

WANT Geotechnics

Site Classification & Bearing Capacity Assessment

For

Stage 3C, Zuccoli, Northern Territory

Prepared for the Ostoja Pty Ltd

Project NTG20222489 Rev A

7 March 2022

PROVIDED FOR INFORMATION PURPOSES ONLY
AND SHOULD NOT BE USED FOR CONSTRUCTION
- BUILDERS/BUYERS ARE TO INFORM THEMSELVES

WANT Geotechnics

Site Classification & Bearing Capacity Assessment

For

Stage 3C, Zuccoli, Northern Territory

Prepared for the Ostoic Pty Ltd

Project NTG20222489 Rev A

Project: NTG20222489		
Date	Revision	Comments
28 February 2022	0	Draft issued to Client
7 March 2022	A	Section 5 amended

This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that for which it was supplied by WANT Geotechnics. We make no representation, undertake no duty and accept no responsibility to any third party who may use or rely upon this document or the information.

Author: Mary Flux

Approved by: Stephen Flux

Distribution: Ostoic Pty Ltd (1 electronic).....

Table of Contents

	Page
1. Introduction	4
2. Zuccoli Stage 3C	4
3. Geology and Land System	4
4. Earthworks and Compaction	5
5. Assessment of Compaction Results	7
6. Assessment of Site Class and Bearing Capacity	7
7. Foundations	10
8. Certification	10
9. References	10
10. Limitations	11

Appendix A:

ADG Drawing 3C_002 Zuccoli Aspire Stage 3C Civil Works
 Borehole Location Plan
 Explanatory Notes
 Borehole Logs
 Dynamic Cone Penetrometer Results
 Photographic Record
 Laboratory Test Results
 ADG Inspection Reports



Site Classification & Bearing Capacity Assessment for Stage 3C, Zuccoli, Northern Territory

1. Introduction

WANT Geotechnics (WANT) was commissioned to undertake a geotechnical investigation to provide a report covering the site classification and bearing capacity of 41 Lots developed as Stage 3C, Zuccoli in the Northern Territory. The investigation and report was commissioned by the Ostojic Pty Ltd (Ostojic).

The assessment of individual lot site classification has been undertaken in general accordance with Australian Standard AS2870 *Residential Slabs and Footings*. The assessment of bearing capacity has been in accordance with the methodology presented in MJ Stockwell (1977) and titled *Determination of Allowable Bearing Pressure Under Small Structures*.

The geotechnical investigation undertaken comprised:

- Drilling an average 1.5 bores per lot; and
- A dynamic cone penetrometer test adjacent to each excavation.

This report presents the investigation data and certification of the site class and bearing capacity of each lot based on the February 2022 investigation undertaken by WANT Geotechnics Pty Ltd.

In our judgement, the extent of this investigation has been sufficient to correlate the observed soil conditions with the known geology and published information for this area. However, localised variations are very difficult to locate using test holes and boreholes and natural soils can vary greatly over short distances. Although the ground conditions revealed during this recent phase of investigation suggest the subsoils are reasonably uniform at Zuccoli Stage 3B.

2. Zuccoli Stage 3C

Zuccoli Stage 3C comprises 41 individual lots, earthworks to form the lots was undertaken by Ostojic, and Level 2 Inspection and Testing by HiQA and Construction Sciences Darwin. A plan showing the lot layout is included in Appendix A.

3. Geology and Land System

The Extractive Geology of the Outer Darwin Area 1:100 000 Geological Series map indicates Stage 3C is predominantly underlain by Tertiary age laterite gravel and ferricrete. Reference to NT Government Natural Resource Maps website indicates the site sits on land of the Bustad Land System (sandstone plains and rises and no occurrence of acid sulphate soils). In addition, WANT Geotechnics understanding of the ground conditions draws on the trench and excavation inspections undertaken during the installation of sewer and water mains. Selected photographs from those visits have been included in the photographic record in Appendix A.



4. Earthworks and Compaction

The specification for the earthworks was prepared by ADG and titled *Zuccoli Aspire, Zuccoli, Northern Territory Technical Specification* dated 11 November 2019.

Earthworks and associated activities undertaken as part of the construction typically comprised:

- Clearing and grubbing
- Stripping of topsoil
- Cutting and filling
- Preparation of the stripped subgrade surface
- Placement and compaction of Fill layers
- Level 2 inspection and testing

For details of specification requirements for the above activities, reference should be made to the relevant sections of the ADG Specification.

For details of inspections following topsoil stripping and proof rolling, see the appended reports by ADG. All areas of Stage 3C passed proof roll testing.

The specification requires the fill placed on residential lots be compacted to 93.0% Maximum Modified Dry Density (MMDD).

The earthworks were undertaken by Ostojic, and various NATA accredited Northern Territory Government Panel Soils Laboratories carried out Level 2 earthworks inspection and testing for the project. Field and laboratory tests were undertaken in accordance with AS1289 *Methods of Testing Soils for Engineering Purposes* to assess the compaction of fill.

The following test reports have been provided as a record of the compaction achieved during placement of the fill. They have been reviewed by WANT Geotechnics and found to conform to the requirements of the Specification:

- Construction Sciences: Lot Report – Dry Density Ratio / Moisture Ratio reports 21791-R-49670, 49816, 49722, 49733, 49723, 49769, 49850, 49851 and 49853
- Construction Sciences: Lot Report – California Bearing Ration reports 21791-R-49816, 49849, 49887,
- HIQA: Material Test Reports D21309-24, 26, 35 and 50

Copies of the above records and documents are included in Appendix A.

Field density and laboratory compaction tests were carried out to assess the relative compaction and moisture condition of compacted fill in accordance with the frequency stated in the Specification.

The following table summarises the compaction results for the fill placement, in order the test reports were issued. Full results are attached at the end of this report in Appendix A.



Table 1: Summarised Compaction Results

	General Fill							
	EWK_07 Lift 1	EWK_07 Lift 2	EWK_07 Lift 3	EWK_07 Lift 4	EWK_08 Lift 1	EWK_08 Lift 2	EWK_07A	EWK_07 14966-14975 Layer 5
Date tested	17/09/2021	17/09/2021	21/09/2021	21/09/2021	19/10/2021	19/10/2021	14/12/2021	14/12/2021
No. of Compaction Tests	3	3	3	3	3	3	1	3
Compaction Results Range (MMDD%)	95.0-96.5	95.5-96.0	93.5-95.5	95.0-95.5	96.5-99.0	96.0-97.5	101.5	97.5-101.5
	General Fill							
	EWK_07 14966-14975 Layer 6	EWK_08 14945-14959 Layer 3	EWK_08 14945-14959 Layer 4	EWK_07A	EWK_07A Layer 3	EWK_07A Layer 4	EWK_07A Layer 5	EWK_07A Layer 6
Date tested	14/12/2021	15/12/2021	15/12/2021	15/12/2021	16/12/2021	16/12/2021	17/12/2021	17/12/2021
No. of Compaction Tests	3	3	3	1	1	1	1	1
Compaction Results Range (MMDD%)	96.5-100.0	95.0-97.5	96.0-101.5	99.5	101.0	100.5	96.0	95.0
	General Fill							
	EWK_07A Layer 7	EWK_07A Layer 8	EWK_07A Layer 9/10	EWK_07A Layer 9/10	EWK_07 Layer 7	EWK_07B Layer 1/2	EWK_07B Layer 2/2	
Date tested	17/12/2021	17/12/2021	21/12/2021	21/12/2021	21/12/2021	21/12/2021	21/12/2021	
No. of Compaction Tests	1	1	1	1	3	1	1	
Compaction Results Range (MMDD%)	95.5	96.0	98.5	99.5	99.5-101.0	97.0	99.5	



5. Assessment of Compaction Results

There were no compaction results below the specification requirement of 93%MMDD.

6. Assessment of Site Class and Bearing Capacity

Australian Standard AS 2870 provides a system of site classification as shown in the table below.

Class	Predicted Surface Movement	Foundation
A		Most sand and rock sites with little or no ground movement from moisture changes
S	<20mm	Slightly reactive clay or silt sites with slight ground movement from moisture changes
M	20mm to 40mm	Moderately reactive clay or silt sites which can experience moderate ground movement from moisture changes
H1	40mm to 60mm	Highly reactive clay site, which can experience high ground movement from moisture changes
H2	60mm to 75mm	Highly reactive clay site, which can experience very high ground movement from moisture changes
E	>75mm	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P		Filled sites
P		Sites which include soft soils, such as soft clays, silts or organic soils, loose sands, landslip, mine subsidence, collapsing soils, soils subject to erosion, reactive sites subject to abnormal moisture conditions, sites with highly variable conditions such as weathered dolerite dykes, and sites which cannot be classified otherwise.

Table 2: AS2870 Site Classes

- The following tables summarise the ground investigation and DCP results and provide an assessment of site class along with the assessed allowable bearing capacity at likely foundation depth (0.30m to 0.50m).



Lot	Summary of Strata		Site Class	Minimum DCP Blow Count per 100mm below 0.30m	Allowable Bearing Capacity at 0.30m to 0.50m (kPa)
	Engineered Fill	Extremely to Highly weathered rock			
14935	0.00-0.10m	0.10-0.20m	S	>20	>300
14936	0.00-0.10m	0.10-0.20m	S	>20	>300
14937	0.00-0.10m	0.10-0.20m	S	>20	>300
14938	0.00-0.10m	0.10-0.20m	S	>20	>300
14939	0.00-0.10m	0.10-0.20m	S	>20	>300
14940	0.00-0.10m	0.10-0.20m	S	>20	>300
14941	0.00-0.10m	0.10-0.20m	S	>20	>300
14942	0.00-0.10m	0.10-0.80m	S	13	280
14943	0.00-0.10m	0.10-0.20m	S	>20	>300
14944	0.00-0.10m	0.10-0.50m	S	4	130
14945	0.00-0.65m	0.65-0.75m	P Equivalent to S	8	210
14946	0.00-0.60m	0.60-0.70m	P Equivalent to S	8	210
14947	0.00-0.20m	0.20-0.30m	S	>20	>300
14948	0.00-0.20m	0.20-0.30m	S	>20	>300
14949	0.00-0.10m	0.10-0.20m	S	>20	>300
14950	0.00-0.10m	0.10-0.20m	S	>20	>300
14951	0.00-0.10m	0.10-0.20m	S	>20	>300
14952	0.00-0.10m	0.10-0.20m	S	>20	>300
14953	0.00-0.35m	0.35-0.45m	S	>20	>300
14954	0.00-0.60m	0.60-0.70m	P Equivalent to S	>20	>300
14955	0.00-0.70m	0.70-0.90m	P Equivalent to S	>20	>300
14956	0.00-1.00m	1.00-1.70m	P Equivalent to S	>20	>300

Table 3: Site Classification and Allowable Bearing Capacity for Lots 14935 to 14956

Site Classification & Bearing Capacity Assessment
 Stage 3C, Zuccoli, Northern Territory



Lot	Summary of Strata		Site Class	Minimum DCP Blow Count per 100mm below 0.30m	Allowable Bearing Capacity at 0.30m to 0.50m (kPa)
	Engineered Fill	Sand / Gravel / Extremely weathered rock			
14957	0.00-1.00m	1.00-1.25m	P Equivalent to S	>20	>300
14958	0.00-0.90m	0.90-1.00m	P Equivalent to S	>20	>300
14959	0.00-0.55m	0.55-0.65m	P Equivalent to S	>20	>300
14960	0.00-0.10m	0.10-0.20m	S	>20	>300
14961	0.00-0.10m	0.10-0.60m	S	12	280
14962	0.00-0.10m	0.10-0.20m	S	>20	>300
14963	0.00-0.10m	0.10-0.20m	S	>20	>300
14964	0.00-0.10m	0.10-0.20m	S	>20	>300
14965	0.00-0.10m	0.10-0.80m	S	>20	>300
14966	0.00-0.50m	0.50-0.75m	P Equivalent to S	>20	>300
14967	0.00-0.25m	Not encountered	P Equivalent to S	>20	>300
14968	0.00-0.70m	0.70-1.20m	P Equivalent to S	>20	>300
14969	0.00-1.15m	1.15-1.50m	P Equivalent to S	>20	>300
14970	0.00-0.70m	0.70-1.40m	P Equivalent to S	>20	>300
14971	0.00-1.30m	1.30-1.60m	P Equivalent to S	>20	>300
14972	0.00-1.60m	1.60-1.70m	P Equivalent to S	>20	>300
14973	0.00-1.60m	1.60-1.70m	P Equivalent to S	>20	>300
14974	0.00-1.70m	Not encountered	P Equivalent to S	>20	>300
14975	0.00-1.70m	Not encountered	P Equivalent to S	>20	>300

Table 4: Site Classification and Allowable Bearing Capacity for Lots 14957 to 14975



7. Foundations

Footings systems for residential dwellings on Class S and P equivalent to S sites can be designed in accordance with standard S class footings as set out in Section 3 of AS 2870.

P equivalent to S class means that in places the site is underlain by more than 0.40m of fill, however because the fill has been engineered (rolled, moisture conditioned and compacted under Level 2 supervision – see Section 4) the fill can be considered equivalent to in situ material, in effect the site is classed as S Class.

8. Certification

Subject to the site preparation set out in Section 5, the data provided, the above review, and utilising Stockwell's method for the determination of bearing capacity, then all 41 Lots making up Zuccoli Stage 3C are certified as having:

- an allowable bearing capacity of at least 100kPa at likely foundation depth (0.30m to 0.50m depth);
- are Class S or P equivalent to S; and
- are considered suitable for the construction of single or double storey masonry buildings.

