C&T GEOTECHNICAL

ABN 51 612 825 313

Level 1 Inspection & Testing

Armstrong Estate Stage 35D, Mount Duneed

Creo Civil Consultants Pty Ltd

28 August 2025

CTGSW Ref: GEO23-6_V1

GEOTECHNICAL

ABN 51 612 825 313

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Level 1 Inspection & Testing Report

Armstrong Estate Stage 35D, Mount Duneed, Victoria

C&T Geotechnical South West has prepared this report to present the results of Level 1 Inspection & Testing completed for the project located at Armstrong Estate Stage 35D, in Mount Duneed.

Distribution

Original held by	C&T Geotechnical South West
1 electronic copy	C&T Consulting Engineers
1 electronic copy	Creo Civil Consultants Pty Ltd

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.

For an on behalf of C&T Geotechnical South West

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1. INTRODUCTION

This report presents the results of the inspection activities, compaction control and laboratory testing services performed by C&T Geotechnical South West for the Armstrong Estate Stage 35D 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 for Armstrong Estate Stage 35D. C&T Geotechnical South West was engaged to provide Level 1 Inspection and Testing services for the construction of these areas. Authorisation to proceed was provided by Creo Civil 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'.

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

3. SCOPE OF WORK

3.1 AREAS OF WORK

This report presents Level 1 Inspection and Testing completed on the residential allotments. C&T Geotechnical South West provided Level 1 Inspection and Testing services for the construction of fill in areas requiring greater than 200 mm of fill to achieve finished surface levels. The areas requiring Level 1 Inspection & Testing are shown on the supplied construction drawing, on Figure 1 (Appendix A), prepared by Creo Civil Consultants Pty Ltd (Armstrong Estate Stage 35D – Functional Layout Plan [180016.35D – F100 Rev A]).

C&T Geotechnical South West previously witnessed stormwater drain backfilling earthworks that took place inside the residential lots, and these works are detailed in the Level 1 Inspection and Testing report "Armstrong Estate Trench Backfill" (ref: GSSW2268-28 dated 3/07/2025).

This report details the Level 1 earthworks process performed on site which commenced on 18 July 2025 and was completed on 24 July 2025, requiring 5 full days 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:

1. all existing loose surficial fill, topsoil, soft material, vegetation and materials containing significant organic matter were removed to expose the natural soil subgrade
2. suitable fill material, sourced by the contractor and approved by C&T Geotechnical South West, was placed in loose horizontal layers not exceeding 300 mm in thickness
3. 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)

4. the fill was moisture conditioned to within +/- 3 % of the standard optimum moisture content
5. the fill material was sorted and mixed to eliminate particles greater than 20 % by volume, particles coarser than 37.5 mm and no particle over 200 mm in any dimension
6. 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 200 mm per 2500 m^2
    - 1 test per 500 m^3 distributed reasonably evenly throughout the full depth and area; or
    - 3 tests per site visit; whichever requires the most tests.

4. INSPECTION & TESTING

4.1 SUBGRADE PREPARATION

Site stripping began on 18 July 2025 with the earthworks contractors removing all organics, topsoil, compressible (soft) soils, as witnessed by the representative geotechnician from C&T Geotechnical South West. Site stripping was carried out progressively throughout the works and commenced from lot 3591 to lot 35102.

Inspection of the prepared subgrade surface on the above lots was carried out on 18 July 2025 by the representative geotechnician from C&T Geotechnical South West. A proof roll using a moxy truck loaded to a weight of 40 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 C&T Geotechnical 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 sourced from cut areas onsite. The material was carted across site using moxy trucks and stockpiled adjacent to the fill zones. C&T Geotechnical South West 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), with sand, trace gravel, medium plasticity, sand 16 % fine to coarse grained, gravel 13 % fine to coarse. Quality assurance tests were performed on the stockpiled fill material before placement. These tests include Particle Size Distribution (AS 1289 3.6.1) and Atterberg Limits (AS 1289 3.1.2, 3.2.1, 3.3.1 & 3.4.1) tests. The test report sheets are presented in Appendix A. C&T Geotechnical South West did not perform any chemical or environmental analysis on the above fill material.

The fill source was assessed to range from dry to close of the optimum moisture content. Portions of the fill material that were found to be dry were moisture conditioned using a water cart prior to compaction. 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;

1. excavator
2. water cart
3. padfoot compactor
4. moxy truck.

During fill placement, the weather conditions ranged from sunny to cloudy with temperatures typically ranging from 3 to 16 degrees Celsius.

The filling process was generally consistent throughout the project. The approved fill was carted across site in moxy trucks and was stockpiled adjacent to the fill placement zones. The material was spread using an excavator 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 compactor applying a minimum of 5 - 8 passes, per layer observed. The thin layers of fill were compacted to form a composite layer, measuring no greater than 250 mm thick, prior to undertaking the field density testing. This process was adopted for the fill placement works.

4.4 RESULTS OF COMPACTION CONTROL TESTING

Level 1 Inspection & Testing was undertaken by experienced technicians from C&T Geotechnical South West who attended the site for the duration of the bulk earthworks and nominated the location of the in-situ density tests. Testing comprised a total of 18 in-situ density tests using a nuclear moisture-density gauge in accordance with Australian Standard (AS 1289 5.8.1) together with 18 “Rapid HILF” compaction tests (AS 1289 5.7.1).

A summary of the field density and compaction control testing is presented in Appendix A. Field density and compaction control testing report sheets are presented in Appendix B. It should be noted that the tests are a representation of the fill placed and support the visual assessment of the works completed. All test areas achieved the required compaction and moisture condition.

4.5 FINAL SURFACE LEVELS

Observations were made by a C&T Geotechnical South West 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. should be obtained from the contractor's survey data.

5. COMPLIANCE

C&T Geotechnical South West field staff have undertaken Level 1 Inspection and Testing services of the construction of the controlled fill in the areas designated on Figure 1. Geotechnical South West 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 C&T Geotechnical South West 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 & 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. C&T Geotechnical South West (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.

7. STATEMENT OF LIMITATIONS

This report has been prepared by C&T Geotechnical South West exclusively for the commissioning client and the project described. The scope of work was limited to the services outlined herein and does not include investigation of all possible site conditions or risks.

Findings, opinions, and recommendations are based on conditions observed during limited sampling, testing, and fieldwork at the time of investigation. Subsurface conditions may vary across the site, and changes can occur after the investigation. No warranty is given that conditions described are representative of the entire site or future conditions.

If site conditions encountered during works differ from those described, C&T Geotechnical South West must be contacted promptly for reassessment and advice. Reliance on this report without such consultation is at the user's risk.

Where information has been provided by the client or third parties, it is assumed to be correct unless otherwise stated. C&T Geotechnical South West accepts no liability for errors, omissions, or misinterpretations arising from such information.

The advice in this report is based on information available at the time of preparation. C&T Geotechnical South West has no ongoing obligation to update or revise this document unless separately engaged.

