



Geotechnical Assessment Sutton Block Extension

Drury Quarry, Drury

Part 2 of 2 – Appendix E to Appendix I



Appendix E

RDCL Borehole Logs





Unit A3, 269a Mt Smart Road
Onewunga
Auckland, 1061
New Zealand

Ph: +64 6 8771652
Fax: +64 6 8775015
Email: info@rdcl.co.nz
www.rdcl.co.nz

Structural Legend

- Structural Legend:**
- BP - Bedding Plane
 - BF - Bedding Fracture
 - JT - Joint
 - FR - Fracture
 - FZ - Fractured Zone
 - SH - Shear
 - CZ - Crushed Zone
 - IF - Infilled Zone
 - DZ - Decomposed Zone
 - UF - Unidentified Feature

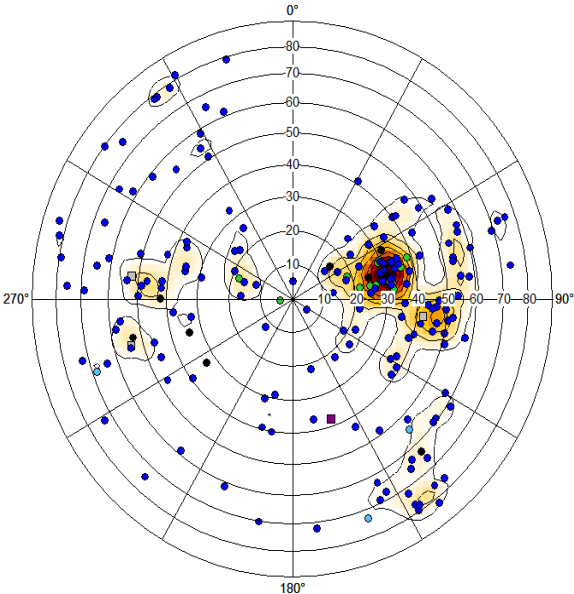
Los Nomenclatures

Log Nomenclature:

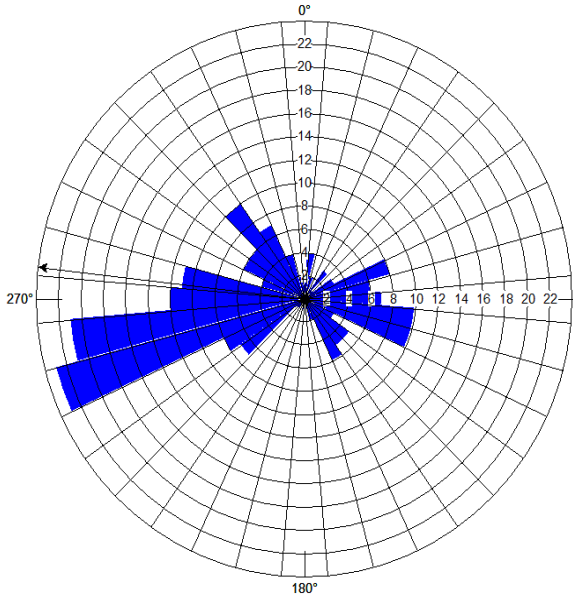
- Azimuth = Tool azimuth from magnetic north
- Tilt = Inclination from vertical
- Acoustic Calliper = 360° average from travel time
- Calliper from Cent = Calliper derived from travel time
- Image-NM = Optical image oriented to magnetic north
- Amplitude-NM = Acoustic amplitude (magnetic north)
- Structures = Apparent Structures oriented to hole
- Structures - True = Structures Oriented to true north
- 3D Optical = 3D representation of optical log
- 3D Acoustic = 3D representation of acoustic log

Comments:

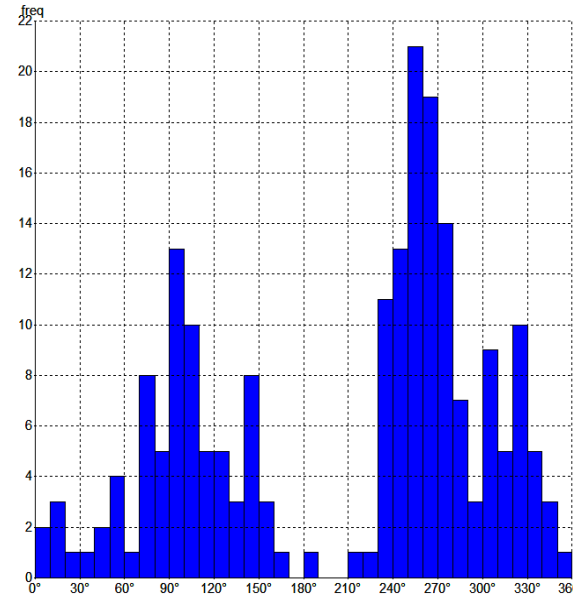
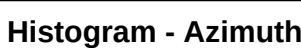
1. Structures - True are reported in dip direction and dip relative to grid north.
2. Inclined hole.
3. Water Quality turbid, obscuring optical data below water level. Optical data not presented below water line.
4. Borehole collapsed at 66.47 m.
5. Calliper assumed above waterline.



Schmidt Plot - Upper (Northern) Hemisphere - Structures - True
Depth: 4.00 m to 66.47 m

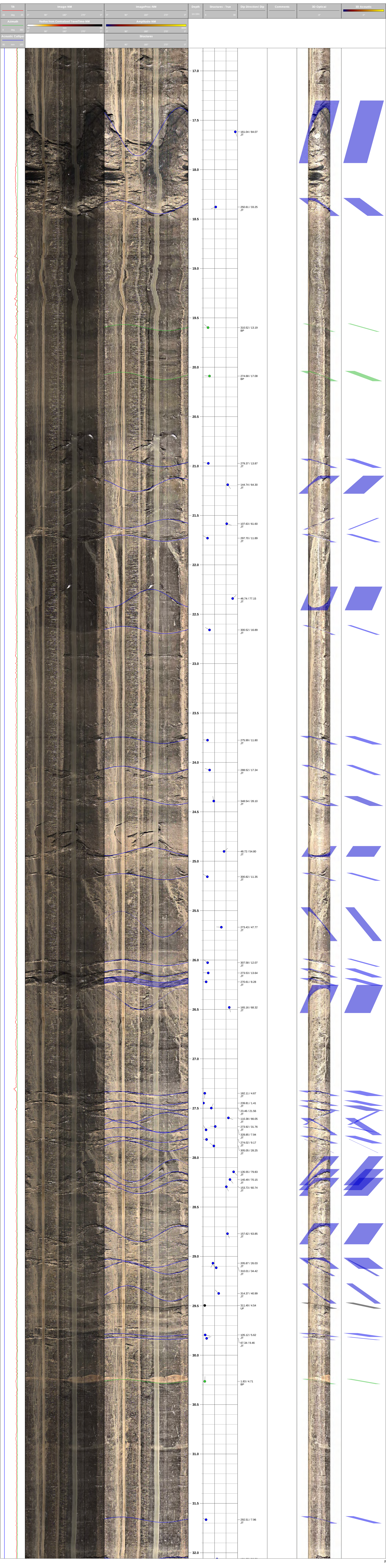


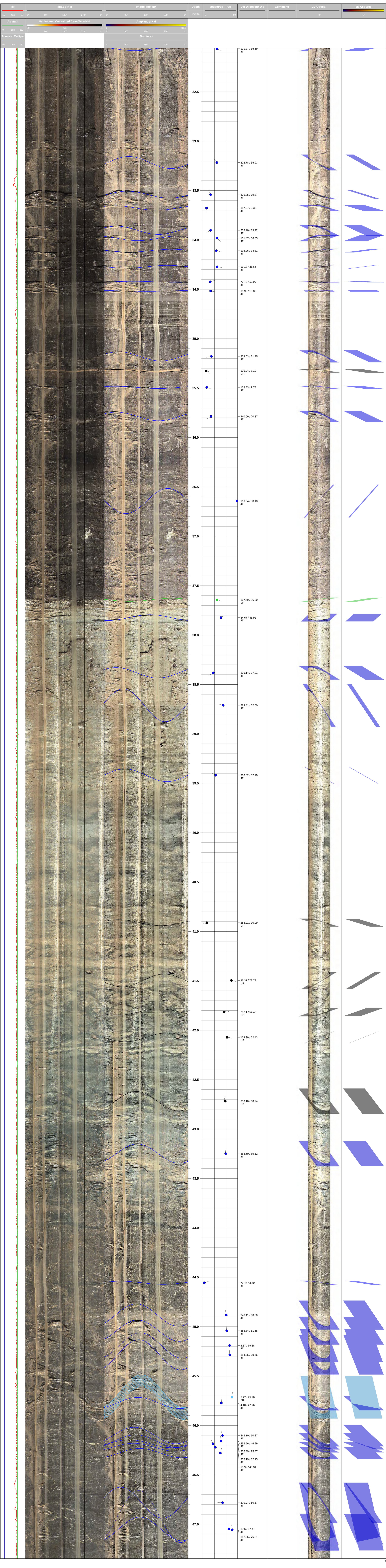
Depth: 4.00 m to 66.47 m

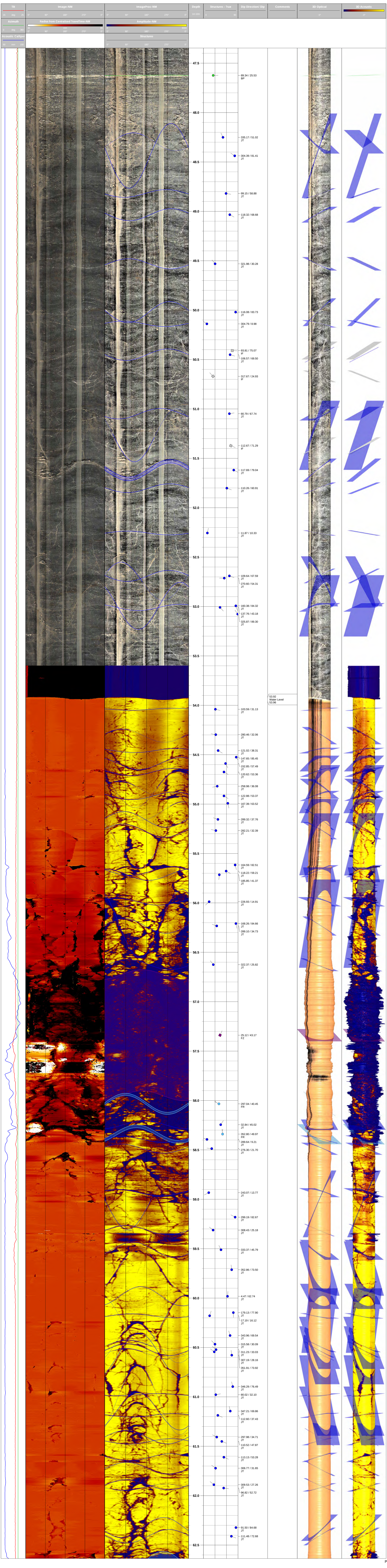


Depth: 4.00 m to 66.47 m

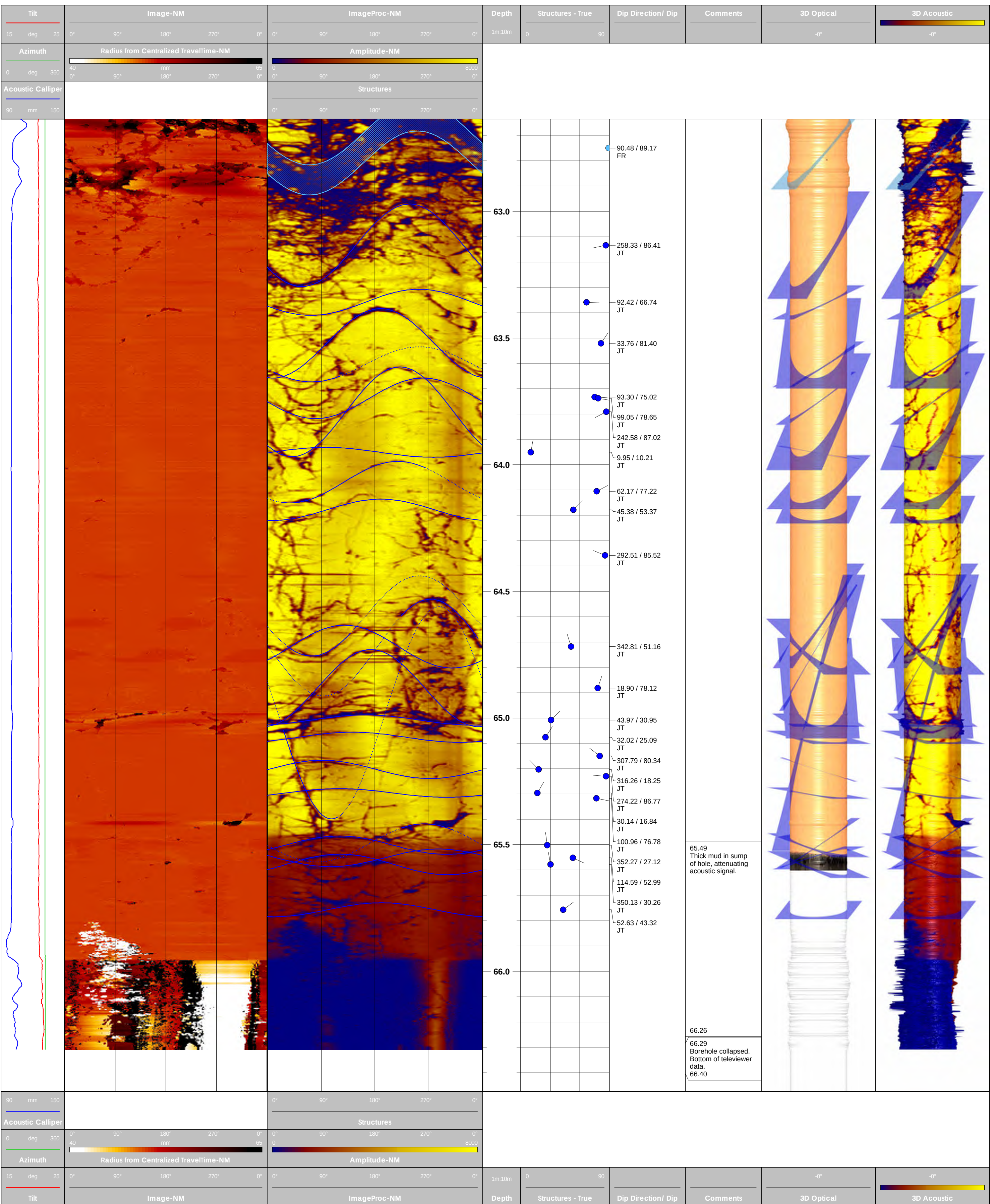
[illegible]







53.92
Water Level
53.96





Unit A3, 269a Mt Smart Road
Onehunga
Auckland, 1061
New Zealand

Ph: +64 6 8771652
Fax: +64 6 8775015
Email: info@rdcl.co.nz
www.rdcl.co.nz

Structural Legend

- Structural Legend:**
-  BP - Bedding Plane
 -  BF - Bedding Fracture
 -  JT - Joint
 -  FR - Fracture
 -  FZ - Fractured Zone
 -  SH - Shear
 -  CZ - Crushed Zone
 -  IF - Infilled Zone
 -  DZ - Decomposed Zone
 -  UF - Unidentified Feature

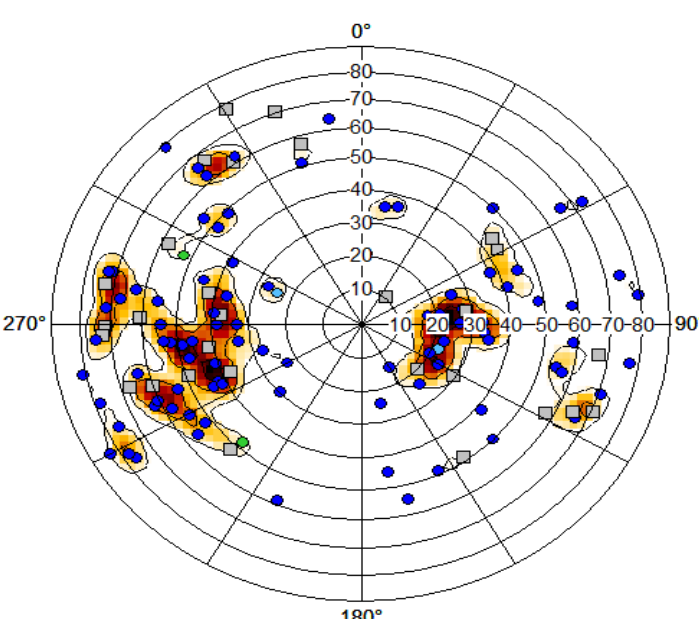
1. nomenclature

Log Nomenclature:

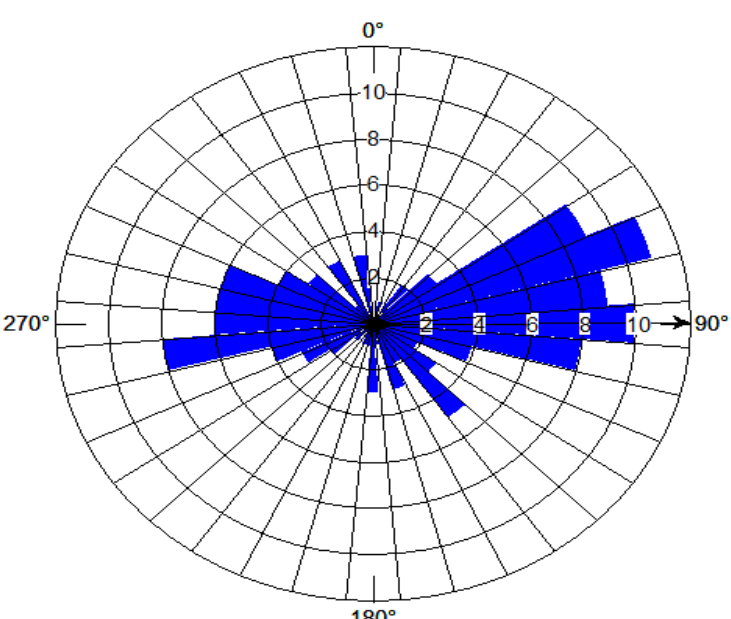
- Azimuth = Tool azimuth from magnetic north
- Tilt = Inclination from vertical
- Acoustic Calliper = 360° average from travel time
- Calliper from Cent = Calliper derived from travel time
- Image-NM = Optical image oriented to magnetic north
- Amplitude-NM = Acoustic amplitude (magnetic north)
- Structures = Apparent Structures oriented to hole
- Structures - True = Structures Oriented to true north
- 3D Optical = 3D representation of optical log
- 3D Acoustic = 3D representation of acoustic log

Comments:

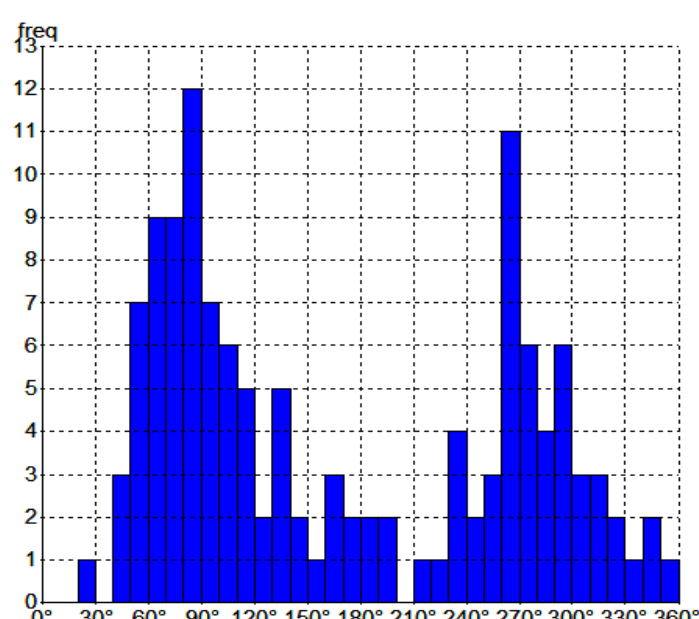
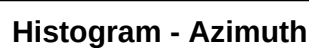
1. Structures - True are reported in dip direction and dip relative to grid north.
2. Inclined hole, so acoustic data slightly uncentralised.
3. Normalised Amplitude presented.
4. Calliper estimated above water line.
5. Dropped HWT casing between 8.24 and 14.57 m.



Schmidt Plot - Upper (Northern) Hemisphere - Structures - True
Depth: 1.04 m to 59.51 m