9. References

1. Northern Territory Geological Survey *Extractive Minerals Within the Outer Darwin Area*
2. Australian Standard AS 2870 *Residential Slabs and Footings*
3. MJ Stockwell, 1977, *Determination of Allowable Bearing Pressure Under Small Structures*



10. Limitations

SCOPE OF SERVICES

This geotechnical report has been prepared in accordance with the scope of services set out in the agreement between WANT Geotechnics and their client and is subject to any qualifications and assumptions set out in the report. In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

In preparing the report, WANT Geotechnics has relied upon data, surveys, and plans provided by the client. WANT Geotechnics has not verified the accuracy or completeness of the data, to the extent that the any statements, opinions, facts, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WANT Geotechnics will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have not been fully disclosed to WANT Geotechnics.

GEOTECHNICAL INVESTIGATION

This report was prepared expressly for the client and expressly for purposes indicated by the client or his representative. Use by any other persons for any purpose, or by the client for a different purpose, is not recommended. The client should not use this report for other than its intended purpose without seeking additional geotechnical advice.

LIMITATIONS OF SITE INVESTIGATION

In assessing a structure from a single exploratory location there is the possibility that variations may occur that were not encountered. Site exploration identifies specific subsurface conditions only at those points from which samples have been taken. The risk that variations will not be detected can be reduced by increasing the frequency of test locations; however, this often does not result in any overall cost savings for the project. The data derived from the investigation and subsequent laboratory testing have been extrapolated to form an inferred model and an engineering opinion is rendered about overall subsurface conditions and their likely behaviour with regard to the structure. Actual conditions at the site might differ from those inferred to exist, since no subsurface exploration program, no matter how comprehensive, can reveal all subsurface details and anomalies. The exploratory test records are the subjective interpretation of subsurface conditions at a particular location, made by trained personnel. The interpretation may be limited by the method of investigation and cannot always be definitive. For example, inspection of an excavation or test pit allows a greater area of the subsurface profile to be inspected than borehole investigation; however, such methods are limited by depth and site disturbance restrictions. In borehole investigation, the actual interface between materials may be more gradual or abrupt than a report indicates.

SUBSURFACE CONDITIONS ARE TIME DEPENDENT

Subsurface conditions may be modified by changing natural forces or man-made influences. A geotechnical engineering report is based on conditions which existed at the time of subsurface exploration. Construction operations, at or adjacent to the site, and natural events, such as floods or groundwater fluctuations may also affect subsurface conditions and thus the continuing adequacy of a geotechnical report. The geotechnical engineer should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

EXPLORATORY LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT



Final exploratory logs are developed by geotechnical engineers based upon their interpretation of field logs and laboratory evaluation of field samples. Customarily, only the final exploratory logs are included in geotechnical engineering reports. These logs should not under any circumstances be redrawn for inclusion in architectural or other design drawings. To minimise the likelihood of exploratory log misinterpretation, contractors should be given access to the complete geotechnical engineering report prepared or authorised for their use. Providing the best available information to contractors helps prevent costly construction problems. For further information on this matter reference should be made to 'Guidelines for the Provision of Geotechnical Information in Construction Contracts' published by the Institution of Engineers Australia, National Headquarters, Canberra 1987.

OTHER LIMITATIONS

WANT Geotechnics will not be liable to update or revise the report to consider any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

WANT Geotechnics Pty Ltd

“Unfortunately, soils are made by nature and not by man, and the products of nature are always complex. As soon as we pass from steel and concrete to earth, the omnipotence of theory ceases to exist. Natural soil is never uniform. Its properties change from point to point while our knowledge of its properties is limited to those few spots at which the samples have been collected. In soil mechanics the accuracy of the computed results never exceeds that of a crude estimate and the principal function of theory consists in teaching us what and how to observe in the field”

Karl Terzaghi – Founder of Modern Geotechnology



Appendix A

ADG Drawing 3C_002 *Zuccoli Aspire Stage 3C Civil Works*

Borehole Location Plans

Explanatory Notes

Borehole Logs

Dynamic Cone Penetrometer Results

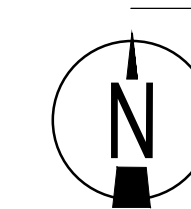
Photographic Record

Laboratory Test Results

ADG Inspection Reports

PROVIDED FOR INFORMATION PURPOSES ONLY
AND SHOULD NOT BE USED FOR CONSTRUCTION
- BUILDERS/BUYERS ARE TO INFORM THEMSELVES

- | | |
|--|--|
| | STAGE BOUNDARY |
| | PROPOSED STORMWATER DRAINAGE PIPE AND SIZE |
| | PROPOSED SIDE ENTRY PIT (REFER LONG SECTION DRAWINGS FOR NO. OF BAYS & CHAMBER SIZE) |
| | PROPOSED STORMWATER DRAINAGE PIT |
| | PROPOSED SEWER |
| | PROPOSED WATER MAIN |
| | PROPOSED ROAD CENTRE LINE |
| | PROPOSED LAYBACK KERB & GUTTER AND UPRIGHT KERB. REFER DETAIL ON DRG. 3C_318. |



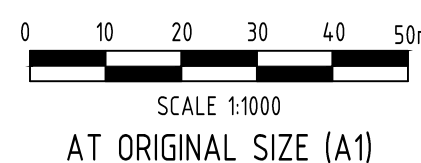
PERMISSION TO USE FOR CONSTRUCTION PURPOSES
ROADWORKS AND STORMWATER DRAINAGE

SIGNED _____ DATE _____

DIRECTOR CITY GROWTH AND OPERATIONS - CITY OF PALMERSTON

This permission to use is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents associated. This permission is valid for two years from date of signing.

0	03.09.21	ISSUED FOR CONSTRUCTION	JMB	SW
Rev	Date	Description	By	Chk



Darwin Office
Suite G01, Manunda Place, 38 Cavenagh Street,
Darwin, Northern Territory 0800, Australia
GPO Box 2422, Darwin, Northern Territory 0801
T 1300 657 402 F +617 3871 2266
E info@adgce.com W www.adgce.com
BRISBANE / DARWIN / GOLD COAST / MELBOURNE
SUNSHINE COAST / SYDNEY / TOOWOOMBA

Client	COSTOJIC PTY LTD
--------	------------------

Project Name
ZUCCOLI ASPIRE
STAGE 3C
CIVIL WORKS

Discipline	CIVIL
------------	-------

Designed By	LC
-------------	----

LS
Project No. 20696

The concepts and information contained in this document are the copyright of ADG Engineers (Aust) Pty Ltd. Use or copying of the document in whole or in part without the written permission of ADG Engineers (Aust) Pty Ltd constitutes an infringement of copyright.

Do not scale drawings. If in doubt, ask!

Status	CONSTRUCTION
--------	--------------

Approved By	EW
-------------	----

	SW
	Scale at A1 1:1000

ISSUED FOR
CONSTRUCTION

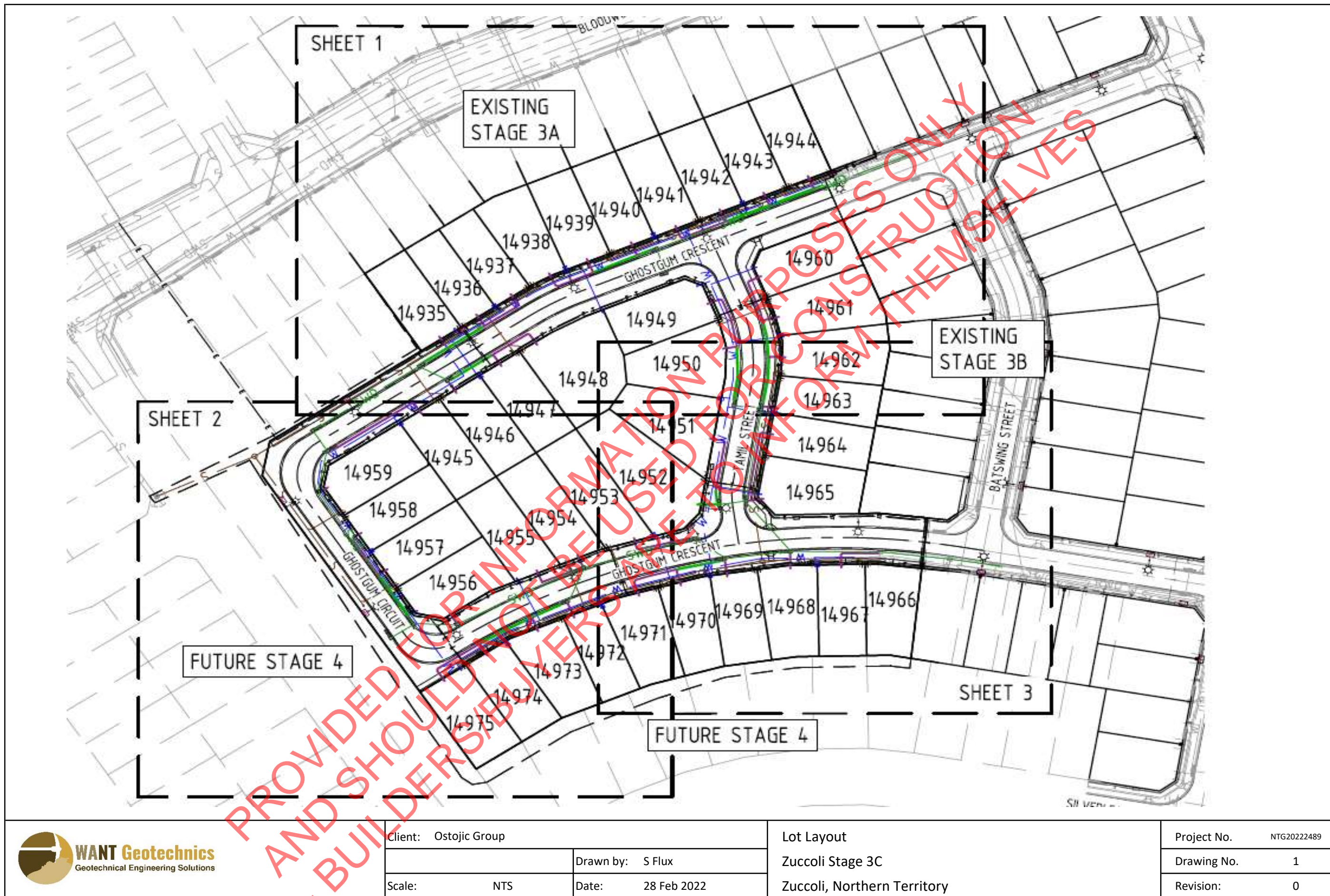
N	Title
	<p>STAGE 3C</p> <p>OVERALL LAYOUT PLAN</p>

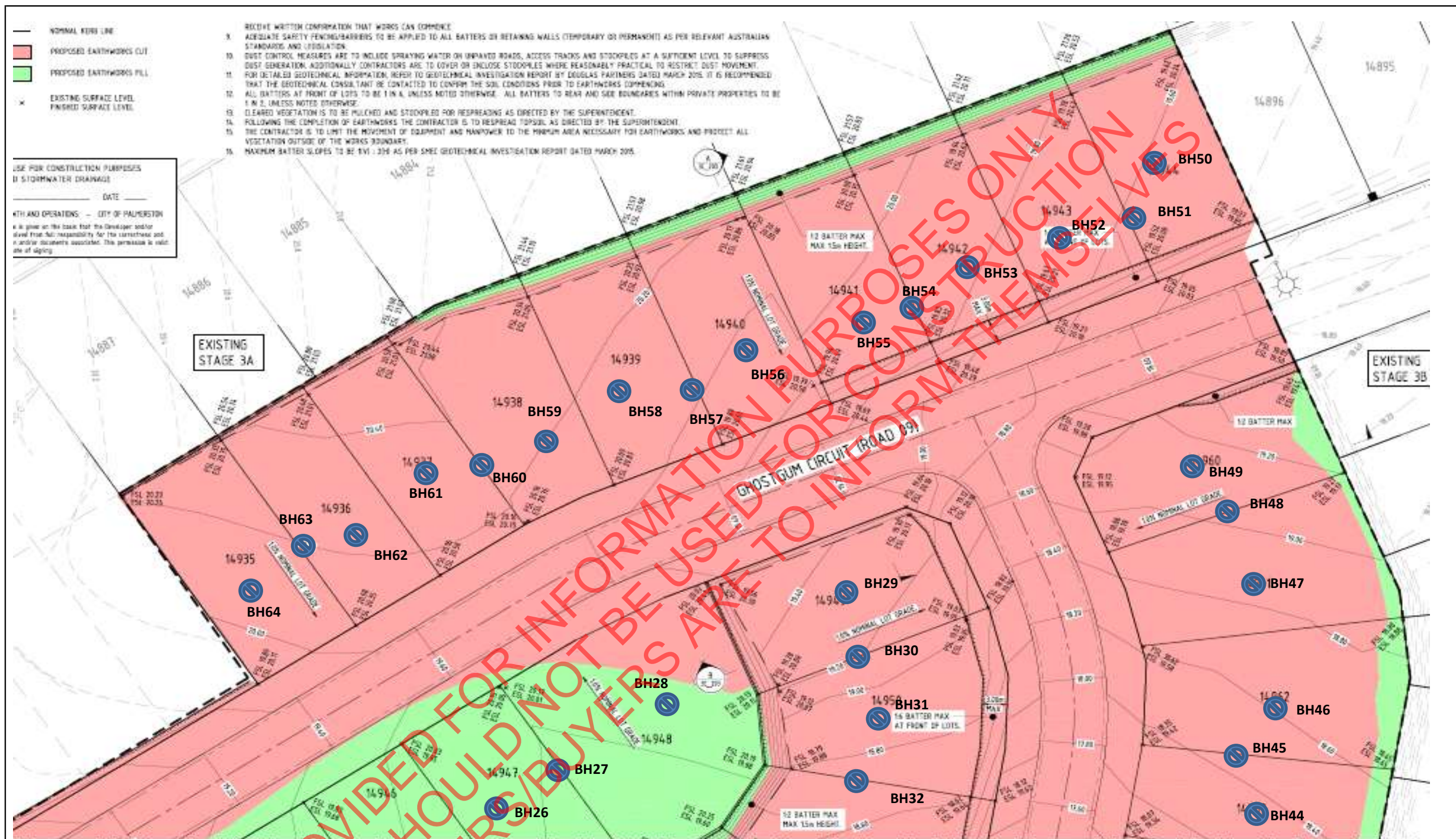
Weight.	Drawing No. 3C_002
---------	-----------------------

