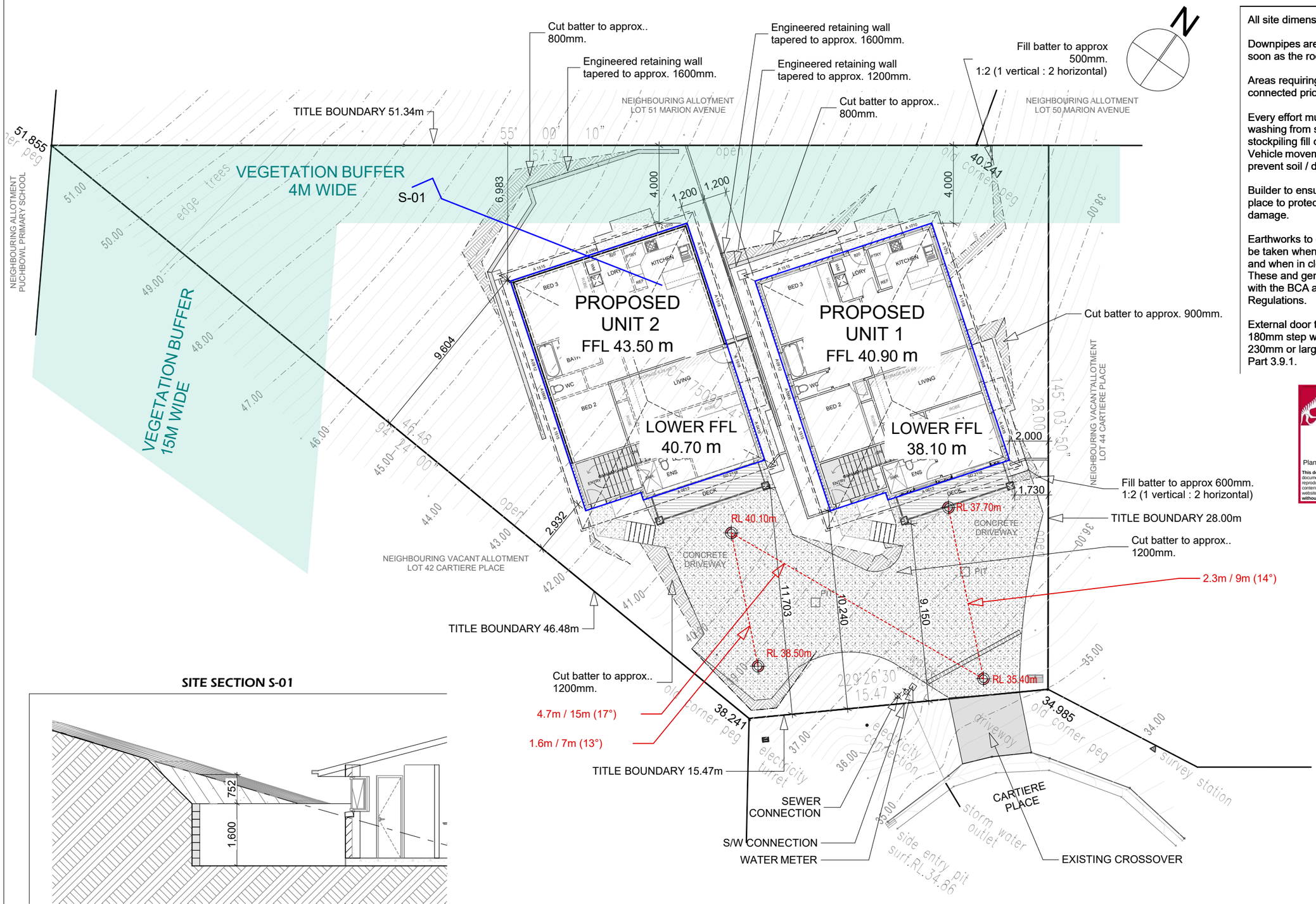

NOTES

All site dimensions are to outside cladding.

Downpipes are to be connected to the SW system as soon as the roof is installed.

Areas requiring sub soil drainage to be installed and connected prior to building footing excavations.

Every effort must be made to prevent sediment washing from site. Install sediment fencing where stockpiling fill or exposing susceptible excavations. Vehicle movement from site must be minimised to prevent soil / debris from entering the roadway.

Builder to ensure all required protection works are in place to protect adjoining property from potential damage.

Earthworks to comply with BCA Part 3.1, care should be taken when exposing unprotected embankments and when in close proximity to adjoining property. These and general earthworks are to be in compliance with the BCA and any Local Council requirements and Regulations.

External door thresholds to have a nominal 150 - 180mm step where required. A measurement of 230mm or larger will require compliant "stairs" to BCA Part 3.9.1.

PLANNING EXHIBITED DOCUMENTS

Ref. No: DA 0521/2018
Date advertised: 03/10/2018
Planning Administration

SITE SECTION S-01

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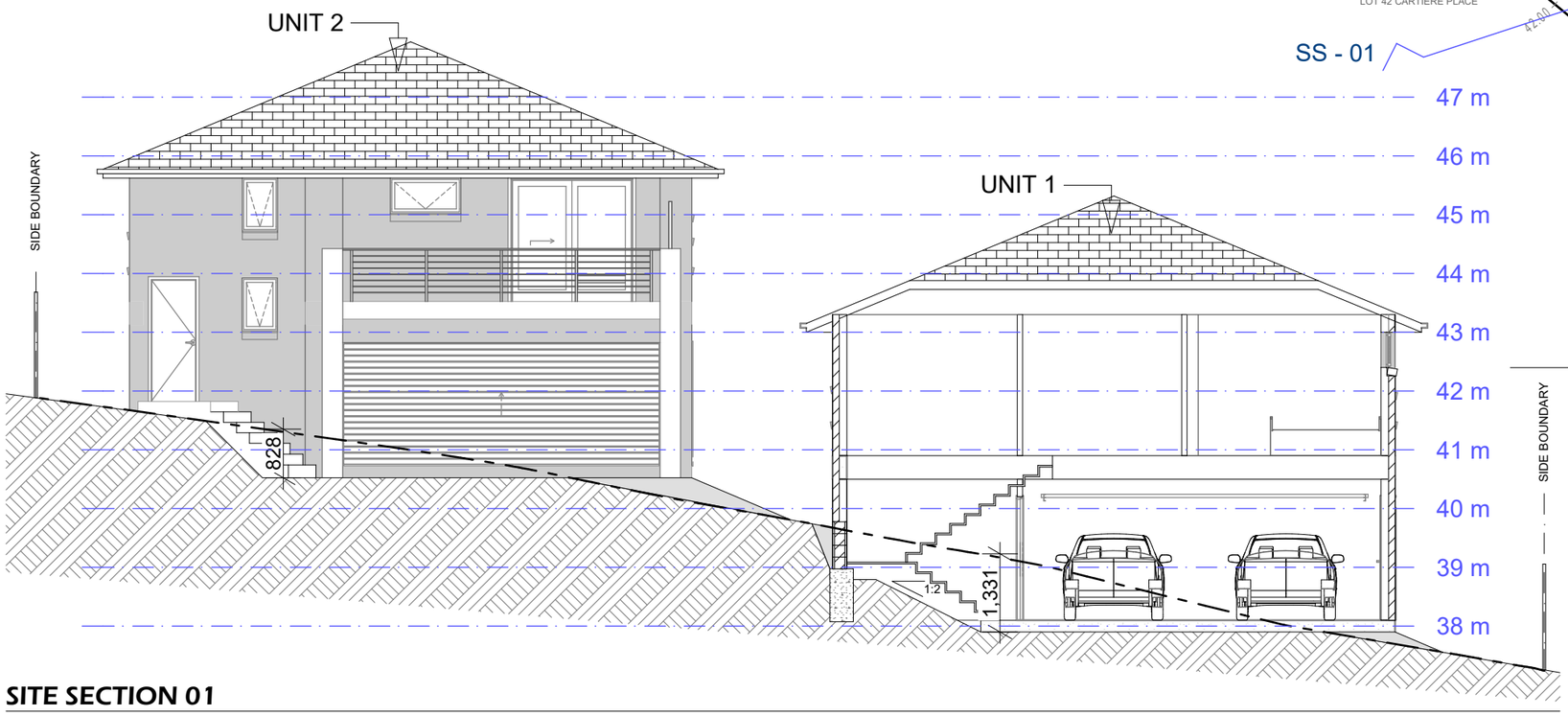
DOUGLAS DESIGN & DRAFTING PTY LTD
PH 0437 00 33 02
Acc No. CC7092
ABN 56 614 751 521

Revision
Rev A 28/09/2018

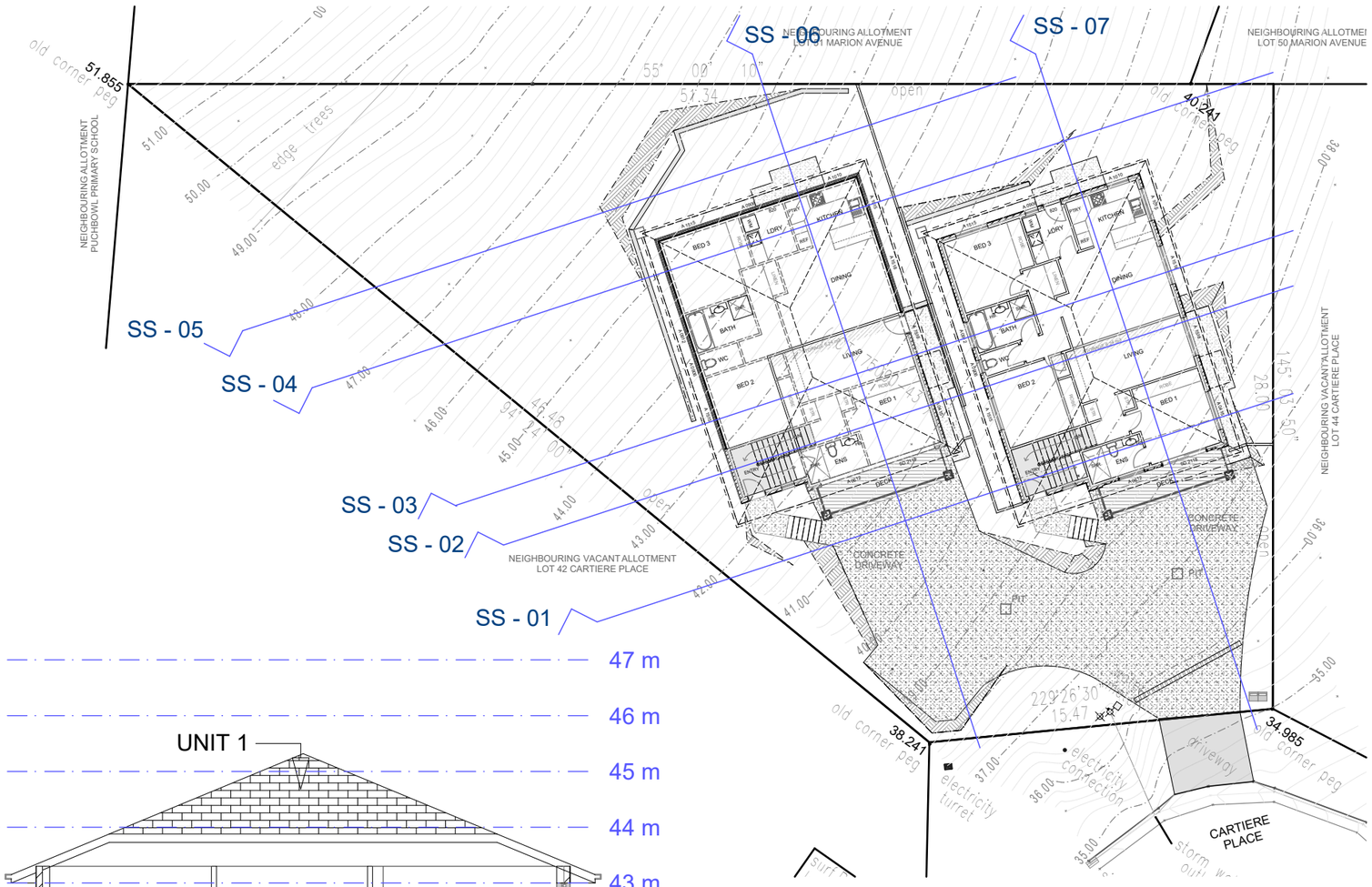
Project / Address / Client: Proposed Unit Development, Lot 43, No.10, Cartiere Place, Newstead TAS 7250, SRK Developments Pty Ltd

Scale: 1:200
Date: 28/09/2018
Issue: PLANNING

Layout: A0.03 OF 17
Site Plan
Drawing No. 180803



SITE SECTION 01



SITE SECTION PLAN (NTS)

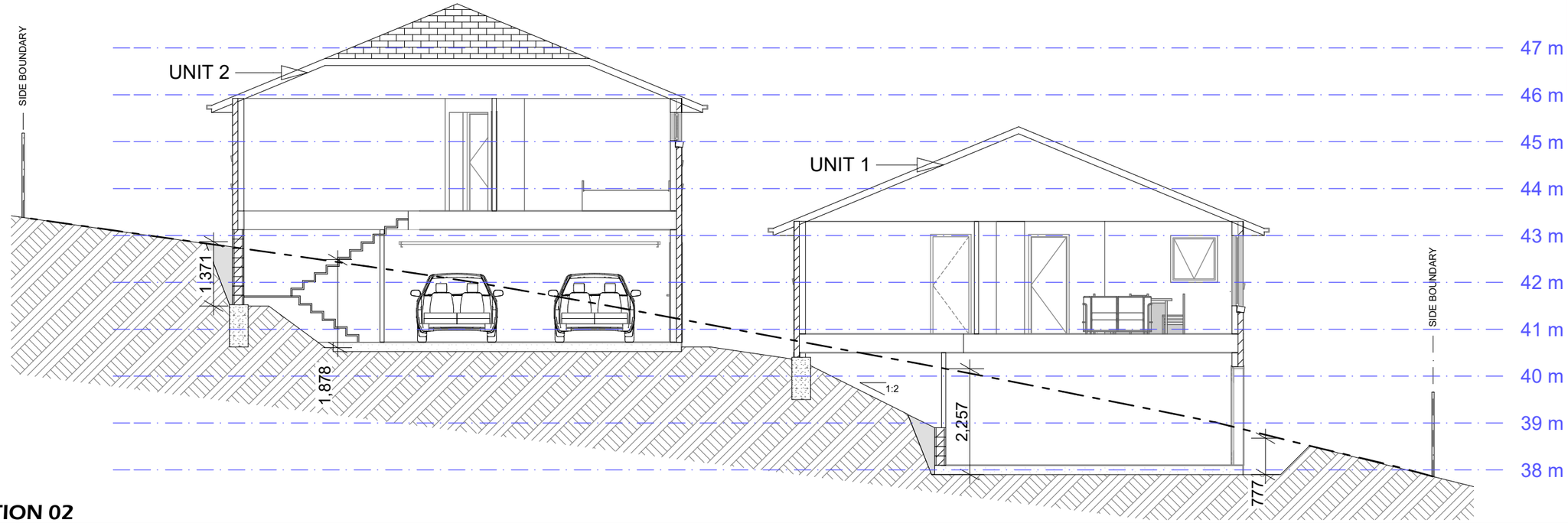
dale@douglasdesignanddrafting.com
DOUGLAS DESIGN & DRAFTING PTY LTD
PH 0437 00 33 02
Acc No. CC7092
ABN 56 614 751 521

Revision
Rev A 28/09/2018

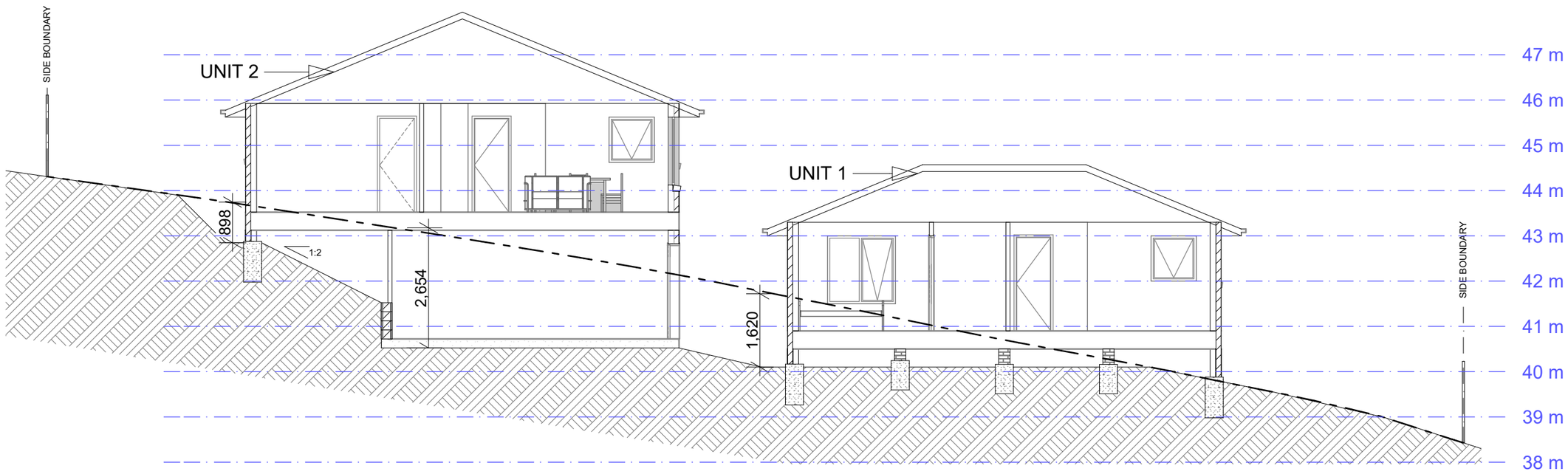
Project Address / Client: Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A0.04 OF 17
Site Section - A
Drawing No. 180803



SITE SECTION 02



SITE SECTION 03

dale@douglasdesignanddrafting.com
DOUGLAS DESIGN & DRAFTING PTY LTD
PH 0437 00 33 02
Acc No. CC7092
ABN 56 614 751 521

