

Page 7 of 8





#### Auckland Transport Client

#### . \_ \_

# HOLE IDENTIFICATION

#### 794688.02mN Co-ordinates 412354.13mE

**DH320** 

Instrumentation

Orientation -90° Elevation 4.19m

DE w	EOLOGICAL ESCRIPTION 'eathering, Colour, Fabric, ROCK NAME. rength, Discontinuities, Lithological Features edding, foliation, mineralogy, cement, etc).	Test Shear Vane/ SPT	Record SPT N Valu 0 - 5	Drilling N	Core Loss/Lift	Ms Relative W Strength	www Www Weathering	Depth	Graphic Log	TCR [RQD] (%)	500 Spacing of 100 Matural 10 Defects	DEFECT DESCRIPTION
FILL	0.0m: FILL comprising clay and sand.							-		100		0.0m: Topsoil. 0.1m: Organic CLAY; black. Firm, moist, high plasticity 0.2m: Pumice SAND; whitish grey. Dense, dry, we graded.
	1.0m: ALLUVIUM comprising clay and peat.			     HQ3				- 1 - - -	F TF TF TF TF TF TF TF F TF TF TF TF TF TF TF TF TF TF TF TF TF TF TF TF TF T	100		1.0m: Spongy PEAT; black. Wet, moist, high plasticity.
		ss 1,0,1, 1,2,1 N=5		SPT				2	* *_ *	100		1.5m: Silty CLAY; brown. Firm, moist, high plasticity. Trace organics.
				       HQ3 				-	<u>     x </u>	100		2.2m: Spongy PEAT; black. Wet, moist, high plasticity. 2.4m: Silty CLAY; brown. Stiff, moist, high plasticity
		76/17 ss 0,0,1, 1,1,2 N=5		II II HW SPT				- 		100		2.6m: Becomes bluish grey. 3.0m: 114mm diameter HWT casing to 3.0m.
				         HQ3				 4 4	8 - X - X 8 - X - X	100		
ЧР		ss 1,0,1, 1,1,1 N=4		     SPT 	_                         			- - - - - 5		100		
TAURANGA GROUP				         ноз					* *	100		5.0m: Becomes soft.
TAUR		ss 0,1,0, 0,0,0			-       -       			- - 6 -	77 77 77 77 7 77 77 77 77 77 77 77 8 7 77 77 77 8 7 77 77 7	100		6.0m: Spongy PEAT; black. Wet, moist, high plasticity.

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

0,0,0 N=0				plasticity.		
58/1 ss 0,0,1, 1,2,1 N=5 33/3 ss 0,0,0 0,00 N=0 SUOW				<ul> <li>6.45m: Silty CLAY with some fine m oluish grey. Firm, moist, high plastic 6.75m: Sand ceases.</li> <li>7.2 to 9.6m: Stiff.</li> </ul>	ity.	
				9.6m: Organic CLAY with minor fine enses; dark brown. Soft, moist, high		
For explanation of symbols and observations, s	ee key sheet	RELATIVE STRENGTH	WEATHERING	Date logged 26/01/2022	Driller	
FLUID DEPTHS AND DRILLING PROGI Date Time Drilled Depth Casing De		VS - Very strong S - Strong MS - Moderately strong	UW - Unweathered SW - Slightly weathered MW - Moderately weathered	Logged SK	McMillan Started	
25/01/2022 14:0019.953.026/01/2022 08:0019.953.0	3.1 1.7	W - Weak VW - Very weak EW - Extremely weak	HW - Highly weathered CW - Completely weathered	Checked GP	25/01/2022 Finished	
26/01/2022 13:30 25.81 3.0	4.8		ith grout upon comp	oletion. NZGD2000 / Mount Eden	26/01/2022 Drill Rig N119	
Hand Held Shear Vane			and Vertical Datum:		Core Boxes	10
DR1980: 19mm (A). Calibrated 28/06/21. CF's: A = 1.76	81, B = -11.22					
vane shear strength per NZGS guideline					Page 1 of	8
						17/03/2022



#### Client Auckland Transport

Project

## Eastern Busway

Eastern Busway

HOLE IDENTIFICATION

# **DH32**

Co-ordinates 412354.13mE 794688.02mN

Orientation -90° Elevation 4.19m

Reserve: 23R Kenwick Place Location

Pr	oject number 606441	13						Mort lace	
				1 I I I		⊢e	ature Retaining Wall		
D w s	EOLOGICAL ESCRIPTION Veathering, Colour, Fabric, ROCK NAME. trength, Discontinuities, Lithological Features vedding, foliation, mineralogy, cement, etc).	Test Records Shear SPT Vane/ N Values SPT 0-50	Drilling Method Casing remarks	Relative Minimize Strength Minimize Rock Minimize Depth	Graphic Log Graphic Log (%)	500 Spacing of 100 Matural 10 Defects	SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. Str grading, bedding, plasticity, sensitivity, major frac fraction description, minor fraction description, ac information, etc DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear et Schistosity, Attitude, Spacing, continuity,	tion description, subordinate Iditional structures, additional	Instrumentation
Ч		48/7         ss 0,0,0,	HQ3                 				9.6m: Organic CLAY with minor fine lenses; dark brown. Soft, moist, high <i>(continued)</i> 10.5m: Silty CLAY with minor fine minor	plasticity.	
TAURANGA GROUP		0,0,0 N=0 SUOW	SP1                    				and trace organics; bluish grey. Firm plasticity.	i, moist, nign	
TAURA		ss           0,0,0,							
	12.5m: Highly weathered, grey, SILTSTONE. Extremely weak.	0,0,0 N=0 SUOW			x x x x x x x x x x x x x x x x x x x		12.5m: Clayey SILT, grey.		
		89/30 2,3,6,	HQ3           		**************************************				
	13.7m: Moderately weathered, grey, fine to coarse SANDSTONE. Extremely weak.	12,16,16 for 55mm N>50	SPT             				13.7m: Fine to coarse SAND; grey.		
		ss 5,8,12,	HQ3             		100				
FORMATION		3,6,12, 13,14,11 for 60mm N>50	SPT         		100				
BAYS	16.05m: Moderately weathered, grey, SILTSTONE. Extremely weak		HQ3         				15.9 to 16.4m: Broken by drilling into 16.05m: Clayey SILT, grey. With clo drilling breaks.		
EAST COAST	to very weak. 16.5 to 16.65m: SANDSTONE bed.	3,6,11, 10,11,11 N=43	SPT           		**************************************				
	17.45 to 17.5m: Fine SANDSTONE bed.		HQ3		× × × × × × 100 * * * * × × 100 * * * * × × × × × × × × × × × × × × × ×				
	18.2m: MW, fine to coarse	ss 5,6,9, 13,18,10 for	SPT		<u>* × -</u> 100	]             	18.2m: Fine to coarse SAND; grey.		
	SANDSTONE. EW. 18.45m: Moderately weathered, grey, SILTSTONE. Extremely weak, moderately thickly bedded.	35mm 24444444 N>50                               	ндз      		x x x x x x x x x x x x x x x x x x x		18.45m: Clayey SILT, grey. 18.45 to 20.0m: With moderately wid drilling breaks.	lely spaced	
		ss 4,6,7, 7,8,12 N=34	SPT		× + × × × × 100				
	or explanation of symbols and obs			RELATIVE STRENGT	H WEATHI	ERING	Date logged 26/01/2022	Driller	
	LUID DEPTHS AND DRILLIN ate Time Drilled Depth	NG PROGRESS Casing Depth F		VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak	UW - Unweathe SW - Slightly w MW - Moderatel HW - Highly we CW - Complete	eathered ly weathered athered	Logged SK	McMillan Started 25/01/2022 Finished	

