

Dartanyon Pty Ltd
c/- John M. Daly & Associates Pty Ltd
PO Box 25
CAMPBELLTOWN NSW 2560

Project 89414.00
25 May 2018
R.001.docx
GRW

Attention: Mr Shane Gray

Email: sgray@jmd.com.au

Dear Sirs

Plan Review
Proposed Residential Subdivision
Picton East Development, Picton

1. Introduction

As requested, Douglas Partners Pty Ltd (DP) has reviewed existing information and the plans titled Picton East Development Zoning Plan – Sheets 1 – 4 (Ref 12122B-E2) and Picton East Development Overall Plan – Sheets 1 – 3 (Ref 12122B-E3) by John M Daly & Associates Pty Ltd (JMD). The review was undertaken to provide geotechnical comment relevant to the road and lot layout for a proposed residential subdivision at the Picton East Development, and to assess potential impacts on the surrounding landscape.

Reports on slope stability assessment (Project 76579.01, Rev 0, dated 17 September 2013, Project 76579.01 Rev B, dated 20 August 2014 and Project 76579.05, dated 2 February 2015) were prepared by DP as part of an overall land capability assessment for a proposed subdivision at Reeves Creek, now Picton East Development, Picton.

The assessment of the urban capability of the site was principally carried out on the basis of geotechnical considerations, specifically risk of slope instability, soil erodibility, water-logging potential and foundation conditions. In summary, it was considered that extensive slope instability affects, or has the potential to affect, the moderately to steeply sloping hillsides of a ridge extending south-easterly from Vault Hill through the eastern section of the site. As such, slope instability was considered a major constraint to development and that high and very high risk areas should not be developed for residential use. The gently sloping, lower and footslope areas of the site were, however, assessed as suitable for residential development, although some areas will require remedial and precautionary works to achieve acceptable risk to property. Additionally, it was recommended that detailed geotechnical investigation and assessment will be required in: proposed areas of cut for roadways or lots; for determination of final retaining, pavement thickness design and lot classification; for the earthworks; and for assessment of mine subsidence.



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2. Plan Review

The following summary points are noted in relation to proposed development layout and details included in the JMD drawings, copies of which are attached for ready reference.

Picton East Development Zoning Plan – Sheets 1 – 4 (Ref 12122B-E2):

These sheets detail:

- the layout of 252 proposed residential lots, ranging from 250 m² to 1500 m², the alignments of new roads with connections to Menangle Street, Baxter Lane and Margaret Street, Picton and the distribution of proposed land zoning.
- A Public Recreation (RE1) and a Rural Landscape Zone (RU2) that generally correspond to areas assessed by DP as high or very high risk of slope instability
- An Environmental Conservation Zone (E2) that mostly corresponds to the course of Reeves Creek and tributary gullies assessed by DP as having erosion and minor slumping constraints for which channel lining and or reprofiling of the drainage paths.
- Three areas of Low Density Residential Zoning (RU) and one Environmental Living (E4) Zoning mostly corresponding to areas of assessed by DP as either currently suitable for residential development or, in some locations, suitable for residential development subject to remedial and precautionary works and good engineering and land management practices for hillside development to achieve an acceptable level of risk to property.
- A line titled 'Geotech Limits' which is consistent with the downslope margin of areas susceptible to new landsliding or remobilisation of debris lobes within the steeper hillslopes as described in the DP reports.

Picton East Development Overall Plan – Sheets 1 – 3 (Ref 12122B-E3):

These sheets include extracts of Drawings 4 and 5 of DP Project 76579.05 that detail landslide susceptibility zones (Zones 5, 6, 6A, 6B, 7 – 16) and the distribution of constraint area. The extracts are overlain with the layout of the proposed residential lots, the alignments of new roads and proposed contour lines, representing the areas of proposed cut and fill associated with lot and road construction.

