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LEVEL 1 INSPECTION & TESTING ARMSTRONG ESTATE STAGE 35A, MOUNT DUNEED

Prepared for Creo Consultants Pty Ltd

Report Reference: GSSW2268.1 AA

Date: 17 December 2024

ABN: 51 612 825 313

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(P) +61 3 5282 1566



PROJECT DETAILS

Project Reference	GSSW2268.1	Rev	AA
Project Title	Armstrong Estate Stage 35A		
Project Location	Mount Duneed	State	VIC
Date	17 December 2024		

CLIENT DETAILS

Prepared For (Client)	Creo Consultants Pty Ltd
Client Address	Level 7/176 Wellington Parade, East Melbourne VIC 3002

DISTRIBUTION

Original Held By	Ground Science South West Pty Ltd
One (1) Electronic Copy	Creo Consultants Pty Ltd

This document presents the results of the Level 1 Inspection and Testing performed by Ground Science South West for the aforementioned project, as the nominated project Geotechnical Inspection & Testing Authority (GITA). This report is detailed for the sole use of the intended recipient(s). Should you have any questions related to this report please do not hesitate to contact the undersigned.

AUTHOR:



Michael Knez
Geotechnical Engineer

REVIEWED:



Gee Singh, RPEng
Senior Geotechnical Engineer

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1. INTRODUCTION

This report presents the results of the inspection activities, compaction control and laboratory testing services performed by Ground Science South West Pty Ltd for the Armstrong Estate Stage 35A project, located in Mount Duneed, Victoria (the site).

2. PROJECT UNDERSTANDING

It is understood that the project involves the placement of fill as part of the bulk earthworks phase for Armstrong Estate Stage 35A. Ground Science was engaged to provide Level 1 Inspection and Testing services for the construction of these areas. Authorisation to proceed was provided by Creo Consultants Pty Ltd (the 'Client').

Level 1 Inspection & Testing, as defined in AS3798 (2007) 'Guidelines on Earthworks for Commercial and Residential Developments' provides for full time inspection of the construction of controlled fill and compaction testing in accordance with AS1289 'Methods of Testing Soils for Engineering Purposes' and AS1726 (2017) 'Geotechnical Site Investigations'.

Ground Science performed the role of the project Geotechnical Inspection & Testing Authority (GITA) with all Level 1 Inspection and Testing services described in this report undertaken by an experienced GITA site representative.

3. SCOPE OF WORK

3.1 AREAS OF WORK

Ground Science provided Level 1 Inspection and Testing services for the construction of fill in areas requiring greater than 200mm of fill to achieve finished levels. The areas requiring Level 1 Inspection & Testing are shown on the supplied construction drawing, on Figure 1, prepared by Creo Consultants Pty Ltd (Armstrong Estate - Stage 35A Layout Plan – 1 [No. 180016.35A R202 Rev 0]).

This report details the Level 1 earthworks process performed on site which commenced on 11 November 2024 and was completed on the 12 December 2024, requiring 22 full days and 1 half day of inspection and testing works.

3.2 PLACEMENT METHODOLOGY

A technical specification for the fill operations was not provided. The placement of controlled fill on the above-mentioned areas was carried out in accordance with Level 1 fill procedures as detailed in AS3798 (2007) 'Guidelines on Earthworks for Commercial and Residential Developments'. The following fill placement guideline was adopted for the works:

- All existing loose surficial fill, topsoil, soft material, vegetation and materials containing significant organic matter were removed to expose the natural soil subgrade;
- Suitable fill material, sourced by the contractor and approved by Ground Science, was placed in loose horizontal layers not exceeding 300mm in thickness;
- The controlled fill material was compacted to achieve a target Dry Density Ratio of at least 95% Standard Compaction (AS 1289: 5.1.1, 5.4.1 or 5.7.1), based on our understanding that future building loads would be similar to residential type structures (i.e. non-commercial structural loading);
- The fill was moisture conditioned to within +/- 3% of the standard optimum moisture content;
- The fill material was sorted and mixed to eliminate particles greater than 20% by volume, particles coarser than 37.5mm and no particle over 200mm in any dimension;
- The frequency of field density testing adopted for the project was generally in line with the requirements for large scale developments (Type 1), as detailed in AS3798 (2007), which nominates a frequency of not less than:

- 1 test per layer or 200mm per 2500m²;
- 1 test per 500m³ distributed reasonably evenly throughout the full depth and area; or
- 3 tests per site visit; whichever requires the most tests.

4. INSPECTION AND TESTING

4.1 SUBGRADE PREPARATION

It is understood that the site had fill placed under procedures that were not in accordance with AS3798 (2007) 'Guidelines on Earthworks for Commercial and Residential Developments' (i.e. uncontrolled fill). This previous fill was deemed to be unsuitable, and in pre-works discussion with the client was recommended to be removed before future filling works commenced. These layers were removed along with any organics, topsoil and compressible (soft) soils by on-site construction contractor, beginning on 11 November 2024, as witnessed by the representative geotechnician from Ground Science South West. Site stripping was carried out progressively throughout the works and commenced from lot 3525 to lot 3531.

Inspection of the prepared subgrade surface on the above lots was carried out on 13 November 2024 by the representative geotechnician from Ground Science South West. A proof roll using a moxy truck loaded to a weight of 30 tonnes was performed over these lots. At the time of the inspection, the prepared subgrade in this area was deemed acceptable and considered suitable for subsequent works to proceed.

Further inspections of the prepared subgrade surface were performed over the course of the works as stripping works progressed alongside placement of controlled fill on previously approved lots. The following methodology was adopted:

- The surface was visually inspected by the representative geotechnician from Ground Science South West;
- A proof roll using a fully loaded moxy truck or water cart was performed over these lots;
- If soft spots were observed, these would be remedied by removing the material in the presence of the representative geotechnician and proof rolled again, until the area showed no deflection.

The above stripped subgrade was visually assessed using tactile methods described in AS1726 (2017) and approved by the GITA representative throughout the project.

4.2 CONSTRUCTION MATERIALS

The fill material used in this project was nominated by the on-site contractor. All materials used for the project were reclaimed fill sourced from the onsite stripping works. The material was stockpiled on site and carted to the fill zones in a Moxy or highway trucks. Ground Science performed an assessment of the fill source to identify the following material characteristics:

- Material suitability as an engineering property;
- Cohesiveness;
- Free of building debris and vegetative matter;
- Free of oversize rock particles.

Visual assessments on the above-mentioned properties were conducted on-site and the fill material used was considered acceptable for use on this project. The nominated fill products were visually assessed to comprise of CLAY (CI), medium plasticity, ranging from pale brown to brown, trace sand and gravel. Quality assurance tests were performed on the stockpiled fill material before placement. These tests include Particle Size Distribution and

Atterberg Limits tests. The test report sheets are presented in Appendix A. Ground Science did not perform any chemical or environmental analysis on the above fill material.

The fill source was assessed to be dry of the optimum moisture content. The fill materials were moisture conditioned at the stockpile using a water cart and blended through using an excavator bucket, the before being placed in Moxy or highway trucks and transported to the fill zones. All fill materials were generally considered suitable for use as engineered fill.

4.3 FILL CONSTRUCTION

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

- Grader;
- Excavator;
- Water Cart;
- Padfoot Roller;
- Compactor;
- Highway Truck;
- Moxy Truck.

During fill placement, the weather conditions ranged from sunny to rainy with temperatures typically ranging from 8 to 38 degrees Celsius.

The filling process was generally consistent throughout the project and involved the approved fill stockpiled adjacent to the fill placement zones. The material was spread using a grader into thin, loose layers. These layers were moisture conditioned by a water cart, applying a minimum of 1-2 passes to bring the placed material close to optimum moisture content.

Each layer was compacted using a padfoot roller or compactor applying a minimum of 5-8 passes, per layer observed. The thin layers of fill were compacted to form a composite layer, measuring 250mm thick, prior to undertaking the field density testing. This process was adopted for the fill placement works.

Rain was forecasted multiple times over the course of the works. A sacrificial layer of material was placed by a compactor to protect the previously placed and tested layers. This material was removed when works recommenced and blended with the stockpile for moisture control and reuse.

4.4 RESULTS OF COMPACTION CONTROL TESTING

Level 1 Inspection and Testing was undertaken by experienced technicians from Ground Science who attended the site for the duration of the construction phase and nominated the location of the in-situ density tests. Testing comprised a total of 82 in-situ density tests using a nuclear moisture-density gauge in accordance with Australian Standard (AS1289 5.8.1) together with 82 "Rapid HILF" Compaction tests (AS1289 5.7.1).

A summary of the field density and compaction control testing is presented in Appendix B. Field density and compaction control testing report sheets are presented in Appendix C. It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. No test areas failed to reach the required target density ratio. No test areas failed to reach the required moisture condition.

4.5 FINAL SURFACE LEVELS

Observations were made by a Ground Science staff member that filling had been complete up to the nominated finished levels designated on Figure 1 as per confirmation provided from the contractor's site foreman. We understand that the observed final levels are the constructed finished surface levels of the controlled fill. The overall

fill depths are estimated using onsite visual tactile methods and may not be a true representation of fill depths given that conditions on site may change over time. True fill depths should be obtained from the contractor's survey data.

5. COMPLIANCE

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

Based on observations made by Ground Science staff and the results of density tests, we consider that the controlled fill placed has been constructed in accordance with the guidelines in AS3798 (2007).

It should be noted that the final fill layers may be subjected to adverse weather conditions resulting in either surface softening or drying and cracking over time; regardless of the compactive efforts and moisture conditioning applied during the works. The integrity of the top 200mm to 300mm of the fill will deteriorate with time and should be taken into account by the foundation engineer prior to the construction of dwellings or buildings. The levels nominated in this report are a guide to amounts of fill placed and do not necessarily reflect an accurate survey of the fill levels.

6. UNDERSTANDING LEVEL 1 INSPECTION & TESTING

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

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

Level 1 Inspection & Testing requires full time inspection and testing of the fill placement undertaken on a site. Ground Science (project GITA), are notified daily (or at the completion of each day's work) by the project foreman where subsequent days of fill placement under Level 1 is to occur. On projects that rely upon the importation of a fill source, there can be delays in the receipt of sufficient materials to warrant fill placement works which may result in periods of time where a GITA representative is not required on site. It is the contractor's responsibility to notify the GITA when works proceed and their attendance on site is required again. A GITA relies upon the integrity of the contractor to advise when site attendance is required and makes all reasonable visual attempts to assess if the works are the same as the previous days attendance.



Ground Science

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

AUTHOR:

A handwritten signature in black ink, appearing to read 'MKnez'.

**Michael Knez
Geotechnical Engineer**

REVIEWED:

A handwritten signature in black ink, appearing to read 'Gee Singh'.

**Gee Singh, RPEng
Senior Geotechnical Engineer**

7. LIMITATIONS

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

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

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

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

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

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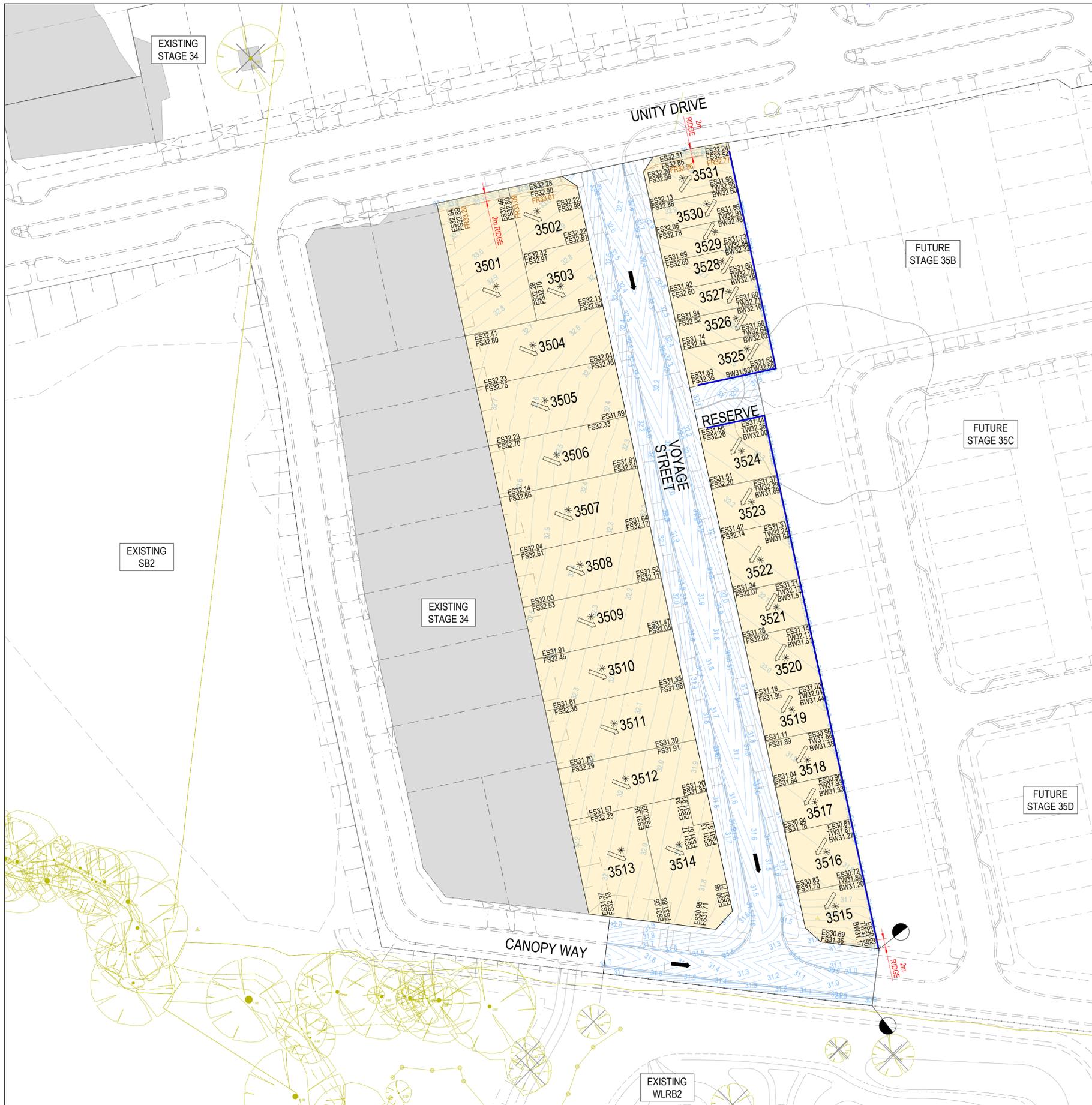
GroundScience

8. REFERENCES

- AS3798 (2007) Guidelines on Earthworks for Residential and Commercial Developments.
- AS1289 Methods of Testing Soils for Engineering Purposes.
- AS1726 (2017): Geotechnical Site Investigations

FIGURE 1

Armstrong Estate - Stage 35A Layout Plan [No. 180016.35A R202 REV 0]



LEGEND - EARTHWORKS PLAN

- RIDGE LINE
- - - - - TOE OF BATTER
- - - - - SWALE DRAIN
- ES141.34 EXISTING SURFACE LEVEL
- FS140.35 FINISHED BUILDING LINE LEVEL
- FR157.40 FINISHED RIDGE LINE LEVEL
- BW140.35 BOTTOM OF RETAINING WALL LEVEL
- TW157.40 TOP OF RETAINING WALL LEVEL
- EXISTING STRUCTURAL FILL > 200mm DEEP
- STRUCTURAL FILL > 200mm DEEP
- DIRECTION OF FALL
- OVERLAND FLOW
- ALLOTMENT TO BE GRADED EVENLY IN
- DIRECTION OF FALL TO LEVELS INDICATED
- 0.10m CONTOUR

CUT/FILL VOLUMES
 CUT TO FILL = 1300m³
 CUT TO SPOIL (DISPOSE OFFSITE) = 300m³

Certification No: 16350

CITY OF GREATER GEELONG TO STAMP HERE UPON APPROVAL

GREATER GEELONG CITY COUNCIL
 PLANNING ENVIRONMENT ACT 1987
 GREATER GEELONG PLANNING SCHEME

Endorsed Plan
 Planning Permit No: PP-496-2012
 Sheet 4 of 18
 Approved By Daniel Cromberge
 Approved Date 30/08/2024

NOTE: THIS IS NOT A BUILDING APPROVAL

WARNING
BEWARE OF UNDERGROUND & OVERHEAD SERVICES

The locations of underground & overhead services are approximate only & their exact position should be proven on site. No guarantee is given that all existing services are shown. Locate all underground services before commencement of works

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REVISION	DATE	ISSUE DESCRIPTION	DRAWN	CHECKED	APPROVED
0	30/08/24	ISSUED FOR CONSTRUCTION	K.MCKELVIE	M.TROUNCE	M.TROUNCE
B	27/08/24	COUNCIL COMMENTS	K.MCKELVIE	M.TROUNCE	M.TROUNCE
A	16/07/24	ISSUED FOR APPROVAL	K.MCKELVIE	M.TROUNCE	M.TROUNCE

villawood properties
 Communities Designed for Living

creo CIVIL

Suite 1, 2 Bloomsbury Street
 Newtown, VIC, Australia 3220

ARMSTRONG
 AT DUNEED

ARMSTRONG - STAGE 35A
 EARTHWORKS PLAN

ISSUED FOR CONSTRUCTION

SCALE @ A1 : 1:500

DESIGNED K.MCKELVIE	PROJECT ENGINEER M.TROUNCE
DRAWN K.MCKELVIE	PROJECT MANAGER M.TROUNCE
PROJECT No. 180016.35A	DRAWING No. R202
	REVISION 0

APPENDIX A

Particle Size Distribution and Atterberg Limits Test Report Sheets

Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-1A
Issue Number: 1
Date Issued: 19/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21715
Sample Number: 2268-S1
Date Sampled: 13/11/2024
Dates Tested: 13/11/2024 - 19/11/2024
Sampling Method: AS 1289.1.2.1 6.2 - Sampling from stockpiles
Remarks: Combined sample made up from six randomly selected increments extracted from the stockpile
Sample Location: Onsite Stockpile
Material: Cl - CLAY, trace sand & gravel, pale brown/brown, medium plasticity, sand 13% fine to coarse grained, gravel 7%.
Material Source: Reclaimed Fill (site won).

