Earthfill Report

Fulton Hogan Land Development Ltd
Rosemerryn Stage 21A

Guinevere Road • Lincoln

20764

June 2024

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Shaping the future since 1880

Earthfill Report

Rosemerryn Stage 21A

(contract name/subdivision name)

RC225189

(contract /subdivision consent number)

Andrew Hall

(Engineers Name)

Junel 2024

(Date of submission)

Rosemerryn Stage 21 was granted subdivision consent RC 225189 in which condition 7 states that "All work shall comply with the Engineering Code of Practice, except as agreed in the Engineering Approval."

Section 2.9 of the Engineering Code of Practice states that Council *"requires the Development Engineering Team to formally accept the completed subdivision. This will require the applicant to provide a full set of Completion Documentation..".* This document is all of the completion documents required presented in the form of an **Engineers Report and Engineers Completion Certificate**

These Quality Assurance measures have been undertaken by Davie Lovell-Smith Ltd in accordance with CCC IDS, Part 3. Clause 3.3.4 explains the purpose of an Engineers Report, and states:

> *An Engineer's Report is a document specific to a project, which describes how the project was managed and administered in compliance with the IDS, the Construction Standard Specifications, the Contract Quality Plan and the resource consent or project brief. It provides background information to the release of the 224(c) certificate.*

This report relates to the earthworks portion of the development. Added to this report is the full set of testing and other documentation from the earthfill as required by the SDC CoP and to fulfil the requirements of Appendix II: S224c Subdivision Engineering Approval - Data Checklist.

Version Control

Version	Date	Details
R0	12/06/2024	

Contents:

1 – Description of Works

1.1 General

This report addresses the earthfill of the completed Stage 21A of Rosemerryn subdivision in Lincoln. This stage is bounded to the west by previously developed stages of the development, to the north by undeveloped land contained within the wider proposed Rosemerryn Development Stages 23 and 24 and to the south and east by Guinevere Drive.

Stage 21A was constructed by Maugers Contracting Limited. The stage development consists of 21 residential lots, two roads, one ROW, sewer infrastructure, stormwater infrastructure, water supply infrastructure, telecommunications and power servicing for all residential lots.

The earthworks for the filling of the Sediment Retention Pond (SRP) have been completed under a separate contract by Rooneys Earthmoving Limited. This consisted of stripping topsoil and cutting and filling works over the site and respreading topsoil to within 1m of the lot boundaries over the site.

This stage has been designed and constructed in accordance with the Selwyn District Council Code of Practice (SDC COP) with accompaniment of other recognised practices including the Christchurch City Council Construction Standards Specification (CCC CSS), Infrastructure Design Standard (CCC IDS) and the New Zealand Building Code (NZBC).

2 – Quality Assurance Summary

2.1 Earthworks

All earthworks have been carried out in accordance with the SDC COP and NZS4431:1989. All lots have been designed and constructed to ensure adequate drainage to the lot frontages and into the drainage network.

All sites have been earth worked to ensure drainage towards the street or feature at a minimum of 1/500 and elevation above secondary flow paths in the 1 in 200 year critical storm event. Some minor contouring and finishing will be required around the boundary of the site.

Sediment flow off the site was controlled as per Regional Council requirements.

All dust created on the site was controlled by Council approved methods.

All bulk filling was compacted in accordance with NZS 4431:1989. All MDD testing was carried out by an independent laboratory. Fill testing was carried out by the contractor.

See Earthfill report below.

Earthworks - Earthfill Report

Location	Rosemerryn Stage 21A, Guinevere Drive, Lincoln
Construction Period	The site works were completed between October 2022 and March 2024.
Material	Engineered fill used on the site is selected cut material from roads and lots. This stage consisted of cut and fill operations.
Compaction Method Used	Filled in layers up to 200mm using excavators, dump trucks, scrapers and graders. Compaction was achieved using a 7 tonne vibrating drum roller as well as wheel rolling incidental to the use of the wheeled equipment listed above for the filling operations. All earthworks have been carried out in accordance with the CCC CSS and NZS4431:1989.
Test Method and Results	Maximum dry density testing was carried out by Fulton Hogan Laboratory to determine the maximum dry density and the optimum water content of the material used for cut to fill. The soils used are described as SILTS and Silty FINE SAND, which have been recovered from within the Rosemerryn development site. **SILTS - MDD: CAN20S-07340** • The **SILTS** was tested by Fulton Hogan, a copy of the test report is attached to this report (MDD 1.79 t/m^3, water content 15%). SILTS are a cohesive material under NZS 4431:1989 and as such shall not be less than 95% of the maximum dry density. Therefore, the target onsite density must be 0.95 x 1790kg/m^3 = 1700.5 kg/m^3. **Silty FINE SAND - MDD: CAN20S-07560** • The **Silty FINE SAND** was tested by Fulton Hogan, a copy of the test report is attached to this report (MDD 1.78 t/m^3, water content 15%). SAND is a non-cohesive material under NZS 4431:1989 and as such shall not be less than 92% of the maximum dry density. Therefore, the target onsite density must be 0.92 x 1780kg/m^3 = 1637.6 kg/m^3. Nuclear Densometer (NDM) Tests were used throughout the construction process to monitor the compaction achieved on the placed fill material, of the 165 test results included in the attached data, 85 tests were conducted on Stage 21A. The NDM testing was undertaken by Maugers Contracting and Rooneys Earthmoving Limited on the SRP Lots. The results are attached to this report. All tests achieved or exceeded a 95% level of compaction. Please also refer to the earthfill as-built plan attached to this report.
Comments	**This report does not negate the requirements of any New Zealand Standard for the purposes of constructing a dwelling.** **Please note that this report only addresses the suitability of the fill material. No testing pertaining to existing in-situ soils is included in this report.**

Earthworks – Maximum Dry Density / Moisture Content Testing

Canterbury Laboratory

24 Miners Road, Templeton, Christchurch
PO Box 16-064, Christchurch 8441
Telephone: +64 3 349 9142
Facsimile: +64 3 349 9143
www.fultonhogan.com
0800 LABORATORY

Report No: MDD:CAN20S-07340
Issue No: 1

Maximum Dry Density Report

Client:
Maugers Contracting Ltd
PO Box 14174
Christchurch Airport

Christchurch 8544
NZ

Project: Maugers Contracting

IANZ ACCREDITED LABORATORY

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

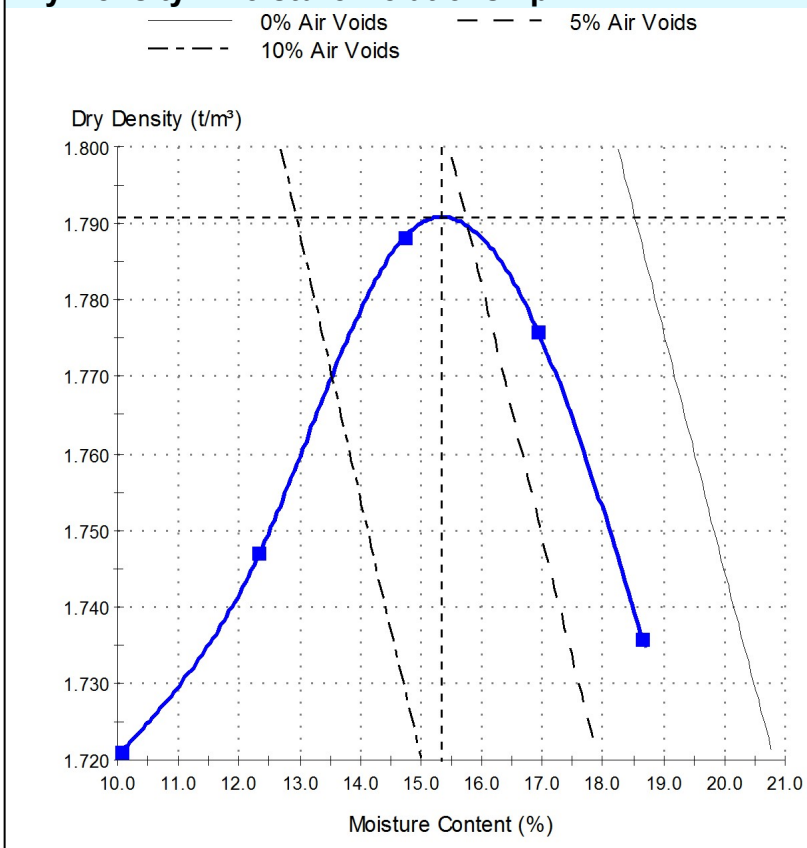
The results in this report relate only to the items / samples that were tested

Approved Signatory: Max Burford (Supervisor)
IANZ Accreditation No:200
Date of Issue: 15/05/2020

Sample Details

Sample ID:	CAN20S-07340	**Client Sample ID:**	QA Testing
Material:	SILT	**Sample Source:**	Miscellaneous Material Source
Site/Sampled From:	Site Rosemerryn	**Date Sampled:**	15/05/2020
Specification:	Standard Compaction Test	**Sampled By:**	Advised - See Comments
Sampling Method:	As Received - Not Accredited	**Date Tested:**	15/05/2020
Technician:	Max Burford	**Sampling Endorsed?:**	No

Dry Density - Moisture Relationship



Test Results

NZS 4402:1986 Test 4.1.1 - 1986

Maximum Dry Density (t/m³):	**1.79**
Optimum Moisture Content (%):	**15**
Solid Density (t/m³):	2.680 assumed
Oversize Sieve (mm):	19.0
Oversize Material (%):	0
Sample History:	Natural
Tested By:	Max Burford
Date Tested:	15/05/2020

Comments

Sampled by Hayden Greene

Canterbury Laboratory

24 Miners Road, Templeton, Christchurch
PO Box 16-064, Christchurch 8441
Telephone: +64 3 349 9142
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0800 LABORATORY

Report No: MDD:CAN20S-07560
Issue No: 1

Maximum Dry Density Report

Client:
Maugers Contracting Ltd
PO Box 14174
Christchurch Airport

Christchurch 8544
NZ

Project: Maugers Contracting

IANZ ACCREDITED LABORATORY

The tests reported herein (unless otherwise indicated) have been performed in accordance with the laboratory's scope of accreditation. Samples are tested as received, in natural condition, unless stated otherwise in the comments. This report may only be reproduced in full.

