



TONKIN & TAYLOR LTD

BOREHOLE LOG

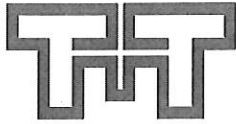
BOREHOLE No:HA01
Hole Location: Refer to site plan
SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393													
CO-ORDINATES: 64677630 mN 2681890 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14													
R.L.: 42.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14													
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe													
								LOGGED BY: rbe													
								CHECKED: EYST													
GEOLOGICAL				ENGINEERING DESCRIPTION																	
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.				FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION		
																			Rock type, minor components, plasticity or particle size, colour.		
																			ROCK DESCRIPTION		
																				Substance: Rock type, particle size, colour, minor components.	
																				Defects: Type, inclination, thickness, roughness, filling.	
PUKETOKA FORMATION																				SILT, some clay, non plastic, wet to saturated, light brown	
																				-light yellowish brown	
																				0.5-	
																				clayey SILT, low to medium plasticity, wet, yellowish brown mottled light greyish white	
																				-medium plasticity, light greyish white mottled yellowish brown	
																				1.0-	
																				1.5-	
																				-light greyish white	
																				2.0-	
																				-low plasticity	
																				SILT, some clay, low to no plasticity, wet, light greyish brown mottled yellowish brown	
																				2.5-	
																				clayey SILT, medium plasticity, wet, brown	
																				SILT, some clay, low to no plasticity, wet, brown, with minor organics	
																				clayey SILT, low plasticity, wet, dark brown	
																				3.0-	
																				sandy SILT, non plastic, saturated, brown	
																				3.5-	
																				CLAY, medium plasticity, wet, grey	
																				4.0-	
																				clayey SILT, medium plasticity, wet, greenish grey	
																				4.5-	

T-T DATATEMPLATE.GDT ib

Log Scale 1:25

BORELOG GINT 30393.GPJ 22-Oct-2014



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: HA01
Hole Location: Refer to site plan
SHEET 2 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393										
CO-ORDINATES: 64677630 mN 2681890 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14										
R.L.: 42.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14										
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe CHECKED: EYST										
GEOLOGICAL				ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)		COMPRESSIVE STRENGTH (MPa)		DEFECT SPACING (mm)	SOIL DESCRIPTION Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
													0-20	20-100	0-20	20-100		
PUKETOKA FORMATION						• 97/26kPa		37.0	x									clayey SILT, medium plasticity, wet, greenish grey
						• 93/38kPa		36.5	x									-light grey
						• 101/46kPa		36.0	x			VSt						
						• 137/62kPa		35.5	x									
						• 129/58kPa		35.0	x			St						
						• 97/46kPa		34.5	x	MCS							clayey SILT, sandy, medium plasticity, wet, light grey	
						• 142/40kPa		34.0	x	MS		VSt					sandy SILT, non plastic, wet, grey	
								33.5	x	MS							sandy SILT, non plastic, wet, greenish grey	
								33.0	x									
								32.5	x	MC								clayey SILT, low plasticity, wet, grey
WEATHERED EAST COAST BAYS FORMATION								32.0	x									-low to no plasticity, becoming hard to auger
								31.5	x			H						
						• UTP		31.0	x									END OF BOREHOLE 8.5m (difficult to auger)
								30.5	x									
								30.0	x									
								29.5	x									
								29.0	x									
								28.5	x									
								28.0	x									
								27.5	x									
								27.0	x									
								26.5	x									
								26.0	x									
								25.5	x									
								25.0	x									
								24.5	x									
								24.0	x									
								23.5	x									
								23.0	x									
								22.5	x									
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								9.0	x									
								8.5	x									
								8.0	x									
								7.5	x									
								7.0	x									
								6.5	x									
								6.0	x									
								5.5	x									
								5.0	x									
								4.5	x									
								4.0	x									
								3.5	x									
								3.0	x									
								2.5	x									
								2.0	x									
								1.5	x									
								1.0	x									
								0.5	x									
								0.0	x									



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BOREHOLE LOG

BOREHOLE No:HA02
Hole Location: Refer to site plan
SHEET 1 OF 2

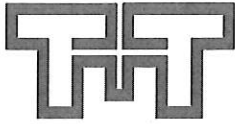
PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393											
CO-ORDINATES: 6467720 mN 2681952 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14											
R.L.: 41.50 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14											
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe											
								LOGGED BY: rbe											
								CHECKED: EYST											
GEOLOGICAL				ENGINEERING DESCRIPTION															
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSION STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION		
																	Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.		
TOPSOIL								42.0		ML	W	St					SILT, non plastic, wet, brown		
PUKETOKA FORMATION	Water in W/L after 24.5hrs					• 80/26kPa		41.5		MC								clayey SILT, low plasticity, wet, light yellowish brown; medium plasticity from 0.2m	
						• 118/48kPa		41.0	0.5			VSt						0.5	-yellowish brown mottled light greyish white
						• 145/59kPa		40.5	1.0									1.0	
						• 115/62kPa		40.0	1.5									1.5	-slightly sandy, low plasticity
						• 224/96kPa		39.5	2.0									2.0	-light greyish white mottled yellowish brown
						• 193/69kPa		39.0	2.5			St						2.5	
						• 185/91kPa		38.5	3.0			CL						3.0	CLAY, medium plasticity, wet, brown, becoming greyish light brown from 2.9m
						• 110/35kPa		38.0	3.5			MC						3.5	clayey SILT, low to medium plasticity, wet, brown
						• 61/35kPa		37.5	4.0			ML	W/Sat					4.0	SILT, non plastic, wet to saturated, brown clayey SILT, low plasticity, wet to saturated, brown
						• 62/22kPa		37.0	4.5			MC						4.5	-greyish brown
						• 66/27kPa		36.5	5.0			CL	W					5.0	CLAY, medium plasticity, wet, light grey
						• 109/26kPa		36.0	5.5			MC						5.5	clayey SILT, medium plasticity, wet, grey
						• 50/24kPa		35.5	6.0			CL						6.0	silty CLAY, medium plasticity, wet, grey
						• 83/35kPa		35.0	6.5									6.5	
						• 50/29kPa		34.5	7.0									7.0	
						• 38/19kPa		34.0	7.5									7.5	

T-T DATA TEMPLATE.GDT lib

Log Scale 1:25

BORELOG GINT 30393.GPJ 22-Oct-2014

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393									
CO-ORDINATES: 6467720 mN 2681952 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14									
R.L.: 41.50 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14									
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe									
				LOGGED BY: rbe				CHECKED: EYST									
GEOLOGICAL				ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION	
																Soil type, minor components, plasticity or particle size, colour.	
ROCK DESCRIPTION																	
Substance: Rock type, particle size, colour, minor components.																	
Defects: Type, inclination, thickness, roughness, filling.																	
PUKETOKA FORMATION						• 66/18kPa		36.5								silty CLAY, medium plasticity, wet, grey	
						• 70/32kPa		36.0									5.5-
						• 53/32kPa											
						• 81/34kPa		35.5		MC							6.0-
										MCS						clayey SILT, medium plasticity, wet, dark grey	
																clayey SILT, sandy, non plastic, wet, dark grey, minor organics	
								35.0								END OF BOREHOLE 6.5m (target depth)	
								34.5								7.0-	
								34.0								7.5-	
								33.5								8.0-	
								33.0								8.5-	
								32.5								9.0-	
								9.5								9.5-	
								10									