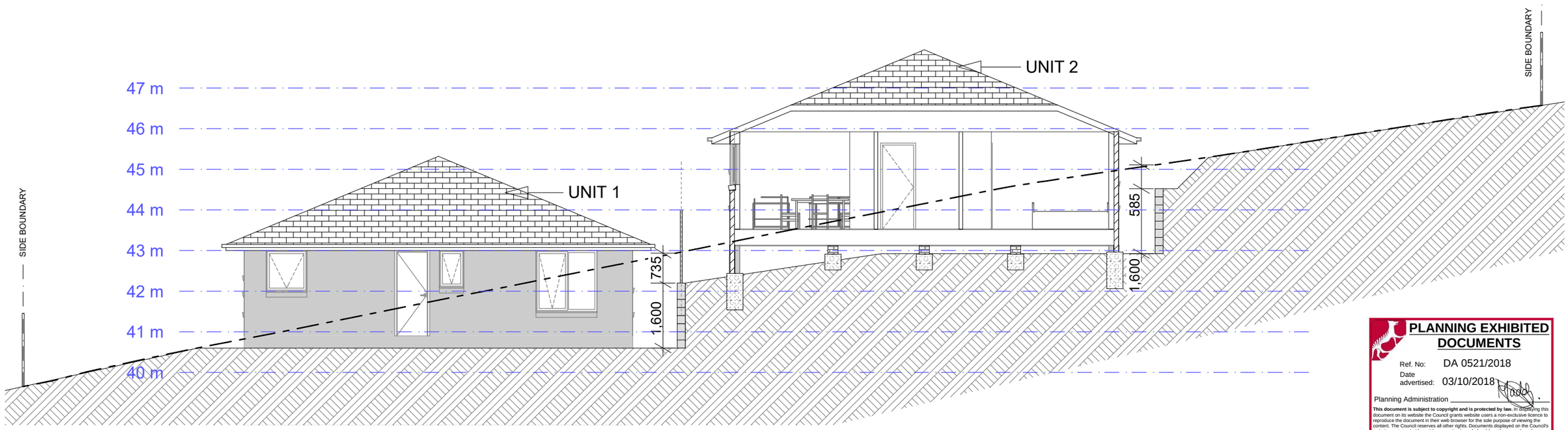
Revision
Rev A 28/09/2018

Project
Address
Client

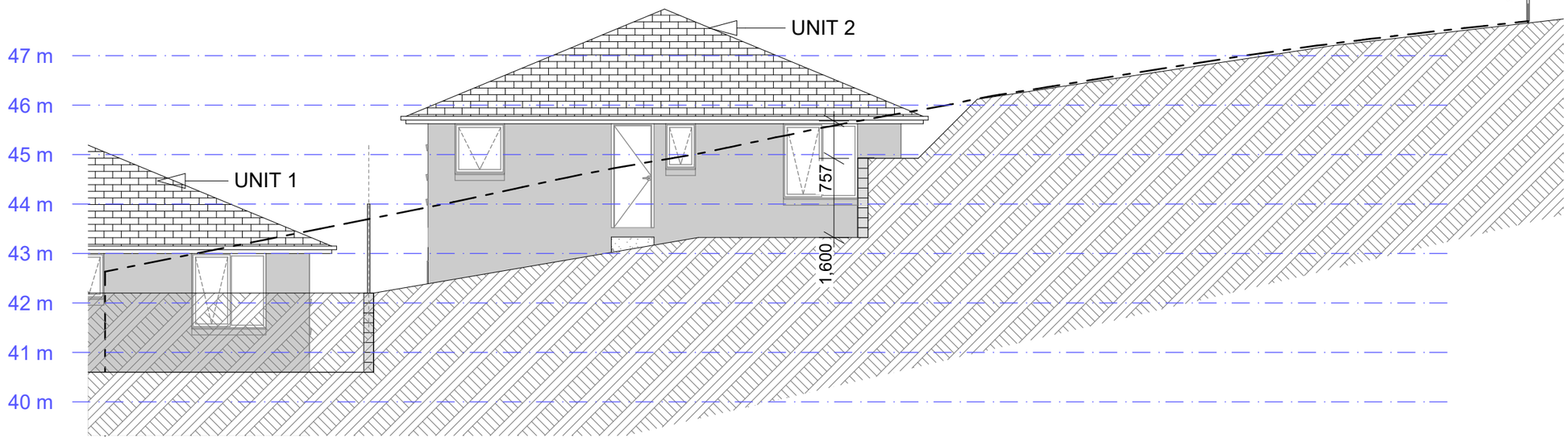
Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A0.05 OF 17
Site Section - B
Drawing No. 180803



SITE SECTION 04



SITE SECTION 05

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DOUGLAS DESIGN & DRAFTING PTY LTD
PH 0437 00 33 02
Acc No. CC7092
ABN 56 614 751 521

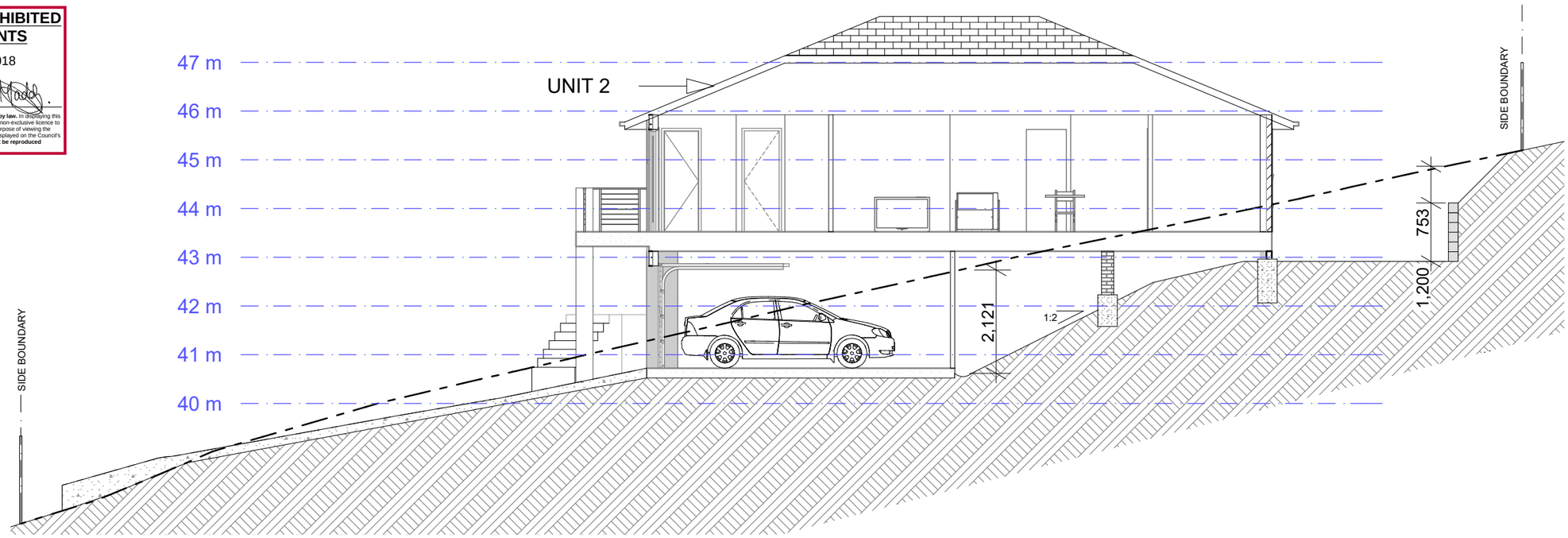
Revision
Rev A 28/09/2018

Project
Address
Client

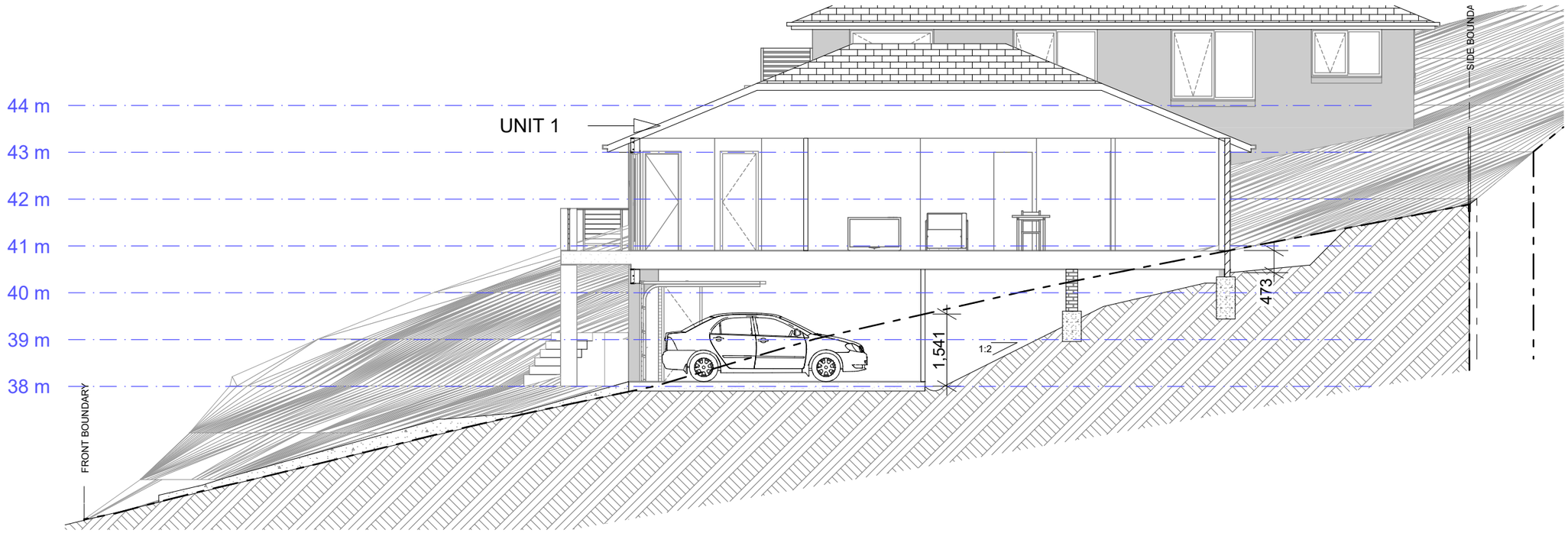
Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A0.06 OF 17
Site Section - C
Drawing No. 180803



SITE SECTION 06



SITE SECTION 07

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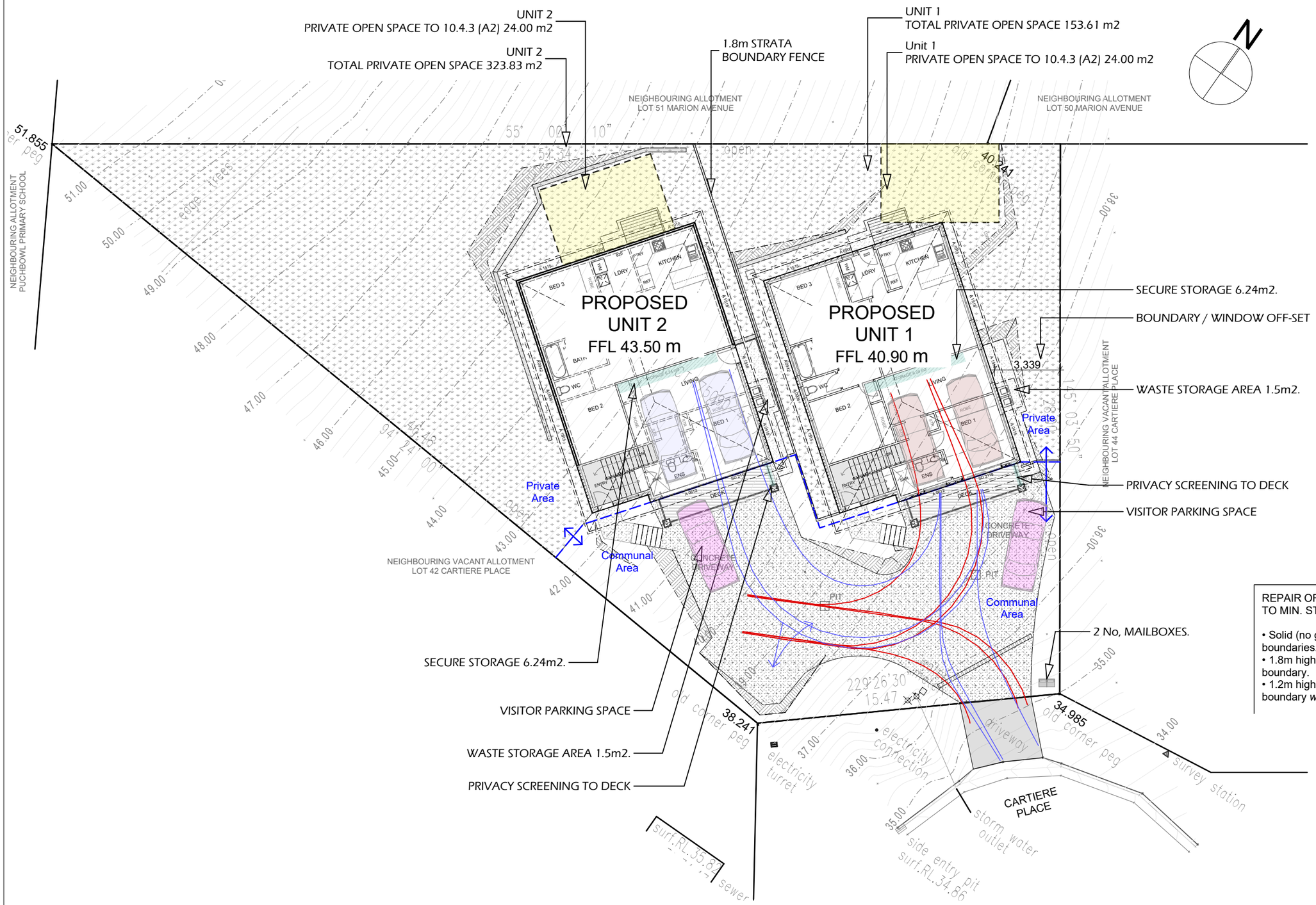
PH 0437 00 33 02
Acc No. CC7092
ABN 56 614 751 521

Revision
Rev A 28/09/2018

Project / Address / Client: Proposed Unit Development, Lot 43, No.10, Cartiere Place, Newstead TAS 7250, SRK Developments Pty Ltd

Scale: 1:100
Date: 28/09/2018
Issue: PLANNING

Layout: A0.07 OF 17
Site Section - D
Drawing No. 180803



FENCING

REPAIR OR REINSTATE ALL BOUNDARY FENCING TO MIN. STANDARD.

- Solid (no gap) fencing to be provided to side and rear boundaries.
- 1.8m high from highest point of either side of the boundary.
- 1.2m high from highest point of either side of the boundary *within 4.5m of frontage*.

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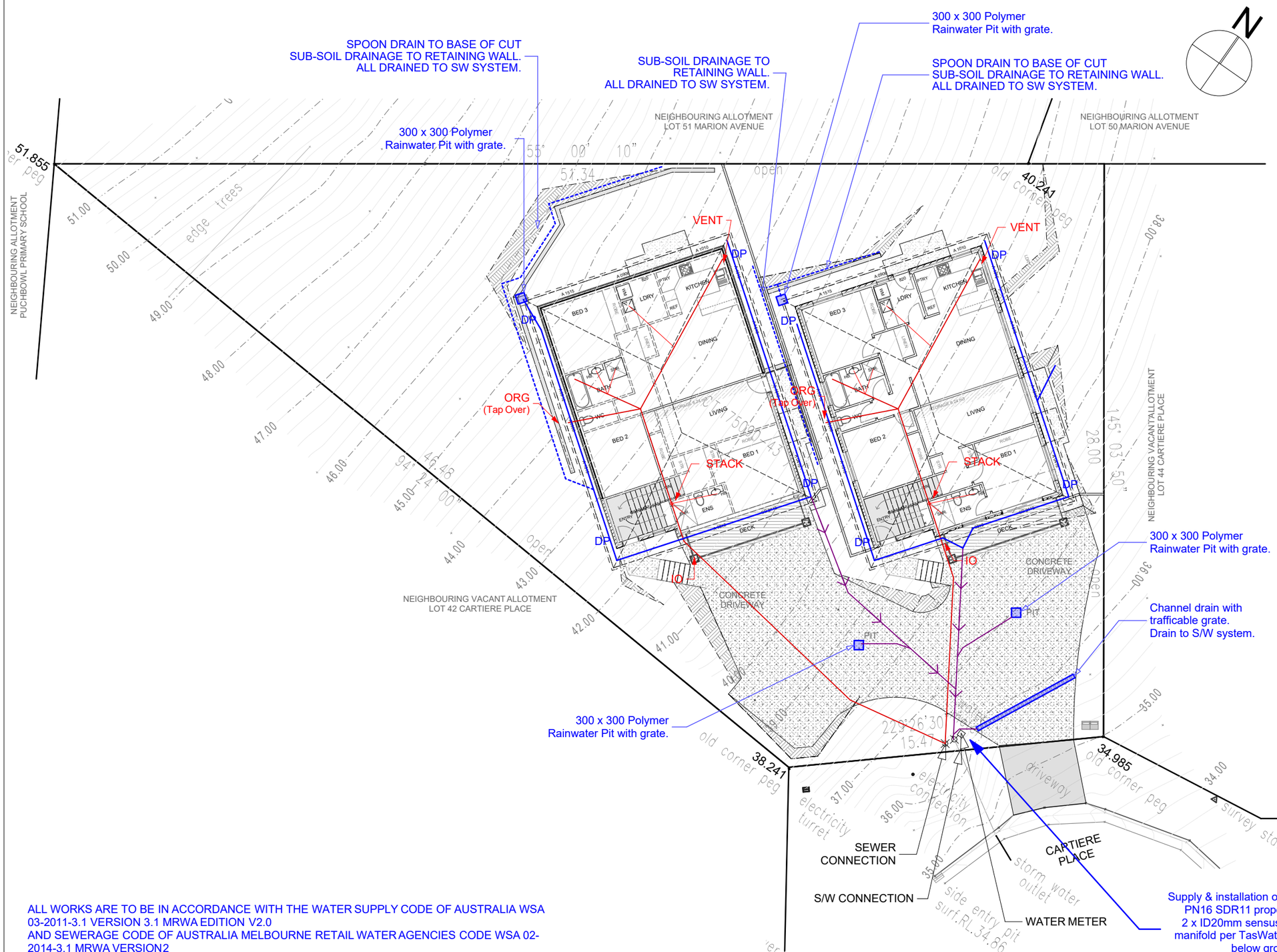
Revision
Rev A 28/09/2018

Project / Address / Client: Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale 1:200
Date 28/09/2018
Issue PLANNING

Layout A0.08 OF 17
Site Plan - Planning
Drawing No. 180803



LEGEND

HB.	HAND BASIN
S.	SINK
T.	TUB
VB.	VANITY BASIN
RF.	REFRIGERATOR
DW.	DISHWASHER
WM.	WASHING MACHINE
RF.	REFRIGERATOR
AJ.	ARTICULATION JOINT
MB.	METER BOX
DP.	DOWNPIPE
FFL.	FINISHED FLOOR LEVEL
FGL.	FINISHED GROUND LEVEL
NGL.	NATURAL GROUND LEVEL
FCL.	FINISHED CEILING LEVEL

90mm Class 6 UPVC Storm water drain to a min. 1 in 100 grade.

100mm Class 6 UPVC Storm water drain to a min. 1 in 100 grade.

100mm Class 6 UPVC Sewer drain at min 1 in 60 grade.

DP 90mm PVC Downpipe connected to SW system.

