DA Form 2 – Building work details

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

This form **must** be used to make a development application **involving building work**.

For a development application involving **building work only**, use this form (*DA Form 2*) only. The DA Forms Guide provides advice about how to complete this form.

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

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*)	Mark Shearer
Contact name *(only applicable for companies)*	Patrick Clifton GMA Certification
Postal address *(PO Box or street address)*	PO Box 831
Suburb	Port Douglas
State	QLD
Postcode	4877
Country	Australia
Contact number	0438 755 374
Email address *(non-mandatory)*	Patrick.c@gmacert.com.au
Mobile number *(non-mandatory)*	0438 755 374
Fax number *(non-mandatory)*	
Applicant's reference number(s) *(if applicable)*	20194017

PART 2 – LOCATION DETAILS

2) Location of the premises *(complete 2.1 and 2.2 if 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.*

2.1) 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).*

Unit No.	Street No.	Street Name and Type	Suburb
	36	Ocean View Road	Killaloe
Postcode	Lot No.	Plan Type and Number *(e.g. RP, SP)*	Local Government Area(s)
4877	14	RP745097	Douglas Shire Council

2.2) Additional premises

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

☒ Not required

3) 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 the DA Forms Guide*

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

☒ No

PART 3 – FURTHER DETAILS

4) Is the application only for building work assessable against the building assessment provisions?

☐ Yes – proceed to 8)

☒ No

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

Douglas Shire Council

6) Has the local government agreed to apply a superseded planning scheme for this development application?

☐ Yes – a copy of the decision notice is attached to this development application

☐ The local government is taken to have agreed to the superseded planning scheme request – relevant documents attached

☒ No

7) 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.

8) Are there any associated development applications or current approvals?

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

☒ No

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

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

10) 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

11) Identify any of the following further legislative requirements that apply to any aspect of this development application			
☐ The proposed development is on a place entered in the **Queensland Heritage Register** or in a local government's **Local Heritage Register**. See the guidance provided at www.des.qld.gov.au about the requirements in relation to the development of a Queensland heritage place			
Name of the heritage place:		Place ID:	

PART 4 – REFERRAL DETAILS

12) Does this development application include any building work aspects that have any referral requirements?
☐ Yes – the *Referral checklist for building work* is attached to this development application ☒ No – proceed to Part 5

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

PART 5 – BUILDING WORK DETAILS

14) Owner's details	
☒ Tick if the applicant is also the owner and proceed to 15). Otherwise, provide the following information.	
Name(s) (*individual or company full name*)	
Contact name *(applicable for companies)*	
Postal address *(P.O. Box or street address)*	
Suburb	
State	

Postcode	
Country	
Contact number	
Email address *(non-mandatory)*	
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	

15) Builder's details	
☒ Tick if a builder has not yet been engaged to undertake the work and proceed to 16). Otherwise provide the following information.	
Name(s) *(individual or company full name)*	
Contact name *(applicable for companies)*	
QBCC licence or owner – builder number	
Postal address *(P.O. Box or street address)*	
Suburb	
State	
Postcode	
Contact number	
Email address *(non-mandatory)*	
Mobile number *(non-mandatory)*	
Fax number *(non-mandatory)*	

16) Provide details about the proposed building work			
What type of approval is being sought?			
☒ Development permit ☐ Preliminary approval			
b) What is the level of assessment?			
☒ Code assessment ☐ Impact assessment *(requires public notification)*			
c) Nature of the proposed building work (tick all applicable boxes)			
☐ New building or structure ☐ Change of building classification *(involving building work)* ☐ Demolition		☒ Repairs, alterations or additions ☒ Swimming pool and/or pool fence ☐ Relocation or removal	
d) Provide a description of the work below or in an attached schedule.			
Dwelling House extension			
e) Proposed construction materials			
External walls	☐ Double brick ☐ Brick veneer ☒ Stone/concrete	☐ Steel ☐ Timber ☐ Fibre cement	☐ Curtain glass ☐ Aluminium ☐ Other
Frame	☐ Timber ☐ Other	☒ Steel	☐ Aluminium
Floor	☒ Concrete	☐ Timber	☐ Other
Roof covering	☐ Slate/concrete ☐ Aluminium	☐ Tiles ☒ Steel	☐ Fibre cement ☐ Other
f) Existing building use/classification? *(if applicable)*			
1A			

g) New building use/classification? *(if applicable)*
1A
h) 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 works are attached to the development application

17) What is the monetary value of the proposed building work?
$N/A

18) Has Queensland Home Warranty Scheme Insurance been paid?		
☐ Yes – provide details below ☒ No		
Amount paid	Date paid (dd/mm/yy)	Reference number
$		

PART 6 – CHECKLIST AND APPLICANT DECLARATION

19) Development application checklist	
The relevant parts of *Form 2 – Building work details* have been completed	☒ Yes
This development application includes a material change of use, reconfiguring a lot or operational work and is accompanied by a completed *Form 1 – Development application details*	☐ Yes ☒ Not applicable
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 9*)	☐ Yes ☒ Not applicable

20) 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 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 7 – FOR COMPLETION BY THE ASSESSMENT MANAGER – FOR OFFICE USE ONLY

Date received: | Reference numbers:

For completion by the building certifier		
Classification(s) of approved building work		
Name	QBCC Certification Licence number	QBCC Insurance receipt number

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	

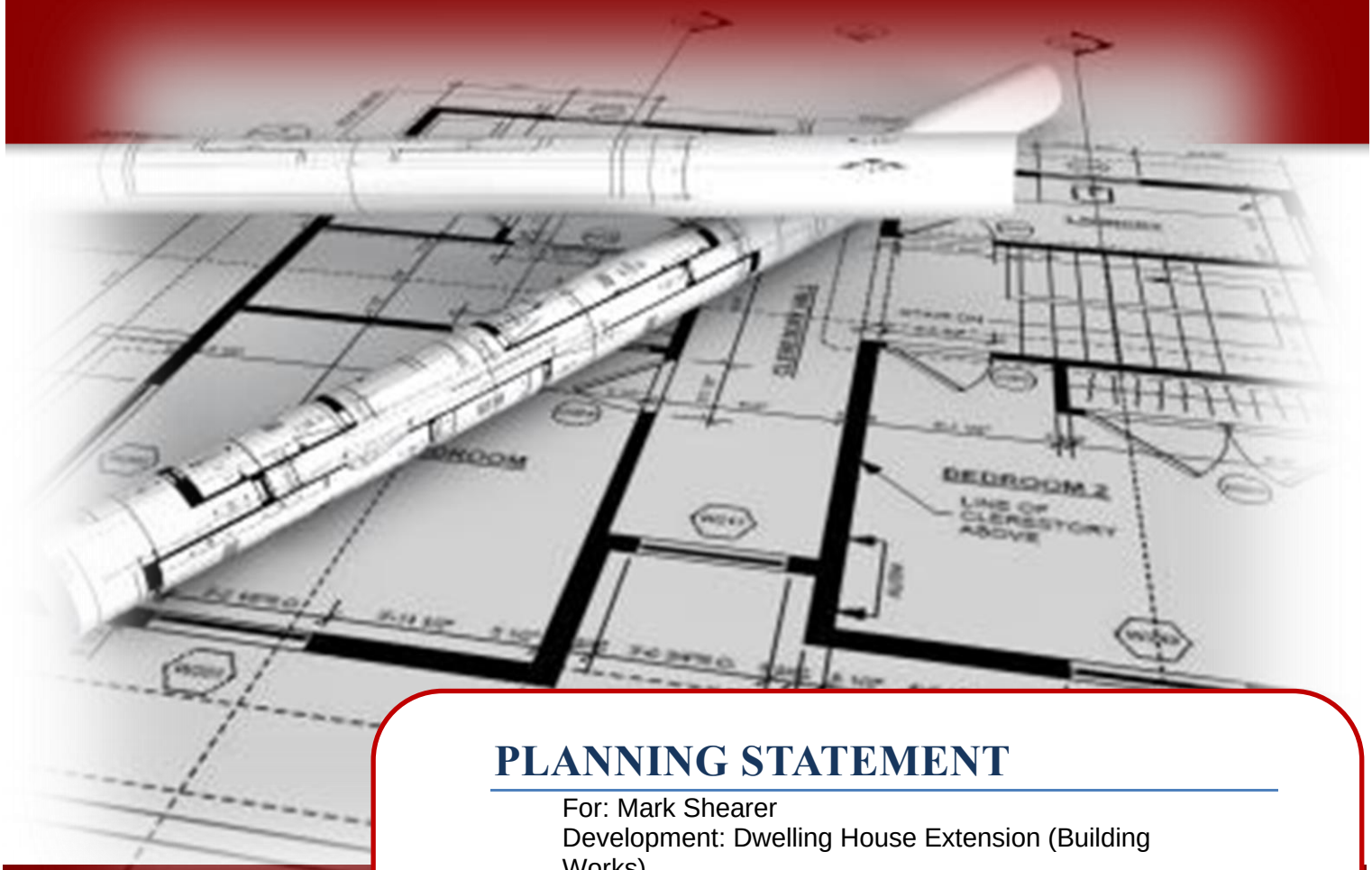
Additional information required by the local government			
Confirm proposed construction materials:			
External walls	☐ Double brick ☐ Brick veneer ☐ Stone/concrete	☐ Steel ☐ Timber ☐ Fibre cement	☐ Curtain glass ☐ Aluminium ☐ Other
Frame	☐ Timber ☐ Other	☐ Steel	☐ Aluminium
Floor	☐ Concrete	☐ Timber	☐ Other
Roof covering	☐ Slate/concrete ☐ Aluminium	☐ Tiles ☐ Steel	☐ Fibre cement ☐ Other

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

Additional building details required for the Australian Bureau of Statistics			
Existing building use/classification? *(if applicable)*			
New building use/classification?			
Site area *(m^2)*		Floor area *(m^2)*	

GMA Certification Group

Leader's in Building Certification Services



PLANNING STATEMENT

For: Mark Shearer
Development: Dwelling House Extension (Building Works)
At: 36 Ocean View Road, Killaloe (Lot 14 RP745097)
Prepared by: GMA Certification Group
File Ref: 20194017
Revision: A

Table of Contents

1.0 Introduction 3
2.0 Development Summary 4
3.0 Site and Locality 6
4.0 Proposal 7
5.0 Statutory Planning Considerations 8
5.1 Planning Act 2016 8
5.1.1 Categorisation of Development 8
5.1.2 Assessment Manager 8
5.1.3 Level of Assessment 8
5.1.4 Statutory Considerations for Assessable Development 8
5.1.5 State Planning Policy 8
5.1.6 Regional Plan 9
5.1.7 Referral Agencies 9
5.1.8 State Development Assessment Provisions 9
6.0 Local Planning Considerations 10
6.1 Douglas Shire Council Planning Scheme 10
6.1.1 Statement of Compliance – Benchmark Assessment 11
7.0 Summary and Conclusion 13
Appendix 1. 14
Appendix 2. 15
Appendix 3. 16
Appendix 4. 17

1.0 Introduction

This report has been prepared on behalf of Mark Shearer in support of a Development Application to Douglas Shire Council for a Development Permit for Building Works Assessable against the Planning Scheme to provide for extensions to an existing dwelling house on land located at 36 Ocean View Road, Killaloe, and described as Lot 14 on RP745097.

The subject site is a single allotment containing an area of 13,620m^2 and with frontage to Ocean View Road of approximately 70 metres. The land is currently improved by a modest Dwelling House that contains three bedrooms, living/dining/kitchen and utility rooms. Access to the site is obtained from an existing driveway off Ocean View Road.

The site has a topography that slopes from the rear (west) to the site frontage to the east with a fall of approximately 90 metres over the 197 metre length of the site. With the exception of the site of the dwelling house and its immediate curtilage, the site is covered with mature and established vegetation.

It is proposed to extend the existing Dwelling House to provide a new double garage with Bathroom, store and laundry and new master bedroom, ensuite and media room. As part of the works one of the bedrooms would be converted to an office and a basement storage room would be provided. External decking would project from the front facade towards the street and would incude a swimming pool.

The application is identified as being Code Assessable and consideration can only be given to the relevant planning Assessment Benchmarks. The proposed development is considered to be consistent with the Assessment Benchmarks contained within the Planning Scheme and is considered to be a suitable use of the site. The development is considered to be consistent in terms of scale and intensity to other forms of development in the locality and the site can contain the use without adverse impact on the amenity of the area.

The application is submitted for approval, subject to reasonable and relevant conditions.

2.0 Development Summary

Address:	36 Ocean View Road, Killaloe
Real Property Description:	Lot 14 RP745097
Easements & Encumbrances:	Nil
Site Area/Frontage:	Area: 13,620m^2 Frontage: Approx. 70m
Registered Owner:	Mark Shearer
Proposal:	Dwelling House Extension (Building Works)
Approval Sought:	Development Permit
Level of Assessment:	Code Assessment
State Interests – State Planning Policy	• Environment and Heritage - MSES Regulated Vegetation (Category B); and, • Safety and Resilience to Hazards, Bushfire Prone Area – Very High Potential Bushfire Intensity and Potential Impact Buffer.
State Interests – SARA Mapping:	• Native Vegetation Clearing: ○ Category B and X on the Regulated Vegetation Management Map; and, ○ Category A or B area containing of concern regional ecosystems;
Referral Agencies:	Nil
State Development Assessment Provisions:	N/A
Regional Plan Designation:	Regional Landscape and Rural Production Area.
Zone:	Environmental Management Zone
Overlays:	• Bushfire Hazard Overlay – Potential Impact Buffer and Very High Potential Bushfire Intensity; • Hillslopes Overlay – Area Affected by Hillslopes; • Landscape Values Overlay – High Landscape Values;

- Potential Landslide Hazards Overlay – Landslide Hazards Area; and,
- Natural Areas Overlay – MSES Wildlife Habitat and MSES Regulated Vegetation.

3.0 Site and Locality

The application site is a single allotment located at 36 Ocean View Road, Killaloe, and described as Lot 14 on RP745097. The site contains an area of 13,620m^2 and has frontage to Ocean View Road of approximately 70 metres. The land is currently improved by a modest Dwelling House that contains three bedrooms, living/dining/kitchen and utility rooms. Access to the site is obtained from an existing lawfully constructed driveway off Ocean View Road.

The site has a topography that slopes from the rear (west) to the site frontage to the east with a fall of approximately 90 metres over the 197 metre length of the site. With the exception of the site of the dwelling house and its immediate curtilage, the site is covered with mature and established vegetation. The Dwelling House is located on an existing beched site that extends beyond the current Dwelling House footprint.

The locality containing the site is generally characterised by rural lifestyle allotments on sloping land. Natioanl Park and landunder cultivation for sugar cane. To the north and south the site adjoins rural lifestyle allotmenst with the allotments to the north being vacant to the lot to the south developed with a Dwelling House. To the west the site adjoins National Park and to the east on the other side of Ocean View Road are rural lifestyle allotment that share a common boundary with land further to the east that is under cultivation for sugar cane.

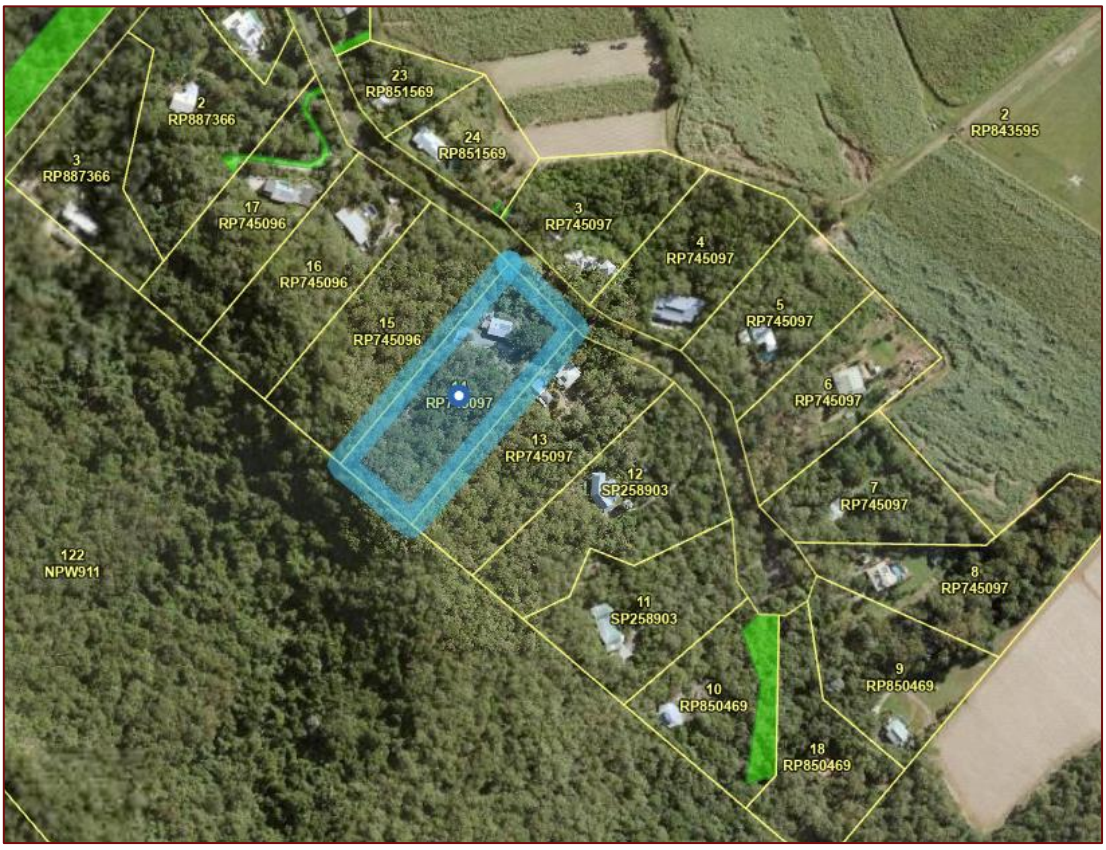


Photo 1 – Site Location (Source Queensland Globe)

4.0 Proposal

It is proposed to extend the existing Dwelling House to provide a new double garage with bathroom, store and laundry and new master bedroom, ensuite and media room. As part of the works one of the bedrooms would be converted to an office and a basement storage room would be provided. External decking would project from the front face towards the street and would incude a swimming pool.

The proposed Dwelling House extension would be contained predominantly within the existing cleared and benched area with the decking projecting over the edge of the bench with a post and beam construction. The Dwelling House would be single storey with a basement provided beneath the deck. The basement would be used for storage purposes and would have an area of 51.86m^2.

As part of the development the existing water storage tanks and the existing o-site effluent disposal system would be retained. The Dwelling House does not result in an increase in bedrooms and on that basis no upgrade to the effluent disposal system is required.

No earthworks are proposed on the site outside of the area of building works as part of this proposal.

Proposal Plans are attached at Appendix 2.

The key development features of the proposed development are summarised in the table below:

Development Feature	Proposal
Site Area:	13,620m^2
Frontage:	Approx. 70 metres
Height:	Max. 7.5 metres
Floor Area (including deck):	502.78m^2
Site Cover:	3.69%
Setbacks:	Approx. 24 metres to the road and a minimum of 3.426 metres to side and rear boundaries.
Access:	Existing driveway from Ocean View Road
Car Parking Spaces:	Two

5.0 Statutory Planning Considerations

This section provides a summary of the legislative framework affecting the application pursuant to the Planning Act 2016.

5.1 Planning Act 2016

5.1.1 Categorisation of Development

The proposed development is not identified as prohibited development having regard to the relevant instruments that can prohibit development under the *Planning Act 2016*, including

- Schedule 10 of the Planning Regulations 2017
- Relevant Categorising Instruments.

The development is made assessable under the Douglas Shire Council Planning Scheme, which is a categorising instrument for the purpose of s43 of the *Planning Act 2016.*

5.1.2 Assessment Manager

Pursuant to Schedule 8 of the *Planning Regulations 2017,* the Assessment Manager for the application is the Douglas Shire Council.

5.1.3 Level of Assessment

The application involves Building Works. The table below identifies the level of assessment and the categorising section of the Douglas Shire Council Planning Scheme.

Development	Categorising Section	Level of Assessment
Dwelling House Extension (Building Works)	Table 5.6.d – Environmental Management Zone	Code Assessable

5.1.4 Statutory Considerations for Assessable Development

As the application is subject to Code Assessment, in deciding the application pursuant to s60 of the *Planning Act 2016,* the Council, as Assessment Manager, can only have regard to the matters established in the relevant planning benchmarks.

This assessment is further discussed in Section 6.0 of this report and a detailed assessment of the proposed development against the assessment benchmarks is provided at Appendix 3.

5.1.5 State Planning Policy

It is understood that the Minister has identified that the State Planning Policy has been appropriately integrated into in the Douglas Shire Council Planning Scheme and consequently no further assessment is required in this instance.

5.1.6 Regional Plan

The application site is identified in the Regional Landscape and Rural Production Area designation of the FNQ Regional Plan. Consistent with the State Planning Policies, it is understood that the Planning Scheme has been determined to appropriately advance the Regional Plan and, on that basis, no further assessment is required in this instance.

5.1.7 Referral Agencies

There are no referral agencies identified in respect of this application.

5.1.8 State Development Assessment Provisions

As there are no referral agencies for the application, no State Development Assessment Provisions Apply to the assessment.

6.0 Local Planning Considerations

6.1 Douglas Shire Council Planning Scheme

Within the Douglas Shire Council Planning Scheme (2018), the site is identified within the Environmental Management Zone and is affected by the following Overlays:

- Bushfire Hazard Overlay – Potential Impact Buffer and Very High Potential Bushfire Intensity;
- Hillslopes Overlay – Area Affected by Hillslopes;
- Landscape Values Overlay – High Landscape Values;
- Potential Landslide Hazards Overlay – Landslide Hazards Area; and,
- Natural Areas Overlay – MSES Wildlife Habitat and MSES Regulated Vegetation.

The Table below identifies the applicable Assessment Benchmarks contained within the Planning Scheme.

Assessment Benchmark	Applicability	Compliance
Environmental Management Zone Code	Applies	Generally complies with the Acceptable Outcome's, consideration is required in respect of Performance Outcome PO2.
Bushfire Hazard Overlay Code	Applies	Complies with all applicable Acceptable Outcomes.
Hillslopes Overlay Code	Applies	Generally complies with the Acceptable Outcomes, consideration is required in respect of Performance Outcome PO1.
Landscape Values Overlay Code	Not applicable	Not an Assessment Benchmark.
Potential Landslide Hazard Overlay Code	Applies	Complies with all applicable Acceptable Outcomes.
Natural Areas Overlay Code	Applies	Complies with all applicable Acceptable Outcomes.
Access, Parking and	Applies	Complies with all

Servicing Code		applicable Acceptable Outcomes.
Filling and Excavation Code	Applies	Complies with all applicable Acceptable Outcomes.
Infrastructure Works Code	Applies	Complies with all applicable Acceptable Outcomes.

6.1.1 Statement of Compliance – Benchmark Assessment

6.1.1.1 Environmental Management Zone Code

Performance Outcome PO2 of the Environmental Management Zone Code States:

PO2

Buildings and structures are set back to:

(a) maintain the natural character of the area;
(b) achieve separation from neighbouring buildings and from road frontages

The associated Acceptable Outcome AO2 requires the building to be setback 6 metres from the side and rear boundaries of the site.

The proposed Dwelling House extension would result in the front deck being 3.426 metres from the eastern side boundary. Notwithstanding that the side setback is less than the accepted 6 metres, the proposed setback would provide for the Dwelling House extension to be accommodated within an existing cleared area, maintaining the character of the area, and would not result in an unacceptable separation distance to neighbouring buildings. The setback would also be consistent with the built form on adjacent sites which have buildings constructed less than 6 metres to the side boundaries.

proposed development is considered to satisfy the Acceptable Outcomes and Performance Outcomes of the environmental Management Zone Code.

6.1.1.2 Hillslopes Overlay Code

Performance Outcome PO1 o the hillslopes overlay Code states:

PO1

The landscape character and visual amenity quality of hillslopes areas is retained to protect the scenic backdrop to the region.

The associated Acceptable Outcome AO1.1 states:

AO1.1

Development is located on parts of the site that are not within the Hillslopes constraint subcategory as shown on the Hillslopes overlay Maps contained in schedule 2.

The proposal is considered to comply with the Performance Outcome. The proposal is for an extension to an existing Dwelling House with the extension being provided predominantly within the existing building pad and disturbed area. The proposal would not result in a significantly greater visual impact than the existing development and would retain the quality of the scenic backdrop to the region.

7.0 Summary and Conclusion

This report has been prepared on behalf of Mark Shearer in support of a Development Application to Douglas Shire Council for a Development Permit for Building Works Assessable against the Planning Scheme to provide for extensions to an existing Dwelling House on land located at 36 Ocean View Road, Killaloe, and described as Lot 14 on RP745097.

The subject site is a single allotment containing an area of 13,620m^2 and with frontage to Ocean View Road of approximately 70 metres. The land is currently improved by a modest Dwelling House that contains three bedrooms, living/dining/kitchen and utility rooms. Access to the site is obtained from an existing driveway off Ocean View Road.

It is proposed to extend the existing Dwelling House to provide a new double garage with bathroom, store and laundry and new master bedroom, ensuite and media room. As part of the works one of the bedrooms would be converted to an office and a basement storage room would be provided. External decking would project from the front facade towards the street and would incude a swimming pool.

The application is identified as being Code Assessable and consideration can only be given to the relevant planning Assessment Benchmarks. An assessment against the relevant Assessment Benchmarks indicates that the proposal is able to satisfy the requirements and is therefore a suitable development in the site. The development is consistent in terms of scale and intensity to other forms of development in the locality and the site can contain the use without adverse impact on the amenity of the area.

The application is submitted for approval, subject to reasonable and relevant conditions.

Appendix 1.

CERTIFICATE OF TITLE

CURRENT TITLE SEARCH

NATURAL RESOURCES, MINES AND ENERGY, QUEENSLAND

Request No: 35750148
Search Date: 08/12/2020 13:30 **Title Reference: 21350211**
Date Created: 15/10/1987

Previous Title: 21329125

REGISTERED OWNER

Dealing No: 714749826 26/10/2012

MARK DOMINIC SHEARER

ESTATE AND LAND

Estate in Fee Simple

LOT 14 REGISTERED PLAN 745097
Local Government: DOUGLAS

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
   Deed of Grant No. 20142246 (POR 61V)

2. EASEMENT No 601403470 (T446774D) 18/10/1989
   BENEFITING THE LAND
   OVER EASEMENT C ON RP748302

3. MORTGAGE No 714749827 26/10/2012 at 15:55
   COMMONWEALTH BANK OF AUSTRALIA A.B.N. 48 123 123 124

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

Requested By: D-ENQ GLOBALX

Appendix 2.

PROPOSAL PLANS

IMPORTANT NOTE

1. This plan was prepared for the sole purposes of the client for the specific purpose of producing a detail plan. This plan is strictly limited to the purpose and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The plan is presented without the assumption of a duty of care to any other person (other than the Client) ("Third Party") and may not be relied on by Third Party.

2. RPS Australia East Pty Ltd will not be liable (in negligence or otherwise) for any direct or indirect loss, damage, liability or claim arising out of or incidental to:
   A. Third Party publishing, using or relying on the plan;
   B. RPS Australia East Pty Ltd relying on information provided to it by the Client or a Third Party where the information is incorrect, incomplete, inaccurate, out-of-date or unreasonable;
   C. any inaccuracies or other faults with information or data sourced from a Third Party;
   D. RPS Australia East Pty Ltd relying on surface indicators that are incorrect or inaccurate;
   E. the Client or any Third Party not verifying information in this plan where recommended by RPS Australia East Pty Ltd;
   F. lodgement of this plan with any local authority against the recommendation of RPS Australia East Pty Ltd;
   G. the accuracy, reliability, suitability or completeness of any approximations or estimates made or referred to by RPS Australia East Pty Ltd in this plan.

3. Without limiting paragraph 1 or 2 above, this plan may not be copied, distributed, or reproduced by any process unless this note is clearly displayed on the plan.

4. Scale shown is correct for the original plan and any copies of this plan should be verified by checking against the bar scale.

5. The title boundaries as shown hereon were not marked at the time of survey and have been determined by plan dimensions only and not by field survey. If not able to be so located, services have been plotted from the records of relevant authorities where available and have been noted accordingly on this plan. Where such records either do not exist or are inadequate a notation has been made hereon.

6. Prior to any demolition, excavation or construction on the site, the relevant authority should be contacted for possible location of further underground services and detailed locations of all services.

15
RP745096

Stn 9500
Screw in Kerb
RL 10.000

OCEAN VIEW ROAD

Stn 9502
Nail in Block
RL 23.673

Stn 9504 Pin
RL 36.196

14
RP745097

Cnr Post of Pool Fence

Tree
T 0.8
H 15
S 11

Tree
T 0.45
H 18
S 10

Tree
T 0.8
H 16
S 10

Tree
T 1.0
H 14
S 14

Tree
T 0.4
H 15
S 10

Block Walls
Water Tank (Slab RL 32.90)
Water Tank (Slab RL 32.83)
Timber Deck
Floor Level 36.97
Single Storey Block Dwelling
Apex RL 41.86
Apex RL 41.82
Floor Level 37.18
Floor Level 37,18
Awning
Stone Pitch Concrete
Step
Conc Slab
Shipping Container
Shed
Concrete Driveway
Approx Elec Alignment (As advised by client)
450 RCP IL 8.03

LEGEND

- Top of Bank
- Toe of Bank
- Road Crown
- Mountable Kerb IL
- Back of Kerb
- Change of Grade
- Gully Invert
- Eaveline
- Edge of Gravel Driveway
- U/G Electricity (From Records)
- U/G Water (From Records)
- U/G Telstra (From Records)
- Telstra Pit
- Electrical Pillar
- Hydrant
- Stop Valve
- Drainage MH Lid

0 5 10 15
metres

SCALE 1:300 IS APPLICABLE ONLY TO THE ORIGINAL SHEET SIZE (A3).