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No: HA03
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
CO-ORDINATES: 6467604 mN 2681921 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
R.L.: 43.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.				FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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TOPSOIL																				SILT, non plastic, wet, brown																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
PUKETOKA FORMATION				W/L after 24.25hrs																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

T-T DATATEMPLATE.GDT lib

Log Scale 1:25

BORELOG GINT 30393.GPJ 22-Oct-2014



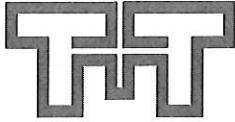
TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA03
Hole Location: Refer to site plan

SHEET 2 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393								
CO-ORDINATES: 6467604 mN 2681921 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14								
R.L.: 43.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14								
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe								
								LOGGED BY: rbe								
								CHECKED: EYST								
GEOLOGICAL				ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION
																Soil type, minor components, plasticity or particle size, colour.
PUKETOKA FORMATION						● 46/21kPa		38.0		CH		F				ROCK DESCRIPTION
																Substance: Rock type, particle size, colour, minor components.
						● 34/16kPa		37.5		MC		VSt				Defects: Type, inclination, thickness, roughness, filling.
						● 141/54kPa		37.0								CLAY, medium to high plasticity, wet, light grey
						● 145/54kPa		36.5								clayey SILT, medium plasticity, wet, grey
						● 145/64kPa		36.0		MCS						clayey SILT, sandy, medium plasticity, wet, greenish grey
						● 142/53kPa		36.0								END OF BOREHOLE 7m (target depth)
								35.5								
								35.0								
								34.5								
								34.0								
								9.5								
								10								



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA04
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393										
CO-ORDINATES: 6467663 mN 2681881 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14										
R.L.: 43.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14										
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe										
								LOGGED BY: rbe										
								CHECKED: EYST										
GEOLOGICAL				ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSION STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION	
																	Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.	
TOPSOIL								43.5		ML	W	VSt					SILT, non plastic, wet, light brown	
PUKETOKA FORMATION	W/L after 22.5hrs	Water in				• 142/54kPa		43.0		MC							clayey SILT, low plasticity, wet, yellowish brown	
						• 139/77kPa		42.5									-medium plasticity, yellowish brown mottled light greyish white	
						• 126/75kPa		42.0										
						• 145/77kPa		41.5										-light greyish white mottled yellowish brown
						• 131/72kPa		41.0					St					
						• 80/43kPa		40.5		CL							silty CLAY, medium plasticity, wet, light whitish grey	
						• 75/45kPa		40.0										
						• 93/48kPa		39.5		MC								clayey SILT, medium plasticity, wet, light greyish white mottled yellowish brown
						• 93/43kPa		39.0										
						• 73/27kPa		38.5		CL								CLAY, medium plasticity, wet, light greyish brown
						• 83/34kPa		38.0										
						• 61/18kPa		37.5		MC								clayey SILT, medium plasticity, wet, light brown
						• 110/26kPa		37.0		MCS	W/Sat	VSt						clayey SILT, sandy, medium to low plasticity, saturated, light brown
						• 133/37kPa		36.5		MS	W							sandy SILT, low to no plasticity, wet, dark grey
						• 104/29kPa		36.0		MC								clayey SILT, low plasticity, wet, light grey
						• 110/34kPa		35.5										



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA04
Hole Location: Refer to site plan

SHEET 2 OF 2

PROJECT: FlatBush School		LOCATION: 187 Flat Bush School Rd.		JOB No: 30393												
CO-ORDINATES: 6467663 mN 2681881 mE		DRILL TYPE: 50mm hand auger		HOLE STARTED: 25/9/14												
R.L.: 43.00 m		DRILL METHOD: HA		HOLE FINISHED: 25/9/14												
DATUM: NZMG		DRILL FLUID:		DRILLED BY: rbe CHECKED: EYST												
GEOLOGICAL		ENGINEERING DESCRIPTION														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
PUKETOKA FORMATION						• 185/70kPa		38.0	x	MC						clayey SILT, low to medium plasticity, wet, greenish grey
						• 142/32kPa		37.5	x			H				-low to no plasticity
						• >224kPa		37.0	x							END OF BOREHOLE 6m (target depth)
						• >224kPa		36.5								
								36.0								
								35.5								
								35.0								
								34.5								
								34.0								
								9.5								
								10								



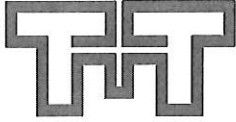
TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA05
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393									
CO-ORDINATES: 6467595 mN 2681872 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14									
R.L.: 44.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14									
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe									
								CHECKED: EYST									
GEOLOGICAL				ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSION STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION
																	Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
HARDFILL								44.0			W	VSt					angular GRAVEL
PUKETOKA FORMATION	W/L after 20.5hrs	Water in				• 128/45kPa		43.5		ML							clayey SILT, low plasticity, wet, yellowish brown
						• 145/66kPa		43.0								-yellowish brown mottled light greyish white	
						• 126/66kPa		42.5								-low to no plasticity, wet, light whitish grey mottled yellowish brown	
						• 192/96kPa		42.0								-medium plasticity	
						• >224kPa		41.5					St			-light brownish grey, trace sand	
						• 117/73kPa		41.0		MLC			F			clayey SILT, sandy, low plasticity, wet, light brown	
						• 91/64kPa		40.5					St			-thin layer of organics	
						• 94/54kPa		40.0		MSC						-medium plasticity, wet, brown	
						• 89/48kPa		39.5					VSt			sandy SILT, clayey, low plasticity, wet, grey	
						• 35/18kPa		39.0					F				
						• 80/34kPa		38.5									clayey SILT, sandy, low plasticity, wet, grey
						• 66/38kPa		38.0					St				
						• 133/53kPa		37.5		MCS			VSt				sandy SILT, clayey, low plasticity, wet, grey
						• 43/22kPa		37.0									
						• 69/34kPa		36.5		MSC							
						• 141/37kPa		36.0									



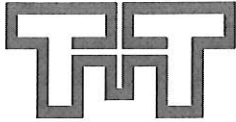
TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA05
Hole Location: Refer to site plan

SHEET 2 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393											
CO-ORDINATES: 6467595 mN 2681872 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14											
R.L.: 44.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14											
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe		CHECKED: EYST									
GEOLOGICAL								ENGINEERING DESCRIPTION											
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.		FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION	
																		Soil type, minor components, plasticity or particle size, colour.	
																		ROCK DESCRIPTION	
																		Substance: Rock type, particle size, colour, minor components.	
																		Defects: Type, inclination, thickness, roughness, filling.	
PUKETOKA FORMATION							• 120/48kPa		39.5										sandy SILT, clayey, low plasticity, wet, grey
							• 75/27kPa		38.5		MCS			St					clayey SILT, sandy, medium plasticity, wet, light grey
							• 99/37kPa		38.0					VSt					
							• 153/30kPa		37.5										
							• 141/38kPa		37.0		MC								-inclusions of decomposed wood
WEATHERED EAST COAST BAYS FORMATION							• 142/35kPa		36.5		MS			H					clayey SILT, low plasticity, wet, dark grey
							• 224/51kPa		36.0		MC								sandy SILT, some clay, low to no plasticity, wet, dark grey
							• >224kPa		35.5		ML								clayey SILT, low plasticity, wet, dark grey
									35.0										SILT, non plastic, wet, dark grey
									34.5										
									34.0										
									33.5										
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TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA06
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393														
CO-ORDINATES: 6467519 mN 2681851 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14														
R.L.: 47.00 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14														
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe		CHECKED: EYST												
GEOLOGICAL				ENGINEERING DESCRIPTION																		
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION					
																	Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.					
PUKETOKA FORMATION	W/L after 19.5hrs					• 142/67kPa		47.0	x	ML	W	VS					clayey SILT, low plasticity, wet, yellowish brown					
									x													
									x													
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BOREHOLE LOG

