

# TERMINOLOGY AND SYMBOLS

## Drilling / Investigation Methods

CFHSA	- Continuous Flight Hollow Stem Auger.
CFSSA	- Continuous Flight Solid Stem Auger.
DC	- Dynamic Coring (eg Terrier Rig).
DCP	- Dynamic Cone Penetrometer.
HA	- Hand Auger.
HQ3	- HQ Triple Tube.
HQWL	- HQ Wire Line.
HWOB	- Heavy Weight Open Barrel.
NQ3	- NQ Triple Tube.
NQWL	- NQ Wire Line.
OB	- 100mm diameter Open Barrel.
OB70	- 70mm diameter Open Barrel.
PERC	- Percussion.
PS	- Piston Sample.
PQ3	- PQ Triple Tube.
PQWL	- PQ Wire Line.
RC	- Reverse Circulation.
RCDHH	- Reverse Circulation Down Hole Hammer.
SPT	- Standard Penetration Test.
SPERC	- Sonic Percussion.
PT	- Push Tube Sample
VAC EX	- Vacuum Excavation.
WASH	- Wash Drilling.

## Test Results

SPT "N" value; uncorrected blow count for 300 mm penetration  
# / # / # / # / # / # blows per 75 mm penetration

ss - Standard Penetration Test - split spoon  
sc - Standard Penetration Test - solid cone (no sample recovery)  
SUOW - Sunk Under Own Weight

### Vane Shear Strength Tests

# / # Vane shear strength test results given as peak / remoulded shear strengths (kPa). Test as per NZGS Guideline, 2001.

# = Vane test performed on core recovered prior to extrusion from core barrel.  
\* = Vane test performed on excavated material of suitable size.

UTP - Unable to penetrate.

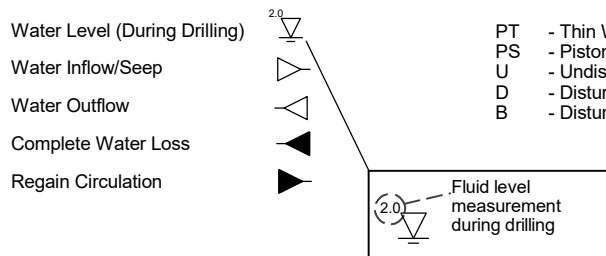
## Unit/Geological Boundary Lines

———— Known  
- - - - Inferred/Unknown

## Installation & Backfill

Standpipe		Grout	
Slotted Standpipe		Cement	
Collapse/Cuttings /Spoil		Gravel Pack Filter	
Bentonite		Sand Pack Filter	
Inclinometer		Gravel Backfill	

## Groundwater Records



## Samples

PT	- Thin Wall Push Sample
PS	- Piston Sample
U	- Undisturbed
D	- Disturbed (Core)
B	- Disturbed (Pit)

## Rock Descriptions

### Relative Strength

ES	- Extremely strong	> 250
VS	- Very Strong	100 - 250
S	- Strong	50 - 100
MS	- Moderately Strong	20 - 50
W	- Weak	5 - 20
VW	- Very Weak	1 - 5
EW	- Extremely Weak	< 1

### Weathering

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

## Soil Descriptions

### Consistency Cohesive Soils

Very Soft	Su (kPa) < 12
Soft	12 - 25
Firm	25 - 50
Stiff	50 - 100
Very Stiff	100 - 200
Hard	200 - 500

### Relative Density Non-cohesive soils

Very Loose	SPT "N" Value (uncorrected) < 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	> 50

## Rock Defect Abbreviations

### Defect Type

BP	= Bedding Plane Defect
CZ	= Crush Zone
DB	= Drilling Break
FZ	= Fracture Zone
HJ	= Healed Joint
J	= Joint
SZ	= Shear Zone
Ve	= Vein

### Defect Aperture

T	= Tight (Nil)
VN	= Very Narrow (>0-2mm)
N	= Narrow (2-6mm)
MN	= Moderately Narrow (6-20mm)
MW	= Moderately Wide (20-60mm)
W	= Wide (60-200mm)
VW	= Very Wide (>200mm)

### Defect Roughness

Pl	= Planar
St	= Stepped
Ud	= Undulating
Ro	= Rough
Sm	= Smooth
Slk	= Slickensided
	= Parallel
Po	= Polished

### Infill Thickness

Sn	= Stained
Vn	= Veneer (<0.5mm)
Cg	= Coating
P	= Partially infilled
C	= Completely infilled

### Infill Colour

bl	= Blue
bn	= Brown
bk	= Black
gn	= Green
gy	= Grey
or	= Orange
pk	= Pink
rd	= Red
wh	= White
ye	= Yellow

