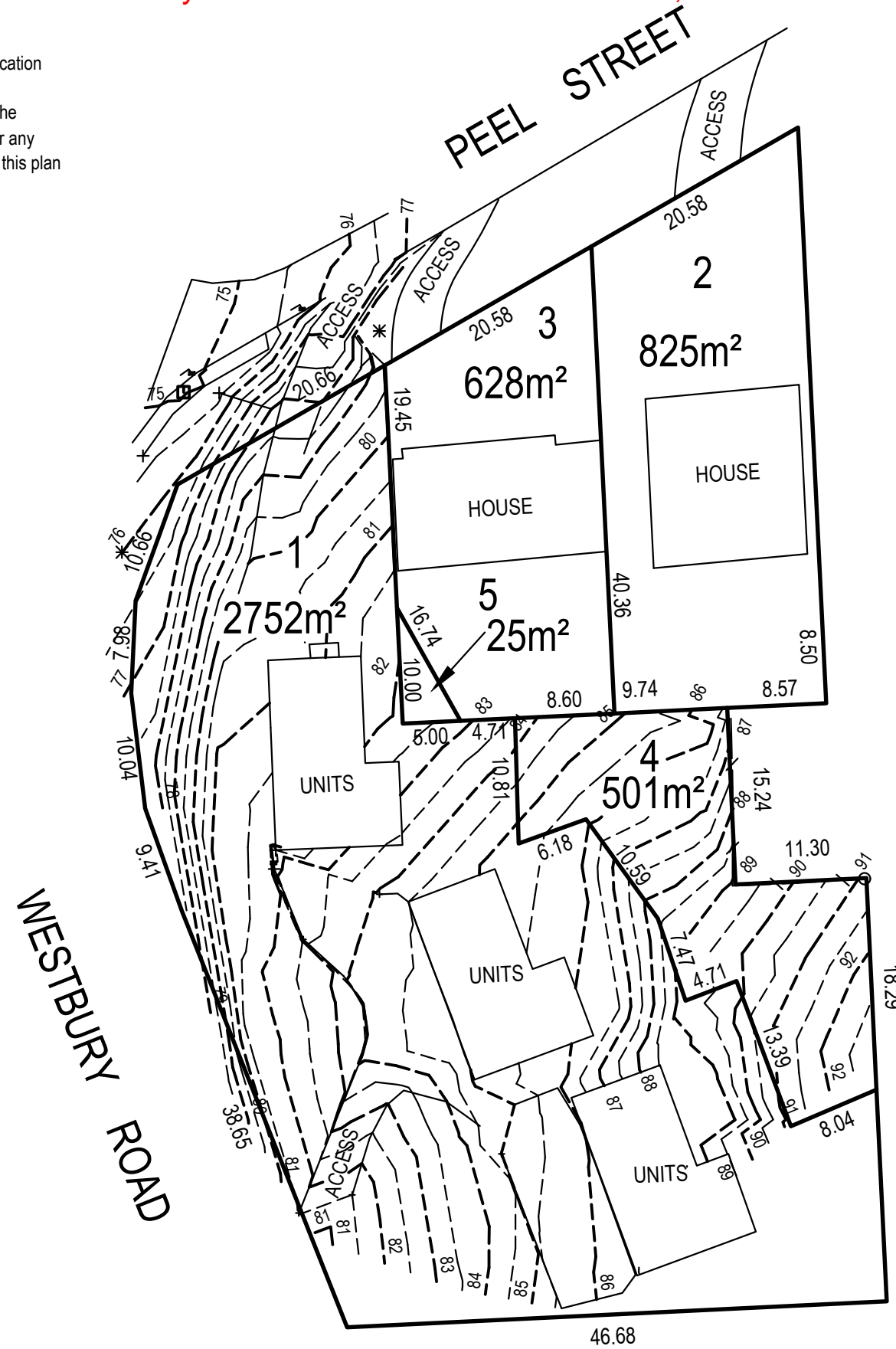


Attachment 2 - 51-55 Westbury Road and 27 and 29 Peel Street, South Launceston - Plans of Proposal (pages = 70)



IMPORTANT NOTE

This plan was prepared as a proposed subdivision to accompany a subdivision application to Launceston City Council and should not be used for any other purpose. The dim. areas and total number of lots shown hereon are subject to field survey and also to the requirements of Council and any other authority which may have requirements under any relevant legislation. In particular, no reliance should be placed on the information on this plan for any financial dealings involving the land. This note is an integral part of this plan.



NOTE: LOT 4 & 5 TO BE ADDED TO LOT 1

AMENDMENTS		
No.	Revision/Issue	Date



NOEL LEARY & ASSOCIATES
 132 Davey Street, HOBART TAS 7000
 P 03 6220 0299 F 03 6220 0290
 E nleary@noelleary.com.au

Project Name and Address
**51 - 55 WESTBURY ROAD
 27 & 29 PEEL STREET
 SOUTH LAUNCESTON**

Drawing Title
PLAN OF SUBDIVISION
 L KOLKA CT 134959 - 1 LOTS 2 & 4. (27 PEEL STREET)
 A & A La Monaca CT 58000 - 4 LOTS 3 & 5. (29 PEEL STREET)
 STRATA CORPORATION CT 169594 - 0 LOTS 1

SCALE	0 5 10 15 20
1:500 at A3	

Contour Interval	0.5 m
Date	12 / 01 / 15
SHEET	1 of 1
DRAWN	ML
CHKD	ML

FILE REF:	8634
Geocomp Ref	xxxxxx
AutoCAD Ref	xxxxxx
DATUM	Horz: xxxxxx
Vert:	xxxxxx



PROPOSED UNITS

SHEET INDEX

PAGE: DRAWING TITLE:

	COVER SHEET
1	SITE & LOCATION PLAN 1:500
2	PARTIAL SITE PLAN 1:200
3	GROUND AND FIRST FLOOR PLAN U7-10
4	SECOND FLOOR AND ROOF PLAN U7-10
5	ELEVATIONS UNITS 7 AND 8
6	SECTIONS UNITS 7 AND 8
7	ELEVATIONS UNITS 9 AND 10
8	SECTIONS UNITS 9 AND 10
9	SHADOW DIAGRAM- U7/8 12PM WinSol



IMPORTANT NOTICE:

1. All work is to be completed in accordance with the current Building Codes (BCA), Australian Standards (AS), Local authority by-laws, workplace health and safety standards & in accordance with the recognised building industry standard of good building practice.
2. All materials, finishes & equipment to be installed in accordance with the manufacturers specifications.
3. Written dimensions are preferred to scaling. All dimensions are to be verified on site prior to setout, construction and fabrication.
4. Any discrepancy, ambiguity and any contradictory information in these documents and any obvious omissions are to be brought to the attention of the Architect immediately as they become apparent.
5. All ground levels are approximates only.
6. All plumbing and draining is to comply with standard sewerage by-laws and requirements of the local authority.
7. Stormwater system to local council requirements.
8. All stairs are to be 190mm maximum risers and 240 minimum goings.
9. All fixtures, appliance & plumbing symbols are diagrammatic only & to be selected by clients.
10. Driveways, paths, clothes lines, storm water lines, landscaping, letter box, hot water system and ground sumps are diagrammatic only.
11. Whilst every care has been taken in the preparation of this document the client should undertake their own review of the documentation in order to satisfy themselves as to the accuracy of the details.


PROJECT NOTES:

LOCAL AUTHORITY:	Launceston City Council
BUILDING CLASS:	1a
BUILDING ZONE:	General Residential
PREVAILING WINDS:	N/W
DESIGN WIND SPEED:	Region A1-A5, N1
SOIL CLASSIFICATION:	Refer to engineers documents where applicable
CLIMATIC ZONE:	7
BAL:	Low. No unmaintained open spaces or bushland within 100m

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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
COVER
 SCALE: 1:1 @ A3



CLIENT:
ANDREW MCCULLUGH
 DATE:
MAR 2015

REV.	DATE	AMENDMENTS
1	16.01.17	Shadow diagram included: U7/8 over U5 10am-3pm Winter Solstice. Unit 1 Existing parking and access noted on 1:500 Site Plan.

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SP134959

TITLE REFERENCE- 169594/1
 PROPERTY ID- 2042829



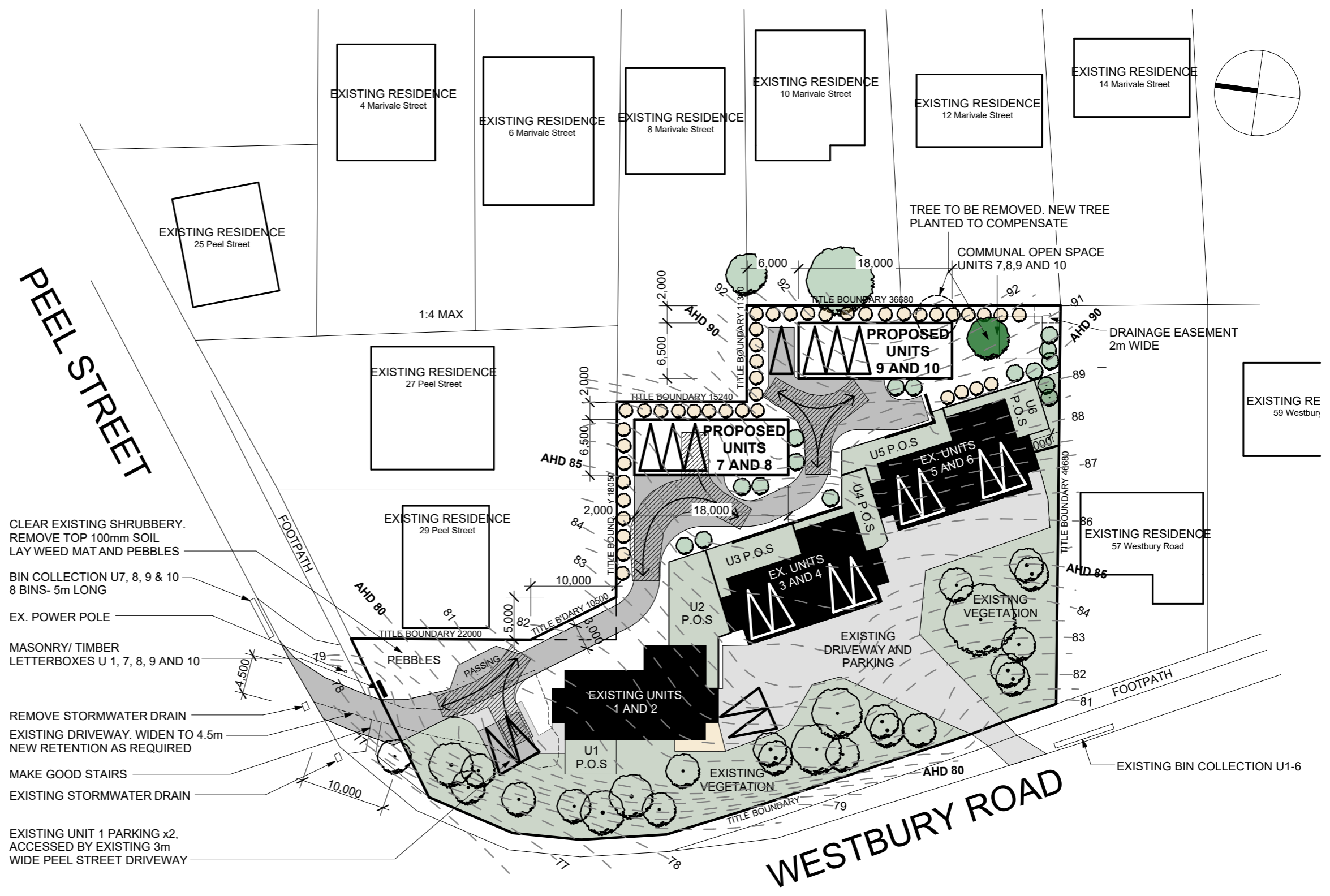
NTS LOCATION PLAN

AREAS:

TOTAL SITE: 3269.4m² / 10 = 326.94m² per UNIT
 SITE COVERAGE: 22.14 %
 PERVIOUS SURFACES: 51.49%
 UNIT 7, 8, 9, 10 FLOOR AREA inc. stairs and balcony: 106m²
 BALCONY: 15.9m² P.O.S / UNIT
 STAIRS: 6.8m²
 UNITS 7-10 GARAGE FLOOR AREA: 90m²

B99 TURNING PATH

NOTE: CONTOUR LINES @ APPROX. 0.5m INTERVALS



PROJECT: PROPOSED UNITS- 2x 2 BED AND 2x 1 BED ADDRESS: 51-55 WESTBURY ROAD, SOUTH LAUNCESTON
--

DRAWING TITLE: LOCATION AND SITE PLAN SCALE: 1:500 @ A3
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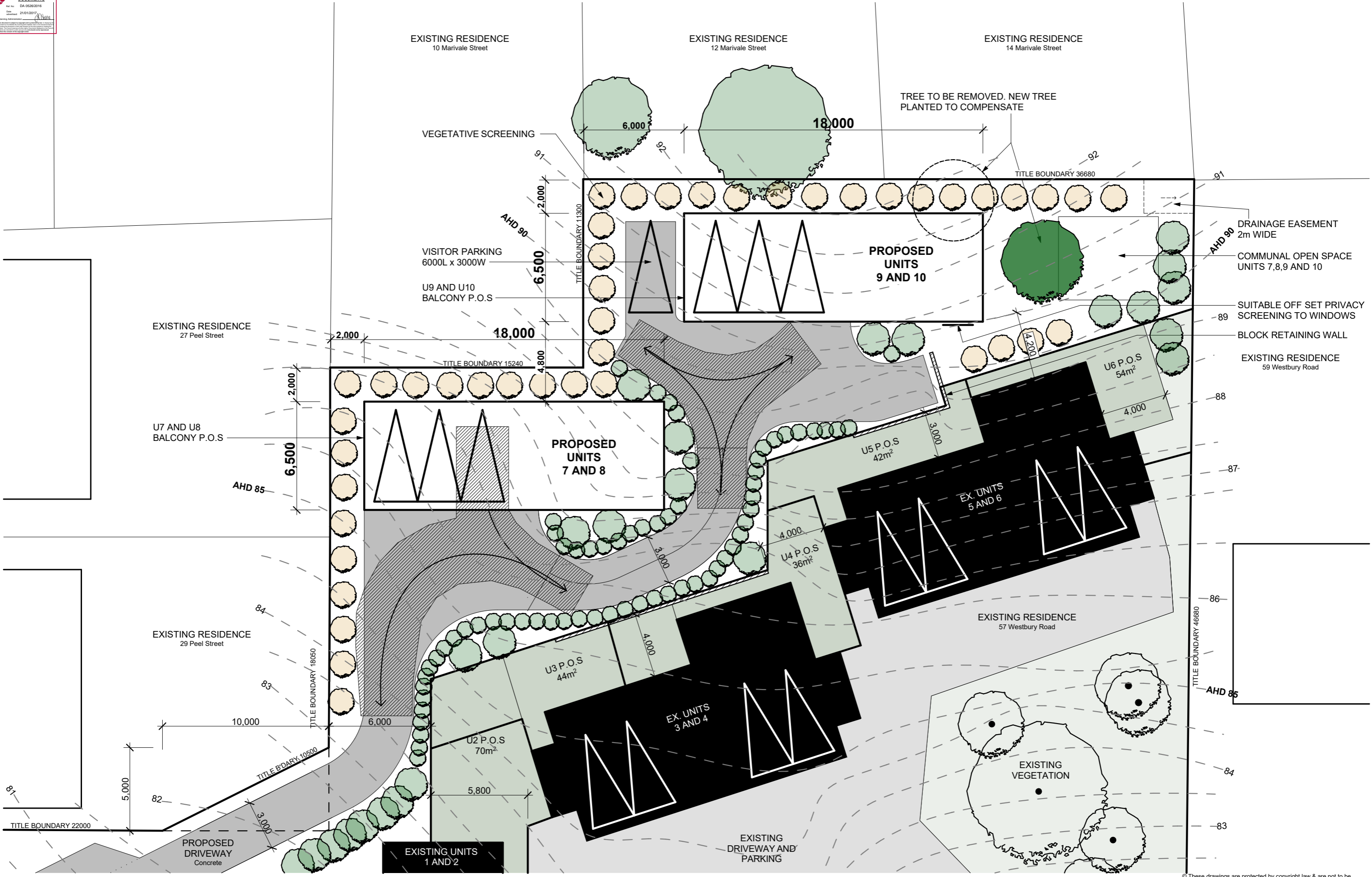
CLIENT: ANDREW MCCULLUGH DATE: MAR 2015
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REV.	DATE	AMENDMENTS
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DA 1625.1-01



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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
LOCATION AND SITE PLAN

SCALE: 1:200 @ A3

CLIENT:
ANDREW MCCULLUGH

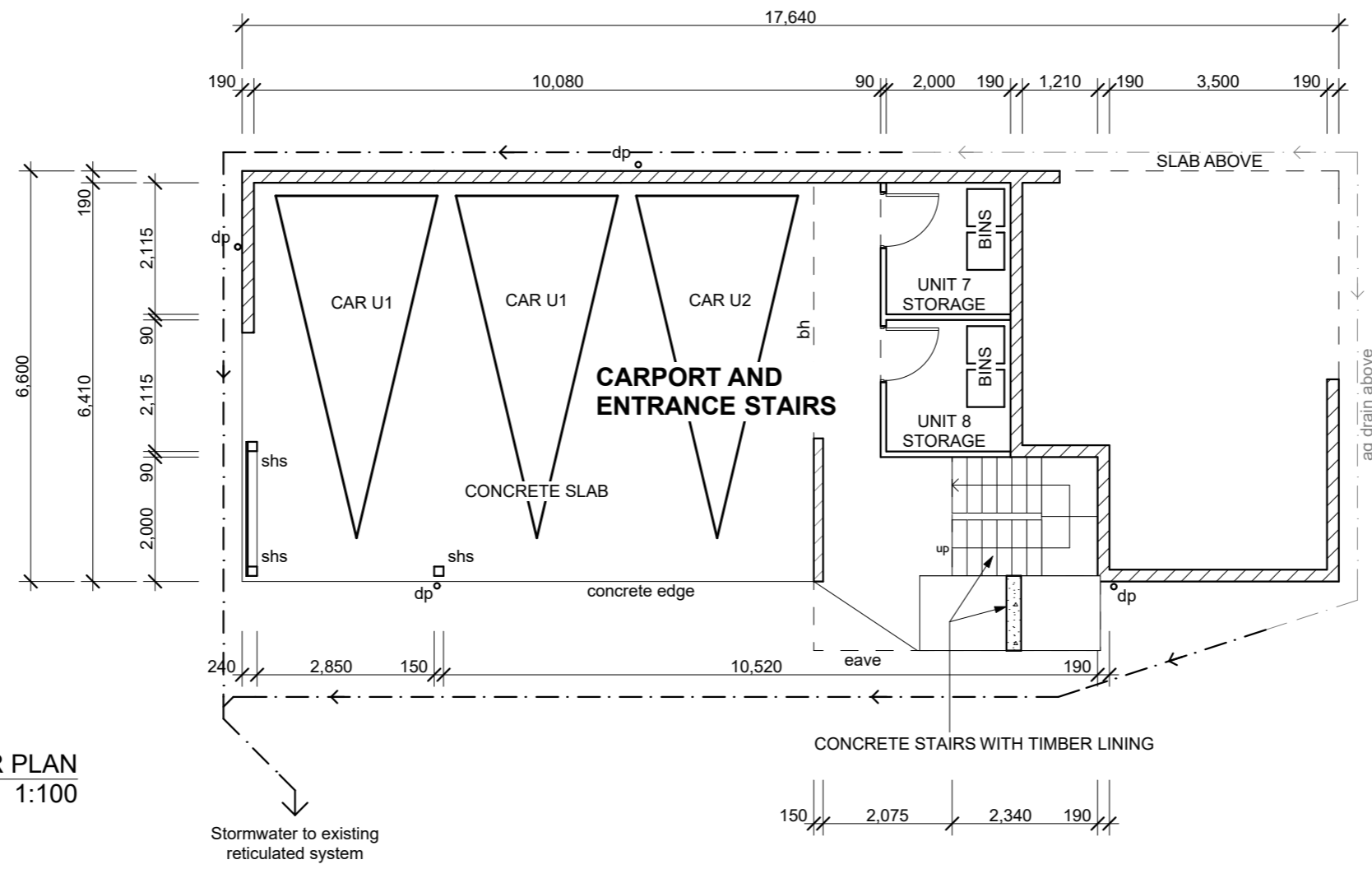
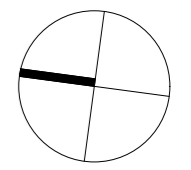
DATE:
MAR 2015