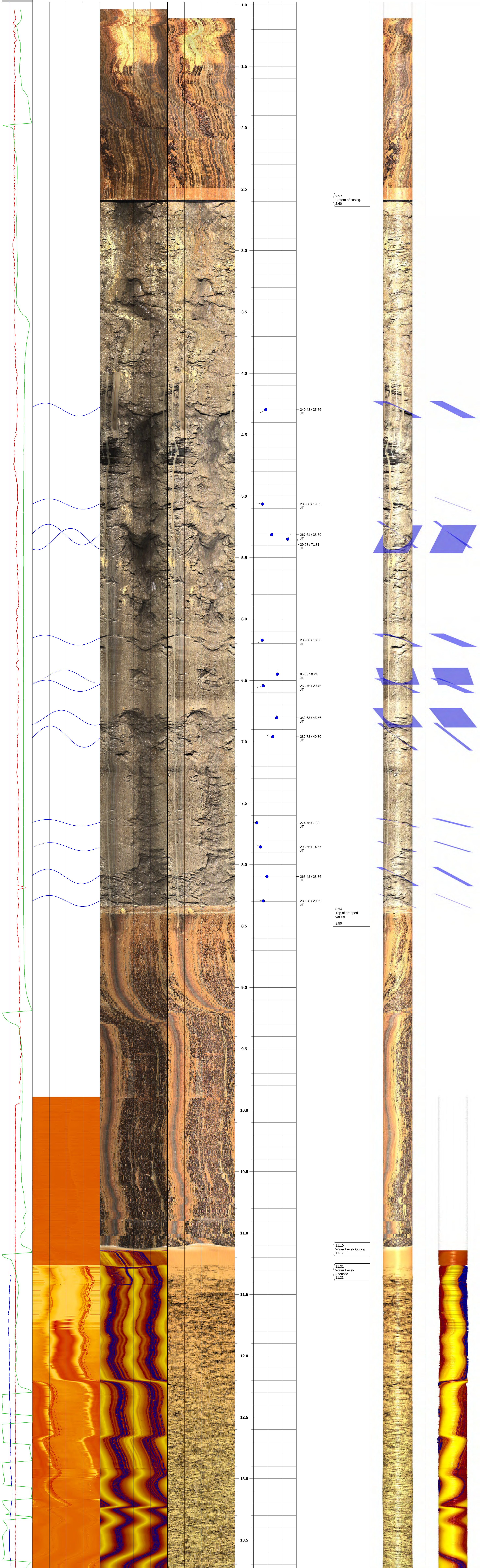


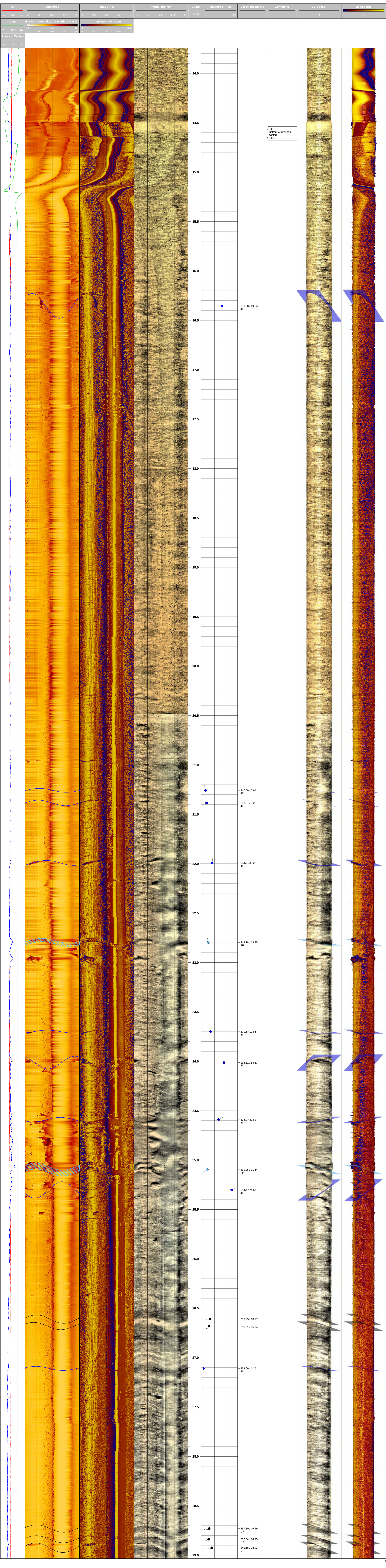
Depth: 1.04 m to 59.51 m

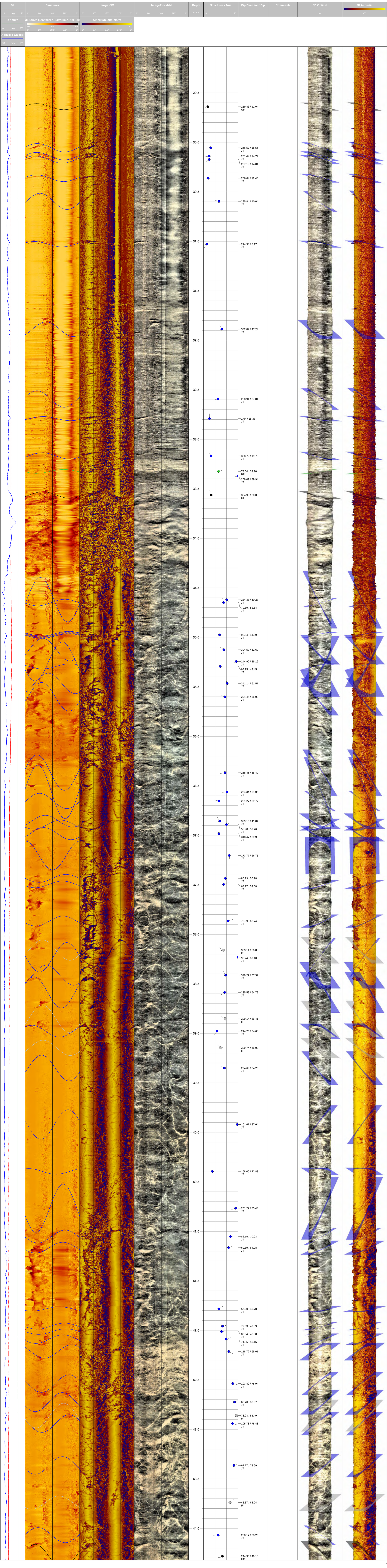


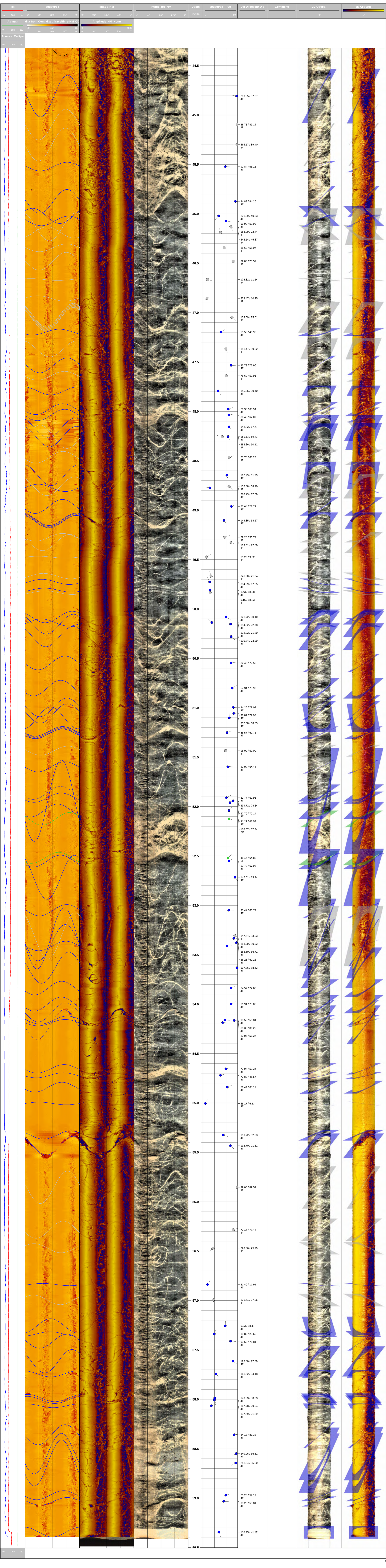
Depth: 1.04 m to 59.51 m

Title		Structures					Image-NM					ImageProc-NM					Depth	Structures - True		Dip Direction/ Dip		Comments		3D Optical		3D Acoustic	
15	deg	25	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	1m.10m	0	90				-0°		-0°	
Azimuth		Dist from Centralized TravTime-NM_OC					Amplitude-NM_Norm																				
0	deg	360	50	mm		ms	0																				
0	deg	360	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°	0°	90°	180°	270°	0°										









Acoustic Caliper																											
0		deg		300		0°		90°		180°		270°		0°		0°		90°		180°		270°		0°			
						40		mm		85		0		0		0		0		0		0		1500			
Azimuth				sus from Centralized Travetime-NM_OG										Amplitude-NM_Norm													
15		deg		25		0°		90°		180°		270°		0°		0°		90°		180°		270°		0°			
Tilt				Structures				Image-NM				ImageProc-NM				Depth		Structures - True		Dip Direction/ Dip		Comments		3D Optical		3D Acoustic	



Unit A3, 269a Mt Smart Road
Onewunga
Auckland, 1061
New Zealand

Ph: +64 6 8771652
Fax: +64 6 8775015
Email: info@rdcl.co.nz
www.rdcl.co.nz

Structural Legend

- Structural Legend:**
- BP - Bedding Plane
 - BF - Bedding Fracture
 - JT - Joint
 - FR - Fracture
 - FZ - Fractured Zone
 - SH - Shear
 - CZ - Crushed Zone
 - IF - Infilled Zone
 - DZ - Decomposed Zone
 - UF - Unidentified Feature

Los Nomenclatures

Log Nomenclature:

- Azimuth = Tool azimuth from magnetic north
- Tilt = Inclination from vertical
- Acoustic Calliper = 360° average from travel time
- Calliper from Cent = Calliper derived from travel time
- Image-NM = Optical image oriented to magnetic north
- Amplitude-NM = Acoustic amplitude (magnetic north)
- Structures = Apparent Structures oriented to hole
- Structures - True = Structures Oriented to true north
- 3D Optical = 3D representation of optical log
- 3D Acoustic = 3D representation of acoustic log

Comments:

1. Structures - True are reported in dip direction and dip relative to grid north.
2. Optical Data not presented due to turbid water, obscuring optical data.
3. Low acoustic amplitudes from 1.18 - 10.59 m, indicating soft hole conditions in this zone.

Basic Information:

Drill hole ID:	BH103
Client:	Drill Force Ltd
Run Number(s):	1, 2 & 3
Tool Type(s):	ABI40-2G Acoustic Televiewer OBi40-2G Optical Televiewer QL40-CAL Mechanical Calliper

Service Company:	RDCL
Operator:	A Caldwell
Date Logged:	07/12/2022
Field:	Drury
State / Province:	Auckland
Country:	New Zealand

Drillhole Information:

Log interval from (m):	1.18	Log interval to (m):	77.37
Depth Driller (m):	80.00	Depth Logger (m):	77.37
Fluid Type:	Water	Fluid Level (m):	Near Surface
Easting:	TBC	Northing:	TBC
Elevation:	N/A	Coord Ref System:	TBC
Hole Azimuth:	Vertical	Hole Inclination:	>88.4°
Magnetic Declination:	+20° 18' East	Magnetic Inclination:	62° 59'
Drill Company:	Drill Force Ltd		

Printing Information:

Depth Unit: Metres Log Scale: 1:10 Log Version: Final

Bit Size Record:

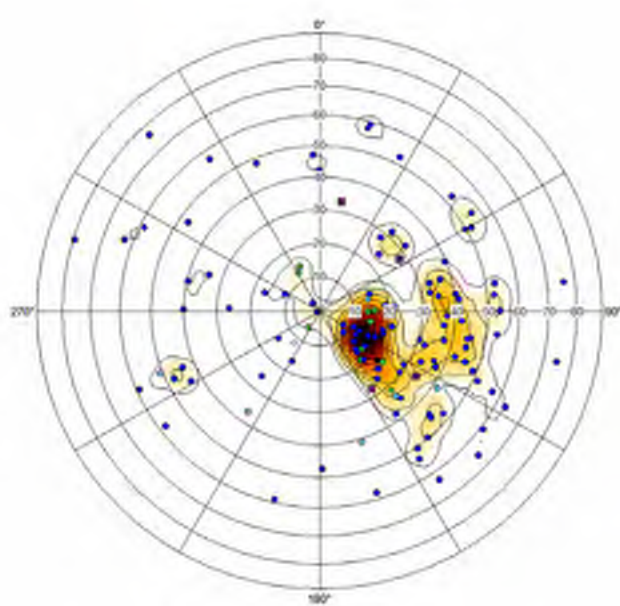
Size (mm):	From (m):	To (m):
HQ (96.0)	0.00	80.0
###.#	###.#	###.#
###.#	###.#	###.#
###.#	###.#	###.#

Casing Record:

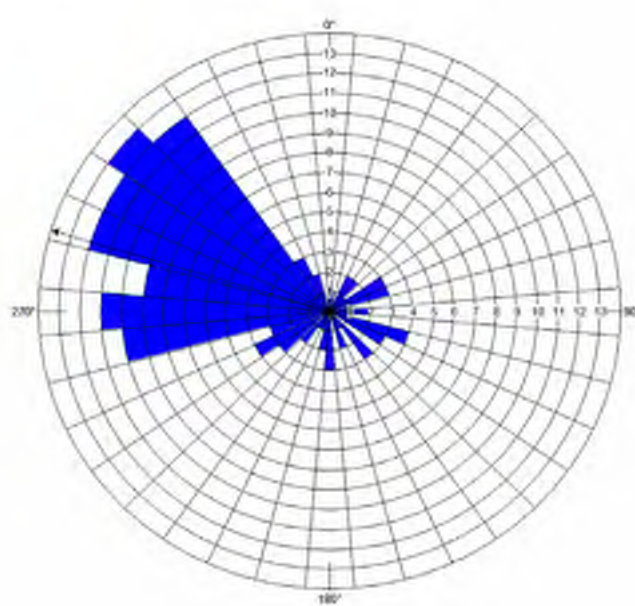
Type:	Size:	From (m):	To (m):
XX	###.#	###.#	###.#
XX	###.#	###.#	###.#
XX	###.#	###.#	###.#
XX	###.#	###.#	###.#

Location Description:

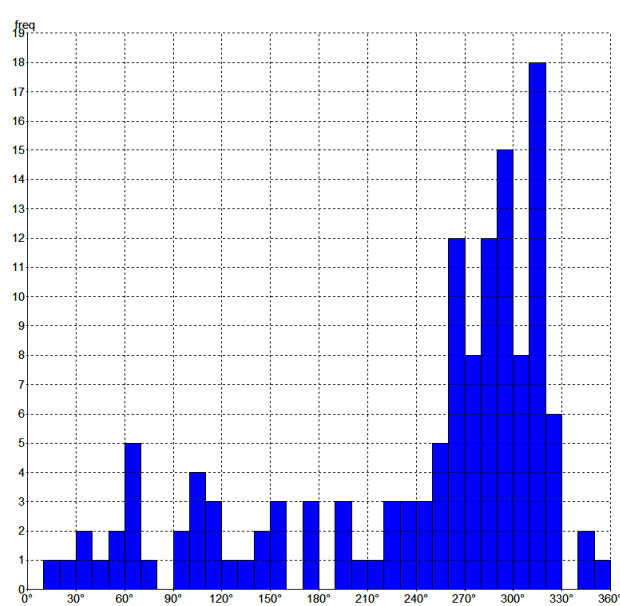
Stevenson Quarr

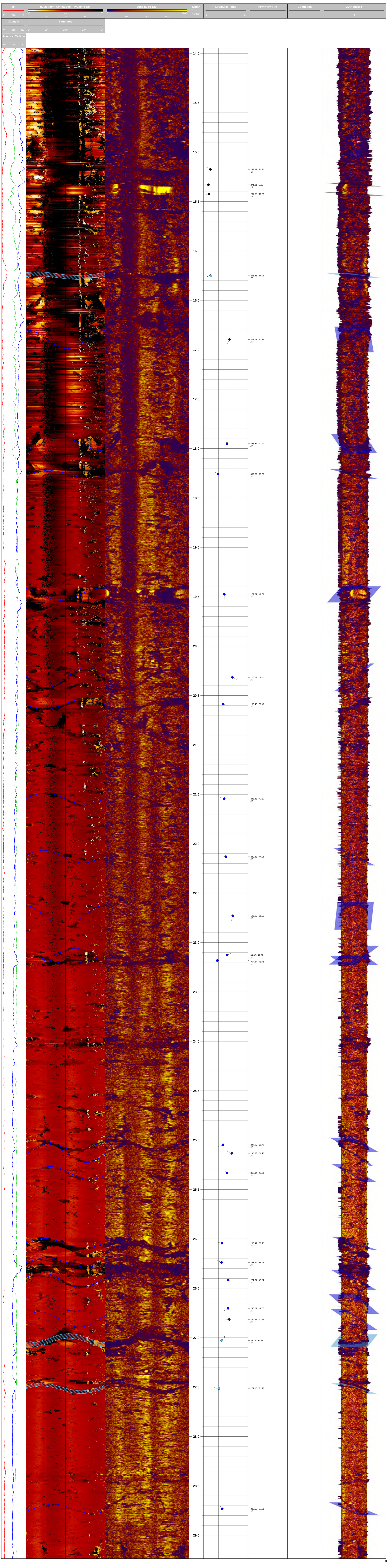


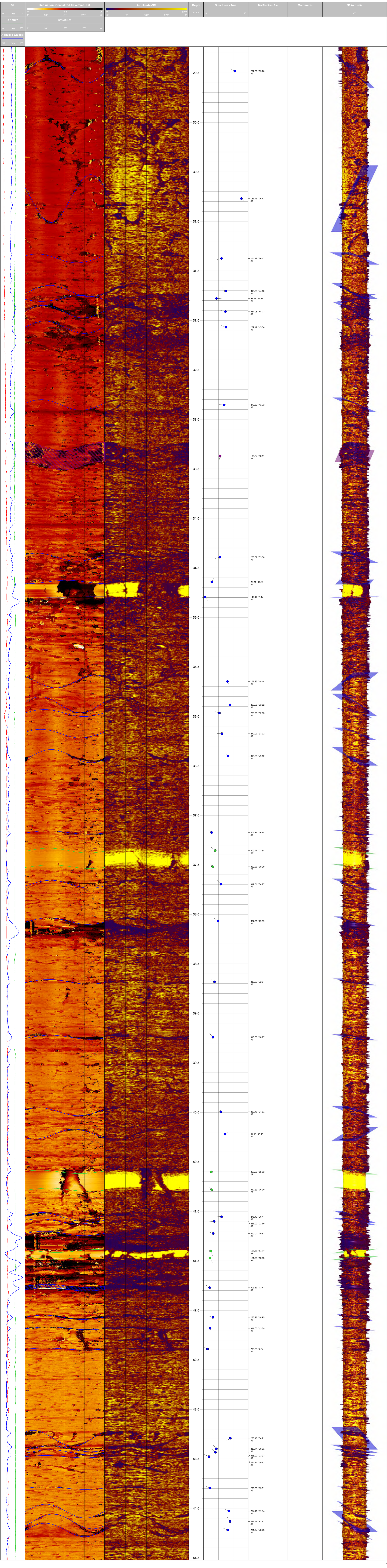
Schmidt Plot - Upper (Northern) Hemisphere - Structures - True
Depth: 1.18 m to 77.37 m

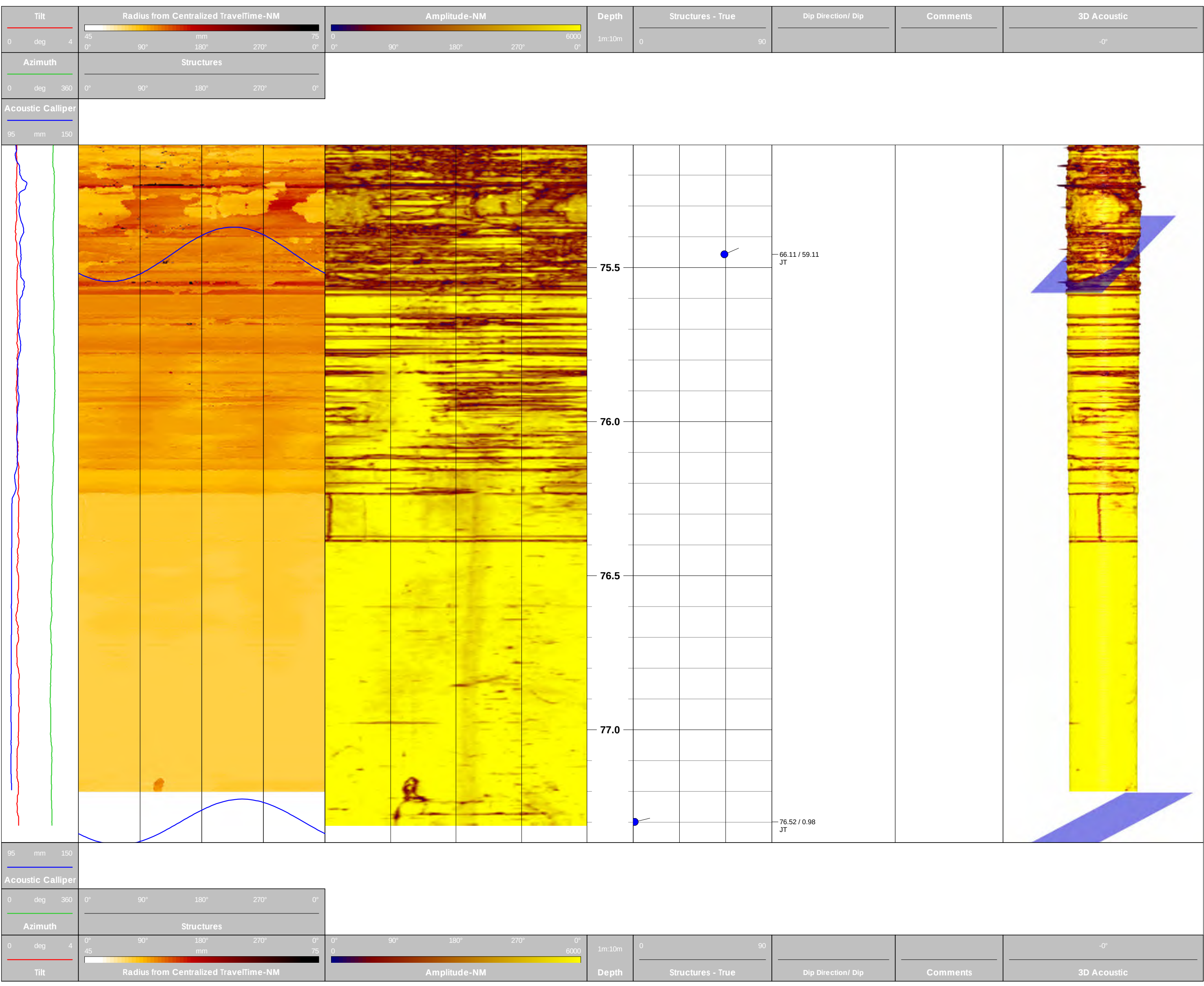


Keywords: child sexual abuse; disclosure; social support

[illegible][illegible]









Unit A3, 269a Mt Smart Road
Onehunga
Auckland, 1061
New Zealand

Ph: +64 6 8771652
Fax: +64 6 8775015
Email: info@rdcl.co.nz
www.rdcl.co.nz

Structural Legend

- Structural Legend:**
-  BP - Bedding Plane
 -  BF - Bedding Fracture
 -  JT - Joint
 -  FR - Fracture
 -  FZ - Fractured Zone
 -  SH - Shear
 -  CZ - Crushed Zone
 -  IF - Infilled Zone
 -  DZ - Decomposed Zone
 -  UF - Unidentified Feature

Les Nomenclatures

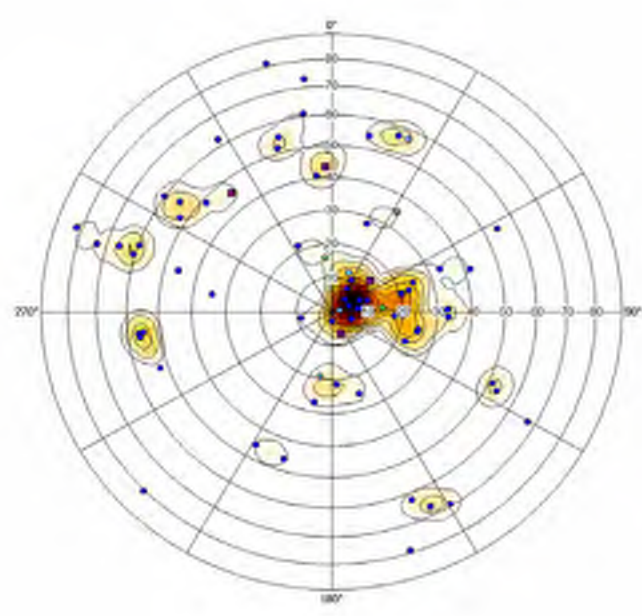
Log Nomenclature:

- Azimuth = Tool azimuth from magnetic north
- Tilt = Inclination from vertical
- Acoustic Calliper = 360° average from travel time
- Calliper from Cent = Calliper derived from travel time
- Image-NM = Optical image oriented to magnetic north
- Amplitude-NM = Acoustic amplitude (magnetic north)
- Structures = Apparent Structures oriented to hole
- Structures - True = Structures Oriented to true north
- 3D Optical = 3D representation of optical log
- 3D Acoustic = 3D representation of acoustic log
- DEN(CDL) = Compensated Density in d/c/cm

Comments:

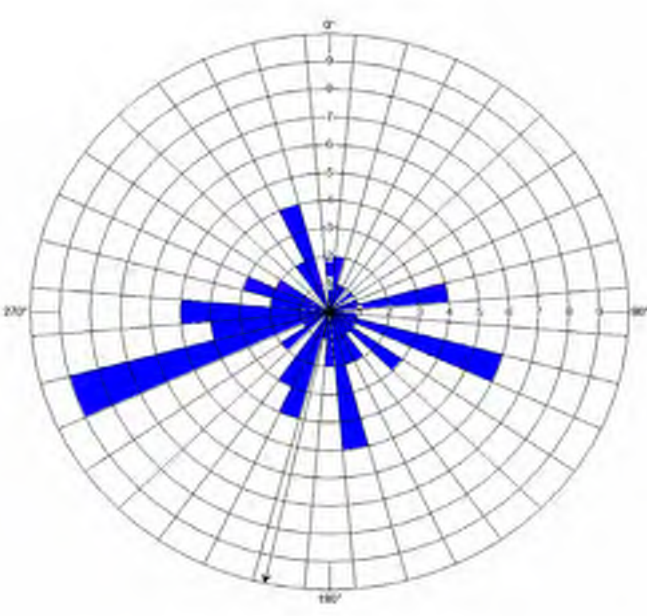
1. Structures - True are reported in dip direction and dip relative to grid north.

