Appendix A Figures

LEGEND

- T+T Machine Borehole(2025)
- T+T Hand Auger(2025)
- Aurecon Machine Borehole(2018)
- Aurecon Machine Borehole(2019)
- Aurecon CPT (2019)
- Site Boundary
- Basement footprint
- 30m Slightly Weathered ECBF Rock contour (1m interval)

A3 SCALE 1:1,000

0 10 20 30 40 50 m

Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

NOTES:

CRS: NZGD 2000 New Zealand Transverse Mercator Credits: Esri Community Maps Contributors, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Earthstar Geographics, Maxar, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS

LOCATION PLAN

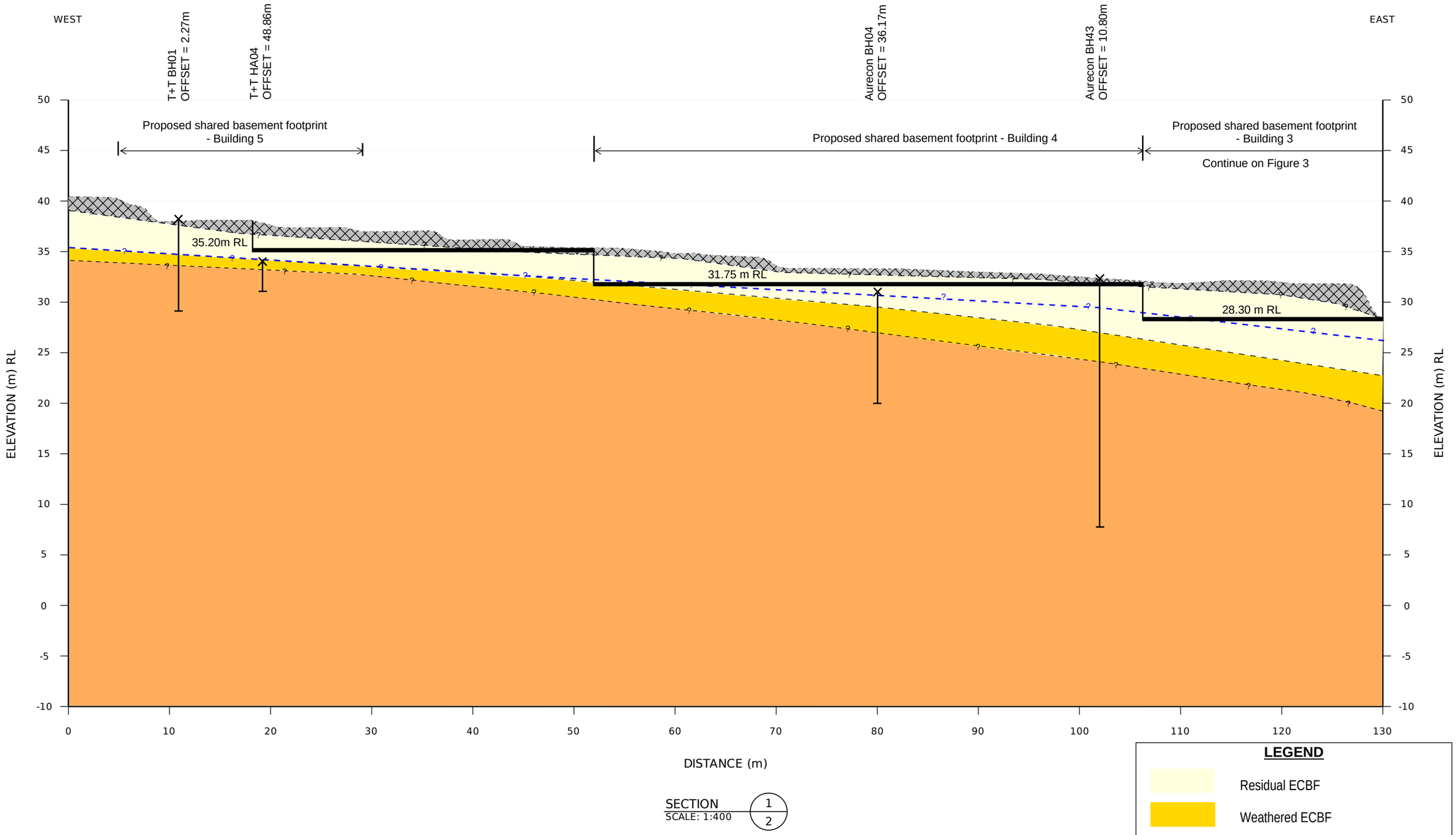
PROJECT No.	1098049.0000		
DESIGNED	SCZH	JUN.25	
DRAWN	SCZH	JUN.25	
CHECKED			
		APPROVED	DATE

CLIENT **GENERUS LIVING GROUP LIMITED**

PROJECT **THE POINT DEVELOPMENT**

TITLE GEOTECHNICAL INVESTIGATION SITE PLAN

SCALE (A3) 1:1,000 FIG No. FIGURE 1. REV 0



SECTION 1/2
SCALE: 1:400

LEGEND

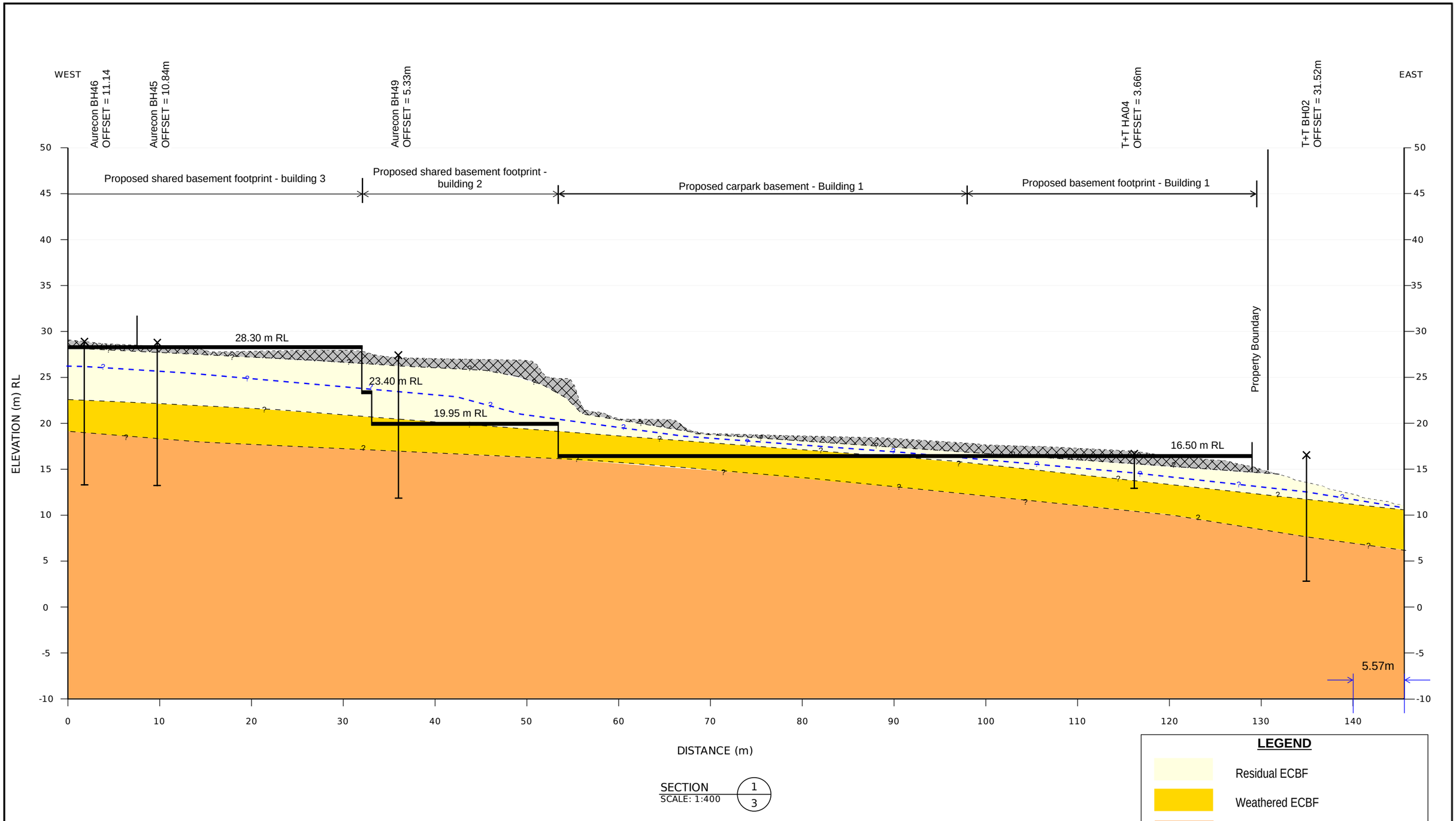
- Residual ECBF
- Weathered ECBF
- ECBF Rock
- Inferred Groundwater Level
- Proposed Basement Elevation RL (m)

T+T Cross-Section Generator (CSG)
Start Point (NZTM): 1762698.97 mE, 5920111.17 mN
End Point (NZTM): 1762828.41 mE, 5920123.0 mN
Date Generated: 2025-06-26, 09:54:13
CSG Version: 2.0 (Second Release)
Vertical Datum: Investigation RLs are shown in NZVD2016 datum.
Groundline Source: LiDAR data licenced by: Auckland Council. Dataset: Auckland North LiDAR (2016-2018).

Tonkin+Taylor
Exceptional thinking together www.tonkintaylor.co.nz

PROJECT No.	1098049.0000	
DESIGNED	SCZH	Jun.25
DRAWN	SCZH	Jun.25
CHECKED	XXXX	
APPROVED	DATE	

CLIENT **GENERUS LIVING GROUP LIMITED**
PROJECT **THE POINT DEVELOPMENT**
TITLE CROSS SECTION 1
DRAFT
SCALE (A3) AS SHOWN FIG No. 2 REV 1



SECTION 1/3
SCALE: 1:400

LEGEND

- Residual ECBF
- Weathered ECBF
- ECBF Rock
- Inferred Groundwater Level
- Proposed Basement Elevation RL (m)

T+T Cross-Section Generator (CSG)
Start Point (NZTM): 1762823.79 mE, 5920129.52 mN
End Point (NZTM): 1762963.15 mE, 5920150.2 mN
Date Generated: 2025-06-27, 09:28:59
CSG Version: 2.0 (Second Release)
Vertical Datum: Investigation RLs are shown in NZVD2016 datum.
Groundline Source: LiDAR data licenced by: Auckland Council. Dataset: Auckland North LiDAR (2016-2018).

Tonkin+Taylor
Exceptional thinking together www.tonkintaylor.co.nz

PROJECT No.	1098049.0000	
DESIGNED	SCZH	Jun.25
DRAWN	SCZH	Jun.25
CHECKED	XXXX	
APPROVED	DATE	

CLIENT **GENERUS LIVING GROUP LIMITED**
PROJECT **THE POINT DEVELOPMENT**
TITLE CROSS SECTION 2

DRAFT

SCALE (A3) AS SHOWN FIG No. 3 REV 1

LEGEND

- T+T Machine Borehole(2025)
- Aurecon Machine Borehole(2018)
- Aurecon Machine Borehole(2019)
- Site Boundary
- Basement footprint
- 30m — Slightly Weathered ECBF Rock contour (1m interval)

Basement RL - 35.20m

Basement RL - 31.75m

Basement RL - 28.3m

Basement RL - 24.85m

Basement RL - 16.50m

T+T- BH01
T+T- BH02
Aurecon - BH01
Aurecon - BH02
Aurecon - BH03
Aurecon - BH04
Aurecon - BH05
Aurecon - BH06
Aurecon - BH41
Aurecon - BH42
Aurecon - BH43
Aurecon - BH44
Aurecon - BH45
Aurecon - BH46
Aurecon - BH47
Aurecon - BH48
Aurecon - BH49
Aurecon - BH50

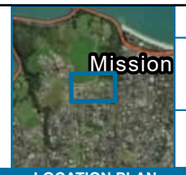
Rukutai Street
Te Arawa Street
Kupe Street
Aotea Street

A3 SCALE 1:1,000
0 10 20 30 40 50 m

NOTES:

Rock level contours are based on data from recent and historical site investigations undertaken at point locations. The nature and continuity of subsoil away from these locations is inferred, but it must be appreciated that actual conditions may vary from the assumed model.

Tonkin+Taylor
Exceptional thinking together www.tonkintaylor.co.nz

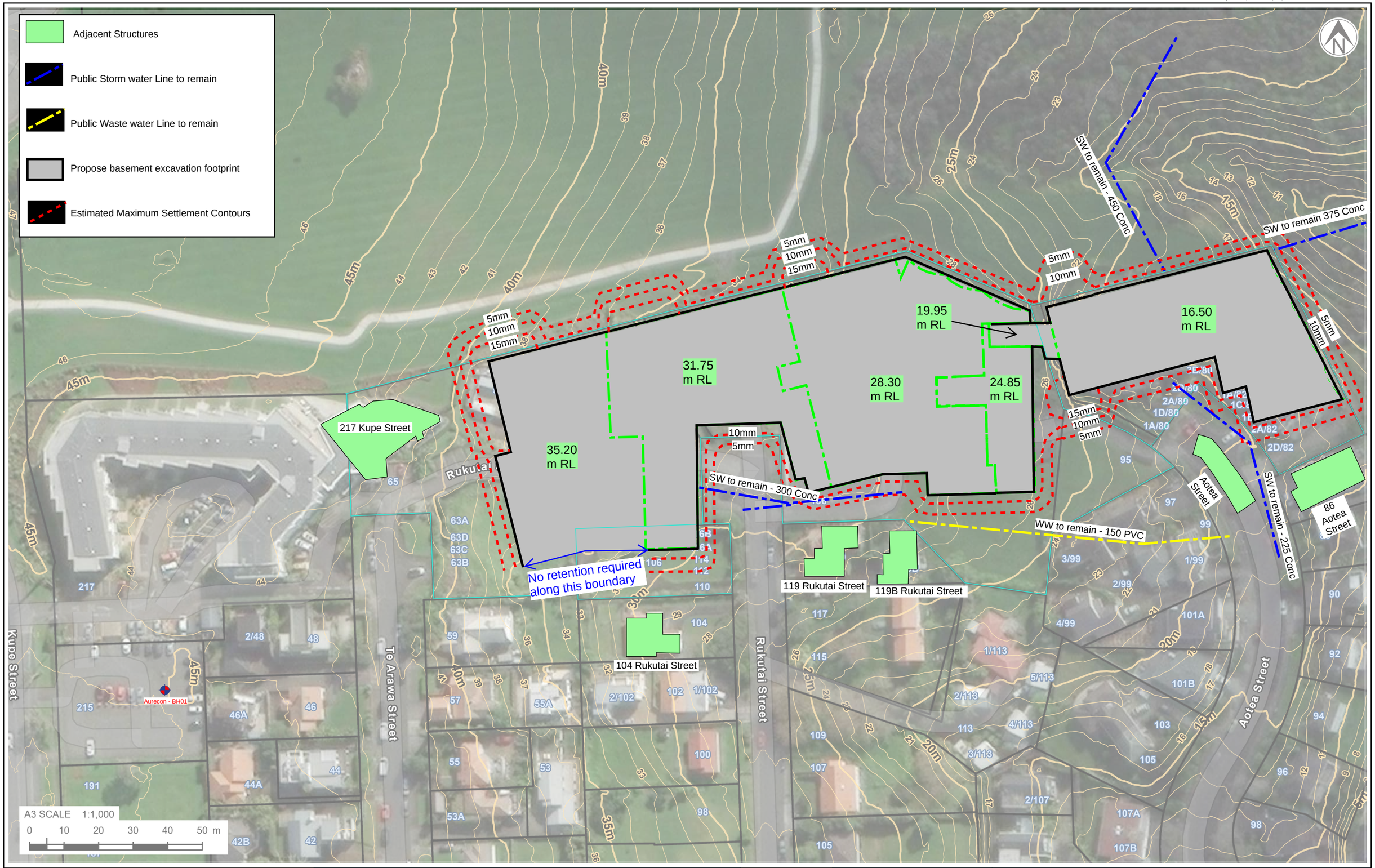


LOCATION PLAN

PROJECT No.	1098049.0000		
DESIGNED	SCZH	JUN.25	
DRAWN	SCZH	JUN.25	
CHECKED			
		APPROVED	DATE

CLIENT GENERUS LIVING GROUP LIMITED
PROJECT THE POINT DEVELOPMENT
TITLE ROCK CONTOUR ISOPACH SITE PLAN

SCALE (A3) 1:1,000 FIG No. 4 REV 0

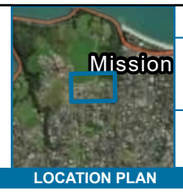


Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

NOTES:

CRS: NZGD 2000 New Zealand Transverse Mercator Credits: Esri Community Maps Contributors, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Earthstar Geographics, Maxar, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS



LOCATION PLAN

PROJECT No.	1098049.0000		
DESIGNED	SCZH	JUN.25	
DRAWN	SCZH	JUN.25	
CHECKED			
		APPROVED	DATE

CLIENT **GENERUS LIVING GROUP LIMITED**

PROJECT **THE POINT DEVELOPMENT**

TITLE SETTLEMENT CONTOUR PLAN

SCALE (A3) 1:1,000 FIG No. 5 REV 0

Appendix B Investigation Logs

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **217 Kupe Street, Auckland**
Project Reference: **255232**

BH01

Sheet **1** of **3**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405347.8m
Northing: 803113.9m
Reduced level: 45m (Auckland MSL 1946 Datum)

Date started: 3/04/2018
Date completed: 3/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: BGW
Input by: BGW
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy / Defect Description / Additional Notes	Installation
Box 1 HA	44	1		F	**0m:** SILT with minor clay and trace building debris; brown. Stiff; moist; non-plastic. [FILL]	ML		100				**0m: FILL**	
SPT	43	2		Va	**1.4m:** Fine ASH; light greyish brown, spotted brownish orange. Stiff; moist; high plasticity. (Silty CLAY with trace completely weathered fine gravel)	CH	1.5m: SPT 6// 2,3,3,3 N = 11	100				**1.4m: AUCKLAND VOLCANIC FIELD**	
OB								100					
Box 2 SPT	42	3					3m: SPT 4// 3,4,4,4 N = 15 3m: IBHSV 148/54 kPa	100					
OB	41	4			**3.4m to 4.2m:**...Minor sand; banded brownish orange.			70					
Box 3 SPT	40	5		ERc	**4.2m:** Sandy CLAY; grey banded orange. Stiff; moist; high plasticity. [RESIDUAL ECBF]	CH	4.5m: SPT 5// 3,3,3,4 N = 13 4.5m: IBHSV 76/34 kPa	100				**4.2m: EAST COAST BAYS FORMATION**	
								0					

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 04/04/18 08:15 | 6.00m | 2.08 m bgl
(2) 05/04/18 08:00 | 6.00m | 4.2 m bgl
(3) 06/04/18 07:30 | 6.00m | 5.23 m bgl
(4) 09/04/18 07:45 | 6.00m | 5.41 m bgl
(5) 23/04/18 11:42 | 6.00m | 3.89 m bgl

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **217 Kupe Street, Auckland**
Project Reference: **255232**

BH01

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405347.8m
Northing: 803113.9m
Reduced level: 45m (Auckland MSL 1946 Datum)

Date started: 3/04/2018
Date completed: 3/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: BGW
Input by: BGW
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB	39	6		ERx	**4.95m:** CORELOSS.			0					
SPT				ERz	**6m:** Sandy SILT with trace clay; light brown mottled brownish orange. Firm; moist; low plasticity.	ML	6m: SPT 4// 2,2,2,2 N = 8	100					
OB	38	7		ERz	**6.55m to 6.6m:**...CLAY.								
				ERc	**6.75m:** CLAY; yellowish brown mottled light grey. Stiff; moist; high plasticity. [Completely weathered ECBF]	CH		100					
				ERc	**7.05m:** Silty CLAY; light brown mottled orange. Stiff; moist; high plasticity.	CH							
				ERc	**7.3m to 7.4m:**...Silty SAND.								
SPT	37	8		ERs	**7.45m:** Silty SAND; light brown mottled orange. Loose; wet.	SM	7.5m: SPT 3// 1,2,2,2 N = 7	100					
				ERs	**8.15m to 8.27m:**...Brownish orange.								
OB	36	9		EWz	**8.3m:** Highly weathered, grey, SILTSTONE; extremely weak (very stiff).	HW	9m: SPT 4// 2,3,4,4 N = 13	100					
SPT				EWz				0					
OB	35	10		EWz	**9.65m to 9.7m:**...CLAY.			100	13	13			

Box 3
Box 4

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 04/04/18 08:15 | 6.00m | 2.08 m bgl
(2) 05/04/18 08:00 | 6.00m | 4.2 m bgl
(3) 06/04/18 07:30 | 6.00m | 5.23 m bgl
(4) 09/04/18 07:45 | 6.00m | 5.41 m bgl
(5) 23/04/18 11:42 | 6.00m | 3.89 m bgl

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **217 Kupe Street, Auckland**
Project Reference: **255232**

BH01

Sheet **3** of **3**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405347.8m
Northing: 803113.9m
Reduced level: 45m (Auckland MSL 1946 Datum)

Date started: 3/04/2018
Date completed: 3/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: BGW
Input by: BGW
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
B				EWz	**8.3m:** Highly weathered, grey, SILTSTONE; extremely weak (very stiff).	HW		100	13	13			
Rock Level													
SPTC		11		EWz	**10.5m:** Moderately weathered, grey, SILTSTONE; very weak.	MW	10.5m: SPTC 50// for 140mm N = 50+	N/A				10.5m: SPT test terminated in seating penetration.	
HQ3	34			EUs	**11.05m:** Slightly weathered, grey, SANDSTONE; weak. Well cemented. **11.23m to 12.19m:**...Very weak. Moderately cemented.	SW		97	88	72			
SPTC	33	12		EUz	**12.19m:** Slightly weathered, grey, SILTSTONE; very weak.	SW		N/A					
HQ3				EUs	**12.57m:** Slightly weathered, grey, SANDSTONE; weak. Well cemented. **12.68m to 12.8m:**...Very weak. Moderately cemented.	SW	12.5m: SPTC 50// for 65mm N = 50+					12.5m: SPT test terminated in seating penetration.	
	32	13		EUz	**12.8m:** Slightly weathered, grey, SILTSTONE; very weak. Laminated with very thin sandstone lenses.	SW		100	100	90			
				EUs	**13.42m:** Slightly weathered, grey, SANDSTONE; weak. Well cemented. **13.51m to 13.56m:**...Very weak.	SW							
SPTC	31	14		EUs	**13.56m:** Slightly weathered, grey, silty fine SANDSTONE; weak. Well cemented. **13.76m to 13.9m:**...SILTSTONE. **13.9m to 14m:**...Weak. Well cemented.	SW	14m: SPTC 50// for 65mm N = 50+	N/A				14m: SPT test terminated in seating penetration.	
					End of borehole at 14.07m (Target Depth)								

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 04/04/18 08:15 | 6.00m | 2.08 m bgl
(2) 05/04/18 08:00 | 6.00m | 4.2 m bgl
(3) 06/04/18 07:30 | 6.00m | 5.23 m bgl
(4) 09/04/18 07:45 | 6.00m | 5.41 m bgl
(5) 23/04/18 11:42 | 6.00m | 3.89 m bgl

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH01**	Date Drilled:	**03/04/2018**
Photographed By:	**RAB**	Date Photographed:	**03/04/2018**

Box 1. - Depth: 0.00m to 1.50m.

Box 2. - Depth: 1.50m to 4.50m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH01**	Date Drilled:	**03/04/2018**
Photographed By:	**RAB**	Date Photographed:	**03/04/2018**

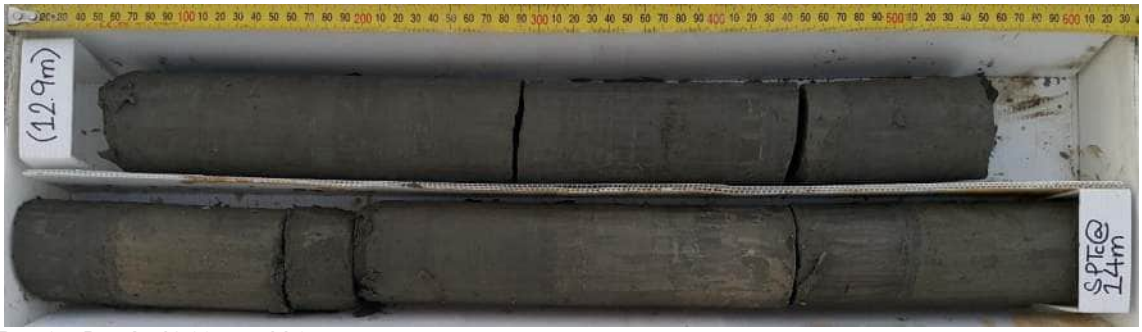
Box 3. - Depth: 4.50m to 7.95m.

Box 4. - Depth: 7.95m to 10.36m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH01**	Date Drilled:	**03/04/2018**
Photographed By:	**RAB**	Date Photographed:	**03/04/2018**

Box 5. - Depth: 10.36m to 12.90m.



Box 6. - Depth: 12.90m to 14.07m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Outside 65 Te Arawa Street, Auckland**
Project Reference: **255232**

BH02

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405415m
Northing: 803159.1m
Reduced level: 41m (Auckland MSL 1946 Datum)

Date started: 5/04/2018
Date completed: 6/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: AGM
Input by: AGM
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HA	41	1		T	**0m:** SILT; dark brown. Firm; moist; low plasticity. [TOPSOIL]	ML						**0m: TOPSOIL**	
				FEc	**0.2m:** Silty CLAY; brownish yellow mottled light and dark grey. Firm; moist; moderate plasticity. [FILL]			100				**0.2m: FILL**	
SPT	40	2			**1.1m to 5.26m:**...Yellowish brown mottled light grey. High plasticity.		1.5m: SPT 4// 1,2,2,3 N = 8	100					
OB	39	3				CL-ML		70					
SPT	38						3m: SPT 6// 3,4,4,6 N = 17	93					
OB	37	4			**4.27m to 4.5m:**...CORELOSS.			83					
SPT		5					4.5m: SPT 6// 4,4,3,3 N = 14 4.5m: IBHSV 117/49 kPa	100 49					

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 09/04/18 07:50 | 6.00m | 2.86 m bgl
(2) 23/04/18 11:48 | 6.00m | 2.32 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Outside 65 Te Arawa Street, Auckland**
Project Reference: **255232**

BH02

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405415m
Northing: 803159.1m
Reduced level: 41m (Auckland MSL 1946 Datum)

Date started: 5/04/2018
Date completed: 6/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: AGM
Input by: AGM
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
Box 2 OB				FEc	**4.95m to 5.26m:**...CORELOSS. **0.2m:** Silty CLAY; brownish yellow mottled light and dark grey. Firm; moist; moderate plasticity. [FILL]	CL-ML							
OB	36			ERz	**5.26m:** SILT; light grey mottled brownish yellow. Stiff; moist; medium plasticity. [RESIDUAL ECBF]	ML		49				**5.26m: EAST COAST BAYS FORMATION**	
SPT	35	6		ERz		ML	6m: SPT 2// 1,2,2,2 N = 7 6m: IBHSV 62/49 kPa	100					
Box 3 OB				ERz	**6.45m:** SILT; brownish orange. Stiff; moist; medium plasticity. [Completely weathered ECBF]	CW							
OB	34	7		EWz	**6.88m:** Highly weathered, grey, SILTSTONE, extremely weak (stiff).	HW		62	40	30			
SPT				EWz	**7.3m:** Highly weathered, grey, SILTSTONE, extremely weak (very stiff). **7.32m to 7.38m:**...SANDSTONE. Poorly cemented. **7.38m to 7.5m:**...CORELOSS.	HW	7.5m: SPT 14// 8,8,8,10 N = 34	100	100	100			
OB	33	8		EWz				100	100	100			
Box 4 HQ3				EWs	**8.3m:** Moderately weathered, dull grey, SANDSTONE; extremely weak (dense). Interbedded siltstone beds up to 200mm thick. **8.4m to 8.7m:**...SILTSTONE. **8.84m to 9.22m:**...SILTSTONE. **9.55m to 9.6m:**...Laminated SILTSTONE.	MW		91	91	72			
HQ3	32	9		EWs		MW							
SPTC		10		EWs		MW	9.75m: SPTC 32// 24,26 for 25mm N = 50+	N/A					

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 09/04/18 07:50 | 6.00m | 2.86 m bgl
(2) 23/04/18 11:48 | 6.00m | 2.32 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Outside 65 Te Arawa Street, Auckland**
Project Reference: **255232**

BH02

Sheet **3** of **3**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405415m
Northing: 803159.1m
Reduced level: 41m (Auckland MSL 1946 Datum)

Date started: 5/04/2018
Date completed: 6/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: AGM
Input by: AGM
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
Box 4 HQ3	31			EWs	**8.3m:** Moderately weathered, dull grey, SANDSTONE; extremely weak (dense). Interbedded siltstone beds up to 200mm thick.	MW		95	91	91		10.13m: JT -45° PlSm Cn	
					10.5m to 10.77m:...SILTSTONE.								
					10.85m to 10.87m:...Thin black carbonaceous material.								
SPTC		11			**10.9m:** Moderately weathered, light grey, SILTSTONE; very weak. Interbedded with moderately thin sandstone beds with disseminated black carbonaceous material.		11m: SPTC 48// 8 for 50mm N = 50+	N/A					
	30												
Box 5 HQ3				EWz		SW		95	94	85			
		12			**11.84m to 11.89m:**...SANDSTONE. Well cemented.								
	29												
					End of borehole at 12.5m (Target Depth)								

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 09/04/18 07:50 | 6.00m | 2.86 m bgl
(2) 23/04/18 11:48 | 6.00m | 2.32 m bgl

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH02**	Date Drilled:	**05/04/2018 – 06/04/2018**
Photographed By:	**RAB**	Date Photographed:	**05/04/2018 – 06/04/2018**

Box 1. - Depth: 0.00m to 2.47m.

