



Box: 7 of 9 - Depth: 19.30m to 22.20m of 28.50m

Date Drilled 26/04/2022 to 27/04/2022 - Date Photographed: 27/04/2022



Box: 8 of 9 - Depth: 22.20m to 25.50m of 28.50m

Date Drilled 26/04/2022 to 27/04/2022 - Date Photographed: 27/04/2022

Project Eastern Busway
Location Reserve: 1R Burswood Drive

HOLE IDENTIFICATION **DH319_P**



Box: 9 of 9 - Depth: 22.50m to 28.50m of 28.50m

Date Drilled 26/04/2022 to 27/04/2022 - Date Photographed: 27/04/2022

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 412354.13mE 794688.02mN
 Orientation -90° Elevation 4.19m
 Location Reserve: 23R Kenwick Place
 Feature Retaining Wall

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
FILL 0.0m: FILL comprising clay and sand. 1.0m: ALLUVIUM comprising clay and peat.			HA						100		0.0m: Topsoil. 0.1m: Organic CLAY; black. Firm, moist, high plasticity 0.2m: Pumice SAND; whitish grey. Dense, dry, well graded.	
			HQ3						100		1.0m: Spongy PEAT; black. Wet, moist, high plasticity.	
TAURANGA GROUP	ss 1,0,1, 1,2,1 N=5		SPT						100		1.5m: Silty CLAY; brown. Firm, moist, high plasticity. Trace organics.	1.7
			HQ3						100		2.2m: Spongy PEAT; black. Wet, moist, high plasticity.	
	76/17 ss 0,0,1, 1,1,2 N=5		SPT	HWT					100		2.4m: Silty CLAY; brown. Stiff, moist, high plasticity. 2.6m: Becomes bluish grey. 3.0m: 114mm diameter HWT casing to 3.0m.	3.1
			HQ3						100			
	ss 1,0,1, 1,1,1 N=4		SPT						100		5.0m: Becomes soft.	4.8
			HQ3						100			
	ss 0,1,0, 0,0,0 N=0		SPT						100		6.0m: Spongy PEAT; black. Wet, moist, high plasticity.	
			HQ3						100		6.45m: Silty CLAY with some fine micaceous sand; bluish grey. Firm, moist, high plasticity. 6.75m: Sand ceases.	
	58/1 ss 0,0,1, 1,2,1 N=5		SPT						100		7.2 to 9.6m: Stiff.	
			HQ3						100			
		SPT						100		9.6m: Organic CLAY with minor fine to coarse sand lenses; dark brown. Soft, moist, high plasticity.		
For explanation of symbols and observations, see key sheet			RELATIVE STRENGTH		WEATHERING		Date logged 26/01/2022		Driller McMillan			
FLUID DEPTHS AND DRILLING PROGRESS (m)			VS - Very strong		UW - Unweathered		Logged SK		Started			
Date Time Drilled Depth Casing Depth Fluid Depth			S - Strong		SW - Slightly weathered		Checked GP		25/01/2022			
25/01/2022 14:00 19.95 3.0 3.1			MS - Moderately strong		MW - Moderately weathered				Finished			
26/01/2022 08:00 19.95 3.0 1.7			W - Weak		HW - Highly weathered				26/01/2022			
26/01/2022 13:30 25.81 3.0 4.8			VW - Very weak		CW - Completely weathered				Drill Rig			
			EW - Extremely weak						N119			
Hand Held Shear Vane			Remarks						Core Boxes 10			
DR1980: 19mm (A). Calibrated 28/06/21. CF's: A = 1.781, B = -11.22			Hole backfilled with grout upon completion.						Page 1 of 8			
vane shear strength per NZGS guideline			Horizontal / Vertical Survey Datums: NZGD2000 / Mount Eden 2000 / New Zealand Vertical Datum 2016									

2021 EB DRILLHOLE LOG 2022-03-17 SBS MASTER.GPJ BASE.GDT 17/03/22

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 412354.13mE 794688.02mN
 Orientation -90° Elevation 4.19m
 Location Reserve: 23R Kenwick Place
 Feature Retaining Wall

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values 0 - 50									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
TAURANGA GROUP	48/7 SS 0,0,0 0,0,0 N=0 SUOW		HQ3						100		9.6m: Organic CLAY with minor fine to coarse sand lenses; dark brown. Soft, moist, high plasticity. (continued)	
			SPT						100	10.5m: Silty CLAY with minor fine micaceous sand and trace organics; bluish grey. Firm, moist, high plasticity.		
EAST COAST BAYS FORMATION	SS 0,0,0 0,0,0 N=0 SUOW		HQ3						100		12.5m: Clayey SILT, grey.	
			SPT						100	13.7m: Moderately weathered, grey, fine to coarse SANDSTONE. Extremely weak.		
			HQ3						100	15.9 to 16.4m: Broken by drilling into coarse gravel.		
			SPT						100	16.05m: Moderately weathered, grey, SILTSTONE. Extremely weak to very weak. 16.5 to 16.65m: SANDSTONE bed.		
			HQ3						100	17.45 to 17.5m: Fine SANDSTONE bed.		
			SPT						100	18.2m: MW, fine to coarse SANDSTONE. EW.		
			HQ3						100	18.45m: Moderately weathered, grey, SILTSTONE. Extremely weak, moderately thickly bedded.		
			SPT						100			
			HQ3						100			
			SPT						100			