BOREHOLE No:HA06

Hole Location: Refer to site plan

SHEET 2 OF 2

[illegible]



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA07
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393									
CO-ORDINATES: 6467539 mN 2681757 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 25/9/14									
R.L.: 45.50 m				DRILL METHOD: HA				HOLE FINISHED: 25/9/14									
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe									
								CHECKED: EYST									
GEOLOGICAL				ENGINEERING DESCRIPTION													
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION
																	Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
TOPSOIL								46.0		ML	W	VSt					SILT, non plastic, wet, brown
PUKETOKA FORMATION								45.5		ML							SILT, non plastic, wet, yellowish brown
						• 101/42kPa		45.0	0.5	MC							clayey SILT, low plasticity, wet, yellowish brown mottled light greyish white
						• 171/64kPa		44.5	1.0								-low to medium plasticity, light grey mottled yellowish brown
						• 185/81kPa		44.0	1.5								-medium plasticity, light greyish white to light grey
						• 168/99kPa		43.5	2.0								-occasional yellowish brown mottles
						• 173/110kPa		43.0	2.5								
						• 168/105kPa		42.5	3.0	CL			St				silty CLAY, medium plasticity, wet, light brownish grey mottled yellowish brown
						• 150/85kPa		42.0	3.5	MC			VSt				clayey SILT, medium plasticity, wet, light grey
						• 126/86kPa		41.5	4.0				St				
						• 101/64kPa		41.0	4.5	CL			F				silty CLAY, medium plasticity, wet, light grey
						• 104/58kPa		40.5					St				
						• 89/45kPa		40.0									
						• 120/66kPa		39.5									
						• 93/38kPa		39.0									
						• 58/34kPa		38.5									
						• 48/18kPa		38.0									
						• 62/29kPa		37.5									

BOREHOLE LOG

BOREHOLE No:HA07

Hole Location: Refer to site plan

SHEET 2 OF 2

[illegible]



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA08
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393																										
CO-ORDINATES: 6467622 mN 2681791 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 26/9/14																										
R.L.: 43.50 m				DRILL METHOD: HA				HOLE FINISHED: 26/9/14																										
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe		CHECKED: EYST																								
GEOLOGICAL				ENGINEERING DESCRIPTION																														
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.				FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION														
																				Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.														
TOPSOIL											44.0		ML	W/Sat	St						SILT, non plastic, wet to saturated, brown													
PUKETOKA FORMATION				Water in/ level after 2hrs							43.5		MC									clayey SILT, low plasticity, wet to saturated, light brown and yellowish brown												
																							80kPa	0.5	F							0.5		
																							35kPa		St									
																							66kPa	1.0	W	VSt						1.0	-medium plasticity, wet, light brownish grey mottled yellowish brown	
																							145/16kPa										-light brown	
																							145/32kPa	1.5								1.5	-medium plasticity, wet, light greyish white mottled yellowish brown	
																							142/80kPa		CL								silty CLAY, medium plasticity, wet, light grey	
																							93/58kPa	2.0		St						2.0		
																							77/30kPa	2.5	MC							2.5	clayey SILT, trace sand, medium plasticity, wet, grey	
																							70/30kPa		MCS								clayey SILT, sandy, low plasticity, wet, grey	
																							104/32kPa	3.0	MS	VSt						3.0	sandy SILT, non plastic, wet, grey	
																							120/42kPa										-abundant organic fragments	
																							85/34kPa	3.5		St						3.5		
																							80/18kPa		MCS								clayey SILT, sandy, low plasticity, wet, grey, with sandy layers and minor organics	
																							83/22kPa	4.0	MSC							4.0		
																							62/19kPa	4.5								4.5	sandy SILT, clayey, low plasticity, wet, grey	
40/18kPa			F																															



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA08
Hole Location: Refer to site plan

SHEET 2 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393												
CO-ORDINATES: 6467622 mN 2681791 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 26/9/14												
R.L.: 43.50 m				DRILL METHOD: HA				HOLE FINISHED: 26/9/14												
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe												
								LOGGED BY: rbe												
								CHECKED: EYST												
GEOLOGICAL								ENGINEERING DESCRIPTION												
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.		FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSION STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION			
																	Soil type, minor components, plasticity or particle size, colour.			
																		ROCK DESCRIPTION		
																		Substance: Rock type, particle size, colour, minor components.		
																		Defects: Type, inclination, thickness, roughness, filling.		
PUKETOKA FORMATION							● 125/32kPa		39.0	x	SM		VS						sandy SILT, clayey, low plasticity, wet, grey	
																			38.5	x
							● 163/35kPa		5.5	x									5.5	
									6.0	x	MCS		F						6.0	clayey SILT, sandy, low plasticity, wet, grey
							● 45/21kPa		6.5	x			St						6.5	-minor organic fragments at 6.3m
							● 70/26kPa		7.0	x			H						7.0	
							● >224kPa		7.5	x									7.5	-minor decomposed organics
									8.0	x									8.0	-sandy, with organic fragments
							● >224kPa		8.5	x									8.5	
									9.0	x									9.0	
									9.5	x									9.5	
									10.0	x									10.0	
									10.5	x									10.5	
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									62.0	x								</		



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA09
Hole Location: Refer to site plan
SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393													
CO-ORDINATES: 6467681 mN 2681807 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 26/9/14													
R.L.: 41.50 m				DRILL METHOD: HA				HOLE FINISHED: 26/9/14													
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe													
								CHECKED: EYST													
GEOLOGICAL				ENGINEERING DESCRIPTION																	
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE CONDITION	WEATHERING	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION				
																	Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.				
TOPSOIL								42.0		ML	W	VSt					SILT, non plastic, wet, brown				
PUKETOKA FORMATION	W/L after 1.25hrs					• 160/69kPa		41.5	x	ML								SILT, non plastic, wet, light brown to yellowish brown			
																			clayey SILT, low plasticity, wet, light grey mottled yellowish brown		
						• 145/61kPa		41.0	0.5	x											
						• 155/81kPa		40.5	1.0	x											
						• 131/64kPa		40.0	1.5	x											-low to medium plasticity
						• 117/66kPa		39.5	2.0	x											
						• 86/50kPa		39.0	2.5	x											
						• 131/66kPa		38.5	3.0	x											
						• 109/46kPa		38.0	3.5	x											
						• 80/35kPa		37.5	4.0	x											
						• 70/27kPa		37.0	4.5	x											
						• 51/27kPa		36.5	5.0	x											
						• 56/19kPa		36.0	5.5	x											
						• 70/19kPa		35.5	6.0	x											
						• 109/29kPa		35.0	6.5	x											
• >224kPa		34.5	7.0	x																	
• UTP		34.0	7.5	x																	
WEATHERED EAST COAST BAYS FORMATION								5.0	x												

T+T DATATEMPLATE.GDT.11b

Log Scale 1:25

BORELOG GINT 30393.GPJ 22-Oct-2014



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA09
Hole Location: Refer to site plan