Ground Science South West Pty Ltd
 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits	Retained %	Retained Limits
19 mm	100		0	
13.2 mm	100		0	
9.5 mm	100		0	
6.7 mm	98		2	
4.75 mm	96		1	
2.36 mm	93		3	
1.18 mm	90		4	
0.6 mm	88		2	
0.425 mm	86		1	
0.3 mm	85		1	
0.15 mm	84		2	
0.075 mm	80		4	

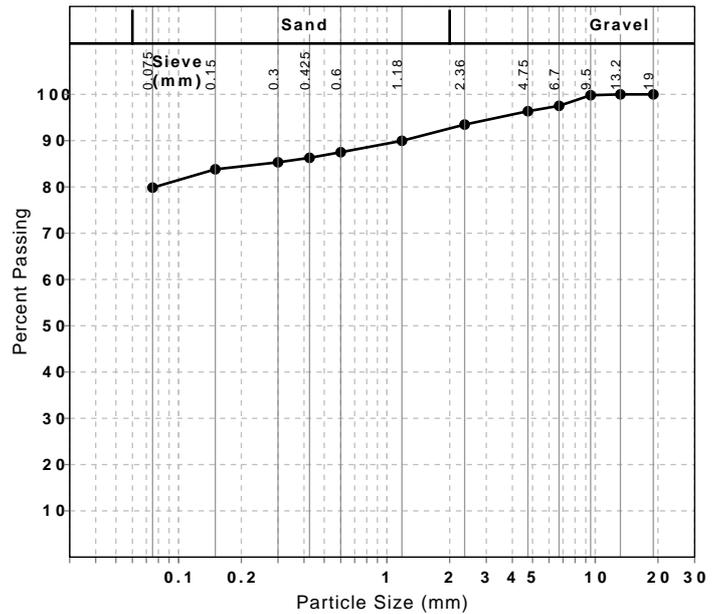
Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)

	Min	Max
Sample History	Oven Dried	
Preparation Method	Dry Sieve	
Liquid Limit (%)	44	
Plastic Limit (%)	17	
Plasticity Index (%)	27	

Linear Shrinkage (AS1289 3.4.1)

	Min	Max
Moisture Condition Determined By	AS 1289.3.1.2	
Linear Shrinkage (%)	10.0	
Cracking Crumbling Curling	Curling	

Particle Size Distribution



APPENDIX B

Field Density Test Report Summary Sheet

Project Summary Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Date: 16/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Specification:
Test Methods: AS 1289 5.7.1 STD & 5.8.1 & 2.1.1 & 5.4.1

Ground Science South West Pty Ltd
 8 Freedman Street North Geelong Vic 3215
 Phone: (03) 5282 1566
 Email: chrism@groundsciencesw.com.au

Lot #	Sample #	Date Sampled	Location	Easting	Northing	Elevation (m)	Layer	Relative Compaction (%)	Moisture Variation (%)	Moisture Content (%)	Field Wet Density (t/m3)
**	2268-S2	13/11/2024	Refer to attached plan Lot 3525	55H 265742	5765680	**	Layer 1	100.5	-1.0	25.4	1.96
**	2268-S3	13/11/2024	Refer to attached plan Lot 3527	55H 265738	5765696	**	Layer 1	100.5	-0.5	26.7	1.98
**	2268-S4	13/11/2024	Refer to attached plan Lot 3528	55H 265767	5765705	**	Layer 1	102.0	0.0	25.1	1.98
**	2268-S5	14/11/2024	Refer to attached plan Lot 3526	55H 265742	5765688	**	Layer 2	99.0	-1.0	25.9	1.95
**	2268-S6	14/11/2024	Refer to attached plan Lot 3528	55H 265740	5765703	**	Layer 2	100.0	0.0	22.5	1.95
**	2268-S7	14/11/2024	Refer to attached plan Lot 3530	55H 265738	5765716	**	Layer 2	105.5	1.5	23.7	2.00
**	2268-S8	14/11/2024	Refer to attached plan Lot 3530	55H 265737	5765715	**	Layer 3	102.5	0.5	22.7	1.96
**	2268-S9	14/11/2024	Refer to attached plan Lot 3527	55H 265748	5765710	**	Layer 3	105.0	1.5	26.5	1.98
**	2268-S10	15/11/2024	Refer to attached plan Lot 3525	55H 265741	5765696	**	Layer 4	103.0	1.5	24.9	1.96
**	2268-S11	15/11/2024	Refer to attached plan Lot 3529	55H 265743	5765709	**	Layer 4	100.5	-0.5	25.4	1.99
**	2268-S12	15/11/2024	Refer to attached plan Voyage Street in front of lot 3526	55H 265727	5765688	**	Layer 1	100.0	-1.0	28.9	1.97
**	2268-S13	15/11/2024	Refer to attached plan Voyage Street in front of lot 3530	55H 265718	5765709	**	Layer 1	100.5	0.5	23.6	1.97
**	2268-S14	15/11/2024	Refer to attached plan Lot 3531	55H 265738	5765724	**	Layer 5	97.5	0.0	23.8	1.94
**	2268-S15	18/11/2024	Refer to attached plan Voyage Street in front of lot 3527	55H 265715	5765758	**	Layer 2	101.0	-1.0	25.8	1.95
**	2268-S16	18/11/2024	Refer to attached plan Voyage Street in front of lot 3531	55H 265719	5765713	**	Layer 2	101.0	-0.5	25.6	1.98
**	2268-S17	18/11/2024	Refer to attached plan Lot 3528	55H 265736	5765706	**	Layer 6	99.5	0.0	26.3	1.94
**	2268-S18	19/11/2024	Refer to attached plan Lot 3505	55H 265719	5765682	**	Layer 1	97.5	-0.5	22.1	1.94
**	2268-S19	19/11/2024	Refer to attached plan Lot 3503	55H 265700	5765700	**	Layer 1	98.5	-0.5	22.4	1.96
**	2268-S20	19/11/2024	Refer to attached plan Lot 3501	55H 265687	5765707	**	Layer 1	97.0	0.5	21.1	1.96
**	2268-S21	20/11/2024	Refer to attached plan Lot 3502	55H 265699	5765711	**	Layer 2	98.5	0.0	20.0	1.96
**	2268-S22	20/11/2024	Refer to attached plan Lot 3504	55H 265701	5765682	**	Layer 2	97.0	-0.5	20.2	1.95
**	2268-S23	20/11/2024	Refer to attached plan Lot 3505	55H 265691	5765673	**	Layer 3	99.5	-0.5	22.6	2.01
**	2268-S24	20/11/2024	Refer to attached plan Lot 3506	55H 265696	5765657	**	Layer 3	99.5	0.0	20.3	2.02
**	2268-S25	21/11/2024	Refer to attached plan Lot 3506	55H 265702	5765667	**	Layer 4	102.0	0.0	24.1	2.02
**	2268-S26	21/11/2024	Refer to attached plan Lot 3503	55H 265698	5765691	**	Layer 4	101.0	-2.0	25.2	2.02
**	2268-S27	21/11/2024	Refer to attached plan Lot 3501	55H 265731	5765751	**	Layer 4	99.5	-2.0	24.0	1.98
**	2268-S28	22/11/2024	Refer to attached plan Lot 3520	55H 265746	5765623	**	Layer 1	102.5	0.0	28.7	1.99
**	2268-S29	22/11/2024	Refer to attached plan Lot 3522	55H 265751	5765645	**	Layer 1	104.5	0.0	29.7	2.02
**	2268-S30	22/11/2024	Refer to attached plan Lot 3524	55H 265753	5765659	**	Layer 1	100.5	0.5	24.3	1.97
**	2268-S31	25/11/2024	Refer to attached plan Reserve between lot 3524 and 3525	55H 265753	5765670	**	Layer 1	103.0	0.0	24.6	2.04
**	2268-S32	25/11/2024	Refer to attached plan Reserve between lot 3524 and 3525	55H 265756	5765673	**	Layer 2	100.0	-1.5	26.3	1.96
**	2268-S33	25/11/2024	Refer to attached plan Lot 3522	55H 265752	5765633	**	Layer 2	99.5	-1.5	24.2	1.96
**	2268-S34	25/11/2024	Refer to attached plan Lot 3521	55H 265758	5765624	**	Layer 3	100.0	-1.5	25.8	1.95
**	2268-S35	25/11/2024	Refer to attached plan Lot 3524	55H 265750	5765654	**	Layer 3	101.0	-1.0	25.5	1.96
**	2268-S36	26/11/2024	Refer to attached plan Lot 3521	55H 265748	5765626	**	Layer 4	100.5	0.0	23.0	1.99

Lot #	Sample #	Date Sampled	Location	Easting	Northing	Elevation (m)	Layer	Relative Compaction (%)	Moisture Variation (%)	Moisture Content (%)	Field Wet Density (t/m3)
**	2268-S37	26/11/2024	Refer to attached plan Lot 3523	55H 265745	5765660	**	Layer 4	100.0	0.5	23.1	1.98
**	2268-S38	26/11/2024	Refer to attached plan Lot 3520	55H 265750	5765617	**	Layer 5	102.0	0.0	25.3	1.96
**	2268-S39	26/11/2024	Refer to attached plan Lot 3524	55H 265751	5765656	**	Layer 5	104.5	-2.0	27.4	1.99
**	2268-S40	27/11/2024	Refer to attached plan Lot 3507	55H 265719	5765631	**	Layer 1	102.5	1.5	24.1	1.96
**	2268-S41	27/11/2024	Refer to attached Lot 3509	55H 265726	5765621	**	Layer 1	99.5	-2.5	28.3	1.97
**	2268-S42	27/11/2024	Refer to attached Lot 3510	55H 265729	5765611	**	Layer 1	102.5	1.5	22.7	1.96
**	2268-S43	28/11/2024	Refer to attached plan Voyage Street in front of lot 3520	55H 265732	5765620	**	Layer 1	101.0	-0.5	23.3	2.01
**	2268-S44	28/11/2024	Refer to attached plan Voyage Street in front of lot 3522	55H 265733	5765631	**	Layer 1	101.5	-2.0	24.2	2.01
**	2268-S45	28/11/2024	Refer to attached plan Voyage Street in front of lot 3524	55H 265730	5765652	**	Layer 1	103.0	2.0	23.2	1.99
**	2268-S46	29/11/2024	Refer to attached plan Lot 3507	55H 265722	5765641	**	Layer 2	98.5	-0.5	25.1	1.95
**	2268-S47	29/11/2024	Refer to attached plan Lot 3508	55H 265725	5765624	**	Layer 2	100.5	0.0	24.0	1.97
**	2268-S48	29/11/2024	Refer to attached plan Lot 3511	55H 265731	5765603	**	Layer 2	98.5	0.0	22.0	1.98
**	2268-S49	02/12/2024	Refer to attached plan Lot 3510	55H 265701	5765650	**	Layer 3	98.0	-0.5	23.8	1.96
**	2268-S50	02/12/2024	Refer to attached plan Lot 3509	55H 265713	5765643	**	Layer 3	95.5	-1.5	23.3	1.94
**	2268-S51	02/12/2024	Refer to attached plan Voyage Street in front of lot 3523	55H 265732	5765648	**	Layer 2	98.5	0.0	20.6	1.99
**	2268-S52	02/12/2024	Refer to attached plan Voyage Street in front of lot 3521	55H 265738	5765626	**	Layer 2	101.0	-0.5	21.9	2.02
**	2268-S53	03/12/2024	Refer to attached plan Lot 3507	55H 265710	5765708	**	Layer 3	99.0	-1.0	24.5	1.97
**	2268-S54	03/12/2024	Refer to attached plan Lot 3508	55H 265719	5765626	**	Layer 3	97.0	-1.0	22.7	1.98
**	2268-S55	03/12/2024	Refer to attached plan Lot 3510	55H 265721	5765620	**	Layer 3	102.0	0.0	24.9	1.96
**	2268-S56	04/12/2024	Refer to attached plan Lot 3508	55H 265694	5765646	**	Layer 4	101.5	-0.5	23.5	2.01
**	2268-S57	04/12/2024	Refer to attached plan Lot 3510	55H 265715	5765630	**	Layer	101.5	-0.5	23.1	2.02
**	2268-S58	04/12/2024	Refer to attached plan Lot 3511	55H 265709	5765594	**	Layer 1	104.0	-1.0	24.4	2.02
**	2268-S59	04/12/2024	Refer to attached plan Lot 3514	55H 265728	5765668	**	Layer 1	102.0	-1.0	25.0	2.01
**	2268-S60	04/12/2024	Refer to attached plan Lot 3512	55H 265723	5765583	**	Layer 2	98.0	-1.5	25.4	1.95
**	2268-S61	04/12/2024	Refer to attached plan Lot 3513	55H 265717	5765557	**	Layer 2	100.5	-1.0	27.5	1.96
**	2268-S62	05/12/2024	Refer to attached plan Lot 3511	55H 265711	5765591	**	Layer 3	100.5	0.5	21.0	2.02
**	2268-S63	05/12/2024	Refer to attached plan Lot 3513	55H 265719	5765558	**	Layer 3	99.5	-1.5	23.0	2.02
**	2268-S64	05/12/2024	Refer to attached plan Lot 3512	55H 265713	5765579	**	Layer 4	100.5	0.0	21.3	2.04
**	2268-S65	05/12/2024	Refer to attached plan Lot 3514	55H 265730	5765668	**	Layer 4	98.5	-0.5	21.9	2.02
**	2268-S66	06/12/2024	Refer to attached plan Lot 3511	55H 265718	5765597	**	Layer 5	104.5	0.5	24.1	2.04
**	2268-S67	06/12/2024	Refer to attached plan Lot 3512	55H 265717	5765579	**	Layer 5	105.5	1.0	25.7	2.02
**	2268-S68	06/12/2024	Refer to attached plan Lot 3514	55H 265730	5765572	**	Layer 5	100.5	0.0	22.9	2.04
**	2268-S69	09/12/2024	Refer to attached plan Lot 3511	55H 265713	5765590	**	Layer 5	101.0	0.0	22.1	2.02
**	2268-S71	09/12/2024	Refer to attached plan Lot 3514	55H 265735	5765563	**	Layer 5	98.5	-1.5	21.9	2.00
**	2268-S70	09/12/2024	Refer to attached plan Lot 3512	55H 265714	5765568	**	Layer 5	98.5	-0.5	23.5	1.98
**	2268-S72	09/12/2024	Refer to attached plan Voyage Street in front of lot 3512	55H 265746	5765586	**	Layer 1	99.5	0.0	25.4	1.97
**	2268-S73	10/12/2024	Refer to attached plan Voyage Street in front of 3519	55H 265740	5765594	**	Layer 2	100.0	-2.0	24.6	1.99
**	2268-S74	10/12/2024	Refer to attached plan Voyage Street in front of lot 3516	55H 265749	5765571	**	Layer 2	97.0	-2.0	22.7	1.99
**	2268-S75	10/12/2024	Refer to attached plan Lot 3519	55H 265763	5765592	**	Layer 1	95.5	-1.5	21.6	1.96
**	2268-S76	11/12/2024	Refer to attached plan Lot 3515	55H 265761	5765557	**	Layer 2	100.0	0.0	23.1	1.98
**	2268-S77	11/12/2024	Refer to attached plan Lot 3517	55H 265759	5765576	**	Layer 2	103.0	0.0	22.4	2.06
**	2268-S78	11/12/2024	Refer to attached plan Lot 3516	55H 265754	5765566	**	Layer 3	99.0	-0.5	21.8	1.99

Lot #	Sample #	Date Sampled	Location	Easting	Northing	Elevation (m)	Layer	Relative Compaction (%)	Moisture Variation (%)	Moisture Content (%)	Field Wet Density (t/m3)
**	2268-S79	11/12/2024	Refer to attached plan Lot 3518	55H 265760	5765587	**	Layer 3	102.0	2.0	20.6	1.99
**	2268-S80	11/12/2024	Refer to attached plan Lot 3519	55H 265755	5765698	**	Layer 4	98.5	-1.0	22.2	1.99
**	2268-S81	12/12/2024	Refer to attached plan Lot 3518	55H 265746	5765601	**	Layer 5	99.0	-0.5	21.5	2.00
**	2268-S82	12/12/2024	Refer to attached plan Lot 3517	55H 265754	5765576	**	Layer 5	98.5	-0.5	21.0	1.97
**	2268-S83	12/12/2024	Refer to attached plan Lot 3516	55H 265757	5765557	**	Layer 5	99.0	-0.5	21.0	1.98

Moisture Variation Note:

Positive values = test is dry of OMC

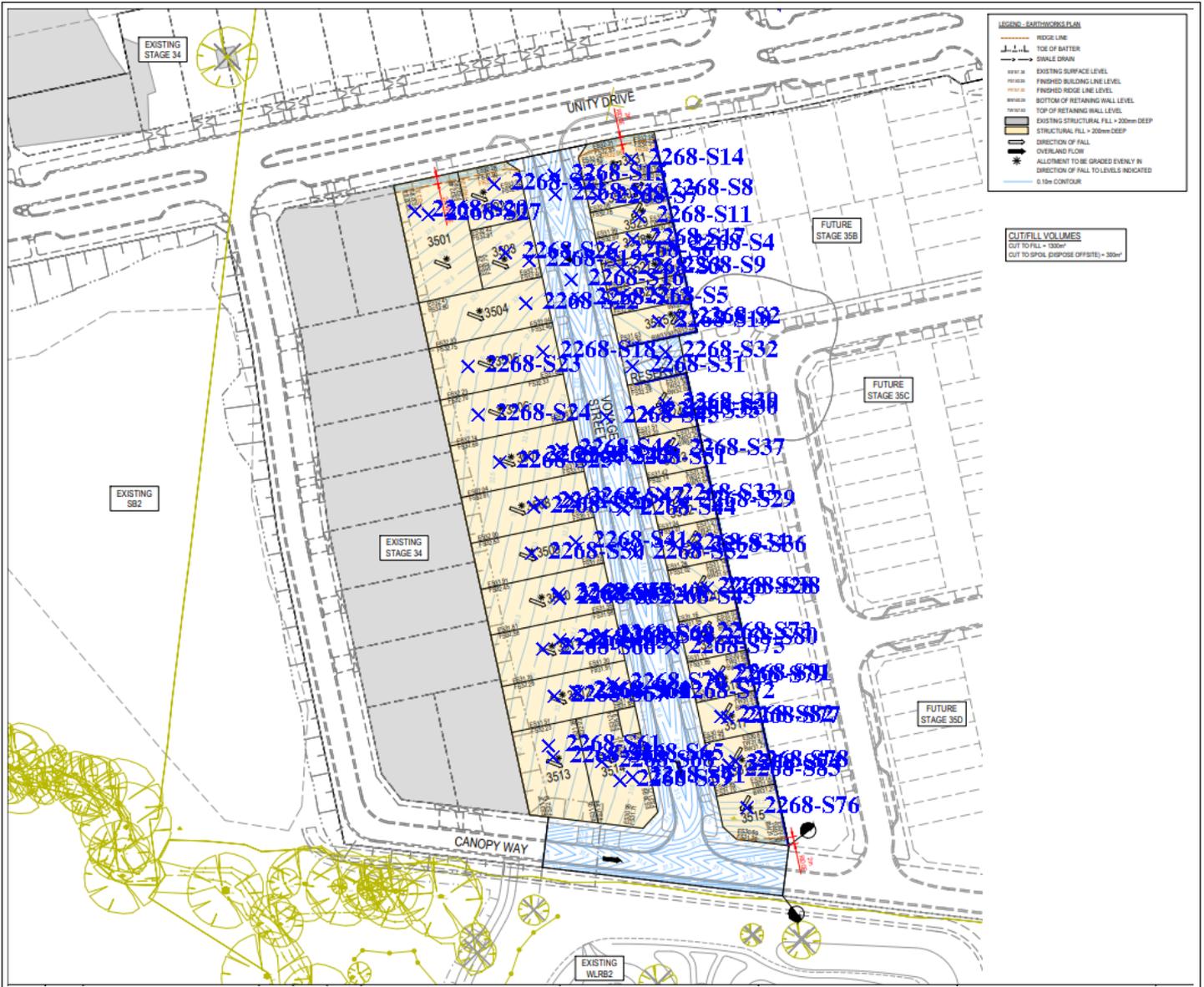
Negative values = test is wet of OMC

Sample Locations Plan

x - approximate test location



Ground Science South West
Geotechnical & Environmental Consultants



APPENDIX C

Field Density Test Report Sheets & Test Locations

Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-1
Issue Number: 1
Date Issued: 15/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21715
Date Sampled: 13/11/2024
Dates Tested: 13/11/2024 - 14/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, pale brown, high plasticity
Material Source: Reclaimed Fill

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Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S2	2268-S3	2268-S4
Date Tested	13/11/2024	13/11/2024	13/11/2024
Time Tested	15:04	15:22	15:48
Test Request #/Location	Refer to attached plan Lot 3525	Refer to attached plan Lot 3527	Refer to attached plan Lot 3528
Easting	55H 265742	55H 265738	55H 265767
Northing	5765680	5765696	5765705
Layer / Reduced Level	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	1.96	1.98	1.98
Field Moisture Content %	25.4	26.7	25.1
Field Dry Density (FDD) t/m ³	1.57	1.56	1.59
Peak Converted Wet Density t/m ³	1.95	1.97	1.95
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.4	26.0	25.1
Adj. Field Moisture Content % (AS1289.5.4.1)	25.4	26.7	25.1
Moisture Ratio % (AS1289.5.4.1)	104.0	103.0	100.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	-1.0	-0.5	0.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	100.5	100.5	102.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