2021 EB DRILLHOLE LOG 2022-03-17 SBS MASTER.GPJ BASE.GDT 17/03/22

For explanation of symbols and observations, see key sheet

FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth	RELATIVE STRENGTH VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak	WEATHERING UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered	Date logged 26/01/2022 Logged SK Checked GP	Driller McMillan Started 25/01/2022 Finished 26/01/2022 Drill Rig N119 Core Boxes 10
Hand Held Shear Vane DR1980: 19mm (A). Calibrated 28/06/21. CF's: A = 1.781, B = -11.22 <i>vane shear strength per NZGS guideline</i>	Remarks Hole backfilled with grout upon completion. Horizontal / Vertical Survey Datums: NZGD2000 / Mount Eden 2000 / New Zealand Vertical Datum 2016			Page 2 of 8

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 412354.13mE 794688.02mN
 Orientation -90° Elevation 4.19m
 Location Reserve: 23R Kenwick Place
 Feature Retaining Wall

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0-100%</small>	Relative Strength <small>MS S W VW EW</small>	Rock Weathering <small>SW MW HW CW</small>	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values <small>0 - 50</small>									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
EAST COAST BAYS FORMATION 20.0m: Moderately weathered, grey, fine to coarse SANDSTONE. Extremely weak. 21.03m: Moderately weathered, grey, SILTSTONE. Extremely weak, moderately thinly to moderately thickly bedded, poorly defined. 21.8 to 21.95m: Fine to medium SANDSTONE bed. 23.5 to 23.6m: Fine SANDSTONE bed 23.6 to 25.13m: Very weak. 24.0 to 24.27m: Fine to medium SANDSTONE bed. 24.7m: Apparent shell fossil. 25.13m: Moderately weathered, grey, fine SANDSTONE. Very weak.			HQ3				20.0		60		20.0m: Fine to coarse SAND; grey. 20.0 to 20.63m: Disturbed by drilling. 20.63 to 21.0m: Core Loss.	[Instrumentation]
	ss 3,5,6,7,8,9 N=30		SPT				21		100		21.03m: Clayey SILT, grey. 21.45 to 21.7m: Poorly defined laminated structure, gently inclined.	
			HQ3				22		100			
	ss 4,6,6,7,9,10 N=32		SPT				23		100		23.01m: With moderately widely spaced drilling breaks.	
			HQ3				24		100		23.6 to 23.7m: J, 60°	
	ss 8,14,27,23 for 55mm N>50		SPT				25		100		25.13m: With closely spaced drilling breaks.	
		HQ3				26				DH320 terminated at 25.81m Depth Criteria Achieved		
	ss 9,13,17,27,6 for 10mm N>50		SPT				27		100			
							28					
							29					

For explanation of symbols and observations, see key sheet

FLUID DEPTHS AND DRILLING PROGRESS (m)
 Date Time Drilled Depth Casing Depth Fluid Depth

RELATIVE STRENGTH
 VS - Very strong
 S - Strong
 MS - Moderately strong
 W - Weak
 VW - Very weak
 EW - Extremely weak

WEATHERING
 UW - Unweathered
 SW - Slightly weathered
 MW - Moderately weathered
 HW - Highly weathered
 CW - Completely weathered

Date logged 26/01/2022
 Logged SK
 Checked GP

Driller McMillan
 Started 25/01/2022
 Finished 26/01/2022
 Drill Rig N119
 Core Boxes 10

Remarks
 Hole backfilled with grout upon completion.

Horizontal / Vertical Survey Datums: NZGD2000 / Mount Eden 2000 / New Zealand Vertical Datum 2016

