DA Form 1 – Development application details

Approved form (version 1.0 effective 3 July 2017) 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**, 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*)	L. & H. Price
Contact name *(only applicable for companies)*	Greg Skyring, Greg Skyring Design and Drafting Pty Ltd
Postal address *(P.O. Box or street address)*	11 Noli Close
Suburb	Mossman
State	QLD
Postcode	4873
Country	AUS
Contact number	07 40982061
Email address *(non-mandatory)*	greg@skyringdesign.com.au
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	

2) Owner's consent
2.1) Is written consent of the owner required for this development application?
☒ Yes – the written consent of the owner(s) is attached to this development application ☐ No – proceed to 3)

PART 2 – LOCATION DETAILS

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

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

3.1) Street address and lot on plan

☒ Street address **AND** lot on plan (*all lots must be listed*), ***or***

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

a)	Unit No.	Street No.	Street Name and Type	Suburb
			Ronald Road	Forest Creek
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
		37	RP735855	Douglas Shire
b)	Unit No.	Street No.	Street Name and Type	Suburb
	Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)

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

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

☒ Not required

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

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

Name of water body, watercourse or aquifer:

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

Lot on plan description of strategic port land:

Name of port authority for the lot:

☐ In a tidal area

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

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

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

Name of airport:

☐ Listed on the Environmental Management Register (EMR) under the *Environmental Protection Act 1994*

EMR site identification:

☐ Listed on the Contaminated Land Register (CLR) under the *Environmental Protection Act 1994*

CLR site identification:

5) Are there any existing easements over the premises?

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

☐ Yes – All easement locations, types and dimensions are included in plans submitted with this development application

☒ No

PART 3 – DEVELOPMENT DETAILS

Section 1 – Aspects of development

6.1) Provide details about the first development aspect

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

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

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

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

c) What is the level of assessment?

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

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

Dwelling house

e) Relevant plans

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

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

6.2) Provide details about the second development aspect

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

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

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

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

c) What is the level of assessment?

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

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

e) Relevant plans

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

☐ Relevant plans of the proposed development are attached to the development application

6.3) Additional aspects of development

☐ Additional aspects of development are relevant to this development application and the details for these aspects that would be required under Part 3 Section 1 of this form have been attached to this development application

☐ Not required

Section 2 – Further development details

7) Does the proposed development application involve any of the following?	
Material change of use	☒ Yes – complete division 1 if assessable against a local planning instrument
Reconfiguring a lot	☐ Yes – complete division 2
Operational work	☐ Yes – complete division 3
Building work	☐ Yes – complete *DA Form 2 – Building work details*

Division 1 – Material change of use

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

8.1) Describe the proposed material change of use			
Provide a general description of the proposed use	Provide the planning scheme definition *(include each definition in a new row)*	Number of dwelling units *(if applicable)*	Gross floor area (m^2) *(if applicable)*
New house	Dwelling house	1	57m^2

8.2) Does the proposed use involve the use of existing buildings on the premises?		
☐ Yes		
☒ No		

Division 2 – Reconfiguring a lot

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

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

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

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

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

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

12) Boundary realignment

12.1) What are the current and proposed areas for each lot comprising the premises?

Current lot		Proposed lot	
Lot on plan description	Area (m^2)	Lot on plan description	Area (m^2)

12.2) What is the reason for the boundary realignment?

13) What are the dimensions and nature of any existing easements being changed and/or any proposed easement? *(attach schedule if there are more than two easements)*

Existing or proposed?	Width (m)	Length (m)	Purpose of the easement? *(e.g. pedestrian access)*	Identify the land/lot(s) benefitted by the easement

Division 3 – Operational work

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

14.1) What is the nature of the operational work?

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

14.2) Is the operational work necessary to facilitate the creation of new lots? *(e.g. subdivision)*

☐ Yes – specify number of new lots:	
☐ No	

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

$

PART 4 – ASSESSMENT MANAGER DETAILS

15) Identify the assessment manager(s) who will be assessing this development application

Douglas Shire Council

16) Has the local government agreed to apply a superseded planning scheme for this development application?

☐ Yes – a copy of the decision notice is attached to this development application
☐ Local government is taken to have agreed to the superseded planning scheme request – relevant documents attached
☒ No

PART 5 – REFERRAL DETAILS

17) Do any aspects of the proposed development require referral for any referral requirements?

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

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

Matters requiring referral to the **chief executive of the Planning Regulation 2017:**

☐ Clearing native vegetation
☐ Contaminated land *(unexploded ordnance)*

☐ Environmentally relevant activities (ERA) *(only if the ERA have not been devolved to a local government)*
☐ Fisheries – aquaculture
☐ Fisheries – declared fish habitat area
☐ Fisheries – marine plants
☐ Fisheries – waterway barrier works
☐ Hazardous chemical facilities
☐ Queensland heritage place *(on or near a Queensland heritage place)*
☐ Infrastructure – designated premises
☐ Infrastructure – state transport infrastructure
☐ Infrastructure – state transport corridors and future state transport corridors
☐ Infrastructure – state-controlled transport tunnels and future state-controlled transport tunnels
☐ Infrastructure – state-controlled roads
☐ Land within Port of Brisbane's port limits
☐ SEQ development area
☐ 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 – residential development
☐ SEQ regional landscape and rural production area or SEQ Rural living area – urban activity
☐ Tidal works or works 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 2 or 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
☐ Strategic port land

Matters requiring referral to the **relevant port operator:**

☐ Brisbane core port land (below high-water mark and within port limits)

Matters requiring referral to the **chief executive of the relevant port authority:**

☐ Land within limits of another port

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

☐ Tidal works, or development in a coastal management district in Gold Coast waters

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

☐ Tidal works, or development in a coastal management district

18) Has any referral agency provided a referral response for this development application?		
☐ Yes – referral response(s) received and listed below are attached to this development application ☒ No		
Referral requirement	Referral agency	Date of referral response
Identify and describe any changes made to the proposed development application that was the subject of the referral response and the development application the subject of this form, or include details in a schedule to this development application *(if applicable).*		

PART 6 – INFORMATION REQUEST

19) Information request under Part 3 of the DA Rules

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

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

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

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

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

PART 7 – FURTHER DETAILS

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

☐ Yes – provide details below or include details in a schedule to this development application

☒ No

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

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

☐ Yes – the yellow local government/private certifier's copy of the receipted QLeave form is attached to this development application

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

☒ Not applicable

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

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

☐ Yes – show cause or enforcement notice is attached

☒ No

23) Further legislative requirements

Environmentally relevant activities

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

☐ Yes – the required attachment (form EM941) for an application for an environmental authority accompanies this development application, and details are provided in the table below

☒ No

***Note**: Application for an environmental authority can be found by searching "EM941" at www.qld.gov.au. An ERA requires an environmental authority to operate. See www.business.qld.gov.au for further information.*

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

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

Hazardous chemical facilities

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

☐ Yes – *Form 69: Notification of a facility exceeding 10% of schedule 15 threshold* is attached to this development application

☒ No

***Note**: See www.justice.qld.gov.au for further information.*

Clearing native vegetation

23.3) Does this development application involve **clearing native vegetation** that requires written confirmation 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 is accompanied by written confirmation from the chief executive of the *Vegetation Management Act 1999* (s22A determination)

☒ No

***Note**: See www.qld.gov.au for further information.*

Environmental offsets

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

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

☒ No

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

Koala conservation

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

☐ Yes

☒ No

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

Water resources

23.6) Does this development application involve **taking or interfering with artesian or sub artesian water, taking or interfering with water in a watercourse, lake or spring, taking overland flow water or waterway barrier works**?

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

☒ No

***Note**: DA templates are available from www.dilgp.qld.gov.au.*

23.7) Does this application involve **taking or interfering with artesian or sub artesian water, taking or interfering with water in a watercourse, lake or spring, or taking overland flow water** under the *Water Act 2000*?

☐ Yes – I acknowledge that a relevant water authorisation under the *Water Act 2000* may be required prior to

commencing development

☒ No

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

Marine activities

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

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

☒ No

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

Quarry materials from a watercourse or lake

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

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

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

Quarry materials from land under tidal waters

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

☐ Yes – I acknowledge that a quarry material allocation notice must be obtained prior to commencing development

☒ No

***Note**: Contact the Department of Environment and Heritage Protection at www.ehp.qld.gov.au for further information.*

Referable dams

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

☐ Yes – the 'Notice Accepting a Failure Impact Assessment' from the chief executive administering the Water Supply Act is attached to this development application

☒ No

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

Tidal work or development within a coastal management district

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

☐ Yes – the following is included with this development application:

- ☐ Evidence the proposal meets the code for assessable development that is prescribed tidal work *(only required if application involves prescribed tidal work)*
- ☐ A certificate of title

☒ No

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

Queensland and local heritage places

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

☐ Yes – details of the heritage place are provided in the table below

☒ No

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

Name of the heritage place:		Place ID:	

Brothels

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

☐ Yes – this development application demonstrates how the proposal meets the code for a development application for a brothel under Schedule 3 of the *Prostitution Regulation 2014*

☒ No

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

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

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

PART 8 – CHECKLIST AND APPLICANT DECLARATION

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

25) Applicant declaration

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

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

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

Privacy – Personal information collected in this form will be used by the assessment manager and/or chosen assessment manager, any relevant referral agency and/or building certifier (including any professional advisers which may be engaged by those entities) while processing, assessing and deciding the development application.
All information relating to this development application may be available for inspection and purchase, and/or published on the assessment manager's and/or referral agency's website.
Personal information will not be disclosed for a purpose unrelated to the *Planning Act 2016*, Planning Regulation 2017 and the DA Rules except where:

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

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

PART 9 – FOR OFFICE USE ONLY

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

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

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

The *Planning Act 2016,* the Planning Regulation 2017 and the DA Rules are administered by the Department of Infrastructure, Local Government and Planning. This form and all other required development application materials should be sent to the assessment manager.

GREG SKYRING Design
and DRAFTING PTY. LTD.
ATF THE SKYRING FAMILY TRUST
ABN 78 409 217 980

1 May 2018

The Manager,
Planning Services,
Douglas Shire Council
P.0. Box 723
Mossman Q 4873

Attention: - Development Services

Dear Sir/Madam,

RE: APPLICATION FOR MATERIAL CHANGE OF USE OF PREMISES – DWELLING HOUSE ON L37 RP735855, Ronald Road, FOREST CREEK
For L. & H. Price

Attached is DA Form 1 duly completed, together with sketches of the proposed modest, one bedroom dwelling house, and planning, geotechnical and waste water reports.
In addition to the house site, the attached site plan shows the extent of all overlays affecting the allotment in the general area of the house site.

The following report provides supporting information to show compliance or otherwise with the planning scheme and codes within. A permit to clear vegetation for the building site is also sought.

1.0 General Details

Applicant	L. & H. Price
Contact	Greg Skyring, Greg Skyring Design and Drafting Pty Ltd 11 Noli Close, Mossman QLD 4873 Ph 07 40982061 Fax 07 40982061 Email greg@skyringdesign.com.au
Registered Owner of Land	L. & H. Price
Real Property Description	L37 RP735855
Location	Ronald Road, FOREST CREEK

1.0 – General Details continued

Tenure	Freehold
Land Area	21560m ^{2}
Present Use	Vacant
Easements and Encumbrances	None
Local Government Authority	Douglas Shire Council
Planning Scheme	2018 Douglas Shire Planning Scheme
Planning Area	Environmental Management Zone
Assessment Level	Code Assessable
Applicable Codes (Affecting building site only)	Environmental Management Zone Code Vegetation Management Code

2.0 Assessment Against the Douglas Shire Planning Scheme Codes

ENVIRONMENTAL MANAGEMENT ZONE CODE

Performance Outcomes	Acceptable Outcomes	Comments
PO1 The height of all buildings and structures is in keeping with the natural characteristics of the site. Buildings and structures are low-rise and not unduly visible from external sites.	AO1.1 Buildings and structures are not more than 8.5 metres and two storeys in height. Note – Height is inclusive of the roof height. AO1.2 Buildings have a roof height not less than 2 metres.	Building complies with max height and storeys. The building has a roof pitch set at 15° to optimize roof strength and fitted solar panels. As this building is modest in size, the narrow width is the major contributor to the roof height being only approximately 1.2m. A concession is requested.
PO5 Development is located, designed, operated and managed to respond to the characteristics, features and constraints of the site and its surrounds. Note - Planning scheme policy –	AO5.1 Buildings, structures and associated access, infrastructure and private open space are sited: (a) within areas of the site which are already cleared; or (b) within areas of the site which are environmentally	There are no cleared areas on this allotment. The Owners have determined the location of the building by observing this planning scheme and state govt. maps to avoid potential areas of interest.

Site assessments provides guidance on identifying the characteristics, features and constraints of a site and its surrounds.	degraded; (c) to minimise additional vegetation clearing. AO5.2 Buildings and structures and associated infrastructure are not located on slopes greater than 1 in 6 (16.6%) or on a ridgeline.	Use of this location also places the site on a 1 in 4 max grade.
PO6 Buildings and structures are responsive to steep slope through innovative construction techniques so as to: (a) maintain the geotechnical stability of slopes; (b) minimise cut and/or fill; (c) minimise the overall height of development.	AO6.1 Where development on land steeper than 1 in 6 (16.6%) cannot be avoided, development follows the natural contours of the land and single plane concrete slab on-ground methods of construction are not utilised. AO6.2 Access and vehicle manoeuvring and parking areas are constructed and maintained to: (a) minimise erosion; (b) minimise cut and fill; (c) follow the natural contours of the site.	The design of the building takes into consideration the sloping nature of the site by utilizing a light weight structure supported by steel posts and being generally aligned with the natural contour. Geotechnical and Waste Water reports are also included as supporting information of location suitability. To facilitate under building car parking, the site will involve minor excavation and fill, with maximum of either being no greater than 1.2m. This also results in an access that follows the general contour and provides table drains with only a slight fall to prevent erosion issues. The driveway will be lightly graveled to ensure constant access. The driveway gully crossing will be fitted with a 450Ø concrete pipe to match the feeder pipe below Ronald Road which is a short distance upstream. Grouted rock or concrete end walls and wing walls will be provided.

VEGETATION MANAGEMENT CODE

Performance Outcomes	Acceptable Outcomes	Comments
PO1 Vegetation is protected to ensure that: (c) the character and amenity of the local area is maintained; (d) vegetation damage does not result in fragmentation of habitats; (e) vegetation damage is undertaken in a sustainable manner; (f) the Shire's biodiversity and ecological values are maintained and protected; (g) vegetation of historical, cultural and / or visual significance is retained; vegetation is retained for erosion prevention and slope stabilisation	AO1.5 Vegetation damage for development where the damage is on land the subject of a valid development approval and is necessary to give effect to the development approval;	Removal of a max 700m² of vegetation is necessary to allow for the construction of the proposed dwelling house. Large trees outside that area will also be considered for removal if posing a threat to occupant safety during a high wind event. Supporting photos would indicate that very few trees, if any, exist within that zone.

CONCLUSION

The development application seeks a Development Permit for Material Change of Use for the purpose of a single dwelling house on land described as L37 RP735855, Ronald Road, FOREST CREEK.

The proposed development is considered generally consistent with the relevant Planning Scheme Codes and overlays. The report includes supporting information intended to address any concerns Council may have as the assessing authority.

EARTH TEST

Wastewater Management System

For

L&H Price

At

Lot 27 Ronald Road

Forest Creek

Postal address: Earth Test, PO Box 1042, Tolga, Qld 4882. Phone: 4095 4734
e-mail: len@earthtest.com.au

INTRODUCTION:

Earth Test has been engaged by L&H Price to design a Domestic Wastewater Management System at Lot 37 Ronald Road, Forest Creek.
Real Property Description:

Lot 37 on RP 735855
Local Authority: Douglas Shire Council

It is understood the intention is to construct a dwelling at the site.
A site and soil evaluation was carried out in March 2018.

SITE FACTORS:

The site was identified by its street address.
A photograph is included as part of this report to confirm the identity of the site.
The Lot has a total area of 2.156 hectares. It is predominantly covered with rainforest.
The site has a slope of 11 degrees falling to the North East.
A borehole was drilled using a hand auger to determine the soil depth, type and structure.

Proposed land application area at Lot 37 Ronald Road, Forest Creek.

SITE AND SOIL EVALUATION

Lot 37 Ronald Road, Forest Creek.

The site and soil evaluation carried out on 21/03/2018 provided the following results.

Site Assessment

Site Factor	Result
Slope	11 degrees
Shape	Linear Planar
Aspect	North East
Exposure	Extremely Limited
Erosion/land slip	Not noted
Boulders/rock outcrop	Not noted
Vegetation	Rainforest
Watercourse	As shown on the site plan.
Water table	Not encountered during investigation.
Wells/Bores	Not noted during investigation
Fill	Not in Land Application Area
Flooding	Not likely
Channelled run-off	Not found
Soil surface conditions	Firm, Moist
Other site specific factors	Not noted

Soil Assessment

Soil Property	Result
Colour	Brown
Texture	Clay-Loam
Structure	High
Coarse Fragments	20%
Measured Permeability Ksat (m/d)	Not tested
Dispersion	Slakes
Soil Category	4
Resultant Design Load Rating, DLR (mm/d)	30

WASTEWATER MANAGEMENT SYSTEM

An "All-Waste" septic tank discharging into an "Advanced Enviro-Septic" bed is considered suitable for this site.