Revision	0
----------	---

PLOT DATE: 9/3/2021 12:50 PM FILENAME: J:\20000\20696\CM\DWG\STAGE 3C\20696_3C_002_STAGE 3C OVERALL LAYOUT PLAN.DWG

Full Size on Original 0 10 20 30 40 50 60 70 80 90 100mm





Test locations are indicative only



WANT Geotechnics
Geotechnical Engineering Solutions

Client: Ostoic Group

Drawn by: S Flux

Scale: NTS

Date: 28 Feb 2022

Auger Hole Locations

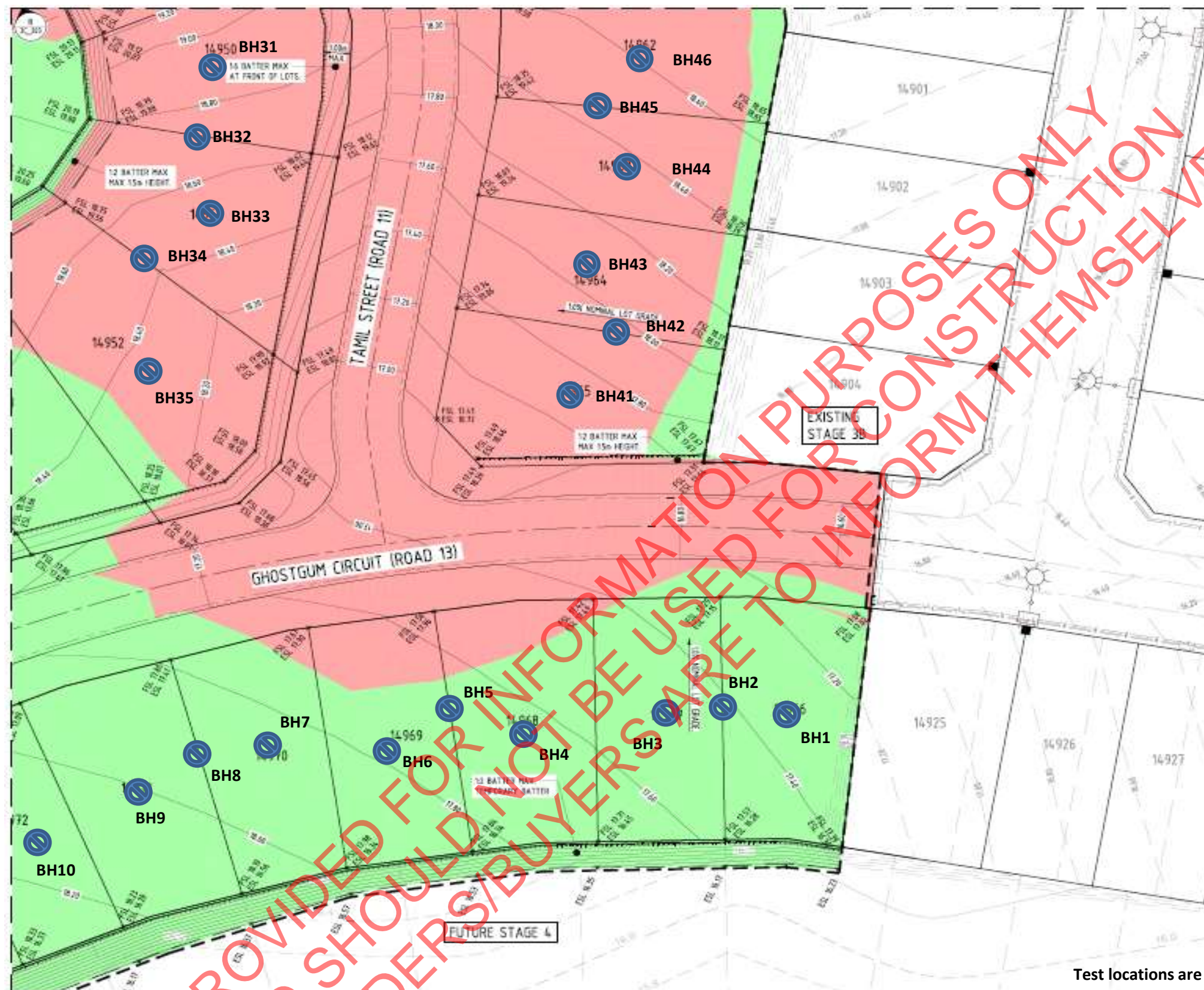
Zuccoli Stage 3C

Zuccoli, Northern Territory

Project No. NTG20222489

Drawing No. 2

Revision: 0



Client: Ostoic Group

Drawn by: S Flux

Scale: NTS

Date: 28 Feb 2022

Auger Hole Locations

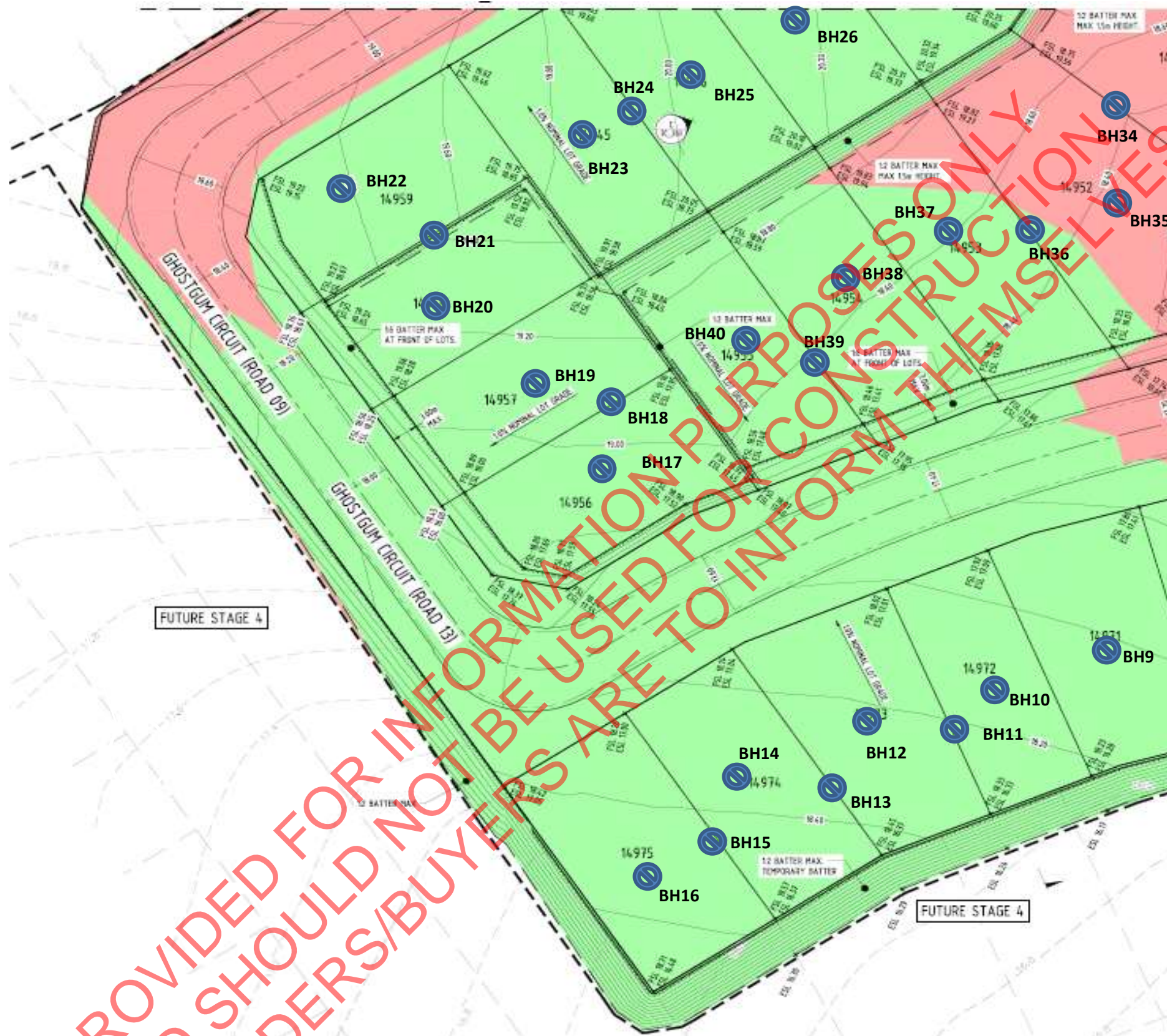
Zuccoli Stage 3C

Zuccoli, Northern Territory

Project No. NTG20222489

Drawing No. 3

Revision: 0



Test locations are indicative only



Client: Ostoic Group

Drawn by: S Flux

Scale: NTS

Date: 28 Feb 2022

Auger Hole Locations

Zuccoli Stage 3C

Zuccoli, Northern Territory

Project No. NTG20222489

Drawing No. 4

Revision: 0

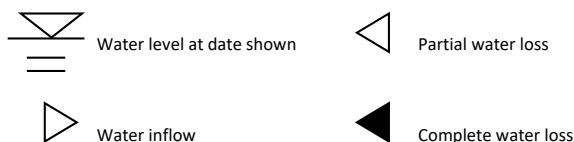
Explanatory Notes - Soil Description

In engineering terms soil includes every type of uncemented or partially cemented inorganic material found in the ground. In practice, if the material can be remoulded by hand in its field condition or in water it is described as a soil. The dominant soil constituent is given in capital letters, with secondary textures in lower case. The dominant feature is assessed from the Unified Soil Classification system and a soil symbol is used to define a soil layer.

METHOD

Method	Description
AS	Auger Screwing
BH	Backhoe
CT	Cable Tool Rig
EE	Existing Excavation/Cutting
EX	Excavator
HA	Hand Auger
HQ	Diamond Core - 63mm
NQ	Diamond Core - 47mm
PQ	Diamond Core - 85mm
JET	Jetting
NMLC	Diamond Core –52mm
PT	Push Tube
RAB	Rotary Air Blast
RB	Rotary Blade
RT	Rotary Tricone Bit
TC	Auger TC Bit
V	Auger V Bit
WB	Washbore

WATER



Not observed: The borehole/test pit was dry soon after excavation. Inflow may have been observed had the borehole/test pit been left open for a longer period.

SAMPLING

Sample	Description
B	Bulk Disturbed Sample
D	Disturbed Sample
Jar	Jar Sample
SPT	Standard Penetration Test
U50	Undisturbed Sample –50mm
U75	Undisturbed Sample –75mm

UNIFIED SOIL CLASSIFICATION

The appropriate symbols are selected on the result of visual examination, field tests and available laboratory tests, such as, sieve analysis, liquid limit and plasticity index.

USC Symbol	Description
GW	Well graded gravel
GP	Poorly graded gravel
GM	Silty gravel
GC	Clayey gravel
SW	Well graded sand
SP	Poorly graded sand
SM	Silty sand
SC	Clayey sand
ML	Silt of low plasticity
CL	Clay of low plasticity
CI	Clay of medium plasticity
OL	Organic soil of low plasticity
MH	Silt of high plasticity
CH	Clay of high plasticity
OH	Organic soil of high plasticity
Pt	Peaty Soil

MOISTURE CONDITION

Dry	- Cohesive soils are friable or powdery Cohesionless soil grains are free-running
Moist	- Soil feels cool, darkened in colour Cohesive soils can be moulded Cohesionless soil grains tend to adhere
Wet	- Cohesive soils usually weakened Free water forms on hands when handling

PLASTICITY

The potential for soil to undergo change in volume with moisture change is assessed from its degree of plasticity. The classification of the degree of plasticity in terms of the Liquid Limit (LL) is as follows:

Description of Plasticity	LL (%)
Low	<35
Medium	35 to 50
High	>50

COHESIVE SOILS - CONSISTENCY

The consistency of a cohesive soil is defined by descriptive terminology such as very soft, soft, firm, stiff, very stiff and hard. These terms are assessed by the shear strength of the soil as observed visually, by pocket penetrometer values and by resistance to deformation to hand moulding.