Stereoplot - Polar Projection Dip



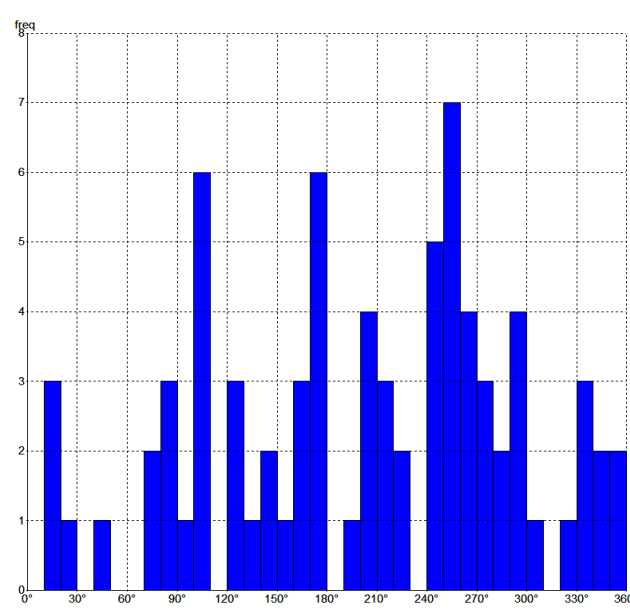
Schmidt Plot - Upper (Northern) Hemisphere - Structures - True
Depth: 2.00 m to 40.23 m

Rose Diagram - Azimuth



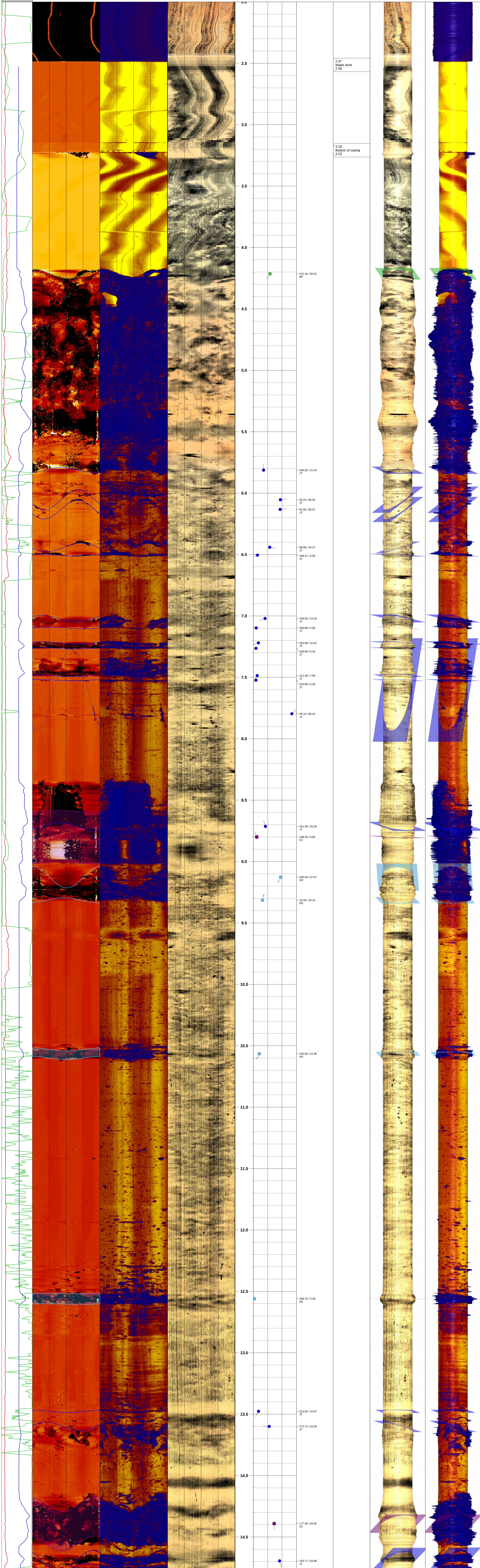
Depth: 2.00 m to 40.23 m

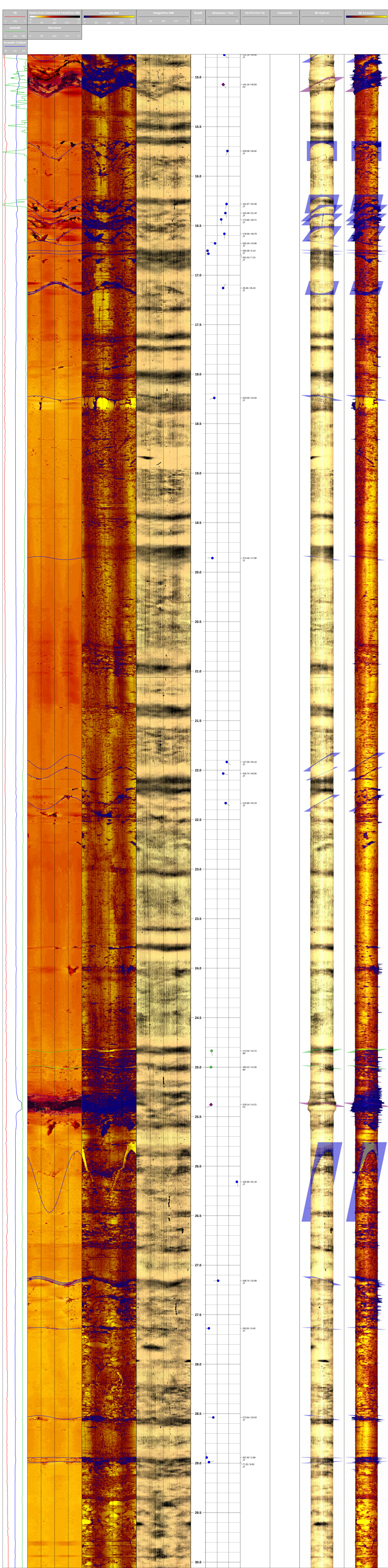
Histogram - Azimuth

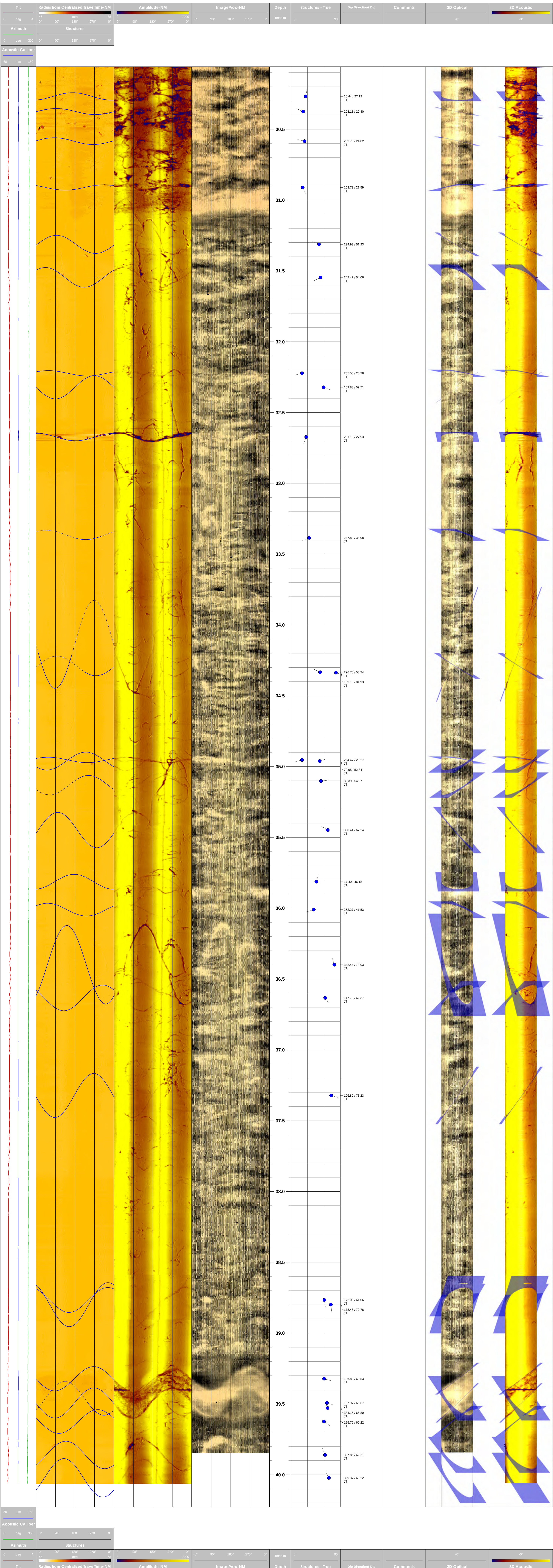


Depth: 2.00 m to 40.23 m

Title	Radius from Centralized Travetime-NM	Amplitude-NM	ImageProc-NM	Depth	Structures - True	Dip Direction/ Dip	Comments	3D Optical	3D Acoustic
0 deg 4			0° 90° 180° 270° 0°	0m10m	0 30			0°	
Azimuth	Structures								
0 deg 360	0° 90° 180° 270° 0°								









Unit A3, 269a Mt Smart Road
Onehunga
Auckland, 1061
New Zealand

Ph: +64 6 8771652
Fax: +64 6 8775015
Email: info@rdcl.co.nz
www.rdcl.co.nz

Structural Legend

- Structural Legend:**
-  BP - Bedding Plane
 -  BF - Bedding Fracture
 -  JT - Joint
 -  FR - Fracture
 -  FZ - Fractured Zone
 -  SH - Shear
 -  CZ - Crushed Zone
 -  IF - Infilled Zone
 -  DZ - Decomposed Zone
 -  UF - Unidentified Feature

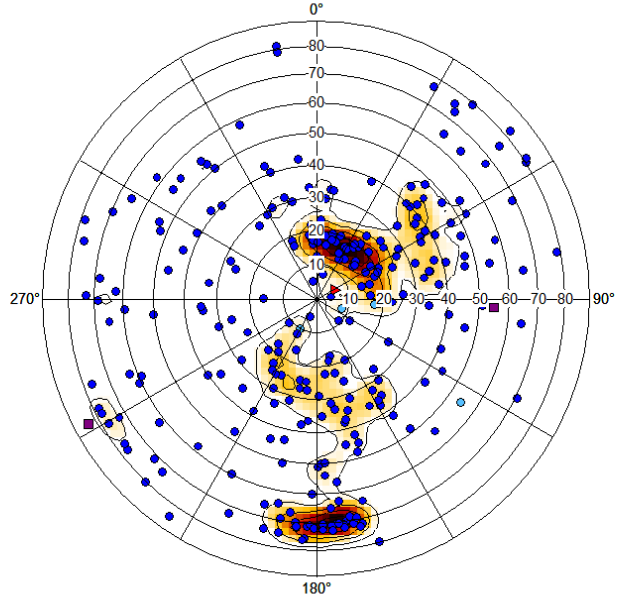
Long Nomenclature:

Log Nomenclature:

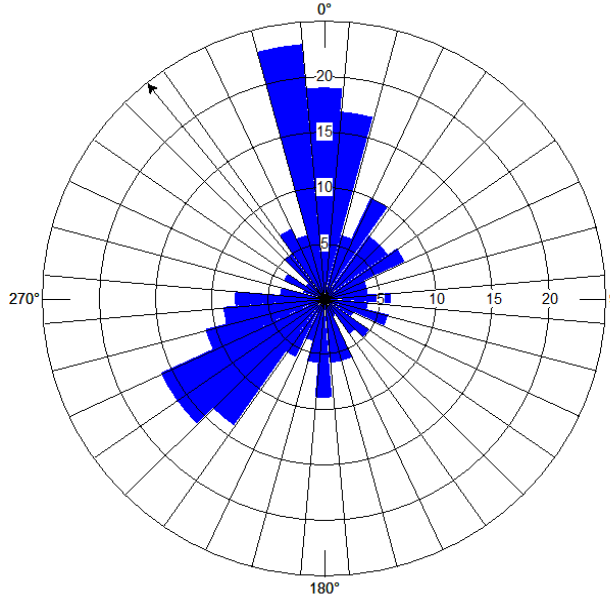
- Azimuth = Tool azimuth from magnetic north
- Tilt = Inclination from vertical
- Acoustic Calliper = 360° average from travel time
- Calliper from Cent = Calliper derived from travel time
- Image-NM = Optical image oriented to magnetic north
- Amplitude-NM = Acoustic amplitude (magnetic north)
- Structures = Apparent Structures oriented to hole
- Structures - True = Structures Oriented to true north
- 3D Optical = 3D representation of optical log
- 3D Acoustic = 3D representation of acoustic log

Comments:

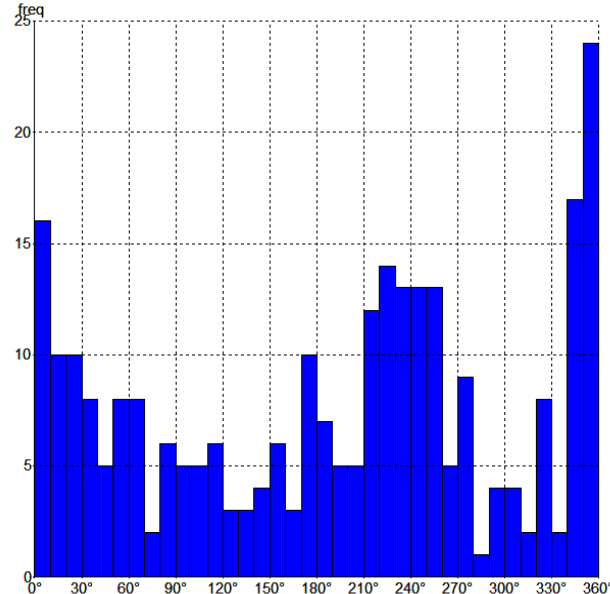
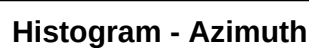
1. Structures - True are reported in dip direction and dip relative to grid north.
2. Turbid water, obscuring optical data below water line. Optical data not presented below water level.



Schmidt Plot - Lower (Southern) Hemisphere - Structures - True
Depth: 3.50 m to 59.72 m

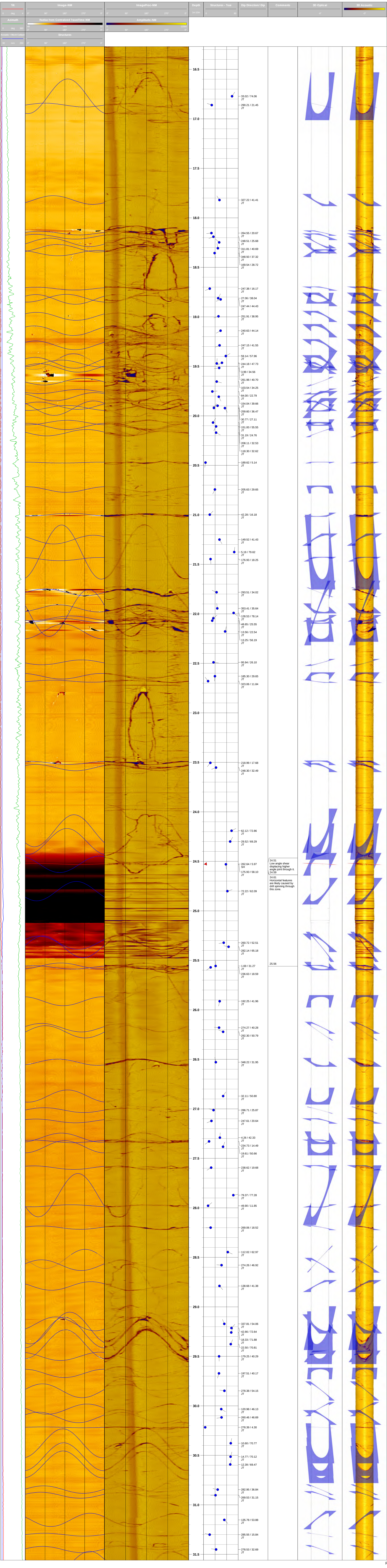


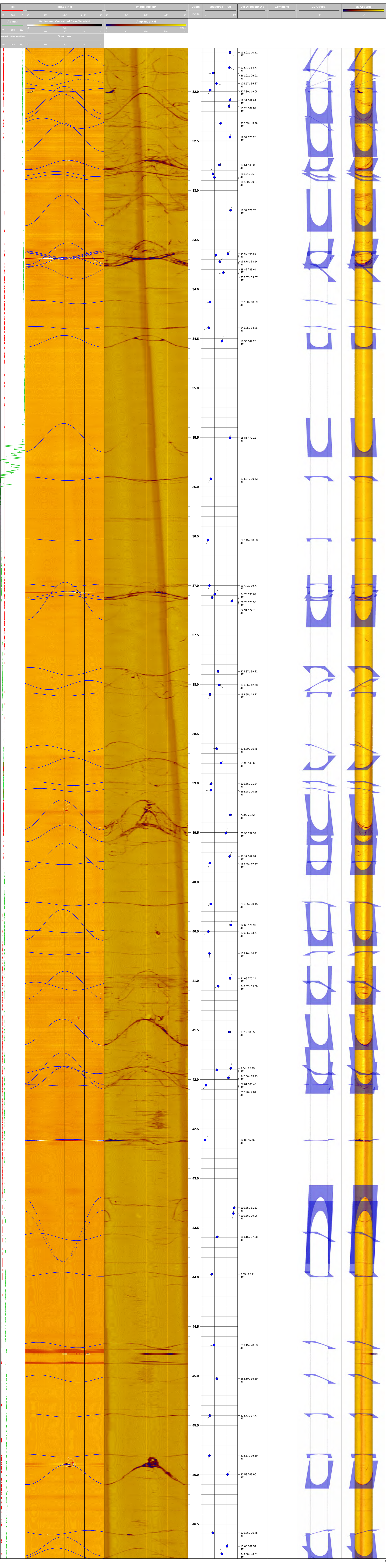
Keywords: child sexual abuse; disclosure; self-blame; social support

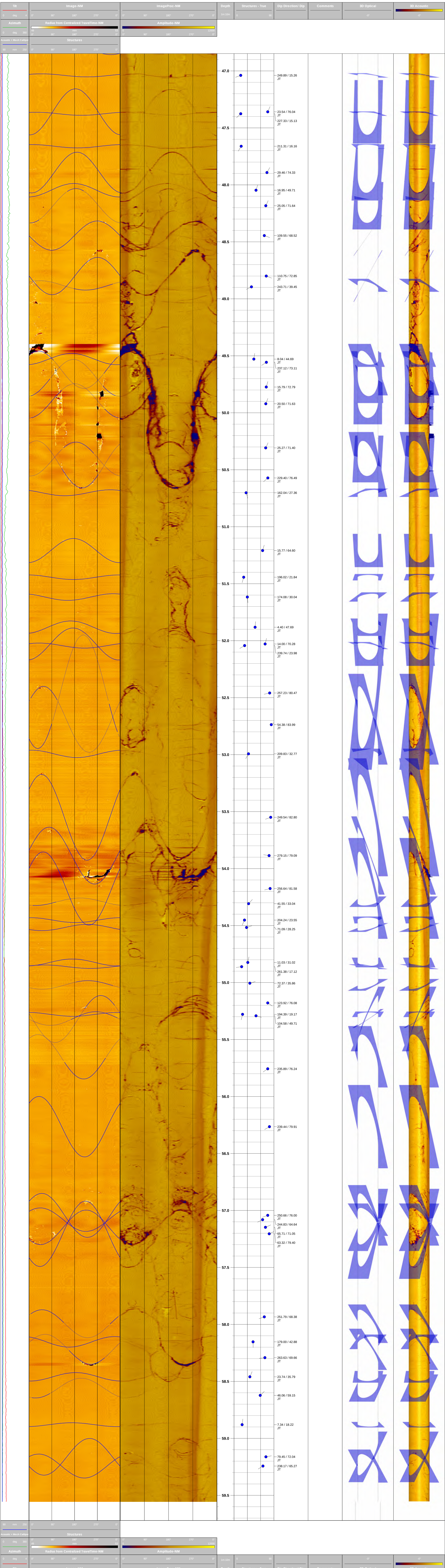
[illegible]

The figure displays a comprehensive set of geological data across several vertical columns:

- Depth:** A central vertical scale ranging from 0 to 16.0.
- Structures - True:** A column showing structural data points, often represented by blue dots with associated numerical values (e.g., 58.20 / 17.15 JT, 2.56 / 45.13 JT).
- Dip Direction/ Dip:** A column showing dip direction and dip angle data points.
- Comments:** A column containing text annotations, such as "4.29 Bottom of Casing 4.34" and "6.40 Water level 6.47".
- 3D Optical:** A column showing 3D optical data, often represented by yellow and orange vertical bars.
- 3D Acoustic:** A column showing 3D acoustic data, often represented by blue and purple vertical bars.
- Image-NM:** A column showing grayscale images of the rock face.
- ImageProc-NM:** A column showing processed grayscale images of the rock face.
- Radius from Centralized TravelTime-NM:** A color scale ranging from 0 to 50 mm.
- Amplitude-NM:** A color scale ranging from 0 to 12000.
- Structures:** A column showing structural data points, often represented by blue dots with associated numerical values.
- Acoustic - Match Column:** A column showing acoustic data, often represented by green and red lines.









Appendix F

Riley Core Photographs





Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	1 and 2 of 23	
		Depth from (m):	1.5	
		Depth To (m):	8.65	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	7.15	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	3 and 4 of 23	
		Depth from (m):	8.65	
		Depth To (m):	14.5	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.75	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	5 and 6 of 23	
		Depth from (m):	14.5	
		Depth To (m):	20.5	
		Interval (m):	6.0	
Project No.	220245—Drury Quarry—Sutton Block			



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	7 and 8 of 23	
		Depth from (m):	20.5	
		Depth To (m):	26.35	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.85	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	9 and 10 of 23	
		Depth from (m):	26.35	
		Depth To (m):	32.30	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.95	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	11 and 12 of 23	
		Depth from (m):	32.30	
		Depth To (m):	38.20	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.90	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	13 and 14 of 23	
		Depth from (m):	38.20	
		Depth To (m):	44.40	
		Interval (m):	6.20	
Project No.	220245—Drury Quarry—Sutton Block			



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	15 and 16 of 23	
		Depth from (m):	44.40	
		Depth To (m):	50.10	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.70	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101		
		Date:	14/11/2022		
Notes:		Box No(s).	17 and 18 of 23		
		Depth from (m):	50.10		
		Depth To (m):	55.50		
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.60		



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	19 and 20 of 23	
		Depth from (m):	55.50	
		Depth To (m):	61.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.0	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	21 and 22 of 23	
		Depth from (m):	61.50	
		Depth To (m):	66.94	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.44	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH101	
		Date:	14/11/2022	
Notes:		Box No(s).	23 of 23	
		Depth from (m):	66.94	
		Depth To (m):	69.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	2.56	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	1 and 2 of 21	
		Depth from (m):	1.5	
		Depth To (m):	7.5	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	3 and 4 of 21	
		Depth from (m):	7.5	
		Depth To (m):	13.5	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	5 and 6 of 21	
		Depth from (m):	13.5	
		Depth To (m):	19.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	7 and 8 of 21	
		Depth from (m):	19.5	
		Depth To (m):	25.5	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	9 and 10 of 21	
		Depth from (m):	25.5	
		Depth To (m):	31.5	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.0	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	11 and 12 of 21	
		Depth from (m):	31.5	
		Depth To (m):	38.1	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	13 and 14 of 21	
		Depth from (m):	38.1	
		Depth To (m):	43.75	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.65	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	15 and 16 of 21	
		Depth from (m):	43.75	
		Depth To (m):	49.10	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.35	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	17 and 18 of 21	
		Depth from (m):	49.10	
		Depth To (m):	54.35	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.25	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	19 and 20 of 21	
		Depth from (m):	54.35	
		Depth To (m):	59.70	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.25	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH102	
		Date:	07/11/2022	
Notes:		Box No(s).	21 of 21	
		Depth from (m):	59.70	
		Depth To (m):	60	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	0.3	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	24/11/2022	
Notes:		Box No(s).	1 and 2 of 25	
		Depth from (m):	0.00	
		Depth To (m):	6.45	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.45	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	24/11/2022	
Notes:		Box No(s).	3 and 4 of 25	
		Depth from (m):	6.45	
		Depth To (m):	12.70	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.25	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	24/11/2022	
Notes:		Box No(s).	5 and 6 of 25	
		Depth from (m):	12.70	
		Depth To (m):	18.57	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.87	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	01/12/2022	
Notes:		Box No(s).	7 and 8 of 25	
		Depth from (m):	18.57	
		Depth To (m):	24.9	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.33	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	01/12/2022	
Notes:		Box No(s).	9 and 10 of 25	
		Depth from (m):	24.90	
		Depth To (m):	31.15	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.25	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	30/11/2022	
Notes:		Box No(s).	11 and 12 of 25	
		Depth from (m):	31.15	
		Depth To (m):	37.25	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.1	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	01/12/2022	
Notes:		Box No(s).	13 and 14 of 25	
		Depth from (m):	37.25	
		Depth To (m):	43.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.25	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	01/12/2022	
Notes:		Box No(s).	15 and 16 of 25	
		Depth from (m):	43.40	
		Depth To (m):	49.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.10	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	02/12/2022	
Notes:		Box No(s).	17 and 18 of 20	
		Depth from (m):	49.50	
		Depth To (m):	55.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.0	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	02/12/2022	
Notes:		Box No(s).	19 and 20 of 25	
		Depth from (m):	55.50	
		Depth To (m):	62.05	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.55	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103		
		Date:	03/12/2022		
Notes:		Box No(s).	21 and 22 of 25		
		Depth from (m):	62.03		
		Depth To (m):	68.40		
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.37		



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	05/12/2022	
Notes:		Box No(s).	23 and 24 of 25	
		Depth from (m):	68.40	
		Depth To (m):	74.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.10	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH103	
		Date:	05/12/2022	
Notes:		Box No(s).	25 of 25	
		Depth from (m):	74.5	
		Depth To (m):	78	
		Interval (m):	3.5	
Project No.	220245—Drury Quarry—Sutton Block			



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH104	
		Date:	12/12/2022	
Notes:		Box No(s).	1 and 2 of 14	
		Depth from (m):	0.0	
		Depth To (m):	7.5	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	7.5	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH104	
		Date:	12/12/2022	
Notes:		Box No(s).	5 and 6 of 14	
		Depth from (m):	13.35	
		Depth To (m):	19.20	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.85	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH104	
		Date:	13/12/2022	
Notes:		Box No(s).	7 and 8 of 14	
		Depth from (m):	19.20	
		Depth To (m):	25.0	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.80	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH104	
		Date:	13/12/2022	
Notes:		Box No(s).	9 and 10 of 14	
		Depth from (m):	25.0	
		Depth To (m):	30.85	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.85	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH104	
		Date:	13/12/2022	
Notes:		Box No(s).	11 and 12 of 14	
		Depth from (m):	30.85	
		Depth To (m):	36.0	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.15	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH104	
		Date:	13/12/2022	
Notes:		Box No(s).	13 and 14 of 14	
		Depth from (m):	36.0	
		Depth To (m):	40.50	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	4.50	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	1 and 2 of 17	
		Depth from (m):	0.0	
		Depth To (m):	6.8	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	6.8	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	3 and 4 of 17	
		Depth from (m):	6.8	
		Depth To (m):	12.2	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.4	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	5 and 6 of 17	
		Depth from (m):	12.2	
		Depth To (m):	17.8	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	7 and 8 of 17	
		Depth from (m):	17.8	
		Depth To (m):	23.4	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.6	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105		
		Date:	01/11/2022		
Notes:		Box No(s).	9 and 10 of 17		
		Depth from (m):	23.4		
		Depth To (m):	29.1		
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.7		



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	11 and 12 of 17	
		Depth from (m):	29.1	
		Depth To (m):	34.25	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.15	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	13 and 14 of 17	
		Depth from (m):	34.25	
		Depth To (m):	39.25	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.0	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	01/11/2022	
Notes:		Box No(s).	15 and 16 of 17	
		Depth from (m):	39.25	
		Depth To (m):	44.35	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	5.10	



Client / Project:	Stevenson Aggregates Ltd. Drury Quarry—Sutton Block	Hole ID:	DH105	
		Date:	02/11/2022	
Notes:		Box No(s).	17 of 17	
		Depth from (m):	44.35	
		Depth To (m):	46.89	
Project No.	220245—Drury Quarry—Sutton Block	Interval (m):	2.54m	



Appendix G

Riley Machine Borehole Logs (DH101 to DH105)



SOIL TYPES AND SYMBOLS

	FILL		CLAY
	TOPSOIL		PEAT
	SILT		GROUNDWATER LEVEL
	SAND		SCALA PENETROMETER
	GRAVEL	10,11,10	LAST 3 NUMBER OF BLOWS PER 50mm INCREMENT

ROCK TYPES AND SYMBOLS

	SANDSTONE		BASALT
	SILTSTONE		TUFF
	MUDSTONE		IGNIMBRITE
	LIMESTONE		GREYWACKE

SOIL STRENGTH CLASSIFICATION

FINE GRAINED COHESIVE SOILS

TERM	FIELD IDENTIFICATION	UNDRAINED SHEAR STRENGTH (kPa)
Very Soft (Vs)	Exudes between fingers when squeezed.	<12
Soft (S)	Easily indented by fingers.	12 – 25
Firm (F)	Indented only by strong finger pressure.	25 – 50
Stiff (St)	Indented by thumb pressure.	50 – 100
Very Stiff (VSt)	Indented by thumbnail.	100 – 200
Hard (H)	Difficult to indent by thumbnail.	200+

SPT & SCALA PENETROMETER RESULTS

TERM	SPT VALUE No. of BLOWS/300mm	SCALA PENETROMETER No. of BLOWS/100mm
very dense	>50	17+
dense	30 – 50	7 – 17
medium dense	10 – 30	3 – 7
loose	4 – 10	1 – 3
very loose	0 – 4	0 – 2

ROCK STRENGTH CLASSIFICATION

TERM	FIELD IDENTIFICATION	UNCONFINED UNIAXIAL COMPRESSIVE STRENGTH (MPa)
Extremely weak (EW)	Indented by thumbnail.	< 1
Very weak (VW)	Crumbles under firm blows with point of geological hammer. Can be peeled with pocket knife.	1 – 5
Weak (W)	Difficult to peel with pocket knife.	5 – 20
Moderately strong (MS)	Cannot be scraped or peeled with pocket knife.	20 – 50
Strong (S)	More than one blow of geological hammer to fracture.	50 – 100
Very strong (VS)	Many blows of geological hammer to break.	100 – 250
Extremely strong (ES)	Can only be chipped with geological hammer.	250+

MOISTURE CONDITION

Dry (D)	Looks and feels dry; powdery and friable.
Moist (M)	Feels cool; darkened in colour; no free water when remoulded.
Wet (W)	Feels cool; darkened in colour; free water forms on hands.
Saturated (S)	Free water is present on sample.

