



LEVEL 1 INSPECTION & TESTING SERVICES

ACACIA ESTATE, STAGE 1

BOTANIC RIDGE, VICTORIA

Prepared for PEET Botanic Village c/- GPR Consulting

8 March 2016
GS3711.1 AA

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Ground Science

PROJECT DETAILS

Project Reference	GS3711.1	Rev	AA
Project Title	Acacia Estate, Stage 1		
Project Location	Botanic Ridge	State	VIC
Date	8/03/2016		

CLIENT DETAILS

Prepared For (Client)	GPR Consulting		
Project Principal	PEET Botanic Village		
Client Address	Suite 217, 202 Jells Road	Suburb	Wheelers Hill

DISTRIBUTION

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This document presents our report on the Level 1 Inspection & Testing services associated with the construction of controlled fill at the above project. The contents of this document are detailed for the sole use of the intended recipient. Should you have any questions related to this report please do not hesitate to contact the undersigned.

AUTHOR:

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1. INTRODUCTION

This report presents the results of inspection activities, compaction control and laboratory testing services performed by Ground Science Pty Ltd (Ground Science) at the project identified as the Acacia Estate located in Botanic Ridge, Victoria (herein referred to as the 'site'). Ground Science was engaged to provide Level 1 Inspection and Testing services for this component of the project. Authorisation to proceed was provided by GPR Consulting on behalf of PEET Botanic Village (herein referred to as the "Client"). Level 1 Testing as defined in AS3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments" provides for full time inspection of the construction of controlled fill and compaction testing in accordance with AS1289 "Methods of Testing Soils for Engineering Purposes". The Level 1 Inspection and Testing was undertaken by experienced geotechnicians from Ground Science.

2. SCOPE OF WORK

2.1 AREAS OF WORK

Ground Science provided Level 1 Inspection and Testing for the controlled fill placed as part of the construction of the residential estate. The areas on which controlled fill was placed is shown on site plan Figure 1 & 2 (presented in Appendix A), which is based on drawings prepared by GPR Consulting. It is understood that the controlled fill was placed and compacted to approximately 100mm below the required finished level, to allow for up to 100mm of topsoil placement. The placement of the fill under Level 1 Inspection and Testing commenced on 23rd October 2015 and was completed on 10th February 2016 which included 22 full days and 12 half days of filling operations, which were observed on a fulltime basis by Ground Science technicians.

2.2 PLACEMENT METHOD

A technical specification for fill placement was not available for this project. The placement of controlled fill on the above mentioned areas was carried out in general accordance with AS3798 (2007) "Guidelines on Earthworks for Commercial and Residential Developments". It should be noted that the method of fill placement, compactive effort and target density ratios varied between the type of fill material used. In general, the fill material comprised of both cohesive (clays/silty clays/sandy clays) and non-cohesive (sands) soils.

Where non-cohesive fill was used, several method placements were trialled by the contractor and inspected by Ground Science. In general, non-cohesive fill material was placed and compacted as follows:

- Placement of layers preferably between 300mm to 400mm thick;
- Control of moisture regulated on site and sand fill material suitably moisture conditioned to achieve acceptable compaction;
- Compaction to be carried out using a smooth drum static roller;
- The use of both field density testing and Perth Sand Penetrometer (PSP) tests carried out to confirm the achieved compaction on site. The results of the Perth Sand Penetrometer (PSP) tests were preferred over density testing given the granular nature of the fill.



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Where cohesive (clays/silty clays/sandy clays) were used as fill, the following process, as described in AS2870 (2011) was adopted:

- Placement of layers not exceeding 250mm in thickness;
- Control of moisture regulated on site and suitably moisture conditioned to within close to optimum moisture content;
- Compaction to be carried out using a Padfoot Roller or 815 Compactor.

The target density ratio for the project varied between cohesive and non-cohesive fill material.

Cohesive fill material required to achieve a minimum target density ratio of 95% (AS 1289: 5.1.1, 5.4.1 or 5.7.1) as per the project specification requirements and moisture conditioned to a moisture ratio of 85% – 115% of standard compaction (AS 1289 5.1.1, 5.4.1, or 5.7.1).

The target density ratio of non-cohesive fill material was assessed using Perth Sand Penetrometer (PSP) tests or a nuclear density gauge. The use PSP tests were preferred given the nature of the fill material. The assessment of fill placement was assessed by assessing the number of blows over a 300mm penetration depth with the top 150mm ignored.

Prior to filling, the nominated placement areas were stripped of topsoil, subsoil, soft material and vegetation to a firm base approved by the superintendent.

3. INSPECTION AND TESTING

3.1 SUBGRADE PREPARATION

Site stripping was conducted with the use of excavators, graders and scrapers. Observations of the stripped base indicated all surface soils and vegetation/topsoil was removed resulting in stripping of between 100mm and 500mm required. In some areas, soft spots were observed which required further stripping. The exposed subgrade was generally observed to be natural soils, ranging from sands, silty sands and sandy clays.

The moisture at subgrade level was assessed to range from dry to moist throughout the project. At the commencement of each fill placement area, the subgrade was test rolled. Where deflections and/or soft spots were not observed, these areas were deemed suitable for subsequent fill placement. In some areas, soft spots were observed and remediated prior to being deemed suitable for subsequent fill placement. Where required, a water cart was used to moisture condition the subgrade.

3.2 CONSTRUCTION MATERIALS

Fill for the project is understood to have been sourced from onsite stockpiles. The material was visually assessed to consist of sands, silty/sandy clays or a mixture of both. The fill material used in this project was nominated by the on-site contractor. Ground Science performed an assessment of the fill source to identify the following material characteristics:

- Material suitability as an engineering property;
- Cohesiveness;



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- Free from building debris and vegetative matter;
- Oversize rock particles.

The use of sand (non-cohesive) fill was proposed by the contractor. Ground Science assessed the proposed sand fill material and approved its use. Where cohesive (clays/sandy clays/silty clays) were used, this material was visually assessed and considered acceptable for use on this project. It should be noted that no chemical analysis was conducted on the fill materials. The maximum oversize particles within the fill matrix were observed to be 150mm and where encountered, removed from fill prior to placement. The fill source was assessed to range from dry to wet of optimum moisture content. A water cart was used to moisture condition the fill prior to and during placement where required.

3.3 FILL CONSTRUCTION

The contractor had the following plant available on site during the construction period for use in the fill placement;

- Excavator;
- Water cart;
- Padfoot roller;
- Smooth Drum Roller;
- Grader;
- Scrapers.

During fill placement the weather conditions were generally sunny, with a maximum temperature of 30 degrees Celsius noted.

The filling process generally involved the grader, excavators and scrapers spreading the nominated fill material into thin loose layers. Compaction was provided using a Smooth Drum Roller (non-cohesive fill) and Padfoot Roller (cohesive), applying a minimum of 6 - 10 passes performed per layer observed. The thin layers were placed to form a composite layer measuring between 150mm and 300mm.

At the commencement of the project, it was noted that difficulty in achieving compaction was experienced within the sand fill. Thicker layers were placed, moisture conditioned and compacted and satisfactory test results were generally achieved. Generally, the placement of sand fill requires carefully monitored operations which include filling at a thicker layer and control of moisture application. It is noted that the site was at times, underlain by saturated soil layers which were removed as required. The project occasionally experienced wet weather which led to trafficability issues and required several areas to be reworked and/or re-compacted.

Throughout the filling process and/or at the completion of the day's production, compaction testing was performed to assess the achieved density ratio of each layer. The use of a nuclear density gauge to assess the achieved compaction within sands is influenced by moisture condition, compaction and timing of the compaction test would influence the resulting density ratio. On this basis, Perth Sand Penetrometer (PSP)



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tests were performed in addition to density testing to confirm a suitable compaction level had been achieved. Particle Size Distribution (PSD) tests were also performed to enable an understanding of the fill material to assess the sand content where PSP testing was performed.

Generally, between 1 and 2 layers of fill were required to achieve the finished surface levels. It should be noted that where 800mm or less of sand fill was required, placement under Level 1 Inspection & Testing is not mandatory as detailed in AS2870 (2011). Ground Science however witnessed the process adopted on site and were satisfied with the day's production.

Figure 1 & 2 provides a guide to the fill placement and is limited to the areas described in this report. It should be noted that a further topsoil layer of approximately 100mm is expected to complete the finished levels of the fill and does not form part of the controlled fill. This layer is placed to provide a growing medium for grass and gardens. Any fill placed as part of drainage, sewer works or similar also does not form part of this Level 1 report.

3.4 RESULTS OF COMPACTION CONTROL TESTING

Level 1 Inspection and Testing was undertaken by experienced technicians from Ground Science who attended the site for the duration of the construction phase and nominated the location of the in-situ density and PSP tests.

Testing for the project comprised of 72 in-situ density tests using a nuclear moisture-density gauge in accordance with Australian Standard (AS1289 5.8.1) together with 72 "Rapid HILF" Compaction tests (AS1289 5.7.1) including re-tests of failed specifications, where deemed necessary. A total of 24 Perth Sand Penetrometer (PSP) tests were performed to support the results of the field density tests.

A summary of the compaction control testing is shown in Appendix B. It should be noted that at the commencement of the project, the field density tests indicated low density ratio values. Trial compactions and the use of different equipment were performed during this time and the use of PSP tests were considered suitable in areas that were filled using sand (non-cohesive) fill. The compactive effort and work methods used by the contractor were visually assessed and deemed suitable by the Ground Science representative.