REV.	DATE	AMENDMENTS
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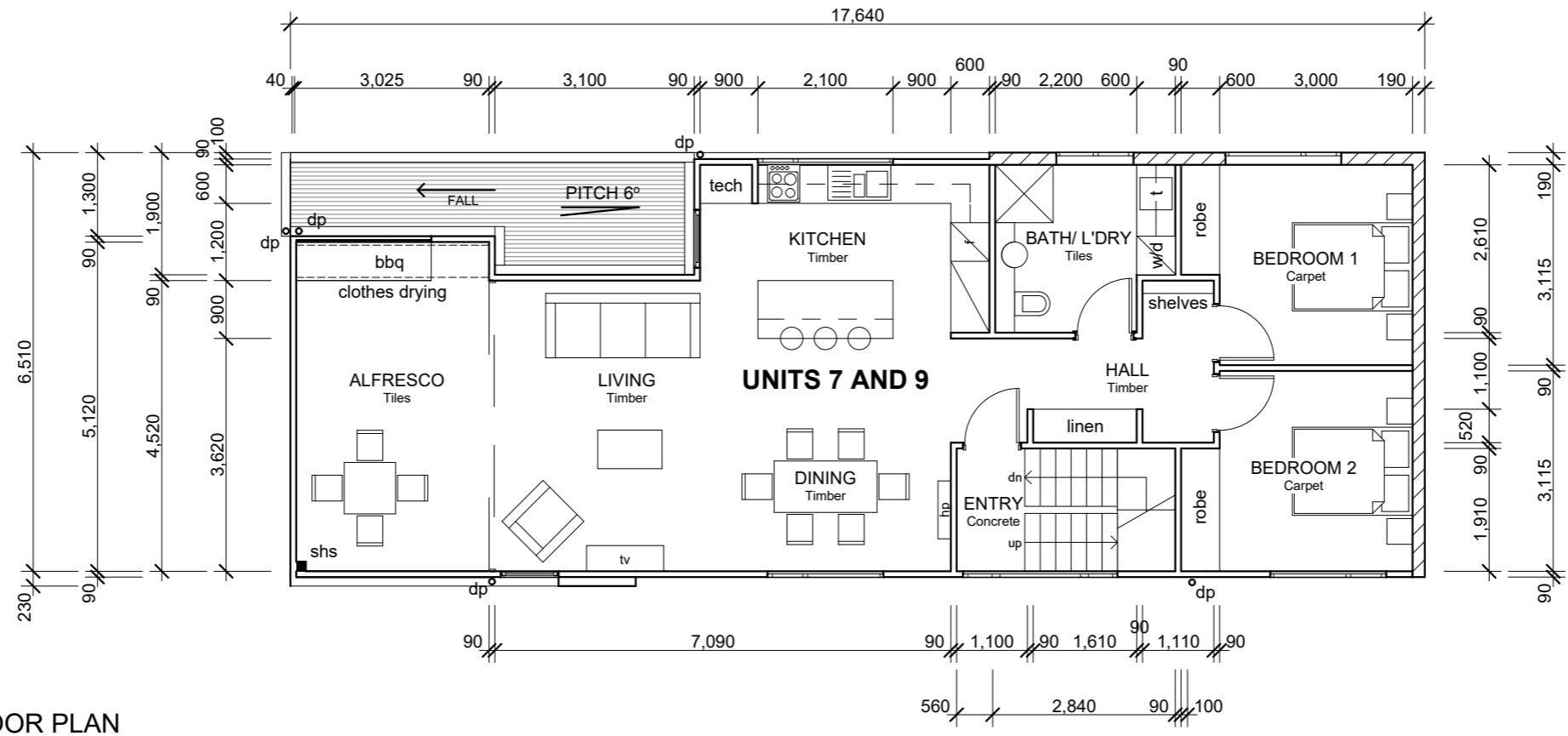
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DA 1625.1-02



GROUND FLOOR PLAN
1:100



FIRST FLOOR PLAN
1:100

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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
GROUND AND FIRST FLOOR PLANS
 SCALE: 1:100 @ A3

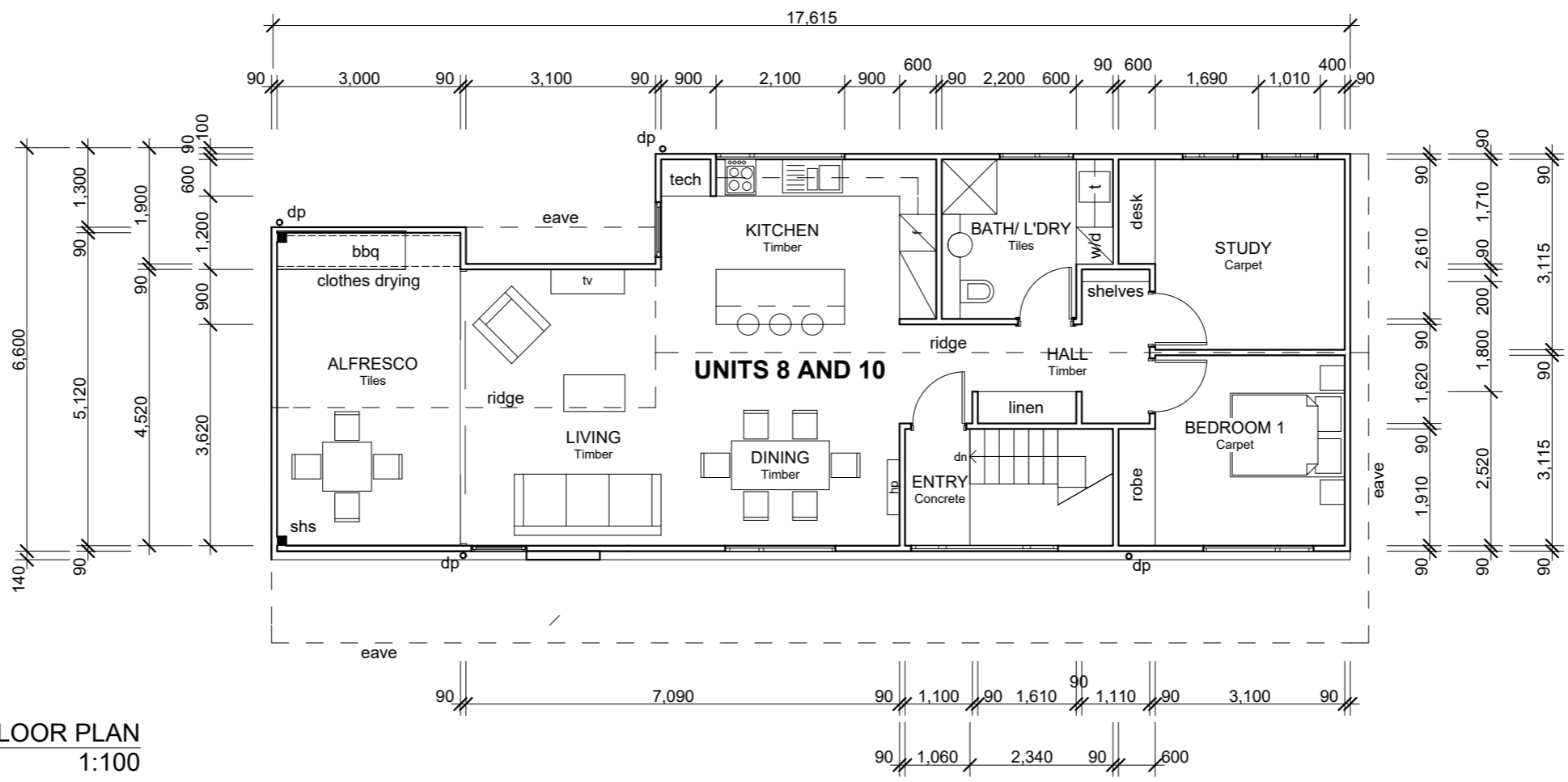
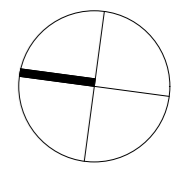


CLIENT:
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 DATE:
MAR 2015

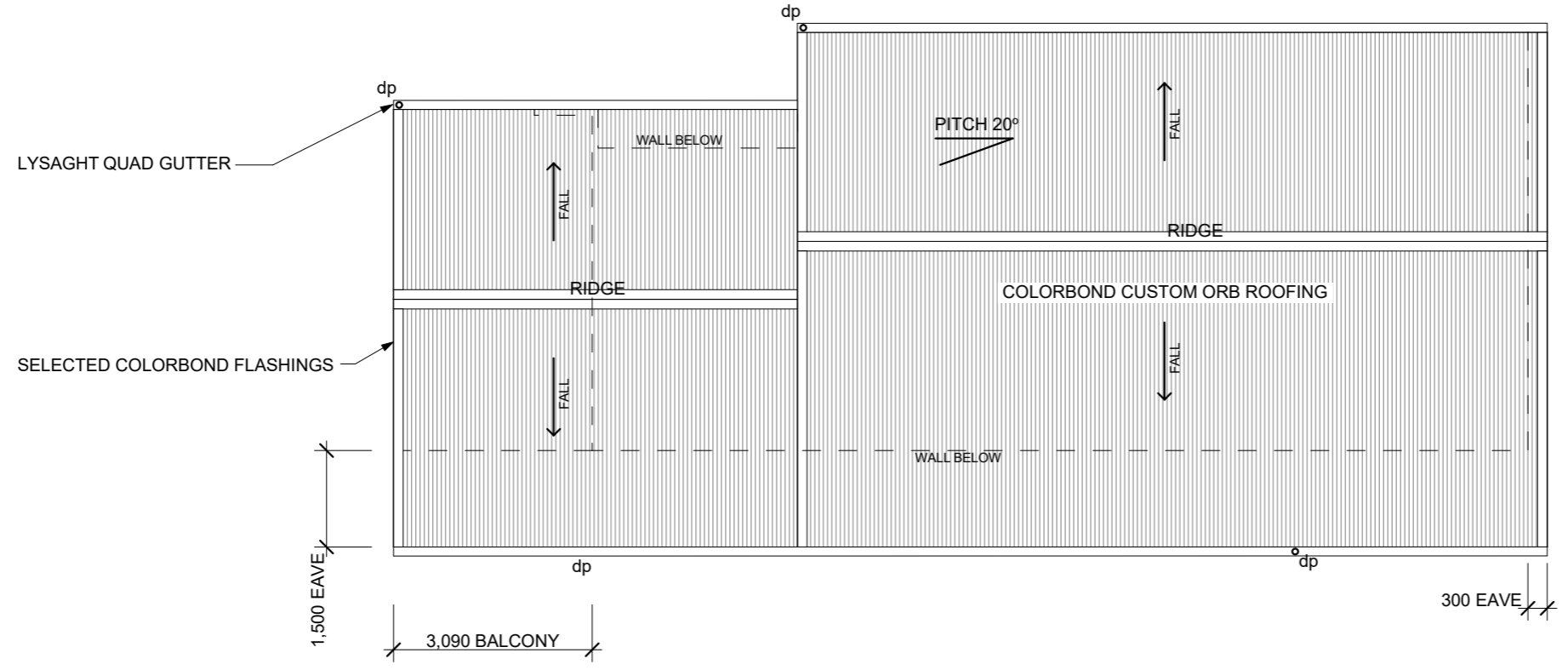
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SECOND FLOOR PLAN
 1:100



ROOF PLAN
 1:100

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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
SECOND FLOOR AND ROOF PLAN
 SCALE: 1:100 @ A3

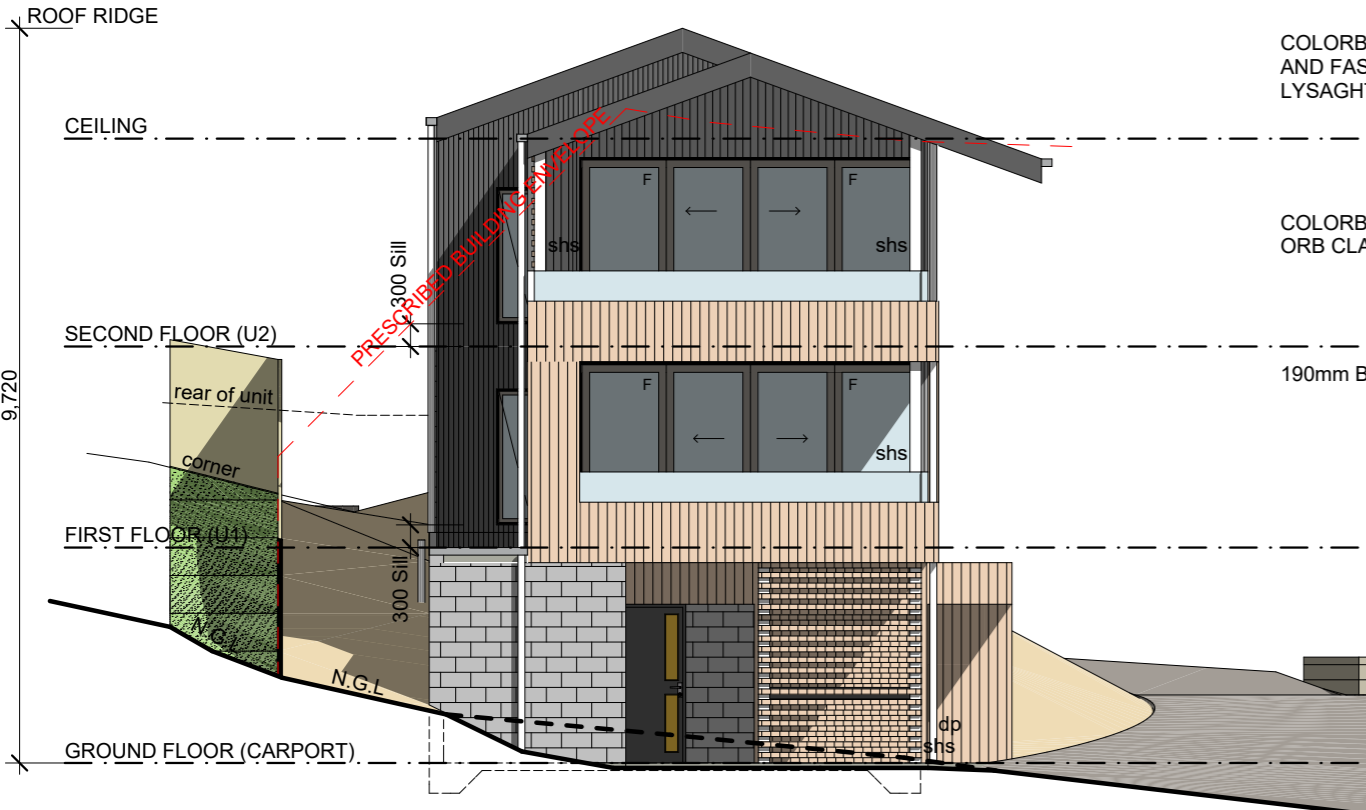


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MAR 2015

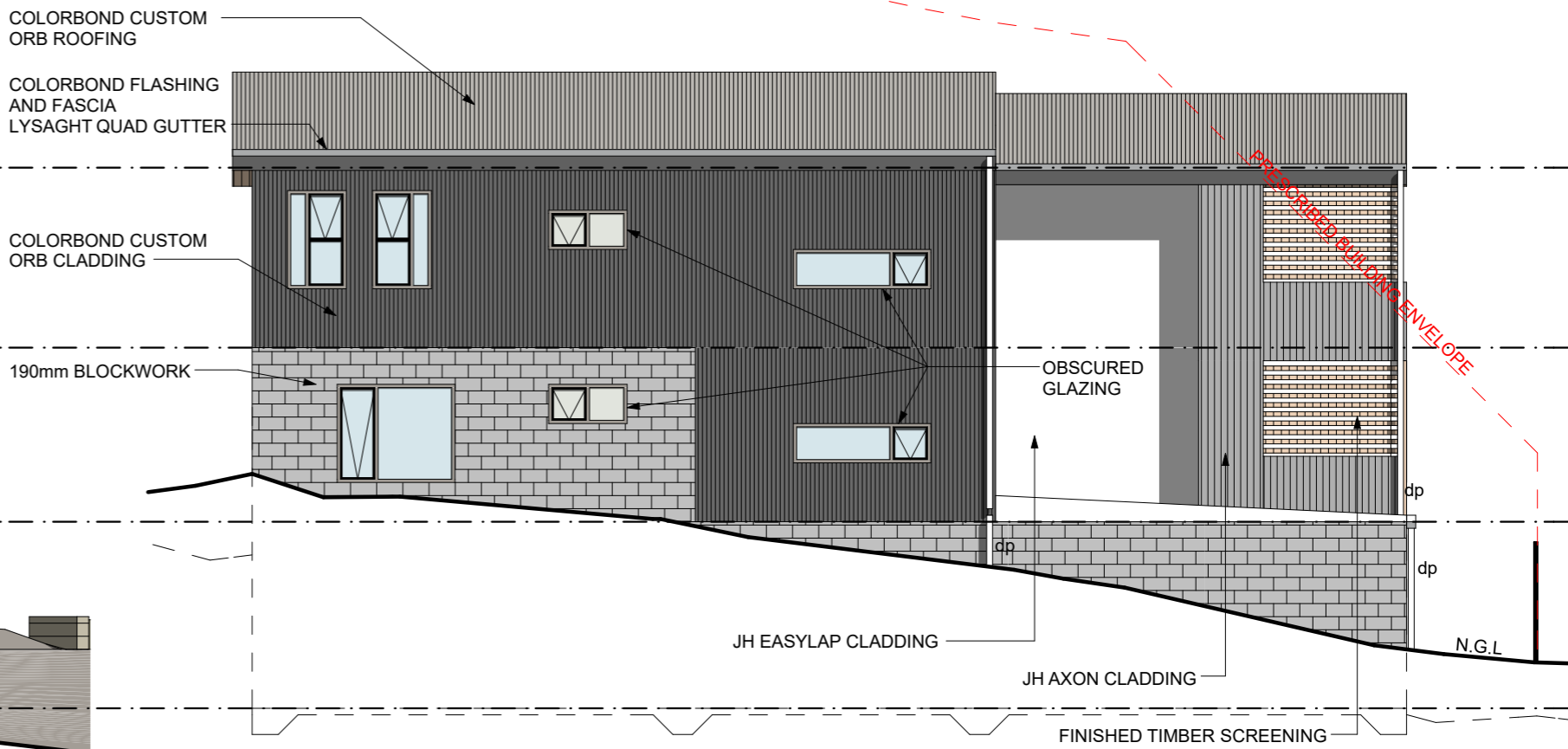
REV.	DATE	AMENDMENTS
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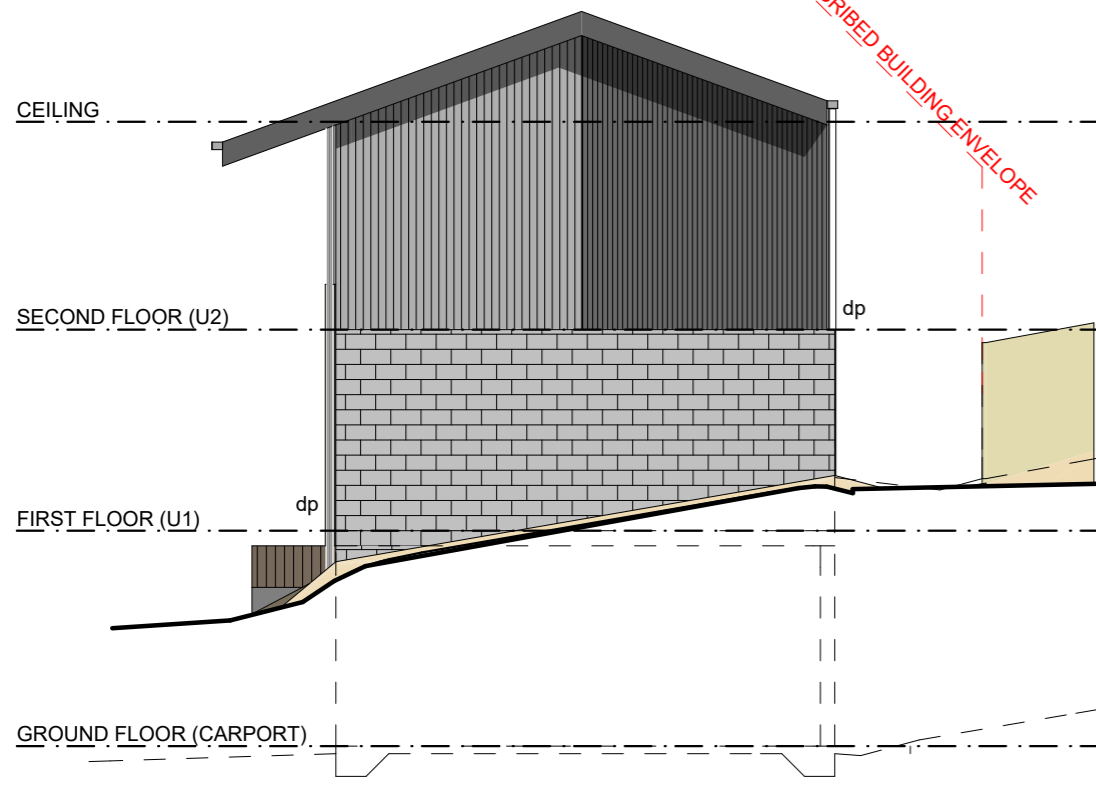