This system has been designed to conform to the requirements of the following codes, acts, regulations and standards. All work to be carried out in accordance with the following codes.

- AS/NZ 1547:2012 On-site domestic-wastewater management.
- Queensland PLUMBING AND DRAINAGE ACT 2002.
- Queensland STANDARD PLUMBING AND DRAINAGE REGULATION 2003.
- Queensland PLUMBING AND WASTEWATER CODE.

SYSTEM SIZING FACTORS.

A population equivalent of three (3) persons has been chosen for the proposed open plan dwelling.

The residence is connected an onsite roof rain water supply.

Standard water-reduction fixtures must be used to ensure the integrity of the system.
They shall include:-

- Dual flush 6/3 Litre water closets.
- Shower-flow restrictors.
- Aerator faucets (taps).
- Water-conserving automatic washing machines.

Note: - Garbage grinders are not permitted.

As per AS/NZ 1547:2012 Appendix H, Table H1 the "Typical wastewater design flow" for a "Onsite roof rain water supply" gives a flow allowance of 120 L/Person/day.

The daily flow for the dwelling (3 persons @ 120 L/person/day) will be 360 L/day.

From AS/NZ 1547:2012 Table J1 the minimum capacity of the All-Waste septic tank required is 3000 L.
The tank must NOT be fitted with an outlet filter.

LAND-APPLICATION SYSTEM

DISPOSAL AREA SIZING

From AS/NZ 1547:2012 APPENDIX L, L4 DESIGN AREA SIZING, L4.2 Sizing

L = Q / (DLRxW)

Where:

L = length in m
Q = design daily flow in L/day
DLR = Design Loading Rate in mm/d
W = Width in m

L = 360/30*2.35
= 5.1m.

Use one 6.6m long by 2.35m wide advanced enviro septic bed.
See site plan and detail cross-section.

SYSTEM SAND

All Advanced Enviro-Septic systems require the use of "system sand" surrounding the pipe. This sand, typically washed coarse sand, must adhere to the following specification.

AS Sieve Size (mm)	Percent Passing %
9.50	100
4.75	95-100
2.36	80-100
1.18	50-85
0.600	25-60
0.300	5-30
0.150	0-10
0.075	0-2

If there is any doubt if the sand media proposed for use will meet the requirements please contact Earth Test for further advice.

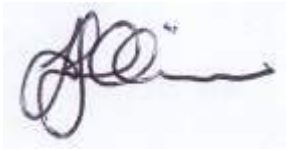
SYSTEM INSTALLATION

The entire bottom of the bed should be scarified a minimum of 200mm deep parallel to the AES pipes.

Avoid compaction by keeping people and machinery off the finished trench or bed floor. The system shall be installed by a licensed plumber in accordance with the manufacturer's recommendations and the relevant Australian Standards.

Operation and Maintenance

Homeowners should be fully informed of the proper operation and maintenance requirements of the on-site wastewater system.

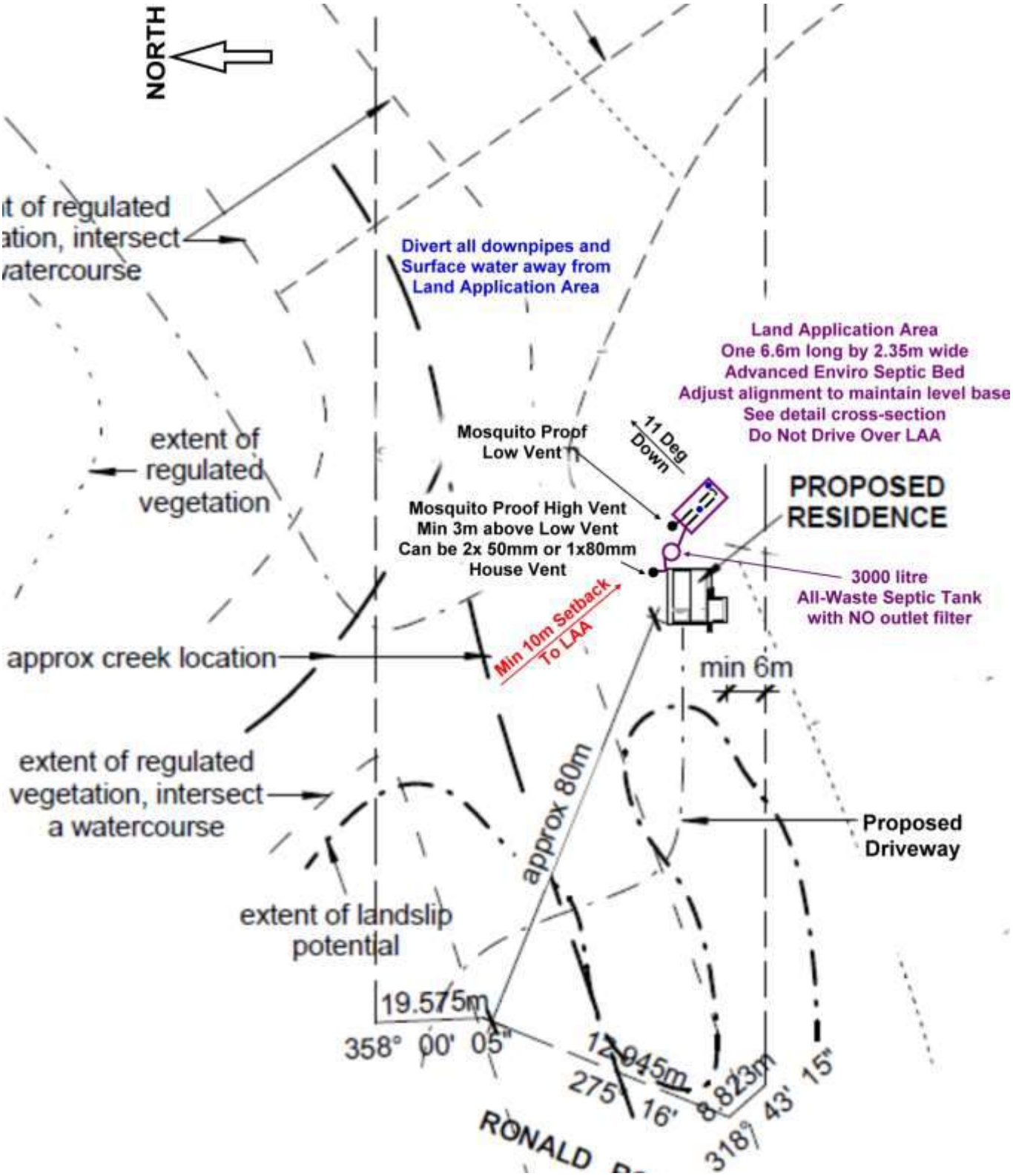


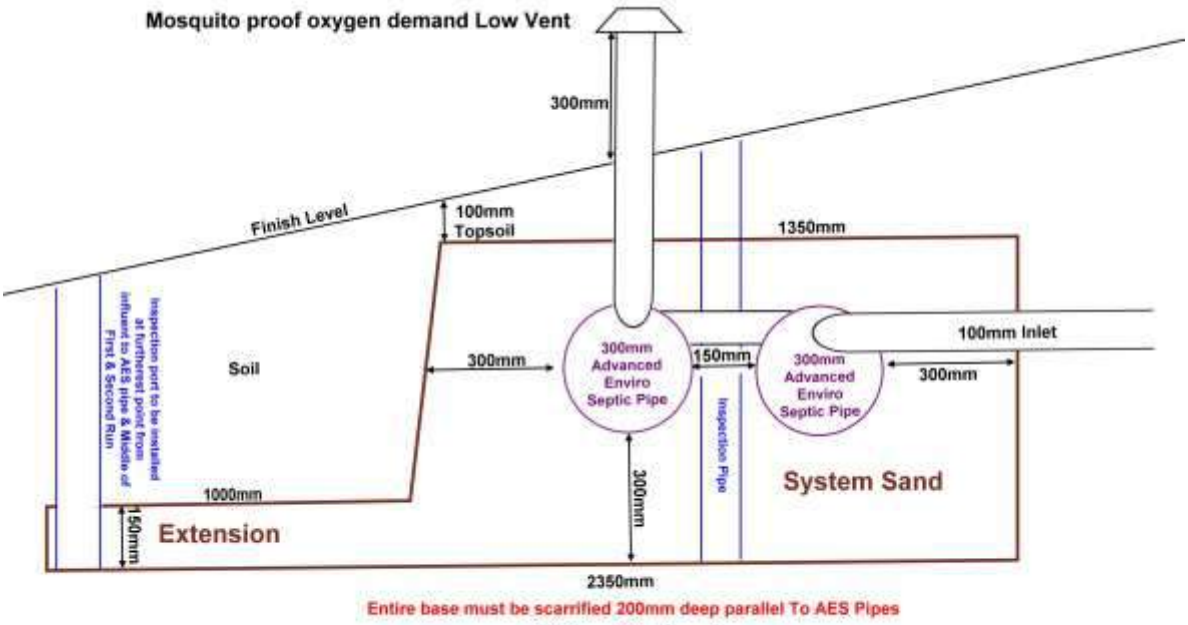
Leonard Quinn
Earth Test

SITE PLAN

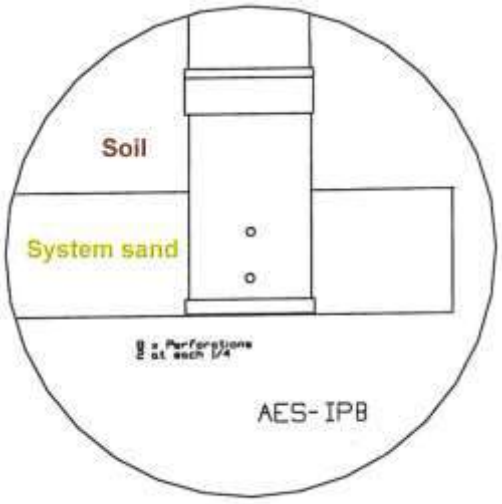
Lot 37 Ronald Road, Forest Creek.

Not to Scale.

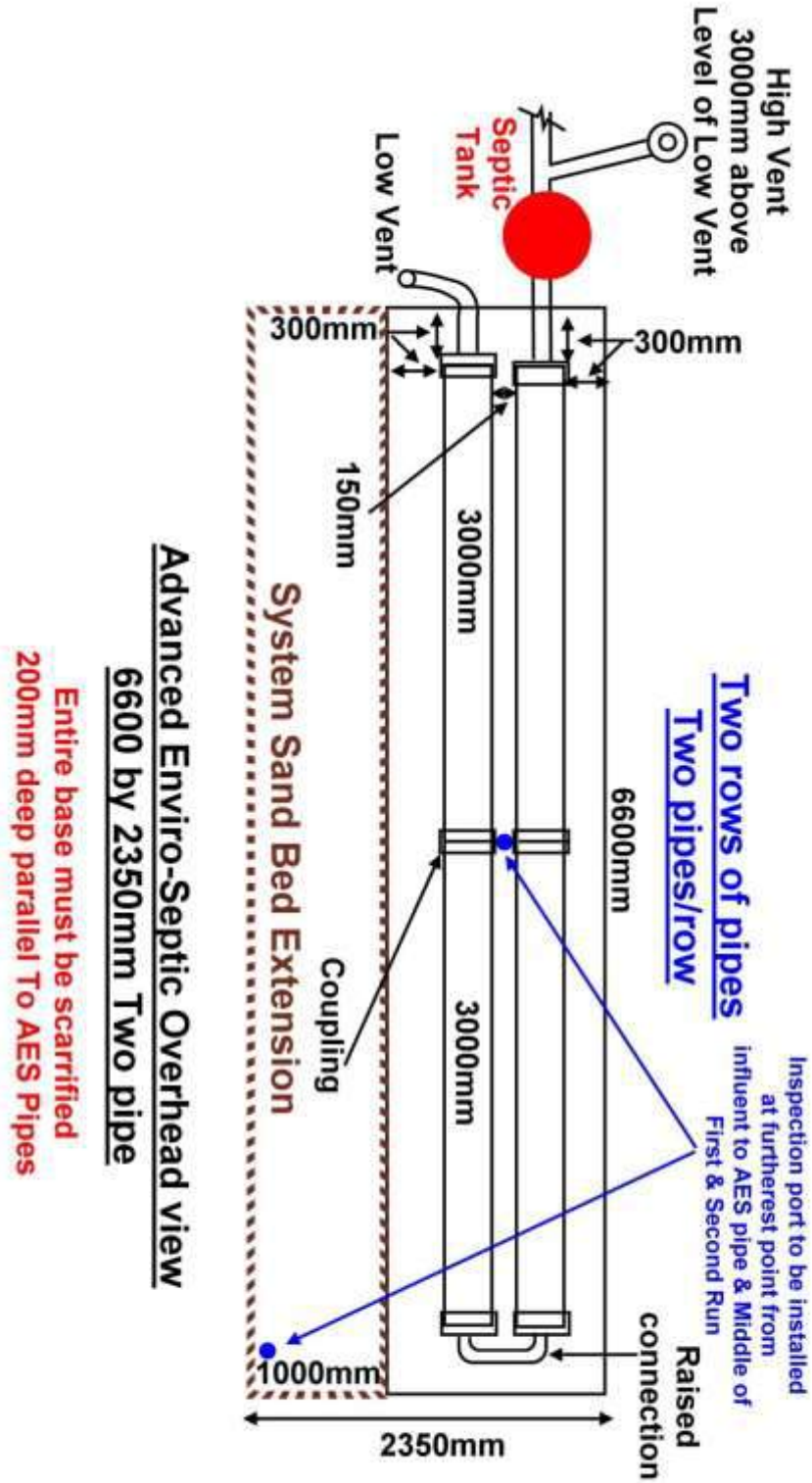




2350mm Wide Two Pipe
Advanced Enviro-Septic Cross-Section
Sloped Ground



AES Inspection point detail


High Vent
3000mm above
Level of Low Vent
Septic
Tank
Low Vent
300mm
300mm
150mm
3000mm
3000mm
6600mm
Coupling
System Sand Bed Extension
Two rows of pipes
Two pipes/row
Inspection port to be installed
at furtherest point from
influent to AES pipe & Middle of
First & Second Run
Raised
connection
1000mm
2350mm
Advanced Enviro-Septic Overhead view
6600 by 2350mm Two pipe
Entire base must be scarrified
200mm deep parallel To AES Pipes

ADVANCED ENVIRO-SEPTIC™ "Always The First Option"

Advanced Enviro-septic Design Calculator V8.5

"Always the BEST Option" until site and soil conditions rule it out.

Site Address	Lot 37 Ronald Road, Forest Creek		State Q	Post Code	
Client Name	L&H Price				
Designers Name	Earth Test	Designers Ph Number	40954734	Designer Lic Number (eg:QBCC)	1017941
Lic Plumber Name		Plumber Ph Number		Plumb / Drainer Lic Number	
Council Area	Douglas Shire Council	Designers AES Cert Number		Date	

This Calculator is a guide only, receiving soil classification, surface water, water tables and all other site constraints addressed by the qualified designer.

System Designers site and soil calculation data entry		IMPORTANT NOTES
Enter the AES litre/meter loading rate, "30" for Advanced Secondary or "38" Secondary	30	>> *This design is for an ADVANCED SECONDARY system*
Is this a new installation Y or N	y	>> Minimun single vent size is 80mm or 2 x 50mm house vents
Number of person	3	a septic tank outlet filter is NOT RECOMMENDED
Daily Design Flow Allowance Litre/Person/Day	120	
Number of rows required to suit site constrants	2	>> The maximum lth of a single AES pipe run is 30 meters
Infiltration surface Soil Category as established by site and soil evaluation. CATEGORY	4	>> Catagory may require design considerations. Ref AS1547
Design Loading Rate based on site & soil evaluation DLR (mm/day)	30	>> Soil conditioning may be necessary. Ref AS1547 & Comments.
Bore log depth below system Basel area	1200	>> Mn depth below basel area is 600 mm to establish water table or restrictive layer
Enter System footprint Slope in % for standard AES systems to calculate extension	20	>> Consideration required for Sloping sites. Ref AS1547. refer comment.
Is this design a gravity system with no outlet filter? Y or N	y	>> A House Vent & LOW VENT required on this system
PLEASE CHECK YOU HAVE FALL FROM TANK TO AES SYSTEM PIPES		

COMMENTS :- *" The outcome must be important to everyone. "*

- Ripping of receiving surface is required in clay soil structures in Cat 4,5,6. In addition refer to AS 1547. Always excavate and rip parallel to the site slope/AES pipe.