The results of the compaction control testing are presented on the NATA endorsed Field Density Test Reports in Appendix C.

Based on the fill material used over various areas of the site, the quality of the fill, work methods of the contractor and supporting density and PSP tests, the fill placed on this site is considered compliant with the intent of the filling works. It should be noted that a majority of the western and south western lots did not require Level 1 Inspection and Testing, given the placement of sand fill of less than 800mm thick. The works in this area were however inspected by Ground Science and deemed acceptable.

3.5 FINAL SURFACE LEVELS

Observations were made by a Ground Science staff member that filling had been complete up to the nominated finished levels. Instructions were also provided from the contractor's site foreman that controlled fill operations were complete. The observed final levels are the constructed finished surface levels of the



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controlled fill.

4. COMPLIANCE

Ground Science Staff have undertaken Level 1 Inspection and Testing services of the construction of the controlled fill in the areas designated on Figure 1. Ground Science field staff have also observed that the prepared subgrade provided an adequate base for the subsequent placement of controlled fill.

Based on observations made by Ground Science staff and the results of density and PSP tests as well as visual observations, we consider that the controlled fill placed has been constructed in accordance with the stated intent of the project, AS 3798 (2007) as well as AS2870 (2011).

5. UNDERSTANDING LEVEL ONE INSPECTION & TESTING

The purpose of performing Level 1 Inspection and Testing is to ensure compliance of the fill with the specification. The engagement of a Geotechnical Inspection Testing Authority (GITA) allows the contractor to perform his role in the construction of the filling operation while the GITA monitors the quality control process of the fill placement. The visual observations of thorough processes and work practices by the contractor allows the GITA to approve the subsequent placement of fill without having to wait for the completion of testing and the extended time it takes to get a test result back. The GITA will however, carry out random spot checks of the filling operations throughout the day's production as confirmation that the placement procedures and the fill moisture content is appropriate. At the end of a day's production the GITA will sign off the completed works as satisfactory. Any failed tests will result in that particular area of operation requiring rectification in the following mornings activities. This may be as simple as extra rolling with compaction plant if moisture conditioning is suitable. Sometimes these areas may be retested if the GITA feels it is necessary.

While the code AS3798 2007 is a guideline on the minimum requirements of filling on commercial and residential developments, some projects require a more detailed project specification to deal with site specific issues. While moisture conditioning of fill sources aids in the ease with which compaction is achieved, it is not necessarily a physical characteristic that determines if the placed fill is acceptable. In some situations the moisture requirement is an extremely important function of the final constructed product. In these situations a specific project specification should apply to the project as detailed by the designing geotechnical engineer. These are typical of clay liners for wet lands, dams, landfill liners and caps and an array of other engineering situations. Creating a consolidated platform of which is similar to equivalent surrounding natural conditions is the primary aim of level one processes, preventing the occurrence of differential ground movements to footing structures.

**For & on behalf of
Ground Science Pty Ltd**

**Gee Singh
Senior Geotechnical Engineer
BE (Hons) Civil**



6. LIMITATIONS

This type of investigation (as per our commission) is not designed or capable of locating all soil conditions, (which can vary even over short distances). The advice given in this report is based on the assumption that the test results are representative of the overall soil conditions. However, it should be noted that actual conditions in some parts of the Site might differ from those found. If further sampling reveals soil conditions significantly different from those shown in our findings, Ground Science must be consulted. Maintenance and upkeep of finished fill placement must be regularly monitored as exposure to extended weather periods/other elements may cause surface drying which may lead to cracking. Conversely, excessive exposure to moisture may cause heaving/softening in the soils.

It is recognised that the passage of time affects the information and assessment provided in this document. Ground Science's assessment is based on information that existed at the time of the preparation of this document. It is understood that the services provided allowed Ground Science to form no more than an opinion of the actual site conditions observed during sampling and observations of the site visit and cannot be used to assess the affects of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

The scope and the period of Ground Science services are described in the proposal and are subject to restrictions and limitations. Ground Science did not perform a complete assessment of all possible conditions or circumstances that may exist at the Site. If a service is not expressly indicated, do not assume it has been provided. If a matter is not addressed, do not assume that any determination has been made by Ground Science in regards to it.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Ground Science for incomplete or inaccurate data supplied by others.

Any drawings or figures presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

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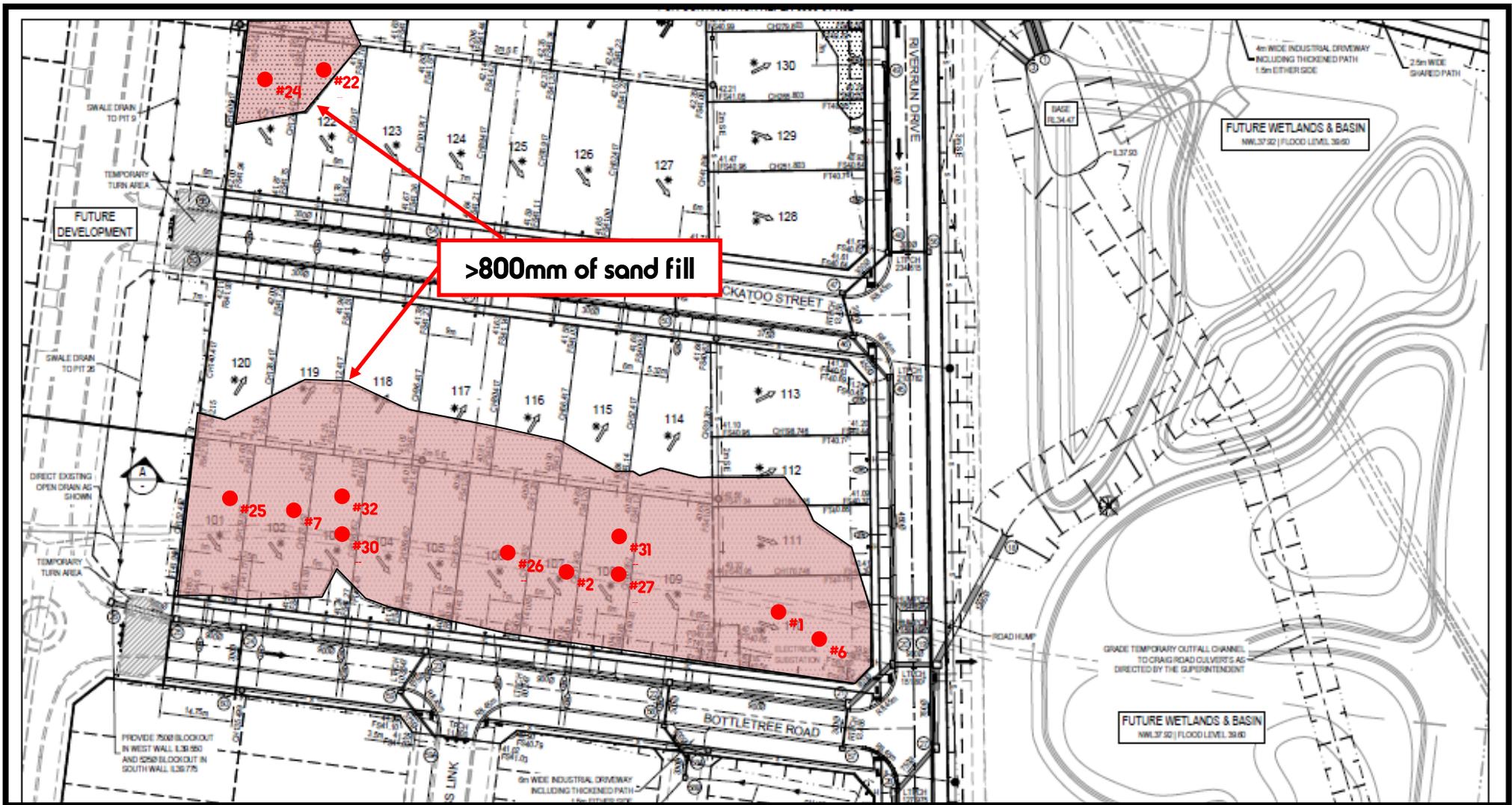


