

Reference
No.: 1917-051

LEVEL ONE

SURVEILLANCE

AND INSPECTION REPORT

*Carried Out
By*



PREPARED FOR: -

DRAPERS CIVIL CONTRACTING PTY LTD



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Appendices

Appendix A Construction Drawings

Appendix B Daily Field Compaction Summary Results



Client Name: Drapers Civil Contracting Pty Ltd

Project Name: Wandana Estate Stage 5

Date: 13th January 2020

Author: Mr. Sam Loza

Reference No.: 1917-051

Revision: 01

Project Manager: Mr. Kieran Missen

1. Introduction & Scope

At the request of Drapers Civil Contracting Pty Ltd, Geotechnical Laboratories has carried out inspection and testing of the above-mentioned site from the 24th July 2019 to 31st July 2019 where a residential development is being constructed. Inspection and testing of stripping, material quality and compaction control tests were carried out to comply with the requirements of AS 3798 Appendix B, Level 1.

The following documentation was submitted to Geotechnical Laboratories by Drapers Civil Contracting Pty Ltd and was used to determine compliance of earthworks in conjunction with the requirements of AS 3798 – 2007 (See Appendix A).

(1). Earthworks Detail Plan Project Reference No. R200 Rev - 0

General site works involved the placement of fill, using on-site derived clay, to construct allotment fill to the required finished levels as indicated on the faceplan drawings.

2. Site Preparation

Site inspections were undertaken on the 24th July 2019 confirming that selected areas to be filled were completely stripped of topsoil prior to filling. The brown silty topsoils had been stockpiled around the site for later removal off-site.

Initial proof roll inspections were performed and subsequently throughout the project duration to ensure no significant soft areas were present prior to filling.

3. Fill Material

It is understood that the fill material used was sourced from on-site excavations, mainly service trenches and road boxing.



The fill material is best described as a CLAY, brown, grey-brown, medium plasticity, slightly silty, slightly moist to moist with basalt gravel and cobbles.

The fill material is consistent with the naturally occurring soils for this region.

Source material was deemed a **Suitable Material** in accordance with guidelines set out in AS 3798 - 2007 Section 4.4.

4. Fill Construction Procedure

The following plant (but not always limited to) were engaged in the fill placement process:

- Dump trucks and / or highway trucks
- A watercart
- A sheepsfoot compactor (815)

The sheepsfoot compactor placed material in horizontal loose layers of approximately 300mm. The sheepsfoot compactor also performed compaction of the clay fill operating in a criss-cross pattern where possible.

The moisture condition of the fill was closely monitored and moisture conditioning procedures were applied to bring the material closer to its Standard Optimum Moisture Content (AS 1289 5.7.1).

5. Compaction Control Testing

Compaction control testing was performed on-site using a Nuclear Densometer in accordance with AS 1289 5.8.1. Laboratory reference densities were determined from material sampled at each test site location using the Hilf Rapid Compaction Method in accordance with AS 1289 5.7.1.

A total of fifteen compaction tests were performed on the allotment filling construction. Results are presented in Appendix B of this report.

6. Testing Frequency

Testing frequencies were in accordance with **AS 3798 - 2007 Table 8.1** for **Large Scale Operations**.

Acceptance of fill layers for compaction was based on the requirements of **AS 3798 - 2007 Table 5.1 Item 1. Residential**.

As a result, the compliance criteria adopted by Geotechnical Laboratories was a hilf density ratio not less than 95 percent of the maximum hilf density value as determined by the Standard Hilf Rapid Compaction Method in accordance with AS 1289 5.7.1.

Test results indicate that the above-mentioned requirements have been successfully achieved.



No moisture criteria was specified.

7. Statement of Compliance

So far as can be determined, Drapers Civil Contracting Pty Ltd has satisfactorily complied with the compaction and construction processes required for the structural filling of this site. As such, structural filling placed on this site by Drapers Civil Contracting Pty Ltd from the 25th July 2019 to 31st July can be categorised as CONTROLLED FILL in accordance with AS 2870-2011.

8. Limitations and Liability of this Report

This report has been produced for and remains the property of Drapers Civil Contracting Pty Ltd.

The release of this report to a third party will only occur if Geotechnical Laboratories Pty Ltd has received, in writing, the authority to do so by our client.

Geotechnical Laboratories Pty Ltd will not engage in any third-party communication regarding this report.

Where information has been supplied by the client or third party, the assumption is made that this is correct. Geotechnical Laboratories Pty Ltd will not be held responsible for any inaccuracies supplied.

Test results and controlled fill compliance relates only to fill placed by Drapers Civil Contracting Pty Ltd and for earthworks completed at the time of inspection and testing. Any previous or subsequent earthworks will require a separate evaluation.

