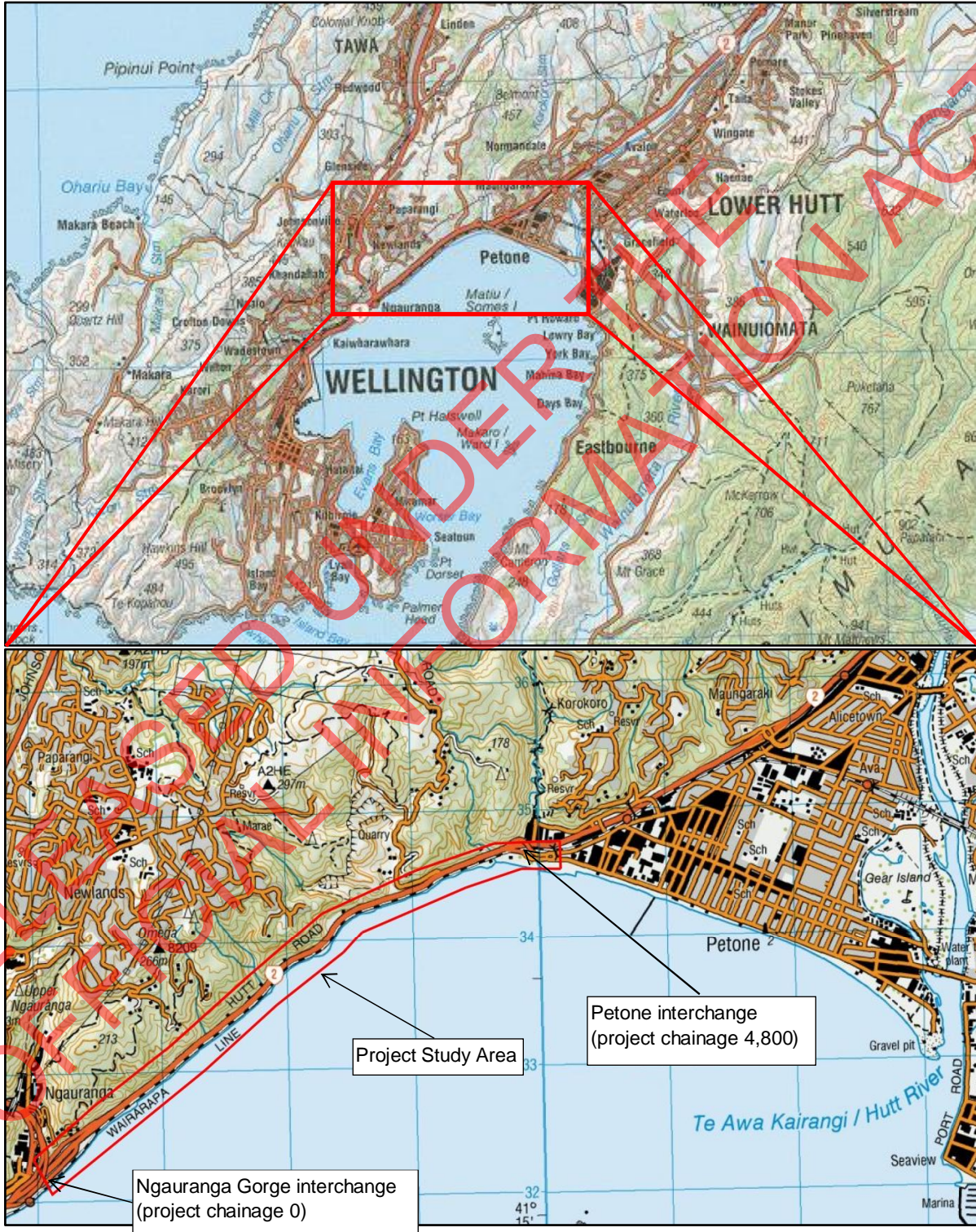


Appendix A

Location Plan

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Appendix A Location Plan



D R A F T

Appendix B

Investigation Location Plans

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Legend

P2G – Proposed investigations

- Borehole
- Cone Penetration Test
- Trial Pit

W2HVlink - Completed investigations

- Drillhole
- Trial Pit

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GEOTECHNICAL INVESTIGATION TABLE

ID	EASTING	NORTHING	DEPTH	LEGAL DESCRIPTION	LAND PARCEL	OWNERSHIP
DH 06	1752517	5432596	13.5m		RAILWAY PARCEL	

FOR INFORMATION ONLY

PETONE TO NGAURANGA CYCLEWAY

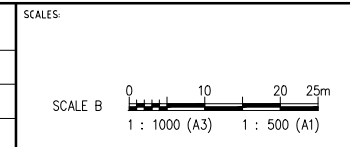
GEOTECHNICAL INVESTIGATION

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DESIGNED	PR	CHECKED	
DRAWN	GD	CHECKED	
APPROVED		DATE	



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Legend

P2G – Proposed investigations

- Borehole
- ▼ Cone Penetration Test
- Trial Pit

W2HVlink - Completed investigations

- Drillhole
- Trial Pit

GEOTECHNICAL INVESTIGATION TABLE

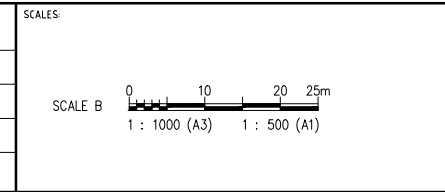
ID	EASTING	NORTHING	DEPTH	LEGAL DESCRIPTION	LAND PARCEL	OWNERSHIP
DH 04	1755069	5434388	8.1m		ROAD PARCEL	
DH 05	1754304	5433973	2m		ROAD PARCEL	

CAD Ref: D:\Temp\publish_34561_SK130_Geotechnical Investigation.dwg

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DRAWN	GD	CHECKED	
APPROVED		DATE	

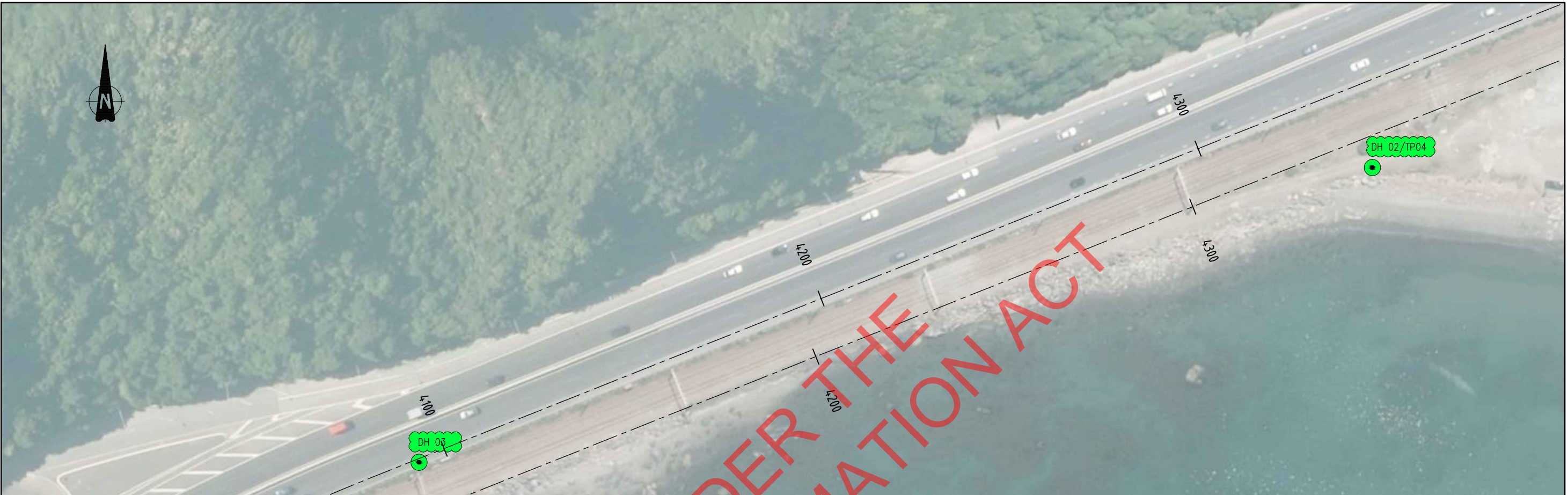


FOR INFORMATION ONLY

PETONE TO NGAURANGA CYCLEWAY

GEOTECHNICAL INVESTIGATION

A1	STATUS FOR INFORMATION ONLY	DRAWING NO. SK130	REV.
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Legend

P2G – Proposed investigations

-  Borehole
-  Cone Penetration Test
-  Trial Pit

W2HVlink - Completed investigations

-  Drillhole
-  Trial Pit

GEOTECHNICAL INVESTIGATION TABLE

ID	EASTING	NORTHING	DEPTH	LEGAL DESCRIPTION	LAND PARCEL	OWNERSHIP
DH 02/TP04	1755518	5434577	7.5m		RAILWAY PARCEL	
DH 03	1755283	5434504	10.5m		ROAD PARCEL	

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PETONE TO NGAURANGA CYCLEWAY

GEOTECHNICAL INVESTIGATION

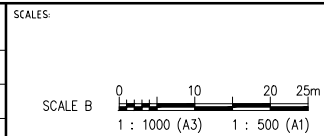
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Legend

P2G – Proposed investigations

- Borehole
- ▼ Cone Penetration Test
- Trial Pit

W2HVlink - Completed investigations

- Drillhole
- Trial Pit

GEOTECHNICAL INVESTIGATION TABLE

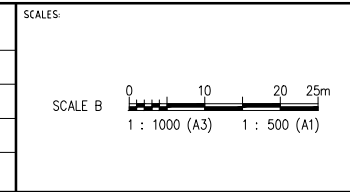
ID	EASTING	NORTHING	DEPTH	LEGAL DESCRIPTION	LAND PARCEL	OWNERSHIP
CPT P7	1755910	5434600	TBC	SECTION 1 SURVEY OFFICE PLAN 407772		CATHERINE MARIE AMOHIA LOVE, HOKIPERA JEAN RUAKERE, HOWARD KEVIN TAMATI,
TP 02	1755803	5434676	2.0m		RAILWAY PARCEL	
TP 03	1755696	5434647	2.5m		RAILWAY PARCEL	

NOT COMPLETED

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No.	BY	DATE	DESCRIPTION	APPD.