The following are comments on the distribution of development outlines shown on Sheets 1 - 3:

- The lines of the proposed contours indicate that cutting is restricted, with the exception of one location at the south-eastern of Zone 15 (refer Sheet 2). This area is assessed as having very low to moderate susceptibility to slope instability and assessed by DP as either currently suitable for residential development or, in some locations, suitable for residential development subject to remedial and precautionary works (refer Sheet 3) and good engineering and land management practices for hillside development to achieve an acceptable level of risk to property.
- At the south-eastern corner of Zone 15, the proposed cut contours indicate that a debris lobe would be impacted with the potential for remobilisation of slope instability. Sheet 2, however, includes a note indicating the 'batter (is) to be restricted using retaining walls or slip zone to be remediated, Details to be provided at DA Stage'. As such, it is considered that due consideration has been given to the content of the DP reports which also include references to requirements for

site specific investigation of cut and retaining structures. Current investigation (Pit 309) indicates bedrock of low to medium strength at a depth of 4.6 m in this general area.

- provision of catch drainage above cut batters will be required to protect against erosion and/or slope instability within the batters. In long batters, intermediate drainage may also be required. In general, drainage lines will need to be lined to minimise the infiltration of stormwater with potential to trigger slope instability, particularly where batters abut areas assessed as having high or very high susceptibility of slope instability.
- Sheets 2 and 3 indicate that two, entrenched drainage gullies (within Susceptibility Zone 16), with susceptibility to bank erosion and minor slumping, at or near the south-eastern corner of the site will be filled over for road and lot construction. Both gullies collect stormwater from significant sections of the adjacent ridge line. The larger, southern-most drainage gully, in particular, has the potential to transport eroded materials, including that from debris lobes, onto the development site. The current layout does not include details of how collected stormwater can be directed across the site to the course of Reeves Creek or how protection against sediment transport will be achieved. It should be noted that construction of a sedimentation pond in the south-eastern corner of the site would be precluded by the road batter and the potential for development of slope instability.

3. Summary

The proposed road and lot layout included on the drawings provided by JMD:

- is generally in accordance with DP's recommendations with respect to slope instability within the steeper hillsides in the eastern section of the site.
- recognises the requirement for remedial works where a proposed road batter locally extends into an area (Zone 15) of high susceptibility to slope instability and has nominated potential alternative batter treatments.
- currently do not provide information on the treatment or potential effect on layout, of two entrenched drainage lines with susceptibility for erosion and bank slumping (Zone 16) within the south-eastern section of the site.

Details of appropriate remedial and precautionary works in relation to slope instability, including soil creep, bank erosion/slumping affected areas are included in Project 76579.05, dated 2 February 2015. Also included in the DP report are the requirements for additional investigation in: proposed areas of cut for roadways or lots; for determination of final retaining, pavement thickness design and lot classification; for the earthworks; and for assessment of mine subsidence in the nominated areas of cut within the roadway and lots.

As the site layout and design elements are progressed, DP should review all plans for the Picton East Development to confirm the geotechnical requirements in the previous reports have been suitably addressed.

4. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at the proposed Picton East Development, Picton, in accordance with DP's proposal WOL180249, dated 22 May 2018. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Dartanyon Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or be relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

DP's advice is based upon the conditions encountered during previous investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Please contact either of the undersigned for clarification of the above as necessary.

Yours faithfully

Douglas Partners Pty Ltd



PP: **Grahame Wilson**
Principal Consultant

Reviewed by


G W McIntosh
Principal

Attachments: About this Report
 Drawing provided by JMD (7 No.)

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.


Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

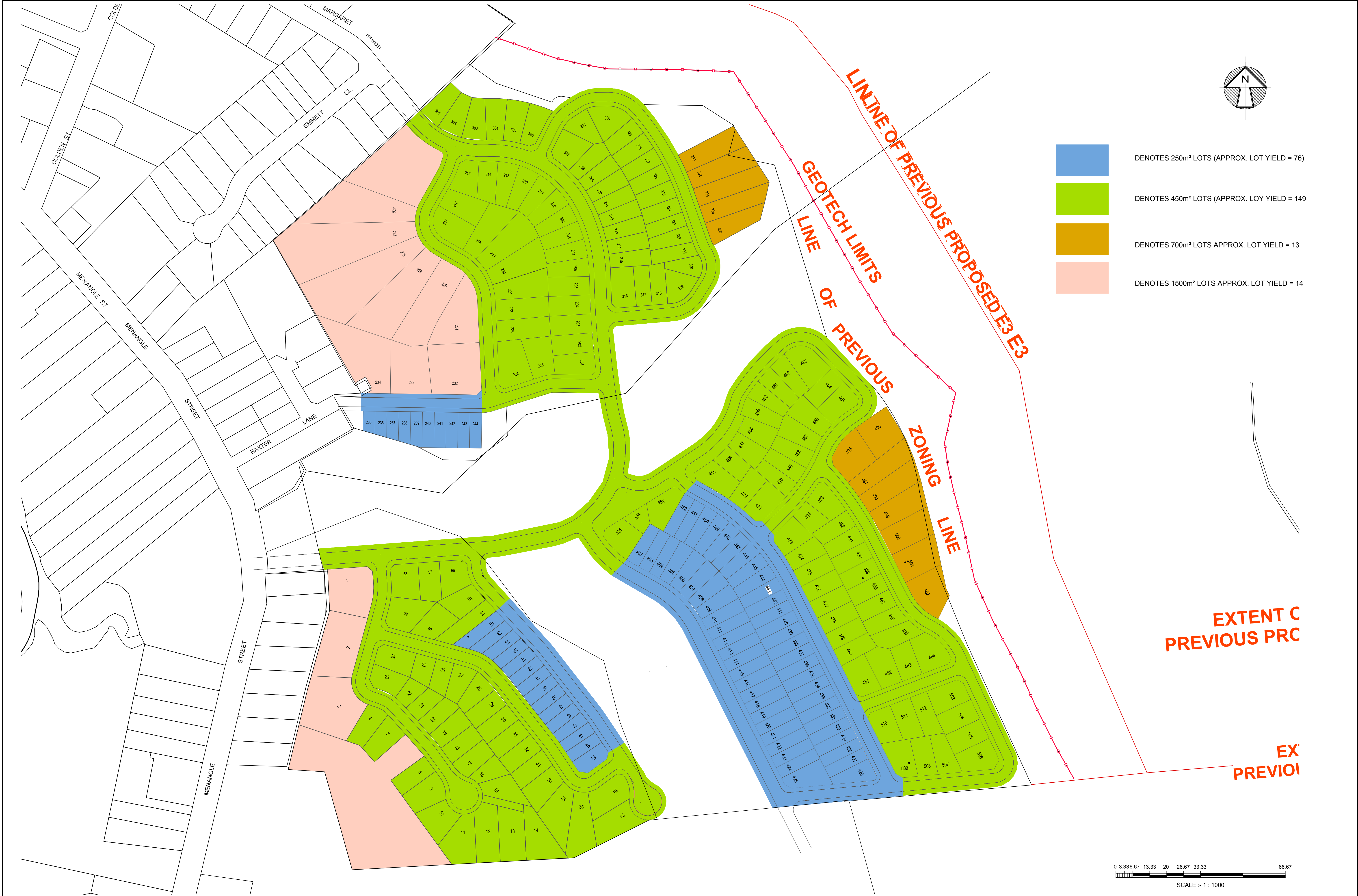
Site Inspection


The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.



