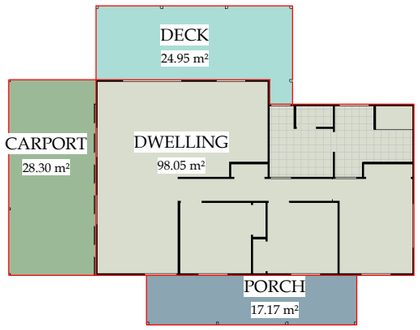
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

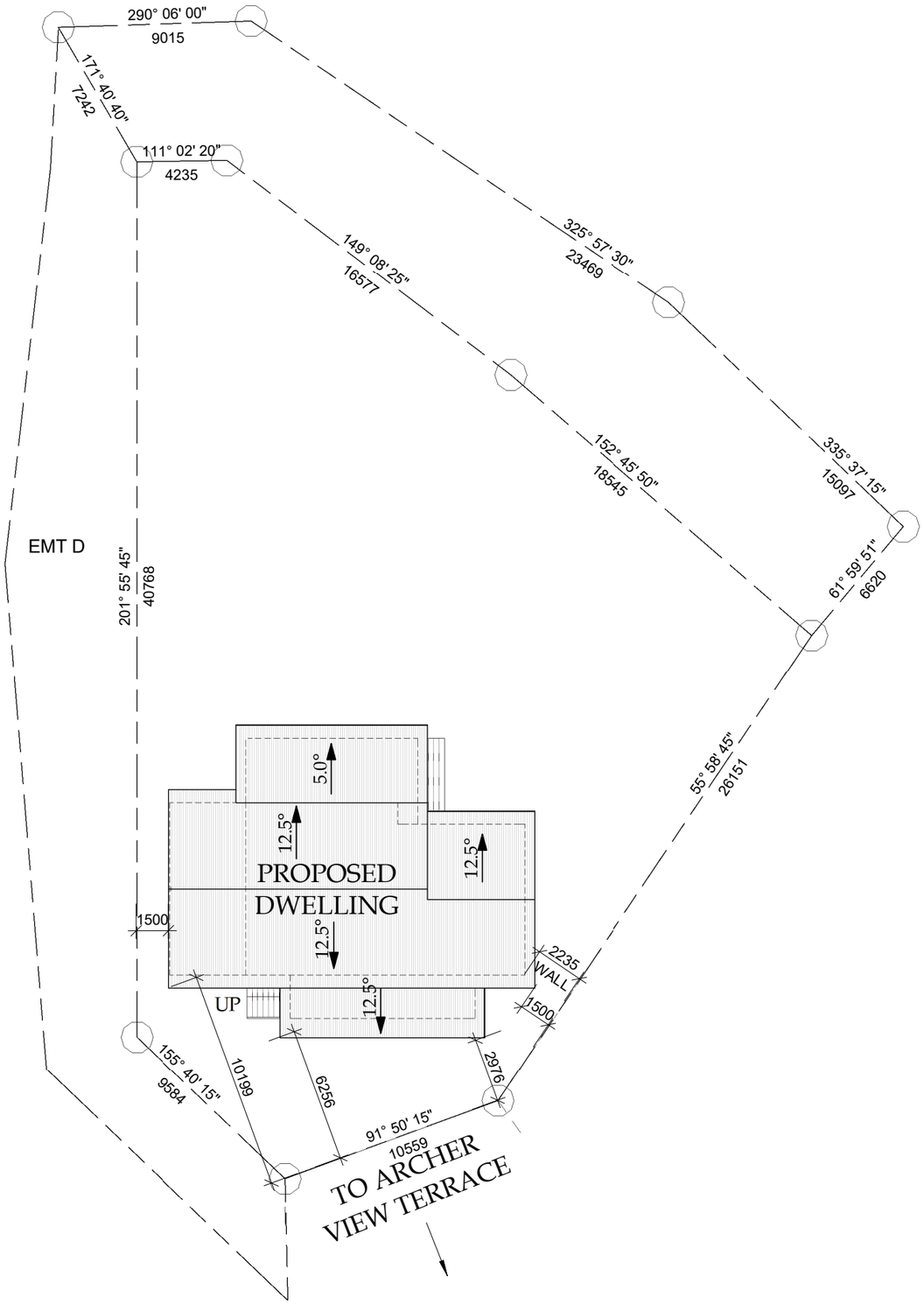
These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/30-2021

Dated: 15 April 2021



4 Area Plan
1 : 250



RP Data

Lot Number :	56
RP/SP Number :	SP106354
Parish :	HEWITTVILLE
County :	LIVINGSTONE
Area :	1239 m²
Site Cover:	12.2%

3 Site Plan
1 : 250

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
B	AMENDED	17/12/20	DEL
C	AMENDED	18/01/21	JG
D	CONSTRUCTION	02/02/21	JG

JOB DESCRIPTION
NEW DWELLING

DESIGN
Option D Cabin

CLIENT
BERNHARD & HELEN HILSE

ADDRESS
14 ARCHER VIEW TERRACE, FRENCHVILLE

CEADS CAPRICORN ENGINEERING AND DRAFTING SERVICES
INDUSTRIAL COMMERCIAL RESIDENTIAL
BSA - 1126594 BSA - 1126593
building designers association of queensland inc.
PO Box 1734, Yeppoon, QLD , 4703
PH: (07) 49250772 Fax: (07) 49395808
Email: info@ceads.com.au
www.ceads.com.au

DATE: 04/02/19

DRAWN: JG
CHECKED: DEL

SCALE: As indicated
SHOWN AT A3

DWG NAME: SITE PLAN

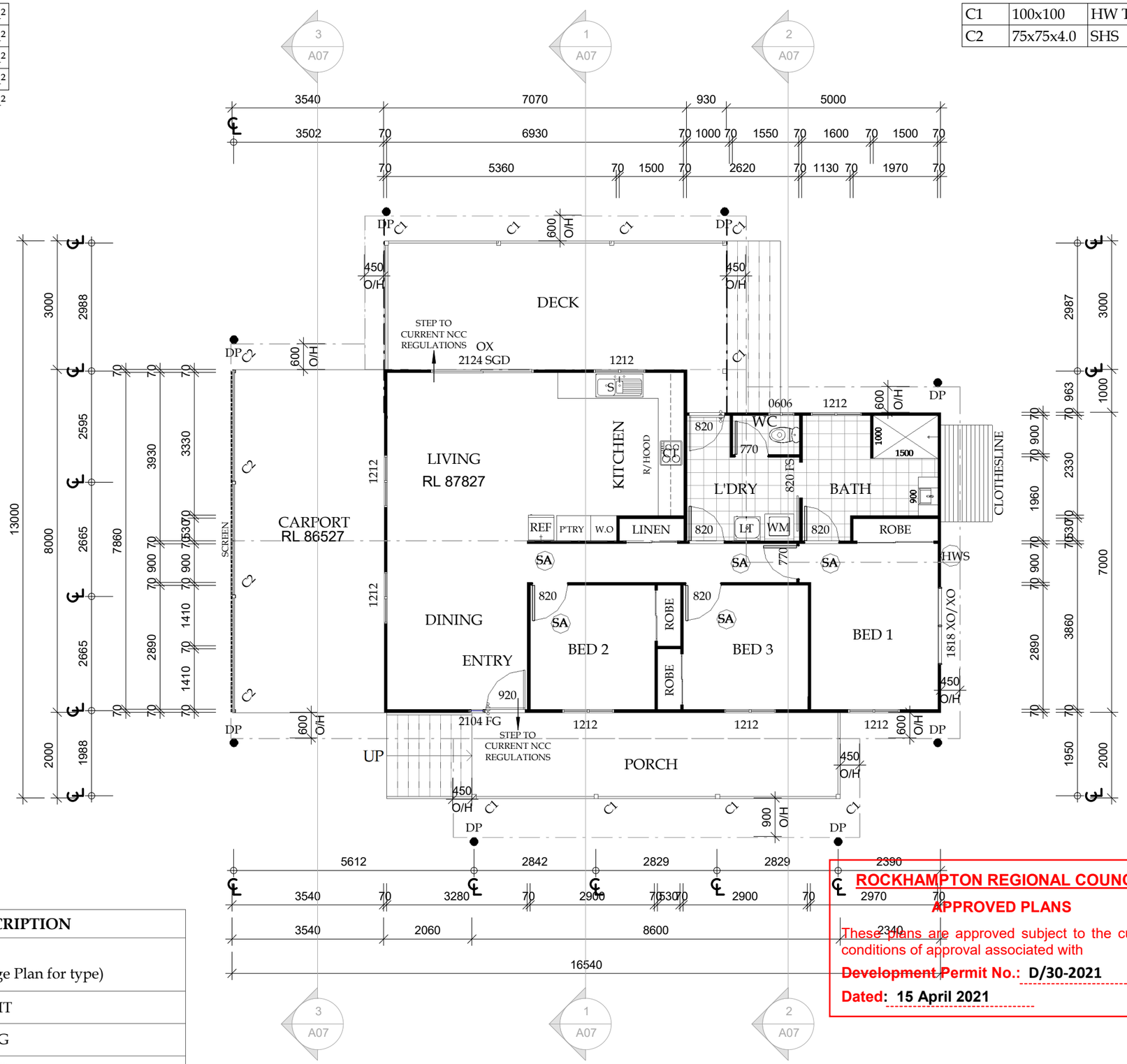
DWG No. 20-261-R SHT No. A02

CURRENT REVISION: D

Area Schedule	
Name	Area
DECK	24.95 m²
DWELLING	98.05 m²
CARPORT	28.30 m²
PORCH	17.17 m²
	168.48 m²

NOTE: 2 x WHIRRLY BIRDS TO CEILING

Column Schedule			
Mark	Post Size	Post Type	Count
C1	100x100	HW Timber	9
C2	75x75x4.0	SHS	30



SYMBOL	DESCRIPTION
●	DOWNPIPE (Refer Roof Drainage Plan for type)
⊠	VENTED SKYLIGHT
▨	DROPPED CEILING
SA	SMOKE DETECTOR (in accordance with part 3.7.2 B.C.A vol 2. Smoke Alarms must comply with AS3786-2014)