A Pocket Penetrometer may be used in the field or the laboratory to provide an approximate assessment of the unconfined compressive strength (UCS) of cohesive soils. The undrained shear strength of cohesive soils is approximately half the UCS. The values are recorded in kPa as follows:

Strength	Symbol	Undrained Shear Strength, C_u (kPa)
Very Soft	VS	< 12
Soft	S	12 to 25
Firm	F	25 to 50
Stiff	St	50 to 100
Very Stiff	VSt	100 to 200
Hard	H	> 200

COHESIONLESS SOILS - RELATIVE DENSITY

Relative density terms such as very loose, loose, medium, dense and very dense are used to describe silty and sandy material, and these are usually based on resistance to drilling penetration or the Standard Penetration Test (SPT) 'N' values. Other condition terms, such as friable, powdery or crumbly may also be used.

Term	Symbol	Density Index	N Value (blows/0.3 m)
Very Loose	VL	0 to 15	0 to 4
Loose	L	15 to 35	4 to 10
Medium Dense	MD	35 to 65	10 to 30
Dense	D	65 to 85	30 to 50
Very Dense	VD	>85	>50

COHESIONLESS SOILS PARTICLE SIZE DESCRIPTIVE TERMS

Name	Subdivision	Size
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 μ m to 2.36 mm
	medium	200 μ m to 600 μ m
	fine	75 μ m to 200 μ m

Rock Description

The rock is described with strength and weathering symbols as shown below. Other features such as bedding and dip angle are given.

METHOD

Refer soil description sheet

WATER

Refer soil description sheet

ROCK QUALITY

The fracture spacing is shown where applicable and the Rock Quality Designation (RQD) or Total Core Recovery (TCR) is given where:

$$\text{TCR (\%)} = \frac{\text{length of core recovered}}{\text{length of core run}}$$

$$\text{SCR (\%)} = \frac{\text{length of core recovered with at least 1 full circumference}}{\text{length of core run}}$$

$$\text{RQD (\%)} = \frac{\text{Sum of Axial lengths of core > 100mm long}}{\text{length of core run}}$$

ROCK MATERIAL WEATHERING

Rock weathering is described using the abbreviations and definitions used in AS1726.

Symbol	Term	Definition
RS	Residual Soil	Soil definition on extremely weathered rock; the mass structure and substance are no longer evident; there is a large change in volume but the soil has not been significantly transported
XW	Extremely Weathered	Rock is weathered to such an extent that it has 'soil' properties, i.e. It either disintegrates or can be remoulded in water
HW	Highly Weathered	The rock substance is affected by weathering to the extent that limonite staining or bleaching affects the whole rock substance and other signs of chemical or physical decomposition are evident. Porosity and strength is usually decreased compared to the fresh rock. The colour and strength of the fresh rock is no longer recognisable.
MW	Moderately Weathered	The whole of the rock substance is discoloured, usually by iron staining or bleaching, to the extent that the colour of the fresh rock is no longer recognisable
SW	Slightly Weathered	Rock is slightly discoloured but shows little or no change of strength from fresh rock
FR	Fresh	Rock shows no sign of decomposition or staining

ROCK STRENGTH

Rock strength is described using AS1726, as follows:

Term	Symbol	Point Load Index Is ₍₅₀₎ (MPa)
Extremely Low	EL	<0.03
Very Low	VL	0.03 to 0.1
Low	L	0.1 to 0.3
Medium	M	0.3 to 1
High	H	1 to 3
Very High	VH	3 to 10
Extremely High	EH	>10

○ Diametral Point Load Index test

● Axial Point Load Index test

DEFECT SPACING/BEDDING THICKNESS

Measured at right angles to defects of same set or bedding.

Term	Defect Spacing	Bedding
Extremely closely spaced	<6 mm	Thinly Laminated
Very closely spaced	6 to 20 mm	Laminated
Closely spaced	20 to 60 mm	Very Thin
Moderately widely spaced	0.06 to 0.2 m	Thin
Widely spaced	0.2 to 0.6 m	Medium
Very widely spaced	0.6 to 2 m	Thick
	>2 m	Very Thick

DEFECT DESCRIPTION

Type:	Definition:
B	Bedding
BP	Bedding Parting
F	Fault
C	Cleavage
J	Joint
SZ	Shear Zone
CZ	Crushed Zone
DB	Drill Break

Planarity:	Roughness:
P – Planar	R – Rough
Ir – Irregular	S – Smooth
St – Stepped	Sl – Slickensides
U – Undulating	Po – Polished

Coating or Infill:	Description
Clean	No visible coating or infilling
Stain	No visible coating or infilling but surfaces are discoloured by mineral staining
Veneer	A visible coating or infilling of soil or mineral substance but usually unable to be measured (<1mm). If discontinuous over the plane, patchy veneer
Coating	A visible coating or infilling of soil or mineral substance, >1mm thick. Describe composition and thickness

The inclinations of defects are measured from perpendicular to the core axis.

**BOREHOLE LOG****BH1 LOT 14966**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717806, 8615385
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
0.50				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
0.75				End of test hole at 0.75m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH2 LOT 14966/14967**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717796, 8615387 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
0.60				SAND trace silt, light grey, medium dense to dense, dry, trace organic matter	MD-D		
0.70				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		
1.00				End of test hole at 1.00m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH3 LOT 14967**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717788, 8615388 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
0.25				OBSTRUCTION End of test hole at 0.25m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH4 LOT 14968**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717773, 8615384 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
0.70				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		18 18 >20
1.20				End of test hole 1.20m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH5 LOT 14968/14969**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717767, 8615383 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
0.75				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
1.10m				End of test hole 1.10m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH6 LOT 14969**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostojic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717757, 8615377 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20 >20
1.15				SAND trace silt, light grey, medium dense to dense, dry, trace organic matter	MD-D		
1.40				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		
1.50				End of test hole 1.50m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH7 LOT 14970**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717744, 8615375 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
0.70				SAND trace silt, light grey, medium dense to dense, dry, trace organic matter	MD-D		20 >20
1.20				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		
1.40				End of test hole 1.40m, virtual machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH8 LOT 14970/14971**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717739, 8615376 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.00				SANDSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
1.50				End of test hole 1.50m, virtual machine refusal			

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
water level (static)	1 - no resistance	shear vane test	VL (very loose)	VS (very soft) <12kPa
water level (at excavation)	ranging to:	pocket penetrometer	L (loose)	S (soft) 12-25
outflow / inflow	4 - refusal		MD (medium dense)	F (firm) 25-50
Weathering		Permeability Test	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		Undisturbed tube sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathered		Disturbed sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil		Bulk sample	MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH9 LOT 14971**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717732, 8615371 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.30				SANDSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
1.60				End of test hole 1.60m, virtual machine refusal			

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static) ▽ water level (at excavation) ◀▶ outflow / inflow	1 - no resistance ranging to: 4 - refusal	✕ shear vane test └─ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH10 LOT 14972**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717729, 8615372 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.60							
1.70				SANDSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 1.70m			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH11 LOT 14972/14973**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717714, 8615367 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.60							
1.70				SANDSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 1.70m			

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static) ▽ water level (at excavation) ◀▶ outflow / inflow	1 - no resistance ranging to: 4 - refusal	✕ shear vane test └ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH12 LOT 14973**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717705, 8615358 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
1.60							20
1.70				SANDSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			>20
				End of test hole 1.70m			

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
water level (static)	1 - no resistance	shear vane test	VL (very loose)	VS (very soft) <12kPa
water level (at excavation)	ranging to:	pocket penetrometer	L (loose)	S (soft) 12-25
outflow / inflow	4 - refusal		MD (medium dense)	F (firm) 25-50
Weathering		Permeability Test	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		Undisturbed tube sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathered		Disturbed sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil		Bulk sample	MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH13 LOT 14973/14974**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717691, 8615353 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.60							
1.70				SANDSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 1.70m			

GROUNDWATER ▼ water level (static) ▽ water level (at excavation) ◀▶ outflow / inflow	PENETRATION 1 - no resistance ranging to: 4 - refusal	FIELD DATA SYMBOLS ✕ shear vane test └ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	DENSITY VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	CONSISTENCY VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH14 LOT 14974**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717681, 8615349
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.70				End of test hole 1.70m			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH15 LOT 14974/14975**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717674, 8615345 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.70				End of test hole 1.70m			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH16 LOT 14975**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717672, 8615344 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
1.70				End of test hole 1.70m			15 17 >20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH17 LOT 14956**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717656, 8615390
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
1.00				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
1.70				End of test hole 1.70m			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH18 LOT 14956/14957**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717655, 8615397 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
1.00				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		19
1.20				End of test hole 1.20m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH19 LOT 14957**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717650, 8615403 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD		5 10 15 20 >20
1.00				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
1.20				End of test hole 1.20m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH20 LOT 14958**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717644, 8615413 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vd	D	5 10 15 20
							16
							14
							16
							>20
0.90				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
1.00				End of test hole 1.00m Virtual Machine refusal			

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static) ▽ water level (at excavation) ◄ outflow / inflow	1 - no resistance ranging to: 4 - refusal	✕ shear vane test └ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH21 LOT 14958/14959**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717641, 8615418 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
0.75							
0.85				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 0.85m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH22 LOT 14959**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 14/02/2022
GPS: 717638, 8615425 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D	D	5 10 15 20
0.55				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		10 18 16 >20
0.65				End of test hole 0.65m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH23 LOT 14945**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717667, 8615427 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D	D	5 10 15 20
0.65				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		
0.75				End of test hole 0.75m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH24 LOT 14945/14946**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717673, 8615429 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
					D		20
							12
							14
							9
							10
0.65					VD		>20
0.75				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
				End of test hole 0.75m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH25 LOT 14946**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717679, 8615435 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
0.60				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		9 16 15 10 8 18
0.70				End of test hole 0.70m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH26 LOT 14947**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717692, 8615445 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 15
0.20				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			>20
0.30				End of test hole 0.30m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH27 LOT 14947/14948**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717697, 8615447 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D	D	5 10 15 20 8
0.20				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		>20
0.30				End of test hole 0.30m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH28 LOT 14948**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717701, 8615452 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	MD	D	5 10 15 20
0.20				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	D		6
0.30				End of test hole 0.30m Virtual Machine refusal	VD		11
							>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY










VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoja
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717724, 8615476 Logged: SF
Checked: MF

FIELD DATA					MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
	Depth (m)	Samples and tests	Groundwater	Penetration Resistance		Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
	0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	MD	D	5 10 15 20
	0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		7
	0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
 water level (static)	1 - no resistance	 shear vane test	VL (very loose)	VS (very soft) <12kPa
 water level (at excavation)	ranging to:	 pocket penetrometer	L (loose)	S (soft) 12-25
 outflow / inflow	4 - refusal	 Permeability Test	MD (medium dense)	F (firm) 25-50
Weathering		 Undisturbed tube sample	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		 Disturbed sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathd		 Bulk sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH30 LOT 14949/14950**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717728, 8615471 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	MD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD		6
0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH31 LOT 14950**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717726, 8615456 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	MD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			5
0.20				End of test hole 0.20m Virtual Machine refusal			5
							>20

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static)	1 - no resistance	✕ shear vane test	VL (very loose)	VS (very soft) <12kPa
▽ water level (at excavation)	ranging to:	└─ pocket penetrometer	L (loose)	S (soft) 12-25
◀▶ outflow / inflow	4 - refusal		MD (medium dense)	F (firm) 25-50
Weathering		○ Permeability Test	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		■ Undisturbed tube sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathered		● Disturbed sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil		□ Bulk sample	MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH32 LOT 14950/14951**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717725, 8615447 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10 0.20				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 0.20m Virtual Machine refusal	VD	D	5 10 15 20 >20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

D=dry M=moist W=wet

**BOREHOLE LOG****BH34 LOT 14951/14952**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717720, 8615433 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
0.15				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			17
				End of test hole 0.25m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY










VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
 water level (static)	1 - no resistance	 shear vane test	VL (very loose)	VS (very soft) <12kPa
 water level (at excavation)	ranging to:	 pocket penetrometer	L (loose)	S (soft) 12-25
 outflow / inflow	4 - refusal	 Permeability Test	MD (medium dense)	F (firm) 25-50
Weathering		 Undisturbed tube sample	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		 Disturbed sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathd		 Bulk sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH36 LOT 14952/14953**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717708, 8615422 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20 8
0.30					VD		13
0.40				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			>20
				End of test hole 0.40m Virtual Machine refusal			

GROUNDWATER ▼ water level (static) ▽ water level (at excavation) ◀▶ outflow / inflow	PENETRATION 1 - no resistance ranging to: 4 - refusal	FIELD DATA SYMBOLS ✕ shear vane test └ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	DENSITY VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	CONSISTENCY VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH37 LOT 14953**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostojic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717701, 8615419
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	MD	D	5 10 15 20
0.35					VD		7 15 >20
0.45				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 0.45m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH38 LOT 14954**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717690, 8615413 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20 >20
0.60				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
0.70				End of test hole 0.70m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200



BOREHOLE LOG

BH39 LOT 14954/14955

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717684, 8615407 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
0.60				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			20
0.70				End of test hole 0.70m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH40 LOT 14955**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717681, 8615406 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vd VD	D	5 10 15 20 5 18 >20
0.70				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			
0.90				End of test hole 0.90m Virtual Machine refusal			

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static) ▽ water level (at excavation) ◀▶ outflow / inflow	1 - no resistance ranging to: 4 - refusal	✕ shear vane test └ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH41 LOT 14965**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717777, 8615422
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	VD	D	5 10 15 20 >20
0.80				End of test hole 0.80m Virtual Machine refusal			

GROUNDWATER

- ▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

- 1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

- ✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

- VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

- VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH42 LOT 14965/14964**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717777, 8615430 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10 0.20				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 0.20m Virtual Machine refusal	VD	D	5 10 15 20 >20