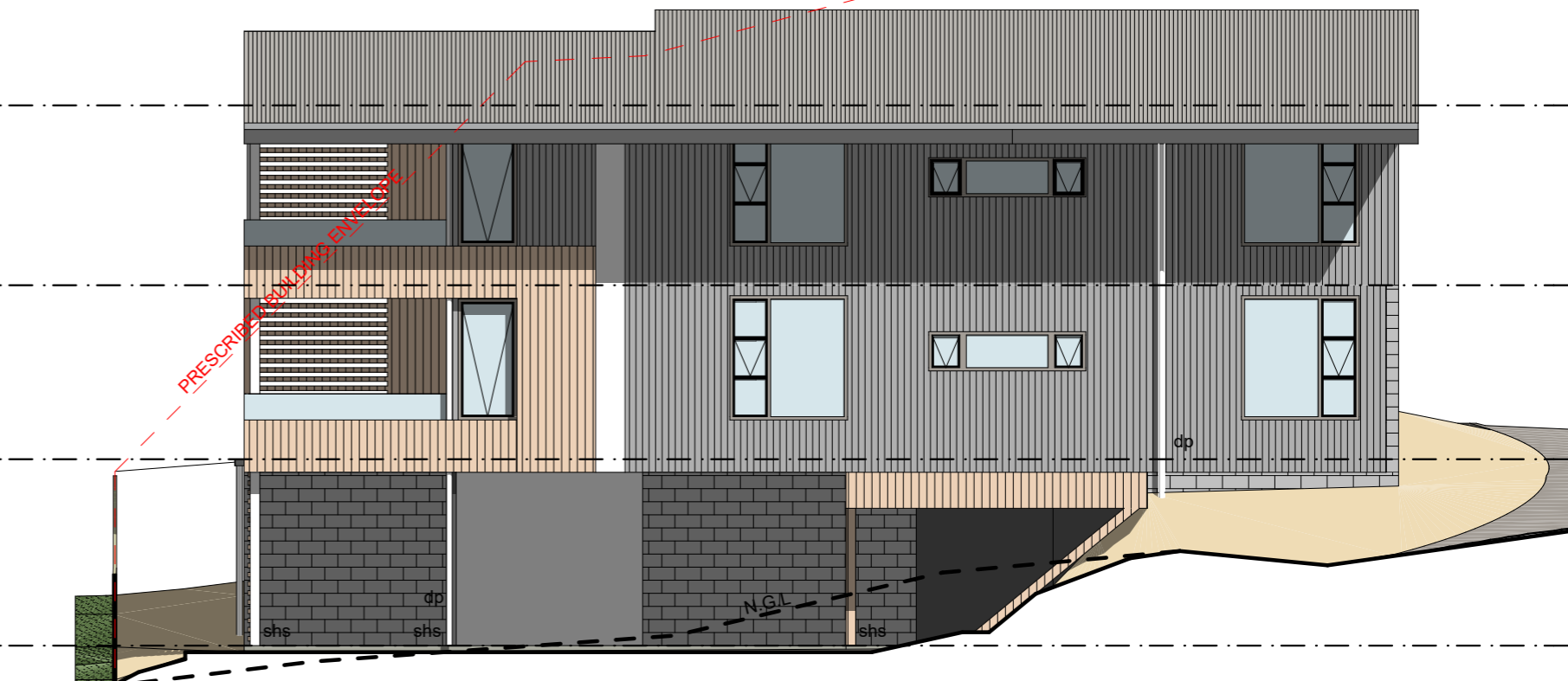
E01 NORTH ELEVATION
1:100



E02 EAST ELEVATION
1:100



E03 SOUTH ELEVATION
1:100



E04 WEST ELEVATION
1:100

PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
ELEVATIONS- UNITS 7 AND 8
 SCALE: 1:100 @ A3



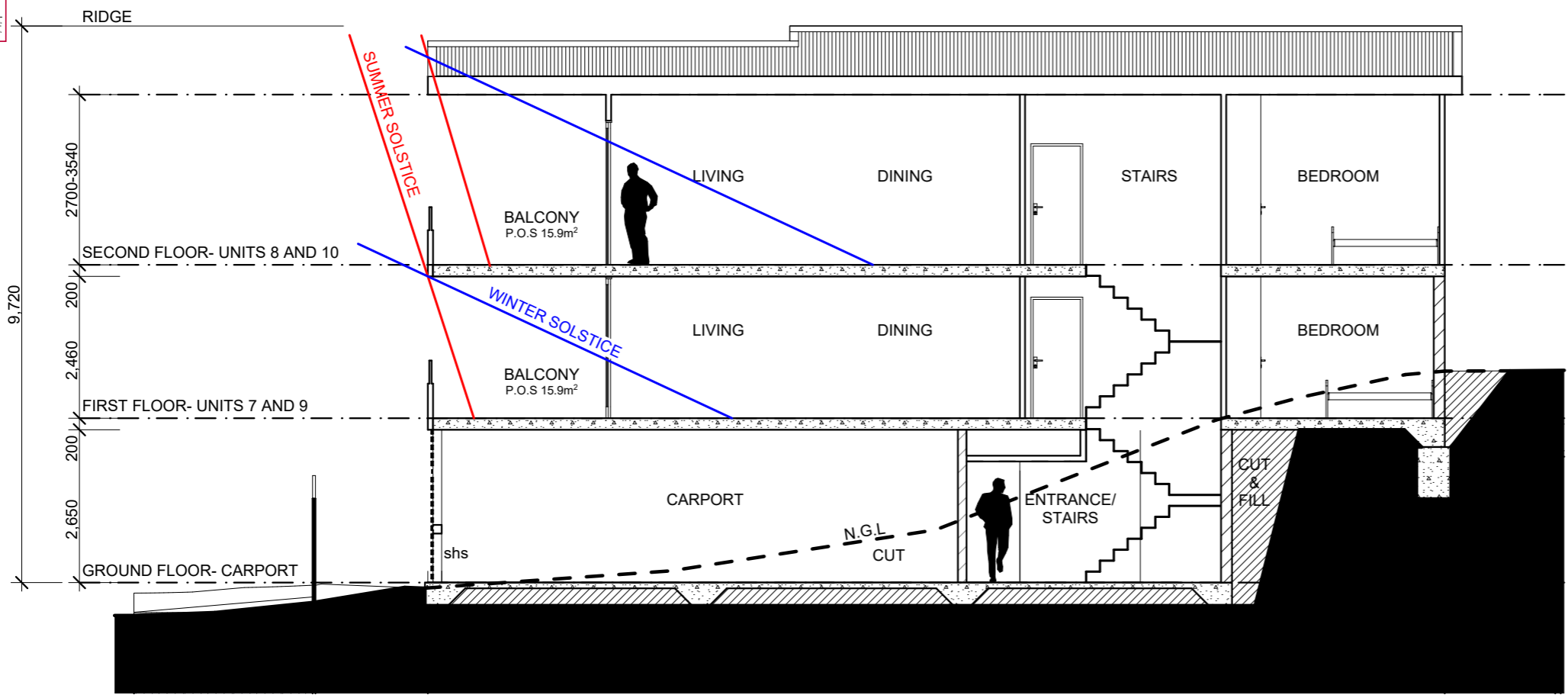
CLIENT:
ANDREW MCCULLUGH
 DATE:
MAR 2015

REV.	DATE	AMENDMENTS
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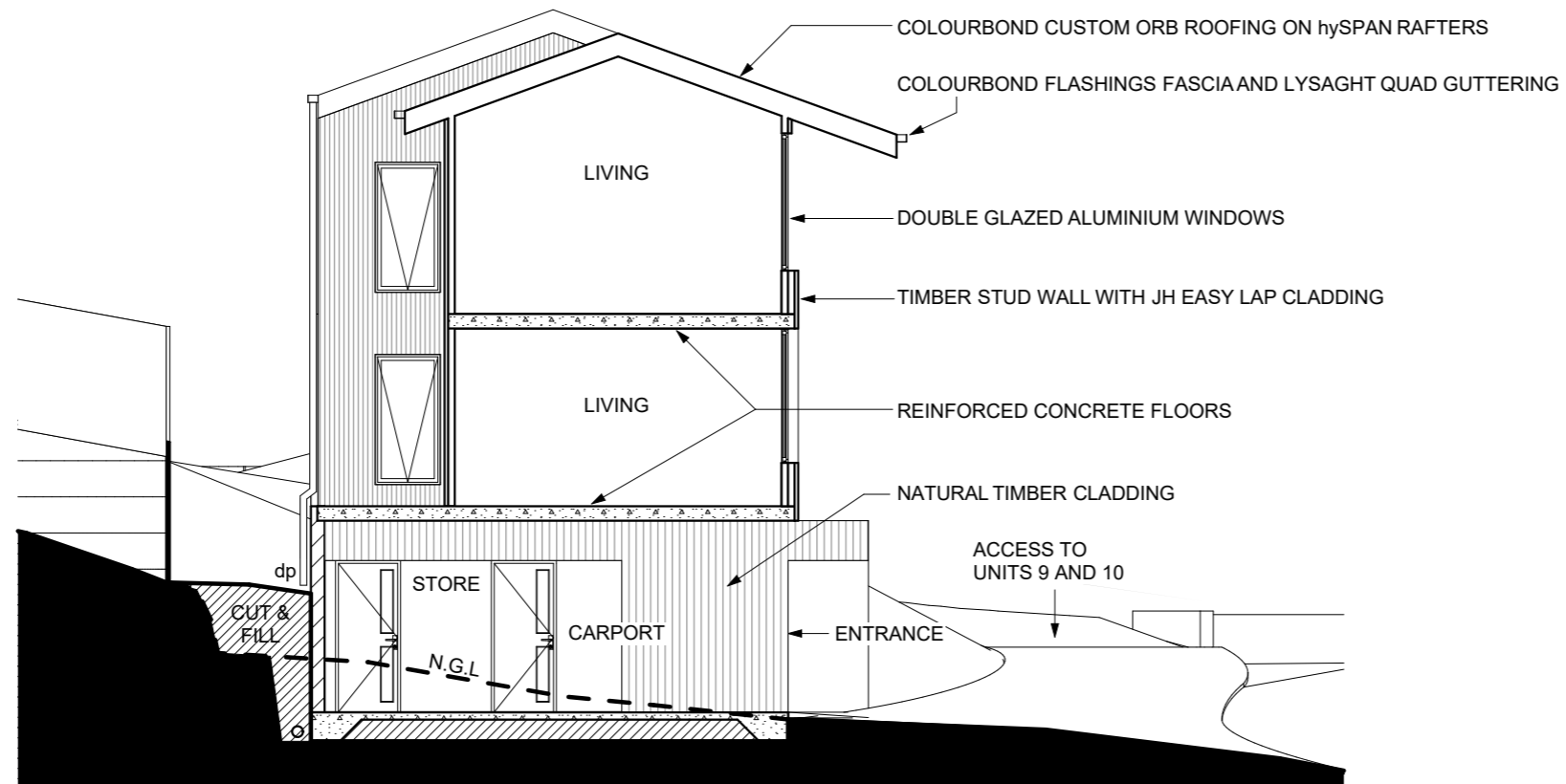
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S01 N/S CROSS SECTION
 1:100



S02 E/W CROSS SECTION
 1:100

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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
SECTIONS- UNITS 7 AND 8
 SCALE: 1:100 @ A3

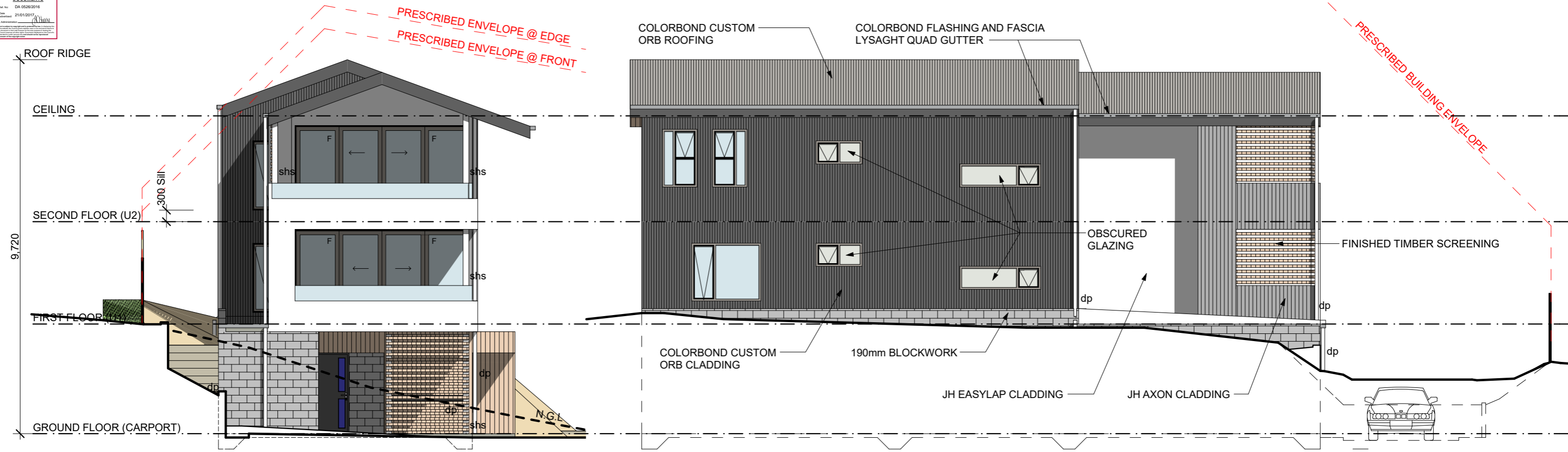


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 DATE:
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REV.	DATE	AMENDMENTS
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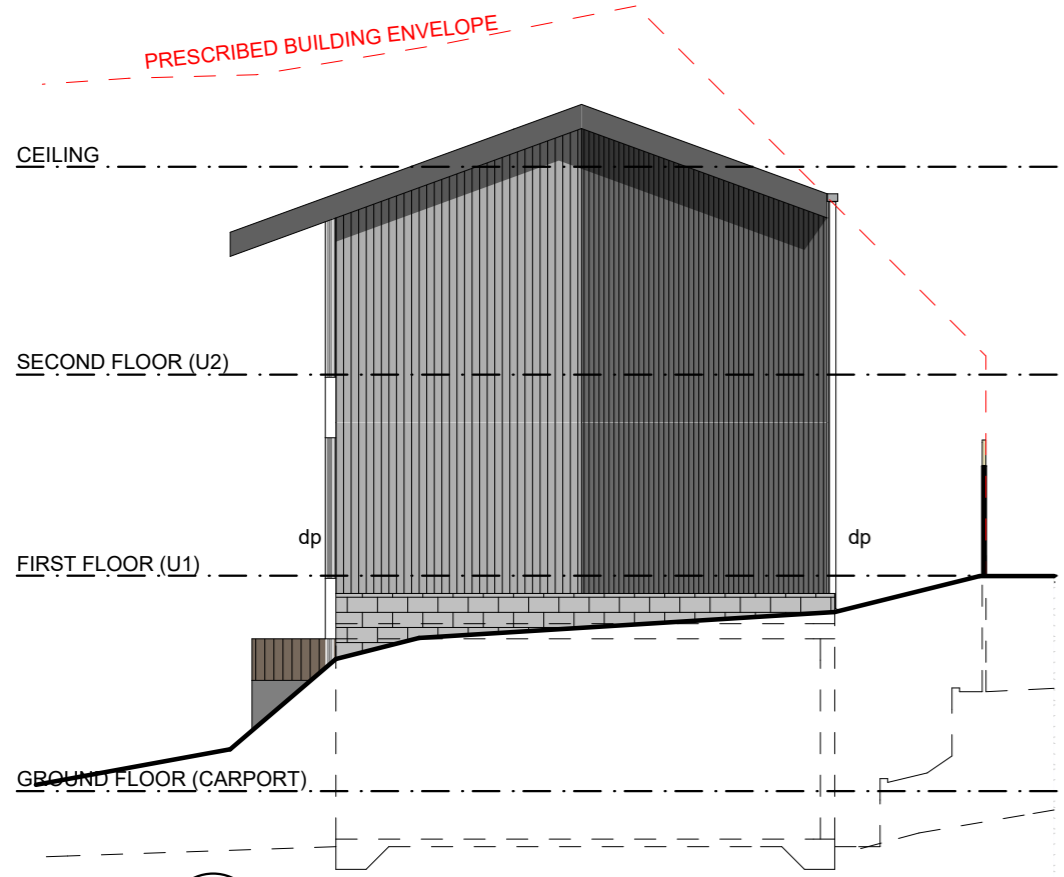
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E05 NORTH ELEVATION
1:100

E06 EAST ELEVATION
1:100



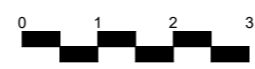
E07 SOUTH ELEVATION
1:100



E08 WEST ELEVATION
1:100

PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
ELEVATIONS- UNITS 9 AND 10
 SCALE: 1:100 @ A3



CLIENT:
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 DATE:
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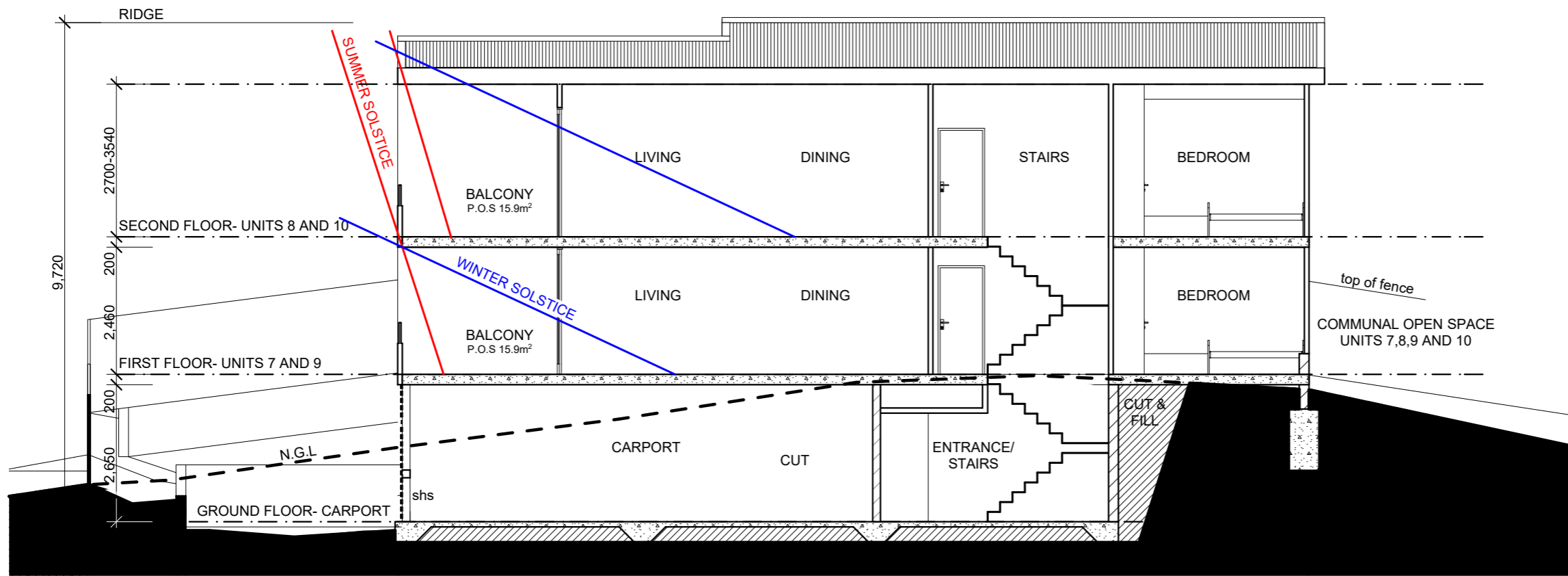
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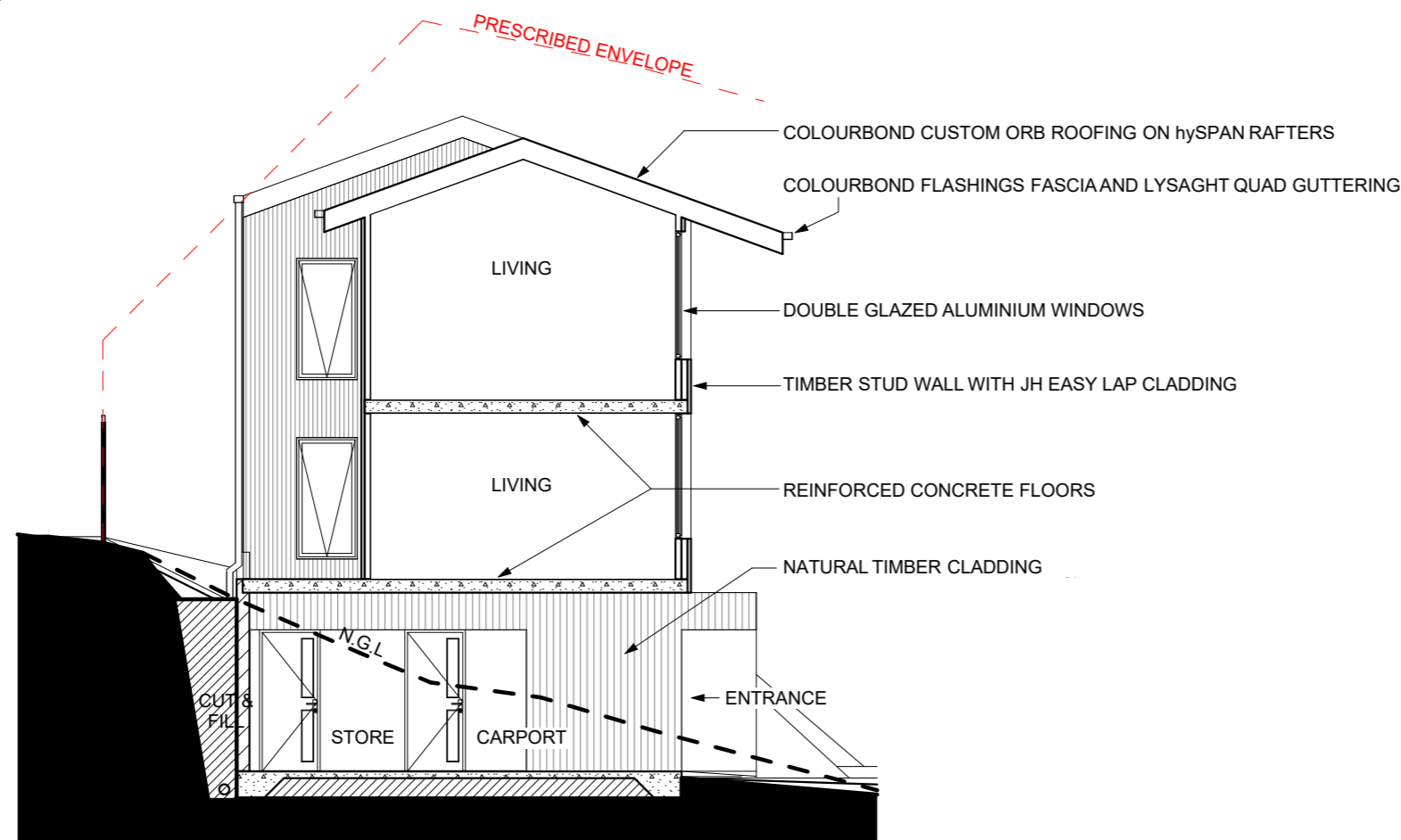
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DA
1625.1-07