- All Sloping sites require special consideration and management through design of slope percentage, surface water and construction methods as per AS1547.
- Plumbers are reminded to practice good construction techniques as per AS 1547 and as provided on AES installation instructions supplied with components.

AES System Calculator Outcomes		
Total System load - litres / day (Q).	360	l/d
Min Length of AES pipe rows to treat loading	6.0	lm
Number of FULL AES Pipe lengths per row	2	lths
Total Capacity of AES System pipe in Litres	848	ltr

AES dimensions	AES System	System Extension
Lth m : (L)	6.6	6.6
Width m:(W)	1.35	1.00
Sand Depth :	0.75	0.15
Area m2	8.9	6.6

DO YOU WISH TO USE CUT LENGTHS OF PIPE IN THIS DESIGN? (ENTER Y)

IF YOU WISH TO USE A TRENCH EXTENSION DESIGN OPTION ENTER "Y" — Enter Custom Width in metre

AES INFILTRATION FOOT PRINT AREA - L = Q / (DLR x W)	Length		Width		Minimum AES foot print required .
for this Basic Serial design is	6.6	x	2.35	=	15.5 m2 total

Code	AES System Bill of Materials		
AES-PIPE	AES 3 mtr Lths required	4	lths
AESC	AESC Couplings required	2	ea
AESO	AESO Offset adaptors	4	ea
AESODV	AES Oxgen demand vent	1	ea
AES-IPB	AES 100mm Inspection point base	2	ea
AES Equ	AES Speed Flow Equaliser		ea
	TOTAL SYSTEM SAND REQUIRED (Guide Only)	9	m3

PLEASE email your AES CALC and Drawings to :
DESIGNREVIEW@ENVIRO-SEPTIC.COM.AU

Chankar Environmental Use Only

ADVANCED ENVIRO-SEPTIC "Always The First Option"

Digitally signed by Kane Dickson
DN: cn=Kane Dickson, o=Chankar Environmental, ou=Design Review, email=designreview@enviro-septic.com.au, c=AU
Date: 2018.04.16 15:49:18 +10'00'
Designreview@enviro-septic.com.au

> *The AES Calculator is a design aid to allow checking of the AES components and configuration and is a guide only. Site and soil conditions referencing the AS 1547 standard are calculated and designed by a Qualified Designer.*
> *Chankar Environmental has no responsibility for the soil evaluation, loading calculations or DLR entered by the designer for this calculator.*
> *AES pipes can be cut to lenght on site. They are supplied in 3 meter lths only.*

I, Laurence Walter Price & Elspeth Heather Price

[Insert full name.]

as owner/s of the premises identified as follows:

Ronald Road, Forest Creek
L37 RP735855

consent to the making of a development application by:

Greg Skyring Design and Drafting Pty Ltd

on the premises described above for:

Development application - Material change of use

L.W. Price E.H. Price 28/2/18

[signature of owner and date signed]

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
Materials Testing and Geotechnical Services
7 Barry Street, Westcourt, PO Box 2234 Cairns Ph 07 4041 4577 Fax 07 4041 4399 e-mail: soiltest@bigpond.net.au

April 2018

Job No: G7455

Geotechnical Report for Proposed Residential Development at Lot 37 (RP 735855) Ronald Road, Forest Creek, Queensland.

Client: L & H Price
c/- Greg Skyring Design & Drafting
11 Noli Close
MOSSMAN QLD 4873

Table of Contents

Attachments:

Figure 1: Site Layout Plan
Figure 2: Test Locations

Appendix A: Results of Field and Laboratory Tests
Appendix B: Stability Analyses
Appendix C: Extract of AGS Vol 42 March 2007 – LR8
Appendix D: Site photographs

Report distribution: 1 copy (email) to Greg Skyring Design & Drafting.

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
Materials Testing and Geotechnical Services
7 Barry Street, Westcourt, PO Box 2234 Cairns Ph 07 4041 4577 Fax 07 4041 4399 e-mail: soiltest@bigpond.net.au

12 April 2018 Job No: G7455

L & H Price
c/- Greg Skyring Design & Drafting
11 Noli Close
MOSSMAN QLD 4873

Re: **Geotechnical Report for Proposed Residential Development at Lot 37 (RP 735855) Ronald Road, Forest Creek, Queensland.**

1. Introduction.

A geotechnical assessment was authorised by L & H Price (`the client') for a proposed residential development at Lot 37 Ronald Road, Forest Creek. A site plan of the proposed development was provided by the Greg Skyring Design. Site survey plan and/or contour plans were not provided. The proposed house location was `pegged' by paint and ribbon onsite by the client.

2. Proposed Development.

The proposed development is a residential house to be constructed on existing sloping ground approximately 80m east of the front (west) allotment boundary. House construction type is understood to be stud framed structure on post/pier footings.

3. Scope / Method of Investigation.

3.1 Scope.

The scope was for a geotechnical assessment and report of the proposed building site in relation to suitable foundation and slope stability assessment. The geotechnical report includes site classification to AS2870, footing foundation recommendations and slope stability assessment of the existing natural slope and proposed foundation.

The scope of the assessment was limited to within accessible areas of the allotment, and for the proposed residential development area only.

3.2 Method of Investigation.

Method of the assessment included:

- Desk top study of landform and geology from available sources.
- Walkover assessment of the site, surface and slope conditions by a professional engineer.
- Assessment of subsurface conditions by augered boreholes and dynamic cone penetrometers (DCPs).
- Laboratory tests on disturbed samples (particle size distribution and atterberg limits).
- Site classification to AS2870 `Residential slabs and footings' for footing design purposes.
- Slope stability analysis of existing site using Galena© software (Version 4.01).

4. Site Information.

4.1 Current Site Description.

The site is identified as Lot 37 on RP735855, Ronald Road, Forest Creek; which is located on the eastern side of Ronald Road. The site `building area' is located approximately 80m east of the front (west) boundary (Lat. -16.25075° and Long. 145.39960°). The site slopes convexly down from west to east then flattens towards `wetlands' (approximately 120m east of the building site). The existing site surface is mainly rainforest tree vegetation and leaf litter. An existing creek runs in a

north-east direction from the front centre of the allotment and continues over the north centre boundary. An earthworks constructed access driveway is located at the front north corner of the allotment to the creek (approximately 20m long). Refer Figure 1 for site layout and Appendix D for site photographs.

4.2 Site History.

The site is a natural forested hill-slope that slopes convexly down and east from Ronald Road. The only obvious earthworks has been the access driveway of approximately 20m in length. The creek was approximately 1m wide and at the time of this investigation carried minor water.

5. Testing/Findings.

5.1 Regional Geology.

According to Qld Department of Mines and Energy 1: 250 000 geology map of Mossman (sheet SE 55-1) the natural site geology comprises: Hodgkinson Formation – *'Dark grey, laminated to thin bedded mudstone (locally phyllitic); subordinate fine to medium-grained, medium to thick bedded arenite; siltstone, minor chert, metabasalt'*. Quaternary deposits (above Hodgkinson Formation 'rock') – *'mainly sand, silt, mud, minor gravel; undivided older flood plain alluvium and outwash'*.

5.2 Slope Analysis.

Existing allotment slope grade (angle):

West to east, Ronald Road (0m) to 5m east into allotment: slope 25-30° (1V:2H).
West to east, Ronald Road (+5m) to 30m east into allotment: slope 20-15° (1V:3H to 1V:4H).
West to east, 30-100m east into allotment: slope 10-12° (1V:5H to 6H).
West to east, 100-200m east into allotment: slope 5° (1V:10H).
Note: Slope angle(s) are based on onsite measurement estimates and available regional contours.

5.3 Surface Conditions.

Site surface conditions of the proposed building area at the time of the investigation was rainforest trees and roots, leaf litter and soil. Surface conditions at the 'house site' area was moist at the time. Exposed weathered rock was observed at Ronald Road subgrade/surface and Ronald Road western cut batter.

5.4 Subsurface Conditions.

Boreholes (BH1 to BH3) were performed to provide inspection and description of soil profile, and sampling of soil types. DCP tests were performed at each borehole. Summary of subsoil stratums:

Test No.	BH1
Soil stratum	**GL-0.9m** Alluvium (gravel, silt, clay). **0.9-1.1m** Extremely to distinctly weathered rock. Borehole limited to 1.1m due to weathered rock.
GWT	Groundwater (seepage) at 1.0m.

Test No.	BH2
Soil stratum	**GL-1.4m** Alluvium (gravel, silt, clay). **1.4-1.1m** Extremely to distinctly weathered rock. Borehole limited to 1.85m due to weathered rock.
GWT	No Groundwater to 1.85m.

Test No.	BH3
Soil stratum	**GL-1.15m** Alluvium (gravel, silt, clay). **1.14-1.45m** Extremely to distinctly weathered rock. Borehole limited to 1.45m due to weathered rock.
GWT	No Groundwater to 1.45m.

Weathered rock was encountered at borehole locations on this site, Depth to, and quality of weathered rock will vary over this site. Groundwater ('GWT') was observed at BH1 (1.0m < GL) as seepage, at the time of logging. Groundwater variations are likely during seasonal climatic conditions. Based on DCP test results, bearing capacity (qa) of 100kPa is estimated from 0.5m to 2m.

Refer Appendix A, reports H13193A/18, H13193B/18 and H13193C/18 for borehole logs and DCPs, and Figure 2 for test locations; also Appendix D photographs.

Disturbed subsoil samples were tested in the laboratory for soil classification purposes. Results indicate the soil samples tested as low to medium plastic silt clay soils. Refer Appendix A, reports H13194/18, H13195/18, H13196/18 and H13197/18 for details). The foundation subsoil type is regarded as slightly reactive with an estimated predicted ground surface movement (y_s) within 0-20mm (AS2870) based on engineering assessment and local knowledge.

5.5 Slope Stability Conditions.

Stability of the site slope was assessed by inspection and observation of the surface for soil/rock type(s), evidence of past slides and erosion, and analysis using a slope stability program.

5.5.1 Surface Stability Features.

No major instability was observed across the nominated 'building area' of the allotment. Debris slide(s) were observed along the western allotment boundary (below Ronald Road) and erosion from creek flow. Observed instability (debris slide and erosion) is likely due to uncontrolled drainage.

No evidence of major recent landslide(s) were observed, however progressive slips causing periodical regression of the embankment (slope) crest along the western (Ronald Road) boundary is possible particularly following heavy rain events coupled with uncontrolled runoff. Flood level(s) of the eastern 'wetlands' is unknown and is outside the scope of this investigation. Potential slope instability due to floodwater events is outside the scope of this investigation and was not assessed.

5.5.2 Slope Stability Analysis.

Slope stability analysis was performed at a section (Section AA) of the existing site slope surface and proposed configuration. Analysis was based on available survey contour estimates and assumed soil parameters estimates (effective strength values; cohesion, c' & friction angle, phi'). Soil stratums were interpolated between test locations. The model analysed concentrates on a potential critical slope condition (mass failure of the foundation slope) relevant to the proposed building foundation. Galena slope stability software (Version 4.01) was used for the analysis. The slope model includes assumed pore pressure ratio(s), ru, to simulate 'dry' condition (ru = 0.0) and potential 'wet ground' conditions (ru = 0.5) and an 'pseudo-static' earthquake coefficient. Slope stability analysis does not include floodwater affects. Flood analysis is beyond the scope of this investigation.

The analysis provides a 'Factor of Safety' (FOS) against mass slope instability, where:
FOS ≥ 1.5 is considered stable
FOS = 1.0 to 1.5 is considered marginally stable
FOS < 1.0 is considered unstable.

Results of the analyses indicate the following stability conditions for the site slope section assessed;

Section	*ru* (note 1)	*Slope Model*	*FOS*	*P %* (note 2)	*Analysis Reference*
AA	ru = 0.0	Existing west - east slope (global)	3.5	0	G7455 – AA (1)
AA	ru = 0.5	Existing west - east slope (global)	2.2	0	G7455 - AA (2)
AA	ru = 0.0	Proposed west - east slope (house platform)	2.8	0	G7455 - AA (3)
AA	ru = 0.5	Proposed west - east slope (house platform)	2.1	1	G7455 - AA (4)

Notes:
1) ru (soil pore pressure ratio) limited to soil above phreatic surface.
2) P% = probability of FOS < 1.0; based on standard deviation, SD, of soil parameters;
where for ALLUVIUM: c' SD = 2.5kPa and phi' SD = 10°; for WEATHERED ROCK: c' SD = 10kPa and phi' SD' = 10°

Refer Appendix B for stability analyses and Figure 2 for section location.

6. *Engineering Comments.*

6.1 Site Classification.

The nominated building site is classified a Class P site in accordance with AS 2870 'Residential Slabs and Footings' due to presence of soft to stiff alluvial soils, uncontrolled drainage across the site, and mature trees within proximity of the proposed foundation site. Footing design shall be performed by a professional engineer based on engineering principles.

6.2 Footing Design.

Based on subsoil conditions and slope stability analysis deep founded footings (e.g. bored piers, screw piles) are recommended for footings founded on the existing slope. Suitable footing type(s) shall be approved by a professional engineer. The following footing design guidelines are provided:

i) All footings shall be founded at least 1m into stiff/dense weathered rock where allowable bearing capacity is estimated to provide 100kPa. It is estimated that deep footings on the site slope will need to be founded to ≥ 2.5m below GL. Footings shall be designed by a professional engineer using engineering principles.

ii) Groundwater (seepage) was observed at 1m <GL (BH1). It is likely that groundwater (seepage) will be encountered during `wet season' construction of pier/post and/or piled footings. Footing design shall provide instruction for preparation and constructing pier/post footings below potential groundwater levels.

iii) Boulders may be encountered within the subsoil on this site. Footings shall not be founded on boulders. Boulders can cause unstable conditions under footings. All boulders found under, against, or protruding into footing trenches/pier holes must be removed. Preparation of post/pier holes shall be included in the footing design by a professional engineer.

iv) Ground conditions and groundwater level(s) will likely vary between borehole/test locations. It is recommended that prepared footing foundations be inspected by a professional engineer and bearing capacity confirmed.

6.3 Control Measures for Slope and Erosion Stability Minimisation.

Control measures shall be provided in the design and construction to minimise site instability and erosion. The following comments in addition to 6.1 & 6.2 are provided as a guide to minimise landslide risk:

6.3.1 Building Platform Foundation Area.

i) Remove and strip all vegetation, including tree roots, from proposed building platform foundation area. Provide a drained surface following vegetation clearing and remediate removed tree/root system cavities.

ii) Generally the existing vegetation immediately outside the development area shall be conserved; footing design shall account for trees in the proximity of the proposed footings. Provide surface stabilisation or re-vegetation to all cleared slope and batter areas around the proposed building.

iii) Cut to fill platform shall be constructed and controlled in accordance to AS 3798 `Guidelines on Earthworks for Commercial and Residential Developments'. Un-retained cut batter(s) shall not exceed 2m in height and Un-retained fill batter(s) shall not exceed 1m in height. Un-retained cut or fill batters shall be no steeper than 1V:2H slope grade. Batters exceeding recommended un-retained heights and slope shall be retained.

iv) Onsite sewerage effluent and/or absorption trenches shall not be discharged immediately upslope (west) of the proposed house platform. Onsite sewerage design and construction shall be performed in accordance with AS1547.

v) Refer Appendix C for Australian Geomechanics Society construction practices guidelines.

6.3.2. Driveway Access Road.

i) Minimise cut batter heights to 1.5m and 1V:1H slope; otherwise retain. Fill is not recommended for access road. Special design and construction attention may be required for access driveway alignment towards the south-west of the allotment where steeper ground exists and potential landslips may occur following earthworks.

ii) Shape driveway surface to slope toward the cut side of the formation. Provide surface drains along the cut side verge (cut batter base), for the entire access road length. Provide surface protection to road to minimise erosion.

iii) Design of access road and drains shall be performed by a professional engineer.

6.3.3 Earthworks.

Earthworks shall be controlled and constructed in accordance to AS3798 and fill layers and final cut surface(s) shall be compacted to a minimum density ratio of 98% (standard) and within +/- 2% of optimum moisture content. Prepared natural ground and fill shall not contain deleterious material (e.g. vegetation and organics, particles > 100mm).

6.3.4 Site Drainage.

The following drainage works are recommended for this development:

i) Provide surface cut off drain above the proposed house platform and the side(s) of the proposed house to catch runoff from the western and up-slope of the site. Provide surface spoon drain(s) along the base of cut batter(s), including access driveway road.

ii) Provide concrete lining (or other equivalent) to all surface drains. Surface drain runoff capture shall be diverted to approved designated discharge point(s) and away from all footings.

iii) Provide behind wall drains to any retaining walls/stabilised systems and weepholes (or equivalent water pressure dissipation) for rigid structures and/or other stabilisation systems.

iv) Discharge roof stormwater to controlled drains or subsurface pipes.

v) All drains shall be diverted and controlled to legal discharge points. Avoid discharge across the foundation area and over and/or down the cut and fill batter slopes as this will increase landslide risk.

v) Design and construct erosion control devices/methods for surface drainage discharge.

vi) Site drainage shall be designed by a professional engineer.

vii) Maintain drains by regularly removing debris and silt build-up; repair any cracks in concrete drains.