GROUNDWATER ▼ water level (static) ▽ water level (at excavation) ◄ outflow / inflow	PENETRATION 1 - no resistance ranging to: 4 - refusal	FIELD DATA SYMBOLS ✕ shear vane test └ pocket penetrometer ○ Permeability Test ■ Undisturbed tube sample ● Disturbed sample □ Bulk sample	DENSITY VL (very loose) L (loose) MD (medium dense) D (dense) VD (very dense)	CONSISTENCY VS (very soft) <12kPa S (soft) 12-25 F (firm) 25-50 St (stiff) 50-100 VSt (very stiff) 100-200 H (hard) >200
Weathering FR - Fresh; SW - Slightly Weathered MW - Mod Weathered; HW - Highly Weathered XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION D=dry M=moist W=wet	

**BOREHOLE LOG****BH43 LOT 14964**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717780, 8615437 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry, cobbles of siltstone	VD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			>20
0.20				End of test hole 0.20m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH44 LOT 14963**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717781, 8615448 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			12
0.20				End of test hole 0.20m Virtual Machine refusal			13
							>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH45 LOT 14963/14962**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717783, 8615450 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			11
0.20				End of test hole 0.20m Virtual Machine refusal			10
							5
							18
							>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH46 LOT 14962**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717786, 8615461
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			8
0.20				End of test hole 0.20m Virtual Machine refusal			12
							17
							>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH47 LOT 14961**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717783, 8615469
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	D-Vb MD D VD	D	5 10 15 20
0.60				End of test hole 0.60m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer
○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH48 LOT 14961/14960**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717781, 8615480 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	MD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	D-VD		7
0.20				End of test hole 0.20m Virtual Machine refusal			14
							>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY










VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
 water level (static)	1 - no resistance	 shear vane test	VL (very loose)	VS (very soft) <12kPa
 water level (at excavation)	ranging to:	 pocket penetrometer	L (loose)	S (soft) 12-25
 outflow / inflow	4 - refusal	 Permeability Test	MD (medium dense)	F (firm) 25-50
Weathering		 Undisturbed tube sample	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		 Disturbed sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathered		 Bulk sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH50 LOT 14944**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717763, 8615535 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	MD	D	5 10 15 20
0.50				End of test hole 0.50m Virtual Machine refusal	VD		4 7 5 4 >20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH51 LOT 14944/14943**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717757, 8615531 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D-Vb	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	MD		11
0.20				End of test hole 0.20m Virtual Machine refusal			7
							13
							>20

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static)	1 - no resistance	✕ shear vane test	VL (very loose)	VS (very soft) <12kPa
▽ water level (at excavation)	ranging to:	└ pocket penetrometer	L (loose)	S (soft) 12-25
◀▶ outflow / inflow	4 - refusal		MD (medium dense)	F (firm) 25-50
Weathering		○ Permeability Test	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		■ Undisturbed tube sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathered		● Disturbed sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil		□ Bulk sample	MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH52 LOT 14943**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717746, 8615527 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	D	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			11
0.20				End of test hole 0.20m Virtual Machine refusal			8
							17
							>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH53 LOT 14942**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717721, 8615519
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered	D-Vb	D	5 10 15 20
							6
							12
							7
							13
							13
							13
					VD		17
0.80				End of test hole 0.80m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY










VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717713, 8615514 Logged: SF
Checked: MF

FIELD DATA					MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
	Depth (m)	Samples and tests	Groundwater	Penetration Resistance		Density/Consistency	Moisture Condition	
	0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	Dynamic Cone Penetrometer Testing penetration per 100mm
	0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			5 10 15 20
	0.20				End of test hole 0.20m Virtual Machine refusal			>20










GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
 water level (static)	1 - no resistance	 shear vane test	VL (very loose)	VS (very soft) <12kPa
 water level (at excavation)	ranging to:	 pocket penetrometer	L (loose)	S (soft) 12-25
 outflow / inflow	4 - refusal	 Permeability Test	MD (medium dense)	F (firm) 25-50
Weathering		 Undisturbed tube sample	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		 Disturbed sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathd		 Bulk sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION	
			D=dry M=moist W=wet	

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717707, 8615513 Logged: SF
Checked: MF

FIELD DATA					MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
	Depth (m)	Samples and tests	Groundwater	Penetration Resistance		Density/Consistency	Moisture Condition	
	0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	Dynamic Cone Penetrometer Testing penetration per 100mm
	0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			5 10 15 20
	0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
 water level (static)	1 - no resistance	 shear vane test	VL (very loose)	VS (very soft) <12kPa
 water level (at excavation)	ranging to:	 pocket penetrometer	L (loose)	S (soft) 12-25
 outflow / inflow	4 - refusal	 Permeability Test	MD (medium dense)	F (firm) 25-50
Weathering		 Undisturbed tube sample	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		 Disturbed sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathd		 Bulk sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION	
			D=dry M=moist W=wet	

**BOREHOLE LOG****BH56 LOT 14940**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostojic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717696, 8615506 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			17
0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH57 LOT 14940/14939**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostojic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717683, 8615499 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00 0.10 0.20				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered End of test hole 0.20m Virtual Machine refusal	VD	D	5 10 15 20 >20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◄ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

D=dry M=moist W=wet

**BOREHOLE LOG****BH59 LOT 14938**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717667, 8615490
Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			>20
0.20				End of test hole 0.20m Virtual Machine refusal			

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200

**BOREHOLE LOG****BH60 LOT 14938/14937**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717664, 8615487 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			20
0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER

▼ water level (static)
▽ water level (at excavation)
◀▶ outflow / inflow

Weathering

FR - Fresh; SW - Slightly Weathered
MW - Mod Weathered; HW - Highly Weathered
XW - Xtremely Weathered; RS - Residual Soil

PENETRATION

1 - no resistance
ranging to:
4 - refusal

FIELD DATA SYMBOLS

✕ shear vane test
└ pocket penetrometer

○ Permeability Test
■ Undisturbed tube sample
● Disturbed sample
□ Bulk sample

DENSITY

VL (very loose)
L (loose)
MD (medium dense)
D (dense)
VD (very dense)

MOISTURE CONDITION

D=dry M=moist W=wet

CONSISTENCY

VS (very soft) <12kPa
S (soft) 12-25
F (firm) 25-50
St (stiff) 50-100
VSt (very stiff) 100-200
H (hard) >200










D=dry M=moist W=wet

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostoja
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717651, 8615477 Logged: SF
Checked: MF

FIELD DATA					MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
	Depth (m)	Samples and tests	Groundwater	Penetration Resistance		Density/Consistency	Moisture Condition	
	0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	Dynamic Cone Penetrometer Testing penetration per 100mm
	0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			5 10 15 20
	0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
 water level (static)	1 - no resistance	 shear vane test	VL (very loose)	VS (very soft) <12kPa
 water level (at excavation)	ranging to:	 pocket penetrometer	L (loose)	S (soft) 12-25
 outflow / inflow	4 - refusal	 Permeability Test	MD (medium dense)	F (firm) 25-50
Weathering		 Undisturbed tube sample	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		 Disturbed sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathd		 Bulk sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil			MOISTURE CONDITION	
			D=dry M=moist W=wet	

D=dry M=moist W=wet

**BOREHOLE LOG****BH64 LOT 14935**

Sheet 1 of 1

Project: Subdivision
Location: Zuccoli Stage 3C
Job No. NTG20222489

Client: Ostojic
Equipment: Rig with 150mm Auger
Surface Conditions: Engineered Fill

Date: 15/02/2022
GPS: 717637, 8615468 Logged: SF
Checked: MF

FIELD DATA				MATERIAL SUBSTANCE	SOIL CONDITION		COMMENTS
Depth (m)	Samples and tests	Groundwater	Penetration Resistance	SOIL TYPE: unified soils classification, colour, structure, particle characteristics, geological origin and minor components	Density/Consistency	Moisture Condition	Dynamic Cone Penetrometer Testing penetration per 100mm
0.00				ENGINEERED FILL: GRAVEL with clay and sand, brown, dense to very dense, dry	VD	D	5 10 15 20
0.10				SILTSTONE light orange to yellow brown and red, extremely low strength, extremely weathered			19
0.20				End of test hole 0.20m Virtual Machine refusal			>20

GROUNDWATER	PENETRATION	FIELD DATA SYMBOLS	DENSITY	CONSISTENCY
▼ water level (static)	1 - no resistance	✕ shear vane test	VL (very loose)	VS (very soft) <12kPa
▽ water level (at excavation)	ranging to:	└ pocket penetrometer	L (loose)	S (soft) 12-25
◀▶ outflow / inflow	4 - refusal		MD (medium dense)	F (firm) 25-50
Weathering		○ Permeability Test	D (dense)	St (stiff) 50-100
FR - Fresh; SW - Slightly Weathered		■ Undisturbed tube sample	VD (very dense)	VSt (very stiff) 100-200
MW - Mod Weathered; HW - Highly Weathered		● Disturbed sample		H (hard) >200
XW - Xtremely Weathered; RS - Residual Soil		□ Bulk sample	MOISTURE CONDITION	
			D=dry M=moist W=wet	



Lot 14966 to 14975



Lot 14960 to 14965



client: OSTOJIC PTY LTD

project: ZUCCOLI ASPIRE STAGE 3C

title: Photographs

project no: NTG20222489

Plates 1 and 2



Lot 14935 to 14944



Excavation on Tamil Street, Zuccoli Stage 3C



Excavation on Ghostgum Circuit, Zuccoli Stage 3C



client: OSTOJIC PTY LTD	
project: ZUCCOLI ASPIRE STAGE 3C	
title: Photographs	
project no: NTG20222489	Plates 3 to 5


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49670-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07A_Backfill
Location:	Darwin	Internal Test Request:	21791/T/21232
Component:	Field Density Testing	Client Reference/s:	TR#155
Area Description:	EWK07A- Zuccoli	Report Date / Page:	17/12/2021 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115361			
ID / Client ID				
Lot Number	EWK_07A_Backfill			
Date / Time Tested	14/12/2021 13:50			
Material Source	Client			
Material Type	Backfill			
Sampling Method	AS1289.1.2.1 Cl 6.4b			
Depths: Test / Nom / Actual (mm)	225 / 250 / 260			
Standard or Modified	Modified			
Stabilised Material Curing Time	-			
Location 1	See Map Attached			
Location 2	Unsuitable Material Area			
Location 3	Layer 1			
Location 4				
Test Fraction (mm)	< 19.0 mm			
Sample Oversize Wet / Dry (%)	0 / 0			
MDR Sample Number	21791/S/115361			
MDR Sample Date / Update	14/12/2021			
Assigned MDR (Yes / No)	No			
Moisture Test Results:				
Field Moisture Content (%)	8.2			
Optimum Moisture Content (%)	10.0			
Variation from OMC (%)	2.0% Drier than OMC			
Moisture Ratio (%)	82.0			
Density Test Results:				
Field Wet Density (t/m³)	2.28			
Field Dry Density (t/m³)	2.10			
Maximum Dry Density (t/m³)	2.07			
Dry Density Ratio Required (%)	95			
Dry Density Ratio (%)	101.5			

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---



DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49722-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07 3C Lots 14966-14975
Location:	Darwin	Internal Test Request:	21791/T/21233
Component:	Field Density testing	Client Reference/s:	TR#156
Area Description:	EWK_07 3C Lots 14966-14975	Report Date / Page:	20/12/2021 Page 1 of 2

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115362	21791/S/115363	21791/S/115364	21791/S/115365
ID / Client ID	-	-	-	-
Lot Number	EWK_07 3C Lots 14966-14975	EWK_07 3C Lots 14966-14975	EWK_07 3C Lots 14966-14975	EWK_07 3C Lots 14966-14975
Date / Time Tested	14/12/2021 14:10	14/12/2021 14:25	14/12/2021 14:35	14/12/2021 14:50
Material Source	Client	Client	Client	Client
Material Type	Backfill	Backfill	Backfill	Backfill
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b
Depths: Test / Nom / Actual (mm)	225 / 250 / 250	225 / 250 / 250	225 / 250 / 260	225 / 250 / 260
Standard or Modified	Modified	Modified	Modified	Modified
Stabilised Material Curing Time	-	-	-	-
Location 1	See Map Attached	See Map Attached	See Map Attached	See Map Attached
Location 2	Layer 6	Layer 6	Layer 6	Layer 5
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	0 / 0
MDR Sample Number	21791/S/115362	21791/S/115363	21791/S/115364	21791/S/115365
MDR Sample Date / Update	14/12/2021	14/12/2021	14/12/2021	14/12/2021
Assigned MDR (Yes / No)	No	No	No	No
Moisture Test Results:				
Field Moisture Content (%)	9.7	10.0	8.2	9.9
Optimum Moisture Content (%)	10.5	9.5	8.0	9.5
Variation from OMC (%)	0.5% Drier than OMC	0.5% Wetter than OMC	0.0% Wetter than OMC	0.5% Wetter than OMC
Moisture Ratio (%)	93.5	104.0	102.5	104.0
Density Test Results:				
Field Wet Density (t/m³)	2.31	2.31	2.26	2.29
Field Dry Density (t/m³)	2.11	2.10	2.09	2.09
Maximum Dry Density (t/m³)	2.11	2.16	2.16	2.14
Dry Density Ratio Required (%)	95	95	95	95
Dry Density Ratio (%)	100.0	97.5	96.5	97.5