Installation and commission of any gas appliance to be
- Performed by a qualified person
- In accordance with manufacturers instructions
- In compliance with all local codes and regulatory authorities
- In compliance with AS/NZS 3500.4, AS 5601 or AS5601.1 as applicable

All plumbing works to comply with the associated Australian Standards and Local Government Authority requirements.

AS/NZS 3500 Plumbing & Drainage
AS/NZS 3500.3:2015 Storm water Drainage
AS/NZS 3500.4:2003/2015 Heated Water Services
AS/NZS 3500.5:2012 Housing Installations

Modifications to the plumbing layout may be made by a licenced plumber providing all modifications are compliant to relative standards.

Where a drain is in proximity to a building footing, ensure this does not encroach within the footing line of influence. Alternative footing system may be sought should this occur.

PLANNING EXHIBITED DOCUMENTS

Ref. No: DA 0521/2018
Date advertised: 03/10/2018
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ALL WORKS ARE TO BE IN ACCORDANCE WITH THE WATER SUPPLY CODE OF AUSTRALIA WSA 03-2011-3.1 VERSION 3.1 MRWA EDITION V2.0
AND SEWERAGE CODE OF AUSTRALIA MELBOURNE RETAIL WATER AGENCIES CODE WSA 02-2014-3.1 MRWA VERSION2
& TASWATER'S SUPPLMENTS TO THESE CODES.

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Revision
Rev A 28/09/2018

Project Address: Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
Client: SRK Developments Pty Ltd

Scale: 1:200
Date: 28/09/2018
Issue: PLANNING

Layout: A0.09 OF 17
Site Plan - Plumbing
Drawing No. 180803

SPECIFIC PLANTING TO VEGETATION BUFFER AS DIRECT BY L.C.C

N

NEIGHBOURING ALLOTMENT LOT 51 MARION AVENUE

NEIGHBOURING ALLOTMENT LOT 50 MARION AVENUE

NEIGHBOURING ALLOTMENT PUCHBOWL PRIMARY SCHOOL

VEGETATION BUFFER 4M WIDE

VEGETATION BUFFER 15M WIDE

NEIGHBOURING VACANT ALLOTMENT LOT 42 CARTIERE PLACE

NEIGHBOURING VACANT ALLOTMENT LOT 44 CARTIERE PLACE

CONCRETE DRIVEWAY

CARTIERE PLACE

51.855 · 40.241 · 38.241 · 34.985

LEGEND

- 75mm depth of mulch to 300mm top soil garden beds.
- Lawn installed to 100mm top soil.
- Japanese Maple
- Naringa Westringia (180cm x 180 cm)
- Tasmanian Flax Lily (Dianella tasmanica) (120cm x 120 cm)
- Phormium 'Platt's Black' (100cm x 100cm)
- Pittosporum tenuifolium Golfball (80cm x 80cm)

PLANNING EXHIBITED DOCUMENTS

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Date advertised: 03/10/2018

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Project / Address / Client: Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale 1:200
Date 28/09/2018
Issue PLANNING

Layout A0.10 OF 17
Site Plan - Landscaping
Drawing No. 180803

3D PERSPECTIVE

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Acc No. CC7092
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Revision
Rev A 28/09/2018

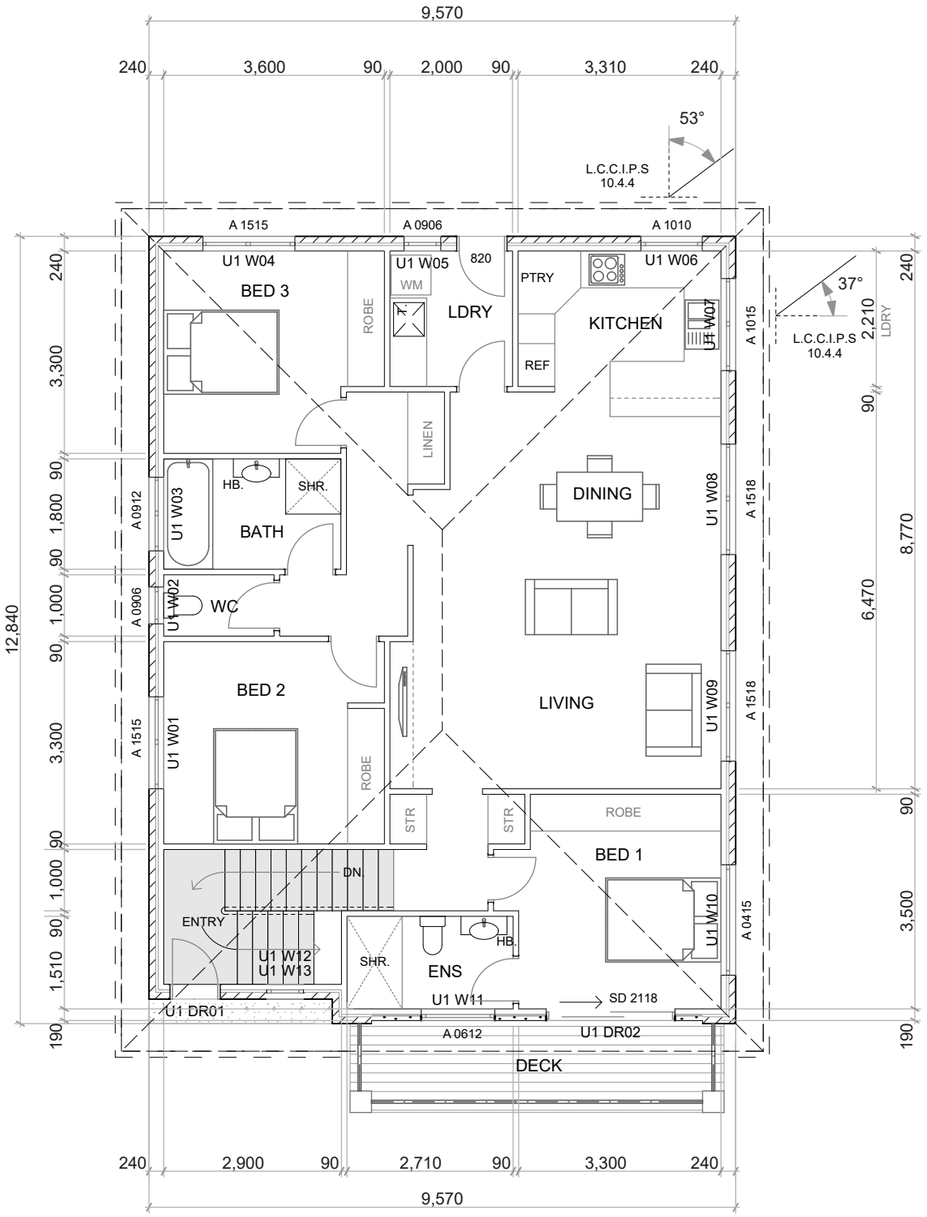
Project Address / Client: Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale: NTS
Date: 28/09/2018
Issue: PLANNING

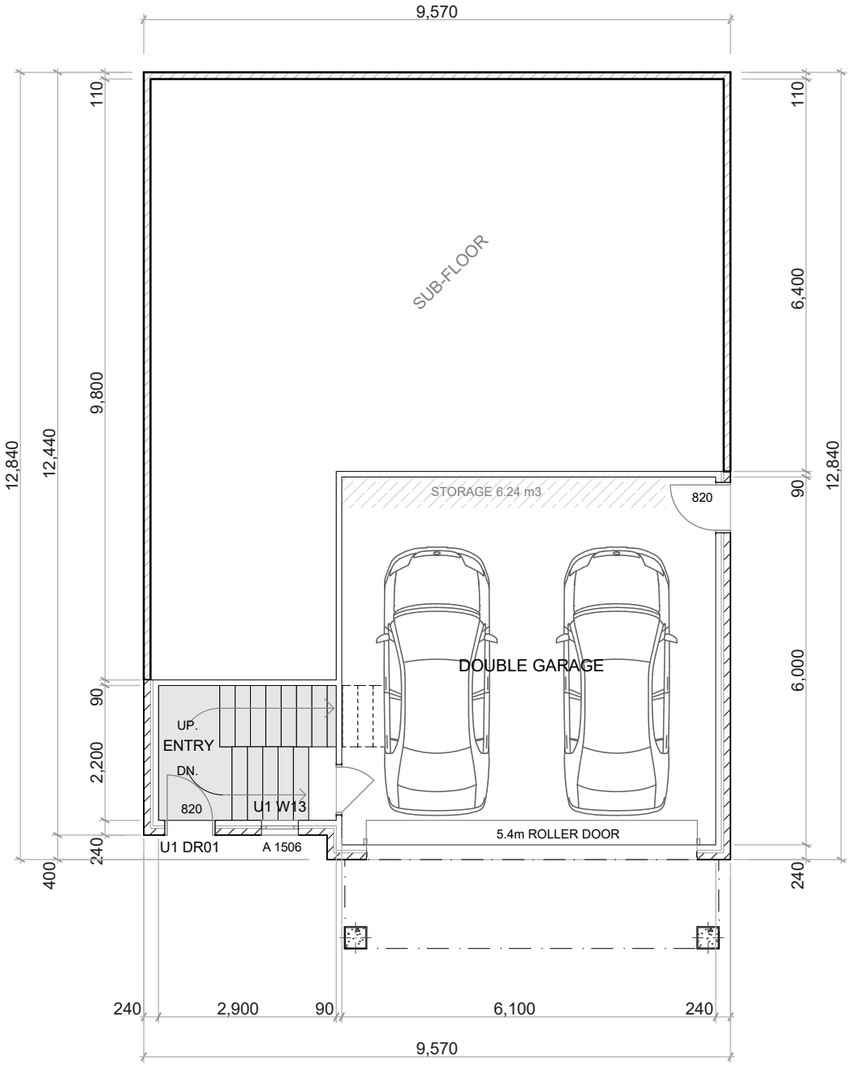
Layout: A0.11 OF 17

Perspective View

Drawing No.: 180803



UPPER FLOOR



LOWER FLOOR

LEGEND

- 240mm BRICK VENEER WALLS
- 90mm STUD WALLS

BATH.	BATHROOM
LDRY.	LAUNDRY
ENS.	ENSUITE
KITCH.	KITCHEN
WC.	WATER CLOSET
ROBE.	WARDROBE
WIR.	WALK IN ROBE
BRM.	BROOM CLOSET
LINEN.	LINEN CUPBOARD
PTRY.	PANTRY CUPBOARD
HB.	HAND BASIN
S.	SINK
T.	TUB
VB.	VANITY BASIN
RF.	REFRIGERATOR
DW.	DISHWASHER
WM.	WASHING MACHINE
RF.	REFRIGERATOR
AJ.	ARTICULATION JOINT
MB.	METER BOX
DP.	DOWNPIPE
FFL.	FINISHED FLOOR LEVEL
FGL.	FINISHED GROUND LEVEL
NGL.	NATURAL GROUND LEVEL
FCL.	FINISHED CEILING LEVEL

- EXHAUST FAN DUCTED TO OUTSIDE AIR.
- SMOKE ALARM HARD WIRED
- HEAT PUMP (EXT.)
- HP — HEAT PUMP (INT.)
- HWC — HOT WATER SYSTEM

Smoke Alarm to be AS 3786 compliant, hard wired to mains power & interconnect where more than one unit is required to be fitted. Position and installation to be BCA Part 3.7.2 compliant.

All exhaust fans specified to be ducted to outside air and fitted with a back draft damper.

Installation and commission of any gas appliance to be
- Performed by a qualified person
- In accordance with manufacturers instructions
- In compliance with all local codes and regulatory authorities
- In compliance with AS/NZS 3500.4, AS 5601 or AS5601.1 as applicable

PLANNING EXHIBITED DOCUMENTS

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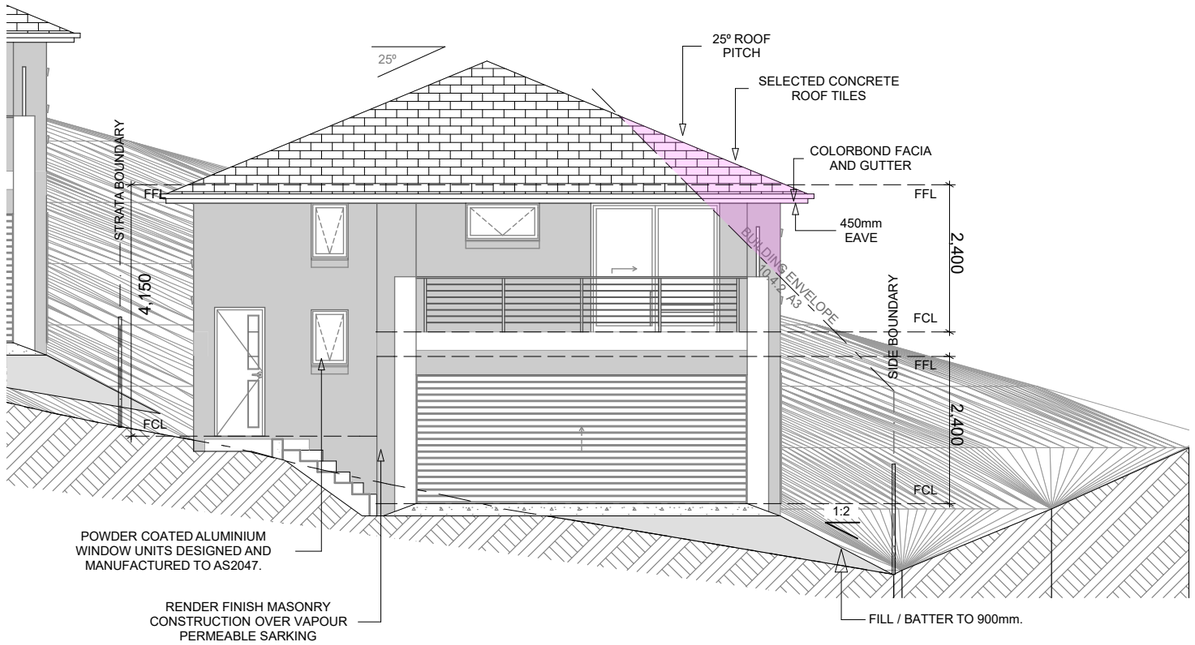
Revision
Rev A 28/09/2018

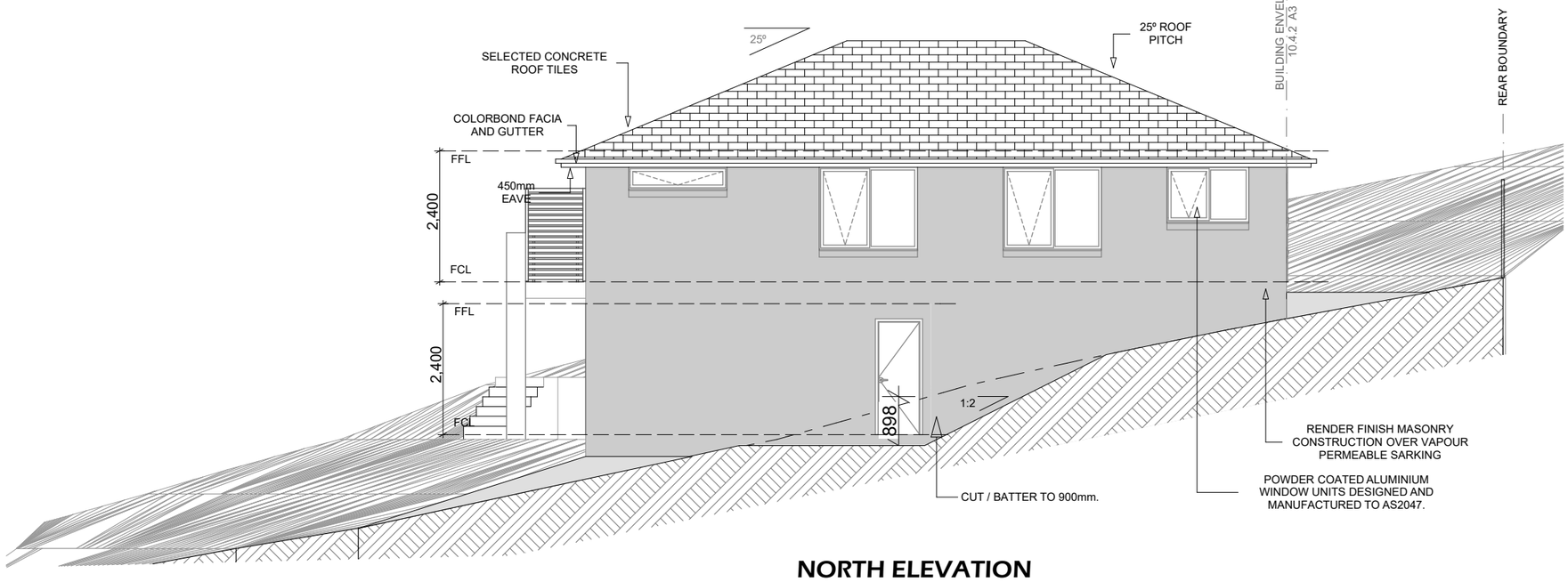
Project Address / Client: Proposed Unit Development, Lot 43, No.10, Cartiere Place, Newstead TAS 7250, SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A1.1 OF 17
Unit 1 Floor Plan
Drawing No. 180803