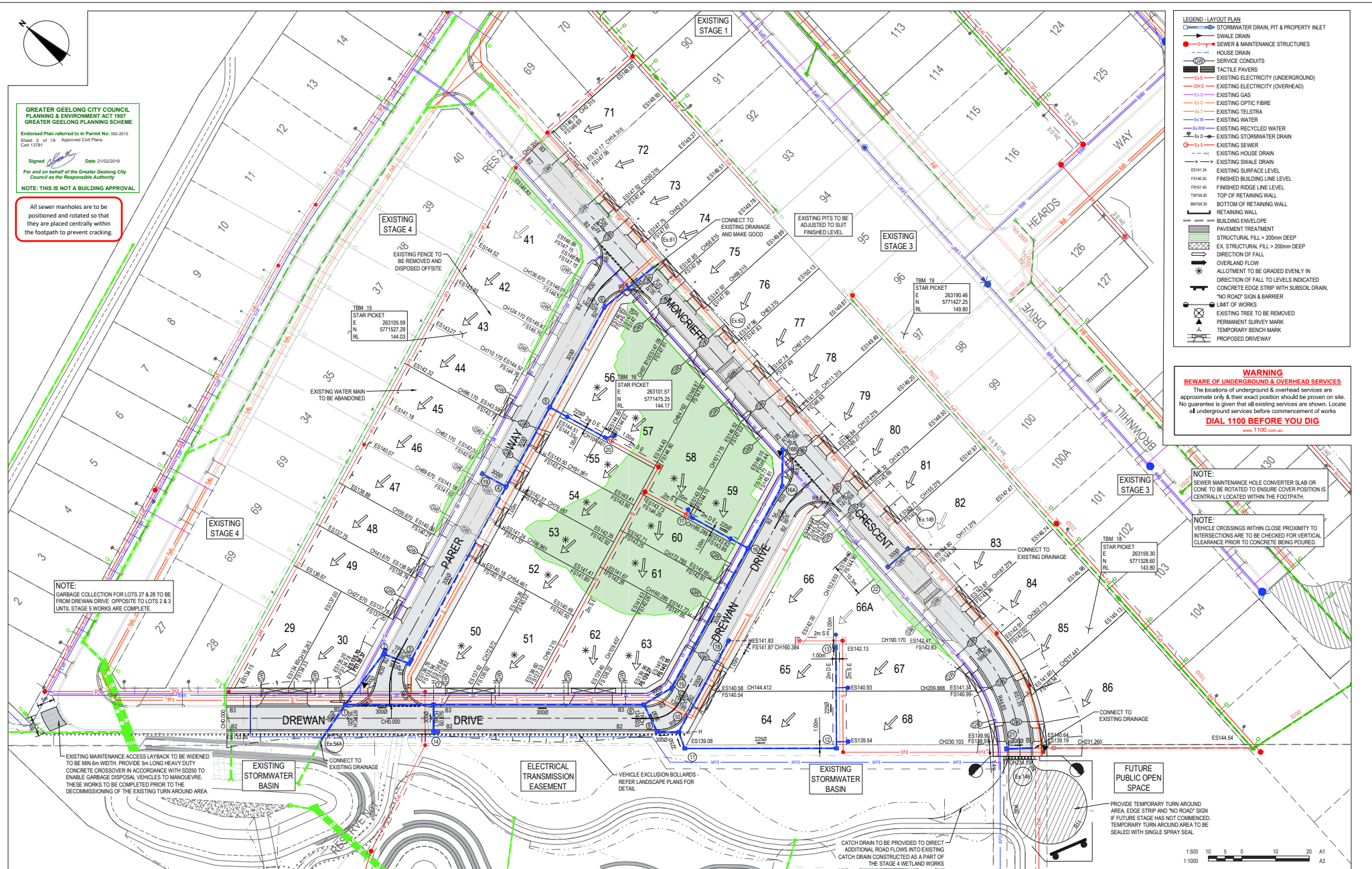
For & on behalf of
Geotechnical Laboratories Pty Ltd.

Sam Loza
Laboratory Manager.



LEVEL ONE
SURVEILLANCE
AND INSPECTION REPORT

APPENDIX A



LEGEND - LAYOUT PLAN

- STORMWATER DRAIN, PIT & PROPERTY INLET
- SWALE DRAIN
- SEWER & MAINTENANCE STRUCTURES
- HOUSE DRAIN
- SERVICE CONDUITS
- TACTILE PAVERS
- EXISTING ELECTRICITY (UNDERGROUND)
- EXISTING ELECTRICITY (OVERHEAD)
- EXISTING GAS
- EXISTING OPTIC FIBRE
- EXISTING TELSTRA
- EXISTING WATER
- EXISTING RECYCLED WATER
- EXISTING STORMWATER DRAIN
- EXISTING SEWER
- EXISTING HOUSE DRAIN
- EXISTING SWALE DRAIN
- EXISTING SURFACE LEVEL
- FINISHED BUILDING LINE LEVEL
- FINISHED RIDGE LINE LEVEL
- TOP OF RETAINING WALL
- BOTTOM OF RETAINING WALL
- RETAINING WALL
- BUILDING ENVELOPE
- PAVEMENT TREATMENT
- STRUCTURAL FILL > 200mm DEEP
- EX. STRUCTURAL FILL > 200mm DEEP
- DIRECTION OF FALL
- OVERLAND FLOW
- ALLOTMENT TO BE GRADED EVENLY IN DIRECTION OF FALL TO LEVELS INDICATED
- CONCRETE EDGE STRIP WITH SUBSOL DRAIN
- "NO ROAD" SIGN & BARRIER
- LIMIT OF WORKS
- EXISTING TREE TO BE REMOVED
- PERMANENT SURVEY MARK
- TEMPORARY BENCH MARK
- PROPOSED DRIVEWAY

