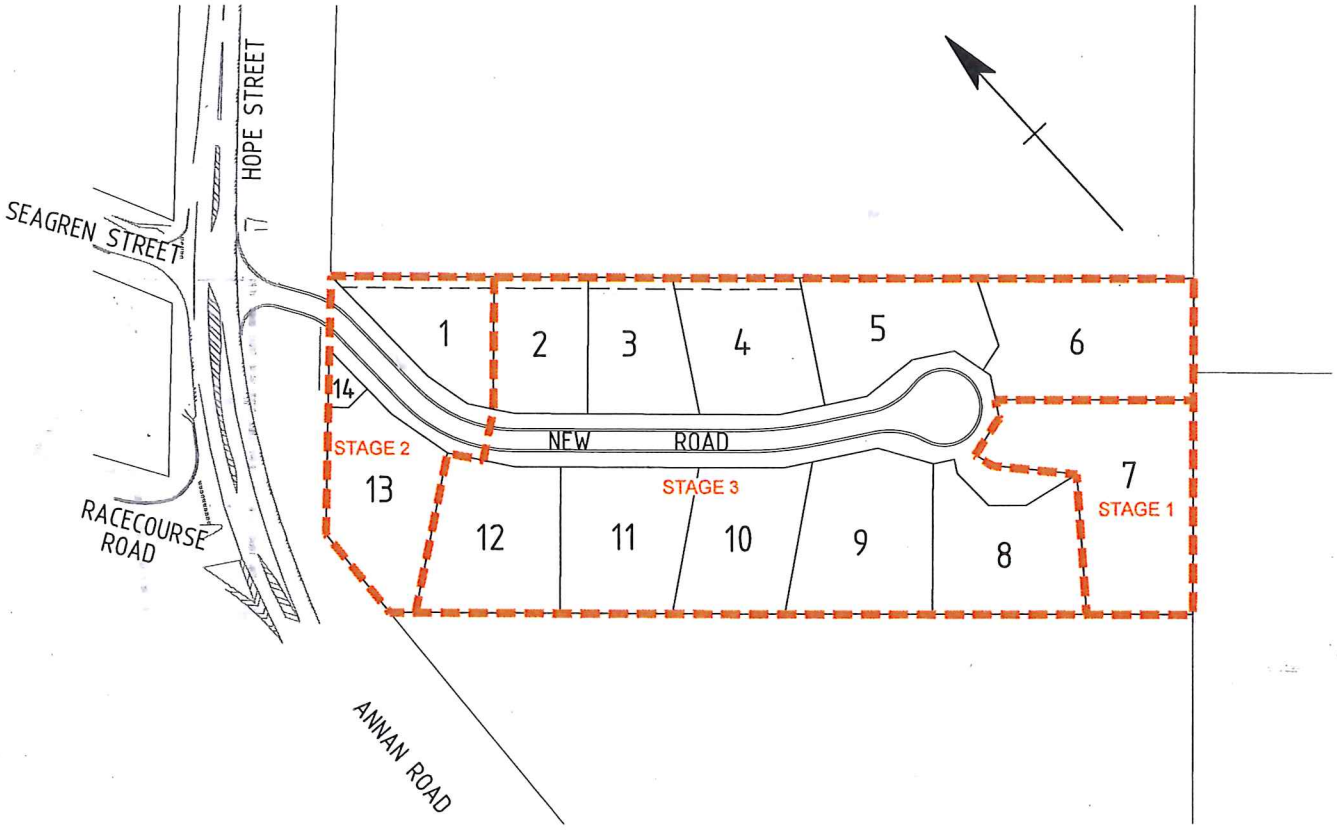
Name in Full Euan Fraser Bruce .....

Signature ..... **Date** 07/02/2023

DESIGN REPORT

MTC TOWER PTY LTD

RESIDENTIAL SUBDIVISION, 2 HOPE STREET, COOKTOWN



LOCALITY PLAN
SCALE 1:1000 (A1)
1:2000 (A3)

CONSULTING ENGINEERS:

KFB ENGINEERS

1/38-42 PEASE STREET, CAIRNS

KFB Engineers
Civil & Structural
ABN 73 618 014 261
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Our Ref: K-9168-REP-001
Your Ref:
Date: 07/02/23

1. DESIGN REPORT

1.1 Lot 23 and Lot 7 on SP 219110 – Reconfiguration Approval

Cook Shire Council Negotiated Decision Notice DA/4310:D22/4374, dated 24 February 2022, approved the reconfiguration of a Lot, one (1) into twelve (12) lots.
The ROL Application was supported by ;

- John MacIsaacs and Associates Pty Ltd – Dwg No 2038-05, dated 27-05-05
- Bayith Design Associates – Staging Plan
- Bruce and Associates Consulting Dwg 3130 sheet C-1A, 11/12/06 and Sheet C-1B, 30/08/07, Road Layout and Drainage Revised
- Bruce and Associates Consulting – Engineering Report – Specifications

1.2 Operational Works Application – Project Drawings

KFB Drawings K-9168, Sheets C01A to C13A (inclusive) and SK1A, detail the proposed Operational Works.

1.3 Compliance with Assessment Managers Conditions of Negotiated Decision Notice DA/4310:D22/4374.

In general the conditions of negotiated DA/4310:D22/4374 have been complied with as detailed in the following summary. The numbers used in the summary are the condition numbering used in the Decision Notice

A. Assessment Manager (Council Conditions)

1., 2., Approved Plans and Documents; Staged Development - Timing
Conditions noted and accepted.

3. 4. Water Supply and Effluent Disposal
Drawings No C11 and C12 detail Water and Sewerage Reticulation and its connection to Council's reticulated sewerage and water network.

The design of the sewerage and water works meets the requirements of Conditions 3. and 4.
With respect to providing sufficient reticulated water capacity for domestic and fire fighting purpose refer to:
ADDENDUM No 1.
CIVIL WALKER REF: 125-008-001L4
HOPE STREET SUBDIVISION, COOKTOWN
WATER RETICULATION MODELLING

General
Analysis of the existing water reticulation network was undertaken to evaluate the ability of the existing network to meet the proposed demands of the development.

Network analysis showed that residual pressures do not achieve the minimum required 22m pressure at Lots 3, 4, 5, 6, 7, 8, 9, or 10. Each of lots 4 through 9 will require pressure to be boosted to provide a minimum of 22m at the dwelling.

Conclusion
The Water Reticulation modelling has established that required pressures cannot be maintained within the proposed water reticulation system for the peak hour potable water demand and positive pressure cannot be maintained for the fire fighting scenario.

The Report recommends that a water booster pumping system be provided such that pressures can be increased to provide the required potable and fire fighting supply.

It is proposed that the design of the booster pumping system should generally be in accordance with the requirements of FNQROC, Section D6.18 "Alternative Water Pumping Systems".

Such a system would include a number of centrifugal pumps co-ordinated by a pump controller which responds to water demand, regulates the pump speed and the volume of water being supplied. Standby power should be supplied by a diesel generator.

A portion of Lot 13 would be excised off, and transferred to Council to house the booster pump assembly.

A design/specification for the booster pump assembly will be prepared and submitted to Council separately from this Operational Works Permit Report.

5. Services
Applications have been made to Service Providers (Ergon Energy and NBN) to advise the conditions under which they will provided services to the development.
Designs/details will be provided.

6. **7. Easements**
Advice to remove Existing Access to Lot 7 and cancellation of Easement A on SP219110 is detailed on Dwg K-9168 Sheet C02A.

Detail of the catch drain and 3.0m wide easement is detailed on Dwg K-9168 Sheets C02A and C04A.

8. Protection of Vegetation / Slope Protection
A note on Dwg K-9168 Sheet C02A states:
" Existing Vegetation on the Plan must be retained where possible".

9. 10. 11. Roadworks
All the requirements for the New Road listed in Conditions 9., 10., and 11. Have been adhered to.

12. Footpaths
Condition 12. Has been specifically noted on Dwg K-9168 Sheet C03A under LANDSCAPING

13. Street Lighting
The Street Lighting Condition will be managed under the provision of electricity in accordance with Condition 13.

14. 15. Sediment Control
Erosion and Sediment Control Strategy is detailed on Dwg K-9168 Sheet C13A

16. Fire Management
Agreed and is accepted as a current and on-going management responsibility.

17. 18. 19. 20. Access

17. Dwg K-9168 Sheet C02A details the possible location of access to lots 1 to 5 and lots 9 to 13.
Those chosen locations provide for residential vehicle crossings in accordance with FNQROC Std Dwg S1015 and driveways within each lot with grades in accordance with FNQROC D2.12 Allotment Accesses.
The access locations detailed on Dwg K-9168 Sheet C02A are such that site distances at the property entrances meet the requirements of FNQROC Development Manual and Austroads Guide to Road Design Part 4A.
For all of the lots it is possible to select alternative access locations to those detailed on Dwg K-9168 Sheet C02A and which meet the design criteria of condition 17.

Submissions were made to the Cook Shire Council for design of allotment accesses and driveways to be excluded from conditions for Operational Works and that the individual lot access locations and driveway design are determined at the building approval stage. This is because individual house design is usually unknown at the Operational Works stage.

18. The cul-de-sac has been designed in accordance with the requirements of FNQROC D1.14, Turning Areas. The cul-de-sac radius is 10m to the kerb invert line and has approach and departure radii of 20m which allows for safe turning of Service Vehicles without the need for reversing.

19. Dwgs K-9168 Sheets C02A, C04A and C05A detail Driveway 1 and Access Driveway 2 which provide access to Lots 6, 7 and 8. The driveways are 3m wide Type 1 concrete in accordance with FNQROC Std Dwg S1110.

20. Removal of the existing access to Lot 7 and cancellation of the Easement A on SP219110 are detailed on Dwg K-9168 Sheet C02A.

21. 22. 23. Stormwater

21. Stormwater drainage has been designed in accordance with section D4 of the FNQROC Design Manual and is detailed on Dwgs K-9168 Sheets C02A, C03A, C04A, C08A, C10A and SK1A. The point of legal discharge is Seagren Street.

22. The stormwater management is appropriate for this form of residential subdivision.

23. The stormwater design/management does not adversely affect flooding or drainage characteristics of properties that are upstream, downstream, or adjacent to the development site.

24. Operational Works

It is confirmed that the Application for Operational Works Permit being prepared will address items i, iii, iv, v, vi, and vii.

Item ii Geotechnical Investigation

Refer to:
ADDENDUM No 2.
GEO DESIGN REF 22028AA-D-R01-v1
GEOTECHNICAL INVESTIGATION
2 HOPE STREET, COOKTOWN, QLD., 4895

Conclusion

Based on the geotechnical investigation, and a review of the provided information, it is considered that the proposed subdivision is feasible from a geotechnical point of view. It is further considered that the risk of instability impacting proposed future residential developments or infrastructure is Very Low to Low if the Geo Design Report's recommendations are implemented.

Item viii Location and grade of driveways

Satisfactory access and satisfactory sight distances are available to all the proposed lots and suitable access positions are shown on Dwg K-9168 Sheet C02A.

It is recommended that the design of lot accesses and driveways are determined at the building approval stage as detailed in the previous Response to Condition 17.

25. Certificate and Maintenance

Conditions noted and accepted.

B. Assessment Manager (Council) Advice

1. Noted and generally accepted. Access suitability has been dealt with in Section A.

2. Noted and accepted.

3. This item dealt with in Section A.

4. The four (4) year approval period is noted.

5.(i) A Revised Stormwater Calculation is detailed on Dwg K-9168 Sheet C10A

5.(ii) The works required in 3.(ii) are detailed on Dwg K-9168 Sheet C03A.

5.(iii) As advised above (Conditions 3., 4.) a booster pump is required.

Attachment 1 – Referral agency conditions

It is confirmed that items 1., 2., and 3. have been complied with and are detailed on Dwgs K-9168 Sheets C02A, C03A, C054A, C11A, C13A.

Attachment 2- Advice to the applicant

General Advice items 1. and 2. are noted and will be followed.

Attachment 3- Reasons for referral agency response.

The reasons for the Sara decision are noted and accepted.

Signed .....

Euan Bruce RPEQ 00491 07/02/2023

Attach:

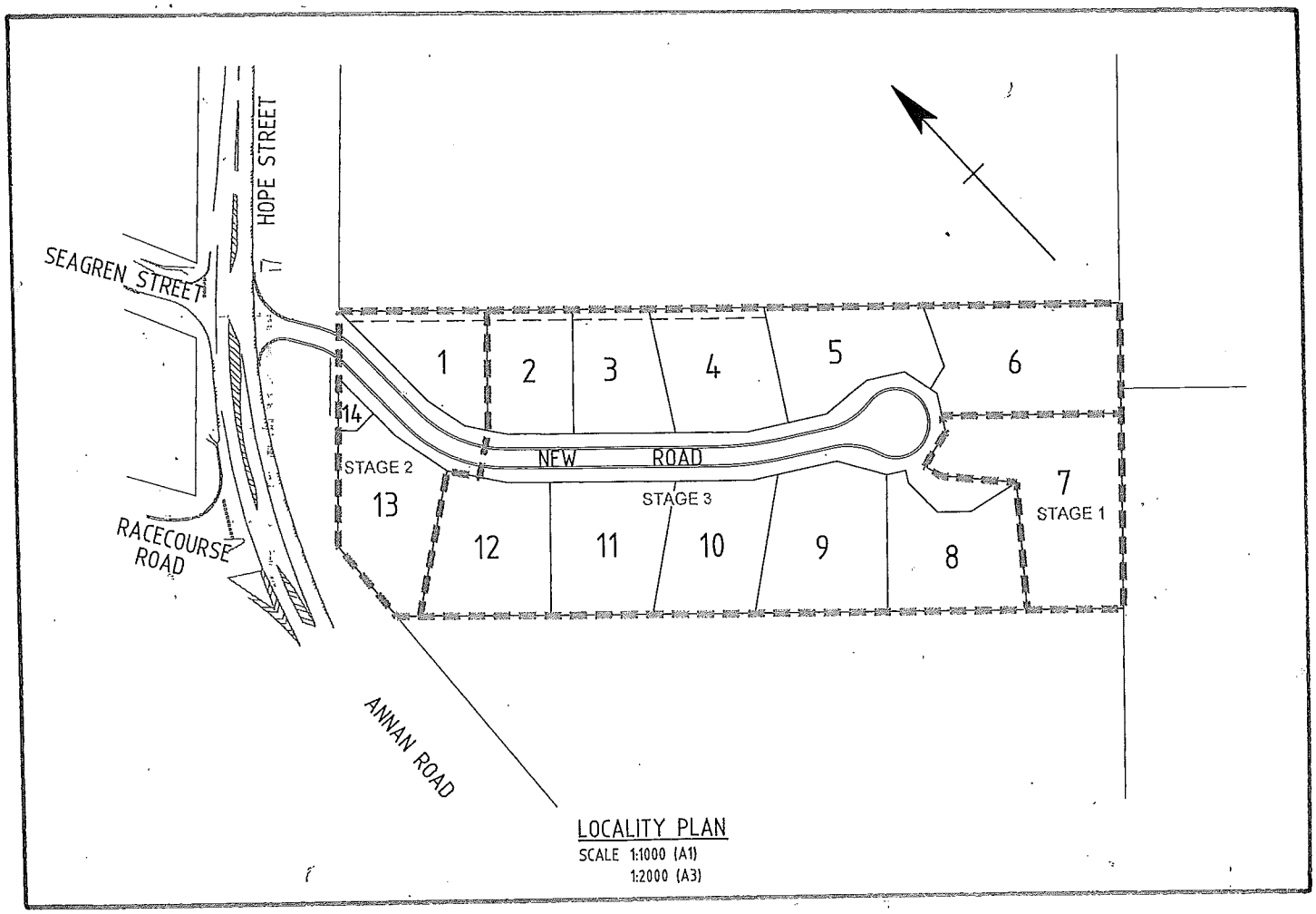
1. KFB Drawings K-9168, Sheets C01A to C13A (inclusive and SK1A
2. Addendum No 1 Civil Walker Report 125-008-001L4
3. Addendum No 2 Geo Design Report 22028AA-D-R01-v1

SPECIFICATION

MTC TOWER PTY LTD

RESIDENTIAL SUBDIVISION, 2 HOPE STREET, COOKTOWN

LOT 23 AND LOT 7 ON SP219110



KFB ENGINEERS

1/38-42 PEASE STREET, CAIRNS

CONTENTS

DRAWING INDEX

Job No K-9168

Sheet No	Drawing Title
C01	Locality Plan and Drawing Index
C02	Roadworks and Stormwater Drainage
C03	Annan Road / Hope Street Works
C04	Miscellaneous Sections and Details
C05	Road Longitudinal Section Sheet 1
C06	Road Longitudinal Section Sheet 2
C07	Road Cross Sections
C08	Stormwater Drainage Catchment Plan
C09	Stormwater Drainage Longitudinal Sections
C10	Stormwater Drainage Calculations
C11	Water and Sewerage Reticulation
C12	Sewerage Longitudinal Sections
C13	Erosion and Sediment Control Strategy
SK1	Seagren Street Stormwater Drainage Catchment Plan

ASSOCIATED DRAWINGS

1. Electrical Drawings
2. Telecommunications Drawings

To be isued

1. PRELIMINARIES

1.1 APPLICATION

1.1.1 This Specification has been developed in accordance with the requirements of the FNQROC Development Manual, Issue 7 (2017).

1.1.2 The Contractor should familiarise himself with the requirements of the FNQROC Development Manual, Issue 7 (2017) including that section that details the specific requirements of the Cook Shire Council. Where this specification differs with the requirements of the FNQROC Development Manual that manual will take precedence.

1.1.3 After amendment for use in other jurisdictions, some references to certain Standard Drawings and/or Standard Specifications may remain. If the Contractor does not have access to this material, it may be obtained from the Superintendent on request.

1.2 QUALITY ASSURANCE FOR CONTRACTORS

1.2.1 The required Standard to be applied to the whole of the Contract is AS/NZS ISO 9002:1994 "Quality systems - Model for quality assurance in production, installation and servicing".

1.2.2 The Contractor shall lodge with the Superintendent, prior to the Pre Start Meeting, a Quality Assurance Plan (including ITP's) to identify project specific works.

.

1.3 EXTENT OF WORK

1.3.1 The work to be executed under this Contract includes the supply of all labour and materials and the performance of all operations of whatever kind necessary for the complete and proper construction of the Works described in the tender documents. Work shall be performed to the complete satisfaction of the Superintendent.

1.4 NATURE OF CONTRACT

1.4.1 This is a Lump Sum Contract not subject to adjustment for Rise and Fall.

1.4.2 The Schedule of Quantities and Prices, contained in Schedule A to this Specification, and to be completed by Tenderers in calculating their tender, shall not form part of the Contract. It may, however, be used for the assessment of Progress Payments.

1.5 SCHEDULE OF DRAWINGS

1.5.1 The following drawings shall accompany this Specification:

refer to Drawing Index, on Contents page.

1.5.2 Any further drawings that may be required will, when supplied by the Superintendent, have the same standing as those supplied with this Contract.

1.6 PROVISIONAL SUMS

1.6.1 There are no Provisional Sums

1.7 TIME OF COMPLETION

1.7.1 The time of completion for the Works shall be as stated in the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A.

1.7.2 Further to Clause 34.6 of the General Conditions of Contract AS 4000-1997, the Superintendent will issue the Contractor with a Certificate of Practical Completion when:

a) construction work is completed to the satisfaction of the Superintendent;

b) the Local Authority have formally agreed to accept the Works onto maintenance; and

c) as-constructed drawings for stormwater drainage, sewage reticulation and water reticulation are submitted to the Superintendent.

1.8 INSURANCE

1.8.1 General

1.8.1.1 The Contractor's insurance requirements are as described in Clauses 16 to 19 (inclusive) in the General Conditions of Contract AS 4000-1997 as supplemented by the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A.

1.8.2 Works

1.8.2.1 The Contractor shall insure the Works in accordance with Clause 16 of the General Conditions of Contract AS 4000-1997 as supplemented by the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A and to the satisfaction of the Principal. Such insurance shall include the risk of loss and damage by fire, theft, explosion, lightning, storm, tempest and flood.

1.8.3 Construction Plant

1.8.3.1 The Contractor shall insure against fire, theft, explosion, lightning, storm, tempest and flood all plant brought onto the Site for the purpose of works by itself or by subcontractors.

1.8.4 Public Liability Insurance

1.8.4.1 Requirements for public liability insurance are specified in Clause 17 of the General Conditions of Contract AS 4000-1997 as supplemented by the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A.

1.9 DISPUTE RESOLUTION

1.9.1 Dispute resolution shall proceed in the manner described in Clause 42 of the General Conditions of Contract AS 4000-1997, as supplemented by the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A.

1.10 CONSTRUCTION SECURITY BOND & PORTABLE LONG SERVICE AND QLEAVE

1.10.1 Refer to clause 10.0 of the attached "Information to Tenderers and Conditions of Tendering" for the detail of lodging a Construction Security Bond.

1.10.2 The Contractor shall be responsible for payment of Portable Long Service and Q leave prior to the Pre Start Meeting.

1.11 RETENTION MONEYS

1.11.1 Retention moneys shall be dealt with in the manner described in Clause 5 of the General Conditions of Contract AS 4000-1997, as supplemented by the attached Annexure to the General Conditions of Contract (AS 4000-1997) - Part A.

1.12 LIQUIDATED DAMAGES

1.12.1 Further to Clause 34.7 of the General Conditions of Contract AS 4000-1997, liquidated damages shall be struck at the rates specified in the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A.

1.13 DEFECTS LIABILITY PERIOD

1.13.1 A defects liability period shall operate in the manner described in Clause 35 of the General Conditions of Contract AS 4000-1997, as supplemented by the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part A.

1.13.2 The Works will only be released from the defects liability period after they have been accepted off-maintenance by the Local Authority.

1.13.3 During the defects liability period, the Contractor shall:

a) make no less than four (4) visits to inspect the works and carry out necessary maintenance works as authorised by the Superintendent; and

b) repair, at no cost to the Principal, all defects, imperfections, shrinkages and other faults or damage due to any source or cause.

1.13.4 At the conclusion of the defects liability period, the Contractor shall ensure that all works are completed in accordance with the Local Authority's off-maintenance inspection checklist.

1.14 ALTERNATIVE MATERIALS

1.14.1 The Contractor may offer alternative materials to those specified or nominated on the drawings. The Contractor shall nominate any alternative materials at the time of tendering.

1.15 DOCUMENTS AND SITE SHED

1.15.1 The Contractor shall maintain on site a copy of this Specification and two sets of Contract drawings together with a copy of all written instructions issued by the Superintendent.

1.16 SITE INFORMATION AND INSPECTION OF SITE

1.16.1 The Contractor is notified that Clause 25 of the General Conditions of Contract AS 4000-1997 is amended as indicated in the attached Annexure to General Conditions of Contract (AS 4000-1997) - Part B.

1.16.2 The Contractor will be held to have included in their tender every item necessary for the full and proper completion of their work. Therefore, the Contractor shall be deemed to have taken into account in their tender the presence of water and mineral substances, and the geological structure of the soil and rock, and the existence of surface and underground services.

1.16.3 Any failure to do so will be at their own risk.

1.16.4 No extra will be allowed on the plea of want of information.

1.17 WEATHER CONDITIONS

1.17.1 The Contractor shall have made due allowance for the average weather pattern prevailing during the course of the project in compiling their tender.

1.17.2 Extensions for wet weather shall be based on the following:

a) at least 10mm must fall on a day before a one day extension will be considered (the Contractor shall supply and maintain a rain gauge on site);

b) boggy conditions shall be determined on site each day by the Superintendent;

c) extensions shall be calculated on the basis of a five day working week.

1.18 GOODS AND SERVICES TAX (GST)

1.18.1 Goods and Services Tax is applicable.

1.19 PAYROLL TAX

1.19.1 The Contractor shall have allowed for Payroll Tax on all wages in submitting its tender.

1.20 BY-LAWS, FEES AND NOTICES

1.20.1 The Contractor shall comply with all by-laws and regulations of the Local Authority and other statutory authorities having jurisdiction over the Works, and be responsible for the payment of fees and customary charges and the giving and receiving of all necessary notices.

1.21 MATERIALS AND WORKMANSHIP

1.21.1 Unless otherwise specified, materials, manufactured articles, and workmanship shall be new, the best of their respective kinds, conform to best trade practices and comply with relevant standards, codes and regulations.

1.22 INTERPRETATION OF TERMS

1.22.1 Unless otherwise specified, all references to the need for direction or approval in this Specification shall mean that the direction or approval of the Superintendent is required.

1.23 NOTICE BOARD AND PUBLIC NOTICE

1.23.1 The Contractor shall post a notice in the Public Notices of the Newspaper approved by Cook Shire Council prior to the commencement of work as required by CP1.11 of FNQROC Regional Development Manual.

1.23.2 The Contractor shall erect a project sign on the Hope Street frontage as required by CP1.11 of FNQROC Regional Development Manual.

1.24 WATER

1.24.1 The Contractor shall make his own arrangements for water and pay all charges.

1.25 LIGHT AND POWER

1.25.1 The Contractor shall make his own arrangements for temporary light and power and pay all charges.

1.26 DAMAGE TO SERVICES

1.26.1 The Contractor shall check with the Superintendent and all relevant authorities regarding the position of existing services such as Telecom cables, electrical power cables, water, gas, sewerage and stormwater pipes and shall be responsible for all damage. The Contractor shall notify the Superintendent and the relevant authority immediately such damage occurs.

1.27 REMOVAL OF RUBBISH AND FINAL CLEAN-UP

1.27.1 The Contractor shall remove all rubbish and debris from the site from time to time.

1.27.2 On completion, the Contractor shall ensure that the site is cleaned of surplus materials, debris, etc. The whole of the site is to be left in a state to the satisfaction of the Superintendent and fit for immediate occupation and/or use.

1.28 SAMPLES, TESTING AND INSPECTIONS

1.28.1 Test samples required by the Superintendent shall be supplied at the times and in the manner set out elsewhere in this Specification.

1.28.2 All testing associated with this Contract shall be carried out in accordance with the standard test procedures prescribed by the controlling Local Authority. Details of these test procedures may be obtained on application to the Superintendent.

1.28.3 The requirements identified in Section CP 1.16 the FNQROC Manual, shall be adhered to where applicable.

1.29 TREE CONSERVATION

1.29.1 Trees that are to be conserved will be marked on site. Every effort should be made to avoid damage to tree roots, trunks and foliage.

1.29.2 Where excavation for roadworks, stormwater drainage and other services are located in the vicinity of trees marked for conservation excavation should be carried out by means that does not damage the root system.

1.30 ORDER OF CONSTRUCTION AND CO-OPERATION

1.30.1 The Principal has arranged for works on site to be carried out by others under the following Contracts:

Contract No	Description	Contractor	Contact
	Telecommunications	To be advised	
	Electrical cable laying	To be advised	

1.30.2 The Contractor shall co-operate with any other Contractor or Subcontractors on the Site in order to minimise inconvenience and disruption.

1.30.3 The Principal shall not be responsible for any extras claimed where Contractors or Subcontractors have not co-operated and co-ordinated construction.

1.30.4 Damage caused in the course of the Works shall be made good by the appropriate trades and surfaces finished to match adjacent surfaces.

1.31 NOTICES

1.31.1 The Contractor shall give all notices and pay all fees required by statutory authorities.

1.31.2 The Contractor shall give 48 hours clear notice in writing to the owners and tenants of the land of its intention to enter private property and shall obtain written permission from the owners/tenants before entering.

1.32 PROVISION OF TRAFFIC

1.32.1 The Contractor shall provide and maintain all necessary temporary bridges, footpaths, drains, supports over or around open excavations, side tracks, roads, footpaths, cables and pipes so as to ensure continuity and safety of all services and vehicular and pedestrian traffic.

1.32.2 The Contractor shall provide and maintain all necessary temporary barriers and night lights necessary to thoroughly protect the general public and to provide for safe passage of all traffic.

1.32.3 All signs, lights, barriers and barricades shall be provided, erected and maintained in accordance with Section A.5 of the Manual of Uniform Traffic Control Devices.

1.32.4 Where sewers or culverts are being constructed on private property, the Contractor shall provide at its own cost all things necessary to give the owner of the property, safe and unobstructed access to buildings, driveways, etc, within the property.

1.33 DEMOLITION

1.33.1 No requirement.

1.34 SETTING OUT

1.34.1 The Contractor shall be responsible for all setting out of the Works in accordance with the Contract drawings and/or in accordance with instructions from the Superintendent.

1.34.2 In order to facilitate setting out by the Contractor, the authorised surveyors responsible for the cadastral survey shall provide such boundary pegs necessary, in the opinion of the Superintendent, for the Contractor to establish the position of sewer manholes, stormwater manholes, kerb and channel alignments, water service alignments and connections, etc.

1.34.3 The Contractor shall be responsible for the pegging of kerb and channel alignments, which shall be carried out by the authorised surveyor.

1.34.4 All pegs and/or marks established by the surveyor or Superintendent shall be carefully preserved.

1.34.5 Where construction necessitates the removal of pegs/marks, off-set pegs/marks shall be provided and their positions recorded on a set of contract drawings such that the original pegs/marks can be accurately re-established if required.

1.34.6 The Contractor shall be liable to pay an amount for full restoration of pegs/marks established by the surveyor or Superintendent that are displaced, removed, knocked out or covered by the Contractor.

1.35 CLEARING AND GRUBBING

1.35.1 Clearing and Grubbing shall be in accordance with FNQROC Development Manual Section S1.08.

1.35.2 There will be no clearing of trees in proposed Lot 10 (Stormwater Detention Basin).

1.35.3 Future lots 1 to 9 incl., the road reserve and pad mount area are to be cleared of all existing trees and vegetation. The Contractor shall remove all trees and vegetation from the site or alternatively mulch it and remove the mulch from the site.

1.35.4 All grub holes shall be filled with selected materials, compacted in layers and finished 75mm above adjacent ground.

1.36 EARTHWORKS

1.36.1 The Contractor shall cut to fill as described in the Contract drawings or as otherwise directed by the Superintendent. The Standard Specification for Earthworks (S1) contained in the FNQROC Development Manual shall be read in conjunction with this section.

1.36.2 Earthworks shall conform to AS 3798-1990 "Guidelines on earthworks for commercial and residential developments".

1.36.3 All earthwork quantities are solid measure. The Contractor is to make its own allowance for bulking and compaction of material even though this has been taken into consideration in the design process.

1.36.4 Finished surface levels are as detailed on Drawing K-4331 Sheet C04/C

1.37 COMPACTION

1.37.1 Unless noted otherwise, the following standards of compaction shall apply:

Element	Compaction (Min. Dry Density Ratio per AS 1289) (Cohesive Soils)	Compaction (Min. Density Index per AS 1289) (Cohesionless Soils)
Pavement Bed (Subgrade)	98%	80
Pavement Base Course	100%	
Pavement Sub-Base Course	100%	
Filling beneath pavement (fill to be placed and compacted in 150mm layers)	98%	
Footpaths Subgrade	95%	65
Allotment Fill	95%	65

1.37.2 Compaction tests shall be in accordance with AS 1289 "Testing soils for engineering purposes".

1.37.3 Unless noted otherwise, the conduct of compaction tests shall be in accordance with "Level 2" as defined in AS 3798-1990 "Guidelines on earthworks for commercial and residential developments".

1.38 ALLOTMENT AND FOOTPATH GRADING

1.38.1 Allotments shall be constructed to achieve the overall detail indicated on drawing C04/C.

1.38.2 Footpaths shall be neatly finished to the grades shown in typical cross-section drawing C02/B.

1.39 EXCAVATED MATERIALS

1.39.1 All excavated material, including spoil cut from roads, allotments and trenches, remains the property of the Principal and shall be spread, compacted and graded on site where directed by the Superintendent.

1.40 USE OF EXPLOSIVES

1.40.1 Blasting will only be permitted with the approval of the Superintendent and Local Authority.

1.40.2 All explosives must be properly stored and handled in compliance with regulations.

1.40.3 Due care for the protection of persons and property must be exercised during blasting operations.

1.40.4 The Contractor shall make good, at its own expense and immediately, all damage incurred by any persons or property as a result of blasting or associated operations.

1.41 INTERSECTION OF SERVICES

1.41.1 Where stormwater sewers and water mains intersect at the same level, the water main shall be lowered to pass under the stormwater sewer.

1.41.2 The Contractor shall carry out the work at no extra cost.

1.42 EROSION AND SEDIMENT CONTROL

1.42.1 The cost of temporary erosion and sediment control measures required by construction shall be borne by the Contractor.

1.42.2 These measures shall be as detailed in the Erosion and Sediment Control Plan provided as part of the design drawings.

1.42.3 If no such plan is provided then any measures adopted by the Contractor must be:

a) consistent with the methods detailed in the FNQROC Development Manual, and

b) approved by the Superintendent.

1.43 AS-CONSTRUCTED DETAILS

1.43.1 The Contractor is to employ licensed surveyors to prepare as-constructed drawings in hardcopy and digital format in accordance with the FNQROC Development Manual.

1.43.2 These drawings shall be submitted to the Superintendent.

1.44 ACTS AND REGULATIONS

1.44.1 The Contractor shall comply with the requirements of:

a) the Workplace Health and Safety Act No. 63 of 1989; and

b) the requirements of any other acts, regulations, codes, etc, of authorities having jurisdiction over the Works.