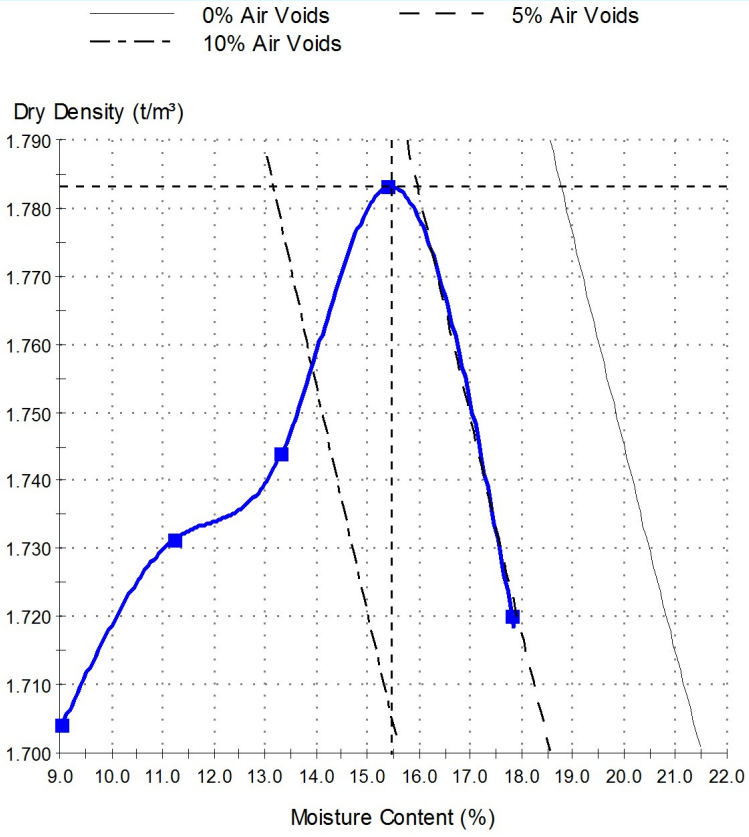
The results in this report relate only to the items / samples that were tested

Approved Signatory: Liam Brennan
(Laboratory Technician)
IANZ Accreditation No:200
Date of Issue: 19/05/2020

Sample Details

Sample ID:	CAN20S-07560	**Client Sample ID:**	QA Testing
Material:	Silty FINE SAND	**Sample Source:**	Miscellaneous Material Source
Site/Sampled From:	Rosemerryn Subdivision	**Date Sampled:**	15/05/2020
Specification:	Standard Compaction Test	**Sampled By:**	Advised - See Comments
Sampling Method:	As Received - Not Accredited	**Date Tested:**	18/05/2020
Technician:	Maciej Gaworecki	**Sampling Endorsed?:**	No

Dry Density - Moisture Relationship



Test Results

NZS 4402:1986 Test 4.1.1 - 1986

Maximum Dry Density (t/m³):	**1.78**
Optimum Moisture Content (%):	**15**
Solid Density (t/m³):	2.680 assumed
Oversize Sieve (mm):	19.0
Oversize Material (%):	0
Sample History:	Natural
Tested By:	Maciej Gaworecki
Date Tested:	18/05/2020

Comments

Material sampled by Hayden Greene.

Earthworks – Nuclear Moisture Density Testing

DAVIE LOVELL-SMITH

DLS Job No.: 20764 Engineer: Davie Lovell-Smith
Checked By: Mark Meates
Drainage Type: Earthfill NDM Testing Council Rep: _____
Development: Rosemerryn Stage 21A
Contractor: Maugers Contracting Contractors rep:
Authorised Drainlayer:

Lift 1	Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7

Earthfill NDM Testing - Lot Order

	Reference		Lot #	Test ID	Material	MDD	Water Content WC	Date of Test	NDM N	Moisture Content M	Compact-ion C	Report #	Compact^{N} Result Pass / Fail	Date Of Check	NDM DLS Checked By
		Stage	Pond	Lifts		kg/m^3	%		kg/m^3	%			C > 95%		Initials
74	Earthfill	21A	832	2	Clay SILTS	1790	15.00	22/11/22	1716	20.9	95.9	221122	Pass	17/06/24	MJWM
75	Earthfill	21A	832	3	Clay SILTS	1790	15.00	22/11/22	1769	14.9	98.8	221122	Pass	17/06/24	MJWM
57	Earthfill	21A	832	5	Clay SILTS	1790	15.00	11/11/22	1743	18.3	97.4	221117	Pass	17/06/24	MJWM
58	Earthfill	21A	832	6	Clay SILTS	1790	15.00	11/11/22	1717	19.0	95.9	221117	Pass	17/06/24	MJWM
50	Earthfill	21A	838	19	SILTs	1790	15.00	15/11/22	1715	14.8	95.8	221115	Pass	14/06/24	MJWM
51	Earthfill	21A	838	20	SILTs	1790	15.00	15/11/22	1832	13.8	102.3	221115	Pass	14/06/24	MJWM
52	Earthfill	21A	838	21	SILTs	1790	15.00	15/11/22	1777	17.3	99.3	221115	Pass	14/06/24	MJWM
47	Earthfill	21A	839	16	SILTs	1790	15.00	15/11/22	1877	14.1	104.9	221115	Pass	14/06/24	MJWM
48	Earthfill	21A	839	17	SILTs	1790	15.00	15/11/22	1737	15.9	97.0	221115	Pass	14/06/24	MJWM
49	Earthfill	21A	839	18	SILTs	1790	15.00	15/11/22	1775	12.7	99.2	221115	Pass	14/06/24	MJWM
44	Earthfill	21A	840	13	SILTs	1790	15.00	15/11/22	1875	15.7	104.7	221115	Pass	14/06/24	MJWM
45	Earthfill	21A	840	14	SILTs	1790	15.00	15/11/22	1776	17.1	99.2	221115	Pass	14/06/24	MJWM
46	Earthfill	21A	840	15	SILTs	1790	15.00	15/11/22	1827	16.2	102.1	221115	Pass	14/06/24	MJWM
120	Earthfill	21A	840	100	Sandy SILT	1780	15.00	13/02/24	1779	13.5	99.9	240213	Pass	11/06/24	MJWM
121	Earthfill	21A	840	101	Sandy SILT	1780	15.00	13/02/24	1745	13.4	98.0	240213	Pass	11/06/24	MJWM
128	Earthfill	21A	840	200	Sandy SILT	1780	15.00	13/02/24	1768	16.6	99.3	240213	Pass	11/06/24	MJWM
129	Earthfill	21A	840	201	Sandy SILT	1780	15.00	13/02/24	1739	14.1	97.7	240213	Pass	11/06/24	MJWM
135	Earthfill	21A	840	300	Sandy SILT	1780	15.00	13/02/24	1773	15.1	99.6	240213	Pass	11/06/24	MJWM
136	Earthfill	21A	840	301	Sandy SILT	1780	15.00	13/02/24	1721	13.7	96.7	240213	Pass	11/06/24	MJWM
41	Earthfill	21A	841	10	SILTs	1790	15.00	15/11/22	1786	15.5	99.8	221115	Pass	14/06/24	MJWM
42	Earthfill	21A	841	11	SILTs	1790	15.00	15/11/22	1782	16.0	99.6	221115	Pass	14/06/24	MJWM
43	Earthfill	21A	841	12	SILTs	1790	15.00	15/11/22	1722	15.8	96.2	221115	Pass	14/06/24	MJWM
122	Earthfill	21A	841	102	Sandy SILT	1780	15.00	13/02/24	1761	15.3	98.9	240213	Pass	11/06/24	MJWM
123	Earthfill	21A	841	103	Sandy SILT	1780	15.00	13/02/24	1772	15.7	99.6	240213	Pass	11/06/24	MJWM
130	Earthfill	21A	841	202	Sandy SILT	1780	15.00	13/02/24	1726	16.7	97.0	240213	Pass	11/06/24	MJWM