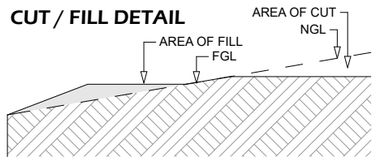


EAST ELEVATION

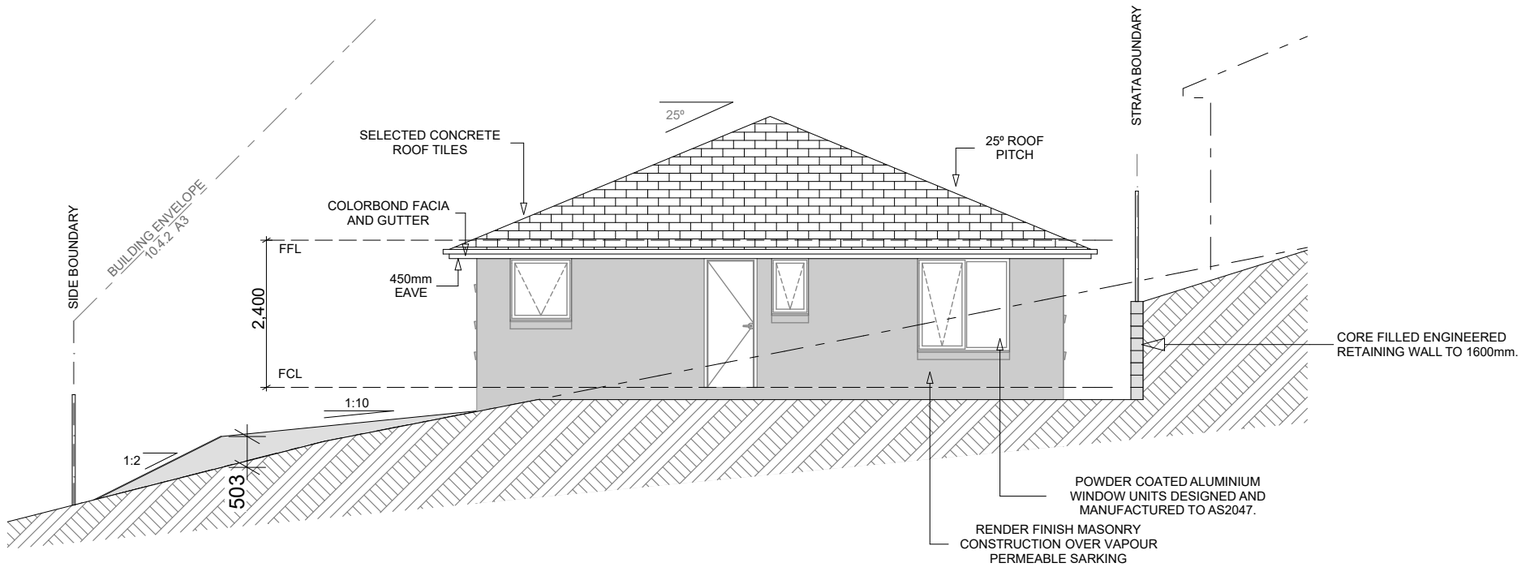


NORTH ELEVATION

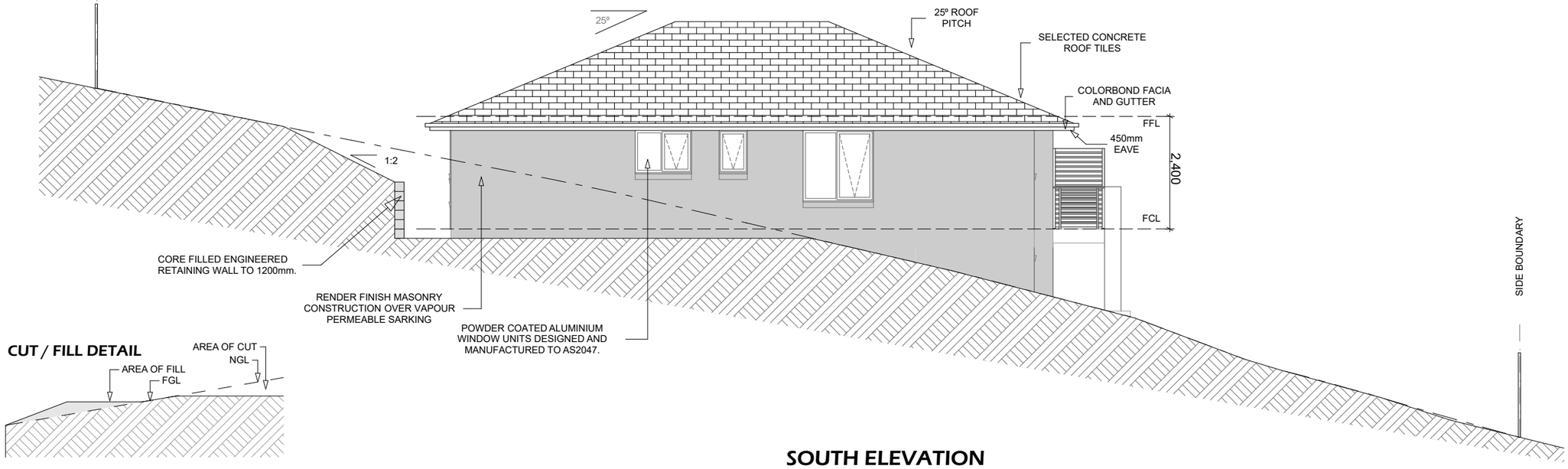
CUT / FILL DETAIL



dale@douglasdesignanddrafting.com	Revision Rev A 28/09/2018	Project Address	Proposed Unit Development Lot 43, No.10, Cartiere Place, Newstead TAS 7250,	Scale 1:100 Date 28/09/2018	Layout A1.2 OF 17
DOUGLAS DESIGN & DRAFTING PTY LTD	PH 0437 00 33 02				Unit 1 Elevations
Acc No. CC7092 ABN 56 614 751 521		Client	SRK Developments Pty Ltd	Issue PLANNING	Drawing No. 180803



WEST ELEVATION



CUT / FILL DETAIL

SOUTH ELEVATION

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Acc No. CC7092
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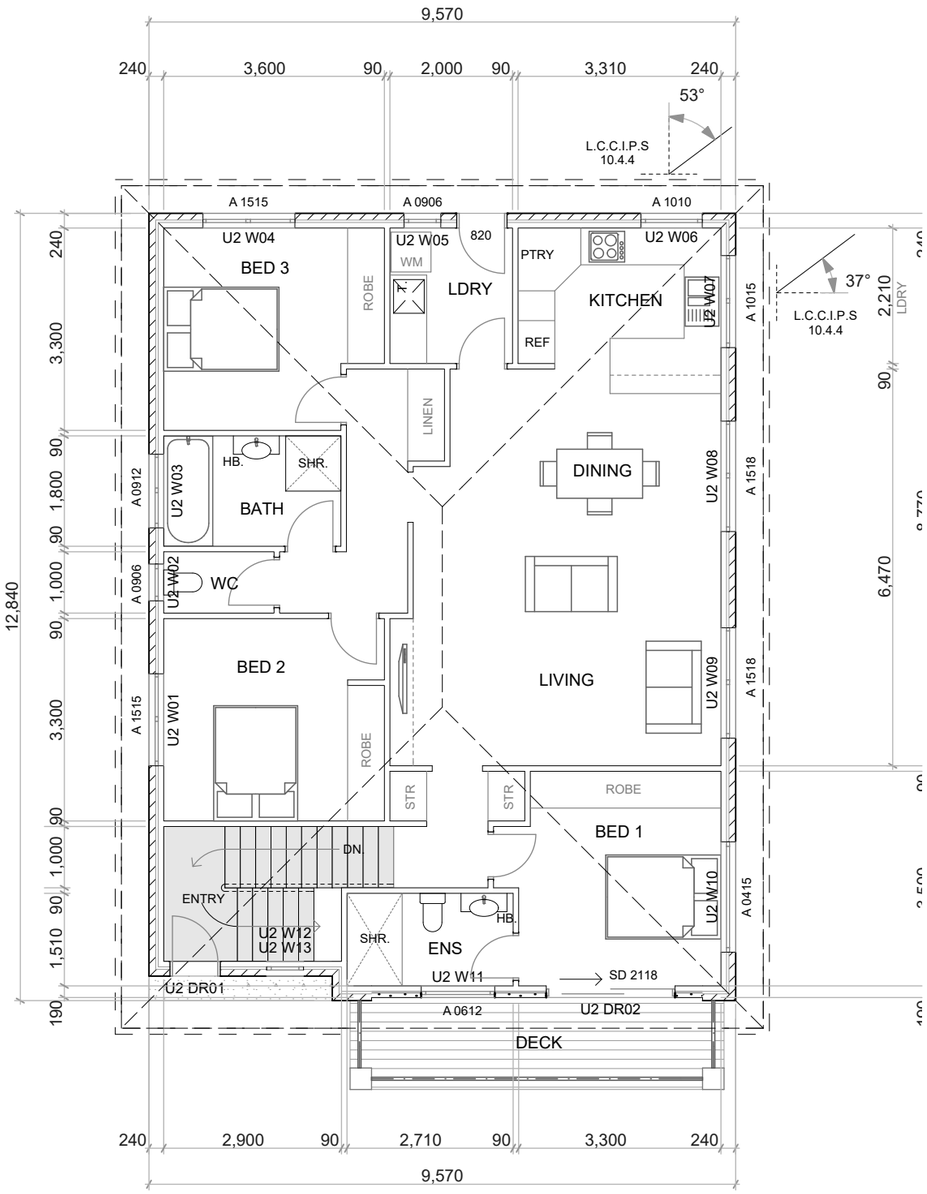
Revision
Rev A 28/09/2018

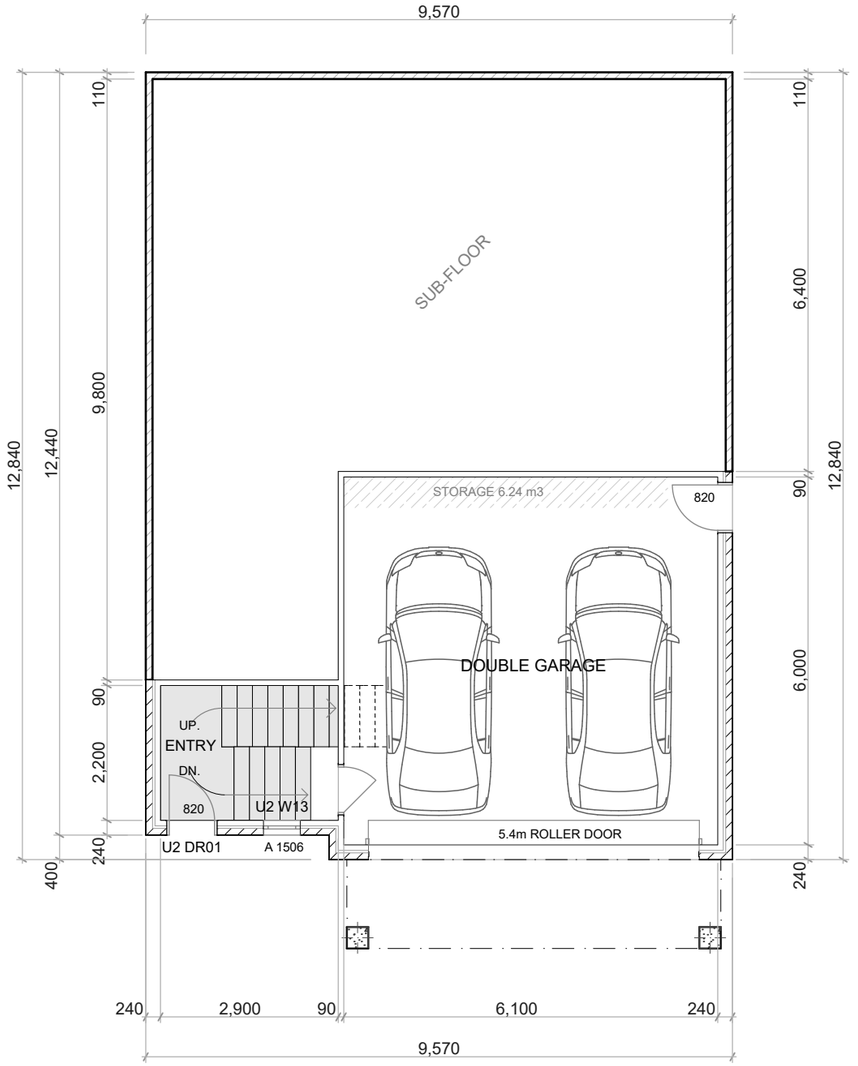
Project / Address / Client
Proposed Unit Development
Lot 43, No.10, Cartiere Place,
Newstead TAS 7250,
SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A1.3 OF 17
Unit 1 Elevations
Drawing No. 180803



UPPER FLOOR



LOWER FLOOR

LEGEND

- 240mm BRICK VENEER WALLS
- 90mm STUD WALLS

BATH.	BATHROOM
LDRY.	LAUNDRY
ENS.	ENSUITE
KITCH.	KITCHEN
WC.	WATER CLOSET
ROBE.	WARDROBE
WIR.	WALK IN ROBE
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S.	SINK
T.	TUB
VB.	VANITY BASIN
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PLANNING EXHIBITED DOCUMENTS

Ref. No: DA 0521/2018
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dale@douglasdesignanddrafting.com
DOUGLAS DESIGN & DRAFTING PTY LTD
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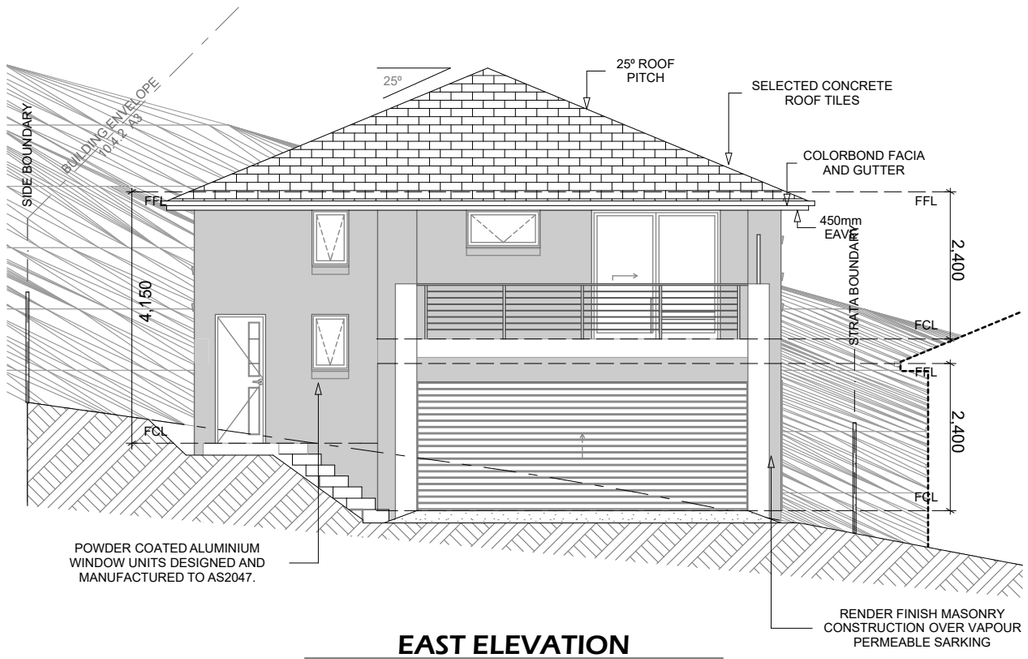
ABN 56 614 751 521

Revision
Rev A 28/09/2018

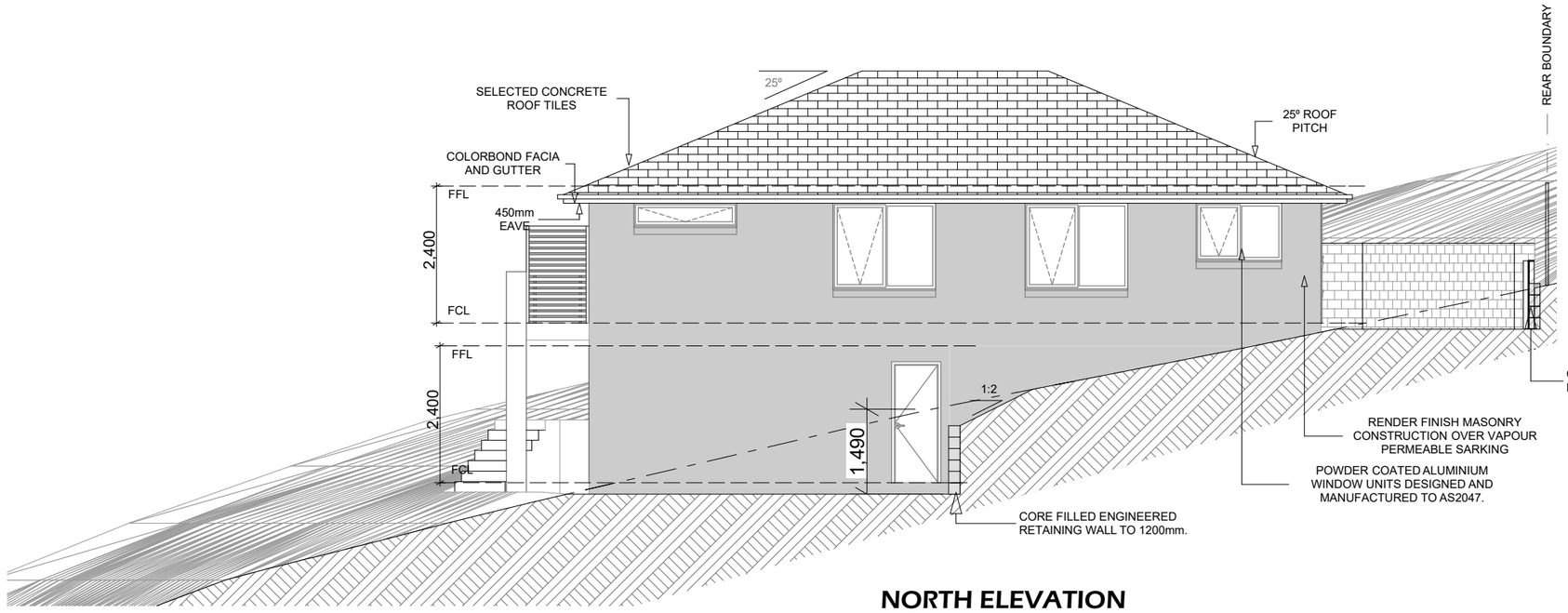
Project Address / Client: Proposed Unit Development, Lot 43, No.10, Cartiere Place, Newstead TAS 7250, SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A2.1 OF 17
Unit 2 Floor Plan
Drawing No. 180803



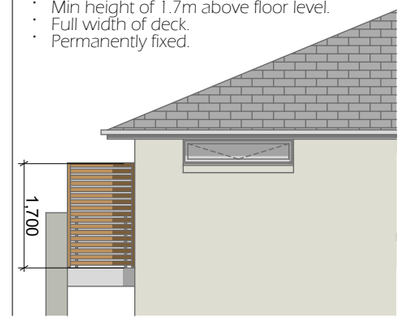
EAST ELEVATION



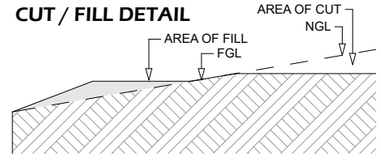
NORTH ELEVATION

DECK PRIVACY SCREENING

Deck Screening must be;
- Uniform transparency of no more than 25%.
- Min height of 1.7m above floor level.
- Full width of deck.
- Permanently fixed.