S03 N/S CROSS SECTION
 1:100



S04 E/W CROSS SECTION
 1:100

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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
SECTIONS- UNITS 9 AND 10
 SCALE: 1:100 @ A3

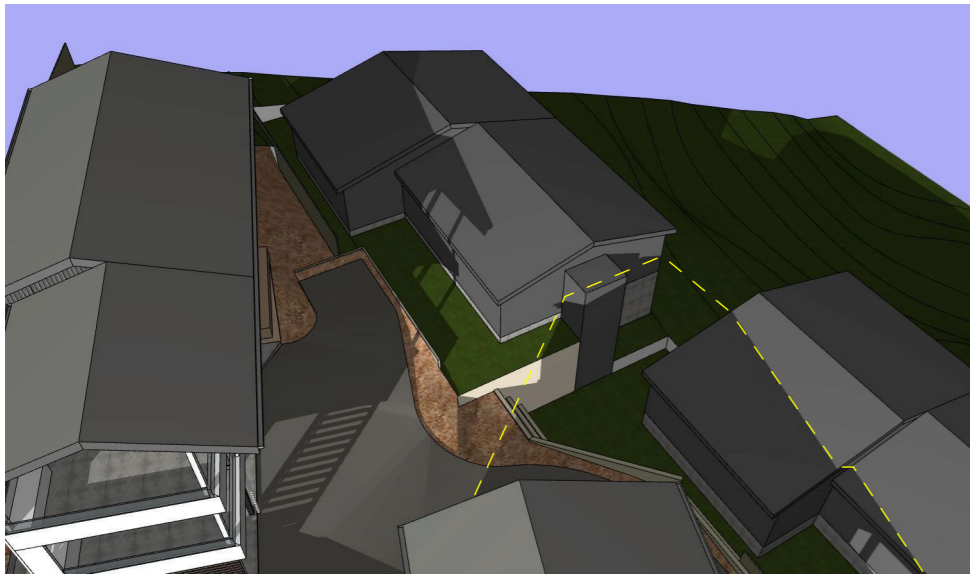


CLIENT:
ANDREW MCCULLUGH
 DATE:
MAR 2015

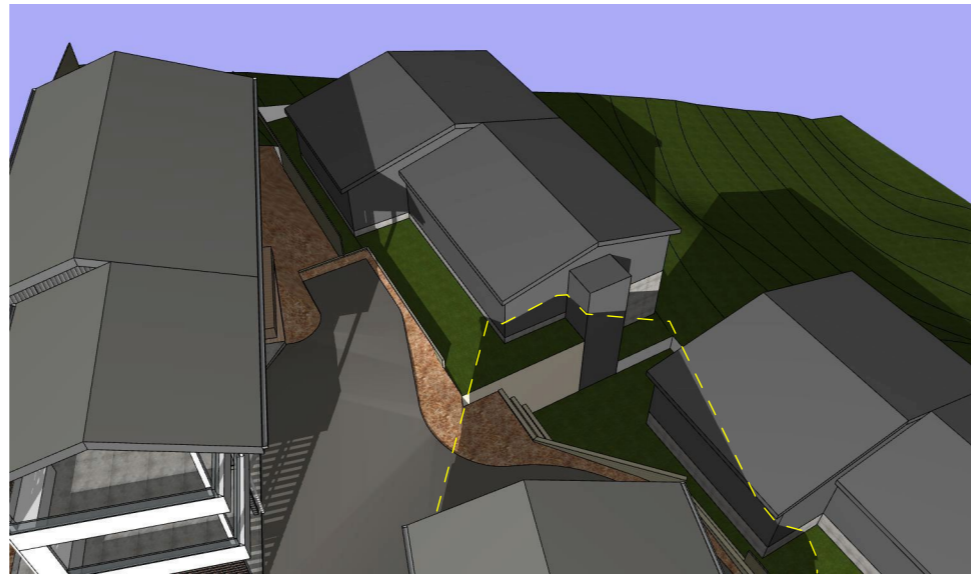
REV.	DATE	AMENDMENTS
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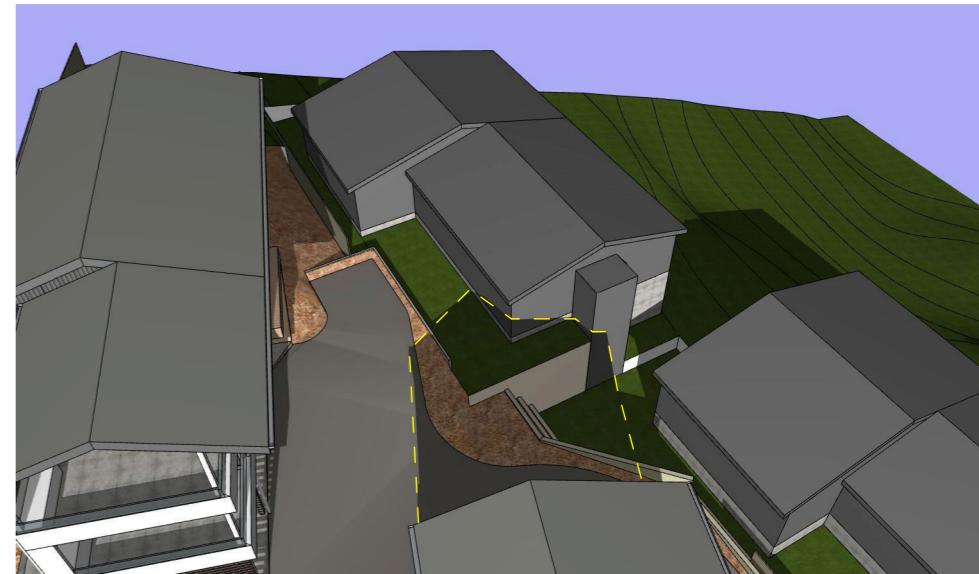




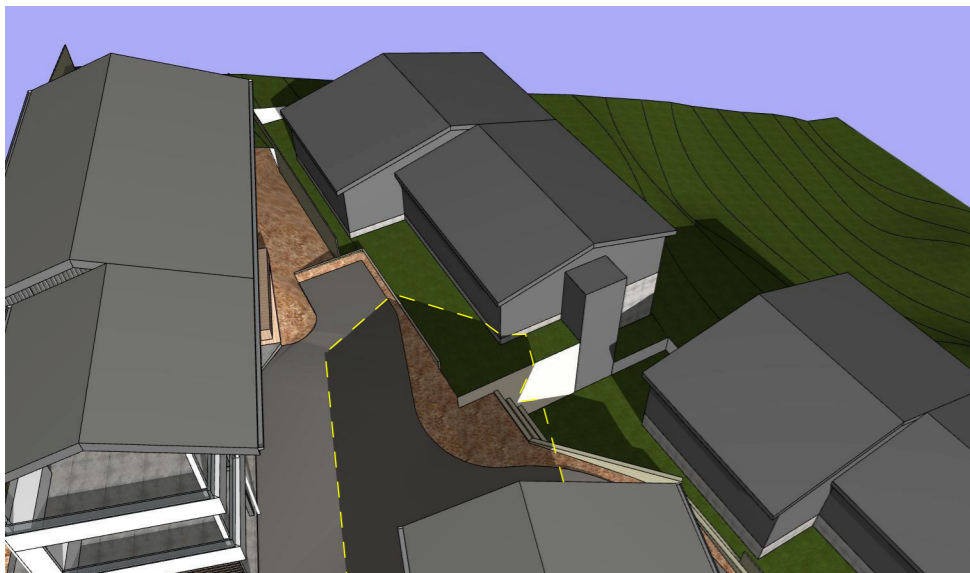
1 SUNSTUDY @ 10am WINTER SOLSTICE
 NTS



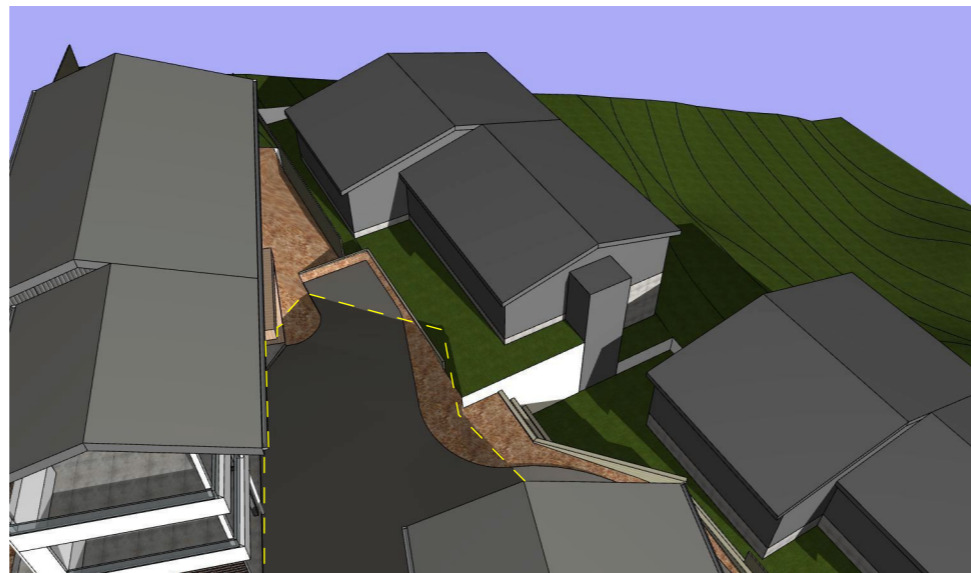
2 SUNSTUDY @ 11am WINTER SOLSTICE
 NTS



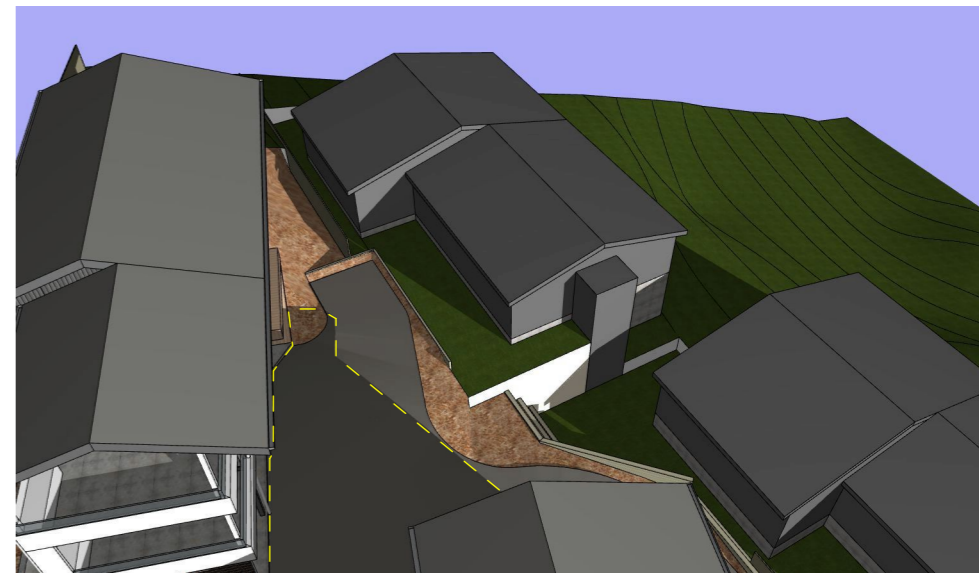
3 SUNSTUDY @ 12pm WINTER SOLSTICE
 NTS



4 SUNSTUDY @ 1pm WINTER SOLSTICE
 NTS



5 SUNSTUDY @ 2pm WINTER SOLSTICE
 NTS



6 SUNSTUDY @ 3pm WINTER SOLSTICE
 NTS

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PROJECT:
PROPOSED UNITS- 2x 2 BED AND 2x 1 BED
 ADDRESS:
51-55 WESTBURY ROAD, SOUTH LAUNCESTON

DRAWING TITLE:
SHADOW DIAGRAM U7/8 OVER EX. U5
 SCALE: NTS @ A3

CLIENT:
ANDREW MCCULLUGH
 DATE:
MAR 2015

REV.	DATE	AMENDMENTS
1	16.01.17	Shadow diagram included: U7/8 over U5 10am-3pm Winter Solstice. Unit 1 Existing parking and access noted on 1:500 Site Plan.

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Planning Submission

Construction and Use of Additional 4 New Dwellings

51-55 Westbury Road, South Launceston

MSR Property Investments Pty Ltd

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2.2 Locality Description	3
2.3 Access and Movement	4
2.4 Services	4
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Figure Index

Figure 1: Location Map

Figure 2: Zoning Map

1. Executive Summary

1.1 Proposal Overview

This submission is prepared in support of a proposal for 4 additional dwelling units at 51-55 Westbury Road, South Launceston. The location of the proposal is identified at CT 169594/1.

This application is made with the consent of the owners.

This application is made under Section 57 of the *Land Use Planning and Approvals Act 1993*, which provides for the submission of an application for a discretionary planning permit. The proposal has been prepared in accordance with the provisions of the Launceston Interim Planning Scheme 2015 and the objectives of the *Land Use Planning and Approvals Act 1993*.

The proposal is summarised as:

- Use and Development of 4 additional new dwellings, and is illustrated in plans, provided by Architectural SOS.

2. Subject Land and Locality

2.1 Subject Land Description

51-55 Westbury Road, South Launceston has an area of 3269.4m² and contains 6 existing dwellings. The site slopes down to the intersection of Peel Street and Westbury Road (northwest).

2.2 Locality Description

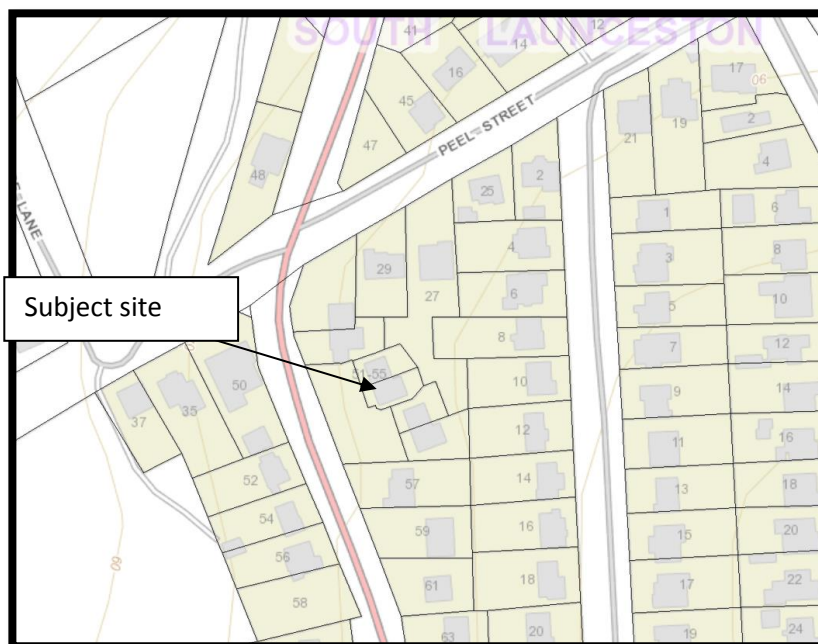


Figure 1: Locality Map

The subject site is located within the suburb of South Launceston. The site is surrounded by residential allotments of various sizes as well as a number of multiple dwellings in the area.

2.3 Access and Movement

There are two existing vehicular access points to the land. The proposal will see the existing access to Peel Street, currently accessing Unit 1 to be widened to 4.5metres.

2.4 Services

The subject site is located within the urban area of South Launceston; it is provided with reticulated water, sewerage, stormwater, power and communications supplies.

2.5 Heritage

The subject site is not identified to be of heritage significance.

2.6 Flora and Fauna

The site is located within the urban area South Launceston and does not support any remnant native vegetation and hence, any habitat of threatened species. A search of the Natural Values Atlas has revealed no recorded species on the subject site. One mature tree (conifer) is to be removed, and a new tree is to be planted on site to offset the removal required to facilitate the location of Units 9 and 10.

3. Proposal

3.1 Development Proposal

The proposal is for the construction of 4 new dwellings. Units 7 and 8 will be located together in one building over three levels. On the ground floor, three car parking spaces will be provided, two spaces for one of the units and the second unit will be provided with a singular car parking space. Each unit will be provided with storage area on this level. Units 9 and 10 will also be located together in one building over three levels. On the ground floor, three car parking spaces will be provided, two spaces for one of the units and the second unit will be provided with a singular car parking space. Each unit will be provided with storage area on this level

Each unit will be accommodated predominantly over a single level. Units 7 and 9 will comprise of open plan kitchen dining and living, two bedrooms, bathroom/laundry and alfresco area. Units 8 and 10 will comprise of open plan kitchen dining and living, one bedroom, study, bathroom/laundry and alfresco area.

The new dwellings will have wall cladding of a combination of face blockwork and JH Easylap and JH Axon wall cladding and Colorbond custom orb with Colorbond custom orb roof sheeting.

4. Planning Assessment

4.1 Launceston Interim Planning Scheme 2015

The subject site is zoned General Residential within the Launceston Interim Planning Scheme 2015. The Scenic Management Area (Western Hillside Precinct) overlay burdens the subject site.