Plans, diagrams, and sketches included are for illustrative purposes only and should not be used for construction or detailed design without independent verification.

This report is intended for the commissioning client's use for the stated project only. No responsibility is accepted for use by other parties or for other purposes. This report must not be altered or reproduced **except** in full without written approval.

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

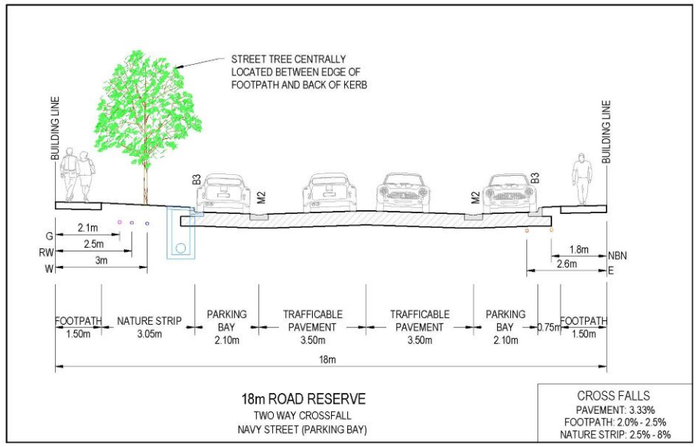
Armstrong Estate Stage 35D – Earthworks Plan [180016.35D – F100 Rev A]

NON STANDARD VEHICLE CROSSING SCHEDULE		
LOT NO.	VEHICLE CROSSING WIDTH(m)	OFFSET FROM NEAREST SIDE BOUNDARY (m) + DIRECTION
35103	3.7	0.8 EAST

SERVICES OFFSET SCHEDULE

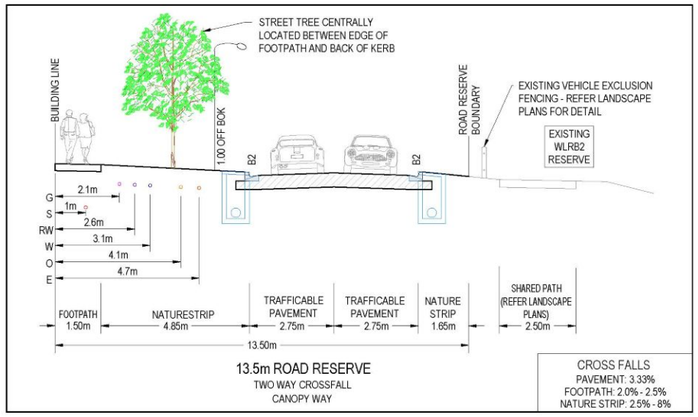
ROAD NAME	GAS		RECYCLED WATER		POTABLE WATER		OPTIC FIBRE		ELECTRICITY		PUBLIC LIGHTING	
	SIDE	OFFSET	SIDE	OFFSET	SIDE	OFFSET	SIDE	OFFSET	SIDE	OFFSET	SIDE	OFFSET
CANOPY WAY	N	2.10	N	2.60	N	3.10	N	4.10	N	4.70	N	1.00*
CHAMPION LANE	-	-	-	-	-	-	W	0.80	W	1.40	-	-
NAVY STREET	W	2.10	W	2.50	W	3.00	E	1.80	E	2.60	E	1.00*

1. * DENOTES OFFSET FROM BACK OF KERB.



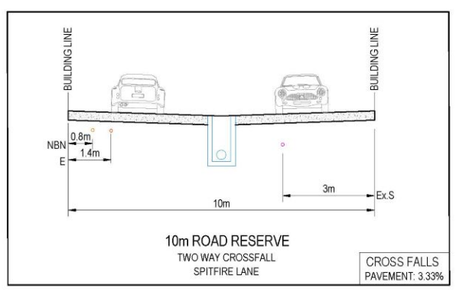
18m ROAD RESERVE
TWO WAY CROSSFALL
NAVY STREET (PARKING BAY)

CROSS FALLS
PAVEMENT: 3.33%
FOOTPATH: 2.0% - 2.5%
NATURE STRIP: 2.5% - 8%



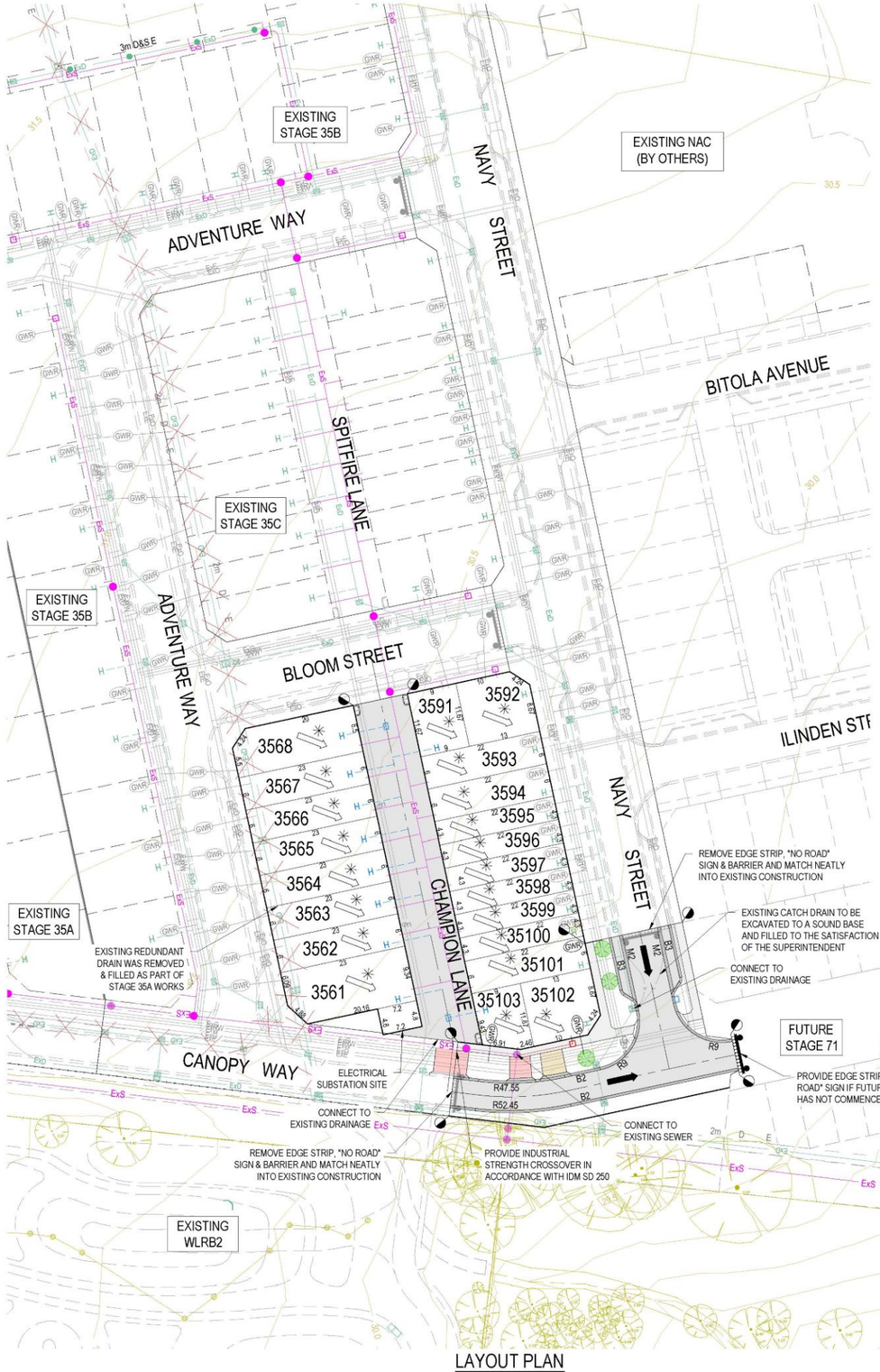
13.5m ROAD RESERVE
TWO WAY CROSSFALL
CANOPY WAY