SHEET 2 OF 2

PROJECT: FlatBush School			LOCATION: 187 Flat Bush School Rd.			JOB No: 30393											
CO-ORDINATES: 6467681 mN 2681807 mE			DRILL TYPE: 50mm hand auger			HOLE STARTED: 26/9/14											
R.L.: 41.50 m			DRILL METHOD: HA			HOLE FINISHED: 26/9/14											
DATUM: NZMG			DRILL FLUID:			DRILLED BY: rbe											
						LOGGED BY: rbe											
						CHECKED: EYST											
GEOLOGICAL		ENGINEERING DESCRIPTION															
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.	FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	R.L. (m)	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
WEATHERED ECBF						• >224kPa		36.5		x x x							SILT, friable, moist to wet, dark grey, difficult to auger
								36.0	5.5								END OF BOREHOLE 5.2m (difficult to auger)
								35.5	6.0								
								35.0	6.5								
								34.5	7.0								
								34.0	7.5								
								33.5	8.0								
								33.0	8.5								
								32.5	9.0								
								9.5									
								10									

T-T DATA TEMPLATE.GDT lib

Log Scale 1:25

BORELOG GINT 30393.GPJ 22-Oct-2014



TONKIN & TAYLOR LTD

BOREHOLE LOG

BOREHOLE No:HA10
Hole Location: Refer to site plan

SHEET 1 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393												
CO-ORDINATES: 6467748 mN 2681806 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 26/9/14												
R.L.: 41.00 m				DRILL METHOD: HA				HOLE FINISHED: 26/9/14												
DATUM: NZMG				DRILL FLUID:				DRILLED BY: rbe												
								LOGGED BY: rbe												
								CHECKED: EYST												
GEOLOGICAL				ENGINEERING DESCRIPTION																
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.				FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSION STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.	
PUKETOKA FORMATION				W/L after 25min.	Water in				• 160/56kPa	41.0	x	ML	W	VSt						SILT, non plastic, wet, light brown
									• 150/80kPa											
									• 182/102kPa	40.0	x							1.0		
									• 165/86kPa										39.5	x
									• 166/94kPa	39.0	x							2.0		
									• 129/72kPa										38.5	x
									• 109/62kPa	38.0	x	CL		St				2.5		
									• 145/77kPa										37.5	x
									• 80/48kPa	37.0	x	ML		St				3.0		
									• 141/46kPa										36.5	x
									• 69/38kPa	36.0	x							3.5		
									• 144/35kPa										35.5	x
									• >224kPa	35.0	x	MS		H				4.0		
									• UTP										34.5	x
									• UTP	34.0	x	SM						4.5		
									• UTP										33.5	x
	33.0	x																		
										32.5	x									
	32.0	x																		
										31.5	x									
	31.0	x																		
										30.5	x									
	30.0	x																		
										29.5	x									
	29.0	x																		
										28.5	x									
	28.0	x																		
										27.5	x									
	27.0	x																		
										26.5	x									
	26.0	x																		
										25.5	x									
	25.0	x																		
										24.5	x									
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										8.5	x									
	8.0	x																		
										7.5	x									
	7.0	x																		
										6.5	x									
	6.0	x																		
										5.5	x									
	5.0	x																		
										4.5	x									
	4.0	x																		
										3.5	x									
	3.0	x																		
										2.5	x									
	2.0	x																		
										1.5	x									
	1.0	x																		
										0.5	x									
	0.0	x																		