### Infill Material

Calc	= Calcareous
Cb	= Carbonaceous
Cc	= Calcite
Cl	= Clay
Fe	= Iron Oxide
Mn	= Manganese
NF	= No Infill
Py	= Pyrite
Qtz	= Quartz
S	= Sand
Slt	= Silt

## Graphic Log (typical symbols)

	Peat		Mudstone
	Clay		Siltstone
	Silt		Sandstone
	Sand		Basalt
	Gravel / Cobbles		No recovery
	Welded Tuff		

## Core Measurements

TCR	= Total Core Recovery
RQD	= Rock Quality Designation

Soil and rock descriptions generally as in "Guidelines for the Field Description of Soil and Rock for Engineering Purposes" by the NZ Geotechnical Society Inc, December 2005.

Client Auckland Transport  
 Project Eastern Busway  
 Project number 60644113

Co-ordinates 411510.79mE 795065.64mN  
 Orientation -90° Elevation 8.88m  
 Location 262 Ti Rakau Drive - China Town  
 Feature Bridge Abutment

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, 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>	
0.0m: FILL comprising silty gravel, cobbles and boulders.			VAC EX						0		0.0m: Vacuum excavation 0.0 to 0.15m: Concrete (car park). 0.15 to 0.75m: Silty fine to coarse GRAVEL with some cobbles and boulders. Densely packed, moist. Gravel, cobbles and boulders are subangular basalt.	
0.75m: SW, dark grey, BASALT. Moderately strong. Highly vesicular (<20%), vesicles typically 5-10mm and up to 60mm. Some iron staining in vesicles.			HQ3				1		100 [100]		1.5 to 2.22m: J, 80°, Ud, Ro, Sn, Fe	
1.7m: Slightly weathered, vesicular, dark grey, BASALT. Strong. Slightly vesicular (<2%). Vesicles up to 5mm.			114 HWT HQ3				2		88 [59]		1.95m: 114mm diameter HWT casing to 1.95m. 2.1 to 2.16m: J, 45°, Ud, Ro, Sn, Fe 2.14 to 2.2m: J, 45°, Ud, Ro, Sn, Fe 2.14 to 2.17m: DB, 60°, Ud, Ro, Sn, Fe 2.27 to 2.46m: J, 85°, Ud, Ro, Sn, Fe 2.46 to 2.49m: J, 20°, Ud, Ro, MN, P, Cl, Stn, Fe. 2.46 to 2.78m: J, 70°, Ud, Ro, Sn, Fe	2.56
4.45 to 4.75m: Slightly vesicular (<5%).			HQ3				4		100 [100]		4.23 to 4.35m: J, 60°, Ud, Ro, Sn, Fe 4.24 to 4.36m: J, 60°, Ud, Ro, Sn, Fe 4.5 to 4.58m: J, 60°, Ud, Ro, Sn, Fe 4.58 to 4.66m: J, 55°, Ud, Ro, VN, Sn, Fe	4.59
4.75m: ALLUVIUM comprising clay, silt, peat and sand.	UTP		HQ3				5		100 [18]		4.75m: Silty CLAY with trace organics; brown mottled orange. Very stiff, moist, high plasticity. 5.3 to 5.6m: Pinkish grey mottled orange.	5.5-5.4
	128/41 ss 1,1,1, 1,2,3 N=7		SPT				6		100		7.3m: CLAY; bluish grey with some orange mottling. Stiff, moist, high plasticity.	
	188/35 ss 1,1,1, 1,2,2 N=6		HQ3				7		100		8.1 to 8.15m: Clayey fine SAND. 8.15m: Silty CLAY with some fine sand; bluish grey. Firm, moist, high plasticity.	
	47/15 ss 0,0,1, 1,0,0 N=2		SPT				8		100		9.5 to 9.8m: Micaceous fine sandy SILT lenses.	
			HQ3				9		100			

For explanation of symbols and observations, see key sheet

FLUID DEPTHS AND DRILLING PROGRESS (m)			
Date Time	Drilled Depth	Casing Depth	Fluid Depth
17/06/2022 16:30	07.95	2.0	2.56
20/06/2022 07:00	07.95	2.0	4.59
20/06/2022 15:45	27.00	2.0	5.45
21/06/2022 07:00	27.00	2.0	5.5

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 20/06/2022 Logged IR/GS Checked GP	Driller McMillan Started 17/06/2022 Finished 20/06/2022 Drill Rig N119 Core Boxes 10
Remarks Flush 50 mm standpipe piezometer installed on completion. DR1980: 19mm blade: Calibrated Jun 2022: Correction Factor: 1.876 used for hand shear vane measurements 9.0m and deeper. Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016			Page 1 of 8

