



20/02/2017

CLIENT: Summit Group

JOB DESCRIPTION: Provide limited site investigation & site classification for the allotment.

PROJECT: Lot 23 Baltimore Avenue, Hamilton Valley

JOB NO.: 43467A-7

REPORT SUMMARY:

The site classification is **Class M-D** with controlled filling placed across the allotment.

1.0 SITE DESCRIPTION:

1.1 The allotment is part of the “Sienna Ridge Estate” Hamilton Valley, Stages 1 and 2. At the time of the investigation there was a patchy cover of vegetation across the surface and there were newly planted trees (approx. 1.0m in height) growing in the front nature strip. The area allocated for the house has good fall across the block, sloping towards the northern boundary. The land slope of the building footprint is the order of 1 in 20. To provide a level building pad, cut and fill earthworks may have to be undertaken. Site drainage should be further enhanced with landscaping works at the completion of construction.



Existing site conditions for proposed dwelling.

- 1.2 Structural filling has been placed under controlled conditions across the new subdivision. The structural fill has been certified as controlled fill in accordance with AS 3798 by Civil Test Albury Wodonga.
- 1.2 Geological Survey Maps for Victoria (Sheet SJ 55-2) of 1:250,000 scale show that the area is within Recent Quaternary fine grained alluvium of the Shepparton Formation. These are deposits of varying clay, silt and sand content laid down in discontinuous lens-like structures. There can be varying combinations and layer thicknesses of these soil types across small areas.

2.0 SITE INVESTIGATION:

2.1 Boreholes of 3000mm and 2000mm were mechanically drilled using 100mm diameter continuous flight auguring at two locations across the site. Their locations and logs are shown on the attached borehole log sheet.

2.2 ***Borehole Description:*** A mix of silty sand / silty sand **controlled filling** soils to the depths between 400mm to 500mm. Natural light brown sand continued down to 1000mm. Silty clay and fine silty clay soils varying in colour extended to the end of the boreholes. Soils were observed in the field to be uniform over the depth of the profile. Dry soils were found and ground water was not encountered in the boreholes.

2.3 ***Filling:*** The filling is of mixed silty clays derived from the area.

Testing of Filling: Filling has been tested for density and moisture content during construction in maximum lifts of 200mm. Field testing was carried out using a nuclear densitometer. Field and laboratory testing was in accordance with AS 1289.

Density/Compaction of Filling: The mean densities of tests on the filling were equal to or in excess of 95% of the maximum dry density for standard compaction. Test results and a comprehensive report on this process are available from Civil Test Albury Wodonga. (Ref. Sienna Ridge Estate - 30 August 2016)

The filling can be considered as controlled filling in the context of AS 2870. That is, load bearing beams of stiffened raft slabs may be founded on or within this filling.

2.4 The prepared surface has an estimated bearing capacity of at least **100kpa**. Soil bearing capacities have been estimated for the underlying soils and these values are listed below:

Depth	Allowable Bearing Capacity
500mm	130 kPa
1000mm	150 kPa

2.5 The soils were similar in profile to others tested in the area and plasticity analyses indicate that the underlying natural soils are of low to medium plasticity. The site classification is **Class ‘M-D’** in accordance with AS 2870 - 2011 with the filling of controlled status as subsequently documented.

3.0 FOOTING DESIGN RECOMMENDATIONS:

The footing system should be designed for a potential seasonal ground movement of between 20mm to 40mm. The recommended footing system is for at least an 'M-D' site with all load bearing elements extending through the disturbed soils and onto controlled filling. Design and construction should comply with AS 2870 – 2011 and AS 3600.

- 3.1 The construction envelope is to have the surface stripped and cleared nominally 50mm to 100mm of all grass, vegetation and any top soil across the surface. Proof roll prior to construction and prepare the site as per section 6 of AS 2870 – 2011.

(Proof rolling refers to thorough trafficking of the area by the earthmoving equipment until there are no indentations left by the wheel tracks)

- 3.2 Conventional raft slab are recommended to be founded on a stripped and proof rolled surface with all load bearing beams at least **200mm** below the stripped surface. A waffle slab may be setup on the stripped and proof rolled surface with edge beams founded a **minimum of 200mm** below the prepared surface.
- 3.3 It is recommended the design engineer be contacted should soft spots or areas of undetected fill be encountered during footing excavation. If site conditions are altered in the course of construction then this report may require review.
- 3.4 The use of brickwork articulation joints to TN61 is recommended throughout.
- 3.5 The following are recommended founding levels for articulated masonry veneer construction below cleared surface:

<u>Stiffened Raft Load Bearing Beams:</u>	Nominally 100mm below existing surface i.e. Through loose surface filling and onto controlled fill.
<u>Internal Beams:</u>	Maybe founded on stripped and proof rolled surface.
<u>Waffle Raft:</u>	Waffle slab using 225mm void formers to be setup on the 50mm to 100mm stripped and proof rolled surface. Edge beams founded a minimum of 100mm below the prepared surface onto controlled fill.
<u>Strip Footings:</u>	650mm minimum and at least 300mm into natural underlying soils.
<u>Stump - Pad Footings:</u>	800mm minimum and at least 200mm into natural underlying soils.

