PO Box 28057
Havelock North
New Zealand
Tel: +64 6 877 1652

Our Ref: L220008-01

26 July 2022

Dawson Group NZ Ltd
dgroupnz@gmail.com

CONSTRUCTION MONITORING ON CUT TO FILL BUILDING PLATFORMS FOR STAGE 1 OF THE 250-280 DURHAM DRIVE SUBDIVISION, HAVELOCK NORTH.

INTRODUCTION

Dawson Group NZ Ltd engaged Resource Development Consultants Ltd (RDCL) to undertake construction monitoring services and provide foundation recommendations for building consent for four (4) cut / fill building platforms for Stage 1of the 250-280 Durham Drive Subdivision, Havelock North. Stage 1 comprises of Lots 2, 3, 4, & 5.

Legal description of the site is LOT 1 DP 538020 and the subdivision consent number with Hastings District Council (HDC) is RMA20210510.

EXTENT OF COVER

This letter covers:

- Construction monitoring & verification for building consent; comprising:
- Certifications of building platform cuts; and
- Certification of engineered fill; based on:
  - Field Nuclear Density Meter compaction test results.
- Issue of HDC Form 6 "Statement of Professional Opinion as to Suitability of Land for Building Development" for the building platforms.
- Issue Completion Report and HDC compliant certificates for building consent.

EXCLUSIONS

- Confirmation of any structural aspects as they relate to this project; and
- Engineering sign off for the access.

PREVIOUS INVESTIGATIONS

RDCL previously completed a geotechnical investigation for the development as described in RDCL Report R-182900602-02 issued 24 May 2021 to Casper 2016.

RDCL subsequently approved the geotechnical suitability of the proposed earthworks and recommended setbacks in RDCL Letter 182900602-03 to Casper2016 Ltd.

STATEMENT OF SUITABILITY

We verify the four (4) cut to fill building platforms for Stage 1 of the 250-280 Durham Drive Subdivision, Havelock North (Lots 2, 3, 4, & 5) have been constructed in accordance with RDCL report R-182900602-02 and RDCL letter 182900602-03, for the following conditions:

- Topsoil, non-engineered fill, landslide debris, and organic material were stripped from platforms;
- Ultimate Bearing Capacity (UBC) of 300 kPa at base of excavations;
- Appropriate surface preparations for fill placement;
- Fill placement in accordance with relevant standards and RDCL geotechnical recommendations; and
- Cut and fill slope angles conform with geotechnical recommendations.

Conditions of Building Consent are as follows:

- Typical foundations in accordance with NZS3604:2011;
  - Underlain by 300kPa UBC at depths achieved within each Lot specified in Table 2 of this report; and
  - At a level clear of topsoil and non-engineered fill.
- Geotechnical setbacks are as follows:
  - 3.0 m setback from the toe of the slope for Lot 4; and
  - 5.0 m setbacks from the crest of the fill batters for all the Lots.
- Further Geotechnical involvement is required to:
  - Inspect foundation excavations to confirm ground conditions as expected; and
  - Confirm building footprints are in accordance with setbacks this report.

CONSTRUCTION MONITORING

RDCL inspected the site to verify:

- Topsoil, deleterious material (residual soil), and organic materials are stripped from the excavation base;
- 300 kPa UBC available on cut ground, under engineered fill;
- Non-engineered fill including buried topsoil below non-engineered fill and landslide debris was removed;
- Appropriate surface preparations (keyways) for fill placement;
- Fill placement in accordance with relevant standards and RDCL geotechnical recommendations; and
- Cut and fill slope angles were in general accordance with geotechnical recommendations.

FILL COMPACTION TESTING

Fergusson Contracting Ltd compacted site-won silty CLAY to build out the platforms. RDCL completed NDM compaction testing every 0.5-1.0 m lift (Reports in Appendix A). A run-down of compaction test results are provided in Table 2:

TABLE 1 - NDM COMPACTION TEST RESULTS

Location	Lift level (approx.)	Number of tests	Compaction (% of MDD)
Lot 2	1.0 m	4	104
	2.0 m	4	104
	Final level	6	97
Lot 3	0.5 m	3	102
	Final level	5	98
Lot 3 Extension	0.5 m	3	101
	Final level	2	100
Lot 4	1.0 m	2	98
	2.0 m	6	102
	3.0 m	5	101
	Final level	6	98
Lot 5	0.5 m	4	98
	1.0 m	4	99
	2.0 m	5	98
	3.5 m	6	96
	Final level	9	98
Lot 5 Extension	1.0 m	2	95
	Final level	3	97

- Earthworks and compaction for the proposed building foundations have been undertaken under the engineering control of RDCL in accordance with:
- Geotechnical recommendations in RDCL report R-182900602-02 and RDCL letter 182900602-03;
- New Zealand Standard 4404:2010 for Land Development and Subdivision Infrastructure;
- New Zealand Standard 4402:1988 Methods of Testing Soils for Civil Engineering Purposes used for relevant tests; and
- Hastings District Council (HDC) Engineering Code of Practice, Engineering Standards, Geotechnical Engineering.

INTERPRETED BEARING CAPACITY

Lot specific DCP tests were undertaken after imported TOPSOIL was laid on top of the finished fill level.

The test locations are presented in Fig. 01 and individual DCP logs (4 per lot) are presented in Appendix B.

DCP test results have been correlated to Ultimate Bearing Capacity (UBC) in accordance with Stockwell (Stockwell M. J., 1997) and are presented in Table 3.

TABLE 2 - INDICATIVE DEPTH TO 300 KPA UBC

Lot No.	Indicative depth (m bgl)
	300 kPa UBC
2	0.5
3	0.5
4	0.4
5	0.4

FURTHER GEOTECHNICAL INVOLVEMENT

We recommend a suitably qualified geotechnical professional be engaged:

- To inspect foundation excavations to confirm ground conditions as expected; and
- Confirm building footprints are in accordance with setbacks this report.

RECORDS

- DCP test locations (Figure 1);
- Laboratory and compaction results (Appendix A);
- DCP test records (Appendix B); and
- HDC Form 6 (Appendix C).

LIMITATIONS

- This letter has been prepared for the particular purpose outlined in the project brief and no responsibility is accepted for the use of any part in other contexts or for any other purpose.
- Ground conditions assessed in this letter are inferred from published sources, site inspection and the investigations described. Variations from the interpreted conditions may occur, and special conditions relating to the site may not have been revealed by this investigation, and which are therefore not taken into account. No warranty is included either expressed or implied that the actual conditions will conform to the interpretation contained in this letter.
- No responsibility is accepted by Resource Development Consultants Ltd for inaccuracies in data supplied by others. Where data has been supplied by others, it has been assumed that this information is correct.
- Groundwater conditions can vary with season or due to other events. Any comments on groundwater conditions are based on observations at the time.
- This letter is provided for sole use by the client and HDC and is confidential to the client and their professional advisors. No responsibility whatsoever for the contents of this letter shall be accepted for any person other than the client.

We trust this meets your current needs. Should you wish to discuss any aspect of the contents of this document please contact me the undersigned on 06 877 1652.

Sincerely,

Prepared by:



T Bartholomew
MSc, MEngNZ

Engineering Geologist

Approved by:



CA Wylie
MSc; CMEngNZ, CPEng

Principal

Attachments

Figure 1: DCP test locations;

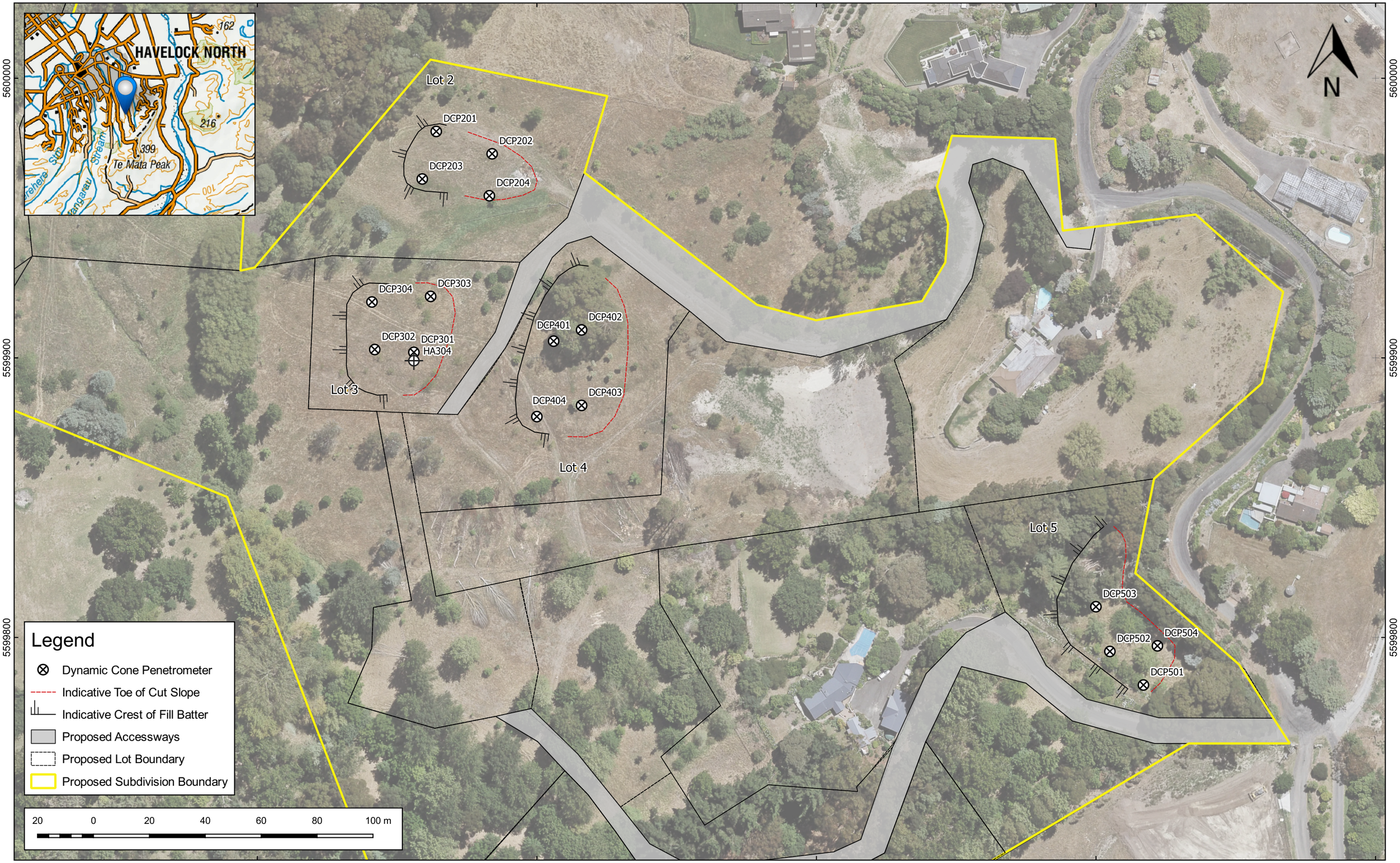
Appendix A: NDM compaction results

Appendix B: DCP Test Results

Appendix C: HDC Form 6

Important Information about your Geotechnical Report

Fig. 01: DCP Test Locations



RDCL PO Box 28057 | 8/308 Queen St East Hastings NZ Tel: +64 6 8771652 | Fax: +64 6 877 5015 Email: info@rdcl.co.nz www.rdcl.co.nz	Title	Site Investigation Plan	Drawn By BT	Date 22/07/22	A3
	Project	220008_4 Lot Subdivision_250-280 Durham Drive, Havelock North	Checked By TBr	Date 22/07/22	
	Client	Casper 2016 Ltd.	Approved By BB	Date 22/07/22	Figure 1