Remarks

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

2021

10

of

Drill Rig

N119

Page 2

Core Boxes

26/01/2022



## Client Auckland Transport

Project

## Eastern Busway

Project number 60644113

HOLE
IDENTIFICATION
IDENTIFICATION

## Co-ordinates 412354.13mE 794688.02mN

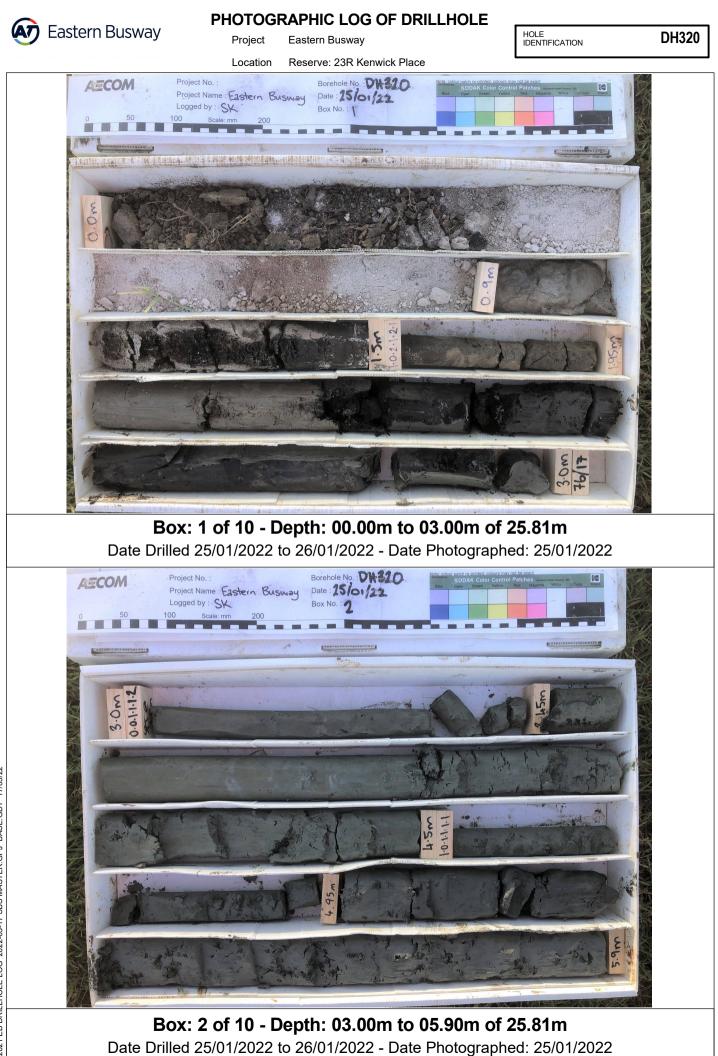
**DH32** 

Orientation -90° Elevation 4.19m

Location Reserve: 23R Kenwick Place

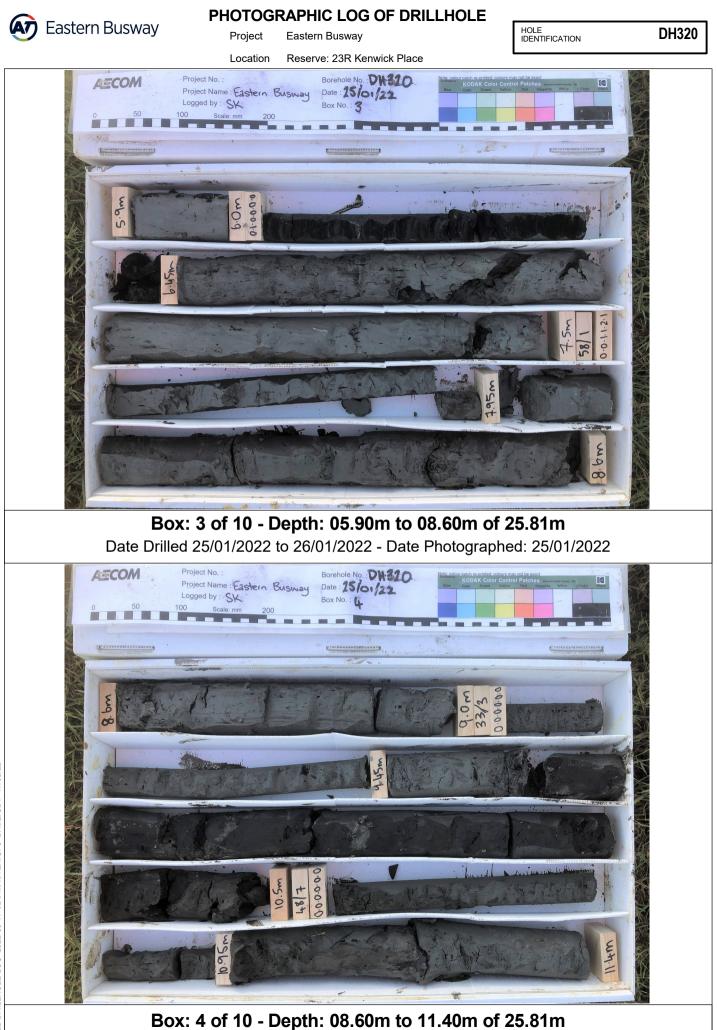
Feature Retaining Wall

D v s	EOLOGICAL ESCRIPTION Veathering, Colour, Fabric, ROCK NAME. trength, Discontinuities, Lithological Features pedding, foliation, mineralogy, cement, etc).		Core Loss/Lift		wwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwwww	Depth	Graphic Log	TCR [RQD] (%)	-500) Spacing of -100 B Natural -10 Defects	SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. Stre grading, bedding, plasticity, sensitivity, major fract fraction description, minor fraction description, ad information, etc DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear a Schistosity, Attitude, Spacing, continuity, r	tion description, subordinate Iditional structures, additional nd Crush Zones, Foliation,	Instrumentation
	20.0m: Moderately weathered, grey, fine to coarse SANDSTONE. Extremely weak.	ндз						60		20.0m: Fine to coarse SAND; grey. 20.0 to 20.63m: Disturbed by drilling. 20.63 to 21.0m: Core Loss.		
	21.03m: Moderately weathered, grey, SILTSTONE. Extremely weak, moderately thinly to	7,8,9 N=30				21		100		21.03m: Clayey SILT, grey. 21.45 to 21.7m: Poorly defined laminate	ed structure,	
RMATION	moderately thickly bedded, poorly defined. 21.8 to 21.95m: Fine to medium SANDSTONE bed.					- 22		100		gently inclined.		
COAST BAYS FORMATION						- 23		100		23.01m: With moderately widely space	ced drilling	
EAST COAS	23.5 to 23.6m: Fine SANDSTONE bed 23.6 to 25.13m: Very weak.	HQ3             HQ3   				- - - - - - -		100		breaks. 23.6 to 23.7m: J, 60°		
	24.0 to 24.27m: Fine to medium SANDSTONE bed.	0, 14,21,         SP1         1           23         1         1         1           for         55mm         1         1         1           N>50         1         1         1         1				- 24 - - - - -	X X X X X X X X X X X X X X X X X X X	100				
	24.7m: Apparent shell fossil. 25.13m: Moderately weathered, grey, fine SANDSTONE. Very weak.	-         HQ3     -				- 25	× × × × × × × × × × × × × × × × × × ×	100		25.13m: With closely spaced drilling I	breaks.	
		27,6 for 10mm N>50 1   1   1 1   1   1   1   1 1   1   1   1   1   1   1   1   1   1				26		100		DH320 terminated at 25.81m Depth Criteria Achieved		
						-						
F	or explanation of symbols and obs LUID DEPTHS AND DRILLIN ate Time Drilled Depth		pth	VS-V S-S MS-M W-V VW-V	/ery stror strong /oderate	ly strong k	UW - SW - MW - HW -	WEATHE Unweather Slightly we Moderately Highly we Completely	ed eathered / weather athered	Checked CP	Driller McMillan Started 25/01/2022 Finished	
D	land Held Shear Vane R1980: 19mm (A). Calibrated 28/06/21 ane shear strength per NZGS guid		Hole Hori	zonta	kfilled al / Ver	tical S	urvey [	Datum	npletion. s: NZGD2000 / Mount Eden n 2016	26/01/2022 Drill Rig N119	10	