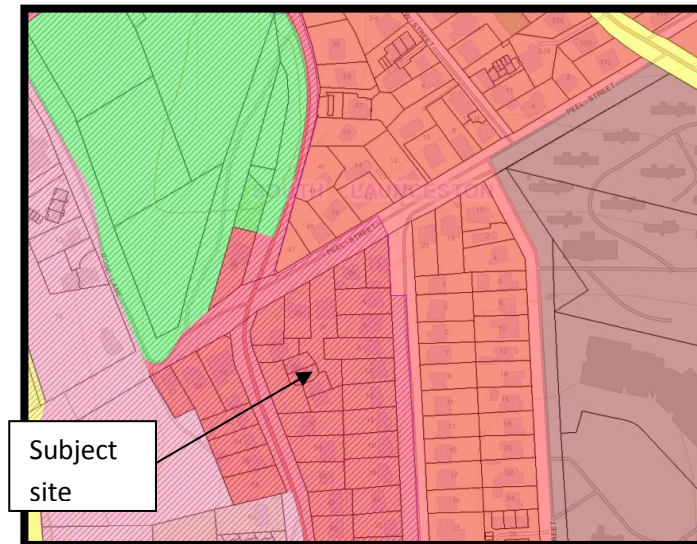


Figure 2: Zoning Map

(Red = General Residential Zone, Green = Recreation)

10.0 General Residential Zone

10.1 Zone Purpose

10.1.1.1 To provide for residential use or development that accommodates a range of dwelling types at suburban densities, where full infrastructure services are available or can be provided.

10.1.1.2 To provide for compatible non-residential uses that primarily serve the local community.

10.1.1.3 Non-Residential uses are not to adversely affect residential amenity, through noise, activity outside of business hours, traffic generation and movement, or other off site impacts.

10.1.1.4 To encourage residential development that respects the existing and desired neighbourhood character.

10.1.1.5 To encourage residential use and development that facilitates solar access, integrated urban landscapes, and utilisation of public transport, walking and cycling networks.

Proposal Response

The proposal furthers the purpose of the zone. The proposal respects the character of the area by proposing dwellings that provide for a range of dwelling types at suburban densities. The design of the dwellings provides an appropriate response to the streetscape character and contributes to high levels of residential amenity, particularly within the development itself.

10.2 Use Table

The proposed use best fits the use class of Residential of which is a Permitted use within the General Residential Zone, as the proposal is for multiple dwellings.

Residential as defined by the Scheme means:

“use of land for self-contained or shared living accommodation. Examples include an ancillary dwelling, boarding house, communal residence, home-based business, hostel, residential aged care home, residential college, respite centre, retirement village and single or multiple dwellings.”

10.3 Use Standards – Not applicable.

10.4 Development Standards

10.4.1 Residential density for multiple dwellings.

Objective: To provide for suburban densities for multiple dwellings that: (a) make efficient use of suburban land for housing; and (b) optimise the use of infrastructure and community services.		
Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1 Multiple dwellings must have a site area per dwelling of not less than: (a) 325m²; or (b) If within a density area specified in Table 10.4.1 below and shown on the planning scheme maps, that specified for the density area.</p>	<p>P1 Multiple dwellings must only have a site area per dwelling that is less than 325m², or that specified for the applicable density area in Table 10.4.1, if the development will not exceed the capacity of infrastructure services and: (a) Is compatible with the density of the surrounding area; or (b) Provides for a significant social or community housing benefit and is in accordance with at least one of the following: (i) the site is wholly or partially within 400m walking distance of a public transport stop;</p>	<p>A1 <i>The proposal complies with the acceptable solution. The site has an area of 3269.4m², resulting in a density of 1:326.94m² for a total of 10 dwellings on the site.</i></p>

(ii) the site is wholly or partially within 400m walking distance of a business, commercial, urban mixed use, village or inner residential zone.

10.4.2 Setbacks and building envelope for all dwellings

Objective:
To control the siting and scale of dwellings to:

- (a) Provide reasonably consistent separation between dwellings on adjacent sites and a dwelling and its frontage; and**
- (b) Assist in the attenuation of traffic noise or any other detrimental impacts from roads with high traffic volumes; and**
- (c) Provide consistency in the apparent scale, bulk, massing and proportion of dwellings; and**
- (d) Provide separation between dwellings on adjacent sites to provide reasonable opportunity for daylight and sunlight to enter habitable rooms and private open space.**

Acceptable Solution	Performance Criteria	<i>Proposal Response</i>
<p>A1 Unless within a building area, a dwelling, excluding protrusions (such as eaves, steps, porches, and awnings) that extend not more than 0.6m into the frontage setback, must have a setback from a frontage that is:</p> <ul style="list-style-type: none"> (a) If the frontage is a primary frontage, at least 4.5m, or, if the setback from the primary frontage is less than 4.5m, not less than the setback, from the primary frontage, of any existing dwelling on the site; or (b) If the frontage is not a primary frontage, at least 3m, or, if the setback from the frontage is less than 3m, not less than the setback, from a frontage that is not a primary frontage, of any existing dwelling on the site; or (c) If for a vacant site with existing dwellings on adjoining sites on the same street, not more 	<p>P1 A dwelling must:</p> <ul style="list-style-type: none"> (a) Have a setback from a frontage that is compatible with the existing dwellings in the street, taking into account any topographical constraints; and (b) If abutting a road identified in Table 10.4.2, include additional design elements that assist in attenuating traffic noise or any other detrimental impacts associated with proximity to the road. 	<p><i>A1 The proposal is setback at least 4.5m from a primary frontage and 3.0m from a secondary frontage.</i></p>

<p>than the greater, or less than the lesser, setback for the equivalent frontage of the dwellings on the adjoining sites on the same street; or</p> <p>(d) If the development is on land that abuts a road specified in Tables 10.4.2, at least that specified for the road.</p>		
<p>A2 A garage or carport must have a setback from a primary frontage of at least:</p> <p>(a) 5.5m, or alternatively 1m behind the façade of the dwelling; or</p> <p>(b) The same as the dwelling façade, if a portion of the dwelling gross floor area is located above the garage or carport; or</p> <p>(c) 1m, if the natural ground level slopes up or down at a gradient steeper than 1 in 5 for a distance of 10m from the frontage.</p>	<p>P2 A garage or carport must have a setback from a primary frontage that is compatible with the existing garages or carports in the street, taking into account any topographical constraints.</p>	<p>A2 <i>The proposal complies with the acceptable solution. The carports proposed are at least 5.5 metres from the front setback.</i></p>
<p>A3 A dwelling, excluding outbuildings with a building height of not more than 2.4m and protrusions (such as eaves, steps, porches, and awnings) that extend not more than 0.6m horizontally beyond the building envelope, must:</p> <p>(a) Be contained within a building envelope (refer to Diagrams 10.4.2A, 10.4.2B, 10.4.2C and 10.4.2D) determined by:</p> <p>(i) A distance equal to the frontage setback or, for an internal lot, a distance of 4.5m from the rear boundary of a lot with an adjoining frontage; and</p> <p>(ii) Projecting a line</p>	<p>P3 The siting and scale of a dwelling must:</p> <p>(a) Not cause unreasonable loss of amenity by:</p> <p>(i) Reduction in sunlight to a habitable room (other than a bedroom) of a dwelling on an adjoining lot; or</p> <p>(ii) Overshadowing the private open space of a dwelling on an adjoining lot; or</p> <p>(iii) Overshadowing of an adjoining vacant lot; or</p> <p>(iv) Visual impacts caused by the apparent scale, bulk or proportions of the dwelling</p>	<p>P3 <i>The proposal relies upon assessment against the performance criteria for a) for Units 7 and 8. The proposal for Units 7 and 8 encroaches within the prescribed building envelope. The encroachments are predominantly related to the roof over Unit 8 alfresco area. Please refer to elevations provided by Architectural SOS. Units 7 and 8 are located 2.0m from the eastern boundary and 2.0m from the northern boundary. The eastern setback has been increased from a previously submitted</i></p>

at an angle of 45 degrees from the horizontal at a height of 3m above natural ground level at the side boundaries and a distance of 4m from the rear boundary to a building height of not more than 8.5m above natural ground level; and

- (b) Only have a setback within 1.5m of a side boundary if the dwelling:
 - (i) Does not extend beyond an existing building built on or within 0.2m of the boundary of the adjoining lot; or
 - (ii) Does not exceed a total length of 9m or one-third the length of the side boundary (whichever is the lesser).

when viewed from an adjoining lot; and

- (b) Provide separation between dwellings on adjoining lots that is compatible with that prevailing in the surrounding area.

development application from 1.0m to 2.0m. The northern setback has been increased from a previously submitted development application from 1.5m to 2.0m.

Units 9 and 10 are now located 2.0m from the eastern boundary and 6.0m from the northern boundary. The eastern setback has been increased from a previously submitted development application from 1.0m to 2.0m. The northern setback has been increased from 4.3m to 6.0m. Units 9 and 10 are 1.5m lower in terms of height above natural ground level than a previously submitted application and are located within the prescribed building envelope.

The proposed multiple dwellings (7 & 8) have been located towards the side and rear boundaries to optimise the available space and utilise the site for vehicle manoeuvring, private open space and reduce overshadowing on the existing units 1-6. Due to the slope of the land, downhill from the adjacent properties on Merivale Street, the existing dwellings on Merivale Street are upslope from the proposal, reducing overshadowing and overlooking. The

dwelling on Merivale Street are also located towards their property frontages giving further separation physically between the proposed buildings and existing dwellings. The Peel Street adjacent properties on the northern side of the development will receive no overshadowing due to orientation. Overlooking is further considered later in this submission. The project architect has designed the multiple dwellings to work with the existing contours of the site and “cut” the buildings into the slope where possible to reduce the visual impact and amenity impacts of the building height. The staggered gable roof contextualises with the existing units on the site and the narrow mass assist to further reduce bulk and scale, together with articulation created by material selection and form. Physical separation between the proposed dwelling buildings and the existing units on the site is compatible with that prevailing in the existing site as well as the surrounding area.

10.4.3 Site coverage and private open space for all dwellings

Objective

To provide:

- (a) For outdoor recreation and the operational needs of the residents; and**
- (b) Opportunities for the planting of gardens and landscaping; and**
- (c) Private open space that is integrated with the living areas of the dwelling; and**
- (d) Private open space that has access to sunlight.**

Acceptable Solution	Performance Criteria	Proposal Response
<p>A1 Dwellings must have:</p> <ul style="list-style-type: none"> (a) A site coverage of not more than 50% (excluding eaves up to 0.6m); and (b) For multiple dwellings, a total area of private open space of not less than 60m² associated with each dwelling, unless the dwelling has a finished floor level that is entirely more than 1.8m above the finished ground level (excluding a garage, carport or entry foyer); and (c) A site area of which at least 25% of the site area is free from impervious surfaces. 	<p>P1 Dwellings must have:</p> <ul style="list-style-type: none"> (a) Private open space that is of a size and dimensions that are appropriate for the size of the dwelling and is able to accommodate: <ul style="list-style-type: none"> (i) Outdoor recreational space consistent with the projected requirements of the occupants and, for multiple dwellings, take into account any communal open space provided for this purpose within the development; and (ii) Operational needs, such as clothes drying and storage; and (b) Reasonable space for the planting of gardens and landscaping. 	<p>A1 a) - <i>The proposal complies for the entire lot. The site coverage for is approximately 22.14%, which complies also for the acceptable solution.</i></p> <p>A1 b) - <i>The proposal complies for each dwelling. Each dwelling is provided a finished floor level that is entirely more than 1.8m above finished ground floor. Each unit is proposed with an alfresco area, and a communal open space area is proposed adjacent to Units 9 and 10 for usage by all proposed units.</i></p> <p>A1 c) - <i>The proposal complies for the entire lot. At least 25% of the site area will be free from impervious surfaces.</i></p>
<p>A2 A dwelling must have an area of private open space that:</p> <ul style="list-style-type: none"> (a) Is in one location and is at least: <ul style="list-style-type: none"> (i) 24m²; or (ii) 12m², if the dwelling is a multiple dwelling with a finished floor level that is entirely more than 1.8m above the finished ground level (excluding a garage, carport or entry foyer); and (b) Has a minimum 	<p>P2 A dwelling must have private open space that:</p> <ul style="list-style-type: none"> (a) Includes an area that is capable of serving as an extension of the dwelling for outdoor relaxation, dining, entertaining and children's play and that is: <ul style="list-style-type: none"> (i) conveniently located in relation to a living area of the dwelling; and (ii) orientated to take advantage of sunlight. 	<p>A2</p> <p><i>The proposal complies with the acceptable solution for each dwelling in terms of the alfresco area as each proposed dwelling is with a finished floor level that is entirely more than 1.8m above finished ground level.</i></p> <p><i>Each dwelling is provided with at least 12sqm of private open space with direct access from a habitable room and orientated to the north.</i></p>

horizontal dimension of:

- (i) 4m; or
- (ii) 2m, if the dwelling is a multiple dwelling with a finished floor level that is entirely more than 1.8m above the finished ground level (excluding a garage, carport or entry foyer); and
- (c) Is directly accessible from, and adjacent to, a habitable room (other than a bedroom); and
- (d) Is not located to the south, south-east or south-west of the dwelling, unless the area receives at least 3 hours of sunlight to 50% of the area between 9.00am and 3.00pm on the 21st June; and
- (e) Is located between the dwelling and the frontage only if the frontage is orientated between 30 degrees west of north and 30 degrees east of north; and
- (f) Has a gradient not steeper than 1 in 10; and
- (g) Is not used for vehicle access and parking.

10.4.4 Sunlight and overshadowing for all dwellings

Objective: To provide:

- (a) The opportunity for sunlight to enter habitable rooms (other than bedrooms) of**

**dwelling; and
 (b) Separation between dwellings on the same site to provide reasonable opportunity for daylight and sunlight to enter habitable rooms and private open space.**

Acceptable Solution	Performance Criteria	Proposal Response
A1 A dwelling must have at least one habitable room (other than a bedroom) in which there is a window that faces between 30 degrees west of north and 30 degrees east of north (see Diagram 10.4.4A).	P1 A dwelling must be sited and designed so as to allow sunlight to enter at least one habitable room (other than a bedroom).	A1 The proposal complies.
A2 A multiple dwelling that is to the north of a window of a habitable room (other than a bedroom) of another dwelling on the same site, which window faces between 30 degrees west of north and 30 degrees east of north (see diagram 10.4.4A), must be in accordance with (a) and (b), unless excluded by (c): (a) The multiple dwelling is contained within a line projecting (see Diagram 10.4.4B): (i) at a distance of 3m from the window; and (ii) vertically to a height of 3 m above natural ground level and then at an angle of 45 degrees from the horizontal. (b) The multiple dwelling does not cause the habitable room to receive less than 3 hours of sunlight between 9.00am and 3.00pm on 21 st June. (c) That part, of a multiple dwelling, consisting of: (i) an outbuilding with a building height no more than 2.4m; or (ii) protrusions (such as eaves, steps, and awnings) that extend no more than 0.6m horizontally from the multiple dwelling.	P2 A multiple dwelling must be designed and sited to not cause unreasonable loss of amenity by overshadowing a window of a habitable room (other than a bedroom), of another dwelling on the same site, that faces between 30 degrees west of north and 30 degrees east of north (see Diagram 10.4.4A). P2 <i>The proposed Units 7 and 8 will have a minimal impact on the level of sunlight required for existing Units 5 and 6. On the Winter Solstice at 12pm the shadow cast from Units 7 and 8 will not penetrate into any habitable rooms of Units 5 and 6. The private open space for Unit 5 will be partially obstructed but still received more than 3 hours of sunlight over 50% of the private open space on the Winter Solstice.</i>	

A3 A multiple dwelling, that is to the north of the private open space, of another dwelling on the same site, required in accordance with A2 or P2 of subclause 10.4.3, must be in accordance with (a) or (b), unless excluded by (c):

- (a) The multiple dwelling is contained within a line projecting (see Diagram 10.4.4C):
 - (i) at a distance of 3m from the northern edge of the private open space; and
 - (ii) vertically to a height of 3m above natural ground level and then at an angle of 45 degrees from the horizontal.
- (b) The multiple dwelling does not cause 50% of the private open space to receive less than 3 hours of sunlight between 9.00am and 3.00pm on 21st June.
- (c) That part, of a multiple dwelling, consisting of:
 - (i) an outbuilding with a building height no more than 2.4m; or
 - (ii) protrusions (such as eaves, steps, and awnings) that extend no more than 0.6m horizontally from the multiple dwelling.

P3 A multiple dwelling must be designed and sited to not cause unreasonable loss of amenity by overshadowing the private open space, of another dwelling on the same site, required in accordance with A2 or P2 of subclause 10.4.3.

A3
Each dwelling is provided with at least 12sqm of private open space with direct access from a habitable room. The private open space will be overshadowed by the roof of the alfresco area on occasions

10.4.5 Width of openings for garages and carports for all dwellings

Objective		
To reduce the potential for garage or carport openings to dominate the primary frontage.		
Acceptable Solution	Performance Criteria	Proposal Response
A1 A garage or carport within 12m of a primary frontage (whether the garage or carport is free-standing or part of the dwelling) must	P1 A garage or carport must be designed to minimise the width of its openings that are visible from the street, so as to reduce the potential for the openings of a garage or carport	A1 <i>The proposal complies with the acceptable solution. The carports are not located within 12m of</i>

have a total width of openings facing the primary frontage of not more than 6m or half the width of the frontage (whichever is the lesser). to dominate the primary frontage. *a primary frontage.*

10.4.6 Privacy for all dwellings

Objective		
To provide reasonable opportunity for privacy for dwellings.		
Acceptable Solution	Performance Criteria	Proposal Response
<p>A1 A balcony, deck, roof terrace, parking space, or carport (whether freestanding or part of the dwelling), that has a finished surface or floor level more than 1m above natural ground level must have a permanently fixed screen to a height of at least 1.7m above the finished surface or floor level, with a uniform transparency of no more than 25%, along the sides facing a:</p> <ul style="list-style-type: none"> (a) Side boundary, unless the balcony, deck, roof terrace, parking space, or carport has a setback of at least 3m from the side boundary; and (b) Rear boundary, unless the balcony, deck, roof terrace, parking space, or carport has a setback of at least 4m from the rear boundary; and (c) Dwelling on the same site, unless the balcony, deck, roof terrace, parking space, or carport is at least 6m: <ul style="list-style-type: none"> (i) from a window or glazed door, to a habitable room of the other dwelling on the same site; or (ii) from a balcony, deck, roof terrace or the 	<p>P1 A balcony, deck, roof terrace, parking space or carport (whether freestanding or part of the dwelling) that has a finished surface or floor level more than 1m above natural ground level, must be screened, or otherwise designed, to minimise overlooking of:</p> <ul style="list-style-type: none"> (a) A dwelling on an adjoining lot or its private open space; or (b) Another dwelling on the same site or its private open space; or (c) An adjoining vacant residential lot. 	<p><i>P1</i> <i>The proposed units all have an alfresco area with F.F.L more than 1.0m above natural ground level and within 3.0m of a side boundary. Screening along the eastern elevations is proposed although it is proposed that the transparency is 50%. There is no overlooking into any of the Merivale Street adjacent dwellings as they are located 8 metres above the proposal's natural ground level.</i></p> <p><i>No screening is proposed above the 1.0m high balustrades on the northern elevations to allow for a northern aspect in terms of view and to gain as much solar access as possible. Units 7 and 8 have been located 2.0m from the northern side boundary and are a suitable distance from the existing dwelling at 27 Peel Street in terms of physical separation.</i></p>

private open space, of the other dwelling on the same site.

A2 A window or glazed door, to a habitable room, or a dwelling, that has a floor level more than 1m above the natural ground level, must be in accordance with (a), unless it is in accordance with (b):

- (a) The window or glazed door:
 - (i) is to have a setback of at least 3m from a side boundary; and
 - (ii) is to have a setback of at least 4m from a rear boundary; and
 - (iii) If the dwelling is a multiple dwelling, is to be at least 6m from a window or glazed door, to a habitable room, of another dwelling on the same site; and
 - (iv) If the dwelling is a multiple dwelling, is to be at least 6m from the private open space of another dwelling on the same site.
- (b) The window or glazed door:
 - (i) is to be offset, in the horizontal plane, at least 1.5m from the edge of a window or glazed door, to a habitable room of another dwelling; or
 - (ii) is to have a sill height of at least 1.7m above the floor level or has fixed obscure

P2 A window or glazed door, to a habitable room of dwelling, that has a floor level more than 1m above the natural ground level, must be screened, or otherwise located or designed, to minimise direct views to:

- (a) Window or glazed door, to a habitable room of another dwelling; and
- (b) The private open space of another dwelling; and
- (c) An adjoining vacant residential lot.

P2 Units 8 and 10 will have windows of habitable rooms that have a F.F.L more than 1.0m above natural ground level and within 3.0m of a side boundary. The bathroom and kitchen windows will be obscured glass. The study windows will not be obscure glazing, bearing in mind the existing level of vegetation along this boundary of adjacent properties, the drop in slope and the physical separation between habitable room windows. As the windows of the study's do not look directly into any habitable rooms, or private open space as well as having a lower floor level to the adjacent Merivale Street properties, the performance criteria is met.

glazing extending to a height of at least 1.7m above the floor level; or
 iii) Is to have a permanently fixed external screen for the full length of the window or glazed door, to a height of at least 1.7m above floor level, with a uniform transparency of not more than 25%.