NOTES
Level Datum: Arbitrary
Origin of Levels: Screw in Kerb 9500
RL: 10.000
Origin of Coords: Stn 9500 Screw in Kerb
E 785.142
N 5256.210
Meridian: RP745097
Contours Major 2.0 Minor 0.5

CHECKED: DGP
DRAFTING CHECKED: DGP

PROJECT MANAGER: DGP
SURVEYED: DCW 11/12/19
DRAWN: DCW
CAD REF: 145997-100.mjo
SHEET 1 OF SHEETS 1
SHEET SIZE: A3

Mark Shearer

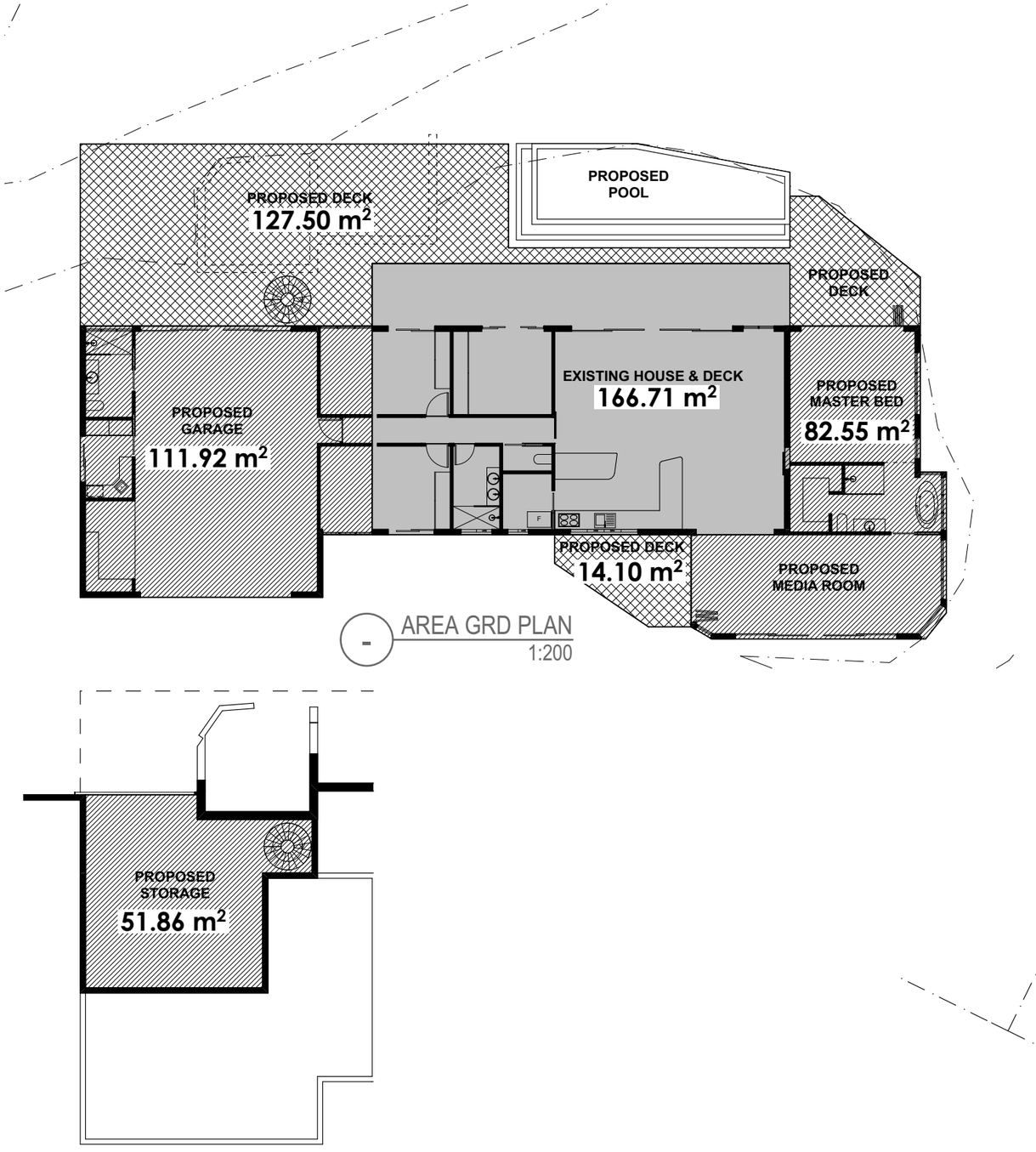
Detail and Contour Survey
of Part of Lot 14 on RP745097
Ocean View Road
Killaloe
Queensland

RPS Australia East Pty Ltd
ACN 140 292 762

5954 Captain Cook Highway,
Craiglie, QLD, 4877
PO Box 91, Port Douglas,
QLD, 4877

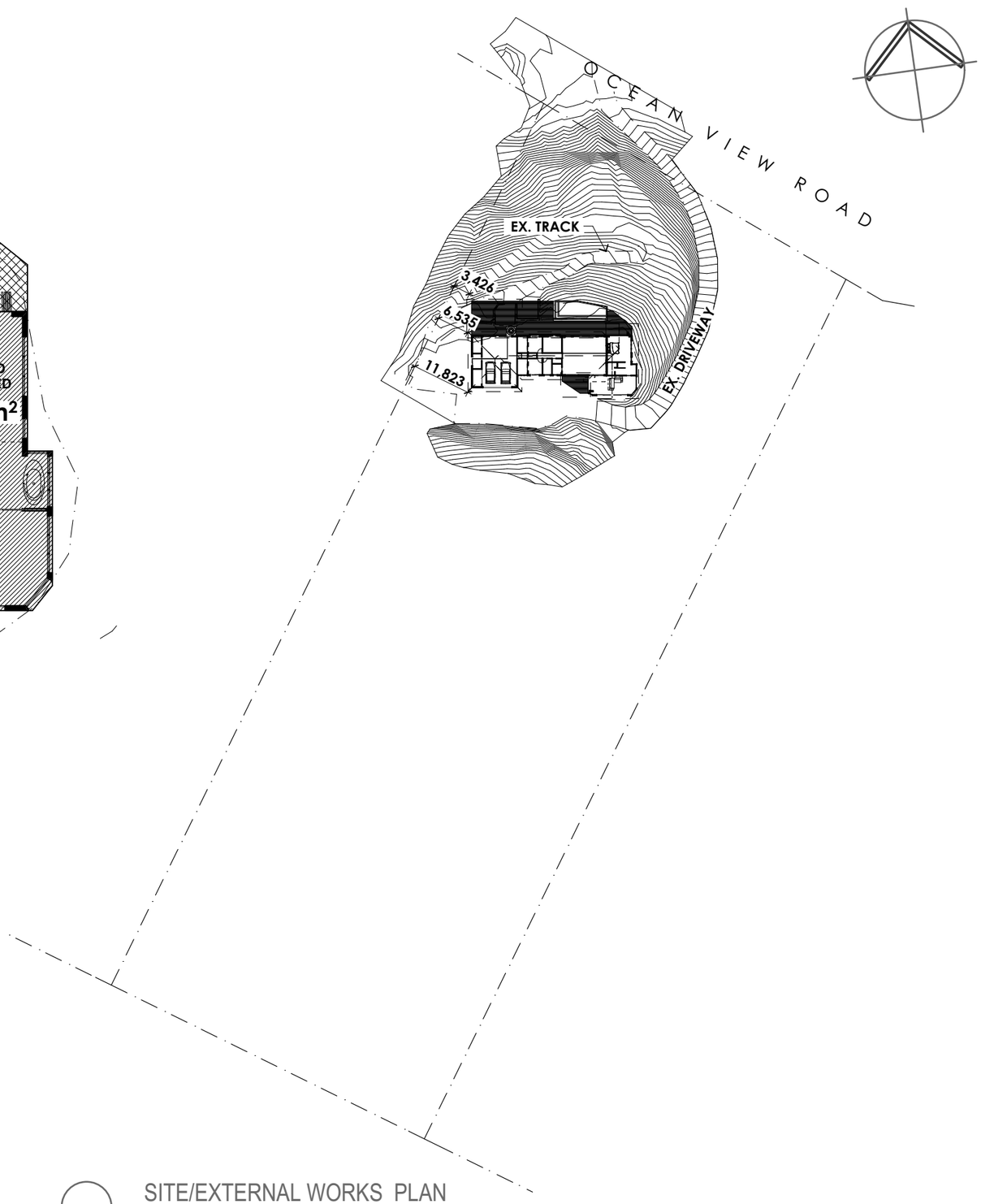
T +61 7 4098 1148
F +61 7 4031 2942
W rpsgroup.com.au

SCALE 1:300 | DATE 12/12/19 | DRAWING NO. 145997 - 100 | ISSUE



AREA GRD PLAN
1:200

AREA LOWER GRD PLAN
1:200



SITE/EXTERNAL WORKS PLAN
1:1000

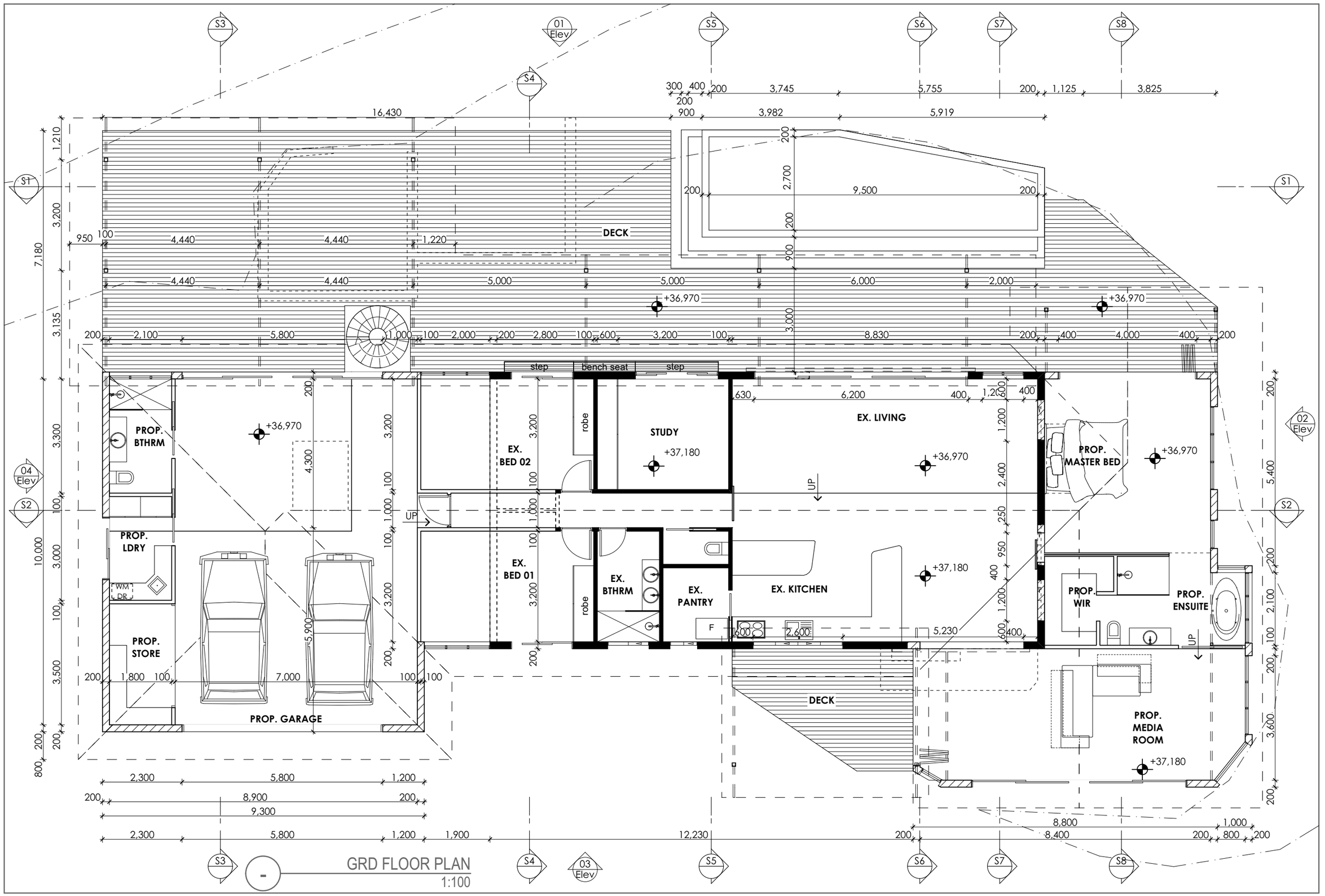
SKETCH DESIGN

REV D
A3 SHEET
30/11/2020

danny VOS Architect
m 0415 300 748

PROPOSED RENOVATION
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)

1.0



GRD FLOOR PLAN
1:100

danny VOS Architect
m 0415 300 748

P R O P O S E D R E N O V A T I O N

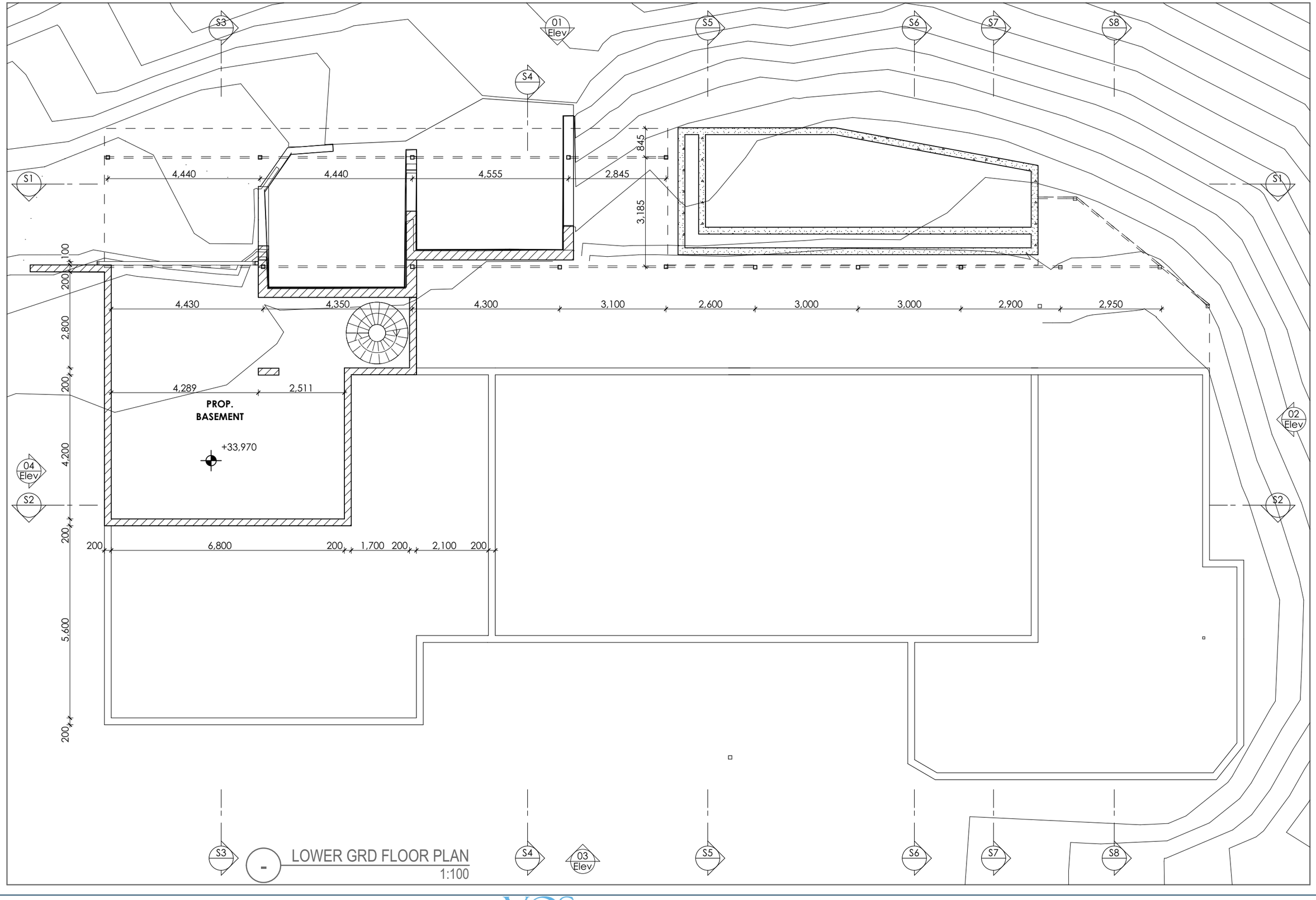
MARK SHEARER & CARA BEADLE

36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)

S K E T C H D E S I G N

REV D
A3 SHEET
30/11/2020

2.0



LOWER GRD FLOOR PLAN
1:100

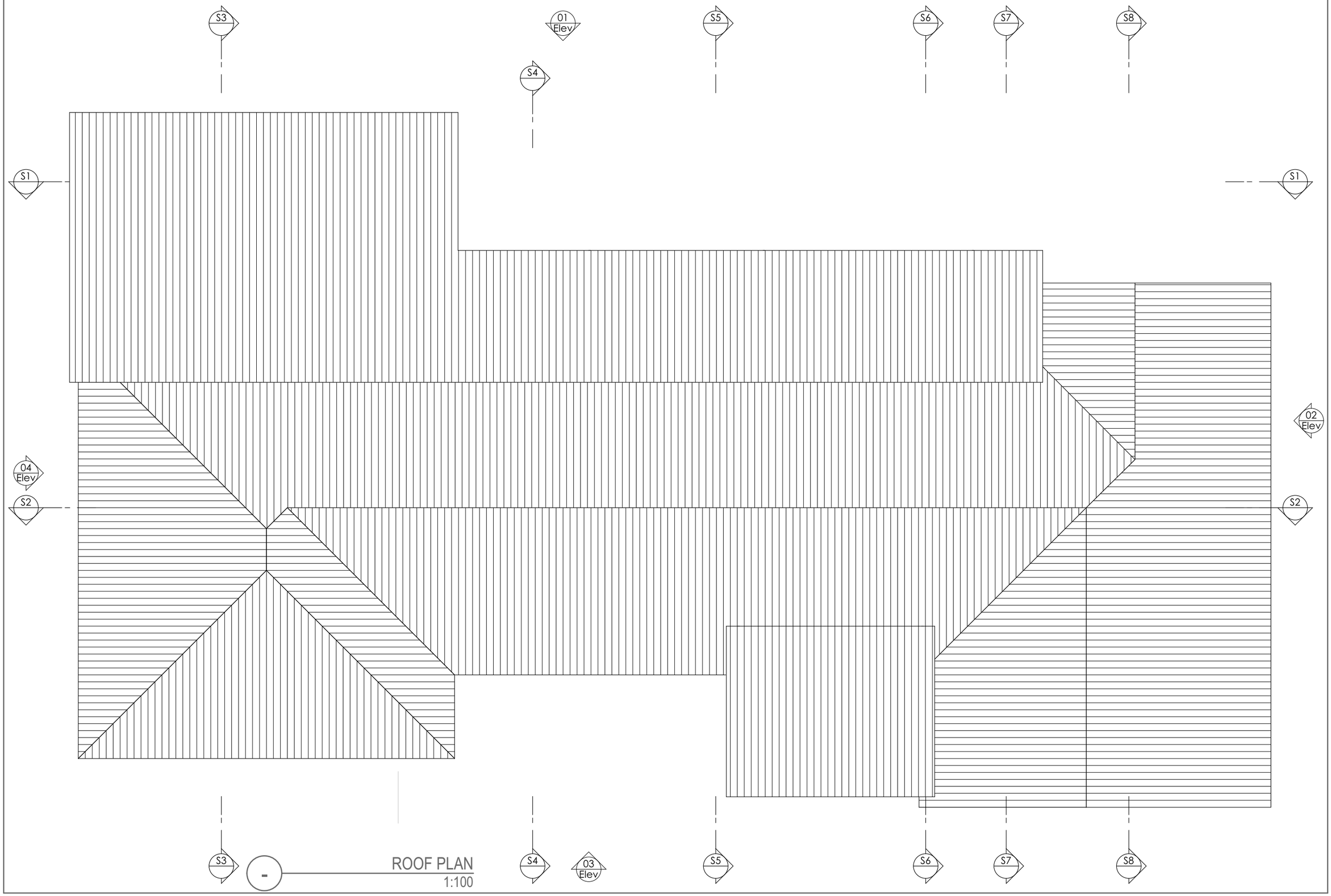
D E S I G N

S K E T C H

REV D
A3 SHEET
30/11/2020

danny VOS Architect
m 0415 300 748

P R O P O S E D R E N O V A T I O N
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)



ROOF PLAN
1:100

SKETCH DESIGN

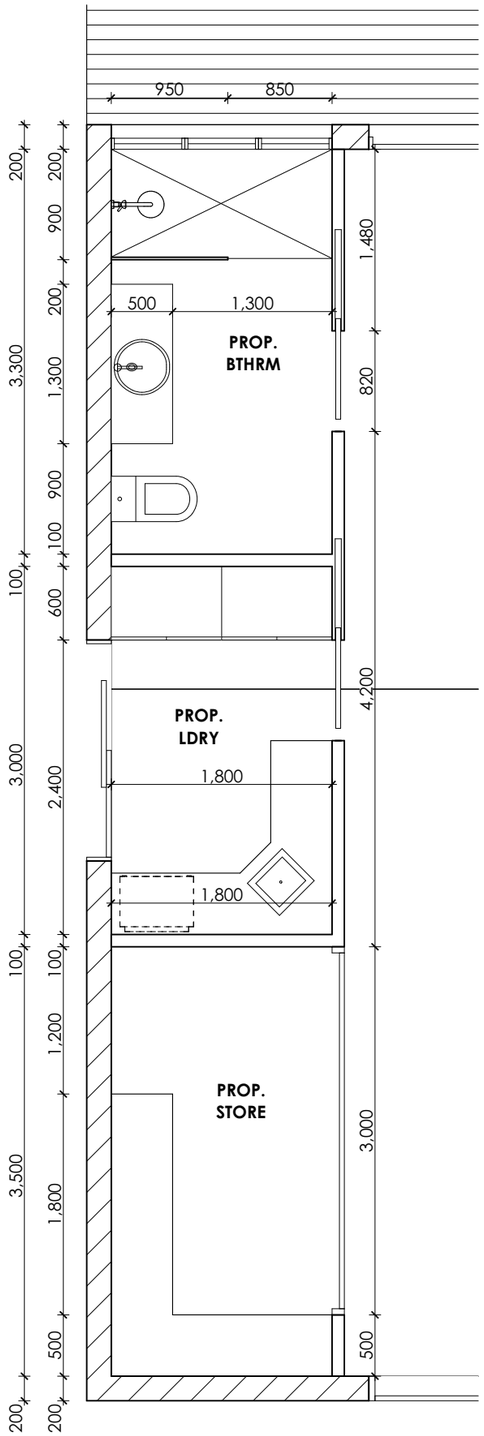
REV D
A3 SHEET
30/11/2020

danny VOS Architect
m 0415 300 748

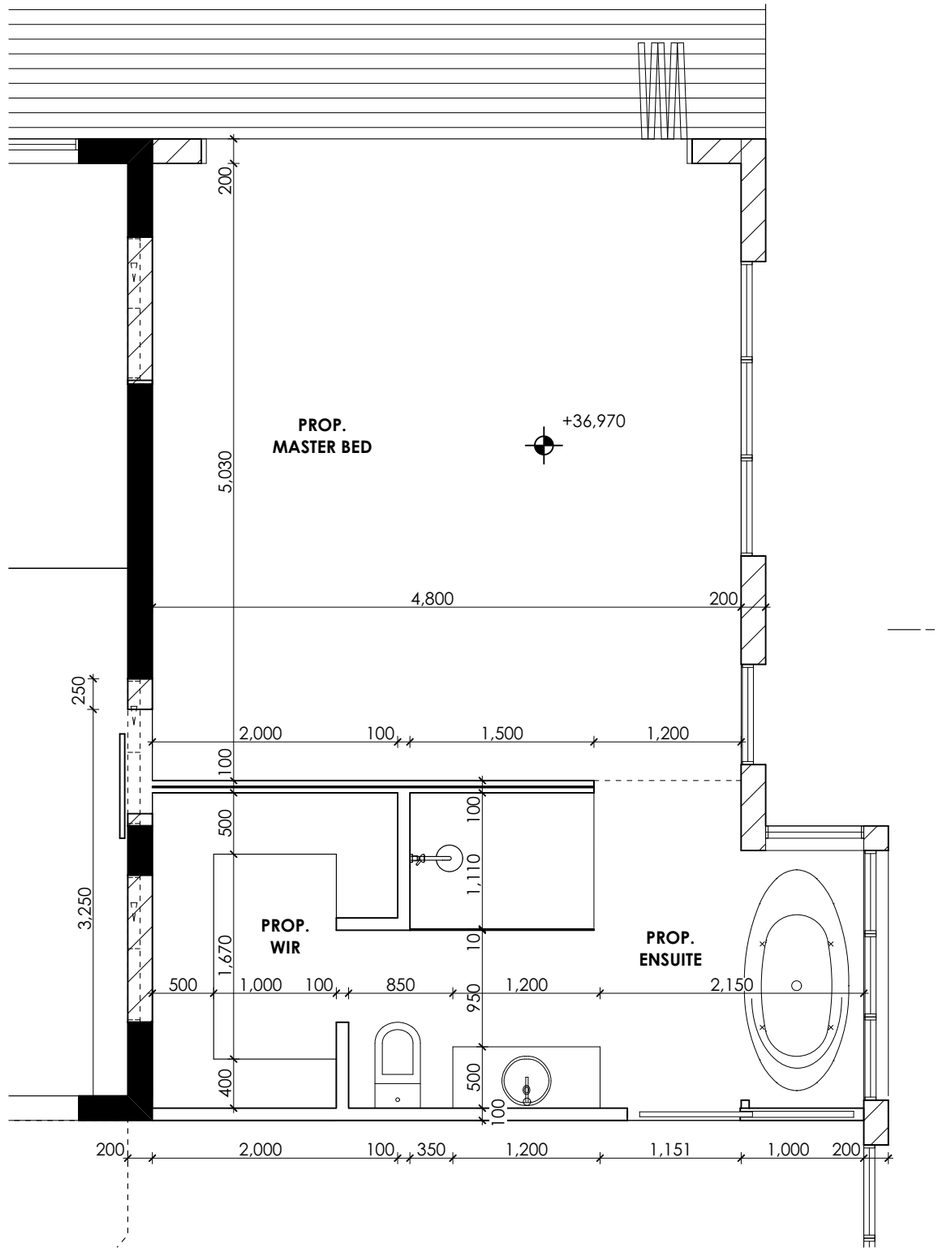
PROPOSED RENOVATION

MARK SHEARER & CARA BEADLE

36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)



BTHRM/LDRY/STORE
1:50



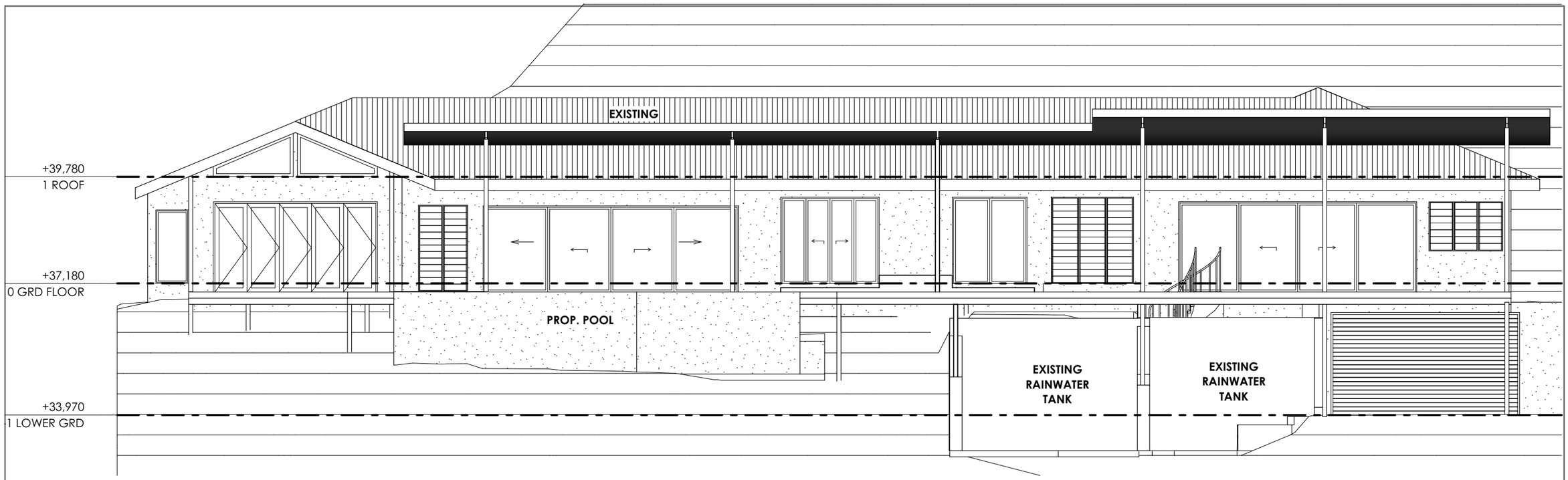
ENSUITE/WIR
1:50

DESIGN SKETCH

REV D
A3 SHEET
30/11/2020

danny VOS Architect
m 0415 300 748

PROPOSED RENOVATION
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)