131	Earthfill	21A	841	203	Sandy SILT	1780	15.00	13/02/24	1699	13.9	95.4	240213	Pass	11/06/24	MJWM
137	Earthfill	21A	841	302	Sandy SILT	1780	15.00	13/02/24	1706	16.1	95.8	240213	Pass	11/06/24	MJWM
138	Earthfill	21A	841	303	Sandy SILT	1780	15.00	13/02/24	1752	14.2	98.4	240213	Pass	11/06/24	MJWM
38	Earthfill	21A	842	7	SILTs	1790	15.00	15/11/22	1811	14.2	101.2	221115	Pass	14/06/24	MJWM
39	Earthfill	21A	842	8	SILTs	1790	15.00	15/11/22	1797	13.9	100.4	221115	Pass	14/06/24	MJWM
40	Earthfill	21A	842	9	SILTs	1790	15.00	15/11/22	1842	15.3	102.9	221115	Pass	14/06/24	MJWM
27	Earthfill	21A	843	18	SILTs	1790	15.00	20/10/22	1851	11.6	103.4	221020	Pass	14/06/24	MJWM
28	Earthfill	21A	843	19	SILTs	1790	15.00	20/10/22	1828	9.9	102.1	221020	Pass	14/06/24	MJWM
29	Earthfill	21A	843	20	SILTs	1790	15.00	20/10/22	1820	9.7	101.7	221020	Pass	14/06/24	MJWM
30	Earthfill	21A	844	21	SILTs	1790	15.00	20/10/22	1814	10.8	101.3	221020	Pass	14/06/24	MJWM
31	Earthfill	21A	844	22	SILTs	1790	15.00	20/10/22	1843	11.8	103.0	221020	Pass	14/06/24	MJWM
80	Earthfill	21A	846	100	Sandy SILT	1780	15.00	22/01/24	1757	17.0	98.7	240122	Pass	11/06/24	MJWM
81	Earthfill	21A	846	101	Sandy SILT	1780	15.00	22/01/24	1714	16.4	96.3	240122	Pass	11/06/24	MJWM
82	Earthfill	21A	846	102	Sandy SILT	1780	15.00	22/01/24	1777	15.1	99.8	240122	Pass	11/06/24	MJWM
83	Earthfill	21A	846	103	Sandy SILT	1780	15.00	22/01/24	1751	14.5	98.4	240122	Pass	11/06/24	MJWM
90	Earthfill	21A	846	200	Sandy SILT	1780	15.00	22/01/24	1740	16.6	97.8	240122	Pass	11/06/24	MJWM
91	Earthfill	21A	846	201	Sandy SILT	1780	15.00	22/01/24	1719	16.6	96.6	240122	Pass	11/06/24	MJWM
92	Earthfill	21A	846	202	Sandy SILT	1780	15.00	22/01/24	1725	16.0	96.9	240122	Pass	11/06/24	MJWM
93	Earthfill	21A	846	203	Sandy SILT	1780	15.00	22/01/24	1710	14.8	96.1	240122	Pass	11/06/24	MJWM
100	Earthfill	21A	846	300	Sandy SILT	1780	15.00	22/01/24	1720	14.4	96.6	240122	Pass	11/06/24	MJWM
101	Earthfill	21A	846	301	Sandy SILT	1780	15.00	22/01/24	1721	16.1	96.7	240122	Pass	11/06/24	MJWM
102	Earthfill	21A	846	302	Sandy SILT	1780	15.00	22/01/24	1722	15.7	96.7	240122	Pass	11/06/24	MJWM
103	Earthfill	21A	846	303	Sandy SILT	1780	15.00	22/01/24	1740	15.8	97.8	240122	Pass	11/06/24	MJWM
110	Earthfill	21A	846	400	Sandy SILT	1780	15.00	22/01/24	1742	17.0	97.9	240122	Pass	11/06/24	MJWM
111	Earthfill	21A	846	401	Sandy SILT	1780	15.00	22/01/24	1715	11.4	96.3	240122	Pass	11/06/24	MJWM
112	Earthfill	21A	846	402	Sandy SILT	1780	15.00	22/01/24	1755	17.1	98.6	240122	Pass	11/06/24	MJWM
113	Earthfill	21A	846	403	Sandy SILT	1780	15.00	22/01/24	1692	14.4	95.1	240122	Pass	11/06/24	MJWM
84	Earthfill	21A	847	104	Sandy SILT	1780	15.00	22/01/24	1695	15.2	95.2	240122	Pass	11/06/24	MJWM
85	Earthfill	21A	847	105	Sandy SILT	1780	15.00	22/01/24	1736	16.5	97.5	240122	Pass	11/06/24	MJWM
86	Earthfill	21A	847	106	Sandy SILT	1780	15.00	22/01/24	1749	14.8	98.3	240122	Pass	11/06/24	MJWM
87	Earthfill	21A	847	107	Sandy SILT	1780	15.00	22/01/24	1778	14.8	99.9	240122	Pass	11/06/24	MJWM
88	Earthfill	21A	847	108	Sandy SILT	1780	15.00	22/01/24	1772	15.7	99.6	240122	Pass	11/06/24	MJWM
89	Earthfill	21A	847	109	Sandy SILT	1780	15.00	22/01/24	1701	15.0	95.6	240122	Pass	11/06/24	MJWM
94	Earthfill	21A	847	204	Sandy SILT	1780	15.00	22/01/24	1715	14.8	96.3	240122	Pass	11/06/24	MJWM
95	Earthfill	21A	847	205	Sandy SILT	1780	15.00	22/01/24	1696	16.6	95.3	240122	Pass	11/06/24	MJWM
96	Earthfill	21A	847	206	Sandy SILT	1780	15.00	22/01/24	1724	14.8	96.9	240122	Pass	11/06/24	MJWM
97	Earthfill	21A	847	207	Sandy SILT	1780	15.00	22/01/24	1692	15.1	95.1	240122	Pass	11/06/24	MJWM

98	Earthfill	21A	847	208	Sandy SILT	1780	15.00	22/01/24	1776	14.5	99.8	240122	Pass	11/06/24	MJWM
99	Earthfill	21A	847	209	Sandy SILT	1780	15.00	22/01/24	1699	15.3	95.4	240122	Pass	11/06/24	MJWM
104	Earthfill	21A	847	304	Sandy SILT	1780	15.00	22/01/24	1692	16.7	95.1	240122	Pass	11/06/24	MJWM
105	Earthfill	21A	847	305	Sandy SILT	1780	15.00	22/01/24	1826	13.7	102.6	240122	Pass	11/06/24	MJWM
106	Earthfill	21A	847	306	Sandy SILT	1780	15.00	22/01/24	1776	17.0	99.8	240122	Pass	11/06/24	MJWM
107	Earthfill	21A	847	307	Sandy SILT	1780	15.00	22/01/24	1763	14.4	99.0	240122	Pass	11/06/24	MJWM
108	Earthfill	21A	847	308	Sandy SILT	1780	15.00	22/01/24	1722	16.0	96.7	240122	Pass	11/06/24	MJWM
109	Earthfill	21A	847	309	Sandy SILT	1780	15.00	22/01/24	1745	15.6	98.0	240122	Pass	11/06/24	MJWM
114	Earthfill	21A	847	404	Sandy SILT	1780	15.00	22/01/24	1725	13.4	96.9	240122	Pass	11/06/24	MJWM
115	Earthfill	21A	847	405	Sandy SILT	1780	15.00	22/01/24	1751	14.6	98.4	240122	Pass	11/06/24	MJWM
116	Earthfill	21A	847	406	Sandy SILT	1780	15.00	22/01/24	1804	14.0	101.3	240122	Pass	11/06/24	MJWM
117	Earthfill	21A	847	407	Sandy SILT	1780	15.00	22/01/24	1768	13.7	99.3	240122	Pass	11/06/24	MJWM
118	Earthfill	21A	847	408	Sandy SILT	1780	15.00	22/01/24	1702	14.8	95.6	240122	Pass	11/06/24	MJWM
119	Earthfill	21A	847	409	Sandy SILT	1780	15.00	22/01/24	1808	13.1	101.6	240122	Pass	11/06/24	MJWM
32	Earthfill	21A	848	1	SILTs	1790	15.00	15/11/22	1817	13.8	101.5	221115	Pass	14/06/24	MJWM
33	Earthfill	21A	848	2	SILTs	1790	15.00	15/11/22	1770	11.9	98.9	221115	Pass	14/06/24	MJWM
34	Earthfill	21A	848	3	SILTs	1790	15.00	15/11/22	1786	12.4	99.8	221115	Pass	14/06/24	MJWM
35	Earthfill	21A	849	4	SILTs	1790	15.00	15/11/22	1736	14.1	97.0	221115	Pass	14/06/24	MJWM
36	Earthfill	21A	849	5	SILTs	1790	15.00	15/11/22	1779	13.6	99.4	221115	Pass	14/06/24	MJWM
37	Earthfill	21A	849	6	SILTs	1790	15.00	15/11/22	1733	12.6	96.8	221115	Pass	14/06/24	MJWM
24	Earthfill	21A	852	15	SILTs	1790	15.00	20/10/22	1725	13.9	96.4	221020	Pass	14/06/24	MJWM
25	Earthfill	21A	852	16	SILTs	1790	15.00	20/10/22	1713	13.5	95.7	221020	Pass	14/06/24	MJWM
26	Earthfill	21A	852	17	SILTs	1790	15.00	20/10/22	1709	15.1	95.5	221020	Pass	14/06/24	MJWM
21	Earthfill	21A	853	12	SILTs	1790	15.00	20/10/22	1751	14.0	97.8	221020	Pass	14/06/24	MJWM
22	Earthfill	21A	853	13	SILTs	1790	15.00	20/10/22	1847	12.2	103.2	221020	Pass	14/06/24	MJWM
23	Earthfill	21A	853	14	SILTs	1790	15.00	20/10/22	1753	13.8	97.9	221020	Pass	14/06/24	MJWM

DAVIE LOVELL-SMITH

DLS Job No.:	20764					Engineer:	Davie Lovell-Smith								
Checked By:	Mark Meates														
Drainage Type:	Earthfill NDM Testing					Council Rep:									
Development:	Rosemerryn		Stage 21A												
Contractor:	Maugers Contracting					Contractors rep:									
Authorised Drainlayer:				Lift 1	Lift 2	Lift 3	Lift 4	Lift 5	Lift 6	Lift 7					