2. ROADWORKS

2.1 APPLICATION

2.1.1 The Standard Specification for Earthworks (S1) ,Road Pavements (S2) and Segmental Paving (S3) contained in the FNQROC Development Manual shall be read in conjunction with this Section.

2.1.2 The Contractor shall also comply with all relevant Australian Standards and relevant Standard Specifications in the Qld Department of Transport publication "Standard Specifications - Roads", 2nd Edition, produced by the Transport Technology Division.

2.1.3 The Contractor in carrying out the works detailed in Section 2.2 Installations Under Road Pavements shall also comply with Section 9. Electrical –Civil Works ; Communications Pit and Pipe Works.

2.2 INSTALLATIONS UNDER ROAD PAVEMENTS

2.2.1 General

2.2.1.1 All pipe and conduit installations under road pavements, shoulders and kerb and channel shall be constructed before any pavement construction is commenced.

2.2.1.2 The Contractor shall install underground power and telephone cable conduits under road pavements and footpaths in locations and to dimensions specified in approved Drawings issued by SPA Consulting and Telstra .

2.2.1.3 After approval by the Superintendent or the relevant Authority, trenches shall be backfilled to subgrade level with sand, crusher dust or other granular material approved by the Superintendent. The backfill shall be compacted to min. 95% of the standard maximum dry density.

2.2.2 Electricity Conduits

2.2.2.1 Conduits shall be uPVC Class 6, orange in colour complying with AS 2053-1984. Draw wire shall be nylon, not less than 1.5mm in diameter.

2.2.2.2 The Contractor shall supply and install the conduits in locations and to depths as detailed on approved Electrical Reticulation Drawings . Joints shall be properly glued and the ends of the conduits closed with styrene plugs. A draw wire shall be installed in each conduit and caution tape placed above the conduits.

2.2.2.3 Prior to backfilling the conduit trenches, the Contractor shall arrange for a approved Electrical Services inspector to inspect and certify that the conduits are correctly installed and that their locations are marked in the approved manner .

2.2.2.4 Permanent markers shall be installed as required by the approved drawings ..

2.2.3 Telephone Conduits

2.2.3.1 The Contractor shall install telephone cable conduits in the locations and at the depths shown in the approved Telecommunications drawings. The conduits,

which are supplied by NBNCo, shall be uPVC pressure pipe Class 9 to AS 1477 with solvent welded joints and coloured white.

2.2.3.2 The joints shall be properly made and the ends of the conduits shall be sealed with polythene sheeting adequately secured to prevent the ingress of sand or soil.

2.2.3.3 Prior to backfilling the conduit trenches, the Contractor shall arrange for a NBNCo officer to inspect and certify that the conduits are correctly installed and that their locations are marked in the approved manner for subsequent installation of permanent marker plates.

2.2.3.4 Permanent markers can be obtained from NBNCo and shall be installed as required by NBNCo.

2.2.3.5 In addition to the conduits shown on the Contract drawings, certain other conduits may also be required to be installed by NBNCo.

2.2.3.6 It shall be the Contractor's responsibility to notify NBNCo of the programme of works before commencing work and to liaise with NBNCo to ensure that it installs its conduits without any interruption to the Contractors activities and prior to the placing of pavement material.

2.3 ROAD SIGNS AND STREET NAME SIGNS

2.3.1 Road signs generally shall comply with Qld Department of Transport Standard Specification MRS11.14 "Road Furniture".

2.3.2 Street name signs shall comply with the FNQROC Manual and the requirements of the Cook Shire Council. .

3. STORMWATER DRAINAGE

3.1 APPLICATION

3.1.1 The Standard Specification for Stormwater Drainage (S4) contained in the FNQROC Development Manual shall be read in conjunction with this Section.

3.1.2 The Contractor shall also comply with all relevant Australian Standards and Standard Specifications in the Qld Department of Transport publication "Standard Specifications - Roads", 2nd Edition, produced by the Transport Technology Division..

3.1.3 If and to the extent that any inconsistency is observed between this Specification generally and the materials specified in this Clause, that inconsistency shall be brought to the attention of the Superintendent who shall make a direction.

3.1.4 All underground stormwater pipe drainage (between 375mm and 2000mm) shall be inspected using CCTV camera in accordance with FNQROC Specification S4.

4. WATER RETICULATION

4.1 APPLICATION

4.1.1 The Standard Specification and Drawings for Water Reticulation (S5) contained in the FNQROC Development Manual shall be read in conjunction with this Section.

4.1.2 The Contractor shall also comply with all relevant Australian Standards and all other Codes, Regulations, Standard Specifications, etc, applicable in the jurisdiction.

4.1.3 If and to the extent that any inconsistency is observed between this Specification generally and the materials specified in this Clause, that inconsistency shall be brought to the attention of the Superintendent who shall make a direction.

4.2 LOCAL AUTHORITY INSPECTOR

4.2.1 The Contractor shall allow the Local Authority's Inspector access to the Works at all times and shall provide him with any facilities he may require for inspecting the work. All necessary instructions will be issued by the Superintendent or his representative.

5. SEWERAGE RETICULATION

5.1 APPLICATION

5.1.1 The Standard Specification and Drawings for Sewerage (S6) contained in the FNQROC Development Manual shall be read in conjunction with this Section.

5.1.2 The Contractor shall also comply with all relevant Australian Standards and all other Codes, Regulations, Standard Specifications, etc., applicable in this jurisdiction.

5.1.3 If and to the extent that any inconsistency is observed between this Specification generally and the materials specified in this clause, that inconsistency shall be brought to the attention of the Superintendent who shall make a direction.

5.2 LOCAL AUTHORITY INSPECTOR

5.2.1 The Contractor shall allow the Local Authority's Inspector access to the works at all times and shall provide him with any facilities he may require for inspecting the work. All necessary instructions will be issued by the Superintendent or his representative.

5.3 CCTV INSPECTION

5.3.1 All constructed sewers shall be inspected by CCTV camera in accordance with FNQROC Specification S6.

6. LANDSCAPING

6.1 GENERAL REQUIREMENTS

6.1.1 FNQROC Development Manual Design Guidelines D9 Landscaping, and

FNQROC Development Manual Specification for Landscaping S8; shall be read with this section and applied where applicable.

6.1.2 The landscape work, is as detailed/scheduled in the Bill of Quantities.

7. CONCRETE WORKS

7.1 APPLICATION

7.1.1 The Standard Specification for Concrete Works (S7) contained in the FNQROC Development Manual shall be read in conjunction with this Section

8. EROSION AND SEDIMENT CONTROL

8.1 GENERAL

8.1.1 Drawing K-9168, Sheet C13, Erosion and Sediment Control Stategy, details the scope of the erosion and sediment control work.

It is intended that Drawing K-9168, Sheet C13 is used as a guide and that variations may apply as the Contractor implements a sediment and erosion control process.

8.2 SEQUENCE OF WORKS

8.2.1 The construction work is to be arranged in such a way that erosion and sediment control is maintained throughout and during all phases of the works. The scale of the works opened up at any one time must be such that when the site is vacated at the end of each day it is secure from the aspect of erosion and sediment control.

8.3 PROGRAMME OF WORK

8.3.1 The contractor shall prepare a Programme of Works and submit it to the Superintendent for approval prior to the commencement of works.

8.3.2 The Programme of Works shall incorporate erosion and sediment controls for pre-construction, during construction and post construction.

8.4 PRE CONSTRUCTION

8.4.1 The following are required to be included in the pre construction process

1. Construct sediment control as shown in drawing K-9168, sheet C13.
2. Identify any natural gullys or water courses that require diversion drains or other appropriate works.

8.5 DURING CONSTRUCTION

8.5.1 In addition to the general works shown on drawing K-8255, sheet C13,

maintain regular maintenance of all erosion and sediment control structures during the construction period.

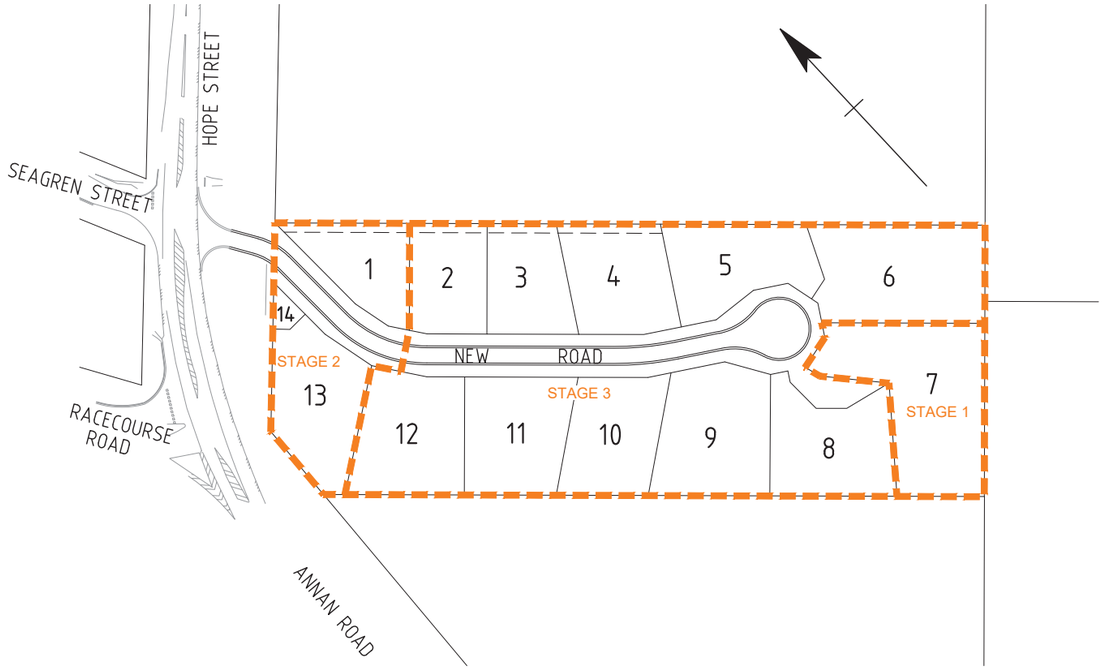
8.6 POST CONSTRUCTION

8.6.1 Upon practical completion the works will be inspected and accepted by Council onto maintenance for a period of 12-months. It will be the Contractors responsibility to maintain any revegetation works and as well maintain all erosion and sediment control measures.

CLIENT: **Mr Matthew Carey**

PROJECT: **Proposed Subdivision Stage 1 - 3**
Hope Street, Cooktown

PROJECT No: **K-9168**



LOCALITY PLAN
SCALE 1:1000 (A1)
1:2000 (A3)

DRAWING INDEX

DRAWING No	DRAWING TITLE
C01	LOCALITY PLAN AND DRAWING INDEX
C02	ROADWORKS AND STORMWATER DRAINAGE
C03	ANNAN ROAD/HOPE STREET WORKS
C04	MISCELLANEOUS SECTIONS AND DETAILS
C05	ROAD LONGITUDINAL SECTION SHEET 1
C06	ROAD LONGITUDINAL SECTION SHEET 2
C07	ROAD CROSS SECTIONS
C08	STORMWATER DRAINAGE CATCHMENT PLAN
C09	STORMWATER DRAINAGE LONGITUDINAL SECTIONS
C10	STORMWATER DRAINAGE CALCULATIONS
C11	WATER AND SEWERAGE RETICULATION
C12	SEWERAGE LONGITUDINAL SECTIONS
C13	EROSION AND SEDIMENT CONTROL STRATEGY
SK1	SEAGREN STREET STORMWATER DRAINAGE CATCHMENT PLAN

KFB Engineers Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Date: 10/2/23 Signed:
Job No: K-9168 RPEQ No: 491

1:1000 0 10 20 30 40 50 60 A1
1:2000 A3

No.	DATE	ISSUE / REVISIONS	DRN	CHKD
A	29/08/22	INITIAL ISSUE	KCDD	EWK

DRAWING FILE: XREF FILE:

Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

LOCALITY PLAN AND DRAWING INDEX

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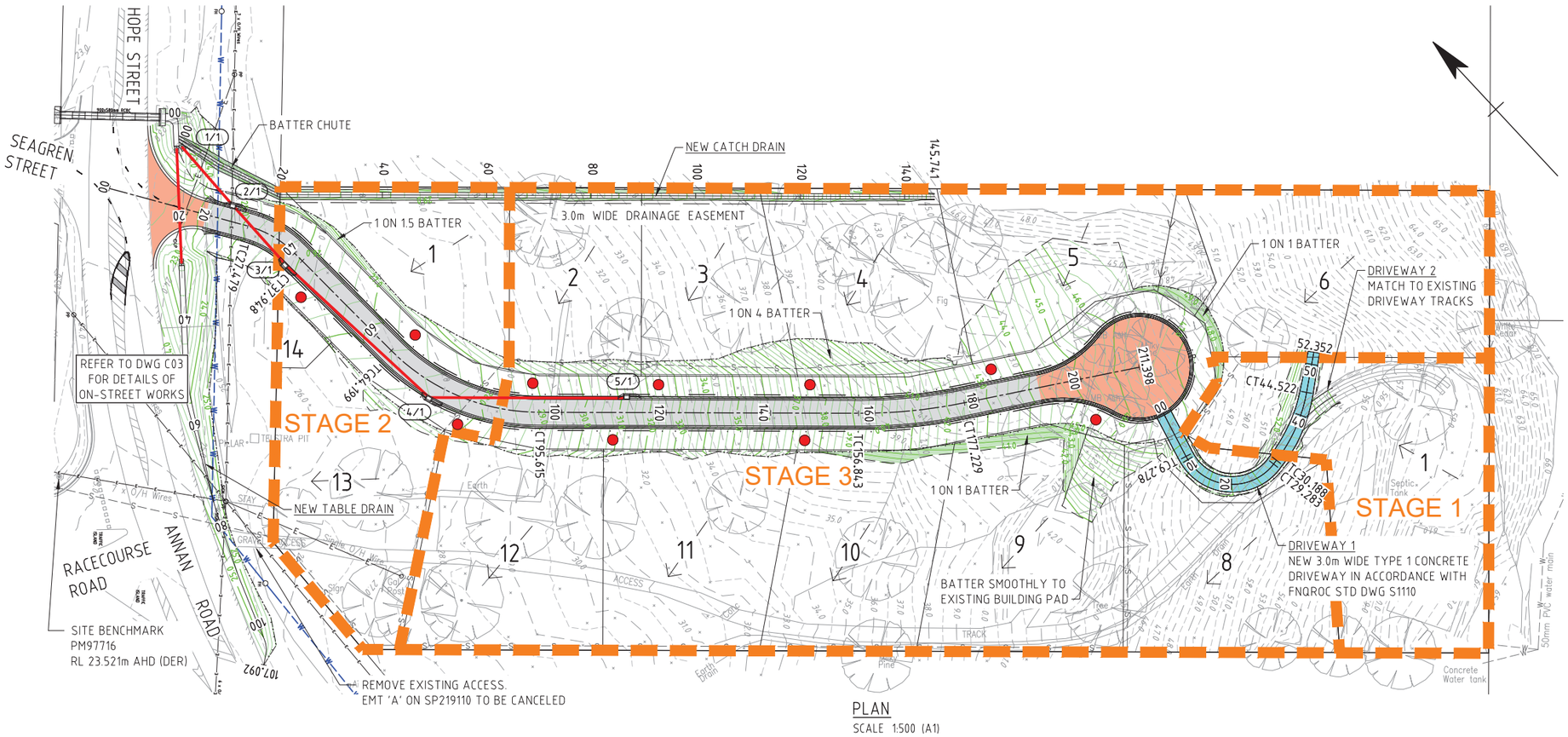
ABN 73 618 014 261
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C01 A
SCALE: 1:1000 (@ A1)



PLAN
SCALE 1:500 (A1)
1:1000 (A3)

LEGEND

- 30mm ASPHALT SEALED PAVEMENT
- 50mm ASPHALT SEALED PAVEMENT
- FALL OF FINISHED LOT
- STORMWATER DRAINAGE PIPE
- SEWER PIPE
- SUBSOIL DRAIN AND FLUSHING POINT
- 1/10 STORMWATER DRAINAGE STRUCTURE/LINE NUMBER
- 25.0 DESIGN SURFACE CONTOURS (0.25m INTERVAL)
- 26.0 EXISTING SURFACE CONTOURS (0.5m INTERVAL)
- POSSIBLE LOCATION OF LOT ACCESS FINAL LOCATION TO BE CONFIRMED AT BUILDING STAGE

ALIGNMENT DETAILS

ROAD A

TYPE	CHAIN	EAST	NORTH	BEARING	LENGTH	RADIUS
IP	0.000	525.903	564.614	148°11'18.56"		
TC	27.479	540.388	541.262	148°11'18.56"		
IP	32.714	543.212	536.710		10.469	20.000
CT	37.948	543.382	531.355	178°10'50.00"		
TC	64.199	544.215	505.117	178°10'50.00"		
IP	79.907	544.742	488.557		31.416	-40.000
CT	95.615	556.823	477.219	133°10'50.00"		
	100.000	560.021	474.219	133°10'50.00"		
TC	156.843	601.471	435.321	133°10'50.00"		
IP	167.036	608.930	428.322		20.386	-100.000
CT	177.229	617.651	422.977	121°30'00.00"		
	200.000	637.066	411.079	121°30'00.00"		
IP	211.398	646.785	405.124	121°30'00.00"		

DRIVEWAY 1

TYPE	CHAIN	EAST	NORTH	BEARING	LENGTH	RADIUS
IP	0.000	644.151	395.477	195°16'24.16"		
TC	9.278	641.707	386.527	195°16'24.16"		
IP	19.281	637.602	371.494		20.005	-10.000
	20.000	644.427	376.680	133°50'24.56"		
CT	29.283	652.978	374.025	80°39'03.55"		
TC	30.188	653.871	374.172	80°39'03.55"		
IP	37.355	661.080	375.359		14.334	-30.000
	40.000	663.122	377.307	61°54'40.51"		
CT	44.522	666.936	379.728	53°16'31.36"		
IP	52.352	673.212	384.410	53°16'31.36"		

NEW TABLE DRAIN

TYPE	CHAIN	EAST	NORTH	BEARING	LENGTH	RADIUS
IP	0.000	544.288	565.820	220°33'42.13"		
	10.000	537.785	558.223	220°33'42.13"		
	20.000	531.283	550.626	220°33'42.13"		
	30.000	524.780	543.029	220°33'42.13"		
	40.000	518.277	535.432	220°33'42.13"		
	50.000	511.775	527.835	220°33'42.13"		
IP	52.877	509.904	525.650			
	60.000	506.438	519.427	209°07'12.16"		
	70.000	501.571	510.691	209°07'12.16"		
IP	74.073	499.589	507.132			
IP	78.011	497.876	503.586			
	80.000	497.025	501.789	205°02'48.02"		
IP	83.334	495.574	498.786		10.644	-200.000
CC	88.656	493.532	493.870	202°34'01.12"		
	90.000	493.020	492.627	202°10'54.78"		
IP	93.676	491.604	489.233		10.041	-200.000
CT	98.697	489.912	484.505	199°41'25.44"		
	100.000	489.473	483.278	199°41'25.44"		
TC	102.024	488.792	481.373	199°41'25.44"		
IP	103.512	488.275	479.929		2.976	5.000
CT	105.000	487.038	479.023	233°47'32.85"		
IP	107.092	485.349	477.787	233°47'32.85"		

NEW CATCH DRAIN

TYPE	CHAIN	EAST	NORTH	BEARING	LENGTH	RADIUS
IP	0.000	542.085	562.477	165°21'17.69"		
IP	9.085	544.382	553.688			
IP	22.132	548.977	541.476			
IP	147.471	640.374	455.707	33°10'50.00"		

ALL WORKS

1. CONSTRUCTION AND INSTALLATION OF ALL WORKS AS DETAILED ON THESE DRAWINGS SHALL BE IN ACCORDANCE WITH THE PROCEDURES, SPECIFICATIONS AND DRAWINGS CONTAINED IN THE CURRENT ISSUE OF THE FNQROC DEVELOPMENT MANUAL AND TO THE REQUIREMENTS OF THE COOK SHIRE COUNCIL.

COMPLIANCE WITH THE ASSESSMENT MANAGER CONDITIONS

1. THE CONTRACTOR SHALL COMPLY WITH ALL ASSESSMENT MANAGER CONDITIONS SET OUT IN COUNCIL DECISION NOTICE FOR OPERATIONAL WORKS.

GENERAL NOTES

1. TRAFFIC CONTROL DEVICES (SIGNS, LINEMARKING ETC) SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT ISSUE OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AS ISSUED BY THE DEPARTMENT OF TRANSPORT, QUEENSLAND AND FNQROC STD DWG S1041.
2. ENSURE SERVICE CONDUITS ARE LAID BENEATH ANY EARLY WORKS FINISHES. E.g. WATER, POWER, TELECOMMUNICATIONS, ETC. NOTE WATER SERVICE CONDUITS TO BE INSTALLED UNDER NEW CONCRETE FOOTPATH IN WISEMAN ROAD EAST.
3. THE CONTRACTOR SHALL REMOVE ALL EXISTING CONSTRUCTION, TREES, SERVICES ETC AS NECESSARY TO PERMIT CONSTRUCTION OF THE NEW WORKS.
4. THE CONTRACTOR SHALL OBTAIN COUNCIL INSPECTIONS AND THEIR WITNESS TO TESTING PRIOR TO MAKING SERVICES LIVE. A COPY OF COUNCIL'S INSPECTION CERTIFICATE SHALL BE PROVIDED TO THE SUPERINTENDENT PRIOR TO PRACTICAL COMPLETION.

SURVEY & EXISTING SERVICES

1. THE LINE AND LEVEL OF EXISTING UNDERGROUND SERVICES SHALL BE DETERMINED BY THE CONTRACTOR AND THE ENGINEER SHALL BE NOTIFIED OF ANY POTENTIAL CLASHES WITH DESIGN STRUCTURES AND SERVICES PRIOR TO COMMENCING CONSTRUCTION.
2. ALL DAMAGE TO EXISTING SERVICES SHALL BE MADE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT AND THE RELEVANT AUTHORITY, ALL AT THE CONTRACTORS EXPENSE. THE CONTRACTOR SHALL NOTIFY THE RELEVANT AUTHORITY IMMEDIATELY WHEN ANY DAMAGE OCCURS.
3. EXISTING OUTLET LEVELS OR CONNECTION LEVELS FOR ALL DESIGN STORMWATER AND SEWER SHALL BE CONFIRMED BY THE CONTRACTOR AND THE ENGINEER SHALL BE NOTIFIED OF ANY VARIATIONS PRIOR TO COMMENCING CONSTRUCTION.
4. EXISTING SERVICES ON THE DRAWINGS ARE PLOTTED FROM THE BEST INFORMATION AVAILABLE. NO RESPONSIBLY IS TAKEN BY THE PRINCIPAL OR SUPERINTENDENT FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION SHOWN.
5. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION THE CONTRACTOR IS TO ESTABLISH ON SITE THE EXACT POSITION OF ALL UNDERGROUND SERVICES IN THE PROPOSED WORKS AREA. METHODS FOR ACHIEVING THIS WILL INCLUDE BUT NOT BE LIMITED TO:-
   - CAREFUL EXAMINATION OF THE CONTRACT DRAWINGS.
   - CONSULTATION WITH THE RELEVANT SERVICE AUTHORITIES INCLUDING DIAL BEFORE YOU DIG.
   - COMPREHENSIVELY SCANNING THE AFFECTED AREAS WITH A CABLE DETECTOR AND MARKING ON THE GROUND THE POSITION OF ALL SERVICES.
   - HAND EXCAVATING TO EXPOSE ALL SUCH SERVICES WHICH MAY BE AFFECTED BY THE PROPOSED WORKS UNDER THE DIRECTION OF THE RELEVANT SERVICE AUTHORITY.

PROTECTION OF VEGETATION / SLOPE PROTECTION

1. EXISTING VEGETATION DETAILED ON THE PLAN MUST BE RETAINED WHERE POSSIBLE.

LANDSCAPING

1. ALL INTERNAL & EXTERNAL LANDSCAPING SHALL BE ESTABLISHED AND MAINTAINED TO THE SATISFACTION OF THE COUNCIL.
2. FOOTPATHS THE VERGE BETWEEN THE PROPERTY BOUNDARY AND K&C SHALL BE FORMED AND GRASSED AND LEFT IN A MOWABLE CONDITION.

'AS CONSTRUCTED' INFORMATION

1. THE CONTRACTOR SHALL PROVIDE 'AS CONSTRUCTED' DRAWINGS INCLUDING BOTH ELECTRONIC AND HARD COPIES CERTIFIED BY A REGISTERED SURVEYOR FOR ALL UNDERGROUND SERVICES INSTALLED FOR THIS PROJECT IN ACCORDANCE WITH FNQROC AND COUNCIL REQUIREMENTS.

SURVEY DATUM

SURVEYOR: JOHN MACISAAC AND ASSOCIATES PTY LTD
REF: 2038-03 DATE: 27/05/2005

LEVEL DATUM: AHD DERIVED
ORIGIN OF LEVELS: PM 97716 RL 23.521
MERIDIAN: SP136525

KFB Engineers Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Date: 10/2/23 Signed:
Job No: K-9168 RPEQ No: 491

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A	29/08/22	INITIAL ISSUE	KCDD	EWK

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Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

ROADWORKS AND STORMWATER DRAINAGE

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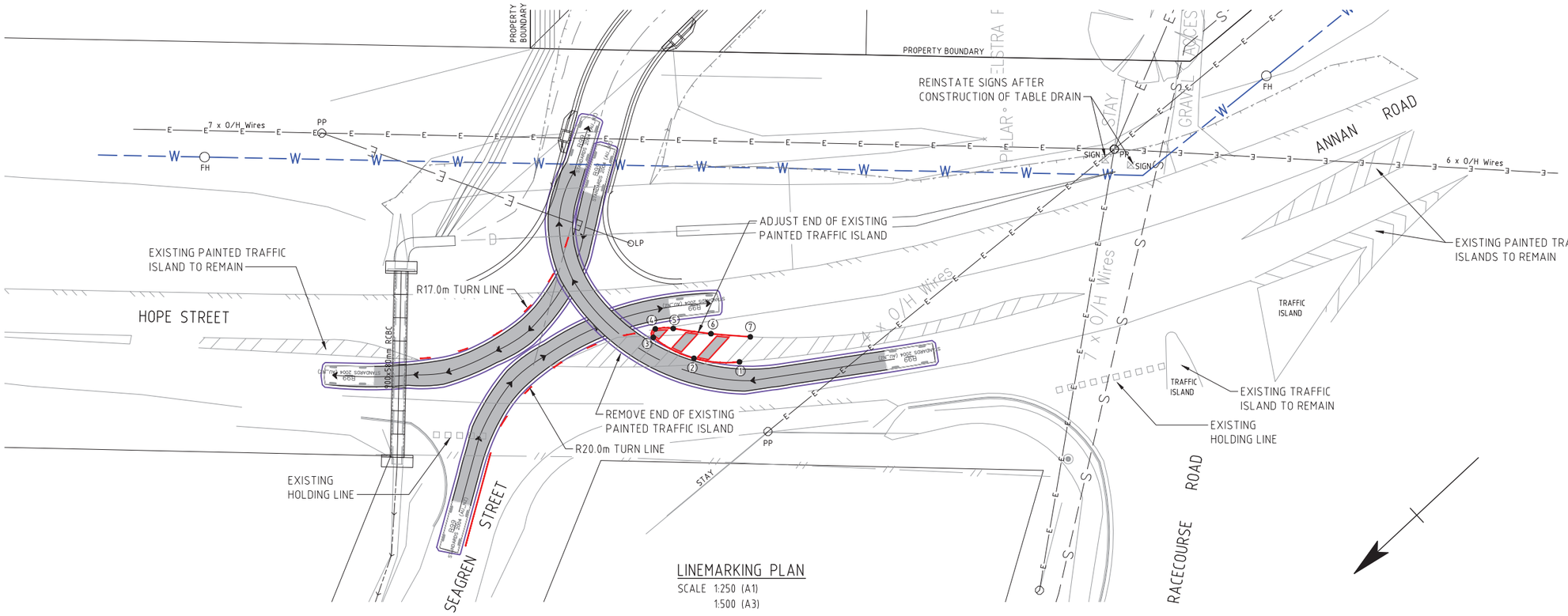
ABN 73 618 014 261
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

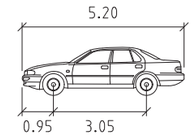
JOB No: K-9168
SHEET: C02 A
SCALE: 1:500 (@ A1)



LINEMARKING PLAN
SCALE 1:250 (A1)
1:500 (A3)

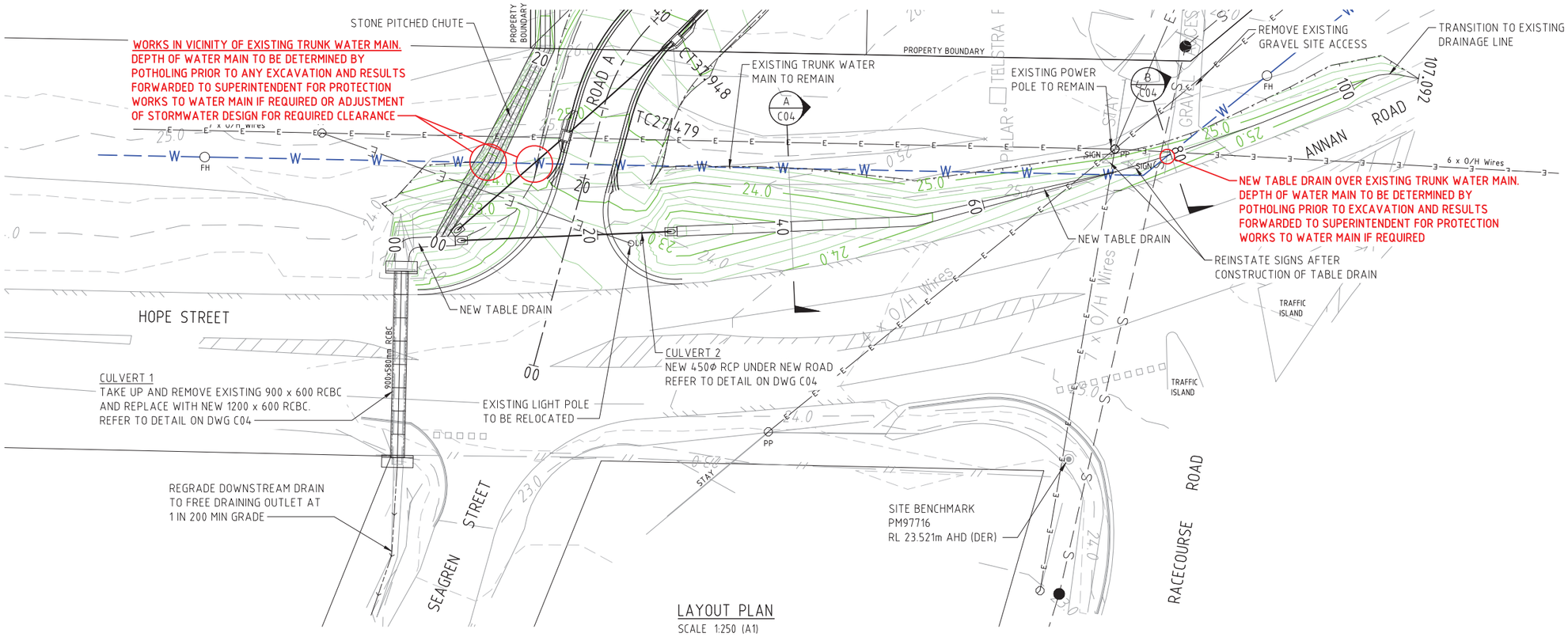
CHEVRON SETOUT

PT	EAST	NORTH
1	511.681	548.836
2	515.156	552.015
3	519.587	553.612
4	520.089	552.859
5	518.854	551.479
6	515.812	549.005
7	512.806	546.261



B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9



LAYOUT PLAN
SCALE 1:250 (A1)
1:500 (A3)

KFB Engineers Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Date: 10/2/23 Signed:
Job No: K-9168 RPEQ No: 491

1:250 0 5 10 15 A1
1:500 A3

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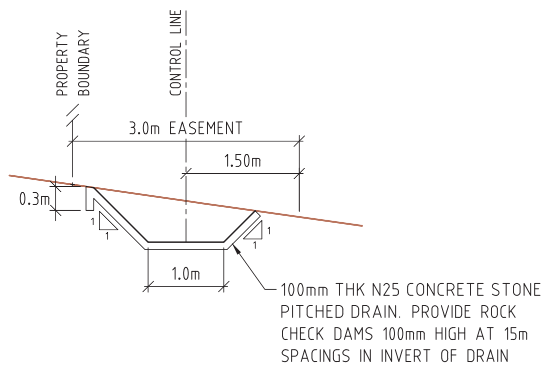
Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

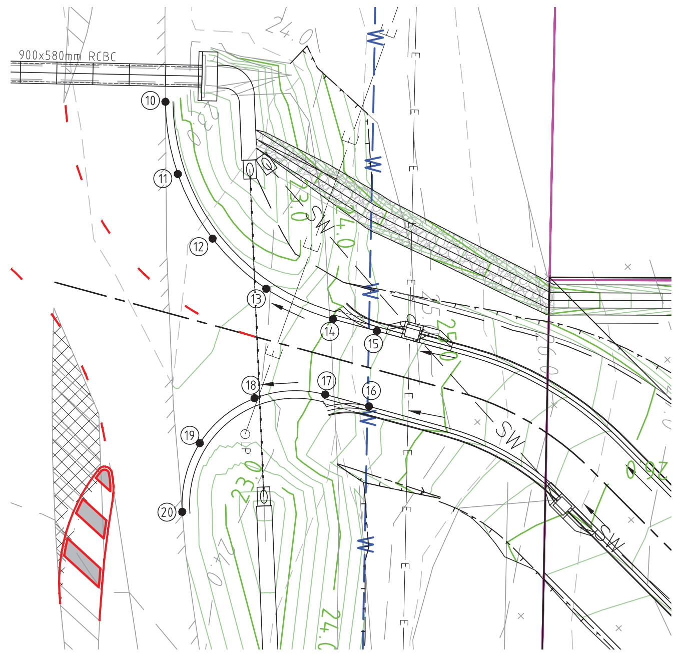
HOPE ST / ANNAN RD
ON-STREET WORKS

KFB ENGINEERS
ABN 73 618 014 261
Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C03 A
SCALE: 1:250 (@ A1)



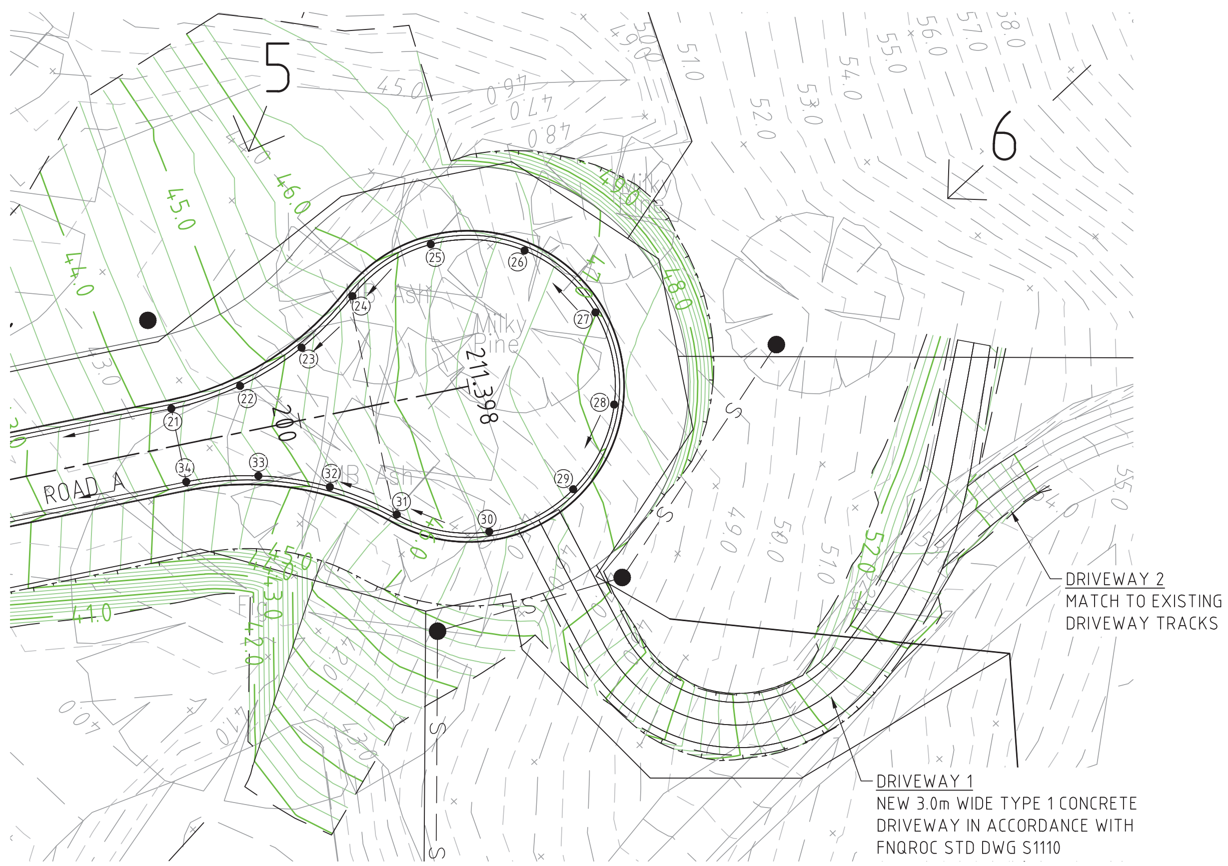
CATCH DRAIN DETAIL
N.T.S.



