


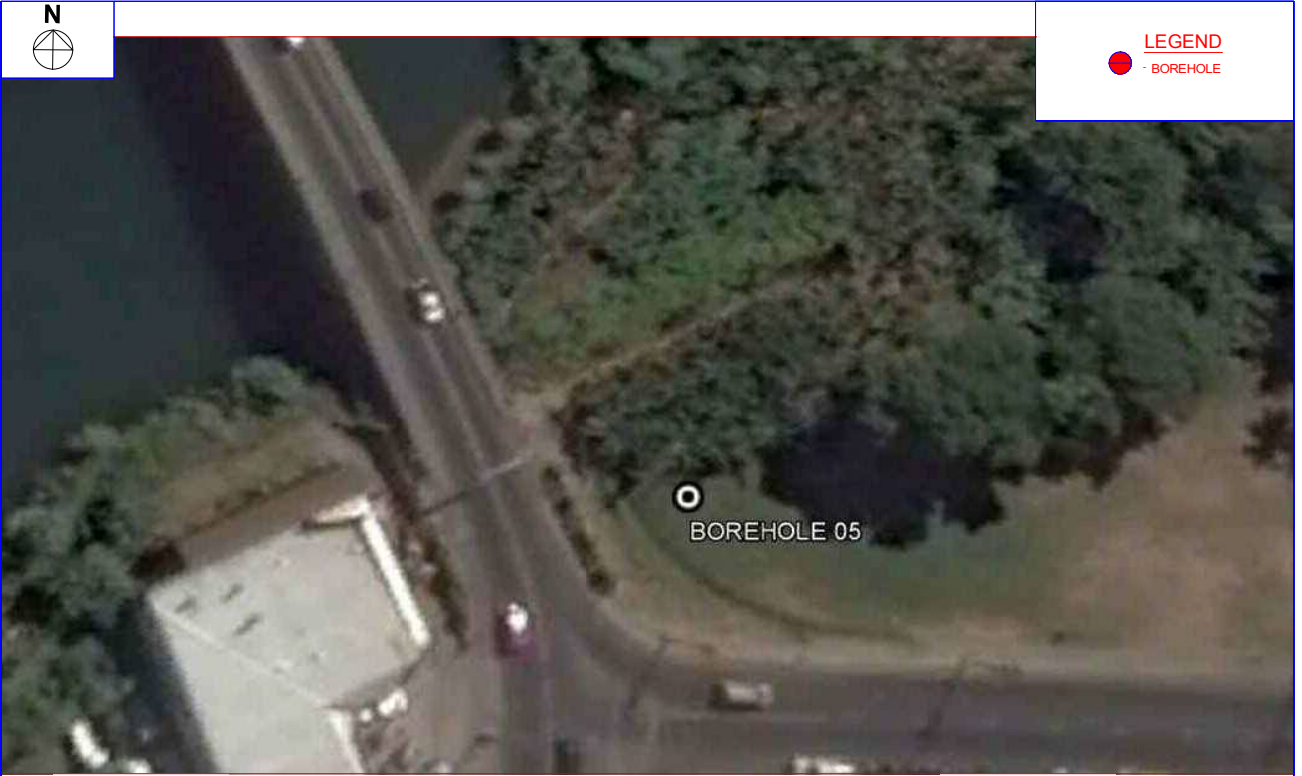
APPENDIX 5


**SITE 5 - Nadi Bridge, Queens Road, Namotomoto,
Fiji.**

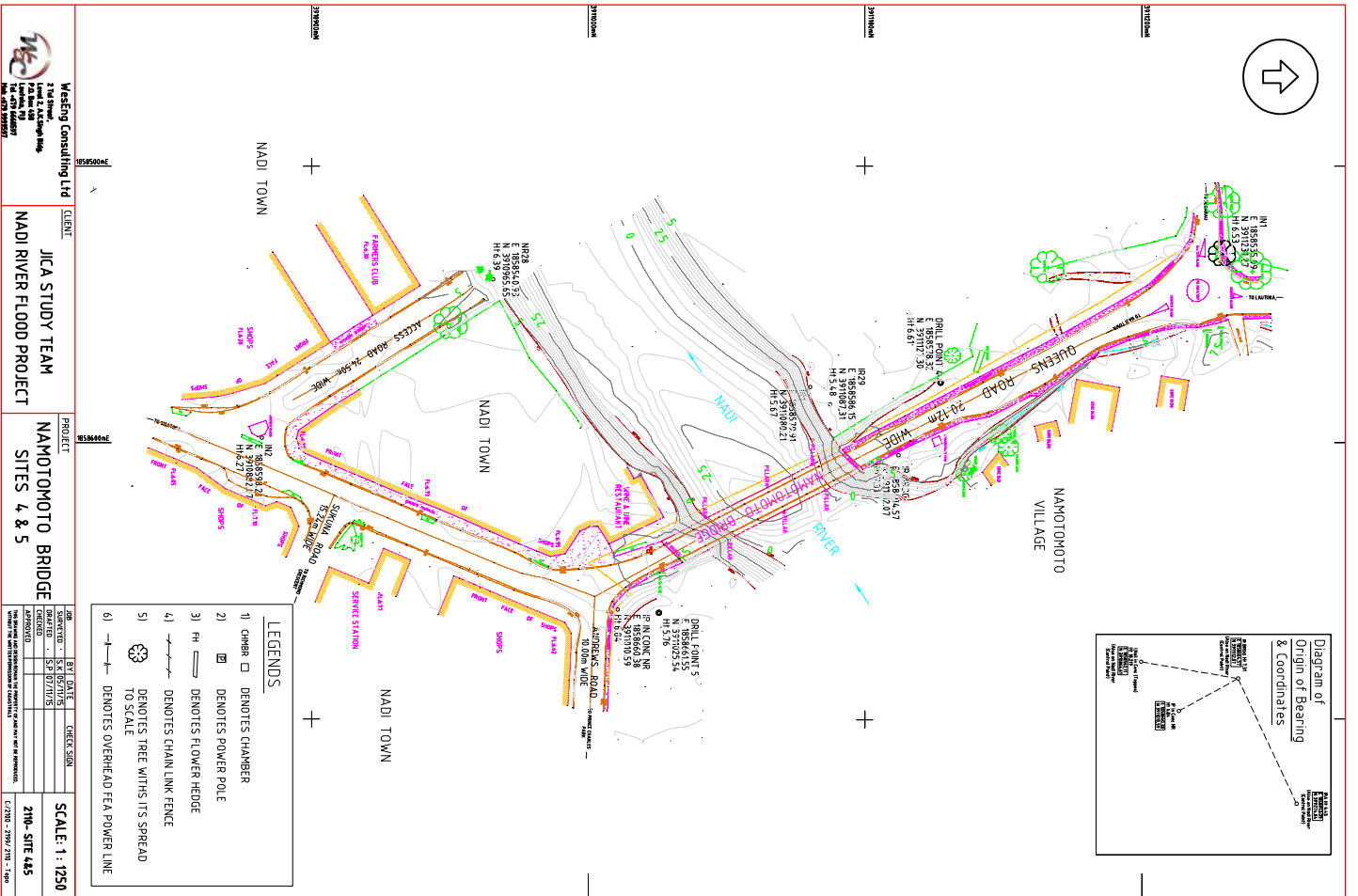
APPENDIX 5a

Test Locality Plan

LEGEND
 - BOREHOLE



	ENTECC LIMITED Level 2, Mid City Plaza Cnr. Cumming St & Renwick Road P.O. Box 12309 Suva, Fiji	ENGINEERING AND SCIENCE CONSULTANTS Unit 2, VT Solutions 24 Cawa Road Marintar P.O. Box 12309 Nadi, Fiji	Phone (679) 330 0300 Fax (679) 331 8618 Email info@entecfiji.com	CLIENT: Japan International Cooperation Agency (JICA) PROJECT: Nadi River Basin Project	NOTE: THIS DRAWING HAS BEEN REPRODUCED BY ENTEC TO SHOW THE APPROXIMATE BOREHOLE LOCATION.	DRAWN BY: SS CHECKED BY: KC APPROVED BY: JD SHEET TITLE: TEST LOCALITY PLAN SCALE: NTS ISSUE DATE: November 2015	A3 PROJECT NO.: 1920815 DRAWING NO.: 1 of 1
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APPENDIX 5b Engineering Borehole Log and Core Photos

DRILL HOLE LOG																
Project: Nadi River Basin Drilling Works					Feature			Location: Main Nadi Bridge Left Bank		No.:						
Job No.: 1920815		Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76		Co-Ordinates (): E 1859661.6 N 3911025.5			BH05							
Client: JICA Study Team					Hole Depth: 30.50 m			Sheet: 1 of 7								
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR SCR ROD (%)	Samples	Tests	
				Clayey SILT with trace of gravel and root fibres, brown, soft, moist, low plasticity	X	W1	S1	+4.76	1		500		60	✓	P= 10 kPa	
				Sandy SILT with trace of fine to medium gravel, dark brown, soft to very soft, moist, low to medium plasticity	X	W1	S1	+4.26	1		500		1.00	SPT 1.00 m N=2	✓	P= 10 kPa
				SILT with trace of fine sand, dark brown, soft to very soft, moist, low to medium plasticity	X	W1	S1	+4.06	1		500		60	✓	P= 10 kPa	
				Silty SAND with trace of sub angular gravel, fine to medium sand, pale grey	X	W1	S1	+3.76	2		500		2.00	SPT 2.00 m N=3	✓	P= 5 kPa
				Sandy SILT, dark brown, soft to very soft, moist, low plasticity	X	W1	S1	+2.26	3		500		53	✓	P= 0 kPa	
				Silty CLAY, brown, soft to very soft, low to medium plasticity	X	W1	S1	+0.86	4		500		3.50 4.00 PT	✓	P= 28.5 kPa	
				Fine to coarse SAND trace of sub angular to sub rounded medium	X	W1	S1	+0.76	4		500		60	✓	P= 21.5 kPa	
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge • Small Disturbed Sample ○ Large Disturbed Sample ▬ Scale Penetrometer - blows/100mm ↓ Permeability Test □ U100 Undisturbed Sample ▽ Insitu Vane Shear Strength (kPa) UTP = Unable to penetrate													Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005			
All dimensions in metres Scale 1:31					Contractor: GDISL			Rig/Plant Used: Drill Rig - Triple Tube			Logged by: KC/TL		Checked by: DMC			

DRILL HOLE LOG															
Project: Nadi River Basin Drilling Works			Feature			Location: Main Nadi Bridge Left Bank		No.: BH05							
Job No.: 1920815		Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76	Co-Ordinates (): E 1858661.6 N 3911025.5										
Client: JICA Study Team			Hole Depth: 30.50 m			Sheet: 2 of 7									
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description (type, orientation, spacing, roughness, persistence aperture, infilling etc)	TCR SCR ROD (%)	Samples	Tests
				Gravel, greyish brown Gravelly SAND, fine to coarse gravel, sub-angular to sub-rounded, greyish dark brown				+0.26			500 100				SPT 5.00 m N=19
				Gravelly SAND, fine to medium sand, fine to medium gravel, sub-angular to sub-rounded, brown black				-0.14	6				27		
				Sandy SILT with trace of fine to medium gravel sub-angular to sub-rounded				-0.74							SPT 6.50 m N=11
				Sandy SILT with trace of gravel, fine to coarse sand, sub-angular gravel, dark brown, soft to very soft, low plasticity				-1.24	7				47		
				Fine to coarse SAND with fine to medium gravel, black brown				-2.24							SPT 6.00 m N=21
				SAND with fine to coarse subangular gravel				-2.74					8.00		
				Fine to coarse SAND with fine sub-angular gravel					9				47		
				Gravelly fine to medium SAND, brown grey, loosely packed, wet				-3.74							SPT 9.50 m N=20
								-4.24							
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge												Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005			
All dimensions in metres Scale 1:31			Contractor: GDISL			Rig/Plant Used: Drill Rig - Triple Tube			Logged by: KC/TL		Checked by: DMC				

ENTEC: L01 (B) (0.0) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

DRILL HOLE LOG															
Project: Nadi River Basin Drilling Works			Feature			Location: Main Nadi Bridge Left Bank		No.: BH05							
Job No.: 1920815		Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76	Co-Ordinates (): E 1858661.6 N 3911025.5										
Client: JICA Study Team			Hole Depth: 30.50 m			Sheet: 3 of 7									
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description (type, orientation, spacing, roughness, persistence aperture, infilling etc)	TCR SCR ROD (%)	Samples	Tests
				SAND with trace of fine to medium sub-angular to sub-rounded gravel											
				Organic SILT with fine to medium sand, dark grey, moist, low plasticity				-5.74	11						SPT 11.00 m N=18
				Silty fine to medium SAND with trace of medium to coarse sub-rounded gravel, grey				-6.24	12						
				Clayey SILT with trace of fine sand and gravel, grey, soft, medium to high plasticity				-8.24	14						
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge												Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005			
All dimensions in metres Scale 1:31			Contractor: GDISL			Rig/Plant Used: Drill Rig - Triple Tube			Logged by: KC/TL		Checked by: DMC				

ENTEC: L01 (B) (0.0) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17) (18) (19) (20) (21) (22) (23) (24) (25) (26) (27) (28) (29) (30) (31) (32) (33) (34) (35) (36) (37) (38) (39) (40) (41) (42) (43) (44) (45) (46) (47) (48) (49) (50) (51) (52) (53) (54) (55) (56) (57) (58) (59) (60) (61) (62) (63) (64) (65) (66) (67) (68) (69) (70) (71) (72) (73) (74) (75) (76) (77) (78) (79) (80) (81) (82) (83) (84) (85) (86) (87) (88) (89) (90) (91) (92) (93) (94) (95) (96) (97) (98) (99) (100)

DRILL HOLE LOG																			
Project: Nadi River Basin Drilling Works			Feature		Location: Main Nadi Bridge Left Bank		No.: BH05												
Job No.: 1920815	Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76	Co-Ordinates (°): E 1858661.6 N 3911025.5															
Client: JICA Study Team			Hole Depth: 30.50 m				Sheet: 4 of 7												
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests		
				Clayey SILT with trace of fine sand and gravel, grey, soft, medium to high plasticity (continued)	X	W1		-9.74	16		500 100					P= 15 kPa			
				Silty SAND with trace of fine to medium sub-angular gravel, grey, very soft to soft, moist	X	W2		-10.24	16							15.50	✓ P= 30 kPa SPT 15.50 m N=4		
				Sandy SILT with traces of shell fragments and gravel, grey, medium to high plasticity, gravel fine to coarse sub-angular to sub-rounded	X	W3		-11.24	17							57	✓ P= 20 kPa ✓ P= 40 kPa		
				SILT with minor sand and trace of fine sub-angular gravel, grey, firm, low to medium plasticity	X	W4		-11.44	17							17.90 17.5 PT	✓ P= 20 kPa P= 38.5 kPa ✓ P= 45 kPa		
				SILT with some silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity	X	W5		-18.50	18							18.50	✓ P= 31.5 kPa ✓ P= 21.5 kPa SPT 18.50 m N=1		
				SILT with fine sand trace of organics, blackish grey, soft to very soft, moist, low to medium plasticity	X	W6		-13.24	19							81	✓ P= 36.5 kPa		
Explanations:				Remarks															
Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered				N = Standard Penetration Test															
Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong				Logged to NZGS 'Field description of soil & rock' December 2005															
TCR - Total Core Recovery				● Small Disturbed Sample															
SCR - Solid Core Recovery				○ Large Disturbed Sample															
ROD - Rock Quality Designation				Scale Penetrometer - blows/100mm															
Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				⬇ Permeability Test															
				⬇ U100 Undisturbed Sample															
				⬇ Insitu Vane Shear Strength (kPa)															
				UTP = Unable to penetrate															
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC											

DRILL HOLE LOG																			
Project: Nadi River Basin Drilling Works			Feature		Location: Main Nadi Bridge Left Bank		No.: BH05												
Job No.: 1920815	Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76	Co-Ordinates (°): E 1858661.6 N 3911025.5															
Client: JICA Study Team			Hole Depth: 30.50 m				Sheet: 5 of 7												
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests		
				SILT with fine sand trace of organics, blackish grey, soft to very soft, moist, low to medium plasticity (continued)	X	W1		-14.74	21								SPT 20.00 m N=4 ✓ P= 8.5 kPa		
				Silty fine to medium SAND with trace of shell fragments, grey, medium dense	X	W2		-15.34	21								87	✓ P= 225 kPa	
				Silty fine to medium SAND with trace of shell fragments, dark brown, soft to very soft, moist, medium plasticity	X	W3		-15.74	22										
				Silty fine to medium SAND with trace of medium to coarse sub-angular to sub-rounded gravel, dark brown grey, medium dense	X	W4		-16.34	22									SPT 21.50 m N=16	
				Silty CLAY with trace of medium to fine sub-angular gravel, dark grey brown, firm, low to medium plasticity	X	W5		-17.24	23									SPT 23.00 m N=42	
				Silty SAND with trace of shell fragments and fine sub-angular gravel, dark grey, very soft to soft, low to medium plasticity	X	W6		-17.74	23									23.00	
				Clayey SILT with sand and shell fragments with trace of coarse gravel and organics, grey, stiff, moist, high plasticity	X	W7		-18.74	24									100	
				Clayey SILT, dark brown, soft to firm, moist, dense to very dense, medium to high plasticity	X	W8		-19.24	24									SPT 24.50 m N=50	
Explanations:				Remarks															
Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered				N = Standard Penetration Test															
Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong				Logged to NZGS 'Field description of soil & rock' December 2005															
TCR - Total Core Recovery				● Small Disturbed Sample															
SCR - Solid Core Recovery				○ Large Disturbed Sample															
ROD - Rock Quality Designation				Scale Penetrometer - blows/100mm															
Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				⬇ Permeability Test															
				⬇ U100 Undisturbed Sample															
				⬇ Insitu Vane Shear Strength (kPa)															
				UTP = Unable to penetrate															
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC											

DRILL HOLE LOG																	
Project: Nadi River Basin Drilling Works			Feature		Location: Main Nadi Bridge Left Bank		No.: BH05										
Job No.: 1920815		Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76	Co-Ordinates (): E 1858661.6 N 3911025.5												
Client: JICA Study Team			Hole Depth: 30.50 m				Sheet: 6 of 7										
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests
				Fine to medium SAND with silt, trace of fine to medium sub-angular to sub-rounded gravel, dark grey, dense to very dense SILTSTONE, moderate to highly weathered, weak to very weak				-19.54									
				Clayey SILT with trace of fine sand and siltstone nodules, light grey brown, firm to stiff, medium to high plasticity				-20.24	26								P=85 kPa SPT 26.00 m N=50 P=151.5 kPa 93
				Silty CLAY with trace of siltstone nodules and fine sand, light brown, firm to stiff, medium to high plasticity				-21.74	27								P=231 kPa SPT 27.50 m N=54 P=146.3 kPa 100 P=193 kPa
				Clayey SILT with siltstone nodules, greyish brown, stiff, medium to high plasticity				-23.24	29								P=121.3 kPa SPT 29.00 m N=50
iii								-24.14									
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge Small Disturbed Sample Large Disturbed Sample Scale Penetrometer - blows/100mm Permeability Test U100 Undisturbed Sample Institu Vane Shear Strength (kPa) UTP = Unable to penetrate										Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005							
All dimensions in metres Scale 1:31			Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL	Checked by: DMC									

ENTEC: L011816703_04_01 NZ 258140621.5 185866201 -0422401515 05 19 8330005 049411414141 N 3911025.5 E 1858661.6
 ENTEC: L011816703_04_01 NZ 258140621.5 185866201 -0422401515 05 19 8330005 049411414141 N 3911025.5 E 1858661.6

DRILL HOLE LOG																	
Project: Nadi River Basin Drilling Works			Feature		Location: Main Nadi Bridge Left Bank		No.: BH05										
Job No.: 1920815		Start Date: 13-10-2015 Finish Date: 13-10-2015		Ground Level (m): 5.76	Co-Ordinates (): E 1858661.6 N 3911025.5												
Client: JICA Study Team			Hole Depth: 30.50 m				Sheet: 7 of 7										
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests
				iii (continued)				-24.74									P=300 kPa
				Hole Terminated at 30.50 m N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005				-24.74	31								SPT 30.50 m N=50 30.50
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge Small Disturbed Sample Large Disturbed Sample Scale Penetrometer - blows/100mm Permeability Test U100 Undisturbed Sample Institu Vane Shear Strength (kPa) UTP = Unable to penetrate										Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005							
All dimensions in metres Scale 1:31			Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL	Checked by: DMC									

ENTEC: L011816703_04_01 NZ 258140621.5 185866201 -0422401515 05 19 8330005 049411414141 N 3911025.5 E 1858661.6
 ENTEC: L011816703_04_01 NZ 258140621.5 185866201 -0422401515 05 19 8330005 049411414141 N 3911025.5 E 1858661.6

Borehole 5 Core Photos (0.00m to 30.50m)



0.00m to 3.80m



3.80m to 8.00m



8.00m to 12.50m



12.50m to 17.20m



17.20m to 19.00m



19.00m to 22.10m



22.10m to 25.30m



25.30m to 27.50m



27.0m to 30.20m



30.20m to 30.50m

APPENDIX 5c

Laboratory Test Schedule and Laboratory Test Results



Wet Sieve Analysis NZS 4407:1991 (Test 3.6.1)

PRINCIPAL : Japan International Cooperation Agency	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / : 20/10/2015
SITE ADDRESS : BH05 Nadi Bridge, Namotomoto	TECHNOLOGIST : RK
SAMPLE LOCATION : BH05 2.0m - 2.5m	MATERIAL TYPE & LOCATION : Sandy SILT, dark brown, soft to very soft, moist, low plasticity
TEST NUMBER : N549	

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

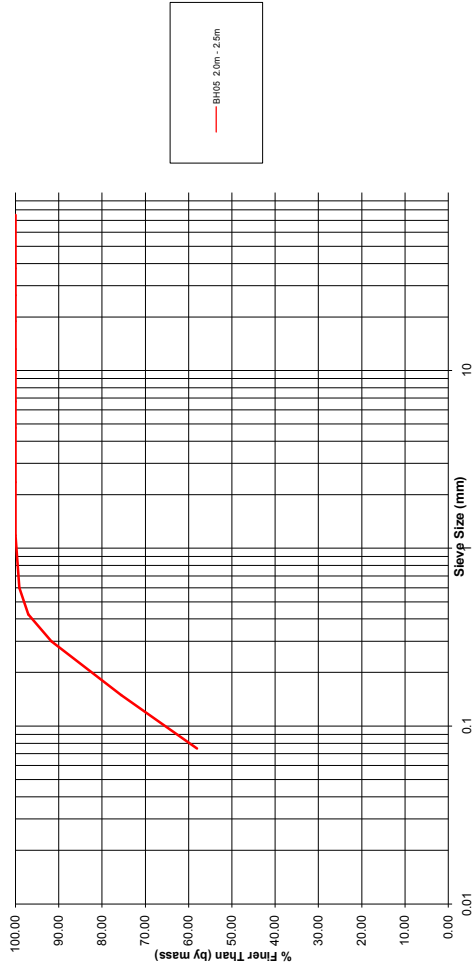
Moisture Content (Material passing 19mm)	Container No.	-	112	113	SPLIT SAMPLE	
Mass of Container	g		11.73	11.88	Mass Passing Last Sieve:	gM ₃
Mass of Container + Wet Soil	g		25.10	25.28	Mass after Splitting:	gM ₄
Mass of Container + Dry Soil	g		21.50	21.67	Splitting Factor = $\frac{M_3}{M_4}$	
Mass of Dry Soil	g		9.77	9.79		
Mass of Moisture	g		3.60	3.61		
Moisture Content	%		36.85	36.87		
Average Moisture Content	%		36.86			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	384.81
	Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$	
		M _T =	281.17