Earthfill NDM Testing - Report Date Order

	Reference		Lot #	Test ID	Material	MDD	Water Content WC	Date of Test	NDM N	Moisture Content M	Compact-ion C	Report #	Compact^{N} Result Pass / Fail	Date Of Check	NDM DLS Checked By
		Stage	Pond	Lifts		kg/m^3	%		kg/m^3	%			C > 95%		Initials
10	Earthfill	21B	857	1	SILTs	1790	15.00	20/10/22	1751	11.8	97.8	221020	Pass	14/06/24	MJWM
11	Earthfill	21B	857	2	SILTs	1790	15.00	20/10/22	1737	15.2	97.0	221020	Pass	14/06/24	MJWM
12	Earthfill	21B	857	3	SILTs	1790	15.00	20/10/22	1746	11.5	97.5	221020	Pass	14/06/24	MJWM
13	Earthfill	21B	856	4	SILTs	1790	15.00	20/10/22	1757	13.5	98.2	221020	Pass	14/06/24	MJWM
14	Earthfill	21B	856	5	SILTs	1790	15.00	20/10/22	1760	12.8	98.3	221020	Pass	14/06/24	MJWM
15	Earthfill	21B	856	6	SILTs	1790	15.00	20/10/22	1772	16.3	99.0	221020	Pass	14/06/24	MJWM
16	Earthfill	21B	855	7	SILTs	1790	15.00	20/10/22	1713	13.8	95.7	221020	Pass	14/06/24	MJWM
17	Earthfill	21B	855	8	SILTs	1790	15.00	20/10/22	1711	14.3	95.6	221020	Pass	14/06/24	MJWM
18	Earthfill	21B	854	9	SILTs	1790	15.00	20/10/22	1787	16.3	99.8	221020	Pass	14/06/24	MJWM
19	Earthfill	21B	854	10	SILTs	1790	15.00	20/10/22	1757	16.7	98.2	221020	Pass	14/06/24	MJWM
20	Earthfill	21B	854	11	SILTs	1790	15.00	20/10/22	1754	15.3	98.0	221020	Pass	14/06/24	MJWM
21	Earthfill	21A	853	12	SILTs	1790	15.00	20/10/22	1751	14.0	97.8	221020	Pass	14/06/24	MJWM
22	Earthfill	21A	853	13	SILTs	1790	15.00	20/10/22	1847	12.2	103.2	221020	Pass	14/06/24	MJWM
23	Earthfill	21A	853	14	SILTs	1790	15.00	20/10/22	1753	13.8	97.9	221020	Pass	14/06/24	MJWM
24	Earthfill	21A	852	15	SILTs	1790	15.00	20/10/22	1725	13.9	96.4	221020	Pass	14/06/24	MJWM
25	Earthfill	21A	852	16	SILTs	1790	15.00	20/10/22	1713	13.5	95.7	221020	Pass	14/06/24	MJWM
26	Earthfill	21A	852	17	SILTs	1790	15.00	20/10/22	1709	15.1	95.5	221020	Pass	14/06/24	MJWM
27	Earthfill	21A	843	18	SILTs	1790	15.00	20/10/22	1851	11.6	103.4	221020	Pass	14/06/24	MJWM
28	Earthfill	21A	843	19	SILTs	1790	15.00	20/10/22	1828	9.9	102.1	221020	Pass	14/06/24	MJWM
29	Earthfill	21A	843	20	SILTs	1790	15.00	20/10/22	1820	9.7	101.7	221020	Pass	14/06/24	MJWM
30	Earthfill	21A	844	21	SILTs	1790	15.00	20/10/22	1814	10.8	101.3	221020	Pass	14/06/24	MJWM
31	Earthfill	21A	844	22	SILTs	1790	15.00	20/10/22	1843	11.8	103.0	221020	Pass	14/06/24	MJWM
32	Earthfill	21A	848	1	SILTs	1790	15.00	15/11/22	1817	13.8	101.5	221115	Pass	14/06/24	MJWM
33	Earthfill	21A	848	2	SILTs	1790	15.00	15/11/22	1770	11.9	98.9	221115	Pass	14/06/24	MJWM
34	Earthfill	21A	848	3	SILTs	1790	15.00	15/11/22	1786	12.4	99.8	221115	Pass	14/06/24	MJWM

35	Earthfill	21A	849	4	SILTs	1790	15.00	15/11/22	1736	14.1	97.0	221115	Pass	14/06/24	MJWM
36	Earthfill	21A	849	5	SILTs	1790	15.00	15/11/22	1779	13.6	99.4	221115	Pass	14/06/24	MJWM
37	Earthfill	21A	849	6	SILTs	1790	15.00	15/11/22	1733	12.6	96.8	221115	Pass	14/06/24	MJWM
38	Earthfill	21A	842	7	SILTs	1790	15.00	15/11/22	1811	14.2	101.2	221115	Pass	14/06/24	MJWM
39	Earthfill	21A	842	8	SILTs	1790	15.00	15/11/22	1797	13.9	100.4	221115	Pass	14/06/24	MJWM
40	Earthfill	21A	842	9	SILTs	1790	15.00	15/11/22	1842	15.3	102.9	221115	Pass	14/06/24	MJWM
41	Earthfill	21A	841	10	SILTs	1790	15.00	15/11/22	1786	15.5	99.8	221115	Pass	14/06/24	MJWM
42	Earthfill	21A	841	11	SILTs	1790	15.00	15/11/22	1782	16.0	99.6	221115	Pass	14/06/24	MJWM
43	Earthfill	21A	841	12	SILTs	1790	15.00	15/11/22	1722	15.8	96.2	221115	Pass	14/06/24	MJWM
44	Earthfill	21A	840	13	SILTs	1790	15.00	15/11/22	1875	15.7	104.7	221115	Pass	14/06/24	MJWM
45	Earthfill	21A	840	14	SILTs	1790	15.00	15/11/22	1776	17.1	99.2	221115	Pass	14/06/24	MJWM
46	Earthfill	21A	840	15	SILTs	1790	15.00	15/11/22	1827	16.2	102.1	221115	Pass	14/06/24	MJWM
47	Earthfill	21A	839	16	SILTs	1790	15.00	15/11/22	1877	14.1	104.9	221115	Pass	14/06/24	MJWM
48	Earthfill	21A	839	17	SILTs	1790	15.00	15/11/22	1737	15.9	97.0	221115	Pass	14/06/24	MJWM
49	Earthfill	21A	839	18	SILTs	1790	15.00	15/11/22	1775	12.7	99.2	221115	Pass	14/06/24	MJWM
50	Earthfill	21A	838	19	SILTs	1790	15.00	15/11/22	1715	14.8	95.8	221115	Pass	14/06/24	MJWM
51	Earthfill	21A	838	20	SILTs	1790	15.00	15/11/22	1832	13.8	102.3	221115	Pass	14/06/24	MJWM
52	Earthfill	21A	838	21	SILTs	1790	15.00	15/11/22	1777	17.3	99.3	221115	Pass	14/06/24	MJWM
53	Earthfill	21B	829	1	Clay SILTS	1790	15.00	11/11/22	1713	17.9	95.7	221117	Pass	17/06/24	MJWM
54	Earthfill	21B	830	2	Clay SILTS	1790	15.00	11/11/22	1721	17.1	96.1	221117	Pass	17/06/24	MJWM
55	Earthfill	21B	830	3	Clay SILTS	1790	15.00	11/11/22	1713	18.7	95.7	221117	Pass	17/06/24	MJWM
56	Earthfill	21B	830	4	Clay SILTS	1790	15.00	11/11/22	1745	17.1	97.5	221117	Pass	17/06/24	MJWM
57	Earthfill	21A	832	5	Clay SILTS	1790	15.00	11/11/22	1743	18.3	97.4	221117	Pass	17/06/24	MJWM
58	Earthfill	21A	832	6	Clay SILTS	1790	15.00	11/11/22	1717	19.0	95.9	221117	Pass	17/06/24	MJWM
59	Earthfill	21B	830	7	Clay SILTS	1790	15.00	11/11/22	1757	17.5	98.2	221117	Pass	17/06/24	MJWM
60	Earthfill	21B	830	8	Clay SILTS	1790	15.00	11/11/22	1751	17.6	97.8	221117	Pass	17/06/24	MJWM
61	Earthfill	21B	830	9	Clay SILTS	1790	15.00	11/11/22	1713	18.3	95.7	221117	Pass	17/06/24	MJWM
62	Earthfill	21B	829	10	Clay SILTS	1790	15.00	11/11/22	1814	16.6	101.3	221117	Pass	17/06/24	MJWM
63	Earthfill	23	1009	11	Clay SILTS	1790	15.00	11/11/22	1770	14.3	98.9	221117	Pass	17/06/24	MJWM
64	Earthfill	23	1009	12	Clay SILTS	1790	15.00	11/11/22	1726	15.6	96.4	221117	Pass	17/06/24	MJWM
65	Earthfill	23	1009	13	Clay SILTS	1790	15.00	11/11/22	1733	46.6	96.8	221117	Pass	17/06/24	MJWM
66	Earthfill	23	1010	14	Clay SILTS	1790	15.00	11/11/22	1766	15.1	98.7	221117	Pass	17/06/24	MJWM
67	Earthfill	23	1010	15	Clay SILTS	1790	15.00	11/11/22	1737	16.0	97.0	221117	Pass	17/06/24	MJWM
68	Earthfill	23	1010	16	Clay SILTS	1790	15.00	11/11/22	1839	14.2	102.7	221117	Pass	17/06/24	MJWM
69	Earthfill	23	1010	17	Clay SILTS	1790	15.00	11/11/22	1876	15.0	104.8	221117	Pass	17/06/24	MJWM
70	Earthfill	23	1011	18	Clay SILTS	1790	15.00	11/11/22	1786	16.4	99.8	221117	Pass	17/06/24	MJWM
71	Earthfill	23	1011	19	Clay SILTS	1790	15.00	11/11/22	1772	12.7	99.0	221117	Pass	17/06/24	MJWM