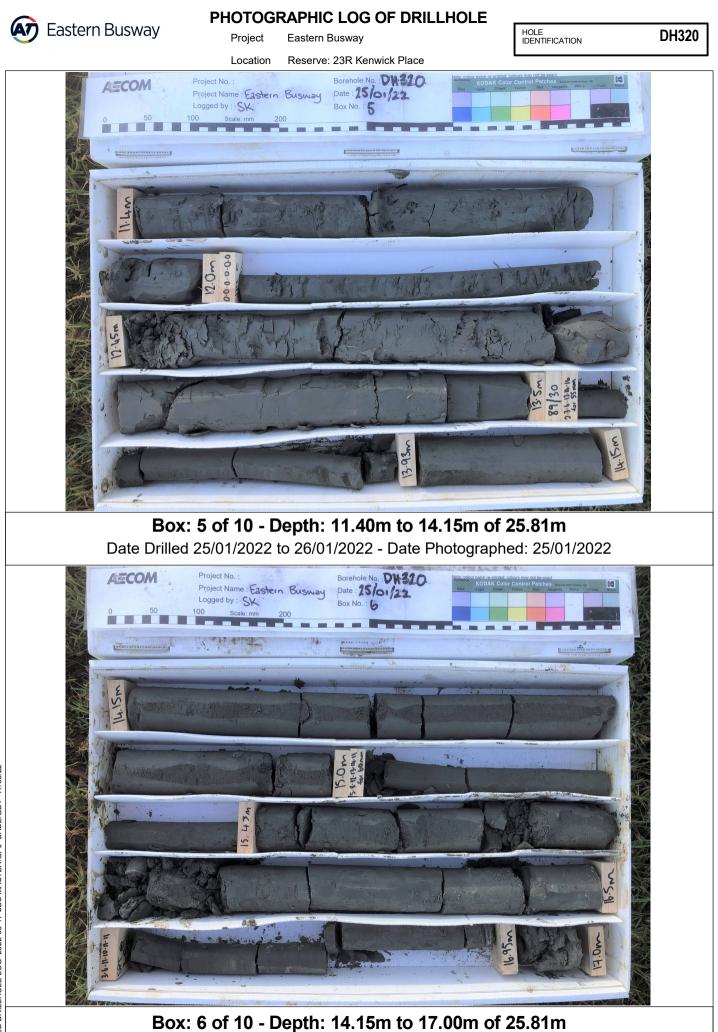


2021 EB DRILLHOLE LOG 2022-03-17 SBS MASTER.GPJ BASE.GDT 17/03/22

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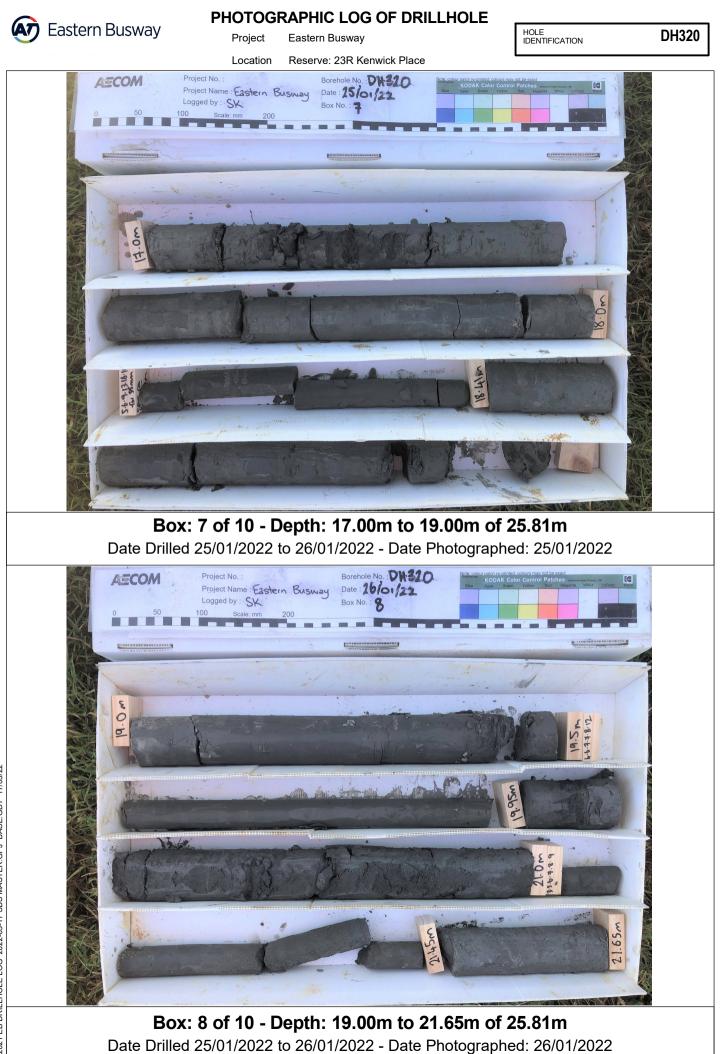
Date Drilled 25/01/2022 to 26/01/2022 - Date Photographed: 25/01/2022



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

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

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



# LOG OF DF

Drilling Method Casing remarks

Test Records

SPT N Values

0 - 50

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Shear Vane/ SPT

79/24

141/64

173/90

176/90

180/69

ss 1,1,1, 2,2,2 N=7

131/29

Core Loss/Lift

XX

VAC EX

SPT

HQ3

114

Relative Strength

∞§≥≶ 100

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#### Client Auckland Transport

Project

## Eastern Busway

Project number 60644113

Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).