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 15 April 2021

NOTE: SGD & SGW
X - OPENING PANEL
O - FIXED PANEL

1 Floor Plan
1 : 100

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
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C	AMENDED	14/01/21	JG
D	AMENDED	18/01/21	JG
E	CONSTRUCTION	02/02/21	JG

JOB DESCRIPTION
NEW DWELLING

DESIGN
Option D Cabin

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PH: (07) 49250772 Fax: (07) 49395808
Email: info@ceads.com.au
www.ceads.com.au

DATE: 15/12/20

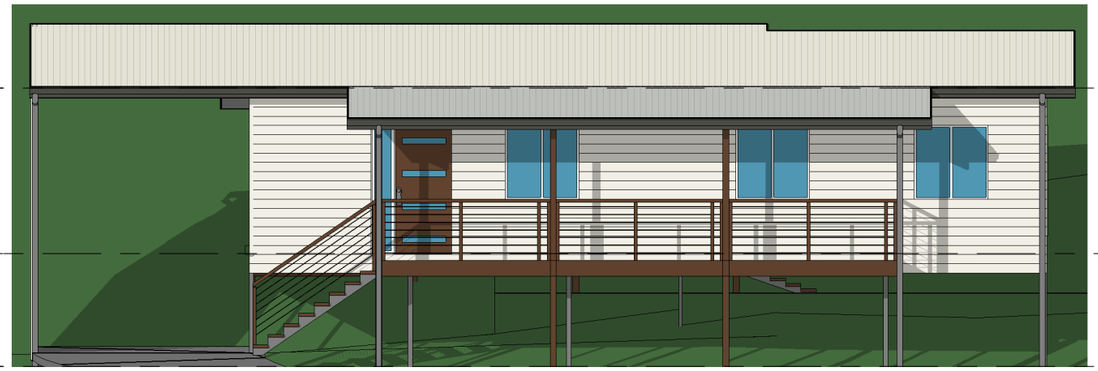
DRAWN	CHECKED
DEL	DEL

SCALE: 1 : 100 SHOWN AT A3

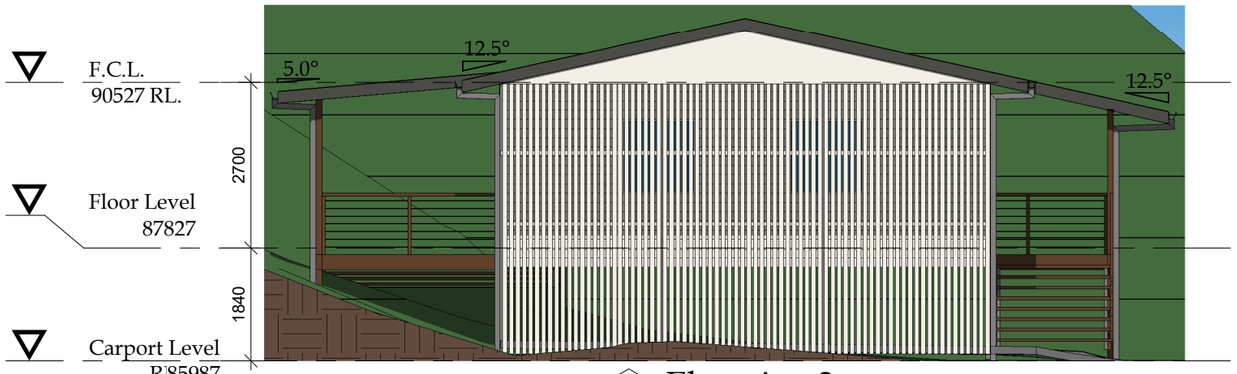
DWG NAME. GROUND FLOOR PLAN

DWG No. 20-261-R SHT No. A03

CURRENT REVISION: E

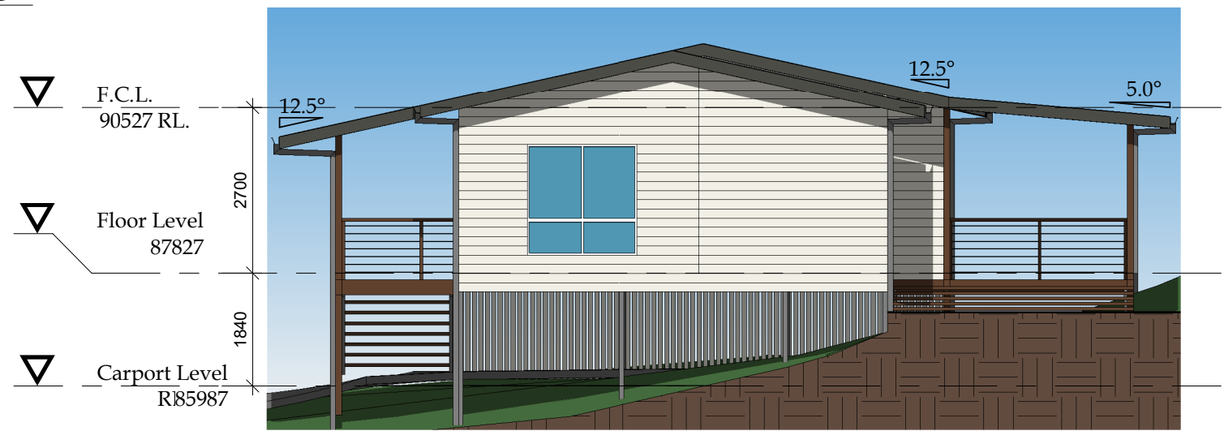


1 Elevation 1
1 : 100



2 Elevation 2
1 : 100

3 Elevation 3
1 : 100



4 Elevation 4
1 : 100

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Dated: 15 April 2021

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
B	AMENDED	17/12/20	DEL
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D	CONSTRUCTION	02/02/21	JG

JOB DESCRIPTION
NEW DWELLING

DESIGN
Option D Cabin

CLIENT
BERNHARD & HELEN HILSE

ADDRESS
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DATE: 15/12/20

DRAWN	CHECKED
DEL	DEL

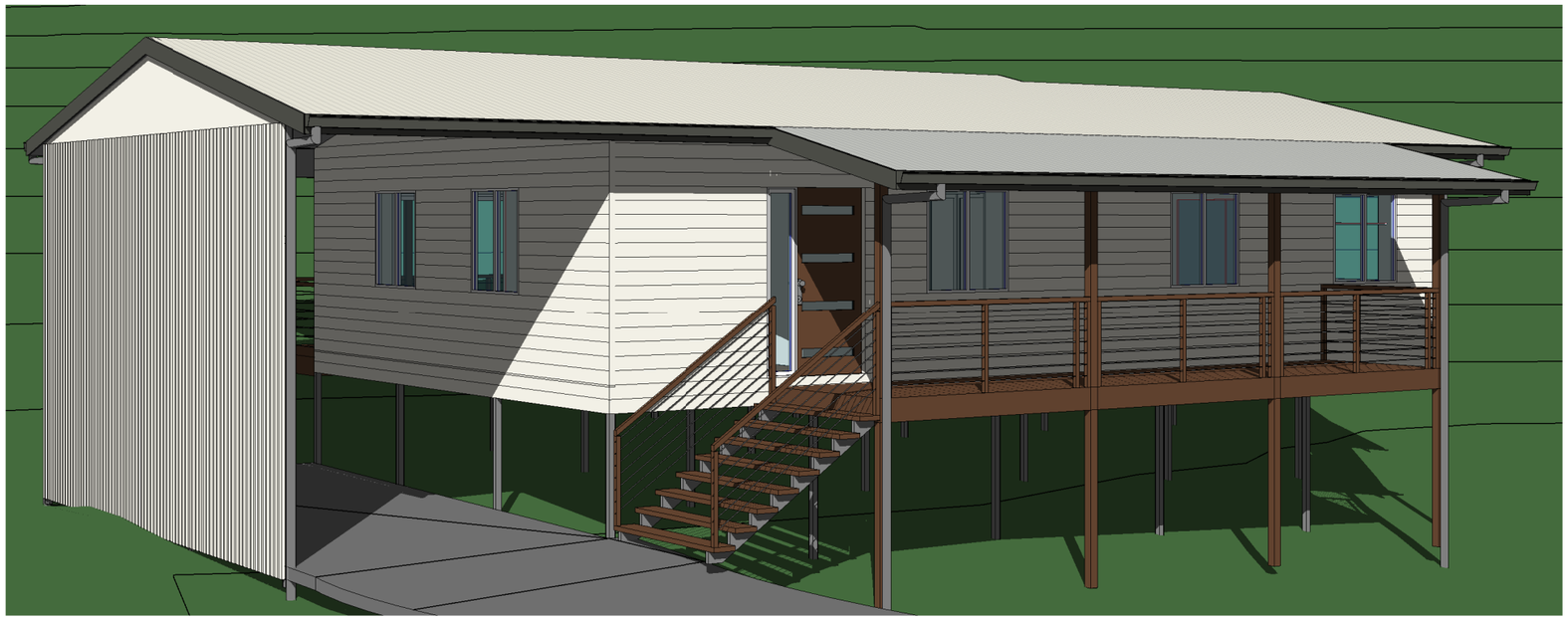
SCALE: 1 : 100 SHOWN AT A3

DWG NAME. ELEVATIONS

DWG No. 20-261-R SHT No. A05

CURRENT REVISION: D

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
B	CONSTRUCTION	02/02/21	JG



1 3D View 1

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/30-2021

Dated: 15 April 2021

2 3D View 2

JOB DESCRIPTION

NEW DWELLING

DESIGN

Option D Cabin

CLIENT

BERNHARD & HELEN HILSE

ADDRESS

14 ARCHER VIEW TERRACE, FRENCHVILLE

CEADS CAPRICORN ENGINEERING AND DRAFTING SERVICES
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Email: info@ceads.com.au
www.ceads.com.au

DATE: 04/02/19

DRAWN	CHECKED
JG	DEL

SCALE: SHOWN AT A3

DWG NAME. 3D VIEWS

DWG No. 20-261-R SHT No. A08

CURRENT REVISION: B

CQ SOIL TESTING

Landslide Risk Assessment Slope Stability Analysis and AS2870 Site Classification

SITE ADDRESS:	Lot 56 (SP106354) 14 Archer View Terrace, Frenchville
Prepared for:	B & H Hilse
Job Number:	CQ18595
Issue Date:	18/02/2021

CQ SOIL TESTING technical excellence

ABN 477 159 434 84
QBCC License 11 17 681

PO Box 9654
Park Avenue QLD 4701

P (07) 4936 1163
F (07) 4936 1162

info@cqsoiltesting.com.au

Client & Document Information

Client:	B & H Hilse
Project:	Lot 56 (SP106354)
	14 Archer View Terrace, Frenchville
Investigation Type:	**Slope Stability, Site Classification**
Job Number:	CQ18595
Date of Issue:	18/02/2021

Contact Information

CQ SOIL TESTING
ABN 47 715 943 484

PO Box 9654
PARK AVENUE QLD 4701

Telephone: (07) 4936 1163
Facsimile: (07) 4936 1162

Email: info@cqsoiltesting.com.au

Document Control

Version	Date	Author	Design Drawings	Reviewer	Reviewer Initials
A	18/02/2021	P Munro	NA	Scott Walton	SWW
		B Blake			

QBCC Subsidence Policy

In accordance with the QBCC "Queensland Building and Construction Commission" the contractor must supply the site classifier with the information in Table 1. The contractor, or the contractor representative (CR), may require the site classifier (SC) gather all or part of this information and the SC must satisfy themselves that all of the "relevant" information has been considered.