72	Earthfill	23	1011	20	Clay SILTS	1790	15.00	11/11/22	1776	18.2	99.2	221117	Pass	17/06/24	MJWM
73	Earthfill	21B	831	1	Clay SILTS	1790	15.00	22/11/22	1794	13.5	100.2	221122	Pass	17/06/24	MJWM
74	Earthfill	21A	832	2	Clay SILTS	1790	15.00	22/11/22	1716	20.9	95.9	221122	Pass	17/06/24	MJWM
75	Earthfill	21A	832	3	Clay SILTS	1790	15.00	22/11/22	1769	14.9	98.8	221122	Pass	17/06/24	MJWM
76	Earthfill	21B	832	4	Clay SILTS	1790	15.00	22/11/22	1725	14.7	96.4	221122	Pass	17/06/24	MJWM
77	Earthfill	21B	830	5	Clay SILTS	1790	15.00	22/11/22	1790	16.2	100.0	221122	Pass	17/06/24	MJWM
78	Earthfill	21B	830	6	Clay SILTS	1790	15.00	22/11/22	1820	15.4	101.7	221122	Pass	17/06/24	MJWM
79	Earthfill	21B	829	7	Clay SILTS	1790	15.00	22/11/22	1722	17.9	96.2	221122	Pass	17/06/24	MJWM
80	Earthfill	21A	846	100	Sandy SILT	1780	15.00	22/01/24	1757	17.0	98.7	240122	Pass	11/06/24	MJWM
81	Earthfill	21A	846	101	Sandy SILT	1780	15.00	22/01/24	1714	16.4	96.3	240122	Pass	11/06/24	MJWM
82	Earthfill	21A	846	102	Sandy SILT	1780	15.00	22/01/24	1777	15.1	99.8	240122	Pass	11/06/24	MJWM
83	Earthfill	21A	846	103	Sandy SILT	1780	15.00	22/01/24	1751	14.5	98.4	240122	Pass	11/06/24	MJWM
84	Earthfill	21A	847	104	Sandy SILT	1780	15.00	22/01/24	1695	15.2	95.2	240122	Pass	11/06/24	MJWM
85	Earthfill	21A	847	105	Sandy SILT	1780	15.00	22/01/24	1736	16.5	97.5	240122	Pass	11/06/24	MJWM
86	Earthfill	21A	847	106	Sandy SILT	1780	15.00	22/01/24	1749	14.8	98.3	240122	Pass	11/06/24	MJWM
87	Earthfill	21A	847	107	Sandy SILT	1780	15.00	22/01/24	1778	14.8	99.9	240122	Pass	11/06/24	MJWM
88	Earthfill	21A	847	108	Sandy SILT	1780	15.00	22/01/24	1772	15.7	99.6	240122	Pass	11/06/24	MJWM
89	Earthfill	21A	847	109	Sandy SILT	1780	15.00	22/01/24	1701	15.0	95.6	240122	Pass	11/06/24	MJWM
90	Earthfill	21A	846	200	Sandy SILT	1780	15.00	22/01/24	1740	16.6	97.8	240122	Pass	11/06/24	MJWM
91	Earthfill	21A	846	201	Sandy SILT	1780	15.00	22/01/24	1719	16.6	96.6	240122	Pass	11/06/24	MJWM
92	Earthfill	21A	846	202	Sandy SILT	1780	15.00	22/01/24	1725	16.0	96.9	240122	Pass	11/06/24	MJWM
93	Earthfill	21A	846	203	Sandy SILT	1780	15.00	22/01/24	1710	14.8	96.1	240122	Pass	11/06/24	MJWM
94	Earthfill	21A	847	204	Sandy SILT	1780	15.00	22/01/24	1715	14.8	96.3	240122	Pass	11/06/24	MJWM
95	Earthfill	21A	847	205	Sandy SILT	1780	15.00	22/01/24	1696	16.6	95.3	240122	Pass	11/06/24	MJWM
96	Earthfill	21A	847	206	Sandy SILT	1780	15.00	22/01/24	1724	14.8	96.9	240122	Pass	11/06/24	MJWM
97	Earthfill	21A	847	207	Sandy SILT	1780	15.00	22/01/24	1692	15.1	95.1	240122	Pass	11/06/24	MJWM
98	Earthfill	21A	847	208	Sandy SILT	1780	15.00	22/01/24	1776	14.5	99.8	240122	Pass	11/06/24	MJWM
99	Earthfill	21A	847	209	Sandy SILT	1780	15.00	22/01/24	1699	15.3	95.4	240122	Pass	11/06/24	MJWM
100	Earthfill	21A	846	300	Sandy SILT	1780	15.00	22/01/24	1720	14.4	96.6	240122	Pass	11/06/24	MJWM
101	Earthfill	21A	846	301	Sandy SILT	1780	15.00	22/01/24	1721	16.1	96.7	240122	Pass	11/06/24	MJWM
102	Earthfill	21A	846	302	Sandy SILT	1780	15.00	22/01/24	1722	15.7	96.7	240122	Pass	11/06/24	MJWM
103	Earthfill	21A	846	303	Sandy SILT	1780	15.00	22/01/24	1740	15.8	97.8	240122	Pass	11/06/24	MJWM
104	Earthfill	21A	847	304	Sandy SILT	1780	15.00	22/01/24	1692	16.7	95.1	240122	Pass	11/06/24	MJWM
105	Earthfill	21A	847	305	Sandy SILT	1780	15.00	22/01/24	1826	13.7	102.6	240122	Pass	11/06/24	MJWM
106	Earthfill	21A	847	306	Sandy SILT	1780	15.00	22/01/24	1776	17.0	99.8	240122	Pass	11/06/24	MJWM
107	Earthfill	21A	847	307	Sandy SILT	1780	15.00	22/01/24	1763	14.4	99.0	240122	Pass	11/06/24	MJWM
108	Earthfill	21A	847	308	Sandy SILT	1780	15.00	22/01/24	1722	16.0	96.7	240122	Pass	11/06/24	MJWM

109	Earthfill	21A	847	309	Sandy SILT	1780	15.00	22/01/24	1745	15.6	98.0	240122	Pass	11/06/24	MJWM
110	Earthfill	21A	846	400	Sandy SILT	1780	15.00	22/01/24	1742	17.0	97.9	240122	Pass	11/06/24	MJWM
111	Earthfill	21A	846	401	Sandy SILT	1780	15.00	22/01/24	1715	11.4	96.3	240122	Pass	11/06/24	MJWM
112	Earthfill	21A	846	402	Sandy SILT	1780	15.00	22/01/24	1755	17.1	98.6	240122	Pass	11/06/24	MJWM
113	Earthfill	21A	846	403	Sandy SILT	1780	15.00	22/01/24	1692	14.4	95.1	240122	Pass	11/06/24	MJWM
114	Earthfill	21A	847	404	Sandy SILT	1780	15.00	22/01/24	1725	13.4	96.9	240122	Pass	11/06/24	MJWM
115	Earthfill	21A	847	405	Sandy SILT	1780	15.00	22/01/24	1751	14.6	98.4	240122	Pass	11/06/24	MJWM
116	Earthfill	21A	847	406	Sandy SILT	1780	15.00	22/01/24	1804	14.0	101.3	240122	Pass	11/06/24	MJWM
117	Earthfill	21A	847	407	Sandy SILT	1780	15.00	22/01/24	1768	13.7	99.3	240122	Pass	11/06/24	MJWM
118	Earthfill	21A	847	408	Sandy SILT	1780	15.00	22/01/24	1702	14.8	95.6	240122	Pass	11/06/24	MJWM
119	Earthfill	21A	847	409	Sandy SILT	1780	15.00	22/01/24	1808	13.1	101.6	240122	Pass	11/06/24	MJWM
120	Earthfill	21A	840	100	Sandy SILT	1780	15.00	13/02/24	1779	13.5	99.9	240213	Pass	11/06/24	MJWM
121	Earthfill	21A	840	101	Sandy SILT	1780	15.00	13/02/24	1745	13.4	98.0	240213	Pass	11/06/24	MJWM
122	Earthfill	21A	841	102	Sandy SILT	1780	15.00	13/02/24	1761	15.3	98.9	240213	Pass	11/06/24	MJWM
123	Earthfill	21A	841	103	Sandy SILT	1780	15.00	13/02/24	1772	15.7	99.6	240213	Pass	11/06/24	MJWM
124	Earthfill	21B	858	104	Sandy SILT	1780	15.00	13/02/24	1752	13.6	98.4	240213	Pass	11/06/24	MJWM
125	Earthfill	21B	858	105	Sandy SILT	1780	15.00	13/02/24	1701	16.7	95.6	240213	Pass	11/06/24	MJWM
126	Earthfill	21B	859	106	Sandy SILT	1780	15.00	13/02/24	1696	15.0	95.3	240213	Pass	11/06/24	MJWM
127	Earthfill	21B	859	107	Sandy SILT	1780	15.00	13/02/24	1728	13.5	97.1	240213	Pass	11/06/24	MJWM
128	Earthfill	21A	840	200	Sandy SILT	1780	15.00	13/02/24	1768	16.6	99.3	240213	Pass	11/06/24	MJWM
129	Earthfill	21A	840	201	Sandy SILT	1780	15.00	13/02/24	1739	14.1	97.7	240213	Pass	11/06/24	MJWM
130	Earthfill	21A	841	202	Sandy SILT	1780	15.00	13/02/24	1726	16.7	97.0	240213	Pass	11/06/24	MJWM
131	Earthfill	21A	841	203	Sandy SILT	1780	15.00	13/02/24	1699	13.9	95.4	240213	Pass	11/06/24	MJWM
132	Earthfill	21B	858	204	Sandy SILT	1780	15.00	13/02/24	1758	13.4	98.8	240213	Pass	11/06/24	MJWM
133	Earthfill	21B	858	205	Sandy SILT	1780	15.00	13/02/24	1701	16.9	95.6	240213	Pass	11/06/24	MJWM
134	Earthfill	21B	859	206	Sandy SILT	1780	15.00	13/02/24	1699	13.7	95.4	240213	Pass	11/06/24	MJWM
135	Earthfill	21A	840	300	Sandy SILT	1780	15.00	13/02/24	1773	15.1	99.6	240213	Pass	11/06/24	MJWM
136	Earthfill	21A	840	301	Sandy SILT	1780	15.00	13/02/24	1721	13.7	96.7	240213	Pass	11/06/24	MJWM
137	Earthfill	21A	841	302	Sandy SILT	1780	15.00	13/02/24	1706	16.1	95.8	240213	Pass	11/06/24	MJWM
138	Earthfill	21A	841	303	Sandy SILT	1780	15.00	13/02/24	1752	14.2	98.4	240213	Pass	11/06/24	MJWM
139	Earthfill	21B	858	304	Sandy SILT	1780	15.00	13/02/24	1694	15.5	95.2	240213	Pass	11/06/24	MJWM
140	Earthfill	21B	859	305	Sandy SILT	1780	15.00	13/02/24	1715	13.9	96.3	240213	Pass	11/06/24	MJWM
141	Earthfill	23	1014	1	Sandy SILT	1790	15.00	30/05/24	1871	12.4	104.5	240530	Pass	11/06/24	MJWM
142	Earthfill	23	1014	2	Sandy SILT	1790	15.00	22/01/24	1840	13.3	102.8	240530	Pass	11/06/24	MJWM
143	Earthfill	23	1013	3	Sandy SILT	1790	15.00	22/01/24	1827	12.6	102.1	240530	Pass	11/06/24	MJWM
144	Earthfill	23	1013	4	Sandy SILT	1790	15.00	22/01/24	1825	13.1	102.0	240530	Pass	11/06/24	MJWM
145	Earthfill	23	1008	5	Sandy SILT	1790	15.00	22/01/24	1796	17.4	100.3	240530	Pass	11/06/24	MJWM