CROSS FALLS
PAVEMENT: 3.33%
FOOTPATH: 2.0% - 2.5%
NATURE STRIP: 2.5% - 8%



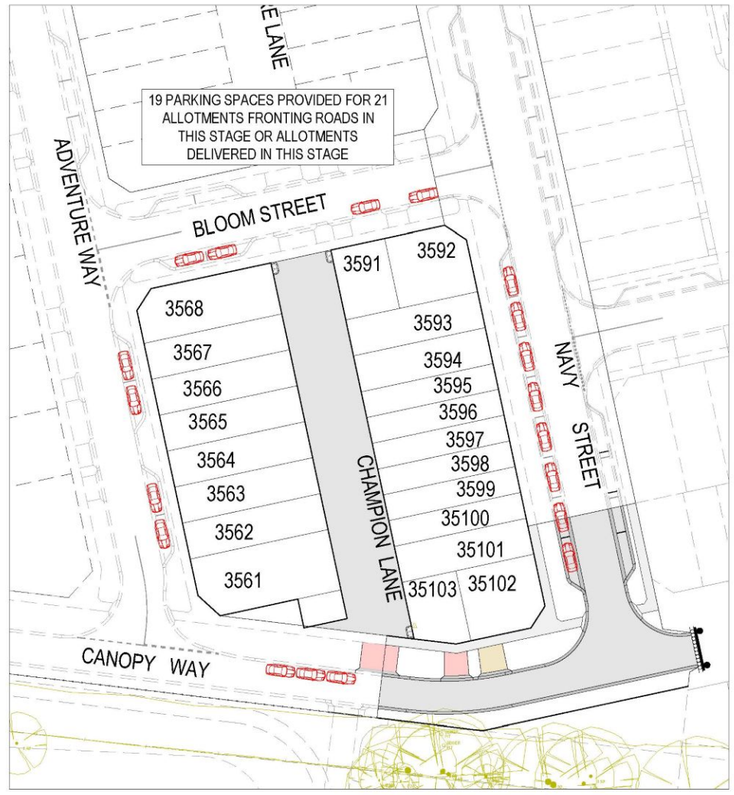
10m ROAD RESERVE
TWO WAY CROSSFALL
SPITFIRE LANE

CROSS FALLS
PAVEMENT: 3.33%



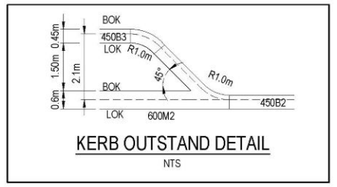
LAYOUT PLAN

CITY OF GREATER GEELONG TO STAMP HERE UPON APPROVAL



PARKING PLAN

LEGEND - FUNCTIONAL LAYOUT PLAN
- STORMWATER DRAIN, PIT & PROPERTY INLET
- EXISTING STORMWATER DRAIN
- SEWER & MAINTENANCE STRUCTURES
- EXISTING SEWER
- HOUSE DRAIN
- TACTILE PAVERS
- SERVICE CONDUITS
- PROPOSED ELECTRICITY (UNDERGROUND)
- PROPOSED GAS
- PROPOSED OPTIC
- PROPOSED WATER
- EXISTING ELECTRICITY (UNDERGROUND0
- EXISTING GAS
- EXISTING OPTIC
- EXISTING WATER
- DIRECTION OF FALL
- OVERLAND FLOW
- ALLOTMENT TO BE GRADED EVENLY IN DIRECTION OF FALL TO LEVELS INDICATED
- CONCRETE EDGE STRIP WITH SUBSOIL DRAIN, "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED
- PROPOSED PAVEMENT, KERB & CHANNEL, FOOTPATH & DRIVEWAY
- PROPOSED PAVEMENT, KERB & CHANNEL, FOOTPATH & NON-STANDARD DRIVEWAY
- 0.25m EXISTING CONTOUR



KERB OUTSTAND DETAIL
NTS

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
DIAL 1100 BEFORE YOU DIG
www.1100.com.au

NOTE: STREET TREE LOCATIONS SHOWN ARE INDICATIVE ONLY. ULTIMATE LOCATION IS TO BE PROVIDED/CONFIRMED BY LANDSCAPE ARCHITECTS

REVISION	DATE	ISSUE DESCRIPTION	DRAWN	CHECKED	APPROVED
A	29/07/24	ISSUED FOR APPROVAL	K.MCKELVIE	M.TROUNCE	M.TROUNCE

CLIENT: villawood properties — Communities Designed for Living

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

PROJECT: ARMSTRONG MT DUNEED

DRAWING TITLE: ARMSTRONG ESTATE - STAGE 35D FUNCTIONAL LAYOUT PLAN

STATUS: **ISSUED FOR APPROVAL** NOT FOR CONSTRUCTION

SCALE @ A1 : 1:500 (0 5 10 20 30)

N

DESIGNED	PROJECT ENGINEER
K.MCKELVIE	M.TROUNCE
DRAWN	PROJECT MANAGER
K.MCKELVIE	M.TROUNCE

PROJECT No.	DRAWING No.	REVISION
180016.35D	F100	A

Appendix A

Quality Assurance Particle Size Distribution & Atterberg Limits Tests Report Sheets

Material Test Report

Report Number: GEO23-1A
Issue Number: 1
Date Issued: 15/08/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Work Request: 24081
Sample Number: 23-S1
Date Sampled: 18/07/2025
Dates Tested: 18/07/2025 - 14/08/2025
Sampling Method: AS 1289.1.2.1 6.2 - Sampling from stockpiles
Sample Location: **Onsite Stockpile**
Material: CI - CLAY, with sand, trace gravel, medium plasticity, sand 16% fine to coarse grained, gravel 13% fine to coarse.
Material Source: Reclaimed fill

C & T Geotechnical (South West)
8 Freedman Street North Geelong Vic 3215
Phone: (03) 5282 1566
Email: Chrism@ctgeotechsw.com.au