T+T DATATEMPLATE.GDT ib

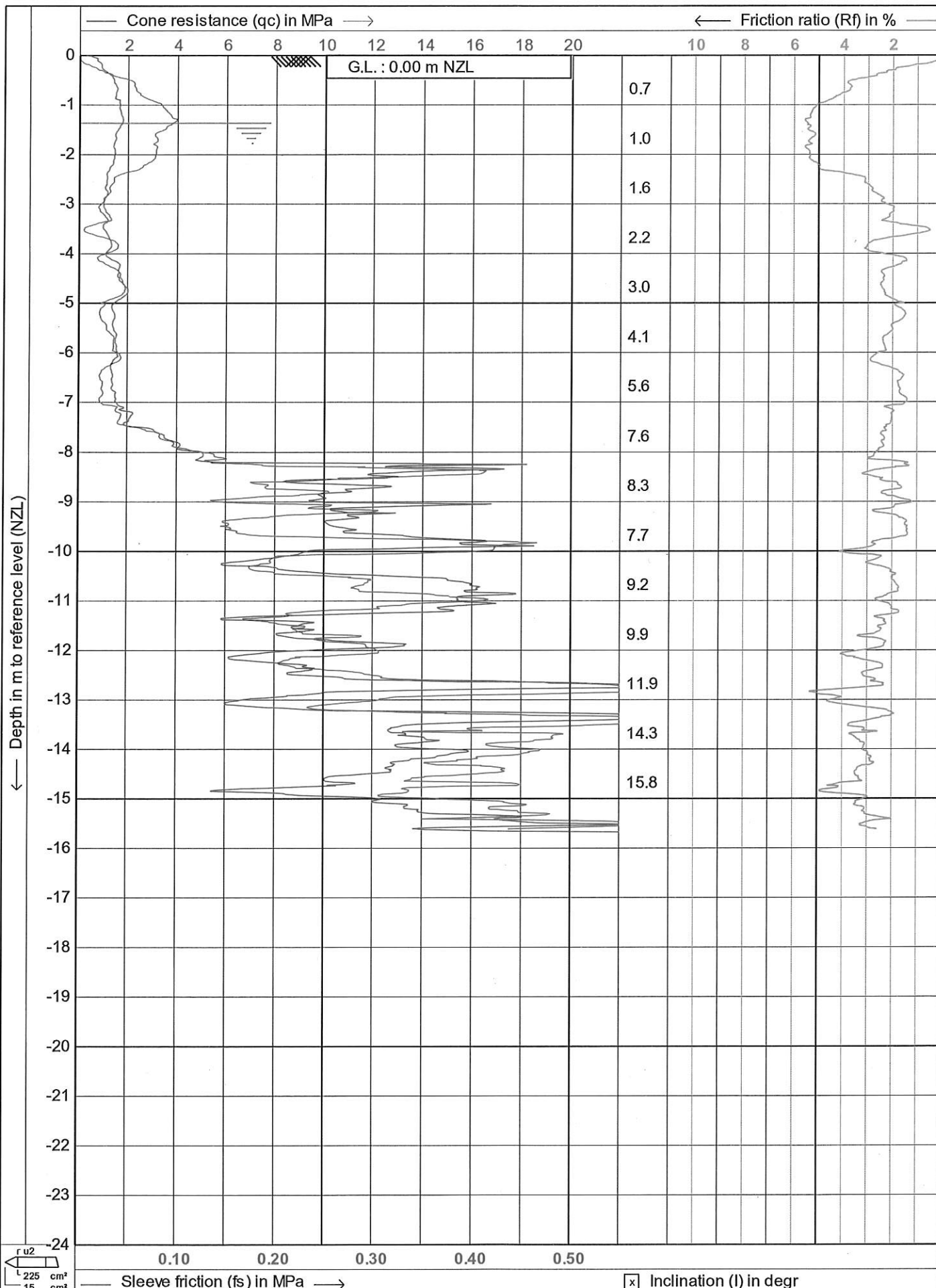
Log Scale 1:25

BORELOG GINT 30393.GPJ 22-Oct-2014

BOREHOLE LOG

BOREHOLE No:HA10
Hole Location: Refer to site plan
SHEET 2 OF 2

PROJECT: FlatBush School				LOCATION: 187 Flat Bush School Rd.				JOB No: 30393											
CO-ORDINATES: 6467748 mN 2681806 mE				DRILL TYPE: 50mm hand auger				HOLE STARTED: 26/9/14											
R.L.: 41.00 m				DRILL METHOD: HA				HOLE FINISHED: 26/9/14											
DATUM: NZMG				DRILL FLUID:				LOGGED BY: rbe		CHECKED: EYST									
GEOLOGICAL				ENGINEERING DESCRIPTION															
GEOLOGICAL UNIT, GENERIC NAME, ORIGIN, MINERAL COMPOSITION.				FLUID LOSS	WATER	CORE RECOVERY (%)	METHOD	CASING	TESTS	SAMPLES	DEPTH (m)	GRAPHIC LOG	CLASSIFICATION SYMBOL	MOISTURE / WEATHERING CONDITION	STRENGTH/DENSITY CLASSIFICATION	SHEAR STRENGTH (kPa)	COMPRESSIVE STRENGTH (MPa)	DEFECT SPACING (mm)	SOIL DESCRIPTION Soil type, minor components, plasticity or particle size, colour. ROCK DESCRIPTION Substance: Rock type, particle size, colour, minor components. Defects: Type, inclination, thickness, roughness, filling.
											36.0	X	MI	M					SILT, non plastic, moist, grey
											35.5								END OF BOREHOLE 5.1m (very hard to auger)
											35.0								
											34.5								
											34.0								
											33.5								
											33.0								
											32.5								
											32.0								
											9.5								
											10								



DCN DRILLING LTD
0274 735 011

Test according ASTM Standard D 5778-07

Project : Flatbush School Road

Location: Manukau

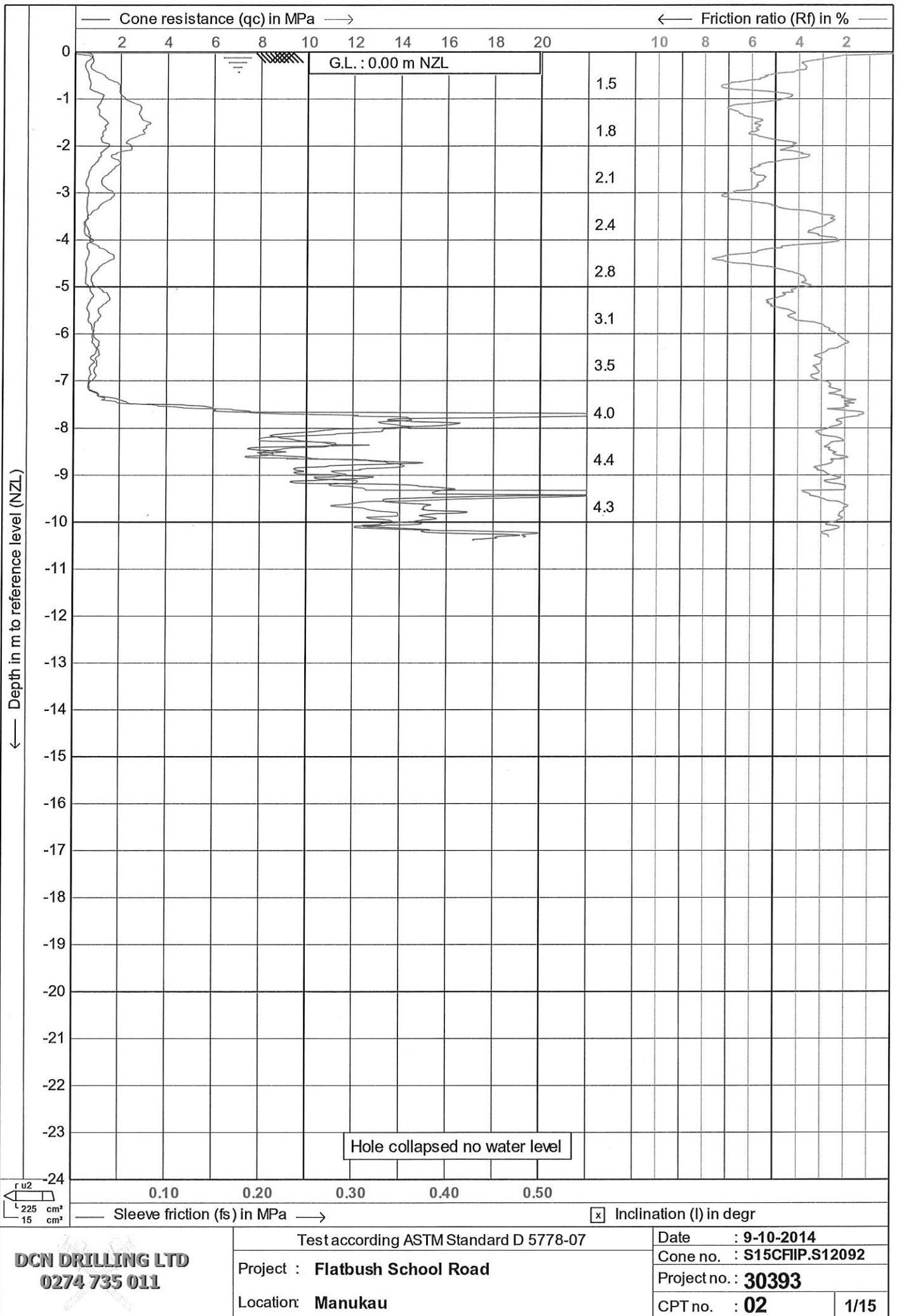
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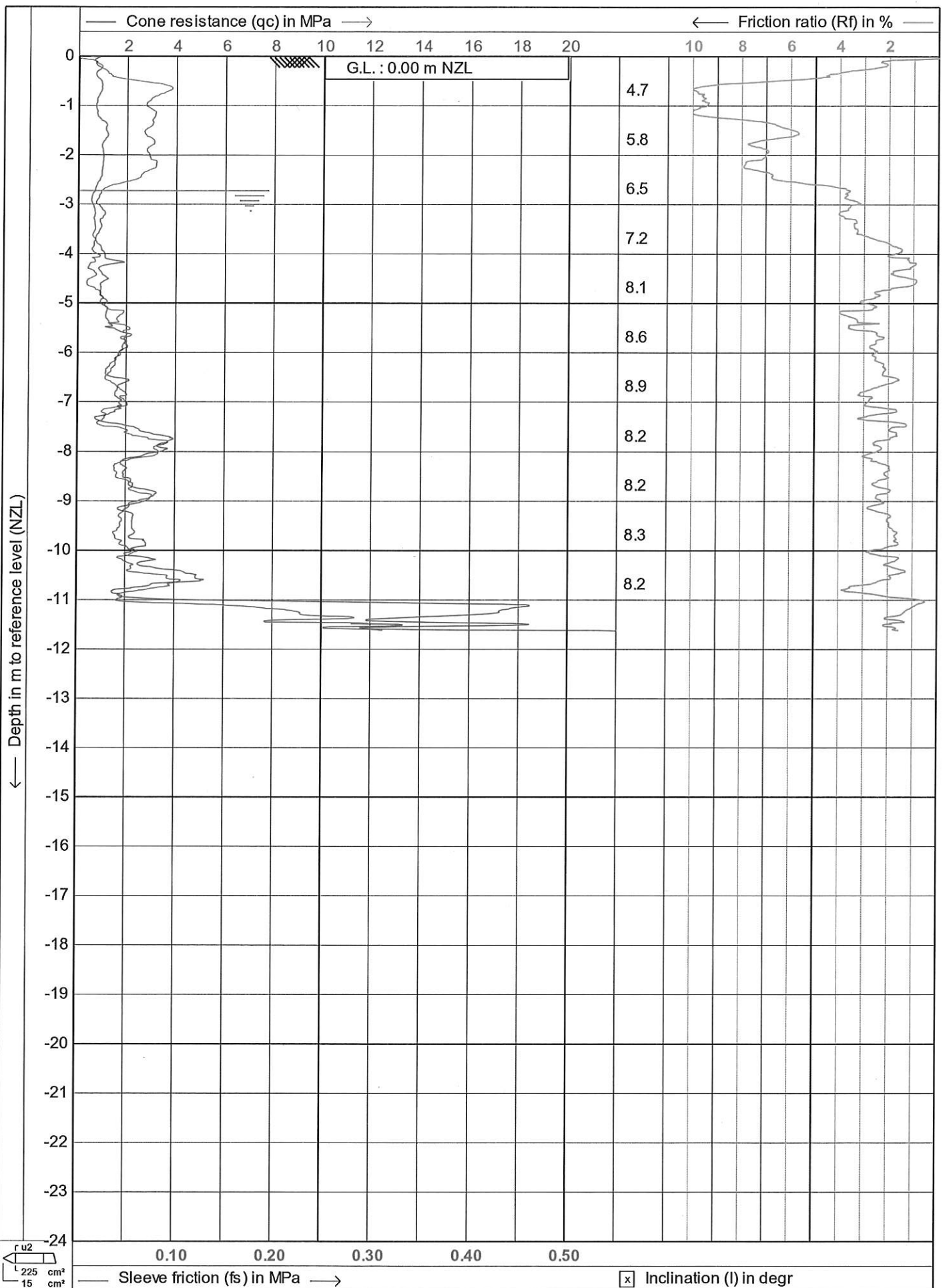
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Project no. : 30393