DESIGNED	PR	CHECKED	
DRAWN	GD	CHECKED	
APPROVED		DATE	



FOR INFORMATION ONLY

PETONE TO NGAURANGA CYCLEWAY

GEOTECHNICAL INVESTIGATION

A1	STATUS FOR INFORMATION ONLY	DRAWING NO. SK132	REV.
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CAD Ref: D:\Temp\publish_34581_SK130_Geotechnical Investigation.dwg

ID	EASTING	NORTHING	DEPTH
BH P1	1755976.2	5434863.85	TBC
BH P2	1756010	5434790	TBC
BH P3	1756278	5434786	TBC
BH P4	1756099	5434734	TBC
BH P5	1756150	5434640	TBC
CPT P1	1756020	5434790	TBC
CPT P10	1756240	5434565	TBC
CPT P2	1756258.8	5434779.58	TBC
CPT P3	1756098	5434740	TBC
CPT P4	1756100	5434670	TBC
CPT P5	1756090	5434635	TBC
CPT P6	1755990	5434660	TBC
CPT P7	1755910	5434600	TBC
CPT P8	1756005	5434585	TBC
CPT P9	1756075	5434545	TBC
TP P1	1756135	5434580	TBC
TP P2	1756235	5434585	TBC

ID	EASTING	NORTHING	DEPTH
DH 01	1755983	5434684	TBC
TP 01	1756024	5434683	2.2m
TP 02	1755803	5434676	2.0m

Legend

P2G - proposed investigations

- Borehole
- Cone Penetration Test
- Trial Pit

W2HVlink - investigations (17/04/2014)

- Borehole
- Trial Pit

SH2 Melling-Petone Upgrade (Beca, 1998)

- Borehole
- Trial Pit

SH2 Petone Overbridge (Works Consultancy, 1992)

- Borehole
- parcels



Prepared For:	Prepared By:	Title:
NZ TRANSPORT AGENCY WAKA KOTAHĪ	OPUS AECOM	Proposed Combined Geotechnical Investigations
Project: Petone to Grenada Link Road & Wellington to Hutt Valley Link		
Scale: 1:1,500	Date: 17 Apr 2014	Project No: Figure: 1

D R A F T

Appendix C

Previous Drillhole Core Logs

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Record of : Borehole P1

Sheet 1 of 1

P1

Job Name : SH2 Melling to Petone Upgrade
 Client : TRANSIT NZ
 Job Number: 3401073

Location : Eastern Borehole at Petone
 Datum : Mean Sea Level
 Elevation: RL2.8 +/- 0.2m

Depth(m)	LGD SYM		Strata Description	Elevation (m)	Depth(m)	Sample		Field Tests		Lab Test
	Depth(m)	Type				SPT	Vane			
0.8			Dark brown rounded to angular GRAVELS. With some sand. (FILL) Increasing sand, brick and concrete fragments present.							
1.0			Wet grey medium dense, sub angular, fine, medium and coarse GRAVELS. With minor sand and a trace of silt.		1.0	SPT	10/11/11	22		
2.0			With some fine medium and coarse angular sand. Shells and orangey red, and brown rounded medium gravels in sample. (MARINE DEPOSITS).		2.0	SPT	6/9/11	20		
2.2			Dark grey medium dense GRAVELLY SILT. With some fine sand. Gravels are sub rounded, fine, medium and coarse. (ALLUVIUM).		2.2	SPT				
3.0					3.0	SPT	6/5/7	12		
3.8			Grey very dense, fine, medium and coarse sub angular and sub rounded GRAVEL. With minor sand and a trace of silt.		3.8	SPT	50 for 100mm	50+		
4.0					4.0	SPT				
4.5			Grey, very dense, slightly weathered SANDSTONE. (Sample comprised angular gravels with a trace of sand)		4.5	SPT	50 for 70mm	50+		
5.0					5.0	SPT				
6.0					6.0		50 for 55mm	50+		
7.0			CORE: Light grey, slightly weathered, moderately strong and weak, SANDSTONE (Greywacke rock) with dark grey Argillite bands (10-15mm depth) space about 1.0 metres apart. Cracks at 30 to 45 degrees below horizontal. Spacing between fractured regions of rock is 0.5 to 1.0m.		7.0	C				
			E.O.B. 10.0m							

Observations:

Coring from 7.0 to 10.0 metres
 Cased to 4.0m
 Water level 2.4m

Samples:

- S Small disturbed sample
- L Large disturbed sample
- U Undisturbed tube sample
- C Undisturbed core sample
- P SPT Split spoon sample

Field Tests

- SPT Standard Penetration test (N=blows/300mm)
- P Scala Penetrometer test data
- C Cohesion as measured direct with shear vane
- CR Remoulded C
- CC Corrected Reading (kPa)

Pilcon Vane

Dial No:

Date Started: 22/4/98
 Date Finished: 23/4/98

Dia:
 Logged By: Tim Sullivan

Rig:
 Contractor: Griffiths Drilling



Record of : Borehole P2

Sheet 1 of 1

P2

Job Name : SH2 Melling to Petone Upgrade
 Client : TRANSIT NZ
 Job Number: 3401073

Location : Western Borehole at Petone
 Datum : Mean Sea Level
 Elevation: RL2.8 +/- 0.1m

Depth(m)	LGD	SYM	Strata		Elevation (m)	Sample		Field Tests		Lab Test
			Description			Depth(m)	Type	SPT	Vane	
1			Yellow Brown, Stiff SANDY SILT. With some fine and medium angular gravels. (FILL)			1.0		8/6/6	12	
2			Dark Grey medium dense, fine, medium and coarse, sub rounded and sub angular GRAVELS. With some angular sand and a trace of silt. White shell fragments. (MARINE DEPOSITS)		1.5	2.0	SPT	6/12/16	28	
3			Increasing density and gravels sub angular.			3.0	SPT	1/37/13 for 40 mm	50+	
4			Some of the gravels have white streaks.			4.0	SPT	50 for 100mm	50+	
5			Dark grey, slightly weathered SANDSTONE.		5.0	5.0	SPT	50 for 115mm	50+	
6			(Sample comprised dark grey, very dense, angular, fine, medium and coarse gravels with a trace of angular sand)			6.0	SPT	50 for 60mm	50+	
7			Crushed dark grey with non-crushed light grey bands (200 to 300mm) moderately strong to weak SANDSTONE (greywacke rock). Crushed rock dimensions of 50 to 70mm extend for 1.5m of the core. From 7.2 to 7.35m and 8.5 to 8.8m the crushed rock is dark grey/black argillite rock. Note that from 8.5 to 8.8m the rock is finely crushed (10 to 20 mm dimensions).		7.0		C			
9.5			E.O.B. 9.5 metres.			9.5				

Observations:

Cased to 5.5m
 Water level 2.3m
 Cored 7.0 to 9.5m

Samples:

- S Small disturbed sample
- L Large disturbed sample
- U Undisturbed tube sample
- C Undisturbed core sample
- P SPT Split spoon sample

Field Tests

- SPT Standard Penetration test (N=blows/300mm)
- P Scala Penetrometer test data
- C Cohesion as measured direct with shear vane
- CR Remoulded C
- CC Corrected Reading (kPa)

Pilcon Vane

Dial No:

Date Started:20/4/98
 Date Finished:21/4/98

Dia:
 Logged By:Tim Sullivan

Rig:
 Contractor:Griffiths Drilling

LOG OF DRILL HOLE

PROJECT SH2 Realignment FEATURE Retaining Wall LOCATION Petone On Ramp

GRID REF CO-ORD. 707 397.61 mN / 306 947.7 m E DATUM M.S.L.