Box 2. - Depth: 2.47m to 5.43m.

Borehole Reference:	**BH02**	Date Drilled:	**05/04/2018 – 06/04/2018**
Photographed By:	**RAB**	Date Photographed:	**05/04/2018 – 06/04/2018**

Box 3. - Depth: 5.43m to 8.16m.

Box 4. - Depth: 8.16m to 11.00m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH02**	Date Drilled:	**05/04/2018 – 06/04/2018**
Photographed By:	**RAB**	Date Photographed:	**05/04/2018 – 06/04/2018**

Box 5. - Depth: 11.0m to 12.50m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **54 Te Arawa Street, Auckland**
Project Reference: **255232**

BH03

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405443.4m
Northing: 803186.7m
Reduced level: 37m (Auckland MSL 1946 Datum)

Date started: 6/04/2018
Date completed: 6/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB	37			Fx	**0m:** CORELOSS.			30				**0m: FILL**	
				F	**0.7m:** Medium to coarse Silty SAND with some fine gravel and trace rootlets; brown. Soft; moist; low plasticity. [FILL]	SM							
		1			**0.8m:** Silty CLAY; bornwish yellow mottled light grey. Firm; moist; high plasticity. [RESIDUAL ECBF] **0.81m to 1m:**...Trace rootlets.							**0.8m: EAST COAST BAYS FORMATION**	
OB	36						1m: IBHSV 34/15 kPa	80					
SPT				ERc		CL-ML	1.5m: SPT 2// 1,2,1,2 N = 6 1.5m: IBHSV 108/53 kPa	100					
		2											
OB	35							71					
				ERs	**2.5m:** Fine to medium silty SAND; brown. Medium dense. [Completely weathered ECBF]	SW-SM							
		3											
SPT	34				**3m:** Highly weathered, grey, SANDSTONE; extremely weak (medium dense). Interbedded with laminated siltstone lenses.		3m: SPT 3// 2,4,4,3 N = 13 3m: IBHSV 148/28 kPa	100	87	22			
				EWs		HW							
OB		4						100	100	100			
	33												
				EWz	**4.1m:** Moderately weathered, grey, SILTSTONE; very weak. With laminated to very thin black carbonaceous banding.	MW							
				EWs	**4.4m:** Moderately weathered, grey, SANDSTONE; very weak. Interbedded with laminated siltstone lenses.	MW	4.5m: SPTC 16// 20,19,11 for 40mm N = 50+	N/A					
SPTC		5				SW		97	97	93			

Box 1
Box 2

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.
6) No piezometer was installed for recording water levels.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **54 Te Arawa Street, Auckland**
Project Reference: **255232**

BH03

Sheet **2** of **2**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405443.4m
Northing: 803186.7m
Reduced level: 37m
(Auckland MSL 1946 Datum)

Date started: 6/04/2018
Date completed: 6/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	32	6		EUz	**4.95m:** Slightly weathered, grey, SILTSTONE; very weak. With thinly laminated sandstone lenses and black carbonaceous banding.	SW		97	97	93			
SPTC	31				**6.5m to 6.65m:**...SANDSTONE. Well Cemented.		6.5m: SPTC 20// 17,33 for 30mm N = 50+	N/A					
HQ3	30	7						100	94	63			
SPTC	29	8		EUs	**7.7m:** Slightly weathered, grey, SANDSTONE; very weak. Well cemented.	SW	8m: SPTC 48// 10 for 0mm N = 50+	N/A					
HQ3	28	9		EUz	**8.35m:** Slightly weathered, grey, SILTSTONE; weak. Interbedded with laminated sandstone lenses.	SW		83	81	50			
SPTC					End of borehole at 9.765m (Target Depth)		9.65m: SPTC 50// for 115mm N = 50+	N/A				9.65m: SPT test terminated in seating penetration.	

Box 2 Box 3 Box 4

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.
6) No piezometer was installed for recording water levels.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH03**	Date Drilled:	**06/04/2018**
Photographed By:	**RAB**	Date Photographed:	**06/04/2018**

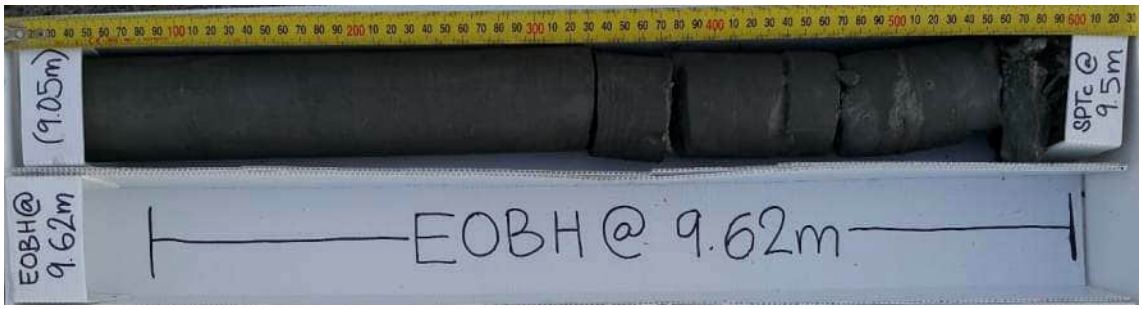
Box 1. - Depth: 0.00m to 3.45m.

Box 2. - Depth: 3.45m to 5.90m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH03**	Date Drilled:	**06/04/2018**
Photographed By:	**RAB**	Date Photographed:	**06/04/2018**

Box 3. - Depth: 5.90m to 9.05m.



Box 4. - Depth: 9.05m to 9.62m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Outside 112 Rukutai Street, Auckland**
Project Reference: **255232**

BH04

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405498.8m
Northing: 803167.7m
Reduced level: 31m (Auckland MSL 1946 Datum)

Date started: 9/04/2018
Date completed: 9/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: AGM
Input by: AGM
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HYDRO VAC EX	31	1			**0m:** VACUUM EXCAVATION.			0					
SPT	30	2		ERz	**1.65m:** Clayey SILT; light grey mottled brownish orange. Firm; moist; medium plasticity. [Residual ECBF]	CL-ML	1.65m: SPT 2// 1,1,1,1 N = 4	100				**1.65m: EAST COAST BAYS FORMATION**	
OB	29			ERc	**2.25m:** Silty CLAY; light brownish yellow mottled light grey. Firm; moist; moderate plasticity.	CL-ML							
OB				ERx	**2.5m:** CORELOSS.			56					
		3		ERc	**2.9m:** Silty CLAY; light brownish yellow mottled light grey. Stiff; moist; moderate plasticity. [Completely Weathered ECBF]	CL-ML							
SPT				EWz	**3.02m:** Highly weathered, grey, SILTSTONE; extremely weak (very stiff).	HW	3m: SPT 8// 4,4,3,4 N = 15	100	47	47			
OB	28			EWz	**3.22m:** Highly weathered, grey, sandy SILTSTONE; extremely weak (medium dense).	HW	3m: IBHSV 60/36 kPa						
OB		4		EWs	**3.8m:** Highly weathered, grey, SANDSTONE; extremely weak (medium dense). Disseminated black carbonaceous material.	HW		100	100	100			
SPTC	27			EWz	**4.2m:** Moderately weathered, grey, sandy SILTSTONE; extremely weak (very stiff).	MW	4.5m: SPTC 10// 10,12,14,14 for 15mm N = 50+	N/A					
HQ3		5			**4.89m:** CORELOSS.			100	89	60			

Box 1

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.
6) No piezometer was installed for recording water levels.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Outside 112 Rukutai Street, Auckland**
Project Reference: **255232**

BH04

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405498.8m
Northing: 803167.7m
Reduced level: 31m (Auckland MSL 1946 Datum)

Date started: 9/04/2018
Date completed: 9/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: AGM
Input by: AGM
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
				EWx	**4.89m:** CORELOSS.								
Box 1 HQ3	26			EWz	**5.34m:** Moderately weathered, grey, sandy SILTSTONE; extremely weak (very stiff).	MW							
		6			**5.72m:** Moderately weathered, grey, SILTSTONE; extremely weak (very stiff).	MW		100	89	60			
	25			EWs	**6m to 6.06m:**...Moderately weathered, grey, SANDSTONE; very weak. Moderately cemented. **6.2m:** Moderately weathered, grey, SANDSTONE; very weak. Moderately cemented.	MW							
SPTC							6.5m: SPTC 42// 10 for 0mm N = 50+	N/A					
Box 2 HQ3	24	7		EWz	**6.57m:** Moderately weathered, grey, SILTSTONE; very weak. **7.67m to 7.71m:**...Moderately weathered, grey, SANDSTONE; very weak. Moderately cemented.	MW		93	93	72			
SPTC	23	8					8m: SPTC 25// 25,15,10 for 30mm N = 50+	N/A					
HQ3		9		EUs	**8.6m:** Slightly weathered, light grey, SANDSTONE; weak. **8.9m to 9.5m:**...SILTSTONE.	SW		97	97	86		8.71m: JT -75° StSm Cn 8.73m: JT -80° UnRo Vn(CLAY)	
Box 3 SPTC	22						9.5m: SPTC 50// for 115mm N = 50+	N/A				9.5m: SPT test terminated in seating penetration.	
HQ3		10						90	90	81		9.615m to 10m: JT -90° UnRo Cg(IRON)	

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.
6) No piezometer was installed for recording water levels.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Outside 112 Rukutai Street, Auckland**
Project Reference: **255232**

BH04

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405498.8m
Northing: 803167.7m
Reduced level: 31m (Auckland MSL 1946 Datum)

Date started: 9/04/2018
Date completed: 9/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: AGM
Input by: AGM
Checked by: RAB
Verified by: MFSL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3 Box 3	21			EUs	**8.6m:** Slightly weathered, light grey, SANDSTONE; weak.	SW		90	90	81		10m: JT -85° UnRo Cg(IRON) 10.65m: JT -60° PlSm Cn	
		11			**10.91m to 11m:**...SILTSTONE. End of borehole at 11m (Target Depth)								

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.
6) No piezometer was installed for recording water levels.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH04**	Date Drilled:	**09/04/2018**
Photographed By:	**RAB**	Date Photographed:	**09/04/2018**

Box 1. - Depth: 0.00m to 5.52m.

Box 2. - Depth: 5.52m to 8.33m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH04**	Date Drilled:	**09/04/2018**
Photographed By:	**RAB**	Date Photographed:	**09/04/2018**

Box 3. - Depth: 8.33m to 11.00m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **124 Rukutai Street, Auckland**
Project Reference: **255232**

BH05

Sheet **1** of **3**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405521.7m
Northing: 803228.1m
Reduced level: 33m (Auckland MSL 1946 Datum)

Date started: 5/04/2018
Date completed: 5/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy / Defect Description / Additional Notes	Installation
HA	32	1		T	**0m:** SILT with some sand and clay and trace rootlets; brown. Firm; moist; low plasticity. [TOPSOIL]	ML						**0m: TOPSOIL**	
				ERc	**0.6m:** Silty CLAY with trace rootlets; yellowish brown mottled dark brown. Firm; moist; low plasticity. [RESIDUAL ECBF] **1m to 1.55m:**...Brownish yellow mottled orange.	CL-ML		100				**0.6m: EAST COAST BAYS FORMATION**	
SPT	31	2		ERz	**1.55m:** Clayey SILT; light grey mottled brownish orange. Firm; moist; low plasticity.	CL-ML	1.5m: SPT 2// 1,1,1,2 N = 5	100					
OB	30	3		ERc	**2.23m:** Silty CLAY; light grey mottled brownish orange. Firm; moist; high plasticity. [Completely Weathered ECBF]	CL-ML		63					
SPT				EWz	**3.15m:** Highly weathered, grey, SILTSTONE; extremely weak (stiff).	HW	3m: SPT 2// 1,2,2,2 N = 7 3m: IBHSV 167/28 kPa	100	96	22			
OB	29	4		EWs	**4.2m:** Highly weathered, grey, SANDSTONE; extremely weak (loose). Uncemented. **4.28m to 4.4m:**...Light yellowish grey.	HW		90	85	76			
SPT	28	5		EWx	**4.4m:** CORELOSS.		4.5m: SPT 4// 2,3,3,4 N = 12 4.5m: IBHSV 90/25 kPa	100	80	67			
								86	86	73			

Box 1
Box 2

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/04/18 07:48 | 6.00m | 1.28 m bgl
(2) 09/04/18 08:02 | 6.00m | 2.24 m bgl
(3) 23/04/18 12:18 | 6.00m | 2.15 m bgl

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **124 Rukutai Street, Auckland**
Project Reference: **255232**

BH05

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405521.7m
Northing: 803228.1m
Reduced level: 33m (Auckland MSL 1946 Datum)

Date started: 5/04/2018
Date completed: 5/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB	27	6		EWz	**5.05m:** Highly weathered, grey, SILTSTONE; extremely weak (very stiff).	HW		86	86	73			
SPT							6m: SPT 5// 3,4,4,4 N = 15	100	93	78			
OB	26	7			**6.45m:** Moderately weathered, grey, SILTSTONE; very weak.	MW		85	85	85			
SPT	25	8		EUz	**7.1m:** Slightly weathered, grey, SILTSTONE; very weak.	SW	7.5m: SPT 14// 8,10,12,12 N = 42	100	100	100			
HQ3	24	9		EUx	**7.95m:** CORELOSS.			68	66	49			
				EUs	**8.45m:** Slightly weathered, grey, SANDSTONE; very weak. Moderately cemented. **8.76m to 9.4m:**...Weak.	SW						9.17m: JT 70° PlSm Cn	
SPTC	23	10					9.5m: SPTC 15// 10,10,12,10 N = 42	N/A					
						SW		97	60	14			

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/04/18 07:48 | 6.00m | 1.28 m bgl
(2) 09/04/18 08:02 | 6.00m | 2.24 m bgl
(3) 23/04/18 12:18 | 6.00m | 2.15 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **124 Rukutai Street, Auckland**
Project Reference: **255232**

BH05

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405521.7m
Northing: 803228.1m
Reduced level: 33m
(Auckland MSL 1946 Datum)

Date started: 5/04/2018
Date completed: 5/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	22			EUz	**9.95m:** Slightly weathered, grey, SILTSTONE; very weak. **10.04m to 10.12m:**...SANDSTONE. Moderately cemented.	SW		97	60	14			
SPTC		11					11m: SPTC 23// 17,17,16 for 25mm N = 50+	N/A					

End of borehole at 11.325m (Target Depth)

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/04/18 07:48 | 6.00m | 1.28 m bgl
(2) 09/04/18 08:02 | 6.00m | 2.24 m bgl
(3) 23/04/18 12:18 | 6.00m | 2.15 m bgl

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH05**	Date Drilled:	**05/04/2018**
Photographed By:	**RAB**	Date Photographed:	**05/04/2018**

Box 1. - Depth: 0.00m to 2.48m.

Box 2. - Depth: 2.48m to 5.52m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH05**	Date Drilled:	**05/04/2018**
Photographed By:	**RAB**	Date Photographed:	**05/04/2018**

Box 3. - Depth: 5.52m to 8.76m.

Box 4. - Depth: 8.76m to 11.33m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **138 Rukutai Street, Auckland**
Project Reference: **255232**

BH06

Sheet **1** of **3**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405588.6m
Northing: 803179.3m
Reduced level: 26m (Auckland MSL 1946 Datum)

Date started: 4/04/2018
Date completed: 4/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy / Defect Description / Additional Notes	Installation
HA	25	1		T	**0m:** Clayey SILT with some rootlets; dark brown. Firm; moist; low plasticity. [TOPSOIL]	CL-ML						**0m: TOPSOIL**	
				Fc	**0.3m:** Silty CLAY with trace rootlets; dark brown. Firm; moist; medium plasticity. [FILL]	CL-ML						**0.3m: FILL**	
				ERc	**0.65m:** CLAY; brownish yellow. Firm; moist; high plasticity. [RESIDUAL ECBF]	CL		100				**0.65m: EAST COAST BAYS FORMATION**	
SPT	24	2		ERx	**1.5m:** CORELOSS.		1.5m: SPT 2// 2,2,2,3 N = 9	0					
OB	23	3		ERc	**2.41m:** Silty CLAY; yellowish orange and light grey streaks. Stiff; moist; high plasticity.	CL-ML		56					
SPT				ERz	**2.88m:** Clayey SILT; light grey mottled brownish orange. Stiff; moist; medium plasticity.	CL-ML	3m: SPT 2// 1,1,2,2 N = 6 3m: IBHSV 73/34 kPa	100					
OB	22	4		ERc	**3.72m:** CLAY; brownish orange mottled light grey. Stiff; moist; high plasticity.	CL		90					
					4.31m: CLAY; yellowish brown. Stiff; moist; high plasticity.	CL							
SPT	21	5		ERz	**4.5m:** SILT; grey. Stiff; moist; low plasticity. [Completely Weathered ECBF]	CW	4.5m: SPT 4// 2,2,3,3 N = 10 4.5m: IBHSV 46/15 kPa	100	100	29			
								100	100	100			

Box 1 Box 2

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/04/18 07:42 | 6.00m | 3.73 m bgl
(2) 09/04/18 07:55 | 6.00m | 4.41 m bgl
(3) 23/04/18 12:11 | 6.00m | 4.78 m bgl

Database File: 255232.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 3/05/2018

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **138 Rukutai Street, Auckland**
Project Reference: **255232**

BH06

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405588.6m
Northing: 803179.3m
Reduced level: 26m (Auckland MSL 1946 Datum)

Date started: 4/04/2018
Date completed: 4/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
Box 2 OB				ERz	**4.5m:** SILT; grey. Stiff; moist; low plasticity. [Completely Weathered ECBF]	CW		100	100	100			
	20	6		EWs	**5.6m:** Highly weathered, grey, SANDSTONE; extremely weak (medium dense). Uncemented. Interbedded with very thin to thin siltstone lenses.	HW							
SPT				EWs	**6m:** Highly weathered, grey, SANDSTONE; extremely weak (medium dense). Uncemented.	HW	6m: SPT 4// 4,5,5,4 N = 18 6m: IBHSV 117/17 kPa	100	100	100			
Box 3 OB				EWx	**6.45m:** CORELOSS.								
	19	7		EWs	**6.68m:** Highly weathered, grey, SANDSTONE; extremely weak (medium dense). Uncemented.	HW		78	78	78			
SPT	18	8		EWz	**7.75m:** Highly weathered, grey, SILTSTONE; very weak.	HW	7.5m: SPT 6// 4,5,6,6 N = 21 7.5m: IBHSV 93/39 kPa	100	93	93			
Box 4 OB				EWz	**8.1m:** Moderately weathered, grey, SILTSTONE; very weak.	MW		72	72	72			
	17	9		EWx	**8.7m:** CORELOSS.								
SPTC				EWz	**9m:** Moderately weathered, grey, SILTSTONE; very weak.	MW	9m: SPTC 12// 10,18,14,8 for 35mm N = 50+	N/A					
HQ3	16	10						100	65	36			

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/04/18 07:42 | 6.00m | 3.73 m bgl
(2) 09/04/18 07:55 | 6.00m | 4.41 m bgl
(3) 23/04/18 12:11 | 6.00m | 4.78 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **138 Rukutai Street, Auckland**
Project Reference: **255232**

BH06

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Tracked Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405588.6m
Northing: 803179.3m
Reduced level: 26m
(Auckland MSL 1946 Datum)

Date started: 4/04/2018
Date completed: 4/04/2018
Inclination: -90°
Azimuth: N/A

Logged by: RAB
Input by: RAB
Checked by: MFSL
Verified by: EMR

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				EWz	**9m:** Moderately weathered, grey, SILTSTONE; very weak.	MW							
				EUs	**10.12m:** Slightly weathered, grey, SANDSTONE; very weak. Poorly cemented. **10.44m to 10.7m:**...Moderately cemented.	SW		100	65	36			
	15												
SPTC		11		EUz	**10.95m:** Slightly weathered, grey, SILTSTONE; very weak.	SW	11m: SPTC 50// for 100mm N = 50+	N/A				11m: SPT test terminated in seating penetration.	
					End of borehole at 11.125m (Target Depth)								

Box 4

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen.
2) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
3) Locations were estimated using Auckland Council GeoMaps and are in terms of Mount Eden 2000 Circuit with an approximate accuracy of +/- 5m.
4) Reduced level reading was obtained from an existing LIDAR dataset with an approximate accuracy of +/- 1.0m.
5) ECBF = East Coast Bays Formation.

HSV Serial No: DR4938 Correction Factor: 1.546

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/04/18 07:42 | 6.00m | 3.73 m bgl
(2) 09/04/18 07:55 | 6.00m | 4.41 m bgl
(3) 23/04/18 12:11 | 6.00m | 4.78 m bgl

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH06**	Date Drilled:	**04/04/2018**
Photographed By:	**RAB**	Date Photographed:	**04/04/2018**

Box 1. - Depth: 0.00m to 3.00m.

Box 2. - Depth: 3.00m to 5.7m.

Eastcliffe Retirement Village Redevelopment Ground Investigation

Borehole Reference:	**BH06**	Date Drilled:	**04/04/2018**
Photographed By:	**RAB**	Date Photographed:	**04/04/2018**

Box 3. - Depth: 5.7m to 8.27m.

Box 4. - Depth: 8.27m to 11.13m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH41

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Dill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405509m
Northing: 803225m
Reduced level: 33.3m
(Auckland MSL 1946 Datum)

Date started: 21/02/2019
Date completed: 22/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB				T	**0m:** SILT with some sand and medium gravel and trace rootlets; brown. Firm, dry, low plasticity. [TOPSOIL]	ML					**0m: TOPSOIL**	
OB	33			ERc	**0.1m:** CLAY; brownish yellow mottled grey. Very stiff, dry, high plasticity. [RESIDUAL ECBF]			100			**0.1m: EAST COAST BAYS FORMATION**	
OB		1			**0.5m to 1.1m:**...moist	CH		100				
SPT	32				**1.1m:** Silty CLAY; brownish yellow mottled grey. Soft, moist, high plasticity.	CH	1.5m: SPT 0// 0,1,0,1 N = 2	100				
OB		2			**2m:** Sandy CLAY with some silt; brownish yellow mottled grey. Firm, moist, low plasticity. Sand, fine to medium grained.	CL		100				
OB	31			ERz	**2.5m:** Clayey SILT; brownish yellow mottled grey. Firm, moist, low plasticity.	ML						
SPT		3		ERc	**2.8m:** Completely weathered, grey, SILTSTONE. Extremely weak (very stiff) [Completely weathered ECBF].		3m: SPT 2// 1,2,3,4 N = 10	100				
OB	30					CW		86	77	55		
HQ3		4			**4.1m to 4.2m:**...stained with black carbonaceous material			100	100	100		
HQ3	29			EWz	**4.2m:** Highly weathered, grey, SILTSTONE. Very weak.	HW						
		5										

REMARKS:
1) OB = Open Barrel drilling.
2) Borehole locations and reduced levels were surveyed and provided Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH41

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Dill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405509m
Northing: 803225m
Reduced level: 33.3m
(Auckland MSL 1946 Datum)

Date started: 21/02/2019
Date completed: 22/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
SPTC	28			EWs	**5m:** Highly weathered, grey, SANDSTONE. Very weak.	HW	5m: SPTC 11// 7,8,8,9 N = 32	N/A				
HQ3		6		EWz	**5.3m:** Highly weathered, grey, SILTSTONE. Very weak.	HW		100	100	65		
SPTC	27						6.5m: SPTC 8// 6,6,7,8 N = 27	N/A				
HQ3		7			**7m to 7.1m:**...black carbonaceous material			100	100	80	6.95m: Corebound	
HQ3	26			EWs	**7.5m:** Moderately weathered, grey, SANDSTONE. Very weak.	MW		100	100	58		
SPTC		8					8m: SPTC 18// 17,20,13 for 40mm N = 50+	N/A				
HQ3	25			EUs	**8.5m:** Slightly weathered, grey, SANDSTONE. Very weak.	SW		100	100	90		
SPTC	24	9					9.5m: SPTC 8// 3,3,4,5 N = 15	N/A				
		10						100	100	81		

REMARKS:
1) OB = Open Barrel drilling.
2) Borehole locations and reduced levels were surveyed and provided Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH41

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Dill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405509m
Northing: 803225m
Reduced level: 33.3m
(Auckland MSL 1946 Datum)

Date started: 21/02/2019
Date completed: 22/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	23	11		EUz	**10m:** Slightly weathered, grey, SILTSTONE. Weak.			100	100	81		
SPTC	22						11m: SPTC 10// 10,14,13,13 for 60mm N = 50+	N/A				
HQ3	21	12		EUz		SW		100	100	54		
SPTC							12.5m: SPTC 21// 21,29 for 75mm N = 50+	N/A				
HQ3		13						0			12.8m: Corebound	
				EUx	**13m:** CORELOSS							
HQ3	20	14		EUz	**13.2m:** Slightly weathered, grey, SILTSTONE. Weak.			100	100	46		
SPTC						SW	14m: SPTC 31// 50 for 60mm N = 50+	N/A				
HQ3	19	15						100	90	45		

REMARKS:
1) OB = Open Barrel drilling.
2) Borehole locations and reduced levels were surveyed and provided Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH41

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Dill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405509m
Northing: 803225m
Reduced level: 33.3m
(Auckland MSL 1946 Datum)

Date started: 21/02/2019
Date completed: 22/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	18			EUz	**13.2m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	90	45		
SPTC							15.5m: SPTC 50// for 100mm N = 50+	N/A				
HQ3	17	16		EUz		SW		100	98	48		
SPTC		17			**16.8m:** Slight weathered, grey, SANDSTONE, weak.		17m: SPTC 50// for 70mm N = 50+	N/A				
HQ3	16			EUs	**17.5m to 17.7m:**...black carbonaceous material	SW		100	100	77		
SPTC		18					18.5m: SPTC 50// for 130mm N = 50+	N/A				
HQ3	15	19		EUs		SW		100	100	52		
	14	20										

REMARKS: End of borehole at 20m (Target Depth)
1) OB = Open Barrel drilling.
2) Borehole locations and reduced levels were surveyed and provided Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Eastcliffe Phase 1
Ground Investigation

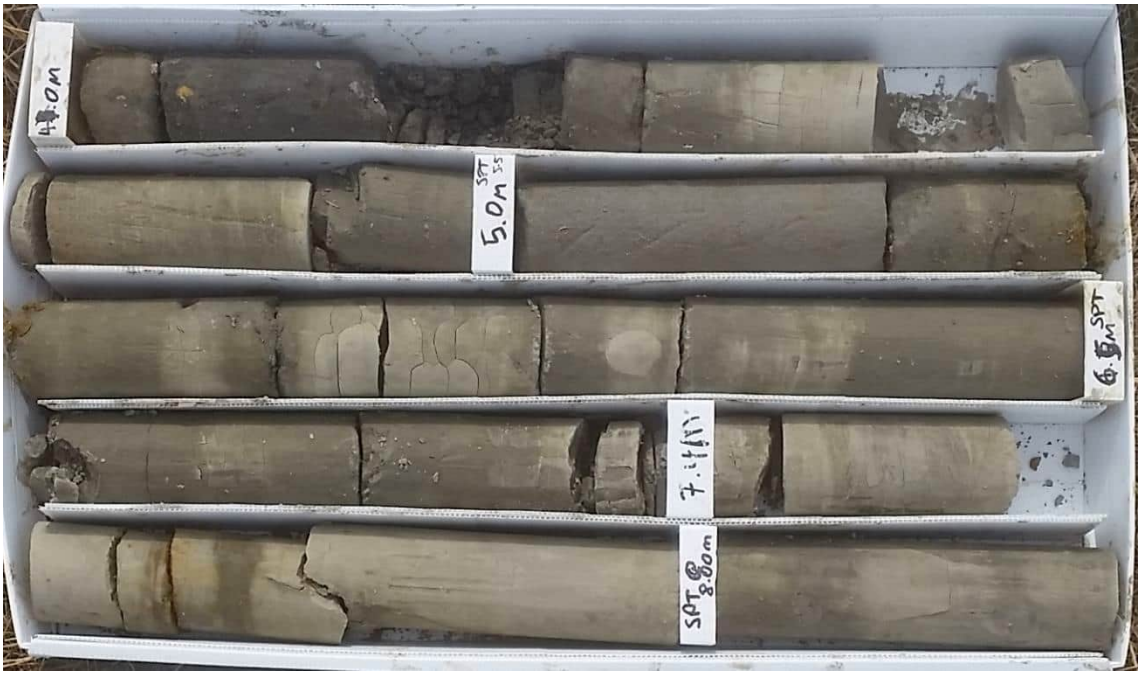
Borehole Reference:	**BH41**	Date Drilled:	**21/02/2019 – 22/02/2019**
Photographed By:	**AD**	Date Photographed:	**21/02/2019 – 22/02/2019**

Box 1. - Depth: 0 m to 1.5 m.