If all of the information listed below is not supplied by the contractor or the contractor does not wish the SC to recover said information (at cost) the contractor may be in breach of the no fault provisions of the QBCC's Policy for Rectification of Building Work and may be held responsible for subsidence or settlement of a building.

Table 1

Element	Supplied/Considered	Remarks
Property description and site address	✓	Client Supplied
Plan and/or survey	✓	Supplied
Contour of the site	✗	Nil Supplied
Location of trees, vegetation etc identified	✓	Supplied
Location and identification of potential overland flow	✓	Supplied
The footprint of proposed building and platform levels	✓	Supplied
Location of proposed or existing cut and fill	✓	Supplied
Appropriate land searches	✓	Supplied

The following (Table 2) is a summary of the information required under the QBCC relating specifically to the SC. Information supplied in this summary is to be read in conjunction with the entire report attached. All relevant data taken into account for the classification is documented in the report.

Table 2

Element	Remarks
Total number of excavations	4
Minimum of two excavations in building footprint	Yes
Soil samples recovered	Yes
Laboratory test performed	Classification
Predicted Surface Movement	NA
Expected movement potential for "P" sites in the absence of fill	31 - 40 mm

1.0 Introduction

CQ Soil Testing Pty Ltd (CQS) was commissioned to undertake a geotechnical investigation for the Proposed Residential Dwelling located at 14 Archer View Terrace, Frenchville.

This report outlines the results of the investigation, laboratory testing, analysis and interpretive reporting on the following items:

- All factual information resulting from the investigation (investigation methodologies, detailed desktop review, test location plans, bore logs);
- Summary of subsurface conditions and adopted subsurface conditions including groundwater;
- Stability assessment in accordance with AGS guidelines;
- Earthworks and site preparation comments;
- Site movements;
- Foundation recommendations and allowable bearing pressures;
- Hillside construction comments

This report must be kept in entirety. This report relates exclusively to the proposed new dwelling at the address stated on page one of this report and has been prepared for the express purpose stated above. This document does not cover any other elements related to construction on the site.

2.0 Site Details

2.1 Detailed Site Description

The site can be described as typical for a residential allotment that has triggered slope stability requirements. The site has varying grades falling away to the north and north west. The site can readily be described as moderately sloping with boundary drainage lines along the northern boundary of the allotment.

Given how the platforms have been prepared, it is envisioned that earthworks will be required at this site which will involve the use of retaining structures for slab on ground construction or "stilt" type construction as seen in the working drawings at the time of preparing this report.

2.2 Geology

Referencing available geology datasets available from QLD Globe, the site is in an area underlain by isolated colluvial deposits underlain by the Early Permian aged lakes Creek Formation which typically comrpsises Arenite and Mudrock. The encountered subsurface conditions broadly agree with the expected geology.

2.3 Groundwater

During the walkover assessment, no groundwater was observed across the entire site. It must be noted that groundwater is transient and seasonal in nature. Given this, the time at which the walkover assessment was undertaken may not indicate worst case conditions.

2.4 Vegetation

During the walkover assessment, a variety of vegetation ranging from low lying shrubs and grasses to mature trees on the slope to the south were observed. Mature trees adjacent to the property were all observed to be typically vertical with no misshapen or curved trunks. Misshapen or curved trunks are usually good indicators for previous slope instability.

2.5 Structures

During the walkover assessment, no competent structure could be assessed to give an indication of structure performance on this site. This usually gives a good indication of surface soil creep movement. The structures on both adjoining sides to the property appeared to be “plumb” and true and behaving within an expected range of movement.

2.6 Fieldwork & Results

The fieldwork was undertaken on 1st Feb 2021 and included 4 boreholes a maximum depth of 2.8 m using rotary auger drilling rig. Any exposed faces were also inspected to inform the results of the investigation. The subsurface conditions were logged through tactile and visual assessment of returned spoil by an experienced geotechnician.

The encountered subsurface conditions are described in detail on the attached bore logs; however, in summary comprise uncontrolled fill , possibly colluvium, underlain by clay soils then weathered soils derived from the parent bedrock which was encountered in all bores at depths typically between 0.5 m and 0.7 m depth.

Groundwater measurements or the lack of groundwater are made within the bore logs attached; however, it must be noted that groundwater is transient and will fluctuate with seasons and time.

It is possible that the soil profile may vary across the site from those shown in the bore logs which were used for this site classification. CQ Soil Testing are required to be notified if different conditions are encountered during construction. No allowance has been made for any substantial earthworks on the site, or importing building platform material.

The classification provided is based on the borehole, which has the highest characteristic surface movement.

3.0 SITE CLASSIFICATION

Based on the findings of the site investigation and subsequent laboratory testing, the predicted surface movement for this site in the absence of fill would be 31 - 40 mm which would give a classification of ‘M’. However, due to the presence of uncontrolled fill, it shall be classified as:

CLASS “P”
(Uncontrolled Fill)

in accordance with Australian Standard 2870, Residential Slabs and Footings. Class P sites require that a footing system be carried out/designed by a qualified engineer using engineering principles and considering the recommendations stated in section C4 of the aforementioned standard.

Any fill placed over the existing ground shall be piered through into the existing suitable material. Further note that the placement of reactive material as fill, or cutting of the site may change the site’s classification.

If trees are present, or have been removed from, within or near to the proposed dwelling it is the responsibility of the designing engineer to apply the principals of AS2870 "Guide to Design of Footings for Trees". The classification herein excludes the effect of trees on the site.

Any fill placed over the existing ground shall be piered through into the existing suitable material. Further note that the placement of reactive material as fill, or cutting of the site may change the site's classification.

It is noteworthy that soil samples recovered from this site may be tested further to aid in the preparation of a database of Central Queensland soils currently being compiled by CQ Soil Testing. The aim of this database is to further understand the types of soils in the region and their mechanical properties.

4.0 LAND STABILITY

4.1 EXPLANATORY NOTES

Local authorities prepare mapping tools to aid in assessing potential slope stability requirements. It is important to note that where a site specific investigation and slope stability assessment are undertaken, they take precedence.

Landslides are caused where a soil or rock mass has a decrease in strength, usually attributed to groundwater, resulting in the material not being able to maintain its own self-weight resulting in a slope failure.

The Australian Geomechanics Society (AGS) developed a set of tools and procedures for assessing the stability of a slope. The tools and procedures presented with the AGS documentation form the basis of the assessment undertaken herein and their documentation is attached for reference.

The guidelines also identify that the regulator typically sets the standard for levels of tolerable risk. AGS defines tolerable risk as "*risks within a range that society can live with so as to secure certain benefits. It is a range of risk regarded as non-negligible and needing to be kept under review and reduced further if practicable".*

The guides suggest that areas of moderate or greater risk should not be developed unless a rigorous remediation plan be implemented to reduce the area to a level of *Acceptable Risk*. AGS defines acceptable risk as "*risk which everyone affected is prepared to accept. Action to further reduce such risk is usually not required unless reasonably practicable measures are available at low cost in terms of money, time and effort.*".

AGS and regulators generally accept risk levels of "low" or lower as a level of acceptable risk.

Broadly speaking, a level of risk that equates to "low" or lower would generally indicate a factor of safety against global instability equal to or greater than 1.5.

4.2 QUANTITATIVE LANDSLIDE STABILITY ANALYSIS

AGS prepared a quantitative assessment tool for determining the level of risk for a site. The tool separates the potential hazards for a site, from a stability context, and rates them with a level of risk frequency. The multiplication of these individual risk frequency summates as the risk frequency rating which is then measured against the levels of risk nominated by AGS.

The results of this analysis are shown in Table 3.

Table 3: Results of AGS Quantitative Risk Assessment

Item	Description	Risk Level	Factor
Natural Surface Slope	Between 15 and 30 degrees	High	1.2
Slope Shape/Appearance	Planar	Moderate	0.9
Site Geology	Volcanic rock	High	1.1
Soil Profile	Residual soil >3m deep	High	1.5
Regional Position on Hill	Mid Slope	High	1.2
Groundwater Evidence	None apparent	Low	0.7
Slope Instability Evidence	Minor Irregularity	Very High	2.0
Proposed Cut Depths	Cuts <1 m in height	Moderate	1.1
Proposed Cut Angles	30 to 45	Moderate	1.0
Fill Depths	Fill 1 m to 3 m in depth	Moderate	1.5
Fill Depth Angles	30 to 45	Moderate	1.0
Battered Support	Nonengineered	Very High	4.0
Type of Fill	Track-rolled fill (sand)	Very High	1.5
Services	Surface disposal >10 m of	Moderate	0.9
Stormwater Disposal	Rainwater tank without	High	1.2
Connectors	AS2870 for reactive sites	Moderate	1.0
Footing Types	AS2870 fit for purpose	High	1.2
Founding Strata	Residual Soil	Moderate	1.0
Inground Tanks	Not Applicable	Not	1
Landscaping/Drainage	Unknown	Very High	4.0
Upslope Failure (if needed)	No action	Very High	4.0
Site Frequency ($0.0004 \times \sum Item\ Risk\ Factors$)			0.25
Site Relative Susceptibility Risk to Instability			Low

Table 4: Results of AGS Qualitative Risk Assessment

Hazard	Likelihood	Consequence	Risk Level
Global Failure	Barely Credible	Catastrophic	Low
Shallow slumping of surface soils	Likely	Minor	Low to Medium
Transitional Sliding of Fill/Colluvium	Likely	Minor	Low to Medium

5.0 GEOTECHNICAL COMMENTS

Geotechnical comments are based on the factual findings of the investigation, best practice, local experience, published correlations; however, are fundamentally founded in opinion and this should be considered.