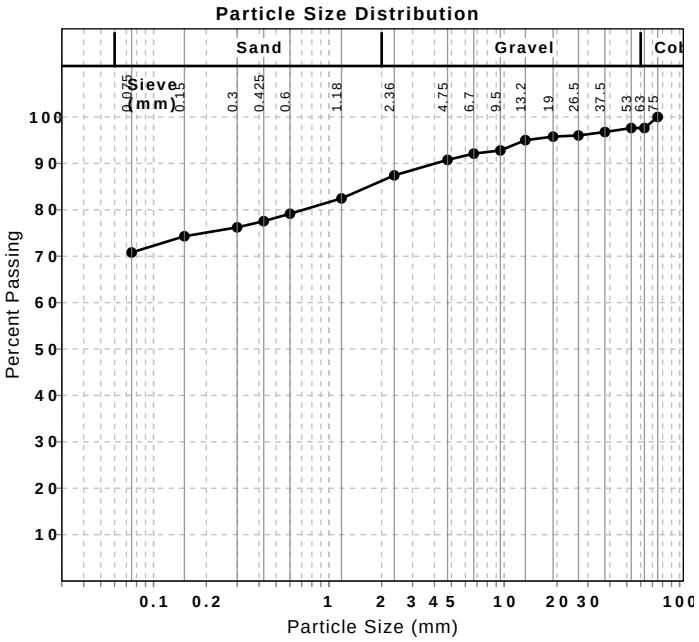
Accredited for compliance with ISO/IEC 17025 - Testing

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	
75 mm	**100**			0		
63 mm	**98**			2		
53 mm	**98**			0		
37.5 mm	**97**			1		
26.5 mm	**96**			1		
19 mm	**96**			0		
13.2 mm	**95**			1		
9.5 mm	**93**			2		
6.7 mm	**92**			1		
4.75 mm	**91**			1		
2.36 mm	**87**			3		
1.18 mm	**82**			5		
0.6 mm	**79**			3		
0.425 mm	**78**			2		
0.3 mm	**76**			1		
0.15 mm	**74**			2		
0.075 mm	**71**			3		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Oven Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	43		
Plastic Limit (%)	16		
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	Cracking & Curling		



Appendix B
Field Density Test Report Summary Sheets

Project Summary Report

Report Date: 07/08/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Specification: 95% Standard Compaction & +/- 3% Moisture Variation
Test Methods: AS 1289 5.7.1 STD & 5.8.1 & 2.1.1 & 5.4.1

C & T Geotechnical (South West)
8 Freedman Street North Geelong Vic 3215
Phone: (03) 5282 1566
Email: Chrism@ctgeotechsw.com.au

Lot #	Sample #	Date Sampled	Location	Easting	Northing	Elevation (m)	Layer	Relative Compaction (%)	Moisture Variation (%)	Moisture Content (%)	Field Wet Density (t/m3)
**	23-S2	18/07/2025	Refer to attached plan Lot 3594	55H 265868	5765621	**	1	103.0	-0.5	23.5	2.04
**	23-S3	18/07/2025	Refer to attached plan Lot 3599	55H 265862	5765617	**	1	100.5	-0.5	23.5	1.96
**	23-S4	18/07/2025	Refer to attached plan Lot 35101	55H 265865	5765630	**	2	103.0	0.5	22.9	2.03
**	23-S5	18/07/2025	Refer to attached plan Lot 3596	55H 265860	5765625	**	2	103.0	0.5	21.8	2.06
**	23-S6	21/07/2025	Refer to attached plan Lot 3593	55H 265838	5765593	**	3	97.0	-1.5	23.0	1.93
**	23-S7	21/07/2025	Refer to attached plan Lot 35102	55H 265864	5765545	**	4	100.0	-1.0	22.3	2.00
**	23-S8	21/07/2025	Refer to attached plan Lot 3598	55H 265858	5765568	**	4	99.5	-0.5	23.0	1.98
**	23-S9	22/07/2025	Refer to attached plan Champion Lane in front of lot 35103	55H 265843	5765538	**	1	99.5	-3.0	24.4	2.00
**	23-S10	22/07/2025	Refer to attached plan Champion Lane in front of lot 3591	55H 265834	5765592	**	2	98.0	-1.5	21.5	2.02
**	23-S11	22/07/2025	Refer to attached plan Champion Lane in front of lot 3594	55H 265834	5765572	**	3	96.5	-2.0	21.8	2.00
**	23-S12	22/07/2025	Refer to attached plan Champion Lane in front of lot 3599	55H 265838	5765558	**	4	96.0	-1.5	20.0	2.00
**	23-S13	23/07/2025	Refer to attached plan Lot 3591 inside the trench	55H 265801	5765586	-2.0m FSL	Base of the trench	98.5	-0.5	23.1	1.96
**	23-S14	23/07/2025	Refer to attached plan Lot 3589 inside in the trench	55H 265866	5765551	-1.6m FSL	Layer 2	103.0	-0.5	28.9	1.94
**	23-S15	23/07/2025	Refer to attached plan Lot 3590 inside the trench	55H 265813	5765577	-1.1m FSL	Layer 4	101.0	0.0	24.2	2.01
**	23-S16	23/07/2025	Refer to attached plan Lot 3584	55H 265825	5765557	**	Layer 1	101.5	-0.5	22.8	2.01
**	23-S17	24/07/2025	Refer to attached plan Lot 3591	55H 265808	5765584	**	2	101.0	-1.0	23.3	2.06
**	23-S18	24/07/2025	Refer to attached plan Lot 3588	55H 265893	5765623	**	3	98.0	-1.0	21.7	2.02
**	23-S19	24/07/2025	Refer to attached plan Lot 3586	55H 265911	5765631	**	4	101.0	2.0	18.7	2.04