INTERSECTION DETAILS
SCALE 1:250 (A1)

INTERSECTION SETOUT

PT	EAST	NORTH	RL LIP
10	539.381	568.360	23.310
11	536.723	564.308	23.331
12	535.496	559.620	23.331
13	535.827	554.785	23.499
14	537.683	550.308	24.018
15	539.265	547.758	24.414
16	535.496	544.463	24.510
17	533.914	547.013	24.134
18	530.328	550.023	23.694
19	525.655	550.319	23.620
20	521.717	547.785	23.680
21	631.401	417.448	44.168
22	635.751	415.445	44.654
23	640.449	414.519	45.140
24	645.234	414.719	45.625
25	651.371	413.694	46.198
26	655.629	409.156	46.616
27	656.262	402.965	46.996
28	653.011	397.659	47.122
29	647.208	395.413	46.808
30	641.231	397.147	46.289
31	637.531	402.150	45.646
32	635.538	406.504	45.153
33	632.579	410.269	44.661
34	628.820	413.236	44.167



INTERSECTION DETAILS
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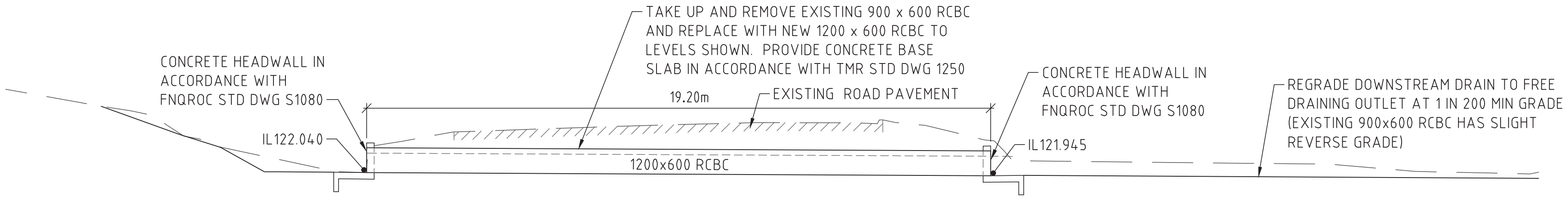
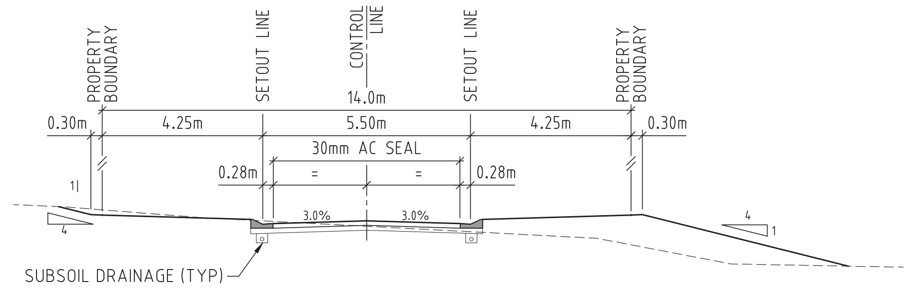
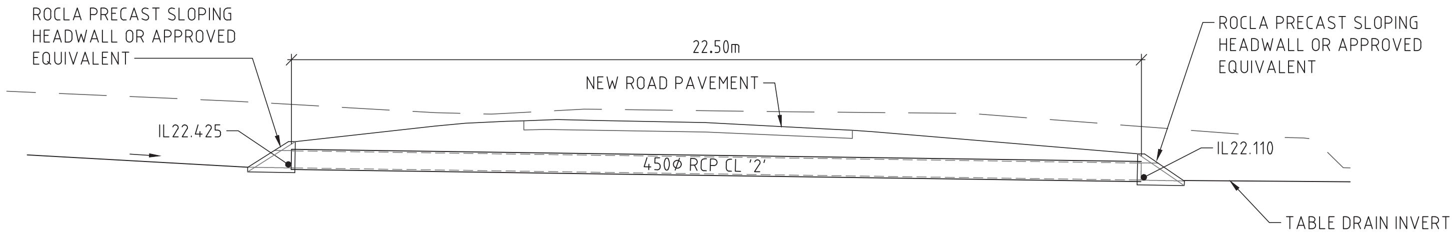


CULVERT 1
SCALE 1:100 (A1)



TYPICAL ROAD CROSS SECTION
N.T.S.



CULVERT 2
SCALE 1:100 (A1)

PAVEMENT DETAILS

SEAL 30mm OR 50mm DENSE GRADED DG10 MIX ASPHALTIC CONCRETE

AMCOO PRIMER SEAL

BASE COURSE: 100mm TYPE 2.2 ROAD GRAVEL C.B.R 60 (MIN)
COMPACT TO 100% M.D.D. (STD)

SUB BASE COURSE: 120mm TYPE 2.3 ROAD GRAVEL C.B.R 45 (MIN)
COMPACT TO 100% M.D.D. (STD)

SUBGRADE: C.B.R. 10 (MIN) COMPACT TO 98% M.D.D. (STD)

WHERE ROAD GRADE IS 10% OR GREATER A PRIME AND SEAL COAT (10mm - 7mm SCREENINGS) IS REQUIRED PRIOR TO APPLICATION OF THE ASPHALT

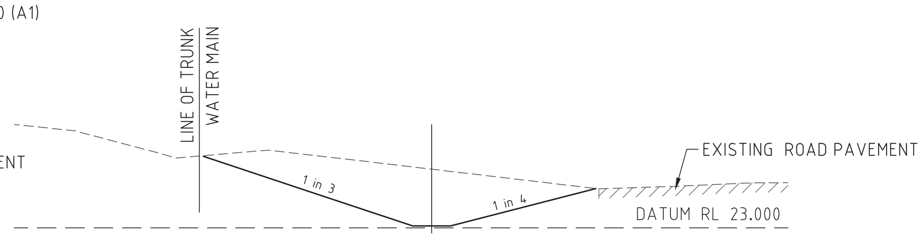
SELECT FILL: 300mm APPROVED SELECT FILL C.B.R. 20 (MIN)
COMPACT TO 95% M.D.D. (STD)

CONTRACTOR TO FORWARD TWO SOAKED C.B.R. TEST RESULTS FOR SUBGRADE FROM EACH ROAD AS SOON AS PRACTICABLY POSSIBLE

PAVEMENT DESIGN SUBJECT TO SUBGRADE C.B.R. RESULTS BEING ACCEPTED BY COUNCIL. (PRIOR TO CONSTRUCTION OF PAVEMENT)

NEW TABLE DRAIN OVER EXISTING TRUNK WATER MAIN. DEPTH OF WATER MAIN TO BE DETERMINED BY POTHOLING PRIOR TO EXCAVATION AND RESULTS FORWARDED TO SUPERINTENDENT FOR PROTECTION WORKS TO WATER MAIN IF REQUIRED

SECTION B (C03)
SCALE 1:100 (A1)



SECTION A (C03)
SCALE 1:100 (A1)

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1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Date: 10/2/23 Signed:
Job No: K-9168 RPEQ No: 491

1:250 0 5 10 15 A1
1:500 A3

No.	DATE	ISSUE / REVISIONS	DRN	CHKD
A	29/08/22	INITIAL ISSUE	KCDD	EWK

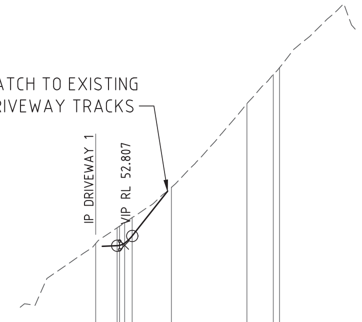
DRAWING FILE: XREF FILE:

Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

MISCELLANEOUS SECTIONS AND DETAILS

KFB ENGINEERS
ABN 73 618 014 261
Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C04 A
SCALE: AS SHOWN (@ A1)



HORIZONTAL CURVE DATA: R 30

VERTICAL CURVE LENGTH (m): VC 2
VERTICAL CURVE RADIUS (m): R 8.17

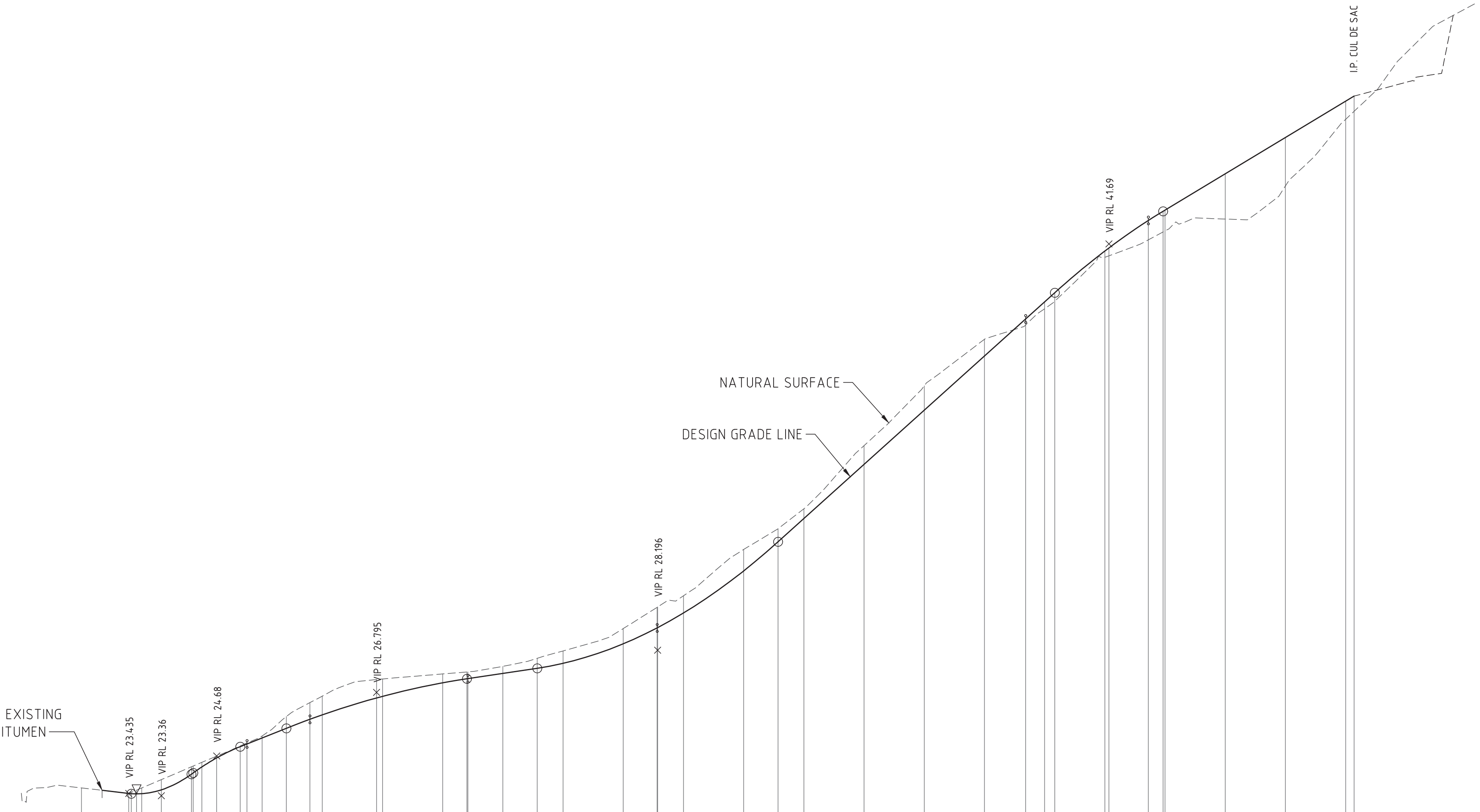
VERTICAL GEOMETRY GRADE (%): 0.8% | 25.2%
VERTICAL GEOMETRY LENGTH (m): 2.96 | 5.67

DATUM RL = 46.000

CONTROL LINE CHAINAGE	FINISHED SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT / FILL DEPTH
0		52.856	
2.828	52.799	53.270	-0.471
3.154	52.808	53.314	-0.506
3.828	52.868	53.405	-0.537
4.828	53.059	53.541	-0.482
10		54.340	
20		56.558	
23.499		57.329	
24.318		57.512	

DRIVE 2 LONGITUDINAL SECTION

SCALE 1:500 H 1:100 V



HORIZONTAL CURVE DATA: R 20 | R -40 | R -100

VERTICAL CURVE LENGTH (m): VC 10 | VC 7.8 | VC 30 | VC 40 | VC 18
VERTICAL CURVE RADIUS (m): R 63.52 | R 122.06 | R 604.4 | R 266.67 | R 302.91

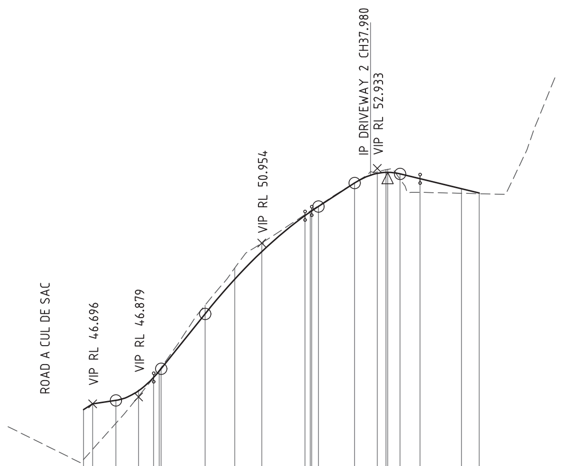
VERTICAL GEOMETRY GRADE (%): -2.4% | -1.4% | 14.4% | 8% | 3% | 18% | 12.1%
VERTICAL GEOMETRY LENGTH (m): 4.41 | 5.43 | 9.2 | 26.56 | 46.69 | 74.97 | 40.72

DATUM RL = 18.000

CONTROL LINE CHAINAGE	FINISHED SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT / FILL DEPTH
0		23.619	
7.836	23.435	23.435	-0.000
8.262	23.429	23.472	-0.042
9.145	23.423	23.546	-0.123
10	23.429	23.619	-0.190
13.262	23.557	23.896	-0.339
18.262	24.078	24.322	-0.245
18.558	24.120	24.348	-0.228
20	24.319	24.472	-0.153
22.458	24.618	24.676	-0.058
26.358	24.991	25.017	-0.026
27.479	25.080	25.115	-0.036
30	25.281	25.348	-0.067
34.02	25.601	25.994	-0.393
37.948	25.901	26.455	-0.554
40	26.047	26.670	-0.623
49.02	26.609	27.220	-0.611
50	26.662	27.240	-0.578
60	27.111	27.406	-0.295
64.02	27.245	27.472	-0.227
64.199	27.251	27.475	-0.225
70	27.425	27.658	-0.233
75.709	27.596	27.926	-0.330
80	27.759	28.172	-0.412
90	28.408	28.913	-0.505
95.615	28.936	29.620	-0.685
95.709	28.946	29.633	-0.687
100	29.431	30.002	-0.571
110	30.829	31.540	-0.711
115.709	31.796	32.228	-0.432
120	32.568	32.891	-0.323
130	34.368	34.991	-0.623
140	36.168	36.976	-0.808
150	37.968	38.524	-0.556
156.843	39.200	38.998	0.202
160	39.768	39.535	0.233
161.676	40.070	39.782	0.288
170	41.454	41.245	0.209
170.676	41.556	41.294	0.262
177.229	42.470	41.825	0.645
179.676	42.775	42.086	0.689
180	42.814	42.121	0.693
190	44.020	42.517	1.503
200	45.226	43.614	1.612
210	46.431	45.829	0.602
211.398	46.600	46.093	0.507

ROAD A LONGITUDINAL SECTION

SCALE 1:500 H 1:100 V



HORIZONTAL CURVE DATA: R -10 | R -30

VERTICAL CURVE LENGTH (m): VC 6 | VC 15 | VC 6
VERTICAL CURVE RADIUS (m): R 27.27 | R 124.47 | R 33.72

VERTICAL GEOMETRY GRADE (%): 12.5% | 3% | 25% | 12.9% | -4.8%
VERTICAL GEOMETRY LENGTH (m): 1.2 | 6.08 | 16.3 | 15.29 | 13.49

DATUM RL = 40.000

CONTROL LINE CHAINAGE	FINISHED SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT / FILL DEPTH
0	46.547	45.222	1.325
1.197	46.696	45.491	1.205
4.274	46.789	46.182	0.606
7.274	47.044	46.895	0.149
9.278	47.398	47.392	0.005
10	47.561	47.580	-0.019
10.274	47.629	47.654	-0.025
16.077	49.079	49.310	-0.231
20	49.998	50.297	-0.299
23.577	50.728	50.939	-0.211
29.283	51.680	51.707	-0.027
30	51.781	51.802	-0.021
30.188	51.807	51.827	-0.020
31.077	51.925	51.943	-0.018
35.862	52.545	52.547	-0.002
38.862	52.800	52.846	-0.047
40	52.827	52.898	-0.071
40.229	52.828	52.908	-0.080
41.862	52.788	52.682	0.106
44.522	52.659	52.298	0.361
50	52.394	52.273	0.121
52.352	52.280	52.262	0.018

DRIVE 1 LONGITUDINAL SECTION

SCALE 1:500 H 1:100 V

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1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au
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Job No: K-9168 RPEQ No: 491

1:500 / 1:1000 — 0 5 10 20 30 — A1 / A3
1:100 / 1:200 — 0 1 2 3 4 5 6 — A1 / A3

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ROAD LONGITUDINAL SECTIONS
SHEET 1

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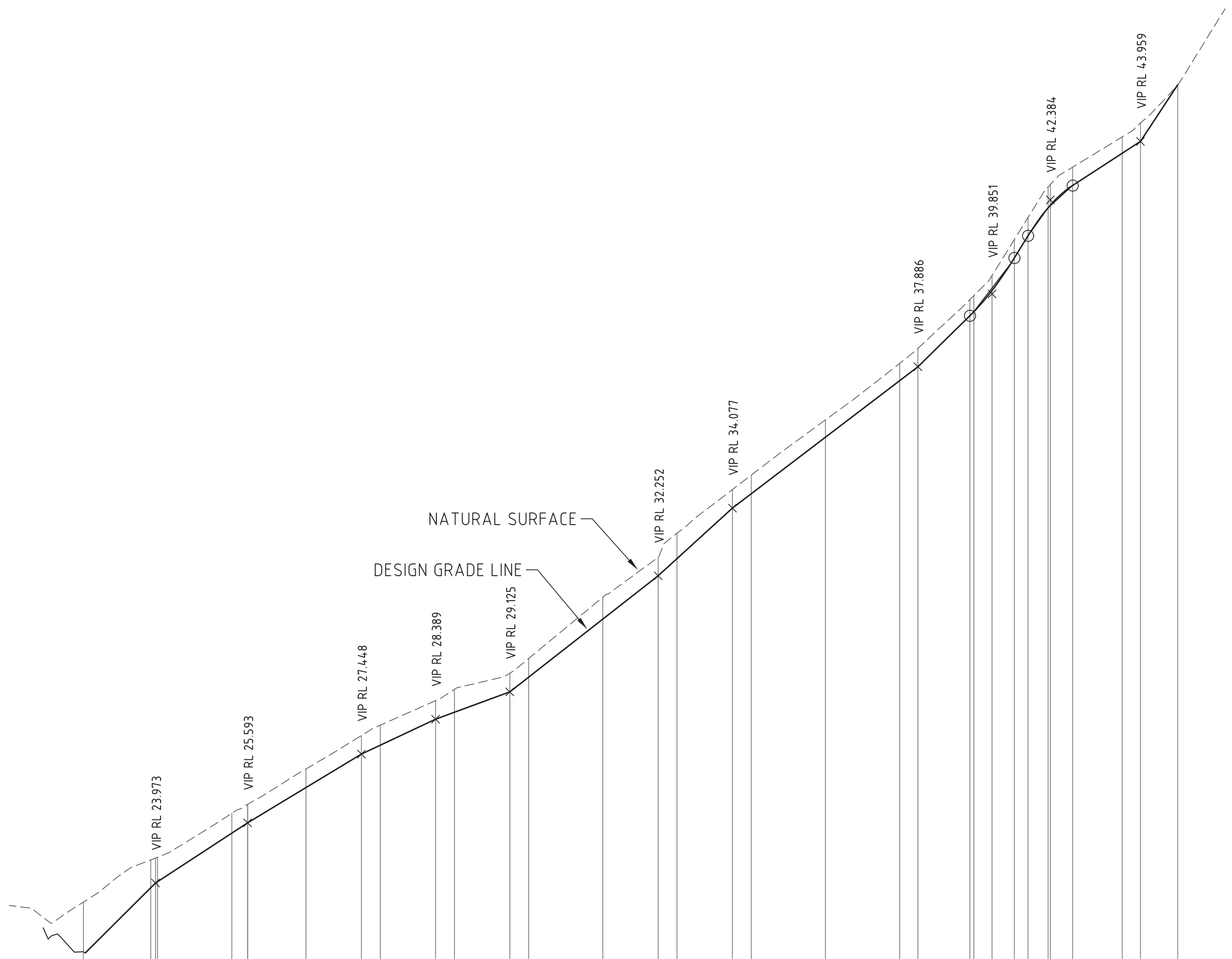
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C05 A
SCALE: AS SHOWN (@ A1)



HORIZONTAL CURVE DATA

VERTICAL CURVE LENGTH (m) / VERTICAL CURVE RADIUS (m): VC 6, R 47.42; VC 6, R 31.02

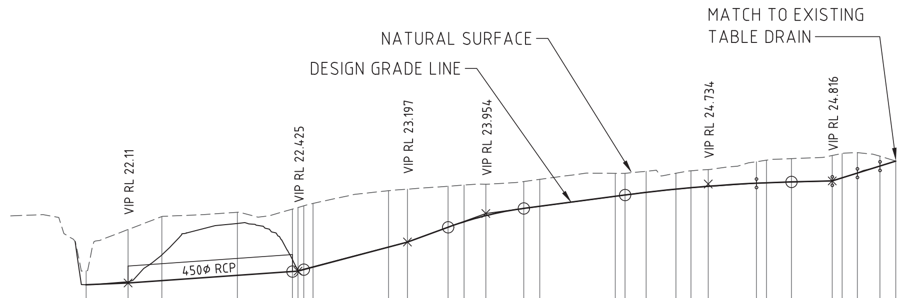
VERTICAL GEOMETRY GRADE (%) / VERTICAL GEOMETRY LENGTH (m): 19.9% / 9.46; 13.1% / 12.4; 12.1% / 15.34; 9.4% / 10; 7.4% / 10; 15.6% / 20; 18.3% / 10; 15.2% / 25; 19.6% / 10; 32.3% / 7.84; 13% / 12.16; 30.4% / 5.01

DATUM RL = 17.000

CONTROL LINE CHAINAGE	FINISHED SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT / FILL DEPTH
0		23.457	
9.085	23.847	24.594	-0.747
9.716	23.973	24.645	-0.672
10	24.010	24.668	-0.658
20	25.316	25.849	-0.533
22.119	25.593	26.092	-0.499
22.132	25.595	26.093	-0.498
30	26.546	27.046	-0.500
37.458	27.448	27.946	-0.498
40	27.687	28.227	-0.540
47.458	28.389	28.887	-0.499
50	28.576	29.189	-0.613
57.458	29.125	29.624	-0.498
60	29.523	30.023	-0.500
70	31.086	31.676	-0.590
77.458	32.252	32.750	-0.498
80	32.716	33.399	-0.684
87.458	34.077	34.575	-0.498
90	34.465	34.965	-0.500
100	35.988	36.453	-0.465
110	37.511	37.978	-0.467
112.458	37.886	38.384	-0.498
119.458	39.261	39.698	-0.437
120	39.371	39.806	-0.435
122.458	39.945	40.346	-0.401
125.458	40.820	41.315	-0.496
127.303	41.415	41.911	-0.496
130	42.169	42.735	-0.565
130.303	42.239	42.799	-0.559
133.303	42.773	43.265	-0.492
140	43.641	44.083	-0.442
142.458	43.959	44.457	-0.498
147.471	45.485	45.475	0.010

CATCH DRAIN LONGITUDINAL SECTION

SCALE 1:500 H 1:100 V



HORIZONTAL CURVE DATA: R -200; R -200; R 5

VERTICAL CURVE LENGTH (m) / VERTICAL CURVE RADIUS (m): VC 1.5, R 38.12; VC 10, R 215.47; VC 22, R 1023.33

VERTICAL GEOMETRY GRADE (%) / VERTICAL GEOMETRY LENGTH (m): 0.8% / 6.17; 1.4% / 22.49; 5.3% / 14.47; 7.3% / 10.38; 2.7% / 29.41; 0.5% / 16.41; 6.3% / 8.4

DATUM RL = 17.000

CONTROL LINE CHAINAGE	FINISHED SURFACE LEVEL	EXISTING SURFACE LEVEL	CUT / FILL DEPTH
0	22.065	22.434	-0.369
5.535	22.110	23.527	-1.418
10	22.172	23.871	-1.699
20	22.312	23.984	-1.672
27.278	22.414	24.069	-1.655
28.028	22.432	24.112	-1.680
28.778	22.465	24.155	-1.690
30	22.530	24.219	-1.689
40	23.064	24.556	-1.492
42.495	23.197	24.598	-1.401
47.877	23.589	24.676	-1.086
50	23.734	24.706	-0.973
52.877	23.896	24.726	-0.830
57.877	24.087	24.800	-0.714
60	24.143	24.857	-0.714
70	24.408	25.016	-0.609
71.291	24.442	25.016	-0.574
74.073	24.512	25.071	-0.559
78.011	24.598	25.018	-0.420
80	24.636	25.084	-0.448
82.291	24.675	25.118	-0.443
88.656	24.755	25.324	-0.569
90	24.767	25.365	-0.598
93.291	24.789	25.404	-0.615
98.697	24.816	25.488	-0.672
100	24.897	25.542	-0.644
102.024	25.024	25.564	-0.540
105	25.210	25.474	-0.264
107.092	25.341	25.341	0.000

TABLE DRAIN LONGITUDINAL SECTION

SCALE 1:500 H 1:100 V

1:500 / 1:1000: 0 5 10 20 30 (A1 / A3)
1:100 / 1:200: 0 1 2 3 4 5 6 (A1 / A3)

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ROAD LONGITUDINAL SECTIONS SHEET 2

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ABN 73 618 014 261
Civil & Structural
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E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C06 A
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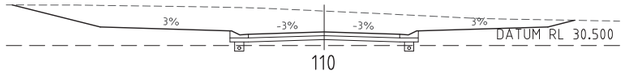

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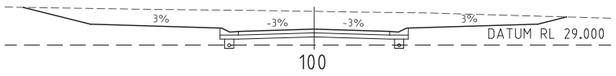

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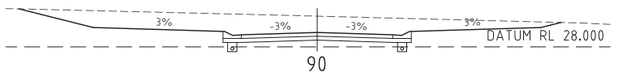

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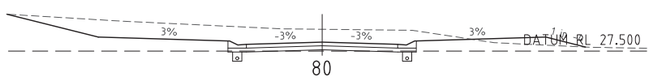

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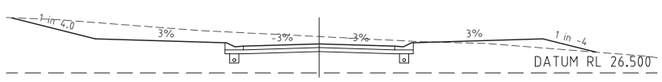

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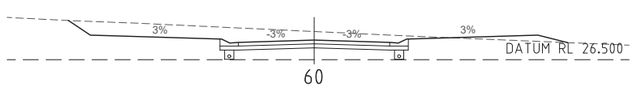

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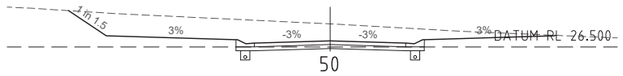

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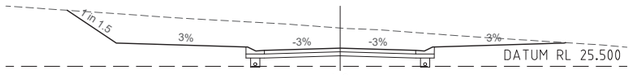

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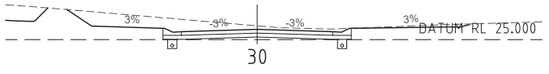

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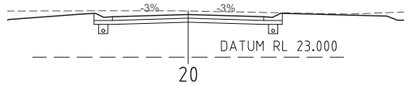