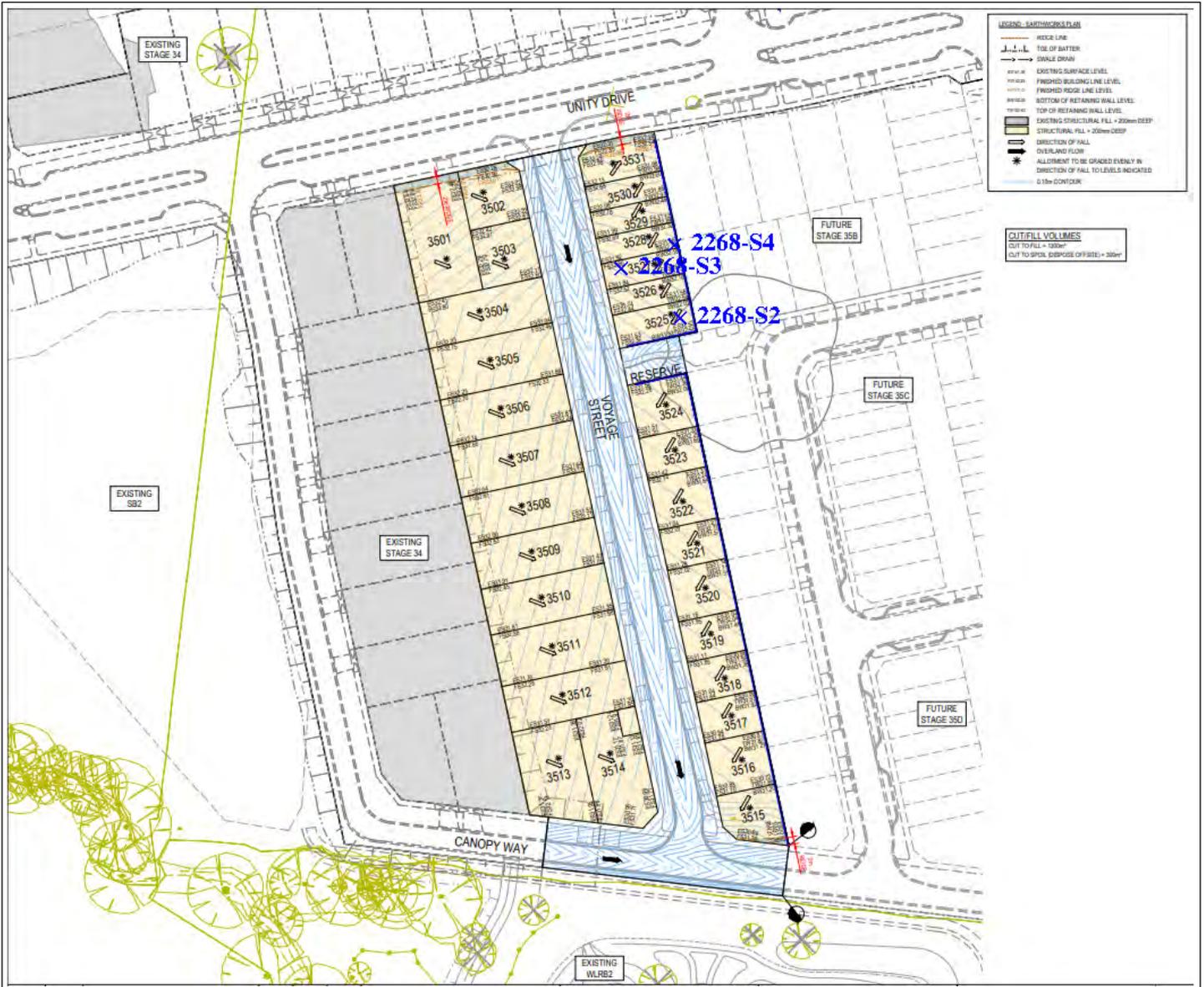
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-2
Issue Number: 1
Date Issued: 18/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21731
Date Sampled: 14/11/2024
Dates Tested: 14/11/2024 - 15/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, pale brown, high plasticity
Material Source: Site Won Fill

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B. Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S5	2268-S6	2268-S7	2268-S8	2268-S9
Date Tested	14/11/2024	14/11/2024	14/11/2024	14/11/2024	14/11/2024
Time Tested	10:00	10:11	10:25	14:47	15:01
Test Request #/Location	Refer to attached plan Lot 3526	Refer to attached plan Lot 3528	Refer to attached plan Lot 3530	Refer to attached plan Lot 3530	Refer to attached plan Lot 3527
Easting	55H 265742	55H 265740	55H 265738	55H 265737	55H 265748
Northing	5765688	5765703	5765716	5765715	5765710
Layer / Reduced Level	Layer 2	Layer 2	Layer 2	Layer 3	Layer 3
Thickness of Layer (mm)	250	250	250	250	250
Soil Description	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity
Test Depth (mm)	225	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	0	0
Field Wet Density (FWD) t/m ³	1.95	1.95	2.00	1.96	1.98
Field Moisture Content %	25.9	22.5	23.7	22.7	26.5
Field Dry Density (FDD) t/m ³	1.55	1.59	1.62	1.60	1.57
Peak Converted Wet Density t/m ³	1.97	1.95	1.90	1.92	1.89
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.9	22.7	25.3	23.1	28.0
Adj. Field Moisture Content % (AS1289.5.4.1)	25.9	22.5	23.7	22.7	26.5
Moisture Ratio % (AS1289.5.4.1)	104.0	99.0	93.5	98.0	94.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**	**
Moisture Variation (Wv) %	-1.0	0.0	1.5	0.5	1.5
Adjusted Moisture Variation %	**	**	**	**	**
Hilf Density Ratio (%)	99.0	100.0	105.5	102.5	105.0
Compaction Method	Standard	Standard	Standard	Standard	Standard
Report Remarks	**	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

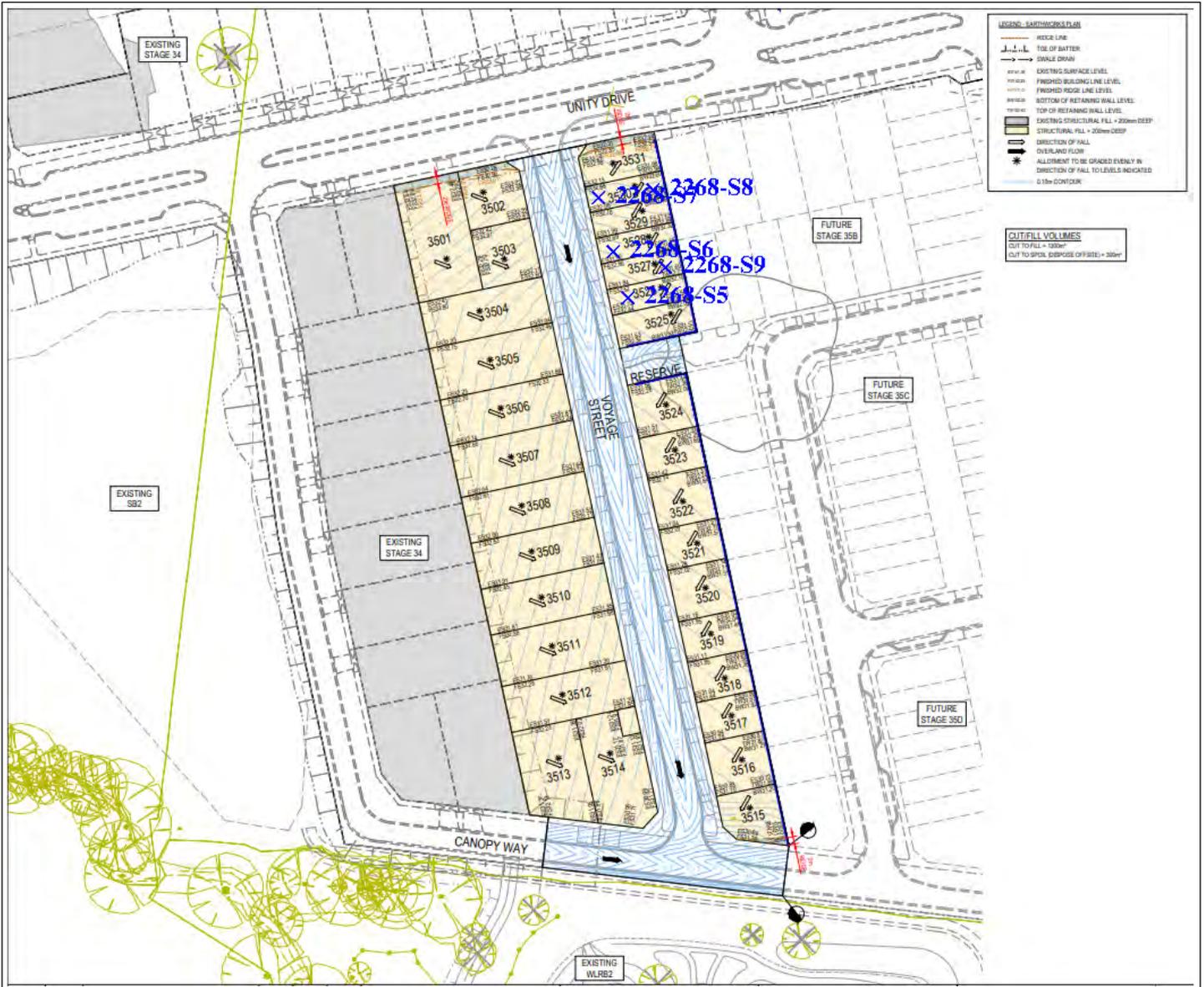
Sample Locations Plan

x - approximate test location



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LEGEND - BATHYMETRY PLAN

- RIDGE LINE
- - - - - TIE OF BATTER
- SHALE DRAIN
- EXISTING SURFACE LEVEL
- FINISHED BUILDING LINE LEVEL
- FINISHED RIDGE LINE LEVEL
- BOTTOM OF RETAINING WALL LEVEL
- TOP OF RETAINING WALL LEVEL
- EXISTING STRUCTURAL FILL - 200mm DEEP
- STRUCTURAL FILL - 200mm DEEP
- DIRECTION OF FILL
- DRAINAGE FLOW
- ALLOWMENT TO BE GRADED EVENLY IN DIRECTION OF FILL TO LEVELS INDICATED
- 0.1m CONTOUR

OUTFILL VOLUMES

- CUT TO FILL - 300m³
- CUT TO SPILL (DEPTH OF SITE) - 300m³

Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-3
Issue Number: 1
Date Issued: 19/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21751
Date Sampled: 15/11/2024
Dates Tested: 15/11/2024 - 18/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, pale brown, high plasticity
Material Source: Reclaimed Fill

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 Email: chrism@groundsciencesw.com.au

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1					
Sample Number	2268-S10	2268-S11	2268-S12	2268-S13	2268-S14
Date Tested	15/11/2024	15/11/2024	15/11/2024	15/11/2024	15/11/2024
Time Tested	10:57	11:07	12:46	12:54	14:51
Test Request #/Location	Refer to attached plan Lot 3525	Refer to attached plan Lot 3529	Refer to attached plan Voyage Street in front of lot 3526	Refer to attached plan Voyage Street in front of lot 3530	Refer to attached plan Lot 3531
Easting	55H 265741	55H 265743	55H 265727	55H 265718	55H 265738
Northing	5765696	5765709	5765688	5765709	5765724
Layer / Reduced Level	Layer 4	Layer 4	Layer 1	Layer 1	Layer 5
Thickness of Layer (mm)	250	250	250	250	250
Soil Description	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity
Test Depth (mm)	225	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	0	0
Field Wet Density (FWD) t/m ³	1.96	1.99	1.97	1.97	1.94
Field Moisture Content %	24.9	25.4	28.9	23.6	23.8
Field Dry Density (FDD) t/m ³	1.57	1.58	1.53	1.59	1.57
Peak Converted Wet Density t/m ³	1.91	1.98	1.97	1.96	1.99
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	26.2	24.7	27.9	23.9	23.7
Adj. Field Moisture Content % (AS1289.5.4.1)	24.9	25.4	28.9	23.6	23.8
Moisture Ratio % (AS1289.5.4.1)	95.0	103.0	103.5	98.5	100.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**	**
Moisture Variation (Wv) %	1.5	-0.5	-1.0	0.5	0.0
Adjusted Moisture Variation %	**	**	**	**	**
Hilf Density Ratio (%)	103.0	100.5	100.0	100.5	97.5
Compaction Method	Standard	Standard	Standard	Standard	Standard
Report Remarks	**	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

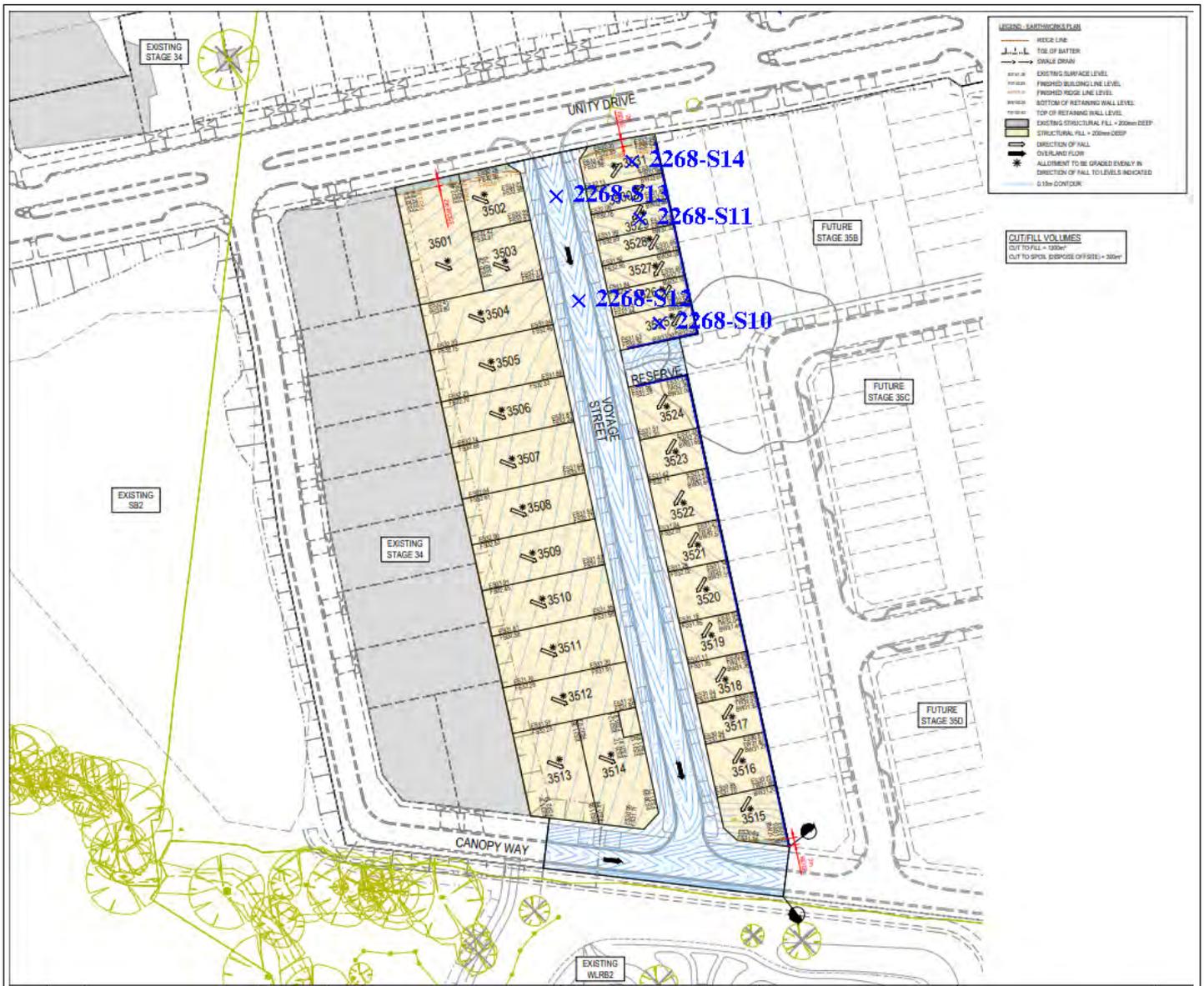
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-4
Issue Number: 1
Date Issued: 20/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21759
Date Sampled: 18/11/2024
Dates Tested: 18/11/2024 - 19/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, pale brown, high plasticity
Material Source: Onsite

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S15	2268-S16	2268-S17
Date Tested	18/11/2024	18/11/2024	18/11/2024
Time Tested	11:53	12:00	14:38
Test Request #/Location	Refer to attached plan Voyage Street in front of lot 3527	Refer to attached plan Voyage Street in front of lot 3531	Refer to attached plan Lot 3528
Easting	55H 265715	55H 265719	55H 265736
Northing	5765758	5765713	5765706
Layer / Reduced Level	Layer 2	Layer 2	Layer 6
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity	sandy CLAY, trace gravel, pale brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	1.95	1.98	1.94
Field Moisture Content %	25.8	25.6	26.3
Field Dry Density (FDD) t/m ³	1.55	1.58	1.54
Peak Converted Wet Density t/m ³	1.93	1.97	1.95
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	25.0	25.3	26.0
Adj. Field Moisture Content % (AS1289.5.4.1)	25.8	25.6	26.3
Moisture Ratio % (AS1289.5.4.1)	103.5	101.0	101.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	-1.0	-0.5	0.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	101.0	101.0	99.5
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

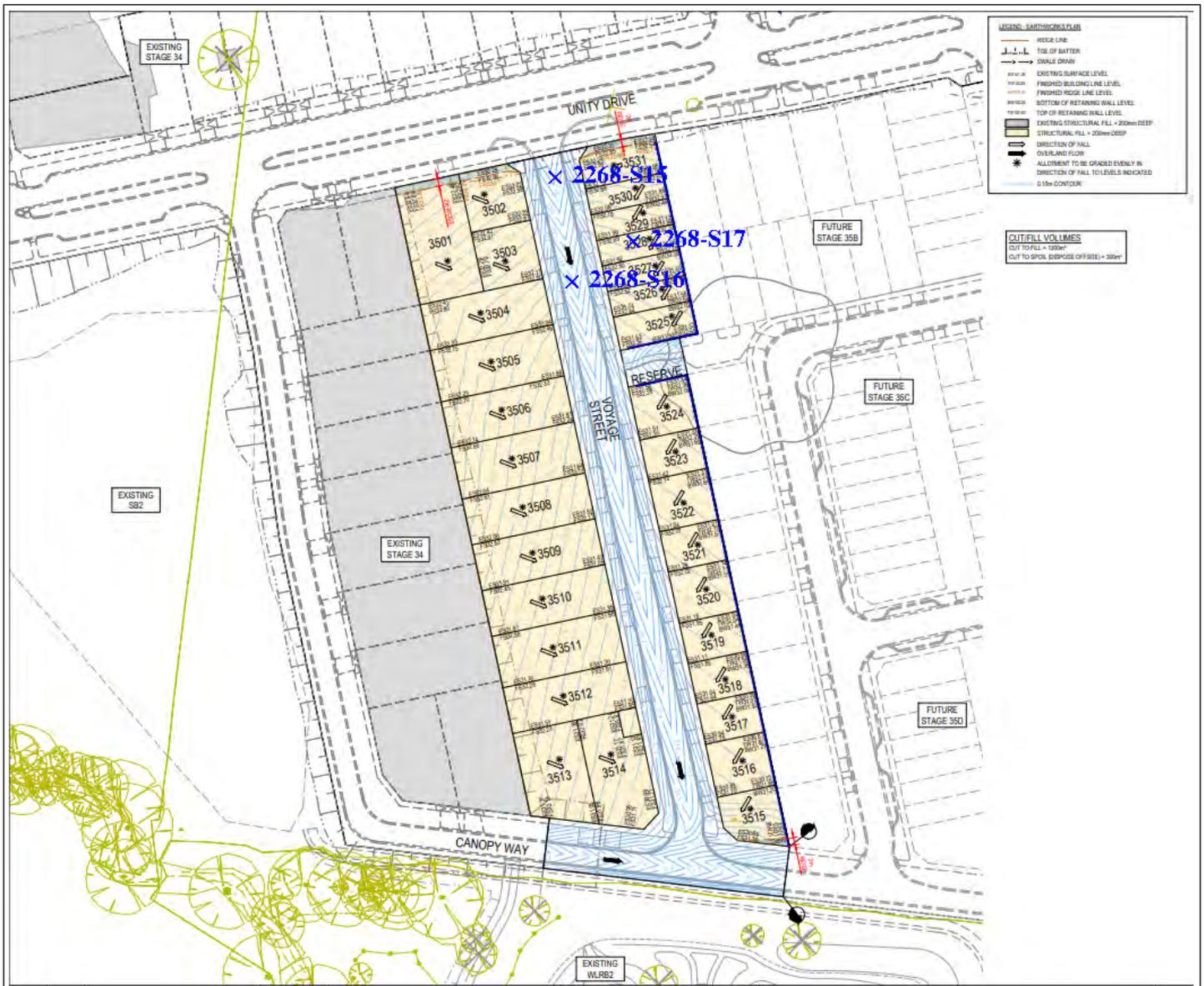
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-5
Issue Number: 1
Date Issued: 21/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21768
Date Sampled: 19/11/2024
Dates Tested: 19/11/2024 - 20/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Onsite