Remarks

 Accredited for compliance with ISO/IEC 17025 – Testing Accreditation Number: 1986 Corporate Site Number: 21791		 Approved Signatory: Eoin O'Brien Form ID: W27ASRep Rev 1
---	--	--


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49722-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07 3C Lots 14966-14975
Location:	Darwin	Internal Test Request:	21791/T/21233
Component:	Field Density testing	Client Reference/s:	TR#156
Area Description:	EWK_07 3C Lots 14966-14975	Report Date / Page:	20/12/2021 Page 2 of 2

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115366	21791/S/115367		
ID / Client ID	-	-		
Lot Number	EWK_07 3C Lots 14966-14975	EWK_07 3C Lots 14966-14975		
Date / Time Tested	14/12/2021 15:00	14/12/2021 15:15		
Material Source	Client	Client		
Material Type	Backfill	Backfill		
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b		
Depths: Test / Nom / Actual (mm)	225 / 250 / 255	225 / 250 / 250		
Standard or Modified	Modified	Modified		
Stabilised Material Curing Time	-	-		
Location 1	See Map Attached	See Map Attached		
Location 2	Layer 5	Layer 5		
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize Wet / Dry (%)	8 / 8	0 / 0		
MDR Sample Number	21791/S/115366	21791/S/115367		
MDR Sample Date / Update	14/12/2021	14/12/2021		
Assigned MDR (Yes / No)	No	No		
Moisture Test Results:				
Field Moisture Content (%)	7.7	9.6		
Optimum Moisture Content (%)	9.0	10.0		
Variation from OMC (%)	1.5% Drier than OMC	0.5% Drier than OMC		
Moisture Ratio (%)	83.5	96.0		
Density Test Results:				
Field Wet Density (t/m³)	2.30	2.40		
Field Dry Density (t/m³)	2.14	2.19		
Maximum Dry Density (t/m³)	2.11	2.16		
Dry Density Ratio Required (%)	95	95		
Dry Density Ratio (%)	101.0	101.5		

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49723-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07A Backfill
Location:	Darwin	Internal Test Request:	21791/T/21256
Component:	Field Density Testing	Client Reference/s:	TR#159
Area Description:	Zuucoli	Report Date / Page:	20/12/2021 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115462			
ID / Client ID	-			
Lot Number	EWK_07A Backfill			
Date / Time Tested	15/12/2021 13:05			
Material Source	Client			
Material Type	Backfill			
Sampling Method	AS1289.1.2.1 Cl 6.4b			
Depths: Test / Nom / Actual (mm)	225 / 250 / 250			
Standard or Modified	Modified			
Stabilised Material Curing Time	-			
Location 1	See Map Attached			
Location 2				
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm			
Sample Oversize Wet / Dry (%)	0 / 0			
MDR Sample Number	21791/S/115462			
MDR Sample Date / Update	15/12/2021			
Assigned MDR (Yes / No)	No			
Moisture Test Results:				
Field Moisture Content (%)	10.6			
Optimum Moisture Content (%)	10.5			
Variation from OMC (%)	Field Moisture at OMC			
Moisture Ratio (%)	100.0			
Density Test Results:				
Field Wet Density (t/m³)	2.26			
Field Dry Density (t/m³)	2.04			
Maximum Dry Density (t/m³)	2.06			
Dry Density Ratio Required (%)	95			
Dry Density Ratio (%)	99.5			

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49769-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07A Backfill
Location:	Darwin	Internal Test Request:	21791/T/21278
Component:	Field Density Testing	Client Reference/s:	TR 160 RV1
Area Description:	EWK_07A Backfill Unsuitable Material Area L3,L4	Report Date / Page:	21/12/2021 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115550	21791/S/115551		
ID / Client ID	Layer 3	Layer 4		
Lot Number	EWK_07A Backfill	EWK_07A Backfill		
Date / Time Tested	16/12/2021 10:20	16/12/2021 10:30		
Material Source	Client	Client		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b		
Depths: Test / Nom / Actual (mm)	225 / 250 / 250	225 / 250 / 255		
Standard or Modified	Modified	Modified		
Stabilised Material Curing Time	-	-		
Location 1	See Map Attached	See Map Attached		
Location 2				
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0		
MDR Sample Number	21791/S/115550	21791/S/115551		
MDR Sample Date / Update	16/12/2021	16/12/2021		
Assigned MDR (Yes / No)	No	No		
Moisture Test Results:				
Field Moisture Content (%)	10.4	11.0		
Optimum Moisture Content (%)	12.5	10.5		
Variation from OMC (%)	2.0% Drier than OMC	0.5% Wetter than OMC		
Moisture Ratio (%)	83.0	105.0		
Density Test Results:				
Field Wet Density (t/m³)	2.24	2.30		
Field Dry Density (t/m³)	2.03	2.08		
Maximum Dry Density (t/m³)	2.01	2.07		
Dry Density Ratio Required (%)	95	95		
Dry Density Ratio (%)	101.0	100.5		

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---


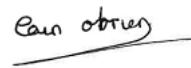
DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49773-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK-08 Lot 14945-14959
Location:	Darwin	Internal Test Request:	21791/T/21255
Component:	Field Density Testing	Client Reference/s:	TR#158
Area Description:	Zuccoli	Report Date / Page:	21/12/2021 Page 1 of 2

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115456	21791/S/115457	21791/S/115458	21791/S/115459
ID / Client ID	-	-	-	-
Lot Number	EWK-08 Lot 14945-14959	EWK-08 Lot 14945-14959	EWK-08 Lot 14945-14959	EWK-08 Lot 14945-14959
Date / Time Tested	15/12/2021 13:20	15/12/2021 13:30	15/12/2021 13:40	15/12/2021 13:55
Material Source	Client	Client	Client	Client
Material Type	General Fill	General Fill	General Fill	General Fill
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b
Depths: Test / Nom / Actual (mm)	225 / 250 / 255	225 / 250 / 250	225 / 250 / 255	225 / 250 / 250
Standard or Modified	Modified	Modified	Modified	Modified
Stabilised Material Curing Time	-	-	-	-
Location 1	See Map Attached	See Map Attached	See Map Attached	See Map Attached
Location 2	Layer 4	Layer 4	Layer 4	Layer 3
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0	0 / 0	0 / 0
MDR Sample Number	21791/S/115456	21791/S/115457	21791/S/115458	21791/S/115459
MDR Sample Date / Update	15/12/2021	15/12/2021	15/12/2021	15/12/2021
Assigned MDR (Yes / No)	No	No	No	No
Moisture Test Results:				
Field Moisture Content (%)	6.7	4.3	6.2	4.3
Optimum Moisture Content (%)	9.0	8.5	8.0	9.5
Variation from OMC (%)	2.5% Drier than OMC	4.0% Drier than OMC	1.5% Drier than OMC	5.0% Drier than OMC
Moisture Ratio (%)	74.5	51.0	79.5	45.5
Density Test Results:				
Field Wet Density (t/m³)	2.31	2.18	2.19	2.05
Field Dry Density (t/m³)	2.17	2.09	2.06	1.96
Maximum Dry Density (t/m³)	2.13	2.15	2.14	2.07
Dry Density Ratio Required (%)	95	95	95	95
Dry Density Ratio (%)	101.5	97.0	96.0	95.0

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing 		Accreditation Number: 1986 Corporate Site Number: 21791		 Approved Signatory: Eoin O'Brien Form ID: W27ASRep Rev 1	
--	--	--	--	--	--


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49773-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK-08 Lot 14945-14959
Location:	Darwin	Internal Test Request:	21791/T/21255
Component:	Field Density Testing	Client Reference/s:	TR#158
Area Description:	Zuccoli	Report Date / Page:	21/12/2021 Page 2 of 2

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115460	21791/S/115461		
ID / Client ID	-	-		
Lot Number	EWK-08 Lot 14945-14959	EWK-08 Lot 14945-14959		
Date / Time Tested	15/12/2021 14:10	15/12/2021 14:20		
Material Source	Client	Client		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b		
Depths: Test / Nom / Actual (mm)	225 / 250 / 250	225 / 250 / 260		
Standard or Modified	Modified	Modified		
Stabilised Material Curing Time	-	-		
Location 1	See Map Attached	See Map Attached		
Location 2	Layer 3	Layer 3		
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize Wet / Dry (%)	0 / 0	0 / 0		
MDR Sample Number	21791/S/115460	21791/S/115461		
MDR Sample Date / Update	15/12/2021	15/12/2021		
Assigned MDR (Yes / No)	No	No		
Moisture Test Results:				
Field Moisture Content (%)	4.2	5.9		
Optimum Moisture Content (%)	8.0	11.5		
Variation from OMC (%)	3.5% Drier than OMC	5.5% Drier than OMC		
Moisture Ratio (%)	54.0	52.0		
Density Test Results:				
Field Wet Density (t/m³)	2.17	2.06		
Field Dry Density (t/m³)	2.08	1.94		
Maximum Dry Density (t/m³)	2.13	2.05		
Dry Density Ratio Required (%)	95	95		
Dry Density Ratio (%)	97.5	95.0		

Remarks

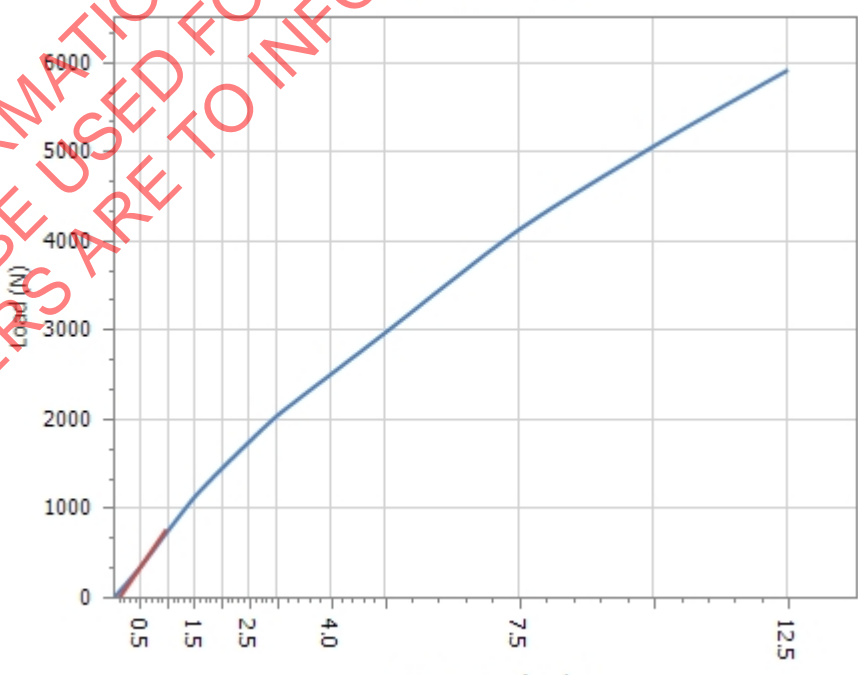
 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---

CALIFORNIA BEARING RATIO REPORT

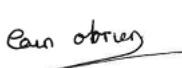

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49816-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07A_Backfill
Location:	Darwin	Internal Test Request:	21791/T/21232
Component:	Field Density Testing	Client Reference/s:	TR#155
Area Description:	EWK07A- Zuccoli	Report Date / Page:	23/12/2021 Page 1 of 1

Test Procedures	AS1289.6.1.1, AS1289.5.2.1, AS1289.2.1.1		
Sample Number	21791/S/115361	Sample Location	
Sampling Method	AS1289.1.2.1 CI 6.4b	Location 1	See Map Attached
Date Sampled	14/12/2021	Location 2	Unsuitable Material Area
Sampled By	Maninder Paul Singh Saagu	Location 3	Layer 1
Date Tested	22/12/2021	Location 4	
Material Source	Client	Material Limit Start	
Material Type	Backfill	Material Limit End	
Client Reference		Compactive Effort	Modified

Material Description Silty Sandy Gravel

Maximum Dry Density (t/m³):	2.07	 <p>CBR PENETRATION PLOT</p>
Optimum Moisture Content (%):	10.0	
Field Moisture Content (%):	8.2	
Sample Percent Oversize (%):	0.0	
Oversize Included / Excluded	Excluded	
Target Density Ratio (%):	95	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m³):	1.98	
Placement Dry Density Ratio (%):	95.5	
Placement Moisture Content (%):	9.8	
Placement Moisture Ratio (%):	98.0	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m³):	1.98	
Total Curing Time (hrs)	92	
Liquid Limit Method	Estimation	
Moisture (top 30mm) After Soak (%)	10.9	
Moisture (remainder) After Soak (%)	12.0	
CBR Swell (%):	0.0	
Minimum CBR Specification (%):	-	
CBR Value @ 5.0mm (%):	15	