Box 2. - Depth: 1.5 m to 4 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH41**	Date Drilled:	**21/02/2019 – 22/02/2019**
Photographed By:	**AD**	Date Photographed:	**21/02/2019 – 22/02/2019**



Box 3. - Depth: 4. m to 8 m.

Box 4. - Depth: 8 m to 12 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH41**	Date Drilled:	**21/02/2019 – 22/02/2019**
Photographed By:	**AD**	Date Photographed:	**21/02/2019 – 22/02/2019**

Box 5. - Depth: 12 m to 15.5 m.

Box 6. - Depth: 15.5 m to 18.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH41**	Date Drilled:	**21/02/2019 – 22/02/2019**
Photographed By:	**AD**	Date Photographed:	**21/02/2019 – 22/02/2019**

Box 7. - Depth: 18.5 m to 20 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH42

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405514m
Northing: 803210m
Reduced level: 33.0m
(Auckland MSL 1946 Datum)

Date started: 22/02/2019
Date completed: 25/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy / Defect Description / Additional Notes	Installation
OB	33			Fg	**0m:** Coarse GRAVEL; dark grey. Very loose, dry. [FILL]	GP		100				**0m: FILL**	
					0.3m: Coarse GRAVEL with some sand and silt; dark grey and brown. Very loose, dry.	GP		100					
OB					**0.8m:** CLAY; brownish yellow mottled grey. Firm, moist, high plasticity. [RESIDUAL ECBF]							**0.8m: EAST COAST BAYS FORMATION**	
	32	1					1m: IBHSV 82/45 kPa	100					
OB													
SPT						CH	1.5m: SPT 1// 0,1,0,1 N = 2 1.5m: IBHSV 75/42 kPa	100					
	31	2											
OB				ERc				100					
					2.7m: Silty CLAY with some fine sand; grey. Firm, moist, high plasticity.								
	30	3				CH	3m: SPT 1// 0,1,1,1 N = 3 3m: IBHSV 60/12 kPa	100					
SPT													
					3.5m: Silty CLAY, trace organics; grey. Very stiff, moist, high plasticity.	CH							
OB	29	4						100					
					4m: Highly weathered, grey, fine to medium SANDSTONE. Extremely weak (very stiff) [Highly weathered ECBF].								
				EWs		HW	4.5m: SPT 5// 4,6,9,10 N = 29	0					
SPT		5						100	100	80			

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
2) OB = Open Barrel drilling.
3) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:11 | 9.00m | 5.39 m bgl
(2) 01/03/19 10:00 | 9.00m | 5.48 m bgl
(3) 04/03/19 16:27 | 9.00m | 5.4 m bgl
(4) 06/03/19 14:51 | 9.00m | 5.39 m bgl
(5) 12/03/19 10:08 | 9.00m | 5.42 m bgl
(6) 13/03/19 12:08 | 9.00m | 5.43 m bgl
(7) 15/03/19 12:30 | 9.00m | 5.48 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH42

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405514m
Northing: 803210m
Reduced level: 33.0m
(Auckland MSL 1946 Datum)

Date started: 22/02/2019
Date completed: 25/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	28				**4m:** Highly weathered, grey, fine to medium SANDSTONE. Extremely weak (very stiff) [Highly weathered ECBF].	HW		100	100	80		
HQ3	27	6		EWs	**5.6m:** Moderately weathered, grey, fine to medium SANDSTONE. Extremely weak (hard).			100	100	80		
SPTC						MW	6.5m: SPTC 9// 12,10,11,13 N = 46	N/A				
HQ3	26	7						97	100	65		
SPTC	25	8			**8m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.		8m: SPTC 20// 18,32 for 75mm N = 50+	N/A				
HQ3	24	9		EUs		SW		100	100	58		
SPTC							9.5m: SPTC 20// 24,26 for 60mm N = 50+	N/A				
HQ3		10		EUx	**9.8m:** CORELOSS			84	100	70		

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
2) OB = Open Barrel drilling.
3) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:11 | 9.00m | 5.39 m bgl
(2) 01/03/19 10:00 | 9.00m | 5.48 m bgl
(3) 04/03/19 16:27 | 9.00m | 5.4 m bgl
(4) 06/03/19 14:51 | 9.00m | 5.39 m bgl
(5) 12/03/19 10:08 | 9.00m | 5.42 m bgl
(6) 13/03/19 12:08 | 9.00m | 5.43 m bgl
(7) 15/03/19 12:30 | 9.00m | 5.48 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH42

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405514m
Northing: 803210m
Reduced level: 33.0m
(Auckland MSL 1946 Datum)

Date started: 22/02/2019
Date completed: 25/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	23	11		EUs	**10m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		84	100	70		
SPTC	22						11m: SPTC 19// 13,11,16,10 for 25mm N = 50+	N/A				
HQ3				EUx	**11.4m:** CORELOSS			0			11.4m: Corebound	
HQ3	21	12		EUz	**11.9m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW		100	100	75		
SPTC							12.5m: SPTC 29// 50 for 45mm N = 50+	N/A				
HQ3	20	13						100	100	55		
SPTC	19	14					14m: SPTC 50// for 140mm N = 50+	N/A				
HQ3					**14.6m to 15.2m:**...weak			100	100	41		
		15										

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
2) OB = Open Barrel drilling.
3) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:11 | 9.00m | 5.39 m bgl
(2) 01/03/19 10:00 | 9.00m | 5.48 m bgl
(3) 04/03/19 16:27 | 9.00m | 5.4 m bgl
(4) 06/03/19 14:51 | 9.00m | 5.39 m bgl
(5) 12/03/19 10:08 | 9.00m | 5.42 m bgl
(6) 13/03/19 12:08 | 9.00m | 5.43 m bgl
(7) 15/03/19 12:30 | 9.00m | 5.48 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH42

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405514m
Northing: 803210m
Reduced level: 33.0m
(Auckland MSL 1946 Datum)

Date started: 22/02/2019
Date completed: 25/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	18				**11.9m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW						
HQ3				EUz	**15.2m:** Slightly weathered, grey, SILTSTONE. Weak.			100	100	41		
SPTC							15.5m: SPTC 50// for 100mm N = 50+	N/A				
HQ3	17	16		EUz		SW		100	100	63		
SPTC	16	17					17m: SPTC 50// for 90mm N = 50+	N/A				
HQ3	15	18		EUs	**17.6m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		100	98	66		
SPTC							18.5m: SPTC 50// for 105mm N = 50+	N/A				
HQ3	14	19		EUz	**18.9m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	90	30	19.2m to 19.9m: Very closely spaced drilling induced fractures.	
		20										

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
2) OB = Open Barrel drilling.
3) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:11 | 9.00m | 5.39 m bgl
(2) 01/03/19 10:00 | 9.00m | 5.48 m bgl
(3) 04/03/19 16:27 | 9.00m | 5.4 m bgl
(4) 06/03/19 14:51 | 9.00m | 5.39 m bgl
(5) 12/03/19 10:08 | 9.00m | 5.42 m bgl
(6) 13/03/19 12:08 | 9.00m | 5.43 m bgl
(7) 15/03/19 12:30 | 9.00m | 5.48 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH42

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405514m
Northing: 803210m
Reduced level: 33.0m
(Auckland MSL 1946 Datum)

Date started: 22/02/2019
Date completed: 25/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
SPTC	13				**20m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.		20m: SPTC 50// for 95mm N = 50+	N/A				
HQ3		21		EUs		SW		100	99	88		
SPTC	12						21.5m: SPTC 50// for 90mm N = 50+	N/A				
					21.6m: CORELOSS							
HQ3	11	22		EUz	**21.8m:** Slightly weathered, grey, SILTSTONE. Weak.			85	98	100		
SPTC	10	23				SW	23m: SPTC 50// for 110mm N = 50+	N/A				
HQ3								100	100	100		
	9	24										
SPTC							24.5m: SPTC 50// for 45mm N = 50+	N/A				

End of borehole at 24.62m (Target Depth)

REMARKS:
1) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
2) OB = Open Barrel drilling.
3) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:11 | 9.00m | 5.39 m bgl
(2) 01/03/19 10:00 | 9.00m | 5.48 m bgl
(3) 04/03/19 16:27 | 9.00m | 5.4 m bgl
(4) 06/03/19 14:51 | 9.00m | 5.39 m bgl
(5) 12/03/19 10:08 | 9.00m | 5.42 m bgl
(6) 13/03/19 12:08 | 9.00m | 5.43 m bgl
(7) 15/03/19 12:30 | 9.00m | 5.48 m bgl

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH42**	Date Drilled:	**22/02/2019 – 25/02/2019**
Photographed By:	**AD**	Date Photographed:	**22/02/2019 – 26/02/2019**

Box 1. - Depth: 0 m to 2 m.

Box 2. - Depth: 2 m to 4.5 m.

Eastcliffe Phase 1
Ground Investigation

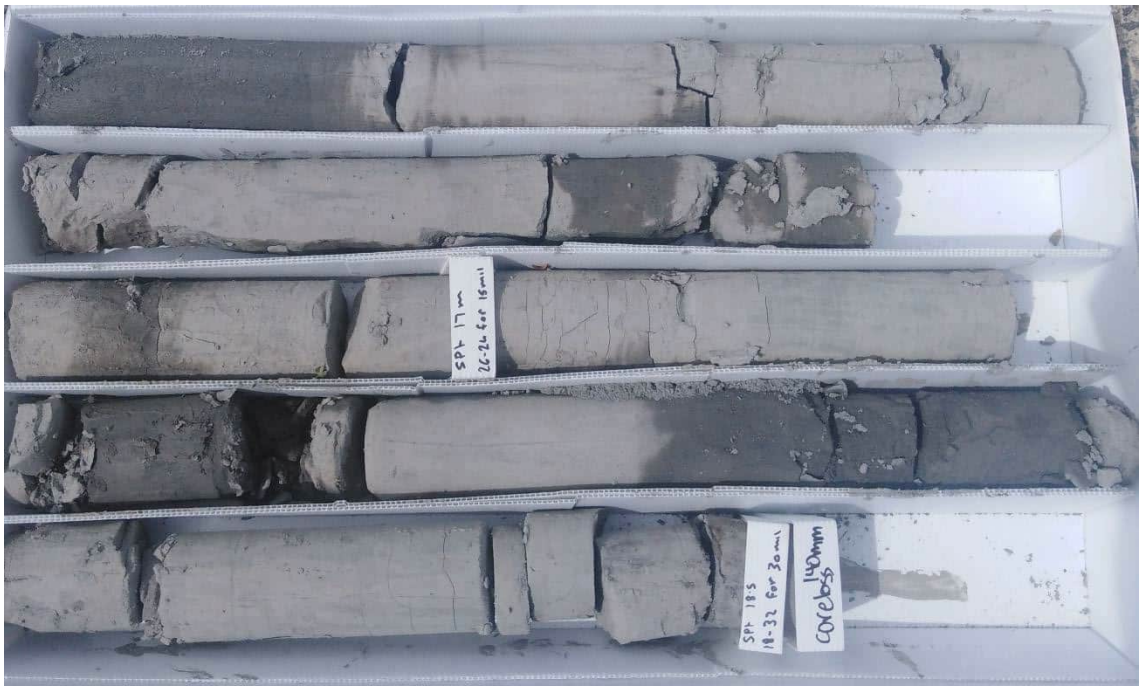
Borehole Reference:	**BH42**	Date Drilled:	**22/02/2019 – 25/02/2019**
Photographed By:	**AD**	Date Photographed:	**22/02/2019 – 26/02/2019**

Box 3. - Depth: 4.5 m to 8 m.

Box 4. - Depth: 8 m to 11.5 m.

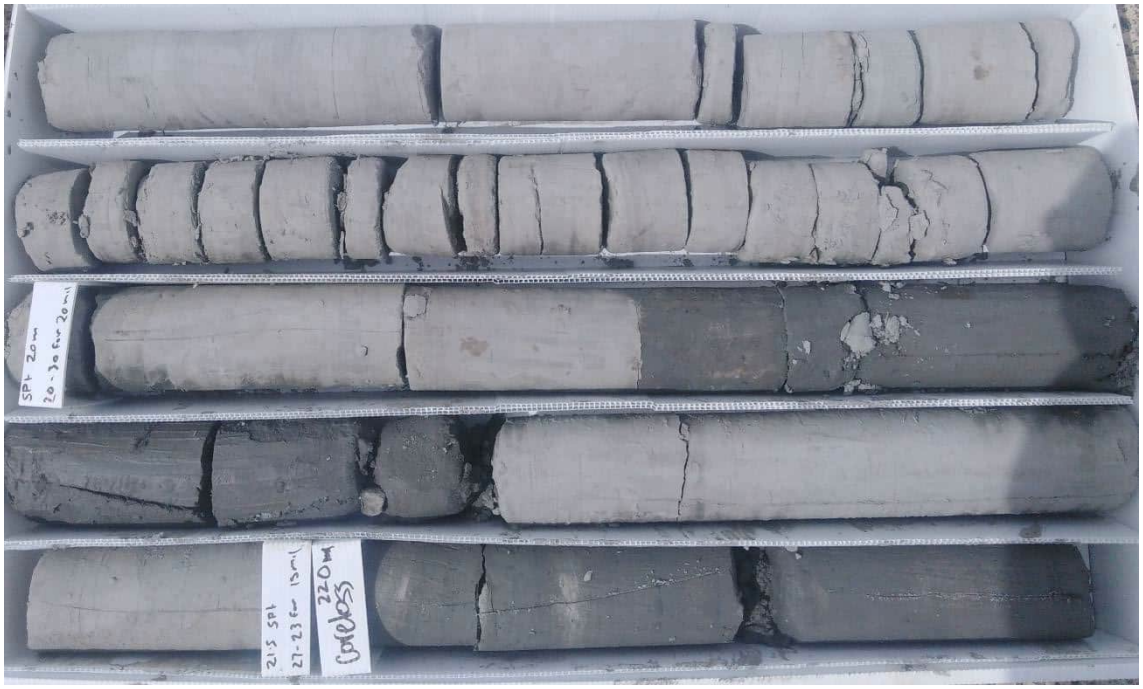
Borehole Reference:	**BH42**	Date Drilled:	**22/02/2019 – 25/02/2019**
Photographed By:	**AD**	Date Photographed:	**22/02/2019 – 26/02/2019**

Box 5. - Depth: 11.5 m to 15.5 m.



Box 6. - Depth: 15.5 m to 18.5 m.

Borehole Reference:	**BH42**	Date Drilled:	**22/02/2019 – 25/02/2019**
Photographed By:	**AD**	Date Photographed:	**22/02/2019 – 26/02/2019**



Box 7. - Depth: 18.5 m to 22m.

Box 8. - Depth: 22 m to 24.5 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH43

Sheet **1** of **5**

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405516m
Northing: 803196m
Reduced level: 32.4m
(Auckland MSL 1946 Datum)

Date started: 25/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB	32			Fx	**0m:** CORELOSS			20				
				Fc	**0.4m:** SILT with some fine gravel; dark brown. Low plasticity.	ML					**0.4m: FILL**	
OB		1		ERc	**0.6m:** Silty CLAY, brownish yellow mottled grey. Stiff, dry, high plasticity [RESIDUAL ECBF]. **0.9m to 2.8m:**...Firm, moist.	CH	1.5m: SPT 3// 1,1,2,1 N = 5	100			**0.6m: EAST COAST BAYS FORMATION**	
	31											
SPT		2						100				
OB	30							89				
		3			**2.8m:** CLAY; grey. Soft, moist, high plasticity.	CH	3m: SPT 1// 0,1,1,1 N = 3					
SPT	29			ERs	**3.2m:** Silty SAND; grey. Very loose, moist. Fine to medium grained.	SM		100				
OB		4		ERc	**4m:** Silty CLAY; grey. Very stiff, moist, high plasticity.	CH		100				
	28			EWz	**4.2m:** Highly weathered, grey, SILTSTONE. Extremely weak (hard). [Highly weathered ECBF] **4.4m to 4.5m:**...black carbonaceous material	HW	4.5m: SPTC 7// 7,10,12,15 N = 44	N/A				
SPTC		5						100	100	88		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:06 | 6.00m | 2.8 m bgl
(2) 01/03/19 09:58 | 6.00m | 2.87 m bgl
(3) 04/03/19 04:31 | 6.00m | 2.89 m bgl
(4) 06/03/19 14:52 | 6.00m | 2.89 m bgl
(5) 12/03/19 12:30 | 6.00m | 2.8 m bgl
(6) 13/03/19 12:10 | 6.00m | 2.81 m bgl
(7) 15/03/19 12:30 | 6.00m | 2.87 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH43

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405516m
Northing: 803196m
Reduced level: 32.4m (Auckland MSL 1946 Datum)

Date started: 25/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	27			EWz	**4.2m:** Highly weathered, grey, SILTSTONE. Extremely weak (hard). [Highly weathered ECBF]	HW		100	100	88		
HQ3	26	6			**5.8m:** Moderately weathered, grey, fine to medium SANDSTONE. Weak. **6.1m to 6.5m:**...fine to coarse SANDSTONE			100	100	88		
SPTC		7			**6.5m to 8.4m:**...fine to medium SANDSTONE		6.5m: SPTC 21// 11,8,11,12 N = 42	N/A				
HQ3	25			EWs		MW		100	97	78		
SPTC	24	8			**7.5m to 7.7m:**...black carbonaceous material		8m: SPTC 11// 13,15,22 for 65mm N = 50+	N/A				
HQ3	23	9		EUz	**8.4m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		91	100	94		
SPTC		10			**9.9m:** CORELOSS		9.5m: SPTC 12// 9,16,15,10 for 30mm N = 50+	N/A 0				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:06 | 6.00m | 2.8 m bgl
(2) 01/03/19 09:58 | 6.00m | 2.87 m bgl
(3) 04/03/19 04:31 | 6.00m | 2.89 m bgl
(4) 06/03/19 14:52 | 6.00m | 2.89 m bgl
(5) 12/03/19 12:30 | 6.00m | 2.8 m bgl
(6) 13/03/19 12:10 | 6.00m | 2.81 m bgl
(7) 15/03/19 12:30 | 6.00m | 2.87 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH43

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405516m
Northing: 803196m
Reduced level: 32.4m
(Auckland MSL 1946 Datum)

Date started: 25/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	22			EUx	**9.9m:** CORELOSS			0				
HQ3		11		EUs	**10.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW	11m: SPTC 27// 24,8,9 for 50mm N = 50+	100	100	58	10.5m: Corebound	
SPTC	21							N/A				
HQ3		12		EUz	**11.6m:** Slightly weathered, grey, SILTSTONE. Weak.			73	100	17		
	20						12.5m: SPTC 17// 15,19 for 55mm N = 50+					
SPTC								N/A				
HQ3	19	13				SW		95	100	100		
SPTC		14					14m: SPTC 50// for 85mm N = 50+	N/A				
HQ3	18							100	100	70		
		15										

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:06 | 6.00m | 2.8 m bgl
(2) 01/03/19 09:58 | 6.00m | 2.87 m bgl
(3) 04/03/19 04:31 | 6.00m | 2.89 m bgl
(4) 06/03/19 14:52 | 6.00m | 2.89 m bgl
(5) 12/03/19 12:30 | 6.00m | 2.8 m bgl
(6) 13/03/19 12:10 | 6.00m | 2.81 m bgl
(7) 15/03/19 12:30 | 6.00m | 2.87 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH43

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405516m
Northing: 803196m
Reduced level: 32.4m
(Auckland MSL 1946 Datum)

Date started: 25/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	17			EUz	**11.6m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	70		
SPTC							15.5m: SPTC 50// for 95mm N = 50+	N/A				
		16		EUs	**15.6m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW						
HQ3	16			EUz	**16m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		94	100	75		
SPTC		17					17m: SPTC 50// for 130mm N = 50+	N/A				
	15											
HQ3				EUs	**17.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		95	100	56		
		18										
HQ3	14			EUz	**18.1m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	100	18.3m: Corebound	
SPTC							18.5m: SPTC 50// for 110mm N = 50+	N/A				
		19										
HQ3	13							94	100	81		
		20										

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:06 | 6.00m | 2.8 m bgl
(2) 01/03/19 09:58 | 6.00m | 2.87 m bgl
(3) 04/03/19 04:31 | 6.00m | 2.89 m bgl
(4) 06/03/19 14:52 | 6.00m | 2.89 m bgl
(5) 12/03/19 12:30 | 6.00m | 2.8 m bgl
(6) 13/03/19 12:10 | 6.00m | 2.81 m bgl
(7) 15/03/19 12:30 | 6.00m | 2.87 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block A**
Project Reference: **255232**

BH43

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405516m
Northing: 803196m
Reduced level: 32.4m (Auckland MSL 1946 Datum)

Date started: 25/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
SPTC				EUz	**18.1m:** Slightly weathered, grey, SILTSTONE. Weak.	SW	20m: SPTC 50// for 120mm N = 50+	N/A				
HQ3				EUx	**20.12m:** CORELOSS			0				
	12			EUs	**20.2m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak.	SW					20.3m: Corebound	
HQ3		21		EUz	**20.5m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		94	100	70		
	11						21.5m: SPTC 50// for 130mm N = 50+					
SPTC								N/A				
HQ3		22		EUs	**21.7m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		100	100	54		
	10											
SPTC		23		EUz	**22.5m:** Slightly weathered, grey, SILTSTONE. Weak.	SW	23m: SPTC 50// for 110mm N = 50+	N/A				
HQ3	9							93	100	95		
		24										
	8											
SPTC					End of borehole at 24.64m (Target Depth)		24.5m: SPTC 50// for 140mm N = 50+	N/A				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 28/02/19 17:06 | 6.00m | 2.8 m bgl
(2) 01/03/19 09:58 | 6.00m | 2.87 m bgl
(3) 04/03/19 04:31 | 6.00m | 2.89 m bgl
(4) 06/03/19 14:52 | 6.00m | 2.89 m bgl
(5) 12/03/19 12:30 | 6.00m | 2.8 m bgl
(6) 13/03/19 12:10 | 6.00m | 2.81 m bgl
(7) 15/03/19 12:30 | 6.00m | 2.87 m bgl

Eastcliffe Phase 1
Ground Investigation

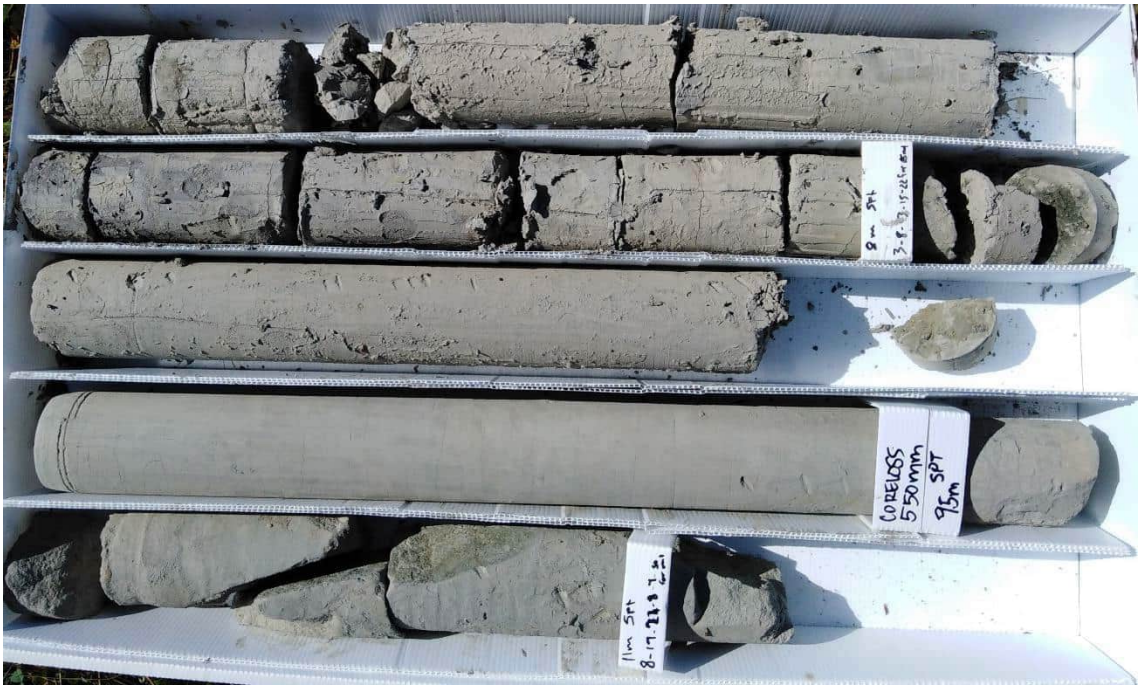
Borehole Reference:	**BH43**	Date Drilled:	**26/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**26/02/2019 – 27/02/2019**

Box 1. - Depth: 0 m to 3 m.

Box 2. - Depth: 3 m to 6.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH43**	Date Drilled:	**26/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**26/02/2019 – 27/02/2019**



Box 3. - Depth: 6.5 m to 11 m.

Box 4. - Depth: 11 m to 15.5 m.

Borehole Reference:	**BH43**	Date Drilled:	**26/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**26/02/2019 – 27/02/2019**

Box 5. - Depth: 11.5 m to 15.5 m.

Box 6. - Depth: 15.5 m to 18.5 m.

Borehole Reference:	**BH43**	Date Drilled:	**26/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**26/02/2019 – 27/02/2019**

Box 7. - Depth: 18.5 m to 21.5m.