146	Earthfill	23	1008	6	Sandy SILT	1790	15.00	22/01/24	1894	12.8	105.8	240530	Pass	11/06/24	MJWM
147	Earthfill	23	1007	7	Sandy SILT	1790	15.00	22/01/24	1764	13.3	98.5	240530	Pass	11/06/24	MJWM
148	Earthfill	23	1007	8	Sandy SILT	1790	15.00	22/01/24	1739	13.9	97.2	240530	Pass	11/06/24	MJWM
149	Earthfill	23	989	9	Sandy SILT	1790	15.00	22/01/24	1783	17.0	99.6	240530	Pass	11/06/24	MJWM
150	Earthfill	24	988	10	Sandy SILT	1790	15.00	22/01/24	1779	18.9	99.4	240530	Pass	11/06/24	MJWM
151	Earthfill	24	988	11	Sandy SILT	1790	15.00	22/01/24	1767	18.6	98.7	240530	Pass	11/06/24	MJWM
152	Earthfill	24	988	12	Sandy SILT	1790	15.00	22/01/24	1800	17.2	100.6	240530	Pass	11/06/24	MJWM
153	Earthfill	24	972	13	Sandy SILT	1790	15.00	22/01/24	1703	19.9	95.1	240530	Pass	11/06/24	MJWM
154	Earthfill	24	972	14	Sandy SILT	1790	15.00	22/01/24	1812	16.3	101.2	240530	Pass	11/06/24	MJWM
155	Earthfill	24	972	15	Sandy SILT	1790	15.00	22/01/24	1781	19.0	99.5	240530	Pass	11/06/24	MJWM
156	Earthfill	24	971	16	Sandy SILT	1790	15.00	22/01/24	1808	17.5	101.0	240530	Pass	11/06/24	MJWM
157	Earthfill	24	971	17	Sandy SILT	1790	15.00	22/01/24	1801	16.9	100.6	240530	Pass	11/06/24	MJWM
158	Earthfill	24	971	18	Sandy SILT	1790	15.00	22/01/24	1787	16.9	99.8	240530	Pass	11/06/24	MJWM
159	Earthfill	23		1	Sandy SILT	1780	15.00	31/05/24	1739	15.7	97.7	240531	Pass	11/06/24	MJWM
160	Earthfill	23		2	Sandy SILT	1780	15.00	31/05/24	1739	14.8	97.7	240531	Pass	11/06/24	MJWM
161	Earthfill	23		3	Sandy SILT	1780	15.00	31/05/24	1712	17.0	96.2	240531	Pass	11/06/24	MJWM
162	Earthfill	23	1013	4	Sandy SILT	1780	15.00	31/05/24	1738	15.8	97.6	240531	Pass	11/06/24	MJWM
163	Earthfill	23	1013	5	Sandy SILT	1780	15.00	31/05/24	1701	16.5	95.6	240531	Pass	11/06/24	MJWM
164	Earthfill	23	1013	6	Sandy SILT	1780	15.00	31/05/24	1849	13.9	103.9	240531	Pass	11/06/24	MJWM
165	Earthfill	23	1008	7	Sandy SILT	1780	15.00	31/05/24	1761	14.4	98.9	240531	Pass	11/06/24	MJWM
166	Earthfill	23	1008	8	Sandy SILT	1780	15.00	31/05/24	1739	17.2	97.7	240531	Pass	11/06/24	MJWM
167	Earthfill	23	1008	9	Sandy SILT	1780	15.00	31/05/24	1784	16.2	100.2	240531	Pass	11/06/24	MJWM
168	Earthfill	23	1007	10	Sandy SILT	1780	15.00	31/05/24	1821	16.2	102.3	240531	Pass	11/06/24	MJWM
169	Earthfill	23	1007	11	Sandy SILT	1780	15.00	31/05/24	1797	17.7	101.0	240531	Pass	11/06/24	MJWM
170	Earthfill	23	1007	12	Sandy SILT	1780	15.00	31/05/24	1719	16.7	96.6	240531	Pass	11/06/24	MJWM
171	Earthfill	23	1012	13	Sandy SILT	1780	15.00	31/05/24	1765	17.1	99.2	240531	Pass	11/06/24	MJWM
172	Earthfill	23	1012	14	Sandy SILT	1780	15.00	31/05/24	1833	17.0	103.0	240531	Pass	11/06/24	MJWM
173	Earthfill	23	1009	15	Sandy SILT	1780	15.00	31/05/24	1859	16.5	104.4	240531	Pass	11/06/24	MJWM
174	Earthfill	23	1005	16	Sandy SILT	1780	15.00	31/05/24	1846	16.7	103.7	240531	Pass	11/06/24	MJWM
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Nuclear Density Report

MAUGERS CONTRACTING

Site Tested	Rosemerryn Stg 20	Material Sample ID	CAN20S-07340
Tested By	Jason Daikee	MDD Method	Back Scatter
Date Tested	20-Oct-22	Max Dry Density	1790
Time Tested	115	Min Dry Density (kg/m3)	
Material Tested	Silt	Solid Density Type	Assumed
Material Source	On Site		

Site No	Layer	Moisture (%)	Wet Density (kg/m3)	Dry Density (kg/m3)	Relative Compaction (%)
1	1	11.8	1958	1751	97.8
2		15.2	2001	1737	97
3		11.5	1947	1746	97.5
4		13.5	1994	1757	98.2
5		12.8	1985	1760	98.3
6		16.3	2061	1772	99.0
7		13.8	1950	1713	95.7
8		14.3	1956	1711	95.6
9		16.3	2079	1787	99.9
10		16.7	2049	1757	98.1
11		15.3	2022	1754	98
12		14	1997	1751	97.8
13		12.2	2072	1847	103.2
14		13.8	1994	1753	97.9
15		13.9	1964	1725	96.3
16		13.5	1945	1713	95.7
17		15.1	1968	1709	95.5
18		11.6	2065	1851	103.4
19		9.9	2008	1828	102.1
20		9.7	1996	1820	101.7
21		10.8	2010	1814	101.3
22		11.8	2062	1843	103

NB: Please attach a copy of the SITE PLAN indicating the site Nos location.


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Nuclear Density Report

MAUGERS CONTRACTING

Site Tested	Rosemerryn	Material Sample ID	CAN20S-07340
Tested By	Jason Daikee	MDD Method	Back Scatter
Date Tested	15-Nov-22	Max Dry Density	1790
Time Tested	1030	Min Dry Density (kg/m3)	
Material Tested	Silts	Solid Density Type	Assumed
Material Source	On Site		

Site No	Layer	Moisture (%)	Wet Density (kg/m3)	Dry Density (kg/m3)	Relative Compaction (%)
1	1	13.8	2067	1817	101.5
2	1	11.9	1981	1770	98.9
3	1	12.4	208	1786	99.8
4	1	14.1	1981	1736	97
5	1	13.6	2021	1779	99.4
6	1	12.6	1951	1733	96.8
7	1	14.2	2068	1811	101.2
8	1	13.9	2047	1797	100.4
9	1	15.3	2124	1842	102.9
10	1	15.5	2063	1786	99.8
11	1	16	2068	1782	99.6
12	1	15.8	1993	1722	96.2
13	1	15.7	2169	1875	104.8
14	1	17.1	2081	1776	99.2
15	1	16.2	2123	1827	102.1
16	1	14.1	2142	1877	104.9
17	1	15.9	2013	1737	97
18	1	12.7	2001	1775	99.2
19	1	14.8	1969	1715	95.8
20	1	13.8	2085	1832	102.4
21	1	17.3	2084	1777	99.3

NB: Please attach a copy of the SITE PLAN indicating the site Nos location.