Hand Held Shear Vane  
 DR2272: 19mm blade: Calibrated 02/22: Correction Factor = 1.595  
 vane shear strength per NZGS guideline

Client Auckland Transport  
 Project Eastern Busway  
 Project number 60644113

Co-ordinates 411510.79mE 795065.64mN  
 Orientation -90° Elevation 8.88m  
 Location 262 Ti Rakau Drive - China Town  
 Feature Bridge Abutment

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	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	38/11		HQ3						100		8.15m: Silty CLAY with some fine sand; bluish grey. Firm, moist, high plasticity. (continued)	[Instrumentation symbols]
			PT						100		10.5m: Water return in basalt. No return in alluvium.	
	ss 1.0,1, 1.2,3 N=7		SPT						100		10.75m: Fibrous PEAT; black. Firm, moist, moderately decomposed wood fragments.	
			HQ3						100		11.0m: Organic CLAY; brown. Firm, moist, high plasticity.	
	131/38 ss 0,1,1, 1,2,1 N=5		SPT						100		11.2m: CLAY with trace indistinct organics; light bluish grey. Very stiff, moist, high plasticity.	
			HQ3						100		12.4m: With some fine sand.	
	12.6m: HW, grey, fine to medium SANDSTONE. EW. 12.8m: MW, grey, fine to medium SANDSTONE. VW.			HQ3					100		12.6m: Fine to medium SAND; grey.	
	13.35m: HW, grey, SILTSTONE. EW. 13.6m: MW, grey, fine SANDSTONE. Very weak.	225* ss 3,8,12, 15,16,7 for 25mm N>50		SPT					100		13.35m: Clayey SILT with trace fine siltstone gravel; grey	
	13.9m: Slightly weathered, grey, SILTSTONE. Very weak.			HQ3					100		13.9m: Gently inclined very thinly to moderately thinly bedded. 13.9 to 15m: DB, 5°, 6 No.	
	14.53m: Slightly weathered, grey, fine SANDSTONE. Very weak.			SPT					100		15.35 to 16.5m: DB, 0°, 3 No. 15.4 to 15.5m: Fine sandy SILTSTONE.	
EAST COAST BAYS FORMATION	15.3m: Slightly weathered, grey, SILTSTONE. Very weak. Gently inclined, very to moderately thinly bedded.	9,14,18, 20,12 for 50mm N>50		HQ3					100 [100]		16.02m: BP, 5°, VN, C, Slt 16.15 to 16.35m: Very thin silt beds.	[Instrumentation symbols]
	16.1m: Slightly weathered, grey, thickly bedded, fine to medium SANDSTONE. Very weak.	sc 15,35 for 70mm N>50		SPT					0		17.4 to 17.55m: Recovered as silty fine to medium SAND.	
				HQ3					100 [73]		18.2 to 18.93m: Recovered as fine SAND. 19.25 to 19.5m: DB, 5°, 4 No.	
	18.2 to 18.93m: Extremely weak.	sc 16,34 for 45mm N>50		SPT					75		18.93 to 19.06m: SILTSTONE bed.	
				HQ3					100 [12]		19.2m: Very thin carbonaceous bed.	
For explanation of symbols and observations, see key sheet			RELATIVE STRENGTH		WEATHERING		Date logged 20/06/2022		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 IR/GS Checked GP		Started 17/06/2022			
Hand Held Shear Vane DR2272: 19mm blade: Calibrated 02/22: Correction Factor = 1.595 vane shear strength per NZGS guideline			Remarks Flush 50 mm standpipe piezometer installed on completion. DR1980: 19mm blade: Calibrated Jun 2022: Correction Factor: 1.876 used for hand shear vane measurements 9.0m and deeper.						Finished 20/06/2022			
			Horizontal / Vertical Survey Datums: NZGD2000 - Mount Eden 2000 / New Zealand Vertical Datum 2016						Drill Rig N119 Core Boxes 10			
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2021 EB DRILLHOLE LOG 2022-08-04 MASTER.GPJ BASE.GDT 07/08/22