A3 A shared driveway or parking space (excluding a parking space allocated to that dwelling) must be separated from a window, or glazed door, to a habitable room of a multiple dwelling by a horizontal distance of at least:

- (a) 2.5m; or
- (b) 1m if:
 - (i) it is separated by a screen of at least 1.7m in height; or
 - (ii) the window, or glazed door, to a habitable room has a sill height of at least 1.7m above the shared driveway or parking space, or has fixed obscure glazing extending to a height of at least 1.7m above the floor level.

P3 A shared driveway or parking space (excluding a parking space allocated to that dwelling), must be screened, or otherwise located or designed, to minimise detrimental impacts of vehicle noise or vehicle light intrusion to a habitable room of a multiple dwelling.

A3
The proposal complies due to the F.F.L of the units habitable rooms.

10.4.7 Frontage fences for all dwellings

Objective:

To control the height and transparency of frontage fences to:

- (a) Provide adequate privacy and security for residents; and
- (b) Allow the potential for mutual passive surveillance between the road and the dwelling; and
- (c) Provide reasonably consistent height and transparency.

Acceptable Solution	Performance Criteria	Proposal Response
A1 A fence (including a free-standing wall) within 4.5m of a frontage must have a height above natural ground level of	P1 A fence (including a free-standing wall) within 4.5m of a frontage must: (a) Provide for the security and privacy of residents, while	A1 <i>Not applicable. No fence is proposed within 4.5 metres of a frontage.</i>

- not more than:
- (a) 1.2m if the fence is solid; or
 - (b) 1.8m, if any part of the fence that is within 4.5m of a primary frontage has openings above a height of 1.2m which provide a uniform transparency of not less than 30% (excluding any posts or uprights).
- allowing for mutual passive surveillance between the road and the dwelling; and
- (b) Be compatible with the height and transparency of fences in the street, taking into account the:
 - (i) topography of the site; and
 - (ii) traffic volumes on the adjoining road.

10.4.8 Waste storage for multiple dwellings

Objective		
To provide for the storage of waste and recycling bins for multiple dwellings.		
Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1</p> <p>A multiple dwelling must have a storage area, for waste and recycling bins, that is an area of at least 1.5m² per dwelling and is within one of the following locations:</p> <ul style="list-style-type: none"> (a) In an area for the exclusive use of each dwelling, excluding the area in front of the dwelling; or (b) In a communal storage area with an impervious surface that: <ul style="list-style-type: none"> (i) has a setback of at least 4.5m from a frontage; and (ii) is at least 5.5m from any dwelling; and (iii) Is screened from the frontage and any dwelling by a wall to a height Is screened from the frontage of at least 1.2m above the finished surface 	<p>P1</p> <p>A multiple dwelling development must provide storage, for waste and recycling bins, that is:</p> <ul style="list-style-type: none"> (a) Capable of storing the number of bins required for the site; and (b) Screened from the frontage and dwellings; and (c) Is the storage area is a communal storage area, separated from dwellings on the site to minimise impacts caused by odours and noise. 	<p>A1</p> <p><i>The proposal complies with the acceptable solution. Each multiple dwelling is provided with a storage area of at least 1.5m² per dwelling and is within an area for the exclusive use of each dwelling.</i></p>

level of the storage area.

10.4.9 Site Facilities for multiple dwellings

Objective
To provide adequate storage facilities for each multiple dwelling.

Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1 Each multiple dwelling must have access to 6 cubic metres of secure storage space not located between the primary frontage and the façade of a dwelling.</p>	<p>P1 Each multiple dwelling must provide storage suitable to the reasonable needs of residents, having regard to:</p> <ul style="list-style-type: none"> (a) The location, type, and size of storage provided; (b) Proximity to the dwelling and whether the storage is convenient and safe to access; (c) Any impacts on the amenity of adjacent sensitive uses; and (d) The existing streetscape. 	<p>A1 <i>The proposal complies with the acceptable solution. The multiple dwelling is provided with a “storage” providing at least 6 cubic metres of secure storage space, on the ground floor level.</i></p>
<p>A2 Mailboxes must be provided at the frontage.</p>	<p>P2 Mailboxes must be provided for each dwelling, having regard to:</p> <ul style="list-style-type: none"> (a) The convenience and safety of the location; and (b) The siting and access needs for mail delivery. 	<p>A1 <i>The proposal complies with the acceptable solution. Mailboxes are provided at the frontage to the site.</i></p>

10.4.10 Common property for multiple dwellings

Objective
To ensure that common areas are easily identified.

Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1 Site drawings must clearly delineate private and common areas, including:</p> <ul style="list-style-type: none"> (a) Driveways; (b) Parking spaces, including visitor parking spaces; (c) Landscaping and gardens; (d) Mailboxes; and (e) Storage for waste and 	<p>P1 No performance criteria.</p>	<p>A1 <i>The proposal complies with the acceptable solution. All areas are private areas dedicated to each multiple dwelling.</i></p>

recycling bins.

10.4.11 Outbuildings, swimming pools and fences

Objective
To ensure that:

- a) Outbuildings, swimming pools and fences:**
 - (i) do not detract from the character of the surrounding area; and**
 - (ii) are appropriate to the site and respect the amenity of neighbouring lots;**
- b) Dwellings remain the dominant built form.**

Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1.1 The combined gross floor area of outbuildings must be no greater than 45m²; and</p> <p>A1.2 Outbuildings (other than for single or multiple dwellings) must meet the setback and building envelope acceptable solutions of Clause 10.4.2, as if the development were for a dwelling.</p>	<p>P1 Outbuildings must not detract from the character of the surrounding area or the amenity of adjoining lots, having regard to:</p> <ul style="list-style-type: none"> (a) The visual impact on the streetscape; (b) Any overshadowing of adjoining lots; (c) The size and location of outbuildings on adjoining lots; (d) Existing buildings on the site; and (e) The topography of the site. 	<p>A1 <i>The proposal complies with the acceptable solution. The carports are not considered to be an outbuilding but rather an extension to the dwelling due to the proximity of the structure.</i></p> <p><i>A1.2 is not applicable.</i></p>
<p>A2 A swimming pool must be located:</p> <ul style="list-style-type: none"> a) No closer to the primary frontage than the main building; or b) In the rear yard. 	<p>P2 A swimming pool must be designed and located having regard to:</p> <ul style="list-style-type: none"> a) The topography of the site; b) The streetscape; c) Any overlooking or overshadowing of adjoining sensitive uses; d) Any existing or proposed screening; and e) The character of the surrounding area. 	<p>A2 <i>Not applicable.</i></p>

10.4.12 Earthworks and Retaining Walls

Objective
To ensure that earthworks and retaining walls are appropriate to the site and respect the amenity of adjoining lots.

Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1 Earthworks and retaining walls requiring cut or fill more than</p>	<p>P1 Earthworks and retaining walls must be designed and located so as</p>	<p>P1 <i>The proposed core filled 190mm blockwork</i></p>

600mm below or above existing ground level must:

- (a) Be located no less than 900mm from each lot boundary;
- (b) Be no higher than 1m (including the height of any batters) above existing ground level;
- (c) Not require cut or fill more than 1m below or above existing ground level;
- (d) Not concentrate the flow of surface water onto an adjoining lot; and
- (e) Be located no less than 1m from any registered easement, sewer main or water main or stormwater drain.

not to have an unreasonable impact on the amenity of adjoining lots, having regard to:

- (a) The topography of the site;
- (b) The appearance, scale and extent of the works;
- (c) Overlooking and overshadowing of adjoining lots;
- (d) The type of construction of the works;
- (e) The need for the works;
- (f) Any impact on adjoining structures;
- (g) The management of groundwater and stormwater; and
- (h) The potential for loss of topsoil or soil erosion.

retaining walls located on the site plan are fitting with the existing topography of the site and to replace an existing embankment that is covered in low shrub vegetation. By installing the two retaining walls, the ground is retained and the landslide risk is reduced. The proposed retaining walls will be constructed as per the recommendations contained in the Landslide Risk Assessment (Tasman geotechnics, 4 July 2016) and designed by suitably qualified persons.

10.4.13 Location of Car Parking

Objective		
To		
<ul style="list-style-type: none"> (a) provide convenient car parking for residents and visitors; (b) protect residents from vehicular noise within sites; and (c) minimise visual impact on the streetscape. 		
Acceptable Solutions	Performance Criteria	Proposal Response
A1 Shared driveways or car parks of residential buildings (other than for single dwellings) must be located at least 1.5m from the windows of habitable rooms.	P1 Shared driveways or car parking spaces (other than for single dwellings) must be designed to protect the amenity of the adjoining habitable rooms having regard to: <ul style="list-style-type: none"> (a) the width of the driveway; (b) the location of the existing dwellings and habitable rooms; (c) the location of car parking spaces; (d) the number of car spaces served by the driveway; and (e) any noise mitigation measures including screening or landscaping. 	A1 <i>The proposal complies.</i>
A2.1	P2	A2.1 and A2.1

<p>Car parking must not be located in the primary front setback, unless it is a tandem car parking space in a driveway located within the setback from the frontage.</p> <p>A2.2 Turning areas for vehicles must not be located within the primary front setback.</p>	<p>The location of car parking and turning areas must be safe, convenient and minimise the visual impact on the streetscape having regard to:</p> <ul style="list-style-type: none"> (a) the visual impact of the car parking location viewed from the road; (b) access for users of the site; (c) pedestrian and vehicular traffic safety; (d) the nature and characteristics of the street; (e) the need for the location; (f) any landscaping of the car parking or turning area location; and (g) construction methods and pavement types. 	<p><i>The proposal complies. Car parking not provided within the primary front setback. The proposal does not provide allowance for turning areas for vehicles within the primary front setback.</i></p>
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10.4.14 – Not applicable as proposal is for dwellings.

10.4.16 – 10.4.24 – Not applicable, proposal is not a subdivision.

4.2 Other Planning Considerations

E1.0 Bushfire Prone Areas Code – Not applicable, the proposal is for Residential use and development.

E2.0 Potentially Contaminated Land Code – Not applicable, the subject site is not potentially contaminated land.

E3.0 Landslip Code – A report prepared by Tasman geotechnics accompanies the submission.

E4.0 Road and Railway Assets Code – Applicable.

E4.6.1 Development Adjacent to Roads and Railways

Objective

To ensure that development adjacent to category 1 or category 2 roads or the rail network:

- (a) Ensures the safe and efficient operation of roads and the rail network;
- (b) Allows for future road and rail widening, realignment and upgrading; and
- (c) Is located to minimise adverse effects of noise, vibration, light and air emissions from roads and the rail network.

Acceptable Solution	Performance Criteria	Proposal Response
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A1.1	P1	A1.1/A1.2
<p>Except as provided in A1.2, the following development must be located at least 50m from the rail network, or a category 1 road or category 2 road, in an area subject to a speed limit of more than 60km/h:</p> <ul style="list-style-type: none"> (a) New buildings; (b) Other road or earth works; and (c) Building envelopes on new lots. 	<p>The location of development, from the rail network, or a category 1 road or category 2 road in an area subject to a speed limit of more than 60km/h, must be safe and not unreasonably impact on the efficiency of the road or amenity of sensitive uses, having regard to:</p> <ul style="list-style-type: none"> (a) The proposed setback; (b) The existing setback of buildings on the site; (c) The frequency of use of the rail network; 	<p><i>Not applicable as the proposed use is not on or within 50 metres of a Category 1 or 2 road.</i></p>
<p>A1.2</p> <p>Buildings must be:</p> <ul style="list-style-type: none"> (a) Located within a row of existing buildings and setback no closer than the immediately adjacent building; or (b) An extension which extends no closer than: <ul style="list-style-type: none"> (i) the existing building; or (ii) an immediately adjacent building. 	<ul style="list-style-type: none"> (d) The speed limit and traffic volume of the road; (e) Any noise, vibration, light and air emissions from the rail network or road; (f) The nature of the road; (g) The nature of the development; (h) The need for the development; (i) Any traffic impact assessment; (j) Any recommendations from a suitably qualified person for mitigation of noise, if for a habitable building for a sensitive use; and (k) Any written advice received from the rail or road authority. 	

E4.6.2 Road Accesses and Junctions

Objective

To ensure that the safety and efficiency of roads is not reduced by the creation of new accesses and junctions.

Acceptable Solution

Performance Criteria

Proposal Response

<p>A1</p> <p>No new access or junction to roads in an area subject to a speed limit of more than 60km/h.</p>	<p>P1</p> <p>For roads in an area subject to a speed limit of more than 60km/h, accesses and junctions must be safe and not unreasonably impact on the efficiency of the road, having regard to:</p> <ul style="list-style-type: none"> (a) The nature and frequency of the traffic generated by the use; (b) The nature of the road; (c) The speed limit and traffic flow of the road; (d) Any alternative access; (e) The need for the access or junction; (f) Any traffic impact assessment; and (g) Any written advice received from the road authority. 	<p>A1</p> <p><i>Not applicable.</i></p>
<p>A2</p> <p>No more than one access providing both entry and exit, or two accesses providing separate entry and exit, to roads in an area subject to a speed limit of 60km/h or less.</p>	<p>P2</p> <p>For roads in an area subject to a speed limit of 60km/h or less, accesses and junctions must be safe and not unreasonable impact on the efficiency of the road, having regard to:</p> <ul style="list-style-type: none"> (a) The nature and frequency of the traffic generated by the use; (b) The nature of the road; (c) The speed limit and traffic flow of the road; (d) Any alternative access; (e) The need for the access or junction; (f) Any traffic impact assessment; and (g) Any written advice received from the road authority. 	<p>A2 <i>Accesses are existing.</i></p>

E4.6.3 New Level Crossings – Not applicable.

E4.6.4 Sight Distance at Accesses, Junctions and Level Crossings

Objective

To ensure that accesses, junctions and level crossings provide sufficient sight distance between vehicles and between vehicles and trains to enable safe movement of traffic.

Acceptable Solution	Performance Criteria	Proposal Response
A1	P1	A1
<p>Sight distances at:</p> <p>(a) An access or junction must comply with the Safe Intersection Sight Distance shown in Table E4.6.4; and</p> <p>(b) Rail level crossings must comply with <i>AS1742.7 Manual of uniform traffic control devices – Railway crossings</i>, Standards Association of Australia.</p>	<p>The design, layout and location of an access, junction or rail level crossing must provide adequate sight distances to ensure the safe movement of vehicles, having regard to:</p> <p>(a) The nature and frequency of the traffic generated by the use;</p> <p>(b) The frequency of use to the road or rail network;</p> <p>(c) Any alternative access;</p> <p>(d) The need for the access, junction or level crossing;</p> <p>(e) Any traffic impact assessment;</p> <p>(f) Any measures to improve or maintain sight distance; and</p> <p>(g) Any written advice received from the road or rail authority.</p>	<p><i>Accesses are existing.</i></p>

E5.0 Flood Prone Areas Code – Not applicable.

E6.0 Car Parking and Sustainable Transport Code

Table E6.1: Parking Space Requirements

Use	Parking Requirement	
	Vehicle	Required
Residential (1 bedroom)	1 space per dwelling	1 space per dwelling
Residential (2 or more bedroom)	2 spaces per dwelling + 1 visitor space per 4 dwellings (rounded up to the nearest whole)	2 spaces per dwelling

dwelling)	number)	
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Proposal Response

The proposal provides for two spaces per dwelling for units 7 and 9 and one space per dwelling for units 8 and 10 and one visitor parking space.

E6.5 Use Standards

E6.6.1 Car Parking Numbers

Objective
To ensure that an appropriate level of car parking is provided to service use.

Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1</p> <p>The number of car parking spaces must:</p> <ul style="list-style-type: none"> a) Not be less than 90% of the requirements of Table E6.1 (except for dwellings in the General Residential Zone); or b) Not be less than 100% of the requirements of Table E6.1 for dwellings in the General Residential Zone; or c) Not exceed the requirements of Table E6.1 by more than 2 spaces or 5% whichever is the greater, except for dwellings in the General Residential Zone; or d) Be in accordance with an acceptable solution contained within a parking precinct plan. 	<p>P1.1</p> <p>The number of car parking spaces for other than residential uses, must be provided to meet the reasonable needs of the use, having regard to:</p> <ul style="list-style-type: none"> (a) The availability of off-road public car parking spaces within reasonable walking distance; (b) The ability of multiple users to share spaces because of: <ul style="list-style-type: none"> (i) variations in car parking demand over time; or (ii) efficiencies gained by consolidation of car parking spaces; (c) The availability and frequency of public transport within reasonable walking distance of the site; (d) Any site constraints such as existing buildings, slope, drainage, vegetation and landscaping; 	<p>A1</p> <p><i>The proposal complies with the acceptable solution. The proposal provides a total 7 spaces.</i></p>

- (e) The availability, accessibility and safety of on-road parking, having regard to the nature of the roads, traffic management and other uses in the vicinity;
- (f) An assessment of the actual car parking demand determined in light of the nature of the use and development;
- (g) The effect on streetscape; and
- (h) Any recommendations of any traffic impact assessment prepared for the proposal; or

P1.2

The number of car parking spaces for residential uses must be provided to meet the reasonable needs of the use, having regard to:

- (a) The intensity of the use and car parking required;
- (b) The size of the dwelling and the number of bedrooms; and
- (c) The pattern of parking in the locality; or

P1.2

The number of car parking spaces complies with any relevant parking precinct plan.

A2

The number of accessible car parking spaces for use by persons with a disability must be:

- (a) For uses that require 5 or

P2

No performance criteria.

A2

Not applicable, the proposal is a residential development not requiring accessible car parking spaces.

less parking spaces – 1 space; or
 (b) For uses that require 6 or more parking spaces – in accordance with Part D3 of Volume 1 of the National Construction Code 2014.

E6.5.2 – E6.5.3 – Not applicable. Development is for Residential use class.

E6.5.4– Not applicable. The proposal is for dwellings in the General Residential Zone.

E6.5.5 – Not applicable. Development is for Residential use class.

6.6 Development Standards

E6.6.1 Construction of Parking Areas

Objective		
To ensure that parking areas are constructed to an appropriate standard.		
Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1</p> <p>All parking, access ways, manoeuvring and circulation spaces must:</p> <ul style="list-style-type: none"> (a) Have a gradient of 10% or less; (b) Be formed and paved; (c) Be drained to the public stormwater system, or contain stormwater on the site; (d) Except for a single dwelling, and all uses in the Rural Resource, Environmental Management and Open Space zones, be provided with an impervious all weather seal; and (e) Except for a single dwelling, be line marked or provided with other clear physical means to delineate parking spaces. 	<p>P1</p> <p>All parking, access ways, manoeuvring and circulation spaces must be readily identifiable and constructed to ensure that they are useable in all weather conditions, having regard to:</p> <ul style="list-style-type: none"> (a) The nature of the site; (b) The topography of the land; (c) The drainage system available; (d) The likelihood of transporting sediment or debris from the site onto a road or public place; (e) The likelihood of generating dust; and (f) The nature of the proposed surfacing and line marking. 	<p>A1</p> <p><i>With appropriate conditions contained in an approval, the proposal is considered to comply with the Acceptable Solution.</i></p>

E6.6.2 Design and Layout of Parking Areas

Objective

To ensure that parking areas are designed and laid out to provide convenient, safe and efficient parking.

Acceptable Solutions	Performance Criteria	Proposal Response
<p>A1.1</p> <p>Car parking, access ways, manoeuvring and circulation spaces must:</p> <ul style="list-style-type: none"> (a) Provide for vehicles to enter and exit the site in a forward direction where providing for more than 4 parking spaces; (b) Have a width of vehicular access no less than the requirements in Table E6.2, and no more than 10% greater than the requirements in Table E6.2; (c) Have parking spaces dimensions in accordance with the requirements in Table E6.3; (d) Have a combined access and manoeuvring width adjacent to parking spaces not less than the requirements in Table E6.3 where there are 3 or more car parking spaces; and (e) Have a vertical clearance of not less than 2.1 metres above the parking surface level. 	<p>P1</p> <p>Car parking, access ways, manoeuvring and circulation spaces must be convenient, safe and efficient to use, having regard to:</p> <ul style="list-style-type: none"> (a) The characteristics of the site; (b) The proposed slope, dimensions and layout; (c) Vehicle and pedestrian traffic safety; (d) The nature and use of the development; (e) The expected number and type of vehicles; (f) The nature of traffic in the surrounding area; and (g) The provisions of Australian Standards AS 2890.1 – <i>Parking Facilities, Part 1: Off Road Car Parking</i> and AS2890.2 <i>Parking Facilities, Part 2: Parking Facilities – Off-Street commercial vehicle facilities</i>. 	<p>A1</p> <p><i>The proposal meets the acceptable solutions. Vehicles are able to enter and exit the site in a forward direction.</i></p>
<p>A1.2</p> <p>All accessible spaces for use by persons with a disability must be located closest to the main entry point to the building.</p>		
<p>A1.3</p> <p>Accessible spaces for people with disability must be designated and</p>		

signed as accessible spaces where there are 6 spaces or more.