6.3.5 Retaining Wall Design.

Retaining wall design, including their footings and drainage, shall be designed by a professional engineer using a minimum of a 60 year design life. Seek professional engineering advice for suitable retaining structures. Retaining wall footing design shall be consistent with 6.2 of this report.

7. Foundation Maintenance / Remarks.

Ongoing foundation maintenance is always essential for the durability and stability of the footings and foundation and the appropriate required maintenance is described in AS 2870 'Residential Slabs and Footings'. Briefly, however, it is advised to keep away from the footings/foundation all water taps, gardens and trees, and provide adequate compaction of loose ground around the outside of the footing perimeter. Rainwater/water should not be allowed to pond against the perimeter of the footings/foundations.

Foundation maintenance should follow with the guidelines as set out in CSIRO BTF 18 'Foundation Maintenance and Footing Performance: A Homeowner's Guide'.

Any earthworks following the date of this report must comply with the requirements of AS 2870 'Residential Slabs and Footings' Section 6 and AS 3798 'Guidelines on Earthworks for Commercial and Residential Developments'. Footing and retaining wall foundations shall be inspected by a professional engineer prior to reinforcement and concrete placement. Site control/treatment methods and earthworks plans shall be reviewed by a professional engineer.

8. Limitations of Report.

This report is based on the extent of the assessment undertaken. Interpolation was used to give soil/rock parameters for stability analysis of areas not specifically tested. Variations of subsurface conditions between test positions are possible. Interpolation to give soil parameters for areas and depths not specifically tested and/or the presence of seasonal spring activity is beyond the scope of this investigation. If any ground profile and groundwater conditions revealed differ or vary from those described in this report, our office or suitably qualified personnel should be contacted.

The client shall need to accept a level of landslide risk (slope instability) when developing this site. 'Engineering Comments' provided in this report aim to minimise landslide risk but does not claim to remove risk entirely. All parties involved in design and construction and dwelling on this site shall need to accept this risk.

Site stability can be reduced by potential incidents such as broken and/or leaking pipes and drains, uncontrolled runoff, vegetation clearing, loading of batters and/or affects from neighbouring allotment developments. Stability analysis presented in this report does not include such hazards or circumstances. It is the client's responsibility to maintain and monitor the site, and to stabilise and/or re-vegetate cleared slopes, address any drainage problems and repair any broken or leaking pipes. If in the event of any incident occurring, or if site conditions vary from the assessment, this office shall be contacted to monitor and/or review site recommendations.

Test boreholes carried out on the site for the investigation were backfilled loosely only. Some slumping of soil should be expected in these location(s). Project design, earthworks and construction shall need to account for such conditions. Construction Soiltest Pty Ltd accepts no responsibility for the impact test locations may have on the safety and development of the site.

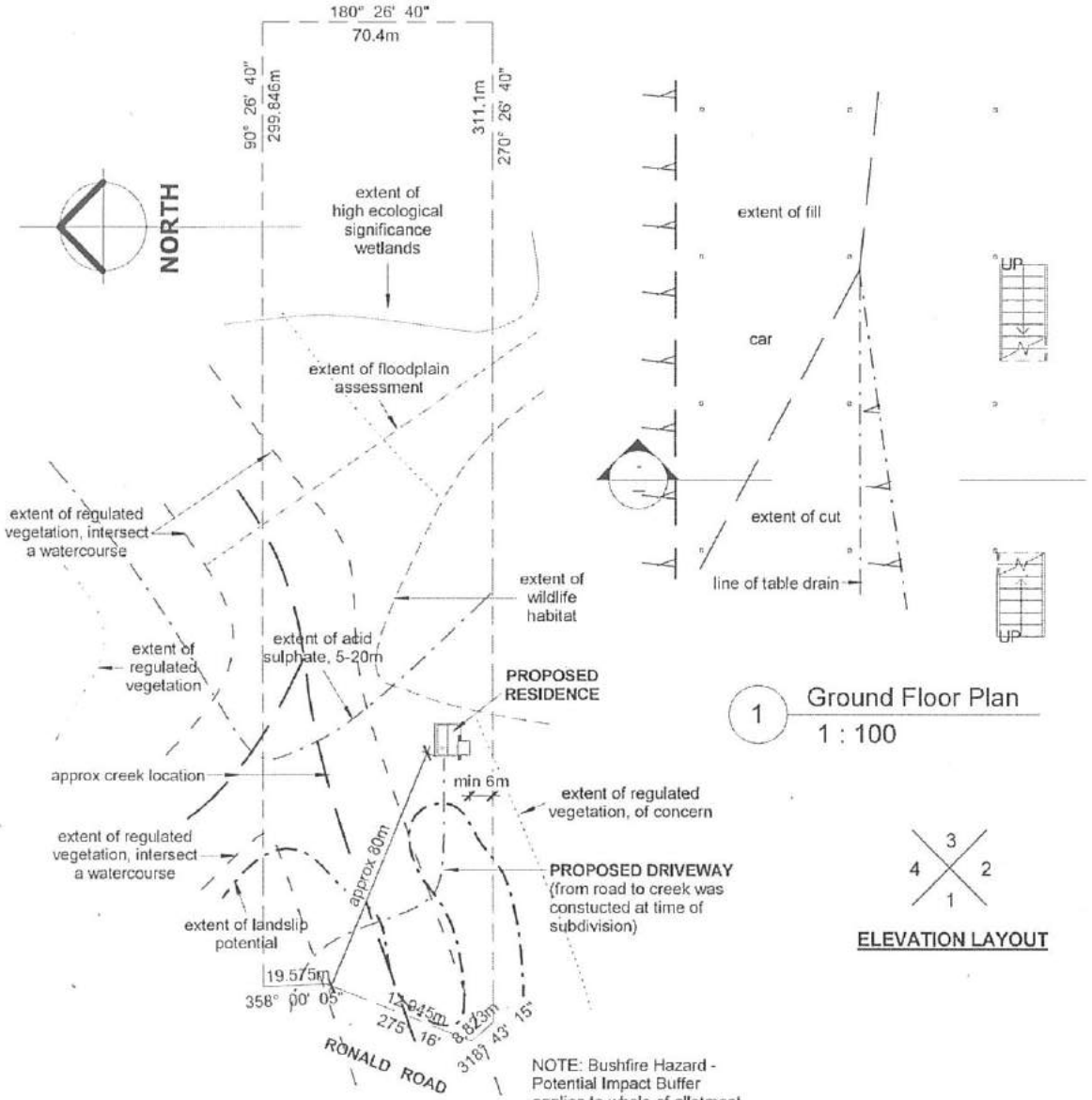
This report is provided for the client (L & H Price) and client project consultants only. The information provided shall not be used by others, or for any purpose other than the stated scope.

Yours faithfully
Construction Soiltest Pty Ltd

P.S. Posar

Paul Posar
CPEng. M.I.E. Aust. R.P.E.Q.

LIST OF FIGURES:



3 Site Plan - overlays
1 : 1500

1 Ground Floor Plan
1 : 100

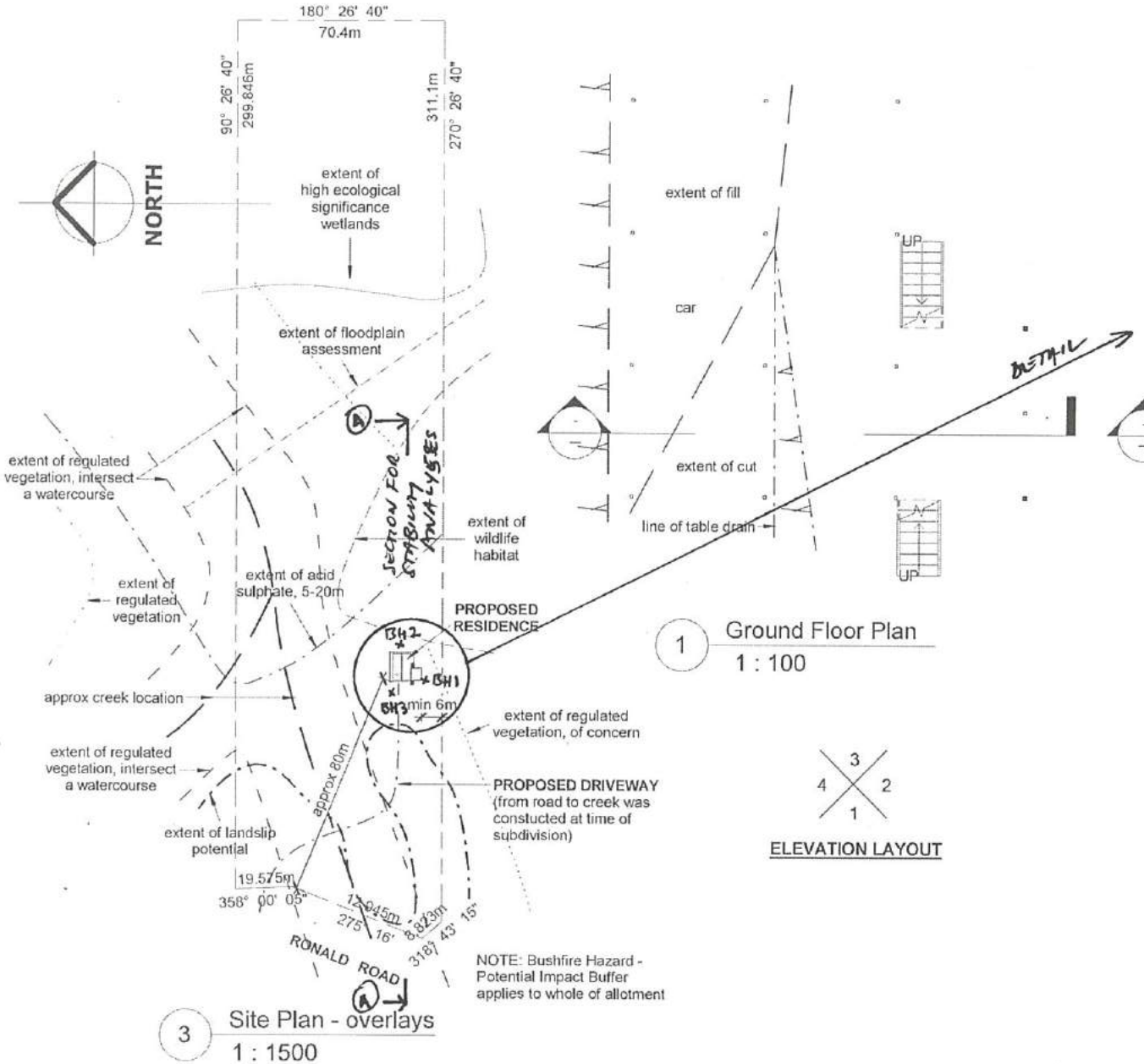
ELEVATION LAYOUT

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
Materials Testing and Geotechnical Services
7 Barry Street, Westcourt QLD 4870, PO Box 2234 Cairns QLD 4870
Ph 07 4041 4577 Fax 07 4041 4399 , e-mail: soiltest@bigpond.net.au

Project: Lot 37 Ronald Road, Forest Creek.	**Client:** L & H Price.	
Job No.: G7455	**Report Ref. :** G7455/R14450	
Drawing Title: Figure 1: Site Layout Plan.		
Drawn by: PP (reproduced)	**Scale:** -	**Date:** 12/4/18

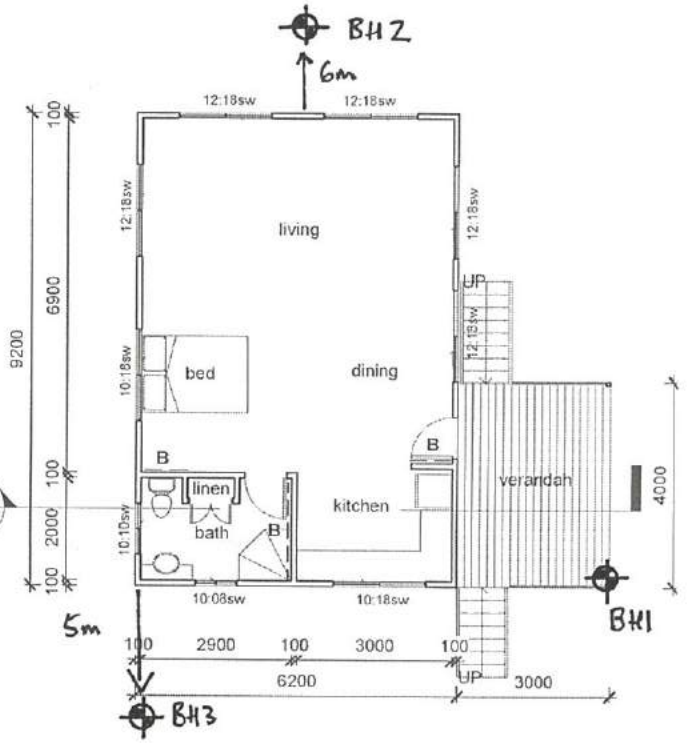
GREG SKYRING Design and DRAFTING Pty. Ltd.
Lic. Under QBSA Act 1991 - No 1040371
11 Noli Close, Mossman Q. 4873
Phone/Fax: (07) 40982061
Mobile: 0419212652
Email: greg@skyringdesign.com.au

PROJECT: Proposed Residence, Ronald Road, L37 RP735855, FOREST CREEK	CLIENT: L. & H. Price	WIND CLASS: C2	PLAN NUMBER: 502-18	SHEET: 1 of 2
	SCALES: As indicated	PLAN TITLE: Site and Floor Plans	DATE OF ISSUE: prelim 13.03.18	REV



3 Site Plan - overlays
1 : 1500

1 Ground Floor Plan
1 : 100



2 First Floor Plan
1 : 100

ELEVATION LAYOUT

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883 Materials Testing and Geotechnical Services 7 Barry Street, Westcourt QLD 4870 PO Box 2234 Cairns QLD 4870 Ph 07 4041 4577 Fax 07 4041 4399 e-mail: soiltest@bigpond.net.au
Project: Lot 37 Ronald Road, Forest Creek.
Client: L & H Price.
Job No.: G7455
Report Ref. : G7455/R14450
Drawing Title: Figure 2: Test Locations.
Drawn by: PP (test locations only)
Scale: - **Date:** 12/4/18
Legend: **BH** denotes test hole

GREG SKYRING Design and DRAFTING Pty. Ltd.
Lic Under QBSA Act 1991 - No 1040371
11 Noli Close, Mossman Q. 4873
Phone/Fax: (07) 40982061
Mobile: 0419212652
Email: greg@skyringdesign.com.au

PROJECT: Proposed Residence, Ronald Road, L37 RP735855, FOREST CREEK	CLIENT: L. & H. Price	WIND CLASS: C2	PLAN NUMBER: 502-18	SHEET: 1 of 2
	SCALES: As indicated	PLAN TITLE: Site and Floor Plans	DATE OF ISSUE: prelim 13.03.18	REV:

APPENDIX A: Field & Laboratory Test Results

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
Materials Testing and Geotechnical Services
7 Barry Street, Westcourt, PO Box 2234 Cairns Ph 07 4041 4577 Fax 07 4041 4399 e-mail: soiltest@bigpond.net

Borehole/Test Pit Log Report

Project: Lot 37 (RP735855) Ronald Road.	**J/N:** G7455	Page 1 of 1
Project Location: Forest Creek, Queensland.	**Reg. No.:** H13193A/18	
Client: L & H Price.	**Logged by:** PP	
Borehole/~~Test Pit~~ No.: BH1 – Refer Figure 1.	**Date Logged:** 28/3/18	
Excavation plant used: 100mm hand auger.	**Plant Contractor:** CST.	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	*Blows/ 100mm*
GL	**GL-** Leaf litter at surface. ORIGINAL GROUND. ML/CL. Brown silty CLAY, trace roots. Soft. Very moist. Low plasticity.	*GL-1.1m augered borehole.*		*Refer DCP test.*	*0.05*	Seat
					0.15	1
					0.25	1
0.25	SM/SC. Orange brown sandy silty CLAY, trace gravel. Soft. Moist. Low plasticity.				*0.35*	2
					0.45	1
			DS @ 0.5-0.7m.		*0.55*	2
0.45	SM/SC. Orange / yellow brown mottled red sandy silty CLAY. Soft to stiff. Very moist. Low plasticity.				*0.65*	2
					0.75	3
					0.85	8
0.9	DISTINCTLY WEATHERED ROCK. GM/GC. Red / orange / yellow mottled gravelly silty CLAY. Stiff/dense. Moist. Low plasticity.				*0.95*	18
					1.05	20
					1.15	25+
					1.25	END
1.0	*Groundwater seepage.*				*1.35*	-
					1.45	-
1.1	Auger refusal (weathered rock). End borehole. Groundwater observed at 1.0m (28/3/18).				*1.55*	-
					1.65	-
					1.75	-
					1.85	-
					1.95	-
					2.05	-
					2.15	-
					2.25	-
					2.35	-
					2.45	-
					2.55	-
					2.65	-
					2.75	-
					2.85	-
					2.95	-
					3.05	-
					3.15	-

Notes:
Soil Description: in accordance with Australian Standard AS1726 -1993, Table A1.
Sampling: DS = Disturbed sample, BS = Bulk sample, SS = SPT spoon sample, U_{50} = Undisturbed sample 50mm dia.
Insitu test:
DCP = Dynamic cone penetrometer (blows/100mm) in accordance with AS1289.6.3.2.
SPT = Standard penetrometer test (blows/150mm) in accordance with AS1289.6.3.1.
PP = Pocket penetrometer UCS (kPa), UCS = Unconfined compressive strength.