Test Sieve Size mm	Mass of Dry Soil Retained (M _c) g	Corrected Mass g	Percentage Retained = $\frac{M_{c,corr}}{M_T} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	N/A	N/A	0.00	100.00	250	200
2.36 mm	N/A	N/A	0.00	100.00	150	200
1.18 mm	0.08	N/A	0.03	99.97	100	200
600 µm	2.47	N/A	0.88	99.09	80	200
425 µm	5.80	N/A	2.06	97.03	70	200
300 µm	15.08	N/A	5.36	91.67	60	200
150 µm	45.15	N/A	16.06	75.61	40	200
75 µm	49.25	N/A	17.52	58.09	25	200
Passing 75 µm	163.34	N/A	58.09	0.00	-	-
Pan Total	281.17	-	100.00	-	-	-

- NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : UM	Approved by : IG
Date : 20 October 2015	Date : 25 November 2015	Date : 25 November 2015



LOCATION: BH05 2.0m - 2.5m
 DESCRIPTION: Sandy SILT, dark brown, soft to very soft, moist, low plasticity
 DATE OF TEST: 20 October 2015
 SAMPLE No: N549

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	20 October 2015
SITE ADDRESS :	BH05 Nadi Bridge	TECHNOLOGIST :	TL
SAMPLE LOCATION :	BH05 5.0-5.50m	MATERIAL TYPE & LOCATION :	Gravelly SAND, fine to coarse gravel, subangular-subrounded, greyish dark brown
TEST NUMBER :	N 551		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	166	169	SPLIT SAMPLE
Mass of Container	g	11.70	11.37	Mass Passing Last Sieve:	- gm ₅
Mass of Container + Wet Soil	g	29.07	29.41	Mass after Splitting:	- gm ₄
Mass of Container + Dry Soil	g	27.46	27.08	Splitting Factor	M ₅ / M ₄
Mass of Dry Soil	g	15.76	15.71	=	M ₅ / M ₄
Mass of Moisture	g	1.61	2.33		
Moisture Content	%	10.22	14.83		
Average Moisture Content	%		12.52		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	304.82
	Total Mass of dry sample (M _T)	M _T =	100M _w / 100 + w
		M _T =	270.89

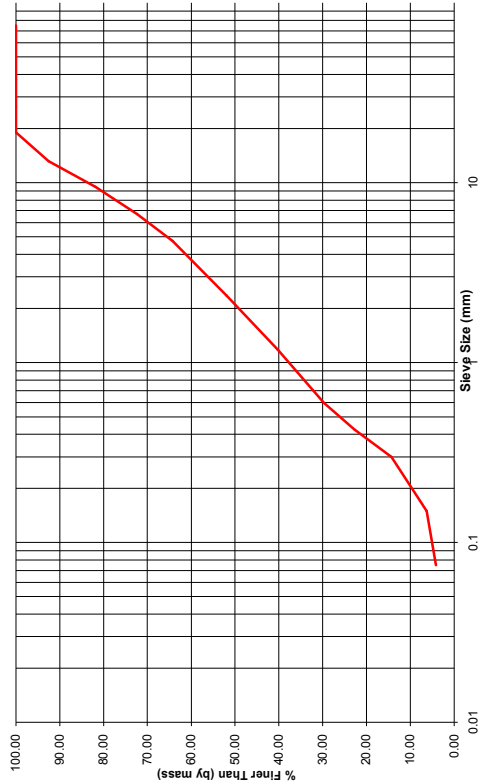
Test Sieve Size mm	Mass of Dry Soil Retained (M _s)	Corrected Mass	Percentage Retained (Mass/M _T) x 100	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g	g	%	%	g	mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	20.17	N/A	7.45	92.55	600	300
9.50 mm	28.96	N/A	10.69	81.86	450	300
6.70 mm	25.78	N/A	9.52	72.35	300	300
4.75 mm	21.80	N/A	8.05	64.30	250	200
2.36 mm	33.58	N/A	12.40	51.90	150	200
1.18 mm	31.65	N/A	11.68	40.22	100	200
600 µm	28.51	N/A	10.52	29.70	80	200
425 µm	18.85	N/A	6.96	22.74	70	200
300 µm	22.71	N/A	8.38	14.35	60	200
150 µm	21.89	N/A	8.08	6.27	40	200
75 µm	5.68	N/A	2.10	4.18	25	200
Passing 75 µm	11.31	N/A	4.18	0.00	-	-
Pan Total	270.89	-	100.00	-	-	-

- NOTES:
 1) Testing performed on fraction passing/retained on 19mm sieve
 2) The percentage passing the finest sieve was obtained by difference

Tested by: TL	C.A. Checked by: KB	Approved by: IG
Date: 20 October 2015	Date: 25 November 2015	Date: 25 November 2015

Form GE-L-06

Page 1 of 2



BH05 5.0-5.50m

LOCATION: BH05 5.0-5.50m
DATE OF TEST: 20 October 2015
DESCRIPTION: Gravely SAND, fine to coarse gravel, subangular-subrounded, greyish dark brown
SAMPLE No. N551

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	20 October 2015
SITE ADDRESS :	BH05 Nadi Bridge	TECHNOLOGIST :	TL
SAMPLE LOCATION :	BH05 8.0-8.50m	MATERIAL TYPE & LOCATION :	SAND with fine to coarse subangular gravel
TEST NUMBER :	N553		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	19	28	SPLIT SAMPLE
Mass of Container	g		14.86	13.97	Mass Passing Last Sieve: - gM ₃
Mass of Container + Wet Soil	g		35.52	35.31	Mass after Splitting: - gM ₄
Mass of Container + Dry Soil	g		32.87	32.92	Splitting Factor = $\frac{M_3}{M_4}$
Mass of Dry Soil	g		18.01	18.95	
Mass of Moisture	g		2.65	2.39	
Moisture Content	%		14.71	12.61	
Average Moisture Content	%		13.66		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g		310.38
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$		
	M _T =	273.07	

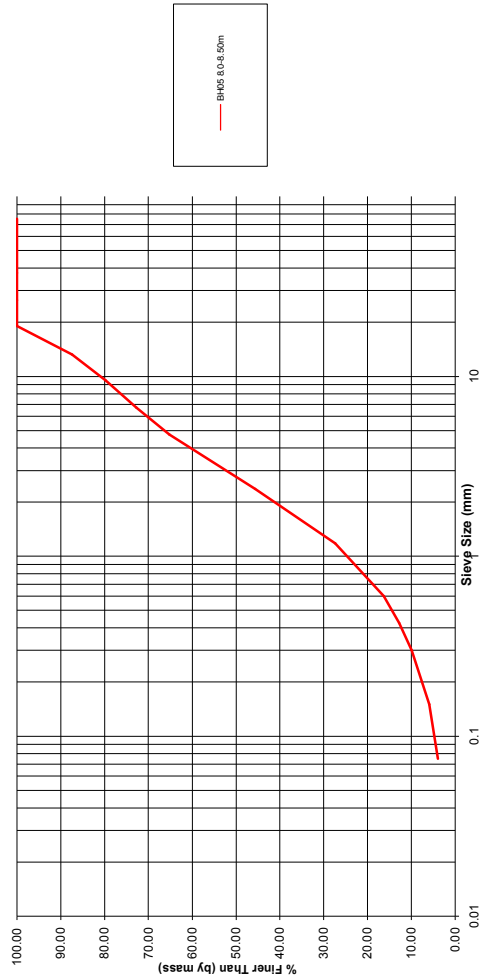
Test Sieve Size mm	Mass of Dry Soil Retained (M _s) g	Corrected Mass	Percentage Retained = $\frac{M_s}{M_T} \times 100$	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter mm
75.0mm		N/A	0.00	100.00	g	300
50.0mm		N/A	0.00	100.00		300
37.5mm		N/A	0.00	100.00		300
26.5mm		N/A	0.00	100.00		300
19.0mm		N/A	0.00	100.00		200
13.2 mm	34.28	N/A	12.55	87.45	600	300
9.50 mm	20.99	N/A	7.69	79.76	450	300
6.70 mm	19.08	N/A	6.99	72.77	300	300
4.75 mm	20.57	N/A	7.53	65.24	250	200
2.36 mm	53.35	N/A	19.54	45.70	150	200
1.18 mm	49.93	N/A	18.28	27.42	100	200
600 µm	30.48	N/A	11.16	16.26	80	200
425 µm	9.35	N/A	3.42	12.83	70	200
300 µm	7.83	N/A	2.87	9.96	60	200
150 µm	11.15	N/A	4.08	5.88	40	200
75 µm	5.14	N/A	1.88	4.00	25	200
Passing 75 µm	10.92	N/A	4.00	0.00	-	-
Pan Total	273.07	-	100.00	-	-	-

- NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by :	Q.A. Checked by : KB	Approved by : IG
Date : 20 October 2015	Date : 25 November 2015	Date : 25 November 2015

Form GE-L-06

Page 1 of 2



DESCRIPTION: SAND WITH FINE TO COARSE SUBANGULAR GRAVEL
 LOCATION: BH05 8.0-8.50m
 DATE OF TEST: 20 October 2015
 SAMPLE No: N553

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	20 October 2015
SITE ADDRESS :	BH05 Nadi Bridge	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH05 15.5- 16.00m	MATERIAL TYPE & LOCATION :	Silty SAND with gravel, grey very soft to soft, moist, gravel fine to medium subangular
TEST NUMBER :	N556		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	6	15	SPLIT SAMPLE
Mass of Container	g	53.10	52.69	Mass Passing Last Sieve:	- gM _s
Mass of Container + Wet Soil	g	66.03	67.51	Mass after Splitting:	- gM _s
Mass of Container + Dry Soil	g	63.36	64.44	Splitting Factor	$\frac{M_3}{M_4}$
Mass of Dry Soil	g	10.26	11.75	=	$\frac{M_4}{M_3}$
Mass of Moisture	g	2.67	3.07		
Moisture Content	%	26.02	26.13		
Average Moisture Content	%	26.08			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g	224.22	
Total Mass of dry sample (M _T)	M _T =	$\frac{100M_w}{100 + w}$	
	M _T =	177.85	

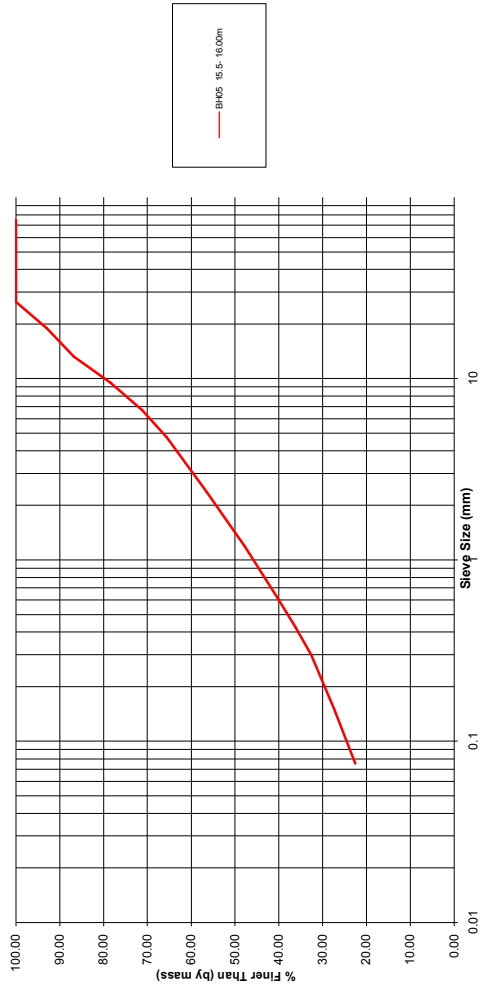
Test Sieve Size mm	Mass of Dry Soil Retained (M _b) g	Corrected Mass	Percentage Retained = (M _{sa} /M _T) x 100 %	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00	g	300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	12.41	N/A	6.98	93.02		200
13.2 mm	11.08	N/A	6.23	86.79	600	300
9.50 mm	15.06	N/A	8.47	78.32	450	300
6.70 mm	12.68	N/A	7.13	71.19	300	300
4.75 mm	9.92	N/A	5.58	65.62	250	200
2.36 mm	16.30	N/A	9.17	56.45	150	200
1.18 mm	15.36	N/A	8.64	47.81	100	200
600 µm	13.79	N/A	7.75	40.06	80	200
425 µm	6.87	N/A	3.86	36.20	70	200
300 µm	6.36	N/A	3.58	32.62	60	200
150 µm	9.42	N/A	5.30	27.32	40	200
75 µm	8.56	N/A	4.81	22.51	25	200
Passing 75 µm	40.04	N/A	22.51	0.00	-	-
Pan Total	177.85	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
 2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : KB	Approved by : IG
Date : 20 October 2015	Date : 25 November 2015	Date : 25 November 2015

Form GE-L-06

Page 1 of 2



LOCATION: BH05 15.5-16.00m
 DATE OF TEST: 20 October 2015
 DESCRIPTION: SILTY SAND with gravel, grey very soft to soft, moist, gravel fine to medium subangular
 SAMPLE No: N558

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	20 October 2015
SITE ADDRESS :	BH05 Nadi Bridge	TECHNOLOGIST :	TL
SAMPLE LOCATION :	BH05 18.50-19.0m	MATERIAL TYPE & LOCATION :	SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity
TEST NUMBER :	N558		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

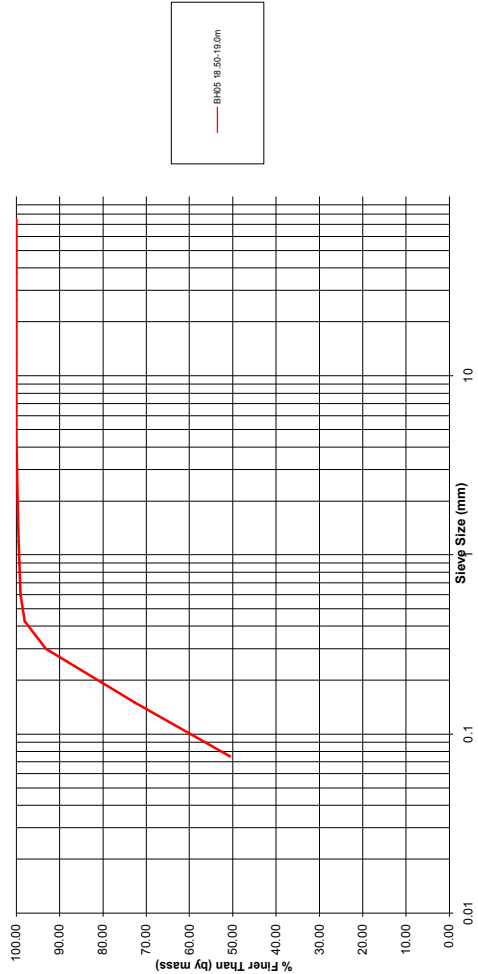
Moisture Content (Material passing 19mm)	Container No.	-	8	12	SPLIT SAMPLE
Mass of Container	g	53.07	53.13	Mass Passing Last Sieve:	- gM _s
Mass of Container + Wet Soil	g	64.75	65.05	Mass after Splitting:	- gM _s
Mass of Container + Dry Soil	g	60.96	61.08	Splitting Factor = $\frac{M_s}{M_u}$	
Mass of Dry Soil	g	7.91	7.95		
Mass of Moisture	g	3.77	3.97		
Moisture Content	%	47.66	49.94		
Average Moisture Content	%	48.80			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g	203.74	
Total Mass of dry sample (M _t)	M _t = $\frac{100M_w}{100 + w}$		
	M _t =	136.92	

Test Sieve Size mm	Mass of Dry Soil Retained (M _b) g	Corrected Mass	Percentage Retained = $\frac{M_{b,c}}{M_t} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	N/A	N/A	0.00	100.00	250	200
2.36 mm	0.37	N/A	0.27	99.73	150	200
1.18 mm	0.35	N/A	0.26	99.47	100	200
600 µm	0.68	N/A	0.50	98.98	80	200
425 µm	1.23	N/A	0.90	98.08	70	200
300 µm	6.69	N/A	4.89	93.19	60	200
150 µm	28.08	N/A	20.51	72.69	40	200
75 µm	30.16	N/A	22.03	50.66	25	200
Passing 75 µm	69.36	N/A	50.66	0.00	-	-
Pan Total	136.92	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
 2) The percentage passing the finest sieve was obtained by difference

Tested by : TL	O.A. Checked by : KB	Approved by : IG
Date : 20 October 2015	Date : 25 November 2015	Date : 25 November 2015



BH05 19.50-19.0m

LOCATION: BH05 19.50-19.0m	DESCRIPTION: SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity
DATE OF TEST: 20 October 2015	SAMPLE No: N564

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL : Japan International Cooperation Agency	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / : 20 October 2015
SITE ADDRESS : BH05 Nadi Bridge	TECHNOLOGIST : RK
SAMPLE LOCATION : BH05 30.50-31.0m	MATERIAL TYPE & LOCATION : Silty SAND, sand fine, brown, moist, dense
TEST NUMBER : N564	

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	10	11	SPLIT SAMPLE
Mass of Container	g	52.30	52.88	Mass Passing Last Sieve: -	gM _s
Mass of Container + Wet Soil	g	83.71	82.52	Mass after Splitting: -	gM _t
Mass of Container + Dry Soil	g	76.66	75.84	Splitting Factor $\frac{M_3}{M_4}$	
Mass of Dry Soil	g	24.36	22.96	=	M ₄
Mass of Moisture	g	7.05	6.68		
Moisture Content	%	28.94	29.09		
Average Moisture Content	%	29.02			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g	310.60	
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$		
	M _T =	240.74	

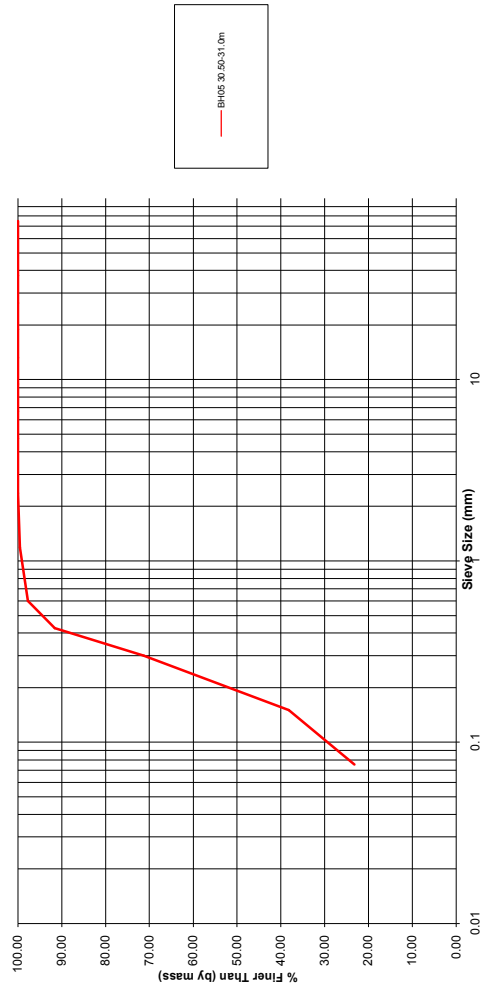
Test Sieve Size mm	Mass of Dry Soil Retained (M _b)	Corrected Mass	Percentage Retained = (M _{sa} /M _t) x 100	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g		%	%	g	mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	N/A	N/A	0.00	100.00	250	200
2.36 mm	N/A	N/A	0.00	100.00	150	200
1.18 mm	1.00	N/A	0.42	99.58	100	200
600 µm	4.44	N/A	1.84	97.74	80	200
425 µm	14.90	N/A	6.19	91.55	70	200
300 µm	48.83	N/A	20.28	71.27	60	200
150 µm	79.55	N/A	33.04	38.22	40	200
75 µm	36.19	N/A	15.03	23.19	25	200
Passing 75 µm	55.83	N/A	23.19	0.00	-	-
Pan Total	240.74	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	O.A. Checked by : KB	Approved by : IG
Date : October 2015	Date : 25 November 2015	Date : 25 November 2015

Form GE-L-06

Page 1 of 2



LOCATION:	BH05 30.50:31.0m
DATE OF TEST:	20 October 2015
DESCRIPTION	Silty SAND - sand fine, brown, moist, dense
SAMPLE No:	N564

Form GE-L-06

Page 2 of 2

Atterberg Limit Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	: Silty CLAY, brown, soft to very soft, low to medium plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N550 BH05 3.5m - 4.0m

NATURAL MOISTURE CONTENT		TEST No.		1	2			Average
Container No.	g	114	106					
Mass of Container	g	11.91	12.04					
Mass of Container + Wet Soil	g	18.07	17.33					
Mass of Container + Dry Soil	g	16.32	15.87					
Mass of Dry Soil	g	4.41	3.83					
Mass of Moisture	g	1.75	1.46					
Moisture Content	%	39.68	38.12					38.90

PLASTIC LIMIT		TEST No.		1	2			Average
Container No.		34	46					
Mass of Container	g	14.89	14.73					
Mass of Container + Wet Soil	g	21.27	20.29					
Mass of Container + Dry Soil	g	19.59	18.82					
Mass of Dry Soil	g	4.70	4.09					
Mass of Moisture	g	1.68	1.47					
Moisture Content	%	35.74	35.94					35.84

LIQUID LIMIT		TEST No.		1	2	3	4	5	6
Number of Blows		40	35	30	25	21	16		
Container No.		20	21	22	25	31	33		
Mass of Container	g	14.09	14.50	14.39	14.48	14.54	14.46		
Mass of Container + Wet Soil	g	20.41	21.93	22.97	24.62	23.58	26.09		
Mass of Container + Dry Soil	g	18.13	19.24	19.85	20.91	20.27	21.79		
Mass of Dry Soil	g	4.04	4.74	5.46	6.43	5.73	7.33		
Mass of Moisture	g	2.28	2.69	3.12	3.71	3.31	4.30		
Moisture Content	%	56.44	56.75	57.14	57.70	57.77	58.66		

LINEAR SHRINKAGE TEST		Mould No.		1	2	3	4	5	Average
Initial length of Sample						125.00			
Final length of Sample after Shrinkage						107.00			
% Shrinkage						14.40			14.40

Sample Preparation		
as received	Liquid Limit	57.50 %
washed/sieved on 425 µm sieve	Plastic Limit	35.84 %
air dried/oven dried 105°C	Plasticity Index	21.66 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	14.40 %