5.1 EARTHWORKS AND SITE PREPARATIONS

The following comments are provided in relation to site preparation for earthworks.

- The area should be stripped of uncontrolled fill, soft, overly wet, foreign, or otherwise deemed unsuitable material (material that is potentially compressible) down to a relatively stiff dry base ensuring no organics material is present.
- Stripped areas must be inspected by the geotechnical testing authority (GTA) to ensure no soft spots or loose zones are present. This should be done with the use of a loaded body truck or 12 tonne roller as a minimum. Areas showing signs of movement under the action of the testing equipment should be either over excavated and replaced with select fill or conditioned onsite through tyning, blending or other suitable methods.
- Although no standard exists for the moisture content of soils, it is recommended that the site soils be placed at or near optimum moisture content (OMC) for general earthworks operations. This increases efficiency during earthworks operations. A range of +/- 2% of OMC is recommend for general earthworks.
- Where site soils are proposed for use as fill in other areas, won material will need to have a maximum particle size of 75 mm or be observed to break down under the energy of compactive equipment.
- Fill materials should be placed in relatively horizontal layers with a maximum placement thickness of 200 mm. The materials should be compacted to a minimum dry density ratio of 95% relative to Standard compactive effort.
- Highly plastic clays at this site will be very sensitive to the presence or lack of moisture and therefore care should be used to place the material within the range nominated and to a maximum dry density of 102% relative to Standard compactive effort. Where this does not happen, the material could readily swell, soften, or be subject to significant trafficability issues.
- Fill material will be subject to potential settlement post placement. Well compacted fill placed in accordance with AS3798 and otherwise, good earthworks procedure should typically be subject to settlement in the order of 0.5% to 1.0% of the fill thickness over a log cycle of time.

5.2 FOUNDATIONS

It is recommended that all high level footings have perimeter, column and load bearing footings found a minimum 0.3 m into the natural very stiff clays or weathered rock.

Where footings found into at this depth and into this material they can be sized and dimensioned for 150 kPa. All foundation excavations should be inspected by a suitably experienced and qualified geotechnical engineer prior to the placement of concrete to confirm ground conditions. Further to this, all footings should found in similar strata to limit differential settlement.

5.3 GOOD HILLSIDE CONSTRUCTION

The following precautionary works should be implemented in additional to other items highlighted within this document. These points are considered to be typical good hillside construction practice as explained in attached documentation:

- All additional fill should be no deeper than 0.5 m with batters less than 3H:1V unless specific analysis has been undertaken and preferably nearer to 3.5H:1V to allow for access for maintenance;
- All footings should found below an imaginary line drawn at a 45 degree angle from the toe of the prepared batter toe or a minimum 0.3 m into medium dense sands. Alternatively, if a perimeter retaining structure is designed and incorporated that retains the building platform, footings can found at any depth with review by this office to confirm assumptions;
- Drainage systems will need to be subjected to regular inspections to ensure no adverse moisture conditioning of the subsurface conditions which can trigger instability;
- Overland flow paths will need to be carefully directed to minimise erosion possibility to approved outlet points; and
- The design and integrity of the retaining structure will need to be confirmed to adhere to good hillside construction methodologies including being globally stable and designed to accommodate potential lateral movements associated with minor and major events.

If the above recommendations are undertaken and confirmed, the risk category detailed within this report can be reclassified as Low (L) if it was identified as greater than this level.

If you should have any queries regarding this report please do not hesitate to contact the undersigned at your convenience.

Yours faithfully

BILLY BLAKE
Senior Geotechnical Engineer – RPEQ, CPEng, NER, MEIAust

SCOTT WALTON
Laboratory Manager

Site/Soil Characteristics and Classification

A. Classification by characteristic surface movement as per AS2780-2011

Site Classification Symbols	Y's Range Value	Generalised Description (Guide Only)
'S'	0 – 20 mm	Slightly reactive clay sites which may experience only slight ground movement due to moisture changes
'M'	21 – 40 mm	Moderately reactive clay or silt sites which may experience moderate ground movement due to moisture changes
'H1'	41 – 60 mm	Highly reactive clay sites which may experience high ground movement due to moisture changes
'H2'	61 – 75 mm	Highly reactive clay sites which may experience very high ground movement due to moisture changes
'E'	>75 mm	Extremely reactive clay sites which may experience extreme ground movement due to moisture changes
'P'	N/A	Problem sites which generally have soils associated with uncontrolled fill, abnormal moisture conditions (trees), soft or collapsing soils, landslip etc...

B. Laboratory Test Results

Borehole Location	3	**Borehole Location**	**Borehole Location**
Depth Range of Sample (m)	1.2-1.8	Depth Range of Sample (m)	Depth Range of Sample (m)
Natural MC %	11	Natural MC %	Natural MC %
% Passing 75 um Sieve	58	% Passing 75 um Sieve	% Passing 75 um Sieve
Liquid Limit %	36	Liquid Limit %	Liquid Limit %
Plastic Index %	14	Plastic Index %	Plastic Index %
Linear Shrinkage %	ND	Linear Shrinkage %	Linear Shrinkage %
Shrink Swell Index	ND	Shrink Swell Index	Shrink Swell Index
Pocket Penetrometer kPa	ND	Pocket Penetrometer kPa	Pocket Penetrometer kPa

C. Permeability Test Results AS1547-2000

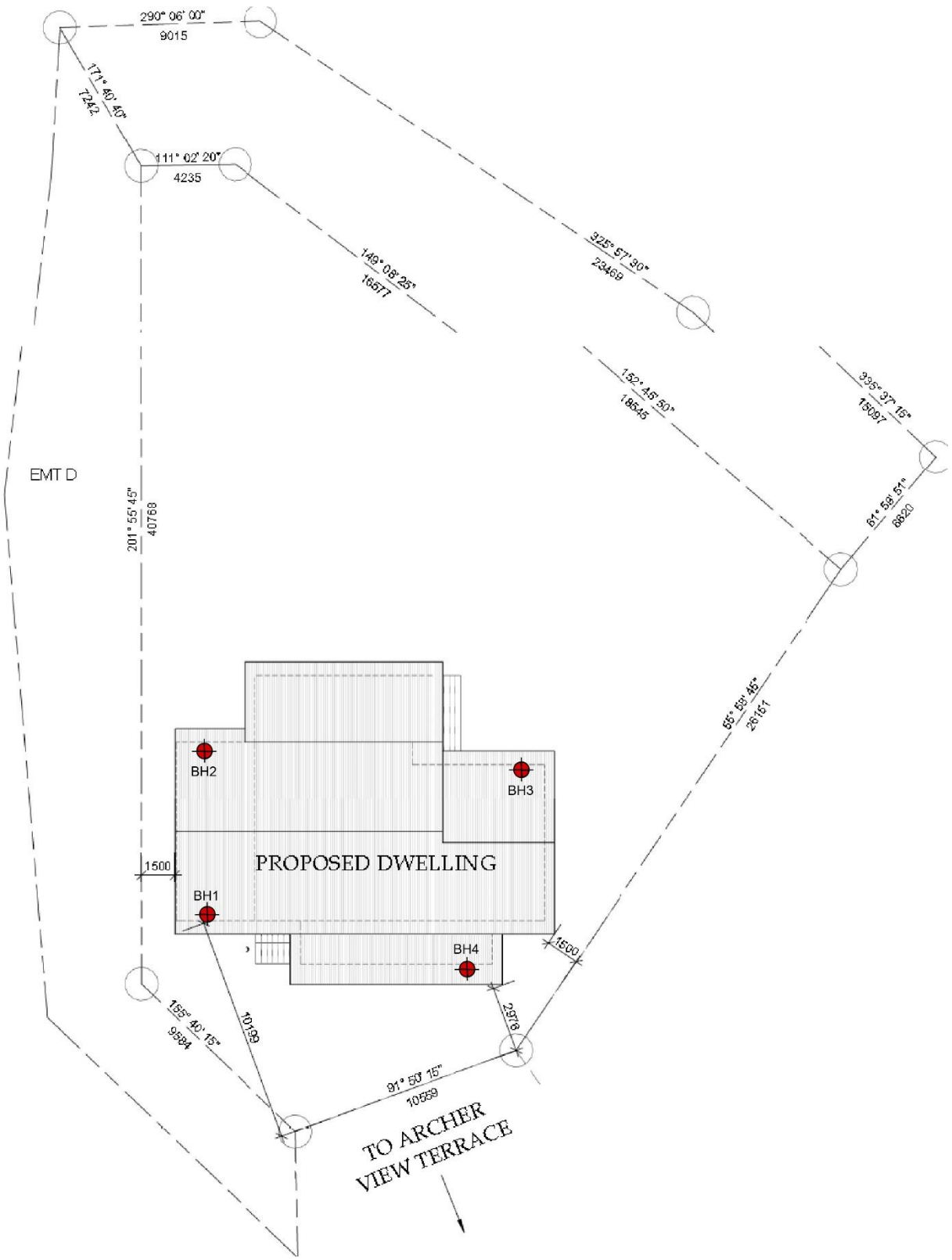
Test Hole Number	Depth Of Test Hole	Range Tested	Permeability M/Day
NA	500 mm	250 – 500 mm	NA

Site Photographs

Image 1: Proposed Construction Site

Image 2: Proposed Construction Site

Site Plan



- Not to scale
- All measurements are to be used as a guide only

CQ SOIL TESTING technical excellence

CLIENT: B & H Hilse
PROJECT: Slope Stability
ADDRESS: 14 Archer View Terrace, Frenchville
DRILL RIG: GT10

PROJECT #: CQ18595
LOGGED: S Walton
EASTING:
NORTHING:

BORE HOLE 1

TEST DATE: 05/02/2021

RL (m)	Depth (m)	Graphic Log	Water	Material Description	Sampling & Testing: Type	Sampling & Testing: Results & Comments	DCP Results (blows per 100 mm)
	0			**FILL** **GRAVELLY CLAYEY SAND (SC):** fine to coarse grained, medium plastic fines, brown, dry, dense. With "floaters" throughout.			4 8 12 16 11 6 15 8 15 12 14 15
	1						
	2						
			2.1	Bore Terminated at 2.1 m. Limit of Investigation.			
	3						

DRILLING METHOD: Solid Flight Auger.