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Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S18	2268-S19	2268-S20
Date Tested	19/11/2024	19/11/2024	19/11/2024
Time Tested	15:40	15:47	15:54
Test Request #/Location	Refer to attached plan Lot 3505	Refer to attached plan Lot 3503	Refer to attached plan Lot 3501
Easting	55H 265719	55H 265700	55H 265687
Northing	5765682	5765700	5765707
Layer / Reduced Level	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	2	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	2	0	0
Field Wet Density (FWD) t/m ³	1.94	1.96	1.96
Field Moisture Content %	22.1	22.4	21.1
Field Dry Density (FDD) t/m ³	1.59	1.60	1.62
Peak Converted Wet Density t/m ³	**	1.99	2.01
Adjusted Peak Converted Wet Density t/m ³	1.99	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	20.9	22.0	21.6
Adj. Field Moisture Content % (AS1289.5.4.1)	21.6	22.4	21.1
Moisture Ratio % (AS1289.5.4.1)	**	102.0	97.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	103.5	**	**
Moisture Variation (Wv) %	**	-0.5	0.5
Adjusted Moisture Variation %	-0.5	**	**
Hilf Density Ratio (%)	97.5	98.5	97.0
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

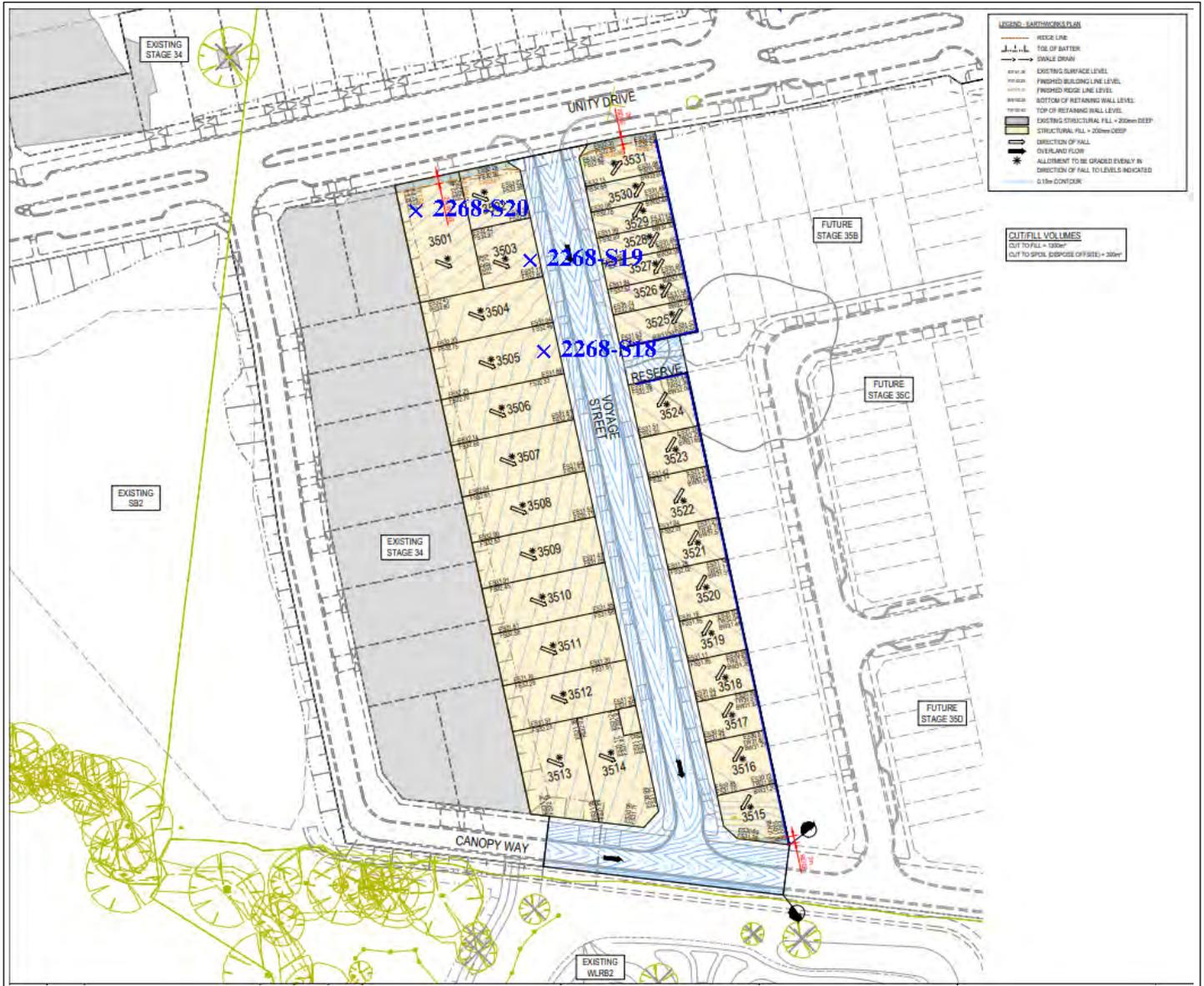
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-6
Issue Number: 1
Date Issued: 22/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21780
Date Sampled: 20/11/2024
Dates Tested: 20/11/2024 - 21/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed Fill

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Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S21	2268-S22	2268-S23	2268-S24
Date Tested	20/11/2024	20/11/2024	20/11/2024	20/11/2024
Time Tested	10:49	10:57	14:34	14:40
Test Request #/Location	Refer to attached plan Lot 3502	Refer to attached plan Lot 3504	Refer to attached plan Lot 3505	Refer to attached plan Lot 3506
Easting	55H 265699	55H 265701	55H 265691	55H 265696
Northing	5765711	5765682	5765673	5765657
Layer / Reduced Level	Layer 2	Layer 2	Layer 3	Layer 3
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	3	0	1	1
Percentage of Dry Oversize (%) (AS1289.5.4.1)	3	0	1	1
Field Wet Density (FWD) t/m ³	1.96	1.95	2.01	2.02
Field Moisture Content %	20.0	20.2	22.6	20.3
Field Dry Density (FDD) t/m ³	1.64	1.62	1.64	1.68
Peak Converted Wet Density t/m ³	**	2.01	**	**
Adjusted Peak Converted Wet Density t/m ³	1.99	**	2.01	2.03
Adj. Optimum Moisture Content % (AS1289.5.4.1)	19.5	19.7	22.0	19.8
Adj. Field Moisture Content % (AS1289.5.4.1)	19.3	20.2	22.4	20.1
Moisture Ratio % (AS1289.5.4.1)	**	102.5	**	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	99.0	**	102.0	101.0
Moisture Variation (Wv) %	**	-0.5	**	**
Adjusted Moisture Variation %	0.0	**	-0.5	0.0
Hilf Density Ratio (%)	98.5	97.0	99.5	99.5
Compaction Method	Standard	Standard	Standard	Standard
Report Remarks	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

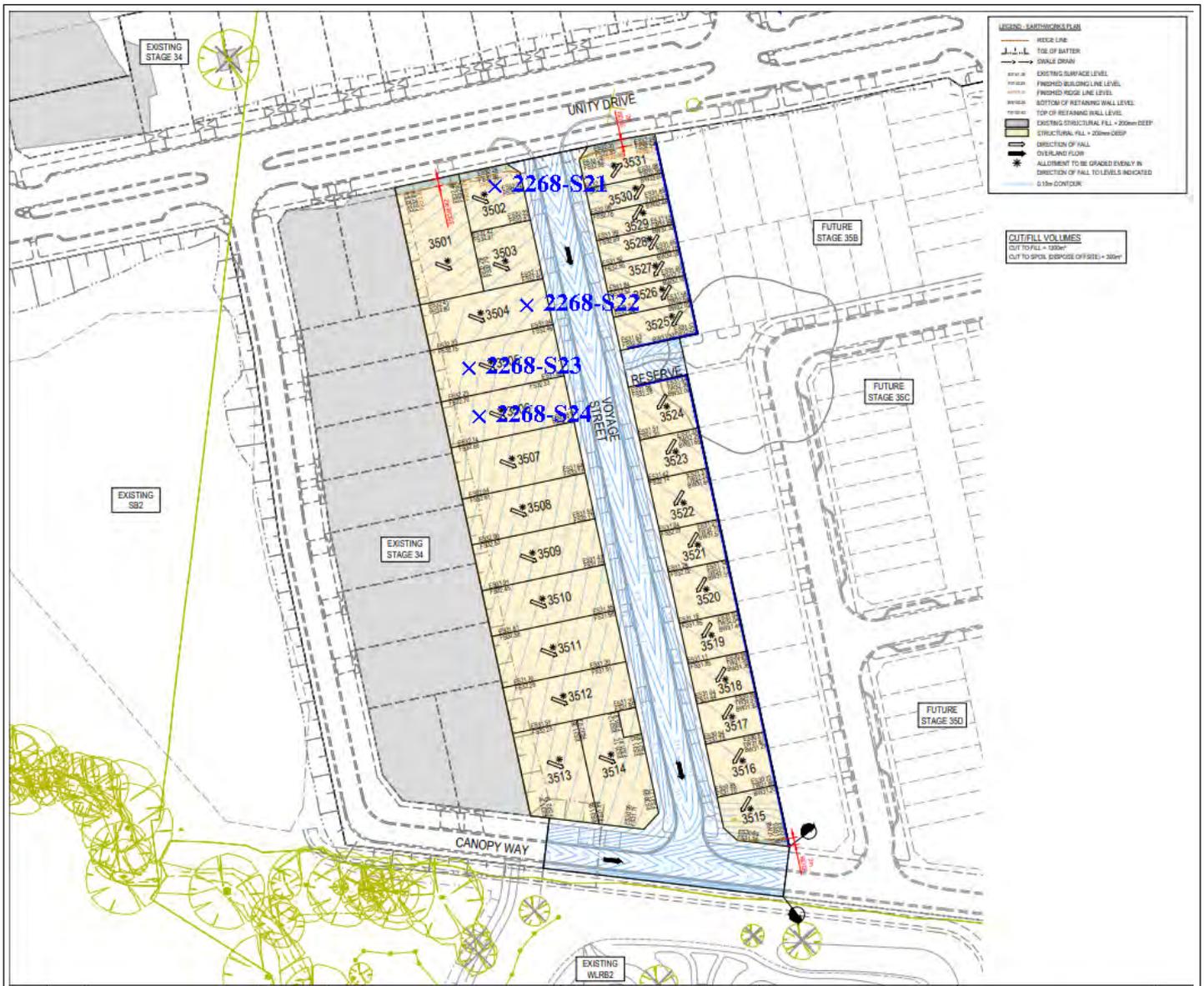
Sample Locations Plan

x - approximate test location



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Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-7
Issue Number: 1
Date Issued: 25/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21795
Date Sampled: 21/11/2024
Dates Tested: 21/11/2024 - 22/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed Fill

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S25	2268-S26	2268-S27
Date Tested	21/11/2024	21/11/2024	21/11/2024
Time Tested	14:48	14:59	15:07
Test Request #/Location	Refer to attached plan Lot 3506	Refer to attached plan Lot 3503	Refer to attached plan Lot 3501
Easting	55H 265702	55H 265698	55H 265731
Northing	5765667	5765691	5765751
Layer / Reduced Level	Layer 4	Layer 4	Layer 4
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	2.02	2.02	1.98
Field Moisture Content %	24.1	25.2	24.0
Field Dry Density (FDD) t/m ³	1.63	1.61	1.60
Peak Converted Wet Density t/m ³	1.99	2.00	1.99
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.1	23.0	21.9
Adj. Field Moisture Content % (AS1289.5.4.1)	24.1	25.2	24.0
Moisture Ratio % (AS1289.5.4.1)	100.0	109.0	109.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	0.0	-2.0	-2.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	102.0	101.0	99.5
Compaction Method	Standard	Standard	Standard
Report Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

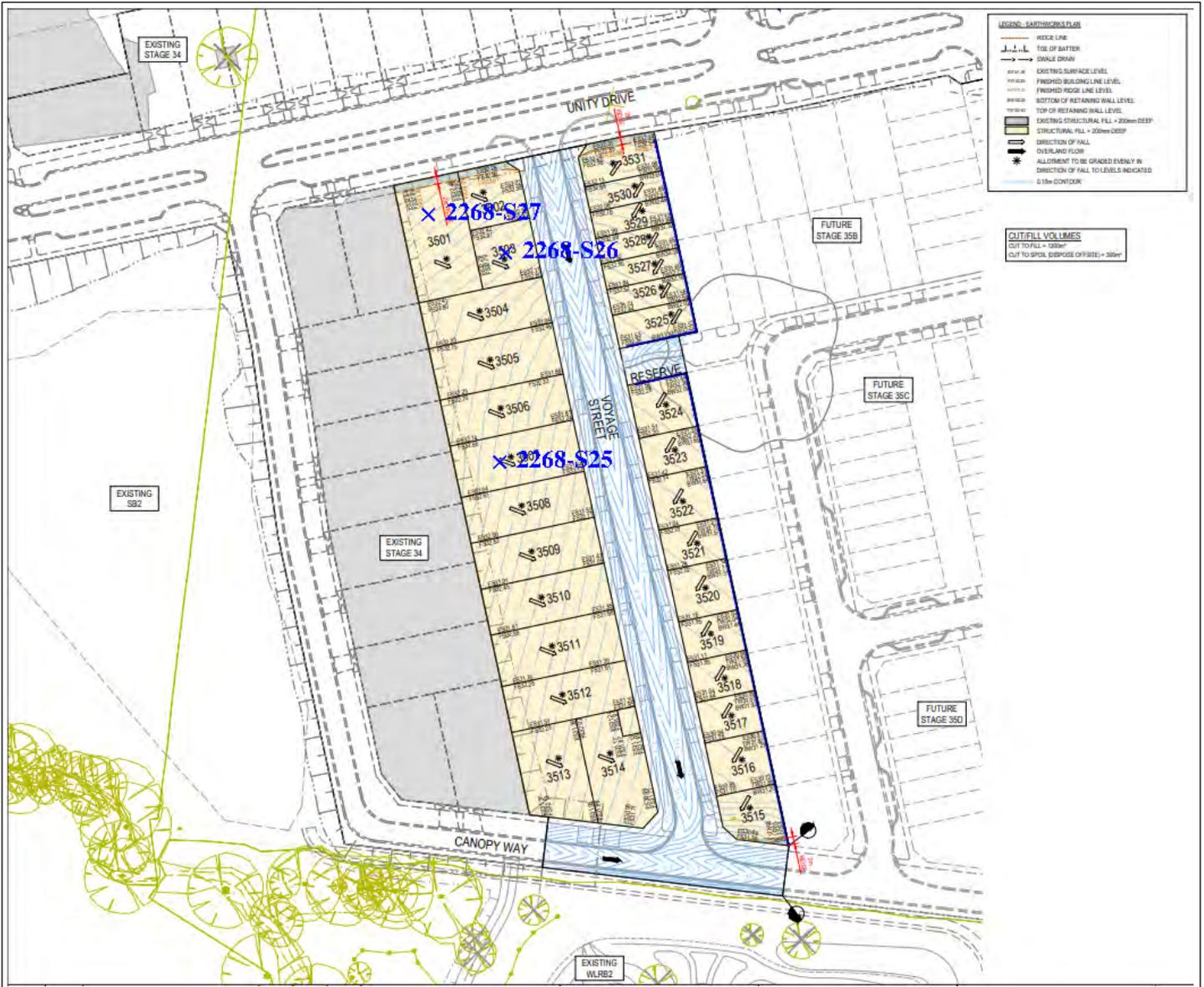
Sample Locations Plan

x - approximate test location



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Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-8
Issue Number: 1
Date Issued: 26/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21809
Date Sampled: 22/11/2024
Dates Tested: 22/11/2024 - 25/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed Fill

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S28	2268-S29	2268-S30
Date Tested	22/11/2024	22/11/2024	22/11/2024
Time Tested	12:31	12:39	12:51
Test Request #/Location	Refer to attached plan Lot 3520	Refer to attached plan Lot 3522	Refer to attached plan Lot 3524
Easting	55H 265746	55H 265751	55H 265753
Northing	5765623	5765645	5765659
Layer / Reduced Level	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	1.99	2.02	1.97
Field Moisture Content %	28.7	29.7	24.3
Field Dry Density (FDD) t/m ³	1.55	1.55	1.59
Peak Converted Wet Density t/m ³	1.94	1.93	1.96
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	28.6	29.7	24.7
Adj. Field Moisture Content % (AS1289.5.4.1)	28.7	29.7	24.3
Moisture Ratio % (AS1289.5.4.1)	100.0	100.0	98.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	0.0	0.0	0.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	102.5	104.5	100.5
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