- 3.6 The planting of trees close to the building should be avoided. Minimum distance from the building should be at least three quarters of the mature height. Where the building is to be positioned such that trees are planted or any existing trees located at an offset distance that is less than three quarters of the mature height, the design engineer will need to consider additional measures to protect the footing system from trees impacting the stability of the soils within the zone of influence.

4.0 LIMITATIONS OF REPORT:

The frequency of borehole sites and the intensity of the testing program have been formulated to reflect the significance of the proposed structure. The testing and reporting is considered reasonable and comprehensive for this project and results correlate to other testing carried out by this company in the region. It is possible that there may be variations in the geotechnical conditions from those described in this report, as no geotechnical investigation can be considered exhaustive. The results and recommendations are therefore a reasonable platform upon which to base subsequent design decisions with flexibility to change course should there be variations in the conditions at the time of construction.

5.0 SITE MAINTENANCE:

In addition to the following, reference should be made to the CSIRO information sheet "Guide to Home Owners On Foundation Maintenance and Performance."

- 5.1** During the works, provide a drainage system as soon as the footings are constructed. It must prevent ponding against, near or beneath the footings in order to maintain stable moisture content within the foundation. Grading the surfaces (1 in 20 for at least 2.0 metres) away from footings and their excavations to collection points will be necessary.
At the completion of the construction the drainage system must also prevent ponding against, near or beneath the finished building. Interception of moisture flow paths toward and under the building is critical.
- 5.2** Preferably pave or grade the natural surface away from the house at a slope of 50mm in 1.0m.
- 5.3** Plumbing trenches should be sloped away from the buildings. The first 1.5m of trench from the building should be backfilled with clay in the top 300mm.
- 5.4** Subsurface drains near footings should be avoided. If they are necessary, the trench must be capable of providing drainage if blockage occurs.
- 5.5** Plumbing problems that could cause changes to foundation's moisture content should be rectified immediately.