Appendix A: NDM compaction results

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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	24th January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	13th January 2022
Location:	250-280 Durham Drive	**NDM No.**	4448
Sub-location:	Lot 2	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Cut to Fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2650 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	1.0 m level

Reported By:	**Checked By:**
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	2010	1681	19.6	108
2	300	2017	1665	22.6	107
3	300	1677	1540	8.9	99
4	300	1979	1612	22.8	103
Avg.		**1921**	**1625**	**18.5**	**104**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	14th January 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	14th January 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 2	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0%
Test Position:	2.0 m level

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	DryDensity (kg/m^3)	Water Content (%)	% of MDD
1	300	1926	1646	17.0	106
2	300	2036	1769	15.1	113
3	300	1781	1509	18.0	97
4	300	1888	1587	18.9	102
Ave		**1908**	**1628**	**17.3**	**104**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.
- Site photo not taken during testing. It is indicative of test location only.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	24th January 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	18th January 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 2	**Test Method:**	NZS 4407:2015 Test 4.3
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	14.0%
Test Position:	Final

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1853	1601	15.8	103
2	300	1794	1480	21.2	95
3	300	1820	1520	19.8	97
4	300	1754	1485	18.1	95
5	300	1770	1498	18.7	96
6	300	1824	1530	19.2	98
Avg.		**1803**	**1519**	**18.8**	**97**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	19th January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	19th January 2022
Location:	280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 3	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24 %
Test Position:	0.5m level

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1941	1578	23.0	101
2	300	1921	1573	22.1	101
3	300	1925	1611	19.5	103
Avg.		**1929**	**1587**	**21.5**	**102**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	19th January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	19th January 2022
Location:	280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 3	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	Final level

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1875	1514	23.8	97
2	300	1886	1549	21.8	99
3	300	1888	1557	21.3	100
4	300	1801	1503	19.8	96
5	300	1831	1521	20.4	98
Avg.		**1856**	**1529**	**21.4**	**98**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	25h January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	25th January 2022
Location:	280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 3 Extension	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Cut to Fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24 %
Test Position:	0.5m level

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1969	1610	22.3	103
2	300	1968	1620	21.5	104
3	300	1893	1515	24.9	97
Avg.		**1943**	**1582**	**22.9**	**101**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	28th January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	28th January 2022
Location:	280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 3 Extension	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	Final

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1977	1613	22.5	103
2	300	1902	1510	26.0	97
Avg.		**1940**	**1562**	**24.3**	100

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3728 dated 09/09/20.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	25th January 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	20th January 2022
Location:	280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 4	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson

Sample Description:	**Clayey Silt**
Sample Name	**Site won fill**
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0%
Test Position:	1.0m level

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1912	1545	23.8	99
2	300	1868	1497	24.8	96
Avg.		**1890**	**1521**	**24.3**	**98**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	20th January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	20th January 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 4	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	**Site won fill**
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0%
Test Position:	2.0m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1912	1581	20.9	101
2	300	1905	1531	24.4	98
3	300	1834	1588	15.5	102
4	300	1784	1490	19.7	96
5	300	2015	1726	16.7	111
6	300	1914	1595	20.0	102
Avg.		**1894**	**1585**	**19.5**	**102**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	21st January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	21st January 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 4	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	**Site won fill**
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	3.0m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1958	1621	20.8	104
2	300	1901	1515	25.5	97
3	300	1941	1609	20.6	103
4	300	1882	1534	22.7	98
5	300	1927	1593	21.0	102
Avg.		**1922**	**1574**	**22.1**	**101**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.
- Site photo not taken during testing. It is indicative of test location only.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	28th January 2022	**Technician:**	Brodie Shannon
Report No:	220008	**Date Tested:**	28th January 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 4	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Dawson Group	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24 %
Test Position:	Final

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	2011	1587	26.7	102
2	300	1895	1481	28.0	95
3	300	1930	1528	26.4	98
4	300	1921	1469	30.7	94
5	300	1896	1578	20.1	101
6	300	1826	1517	20.4	97
Avg.		**1913**	**1527**	**25.4**	**98**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	19th February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	19th February 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 5	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	0.5 m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1911	1548	23.4	99
2	300	1897	1584	19.8	102
3	300	1786	1477	20.9	95
4	300	1810	1483	22.1	95
Ave		**1851**	**1523**	**21.6**	**98**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



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EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	21st February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	21st February 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 5	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	1m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1873	1536	21.9	98
2	300	1809	1490	20.9	96
3	300	1880	1550	21.3	99
4	300	1920	1599	20.0	103
Ave		**1871**	**1544**	**21.0**	**99**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.
- Site photo was not taken during testing. It is indicative of test location only.

Site Photo and Test Locations:



PO Box 28057
Havelock North
New Zealand
Tel: +64 6 877 1652

EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	21st February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	21st February 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 5	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	2.0 m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	DryDensity (kg/m^3)	Water Content (%)	% of MDD
1	300	1841	1488	23.8	95
2	300	1800	1475	22.1	95
3	300	1964	1527	28.6	98
4	300	1899	1538	23.5	99
5	300	1933	1592	21.4	102
Ave		**1887**	**1524**	**23.9**	**98**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA 3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



PO Box 28057
Havelock North
New Zealand
Tel: +64 6 877 1652

EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	22nd February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	21st February 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 5	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	3.5 m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	DryDensity (kg/m^3)	Water Content (%)	% of MDD
1	300	1886	1533	23.1	98
2	300	1884	1522	23.8	98
3	300	1892	1496	26.4	96
4	300	1882	1517	24.1	97
5	300	1868	1479	26.3	95
6	300	1854	1485	24.4	95
Ave		**1878**	**1505**	**24.7**	**96**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



PO Box 28057
Havelock North
New Zealand
Tel: +64 6 877 1652

EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	24th February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	24th February 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 5	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	Final level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	DryDensity (kg/m^3)	Water Content (%)	% of MDD
1	300	1846	1518	21.6	97
2	300	1854	1528	21.3	98
3	300	1858	1525	21.8	98
4	300	1885	1559	20.9	100
5	300	1884	1582	19.1	101
6	300	1810	1527	18.5	98
7	300	1869	1502	24.4	96
8	300	1889	1508	25.3	97
9	300	1912	1535	24.6	98
Ave		**1867**	**1532**	**21.9**	**98**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA 3969 dated 14/01/20.
- Solid Density is assumed.

Site Photo and Test Locations:



PO Box 28057
Havelock North
New Zealand
Tel: +64 6 877 1652

EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	23rd February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	23rd February 2022
Location:	250-280 Durham Drive	**NDM No.**	77942
Sub-location:	LOT 5 Extension	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24 %
Test Position:	1.0 m level

Reported By:	**Checked By**:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1693	1477	14.7	95
2	300	1827	1486	23.0	95
Ave		**1760**	**1482**	**18.9**	**95**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA 3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



PO Box 28057
Havelock North
New Zealand
Tel: +64 6 877 1652

EARTHWORKS COMPACTION CONTROL: NUCLEAR DENSOMETER TEST RESULTS

Report Date:	24th February 2022	**Technician:**	John Hirawani
Report No:	220008	**Date Tested:**	24th February 2022
Location:	280 Durham Drive	**NDM No.**	77942
Sub-location:	Lot 5 Extension	**Test Method:**	NZS 4407:2015 Test 4.2
Client:	Brendon Dawson	**Contractor:**	Fergusson Contracting

Sample Description:	**Silty CLAY**
Sample Name	Site won fill
Sample Condition:	Moist, compact
Solid Density (assumed)	2560 kg/m^3
Max Dry Density (assumed)	1560 kg/m^3
Optimum Water Content (assumed)	24.0 %
Test Position:	Final

Reported By:	Checked By:
J Hirawani	T Bartholomew
Senior Technician	Engineering Geologist

Test Number	Depth (mm)	Wet Density (kg/m^3)	Dry Density (kg/m^3)	Water Content (%)	% of MDD
1	300	1721	1522	13.1	98
2	300	1735	1493	16.3	96
3	300	1736	1529	13.6	98
Ave		**1728**	**1508**	**14.3**	**97**

NOTES:

- MDD and Optimum Water Content is assumed using WSP Test Report NA3969 dated 14/01/2020.
- Solid Density is assumed.