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:
SEWER MAINTENANCE HOLE CONVERTER SLAB OR CONE TO BE ROTATED TO ENSURE COVER POSITION IS CENTRALLY LOCATED WITHIN THE FOOTPATH.

NOTE:
VEHICLE CROSSINGS WITHIN CLOSE PROXIMITY TO INTERSECTIONS ARE TO BE CHECKED FOR VERTICAL CLEARANCE PRIOR TO CONCRETE BEING POURED.

GREATER GEELONG CITY COUNCIL
PLANNING & ENVIRONMENT ACT 1987
GREATER GEELONG PLANNING SCHEME
Endorsed Plan referred to in Permit No: 192-2015
Sheet 2 of 19 Approved Civil Plans
Cust 12/91

Signed: [Signature] Date: 21/02/2019
For and on behalf of the Greater Geelong City Council as the Responsible Authority

NOTE: THIS IS NOT A BUILDING APPROVAL

All sewer manholes are to be positioned and rotated so that they are placed centrally within the footpath to prevent cracking.

NOTE:
GARBAGE COLLECTION FOR LOTS 27 & 28 TO BE FROM DREWAN DRIVE OPPOSITE TO LOTS 2 & 3 UNTIL STAGE 5 WORKS ARE COMPLETE

EXISTING MAINTENANCE ACCESS LAYBACK TO BE WIDENED TO BE MIN 6m WIDTH. PROVIDE 5m LONG HEAVY DUTY CONCRETE CROSSOVER IN ACCORDANCE WITH S2090 TO ENABLE GARBAGE DISPOSAL VEHICLES TO MANOEUVRE. THESE WORKS TO BE COMPLETED PRIOR TO THE DECOMMISSIONING OF THE EXISTING TURN AROUND AREA.

REVISION	DATE	ISSUE DESCRIPTION	DRAWN	CHECKED	APPROVED
0	21/02/19	CONSTRUCTION ISSUE	M.T.	M.T.	T.P.
B	06/02/19	COUNCIL COMMENTS DATED 12/19	M.T.	M.T.	T.P.
A	19/11/18	ISSUED FOR APPROVAL	S.D.	M.T.	T.P.

villawood properties
Communities Designed for Living

creo
CONSULTANTS
Level 7, 176 Wellington Parade
East Melbourne, VIC, Australia 3002

WANDANA
Residential Property

WANDANA ESTATE - STAGE 5
LAYOUT PLAN

ISSUED FOR CONSTRUCTION

SCALE: AT A1	DRAWN: S. DAVIES	DESIGNED: M. TROUNCE
PROJECT ENGINEER: A. WALE	PROJECT MANAGER: T. PALIOS	DATE FIRST ISSUE: NOVEMBER 2018
PRODUCT No: 180363.5	DRAWING No: R200	REVISION: 0



LEVEL ONE
SURVEILLANCE
AND INSPECTION REPORT

APPENDIX B



GEOTECHNICAL LABORATORIES
ACN 102 571 077
 14 Ravenhall Way, Ravenhall, Vic 3023
 Email: info@geolab.com.au PH: (03) 8361-9140

DAILY SUMMARY - FIELD DENSITY TESTS

REPORT NO.: # 1992/154
 LOCATION: DRAPERS - Wandana Stage 5

DATE OF TESTS	TEST NUM.	TEST LOCATION	FIELD WET DENSITY (t/m ³)	FIELD MOISTURE CONTENT (%)	HILF DENSITY RATIO STANDARD (%)	STANDARD PCWD OR APCWD (t/m ³)	STANDARD OPTIMUM MOISTURE CONTENT (%)	PROBE DEPTH SETTING (mm)	VARIATION FROM OPTIMUM MOISTURE CONTENT (%)	MOISTURE RATIO (%)	WET +19mm (%)	WET +37.5mm (%)	APPROX. DEPTH BELOW FINISH LEVEL (mm)
25/07/19	1	<i>Refer to #1992/155 for approx. test site locations.</i>	2.01	19.5	103.0	1.95	21.0	175	1.5 Drier	92.0	0	0	200
25/07/19	2		1.97	19.5	102.0	1.93	20.5	175	1.0 Drier	95.5	0	0	200
25/07/19	3		2.01	24.0	102.5	1.95	24.0	175	0.0 Drier	100.0	0	0	200
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-

NOTES: Clayey Fill Ex. Onsite

Test sites located - Geolab Procedure 4, Part 4.4.