Tested By: RK
Date: 20 October 2015

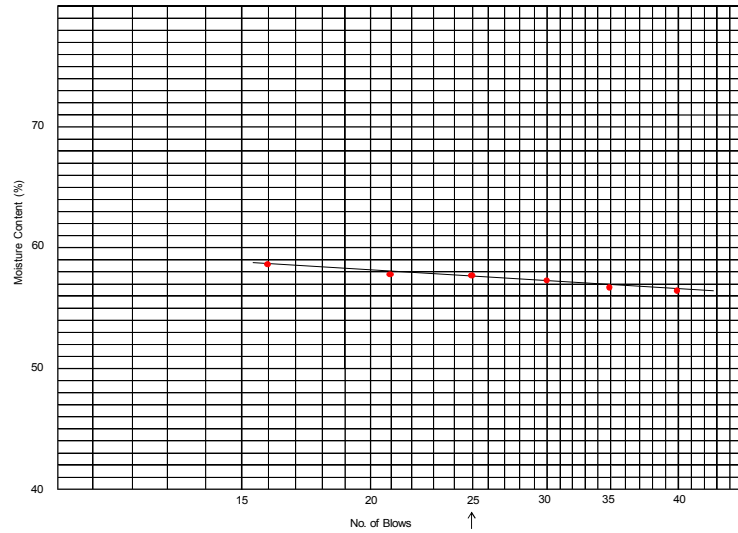
Q.A. Checked By: UM
Date: 25 November 2015

Approved By: IG
Date: 25 November 2015

Form: GE-L-03

Page 2 of 2

Graph of Moisture Content vs. No. of Blows



Project No: 1920815
Sample No: N550

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 21 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	: Clayey SILT trace of fine sand and gravel, grey, soft, medium to high plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N555 BH05 14.0m - 14.5m

NATURAL MOISTURE CONTENT		1	2				Average
TEST No.							
Container No.	g	14	16				
Mass of Container	g	53.55	52.74				
Mass of Container + Wet Soil	g	69.15	70.38				
Mass of Container + Dry Soil	g	65.64	66.36				
Mass of Dry Soil	g	12.09	13.62				
Mass of Moisture	g	3.51	4.02				
Moisture Content	%	29.03	29.52				29.27

PLASTIC LIMIT		1	2				Average
TEST No.							
Container No.		98	99				
Mass of Container	g	11.90	11.82				
Mass of Container + Wet Soil	g	17.90	18.12				
Mass of Container + Dry Soil	g	16.51	16.70				
Mass of Dry Soil	g	4.61	4.88				
Mass of Moisture	g	1.39	1.42				
Moisture Content	%	30.15	29.10				29.63

LIQUID LIMIT		1	2	3	4	5	6
TEST No.							
Number of Blows		40	35	30	25	20	15
Container No.		103	104	134	135	136	137
Mass of Container	g	11.32	11.90	11.25	11.58	11.76	11.32
Mass of Container + Wet Soil	g	16.29	17.15	16.57	17.80	16.71	17.50
Mass of Container + Dry Soil	g	14.76	15.49	14.87	15.81	15.09	15.46
Mass of Dry Soil	g	3.44	3.59	3.62	4.23	3.33	4.14
Mass of Moisture	g	1.53	1.66	1.70	1.99	1.62	2.04
Moisture Content	%	44.48	46.24	46.96	47.04	48.65	49.28

LINEAR SHRINKAGE TEST		1	2	3	4	5	Average
Mould No.							
Initial length of Sample				125.00			
Final length of Sample after Shrinkage				105.00			
% Shrinkage				16.00			16.00

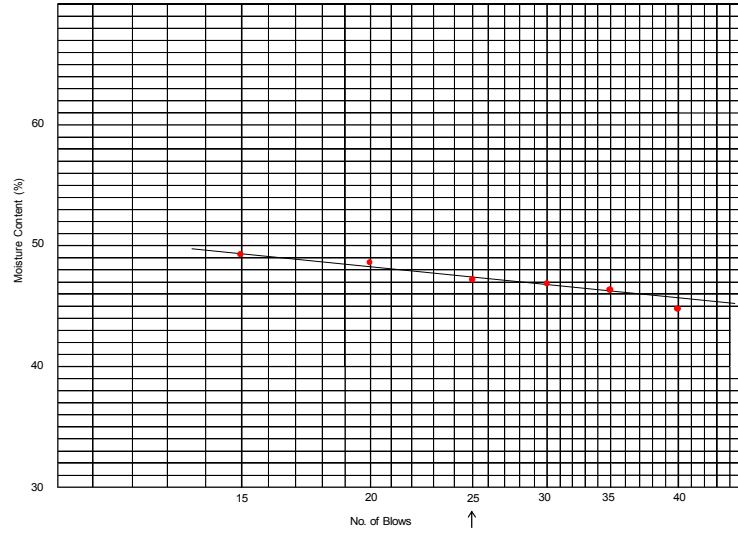
Sample Preparation		
as received	Liquid Limit	47.25 %
washed/sieved on 425 µm sieve	Plastic Limit	29.63 %
air dried/oven dried 105°C	Plasticity Index	17.62 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	16.00 %

Tested By: RK
Date: 21 October 2015

Q.A. Checked By: UM
Date: 25 November 2015

Approved By:IG
Date: 25 November 2015

Graph of Moisture Content vs. No. of Blows



Project No: 1920815
Sample No: N555

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 21 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	: Clayey SILT, dark brown, soft to firm moist, dense to very dense, medium to high plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N561 BH05 24.5m - 25.0m

NATURAL MOISTURE CONTENT		1	2	Average	
TEST No.					
Container No.	g	5	7		
Mass of Container	g	53.38	52.79		
Mass of Container + Wet Soil	g	67.40	67.69		
Mass of Container + Dry Soil	g	63.47	63.62		
Mass of Dry Soil	g	10.09	10.83		
Mass of Moisture	g	3.93	4.07		
Moisture Content	%	38.95	37.58	38.27	

PLASTIC LIMIT		1	2	Average	
TEST No.					
Container No.		138	139		
Mass of Container	g	11.12	11.35		
Mass of Container + Wet Soil	g	18.04	18.03		
Mass of Container + Dry Soil	g	16.05	16.08		
Mass of Dry Soil	g	4.93	4.73		
Mass of Moisture	g	1.99	1.95		
Moisture Content	%	40.37	41.23	40.80	

LIQUID LIMIT		1	2	3	4	5	6
TEST No.							
Number of Blows		40	36	31	26	20	15
Container No.		131	153	155	117	142	148
Mass of Container	g	11.65	11.20	11.70	11.21	11.84	11.75
Mass of Container + Wet Soil	g	16.26	15.10	15.73	15.29	15.34	16.23
Mass of Container + Dry Soil	g	14.48	13.59	14.15	13.63	13.88	14.32
Mass of Dry Soil	g	2.83	2.39	2.45	2.42	2.04	2.57
Mass of Moisture	g	1.78	1.51	1.58	1.66	1.46	1.91
Moisture Content	%	62.90	63.18	64.49	68.60	71.57	74.32

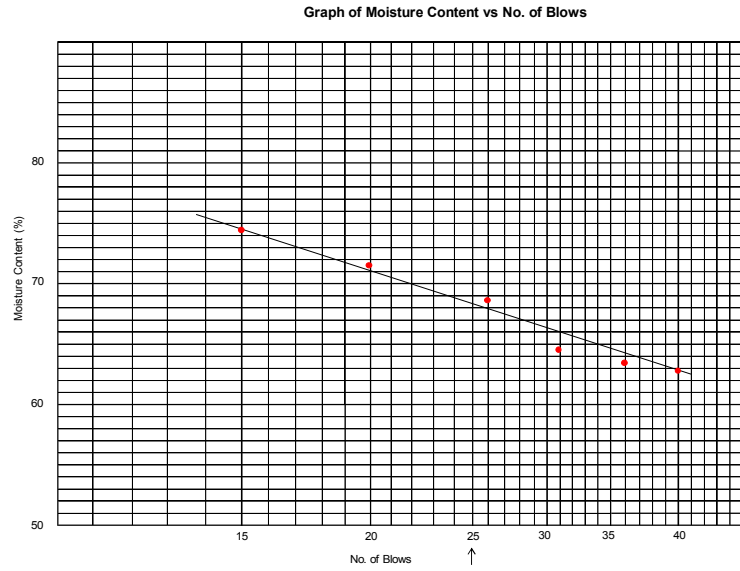
LINEAR SHRINKAGE TEST		1	2	3	4	5	Average
Mould No.							
Initial length of Sample					125.00		
Final length of Sample after Shrinkage					105.00		
% Shrinkage					16.00		16.00

Sample Preparation		Liquid Limit	68.20 %
as received		Plastic Limit	40.80 %
washed/sieved on 425 µm sieve		Plasticity Index	27.40 %
air dried/oven dried 105°C		Shrinkage Limit	16.00 %
after making a paste cured for 12-16 hrs			

Tested By: RK
Date: 21 October 2015

Q.A. Checked By: UM
Date: 25 November 2015

Approved By: IG
Date: 25 November 2015



Project No: 1920815
Sample No: N561

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE / TESTED :	20 October 2015
SITE ADDRESS :	Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST :	TL/LN
SAMPLE LOCATION :	BH05 3.5m - 4.0m	MATERIAL TYPE :	Silty CLAY, brown, soft to very soft, low to medium plasticity
TEST NUMBER :	N550	SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN	

Moisture Content	Container No.	-	66	83
	Mass of Container	g	91.00	71.30
	Mass of Container + Wet Soil	g	123.54	104.54
	Mass of Container + Dry Soil	g	114.22	94.97
	Mass of Dry Soil	g	23.22	23.67
	Mass of Moisture	g	9.32	9.57
	Moisture Content	%	40.14	40.43
				40.28

Bulk Density	Sample No.	-	N550
	Diameter of Specimen	mm	52.77
	Initial area of specimen A_0 ($\pi/4 d^2$)	mm ²	2185.97
	Initial length of specimen L_0	mm	58.59
	Initial mass of specimen M_i	g	237.10
	Bulk Density ρ	t/m ³	1.85
	Dry Density ρ_d	t/m ³	1.32

Tested by : LN/TL	Q.A. Check by : KB	Approved by : IG
Date : 20 October 2015	Date : 25 November 2015	Date : 25 November 2015

BULK DENSITY
NZS 4402:1986 (Test 5.1.3)

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE / TESTED :	20 October 2015
SITE ADDRESS :	Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST :	KB/LN
SAMPLE LOCATION :	BH05 17.0m -17.5m	MATERIAL TYPE :	SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity
TEST NUMBER :	N557		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	74	63
	Mass of Container	g	86.81	102.12
	Mass of Container + Wet Soil	g	273.45	270.36
	Mass of Container + Dry Soil	g	228.87	225.57
	Mass of Dry Soil	g	142.06	123.45
	Mass of Moisture	g	44.58	44.79
	Moisture Content	%	31.38	36.28
				33.83

Bulk Density	Sample No.	-	N557
	Diameter of Specimen	mm	53.66
	Initial area of specimen A_0 (πr^2)	mm ²	2260.33
	Initial length of specimen L_0	mm	78.49
	Initial mass of specimen M_i	g	345.32
	Bulk Density ρ	t/m ³	1.95
	Dry Density ρ_d	t/m ³	1.45

Tested by : KB/LN	Q.A. Check by : KB	Approved by : IG
Date : 20 October 2015	Date : 25 November 2015	Date : 25 November 2015

Moisture Content Test Results

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE :	20 October 2015
SITE ADDRESS :	Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST :	RK/TL
MATERIAL TYPE & DESCRIPTION :	Sandy SILT trace of fineto medium gravel, dark brown, soft to very soft, moist, low to medium plasticity	TEST METHOD :	NZS 4402:1986
		SAMPLE No. :	N548 (BH05 1.00 - 1.50m)

Moisture Content	%				
Container No.	g	150	158		
Mass of Container	g	10.76	12.13		
Mass of Container + Wet Soil	g	26.55	29.25		
Mass of Container + Dry Soil	g	23.63	25.88		
Mass of Dry Soil	g	12.87	13.75		
Mass of Moisture	g	2.92	3.37		
Moisture Content	%	22.69	24.51		23.60

Tested By: RK/TL
Date: 20 October 2015

Q.A. Checked By: KB
Date: 25 November 2015

Approved By: IG
Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: Silty CLAY, brown, soft to very soft, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N550 (BH05 3.5m - 4.0m)

Moisture Content	%					
Container No.	g	44	36			
Mass of Container	g	14.59	14.11			
Mass of Container + Wet Soil	g	26.43	23.86			
Mass of Container + Dry Soil	g	23.58	21.52			
Mass of Dry Soil	g	8.99	7.41			
Mass of Moisture	g	2.85	2.34			
Moisture Content	%	31.70	31.58			31.64

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: Sandy SILT trace of gravel, fine to coarse sand, subangular gravel, dark brown, soft to very soft, low plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N552 (BH05 6.5m - 7.00m)

Moisture Content	%					
Container No.	g	149	152			
Mass of Container	g	11.74	11.48			
Mass of Container + Wet Soil	g	24.40	24.64			
Mass of Container + Dry Soil	g	22.81	22.95			
Mass of Dry Soil	g	11.07	11.47			
Mass of Moisture	g	1.59	1.69			
Moisture Content	%	14.36	14.73			14.55

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River : Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, : Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: Gravelly SAND, brown grey, fine : to medium, loosely packed, wet	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N554 (BH05 9.5m - 10.0m)

Moisture Content	%					
Container No.	g	160	151			
Mass of Container	g	11.93	12.00			
Mass of Container + Wet Soil	g	28.54	28.65			
Mass of Container + Dry Soil	g	27.00	26.90			
Mass of Dry Soil	g	15.07	14.90			
Mass of Moisture	g	1.54	1.75			
Moisture Content	%	10.22	11.74			10.98

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River : Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, : Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: Clayey SILT trace of fine sand : and gravel, grey, soft, medium : to high plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N555 (BH05 14.0m - : 14.50m)

Moisture Content	%					
Container No.	g	157	159			
Mass of Container	g	11.86	12.18			
Mass of Container + Wet Soil	g	27.38	27.30			
Mass of Container + Dry Soil	g	23.08	23.12			
Mass of Dry Soil	g	11.22	10.94			
Mass of Moisture	g	4.30	4.18			
Moisture Content	%	38.32	38.21			38.27

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N557 (BH05 17.0m - 17.5m)

Moisture Content	%					
Container No.	g	19	28			
Mass of Container	g	14.86	13.93			
Mass of Container + Wet Soil	g	23.80	23.79			
Mass of Container + Dry Soil	g	21.36	21.11			
Mass of Dry Soil	g	6.50	7.18			
Mass of Moisture	g	2.44	2.68			
Moisture Content	%	37.54	37.33			37.43

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: SILT with fine sand trace of organics, blackish grey, soft to very soft, moist, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N559 (BH05 20.0m - 20.50m)

Moisture Content	%					
Container No.	g	23	42			
Mass of Container	g	14.73	14.58			
Mass of Container + Wet Soil	g	34.12	34.11			
Mass of Container + Dry Soil	g	28.08	27.96			
Mass of Dry Soil	g	13.35	13.38			
Mass of Moisture	g	6.04	6.15			
Moisture Content	%	45.24	45.96			45.60

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	Silty SAND trace of shell fragments and fine gravel, dark grey, very soft to soft, low to medium plasticity, gravel subangular	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N560 (BH05 23.0m - 23.50m)

Moisture Content	%					
Container No.	g	24	26			
Mass of Container	g	14.63	15.01			
Mass of Container + Wet Soil	g	30.60	30.56			
Mass of Container + Dry Soil	g	26.75	26.88			
Mass of Dry Soil	g	12.12	11.87			
Mass of Moisture	g	3.85	3.68			
Moisture Content	%	31.77	31.00			31.38

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	Silty CLAY trace siltstone nodules and fine sand, light brown, firm to stiff, medium to high plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N562 (BH05 27.5m - 28.00m)

Moisture Content	%					
Container No.	g	58	60			
Mass of Container	g	62.66	62.91			
Mass of Container + Wet Soil	g	90.67	89.99			
Mass of Container + Dry Soil	g	83.44	82.88			
Mass of Dry Soil	g	20.78	19.97			
Mass of Moisture	g	7.23	7.11			
Moisture Content	%	34.79	35.60			35.20

 Tested By: RK/TL
 Date: 20 October 2015

 Q.A. Checked By: KB
 Date: 25 November 2015

 Approved By: IG
 Date: 25 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 20 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto.	TECHNOLOGIST	: RK/TL
MATERIAL TYPE & DESCRIPTION	: Clayey SILT with siltstone nodules, greyish brown, stiff, medium to high plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N563 BH05 29.00m - 29.50m)

Moisture Content		%							
Container No.	g	64	72						
Mass of Container	g	82.05	86.33						
Mass of Container + Wet Soil	g	132.10	132.51						
Mass of Container + Dry Soil	g	119.80	121.07						
Mass of Dry Soil	g	37.75	34.74						
Mass of Moisture	g	12.30	11.44						
Moisture Content	%	32.58	32.93						32.76

Tested By: RK/TL
Date: 20 October 2015

Q.A. Checked By: KB
Date: 25 November 2015

Approved By: IG
Date: 25 November 2015

**Determination of Permeability of a Soil
Constant Head Method for Remoulded Sample**

PRINCIPAL	: Japan International Cooperation Agency	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 05, Nadi Bridge, Namotomoto	TECHNOLOGIST	: IG
MATERIAL TYPE & DESCRIPTION	: Gravely SAND, brown grey, fine to medium, loosely packed, wet	TEST METHOD	: AS 1289.6.7.3-2001
		SAMPLE No.	: N554 (BH05 9.5m - 10.0m)

Total Weight : -
Weight Retained on : -
Percentage retained: -

MOISTURE CONTENT	
Container No.	116
Mass of Container	g 11.72
Mass of Container + Wet	g 33.13
Mass of Container + Dry	g 29.96
Mass of Dry Soil	g 18.24
Mass of Moisture	g 3.17
Moisture Content	% 17.38
Optimum moisture content	% -
Laboratory moisture ratio	% -

DENSITY	
Mass of Specimen	g 1840
Volume of Specimen	cm ³ 839.43
Wet Density	t/m ³ 2.19
Dry Density	t/m ³ 1.87
Maximum Dry Density	t/m ³ -
Laboratory Density ratio	% -

Area of stand pipe (dia. 12mm)	mm ² 113.10
Cross sectional area of soil	cm ² 50.27
Length of soil specimen	cm 16.70

TEST #	Constant Head h (cm)	Elapsed Time (t/min)	Out Flow Volume Q (cm ³)	Water temp T(°C)	KT cm/min	K ₂₀ cm/min
1	124	10.00	22	26	0.006	0.005
2	124	10.00	22	26	0.006	0.005
3	124	10.00	21	26	0.006	0.005
4	116	10.00	18	26	0.005	0.005
5	116	10.00	17	26	0.005	0.004
6	116	10.00	17	26	0.005	0.004
7	108	10.00	15	26	0.005	0.004
8	108	10.00	15	26	0.005	0.004
9	108	10.00	15	26	0.005	0.004
10	101	10.00	14	26	0.005	0.004
11	101	10.00	14	26	0.005	0.004
12	101	10.00	14	26	0.005	0.004

Average K₂₀ m/s 7.41E-07

Tested By: IG
Date: 23 October 2015

Q.A. Check By: KB
Date: 25 November 2015

Approved By: IG
Date: 25 November 2015

Unconfined Compressive Strength
NZS 4402:1986 (Test 6.3.1)

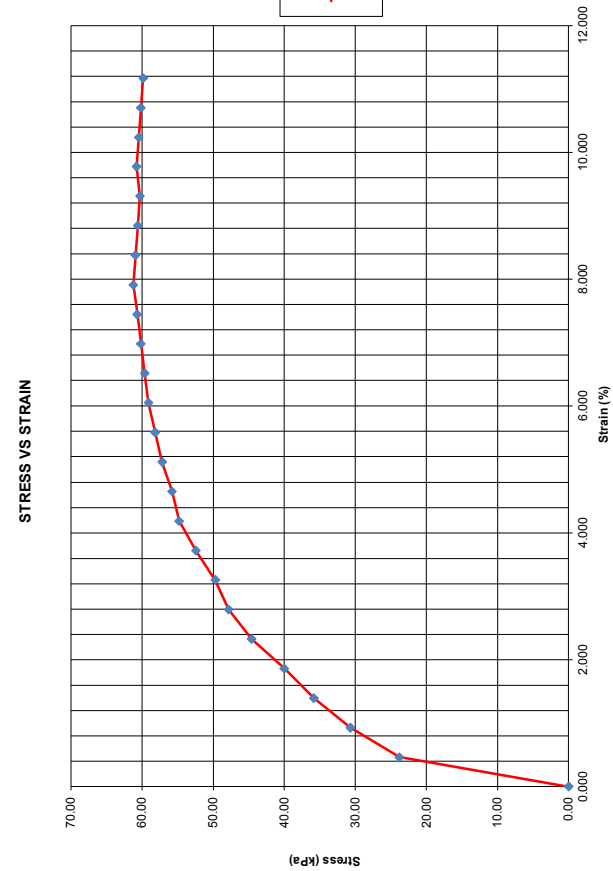
PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works.	DATE TESTED :	20 October 2015
SITE ADDRESS :	Site 5 Nadi Bridge, Namotomoto	TECHNOLOGIST :	LN/TL
SAMPLE LOCATION :	BH 05 3.5m - 4.0m	MATERIAL TYPE :	Silty CLAY, brown, soft to very soft, low to medium plasticity
TEST NUMBER :	N550		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	84
	Mass of Container	g	85.02
	Mass of Container + Wet Soil	g	317.04
	Mass of Container + Dry Soil	g	243.04
	Mass of Dry Soil	g	158.02
	Mass of Moisture	g	74.00
	Moisture Content	%	46.83

Bulk Density	Sample No.	-	N550
	Diameter of Specimen	mm	53.72
	Initial area of specimen A ₀ (m ² d ²)	mm ²	2265.38
	Initial length of specimen L ₀	mm	107.44
	Initial mass of specimen M _i	g	424.50
	Bulk Density ρ	t/m ³	1.74
	Dry Density ρ _d	t/m ³	1.19

Compression Gauge Reading	Load Gauge Reading	Load	Strain $\epsilon = \frac{C_n - C_0}{L_0}$	Corrected Area A = A ₀ / (1 - ε)	Principal Stress Difference σ ₁ - σ ₃ = 1000P/A
mm		(kN)	%	m ²	kPa
0.00	0	0	0.000	0.002265	0.00
0.50	27	0.0542	0.465	0.002276	23.81
1.00	35.0	0.0702	0.931	0.002287	30.70
1.50	41.0	0.0823	1.396	0.002297	35.82
2.00	46.0	0.0923	1.862	0.002308	39.99
2.50	51.5	0.1034	2.327	0.002319	44.58
3.00	55.5	0.1114	2.792	0.002330	47.80
3.50	58.0	0.1164	3.258	0.002342	49.71
4.00	61.5	0.1234	3.723	0.002353	52.44
4.50	64.5	0.1295	4.188	0.002364	54.77
5.00	66.0	0.1325	4.654	0.002376	55.77
5.50	68.0	0.1365	5.119	0.002388	57.17
6.00	69.5	0.1395	5.585	0.002399	58.14
6.50	71.0	0.1425	6.050	0.002411	59.10

BH 05 3.5r



LOCATION: BH 05 - 3.50m - 4.00m
DESCRIPTION: Silty CLAY, brown, soft to very soft, low to medium plasticity
DATE OF TEST: 20 October 2015

Unconfined Compressive Strength
NZS 4402:1986 (Test 6.3.1)