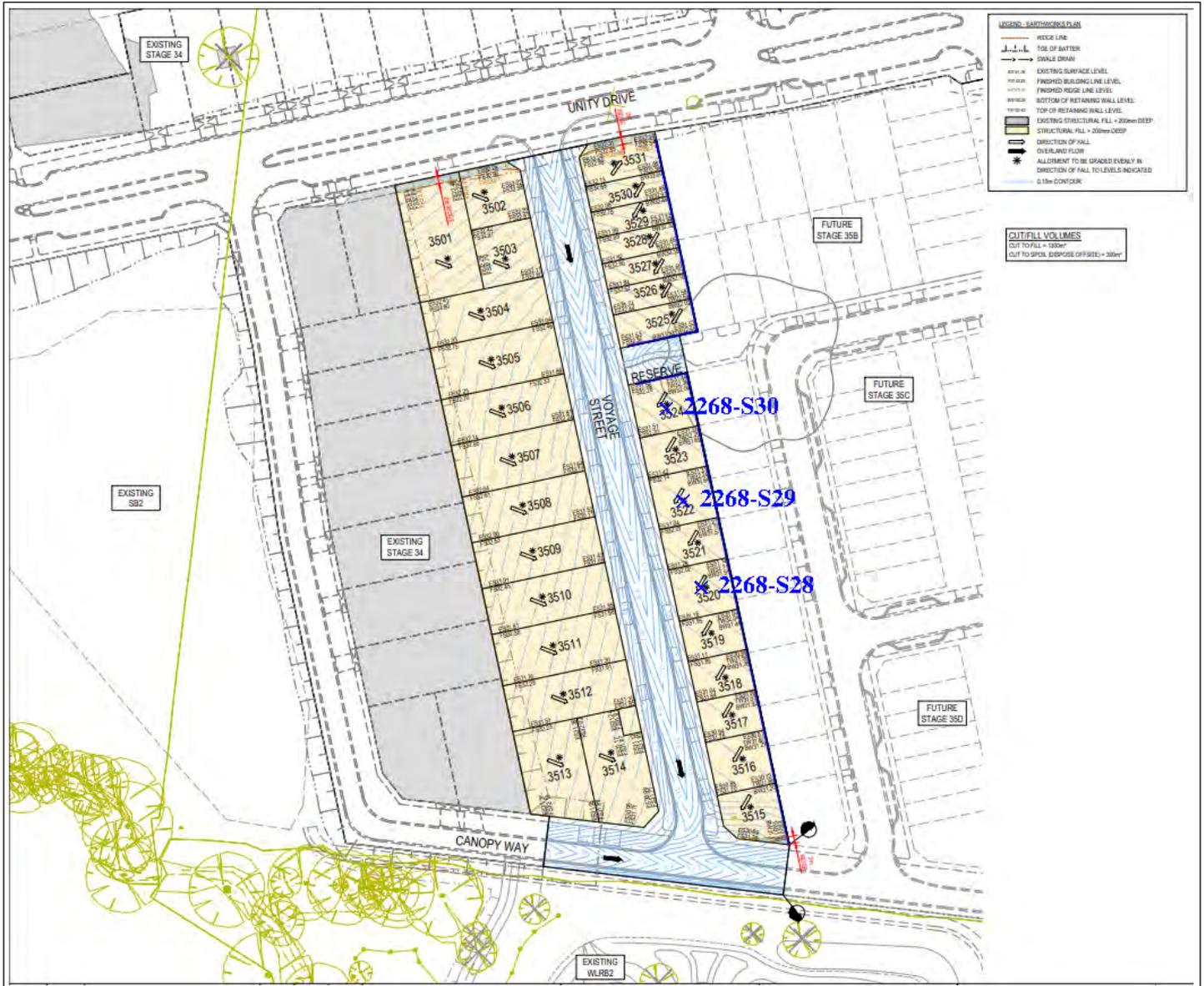
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-9
Issue Number: 1
Date Issued: 27/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21825
Date Sampled: 25/11/2024
Dates Tested: 25/11/2024 - 26/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed Fill

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Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S31	2268-S32	2268-S33	2268-S34	2268-S35
Date Tested	25/11/2024	25/11/2024	25/11/2024	25/11/2024	25/11/2024
Time Tested	08:57	12:01	12:08	15:35	15:43
Test Request #/Location	Refer to attached plan Reserve between lot 3524 and 3525	Refer to attached plan Reserve between lot 3524 and 3525	Refer to attached plan Lot 3522	Refer to attached plan Lot 3521	Refer to attached plan Lot 3524
Easting	55H 265753	55H 265756	55H 265752	55H 265758	55H 265750
Northing	5765670	5765673	5765633	5765624	5765654
Layer / Reduced Level	Layer 1	Layer 2	Layer 2	Layer 3	Layer 3
Thickness of Layer (mm)	250	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	0	0
Field Wet Density (FWD) t/m ³	2.04	1.96	1.96	1.95	1.96
Field Moisture Content %	24.6	26.3	24.2	25.8	25.5
Field Dry Density (FDD) t/m ³	1.63	1.55	1.58	1.55	1.56
Peak Converted Wet Density t/m ³	1.97	1.95	1.97	1.95	1.94
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.4	24.5	22.6	24.2	24.5
Adj. Field Moisture Content % (AS1289.5.4.1)	24.6	26.3	24.2	25.8	25.5
Moisture Ratio % (AS1289.5.4.1)	101.0	107.0	107.0	106.5	104.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**	**
Moisture Variation (Wv) %	0.0	-1.5	-1.5	-1.5	-1.0
Adjusted Moisture Variation %	**	**	**	**	**
Hilf Density Ratio (%)	103.0	100.0	99.5	100.0	101.0
Compaction Method	Standard	Standard	Standard	Standard	Standard
Remarks	**	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

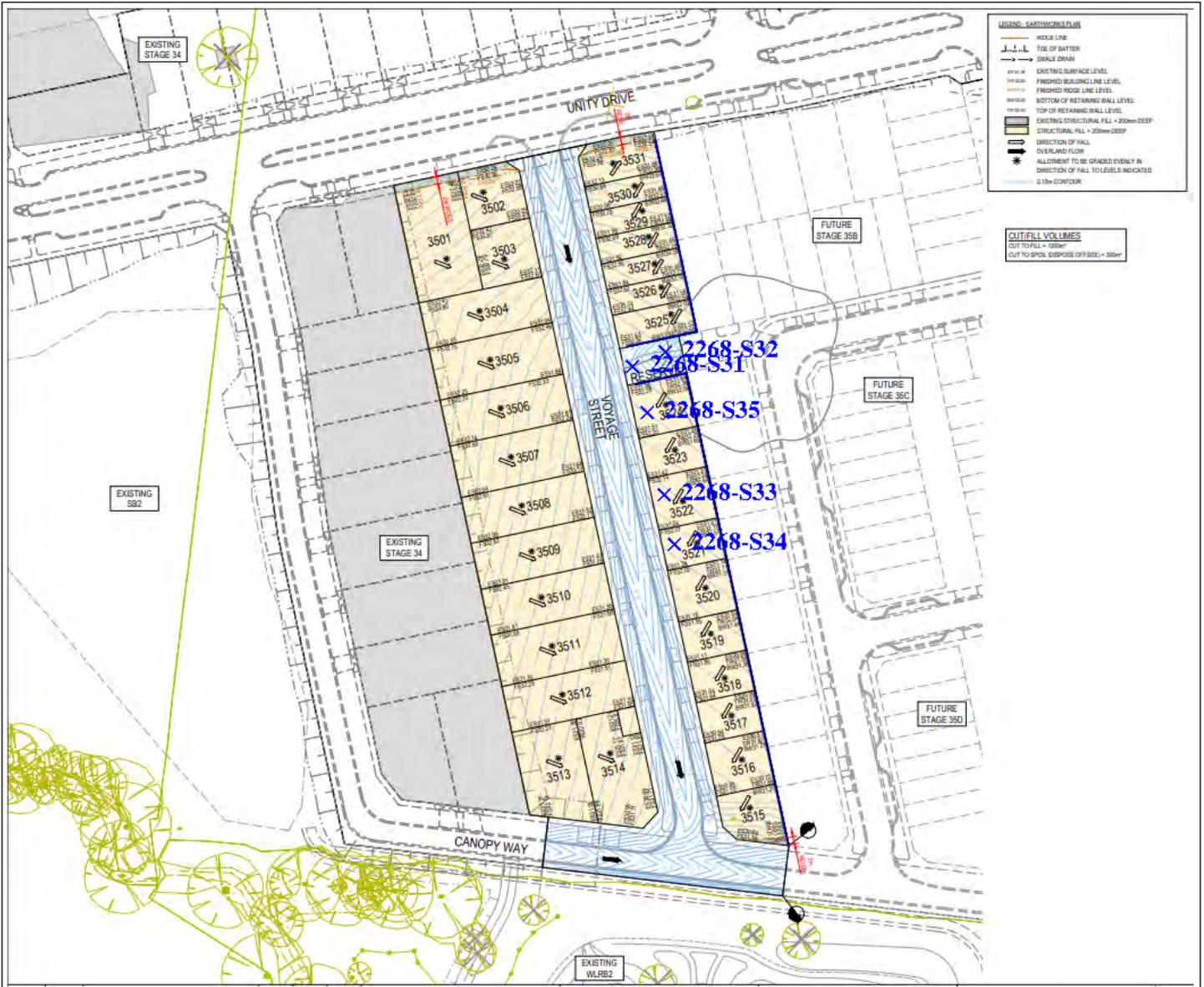
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-10
Issue Number: 1
Date Issued: 28/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21841
Date Sampled: 26/11/2024
Dates Tested: 26/11/2024 - 27/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Onsite

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Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S36	2268-S37	2268-S38	2268-S39
Date Tested	26/11/2024	26/11/2024	26/11/2024	26/11/2024
Time Tested	10:55	11:01	14:44	14:53
Test Request #/Location	Refer to attached plan Lot 3521	Refer to attached plan Lot 3523	Refer to attached plan Lot 3520	Refer to attached plan Lot 3524
Easting	55H 265748	55H 265745	55H 265750	55H 265751
Northing	5765626	5765660	5765617	5765656
Layer / Reduced Level	Layer 4	Layer 4	Layer 5	Layer 5
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	0
Field Wet Density (FWD) t/m ³	1.99	1.98	1.96	1.99
Field Moisture Content %	23.0	23.1	25.3	27.4
Field Dry Density (FDD) t/m ³	1.61	1.61	1.57	1.56
Peak Converted Wet Density t/m ³	1.97	1.98	1.92	1.90
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	22.8	23.6	25.5	25.4
Adj. Field Moisture Content % (AS1289.5.4.1)	23.0	23.1	25.3	27.4
Moisture Ratio % (AS1289.5.4.1)	101.0	98.0	99.5	108.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**
Moisture Variation (Wv) %	0.0	0.5	0.0	-2.0
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	100.5	100.0	102.0	104.5
Compaction Method	Standard	Standard	Standard	Standard
Remarks	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

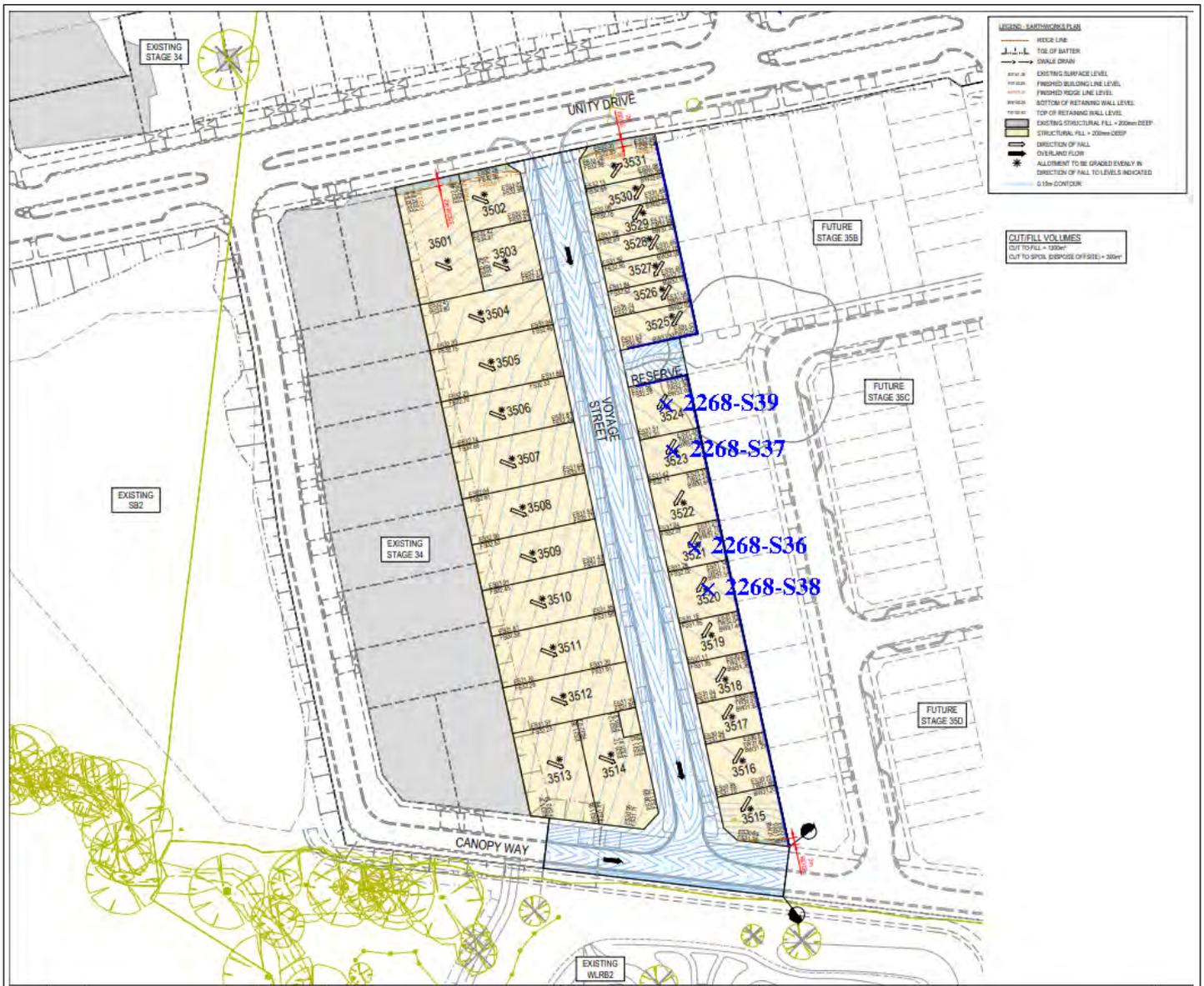
Sample Locations Plan

x - approximate test location



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Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-11
Issue Number: 1
Date Issued: 29/11/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21847
Date Sampled: 27/11/2024
Dates Tested: 27/11/2024 - 28/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed Fill

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Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S40	2268-S41	2268-S42
Date Tested	27/11/2024	27/11/2024	27/11/2024
Time Tested	14:44	14:50	15:01
Test Request #/Location	Refer to attached plan Lot 3507	Refer to attached Lot 3509	Refer to attached Lot 3510
Easting	55H 265719	55H 265726	55H 265729
Northing	5765631	5765621	5765611
Layer / Reduced Level	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	1.96	1.97	1.96
Field Moisture Content %	24.1	28.3	22.7
Field Dry Density (FDD) t/m ³	1.58	1.53	1.60
Peak Converted Wet Density t/m ³	1.91	1.98	1.91
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	25.9	25.7	24.4
Adj. Field Moisture Content % (AS1289.5.4.1)	24.1	28.3	22.7
Moisture Ratio % (AS1289.5.4.1)	93.5	110.5	93.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	1.5	-2.5	1.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	102.5	99.5	102.5
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

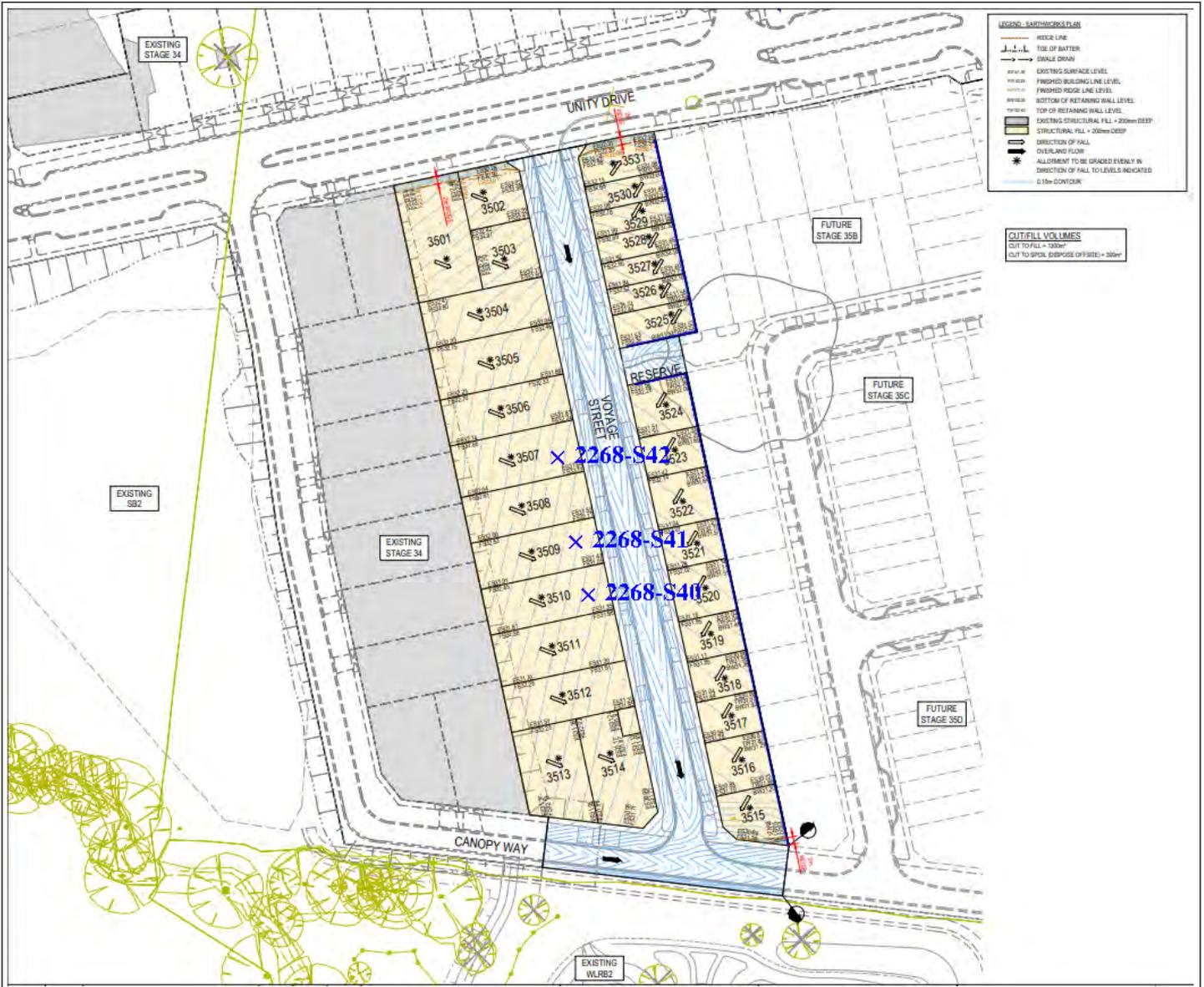
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-12
Issue Number: 1
Date Issued: 02/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21853
Date Sampled: 28/11/2024
Dates Tested: 28/11/2024 - 29/11/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

Ground Science South West Pty Ltd
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 Phone: (03) 5282 1566
 Email: chrism@groundsciencesw.com.au

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	2268-S43	2268-S44	2268-S45
Date Tested	28/11/2024	28/11/2024	28/11/2024
Time Tested	13:55	14:01	14:10
Test Request #/Location	Refer to attached plan Voyage Street in front of lot 3520	Refer to attached plan Voyage Street in front of lot 3522	Refer to attached plan Voyage Street in front of lot 3524
Easting	55H 265732	55H 265733	55H 265730
Northing	5765620	5765631	5765652
Layer / Reduced Level	Layer 1	Layer 1	Layer 1
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	2.01	2.01	1.99
Field Moisture Content %	23.3	24.2	23.2
Field Dry Density (FDD) t/m ³	1.63	1.62	1.62
Peak Converted Wet Density t/m ³	1.99	1.98	1.94
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.0	22.1	25.0
Adj. Field Moisture Content % (AS1289.5.4.1)	23.3	24.2	23.2
Moisture Ratio % (AS1289.5.4.1)	101.0	109.0	92.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	-0.5	-2.0	2.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	101.0	101.5	103.0
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