SAMPLE TYPES

	UNDISTURBED
	MACHINE AUGER DISTURBED
	HAND AUGER DISTURBED
	STANDARD PENETRATION TEST (solid cone)
	STANDARD PENETRATION TEST (hollow cone)

DRILLING METHOD

OB	OPEN BARREL
TT	TRIPLE TUBE
WB	WASH BORE
SH	UNDISTURBED SHELBY TUBE
RC	ROCK CORE
SPT	STANDARD PENETRATION TEST

FIELD TESTS

V	SHEAR VANE (corrected to BS:1377)
R	REMOULDED STRENGTH
P	POCKET PENETROMETER
CH	CLEGG HAMMER

INFORMATION BASED ON THE NZ GEOTECHNICAL SOCIETY INC. GUIDELINES FOR THE CLASSIFICATION AND DESCRIPTION OF SOIL AND ROCK FOR ENGINEERING PURPOSES



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 1 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26 W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38 W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64 W65 W66 W67 W68 W69 W70 W71 W72 W73 W74 W75 W76 W77 W78 W79 W80 W81 W82 W83 W84 W85 W86 W87 W88 W89 W90 W91 W92 W93 W94 W95 W96 W97 W98 W99 W100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation	
		Rotary cored	0.00			ALLUVIUM		CORE LOSS									
0.5																	
1.0																	
1.50			1.50			TE KUITI GROUP		CLAY, with minor silt; orange-brown. Soft to firm; medium plasticity to high plasticity.									
1.6																	
1.75																	
2.0									CLAY, with trace silt; brown . Firm; medium plasticity to high plasticity.								
2.5																	
3.0			3.00						3.00m - 3.40m: CORE LOSS								
3.5			3.40														
4.0																	
4.40								4.10m - 4.30m: Corestone; moderately weathered; brown; MUDSTONE; very weak.									
								CLAY; brown . Stiff to very stiff; medium									

Explanations: Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 2 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
			4.50		100			plasticity to high plasticity.								
			4.60					4.50m - 4.60m: CORE LOSS								
5.0																5.0
5.5								5.70m: Grades to firm.								5.5
6.0																6.0
6.5								6.20m: Grades to very stiff to hard.								6.5
7.0																7.0
7.5																7.5
8.0																8.0
8.5																8.5
9.0																9.0

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 3 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26 W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38 W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64 W65 W66 W67 W68 W69 W70 W71 W72 W73 W74 W75 W76 W77 W78 W79 W80 W81 W82 W83 W84 W85 W86 W87 W88 W89 W90 W91 W92 W93 W94 W95 W96 W97 W98 W99 W100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
9.5		Rotary cored		100		TE KUITI GROUP		CLAY; grey-brown. Hard; MUDSTONE; extremely weak, slightly to moderately weathered, laminated/fissured.								
10.0																
10.5																
11.0																
11.5																
12.0																
12.5																
13.0																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Peat Fill Core Loss Clay Silt Sand Gravel Bentonite Grout/concrete Drill arisings Filter sand	Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

All dimensions in metres NOT TO SCALE	Drilling Contractor:	Drilling Rig ID:	Driller:	Logged By:	Checked By:
	Drillforce	YDX-3L		SJA	SRO

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG																				
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH101																		
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022		Hole Location: Farmhouse West																						
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground		Hole Depth (m): 69.50		Inclination: 70°	Azimuth: 290°	Sheet: 5 of 16	Status: FINAL																	
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation										
		Rotary cored		100		TE KUITI GROUP		18.00m: Grades to slightly weathered.																		
18.5																18.5										
19.0																19.0										
19.5																19.5										
20.0																20.0										
20.5								20.50m: Grades to moderately weathered with minor 50mm highly weathered layers.								20.5										
21.0																21.0										
21.5																21.5										
22.0																22.0										
Explanations: Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer Topsoil Peat Fill Core Loss Clay Silt Sand Gravel Bentonite Grout/concrete Drill arisings Filter sand Backfill: Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested. <tr><td colspan="2">All dimensions in metres NOT TO SCALE</td><td colspan="3">Drilling Contractor: Drillforce</td><td colspan="2">Drilling Rig ID: YDX-3L</td><td>Driller:</td><td>Logged By: SJA</td><td>Checked By: SRO</td></tr>																	All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L		Driller:	Logged By: SJA	Checked By: SRO
All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L		Driller:	Logged By: SJA	Checked By: SRO																	

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°		

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26 W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38 W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64 W65 W66 W67 W68 W69 W70 W71 W72 W73 W74 W75 W76 W77 W78 W79 W80 W81 W82 W83 W84 W85 W86 W87 W88 W89 W90 W91 W92 W93 W94 W95 W96 W97 W98 W99 W100	Field Strength Soil Rock S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 S17 S18 S19 S20 S21 S22 S23 S24 S25 S26 S27 S28 S29 S30 S31 S32 S33 S34 S35 S36 S37 S38 S39 S40 S41 S42 S43 S44 S45 S46 S47 S48 S49 S50 S51 S52 S53 S54 S55 S56 S57 S58 S59 S60 S61 S62 S63 S64 S65 S66 S67 S68 S69 S70 S71 S72 S73 S74 S75 S76 S77 S78 S79 S80 S81 S82 S83 S84 S85 S86 S87 S88 S89 S90 S91 S92 S93 S94 S95 S96 S97 S98 S99 S100	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		TE KUITI GROUP		22.80m: Grades to slightly weathered. 23.40m: Grades to extremely weak, moderately weathered, with some 50mm highly weathered sections; CLAY, with trace of silt.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.

-  Initial Water Level
-  Out flow
-  In flow

-  Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
-  Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

	Topsoil		Clay
	Peat		Silt
	Fill		Sand
	Core Loss		Gravel

Backfill:

Legend

- Bentonite
- Grout/concrete
- Drill arisings
- Filter sand

Remarks:

Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 7 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
27.5		Rotary cored				TE KUITI GROUP		27.00m: Extremely weak, moderately weathered, with some 50mm highly weathered sections; CLAY, with trace of silt.								
28.0																
28.5																
29.0																
29.5																
30.0																
30.5																
31.0																
								30.50m: Grades to very weak, slightly weathered.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 8 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
32.0																
32.5																
33.0				100				32.65m: Grades to highly weathered, extremely weak (CLAY with some silt, firm to hard).								
33.5																
34.0																
34.5			34.50	0				34.50m - 35.00m: CORE LOSS								
35.0					100											
35.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 10 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
41.0								[CONT] Slightly to moderately weathered; light grey; GREYWACKE; very weak. Extremely to very closely spaced fractures at multiple orientations. Clay weathering and infill on defect surfaces. Abundant quartz veins infilling healed fractures.								
41.5								41.50m - 42.00m: Grades to extremely to closely spaced fractures, rough to smooth, undulating, striations on most surfaces. Becomes extremely to very weak.								
42.0																
42.5																
43.0																
43.5																
44.0																
44.5																

Explanations: Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Refer to "Geological and Geotechnical Information" sheet for further details. Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Peat Fill Core Loss Clay Silt Sand Gravel Bentonite Grout/concrete Drill arisings Filter sand	Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	---	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

MACHINE HOLE LOG



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 12 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
50.0		Rotary cored				WAIPAPA GROUP		49.50m: Slightly to moderately weathered; light grey; GREYWACKE; extremely to very weak. Closely spaced fractures at multiple orientations. Clay weathering and infill on defect surfaces. Abundant quartz veins infilling healed fractures.								
50.5																
51.0								50.90m: Fractures become extremely to very closely spaced.								
51.5																
52.0																
52.5																
53.0								52.80m: Fractures become closely spaced.								
53.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.		Backfill:		Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.	
 Initial Water Level	 Standard Penetration Test (SPT)	 Topsoil	 Clay		 Bentonite
 Out flow	Filled = Solid cone (C) No Fill = Split spoon (S)	 Peat	 Silt		 Grout/concrete
 In flow		 Fill	 Sand		 Drill arisings
Moisture: M = moist W = wet S = saturated	 Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Core Loss	 Gravel		 Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG											
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH101									
Client: Stevenson Aggregates Ltd			Start Date: 09 Nov 2022 End Date: 14 Nov 2022		Hole Location: Farmhouse West												
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground		Hole Depth (m): 69.50		Inclination: 70°	Azimuth: 290°	Sheet: 13 of 16	Status: FINAL								
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation	
		Rotary cored				WAIPAPA GROUP		[CONT] 52.80m: Fractures become closely spaced.									
									54.30m: Fractures become extremely to very closely spaced.								
54.5																	
55.0																	
55.5																	
56.0																	
56.5																	
56.60																	
								Silty sandy GRAVEL with minor clay. [CRUSH ZONE]						56.60-56.85m, CZ			
56.85																	
								Slightly to moderately weathered; light grey; GREYWACKE; very weak. Extremely to very closely spaced fractures at all angles. Clay weathering and infill on defect surfaces. Abundant quartz veins infilling healed fractures.									
57.0																	
								57.40m - 57.70m: Trace pyrite inclusions/staining.									
57.5																	
57.60																	
								Sandy GRAVEL with some silt. [CRUSH ZONE]						57.60-57.90m, CZ			
57.90																	
								Slightly to moderately weathered; light grey; GREYWACKE; very weak. Extremely to very closely spaced fractures at all angles. Clay weathering and infill on defect surfaces. Abundant quartz veins infilling healed fractures.									
58.0								58.00m - 62.00m: Circulation loss.									

Explanations:
 Initial Water Level
 Out flow
 In flow
Moisture:
M = moist
W = wet
S = saturated

 Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
 Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

 Topsoil
 Peat
 Fill
 Core Loss

 Clay
 Silt
 Sand
 Gravel

Backfill:
 Bentonite
 Grout/concrete
 Drill arisings
 Filter sand

Remarks:
Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce		Drilling Rig ID: YDX-3L		Driller:		Logged By: SJA		Checked By: SRO	
--	--	------------------------------------	--	----------------------------	--	----------	--	-------------------	--	--------------------	--

Printed: 22/06/2023 1:04:34 pm

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°		

[illegible]

RILEY CONSULTANTS LTD, REPORT: RILEY MH-R (rock) - generated with CORE-GS by Geroc

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.		Backfill:		Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.	
 Initial Water Level  Out flow  In flow Moisture: M = moist W = wet S = saturated	 Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)  Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Topsoil  Peat  Fill  Core Loss	 Clay  Silt  Sand  Gravel	 Bentonite  Grout/concrete  Drill arisings  Filter sand	
All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO

All dimensions in metres NOT TO SCALE	Drilling Contractor:	Drilling Rig ID:	Driller:	Logged By:	Checked By:
	Drillforce	YDX-3L		SJA	SRO



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH101	
Client: Stevenson Aggregates Ltd		Start Date: 09 Nov 2022 End Date: 14 Nov 2022	Hole Location: Farmhouse West				
Co-ordinates : E 1777245, N 5890541		Ground Level (m): Ground	Hole Depth (m): 69.50	Inclination: 70°	Azimuth: 290°	Sheet: 16 of 16	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100 mm 10 20 30 40 50 60 70 80 90 100 mm 10 20 30 40 50 60 70 80 90 100 mm	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
68.0						WAIPAPA GROUP		[CONT] 66.00m: Circulation loss.								
68.5								68.20m - 68.30m: Highly fractured zone, recovered as sand to gravel sized material.								
69.0								68.70m - 69.00m: Highly fractured zone, recovered as sand to gravel sized material.								
69.50	69.5							END OF HOLE: 69.50m								
70.0																
70.5																
71.0																
71.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: Drilling circulation loss at 58.0m and 66.0m. See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH102	
Client: Stevenson Aggregates Ltd	Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East		
Co-ordinates : E 1777674, N 5890408	Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°
		Sheet: 1 of 14	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
			0.00					CORE LOSS								
0.5																
1.0																
1.50																
1.5			1.50					CLAY, with minor silt; medium brown. Stiff to very stiff.								
1.75																
1.95								CLAY, with trace silt; orange and light grey mixed. Firm to stiff; medium plasticity to high plasticity.								
2.0								CLAY, with trace silt; brown-grey with orange mottles. Stiff to very stiff; medium plasticity to high plasticity.								
2.30																
2.5								CLAY; brownish grey. Very stiff to hard; [TE KUITI GROUP].								
2.75																
3.00			2.75					CORE LOSS								
3.0																
3.0			3.00					CLAY; brownish grey. Very stiff to hard.								
3.5																
4.0																
4.50																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 2 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		TE KUITI GROUP		Moderately weathered, extremely weak, carbonaceous MUDSTONE, greyish-brown. Thinly laminated; CLAY, hard. 4.60m: Coal seam, lens, up to 2mm thick. 7.15m - 7.50m: Minor coal laminations and organic inclusions up to 1mm thick. 8.00m: Becomes very weak. Moderately weathered, very weak, carbonaceous MUDSTONE, dark brown. Thinly laminated; minor organic inclusions. Contains several highly to completely weathered sections; CLAY, firm.								

Explanations: Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Peat Fill Core Loss Bentonite Grout/concrete Drill arisings Filter sand	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG													
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH102											
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022		Hole Location: Farmhouse East															
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground		Hole Depth (m): 60.00		Inclination: 70°	Azimuth: 270°	Sheet: 3 of 14	Status: FINAL										
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26 W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38 W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64 W65 W66 W67 W68 W69 W70 W71 W72 W73 W74 W75 W76 W77 W78 W79 W80 W81 W82 W83 W84 W85 W86 W87 W88 W89 W90 W91 W92 W93 W94 W95 W96 W97 W98 W99 W100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation			
9.5		Rotary cored		100		TE KUITI GROUP		[CONT] Moderately weathered, very weak, carbonaceous MUDSTONE, dark brown. Thinly laminated; minor organic inclusions. Contains several highly to completely weathered sections; CLAY, firm.									9.5		
10.0																			10.0
10.30																			
10.30			10.30	0				CORE LOSS										10.5	
10.50																			
10.50			10.50					Moderately weathered, very weak, carbonaceous MUDSTONE, dark brown. Thinly laminated; minor organic inclusions. Contains several highly to completely weathered layers; CLAY, firm.										11.0	
11.0																		11.5	
11.5								11.30m - 12.65m: Sandy laminations 2mm to 10mm thick.										12.0	
12.0				100														12.5	
12.5																		13.0	
13.0								13.05m: Becomes moderately weathered.										13.5	
13.50																			
Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand Backfill: Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.																			
All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L			Driller:		Logged By: SJA		Checked By: SRO							



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH102	
Client: Stevenson Aggregates Ltd	Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East		
Co-ordinates : E 1777674, N 5890408	Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°
		Sheet: 4 of 14	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
14.0		Rotary cored				TE KUITI GROUP		Slightly to moderately weathered, weak, carbonaceous MUDSTONE, greyish-brown. Thinly laminated; closely to moderately-widely spaced fractures along lamination planes.								
14.5																
15.0																
15.5																
16.0				100												
16.5																
17.0																
17.5																
17.90																
18.00			17.90					CORE LOSS								
								16.45m - 16.65m: Extremely weak, moderately weathered layer.			UCS26*: 15.65 - 15.85m					

Explanations: Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Refer to "Geological and Geotechnical Information" sheet for further details. Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
---	---	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 5 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored	18.00			TE KUITI GROUP		Slightly to moderately weathered, weak, carbonaceous MUDSTONE, greyish-brown. Thinly laminated; closely to moderately-widely spaced fractures along lamination planes.								
18.5																18.5
19.0								18.90m: Coal lens approximately 2mm thick.								19.0
19.5								19.30m - 20.20m: Highly weathered, extremely closely spaced fractures, very to extremely weak layer.								19.5
20.0				100												20.0
20.5																20.5
21.0																21.0
21.5																21.5
22.0																22.0

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.			Backfill:	Remarks:
Initial Water Level	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)	Topsoil	Clay	See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Out flow	Peat	Silt	Bentonite	
In flow	Fill	Sand	Grout/concrete	
Moisture: M = moist W = wet S = saturated	Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Core Loss	Drill arisings	
		Gravel	Filter sand	

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 6 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
			Box No.					In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Soil Rock					In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation		
	23.0	Rotary cored		100	0	TE KUITI GROUP		[CONT] 19.30m - 20.20m: Highly weathered, extremely closely spaced fractures, very to extremely weak layer.						23.00-23.30m, CZ	23.0	
							23.00m - 23.30m: Highly to completely weathered CRUSH ZONE; CLAY with some silt and gravel, firm.						23.5			
	23.5															
							23.90m - 24.05m: Extremely to closely spaced fractures, moderately weathered.									
	24.0															
							Slightly to moderately weathered, extremely to very weak carbonaceous MUDSTONE, grey-brown. Closely to very closely spaced fractures, thinly laminated; contains highly to completely weathered and/or extremely closely fractured sections throughout.									
	24.5															
																
	25.0															
																
	25.5															
																
	26.0															
																
	26.5															

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.

-  Initial Water Level
-  Out flow
-  In flow

-  Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
-  Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

	Topsoil		Clay
	Peat		Silt
	Fill		Sand
	Core Loss		Gravel

Backfill:

 Bentonite
 Grout/concrete
 Drill arisings
 Filter sand

Remarks:

See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE	Drilling Contractor:	Drilling Rig ID:	Driller:	Logged By:	Checked By:
	Drillforce	YDX-3L		SJA	SRO



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 7 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
27.5		Rotary cored		100		TE KUITI GROUP		[CONT] Slightly to moderately weathered, extremely to very weak carbonaceous MUDSTONE, grey-brown. Closely to very closely spaced fractures, thinly laminated; contains highly to completely weathered and/or extremely closely fractured sections throughout.								
28.0																
28.5																
29.0																
29.5																
30.0																
30.5																
31.0																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.		Backfill:		Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.	
 Initial Water Level	 Standard Penetration Test (SPT)	 Topsoil	 Clay		 Bentonite
 Out flow	Filled = Solid cone (C) No Fill = Split spoon (S)	 Peat	 Silt		 Grout/concrete
 In flow					
Moisture: M = moist W = wet S = saturated	 Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Fill	 Sand	 Drill arisings	
		 Core Loss	 Gravel	 Filter sand	

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG										
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH102								
Client: Stevenson Aggregates Ltd			Start Date: 01 Nov 2022 End Date: 04 Nov 2022		Hole Location: Farmhouse East											
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground		Hole Depth (m): 60.00		Inclination: 70°	Azimuth: 270°	Sheet: 8 of 14	Status: FINAL							
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering Soil Rock	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored				TE KUITI GROUP		[CONT] Slightly to moderately weathered, extremely to very weak carbonaceous MUDSTONE, grey-brown. Closely to very closely spaced fractures, thinly laminated; contains highly to completely weathered and/or extremely closely fractured sections throughout.								
								33.80m - 34.30m: [FAULT GOUGE] Silty gravelly CLAY. Dark grey; very soft.						33.80-34.20m, FT		
								Slightly weathered, moderately strong, GREYWACKE, medium grey. Extremely closely spaced fractures to disintegrated. Many fractures infilled with light mineral or brown clay [CRUSH ZONE]						34.30-34.40m, CZ		
								CORE LOSS						34.50-35.90m, ?		
						WAIAPAPA GROUP		Slightly to moderately weathered, moderately strong, GREYWACKE, medium grey. Extremely closely spaced fractures to disintegrated. Many fractures infilled with light mineral or brown clay. Fractures rough, undulating [CRUSH ZONE].								
								35.85m - 36.00m: Completely fractured, disintegrated section.								
Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer Topsoil Peat Fill Core Loss Clay Silt Sand Gravel Bentonite Grout/concrete Drill arisings Filter sand Backfill: Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.																
All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L			Driller:		Logged By: SJA		Checked By: SRO				

RILEY CONSULTANTS LTD. REPORT: RILEY MH-R (rock) - generated with CORE-GS by Genoc

Printed: 22/06/2023 1:05:49 pm

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°		

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering SP CR CS MS ML CL SL AL VV Slightly to very strongly weathered	Field Strength Soil Rock S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 Very weak to very strong	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation		
		Rotary cored	36.00			WAIPAPA GROUP		CORE LOSS							36.00-38.10m, ?			
-36.5									Slightly to moderately weathered, moderately strong, GREYWACKE, medium grey. Extremely closely spaced fractures to disintegrated. Many fractures infilled with light mineral or brown clay. Fractures rough, undulating [CRUSH ZONE]									
-37.0									36.10m - 36.25m: Completely fractured, disintegrated section.									
-37.5																		
-38.0																		
-38.5				100				38.10m: Closely to moderately widely spaced open fractures with iron staining and clay weathering along surfaces. Extremely closely spaced healed fractures infilled with light mineral and/or brown clay.										
-39.0																		
-39.5																		
-40.0											UCS21 - 62MPa: 39.55 - 40.35m							

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.

 Initial Water Level
 Out flow
 In flow



Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)



Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer



1



Peat



Fill



Core Loss



1



☐ Silt



Sand



Gravel

Backfill:

 Bentonite
 Grout/concrete
 Drill arisings
 Filter sand

Remarks:

See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE	Drilling Contractor:	Drilling Rig ID:	Driller:	Logged By:	Checked By:
	Drillforce	YDX-3L		SJA	SRO



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 10 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
41.0								[CONT] 38.10m: Closely to moderately widely spaced open fractures with iron staining and clay weathering along surfaces. Extremely closely spaced healed fractures infilled with light mineral and/or brown clay.								
41.5																
42.0																
42.5								42.35m - 46.20m: Highly weathered, some areas nearing completely weathered. Significant clay weathering along joint surfaces. Extremely closely spaced fractures [CRUSH ZONE].						42.35-46.20m, CZ		
43.0																
43.5																
44.0																
44.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 11 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
45.5		Rotary cored				WAIPAPA GROUP		[CONT] 42.35m - 46.20m: Highly weathered, some areas nearing completely weathered. Significant clay weathering along joint surfaces. Extremely closely spaced fractures [CRUSH ZONE].								
46.0																
46.5																
47.0																
47.5																
48.0																
48.5																
49.0																
								48.70m: Becomes strong. Abundant light clay infill of healed joints.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

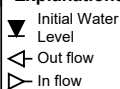
4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

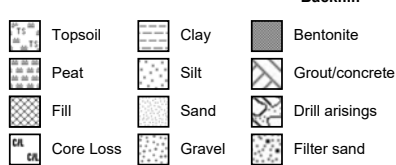
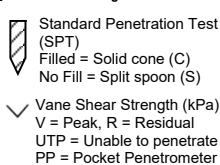
Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 12 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		WAIPAPA GROUP		[CONT] 48.70m: Becomes strong. Abundant light clay infill of healed joints.			UCS27 - 20MPa: 49.50 - 49.65m UCS28 - 24MPa: 49.85 - 50.05m					
-50.0																-50.0
-50.5																-50.5
-51.0																-51.0
-51.5																-51.5
-52.0																-52.0
-52.5																-52.5
-53.0																-53.0
-53.5																-53.5

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.