A1.4

Accessible car parking spaces for use by persons with disabilities must be designed and constructed in accordance with *AS/NZ2890.6-2009 Parking facilities – Off-street parking for people with disabilities*.

E6.6.3 Pedestrian Access

Objective

To ensure pedestrian access is provided in a safe and convenient manner.

Acceptable Solutions	Performance Criteria	Proposal Response
A1	P1	A1/A1.2
<p>Uses that require 10 or more parking spaces must:</p> <ul style="list-style-type: none"> (a) Have a 1m wide footpath that is separated from the access ways or parking aisles, except where crossing access ways or parking aisles, by: <ul style="list-style-type: none"> (i) a horizontal distance of 2.5m between the edge of the footpath and the access way or parking aisle; or (ii) protective devices such as bollards, guard rails or planters between the footpath and the access ways or parking aisle; and (b) Be signed and line marked at points where pedestrians cross access ways or parking aisles; and 	<p>Safe pedestrian access must be provided within car parks, having regard to:</p> <ul style="list-style-type: none"> (a) The characteristics of the site; (b) The nature of the use; (c) The number of parking spaces; (d) The frequency of vehicle movements; (e) The needs of persons with a disability; (f) The location and number of footpath crossings; (g) Vehicle and pedestrian traffic safety; (h) The location of any access ways or parking aisles; and (i) Any protective devices proposed for pedestrian safety. 	<p><i>Not applicable.</i></p>
A1.2		
<p>In parking areas containing accessible car parking spaces for use by persons with disability, a footpath having a minimum width of</p>		

1.5m and a gradient not exceeding 1 in 14 is required from those spaces to the main entry point to the building.

E6.6.4 – 6.6.6 – Not applicable as no loading bays proposed and the use does not require bicycle parking provisions in accordance with E6.2.3.1.

E7.0 Scenic Management Code –applicable.

E7.6.2 Local Scenic Management Areas

Objective

The siting and design of development is to be unobtrusive in the landscape and complement the character of the scenic management areas.

Acceptable Solutions	Performance Criteria	Proposal Response
A1 No acceptable solution.	P1 Development (not including development that involves only the clearance or removal of vegetation, or subdivision) must have regard to: <ul style="list-style-type: none"> (a) The scenic management precinct existing character statement and management objectives in clause E7.6.3; (b) The impact on skylines, ridgelines and prominent locations; (c) The nature and extent of existing development of the site; (d) The retention or establishment of vegetation to provide screening; (e) The need to clear existing vegetation; 	P1 <i>The proposal has had regard to E7.6.3.3, the development blends with other development in the area by its form, scale, materials and colours. The proposal is consistent and in context with the development within the locality. Only 1 tree is to be removed and a new tree in a slightly different location (further to the south by 6m) will be planted as an offset. Selected low shrubbery is to be removed during site clearing.</i>

- (f) The requirements for any hazard management;
- (g) The need for infrastructure services;
- (h) The specific requirements of the development;
- (i) The location of development to facilitate the retention of trees; and
- (j) Design treatment of development, including:
 - (i) the bulk and form of buildings including materials and finishes;
 - (ii) any earthworks for cut or fill;
 - (iii) the physical (built or natural) characteristics of the site or area;
 - (iv) The nature and character of the existing development; and
 - (v) The retention of trees.

A2 No vegetation is to be removed.

P2 Development that involves only the clearance or removal of vegetation must have regard to:

- (a) The scenic management precinct existing character

P2

Only 1 tree is to be removed and a new tree in a slightly different location (further to the south by 6m) will be planted as an offset. Selected low shrubbery is to

statement and *be removed during site management clearing.*
 objectives in clause E7.6.3;

- (b) The physical characteristics of the site;
- (c) The location of existing buildings;
- (d) The type and condition of the existing vegetation;
- (e) Any proposed revegetation; and
- (f) The options for management of the vegetation.

<p>A3</p> <p>Subdivision is in accordance with the specific area plan.</p>	<p>P3</p> <p>Subdivision must have regard to:</p> <ul style="list-style-type: none"> (a) The scenic management precinct existing character statement and management objectives in clause E7.6.3; (b) The size, shape and orientation of the lot; (c) The density of potential development on lots created; (d) The need for the clearance or retention of vegetation; (e) The need to retain existing vegetation; (f) The requirements for any hazard management; (g) The need for 	<p><i>Not applicable.</i></p>
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- infrastructure services;
- (h) The specific requirements of the subdivision;
- (i) The extent of works required for roads or to gain access to sites, including any cut and fill;
- (j) The physical characteristics of the site and locality;
- (k) The existing landscape character;
- (l) The scenic qualities of the site; and
- (m) Any agreement under s.71 of the Act affecting the land.

E8.0 Biodiversity Code – Not applicable.

E9.0 Water Quality Code – Applicable. The development is exempt under E9.4.1 as the use and development is to be connected to reticulated stormwater.

E10.0 Recreation and Open Space Code – Not applicable, the proposal is not for a subdivision.

E11.0 Environmental Impacts and Attenuation Code – Not applicable.

E12.0 Airports Impact Management Code – Not applicable.

E13.0 Local Historic Heritage Code – Not applicable.

E14.0 Coastal Code – Not applicable.

E15.0 Telecommunications Code – Not applicable.

E16.0 Invermay/Inveresk Flood Inundation Area Code – Not applicable.

E17.0 Cataract Gorge Management Area Code – Not applicable.

E18.0 Signs Code – Not applicable.

E19.0 Development Plan Code – Not applicable.

4.3 State Policies

4.3.1 State Coastal Policy 1996

The State Coastal Policy was created under the *State Policies and Projects Act 1993*. This Policy applies to the Coastal Zone, which is defined as the area within State waters and all areas within one kilometre of the coast.

Proposal Response

The subject site is not located within one kilometre from the coast.

4.3.2 State Policy on Water Quality Management 1997

This Policy applies to all surface waters, including coastal waters, and ground waters, other than:

- i. Privately owned waters that are not accessible to the public and are not connected to, or flow directly into, waters that are accessible to the public; or
- ii. Waters in any tank, pipe or cistern.

The purpose of the Policy is to achieve the sustainable management of Tasmania's surface water and groundwater resources by protecting or enhancing their qualities while allowing for sustainable development in accordance with the objectives of Tasmania's Resource Management and Planning System (Schedule 1 of the *State Policies and Projects Act 1993*).

The objectives of this Policy are to:

1. *Focus water quality management on the achievement of water quality objectives which will maintain or enhance water quality and further the objectives of Tasmania's Resource Management and Planning System;*
2. *Ensure that diffuse source and point source pollution does not prejudice the achievement of water quality objectives and that pollutants discharged to waterways are reduced as far as is reasonable and practical by the use of best practice environmental management;*
3. *Ensure that efficient and effective water quality monitoring programs are carried out and that the responsibility for monitoring is shared by those who use and benefit from the resource, including polluters, who should bear an appropriate share of the costs arising from their activities, water resource managers and the community;*
4. *Facilitate and promote integrated catchment management through the achievement of objectives (1) to (3) above; and*
5. *Apply the precautionary principle to Part 4 of this Policy.*

Proposal Response

The proposal involves continual collection and discharge of stormwater via Council's stormwater collection network. The objectives of this Policy will therefore be managed in this urban environment.

The proposal is consistent with the policy.

4.3.3 State Policy on Protection of Agricultural Land 2009

The subject site is within the urban area of South Launceston and therefore is not considered to have any agricultural value.

4.4 Land Use Planning and Approvals Act 1993

The *Land Use Planning and Approvals Act 1993* provides objectives for all development considered under this Act. The proposal has been considered against the objectives of this Act. The proposal has been prepared to be consistent with the provisions of the Launceston Interim Planning Scheme 2015. The proposal is therefore considered to be consistent with the objectives of the Act.

4.5 National Environment Protection Measures

A series of National Environment Protection Measures (NEPMs) have been established by the National Environment Protection Council. These measures are:

- Ambient air quality;
- National pollutant inventory;
- Movement of controlled waste;
- Use packaging materials;
- Assessment of site contamination; and
- Diesel vehicle emissions.

Proposal Response

It is considered that the NEPMs are not relevant to the proposed development.

5. Conclusion

The proposal is for the use and construction of 4 additional dwellings at 51-55 Westbury Road, South Launceston, and is illustrated in plans, provided by Architectural SOS.

The proposal complies with the development standards prescribed by the Scheme, and can be approved under the Launceston Interim Planning Scheme 2015. This application is therefore made due to the use and development pursuant to Section 57 of the *Land Use Planning and Approvals Act 1993*.

The proposal is consistent with the relevant State and local policies, Planning Scheme objectives and considerations and objectives of the *Land Use Planning and Approvals Act 1993*. It is therefore recommended that the proposal be considered for planning approval.

Author	Version	Date
Rebecca Green	1	20 December 2016



TASMAN
geotechnics

**LANDSLIDE RISK ASSESSMENT,
51-55 WESTBURY ROAD, SOUTH LAUNCESTON**

Prepared for: **Andrew McCullagh**

Date: 4 July 2016

Document Reference: TG16086/1 - 01report

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Important information about your report

Figures

- Figure 1 MRT Geological Mapping
- Figure 2 Site Layout and Borehole Locations

Appendices

- Appendix A Engineering Borehole Logs
- Appendix B Landslide Risk Matrix
- Appendix C Guidelines to Hillside Construction

Version	Date	Prepared by	Reviewed by	Distribution
Original	4 July 2016	Emily Bartlett	Dr Wayne Griffioen	Electronic

1 INTRODUCTION

Tasman Geotechnics was commissioned by Andrew McCullagh to carry out a Landslide Risk Assessment for a proposed development at 51-55 Westbury Road, South Launceston. We understand that the land is currently part of 27 Peel Street (title reference 134959/2), but will be subdivided for additional units at 51-55 Westbury Road. In this report, we will refer to "the site" as the land to be subdivided for Units 7 to 10.

The development involves the construction of four units (two duplexes), and associated driveway. A site plan showing the locations of the proposed units was provided by the client. Although no information on proposed floor levels was provided, we have assumed up to 1.5m of excavation will likely be required for each unit.

The assessment is required as part of the Planning Application process as the development is mapped within a "Medium" hazard band on the Landslide Planning Map V2 – Hazard Bands overlay on The LIST.

Our scope of work consisted of:

- Carrying out a site walkover to note geomorphological features associated with landslide activity;
- Drilling of two boreholes (BH1 and HA2) to determine subsurface conditions;
- Performing a Landslide Risk Assessment.

The assessment is consistent with the Landslide Risk Assessment guidelines published by the Australian Geomechanics Society (2007).

2 BACKGROUND INFORMATION

2.1 Regional Setting

The site is on the eastern flank of a valley, at the southern end of the Tamar Valley. Slopes in the valley average about 12°.

2.2 Geology

The Mineral Resources Tasmania (MRT) 1:25,000 Series Digital Geological map, Launceston Sheet, shows the site to be mapped on Tertiary aged sediments described as "*Partly consolidated clay, silt, and clayey labile sand with rare gravel and lignite; some iron oxide-cemented layers and concretions; some leaf fossils*".

An extract of the MRT map is presented on Figure 1.

2.3 Landslide Mapping

In 2013, MRT published landslide maps for the Tamar Valley, as part of the Tasmanian Landslide Map Series. Of particular interest is the Launceston Deep-Seated Landslide Susceptibility map.

The susceptibility map shows the site to be located in a possible "Source" area associated with landslide movement. A recent or active landslide is mapped 80m north of the site, and a landslide of activity unknown is mapped 60m southwest of the site. The headscarps of both mapped landslides are mapped along Westbury Road.

An extract of the MRT Slide Susceptibility map is presented on Figure 1.

2.4 Previous Reports

A search of the MRT online database found one report relevant to the present investigation. The report (W.L. Mathews, 1975) investigates the stability of 77-83 Westbury Road with respect to proposed widening of Westbury Road. The report discusses a known slip 200m downhill of 77-83 Westbury Road, which is interpreted to be the recent or active landslide mapped by MRT. The

report concludes that the landslide is a result of clay quarrying operations in the 1950s, and some movement has persisted since. 77-83 Westbury Road did not show signs of movement at the time of reporting.

3 FIELD INVESTIGATION

The fieldwork was carried out by a Geotechnical Engineer and an Environmental Engineer from Tasman Geotechnics. The fieldwork involved the drilling of two boreholes (BH1 and HA2) to depths of 4.0m and 0.9m respectively. BH1 was drilled using a Rockmaster 4WD mounted auger rig, and HA2 was drilled using a hand auger.

The borehole logs are presented in Appendix A and the borehole locations are shown on Figure 2.

One soil sample was analyzed by Tasman Geotechnics for Atterberg Limits. The results are presented in Section 4.3.

4 RESULTS

4.1 Surface Conditions

The site is surrounded by residential units and houses in all directions. The site was accessed from 27 Peel Street (north of the site). Existing units at 51-55 Westbury Road are located west of the site.

The site is vegetated with grass, some low lying shrubs and a tree. The site slopes about 10° northwest, steeping to about 20° west at the center of the block, and flattening at the south end of the block.

No evidence of recent landslide movement, including tension cracks and hummocky topography, was noted on site. No springs were noted on or near the site. The site appeared well drained.

Nearby houses and units did not show signs of landslide movement.

4.2 Subsurface Conditions

The boreholes encountered similar conditions:

- 0.1m of sandy clay FILL (HA2), overlying
- Clayey/silty SAND (to 0.2m below ground level in BH1 and to 0.5m below ground level in HA2), overlying
- High plasticity, grey/orange/red mottled SANDY CLAY to at least 4m below ground level.

The sandy clay was assessed to be Firm to Hard. No groundwater inflow was noted in the boreholes.

4.3 Laboratory Results

Laboratory testing by Tasman Geotechnics on a soil sample from BH1 at 1.9-2.0m below ground level found the following Atterberg Limits:

- Liquid Limit = 80%
- Plastic Limit = 27%
- Plasticity Index = 53%
- Linear Shrinkage = 17%.

Thus, the soil is a high plasticity (sandy) clay.

5 LANDSLIDE RISK ASSESSMENT

5.1 General

Risk assessment and management principles applied to slopes can be interpreted as answering the following questions;

- What might happen? (HAZARD IDENTIFICATION).
- How likely is it? (LIKELIHOOD).
- What damage or injury might result? (CONSEQUENCE).
- How important is it? (RISK EVALUATION).
- What can be done about it? (RISK TREATMENT).

The risk is a combination of the likelihood and the consequences for the hazard in question. Thus both likelihood and consequences are taken into account when evaluating a risk and deciding whether treatment is required.

The qualitative likelihood, consequence and risk terms used in this report for risk to property are given in Appendix B and are based on the Landslide Risk Management Guidelines, published by Australian Geomechanics Society (AGS, 2007). The risk terms are defined by a matrix that brings together different combinations of likelihood and consequence. Risk matrices help to communicate the results of risk assessment, rank risks, set priorities and develop transparent approaches to decision making.

5.2 Potential Hazards

Based on the site observations, borehole data and available information discussed in the sections above, the following landslide hazards are identified for the site:

Regression of “active” deep-seated landslide mapped 80m north of site. Field observations indicate that the site is not affected by the “active” landslide. The likelihood of the landslide regressing to the site is assessed to be Barely Credible.

Activation and regression of landslide of unknown activity mapped 60m southwest of site. No evidence suggests that the mapped landslide of unknown activity has been recently activated. The proposed development does not have a significant impact on the overall slope, thus the likelihood of the landslide activating is assessed to be Rare.

Shallow to medium scale slide on steep slopes around units. The probability of such a landslide occurring depends on the strength of the deeper foundation material and the geometry of the (cut or fill) slope. In terms of likelihood, a shallow to medium slide could occur if retaining walls and cuts were poorly designed and executed. For engineered retaining walls with less than 2m depth of cut and less than 1m of fill, the likelihood of shallow slides is assessed to be Unlikely. The consequence of failure is Medium as some stabilization works would be required.

The identification of the potential hazards considers both the site and nearby properties, and is necessary to address stability issues that may negatively impact upon the site and influence the risk to property.

Both of the identified landslide hazards involve activation/regression of landslides with the site located above the potentially active areas. Thus, it is important that significant weight is not added to the site as part of the development.

5.3 Risk to Property

The following table summarizes the risk to property of the landslide events in relation to the proposed development as described in Section 2.5, **assuming limitations in Section 6 are incorporated.**

Table 2. Landslide risk profiles

Scenario	Likelihood	Consequence	Risk Profile
Regression of “active” deep-seated landslide	Rare: Landslide would have to regress 80m, regression is likely to be slow	Major: May cause considerable damage to proposed units	Low
Activation of landslide of “unknown activity”	Rare: No evidence of recent activation, development does not have significant impact on site.	Major: May cause considerable damage to proposed units	Low
Shallow to medium scale slide	Unlikely: Engineered retaining wall less than 2m cut, and less than 1m fill	Medium: Some stabilization works may be required	Low

The assessment shows that the proposed development presents a Low level of risk, **provided the limitations listed in Section 6 are incorporated in the design.**

6 DISCUSSION & RECOMMENDATIONS

6.1 Limitations on Development

In order to ensure the proposed development does not change the risk profile above Low for the site, it is recommended that the following limitations be enforced:

- Permanent cut slopes should be designed at 55° (1V:1.4H) or flatter. Cut slopes should be limited to 1m in vertical height. Cuts greater than 1m should be retained by an engineer designed retaining wall. Any proposed cuts greater than 1.5m should be reviewed by a Geotechnical Engineer.
- Retaining walls should be designed to withstand at-rest earth pressures ($K_0 = 1 - \sin \phi$). A friction angle of 23° should be assumed for the clay. Allowance should also be made for sloping backfill and provision of drainage behind the wall.
- Fill earthworks should be limited to a maximum height of 1m.
- Stormwater from roofs and paved areas should be diverted to council stormwater drains.
- Where possible, vegetation should be maintained on the slopes to prevent erosion of surface soils. As a minimum, vegetation should comprise grass. If trees are planted on the slope, then the site should be managed such that when the trees reach maturity and are removed, they are replaced with new (young) trees.
- Maintenance of surface runoff, vegetation, retaining structures and other measures described above are the responsibility of the site owner.
- Good hillside construction practices should be followed. A copy of Some Guidelines for Hillside Construction are presented in Appendix C.

As exact details of the proposed development are not known at this stage, we recommend architectural and engineering drawings be reviewed by Tasman Geotechnics to ensure compliance with above recommendations.

6.2 Site Classification

Due to the “medium” hazard band mapped across the site, the proposed units have been given a site classification of:

Class P (AS2870 – 2011)

Footings should be designed by a structural engineer from first principals. Some recommendations are given in Section 6.3

Notwithstanding the above, the soil classification for the proposed units is as follows:

CLASS H2 (AS 2870 – 2011)

Characteristic Surface Movement = 65mm

If an excavation greater than 0.5 is carried out for the units, the site classification is Class E, with characteristic surface movement greater than 75mm.

6.3 Footings

An allowable bearing pressure of 100 kPa is available for edge beams, strip and pad footings founded on the high plasticity, orange/grey/red mottled sandy clay.

If the site is filled, it is recommended that no structure be founded across the fill without the footings extending through the fill to the natural soils, allowance made in the structural design for differential settlements or engineer designed pier or pile foundations adopted.

Bored piers founded at least 1m in the sandy clay may be proportioned for an allowable end bearing pressure of 200kPa. The base of bored piers should be inspected to ensure they are clean and free of loose soil prior to pouring concrete.

The site classification presented in Section 6.2 assumes that the current natural drainage and infiltration conditions at the site will not be markedly affected by the proposed site development work. Care should therefore be taken to ensure that surface water is not permitted to collect adjacent to the structure and that significant changes to seasonal soil moisture equilibria do not develop as a result of service trench construction or tree root action.

Attention is drawn to Appendix B of AS 2870 and CSIRO Building Technical File BTF18 “Foundation Maintenance and Footing Performance: A Homeowner’s Guide” as a guide to maintenance requirement for the proposed structure.

Variations in soil conditions may occur in areas of the site not specifically covered by the field investigation. The base of all footing or beam excavations should therefore be inspected to ensure that the founding medium meets the requirements discussed above.



TASMAN geotechnics

Important information about your report

These notes are provided to help you understand the limitations of your report.

Project Scope

Your report has been developed on the basis of your unique project specific requirements as understood by Tasman Geotechnics at the time, and applies only to the site investigated. Tasman Geotechnics should be consulted if there are subsequent changes to the proposed project, to assess how the changes impact on the report's recommendations.

Subsurface Conditions

Subsurface conditions are created by natural processes and the activity of man.