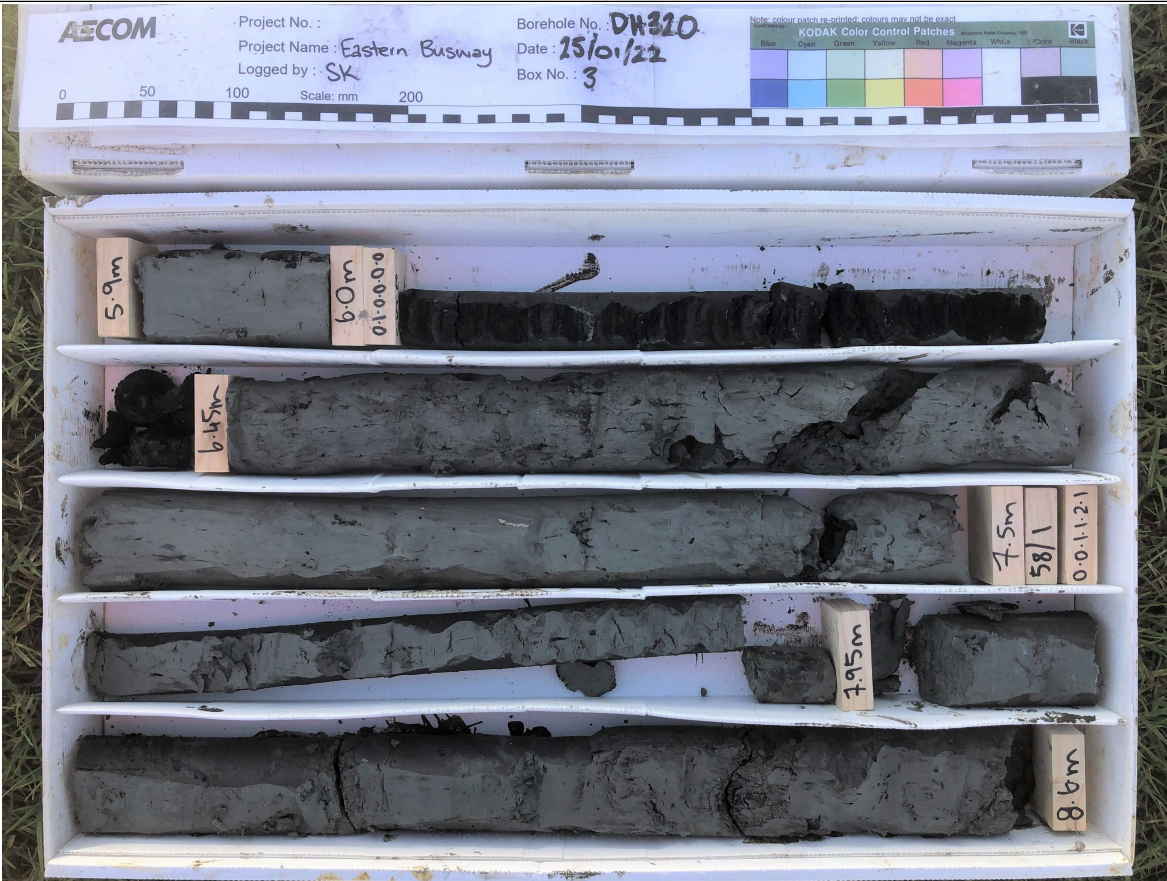
Hand Held Shear Vane
 DR1980: 19mm (A). Calibrated 28/06/21. CF's: A = 1.781, B = -11.22
 vane shear strength per NZGS guideline



Box: 1 of 10 - Depth: 00.00m to 03.00m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



Box: 2 of 10 - Depth: 03.00m to 05.90m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



Box: 3 of 10 - Depth: 05.90m to 08.60m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



Box: 4 of 10 - Depth: 08.60m to 11.40m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022

Project Eastern Busway
 Location Reserve: 23R Kenwick Place

HOLE IDENTIFICATION **DH320**



Box: 5 of 10 - Depth: 11.40m to 14.15m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



Box: 6 of 10 - Depth: 14.15m to 17.00m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



Box: 7 of 10 - Depth: 17.00m to 19.00m of 25.81m

Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



Box: 8 of 10 - Depth: 19.00m to 21.65m of 25.81m

Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 26/01/2022



Box: 9 of 10 - Depth: 21.65m to 23.65m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 26/01/2022



Box: 10 of 10 - Depth: 23.65m to 25.81m of 25.81m
 Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 26/01/2022

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 411731.67mE 795021.63mN
 Orientation -90° Elevation 10.99m
 Location 22 Tullis Place
 Feature Zone 5 ground conditions/Busway through burswood residential area

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc.)</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS MS W VW EW</small>	Rock Weathering <small>SW MW HW CW</small>	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm) <small>400 300 200 100 50 0</small>	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values <small>0 - 50</small>									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
0.0m: TOPSOIL											0.0m: Silty CLAY with trace rootlets; brown. Stiff, wet, high plasticity.	
0.25m: ALLUVIUM comprising of Silt, Clay, and Organics	79/24		VAC EX						0		0.25m: Silty CLAY with minor fine sand and trace fine gravels; brown with orange mottling. Very stiff, moist, high plasticity.	
	141/64										0.75 to 1.2m: Micaceous	
	173/90											
	176/90											
	180/69	SS 1,1,1, 2,2,2 N=7	SPT						100		1.9m: Becomes blue with orange and grey mottling	
TAURANGA GROUP	131/29	SS 1,1,0, 2,1,2 N=5	SPT						100		2.9m: Becomes light brown with orange and blue mottling	
	14/2		HQ3						29		3.5m: Organic CLAY; dark brown. Very soft, wet, high plasticity. 3.75 to 4.5m: Core loss	
			PT						100		4.5m: Push tube only went 300mm, encountered basalt. Basalt in bottom of tube.	
<p><i>For explanation of symbols and observations, see key sheet</i></p> <p>FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth</p>			<p>RELATIVE STRENGTH</p> <p>VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak</p>		<p>WEATHERING</p> <p>UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered</p>		<p>Date logged 24/11/2022</p> <p>Logged SK</p> <p>Checked GP</p>		<p>Driller McMillan Started 23/11/2022 Finished 24/11/2022 Drill Rig N119 Core Boxes 8</p>			
<p>Hand Held Shear Vane DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876 vane shear strength per NZGS guideline</p>			<p>Remarks</p> <p>Hole drilled to confirm extent of basalt. Hand shear measurements to 1.5m are undertaken downhole. Shear vane readings below 1.5m are taken from the end of the barrel. Corrected values present on the log. Hole backfilled with grout.</p>		<p>Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016</p>		<p>Page 1 of 9</p>					