PROPOSED ELEV 01
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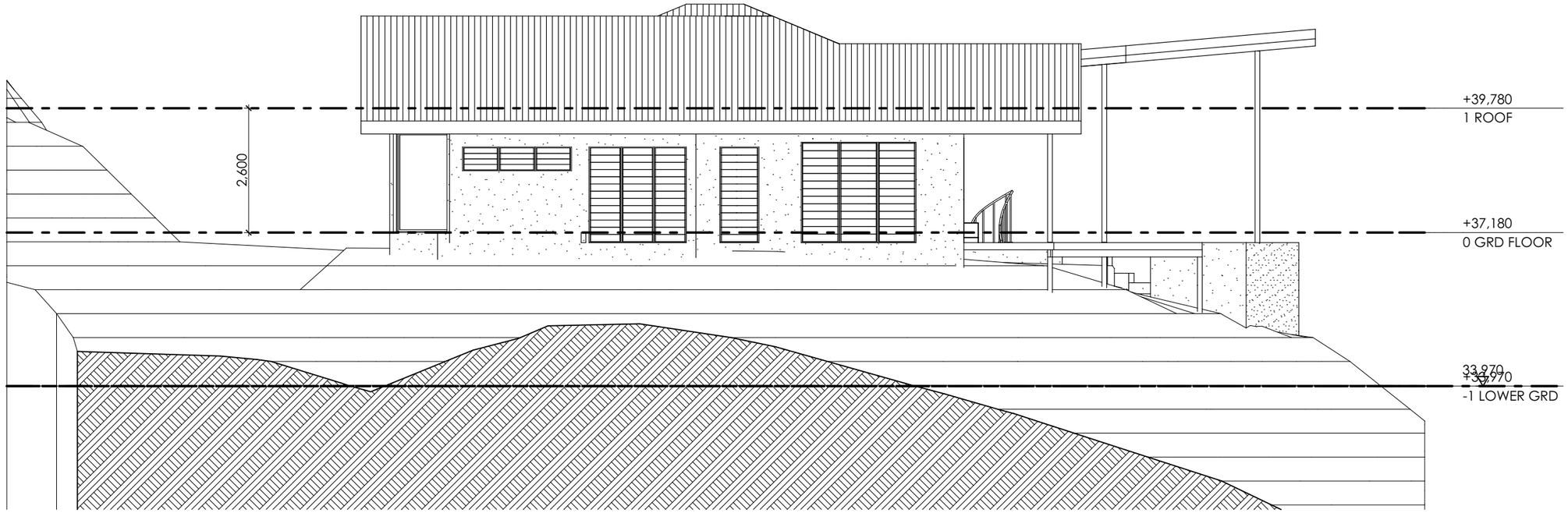


PROPOSED ELEV 02
1:100

D E S I G N

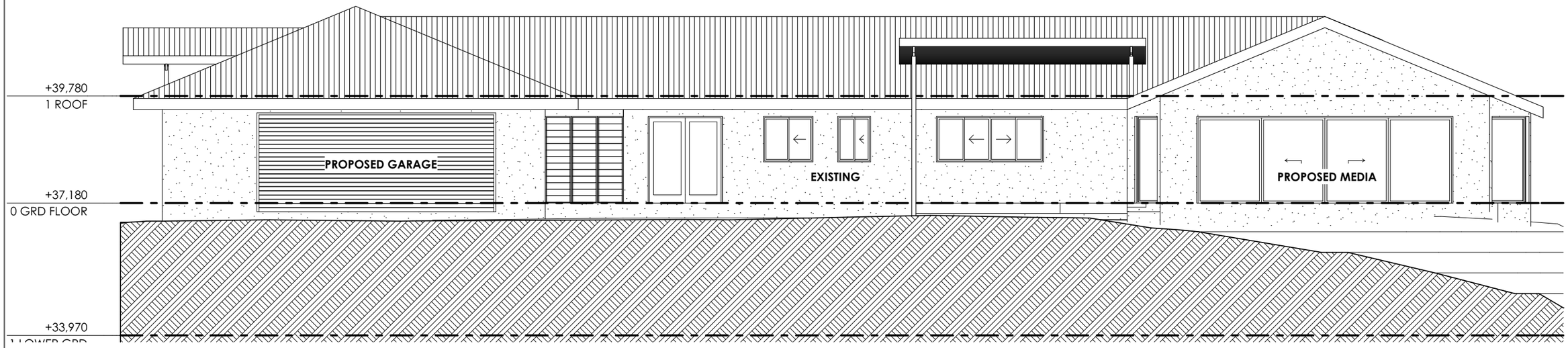
S K E T C H

REV D
A3 SHEET
30/11/2020

3.0

danny VOS Architect
m 0415 300 748

P R O P O S E D R E N O V A T I O N
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)



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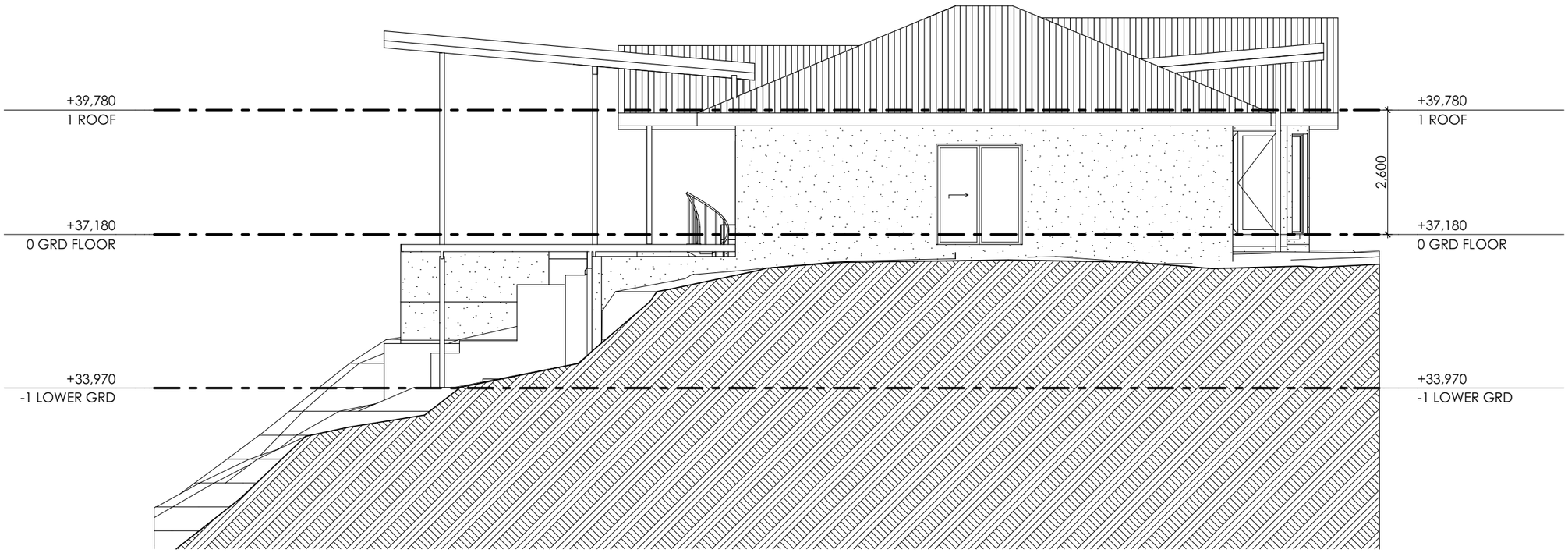

- PROPOSED ELEV 04
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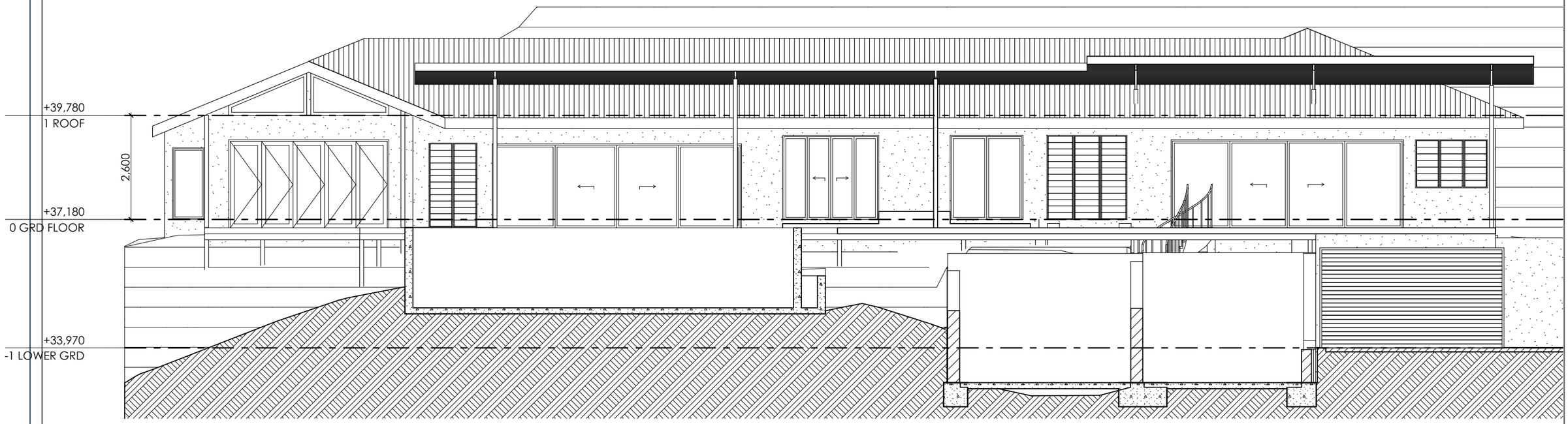
DESIGN SKETCH

REV D
A3 SHEET
30/11/2020

danny VOS Architect
m 0415 300 748

PROPOSED RENOVATION
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)



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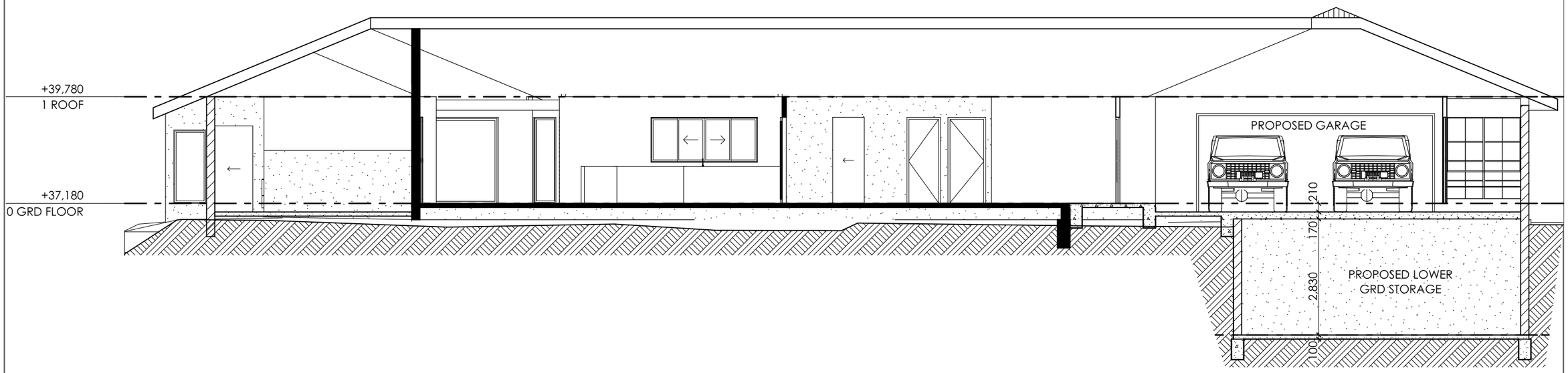


SECTION 02
1:100

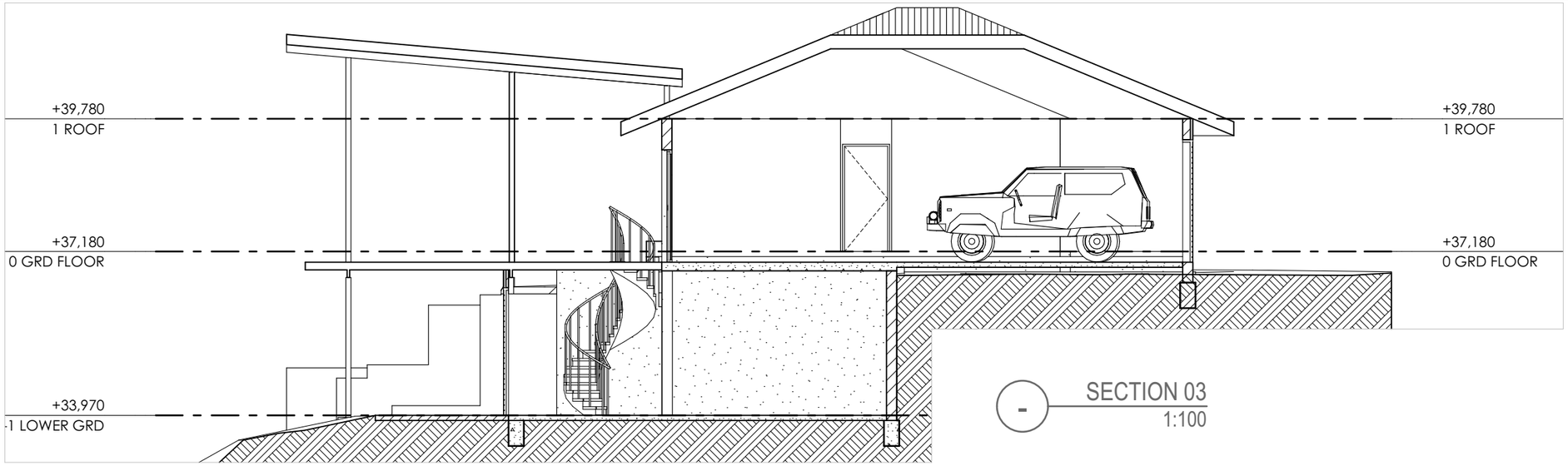
D E S I G N

S K E T C H

REV D
A3 SHEET
30/11/2020

danny VOS Architect
m 0415 300 748

P R O P O S E D R E N O V A T I O N
M A R K S H E A R E R & C A R A B E A D L E
3 6 R O C E A N V I E W R O A D , K I L L A L O E (L o t 1 4 o n R P 7 4 5 0 9 7)



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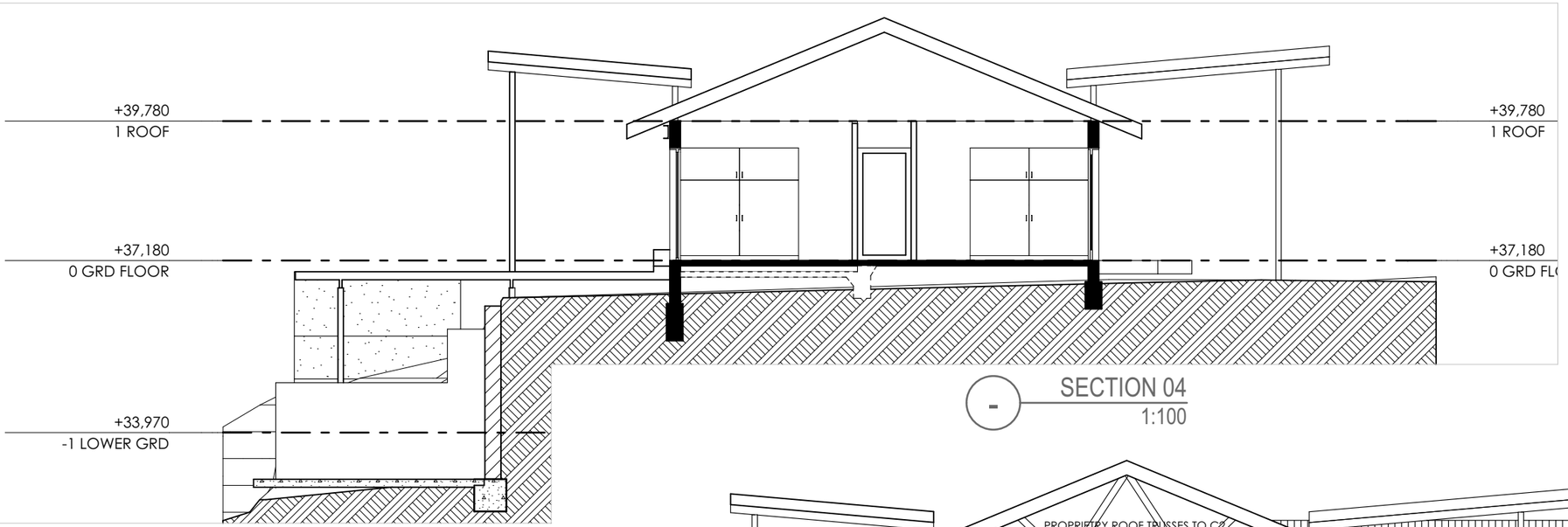

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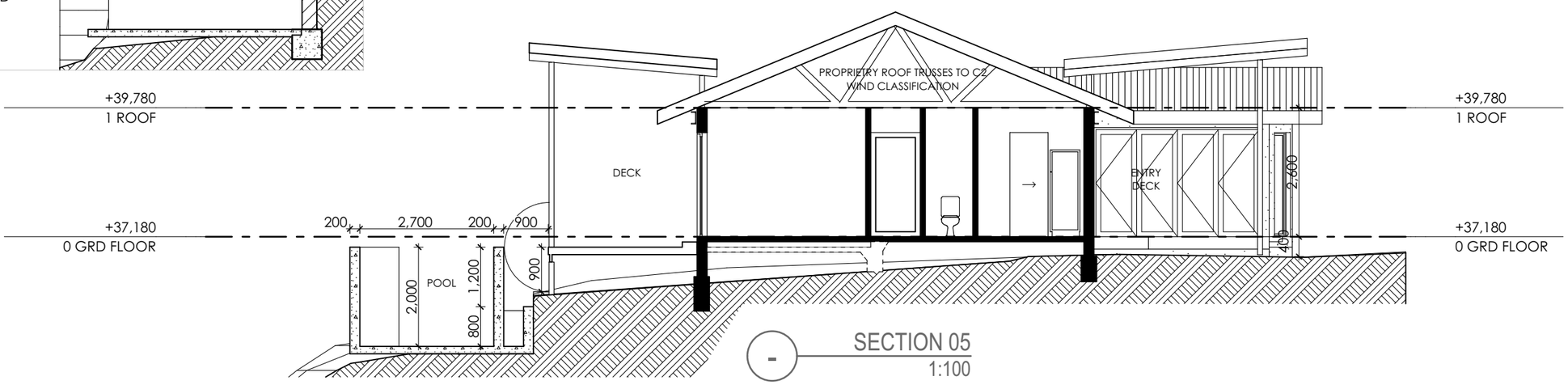


SECTION 05
1:100

D E S I G N

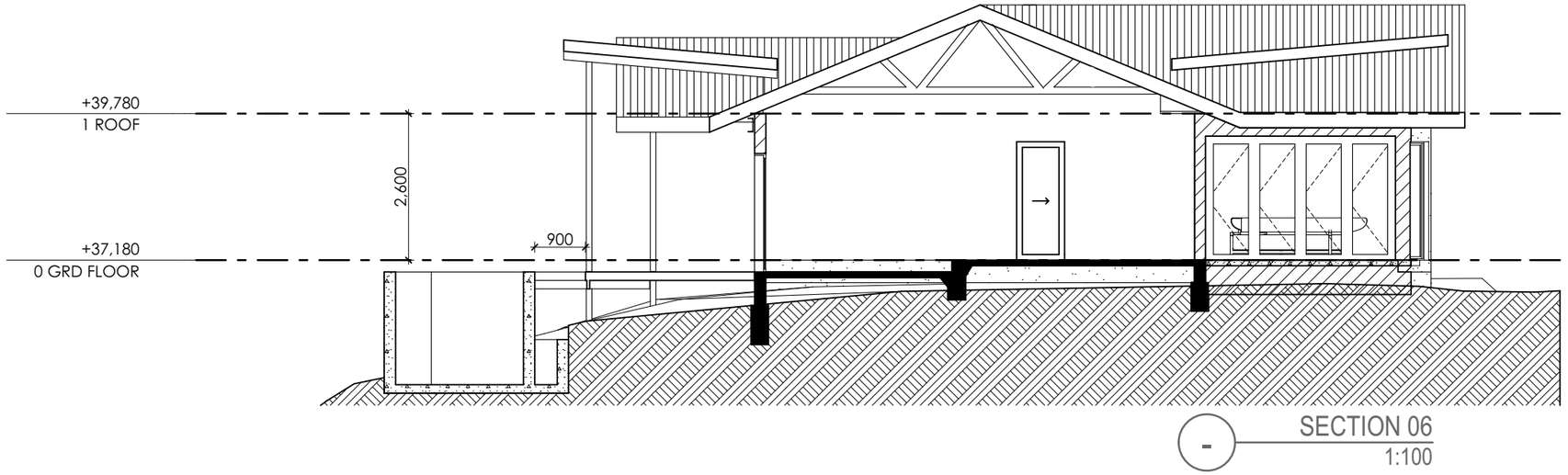
S K E T C H

REV D
A3 SHEET
30/11/2020

4.1

danny VOS
Architect
m 0415 300 748

P R O P O S E D R E N O V A T I O N
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)



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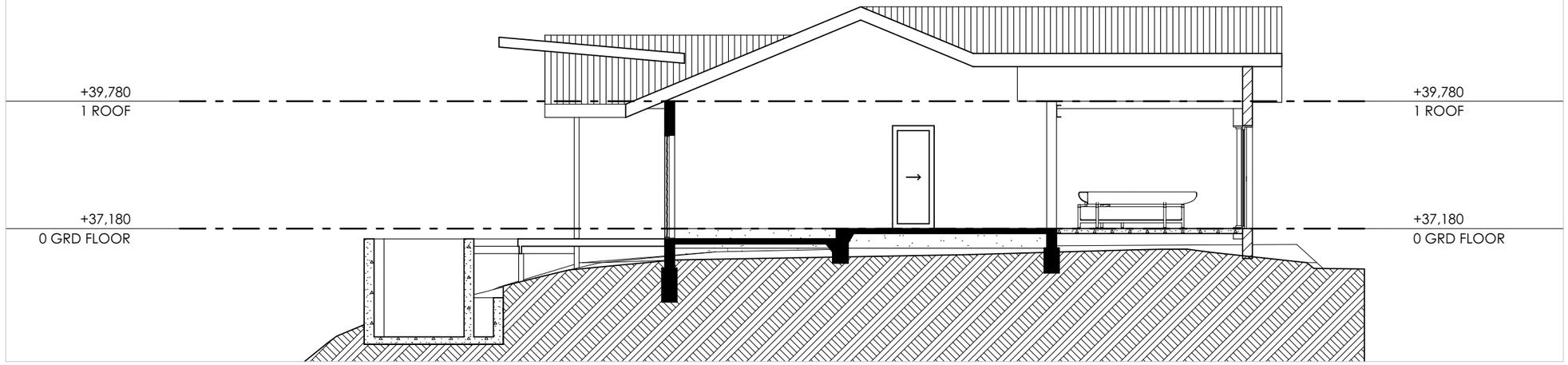

SECTION 07
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D E S I G N

S K E T C H

REV D
A3 SHEET
30/11/2020

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m 0415 300 748

P R O P O S E D R E N O V A T I O N
MARK SHEARER & CARA BEADLE
36R OCEAN VIEW ROAD, KILLALOE (Lot 14 on RP 745 097)

Appendix 3.

PLANNING BENCHMARK ASSESSMENT

6.2.4 Environmental management zone code

6.2.6.1 Application

(1) This code applies to assessing development in the Environmental management zone.

(2) When using this code, reference should be made to Part 5.

6.2.4.2 Purpose

(1) The purpose of the Environmental management zone code is to recognise environmentally sensitive areas and provide for houses on lots and other low impact activities where suitable.

These areas are protected from intrusion of any urban, suburban, centre or industrial land use.

(2) The local government purpose of the code is to:

(a) implement the policy direction set in the Strategic Framework, in particular:

(i) Theme 2 : Environment and landscape values, Element 3.5.3 – Biodiversity, Element 3.5.5 – Scenic amenity.

(b) protect and buffer areas of environmental significance from inappropriate development.

(3) The purpose of the code will be achieved through the following overall outcomes:

(a) Development is generally restricted to a dwelling house;

(b) Adverse impacts on natural systems, both on-site and on adjoining land are minimised through the location, design and management of development;

(c) Development reflects and responds to the natural features and environmental values of the area;

(d) Visual impacts are minimised through the location and design of development;
(e) Development does not adversely affect water quality;
(f) Development responds to land constraints, including but not limited to topography, vegetation, bushfire, landslide and flooding.

6.2.4.3 Criteria for assessment

Table 6.2.4.3.a – Environmental management zone – assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
PO1 The height of all buildings and structures is in keeping with the natural characteristics of the site. Buildings and structures are low-rise and not unduly visible from external sites	**AO1** Buildings and structures are not more than 8.5 metres and two storeys in height. Note – Height is inclusive of the roof height.	**Complies with AO1** The proposed Dwelling House extension would have a maximum height of 7.5 metres.
	AO1.2 Buildings have a roof height not less than 2 metres	**Complies with AO1.2** The roof height would not exceed 2 metres.
PO2	**AO2**	**Complies with PO2**

Performance outcomes	Acceptable outcomes	Compliance
Buildings and structures are set back to: (a) maintain the natural character of the area; (b) achieve separation from neighbouring buildings and from road frontages	Buildings and structures are set back not less than: (a) 40 metres from the frontage of a state controlled road; (b) 25 metres from the frontage to Cape Tribulation Road; (c) 6 metres from any other road; (d) 6 metres from the side and rear boundaries of the site.	The proposed Dwelling House extension would maintain a setback of greater than 6 metres to the property frontage, however, it would result in the front deck being 3.426 metres from the eastern side boundary. Notwithstanding that the side setback is less than the accepted 6 metres, the proposed setback would provide for the Dwelling House extension to be accommodated within an existing cleared area, maintaining the character of the area, and would not result in an unacceptable separation distance to neighbouring buildings. The setback would also be consistent with the built form on adjacent sites which have buildings constructed less than 6 metres to the side boundaries.
For assessable development		
PO3 Development is consistent with the purpose of the Environmental management zone and protects the zone from the intrusion of inconsistent uses.	**AO3** Inconsistent uses as identified in Table 6.2.4.3.b are not established in the Environmental management zone.	**Complies with AO3** A Dwelling House is not identified as an inconsistent use.

Performance outcomes	Acceptable outcomes	Compliance
PO4 The site coverage of all buildings and structures and associated services do not have an adverse effect on the environmental or scenic values of the site.	**AO4** No acceptable outcomes are prescribed.	**Complies with PO4** The Dwelling House extension, in the context of a 1.3 hectare site, would not result in a site coverage that would adversely affect the environmental or scenic values.
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 – Site assessments provides guidance on identifying the characteristics, features and constraints of a site and its surrounds.	**AO5.1** Buildings, structures and associated access, infrastructure and private open space are sited: (a) within areas of the site which are already cleared; or (b) within areas of the site which are environmentally degraded; (c) to minimise additional vegetation clearing.	**Complies with AO5.1** The Dwelling House extensions would be undertaken within existing cleared and disturbed areas.
	AO5.2	**Complies with AO5.2** The proposed extensions would be a continuation of the existing Dwelling House and would

Performance outcomes	Acceptable outcomes	Compliance
	Buildings and structures and associated infrastructure are not located on slopes greater than 1 in 6 (16.6%) or on a ridgeline	predominantly be accommodated within the existing building pad, where the slope doe sot exceed 1 in 6 and is below the ridgeline.
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.	**Not applicable** Complies with AO5.2.
	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.	**Complies with AO6.2** The vehicle parking and manoeuvring areas would be contained within the existing approved areas.
PO7	**AO7**	**Able to comply with AO7**

Performance outcomes	Acceptable outcomes	Compliance
The exterior finishes of buildings and structures are consistent with the surrounding natural environment	The exterior finishes and colours of buildings and structures are non-reflective and are moderately dark to darker shades of grey, green, blue and brown or the development is not visible external to the site.	Council are invited to attach a condition to any approval granted to secure compliance.
PO8 Development does not adversely affect the amenity of the zone and adjoining land uses in terms of traffic, noise, dust, odour, lighting or other physical or environmental impacts.	**AO8** No acceptable outcomes are prescribed.	**Complies with PO8** The proposed development would not involve a change in use to the existing lawful use or the generation of additional traffic, noise, dust or other environmental impacts.
PO9 The density of development ensures that the environmental and scenic amenity values of the site and surrounding area are not adversely affected.	**AO9** The maximum residential density is one dwelling house per lot.	**Complies with AO9** Only a single Dwelling House is proposed.
PO10 Lot reconfiguration results in no additional lots.	**AO10** No acceptable outcomes are prescribed**.**	**Not applicable** No lot reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
Note - Boundary realignments to resolve encroachments and lot amalgamation are considered appropriate.		

Table 6.2.4.3.b — Inconsistent uses within the Environmental management zone.

Inconsistent uses		
• Adult store • Agricultural supplies store • Air services • Aquaculture • Bar • Brothel • Bulk landscape supplies • Car wash • Caretaker's accommodation • Cemetery • Child care centre • Club • Community care centre • Community residence • Community use • Crematorium • Cropping	• Hardware and trade supplies • Health care services • High impact industry • Hospital • Hotel • Indoor sport and entertainment • Intensive animal industry • Intensive horticulture • Landing • Low impact industry • Major electricity infrastructure • Major sport, recreation and entertainment facility • Marine industry • Market • Motor sport facility • Multiple dwelling	• Renewable energy facility • Relocatable home park • Research and technology industry • Residential care facility • Resort complex • Retirement facility • Rooming accommodation • Rural industry • Rural workers accommodation • Sales office • Service Station • Shop • Shopping centre • Short-term accommodation • Showroom • Special industry • Substation

• Detention facility • Dual occupancy • Dwelling unit • Educational establishment • Food and drink outlet • Function facility • Garden centre	• Nightclub entertainment facility • Office • Outdoor sales • Outstation • Parking station • Place of worship • Port services	• Theatre • Transport depot • Utility installation • Veterinary services • Warehouse • Wholesale nursery • Winery

Note – This table does not imply that all other uses not listed in the table are automatically consistent uses within the zone. Assessable development must still demonstrate consistency through the assessment process.