Compaction specimens sampled after compaction.

Start Time: 10.07am Finish Time: 10.27am

A Hilf Rapid Compaction test was carried out on a sample taken from each Field Density location to obtain the Compaction Parameters tabulated on this Report.

Moisture Content: AS 1289 2.1.1

Compaction Test: AS 1289 5.7.1

Soil Layer thickness: 200mm

Hilf Density Ratio and Hilf Moisture Variation ,Hilf Adjusted (APCWD) & Peak (PCWD) Converted Wet Density AS 1289 5.7.1

Field Density, Nuclear Gauge: AS 1289 5.8.1

Materials Sampled : AS 1289 1.2.1 Clause 6.4(b)

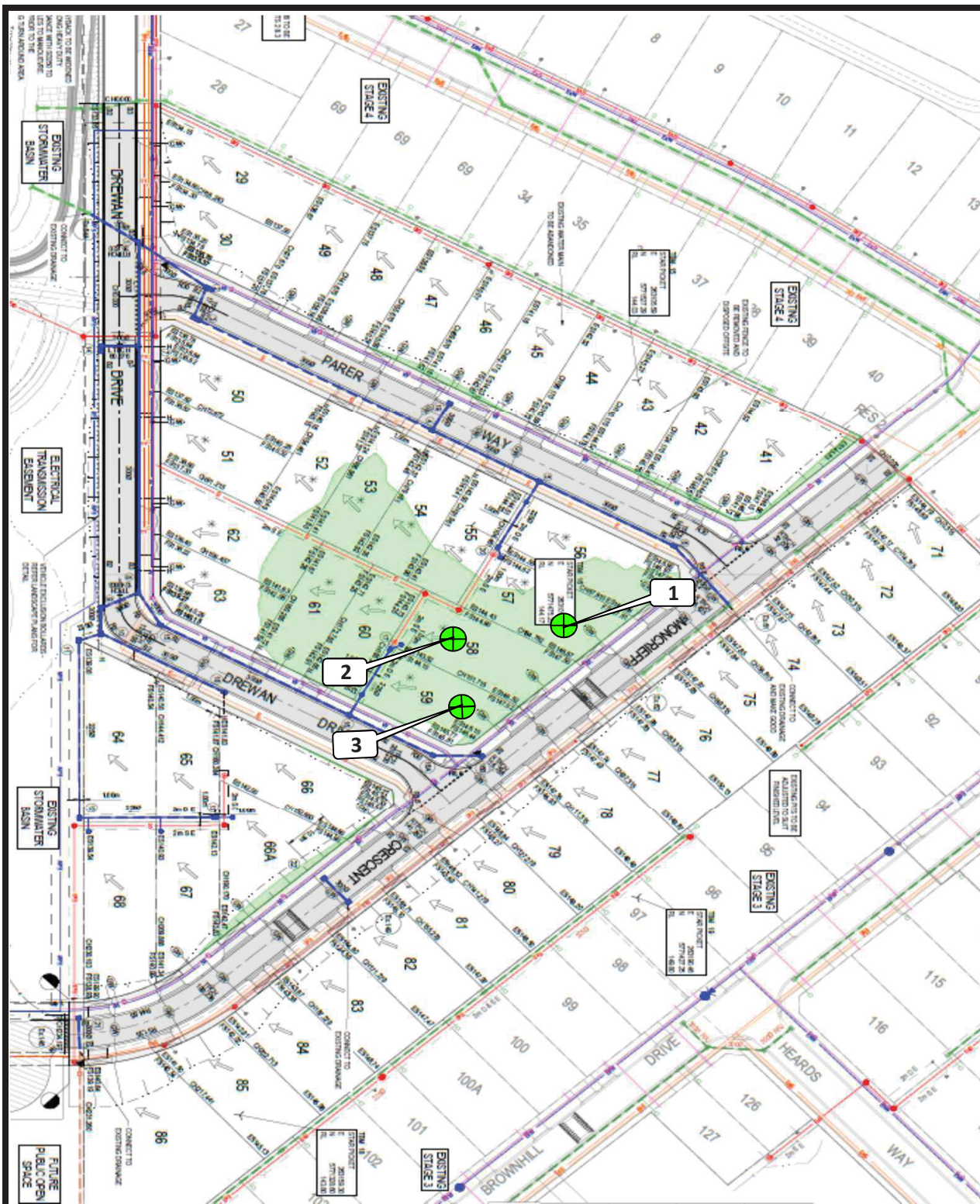


Accredited for compliance with ISO/IEC
17025 - Testing

NATA Accredited Laboratory Number 14561

MICK CROWE
 (Approved Signatory)