CASING:

GROUNDWATER: No groundwater seepage observed at time of drilling.

REMARKS: Tungsten carbide drill bit refusal at 2.1 m.

LEGEND:

D - Disturbed Sample from Auger
B - Bulk Sample from Auger
C - Rock Core
U_{50} - Undisturbed Sample (mm)

SPT - Standard Penetration Test
Is_{50} - Point Load Result (MPa)
PP - Pocket Penetrometer (kPa)

- Groundwater Seepage Level
- Standing Groundwater Level
- Partial Groundwater Loss
- Perched Groundwater Level

CQ SOIL TESTING technical excellence

CLIENT: B & H Hilse
PROJECT: Slope Stability
ADDRESS: 14 Archer View Terrace, Frenchville
DRILL RIG: GT10

PROJECT #: CQ18595
LOGGED: S Walton
EASTING:
NORTHING:

BORE HOLE 2

TEST DATE: 05/02/2021

RL (m)	Depth (m)	Graphic Log	Water	Material Description	Sampling & Testing: Type	Sampling & Testing: Results & Comments	DCP Results (blows per 100 mm)
	0			**FILL** **GRAVELLY CLAYEY SAND (SC):** fine to coarse grained, medium plastic fines, brown, dry, dense. With "floaters" throughout.			4 8 12 16
	1						11 8 15 11 15 15
	1.6		1.6	Bore Terminated at 1.6 m. Limit of Investigation.			
	2						
	3						

DRILLING METHOD: Solid Flight Auger.

CASING:

GROUNDWATER: No groundwater seepage observed at time of drilling.

REMARKS: Tungsten carbide drill bit refusal at 1.6 m.

LEGEND:

D - Disturbed Sample from Auger
B - Bulk Sample from Auger
C - Rock Core
U_{50} - Undisturbed Sample (mm)

SPT - Standard Penetration Test
Is_{50} - Point Load Result (MPa)
PP - Pocket Penetrometer (kPa)

- Groundwater Seepage Level
- Standing Groundwater Level
- Partial Groundwater Loss
- Perched Groundwater Level

CQ SOIL TESTING technical excellence

CLIENT: B & H Hilse
PROJECT: Slope Stability
ADDRESS: 14 Archer View Terrace, Frenchville
DRILL RIG: GT10

PROJECT #: CQ18595
LOGGED: S Walton
EASTING:
NORTHING:

BORE HOLE 3

TEST DATE: 05/02/2021

RL (m)	Depth (m)	Graphic Log	Water	Material Description	Sampling & Testing: Type	Sampling & Testing: Results & Comments	DCP Results (blows per 100 mm)
				FILL **GRAVELLY CLAYEY SAND (SC):** fine to coarse grained, medium plastic fines, brown, dry, dense. With "floaters" throughout.			6, 5, 15
			0.8	**NATURAL** **GRAVELLY CLAYEY SAND (SC):** fine to coarse grained, low plastic fines, grey to brown with depth, dry, dense.			5, 12, 14, 10, 15
	1		1.1	**SANDY CLAY (CI):** medium plasticity, fine to coarse grained, with fine to coarse grained gravel, light brown, dry, hard.			8, 15
			1.8	**WEATHERED ROCK**			
	2		1.9	Bore Terminated at 1.9 m. Limit of Investigation.			
	3						

DCP Results (blows per 100 mm) scale: 4, 8, 12, 16

DRILLING METHOD: Solid Flight Auger.

CASING:

GROUNDWATER: No groundwater seepage observed at time of drilling.

REMARKS: Tungsten carbide drill bit refusal at 1.9 m.

LEGEND:

- **D** - Disturbed Sample from Auger
- **B** - Bulk Sample from Auger
- **C** - Rock Core
- **U_{50}** - Undisturbed Sample (mm)
- **SPT** - Standard Penetration Test
- **Is_{50}** - Point Load Result (MPa)
- **PP** - Pocket Penetrometer (kPa)
- - Groundwater Seepage Level
- - Standing Groundwater Level
- - Partial Groundwater Loss
- - Perched Groundwater Level

CQ SOIL TESTING technical excellence

CLIENT: B & H Hilse
PROJECT: Slope Stability
ADDRESS: 14 Archer View Terrace, Frenchville
DRILL RIG: GT10

PROJECT #: CQ18595
LOGGED: S Walton
EASTING:
NORTHING:

BORE HOLE 4

TEST DATE: 05/02/2021

RL (m)	Depth (m)	Graphic Log	Water	Material Description	Sampling & Testing: Type	Sampling & Testing: Results & Comments	DCP Results (blows per 100 mm)
				FILL **GRAVELLY CLAYEY SAND (SC):** fine to coarse grained, medium plastic fines, brown, dry, dense. With "floaters" throughout.			7, 7, 15
	1						15
	2		2.3	**SANDY CLAY (CI):** medium plasticity, fine to coarse grained, with fine to coarse grained gravel, light brown, dry, hard.			6, 7, 7, 15
			2.6	**WEATHERED ROCK**			10, 11, 14, 15
	3		2.8	Bore Terminated at 2.8 m. Limit of Investigation.			

DCP Results (blows per 100 mm): 4 8 12 16

DRILLING METHOD: Solid Flight Auger.

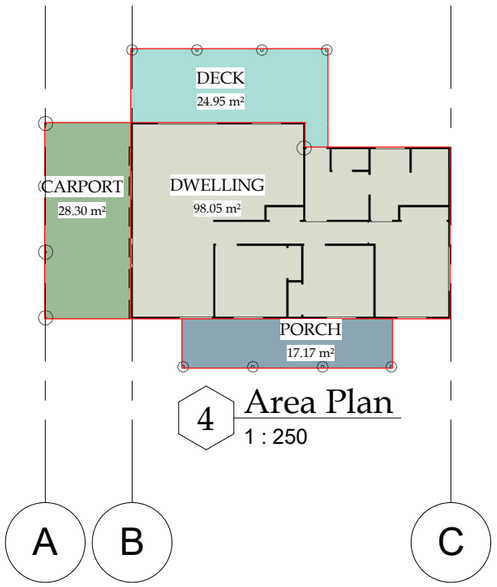
CASING:

GROUNDWATER: No groundwater seepage observed at time of drilling.

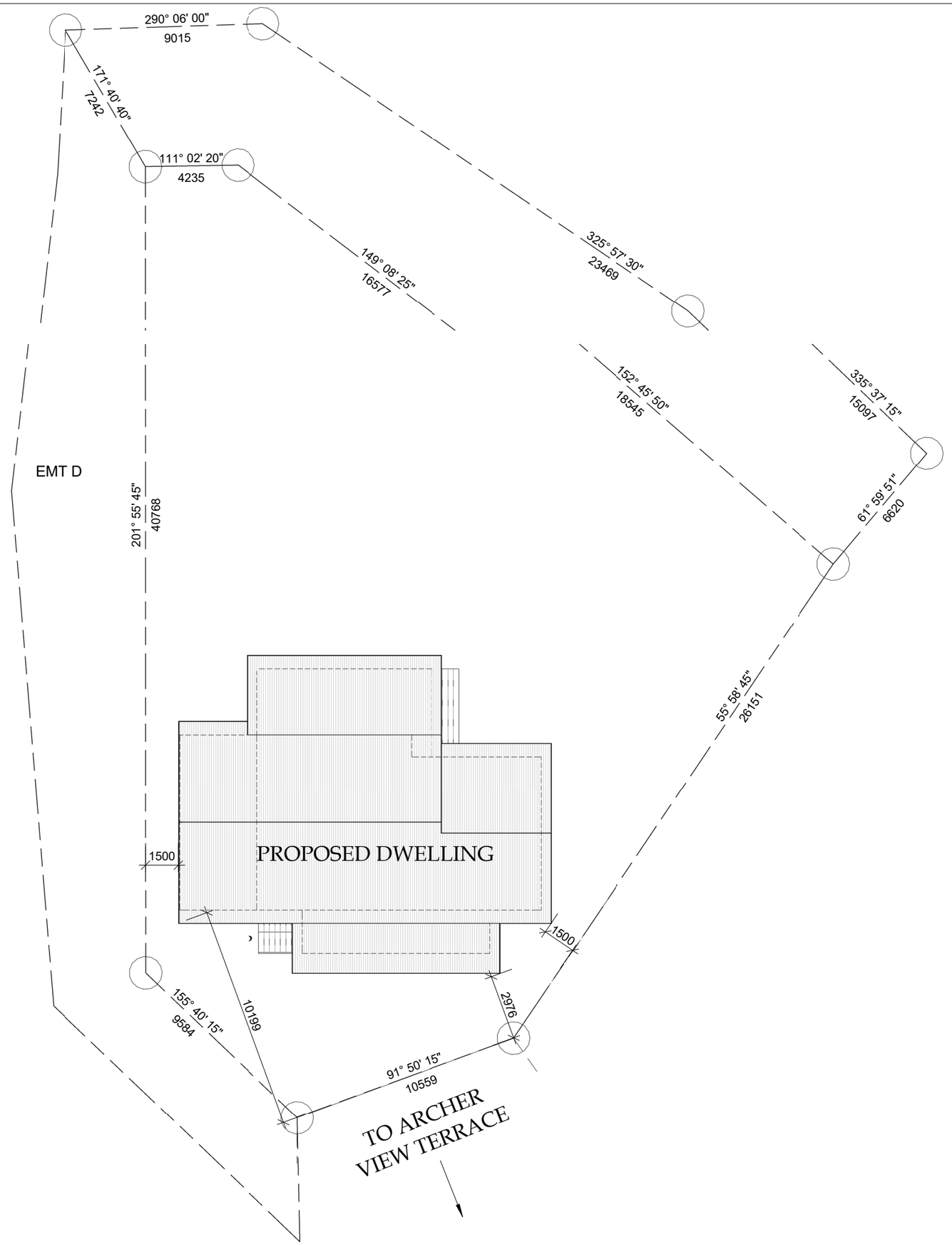
REMARKS: Tungsten carbide drill bit refusal at 2.8 m.