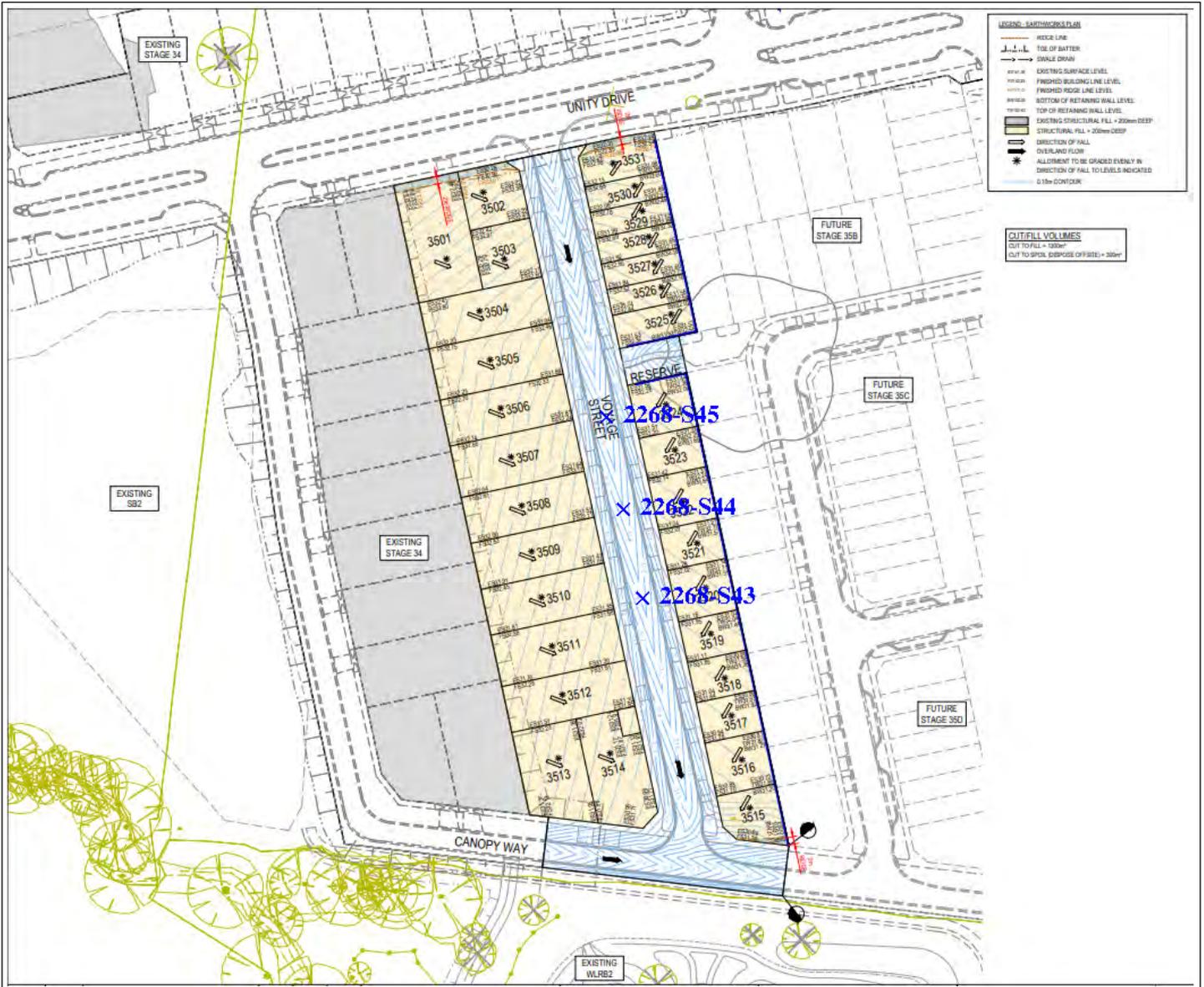
Positive values = test is dry of OMC
 Negative values = test is wet of OMC

Sample Locations Plan

x - approximate test location



Ground Science South West
Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-13
Issue Number: 1
Date Issued: 03/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21882
Date Sampled: 29/11/2024
Dates Tested: 29/11/2024 - 02/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S46	2268-S47	2268-S48
Date Tested	29/11/2024	29/11/2024	29/11/2024
Time Tested	14:29	14:36	14:46
Test Request #/Location	Refer to attached plan Lot 3507	Refer to attached plan Lot 3508	Refer to attached plan Lot 3511
Easting	55H 265722	55H 265725	55H 265731
Northing	5765641	5765624	5765603
Layer / Reduced Level	Layer 2	Layer 2	Layer 2
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	1.95	1.97	1.98
Field Moisture Content %	25.1	24.0	22.0
Field Dry Density (FDD) t/m ³	1.56	1.59	1.62
Peak Converted Wet Density t/m ³	1.98	1.96	2.01
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.7	24.3	21.9
Adj. Field Moisture Content % (AS1289.5.4.1)	25.1	24.0	22.0
Moisture Ratio % (AS1289.5.4.1)	101.5	99.0	100.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	-0.5	0.0	0.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	98.5	100.5	98.5
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

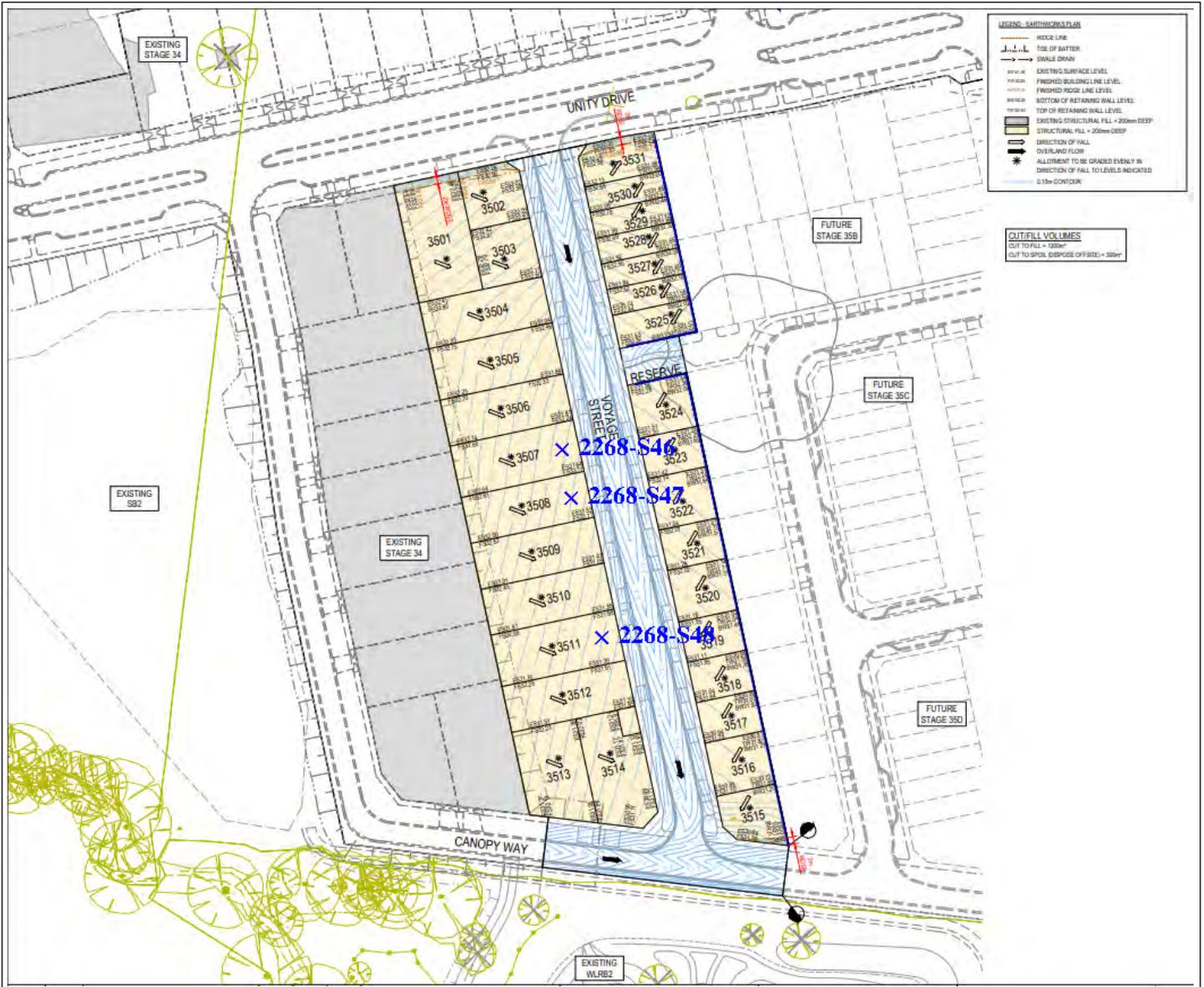
Sample Locations Plan

x - approximate test location



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LEGEND - BATHYMETRIC PLAN

- RIDGE LINE
- - - - - TIE OF BATTER
- J.J.L. SHALE DRAIN
- ELECTRIC SURFACE LEVEL
- FINISHED BUILDING LINE LEVEL
- FINISHED RIDGE LINE LEVEL
- BOTTOM OF RETAINING WALL LEVEL
- TOP OF RETAINING WALL LEVEL
- EXISTING STRUCTURAL FILL - 200mm DEEP
- STRUCTURAL FILL - 200mm DEEP
- DIRECTION OF FILL
- DRAINAGE FLOW
- ALLOWMENT TO BE GRADED EVENLY IN DIRECTION OF FILL TO LEVELS INDICATED
- 0.1% CONTOUR

OUTFILL VOLUMES

- CUT TO FILL - 300mm
- CUT TO SPILL (DEPTH OF SITE) - 300mm

Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-14
Issue Number: 1
Date Issued: 04/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21891
Date Sampled: 02/12/2024
Dates Tested: 02/12/2024 - 03/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

Ground Science South West Pty Ltd
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Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S49	2268-S50	2268-S51	2268-S52
Date Tested	02/12/2024	02/12/2024	02/12/2024	02/12/2024
Time Tested	13:20	13:29	15:35	15:41
Test Request #/Location	Refer to attached plan Lot 3510	Refer to attached plan Lot 3509	Refer to attached plan Voyage Street in front of lot 3523	Refer to attached plan Voyage Street in front of lot 3521
Easting	55H 265701	55H 265713	55H 265732	55H 265738
Northing	5765650	5765643	5765648	5765626
Layer / Reduced Level	Layer 3	Layer 3	Layer 2	Layer 2
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	0
Field Wet Density (FWD) t/m ³	1.96	1.94	1.99	2.02
Field Moisture Content %	23.8	23.3	20.6	21.9
Field Dry Density (FDD) t/m ³	1.58	1.57	1.65	1.66
Peak Converted Wet Density t/m ³	2.00	2.03	2.01	2.00
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.2	22.0	20.6	21.4
Adj. Field Moisture Content % (AS1289.5.4.1)	23.8	23.3	20.6	21.9
Moisture Ratio % (AS1289.5.4.1)	102.5	106.0	100.0	102.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**
Moisture Variation (Wv) %	-0.5	-1.5	0.0	-0.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	98.0	95.5	98.5	101.0
Compaction Method	Standard	Standard	Standard	Standard
Remarks	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

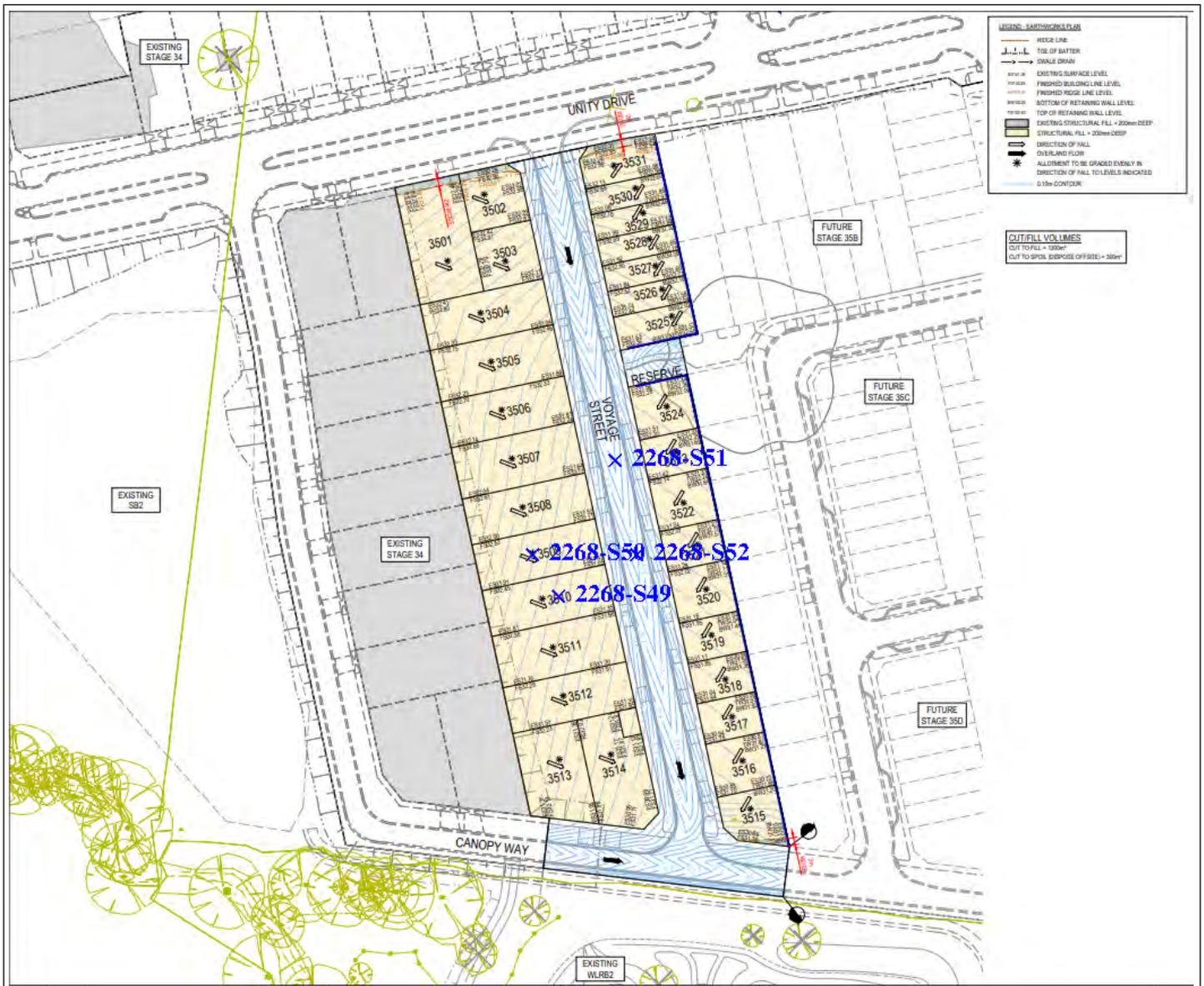
Negative values = test is wet of OMC

Sample Locations Plan

x - approximate test location



Ground Science South West
Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-15
Issue Number: 1
Date Issued: 05/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21902
Dates Tested: 03/12/2024 - 04/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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B. Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S53	2268-S54	2268-S55
Date Tested	03/12/2024	03/12/2024	03/12/2024
Time Tested	15:17	15:22	15:31
Test Request #/Location	Refer to attached plan Lot 3507	Refer to attached plan Lot 3508	Refer to attached plan Lot 3510
Easting	55H 265710	55H 265719	55H 265721
Northing	5765708	5765626	5765620
Layer / Reduced Level	Layer 3	Layer 3	Layer 3
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	1	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	1	0	0
Field Wet Density (FWD) t/m ³	1.97	1.98	1.96
Field Moisture Content %	24.5	22.7	24.9
Field Dry Density (FDD) t/m ³	1.59	1.61	1.57
Peak Converted Wet Density t/m ³	**	**	1.92
Adjusted Peak Converted Wet Density t/m ³	1.99	2.03	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.2	21.5	24.8
Adj. Field Moisture Content % (AS1289.5.4.1)	24.2	22.6	24.9
Moisture Ratio % (AS1289.5.4.1)	**	**	100.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	104.5	105.0	**
Moisture Variation (Wv) %	**	**	0.0
Adjusted Moisture Variation %	-1.0	-1.0	**
Hilf Density Ratio (%)	99.0	97.0	102.0
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

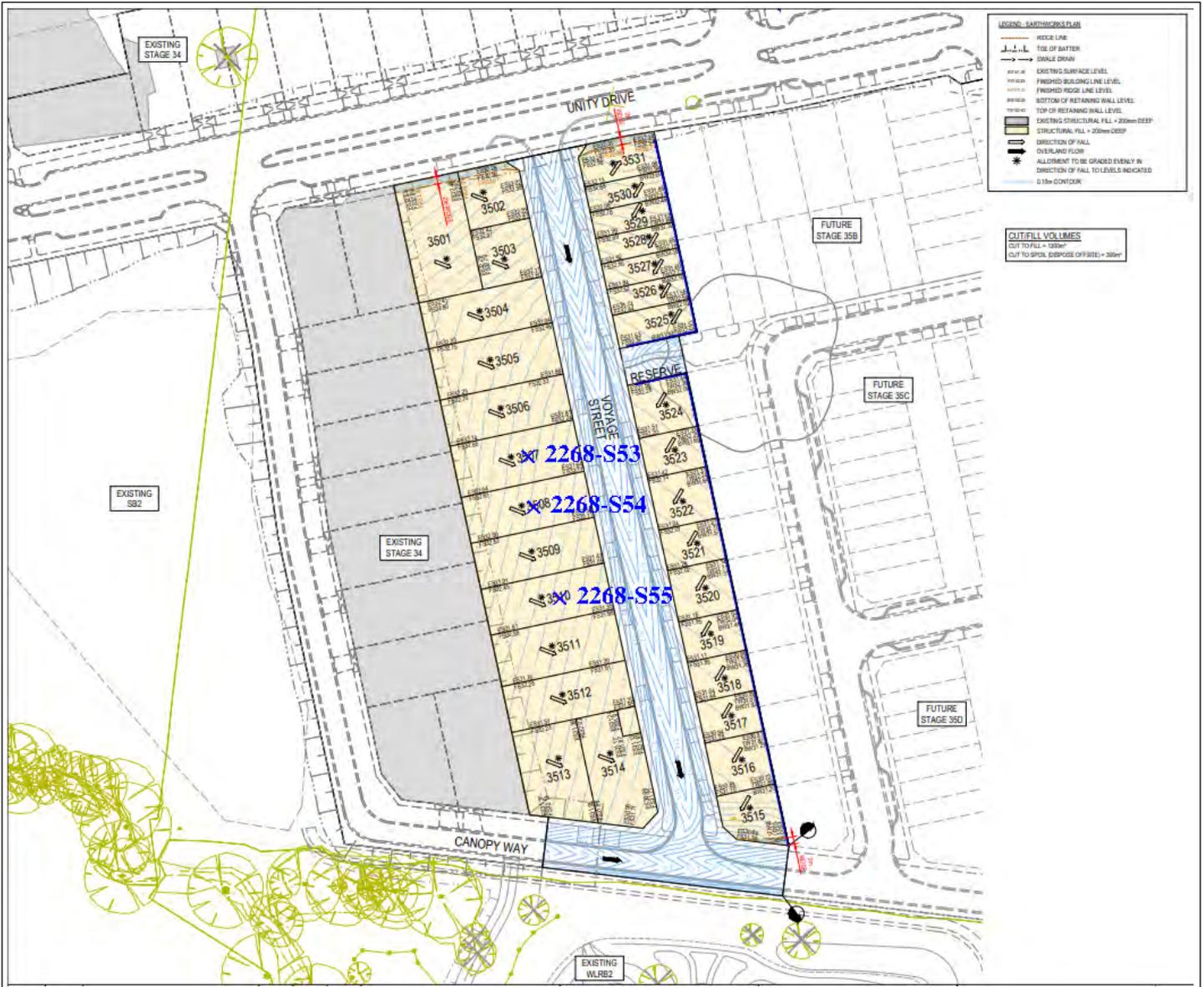
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-16
Issue Number: 1
Date Issued: 06/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21912
Dates Tested: 04/12/2024 - 05/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S56	2268-S57	2268-S58	2268-S59	2268-S60	2268-S61
Date Tested	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024	04/12/2024
Time Tested	10:31	10:41	12:18	12:26	13:50	13:58
Test Request #/Location	Refer to attached plan Lot 3508	Refer to attached plan Lot 3510	Refer to attached plan Lot 3511	Refer to attached plan Lot 3514	Refer to attached plan Lot 3512	Refer to attached plan Lot 3513
Easting	55H 265694	55H 265715	55H 265709	55H 265728	55H 265723	55H 265717
Northing	5765646	5765630	5765594	5765668	5765583	5765557
Layer / Reduced Level	Layer 4	Layer	Layer 1	Layer 1	Layer 2	Layer 2
Thickness of Layer (mm)	250	250	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	0	0	0
Field Wet Density (FWD) t/m ³	2.01	2.02	2.02	2.01	1.95	1.96
Field Moisture Content %	23.5	23.1	24.4	25.0	25.4	27.5
Field Dry Density (FDD) t/m ³	1.63	1.65	1.62	1.61	1.56	1.53
Peak Converted Wet Density t/m ³	1.98	2.00	1.94	1.98	1.99	1.95
Adjusted Peak Converted Wet Density t/m ³	**	**	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.1	22.6	23.4	24.1	23.9	26.6
Adj. Field Moisture Content % (AS1289.5.4.1)	23.5	23.1	24.4	25.0	25.4	27.5
Moisture Ratio % (AS1289.5.4.1)	102.0	102.0	104.0	103.5	106.5	103.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**	**	**
Moisture Variation (Wv) %	-0.5	-0.5	-1.0	-1.0	-1.5	-1.0
Adjusted Moisture Variation %	**	**	**	**	**	**
Hilf Density Ratio (%)	101.5	101.5	104.0	102.0	98.0	100.5
Compaction Method	Standard	Standard	Standard	Standard	Standard	Standard
Remarks	**	**	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