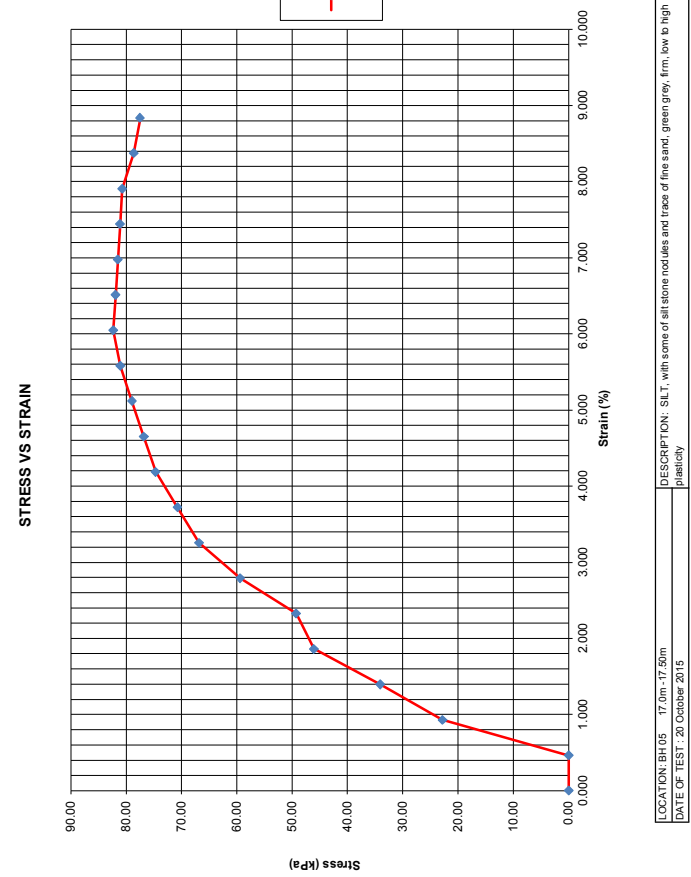
PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works.	DATE TESTED :	20 October 2015
SITE ADDRESS :	Site 5, Nadi Bridge, Namotomoto	TECHNOLOGIST :	LN/KB
SAMPLE LOCATION :	BH 05 17.0m -17.5m	MATERIAL TYPE :	SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity
TEST NUMBER :	N557		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	88
	Mass of Container	g	124.16
	Mass of Container + Wet Soil	g	568.65
	Mass of Container + Dry Soil	g	449.29
	Mass of Dry Soil	g	325.13
	Mass of Moisture	g	119.36
	Moisture Content	%	36.71

Bulk Density	Sample No.	-	N557
	Diameter of Specimen	mm	53.74
	Initial area of specimen A ₀ (π/4 d ²)	mm ²	2267.07
	Initial length of specimen L ₀	mm	107.48
	Initial mass of specimen M _i	g	444.79
	Bulk Density ρ	t/m ³	1.83
	Dry Density ρ_d	t/m ³	1.34

Compression Gauge Reading	Load Gauge Reading	Load	Strain $\epsilon = \frac{C_n - C_0}{L_0}$	Corrected Area $A = A_0 / (1 - \epsilon)$	Principal Stress Difference $\sigma_1 - \sigma_3 = 1000P/A$
mm		(kN)	%	m ²	kPa
0.00	0	0	0.000	0.002267	0.00
0.50	0	0	0.465	0.002278	0.00
1.00	26.0	0.0522	0.930	0.002288	22.81
1.50	39.0	0.0783	1.396	0.002299	34.06
2.00	53.0	0.1064	1.861	0.002310	46.06
2.50	57.0	0.1144	2.326	0.002321	49.29
3.00	69.0	0.1385	2.791	0.002332	59.39
3.50	78.0	0.1566	3.256	0.002343	66.83
4.00	83.0	0.1666	3.722	0.002355	70.75
4.50	88.0	0.1767	4.187	0.002366	74.68
5.00	91.0	0.1827	4.652	0.002378	76.84
5.50	94.0	0.1887	5.117	0.002389	78.98
6.00	97.0	0.1947	5.582	0.002401	81.09
6.50	99.0	0.1987	6.048	0.002413	82.35

BH 05 17.0m



LOCATION: BH 05 - 17.0m - 17.5m
DATE OF TEST: 20 October 2015
DESCRIPTION: SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity

Project No.	Site	Soil Type	Sample type	Depth (m)		Permeability	Density	Moisture Content	Lab Tests Required		LCS	Consolidation	Remarks		
				1.00 - 1.5	2.00 - 2.5				PSD	Atterberg					
1920815	Site 8, Nadi Bridge (BH 05) Namotomoto.	Clayey Silt Silty Sand Silty Silt Sandy Gravel Gravelly Sand Gravelly Silt Gravelly Sand Gravel Clayey Silt Clayey Silt Gravelly Sand Silt trace of fine sand Silty sand Silty sand Silty Sand Silty Sand Clayey Silt Clayey Silt Silty CLAY Silty CLAY Silty sand	SPT	1.00 - 1.5	2.00 - 2.5		1	1	1	1	1				
			U	3.50 - 4.00		1									
			SPT	5.00 - 5.5		1									
			SPT	6.50 - 7.0		1									
			SPT	8.00 - 8.5		1									
			SPT	9.50 - 10.0		1									
			SPT	11.00 - 11.20		1									No sample
			SPT	12.50 - 12.80		1									No sample
			SPT	14.00 - 14.50		1									
			SPT	15.50 - 16.0		1									
			U	17.00 - 17.50		1									
			SPT	18.50 - 19.0		1									
			SPT	20.00 - 20.50		1									
			SPT	21.50 - 22.00		1									
			SPT	23.00 - 23.5		1									
			SPT	24.50 - 25.0		1									
			SPT	26.00 - 26.5		1									
			SPT	27.50 - 28.0		1									
			SPT	29.00 - 29.5		1									
			SPT	30.50 - 31.00		1									
TOTALS							2	10	6	6	3	2	3		
Bill of Quantity							1	3				2	3		

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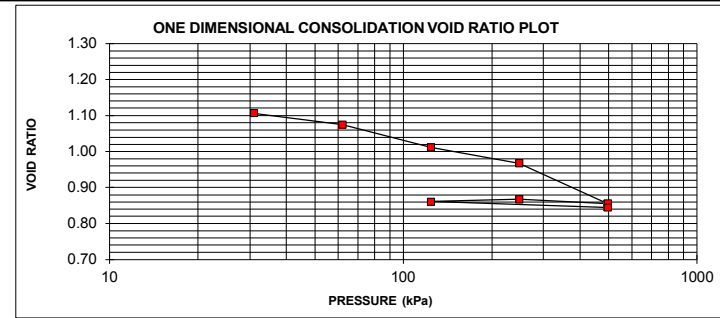
ENTEC LIMITED Determination of The One-Dimensional Consolidation Properties
ENGINEERING & SCIENCE CONSULTANTS NZS 4402 : 1986 Test 7.1

Project Name: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works
Client Name: Japan International Cooperation Agency (JICA)
Job No: 1920815
Site Address: Namotomoto Bridge left bank
Sample Location: BH 05

Sample No: N 557
Depth: 17.0m - 17.5m
Tested By: IG
Date Tested: 21 November 2015

Sample Description: SILT, with some of silt stone nodules and trace of fine sand, green grey, firm, low to high plasticity
Sample History: Undisturbed /Remoulded /Compacted /Slurried /Unknown
Date Sample Collected: 13/10/15
Loading Cycle: 24 hrs 0 mins
Diameter of ring (D): 44.96 mm
Solid density of soil particles (Q_s): 2.65 t/m³ (Measured / Assumed)
Method used: Square root of time fitting method

Temperature: Max: 27°C Min: 25°C
Height of ring: 23.8 mm
Area of ring (A): 1587.61 mm²



		Initial		Final	
Measured thickness of specimen, H	mm	H _i	23.8	H _f	20.69
Mass of ring + watch-glass + wet specimen	g	M ₃	268.94	M _d	268.00
Mass of ring + watch-glass + dry specimen	g			253.27	
Mass of ring	g			206.07	
Mass of watch-glass	g			0	
Mass of dry specimen	g	M _s = M ₃ - M _r - M ₂		47.2	
Mass of water	g	M ₃ - M _s	15.67	M _d - M _s	14.73
Water content, w	%	w _i	33.20	w _f	31.21
Dry density, Q _d	t/m ³	Q _{di}	1.25	Q _{df}	1.44
Height of soil particles, H _s	mm			11.22	
Voids ratio, e		e _i	1.12	e _f	0.84
Degree of saturation, S		S _i	78.45	S _f	97.96

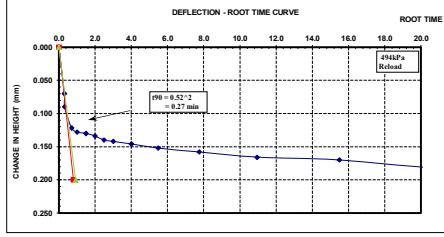
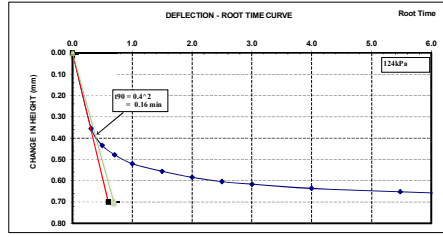
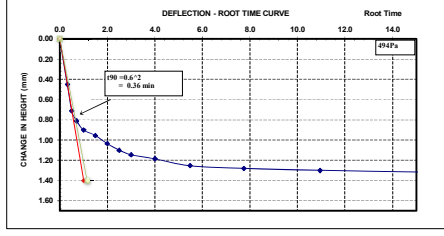
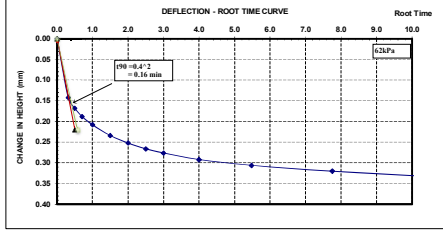
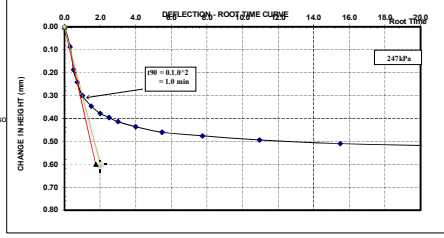
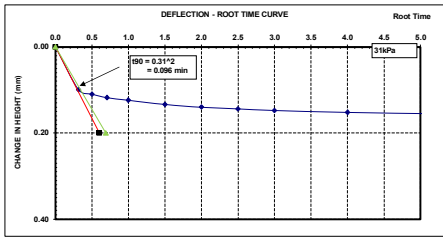
Applied Pressure kPa	Incremental deflection (ΔH) mm	Thickness of specimen mm	% Change in thickness %	Height of voids mm	Voids ratio	Coefficient of consolidation C _v (m ² /yr)	Coefficient of compressibility M _v (m ² /MN)
31	0.176	23.624	0.007	12.41	1.11	645.30	
62	0.528	23.272	0.023	12.05	1.07	375.73	0.72
124	1.236	22.564	0.055	11.35	1.01	353.21	0.84
248	1.726	22.074	0.078	10.86	0.97	54.09	0.58
496	2.982	20.818	0.143	9.60	0.86	133.63	0.51
248	2.850	20.950	0.136	9.73	0.87	0.00	-0.48
124	2.928	20.872	0.140	9.65	0.86	0.00	-0.99
496	3.110	20.690	0.150	9.47	0.84	175.99	0.35
0	0.00	23.800	0.000	12.58	1.12	0.00	

Tested by: IG/KB Date: 21 November 2015
Q.A. Check By: UM Date: 01 December 2015
Approved By: IG Date: 01 December 2015


Loading Date & Time		21/11/2015 @ 10:57hrs			22/11/2015 @ 11:00hrs			23/11/2015 @ 11:02hrs			24/11/2015 @ 12:21hrs			25/11/2015 @ 12:22hrs			26/11/2015 @ 12:31hrs											
Hanger Load		500g			1000g			2000g			4000g			8000g			4000g											
Effective Pressure		31kPa			62kPa			124kPa			247kPa			494kPa			247kPa											
Time Elapsed		Clock			Dial			H			Clock			Dial			H			Clock			Dial			H		
hrs	min	sec	t min	√t min	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm			
			0	0.00	10:57:00	2260	0.000	11:00:00	2171	0.000	11:02:00	1988	0.000	12:21:00	1624	0.000	12:22:00	1355	0.000	12:31:00	672	0.000						
			6	0.100	10:57:06	2210	0.100	11:00:06	2100	0.142	11:02:06	1810	0.356	12:21:06	1580	0.088	12:22:06	1130	0.450	12:31:06	690	0.036						
			15	0.250	10:57:15	2205	0.110	11:00:15	2087	0.168	11:02:15	1771	0.434	12:21:15	1530	0.188	12:22:15	1000	0.710	12:31:15	693	0.042						
			30	0.500	10:57:30	2201	0.118	11:00:30	2077	0.188	11:02:30	1749	0.478	12:21:30	1503	0.242	12:22:30	950	0.810	12:31:30	697	0.050						
	1		1.000	1.000	10:58:00	2198	0.124	11:01:00	2067	0.208	11:03:00	1728	0.520	12:22:00	1474	0.300	12:23:00	905	0.900	12:32:00	699	0.054						
	2	15	2.250	1.500	10:59:15	2193	0.134	11:02:15	2054	0.234	11:04:15	1710	0.556	12:23:15	1451	0.346	12:24:15	877	0.956	12:33:15	600	-0.144						
	4		4.000	2.000	11:01:00	2190	0.140	11:04:00	2045	0.252	11:06:00	1696	0.584	12:25:00	1435	0.378	12:26:00	837	1.036	12:35:00	601	-0.142						
	6	15	6.250	2.500	11:03:15	2188	0.144	11:06:15	2038	0.266	11:08:15	1686	0.604	12:27:15	1426	0.396	12:28:15	805	1.100	12:37:15	602	-0.140						
	9		9.000	3.000	11:06:00	2186	0.148	11:09:00	2033	0.276	11:11:00	1680	0.616	12:30:00	1417	0.414	12:31:00	782	1.146	12:40:00	602.2	-0.140						
	16		16.00	4.000	11:13:00	2184	0.152	11:16:00	2025	0.292	11:18:00	1670	0.636	12:37:00	1406	0.436	12:38:00	762	1.166	12:47:00	603	-0.138						
	30		30.00	5.480	11:27:00	2182	0.156	11:30:00	2018	0.306	11:32:00	1662	0.652	12:51:00	1394	0.460	12:52:00	728	1.254	13:01:00	603	-0.138						
	1		60.00	7.750	11:57:00	2179	0.162	12:00:00	2011	0.320	12:02:00	1652	0.672	13:21:00	1386	0.476	13:22:00	715	1.280	13:31:00	604	-0.136						
	2		120.0	10.950	12:57:00	2176	0.168	13:00:00	2004	0.334	13:02:00	1644	0.688	14:21:00	1377	0.494	14:22:00	705	1.300	14:31:00	605	-0.134						
	4		240.0	15.49	14:57:00	2174	0.172	15:00:00	1999	0.344	15:02:00	1636	0.704	16:21:00	1369	0.510	16:22:00	696	1.318	16:31:00	606	-0.132						
	8		480.0	21.91	18:57:00	2172	0.176	19:00:00	1997	0.348	19:02:00	1628	0.720	20:21:00	1364	0.520	20:22:00	684	1.342	20:31:00	606.2	-0.132						
	24		1440	37.95	10:57:00	2171	0.178	11:00:00	1988	0.366	11:02:00	1624	0.728	12:21:00	1355	0.538	12:22:00	672	1.366	12:31:00	608	-0.128						
UNLOADING																												
Machine Correction					0.002			0.014			0.02			0.048			0.110			0.004								
Δ H (Corrected)					0.176			0.352			0.708			0.490			1.256			-0.132								
Net Total Settlement					0.176			0.528			1.236			1.726			2.982			2.850								

D15-166

Loading Date and Time		27/11/2015 @ 12:36hrs			28/11/2015 @ 12:38hrs			N 515																				
Hanger Load		2000g			8000g			6.50m-7.0m																				
Effective Pressure		124kPa			494kPa																							
Time Elapsed		Clock			Dial			H			Clock			Dial			H			Clock			Dial			H		
hrs	min	sec	t min	√t min	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm			
			0	0	12:36:00	608	0.000	11:38:00	625	0.000																		
			6	0.100	12:36:06	628	0.040	11:38:06	590	0.070																		
			15	0.250	12:36:15	632	0.048	11:38:15	580	0.090																		
			30	0.500	12:36:30	635	0.054	11:38:30	564	0.122																		
	1		1.000	1.000	12:37:00	636	0.056	11:39:00	561	0.128																		
	2	15	2.250	1.500	12:38:15	638	0.060	11:40:15	560	0.130																		
	4		4.000	2.000	12:40:00	639	0.062	11:42:00	558	0.134																		
	6	15	6.250	2.500	12:42:15	641	0.066	11:44:15	555	0.140																		
	9		9.000	3.000	12:45:00	642	0.068	11:47:00	554	0.142																		
	16		16.00	4.000	12:52:00	643	0.070	11:54:00	552	0.146																		
	30		30.00	5.480	13:06:00	644	0.072	12:08:00	549	0.152																		
	1		60.00	7.750	13:36:00	645	0.074	12:38:00	546	0.158																		
	2		120.0	10.950	14:36:00	646	0.076	13:38:00	542	0.166																		
	4		240.0	15.49	16:36:00	648	0.080	15:38:00	540	0.170																		
	8		480.0	21.91	20:36:00	650	0.084	19:38:00	533	0.184																		
	24		1440	37.95	12:36:00	652	0.088	11:38:00	523	0.204																		
					UNLOADING			RELOADING																				
Machine Correction					0.01			0.022																				
Δ H (Corrected)					0.078			0.182																				
Net Total Settlement					2.928			3.110																				



Oedometer Settlement Test


Sample Details	Depth	3.5 - 4.0m	
	Description Type	Silty Clay, brown, soft to very soft, low to medium plasticity.	
 <p>sketch showing specimen location in original sample</p>	Initial Height	L ₀ (mm)	20.0
	Initial Diameter	D ₀ (mm)	50.0
	Initial Weight	W ₀ (gr)	63.4
	Bulk Density	ρ ₀ (Mg/m ³)	1.61
	Particle Density	ρ _s (Mg/m ³)	2.65

Initial Conditions			
Settlement Input	L _{IP} (mm)	CH	3
Initial Moisture	ω _i % (%)		50
Initial Dry Density	ρ _{di} (Mg/m ³)		1.08
Initial Voids Ratio	e _i		1.455
Initial Degree of Saturation	S _i (%)		90.3
Initial Swelling	S _s (kPa)		0

Final Conditions			
Final Moisture	ω _f % (%)		37
Dry Density	ρ _{df} (Mg/m ³)		1.08
Voids Ratio	e _f		1.459
Saturation	S _f (%)		67
Height Settlement	ΔL _s (mm)		-0.032

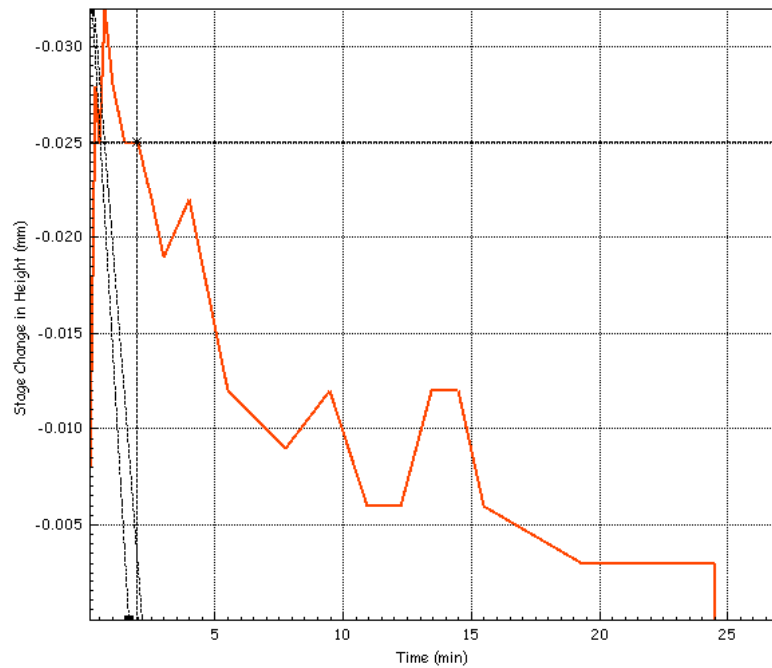
Vertical Stress σ' _i (kPa)	Voids Ratio e _f	Height ΔL _s (mm)	Consolidation C _v (m ² /year)	Compressibility m _v (m ² /MN)	Initial T _i (°C)	Final T _f (°C)	t ₅₀ Time t ₅₀ (min)	t ₉₀ Time t ₉₀ (min)	Secondary C _{SEC} (m ² /MN)
30	1.455	0.000	11.8		29.0	0.0		3.752	0.0087
60	1.459	-0.032	9.3	0.053	29.0	0.0		4.782	0.0087
120	1.459	-0.032	11.6		29.0	0.0		3.833	0.0087
240	1.459	-0.032	12.4		29.0	0.0		3.582	0.0087
480	1.459	-0.032	7.4		29.0	0.0		6.044	0.0087
960	1.459	-0.032	4.7		29.0	0.0		9.526	0.0087
120	1.459	-0.032			29.0	0.0			
30	1.459	-0.032			29.0	0.0			

Notes

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	12/9/2015
	Client	Japan International Cooperation	Sample	N550
	Operator	IG/MK	Borehole	BH05 (Retest)
	Checked	DMC	Approved	DMC

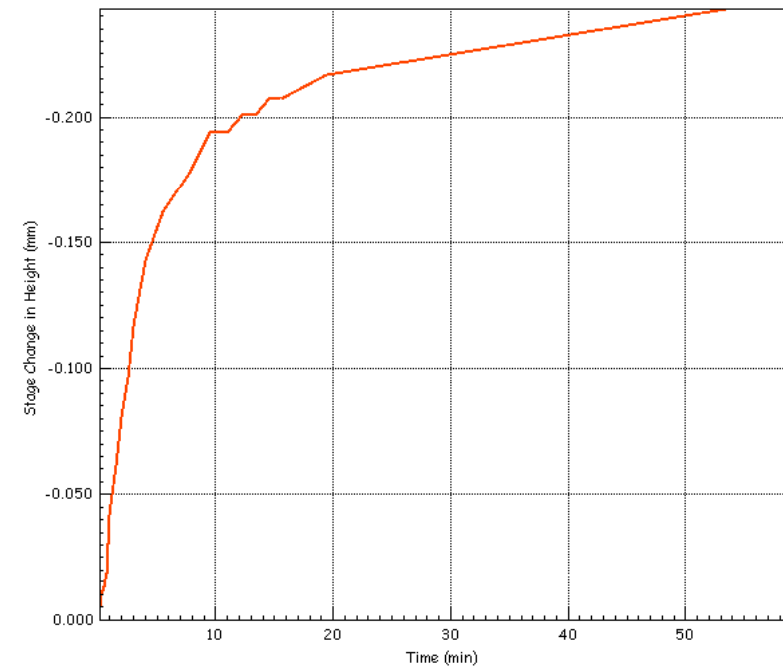
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	30
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	0.000
Voids Ratio	e_f	.	1.455
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	3.752
Consolidation	C_v	(m ² /year)	11.8
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	30
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	12/9/2015
	Client	Japan International Cooperation	Sample	N550
	Operator	IG/MK	Borehole	BH05 (Retest)
	Checked	DMC	Approved	DMC