comprising of Silt, Clay, and Organics

GEOLOGICAL

DESCRIPTION

0.0m: TOPSOIL

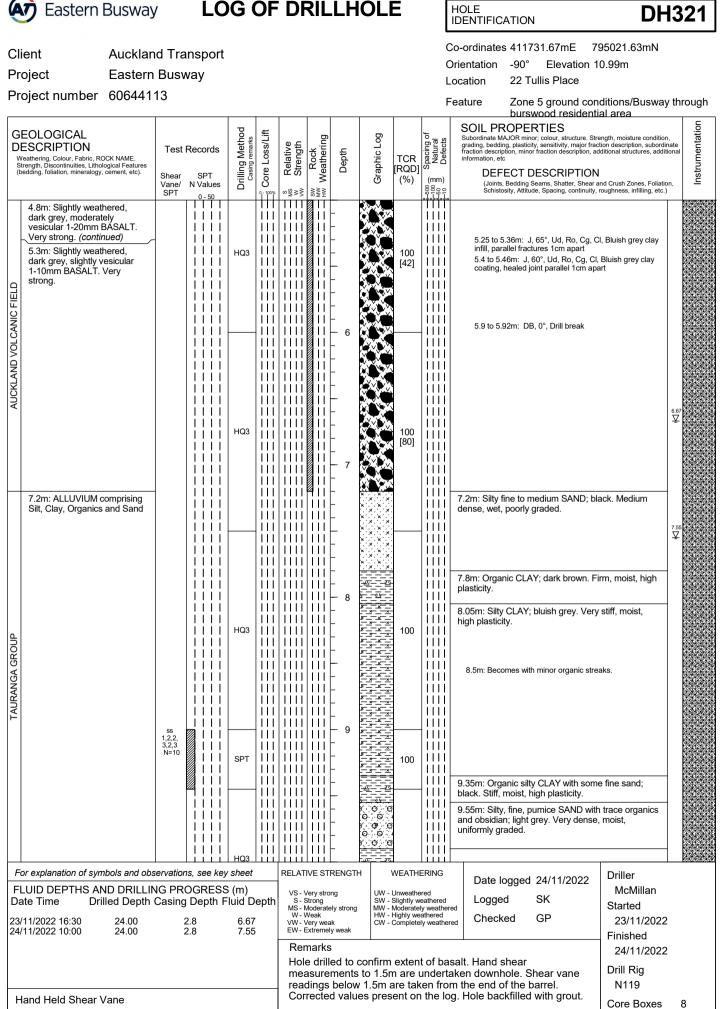
0.25m: ALLUVIUM

R	IL	LH	IOLI	Ε		ŀ	HOLE DENTIFICATION	H3	21
						0	o-ordinates 411731.67mE 795021.63mM rientation -90° Elevation 10.99m ocation 22 Tullis Place	N	
						Fe	eature Zone 5 ground conditions/Busy burswood residential area	vay th	rough
	WW Weathering	Depth	Graphic Log	TCR [RQD] (%)	500 Spacing of Natural	1)	SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. Strength, moisture cond grading, bedding, plasticity, sensitivity, major fraction description, sub fraction description, minor fraction description, additional structures, a information, etc DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear and Crush Zones, For Schistosity, Attitude, Spacing, continuity, roughness, infiling,		Instrumentation
		_	x - x			ļ	0.0m: Silty CLAY with trace rootlets; brown. Stiff, wet, high plasticity.		
		- - - - - - - - - - - -		0		11	0.25m: Silty CLAY with minor fine sand and trace fine gravels; brown with orange mottling. Very stiff, moist, high plasticity. 0.75 to 1.2m: Micaceous		
			F - X	100			1.9m: Becomes blue with orange and grey mottling		
		- 2 - - - - - - - - - - - - 3		100		I I	2.9m: Becomes light brown with orange and blue mottling		
		- - -		100			3.5m: Organic CLAY; dark brown. Very soft, wet,		
		- - - - - - 4 -		29			high plasticity. 3.75 to 4.5m: Core loss		

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

TAURANGA GROUP

ss 1,1,0, 2,1,2 N=5       	PT	-3 5-          - 5-          - 5-          - 5-          - 5-          - 5- 	*     *     *     *     *      *      *		
14/2	Q3		29	3.5m: Organic CLAY; dark brown. V high plasticity. 3.75 to 4.5m: Core loss	/ery soft, wet,
			**** **** **** **** 100	4.5m: Push tube only went 300mm, basalt. Basalt in bottom of tube.	encountered
For explanation of symbols and observations, see key shi FLUID DEPTHS AND DRILLING PROGRESS (n Date Time Drilled Depth Casing Depth Fluid	n)	RELATIVE STRENGTH VS - Very strong S - Strong MS - Moderately strong W- Veak VW- Very weak EW - Extremely weak	WEATHERING UW - Unweathered SW - Slightly weather MW - Moderately weat HW - Highly weathere CW - Completely wea	Date logged 24/11/2022	Driller McMillan Started 23/11/2022 Finished
Hand Held Shear Vane DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876 vane shear strength per NZGS guideline	6	measurements to readings below 1 Corrected values	1.5m are unde .5m are taken f present on the cal Survey Datu	pasalt. Hand shear Intaken downhole. Shear vane rom the end of the barrel. log. Hole backfilled with grout.	24/11/2022 Drill Rig N119 Core Boxes 8 Page 1 of 9



Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden

2000 / New Zealand Vertical Datum 2016

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

DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876

vane shear strength per NZGS guideline

of

Page 2



GEOLOGICAL

DESCRIPTION

# LOG OF DRILLHOLE

Rock Weathering

Depth

Relative Strength

Graphic Log

Drilling Method Casing remarks Core Loss/Lift

Test Records

#### Client Auckland Transport

Project

Eastern Busway

Project number 60644113

Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).

E	Ξ	[	HOLE IDENTIFICATION	1321
		(	Co-ordinates 411731.67mE 795021.63mN Drientation -90° Elevation 10.99m .ocation 22 Tullis Place	
		I	Feature Zone 5 ground conditions/Busway	/ through
	TCR [RQD] (%)	-500) Spacing of -100 Matural -10 (Defects	SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. Strength, moisture condition grading, bedding, plasticity, sensitivity, major fraction description, subordin fraction description, minor fraction description, additional structures, additi information, et: DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliatic Schistosity, Attitude, Spacing, continuity, roughness, infiling, etc.)	nate lunai ional lunai lunai lunai n, on,
	100		<ul> <li>9.9m: Organic, silty CLAY; dark brown. Soft, moist, high plasticity. (continued)</li> <li>10.2m: Silty, fine, pumice SAND with trace organics and obsidian; light grey. Very dense, moist, uniformly graded.</li> </ul>	
	100		10.85m: Organic CLAY; dark brown. Soft, moist, high plasticity. Trace decomposed wood, spongy in	
1,1,1,1,1,2,1,1,1,1,2,1,1,1,1,1,1,1,1,1	100		places.	
1111			11.9m: Silty CLAY with trace organics; bluish grey. Soft. moist. high plasticity.	

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

(bedding, foliation, mineralogy, cement	<sup>t, etc).</sup> Shear Vane/	SPT N Values		Core	Str Re		Grap	[RQD] (%)	(mm)	DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear a Schistosity, Attitude, Spacing, continuity,	and Crush Zones, Foliation,	Instru
	SPT	0 - 50	HQ3	- 100%		}}    -    -		100		9.9m: Organic, silty CLAY; dark brow high plasticity. <i>(continued)</i>		
	ss					-    -    _	00000			10.2m: Silty, fine, pumice SAND with and obsidian; light grey. Very dense uniformly graded.		
	10,16,20 23,7 for 30mm N>50		SPT   				00000 00000 00000	100		10.85m: Organic CLAY; dark brown	Soft moiet	
			HQ3			- 11    -    -    -    -    -    - 		100		high plasticity. Trace decomposed v places. 11.9m: Silty CLAY with trace organic	vood, spongy in	
GROUP			SPT   			-    -    -		100		Soft, moist, high plasticity.		
TAURANGA GROUP	ss 0,0,0, 0,1,0 N=1		HQ3             			    -    -    -    -    -    - 		100				
	0,0,0, 0,0,1 N=1		SPT			-    -    -    -		100				
	33/6		HQ3             			- 14    -    -    -    -    -    -    - 		100		14.5 to 15.6m: Firm with some fine mic	aceous sand	
For explanation of symbols					RELATIV	E STRENGTH	۱ <i>۱</i>	VEATHE	ERING	Date logged 24/11/2022	Driller	
FLUID DEPTHS AND D Date Time Drilled D	Depth Casin			pth	W - We VW - Ver	ong derately strong ak	SW - 9 MW - 1 HW - 1	lighly wea	eathered y weather	Chackad CP	McMillan Started 23/11/2022 Finished	
Hand Held Shear Vane DR1980: 19mm (A). Calibrated J		tion Factor: 1	876		meas readi Corre	drilled to c surements ngs below ected value	to 1.5m 1.5m a es pres	n are u ire tak ent on	inderta en froi the lo	salt. Hand shear aken downhole. Shear vane m the end of the barrel. g. Hole backfilled with grout.	24/11/2022 Drill Rig N119	8
vane shear strength per NZ			.070		Horiz 2000	ontal / Ver / New Zea	tical Su aland V	irvey [ ertical	Datum Datur	s: NZGD2000 - Mount Eden	Page 3 of	9