8.2.2 Bushfire hazard overlay code

Note - Land shown on the bushfire hazard overlay map is designated as the bushfire prone area for the purposes of section 12 of the Building Regulations 2006. The bushfire hazard area (bushfire prone area) includes land covered by the high and medium hazard areas as well as the buffer area category on the overlay map.

8.2.2.1 Application

(1) This code applies to assessing a material change of use, reconfiguring a lot, operational works or building work in the Bushfire hazard overlay, if:
   (a) self-assessable or assessable where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
   (b) impact assessable development.

(2) Land in the Bushfire hazard overlay is identified on the Bushfire hazard overlay map in Schedule 2 and includes the following sub-categories:
   (a) Medium bushfire risk sub-category;
   (b) High bushfire risk sub-category;
   (c) Very high bushfire risk sub-category;
   (d) Potential impact buffer sub-category.

(3) When using this code, reference should be made to Part 5.

8.2.2.2 Purpose

(1) The purpose of the Bushfire overlay code is to:

   (a) implement the policy direction in the Strategic Framework, in particular:

(i) Theme 1 Settlement pattern: Element 3.4.7 Mitigation of hazards;
(ii) Theme 6 Infrastructure and transport: Element 3.9.2 Energy.

(b) enable an assessment of whether development is suitable on land within the Bushfire risk overlay sub-categories.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) development avoids the establishment or intensification of vulnerable activities within or near areas that are subject to bushfire hazard;
(b) development is designed and located to minimise risks to people and property from bushfires;
(c) bushfire risk mitigation treatments are accommodated in a manner that avoids or minimises impacts on the natural environment and ecological processes;
(d) development involving the manufacture or storage of hazardous materials does not increase the risk to public safety or the environment in a bushfire event;
(e) development contributes to effective and efficient disaster management response and recovery capabilities.

Note - A site based assessment may ground-truth the extent of hazardous vegetation and extent and nature of the bushfire hazard area (bushfire prone area). Such assessments should be undertaken using the methodology set out in Planning scheme policy SC6.9 - Natural Hazards.

8.2.2.3 Criteria for assessment
Table 8.2.2.3.a – Bushfire hazard overlay code –assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
Compatible development		
PO1 A vulnerable use is not established or materially intensified within a bushfire hazard area (bushfire prone area) unless there is an overriding need or other exceptional circumstances. Note - See the end of this code for examples of vulnerable uses.	**AO1** Vulnerable uses are not established or expanded. Note – Where, following site inspection and consultation with Council, it is clear that the mapping is in error in identifying a premises as being subject to a medium, high, very high bushfire hazard or potential impact buffer sub-category, Council may supply a letter exempting the need for a Bushfire Management Plan. Note – Where the assessment manager has not previously approved a Bushfire Management Plan (either by condition of a previous development approval), the development proponent will be expected to prepare such a plan. Note – Planning scheme policy SC6.9 - Natural hazards, provides a guide to the preparation of a	**Complies with AO1** The proposal does not involve a vulnerable use.

Performance outcomes	Acceptable outcomes	Compliance
	Bushfire Management Plan.	
PO2 Emergency services and uses providing community support services are able to function effectively during and immediately after a bushfire hazard event.	**AO2** Emergency Services and uses providing community support services are not located in a bushfire hazard sub-category and have direct access to low hazard evacuation routes.	**Not applicable** The proposal does not involve an emergency service or community support service.
PO3 Development involving hazardous materials manufactured or stored in bulk is not located in bushfire hazard sub-category.	**AO3** The manufacture or storage of hazardous material in bulk does not occur within bushfire hazard sub-category.	**Complies with AO3** The proposal does not involve the manufacture or storage of hazardous materials.
Development design and separation from bushfire hazard – reconfiguration of lots		
PO4.1 Where reconfiguration is undertaken in an urban area or is for urban purposes or smaller scale rural residential purposes, a separation distance from hazardous vegetation is provided to achieve a radiant heat flux level of 29kW/m^2 at the edge of	**AO4.1** No new lots are created within a bushfire hazard sub-category. or	**Not applicable** No reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
the proposed lot(s). Note - "Urban purposes" and "urban area" are defined in the *Sustainable Planning Regulations 2009*. Reconfiguration will be taken to be for rural residential purposes where proposed lots are between 2000m^2 and 2ha in area. "Smaller scale" rural residential purposes will be taken to be where the average proposed lot size is 6000m2 or less. Note - The radiant heat levels and separation distances are to be established in accordance with method 2 set out in AS3959-2009.		
PO4.2 Where reconfiguration is undertaken for other purposes, a building envelope of reasonable dimensions is provided on each lot which achieves radiant heat flux level of 29kW/m^2 at any point.	**AO4.2** Lots are separated from hazardous vegetation by a distance that: (a) achieves radiant heat flux level of 29kW/m^2 at all boundaries; and (b) is contained wholly within the development site. Note - Where a separation distance is proposed to be achieved by utilising existing cleared developed areas	**Not applicable** No reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
	external to the site, certainty must be established (through tenure or other means) that the land will remain cleared of hazardous vegetation. For staged developments, temporary separation distances, perimeter roads or fire trails may be absorbed as part of subsequent stages. Note - The achievement of a cleared separation distance may not be achievable where other provisions within the planning scheme require protection of certain ecological, slope, visual or character features or functions.	
PO5 Where reconfiguration is undertaken in an urban area or is for urban purposes, a constructed perimeter road with reticulated water supply is established between the lots and the hazardous vegetation and is readily accessible at all times for urban fire fighting vehicles. The access is available for both fire fighting and	**AO5.1** Lot boundaries are separated from hazardous vegetation by a public road which: (a) has a two lane sealed carriageway; (b) contains a reticulated water supply; (c) is connected to other public roads at both ends and at intervals of no more than 500m; (d) accommodates geometry and turning radii in accordance with Queensland Fire and	**Not applicable** No reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
maintenance/defensive works.	Emergency Services' Fire Hydrant and Vehicle Access Guidelines; (e) has a minimum of 4.8m vertical clearance above the road; (f) is designed to ensure hydrants and water access points are not located within parking bay allocations; and (g) incorporates roll-over kerbing.	
	AO5.2 Fire hydrants are designed and installed in accordance with AS2419.1 2005, unless otherwise specified by the relevant water entity. Note - Applicants should have regard to the relevant standards set out in the reconfiguration of a lot code and works codes in this planning scheme.	**Not applicable** No reconfiguration is proposed.
PO6 Where reconfiguration is undertaken for smaller scale rural residential purposes, either a constructed perimeter road or a formed, all	**AO6** Lot boundaries are separated from hazardous vegetation by a public road or fire trail which has: (a) a reserve or easement width of at least 20m;	**Not applicable** No reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
weather fire trail is established between the lots and the hazardous vegetation and is readily accessible at all times for the type of fire fighting vehicles servicing the area. The access is available for both fire fighting and maintenance/hazard reduction works.	(b) a minimum trafficable (cleared and formed) width of 4m capable of accommodating a 15 tonne vehicle and which is at least 6m clear of vegetation; (c) no cut or fill embankments or retaining walls adjacent to the 4m wide trafficable path; (d) a minimum of 4.8m vertical clearance; (e) turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; (f) a maximum gradient of 12.5%; (g) a cross fall of no greater than 10 degrees; (h) drainage and erosion control devices in accordance with the standards prescribed in a planning scheme policy; (i) vehicular access at each end which is connected to the public road network at intervals of no more than 500m;	

Performance outcomes	Acceptable outcomes	Compliance
	(j) designated fire trail signage; (k) if used, has gates locked with a system authorised by Queensland Fire and Emergency Services; and (l) if a fire trail, has an access easement that is granted in favour of Council and Queensland Fire and Emergency Services.	
PO7 Where reconfiguration is undertaken for other purposes, a formed, all weather fire trail is provided between the hazardous vegetation and either the lot boundary or building envelope, and is readily accessible at all times for the type of fire fighting vehicles servicing the area. However, a fire trail will not be required where it would not serve a practical fire management purpose.	**AO7** Lot boundaries are separated from hazardous vegetation by a public road or fire trail which has: (a) a reserve or easement width of at least 20m; (b) a minimum trafficable (cleared and formed) width of 4m capable of accommodating a 15 tonne vehicle and which is at least 6m clear of vegetation; (c) no cut or fill embankments or retaining walls adjacent to the 4m wide trafficable path; (d) a minimum of 4.8m vertical clearance; (e) turning areas for fire-fighting appliances in	**Not applicable** No reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
	accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; (f) a maximum gradient of 12.5%; (g) a cross fall of no greater than 10 degrees; (h) drainage and erosion control devices in accordance with the standards prescribed in a planning scheme policy; (i) vehicular access at each end which is connected to the public road network; (j) designated fire trail signage; (k) if used, has gates locked with a system authorised by Queensland Fire and Emergency Services; and (l) if a fire trail, has an access easement that is granted in favour of Council and Queensland Fire and Emergency Services.	
PO8 The development design responds to the potential	**AO8** The lot layout:	**Not applicable** No reconfiguration is proposed.

Performance outcomes	Acceptable outcomes	Compliance
threat of bushfire and establishes clear evacuation routes which demonstrate an acceptable or tolerable risk to people.	(a) minimises the length of the development perimeter exposed to, or adjoining hazardous vegetation; (b) avoids the creation of potential bottle-neck points in the movement network; (c) establishes direct access to a safe assembly /evacuation area in the event of an approaching bushfire; and (d) ensures roads likely to be used in the event of a fire are designed to minimise traffic congestion. Note - For example, developments should avoid finger-like or hour-glass subdivision patterns or substantive vegetated corridors between lots. In order to demonstrate compliance with the performance outcome, a bushfire management plan prepared by a suitably qualified person may be required. The bushfire management plan should be developed in accordance with the Public Safety Business Agency (PSBA) guideline entitled "Undertaking a Bushfire Protection Plan.	

Performance outcomes	Acceptable outcomes	Compliance
	Advice from the Queensland Fire and Emergency Services (QFES) should be sought as appropriate	
PO9 Critical infrastructure does not increase the potential bushfire hazard.	**AO9** Critical or potentially hazardous infrastructure such as water supply, electricity, gas and telecommunications are placed underground.	**Not applicable** No reconfiguration is proposed.
Development design and separation from bushfire hazard – material change of use		
PO10 Development is located and designed to ensure proposed buildings or building envelopes achieve a radiant heat flux level at any point on the building or envelope respectively, of: (e) 10kW/m^2 where involving a vulnerable use; or (f) 29kW/m^2 otherwise. The radiant heat flux level is achieved by separation unless this is not practically achievable. Note - The radiant heat levels and separation distances are to be established in accordance with method 2 set	**AO10** Buildings or building envelopes are separated from hazardous vegetation by a distance that: (a) achieves a radiant heat flux level of at any point on the building or envelope respectively, of 10kW/m^2 for a vulnerable use or 29kW/m^2 otherwise; and (b) is contained wholly within the development site. Note - Where a separation distance is proposed to be achieved by utilising existing cleared developed areas external to the site, certainty must be established	**Not applicable** No material change of use is proposed.

Performance outcomes	Acceptable outcomes	Compliance
out in AS3959-2009.	(through tenure or other means) that the land will remain cleared of hazardous vegetation. For staged developments, temporary separation distances, perimeter roads or fire trails may be absorbed as part of subsequent stages. Note - The achievement of a cleared separation distance may not be achievable where other provisions within the planning scheme require protection of certain ecological, slope, visual or character features or functions.	
PO11 A formed, all weather fire trail is provided between the hazardous vegetation and the site boundary or building envelope, and is readily accessible at all times for the type of fire fighting vehicles servicing the area. However, a fire trail will not be required where it would not serve a practical fire management purpose.	**AO11** Development sites are separated from hazardous vegetation by a public road or fire trail which has: (a) a reserve or easement width of at least 20m; (b) a minimum trafficable (cleared and formed) width of 4m capable of accommodating a 15 tonne vehicle and which is at least 6m clear of vegetation; (c) no cut or fill embankments or retaining walls adjacent to the 4m wide trafficable path;	**Not applicable** No material change of use is proposed.

Performance outcomes	Acceptable outcomes	Compliance
Note - Fire trails are unlikely to be required where a development site involves less than 2.5ha	(d) a minimum of 4.8m vertical clearance; (e) turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; (f) a maximum gradient of 12.5%; (g) a cross fall of no greater than 10 degrees; (h) drainage and erosion control devices in accordance with the standards prescribed in a planning scheme policy; (i) vehicular access at each end which is connected to the public road network which is connected to the public road network at intervals of no more than 500m; (j) designated fire trail signage; (k) if used, has gates locked with a system authorised by Queensland Fire and Emergency Services; and (l) if a fire trail, has an access easement that is	

Performance outcomes	Acceptable outcomes	Compliance
	granted in favour of Council and Queensland Fire and Emergency Services.	
All development		
PO12 All premises are provided with vehicular access that enables safe evacuation for occupants and easy access by fire fighting appliances.	**AO12** Private driveways: (a) do not exceed a length of 60m from the street to the building; (b) do not exceed a gradient of 12.5%; (c) have a minimum width of 3.5m; (d) have a minimum of 4.8m vertical clearance; (e) accommodate turning areas for fire-fighting appliances in accordance with Queensland Fire and Emergency Services' Fire Hydrant and Vehicle Access Guidelines; and (f) serve no more than 3 dwellings or buildings.	**Not applicable** The site is serviced by an existing and lawfully constructed driveway that would not be altered as part of the proposed development.
PO13 Development outside reticulated water supply	**AO13** A water tank is provided within 10m of each	**Complies with AO13** The existing development is provided with two

Performance outcomes	Acceptable outcomes	Compliance
areas includes a dedicated static supply that is available solely for fire fighting purposes and can be accessed by fire fighting appliances.	building (other than a class 10 building) which: (a) is either below ground level or of non-flammable construction; (b) has a take off connection at a level that allows the following dedicated, static water supply to be left available for access by fire fighters: (i) 10,000l for residential buildings Note – A minimum of 7,500l is required in a tank and the extra 2,500l may be in the form of accessible swimming pools or dams (ii) 45,000l for industrial buildings; and (iii) 20,000l for other buildings; (c) includes shielding of tanks and pumps in accordance with the relevant standards; (d) includes a hardstand area allowing medium rigid vehicle (15 tonne fire appliance) access within 6m of the tank; (e) is provided with fire brigade tank fittings – 50mm ball valve and male camlock coupling and, if underground, an access hole of 200mm	rainwater tanks that would be retained as part of the Dwelling House extension and would be provided with a swimming pool.

Performance outcomes	Acceptable outcomes	Compliance
	(minimum) to accommodate suction lines; and (f) is clearly identified by directional signage provided at the street frontage.	
PO14 Landscaping does not increase the potential bushfire risk.	**AO14** Landscaping uses species that are less likely to exacerbate a bushfire event and does not increase fuel loads within separation areas.	**Not applicable** No additional landscaping is proposed.
PO15 The risk of bushfire and the need to mitigate that risk is balanced against other factors (such as but not limited to, biodiversity or scenic amenity).	**AO15** Bushfire risk mitigation treatments do not have a significant impact on the natural environment or landscape character of the locality where this has value.	**Not applicable** No bushfire risk mitigation measures are proposed.

8.2.5 Hillslopes overlay code

8.2.5.1 Application

(1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Hillslopes overlay, if:

(a) self assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;
(b) impact assessable development.

(2) Land in the Hillslopes overlay is identified on the Hillslopes overlay map in Schedule 2 and includes the following sub-categories:
(a) Hillslopes constraint sub-category.

(3) When using this code, reference should be made to Part 5.

8.2.5.2 Purpose

(1) The purpose of the Hillslopes overlay code is to:

(a) implement the policy direction in the Strategic Framework, in particular:

(i) Theme 1 - Settlement pattern: Element 3.4.7 Mitigation of hazards;
(ii) Theme 2 – Environment and landscape values: Element 3.5.5 Scenic amenity.

(b) enable an assessment of whether development is suitable on land within the Hillslopes sub-categories.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) development on hillslopes is safe, serviceable and accessible;
(b) the ecological values, landscape character and visual quality of the hillslopes are protected from development so as to retain the scenic backdrop to the region;
(c) Development on hillslopes is appropriate, having regard to the topographic constraints and environmental characteristics of the land;
(d) Development responds to the constraints of the site including gradient and slope stability;
(e) Works do not involve complex engineering solutions.

8.2.5.3 Criteria for assessment

Table 8.2.5.3.a – Hillslopes overlay code –assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable development		
PO1 The landscape character and visual amenity quality of hillslopes areas is retained to protect the scenic backdrop to the region.	**AO1.1** Development is located on parts of the site that are not within the Hillslopes constraint subcategory as shown on the Hillslopes overlay Maps contained in schedule 2.	**Complies with PO1** The proposal is for an extension to an existing Dwelling House with the extension being provided predominantly within the existing building pad and disturbed area. The proposal would not result in a significantly greater visual impact than the existing development and would retain the quality of the scenic backdrop to the region.

For assessable development		
PO2 The landscape character and visual amenity quality of hillslopes areas is retained to protect the scenic backdrop to the region	**AO2.1** Development does not occur on land with a gradient in excess of 1 in 6 (16.6%)	**Complies with AO2.1** The development would occur on the existing benched area on site.
	or **AO2.2** Where development on land steeper than 1 in 6 (16.6%) cannot be avoided, development follows the natural contours of the site.	**Not applicable** Complies with AO2.1
	AO2.3 Access ways and driveways are: (a) constructed with surface materials that blend with the surrounding environment; (b) landscaped with dense planting to minimise the visual impact of the construction; (c) provided with erosion control measures immediately after construction.	**Not applicable** Access would be provided by the existing and lawfully constructed driveway.
	AO2.4	**Complies with AO2.4**

	The clearing or disturbance of vegetation is limited to clearing and disturbance that: (a) is necessary for the construction of driveways; (b) is necessary to contain the proposed development; (c) minimises canopy clearing or disturbance; (d) minimises riparian clearing or disturbance.	Vegetation disturbance would be limited to the building works area.
	AO2.5 On land with slopes greater than 1 in 6 (16.6%) or greater, alternative construction methods to concrete slab on ground are utilised (i.e. split level or post and beam constructed buildings that minimise modification to the natural terrain of the land).	**Complies with AO2.5** The development would generally occur on land with a slope of less than 1 in 6. Development in sloping land would be post and beam construction.
	AO2.6 Development does not alter the sky line.	**Complies with AO2.6** The Dwelling House extension would not result in a greater impact than the existing development and is not located above the ridgeline.

	AO2.7 Buildings and structures: (a) are finished predominantly in the following exterior colours or surfaces: (i) moderately dark to darker shades of olive green, brown, green, blue, or charcoal; or (ii) moderately dark to darker wood stains that blend with the colour and hues of the surrounding vegetation and landscape; (b) are not finished in the following exterior colours or surfaces: (i) pastel or terracotta colours, reds, yellows, shades of white or beige, or other bright colours that do not blend with the surrounding vegetation and landscape; (ii) reflective surfaces.	**Complies with AO2.7** The proposed Dwelling House extension would be finished to match the existing house.
	AO2.8	**Complies with AO2.8**

	Exterior colour schemes limit the use of white or other light colours to exterior trim and highlighting of architectural features	The proposed Dwelling House extension would be finished to match the existing house.
	AO2.9 Areas between the first floor (including outdoor deck areas) and ground level are screened from view.	**Complies with AO2.9** The areas beneath the decks would be screened from view by the proposed swimming pool and existing rain water tanks.
	AO2.10 Recreational or ornamental features (including tennis courts, ponds or swimming pools) do not occur on land: (a) with a gradient of 1 in 6 (16.6%) or more; (b) are designed to be sited and respond to the natural constraints of the land and require minimal earthworks.	**Complies with AO2.10** The proposed swimming pool would be located predominantly within the existing building pad.
PO3 Excavation or filling does not have an adverse impact on the amenity, safety, stability or function of the site or adjoining premises through:	**AO3** Excavation or fill: (a) is not more than 1.2 metres in height for each batter or retaining wall;	**Not applicable** No excavation or filling would occur outside the area of building works.

(a) loss of privacy; (b) loss of access to sunlight; (c) intrusion of visual or overbearing impacts; (d) complex engineering solutions.	(b) is setback a minimum of 2 metres from property boundaries; (c) is stepped with a minimum 2 metre wide berm to incorporate landscaping in accordance with Planning scheme policy SC6.7 – Landscaping; (d) does not exceed a maximum of 3 batters and 3 berms (i.e. not greater than 3.6 metres in height) on any one lot.	
Lot reconfiguration		
PO4 For development that involves reconfiguring a lot, lot layout and design is responsive to the natural constraints of the land and each lot is capable of being used for its intended purpose.	**AO4.1** The frontage and depth of all lots is of sufficient width to: (a) allow driveways to follow the natural contours of the site and not exceed a gradient of 1 in 6 (16.6%); (b) accommodate any changes in gradient between the road and lot within the lot boundary and not within the road reserve.	**Not applicable** No lot reconfiguration is proposed.

	AO4.2 Development does not create new lots containing land of greater than 1 in 6 (16.6%), except where a rectangular area of land of lesser grade is contained within the new lots to accommodate the intended land use, with the balance left in its natural state to the greatest extent possible. Note – The size of rectangular areas is outlined within each zone code.	**Not applicable** No lot reconfiguration is proposed.
	AO4.3 Development does not alter ridgelines.	**Not applicable** No lot reconfiguration is proposed.
	AO4.4 Lots are designed to ensure rooflines of future buildings and structures do not protrude above a ridgeline.	**Not applicable** No lot reconfiguration is proposed.

8.2.7 Natural areas overlay code

8.2.7.1 Application

(1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Natural areas overlay, if:

(a) self-assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;

(b) impact assessable development.

(2) Land in the Natural areas overlay is identified on the Natural areas overlay map in Schedule 2 and includes the following sub-categories:

(a) MSES – Protected area;
(b) MSES – Marine park;
(c) MSES – Wildlife habitat;
(d) MSES – Regulated vegetation;
(e) MSES – Regulated vegetation (intersecting a Watercourse);
(f) MSES – High ecological significance wetlands;
(g) MSES – High ecological value waters (wetlands);
(h) MSES – High ecological value waters (watercourse);
(i) MSES – Legally secured off set area.

Note – MSES = Matters of State Environmental Significance.

(3) When using this code, reference should be made to Part 5.

8.2.7.2 Purpose

(1) The purpose of the Natural areas overlay code is to:

(a) implement the policy direction in the Strategic Framework, in particular:
  (i) Theme 2: Environment and landscape values, Element 3.5.3 Biodiversity, Element 3.5.4 Coastal zones;
  (ii) Theme 3: Natural resource management Element 3.6.2 Land and catchment management, Element 3.6.3 Primary production, forestry and fisheries.
(b) enable an assessment of whether development is suitable on land within the Biodiversity area overlay sub-categories.

(2) The purpose of the code will be achieved through the following overall outcomes:
(a) development is avoided within:
  (i) areas containing matters of state environmental significance (MSES);
  (ii) other natural areas;
  (iii) wetlands and wetland buffers;
  (iv) waterways and waterway corridors.
(b) where development cannot be avoided, development:
  (i) protects and enhances areas containing matters of state environmental significance;
  (ii) provides appropriate buffers;
  (iii) protects the known populations and supporting habitat of rare and threatened flora and fauna species, as listed in the relevant State and Commonwealth legislation;

(iv) ensures that adverse direct or indirect impacts on areas of environmental significance are minimised through design, siting, operation, management and mitigation measures;
(v) does not cause adverse impacts on the integrity and quality of water in upstream or downstream catchments, including the Great Barrier Reef World Heritage Area;
(vi) protects and maintains ecological and hydrological functions of wetlands, waterways and waterway corridors;
(vii) enhances connectivity across barriers for aquatic species and habitats;
(viii) rehabilitates degraded areas to provide improved habitat condition, connectivity, function and extent;
(ix) protects areas of environmental significance from weeds, pests and invasive species.

(c) strategic rehabilitation is directed to areas on or off site, where it is possible to achieve expanded habitats and increased connectivity.

8.2.7.3 Criteria for assessment

Table 8.2.7.3.a – Natural areas overlay code –assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
Protection of matters of environmental significance		
PO1 Development protects matters of environmental significance**.**	**AO1.1** Development avoids significant impact on the relevant environmental values.	**Complies with AO1.1** Development would occur outside of the area identified as of environmental significance on the

Performance outcomes	Acceptable outcomes	Compliance
	or **AO1.2** A report is prepared by an appropriately qualified person demonstrating to the satisfaction of the assessment manager, that the development site does not contain any matters of state and local environmental significance. or **AO1.3** Development is located, designed and operated to mitigate significant impacts on environmental values. For example, a report certified by an appropriately qualified person demonstrating to the satisfaction of the assessment manager, how the proposed development mitigates impacts, including on water quality, hydrology and biological processes.	site.
Management of impacts on matters of environmental significance		
PO2	**AO2**	**Complies with AO2**

Performance outcomes	Acceptable outcomes	Compliance
Development is located, designed and constructed to avoid significant impacts on matters of environmental significance.	The design and layout of development minimises adverse impacts on ecologically important areas by: (a) focusing development in cleared areas to protect existing habitat; (b) utilising design to consolidate density and preserve existing habitat and native vegetation; (c) aligning new property boundaries to maintain ecologically important areas; (d) ensuring that alterations to natural landforms, hydrology and drainage patterns on the development site do not negatively affect ecologically important areas; (e) ensuring that significant fauna habitats are protected in their environmental context; and (f) incorporating measures that allow for the safe movement of fauna through the site.	Development would occur outside of the area identified as of environmental significance and within a previously disturbed area on the site.
PO3 An adequate buffer to areas of state	**AO3.1** A buffer for an area of state environmental	**Not applicable** The site does not adjoin or contain wetlands.

Performance outcomes	Acceptable outcomes	Compliance
environmental significance is provided and maintained.	significance (Wetland protection area) has a minimum width of: (a) 100 metres where the area is located outside Urban areas; or (b) 50 metres where the area is located within a Urban areas. **or** **AO3.2** A buffer for an area of state environmental significance is applied and maintained, the width of which is supported by an evaluation of environmental values, including the function and threats to matters of environmental significance.	
PO4 Wetland and wetland buffer areas are maintained, protected and restored. Note – Wetland buffer areas are identified in AO3.1**.**	**AO4.1** Native vegetation within wetlands and wetland buffer areas is retained.	**Not applicable** The site does not adjoin or contain wetlands
	AO4.2	**Not applicable**

Performance outcomes	Acceptable outcomes	Compliance
	Degraded sections of wetlands and wetland buffer areas are revegetated with endemic native plants in patterns and densities, which emulate the relevant regional ecosystem**.**	The site does not adjoin or contain wetlands
PO5 Development avoids the introduction of non-native pest species (plant or animal) that pose a risk to ecological integrity.	**AO5.1** Development avoids the introduction of non-native pest species**.**	**Complies with AO5.1** It is not proposed to introduce pest species.
	AO5.2 The threat of existing pest species is controlled by adopting pest management practices for long-term ecological integrity.	**Not applicable** The site is not known to contain pest species.
Ecological connectivity		
PO6 Development protects and enhances ecological connectivity and/or habitat extent.	**AO6.1** Development retains native vegetation in areas large enough to maintain ecological values, functions and processes.	**Not applicable** The development would occur outside of any identified wildlife habitats or areas on environmental significance.

Performance outcomes	Acceptable outcomes	Compliance
	and **AO6.2** Development within an ecological corridor rehabilitates native vegetation**.** and **AO6.3** Development within a conservation corridor mitigates adverse impacts on native fauna, feeding, nesting, breeding and roosting sites and native fauna movements.	
PO7 Development minimises disturbance to matters of state environmental significance (including existing ecological corridors).	**AO7.1** Development avoids shading of vegetation by setting back buildings by a distance equivalent to the height of the native vegetation. and **AO7.2** Development does not encroach within 10 metres of existing riparian vegetation and watercourses.	**Complies with AO7.1** The proposed development would not result in the shading of native vegetation.

Performance outcomes	Acceptable outcomes	Compliance
Waterways in an urban area		
PO8 Development is set back from waterways to protect and maintain: (a) water quality; (b) hydrological functions; (c) ecological processes; (d) biodiversity values; (e) riparian and in-stream habitat values and connectivity; (f) in-stream migration.	**AO8.1** Where a waterway is contained within an easement or a reserve required for that purpose, development does not occur within the easement or reserve**;** or **AO8.2** Development does not occur on the part of the site affected by the waterway corridor. Note – Waterway corridors are identified within 8.	**Not applicable** The site is not within an urban area.
Waterways in a non-urban area		
PO9 Development is set back from waterways to protect and maintain: (a) water quality;	**AO9** Development does not occur on that part of the site affected by a waterway corridor. Note – Waterway corridors are identified within table	**Not applicable** The site does not contain a waterway.

Performance outcomes	Acceptable outcomes	Compliance
(b) hydrological functions; (c) ecological processes; (d) biodiversity values; (e) riparian and in-stream habitat values and connectivity; (f) in-stream migration.	8.2.7.3.b.	

8.2.7.3.a — Widths of waterway corridors for waterways

Waterways classification	Waterway corridor width
Waterways in Urban areas	10 metres measured perpendicular from the top of the high bank.
Waterways in Other areas	For a dwelling house, 10 metres measured perpendicular from the top of the high bank. For all other development, 20 metres measured perpendicular from the top of the high bank.