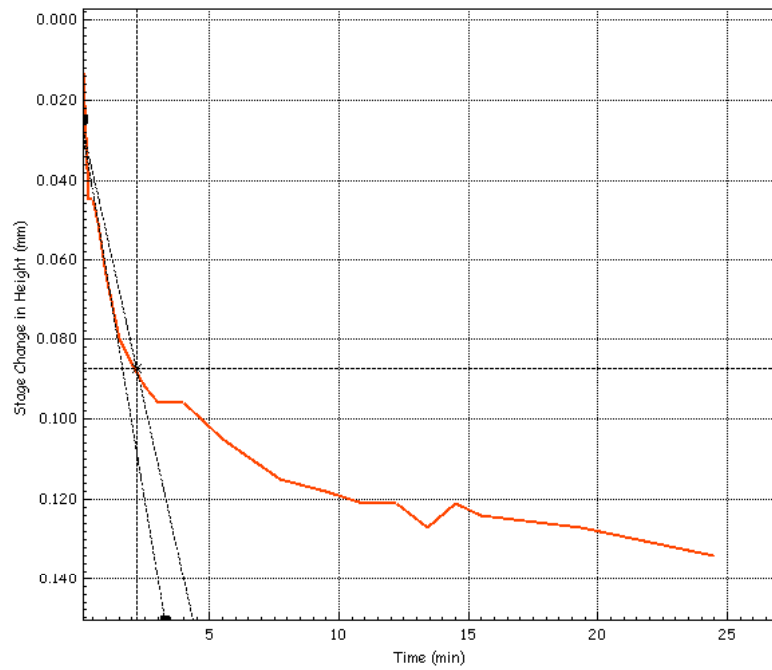
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	12/9/2015
	Client	Japan International Cooperation	Sample	N550
	Operator	IG/MK	Borehole	BH05 (Retest)
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

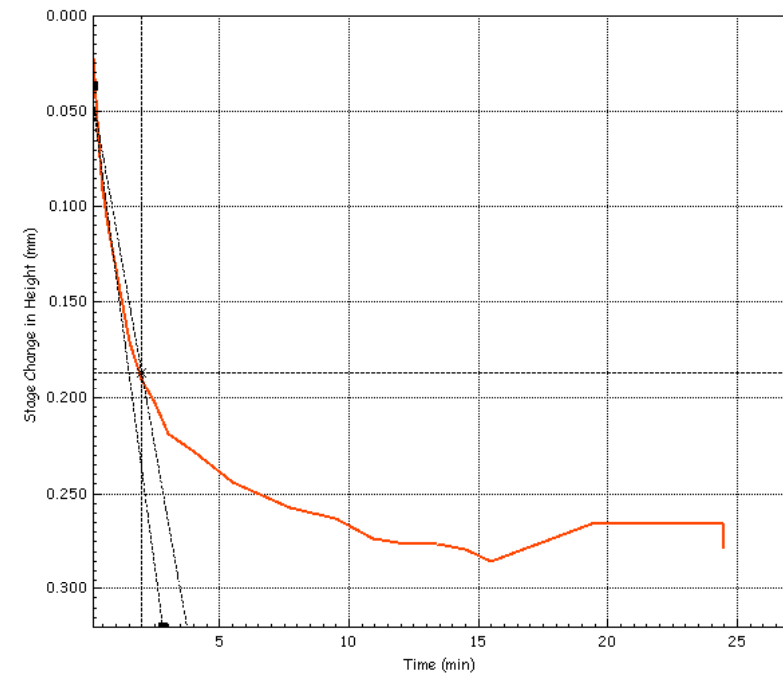
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	60
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	4.782
Consolidation	C_v	(m ² /year)	9.3
Compressibility	m_v	(m ² /MN)	0.053
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	120
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	3.833
Consolidation	C_v	(m ² /year)	11.6
Compressibility	m_v	(m ² /MN)	0.053
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013	
			Database:	.\SQLEXPRESS\ENTEC	
	Site Reference	1920815	Test Date	12/9/2015	
	Jobfile	Geotechnical Engineering	Sample	N550	
	Client	Japan International Cooperation	Borehole	BH05 (Retest)	
Operator	IG/MK	Checked	DMC	Approved	DMC

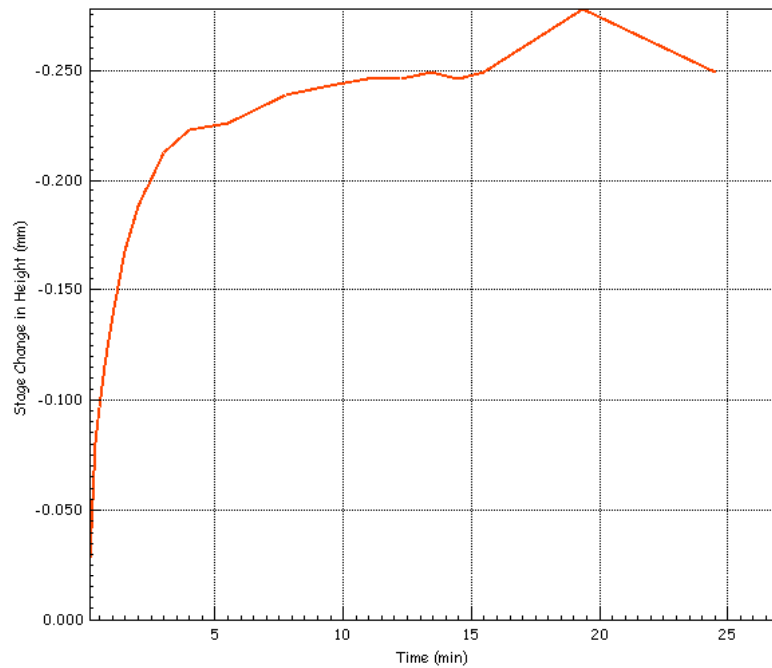
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013	
			Database:	.\SQLEXPRESS\ENTEC	
	Site Reference	1920815	Test Date	12/9/2015	
	Jobfile	Geotechnical Engineering	Sample	N550	
	Client	Japan International Cooperation	Borehole	BH05 (Retest)	
Operator	IG/MK	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

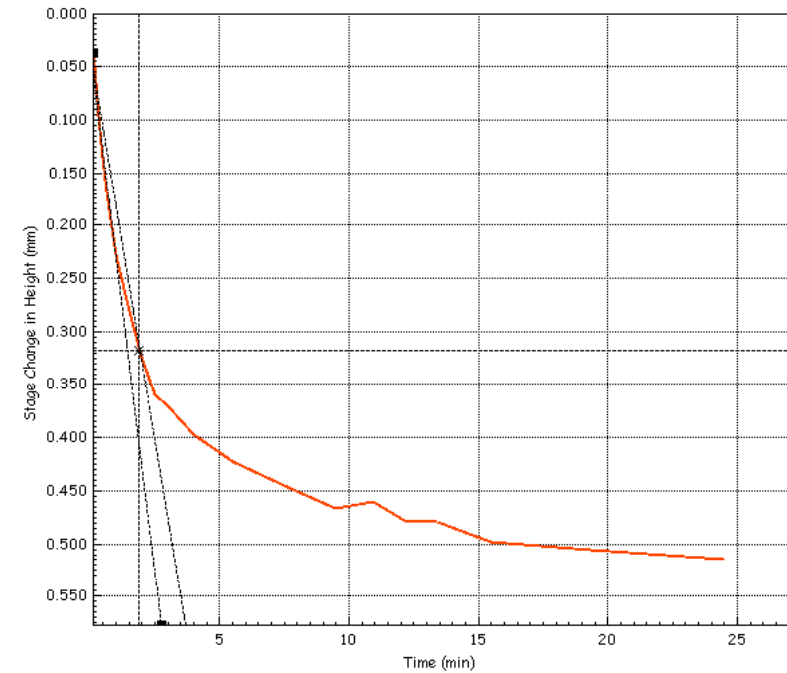
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	120
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	240
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	3.582
Consolidation	C_v	(m ² /year)	12.4
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	12/9/2015
	Client	Japan International Cooperation	Sample	N550
	Operator	IG/MK	Borehole	BH05 (Retest)
	Checked	DMC	Approved	DMC

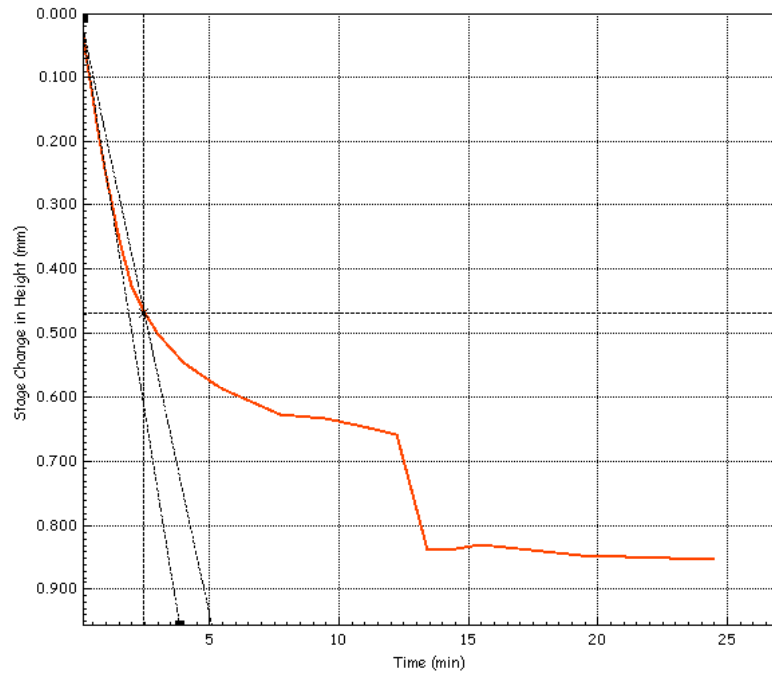
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	12/9/2015
	Client	Japan International Cooperation	Sample	N550
	Operator	IG/MK	Borehole	BH05 (Retest)
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

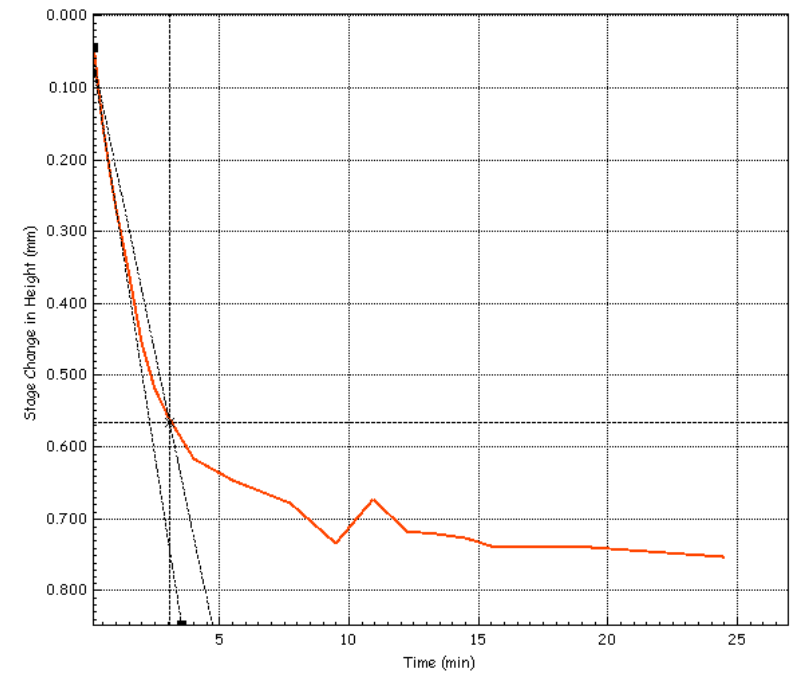
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	480
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	6.044
Consolidation	C_v	(m ² /year)	7.4
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	960
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.032
Voids Ratio	e_f	.	1.459
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	9.526
Consolidation	C_v	(m ² /year)	4.7
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
			Database:	..SQLEXPRESS\ENTEC
	Site Reference	1920815	Test Date	12/9/2015
	Jobfile	Geotechnical Engineering	Sample	N550
	Client	Japan International Cooperation	Borehole	BH05 (Retest)
	Operator	IG/MK	Checked	DMC
			Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-15_013
			Database:	..SQLEXPRESS\ENTEC
	Site Reference	1920815	Test Date	12/9/2015
	Jobfile	Geotechnical Engineering	Sample	N550
	Client	Japan International Cooperation	Borehole	BH05 (Retest)
	Operator	IG/MK	Checked	DMC
			Approved	DMC

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APPENDIX 5d
Site Photos



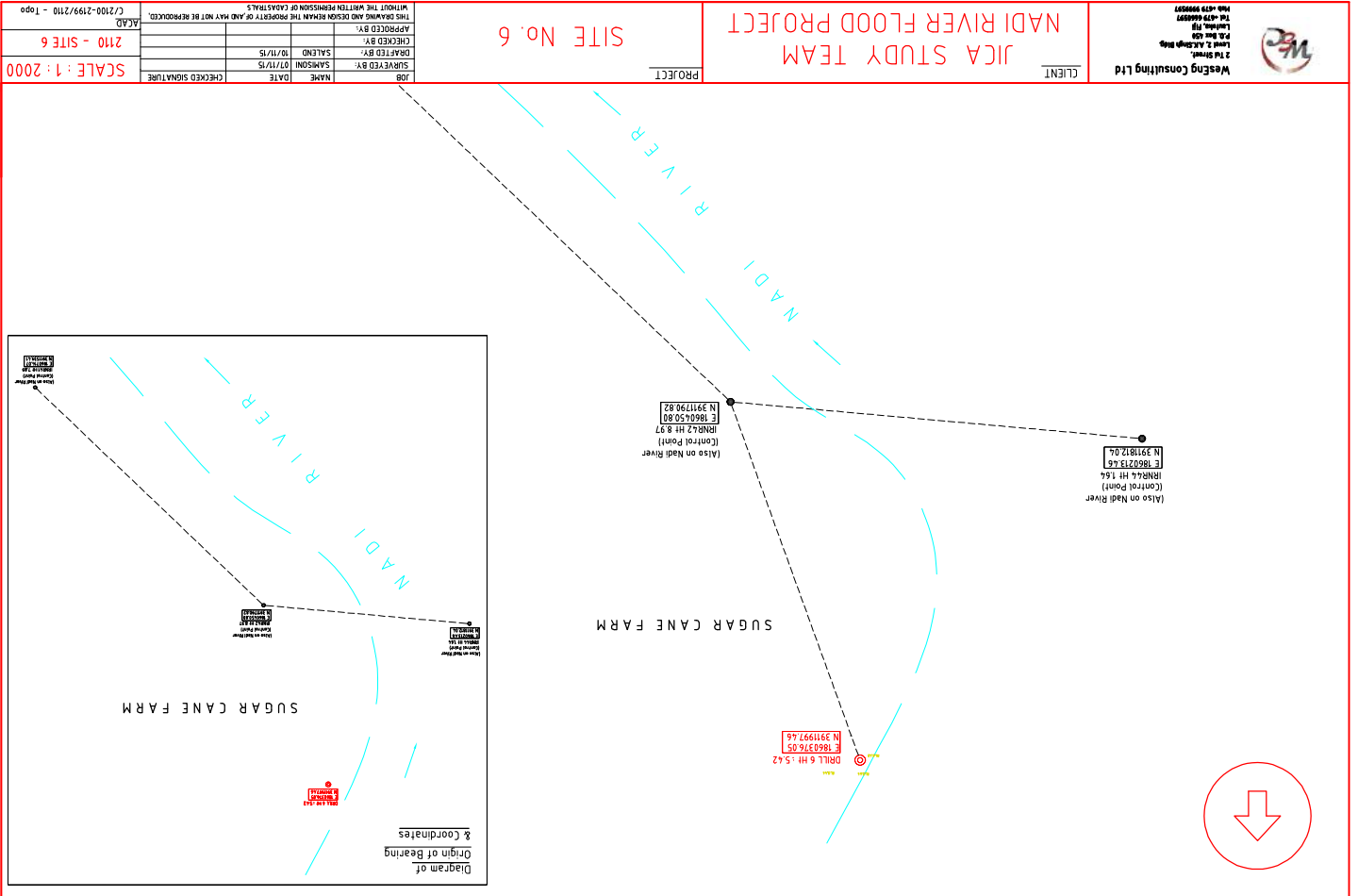
APPENDIX 6
SITE 6 – Moala Saunaka Village Fiji.

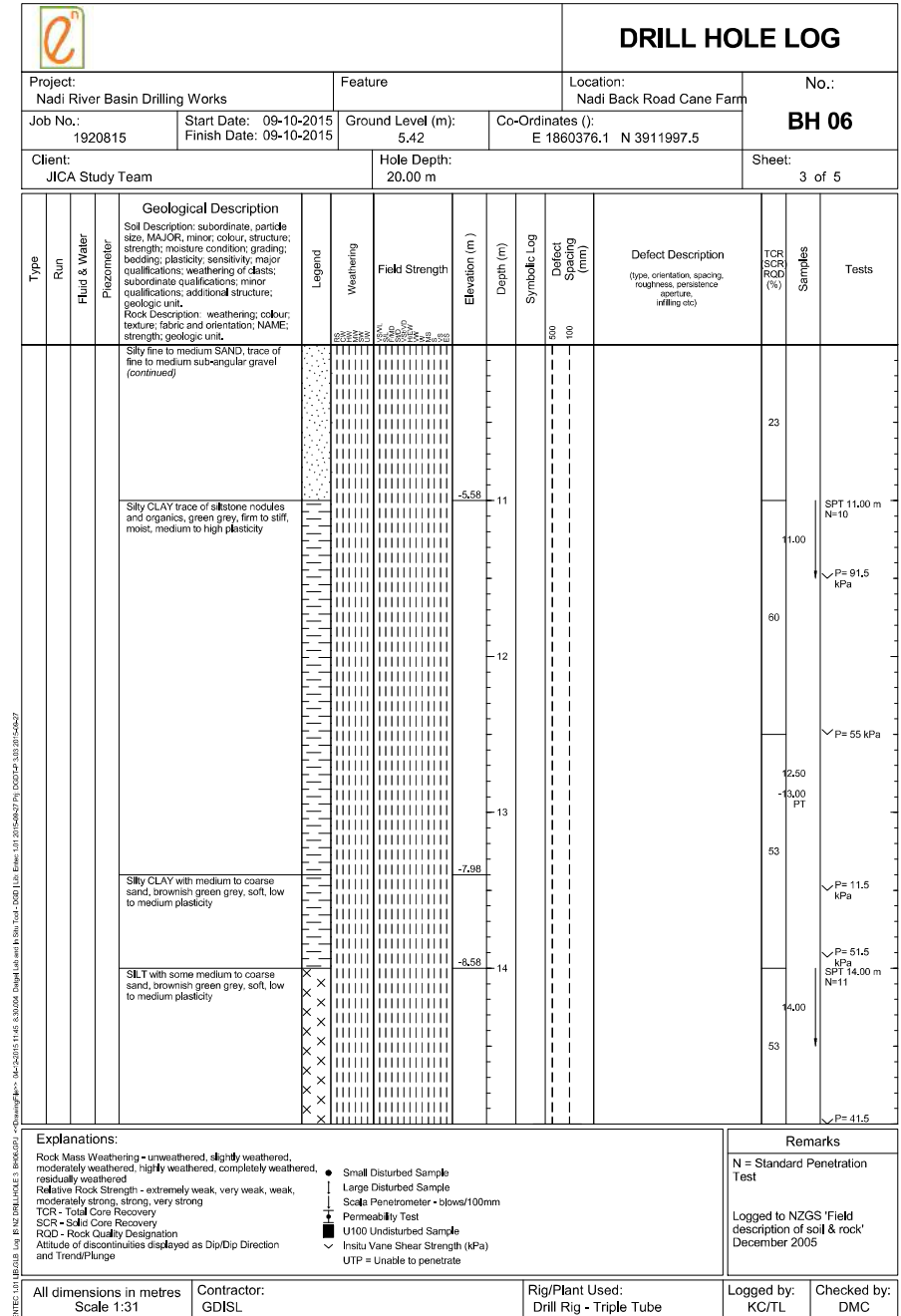
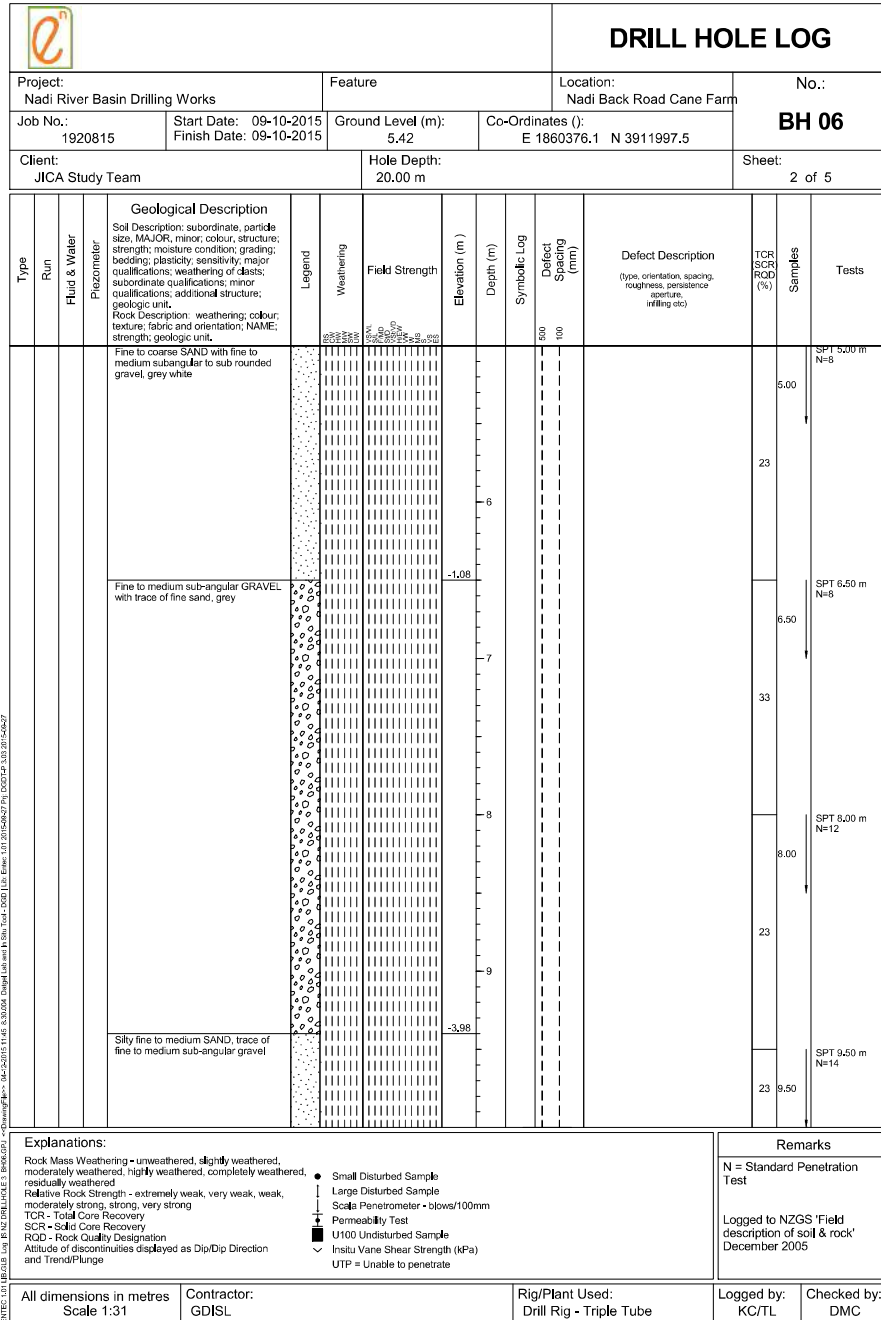
APPENDIX 6a
Test Locality Plan