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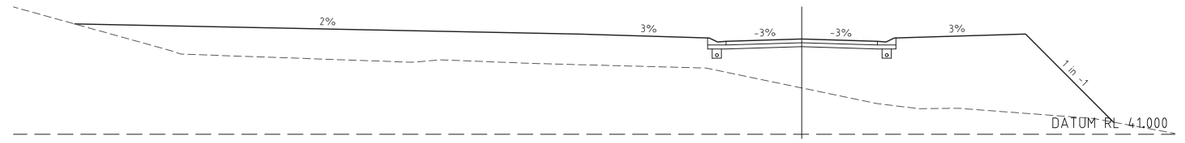

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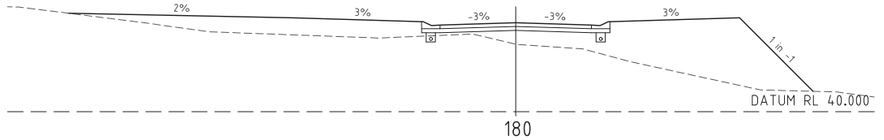

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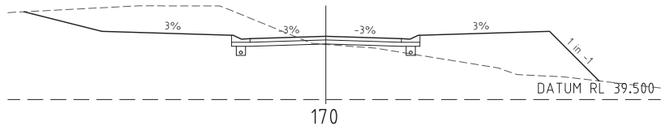

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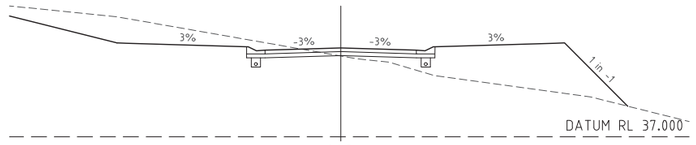

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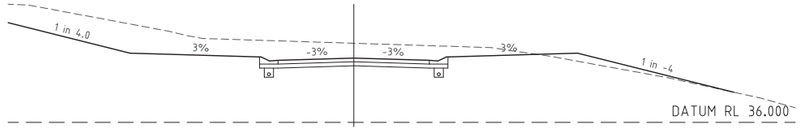

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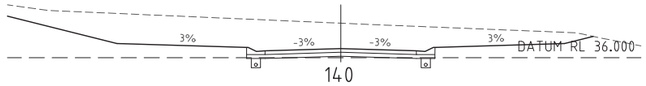

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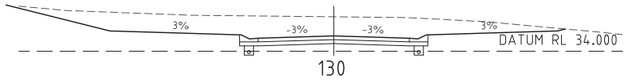

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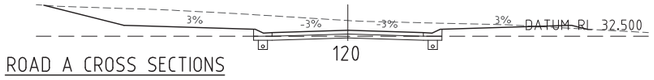

120

ROAD A CROSS SECTIONS

SCALE 1:100 H 1:100 V

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1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870

P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

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Job No: K-9168 RPEQ No: 491

1:100 0 1 2 3 4 5 6 A1

1:200 A3

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ROAD CROSS SECTIONS

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ABN 73 618 014 261

Civil & Structural

1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870

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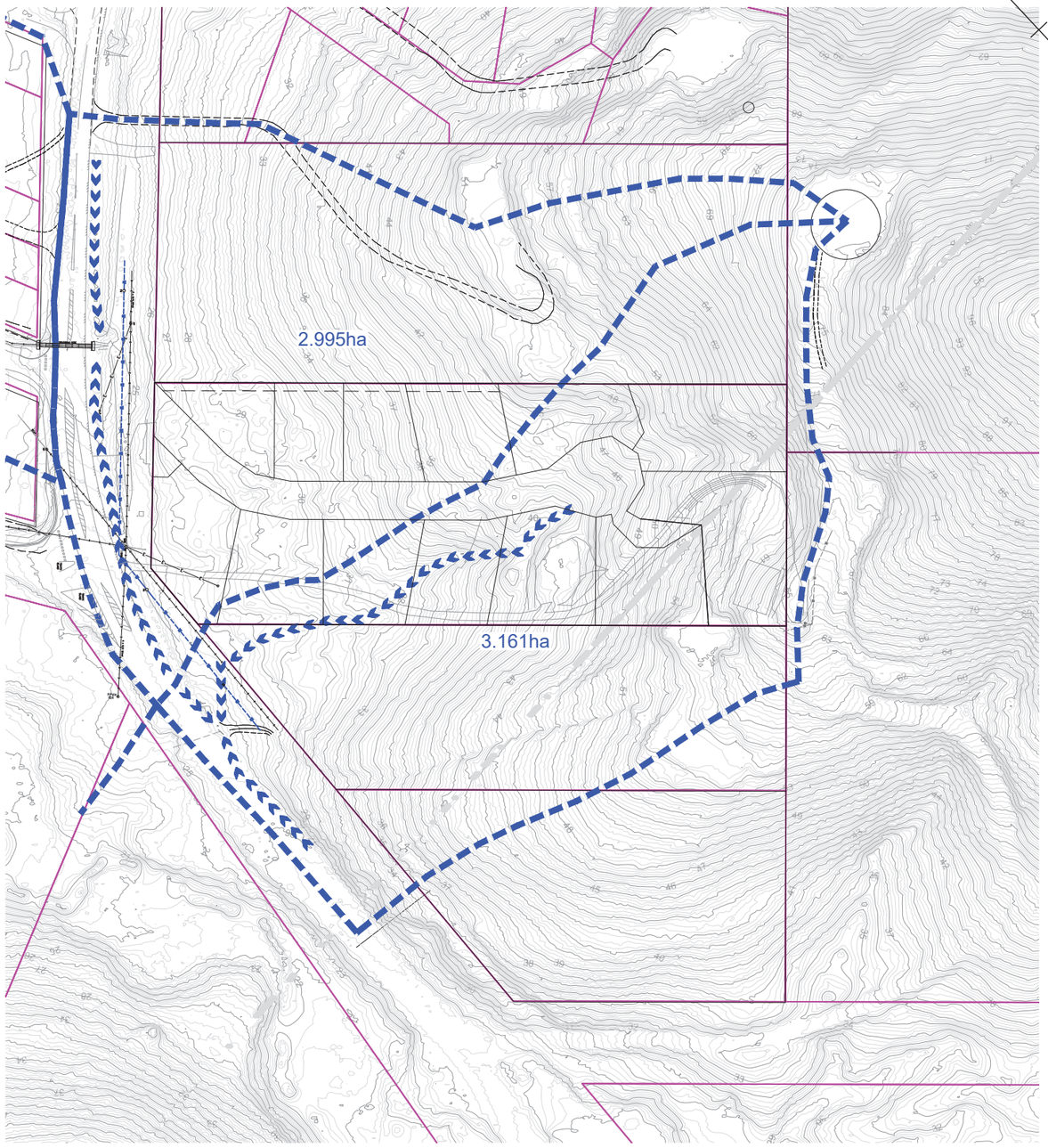
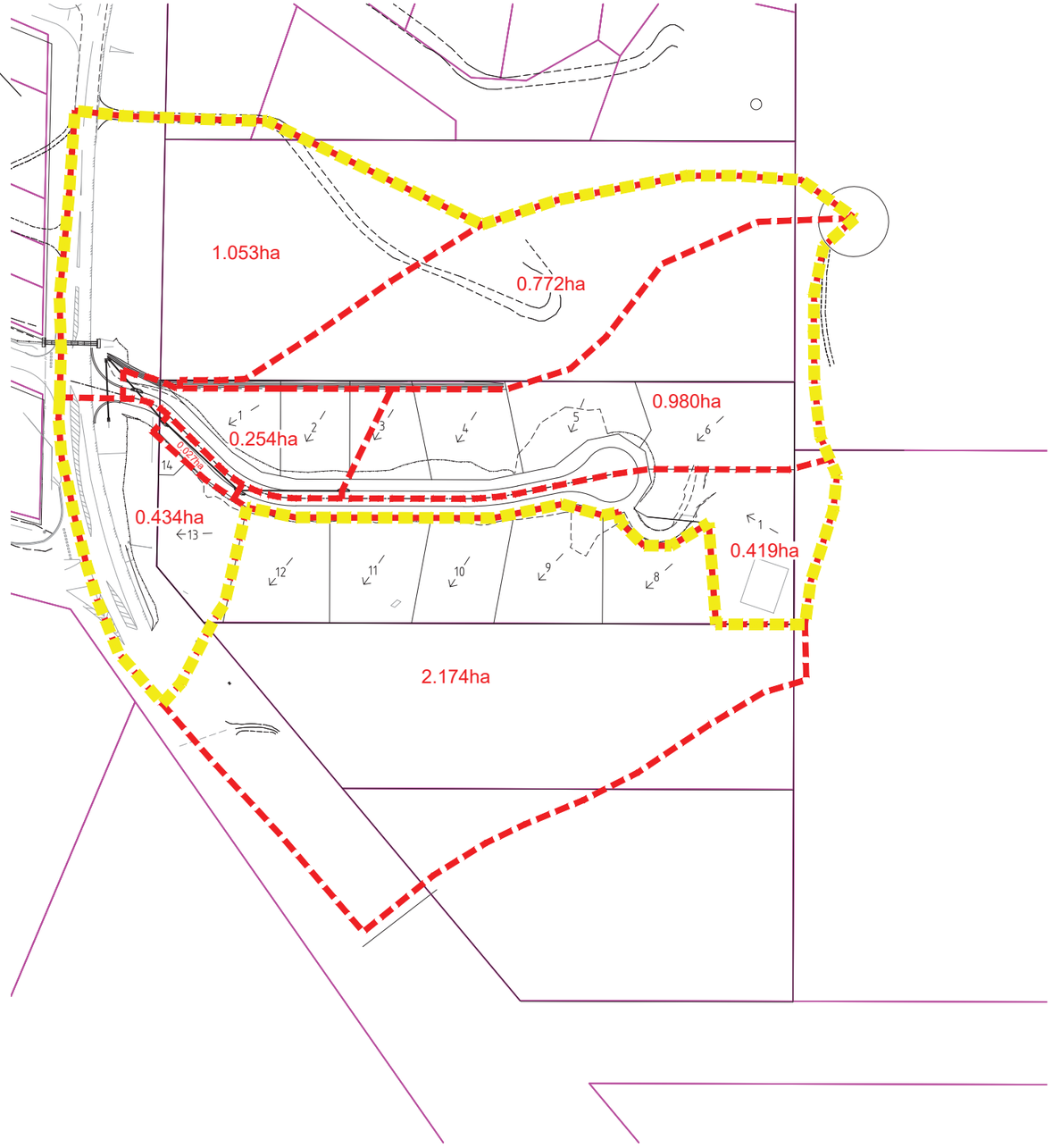
JOB No:	K-9168
SHEET:	C07 A
SCALE:	AS SHOWN (@ A1)



PREDEVELOPMENT STORMWATER DRAINAGE CATCHMENT PLAN
SCALE 1:1000 A1



POSTDEVELOPMENT STORMWATER DRAINAGE CATCHMENT PLAN
SCALE 1:1000 A1

KFB Engineers Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Date: 10/2/23 Signed:
Job No: K-9168 RPEQ No: 491

1:1000 0 10 20 30 40 50 60 A1
1:2000 A3

No.	DATE	ISSUE / REVISIONS	DRN	CHKD
A	29/08/22	INITIAL ISSUE	KCDD	EWK

DRAWING FILE: XREF FILE:

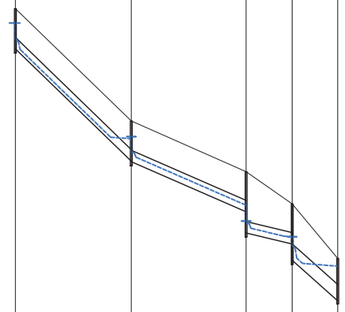
Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

STORMWATER DRAINAGE CATCHMENT PLAN

KFB ENGINEERS
ABN 73 618 014 261
Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C08 A
SCALE: AS SHOWN (@ A1)

STRUCTURE NAME	5/1	4/1	3/1	2/1	1/1
STRUCTURE DESCRIPTION	FNQROC KERB INLET 'S' LINTEL ON GRADE	FNQROC KERB INLET 'S' LINTEL ON GRADE	FNQROC KERB INLET 'S' LINTEL ON GRADE	FNQROC KERB INLET 'S' LINTEL ON GRADE	OUTLET TO TABLE DRAIN



PIPE SIZEmm (Class)		375(2)	375(2)	375(2) x 2	525(2)
PIPE GRADE %		9.69%	4.36%	2.39%	8.93%
PIPE SLOPE 1 in X		10.32	22.93	41.81	11.20
FULL PIPE FLOW VELOCITY (m/s)		1.27(1.10 1y)			1.78(1.29 1y)
PART FULL FLOW VELOCITY (m/s)		4.13 (3.97 1y)	3.50 (3.33 1y)	2.48 (2.31 1y)	5.23 (4.78 1y)
	DATUM RL 13.0				
WATER LEVEL IN STRUCTURE	30.678	26.974	24.222	23.710	22.750
HYDRAULIC GRADE LEVEL	30.678	30.210 / 26.908	26.529 / 24.222	24.205 / 23.710	23.478 / 22.750
PIPE FLOW (Q5) (Cumecs)		0.140	0.230	0.283	0.399
PIPE CAPACITY AT GRADE (Cumecs)		0.545	0.366	0.542	1.344
DEPTH TO INVERT		1.310 / 1.310	1.330 / 1.310	2.000 / 1.310	1.837 / 1.384
INVERT LEVEL OF DRAIN		***29.835*** / ***26.174***	***26.154*** / ***24.520***	***23.830*** / ***23.471***	***22.944*** / ***21.616***
DESIGN SURFACE LEVEL	31.145	27.484	25.830	24.781	23.000
ROAD CHAINAGE (Offset)					
RUNNING CHAINAGE	0.000	37.800 / 37.800	37.471 / 75.271	15.009 / 90.280	14.872 / 105.152
LINE			1		

1:1000 0 10 20 30 40 50 60 A1
1:2000 A3

1:100 0 1 2 3 4 5 6 A1
1:200 A3

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STORMWATER DRAINAGE
LONGITUDINAL SECTION

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ABN 73 618 014 261
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
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JOB No: K-9168
SHEET: C09 A
SCALE: AS SHOWN (@ A1)

LOCATION				TIME		SUB-CATCHMENT RUNOFF						INLET DESIGN							DRAIN DESIGN												HEADLOSSES								PART FULL		DESIGN LEVELS						
				tc	I	C10	C	A	C×A	+CA	Q					Qg	Qb		tc	I	+CA	Qt	Qm	Qs	Qp	L	S		V	T			V2/2g	Ku	hu	Kl	hl	Kw	hw	Sf	hf		Vp						
DESIGN ARI	STRUCTURE No.	DRAIN SECTION	SUB-CATCHMENTS CONTRIBUTING	SUB-CATCHMENT TIME OF CONC.	RAINFALL INTENSITY	10yr RUNOFF CO-EFFICIENT	CO-EFFICIENT OF RUNOFF	SUB-CATCHMENT AREA	EQUIVALENT AREA	SUM OF (C x A)	SUB-CATCHMENT DISCHARGE	FLOW IN K&C (INC. BYPASS)	ROAD GRADE AT INLET	MINOR FLOW ROAD CAPACITY	INLET TYPE	FLOW INTO INLET	BYPASS FLOW	BYPASS STRUCTURE No.	CRITICAL TIME OF CONC.	RAINFALL INTENSITY	TOTAL (C x A)	MAJOR TOTAL FLOW	MAJOR SURFACE FLOW CAPACITY	MAJOR SURFACE FLOW	PIPE FLOW	REACH LENGTH	PIPE GRADE	PIPE / BOX DIMENSIONS (CLASS)	FLOW VELOCITY FULL (PIPE GRADE VELOCITY)	TIME OF FLOW IN REACH	STRUCTURE CHART No.	STRUCTURE RATIOS FOR 'K' VALUE CALCULATIONS	VELOCITY HEAD	U/S HEADLOSS COEFFICIENT	U/S PIPE STRUCT. HEADLOSS	LAT. HEADLOSS CO-EFFICIENT	LAT. PIPE STRUCT. HEADLOSS	W.S.E CO-EFFICIENT	CHANGE IN W.S.E	PIPE FRICTION SLOPE	PIPE FRICTION HEADLOSS (L x Sf)	DEPTH	VELOCITY	OBVERT LEVELS	DRAIN SECTION H.G.L	UPSTREAM H.G.L	LAT. H.G.L	W.S.E.	SURFACE OR K&C INVERT LEVEL	STRUCTURE No.
yrs				min	mm/h			ha	ha	ha	l/s	l/s	%	l/s		l/s	l/s		min	mm/h	ha	l/s	l/s	l/s	l/s	m	%	mm	m/s	min			m		m		m		m	%	m	m	m/s	m	m	m	m	m	m	
5 100	5/1	5/1 to 4/1	5/1	5.00 5.00	214 368		0.67 0.84	0.980 0.980	0.657 0.823	0.657 0.823	391 84.1	391 FLOW DEPTH DOWNSTREAM	17.00 0.088 m 0.076m	4.69	1	14.0 (UNLOCKED 0)	251	2/1	5.00 5.00	214 368	0.657 0.823	84.1	1184	701 (Pipe flow= Grate flow)	14.0	37.800	9.69	375(2)	1.27(1.10 1y) (4.94)	0.50		Qg 0.140 Qo 0.140 Do 375 CHRT 32: Vo2/2gDo 0.22 H/Do 0.00 Kg side flow 5.69 end flow 4.70	0.082	5.69	0.468			5.69	0.468	0.64	0.241	0.130 (0.120 1y)	4.13 (3.97 1y)	30.210 26.549	30.210 26.908	30.678		30.678	31.145	5/1
5 100	4/1	4/1 to 3/1	5/1,4/1	5.00 5.00	214 368		0.67 0.84	0.419 0.419	0.281 0.352	0.281 0.352	167 360	167 FLOW DEPTH DOWNSTREAM	2.80 0.090 m 0.066m	190	1	98 (UNLOCKED 0)	69	3/1	5.50 5.50	207 358	0.938 1.175	1168		230 (Pipe flow= Sum upstr atten flows)	37.471	4.36	375(2) x 2	2.08(1.69 1y) (3.31)	0.30		Qg 0.095 Qo 0.230 Do 375 Angle 43 Chart 39 S/Do 2.5 chartdeg Du/Do 1.00 K0 1.80 K0.5 1.91 Qu/Qo 0.59 Cg 0.87 K 1.90 S/Do 2.5 K0 1.80 K0.5 1.91 K 1.90 S/Do 2.0 K0 1.98 K0.5 2.10 K 2.09	0.221	1.72	0.379	Interp val for S/Do 2.19 Kw 2.02 CHART 38 S/Do 2.5 K0 1.70 K0.5 1.66 K 1.66 S/Do 2.0 K0 1.84 K0.5 1.75 K 1.76 Interp val for S/Do 2.19 Ku 1.72	2.02	0.445	1.73	0.647	0.216 (0.190 1y)	3.50 (3.33 1y)	26.529 24.895	26.529 24.736	26.908		26.974	27.484	4/1
5 100	3/1	3/1 to 2/1	5/1,4/1,3/1	5.00 5.00	214 368		0.67 0.84	0.025 0.025	0.017 0.021	0.017 0.021	10 22	79 FLOW DEPTH DOWNSTREAM	13.80 0.052 m 0.032m	422	1	59 (UNLOCKED 0)	20		5.80 5.80	204 352	0.955 1.196	1169		283 (Pipe flow= Sum upstr atten flows)	15.009	2.39	375(2) x 2	1.28(0.96 1y) (2.45)	0.20		Qg 0.056 Qo 0.283 Do 530 Flow 4/1 made eqv grate flow CHRT 32: Vo2/2gDo 0.22 H/Do 0.00 Kg side flow 5.65 end flow 4.67 K vals above for stepped pipes as grate flow grate flow decreased by 0.227 from 4/1	0.084	0.20	0.017	CHART 33 Angle 4 S/Do 2.5 Du/Do 0.71 Qg/Qo 0.20 K -0.38 S/Do 0.99 cor 0.36 Ku -0.02 Kw -0.02 K vals step pipes as pipe flow Ku -0.02 Kw -0.02	0.20	0.017	0.65	0.098	0.193 (0.163 1y)	2.48 (2.31 1y)	24.205 23.846	24.205 23.710	24.222		24.222	25.830	3/1
5 100	2/1	2/1 to 1/1	5/1,4/1,3/1,2/1	5.00 5.00	214 368		0.67 0.84	0.030 0.030	0.020 0.025	0.020 0.025	12 26	263	0.00	0	1	126 (UNLOCKED 0)	137		6.00 6.00	202 348	0.975 1.221	1180		399 (Pipe flow= Sum upstr atten flows)	14.872	8.93	525(2)	1.78(1.29 1y) (6.00)	0.14		Qg 0.118 Qo 0.399 Do 525 Flow 3/1 made eqv grate flow CHRT 32: Vo2/2gDo 0.30 H/Do 0.00 Kg side flow 4.86 end flow 4.14 K vals above for stepped pipes as grate flow grate flow decreased by 0.281 from 3/1	0.161	1.44	0.232	CHART 33 Angle 3 S/Do 2.5 Du/Do 1.01 Qg/Qo 0.30 K 1.08 S/Do 1.43 cor 0.36 Ku 1.44 Kw 1.44 K vals step pipes as pipe flow Ku 1.44 Kw 1.44	1.44	0.232	0.79	0.117	0.199 (0.168 1y)	5.23 (4.78 1y)	23.478 22.150	23.478 22.750	23.710		23.710	24.781	2/1

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STORMWATER DRAINAGE CALCULATIONS

KFB ENGINEERS — Civil & Structural
ABN 73 618 014 261
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P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

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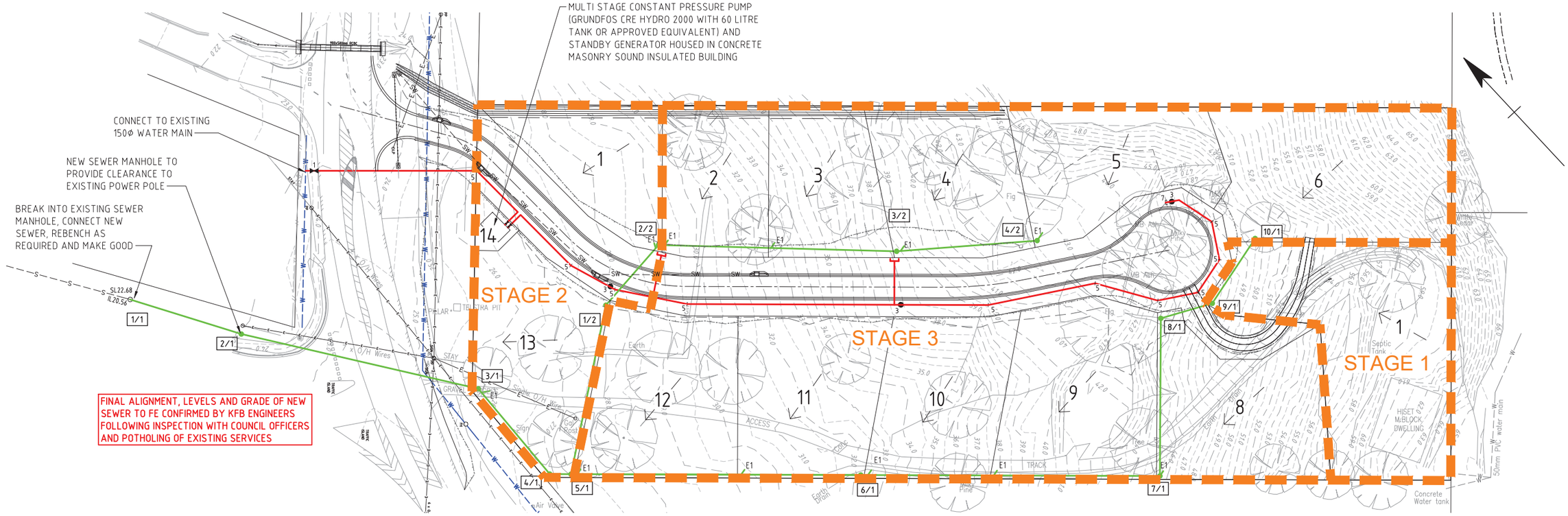
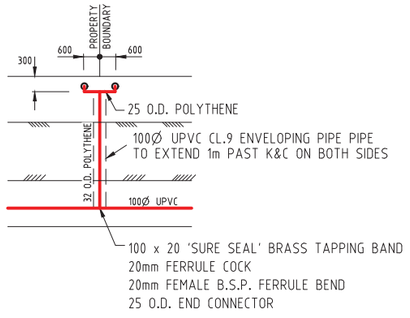


PLAN
SCALE 1:500 (A1)

SEWER LEGEND

- 1/4 — MANHOLE No. / LINE NUMBER
- UPVC SEWER MAIN (Ø 150 U.N.O.)
- MANHOLE
- E1 — HOUSE CONNECTION BRANCH / TYPE
- 42.0 — EXISTING SURFACE CONTOURS (0.5m INTERVAL)
- —S— EXISTING SEWER LINE AND MANHOLE
- —SW— STORMWATER DRAINAGE PIPE



DOUBLE
TYPICAL ALLOTMENT WATER CONNECTIONS

WATER RETICULATION

1. WATER MAIN TO BE 100 DIA CLASS CLASS 16 uPVC.
2. ALL MAINS ARE ON 2.80m ALIGNMENT.
3. CONSTRUCTION OF THE WATER RETICULATION SYSTEM SHALL BE IN ACCORDANCE WITH THE PROCEDURES, SPECIFICATIONS AND DRAWINGS INCLUDING REQUIREMENTS FOR "AS CONSTRUCTED" DRAWINGS AS CONTAINED IN THE CURRENT ISSUE OF THE FNQROC "REGIONAL DEVELOPMENT MANUAL".
4. CONNECTIONS TO EXISTING COUNCIL MAINS TO BE MADE BY C.S.C. THE CONTRACTOR IS TO SUPPLY ALL ASSOCIATED FITTINGS.
5. THE CONTRACTOR IS TO LOCATE ALL EXISTING SERVICES IN THE WORKS AREA PRIOR TO COMMENCEMENT OF CONSTRUCTION.

SEWERAGE RETICULATION

1. ALL GRAVITY SEWER PIPES SHALL BE 150 DIA uPVC (RRJ) CLASS SN8 UNLESS NOTED OTHERWISE.
2. REFER TO THE SEWERAGE LONGITUDINAL SECTION FOR SEWER PIPE GRADES, INVERT LEVELS, STORMWATER CLASHES, ETC.
3. CONSTRUCTION OF THE SEWERAGE RETICULATION SYSTEM SHALL BE IN ACCORDANCE WITH THE PROCEDURES, SPECIFICATIONS AND DRAWINGS INCLUDING REQUIREMENTS FOR "AS CONSTRUCTED" DRAWINGS AS CONTAINED IN THE CURRENT ISSUE OF THE FNQROC "REGIONAL DEVELOPMENT MANUAL".
4. MANHOLES ADJACENT ROAD BOUNDARIES SHALL BE ON A 1.5m ALIGNMENT U.N.O. ALL OTHER MANHOLES SHALL BE ON A 0.8m ALIGNMENT U.N.O.
5. SEWER MANHOLES SHALL BE FINISHED 50mm ABOVE FINISHED SURFACE LEVEL IN ALLOTMENTS AND FLUSH IN ROAD RESERVES.
6. EXISTING LOTS TO BE REINSTATED AFTER CONSTRUCTION OF THE SEWER.
7. ALL HCB OBLIQUE JUNCTIONS SHALL BE CONSTRUCTED USING FIBREGLASS HEAVY DUTY SEWER DROPS.
8. ALL HOUSE CONNECTION BRANCHES ARE TO BE BROUGHT TO FINISHED SURFACE LEVEL TERMINATING WITH A VERTICAL RISER FITTED WITH A BOLTED TRAP SCREW AND SURROUND. A CAPPED STAR PICKET PAINTED RED SHALL BE INSTALLED AT A MINIMUM HEIGHT OF 1.0 m ABOVE GROUND LEVEL IMMEDIATELY ADJACENT TO THE RISER.
9. INSTALL PIPE ANCHOR BLOCKS TO ALL SEWERS AT GRADES GREATER THAN 1 ON 6 IN ACCORDANCE WITH FNQROC STD DWG No. S3015 AND WSA.
10. THE CONTRACTOR SHALL MAKE ALL APPLICATIONS AND PAY ALL FEES TO COUNCIL FOR THE SEWERAGE WORKS AND SHALL ARRANGE AND MANAGE COUNCIL'S INSPECTIONS AND TESTING OF THE WORKS. A COPY OF COUNCIL'S INSPECTION CERTIFICATE SHALL BE PROVIDED BY THE CONTRACTOR TO THE OWNER PRIOR TO PRACTICAL COMPLETION.