2021 EB DRILLHOLE LOG 2023-05-15 MASTER.GPJ BASE.GDT 16/05/23

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 411731.67mE 795021.63mN
 Orientation -90° Elevation 10.99m
 Location 22 Tullis Place
 Feature Zone 5 ground conditions/Busway through burswood residential area

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
4.8m: Slightly weathered, dark grey, moderately vesicular 1-20mm BASALT. Very strong. <i>(continued)</i> 5.3m: Slightly weathered, dark grey, slightly vesicular 1-10mm BASALT. Very strong.		0 - 50							100 [42]		5.25 to 5.36m: J, 65°, Ud, Ro, Cg, Cl, Bluish grey clay infill, parallel fractures 1cm apart 5.4 to 5.46m: J, 60°, Ud, Ro, Cg, Cl, Bluish grey clay coating, healed joint parallel 1cm apart 5.9 to 5.92m: DB, 0°, Drill break	
	AUCKLAND VOLCANIC FIELD			HQ3			6					
7.2m: ALLUVIUM comprising Silt, Clay, Organics and Sand									100 [80]		7.2m: Silty fine to medium SAND; black. Medium dense, wet, poorly graded. 7.8m: Organic CLAY; dark brown. Firm, moist, high plasticity. 8.05m: Silty CLAY; bluish grey. Very stiff, moist, high plasticity. 8.5m: Becomes with minor organic streaks.	
	TAURANGA GROUP			HQ3			7					6.67
										100		
										100		7.55
	SS 1,2,2, 3,2,3 N=10		SPT			8						
									100		9.35m: Organic silty CLAY with some fine sand; black. Stiff, moist, high plasticity. 9.55m: Silty, fine, pumice SAND with trace organics and obsidian; light grey. Very dense, moist, uniformly graded.	
			HQ3			9						

2021 EB DRILLHOLE LOG 2023-05-15 MASTER.GPJ BASE.GDT 16/05/23

<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH	WEATHERING	Date logged 24/11/2022	Driller McMillan Started 23/11/2022 Finished 24/11/2022 Drill Rig N119 Core Boxes 8
FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth 23/11/2022 16:30 24.00 2.8 6.67 24/11/2022 10:00 24.00 2.8 7.55				VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak	UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered	Logged SK Checked GP	
Hand Held Shear Vane DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876 vane shear strength per NZGS guideline				Remarks Hole drilled to confirm extent of basalt. Hand shear measurements to 1.5m are undertaken downhole. Shear vane readings below 1.5m are taken from the end of the barrel. Corrected values present on the log. Hole backfilled with grout.		Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016	
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Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 411731.67mE 795021.63mN
 Orientation -90° Elevation 10.99m
 Location 22 Tullis Place
 Feature Zone 5 ground conditions/Busway through burswood residential area

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure. Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
TAURANGA GROUP		0 - 50	HQ3						100		9.9m: Organic, silty CLAY; dark brown. Soft, moist, high plasticity. (continued)	
	ss 10,16,20 23,7 for 30mm N>50		SPT						100		10.2m: Silty, fine, pumice SAND with trace organics and obsidian; light grey. Very dense, moist, uniformly graded.	
			HQ3						100		10.85m: Organic CLAY; dark brown. Soft, moist, high plasticity. Trace decomposed wood, spongy in places.	
			SPT						100		11.9m: Silty CLAY with trace organics; bluish grey. Soft, moist, high plasticity.	
	ss 0,0,0, 0,1,0 N=1		HQ3						100			
	ss 0,0,0, 0,0,1 N=1		SPT						100			
	33/6		HQ3						100		14.5 to 15.6m: Firm with some fine micaceous sand	
For explanation of symbols and observations, see key sheet			RELATIVE STRENGTH		WEATHERING		Date logged 24/11/2022		Driller McMillan			
FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth			VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak		UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered		Logged SK Checked GP		Started 23/11/2022 Finished 24/11/2022 Drill Rig N119 Core Boxes 8			
Hand Held Shear Vane DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876 vane shear strength per NZGS guideline			Remarks Hole drilled to confirm extent of basalt. Hand shear measurements to 1.5m are undertaken downhole. Shear vane readings below 1.5m are taken from the end of the barrel. Corrected values present on the log. Hole backfilled with grout.									
			Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016						Page 3 of 9			

2021 EB DRILLHOLE LOG 2023-05-15 MASTER.GPJ BASE.GDT 16/05/23

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 411731.67mE 795021.63mN
 Orientation -90° Elevation 10.99m
 Location 22 Tullis Place
 Feature Zone 5 ground conditions/Busway through burswood residential area