Site Photo and Test Locations:



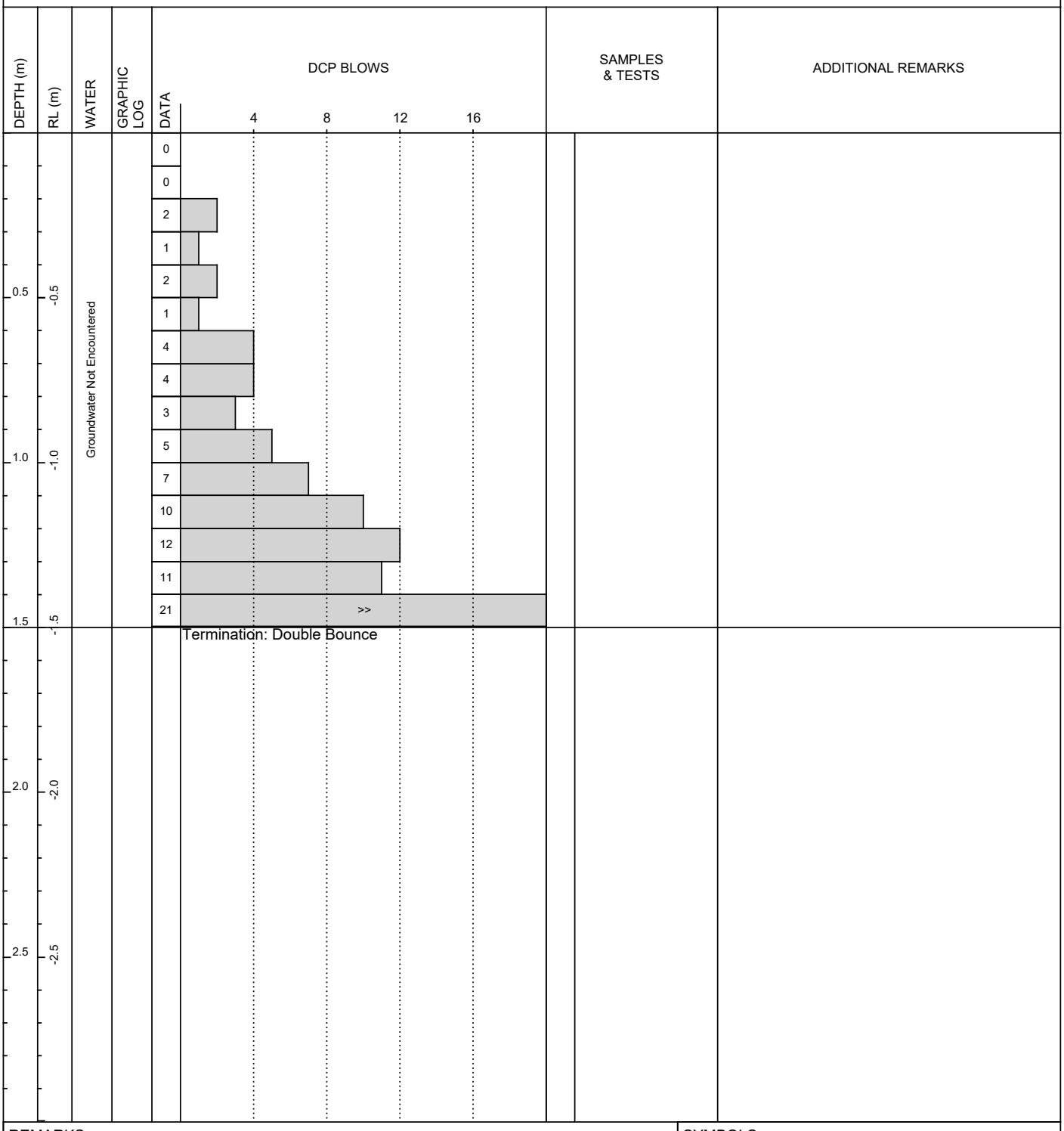
Appendix B: DCP Test Results

DCP LOG

DCP201

SHEET 1 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 2
PROJECT:	220008	EASTING:	1934564.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599981.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY: AL/AJ	DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS: Final data	



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP202

SHEET 2 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 2
PROJECT:	220008	EASTING:	1934584.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599973.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY:	AL/AJ DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data

DEPTH (m)	RL (m)	WATER	GRAPHIC LOG	DATA	DCP BLOWS	SAMPLES & TESTS	ADDITIONAL REMARKS
0.5	-0.5	Groundwater Not Encountered		0 1 10 17 17 18	4 8 12 16 Termination: Blow Count		
1.0	-1.0						
1.5	-1.5						
2.0	-2.0						
2.5	-2.5						

REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

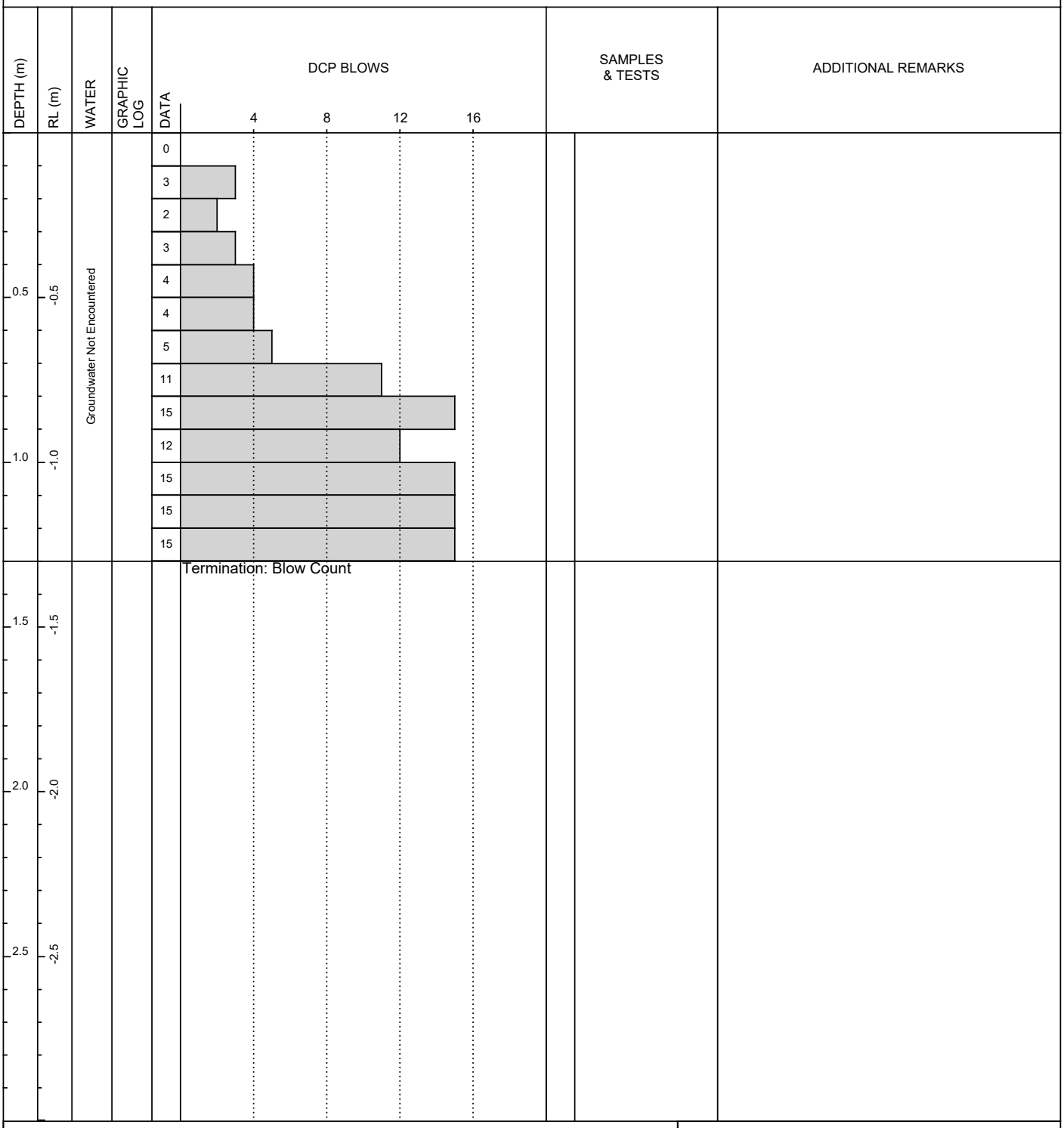
RDCL
8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP203

SHEET 3 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 2
PROJECT:	220008	EASTING:	1934559.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599964.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY: AL/AJ	DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

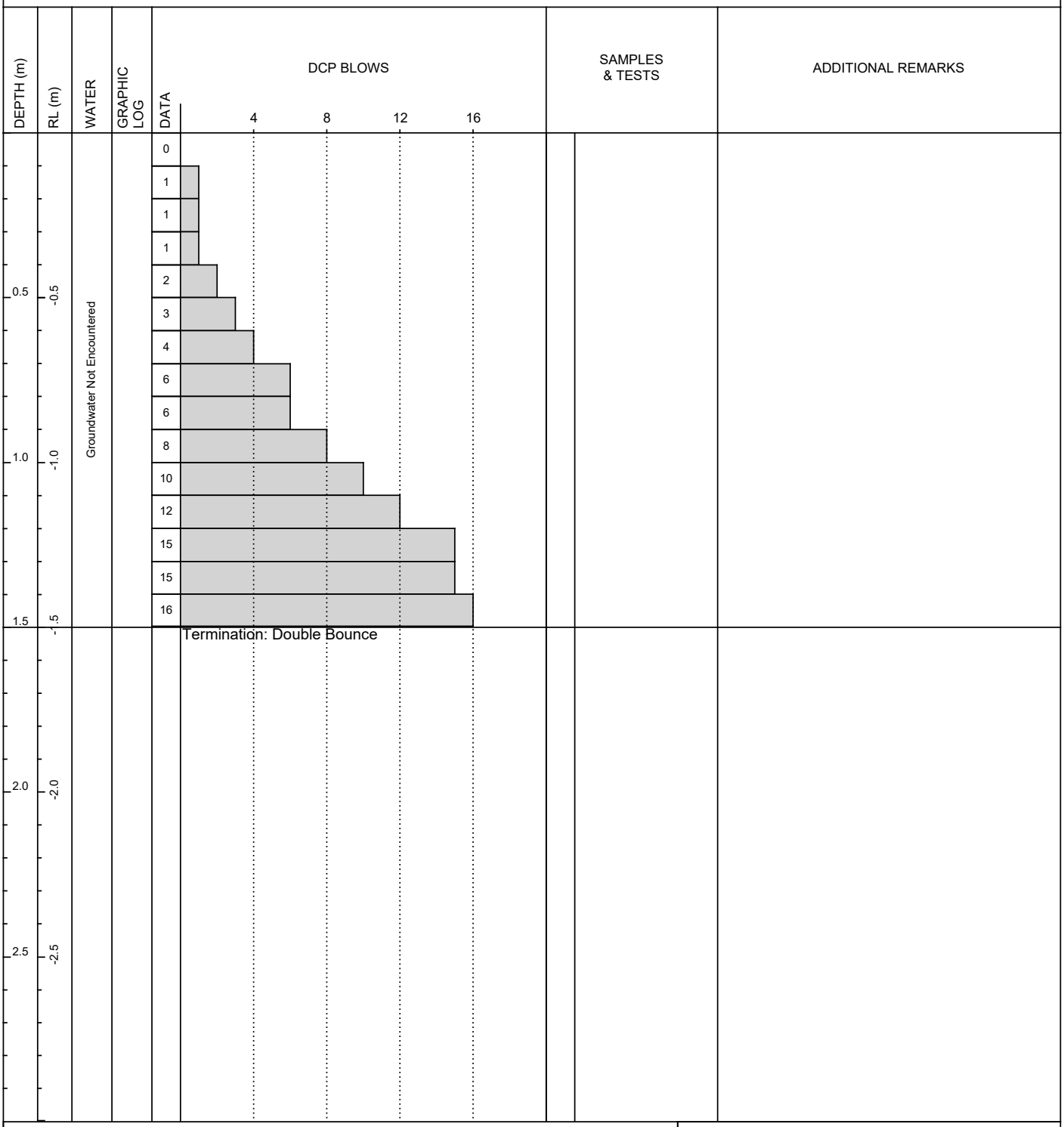
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP204