Box 8. - Depth: 22 m to 24.5 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block C**
Project Reference: **255232**

BH44

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405527m
Northing: 803174m
Reduced level: 31.3m (Auckland MSL 1946 Datum)

Date started: 28/02/2019
Date completed: 28/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB	31			F	**0m:** Gravelly SILT; dark brown. Firm, dry, low plasticity. Gravel, medium. [FILL]	ML					**0m: FILL**	
OB				Fc	**0.2m:** SILT with some medium gravel; brown. Very stiff, dry, low plasticity.	ML	0.5m: IBHSV UTP	100				
OB		1			**0.9m:** Silty CLAY; brownish yellow mottled grey. Firm, moist, high plasticity. [RESIDUAL ECBF]		1m: IBHSV UTP	100			**0.9m: EAST COAST BAYS FORMATION**	
OB	30							100				
SPT					**1.5m to 3.3m:**...trace fine gravel		1.5m: SPT 2// 1,1,2,2 N = 6 1.5m: IBHSV 120/60 kPa	49				
OB		2		ERc		CH						
OB	29							90				
SPT		3					3m: SPT 1// 0,1,1,1 N = 3 3m: IBHSV 45/18 kPa	100				
OB	28			ERs	**3.3m:** Silty SAND; grey. Very loose, moist.	SM		95				
OB		4			**4m:** Silty CLAY; grey. Very stiff, moist, high plasticity.							
OB	27			ERc		CH						
SPT		5					4.5m: SPT 5// 5,4,5,5 N = 19 4.5m: IBHSV 200+ kPa	100				
								100				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 15:03 | 6.00m | 4.44 m bgl
(2) 12/03/19 10:01 | 6.00m | 3.87 m bgl
(3) 13/03/19 12:12 | 6.00m | 3.89 m bgl
(4) 15/03/19 12:30 | 6.00m | 3.94 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block C**
Project Reference: **255232**

BH44

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405527m
Northing: 803174m
Reduced level: 31.3m (Auckland MSL 1946 Datum)

Date started: 28/02/2019
Date completed: 28/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB				ERc	**4m:** Silty CLAY; grey. Very stiff, moist, high plasticity.	CH		100				
HQ3	26			ERx	**5.2m:** CORELOSS							
				EWz	**5.5m:** Moderately weathered, grey, SILTSTONE. Weak [Moderately weathered ECBF].	MW						
		6		EUz	**5.7m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW		77	100	97		
SPTC	25			EUs	**6m:** Slightly weathered, grey, fine to medium SANDSTONE.	SW	6.5m: SPTC 22// 18,14,14,14 for 20mm N = 50+	N/A			6m to 6.5m: JT 75-90° UnRo Sn(Fe)	
HQ3		7		EUz	**7m:** Slightly weathered, grey SILTSONE. Weak.	SW		100	100	90		
SPTC	24				**7.4m to 7.5m:**...black carbonaceous material		8m: SPTC 8// 10,10,14,16 for 15mm N = 50+	N/A				
HQ3	23	8						95	100	77		
SPTC	22	9		EUs	**9.4m:** Slightly weathered, grey, medium to coarse SANDSTONE. Very weak.	SW	9.5m: SPTC 35// 17,11,10,12 for 75mm N = 50+	N/A				
		10						100	100	86		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 15:03 | 6.00m | 4.44 m bgl
(2) 12/03/19 10:01 | 6.00m | 3.87 m bgl
(3) 13/03/19 12:12 | 6.00m | 3.89 m bgl
(4) 15/03/19 12:30 | 6.00m | 3.94 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block C**
Project Reference: **255232**

BH44

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405527m
Northing: 803174m
Reduced level: 31.3m
(Auckland MSL 1946 Datum)

Date started: 28/02/2019
Date completed: 28/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	21	11		EUs	**9.4m:** Slightly weathered, grey, medium to coarse SANDSTONE. Very weak.	SW		100	100	86		
					10.5m: Slightly weathered, grey, SILTSTONE. Very weak.							
					10.8m to 15.4m:...weak							
SPTC	20						11m: SPTC 21// 22,28 for 75mm N = 50+	N/A				
HQ3		12						100	100	97		
SPTC	19			EUz		SW	12.5m: SPTC 12// 14,18,18 for 70mm N = 50+	N/A				
HQ3		13						85	100	83		
SPTC	18	14					14m: SPTC 50// for 140mm N = 50+	N/A				
HQ3	17	15						100	100	28		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 15:03 | 6.00m | 4.44 m bgl
(2) 12/03/19 10:01 | 6.00m | 3.87 m bgl
(3) 13/03/19 12:12 | 6.00m | 3.89 m bgl
(4) 15/03/19 12:30 | 6.00m | 3.94 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block C**
Project Reference: **255232**

BH44

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405527m
Northing: 803174m
Reduced level: 31.3m
(Auckland MSL 1946 Datum)

Date started: 28/02/2019
Date completed: 28/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	16			EUz	**10.5m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW		100	100	28		
SPTC				EUs	**15.4m:** Slightly weathered, grey, medium to coarse SANDSTONE. Weak.	SW	15.5m: SPTC 50// for 120mm N = 50+	N/A				
HQ3	15	16		EUz	**16.1m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		94	100	68		
				EUs	**16.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW						
SPTC		17					17m: SPTC 50// for 70mm N = 50+	N/A				
HQ3	14			EUz	**16.9m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	87		
		18		EUs	**18.1m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW						
SPTC	13				**18.4m:** Slightly weathered, grey, SILTSTONE. Weak.		18.5m: SPTC 50// for 130mm N = 50+	N/A				
HQ3	12	19		EUz		SW		93	100	95		
		20										

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 15:03 | 6.00m | 4.44 m bgl
(2) 12/03/19 10:01 | 6.00m | 3.87 m bgl
(3) 13/03/19 12:12 | 6.00m | 3.89 m bgl
(4) 15/03/19 12:30 | 6.00m | 3.94 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block C**
Project Reference: **255232**

BH44

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405527m
Northing: 803174m
Reduced level: 31.3m
(Auckland MSL 1946 Datum)

Date started: 28/02/2019
Date completed: 28/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
SPTC							20m: SPTC 50// for 150mm N = 50+	N/A				

End of borehole at 20.15m (Target Depth)

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 15:03 | 6.00m | 4.44 m bgl
(2) 12/03/19 10:01 | 6.00m | 3.87 m bgl
(3) 13/03/19 12:12 | 6.00m | 3.89 m bgl
(4) 15/03/19 12:30 | 6.00m | 3.94 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH44**	Date Drilled:	**28/02/2019 – 28/02/2019**
Photographed By:	**AD**	Date Photographed:	**28/03/2019 – 1/03/2019**

Box 1. - Depth: 0 m to 3 m.

Box 2. - Depth: 3 m to 5.5 m.

Borehole Reference:	**BH44**	Date Drilled:	**28/02/2019 – 28/02/2019**
Photographed By:	**AD**	Date Photographed:	**28/03/2019 – 1/03/2019**

Box 3. - Depth: 5.5 m to 9 m.

Box 4. - Depth: 9 m to 12.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH44**	Date Drilled:	**28/02/2019 – 28/02/2019**
Photographed By:	**AD**	Date Photographed:	**28/03/2019 – 1/03/2019**

Box 5. - Depth: 12.5 m to 16 m.

Box 6. - Depth: 16 m to 19 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH44**	Date Drilled:	**28/02/2019 – 28/02/2019**
Photographed By:	**AD**	Date Photographed:	**28/03/2019 – 1/03/2019**

Box 7. - Depth: 19 m to 20m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH45

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405556m
Northing: 803200m
Reduced level: 28.8m
(Auckland MSL 1946 Datum)

Date started: 13/03/2019
Date completed: 13/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
VAC EX	28	1			**0m:** CORELOSS			0			0m: Vacuum excavation.	
SPT	27	2		ERc	**1.5m:** Silty CLAY; brownish yellow mottled grey. Soft, moist, high plasticity [RESIDUAL ECBF].	CH	1.5m: SPT 1// 0,1,0,1 N = 2	100			**1.5m: EAST COAST BAYS FORMATION**	
OB					**1.9m:** Sandy CLAY; grey. Firm, moist, low plasticity.	CL						
				ERs	**2.2m:** Clayey SAND; grey. Very loose, moist.	SC		100				
	26	3		ERc	**2.7m:** Silty CLAY; grey. Firm, moist, high plasticity.	CH						
SPT				ERs	**2.9m:** Silty SAND; grey. Very loose, moist.	SM	3m: SPT 0// 0,1,0,1 N = 2	100				
OB	25	4		ERc	**4m:** Silty CLAY; grey. Stiff, moist, high plasticity [Completely weathered ECBF].	CW		100				
SPT	24	5			**4.5m to 5.5m:**...very stiff		4.5m: SPT 2// 2,3,1,3 N = 9	100				
								100				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 13/03/19 16:30 | m | 6.26 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH45

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405556m
Northing: 803200m
Reduced level: 28.8m
(Auckland MSL 1946 Datum)

Date started: 13/03/2019
Date completed: 13/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB					**4m:** Silty CLAY; grey. Stiff, moist, high plasticity [Completely weathered ECBF].			100				
HQ3	23	6		ERc		CW		0				
SPT	22			EWs	**6.5m:** Highly weathered, grey, medium to coarse SANDSTONE. Extremely weak (dense).	HW	6.5m: SPT 2// 1,2,2,3 N = 8	100	100	100		
HQ3	21	7		EWz	**6.9m:** Highly weathered, grey, SILTSTONE. Extremely weak (very stiff).	HW		86	100	53		
SPTC		8					8m: SPTC 2// 1,2,3,4 N = 10	N/A				
HQ3	20	9			**8.5m:** Moderately weathered, grey, SILTSTONE. Extremely weak (hard).	MW		100	100	100		
SPTC	19	10					9.5m: SPTC 10// 9,10,10,11 N = 40	N/A				
								100	100	100		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 13/03/19 16:30 | m | 6.26 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH45

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405556m
Northing: 803200m
Reduced level: 28.8m
(Auckland MSL 1946 Datum)

Date started: 13/03/2019
Date completed: 13/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	18	11		EWz	**8.5m:** Moderately weathered, grey, SILTSTONE. Extremely weak (hard).	MW	11m: SPTC 11// 11,13,15,11 for 45mm N = 50+	100	100	100		
SPTC								N/A				
HQ3	17	12		EUz	**11.5m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW		93	100	85		
				EUs	**12.1m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW						
SPTC							12.5m: SPTC 50// for 130mm N = 50+	N/A				
HQ3	16	13		EUz	**12.7m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		84	100	100		
	15			EUs	**13.3m:** Slightly weathered, grey, medium to coarse SANDSTONE. Weak.	SW						
SPTC		14					14m: SPTC 25// 20,30 for 45mm N = 50+	N/A				
HQ3	14	15		EUz	**13.8m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	100		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 13/03/19 16:30 | m | 6.26 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH45

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405556m
Northing: 803200m
Reduced level: 28.8m
(Auckland MSL 1946 Datum)

Date started: 13/03/2019
Date completed: 13/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				EUs	**15m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		100	100	100		
				EUz	**15.2m:** Slightly weathered, grey, SILTSTONE. Weak.	SW						
SPTC							15.5m: SPTC 50// for 130mm N = 50+	N/A				
					End of borehole at 15.63m (Target Depth)							

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 13/03/19 16:30 | m | 6.26 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH45**	Date Drilled:	**13/03/2019 – 13/03/2019**
Photographed By:	**AD**	Date Photographed:	**13/03/2019 – 13/03/2019**

Box 1. - Depth: 0 m to 4 m.

Box 2. - Depth: 4 m to 7.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH45**	Date Drilled:	**13/03/2019 – 13/03/2019**
Photographed By:	**AD**	Date Photographed:	**13/03/2019 – 13/03/2019**

Box 3. - Depth: 7.5 m to 12 m.

Box 4. - Depth: 12 m to 15.5 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH46

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405545m
Northing: 803222m
Reduced level: 28.9m (Auckland MSL 1946 Datum)

Date started: 4/03/2019
Date completed: 4/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
SSA				Fx	**0m:** CORELOSS			0			0m: No material recovered from auger; drillers observed gravel between 0-0.8m.	
OB	28	1		ERc	**0.8m:** Silty CLAY with some gravel; brownish yellow mottled grey. Moist, firm, high plasticity [RESIDUAL ECBF].	CH		100			**0.8m: EAST COAST BAYS FORMATION**	
SPT	27	2					1.5m: SPT 1// 0,1,0,1 N = 2	100				
OB				ERx	**2m:** CORELOSS			50				
	26	3			**2.5m:** CLAY trace gravel; grey. Firm, moist, high plasticity. Gravel, fine.	CH						
SPT					**3m:** Silty CLAY; grey. Firm, moist, high plasticity.		3m: SPT 1// 1,0,1,2 N = 4	100				
OB	25	4		ERc		CH		100				
					4.2m to 4.5m:...iron staining							
SPT	24	5			**4.5m:** Sandy CLAY; grey. Stiff, moist, high plasticity.	CH	4.5m: SPT 1// 0,1,1,2 N = 4 4.5m: IBHSV 135/30 kPa	100				
								100				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:33 | m | 2.75 m bgl
(2) 12/03/19 10:20 | m | 2.72 m bgl
(3) 13/03/19 11:45 | m | 3.7 m bgl
(4) 15/03/19 12:25 | m | 2.81 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH46

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405545m
Northing: 803222m
Reduced level: 28.9m (Auckland MSL 1946 Datum)

Date started: 4/03/2019
Date completed: 4/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB	23	6		ERc	**4.5m:** Sandy CLAY; grey. Stiff, moist, high plasticity.	CH	6m: SPT 3// 2,2,2,2 N = 8 6m: IBHSV 135/36 kPa	100				
SPT								100				
OB	22	7			**6.5m:** Silty CLAY; grey. Very stiff, moist, high plasticity.	CH		100				
HQ3	21	8		EWz	**7m:** Highly weathered, grey, SILTSTONE. Extremely weak (hard) [Highly weathered ECBF].	HW		100	100	100		
SPT					**7.2m:** Moderately weathered, grey, SILTSTONE. Very weak.	MW	8m: SPT 4// 4,5,7,10 N = 26	100	100	100		
HQ3	20	9						100	98	87		
				EUs	**9.1m:** Slightly weathered, fine to medium SANDSTONE. Weak.	SW						
SPTC	19	10		EUz	**9.4m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW	9.5m: SPTC 17// 13,14,12,11 for 60mm N = 50+	N/A				
								100	100	85		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:33 | m | 2.75 m bgl
(2) 12/03/19 10:20 | m | 2.72 m bgl
(3) 13/03/19 11:45 | m | 3.7 m bgl
(4) 15/03/19 12:25 | m | 2.81 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH46

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405545m
Northing: 803222m
Reduced level: 28.9m (Auckland MSL 1946 Datum)

Date started: 4/03/2019
Date completed: 4/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				EUz	**9.4m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW		100	100	85		
	18	11		EUs	**10.6m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW	11m: SPTC 33// 14,20,16 for 50mm N = 50+					
SPTC								N/A				
HQ3				EUz	**11.4m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	77		
	17	12		EUs	**11.8m:** Slightly weathered, grey, medium to coarse, SANDSTONE. Weak.	SW						
				EUz	**12.1m:** Slightly weathered, grey, SILTSTONE. Weak.	SW	12.5m: SPTC 13// 12,17,12 for 35mm N = 50+					
SPTC								N/A				
HQ3	16	13		EUs	**12.8m:** Slightly weathered, grey, fine to medium, SANDSTONE. Weak.	SW		100	100	100	12.84m: 200 mm drilled in excess	
	15	14		EUz	**13.4m:** Slightly weathered, grey, SILTSTONE. Weak.	SW	14.2m: SPTC 50// for 90mm N = 50+					
SPTC								N/A				
HQ3	14	15						93	100	95		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:33 | m | 2.75 m bgl
(2) 12/03/19 10:20 | m | 2.72 m bgl
(3) 13/03/19 11:45 | m | 3.7 m bgl
(4) 15/03/19 12:25 | m | 2.81 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH46

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405545m
Northing: 803222m
Reduced level: 28.9m
(Auckland MSL 1946 Datum)

Date started: 4/03/2019
Date completed: 4/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				EUz	**13.4m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		93	100	95		
SPTC							15.5m: SPTC 50// for 110mm N = 50+	N/A				
					End of borehole at 15.61m (Target Depth)							

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:33 | m | 2.75 m bgl
(2) 12/03/19 10:20 | m | 2.72 m bgl
(3) 13/03/19 11:45 | m | 3.7 m bgl
(4) 15/03/19 12:25 | m | 2.81 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH46**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 1. - Depth: 0 m to 4 m.

Box 2. - Depth: 4 m to 6 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH46**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 3. - Depth: 6 m to 9 m.

Box 4. - Depth: 9 m to 12.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH46**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 5. - Depth: 12.5 m to 15.5 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH47

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405559m
Northing: 803234m
Reduced level: 28.6m (Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB				T	**0m:** Clayey SILT; dark brown. Firm, dry, low plasticity.	ML					**0m: TOPSOIL**	
OB				Fc	**0.2m:** Silty CLAY; brown. Stiff, dry, low plasticity.	CL		80			**0.2m: FILL**	
	28				**0.4m:** Clayey SILT with some gravel, trace rootlets; brown. Firm, moist, low plasticity. Gravel, medium.	CL						
OB					**0.6m:** Silty CLAY; brown. Firm, moist, high plasticity.	CH		90				
		1			**0.8m:** CLAY with some sand and minor gravel; brown. Firm, moist, high plasticity.	CH						
OB					**1m:** Silty CLAY; brown. Firm, moist, high plasticity.	CH		100				
					1.3m: Sandy CLAY with some silt; brown with mottled dark brown and grey. Firm, moist, high plasticity.	CH						
SPT	27				**1.5m:** Silty CLAY trace rootlets; brownish yellow mottled grey and dark red. Firm, moist, high plasticity [RESIDUAL ECBF].	CH	1.5m: SPT 2// 1,1,1,1 N = 4	100			**1.5m: EAST COAST BAYS FORMATION**	
		2			**1.8m:** CLAY; brownish yellow mottled grey. Firm, moist, high plasticity.	CH						
OB					**2m:** Silty CLAY; brownish yellow mottled grey and dark red. Firm, moist, high plasticity.			100			1.95m: Driller advised of trouble drilling through the material. Rods were pull out and a new run was undertaken from 2.7m	
	26											
OB		3		ERc		CH		100				
SPT	25						3.5m: SPT 1// 0,0,1,1 N = 2	100			3.7m: Water loss of 50%	
		4			**3.7m:** CLAY; brownish yellow mottled grey. Firm, moist, high plasticity.							
OB						CH		100				
SPT	24						4.5m: SPT 0// 0,1,1,2 N = 4	100				
					4.8m to 4.9m:...grey							
		5			**4.9m:** Silty SAND; grey. Loose, moist.	SM		100				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH47

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405559m
Northing: 803234m
Reduced level: 28.6m (Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB				ERs	**4.9m:** Silty SAND; grey. Loose, moist.	SM					4.95m: Wider casing placed	
	23			ERc	**5.2m:** CLAY; grey. Firm, moist, high plasticity.	CH		100				
		6			**5.9m to 6m:**...stiff							
SPTC				ERx	**6m:** CORELOSS		6m: SPTC 2// 2,3,3,3 N = 11	N/A				
OB	22			ERz	**6.3m:** Clayey SILT; grey. Very stiff, moist, high plasticity [Completely weathered ECBF].	CW		100				
		7			**6.9m:** Highly weathered, grey, SILTSTONE. Very weak.	HW						
HQ3	21			EWz	**7.5m:** Moderately weathered, grey, SILTSTONE. Weak.			93	95	85		
		8					8m: SPTC 6// 8,8,8,10 N = 34	N/A				
SPTC						MW						
HQ3	20							100	100	100		
		9										
SPTC	19			EUz	**9.4m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW	9.5m: SPTC 22// 36,14 for 15mm N = 50+	N/A				
HQ3				EUs	**9.7m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		94	100	53		
		10										

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH47

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405559m
Northing: 803234m
Reduced level: 28.6m
(Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3				EUs	**9.7m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW						
HQ3	18	11		EUz	**10.5m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		94	100	53		
SPTC							11m: SPTC 29// 21,29 for 30mm N = 50+	N/A				
HQ3	17	12		EUz		SW		92	100	95		
SPTC	16			EUs	**12.2m:** Slightly weathered, grey, fine to medium SANDSTONE. Moderately strong.	SW	12.5m: SPTC 50// for 110mm N = 50+	N/A				
HQ3	15	13		EUz	**12.8m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	90		
SPTC							14m: SPTC 50// for 140mm N = 50+	N/A				
HQ3	14	14						100	100	93		
		15										

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH47

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405559m
Northing: 803234m
Reduced level: 28.6m
(Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3					**12.8m:** Slightly weathered, grey, SILTSTONE. Weak.	SW						
HQ3				EUs	**15.1m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		100	100	93		
SPTC	13				End of borehole at 15.61m (Target Depth)		15.5m: SPTC 50// for 110mm N = 50+	N/A				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH47**	Date Drilled:	**27/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**27/02/2018 – 27/02/2019**

Box 1. - Depth: 0 m to 2 m.

Box 2. - Depth: 2 m to 4.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH47**	Date Drilled:	**27/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**27/02/2018 – 27/02/2019**

Box 3. - Depth: 4.5 m to 7 m.

Box 4. - Depth: 7 m to 10.5 m.

Borehole Reference:	**BH47**	Date Drilled:	**27/02/2019 – 27/02/2019**
Photographed By:	**AD**	Date Photographed:	**27/02/2018 – 27/02/2019**

Box 5. - Depth: 10.5 m to 14 m.

Box 6. - Depth: 14 m to 15.5 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH48

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405585m
Northing: 803225m
Reduced level: 27.2m (Auckland MSL 1946 Datum)

Date started: 5/03/2019
Date completed: 5/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB	27			Fg	**0m:** Silty fine GRAVEL; dark brown. Loose, moist, low plasticity [FILL].	GM						**0m: FILL**	
OB				Fc	**0.2m:** SILT with some fine gravel; brown. Very stiff, moist, low plasticity.	ML		80					
OB				Fx	**0.5m:** CORELOSS		0.5m: IBHSV UTP	24				0.5m: Core affected by drilling; shear vane result not representative.	
OB	26	1		Fc	**0.9m:** Silty CLAY with some gravel; brown. Hard, moist, high plasticity. **1m:** CLAY trace rootlets; olive brown mottled dark grey. Firm, moist, high plasticity.	CH	1m: IBHSV 200+ kPa	100				1m: Core affected by drilling; shear vane result not representative.	
SPT	25	2				CH	2m: SPT 1// 0,1,1,1 N = 3 2m: IBHSV 90/30 kPa	100					
OB					**2.5m:** Silty CLAY; olive brown mottled dark grey. Firm, moist, high plasticity.	CH		100					
SPT	24	3			**2.9m:** Silty CLAY; brown mottled grey. Firm, moist, high plasticity.	CH	3m: SPT 0// 0,1,0,1 N = 2 3m: IBHSV 45/33 kPa	100					
OB	23	4		ERc	**3.8m:** Silty CLAY; brownish yellow mottled grey. Firm, moist, high plasticity [RESIDUAL ECBF]. **4.1m to 4.5m:**...with some sand, soft	CH	4m: IBHSV 60/20 kPa 4.5m: SPT 0// 0,0,0,1 N = 1	100				**3.8m: EAST COAST BAYS FORMATION**	
SPT		5						100 86					

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:30 | m | 3.53 m bgl
(2) 12/03/19 10:21 | m | 3.47 m bgl
(3) 13/03/19 11:41 | m | 3.38 m bgl
(4) 15/03/19 12:20 | m | 3.72 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 1/05/2019

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH48

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405585m
Northing: 803225m
Reduced level: 27.2m (Auckland MSL 1946 Datum)

Date started: 5/03/2019
Date completed: 5/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
OB	22			ERc	**3.8m:** Silty CLAY; brownish yellow mottled grey. Firm, moist, high plasticity [RESIDUAL ECBF].	CH							
					5.5m: Silty CLAY; grey. Stiff, moist, high plasticity.			86					
SPT	21	6				CH	6m: SPT 2// 2,1,2,2 N = 7 6m: IBHSV 76/20 kPa	100					
OB		7		ERz	**6.5m:** Completely weathered, grey, SILTSTONE. Extremely weak (very stiff) [Completely weathered].			100	100	100			
	20				**7.1m to 7.2m:**...black carbonaceous material	CW							
SPT							7.5m: SPT 5// 4,4,5,6 N = 19 7.5m: IBHSV 200+ kPa	100	100	100			
HQ3		8		EWz	**7.95m:** Highly weathered, grey, SILTSTONE. Extremely weak (hard).	HW		100	100	100			
HQ3	19				**8.5m:** Moderately weathered, grey, fine to medium SANDSTONE. Extremely weak (hard).			99	100	72			
		9		EWs		MW							
	18												
SPTC				EUz	**9.55m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW	9.5m: SPTC 13// 10,12,12,16 for 65mm N = 50+	N/A					
		10						100	100	100			

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:30 | m | 3.53 m bgl
(2) 12/03/19 10:21 | m | 3.47 m bgl
(3) 13/03/19 11:41 | m | 3.38 m bgl
(4) 15/03/19 12:20 | m | 3.72 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 1/05/2019

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH48

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405585m
Northing: 803225m
Reduced level: 27.2m
(Auckland MSL 1946 Datum)

Date started: 5/03/2019
Date completed: 5/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	17			EUz	**9.55m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW							
HQ3				EUs	**10.3m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak. **10.7m to 10.8m:**...medium to coarse SANDSTONE	SW		100	100	100			
SPTC	16	11		EUz	**10.8m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW	11m: SPTC 14// 8,9,17,16 for 40mm N = 50+	N/A					
HQ3		12		EUs	**11.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak.	SW		100	100	78			
SPTC	15	13		EUz	**12m:** Slightly weathered, grey SILTSTONE. Very weak. **12.4m to 12.5m:**...black carbonaceous material	SW	12.5m: SPTC 21// 12,12,10,12 N = 46	N/A					
HQ3	14	14						100	100	100			
SPTC	13						14m: SPTC 50// for 110mm N = 50+	N/A					
HQ3		15		EUs	**14.3m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW		100	100	80			

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:30 | m | 3.53 m bgl
(2) 12/03/19 10:21 | m | 3.47 m bgl
(3) 13/03/19 11:41 | m | 3.38 m bgl
(4) 15/03/19 12:20 | m | 3.72 m bgl

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH48

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405585m
Northing: 803225m
Reduced level: 27.2m
(Auckland MSL 1946 Datum)

Date started: 5/03/2019
Date completed: 5/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Fracture Log (VWS WS MWS CS VCS ECS)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	12			EUz	**15m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	80			
SPTC				EUs	**15.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW	15.5m: SPTC 50// for 90mm N = 50+	N/A					
HQ3	11	16		EUz	**16m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	90			
SPTC		17			End of borehole at 17.09m (Target Depth)		17m: SPTC 50// for 90mm N = 50+	N/A					

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
(1) 06/03/19 14:30 | m | 3.53 m bgl
(2) 12/03/19 10:21 | m | 3.47 m bgl
(3) 13/03/19 11:41 | m | 3.38 m bgl
(4) 15/03/19 12:20 | m | 3.72 m bgl

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOG V3.9 **Date Generated:** 1/05/2019

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH48**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 1. - Depth: 0 m to 2.5 m.

Box 2. - Depth: 2.5 m to 4.5 m.

Eastcliffe Phase 1
Ground Investigation

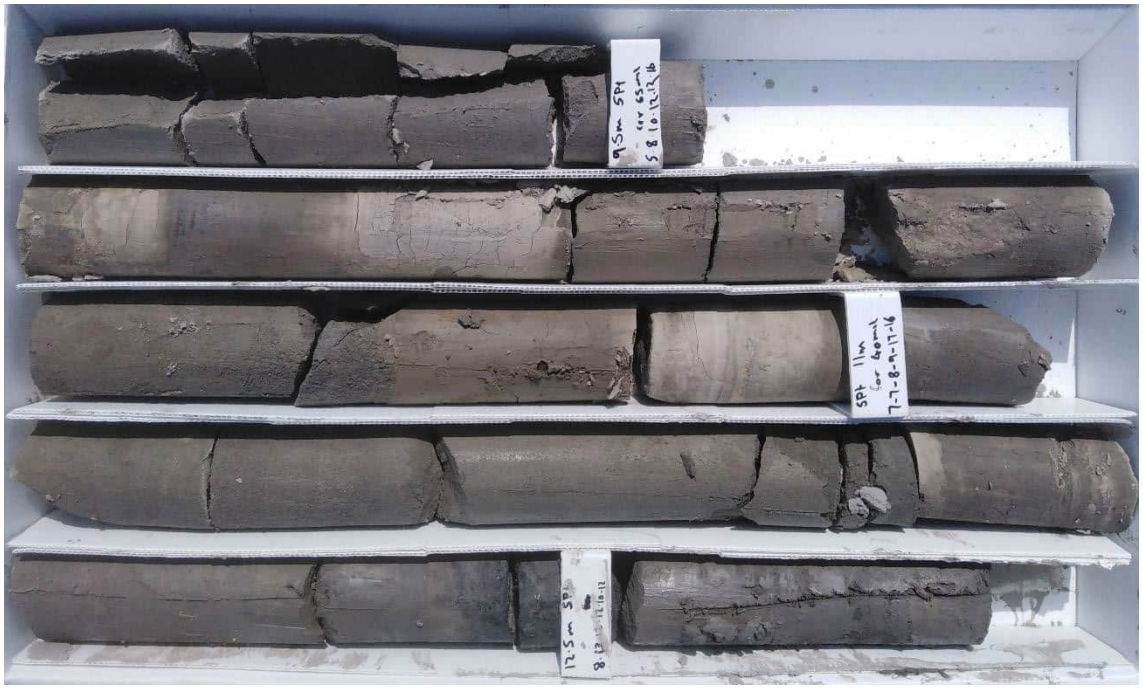
Borehole Reference:	**BH48**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 3. - Depth: 4.5 m to 7 m.