WATER LEGEND

- —W— EXISTING WATER MAIN
- —SV— EXISTING SLUICE/GATE VALVE
- —FH— EXISTING HYDRANT
- —S— EXISTING SEWER
- —D— EXISTING STORMWATER DRAINAGE
- 100 uPVC WATER MAIN CLASS '16' RUBBER RING JOINTED
- 1 — SLUICE VALVE CLASS '14' COMPLETE WITH C.I. COVER BOX, CONCRETE MARGIN AND MARKER
- 2 — 50 BRONZE GATE VALVE COMPLETE WITH C.I. COVER BOX, CONCRETE MARGIN AND MARKER
- 3 — 80 SPRING HYDRANT COMPLETE WITH RISER, TEE, C.I. COVER BOX, CONCRETE MARGIN AND MARKER
- 4 — TEE OR WYE WITH CONCRETE THRUST BLOCK
- 5 — BEND TO SUIT WITH CONCRETE THRUST BLOCK
- 6 — SINGLE CONNECTION TO 'LOOP MAIN'
- 7 — DEAD END CAP WITH CONCRETE THRUST BLOCK
- —SW— PROPOSED STORMWATER

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WATER AND SEWERAGE RETICULATION

KFB ENGINEERS
ABN 73 618 014 261
Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

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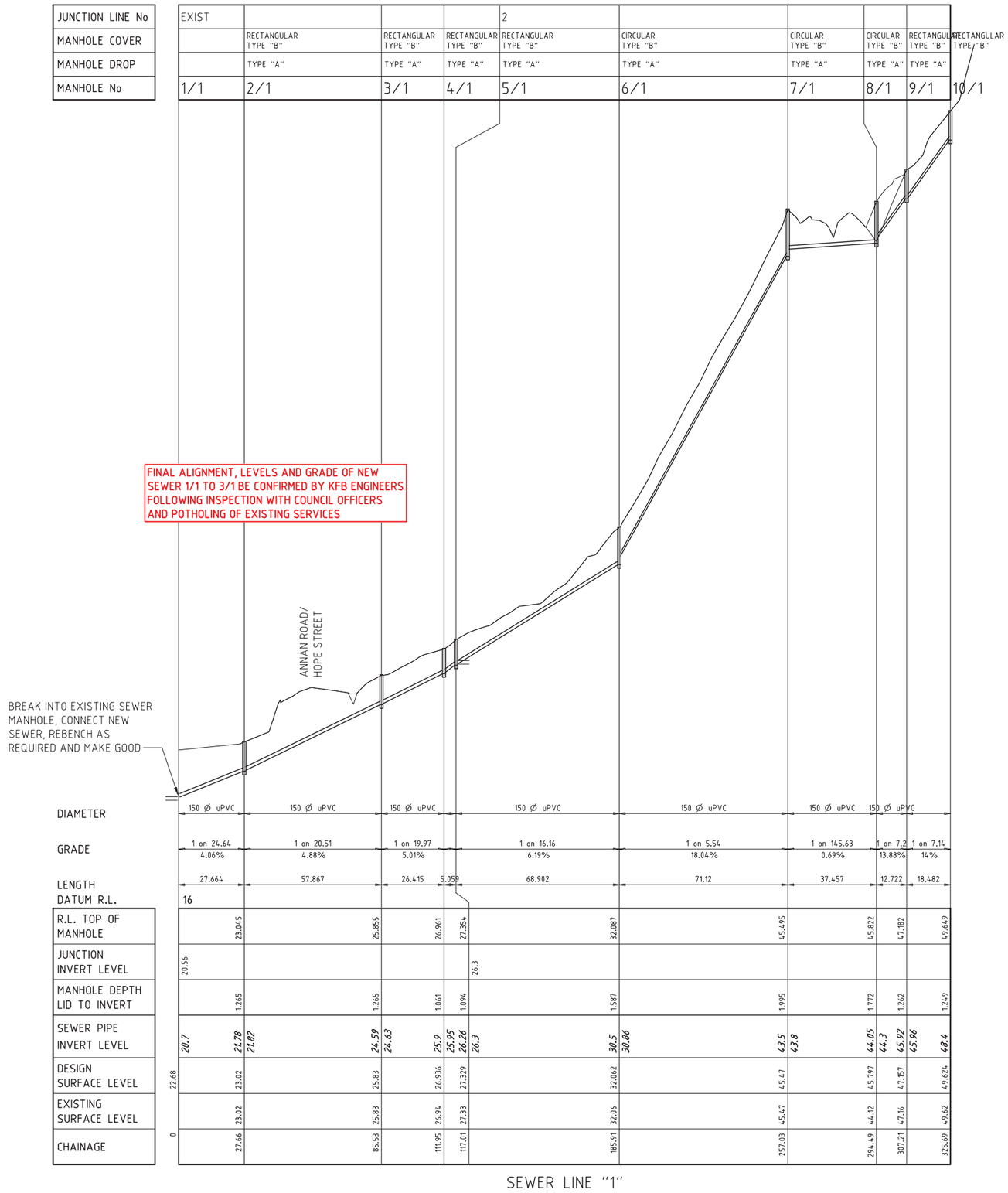

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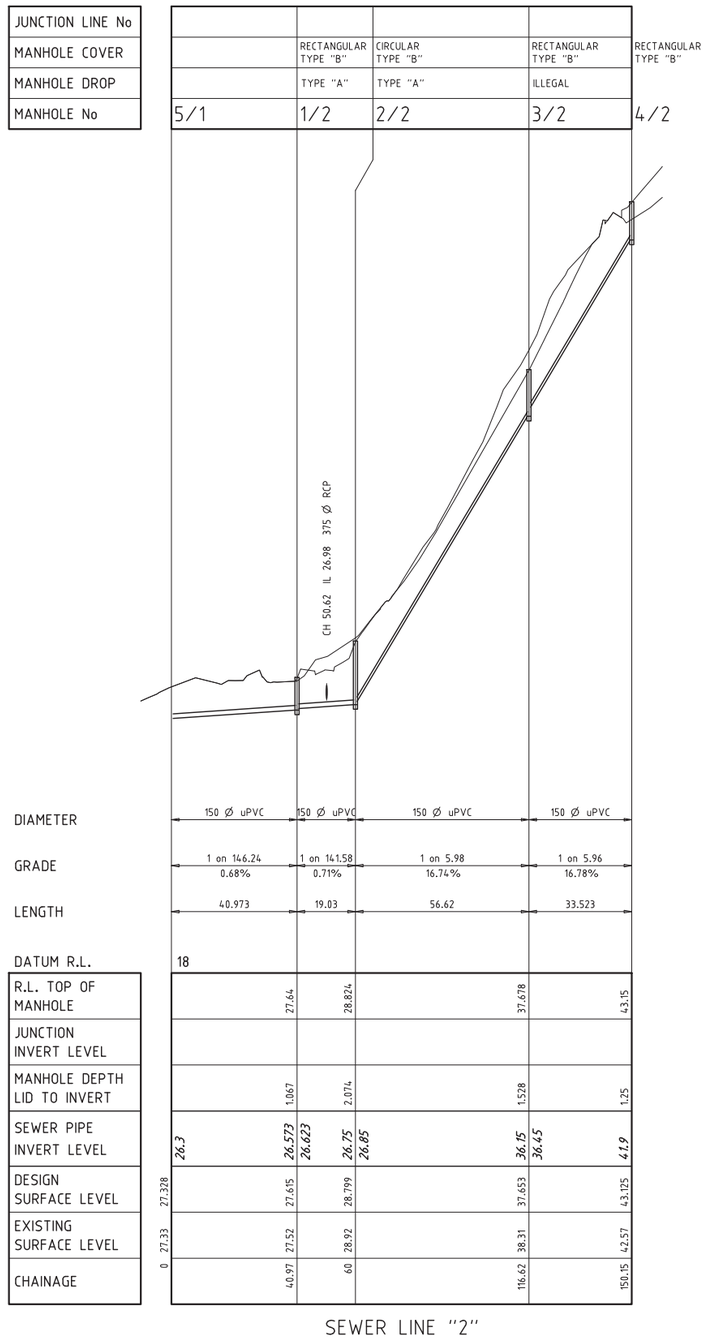

SEWER LINE "2"

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SEWERAGE LONGITUDINAL SECTIONS

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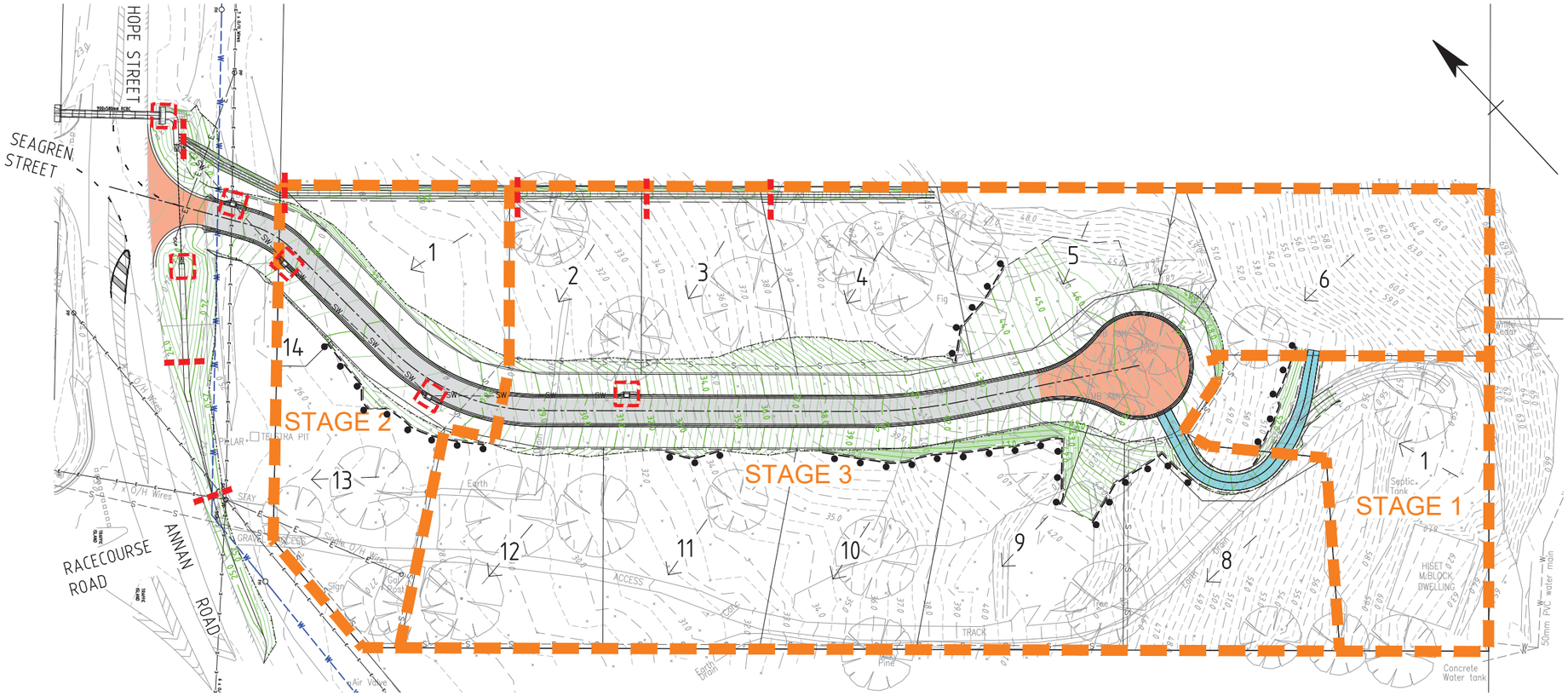

PLAN

SCALE 1:500 (A1)
1:1000 (A3)

LEGEND

CONSTRUCT SILT TRAP / ROCK CHECK DAM AT EACH PIPE INLET (TYP). CLEAN WATER TO DISCHARGE TO PIT AND PIPE

CHECK DAM

SILT FENCE

EROSION SEDIMENT CONTROL STRATEGY AND ENVIRONMENTAL PROTECTION

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROTECT AND PRESERVE THE NATURAL ENVIRONMENT AND SHALL AVOID ENVIRONMENTAL POLLUTION IN ACCORDANCE WITH THE ENVIRONMENTAL PROTECTION ACT.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INCORPORATION OF APPROPRIATE CONTROL AND MANAGEMENT MEASURES CONFORMING TO THE REQUIREMENTS OF THE ACT AND THE RELEVANT AUTHORITIES.
3. THE EROSION AND SEDIMENT CONTROL STRATEGY, SHOWN OR NOTED ON THESE DRAWINGS, HAS BEEN PROVIDED AS A GUIDE.
4. THE CONTRACTOR SHALL PROVIDE AN EROSION SEDIMENT CONTROL PLAN (ESCP) FOR EACH PHASE OF HIS PROPOSED CONSTRUCTION PROGRAM AND WORK METHODS, AND IS WHOLLY RESPONSIBLE FOR THE IMPLEMENTATION, CONTROL AND MANAGEMENT OF SUCH PLAN.
5. THE CONTRACTOR SHALL INSTALL ALL DEVICES/MEASURES NECESSARY TO COMPLY WITH THE PROVISIONS OF THE ESCP FNQROC DEVELOPMENT MANUAL, THE ENVIRONMENTAL PROTECTION ACT, AND COUNCIL REQUIREMENTS.
6. THE ESCP SHALL INCLUDE SUCH MEASURES AS SHOWN ON THE STRATEGIC PLAN.
7. KFB ENGINEERS DOES DO NOT ACCEPT RESPONSIBILITY FOR THE CONTRACTOR'S DESIGN & IMPLEMENTATION OF HIS ESCP NOR THE CONSEQUENCES OF HIS FAILURE TO APPLY ALL REASONABLE CONTROLS.
8. ALL STORMWATER INLETS, TRENCHES, ETC, SHALL BE CONSTRUCTED IN SUCH A WAY AS TO PREVENT THE ENTRY OF SEDIMENT INTO THE STRUCTURE. IF IT IS NECESSARY TO DISCHARGE INTO SUCH INLETS THEN SUITABLE SILT TRAPS SHALL BE CONSTRUCTED UPSTREAM OF THE INLETS SUCH THAT OVERFLOW FROM TRAPS ENTERS THE DRAINS AFTER THE SEDIMENT HAS DROPPED OUT.
9. ALL SEDIMENT CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL THE END OF THE MAINTENANCE PERIOD, UNLESS NOTED OTHERWISE. ALL SEDIMENT CONTROL DEVICES ARE TO BE FULLY MAINTAINED IN AN EFFECTIVE WORKING CONDITION DURING CONSTRUCTION AND THE MAINTENANCE PERIOD. THE CONTRACTOR SHALL ENSURE THAT ALL SEDIMENT CONTROL DEVICES ARE KEPT FREE OF SEDIMENT BUILD-UP.
10. SEDIMENT FENCES SHALL BE INSTALLED SUCH THAT THE BASE OF THE FENCE IS PLACED 150mm MINIMUM BELOW GROUND LEVEL, AND ANCHORED SECURELY IN SUCH POSITION.
11. ALL VEHICLE EXIT POINTS SHALL HAVE SHAKER GRIDS, WASH BAYS OR SIMILAR TO PREVENT VEHICLES FROM TRACKING SOIL AND MUD OFF SITE.
12. ALL SOIL STOCKPILES SHALL BE PROTECTED AGAINST WIND EROSION BY COVERING AND AGAINST STORMWATER RUNOFF BY SILT FENCES AT THE DOWNHILL SLOPES. STOCKPILE LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR AND EROSION/CONTROL MEASURES IMPLEMENTED & MAINTAINED FOR THE LIFE OF THE STOCKPILE.
13. THE CONTRACTOR SHALL INSTALL TURF STRIPS BEHIND ALL KERB & CHANNEL, ADJACENT CONCRETE INVERTS AND ALLOTMENT DRAINS ETC. WHERE DIRTY WATER SHEET FLOWS INTO DRAINAGE COLLECTION SYSTEMS.
14. DIVERT CLEAN WATER AROUND AREAS OF CONSTRUCTION.
15. ALL ROAD SHOULDERS, FOOTPATHS, DRAINS AND CUT BATTERS UP TO 1 on 4 SLOPE SHALL BE DRILL SEEDED WITH APPROVED GRASS SPECIES, FERTILIZED AND MAINTAINED FOR THE REQUIRED MAINTENANCE PERIOD.
16. HYDROMULCH ALL CUT AND FILL BATTERS STEEPER THAN 1 on 4, WITH APPROVED SUITABLE GRASS SPECIES AND MAINTAINED FOR THE REQUIRED MAINTENANCE PERIOD.
17. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY BERMS AT THE TOP OF ALL BATTERS TO DIRECT AND CONTROL RUNOFF TO A SINGLE LOCATION. THE DISCHARGE OVER THE BATTER SHALL BE THROUGH A STABILIZED CHUTE ADDRESSED IN THE CONTRACTORS PLAN, e.g. REINFORCED TURF, GEOTEXTILE, CONCRETE OR SIMILAR.
18. ALL WORKS AND MATERIALS SHALL BE IN ACCORDANCE WITH FNQROC.

PROTECTION OF VEGETATION / SLOPE PROTECTION

1. EXISTING VEGETATION DETAILED ON THE PLAN MUST BE RETAINED WHERE POSSIBLE.

SEDIMENT CONTROL TURF DETAILS

1. PROVIDE ONE STRIP OF TURF ADJACENT TO ALL KERBS, CONCRETE SLABS, DRIVEWAYS, BATTER CHUTES ETC, WITH ONE METRE LONG RETURNS AT 10 METRE CENTRES WHERE LONGITUDINAL GRADES EXCEED 5%). PROVIDE TWO STRIPS OF TURF TO INVERT OF ALL EARTH CATCH AND DIVERSION DRAINS.

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No.	DATE	ISSUE / REVISIONS	DRN	CHKD
A	29/08/22	INITIAL ISSUE	KCDD	EWK

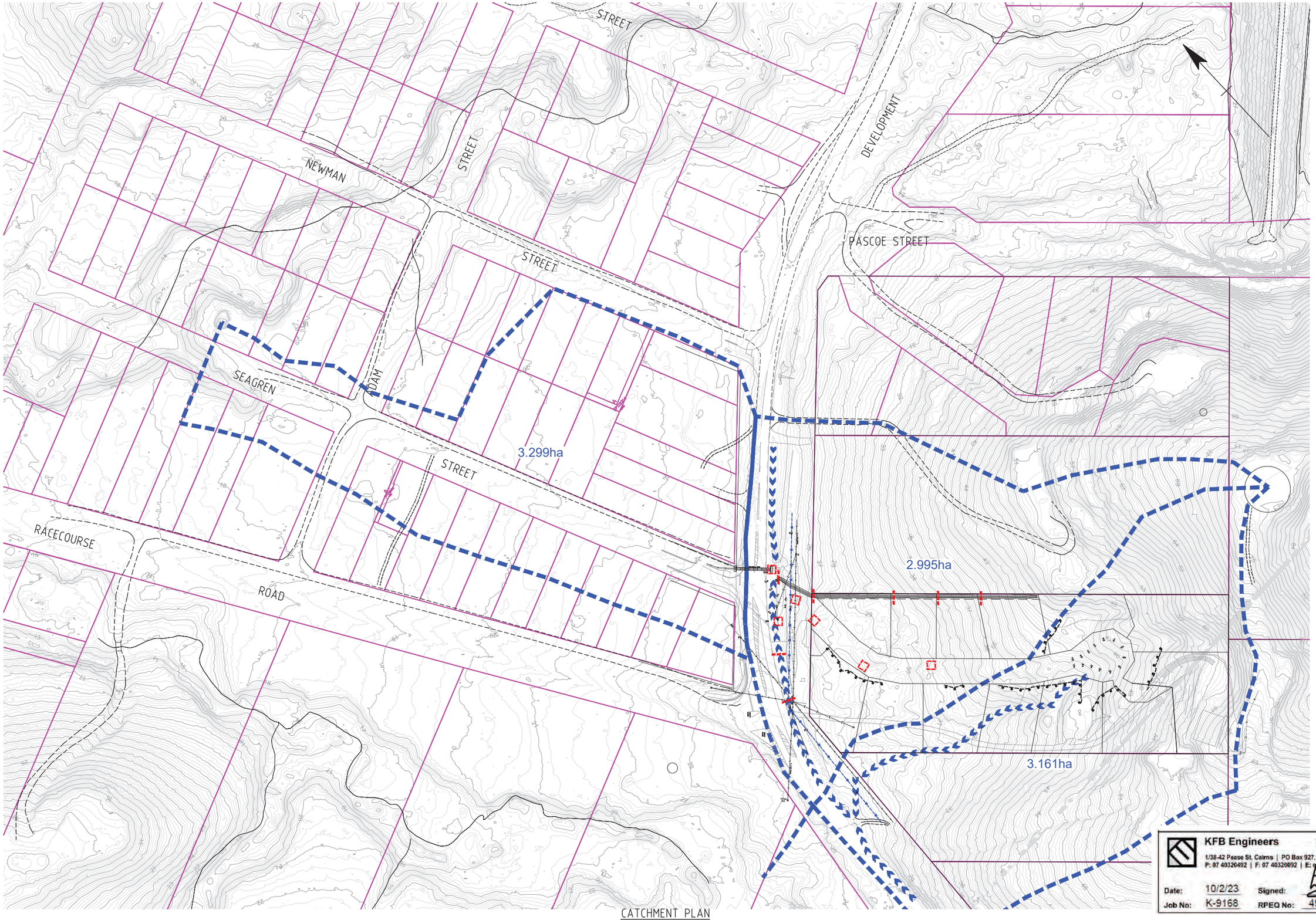
DRAWING FILE: XREF FILE:

Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

EROSION AND SEDIMENT CONTROL STRATEGY

KFB ENGINEERS
ABN 73 618 014 261
Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C13 A
SCALE: 1:500 (@ A1)



CATCHMENT PLAN
SCALE 1:1000 A1

KFB Engineers Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092 | E: email@kfbeng.com.au

Date: 10/2/23 Signed:
Job No: K-9168 RPEQ No: 491

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No.	DATE	ISSUE / REVISIONS	DRN	CHKD
A	29/08/22	INITIAL ISSUE	KCDD	EWK

DRAWING FILE: XREF FILE:

Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

SEAGREN STREET
STORMWATER DRAINAGE
CATCHMENT PLAN

KFB ENGINEERS
ABN 73 618 014 261

Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: SK1 A
SCALE: AS SHOWN (@ A1)

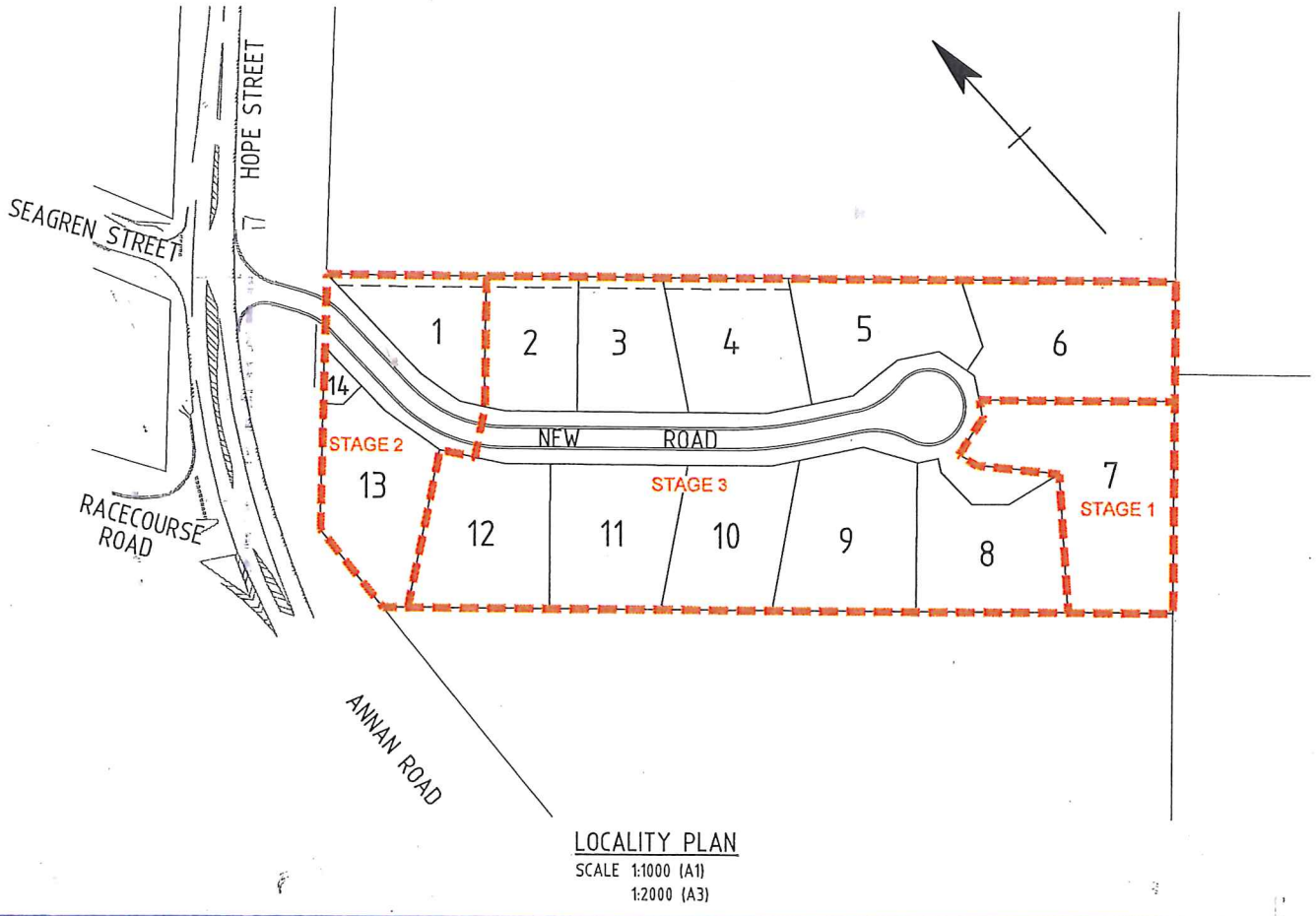
DESIGN REPORT

ADDENDUM No 1.

CIVIL WALKER REF: 125-008-001L4

WATER RETICULATION MODELLING

RESIDENTIAL SUBDIVISION, 2 HOPE STREET, COOKTOWN



LOCALITY PLAN
SCALE 1:1000 (A1)
1:2000 (A3)

CONSULTING ENGINEERS:

KFB ENGINEERS

1/38-42 PEASE STREET, CAIRNS

CivilWalker
CONSULTING ENGINEERS

Ref: 125-008-001L4

4 July 2022

KFB Engineers
Unit 1, Bohemia Business Centre
38-42 Pease Street
Cairns Qld 4879
Attention: Mr Euan Bruce

Dear Euan

Hope Street Subdivision, Cooktown
Water Reticulation Modelling

CivilWalker Consulting Engineers have been engaged to undertake a water reticulation analysis for a subdivision at 2 Hope Street, Cooktown. The site is more formally described as Lot 23 on C17953 in the parish of Cook, County of Banks. The purpose of this report is to confirm the analysis parameters, detail the modelling undertaken, present the results and derive conclusions.

Proposed Development

The proposed development involves reconfiguration of the existing Lot 23 into 13 freehold residential allotments. A copy of the proposed development layout is contained within **Attachment 1**.

Existing Network and Proposed Connection Location

The existing water reticulation network surrounding the proposed development is described below and shown on KFB Engineers drawing K-9168-C10 Revision A "Water and Sewerage Reticulation".

- Reservoir located on adjacent Lot 29 C17953 to the south-east.
- 300mm diameter main the eastern side of Hope Street, which runs along the development site frontage.
- 150mm diameter main on the western side of Hope Street.
- Fire hydrant located on the 300mm diameter water main near southern side of the development site Hope Street frontage.
- Fire hydrant located on the 300mm diameter water main on the adjacent Lot 22 C17953 Hope Street frontage.
- Fire hydrant located on the 150mm diameter water main opposite adjacent Lot 22 C17953 Hope Street frontage.

Connection is proposed to the existing 150mm diameter main as shown on the abovementioned KFB Engineers drawing.

Modelling

Analysis of the existing water reticulation network has been undertaken to evaluate the ability of the existing network to meet the proposed demands of the development. Modelling has been undertaken using the water distribution system software package EPANet2.

Demand

Water demand requirements were determined using equivalent demands specified within Table 6.1 of the FNQROC Regional Development Manual Design Guidelines. Allotments vary in size from approximately 902m² up to 2,147m². An assessment of equivalent persons / connection for each proposed allotment is provided below:

- Lot 1 Size 902m2 Demand = 3.1 EP
- Lot 2 Size 908m2 Demand = 3.1 EP
- Lot 3 Size 945m2 Demand = 3.1 EP
- Lot 4 Size 1,207m2 Demand = 3.4 EP
- Lot 5 Size 1,232m2 Demand = 3.4 EP
- Lot 6 Size 1,756m2 Demand = 3.7 EP
- Lot 7 Size 2,147m2 Demand = 3.7 EP
- Lot 8 Size 1,325m2 Demand = 3.4 EP
- Lot 9 Size 1,499m2 Demand = 3.4 EP
- Lot 10 Size 1,160m2 Demand = 3.4 EP
- Lot 11 Size 1,289m2 Demand = 3.4 EP
- Lot 12 Size 1,380m2 Demand = 3.4 EP
- Lot 13 Size 1,405m2 Demand = 3.4 EP

Water Supply Requirements

In accordance with Cooktown Shire Council's requirements, a rate of 400 litres/EP/day was adopted. The following peaking factors were adopted to obtain flow parameters for the Mean Day Maximum Month, Peak Day and Peak Hour, as required by the FNQROC Regional Development Manual:

- Mean Day Max Month (MDMM) = 1.50 x Average Daily Consumption
- Peak Day (PD) = 2.25 x Average Daily Consumption
- Peak Hour (PH) = 1/12 x Peak Day (in hours)

Calculations to determine flows demand per allotment were undertaken, with an example calculation for Lot 1 provided below. Results of the demand calculations are provided in **Table 1**.

- Average Day = 400 litres x 3.1 / (24 x 3600) = 0.015 litres / second
- MDMM = 1.5 x 0.015 = 0.023 litres / second
- PD = 2.25 x 0.015 = 0.034 litres / second
- PH = 0.068 litres / second

Table 1 – Allotment Demand Calculation Results

Lot	Size (m^2)	EP	MDMM (litres /sec)	PD (litres /sec)	PH (litres /sec)
1	902	3.1	0.022	0.032	0.065
2	948	3.1	0.022	0.032	0.065
3	945	3.1	0.022	0.032	0.065
4	1,207	3.4	0.024	0.035	0.071
5	1,232	3.4	0.024	0.035	0.071
6	1,756	3.7	0.026	0.039	0.077
7	2,147	3.7	0.026	0.039	0.077
8	1,325	3.4	0.024	0.035	0.071
9	1,499	3.4	0.024	0.035	0.071

10	1,160	3.4	0.024	0.035	0.071
11	1,289	3.4	0.024	0.035	0.071
12	1,380	3.4	0.024	0.035	0.071
13	1,405	3.4	0.024	0.035	0.071

Peak hour was assessed to be the critical design element to satisfy the FNQROC Regional Development Manual requirements for potable water supply. For analysis, a node was created at each allotment with the associated demand for that allotment assigned to the node. The following parameters were adopted in the Peak Hour analysis:

- Design Flow = allotment peak hour demand as calculated above
- Minimum pressure = 22m head
- Maximum pressure = 60m head

Fire Flow Requirements

A static fire flow analysis was undertaken in accordance with Council's requirements. The FNQROC Regional Development Manual requires the following parameters to be adopted in a fire flow analysis for residential developments:

- Fire Flow = 15 litres/second
- Minimum pressure = 12m
- Background Demand = 2/3 peak hour

Fire Demand was allocated at the highest allotment within the analysis area, being Lot 6. The fire-fighting demand at this location was calculated to be 15.051 litres/second (being the fire-fighting flow plus 2/3 peak hour demand). A 2/3 peak hour demand was allocated for the remaining allotments for the analysis.

Pipe-Line Parameters

Analysis of the pipe system will be performed using the Hazen-Williams equations. The values of the Hazen-Williams friction co-efficient (C) adopted are detailed below:

- Diameter <= 150mm C = 100
- 150mm < diameter <= 300mm C = 110
- Diameter > 600mm C = 120

The above values allow for losses through pipe fittings such as bends, valves and tees etc. The values also allow for the effect of pipe aging.

Existing Network Pressure

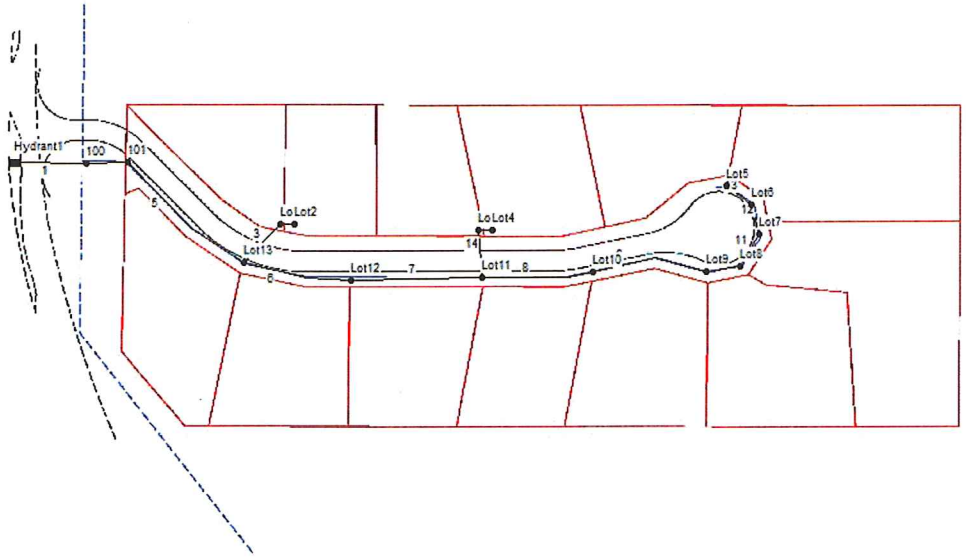
Hydrant testing was undertaken by Gilboy Hydraulic Solutions, the results of which are provided in **Attachment 2**.

The relevant test is for Hydrant 3, which is located on the 150mm main near the proposed connection point. It provided a pressure of 570 kPA with a static flow and 540kPA at a flow of 5 litres/second. The proposed development peak hour demand is calculated to be 0.915 litres/second (aggregate peak hour demand for all allotments). Existing pressure within the 150mm diameter main was calculated for a flow of 1 litre/second by interpolation, giving a value of 564kPA (56.4m head) for the purpose of analysis in the peak hour scenario.

The total fire-fighting development demand was calculated at 15.610 litres/second (being 15 litres / second fire-fighting flow plus the aggregate 2/3 peak hour demand for all allotments). Hydrant test results identified existing pressure in the 150mm diameter main of 400kPA at 15 litres/second and 275kPA at 20 litres / second. Existing pressure within the 150mm diameter main was calculated for a flow of 16 litres/second by interpolation, giving a value of 375kPA (37.5m head) for the purpose of analysis in the fire-fighting hour scenario.

Model Arrangement

The arrangement modelled in EPANet is shown below.



Results

Peak Hour

Network analysis results for the peak hour flow are presented below. An elevation equal to the approximate mid-block height was adopted for each allotment. It is noted that residual pressures do not achieve the minimum required 22m pressure at Lots 3, 4, 5, 6, 7, 8, 9 or 10 with negative pressure reported at Lots 6 and 7. Each of Lots 4 through 9 will require pressure to be boosted to provide the minimum required head of 22m at the dwelling.

Network Table - Nodes

Node ID	Elevation m	Demand LPS	Head m	Pressure m
Junc 100	25	0.00	56.38	31.38
Junc 101	26.5	0.00	56.38	29.88
Junc Lot13	27	0.07	56.36	29.36
Junc Lot12	29	0.07	56.36	27.36
Junc Lot11	33	0.07	56.35	23.35
Junc Lot10	36	0.07	56.35	20.35
Junc Lot9	41	0.07	56.34	15.34
Junc Lot8	50	0.07	56.34	6.34
Junc Lot7	59	0.08	56.34	-2.66
Junc Lot6	60	0.08	56.34	-3.66
Junc Lot5	46.5	0.07	56.34	9.84
Junc Lot1	28.5	0.07	56.29	27.79
Junc Lot3	36	0.07	56.27	20.27
Junc Lot2	31.5	0.07	56.29	24.79
Junc Lot4	42	0.07	56.26	14.26
Resvr Hydrant1	56.4	-0.92	56.40	0.00

Network Table - Links

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s
Pipe 1	44	100	100	0.92	0.12
Pipe 4	12	100	100	0.92	0.12
Pipe 5	43	100	100	0.92	0.12
Pipe 6	29	100	100	0.72	0.09
Pipe 7	36	100	100	0.64	0.08
Pipe 8	30	100	100	0.44	0.06
Pipe 9	33	100	100	0.37	0.05
Pipe 10	10	100	100	0.30	0.04
Pipe 11	9	100	100	0.23	0.03
Pipe 12	9	100	100	0.15	0.02
Pipe 13	9	100	100	0.07	0.01
Pipe 3	30	32	100	0.13	0.16
Pipe 14	30	32	100	0.14	0.17
Pipe 15	2	32	100	0.07	0.08
Pipe 16	2	32	100	0.07	0.09

To further assess the negative pressure issue, further modelling was undertaken. This adopted levels for Lots 6 and 7 at the approximate verge level to confirm that positive pressure is maintained within the water network at the property frontage (ie in the road). The analysis results for this scenario are presented below.