figures

Figure 1-3: Site Locality



FIELD DENSITY TEST LOCATIONS



FIELD DENSITY TEST LOCATIONS



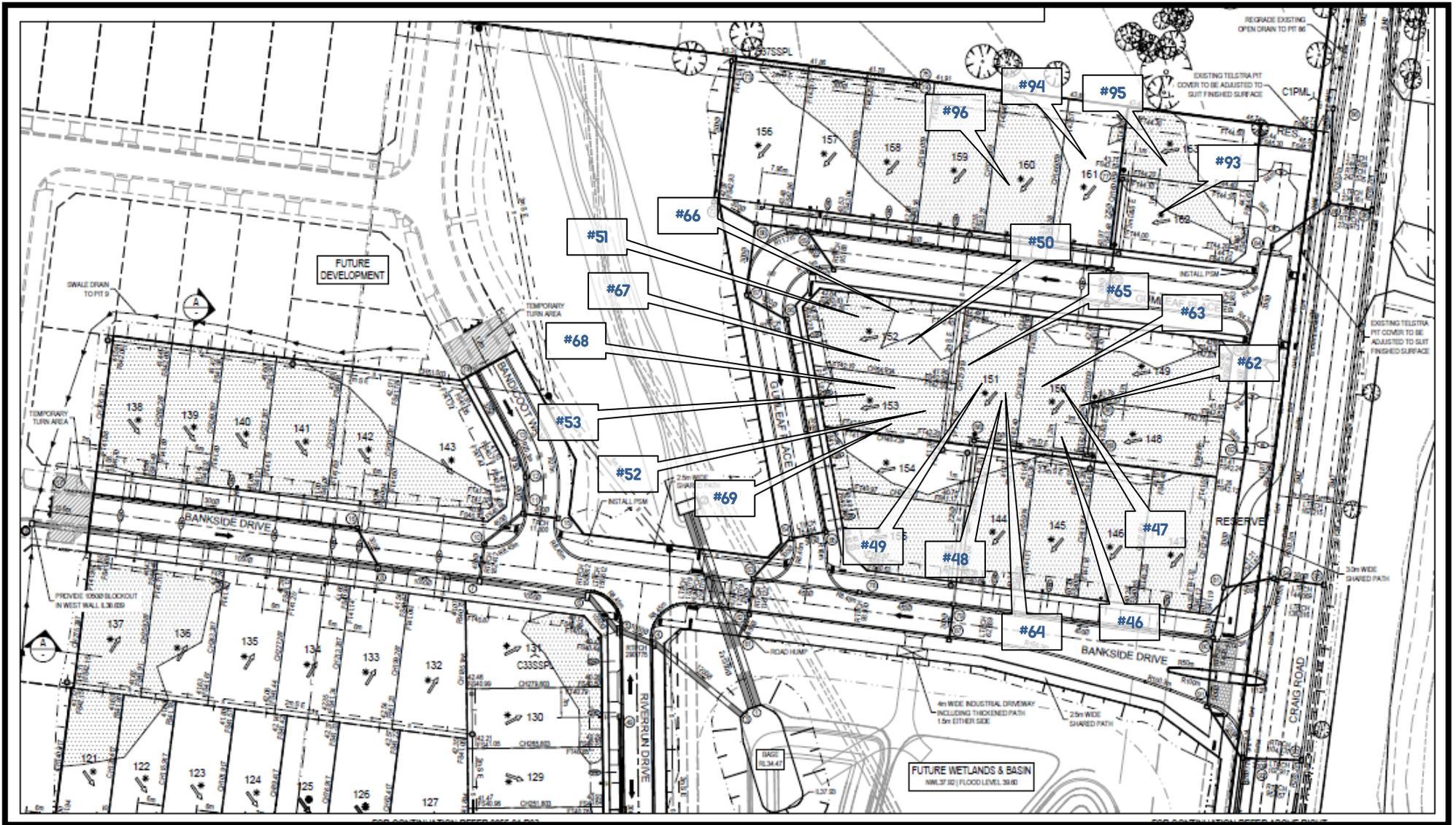
Project
ACACIA ESTATE, STAGE 1, BOTANIC RIDGE

Details
TEST LOCATIONS

Project
GS3711.1 AA
 Drawn
GS

Drawing No
Figure 2
 Checked

Scale
Not to Scale
 Date
8 March 2016



PERTH SAND PENETROMETER TEST LOCATIONS



Project
ACACIA ESTATE, STAGE 1, BOTANIC RIDGE

Details
TEST LOCATIONS

Project
GS3711.1 AA
 Drawn
GS

Drawing No
Figure 3
 Checked

Scale
Not to Scale
 Date
8 March 2016



Appendix B

summary of field density tests



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LEVEL 1 - COMPACTION TEST SUMMARY

Client: PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	Job No: GS3711/1
Project: ACACIA- STAGE 1	Tech: LH / JM
Location: BOTANIC RIDGE	

Date	Test No.	Location	Lot No.	Layer No.	Density Ratio (%)	Moisture Ratio (%)	Moisture variation	(P) Pass (F) Fail	Comments
23/10/2015	1	6m West 15m North from SE corner of Lot	110	1	84.5	48	-5.5	F	Density Testing deemed unsuitable through trial compaction .
26/10/2015	2	11m North 50m West from SE corner of Lot	110	1	93	65	-3.5	F	
27/10/2015	3	15m North 93m West from SE corner of Lot	110	1	93.5	85	-2	F	
27/10/2015	4	12m North 27m West from SE corner of Lot	110	1	97	85	-1.5	P	Density Testing deemed unsuitable through trial compaction .
27/10/2015	5	5m North 7m West from SE corner of Lot	140	1	91.5	59	-3.5	F	
28/10/2015	6	14m North 16m West from SE corner of Lot	110	1	94	68	-4	F	
28/10/2015	7	13m North 2m West from SE corner of Lot	102	1	92	60	-4	F	
28/10/2015	8	16m North 4m West from SE corner of Lot	139	1	91.5	109	1	F	
28/10/2015	9	14m North 2m West from SE corner of Lot	142	1	92.5	94	-0.5	F	
28/10/2015	10	23m North 45 West from SE corner of Lot	145	Base	101	127	2	P	
30/10/2015	11	10m North 4m West from SE corner of Lot	141	1	96	105	0.5	P	
30/10/2015	12	10m North 7m West from SE corner of Lot	139	1	93.5	123	2.5	F	Visually deemed suitable
30/10/2015	13	12m North 2m West from SE corner of Lot	138	1	94.5	105	0.5	P	Re-worked
30/10/2015	14	13m North 5m West from SE corner of Lot	142	1	93	120	2	F	Visually deemed suitable
4/11/2015	15	5m North 3m West from SE corner of Lot	140	1	94.5	100	0	P	Re-worked
4/11/2015	16	12m North 10m West from SE corner of Lot	142	1	96	104	0.5	P	
5/11/2015	17	19m North 5m West from SE corner of Lot	139	1	96	137	5	P	
5/11/2015	18	4m North 7m West from SE corner of Lot	141	1	91	153	5	P	
5/11/2015	19	5m North 9m West from SE corner of Lot	142	1	90	144	5	P	Visually deemed suitable (<800mm of fill)
9/11/2015	20	6m North 3m West from SE corner of Lot	140	1	100	140	4	P	
9/11/2015	21	8m North 7m West from SE corner of Lot	139	1	92.5	150	5.5	P	Visually deemed suitable (<800mm of fill)
9/11/2015	22	22m North 15m West from SW corner of Lot	121	1	95	128	3	P	
9/11/2015	23	12m South 11m West from NE corner of Lot	137	1	92.5	131	3.5	P	Visually deemed suitable (<800mm of fill)
9/11/2015	24	11m North 4m West from SW corner of Lot	121	1	92	119	2.5	P	Visually deemed suitable (<800mm of fill)
9/11/2015	25	11m North 2m West from SE corner of Lot	101	1	89	167	6	P	Visually deemed suitable (<800mm of fill)
9/11/2015	26	13m North 2m West from SE corner of Lot	106	1	97	115	1.5	P	
9/11/2015	27	14m North 3m West from SE corner of Lot	108	1	93	105	0.5	P	Visually deemed suitable (<800mm of fill)
10/11/2015	28	17m South 11m East from NW corner of Lot	136	1	95	109	1	P	
10/11/2015	29	17m North 4m East from SW corner of Lot	121	1	97.5	115	1.5	P	
10/11/2015	30	11m North 2m West from SE corner of Lot	103	1	90	113	1.5	P	Visually deemed suitable (<800mm of fill)



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LEVEL 1 - COMPACTION TEST SUMMARY

Client:	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	Job No:	GS3711/1
Project:	ACACIA- STAGE 1	Tech:	LH / JM
Location:	BOTANIC RIDGE		

Date	Test No.	Location	Lot No.	Layer No.	Density Ratio (%)	Moisture Ratio (%)	Moisture variation	(P) Pass (F) Fail	Comments
10/11/2015	31	14m North 3m West from SE corner of Lot	108	1	95	125	2.5	P	
11/11/2015	32	18m North 3m West from SE corner of Lot	103	1	99.5	100	0	P	
19/11/2015	33	10m North 10m West from SE corner of Lot	155	1	95	107	1	P	
19/11/2015	34	6m North 15m West from SE corner of Lot	154	1	95.5	92	-1	P	
19/11/2015	35	15m North 8m West from SE corner of Lot	144	1	87.5	116	3	P	PSP test performed and deemed suitable
23/11/2015	36	Particle Size Distribution							
20/11/2015	37	8m North 15m West from SE corner of Lot	153	1	87.5	125	3	F	
20/11/2015	38	12m North 15m West from SE corner of Lot	152	1	97	95	-0.5	P	
20/11/2015	39	15m North 5m West from SE corner of Lot	151	1	95.5	76	-2.5	P	
25/11/2015	40	Particle Size Distribution							
24/11/2015	41	8m North 15m West from SE corner of Lot	153	1	96	108	1	P	Re-Test # 37
24/11/2015	42	5m North 22m West from SE corner of Lot	152	2	100	95	-0.5	P	
24/11/2015	43	6m North 8m West from SE corner of Lot	151	2	100.5	91	-1	P	
24/11/2015	44	5m North 10m West from SE corner of Lot	150	2	100.5	110	1	P	
1/12/2015	45	Particle Size Distribution							
24/11/2015	46	Perth Sand Penetrometer	150	1&2				P	
24/11/2015	47	Perth Sand Penetrometer	150	1&2				P	
24/11/2015	48	Perth Sand Penetrometer	151	1&2				P	
24/11/2015	49	Perth Sand Penetrometer	151	1&2				P	
24/11/2015	50	Perth Sand Penetrometer	152	1&2				P	
24/11/2015	51	Perth Sand Penetrometer	152	1&2				P	
24/11/2015	52	Perth Sand Penetrometer	153	1&2				P	
24/11/2015	53	Perth Sand Penetrometer	153	1&2				P	
25/11/2015	54	15m North 10m West from SE corner of Lot	146	1	100.5	105	1	P	
25/11/2015	55	12m North 8m West from SE corner of Lot	147	1	102	103	0.5	P	
25/11/2015	56	10m North 5m West from SE corner of Lot	151	3	94.5	81	-2	P	
1/12/2015	57	Particle Size Distribution							
26/11/2015	58	8m North 8m West from SE corner of Lot	153	4	100	83	-2	P	
26/11/2015	59	7m North 2m West from SE corner of Lot	151	4	98	96	-0.5	P	
10/12/2015	60	Particle Size Distribution							