CUT / FILL DETAIL



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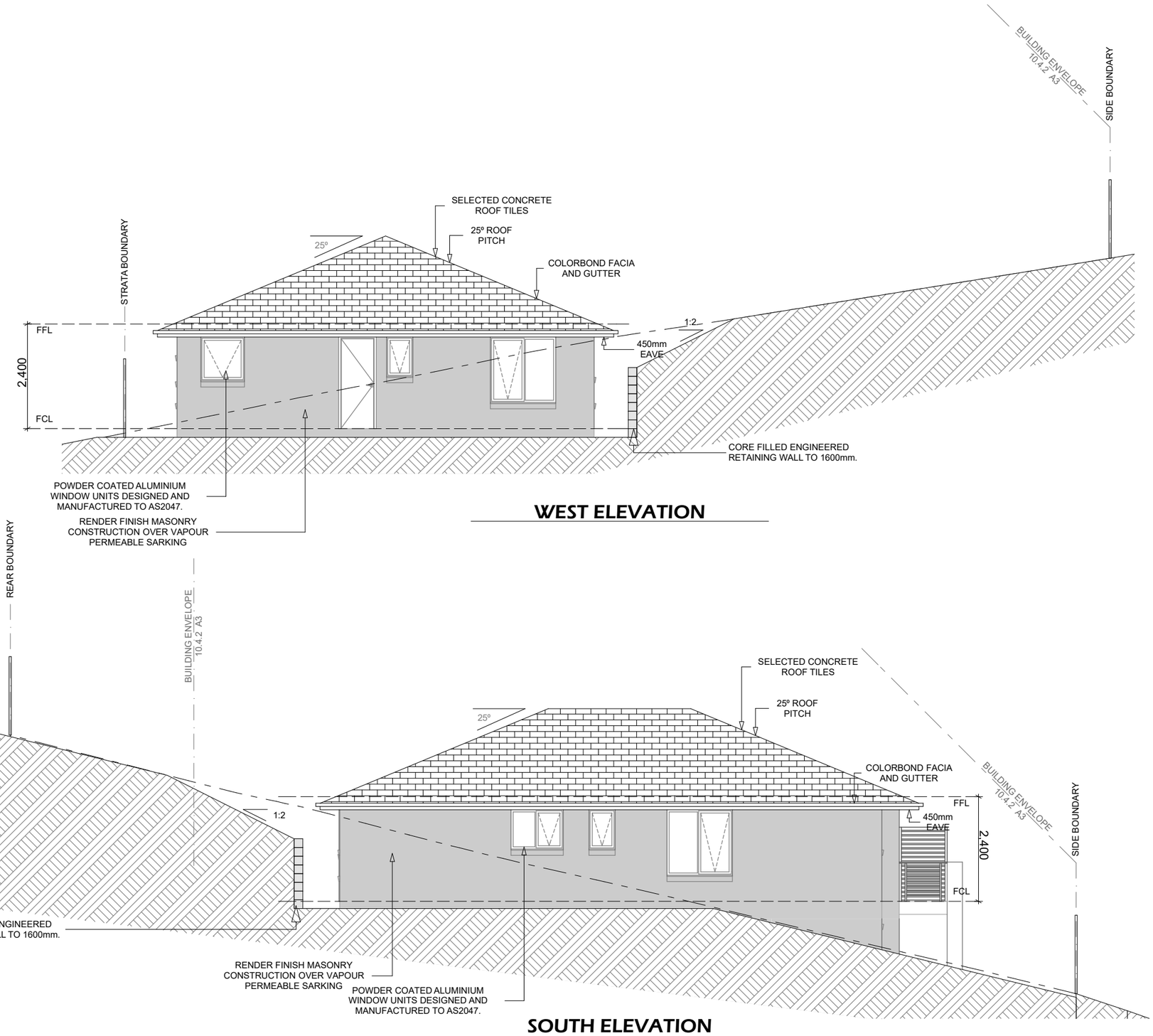
Project Address / Client: Proposed Unit Development, Lot 43, No.10, Cartiere Place, Newstead TAS 7250, SRK Developments Pty Ltd

Scale 1:100
Date 28/09/2018
Issue PLANNING

Layout A2.2 OF 17
Unit 2 Elevations
Drawing No. 180803



WEST ELEVATION

SOUTH ELEVATION

dale@douglasdesignanddrafting.com	Revision Rev A 28/09/2018	Project Address	Proposed Unit Development Lot 43, No.10, Cartiere Place, Newstead TAS 7250,	Scale 1:100 Date 28/09/2018	Layout A2.3 OF 17
DOUGLAS DESIGN & DRAFTING PTY LTD PH 0437 00 33 02					Unit 2 Elevations
Acc No. CC7092 ABN 56 614 751 521		Client	SRK Developments Pty Ltd	Issue PLANNING	Drawing No. 180803

ABN 71162701528

PO Box 128
Prospect
TAS 7250

mail@rjkconsultants.com.au

Ref # 18/19 TAS 050

21 November 2018

Attn : Dale Douglas
Douglas Design & Drafting
PO Box 7708
Launceston TAS 7250

RE : 10 Cartiere Place, Newstead (Lot 43, Title 175090)

Dear Dale,

In regards to issues raised regarding the design at 10 CARTIERE PLACE, NEWSTEAD, I have reviewed the development plans and assessed them, as a suitably qualified person, in accordance with the Australian Geomechanics Society - Practice Notes Guidelines for Landslide Risk Management 2007. I have determined in this assessment that there is suitably low risk of landslide with the proposed development on this site.

We note that landslip was not identified in the William C Cromer report (dated 11 August 2018) as an issue. The site was classified as a class H1 and we have designed according to that classification and also as 2870.

Should the site have had any issues the classification would have been class P. As such we believe the design is sound in meeting the report classification.

Yours faithfully,

Risden Knightley
BE Civil FIEAust CPEng NER

LOT 43
(10 CARTIERE PLACE)
EASTMANS GREEN SUBDIVISION
NEWSTEAD

GEOTECHNICAL SUMMARY

In general accordance with AS1726 (1993) *Geotechnical Site Investigations*

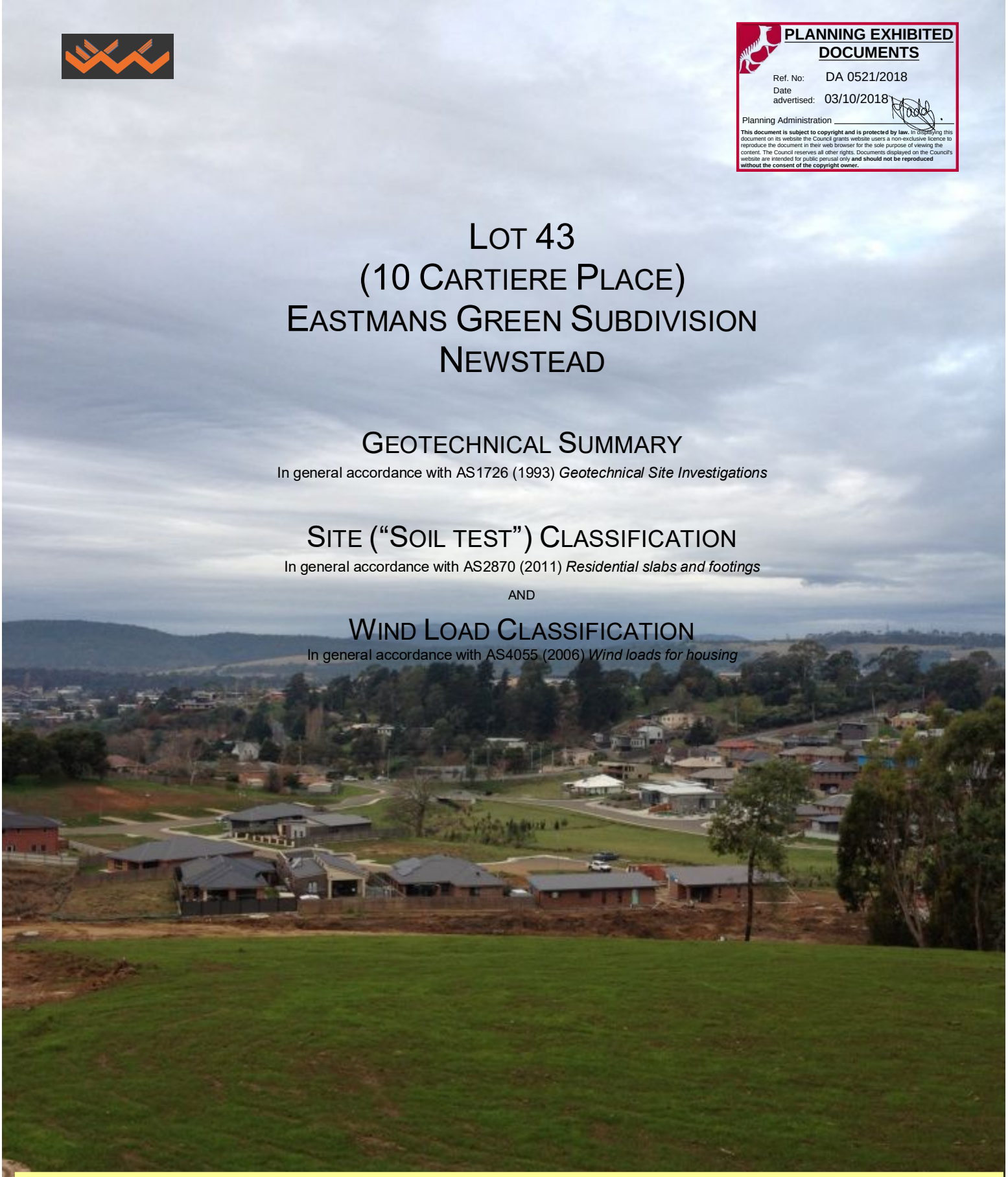
SITE ("SOIL TEST") CLASSIFICATION

In general accordance with AS2870 (2011) *Residential slabs and footings*

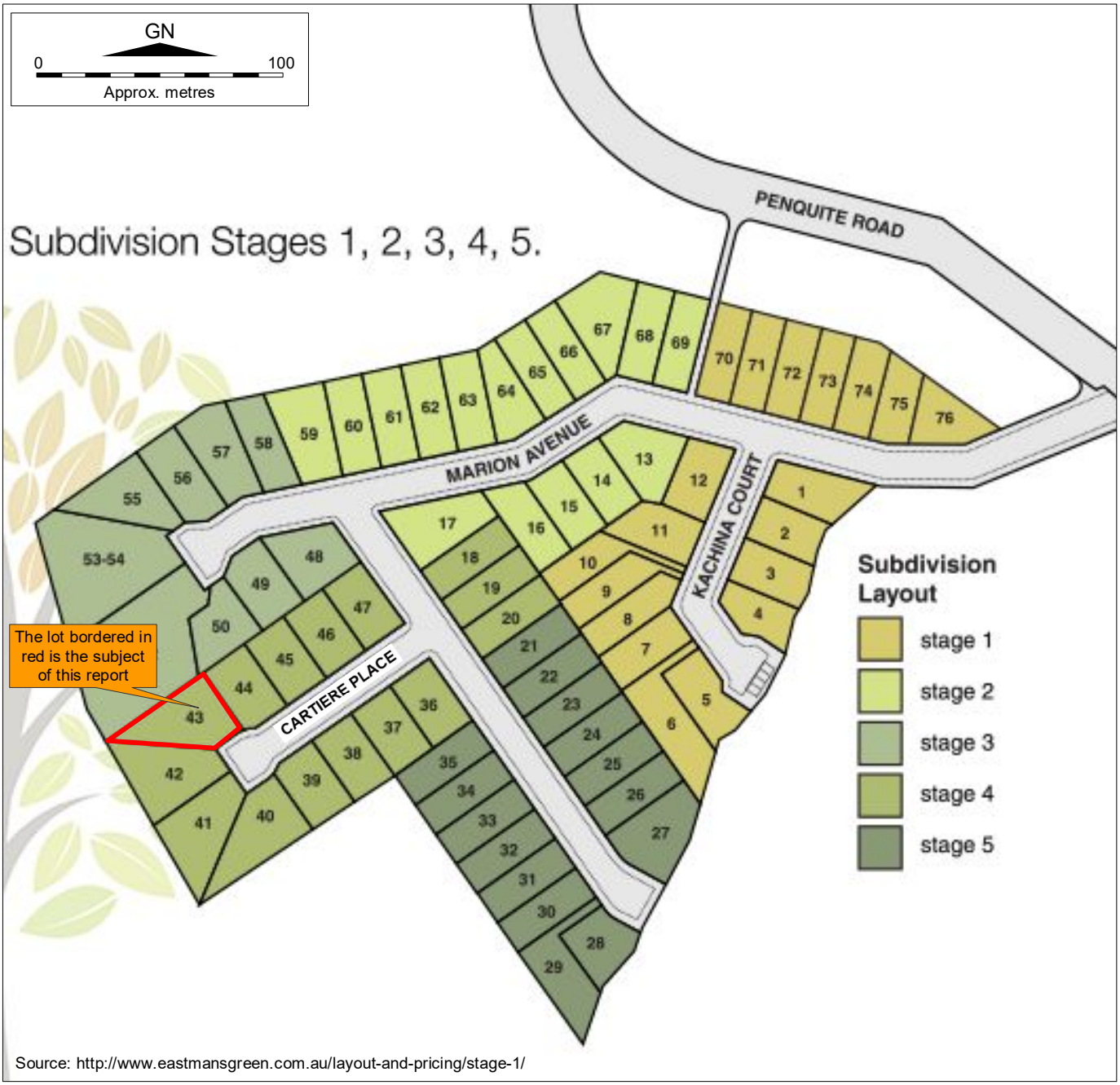
AND

WIND LOAD CLASSIFICATION

In general accordance with AS4055 (2006) *Wind loads for housing*



The Eastmans Green Subdivision and its 5 stages



Source: http://www.eastmansgreen.com.au/layout-and-pricing/stage-1/

Geotechnical summary

Risks associated with a variety of geotechnical issues on and near Lot 43 Eastmans Green Subdivision, Newstead range from Very Low to High. This is a normal situation for many undeveloped hillsides in Launceston. Provided the recommendations in Attachment 1, and in the Table on the next page, are followed, the risks will be reduced to, and will remain mostly in, the Very Low – Low range during and after residential development.

AS2870 Site Classification

In accordance with Australian Standard 2870 (2011) *Residential slabs and footings*, the area **abcd** shown on the accompanying site plan (page 6) of Lot 43 Eastmans Green Subdivision, Newstead is classified as **Class H1**.

Footings for Class H1 sites should be certified by a suitably qualified and experienced engineer. The engineer should visit the site.

AS4055 Wind Classification

In accordance with Australian Standard 4055 (2006) *Wind loads for housing*, the following wind load classification is made for a house site on Lot 43 Eastmans Green Subdivision, Newstead:

Wind Region	**A**
Terrain Category classification	**TC3**
Topographic classification	**T2**
Shielding classification	**PS**
Wind classification	**N2**
Max. Design Gust Wind Speed	**26m/s** [Serviceability limit state ($V_{h,s}$)]
	40m/s [Ultimate limit state ($V_{h,u}$)]

W. C. Cromer

Principal
11 August 2018

This report is in two parts
PART 1 of this AS2870 assessment is this report accompanied by the following Attachments:

Attachment 1. Summary of geotechnical issues, consequences and risks to house site, before and after management of the risks
Attachment 2. Title plan
Attachment 3. Excavation logs of test pits
Attachment 4. Site and test pit photographs
Attachment 5. Good and poor hillside construction practices
Attachment 6. Important notes about this report

PART 2 of this AS2870 assessment contains important additional geotechnical information in a separate report entitled *Geotechnical Notes to accompany AS2870 ("soil test") reports for individual lots, Eastmans Green Subdivision, Newstead.* It is freely available on-line at http://eastmansgreen.com.au/ and http://www.williamccromer.com/ and hard copies are available on request free of charge.

Stakeholders shall consider both Part 1 and Part 2 for the development of this lot.

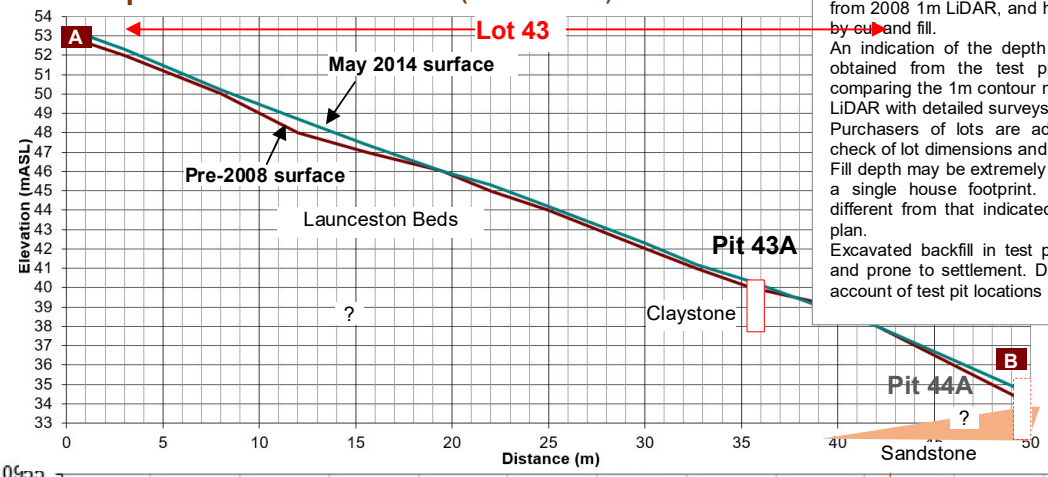
Summary of geotechnical information for this Lot

Test pits dug	43A
Photographs	Of the pit and excavated materials
Dumpy levelling	None
DCP profiles	1; range 0.5 >20 blows/100mm
Shear vane readings	3; range 185 to >250kPa
Shrink-swell tests	1. Iss = 3.2 % for clay In pit 43A
Est. ground surface movement	50-550mm (Class H1 based on log of test pit 43A, and the following depth ranges and Iss estimates: 0-0.3m (Iss = 0.5%); 0.5 – 1m (Iss = 4.2% as tested in pit 44A); 1 – 2.7m (Iss in the range 0.5– 1% claystone)
AS2870 site classification	Class H1 based on shrink-swell testing and test pit profiles
Dispersion tests	None
Fill	0.4m in pit 42A; 0.1m in pit 42B; 0.3m in pit 43A; 0.1m in pit 44Al 0.5m in pit 44B; 0.3m in pit 52C; expect no more than about 0.5m over lot.
Soils	Absent; previously stripped from lot.
Geology	Launceston Beds: weakly consolidated Tertiary claystone in pit 43A; sandstone in pits 44A and 44B
Groundwater	None encountered
Subsurface conditions	Expect claystone lower part of lot, and weakly cemented sandstone upper part; latter with colluvium?
	Assume moderately reactive clays present over lot.
	Bearing capacities variable across lot (see DCP profiles on test pit logs). May be locally inadequate in colluvium? on higher parts of lot; generally adequate on lower parts.
	Risk of settlement low
	Risk of slope instability low to moderate .See Attachment 1.