LEGEND:

- **D** - Disturbed Sample from Auger
- **B** - Bulk Sample from Auger
- **C** - Rock Core
- **U_{50}** - Undisturbed Sample (mm)
- **SPT** - Standard Penetration Test
- **Is_{50}** - Point Load Result (MPa)
- **PP** - Pocket Penetrometer (kPa)
- - Groundwater Seepage Level
- - Standing Groundwater Level
- - Partial Groundwater Loss
- - Perched Groundwater Level



4 Area Plan
1 : 250



3 Site Plan
1 : 200

RP Data

Lot Number :	56
RP/SP Number :	SP106354
Parish :	HEWITTVILLE
County :	LIVINGSTONE
Area :	1239 m²
Site Cover:	12.2%

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
B	Amended	17/12/20	DEL
C	Amended	18/01/21	JG

N

JOB DESCRIPTION
NEW DWELLING

DESIGN
Option D Cabin

CLIENT
Bernhard & Helen HILSE

ADDRESS
14 Archer View Terrace,
Frenchville

CEADS CAPRICORN ENGINEERING AND DRAFTING SERVICES
INDUSTRIAL COMMERCIAL RESIDENTIAL
BSA - 1126594 BSA - 1126593
building designers association of queensland inc.
PO Box 1734, Yeppoon, QLD , 4703
PH: (07) 49250772 Fax: (07) 49395808
Email: info@ceads.com.au
www.ceads.com.au

DATE: 04/02/19

DRAWN: JG
CHECKED: DEL

SCALE: As indicated
SHOWN AT A3

DWG NAME: SITE PLAN

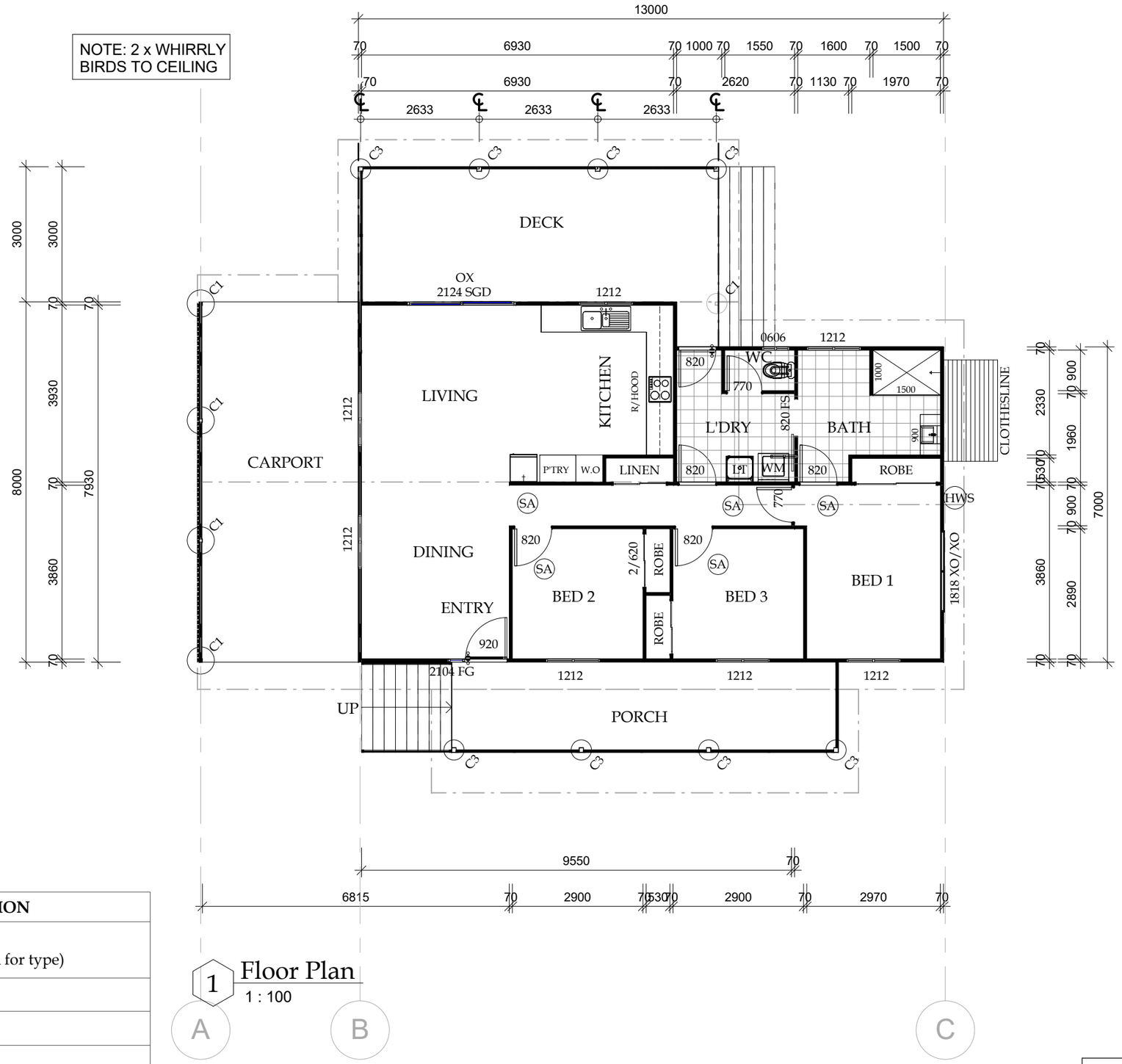
DWG No. 20-261-R SHT No. A02

CURRENT REVISION: C

Area Schedule	
Name	Area

DECK	24.95 m²
DWELLING	98.05 m²
CARPORT	28.30 m²
PORCH	17.17 m²
	168.48 m²

NOTE: 2 x WHIRRLY BIRDS TO CEILING



1 Floor Plan
1 : 100

A B C

SYMBOL	DESCRIPTION
●	DOWNPIPE (Refer Roof Drainage Plan for type)
⊠	VENTED SKYLIGHT
	DROPPED CEILING
(SA)	SMOKE DETECTOR (in accordance with part 3.7.2 B.C.A vol 2. Smoke Alarms must comply with AS3786-2014)

NOTE: SGD & SGW
X - OPENING PANEL
O - FIXED PANEL

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
B	Amended	17/12/20	DEL
C	Amended	14/01/21	JG
D	Amended	18/01/21	JG

JOB DESCRIPTION
NEW DWELLING

DESIGN
Option D Cabin

CLIENT
Bernhard & Helen HILSE

ADDRESS
14 Archer View Terrace, Frenchville

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PO Box 1734, Yeppoon, QLD , 4703
PH: (07) 49250772 Fax: (07) 49395808
Email: info@ceads.com.au
www.ceads.com.au