Network Table - Nodes

Node ID	Elevation m	Demand LPS	Head m	Pressure m
Junc 100	25	0.00	56.40	31.40
Junc 101	26.5	0.00	56.39	29.89
Junc Lot13	27	0.07	56.38	29.38
Junc Lot12	29	0.07	56.37	27.37
Junc Lot11	33	0.07	56.36	23.36
Junc Lot10	36	0.07	56.36	20.36
Junc Lot9	41	0.07	56.36	15.36
Junc Lot8	50	0.07	56.36	6.36
Junc Lot7	48	0.08	56.36	8.36
Junc Lot6	49	0.08	56.36	7.36
Junc Lot5	46.5	0.07	56.36	9.86
Junc Lot1	28.5	0.07	56.30	27.80
Junc Lot3	36	0.07	56.28	20.28
Junc Lot2	31.5	0.07	56.30	24.80
Junc Lot4	42	0.07	56.28	14.28
Resvr Hydrant1	56.4	-0.92	56.40	0.00

Network Table - Links

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s
Pipe 1	44	150	100	0.92	0.05
Pipe 4	12	100	100	0.92	0.12
Pipe 5	43	100	100	0.92	0.12
Pipe 6	29	100	100	0.72	0.09
Pipe 7	36	100	100	0.64	0.08
Pipe 8	30	100	100	0.44	0.06
Pipe 9	33	100	100	0.37	0.05
Pipe 10	10	100	100	0.30	0.04
Pipe 11	9	100	100	0.23	0.03
Pipe 12	9	100	100	0.15	0.02
Pipe 13	9	100	100	0.07	0.01
Pipe 3	30	32	100	0.13	0.16
Pipe 14	30	32	100	0.14	0.17
Pipe 15	2	32	100	0.07	0.08
Pipe 16	2	32	100	0.07	0.09

These results identify that positive pressure is maintained within the proposed system in the road reserve based on the calculations undertaken.

Fire Flow

Network analysis results for fire flow with a background two-thirds peak hour demand modelled at the approximate mid-block height (60m AHD) on the highest allotment (Lot 6) are presented below. It is noted that residual pressures do not achieve the minimum required 12m pressure anywhere within the proposed development, with negative pressure reported at Lots 3 to 11, inclusive.

Network Table - Nodes

Node ID	Elevation m	Demand LPS	Head m	Pressure m
Junc 100	25	0.00	37.07	12.07
Junc 101	26.5	0.00	36.22	9.72
Junc Lot13	27	0.05	33.18	6.18
Junc Lot12	29	0.05	31.17	2.17
Junc Lot11	33	0.05	28.68	-4.32
Junc Lot10	36	0.05	26.64	-9.36
Junc Lot9	41	0.05	24.41	-16.59
Junc Lot8	50	0.05	23.73	-26.27
Junc Lot7	59	0.05	23.13	-35.87
Junc Lot6	60	15.05	22.53	-37.47
Junc Lot5	46.5	0.05	22.53	-23.97
Junc Lot1	28.5	0.04	33.15	4.65
Junc Lot3	36	0.04	28.64	-7.36
Junc Lot2	31.5	0.04	33.15	1.65
Junc Lot4	42	0.05	28.64	-13.36
Resvr Hydrant1	37.5	-15.61	37.50	0.00

Network Table - Links

Link ID	Length m	Diameter mm	Roughness	Flow LPS	Velocity m/s
Pipe Hydrant1	44	150	100	15.61	0.88
Pipe 4	12	100	100	15.61	1.99
Pipe 5	43	100	100	15.61	1.99
Pipe 6	29	100	100	15.47	1.97
Pipe 7	36	100	100	15.43	1.96
Pipe 8	30	100	100	15.29	1.95
Pipe 9	33	100	100	15.24	1.94
Pipe 10	10	100	100	15.20	1.93
Pipe 11	9	100	100	15.15	1.93
Pipe 12	9	100	100	15.10	1.92
Pipe 13	9	100	100	0.05	0.01
Pipe 3	30	32	100	0.09	0.11
Pipe 14	30	32	100	0.09	0.11
Pipe 15	2	32	100	0.04	0.05
Pipe 16	2	32	100	0.05	0.06

Given the lack of pressure in the peak hour flow analysis for the adopted allotment levels, these results are not surprising. Further modelling was undertaken, with levels adopted for Lots 3 through 11 at the approximate verge level to confirm that positive pressure is maintained within the system at the property frontage during fire-fighting flows. This further analysis identified that negative pressures remained within the water network throughout the majority of the development in the fire-fighting scenario.

CivilWalker
CONSULTING ENGINEERS

Conclusion

Conditions 3 and 4 of the Reconfiguration of a Lot Development Permit (DA/4310: D21/28381) for 2 Hope Street, Cooktown requires that:

- Sufficient reticulated water capacity must be provided for domestic and fire-fighting purposes, and
- The developer must design and construct all water works in accordance with the approved plans, the FNQROC Development Manual, Water Supply (Safety and Reliability Act) and the Plumbing and Drainage Act.

As well, Condition 3(iii) of the Assessment Manager (Council) Advice stated that "A booster Pump may be required to obtain adequate water pressure".

The foregoing water reticulation analysis has established that required pressures cannot be maintained within the proposed water reticulation system for the peak hour potable water demand and positive pressure cannot be maintained for the fire-fighting scenario. It is therefore recommended that a water booster pumping system be provided such that pressures can be increased to provide the required potable and fire-fighting supply.

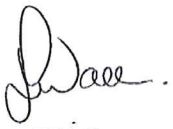
Design should generally be in accordance with the requirements of FNQROC Section D6.18 "Alternative Water Pumping systems".

Such a system should generally include a number of centrifugal pumps installed in parallel and coordinated by a pump controller, which senses, and responds to water demand. The pump controller shall also regulate the pump speed to give a graduated increase or decrease in the volume of water being supplied and evenly shares the work between pump units. Stand by power should be provided by a diesel generator. A portion of Lot 13 could be excised off, and transferred to Council, to house the booster pump assembly.

In general, the proposal for a booster pump satisfies the conditions of Section D6.18 within FNQROC. A design report, as required by Section 6.18 of FNQROC, should be submitted with the Application for Operational Works Permit.

Yours faithfully

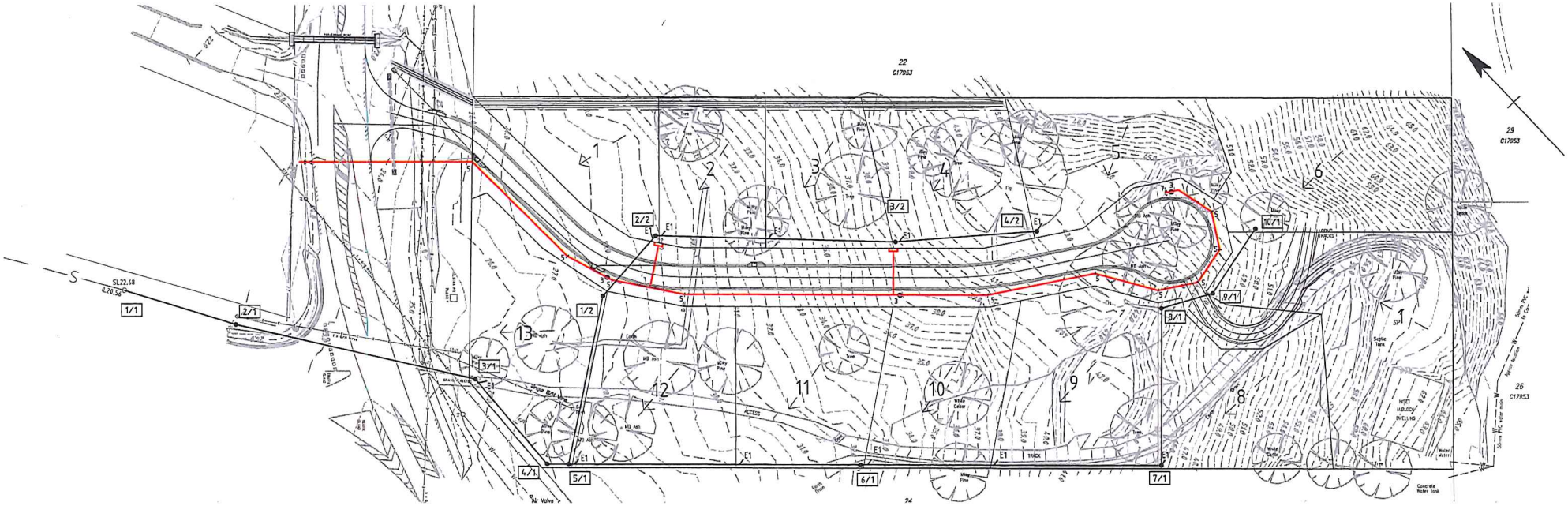
CivilWalker Consulting Engineers



Daryl Walker
Director | Principal Engineer
BE(Hons) ME DipPM RPEQ RPEng

CivilWalker
CONSULTING ENGINEERS

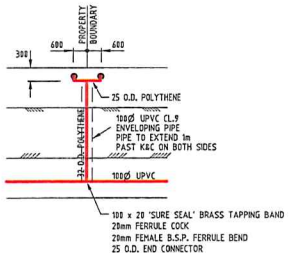
Attachment 1
Proposed Development Layout



PLAN
SCALE 1:500 (A1)

SEWER LEGEND

- 1/4 — MANHOLE No. / LINE NUMBER
- UPVC SEWER MAIN (Ø 150 U.N.O.)
- MANHOLE
- E1 — HOUSE CONNECTION BRANCH / TYPE
- EXISTING HOUSE CONNECTION BRANCH
- FINISHED SURFACE LEVEL
- DESIGN SURFACE CONTOURS (0.5m INTERVAL)
- EXISTING SURFACE CONTOURS (1.0m INTERVAL)
- BATTER
- EXISTING SEWER LINE AND MANHOLE
- D — STORMWATER DRAINAGE PIPE



DOUBLE

TYPICAL ALLOTMENT WATER CONNECTIONS

WATER LEGEND

- W — EXISTING WATER MAIN
- SV — EXISTING SLUICE/GATE VALVE
- FH — EXISTING HYDRANT
- S — EXISTING SEWER
- D — EXISTING STORMWATER DRAINAGE
- 100 uPVC WATER MAIN CLASS '16' RUBBER RING JOINTED
- 1 — SLUICE VALVE CLASS '14' COMPLETE WITH C.I. COVER BOX, CONCRETE MARGIN AND MARKER
- 2 — 50 BRONZE GATE VALVE COMPLETE WITH C.I. COVER BOX, CONCRETE MARGIN AND MARKER
- 3 — 80 SPRING HYDRANT COMPLETE WITH RISER, TEE, C.I. COVER BOX, CONCRETE MARGIN AND MARKER
- 4 — TEE OR WYE WITH CONCRETE THRUST BLOCK
- 5 — BEND TO SUIT WITH CONCRETE THRUST BLOCK
- 6 — SINGLE CONNECTION TO 'LOOP MAIN'
- 9 7 — DEAD END CAP WITH CONCRETE THRUST BLOCK
- D — PROPOSED STORMWATER
- S — PROPOSED SEWER

ISSUED FOR
PRELIMINARY
NOT FOR CONSTRUCTION

No.	DATE	ISSUE / REVISIONS	DRN	CHKD
A	???	INITIAL ISSUE	KCDD	EWK

DRAWING FILE: XREF FILE:

Mr Matthew Carey
Proposed Subdivision
at Hope Street, Cooktown

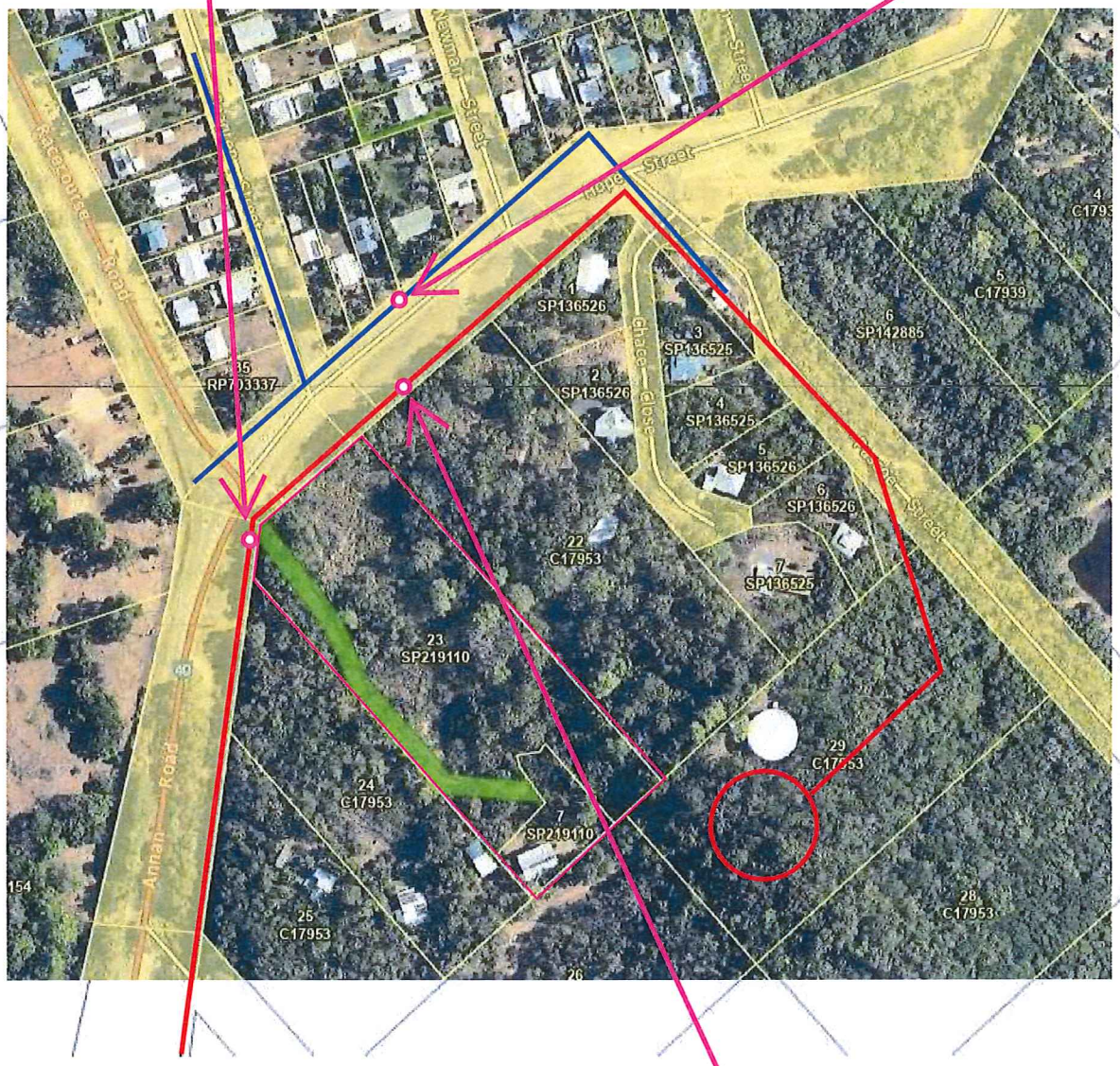
WATER AND SEWERAGE RETICULATION

KFB ENGINEERS
ABN 73 618 014 261
Civil & Structural
1/38-42 Pease St, Cairns | PO Box 927, Cairns Q 4870
P: 07 40320492 | F: 07 40320092
E: email@kfbeng.com.au

JOB No: K-9168
SHEET: C10 A
SCALE: AS SHOWN (@ A1)

CivilWalker
CONSULTING ENGINEERS

Attachment 2
Hydrant Test Results



GILBOY HYDRAULIC SOLUTIONS
Building Hydraulic Services Design

214633 / FH001 (A) 28.03.22

FIRE HYDRANT LOCATIONS

Hydrant #1	Time
25/03/2022	11.00am
Flow Lit/Sec	Pressure (kPa)
0 (Static)	600
5	580
10	540
15	500
20	440
25	375
30	300
35	200
Full Flow = 38	100
ADDITIONAL	
Flow at 200kPa	38L/s
Flow at 350kPa	27L/s

Hydrant #2	Time
25/03/2022	11.30am
Flow Lit/Sec	Pressure (kPa)
0 (Static)	580
5	560
10	525
15	475
20	400
25	325
30	200
35	NA
Full Flow = 33	75
ADDITIONAL	
Flow at 200kPa	30L/s
Flow at 350kPa	24L/s

Hydrant #3	Time
25/03/2022	11.50am
Flow Lit/Sec	Pressure (kPa)
0 (Static)	570
5	540
10	475
15	400
20	275
25	125
30	NA
35	NA
Full Flow = 27	50
ADDITIONAL	
Flow at 200kPa	23L/s
Flow at 350kPa	17L/s

GILBOY HYDRAULIC SOLUTIONS
Building Hydraulic Services Design
AHSCA

214633 / FH002 (A) 28.03.22

FIRE HYDRANT TEST RESULTS

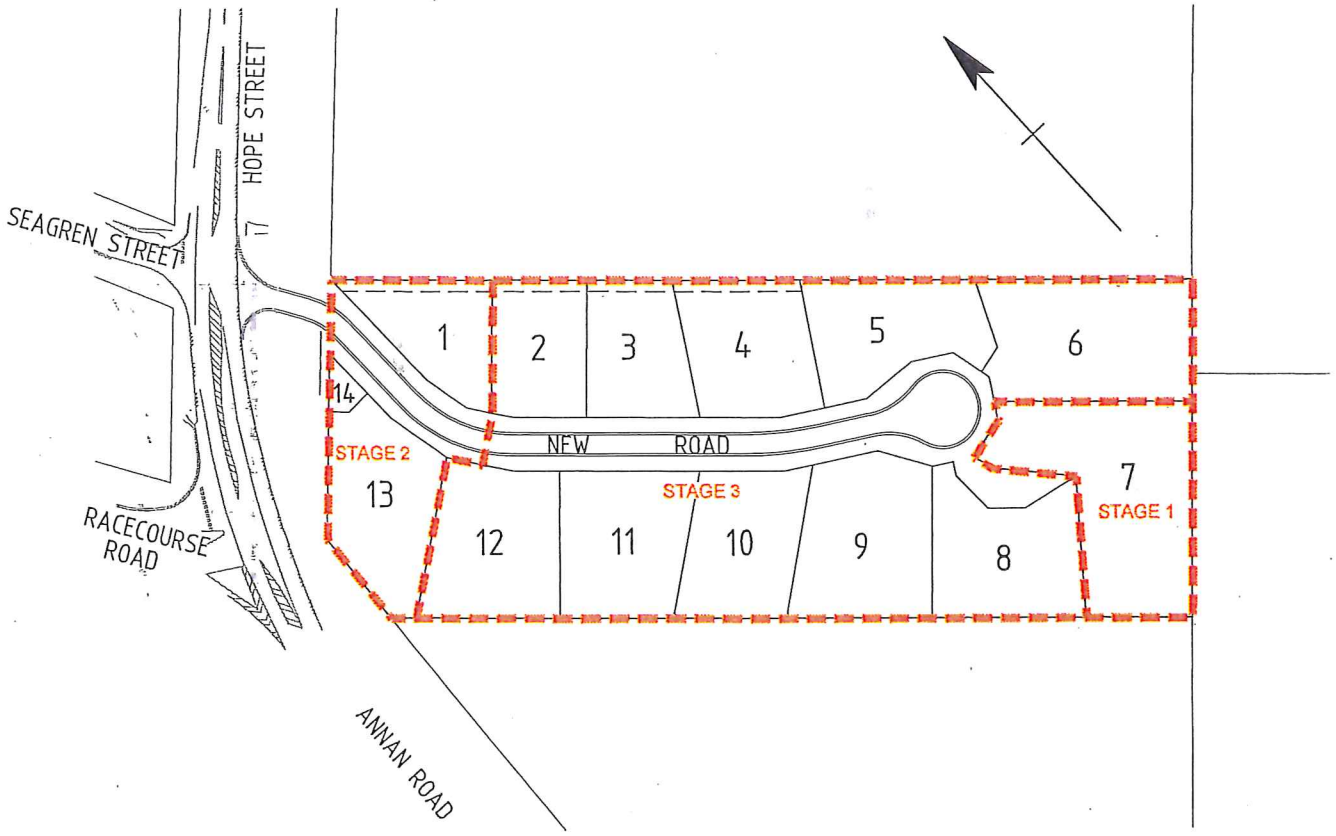
DESIGN REPORT

ADDENDUM No 2.

GEO DESIGN REF: 22028AA-D-R01-v1

GEOTECHNICAL INVESTIGATION

RESIDENTIAL SUBDIVISION, 2 HOPE STREET, COOKTOWN



LOCALITY PLAN
SCALE 1:1000 (A1)
1:2000 (A3)

CONSULTING ENGINEERS:

KFB ENGINEERS

1/38-42 PEASE STREET, CAIRNS

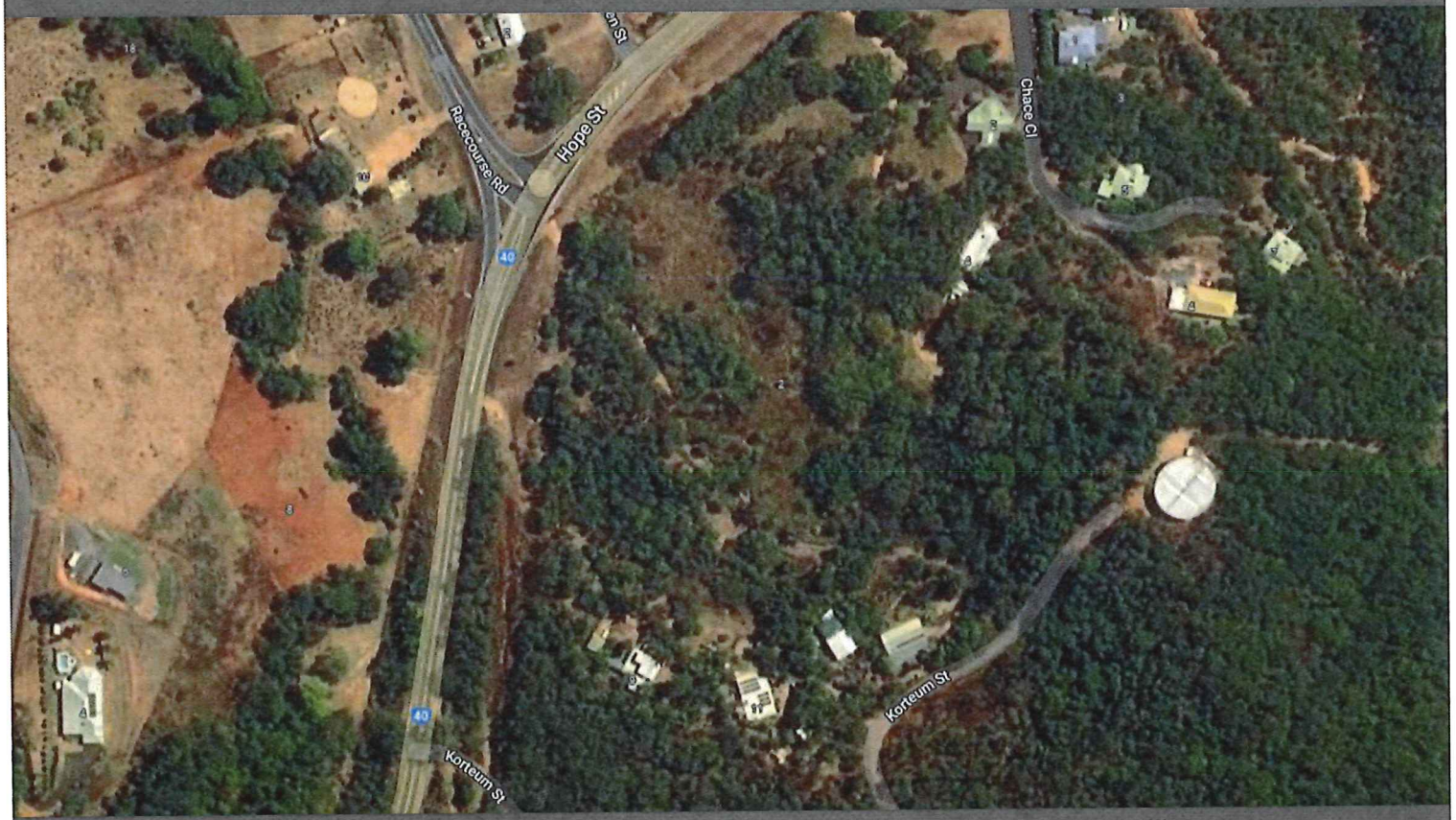
GEO | design

ISO 9001
ISO 14001
ISO 45001
BUREAU VERITAS
Certification

REPORT

Geotechnical Investigation

Proposed Subdivision
2 Hope Street
Cooktown QLD 4895



22028AA-D-R01-v1
MTC Tower Pty Ltd
30 August 2022

GEO | design

Table of Contents

List of Appendices

1.0 Introduction

GEO Design has carried out a geotechnical investigation for the proposed subdivision of 2 Hope Street, Cooktown. It is understood that it is proposed to reconfigure the current allotment into twelve separate allotments. Proposed plans for the subdivision provided to us are presented in Appendix A.

Given the above, the aims of the geotechnical investigation were as follows:

- Evaluate the subsurface conditions at the site.
- Comment on geotechnical matters in relation to the site and proposed subdivision.
- Comment on slope stability issues at the subject allotments and provide comments in regards to the development's adherence to the State Planning Policy 1/03-Mitigating the Adverse Impacts of Flood, Bushfire and Landslide (Landslides only).
- Comment on earthworks including recommended cut and fill batters, procedures and site preparation.
- Comment on geotechnical issues to be considered for future developments at the site.

This report presents the results of the geotechnical investigation together with the engineering comments outlined above.

2.0 Fieldwork

The fieldwork for the current investigation comprised the following:

- A walkover assessment, carried out by an experienced Engineering Geologist.
- Mapping of exposed batters at the site.
- Excavation of 12 test pits (TP1 to TP12) to maximum depths of around 1.2 m, where refusal was reached.

The locations of field tests are presented in Appendix A. The results of the fieldwork are presented in Appendix B.

3.0 Results of Fieldwork

3.1 Surface Conditions

The site is located at 2 Hope Street, Cooktown. The subject allotment is also known as Lot 23 on SP219110. The site is bound to the north, south and east by existing residential allotments, and to the northwest by Hope Street.

The site is located on a north-western trending slope and is generally located within a broad depression or gully that extends to the northwest and terminates at Hope Street. An ephemeral drainage gully extends from the north-eastern and central portion of the site, then traverses the lot to extend in a north-western direction, adjacent to a formed unlined driveway which extends along the lots south-western boundary. The unlined driveway then continues past the allotments south-eastern boundary to an adjacent residence at Lot 7 on SP219110.

A temporary access track comprising the placement of fill and other materials extends from the driveway across the drainage gully, in a northerly direction, near the boundary between the proposed Lots 9 and 10. The filling works appears to have extended into the gully forming an exposed fill batter downslope of the track.

An existing building platform is located in the proposed Lot 9 and is bound by a cut batter up to about 3 m in height to the east and the drainage gully to the north. It is understood that a residential structure was previously located on the building platform and has been recently demolished and removed. It was noted that the building platform contained building debris and some refuse materials.

At the time of the fieldwork, the central portion of the site, in the area of the proposed access road, had been cleared. The remainder of the site was covered by grass and trees.

The surface of the site generally slopes to the northwest. The slopes generally range up to about 15° with locally steeper slopes along the allotments northern and eastern boundaries. The slope of the fill batter created is up to about 30°. The sides of the natural drainage gully are generally low sloping, with locally steeper sections.

Some boulders are located within the drainage path.

No signs of significant instability were noted in the walkover survey. Some zones of minor erosion and scouring were noted within the batters, gully banks and within the fill batter.

Figure 1: Site Location

Figure 2: Site Photographs

Figure 3: Site Photographs

Figure 4: Site Photographs

3.2 Subsurface Conditions

The subsurface conditions encountered within the test pits is summarised in Figures 5 to 7 below. The subsurface conditions encountered as part of the current investigation are consistent with previous investigations carried out in this area and our experience in this area of Cooktown.

In general, the subsurface conditions encountered within the test pits comprised a thin layer of sandy topsoil over very stiff to hard sandy clay over weathered, low to medium strength meta-greywacke rock.

The meta-greywacke rock is part of the Late Silurian to Early Devonian aged Hodgkinson Formation. The subject site is located near the contact aureole of the Early Permian Cooktown Granite and Charlotte Granite.

Some filling was encountered and observed at the site. It is considered, in the absence of compaction records and the presence of refuse material, that all existing fill be classified as uncontrolled fill.

At the time of fieldwork groundwater was not encountered or observed at the site.