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LEVEL 1 - COMPACTION TEST SUMMARY

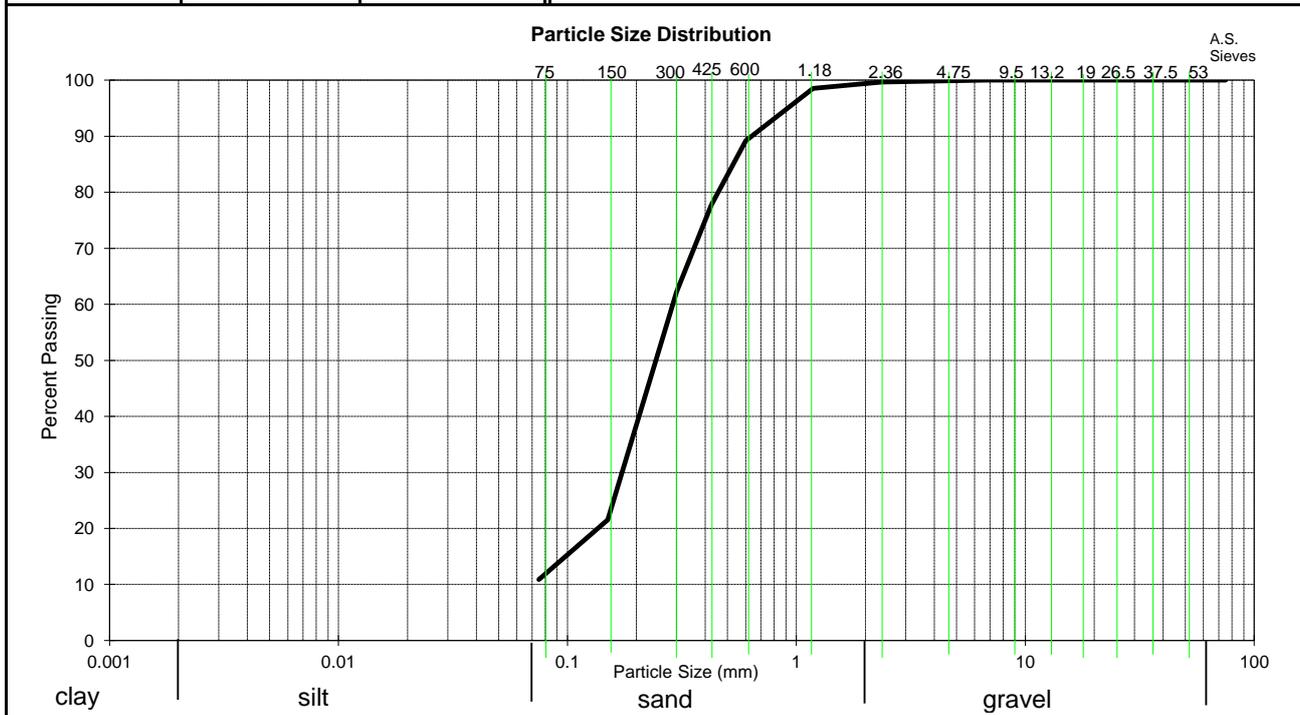
Client:	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	Job No:	GS3711/1
Project:	ACACIA- STAGE 1	Tech:	LH / JM
Location:	BOTANIC RIDGE		

Date	Test No.	Location	Lot No.	Layer No.	Density Ratio (%)	Moisture Ratio (%)	Moisture variation	(P) Pass (F) Fail	Comments
62/11/2015	61	5m North 29m West from SE corner of Lot	148	2	100.5	119	3.5	P	
26/11/2015	62	Perth Sand Penetrometer	150	3&4				P	
26/11/2015	63	Perth Sand Penetrometer	150	3&4				P	
26/11/2015	64	Perth Sand Penetrometer	151	3&4				P	
26/11/2015	65	Perth Sand Penetrometer	151	3&4				P	
26/11/2015	66	Perth Sand Penetrometer	152	3&4				P	
26/11/2015	67	Perth Sand Penetrometer	152	3&4				P	
26/11/2015	68	Perth Sand Penetrometer	153	3&4				P	
26/11/2015	69	Perth Sand Penetrometer	153	3&4				P	
1/12/2015	70	5m North 8m West from SE corner of Lot	148	3	95.5	103	0.5	P	
1/12/2015	71	11m North 20m West from SE corner of Lot	148	3	95	83	-2	P	
1/12/2015	72	6m North 5m West from SE corner of Lot	149	3	99	81	-2.5	P	
1/12/2015	73	6m North 16m West from SE corner of Lot	149	4	100	98	-0.5	P	
1/12/2015	74	5m North 15m West from SE corner of Lot	148	4	101	111	2.5	P	
1/12/2015	75	6m North 5m West from SE corner of Lot	149	4	97.5	100	0	P	
28/01/2016	76	8m North 22m West from SE corner of Lot	162	1	102.5	64	-4	P	
1/02/2016	77	8m North 26m West from SE corner of Lot	163	1	93.5	140	3	P	PSP test performed and deemed suitable
1/02/2016	78	20m North 12 West from SE corner of Lot	161	1	103.5	186	3	P	
1/02/2016	79	12m North 5m West from SE corner of Lot	156	1	87	112	1.5	F	Re-tested #84
1/02/2016	80	29m North 11m West from SE corner of Lot	157	2	94	87	-1.5	P	PSP test performed and deemed suitable
2/02/2016	81	10m North 12m West from SE corner of Lot	159	1	91.5	100	0	F	Re-tested #82
3/02/2016	82	12m North 12m West from SE corner of Lot	159	1	96	110	1.5	P	Re-Test #81
3/02/2016	83	20m North 15m West from SE corner of Lot	159	2	94.5	106	1	P	
3/02/2016	84	21m North 5m West from SE corner of Lot	156	1	94.5	160	3	P	Re-Test #79
4/02/2016	85	24m North 16m West from SE corner of Lot	159	3	101.5	103	0.5	P	
4/02/2016	86	13m North 7m West from SE corner of Lot	159	4	101.5	97	-0.5	P	
4/02/2016	87	7m North 19m West from SE corner of Lot	159	5	98.5	103	0.5	P	
5/02/2016	88	15m North 2m West from SE corner of Lot	128	6	97.5	100	0	P	
10/02/2016	89	12m North 17m West from SE corner of Lot	162	2	98.5	146	3	P	
10/02/2016	90	10m North 4m West from SE corner of Lot	161	2	98	96	-0.5	P	



Client:	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	Job No.	GS3711/1
Project:	ACACIA- STAGE 1	Test Date:	20-Nov-15
Location:	BOTANIC RIDGE	Report No.	AM
Lab Reference No.	36	Sample Identification:	15m North 8.0m West from S/E Corner
Laboratory Specimen Classification:		SAND, fine to coarse, black, with clay.	

Particle Size Distribution AS1289 3.6.1			Consistency Limits and Moisture Content			
Sieve Size	% Passing	Specification	Test	Method	Result	Spec.
150 mm	100		Liquid Limit	% AS1289 3.1.2	ND	
75 mm	100		Plastic Limit	% AS1289 3.2.1	ND	
53mm	100		Plasticity Index	% AS1289 3.3.1	ND	
37.5 mm	100		Linear Shrinkage	% AS1289 3.4.1	ND	
26.5 mm	100		Moisture Content	% AS1289 2.1.1	20.1	
19.0 mm	100		Sample History:		Oven Dried	
13.2 mm	100		Preparation Method:		Dry sieved	
9.5 mm	100		Crumbling / Curling of linear shrinkage:		-	
6.7 mm	100		Linear shrinkage mould length:		250 mm	
4.75 mm	100		ND = not determined NO = not obtainable NP = non plastic			
2.36 mm	100		Moisture / Dry Density Relationship		AS 1289 5.2.1	
1.18 mm	99		Maximum Dry Density:		t/m ³	
600 um	89		Optimum Moisture Content:		%	
425 um	78		Notes			
300 um	62		Sampled by L. High 19/11/2015			
150 um	22					
75 um	11					