DATE: 15/12/20

DRAWN	CHECKED
DEL	DEL

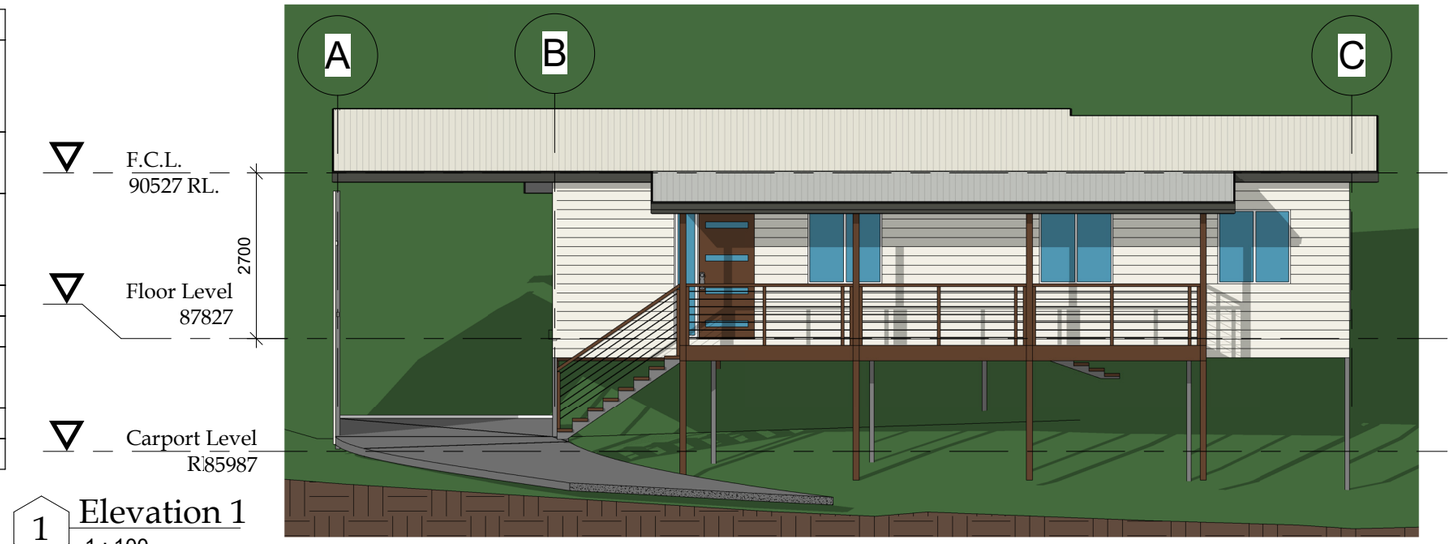
SCALE: 1 : 100 SHOWN AT A3

DWG NAME. GROUND FLOOR PLAN

DWG No. 20-261-R SHT No. A04

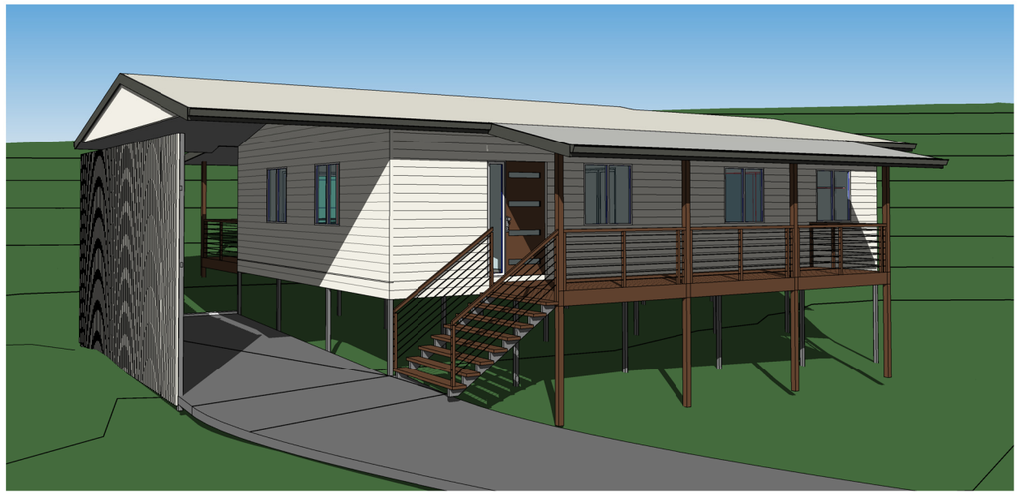
CURRENT REVISION: D

ELEVATION NOTES
SELECTED COLORBOND ROOF SHEETING FIXED TO MANUFACTURER'S SPEC
SELECTED FASCIAS & GUTTERS TO MANUFACTURER'S SPEC.
SELECTED ALUMINIUM FRAMED GLASS DOORS & WINDOWS FIXED TO MANUFACTURER'S SPEC.
FC SHEETING TO EAVES
SELECTED CLADDING
SELECTED BALUSTRADING TO AUSTRALIAN STANDARDS.
HWD POST
SHS POST



1 Elevation 1
1 : 100

3 Elevation 3
1 : 100



2 3D View 1

SUF	REVISIONS	DATE	INIT
A	PRELIMINARY	29/04/20	DEL
B	Amended	17/12/20	DEL
C	Amended	14/01/21	JG

JOB DESCRIPTION
NEW DWELLING

DESIGN
Option D Cabin

CLIENT
Bernhard & Helen HILSE

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14 Archer View Terrace, Frenchville

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PH: (07) 49250772 Fax: (07) 49395808
Email: info@ceads.com.au
www.ceads.com.au

DATE: 15/12/20

DRAWN	CHECKED
DEL	DEL

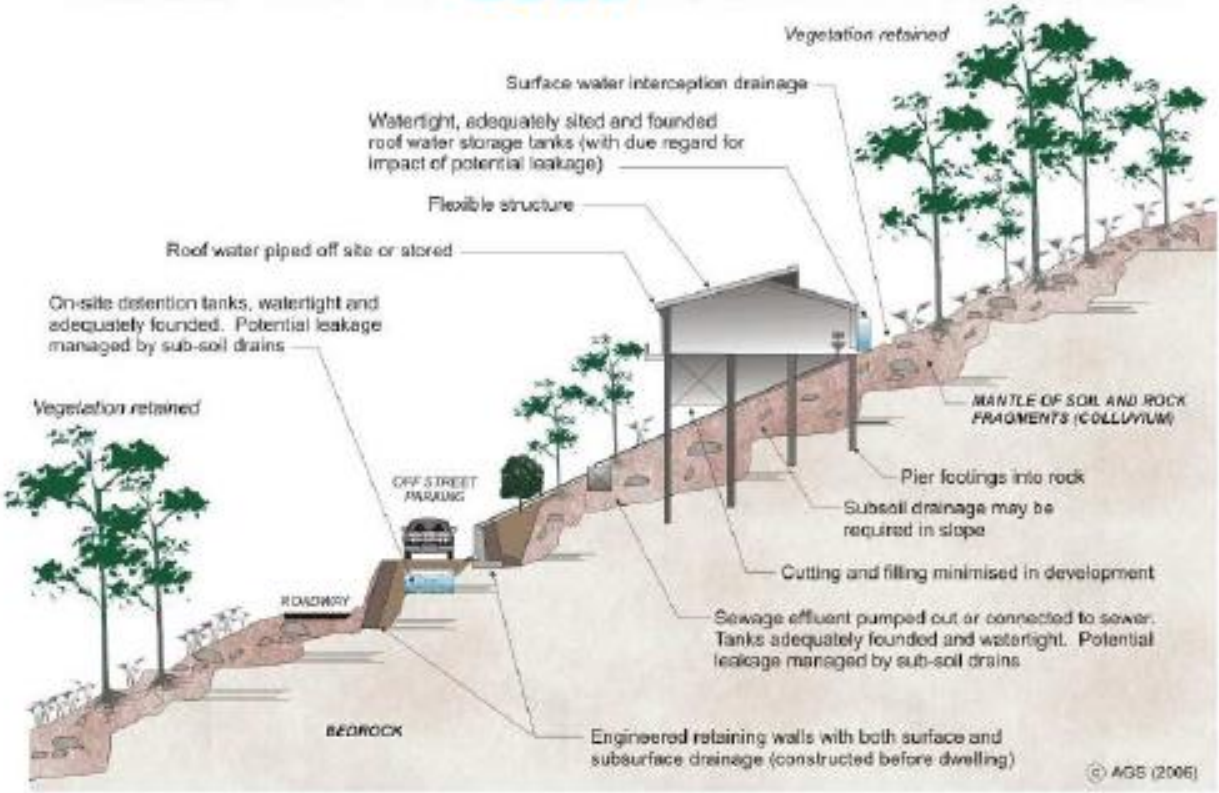
SCALE: 1 : 100 SHOWN AT A3

DWG NAME. ELEVATIONS

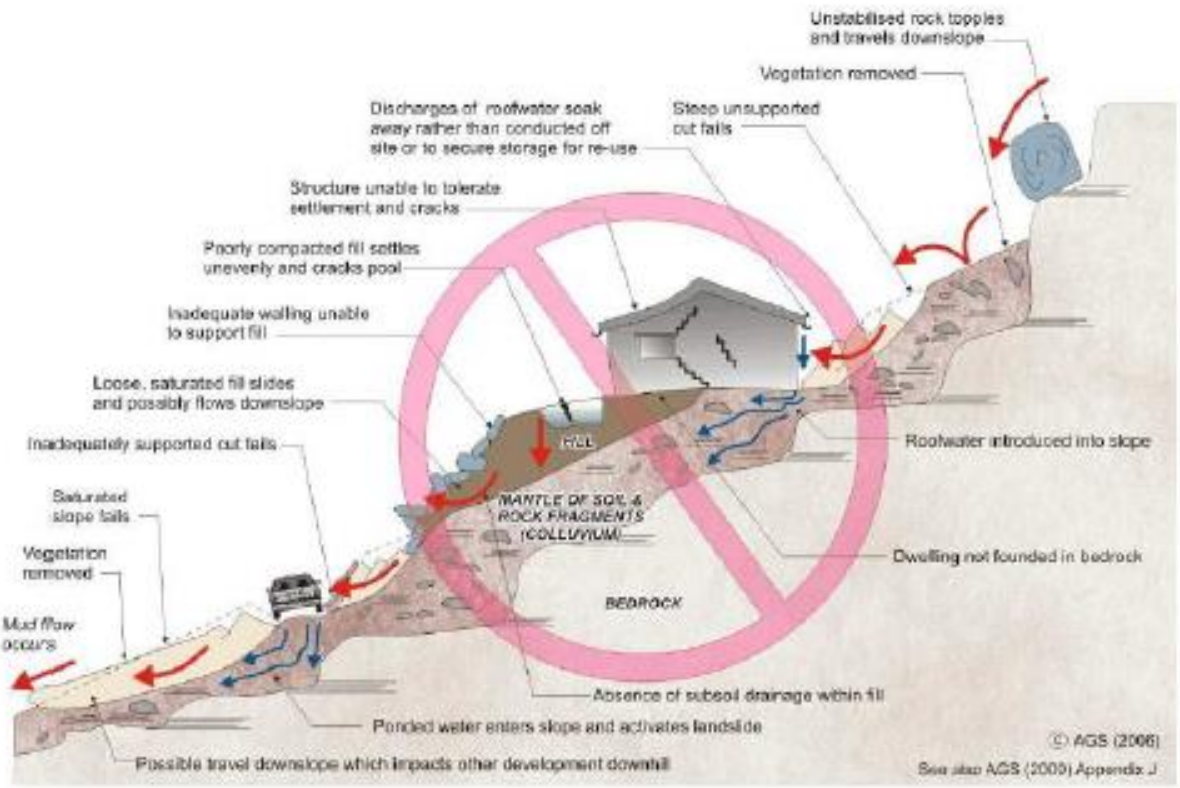
DWG No. 20-261-R SHT No. A06

CURRENT REVISION: C

EXAMPLES OF GOOD HILLSIDE PRACTICE



EXAMPLES OF POOR HILLSIDE PRACTICE



PRACTICE NOTE GUIDELINES FOR LANDSLIDE RISK MANAGEMENT 2007

APPENDIX C: LANDSLIDE RISK ASSESSMENT

QUALITATIVE TERMINOLOGY FOR USE IN ASSESSING RISK TO PROPERTY

QUALITATIVE MEASURES OF LIKELIHOOD

Approximate Annual Probability		Implied Indicative Landslide Recurrence Interval		Description	Descriptor	Level
Indicative Value	Notional Boundary					
10^{-1}	$5x10^{-2}$	10 years	20 years	The event is expected to occur over the design life.	ALMOST CERTAIN	A
10^{-2}	$5x10^{-3}$	100 years	200 years	The event will probably occur under adverse conditions over the design life.	LIKELY	B
10^{-3}	$5x10^{-4}$	1000 years	2000 years	The event could occur under adverse conditions over the design life.	POSSIBLE	C
10^{-4}	$5x10^{-5}$	10,000 years	20,000 years	The event might occur under very adverse circumstances over the design life.	UNLIKELY	D
10^{-5}	$5x10^{-6}$	100,000 years	200,000 years	The event is conceivable but only under exceptional circumstances over the design life.	RARE	E
10^{-6}		1,000,000 years		The event is inconceivable or fanciful over the design life.	BARELY CREDIBLE	F

Note: (1) The table should be used from left to right; use Approximate Annual Probability or Description to assign Descriptor, not *vice versa*.