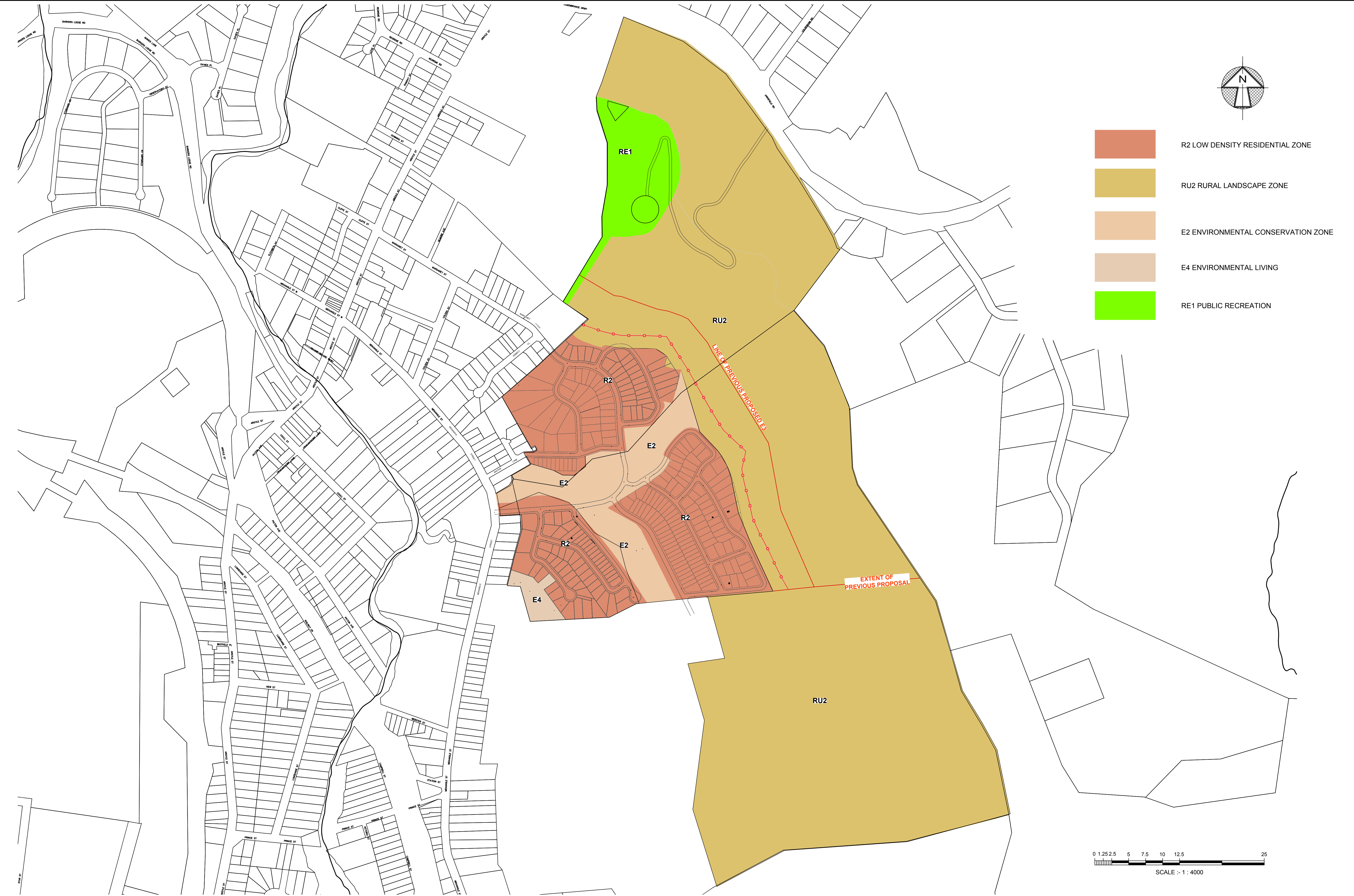
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				Date of Drawing : 25-10-2017	-		32 Iolanthe Street P.O. BOX 25 CAMPBELLTOWN N.S.W. 2560	PH. (02) 4625 5055 FAX (02) 4628 2013 email: admin@jmd.com.au					
A	T.H.	25-10-2017	ISSUE FOR PLANNING DISCUSSION	Ratio (A1) : 1:4000	Date of Survey : -					Locality : PICTON	L.G.A. : WOLLONDILLY	CAD Ref: s:\data\12\12122\reeves creek\eng\cad\12122b-e2 - zoning plans\12122e1-plan.dwg	