8.2.9 Potential landslide hazard overlay code

8.2.9.1 Application

(1) This code applies to assessing a material change of use, reconfiguring a lot, operational work or building work within the Potential landslide hazard overlay; if

(a) self-assessable or assessable development where the code is identified as being applicable in the Assessment criteria for the Overlay Codes contained in the Levels of Assessment Tables in section 5.6;

(b) impact assessable development.

(2) Land in the Potential landslip hazard overlay is identified on the Potential landslide hazard overlay maps in Schedule 2 and includes the following sub-categories:

(a) Places of potential landslide hazard sub-category.

(3) When using this code, reference should be made to Part 5.

Note – The Potential landslide hazard overlay shows modelled areas where the factors contributing to landslip potential accumulate to provide a moderate or higher risk if certain factors are exacerbated (e.g. factors include significant vegetation clearing, filling and excavation, changes to soil characteristics, changes to overland water flow, or changes to sub-surface water flow). It shows areas that the Council has identified where landslides may occur and where land may be impacted by a landslide, but does not mean that landslides will occur or that the land will be impacted by a landslide. Other areas not contained within the potential landslide hazard overlay may sustain landslides or be impacted by landslides and consideration should be given to this issue, where appropriate.

8.2.9.2 Purpose

(1) The purpose of the Potential landslide hazard overlay code is:

(a) implement the policy direction of the Strategic Framework, in particular:
(i) Theme 1: Settlement pattern Element 3.4.7 Mitigation of hazards.
(b) enable an assessment of whether development is suitable on land within the Potential landslip hazard overlay.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) development is located, designed and constructed to not put at risk the safety of people, property and the environment;
(b) development is not at risk from and does not pose a risk to adjacent and nearby sites from landslides;
(c) ensures that community infrastructure is protected from the effects of potential landslides;
(d) ensures that vegetation clearing, stormwater management and filling and/or excavation does not create a landslide hazard and/or rectifies potential pre-existing landslide risks;
(e) development does not occur where works to provide a solution for safety of people, property or the environment involves complex engineering solutions to overcome the risk, or would result in a built form or outcome that causes an adverse visual impact on the Hillslopes or Landscape values of Douglas Shire.

8.2.9.3 Criteria for assessment

Table 8.2.9.3.a – Potential landslide hazard overlay code –assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
PO1 The siting and design of development does not involve complex engineering solutions and does not create or increase the potential landslide hazard risk to the site or adjoining premises through: (a) building design; (b) increased slope; (c) removal of vegetation; (d) stability of soil; (e) earthworks; (f) alteration of existing ground water or surface water paths; (g) waste disposal areas.	**AO1.1** Development is located on that part of the site not affected by the Potential landslide hazard overlay. or **AO1.2** Development is on an existing stable, benched site and requires no further earthworks or **AO1.3** A competent person certifies that: (h) the stability of the site, including associated buildings and infrastructure, will be maintained during the course of the development and will remain stable for the life of the development; (i) development of the site will not increase the risk of landslide hazard activity on other land, including land above the site;	**Complies with AO1.3** The site has been the subject to a geotechnical assessment, prepared by Construction Soiltest and attached at Appendix 4.

Performance outcomes	Acceptable outcomes	Compliance
	(j) the site is not subject to the risk of landslide activity on other land; (k) any measures identified in a site-specific geotechnical report for stabilising the site or development have been fully implemented; (l) development does not concentrate existing ground water and surface water paths; (m) development does not incorporate on-site waste water disposal. Note – Planning scheme policy SC6.9 – Natural hazards provides guidance on preparing a site specific geo-technical assessment. Note – Development may alter the conditions of ground water and surface water paths in accordance with a site-specific geotechnical report, but should ensure that its final disbursement is as-per pre-developed conditions. Consideration for location, velocity, volume and quality should be given.	
PO2	**AO2** Excavation or fill:	**Not applicable**

Performance outcomes	Acceptable outcomes	Compliance
The siting and design of necessary retaining structures does not cause an adverse visual impact on landscape character or scenic amenity quality of the area.	(a) is not more than 1.2 metres in height for each batter or retaining wall; (b) is setback a minimum of 2 metres from property boundaries; (c) is stepped with a minimum 2 metre wide berm to incorporate landscaping in accordance with Planning scheme policy SC6.7 – Landscaping; (d) does not exceed a maximum of 3 batters and 3 berms (i.e. Not greater than 3.6 metres in height) on any one lot.	No batters or retaining wall are proposed outside of the building works area.
Additional requirements for Community infrastructure		
PO3 Development for community infrastructure: (a) is not at risk from the potential landslide hazard areas; (b) will function without impediment from a landslide;	**AO3** Development is designed in accordance with the recommendations of a site-specific geotechnical assessment which makes reference to the community infrastructure and its needs and function.	**Not applicable** No community infrastructure is proposed.

Performance outcomes	Acceptable outcomes	Compliance
(c) provides access to the infrastructure without impediment from the effects of a landslide; (d) does not contribute to an elevated risk of a landslide to adjoining properties.	Note - A site specific geotechnical assessment will detail requirements that will address the Acceptable Outcomes of this Performance Outcome. Planning scheme policy SC6.9 – Natural hazards provides guidance on preparing a site specific geotechnical assessment.	

9.4.1 Access, parking and servicing code

9.4.1.1 Application

(1) This code applies to assessing:

(a) operational work which requires a compliance assessment as a condition of a development permit; or
(b) a material change of use or reconfiguring a lot if:
(i) self-assessable or assessable development where this code is identified in the assessment criteria column of the table of assessment;
(ii) impact assessable development, to the extent relevant.

(2) When using this code, reference should be made to Part 5.

9.4.1.2 Purpose

(1) The purpose of the Access, parking and servicing code is to assess the suitability of access, parking and associated servicing aspects of a development.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) sufficient vehicle parking is provided on-site to cater for all types of vehicular traffic accessing and parking on-site, including staff, guests, patrons, residents and short term delivery vehicles;
(b) sufficient bicycle parking and end of trip facilities are provided on-site to cater for customer and service staff;
(c) on-site parking is provided so as to be accessible and convenient, particularly for any short term uses;
(d) development provides walking and cycle routes through the site which link the development to the external walking and cycling network;
(e) the provision of on-site parking, loading / unloading facilities and the provision of access to the site do not impact on the efficient function of street network or on the area in which the development is located;
(f) new vehicular access points are safely located and are not in conflict with the preferred ultimate streetscape character and local character and do

not unduly disrupt any current or future on-street parking arrangements.

9.4.1.3 Criteria for assessment

Table 9.4.1.3.a – Access, parking and servicing code –assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
PO1 Sufficient on-site car parking is provided to cater for the amount and type of vehicle traffic expected to be generated by the use or uses of the site, having particular regard to: (a) the desired character of the area; (b) the nature of the particular use and its specific characteristics and scale; (c) the number of employees and the likely number of visitors to the site;	**AO1.1** The minimum number of on-site vehicle parking spaces is not less than the number prescribed in Table 9.4.1.3.a for that particular use or uses. Note - Where the number of spaces calculated from the table is not a whole number, the number of spaces provided is the next highest whole number.	**Complies with AO1.1** The proposed development would provide a double garage for the parking of cars.
	AO1.2 Car parking spaces are freely available for the parking of vehicles at all times and are not used	**Complies with AO1.2** The car parking spaces would be retained for car parking.

Performance outcomes	Acceptable outcomes	Compliance
(d) the level of local accessibility; (e) the nature and frequency of any public transport serving the area; (f) whether or not the use involves the retention of an existing building and the previous requirements for car parking for the building (g) whether or not the use involves a heritage building or place of local significance; (h) whether or not the proposed use involves the retention of significant vegetation.	for external storage purposes, the display of products or rented/sub-leased.	
	AO1.3 Parking for motorcycles is substituted for ordinary vehicle parking to a maximum level of 2% of total ordinary vehicle parking.	**Not applicable** No motorcycle parking is proposed.
	AO1.4 For parking areas exceeding 50 spaces parking, is provided for recreational vehicles as a substitute for ordinary vehicle parking to a maximum of 5% of total ordinary vehicle parking rate.	**Not applicable** Only two spaces are proposed.
PO2 Vehicle parking areas are designed and constructed in accordance with relevant standards.	**AO2** Vehicle parking areas are designed and constructed in accordance with Australian Standard:	**Complies with AO2** The car parking complies with the Australian Standard for a domestic use.

Performance outcomes	Acceptable outcomes	Compliance
	(a) AS2890.1; (b) AS2890.3; (c) AS2890.6.	
PO3 Access points are designed and constructed: (a) to operate safely and efficiently; (b) to accommodate the anticipated type and volume of vehicles (c) to provide for shared vehicle (including cyclists) and pedestrian use, where appropriate; (d) so that they do not impede traffic or pedestrian movement on the adjacent road area;	**AO3.1** Access is limited to one access cross over per site and is an access point located, designed and constructed in accordance with: (a) Australian Standard AS2890.1; (b) Planning scheme policy SC6.5 – FNQROC Regional Development Manual - access crossovers.	**Complies with AO3.1** Access would be via the existing crossover.
	AO3.2 Access, including driveways or access crossovers: (a) are not placed over an existing:	**Not applicable** No new crossovers are proposed.

Performance outcomes	Acceptable outcomes	Compliance
(e) so that they do not adversely impact upon existing intersections or future road or intersection improvements; (f) so that they do not adversely impact current and future on-street parking arrangements; (g) so that they do not adversely impact on existing services within the road reserve adjacent to the site; (h) so that they do not involve ramping, cutting of the adjoining road reserve or any built structures (other than what may be necessary to cross over a stormwater channel).	(i) telecommunications pit; (ii) stormwater kerb inlet; (iii) sewer utility hole; (iv) water valve or hydrant. (b) are designed to accommodate any adjacent footpath; (c) adhere to minimum sight distance requirements in accordance with AS2980.1.	
	AO3.3 Driveways are: (a) designed to follow as closely as possible to the existing contours, but are no steeper than the gradients outlined in Planning scheme policy SC6.5 – FNQROC Regional Development Manual;	**Not applicable** Access would be via the existing lawfully constructed driveway and no new driveways are proposed.

Performance outcomes	Acceptable outcomes	Compliance
	(b) constructed such that where there is a grade shift to 1 in 4 (25%), there is an area with a grade of no more than 1 in in 6 (16.6%) prior to this area, for a distance of at least 5 metres; (c) on gradients greater than 1 in 6 (16.6%) driveways are constructed to ensure the cross-fall of the driveway is one way and directed into the hill, for vehicle safety and drainage purposes; (d) constructed such that the transitional change in grade from the road to the lot is fully contained within the lot and not within the road reserve; (e) designed to include all necessary associated drainage that intercepts and directs storm water runoff to the storm water drainage system.	
	AO3.4	**Not applicable**

Performance outcomes	Acceptable outcomes	Compliance
	Surface construction materials are consistent with the current or intended future streetscape or character of the area and contrast with the surface construction materials of any adjacent footpath.	Access would be via the existing lawfully constructed driveway and no new driveways are proposed.
PO4 Sufficient on-site wheel chair accessible car parking spaces are provided and are identified and reserved for such purposes.	**AO4** The number of on-site wheel chair accessible car parking spaces complies with the rates specified in AS2890 Parking Facilities.	**Not applicable** Not required for a Dwelling House use.
PO5 Access for people with disabilities is provided to the building from the parking area and from the street.	**AO5** Access for people with disabilities is provided in accordance with the relevant Australian Standard.	**Not applicable** Not required for a Dwelling House use.
PO6 Sufficient on-site bicycle parking is provided to cater for the anticipated demand generated by the development.	**AO6** The number of on-site bicycle parking spaces complies with the rates specified in Table 9.4.1.3.b.	**Not applicable** Not required for a Dwelling House use.

Performance outcomes	Acceptable outcomes	Compliance
PO7 Development provides secure and convenient bicycle parking which: (a) for visitors is obvious and located close to the building's main entrance; (b) for employees is conveniently located to provide secure and convenient access between the bicycle storage area, end-of-trip facilities and the main area of the building; (c) is easily and safely accessible from outside the site.	**AO7.1** Development provides bicycle parking spaces for employees which are co-located with end-of-trip facilities (shower cubicles and lockers);	**Not applicable** Not required for a Dwelling House use.
	AO7.2 Development ensures that the location of visitor bicycle parking is discernible either by direct view or using signs from the street.	**Not applicable** Not required for a Dwelling House use.
	AO7.3 Development provides visitor bicycle parking which does not impede pedestrian movement.	**Not applicable** Not required for a Dwelling House use.
PO8 Development provides walking and cycle routes through the site which:	**AO8** Development provides walking and cycle routes which are constructed on the carriageway or through the site to:	**Not applicable** Not required for a Dwelling House use.

Performance outcomes	Acceptable outcomes	Compliance
(a) link to the external network and pedestrian and cyclist destinations such as schools, shopping centres, open space, public transport stations, shops and local activity centres along the safest, most direct and convenient routes; (b) encourage walking and cycling; (c) ensure pedestrian and cyclist safety.	(a) create a walking or cycle route along the full frontage of the site; (b) connect to public transport and existing cycle and walking routes at the frontage or boundary of the site.	
PO9 Access, internal circulation and on-site parking for service vehicles are designed and constructed: (a) in accordance with relevant standards; (b) so that they do not interfere with the amenity of the surrounding area;	**AO9.1** Access driveways, vehicle manoeuvring and on-site parking for service vehicles are designed and constructed in accordance with AS2890.1 and AS2890.2.	**Complies with AO2** The driveway and manoeuvring areas comply with the Australian Standard for a domestic use.
	AO9.2 Service and loading areas are contained fully within the site.	**Not applicable** Not required for a Dwelling House use.

Performance outcomes	Acceptable outcomes	Compliance
(c) so that they allow for the safe and convenient movement of pedestrians, cyclists and other vehicles.	**AO9.3** The movement of service vehicles and service operations are designed so they: (a) do not impede access to parking spaces; (b) do not impede vehicle or pedestrian traffic movement.	**Not applicable** Not required for a Dwelling House use.
PO10 Sufficient queuing and set down areas are provided to accommodate the demand generated by the development.	**AO10.1** Development provides adequate area on-site for vehicle queuing to accommodate the demand generated by the development where drive through facilities or drop-off/pick-up services are proposed as part of the use, including, but not limited to, the following land uses: (a) car wash; (b) child care centre; (c) educational establishment where for a school;	**Not applicable** Not required for a Dwelling House use.

Performance outcomes	Acceptable outcomes	Compliance
	(d) food and drink outlet, where including a drive-through facility; (e) hardware and trade supplies, where including a drive-through facility; (f) hotel, where including a drive-through facility; (g) service station.	
	AO10.2 Queuing and set-down areas are designed and constructed in accordance with AS2890.1.	**Not applicable** Not required for a Dwelling House use.

9.4.4 Filling and excavation code

9.4.4.1 Application

(1) This code applies to assessing:

(a) operational work for filling or excavation which is self-assessable or code assessable development if this code is an applicable code identified in the assessment criteria column of a table of assessment; or
(b) a material change of use or reconfiguring a lot if:
(i) assessable development where this code is identified as a prescribed secondary code in the assessment criteria column of a table of assessment; or
(ii) impact assessable development, to the extent relevant.

Note—This code does not apply to building work that is regulated under the Building Code of Australia.

(2) When using this code, reference should be made to Part 5.

9.4.4.2 Purpose

(1) The purpose of the Filling and excavation code is to assess the suitability of development for filling or excavation.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) filling or excavation does not impact on the character or amenity of the site and surrounding areas;
(b) filling and excavation does not adversely impact on the environment;
(c) filling and excavation does not impact on water quality or drainage of upstream, downstream or adjoining properties;
(d) filling and excavation is designed to be fit for purpose and does not create land stability issues;

(e) filling and excavation works do not involve complex engineering solutions.

9.4.4.3 Criteria for assessment

Table 9.4.4.3.a – Filling and excavation code – for self-assessable and assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
Filling and excavation - General		
PO1 All filling and excavation work does not create a detrimental impact on the slope stability, erosion potential or visual amenity of the site or the surrounding area**.**	**AO1.1** The height of cut and/or fill, whether retained or not, does not exceed 2 metres in height. and Cuts in excess of those stated in A1.1 above are separated by benches/ terraces with a minimum width of 1.2 metres that incorporate drainage provisions and screen planting.	**Complies with AO1.1** All excavation and filling would be undertaken as Building Work and no external excavation or filling would exceed 2 metres in height.
	AO1.2	**Not Applicable**

Performance outcomes	Acceptable outcomes	Compliance
	Cuts are supported by batters, retaining or rock walls and associated benches/terraces are capable of supporting mature vegetation.	No cuts would be external to the building footprint.
	AO1.3 Cuts are screened from view by the siting of the building/structure, wherever possible.	**Not Applicable** No cuts would be external to the building footprint.
	AO1.4 Topsoil from the site is retained from cuttings and reused on benches/terraces.	**Not Applicable** No filling or excavation would be external to the building footprint.
	AO1.5 No crest of any cut or toe of any fill, or any part of any retaining wall or structure is closer than 600mm to any boundary of the property, unless the prior written approval of the adjoining landowner has been obtained.	**Complies with AO1.5** No excavation or fill would be undertaken within 600mm of the boundary.

Performance outcomes	Acceptable outcomes	Compliance
	AO1.6 Non-retained cut and/or fill on slopes are stabilised and protected against scour and erosion by suitable measures, such as grassing, landscaping or other protective/aesthetic measures.	**Not Applicable** No excavation or fill would be undertaken external to the building footprint.
Visual Impact and Site Stability		
PO2 Filling and excavation are carried out in such a manner that the visual/scenic amenity of the area and the privacy and stability of adjoining properties is not compromised.	**AO2.1** The extent of filling and excavation does not exceed 40% of the site area, or 500m^2 whichever is the lesser, except that AO2.1 does not apply to reconfiguration of 5 lots or more.	**Complies with AO2.1** No excavation or fill would be undertaken outside of the building footprint.
	AO2.2 Filling and excavation does not occur within 2 metres of the site boundary.	**Complies with Ao2.2** No excavation or fill would be undertaken within 2 metres of the site boundaries.

Performance outcomes	Acceptable outcomes	Compliance
Flooding and drainage		
PO3 Filling and excavation does not result in a change to the run off characteristics of a site which then have a detrimental impact on the site or nearby land or adjacent road reserves.	**AO3.1** Filling and excavation does not result in the ponding of water on a site or adjacent land or road reserves.	**Complies with AO3.1** No excavation or fill would be undertaken outside of the building footprint.
	AO3.2 Filling and excavation does not result in an increase in the flow of water across a site or any other land or road reserves.	**Complies with AO3.2** No excavation or fill would be undertaken outside of the building footprint.
	AO3.3 Filling and excavation does not result in an increase in the volume of water or concentration of water in a watercourse and overland flow paths**.**	**Complies with AO3.3** No excavation or fill would be undertaken outside of the building footprint.
	AO3.4	**Not Applicable**

Performance outcomes	Acceptable outcomes	Compliance
	Filling and excavation complies with the specifications set out in Planning Scheme Policy No SC5 – FNQROC Development Manual.	All excavation and filling would be assessed as part of the building works application.
Water quality		
PO4 Filling and excavation does not result in a reduction of the water quality of receiving waters.	**AO4** Water quality is maintained to comply with the specifications set out in Planning Scheme Policy No SC5 – FNQROC Development Manual.	**Complies with AO4** No excavation or fill would be undertaken outside of the building footprint.
Infrastructure		
PO5 Excavation and filling does not impact on Public Utilities.	**AO5** Excavation and filling is clear of the zone of influence of public utilities.	**Not Applicable** No excavation or fill would be undertaken outside of the building footprint..

9.4.5 Infrastructure works code

9.4.5.1 Application

(1) This code applies to assessing:

(a) operational work which requires an assessment as a condition of a development permit or is assessable development if this code is identified in the assessment criteria column of a table of assessment;
(b) a material change of use or reconfiguring a lot if:
(i) assessable development where this code is identified in the assessment criteria column of the table of assessment;
(ii) impact assessable development, to the extent relevant.

Note – The Filling and excavation code applies to operational work for filling and excavation.

(2) When using this code, reference should be made to Part 5.

9.4.5.2 Purpose

(1) The purpose of the Infrastructure works code is to ensure that development is safely and efficiently serviced by, and connected to, infrastructure.

(2) The purpose of the code will be achieved through the following overall outcomes:

(a) the standards of water supply, waste water treatment and disposal, stormwater drainage, local electricity supply, telecommunications, footpaths and road construction meet the needs of development and are safe and efficient;
(b) development maintains high environmental standards;
(c) development is located, designed, constructed and managed to avoid or minimise impacts arising from altered stormwater quality or flow, wastewater discharge, and the creation of non-tidal artificial waterways;

(d) the integrity of existing infrastructure is maintained;
(e) development does not detract from environmental values or the desired character and amenity of an area.

9.4.5.3 Criteria for assessment

Table 9.4.5.3.a – Infrastructure Works code –assessable development

Performance outcomes	Acceptable outcomes	Compliance
For self-assessable and assessable development		
Works on a local government road		
PO1 Works on a local government road do not adversely impact on footpaths or existing infrastructure within the road verge and maintain the flow, safety and efficiency of pedestrians, cyclists and vehicles.	**AO1.1** Footpaths/pathways are located in the road verge and are provided for the hierarchy of the road and located and designed and constructed in accordance with Planning scheme policy SC5 – FNQROC Regional Development Manual.	**Not applicable** No works are proposed on a local government road.
	AO1.2 Kerb ramp crossovers are constructed in accordance with Planning scheme policy SC 5 –	**Not applicable** No works are proposed on a local government

Performance outcomes	Acceptable outcomes	Compliance
	FNQROC Regional Development Manual.	road.
	AO1.3 New pipes, cables, conduits or other similar infrastructure required to cross existing footpaths: (a) are installed via trenchless methods; or (b) where footpath infrastructure is removed to install infrastructure, the new section of footpath is installed to the standard detailed in the Planning scheme policy SC5 – FNQROC Regional Development Manual, and is not less than a 1.2 metre section.	**Not applicable** No works are proposed on a local government road.
	AO1.4 Where existing footpaths are damaged as a result of development, footpaths are reinstated ensuring: (a) similar surface finishes are used; (b) there is no change in level at joins of new	**Not applicable** No works are proposed on a local government road.

Performance outcomes	Acceptable outcomes	Compliance
	and existing sections; (c) new sections are matched to existing in terms of dimension and reinforcement.	
	AO1.5 Decks, verandahs, stairs, posts and other structures located in the road reserve do not restrict or impede pedestrian movement on footpaths or change the level of the road verges.	**Not applicable** No works are proposed on a local government road.
Accessibility structures		
PO2 Development is designed to ensure it is accessible for people of all abilities and accessibility features do not impact on the efficient and safe use of footpaths. Note – Accessibility features are those features	**AO2.1** Accessibility structures are not located within the road reserve.	**Not applicable** No accessibility structures are proposed.
	AO2.2 Accessibility structures are designed in	**Not applicable** No accessibility structures are proposed.

Performance outcomes	Acceptable outcomes	Compliance
required to ensure access to premises is provided for people of all abilities and include ramps and lifts.	accordance with AS1428.3.	
	AO2.3 When retrofitting accessibility features in existing buildings, all structures and changes in grade are contained within the boundaries of the lot and not within the road reserve.	**Not applicable** No accessibility structures are proposed.
Water supply		
PO3 An adequate, safe and reliable supply of potable, fire fighting and general use water is provided.	**AO3.1** The premises is connected to Council's reticulated water supply system in accordance with the Design Guidelines set out in Section D6 of the Planning scheme policy SC5 – FNQROC Regional Development Manual; or **AO3.2**	**Complies with AO3.2** The existing Dwelling House is provided with a suitable water supply.

Performance outcomes	Acceptable outcomes	Compliance
	Where a reticulated water supply system is not available to the premises, on site water storage tank/s with a minimum capacity of 10,000 litres of stored water, with a minimum 7,500 litre tank, with the balance from other sources (e.g. accessible swimming pool, dam etc.) and access to the tank/s for fire trucks is provided for each new house or other development. Tank/s are to be fitted with a 50mm ball valve with a camlock fitting and installed and connected prior to occupation of the house and sited to be visually unobtrusive.	
Treatment and disposal of effluent		
PO4 Provision is made for the treatment and disposal of effluent to ensure that there are no adverse impacts on water quality and no adverse ecological impacts as a result of the system or as a result of increasing the cumulative effect of	**AO4.1** The site is connected to Council's sewerage system and the extension of or connection to the sewerage system is designed and constructed in accordance with the Design Guidelines set out in Section D7 of the Planning scheme policy SC5 –	**Complies with AO4.2** The existing three bedroom house is provided with an on-site effluent disposal system. The proposed extension would not result in any additional bedrooms above that existing and consequently the existing system has capacity to

Performance outcomes	Acceptable outcomes	Compliance
systems in the locality.	FNQROC Regional Development Manual; or **AO4.2** Where not in a sewerage scheme area, the proposed disposal system meets the requirements of Section 33 of the *Environmental Protection Policy (Water) 1997* and the proposed on site effluent disposal system is designed in accordance with the *Plumbing and Drainage Act (2002).*	accommodate the proposed development.
Stormwater quality		
PO5 Development is planned, designed, constructed and operated to avoid or minimise adverse impacts on stormwater quality in natural and developed catchments by:	**AO5.1** A connection is provided from the premises to Council's drainage system; or **AO5.2**	**Complies with AO5.1** The proposed development would not alter the existing stormwater management regime.

Performance outcomes	Acceptable outcomes	Compliance
(a) achieving stormwater quality objectives; (b) protecting water environmental values; **(c)** maintaining waterway hydrology.	An underground drainage system is constructed to convey stormwater from the premises to Council's drainage system in accordance with the Design Guidelines set out in Sections D4 and D5 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.	
	AO5.3 A stormwater quality management plan is prepared, and provides for achievable stormwater quality treatment measures meeting design objectives listed in Table 9.4.5.3.b and Table 9.4.5.3.c, reflecting land use constraints, such as: (a) erosive, dispersive and/or saline soil types; (b) landscape features (including landform); (c) acid sulfate soil and management of nutrients of concern; (d) rainfall erosivity.	**Not applicable** Not considered applicable to Dwelling Houses and Dwelling House extensions.

Performance outcomes	Acceptable outcomes	Compliance
	AO5.4 Erosion and sediment control practices are designed, installed, constructed, monitored, maintained, and carried out in accordance with an erosion and sediment control plan.	**Not applicable** Not considered applicable to Dwelling Houses and Dwelling House extensions.
	AO5.5 Development incorporates stormwater flow control measures to achieve the design objectives set out in Table 9.4.5.3.b and Table 9.4.5.3.c, including management of frequent flows, peak flows, and construction phase hydrological impacts. Note – Planning scheme policy SC5 – FNQROC Regional Development Manual provides guidance on soil and water control measures to meet the requirements of the *Environmental Protection Act 1994.* Note – During construction phases of development, contractors and builders are to have consideration in	**Not applicable** Not considered applicable to Dwelling Houses and Dwelling House extensions.

Performance outcomes	Acceptable outcomes	Compliance
	their work methods and site preparation for their environmental duty to protect stormwater quality.	
Non-tidal artificial waterways		
PO6 Development involving non-tidal artificial waterways is planned, designed, constructed and operated to: (a) protect water environmental values; (b) be compatible with the land use constraints for the site for protecting water environmental values; (c) be compatible with existing tidal and non-tidal waterways; (d) perform a function in addition to stormwater management;	**AO6.1** Development involving non-tidal artificial waterways ensures: (a) environmental values in downstream waterways are protected; (b) any ground water recharge areas are not affected; (c) the location of the waterway incorporates low lying areas of the catchment connected to an existing waterway; (d) existing areas of ponded water are included**.**	**Not applicable** No waterways are proposed.
	AO6.2	**Not applicable**

Performance outcomes	Acceptable outcomes	Compliance
(e) achieve water quality objectives.	Non-tidal artificial waterways are located: (a) outside natural wetlands and any associated buffer areas; (b) to minimise disturbing soils or sediments; (c) to avoid altering the natural hydrologic regime in acid sulfate soil and nutrient hazardous areas.	No waterways are proposed.
	AO6.3 Non-tidal artificial waterways located adjacent to, or connected to a tidal waterway by means of a weir, lock, pumping system or similar ensures: (a) there is sufficient flushing or a tidal range of >0.3 m; or (b) any tidal flow alteration does not adversely impact on the tidal waterway; or (c) there is no introduction of salt water into	**Not applicable** No waterways are proposed.

Performance outcomes	Acceptable outcomes	Compliance
	freshwater environments.	
	AO6.4 Non-tidal artificial waterways are designed and managed for any of the following end-use purposes: (a) amenity (including aesthetics), landscaping or recreation; or (b) flood management, in accordance with a drainage catchment management plan; or (c) stormwater harvesting plan as part of an integrated water cycle management plan; or (d) aquatic habitat.	**Not applicable** No waterways are proposed.
	AO6.5 The end-use purpose of the non-tidal artificial waterway is designed and operated in a way that protects water environmental values.	**Not applicable** No waterways are proposed.

Performance outcomes	Acceptable outcomes	Compliance
	AO6.6 Monitoring and maintenance programs adaptively manage water quality to achieve relevant water quality objectives downstream of the waterway**.**	**Not applicable** No waterways are proposed.
	AO6.7 Aquatic weeds are managed to achieve a low percentage of coverage of the water surface area, and pests and vectors are managed through design and maintenance.	**Not applicable** No waterways are proposed.
Wastewater discharge		
PO7 Discharge of wastewater to waterways, or off site: (a) meets best practice environmental management; (b) is treated to:	**AO7.1** A wastewater management plan is prepared and addresses: (a) wastewater type; (b) climatic conditions;	**Not applicable** No waste water would be discharged off-site.