QUALITATIVE MEASURES OF CONSEQUENCES TO PROPERTY

Approximate Cost of Damage		Description	Descriptor	Level
Indicative Value	Notional Boundary			
200%	100%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequence damage.	CATASTROPHIC	1
60%	40%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequence damage.	MAJOR	2
20%	10%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequence damage.	MEDIUM	3
5%	1%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works.	MINOR	4
0.5%		Little damage. (Note for high probability event (Almost Certain), this category may be subdivided at a notional boundary of 0.1%. See Risk Matrix.)	INSIGNIFICANT	5

Notes: (2) The Approximate Cost of Damage is expressed as a percentage of market value, being the cost of the improved value of the unaffected property which includes the land plus the unaffected structures.

(3) The Approximate Cost is to be an estimate of the direct cost of the damage, such as the cost of reinstatement of the damaged portion of the property (land plus structures), stabilisation works required to render the site to tolerable risk level for the landslide which has occurred and professional design fees, and consequential costs such as legal fees, temporary accommodation. It does not include additional stabilisation works to address other landslides which may affect the property.

(4) The table should be used from left to right; use Approximate Cost of Damage or Description to assign Descriptor, not vice versa

Form No. 68039 RL2 August 2010

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 G - SOME GUIDELINES FOR HILLSIDE CONSTRUCTION

	GOOD ENGINEERING PRACTICE	*POOR ENGINEERING PRACTICE*
ADVICE		
GEOTECHNICAL ASSESSMENT	Obtain advice from a qualified, experienced geotechnical practitioner at early stage of planning and before site works.	Prepare detailed plan and start site works before geotechnical advice.
PLANNING		
SITE PLANNING	Having obtained geotechnical advice, plan the development with the risk arising from the identified hazards and consequences in mind.	Plan development without regard for the Risk.
DESIGN AND CONSTRUCTION		
HOUSE DESIGN	Use flexible structures which incorporate properly designed brickwork, timber or steel frames, timber or panel cladding. Consider use of split levels. Use decks for recreational areas where appropriate.	Floor plans which require extensive cutting and filling. Movement intolerant structures.
SITE CLEARING	Retain natural vegetation wherever practicable.	Indiscriminately clear the site.
ACCESS & DRIVEWAYS	Satisfy requirements below for cuts, fills, retaining walls and drainage. Council specifications for grades may need to be modified. Driveways and parking areas may need to be fully supported on piers.	Excavate and fill for site access before geotechnical advice.
EARTHWORKS	Retain natural contours wherever possible.	Indiscriminatory bulk earthworks.
CUTS	Minimise depth. Support with engineered retaining walls or batter to appropriate slope. Provide drainage measures and erosion control.	Large scale cuts and benching. Unsupported cuts. Ignore drainage requirements
FILLS	Minimise height. Strip vegetation and topsoil and key into natural slopes prior to filling. Use clean fill materials and compact to engineering standards. Batter to appropriate slope or support with engineered retaining wall. Provide surface drainage and appropriate subsurface drainage.	Loose or poorly compacted fill, which if it fails, may flow a considerable distance including onto property below. Block natural drainage lines. Fill over existing vegetation and topsoil. Include stumps, trees, vegetation, topsoil, boulders, building rubble etc in fill.
ROCK OUTCROPS & BOULDERS	Remove or stabilise boulders which may have unacceptable risk. Support rock faces where necessary.	Disturb or undercut detached blocks or boulders.
RETAINING WALLS	Engineer design to resist applied soil and water forces. Found on rock where practicable. Provide subsurface drainage within wall backfill and surface drainage on slope above. Construct wall as soon as possible after cut/fill operation.	Construct a structurally inadequate wall such as sandstone flagging, brick or unreinforced blockwork. Lack of subsurface drains and weepholes.
FOOTINGS	Found within rock where practicable. Use rows of piers or strip footings oriented up and down slope. Design for lateral creep pressures if necessary. Backfill footing excavations to exclude ingress of surface water.	Found on topsoil, loose fill, detached boulders or undercut cliffs.
SWIMMING POOLS	Engineer designed. Support on piers to rock where practicable. Provide with under-drainage and gravity drain outlet where practicable. Design for high soil pressures which may develop on uphill side whilst there may be little or no lateral support on downhill side.	
DRAINAGE		
SURFACE	Provide at tops of cut and fill slopes. Discharge to street drainage or natural water courses. Provide general falls to prevent blockage by siltation and incorporate silt traps. Line to minimise infiltration and make flexible where possible. Special structures to dissipate energy at changes of slope and/or direction.	Discharge at top of fills and cuts. Allow water to pond on bench areas.
SUBSURFACE	Provide filter around subsurface drain. Provide drain behind retaining walls. Use flexible pipelines with access for maintenance. Prevent inflow of surface water.	Discharge roof runoff into absorption trenches.
SEPTIC & SULLAGE	Usually requires pump-out or mains sewer systems; absorption trenches may be possible in some areas if risk is acceptable. Storage tanks should be water-tight and adequately founded.	Discharge sullage directly onto and into slopes. Use absorption trenches without consideration of landslide risk.
EROSION CONTROL & LANDSCAPING	Control erosion as this may lead to instability. Revegetate cleared area.	Failure to observe earthworks and drainage recommendations when landscaping.
DRAWINGS AND SITE VISITS DURING CONSTRUCTION		
DRAWINGS	Building Application drawings should be viewed by geotechnical consultant	
SITE VISITS	Site Visits by consultant may be appropriate during construction/	
INSPECTION AND MAINTENANCE BY OWNER		
OWNER'S RESPONSIBILITY	Clean drainage systems; repair broken joints in drains and leaks in supply pipes. Where structural distress is evident see advice. If seepage observed, determine causes or seek advice on consequences.	

Limitations

1. Recommendations given in this report are based on the information supplied by the client regarding the proposed building construction in conjunction with the findings of the investigation. Any change in construction type, building location or omission in the client supplied information, may require additional testing and/or make the recommendations invalid.

2. The recommendations herein may identify a target soil stratum into which the footings should be founded. The target stratum has been located by the depth in mm of the target stratum's upper horizon boundary below the existing ground surface level at the time of the site investigation. Any cutting or filling works and any surface erosion or deposits subsequent to the site investigation, will alter the measured location of the stratum relative to the surface. Where required, the author should be notified in such cases to confirm the location of the target stratum.

3. The description of the soil given in Section 3.0 of this report is intended as a brief overview of the soil's primary constituents. For a detailed classification of the soil, the reader should refer to the Soil Profile Reports and/or Borehole Reports.

4. Every reasonable effort has been made to locate the test sites so that the borehole profiles are representative of the soil conditions within the area investigated. The client should be made aware however, that exploration is limited by time available and economic restraints. In some cases soil conditions can change dramatically over short distances, therefore, even careful exploration programs may not locate all the variations.

5. If soil conditions different from those shown in this report are encountered or are inferred from other sources, then the author must be notified immediately.

6. This report may not be reproduced except in full, and only then with the permission of the entity trading as CQ Soil Testing. The information and site sketch shall only be used and will only be applicable for the development shown on the client-supplied information provided for this site.

7. All information contained within this report is the intellectual property of the entity trading as CQ Soil Testing. All information contained with can only be used for the express purposes of the commissioned scope of works.

8. Any dimensions, contours, slope directions and magnitudes shown on the site sketch plan shall not be used for any building construction or costing calculations. The purpose of the plan is to show approximate location of field tests only.

9. Any changes made to these recommendations by persons unauthorized by the author will legally be interpreted at that person assuming the responsibility for the long-term performance of the footing system.

10. The recommendations contained in this report have not taken into consideration the long term effects of any previous, current or potential subsurface work by mining companies or potential slope instability problems. At the time of writing this report neither our client (nor his agent) nor the local authority had made the author aware that these problems may be affecting this allotment. If a mining subsidence or slope stability assessment is required for this allotment, the recommendations of a suitably qualified geotechnical engineer should be sought.

11. Removal of trees from a site before an investigation can cause significant swelling of the soil over large areas. The removal of large trees from a construction site during development is rarely picked up during the investigation phase and is generally outside the scope of AS2870. Sites affected by large trees are often classified "P". If, during the footing excavation, it is noticed that there are soils with varying moisture contents or evidence of large trees having been removed CQ Soil Testing should be notified immediately.

12. The following documents are available from the CSIRO and QBCC and shall be read and adhered to in relation to this site:

    - Builder's Guide to Preventing Damage to Dwellings- Part 1 Site Investigation and Preparation
      http://www.publish.csiro.au/nid/22/pid/3621.htm
    - Builder's Guide to Preventing Damage to Dwellings- Part 2 Sound Construction Methods
      http://www.publish.csiro.au/nid/22/pid/3661.htm
    - Foundation Maintenance and Footing Performance- A Homeowner's Guide
      http://www.publish.csiro.au/nid/22/pid/3612.htm
    - BSA Subsidence Fact Sheet
      http://www.bsa.qld.gov.au/NR/rdonlyres/4CA6BA57-3CB5-4B75-B75E-3CA0469D7463/0/SubsidenceFacts.pdf