ANGLE FROM HORIZONTAL 90° DIRECTION H.A.D. GROUND 9.26 m H.A.D. COLLAR

DESCRIPTION OF CORE WEATHERING, HARDNESS, STRENGTH, COLOUR, ROCK OR SOIL TYPE, DEFECT SPACING. LITHOLOGICAL FEATURES (bedding, foliation, mineralogy, texture, cement, etc): STRATIGRAPHIC NAME	ROCK WEATHERING SW MW HW CW	ROCK HARDNESS VH H MH MS S VS	SAMPLE TYPE	CORE LIFT m 50 100	DEPTH H.A.D. m Core size casing	LOG GRAPHIC LOG	FRACTURE LOG Spacing of natural fractures cm/m Fractures/m of core	ROCK DEFECTS PROMINENT JOINTS, BEDDING, SEAMS, VEINS SHATTER, SHEAR, AND CRUSH ZONES, FOL- IATION SCHISTOSITY (attitude, width, spacing, smoothness) (OR SOIL DESCRIPTION) (consistency, compactness, water content, group symbol etc.)	DATE/DEPTH R.O.D. %	WATER LEVEL	DRILL WATER LOSS %	STANDARD PENETRATION TEST (SPT)

Brown gravelly clayey sandy SILT					5	XX		Concrete + bitumen				
Brown gravelly sandy clayey SILT silty CLAY			SPT		5	0 x x 0		- dry; firm; stiff silt; sand; clay, gravel, fine to medium angular greywacke				3/5/6/5/4/5 N=20
" "			SPT		5	0 x x 0		" "				3/4/6/5/6/6 N=23
Brown gravelly clayey SILT with some sand			SPT		5	0 x x 0		- moist; firm; stiff; silt; clay gravel, fine angular greywacke with some sand				5/5/6/5/6/5 N=22
Brown sandy clayey GRAVEL			SPT		5	0 x x 0		- moist; medium dense; gravel, fine, medium angular greywacke; sand; clay.				2/4/3/5/4 N=17
Old Road Surface			SPT		5	0 x x 0		Asphalt and base course				13/60 for 75mm REF
Grey gravelly SAND [FILL]			SPT		5	0 x x 0		- moist; sand; gravel, medium angular greywacke. - medium dense				4/6/4/5/5/5 N=19
			SPT		5	0 x x 0		- NO sample.				5/65 for 50mm REF
Grey, unweathered, strong, greywacke SANDSTONE jointing closely spaced with crushed, shattered and sheared zones.					5			Jl 60°, smooth; light grey silty crush zone and shatter grey broken (drilling induced) angular (Fol) greywacke gravel				
[WELLINGTON GREYWACKES.]			COKE		5			J60-70°, smooth; MW; Dark brown silty CLAY infill				
					5			Crush zone: light grey silty SAND with fine greywacke gravel				
					5			H00°, smooth, un; light grey silty infill (crushy)				
					5			sheared and shattered greywacke				
					5			End of Hole 11.5m				

DRILLER: M. Griffiths
 STARTED: 4/8/92
 FINISHED: 5/8/92
 DRILL: Sanderson Cydon

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

ROCK HARDNESS
 VH - Very hard
 H - Hard
 MH - Moderately hard
 MS - Moderately soft
 S - Soft
 VS - Very soft

FRACTURE LOG
 Spacing of natural fractures
 Fractures/m of core

LOGGED: J. McManis
 DATE: 4/8/92
 TRACED:
 CHECKED:
 ORIGINAL VERTICAL:
 SCALE: 1:50
 SHEET 1 OF 1 DRG NO

PROJECT: SH2 Realignment
 HOLE NO.: BH 1
 LENGTH: 11.5m
 CORE BOXES: 1

EXPLANATION
 SPT = number of blows recorded for each 75mm penetrated to a total of 450mm. The first 150mm are considered as seating blows and disregarded

LOG OF DRILL HOLE
 PROJECT SH2 Raakgund... FEATURE beneath the of Kamp... LOCATION below...
 GRID REF... CO-ORD. 702 323.03 M.N / 1306 997.04 M.E DATUM M.S.L.
 ANGLE FROM HORIZONTAL 90° DIRECTION... H.A.D. GROUND 3.30m H.A.D. COLLAR...

DESCRIPTION OF CORE WEATHERING, HARDNESS, STRENGTH, COLOUR. ROCK OR SOIL TYPE, DEFECT SPACING. LITHOLOGICAL FEATURES (bedding, foliation, mineralogy, texture, cement, etc): STRATIGRAPHIC NAME	ROCK WEATHERING SW MW HW CW	ROCK HARDNESS VH H MH MS S VS	SAMPLE TYPE Chip SPT	CORE LOSS % LIFT	DEPTH H.A.D. Core case casing	LOG GRAPHIC LOG	FRACTURE LOG (Spacing of natural fractures)	ROCK DEFECTS PROMINENT JOINTS, BEDDING, SEAMS, VENS SHATTER, SHEAR, AND CRUSH ZONES, FOLIATION SCHISTOSITY (altitude, width, spacing, smoothness) (OR SOIL DESCRIPTION) (consistency, compactness, water content, group symbol etc)	DATE/DEPTH ROD, "	WATER LEVEL Date	DRILL WATER LOSS %"	STANDARD PENETRATION TEST (SPT)

Grey brown sandy silty GRAVEL			Chip		5			Old road surface.				
Yellow brown sandy silty GRAVEL with rare clay			SPT		1			- Wet; gravel; fine angular greywacke.				
[ALLUVIAL GRAVEL]			SPT		5			- no sample				
			SPT		2							
			SPT		5			- Wet gravel; fine to medium fine to medium angular greywacke; sand; silt; clay - very dense				
			SPT		3							
			SPT		5			no sample				
			SPT		4							
Grey; unweathered to slightly weathered; strong greywacke sandstone.					5			Jts 50:60 - crush grey silty sand with some clay				
					5			Jts 50 - unstained				
					5			Jts 60				
					5			Jts 60 - rescaled (quartz)				
					6			shatter zone - broken iron stained pebbles				
					5							
					7			shatter/sheared zone				
					5			End of Hole 7.15m				

DRILLER: M. Onif... STARTED: 5/8/92 FINISHED: 1/8/92 DRILL: Sanderson Cyclone	ROCK WEATHERING UW - Unweathered SW - Slightly weathered MW - Moderately weathered HW - Highly weathered CW - Completely weathered	ROCK HARDNESS VH - Very hard H - Hard MH - Moderately hard MS - Moderately soft S - Soft VS - Very soft	FRACTURE LOG (cm) Spacing of natural fractures Fracture/m of core	LOGGED: J. McMan DATE: 10/8/92 TRACED: CHECKED: ORIGINAL VERTICAL: SCALE: 1:50 SHEET... OF... DRG NO...	PROJECT: SH2 Raakgund HOLE NO: BN2 LENGTH: 7.15m CORE BOXES: 1
--	---	---	---	---	---

EXPLANATION
 SPT = number of blows recorded for each 75mm penetrated to a total of 450mm. The initial 150mm are considered as seating blows and disregarded

D R A F T

Appendix D

Drillhole Core Logs and Photographs

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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.
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
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.

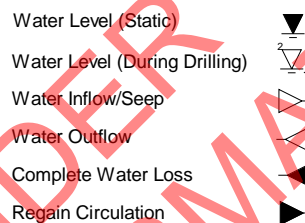
* = Vane test performed on core recovered prior to extrusion from core barrel.
= Vane test performed on excavated material of suitable size.

UTP - Unable to penetrate.

Piezometer Installation

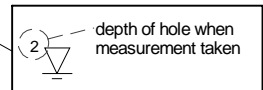
Standpipe		Grout	
Slotted Standpipe		Cement	
Drill Cuttings		Gravel Pack Filter	
Bentonite		Sand Pack Filter	

Groundwater Records



Samples

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



ROCK DESCRIPTIONS

Relative Strength

ES	- Extremely strong	USC (MPa)	> 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

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

Relative Density Non-cohesive soils

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

Rock Defect Abbreviations

Defect Type

J = Joint
Slk = Slickenside
BP = Bedding Plane Defect
SZ = Shear Zone
FZ = Fracture Zone
WZ = Weak Zone
F = Fracture
BkJ = Broken Joint
L = Lamination
HJ = Healed Joint
DB = Drilling Break

Defect Appearance

BkJ = Broken Joint
L = Lamination
HJ = Healed Joint
DB = Drilling Break
R = Rough
vR = Very Rough
Sm = Smooth
T = Tight
Pl = Planar
Cn = Clean
Bed = Bedding
\ = Parallel
Ud = Undulating
St = Stepped
Op = Open
Pol = Polished
H = Healed

Infill Material

Mn = Manganese
Fe = Iron Oxide
Qtz = Quartz
S = Sand
Gr = Graphite
Ch = Chlorite
NF = No Infill
Co = Coalified
Py = Pyrite
Slt = Silt
CC = Calcite
Cb = Carbonaceous
Cl = Clay
V = Veneer
Calc = Calcareous

Graphic Log (typical symbols)

	Organic Material		Mudstone
	Clay		Siltstone
	Silt		Sandstone
	Sand		Volcanic Rock
	Gravel / Cobbles		No recovery

Rock Classification Abbreviations

GSI = Geological Strength Index
RQD = Rock Quality Designation
Jn = Joint Set Number
Jr = Joint Roughness Number
Ja = Joint Alteration Number

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 **NZTA**
 Project **P2N Cycleway**
 Project number **60306339**

Co-ordinates **1755518mE 5434577mN**
 Orientation **-90°** Elevation **3m (Approx)**
 Location **KiwiRail Wairarapa Line**
 Feature **50m southwest of rowing clubhouse.**

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	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 RW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm)</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
FILL 0m: Reclamation FILL for rail/road corridor		Sonic				1		73		0m: Silty coarse GRAVEL with minor coarse sand, cobbles and traces of bricks and shells; dark brown. Medium dense, dry, gap graded. Gravel is moderately weathered, grey, fine SANDSTONE, strong, angular to subangular, 40-120mm.	
										0.8 to 3m: Grades to moist.	
										1.1 to 1.5m: Core Loss	
COLLUVIUM 3m: Reworked COLLUVIUM and alluvial fan sediments deposited on shore platform	SS 4,4,4, 3,3,4 N=14	SPT				2		100		2.4 to 3m: Rock fragments are moderately weathered, grey with black staining, fine SANDSTONE, moderately strong.	
										3m: Fine to coarse GRAVEL with some coarse sand; dark greyish brown. Loose, moist, poorly graded. Gravel is moderately weathered, fine SANDSTONE, moderately strong, rounded to subrounded, 5-30mm.	
RAKAIA TERRANE 4.1m: Slightly weathered, bluish grey, fine SANDSTONE. Extremely weak, sheared (possibly associated with the Wellington Fault) [TORLESSE SUPERGROUP greywacke].	SS 1,2,1, 2,2,2 N=7	SPT				3		100		4.1m: Recovered as silty fine to medium GRAVEL (sonic drilling induced); bluish grey. Dense, wet, gap graded. Gravel is moderately weathered, fine SANDSTONE, moderately strong, rounded to subrounded, 5-20mm.	
	SS 14,27,27, 23 for 60mm N>50	SPT				4		100			