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records <small>Shear Vane/ SPT N Values</small>	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0-100%</small>	Relative Strength <small>MS, S, W, VW, EW</small>	Rock Weathering <small>SW, MW, HW, CW</small>	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
TAURANGA GROUP	0-50 0,0,1,1,1,1 N=4	SPT						100		11.9m: Silty CLAY with trace organics; bluish grey. Soft, moist, high plasticity. (continued)	
		HQ3				16		100		15.6m: Organic CLAY; dark brown. Firm, moist, high plasticity.	
	0,1,2,2,2,3 N=9	SPT						100		16.15m: Silty CLAY with trace fine micaceous sand; bluish grey. Stiff, moist, high plasticity.	
		HQ3						100		17.05 to 17.1m: Organic band	
	96/21 0,0,1,1,1,1 N=4	SPT						100			
		HQ3						100		18.55m: Spongy PEAT; black. Firm, moist, high plasticity.	
19.0m: Highly weathered, fine SANDSTONE. Extremely weak. 19.3m: Moderately weathered, grey, fine to medium SANDSTONE. Extremely weak. 19.63m: Grades to very weak	5,23,45,5 for 5mm N>50	SPT						100		19.0m: Recovered as silty, fine to medium SAND; grey. Very dense, moist, poorly graded.	
										19.87 to 20.04m: HJ, 90°, Ud, Ro, T	
For explanation of symbols and observations, see key sheet				RELATIVE STRENGTH		WEATHERING		Date logged 24/11/2022		Driller McMillan	
FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth				VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak		UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered		Logged SK Checked GP		Started 23/11/2022	
Hand Held Shear Vane DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876 vane shear strength per NZGS guideline				Remarks Hole drilled to confirm extent of basalt. Hand shear measurements to 1.5m are undertaken downhole. Shear vane readings below 1.5m are taken from the end of the barrel. Corrected values present on the log. Hole backfilled with grout.						Finished 24/11/2022	
				Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016						Drill Rig N119 Core Boxes 8	
										Page 4 of 9	

2021 EB DRILLHOLE LOG 2023-05-15 MASTER.GPJ BASE.GDT 16/05/23

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 411731.67mE 795021.63mN
 Orientation -90° Elevation 10.99m
 Location 22 Tullis Place
 Feature Zone 5 ground conditions/Busway through burswood residential area

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
19.75m: Slightly weathered, grey, massive, VOLCANICLASTIC SANDSTONE. Weak. Subangular fine to medium gravel clasts, dark grey, light grey, red. (continued)		0 - 50	HQ3				21		100 [54]		19.88 to 23.9m: DB, 0°, Drill breaks 31 No. 20.29 to 20.57m: J, 85°, Ud, Ro 20.57 to 20.73m: HJ, 90°, Ud, Ro, T 20.73 to 20.8m: J, 70°, Ud, Ro	
			HQ3				22		100 [65]		21.7 to 21.74m: J, 45°, Ud, Ro 21.9 to 22.01m: J, 60°, Ud, Ro	
			HQ3				23		100 [37]		23.34 to 23.37m: J, 30°, Ud, Ro 23.94 to 24m: HJ, 60°, Ud, Ro	
							24				DH321 terminated at 24.0m	
<p>For explanation of symbols and observations, see key sheet</p> <p>FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth</p>			<p>RELATIVE STRENGTH</p> <p>VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak</p>		<p>WEATHERING</p> <p>UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered</p>		<p>Date logged 24/11/2022</p> <p>Logged SK</p> <p>Checked GP</p>		<p>Driller McMillan</p> <p>Started 23/11/2022</p> <p>Finished 24/11/2022</p> <p>Drill Rig N119</p> <p>Core Boxes 8</p>			
<p>Hand Held Shear Vane</p> <p>DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876</p> <p>vane shear strength per NZGS guideline</p>			<p>Remarks</p> <p>Hole drilled to confirm extent of basalt. Hand shear measurements to 1.5m are undertaken downhole. Shear vane readings below 1.5m are taken from the end of the barrel. Corrected values present on the log. Hole backfilled with grout.</p>		<p>Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016</p>		<p>Page 5 of 9</p>					

2021 EB DRILLHOLE LOG 2023-05-15 MASTER.GPJ BASE.GDT 16/05/23



Box: 1 of 8 - Depth: 00.00m to 05.30m of 24.00m

Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 2 of 8 - Depth: 05.30m to 08.00m of 24.00m

Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 3 of 8 - Depth: 08.00m to 10.83m of 24.00m
 Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 4 of 8 - Depth: 10.83m to 14.15m of 24.00m
 Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 5 of 8 - Depth: 14.15m to 16.95m of 24.00m
 Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 6 of 8 - Depth: 16.95m to 19.73m of 24.00m
 Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 7 of 8 - Depth: 19.73m to 21.80m of 24.00m
 Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022



Box: 8 of 8 - Depth: 21.80m to 24.00m of 24.00m
 Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 412397.84mE 794695.97mN
 Orientation -90° Elevation 6.44m
 Location Reserve: 23R Kenwick Place
 Feature Retaining Wall