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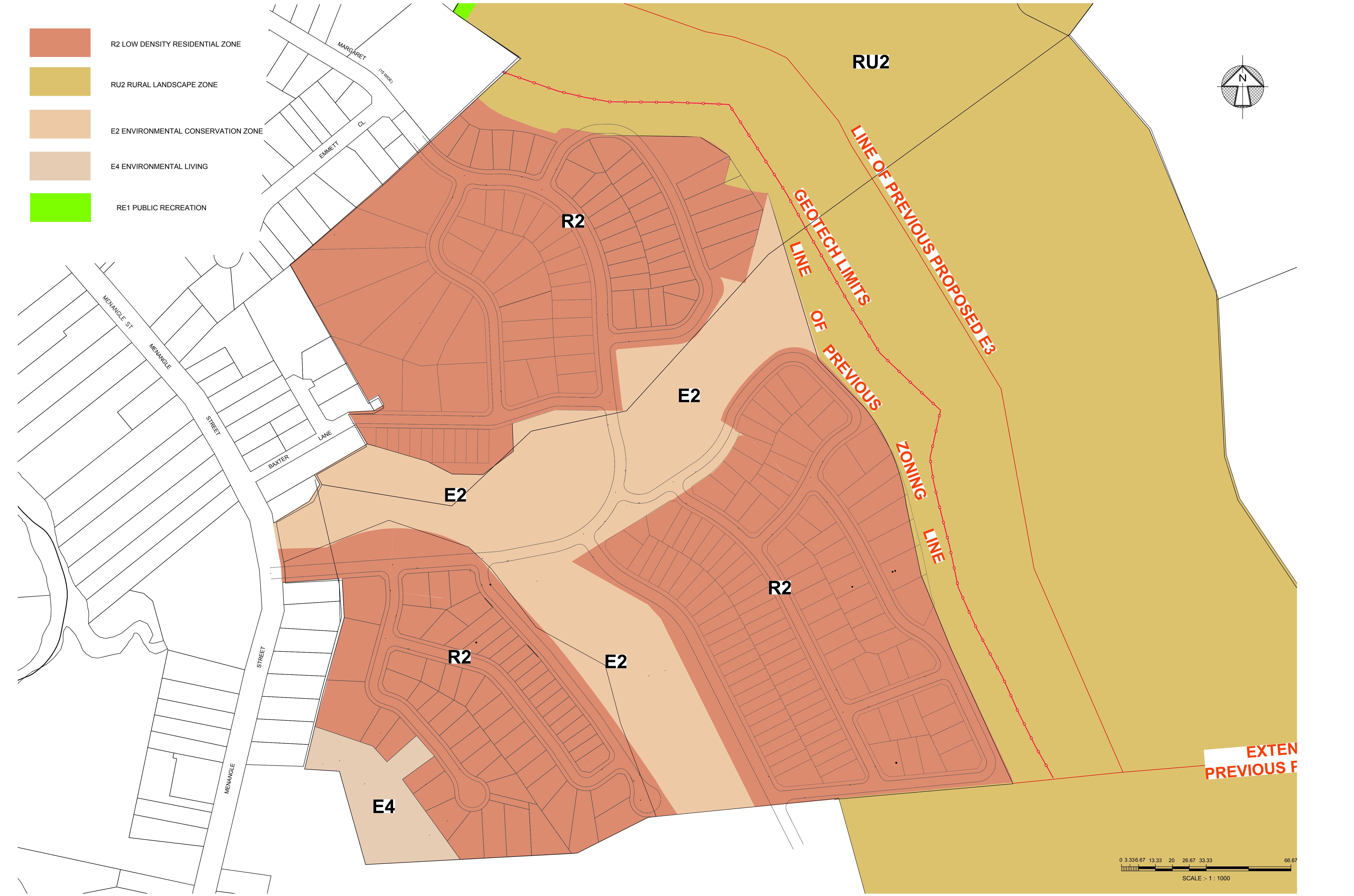
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					Date of Drawing : 25-10-2017						
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