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DRILLHOLE LOG DH02.GPJ BASE.GDT 03/03/14

<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH		WEATHERING		Date logged	20/12/2013	Driller Griffiths Drilling Ltd. Started 19/12/2013 Finished 19/12/2013 Drill Rig Sonic Core Boxes 3
FLUID DEPTHS DURING DRILLING				VS - Very strong	UW - Unweathered			Logged	PGR	
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	S - Strong	SW - Slightly weathered			Checked	DAB	
				MS - Moderately strong	MW - Moderately weathered					
				W - Weak	HW - Highly weathered					Page 1 of 4
				VW - Very weak	CW - Completely weathered					
Hand Held Shear Vane				EW - Extremely weak	RW - Residually weathered					
vane shear strength per NZGS guideline				Remarks						
				Drillhole was pre-excavated and backfilled to 2.0m depth to remove large site obstacles.						
				Drillhole was back filled upon completion.						

Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1755518mE 5434577mN
 Orientation -90° Elevation 3m (Approx)
 Location KiwiRail Wairarapa Line
 Feature 50m southwest of rowing clubhouse.

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS W VW</small>	Rock Weathering <small>SW MW EW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm)</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
4.1m: Slightly weathered, bluish grey, fine SANDSTONE. Extremely weak, sheared (possibly associated with the Wellington Fault) [TORLESSE SUPERGROUP greywacke].		Sonic				6		100 [60] 40		4.1m: Recovered as silty fine to medium GRAVEL (sonic drilling induced); bluish grey. Dense, wet, gap graded. Gravel is moderately weathered, fine SANDSTONE, moderately strong, rounded to subrounded, 5-20mm. 5 to 6m: Recovered as rock fragments crumbling under finger pressure into coarse sandy fine to coarse GRAVEL (sonic drilling induced); grey. Moist. Gravel is 5-50mm.	
		Sonic				7		90 [0] 0		6 to 7m: Recovered as coarse gravel with some coarse sand (sonic drilling induced). Dense, dry, poorly graded. Gravel is 40-60mm. 7 to 7.5m: Recovered core has a smooth vibration induced coating on the outside, 3mm (sonic drilling induced).	
						8				DH02 terminated at 7.5m Target Depth	
						9					

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DRILLHOLE LOG DH02.GPJ BASE.GDT 03/03/14

<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH	WEATHERING	Date logged 20/12/2013	Driller Griffiths Drilling Ltd. Started 19/12/2013 Finished 19/12/2013 Drill Rig Sonic Core Boxes 3
FLUID DEPTHS DURING DRILLING				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 RW - Residually weathered	Logged PGR	
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	Remarks		Checked DAB	
Hand Held Shear Vane				Drillhole was pre-excavated and backfilled to 2.0m depth to remove large site obstacles. Drillhole was back filled upon completion.			
vane shear strength per NZGS guideline							Page 2 of 4



Box: 1 of 3 - Depth: 0.00m to 3.45m of 7.50m

Date Drilled 19/12/2013 to 19/12/2013 - Date Photographed: 19/12/2013



Box: 2 of 3 - Depth: 3.45m to 6.15m of 7.50m

Date Drilled 19/12/2013 to 19/12/2013 - Date Photographed: 19/12/2013



Box: 3 of 3 - Depth: 6.15m to 7.50m of 7.50m

Date Drilled 19/12/2013 to 19/12/2013 - Date Photographed: 19/12/2013

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Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1755283mE 5434504mN
 Orientation -90° Elevation 3m (Approx)
 Location State Highway 2, Wellington
 Feature Southbound shoulder opposite to Horokiwi Quarry access.

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS W VW</small>	Rock Weathering <small>SW MW HW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm) 500 100 50 10</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
0m: Road pavement. 0.2m: Reclamation FILL for road/rail corridor										0m: Asphalt. 0.2m: Vacuum excavation, no recovery	
FILL			VAC EX			1		0			
				Sonic		2		0		2.3 to 3m: Core Loss	
3m: Possibly reworked colluvium and alluvial fan sediments	SS 2,3,8, 7,5,9 N=28			SPT		3		100		3m: Medium to coarse GRAVEL with minor fine to coarse sand; greyish black, brown. Medium dense, wet, uniform grading. Gravel is slightly weathered, fine SANDSTONE, strong, angular.	
				Sonic		4		100		3.7m: GRAVEL with some fine to coarse sand, silt and minor clay; light brown. Medium dense, wet, well graded. Gravel is slightly weathered, fine SANDSTONE, strong, angular.	
COLLUVIUM 4.5m: Reworked COLLUVIUM and alluvial fan sediments deposited on shore platform.	SS 3,5,5, 6,4,4 N=19			SPT				100		4.5m: Fine to medium sandy GRAVEL with some silt and clay; dark grey. Medium dense, wet, well graded. Gravel is slightly weathered to unweathered, fine SANDSTONE, strong, angular to subangular.	
<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH		WEATHERING		Date logged 13/12/2013		Driller Griffiths Drilling Ltd.	
FLUID DEPTHS DURING DRILLING				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 RW - Residually weathered		Logged JM		Started 12/12/2013	
Date Time Drilled Depth (m) Casing Depth (m) Fluid Depth (m)				Remarks				Checked DAB		Finished 13/12/2013	
Hand Held Shear Vane				Drill hole was back filled upon completion.						Drill Rig Sonic	
vane shear strength per NZGS guideline										Core Boxes 3	
										Page 1 of 5	

DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE.GDT 03/03/14

RELEASED UNDER THE OFFICIAL INFORMATION ACT

Client **NZTA**
 Project **P2N Cycleway**
 Project number **60306339**

Co-ordinates **1755283mE 5434504mN**
 Orientation **-90°** Elevation **3m (Approx)**
 Location **State Highway 2, Wellington**
 Feature **Southbound shoulder opposite to Horokiwi Quarry access.**

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	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 RW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm)</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 etc</small>	DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	Instrumentation
COLLUVIUM 4.5m: Reworked COLLUVIUM and alluvial fan sediments deposited on shore platform.		Sonic						100		4.5m: Fine to medium sandy GRAVEL with some silt and clay; dark grey. Medium dense, wet, well graded. Gravel is slightly weathered to unweathered, fine SANDSTONE, strong, angular to subangular. 5 to 6m: Grades to dense.		
	RAKAIA TERRANE 6m: Slightly weathered, bluish grey, fine SANDSTONE. Extremely weak, sheared (possibly associated with Wellington Fault) [TORLESSE SUPERGROUP greywacke].	SS 6,18,23,9 for 0mm N>50	SPT				6		100		6m: Clayey, fine to coarse SAND with some silt and gravel; dark bluish grey. Very dense, moist, well graded. Gravel is slightly weathered to unweathered, fine SANDSTONE, strong, angular to subangular.	
		Sonic				7		100 [0] 0		6.5m: Grades to clayey GRAVEL with trace cobbles.		
SS 20,30,30 for 0mm N>50		SPT				8		100 [0] 0		7m: Grades to clayey, fine to coarse SAND with some silt and gravel.		
		Sonic				9		100 [0] 0		8.5m: Recovered as fine to coarse SAND with some silt, gravel and trace cobbles (sonic drilling induced); dark greyish brown. Very dense, dry, well graded. Gravel is slightly weathered to unweathered, fine SANDSTONE, strong, angular to subangular.		
		Sonic						100 [0] 0		9m: Recovered as clayey GRAVEL with minor silt and fine to coarse sand (sonic drilling induced); bluish grey. Very dense, wet, gap graded. Gravel is slightly weathered to unweathered, fine SANDSTONE, strong, angular to subangular.		
		Sonic						100 [0] 0		9.8m: Grades to fine to coarse sandy GRAVEL with minor silt and clay.		

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DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE_GDT 03/03/14

<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH	WEATHERING	Date logged 13/12/2013	Driller Griffiths Drilling Ltd.
FLUID DEPTHS DURING DRILLING				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 RW - Residually weathered	Logged JM	Started 12/12/2013
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	Remarks		Checked DAB	Finished 13/12/2013
Hand Held Shear Vane				Drill hole was back filled upon completion.		Drill Rig Sonic	
vane shear strength per NZGS guideline						Core Boxes 3	
						Page 2 of 5	

Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1755283mE 5434504mN
 Orientation -90° Elevation 3m (Approx)
 Location State Highway 2, Wellington
 Feature Southbound shoulder opposite to Horokiwi Quarry access.