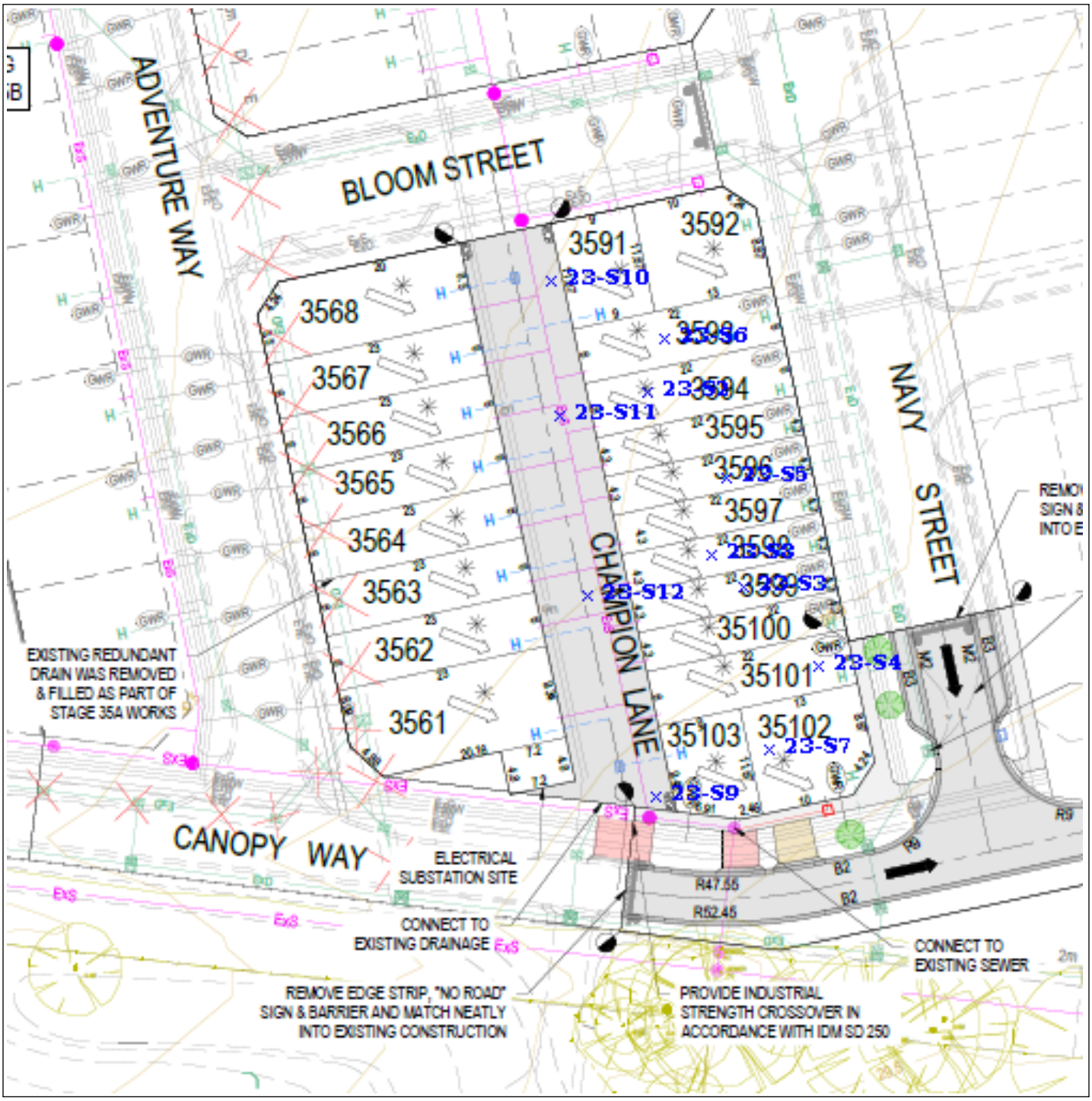
Moisture Variation Note:

Positive values = test is dry of OMC

Negative values = test is wet of OMC

Sample Locations Plan

x - approximate test location



Sample Locations Plan

x - approximate test location

Appendix C
Field Density Test Report Sheets & Test Locations

Material Test Report

Report Number: **GEO23-1**
Issue Number: 1
Date Issued: 21/07/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Work Request: 24081
Dates Tested: 18/07/2025 - 21/07/2025
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
Location: Lot 3592 - 35102
Material: sandy CLAY, trace gravel, high plasticity
Material Source: Reclaimed fill

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8 Freedman Street North Geelong Vic 3215
Phone: (03) 5282 1566
Email: Chrism@ctgeotechsw.com.au

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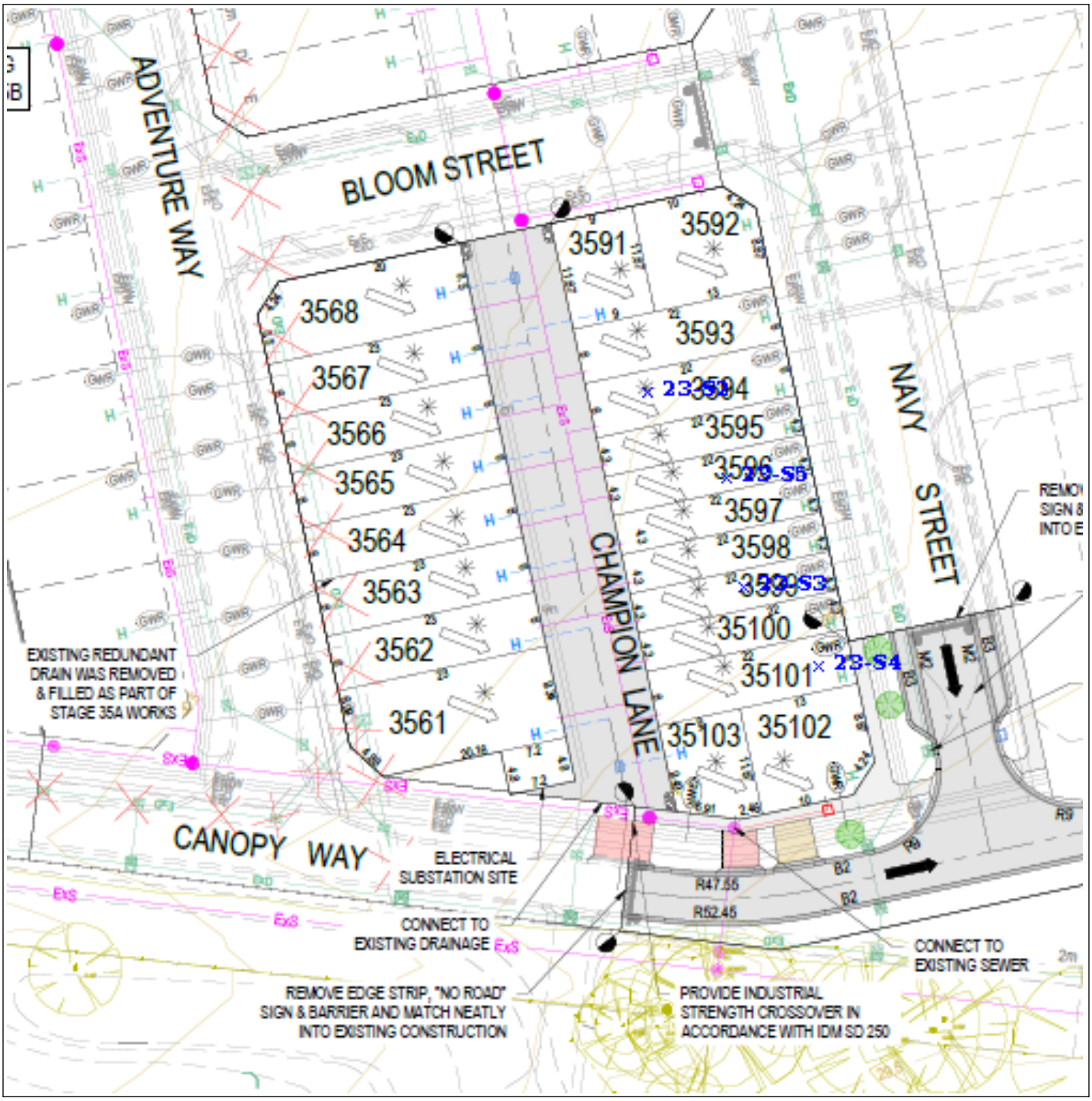
Approved Signatory: Brent Elliott
Laboratory Manager
NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1				
Sample Number	23-S2	23-S3	23-S4	23-S5
Date Tested	18/07/2025	18/07/2025	18/07/2025	18/07/2025
Time Tested	12:05	12:16	14:39	14:52
Test Request #/Location	Refer to attached plan Lot 3594	Refer to attached plan Lot 3599	Refer to attached plan Lot 35101	Refer to attached plan Lot 3596
Easting	55H 265868	55H 265862	55H 265865	55H 265860
Northing	5765621	5765617	5765630	5765625
Layer / Reduced Level	1	1	2	2
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, 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	2.04	1.96	2.03	2.06
Field Moisture Content %	23.5	23.5	22.9	21.8
Field Dry Density (FDD) t/m^3	1.65	1.59	1.65	1.69
Peak Converted Wet Density t/m^3	1.98	1.95	1.97	1.99
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	23.0	23.1	23.4	22.4
Adj. Field Moisture Content % (AS1289.5.4.1)	23.5	23.5	22.9	21.8
Moisture Ratio % (AS1289.5.4.1)	102.0	101.5	98.0	97.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**
Moisture Variation (Wv) %	-0.5	-0.5	0.5	0.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	**103.0**	**100.5**	**103.0**	**103.0**
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