Client Auckland Transport  
 Project Eastern Busway  
 Project number 60644113

Co-ordinates 411510.79mE 795065.64mN  
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EAST COAST BAYS FORMATION  16.1m: Slightly weathered, grey, thickly bedded, fine to medium SANDSTONE. Very weak. (continued) 20.68m: SW, grey, SILTSTONE. Very weak. 20.94m: Slightly weathered, grey, fine SANDSTONE. Very weak. 22.3m: Slightly weathered, grey, SILTSTONE. Very weak. 22.67m: Slightly weathered, grey, thickly bedded, fine SANDSTONE. Very weak.  26.7 to 27.0m: Siltstone			HQ3						100 [90]		21.0 to 22.5m: DB, 0°, 2 No. 21.05 to 21.15m: Recovered as subangular SILTSTONE gravel. 21.2m: SILTSTONE clast, 50mm long.  22.3 to 22.4m: Thinly laminated. 22.5m: Subrounded SILTSTONE clast, 20mm.  23.5 to 25.5m: Subhorizontal, thinly to moderately thinly bedded with thin laminations or partings of mudstone. Drilling breaks infilled with mud.  25.5 to 27m: DB, 0°, 4 No.  26.7 to 27.0m: Thinly laminated.	
			HQ3						100 [93]			
			HQ3						100 [67]			
			HQ3						100 [25]			
			HQ3						100 [100]			
											DH308 terminated at 27.0m Depth Criteria Achieved	
For explanation of symbols and observations, see key sheet			RELATIVE STRENGTH			WEATHERING			Date logged 20/06/2022		Driller McMillan Started 17/06/2022 Finished 20/06/2022 Drill Rig N119 Core Boxes 10	
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2021 EB DRILLHOLE LOG 2022-08-04 MASTER.GPJ BASE.GDT 07/08/22