SHEET 4 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 2
PROJECT:	220008	EASTING:	1934583.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599958.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY: AL/AJ	DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

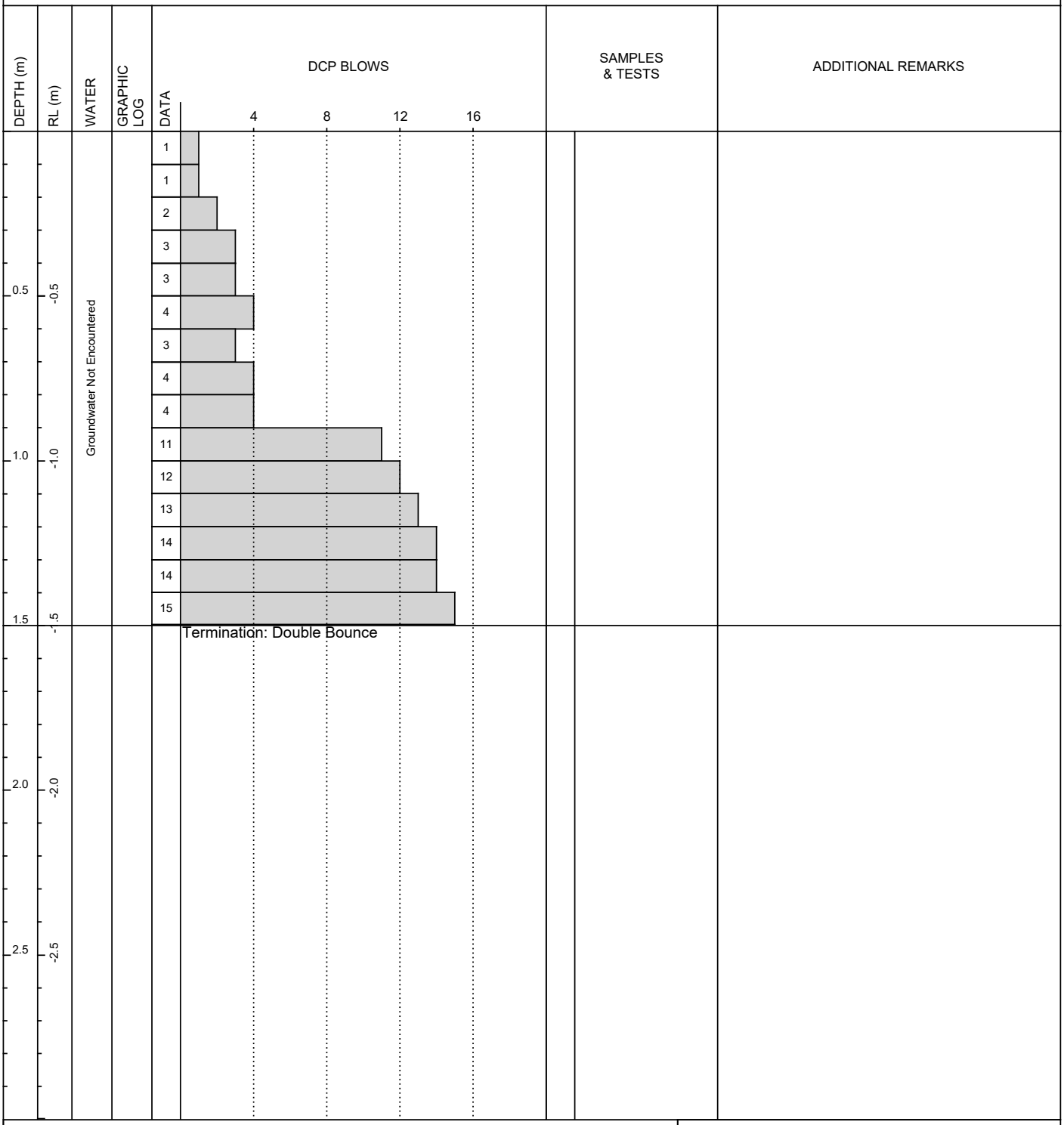
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP301

SHEET 5 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 3
PROJECT:	220008	EASTING:	1934556.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599902.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY:	BR/TO DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

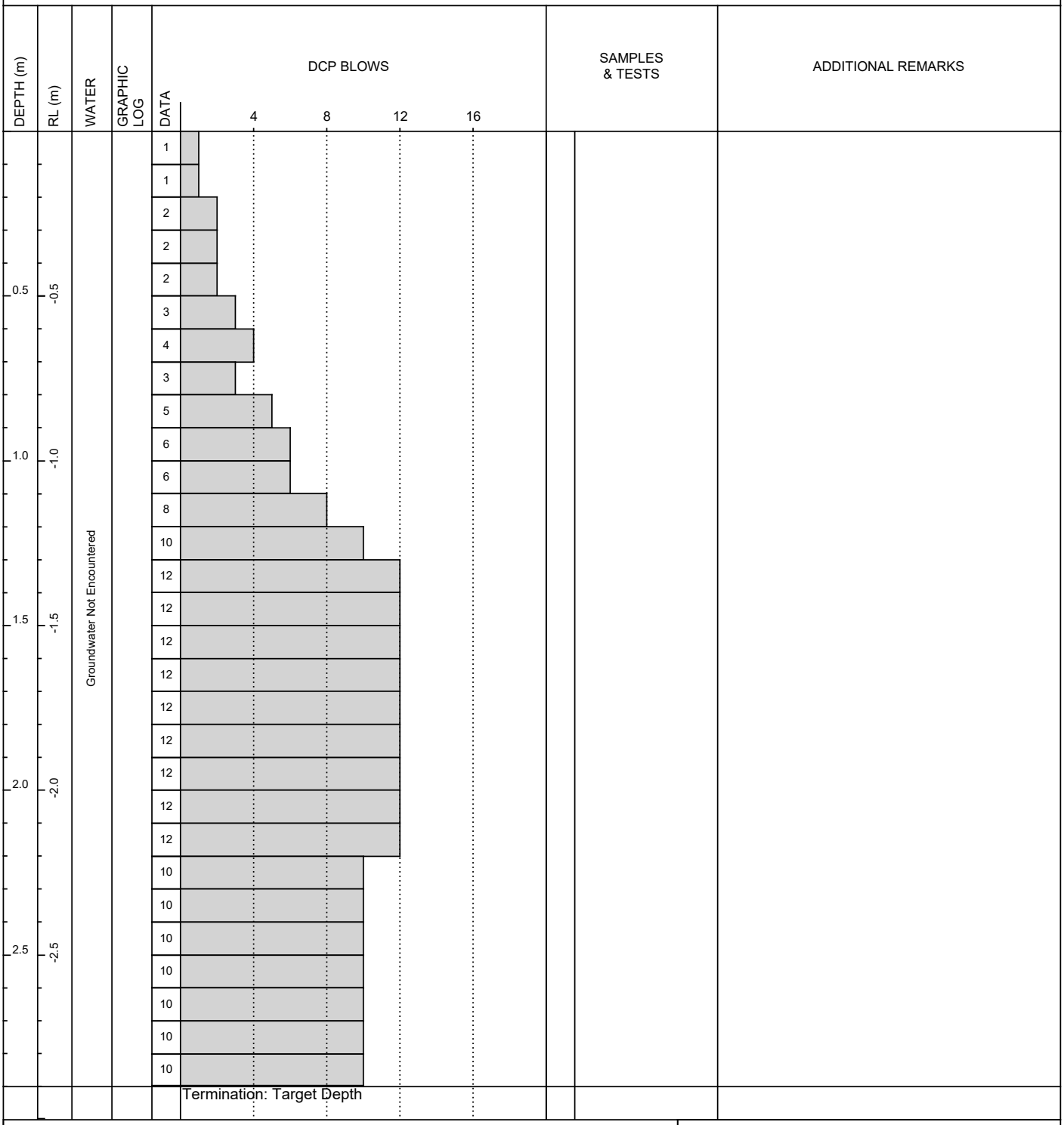
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP302

SHEET 6 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 3
PROJECT:	220008	EASTING:	1934542.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599903.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY: BR/TO	DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS: Final data	