CPT no. : 01

1/15

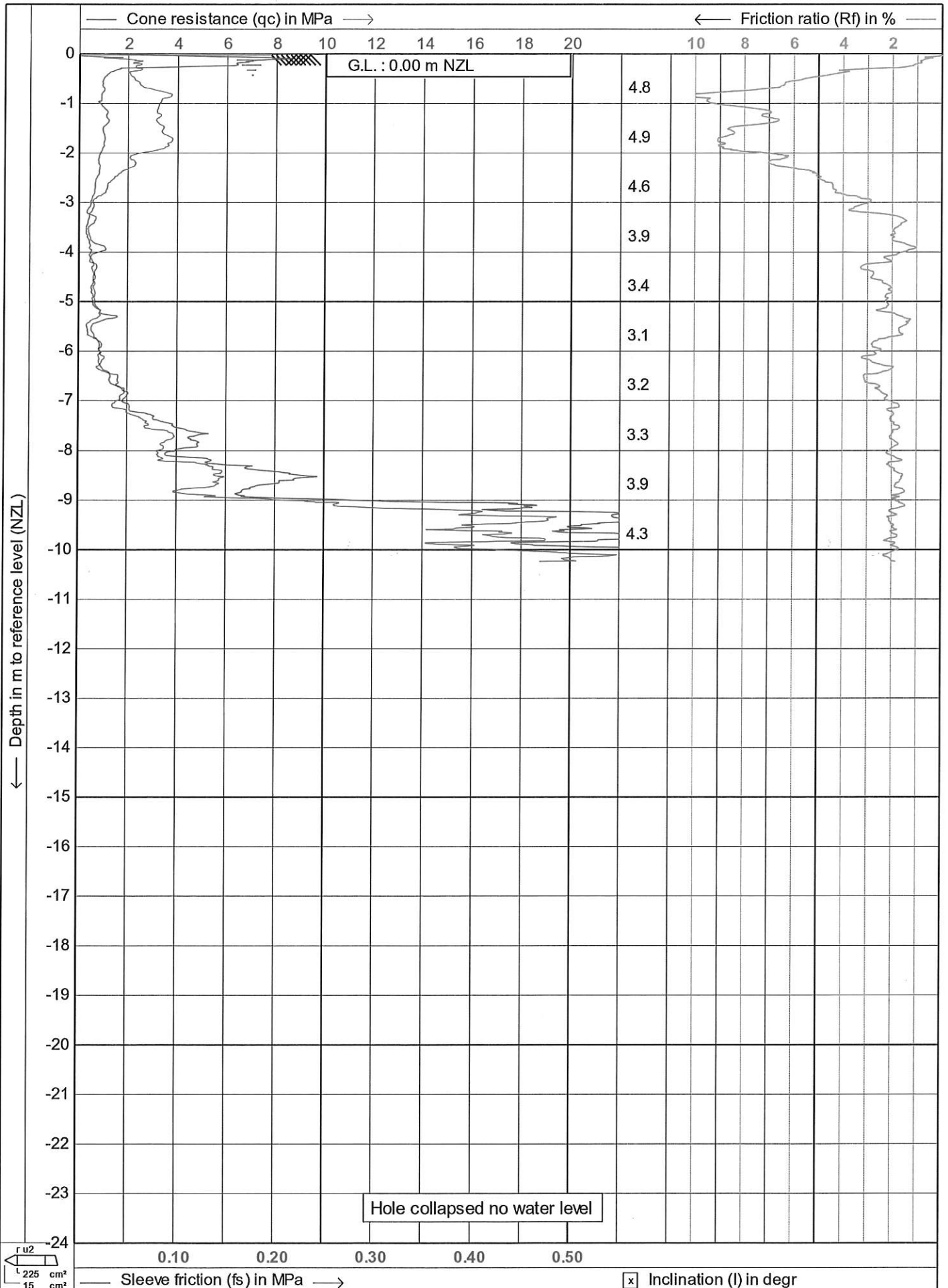




DCN DRILLING LTD
0274 735 011

Test according ASTM Standard D 5778-07
Project : **Flatbush School Road**
Location: **Manukau**

Date : **9-10-2014**
Cone no. : **S15CFIIP.S12092**
Project no.: **30393**
CPT no. : **04** 1/15