**Box: 1 of 10 - Depth: 00.75m to 03.10m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 17/06/2022



**Box: 2 of 10 - Depth: 03.10m to 05.90m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 17/06/2022



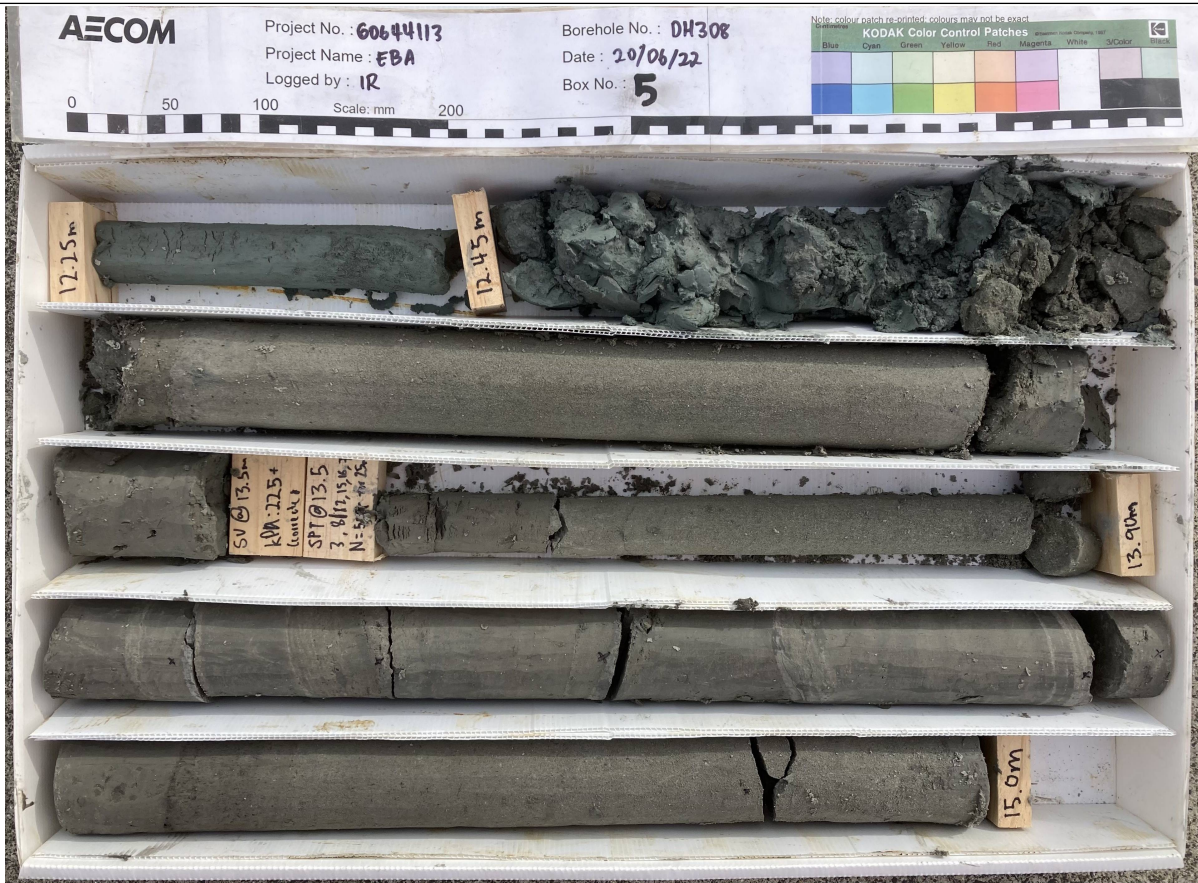


**Box: 3 of 10 - Depth: 05.90m to 08.75m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022



**Box: 4 of 10 - Depth: 08.75m to 12.25m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022





**Box: 5 of 10 - Depth: 12.25m to 15.00m of 27.00m**

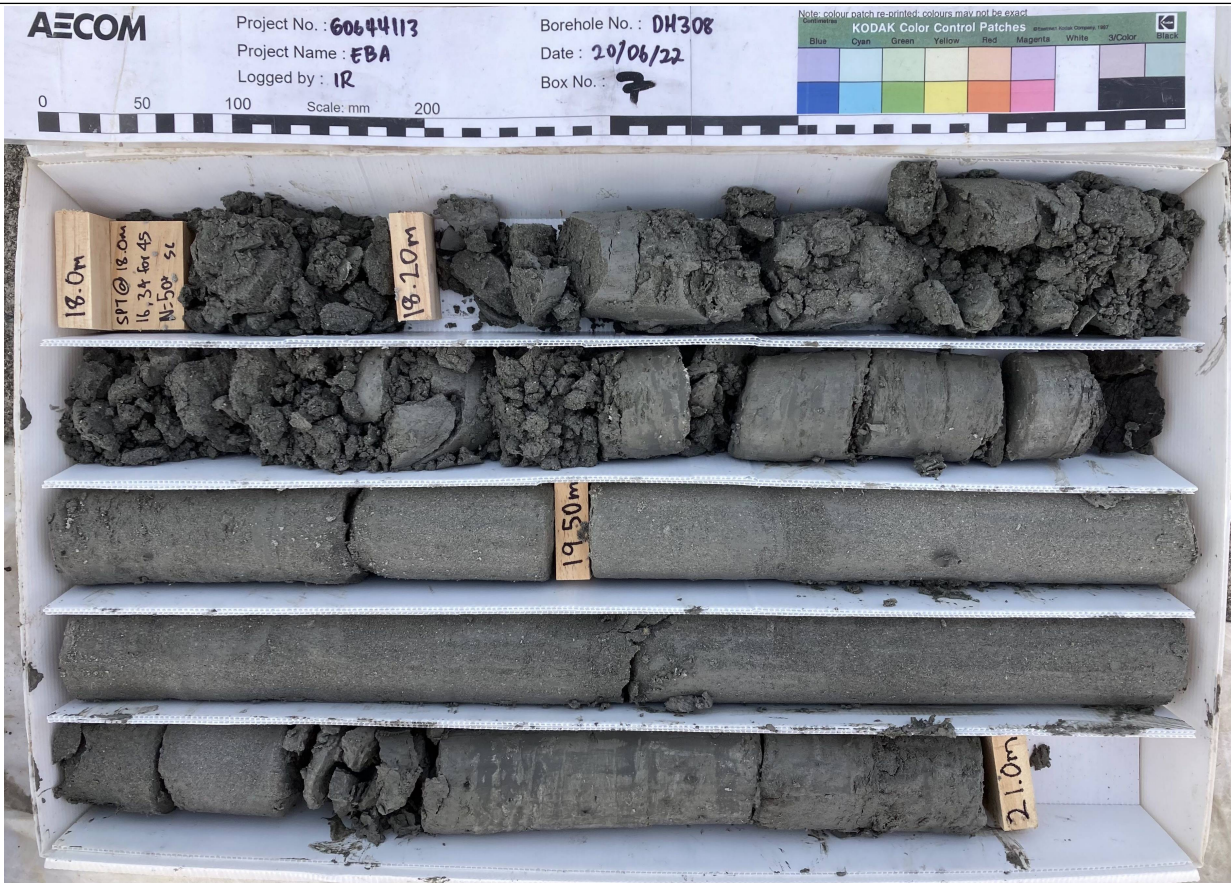
Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022



**Box: 6 of 10 - Depth: 15.00m to 18.00m of 27.00m**

Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022





**Box: 7 of 10 - Depth: 18.00m to 21.00m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022



**Box: 8 of 10 - Depth: 21.00m to 23.65m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022





**Box: 9 of 10 - Depth: 23.65m to 26.35m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022



**Box: 10 of 10 - Depth: 26.35m to 27.00m of 27.00m**  
 Date Drilled 17/06/2022 to 20/06/2022 - Date Photographed: 20/06/2022