A site assessment identifies subsurface conditions at discreet locations. Actual conditions at other locations may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time.

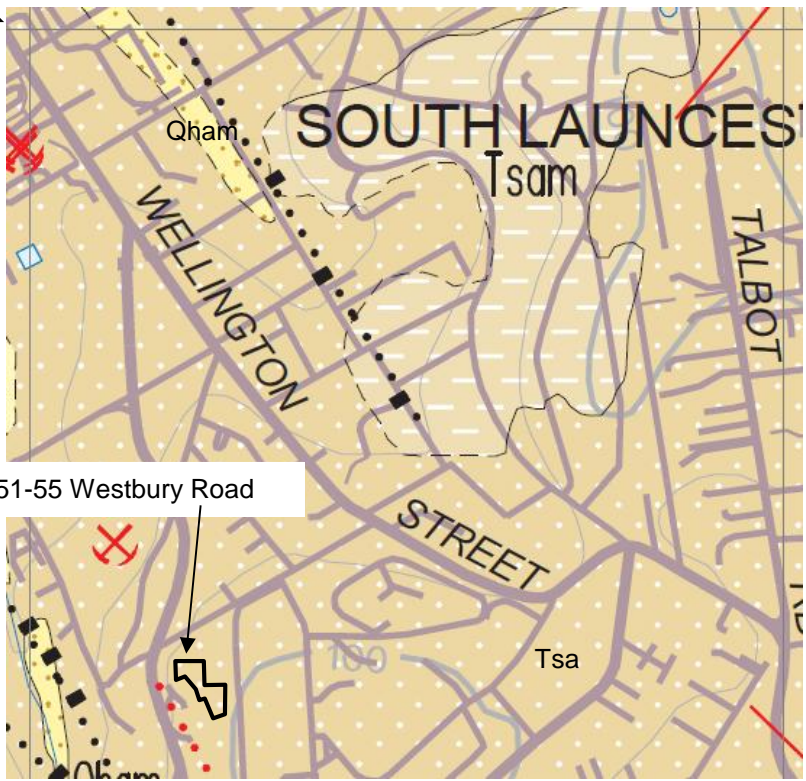
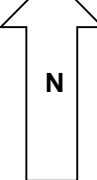
Nothing can be done to change the conditions that exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, the services of Tasman Geotechnics should be retained throughout the project, to identify variable conditions, conduct additional investigation or tests if required and recommend solutions to problems encountered on site.

Advice and Recommendations

Your report contains advice or recommendations which are based on observations, measurements, calculations and professional interpretation, all of which have a level of uncertainty attached.

The recommendations are based on the assumption that subsurface conditions encountered at the discreet locations are indicative of an area. This can not be substantiated until implementation of the project has commenced. Tasman Geotechnics is familiar with the background information and should be consulted to assess whether or not the report's recommendations are valid, or whether changes should be considered.

The report as a whole presents the findings of the site assessment, and the report should not be copied in part or altered in any way.

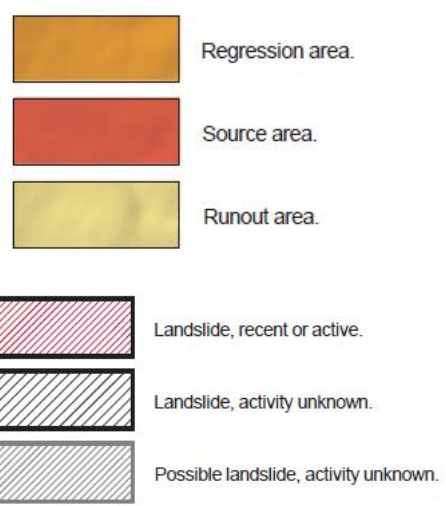
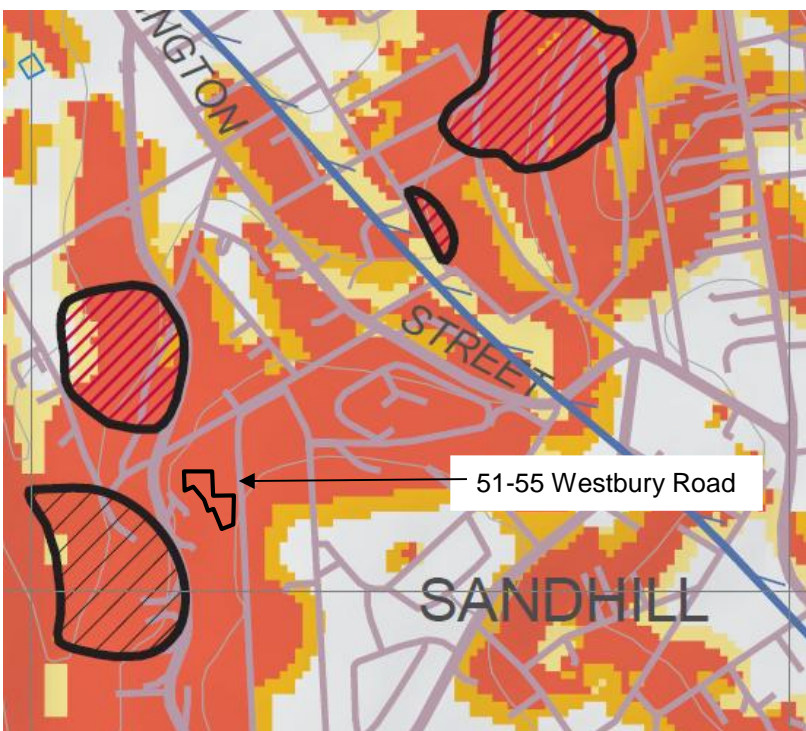


Qham: Quaternary "Alluvial, and swamp deposits of gravel, sand, silt and clay, commonly with organic-rich top layer"

Tsa: Tertiary aged "Partly consolidated clay, silt, and clayey labile sand with rare gravel and lignite; some iron oxide-cemented layers and concretions; some leaf fossils"

Tsam: Tertiary aged "Brown-grey plastic clay, minor silt, clayey sand and ironstone at South Launceston"

51-55 Westbury Road



drawn	EB
approved	WG
date	21/06/2016
scale	~1:10,000
original size	A4



client:	Andrew McCullagh	
project:	Landslide Risk Assessment, 51-55 Westbury Road, South Launceston	
title:	MRT Geological Mapping	
project no:	TG16086/1 – 01report	figure no: FIGURE 1



drawn	FH
approved	WG
date	15/06/16
scale	NTS
original size	A4



client:	Andrew McCullagh	
project:	Landslide Risk Assessment 51-55 Westbury Road, South Launceston	
title:	Site Layout and Borehole Locations	
project no:	TG16086/1 – 01report	figure no: FIGURE 1



Appendix A

Engineering Borehole Logs



Soils are described in accordance with the Unified Soil Classification System (USCS), as shown in the following table.

FIELD IDENTIFICATION

COARSE GRAINED SOILS	more than 50% of material less than 63mm is larger than 0.075mm	GRAVELS	GW	Well graded gravels and gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines
		GRAVELLY SOILS	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
		SANDS	SW	Well graded sands and gravelly sands, little or no fines
			SP	Poorly graded sands and gravelly sands, little or no fines
		SANDY SOILS	SM	Silty sand, sand-silt mixtures, non-plastic fines
			SC	Clayey sands, sand-clay mixtures, plastic fines

			DRY STRENGTH	DILATANCY	TOUGHNESS		
FINE GRAINED SOILS	more than 50% of material less than 63mm is less than 0.075mm	SILT & CLAY, liquid limit less than 50%	ML	Inorganic silts, very fine sands or clayey fine sands	None to low	Quick to slow	None
		SILT & CLAY, liquid limit less than 50%	CL	Inorganic clays or low to medium plasticity, gravelly clays, sandy clays and silty clays	Medium to high	None to very slow	Medium
			OL	Organic silts and organic silty clays of low plasticity	Low to medium	Slow	Low
		SILT & CLAY, liquid limit greater than 50%	MH	Inorganic silts, micaceous or diatomaceous fine sands or silts	Low to medium	Slow to none	Low to medium
			CH	Inorganic clays of high plasticity, fat clays	High	None	High
			OH	Organic clays of medium to high plasticity	Medium to high	None to very slow	Low to medium
PEAT	Pt	Peat muck and other highly organic soils					

Particle size descriptive terms

Name	Subdivision	Size
Boulders		>200mm
Cobbles		63mm to 200mm
Gravel	coarse	20mm to 63mm
	medium	6mm to 20mm
	fine	2.36mm to 6mm
Sand	coarse	600µm to 2.36mm
	medium	200µm to 600µm
	fine	75µm to 200µm

Consistency of cohesive soils

Term	Undrained strength	Field guide
Very soft VS	<12kPa	A finger can be pushed well into soil with little effort
Soft S	12 - 25kPa	Easily penetrated several cm by fist
Firm F	25 - 50kPa	Soil can be indented about 5mm by thumb
Stiff St	50-100kPa	Surface can be indented but not penetrated by thumb
Very stiff VSt	100-200kPa	Surface can be marked but not indented by thumb
Hard H	>200kPa	Indented with difficulty by thumb nail
Friable Fb	-	Crumbles or powders when scraped by thumb nail

Moisture Condition

Dry (D)	Looks and feels dry. Cohesive soils are hard, friable or powdery. Granular soils run freely through fingers.
Moist (M)	Soil feels cool, darkened in colour. Cohesive soils are usually weakened by moisture presence, granular soils tend to cohere.
Wet (W)	As for moist soils, but free water forms on hands when sample is handled

Density of granular soils

Term	Density index
Very loose	<35%
Loose	15 to 35%
medium dense	35 to 65%
Dense	65 to 85%
Very dense	>85%

Cohesive soils can also be described relative to their plastic limit, ie: <Wp, =Wp, >Wp

The plastic limit is defined as the minimum water content at which the soil can be rolled into a thread 3mm thick.

Minor Components

Term	Proportions	Observed properties
Trace of	Coarse grained: <5% Fine grained: <15%	Presence just detectable by feel or eye. Soil properties little or no different to general properties of primary component.
With some	Coarse grained: 5-12% Fine grained: 15-30%	Presence easily detected by feel or eye. Soil properties little different to general properties of primary component.

ENGINEERING BOREHOLE LOG



Borehole no. BH1

Sheet no. 1 of 1
 Job no. TG16086/1

Client : Andrew McCullagh
 Project : LRA
 Location : 51-55 Westburry Road,
 South Launceston

TASMAN
 geotechnics

Date : 14/06/2016
 Logged By : FH

Drill model : Rockmaster
 Hole diameter : 120mm

Slope : deg
 Bearing : deg

RL Surface :
 Datum :

Method	Penetration				Notes Samples Tests	Water	Graphic Log	Classification	Material Description	Moisture Condition	Consistency density, index	Structure, additional observations
	1	2	3	4								
Auger							SM	SILTY SAND, fine grained, brown with medium grained, rounded gravel	M	MD		
							CH	SANDY CLAY, high plasticity fines, orange	M	St		
					U50			orange/grey mottled				PP = 100 kPa
							CH	CLAY, high plasticity, yellow with a trace of sand	M	F		
					D						St	
											VSt	
											H	

Terminated at 4.0m. Still going.

ENGINEERING BOREHOLE LOG



Borehole no. HA2

Sheet no. 1 of 1
 Job no. TG16086/1

Client : Andrew McCullagh
 Project : LRA
 Location : 51-55 Westburry Road,
 South Launceston

TASMAN
 geotechnics

Date : 14/06/2016
 Logged By : EB

Drill model : Hand auger
 Hole diameter : 60mm

Slope : deg
 Bearing : deg

RL Surface :
 Datum :

Method	Penetration				Notes Samples Tests	Water	Graphic Log	Classification	Material Description	Moisture Condition	Consistency density, index	Structure, additional observations
	1	2	3	4								
Auger							CH	FILL: SANDY CLAY, dark and light brown patches	M	F		
						0.50	SC	CLAYEY SAND, medium grained, brown	M	MD		
							CH	SILTY CLAY, high plasticity, orange/red mottled	M	H		
					D		CH	SANDY CLAY, high plasticity, grey/orange/red mottled	M	H		
						1.00		Terminated at 0.9m due to refusal on hard clay				
						1.50						
						2.00						
						2.50						
						3.00						
						3.50						
						4.00						



Appendix B

Landslide Risk Matrix



Terminology for use in Assessing Risk to Property

These notes are provided to help you understand concepts and terms used in Landslide Risk Assessment and are based on the “Practice Note Guidelines for Landslide Risk Management 2007” published in *Australian Geomechanics Vol 42, No 1, 2007*.

Likelihood Terms

The qualitative likelihood terms have been related to a nominal design life of 50 years. The assessment of likelihood involves judgment based on the knowledge and experience of the assessor. Different assessors may make different judgments.

Approximate Annual Probability	Implied indicative Recurrence Interval	Description	Descriptor	Level
10 ⁻¹	10 years	The event is expected to occur over the design life	Almost Certain	A
10 ⁻²	100 years	The event will probably occur under adverse conditions over the design life	Likely	B
10 ⁻³	1000 years	The event could occur under adverse conditions over the design life	Possible	C
10 ⁻⁴	10,000 years	The event might occur under very adverse conditions over the design life	Unlikely	D
10 ⁻⁵	100,000 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 for the design life	Barely Credible	F

Qualitative Measures of Consequence to Property

Indicative Cost of Damage	Description	Descriptor	Level
200%	Structure(s) completely destroyed and/or large scale damage requiring major engineering works for stabilisation. Could cause at least one adjacent property major consequential damage.	Catastrophic	1
60%	Extensive damage to most of structure, and/or extending beyond site boundaries requiring significant stabilisation works. Could cause at least one adjacent property medium consequential damage	Major	2
20%	Moderate damage to some of structure, and/or significant part of site requiring large stabilisation works. Could cause at least one adjacent property minor consequential damage.	Medium	3
5%	Limited damage to part of structure, and/or part of site requiring some reinstatement stabilisation works	Minor	4
0.5%	Little damage.	Insignificant	5

The assessment of consequences involves judgment based on the knowledge and experience of the assessor. The relative consequence terms are value judgments related to how the potential consequences may be perceived by those affected by the risk. Explicit descriptions of potential consequences will help the stakeholders understand the consequences and arrive at their judgment.

Qualitative Risk Analysis Matrix – Risk to Property

Likelihood		Consequences to Property				
	Approximate annual probability	1: Catastrophic	2: Major	3: Medium	4: Minor	5: Insignificant
A: Almost Certain	10 ⁻¹	VH	VH	VH	H	L
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:

1. The risk associated with Insignificant consequences, however likely, is defined as Low or Very Low
2. The main purpose of a risk matrix is to help rank risks and set priorities and help the decision making process.

Response to Risk

In general, it is the responsibility of the client and/or regulatory and/or others who may be affected to decide whether to accept or treat the risk. The risk assessor and/or other advisers may assist by making risk comparisons, discussing treatment options, explaining the risk management process, advising how others have reacted to risk in similar situations and making recommendations. Attitudes to risk vary widely and risk evaluation often involves considering more than just property damage (eg environmental effects, public reaction, business confidence etc).

The following is a guide to typical responses to assessed risk.

Risk Level		Example Implications
VH	Very High	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 the value of the property.
H	High	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	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	Usually accepted by regulators. Where treatment has been required to reduce the risk to this level, ongoing maintenance is required.
VL	Very Low	Acceptable. Manage by normal slope maintenance procedures



Appendix C

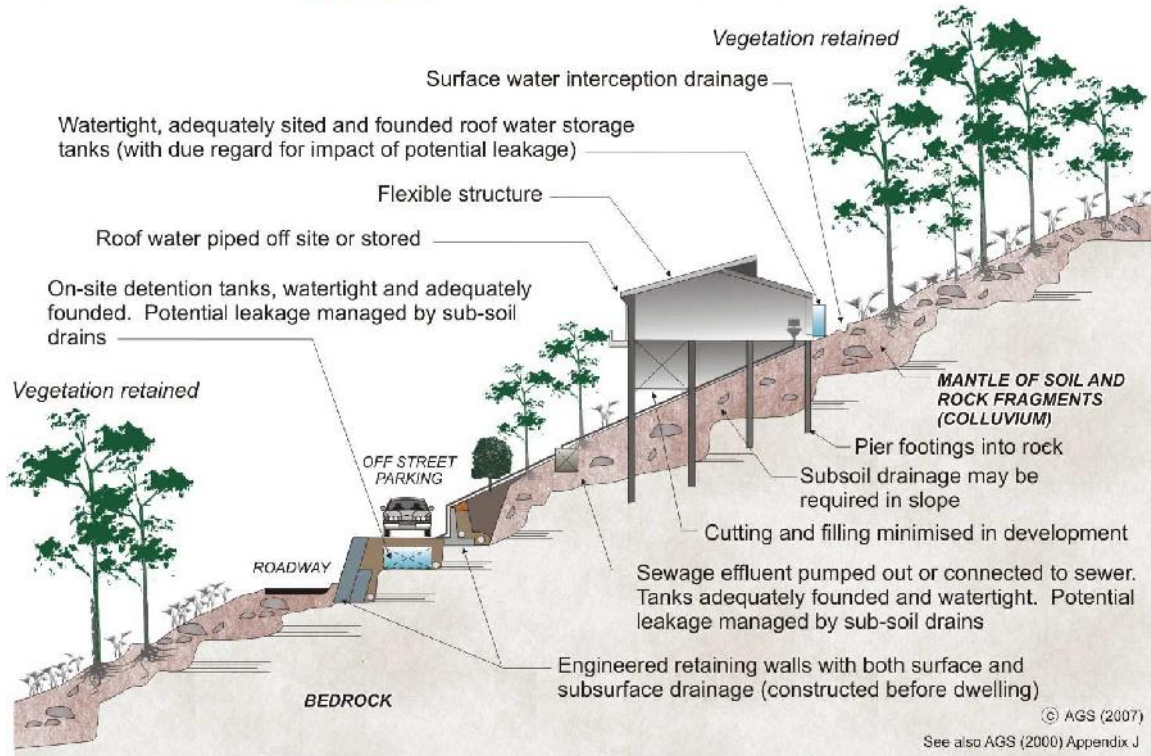
Guidelines to Hillside Construction

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.

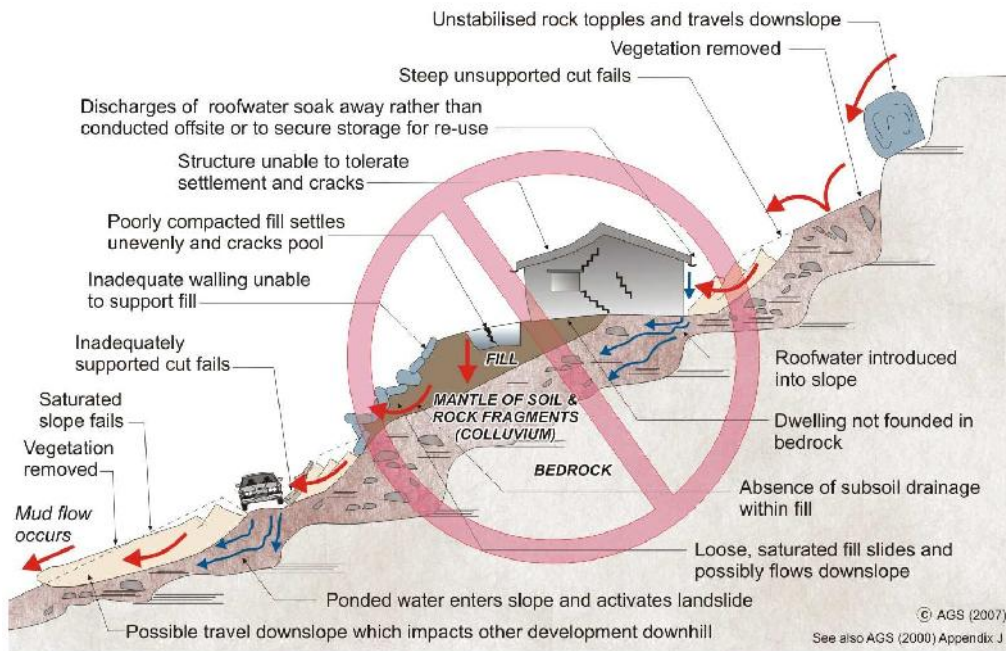
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing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



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01 - September - 2016

A. McCullugh
C/- stuoat@gmail.com

Response to planning concern re the geotech report and the proposed unit development at 51-55 Westbury Rd Prospect.

I have reviewed the unit development proposal prepared by SOS Architectural project No. 16251.1- and the geotech report prepared by Tasman Geotechnics, report No. TG16086.1

The report rates a low risk landslide profile and requires specific Engineering for retaining walls suitable for the site.

I am of the opinion the proposed development can be suitably Engineered giving consideration to the geotech report.

For any clarification please contact MV Consulting

Kind Regards

Meindert van der Molen