Site No	Layer	Moisture (%)	Wet Density (kg/m3)	Dry Density (kg/m3)	Relative Compaction (%)


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Nuclear Density Report

MAUGERS CONTRACTING

Site Tested	Rosemerryn	Material Sample ID	
Tested By	Jason Daikee	MDD Method	Back Scatter
Date Tested	17-Nov-22	Max Dry Density	1790
Time Tested	1130	Min Dry Density (kg/m3)	
Material Tested	clay silts	Solid Density Type	Assumed
Material Source			

Site No	Layer	Moisture (%)	Wet Density (kg/m3)	Dry Density (kg/m3)	Relative Compaction (%)
1	1	17.9	2020	1713	95.7
2		17.1	2017	1721	96.2
3		18.7	2034	1713	95.7
4		17.1	2045	1745	7.5
5		18.3	2062	1743	97.4
6	2	19.0	2043	1717	95.9
7		17.5	2064	1757	98.2
8		17.6	2060	1751	97.8
9		18.3	2027	1713	95.7
10		16.6	2115	1814	101.3
11	1	14.3	2023	1770	98.9
12	1	15.6	1996	1726	96.4
13	1	16.6	2020	1733	96.8
14	1	15.1	2033	1766	98.7
15	1	16.0	2015	1737	97.0
16	1	14.2	2099	1839	102.7
17	1	15.0	2163	1876	104.8
18	1	16.4	2078	1786	99.8
19	1	12.7	1997	1772	99.0
20	1	18.2	2099	1776	99.2

NB: Please attach a copy of the SITE PLAN indicating the site Nos location.


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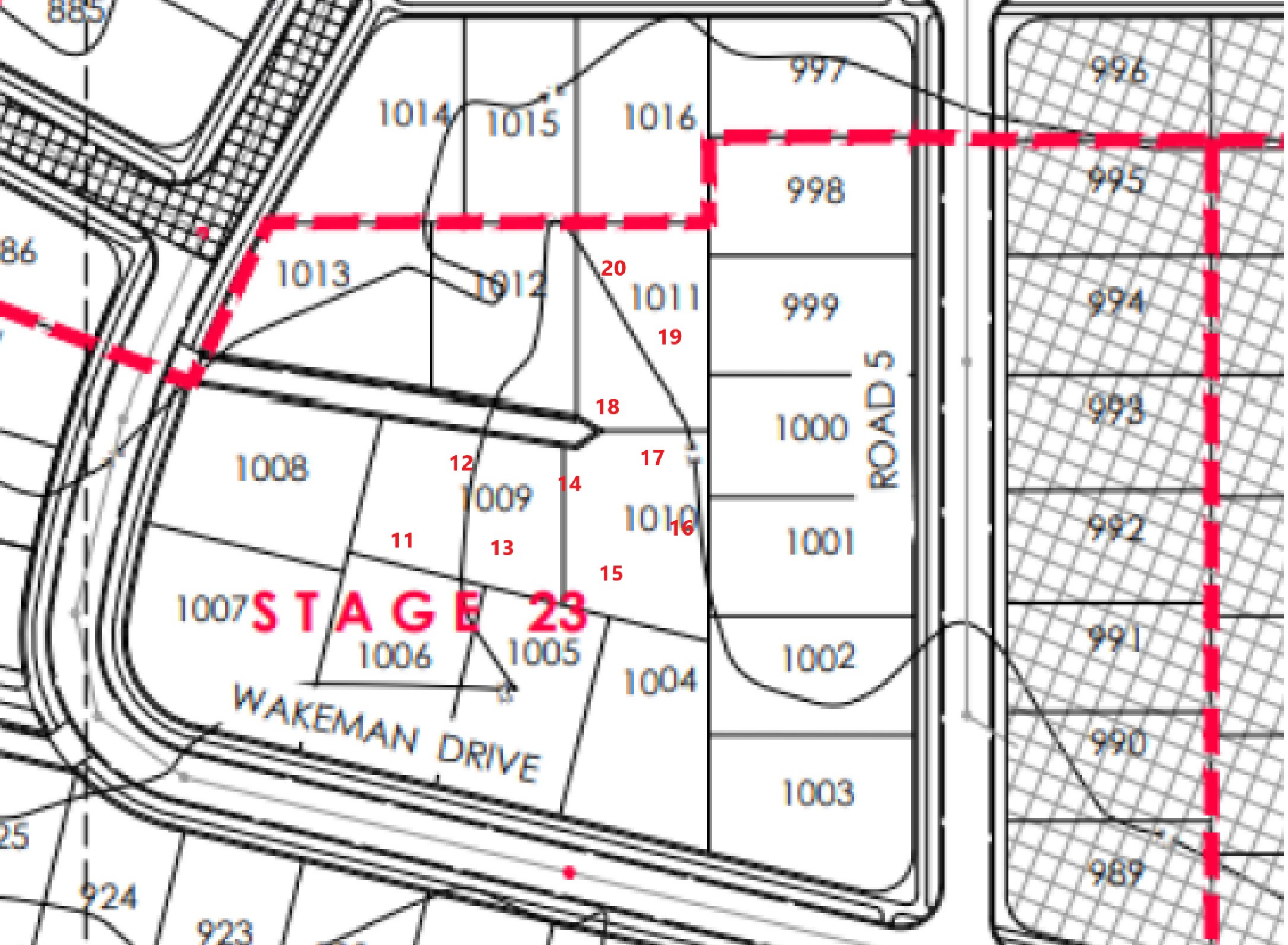
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Nuclear Density Report

MAUGERS CONTRACTING

Site Tested	Rosemerryn	Material Sample ID	
Tested By	Jason Daikee	MDD Method	Back Scatter
Date Tested	22-Nov-22	Max Dry Density	1790
Time Tested	100	Min Dry Density (kg/m3)	
Material Tested	clay silts	Solid Density Type	Assumed
Material Source			

Site No	Layer	Moisture (%)	Wet Density (kg/m3)	Dry Density (kg/m3)	Relative Compaction (%)
1	3	13.5	2036	1794	100.2
2	3	20.9	2075	1716	95.9
3	3	14.9	2032	1769	98.8
4	3	14.7	1979	1725	96.4
5	3	16.2	2079	1790	100.0
6	3	15.4	2100	1820	101.7
7	3	17.9	2030	1722	96.2

NB: Please attach a copy of the SITE PLAN indicating the site Nos location.


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NUCLEAR DENSITY TEST REPORT

Client: DAVIE LOVELL-SMITH **Date tested :** 22&23/01/2024

Site: *ROSEMERRYN*

Test Materia Stily FINE SAND

Pond Backfill

Target Density is 95% of MDD

Target Dry Density : 1691 (kg/m^3) Lab. MDD 1780 kg/m^3

Test ID	RL	Dry Density (kg/m^3)	W. Content (%)	(%) of MDD	Air Voids (%)	Comments/Location (see plan)
100		1757	17.0	98.7	PASS	1ST LIFT
101		1714	16.4	96.3	PASS	
102		1777	15.1	99.8	PASS	
103		1751	14.5	98.4	PASS	
104		1695	15.2	95.2	PASS	
105		1735	16.5	97.5	PASS	
106		1749	14.8	98.3	PASS	
107		1778	14.8	99.9	PASS	
108		1772	15.7	99.6	PASS	
109		1701	15.0	95.6	PASS	
200		1740	16.6	97.8	PASS	
201		1719	16.6	96.6	PASS	2DN LIFT
202		1725	16.0	96.9	PASS	
203		1710	14.8	96.1	PASS	
204		1715	14.8	96.3	PASS	
205		1696	16.6	95.3	PASS	
206		1724	14.8	96.9	PASS	
207		1692	15.1	95.1	PASS	
208		1776	14.5	99.8	PASS	
209		1699	15.3	95.4	PASS	
300		1720	14.4	96.6	PASS	3RD LIFT
301		1721	16.1	96.7	PASS	
302		1722	15.7	96.7	PASS	
303		1740	15.8	97.8	PASS	
304		1692	16.7	95.1	PASS	
305		1826	13.7	102.6	PASS	
306		1776	17.0	99.8	PASS	
307		1763	14.4	99.0	PASS	
308		1722	16.0	96.7	PASS	
309		1745	15.6	98.0	PASS	
Average Values:		**1735**	**15.5**	**97.5**		

This report does not confirm acceptance of the fill material by a 3rd party & is a sample of the soil properties on the day of test only.

Tested by: KF Checked by: BT

Entered by: KF

NUCLEAR DENSITY TEST REPORT

Client: DAVIE LOVELL-SMITH **Date tested :** 22&23/01/2024

Site: *ROSEMERRYN*

Test Materia Stily FINE SAND

Target Density is 95% of MDD

Target Dry Density : 1691 (kg/m^3) Lab. MDD 1780 kg/m^3

Test ID	RL	Dry Density (kg/m^3)	W. Content (%)	(%) of MDD	Air Voids (%)	Comments/Location (see plan)
400		1742	17.0	97.9	PASS	4TH LIFT
401		1715	11.4	96.3	PASS	
402		1755	17.1	98.6	PASS	
403		1692	14.4	95.1	PASS	
404		1725	13.4	96.9	PASS	
405		1751	14.6	98.4	PASS	
406		1804	14.0	101.3	PASS	
407		1768	13.7	99.3	PASS	
408		1702	14.8	95.6	PASS	
409		1808	13.1	101.6	PASS	
Average Values:		**1746**	**14.4**	**98.1**		

This report does not confirm acceptance of the fill material by a 3rd party & is a sample of the soil properties on the day of test only.