Date: 23/11/2015



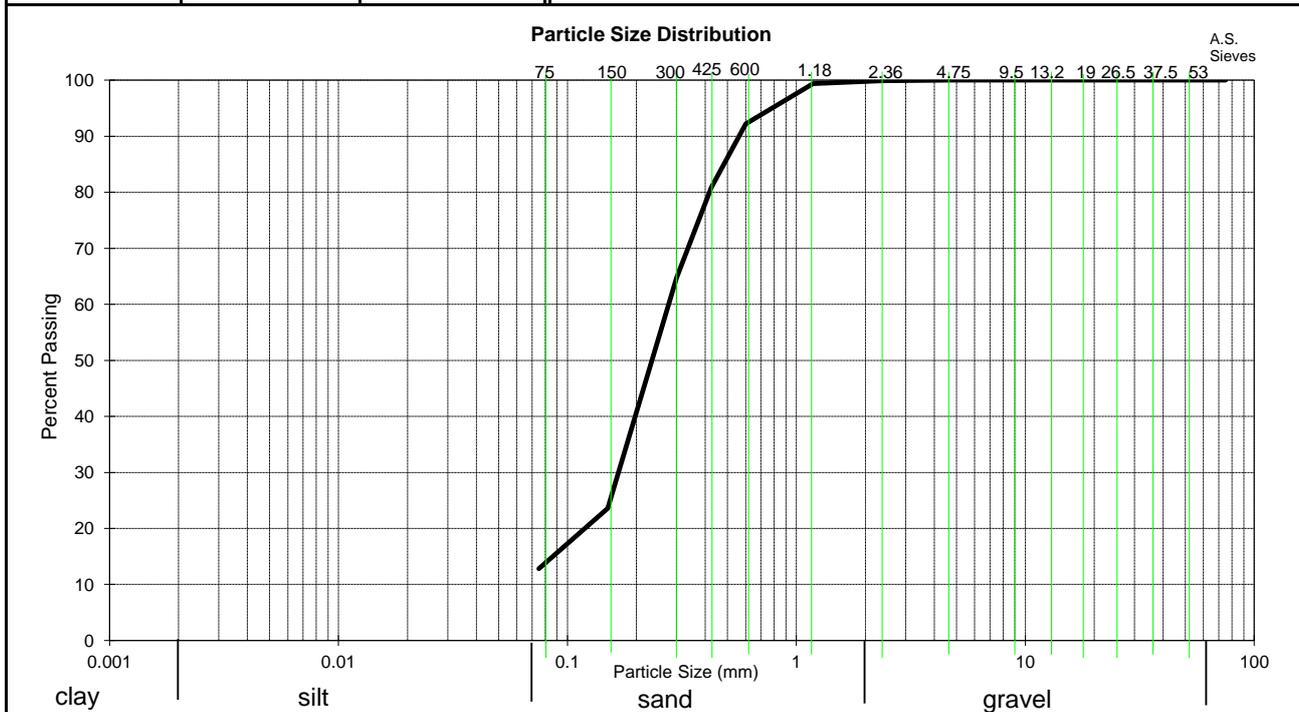
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Client:	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTIN	Job No.	GS3711/1
Project:	ACACIA- STAGE 1	Test Date:	24-Nov-15
Location:	BOTANIC RIDGE	Report No.	AP
Lab Reference No.	40	Sample Identification:	12m North 7.0m West from Lot 150
Laboratory Specimen Classification: silty SAND, fine to coarse, black, fines of low plasticity.			

Particle Size Distribution AS1289 3.6.1			Consistency Limits and Moisture Content			
Sieve Size	% Passing	Specification	Test	Method	Result	Spec.
150 mm	100		Liquid Limit	% AS1289 3.1.2	ND	
75 mm	100		Plastic Limit	% AS1289 3.2.1	ND	
53mm	100		Plasticity Index	% AS1289 3.3.1	ND	
37.5 mm	100		Linear Shrinkage	% AS1289 3.4.1	ND	
26.5 mm	100		Moisture Content	% AS1289 2.1.1	11.6	
19.0 mm	100		Sample History: Oven Dried			
13.2 mm	100		Preparation Method: Dry sieved			
9.5 mm	100		Crumbling / Curling of linear shrinkage: -			
6.7 mm	100		Linear shrinkage mould length: 250 mm			
4.75 mm	100		ND = not determined NO = not obtainable NP = non plastic			
2.36 mm	100		Moisture / Dry Density Relationship AS 1289 5.2.1			
1.18 mm	99		Maximum Dry Density: t/m ³			
600 um	92		Optimum Moisture Content: %			
425 um	81		Notes			
300 um	65		Sampled by L. High 20/11/2015			
150 um	24					
75 um	13					



Date: 25/11/2015



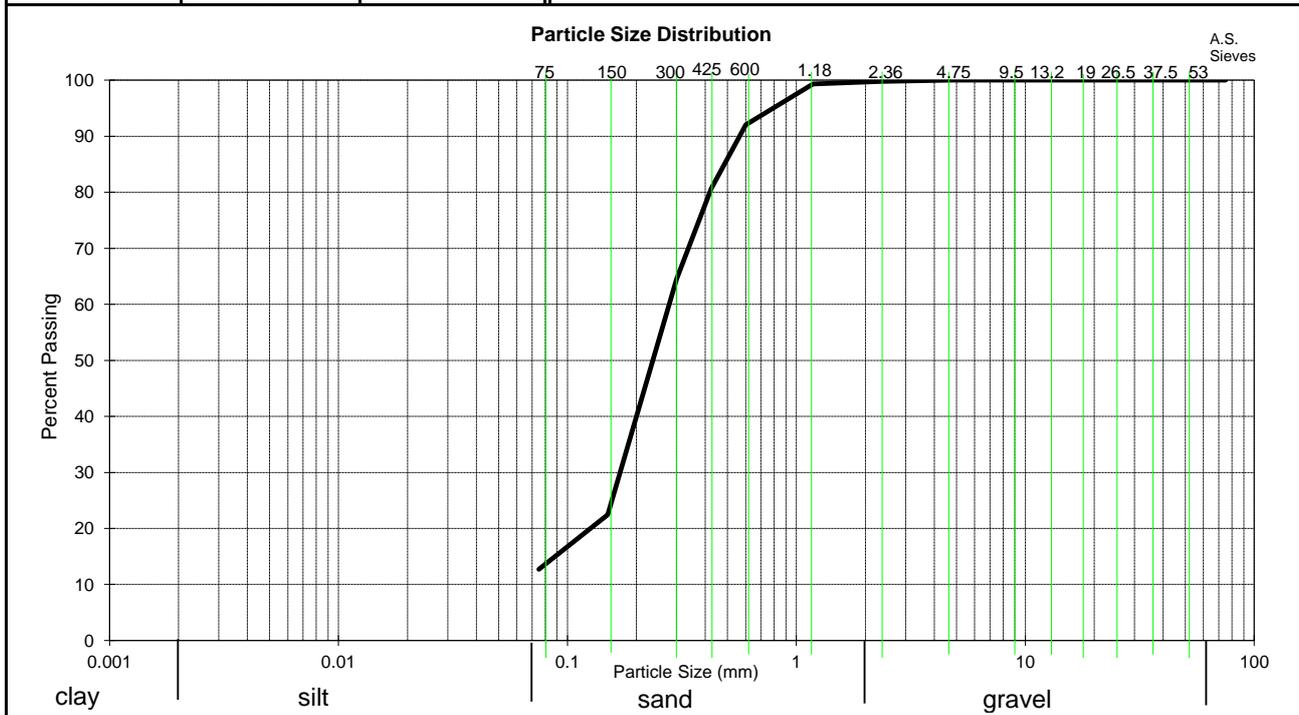
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Client:	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	Job No.	GS3711/1
Project:	ACACIA- STAGE 1	Test Date:	26-Nov-15
Location:	BOTANIC RIDGE	Report No.	AR
Lab Reference No.	45	Sample Identification:	2m North 5m West from S/E Crn of lot 151
Laboratory Specimen Classification:		SAND, fine to coarse, black.	

Particle Size Distribution AS1289 3.6.1			Consistency Limits and Moisture Content			
Sieve Size	% Passing	Specification	Test	Method	Result	Spec.
150 mm	100		Liquid Limit	% AS1289 3.1.2	ND	
75 mm	100		Plastic Limit	% AS1289 3.2.1	ND	
53mm	100		Plasticity Index	% AS1289 3.3.1	ND	
37.5 mm	100		Linear Shrinkage	% AS1289 3.4.1	ND	
26.5 mm	100		Moisture Content	% AS1289 2.1.1	12.9	
19.0 mm	100		Sample History:		Oven Dried	
13.2 mm	100		Preparation Method:		Dry sieved	
9.5 mm	100		Crumbling / Curling of linear shrinkage:		-	
6.7 mm	100		Linear shrinkage mould length:		250 mm	
4.75 mm	100		ND = not determined NO = not obtainable NP = non plastic			
2.36 mm	100		Moisture / Dry Density Relationship		AS 1289 5.2.1	
1.18 mm	99		Maximum Dry Density:		t/m ³	
600 um	92		Optimum Moisture Content:		%	
425 um	81		Notes			
300 um	65		Sampled by L.High 24/11/2015			
150 um	22					
75 um	13					