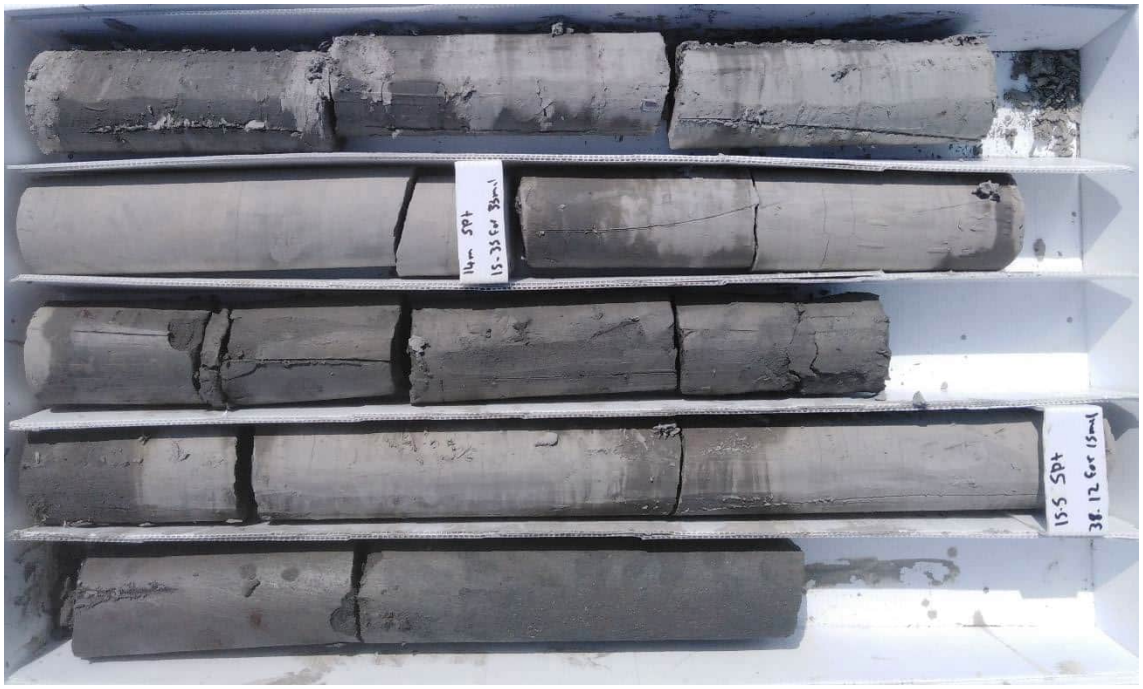
Box 4. - Depth: 7 m to 9 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH48**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**



Box 5. - Depth: 9 m to 13 m.



Box 6. - Depth: 13 m to 16 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH48**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 7. - Depth: 16 m to 17 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH49

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405581m
Northing: 803209m
Reduced level: 27.4m (Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
SSA	27				**0m:** CORELOSS			0			0m: No material recovered from auger; drillers noted gravel between 0-0.6m.	
OB		1		Fc	**0.9m:** CLAY; dark green mottled dark grey. Firm, moist, high plasticity.	CH		100			**0.9m: FILL**	
SPT	26				**1.2m:** CLAY brownish yellow mottled grey. Stiff, moist, high plasticity [RESIDUAL ECBF].		1.5m: SPT 2// 1,1,2,2 N = 6 1.5m: IBHSV 195/105 kPa	89			**1.2m: EAST COAST BAYS FORMATION**	
OB		2						86				
OB	25			ERc		CH						
		3			**2.8m to 3.9m:**...Stiff		3m: SPT 1// 1,0,1,1 N = 3 3m: IBHSV 75/42 kPa	100				
SPT	24											
OB		4			**3.9m:** Silty CLAY with some sand; brownish yellow mottled grey. Firm, moist, low plasticity.	CL		76				
	23											
SPT		5		ERs	**4.5m:** Silty SAND; grey mottled brownish yellow. Very loose, moist.	SM	4.5m: SPT 0// 0,0,0,0 N = 0	100				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test, SSA = Solid Stem Auger.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH49

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405581m
Northing: 803209m
Reduced level: 27.4m
(Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB	22	6		ERs	**4.5m:** Silty SAND; grey mottled brownish yellow. Very loose, moist. **5.9m to 6.9m:**...grey, loose to medium dense	SM	6m: SPT 2// 1,1,1,1 N = 4 6m: IBHSV 81/27 kPa	65				
SPT	21							100				
OB	20	7		EWz	**6.9m:** Highly weathered, grey, SILTSTONE. Extremely weak (very stiff); widely spaced [Highly weathered ECBF].	HW	7.5m: SPTC 7// 4,7,6,8 N = 25 7.5m: IBHSV UTP	100				
SPTC								N/A				
HQ3		8						100				
				EWs	**8.1m:** Moderately weathered, grey, fine to medium SANDSTONE. Very weak.	MW						
	19			EWz	**8.3m:** Moderately weathered, grey, SILTSTONE. Very weak.	MW		100				
HQ3		9		EWs	**8.8m:** Moderately weathered, grey, fine to medium SANDSTONE. Very weak.	MW						
	18			EWz	**9.1m:** Moderately weathered, grey, SILTSTONE. Very weak. **9.15m to 9.3m:**...black carbonaceous material.	MW	9.5m: SPTC 9// 8,7,8,10 N = 33	N/A				
SPTC		10						100	100	100		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test, SSA = Solid Stem Auger.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH49

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405581m
Northing: 803209m
Reduced level: 27.4m
(Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	17			EUz	**10m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW		100	100	100		
		11		EUs	**10.7m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak.	SW						
SPTC							11m: SPTC 50// for 140mm N = 50+	N/A				
	16				**11.3m to 11.5m:**...medium to coarse SANDSTONE							
HQ3				EUz	**11.5m:** Slightly weathered, grey, SILTSTONE. Very weak, widely spaced.	SW		96	100	100		
		12		EUs	**12m:** Slightly weathered, grey, medium to coarse SANDSTONE. Very weak.	SW						
	15			EUz	**12.3m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW						
SPTC							12.5m: SPTC 13// 11,15,19,5 for 15mm N = 50+	N/A				
		13										
HQ3	14			EUs	**13m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak.	SW		100	100	99		
		14		EUz	**13.8m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW						
SPTC							14m: SPTC 50// for 100mm N = 50+	N/A				
	13											
HQ3				EUs	**14.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak.	SW		93	100	97		
		15										

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test, SSA = Solid Stem Auger.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block B**
Project Reference: **255232**

BH49

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405581m
Northing: 803209m
Reduced level: 27.4m
(Auckland MSL 1946 Datum)

Date started: 27/02/2019
Date completed: 27/02/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	12			EUs	**14.5m:** Slightly weathered, grey, fine to medium SANDSTONE. Very weak.	SW		93	100	97		
SPTC					End of borehole at 15.61m (Target Depth)		15.5m: SPTC 50// for 110mm N = 50+	N/A				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Water level readings taken post drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test, SSA = Solid Stem Auger.
4) Borehole locations and reduced levels were surveyed and provided Woods.
5) No piezometer was installed for recording water levels.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH49**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 1. - Depth: 0 m to 3.5 m.

Box 2. - Depth: 3.5 m to 6.5 m.

Borehole Reference:	**BH49**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 3. - Depth: 6.5 m to 9.5 m.

Box 4. - Depth: 9.5 m to 13.5 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH49**	Date Drilled:	**05/03/2019 – 05/03/2019**
Photographed By:	**AD**	Date Photographed:	**05/03/2019 – 05/03/2019**

Box 5. - Depth: 13.5 m to 15.5 m.

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH50

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405558m
Northing: 803178m
Reduced level: 29.1m (Auckland MSL 1946 Datum)

Date started: 7/03/2019
Date completed: 7/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB	29			Fx	**0m:** CORELOSS			40			0m: Driller noted that material may have been compressed.	
				Fc	**0.3m:** SILT with some gravel; dark brown. Stiff, moist, low plasticity.	ML					**0.3m: FILL**	
OB				ERz	**0.4m:** Clayey SILT with some gravel; dark brown. Firm, moist, low plasticity [RESIDUAL ECBF].	ML		90			**0.4m: EAST COAST BAYS FORMATION**	
		1			**0.8m:** Silty CLAY; brownish yellow mottled grey. Very stiff, high plasticity.	CH						
OB	28				**1m:** Sandy CLAY with some silt; brownish yellow mottled grey. Stiff, moist, low plasticity.	CL	1m: IBHSV 127/60 kPa	100				
					1.2m: CLAY; brownish yellow mottled grey. Stiff, moist, high plasticity.	CH						
					1.5m: Sandy CLAY with some silt; brownish yellow mottled grey. Stiff, moist, low plasticity.	CL						
		2			**1.7m:** Silty CLAY; brownish yellow mottled grey. Soft, moist, high plasticity. Locally stiff.							
SPT	27						2m: SPT 0// 0,0,0,0 N = 0 2m: IBHSV 67/21 kPa	100				
OB				ERc				100				
		3				SM						
SPT	26				**3m to 4.2m:**...grey		3m: SPT 0// 0,1,1,1 N = 3 3m: IBHSV 48/15 kPa	100				
OB		4						97				
	25				**4.1m to 4.2m:**...black carbonaceous material							
					4.2m: Silty CLAY with some sand; grey. Very stiff, moist, low plasticity.	CL					4.2m to 4.2m: 0° UnRo Black carbonaceous material	
SPT				ERs	**4.6m:** Clayey SAND; grey. Loose, moist, low plasticity.	SC	4.5m: SPT 2// 2,2,2,3 N = 9 4.5m: IBHSV 108/30 kPa	100				
		5						86				

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH50

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405558m
Northing: 803178m
Reduced level: 29.1m
(Auckland MSL 1946 Datum)

Date started: 7/03/2019
Date completed: 7/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
OB	24			ERs	**4.6m:** Clayey SAND; grey. Loose, moist, low plasticity.	SC						
OB		6		EWz	**5.4m:** Highly weathered, grey, SILTSTONE. Extremely weak (hard) [Highly weathered ECBF].	HW	6m: SPTC 9// 5,6,6,6 N = 23	86				
SPTC	23							N/A				
OB								100				
HQ3		7		EWz	**6.5m:** Moderately weathered, grey, SILTSTONE. Very weak.	MW		100	100	92		
	22			EWs	**7.3m:** Moderately weathered, grey, fine to medium SANDSTONE. Weak.	MW						
		8		EWz	**7.7m:** Moderately weathered, grey, SILTSTONE. Weak.	MW	8m: SPTC 12// 8,6,5,7 N = 26					
SPTC	21							N/A				
HQ3		9		EWs	**8.5m:** Moderately weathered, grey, fine to medium SANDSTONE. Very weak.	MW		88	100	100		
	20						9.5m: SPTC 19// 17,16,11,6 for 30mm N = 50+					
SPTC				EWz	**9.6m:** Moderately weathered, grey, SILTSTONE. Very weak.	MW		N/A				
		10						100	100	85		

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH50

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405558m
Northing: 803178m
Reduced level: 29.1m (Auckland MSL 1946 Datum)

Date started: 7/03/2019
Date completed: 7/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	19	11		EWz	**9.6m:** Moderately weathered, grey, SILTSTONE. Very weak.	MW		100	100	85		
SPTC	18				**11m to 13.5m:**...extremely weak (hard)		11m: SPTC 8// 5,5,6,9 N = 25	N/A				
HQ3	17	12		EWz		MW		100	100	100		
SPTC							12.5m: SPTC 12// 7,7,6,12 N = 32	N/A				
HQ3	16	13		EWz		MW		100	100	63		
		14		EUz	**13.5m:** Slightly weathered, grey, SILTSTONE. Very weak.	SW						
SPTC	15						14m: SPTC 27// 23,27 for 75mm N = 50+	N/A				
HQ3				EUs	**14.3m:** Slightly weathered, grey, medium to coarse SANDSTONE. Weak.	SW		100	100	100		
		15		EUz	**14.8m:** Slightly weathered, grey, SILTSTONE. Weak.	SW						

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

aurecon
Level 4, 139 Carlton Gore Road
PO Box 9762, Newmarket
Auckland, New Zealand
Tel: +64 9 520 6019
www.aurecongroup.com

Client: **Ngati Whatua Orakei Whai Rawa Ltd**
Project: **Eastcliffe Retirement Village**
Location: **Phase 1 - Block D**
Project Reference: **255232**

BH50

BOREHOLE INFORMATION
Method: Rotary Core Wireline
Equipment: Excavator Mounted Rig
Contractor: Pro-Drill Ltd

CO-ORDINATES: Mt Eden Circuit 2000
Easting: 405558m
Northing: 803178m
Reduced level: 29.1m
(Auckland MSL 1946 Datum)

Date started: 7/03/2019
Date completed: 7/03/2019
Inclination: 90°
Azimuth: N/A

Logged by: AD
Input by: AD
Checked by: JME
Verified by: BL

Method	R.L. (m)	Length (m)	Graphic Log	Layer Code	Material Description	Weathering/USC	Testing	TCR (%)	SCR (%)	RQD (%)	Stratigraphy Defect Description Additional Notes	Installation
HQ3	14			EUz	**14.8m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	100		
SPTC				EUs	**15.3m:** Slightly weathered, grey, fine to medium SANDSTONE. Weak.	SW	15.5m: SPTC 50// for 140mm N = 50+	N/A				
HQ3	13	16		EUz	**15.8m:** Slightly weathered, grey, SILTSTONE. Weak.	SW		100	100	100		
SPTC		17		EUs	**16.5m:** Slightly weathered, grey, medium to coarse SANDSTONE. Weak.	SW	17m: SPTC 50// for 90mm N = 50+	N/A				
					End of borehole at 17.09m (Target Depth)							

REMARKS:
1) Refer to masterplan Drawing No. SK-012 dated 22/02/2019 provided by Klein.
2) Hole depth specified in Water Level Readings is the bottom of the piezometric screen. Readings taken post-drilling.
3) IBHSV = In Barrel Hand Shear Vane, SPT = Standard Penetration Test, SPTC = Solid Cone Standard Penetration Test.
4) Borehole locations and reduced levels were surveyed and provided by Woods.

Water Level Readings:
Date Time | Hole Depth | Water Level
No water level recorded

Database File: 255232 - 20190329_AD_V1.GPJ **Library file:** AURECON_AKL_NOFRACLOG_201612.GLB **Template:** AURECON_AKL_20130722.GDT **Report File:** AURECON DH LOH V4.0 NO FRACTURE LOG **Date Generated:** 1/05/2019

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH50**	Date Drilled:	**07/03/2019 – 07/03/2019**
Photographed By:	**AD**	Date Photographed:	**07/03/2019 – 07/03/2019**

Box 1. - Depth: 0 m to 2.5 m.

Box 2. - Depth: 2.5 m to 4.5 m.

Borehole Reference:	**BH50**	Date Drilled:	**07/03/2019 – 07/03/2019**
Photographed By:	**AD**	Date Photographed:	**07/03/2019 – 07/03/2019**

Box 3. - Depth: 4.5 m to 8 m.

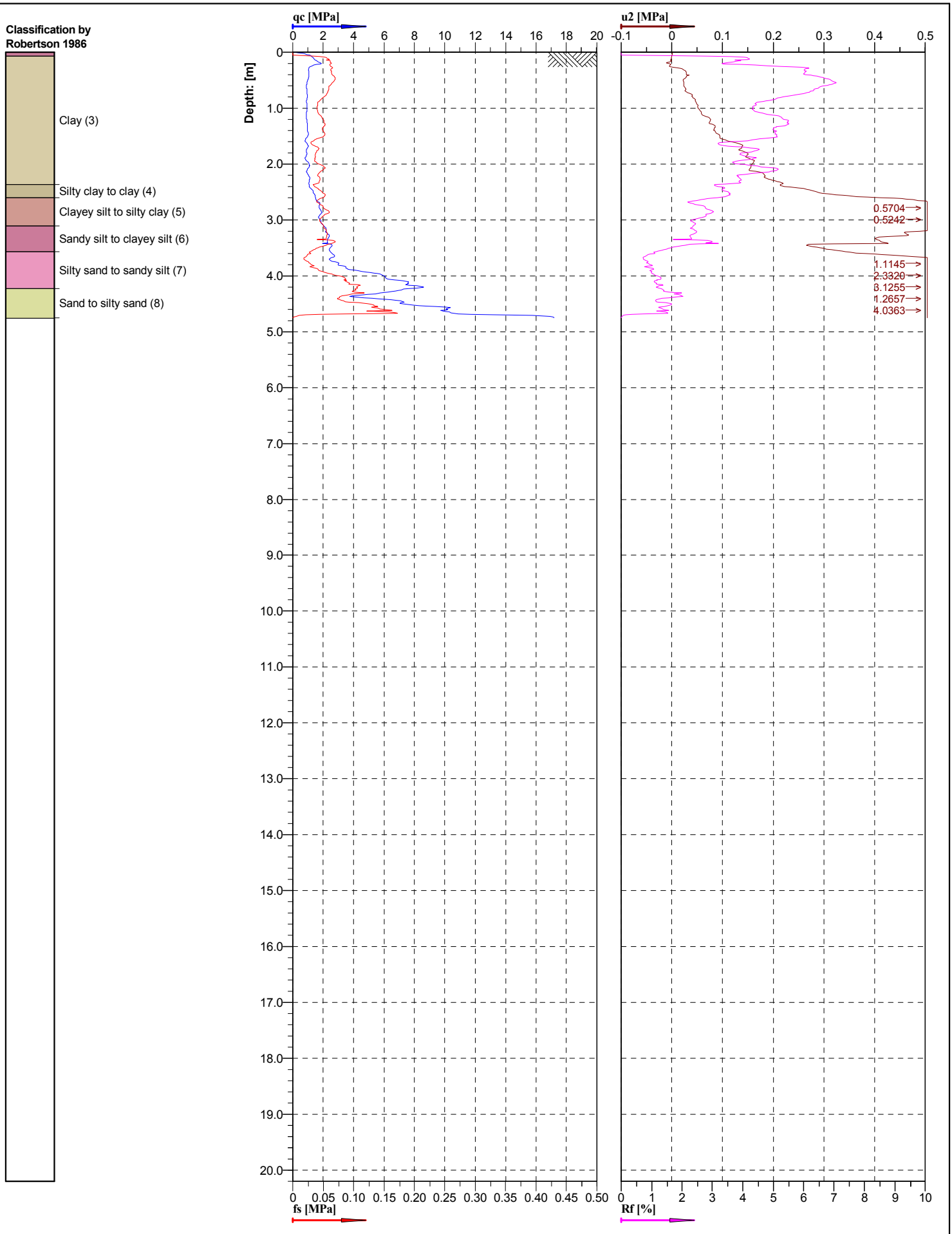
Box 4. - Depth: 8 m to 12 m.

Eastcliffe Phase 1
Ground Investigation

Borehole Reference:	**BH50**	Date Drilled:	**07/03/2019 – 07/03/2019**
Photographed By:	**AD**	Date Photographed:	**07/03/2019 – 07/03/2019**

Box 5. - Depth: 12 m to 17 m.

Box 6. - Depth: 17 m to 17.5 m.

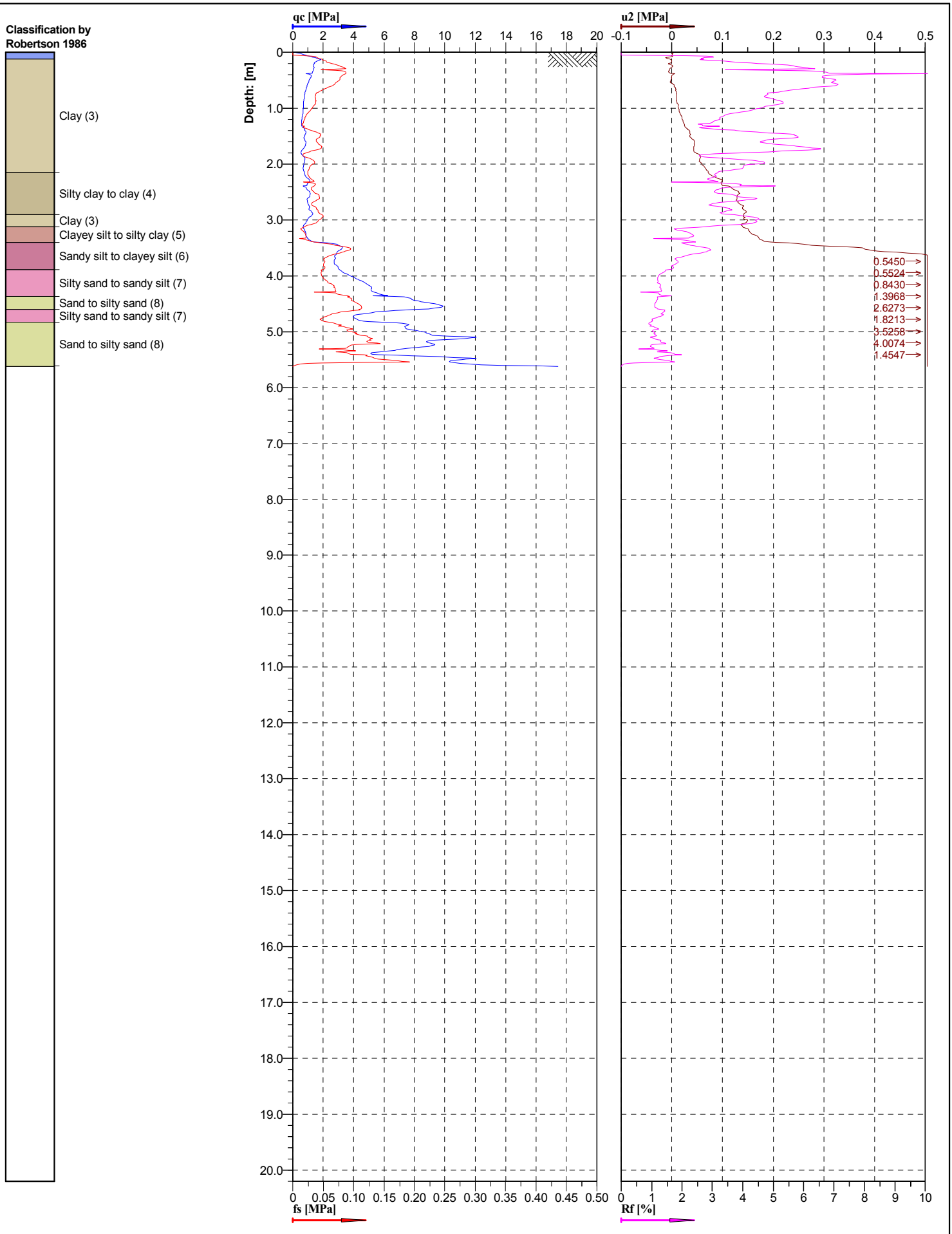


PRO-DRILL
SPECIALIST DRILLING ENGINEERS

u2

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT06
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT06.GEF	

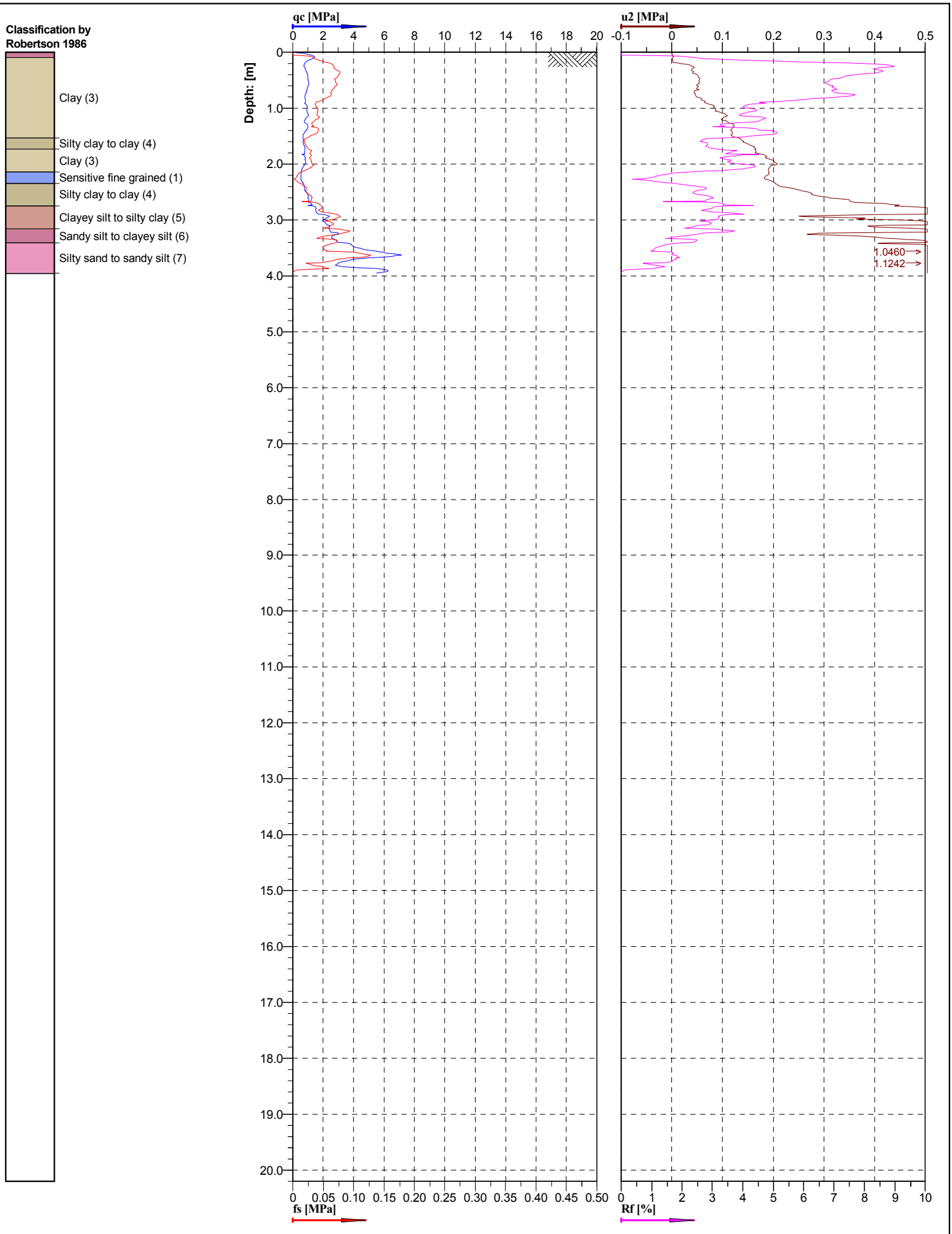


PRO-DRILL
SPECIALIST DRILLING ENGINEERS

u2

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT07
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT07.GEF	