Tested by: KF Checked by: BT

Entered by: KF

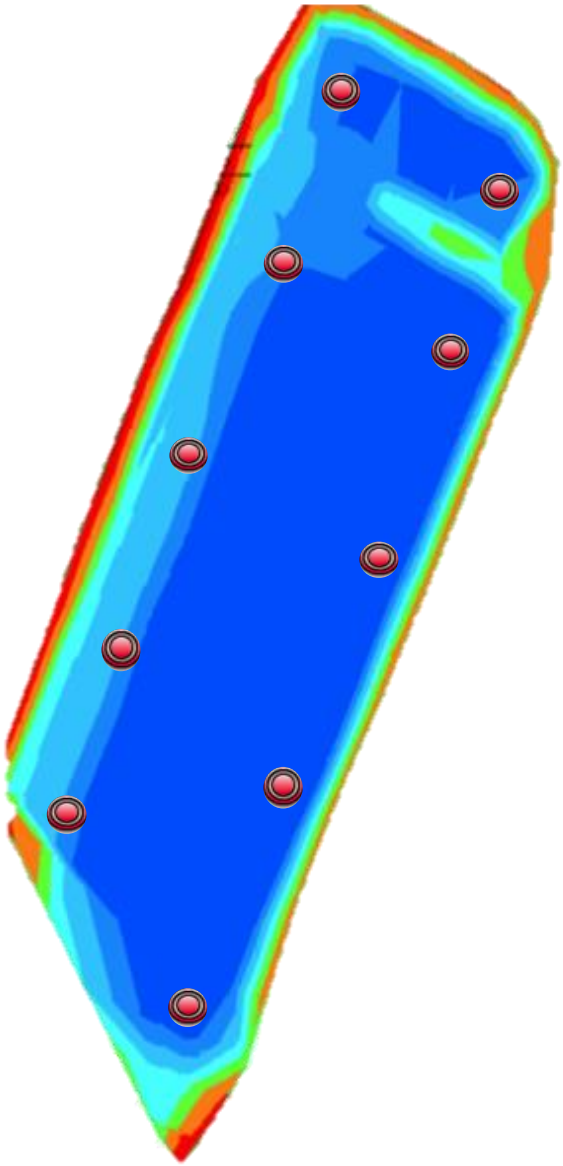
NUCLEAR DENSITY TEST REPORT

Clier DAVIE LOVELL-SMITH **Date tested :** 22&23/01/2024

Site: *ROSEMERRYN*

Test Material: Stily FINE SAND

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	−0.74	−0.50	7.06	
2	−0.50	−0.25	30.84	
3	−0.25	0.00	69.70	
4	0.00	0.20	64.66	
5	0.20	0.40	89.81	
6	0.40	0.60	168.59	
7	0.60	0.80	161.71	
8	0.80	1.04	597.36	



Entered by: KF Checked by: BT

NUCLEAR DENSITY TEST REPORT

Clier DAVIE LOVELL-SMITH **Date tested :** 22&23/01/2024

Site: *ROSEMERRYN*

Test Material: Stily FINE SAND

NUCLEAR DENSITY TEST REPORT

Client: DAVIE LOVELL-SMITH **Date tested :** 13-14/02/2024

Site: *ROSEMERRYN*

Test Materia Stily FINE SAND

Strip Backfill on LOTs 840,841,858&859

Target Density is 95% of MDD

Target Dry Density : 1691 (kg/m^3) Lab. MDD 1780 kg/m^3

Test ID	RL	Dry Density (kg/m^3)	W. Content (%)	(%) of MDD	Air Voids (%)	Comments/Location (see plan)
100		1779	13.5	99.9	PASS	1ST LIFT
101		1745	13.4	98.0	PASS	
102		1761	15.3	98.9	PASS	
103		1772	15.7	99.6	PASS	
104		1752	13.6	98.4	PASS	
105		1701	16.7	95.6	PASS	
106		1696	15.0	95.3	PASS	
107		1728	13.5	97.1	PASS	
200		1768	16.6	99.3	PASS	2ND LIFT
201		1737	14.1	97.6	PASS	
202		1726	16.7	97.0	PASS	
203		1699	13.9	95.4	PASS	
204		1758	13.4	98.8	PASS	
205		1701	16.9	95.6	PASS	
206		1699	13.7	95.4	PASS	
300		1773	15.1	99.6	PASS	3RD LIFT
301		1721	13.7	96.7	PASS	
302		1706	16.1	95.8	PASS	
303		1752	14.2	98.4	PASS	
304		1694	15.5	95.2	PASS	
305		1715	13.9	96.3	PASS	
Average Values:		**1733**	**14.8**	**97.3**		

This report does not confirm acceptance of the fill material by a 3rd party & is a sample of the soil properties on the day of test only.

Tested by: KF Checked by: BT

Entered by: KF

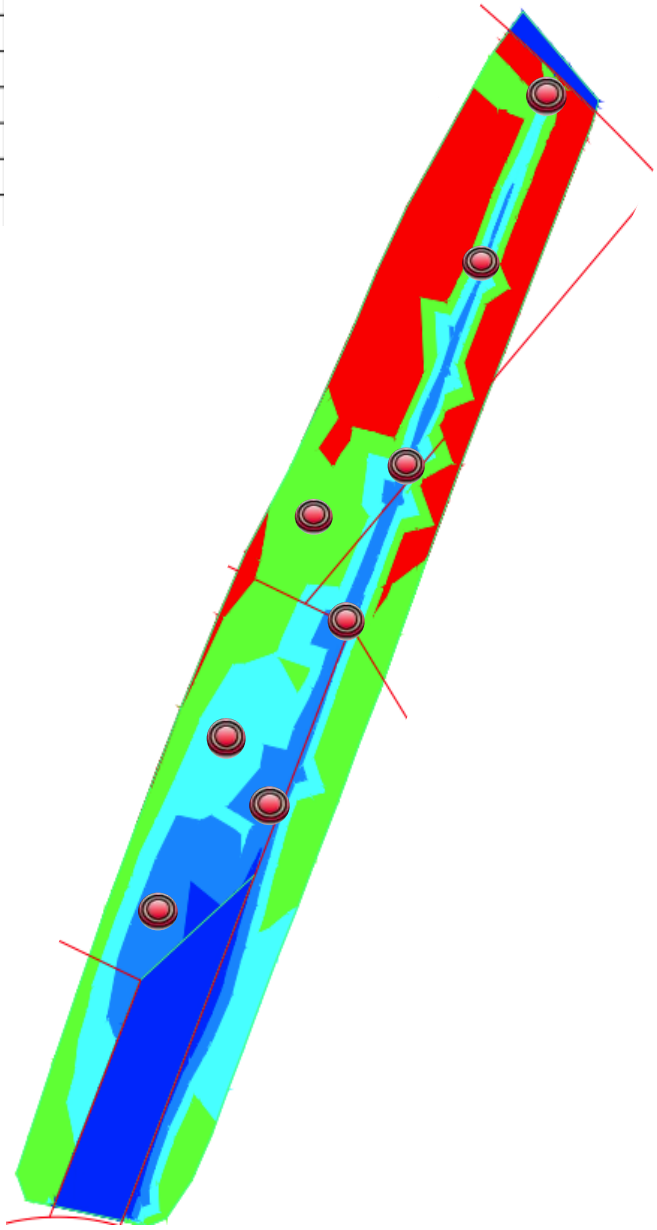
NUCLEAR DENSITY TEST REPORT

Clier **Date tested :** 13-14/02/2024

Site: *ROSEMERRYN*

Test Material: Stily FINE SAND

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-0.28	0.00	140.64	
2	0.00	0.20	188.25	
3	0.20	0.40	159.36	
4	0.40	0.60	104.12	
5	0.60	0.86	24.11	



Entered by: KF Checked by: BT

NUCLEAR DENSITY TEST REPORT

Clier **Date tested :** 13-14/02/2024

Site: *ROSEMERRYN*

Test Material: Stily FINE SAND

Entered by: KF Checked by: BT

Earthworks – NZS4431:1989 Certification

APPENDIX A

STATEMENT OF SUITABILITY OF EARTHFILL
FOR RESIDENTIAL DEVELOPMENT

To **Selwyn District Council**
PO Box 90
ROLLESTON, 7643
Attention: Development Engineer

STATEMENT OF SUITABILITY OF EARTH FILL FOR RESIDENTIAL DEVELOPMENT

Rosemerryn Stage 21A
Fulton Hogan Ltd
Rosemerryn, Guinevere Drive, Lincoln

The earthfill shown on the attached plan Rosemerryn Stage 21A – Earthfill Asbuilt H.20764.AB.EF01 has been placed in compliance with the terms of NZS 4431:1989.

While work was in progress I retained as my inspecting engineer (or staff under his control) the engineer named below who is registered in terms of the Engineers Registration Act 1924.

Andy Hall (Registration Number 246334)

Address: **C/- Davie, Lovell-Smith Limited, PO Box 679, Christchurch**

During the work, the inspecting engineer or staff under his control made periodic visits of inspection to the site as detailed in this report, Contract 20764-001. Details of the soil testing carried out to check the quality of the fill by the inspecting engineer and his testing agency are also included.

The plan Rosemerryn Stage 21A – Earthfill Asbuilt H.20764.AB.EF01 shows the building lots within the Subdivision site which are affected by filling.

In the opinion of the inspecting engineer the following special limitations should be observed:

- Foundation design in all filled lots to take into account the location of the cut/fill interface (to be confirmed on site) and design appropriately.
- This report deals with the fill material only, not the underlying existing material.

This certification, that the earth fills have been placed in compliance with the terms of NZS:4431 does not remove the necessity for the normal inspection and design of foundations as would be made in natural ground.

.....
Chartered Professional Engineer

on behalf of: Fulton Hogan Limited Date: 14 May 2024

Earthworks – Earthfill As-built plans

1. This plan has been prepared for earth fill asbuilt purposes only. No liability is accepted if the plan is used for any other purpose.
2. Any measurements taken from information which is not dimensioned on the electronic copy are at the risk of the recipient.

LEGEND

CONTOURS SHOWN ARE APPROXIMATELY CUT (-ve) AND FILL (+ve) AT 0.1m INTERVALS.

CUT

ASBUILT FILL ≥ 0.2m

ASBUILT KERB

ASBUILT FOOTPATH

DAVIE LOVELL-SMITH

PLANNING SURVEYING ENGINEERING

Rosemerryn - Stage 21A

Earthfill Asbuilt

Asbuilt

1:500@A1
1:1000@A3

June 2024

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