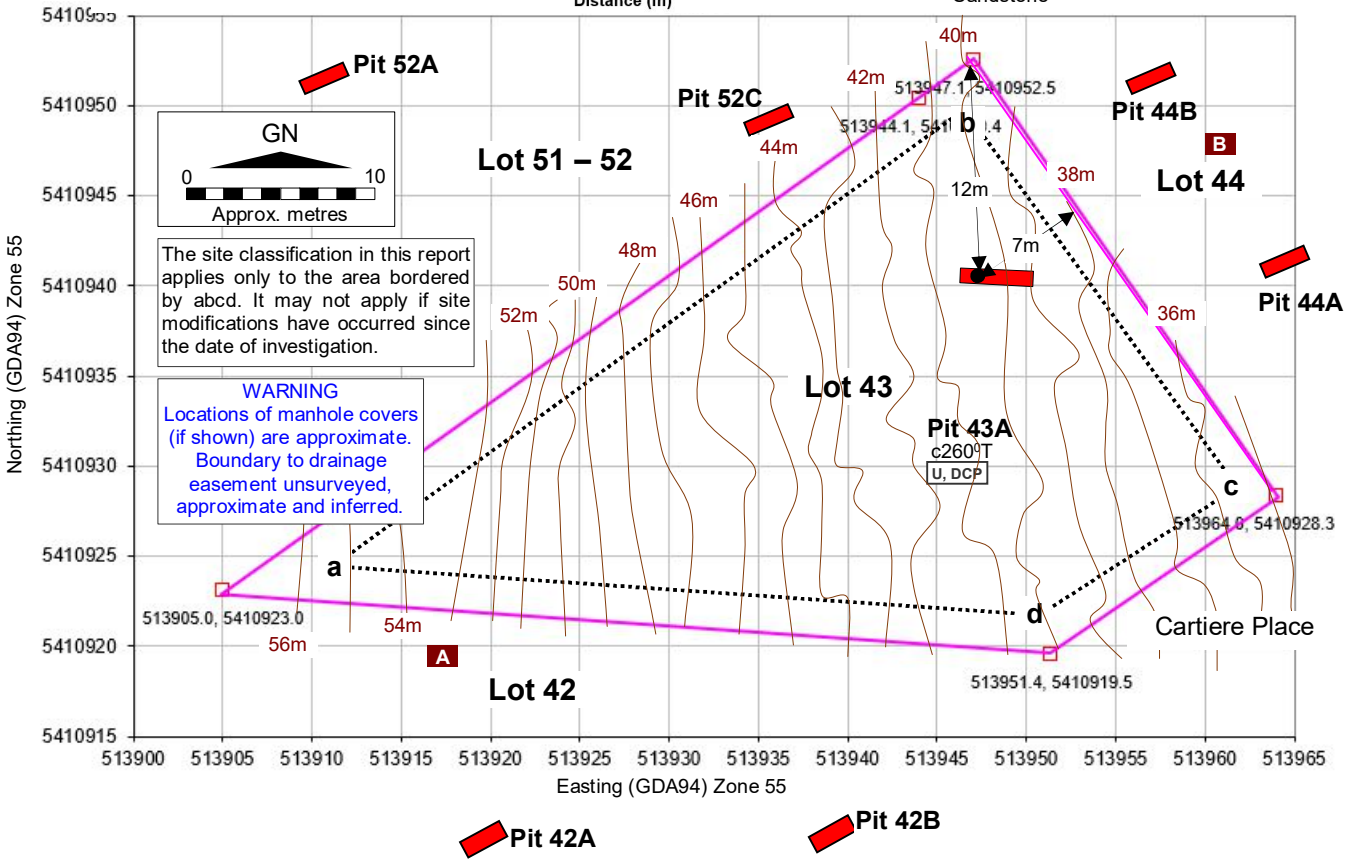
Recommendations

General	Adopt good hillside construction practices (Attachment 5). Keep records/photographs of all construction stages (Attachment 6).
General	Avoid loading the slope unnecessarily, at all scales. Consider building with flexible, light-weight materials.
Surface drainage	Ensure upslope surface runoff is diverted from lot by open cut-off drain; maintain drain.
Test pits	Locate backfilled test pit; design footings to avoid it
Footings	Piers instead of, or supporting, strip or raft footings, are recommended. All footings should penetrate fill (if present) and will therefore be of variable depth
Footing target and depth	Recommended target is Tertiary claystone at about 1m at pit 43A, and perhaps weakly cemented sandstone (possibly beneath colluvium) in higher parts. Visually inspect bottom material to ensure target has been reached. Clean base of each footing Surface 1m or so of any pier hole to be lined with double thickness of Fortecon plastic or similar to minimise friction with reactive soil. If concrete-poured, avoid flanging at surface.
Footings inspection	Engineering inspection desirable; before pouring concrete, and before installation of screw or driven piers
Excavations	Avoid excavations or minimise height and number. Support all excavations higher than about 0.8m with engineered, drained retaining walls. Construct upslope cut-off drains. All drains to discharge to stormwater system.
Treatment of fill embankments	Fill embankments should be supported by engineered and drained retaining walls or battered gentler than 1 vertical:2 horizontal (<26^0), or both. Avoid using fill as a weight bearing material, unless its placement is controlled using engineering principles
Access drives	Where the grades of access drives exceed about 15% (8.5^0), the access should be constructed with asphalt or concrete surfaces.
Services	All water and sewer services should be in flexible pipework, laid in trenches aligned up and down the slope as far as possible. All trenches to be backfilled with clayey materials (not screened gravel). Where stormwater or sewer pipes are constructed on grades greater than 15% (8.5^0), they should be constructed with anchors to prevent movement down the slope.
Revegetating	Restrict tree planting or removal. See Attachment 1.
Subsurface issues	Contact Bill Cromer (0408 122 127; billcromer@bigpond.com) if unexpected site or subsurface conditions are found. Take photographs of the conditions.

Site plan and cross section (natural scale)



WARNINGS
The contour lines shown in this site plan have been obtained from 2008 1m LiDAR, and have since probably been altered by cut and fill.
An indication of the depth of fill (if fill is present) can be obtained from the test pit logs in this report, and by comparing the 1m contour map generated from the 2008 1m LiDAR with detailed surveys of the current land surface.
Purchasers of lots are advised to commission a survey check of lot dimensions and a detail survey.
Fill depth may be extremely variable across a lot, and across a single house footprint. The distribution of fill may be different from that indicated in test pit logs, or on this site plan.
Excavated backfill in test pits is uncontrolled, low strength and prone to settlement. Designers and builders must take account of test pit locations in footing design and placement.



Surveyed peg with grid coordinates. XY data file (to 3 decimal places, but rounded to one) supplied by D. J. McCulloch & Associates, Surveyors, Riverside. Grid and all other features added by William C Cromer Pty Ltd. is the section line on the next page.

Pre-subdivision contours (mASL) at 1m intervals, from LiDAR coverage based on the 2008 Climate Futures. Prospective or actual land purchasers are strongly advised to do a detail survey of the lot prior to building design to (a) establish that survey pegs as shown are accurately located, and (b) compare the pre-subdivision contours shown here with present-day contours to estimate the extent and depth of ground disturbance (cut or fill) to assist in footing and house design.

Areas inferred to comprise controlled fill other than sand and deeper than 0.4m, and/or uncontrolled fill deeper than 0.8m for sand and 0.4m for material other than sand,

Pit 62A 040°T
21m

Numbered excavator test pit, approximately drawn to scale. Black dot is deepest part of pit. The alignment of the long axis of the pit is shown as degrees true (°T). Distances from deepest part of pit (black dot) to pegs or other indicated features are accurate to 0.3m. [It will be important to relocate the backfilled test pit(s), and their deepest points, so that the ground disturbance they caused can be accounted for in footing design and location.]

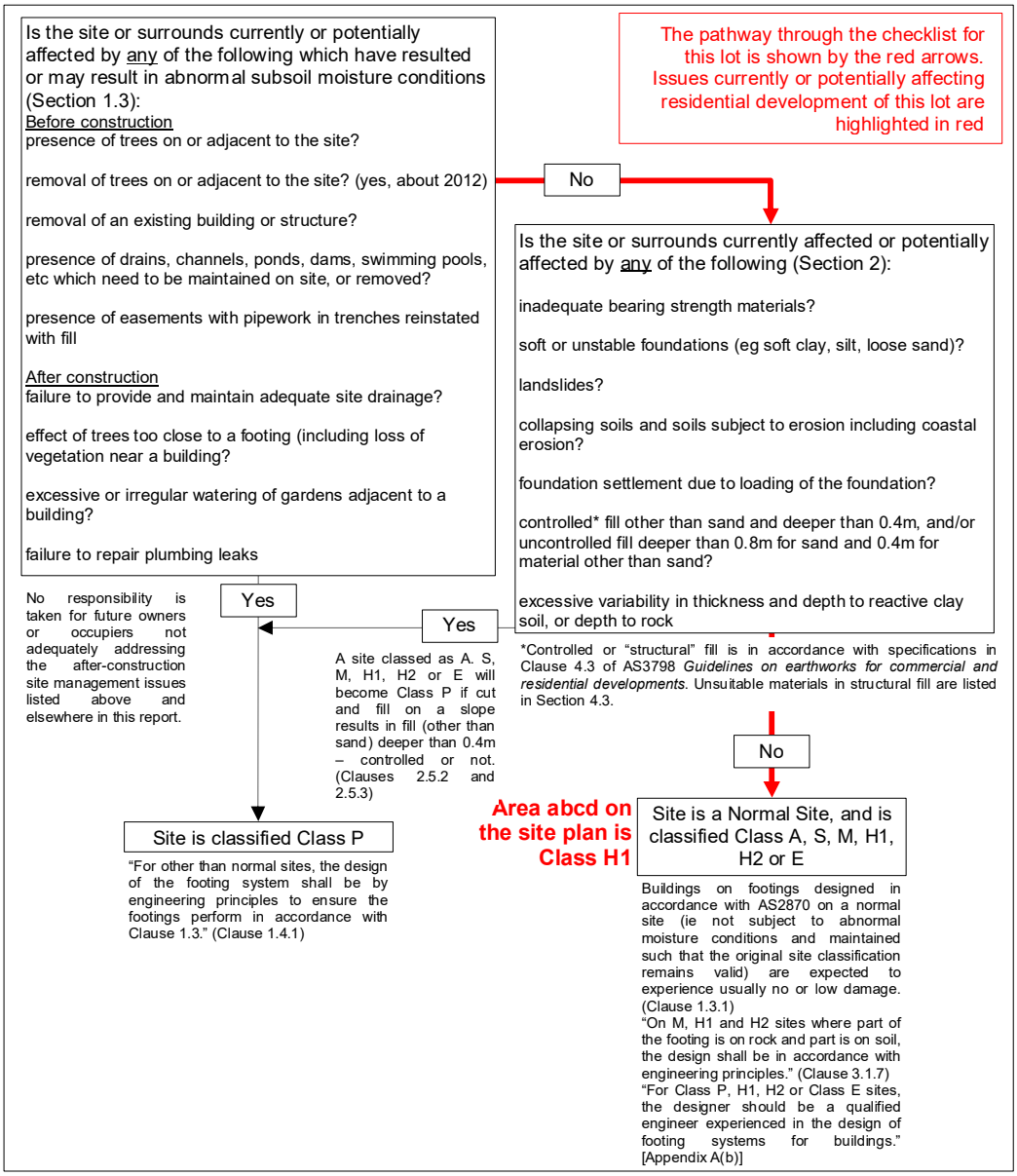
The green figure (where present) is an arbitrary elevation of 21m for the ground surface at (one of) the test pit(s). (No surveyed elevations are available). Other green figures are dumpy-levelled elevations relative to the test pit. Assume elevations are accurate to about 0.1m.

U, DCP

D = Disturbed sample collected; U = Undisturbed sample collected; DCP = Dynamic cone penetrometer profile done

Checklist for AS2870 site classification

Derived from and in general accordance with AS2870:2011 *Residential slabs and footings*



Attachment 1

Summary of geotechnical issues, consequences and risks to house site on Lot 43, before and after treatment (management) of the risks

Summary of geotechnical issues, risks and treatments for residential development

			Before treatment				After treatment		
	Issue #	Issue	Likelihood of occurrence	Consequences to property	Level of risk to property	Recommended risk treatment	Likelihood of occurrence	Consequences to property	Level of risk to property
Landslide/slope instability	1	Rotational or translational deep seated earth or debris slide. (Scenario 1 in Figure 4.3 of Attachment 4 in PART 2.)	Rare	Minor to Major	Very Low to Low	None	Rare	Minor to Major	Low
	2	Rotational or translational shallow earth or debris slide. (Scenario 2 in Figure 4.3 of Attachment 4 in PART 2.)		Minor to Medium			Unlikely		
	3	Translational earth or debris slide, fall or topple: Very small scale; on steep, unsupported (artificial) excavations. (Scenario 3 in Figure 4.3 of Attachment 4 in PART 2.)	Likely to Almost Certain	Minor	Moderate to High	Control stormwater discharge. Incorporate good hillside construction practices. Avoid or minimise excavations. Support excavations with engineered, drained retaining walls designed to resist lateral movement. Ensure fill placement is controlled, with appropriate batter angles or drained support. See Attachment 5.	Unlikely	Minor	
	4	Rotational or translational earth or debris slide: Very small to small scale; shallow, in fill (eg beneath or next to houses; on the outside of access drives). (Scenario 4 in Figure 4.3 of Attachment 4 in PART 2.)	Possible to Likely	Medium				Insignificant to Minor	Very Low to Low
	5	Earth or debris flow: Very small to small scale; shallow; in soil and/or uncontrolled fill. (Scenario 5 in Figure 4.3 of Attachment 4 in PART 2.)	Unlikely	Minor	Low			Minor	Low
	6	Soil creep. (Scenario 6 in Figure 4.3 of Attachment 4 in PART 2.)					Rare		Very low

ummary of geotechnical issues (continued)

		Before treatment				After treatment		
Issue #	Issue	Likelihood of occurrence	Consequences to property	Level of risk to property	Recommended risk treatment	Likelihood of occurrence	Consequences to property	Level of risk to property
7	Surface soil erosion	Possible	Minor	Moderate	As for Issues 2-6. Revegetate (but no large trees close to house (see below)	Unlikely	Minor	Low
8	Tunnel erosion (dispersive soils)	Rare	Medium	Low	As for Issue 2. Revegetate (but no large trees close to house (see below)			
9	Low strength materials (eg uncontrolled fill, soft soils)	Unlikely			Design footing apprpriate to site classificaton. Pier all footings for house through any fill identified during construction. Refer to accompanying site plan.			
10	Foundation movement due to reactive or unstable soils	Likely		High	As for Issue 9 and 11. Control drainage. Avoid ponding of water against buildings. Avoid gardens adjacent to building; Do not overwater. Repair plumbing leaks promptly.			
11	Foundation movement due to tree removal or planting	Likely			Restrict tree planting to (and tree removal from) a distance from the house of 1.5x, 1x and 0.75x mature tree height for Class P, (H1, H2) and M sites respectively			
12	Restricted surface drainage	Likely	Minor	Moderate	Divert surface drainage away from buildings to reticulated system	Possible	Insignif	Very Low
13	Flooding or waterlogging	Unlikely	Medium	Low	As for Issues 10 and 12	Unlikely	Minor	Low
14	Shallow groundwater seepages		Medium		Divert seepages with cut-off drains behind retaining walls, or (if practicable) in herring bone alignment diagonally down slope, away from buildings			
15	Site contamination from previous activities		Minor to Medium		Visual examination during construction. Testing and/or removal of suspect materials		Minor to Medium	
16	Earthquake risk	Almost certain (mag. <5); Likely (mag. >5)	Insignificant to Medium	Low to Moderate	Accept risk. Risk applies to all houses to varying degrees depending on quake intensity, geology and house construction	Almost certain (mag. <5); Likely (mag. >5)	Insignif to Medium	Low to Moderate

1. The assessments are unavoidably subjective to varying degrees.
2. Further reading: AGS (2007c). Practice Notes Guidelines for Landslide Risk Management. Australian Geomechanics Vol 42 No 1 March 2007

Attachment 2
Title plan

OWNER: ECOAST HOMES PTY LTD

FOLIO REFERENCE: F/R

GRANTEE: PART OF 60 ACRES LOCATED TO WILLIAM CAREY, PART OF 60 ACRES GRANTED TO ALEXANDER WADDLE & PART OF LOT29230, 17A-0R-1P, GRANTED TO JOHN HALLEY

PLAN OF SURVEY

BY SURVEYOR DALLAS McCULLOCH
D.J.McCULLOCH SURVEYING
RIVERSIDE, TASMANIA 7250

LOCATION
CITY OF LAUNCESTON

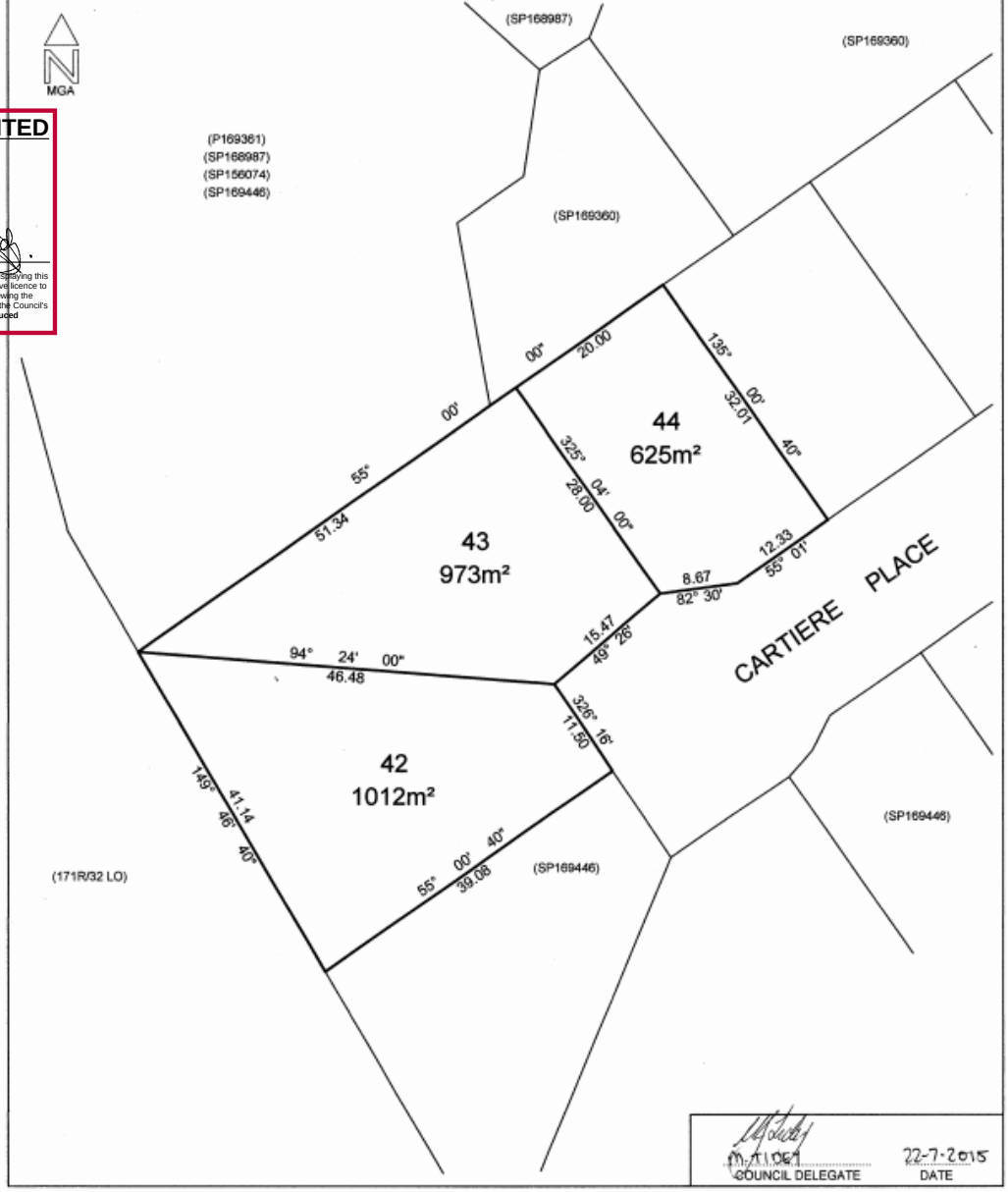
SCALE 1 : 400 LENGTHS IN METRES

Registered Number

APPROVED
EFFECTIVE FROM .....