DCN DRILLING LTD
0274 735 011

Test according ASTM Standard D 5778-07

Project : **Flatbush School Road**

Location: **Manukau**

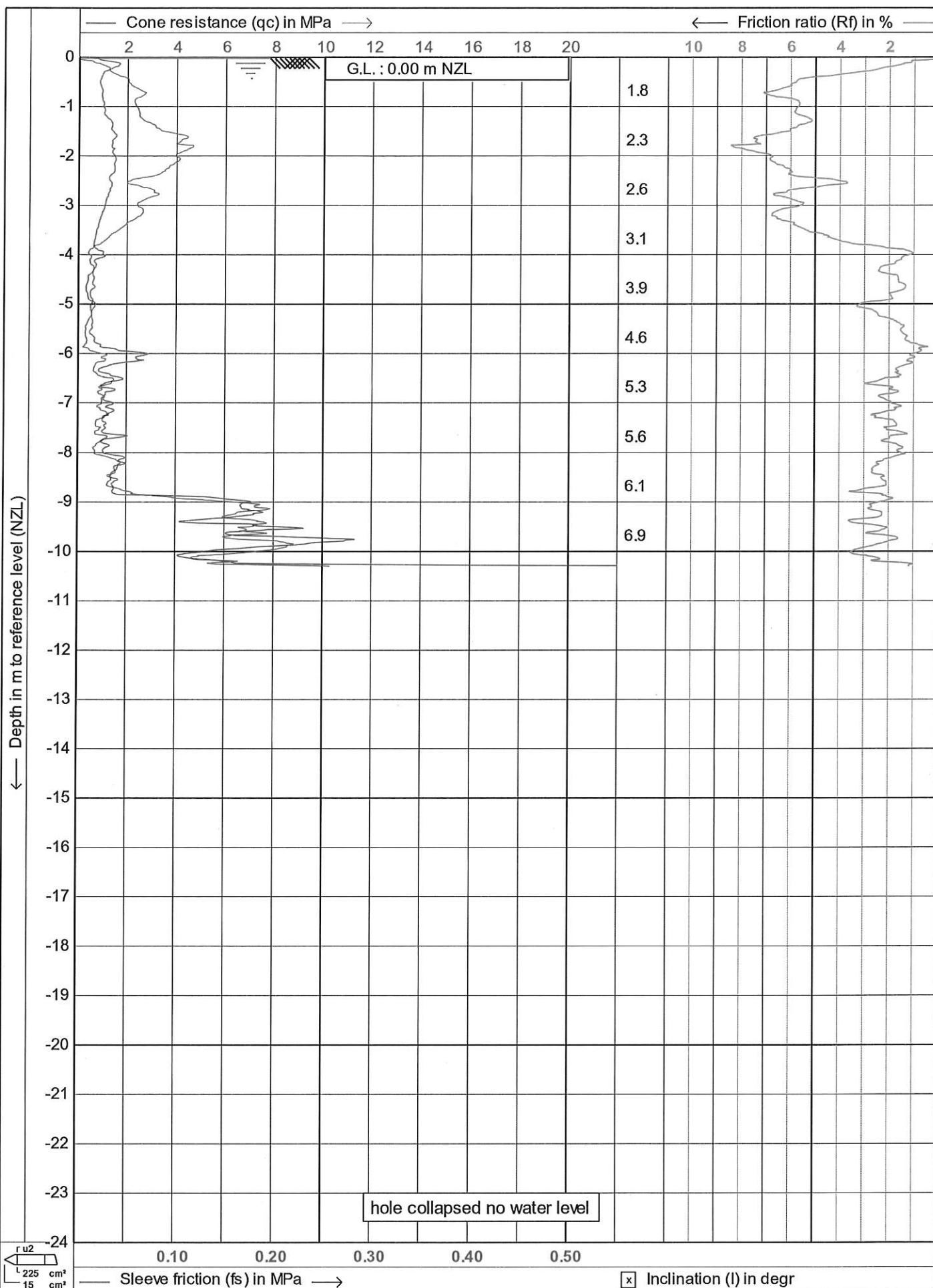
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Project no. : **30393**

CPT no. : **05**

1/15



DCN DRILLING LTD
0274 735 011

Test according ASTM Standard D 5778-07

Project : **Flatbush School Road**

Location: **Manukau**

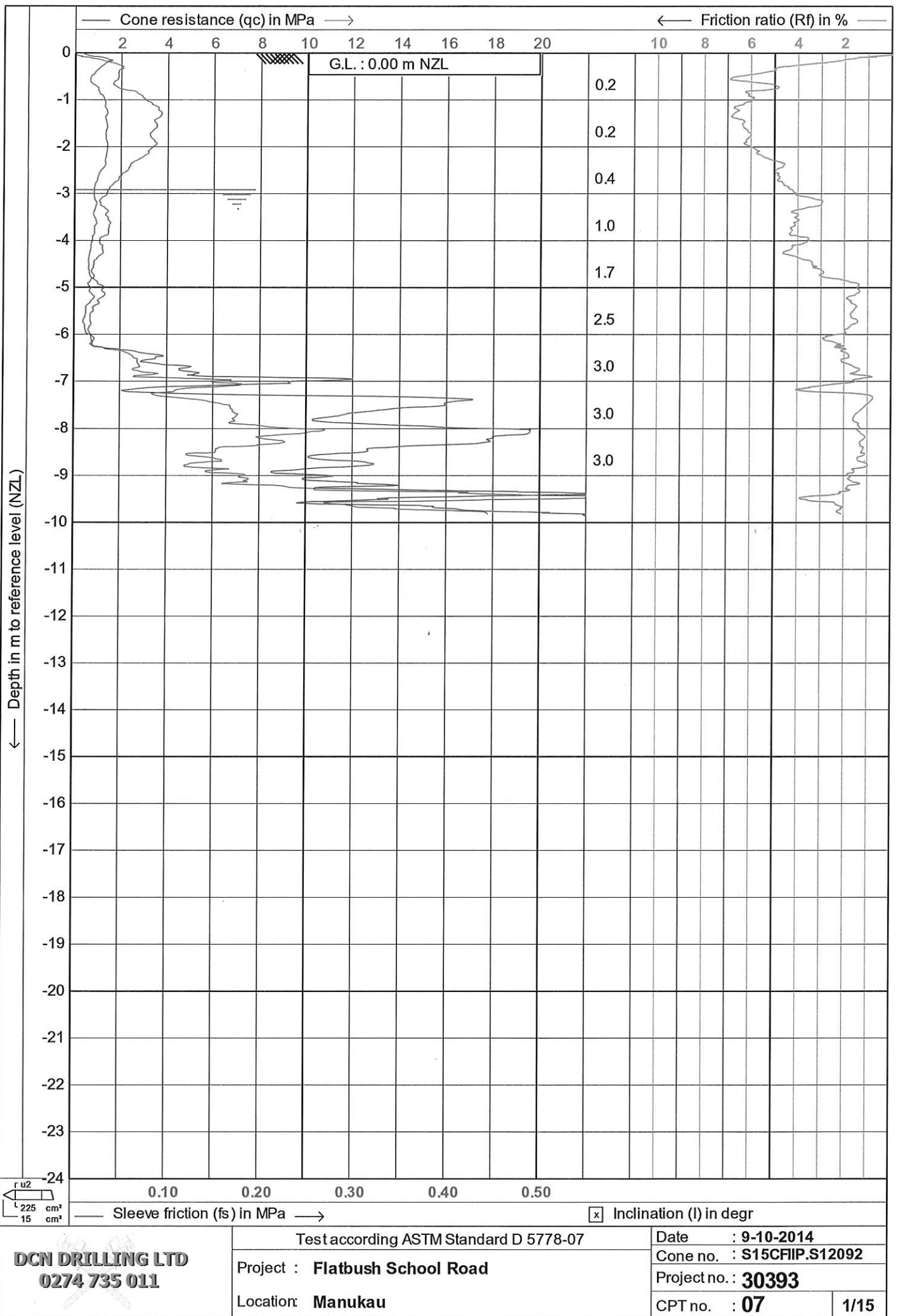
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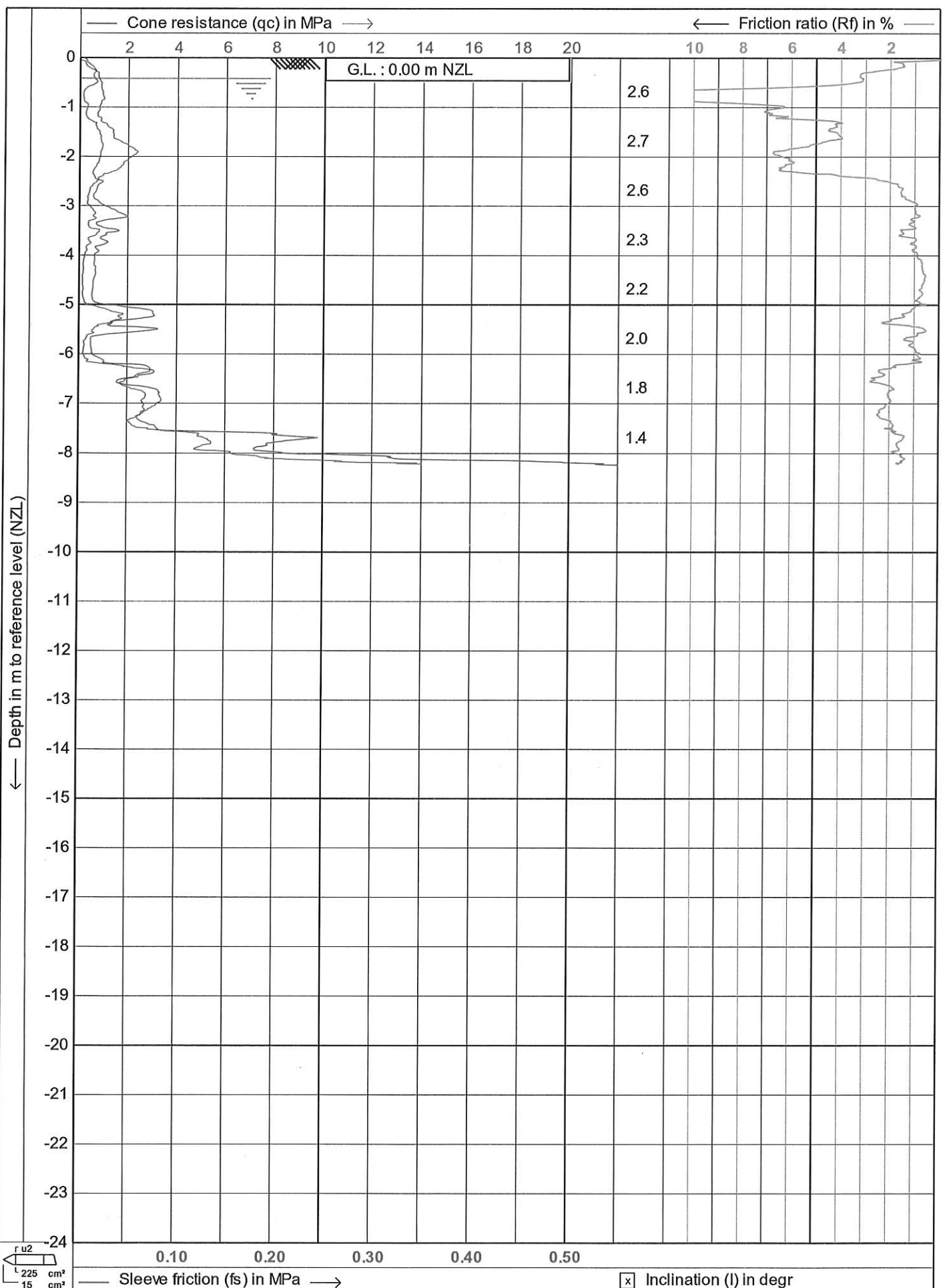
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Project no. : **30393**