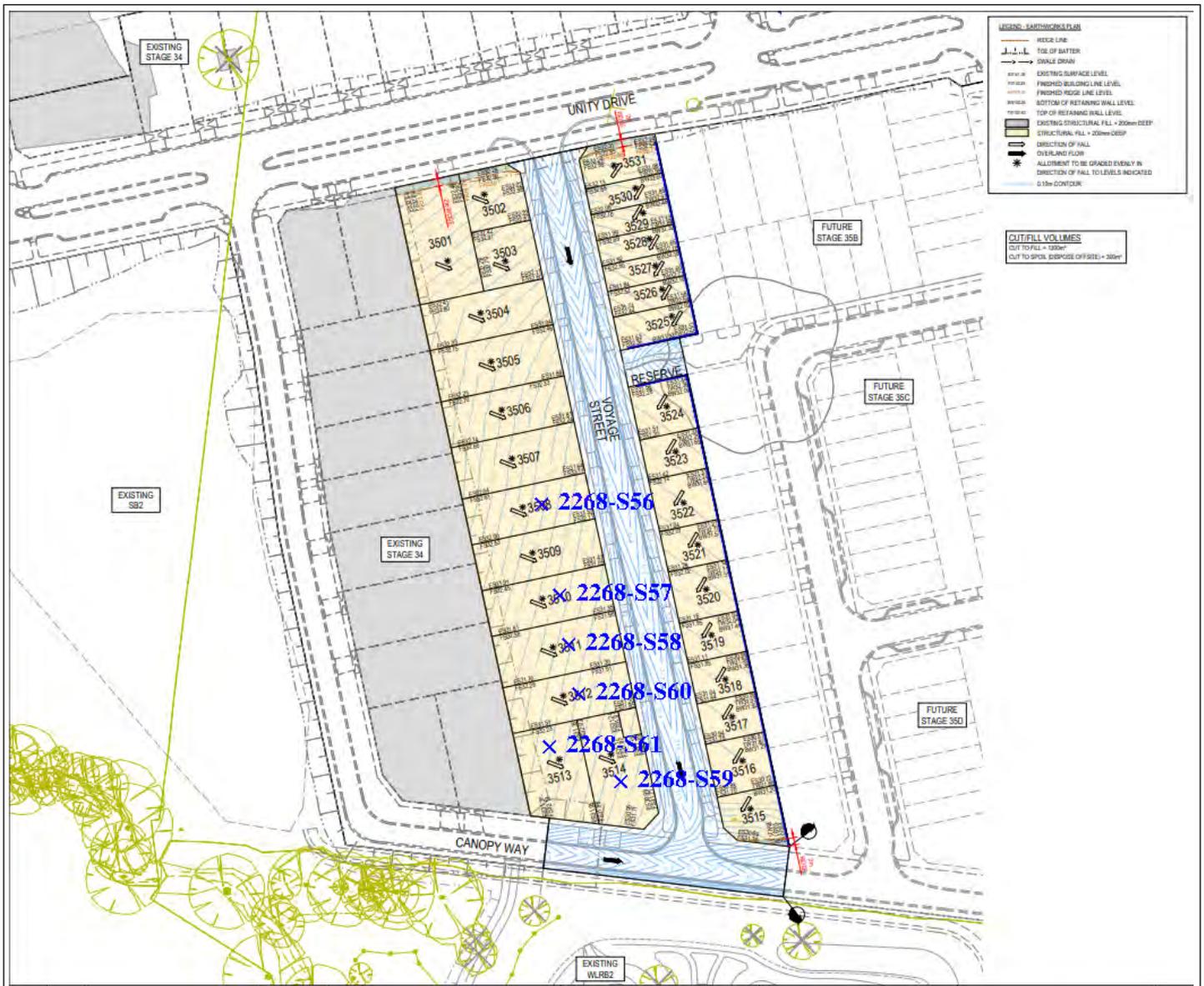
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-17
Issue Number: 1
Date Issued: 09/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21926
Date Sampled: 05/12/2024
Dates Tested: 05/12/2024 - 06/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

Ground Science South West Pty Ltd
 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S62	2268-S63	2268-S64	2268-S65
Date Tested	05/12/2024	05/12/2024	05/12/2024	05/12/2024
Time Tested	10:40	10:53	12:54	13:54
Test Request #/Location	Refer to attached plan Lot 3511	Refer to attached plan Lot 3513	Refer to attached plan Lot 3512	Refer to attached plan Lot 3514
Easting	55H 265711	55H 265719	55H 265713	55H 265730
Northing	5765591	5765558	5765579	5765668
Layer / Reduced Level	Layer 3	Layer 3	Layer 4	Layer 4
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0	2
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0	2
Field Wet Density (FWD) t/m ³	2.02	2.02	2.04	2.02
Field Moisture Content %	21.0	23.0	21.3	21.9
Field Dry Density (FDD) t/m ³	1.67	1.64	1.68	1.67
Peak Converted Wet Density t/m ³	2.01	2.03	2.03	**
Adjusted Peak Converted Wet Density t/m ³	**	**	**	2.06
Adj. Optimum Moisture Content % (AS1289.5.4.1)	21.3	21.4	21.5	20.9
Adj. Field Moisture Content % (AS1289.5.4.1)	21.0	23.0	21.3	21.4
Moisture Ratio % (AS1289.5.4.1)	98.5	107.5	99.0	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	102.5
Moisture Variation (Wv) %	0.5	-1.5	0.0	**
Adjusted Moisture Variation %	**	**	**	-0.5
Hilf Density Ratio (%)	100.5	99.5	100.5	98.5
Compaction Method	Standard	Standard	Standard	Standard
Remarks	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

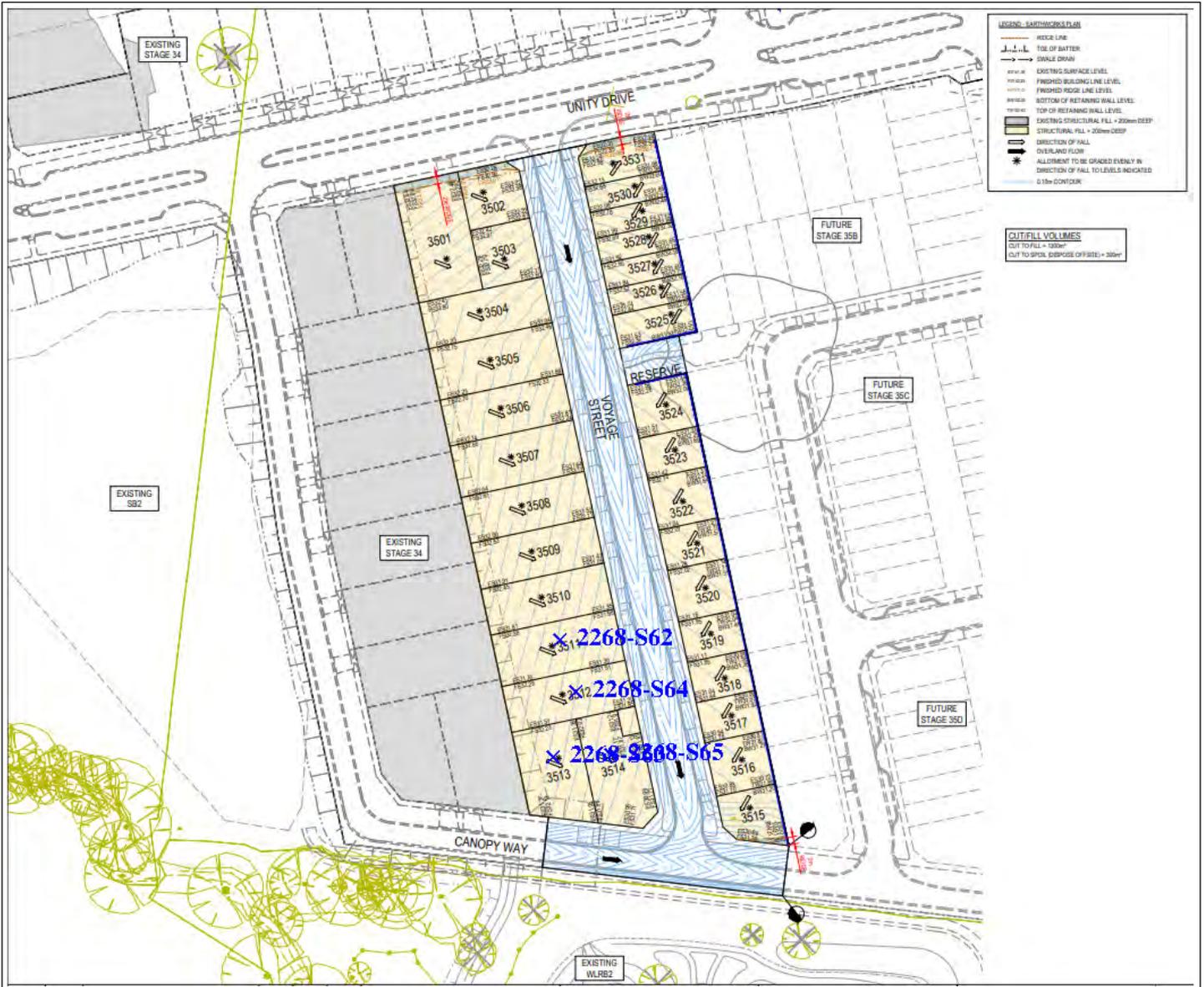
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-18
Issue Number: 1
Date Issued: 10/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21946
Date Sampled: 06/12/2024
Dates Tested: 06/12/2024 - 09/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

Ground Science South West Pty Ltd
 8 Freedman Street North Geelong Vic 3215

Phone: (03) 5282 1566

Email: chrism@groundsciencesw.com.au

Accredited for compliance with ISO/IEC 17025 - Testing



B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S66	2268-S67	2268-S68
Date Tested	06/12/2024	06/12/2024	06/12/2024
Time Tested	11:16	11:26	12:52
Test Request #/Location	Refer to attached plan Lot 3511	Refer to attached plan Lot 3512	Refer to attached plan Lot 3514
Easting	55H 265718	55H 265717	55H 265730
Northing	5765597	5765579	5765572
Layer / Reduced Level	Layer 5	Layer 5	Layer 5
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	1
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	1
Field Wet Density (FWD) t/m ³	2.04	2.02	2.04
Field Moisture Content %	24.1	25.7	22.9
Field Dry Density (FDD) t/m ³	1.64	1.61	1.66
Peak Converted Wet Density t/m ³	1.95	1.91	**
Adjusted Peak Converted Wet Density t/m ³	**	**	2.02
Adj. Optimum Moisture Content % (AS1289.5.4.1)	24.7	26.8	22.6
Adj. Field Moisture Content % (AS1289.5.4.1)	24.1	25.7	22.7
Moisture Ratio % (AS1289.5.4.1)	97.5	96.0	**
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	100.5
Moisture Variation (Wv) %	0.5	1.0	**
Adjusted Moisture Variation %	**	**	0.0
Hilf Density Ratio (%)	104.5	105.5	100.5
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

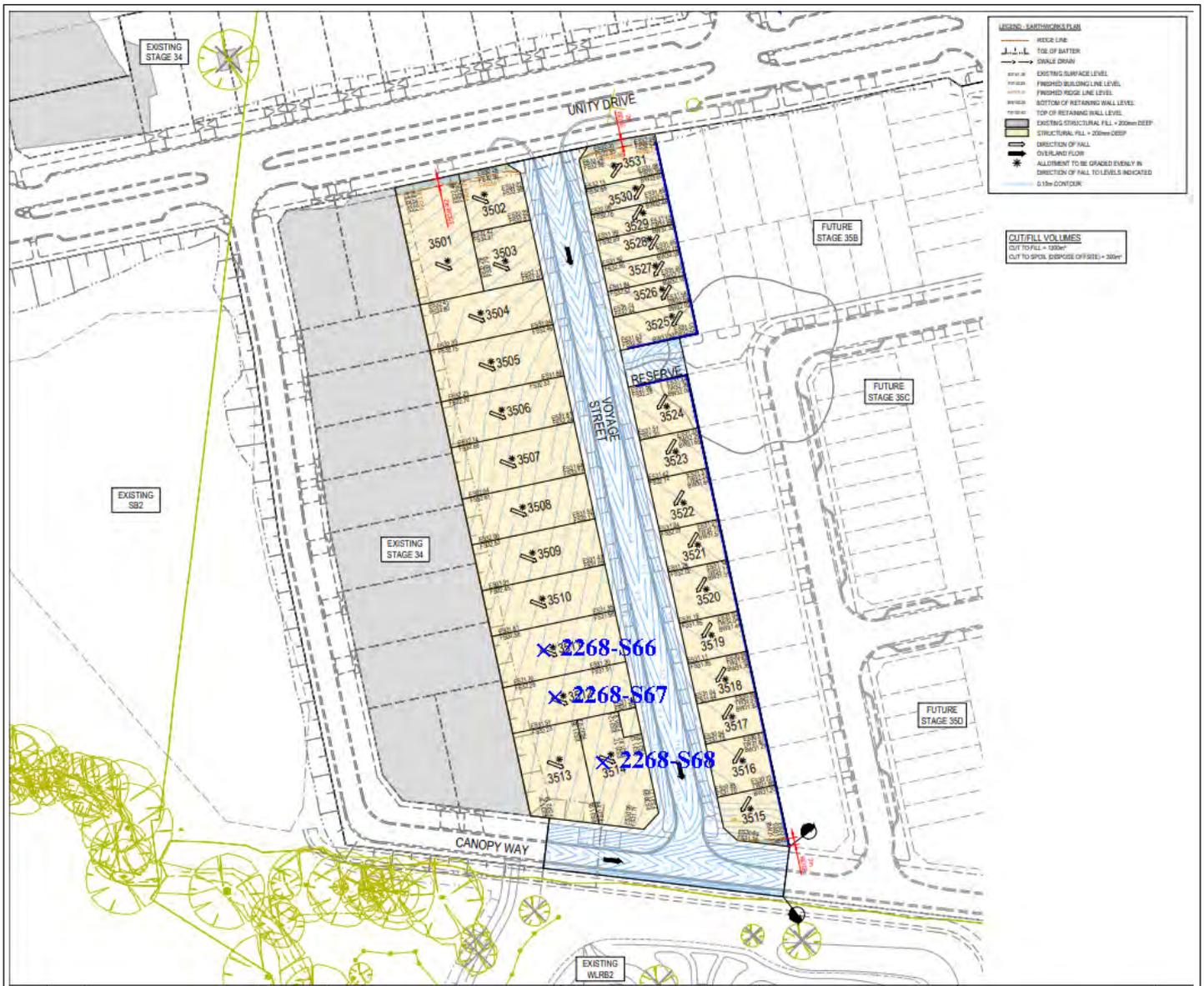
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-19
Issue Number: 1
Date Issued: 11/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21955
Date Sampled: 09/12/2024
Dates Tested: 09/12/2024 - 10/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1				
Sample Number	2268-S69	2268-S70	2268-S71	2268-S72
Date Tested	09/12/2024	09/12/2024	09/12/2024	09/12/2024
Time Tested	14:11	14:29	14:26	15:38
Test Request #/Location	Refer to attached plan Lot 3511	Refer to attached plan Lot 3512	Refer to attached plan Lot 3514	Refer to attached plan Voyage Street in front of lot 3512
Easting	55H 265713	55H 265714	55H 265735	55H 265746
Northing	5765590	5765568	5765563	5765586
Layer / Reduced Level	Layer 5	Layer 5	Layer 5	Layer 1
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	1	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	1	0	0
Field Wet Density (FWD) t/m ³	2.02	1.98	2.00	1.97
Field Moisture Content %	22.1	23.5	21.9	25.4
Field Dry Density (FDD) t/m ³	1.66	1.60	1.64	1.57
Peak Converted Wet Density t/m ³	2.00	**	2.03	1.98
Adjusted Peak Converted Wet Density t/m ³	**	2.01	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	22.1	22.8	20.4	25.4
Adj. Field Moisture Content % (AS1289.5.4.1)	22.1	23.3	21.9	25.4
Moisture Ratio % (AS1289.5.4.1)	100.0	**	107.0	100.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	102.0	**	**
Moisture Variation (Wv) %	0.0	**	-1.5	0.0
Adjusted Moisture Variation %	**	-0.5	**	**
Hilf Density Ratio (%)	101.0	98.5	98.5	99.5
Compaction Method	Standard	Standard	Standard	Standard
Remarks	**	**	**	**

Moisture Variation Note:

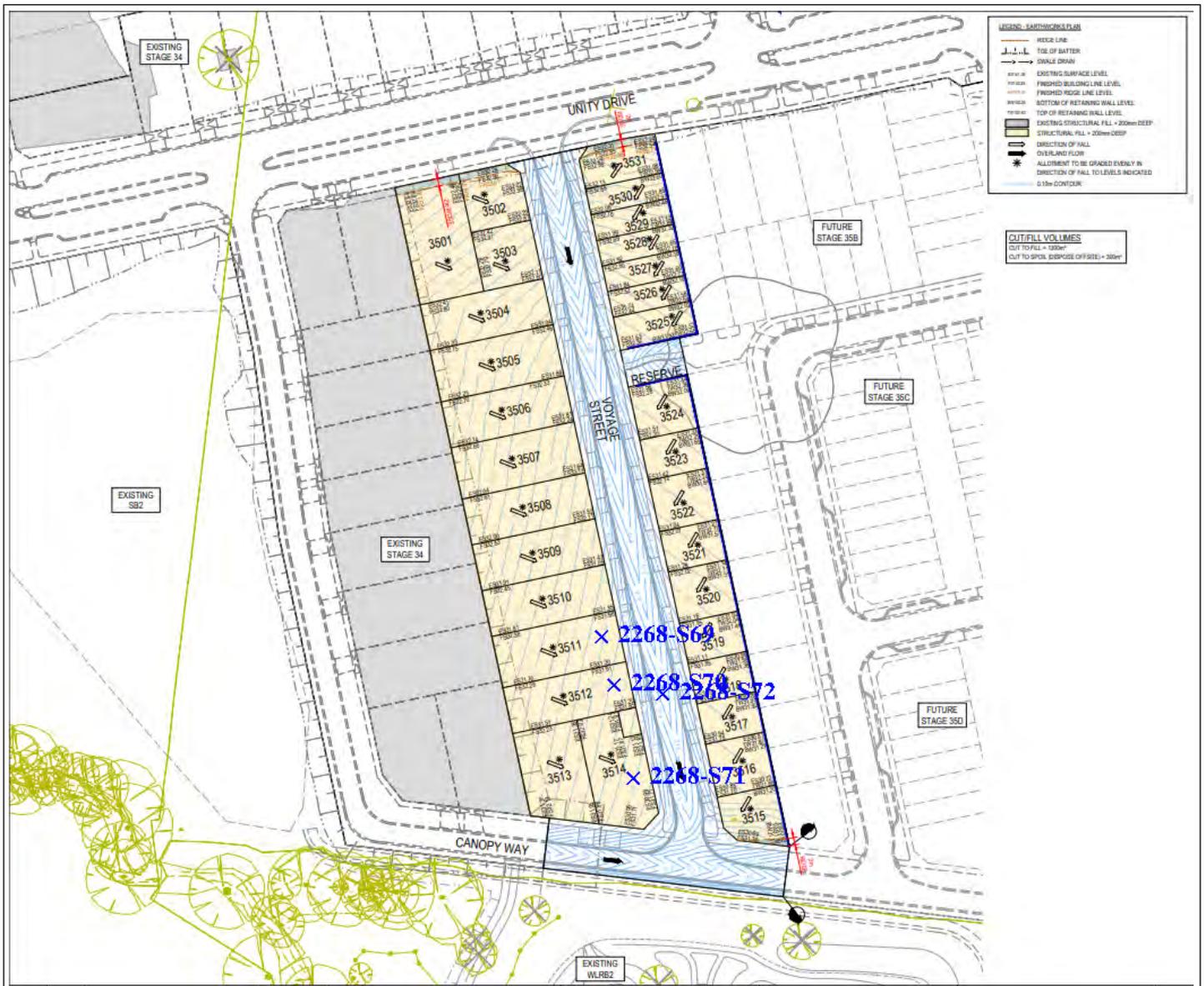
Positive values = test is dry of OMC
 Negative values = test is wet of OMC