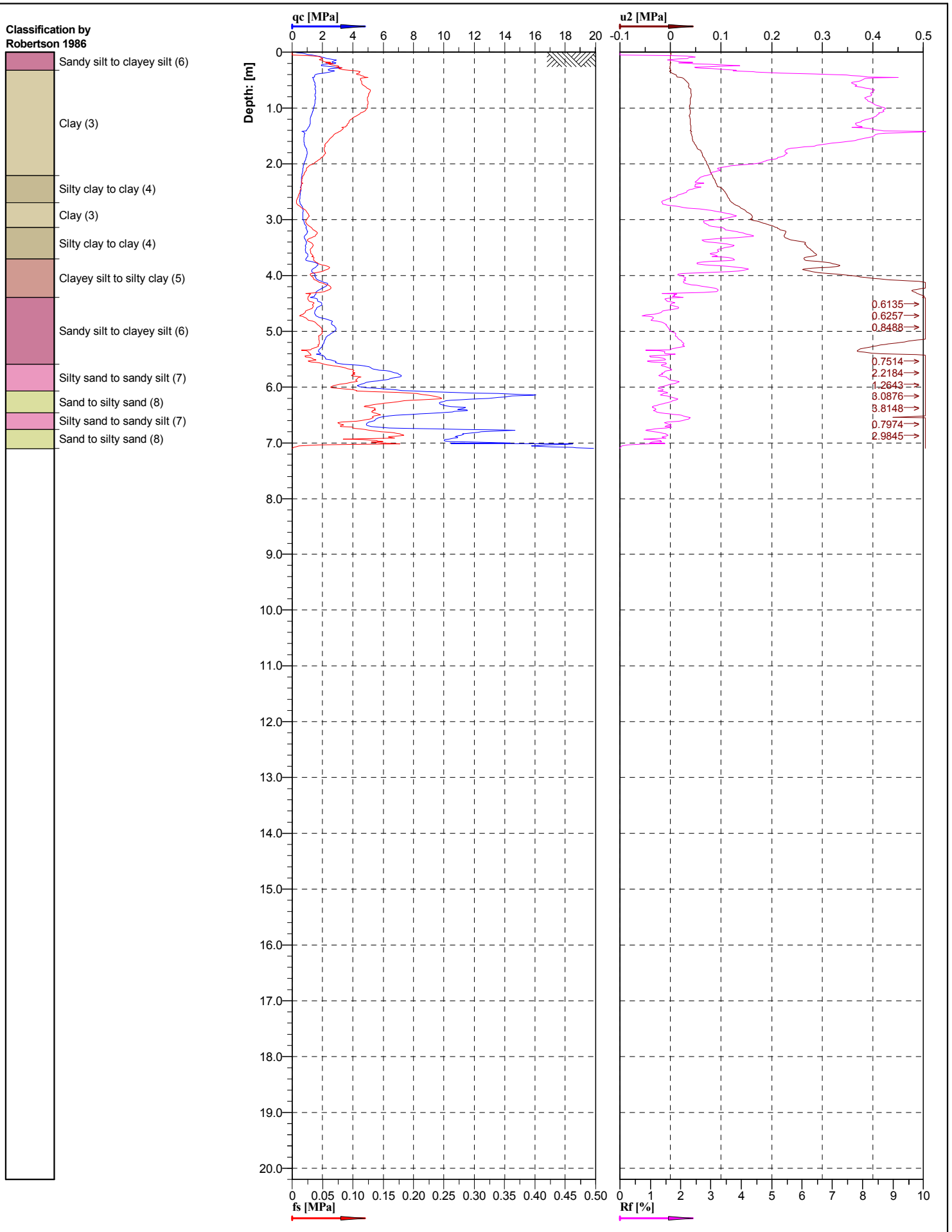


PRO-DRILL
SPECIALIST DRILLING ENGINEERS

u2

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

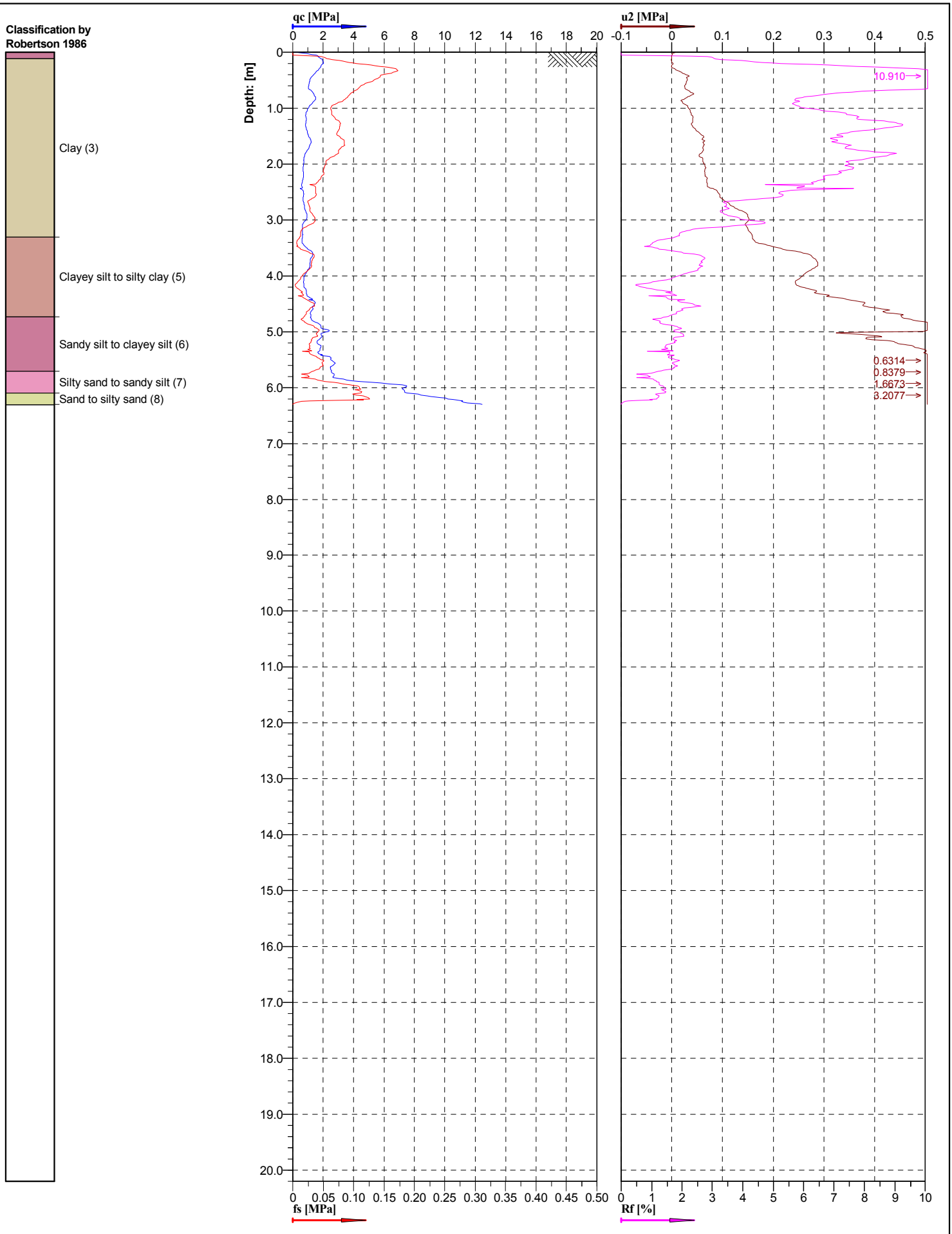
Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT08
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT08.GEF	



PRO-DRILL
SPECIALIST DRILLING ENGINEERS

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT09
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT09.GEF	

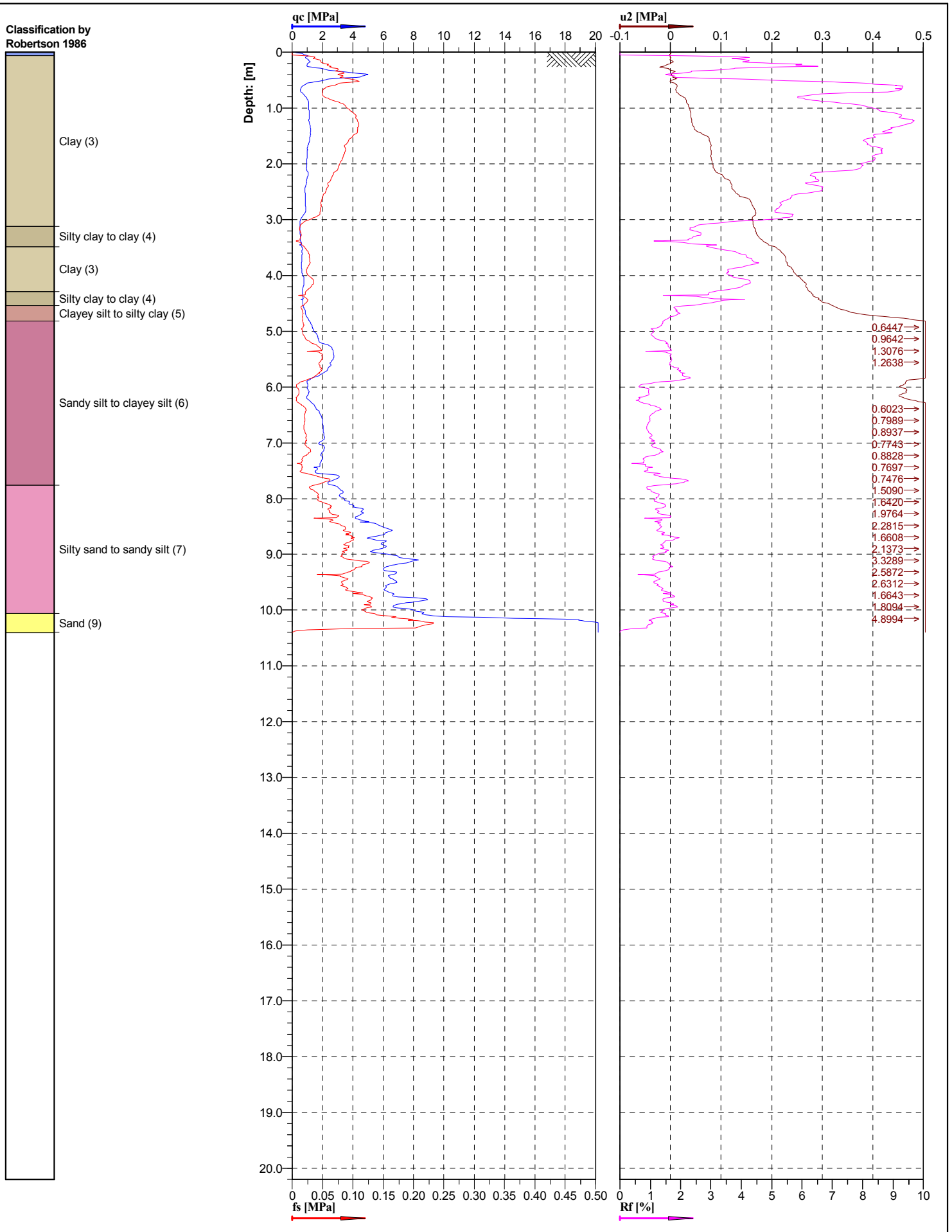


PRO-DRILL
SPECIALIST DRILLING ENGINEERS

u2

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT10
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT10.GEF	

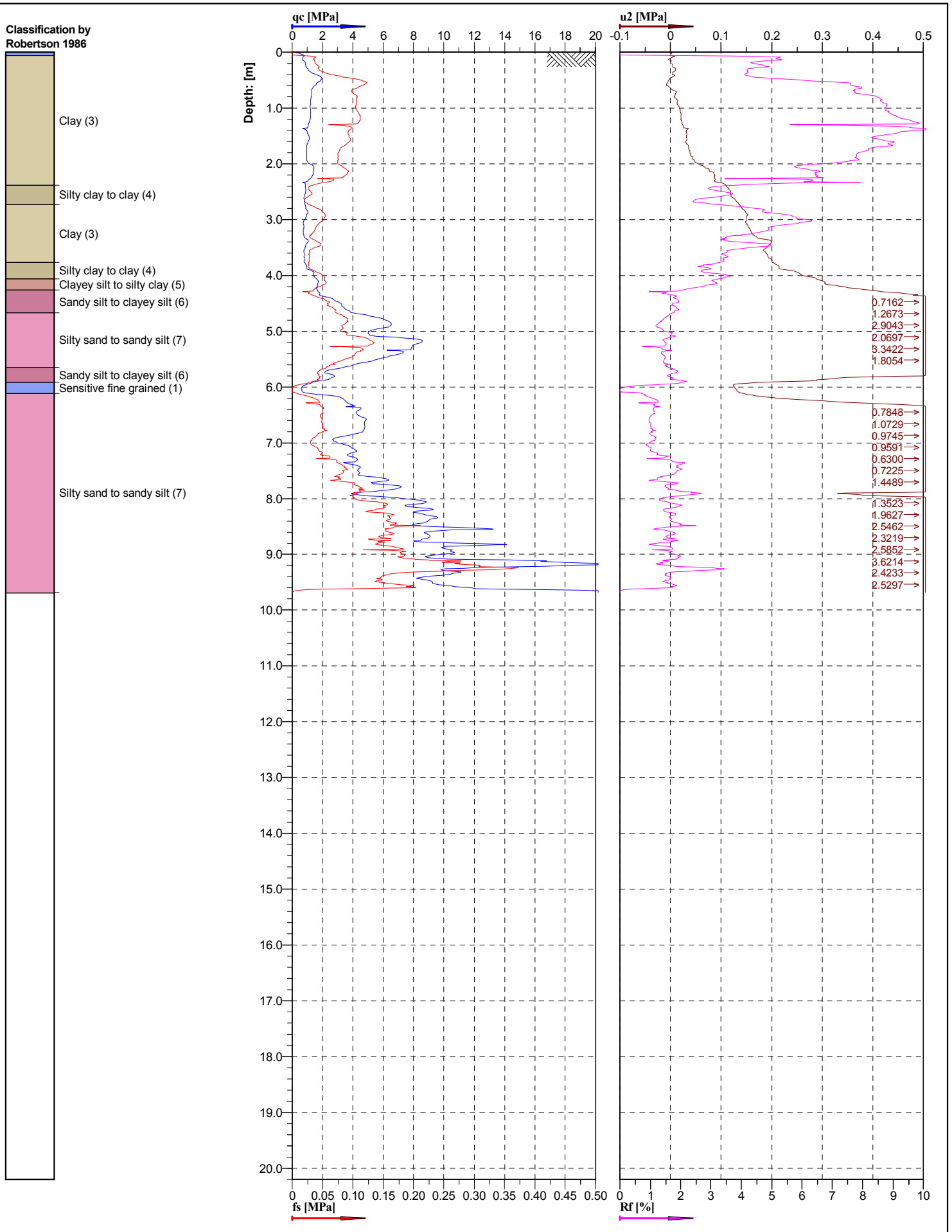


PRO-DRILL

u2

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT11
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT11.GEF	



PRO-DRILL
SPECIALIST DRILLING ENGINEERS

u2

Cone No: S10CFIIP.S14547
Tip area [cm2]: 10
Sleeve area [cm2]: 150

Location: Orakei	Position: X: 0 m, Y: 0 m	Ground level: 0.000	Test No.: CPT12
Project ID: Aurecon Eastcliffe 25523	Client: Aurecon	Date: 3/04/2018	Scale: 1 : 87
Project: Aurecon Eastcliffe 25523		Page: 1/1	Fig.:
		File: Aurecon Eastcliffe 25523_CPT12.GEF	

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH01

SHEET: 1 OF 2

PROJECT: The Point Development
JOB No.: 1098049.0000
LOCATION: 52-64 Rukutai Street

CO-ORDINATES: 5920109 mN 1762714 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 38.3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Handheld GPS

DRILLED BY: SCZH
LOGGED BY: SCZH
CHECKED: RXSW
START DATE: 09/06/2025
FINISH DATE: 09/06/2025
CONTRACTOR: SCZH

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
Fill	*0.00m:* Silty fine to medium GRAVEL; light grey mottled brown. Loosely packed, moist. [FILL].			HYDRO EXCAVATION	0		38	0.5									
Residual East Coast Bays Formation	*0.65m:* Silty CLAY; yellowish brown mottled light grey. Stiff to very stiff, moist, high plasticity. [RESIDUAL ECBF].			HQTT	100	48/24 kPa	37	1.0									
				SPT	100	0/1// 0/1/1/0 **N=2**		1.5									
	2.10m: CLAY, some silt; brownish grey. Stiff, moist, high plasticity.						36	2.0									
	2.40m: SILT, some sand, trace clay; grey and brownish grey. Very stiff, moist to wet, non-plastic to low plasticity. Sand, fine.			HQTT	100			2.5						09/06/2025			
	2.75m: CLAY, some silt; grey. Stiff, moist, high plasticity.					89/27 kPa											
	3.00m: SILT, some sand, trace clay; dark grey. Hard, moist to wet, non-plastic to low plasticity. Sand, fine.			SPT	100	2/2// 2/2/4/1 **N=9**	35	3.0									
East Coast Bays Formation	*3.45m:* Highly to completely weathered, dark grey, SANDSTONE. Extremely weak. Recovered as: Silty fine SAND; dark grey. Hard, wet. [HW ECBF]. *3.85 - 3.90m:* Crush zone			HQTT	100			3.5				19					Box 0.00-3.65m
						UTP	34	4.0									
				SPT	100	7/10// 12/13/20/5 for 5mm **N>=50**		4.5									
	4.88m: Unweathered to slightly weathered, dark grey,			HQ...	100							100					

COMMENTS:

Hole Depth 9.15m

Scale 1:25

Rev.: A

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH01

SHEET: 2 OF 2

PROJECT: The Point Development
JOB No.: 1098049.0000
LOCATION: 52-64 Rukutai Street

CO-ORDINATES: 5920109 mN, 1762714 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 38.3m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Handheld GPS

DRILLED BY: SCZH
LOGGED BY: SCZH
CHECKED: RXSW
START DATE: 09/06/2025
FINISH DATE: 09/06/2025
CONTRACTOR: SCZH

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering (UW, SW, MW, HW, DW, RS)	Rock Strength (VS+, S, MS, W, VW, EW)	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm) (2000, 600, 200, 60, 20)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%) (25, 50, 75)	Casing	Installation	Core Box No
East Coast Bays Formation	SILTSTONE. Very weak to weak. Interbedded with: Unweathered to slightly weathered, dark grey, SANDSTONE. Very weak to weak, fine grained.			HQTT	100		33	5.5				100					
				SPTC	0	11/31// 19 for 50mm N>=50 Solid Cone		6.0									
				HQTT	88		32	6.5				11					Box 3.65-6.80m
	7.35m: Core Loss						31	7.0									
	7.50m: Unweathered to slightly weathered, dark grey, SILTSTONE. Very weak to weak. Interbedded with: Unweathered to slightly weathered, dark grey, SANDSTONE. Very weak to weak, fine grained.			SPTC	0	8/42// 8 for 5mm N>=50 Solid Cone		7.5									
				HQTT	100		30	8.0				14					
				SPTC	0	20/50// for 70 mm N>=50 Solid Cone		8.5									Box 6.80-9.00m
	9.15m: Target depth						29	9.0									
								9.5									

COMMENTS:

Hole Depth 9.15m

Scale 1:25

Rev.: A

CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: 52-64 Rukutai Street

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920109 mN (NZTM2000) 1762714 mE R.L.: 38.3m DATUM: NZVD2016	DRILL TYPE: MST-600VD METHOD: Rotary cored	HOLE STARTED: 09/06/2025 HOLE FINISHED: 09/06/2025 DRILLED BY: SCZH LOGGED BY: SCZH CHECKED: RXSW

0.00-3.65m

3.65-6.80m

CORE PHOTOS

BOREHOLE No.: **BH01**

Hole Location: 52-64 Rukutai Street

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920109 mN (NZTM2000) 1762714 mE R.L.: 38.3m DATUM: NZVD2016	DRILL TYPE: MST-600VD METHOD: Rotary cored	HOLE STARTED: 09/06/2025 HOLE FINISHED: 09/06/2025 DRILLED BY: SCZH LOGGED BY: SCZH CHECKED: RXSW

6.80-9.00m

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH02

SHEET: 1 OF 3

PROJECT: The Point Development
JOB No.: 1098049.0000
LOCATION: 82 Aotea Street

CO-ORDINATES: 5920110 mN, 1762965 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 16.6m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Handheld GPS

DRILLED BY: SCZH
LOGGED BY: SCZH
CHECKED: RXSW
START DATE: 10/06/2025
FINISH DATE: 10/06/2025
CONTRACTOR: SCZH

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
Fill	*0.00m:* Silty fine to medium GRAVEL, minor clay; grey mottled orange. Loosely packed, moist, low plasticity. [FILL].			HYDRO EXCAVATION	0		16	0.5									
Fill	*0.75m:* Clayey SILT; orange mottled dark brown and light grey. Stiff to very stiff, moist to wet, medium to high plasticity.			SPT	100	1/2// 1/2/1/3 N=7	15	1.0 / 1.5						10/06/2025			
Fill	*1.95m:* Fine GRAVEL. Loosely packed, wet.			HQTT	100			2.0									
Residual East Coast Bays Formation	*2.20m:* Silty CLAY; orange mottled light grey. Stiff, moist, high plasticity. [RESIDUAL ECBF].			HQTT	100	48/6 kPa	14	2.5									
Residual East Coast Bays Formation				SPT	100	1/0// 1/1/1/1 N=4		3.0									
Residual East Coast Bays Formation	*3.50m:* CLAY, some silt; orange mottled grey. Stiff, moist, high plasticity. *3.80m:* Colour becomes dark brownish grey			HQTT	100		13	3.5									
Residual East Coast Bays Formation	*4.05m:* SILT, minor organic and minor clay; blackish grey. Very stiff, moist, low plasticity.			HQTT	100	104/37 kPa		4.0									
East Coast Bays Formation	*4.50m:* Completely weathered, dark grey, MUDSTONE. Extremely weak. Recovered as: CLAY, some silt; dark grey. Hard, moist to wet, high plasticity. [CW ECBF].			SPT	100	1/2// 2/2/2/3 N=9	12	4.5									Box 0.00-4.60m

COMMENTS:

Hole Depth 13.8m

Scale 1:25

Rev.: A

TTNZ_20240902 - GeneralLog - 26/06/2025 8:47:11 am - Produced with Core-GS by GeRoc

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH02

SHEET: 2 OF 3

PROJECT: The Point Development
JOB No.: 1098049.0000
LOCATION: 82 Aotea Street

CO-ORDINATES: 5920110 mN, 1762965 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 16.6m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Handheld GPS

DRILLED BY: SCZH
LOGGED BY: SCZH
CHECKED: RXSW
START DATE: 10/06/2025
FINISH DATE: 10/06/2025
CONTRACTOR: SCZH

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
East Coast Bays Formation	[CONT] *4.50m:* Completely weathered, dark grey, MUDSTONE. Extremely weak. Recovered as: CLAY, some silt; dark grey. Hard, moist to wet, high plasticity. [CW ECBF].			HQTT	100	UTP	11	5.5									
				SPT	100	1/2// 2/2/3/3 **N=10**	10	6.0									
				HQTT	100			6.5									
				SPT	100	2/2// 3/3/3/4 **N=13**	9	7.0									
				HQTT	90			7.5									
	8.30m: Core Loss						8	8.0									
	8.40m: Moderately to highly weathered, dark grey, SILTSTONE. Very weak. Interbedded with: Moderately to highly weathered, dark grey, SANDSTONE. Very weak, fine grained. [HW-MW ECBF].							8.5				28					
				HQTT	0	5/9// 11/14/18/7 for 30mm **N>=50**		9.0									
	9.41m: Unweathered to slightly weathered, dark grey, SILTSTONE. Very weak. Interbedded with: Unweathered to slightly weathered, dark grey, SANDSTONE. Very weak, fine grained. [SW-UW ECBF].			HQTT	100		7	9.5				45					

Box 4.60-7.40m

COMMENTS:

Hole Depth 13.8m

Scale 1:25

Rev.: A

BOREHOLE LOG

Tonkin+Taylor

BOREHOLE No.: BH02

SHEET: 3 OF 3

PROJECT: The Point Development
JOB No.: 1098049.0000
LOCATION: 82 Aotea Street

CO-ORDINATES: 5920110 mN, 1762965 mE (NZTM2000)
DIRECTION:
ANGLE FROM HORIZ.: -90°

R.L. GROUND: 16.6m
R.L. COLLAR:
DATUM: NZVD2016
SURVEY: Handheld GPS

DRILLED BY: SCZH
LOGGED BY: SCZH
CHECKED: RXSW
START DATE: 10/06/2025
FINISH DATE: 10/06/2025
CONTRACTOR: SCZH

GEOLOGICAL UNIT	MATERIAL DESCRIPTION (SOIL: Classification, colour, consistency / density, moisture, plasticity; ROCK: Weathering, colour, fabric, name, strength, cementation)	Rock Weathering	Rock Strength	Sampling Method	Core Recovery (%)	Testing	RL (m)	Depth (m)	Graphic Log	ROCK MASS DISCONTINUITIES: Defect Log	Fracture Spacing (mm)	RQD (%)	Description & Additional Observations	Water Level / Fluid Loss (%)	Casing	Installation	Core Box No
East Coast Bays Formation	[CONT] *9.41m:* Unweathered to slightly weathered, dark grey, SILTSTONE. Very weak. Interbedded with: Unweathered to slightly weathered, dark grey, SANDSTONE. Very weak, fine grained. [SW-UW ECBF].	UW SW MW HW DW RS	VS+ S MS W VW EW	HQTT	100		6	10.5				45					Box 7.40-10.40m
					0	21/50// for 0 mm N>=50 Solid Cone											
				HQTT	100		5	11.0				11	*10.40-10.90m:* J, 80-85°, PL, R, C				
					0	16/50// for 0 mm N>=50 Solid Cone		11.5									
				HQTT	100		4	12.0				14					
								12.5									
								13.0									Box 10.40-13.50m
					0	16/22// 34/16 for 0mm N>=50	3	13.5									
	13.8m: Target depth						2	14.0									
								14.5									

COMMENTS:

Hole Depth 13.8m

Scale 1:25

Rev.: A

TTNZ_20240902 - GeneralLog - 26/06/2025 8:47:11 am - Produced with Core-GS by GeRoc

CORE PHOTOS

BOREHOLE No.: **BH02**

Hole Location: 82 Aotea Street

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920110 mN (NZTM2000) 1762965 mE R.L.: 16.6m DATUM: NZVD2016	DRILL TYPE: MST-600VD METHOD: Rotary cored	HOLE STARTED: 10/06/2025 HOLE FINISHED: 10/06/2025 DRILLED BY: SCZH LOGGED BY: SCZH CHECKED: RXSW

0.00-4.60m

4.60-7.40m

CORE PHOTOS

BOREHOLE No.: **BH02**

Hole Location: 82 Aotea Street

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920110 mN (NZTM2000) 1762965 mE R.L.: 16.6m DATUM: NZVD2016	DRILL TYPE: MST-600VD METHOD: Rotary cored	HOLE STARTED: 10/06/2025 HOLE FINISHED: 10/06/2025 DRILLED BY: SCZH LOGGED BY: SCZH CHECKED: RXSW

7.40-10.40m

10.40-13.50m

HAND AUGER LOG

HOLE Id: **HA01**

Hole Location: 217 Kupe Street, south

SHEET: 1 OF 1

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920058 mN (NZTM2000) 1762661 mE	DRILL TYPE: 50mm hand auger	HOLE STARTED: 08/04/2025
	METHOD: Hand auger	HOLE FINISHED: 08/04/2025
R.L.: 45m		DRILLED BY: SCZH
DATUM: NZVD2016		LOGGED BY: SCZH CHECKED: RXSW

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm) 0 1 2 3 4 5 6 7 8 9	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 VS S F St VSt H	DESCRIPTION
Fill					>227 kPa >227 kPa		44				D	H		*0.00m:* SILT, some gravel; light brown. Hard, dry, non-plastic. Gravel, fine. [FILL].
Auckland Volcanic Field					>227 kPa UTP >227 kPa 104/45 kPa		43	1 2			D M	H TP		*0.70m:* SILT, some clay; light brown mottled orange. Hard, dry, low to medium plasticity. [AUCKLAND VOLCANIC FIELD - ASH]. *1.80m:* Silty fine GRAVEL. Tightly packed, moist. [AUCKLAND VOLCANIC FIELD - TUFF].
East Coast Bays Formation	08/04/2025	100	HA		81/29 kPa 78/36 kPa 84/32 kPa		42	3			M-W	St		*2.20m:* Clayey SILT; yellowish grey mottled dark brown. Stiff, moist to wet, medium to high plasticity. [RESIDUAL ECBF].
							41	4						3m: Target depth
							40	5						
							39							

0.0-3.0m

COMMENTS:

Hole Depth 3m

Scale 1:30

Rev.: A

HAND AUGER PHOTOS

BOREHOLE No.: **HA01**

Hole Location: 217 Kupe Street, south

SHEET: 1 OF 1

PROJECT: The Point Development		LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: (NZTM2000)	5920058 mN 1762661 mE	DRILL TYPE: 50mm hand auger METHOD: Hand auger	HOLE STARTED: 08/04/2025 HOLE FINISHED: 08/04/2025 DRILLED BY: SCZH
R.L.:	45m		
DATUM:	NZVD2016		LOGGED BY: SCZH CHECKED: RXSW