Remarks

Hole drilled to confirm extent of basalt. Hand shear

2000 / New Zealand Vertical Datum 2016

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

#### Client Α

## Е

HOLE	
TULE	
IDENTIFICATION	

## **DH321**

	Dusway	y										IDENTIFICATION	DH3	21						
Client Project Project number	Aucklar Eastern r 606441	n Busv	-	t							C L	o-ordinates 411731.67mE 7 prientation -90° Elevation ocation 22 Tullis Place eature Zone 5 ground cor		rough						
GEOLOGICAL DESCRIPTION Weathering, Colour, Fabric, F Strength, Discontinuities, Lith (bedding, foliation, mineralog	thological Features	Test Shear Vane/ SPT		illing N Casing re	Core Loss/Lift		wwwwweathering Depth	Graphic Log	TCR [RQE (%)	)] <u>v</u>	Defects	burswood resident burswood resident SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. St grading, bedding, plasticity, sensitivity, major fra fraction description, minor fraction description, a information, etc DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear Schistosity, Attitude, Spacing, continuity	tial area rength, moisture condition, ction description, subordinate dditional structures, additional J and Crush Zones, Foliation,	Instrumentation						
		ss 0,0,1, 1,1,1 N=4		SPT			-      -      -      -      _					11.9m: Silty CLAY with trace organi Soft, moist, high plasticity. <i>(continue</i>								
				HQ3			_       -       -       -       -       -       -		<u>「利口島」「口口」」</u> 100		          	15.6m: Organic CLAY; dark brown. high plasticity.	Firm, moist,							
		ss 0,1,2,									       	16.15m: Silty CLAY with trace fine r bluish grey. Stiff, moist, high plastici	nicaceous sand; ty.							
	2.2.3 N=9		2.2.3 N=9			SPT	- 1   1		-         -         _         _         _         = 17	8	×		       							
				HQ3					가사가사가사가사가사가사			17.05 to 17.1m: Organic band								
	ss 0.0,1	0,0,1,	ss 0,0,1,		ss 0,0,1,		ss 0,0,1,	ss 0,0,1,		SPT			_     _     _     _		시:		          			
								२२ २२ २ २ २२ २२ २२ २२ २२ २२ २२ २ २२ २२ २	4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			18.55m: Spongy PEAT; black. Firm plasticity.	, moist, high							
19.0m: Highly wea SANDSTONE. Ex weak. 19.3m: Moderately	xtremely ly	1							100			19.0m: Recovered as silty, fine to n grey. Very dense, moist, poorly grad	nedium SAND; ded.							
weathered, grey, f medium SANDST Extremely weak. 19.63m: Grades to	TONE.	ss 5,23,45, 5 for 5mm N>50		SPT				8 8 8		-             -       	          	19.87 to 20.04m: HJ, 90°, Ud, Ro, <sup>-</sup>	г							
For explanation of syn FLUID DEPTHS A Date Time Di		NG PR	ROGRES	5 S (m)		VS - V S - S MS - N	VE STRENG	GTH UV ong MV	WEATI / - Unweati / - Slightly / - Modera	HERIN hered weathe	ered	Date logged 24/11/2022 Logged SK	Driller McMillan Started							
						W-V VW-V EW-E	Veak /ery weak Extremely wea	- HV	/ - Highly v / - Comple	veather	ed	Checked GP	23/11/2022 Finished							

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

Hand Held Shear Vane

vane shear strength per NZGS guideline

DR1980: 19mm (A). Calibrated Jun 2022: Correction Factor: 1.876

9 16/05/2023

8

of

24/11/2022

Drill Rig

N119

Page 4

Core Boxes



#### Client Auckland Transport

Project

Eastern Busway

Project number 60644113

HOLE IDENTIFICATION

**DH32** 

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

	GEOLOGICAL DESCRIPTION Weathering, Colour, Fabric, ROCK NAME. Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc).	Test Records Shear SPT Vane/ N Values SPT 0-50	Drilling Method Casing remarks	0 - 100%	s Relative w Strength	>	Depth	Graphic Log	TCR [RQD] (%)	500) Spacing of 100 J Natural 100 Defects	Solid PROPERTIES Subordinate MAJOR minor; colour, structure. Stre grading, bedding, plasticity, sensitivity, major frac fraction description, minor fraction description, ac information, etc DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear a Schistosity, Attitude, Spacing, continuity,	ength, moisture condition, tion description, subordinate Iditional structures, additiona und Crush Zones, Foliation,	Instrumentation
	19.75m: Slightly weathered, grey, massive, VOLCANICLASTIC SANDSTONE. Weak. Subangular fine to medium gravel clasts, dark grey, light grey, red. <i>(continued)</i>		НQ3				- - - - - - - - - - - 21	ୟ କ	100 [54]		19.88 to 23.9m: DB, 0°, Drill breaks 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		
EAST COAST BAYS FORMATION			наз				    222 	8         8	100 [65]		21.7 to 21.74m: J, 45°, Ud, Ro 21.9 to 22.01m: J, 60°, Ud, Ro		
			HQ3				- - - - - - - - - - - - - - - - - - -	କୁ କ	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		
F D	For explanation of symbols and obs		5 (m)		VS- S- MS- W- VW-	Very strong Strong Moderate Weak Very wea Extremely	ng Iy strong Ik	UW - 1 SW - 5 MW - 1 HW - 1	Highly we	red eathered ly weathere	Checked CP	Driller McMillan Started 23/11/2022 Finished	
	Hand Held Shear Vane DR1980: 19mm (A). Calibrated Jun 2022 vane shear strength per NZGS guid		1.876		Hol mea rea Cor Hor	asurei dings recteo rizonta	ed to ments belov d valu al / Ve	s to 1.5n v 1.5m a les pres	n are u are tak ent or urvey l	underta en fror the log Datum	salt. Hand shear aken downhole. Shear vane n the end of the barrel. g. Hole backfilled with grout. s: NZGD2000 - Mount Eden	24/11/2022 Drill Rig N119 Core Boxes Page 5 of	8