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS W VW</small>	Rock Weathering <small>SW MW EW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm)</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
		Sonic						100 [0] 0		9.8m: Grades to fine to coarse sandy GRAVEL with minor silt and clay.	
						11				DH03 terminated at 10.5m Target Depth	
						12					
						13					
						14					
<i>For explanation of symbols and observations, see key sheet</i>				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 RW - Residually weathered		Date logged 13/12/2013 Logged JM Checked DAB		Driller Griffiths Drilling Ltd. Started 12/12/2013 Finished 13/12/2013 Drill Rig Sonic Core Boxes 3	
FLUID DEPTHS DURING DRILLING Date Time Drilled Depth Casing Depth Fluid Depth (m) (m) (m)				Remarks Drill hole was back filled upon completion.						Page 3 of 5	
Hand Held Shear Vane											
vane shear strength per NZGS guideline											

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DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE.GDT 03/03/14



Box: 1 of 3 - Depth: 2.30m to 5.55m of 10.50m
Date Drilled 12/12/2013 to 13/12/2013 - Date Photographed: 18/12/2013



Box: 2 of 3 - Depth: 5.55m to 8.25m of 10.50m
Date Drilled 12/12/2013 to 13/12/2013 - Date Photographed: 18/12/2013



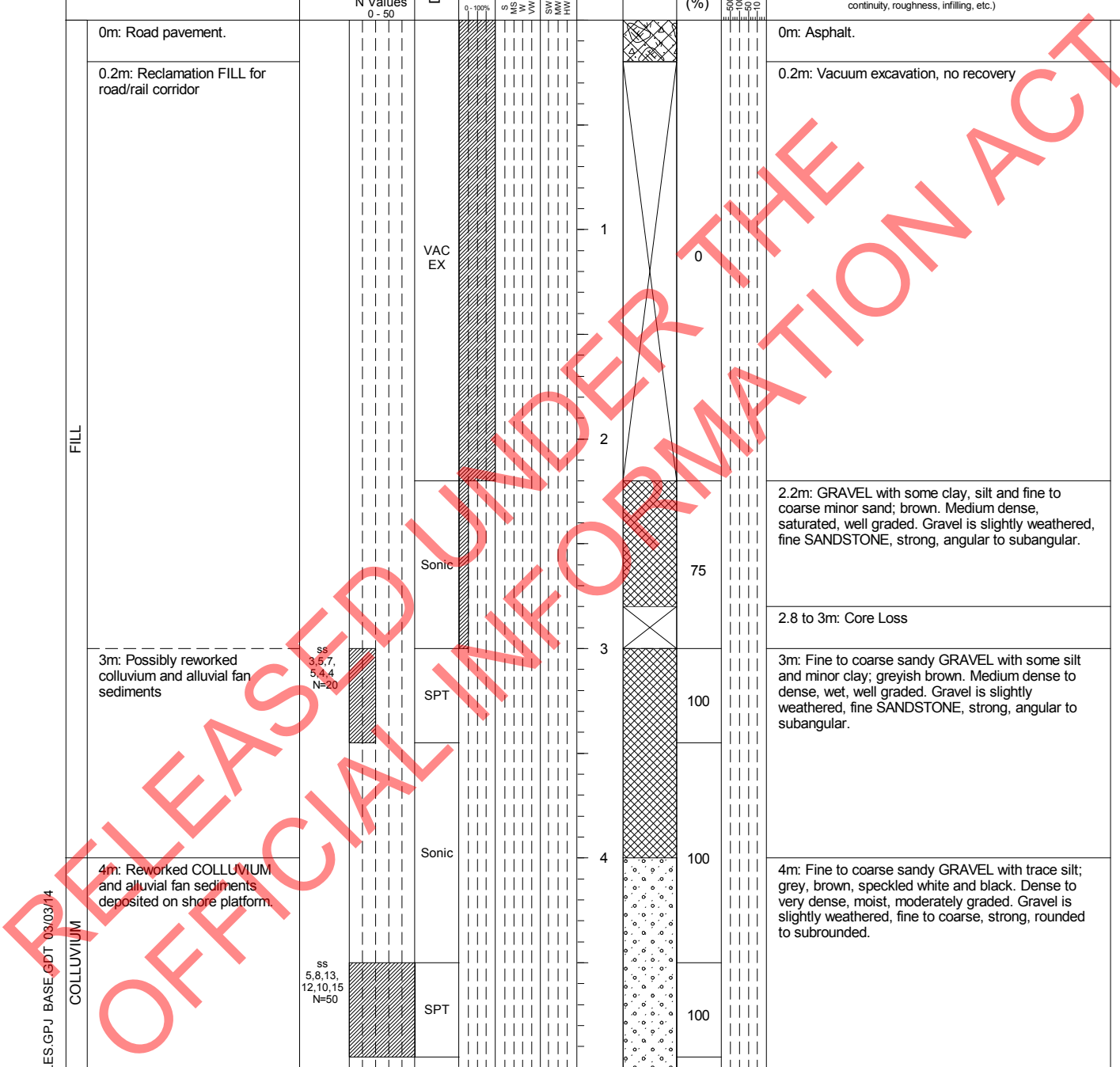
Box: 3 of 3 - Depth: 8.25m to 10.50m of 10.50m

Date Drilled 12/12/2013 to 13/12/2013 - Date Photographed: 18/12/2013

Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1755069mE 5434388mN
 Orientation -90° Elevation 3m (Approx)
 Location State Highway 2, Wellington
 Feature Southbound shoulder 100m south of the Horokiwi Quarry access.

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS W VW</small>	Rock Weathering <small>SW MW HW RW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm) 500 100 50 10</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
0m: Road pavement.										0m: Asphalt.	
0.2m: Reclamation FILL for road/rail corridor										0.2m: Vacuum excavation, no recovery	
FILL		VAC EX				1		0			
		Sonic				2					
										2.2m: GRAVEL with some clay, silt and fine to coarse minor sand; brown. Medium dense, saturated, well graded. Gravel is slightly weathered, fine SANDSTONE, strong, angular to subangular.	
										2.8 to 3m: Core Loss	
3m: Possibly reworked colluvium and alluvial fan sediments	SS 3,5,7, 5,7,4 N=20					3		75		3m: Fine to coarse sandy GRAVEL with some silt and minor clay; greyish brown. Medium dense to dense, wet, well graded. Gravel is slightly weathered, fine SANDSTONE, strong, angular to subangular.	
		SPT						100			
		Sonic				4		100			
4m: Reworked COLLUVIUM and alluvial fan sediments deposited on shore platform.	SS 5,8,13, 12,10,15 N=50							100		4m: Fine to coarse sandy GRAVEL with trace silt; grey, brown, speckled white and black. Dense to very dense, moist, moderately graded. Gravel is slightly weathered, fine to coarse, strong, rounded to subrounded.	
		SPT						100			
COLLUVIUM											
For explanation of symbols and observations, see key sheet				RELATIVE STRENGTH		WEATHERING		Date logged 16/12/2013		Driller Griffiths Drilling Ltd.	
FLUID DEPTHS DURING DRILLING				VS - Very strong		UW - Unweathered		Logged PGR		Started 15/12/2013	
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	S - Strong		SW - Slightly weathered		Checked DAB		Finished 16/12/2013	
				MS - Moderately strong		MW - Moderately weathered					
				W - Weak		HW - Highly weathered					
				VW - Very weak		CW - Completely weathered					
				EW - Extremely weak		RW - Residually weathered					
Hand Held Shear Vane				Remarks Drill hole was back filled upon completion.							
vane shear strength per NZGS guideline				Drill Rig Sonic Core Boxes 3							
				Page 1 of 4							

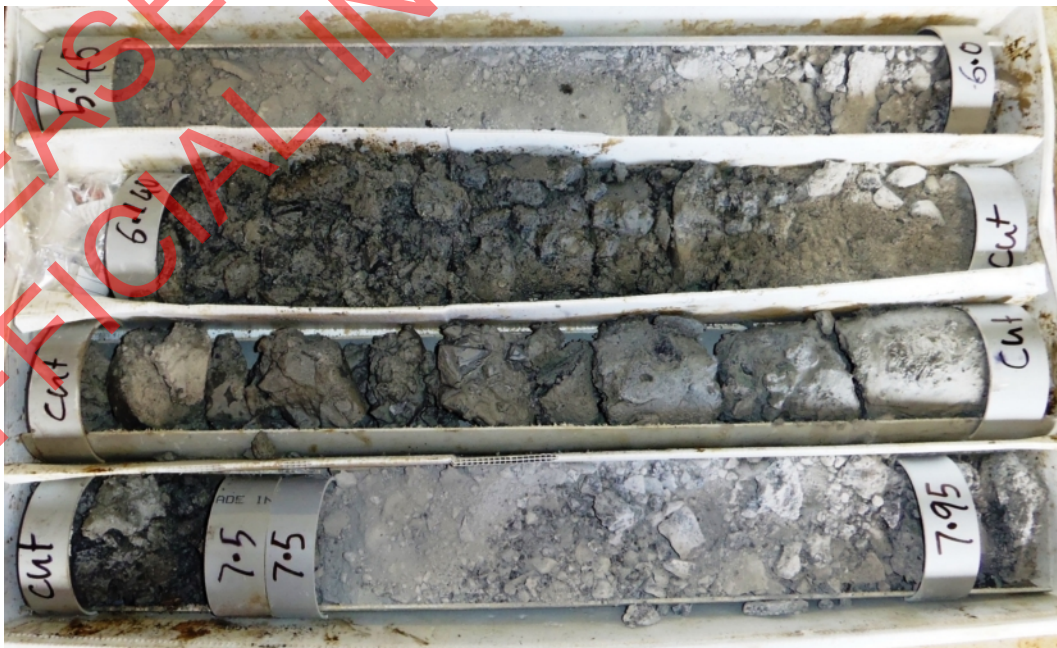


DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE.GDT 03/03/14



Box: 1 of 3 - Depth: 2.20m to 5.45m of 8.10m

Date Drilled 15/12/2013 to 16/12/2013 - Date Photographed: 18/12/2013



Box: 2 of 3 - Depth: 5.45m to 7.95m of 8.10m

Date Drilled 15/12/2013 to 16/12/2013 - Date Photographed: 18/12/2013



Box: 3 of 3 - Depth: 7.95m to 8.10m of 8.10m

Date Drilled 15/12/2013 to 16/12/2013 - Date Photographed: 18/12/2013

RELEASED UNDER THE OFFICIAL INFORMATION ACT

Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1754304mE 5433973mN
 Orientation -90° Elevation 3m (Approx)
 Location State Highway 2, Wellington
 Feature Southbound shoulder 60m north of Kiwirail seaward building