Material Test Report

Report Number: **GEO23-2**
Issue Number: 1
Date Issued: 23/07/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Work Request: 24094
Dates Tested: 21/07/2025 - 22/07/2025
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
Location: Lot 3591 to 35103
Material: sandy CLAY, trace gravel, high plasticity
Material Source: Reclaimed fill

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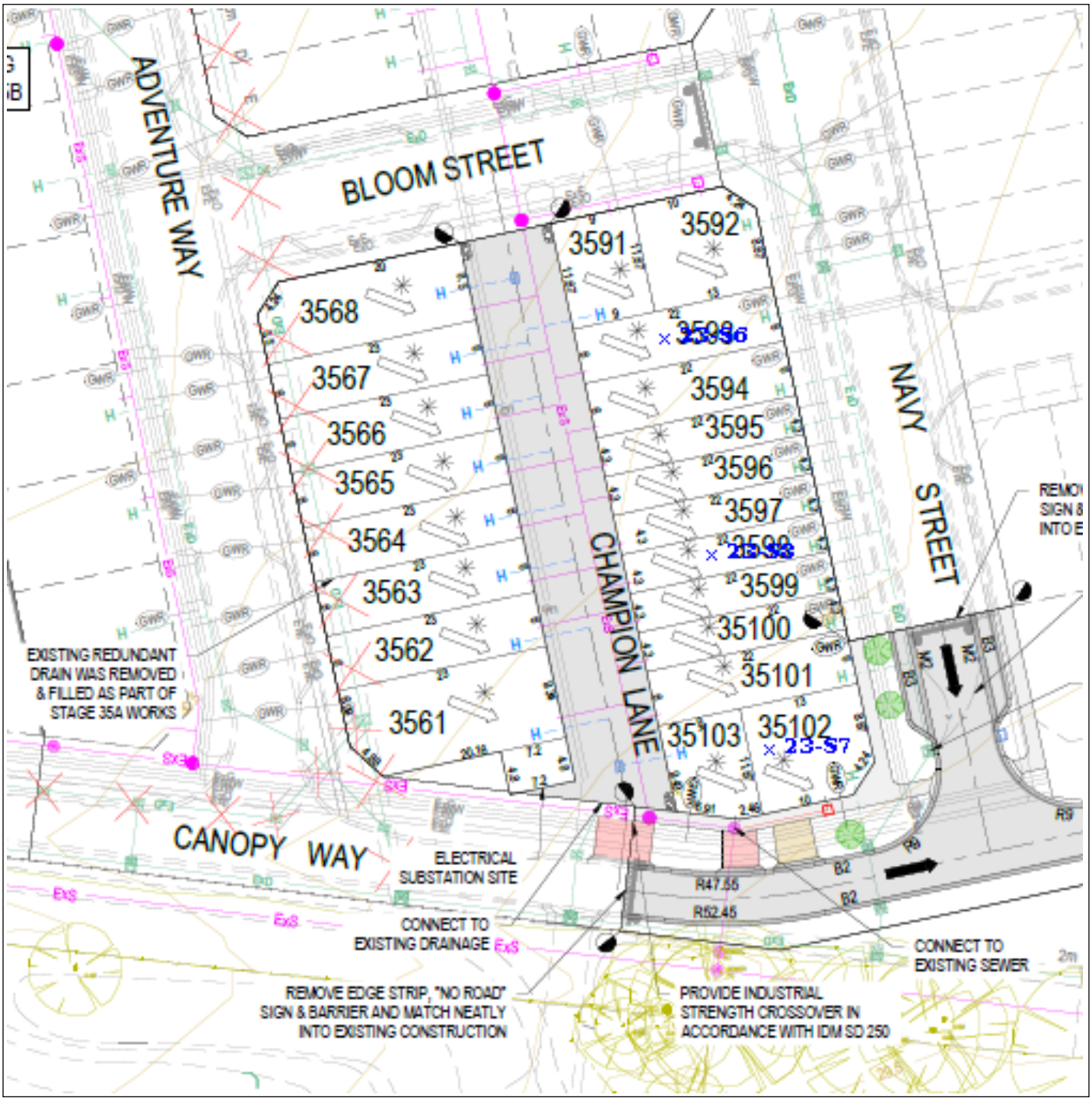
Approved Signatory: Brent Elliott
Laboratory Manager
NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	23-S6	23-S7	23-S8
Date Tested	21/07/2025	21/07/2025	21/07/2025
Time Tested	09:55	13:10	14:52
Test Request #/Location	Refer to attached plan Lot 3593	Refer to attached plan Lot 35102	Refer to attached plan Lot 3598
Easting	55H 265838	55H 265864	55H 265858
Northing	5765593	5765545	5765568
Layer / Reduced Level	3	4	4
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, 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	1.93	2.00	1.98
Field Moisture Content %	23.0	22.3	23.0
Field Dry Density (FDD) t/m^3	1.58	1.64	1.61
Peak Converted Wet Density t/m^3	**	2.00	2.00
Adjusted Peak Converted Wet Density t/m^3	1.99	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	20.8	21.5	22.4
Adj. Field Moisture Content % (AS1289.5.4.1)	22.5	22.3	23.0
Moisture Ratio % (AS1289.5.4.1)	**	103.5	102.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	108.0	**	**
Moisture Variation (Wv) %	**	-1.0	-0.5
Adjusted Moisture Variation %	-1.5	**	**
Hilf Density Ratio (%)	**97.0**	**100.0**	**99.5**
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