Issue Date: 30/7/2019



**GEOTECHNICAL
LABORATORIES**

**GEOTECHNICAL LABORATORIES
ACN 102 571 077**

14 Ravenhall Way, Ravenhall, Vic 3023
Email: info@geolab.com.au PH: (03) 8361-9140

CLIENT: DRAPERS

LOCATION: Wandana Estate Stage 5

Sketch indicating compaction test locations

DATE: 25/7/19

OPERATOR: RW

SCALE: NTS

JOB No.: 1992/155

CHECKED: EG

FIGURE No: -



GEOTECHNICAL LABORATORIES
ACN 102 571 077
 14 Ravenhall Way, Ravenhall, Vic 3023
 Email: info@geolab.com.au PH: (03) 8361-9140

DAILY SUMMARY - FIELD DENSITY TESTS

REPORT NO.: # 1992/156
 LOCATION: DRAPERS - Wandana Stage 5

DATE OF TESTS	TEST NUM.	TEST LOCATION	FIELD WET DENSITY (t/m ³)	FIELD MOISTURE CONTENT (%)	HILF DENSITY RATIO STANDARD (%)	STANDARD PCWD OR APCWD (t/m ³)	STANDARD OPTIMUM MOISTURE CONTENT (%)	PROBE DEPTH SETTING (mm)	VARIATION FROM OPTIMUM MOISTURE CONTENT (%)	MOISTURE RATIO (%)	WET +19mm (%)	WET +37.5mm (%)	APPROX. DEPTH BELOW FINISH LEVEL (mm)
26/07/19	1	<i>Refer to #1992/157 for approx. test site locations.</i>	2.01	18.5	100.5	2.00	19.0	175	0.5 Drier	97.5	0	0	200
26/07/19	2		1.98	18.5	101.0	1.96	20.0	175	1.0 Drier	94.0	0	0	200
26/07/19	3		1.96	20.5	98.0	2.00	20.5	175	0.0 Wetter	101.0	0	0	200
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-

NOTES: Clayey Fill Ex. Onsite

Test sites located - Geolab Procedure 4, Part 4.4.

Compaction specimens sampled after compaction.

Start Time: 1.20pm Finish Time: 1.34pm

A Hilf Rapid Compaction test was carried out on a sample taken from each Field Density location to obtain the Compaction Parameters tabulated on this Report.

Moisture Content: AS 1289 2.1.1

Compaction Test: AS 1289 5.7.1

Soil Layer thickness: 200mm

Hilf Density Ratio and Hilf Moisture Variation ,Hilf Adjusted (APCWD) & Peak (PCWD) Converted Wet Density AS 1289 5.7.1

Field Density, Nuclear Gauge: AS 1289 5.8.1

Materials Sampled : AS 1289 1.2.1 Clause 6.4(b)



Accredited for compliance with ISO/IEC 17025 - Testing

NATA Accredited Laboratory Number 14561

MICK CROWE
 (Approved Signatory)

Issue Date: 30/7/2019



14 Ravenhall Way, Ravenhall, Vic 3023
Email: info@geolab.com.au PH: (03) 8361-9140

CLIENT: DRAPERS

LOCATION: Wandana Estate Stage 5

Sketch indicating compaction test locations

DATE: 26/7/19

JOB No.: 1992/157

OPERATOR: RW

CHECKED: EG

SCALE: NTS

FIGURE No: -



GEOTECHNICAL LABORATORIES
ACN 102 571 077
 14 Ravenhall Way, Ravenhall, Vic 3023
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DAILY SUMMARY - FIELD DENSITY TESTS

REPORT NO.: # 1992/162
 LOCATION: DRAPERS - Wandana Stage 5

DATE OF TESTS	TEST NUM.	TEST LOCATION	FIELD WET DENSITY (t/m ³)	FIELD MOISTURE CONTENT (%)	HILF DENSITY RATIO STANDARD (%)	STANDARD PCWD OR APCWD (t/m ³)	STANDARD OPTIMUM MOISTURE CONTENT (%)	PROBE DEPTH SETTING (mm)	VARIATION FROM OPTIMUM MOISTURE CONTENT (%)	MOISTURE RATIO (%)	WET +19mm (%)	WET +37.5mm (%)	APPROX. DEPTH BELOW FINISH LEVEL (mm)
29/07/19	1	<i>Refer to #1992/163 for approx. test site locations.</i>	2.05	15.5	100.0	✱ 2.05	16.0	175	0.5 Drier	97.0	6	0	0
29/07/19	2		1.99	19.5	98.0	✱ 2.03	19.0	175	0.5 Wetter	102.5	6	0	0
29/07/19	3		2.08	14.0	101.5	✱ 2.05	14.5	175	0.0 Drier	98.5	5	0	200
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-

NOTES: Onsite Clayey Fill Ex. Onsite

Test sites located - Geolab Procedure 4, Part 4.4.