Performance outcomes	Acceptable outcomes	Compliance
(i) meet water quality objectives for its receiving waters; (ii) avoid adverse impact on ecosystem health or waterway health; (iii) maintain ecological processes, riparian vegetation and waterway integrity; (iv) offset impacts on high ecological value waters**.**	(c) water quality objectives; (d) best practice environmental management**.**	
	AO7.2 The waste water management plan is managed in accordance with a waste management hierarchy that: (a) avoids wastewater discharge to waterways; or (b) if wastewater discharge cannot practicably be avoided, minimises wastewater discharge to waterways by re-use, recycling, recovery and treatment for disposal to sewer, surface water and ground water.	**Not applicable** No waste water would be discharged off-site.
	AO7.3 Wastewater discharge is managed to avoid or minimise the release of nutrients of concern so as to minimise the occurrence, frequency and	**Not applicable** No waste water would be discharged off-site.

Performance outcomes	Acceptable outcomes	Compliance
	intensity of algal blooms.	
	AO7.4 Development in coastal catchments avoids or minimises and appropriately manages soil disturbance or altering natural hydrology and: (a) avoids lowering ground water levels where potential or actual acid sulfate soils are present; (b) manages wastewater so that: (i) the pH of any wastewater discharges is maintained between 6.5 and 8.5 to avoid mobilisation of acid, iron, aluminium and other metals; (ii) holding times of neutralised wastewater ensures the flocculation and removal of any dissolved iron prior to release; (iii) visible iron floc is not present in any	**Not applicable** No waste water would be discharged off-site.

Performance outcomes	Acceptable outcomes	Compliance
	discharge; (iv) precipitated iron floc is contained and disposed of; (v) wastewater and precipitates that cannot be contained and treated for discharge on site are removed and disposed of through trade waste or another lawful method.	
Electricity supply		
PO8 Development is provided with a source of power that will meet its energy needs.	**AO8.1** A connection is provided from the premises to the electricity distribution network; or **AO8.2** The premises is connected to the electricity distribution network in accordance with the Design Guidelines set out in Section D8 of the Planning	**Complies with AO8.1** The site has an existing electricity connection.

Performance outcomes	Acceptable outcomes	Compliance
	scheme policy SC5 – FNQROC Regional Development Manual. Note - Areas north of the Daintree River have a different standard.	
PO9 Development incorporating pad-mount electricity infrastructure does not cause an adverse impact on amenity.	**AO9.1** Pad-mount electricity infrastructure is: (a) not located in land for open space or sport and recreation purposes; (b) screened from view by landscaping or fencing; (c) accessible for maintenance.	**Not applicable** No padmount infrastructure is proposed.
	AO9.2 Pad-mount electricity infrastructure within a building, in a Town Centre is designed and located to enable an active street frontage. Note – Pad-mounts in buildings in activity centres	**Not applicable** No padmount infrastructure is proposed.

Performance outcomes	Acceptable outcomes	Compliance
	should not be located on the street frontage.	
Telecommunications		
PO10 Development is connected to a telecommunications service approved by the relevant telecommunication regulatory authority.	**AO10** The development is connected to telecommunications infrastructure in accordance with the standards of the relevant regulatory authority.	**Complies with AO10** The site has an existing telecommunications connection.
PO11 Provision is made for future telecommunications services (e.g. fibre optic cable).	**AO11** Conduits are provided in accordance with Planning scheme policy SC5 – FNQROC Regional Development Manual.	**Complies with AO11** The site has an existing telecommunications connection.
Road construction		
PO12 The road to the frontage of the premises is	**AO12.1** The road to the frontage of the site is constructed	**Complies with AO12.1** Ocean View Road is a constructed and Council

Performance outcomes	Acceptable outcomes	Compliance
constructed to provide for the safe and efficient movement of: (a) pedestrians and cyclists to and from the site; (b) pedestrians and cyclists adjacent to the site; (c) vehicles on the road adjacent to the site; (d) vehicles to and from the site; (e) emergency vehicles.	in accordance with the Design Guidelines set out in Sections D1 and D3 of the Planning scheme policy SC5 – FNQROC Regional Development Manual, for the particular class of road, as identified in the road hierarchy.	maintained road.
	AO12.2 There is existing road, kerb and channel for the full road frontage of the site**.**	**Complies with AO12.2** Ocean View Road is a constructed and Council maintained road
	AO12.3 Road access minimum clearances of 3.5 metres wide and 4.8 metres high are provided for the safe passage of emergency vehicles.	**Complies with AO12.3** Ocean View Road is a constructed and Council maintained road
Alterations and repairs to public utility services		
PO13 Infrastructure is integrated with, and efficiently	**AO13** Development is designed to allow for efficient	**Not applicable** No alterations or repairs to public utilities are

Performance outcomes	Acceptable outcomes	Compliance
extends, existing networks.	connection to existing infrastructure networks.	required.
PO14 Development and works do not affect the efficient functioning of public utility mains, services or installations.	**AO14.1** Public utility mains, services and installations are not required to be altered or repaired as a result of the development; or **AO14.2** Public utility mains, services and installations are altered or repaired in association with the works so that they continue to function and satisfy the relevant Design Guidelines set out in Section D8 of the Planning scheme policy SC5 – FNQROC Regional Development Manual.	**Complies with AO14.1** No alterations to public utilities are required.
Construction management		
PO15	**AO15**	**Not applicable**

Performance outcomes	Acceptable outcomes	Compliance
Work is undertaken in a manner which minimises adverse impacts on vegetation that is to be retained**.**	Works include, at a minimum: (a) installation of protective fencing around retained vegetation during construction; (b) erection of advisory signage; (c) no disturbance, due to earthworks or storage of plant, materials and equipment, of ground level and soils below the canopy of any retained vegetation; (d) removal from the site of all declared noxious weeds.	No trees are to eb retained in the proposed building footprint.
PO16 Existing infrastructure is not damaged by construction activities**.**	**AO16** Construction, alterations and any repairs to infrastructure is undertaken in accordance with the Planning scheme policy SC5 – FNQROC Regional Development Manual. Note - Construction, alterations and any repairs to State-controlled roads and rail corridors are undertaken	**Not applicable** No alteration to existing infrastructure is proposed.

Performance outcomes	Acceptable outcomes	Compliance
	in accordance with the Transport Infrastructure Act 1994.	
For assessable development		
High speed telecommunication infrastructure		
PO17 Development provides infrastructure to facilitate the roll out of high speed telecommunications infrastructure.	**AO17** No acceptable outcomes are prescribed.	**Not applicable** The site has an existing telecommunications connection.
Trade waste		
PO18 Where relevant, the development is capable of providing for the storage, collection treatment and disposal of trade waste such that: (a) off-site releases of contaminants do not occur;	**AO18** No acceptable outcomes are prescribed.	**Not applicable** No trade water would be generated by the proposed development.

Performance outcomes	Acceptable outcomes	Compliance
(b) the health and safety of people and the environment are protected; (c) the performance of the wastewater system is not put at risk.		
Fire services in developments accessed by common private title		
PO19 Hydrants are located in positions that will enable fire services to access water safely, effectively and efficiently.	**AO19.1** Residential streets and common access ways within a common private title places hydrants at intervals of no more than 120 metres and at each intersection. Hydrants may have a single outlet and be situated above or below ground**.**	**Not applicable** No common private title is proposed.
	AO19.2 Commercial and industrial streets and access ways within a common private title serving commercial properties such as factories and warehouses and offices are provided with above	**Not applicable** No common private title is proposed.

Performance outcomes	Acceptable outcomes	Compliance
	or below ground fire hydrants located at not more than 90 metre intervals and at each intersection. Above ground fire hydrants have dual-valved outlets.	
PO20 Hydrants are suitable identified so that fire services can locate them at all hours. Note – Hydrants are identified as specified in the Department of Transport and Main Roads Technical Note: 'Identification of street hydrants for fire fighting purposes' available under 'Publications'.	**AO20** No acceptable outcomes are prescribed.	**Not applicable** No common private title is proposed.

Appendix 4.

GEOTECHNICAL REPORT

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

September 1 2020

Job No: G7503

Geotechnical Report for Proposed Residential Extensions Development at Lot 14 Ocean View Road, Killaloe, Queensland.

Client: M. Shearer
Lot 14 Ocean View Road
KILLALOE QLD 4877

Table of Contents

1. Introduction
2. Proposed Development
3. Scope / Method of Investigation
4. Site Information
5. Testing / Findings
5.1 Regional Geology
5.2 Slope Analysis
5.3 Surface Conditions
5.4 Subsurface Conditions
5.5 Slope Stability Conditions
5.6 Landslide Risk Assessment
6. Engineering Comments
6.1 Site Classification
6.2 Footing Design
6.3 Control Measures for Slope and Erosion Stability Minimisation
7. Foundation Maintenance/Remarks
8. Limitations of Report

Attachments:

Figure 1: Proposed Development Plan
Figure 2: Site Survey Plan & Test Locations

Appendix A: Field and Laboratory Test Results
Appendix B: Stability Analysis & Landslide Risk Assessment
Appendix C: Extract of AGS Vol 42 March 2007 – LR8
Appendix D: Photographs of site, test holes & exposures.

Report distribution: 1 copy (email) to M. Shearer.

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

1 September 2020 Job No: G7503

M. Shearer
36R, Lot 14 Ocean View Road
KILLALOE QLD 4877

Re: **Geotechnical Report for Proposed Residential Extensions Development at Lot 14 Ocean View Road, Killaloe, Queensland.**

1. Introduction.

A geotechnical assessment was authorised by M. Shearer (`the client') for a proposed residential extensions development at Lot 14 Ocean View Road, Killaloe. A site plan of the proposed extensions development and current survey plan (ref: RPS Dwg No. 145997-100, date 12/12/19) was provided by the client. The proposed house extensions locations were provided onsite by the client. *Note: reduced levels (RLs) provided in this report are estimated from RPS Dwg No. 145997-100, date 12/12/19 survey plan where levels are based on an arbitrary datum.*

2. Proposed Development.

The proposed development is for residential extensions & swimming pool to the existing house. Major earthworks are not proposed for the extension foundations. Refer Figure 1.
`Site A': West side of existing house; single storey, masonry block, founded on the existing upper bench.
`Site B': East side of existing house; single storey, masonry block, founded on the existing upper bench.
`Site C': North side of existing house; concrete swimming pool, founded on the existing bench / part on downslope (?).

3. Scope / Method of Investigation.

3.1 Scope.

The scope was for a geotechnical assessment and report of the proposed extension development site(s) in relation to suitable foundation and landslide risk assessment. The geotechnical report includes site classification to AS2870, footing foundation recommendations and landslide risk assessment of the proposed extensions development works in relation to the existing (previously developed) site slope conditions.

The scope of the assessment was limited to within accessible areas of the allotment, and for the proposed development areas only. Existing house, sheds, water tanks and retaining wall & foundations, and existing access driveways are outside the scope of this assessment. Landslide risk assessment does not include existing site slope(s), and their stability conditions, where such slopes do not potentially influence, or impact, the proposed development works i.e. eastern driveway & driveway cut batter, and southern cut rock batter not in direct impact line with the proposed development.

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 excavated pits 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).
- Landslide risk assessment in accordance with Australian Geomechanics Society (AGS) – Landslide Risk Management Guidelines (LRM-AGS, 2007).

4. Site Information.

4.1 Current Site Description.

The site is identified Lot 14 on RP745097 Ocean View Road, Killaloe; which is located on the southern side of Ocean View Road. The existing site area slopes generally from south (top existing house bench) to north (front boundary).

Original site earthworks has provided a upper level bench where an existing single storey masonry block house on slab, and sheds are located, and a lower bench where existing water tanks are located. A masonry block retaining wall exists at the rear of the water tanks. The upper bench was excavated from rock, and the existing south batter slope is exposed rock. The hillslope below the existing house is vegetated by grass/weeds and interspersed by natural forest and some planted fruit trees. Two terraced benches exist on the hillslope below the existing house. A concrete driveway links Ocean View Road to the eastern side of the upper bench. A seasonal creek exists west of the property boundary and slopes (flows) south to north. Existing services include sewer septic tank, water and electricity. Refer Figure 2 for existing site layout and Appendix D (i) for site photographs.

4.2 Site History.

According to the client the site was originally developed by others (> 10 years ago) to provide a benched area (& cut batter), residential house, and access driveway (all still exist). Some further excavation works was performed previously by the client to provide additional area at the rear (south) of the house, and eastern driveway concrete surfacing.

5. Testing/Findings.

5.1 Regional Geology.

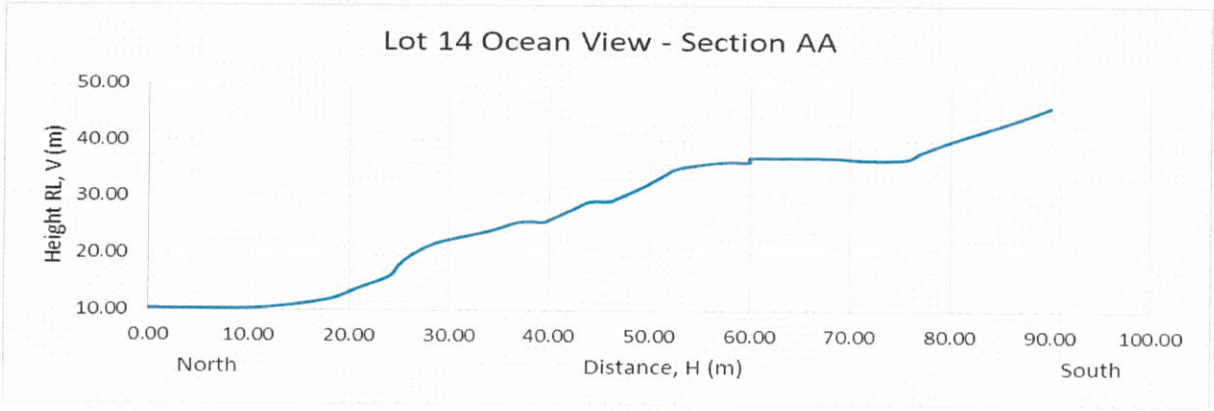
According to Qld Department of Mines and Energy geology map of Mossman (sheet SE 55-1, 1996) the natural site geology comprises '*Hodgkinson Formation – micaceous greywacke / siltstone / slate'.*

Colluvial deposits and residual soils generally overly weathered rock in this region.

5.2 Slope Analysis.

Based on the provided survey plan a north to south section through the centre of the allotment is estimated for site assessment.

Section AA (Refer Figure 2 for section location):



Existing allotment slope grade (angle):

South to north, rear batter to upper platform toe: RL 46 to RL 37, average estimated slope 30°.
South to north, across upper platform @ RL 37: slope 0°.
South to north, below upper platform: RL 37 to RL 35, average estimated slope 15°.
South to north, below upper platform: RL 35 to RL 12, variable from 25-35°, average estimated slope 30°.
Isolated section where slope from south to north, RL 20 to RL 16, average estimated slope 50°.

Note: Slope level & distance section plot is based on RPS Dwg No. 145997-100, date 12/12/19, RLs based on arbitrary level datum.

5.3 Surface Conditions.

5.3.1 Proposed Development Sites.

Site surface conditions of the proposed building extension areas at the time of the investigation was grass. A 1V:0.5H cut batter with exposed soil with cobbles exists below the proposed western extension (Site A). A 1V:1H grassed batter exists north & east of the proposed east extension (Site B) & north of the proposed swimming pool (Site C).

5.3.2 Allotment Exposed Rock.

The existing rear (southern) cut batter, with toe at RL 37, was inspected to provide a general appreciation of site rock conditions. The batter is approximately 10m from the existing house & 8m from the proposed western extension, is sloping at 45-70° (varies) and is exposed moderately to slightly weathered rock. Exposed rock batter is cleaved and jointed.

Summary of rock discontinuities at southern cut batter (Exposure 1 & 2):
Bedding plane: Dip 70° in 065° direction (NE).
Joint (1): Dip 70° in 340° direction (NW). Joint (2): Dip 40° in 070° direction (NE to E).

Rock exposure conditions at this location are assumed to be consistent with the underlying rock across the allotment for the purpose of the assessment.

Refer Appendix D (iii) for site surface exposures 1-10 photographs.

5.4 Subsurface Conditions.

Excavated test pits (TP1 to TP5) were performed to provide inspection and description of the soil and rock profile, and sampling of soil types. Summary of subsurface stratums:

Test No.	Soil stratum
TP1	**GL-1.75m** Fill (silty clayey gravel, some cobbles & small boulders; original cut to fill). **1.75-1.9m** Colluvium / Residual? (gravelly clayey silt; original ground). **1.9-1.95m** Rock (moderately weathered rock).
TP2	**GL-0.05m** Gravel (imported gravel to driveway). **0.05m** Rock (moderately weathered rock).
TP3	**GL-1.35m** Fill (gravelly clayey silt, some cobbles & small boulders; original cut to fill). **1.35m** Rock (moderately weathered rock).
TP4	**GL-0.7m** Fill (silty clayey gravel, some cobbles & small boulders; original cut to fill). **0.7-0.9m** Colluvium / Residual? (gravelly clayey silt; original ground). **0.9-1.0m (to 1.8m*)** Rock (distinctly to moderately weathered rock). * *Inferred from DCP test, 1m downslope from TP4* .
TP5	**GL-0.15m** Fill (gravelly silty clay, some cobbles & small boulders; original cut to fill). **0.15-1.5m** Residual (gravelly silty clay / clayey silt; original ground). **1.5-2.1m** Weathered rock (extremely weathered rock). **2.1-2.3m** Weathered rock (distinctly weathered rock).

Fill is regarded as uncontrolled fill in accordance with AS 3798 `Guidelines on Earthworks for Commercial and Residential Developments' due to unknown compaction control. Weathered rock was encountered at test pits TP1 to TP5 locations on this site. Depth to, and quality of weathered rock will vary over this site. Groundwater was not observed at any of the test holes, at the time of logging. Groundwater may vary during seasonal climatic conditions.

In-situ DCP tests indicate generally medium dense to loose conditions for fill soils, firm to stiff for residual soils and dense/hard for weathered rock. Bearing capacity (qa) of <100kPa is estimated for fill and residual soils, and (qa) of 150kPa is estimated for distinctly weathered rock.

Refer Appendix A, reports H13622A/20 to H13622E/20 for test pit logs and DCP test results, and Figure 2 for test locations; also Appendix D (ii) for test pits TP1-TP5 photographs.

Disturbed subsoil samples were tested in the laboratory for soil classification purposes. Results indicate the soil samples tested as low plastic silty gravel fill, and medium plastic silty clay residual soils. Refer Appendix A, reports H13623/20 and H13625/20 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.

Settlement of uncontrolled fill, under footing load(s), will likely exceed predicted ground surface movement (y_s) from shrink swell. Quantitative settlement is beyond the scope of this assessment.

Summary of subsurface conditions at proposed development sites:

Site A (western extension building @ approx. RL 36.5, existing ground level): Uncontrolled fill above residual soils to rock at northern end (TP1), and rock close to surface at the southern end (TP2).

Site B (eastern extension building @ approx. RL36.5, existing ground level): Uncontrolled fill above rock at northern end (TP3), and rock close to surface at the southern end (EXP 11).

Site C (northern swimming pool @ approx. RL36, existing ground level): Uncontrolled fill above residual soils to rock (TP4); depth to rock, from surface, will increase downslope (north) from TP4.

5.5 Slope Stability Conditions.

Stability of the site slope was assessed by inspection and observation of the surface and exposures 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 proposed building extension areas or on the immediate slopes surrounding, and downslope, of the existing building and upper platform.

Minor slippage and progressive crest erosion has occurred in `uncontrolled fill' batter along the northern side of the upper bench at Site A. Landslide risk exists for the proposed extension buildings and swimming pool due to uncontrolled fill foundation at these sites. Refer *5.6 Landslide Risk Assessment), (Refer Appendix D (iii) for site exposure photographs.*

Minor slips were observed along the eastern driveway upslope cut batter where residual soils and extremely weathered rock has eroded/slipped as debris at isolated areas. Minor rock dislodgement/falls were observed along the steeper section of the rear (southern) cut rock batter generally where steep rock joints are oriented in an `out of slope' direction (refer 5.3.2). These observed instability events are historical, but are likely to re-occur intermittently. Refer *5.6 Landslide Risk Assessment, Refer Appendix D (iii) for site exposure photographs).*

Controlled site drainage is currently limited to: i) existing house roof runoff to water tanks and ii) the eastern concrete driveway surface runoff. No obvious drainage control measures were observed along existing downslope benches & batters. Uncontrolled drainage will likely cause progressive erosion of the existing batters and benches, and could cause future washouts and slope instability in areas of the site that currently appear stable.

5.5.2 Slope Stability Analysis.

Slope stability analysis was performed at a section (Section AA) of the existing site slope surface configuration. Analysis was based on available survey level estimates and assumed soil parameters estimates (effective strength values; cohesion, c' & friction angle, phi') and Hoek Brown parameters for rock type & conditions. Soil and rock stratums were interpolated between test locations and extrapolated to the southern hillslope. The model analysed concentrates on potential critical slope conditions relevant to the proposed building extension foundation and swimming pool. Galena slope stability software (Version 4.01) was used for the analysis. The slope model includes an assumed phreatic surface (above rock), to simulate potential variable ground water conditions, and a `pseudo-static' earthquake coefficient.

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	***Phreatic*** (note 1)	***Slope Model***	***FOS***	***P %*** (note 2)	***Analysis Reference***
AA	No	Existing south hillslope below house	1.5	1	G7503/A1
AA	Yes	Existing south hillslope below house	1.4	1	G7503/A2

Notes:
1) Phreatic surface modelled at rock interface; limited to saturated soil above phreatic surface.
2) P% = probability of FOS < 1.0; based on standard deviation (SD) of soil parameters; fill, residual soils: c' SD = 5kPa and phi' SD' = 5°.

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

5.6 Landslide Risk Assessment.

5.6.1 Landslide Hazards.

Based on the site slope, geological conditions, surface stability features, stability analysis and proposed development locations (i.e. Sites A, B & C) the following landslide hazards (events) were considered for the assessment:

EVENT 1: 50-200m3 debris slide of the existing batter below house (≈RL37 to 25) undermining proposed buildings & swimming pool on high level footings, & un-retained foundation batter slope.

EVENT 2: 50-200m3 debris slide of the existing batter below house (≈RL37 to 25) undermining proposed buildings & swimming pool buildings on piered footings (into rock), and retained site (i.e. control measures applied to EVENT 1).

EVENT 3: 10-50m3 rock slide of the existing southern batter behind house (≈RL37 to 45) impacting proposed buildings.

Landslide risk assessment is limited to the new development only (i.e. Sites A, B & C). Landslide risk of the existing southern cut batter and driveway(s) impacting persons, vehicles or property not within the new proposed development is outside the scope of this assessment.

5.6.2 Hazard Probability.

Landslide hazard annual probability is an estimation of the probability that a landslide will occur; based on site slope, landslide trigger and rainfall frequency (sustained heavy rainfall and/or uncontrolled drainage would be a likely trigger of event(s).

EVENT 1: annual probability of 2×10^{-3}.
EVENT 2: annual probability of 4×10^{-5}.
EVENT 3: annual probability of 3×10^{-4}.

5.6.3 Landslide Risk.

A quantitative risk assessment is provided for the proposed development location (i.e. Sites A, B & C) and assumed footing options. The following qualitative risk descriptions are based on the quantitative assessment.

EVENT No.	EVENT 1 (Property)	EVENT 2 (Property)	EVENT 3 (Property)
Qualitative Risk to Property	MODERATE	LOW	LOW

EVENT No.	EVENT 1 (Loss of life)	EVENT 2 (Loss of life)	EVENT 3 (Loss of life)
Qualitative Risk to Life	UNACCEPTABLE	ACCEPTABLE	TOLERABLE

Refer Appendix B for Landslide Risk Assessment quantitative analysis.

It is recommended that property risk be reduced, and, maintained to LOW, and life risk be at least TOLERABLE. Event 2 is a residual risk of Event 1 after assumed treatment application. Treatment options are suggested for risk management (refer section *6.2 Footing Design* and *6.3 Control Measures for Slope and Erosion Stability)* and Appendix C (Extract of AGS Vol 42 March 2007 – LR8 & LR9).

Landslide risk assessment is limited to Property risk and Loss of Life risk from the modelled landslide event(s) of the existing site slope configuration, the proposed development locations (i.e. Sites A, B & C) and the footing options used. This landslide risk assessment does not include slope failure, damage or injury caused by excessive garden watering, broken or leaking sewer or stormwater pipes, uncontrolled drainage runoff, fallen trees, fire, flooding or activity from neighbouring allotments. Minor debris, minor rock slides and runoff erosion are still possible on this site. The client will need to accept the possibility of minor failures on this site and civil/structural engineering design shall include this risk.

The landslide hazard(s) identified could pose a risk to the Lot 14 proposed development locations (i.e. Sites A, B & C) property and life. The quantitative risk to property and life of the consequence of hazards occurring are estimated to provide guidance to the owner, developer, designer, builder and resident(s) of the property in regard to landslide risk management.

6. *Engineering Comments.*

6.1 Site Classification.

The nominated house building site is classified a Class P site in accordance with AS 2870 'Residential Slabs and Footings' Clause 2.5.3 (b) due to the presence of existing uncontrolled fill (at TP1, TP3 & TP4). Footing design shall be performed by a professional engineer based on engineering principles.

6.2 Footing Design.

i) Footings shall be founded into moderately weathered rock for LOW landslide risk. Moderately weathered rock is estimated to provide at least 200kPa allowable bearing capacity. Existing fill is estimated to provide 40kPa for non-structural (non-load bearing) floor slab. Structural load bearing footings shall not be founded on, or in, uncontrolled fill.

ii) Foundation preparation and suitable footing type(s) shall be designed by a professional engineer. Footing design shall be performed by a professional engineer based on engineering principles and the landslide risk assessment. Underlying rock stratum is sloping from south to north down hillslope, and connection of footing base to rock will need to be considered by the footing designer for stable founding.

iii) Partial rock foundation may apply for slab footing design. 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.

iv) Footings shall not be founded on boulders. Boulders can cause unstable conditions under footings. Boulders found under, against, or protruding into footing trenches/holes must be removed and footing trenches/holes remediated.

v) Ground conditions will likely vary between 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.

Section 6.1, 6.2 and the following comments are recommended for LOW landslide risk for the proposed development:

6.3.1 Building Platform Foundation Area.

i) Provide a controlled drained surface to the building platforms.

ii) Conserve the existing vegetation immediately outside the development areas. Any large trees that may impact the proposed foundation and footings shall be brought to the attention of the footing design engineer for instruction. Stabilise and/or re-vegetate all cleared slope and batter areas around the proposed foundations.

iii) Provide structural retaining wall (or equivalent stabilisation) to un-retained batter slope north of Sites A, B & C foundations, and the un-retained batter slope east of Site B foundation. Retaining wall type, footings, and retaining wall drainage, shall be designed by a professional engineer (refer *6.2 Footing Design*). Existing site retaining wall (below part of Site A) shall be assessed by a professional engineer for structural adequacy to satisfy as a control measure.

iv) Refer Appendix C for Australian Geomechanics Society construction practices guidelines – LR8.

6.3.2 Site Drainage.

The following drainage works are recommended for the proposed development:

i) Provide surface controlled drains above and below the proposed development to minimise runoff impacting foundations & footings. Controlled surface drainage management should include existing lower batters (below proposed structures).

ii) Discharge roof stormwater to controlled drains and avoid overland flows. Discharge to water tanks is satisfactory.

iii) All drains shall be diverted and controlled to legal discharge points and away from all footings. Avoid uncontrolled discharge across the foundation area and over and/or down unprotected batter and/or embankment slopes. Provide concrete lining (or other equivalent non erodible condition) to all surface drains.

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

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

6.3.3 Site Monitoring.

Site stability conditions can change over time particularly following wet season rain. Annual inspection of the proposed development site by a geotechnical consultant is recommended. Inspections can provide reassurance of site stability and / or the identification of new or potential unstable zones.

6.3.4 Onsite Sewerage Effluent Management.

The existing site has an onsite septic system for sewerage management. Any change in onsite sewerage management involving effluent absorption trenches (or equivalent) shall be assessed and designed by a specialist consultant. Sewerage effluent system(s) (e.g. absorption trenches) can change the landslide risk of the proposed development, depending on type, size and location. Generally locating effluent system(s) (e.g. absorption trenches) downslope from structures and on less steep ground should minimise landslide risk. However any changes to the onsite sewerage management system will require further assessment to confirm, or review, the landslide risk. Refer Appendix C for Australian Geomechanics Society effluent disposal practices guidelines- LR9.

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 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. Slope stability analysis and landslide risk assessment is limited to the proposed development sites only. Landslide risk for other areas of the allotment and for previous development works are not included in the assessment.