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0-100%</small>	Relative Strength <small>MS MSW VW W</small>	Rock Weathering <small>SW MW HW</small>	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm) <small>400 300 200 100 50 0</small>	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure. Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation	
	Shear Vane/ SPT	SPT N Values <small>0 - 50</small>									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>		
0.0m: TOPSOIL.											0.0m: Topsoil.		
0.2m: ALLUVIUM comprising clay, sand, silt, organic clay and peat.			HA				1		100		0.2m: Silty fine to medium SAND; whitish grey. Very dense, dry, well graded. (Pumice).		
	ss 0,0,0, 1,0,1 N=2		SPT				2		100		1.3m: Silty CLAY with some fine to medium sand; brownish grey with light grey and orange staining/mottling. Firm, moist, high plasticity.		
			HQ3						100				
	ss 1,2,2, 3,2,3 N=10		SPT				3		100				
			HQ3						100				
	ss 0,1,1, 1,1,1 N=4		SPT				5		100				
			HQ3						100				
	ss 0,0,0, 0,0,1 N=1		SPT				6		100			3.35m: Silty CLAY; bluish grey. Stiff, moist, high plasticity.	
			HQ3						100				
ss 0,0,1, 0,1,2 N=4		SPT				7		100			6.35m: Spongy PEAT; black. Firm, moist, high plasticity.		
		HQ3						100			6.55m: Organic CLAY with decomposed wood flecks; dark brown. Soft, moist, high plasticity.		
ss 0,0,1, 0,1,2 N=4		SPT				8		100			7.05m: Silty fine to medium SAND with some clay and trace organics; brown. Medium dense, moist, well graded. 7.35m: Becomes bluish grey.		
		HQ3						100			7.5m: Silty CLAY with trace fine micaceous sand and organics; bluish grey. Stiff, moist, high plasticity.		
ss 0,0,0, 0,0,0 N=0 SUOW		SPT				9		100			8.7m: Becomes firm.		
		HQ3						100			9.7 to 10.35m: With some fine to medium sand.		

For explanation of symbols and observations, see key sheet

FLUID DEPTHS AND DRILLING PROGRESS (m)			
Date Time	Drilled Depth	Casing Depth	Fluid Depth
21/01/2022 17:15	19.50	13.4	3.4
24/01/2022 08:30	19.50	13.4	2
24/01/2022 11:45	27.00	13.4	1.6

RELATIVE STRENGTH	WEATHERING
VS - Very strong	UW - Unweathered
S - Strong	SW - Slightly weathered
MS - Moderately strong	MW - Moderately weathered
W - Weak	HW - Highly weathered
VW - Very weak	CW - Completely weathered
EW - Extremely weak	

Date logged 24/01/2022
 Logged SK
 Checked GP

Driller McMillan
 Started 20/01/2022
 Finished 24/01/2022
 Drill Rig N119
 Core Boxes 9

Remarks
 50 mm standpipe piezometer installed on completion.
 Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016

Hand Held Shear Vane

vane shear strength per NZGS guideline

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 412397.84mE 794695.97mN
 Orientation -90° Elevation 6.44m
 Location Reserve: 23R Kenwick Place
 Feature Retaining Wall

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values 0 - 50									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
TAURANGA GROUP	ss 0.4,5, 3,3,2 N=13		HQ3						100		7.5m: Silty CLAY with trace fine micaceous sand and organics; bluish grey. Stiff, moist, high plasticity. (continued)	[Instrumentation symbols]
			SPT						100		10.35 to 10.4m: Fine to medium SAND with some organics.	
			HQ3						100		10.6m: Silty fine to medium SAND with trace organics; grey. Medium dense, moist, well graded.	
	ss 1,1,2, 2,2,3 N=9		SPT						100			
EAST COAST BAYS FORMATION			HQ3						100		12.8m: Becomes very dense.	
	ss 2,2,4, 3,5,4 N=16		HWT SPT						100		13.09m: Clayey SILT; grey. Very stiff. 13.09 to 13.16m: Silty fine SAND. 13.26 to 13.31m: Silty fine SAND. 13.5m: 114mm diameter HWT casing to 13.5m.	
			HQ3						100		14.25 to 14.32m: Silty fine to medium SAND.	
	ss 5,9,16, 14,13,7 for 40mm N>50		SPT						100		14.9m: Silty fine to coarse SAND; grey. Very dense.	
			HQ3						100		15.7m: Clayey SILT; grey. Very stiff to hard.	
	ss 2,3,4, 5,7,10 N=26		SPT						100			
			HQ3						100		16.9m: Silty fine to coarse SAND; grey. Medium dense.	
	ss 4,6,8, 9,11,11 N=39		SPT						100		17.7m: Clayey SILT; grey. Very stiff to hard.	
			HQ3						100			
	ss 6,8,10, 12,13,15 for 70mm		SPT						99		19.6 to 19.7m: Fine to medium SAND.	
For explanation of symbols and observations, see key sheet			RELATIVE STRENGTH		WEATHERING		Date logged 24/01/2022		Driller McMillan			
FLUID DEPTHS AND DRILLING PROGRESS (m) Date Time Drilled Depth Casing Depth Fluid Depth			VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak		UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered		Logged SK Checked GP		Started 20/01/2022			
Hand Held Shear Vane			Remarks 50 mm standpipe piezometer installed on completion.						Finished 24/01/2022			
vane shear strength per NZGS guideline			Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016						Drill Rig N119 Core Boxes 9			
									Page 2 of 8			

2021 EB DRILLHOLE LOG 2022-04-12 SBS MASTER.GPJ BASE.GDT 12/04/22

Client Auckland Transport
 Project Eastern Busway
 Project number 60644113

Co-ordinates 412397.84mE 794695.97mN
 Orientation -90° Elevation 6.44m
 Location Reserve: 23R Kenwick Place
 Feature Retaining Wall