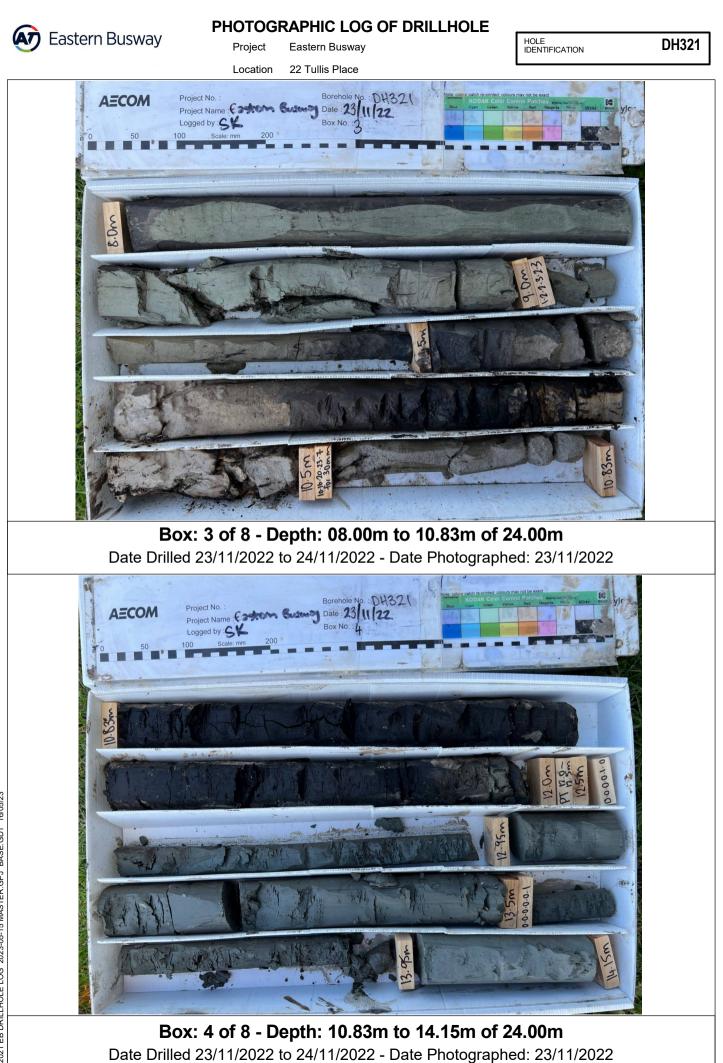
16/05/2023



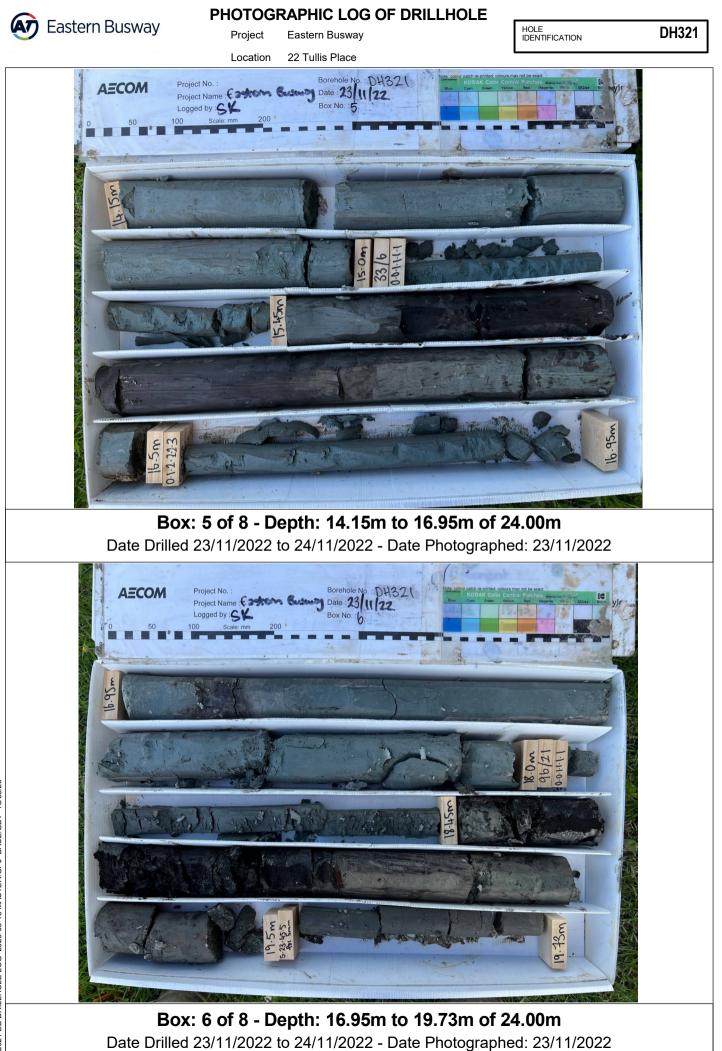
Date Drilled 23/11/2022 to 24/11/2022 - Date Photographed: 23/11/2022

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

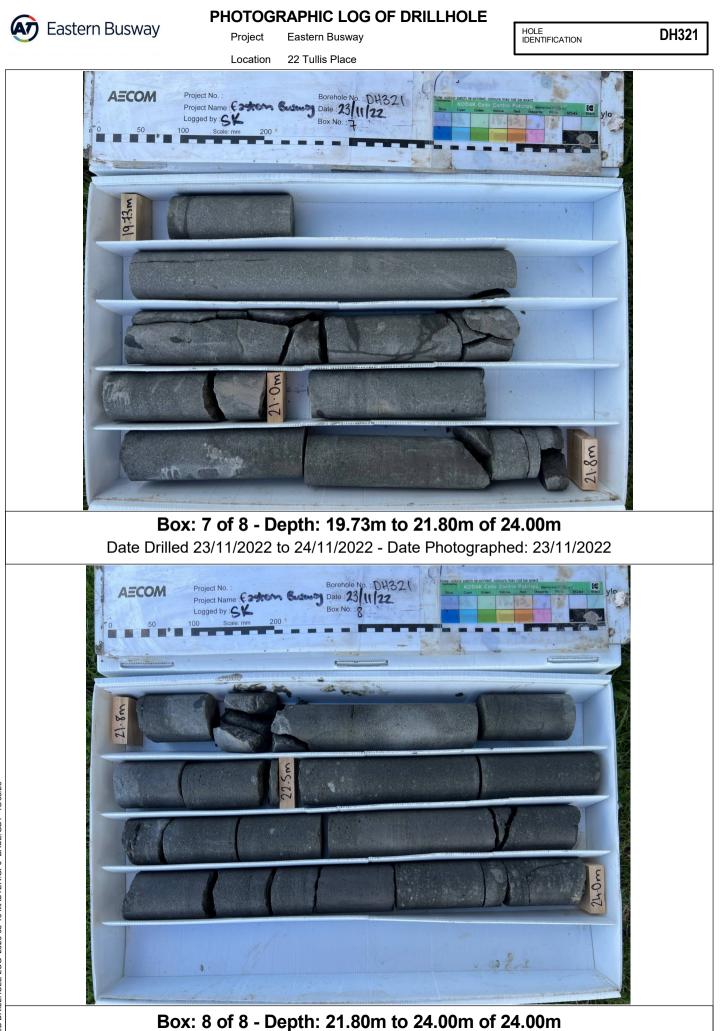
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2021 EB DRILLHOLE LOG 2023-05-15 MASTER.GPJ BASE.GDT 16/05/23