Site stability can be reduced by potential incidents such as broken and/or leaking pipes and drains, uncontrolled drainage 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 holes carried out on the site for the investigation were backfilled by excavator bucket 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 (M Shearer) 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

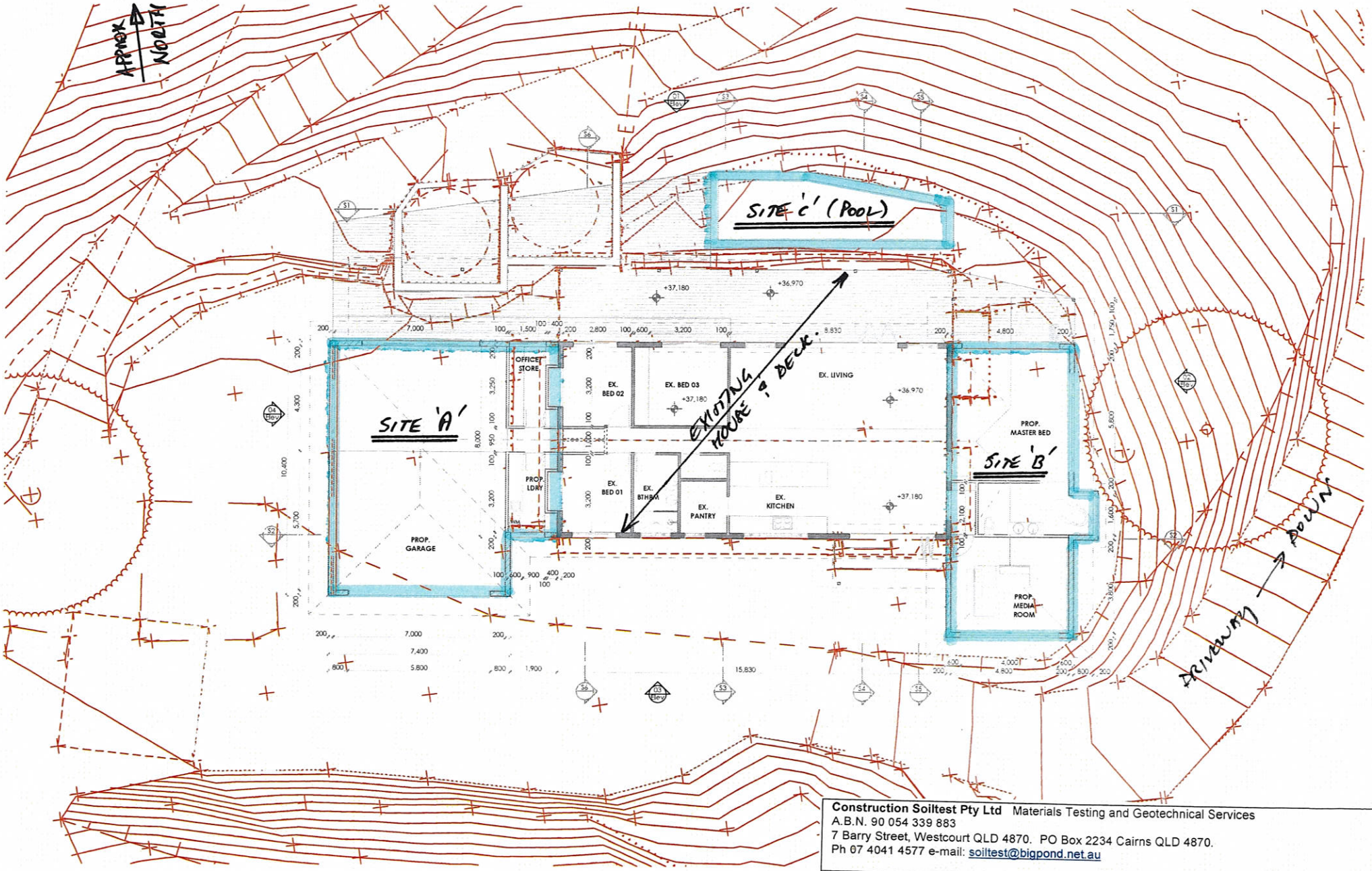
P.A. Posar

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

LIST OF FIGURES:

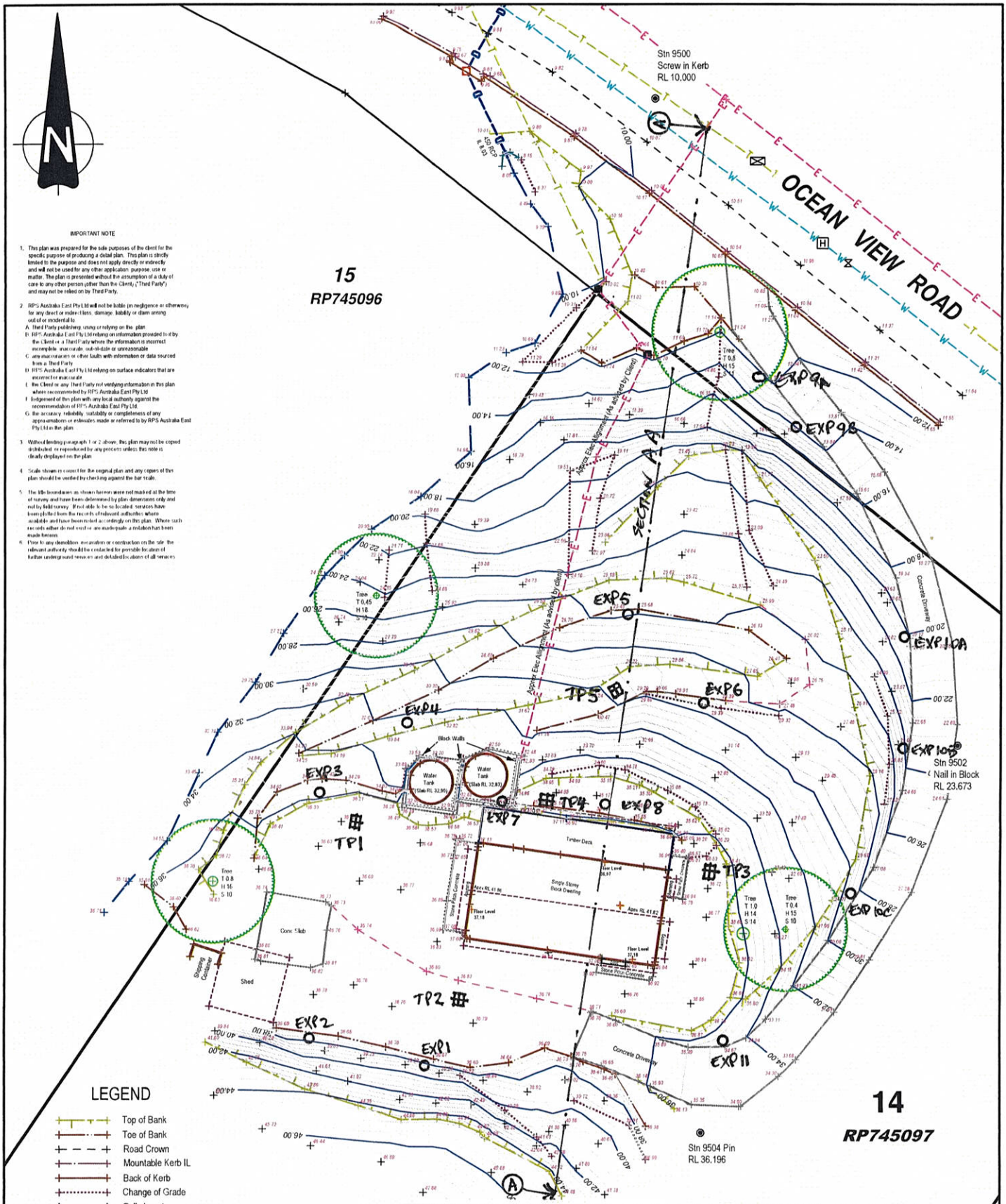
i) Figure 1: Proposed Development Plan

ii) Figure 2: Site Survey Plan & Test Locations



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

Project: Lot 14 Ocean View Road, Killaloe – Proposed Extensions	**Job No.:** G7503
Client: M. Shearer	**Report Ref. :** G7503/R14557
Drawing Title: Figure 1: Proposed Development.	
Drawn by: Reproduced (Site A, B & C descriptors added by PP).	**Scale:** - **Date:** 31/8/20



IMPORTANT NOTE

1. This plan was prepared for the sole purposes of the client for the specific purpose of producing a detail plan. This plan is strictly limited to the purpose and does not apply directly or indirectly and will not be used for any other application, purpose, use or matter. The plan is presented without the assumption of a duty of care to any other person (other than the Client) ("Third Party") and may not be relied on by Third Party.
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   A. Third Party publishing, using or relying on the plan
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   D. RPS Australia East Pty Ltd relying on surface indicators that are incorrect or inaccurate
   E. the Client or any Third Party not verifying information in this plan where recommended by RPS Australia East Pty Ltd
   F. lodgement of this plan with any local authority against the recommendation of RPS Australia East Pty Ltd.
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5. The title boundaries as shown hereon were not marked at the time of survey and have been determined by plan dimensions only and not by field survey. If not able to be so located, services have been plotted from the records of relevant authorities where available and have been noted accordingly on this plan. Where such records either do not exist or are inadequate a notation has been made hereon.
6. Prior to any demolition, excavation or construction on the site the relevant authority should be contacted for possible locations of further underground services and detailed locations of all services

LEGEND

- Top of Bank
- Toe of Bank
- Road Crown
- Mountable Kerb IL
- Back of Kerb
- Change of Grade
- Gully Invert
- Eaveline
- Edge of Gravel Driveway
- U/G Electricity (From Records)
- U/G Water (From Records)
- U/G Telstra (From Records)
- Telstra Pit
- Electrical Pillar
- Hydrant
- Stop Valve
- Drainage MH Lid

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Project: Lot 14 Ocean View Road, Killaloe – Proposed Extensions	**Job No.:** G7503
Client: M. Shearer	**Report Ref. :** G7503/R14557
Drawing Title: Figure 2: Site Survey & test locations.	
Drawn by: PP (Test locations).	**Scale:** - **Date:** 31/8/20

TP = Test Pit. **DCP** = DCP test. **EXP** = Exposure inspection. **Section AA** = cross section for slope analysis.

Cnr Post of Pool Fence

0 5 10 15
metres

SCALE 1:300 IS APPLICABLE ONLY TO THE ORIGINAL SHEET SIZE (A3).

NOTES
Level Datum Arbitrary
Origin of Levels Screw in Kerb 9500 RL 10.000
Origin of Coords Stn 9500 Screw in Kerb E 785.142 N 5256.210
Meridian RP745097
Contours Major 2.0 Minor 0.5

PROJECT MANAGER: DGP
SURVEYED: DCW 11/12/19
DRAWN: DCW
CHECKED: DGP
DRAFTING CHECKED: DGP
CAD REF: 145997-100.mjo
SHEET 1 OF SHEETS 1
SHEET SIZE: A3

Mark Shearer

Detail and Contour Survey
of Part of Lot 14 on RP745097
Ocean View Road
Killaloe
Queensland

RPS Australia East Pty Ltd
ACN 140 292 762
5954 Captain Cook Highway,
Craigie, QLD, 4877
PO Box 91, Port Douglas,
QLD, 4877
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SCALE	DATE	DRAWING NO.	ISSUE
1:300	12/12/19	145997 - 100	

APPENDIX A: Field & Laboratory Test Results

Construction Soiltest Pty Ltd A.B.N. 90 054 339 883
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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: Proposed House Extensions at Lot 14 Ocean View Road.	**J/N:** G7503	Page 1 of 1
Project Location: Killaloe, Queensland.	**Reg. No.:** H13622A/20	
Client: M. Shearer.	**Logged by:** PP	
~~**Borehole**~~ **/ Test Pit No.:** TP1 – Refer Figure 2.	**Date Logged:** 7/8/20	
Excavation plant used: Kubota kx 057.4 excavator, 300mm bucket.	**Plant Contractor:** Client	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	*Blows/ 100mm*
GL	Grass at surface.	*GL- 1.95m Excavated pit.*		*Refer DCP test.*	*0.05*	Seat
	FILL (topsoil). GM/SM. Grey brown gravelly sandy SILT. Grass & grass roots to 0.1m. Medium dense. Dry. Low plasticity.				*0.15*	6
					0.25	6
					0.35	5
0.15	FILL (original cut to fill) GM/GC. Pale brown silty clayey sandy GRAVEL, some cobbles, occasional small boulders. 1 x concrete slab piece 600mm long & 50mm thick. Medium dense to loose. Slightly moist. Low plasticity.		*DS @ 0.8-1.0m.*		*0.45*	6
					0.55	6
					0.65	5
					0.75	4
1.75	ORIGINAL GROUND. GM/GC. Brown gravelly clayey SILT. Stiff. Moist. Low plasticity.				*0.85*	4
					0.95	3
					1.05	4
1.9	WEATHERED ROCK Pale brown distinctly / moderately weathered rock.				*1.15*	5
					1.25	7
					1.35	6
1.95	Excavation refusal. End pit. No groundwater to 1.95m (7/8/20).				*1.45*	3
					1.55	4
					1.65	7
					1.75	10
					1.85	11
					1.95	5
					2.05	7
					2.15	20+
					2.25	END
					2.35	-
					2.45	-
					2.55	-

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. Porter Date: 1/9/20

NATA Accredited Laboratory No.1952.

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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: Proposed House Extensions at Lot 14 Ocean View Road.	**J/N:** G7503	Page 1 of 1
Project Location: Killaloe, Queensland.	**Reg. No.:** H13622B/20	
Client: M. Shearer.	**Logged by:** PP	
~~**Borehole**~~ **/ Test Pit No.:** TP2 – Refer Figure 2.	**Date Logged:** 7/8/20	
Excavation plant used: Kubota kx 057.4 excavator, 300mm bucket.	**Plant Contractor:** Client	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	*Blows/ 100mm*
GL	Gravel at surface.	*GL- 0.05m Excavated pit.*	-	*Refer DCP test.*	*0.05*	N
	FILL (Imported gravel). GW/GP. Grey GRAVEL / SAND / SILT. Medium dense. Dry. Low plasticity.				*0.15*	O
					0.25	T
0.05	WEATHERED ROCK Pale brown slightly / moderately weathered rock.				*0.35*	
					0.45	T
					0.55	E
0.05	Excavation refusal. End pit.				*0.65*	S
					0.75	T
					0.85	E
					0.95	D
					1.05	-
					1.15	R
					1.25	O
					1.35	C
					1.45	K
					1.55	
					1.65	
					1.75	
					1.85	
					1.95	
					2.05	
					2.15	
					2.25	
					2.35	-
					2.45	-
					2.55	-

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. Rosen Date: 1/9/20

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: Proposed House Extensions at Lot 14 Ocean View Road.	**J/N:** G7503	Page 1 of 1
Project Location: Killaloe, Queensland.	**Reg. No.:** H13622C/20	
Client: M. Shearer.	**Logged by:** PP	
~~**Borehole**~~ **/ Test Pit No.:** TP3 – Refer Figure 2.	**Date Logged:** 7/8/20	
Excavation plant used: Kubota kx 057.4 excavator, 300mm bucket.	**Plant Contractor:** Client	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	***Blows/ 100mm***
GL	Grass at surface.	*GL- 1.35m Excavated pit.*		*Refer DCP test.*	*0.05*	Seat
	FILL (original cut to fill) GM/GC. Pale brown gravelly clayey sandy SILT, some cobbles, occasional small boulders. Medium dense to loose. Dry. Low plasticity.				*0.15*	10
					0.25	8
					0.35	9
1.35	WEATHERED ROCK Pale brown distinctly / moderately weathered rock.				*0.45*	8
					0.55	4
			DS @ 0.6-0.8m.		*0.65*	4
1.35	Excavation refusal. End pit. No groundwater to 1.35m (7/8/20).				*0.75*	2
					0.85	3
					0.95	4
					1.05	3
					1.15	4
					1.25	6
					1.35	11
					1.45	20+
					1.55	END
					1.65	-
					1.75	-
					1.85	-
					1.95	-
					2.05	-
					2.15	-
					2.25	-
					2.35	-
					2.45	-
					2.55	-

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. Poston Date: 1/9/20

NATA Accredited Laboratory No.1952.

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Borehole/Test Pit Log Report

Project: Proposed House Extensions at Lot 14 Ocean View Road.	**J/N:** G7503	Page 1 of 1
Project Location: Killaloe, Queensland.	**Reg. No.:** H13622D/20	
Client: M. Shearer.	**Logged by:** PP	
~~**Borehole**~~ **/ Test Pit No.:** TP4 – Refer Figure 2.	**Date Logged:** 7/8/20	
Excavation plant used: Kubota kx 057.4 excavator, 300mm bucket.	**Plant Contractor:** Client	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	*Blows/ 100mm*
GL	Grass at surface.	*GL- 1.0m Excavated pit.*	-	*Refer DCP test.*	*0.05*	Seat
	FILL (original cut to fill) GM/GC. Pale brown gravelly clayey sandy SILT, some cobbles, occasional small boulders. Medium dense to loose. Dry. Low plasticity.				*0.15*	6
					0.25	5
					0.35	4
0.7	ORIGINAL GROUND. GM/GC. Brown gravelly clayey SILT. Loose. Moist. Low plasticity.				*0.45*	3
					0.55	4
					0.65	4
0.9	WEATHERED ROCK Pale brown distinctly / moderately weathered rock.				*0.75*	3
					0.85	4
					0.95	4
1.0	Excavation refusal. End pit. No groundwater to 1.0m (7/8/20).				*1.05*	4
					1.15	3
					1.25	4
					1.35	4
					1.45	3
					1.55	2
					1.65	3
					1.75	4
					1.85	6
					1.95	20+
					2.05	END
					2.15	-
					2.25	-
					2.35	-
					2.45	-
					2.55	-

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. Brown Date: 11/9/20

NATA Accredited Laboratory No.1952.

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Borehole/Test Pit Log Report

Project: Proposed House Extensions at Lot 14 Ocean View Road.	**J/N:** G7503	Page 1 of 1
Project Location: Killaloe, Queensland.	**Reg. No.:** H13622E/20	
Client: M. Shearer.	**Logged by:** PP	
~~**Borehole**~~ **/ Test Pit No.:** TP5 – Refer Figure 2.	**Date Logged:** 7/8/20	
Excavation plant used: Kubota kx 057.4 excavator, 300mm bucket.	**Plant Contractor:** Client	

Depth (m) (< GL)	Soil Description	Drill method	Sampling	Insitu Test	DCP Test	
					Depth m<GL	***Blows/ 100mm***
GL	Grass at surface.	*GL- 2.3m Excavated pit.*		*Refer DCP test.*	*0.05*	Seat
	FILL? / COLLUVIUM? GM/GC. Pale brown gravelly silty CLAY. Soft / loose. Moist. Low plasticity.				*0.15*	2
					0.25	3
0.15	NATURAL GROUND / RESIDUAL. Cl. Red / orange brown gravelly silty CLAY. Firm. Moist. Medium plasticity.		*DS @ 0.5-0.7m.*		*0.35*	2
					0.45	3
					0.55	3
1.5	EXTREMELY WEATHERED ROCK Pale brown extremely weathered rock. Breaks to clay / silt. Stiff. Moist. Medium plasticity.				*0.65*	2
					0.75	3
					0.85	2
					0.95	2
2.1	DISTINCTLY WEATHERED ROCK Pale brown distinctly weathered rock.				*1.05*	3
					1.15	4
					1.25	3
2.3	Excavation difficult. End pit. No groundwater to 2.3m (7/8/20).				*1.35*	4
					1.45	3
					1.55	3
					1.65	3
					1.75	3
					1.85	3
					1.95	4
					2.05	5
					2.15	5
					2.25	6
					2.35	12
					2.45	20+
					2.55	END

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. Rosan Date: 1/9/20

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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

REPORT OF PARTICLE SIZE DISTRIBUTION, ATTERBERG LIMITS & MOISTURE CONTENT OF SOILS.

Project: Lot 14 Ocean View Road, Killaloe - Extensions.	Report No.: H13623/20	
Client: M. Shearer.	Job No. : G7503	
Sample Location: TP1 0.8-1.0m < GL.	Report Page No. 1 of 1	
Sample Source: Existing fill.	Sample by: PP	Sample date: 7/8/20
Submitted as: Foundation soil.	Test by: JH	Test date: 13 & 18/8/20

Results of Particle Size Distribution

Sieve size (mm)	Percent Passing (%)	Spec. (%)	Test Method
53.0	100		AS1289.3.6.1
37.5	89		
19.0	77		
9.5	62		
4.75	49		
2.36	41		
0.425	31		
0.075	25		

Results of In-situ Moisture Content

Moisture content, %	10.7		AS1289.2.1.1

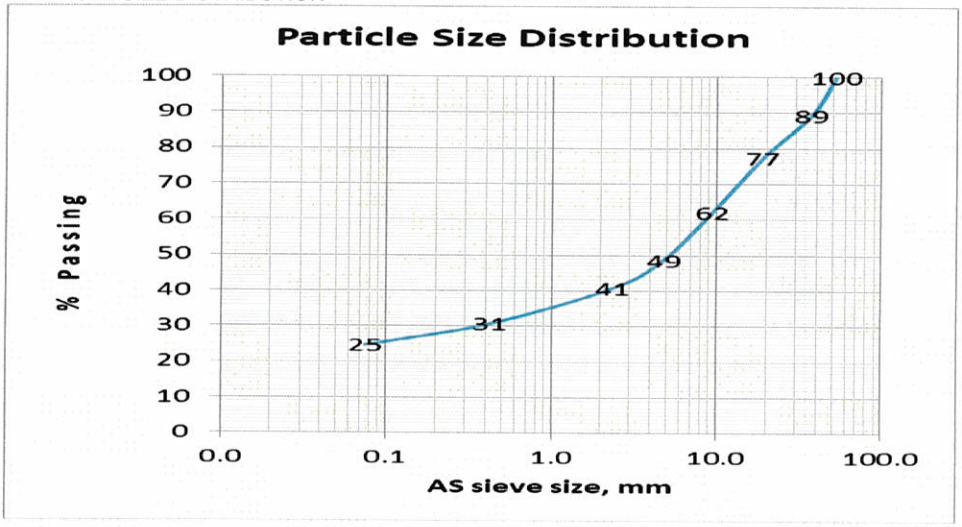
Results of Atterberg Limits

Test Type	Result (%)	Spec. (%)	Test Method
Liquid Limit (LL)	30	-	AS1289.3.1.2
Plastic Limit (PL)	23	-	AS1289.3.2.1
Plastic Index (PI)	7	-	AS1289.3.3.1
Linear Shrinkage (LS)	2.5	-	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.
Linear Shrinkage Mould: 250mm, ~~150mm~~.
Linear Shrinkage History: ~~Cracking~~, Crumbling, ~~Curling, Neither~~.

Remarks:
Results only relate to the item tested. # Information provided by client / customer. Sampling Method: AS1289. 1.2.1 Clause 6.4 b & 6.5.1.

PARTICLE SIZE DISTRIBUTION



Approved by: P.A. Posar P.A. Posar Date: 1/9/20

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

REPORT OF PARTICLE SIZE DISTRIBUTION, ATTERBERG LIMITS & MOISTURE CONTENT OF SOILS.

Project: Lot 14 Ocean View Road, Killaloe - Extensions.	Report No.: H13625/20	
Client: M. Shearer.	Job No. : G7503	
Sample Location: TP5 0.5-0.7m < GL.	Report Page No. 1 of 1	
Sample Source: Existing natural ground.	Sample by: PP	Sample date: 7/8/20
Submitted as: Hillslope soil.	Test by: JH	Test date: 13 & 18/8/20

Results of Particle Size Distribution

Sieve size (mm)	Percent Passing (%)	Spec. (%)	Test Method
53.0	-		AS1289.3.6.1
37.5	100		
19.0	100		
9.5	93		
4.75	88		
2.36	85		
0.425	84		
0.075	80		

Results of In-situ Moisture Content

Moisture content, %	13.5		AS1289.2.1.1

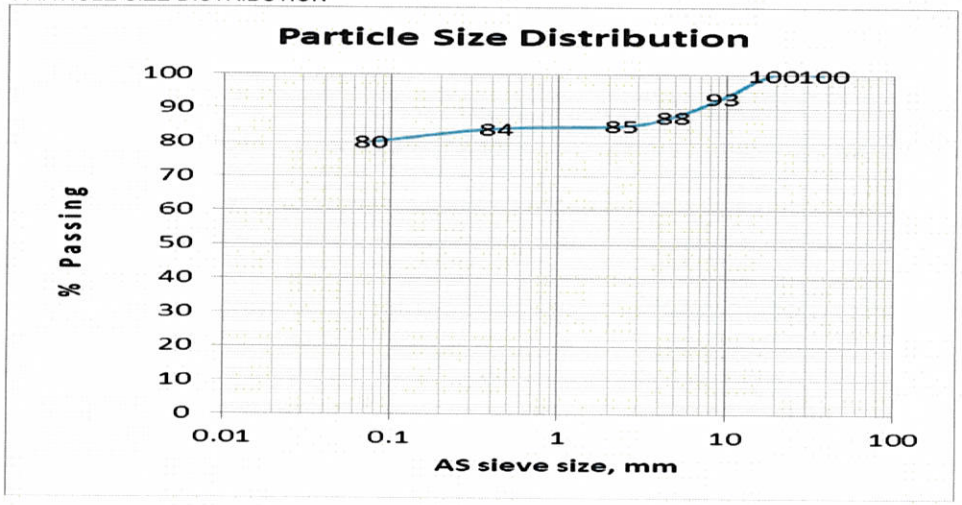
Results of Atterberg Limits

Test Type	Result (%)	Spec. (%)	Test Method
Liquid Limit (LL)	41	-	AS1289.3.1.2
Plastic Limit (PL)	24	-	AS1289.3.2.1
Plastic Index (PI)	17	-	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.
Linear Shrinkage Mould: 250mm, ~~150mm~~.
Linear Shrinkage History: Cracking, ~~Crumbling~~, ~~Curling, Neither~~.

Remarks:
Results only relate to the item tested. # Information provided by client / customer. Sampling Method: AS1289. 1.2.1 Clause 6.4 b & 6.5.1.

PARTICLE SIZE DISTRIBUTION



Approved by: P.A. Posar P.A. Posar Date: 1/9/20

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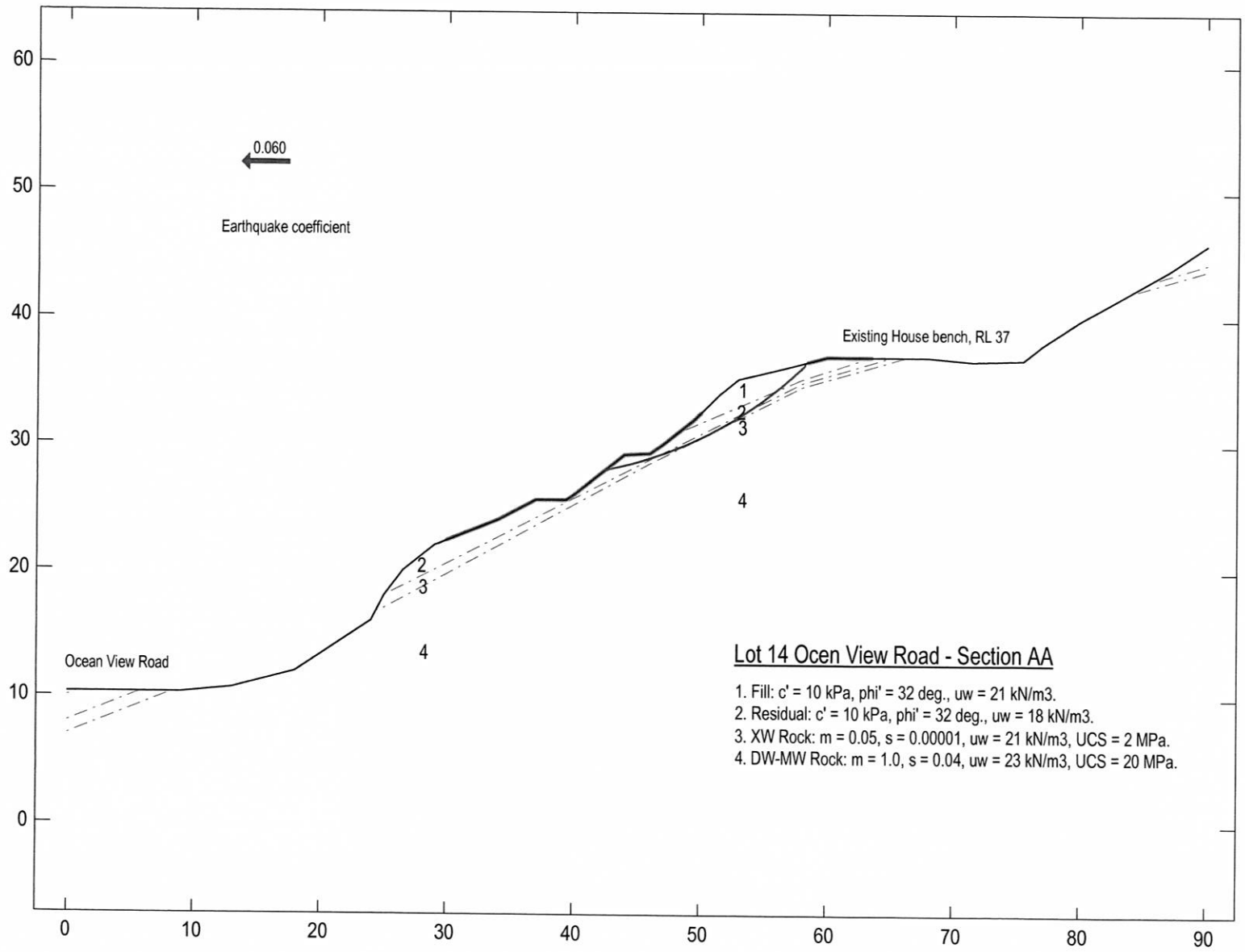
APPENDIX B: Stability Analysis & Landslide Risk Assessment

GALENA Version 4.01



Analysis: 1

Multiple Stability Analysis

Method: Bishop Simplified

Surface: Circular

Results

Critical (minimum)

Factor of Safety: 1.48

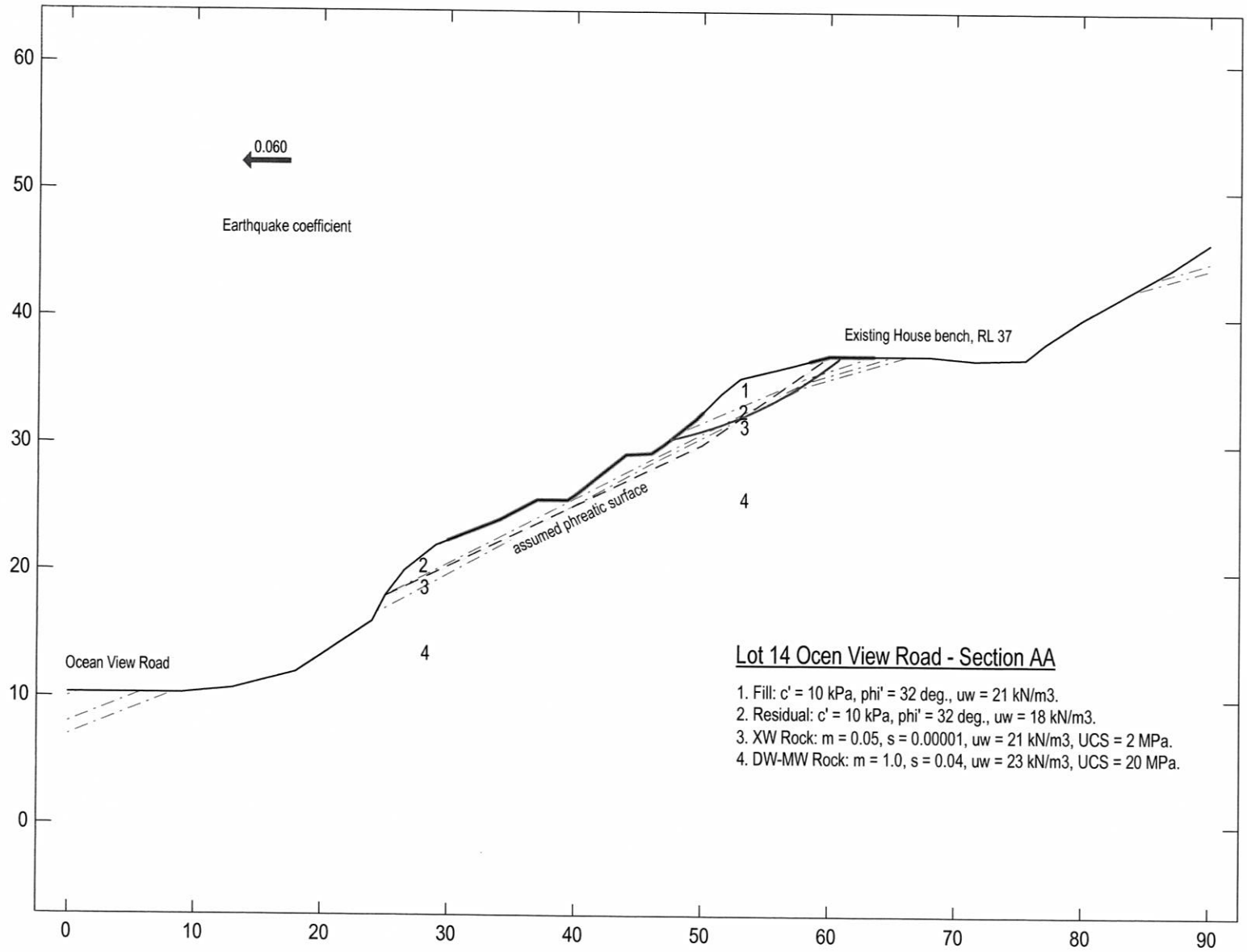
Project: Lot 14 Ocen View Sect AA (1) (Existing) Aug 2020

G7503/A1

File: C:\Documents and Settings\Paul P\My Documents\Examples\Lot 14 Ocean View (AA1) Aug 2020.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: 1.43

Project: Lot 14 Ocen View Sect AA (2) (Existing) Aug 2020

G7503/A2

File: C:\Documents and Settings\Paul P\My Documents\Examples\Lot 14 Ocean View (AA2) Aug 2020.gmf

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Quantitative Landslide Risk Assessment.