Checked by: P.A. Price Date: 12/4/18

NATA Accredited Laboratory No.1952.

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
Materials Testing and Geotechnical Services
7 Barry Street, Westcourt, PO Box 2234 Cairns Ph 07 4041 4577 Fax 07 4041 4399 e-mail: soiltest@bigpond.net

Borehole/Test Pit Log Report

Project: Lot 37 (RP735855) Ronald Road.	**J/N:** G7455	Page 1 of 1
Project Location: Forest Creek, Queensland.	**Reg. No.:** H13193B/18	
Client: L & H Price.	**Logged by:** PP	
Borehole/~~Test Pit~~ No.: BH2 – Refer Figure 1.	**Date Logged:** 28/3/18	
Excavation plant used: 100mm hand auger.	**Plant Contractor:** CST.	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	*Blows/ 100mm*
	GL- Leaf litter at surface.	*GL-1.85m augered borehole.*		*Refer DCP test.*	*0.05*	Seat
	ORIGINAL GROUND.				*0.15*	2
	Cl. Brown sandy silty CLAY, some gravel, tree roots. Firm. Moist. Medium plasticity.				*0.25*	2
0.25	GM/GC. Orange brown gravelly sandy silty CLAY, occasional small cobbles. Stiff. Moist. Medium plasticity.				*0.35*	2
					0.45	6
					0.55	6
1.15	Cl. Orange red brown sandy silty CLAY. Stiff. Very moist. Medium plasticity.		*DS @ 0.6-0.8m.*		*0.65*	4
					0.75	4
1.4	EXTREMELY WEATHERED ROCK. Cl. Orange brown mottled yellow gravelly silty CLAY. Stiff/dense. Moist. Medium plasticity.				*0.85*	4
					0.95	5
					1.05	3
					1.15	4
1.8	DISTINCTLY WEATHERED ROCK. Cl. Brown mottled yellow gravelly silty CLAY. Stiff/dense. Moist. Medium plasticity.		*DS @ 1.2-1.4m.*		*1.25*	6
					1.35	5
					1.45	7
					1.55	10
1.85	Auger refusal (weathered rock). End borehole. Groundwater not observed to 1.85m (28/3/18).				*1.65*	13
					1.75	14
					1.85	16
					1.95	19
					2.05	22
					2.15	END
					2.25	-
					2.35	-
					2.45	-
					2.55	-
					2.65	-
					2.75	-
					2.85	-
					2.95	-
					3.05	-
					3.15	-

Notes:
Soil Description: in accordance with Australian Standard AS1726 -1993, Table A1.
Sampling: DS = Disturbed sample, BS = Bulk sample, SS = SPT spoon sample, U_{50} = Undisturbed sample 50mm dia.
Insitu test:
DCP = Dynamic cone penetrometer (blows/100mm) in accordance with AS1289.6.3.2.
SPT = Standard penetrometer test (blows/150mm) in accordance with AS1289.6.3.1.
PP = Pocket penetrometer UCS (kPa), UCS = Unconfined compressive strength.

Checked by: P.S. Price Date: 12/4/18

NATA Accredited Laboratory No.1952.

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
Materials Testing and Geotechnical Services
7 Barry Street, Westcourt, PO Box 2234 Cairns Ph 07 4041 4577 Fax 07 4041 4399 e-mail: soiltest@bigpond.net

Borehole/Test Pit Log Report

Project: Lot 37 (RP735855) Ronald Road.	**J/N:** G7455	Page 1 of 1
Project Location: Forest Creek, Queensland.	**Reg. No.:** H13193C/18	
Client: L & H Price.	**Logged by:** PP	
Borehole/~~Test Pit~~ No.: BH3 – Refer Figure 1.	**Date Logged:** 28/3/18	
Excavation plant used: 100mm hand auger.	**Plant Contractor:** CST.	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	*Blows/ 100mm*
	GL- Leaf litter at surface.	*GL-1.45m augered borehole.*		*Refer DCP test.*	*0.05*	Seat
	ORIGINAL GROUND.				*0.15*	4
	Cl. Brown sandy silty CLAY, containing tree roots. Stiff. Moist. Medium plasticity.				*0.25*	4
0.25	GM/GC. Orange red brown gravelly sandy silty CLAY. Stiff. Moist. Medium plasticity.				*0.35*	3
					0.45	3
0.85	Cl. Orange mottled yellow brown sandy silty CLAY. Stiff. Moist. Medium plasticity.		*DS @ 0.5-0.6m.*		*0.55*	4
					0.65	3
1.15	EXTREMELY WEATHERED ROCK. Cl. Pale yellow mottled pale brown sandy silty CLAY. Stiff/dense. Moist. Medium plasticity.				*0.75*	4
					0.85	4
					0.95	6
					1.05	10
1.4	DISTINCTLY WEATHERED ROCK. Cl. Pale brown mottled yellow gravelly silty CLAY. Stiff/dense. Moist. Medium plasticity.				*1.15*	18
					1.25	20
					1.35	17
					1.45	15
1.45	Auger refusal (weathered rock). End borehole. Groundwater not observed to 1.45m (28/3/18).				*1.55*	20
					1.65	22
					1.75	END
					1.85	-
					1.95	-
					2.05	-
					2.15	-
					2.25	-
					2.35	-
					2.45	-
					2.55	-
					2.65	-
					2.75	-
					2.85	-
					2.95	-
					3.05	-
					3.15	-

Notes:
Soil Description: in accordance with Australian Standard AS1726 -1993, Table A1.
Sampling: DS = Disturbed sample, BS = Bulk sample, SS = SPT spoon sample, U_{50} = Undisturbed sample 50mm dia.
Insitu test:
DCP = Dynamic cone penetrometer (blows/100mm) in accordance with AS1289.6.3.2.
SPT = Standard penetrometer test (blows/150mm) in accordance with AS1289.6.3.1.
PP = Pocket penetrometer UCS (kPa), UCS = Unconfined compressive strength.

Checked by: P.S. Price Date: 12/4/18

NATA Accredited Laboratory No.1952.

Construction Soiltest PTY LTD A.B.N. 90 054 339 883

7 Barry Street, Westcourt Qld. PO Box 2234 Cairns Qld 4870.
Ph: 07 4041 4577. Fax: 07 4041 4399. e-mail: soiltest@bigpond.net.au

Project : Lot 37 (RP735855), Ronald Road, Forest Creek.	**Report No.:** H13194/18	
Client : L & H Price.	**Job No.** : G7455	
Sample Location: BH1 0.5-0.65m < GL.	**Sample by:** PP	**Sample date:** 28/3/18
Sample Source: Existing ground.	**Sample method:** AS1289.1.2.1.6.5.2	
Submitted as: Foundation subsoil.	**Test by:** PP/JH	**Test date:** 29/3 & 3/4/18

Results of Particle Size Distribution

Sieve size (mm)	Percent Passing (%)	Spec. (%)	Test Method
37.5	-	-	AS1289.3.6.1
19.0	100	-	
9.5	100	-	
4.75	98	-	
2.36	93	-	
0.425	66	-	
0.150	56	-	
0.075	45	-	

Results of Insitu Moisture Content

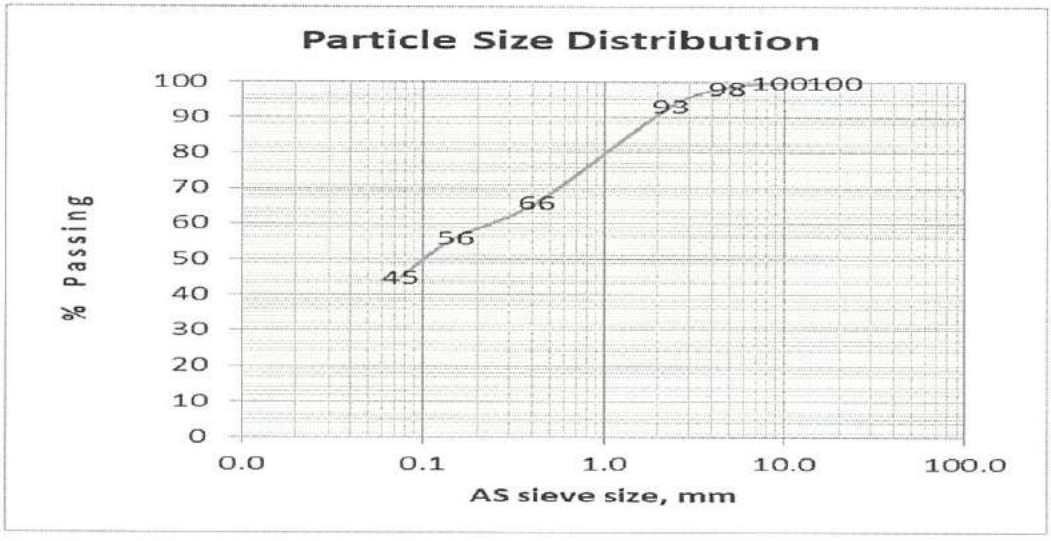
Moisture content, %	27.1	-	AS1289.2.1.1

Results of Atterberg Limits

Test Type	Result (%)	Spec. (%)	Test Method
Liquid Limit (LL)	31	-	AS1289.~~3.1.1~~, 3.1.2
Plastic Limit (PL)	22	-	AS1289.3.2.1
Plastic Index (PI)	9	-	AS1289.3.3.1
Linear Shrinkage (LS)	5.0	-	AS1289.3.4.1

Atterberg Limits Sample History: ~~Natural State~~, ~~Air Dried~~, Oven Dried, ~~Unknown~~
Atterberg Limits Method of Preparation: ~~Wet Sieved~~, Dry Sieved.
Method for Determination of Moisture Content: AS1289 2.1.1, ~~2.1.2, 2.1.4~~.
Linear Shrinkage Mould: 250mm, ~~150mm~~.
Linear Shrinkage History: Cracking, ~~Crumbling~~, ~~Curling~~, ~~Neither~~.

Remarks: Test results apply only to the sample tested.



Approved by: P.A. Posar P.A. Posar Date: 12/4/18

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7 Barry Street, Westcourt Qld. PO Box 2234 Cairns Qld 4870.
Ph: 07 4041 4577. Fax: 07 4041 4399. e-mail: soiltest@bigpond.net.au

Project : Lot 37 (RP735855), Ronald Road, Forest Creek.	**Report No.:** H13195/18	
Client : L & H Price.	**Job No.** : G7455	
Sample Location: BH2 0.6-0.8m < GL.	**Sample by:** PP	**Sample date:** 28/3/18
Sample Source: Existing ground.	**Sample method:** AS1289.1.2.1.6.5.2	
Submitted as: Foundation subsoil.	**Test by:** KR/JH	**Test date:** 29/3 & 3/4/18

Results of Particle Size Distribution

Sieve size (mm)	Percent Passing (%)	Spec. (%)	Test Method
37.5	100	-	AS1289.3.6.1
19.0	99	-	
9.5	89	-	
4.75	70	-	
2.36	55	-	
0.425	53	-	
0.150	50	-	
0.075	41	-	

Results of Insitu Moisture Content

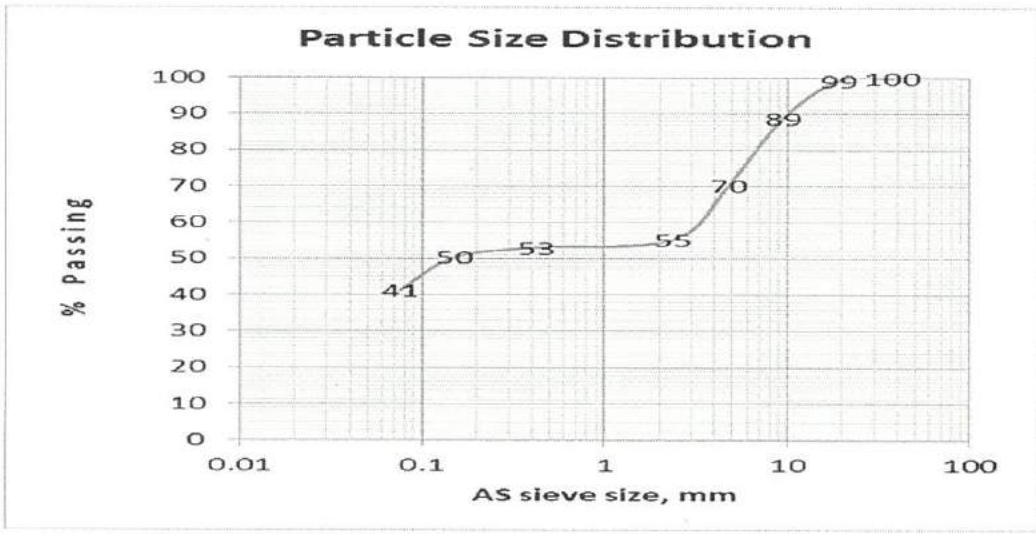
Moisture content, %	14.8	-	AS1289.2.1.1

Results of Atterberg Limits

Test Type	Result (%)	Spec. (%)	Test Method
Liquid Limit (LL)	36	-	AS1289.~~3.1.1~~, 3.1.2
Plastic Limit (PL)	21	-	AS1289.3.2.1
Plastic Index (PI)	15	-	AS1289.3.3.1
Linear Shrinkage (LS)	8.0	-	AS1289.3.4.1

Atterberg Limits Sample History: ~~Natural State~~, ~~Air Dried~~, Oven Dried, ~~Unknown~~
Atterberg Limits Method of Preparation: ~~Wet Sieved~~, Dry Sieved.
Method for Determination of Moisture Content: AS1289 2.1.1, ~~2.1.2, 2.1.4~~.
Linear Shrinkage Mould: 250mm, ~~150mm~~.
Linear Shrinkage History: Cracking, ~~Crumbling~~, ~~Curling~~, Neither.

Remarks: Test results apply only to the sample tested.



Approved by: P.A. Posar P.A. Posar Date: 12/4/18

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Ph: 07 4041 4577. Fax: 07 4041 4399. e-mail: soiltest@bigpond.net.au

Project : Lot 37 (RP735855), Ronald Road, Forest Creek.	**Report No.:** H13196/18	
Client : L & H Price.	**Job No.** : G7455	
Sample Location: BH2 1.2-1.4m < GL.	**Sample by:** PP	**Sample date:** 28/3/18
Sample Source: Existing ground.	**Sample method:** AS1289.1.2.1.6.5.2	
Submitted as: Foundation subsoil.	**Test by:** PP/JH	**Test date:** 29/3 & 3/4/18

Results of Particle Size Distribution

Sieve size (mm)	Percent Passing (%)	Spec. (%)	Test Method
37.5	-	-	AS1289.3.6.1
19.0	100	-	
9.5	97	-	
4.75	93	-	
2.36	85	-	
0.425	77	-	
0.150	71	-	
0.075	63	-	

Results of Insitu Moisture Content

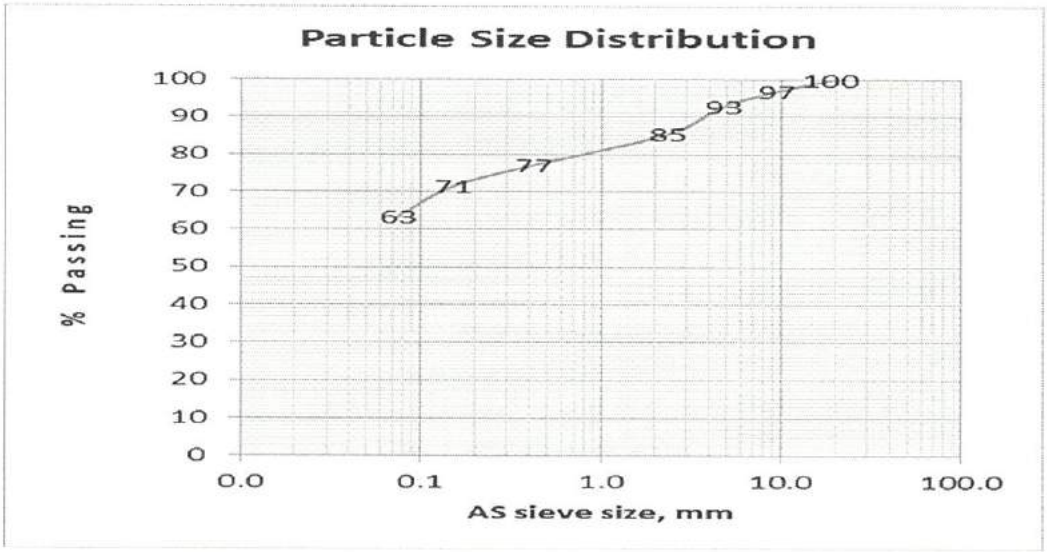
Moisture content, %	24.6	-	AS1289.2.1.1

Results of Atterberg Limits

Test Type	Result (%)	Spec. (%)	Test Method
Liquid Limit (LL)	46	-	AS1289.~~3.1.1~~, 3.1.2
Plastic Limit (PL)	27	-	AS1289.3.2.1
Plastic Index (PI)	19	-	AS1289.3.3.1
Linear Shrinkage (LS)	9.5	-	AS1289.3.4.1

Atterberg Limits Sample History: ~~Natural State~~, ~~Air Dried~~, Oven Dried, ~~Unknown~~
Atterberg Limits Method of Preparation: ~~Wet Sieved~~, Dry Sieved.
Method for Determination of Moisture Content: AS1289 2.1.1, ~~2.1.2, 2.1.4~~.
Linear Shrinkage Mould: 250mm, ~~150mm~~.
Linear Shrinkage History: Cracking, ~~Crumbling~~, ~~Curling~~, Neither.