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

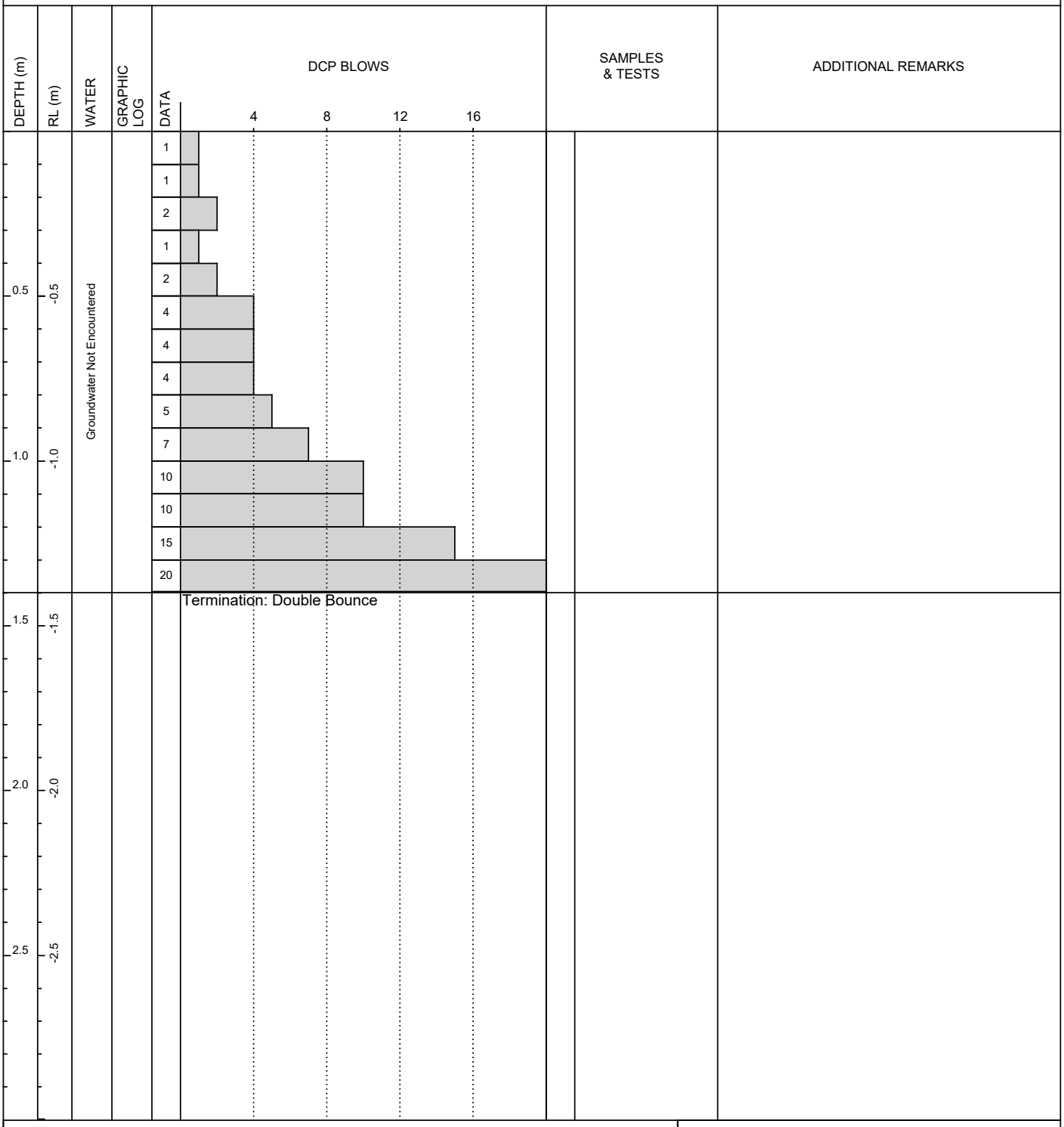
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP303

SHEET 7 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 3
PROJECT:	220008	EASTING:	1934562.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599922.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY:	BR/TO DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

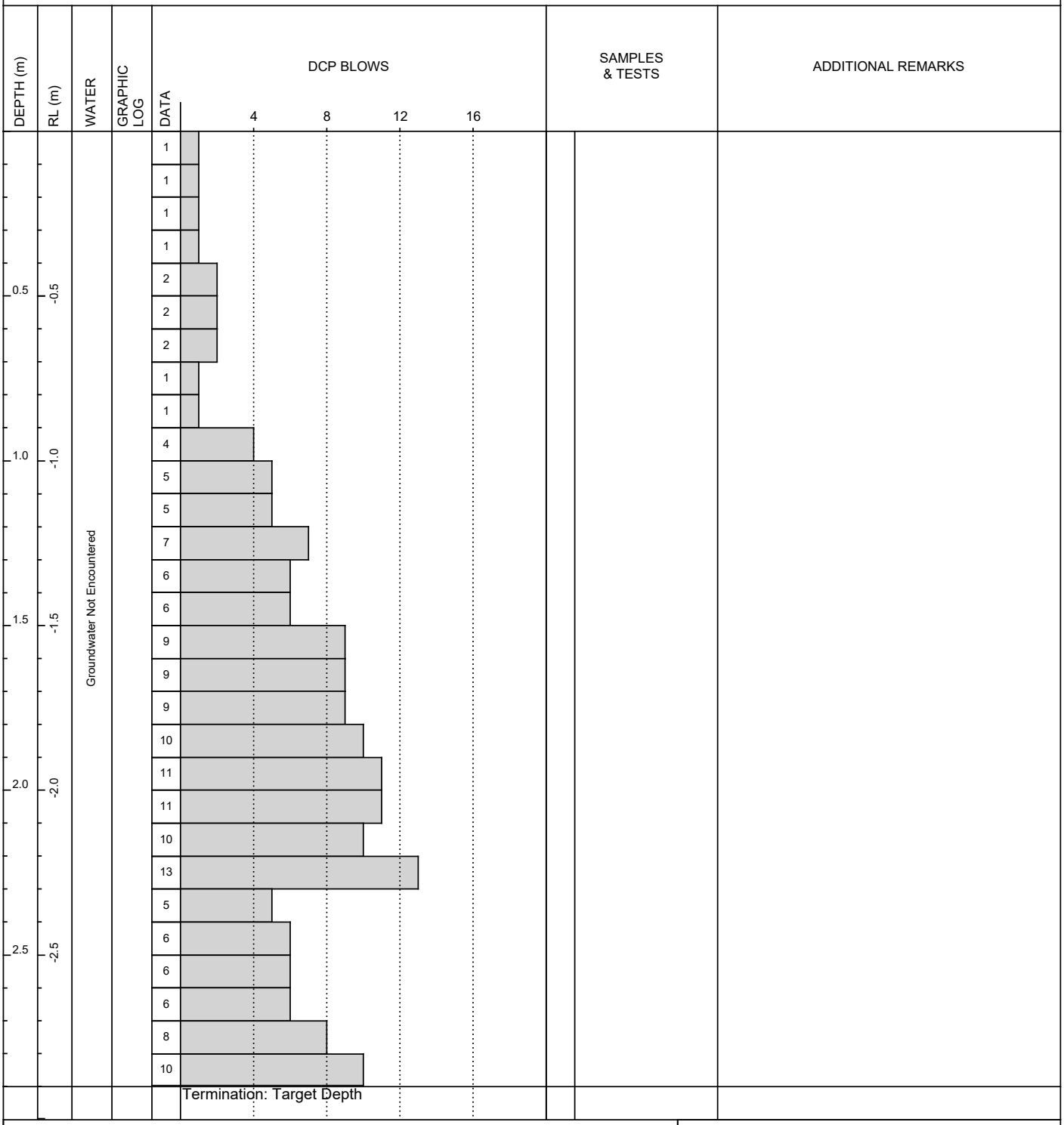
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP304

SHEET 8 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 3
PROJECT:	220008	EASTING:	1934541.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599920.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY: BR/TO	DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS: Final data	



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

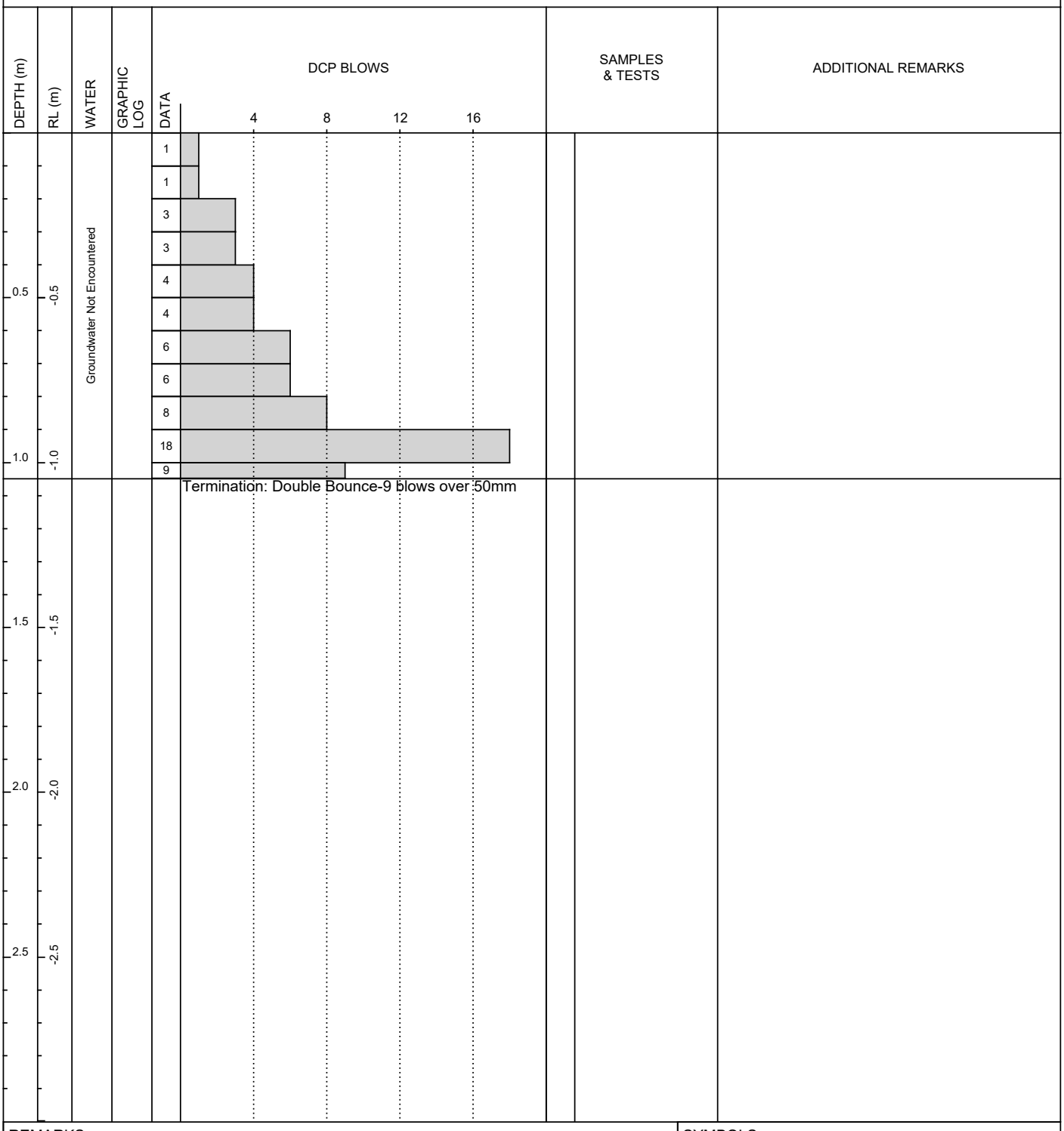
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP401