7.1 QUANTITATIVE RISK ESTIMATION

AGS Vol 42 No 1 March 2007

Quantitative risk estimation involves integration of the frequency analysis and the consequences.

For property, the risk can be calculated from:

R(Prop) = P(H) x P(S:H) x P(T:S) x V(Prop:S) x E **(1)**

Where

R(Prop) is the risk (annual loss of property value).

P(H) is the annual probability of the landslide.

P(S:H) is the probability of spatial impact by the landslide on the property, taking into account the travel distance and travel direction.

P(T:S) is the temporal spatial probability. For houses and other buildings P(T:S)= 1.0. For Vehicles and other moving elements at risk1.0< P(T:S) >0.

V(Prop:S) is the vulnerability of the property to the spatial impact (proportion of property value lost).

E is the element at risk (e.g. the value or net present value of the property).

For loss of life, the individual risk can be calculated from:

R(LoL) = P(H) x P(S:H) x P(T:S) x V(D:T) **(2)**

Where

R(LoL) is the risk (annual probability of loss of life (death) of an individual).

P(H) is the annual probability of the landslide.

P(S:H) is the probability of spatial impact of the landslide impacting a building (location) taking into account the travel distance and travel direction given the event.

P(T:S) is the temporal spatial probability (e.g. of the building or location being occupied by the individual) given the spatial impact and allowing for the possibility of evacuation given there is warning of the landslide occurrence.

V(D:T) is the vulnerability of the individual (probability of loss of life of the individual given the impact).

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Appendix D: Quantitative Landslide Risk Assessment.

Project: Lot 14 Ocean View Road

J/N: G7503

Report reference: G7503/R14557

Event 1: Site A, B & C; Existing slope; debris slide of front batter, undermining new development -assumed high level footings, no retaining wall.

Event 2: Site A, B & C; Existing slope; debris slide of front batter, undermining new development - assumed pier footings into rock & structural retaining wall.

Event 3: Site A, B & C; Existing southern cut batter slope, minimum distance ≈ 8m south from new development; rock slide, impacting new development.

Hazard Analysis:	Event 1	Event 2	Event 3
Volume m3	50-200	50-200	10 to 50
Rainfall, mm	≤ 300	≤ 300	≤ 300
Duration, hrs	12	12	12
ARI yrs	50	50	50
Probability %	2	2	2
Annual frequency P(H)g	0.02	0.02	0.02

Frequency Assessment:	Event 1	Event 2	Event 3
P(H)g	0.02	0.02	0.02
Tf (trigger factor)	0.05	0.001	0.01
BSf (constructed slope factor)	2	2	1
NSf (natural slope factor)	1	1	1.5
P(H) = P(H)g x Tf x BSf x NSf	2.00E-03	4.00E-05	3.00E-04

P(H)g) = annual frequency.

Tf: Event 1 use 0.05 (5% probability FOS<1 based on stability analysis & P(H)g); Event 2 use 0.001 (0.1% probabilility for retainin wall failure). Event 3 use 0.01 (1% probability).

BSf (assumed) use BSf = 2.0 for constructed slope > 20% slope (Event 1 & 2), use BSf = 1.0 for constructed slope < 20% slope (Event 3).

NSf Factor (assumed) for ground slope (soil) steepness behind embankment, for Event 1 & 2 use 1.0 for 0% slope. Event 3 use 1.5 for 25% slope.

P(H) = P(H)g x Tf x BSf x NSf

Property Risk Assessment:	Event 1	Event 2	Event 3
P(H)	2.00E-03	4.00E-05	3.00E-04
P(S:H)	0.5	0.5	0.1
P(H) x P(S:H) Indicative annual probability	**1.00E-03**	**2.00E-05**	**3.00E-05**
P(T:S)	1	1	1
V(Prop:S)	0.3	0.3	0.1
E (unit value)	1	1	1
R(Prop)	**3.00E-04**	**6.00E-06**	**3.00E-06**
Qualitative property risk assessment:			
Qualitative Likelihood of $P_{(H)}$ x $P_{(S:H)}$	POSSIBLE	RARE	RARE
Qualitative Consequences of $V_{(PROP:S)}$	MEDIUM	MEDIUM	MEDIUM
Qualitative Risk to Property	**MODERATE**	**LOW**	**LOW**

$P_{(S:H)}$ estimated: debris slide: Event 1 & 2 use 0.5 (50% of landslide volume undermining new building or pool). Event 3 use 0.1 (10% of landslide volume impact).

P(T:S) use 1.0 for permanent structures (AGS 2007).

$V_{(PROP:S)}$ (% of property damaged) – Event 1 & 2 assume 0.3 (30% property damage). Event 3 use 0.1 (10% property damage).

Qualitative property risk criteria matrix: Refer AGS LRM 2007 Appendix C.

Loss of Life Risk:	Event 1	Event 2	Event 3
P(H)	2.00E-03	4.00E-05	3.00E-04
P(S:H)	0.5	0.5	0.1
P(H) x P(S:H)	**1.00E-03**	**2.00E-05**	**3.00E-05**
P(T:S)	0.5	0.5	0.5
V(D:T)	0.1	0.1	1
R(LoL)	**5.00E-05**	**1.00E-06**	**1.50E-05**

Qualitative Risk to Life	**UNACCEPTABLE**	**ACCEPTABLE**	**TOLERABLE**
Tolerable Risk Criteria / annum	1.0 E-04	for existing slope / existing development.	
	1.0 E-05	for new constructed slope / for new development.	

$P_{(S:H)}$ estimated: debris slide: Event 1 & 2 use 0.5 (50% of landslide volume undermining new building or pool). Event 3 use 0.1 (10% of landslide volume impact).

P(T:S) use 0.5 for person in building for debris slide (50% occupancy in critical area of building).

V(D:T): Event 1 & 2 assume 0.1 (structure collapse from foundation soil slide & person remaining in critical area). Event 3 assume 1.0 (impact to perdon in critical area).

APPENDIX C: – QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY (CONTINUED)

QUALITATIVE RISK ANALYSIS MATRIX – LEVEL OF RISK TO PROPERTY

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

Notes: (5) For Cell A5, may be subdivided such that a consequence of less than 0.1% is Low Risk.
(6) When considering a risk assessment it must be clearly stated whether it is for existing conditions or with risk control measures which may not be implemented at the current time.

RISK LEVEL IMPLICATIONS

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

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

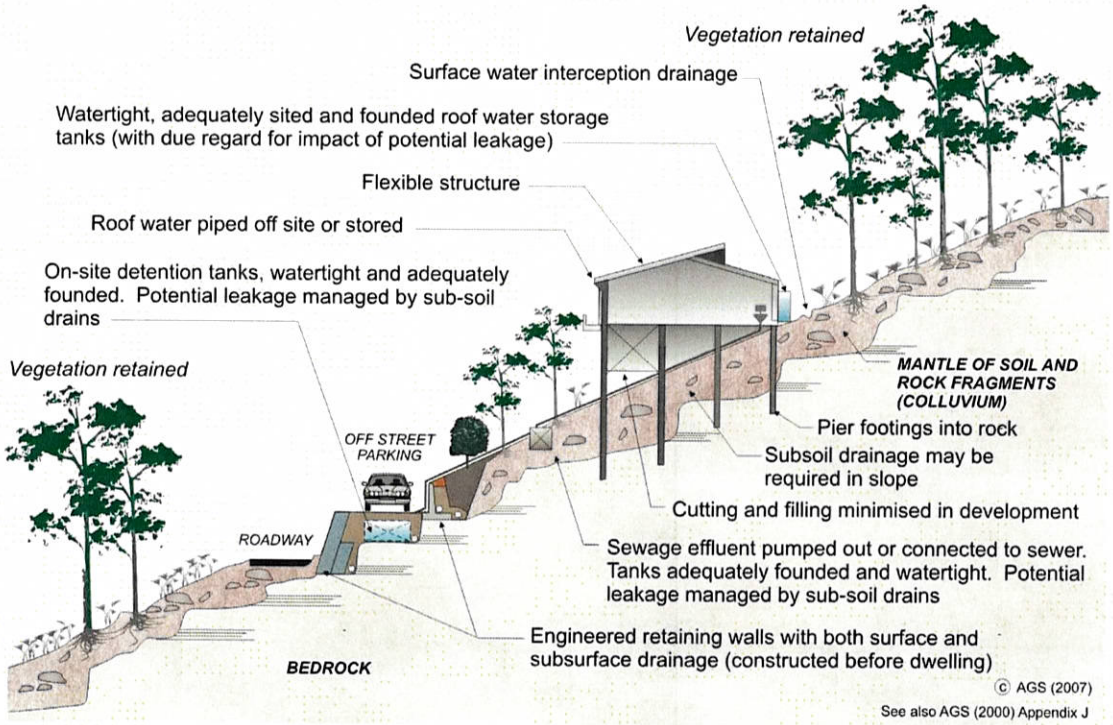
APPENDIX C: Extract of AGS Vol 42 March 2007 – LR8 & LR9

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



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.

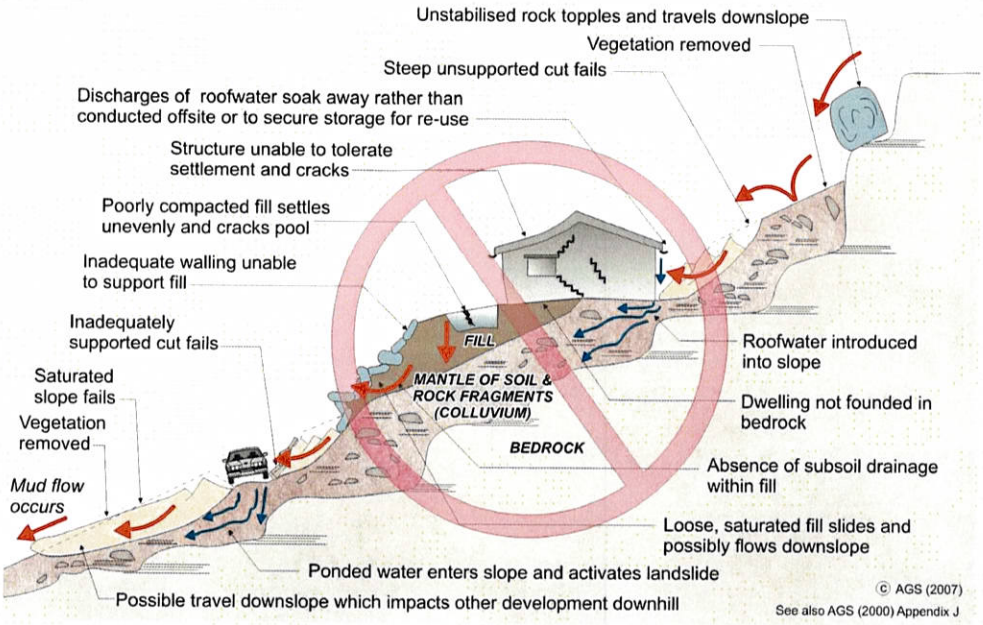
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing 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.

EFFLUENT AND SURFACE WATER DISPOSAL

EFFLUENT AND WASTEWATER

All households generate effluent and wastewater. The disposal of these products and their impact on the environment are key considerations in the planning of safe and sustainable communities. Cities and townships generally have reticulated water, sewer and stormwater systems, which are designed to deliver water and dispose of effluent and wastewater with minimal impact on the environment. However, many smaller communities and metropolitan fringe suburbs throughout Australia are un-sewered. Some of these are located in hillside or coastal settings where landslides present a hazard.

Processes by which wastewater can affect slope stability

As explained in GeoGuides LR3 and LR5, groundwater variations have a significant impact on slope stability. Inappropriate disposal of effluent and wastewater may result in the ground becoming saturated. The result is equivalent to a localised rise of the groundwater table and may have the potential to cause a landslide (GeoGuides LR2, LR5 and LR8).

On-site effluent disposal

In un-sewered areas disposal of effluent must be achieved through suitable methods. These methods usually involve containment within the boundaries of the site ("on-site disposal"). State environment protection agencies and local government authorities can usually provide advice on suitable disposal systems for your area. Such systems may include:

- *Septic systems,* which involve a storage/digestion tank for solids, with disposal of the liquid effluent via absorption trenches and beds, leach drains, or soak wells. Such systems are best suited to areas not prone to landslides.
- *Aerobic treatment units* which incorporate an individual household treatment plant to aid breakdown of the waste into a higher quality effluent. Such effluent is further treated and disposed of by surface or sub-surface irrigation, sub-soil dripper, or shallow leach drain system.
- *Nutrient retentive leaching systems* which utilise septic tanks to process the solid and liquid wastes in conjunction with discharge of the effluent through sand filters, media filters, mound systems and nutrient retentive leaching systems, which strip the effluent of nutrients.

Toilet (and sometimes kitchen) waste is known as *black water.* Other, less contaminated, wastewater streams from showers, baths and laundries are known as *grey water. Grey water re-use systems* allow a household to conserve water from bathrooms, kitchens and laundries, for re-use on gardens and lawns.

Recommendations for effluent disposal

In areas prone to landslide hazard, it is recommended that whatever effluent disposal system is employed, it should be designed by a qualified professional, familiar with how such a system can impact on the local environment. Local council, and in some instances state environment protection agency, approval is usually required as well. Many local authorities require a site assessment report, which covers all relevant issues. If approved, the report's recommendations must be incorporated in the system design. Reduction in the volume of effluent is beneficial so composting toilets and highly rated (i.e. low consumption) water appliances are recommended. It should be noted that in some state and local government jurisdictions there are restrictions on the alternative measures that can be applied. Consideration should be given to applying treated wastewater to land at low rates and over as large an area as possible. Further guidance can be found in Australian Standard AS/NZS 1547:2000 On-site domestic wastewater management.

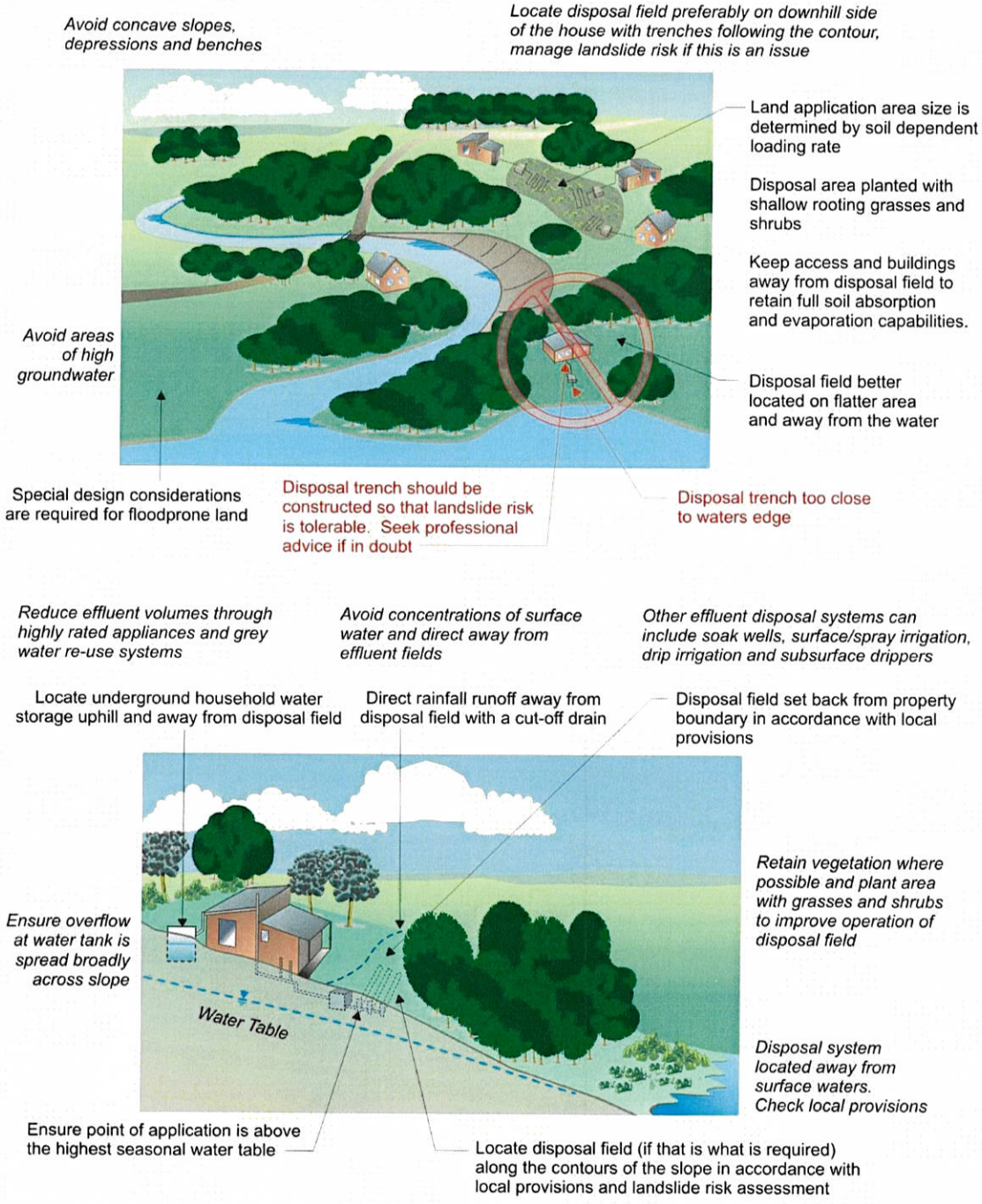
Effluent disposal fields should be sited with due consideration to the overall landscape and the individual characteristics of the property. Some guidance is provided. In particular, effluent fields should be located downslope of the building, away from stormwater, or *grey water,* discharge areas and where there is minimal potential for downstream pollution. Set backs and buffer distances vary from state to state and local requirements should be adhered to. All systems require regular maintenance and inspection. Efficient operation of the system must be a priority for property owners/occupiers to ensure safe and sustainable communities. Responsibility for maintenance rests with owners.

SURFACE WATER DRAINAGE

Attention to on-site surface water management is also important. Runoff from developments, including buildings, decks, access tracks and hardstand areas should be collected and discharged away from the development and other effluent disposal fields. Particular care must be given to the design of overflows on water tanks, as this is often overlooked. Discharge from any development should be spread out as much as possible, unless it can be directed to an existing natural water course. Ponding of water on hillsides and the concentration of water flows on slopes must be avoided.

It is recommended that a specific drainage plan and strategy should be developed in conjunction with the effluent disposal system for sites with a high potential for slope instability. Maintenance of the surface water drainage system is as important as maintenance of the effluent disposal system and again the responsibility rests with owners.

AUSTRALIAN GEOGUIDE LR9 (EFFLUENT DISPOSAL)



Note: Adapted from EPA Vic. Publication 451 (March 1996) "Code of Practice - Septic Tanks", which was sourced from Vic. Department of Planning and Loddon-Campaspe Regional Planning Authority.

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

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APPENDIX D: Site, Test Pit & Surface Exposures – Photographs.

Appendix D: Lot 14 Ocean View Road, Killaloe – (i) Site Photographs.

Existing house: looking north from rear yard.

Existing house: looking east. Proposed extension area west of house (Site A), & TP1 location.

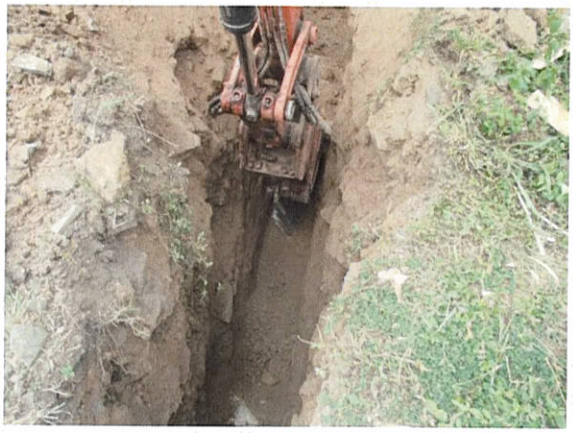
Existing house: looking north. Proposed extension area east of house (Site B), & TP3 location.

Existing house: looking west. Proposed swimming pool area north of house (Site C), & TP4 location.

Appendix D: Lot 14 Ocean View Road, Killaloe – (ii) Test Pit Photographs.

(Refer Figure 2 for locations).

TP1: excavated pit (east pit wall @ LHS of photo).



TP1: excavated pit (north pit wall @ top of photo).

TP2: excavated pit GL- 0.1m (rock near surface).

TP3: excavated pit (rock at base).

TP3: excavated pit (west pit wall).

TP3: excavated pit (rock at base).

TP4: excavated pit (south pit wall @ LHS of photo).

TP4: excavated pit (south pit wall @ top of photo).

TP4: excavated pit GL- 0.9m (rock at base).

TP5: excavated pit (looking east).

TP5: excavated pit (north pit wall @ top of photo).

TP5: excavated pit (weathered rock @ base).

Appendix D: Lot 14 Ocean View Road, Killaloe – (iii) Surface Exposures Photographs.

(Refer Figure 2 for locations).

EXP1: existing rear cut batter.

EXP2: existing rear cut batter.

EXP3: existing batter - proposed west extension foundation (Site A) at top.

EXP3: existing batter - proposed west extension foundation (Site A) at top.

EXP4: existing batter below water tanks.

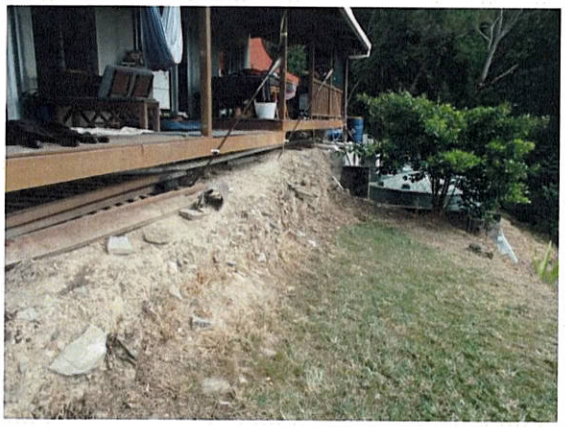
EXP5: existing batter (looking upslope).

EXP5: existing hillslope (looking downslope).

EXP6: existing batter (looking upslope).

EXP7: Existing retaining wall behind water tanks.

EXP7: Existing retaining wall behind water tanks.



EXP8: existing batter looking west - proposed swimming pool foundation (Site C).

EXP8: existing batter looking east - proposed swimming pool foundation (Site C).

EXP9A: existing driveway cut batter (bottom of d'way)

EXP9B: existing driveway cut batter (bottom of d'way)

EXP10A: existing driveway cut batter (exposed rock at toe).

EXP10B: existing driveway cut batter (exposed rock at toe).

EXP10C: existing driveway cut batter.

EXP11: existing driveway cut batter (exposed rock).

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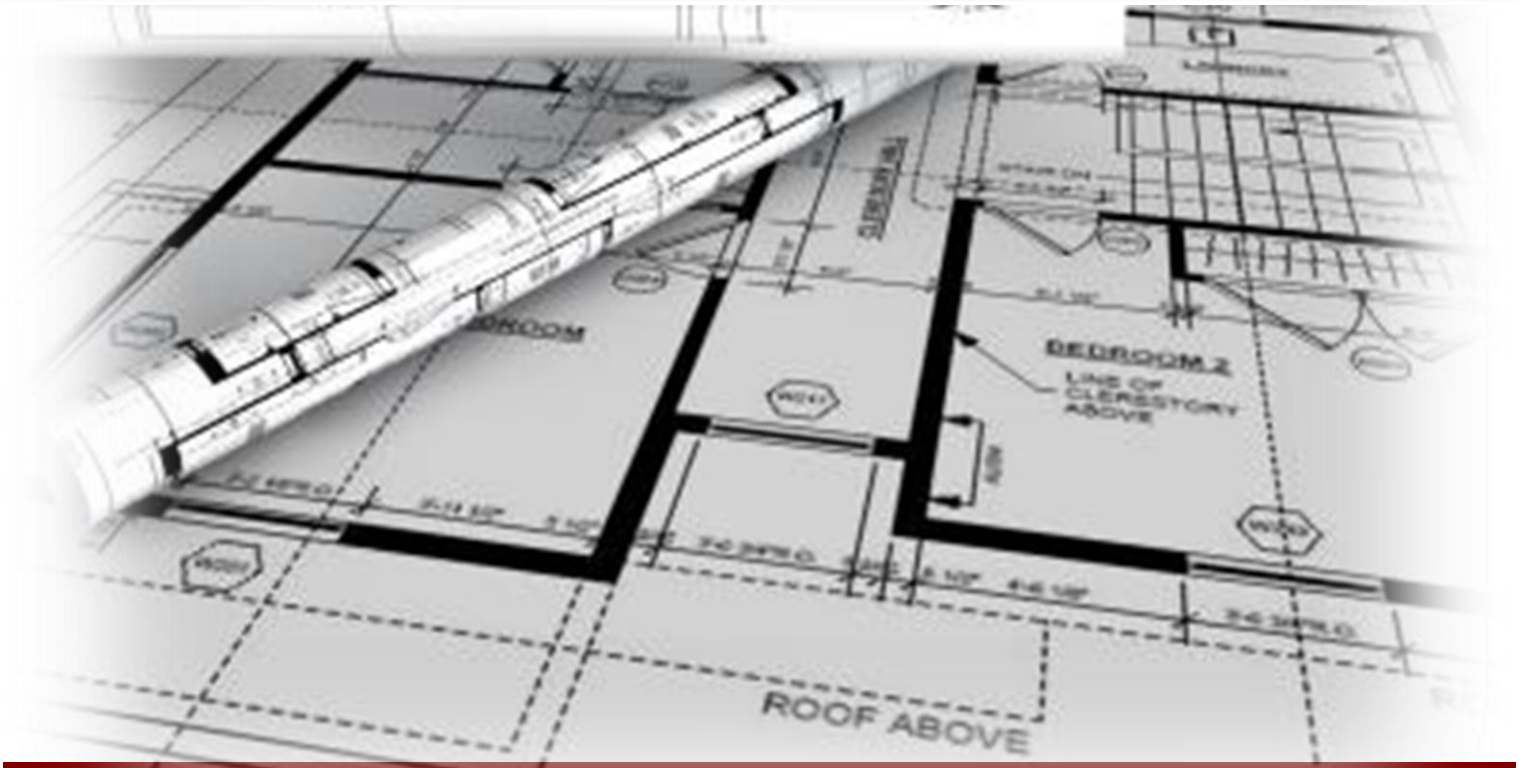

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