Remarks: Test results apply only to the sample tested.



Approved by: P.A. Posar P.A. Posar Date: 12/4/18

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Project : Lot 37 (RP735855), Ronald Road, Forest Creek.	**Report No.:** H13197/18	
Client : L & H Price.	**Job No.** : G7455	
Sample Location: BH3 0.5-0.6m < GL.	**Sample by:** PP	**Sample date:** 28/3/18
Sample Source: Existing ground.	**Sample method:** AS1289.1.2.1.6.5.2	
Submitted as: Foundation subsoil.	**Test by:** PP/JH	**Test date:** 29/3 & 3/4/18

Results of Particle Size Distribution

Sieve size (mm)	Percent Passing (%)	Spec. (%)	Test Method
37.5	100	-	AS1289.3.6.1
19.0	99	-	
9.5	91	-	
4.75	77	-	
2.36	66	-	
0.425	55	-	
0.150	51	-	
0.075	47	-	

Results of Insitu Moisture Content

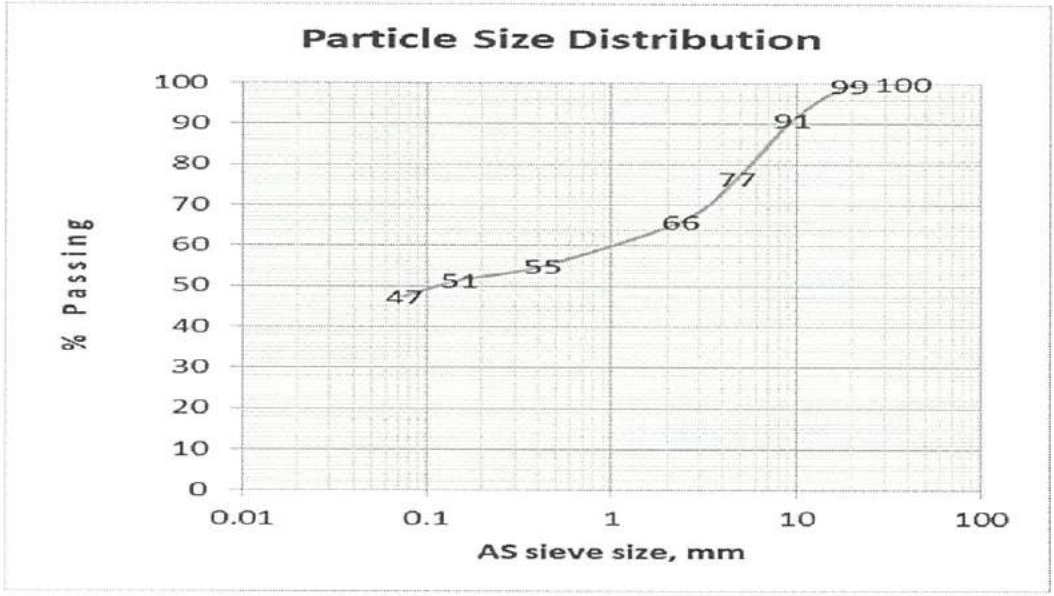
Moisture content, %	20.7	-	AS1289.2.1.1

Results of Atterberg Limits

Test Type	Result (%)	Spec. (%)	Test Method
Liquid Limit (LL)	43	-	AS1289.~~3.1.1~~, 3.1.2
Plastic Limit (PL)	27	-	AS1289.3.2.1
Plastic Index (PI)	16	-	AS1289.3.3.1
Linear Shrinkage (LS)	8.5	-	AS1289.3.4.1

Atterberg Limits Sample History: ~~Natural State~~, ~~Air Dried~~, Oven Dried, ~~Unknown~~
Atterberg Limits Method of Preparation: ~~Wet Sieved~~, Dry Sieved.
Method for Determination of Moisture Content: AS1289 2.1.1, ~~2.1.2, 2.1.4~~.
Linear Shrinkage Mould: 250mm, ~~150mm~~.
Linear Shrinkage History: Cracking, ~~Crumbling~~, ~~Curling~~, ~~Neither~~.

Remarks: Test results apply only to the sample tested.



Approved by: P.A. Posar P.A. Posar Date: 12/4/18

NATA Accredited Laboratory No.1952.
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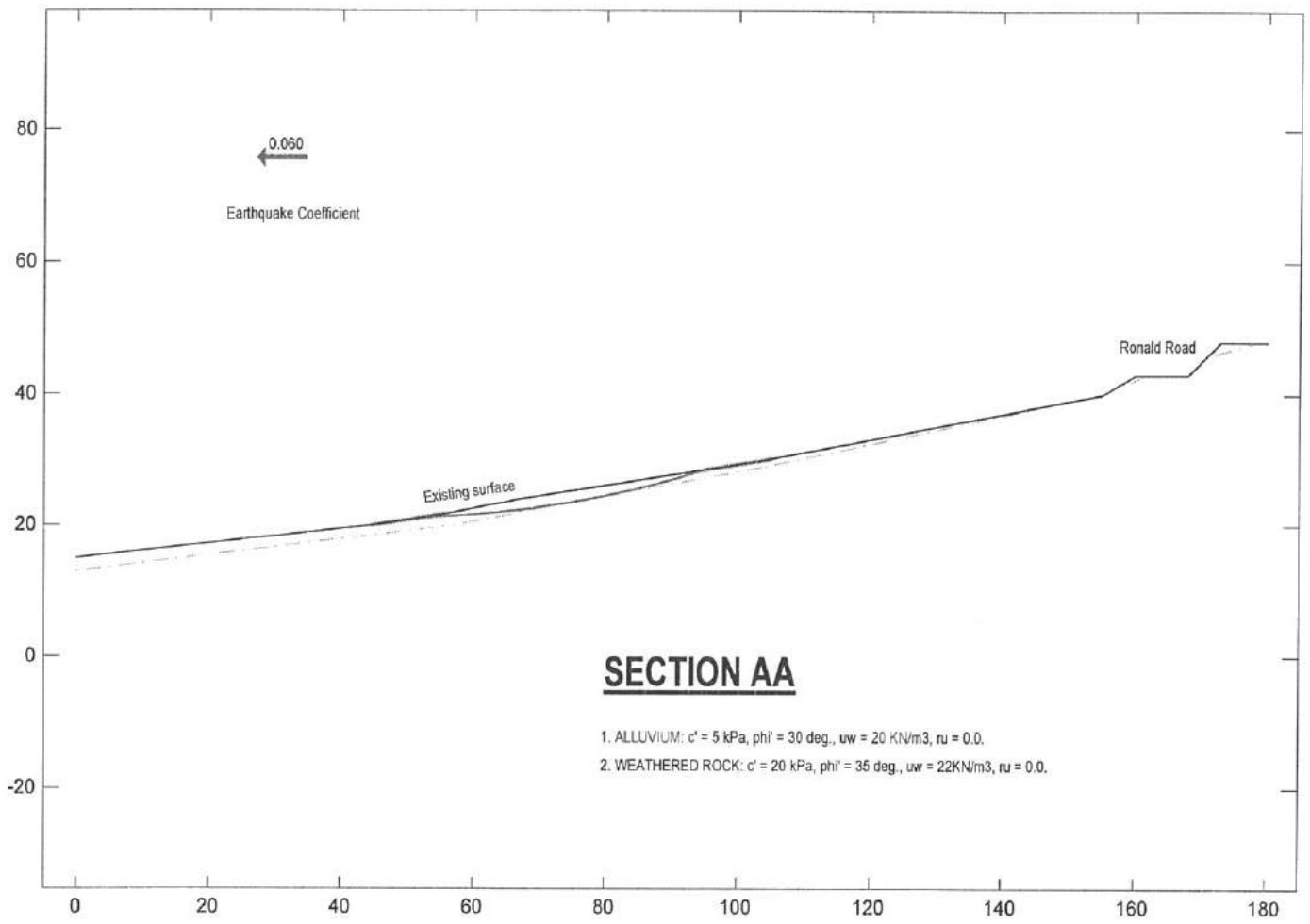
APPENDIX B: Stability Analyses

GALENA Version 4.01



Analysis: 1
Multiple Stability Analysis
Method: Bishop Simplified
Surface: Circular

Results
Critical (minimum)
Factor of Safety: 3.47

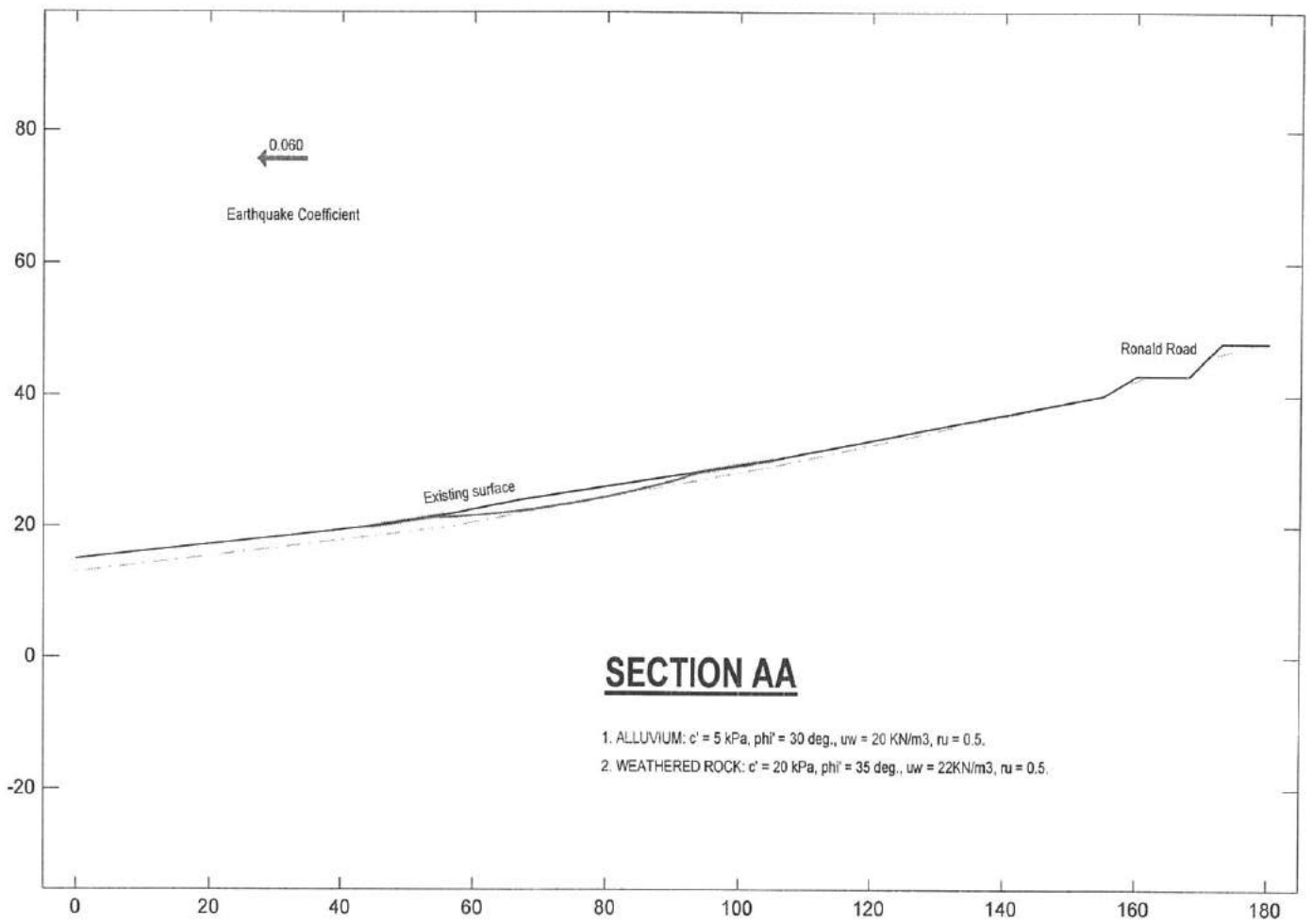
Project: Lot 37 Ronald Sect AA (1) - Existing slope, ru=0.0.

G7455 - AA (1)

File: C:\Documents and Settings\Paul P\My Documents\Examples\Lot 37 Ronald Road Sect. AA (1).gmf

Construction Soiltest Pty Ltd

GALENA Version 4.01



Analysis: 1
Multiple Stability Analysis
Method: Bishop Simplified
Surface: Circular

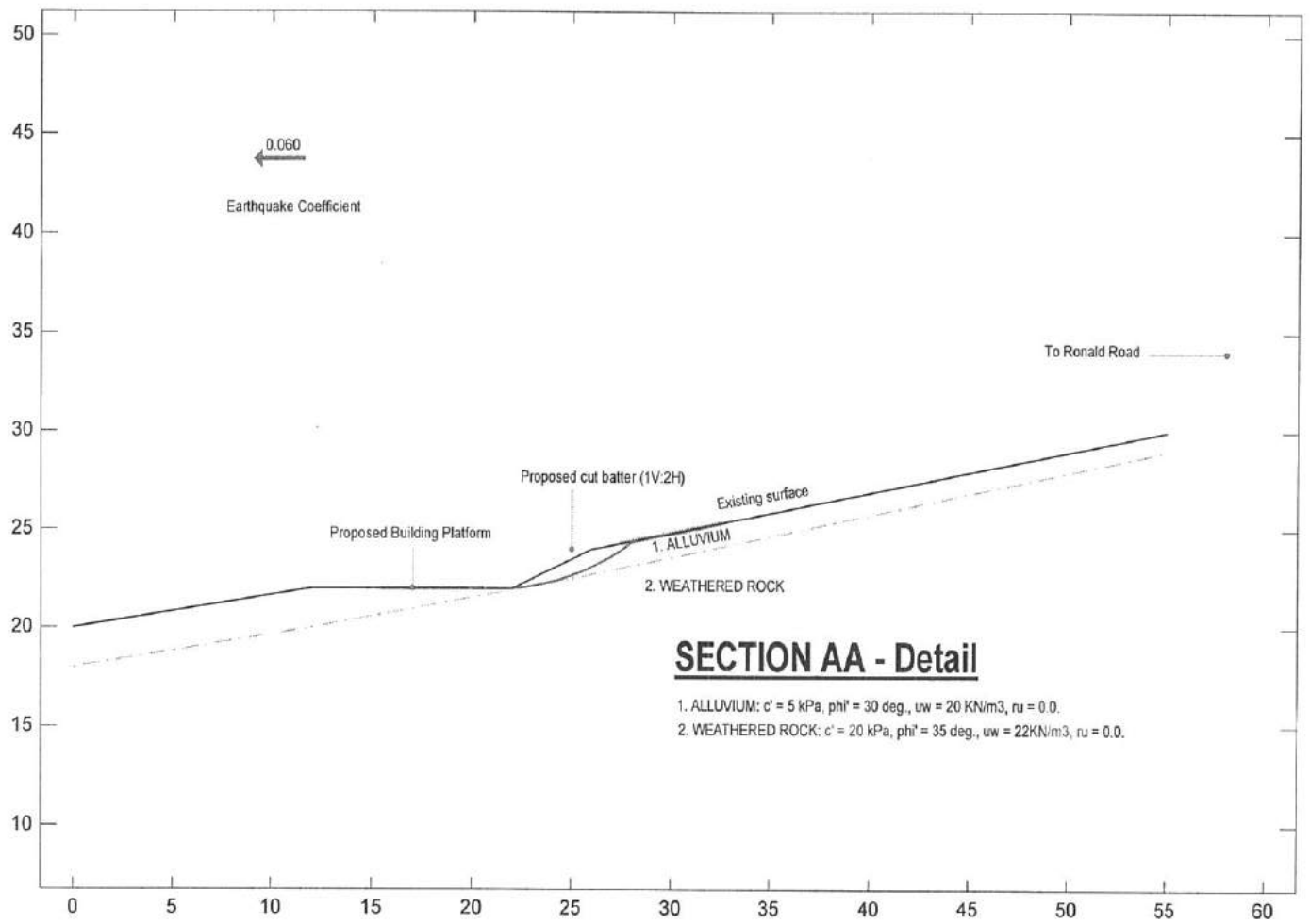
Results
Critical (minimum)
Factor of Safety: 2.18

Project: Lot 37 Ronald Sect AA (2) - Existing slope, ru=0.5.