Moisture:
M = moist
W = wet
S = saturated



Backfill:

Remarks:

See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 13 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
54.5		Rotary cored				WAIPAPA GROUP		[CONT] 48.70m: Becomes strong. Abundant light clay infill of healed joints.								54.5
55.0																55.0
55.5																55.5
56.0																56.0
56.5																56.5
57.0																57.0
57.5																57.5
58.0																58.0

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH102	
Client: Stevenson Aggregates Ltd		Start Date: 01 Nov 2022 End Date: 04 Nov 2022	Hole Location: Farmhouse East				
Co-ordinates : E 1777674, N 5890408		Ground Level (m): Ground	Hole Depth (m): 60.00	Inclination: 70°	Azimuth: 270°	Sheet: 14 of 14	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
59.0				100		WAIPAPA GROUP		[CONT] 48.70m: Becomes strong. Abundant light clay infill of healed joints.								59.0
59.5																59.5
60.00																60.0
60.5								END OF HOLE: 60.00m								60.5
61.0																61.0
61.5																61.5
62.0																62.0
62.5																62.5

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH103
Client: Stevenson Aggregates Ltd	Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East	
Co-ordinates : E 1777257, N 5889715	Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A Azimuth: N/A
		Sheet: 1 of 18	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
	0.10		0.00				IS	TOPSOIL, dark brown; soft.								
	0.40							CLAY, with trace silt; red-brown with orange-brown laminations. Very stiff to hard; medium plasticity to high plasticity; [SOUTH AUCKLAND VOLCANIC FIELD].								
	0.5							CLAY, with some silt; orange brown. Firm to stiff; medium plasticity to high plasticity.								
	0.80															
	1.0							CLAY, with trace silt; red brown with orange brown laminations. Very stiff to hard; medium plasticity to high plasticity.								
	1.5															
	1.95															
	2.0							Silty CLAY; red orange mixed, with minor grey mottles. Soft to firm; medium plasticity.								
	2.5															
	3.00															
	3.0							CLAY, with trace silt; red-brown. Very stiff to hard; medium plasticity to high plasticity.								
	3.5															
	4.0															
	4.20							Silty CLAY; orange brown. Stiff to very stiff; medium plasticity.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH103	
Client: Stevenson Aggregates Ltd	Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East		
Co-ordinates : E 1777257, N 5889715	Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A	Azimuth: N/A
		Sheet: 2 of 18	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		KERIKERI VOLCANIC GROUP		[CONT] Silty CLAY; orange brown. Stiff to very stiff; medium plasticity.							1, 1 / 1, 1, 1, 3 Nc=6	
5.0																
5.50	5.5							Clayey fine to coarse SAND, with trace gravel; red-brown. Soft to stiff; non-plastic; highly weathered basalt scoria.								
6.0																
6.5																
7.0																
7.40								Clayey sandy SILT, with trace gravel; dark red-brown. Soft to firm; non-plastic; highly weathered basalt scoria.								
7.5																
7.95																
8.0								Sandy gravelly SILT; orange-brown with volcanic gravels (red, orange, black). Very stiff to hard; non-plastic; gravels up to 30mm.								
8.15								Slightly weathered, carbonaceous MUDSTONE, medium grey. Extremely weak; CLAY, hard; [TE KUITI GROUP]								
8.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH103	
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East				
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A	Azimuth: N/A		

[illegible]

RILEY CONSULTANTS LTD, REPORT: RILEY MH-R (rock) - generated with CORE-GS by Geroc

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.		Backfill:		Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.	
 Initial Water Level  Out flow  In flow Moisture: M = moist W = wet S = saturated	 Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)  Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Topsoil  Peat  Fill  Core Loss	 Clay  Silt  Sand  Gravel	 Bentonite  Grout/concrete  Drill arisings  Filter sand	
All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH103
Client: Stevenson Aggregates Ltd	Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East	
Co-ordinates : E 1777257, N 5889715	Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A Azimuth: N/A
		Sheet: 4 of 18	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
		Rotary cored		100		TE KUITI GROUP		[CONT] 13.10m - 13.25m: Moderately strong, light brown MUDSTONE layer, closely fractured.							3, 5 / 14, 19, 17 for 60mm Nc=50+	
								15.45m - 15.60m: Moderately strong, light brown MUDSTONE layer, closely fractured.							3, 10 / 17, 17, 16 for 65mm Nc=50+	
								17.30m - 17.40m: Moderately weathered layer.							10, 17 / 20, 24, 6 for 20mm Nc=50+	

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH103	
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East				
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A	Azimuth: N/A	Sheet: 5 of 18	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
18.5		Rotary cored				TE KUITI GROUP		[CONT] 17.30m - 17.40m: Moderately weathered layer.								
18.57m - 19.00m: Extremely closely fractured layer.																
19.0																
19.5																
19.70m - 19.80m: Moderately weathered layer.																
20.0				100												
20.5																
21.0																
21.5																
22.0								22.25m - 22.60m: Moderately to highly weathered layer.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.										Backfill:				Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.					
 Initial Water Level	 Out flow	 In flow	 Moisture: M = moist W = wet S = saturated	 Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)	 Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Topsoil	 Peat	 Fill	 Core Loss	 Clay	 Silt	 Sand	 Gravel	 Bentonite	 Grout/concrete	 Drill arisings	 Filter sand		
All dimensions in metres NOT TO SCALE						Drilling Contractor: Drillforce				Drilling Rig ID: YDX-3L				Driller:		Logged By: SJA		Checked By: SRO	

MACHINE HOLE LOG

MACHINE HOLE LOG



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH103	
Client: Stevenson Aggregates Ltd	Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East		
Co-ordinates : E 1777257, N 5889715	Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A	Azimuth: N/A
		Sheet: 9 of 18	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		TE KUITI GROUP		[CONT] 34.80m - 36.00m: Moderately weathered layer.								
36.5																36.5
37.0																37.0
37.5								37.25m - 37.80m: Becomes weak.								37.5
38.0																38.0
38.5								38.10m - 38.25m: Moderately weathered layer.								38.5
39.0																39.0
39.5																39.5
40.0																40.0

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks:
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
Topsoil Peat Fill Core Loss	Clay Silt Sand Gravel	
Bentonite Grout/concrete Drill arisings Filter sand		

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG										
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH103								
Client: Stevenson Aggregates Ltd			Start Date: 23 Nov 2022 End Date: 05 Dec 2022		Hole Location: Ballards Cone East											
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground			Hole Depth (m): 78.00		Inclination: N/A	Azimuth: N/A	Sheet: 10 of 18	Status: FINAL						
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored	100			TE KUITI GROUP		[CONT] 38.10m - 38.25m: Moderately weathered layer.								
41.0								41.20m - 41.35m: Extremely weak layer.								41.0
41.5																41.5
42.0								42.00m - 42.10m: Extremely weak layer.								42.0
42.5								42.40m - 42.50m: Moderately to highly weathered layers, extremely weak to firm.								42.5
43.0																43.0
43.5								43.35m - 43.50m: Disintegrated layer, moderately weathered.								43.5
44.0								43.50m - 49.50m: Grades to extremely to very closely spaced fractures, MUDSTONE, breaks up when handled.								44.0
44.5																44.5
																44.90m - 45.00m: Highly weathered
Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.  Initial Water Level  Out flow  In flow Moisture: M = moist W = wet S = saturated  Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)  Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer  Topsoil  Peat  Fill  Core Loss  Clay  Silt  Sand  Gravel  Bentonite  Grout/concrete  Drill arisings  Filter sand Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.																
All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L		Driller:	Logged By: SJA	Checked By: SRO							

MACHINE HOLE LOG



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH103	
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East				
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A	Azimuth: N/A	Sheet: 12 of 18	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		TE KUITI GROUP		[CONT] 46.10m - 46.50m: Highly to completely weathered layer, extremely weak to firm. 51.00m - 51.05m: Extremely weak, moderately to highly weathered layer. 52.20m - 52.25m: Extremely weak layer. 53.85m - 54.00m: Extremely weak to firm, highly weathered layer.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Peat Fill Core Loss Clay Silt Sand Gravel Bentonite Grout/concrete Drill arisings Filter sand	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG										
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH103								
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022			Hole Location: Ballards Cone East											
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground			Hole Depth (m): 78.00		Inclination: N/A	Azimuth: N/A	Sheet: 13 of 18	Status: FINAL						
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		TE KUITI GROUP		[CONT] 53.85m - 54.00m: Extremely weak to firm, highly weathered layer.								
	54.5															54.5
	55.0															55.0
	55.5															55.5
	56.0															56.0
	56.5															56.5
	57.0															57.0
	57.5															57.5
	58.0															58.0

Explanations:
Initial Water Level
Out flow
In flow
Moisture:
M = moist
W = wet
S = saturated

Refer to "Geological and Geotechnical Information" sheet for further details.
Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

Topsoil

Peat

Fill

Core Loss

Clay

Silt

Sand

Gravel

Bentonite

Grout/concrete

Drill arisings

Filter sand

Backfill:
Bentonite
Grout/concrete
Drill arisings
Filter sand

Remarks:
See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres
NOT TO SCALE

Drilling Contractor:
Drillforce

Drilling Rig ID:
YDX-3L

Driller:

Logged By:
SJA

Checked By:
SRO

RILEY CONSULTANTS LTD. REPORT: RILEY MH-R (rock) - generated with CORE-GS by Geoc

Printed: 22/06/2023 1:09:44 pm

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG													
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH103											
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022			Hole Location: Ballards Cone East														
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground			Hole Depth (m): 78.00		Inclination: N/A	Azimuth: N/A	Sheet: 16 of 18	Status: FINAL									
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450 460 470 480 490 500 510 520 530 540 550 560 570 580 590 600 610 620 630 640 650 660 670 680 690 700 710 720 730 740 750 760 770 780 790 800 810 820 830 840 850 860 870 880 890 900 910 920 930 940 950 960 970 980 990 1000	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation			
		Rotary cored		100		TE KUITI GROUP		67.45m - 67.50m: Moderately to highly weathered layer.											
68.0																			
68.5																			
69.0																			
								69.35m - 69.40m: Disintegrated layer, gravel sized MUDSTONE inclusions in soil matrix.											
69.5																			
70.0																			
								70.40m - 70.90m: Moderately to highly weathered layer, firm to very weak.											
70.5																			
71.0								Slightly weathered, carbonaceous MUDSTONE, brown grey. Weak; thinly laminated with distinct organic laminations. Very closely to closely spaced, sub-horizontal fractures along lamination planes, rough, planar to undulating.											
71.5																			
71.90																			
71.95								Organic CLAY, dark brown. Firm; highly											

Explanations:
 Initial Water Level
 Out flow
 In flow
Moisture:
M = moist
W = wet
S = saturated

 Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
 Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

 Topsoil
 Peat
 Fill
 Core Loss
 Clay
 Silt
 Sand
 Gravel

Backfill:
 Bentonite
 Grout/concrete
 Drill arisings
 Filter sand

Remarks:
See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce		Drilling Rig ID: YDX-3L		Driller:		Logged By: SJA		Checked By: SRO	
--	--	------------------------------------	--	----------------------------	--	----------	--	-------------------	--	--------------------	--

Printed: 22/06/2023 1:09:44 pm



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH103	
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022	Hole Location: Ballards Cone East				
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground	Hole Depth (m): 78.00	Inclination: N/A	Azimuth: N/A	Sheet: 17 of 18	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
						TE KUITI GROUP		plastic.								
						WAIPAPA GROUP		Slightly weathered, carbonaceous MUDSTONE, brown grey. Weak; thinly laminated with distinct organic laminations. Very closely to closely spaced, sub-horizontal fractures along lamination planes, rough, planar to undulating.								
								Moderately to highly weathered GREYWACKE, medium grey. Very weak to moderately strong. Extremely to very closely spaced fractures, planar to stepped, rough. Some fractured chunks are well rounded [WAIPAPA GROUP].								
								74.50m: Becomes highly weathered.								
								75.15m - 76.50m: Highly to completely weathered layer. Sandy SILT with trace of clay, very soft to firm.								

Explanations: Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: See RDCL geophysical data for defect details. *Sample broke during preparation of test. No core able to be tested.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG										
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH103								
Client: Stevenson Aggregates Ltd		Start Date: 23 Nov 2022 End Date: 05 Dec 2022			Hole Location: Ballards Cone East											
Co-ordinates : E 1777257, N 5889715		Ground Level (m): Ground			Hole Depth (m): 78.00		Inclination: N/A	Azimuth: N/A	Sheet: 18 of 18	Status: FINAL						
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
77.0				100		WAIPAPA GROUP		Slightly weathered GREYWACKE, light bluish-grey. Moderately strong. Closely spaced fractures, rough to smooth, planar to stepped, disintegrated layers, hydrothermally altered.			UCS13 - 10MPa: 76.50 - 76.70m UCS14 - 9.1MPa: 76.95 - 77.15m					
77.5								77.60m: Weak, highly weathered, manganese stained joint surface. Dark black-green. Joint is inclined 50°, rough and planar.								
78.00	78.0							END OF HOLE: 78.00m								
78.5																
79.0																
79.5																
80.0																
80.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.
 Initial Water Level
 Out flow
 In flow
Moisture:
M = moist
W = wet
S = saturated
 Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
 Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

Backfill:
 Topsoil
 Clay
 Bentonite
 Peat
 Silt
 Grout/concrete
 Fill
 Sand
 Drill arisings
 Core Loss
 Gravel
 Filter sand

Remarks:
See RDCL geophysical data for defect details.

*Sample broke during preparation of test. No core able to be tested.

All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce		Drilling Rig ID: YDX-3L		Driller:		Logged By: SJA		Checked By: SRO	
--	--	------------------------------------	--	----------------------------	--	----------	--	-------------------	--	--------------------	--

Printed: 22/06/2023 1:09:44 pm

RILEY CONSULTANTS LTD. REPORT: RILEY MH-R (rock) - generated with CORE-GS by Geoc



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH104	
Client: Stevenson Aggregates Ltd		Start Date: 09 Dec 2022 End Date: 13 Dec 2022	Hole Location: Ballards Cone West				
Co-ordinates : E 1776824, N 5889669		Ground Level (m): Ground	Hole Depth (m): 40.50	Inclination: N/A	Azimuth: N/A	Sheet: 1 of 8	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
	0.20		0.00	100		TOPSOIL	TS	TOPSOIL; brown; firm.								
	0.40		0.40					Silty gravelly CLAY; orange brown with grey clasts. Stiff to hard; non-plastic; gravel, fine to coarse; Gravel clasts up to 50mm diameter [RECENT ALLUVIUM]. CORE LOSS								
	0.5															
	1.0															
	1.5															
	1.59		1.59	100		RECENT ALLUVIUM	RA	GRAVEL, medium grey. Hard to extremely weak; non-plastic; clasts up to 60mm diameter. Silty gravelly CLAY; brown-grey. Very soft to soft; non-plastic; gravel, fine to coarse; Gravel clasts up to 35mm.							0, 0 / 0, 0, 0, 1 Nc=1	
	2.0															
	2.20		2.20					CORE LOSS								
	2.5															
	3.00		3.00					Unweathered to slightly weathered, fine grained BASALT, medium grey. Strong to very strong [SOUTH AUCKLAND VOLCANIC FIELD].							Nc=0	
	3.0															
	3.5															
	4.0															
	4.10															
	4.5			100		KERIKERI VOLCANIC GROUP	KV	Clayey SILT, with some gravel; red-brown to orange-brown. Firm to stiff; non-plastic to low plasticity; gravel, fine to coarse; Gravel clasts up to 10mm diameter.							1, 2 / 2, 2, 2, 4 Nc=10	
	5.0															

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Peat Fill Core Loss Bentonite Grout/concrete Drill arisings Filter sand	Remarks: See RDCL geophysical data for defect details.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH104	
Client: Stevenson Aggregates Ltd	Start Date: 09 Dec 2022 End Date: 13 Dec 2022	Hole Location: Ballards Cone West		
Co-ordinates : E 1776824, N 5889669	Ground Level (m): Ground	Hole Depth (m): 40.50	Inclination: N/A	Azimuth: N/A
		Sheet: 2 of 8	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation									
		Rotary cored				KERIKERI VOLCANIC GROUP		In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation						In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation											
	5.80																								
	6.00																								
	6.00								[CONT] Clayey SILT, with some gravel; red-brown to orange-brown. Firm to stiff; non-plastic to low plasticity; gravel, fine to coarse; Gravel clasts up to 10mm diameter.																
	6.00								CLAY, with some silt; brown. Soft; low plasticity to medium plasticity; [TE KUITI GROUP].																
	6.00								CLAY; dark brown. Stiff to very stiff.																
	6.5				100																				
	7.0								7.00m: Becomes soft to firm.																
	7.35																								
	7.35			7.35					CORE LOSS																
	7.50		7.50		100			CLAY; dark brown. Firm to stiff; broken up.																	
	7.50					TE KUITI GROUP																			
	8.0																								
	8.5								8.60m: Becomes firm to stiff, broken up.																
	9.0								9.00m: Becomes very stiff to hard.																
	9.5			100																					
	10.00																								
	10.00																								
	10.00																								
	10.5							Slightly weathered, organic MUDSTONE. Extremely weak to very weak, thinly laminated. Sub-horizontal, very closely to moderately-widely spaced, fractures. Stepped, smooth to rough.																	
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								
	10.5																								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details.
 Initial Water Level Out flow In flow	 Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	
 Topsoil Peat Fill Core Loss	 Clay Silt Sand Gravel	 Bentonite Grout/concrete Drill arisings Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

		22 Moorhouse Avenue Addington CHRISTCHURCH 8011 Ph: 03.379.4402 E: www.rileychch.co.nz		4 Fred Thomas Drive Takapuna AUCKLAND 0622 Ph: 09.489.7872 E: www.riley.co.nz		MACHINE HOLE LOG										
Project No.: 220245		Project Name: Drury Quarry - Sutton Block			Project Location: Quarry Rd, Drury			No.: DH104								
Client: Stevenson Aggregates Ltd		Start Date: 09 Dec 2022 End Date: 13 Dec 2022			Hole Location: Ballards Cone West											
Co-ordinates : E 1776824, N 5889669		Ground Level (m): Ground			Hole Depth (m): 40.50		Inclination: N/A	Azimuth: N/A	Sheet: 3 of 8	Status: FINAL						
Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
11.5	12.0 12.10	Rotary cored		100		TE KUITI GROUP		[CONT] Slightly weathered, organic MUDSTONE. Extremely weak to very weak, thinly laminated. Sub-horizontal, very closely to moderately-widely spaced, fractures. Stepped, smooth to rough.			UCS3 - 11MPa: 12.35 - 12.50m					
12.5	13.0							Slightly weathered, organic SANDY MUDSTONE, dark brown. Very weak, thinly laminated.								
13.5	14.0							Interlayered MUDSTONE, as at 10.0m, and sandy MUDSTONE, as at 12.10m.								
14.5	15.0 15.0															
15.5	16.0															
16.0																

Explanations:
 Initial Water Level
 Out flow
 In flow
Moisture:
M = moist
W = wet
S = saturated

 Standard Penetration Test (SPT)
Filled = Solid cone (C)
No Fill = Split spoon (S)
 Vane Shear Strength (kPa)
V = Peak, R = Residual
UTP = Unable to penetrate
PP = Pocket Penetrometer

 Topsoil
 Peat
 Fill
 Core Loss
 Clay
 Silt
 Sand
 Gravel

Backfill:
 Bentonite
 Grout/concrete
 Drill arisings
 Filter sand

Remarks:
See RDCL geophysical data for defect details.

All dimensions in metres NOT TO SCALE		Drilling Contractor: Drillforce		Drilling Rig ID: YDX-3L		Driller:		Logged By: SJA		Checked By: SRO	
--	--	------------------------------------	--	----------------------------	--	----------	--	-------------------	--	--------------------	--

Printed: 22/06/2023 1:11:32 pm



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH104	
Client: Stevenson Aggregates Ltd		Start Date: 09 Dec 2022 End Date: 13 Dec 2022	Hole Location: Ballards Cone West				
Co-ordinates : E 1776824, N 5889669		Ground Level (m): Ground	Hole Depth (m): 40.50	Inclination: N/A	Azimuth: N/A	Sheet: 4 of 8	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100 mm	Field Strength Soil Rock 10 20 30 40 50 60 70 80 90 100 kPa	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
		Rotary cored		100		TE KUITI GROUP		16.50m - 16.55m: Highly weathered layer, CLAY with some silt, firm.								
17.0																17.0
17.5																17.5
18.0								17.70m - 17.75m: Highly weathered layer, silty sandy CLAY, soft.								18.0
18.5								18.25m - 18.40m: Moderately strong, moderately weathered, grey, MUDSTONE, highly fractured, blocky								18.5
19.0																19.0
19.5																19.5
20.0																20.0
20.5																20.5
21.0								20.90m - 21.00m: Moderately weathered layer.								21.0
21.5																21.5

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH104		
Client: Stevenson Aggregates Ltd	Start Date: 09 Dec 2022 End Date: 13 Dec 2022	Hole Location: Ballards Cone West			
Co-ordinates : E 1776824, N 5889669	Ground Level (m): Ground	Hole Depth (m): 40.50	Inclination: N/A	Azimuth: N/A	Sheet: 5 of 8
					Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
22.5		Rotary cored				TE KUITI GROUP		[CONT] 20.90m - 21.00m: Moderately weathered layer.								22.5
23.0																23.0
23.5																23.5
24.0																24.0
24.5																24.5
24.80																24.80
25.0																25.0
25.5																25.5
26.0																26.0
26.5																26.5
27.0								26.70m - 26.75m: Extremely weak organic layer.								27.0

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.				Backfill:				Remarks: See RDCL geophysical data for defect details.									
 Initial Water Level		 Standard Penetration Test (SPT)		 Topsoil		 Clay		 Bentonite									
 Out flow		Filled = Solid cone (C)		 Peat		 Silt		 Grout/concrete									
 In flow		No Fill = Split spoon (S)		 Fill		 Sand		 Drill arisings									
Moisture: M = moist W = wet S = saturated		 Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer		 Core Loss		 Gravel		 Filter sand									
All dimensions in metres NOT TO SCALE				Drilling Contractor: Drillforce				Drilling Rig ID: YDX-3L				Driller:		Logged By: SJA		Checked By: SRO	



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH104		
Client: Stevenson Aggregates Ltd	Start Date: 09 Dec 2022 End Date: 13 Dec 2022	Hole Location: Ballards Cone West			
Co-ordinates : E 1776824, N 5889669	Ground Level (m): Ground	Hole Depth (m): 40.50	Inclination: N/A	Azimuth: N/A	Sheet: 6 of 8
					Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
28.0		Rotary cored				TE KUITI GROUP		[CONT] 26.70m - 26.75m: Extremely weak organic layer.								
28.5																
29.0																
29.5																
30.0																
30.5																
31.0																
31.10																
31.5						WAIPAPA GROUP		Slightly weathered GREYWACKE, medium grey. Moderately strong to strong, limonite on defect surfaces, some quartz veins. Very-closely to closely spaced fractures, planar to stepped, rough.								
32.0																
32.5																
33.0																
33.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.										Backfill:			Remarks: See RDCL geophysical data for defect details.					
 Initial Water Level	 Out flow	 In flow	 Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)	 Moisture: M = moist W = wet S = saturated	 Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Topsoil	 Peat	 Fill	 Core Loss	 Clay	 Silt	 Sand	 Gravel	 Bentonite	 Grout/concrete	 Drill arisings	 Filter sand	
All dimensions in metres NOT TO SCALE					Drilling Contractor: Drillforce					Drilling Rig ID: YDX-3L			Driller:		Logged By: SJA		Checked By: SRO	