Compaction specimens sampled after compaction.

Start Time: 7.58am Finish Time: 8.10am

A Hilf Rapid Compaction test was carried out on a sample taken from each Field Density location to obtain the Compaction Parameters tabulated on this Report.

Moisture Content: AS 1289 2.1.1

Compaction Test: AS 1289 5.7.1

Soil Layer thickness: 200mm

Hilf Density Ratio and Hilf Moisture Variation ,Hilf Adjusted (APCWD) & Peak (PCWD) Converted Wet Density AS 1289 5.7.1

Field Density, Nuclear Gauge: AS 1289 5.8.1

Materials Sampled : AS 1289 1.2.1 Clause 6.4(b)

✱ Indicates APCWD

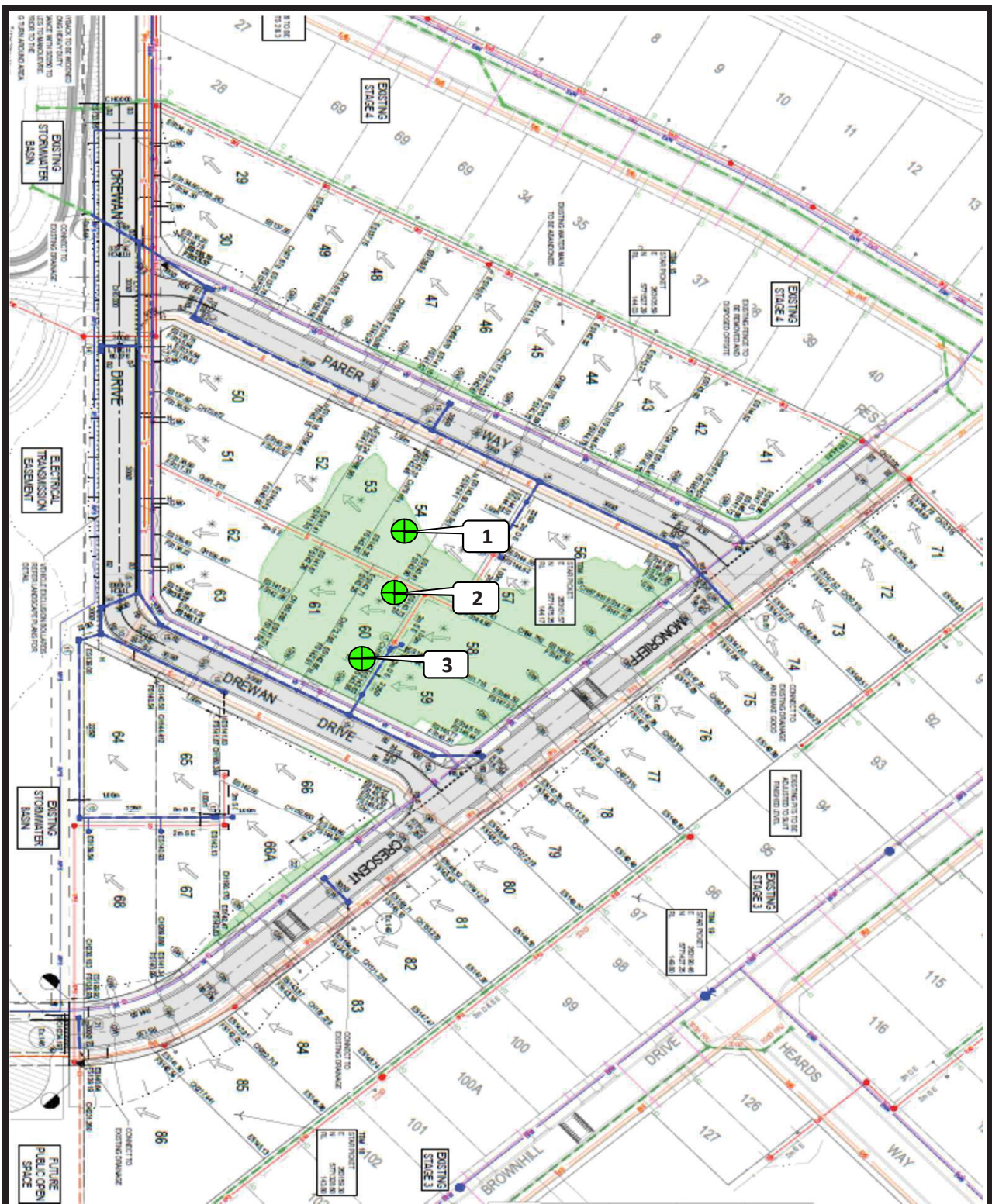


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17025 - Testing

NATA Accredited Laboratory Number 14561

MICK CROWE
 (Approved Signatory)