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



## Client Auckland Transport

Project

## t Eastern Busway

Project number 60644113

HOLE IDENTIFICATION

Co-ordinates 412397.84mE 794695.97mN

**DH322** 

Ρ

Orientation -90° Elevation 6.44m

Location Reserve: 23R Kenwick Place

Feature Retaining Wall

	DE	EOLOGICAL ESCRIPTION eathering, Colour, Fabric, ROCK NAME. rength, Discontinuities, Lithological Features edding, foliation, mineralogy, cement, etc).	Test Shear Vane/ SPT	Records SPT N Values	Drilling Method Casing remarks	Core Loss/Lift	s Relative w Strength	>	Depth	Graphic Log	TCR [RQD] (%)	-500 Spacing of	m)	SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. Str grading, bedding, plasticity, sensitivity, major frac fraction description, minor fraction description, at information, etc DEFECT DESCRIPTION (Joints, Bedding Seams, Shatter, Shear Schistosity, Attitude, Spacing, continuity,	tion description, subordinat Iditional structures, addition	Instrumentation
F		0.0m: TOPSOIL.		0 - 50			m		-					0.0m: Topsoil.		
		0.2m: ALLUVIUM comprising clay, sand, silt, organic clay and peat.			HA						100		             	0.2m: Silty fine to medium SAND; w dense, dry, well graded. (Pumice).		
			ss 0,0,0, 1,0,1 N=2		SPT				- - - - - 2		100			<ol> <li>Silty CLAY with some fine to r brownish grey with light grey and ora staining/mottling. Firm, moist, high p</li> </ol>	ange	
					HQ3				- - - - -		100					
			ss 1,2,2, 3,2,3 N=10		SPT				- 3 	x x	100		      -	3.35m: Silty CLAY; bluish grey. Stiff,	moist, high	
					HQ3				- - - - - 4		100		11 11 11 11	plasticity.		
	TAURANGA GROUP		ss 0,1,1, 1,1,1 N=4		SPT				  5 5		100		         			
	TAURAN		ss		HQ3				- - - - - - - - - - - - - - - - - - -	5 - X - X 5 - X 5	100					
			0,0,0, 0,0,1		SPT			!!!	-	<u> </u>	100	11	Ш			
			N=1		HQ3				- - - - - - 7		100		_         	<ul> <li>6.35m: Spongy PEAT; black. Firm, r plasticity.</li> <li>6.55m: Organic CLAY with decompt flecks; dark brown. Soft, moist, high</li> <li>7.05m: Silty fine to medium SAND w and trace organics; brown. Medium</li> </ul>	osed wood plasticity. //ith some clay	
					SPT						100			well graded. 7.35m: Becomes bluish grey. 7.5m: Silty CLAY with trace fine mic: and organics; bluish grey. Stiff, mois plasticity.	aceous sand t, high	
GUI 12/04/22			ss		HQ3				- - - - - - - 9		100			8.7m: Becomes firm.		
EK.GPJ BASE			0,0,0, 0,0,0 N=0 SUOW		SPT					5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X 5 _ X _ X	100			9.7 to 10.35m: With some fine to mediu	im sand	
		, , <b>,</b> , , , , , , , , , , , , , , , ,							<u> </u>	× · · · ·	1		ш			° ° ° °
2022-04-12	For explanation of symbols and observations, seeFLUID DEPTHS AND DRILLING PROGREDate TimeDrilled Depth Casing Dept21/01/2022 17:1519.5013.424/01/2022 08:3019.5013.4				G PROGRESS (m) Casing Depth Fluid Depth 13.4 3.4 13.4 2				RELATIVE STRENGTH VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak			ather	red	Checked GP	Driller McMillan Started 20/01/2022 Finished	
		01/2022 11:45 27.00		3.4	1.6		50 ı Hor	izont	standpi al / Ve	· · · ertical S	urvey [	Dat	ums	led on completion. s: NZGD2000 - Mount Eden	24/01/2022 Drill Rig N119	
	Н	and Held Shear Vane					200	iu / N	ew Ze	aland V	ertical	Da	លោ	12010	Core Boxes	9
	Vá	ane shear strength per NZGS guid	deline												Page 1 of	8



## Client Auckland Transport

Eastern Busway

HOLE IDENTIFICATION

## Co-ordinates 412397.84mE 794695.97mN

**DH322** 

Ρ

Orientation -90° Elevation 6.44m

GEOLOGI DESCRIP Weathering, Colo	TION our, Fabric, ROCK NAME.	Test	Records	Drilling Method Casing remarks	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log	TCR	Spacing of Natural Defects	SOIL PROPERTIES Subordinate MAJOR minor; colour, structure. Strength, moisture conditio grading, bedding, plasticity, sensitivity, major fraction description, subord fraction description, minor fraction description, additional structures, add information, etc	
Strength, Discon	inuities, Lithological Features n, mineralogy, cement, etc).	Shear Vane/ SPT	SPT N Values 0 - 50		Core L	MS Rel	MW Weat	De	Grapl	[RQD] (%)	(mm)	LEFECT DESCRIPTION	
		SS		HQ3						100			
ЧЛ		0,4,5, 3,3,2 N=13		SPT	                 			- 11	× × × ×	100		10.6m: Silty fine to medium SAND with trace organics; grey. Medium dense, moist, well graded.	
TAURANGA GROUP				HQ3						100			
TAU		ss 1,1,2, 2,2,3 N=9		SPT				- 12 - -		100			
	Highly weathered,			HQ3				- - - - - 13		100		12.8m: Becomes very dense. 13.09m: Clayey SILT; grey. Very stiff.	
grey, SIL weak.	grey, SILTSTONE. Extremely	1 1 40 1/4		HWT SPT				- - - - -	× × × × × × × × × × × × × × × × × × ×	100		13.26 to 13.31m: Silty fine SAND. 13.5m: 114mm diameter HWT casing to 13.5m.	
				ндз				- 14 - - - -	· · · · · · · · · · · · · · · · · · ·	100		14.25 to 14.32m: Silty fine to medium SAND.	
grey SAN	oderately d, fine to coarse, IDSTONE. v weak.	ss 5,9,16, 14,13,7 for 40mm N>50		SPT						100		14.9m: Silty fine to coarse SAND; grey. Very dense.	
DILY 15.7m: H grey, SIL weak.	ighly weathered, TSTONE. Extremely	N>50		НQ3					× × × × × × × × × × × × × × × × × × ×	100		15.7m: Clayey SILT; grey. Very stiff to hard.	
IN IN IN IN IN IN IN IN IN IN IN IN IN I		ss 2,3,4, 5,7,10 N=26		SPT					× × × × × × × × × × × × × × × × × × ×	100			
ວ່ grey, fine	ighly weathered, to coarse ONE. Extremely			HQ3	    		- 17 - - -		100		dense.		
weathere SILTSTO	NE. Extremely ry thickly bedded,	ss 4,6,8, 9,11,11 N=39		SPT				18 18 	× × × × × × × × × × × × × × × × × × ×	100			
				НQ3						100			

70mm For explanation of symbols and observations, see key sheet RELATIVE STRENGTH WEATHERING Driller Date logged 24/01/2022 FLUID DEPTHS AND DRILLING PROGRESS (m) VS - Very strong S - Strong MS - Moderately strong W - Weak VW - Very weak EW - Extremely weak McMillan UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered SK Logged Date Time Drilled Depth Casing Depth Fluid Depth Started Checked GP 20/01/2022 Finished Remarks 24/01/2022 50 mm standpipe piezometer installed on completion. Drill Rig Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden N119 2000 / New Zealand Vertical Datum 2016 Hand Held Shear Vane Core Boxes 9 vane shear strength per NZGS guideline Page 2 of 8