MACHINE HOLE LOG



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH104		
Client: Stevenson Aggregates Ltd	Start Date: 09 Dec 2022 End Date: 13 Dec 2022	Hole Location: Ballards Cone West			
Co-ordinates : E 1776824, N 5889669	Ground Level (m): Ground	Hole Depth (m): 40.50	Inclination: N/A	Azimuth: N/A	Sheet: 8 of 8
					Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering 10 20 30 40 50 60 70 80 90 100 Very Weak Weak Moderate Strong Very Strong	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
39.0						WAIPAPA GROUP		[CONT] 33.40m: Grades to extremely closely to closely spaced fractures.			- 38.50m					
39.5				100				39.30m - 39.55m: Highly weathered, extremely weak thin layer of gravel, silt and sand sized material.								
40.0																
40.50																
40.5								END OF HOLE: 40.50m								
41.0																
41.5																
42.0																
42.5																
43.0																
43.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH105	
Client: Stevenson Aggregates Ltd	Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West		
Co-ordinates : E 1776856, N 5890256	Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A
		Sheet: 1 of 11	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
0.10	0.10	Rotary cored	0.00	100		TOPSOIL	IS	TOPSOIL. Organic silty CLAY, dark brown with minor orange streaks.								
0.5	0.5					RECENT ALLUVIUM		CLAY, with minor silt; orange and light brown mixed. Very stiff; medium plasticity; [RECENT ALLUVIUM].								
0.95	0.95							CLAY, with trace silt; orange. Firm; medium plasticity to high plasticity.								
1.0	1.0							CLAY, with trace silt; orange with mid grey mottles. Soft; medium plasticity to high plasticity.								
1.50	1.5							CLAY, with minor silt, with trace gravel; light brown with orange and dark brown mottles. Soft; medium plasticity to high plasticity; gravel, fine.								
1.6	1.6															
1.80	1.8															
2.0	2.0															
2.5	2.5															
3.00	3.0															
3.0	3.0					TE KUITI GROUP		CLAY, with trace silt; dark brown. Very stiff to hard; [TE KUITI GROUP].								
3.20	3.2							Slightly weathered organic MUDSTONE, dark brown. Extremely weak; thinly laminated.								
3.5	3.5							3.66m - 4.40m: Highly weathered CLAY with minor silt and gravel, stiff; [CRUSH ZONE].						3.66-4.40m, CZ		
4.0	4.0															
4.40	4.4															
						W...		Moderately to highly weathered,								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH105	
Client: Stevenson Aggregates Ltd		Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West				
Co-ordinates : E 1776856, N 5890256		Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A	Sheet: 2 of 11	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
5.0		Rotary cored				WAIPAPA GROUP		moderately strong, GREYWACKE, medium grey. Extremely closely spaced fractures to disintegrated; joint surfaces are smooth to rough, undulating. Minor light mineral veins present; [WAIPAPA GROUP].								
5.5																
6.0																
6.5																
7.0								6.80m: Grades to extremely closely to closely spaced fractures.								
7.5																
8.0																
8.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury		No.: DH105	
Client: Stevenson Aggregates Ltd		Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West			
Co-ordinates : E 1776856, N 5890256		Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90° Azimuth: N/A		

[illegible]

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.		Backfill:		Remarks: See RDCL geophysical data for defect details.	
 Initial Water Level  Out flow  In flow Moisture: M = moist W = wet S = saturated	 Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)  Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	 Topsoil  Peat  Fill  Core Loss	 Clay  Silt  Sand  Gravel	 Bentonite  Grout/concrete  Drill arisings  Filter sand	
All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH105	
Client: Stevenson Aggregates Ltd		Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West				
Co-ordinates : E 1776856, N 5890256		Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A	Sheet: 4 of 11	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
14.0		Rotary cored	100			WAIPAPA GROUP		[CONT] 12.40m: Grades to slightly to moderately weathered.								
14.5								Slightly weathered, moderately strong, GREYWACKE, medium grey. Very closely to moderately widely spaced fractures; planar to undulating, rough. Light mineral veins present.								
15.00 15.0																
15.5																
16.0																
16.5																
17.0																
17.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: See RDCL geophysical data for defect details.
--	--	--

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH105	
Client: Stevenson Aggregates Ltd	Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West		
Co-ordinates : E 1776856, N 5890256	Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A
		Sheet: 5 of 11	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26 W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38 W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64 W65 W66 W67 W68 W69 W70 W71 W72 W73 W74 W75 W76 W77 W78 W79 W80 W81 W82 W83 W84 W85 W86 W87 W88 W89 W90 W91 W92 W93 W94 W95 W96 W97 W98 W99 W100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
18.5		Rotary cored				WAIPAPA GROUP		[CONT] Slightly weathered, moderately strong, GREYWACKE, medium grey. Very closely to moderately widely spaced fractures; planar to undulating, rough. Light mineral veins present.								
19.0																
19.5																
20.0																
20.5																
21.0																
21.5																
22.0																
								22.15m - 22.60m: Disintegrated layer.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer Topsoil Peat Fill Core Loss Clay Silt Sand Gravel Bentonite Grout/concrete Drill arisings Filter sand										Remarks: See RDCL geophysical data for defect details.				
All dimensions in metres NOT TO SCALE					Drilling Contractor: Drillforce					Drilling Rig ID: YDX-3L				
					Driller:					Logged By: SJA				
										Checked By: SRO				



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileych.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH105	
Client: Stevenson Aggregates Ltd	Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West		
Co-ordinates : E 1776856, N 5890256	Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A
		Sheet: 6 of 11	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
								[CONT] 22.15m - 22.60m: Disintegrated layer.								
								23.10m: Light coloured mineral vein infill up to 10mm thick.								
								24.30m - 25.80m: Disintegrated layer, subrounded to subangular blocks.								
								26.50m: Becomes strong.								

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.	Backfill:	Remarks: See RDCL geophysical data for defect details.
Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand

All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH105	
Client: Stevenson Aggregates Ltd	Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West		
Co-ordinates : E 1776856, N 5890256	Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A
		Sheet: 7 of 11	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
27.5								27.00m: Slightly weathered, moderately strong, GREYWACKE, medium grey. Very closely to moderately widely spaced fractures; planar to undulating, rough. Light mineral veins present.								
28.0																
28.5																
29.0																
29.5																
30.0																
30.5																
31.0																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer										Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand		Remarks: See RDCL geophysical data for defect details.			
All dimensions in metres NOT TO SCALE					Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L		Driller:		Logged By: SJA		Checked By: SRO	

All dimensions in metres NOT TO SCALE	Drilling Contractor:	Drilling Rig ID:	Driller:	Logged By:	Checked By:
	Drillforce	YDX-3L		SJA	SRO



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block		Project Location: Quarry Rd, Drury			No.: DH105	
Client: Stevenson Aggregates Ltd		Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West				
Co-ordinates : E 1776856, N 5890256		Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A	Sheet: 9 of 11	Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering W1 W2 W3 W4 W5 W6 W7 W8 W9 W10 W11 W12 W13 W14 W15 W16 W17 W18 W19 W20 W21 W22 W23 W24 W25 W26 W27 W28 W29 W30 W31 W32 W33 W34 W35 W36 W37 W38 W39 W40 W41 W42 W43 W44 W45 W46 W47 W48 W49 W50 W51 W52 W53 W54 W55 W56 W57 W58 W59 W60 W61 W62 W63 W64 W65 W66 W67 W68 W69 W70 W71 W72 W73 W74 W75 W76 W77 W78 W79 W80 W81 W82 W83 W84 W85 W86 W87 W88 W89 W90 W91 W92 W93 W94 W95 W96 W97 W98 W99 W100	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
36.5		Rotary cored				WAIPAPA GROUP		[CONT] 33.00m: Grades to closely to moderately widely spaced fractures.								
37.0																
37.5																
38.0								37.60m - 37.61m: Light coloured mineral vein 3mm thick.								
38.5																
39.0																
39.5																
40.0																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.										Backfill:										Remarks: See RDCL geophysical data for defect details.																																							
 Initial Water Level		 Standard Penetration Test (SPT)		 Topsoil		 Clay		 Bentonite				 Out flow		 Filled = Solid cone (C)		 Peat		 Silt		 Grout/concrete				 In flow		 No Fill = Split spoon (S)		 Fill		 Sand		 Drill arisings																											
Moisture: M = moist W = wet S = saturated		 Vane Shear Strength (kPa)		 Core Loss		 Gravel		 Filter sand																																																			
		V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer																																																									
All dimensions in metres NOT TO SCALE										Drilling Contractor: Drillforce										Drilling Rig ID: YDX-3L										Driller:										Logged By: SJA										Checked By: SRO									



22 Moorhouse Avenue
Addington
CHRISTCHURCH 8011
Ph: 03.379.4402
E: www.rileychch.co.nz

4 Fred Thomas Drive
Takapuna
AUCKLAND 0622
Ph: 09.489.7872
E: www.riley.co.nz

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH105	
Client: Stevenson Aggregates Ltd	Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West		
Co-ordinates : E 1776856, N 5890256	Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90°	Azimuth: N/A
		Sheet: 10 of 11	Status: FINAL	

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description	Weathering	Field Strength	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description	In-Situ Testing Data / Results	Backfill / Installation
								In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation								
41.0								[CONT] 37.60m - 37.61m: Light coloured mineral vein 3mm thick.								
41.5																
42.0																
42.5																
43.0																
43.5																
44.0																
44.5																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details.										Backfill:		Remarks: See RDCL geophysical data for defect details.				
Initial Water Level	Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S)	Topsoil	Clay	Bentonite												
Out flow		Peat	Silt	Grout/concrete												
In flow		Fill	Sand	Drill arisings												
Moisture: M = moist W = wet S = saturated	Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Core Loss	Gravel	Filter sand												
All dimensions in metres NOT TO SCALE					Drilling Contractor: Drillforce			Drilling Rig ID: YDX-3L			Driller:		Logged By: SJA		Checked By: SRO	

MACHINE HOLE LOG

Project No.: 220245	Project Name: Drury Quarry - Sutton Block	Project Location: Quarry Rd, Drury	No.: DH105
Client: Stevenson Aggregates Ltd	Start Date: 27 Oct 2022 End Date: 03 Nov 2022	Hole Location: Paddock West	
Co-ordinates : E 1776856, N 5890256	Ground Level (m): Ground	Hole Depth (m): 46.89	Inclination: -90° Azimuth: N/A Sheet: 11 of 11 Status: FINAL

Elevation (m)	Depth (m)	Method	Run Box No.	TCR (SCR) RQD (%)	Core Loss (%)	Geological Unit	Legend	Geological Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	Weathering	Field Strength Soil Rock	Samples	Defect Spacing (mm)	Defect Symbolic Log	Defect Description In accordance with NZGS Guidelines (2005); refer to appended Information sheet and abbreviation explanation	In-Situ Testing Data / Results	Backfill / Installation
45.5				100		WAIPAPA GROUP		[CONT] 37.60m - 37.61m: Light coloured mineral vein 3mm thick.			UCS30 - 135MPa: 45.40 - 45.75m					
46.0																
46.5																
46.89																
47.0								END OF HOLE: 46.89m								
47.5																
48.0																
48.5																
49.0																

Explanations: Refer to "Geological and Geotechnical Information" sheet for further details. Initial Water Level Out flow In flow Moisture: M = moist W = wet S = saturated Standard Penetration Test (SPT) Filled = Solid cone (C) No Fill = Split spoon (S) Vane Shear Strength (kPa) V = Peak, R = Residual UTP = Unable to penetrate PP = Pocket Penetrometer	Backfill: Topsoil Clay Bentonite Peat Silt Grout/concrete Fill Sand Drill arisings Core Loss Gravel Filter sand	Remarks: See RDCL geophysical data for defect details.
--	--	--

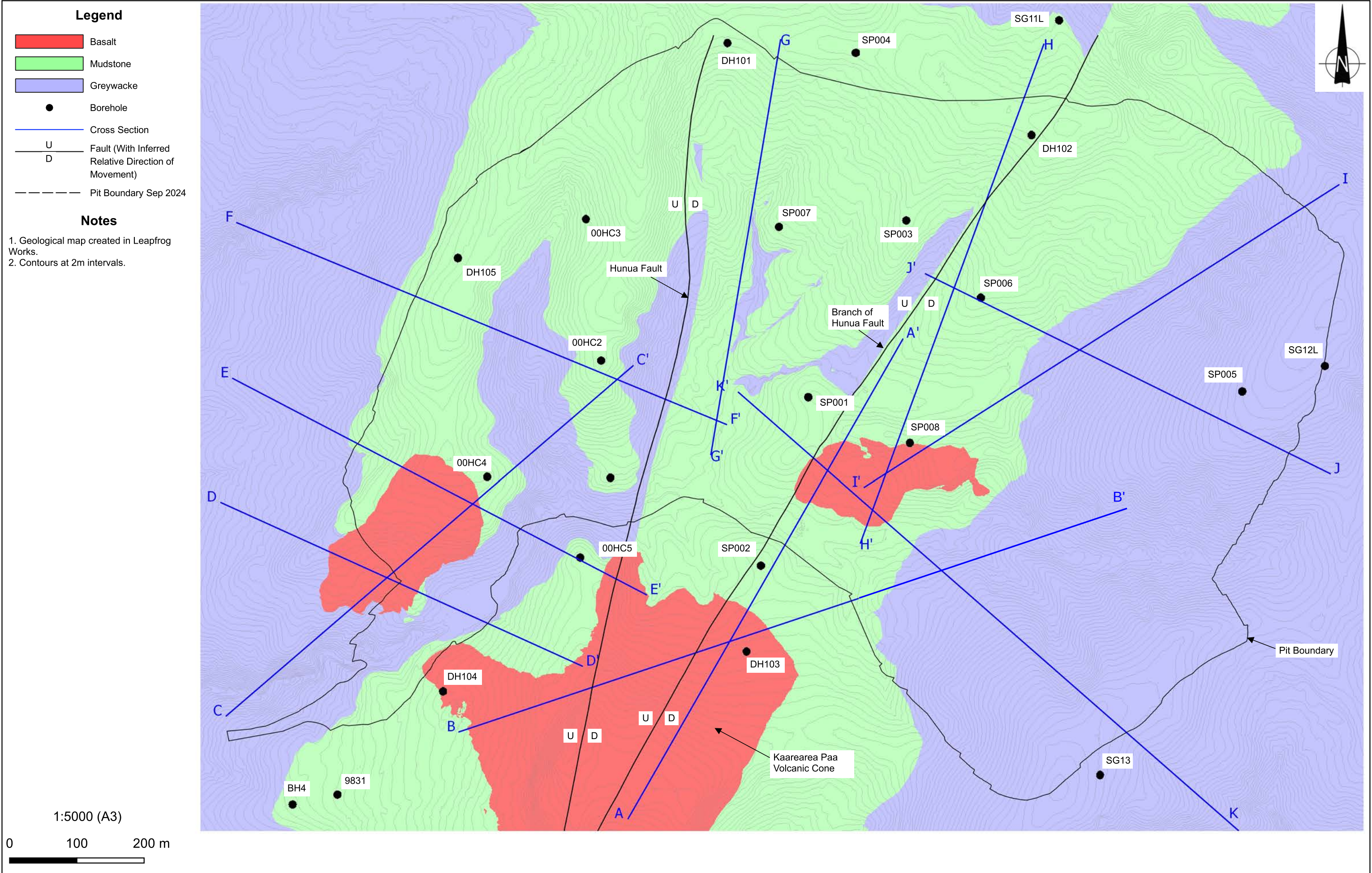
All dimensions in metres NOT TO SCALE	Drilling Contractor: Drillforce	Drilling Rig ID: YDX-3L	Driller:	Logged By: SJA	Checked By: SRO
--	---	-----------------------------------	-----------------	--------------------------	---------------------------



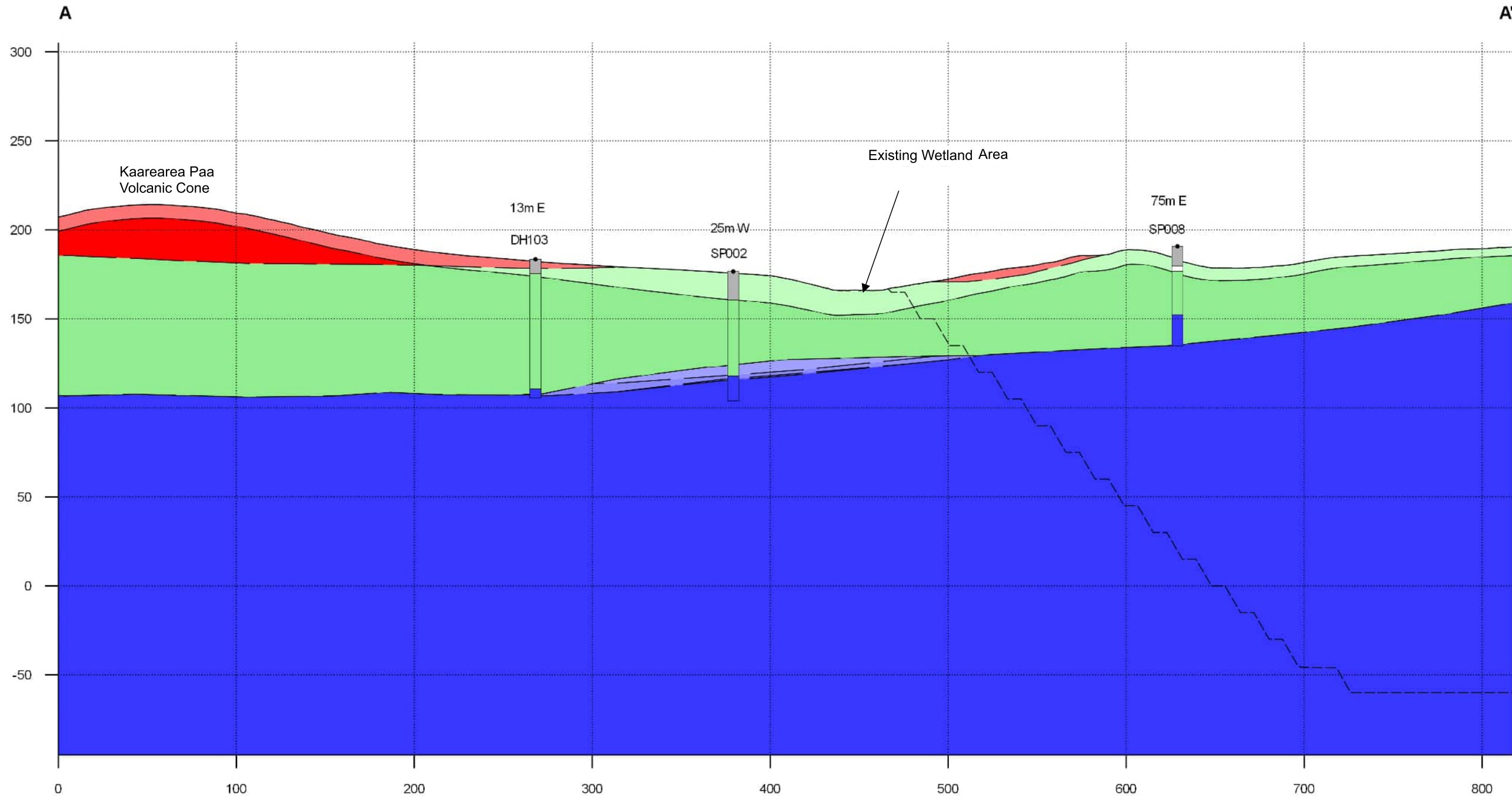
Appendix H

Riley Geology Map and Cross Sections





Section A



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Kerikeri Volcanic Group Basalt
- Waikato Coal Measures Mudstone

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

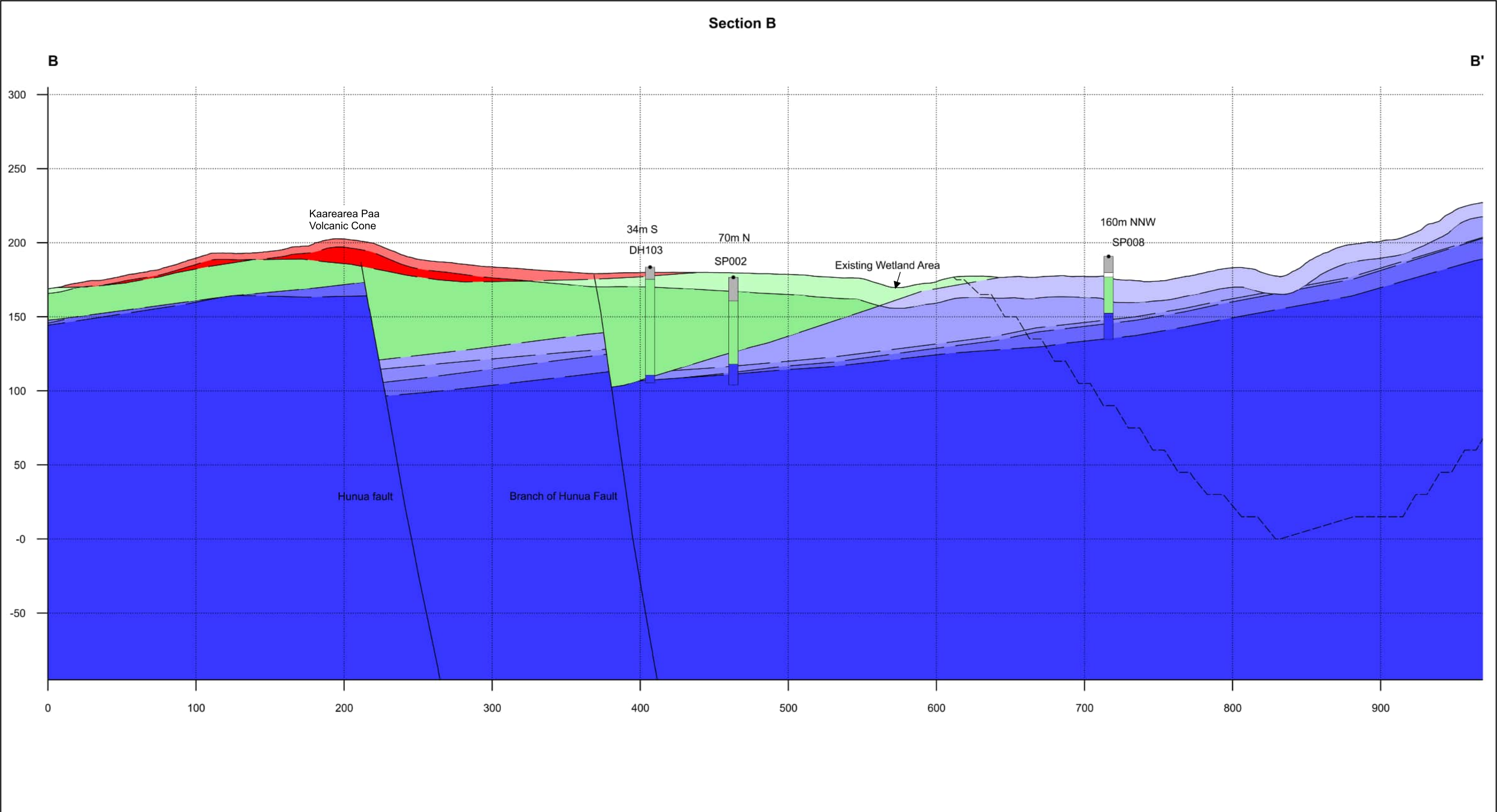
Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

Scale: 1:2,500
Vertical exaggeration: 1x



		Client	Stevenson Aggregates Ltd.	Created	Checked	Approved
		Address	Drury Quarry, Drury			
		Project	Riley Ref 220245 - Sutton Block Extension			
Figure Title		Section A	04.10.2024	DRAFT	DRAFT	



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Kerikeri Volcanic Group Basalt
- Waikato Coal Measures Mudstone

Greywacke Weathering Grade

- Residually Weatherd
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

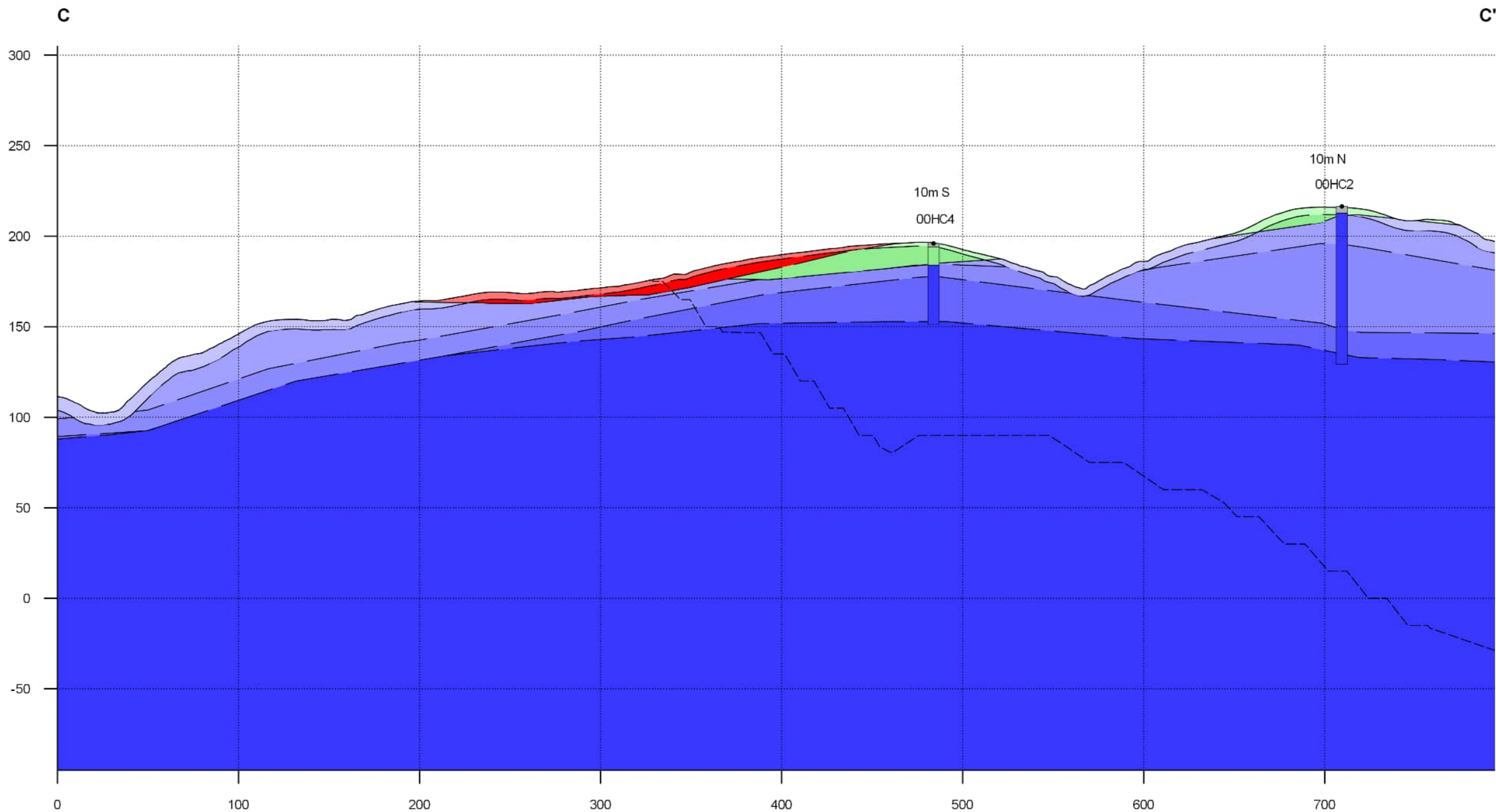
Scale: 1:2,500
Vertical exaggeration: 1x