G7455 - AA (2)

File: C:\Documents and Settings\Paul P\My Documents\Examples\Lot 37 Ronald Road Sect. AA (2).gmf

Construction Soiltest Pty Ltd



Analysis: 1
Multiple Stability Analysis
Method: Bishop Simplified
Surface: Circular

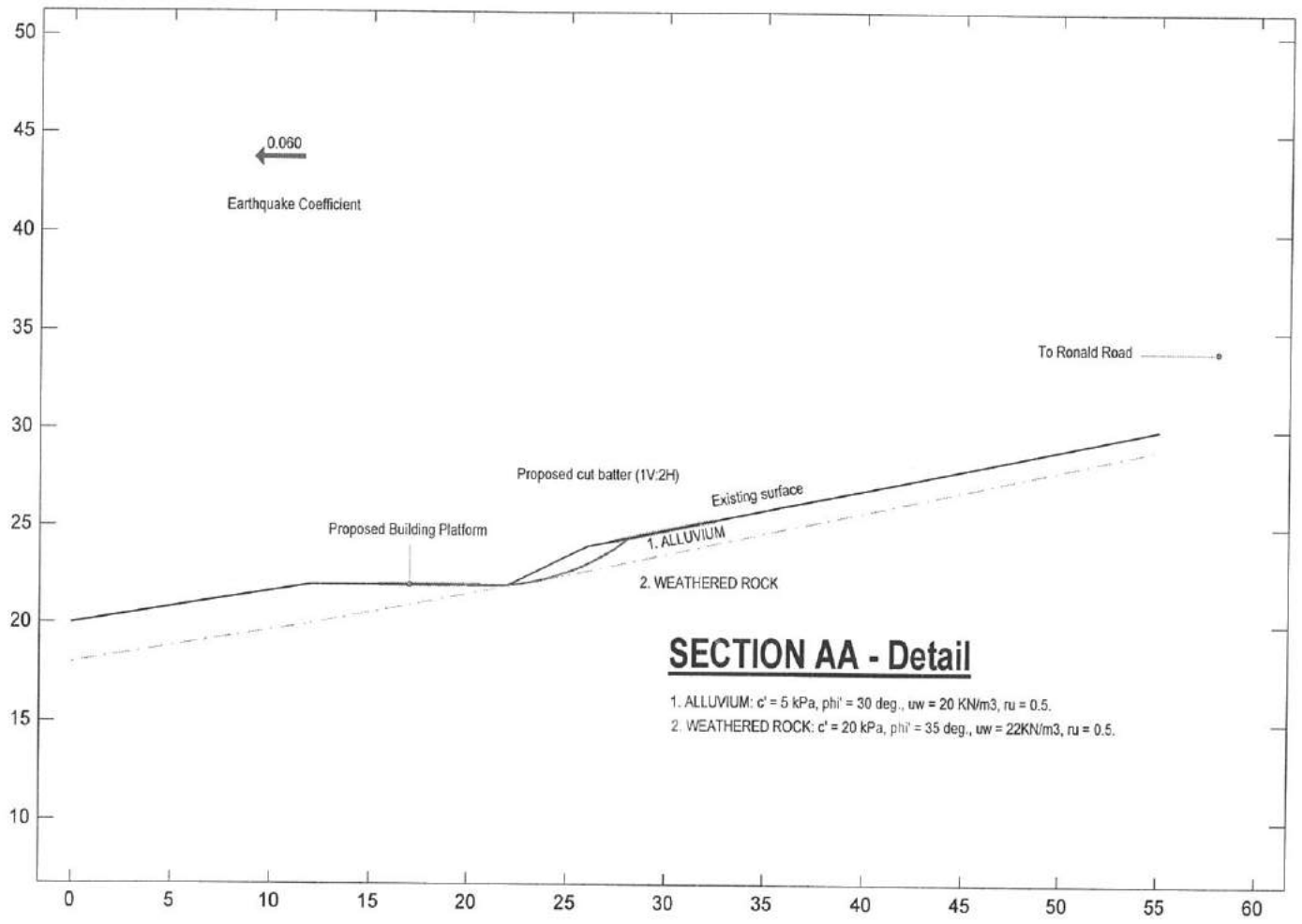
Results
Critical (minimum)
Factor of Safety: 2.85

Project: Lot 37 Ronald Sect AA (3) - Proposed, ru=0.0.

G7455 - AA (3)

File: C:\Documents and Settings\Paul P\My Documents\Examples\Lot 37 Ronald Road Sect. AA (3).gmf

Construction Soiltest Pty Ltd



GALENA Version 4.01

Analysis: 1
Multiple Stability Analysis
Method: Bishop Simplified
Surface: Circular

Results
Critical (minimum)
Factor of Safety: 2.10

Project: Lot 37 Ronald Sect AA (4) - Proposed, ru=0.5.

G7455 - AA (4)

File: C:\Documents and Settings\Paul P\My Documents\Examples\Lot 37 Ronald Road Sect. AA (4).gmf

Construction Soiltest Pty Ltd

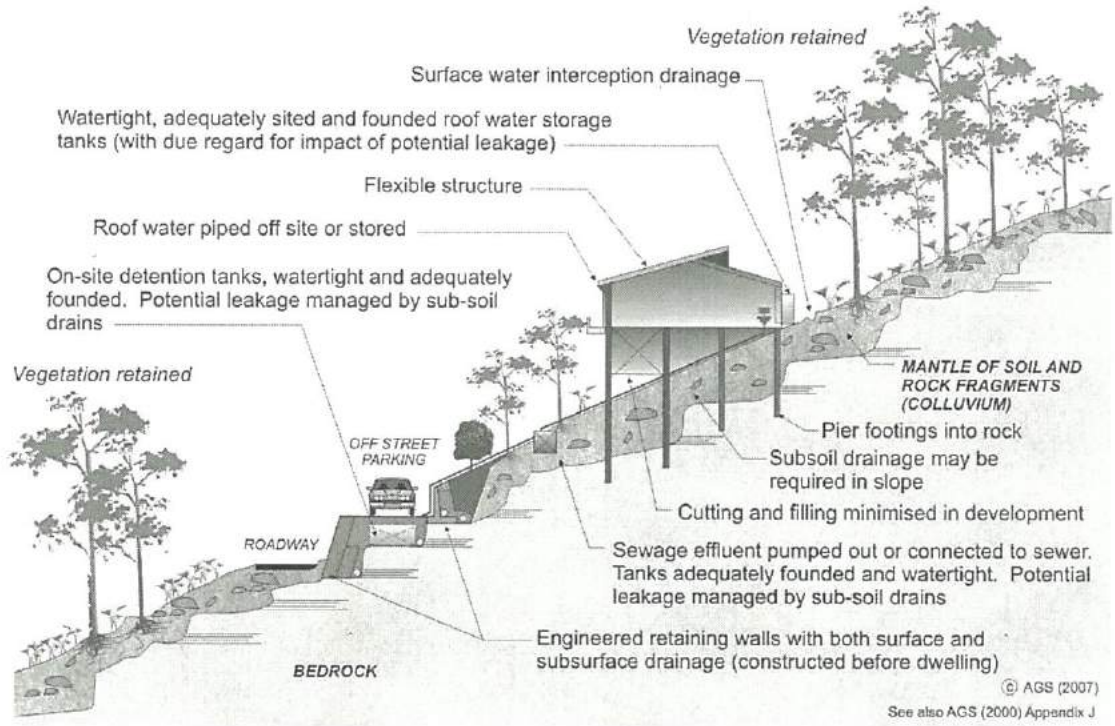
APPENDIX C: Extract of AGS Vol 42 March 2007 – LR8

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.

EXAMPLES OF GOOD HILLSIDE CONSTRUCTION PRACTICE



See also AGS (2000) Appendix J

WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

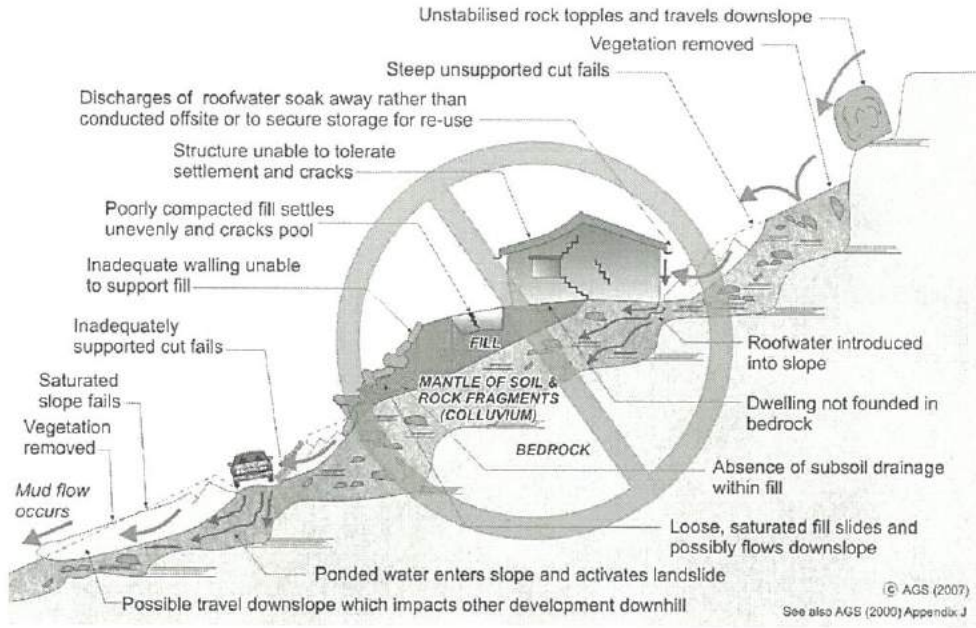
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF POOR HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

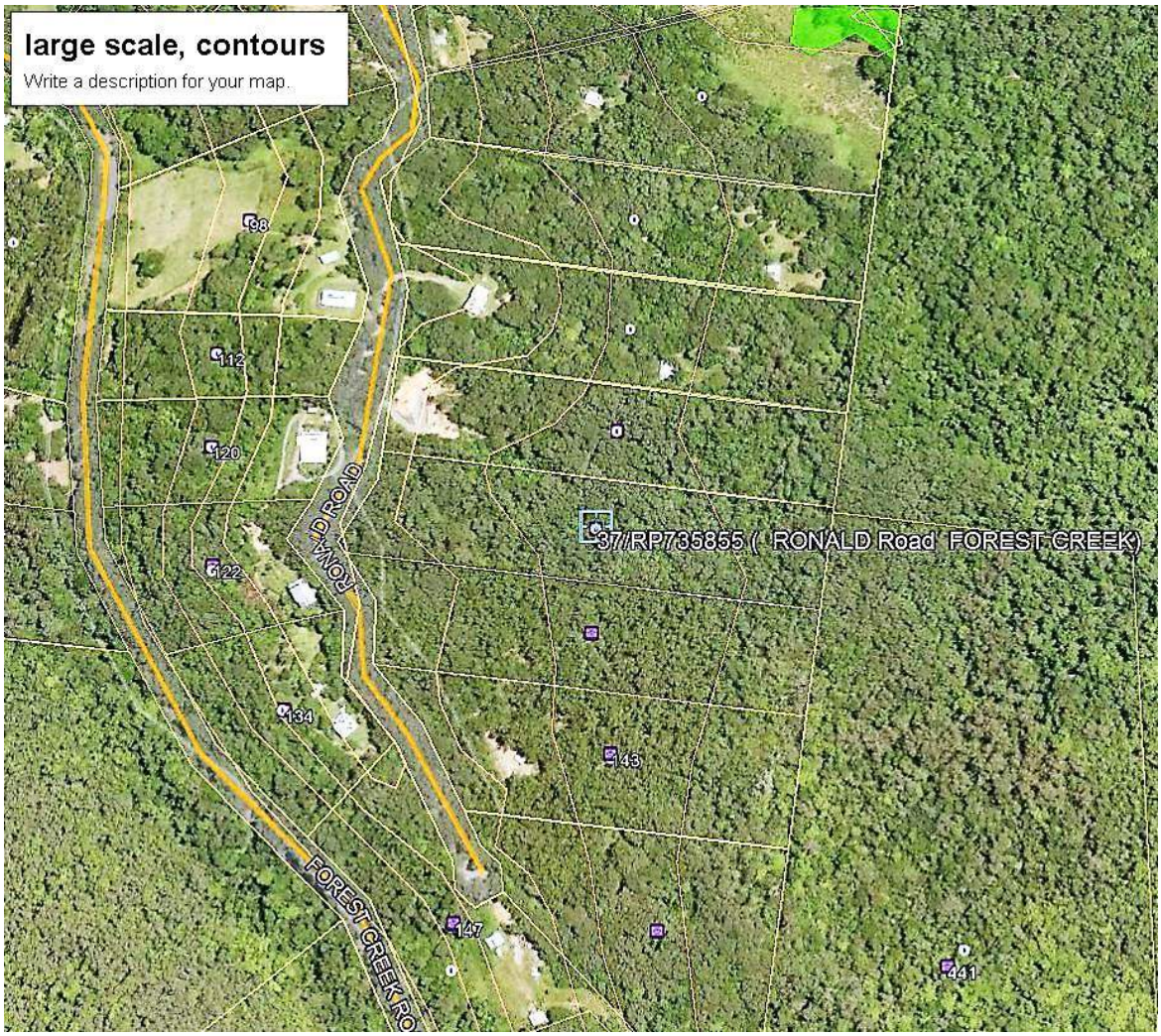
- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal

GeoGuide LR10 - Coastal Landslides

- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

J/N G7455: Appendix D - Lot 37 Ronald Road, Forest Creek – Site Photographs.



Lot 37 Ronald Road, Forest Creek: Aerial.

Lot 37 Ronald Road, Forest Creek: Front of site looking east from Ronald Road (28/3/18).

Lot 37 Ronald Road, Forest Creek: Front of site looking south from Ronald Road (28/3/18).

Lot 37 Ronald Road, Forest Creek: Front of site looking east from Ronald Road (28/3/18).

Lot 37 Ronald Road, Forest Creek: Existing surface at BH1 (28/3/18).

Lot 37 Ronald Road, Forest Creek: BH1, showing groundwater seepage at borehole base (28/3/18).

Lot 37 Ronald Road, Forest Creek: BH1, excavated soil (28/3/18).

Lot 37 Ronald Road, Forest Creek: Existing surface at BH2 (28/3/18).