Date: 1/12/2015



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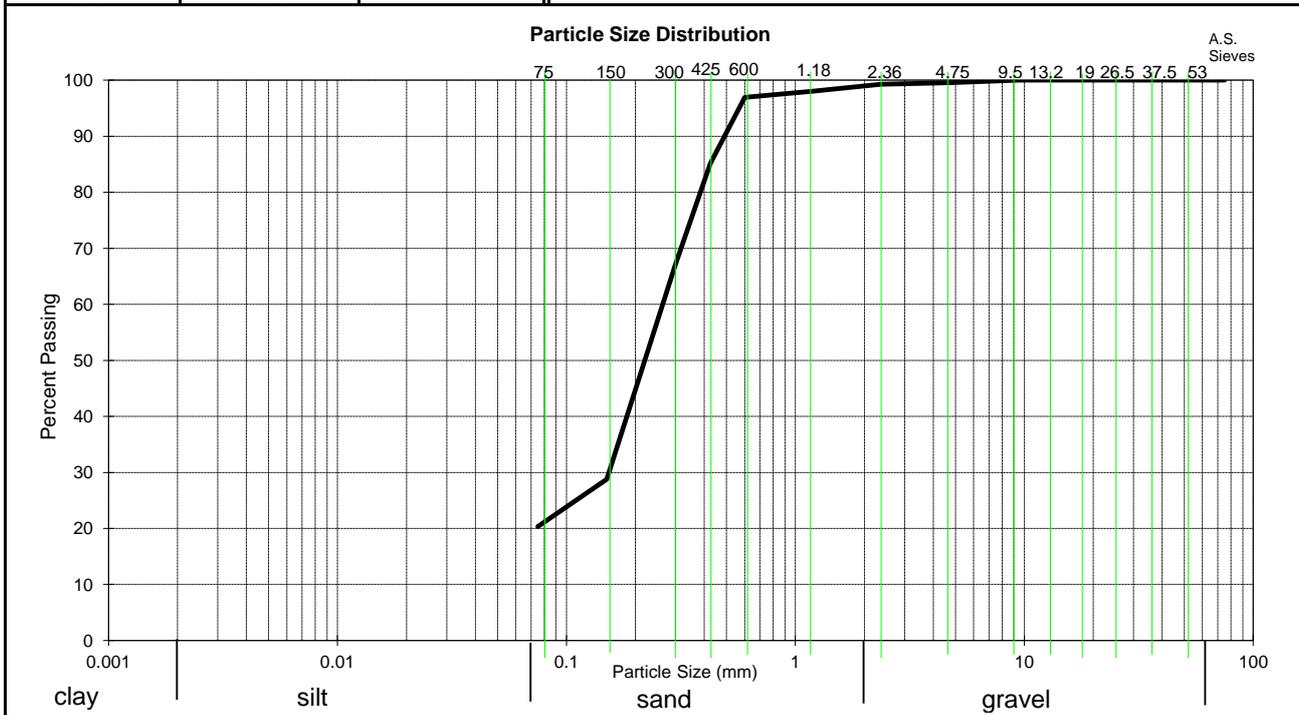
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Client:	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTIN	Job No.	GS3711/1
Project:	ACACIA- STAGE 1	Test Date:	7-Dec-15
Location:	BOTANIC RIDGE	Report No.	AV
Lab Reference No.	60	Sample Identification:	5.0m North 5.0m West from SE Crn of lot 152

Laboratory Specimen Classification: clayey SAND, fine to coarse, brown, fines of low plasticity.

Particle Size Distribution AS1289 3.6.1			Consistency Limits and Moisture Content			
Sieve Size	% Passing	Specification	Test	Method	Result	Spec.
150 mm	100		Liquid Limit	% AS1289 3.1.2	ND	
75 mm	100		Plastic Limit	% AS1289 3.2.1	ND	
53mm	100		Plasticity Index	% AS1289 3.3.1	ND	
37.5 mm	100		Linear Shrinkage	% AS1289 3.4.1	ND	
26.5 mm	100		Moisture Content	% AS1289 2.1.1	11.9	
19.0 mm	100		Sample History: Oven Dried			
13.2 mm	100		Preparation Method: Dry sieved			
9.5 mm	100		Crumbling / Curling of linear shrinkage: -			
6.7 mm	100		Linear shrinkage mould length: 250 mm			
4.75 mm	100		ND = not determined NO = not obtainable NP = non plastic			
2.36 mm	99		Moisture / Dry Density Relationship AS 1289 5.2.1			
1.18 mm	98		Maximum Dry Density: t/m ³			
600 um	97		Optimum Moisture Content: %			
425 um	85		Notes			
300 um	67		Sampled by L. High 26/11/2015			
150 um	29					
75 um	20					



Date: 10/12/2015



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Appendix C

field density test reports



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1		
project :	ACACIA- STAGE 1		report No.:	AA		
location :	BOTANIC RIDGE		test date:	23-Oct-15		
Test Number	1					
Test location from S/E Corner of lot	6.0m West					
Offset (m)	15m North					
Lot Number	110					
Layer Number	1					
Time of tests	-					
Depth of Test	mm 75					
Field Wet Density	t/m ³ 1.595					
*Field Moisture Content	% 5.0					
Oversize Material	Wet % 0					
Sieve Size	mm 19.0					
Peak Converted Wet Density	t/m ³ 1.887					
*Optimum Moisture Content	% 10.5					
Compactive Effort Used	std / mod STD					
Moisture Ratio	% 48					
Moisture Variation	% -5.5					
Moisture Variation	DRY					
Density Ratio	% 84.5					

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	job No:	GS3711/1
project :	ACACIA- STAGE 1	report No.:	AB
location :	BOTANIC RIDGE	test date:	26-Oct-15

Test Number	2				
Test location from					
S/E Corner of lot	11m North				
Offset (m)	50m West				
Lot Number	110				
Layer Number	1				
Time of tests	-				
Depth of Test	mm	200			
Field Wet Density	t/m ³	1.809			
*Field Moisture Content	%	6.5			
Oversize Material	Wet %	0			
Sieve Size	mm	19.0			
Peak Converted Wet Density	t/m ³	1.945			
*Optimum Moisture Content	%	10.0			
Compactive Effort Used	std / mod	STD			
Moisture Ratio	%	65			
Moisture Variation	%	-3.5			
Moisture Variation		DRY			
Density Ratio	%	93.0			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)

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field density test results

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	AC	
location :	BOTANIC RIDGE			test date:	27-Oct-15	
Test Number	3	4	5			
Test location from						
S/E Corner of lot	15m North	12m North	5.0m North			
Offset (m)	93m West	27m West	7.0m West			
Lot Number	110	110	140			
Layer Number	1	1	1			
Time of tests	-	-	-			
Depth of Test	mm 200	200	200			
Field Wet Density	t/m ³ 1.820	1.881	1.820			
*Field Moisture Content	% 11.0	8.5	5.0			
Oversize Material	Wet % 0	0	0			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 1.950	1.939	1.986			
*Optimum Moisture Content	% 13.0	10.0	8.5			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 85	85	59			
Moisture Variation	% -2.0	-1.5	-3.5			
Moisture Variation	DRY	DRY	DRY			
Density Ratio	% 93.5	97.0	91.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)

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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1	
project :	ACACIA- STAGE 1		report No.	AD	
location :	BOTANIC RIDGE		test date:	28-Oct-15	
Test Number	6	7	8	9	10
Test location from					
S/E Corner of lot	14m North	13m North	16m North	14m North	23m North
Offset (m)	16m West	2.0m West	4.0m West	2.0m West	45m West
Lot Number	110	102	139	142	145
Layer Number	1	1	1	1	Base
Time of tests	-	-	-	-	-
Depth of Test	mm 225	175	100	125	300
Field Wet Density	t/m ³ 1.848	1.805	1.874	1.913	2.080
*Field Moisture Content	% 8.5	6.0	12.5	8.0	9.5
Oversize Material	Wet % 0	0	0	0	0
Sieve Size	mm 19.0	19.0	19.0	19.0	19.0
Peak Converted Wet Density	t/m ³ 1.961	1.962	2.053	2.071	2.061
*Optimum Moisture Content	% 12.5	10.0	11.5	8.5	7.5
Compactive Effort Used	std / mod STD	STD	STD	STD	STD
Moisture Ratio	% 68	60	109	94	127
Moisture Variation	% -4.0	-4.0	1.0	-0.5	2.0
Moisture Variation	DRY	DRY	WET	DRY	WET
Density Ratio	% 94.0	92.0	91.5	92.5	101.0

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1	
project :	ACACIA- STAGE 1		report No.	AE	
location :	BOTANIC RIDGE		test date:	30-Oct-15	
Test Number	11	12	13	14	
Test location from					
South Eas corner of Lot	10m North 4m West	19m North 7m West	12m North 2m West	13m North 5m West	
Lot Number	141	139	138	142	
Layer Number	1	1	1	1	
Time of tests	-	-	-	-	
Depth of Test	mm 200	175	125	125	
Field Wet Density	t/m ³ 2.001	2.049	2.017	1.991	
*Field Moisture Content	% 11.5	13.5	11.0	12.0	
Oversize Material	Wet % 0	0	0	0	
Sieve Size	mm 19.0	19.0	19.0	19.0	
Peak Converted Wet Density	t/m ³ 2.088	2.197	2.136	2.138	
*Optimum Moisture Content	% 11.0	11.0	10.5	10.0	
Compactive Effort Used	std / mod STD	STD	STD	STD	
Moisture Ratio	% 105	123	105	120	
Moisture Variation	% 0.5	2.5	0.5	2.0	
Moisture Variation	WET	WET	WET	WET	
Density Ratio	% 96.0	93.5	94.5	93.0	

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1		
project :	ACACIA- STAGE 1		report No.:	AF		
location :	BOTANIC RIDGE		test date:	4-Nov-15		
Test Number	15	16				
Test location from						
South East corner of Lot	5m North 3m West	12m North 10m West				
Lot	140	142				
Layer Number	1	1				
Time of tests	-	-				
Depth of Test	mm 225	175				
Field Wet Density	t/m ³ 1.967	2.000				
*Field Moisture Content	% 10.5	14.0				
Oversize Material	Wet % 0	0				
Sieve Size	mm 19.0	19.0				
Peak Converted Wet Density	t/m ³ 2.082	2.083				
*Optimum Moisture Content	% 10.5	13.5				
Compactive Effort Used	std / mod STD	STD				
Moisture Ratio	% 100	104				
Moisture Variation	% 0.0	0.5				
Moisture Variation	-	WET				
Density Ratio	% 94.5	96.0				