0.00-3.00m

HAND AUGER LOG

HOLE Id: **HA02**

Hole Location: 217 Kupe Street, north

SHEET: 1 OF 1

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920113 mN (NZTM2000) 1762605 mE	DRILL TYPE: 50mm hand auger	HOLE STARTED: 08/04/2025
R.L.: 45m	METHOD: Hand auger	HOLE FINISHED: 08/04/2025
DATUM: NZVD2016		DRILLED BY: SCZH
		LOGGED BY: SCZH CHECKED: RXSW

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm) 0 1 2 3 4 5 6 7 8 9	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil									TS		M	F		*0.00m:* Organic SILT, minor clay; dark brown. Firm, moist, low plasticity. [TOPSOIL].
					100/3 kPa							St-VSt		*0.25m:* Silty CLAY; light grey mottled orange. Stiff to very stiff, moist, high plasticity. [RESIDUAL ECBF].
					61/16 kPa									
					165/65 kPa		44	1						*1.00m:* SILT, some clay; light grey mottled orange. Stiff to very stiff, moist, medium plasticity.
					142/52 kPa									
East Coast Bays Formation		100	HA		74/32 kPa									
					74/29 kPa		43	2				St		*1.60m:* SILT, some clay; light grey mottled orange. Stiff, moist, low to medium plasticity.
					81/29 kPa									
					94/36 kPa									*2.40m:* Colour becomes orange
	DRY 08/04/2025				104/32 kPa									
					81/36 kPa		42	3						3m: Target depth
							41	4						
							40	5						

0.0-3.0m

COMMENTS:

Hole Depth 3m

Scale 1:30

Rev.: A

TTNZ_20240902 - HandAugerLog - 10/04/2025 9:46:05 am - Produced with Core-GS by GeRoc

HAND AUGER PHOTOS

BOREHOLE No.: **HA02**

Hole Location: 217 Kupe Street, north

SHEET: 1 OF 1

PROJECT: The Point Development		LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: (NZTM2000)	5920113 mN 1762605 mE	DRILL TYPE: 50mm hand auger METHOD: Hand auger	HOLE STARTED: 08/04/2025 HOLE FINISHED: 08/04/2025 DRILLED BY: SCZH
R.L.:	45m		
DATUM:	NZVD2016		LOGGED BY: SCZH CHECKED: RXSW

0.00-3.00m

HAND AUGER LOG

HOLE Id: **HA03**

Hole Location: 63 Rukutai Street

SHEET: 1 OF 1

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920070 mN (NZTM2000) 1762723 mE	DRILL TYPE: 50mm hand auger	HOLE STARTED: 09/06/2025
	METHOD: Hand auger	HOLE FINISHED: 09/06/2025
R.L.: 34.0m		DRILLED BY: SCZH
DATUM: NZVD2016		LOGGED BY: SCZH CHECKED: RXSW

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm) 0 1 2 3 4 5 6 7 8 9	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Topsoil					92/27 kPa		34	0			M	St		*0.00m:* Clayey SILT, some organic; dark brown. Soft, wet, medium to high plasticity. [TOPSOIL].
					83/36 kPa			0.5						*0.05m:* Silty CLAY; yellowish brown mottled light grey. Stiff, moist, high plasticity. [RESIDUAL ECBF].
					74/45 kPa		33	1.0						
	09/06/2025				98/51 kPa						W-S	VSt		*1.20m:* SILT, trace clay; yellowish motted grey. Very stiff, wet to saturated, non-plastic to low plasticity.
Residual East Coast Bays Formation		100	HA		107/18 kPa			1.5						*1.60m:* Colour becomes grey
					146/9 kPa									
					>208 kPa		32	2.0				H		*1.90m:* SILT, trace clay; yellowish motted grey. Hard, wet to saturated, non-plastic to low plasticity.
					>208 kPa			2.5						
					>208 kPa									
					UTP		31	3.0						3m: Refusal
								3.5						
							30	4.0						
								4.5						

0.0-3.0m

COMMENTS:

Hole Depth 3m

Scale 1:25

Rev.: A

HAND AUGER PHOTOS

BOREHOLE No.: **HA03**

Hole Location: 63 Rukutai Street

SHEET: 1 OF 1

PROJECT: The Point Development		LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: (NZTM2000)	5920070 mN 1762723 mE	DRILL TYPE: 50mm hand auger METHOD: Hand auger	HOLE STARTED: 09/06/2025 HOLE FINISHED: 09/06/2025 DRILLED BY: SCZH
R.L.:	34.0m		
DATUM:	NZVD2016		LOGGED BY: SCZH CHECKED: RXSW

0.00-3.00m

HAND AUGER LOG

HOLE Id: **HA04**

Hole Location: 82 Aotea Street

SHEET: 1 OF 1

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920141 mN (NZTM2000) 1762939 mE	DRILL TYPE: 50mm hand auger	HOLE STARTED: 10/06/2025
R.L.: 16.7m	METHOD: Hand auger	HOLE FINISHED: 10/06/2025
DATUM: NZVD2016		DRILLED BY: SCZH
		LOGGED BY: SCZH CHECKED: RXSW

GEOLOGICAL	METHOD OBSERVATIONS								ENGINEERING DESCRIPTION					
STRATIGRAPHY / ENG GEOLOGICAL UNIT / ADDITIONAL OBSERVATIONS	WATER	CORE RECOVERY (%)	METHOD	SCALA PENETROMETER (Blows/100mm) 0 1 2 3 4 5 6 7 8 9	TESTS	SAMPLES	RL (m)	DEPTH (m)	GRAPHIC LOG	WEATHERING CLASSIFICATION	MOISTURE CLASSIFICATION	CONSISTENCY / DENSITY CLASSIFICATION	ESTIMATED SOIL SHEAR STRENGTH (Su, kPa) VS 12 25 50 100 200 H	DESCRIPTION
Fill					152/71 kPa		16	0.5			M	St-VSt		*0.00m:* Gravelly SILT, minor clay; greyish brown. Stiff to very stiff, moist, low plasticity. [FILL].
					146/56 kPa			1.0				VSt		*0.55m:* Silty CLAY; brownish orange mottled dark brown. Very stiff, moist, high plasticity.
Residual East Coast Bays Formation	10/06/2025	100	HA		137/54 kPa		15					St-VSt		*1.10m:* Silty CLAY; brown mottled light grey. Stiff to very stiff, moist, high plasticity. [Residual ECBF].
					92/27 kPa			1.5						
					86/30 kPa						W			*1.80m:* SILT, some sand, minor clay; grey mottled light brown. Stiff to very stiff, wet, low plasticity.
					89/6 kPa			2.0						
					137/45 kPa			2.5			W-S	H		*2.50m:* SILT, minor sand; grey. Hard, wet to saturated, dilatant rapid. Sand, fine. [CW ECBF].
East Coast Bays Formation					>208 kPa		14							
					>208 kPa			3.0						
					UTP									
					UTP		13	3.5						0.0-3.8m
														3.8m: Refusal
							12	4.0						
								4.5						

COMMENTS:

Hole Depth 3.8m

Scale 1:25

Rev.: A

HAND AUGER PHOTOS

BOREHOLE No.: **HA04**

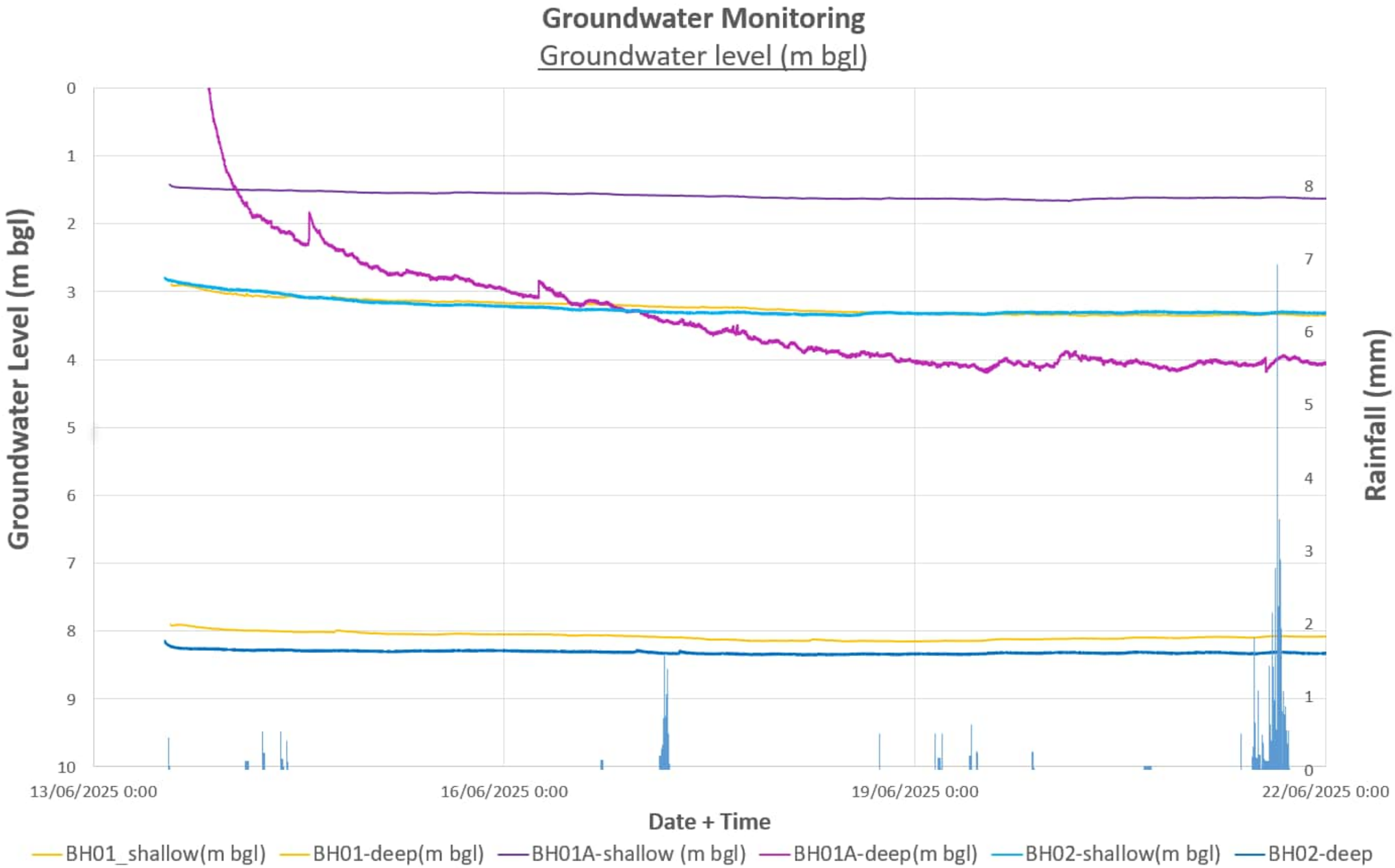
Hole Location: 82 Aotea Street

SHEET: 1 OF 1

PROJECT: The Point Development	LOCATION: 110-160 Rukutai Street	JOB No.: 1098049.0000
CO-ORDINATES: 5920141 mN (NZTM2000) 1762939 mE R.L.: 16.7m DATUM: NZVD2016	DRILL TYPE: 50mm hand auger METHOD: Hand auger	HOLE STARTED: 10/06/2025 HOLE FINISHED: 10/06/2025 DRILLED BY: SCZH LOGGED BY: SCZH CHECKED: RXSW

0.00-3.80m

Appendix C Groundwater Monitoring



Tonkin+Taylor
Exceptional thinking together www.tonkintaylor.co.nz

PROJECT No.	1098049.0000		
DESIGNED	SCZH	Jun.25	
DRAWN	SCZH	Jun.25	
CHECKED			
APPROVED	DATE		

CLIENT **GENERUS LIVING GROUP LIMITED**
PROJECT **THE POINT DEVELOPMENT**
TITLE Groundwater Monitoring Graph
DRAFT
SCALE (A3) AS SHOWN FIG No. 4 REV 1

Appendix D Conceptual basement retention sequence

Type 1 retaining wall- 750RC @ 2.25m cs pile wall.
Temporary retained heights of up to 5.9m.

Type 2 retaining wall - 600RC @ 1.8m cs pile wall.
Temporary retained heights of up to 4m.

Type 3 retaining wall - 750RC @ 2.25m cs propped pile wall.
Temporary retained heights of up to 8.75m.

Type 4 Retention - Temporary batters up to 4m (or Type 2 wall)

Type 5 Retention - Temporary batters up to 6m (or Type 1 wall)

Stage 5

Stage 4

Stage 2

Stage 1

Stage 3

Section C

Section A

Section B

Rukutai Street

Te Arawa Street

Kupe Street

Rukutai Street

Aotea Street

Aurecon - BH01

A3 SCALE 1:1,000

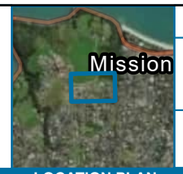
0 10 20 30 40 50 m

Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

NOTES:

CRS: NZGD 2000 New Zealand Transverse Mercator Credits: Esri Community Maps Contributors, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Earthstar Geographics, Maxar, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS



LOCATION PLAN

PROJECT No.	1098049.0000		
DESIGNED	SCZH	JUN.25	
DRAWN	SCZH	JUN.25	
CHECKED			
		APPROVED	DATE

CLIENT **GENERUS LIVING GROUP LIMITED**

PROJECT **THE POINT DEVELOPMENT**

TITLE CONCEPTUAL TEMPORARY BASEMENT RETENTION SEQUENCE

DRAFT

SCALE (A3) 1:1,000 FIG No. FIGURE 1. REV 0

Appendix E Draft Monitoring & Contingency Plan

REPORT

Tonkin+Taylor

The Point Development

Groundwater and Settlement Monitoring Contingency Plan (GSMCP)

Prepared for
Generus Living Group Limited
Prepared by
Tonkin & Taylor Ltd
Date
August 2025
Job Number
1098049.0000 v3

Together we create and sustain a better world
www.tonkintaylor.co.nz

Document control

Title: The Point Development					
Date	**Version**	**Description**	**Prepared by:**	**Reviewed by:**	**Authorised by:**
11 July 2025	1	Draft for Client Review	S. Zhang	R. Wilkinson	
14 August 2025	2	Draft v2 for Client Review	S. Zhang	M. Thomas	
27 August 2025	3	Draft v3 for RC Application	S. Zhang	R. Wilkinson	A. Langbein

Distribution:

Generus Living Group Limited	1 PDF copy
Tonkin & Taylor Ltd (FILE)	1 PDF copy

Table of contents

Definitions

AC	Means the Auckland Council (Team Leader, Water Allocation, NRSI) or nominated AC staff acting on the Team Leader's behalf
Bulk Excavation	Includes all excavation that affects groundwater, excluding minor enabling works and pilling
Commencement of Excavation	Means commencement of Bulk Excavation or excavation to create perimeter walls
Commencement of Dewatering	Means commencement of Bulk Excavation and/or the commencement of the taking or diversion of groundwater, other than for initial state monitoring purposes
Completion of Excavation	When all bulk excavation has been completed and all foundation/footing excavations within 10 m of the retaining wall or excavation batter have been completed
Completion of Dewatering	Means, in the case of a tanked building or structure construction, the stage when all the external base slab and walls are essentially watertight, the structures internal support mechanisms, including ground floor have been completed, any temporary retention removed, and no further groundwater is being taken for the construction on the perimeter retention system. Means, in the case of a drained building or structure, the stage the structures external and internal support mechanisms, including ground floors have been completed, the permanent drainage systems are in place, and no further groundwater is being taken for the construction of the perimeter retention system.
Completion of Construction	Means when the code compliance Certificate (CCC) is issued by Auckland Council
Damage	Includes Aesthetic, Serviceability and Stability damage categories in accordance with building damage classification after Burland 1995 and Mair *et. al.* 1996
Alert Level	Monitoring reaches a level close to, or equal to the design value, which is above the level where damage could occur, and requires review to assess the future trend
Alarm Level	Is the deformation limit set at a threshold which has the potential to cause damage to buildings, structures and services, and requires immediate action including the cessation of activities that may influence ground deformation and at which the Consent Holder shall implement the relevant procedure described in this GSMCP
The Team Leader	Team Leader, Centre Monitoring, Auckland Council (AC), or nominated AC staff acting on The Team Leader's behalf
Services	Includes fibre optic cables, sanitary drainage, stormwater drainage, gas and water mains, power and telephone installations, road infrastructure assets such as footpaths, kerbs, catch-pits, pavements and street furniture
SQEP	Means Suitably Qualified Engineering Professional (Tonkin & Taylor)
SQES	Means Suitably Qualified Engineering Surveyor
GSMCP	Means Groundwater and Settlement Monitoring and Contingency Plan

1 Introduction

Tonkin & Taylor Ltd (T+T) have been engaged by Generus Living Group Ltd (Generus) to prepare a draft Groundwater and Settlement Monitoring and Contingency Plan (GSMCP) to support the Resource Consent application for the proposed development of the retirement village referred to as 'The Point Mission Bay' (TPMB).

Monitoring of the excavation works and surroundings will be undertaken to assess effects on ground and structures adjacent to the site. Monitoring plans are shown in Appendix A.

This GSMCP serves to establish a set of project controls to monitor ground settlement, and to address potential geotechnical effects related to the project works. The GSMCP also provides contingency and mitigation measures that may be applied should monitoring results indicate ground settlement are approaching or likely to exceed established alert and alarm limits.

This GSMCP is applicable for the excavation based on the T+T Geotechnical Assessment Report[1].

1.1 Project description

The proposed development involves the construction of 5 buildings across the site ranging in height between 5 to 7 stories, which includes partial basement levels of 1 to 2 stories that daylight from the sloping ground across the site that falls from west to east. A shared basement is proposed between Buildings 2, 3 & 4. The area between the buildings is to be used for recreation and hard and soft landscaping.

In accordance with the preliminary development plans provided[2], the basement levels across the buildings are summarised below:

- Building 1: RL 16.50 m
- Building 2: RL 23.4 m to 28.3 m
- Building 3: RL 28.3 m to RL 31.75
- Building 4: RL 31.75 m
- Building 5: RL 35.20 m

Our assessment has allowed for bulk excavation up to 1.0 m below the finished floor levels to account for the floor slab and subsoil drainage construction. On this basis, the temporary retained heights of up to approximately 8.75 m are required to support the proposed excavation.

[1] T+T (August 2025), The Point Development – Geotechnical Assessment Report, v3. T+T Ref: 1094098.0000.
[2] Warren & Mahoney (22 August 2025). Architectural Design Report Prepared for Generus Living Group, Rev A. Job No. 10476.

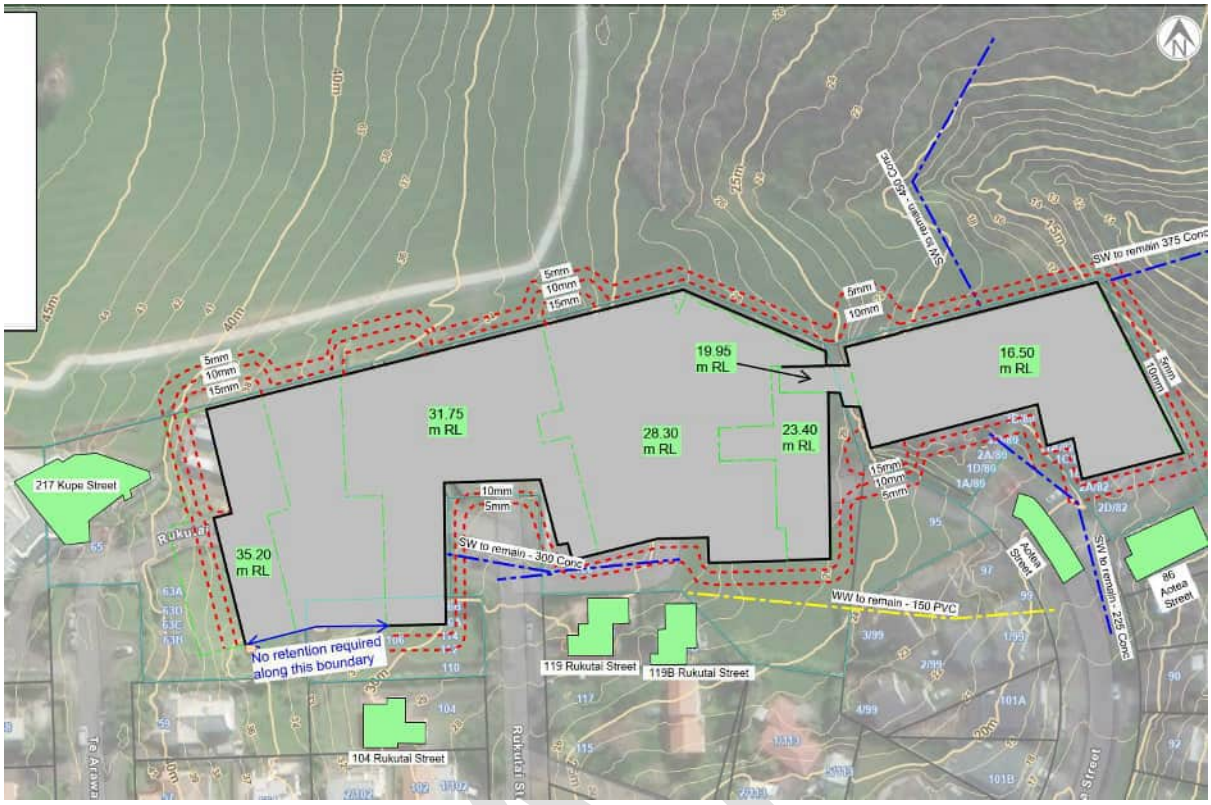


Figure 1.1: Current development site and surrounds, with locations of potentially affected structures

1.2 Nearby potentially affected structure and services

1.2.1 Structures

The structures shown in Figure 1.1 and listed in Table 1.1 have been identified as "potentially affected structures". The degree of risk to these structures as summarised below based on the assessment of effects presented in the T+T Geotechnical Assessment Report[1] for this site.

Table 1.1: Potentially affected structures

Structure	Direction (N,S,E,W)	Approximate distance from excavation (m)	Risk
217 Kupe Street	W	17.5	Negligible
104 Rukutai Street	S	18.0	Negligible
119 Rukutai Street		10.0	Negligible
119B Rukutai Street		16.0	Negligible
86 Aotea Street		14.5	Negligible

1.2.2 Services

Potentially affected services for the purposes of monitoring were assessed using public utility services identified in the online Auckland Council GIS database[3]. A plan extracted from the GIS online tool is shown in Figure 1.2. A summary of the identified affected services is given in Table 1.2.

[3] https://geomapspublic.aucklandcouncil.govt.nz

The Geotechnical Assessment Report for the site concluded that the likely effect of the proposed development for identified services was negligible to moderate.

Table 1.2: Potentially affected services

Service ID	Street	Service type	Material	Diameter (mm)	Direction (N,S,E,W)	Approximate distance from excavation (m)
2000609020	Michael Joseph Savage Memorial Park	Stormwater	Concrete	450	N	0
2000403490	Michael Joseph Savage Memorial Park	Stormwater	Concrete	375	E	0
300135283, 3000135314, and 2000154512	Aotea Street	Stormwater	Concrete	225	S	6.0
2000158462, and 2000616277	Rukutai Street	Stormwater	Concrete	300	S	2.5
2601731, 2496144, and 2493377	Rukutai Street	Wastewater	VC	150	S	7.5

Figure 1.2: Auckland Council public underground services (potentially affected serviced are highlighted in bold dashed line)

1.3 Reporting requirements

1.3.1 Allocation of monitoring and reporting tasks

The completion of the Groundwater and Settlement Monitoring and Contingency Plan detailed herein shall be the overall responsibility of the consent holder. The following allocation of monitoring and reporting tasks is assumed to enable successful plan completion.

Monitoring item	Install / baseline	Regular monitoring	Individual monitoring round reporting to T+T	Bi-monthly reporting to AC
Service condition surveys	Principal contractor	Principal contractor	Principal contractor	N/A
Structural condition surveys	Principal contractor / SQEP	Principal contractor	Principal contractor	T+T
Buildings and ground deformation pin survey	Principal contractor / SQES	Principal contractor / SQES	Principal contractor / SQES	T+T

1.3.2 General notification timeframes

The Team Leader shall be advised by the Principal Contractor of the following project milestones:

Project milestone	Notification requirement
Commencement of Excavation	10 working days prior
Commencement of Dewatering	10 working days prior

1.3.3 Monitoring records/reporting

Survey data collected during the course of the project shall be forwarded to T+T within three working days of that data being collected.

Monitoring results will be collated by T+T and compared with the specified trigger levels. These records will be held by T+T and will be available for inspection as required.

During construction, reporting of the monitoring results will be forwarded to AC at two-monthly intervals. Each report shall include the following:

- Monitoring records presented on a timeline plot.
- Comparison of monitoring data with the adopted trigger levels.
- Previous results set out with an explanation of any trends.
- A construction progress summary.
- Any other information relevant to the reporting period (i.e. exceedance of trigger levels and contingency measures being undertaken).

At the completion of the perimeter retention system construction, monitoring will continue for the timeframes required by the consent (or at such time that stable measurements are demonstrated, and written approval to cease monitoring is granted from AC).

In the event of any exceedance of the trigger levels, the relevant monitoring and reporting procedure will be implemented in accordance with Section 3 of the plan.

At the completion of the works a summary completion report will be prepared.

2 Monitoring

2.1 General

Monitoring of the excavation works and surroundings shall be undertaken to ensure that the ground and groundwater conditions are consistent with the design analyses and that the response of the structures is within design tolerances.

The monitoring requirements, including location of monitoring points, frequency of monitoring, action trigger levels, response procedures and reporting requirements, are detailed in the following sections. Survey monitoring locations are shown in the Construction Monitoring Instrumentation Plan in Appendix A.

The proposed construction phase monitoring to assess the effects on ground surrounding the site and of the services and structures identified above shall include:

- Pre and post-retention system construction, condition surveys of the potentially affected structures and services identified in Table 1.1 and Table 1.2 above.
- Regular visual external survey of the surrounding ground, pavement, associated street infrastructure and structures during construction to identify any deterioration of pre-construction baseline conditions.
- Precise levelling survey of the ground and buildings surrounding the site. The marks shall be set as low as practicable on the building on elements in direct connection with the foundation level (i.e. columns or perimeter footings).
- Precise levelling survey of pavement line levels surrounding the site.

2.2 Pre-condition surveys

2.2.1 Service condition surveys

Prior to the Commencement of Dewatering and following Completion of Dewatering (and within 6 months of completion of the retention system construction), a condition survey of potentially affected buried services (refer to Table 2.1) shall be undertaken in consultation with the relevant service provider.

Suitable condition surveys are expected to comprise CCTV survey for stormwater and wastewater services.

A condition survey is not required where written evidence is provided to the Council that the owner of that service has confirmed they do not require a condition survey.

Table 2.1: List of neighbouring underground services requiring condition surveys

Service ID	Direction (N,S,E,W)	Internal Survey	Settlement Pins (Yes/No)
2000609020	N	✓	Yes
2000403490	E	✓	Yes
300135283, 3000135314, and 2000154512	S	✓	Yes
2000158462, and 2000616277	S	✓	Yes

2.2.2 Building condition surveys

In accordance with the T+T Geotechnical Assessment Report[1], estimated settlement across all potentially affected adjacent structures is less than 5 mm. On this basis, no building condition survey is considered to be required for the proposed basement excavation.

2.2.3 Construction phase monitoring

An external visual inspection undertaken by the Principal Contractor at regular intervals shall monitor any new damage or deterioration of any pre-existing damage for the following:

- The ground within 10 m of the excavation.

A photographic record of the surveys is to be maintained, including the time, date and any observations for each inspection. This record is to be maintained on site and forwarded to T+T typically monthly, but within one day if any deterioration or cracking is observed.

2.2.4 Condition survey intervals

A visual inspection of the surrounding ground and buildings listed above shall be carried out at the following intervals:

Pre-commencement of dewatering	Pre-construction survey as detailed in Section 2.2.1 and 2.2.2.
From commencement of dewatering to completion of dewatering	Fortnightly external visual inspections as detailed in Section 2.2.3.
After completion of dewatering	Post-construction survey within six months of completion of construction as detailed in Section 2.2.1 and 2.2.2.

At the reasonable request of the Council, an additional survey on any building shall be carried out for the purpose of checking for damage and for following up on a report of damage to that building.

2.3 Ground and building deformation

2.3.1 General

Ground and building deformation monitoring marks shall be established on the pavements and buildings surrounding the excavation area at the locations shown in Appendix A.