Sample Locations Plan

x - approximate test location



Ground Science South West
Geotechnical & Environmental Consultants



Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-20
Issue Number: 1
Date Issued: 12/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21975
Date Sampled: 10/12/2024
Dates Tested: 10/12/2024 - 11/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S73	2268-S74	2268-S75
Date Tested	10/12/2024	10/12/2024	10/12/2024
Time Tested	10:10	10:16	15:26
Test Request #/Location	Refer to attached plan Voyage Street in front of 3519	Refer to attached plan Voyage Street in front of lot 3516	Refer to attached plan Lot 3519
Easting	55H 265740	55H 265749	55H 265763
Northing	5765594	5765571	5765592
Layer / Reduced Level	Layer 2	Layer 2	Layer 1
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	0
Field Wet Density (FWD) t/m ³	1.99	1.99	1.96
Field Moisture Content %	24.6	22.7	21.6
Field Dry Density (FDD) t/m ³	1.60	1.62	1.61
Peak Converted Wet Density t/m ³	1.98	2.06	2.05
Adjusted Peak Converted Wet Density t/m ³	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	22.8	20.4	20.3
Adj. Field Moisture Content % (AS1289.5.4.1)	24.6	22.7	21.6
Moisture Ratio % (AS1289.5.4.1)	108.0	111.5	106.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	-2.0	-2.0	-1.5
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	100.0	97.0	95.5
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

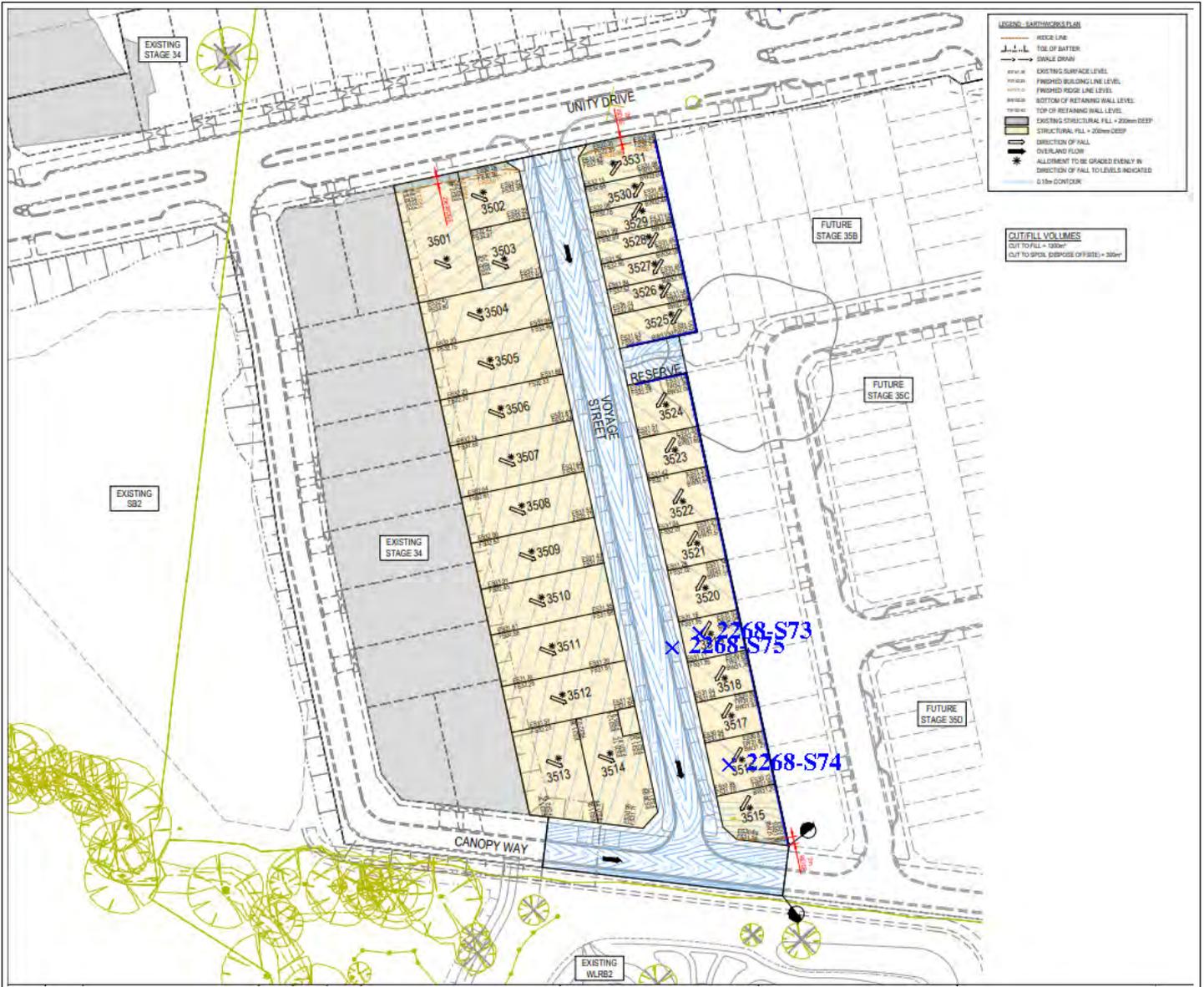
Sample Locations Plan

x - approximate test location



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Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-21
Issue Number: 1
Date Issued: 13/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 21994
Date Sampled: 11/12/2024
Dates Tested: 11/12/2024 - 12/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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B Elliott

Approved Signatory: Brent Elliott
 Laboratory Manager
 NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S76	2268-S77	2268-S78	2268-S79	2268-S80
Date Tested	11/12/2024	11/12/2024	11/12/2024	11/12/2024	11/12/2024
Time Tested	09:16	09:24	12:01	12:15	15:37
Test Request #/Location	Refer to attached plan Lot 3515	Refer to attached plan Lot 3517	Refer to attached plan Lot 3516	Refer to attached plan Lot 3518	Refer to attached plan Lot 3519
Easting	55H 265761	55H 265759	55H 265754	55H 265760	55H 265755
Northing	5765557	5765576	5765566	5765587	5765698
Layer / Reduced Level	Layer 2	Layer 2	Layer 3	Layer 3	Layer 4
Thickness of Layer (mm)	250	250	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	0	1	2	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	0	1	2	0
Field Wet Density (FWD) t/m ³	1.98	2.06	1.99	1.99	1.99
Field Moisture Content %	23.1	22.4	21.8	20.6	22.2
Field Dry Density (FDD) t/m ³	1.61	1.68	1.64	1.66	1.63
Peak Converted Wet Density t/m ³	1.99	2.00	**	**	2.02
Adjusted Peak Converted Wet Density t/m ³	**	**	2.01	1.95	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	22.8	22.4	21.4	22.2	21.2
Adj. Field Moisture Content % (AS1289.5.4.1)	23.1	22.4	21.6	20.1	22.2
Moisture Ratio % (AS1289.5.4.1)	101.0	100.0	**	**	104.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	101.5	90.5	**
Moisture Variation (Wv) %	0.0	0.0	**	**	-1.0
Adjusted Moisture Variation %	**	**	-0.5	2.0	**
Hilf Density Ratio (%)	100.0	103.0	99.0	102.0	98.5
Compaction Method	Standard	Standard	Standard	Standard	Standard
Remarks	**	**	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC
 Negative values = test is wet of OMC

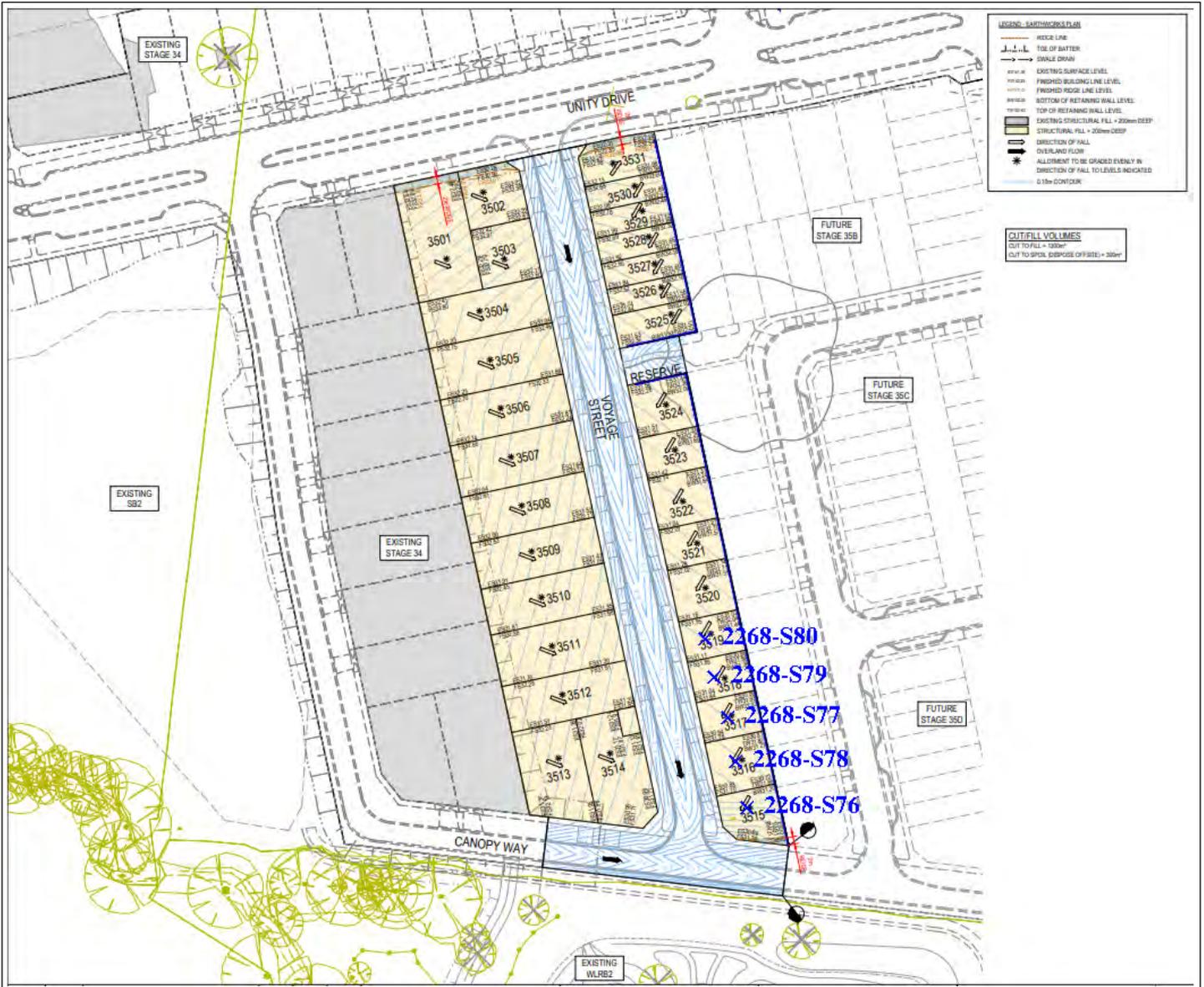
Sample Locations Plan

x - approximate test location



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LEGEND - EARTHWORKS PLAN

- RIDGE LINE
- TOP OF BATTER
- J.J.L. SHALL DRAIN
- EXISTING SURFACE LEVEL
- FINISHED BUILDING LINE LEVEL
- FINISHED RIDGE LINE LEVEL
- BOTTOM OF RETAINING WALL LEVEL
- TOP OF RETAINING WALL LEVEL
- EXISTING STRUCTURAL FILL - 200mm DEEP
- STRUCTURAL FILL - 200mm DEEP
- DIRECTION OF FILL
- DRAINAGE FLOW
- ALLOWMENT TO BE GRADED EVENLY IN DIRECTION OF FILL TO LEVELS INDICATED
- 0.1% CONTOUR

OUTFILL VOLUMES

- CUT TO FILL - 300m³
- CUT TO SPILL, DEPOSE OFF SITE - 300m³

Material Test Report



Ground Science South West

Geotechnical & Environmental Consultants

Report Number: GSSW2268-22
Issue Number: 1
Date Issued: 16/12/2024
Client: CREO CONSULTANTS PTY LTD
 Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GSSW2268
Project Name: ARMSTRONG ESTATE STAGE 35A
Project Location: MOUNT DUNEED
Work Request: 22003
Date Sampled: 12/12/2024
Dates Tested: 12/12/2024 - 13/12/2024
Sampling Method: AS 1289.1.2.1 6.4 (b) - Sampling from layers in earthworks or pavement - compacted
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Material: sandy CLAY, trace gravel, dark brown, high plasticity
Material Source: Reclaimed fill

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B Elliott

Approved Signatory: Brent Elliott

Laboratory Manager

NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1

Sample Number	2268-S81	2268-S82	2268-S83
Date Tested	12/12/2024	12/12/2024	12/12/2024
Time Tested	12:07	12:16	12:23
Test Request #/Location	Refer to attached plan Lot 3518	Refer to attached plan Lot 3517	Refer to attached plan Lot 3516
Easting	55H 265746	55H 265754	55H 265757
Northing	5765601	5765576	5765557
Layer / Reduced Level	Layer 5	Layer 5	Layer 5
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity	sandy CLAY, trace gravel, dark brown, high plasticity
Test Depth (mm)	225	225	225
Sieve used to determine oversize (mm)	19.0	19.0	19.0
Percentage of Wet Oversize (%)	0	1	0
Percentage of Dry Oversize (%) (AS1289.5.4.1)	0	1	0
Field Wet Density (FWD) t/m ³	2.00	1.97	1.98
Field Moisture Content %	21.5	21.0	21.0
Field Dry Density (FDD) t/m ³	1.64	1.63	1.64
Peak Converted Wet Density t/m ³	2.01	**	2.01
Adjusted Peak Converted Wet Density t/m ³	**	2.00	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	20.8	20.5	20.6
Adj. Field Moisture Content % (AS1289.5.4.1)	21.5	20.8	21.0
Moisture Ratio % (AS1289.5.4.1)	103.5	**	102.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	101.5	**
Moisture Variation (Wv) %	-0.5	**	-0.5
Adjusted Moisture Variation %	**	-0.5	**
Hilf Density Ratio (%)	99.0	98.5	99.0
Compaction Method	Standard	Standard	Standard
Remarks	**	**	**

Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

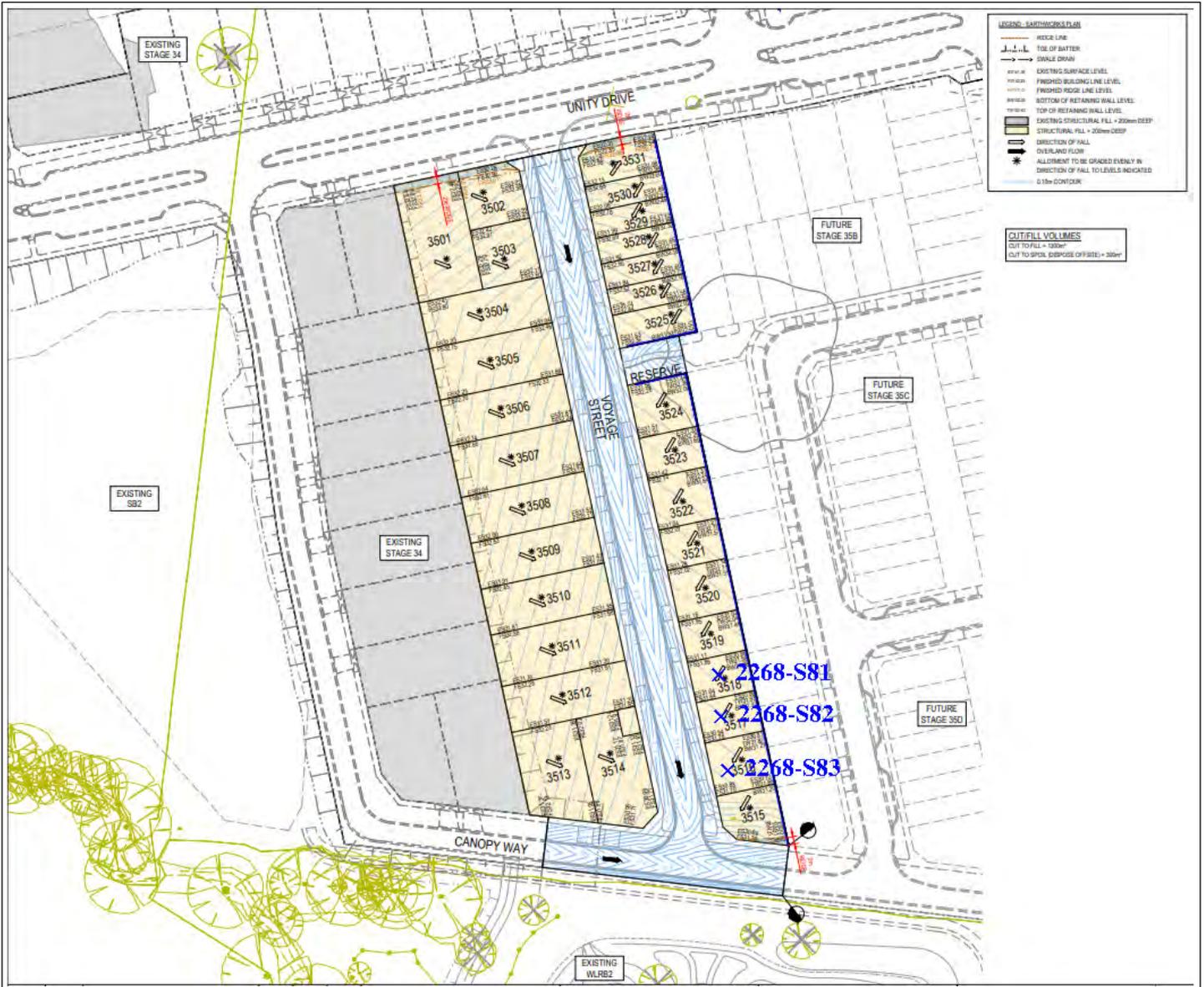
Sample Locations Plan

x - approximate test location



Ground Science South West

Geotechnical & Environmental Consultants



APPENDIX D

Site Photographs