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B.M
CIVIL ENGINEERS

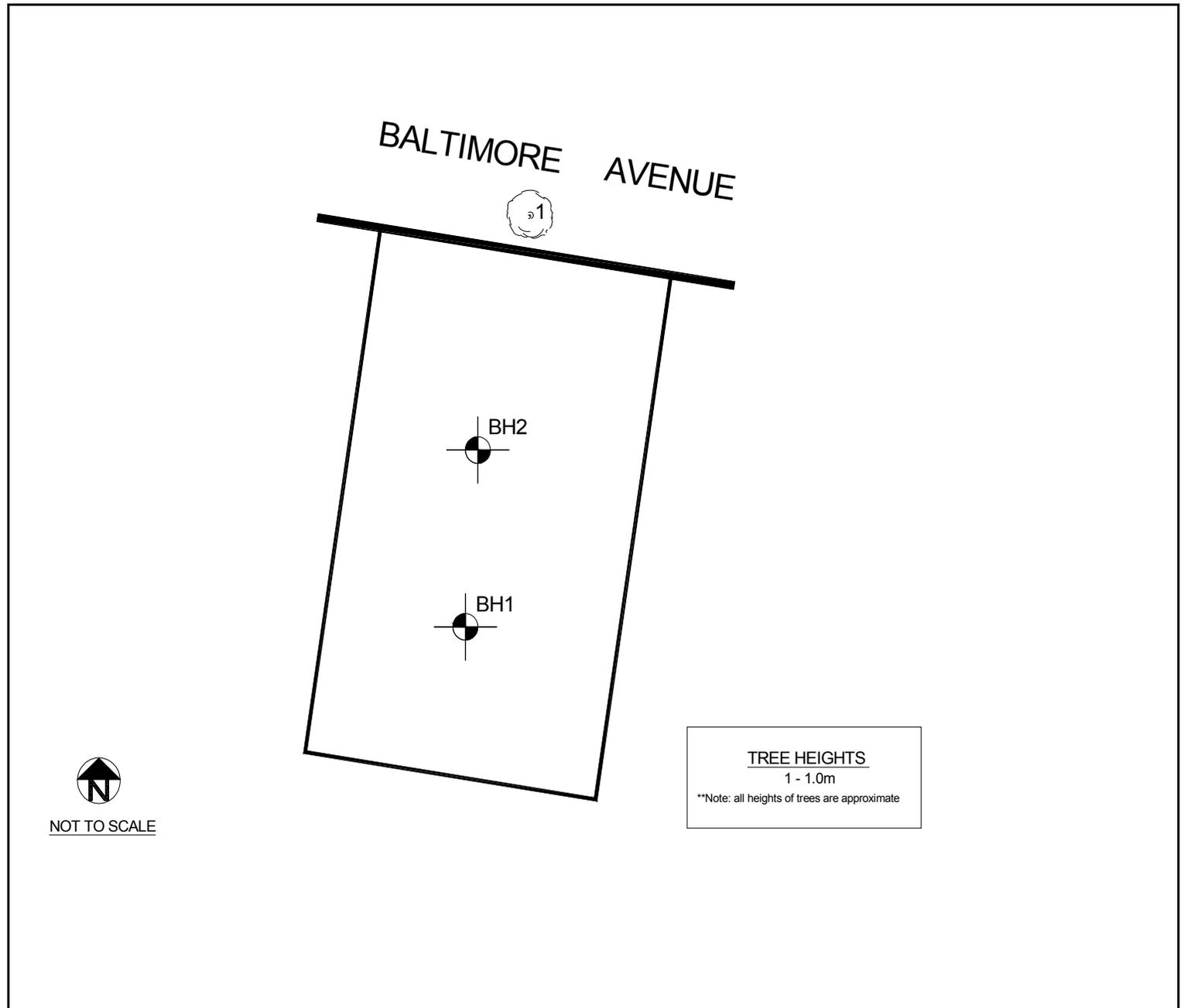
Date: 20/02/2017

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SITE
INVESTIGATION
BORELOG
LOCATION
PLAN



NOT TO SCALE

<u>TREE HEIGHTS</u> 1 - 1.0m <small>**Note: all heights of trees are approximate</small>
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Job No.: 43467A-7
Location: Lot 23 Baltimore Avenue, Hamilton Valley
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Date: 20/02/2017
Borehole No.: **1**

Depth	Description	Plasticity	Cohesion Density	Moisture	
100	CONTROLLED FILLING silty sand / sandy clay mix				
200					
300					
400					
500					
600	light brown SAND	LP	MD	D	
700					
800					
900					
1000					
1100	light brown silty CLAY	MP	F	D	
1200					
1300					
1400					
1500					
1600	yellow light brown fine silty CLAY	LP - MP	F	D	
1700					
1800					
1900					
2000					
2100	brown silty CLAY	MP	ST	D	
2200					
2300					
2400					
2500					
2600					
2700					
2800					
2900					
3000					
3100	EOB				
3200					
PLASTICITY		LP- LOW	MP- MEDIUM	HP- HIGH	
CONSISTENCY		COHESIVE SOILS VS- very soft S-soft F-firm ST - stiff VST - very stiff H-hard			
		NON COHESIVE SOILS VL very loose L- loose MD-medium dense DS-dense VD-very dense			
MOISTURE CONDITION		D-dry M- moist W-wet SA-saturated			
DRILLING METHOD		continuous flight auger	<input checked="" type="checkbox"/>	hand auger	<input type="checkbox"/>



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Location: Lot 23 Baltimore Avenue, Hamilton Valley
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Date: 20/02/2017
Borehole No.: **2**

Depth	Description	Plasticity	Cohesion Density	Moisture
100	CONTROLLED FILLING silty sand / sandy clay mix			
200				
300				
400				
500	light brown SAND	LP	MD	D
600				
700				
800				
900				
1000				
1100	light brown silty CLAY	MP	F	D
1200				
1300				
1400				
1500				
1600				
1700	yellow light brown fine silty CLAY	LP - MP	F	D
1800				
1900				
2000				
2100	EOB			
2200				
2300				
2400				
2500				
2600				
2700				
2800				
2900				
3000				
3100				
3200				
PLASTICITY LP- LOW MP- MEDIUM HP- HIGH				
CONSISTENCY COHESIVE SOILS VS- very soft S-soft F-firm ST - stiff VST - very stiff H-hard NON COHESIVE SOILS VL very loose L- loose MD-medium dense DS-dense VD-very dense				
MOISTURE CONDITION D-dry M- moist W-wet SA-saturated				
DRILLING METHOD continuous flight auger <input checked="" type="checkbox"/> hand auger <input type="checkbox"/>				