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	AG	
location :	BOTANIC RIDGE			test date:	5/11/201	
Test Number	17	18	19			
Test location from						
South East corner of Lot	19m North 5m West	4m North 7m West	5m North 9m West			
Lot	139	141	142			
Layer Number	1	1	1			
Time of tests	-	-	-			
Depth of Test	mm 275	275	225			
Field Wet Density	t/m ³ 2.014	1.947	1.842			
*Field Moisture Content	% 18.5	14.5	16.5			
Oversize Material	Wet % 0	0	0			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 2.097	2.136	2.047			
*Optimum Moisture Content	% 13.5	9.5	11.5			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 137	153	144			
Moisture Variation	% 5.0	5.0	5.0			
Moisture Variation	WET	WET	WET			
Density Ratio	% 96.0	91.0	90.0			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1		
project :	ACACIA- STAGE 1		report No.	AH		
location :	BOTANIC RIDGE		test date:	9-Nov-15		
Test Number	20	21	22	23	24	25
Test location from	S/E cnr of Lot 6m North 3m West	S/E cnr of Lot 8m North 7m West	S/W cnr of Lot 22m North 15m West	N/E cnr of Lot 12m South 11m West	S/W cnr of Lot 11m North 4m West	S/E cnr of Lot 11m North 2m West
Lot	140	139	121	137	121	101
Layer Number	1	1	1	1	1	1
Time of tests	-	-	-	-	-	-
Depth of Test	mm 300	225	150	175	175	150
Field Wet Density	t/m ³ 1.986	1.967	1.960	1.951	1.908	1.921
*Field Moisture Content	% 14.0	16.5	14.0	15.0	15.5	15.0
Oversize Material	Wet % 0	0	0	0	0	0
Sieve Size	mm 19.0	19.0	19.0	19.0	19.0	19.0
Peak Converted Wet Density	t/m ³ 1.988	2.131	2.066	2.106	2.069	2.154
*Optimum Moisture Content	% 10.0	11.0	11.0	11.5	13.0	9.0
Compactive Effort Used	std / mod STD	STD	STD	STD	STD	STD
Moisture Ratio	% 140	150	128	131	119	167
Moisture Variation	% 4.0	5.5	3.0	3.5	2.5	6.0
Moisture Variation	WET	WET	WET	WET	WET	WET
Density Ratio	% 100.0	92.5	95.0	92.5	92.0	89.0

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1		
project :	ACACIA- STAGE 1		report No.	AI		
location :	BOTANIC RIDGE		test date:	9-Nov-15		
Test Number	26	27				
Test location from						
South East corner of Lot	13m North 2m West	14m North 3m West				
Lot	106	108				
Layer Number	1	1				
Time of tests	-	-				
Depth of Test	mm 300	150				
Field Wet Density	t/m ³ 1.964	1.914				
*Field Moisture Content	% 12.0	11.5				
Oversize Material	Wet % 0	0				
Sieve Size	mm 19.0	19.0				
Peak Converted Wet Density	t/m ³ 2.025	2.060				
*Optimum Moisture Content	% 10.5	11.0				
Compactive Effort Used	std / mod STD	STD				
Moisture Ratio	% 115	105				
Moisture Variation	% 1.5	0.5				
Moisture Variation	WET	WET				
Density Ratio	% 97.0	93.0				

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1	
project :	ACACIA- STAGE 1		report No.	AJ	
location :	BOTANIC RIDGE		test date:	10-Nov-15	
Test Number	28	29	30	31	
Test location from	N/W cnr of Lot 17m South 11m East	S/W cnr of Lot 17m North 4m East	S/E cnr of Lot 11m North 2m West	S/E cnr of Lot 14m North 3m West	
Lot	136	121	103	108	
Layer Number	1	1	1	1	
Time of tests	-	-	-	-	
Depth of Test	mm 175	175	200	175	
Field Wet Density	t/m ³ 1.911	1.939	1.867	1.986	
*Field Moisture Content	% 12.0	12.0	13.0	12.5	
Oversize Material	Wet % 0	0	0	0	
Sieve Size	mm 19.0	19.0	19.0	19.0	
Peak Converted Wet Density	t/m ³ 2.013	1.992	2.072	2.085	
*Optimum Moisture Content	% 11.0	10.5	11.5	10.0	
Compactive Effort Used	std / mod STD	STD	STD	STD	
Moisture Ratio	% 109	115	113	125	
Moisture Variation	% 1.0	1.5	1.5	2.5	
Moisture Variation	WET	WET	WET	WET	
Density Ratio	% 95.0	97.5	90.0	95.0	

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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 Date

18-Feb-16



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	job No:	GS3711/1
project :	ACACIA- STAGE 1	report No.:	AK
location :	BOTANIC RIDGE	test date:	11-Nov-15

Test Number	32				
Test location from South East corner of Lot	18m North 3m West				
Lot	103				
Layer Number	1				
Time of tests	-				
Depth of Test	mm 250				
Field Wet Density	t/m ³ 1.997				
*Field Moisture Content	% 11.0				
Oversize Material	Wet % 0				
Sieve Size	mm 19.0				
Peak Converted Wet Density	t/m ³ 2.007				
*Optimum Moisture Content	% 11.0				
Compactive Effort Used	std / mod STD				
Moisture Ratio	% 100				
Moisture Variation	% 0.0				
Moisture Variation	% -				
Density Ratio	% 99.5				

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.	AL	
location :	BOTANIC RIDGE			test date:	19-Nov-15	
Test Number	33	34	35			
Test location from						
South East corner of lot	10m North 10m West	6m North 15m West	15m North 8m West			
Lot	155	154	144			
Layer Number	1	1	1			
Time of tests	-	-	-			
Depth of Test	mm 300	300	300			
Field Wet Density	t/m ³ 1.900	1.949	1.838			
*Field Moisture Content	% 17.0	11.5	22.0			
Oversize Material	Wet % 0	0	0			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 1.999	2.040	2.105			
*Optimum Moisture Content	% 16.0	12.5	19.0			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 107	92	116			
Moisture Variation	% 1.0	-1.0	3.0			
Moisture Variation	WET	DRY	WET			
Density Ratio	% 95.0	95.5	87.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

field density test results

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	AN	
location :	BOTANIC RIDGE			test date:	20-Nov-15	
Test Number	37	38	39			
Test location from						
South East corner of Lot	8m North 15m West	12m North 15m West	15m North 5m West			
Lot number	153	152	151			
Layer number	1	1	1			
Time of tests	-	-	-			
Depth of Test	mm 300	300	300			
Field Wet Density	t/m ³ 1.843	1.890	1.834			
*Field Moisture Content	% 15.0	10.0	8.0			
Oversize Material	Wet % 0	0	0			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 2.109	1.951	1.924			
*Optimum Moisture Content	% 12.0	10.5	10.5			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 125	95	76			
Moisture Variation	% 3.0	-0.5	-2.5			
Moisture Variation	WET	DRY	DRY			
Density Ratio	% 87.5	97.0	95.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

field density test results

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1	
project :	ACACIA- STAGE 1		report No.	AO	
location :	BOTANIC RIDGE		test date:	24-Nov-15	
Test Number	41	42	43	44	
Test location from					
South East corner of Lot	8m North 15m West Re-Test # 37	5m North 22m West	6m North 8m West	5m North 10m West	
Lot number	153	152	151	150	
Layer number	1	2	2	2	
Time of tests	-	-	-	-	
Depth of Test	mm 300	300	300	300	
Field Wet Density	t/m ³ 2.009	2.095	2.031	1.996	
*Field Moisture Content	% 14.5	9.5	9.5	11.0	
Oversize Material	Wet % 0	0	0	0	
Sieve Size	mm 19.0	19.0	19.0	19.0	
Peak Converted Wet Density	t/m ³ 2.097	2.100	2.020	1.983	
*Optimum Moisture Content	% 13.5	10.0	10.5	10.0	
Compactive Effort Used	std / mod STD	STD	STD	STD	
Moisture Ratio	% 108	95	91	110	
Moisture Variation	% 1.0	-0.5	-1.0	1.0	
Moisture Variation	WET	DRY	DRY	WET	
Density Ratio	% 96.0	100.0	100.5	100.5	

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	AQ	
location :	BOTANIC RIDGE			test date:	25-Nov-15	
Test Number	54	55	56			
Test location from						
South East corner of Lot	15m North 10m West	12m North 8m West	10m North 5m West			
Lot number	146	147	151			
Layer number	1	1	3			
Time of tests	-	-	-			
Depth of Test	mm 300	300	300			
Field Wet Density	t/m ³ 2.048	2.073	1.835			
*Field Moisture Content	% 20.5	22.5	8.5			
Oversize Material	Wet % 0	0	0			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 2.034	2.033	1.947			
*Optimum Moisture Content	% 19.5	22.0	10.5			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 105	103	81			
Moisture Variation	% 1.0	0.5	-2.0			
Moisture Variation	WET	WET	DRY			
Density Ratio	% 100.5	102.0	94.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty CLAY #54 - 55 & silty SAND #56

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	AT	
location :	BOTANIC RIDGE			test date:	26-Nov-15	
Test Number	58	59	61			
Test location from						
South East corner of Lot	8m North 8m West	7m North 3m West	5m North 29m West			
Lot number	153	151	148			
Layer number	4	4	2			
Time of tests	-	-	-			
Depth of Test	mm 300	300	300			
Field Wet Density	t/m ³ 1.935	1.955	2.039			
*Field Moisture Content	% 9.5	10.5	22.5			
Oversize Material	Wet % 0	0	0			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 1.933	1.996	2.033			
*Optimum Moisture Content	% 11.5	11.0	19.0			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 83	96	119			
Moisture Variation	% -2.0	-0.5	3.5			
Moisture Variation	DRY	DRY	WET			
Density Ratio	% 100.0	98.0	100.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description # 58 - 59 silty SAND, #61 silty CLAY

