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20/02/2017

CLIENT: Summit Group

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

PROJECT: Lot 22 Baltimore Avenue, Hamilton Valley

JOB NO.: 43466A-7

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 two newly planted trees (approx. 1.5m in height) growing in the front nature strip along the northern and eastern boundaries. The area allocated for the house has good fall across the block, sloping towards the front northern boundary. The land slope of the building footprint is the order of 1 in 15. 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.



SOIL TESTING LABORATORY • STRUCTURAL & CIVIL DESIGN

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 auger at two locations across the site. Their locations and logs are shown on the attached borehole log sheet.

2.2 **Borehole Description:** The soil properties established in each borehole were very similar if not identical. There is **uncontrolled** brown silty clay / sandy clay **filling** to a depth down to 500mm. After the filling, there is light brown sand continuing to 700mm and orange sandy clay following to 1000mm below the existing surface. Fine silty clay and silty clay soils varying in colour extend to the end of the boreholes. Soils were observed in the field to be uniform over the depth of the profile. Dry to slightly moist 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 underlying natural soils are of low to medium plasticity and there is potential for seasonal ground movement between 20mm and 40mm. Consideration should be given to clause 3.6 of this report when positioning the house due to the proximity of the trees located in the nature strip along the northern and eastern boundaries.

2.5 The natural soils, located immediately below the filling (i.e. 500mm below the surface), have an estimated bearing capacity of at least **130kpa**. Soil bearing capacities have been estimated for the underlying soils and these values are listed below:

Depth	Allowable Bearing Capacity
100mm	100 kPa
500mm	130 kPa
1000mm	150 kPa
1500mm	180 kPa

3.0 FOOTING DESIGN RECOMMENDATIONS:

The footing system should be designed for a 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 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.

3.3 The use of brickwork articulation joints to TN61 is recommended throughout.

3.4 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.

Note: Where cut/fill earthworks are carried out to form a level platform, extend beams through filling and found in natural ground or support beams in filled zone on bored concrete piers, founded through the imported filling and extending a minimum depth of 400mm into natural ground.

3.5 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 building at a slope of 50mm in 1.0m.

5.3 Plumbing trenches should be sloped away from the building. 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.

5.6 The planting of trees close to the building should be avoided. Minimum distance from the building should be equal to three quarters of their mature height.



Anthony Kruse



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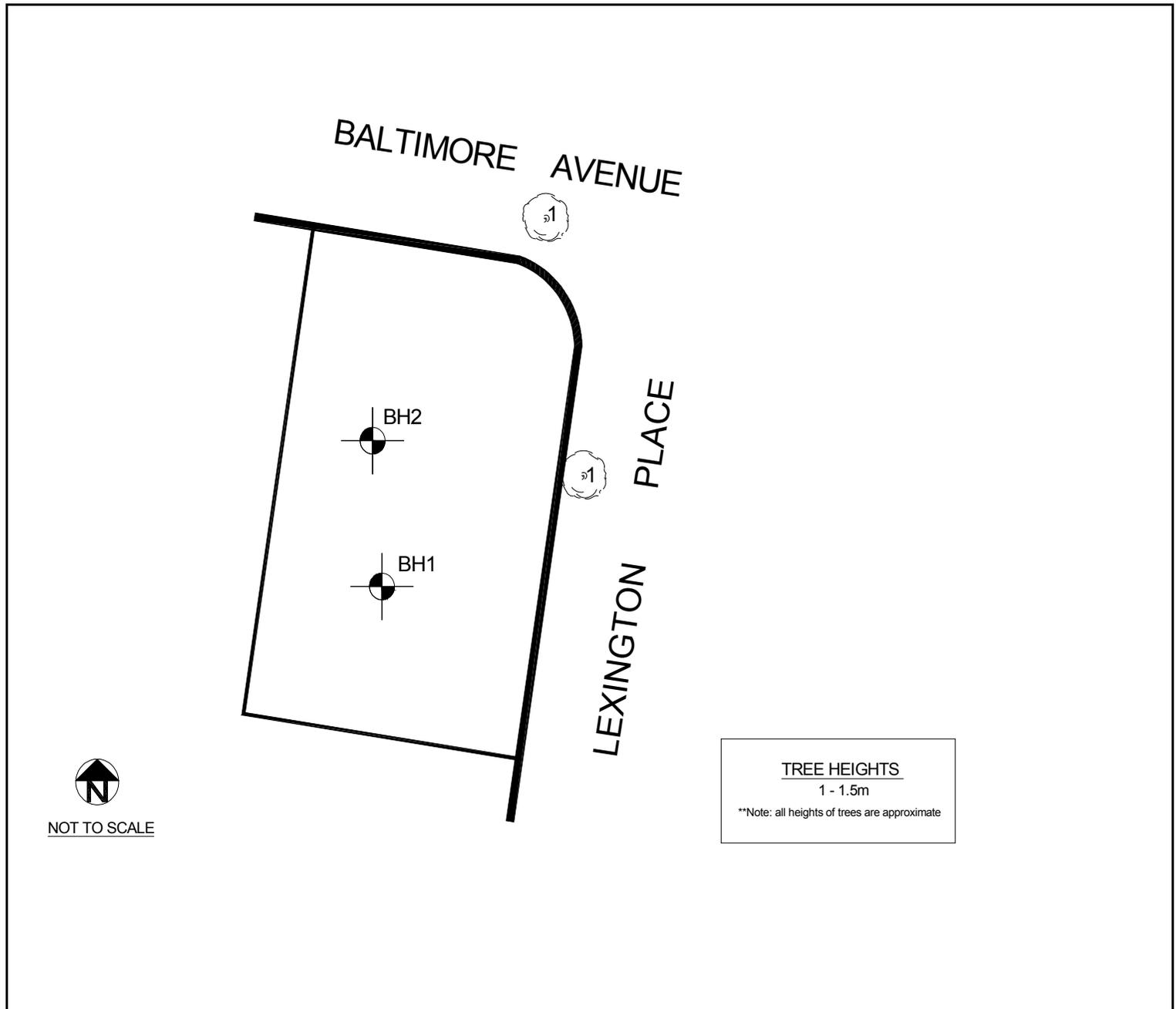
Date: 20/02/2017

Location: Lot 22 Baltimore Avenue, Hamilton Valley

Client: Summit Group

Job No.: 43466A-7

SITE
INVESTIGATION
BORELOG
LOCATION
PLAN





Job No.: 43466A-7
Location: Lot 22 Baltimore Avenue, Hamilton Valley
Client: Summit Group

Date: 20/02/2017
Borehole No.: **1**

Depth	Description	Plasticity	Cohesion Density	Moisture				
100	CONTROLLED FILLING silty clay / sandy clay mix							
200								
300								
400								
500								
600	light brown SAND	LP	MD	D - M				
700	orange sandy CLAY	LP - MP	F	D - M				
800								
900								
1000	light orange fine silty CLAY	LP -MP	F	D				
1100								
1200								
1300								
1400								
1500								
1600								
1700								
1800								
1900								
2000	light brown fine silty CLAY	LP - MP	F	D				
2100								
2200								
2300					brown silty CLAY	MP	ST	D
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"/>			



Job No.: 43466A-7
Location: Lot 22 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 clay / sandy clay mix			
200				
300				
400				
500				
600	light brown SAND	LP	MD	D - M
700	orange sandy CLAY	LP - MP	F	D - M
800				
900				
1000	light orange fine silty CLAY	LP -MP	F	D
1100				
1200				
1300				
1400				
1500				
1600				
1700				
1800				
1900				
2000	EOB			
2100				
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"/>				