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc.)</small>	Test Records		Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS S W VW EW</small>	Rock Weathering <small>SW MW HW</small>	Depth	Graphic Log	TCR [RQD] (%)	Spacing of Natural Defects (mm)	SOIL PROPERTIES <small>Subordinate MAJOR minor: colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description, subordinate fraction description, minor fraction description, additional structures, additional information, etc</small>	Instrumentation
	Shear Vane/ SPT	SPT N Values <small>0 - 50</small>									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
EAST COAST BAYS FORMATION 17.7m: Moderately weathered, grey, SILTSTONE. Extremely weak. Very thickly bedded, indistinct. (continued)	N>50		HQ3						100		17.7m: Clayey SILT; grey. Very stiff to hard. (continued) 20.55 to 20.7m: Fine to medium SAND.	[Pattern]
	ss 6,8,11,11,12,14 N=48		SPT				21		100			
			HQ3				22		100			
	ss 14,12,15,20,15		SPT				23		100			
	45mm N>50		HQ3				24		57			
22.45m: MW, grey, fine to coarse SANDSTONE. EW.	ss 8,10,14,13,15,8 for 50mm N>50		SPT				24		100		22.45m: Silty fine to coarse SAND; grey. Very dense. 22.85m: Clayey SILT; grey. Hard.	[Pattern]
			HQ3				25		87			
			HQ3				26		100			
24.8m: Moderately weathered, grey, silty fine to coarse SANDSTONE. Extremely weak.			HQ3				25		87		24.8m: Silty fine to coarse SAND; grey. Very dense.	[Pattern]
25.5m: Moderately weathered, grey, SILTSTONE. Extremely weak. Moderately thickly bedded, indistinct.	ss 9,11,12,16,17,5 for 25mm N>50		SPT				26		100		25.5m: Clayey SILT; grey. Hard. 25.5 to 27.0m: Moderately widely spaced drilling breaks, planar or irregular.	[Pattern]
			HQ3				27		100			
							27				DH322_P terminated at 27.0m Depth Criteria Achieved	[Pattern]
							28					
							29					

For explanation of symbols and observations, see key sheet

FLUID DEPTHS AND DRILLING PROGRESS (m)
 Date Time Drilled Depth Casing Depth Fluid Depth

RELATIVE STRENGTH
 VS - Very strong
 S - Strong
 MS - Moderately strong
 W - Weak
 VW - Very weak
 EW - Extremely weak

WEATHERING
 UW - Unweathered
 SW - Slightly weathered
 MW - Moderately weathered
 HW - Highly weathered
 CW - Completely weathered

Date logged 24/01/2022
 Logged SK
 Checked GP

Driller McMillan
 Started 20/01/2022
 Finished 24/01/2022
 Drill Rig N119
 Core Boxes 9

Remarks
 50 mm standpipe piezometer installed on completion.

Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016

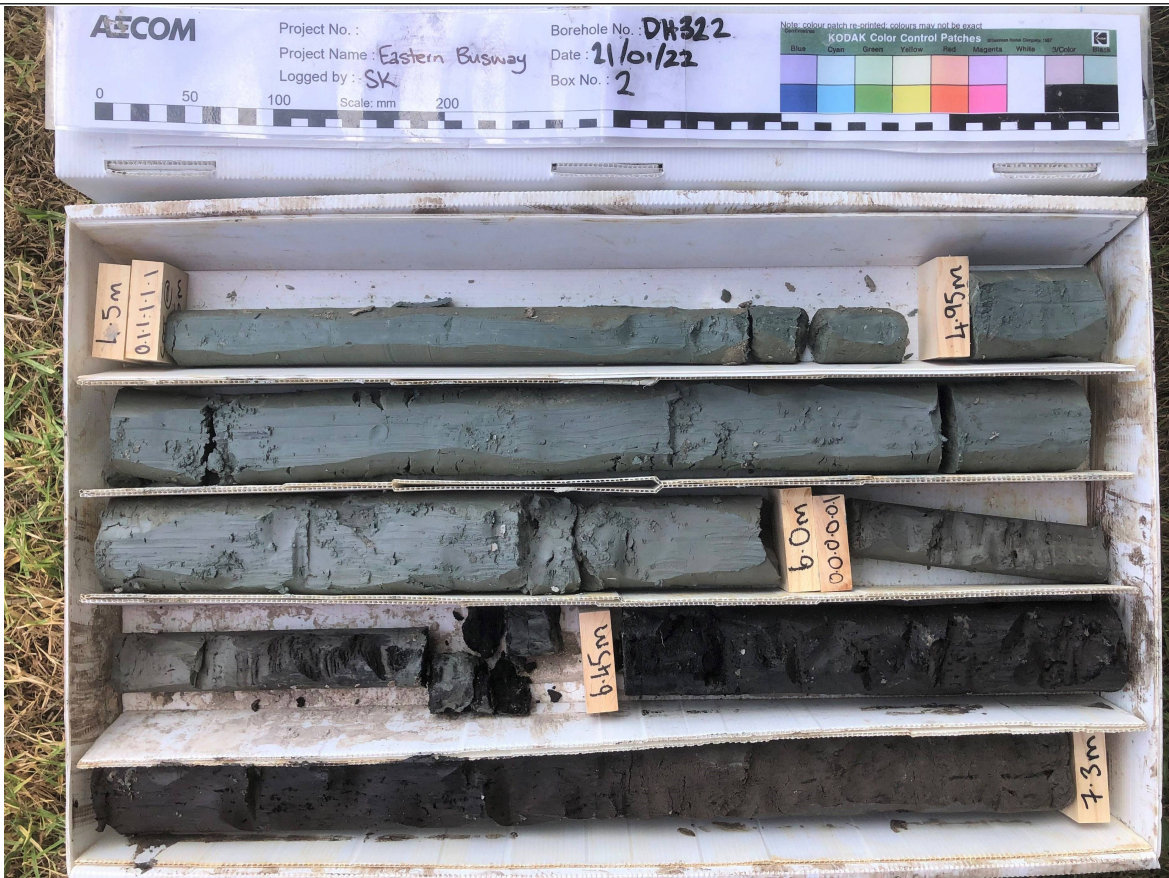
Hand Held Shear Vane

vane shear strength per NZGS guideline



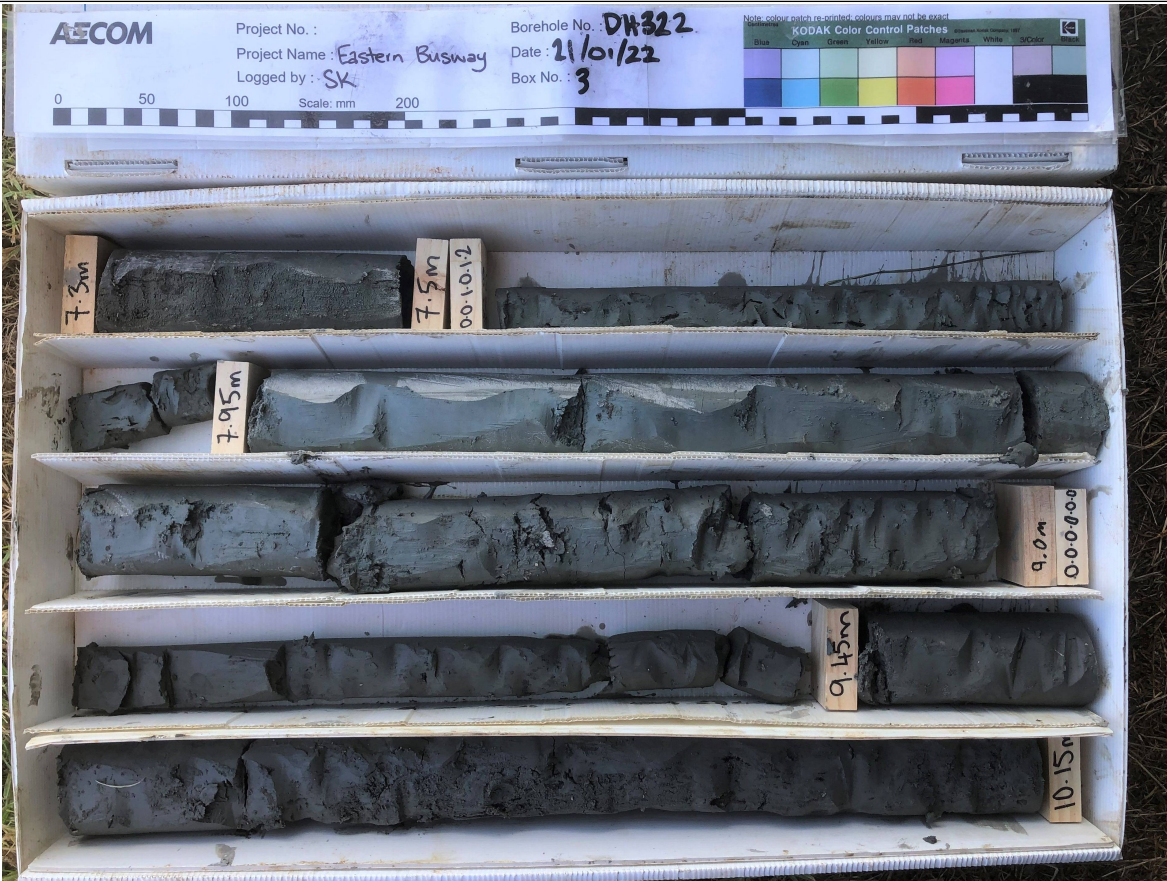
Box: 1 of 9 - Depth: 01.50m to 04.50m of 27.00m

Date Drilled 20/01/2022 to 24/01/2022 - Date Photographed: 21/01/2022



Box: 2 of 9 - Depth: 04.50m to 07.30m of 27.00m

Date Drilled 20/01/2022 to 24/01/2022 - Date Photographed: 21/01/2022



Box: 3 of 9 - Depth: 07.30m to 10.15m of 27.00m

Date Drilled 20/01/2022 to 24/01/2022 - Date Photographed: 21/01/2022



Box: 4 of 9 - Depth: 10.15m to 12.90m of 27.00m

Date Drilled 20/01/2022 to 24/01/2022 - Date Photographed: 21/01/2022