Recorder of Titles

MAPSHEET MUNICIPAL CODE No. 120 (5041-54) | LAST UPI No. | LAST PLAN No. | ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN



COUNCIL DELEGATE 22-7-2015 DATE

Attachment 3

Excavation logs of test pits 42A, 42B, 43A, 44A and 44B

William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists
http://www.williamccromer.com/

Excavation log

EG42A
Sheet 1 of 1

Project – Eastmans Green Subdivision, Newstead — Location – Lot 42

Coordinates	513919mE 5410913mN	**Exposure type**	Excavator test pit	**Date dug**	11 March 2015
Datum	GDA94	**Equipment**	12t Caterpillar with 0.6m GP bucket with 3 teeth	**Date logged**	11 March 2015
RL	Approx. 46m (unsurveyed)			**Logged by**	W. C. Cromer
Dimensions (m)	Depth 2.9 Length 3 Width 0.7	**Operator**	Harry Bracey	**Checked by**	W. C. Cromer

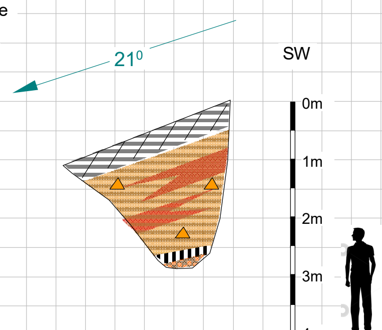
Penetration	Support	Water	Notes (Samples and tests)	Depth (metres)	USCS	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	Moisture condition	Consistency / Density index	Hand penetrometer (kPa)	Shear Vane (kPa)	Dynamic cone penetrometer (Blows per 100mm)	Structure, geology and interpretation
	None	GNE		0	CL	Silty CLAY and clayey SILT: grey; pedal; cloddy; low plasticity	D	H				Fill
			D; U50 0.5–0.8. Emerson Class 4, 5 or 6 @0.6m. Not suitable for testing	0.5	CH	CLAY: coarsely mottled grey, orange and red/brown; high plasticity; occasional angular sandstone clasts to 20mm	M<PL	VSt		>240KPa		Quaternary colluvium?
			U50 1.1–1.4. Iss = 2.1%, m = 26%, ρ = 1.84g/cc	1.3						186KPa@1.3m		
				1.7						184KPa@1.7m		
				2.2						220KPa@2.2m		
				2.5	CH	CLAYSTONE: grey; app. dip 11° to 240°T						Tertiary sediments
						SANDSTONE: orange brown; subhorizontal; weakly cemented	D	D-VD				
				2.9		Hole terminated at required depth of 2.9m in Tertiary sandstone						

Dispersion testing @ 0.6m

24hrs: slaking; no dispersion; remoulding no dispersion

1m V and H scale

Test pit is aligned 237°True



45mm (Class H1) = ground surface movement estimated from test pit log and Iss =2.1% for depth interval 0 – 2.5m

Moisture and density
D = Dry M = Moist W = Wet
m=31% = lab-measured moisture content of U50 sample
ρ = 1.86g/cc = lab-measured density of U50 sample

Samples
D = disturbed; U50 = undisturbed; 50mm diameter drive tube (top & bottom depths shown)

Water
Water level
Water inflow
Water outflow
GNE = Groundwater not encountered

Penetration
1 2 3 4
No resistance
Refusal

Graphic log key
CLAY (CH, CL)
SAND (SP)
SILT (SM)
GRAVEL (GP, GW)
COBBLES (63-200mm)
BOULDERS (>200mm)
SHELLS
SHELL FRAGMENTS
ROOTS
FRACTURES

Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

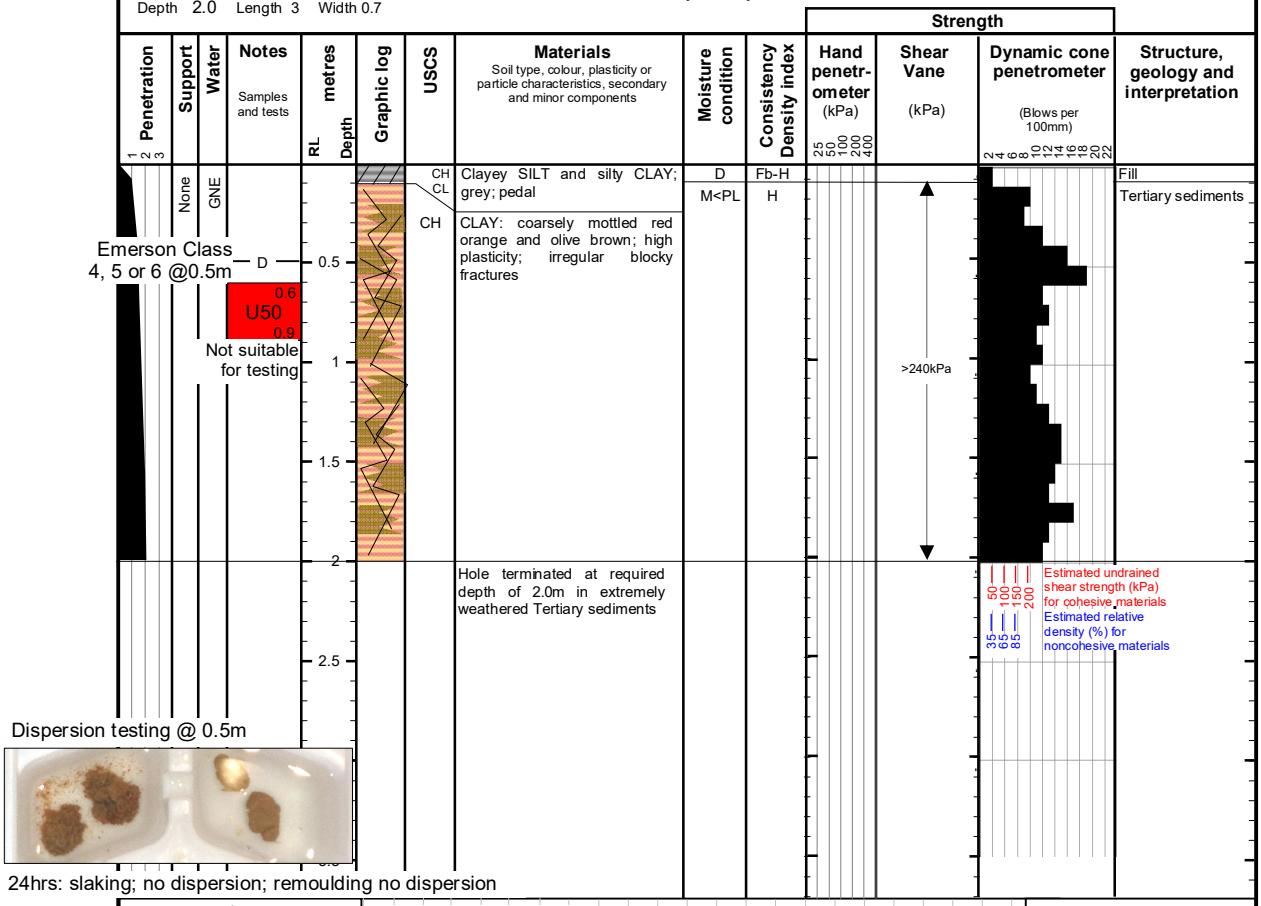
William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists
http://www.williamccromer.com/

Excavation log

EG42B Sheet 1 of 1

Project – Eastmans Green Subdivision, Newstead **Location – Lot 42**

Coordinates	513958mE 5410913mN	**Exposure type**	Excavator test pit	**Date dug**	11 March 2015
Datum	GDA94	**Equipment**	12t Caterpillar with 0.6m GP bucket with 3 teeth	**Date logged**	11 March 2015
RL	Approx. 41.5m (unsurveyed)			**Logged by**	W. C. Cromer
Dimensions (m) Depth 2.0 Length 3 Width 0.7		**Operator**	Harry Bracey	**Checked by**	W. C. Cromer



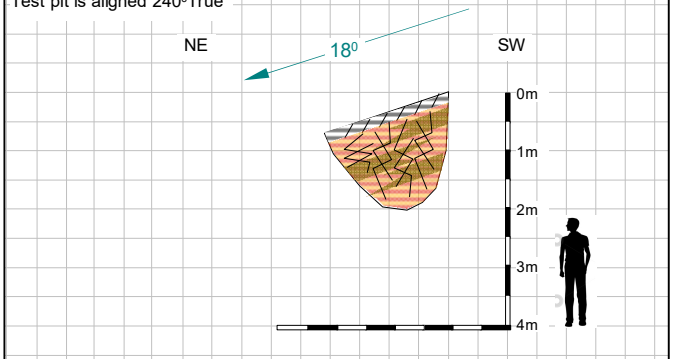
1m
1m
V and H scale

Moisture and density
D = Dry M = Moist W = Wet
m=31% = lab-measured moisture content of U50 sample
ρ = 1.86g/cc = lab-measured density of U50 sample

Samples
D = disturbed; U50 = undisturbed; 50mm diameter drive tube (top & bottom depths shown)

Water
Water level
Water inflow
Water outflow
GNE = Groundwater not encountered

Penetration
1 2 3 4
No resistance
Refusal



50mm (Class H1) = ground surface movement estimated from test pit log and assuming Iss =2.5% for depth interval 0.1 – 2.5m

Graphic log key
CLAY (CH, CL)
SAND (SP)
SILT (SM)
GRAVEL (GP, GW)
COBBLES (63-200mm)
BOULDERS (>200mm)
SHELLS
SHELL FRAGMENTS
ROOTS
FRACTURES

Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists
http://www.williamccromer.com/

Excavation log

EG43A
Sheet 1 of 1

Project – Eastmans Green Subdivision, Newstead
Location – Lot 43

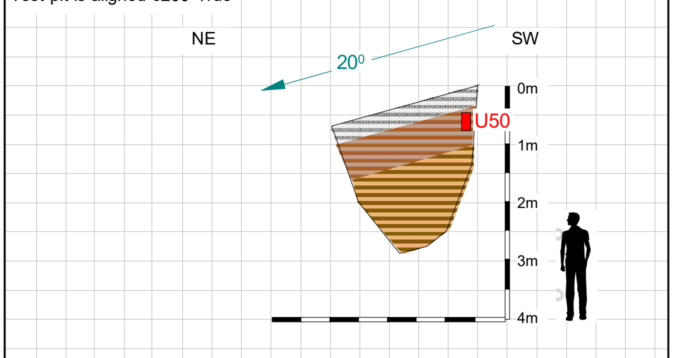
Coordinates	513948mE 5410944mN	**Exposure type**	Excavator test pit	**Date dug**	26 May 2015
Datum	GDA94	**Equipment**	12t Caterpillar with 0.6m GP bucket with 3 teeth	**Date logged**	26 May 2015
RL	40.5m (Estimated)			**Logged by**	W. C. Cromer
Dimensions (m) Depth 2.8 Length 2.5 Width 0.7		**Operator**	Harry Bracey	**Checked by**	W. C. Cromer

Support	Water	Notes (Samples and tests)	Depth (metres)	USCS	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	Moisture condition	Consistency / Density index	Shear Vane (kPa)	Structure, geology and interpretation
None	GNE		0–0.3	CH	CLAY: black; high plasticity, with pebbles, charcoal; cloddy, pedal	M<>PL	Fb-		FILL
		U50 0.6–0.9; Iss=3.2%; m = 31%; ρ = 1.84g/cc	0.3–1.0	CH	CLAY: pinkish orange mottled with light olive grey; high plasticity; irregular hackly fractures with some weakly striated surfaces in 3D; occasional roots; 1cm thick clayey gravel at sharp base	M<PL	VSt	200kPa@0.5m; 180kPa@0.9m	Natural ground Tertiary sediments
			1.0–2.8		CLAY and sandy CLAY: olive grey and orange; blocky fracture with MnO2 on some defect surfaces; some residual bedding with dip c.7-8⁰ to 100⁰T			250kPa@1.3m	Tertiary claystone
			2.8		Hole terminated at required depth of 2.8m in Tertiary claystone				

Dynamic cone penetrometer (Blows per 100mm): 2 4 6 8 10 12 14 16 18 20 22
Estimated undrained shear strength (kPa) for cohesive materials: 50 100 150 200
Estimated relative density (%) for noncohesive materials: 35 65 85
Hand penetrometer (kPa): 25 50 100 200 400

1m V and H scale 1m

Test pit is aligned c260⁰True



50 – 55mm (Class H1) = ground surface movement estimated from log of test pit 43A, and the following depth ranges and Iss estimates: 0-0.3m (Iss = 0.5%); 0.5 – 1m (Iss = 4.2% as tested in pit 44A); 1 – 2.7m (Iss in the range 0.5– 1% claystone)

Moisture and density
D = Dry M = Moist W = Wet
m=31% = lab-measured moisture content of U50 sample
ρ = 1.86g/cc = lab-measured density of U50 sample

Samples
D = disturbed; U50 = undisturbed; 50mm diameter drive tube (top & bottom depths shown)

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Water level
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ROOTS
FRACTURES

Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists
http://www.williamccromer.com/

Excavation log

EG44A
Sheet 1 of 1

Project – Eastmans Green Subdivision, Newstead — Location – Lot 44

Coordinates	513963mE 5410944mN	**Exposure type**	Excavator test pit	**Date dug**	26 May 2015
Datum	GDA94	**Equipment**	12t Caterpillar with 0.6m GP bucket with 3 teeth	**Date logged**	26 May 2015
RL	36.5m (Estimated)			**Logged by**	W. C. Cromer
Dimensions (m)	Depth 2.9 Length 2.5 Width 0.7	**Operator**	Harry Bracey	**Checked by**	W. C. Cromer

Depth (metres)	Penetration (1 2 3)	Support	Water	Notes (Samples and tests)	Graphic log	USCS	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	Moisture condition	Consistency / Density index	Strength: Hand penetrometer (kPa)	Strength: Shear Vane (kPa)	Dynamic cone penetrometer (Blows per 100mm)	Structure, geology and interpretation
0–0.05		None	GNE		Fill	CH	CLAY: yellowish orange; high plasticity	M<PL	VSt				FILL
0.05–2.0				U50 0.5–0.8: Iss=4.2%, m = 27%, ρ = 1.90g/cc; U50 1.2–1.5: Iss=1.0%, m = 20%, ρ = 2.12g/cc	Clay	CH	CLAY: pinkish orange mottled with light olive grey; high plasticity; trace-some sand	M<PL	VSt-H		172kPa@0.6m; 192kPa@1m; >260kPa@1.5m		Natural ground; Tertiary sediments
2.0–2.9					Sand		SANDSTONE; orange; weakly cemented; low rock strength; no dip measurement	D	Fb-VD				
2.9							Hole terminated at required depth of 2.9m in Tertiary sandstone						

Hand penetrometer scale: 25 50 100 200 400. Dynamic cone penetrometer scale: 2 4 6 8 10 12 14 16 18 20 22.