SHEET 9 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 4
PROJECT:	220008	EASTING:	1934606.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599906.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY:	AL/AJ DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

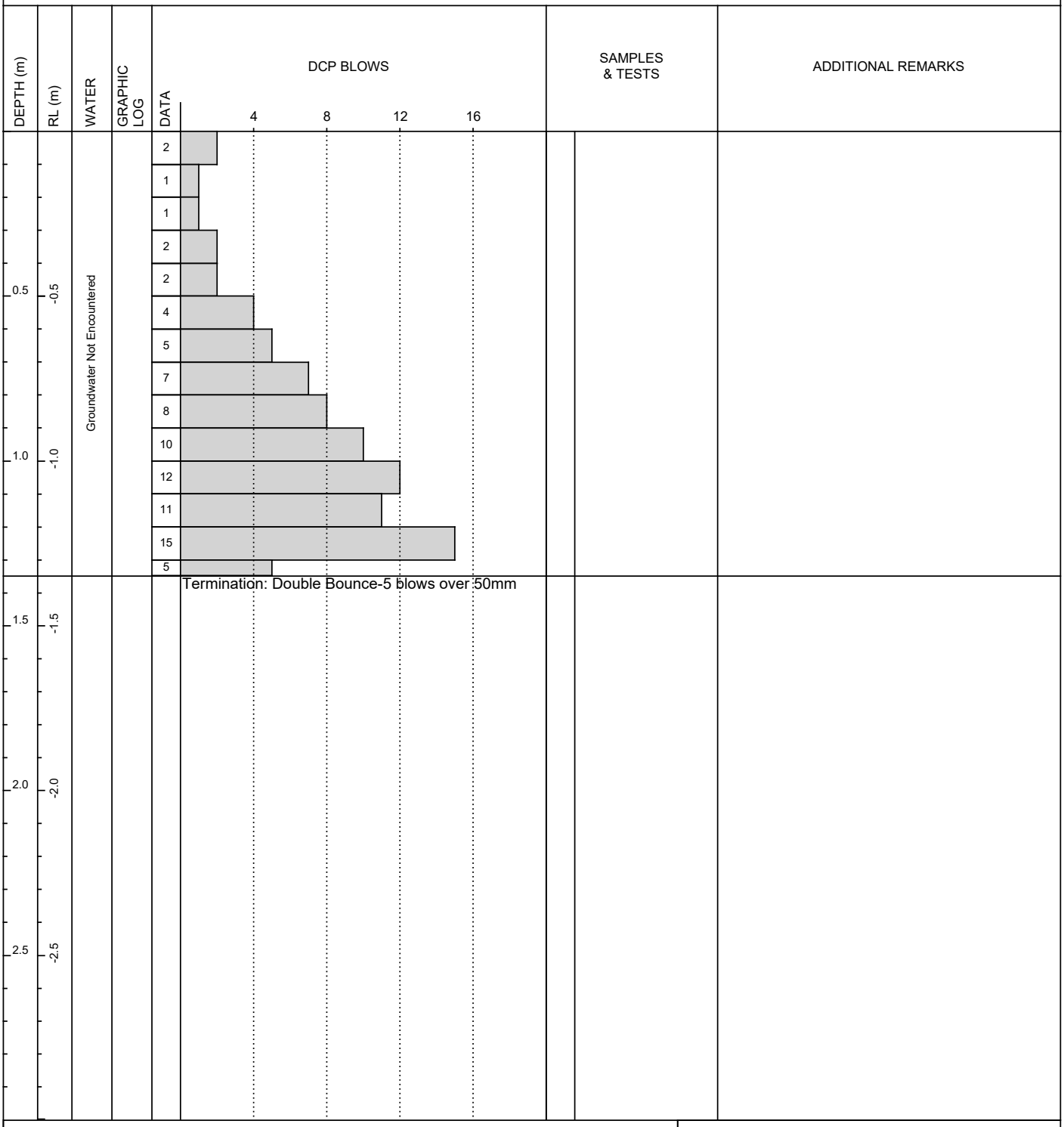
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP402

SHEET 10 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 4
PROJECT:	220008	EASTING:	1934616.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599910.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY: AL/AJ	DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS: Final data	



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

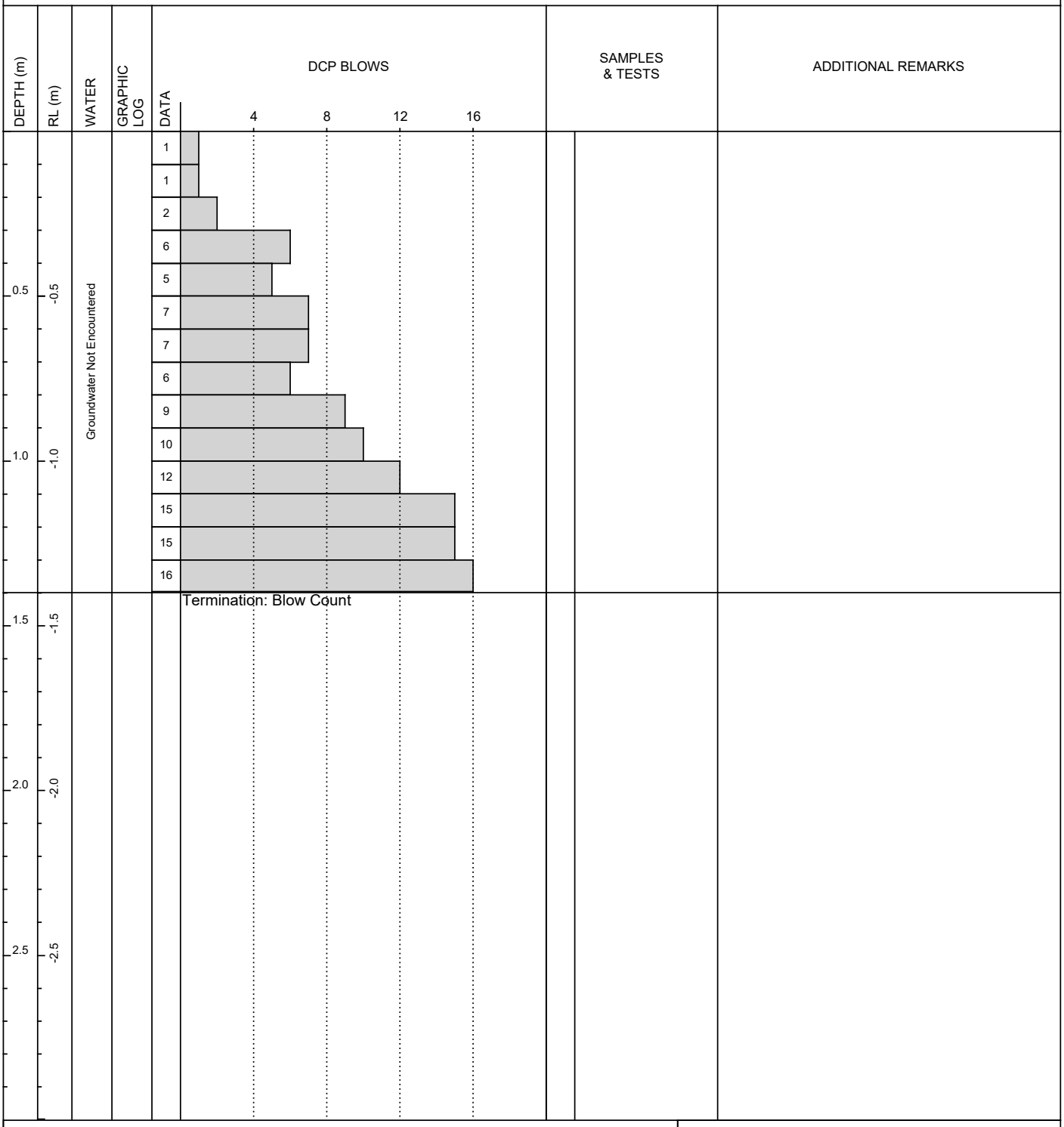
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP403

SHEET 11 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 4
PROJECT:	220008	EASTING:	1934616.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599883.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY:	AL/AJ DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

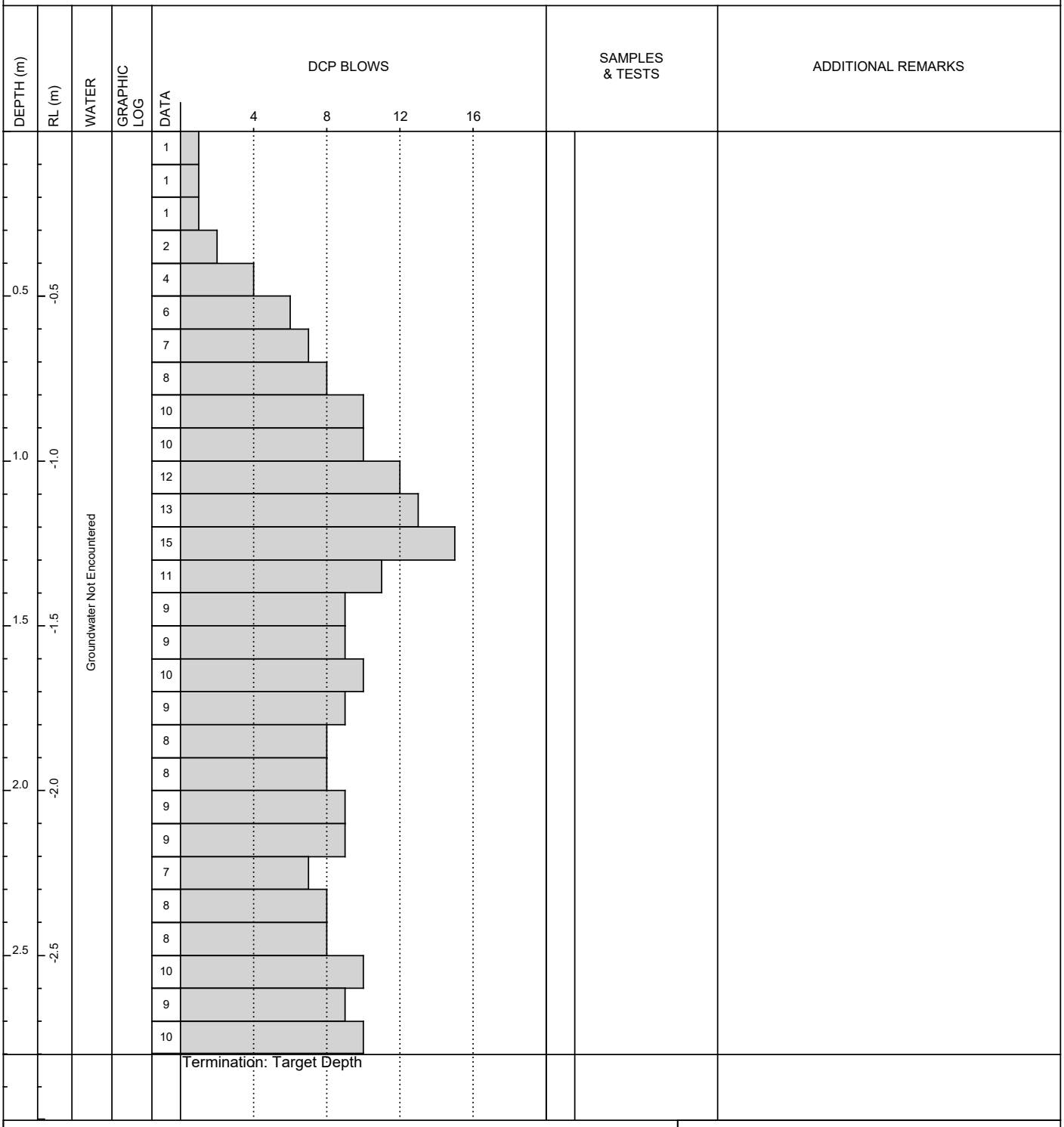
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP404