	ENTEC LIMITED Level 2, Mid City Plaza Cnr. Cumming St & Renwick Road P.O. Box 12309 Suva, Fiji.	ENGINEERING AND SCIENCE CONSULTANTS Unit 2, VT Solutions 24 Cawa Road Marintar P.O. Box 72309 Nadi, Fiji.	Phone (679) 330 0300 Fax (679) 331 8618 Email info@entecfiji.com	CLIENT: Japan International Cooperation Agency (JICA) PROJECT: Nadi River Basin Project	NOTE: THIS DRAWING HAS BEEN REPRODUCED BY ENTEC TO SHOW THE APPROXIMATE BOREHOLE LOCATION.	DRAWN BY: SS CHECKED BY: KC APPROVED BY: JD SHEET TITLE: TEST LOCALITY PLAN SCALE: NTS ISSUE DATE: November 2015	A3 PROJECT NO.: 1920815 DRAWING NO.: 1 of 1
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DIS-174





DRILL HOLE LOG																		
Project: Nadi River Basin Drilling Works			Feature		Location: Nadi Back Road Cane Farm		No.: BH 06											
Job No.: 1920815		Start Date: 09-10-2015 Finish Date: 09-10-2015		Ground Level (m): 5.42	Co-Ordinates (): E 1860376.1 N 3911997.5													
Client: JICA Study Team			Hole Depth: 20.00 m				Sheet: 4 of 5											
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests	
				SILT with some medium to coarse sand, brownish green grey, soft, low to medium plasticity (continued)	X			-10.06	16		500 100					53	KPa	
				Silty medium to coarse SAND, grey black												15.50 16.00 PT	✓ P= 53 kPa ✓ P= 75 kPa	
				SILT with some medium to coarse sand trace of organics and fine to medium sub angular to sub rounded gravel, brown, firm, low to medium plasticity	X			-11.28	17							17.00	SPT 17.00 m N=50 ✓ P= 16.5 kPa ✓ P= 58 kPa	
				medium SAND and trace of fine to coarse sub angular to sub rounded gravel, brown grey				-12.16	18							85	✓ P= 55 kPa	
				Fine to coarse SAND with some silt, dark brown				-13.06	19							18.50	SPT 18.50 m N=43 ✓ P= 300 kPa	
				Fine SAND with some silt trace of fine to medium sub angular gravel and shell fragments, dark grey brown				-14.28								61		
				Fine SAND with some silt trace of fine to medium sub angular gravel and shell fragments, dark grey black (moderately to highly weathered)				-14.58										
Explanations:				<ul style="list-style-type: none"> Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge Small Disturbed Sample Large Disturbed Sample Scale Penetrometer - blows/100mm Permeability Test U100 Undisturbed Sample In situ Vane Shear Strength (kPa) UTP = Unable to penetrate 														
Remarks				<ul style="list-style-type: none"> N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005 														
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC										

DRILL HOLE LOG																		
Project: Nadi River Basin Drilling Works			Feature		Location: Nadi Back Road Cane Farm		No.: BH 06											
Job No.: 1920815		Start Date: 09-10-2015 Finish Date: 09-10-2015		Ground Level (m): 5.42	Co-Ordinates (): E 1860376.1 N 3911997.5													
Client: JICA Study Team			Hole Depth: 20.00 m				Sheet: 5 of 5											
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests	
				SANDSTONE, dark grey black, weak to very weak														
				Hole Terminated at 20.00 m N = Standard Penetration Test														
				Logged to NZGS 'Field description of soil & rock' December 2005													SPT 20.00 m N=50 ✓ P= 300 kPa	
Explanations:				<ul style="list-style-type: none"> Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge Small Disturbed Sample Large Disturbed Sample Scale Penetrometer - blows/100mm Permeability Test U100 Undisturbed Sample In situ Vane Shear Strength (kPa) UTP = Unable to penetrate 														
Remarks				<ul style="list-style-type: none"> N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005 														
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC										

Borehole 6 Core Photos (0.00m to 20.00m)



0.00m to 3.20m



3.20m to 9.50m



9.50m to 14.70m



14.70m to 17.60m



17.60m to 20.00m

APPENDIX 6c Laboratory Test Schedule and Test Results

Project No.	Slit	Soil Type	Sample Type	Depth (m)	Permeability	Density	Moisture Content	PSD	Lab Tests Required	UCS	Consolidation	Remarks		
1920815.06	Site Six	Gravelly Silt Clayey Silt Sand Sandy Gravel Gravel with trace of sand Gravel Clay Sandy Clay Silty Sand Sandy Gravel Sandy Gravel	SPT	1.00 - 1.5	1	1	1	1	1	1	1			
			SPT	2.00 - 2.5	1	1	1	1	1	1	1	1		
			U	3.50 - 4.00	1	1	1	1	1	1	1	1		
			SPT	5.00 - 5.50	1	1	1	1	1	1	1	1		
			SPT	6.50 - 7.00	1	1	1	1	1	1	1	1		
			SPT	9.50 - 10.00	1	1	1	1	1	1	1	1		
			SPT	12.50 - 13.00	1	1	1	1	1	1	1	1		
			SPT	14.00 - 14.5	1	1	1	1	1	1	1	1		
			SPT	15.50 - 16.00	1	1	1	1	1	1	1	1		
			SPT	18.50 - 19.0	1	1	1	1	1	1	1	1		
			SPT	20.00 - 20.50	1	1	1	1	1	1	1	1		
			TOTALS											
Bill of Quantity														
Lab Test Schedule checked by: DMC														

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Basin Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH02, Navo Nadi Town	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	: Silty, CLAY, minor traces of root fibres, brown, firm, moist, high plasticity.	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N512 (BH02 2.00m - 2.50m)

NATURAL MOISTURE CONTENT						
TEST No.		1	2			Average
Container No.	g	92	95			
Mass of Container	g	91.40	89.87			
Mass of Container + Wet Soil	g	128.64	122.22			
Mass of Container + Dry Soil	g	120.58	115.31			
Mass of Dry Soil	g	29.18	25.44			
Mass of Moisture	g	8.06	6.91			
Moisture Content	%	27.62	27.16			27.39

PLASTIC LIMIT						
TEST No.		1	2			Average
Container No.		38	39			
Mass of Container	g	14.79	14.21			
Mass of Container + Wet Soil	g	20.58	20.46			
Mass of Container + Dry Soil	g	19.00	18.74			
Mass of Dry Soil	g	4.21	4.53			
Mass of Moisture	g	1.58	1.72			
Moisture Content	%	37.53	37.97			37.75

LIQUID LIMIT							
TEST No.		1	2	3	4	5	6
Number of Blows		40	36	30	25	20	15
Container No.		18	19	22	23	24	25
Mass of Container	g	14.60	14.85	14.40	14.73	14.61	14.44
Mass of Container + Wet Soil	g	24.74	23.75	22.98	21.52	21.25	21.31
Mass of Container + Dry Soil	g	20.82	20.30	19.63	18.83	18.57	18.51
Mass of Dry Soil	g	6.22	5.45	5.23	4.10	3.96	4.07
Mass of Moisture	g	3.92	3.45	3.35	2.69	2.68	2.80
Moisture Content	%	63.02	63.30	64.05	65.61	67.68	68.80

LINEAR SHRINKAGE TEST							
Mould No.		1	2	3	4	5	Average
Initial length of Sample					125.00		
Final length of Sample after Shrinkage					101.00		
% Shrinkage					19.20		19.20

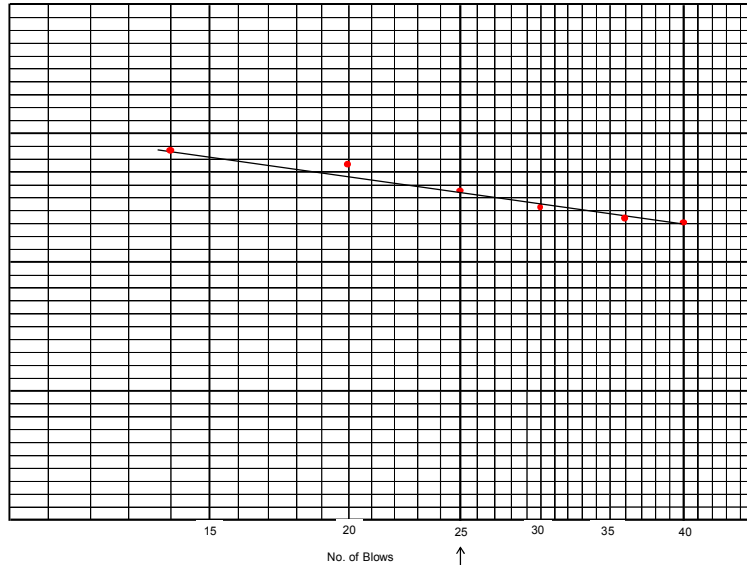
Sample Preparation	
as received	Liquid Limit = 65.30 %
washed/sieved on 425 µm sieve	Plastic Limit = 37.75 %
air dried/oven dried 105°C	Plasticity Index = 27.55 %
after making a paste cured for 12-16 hrs	Shrinkage Limit = 19.20 %

Tested By: RK
Date: 13 October 2015
Form: GE-L-03

Q.A. Checked By: TL
Date: 15 October 2015

Approved By: IG
Date: 18 November 2015

Graph of Moisture Content vs No. of Blows



Project No: 1920815
Sample No: N512

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Basin Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: Site 2, Navo Nadi Town	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: Clayey SILT with traces of fine sand, pale brown, very soft-soft, moist, medium plasticity.	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N514 (BH02 5.00m - 5.50m)

NATURAL MOISTURE CONTENT		1	2				Average
TEST No.							
Container No.	g	65	79				
Mass of Container	g	87.16	87.10				
Mass of Container + Wet Soil	g	113.47	114.14				
Mass of Container + Dry Soil	g	106.02	106.30				
Mass of Dry Soil	g	18.86	19.20				
Mass of Moisture	g	7.45	7.84				
Moisture Content	%	39.50	40.83				40.17

PLASTIC LIMIT		1	2				Average
TEST No.							
Container No.		149	150				
Mass of Container	g	11.75	10.77				
Mass of Container + Wet Soil	g	16.55	14.86				
Mass of Container + Dry Soil	g	15.56	14.01				
Mass of Dry Soil	g	3.81	3.24				
Mass of Moisture	g	0.99	0.85				
Moisture Content	%	25.98	26.23				26.11

LIQUID LIMIT		1	2	3	4	5	6
TEST No.							
Number of Blows		40	35	30	25	20	15
Container No.		151	152	160	159	158	157
Mass of Container	g	12.00	11.50	11.93	12.17	12.13	11.92
Mass of Container + Wet Soil	g	21.99	22.74	26.95	26.12	22.31	22.14
Mass of Container + Dry Soil	g	18.80	19.09	21.91	21.41	18.70	18.36
Mass of Dry Soil	g	6.80	7.59	9.98	9.24	6.57	6.44
Mass of Moisture	g	3.19	3.65	5.04	4.71	3.61	3.78
Moisture Content	%	46.91	48.09	50.50	50.97	54.95	58.70

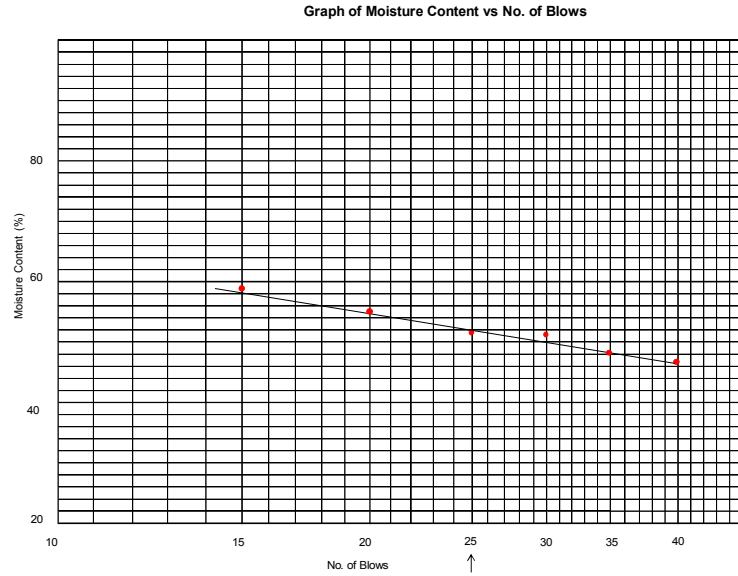
LINEAR SHRINKAGE TEST		1	2	3	4	5	Average
Mould No.							
Initial length of Sample						125.00	
Final length of Sample after Shrinkage						104.00	
% Shrinkage						16.80	16.80

Sample Preparation		
as received	Liquid Limit	52.00 %
washed/sieved on 425 µm sieve	Plastic Limit	26.11 %
air dried/oven dried 105°C	Plasticity Index	25.89 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	16.80 %

Tested By: KB
Date: 15 October 2015

Q.A. Checked By: TL
Date: 16 October 2015

Approved By: IG
Date: 18 November 2015



Project No: 1920815
Sample No: N 514

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Basin Drilling Works	DATE	: 15 October 2015
SITE ADDRESS	: Site 2 Navo, Nadi	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Silty CLAY, red brown mottled grey with iron stain, medium to high plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N518 (BH02 12.50m -13.00m)

NATURAL MOISTURE CONTENT					
TEST No.		1	2		Average
Container No.	g	81	82		
Mass of Container	g	87.45	90.15		
Mass of Container + Wet Soil	g	117.97	117.91		
Mass of Container + Dry Soil	g	110.75	111.71		
Mass of Dry Soil	g	23.30	21.56		
Mass of Moisture	g	7.22	6.20		
Moisture Content	%	30.99	28.76		29.87

PLASTIC LIMIT					
TEST No.		1	2		Average
Container No.		105	106		
Mass of Container	g	11.58	12.04		
Mass of Container + Wet Soil	g	16.03	15.97		
Mass of Container + Dry Soil	g	15.00	15.05		
Mass of Dry Soil	g	3.42	3.01		
Mass of Moisture	g	1.03	0.92		
Moisture Content	%	30.12	30.56		30.34

LIQUID LIMIT							
TEST No.		1	2	3	4	5	6
Number of Blows		40	35	29	25	20	16
Container No.		121	122	123	124	125	126
Mass of Container	g	11.63	11.70	11.60	11.75	11.88	12.83
Mass of Container + Wet Soil	g	24.92	25.60	27.37	28.83	25.49	27.54
Mass of Container + Dry Soil	g	20.89	21.31	22.46	23.44	21.10	22.76
Mass of Dry Soil	g	9.26	9.61	10.86	11.69	9.22	9.93
Mass of Moisture	g	4.03	4.29	4.91	5.39	4.39	4.78
Moisture Content	%	43.52	44.64	45.21	46.11	47.61	48.14

LINEAR SHRINKAGE TEST							
Mould No.		1	2	3	4	5	Average
Initial length of Sample					125.00		
Final length of Sample after Shrinkage					104.00		
% Shrinkage					16.80		16.80

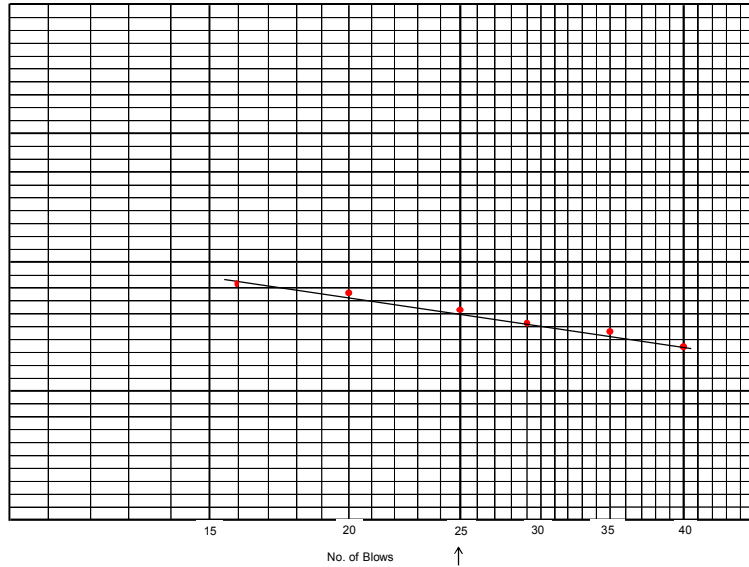
Sample Preparation			
as received		Liquid Limit	46.00 %
washed/sieved on 425 µm sieve		Plastic Limit	30.34 %
air dried/oven dried 105°C		Plasticity Index	15.66 %
after making a paste cured for 12-16 hrs		Shrinkage Limit	16.80 %

Tested By: LN
Date: 15 October 2015

Q.A. Checked By: TL
Date: 16 October 2015

Approved By: IG
Date: 18 November 2015

Graph of Moisture Content vs No. of Blows



Project No: 1920815
Sample No:N518

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE / TESTED :	16 October 2015
SITE ADDRESS :	BH02, Navo, Nadi Town	TECHNOLOGIST :	LN/IG
SAMPLE LOCATION :	BH02 3.50m - 4.00m	MATERIAL TYPE :	Silty, CLAY traces of root fibres, brown, firm, moist, high plasticity.
TEST NUMBER :	N513	SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN	

Moisture Content	Container No.	-	65	79
	Mass of Container	g	87.17	87.13
	Mass of Container + Wet Soil	g	214.36	208.59
	Mass of Container + Dry Soil	g	179.6	175.67
	Mass of Dry Soil	g	92.43	88.54
	Mass of Moisture	g	34.76	32.92
	Moisture Content	%	37.61	37.18
				37.39

Bulk Density	Sample No.	-	N513
	Diameter of Specimen	mm	53.82
	Initial area of specimen A_0 ($\pi/4 d^2$)	mm ²	2273.83
	Initial length of specimen L_0	mm	59.85
	Initial mass of specimen M_i	g	248.77
	Bulk Density ρ	t/m ³	1.83
	Dry Density ρ_d	t/m ³	1.33

Tested by : LN/IG	Q.A. Check by : MK	Approved by : IG
Date : 16 October 2015	Date : 18 October 2015	Date : 18 November 2015

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE / TESTED :	16 October 2015
SITE ADDRESS :	BH02, Navo, Nadi Town	TECHNOLOGIST :	IG/LN/TL
SAMPLE LOCATION :	BH02 6.50m - 7.00m	MATERIAL TYPE :	Clayey organic SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity
TEST NUMBER :	N515		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	89	90	
	Mass of Container	g	121.44	118.14	
	Mass of Container + Wet Soil	g	210.63	216.78	
	Mass of Container + Dry Soil	g	179.79	182.77	
	Mass of Dry Soil	g	58.35	64.63	
	Mass of Moisture	g	30.84	34.01	
	Moisture Content	%	52.85	52.62	52.74

Bulk Density	Sample No.	-	N515
	Diameter of Specimen	mm	53.05
	Initial area of specimen A_0 ($\pi/4 d^2$)	mm ²	2209.23
	Initial length of specimen L_0	mm	52.69
	Initial mass of specimen M_i	g	189.23
	Bulk Density ρ	t/m ³	1.63
	Dry Density ρ_d	t/m ³	1.06

Tested by : IG/LN/TL	Q.A. Check by : MK	Approved by : IG
Date : 16 October 2015	Date : 18 October 2015	Date : 18 November 2015


PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE / TESTED :	16 October 2015
SITE ADDRESS :	BH02, Navo, Nadi Town	TECHNOLOGIST :	IG/TL
SAMPLE LOCATION :	BH02 9.50m -10.00m	MATERIAL TYPE :	Clayey organic SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity
TEST NUMBER :	N516		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	70	77	
	Mass of Container	g	90.08	91.32	
	Mass of Container + Wet Soil	g	195.82	196.13	
	Mass of Container + Dry Soil	g	166.00	165.95	
	Mass of Dry Soil	g	75.92	74.63	
	Mass of Moisture	g	29.82	30.18	
	Moisture Content	%	39.28	40.44	39.86

Bulk Density	Sample No.	-	N516
	Diameter of Specimen	mm	53.43
	Initial area of specimen A_0 ($\pi/4 d^2$)	mm ²	2240.99
	Initial length of specimen L_0	mm	56.34
	Initial mass of specimen M_i	g	210.20
	Bulk Density ρ	t/m ³	1.66
	Dry Density ρ_d	t/m ³	1.19

Tested by : IG/TL	Q.A. Check by : MK	Approved by : IG
Date : 16 October 2015	Date : 18 October 2015	Date : 18 November 2015

Oedometer Settlement Test


Sample Details	 <p style="font-size: small; text-align: center;">sketch showing specimen location in original sample</p>	Depth Description Type	3.50m - 3.76m Sample 1 of 3 from Borehole B2 Default
	Initial Height Initial Diameter Initial Weight Bulk Density Particle Density	L ₀ D ₀ W ₀ ρ ₀ ρ _s	(mm) 20.0 (mm) 50.0 (gr) 66.4 (Mg/m ³) 1.69 (Mg/m ³) 2.65

Initial Conditions			
Settlement Input	L _{IP}	(mm)	CH 3
Initial Moisture	ω _i %	(%)	39
Initial Dry Density	ρ _{di}	(Mg/m ³)	1.22
Initial Voids Ratio	e _i	.	1.180
Initial Degree of Saturation	S _i	(%)	87.8
Initial Swelling	S _s	(kPa)	0

Final Conditions			
Final Moisture	ω _f %	(%)	0.00
Dry Density	ρ _{df}	(Mg/m ³)	1.30
Voids Ratio	e _f	.	1.035
Saturation	S _f	(%)	0
Height Settlement	ΔL _s	(mm)	1.325

Vertical Stress σ' _i (kPa)	Voids Ratio e _f	Height ΔL _s (mm)	Consolidation C _v (m ² /year)	Compressibility m _v (m ² /MN)	Initial T _i (°C)	Final T _f (°C)	t ₅₀ Time t ₅₀ (min)	t ₉₀ Time t ₉₀ (min)	Secondary C _{SEC} (m ² /MN)
30	1.133	0.433	3.2	0.722	27.0	0.0	3,171		0.0087
60	1.118	0.564	3.1	0.223	27.0	0.0	3,171		0.0087
120	1.090	0.826	3.1	0.225	27.0	0.0	3,171		0.0087
240	1.035	1.325	2.9	0.217	27.0	0.0	3,171		0.0087
480	0.993	1.715	2.8	0.087	27.0	0.0	3,171		0.0087
120	1.010	1.555			27.0	0.0			
30	1.035	1.325			27.0	0.0			