#### Client Auckland Transport

Project

### Eastern Busway

HOLE IDENTIFICATION

#### Co-ordinates 412397.84mE 794695.97mN

**DH322** 

Ρ

Orientation -90° Elevation 6.44m

Location Reserve: 23R Kenwick Place

EOLOGICAL ESCRIPTION eathering, Colour, Fabric, ROCK NAME. terrgth, Discontinuities, Lithological Features adding, follation, mineralogy, cement, etc).	Test Reco Shear Si	ords PT	Drilling Method Casing remarks	Core Loss/Lift	Relative Strength	Rock Weathering	Depth	Graphic Log		Spacing of Natural		SOIL PROPERTIES 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 DEFECT DESCRIPTION	Instrumentation
	Vane/ N Va	alues - 50	Ē	0 - 100%	∞ã≥≷			U 	(%)	mm) 1960 1960	.e	(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)	<u></u>
17.7m: Moderately weathered, grey, SILTSTONE. Extremely weak. Very thickly bedded, indistinct. <i>(continued)</i>			HQ3					× × × × × × × × × × × × × × × × × × ×	100			17.7m: Clayey SILT; grey. Very stiff to hard. (continued) 20.55 to 20.7m: Fine to medium SAND.	
	ss 6,8,11, 11,12,14 N=48		SPT				- 21 - -	× × × × × × × × × × × × × × × × × × ×	100				。 。 。 。 。
			HQ3				- 	× × × × × × × × × × × × × × × × × × ×	100				
22.45m: MW, grey, fine to coarse SANDSTONE. EW.	ss 14,12,15, 20,15		SPT				-	× × × ×	100			22.45m: Silty fine to coarse SAND; grey. Very dense.	
22.85m: Moderately weathered, grey, SILTSTONE. Extremely weak. Moderately thickly bedded, indistinct.	- for 45mm N>50     		HQ3				23 		57			22.85m: Clayey SILT; grey. Hard.	
	ss 8,10,14, 13,15,8 for 50mm N>50		SPT				24 24 	× × × × × × × × × × × × × × × × × × ×	100			e e e	。 。 。 。
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.	•
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.	。 。 。 。
			HQ3				- - - - - - - - - - - - - - - - - - -	× × × × × × × × × × × × × × × × × × ×	100			e e e	
							- 28					DH322_P terminated at 27.0m Depth Criteria Achieved	
							- - - - - - - - - - - - - - - - - - -						

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

Remarks

Drilled Depth Casing Depth Fluid Depth

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

50 mm standpipe piezometer installed on completion.

2000 / New Zealand Vertical Datum 2016

Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden

9

of

20/01/2022 Finished

24/01/2022

Started

Drill Rig

N119

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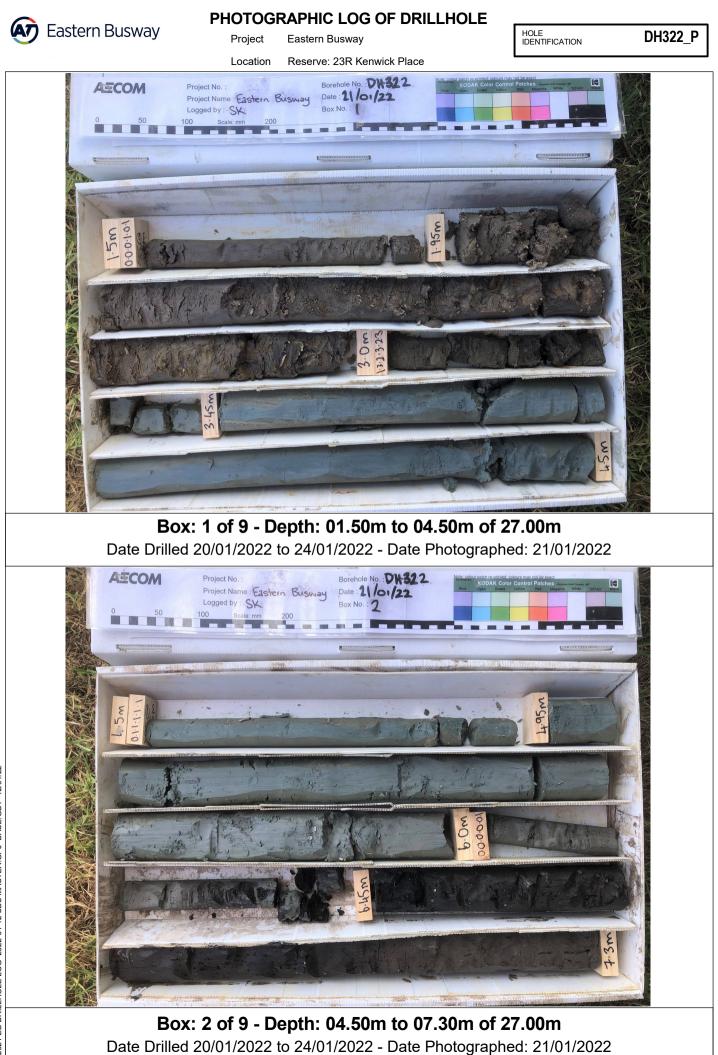
Core Boxes

SK

GP

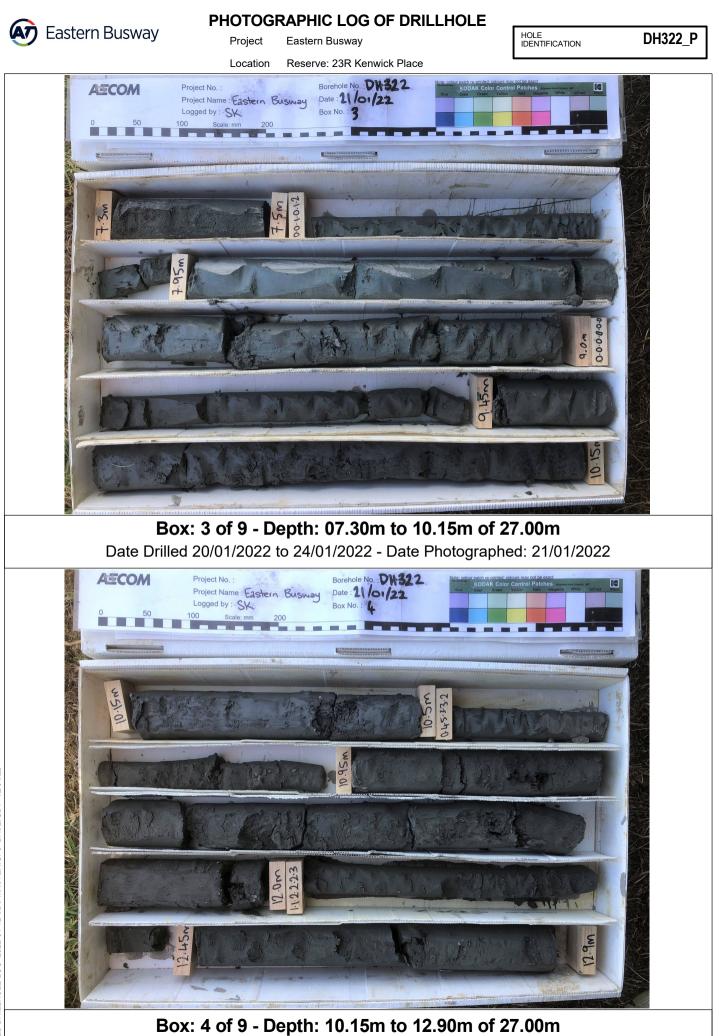
Logged

Checked



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

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

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

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