SHEET 12 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 4
PROJECT:	220008	EASTING:	1934600.00	STARTED:	14/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599879.00	FINISHED:	14/07/2022
		DATUM:	NZVD2016	LOGGED BY: AL/AJ	DATE: 14/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS: Final data	



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

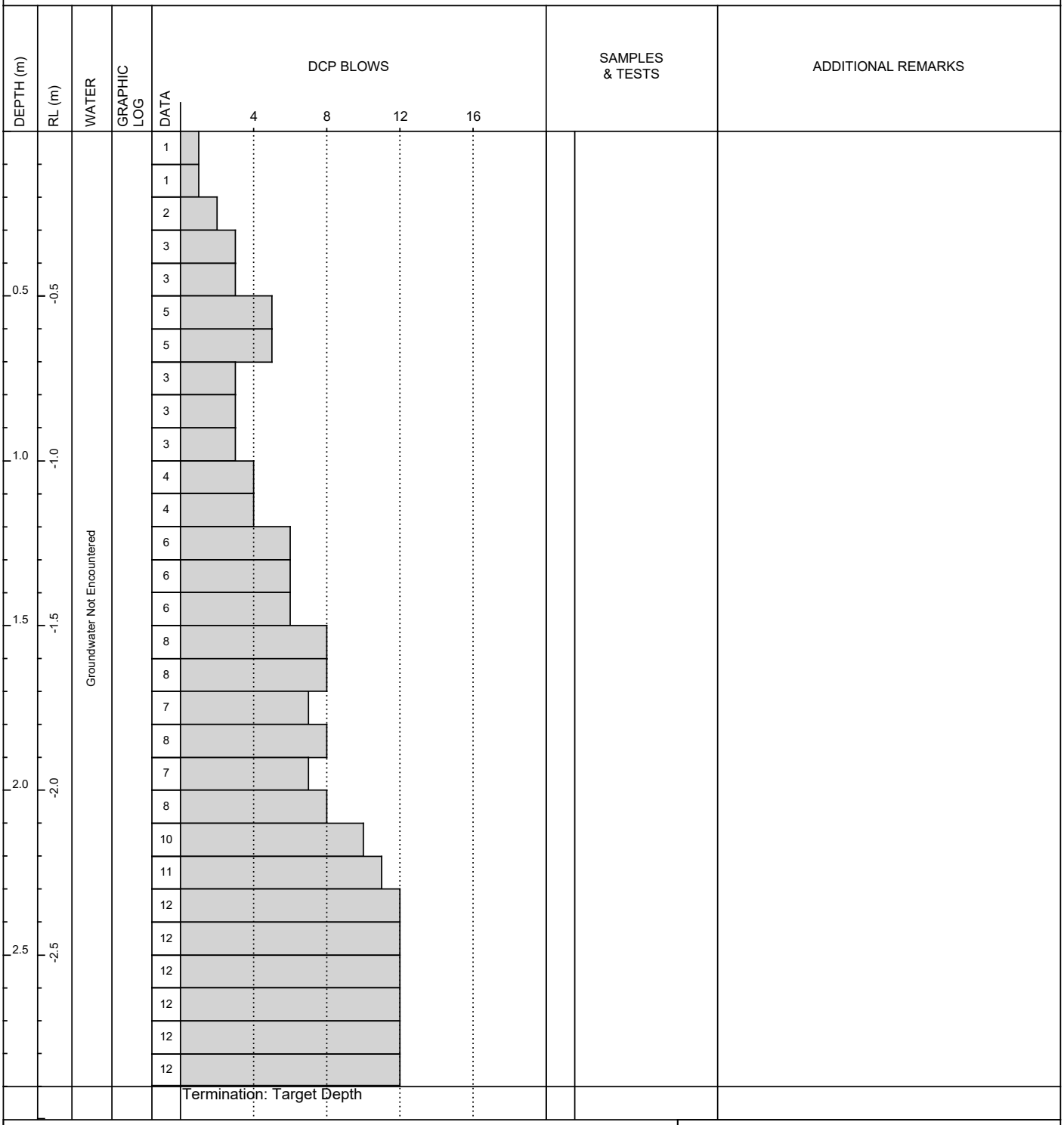
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP501

SHEET 13 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 5
PROJECT:	220008	EASTING:	1934817.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599783.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY: BR/TO	DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY: AL	DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS: Final data	



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

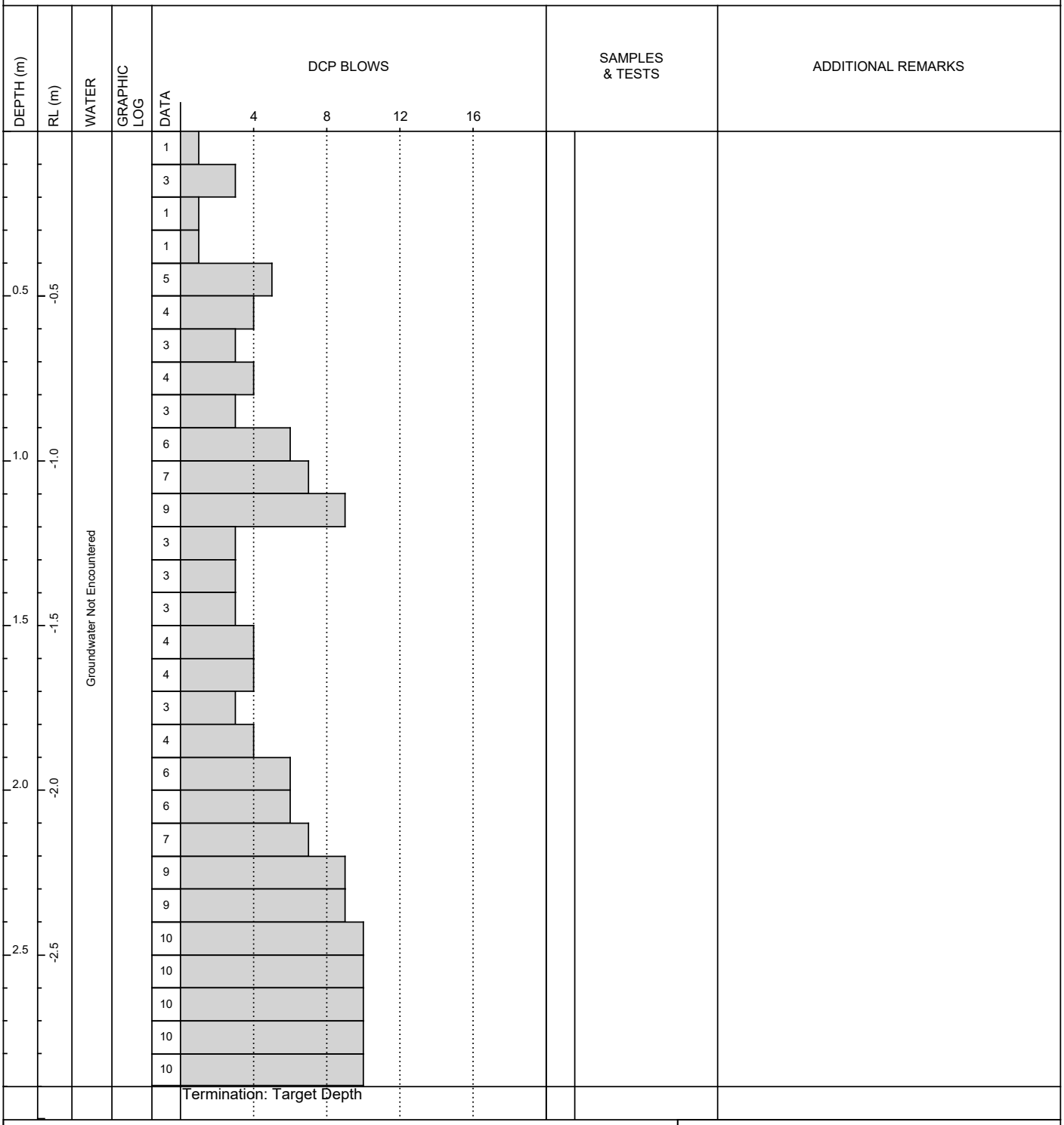
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP502

SHEET 14 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 5
PROJECT:	220008	EASTING:	1934805.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599795.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY:	BR/TO DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