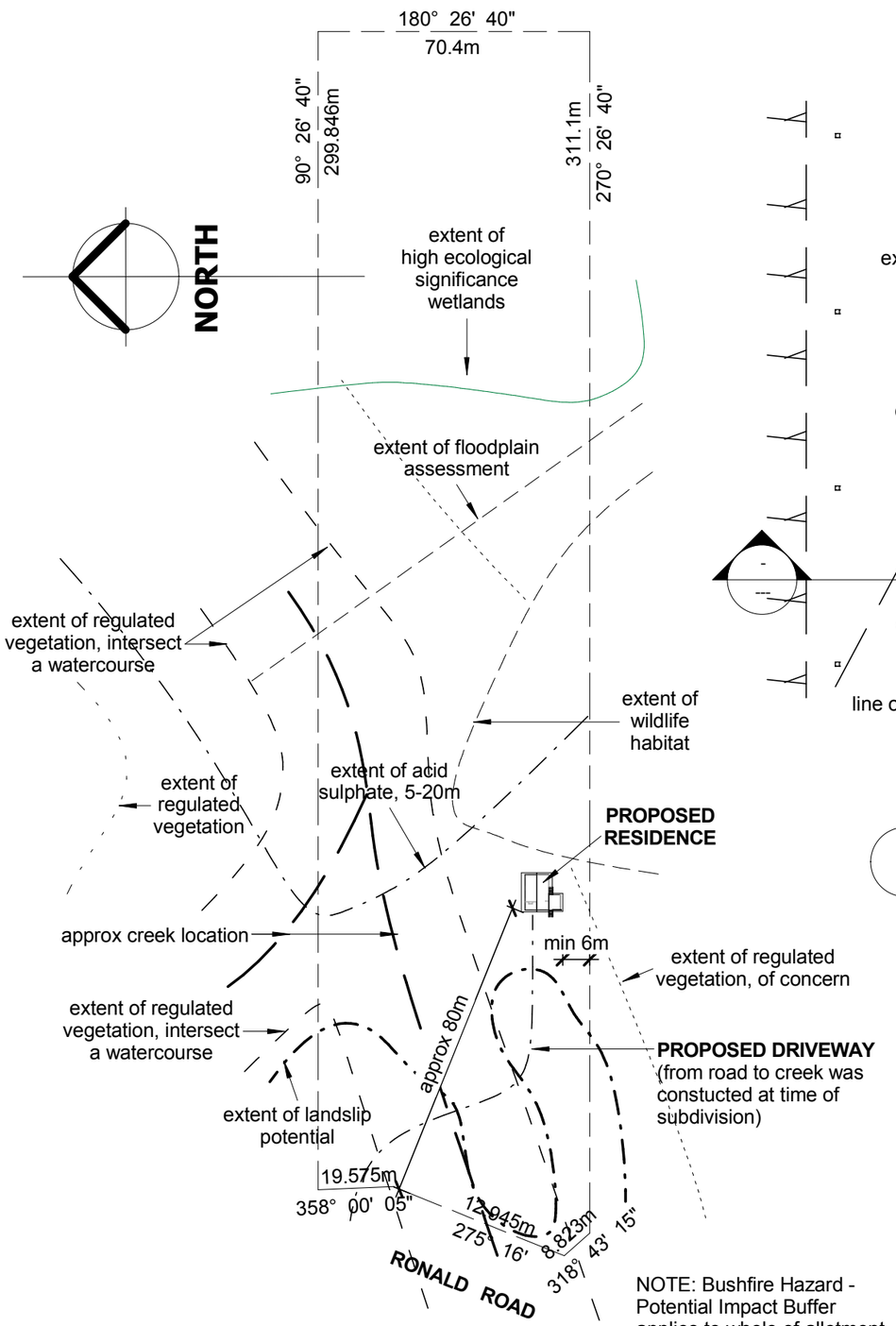
Lot 37 Ronald Road, Forest Creek: BH2, excavated soil (28/3/18).

Lot 37 Ronald Road, Forest Creek: BH2, excavated soil @ 1.75m (28/3/18).

Lot 37 Ronald Road, Forest Creek: Existing surface at BH3 (28/3/18).

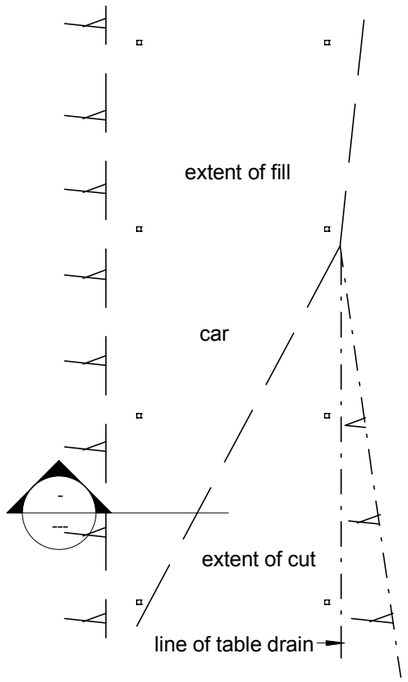
Lot 37 Ronald Road, Forest Creek: BH3, excavated soil (28/3/18).

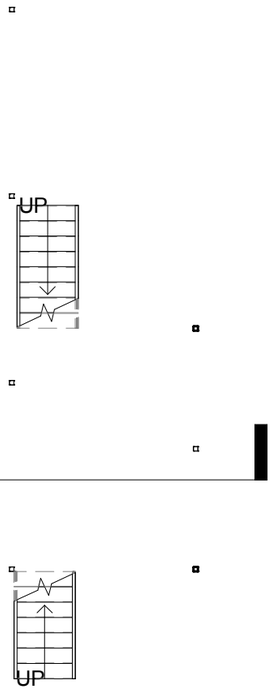
Lot 37 Ronald Road, Forest Creek: BH3, excavated soil @ 1.0m (28/3/18).



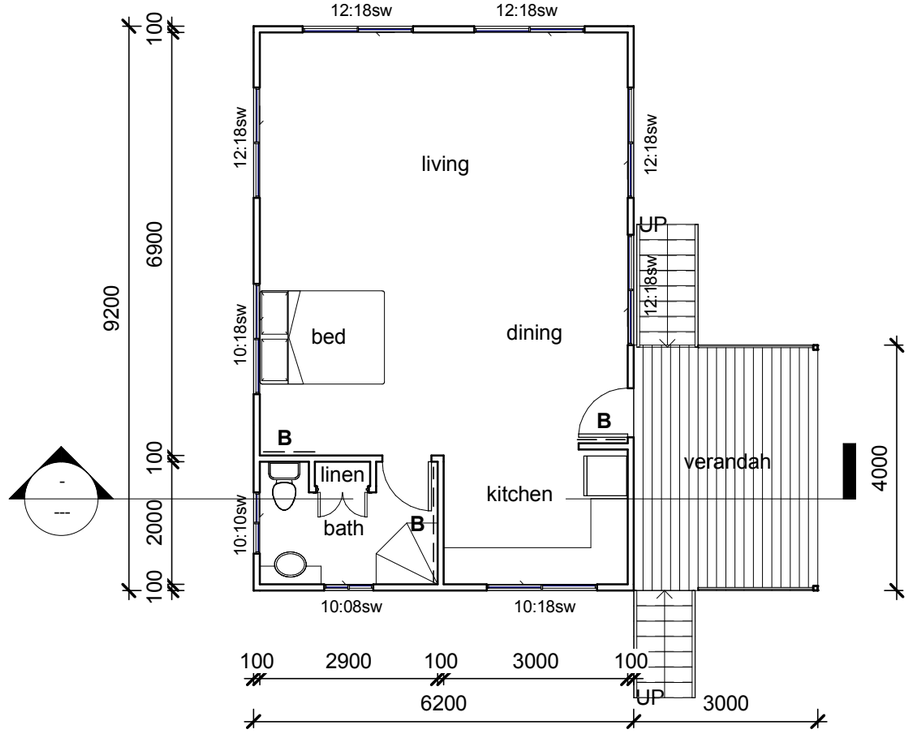
NOTE: Bushfire Hazard - Potential Impact Buffer applies to whole of allotment

3 Site Plan - overlays
1 : 1500

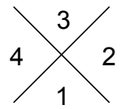




1 Ground Floor Plan
1 : 100



2 First Floor Plan
1 : 100



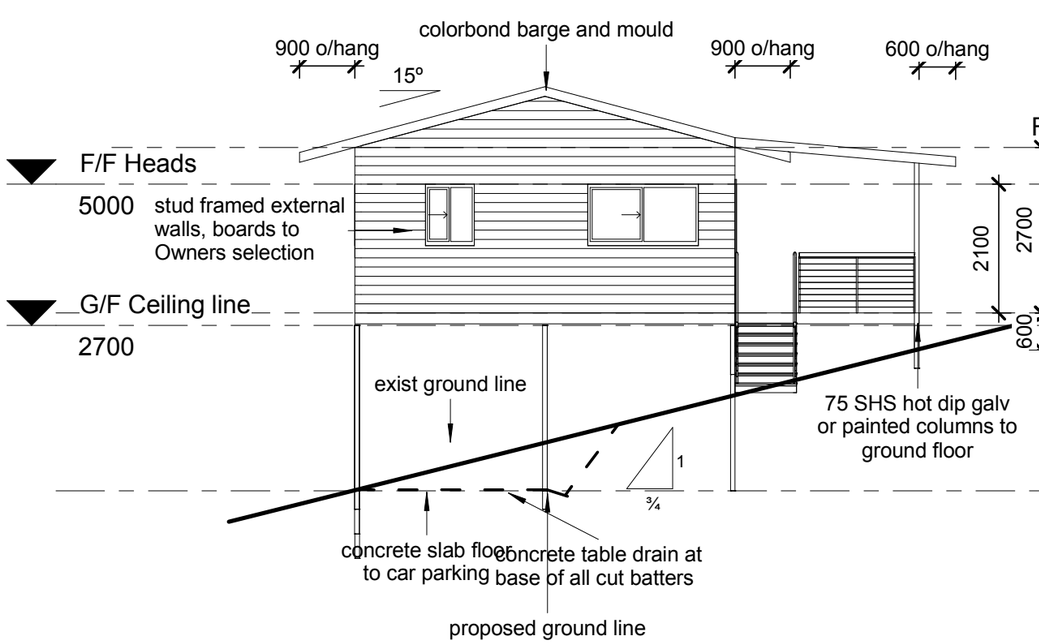
ELEVATION LAYOUT

LEGEND

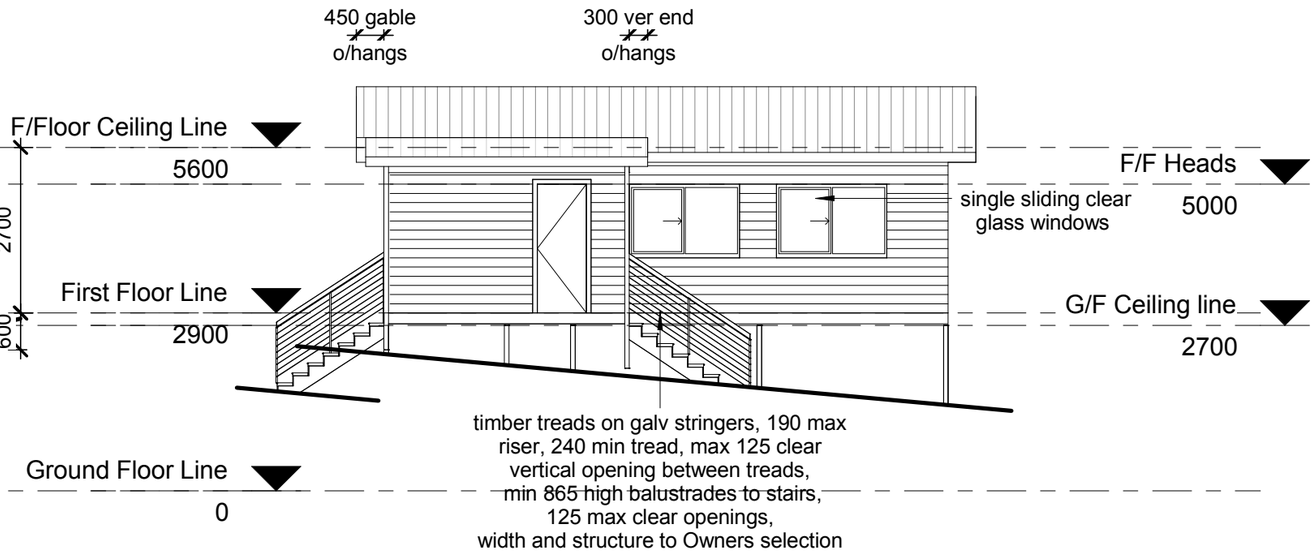
- timber stud framed external and internal walls, gyprock lining to internal, villaboard to wet areas, select boards to external
- B — timber stud framed bracing walls, lined one face, refer to Bracing Wall and Wall Fixing Notes
- 75 x 4 SHS Posts to ground floor
- WP — waterproof wet areas to AS3740
- S/A — smoke alarms to AS3786

GREG SKYRING Design and DRAFTING Pty. Ltd.
Lic Under QBSA Act 1991 - No 1040371
11 Noli Close,
Mossman Q. 4873
Phone/Fax: (07) 40982061
Mobile: 0419212652
Email: greg@skyringdesign.com.au

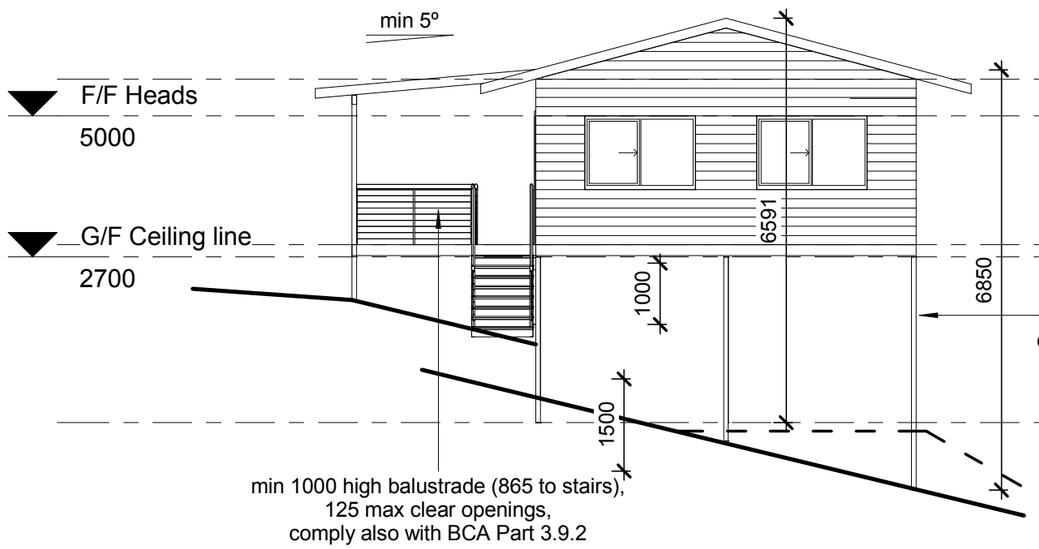
PROJECT: Proposed Residence, Ronald Road, L37 RP735855, FOREST CREEK	CLIENT: L. & H. Price	WIND CLASS: C2	PLAN NUMBER: 502-18	SHEET: 1 of 2
	SCALES: As indicated	PLAN TITLE: Site and Floor Plans	DATE OF ISSUE: prelim 13.03.18	REV:



1 Elevation 1
1 : 100



2 Elevation 2
1 : 100



3 Elevation 3
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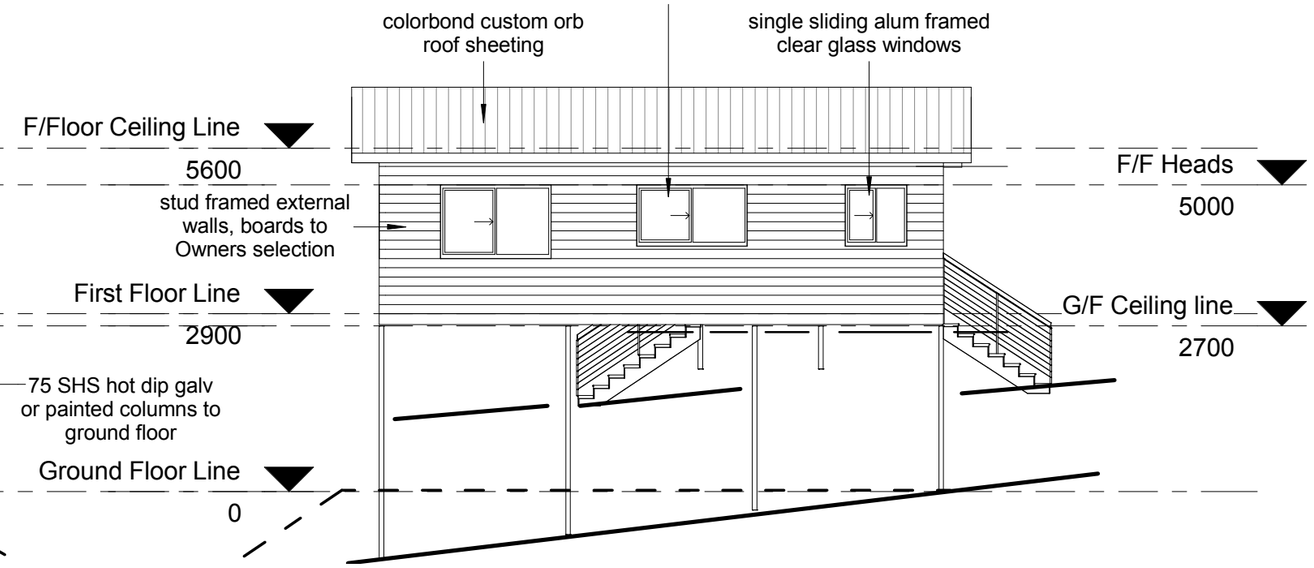

4 Elevation 4
1 : 100

GREG SKYRING Design and DRAFTING Pty. Ltd.
Lic Under QBSA Act 1991 - No 1040371
11 Noli Close,
Mossman Q. 4873
Phone/Fax: (07) 40982061
Mobile: 0419212652
Email: greg@skyringdesign.com.au

PROJECT
Proposed Residence,
Ronald Road,
L37 RP735855,
FOREST CREEK

CLIENT	WIND CLASS	PLAN NUMBER	SHEET
L. & H. Price	C2	502-18	2 of 2

SCALES	PLAN TITLE	DATE OF ISSUE	REV
1 : 100	Elevations	prelim 13.03.18	