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS W VW</small>	Rock Weathering <small>SW MW HW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects (mm) <small>500 100 50 10</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
0m: Road pavement. 0.2m: Reclamation FILL for road/rail corridor						1				0m: Asphalt. 0.2m: Vacuum excavation. Angular cobbles (rock fill) up to 150mm width.	
		VAC EX				2		0		DH05 terminated at 2m Unable to advance due to services	
						3					
						4					

RELEASED UNDER THE OFFICIAL INFORMATION ACT

DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE_GDT 03/03/14

<i>For explanation of symbols and observations, see key sheet</i>				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 RW - Residually weathered		Date logged 16/12/2013 Logged JP Checked DAB		Driller Griffiths Started 16/12/2013 Finished 16/12/2013 Drill Rig Sonic Core Boxes 0	
FLUID DEPTHS DURING DRILLING Date Time Drilled Depth (m) Casing Depth (m) Fluid Depth (m)				Remarks Drillhole was interrupted due to presence of unmarked service.							
Hand Held Shear Vane											
vane shear strength per NZGS guideline				Page 1 of 1							

Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1752517mE 5432596mN
 Orientation -90° Elevation 3m (Approx)
 Location State Highway 2, Wellington
 Feature 650m northeast of Ngauranga Station.

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS MSW VW</small>	Rock Weathering <small>SW MW RW</small>	Depth	Graphic Log	TCR (SCR) RQD (%)	Spacing of Natural Defects <small>(mm)</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
0m: Reclamation FILL for road/rail corridor										0m: Vacuum excavation, no recovery	
FILL			VAC EX			0		0		1.5m: Recovered as coarse GRAVEL with minor cobbles. Loosely packed, dry. Gravel is angular, slightly weathered, strong greywacke. Cobbles up to 70mm diameter.	
			HQ3			1		87		1.6m: Clayey, silty medium to coarse GRAVEL; brown. Medium dense, moist. Gravel is subangular to angular, moderately to slightly weathered, strong greywacke. 1.7m: Increase in silt content. Firm, moist, low plasticity.	
		SS 6,6,5, 5,5,4 N=19	SPT			2		78		2m: Medium to coarse GRAVEL with some silt and sand; greyish brown. Medium dense, moist. Gravels as described above. 2.3m: Sandy medium to coarse GRAVEL with minor silt and trace cobbles and boulders; greyish brown. Sand is fine to medium. Gravels as described above. Cobbles estimated size up to 80mm diameter.	
			HQ3			3		51		3.95 to 4.16m: Boulder; moderately weathered, moderately strong greywacke. Some white veins, brown joint staining.	
		SS 2,2,4, 2,2,3 N=11	SPT			4		22		4.5m: Sandy, silty GRAVEL; brown. Loose to medium dense, moist. Sand is fine to medium. Gravel is medium to coarse, subangular to angular, moderately to slightly weathered, moderately strong greywacke.	
<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH		WEATHERING		Date logged 21/02/2014	Driller Griffiths		
FLUID DEPTHS DURING DRILLING				VS - Very strong		UW - Unweathered		Logged JP	Started 19/02/2014		
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	S - Strong		SW - Slightly weathered		Checked DAB	Finished 21/02/2014		
				MS - Moderately strong		MW - Moderately weathered			Drill Rig HC 150		
				W - Weak		HW - Highly weathered			Core Boxes 3		
				VW - Very weak		CW - Completely weathered			Page 1 of 5		
				EW - Extremely weak		RW - Residually weathered					
Hand Held Shear Vane				Remarks				Drillhole was back filled upon completion.			
<i>vane shear strength per NZGS guideline</i>											

DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE.GDT 03/03/14

Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1752517mE 5432596mN
 Orientation -90° Elevation 3m (Approx)
 Location State Highway 2, Wellington
 Feature 650m northeast of Ngauranga Station.

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small> Core Loss/Lift 0 - 100%	Relative Strength <small>MS S W VW MW HW RW</small>	Rock Weathering <small>SW MW HW RW</small>	Depth	Graphic Log	TCR [SCR] 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 etc</small>	Instrumentation
									DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
FILL	SS 2,2,2, 1,2,4 N=9	HQ3	MS	SW	6	[Graphic Log]	81	[Spacing of Natural Defects]	4.5m: Sandy, silty GRAVEL; brown. Loose to medium dense, moist. Sand is fine to medium. Gravel is medium to coarse, subangular to angular, moderately to slightly weathered, moderately strong greywacke.	[Instrumentation]
									6m: Recovered as loose packed gravel where fine material was washed away during drilling.	
									6.65m: Reworked COLLUVIUM and alluvial fan sediments	
COLLUVIUM	SS 10,10,10, 10,9,9 N=38	HQ3	MS	SW	7	[Graphic Log]	38	[Spacing of Natural Defects]	6.65m: Silty, gravelly medium to coarse SAND with minor clay; bluish grey. Loose to dense, moist, slightly cohesive. Gravel as described above.	9.45 ▽
									7.5 to 7.95m: Grades to dense.	
									7.95m: Sandy medium to coarse GRAVEL with some silt and minor cobbles; greyish brown. Medium dense, moist. Sand is medium to coarse. Gravel as described above. Cobbles are slightly weathered, strong greywacke, up to 70mm.	
	SS 20,19,8, 5,6,5 N=24	HQ3	MS	SW	9	[Graphic Log]	69	[Spacing of Natural Defects]		

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DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE_GDT 03/03/14

<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH		WEATHERING		Date logged 21/02/2014		Driller Griffiths	
FLUID DEPTHS DURING DRILLING				VS - Very strong		UW - Unweathered		Logged JP		Started 19/02/2014	
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	S - Strong		SW - Slightly weathered		Checked DAB		Finished 21/02/2014	
20/02/2014 09:00	9.45	9.5	7	MS - Moderately strong		MW - Moderately weathered		Drill Rig HC 150 Core Boxes 3			
				W - Weak		HW - Highly weathered					
				VW - Very weak		CW - Completely weathered					
Hand Held Shear Vane				EW - Extremely weak		RW - Residually weathered		Page 2 of 5			
vane shear strength per NZGS guideline				Remarks Drillhole was back filled upon completion.							

Client **NZTA**
 Project **P2N Cycleway**
 Project number **60306339**

Co-ordinates **1752517mE 5432596mN**
 Orientation **-90°** Elevation **3m (Approx)**
 Location **State Highway 2, Wellington**
 Feature **650m northeast of Ngauranga Station.**

GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records N Values 0 - 50	Drilling Method <small>Casing remarks</small>	Core Loss/Lift <small>0 - 100%</small>	Relative Strength <small>MS W VW</small>	Rock Weathering <small>SW MW HW RW</small>	Depth	Graphic Log	TCR [SCR] RQD (%)	Spacing of Natural Defects <small>(mm)</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 etc</small>	Instrumentation
										DEFECT DESCRIPTION <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, continuity, roughness, infilling, etc.)</small>	
COLLUVIUM	ss 7.7,7 7.6,8 N=28	HQ3						40		7.95m: Sandy medium to coarse GRAVEL with some silt and minor cobbles; greyish brown. Medium dense, moist. Sand is medium to coarse. Gravel as described above. Cobbles are slightly weathered, strong greywacke, up to 70mm.	
		SPT						76			
RAKAIA TERRANE	ss 50,10 for 45mm N>50	HQ3						0		12.97m: Grades to coarse gravels, subrounded.	
		SPT						58			
		HQ3						0			
		HQ3						100			
		HQ3						96 [38] 38		13.4 to 13.5m: Recovered as loose packed fine to medium gravel (drilling induced).	
										DH06 terminated at 13.5m Target Depth	
<i>For explanation of symbols and observations, see key sheet</i>				RELATIVE STRENGTH		WEATHERING		Date logged 21/02/2014		Driller Griffiths	
FLUID DEPTHS DURING DRILLING				VS - Very strong		UW - Unweathered		Logged JP		Started	
Date Time Drilled Depth Casing Depth Fluid Depth (m) (m) (m)				S - Strong		SW - Slightly weathered		Checked DAB		19/02/2014	
				MS - Moderately strong		MW - Moderately weathered				Finished	
				W - Weak		HW - Highly weathered				21/02/2014	
				VW - Very weak		CW - Completely weathered				Drill Rig	
				EW - Extremely weak		RW - Residually weathered				HC 150	
Hand Held Shear Vane				Remarks						Core Boxes 3	
<i>vane shear strength per NZGS guideline</i>				Drillhole was back filled upon completion.						Page 3 of 5	

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DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE_GDT_03/03/14

PHOTOGRAPHIC LOG OF DRILLHOLE



Project P2N Cycleway
Location

HOLE IDENTIFICATION **DH06**



Box: 1 of 3 - Depth: 1.50m to 4.50m of of 13.50m
Date Drilled 19/02/2014 to 21/02/2014