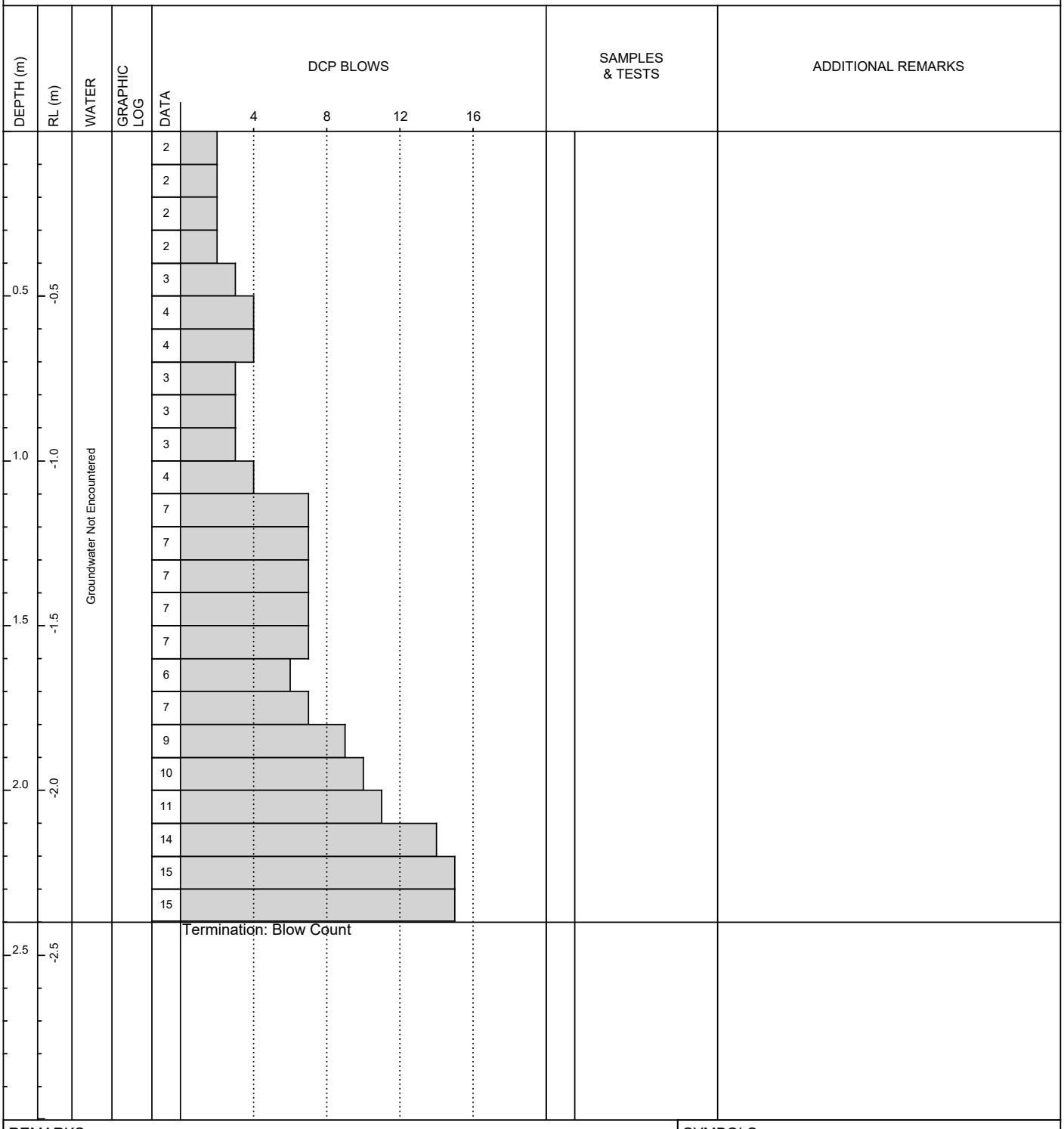
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP503

SHEET 15 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 5
PROJECT:	220008	EASTING:	1934800.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599811.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY:	BR/TO DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

RDCL

8/308 QUEEN ST EAST, HASTINGS PO BOX 28057, HAVELOCK NORTH 4130 NEW ZEALAND

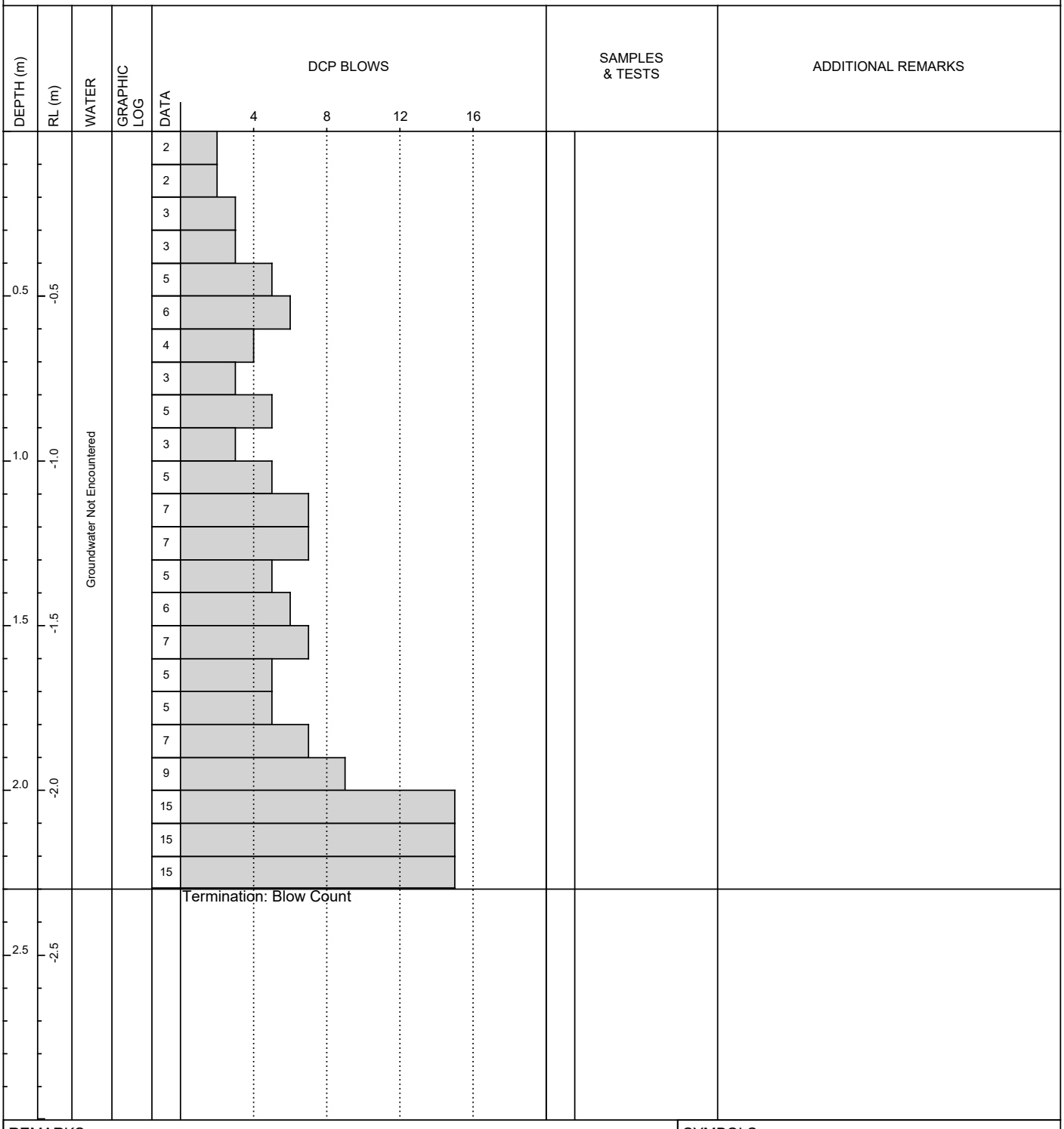
Ph: +64 6 8771652 | Email: info@rdcl.co.nz

DCP LOG

DCP504

SHEET 16 OF 16

CLIENT:	Dawson Group NZ	PROJECTION:	NZTM2000	SUB-LOCATION:	Lot 5
PROJECT:	220008	EASTING:	1934822.00	STARTED:	13/07/2022
LOCATION:	250-280 Durham Drive, Havelock North 4130	NORTHING:	5599797.00	FINISHED:	13/07/2022
		DATUM:	NZVD2016	LOGGED BY:	BR/TO DATE: 13/07/2022
OFFICE:	RDCL - Hastings	ELEVATION:	-	CHECKED BY:	AL DATE: 22/07/2022
ENGINEER:	TBr	AZIMUTH:	PLUNGE: 90°	STATUS:	Final data



REMARKS

Soils tested in accordance with NZGS

SYMBOLS

- Standing Water Level
- Out flow
- In flow

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Ph: +64 6 8771652 | Email: info@rdcl.co.nz

Appendix C: HDC Form 6

APPENDIX 62
FORM 6

To: Hastings District Council
Private Bag 9002
HASTINGS 4156

STATEMENT OF PROFESSIONAL OPINION AS TO SUITABILITY OF LAND FOR BUILDING DEVELOPMENT

Subdivision: Stage 1 of the subdivision at 250 - 280 Durham Drive, Havelock North

Owner/Developer: Dawson Group NZ Ltd

Location: Lots 2, 3, 4, & 5 250 - 280 Durham Drive, Havelock North

I Cameron Andrew Wylie
(full name)

of RDCL, 308 Queen Street East, Hastings
(address)

hereby confirm that:

1. I am a suitably qualified professional experienced in the field of Geotechnical Engineering and was retained by the owner/developer in this regard on the above subdivision. My qualifications are MSc, CMEngNZ, CPEng

2. The extent of my inspections during construction, and the results of all tests carried out are described in my report dated 06/07/2022

3. In my professional opinion, not to be construed as a guarantee, I consider that:

   * a. The earth fills shown on the attached Plan No Development Nous H20210040-EPA-300, 301, 302 have been placed in compliance with the Code of Practice of the Hastings District Council.
   b. The completed works give due regard to the land slope and foundation stability considerations.
   c. The filled ground is suitable for the erection thereon of residential buildings not requiring
   * specific design in terms of NZS 3604 and related documents providing that:
      i. Subject to site specific geotechnical investigation
      ii. .....
      iii. .....
   * d. The original ground not affected by filling is suitable for the erection thereon of residential buildings not requiring specific design in terms of NZS 3604 and related documents providing that.
      i. Subject to site specific geotechnical investigation
      ii. .....
      iii. .....

4. This professional opinion is furnished to the Council and the owner/developer for their purposes alone, on the express conditions that it will not be relied upon by any other person and does not remove the necessity for the normal inspection of foundation conditions at the time of erection of any dwelling.

Signed .....Date 06/07/2022

* Delete items not applicable
A similar form for those giving their professional opinion relating to the new NES on contaminated soils

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

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