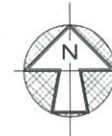
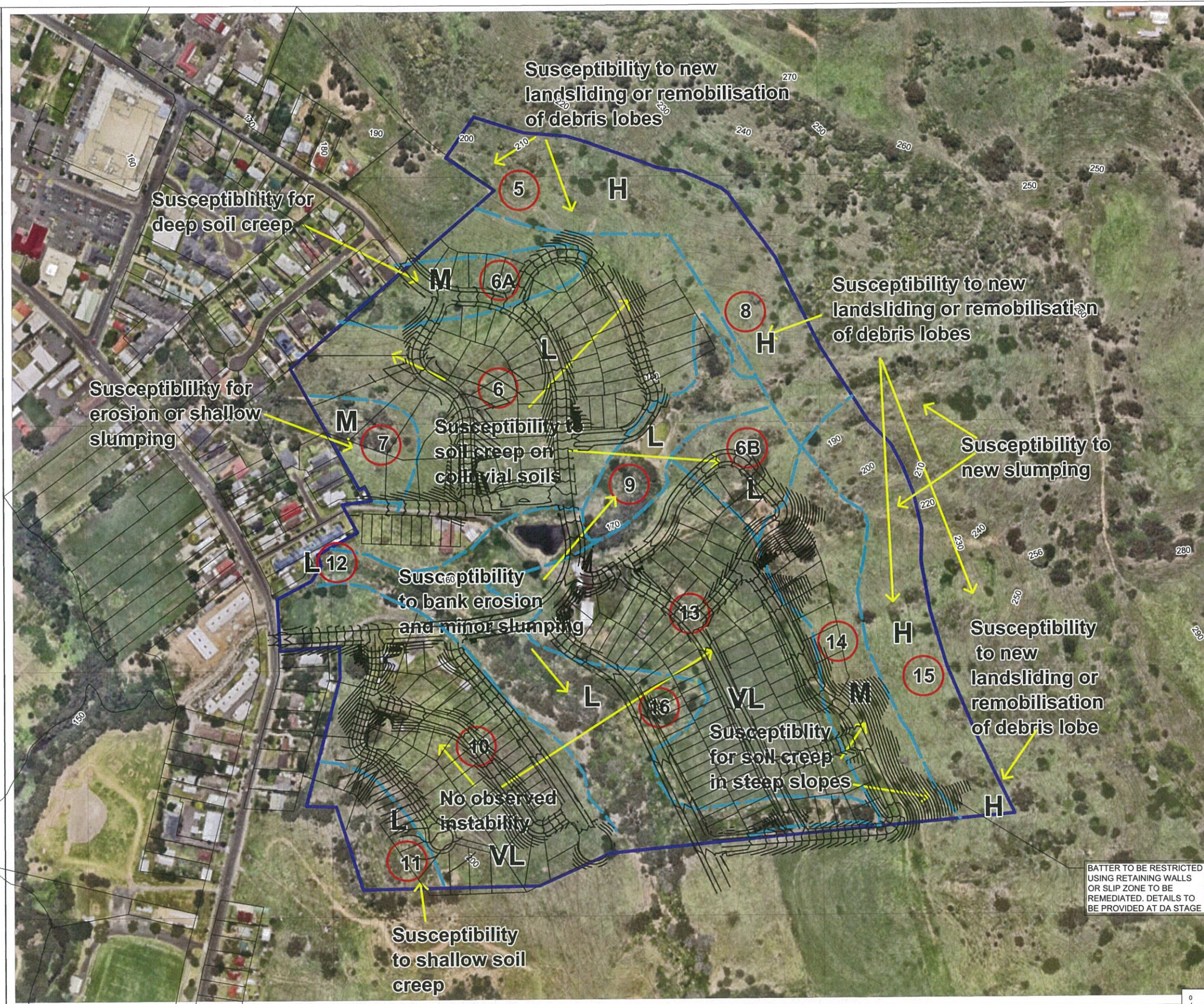
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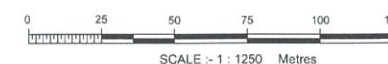



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