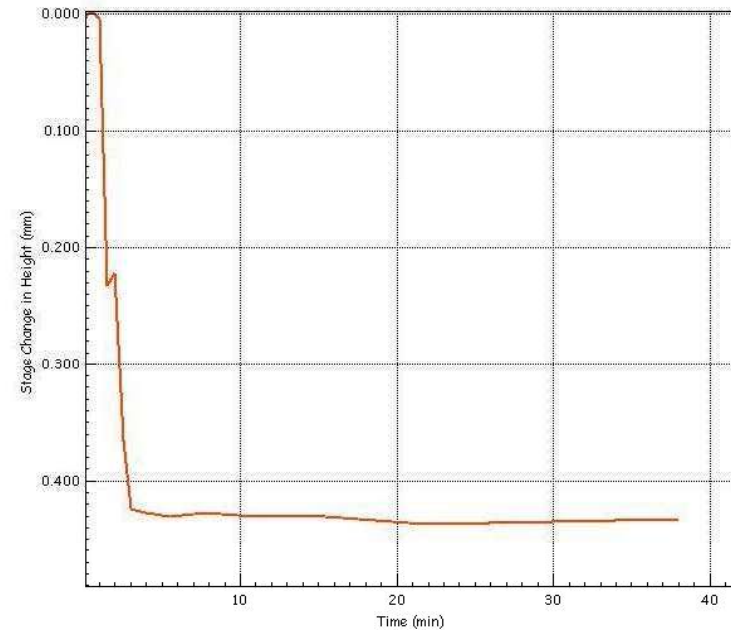
Notes


	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-01
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering Investigation	Test Date	10/27/2015
	Client	Japan International Cooperation Agency	Sample	N513
	Operator	IG/MK	Borehole	BH02
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Oedometer Consolidation Settlement Report

Vertical Stress	σ' _i	(kPa)	30
Initial Temperature	T _i	(°C)	27.0
Frame Correction	L _{CORR}	(mm)	0.000
Height Settlement	ΔL _s	(mm)	0.433
Voids Ratio	e _f	.	1.133
Final Temperature	T _f	(°C)	0.0
t ₅₀ Time	t ₅₀	(min)	3,171
t ₉₀ Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	3.2
Compressibility	m _v	(m ² /MN)	0.722
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087

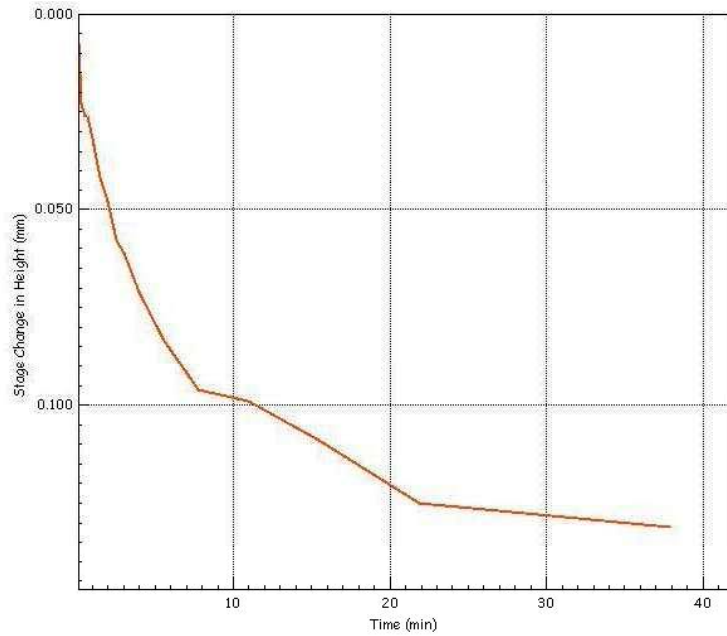


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	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering Investigation	Test Date	10/27/2015
	Client	Japan International Cooperation Agency	Sample	N513
	Operator	IG/MK	Borehole	BH02
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

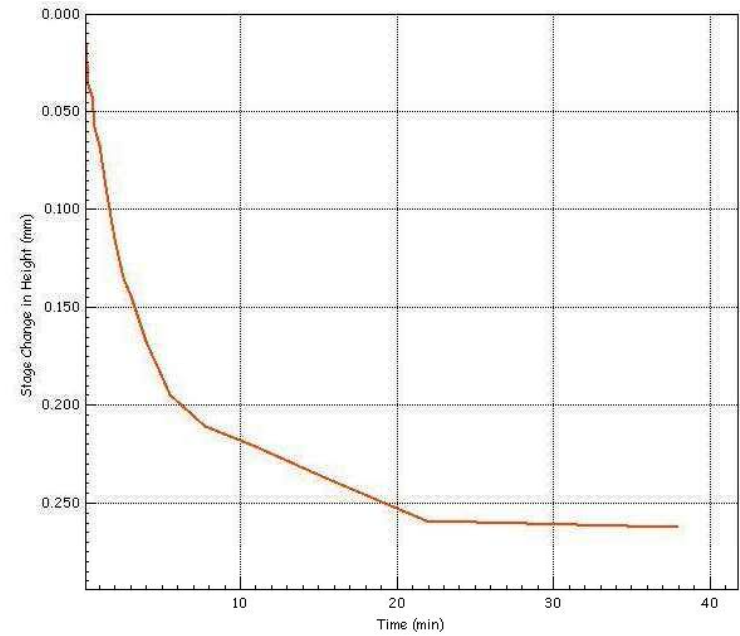
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i_1}	(kPa)	60
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	0.564
Void Ratio	e_f	.	1.118
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	3.1
Compressibility	m _v	(m ² /MN)	0.223
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i_1}	(kPa)	120
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	0.826
Void Ratio	e_f	.	1.090
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	3.1
Compressibility	m _v	(m ² /MN)	0.225
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289,6.6,1-1998	Test Name	ODO-01	
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	Site Reference	1920815	Test Date	10/27/2015	
	Jobfile	Geotechnical Engineering Investigation	Sample	N513	
	Client	Japan International Cooperation Agency	Borehole	BH02	
	Operator	IG/MK	Checked	DMC	Approved

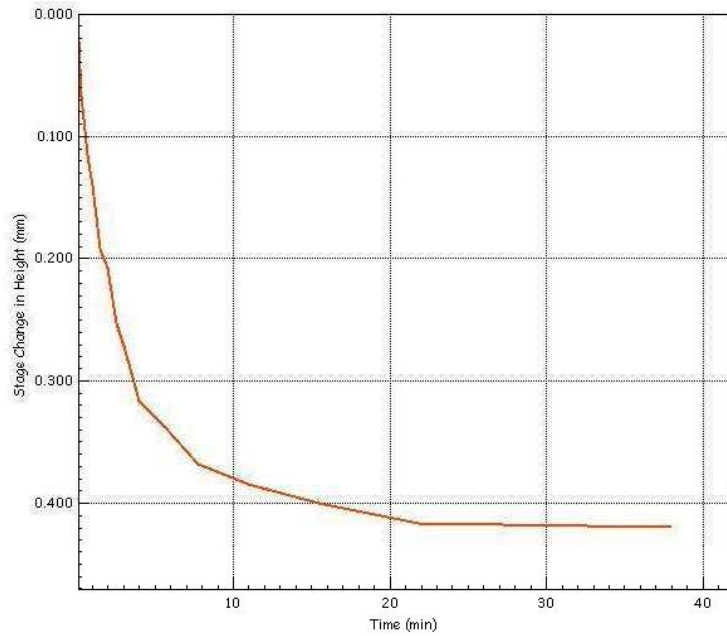
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

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	Site Reference	1920815	Test Date	10/27/2015	
	Jobfile	Geotechnical Engineering Investigation	Sample	N513	
	Client	Japan International Cooperation Agency	Borehole	BH02	
	Operator	IG/MK	Checked	DMC	Approved

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

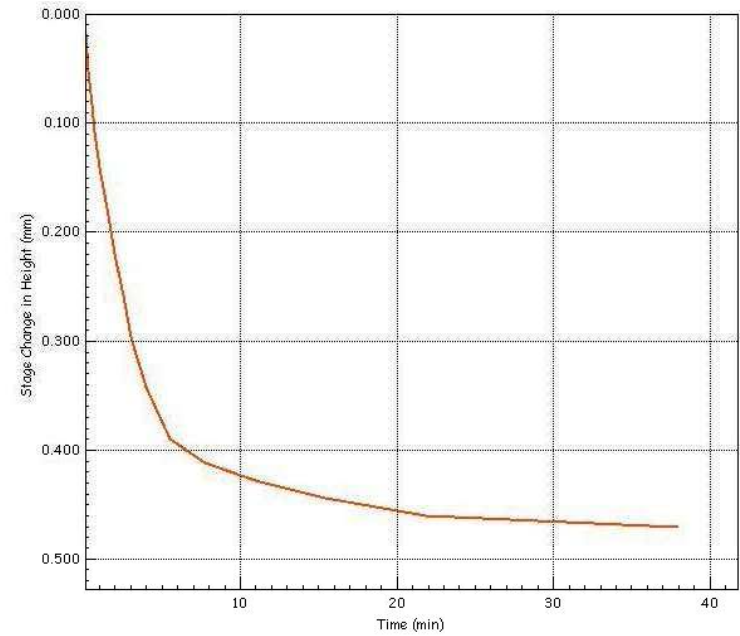
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i_1}	(kPa)	240
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.325
Void Ratio	e_f	.	1.035
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	2.9
Compressibility	m _v	(m ² /MN)	0.217
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i_1}	(kPa)	480
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.715
Void Ratio	e_f	.	0.993
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	2.8
Compressibility	m _v	(m ² /MN)	0.086
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289,6.6,1-1998	Test Name	ODO-01	
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	Site Reference	1920815	Test Date	10/27/2015	
	Jobfile	Geotechnical Engineering Investigation	Sample	N513	
	Client	Japan International Cooperation Agency	Borehole	BH02	
	Operator	IG/MK	Checked	DMC	Approved

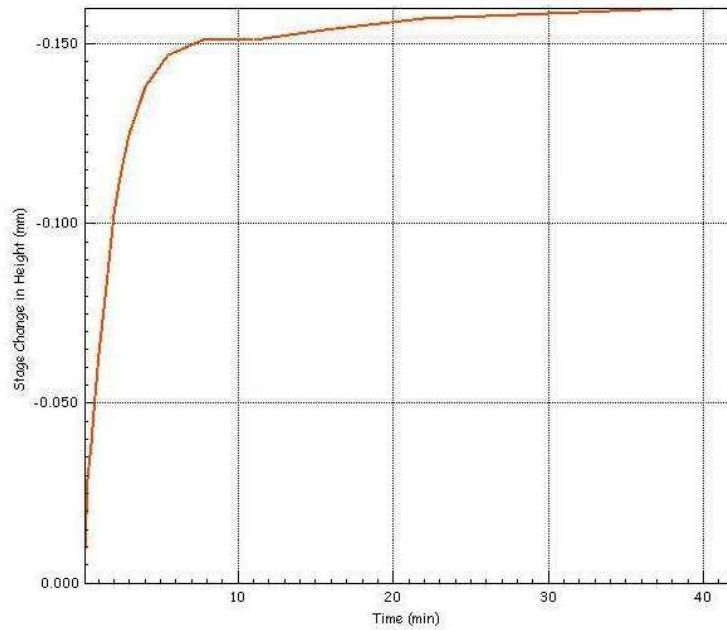
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289,6.6,1-1998	Test Name	ODO-01	
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	Site Reference	1920815	Test Date	10/27/2015	
	Jobfile	Geotechnical Engineering Investigation	Sample	N513	
	Client	Japan International Cooperation Agency	Borehole	BH02	
	Operator	IG/MK	Checked	DMC	Approved

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

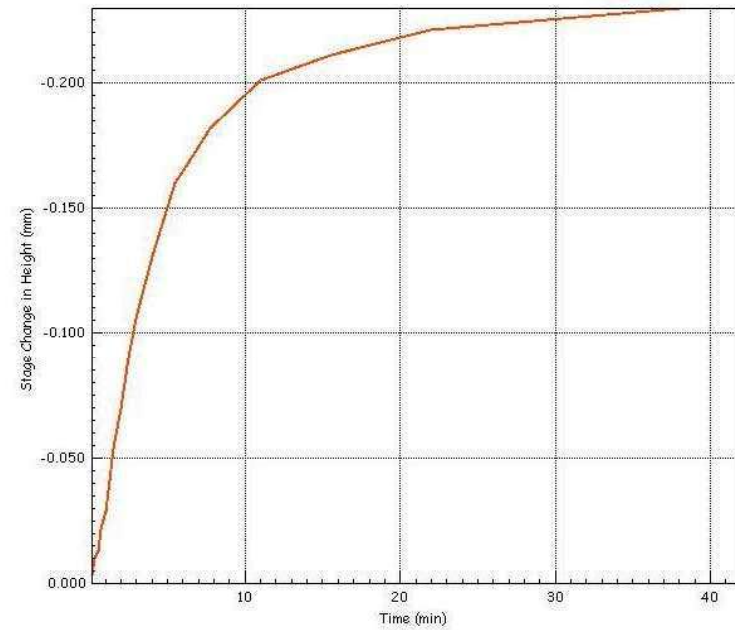
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i_1}	(kPa)	120
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.555
Voids Ratio	e_f	.	1.010
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	
Compressibility	m _v	(m ² /MN)	
Secondary Compression	C _{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i_1}	(kPa)	30
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.325
Voids Ratio	e_f	.	1.035
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	
Compressibility	m _v	(m ² /MN)	
Secondary Compression	C _{SEC}	(m ² /MN)	



	Test Method	AS 1289,6,6,1-1998	Test Name	ODO-01	
			Database:	.\SQLEXPRESS \ ENTEC	
	Site Reference	1920815	Test Date	10/27/2015	
	Jobfile	Geotechnical Engineering Investigation	Sample	N513	
	Client	Japan International Cooperation Agency	Borehole	BH02	
	Operator	IG/MK	Checked	DMC	Approved

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

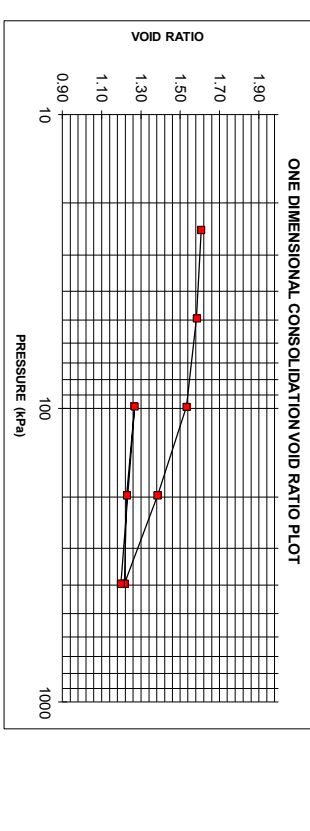
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	Jobfile	Geotechnical Engineering Investigation	Sample	N513	
	Client	Japan International Cooperation Agency	Borehole	BH02	
	Operator	IG/MK	Checked	DMC	Approved

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Project Name: Geotechnical Engineering Investigation for Nadi River
Client Name: Basin Drilling Works
Job No.: Japan International Cooperation Agency (JICA) 1920815
Site Address: Navo, Nadi
Sample Location: BH 02

Sample No.: N 515
Depth: 6.50m-7.0m
Tested By: IG
Date Tested: 27 October 2015

Sample Description: Clayey SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity
Sample History: Undisturbed / Remoulded + Compacted + Stirred + Heave
Date Sample Collected: 08/10/15
Loading Cycle: 24 hrs 0 mins
Temperature: Max: 27°C Min: 25°C
Diameter of ring (D): 44.96 mm
Height of ring: 23.8 mm
Area of ring (A): 1587.61 mm²
Solid density of soil particles (Q_s): 2.65 t/m³ (Measured + Assumed)
Method used: Square root of time fitting method



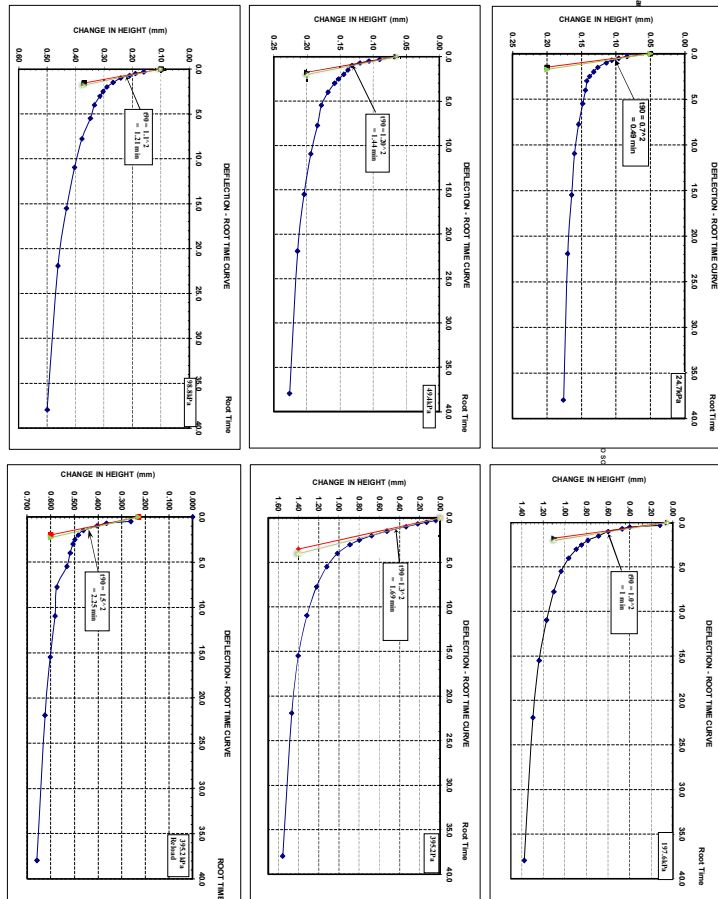
Measured thickness of specimen, H	mm	Initial	Final
Mass of ring + watch glass + wet specimen	g	23.8	19.96
Mass of ring + watch glass + dry specimen	g	265.81	261.13
Mass of ring	g	244.29	
Mass of watch glass	g	206.07	
Mass of dry specimen	g	0	38.22
Mass of water	g	M _s -M _d	16.84
Water content, w	%	W _f	44.06
Dry density, Q _d	t/m ³	Q _{dl}	1.21
Height of soil particles, H _s	mm		9.08
Void ratio, e		e _i	1.20
Degrees of saturation, S		S _i	97.55

Applied Pressure (kPa)	Incremental deflection (ΔH) (mm)	Thickness of specimen (mm)	% Change in thickness	Height of voids (mm)	Void ratio	Coefficient of consolidation C _v (m ² /yr)	Coefficient of compressibility M _v (m ² /MN)
24.7	0.122	23.678	0.005	14.59	1.61	127.00	
49.4	0.328	23.472	0.014	14.39	1.58	42.47	0.56
98.8	0.804	22.996	0.035	13.91	1.53	48.57	0.68
197.6	2.148	21.652	0.099	12.57	1.38	52.04	0.91
395.2	3.668	20.132	0.182	11.05	1.22	26.62	0.78
197.6	3.562	20.238	0.176	11.15	1.23	0.00	-0.76
98.6	3.206	20.594	0.156	11.51	1.27	0.00	-1.36
395.2	3.842	19.968	0.193	10.87	1.20	19.65	0.54
0	0.00	23.800	0.000	14.72	1.62	0.00	


Tested by: IG Date: 27 October 2015
 Q.A. Check By: MK Date: 27 October 2015
 Approved By: IG Date: 18 November 2015
 Page 1 of 4

Loading Date & Time	27/10/2015 @ 09:33hrs			28/10/2015 @ 09:39hrs			29/10/2015 @ 09:41hrs			30/10/2015 @ 10:46hrs			31/10/2015 @ 10:50hrs			01/11/2015 @ 10:53hrs				
	Hanger Load			Effective Pressure			Time Elapsed			Time Elapsed			Time Elapsed			Time Elapsed				
	Time	min	sec	Clock	Dial	H	Clock	Dial	H	Clock	Dial	H	Clock	Dial	H	Clock	Dial	H		
400g	24.7kPa	0	09:33:00	2251	0.084	09:39:06	2163	0.090	09:41:06	2050	0.160	10:46:06	1740	0.120	10:50:06	1090	0.042	11:53:06	353	0.040
800g	49.4kPa	6	09:33:06	2209	0.096	09:39:15	2110	0.106	09:41:15	1955	0.190	10:46:15	1600	0.400	10:50:15	1045	0.132	11:53:15	357	0.048
1600g	98.8kPa	15	09:33:15	2188	0.106	09:39:30	2103	0.120	09:41:30	1945	0.210	10:46:30	1565	0.470	10:50:30	1000	0.222	11:53:30	362	0.058
3200g	197.6kPa	30	09:33:30	2194	0.114	09:40:00	2097	0.132	09:42:00	1929	0.242	10:47:00	1500	0.600	10:51:00	942	0.338	11:54:00	366	0.066
6400g	395.2kPa	1	09:34:00	2188	0.126	09:41:15	2094	0.138	09:43:15	1916	0.268	10:48:15	1456	0.688	10:52:15	849	0.524	11:55:15	371	0.076
3200g	197.6kPa	4	09:37:00	2185	0.132	09:43:00	2091	0.144	09:45:00	1905	0.290	10:50:00	1407	0.786	10:54:00	773	0.676	11:57:00	373	0.080
6400g	395.2kPa	6	09:39:15	2182	0.138	09:45:15	2087	0.152	09:47:15	1898	0.304	10:52:15	1377	0.846	10:56:15	712	0.798	11:59:15	375	0.084
3200g	197.6kPa	9	09:42:00	2180	0.142	09:48:00	2084	0.158	09:50:00	1893	0.314	10:55:00	1353	0.894	10:59:00	666	0.890	12:02:00	376	0.086
6400g	395.2kPa	16	09:49:00	2179	0.144	09:55:00	2079	0.168	09:57:00	1883	0.334	11:02:00	1318	0.964	11:06:00	604	1.014	12:09:00	377	0.088
3200g	197.6kPa	30	10:03:00	2177	0.148	10:09:00	2074	0.178	10:11:00	1876	0.348	11:16:00	1283	1.034	11:20:00	551	1.120	12:23:00	378	0.090
6400g	395.2kPa	1	10:33:00	2174	0.154	10:39:00	2071	0.184	10:41:00	1861	0.378	11:46:00	1249	1.102	11:50:00	500	1.222	12:53:00	380	0.094
3200g	197.6kPa	2	11:33:00	2171	0.160	11:39:00	2066	0.194	11:41:00	1848	0.404	12:46:00	1216	1.168	12:50:00	453	1.316	13:53:00	382	0.098
6400g	395.2kPa	4	13:33:00	2169	0.164	13:39:00	2061	0.204	13:41:00	1834	0.432	14:46:00	1181	1.238	14:50:00	410	1.402	15:53:00	383	0.100
3200g	197.6kPa	8	17:33:00	2166	0.170	17:39:00	2056	0.214	17:41:00	1819	0.462	18:46:00	1152	1.296	18:50:00	378	1.466	19:53:00	386	0.106
6400g	395.2kPa	24	09:33:00	2163	0.176	09:39:00	2050	0.226	09:41:00	1800	0.500	10:46:00	1111	1.378	10:50:00	333	1.556	11:53:00	388	0.110
UNLOADING																				
Machine Correction			0.054			0.020			0.024			0.034			0.036			0.004		
Δ H (Corrected)			0.122			0.206			0.476			1.344			1.520			0.106		
Net Total Settlement			0.122			0.328			0.804			2.148			3.668			3.562		