Issue Date: 31/7/2019



**GEOTECHNICAL
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ACN 102 571 077**

14 Ravenhall Way, Ravenhall, Vic 3023
Email: info@geolab.com.au PH: (03) 8361-9140

CLIENT: DRAPERS

LOCATION: Wandana Estate Stage 5

Sketch indicating compaction test locations

DATE: 29/7/19

OPERATOR: RW

SCALE: NTS

JOB No.: 1992/163

CHECKED: CL

FIGURE No: -



GEOTECHNICAL LABORATORIES
ACN 102 571 077
 14 Ravenhall Way, Ravenhall, Vic 3023
 Email: info@geolab.com.au PH: (03) 8361-9140

DAILY SUMMARY - FIELD DENSITY TESTS

REPORT NO.: # 1992/164
 LOCATION: DRAPERS - Wandana Stage 5

DATE OF TESTS	TEST NUM.	TEST LOCATION	FIELD WET DENSITY (t/m ³)	FIELD MOISTURE CONTENT (%)	HILF DENSITY RATIO STANDARD (%)	STANDARD PCWD OR APCWD (t/m ³)	STANDARD OPTIMUM MOISTURE CONTENT (%)	PROBE DEPTH SETTING (mm)	VARIATION FROM OPTIMUM MOISTURE CONTENT (%)	MOISTURE RATIO (%)	WET +19mm (%)	WET +37.5mm (%)	APPROX. DEPTH BELOW FINISH LEVEL (mm)
30/07/19	1	<i>Refer to #1992/165 for approx. test site locations.</i>	2.00	21.0	99.5	2.01	20.5	175	0.5 Wetter	102.5	0	0	0
30/07/19	2		1.98	22.5	98.0	2.03	21.0	175	1.5 Wetter	107.0	0	0	0
30/07/19	3		2.10	18.0	100.5	✱ 2.08	17.5	175	0.5 Wetter	104.0	8	0	0
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-

NOTES: Clayey Fill Ex. Onsite

Test sites located - Geolab Procedure 4, Part 4.4.

Compaction specimens sampled after compaction.

Start Time: 9.28am Finish Time: 9.45am

A Hilf Rapid Compaction test was carried out on a sample taken from each Field Density location to obtain the Compaction Parameters tabulated on this Report.

Moisture Content: AS 1289 2.1.1

Compaction Test: AS 1289 5.7.1

Soil Layer thickness: 200mm

Hilf Density Ratio and Hilf Moisture Variation ,Hilf Adjusted (APCWD) & Peak (PCWD) Converted Wet Density AS 1289 5.7.1

Field Density, Nuclear Gauge: AS 1289 5.8.1

Materials Sampled : AS 1289 1.2.1 Clause 6.4(b)

✱ Indicates APCWD



Accredited for compliance with ISO/IEC
17025 - Testing

NATA Accredited Laboratory Number 14561

MICK CROWE
 (Approved Signatory)

Issue Date: 1/8/2019



14 Ravenhall Way, Ravenhall, Vic 3023
Email: info@geolab.com.au PH: (03) 8361-9140

Sketch indicating compaction test locations

SCALE: NTS

FIGURE No: -



GEOTECHNICAL LABORATORIES
ACN 102 571 077
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DAILY SUMMARY - FIELD DENSITY TESTS

REPORT NO.: # 1992/166
 LOCATION: DRAPERS - Wandana Stage 5

DATE OF TESTS	TEST NUM.	TEST LOCATION	FIELD WET DENSITY (t/m ³)	FIELD MOISTURE CONTENT (%)	HILF DENSITY RATIO STANDARD (%)	STANDARD PCWD OR APCWD (t/m ³)	STANDARD OPTIMUM MOISTURE CONTENT (%)	PROBE DEPTH SETTING (mm)	VARIATION FROM OPTIMUM MOISTURE CONTENT (%)	MOISTURE RATIO (%)	WET +19mm (%)	WET +37.5mm (%)	APPROX. DEPTH BELOW FINISH LEVEL (mm)
31/07/19	1	<i>Refer to #1992/167 for approx. test site locations.</i>	1.90	25.0	96.5	1.97	23.0	175	2.0 Wetter	108.5	0	0	0
31/07/19	2		1.85	27.5	95.0	1.94	25.0	175	2.0 Wetter	108.0	0	0	0
31/07/19	3		1.86	28.5	98.0	1.89	28.5	175	0.5 Drier	99.0	0	0	0
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-
-	-		-	-	-	-	-	-	-	-	-	-	-

NOTES: Clayey Fill Ex. Onsite

Test sites located - Geolab Procedure 4, Part 4.4.

Compaction specimens sampled after compaction.

Start Time: 10.35am Finish Time: 10.55am

A Hilf Rapid Compaction test was carried out on a sample taken from each Field Density location to obtain the Compaction Parameters tabulated on this Report.