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1		
project :	ACACIA- STAGE 1		report No.	AU		
location :	BOTANIC RIDGE		test date:	1-Dec-15		
Test Number	70	71	72	73	74	75
Test location from						
South East corner of Lot	5m North 8m West	11m north 20m West	6m North 15m West	6m North 16m West	5m North 15m West	6m North 5m West
Lot number	148	148	149	149	148	149
Layer number	3	3	3	4	4	4
Time of tests	-	-	-	-	-	-
Depth of Test	mm 300	300	300	300	300	300
Field Wet Density	t/m ³ 2.026	2.042	2.068	1.992	2.014	1.973
*Field Moisture Content	% 16.0	9.5	10.5	23.0	26.5	23.5
Oversize Material	Wet % 0	0	0	0	0	0
Sieve Size	mm 19.0	19.0	19.0	19.0	19.0	19.0
Peak Converted Wet Density	t/m ³ 2.119	2.152	2.087	1.987	1.994	2.026
*Optimum Moisture Content	% 15.5	11.5	13.0	23.5	24.0	23.5
Compactive Effort Used	std / mod STD	STD	STD	STD	STD	STD
Moisture Ratio	% 103	83	81	98	111	100
Moisture Variation	% 0.5	-2.0	-2.5	-0.5	2.5	0.0
Moisture Variation	WET	DRY	DRY	DRY	WET	-
Density Ratio	% 95.5	95.0	99.0	100.0	101.0	97.5

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty CLAY

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	job No:	GS3711/1
project :	ACACIA- STAGE 1	report No.:	AW
location :	BOTANIC RIDGE	test date:	28-Jan-16

Test Number	76				
Test location from South East corner of Lot	8m North 22m West				
Lot	162				
Layer	1				
Time of tests	-				
Depth of Test	mm 275				
Field Wet Density	t/m ³ 2.029				
*Field Moisture Content	% 7.0				
Oversize Material	Wet % 0				
Sieve Size	mm 19.0				
Peak Converted Wet Density	t/m ³ 1.977				
*Optimum Moisture Content	% 11.0				
Compactive Effort Used	std / mod STD				
Moisture Ratio	% 64				
Moisture Variation	% -4.0				
Moisture Variation	DRY				
Density Ratio	% 102.5				

Specification Requirements 98% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1	
project :	ACACIA- STAGE 1		report No.	AX	
location :	BOTANIC RIDGE		test date:	1-Feb-16	
Test Number	77	78	79	80	
Test location from					
South East corner of Lot	26m West 8m North	12m West 20m North	5m West 12m North	11m West 29m North	
Lot Number	163	161	156	157	
Layer Number	1	1	1	2	
Time of tests	-	-	-	-	
Depth of Test	mm 275	275	275	275	
Field Wet Density	t/m ³ 1.931	2.077	1.874	1.919	
*Field Moisture Content	% 10.5	6.5	14.5	10.0	
Oversize Material	Wet % 0	0	0	0	
Sieve Size	mm 19.0	19.0	19.0	19.0	
Peak Converted Wet Density	t/m ³ 2.070	2.004	2.149	2.043	
*Optimum Moisture Content	% 7.5	3.5	13.0	11.5	
Compactive Effort Used	std / mod STD	STD	STD	STD	
Moisture Ratio	% 140	186	112	87	
Moisture Variation	% 3.0	3.0	1.5	-1.5	
Moisture Variation	WET	WET	WET	DRY	
Density Ratio	% 93.5	103.5	87.0	94.0	

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	job No:	GS3711/1
project :	ACACIA- STAGE 1	report No.:	AY
location :	BOTANIC RIDGE	test date:	2-Feb-16
Test Number	81		
Test location from South East corner of Lot	12m West 10m North		
Lot Number	159		
Layer Number	1		
Time of tests	-		
Depth of Test	mm 250		
Field Wet Density	t/m ³ 1.945		
*Field Moisture Content	% 15.5		
Oversize Material	Wet % 0		
Sieve Size	mm 19.0		
Peak Converted Wet Density	t/m ³ 2.127		
*Optimum Moisture Content	% 15.5		
Compactive Effort Used	std / mod STD		
Moisture Ratio	% 100		
Moisture Variation	% 0.0		
Moisture Variation	% -		
Density Ratio	% 91.5		

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty CLAY

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	AZ	
location :	BOTANIC RIDGE			test date:	3-Feb-16	
Test Number	82	83	84			
Test location from South East corner of Lot	12m West 12m North	15m West 20m North	5m West 21m North			
Time of tests	-	-	-			
Depth of Test	mm 275	mm 275	mm 275			
Field Wet Density	t/m ³ 2.020	t/m ³ 2.000	t/m ³ 1.945			
*Field Moisture Content	% 17.0	% 17.5	% 8.0			
Oversize Material	Wet % 0	Wet % 0	Wet % 0			
Sieve Size	mm 19.0	mm 19.0	mm 19.0			
Peak Converted Wet Density	t/m ³ 2.107	t/m ³ 2.122	t/m ³ 2.053			
*Optimum Moisture Content	% 15.5	% 16.5	% 5.0			
Compactive Effort Used	std / mod STD	std / mod STD	std / mod STD			
Moisture Ratio	% 110	% 106	% 160			
Moisture Variation	% 1.5	% 1.0	% 3.0			
Moisture Variation	WET	WET	WET			
Density Ratio	% 96.0	% 94.5	% 94.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty CLAY / silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING			job No:	GS3711/1	
project :	ACACIA- STAGE 1			report No.:	BA	
location :	BOTANIC RIDGE			test date:	4-Feb-16	
Test Number	85	86	87			
Test location from						
South East corner of Lot	16m West 24m North	7m West 13m North	19m West 7m North			
Lot Number	159	159	159			
Layer Number	3	4	5			
Time of tests	-	-	-			
Depth of Test	mm 275	275	275			
Field Wet Density	t/m ³ 2.095	2.074	2.026			
*Field Moisture Content	% 19.0	15.5	18.5			
Oversize Material	Wet % 0	0	1			
Sieve Size	mm 19.0	19.0	19.0			
Peak Converted Wet Density	t/m ³ 2.061	2.043	2.059			
*Optimum Moisture Content	% 18.5	16.0	18.0			
Compactive Effort Used	std / mod STD	STD	STD			
Moisture Ratio	% 103	97	103			
Moisture Variation	% 0.5	-0.5	0.5			
Moisture Variation	WET	DRY	WET			
Density Ratio	% 101.5	101.5	98.5			

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty CLAY

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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field density test results

A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING	job No:	GS3711/1
project :	ACACIA- STAGE 1	report No.:	BB
location :	BOTANIC RIDGE	test date:	5-Feb-16

Test Number	88				
Test location from South East corner of Lot	2m West 15m North				
Lot Number	158				
Layer Number	6				
Time of tests	-				
Depth of Test	mm 275				
Field Wet Density	t/m ³ 2.019				
*Field Moisture Content	% 19.0				
Oversize Material	Wet % 0				
Sieve Size	mm 19.0				
Peak Converted Wet Density	t/m ³ 2.066				
*Optimum Moisture Content	% 19.0				
Compactive Effort Used	std / mod STD				
Moisture Ratio	% 100				
Moisture Variation	% 0.0				
Moisture Variation	% -				
Density Ratio	% 97.5				

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty CLAY

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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A C N 105 704 078

13 Brock Street Thomastown VIC, P 03 9464 4617 F 03 9464 4618

client :	PEET BOTANIC VILLAGE LIMITED C/- GPR CONSULTING		job No:	GS3711/1	
project :	ACACIA- STAGE 1		report No.	BC	
location :	BOTANIC RIDGE		test date:	10-Feb-16	
Test Number	89	90	91	92	
Test location from					
South East corner of Lot	17m West 12m North	4m West 10m North	12m West 12m North	14m West 20m North	
Lot Number	162	161	160	160	
Layer Number	2	2	2	1	
Time of tests	-	-	-	-	
Depth of Test	mm 275	275	275	275	
Field Wet Density	t/m ³ 1.954	1.952	2.055	2.068	
*Field Moisture Content	% 9.5	10.5	12.5	13.0	
Oversize Material	Wet % 0	0	0	0	
Sieve Size	mm 19.0	19.0	19.0	19.0	
Peak Converted Wet Density	t/m ³ 1.983	1.992	2.060	2.087	
*Optimum Moisture Content	% 6.5	11.0	10.0	10.0	
Compactive Effort Used	std / mod STD	STD	STD	STD	
Moisture Ratio	% 146	96	125	130	
Moisture Variation	% 3.0	-0.5	2.5	3.0	
Moisture Variation	WET	DRY	WET	WET	
Density Ratio	% 98.5	98.0	99.5	99.0	

Specification Requirements 95% Standard compaction

Notes: Moisture Variation: (-) indicates dry; (+) indicates wet

Material description silty SAND

Test Methods AS1289 5.8.1 5.7.1 2.1.1 1.2.1 (6.4)



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 The results of the tests, calibrations and/or
 measurements in this document are traceable to
 Australian/National Standards

Anthony Cristofaro
 Approved Signatory
 Date

22-Feb-16



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