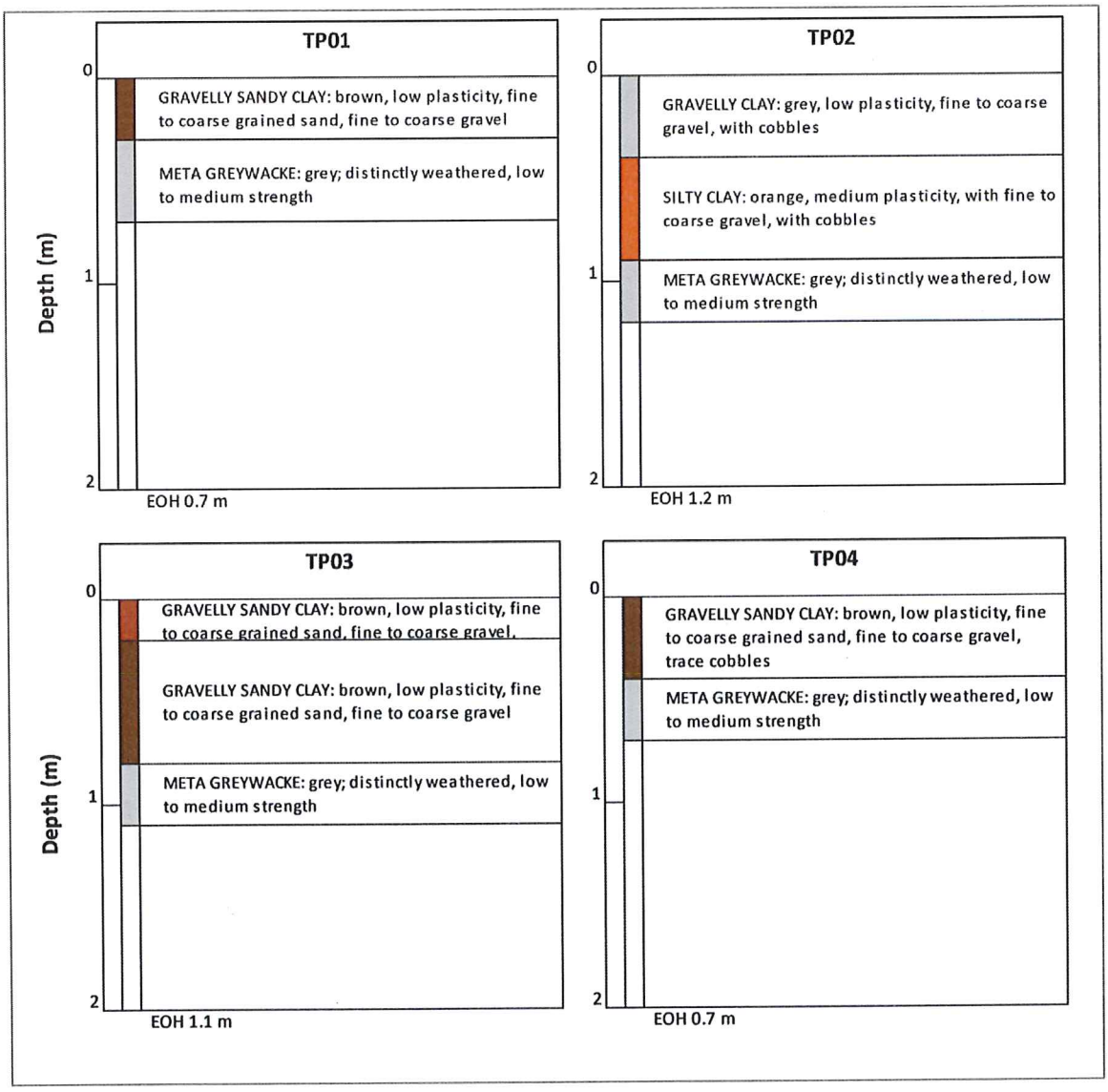


Figure 5: Summary of Test Pit Results

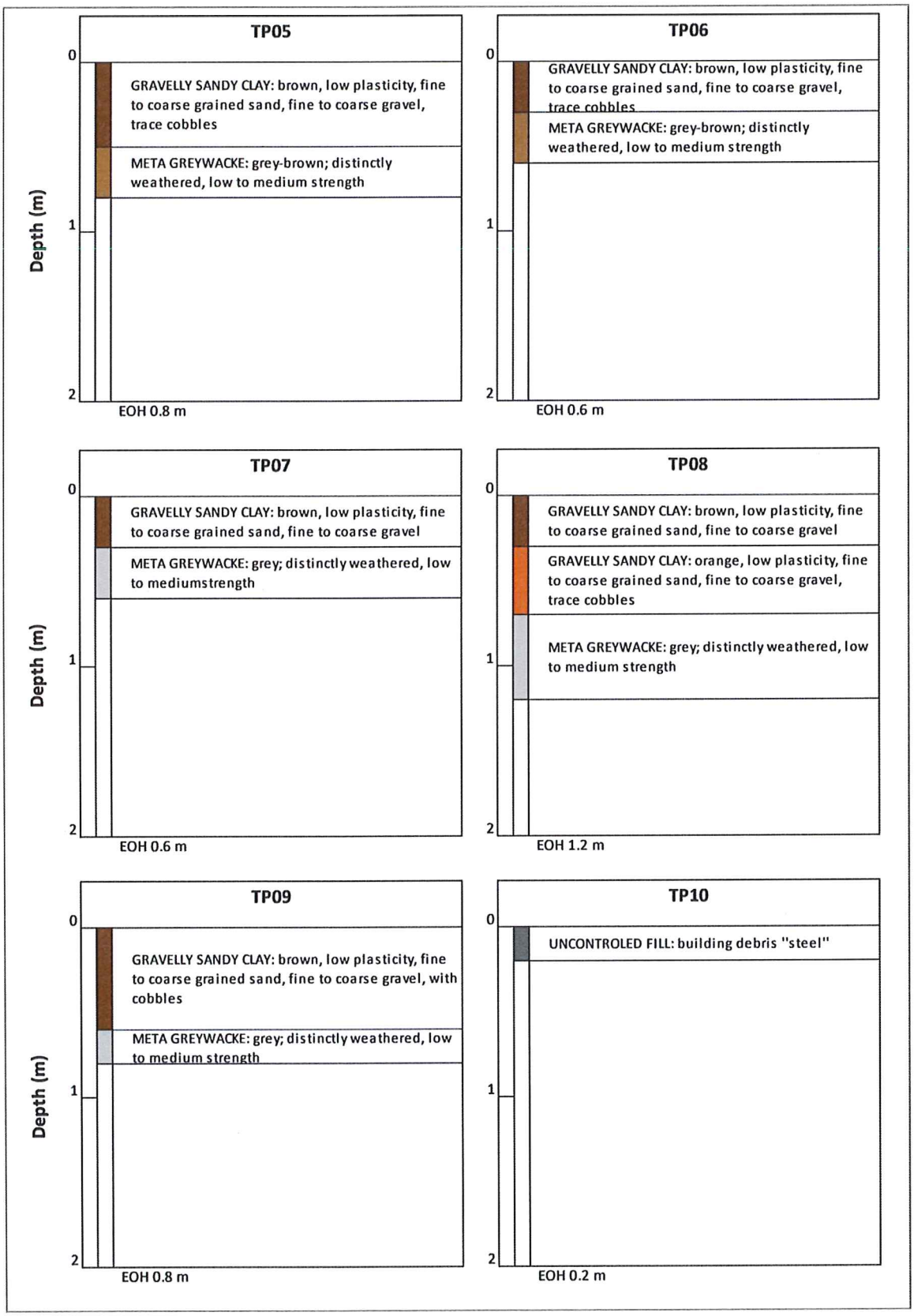


Figure 6: Summary of Test Pit Results

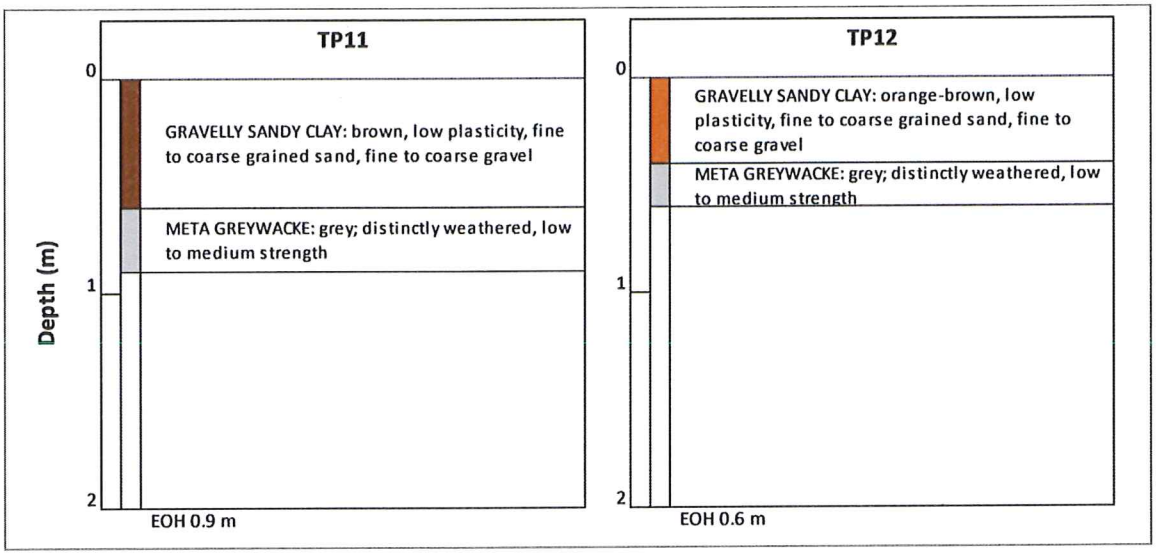


Figure 7: Summary of Test Pit Results

4.0 Stability

4.1 General

Based on the results of the investigation at this site and experience with similar sites in this area of Cooktown, it is considered the geotechnical model for this site generally comprises natural clayey colluvium overlying weathered rocks of the Hodgkinson Formation. As outlined above, some filling has been placed at the site.

Given the above geotechnical model, together with the results of the fieldwork, stability analyses were carried out for the proposed profile of the allotment including the existing slopes where present. A distributed load was placed on the proposed access road to simulate construction traffic.

A summary of the results of the stability analyses carried out for the site is presented in the following section.

4.2 Stability Analysis

Stability analyses were carried out for two profiles at the site as shown on Figure 1 in Appendix A. The profile was based on site measurements and the provided survey plans. Based on the materials observed at the site, together with parameters commonly used for engineered fill, the following effective (drained) strength parameters were adopted for the stability analyses:

Material Type	Strength Parameters	
	c'	ϕ'
Engineered Fill	8 kPa	30°
Clayey Colluvium	4 kPa	30°
Weathered Rock	15 kPa	35°

Analyses were initially performed for what were considered to be dry or "normal" conditions. Analyses were then performed for what were considered to be wet or "extreme" conditions. The "extreme" conditions considered near saturation of the materials with a pore water pressure co-efficient (R_u) of between 0.1-0.2 adopted for the material properties to simulate seepage/water infiltration.

The analyses were carried out for a potential local (medium scale) or global (large scale) circular failure using the proprietary software SLIDE 2018 The results of the stability analyses are presented in Appendix C and summarised as follows:

Section	Calculated Factor of Safety (FOS)	
	Dry Conditions	Extreme Conditions
A	2.825	2.572
B	3.976	3.335

For the purposes of assessing stability we provide the following guidelines which are appropriate to the conditions at this site:

- A calculated factor of safety > 1.5 indicates the profile is likely to be stable.
- A calculated factor of safety from 1.0 – 1.5 indicates a marginally stable profile.
- A calculated factor of safety < 1.0 indicates the profile is likely to be unstable.

In general terms the factor of safety is calculated by dividing the forces resisting instability (i.e. the strength of the soil/rock or the strength of discontinuities within the soil/rock) by the forces driving instability (i.e. the weight of the soil/rock, plus groundwater/seepage, plus surcharges/loads on the slope). A calculated factor of safety of 1.0 indicates the forces are balanced, whereas a calculated factor of safety <1.0 indicates instability will likely occur.

For this site we consider that a calculated factor of safety >1.3 should be achieved for the wet or "extreme" conditions modelled, and that a calculated factor of safety >1.5 should be achieved for the dry or "normal" conditions modelled.

The results of the stability analyses indicate that the FOS for stability at the site are >1.5 under the dry and wet conditions modelled. As such, it is considered that the overall site should be stable if the measures outlined in the following sections are adopted.

Analyses for small scale slumping at this site is not possible and is dependent upon slight profile variations and the cover of soil materials, angle and orientation of the discontinuities and the influences of trees and water flow. It is considered that small scale slumping within unsupported batters and in the steep sections of natural slopes should be expected. It is considered that this instability should be in the form of relatively small slumps or erosion failures and occur during or following prolonged rainfall events. This type of instability is common in this area of Cooktown.

4.3 Landslide Risk

As part of the investigation, a landslide risk assessment was carried out for the area of the proposed development in general accordance with the guidelines of the Landslide Risk Management Concepts and Guidelines published by the Australian Geomechanics Society in March 2000. Risk assessment in accordance with the New South Wales Road Traffic Authority (RTA) Guide to Slope Risk Analysis, Version 3.1, and the Queensland Department of Transport and Main Roads (DTMR) Batter Slope Risk Element procedures were also carried out. These guides are based on the approach suggested in the Landslide Risk Management Concepts and Guidelines and to those outlined in the Australian Geoguide LR7 (Landslide Risk).

The landslide risk assessment generally involves the evaluation of slopes enabling the identification of potential hazards ("a condition with the potential for causing an undesirable consequence", for example, rockfall or slump type failure) and analyses the identified hazards with respect to likelihood and consequences using prescribed risk matrices. The risk matrices use a number of estimated conditional probabilities to calculate an Assessed Risk Level (ARL) rating for individual slopes.

The risk assessment procedure generally uses estimated conditional probabilities designed to characterise a sequence of events which must occur for slope instability to result in a fatality or injury to the community, damage to structures or buildings, and/or economical costs that may be associated with the effects of instability.

The principal conditional probabilities used in the risk assessment include the following:

- Temporal Probability (T)
- Vulnerability (V)
- Likelihood of instability (L)

In general, the risk assessments use T and V to estimate a Consequence rating (C) for loss of life or economic loss as a result of instability. The rating C is combined with L to derive the ARL rating.

The RTA system has five separate ARL categories, namely ARL1 to ARL5, with ARL1 being the highest risk rating and ARL5 being the lowest risk rating. It is generally understood that all slopes with a risk rating of ARL1 or ARL2 are given the highest priority and should have risk reduction measures implemented within the short term (<3 years). ARL3 sites generally undergo regular monitoring with risk reduction measures carried out if the assessed risk levels are considered to increase. Sites assessed as ARL4 and ARL5 are periodically inspected for any significant site changes.

In terms of the Guidelines for Landslide Risk Management outlined in Australian Geomechanics, Volume 42, No. 1 March 2007 (AGS 2007) the risk to property is defined as Very Low to Very High. In general terms risks of very low to low are tolerable for regulatory bodies in relation to developments while higher risks are generally unacceptable without detailed investigation and implementation of risk reduction strategies to enable the reduction of risk to an acceptable level. The risk system matrix outlined in AGS 2007 is presented in Appendix D.

A full description of the risk analyses procedures are presented in the RTA and AGS 2007 documents. For further information the reader is directed to these documents.

The landslide risk assessment carried out as part of this investigation was based on the constructed development including the satisfactory implementation of the engineering and slope stability measures outlined in the following sections. The risk assessment considered the results of the stability analyses (outlined in the previous section), the walkover survey, site observations and based on experience in this area of Cooktown.

The hazards evaluated as part of the risk analysis were based on the proposed development with the adoption of the construction recommendations and measures included within this report.

The hazards considered comprised the following:

1. Instability within constructed batters or natural slopes resulting in downward migration of <2 m^3 of soil debris impacting the residence and associated structures or surrounding structures.
2. Instability within constructed batters or natural slopes resulting in downward migration of >2 m^3 of soil debris impacting the residence and associated structures or surrounding structures.

Based on the above, the following AGS 2007 and RTA risk classifications have been assessed for the proposed development:

Hazard	AGS 2007 Risk Rating	ARL Risk Rating
1	Very Low	ARL5
2	Very Low	ARL5

Low to Very Low risks are generally considered acceptable to regulators for development approval in accordance with the relevant guides. As such, no further risk reduction measures are warranted at the site to allow the proposed residence.

In addition to the above, to maintain long term stability at the site, the measures recommended in the following sections should be implemented as a minimum.

5.0 Engineering Comments

5.1 General

Engineering comments relating to site preparation and earthworks procedures, excavation conditions, slope stability, retaining walls and proposed development recommendations are presented in the following sections.

5.2 Cut and Fill Earthworks

As presented in the provided development plans, significant cut and fill earthworks are proposed. Based on a review of the drawings, it is understood that up to about 2.5 m of filling is proposed to be placed in some section near about Chainage 170 of the proposed new road and downslope. The plans indicate that fill batters would be formed at about 1V:4H.

In addition, cut batters up to about 3 m in height and formed at about 1V:1H are also proposed.

It is considered that the proposed cut and fill batters would be feasible from a geotechnical point of view. Consideration to the placement of erosion protection such as rock mulch, vegetation and erosion matting should be made. Further comments on erosion and scour protection, together with drainage provisions, are outlined in the following sections.

It is envisaged that some further cut and fill earthworks will be required as part of the proposed development.

Site preparation and earthworks procedures should involve the following:

- Strip and remove existing debris/materials, topsoil and soil containing significant amounts of organic materials.
- Strip and remove all cobble and boulders >150 mm in diameter from the surface.
- Strip and remove all existing uncontrolled fill from the site.
- Compact the subgrade with a heavy roller to reveal soft or loose materials. Soft or loose material that cannot be improved by compaction should be removed and replaced with engineered fill.
- Place fill where required in uniform horizontal layers not exceeding 200 mm loose thickness and compact to achieve a relative dry density ratio of at least 95% using Standard Compaction. Each layer of filling should be keyed into natural ground. Filling should be placed at least 1 m beyond the design profile and then trimmed to the design profile.

If required, imported fill materials should have a Plasticity Index less than 20 and a soaked CBR value of >15%.

It is recommended that all earthworks procedures be carried out in accordance with AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments" and local authority requirements. It is recommended that the earthworks contractor be familiar with site conditions.

5.3 Excavation Conditions

Excavations at the site are likely to encounter clayey soils and weathered rock. Excavation of the soils would be readily achievable for a conventional small (>8T) excavator. Excavation of the weathered rock will likely require the use of a large (>20T) excavator. An impact breaker or ripper may be required to loosen harder zones of rock.

5.4 Drainage

Drainage measures that should be implemented include:

- Provision of lined drains at the crest of any proposed new cut and fill batters.
- Provision of lined drains and kerbing or similar along the proposed access road, and proposed allotment access.

All stormwater should be collected and discharged from the site via pipes into designated drainage paths and not be allowed to flow on to the ground or around proposed footings or structures. Concentrated flows should be avoided. Where this is not possible, stormwater should be directed into flow spreaders or energy dissipaters.

As outlined above, exposed cut and fill batters should be protected from erosion and scour. This could be provided by one or more of the following measures:

- Implementation of a detailed landscape plan ensuring the planting of appropriate plant species and mulching.
- Placement of rock mulching and rock protection in drainage path areas.
- Placement of erosion matting over exposed batters.
- Placement or erosion protection within the creek in the form of rock check dams, vegetation, or a combination.

All sediment and erosion protection measures should be maintained in the long term to ensure adequate ongoing protection. Excessive erosion and scouring may lead to the forming of localised failures.

Specialist advice should be sought for the development of a suitable long term plan to reduce potential erosion and scouring.

5.5 Retaining Structures

If proposed, retaining walls could be founded on high level or bored pier footings. High level footings (strip/pad or slab on ground) should be founded on the weathered rock. High level footings for the retaining walls founded in this manner could be designed with an allowable bearing pressure of 100 kPa.

Bored pier footings for retaining walls should be extended at least three times their diameter into the weathered rock. Bored pier footings founded in this manner can be designed using an allowable end bearing pressure of 350 kPa and an allowable shaft adhesion of up to 60 kPa, neglecting the contribution of the upper 1 m of the shaft.

It is recommended that all new retaining walls be designed using the following at rest (K_0), active (K_a) and passive (K_p) earth pressure coefficients.

Material Description	K_0	K_a	K_p
Stiff or stronger clayey colluvium/fill	0.6	0.4	2.0
Weathered Rock	0.1	0.25	5.0

All retaining walls should include any surcharge loads imposed on the walls.

All retaining walls should be designed by a Structural Engineer.

5.6 Further Recommendations

Based on the geotechnical investigation, and a review of the provided information, it is considered that the proposed subdivision is feasible from a geotechnical point of view. It is further considered that the risk of instability impacting proposed future developments or infrastructure is Very Low to Low if the above measures are implemented.

It is recommended that site specific geotechnical investigations be carried out for all new proposed residential developments at the site. The geotechnical investigations would need to consider the proposed siting of structures, excavation depths, details of the structures and driveways and provide comments on suitable footings, site classification in accordance with AS2870-2011, site preparation and earthworks, retaining wall design, and slope stability including a risk classification and potential impacts on adjacent developments.

6.0 Limitations

GEO Design has prepared this report for the use of MTC Tower Pty Ltd for design purposes in accordance with generally accepted geotechnical engineering practices. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has not been prepared for use by parties other than MTC Tower Pty Ltd and their other consultants. It may not contain sufficient information for purposes of other parties or for other uses.

Your attention is drawn to the document - "Important Information About Your Geotechnical Engineering Report". This document has been prepared by the ASFE (Professional Firms Practicing in the Geosciences). The statements presented in this document are intended to advise you of what your realistic expectations of this report should be, and to present you with recommendations on how to minimise the risks associated with the ground works for this project. The document is not intended to reduce the level of responsibility accepted by GEO Design Pty Ltd, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.

We would be pleased to answer any questions that you may have regarding this matter.

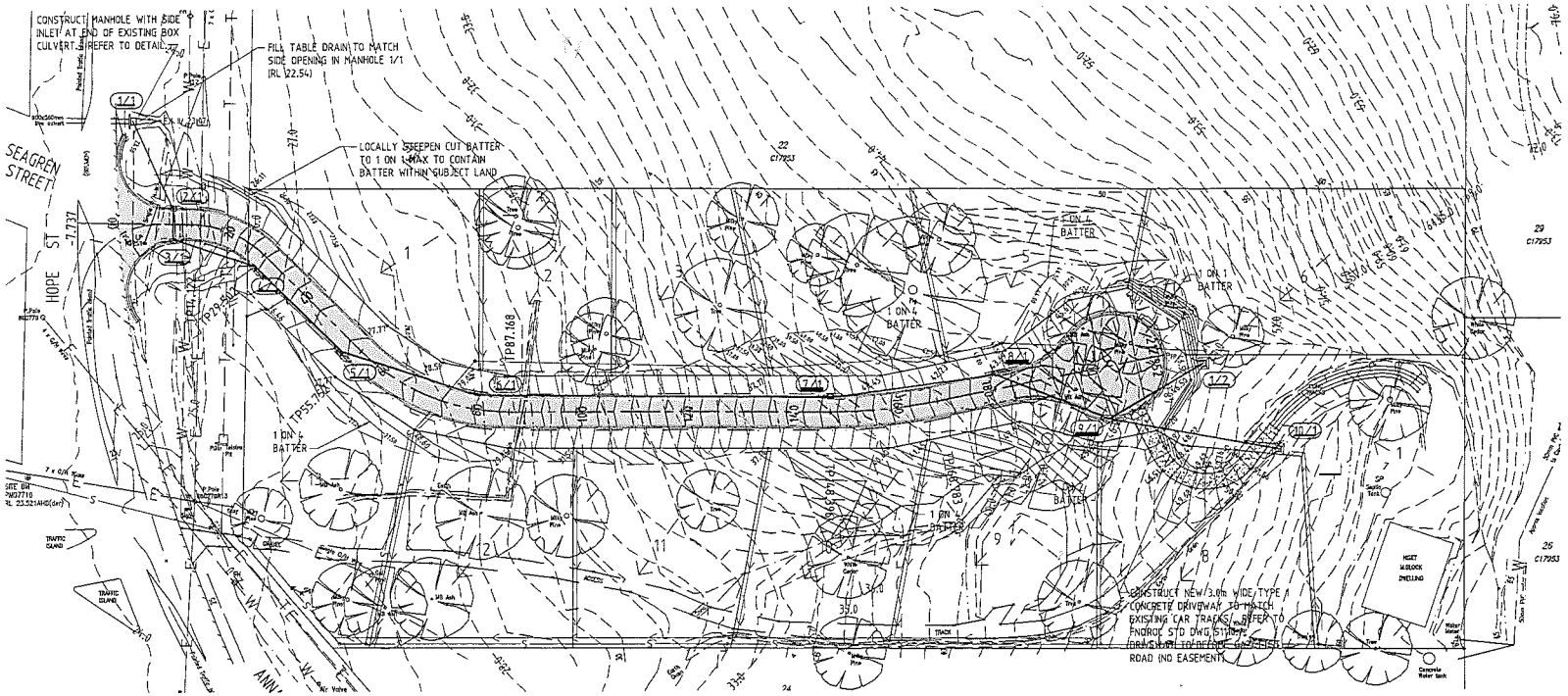
Regards,

Steve Ford

Principal Geotechnical Engineer
BSc (Geo) BSc Hons (Geo) MEngSc (Geotechnical)
RPEQ 25762

Appendix A

Provided Plans & Site Plan



PLAN
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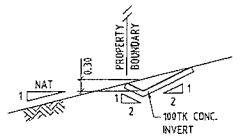
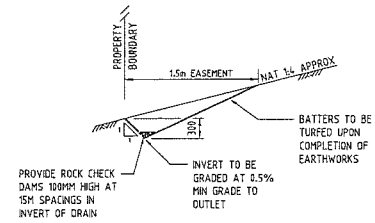


CUT OFF DRAIN
N.T.S.



GRASS SWALE DRAIN DETAIL
N.T.S.

LEGEND

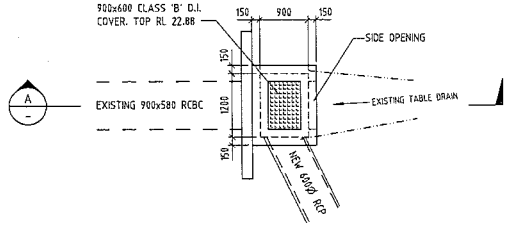
- ASPHALT SEALED PAVEMENT
- BATTER LINE
- FALL OF FINISHED LOT
- STORMWATER DRAINAGE PIPE
- SEWER PIPE
- SUBSOIL DRAIN AND FLUSHING POINT
- 1/10 STORMWATER DRAINAGE STRUCTURE/LINE NUMBER
- 44.00 DESIGN SURFACE CONTOURS (0.5m INTERVAL)
- 42.00 EXISTING SURFACE CONTOURS (1.0m INTERVAL)
- GRASS SWALE DRAIN REFER TO DETAIL

NOTES

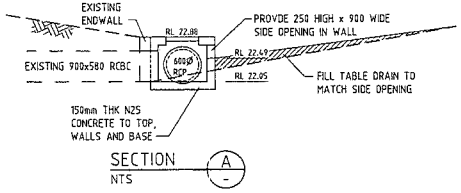
1. FOR KERB PROFILE DETAILS REFER FNQROC STD DWG S1000.
3. FOOTPATHS ARE TO BE TOPSOILED AND GRASSED BY DRILLSEEDING. ALL REGRASSED AREAS TO BE SUITABLY IRRIGATED TO PROMOTE GROWTH.
4. FOR STANDARD STORMWATER DRAINAGE DETAILS REFER TO FNQROC STD. DWGS. S1045-S1100 INCLUSIVE.
5. SUBSURFACE DRAINAGE TO DISCHARGE INTO STORMWATER PIT OR CULVERT. REFER TO FNQROC STD DWG S1095 FOR SUBSOIL DRAINAGE DETAILS.
6. THE CONTRACTOR IS TO LOCATE ALL EXISTING SERVICES IN THE WORKS AREA PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
7. EXISTING SERVICES ARE PLOTTED FROM THE BEST INFORMATION AVAILABLE. NO RESPONSIBILITY IS TAKEN BY THE PRINCIPAL OR SUPERINTENDENT FOR THE ACCURACY AND COMPLETENESS OF THE INFORMATION SHOWN.

ALLOTMENT ACCESSES

- ALIGNMENT TO BE DETERMINED ON SITE FOR HOUSE LOCATION
- TO BE CONSTRUCTED ACCORDANCE WITH FNQROC DWGS S1015 AND S1110, MAX GRADE 1 IN 5



CONNECTION TO EXISTING RCBC
N.T.S.



SECTION A
NTS

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B	30/08/07	ROAD LAYOUT AND DRAINAGE REVISED	EWK	EWK	KB	KB
A	11/12/06	INITIAL ISSUE	EWK	EWK	KFB	KFB

DRAWING FILE: XREF FILE:

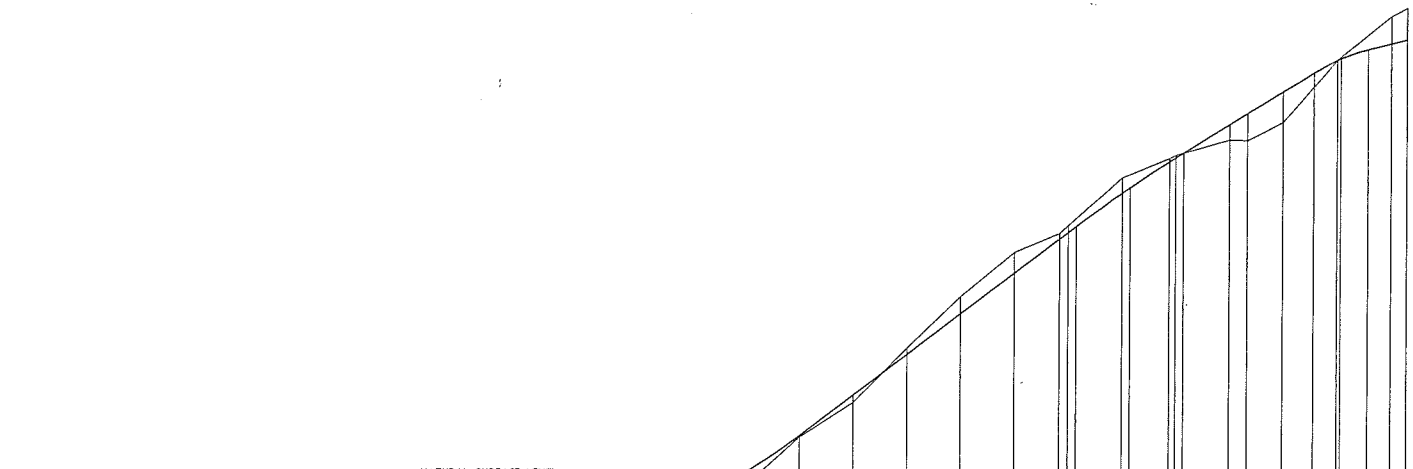
MR MATTHEW CAREY
PROPOSED SUBDIVISION
HOPE ST, COOKTOWN

ROADWORKS AND STORMWATER DRAINAGE

BRUCE & ASSOCIATES CONSULTING
CIVIL & STRUCTURAL ENGINEERS
PROJECT MANAGERS
DEVELOPMENT CONSULTANTS
29 Scott St
PO Box 827
CAIRNS Q 4870
Ph: (07) 4052 1700 Fax: (07) 4052 1634
Email: email@bruceconsult.com.au

Designed	EWK	Drawn	EWK
Checked	KB	Date	DEC 06
Approved		R.P.E.Q.	5571

JOB No: 3130
SHEET: C-1 B
SCALE: AS SHOWN



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KERB INVERT RHS								23.269	23.855				25.323		26.560		27.523	27.523	27.651		28.869	29.603		31.311		34.366		37.422	38.704			40.427		41.611			43.018			45.075						
KERB INVERT LHS								23.269	23.855				25.323		26.560		27.523	27.523	27.651		28.869	29.603		31.311		34.366		37.422	38.704			40.427		41.611			43.018			45.513	45.606	45.950				
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NATURAL SURFACE LEVEL	23.498		24.276	24.302			24.269	24.493		25.199			26.455	26.586	27.208	27.381	27.475	27.601		28.086	28.720	29.628	29.523	31.344	32.651	34.703	36.631	38.287	38.998	39.308		41.096		41.875	41.955		42.529	42.503	43.202					47.192	47.510
CUT/FILL	+0.000		-1.007	-1.034			-0.989	-1.130		-1.250			-1.037	-1.020	-0.554	+0.009	+0.142	+0.145		+0.115	+0.243	+0.077	+0.508	+0.061	+0.282	-0.242	-0.643	-0.772	-0.200	-0.265		-0.576		-0.120	-0.094		+0.584	+1.034	+1.160					-1.027	-1.198

ROAD LONGITUDINAL SECTIONS
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1:2000 (A3) 20 10
1:100 (A1) 0 2 4 6 8 10m
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No.	DATE	ISSUE / REVISIONS	DES.	DRN	CHKD	APPD
B	30/08/07	ROAD A REVISED	EWK	EWK		
A	11/12/06	INITIAL ISSUE	EWK	EWK	KFB	KFB

DRAWING FILE: XREF FILE:

MR MATTHEW CAREY
PROPOSED SUBDIVISION
HOPE ST, COOKTOWN

ROAD LONGITUDINAL SECTIONS

BRUCE & ASSOCIATES CONSULTING
CIVIL & STRUCTURAL ENGINEERS
PROJECT MANAGERS
DEVELOPMENT CONSULTANTS
28 Scott St
PO Box 927
CAIRNS Q 4870
Ph: (07) 4052 1700 Fax: (07) 4052 1634
Email: email@bruceconsult.com.au

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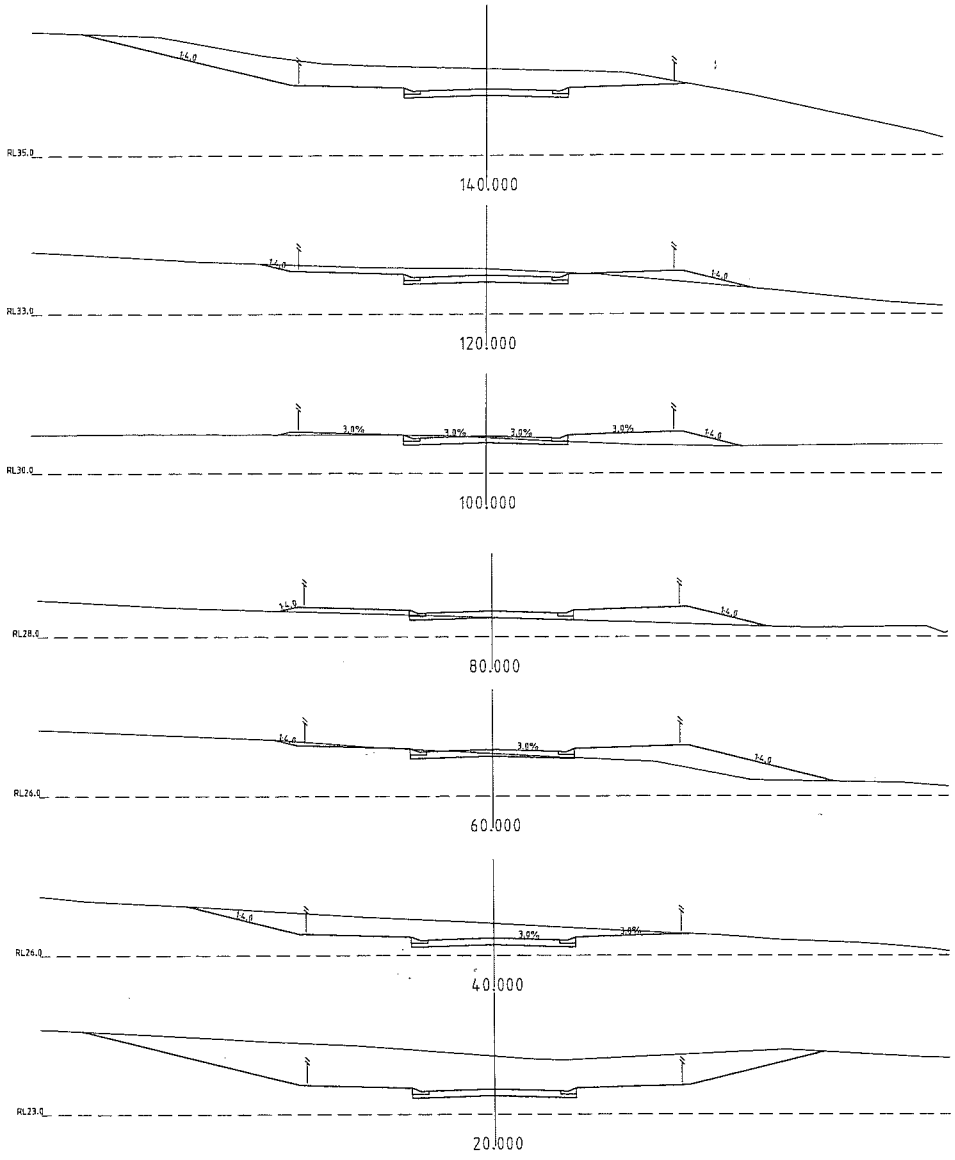
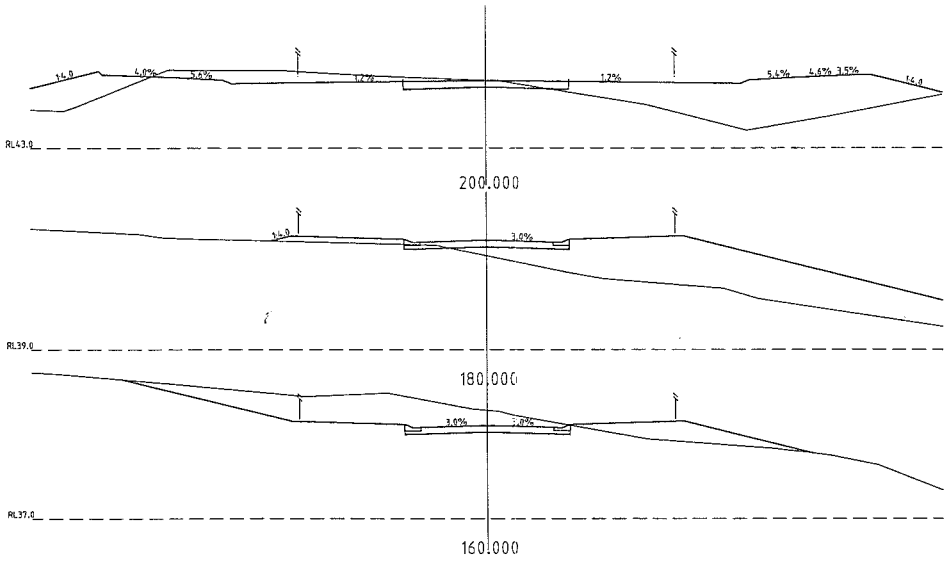
Approved	R.P.E.Q. 5571	SCALE:	AS SHOWN