Remarks

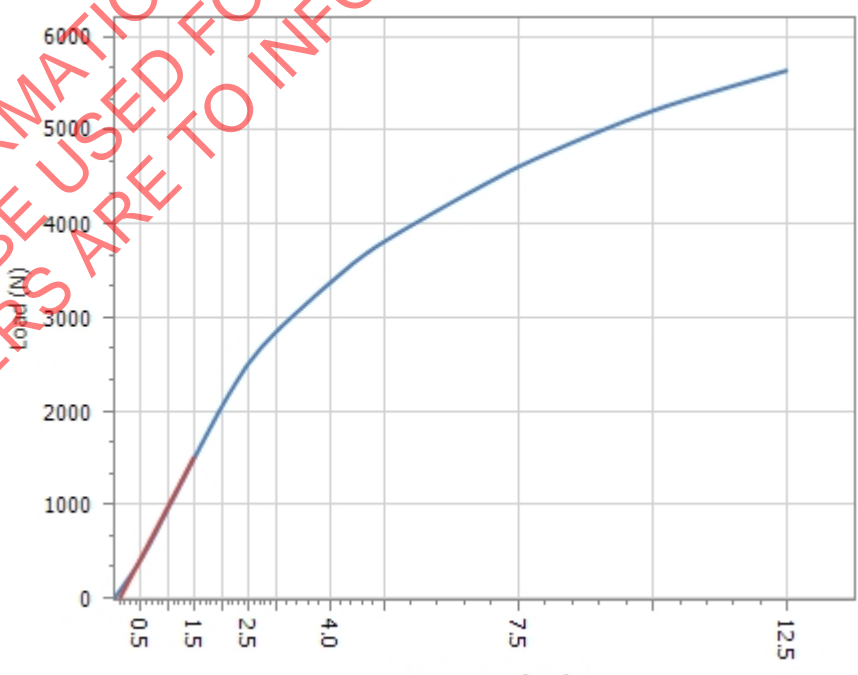
Accredited for compliance with ISO/IEC 17025 – Testing		
	Accreditation Number: 1986	
	Corporate Site Number: 21791	
		Approved Signatory: Eoin O'Brien
		Form ID: W2ASRep Rev2

CALIFORNIA BEARING RATIO REPORT


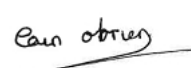
Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49849-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07 3C Lots 14966-14975
Location:	Darwin	Internal Test Request:	21791/T/21233
Component:	Field Density testing	Client Reference/s:	TR#156
Area Description:	EWK_07 3C Lots 14966-14975	Report Date / Page:	24/12/2021 Page 1 of 1

Test Procedures	AS1289.6.1.1, AS1289.5.2.1, AS1289.2.1.1		
Sample Number	21791/S/115362	Sample Location	
Sampling Method	AS1289.1.2.1 CI 6.4b	Location 1	See Map Attached
Date Sampled	14/12/2021	Location 2	Layer 6
Sampled By	Maninder Paul Singh Saagu	Location 3	
Date Tested	23/12/2021	Location 4	
Material Source	Client	Material Limit Start	
Material Type	Backfill	Material Limit End	
Client Reference	-	Compactive Effort	Modified

Material Description Silty Sandy Gravel

Maximum Dry Density (t/m³):	2.11	 <p>CBR PENETRATION PLOT</p>
Optimum Moisture Content (%):	10.5	
Field Moisture Content (%):	9.7	
Sample Percent Oversize (%):	0.0	
Oversize Included / Excluded	Excluded	
Target Density Ratio (%):	95	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m³):	2.01	
Placement Dry Density Ratio (%):	95.0	
Placement Moisture Content (%):	10.2	
Placement Moisture Ratio (%):	98.0	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m³):	2.01	
Total Curing Time (hrs)	48	
Liquid Limit Method	Estimation	
Moisture (top 30mm) After Soak (%)	12.7	
Moisture (remainder) After Soak (%)	12.4	
CBR Swell (%):	0.0	
Minimum CBR Specification (%):	-	
CBR Value @ 2.5mm (%):	20	

Remarks

Accredited for compliance with ISO/IEC 17025 – Testing		
Accreditation Number:	1986	
Corporate Site Number:	21791	
		
		Approved Signatory: Eoin O'Brien
		Form ID: W2ASRep Rev2


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49850-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	TR_164_EWK07A-L9, L10
Location:	Darwin	Internal Test Request:	21791/T/21306
Component:	Field Density Testing	Client Reference/s:	TR#164
Area Description:	Zuccoli	Report Date / Page:	24/12/2021 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115743	21791/S/115744		
ID / Client ID	-	-		
Lot Number	TR_164_EWK07A-L9, L10	TR_164_EWK07A-L9, L10		
Date / Time Tested	21/12/2021 08:25	21/12/2021 08:35		
Material Source	Client	Client		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b		
Depths: Test / Nom / Actual (mm)	225 / 250 / 260	225 / 250 / 255		
Standard or Modified	Modified	Modified		
Stabilised Material Curing Time	-	-		
Location 1	See Map Attached	See Map Attached		
Location 2				
Location 3				
Location 4				
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize Wet / Dry (%)	9 / 9	7 / 7		
MDR Sample Number	21791/S/115743	21791/S/115744		
MDR Sample Date / Update	21/12/2021	21/12/2021		
Assigned MDR (Yes / No)	No	No		
Moisture Test Results:				
Field Moisture Content (%)	10.7	9.8		
Optimum Moisture Content (%)	9.5	9.5		
Variation from OMC (%)	1.0% Wetter than OMC	0.0% Wetter than OMC		
Moisture Ratio (%)	111.5	101.0		
Density Test Results:				
Field Wet Density (t/m³)	2.27	2.30		
Field Dry Density (t/m³)	2.05	2.10		
Maximum Dry Density (t/m³)	2.08	2.10		
Dry Density Ratio Required (%)	95	95		
Dry Density Ratio (%)	98.5	99.5		

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---


DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49851-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07_L7
Location:	Darwin	Internal Test Request:	21791/T/21314
Component:	Field Density Testing	Client Reference/s:	TR#165
Area Description:	Zuccoli	Report Date / Page:	24/12/2021 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115776	21791/S/115777	21791/S/115778
ID / Client ID	-	-	-
Lot Number	EWK_07_L7	EWK_07_L7	EWK_07_L7
Date / Time Tested	21/12/2021 15:20	21/12/2021 15:30	21/12/2021 15:40
Material Source	Client	Client	Client
Material Type	General Fill	General Fill	General Fill
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b
Depths: Test / Nom / Actual (mm)	225 / 250 / 260	225 / 250 / 260	225 / 250 / 260
Standard or Modified	Modified	Modified	Modified
Stabilised Material Curing Time	-	-	-
Location 1	See Map Attached	See Map Attached	See Map Attached
Location 2			
Location 3			
Location 4			
Test Fraction (mm)	< 19.0 mm	< 19.0 mm	< 19.0 mm
Sample Oversize Wet / Dry (%)	4 / 4	0 / 0	2 / 2
MDR Sample Number	21791/S/115776	21791/S/115777	21791/S/115778
MDR Sample Date / Update	21/12/2021	21/12/2021	21/12/2021
Assigned MDR (Yes / No)	No	No	No
Moisture Test Results:			
Field Moisture Content (%)	9.3	8.6	7.5
Optimum Moisture Content (%)	10.0	10.0	10.0
Variation from OMC (%)	0.5% Drier than OMC	1.5% Drier than OMC	2.5% Drier than OMC
Moisture Ratio (%)	93.0	84.5	73.5
Density Test Results:			
Field Wet Density (t/m³)	2.28	2.30	2.22
Field Dry Density (t/m³)	2.08	2.12	2.06
Maximum Dry Density (t/m³)	2.09	2.10	2.08
Dry Density Ratio Required (%)	95	95	95
Dry Density Ratio (%)	100.0	101.0	99.5

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---




DRY DENSITY RATIO / MOISTURE RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49853-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK_07B_L1, L2
Location:	Darwin	Internal Test Request:	21791/T/21315
Component:	Field Density Testing	Client Reference/s:	TR#166
Area Description:	Zuccoli	Report Date / Page:	24/12/2021 Page 1 of 1

Test Procedures:	AS1289.5.4.1, AS1289.5.2.1, AS1289.5.8.1, AS1289.2.1.1
------------------	--

Sample Number	21791/S/115779	21791/S/115780		
ID / Client ID	-	-		
Lot Number	EWK_07B_L1, L2	EWK_07B_L1, L2		
Date / Time Tested	21/12/2021 15:50	21/12/2021 16:00		
Material Source	Client	Client		
Material Type	General Fill	General Fill		
Sampling Method	AS1289.1.2.1 Cl 6.4b	AS1289.1.2.1 Cl 6.4b		
Depths: Test / Nom / Actual (mm)	225 / 250 / 260	225 / 250 / 265		
Standard or Modified	Modified	Modified		
Stabilised Material Curing Time	-	-		
Location 1	See Map Attached	See Map Attached		
Location 2				
Location 3				
Location 4	Lift 2	Lift 1		
Test Fraction (mm)	< 19.0 mm	< 19.0 mm		
Sample Oversize Wet / Dry (%)	2 / 2	3 / 3		
MDR Sample Number	21791/S/115779	21791/S/115780		
MDR Sample Date / Update	21/12/2021	21/12/2021		
Assigned MDR (Yes / No)	No	No		
Moisture Test Results:				
Field Moisture Content (%)	9.7	9.9		
Optimum Moisture Content (%)	10.5	10.0		
Variation from OMC (%)	1.0% Drier than OMC	0.0% Drier than OMC		
Moisture Ratio (%)	90.5	99.0		
Density Test Results:				
Field Wet Density (t/m³)	2.23	2.28		
Field Dry Density (t/m³)	2.03	2.08		
Maximum Dry Density (t/m³)	2.09	2.09		
Dry Density Ratio Required (%)	95	95		
Dry Density Ratio (%)	97.0	99.5		

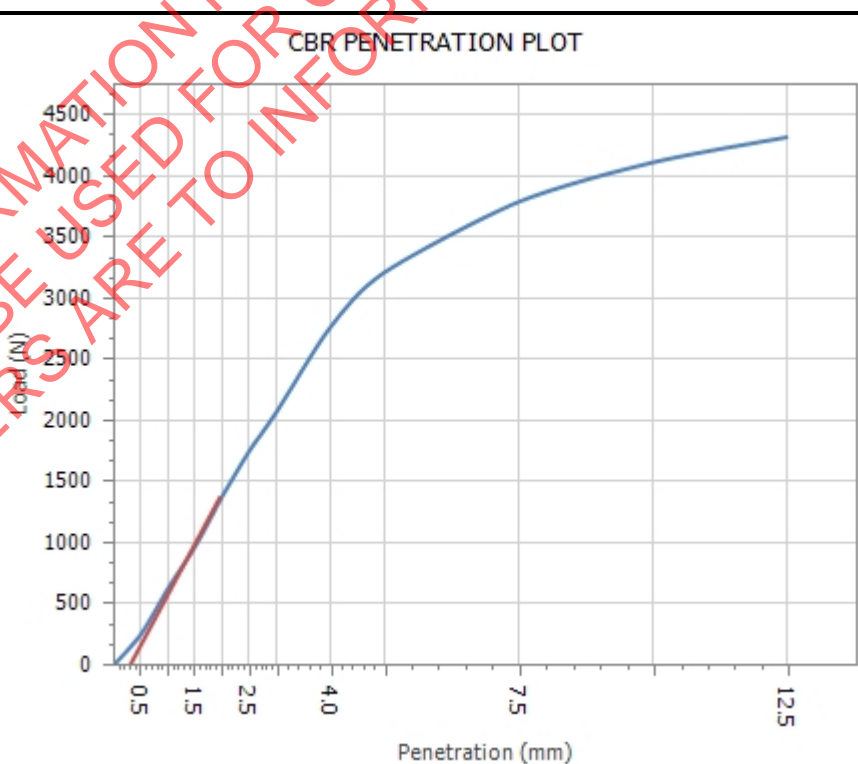
Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p> <p>Accreditation Number: 1986</p> <p>Corporate Site Number: 21791</p>	<p><i>Eoin O'Brien</i></p> <p>Approved Signatory: Eoin O'Brien</p> <p>Form ID: W27ASRep Rev 1</p>
--	---


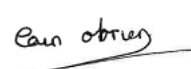
CALIFORNIA BEARING RATIO REPORT

Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49887-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK-08 Lot 14945-14959
Location:	Darwin	Internal Test Request:	21791/T/21255
Component:	Field Density Testing	Client Reference/s:	TR#158
Area Description:	Zuccoli	Report Date / Page:	29/12/2021 Page 1 of 2

Test Procedures	AS1289.6.1.1, AS1289.5.2.1, AS1289.2.1.1		
Sample Number	21791/S/115456	Sample Location	
Sampling Method	AS1289.1.2.1 CI 6.4b	Location 1	See Map Attached
Date Sampled	15/12/2021	Location 2	Layer 4
Sampled By	Maninder Paul Singh Saagu	Location 3	
Date Tested	24/12/2021	Location 4	
Material Source	Client	Material Limit Start	
Material Type	General Fill	Material Limit End	
Client Reference	-	Compactive Effort	Modified

Material Description	Silty Gravel		
Maximum Dry Density (t/m³):	2.13	 <p>CBR PENETRATION PLOT</p>	
Optimum Moisture Content (%):	9.0		
Field Moisture Content (%):	6.7		
Sample Percent Oversize (%):	0.0		
Oversize Included / Excluded	Excluded		
Target Density Ratio (%):	95		
Target Moisture Ratio (%):	100		
Placement Dry Density (t/m³):	2.02		
Placement Dry Density Ratio (%):	95.0		
Placement Moisture Content (%):	9.1		
Placement Moisture Ratio (%):	101.0		
Test Condition / Soaking Period:	Soaked / 4 Days		
CBR Surcharge (kg)	4.5		
Dry Density After Soak (t/m³):	2.02		
Total Curing Time (hrs)	48		
Liquid Limit Method	Estimation		
Moisture (top 30mm) After Soak (%)	12.0		
Moisture (remainder) After Soak (%)	12.3		
CBR Swell (%):	0.0		
Minimum CBR Specification (%):	-		
CBR Value @ 5.0mm (%):	17		