CPT no. : **06**

1/15





DCN DRILLING LTD
0274 735 011

Test according ASTM Standard D 5778-07

Project : **Flatbush School Road**

Location: **Manukau**

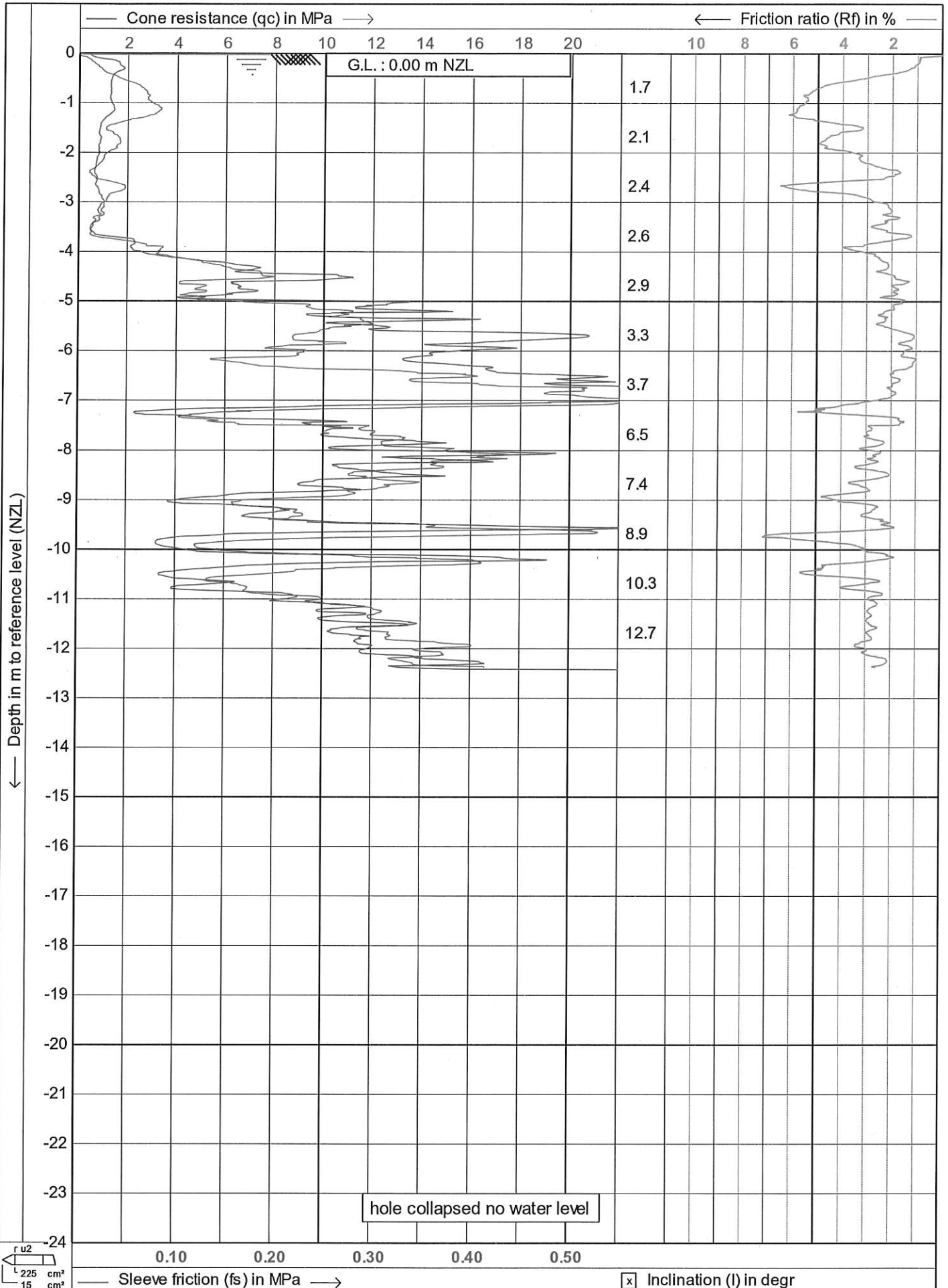
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Project no.: **30393**

CPT no. : **08**

1/15



DCN DRILLING LTD
0274 735 011

Test according ASTM Standard D 5778-07

Project : **Flatbush School Road**

Location: **Manukau**

Date : **9-10-2014**

Cone no. : **S15CFIIP.S12092**

Project no. : **30393**

CPT no. : **10**

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