Estimated undrained shear strength (kPa) for cohesive materials: 50 100 150 200
Estimated relative density (%) for noncohesive materials: 35 65 85

1m / 1m V and H scale

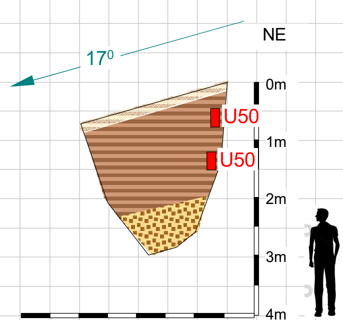
Moisture and density
D = Dry M = Moist W = Wet
m=31% = lab-measured moisture content of U50 sample
ρ = 1.86g/cc = lab-measured density of U50 sample

Samples
D = disturbed; U50 = undisturbed; 50mm diameter drive tube (top & bottom depths shown)

Water
Water level
Water inflow
Water outflow
GNE = Groundwater not encountered

Penetration
1 2 3 4
No resistance
Refusal

Test pit is aligned c220⁰True



70mm (Class H2) = ground surface movement estimated from test pit log and Iss results

Graphic log key
CLAY (CH, CL)
SAND (SP)
SILT (SM)
GRAVEL (GP, GW)
COBBLES (63-200mm)
BOULDERS (>200mm)
SHELLS SHELL FRAGMENTS
ROOTS
FRACTURES

Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

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Excavation log

EG44B
Sheet 1 of 1

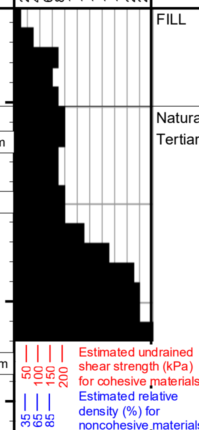
Project – Eastmans Green Subdivision, Newstead

Location – Lot 44

Coordinates	513957mE 5410954mN	**Exposure type**	Excavator test pit	**Date dug**	28 May 2015
Datum	GDA94	**Equipment**	12t Caterpillar with 0.6m GP bucket with 3 teeth	**Date logged**	28 May 2015
RL	37m (Estimated)			**Logged by**	W. C. Cromer
Dimensions (m)	Depth 3.3 Length 2.5 Width 0.7	**Operator**	Harry Bracey	**Checked by**	W. C. Cromer

Penetration (1 2 3)	Support	Water	Notes (Samples and tests)	Depth (metres)	Graphic log	USCS	Materials (Soil type, colour, plasticity or particle characteristics, secondary and minor components)	Moisture condition	Consistency / Density index	Hand penetrometer (kPa)	Shear Vane (kPa)	Dynamic cone penetrometer (Blows per 100mm)	Structure, geology and interpretation
	None	GNE		0–0.5		CH	CLAY: yellowish and pinkish orange; high plasticity; trace charcoal and timber	M>>PL	S				FILL
			U50 0.5–0.8; Iss=3.3%; m = 30%; ρ = 1.82g/cc	0.5–1.6			CLAY: yellowish brown and pinkish orange; high plasticity	M<>PL	VSt		224kPa@0.7m; 248kPa@1m		Natural ground Tertiary sediments
				1.6–2.3		GW	Sandy GRAVEL: pinkish red; nonplastic	M	D-VD		>260kPa@1.8m		
				2.3–3.3			SANDSTONE; yellowish orange; weakly cemented; irregular blocky fracture; low rock strength; no dip	D-M	D-VD				
				3.3			Hole terminated at required depth of 3.3m in Tertiary sandstone						

Hand penetrometer scale: 25 50 100 200 400
Dynamic cone penetrometer scale: 2 4 6 8 10 12 14 16 18 20 22



1m V and H scale

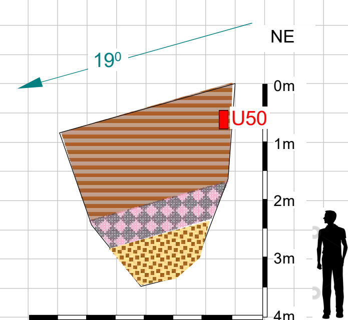
Moisture and density
D = Dry M = Moist W = Wet
m=31% = lab-measured moisture content of U50 sample
ρ = 1.86g/cc = lab-measured density of U50 sample

Samples
D = disturbed; U50 = undisturbed; 50mm diameter drive tube (top & bottom depths shown)

Water
Water level
Water inflow
Water outflow
GNE = Groundwater not encountered

Penetration
1 2 3 4
No resistance
Refusal

Test pit is aligned c220°True



60mm (Class H2) = ground surface movement estimated from test pit log and Iss result

Graphic log key
CLAY (CH, CL)
SAND (SP)
SILT (SM)
GRAVEL (GP, GW)
COBBLES (63-200mm)
BOULDERS (>200mm)
SHELLS
SHELL FRAGMENTS
ROOTS
FRACTURES

Consistency (silt, clay, sandy clay, silty clay) VS = Very soft (<25kPa; exudes in fingers when squeezed); S = Soft (25-50kPa; easily penetrated by fist); F = Firm (50-100kPa; easily penetrated by thumb); St = Stiff (100-200kPa; indented by thumb, penetrated with difficulty); VSt= Very Stiff (200-400kPa; easily penetrated by thumbnail); H = Hard (>400kPa; indented by thumbnail with difficulty); Fb = Friable (crumbles or powders when scraped by thumbnail)
Relative density (sand and gravel) VL = Very loose (ravelling); L = Loose (easy shovelling); MD = Medium dense (hard shovelling); D = Dense (picking); VD = Very dense (hard picking)

Attachment 4
Site and test pit photographs

The staff in these photographs is graduated in yellow and white sections each one metre long.
The numbers on the staff are decimetres (tenths of a metre).

The main photograph depicts the soil profile in the test pit.
Smaller photos (if present) show the materials excavated from the pit, the location of the pit in relation to roads, etc, and other aspects of interest as indicated.

Attachment 5

(4 pages)

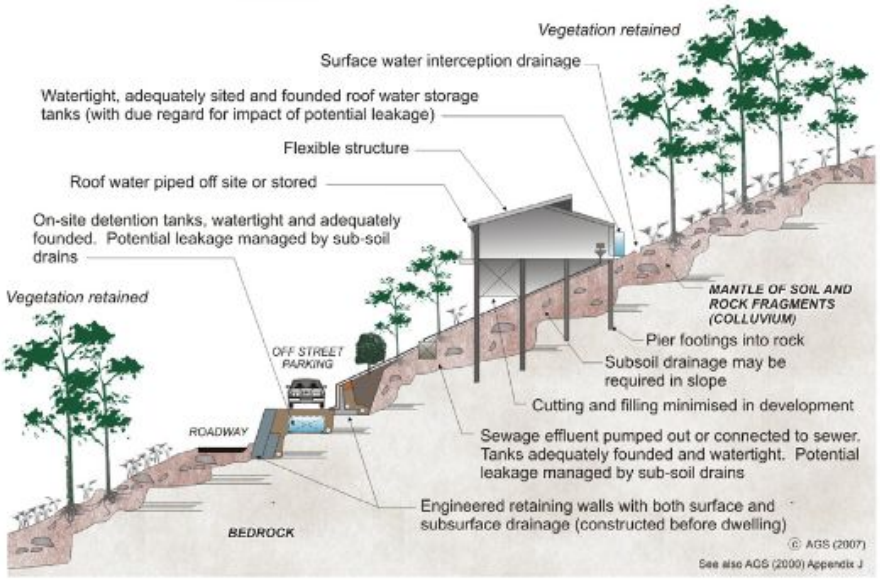
Good and poor hillside construction practices

AGS 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 belowthe 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.

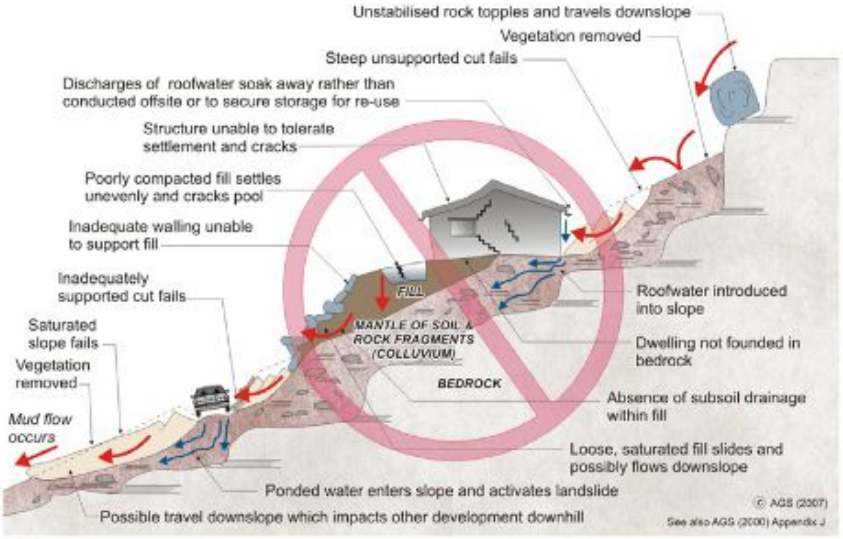
Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact 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

174 Australian Geomechanics Vol 42 No 1 March 2007

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 flowpaths". 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

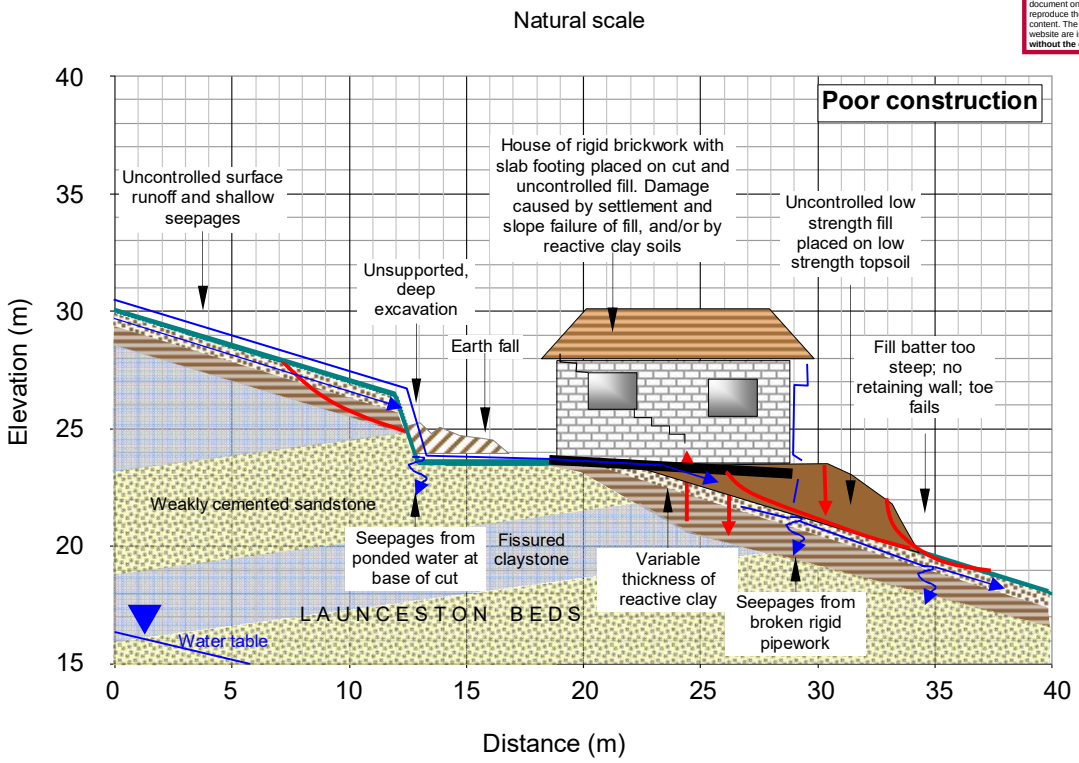
More information relevant to your particular situation may be found in other Australian GeoGuides:

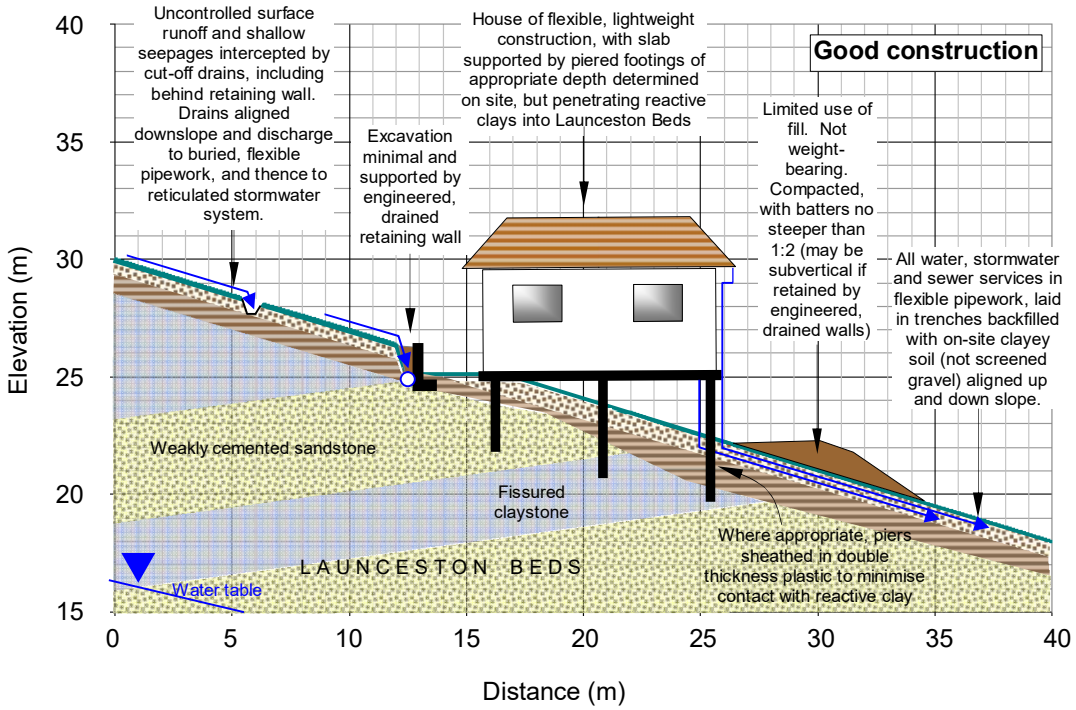
- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal 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.

Generalised good and poor construction practices for hillsides in Launceston

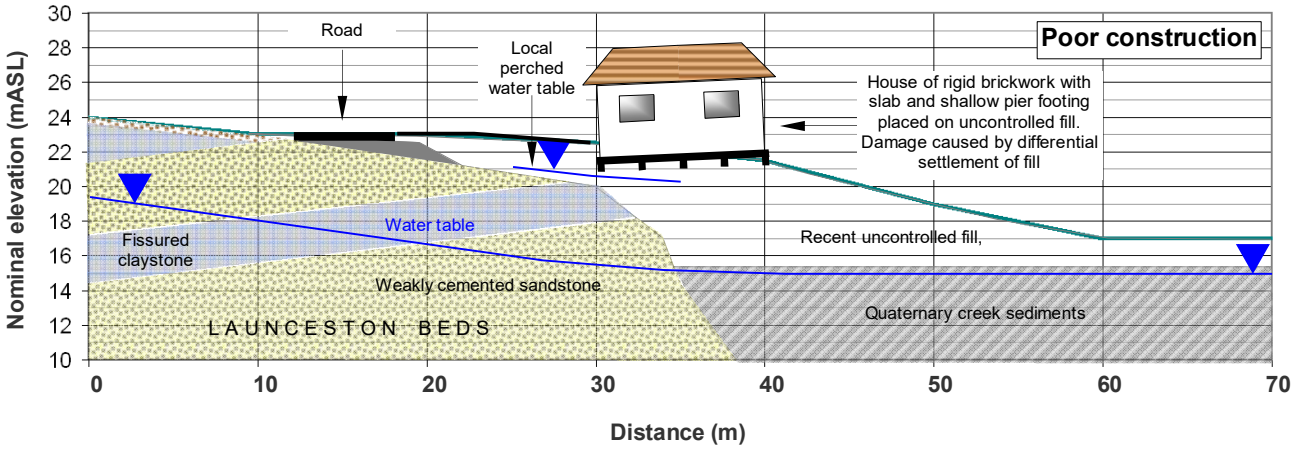
These schematic cross sections apply to houses on hillsides on geologic materials called the Launceston Beds. See Attachment 3 of Part 2 of this report.

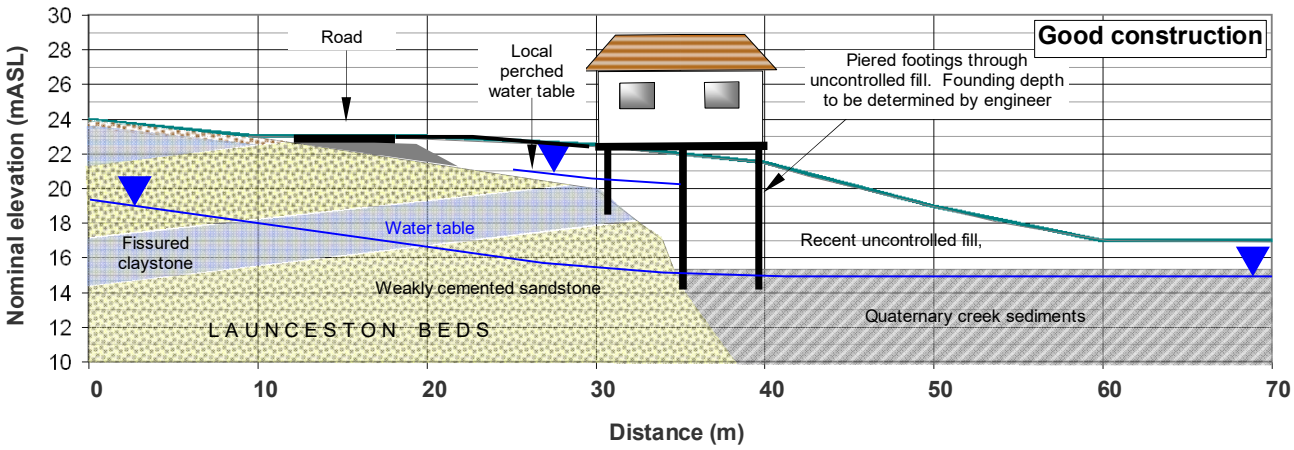




Generalised good and poor hillside construction practices on fill

Natural scale





Attachment 6

(2 pages)

Important notes about this report

Background information

William C Cromer Pty Ltd has been engaged by Ecoast Homes Pty Ltd to prepare site classification ("soil test") reports for about 50 lots in the Eastmans Green Subdivision.

The assessments are being done in accordance with Australian Standard 2870:2011 *Residential slabs and footings*, and draft Tasmanian guidelines[1] relating to the draft Tasmanian Landslide Code.

This individual AS2870 soil test report contains geotechnical information specific to the lot in question and is freely available at http://eastmansgreen.com.au/ It is PART 1 of the AS2870 site assessment for the lot.

Important geotechnical information is common to all lots in the subdivision. Rather than repeat this information in each individual report, it was thought preferable to provide it as a separate document (PART 2), freely available at http://eastmansgreen.com.au/ and http://www.williamccromer.com/

PART 1 and PART 2 together constitute the AS2870 site classification for this lot.

Design of footing systems for this site

Recommendations for a footing system in this report do not preclude the use of alternative footing systems based on sound engineering principles sensitive to the site.

Implications for AS2870 reports from the E3.0 Tasmanian Landslide Code and guidelines

Most of the Eastmans Green Subdivision is in the Medium landslide hazard band (see Attachment 1 of PART 2). A general Landslide Risk Management (LRM) Plan has been completed for the subdivision as Attachment 4 in PART 2.

Refer to this report as:

Cromer, W. C. (2018). *Geotechnical summary, site classification and wind classification, Lot 43 Eastmans Green Subdivision, Newstead.* Unpublished report for Ecoast Homes Pty Ltd by William C. Cromer Pty. Ltd., 11 August 2018.

Dissemination of information is important

New geotechnical information is contained in this report. The information may be useful to regulators and other geotechnical practitioners. Dissemination of such knowledge is important.

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William C Cromer Pty Ltd may submit hard or electronic copies of this report to Mineral Resources Tasmania to enhance the geotechnical database of Tasmania.

This report is freely available at http://eastmansgreen.com.au/ and http://www.williamccromer.com/

[1] Cromer, W. C. (2014). *Building for landslide: Geotechnical guidance for regulators and practitioners using the Tasmanian Landslide Code.* Report for the Tasmanian Department of Premier and Cabinet by William C. Cromer Pty. Ltd., June 2014).

Other reports on this subdivision

William C Cromer Pty Ltd produced detailed geotechnical reports (including landslide risk management, LRM) for Ecoast Homes Pty Ltd for the original Eastmans Green subdivision:

- Cromer, W. C. (2009). *Geotechnical assessment, 76 – lot subdivision, Penquite Road, Newstead.* (Unpublished report for ECoast Homes Pty Ltd by William C. Cromer Pty. Ltd., 7 April 2009; 137 pages), and

- Cromer, W. C. (2011). *Geotechnical Assessment Addendum Report, Eastman's Green subdivision, Penquite Road, Newstead.* (Unpublished report for ECoast Homes Pty Ltd by William C. Cromer Pty. Ltd., 22 May 2011; 33 pages)

Both are available at http://eastmansgreen.com.au/ and http://www.williamccromer.com/

Suggestions about how Tasmanian practitioners should prepare AS2870 soil test reports for houses are available at http://www.williamccromer.com/soil-testing-for-houses/

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