The marks shall be set as low as practicable on the building on elements in direct connection with the foundation level (i.e. columns or perimeter footings).

Survey measurements shall be accurate to ± 2 mm.

2.3.2 Settlement monitoring intervals

Surveys shall be carried out at the following intervals:

Pre-commencement of dewatering	At least two baseline surveys are required to establish baseline readings.
Commencement of dewatering to completion of excavation	Fortnightly
Completion of excavation to completion of dewatering	Fortnightly
After the completion of dewatering	Monthly for six months or until such a time following the completion of dewatering that stable measurements are demonstrated, and written approval is granted from the Council.

Subject to the Team Leader's approval, monitoring may be reduced in frequency, subject to demonstration of consistent results below the alert/alarm levels.

2.3.3 Ground trigger levels

Monitoring data is to be compared with the design assumptions and baseline readings. Alert and Alarm Levels at which actions are required to be undertaken are summarised in Table 2.2. If the alert or alarm levels in Table 2.2 are reached, the actions outlined in Section 4 shall be carried out.

Table 2.2: Ground deformation mark trigger levels

Settlement mark ID	Description	Settlement alert level (mm)	Settlement alarm level (mm)	Differential settlement alert level	Differential settlement alarm level
GS1 to G4	North ground monitoring points	15	25	1:450 between two ground monitoring marks	1:550 between two ground monitoring marks
GS5 to G12	South ground monitoring points	10	20		

2.4 Summary of monitoring frequency requirements

Monitoring Item	Monitoring Points	Alert Level (mm)	Alarm Level (mm)	Monitoring Frequencies[2]			Reporting Frequency
				Pre-Commencement of dewatering / Baseline	**From Commencement of Dewatering/Excavation**	**After Completion of Dewatering/Excavation**	
Differential Ground Surface Settlement [1]	GS1 to GS12	1:450 between two ground monitoring marks	1:550 between two ground monitoring marks	At least two baseline surveys for all deformation points to a horizontal and vertical accuracy of ± 2 mm.	Fortnightly to Completion of Excavation. Fortnightly following Completion of Excavation.	Monthly for six months or until such a time following the completion of dewatering that stable measurements are demonstrated, and written approval for monitoring termination is granted from the Council.	Results of the monitoring programme to be reported to Council at two monthly intervals during the monitoring period.
Total Ground Surface Settlement [1]	GS1 to GS4	15	25				
	GS5 to G12	10	20				
Services condition survey	Refer Table 2.1	N/A	N/A	Pre-construction condition survey prior to commencement of perimeter retaining walls construction or commencement of dewatering.	Fortnightly external visual inspections. N/A	Post-construction condition survey within 6 months of the Completion of Dewatering.	

Notes:

1 Deformation stations shall be surveyed to a horizontal and vertical accuracy of + 2 mm (precise survey techniques).

2 Subject to the Team Leader's approval, monitoring may be reduced in frequency, subject to demonstration of consistent results.

3 Reporting of monitoring records

3.1 Baseline readings

Baseline readings for ground and building deformation shall be established and baselined before any construction is commenced, including piling.

These baseline readings shall be compiled and submitted to the Council for certification prior to the commencement of excavation.

3.2 Reporting intervals and requirements

All monitoring records as detailed in this report shall be compiled and submitted to the Council at two monthly intervals from the commencement of construction, until six months after the completion of excavation (or at such time following the completion of excavation that stable measurements are demonstrated, and written approval for cessation of monitoring is granted from the Council), or completion of the retention system construction as appropriate.

As a minimum each report shall include the following:

1 Monitoring records presented in a tabulated format as well as on a timeline plot;
2 Comparison of monitoring data with trigger levels and the assumed design models;
3 Previous results set out with an explanation of any trends;
4 A construction progress summary; and
5 Any other information relevant to the reporting period (i.e. exceedance of trigger levels and contingency measures being undertaken).

4 Alert and Alarm trigger level reponse procedures

4.1 Response procedure if the alert levels are exceeded

If any of the monitoring alert trigger levels are reached, then one or more of the contingency options described in Section 5 of this plan should be carried out together with:

1 Notify the Project Manager.
2 Notify the Council, in writing within one working day of the trigger level being exceeded, with details of any actions being undertaken.
3 Survey all monitoring marks within a 25 m radius of the affected monitoring mark(s) to confirm the extent of deformation and exceedance of the Alert Trigger.
4 Ensure the data is reviewed, and advice provided, by a SQEP on the need for mitigation measures or other actions necessary to avoid further deformation. Where mitigation measures or other actions are recommended those measures shall be implemented.
5 Submit a written report, prepared by the SQEP responsible for overviewing the monitoring, to the Team Leader Central Monitoring within five working days of Alert Level exceedance. The report shall provide an analysis of all monitoring data relating to the exceedance, actions taken to date to address the issue, recommendations for additional monitoring (i.e. the need for increased frequency or repeat condition survey(s) of building or structures) and recommendations for future remedial actions necessary to prevent Alarm Levels being exceeded.
6 Measure and record all Monitoring Stations within 25 metres of the location of any Alert Level exceedance every three days until such time the written report referred to above has been submitted to the Team Leader Central Monitoring.

7 Once approved, the recommendations shall be implemented.

4.2 Response procedure if the alarm levels are exceeded

If the monitoring alarm trigger levels are reached for any ground or building deformation then the following shall be carried out in addition to the actions outlined in Section 5:

1 Immediately halt construction activity, including excavation, dewatering or any other works that may result in increased deformation, unless halting the activity is considered by a SQEP to be likely to be more harmful (in terms of effects on the environment) than continuing to carry out the activity.

2 Notify the Team Leader (AC), within 24 hours of the alarm level exceedance being detected and provide details of the measurements taken.

3 Undertake a condition survey (this could comprise either a detailed condition survey or an external visual inspection at the discretion of the SQEP responsible for overviewing the monitoring) by a SQEP or suitably qualified building surveyor (SQBS) of any building or structure located adjacent to any Monitoring Station where the Alarm Level has been exceeded.

4 Take advice from the author of the Alert Level exceedance report (if there was one) or another SQEP on actions required to avoid remedy or mitigate adverse effects on ground, buildings or structures that may occur as a result of the exceedance.

5 Submit a written report, prepared by the SQEP responsible for overviewing the monitoring, for certification by the Team Leader Compliance Monitoring NW1, on the results of the condition survey(s), the mitigation measures implemented and any remedial works and/or agreements with affected parties within five working days of recommencement of works.

6 Not resume construction activities (or any associated activities), halted in accordance with paragraph (1) above, until any mitigation measures (recommended in accordance with paragraphs (4) or (5) above) have been implemented, to the satisfaction of a SQEP.

5 Contingency

5.1 General

If any of the monitoring trigger levels are exceeded, the general response will be as detailed in Section 4. Specific actions will be selected depending on the exact nature of the problem. Possible contingency actions are detailed in the following sections.

5.2 Ground and building deformation contingency measures

In the event of ground or building deformation exceeding the monitoring trigger levels, one or more of the following actions shall be taken:

- Check public safety is maintained.
- Discussions on the situation with the property/service owner that may be affected.
- Monitor the rate of settlement (assuming that other steps have been undertaken to address the cause).
- Consider options to mitigate further settlement if recommended by the SQEP, which may involve:
  - Install a berm or temporary prop in front of the retaining wall or excavation
- Accept and reinstate resultant damage.

6 Applicability

This report has been prepared for the exclusive use of our client Generus Living Group Limited, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application for resource consent under the Fast-track Approvals Act 2024 and that an Expert Panel as the consenting authority will use this report for the purpose of assessing that application.

Tonkin & Taylor Ltd
Environmental and Engineering Consultants

Report prepared by:	Report reviewed by:
.....	.....
Scott Zhang Geotechnical Engineer	Ric Wilkinson Senior Geotechnical Engineer

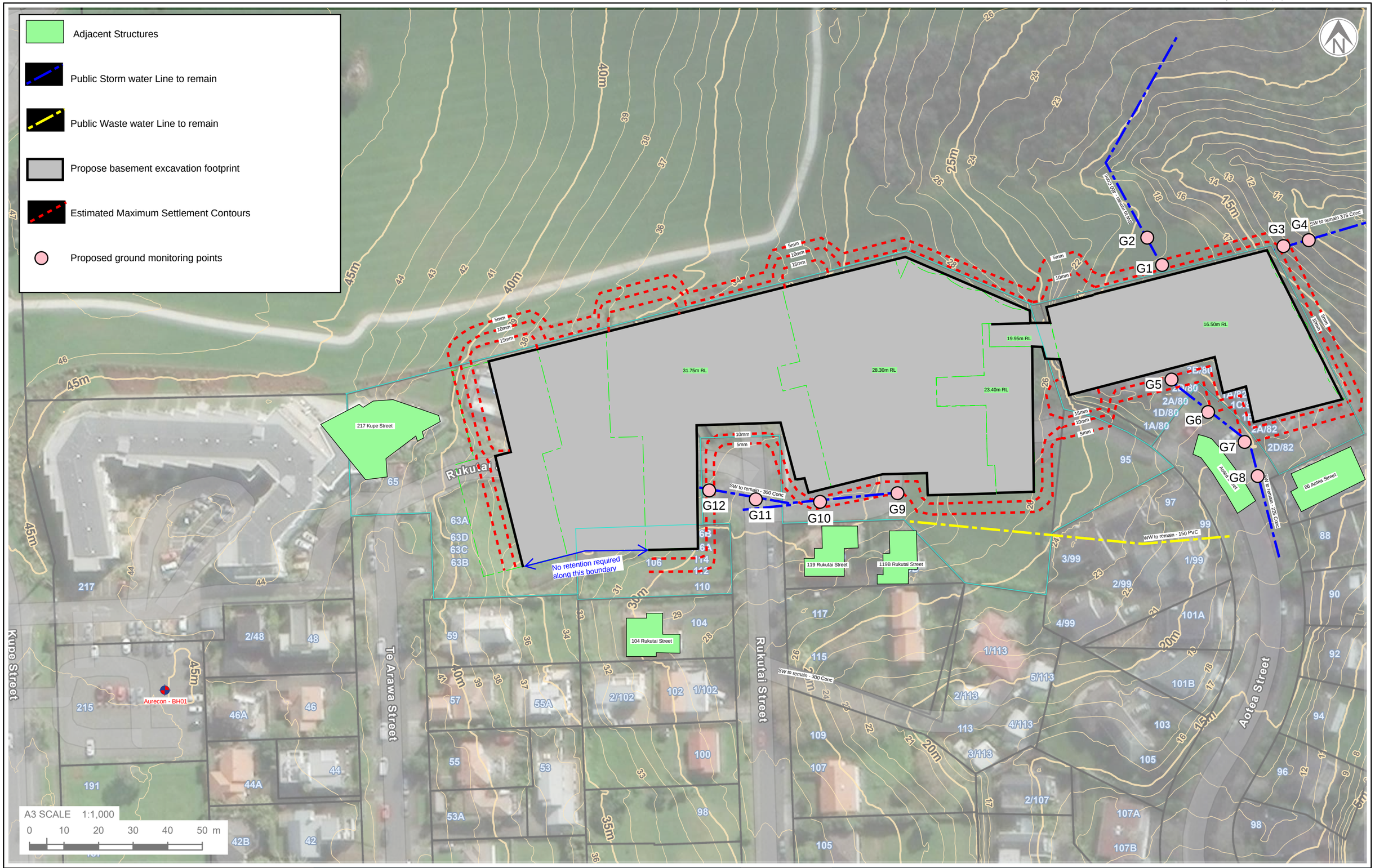
Authorised for Tonkin & Taylor Ltd by:

.....
Andrew Langbein
Project Director

27-Aug-25
\\ttgroup.local\corporate\auckland\projects\1098049\workingmaterial\3. report\the point\gsmcp\draft gscmp (bentley - gr - ae comments - 12.08.25).docx

Appendix A Monitoring Summary

- Construction monitoring instrumentation plan

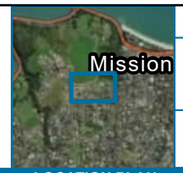


Tonkin+Taylor

Exceptional thinking together www.tonkintaylor.co.nz

NOTES:

CRS: NZGD 2000 New Zealand Transverse Mercator Credits: Esri Community Maps Contributors, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS, Earthstar Geographics, Maxar, LINZ, Stats NZ, Esri, TomTom, Garmin, Foursquare, METI/NASA, USGS



LOCATION PLAN

PROJECT No.	1098049.0000		
DESIGNED	SCZH	JUN.25	APPROVED
DRAWN	SCZH	JUN.25	DATE
CHECKED			

CLIENT **GENERUS LIVING GROUP LIMITED**

PROJECT **THE POINT DEVELOPMENT**

TITLE CONSTRUCTION MONITORING INSTRUMENTATION PLAN

SCALE (A3) 1:1,000 FIG No. FIGURE 1. REV 0

www.tonkintaylor.co.nz

Appendix F Proposed Consent Conditions

Proposed Conditions of Consent – Water Permit

Abbreviations and definitions:

The following abbreviations and definitions apply to these consent conditions.

Alarm Level	Means specific levels at which actions are required as described in the relevant conditions.
Alert Level	Means specific levels at which actions are required as described in the relevant conditions.
Bulk Excavation	Includes all excavation that affects groundwater excluding minor enabling works and piling less than 1.5m in diameter.
Commencement of Dewatering	Means commencement of Bulk Excavation and/or the commencement of the taking or diversion of groundwater, other than for initial state monitoring purposes.
Completion of Dewatering	Means, in the case of a drained building or structure, the stage when the structure's external and internal support mechanisms, including basement floors, have been completed, the permanent drainage system(s) are in place, and no further groundwater is being taken for the construction of the basement.
Completion of Construction	Means when the Code Compliance Certificate (CCC) is issued by Council.
Commencement of Excavation	Means commencement of Bulk Excavation or excavation to create perimeter walls.
Commencement of Excavation	Means commencement of Bulk Excavation or excavation to create perimeter walls.
Completion of Excavation	Means the stage when all Bulk Excavation and all foundation/footing excavations within ten (10) metres of the perimeter building retaining walls has been completed.
Condition Survey	Means an External Visual Inspection or a detailed Condition Survey (as defined in the relevant conditions).

Damage	Includes Aesthetic, Serviceability and Stability Damage, but does not include Negligible Damage, as described in Table 1 below.
External Visual Inspection	A Condition Survey undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage. Includes as a minimum a visual inspection of the exterior and a dated photographic record of all observable exterior Damage.
Monitoring Station	Means any monitoring instrument including a ground or building deformation station, inclinometer, groundwater monitoring bore, retaining wall deflection station, or other monitoring device required by this consent.
Seasonal Low Groundwater Level	Means the annual lowest groundwater level – which typically occurs in summer.
Services	Include fibre optic cables, sanitary drainage, stormwater drainage, gas and water mains, power and telephone installations and infrastructure, road infrastructure assets such as footpaths, kerbs, catch-pits, pavements and street furniture.
SQBS	Means Suitably Qualified Building Surveyor.

Table 1: Building Damage Classification Category of Damage

Category of Damage	Normal Degree of Severity	Description of Typical Damage (Building Damage Classification after Burland (1995), and Mair et al (1996))	General Category (after Burland
0	Negligible	Hairline cracks	Aesthetic Damage
1	Very Slight	Fine cracks easily treated during normal redecoration. Perhaps isolated slight fracture in building. Cracks in exterior visible upon close inspection. Typical crack widths up to 1mm.	
2	Slight	Cracks easily filled. Redecoration probably required. Several slight fractures inside building. Exterior cracks visible, some repainting may be required for weathertightness. Doors and windows may stick slightly. Typically, crack widths up to 5mm.	

3	Moderate	Cracks may require cutting out and patching. Recurrent cracks can be masked by suitable linings. Brick pointing and possible replacement of a small amount of exterior brickwork may be required. Doors and windows sticking. Utility services may be interrupted. Weather tightness often impaired. Typical crack widths are 5mm to 15mm or several >3mm.	Serviceability Damage
4	Severe	Extensive repair involving removal and replacement of walls especially over doors and windows. Window and door frames distorted. Floor slopes noticeably. Walls lean or bulge noticeably. Some loss of bearing in beams. Utility services disrupted. Typical crack widths are 15mm to 25mm but also depends on the number of cracks.	
5	Very Severe	Major repair required involving partial or complete reconstruction. Beams lose bearing, walls lean badly and require shoring. Windows broken by distortion. Danger of instability. Typical crack widths are greater than 25mm but depend on the number of cracks.	Stability Damage
Note: In the table above, the column headed “Description of Typical Damage” applies to masonry buildings only and the column headed “General Category” applies to all buildings			

Duration of consent

1. The take (dewatering) and groundwater diversion consent [WATXXXXXXXX] expires thirty-five (35) years from the date of commencement, unless it has lapsed, been surrendered, or been cancelled at an earlier date pursuant to the RMA.

Notice of Commencement of Dewatering

2. The consent holder must notify the Council in writing at least ten (10) working days prior to the date of the Commencement of Construction Phase Dewatering.

Design and Construction of Basement and Retaining Walls

3. The design and construction of the basement and retaining walls must be undertaken in accordance with the specifications contained in the report titled: “Geotechnical Assessment Report – The Point Mission Bay”, prepared by Tonkin & Taylor, dated October 2025. The consent holder must provide verification in writing from an SQEP that the recommendations of this report have been implemented on the Site. This must be provided no later than ten (10) working days after completion of basement construction.

Damage Avoidance

4. All excavation, dewatering systems, retaining structures, basements and works associated with the diversion or taking of groundwater, must be designed, constructed and maintained so as to avoid damage to land, buildings, structures and services on the site and adjacent properties, outside that considered as part of the application process unless otherwise agreed in writing with the asset owner.

Alert and Alarm Levels

5. The activity must not cause any settlement or movement greater than the Alarm Level thresholds specified in **Schedule A** below. Alert and Alarm Levels are triggered when the following Alert and Alarm Trigger thresholds are exceeded:

Schedule A: Alarm and Alert Levels

Movement (Note 1)		**Trigger Thresholds (+/-)**	
		Alarm	**Alert**
a)	Differential vertical settlement between any two Ground Surface Settlement Monitoring Stations (the **Differential Ground Surface Settlement Alarm or Alert Level**):		
	GS01 to GS12	1:550	1:450
b)	Total vertical settlement between the pre-excavation baseline level at any Ground Surface Settlement Monitoring Station (the **Total Ground Surface Settlement Alarm or Alert Level**):		
	GS01 to GS04	15mm	25mm
	GS05 to GS12	10mm	20mm

Note	(1)	The locations of the Monitoring Stations listed in Schedule A are shown on the Proposed Construction Monitoring Instrumentation Plan included in Appendix A of the GSCMP referenced in **Attachment 1**.

These levels may be amended subject to approval by the Council as part of the GSMCP certification process and recommendations from a SQEP, but only to the extent that avoidance of Damage to building, structures and Services can still be achieved.

***Advice note**: There are conditions below that must be complied with when the Alert and Alarm Level triggers are exceeded. These include actions that must be taken immediately including seeking the advice of a SQEP.*

Alert Level Actions

6. In the event of any Alert Level from **Schedule A** (**Condition 5**) being exceeded, the consent holder must:

(a) Notify the Council within twenty-four hours (24) of the exceedance.

(b) Re-measure all Monitoring Stations within twenty (20) metres of the affected monitoring location(s) to confirm the extent of apparent movement.

(c) Ensure the data is reviewed, and advice provided, by a SQEP on the need for mitigation measures or other actions necessary to avoid further deformation. Where mitigation measures or other actions are recommended those measures must be implemented.

(d) Submit a written report, prepared by the SQEP responsible for overviewing the monitoring, to the Council within five (5) working days of Alert Level exceedance. The report must provide an analysis of all monitoring data relating to the exceedance, actions taken to date to address the issue, recommendations for additional monitoring (i.e. the need for increased frequency or repeat Condition Survey(s)) and recommendations for future remedial actions necessary to prevent Alarm Levels being exceeded.

(e) Measure and record all Monitoring Stations within twenty (20) metres of the location of any Alert Level exceedance every two (2) working days until such time the written report referred to above has been submitted to the Council.

Alarm Level Actions

7. In the event of any Alarm Level from **Schedule A** (**Condition 5**) being exceeded, the consent holder must:

(a) Immediately halt construction activity relevant to the location of the Alarm Level exceedance, including excavation, dewatering, or any other works that may result in increased deformation, unless halting the activity is considered by a SQEP to be likely to be more harmful (in terms of effects on the environment) than continuing to carry out the activity.

(b) Notify the Council within twenty-four (24) hours of the Alarm Level exceedance being detected and provide details of the measurements taken.

(c) Take advice from the author of the Alert Level exceedance report (if there was one) on actions required to avoid, remedy or mitigate adverse effects on ground, buildings or structures that may occur as a result of the exceedance.

(d) Not resume construction activities (or any associated activities), halted in accordance with paragraph (a) above, until any mitigation measures have been implemented to the satisfaction of a SQEP.

(e) Submit a written report, prepared by the SQEP responsible for overviewing the monitoring on the mitigation measures implemented, and any remedial works and/or agreements with affected parties within five (5) working days of recommencement of works.

Groundwater Settlement Monitoring and Contingency Plan (GSMCP)

8. At least ten (10) working days prior to the intended Commencement of Dewatering, a final GSMCP prepared by SQEP, must be submitted to the Council for certification. Any amendment of the GSMCP must also be submitted to the Council for certification. The submitted information must be generally in accordance with the draft GSMCP prepared by Tonkin + Taylor.

The overall objective of the GSMCP is to set out the practices and procedures to be adopted to ensure compliance with the consent conditions. To achieve this objective, the final GSMCP must include, at a minimum, the following information:

(a) A monitoring location plan showing the location and type of all Monitoring Stations.

(b) Final completed **Schedule B** (as per the conditions below) for the ground surface monitoring programme (including any proposed changes to the monitoring frequency) as required by the conditions below.

(c) All monitoring data and the identification of services susceptible to damage required by the conditions below.

(d) A bar chart or a schedule, showing the timing and frequency of Condition Surveys, External Visual Inspections, and all other monitoring required by this consent, and a sample report template for the two (2)-monthly monitoring required by **Condition 14**.

(e) All Alert and Alarm Level triggers (including reasons if changes to such are proposed, for example as a result of recommendations in the Services Condition Surveys (required by **Condition 10**) or data obtained from pre-dewatering monitoring).

(f) Details of the contingency actions to be implemented if Alert or Alarm Levels are exceeded.

9. All construction, dewatering, monitoring and contingency actions must be carried out in accordance with the certified GSCMP. No Bulk Excavation (that may affect groundwater levels) or other dewatering activities must commence until the GSMCP is certified in writing by the Council.

Services Condition Surveys

10. The consent holder must engage a SQEP to undertake pre-condition and post-condition surveys for the following underground services:

(a) Service ID 2000609020 (Stormwater 450 dia. Conc);

(b) Service ID 2000403490 (Stormwater 375 dia. Conc);

(c) Service ID 300135283,3000135314 and 2000154512 (Stormwater 225 dia. Conc)

(d) Service ID 2000158462 and 2000616277 (Wastewater 150 dia. VC)

11. The Condition Survey required by **Condition 10** must include the following:

(a) Type of services.

(b) Existing levels of damage.

(c) Susceptibility of structure to further movement.

(d) Photographic evidence of items (b), (c) and (d) via CCTV Survey.

(e) A review and the suitability of the proposed Alarm and density of building deformation stations.

A reasonable attempt must be made to contact the service owner to carry out surveys and if access is not made available, the reasons must be recorded.

A copy of the pre-condition and post condition surveys must be provided to the Council within twenty (20) working days following completing the survey.

Advice note: *This condition does not apply to any Service where written evidence is provided to the Council that the owner of that Service has confirmed they do not require a condition survey.*

External Visual Inspections during Construction Phase Dewatering

12. External Visual Inspections of the surrounding ground within 10m of the basement excavation must be undertaken for the purpose of detecting any new external Damage or deterioration of existing external Damage. Inspections must be carried out fortnightly from the Commencement to Completion of Dewatering. A photographic record must be kept, including time and date, of each inspection and all observations made during the inspection, and must be of a quality that is fit for purpose.

The results of the External Visual Inspections and an assessment of the results must be reviewed by the SQEP responsible for overviewing the monitoring and must be included in the bimonthly monitoring report required by **Condition 16** for the relevant monitoring period.

Advice note: *This condition does not apply to any land, building or structure where written evidence is provided to the Council confirming that the owner of the land, building or structure does not require visual inspections to be carried out.*

Completion of Dewatering - Services Condition Surveys

13. Between six (6) and twelve (12) months after the Completion of Dewatering, a detailed Condition Survey of all previously surveyed Services referenced in **Condition 10** must be undertaken by a SQEP and a written report must be prepared. The report must be prepared and/or reviewed by the SQEP responsible for overviewing the monitoring and submitted to the Council, within 20 working days of completion of the Condition Survey.

The Condition Survey report must make specific comment on those matters identified in the Condition Surveys required by **Condition 10**. It must also identify any new Damage that has occurred since the condition surveys were undertaken and must provide an assessment of the likely cause of any such Damage.

Advice note: *This condition does not apply to any building, structure or Service where written evidence is provided to the Council confirming that the owner of that building, structure, or Service does not require a condition survey to be undertaken.*

Ground Surface Deformation Monitoring

14. Ground Surface Deformation Monitoring Stations must be established and maintained in the locations shown on the monitoring location plan in the certified GSMCP, as required in accordance with **Condition 8(a)**.

The Monitoring Stations must be monitored at the frequency set out in **Schedule B** below. The purpose of the Monitoring Stations is to record any vertical or horizontal (including differential) movement. Benchmark positions must be established no less than twenty (20) metres away from the excavated area.

The monitoring frequency may be changed through amendment to the GSMCP.

Schedule B: Monitoring frequency		
Monitoring period	**Monitoring station and type**	
	GS01 to GS12	**Services Condition Survey**
Pre-Commencement of Dewatering/Baseline	At least two (2) baseline surveys for all deformation points to a horizontal and vertical accuracy of +2mm.	Pre-construction Condition Survey prior to commencement of perimeter retaining walls construction or commencement of dewatering.
From Commencement of Dewatering/Excavation	Fortnightly to Completion of Excavation. Fortnightly following Completion of Excavation.	Fortnightly external visual inspections.
After Completion of Dewatering/Excavation	Monthly for six (6) months or until such a time following the completion of dewatering that stable measurements are demonstrated, and written approval for monitoring termination is granted from the Council.	Post-construction Condition Survey within six (6) months of the Completion of Dewatering.

Contingency Actions

15. If the consent holder becomes aware of any Damage to buildings, structures or Services potentially caused wholly, or in part, by the exercise of this consent, the consent holder must:

(a) Notify the Council and the asset owner within two (2) working days of the consent holder becoming aware of the Damage.

(b) Provide a report prepared by a SQEP (engaged by the consent holder at their cost) that describes the Damage, identifies the cause of the Damage, identifies methods to remedy and/or mitigate the Damage that has been caused, identifies the potential for further Damage to occur, and describes actions that will be taken to avoid further Damage.

(c) Provide a copy of the report, prepared under (b) above, to the Council and the asset owner within ten (10) working days of notification under (a) above.

(d) Where the report provided by the SQEP in accordance with (b) above identifies the cause of the Damage to be activities authorised by this consent, the consent holder must offer to and, if accepted by the asset owner, rectify the Damage at the consent holder's cost, as soon as practicable, in consultation with the asset owner.

Advice note: *It is anticipated the consent holder will seek the permission of the damaged asset owner to access the property and asset to enable the inspection/ investigation. It is understood that if access is denied the report will be of limited extent.*

Reporting of Monitoring Data

16. At two (2) monthly intervals, until the Completion of Dewatering, and at six (6) monthly intervals until twelve (12) months following Completion of Dewatering, a report containing all monitoring data required by conditions of this consent must be submitted to the Council. This report must include a construction progress timeline, the monitoring data recorded in that period, and a comparison of that data with previously recorded data and with the Alert and Alarm Levels for each Monitoring Station.

Notice of Completion

17. The Council must be advised in writing within ten (10) working days of when Bulk Excavation and Completion of Dewatering has been completed.

Groundwater Maintenance Program

18. Within twelve (12) months of Completion of Dewatering, the Council must be provided with a maintenance program for any permanent groundwater drainage system used to manage groundwater levels.

Advice note**:** *The consent holder is advised that the discharge of pumped groundwater to a stormwater system or waterbody will need to comply with any other regulations, bylaws or discharge rules that may apply.*

www.tonkintaylor.com