Moisture Content: AS 1289 2.1.1

Compaction Test: AS 1289 5.7.1

Soil Layer thickness: 200mm

Hilf Density Ratio and Hilf Moisture Variation ,Hilf Adjusted (APCWD) & Peak (PCWD) Converted Wet Density AS 1289 5.7.1

Field Density, Nuclear Gauge: AS 1289 5.8.1

Materials Sampled : AS 1289 1.2.1 Clause 6.4(b)

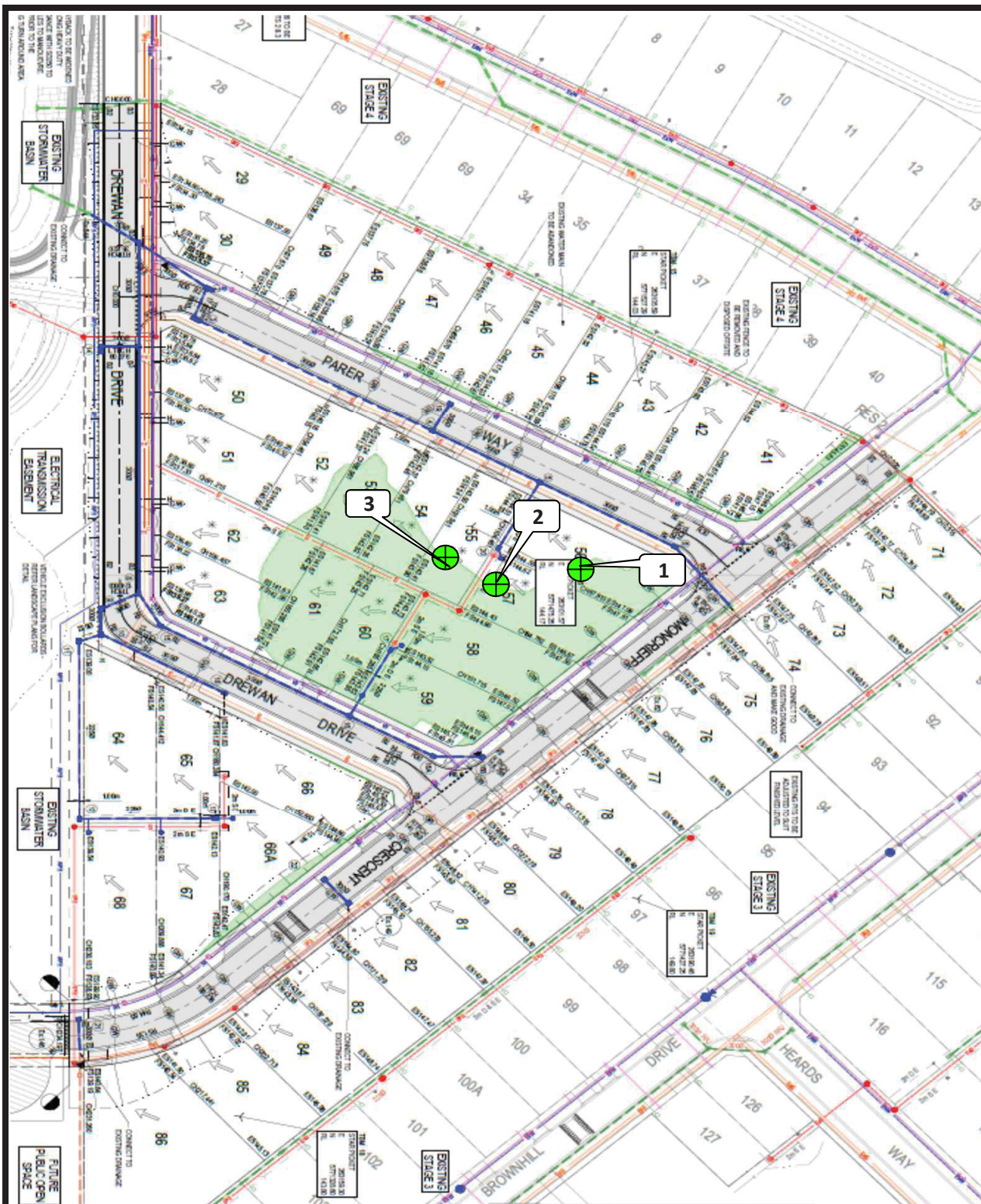


Accredited for compliance with ISO/IEC
17025 - Testing

NATA Accredited Laboratory Number 14561

MICK CROWE
 (Approved Signatory)

Issue Date: 2/8/2019



**GEOTECHNICAL
LABORATORIES**

**GEOTECHNICAL LABORATORIES
ACN 102 571 077**

14 Ravenhall Way, Ravenhall, Vic 3023
Email: info@geolab.com.au PH: (03) 8361-9140

CLIENT: DRAPERS

LOCATION: Wandana Estate Stage 5

Sketch indicating compaction test locations

DATE: 31/7/19

OPERATOR: TI

SCALE: NTS

JOB No.: 1992/167

CHECKED: EG

FIGURE No: -