0m

200m

RILEY STEVENSON	Client		Stevenson Aggregates Ltd.			Created	Checked	Approved
	Address		Drury Quarry, Drury			JJW	SO	BB
	Project		Riley Ref 220245 - Sutton Block Extension			04.10.2024	DRAFT	DRAFT
Figure Title		Section B						

Section C



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Kerikeri Volcanic Group Basalt
- Waikato Coal Measures Mudstone

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

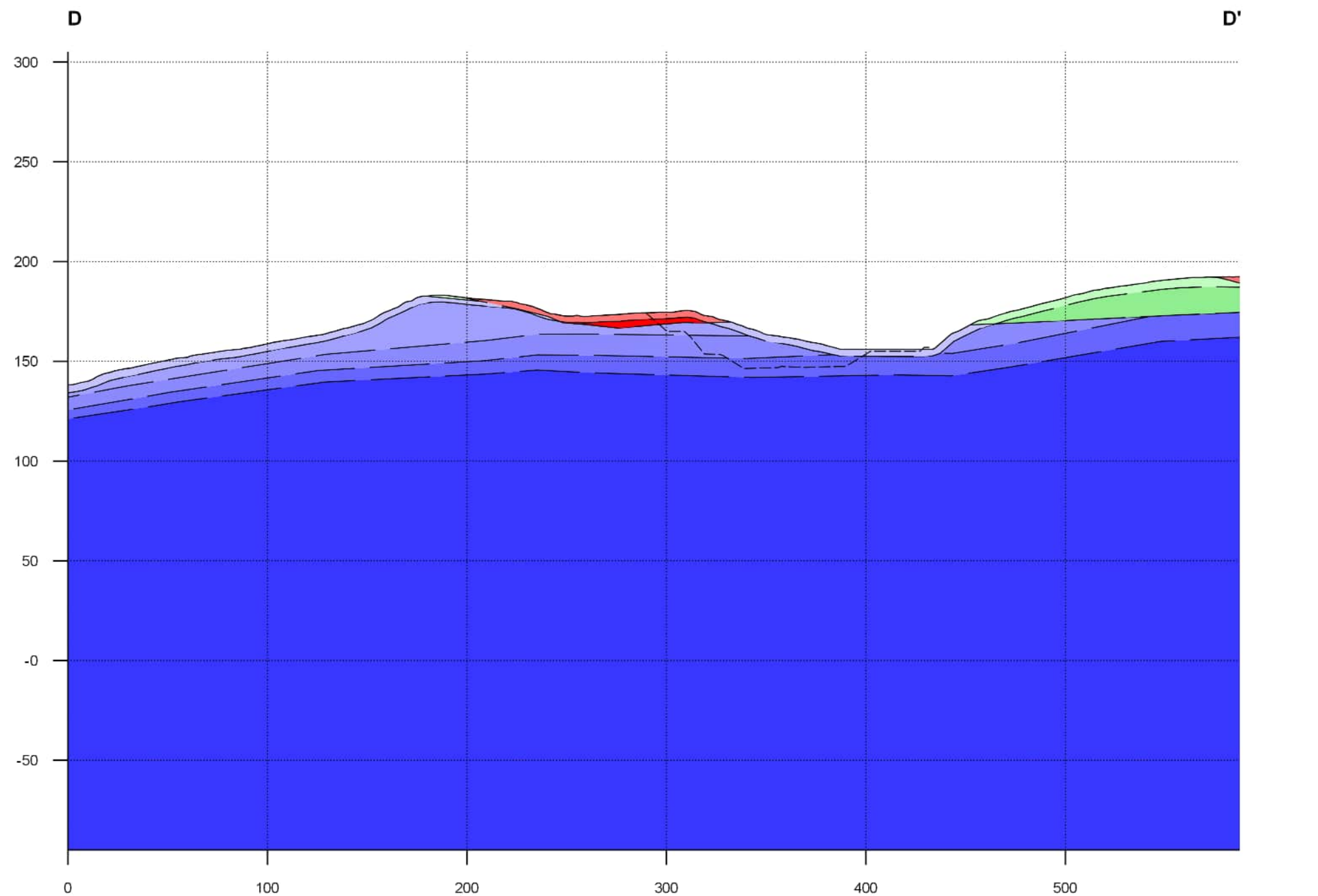
Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

Scale: 1:2,500
Vertical exaggeration: 1x
0m 200m

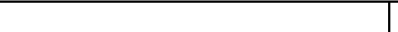
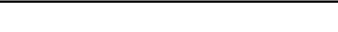
		Client Stevenson Aggregates Ltd.			Created	Checked	Approved	
		Address Drury Quarry, Drury						
		Project Riley Ref 220245 - Sutton Block Extension			JJW	SO	BB	
Figure Title			Section C			04.10.2024	DRAFT	DRAFT

Section D

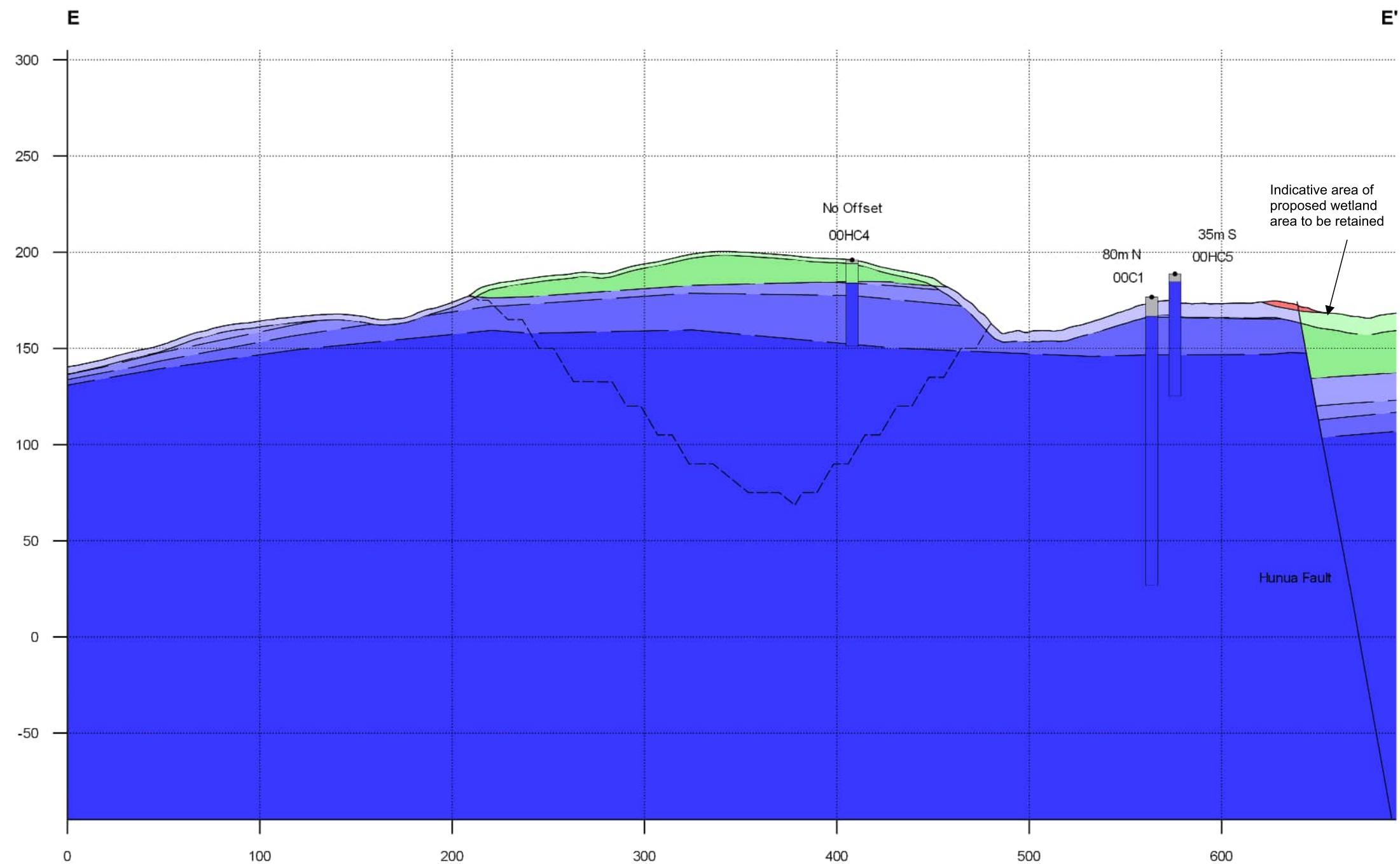


Scale: 1:2,500
Vertical exaggeration: 1x



		Client	Stevenson Aggregates Ltd.	Created	Checked	Approved
		Address	Drury Quarry, Drury			
		Project	Riley Ref 220245 - Sutton Block Extension			
		Figure Title	Section D			

Section E



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual greywacke

Surficial Lithology

- Waikato Coal Measures Mudstone

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

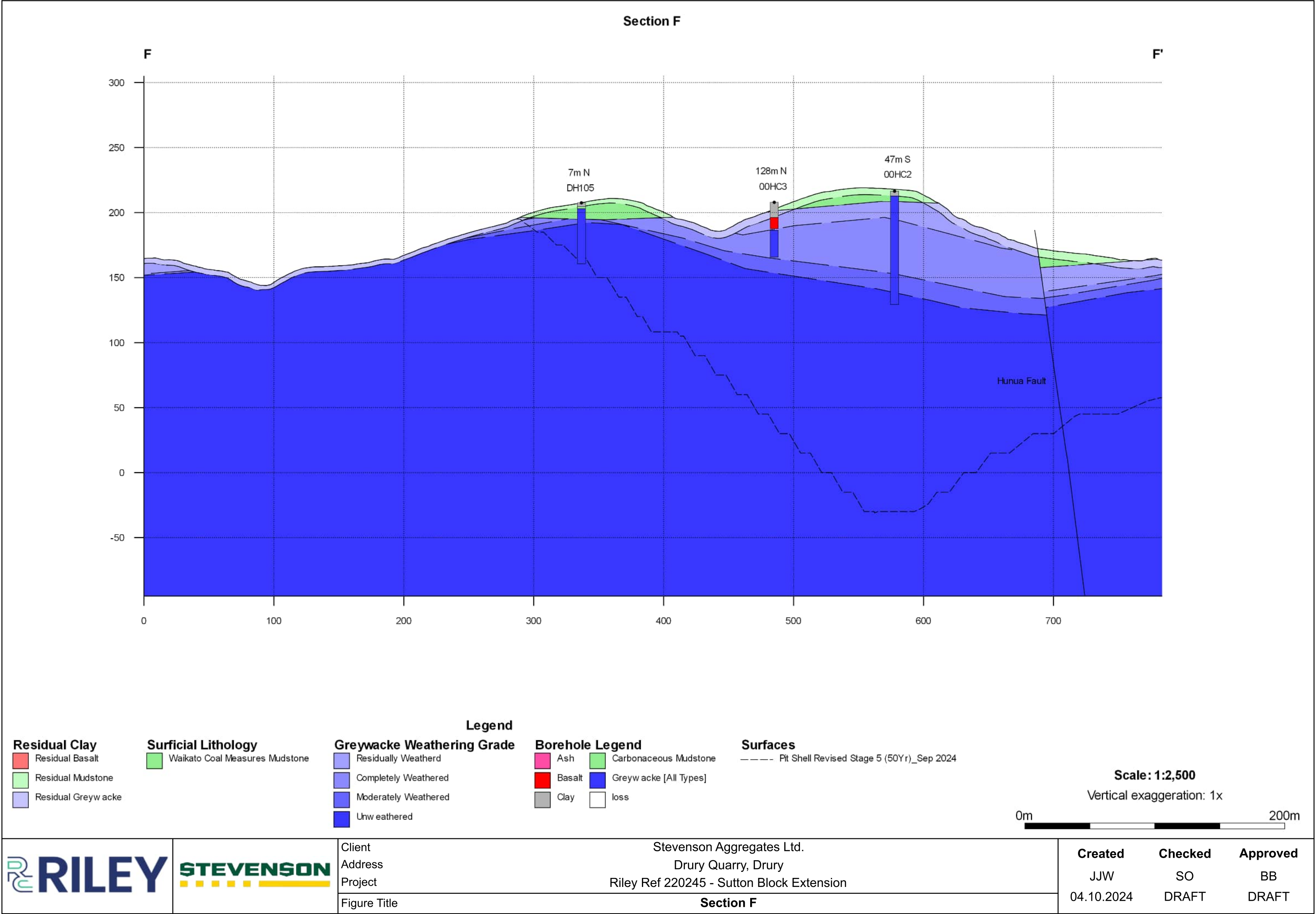
Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

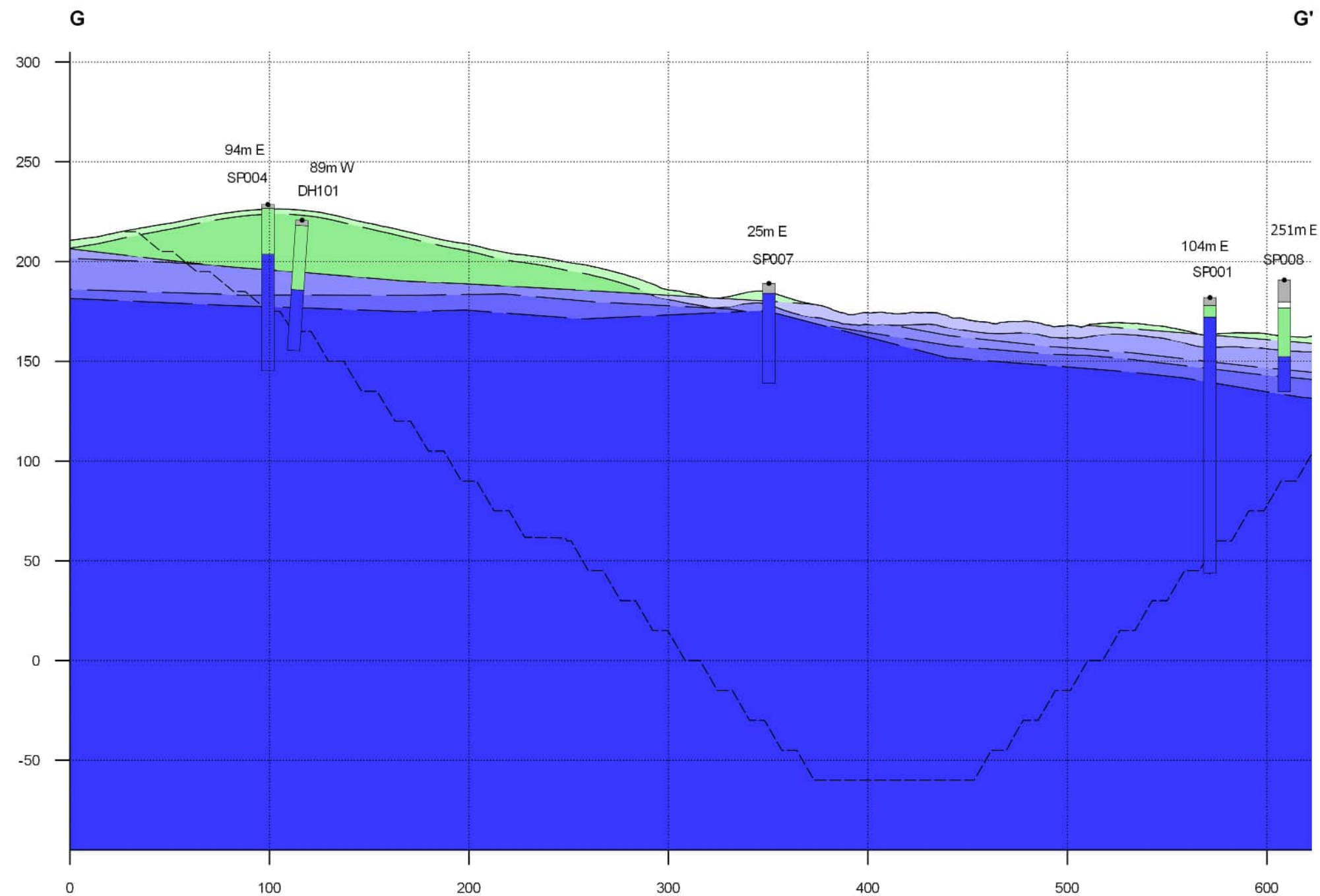
Scale: 1:2,500
Vertical exaggeration: 1x

0m 200m

 	Client Address Project	Stevenson Aggregates Ltd. Drury Quarry, Drury Riley Ref 220245 - Sutton Block Extension	Created JJW 04.10.2024	Checked SO DRAFT	Approved BB DRAFT
	Figure Title	Section E			



Section G



Scale: 1:2,500

Vertical exaggeration: 1x

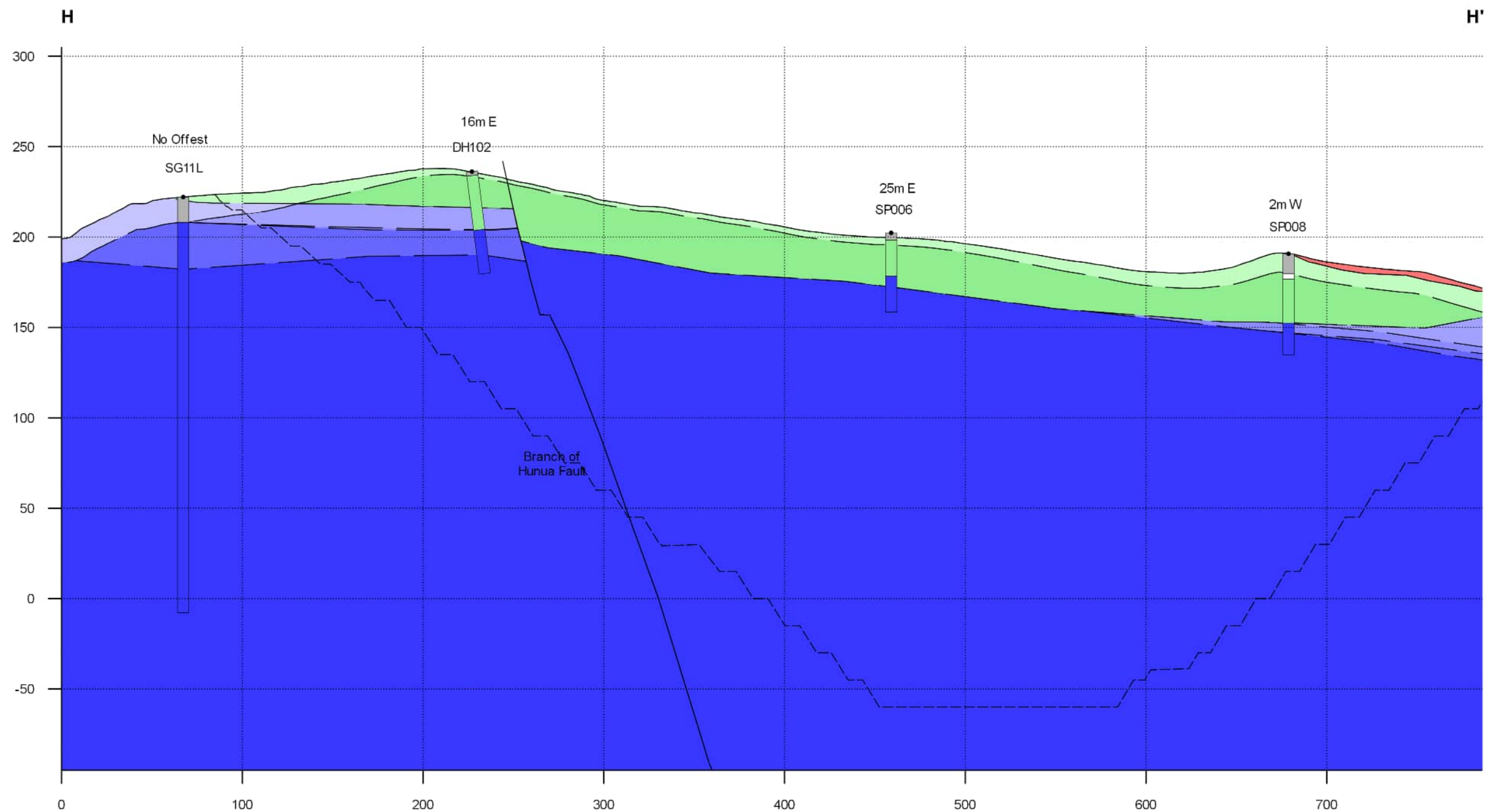


Client
Address
Project
Figure Title

Stevenson Aggregates Ltd.
Drury Quarry, Drury
Riley Ref 220245 - Sutton Block Extension
Section G

Created	Checked	Approved
JJW	SO	BB
04.10.2024	DRAFT	DRAFT

Section H



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Waikato Coal Measures Mudstone

Legend

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

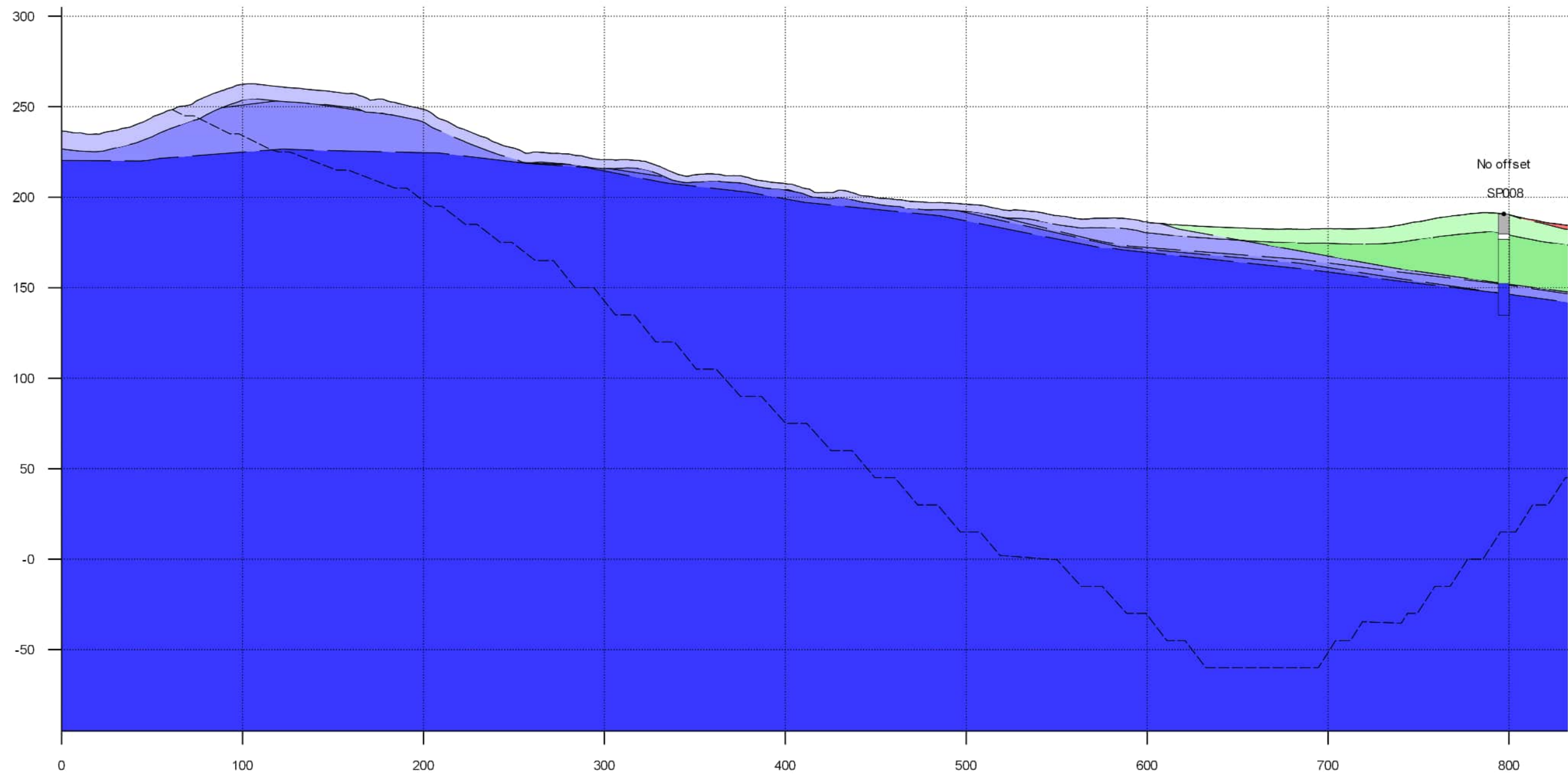
Scale: 1:2,500
Vertical exaggeration: 1x