Material Test Report

Report Number: GEO23-3
Issue Number: 1
Date Issued: 24/07/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Work Request: 24107
Date Sampled: 22/07/2025
Dates Tested: 22/07/2025 - 23/07/2025
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
Location: Champion Lane
Material: sandy CLAY, trace gravel, high plasticity
Material Source: Reclaimed fill

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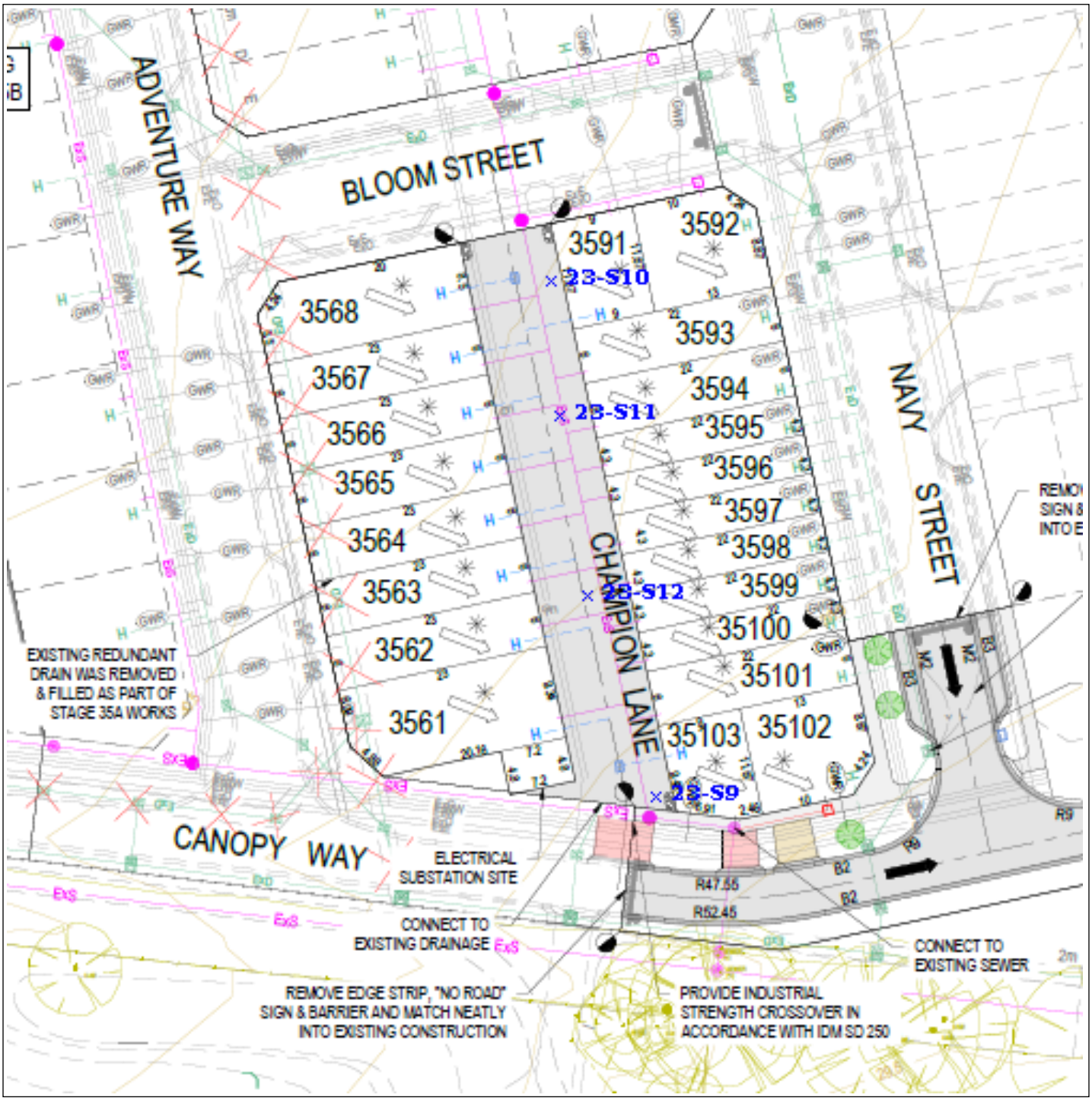
Approved Signatory: Brent Elliott
Laboratory Manager
NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1				
Sample Number	23-S9	23-S10	23-S11	23-S12
Date Tested	22/07/2025	22/07/2025	22/07/2025	22/07/2025
Time Tested	08:10	09:46	11:37	14:38
Test Request #/Location	Refer to attached plan Champion Lane in front of lot 35103	Refer to attached plan Champion Lane in front of lot 3591	Refer to attached plan Champion Lane in front of lot 3594	Refer to attached plan Champion Lane in front of lot 3599
Easting	55H 265843	55H 265834	55H 265834	55H 265838
Northing	5765538	5765592	5765572	5765558
Layer / Reduced Level	1	2	3	4
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, 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	2.00	2.02	2.00	2.00
Field Moisture Content %	24.4	21.5	21.8	20.0
Field Dry Density (FDD) t/m^3	1.60	1.66	1.64	1.67
Peak Converted Wet Density t/m^3	2.01	2.06	2.07	2.09
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	21.4	20.1	19.7	18.7
Adj. Field Moisture Content % (AS1289.5.4.1)	24.4	21.5	21.8	20.0
Moisture Ratio % (AS1289.5.4.1)	114.5	107.0	110.5	107.0
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**
Moisture Variation (Wv) %	-3.0	-1.5	-2.0	-1.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	**99.5**	**98.0**	**96.5**	**96.0**
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



Material Test Report

Report Number: **GEO23-4**
Issue Number: 1
Date Issued: 25/07/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Work Request: 24121
Date Sampled: 23/07/2025
Dates Tested: 23/07/2025 - 24/07/2025
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
Location: Lot 3584 to 3591
Material: sandy CLAY, trace gravel, high plasticity
Material Source: Reclaimed fill

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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	23-S13	23-S14	23-S15	23-S16
Date Tested	23/07/2025	23/07/2025	23/07/2025	23/07/2025
Time Tested	08:34	09:55	12:06	14:50
Test Request #/Location	Refer to attached plan Lot 3591 inside the trench	Refer to attached plan Lot 3589 inside in the trench	Refer to attached plan Lot 3590 inside the trench	Refer to attached plan Lot 3584
Easting	55H 265801	55H 265866	55H 265813	55H 265825
Northing	5765586	5765551	5765577	5765557
Elevation (m)	-2.0m FSL	-1.6m FSL	-1.1m FSL	**
Layer / Reduced Level	Base of the trench	Layer 2	Layer 4	Layer 1
Thickness of Layer (mm)	250	250	250	250
Soil Description	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, 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
Field Wet Density (FWD) t/m^3	1.96	1.94	2.01	2.01
Field Moisture Content %	23.1	28.9	24.2	22.8
Field Dry Density (FDD) t/m^3	1.59	1.50	1.62	1.64
Peak Converted Wet Density t/m^3	1.99	1.88	1.99	1.98
Adjusted Peak Converted Wet Density t/m^3	**	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	22.7	28.4	**	22.4
Adj. Field Moisture Content % (AS1289.5.4.1)	23.1	28.9	24.2	22.8
Moisture Ratio % (AS1289.5.4.1)	102.0	101.5	100.5	101.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**	**
Moisture Variation (Wv) %	-0.5	-0.5	0.0	-0.5
Adjusted Moisture Variation %	**	**	**	**
Hilf Density Ratio (%)	**98.5**	**103.0**	**101.0**	**101.5**
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