Box: 2 of 3 - Depth: 4.50m to 10.50m of of 13.50m
Date Drilled 19/02/2014 to 21/02/2014

DRILLHOLE LOG P2N CYCLEWAY DRILLHOLES.GPJ BASE.GDT 03/03/14



Box: 3 of 3 - Depth: 10.50m to 13.50m of of 13.50m
Date Drilled 19/02/2014 to 21/02/2014

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D R A F T

Appendix E

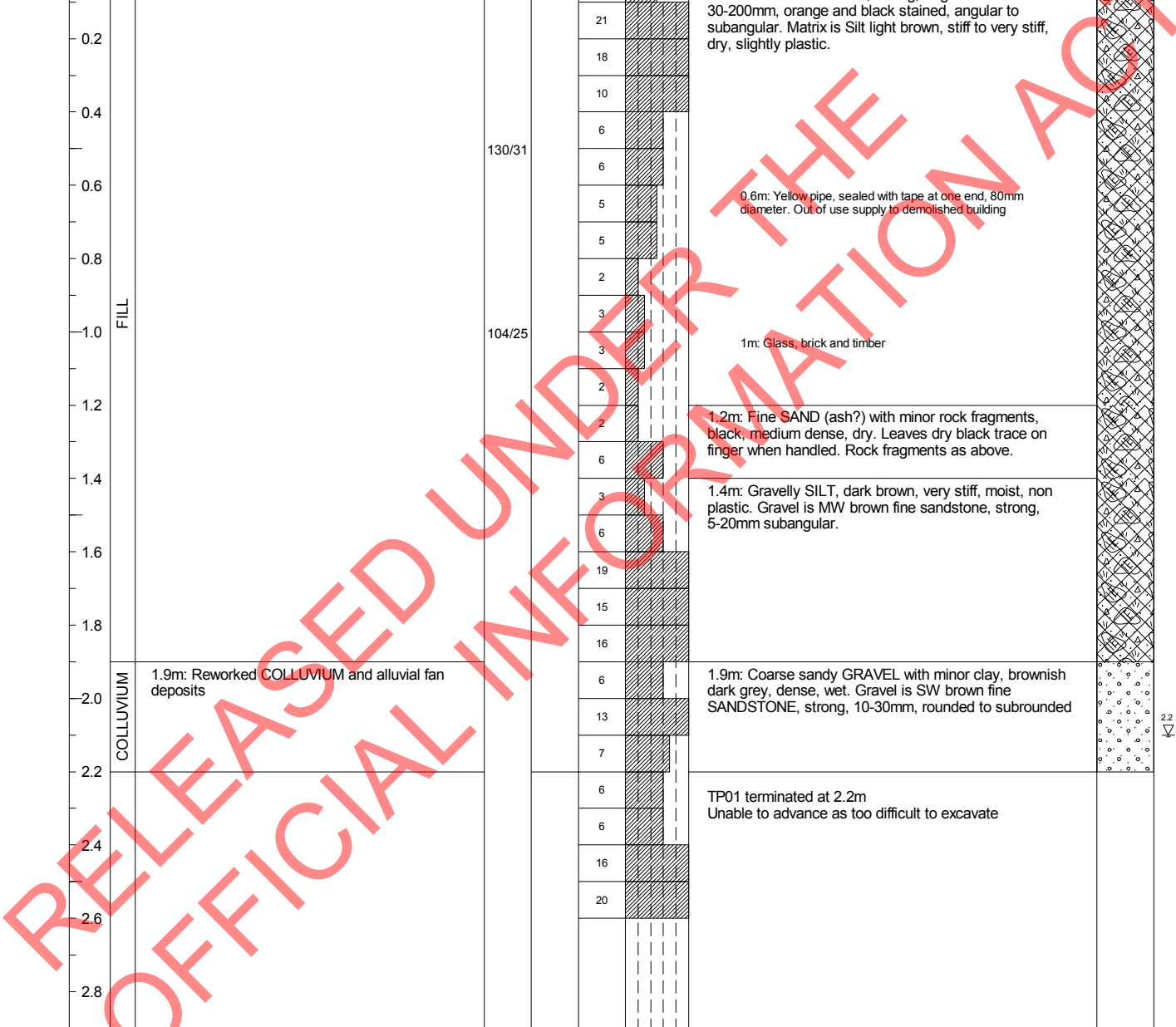
Investigation Pit Logs and Photographs

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Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1756024mE 5434683mN
 Orientation -90° Elevation 2m (Approx)
 Location KiwiRail Wairarapa Line
 Feature 50m E of Korokoro Stream Rail Bridge

Depth	GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records	Sampling	Dynamic Cone Penetrometer (Blows per 100 mm) <small>2 4 6 8</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 etc</small>	Graphic Log	Instrumentation
					Depth Related Remarks <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, Continuity, Roughness, Infilling, etc.)</small>		
0m	Fill						
0.2				5			
0.4				21			
0.6		130/31		18			
0.8				10			
1.0	FILL			6			
1.2				6			
1.4		104/25		5	0.6m: Yellow pipe, sealed with tape at one end, 80mm diameter. Out of use supply to demolished building		
1.6				5			
1.8				2			
2.0	COLLUVIUM			3	1m: Glass, brick and timber		
2.2	1.9m: Reworked COLLUVIUM and alluvial fan deposits			3			
2.4				2	1.2m: Fine SAND (ash?) with minor rock fragments, black, medium dense, dry. Leaves dry black trace on finger when handled. Rock fragments as above.		
2.6				6	1.4m: Gravelly SILT, dark brown, very stiff, moist, non plastic. Gravel is MW brown fine sandstone, strong, 5-20mm subangular.		
2.8				6			
				19			
				15			
				16			
				6	1.9m: Coarse sandy GRAVEL with minor clay, brownish dark grey, dense, wet. Gravel is SW brown fine SANDSTONE, strong, 10-30mm, rounded to subrounded		
				13			
				7			
				6	TP01 terminated at 2.2m Unable to advance as too difficult to excavate		
				6			
				16			
				20			




<i>For explanation of symbols and observations, see key sheet</i>				Length 2.5m	Excavation Method 12t excavator	Started 10/02/2014 Finished 10/02/2014 Date logged 10/02/2014 Logged PGR Checked DAB
FLUID DEPTHS DURING DRILLING Date Time Drilled Depth Casing Depth Fluid Depth (m) (m) (m) 10/02/2014 00:00 2.20 - 2.1				Width 1.5m	Orientation	
Hand Held Shear Vane 1179: 19mm blade: Correction Factor = 1.387 Vane shear strength per NZGS guideline				Stability Stable	Remarks	
Page 1 of 1						

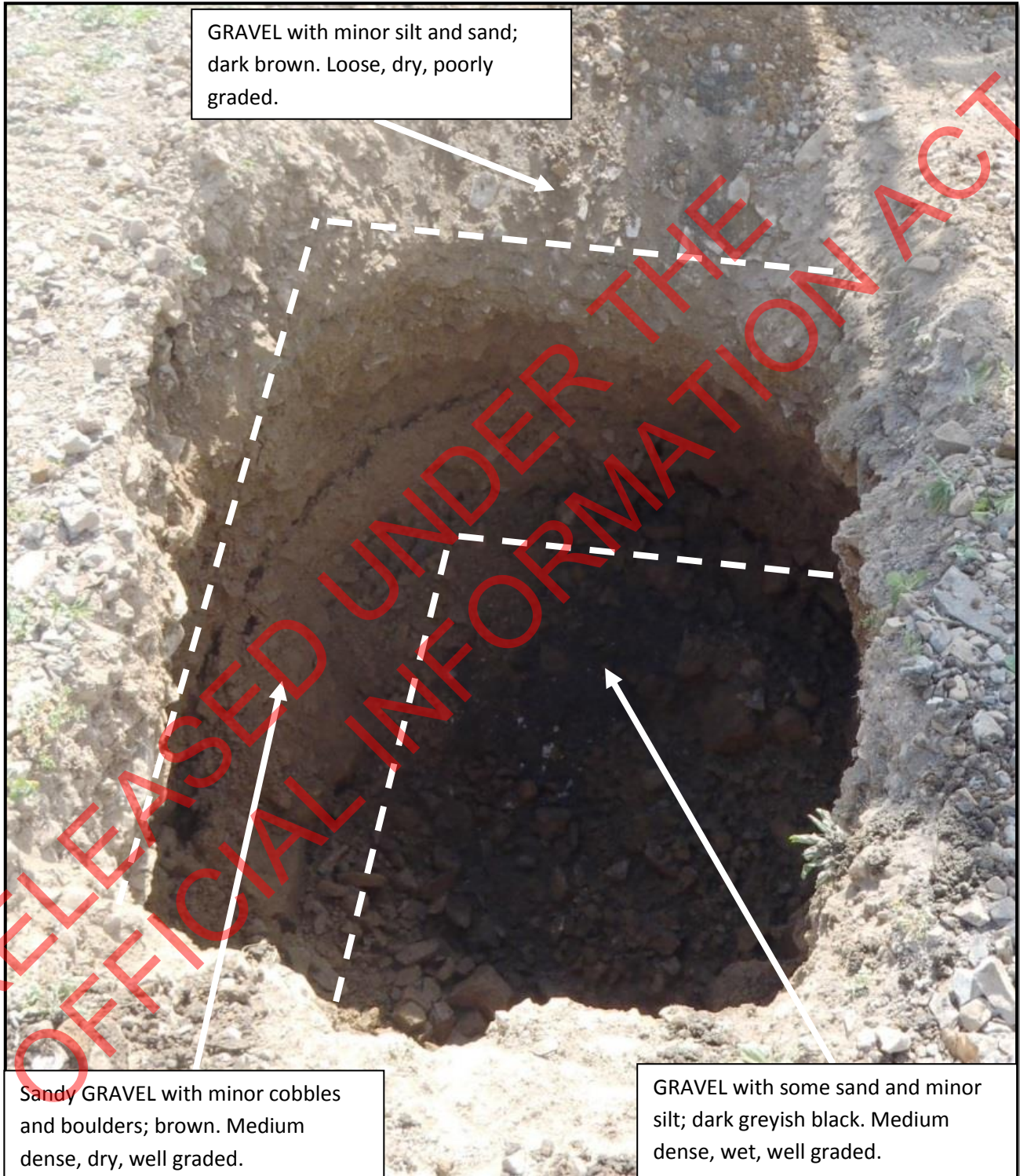


Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1755803mE 5434676mN
 Orientation -90° Elevation 2m (Approx)
 Location KiwiRail Wairarapa Line
 Feature Opposite Boat Ski Clubhouse