0m 200m

 	Client	Stevenson Aggregates Ltd.		Created	Checked	Approved
	Address	Drury Quarry, Drury		JJW	SO	BB
	Project	Riley Ref 220245 - Sutton Block Extension		04.10.2024	DRAFT	DRAFT
Figure Title		Section H				

Section I

I'



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Kerikeri Volcanic Group Basalt
- Waikato Coal Measures Mudstone

Legend

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

Scale: 1:2,500

Vertical exaggeration: 1x

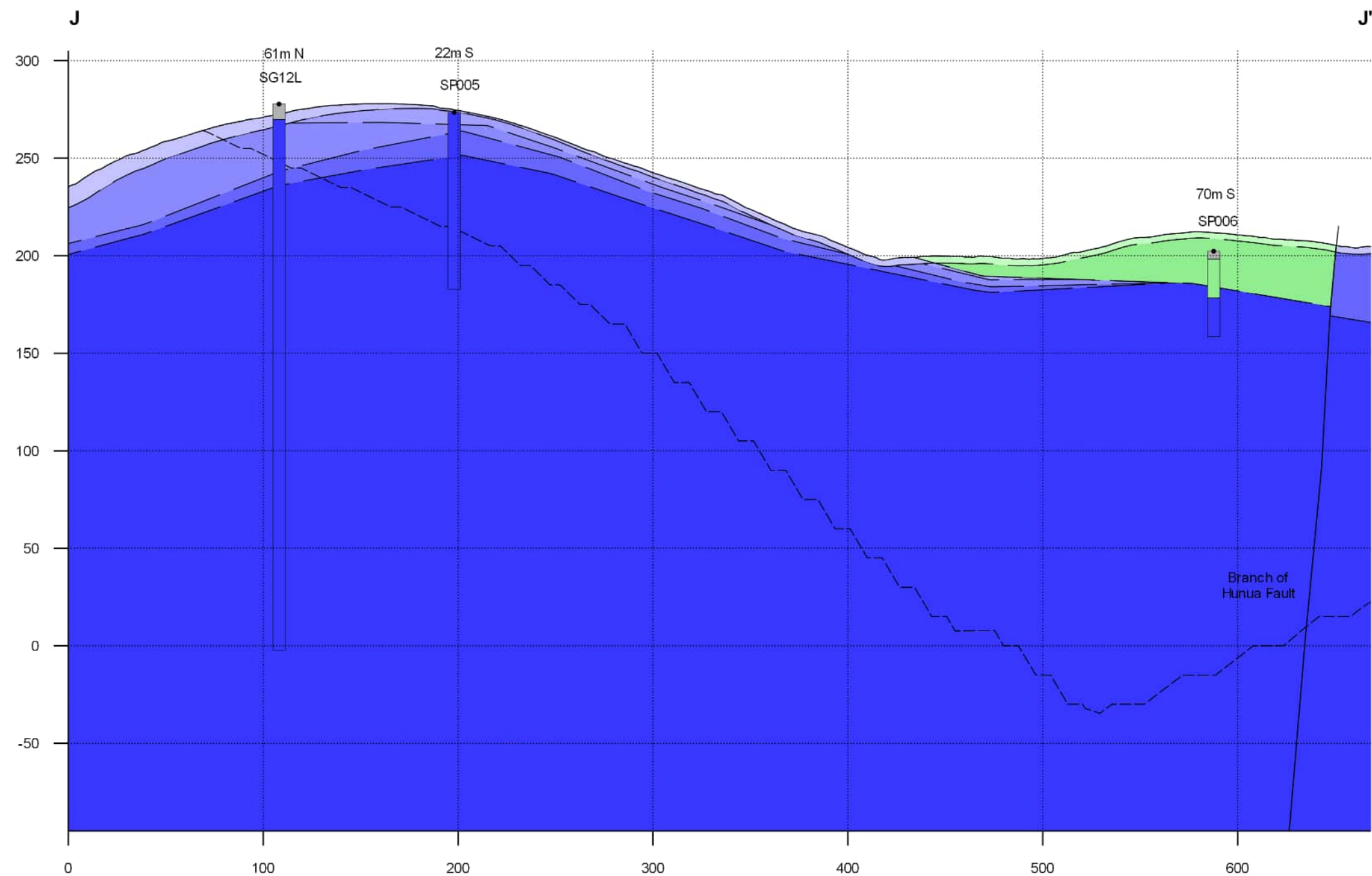
0m 200m



Client Stevenson Aggregates Ltd.
Address Drury Quarry, Drury
Project Riley Ref 220245 - Sutton Block Extension
Figure Title Section I

Created	Checked	Approved
JJW	SO	BB
04.10.2024	DRAFT	DRAFT

Section J



Residual Clay

- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Waikato Coal Measures Mudstone

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

Surfaces

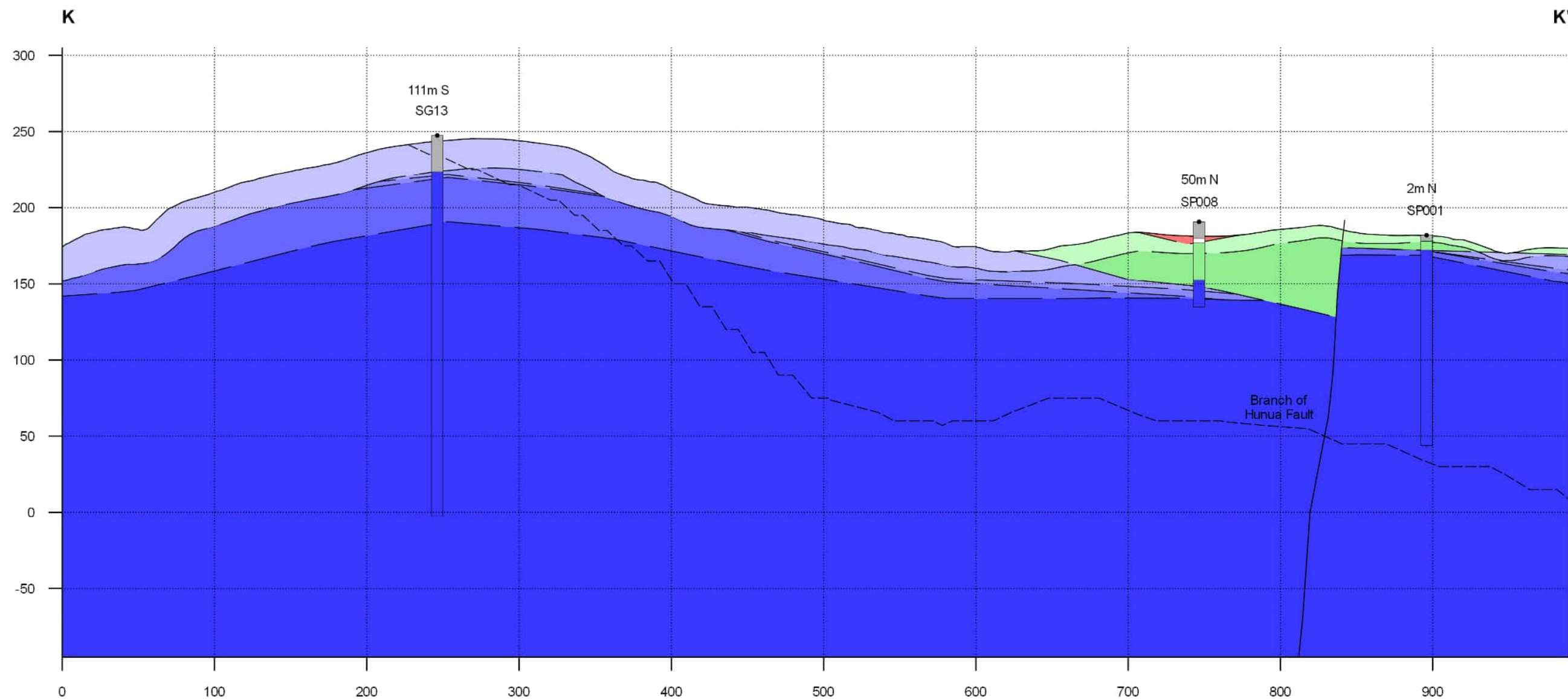
- Fit Shell Revised Stage 5 (50Yr)_Sep 2024

Scale: 1:2,500
Vertical exaggeration: 1x

0m  200m

 	Client	Stevenson Aggregates Ltd.		
	Address	Drury Quarry, Drury		
	Project	Riley Ref 220245 - Sutton Block Extension		
	Figure Title	Section J		
		Created	Checked	Approved
		JJW	SO	BB
		04.10.2024	DRAFT	DRAFT

Section K



Residual Clay

- Residual Basalt
- Residual Mudstone
- Residual Greywacke

Surficial Lithology

- Kerikeri Volcanic Group Basalt
- Waikato Coal Measures Mudstone

Legend

Greywacke Weathering Grade

- Residually Weathered
- Completely Weathered
- Moderately Weathered
- Unweathered

Borehole Legend

- Ash
- Basalt
- Clay
- Carbonaceous Mudstone
- Greywacke [All Types]
- loss

Surfaces

- Pit Shell Revised Stage 5 (50Yr)_Sep 2024

Scale: 1:3,000

Vertical exaggeration: 1x



Client	Stevenson Aggregates Ltd.
Address	Drury Quarry, Drury
Project	Riley Ref 220245 - Sutton Block Extension
Figure Title	Section K

Created	Checked	Approved
JJW	SO	BB
04.10.2024	DRAFT	DRAFT



Appendix I

**Riley Drawings:
220245-10 to -13**



LEGEND

PROPOSED QUARRY EXTENT

LINEATION

INFERRED FAULT – TEETH
INDICATE DOWNTHROWN BLOCK

TOP OF SLOPE

SCARP

RIDGE LINE

WATERCOURSE

SPRINGS

HUMMOCKY GROUND

SOIL CREEP

REEDS

RILEY 2022
MACHINE BOREHOLES

PDP 2022
MACHINE BOREHOLES

TERRA MINING 2005
MACHINE BOREHOLES

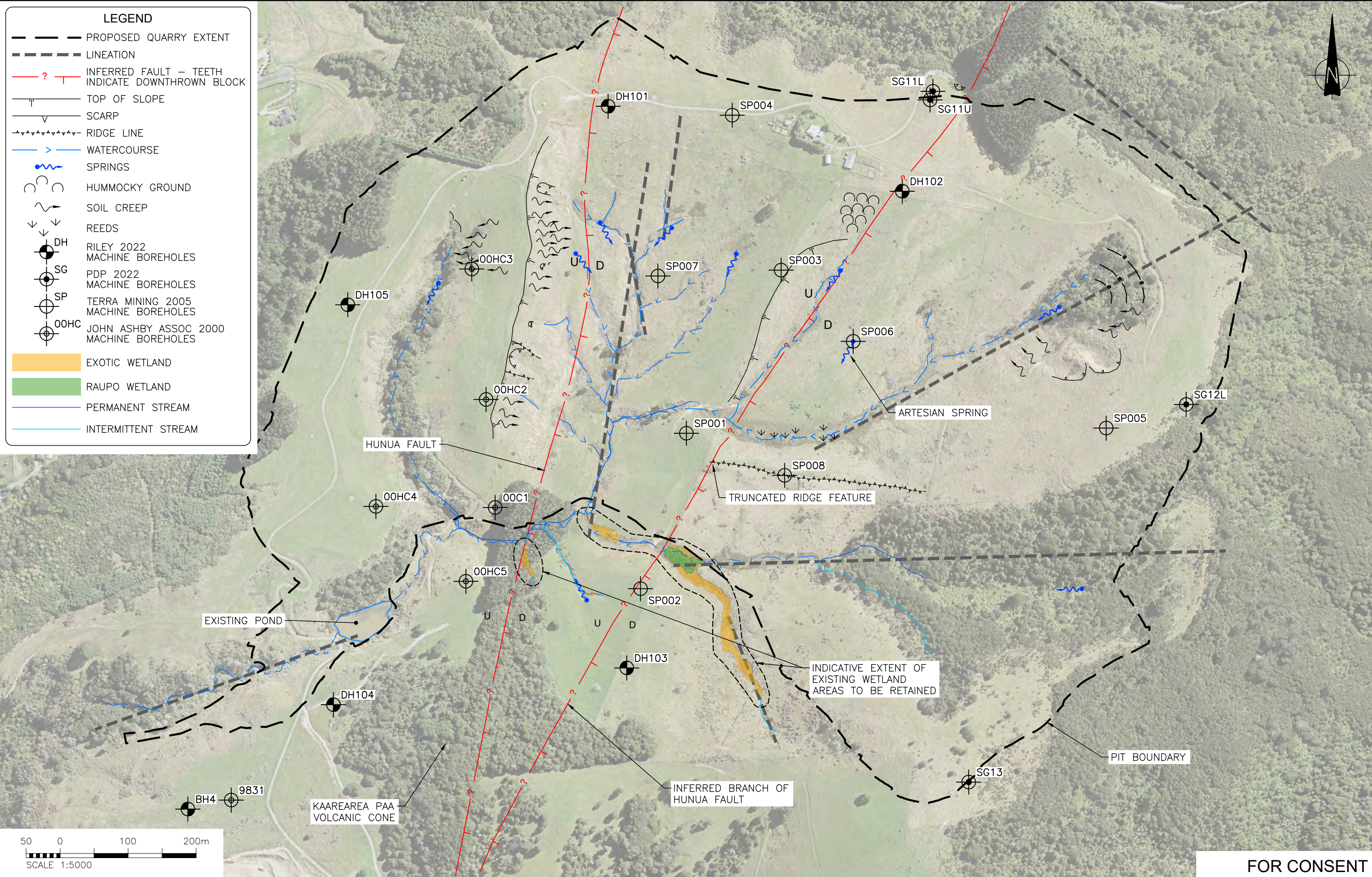
JOHN ASHBY ASSOC 2000
MACHINE BOREHOLES

EXOTIC WETLAND

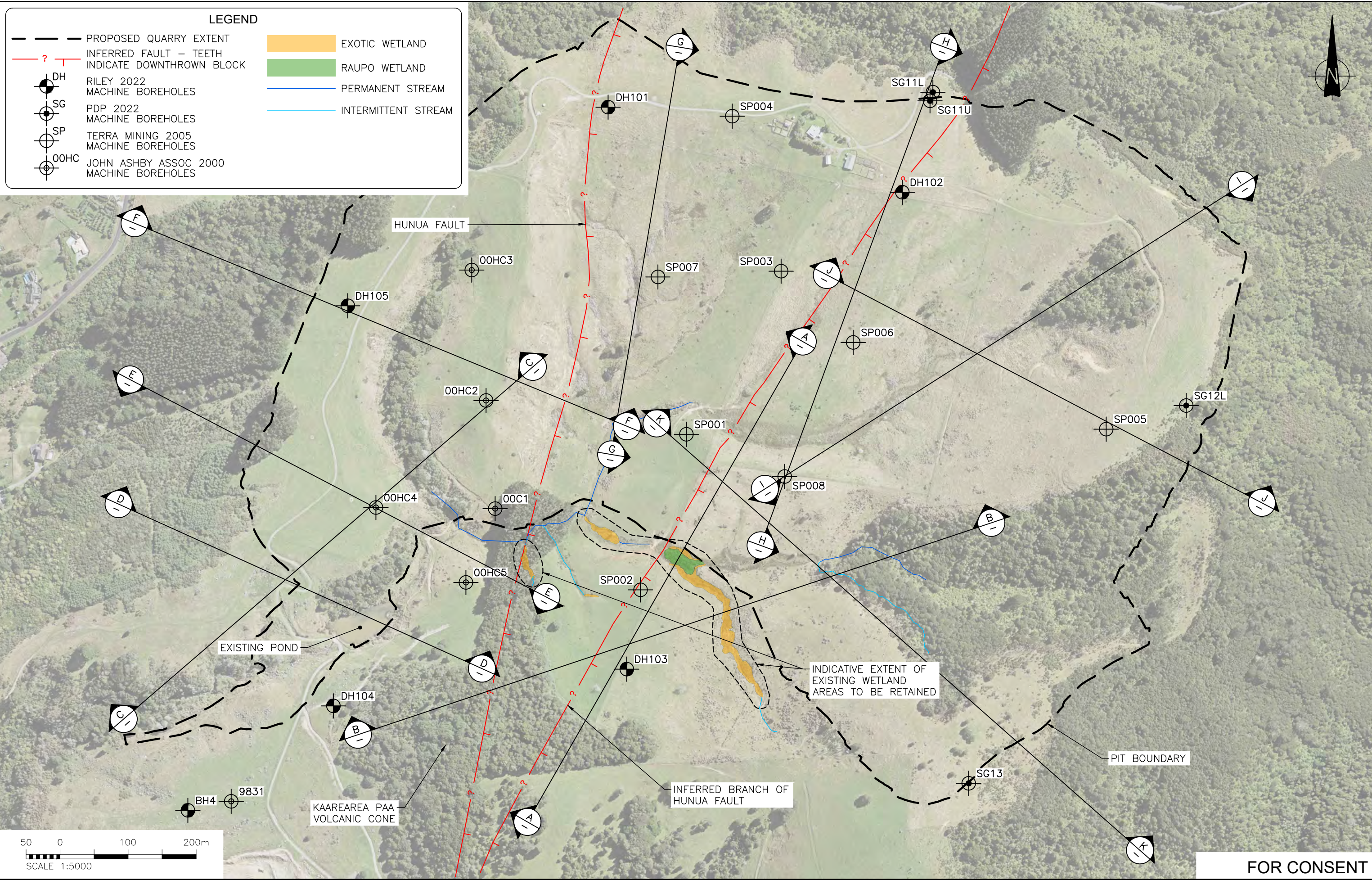
RAUPO WETLAND

PERMANENT STREAM

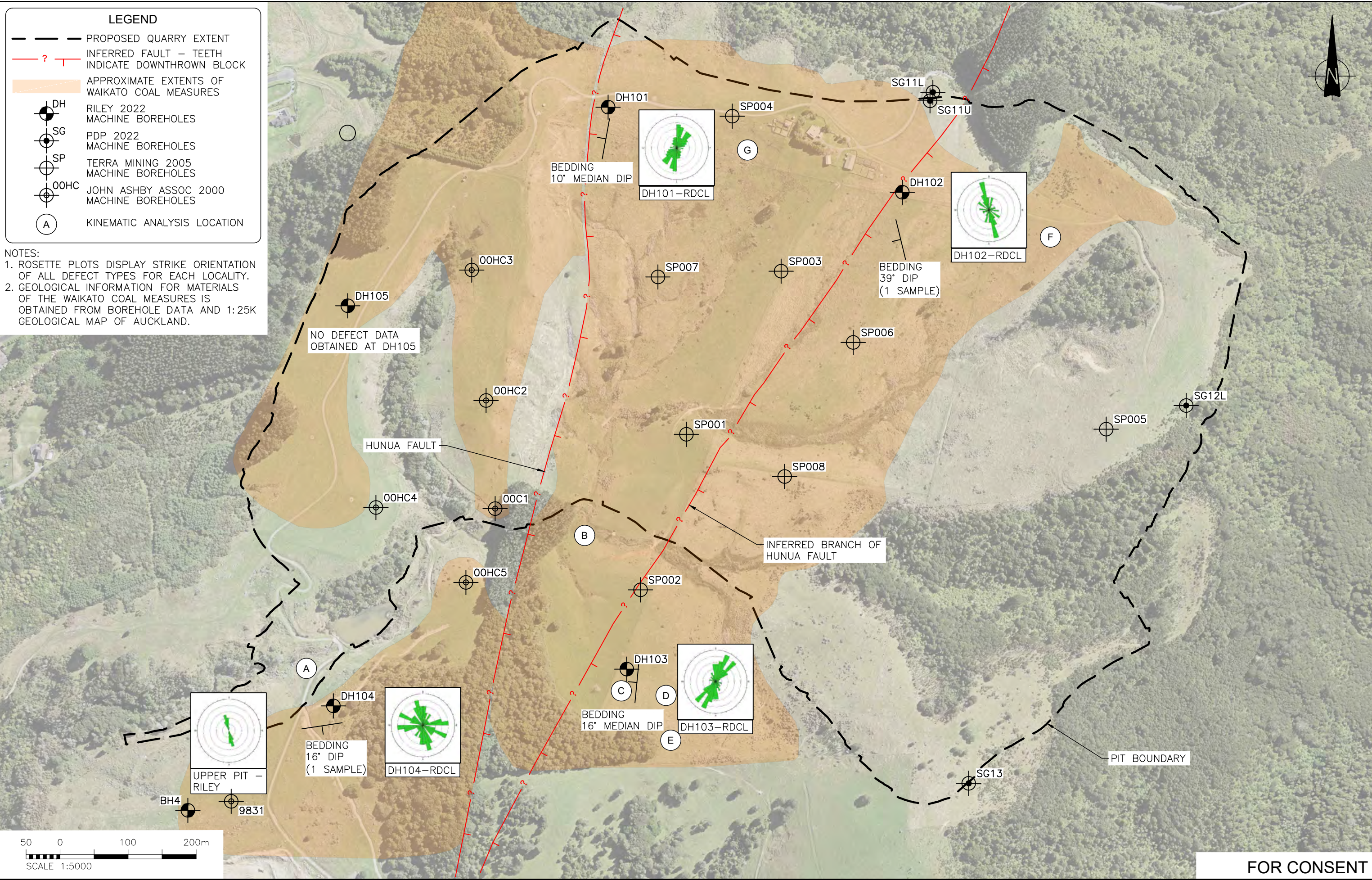
INTERMITTENT STREAM



					DESIGN SA	DES CHECK SRO	APPROVED FOR ISSUE B. BLACK	 www.riley.co.nz		CLIENT STEVENSON AGGREGATES LTD	ADDRESS QUARRY ROAD, DRURY	PROJECT DRURY QUARRY - SUTTON BLOCK	SHEET TITLE GEOMORPHOLOGICAL FEATURES	 ACENZ	CADFILE 220245-10.dwg	
3	13.01.25	FOR CONSENT	FY	DRAWN	CAD CHECK	SCALE (A3) 1:5000									ORIG. SHEET SIZE A3	
2	18.12.23	FOR CONSENT	ZL	FY	ZL	DRAWING No. 220245-10									REV. 3	
1	03.11.23	FOR INFORMATION	FY	DATE DRAWN 28.03.2023	ISSUE DATE 13 / 01 / 25									 GCS		
REV	DATE	ISSUE	BY													



				DESIGN SA	DES CHECK SRO	APPROVED FOR ISSUE B. BLACK	 www.riley.co.nz		CLIENT	STEVENSON AGGREGATES LTD		 ACENZ	CADFILE 220245-11.dwg	
3	13.01.25	FOR CONSENT	FY	DRAWN	CAD CHECK				ADDRESS	QUARRY ROAD, DRURY			SCALE (A3) 1:5000	ORIG. SHEET SIZE A3
2	18.12.23	FOR CONSENT	ZL	FY	ZL				PROJECT	DRURY QUARRY - SUTTON BLOCK			DRAWING No. 220245-11	REV. 3
1	03.11.23	FOR INFORMATION	FY	DATE DRAWN		ISSUE DATE			SHEET TITLE	GEOTECHNICAL SITE LOCATION PLAN		 ISO 9001 CERTIFIED GCS		
REV	DATE	ISSUE	BY	28.03.2023		13 / 01 / 25								



				DESIGN SA	DES CHECK SRO	APPROVED FOR ISSUE B. BLACK	 www.riley.co.nz		CLIENT STEVENSON AGGREGATES LTD ADDRESS QUARRY ROAD, DRURY PROJECT DRURY QUARRY - SUTTON BLOCK SHEET TITLE WAIKATO COAL MEASURES ROSETTE PLAN	 ISO 9001 GCS	CADFILE 220245-12.dwg		
3	13.01.25	FOR CONSENT	FY	DRAWN	CAD CHECK						SCALE (A3) 1:5000	ORIG. SHEET SIZE A3	
2	18.12.23	FOR CONSENT	ZL	FY	ZL								
1	03.11.23	FOR INFORMATION	FY	DATE DRAWN		ISSUE DATE					DRAWING No. 220245-12	REV. 3	
REV	DATE	ISSUE	BY	12.04.2023		13 / 01 / 25							

FOR CONSENT

AUCKLAND

4 Fred Thomas Drive, Takapuna
riley@riley.co.nz

CHRISTCHURCH

22 Moorhouse Avenue, Addington
rileychch@riley.co.nz

riley.co.nz