Material Test Report

Report Number: **GEO23-5**
Issue Number: 1
Date Issued: 28/07/2025
Client: CREO CIVIL CONSULTANTS PTY LTD
Level 7/176 Wellington Parade, East Melbourne Victoria 3002
Project Number: GEO23
Project Name: ARMSTRONG ESTATE STAGE 35D
Project Location: MOUNT DUNEED
Work Request: 24130
Dates Tested: 24/07/2025 - 25/07/2025
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
Location: Lot 3584 to 3591
Material: sandy CLAY, trace gravel, high plasticity
Material Source: Reclaimed fill

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Accredited for compliance with ISO/IEC 17025 - Testing

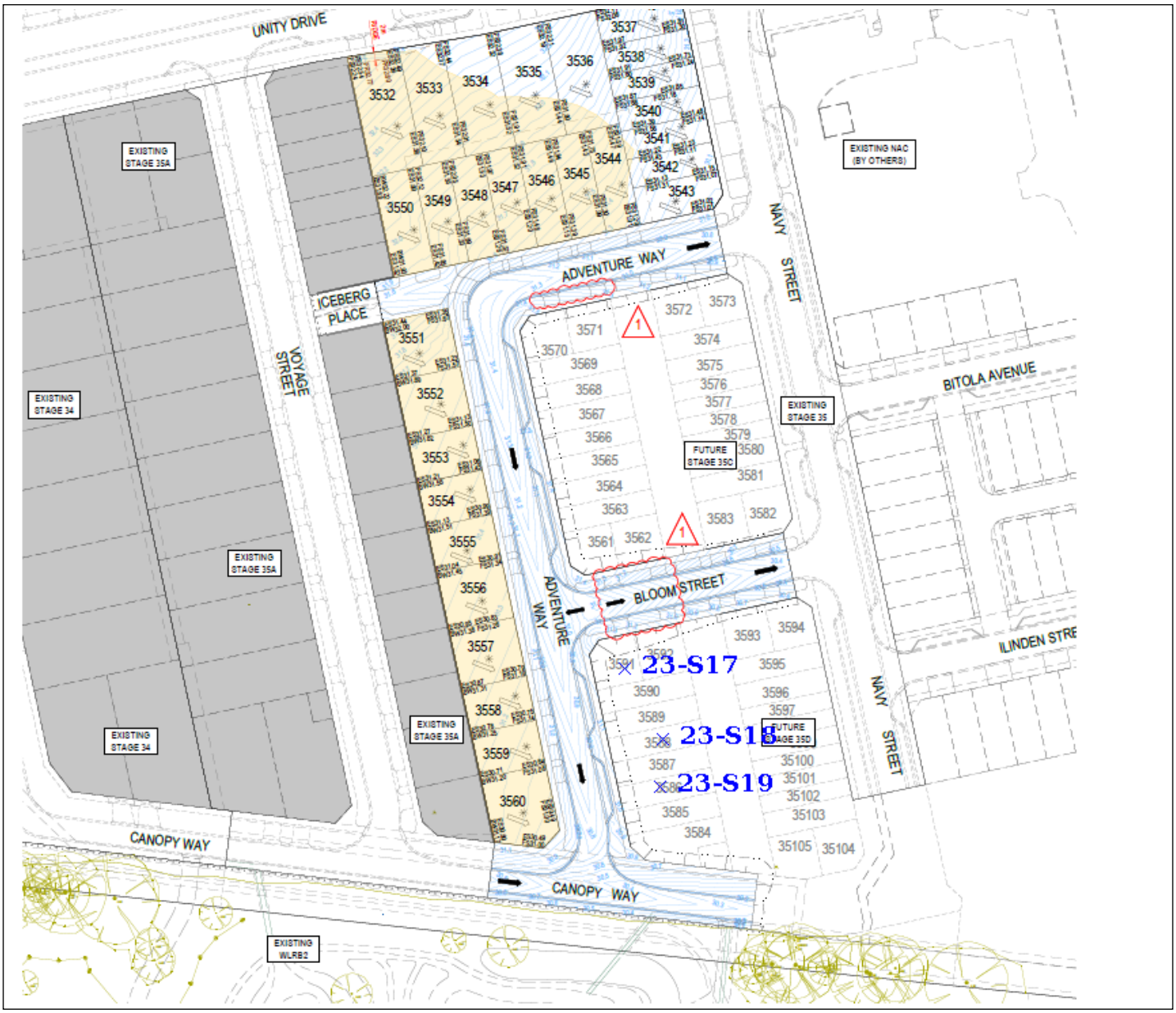
Approved Signatory: Brent Elliott
Laboratory Manager
NATA Accredited Laboratory Number: 20109

Compaction Control AS 1289 5.7.1 & 5.8.1 & 2.1.1			
Sample Number	23-S17	23-S18	23-S19
Date Tested	24/07/2025	24/07/2025	24/07/2025
Time Tested	09:08	11:24	15:21
Test Request #/Location	Refer to attached plan Lot 3591	Refer to attached plan Lot 3588	Refer to attached plan Lot 3586
Easting	55H 265808	55H 265893	55H 265911
Northing	5765584	5765623	5765631
Layer / Reduced Level	2	3	4
Thickness of Layer (mm)	250	250	250
Soil Description	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, high plasticity	sandy CLAY, trace gravel, 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	2.06	2.02	2.04
Field Moisture Content %	23.3	21.7	18.7
Field Dry Density (FDD) t/m^3	1.67	1.66	1.72
Peak Converted Wet Density t/m^3	2.04	2.06	2.02
Adjusted Peak Converted Wet Density t/m^3	**	**	**
Adj. Optimum Moisture Content % (AS1289.5.4.1)	22.4	20.9	20.9
Adj. Field Moisture Content % (AS1289.5.4.1)	23.3	21.7	18.7
Moisture Ratio % (AS1289.5.4.1)	104.0	104.0	89.5
Adjusted Moisture Ratio % (AS1289.5.4.1)	**	**	**
Moisture Variation (Wv) %	-1.0	-1.0	2.0
Adjusted Moisture Variation %	**	**	**
Hilf Density Ratio (%)	**101.0**	**98.0**	**101.0**
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



Appendix D
Site Photographs


CATERPILLAR


KOMATSU
DRAPER'S
PC
290
LCi
Intelligent
2.0