Depth	GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records	Sampling	Dynamic Cone Penetrometer (Blows per 100 mm) 2 4 6 8	SOIL PROPERTIES	Graphic Log	Instrumentation
					Subordinate MAJOR minor, colour, structure. Strength, moisture condition, grading; bedding; plasticity; sensitivity, major fraction description; subordinate fraction description; minor fraction description etc Depth Related Remarks <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, Continuity, Roughness, Infilling, etc.)</small>		
0m	Old Ballast.			3	0m: GRAVEL with minor silt and fine to coarse sand; dark brown. Loose, dry, poorly graded. Gravel is fine to coarse, slightly weathered fine sandstone, very strong and subangular to angular.		
0.2m	Rock fill comprising sand, gravel, cobbles and boulders.			5			
0.2m				15	0.2m: Fine to coarse sandy GRAVEL with minor cobbles and boulders; brown. Medium dense, dry, well graded. Gravel is fine to coarse, slightly weathered fine sandstone, strong to very strong and sub angular to angular. Boulders are up to 700mmx500mmx250mm.		
0.4m							
0.6m							
0.8m							
1.0m							
1.2m					1.1 to 1.5m: Grades to moist, no boulders.		
1.4m				LB1			
1.6m	1.5m: Reworked COLLUVIUM and alluvial fan deposits				1.5m: GRAVEL with some fine to coarse sand and minor silt; dark greyish black. Medium dense, wet, well graded. Gravel is fine to coarse, slightly weathered fine sandstone, very strong and subrounded to rounded.		
1.8m							
2.0m				LB2	1.8 to 2m: Grades to very dense.		
2.2m					TP02 terminated at 2m Unstable pit wall(s) / Spalling from pit wall(s)		
2.4m							
2.6m							
2.8m							
For explanation of symbols and observations, see key sheet FLUID DEPTHS DURING DRILLING Date Time Drilled Depth Casing Depth Fluid Depth (m) (m) (m)				Length 2.5m Width 1.5m Stability Unstable	Excavation Method 12t excavator Orientation 	Started 17/12/2013 Finished 17/12/2013 Date logged 17/12/2013 Logged JM Checked DAB	
Hand Held Shear Vane Vane shear strength per NZGS guideline				Remarks Wall caving in with hole at 2.0m depth. Test Pit was backfilled upon completion. No groundwater encountered		Page 1 of 1	

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Client NZTA
 Project P2N Cycleway
 Project number 60306339


Co-ordinates 1755696mE 5434647mN
 Orientation -90° Elevation 2m (Approx)
 Location KiwiRail Wairarapa Line
 Feature 50m NE of Rowing Clubhouse

Depth	GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records	Sampling	Dynamic Cone Penetrometer (Blows per 100 mm) 2 4 6 8	SOIL PROPERTIES <small>Subordinate MAJOR minor, colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description; subordinate fraction description; minor fraction description etc</small>	Graphic Log	Instrumentation							
					Depth Related Remarks <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, Continuity, Roughness, Infilling, etc.)</small>			DEFECT DESCRIPTION						
0m	Old Ballast.				0m: GRAVEL with minor silt and fine to coarse sand; dark brown. Loose, dry, poorly graded. Gravel is fine to coarse, slightly weathered fine sandstone, very strong and subangular to angular.									
0.2m	Fill comprising clay, silt, sand, gravel and cobbles.				0.2m: GRAVEL with some fine to coarse sand; dark brown. Loose, dry, poorly graded. Gravel is coarse, slightly weathered fine sandstone, strong and subrounded to rounded.									
0.45m					0.45m: GRAVEL with some clay, silt, fine to coarse sand and trace cobbles; dark brown. Medium dense, moist, well graded. Gravel is fine to coarse, slightly weathered fine sandstone, strong and angular. Red staining of joints.									
1.7m to 2.3m					1.7 to 2.3m: Grades to wet.									
2.3m to 2.4m					2.3 to 2.4m: Grades to saturated.									
2.4m	2.4m: Reworked COLLUVIUM and alluvial fan deposits				2.4m: Gravelly, fine to coarse SAND; dark greyish black. Dense, saturated, uniformly graded. Gravel is fine to medium, slightly weathered fine sandstone, strong and rounded to subrounded.									
2.5m					TP03 terminated at 2.5m Unable to advance as too difficult to excavate									
<p><i>For explanation of symbols and observations, see key sheet</i></p> <p>FLUID DEPTHS DURING DRILLING</p> <table border="1"> <thead> <tr> <th>Date Time</th> <th>Drilled Depth (m)</th> <th>Casing Depth (m)</th> <th>Fluid Depth (m)</th> </tr> </thead> <tbody> <tr> <td>13/12/2013 11:00</td> <td>2.50</td> <td>-</td> <td>2.4</td> </tr> </tbody> </table>				Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)	13/12/2013 11:00	2.50	-	2.4	Length 2.5m Width 1.5m Stability Unstable	Excavation Method 12t excavator Orientation 	Started 17/12/2013 Finished 17/12/2013 Date logged 17/12/2013 Logged JM Checked DAB
Date Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)											
13/12/2013 11:00	2.50	-	2.4											
Hand Held Shear Vane				Remarks										
Vane shear strength per NZGS guideline				Wall caving in with hole at 2.5m depth. Test Pit was backfilled upon completion.										



Client NZTA
 Project P2N Cycleway
 Project number 60306339

Co-ordinates 1755518mE 5434577mN
 Orientation -90° Elevation 2m (Approx)
 Location KiwiRail Wairarapa Line
 Feature 50m SW of Rowing Clubhouse

Depth	GEOLOGICAL DESCRIPTION <small>Weathering, Colour, Fabric, Rock Name, Strength, Discontinuities, Lithological Features (bedding, foliation, mineralogy, cement, etc)</small>	Test Records	Sampling	Dynamic Cone Penetrometer (Blows per 100 mm) 2 4 6 8	SOIL PROPERTIES <small>Subordinate MAJOR minor, colour, structure, Strength, moisture condition, grading, bedding, plasticity, sensitivity, major fraction description; subordinate fraction description; minor fraction description etc</small>	Graphic Log	Instrumentation									
					Depth Related Remarks <small>(Joints, Bedding Seams, Shatter, Shear and Crush Zones, Foliation, Schistosity, Attitude, Spacing, Continuity, Roughness, Infilling, etc.)</small>			DEFECT DESCRIPTION								
0m	Reclamation FILL for rail/road corridor				0m: GRAVEL with some silt, fine to coarse sand and trace cobbles, brick and glass; dark brown. Medium dense, moist, well graded. Gravel is fine to coarse, slightly weathered, strong and angular.											
0.2m																
0.4m																
0.6m					0.6 to 0.75m: Concrete block, 800mmx900mmx150mm.											
0.8m																
1.0m																
1.2m																
1.4m																
1.6m																
1.7m	Reworked COLLUVIUM and alluvial fan deposits				1.7m: Gravelly, fine to coarse SAND with minor silt; light grey and brown mottling. Medium dense, wet, poorly graded. Gravel is fine to medium, slightly weathered, strong and rounded to subrounded.											
2.0m																
2.2m					2m: Gravelly fine to coarse SAND; dark greyish black. Medium dense, saturated, uniformly graded. Gravel is fine to medium, slightly weathered, strong and rounded to subrounded.											
2.4m					TP04 terminated at 2.2m Unstable pit wall(s) / Spalling from pit wall(s)											
2.6m																
2.8m																
<p><i>For explanation of symbols and observations, see key sheet</i></p> <p>FLUID DEPTHS DURING DRILLING</p> <table border="1"> <thead> <tr> <th>Date</th> <th>Time</th> <th>Drilled Depth (m)</th> <th>Casing Depth (m)</th> <th>Fluid Depth (m)</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Date	Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)						Length 2.5m Width 1.5m Stability Unstable	Excavation Method 12t excavator Orientation 	Started 17/12/2013 Finished 17/12/2013 Date logged 17/12/2013 Logged JM Checked DAB
Date	Time	Drilled Depth (m)	Casing Depth (m)	Fluid Depth (m)												
Hand Held Shear Vane <i>Vane shear strength per NZGS guideline</i>				Remarks Wall caving in with hole at 1.7m depth. Test Pit was backfilled upon completion. No groundwater encountered		Page 1 of 1										

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