Remarks

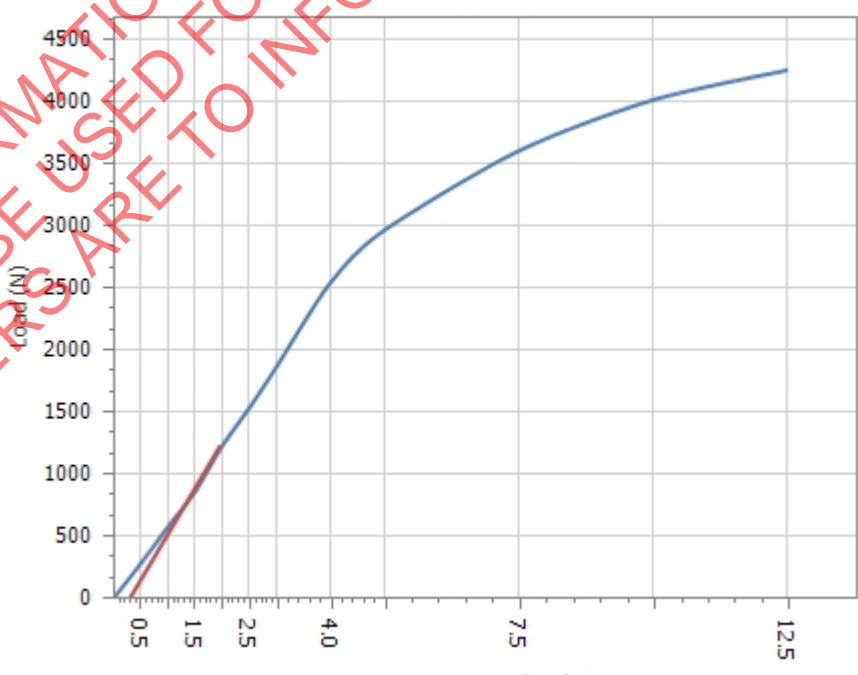
 Accredited for compliance with ISO/IEC 17025 – Testing Accreditation Number: 1986 Corporate Site Number: 21791		 Approved Signatory: Eoin O'Brien Form ID: W2ASRep Rev2
---	--	--

CALIFORNIA BEARING RATIO REPORT


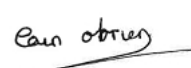
Client:	Ostojic Group PTY LTD	Report Number:	21791/R/49887-1
Client Address:	Lot 4723 Tivendale Road, Berrimah	Project Number:	21791/P/978
Project:	OST2109-Zuccoli Stage 3BC	Lot Number:	EWK-08 Lot 14945-14959
Location:	Darwin	Internal Test Request:	21791/T/21255
Component:	Field Density Testing	Client Reference/s:	TR#158
Area Description:	Zuccoli	Report Date / Page:	29/12/2021 Page 2 of 2

Test Procedures	AS1289.6.1.1, AS1289.5.2.1, AS1289.2.1.1		
Sample Number	21791/S/115460	Sample Location	
Sampling Method	AS1289.1.2.1 CI 6.4b	Location 1	See Map Attached
Date Sampled	15/12/2021	Location 2	Layer 3
Sampled By	Maninder Paul Singh Saagu	Location 3	
Date Tested	24/12/2021	Location 4	
Material Source	Client	Material Limit Start	
Material Type	General Fill	Material Limit End	
Client Reference	-	Compactive Effort	Modified

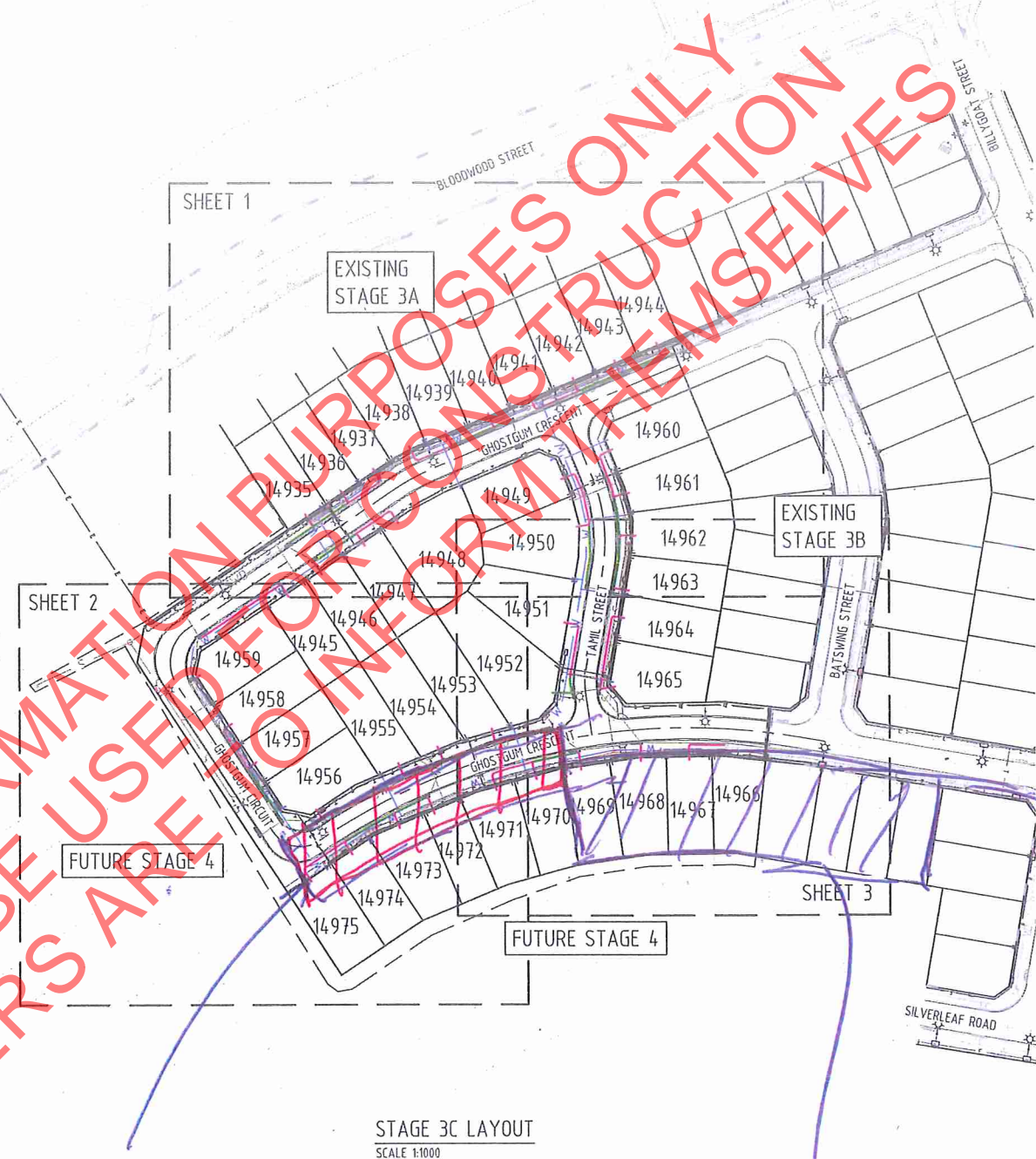
Material Description Sandy Silty Gravel

Maximum Dry Density (t/m³):	2.13	 <p>CBR PENETRATION PLOT</p>
Optimum Moisture Content (%):	8.0	
Field Moisture Content (%):	4.2	
Sample Percent Oversize (%):	0.0	
Oversize Included / Excluded	Excluded	
Target Density Ratio (%):	95	
Target Moisture Ratio (%):	100	
Placement Dry Density (t/m³):	2.02	
Placement Dry Density Ratio (%):	95.0	
Placement Moisture Content (%):	7.8	
Placement Moisture Ratio (%):	100.0	
Test Condition / Soaking Period:	Soaked / 4 Days	
CBR Surcharge (kg)	4.5	
Dry Density After Soak (t/m³):	2.02	
Total Curing Time (hrs)	73	
Liquid Limit Method	Estimation	
Moisture (top 30mm) After Soak (%)	12.2	
Moisture (remainder) After Soak (%)	12.3	
CBR Swell (%):	0.0	
Minimum CBR Specification (%):	-	
CBR Value @ 5.0mm (%):	15	

Remarks

 <p>Accredited for compliance with ISO/IEC 17025 – Testing</p>		
Accreditation Number:	1986	
Corporate Site Number:	21791	Approved Signatory: Eoin O'Brien
		Form ID: W2ASRep Rev2

Site inspection report. 42181.
14/10/21.



Stage 3C

- Area to the south
needs drying out
and further compaction prior
to filling

Stage 3C
Area acceptable
to fill

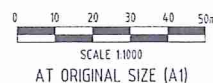
PERMISSION TO USE FOR CONSTRUCTION PURPOSES
ROADWORKS AND STORMWATER DRAINAGE

SIGNED _____ DATE _____

DIRECTOR CITY GROWTH AND OPERATIONS - CITY OF PALMERSTON

This permission to use is given on the basis that the Developer and/or Consultant is not absolved from full responsibility for the correctness and accuracy of the design and/or documents associated. This permission is valid for two years from date of signing.

0	03.09.21	ISSUED FOR CONSTRUCTION	JM	SW
Rev	Date	Description	By	Chk



Darwin Office
Suite G01, Manunda Place, 38 Cavenagh Street
Darwin, Northern Territory 0800, Australia
GPO Box 2422, Darwin, Northern Territory 0801
T 1300 657 402 F +617 3371 2266
E info@adgc.com W www.adgc.com
BRISBANE / DARWIN / GOLD COAST / MELBOURNE
PERTH / SYDNEY / TOWNSVILLE

Client	COSTOJIC PTY LTD
Project Name	ZUCCOLI ASPIRE STAGE 3C CIVIL WORKS

Discipline CIVIL		Status CONSTRUCTION	
Designed By LS	Checked By SW	Approved By SW	
Project No 20696	Drawn By JMB	Scale at A1 1:1000	
<p>The concepts and/or information contained in this document are the copyright of ADG Engineers (Australia) Pty Ltd. Use or copying of the document in whole or in part without the written permission of ADG Engineers (Australia) Pty Ltd constitutes an infringement of copyright.</p> <p>Do not scale drawings. If in doubt, ask!</p>			

ISSUED FOR
CONSTRUCTION

Title	STAGE 3C OVERALL LAYOUT PLAN		Revision
Drawing No	3C_002	0	



SITE INSPECTION REPORT

ADG Engineers (Aust) Pty Ltd
ABN 63 131 876 143

BRISBANE
DARWIN
GOLD COAST
MELBOURNE
PERTH
SUNSHINE COAST
SYDNEY

NO. 42155

To: Brad Hodge - Ostojic Group Job No: 20696
Attn: Brad Hodge Date: 22 / 7 / 21
Job Name: Zuccoli - Stage 3B Time: 9:30am
Subject: _____

T 1300 657 402
E info@adgce.com
W www.adgce.com

☐ NON CONFORMANCE

☒ INSPECTION NOTICE

☐ SITE INSTRUCTION

ITEM	DETAILS
(1)	Clearing & grubbing inspection of the verge east of Billygoat Street.
	Verge clearing was acceptable. A few larger roots & sticks were identified. These are to be removed prior to filling.
	Proof roll conducted to confirm compact. No notable defects - therefore acceptable.
	Billygoat Street pre-subgrade compact & inspection.
	Box cut was acceptable. A couple of tree roots noted that should be removed pre-fill.
	Proof roll conducted. Proof roll passed.

Notes: 1) Should this instruction constitute a variation to the contract, the contractor is NOT to proceed with work until a variation order is approved by the superintendent.
2) Commencement of works signifies the contractor's acceptance that these works do not constitute a variation to the contract.
3) This site inspection report does not relieve the contractor of their responsibility to comply with the documentation specifications.

ISSUED BY: [Signature]
For and on behalf of ADG Engineers (Aust) Pty Ltd

PRINT NAME: Jonathan Lemmon

RECEIVED BY: _____
For and on behalf of: Ostojic Group

PRINT NAME: Brad Hodge



SITE INSPECTION REPORT

ADG Engineers (Aust) Pty Ltd
ABN 63 131 876 143

BRISBANE
DARWIN
GOLD COAST
MELBOURNE
PERTH
SUNSHINE COAST
SYDNEY

NO. 42181

To: Richard Houghton Job No: 20696
Attn: Ostojic Group Date: 14, 10, 21
Job Name: Zuccoli - Stage 3CB Time: 10:00
Subject: Pre fitting inspection

T 1300 657 402
E info@adgce.com
W www.adgce.com

☐ NON CONFORMANCE ☒ INSPECTION NOTICE ☐ SITE INSTRUCTION

ITEM	DETAILS
(1)	Pre fitting inspection on Stage 3CB + Stage 3B.
as	Stage 3B and eastern area of Stage 3C is acceptable to H/I (note to the plan)
	Area to the west of Stage 3C requires further compaction once dried out - particularly the southern area which was flooded in the recent rains prior to H/I

Notes: 1) Should this instruction constitute a variation to the contract, the contractor is NOT to proceed with work until a variation order is approved by the superintendent.
2) Commencement of works signifies the contractor's acceptance that these works do not constitute a variation to the contract.
3) This site inspection report does not relieve the contractor of their responsibility to comply with the documentation specifications.

ISSUED BY: [Signature]
For and on behalf of ADG Engineers (Aust) Pty Ltd

RECEIVED BY: [Signature]
For and on behalf of: Ostojic Group

PRINT NAME: Jonathan Houghton

PRINT NAME: Richard Houghton