ROAD CROSS SECTIONS
SCALE 1:1000 H 1:100 V

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1:2000 (A3) 20 10
1:100 (A1) 0 2 4 6 8 10m
1:200 (A3) 2 1

No.	DATE	ISSUE / REVISIONS	DES.	DRN	CHKD	APPD
B	30/08/07	ROAD A REVISED	EWK	EWK	KB	KB
A	11/12/06	INITIAL ISSUE	EWK	EWK	KFB	KFB

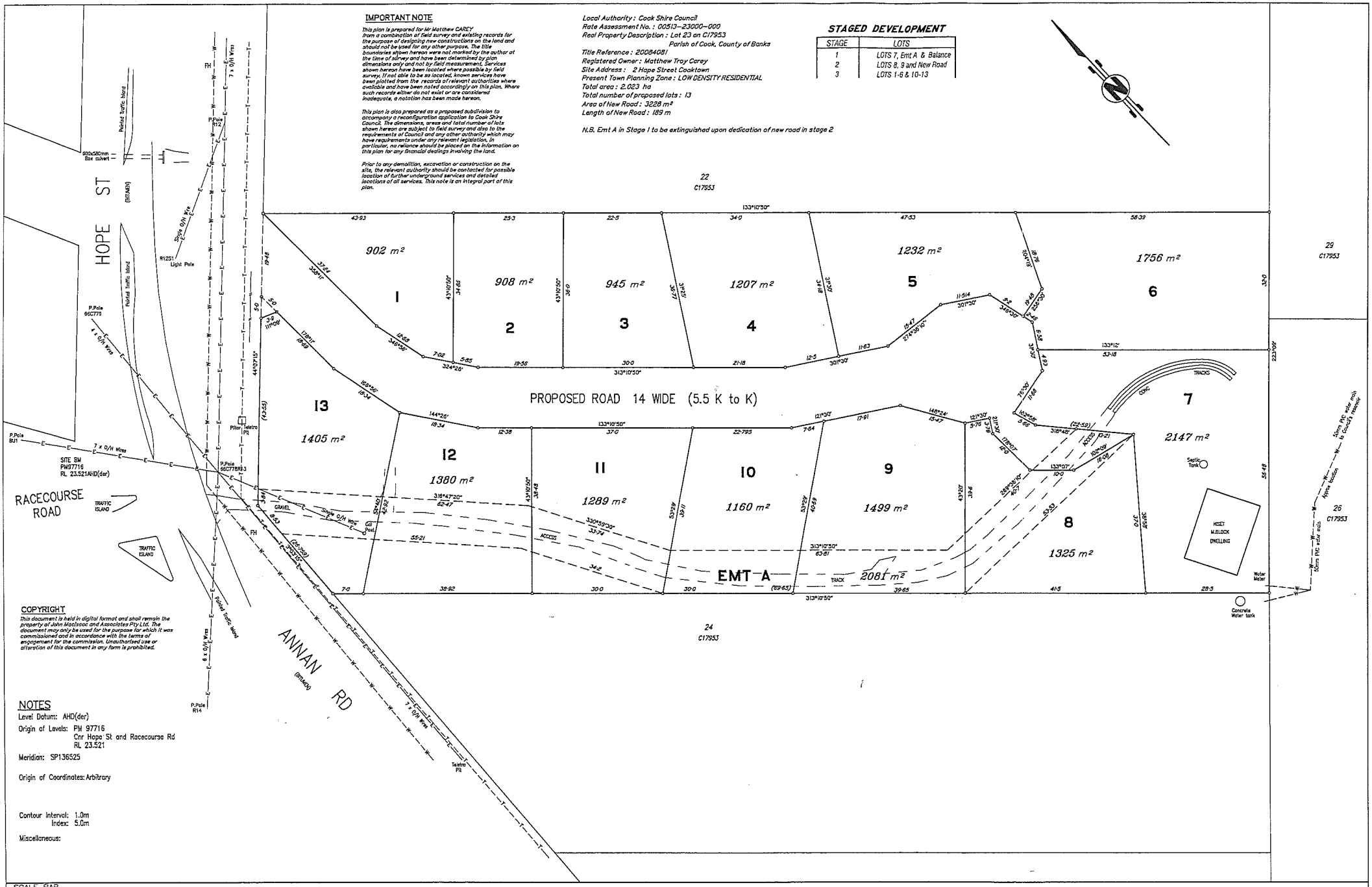
DRAWING FILE: XREF FILE:

MR MATTHEW CAREY
PROPOSED SUBDIVISION
HOPE ST, COOKTOWN

ROAD CROSS SECTIONS

BRUCE & ASSOCIATES CONSULTING
CIVIL & STRUCTURAL ENGINEERS
PROJECT MANAGERS
DEVELOPMENT CONSULTANTS
28 Scott St
PO Box 927
CAIRNS Q 4870
Ph: (07) 4052 1700 Fax: (07) 4052 1634
Email: email@bruceconsult.com.au

Designed EWK	Drawn EWK	JOB No:	3130
Checked KB	Date DEC 06	SHEET:	C-4 B
Approved	R.P.E.Q. 5571	SCALE:	AS SHOWN



ISSUE	AMENDMENT	DATE	INIT

John MacIsaac and Associates Pty. Ltd. A.C.N. 010 553 312 hereby certify that Robert William PENTECOST, Cadastral Surveyor for whose work the company accepts responsibility, has prepared this plan.

John Gerald MacIsaac
Director and Cadastral Surveyor

Robert William Pentecost
Director

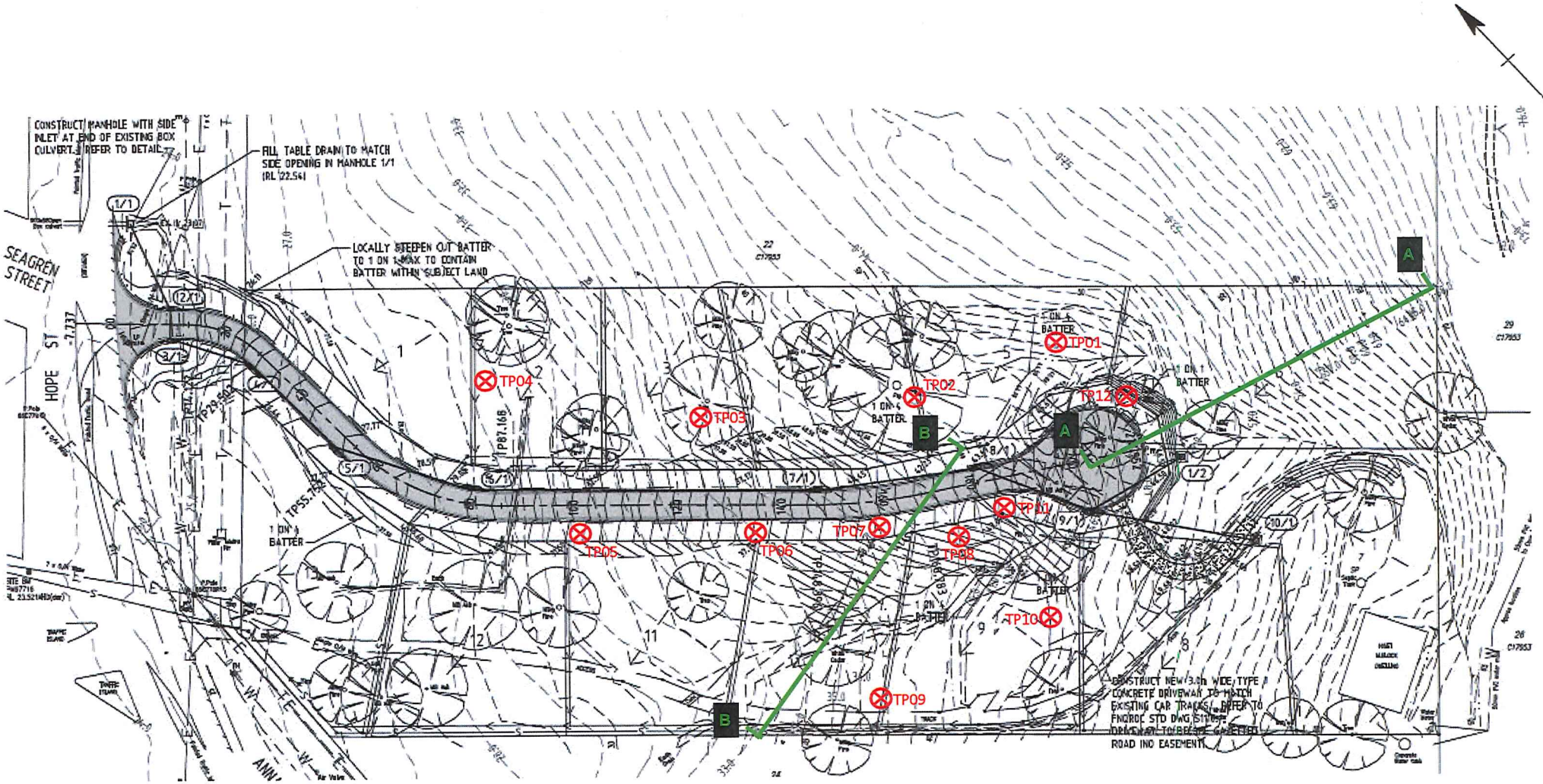
Date .....

CLIENT : **MR MATTHEW CAREY**

PROPOSED LOTS 1 – 13
Cancelling Lot 23 on C17953
Parish of COOK County of BANKS

JOHN MacISAAC AND ASSOCIATES PTY. LTD.
A.C.N. 010 553 312
CONSULTING SURVEYORS & PROPERTY DEVELOPMENT CONSULTANTS
146 MARTYN STREET, CAIRNS N.Q.
P.O. Box 5174 Cairns. 4870
Phone (07) 4031 3288 Fax (07) 4031 4944
Email : jmacisc@ozemail.com.au

SURVEYED RWPentecost	MERIDIAN SP136525	SCALE 1:400	A1
DATE 27-05-05	LEVEL DATUM AHD(der)	CONTOUR INTERVAL 1.0m	
DRAWN RWP 10-06-2008		SHEET 1 OF 1 SHEETS	
CHECKED / /	DATA SOURCE 203802.Pts&Str 2038-04revA.DWG	FB/LB FB375	PLAN 2038-05 ISSUE



GEO | design

Client:	MTC Tower Pty Ltd	**GEOTECHNICAL ASSESSMENT**
Drawn:	SRF	**2 HOPE STREET, COOKTOWN**
Scale:	NTS	**FIGURE 1** **SITE PLAN – STABILITY PROFILE**
Project No:	22028AA-D	

Appendix B

Results of Fieldwork

TEST PIT: TP01

GEO
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Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel	M	VSt to H	
				0.30								
			0.5						META GREYWACKE: grey; distinctly weathered, low to medium strength			
				0.70								
			1.0						TEST TERMINATED AT 0.70 m Refusal			
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF
Date 25/8/22

GEO
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TEST PIT: TP02

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY CLAY: grey, low plasticity, fine to coarse gravel, with cobbles	M	VSt to H	
				0.40								
			0.5					CI	SILTY CLAY: orange, medium plasticity, with fine to coarse gravel, with cobbles			
				0.90								
			1.0						META GREYWACKE: grey; distinctly weathered, low to medium strength			
				1.20								
			1.5						TEST TERMINATED AT 1.20 m Refusal			
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF
Date 25/8/22

MFC_LIB_03.GLB Log MFC TEST PIT WITH SKETCH 22028AA-D.GPJ <<DrawingFile>> 25/08/2022 15:52 8.30.003 Developed by Datgel

GEO

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TEST PIT: TP03

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel, trace cobbles	M	VSt to H	
				0.20								
			0.5					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel			
				0.80								
				0.90					META GREYWACKE: grey; distinctly weathered, low to medium strength			
			1.0	1.10								
									TEST TERMINATED AT 1.10 m Refusal			
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF

Date 25/8/22

TEST PIT: TP04

GEO
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Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel, trace cobbles	M	VSt to H	
				0.40								
			0.5						META GREYWACKE: grey; distinctly weathered, low to medium strength			
				0.70								
									TEST TERMINATED AT 0.70 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF
Date 25/8/22

GEO

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TEST PIT: TP05

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel, trace cobbles	M	VSt to H	
			0.5	0.50					META GREYWACKE: grey-brown; distinctly weathered, low to medium strength			
				0.80					TEST TERMINATED AT 0.80 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF

Date 25/8/22

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TEST PIT: TP06

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel, trace cobbles	M	VSt to H	
				0.30								
			0.5						META GREYWACKE: grey-brown; distinctly weathered, low to medium strength			
				0.60								
									TEST TERMINATED AT 0.60 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF

Date 25/8/22

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TEST PIT: TP07

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel	M	VSt to H	
				0.30					META GREYWACKE: grey; distinctly weathered, low to medium strength			
			0.5	0.60					TEST TERMINATED AT 0.60 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF

Date 25/8/22

TEST PIT: TP08

GEO
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Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel	M	VSt to H	
				0.30								
			0.5					CL	GRAVELLY SANDY CLAY: orange, low plasticity, fine to coarse grained sand, fine to coarse gravel, trace cobbles			
				0.70								
									META GREYWACKE: grey; distinctly weathered, low to medium strength			
			1.0									
				1.20								
									TEST TERMINATED AT 1.20 m Refusal			
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF
Date 25/8/22

TEST PIT: TP09

GEO
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Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel, with cobbles	M	VSt to H	
			0.5	0.60					META GREYWACKE: grey; distinctly weathered, low to medium strength			
				0.80					TEST TERMINATED AT 0.80 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF
Date 25/8/22

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TEST PIT: TP10

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-M	Not Encountered	0.0						UNCONTROLED FILL: building debris "steel"			
				0.20					TEST TERMINATED AT 0.20 m Refusal			
			0.5									
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF

Date 25/8/22

TEST PIT: TP11

GEO
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Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: brown, low plasticity, fine to coarse grained sand, fine to coarse gravel	M	VSt to H	
			0.5	0.60					META GREYWACKE: grey; distinctly weathered, low to medium strength			
				0.90					TEST TERMINATED AT 0.90 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

Sketch & Other Observations

Comments

Checked SRF
Date 25/8/22

GEO

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TEST PIT: TP12

Project	Geotechnical Investigation			Sheet	1 OF 1
Site	2 Hope Street				
Location	Cooktown				
Position	Refer to Site Plan	Contractor	Geo Design	Date	4/8/22
Job No.	22028AA-D	Machine	1-2t Excavator	Logged	SRF
Client	MTC Tower	Bucket Size	Tooth Bucket		

Excavation					Sampling		Field Material Description					
METHOD	EXCAVATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
EX	L-H	Not Encountered	0.0					CL	GRAVELLY SANDY CLAY: orange-brown, low plasticity, fine to coarse grained sand, fine to coarse gravel	M	VSt to H	
				0.40								
			0.5						META GREYWACKE: grey; distinctly weathered, low to medium strength			
				0.60								
									TEST TERMINATED AT 0.60 m Refusal			
			1.0									
			1.5									
			2.0									
			2.5									

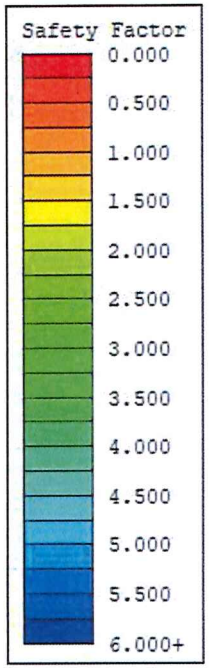
Sketch & Other Observations

Comments

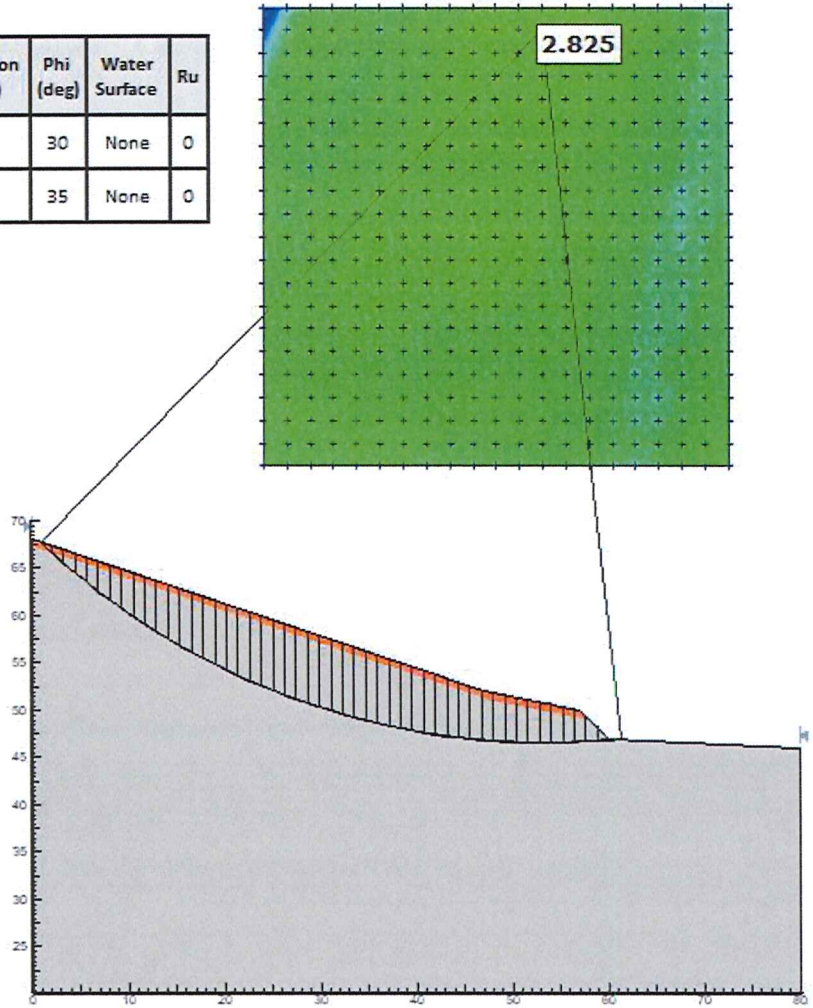
Checked SRF

Date 25/8/22

Appendix C
Stability Analysis

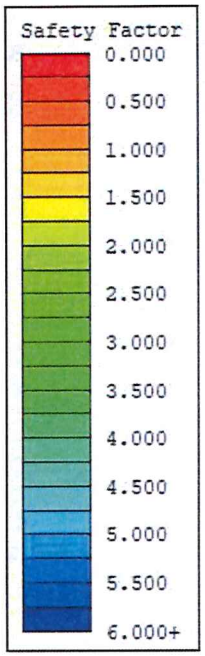


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Clayey Colluvium		18	Mohr-Coulomb	4	30	None	0
Meta-Greywacke		20	Mohr-Coulomb	15	35	None	0

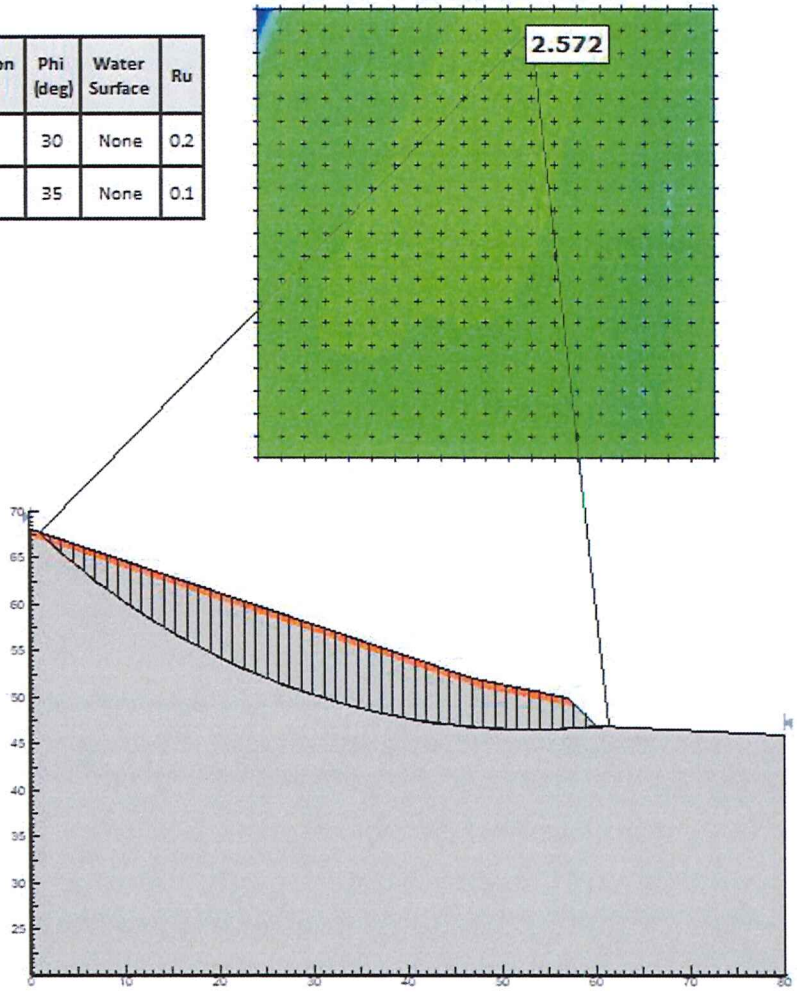


GEO | design

Client:	MTC Tower Pty Ltd	**Geotechnical Assessment**
Drawn:	SRF	**2 Hope Street, Cooktown**
Scale:	NTS	**RESULTS OF STABILITY ANALYSES SECTION A EXISTING PROFILE DRY CONDITIONS**
Project No:	22028AA-D	

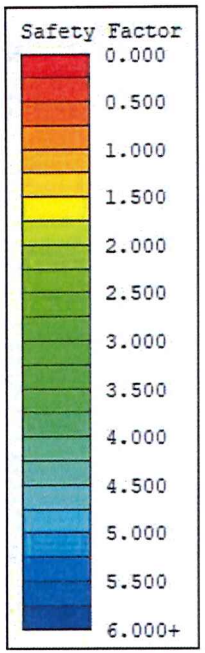


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Clayey Colluvium		18	Mohr-Coulomb	4	30	None	0.2
Meta-Greywacke		20	Mohr-Coulomb	15	35	None	0.1

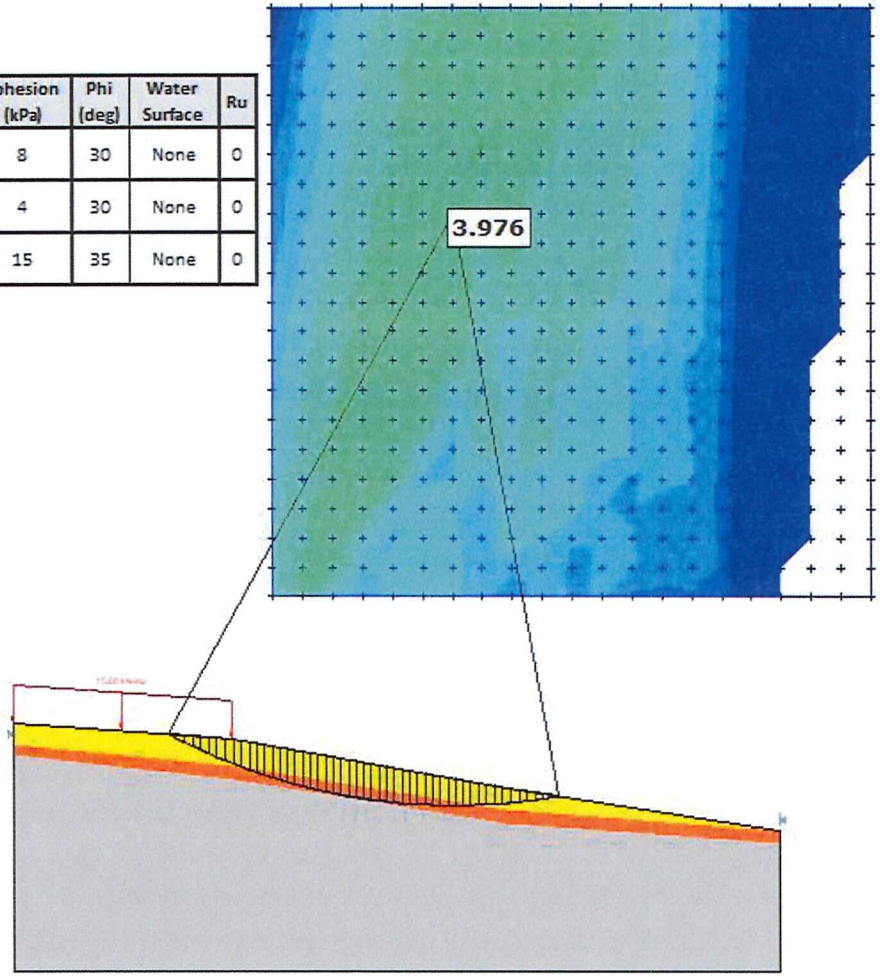


GEO | design

Client:	MTC Tower Pty Ltd	**Geotechnical Assessment**
Drawn:	SRF	**2 Hope Street, Cooktown**
Scale:	NTS	**RESULTS OF STABILITY ANALYSES SECTION A EXISTING PROFILE WET CONDITIONS**
Project No:	22028AA-D	

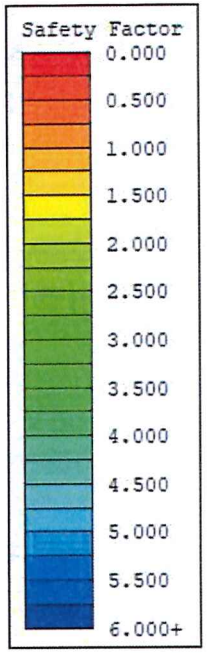


Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Engineered Fill		20	Mohr-Coulomb	8	30	None	0
Clayey Colluvium		18	Mohr-Coulomb	4	30	None	0
Meta-Greywacke		20	Mohr-Coulomb	15	35	None	0

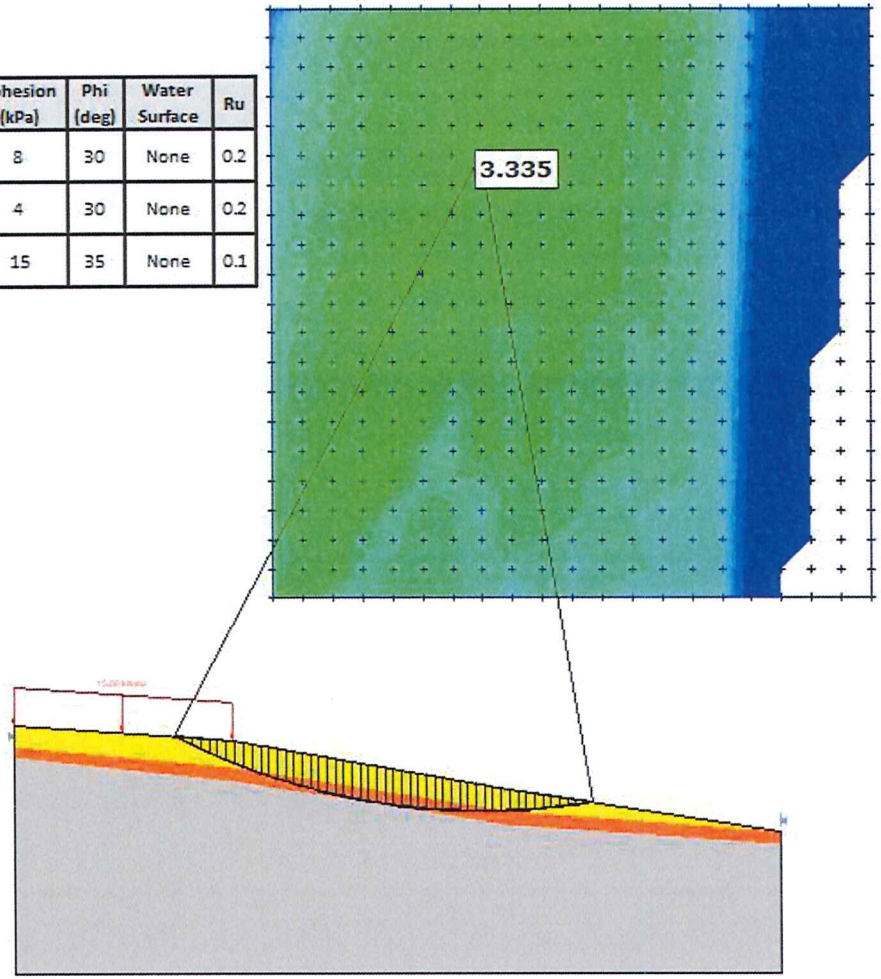


GEO | design

Client:	MTC Tower Pty Ltd	**Geotechnical Assessment**
Drawn:	SRF	**2 Hope Street, Cooktown**
Scale:	NTS	**RESULTS OF STABILITY ANALYSES SECTION B EXISTING PROFILE DRY CONDITIONS**
Project No:	22028AA-D	



Material Name	Color	Unit Weight (kN/m3)	Strength Type	Cohesion (kPa)	Phi (deg)	Water Surface	Ru
Engineered Fill		20	Mohr-Coulomb	8	30	None	0.2
Clayey Colluvium		18	Mohr-Coulomb	4	30	None	0.2
Meta-Greywacke		20	Mohr-Coulomb	15	35	None	0.1



GEO | design

Client:	MTC Tower Pty Ltd	**Geotechnical Assessment**
Drawn:	SRF	**2 Hope Street, Cooktown**
Scale:	NTS	**RESULTS OF STABILITY ANALYSES SECTION B EXISTING PROFILE WET CONDITIONS**
Project No:	22028AA-D	

Appendix D

AGS 2007 Risk Matrix

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

LIKELIHOOD		CONSEQUENCES TO PROPERTY (With Indicative Approximate Cost of Damage)				
	Indicative Value of Approximate Annual Probability	1: CATASTROPHIC 200%	2: MAJOR 60%	3: MEDIUM 20%	4: MINOR 5%	5: INSIGNIFICANT 0.5%
A - ALMOST CERTAIN	10^{-1}	VH	VH	VH	H	M or L (5)
B - LIKELY	10^{-2}	VH	VH	H	M	L
C - POSSIBLE	10^{-3}	VH	H	M	M	VL
D - UNLIKELY	10^{-4}	H	M	L	L	VL
E - RARE	10^{-5}	M	L	L	VL	VL
F - BARELY CREDIBLE	10^{-6}	L	VL	VL	VL	VL

Notes: (5) For cell A5, may be subdivided such as that a consequence of less than 0.1% is Low risk

(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time

RISK LEVEL IMPLICATIONS

Risk Level		Example Implications (7)
VH	VERY HIGH RISK	Unacceptable without treatment. Extensive detailed investigation and research, planning and implementation of treatment options essential to reduce risk to low; may be too expensive and not practical. Work likely to cost more the value of the property.
H	HIGH RISK	Unacceptable without treatment. Detailed investigation, planning and implementation of treatment options required to reduce risk to Low. Work would cost a substantial sum in relation to the value of the property.
M	MODERATE RISK	May be tolerated in certain circumstances (subject to regulator's approval) but requires investigation, planning and implementation of treatment options to reduce risk to Low. Treatment options to reduce to Low should be implemented as soon as practical.
L	LOW RISK	Usually acceptable to regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	VERY LOW RISK	Acceptable. Manage by normal slope maintenance procedures.

Note: (7) The implications for a particular situation are to be determined by all parties to the risk assessment and may depend on the nature of the property at risk; these are only given as a general guide.