Loading Date and Time				02/11/2015 @ 11:54hrs			03/11/2015 @ 11:56hrs			N 515								
Hanger Load				1600g			6400g			6.50m-7.0m								
Effective Pressure				98.8kPa			395.2kPa											
Time Elapsed				Clock	Dial	H	Clock	Dial	H	Clock	Dial	H	Clock	Dial	H	Clock	Dial	H
hrs	min	sec	mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm	△Time/4	Gauge	x10 mm
	0	0	0	11:54	388	0.000	11:56	571	0.000									
	6	dark grey, very soft		11:54:06	390	0.004	11:56:06	500	0.142									
	15	0.250	0.500	11:54:15	407	0.038	11:56:15	440	0.262									
	30	0.500	0.707	11:54:30	413	0.050	11:56:30	389	0.364									
1		1.000	1.000	11:55:00	419	0.062	11:57:00	369	0.404									
2	15	2.250	1.500	11:56:15	428	0.080	11:58:15	340	0.462									
4		4.000	2.000	11:58:00	433	0.090	12:00:00	329	0.484									
6	15	6.250	2.500	12:00:15	436	0.096	12:02:15	322	0.498									
9		9.000	3.000	12:03:00	440	0.104	12:05:00	318	0.506									
16		16.00	4.000	12:10:00	443	0.110	12:12:00	312	0.518									
30		30.00	5.480	12:24:00	446	0.116	12:26:00	305	0.532									
1		60.00	7.750	12:54:00	450	0.124	12:56:00	284	0.574									
2		120.0	10.950	13:54:00	454	0.132	13:56:00	280	0.582									
4		240.0	15.49	15:54:00	559	0.342	15:56:00	270	0.602									
8		480.0	21.91	19:54:00	564	0.352	19:56:00	259	0.624									
24		1440	37.95	11:54:00	571	0.366	11:56:00	242	0.658									
				UNLOADING			RELOADING											
Machine Correction				0.01			0.022											
Δ H (Corrected)				0.356			0.636											
Net Total Settlement				3.206			3.842											



Oedometer Settlement Test


Sample Details  <i>sketch showing specimen location in original sample</i>	Depth	9.50m - 10.00m		
	Description Type	Sample 3 of 3 from Borehole B2 Silty CLAY with trace of organic		
Initial Height	L ₀	(mm)	18.7	
Initial Diameter	D ₀	(mm)	49.9	
Initial Weight	W ₀	(gf)	57.9	
Bulk Density	ρ ₀	(Mg/m ³)	1.58	
Particle Density	ρ _s	(Mg/m ³)	2.65	

Initial Conditions			
Settlement Input	L _{1P}	(mm)	CH 3
Initial Moisture	ω _i %	(%)	40
Initial Dry Density	ρ _{di}	(Mg/m ³)	1.13
Initial Voids Ratio	e _i	.	1.343
Initial Degree of Saturation	S _i	(%)	78.9
Initial Swelling	S _s	(kPa)	0

Final Conditions			
Final Moisture	ω _f %	(%)	32
Dry Density	ρ _{df}	(Mg/m ³)	1.45
Voids Ratio	e _f	.	0.824
Saturation	S _f	(%)	100
Height Settlement	ΔL _s	(mm)	4.138

Vertical Stress σ' _i (kPa)	Voids Ratio e _f	Height ΔL _s (mm)	Consolidation C _v (m ² /year)	Compressibility m _v (m ² /MN)	Initial T _i (°C)	Final T _f (°C)	t ₅₀ Time t ₅₀ (min)	t ₉₀ Time t ₉₀ (min)	Secondary C _{SEC} (m ² /MN)
40	1.129	1.707	2.6	2.282	27.0	29.0	3.171		0.0087
100	0.999	2.742	2.2	1.015	27.0	29.0	3.171		0.0087
200	0.879	3.700	2.0	0.600	27.0	29.0	3.171		0.0087
450	0.731	4.884	1.7	0.316	27.0	29.0	3.171		0.0087
200	0.756	4.684			27.0	0.0			
100	0.783	4.468			27.0	0.0			
40	0.824	4.138			27.0	0.0			

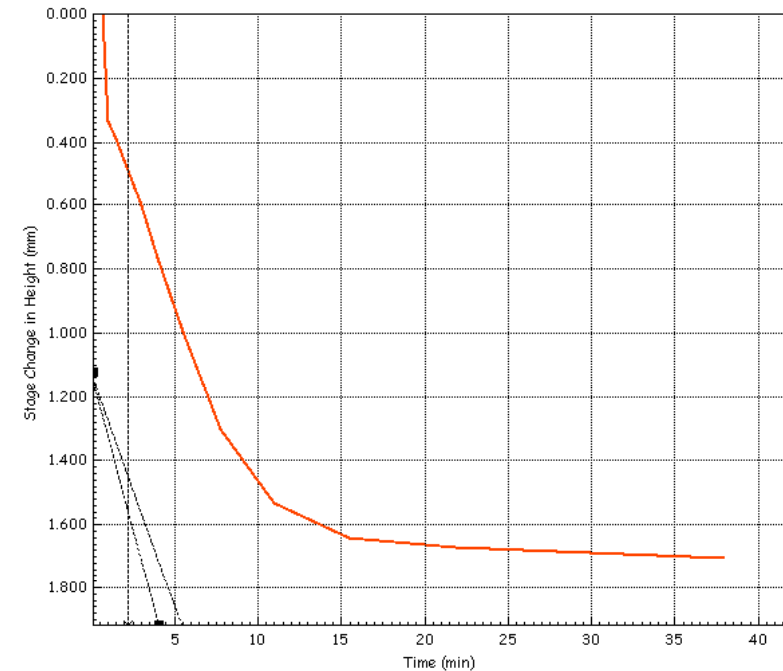
Notes


	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Oedometer Consolidation Settlement Report

Vertical Stress	σ' _i	(kPa)	40
Initial Temperature	T _i	(°C)	27.0
Frame Correction	L _{CORR}	(mm)	0.000
Height Settlement	ΔL _s	(mm)	1.707
Voids Ratio	e _f	.	1.129
Final Temperature	T _f	(°C)	29.0
t ₅₀ Time	t ₅₀	(min)	3.171
t ₉₀ Time	t ₉₀	(min)	
Consolidation	C _v	(m ² /year)	2.6
Compressibility	m _v	(m ² /MN)	2.282
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087

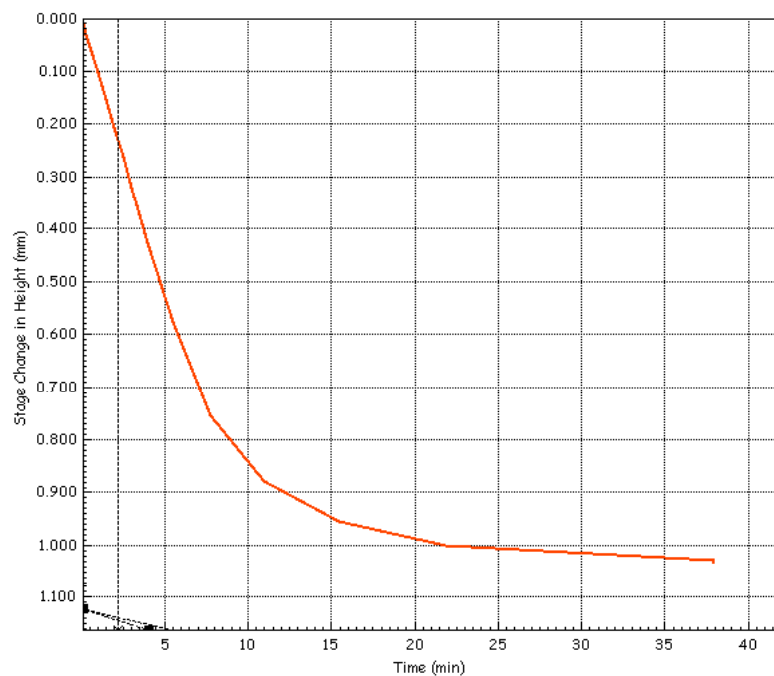


	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

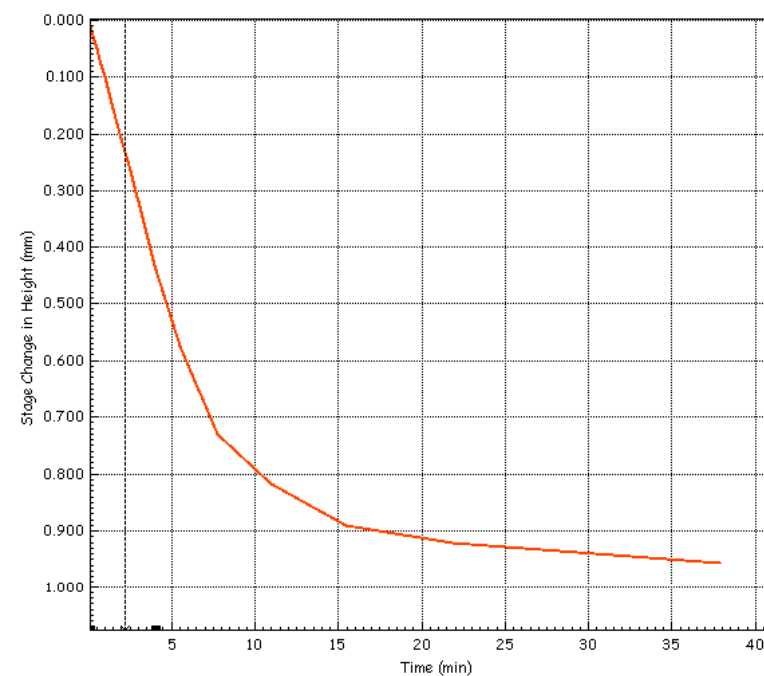
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	100
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.742
Voids Ratio	e_f	.	0.999
Final Temperature	T_f	(oC)	29.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	2.2
Compressibility	m_v	(m ² /MN)	1.015
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	200
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.700
Voids Ratio	e_f	.	0.879
Final Temperature	T_f	(oC)	29.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	2.0
Compressibility	m_v	(m ² /MN)	0.600
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
Checked	DMC	Approved	DMC	

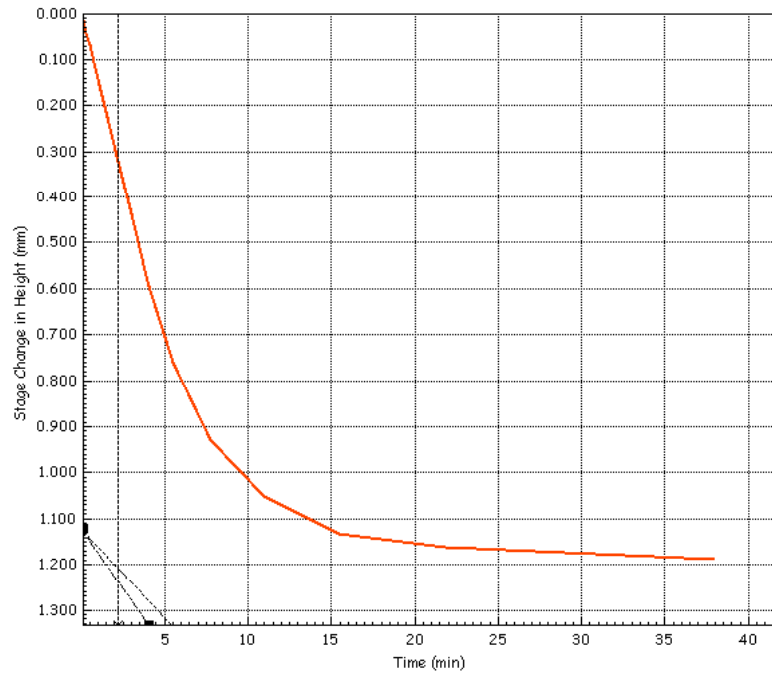
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

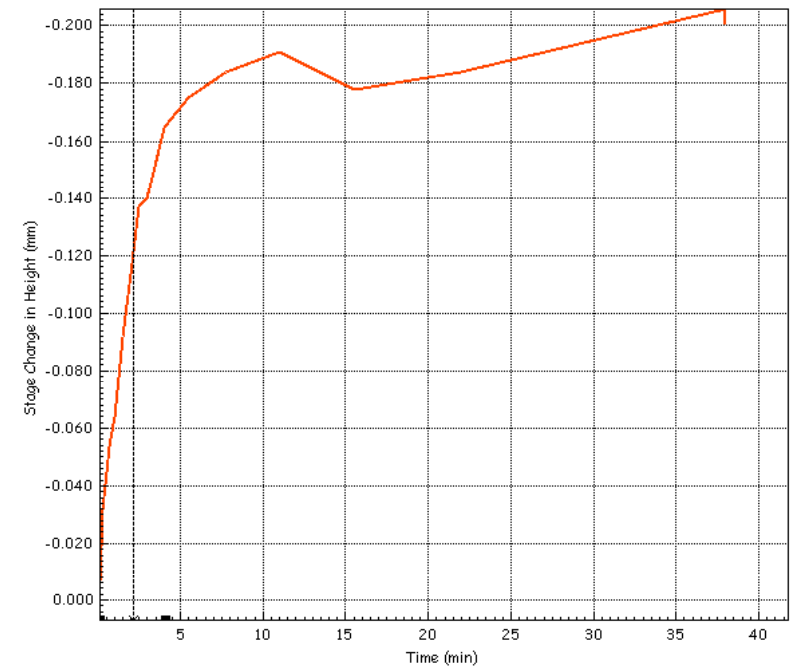
Oedometer Consolidation Settlement Report


Vertical Stress	σ'_{i}	(kPa)	450
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	4.884
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	29.0
t50 Time	t ₅₀	(min)	3.171
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	1.7
Compressibility	m_v	(m ² /MN)	0.316
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087




Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	200
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	4.684
Voids Ratio	e_f	.	0.756
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
	Checked	DMC	Approved	DMC

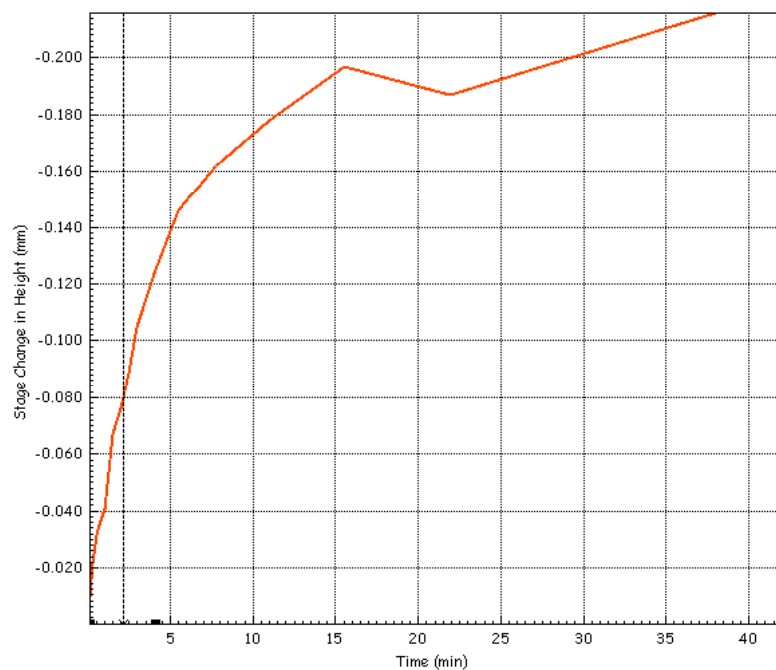
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

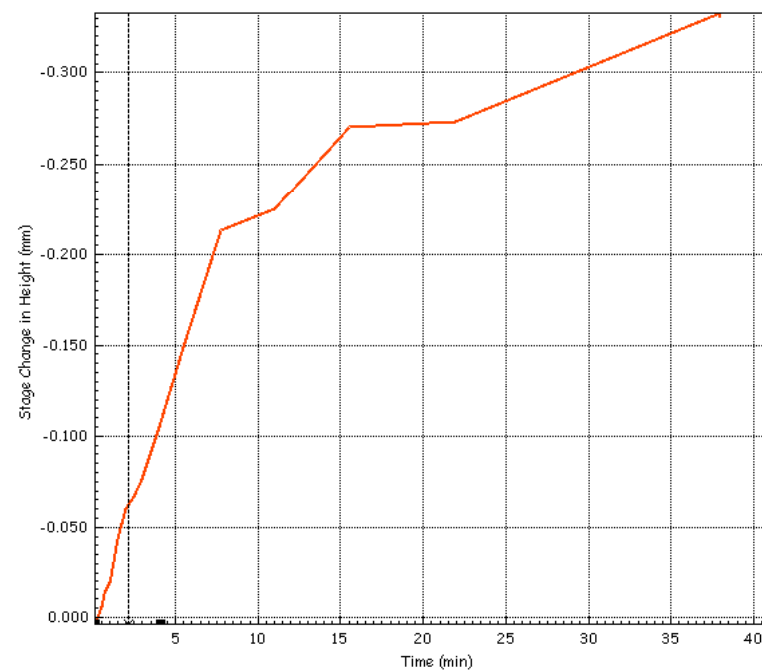
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	100
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	4.468
Voids Ratio	e_f	.	0.783
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	40
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	4.138
Voids Ratio	e_f	.	0.824
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-02
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/3/2015
	Client	Japan International Cooperation	Sample	N516
	Operator	IG/MK	Borehole	BH02
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Basin Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Gravel, SILT traces of clay, soft, moist, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N511 BH02 1.00m - 1.50m

Moisture Content	%					
Container No.	g	40	45			
Mass of Container	g	14.53	14.43			
Mass of Container + Wet Soil	g	21.09	23.38			
Mass of Container + Dry Soil	g	19.52	21.20			
Mass of Dry Soil	g	4.99	6.77			
Mass of Moisture	g	1.57	2.18			
Moisture Content	%	31.46	32.20			31.83

 Tested By:LN
 Date: 13 October 2015

 Q.A. Checked By: TL
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 10 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Silty, CLAY traces of root fibres, brown, firm, moist, high plasticity.	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N 513 BH02 3.50m - 4.00m

Moisture Content	%					
Container No.	g	10	6			
Mass of Container	g	52.26	53.09			
Mass of Container + Wet Soil	g	109.91	119.98			
Mass of Container + Dry Soil	g	93.83	101.23			
Mass of Dry Soil	g	41.57	48.14			
Mass of Moisture	g	16.08	18.75			
Moisture Content	%	38.68	38.95			38.82

 Tested By:IG
 Date:10 October 2015

 Q.A. Checked By: LN
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Clayey SILT with traces of fine sand, pale brown, very soft-soft, moist, medium plasticity.	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N 514 BH02 5.00m - 5.50m

Moisture Content	%					
Container No.	g	46	34			
Mass of Container	g	14.71	14.89			
Mass of Container + Wet Soil	g	29.25	27.35			
Mass of Container + Dry Soil	g	25.11	23.78			
Mass of Dry Soil	g	10.40	8.89			
Mass of Moisture	g	4.14	3.57			
Moisture Content	%	39.81	40.16			39.98

Tested By:LN
Date: 13 October 2015

Q.A. Checked By: TL
Date:15 October 2015

Approved By: IG
Date:18 November 2015

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 10 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: IG
MATERIAL TYPE & DESCRIPTION	: Clayey SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N 515 BH02 6.50m - 7.00m

Moisture Content	%					
Container No.	g	5	7			
Mass of Container	g	53.34	52.76			
Mass of Container + Wet Soil	g	87.27	90.12			
Mass of Container + Dry Soil	g	74.50	76.35			
Mass of Dry Soil	g	21.16	23.59			
Mass of Moisture	g	12.77	13.77			
Moisture Content	%	60.35	58.37			59.36

Tested By:IG
Date:10 October 2015

Q.A. Checked By: LN
Date:15 October 2015

Approved By: IG
Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 10 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: IG
MATERIAL TYPE & DESCRIPTION	: Clayey organic SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N 516 BH02 9.50m - 10.00m

Moisture Content		%	
Container No.	g	4	11
Mass of Container	g	52.62	52.76
Mass of Container + Wet Soil	g	114.83	120.33
Mass of Container + Dry Soil	g	97.01	101.23
Mass of Dry Soil	g	44.39	48.47
Mass of Moisture	g	17.82	19.10
Moisture Content	%	40.14	39.41
			39.77

 Tested By:IG
 Date:10 October 2015

 Q.A. Checked By: LN
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Silty CLAY, red brown, mottled grey, medium to high plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N517 BH02 11.00m - 11.50m

Moisture Content		%	
Container No.	g	31	43
Mass of Container	g	14.52	14.86
Mass of Container + Wet Soil	g	22.23	22.91
Mass of Container + Dry Soil	g	20.38	20.96
Mass of Dry Soil	g	5.86	6.10
Mass of Moisture	g	1.85	1.95
Moisture Content	%	31.57	31.97
			31.77

 Tested By:LN
 Date: 13 October 2015

 Q.A. Checked By: TL
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	Silty CLAY, red brown mottled : grey with iron stain, medium to high plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N518 BH02 12.50 - 13.00m

Moisture Content	%					
Container No.	g	32	33			
Mass of Container	g	14.53	14.46			
Mass of Container + Wet Soil	g	26.90	26.94			
Mass of Container + Dry Soil	g	23.65	23.71			
Mass of Dry Soil	g	9.12	9.25			
Mass of Moisture	g	3.25	3.23			
Moisture Content	%	35.64	34.92			35.28

 Tested By:LN
 Date: 13 October 2015

 Q.A. Checked By: TL
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	Clayey fine to medium SAND : with trace of some gravel, brown black	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N519 BH02 14.00m - 14.50m

Moisture Content	%					
Container No.	g	51	52			
Mass of Container	g	3.56	3.54			
Mass of Container + Wet Soil	g	16.29	14.43			
Mass of Container + Dry Soil	g	13.74	12.26			
Mass of Dry Soil	g	10.18	8.72			
Mass of Moisture	g	2.55	2.17			
Moisture Content	%	25.05	24.89			24.97

 Tested By:LN
 Date: 13 October 2015

 Q.A. Checked By: TL
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	Highly to completely weathered conglomerate, extremely weak to very weak, brown (silty fine to medium sand with some fine to medium gravel, subangular)	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N520 BH02 15.50 - 16.00m

Moisture Content		%	
Container No.	g	49	53
Mass of Container	g	3.62	3.52
Mass of Container + Wet Soil	g	14.66	15.88
Mass of Container + Dry Soil	g	12.85	13.84
Mass of Dry Soil	g	9.23	10.32
Mass of Moisture	g	1.81	2.04
Moisture Content	%	19.61	19.77

 Tested By:LN
 Date: 13 October 2015

 Q.A. Checked By: TL
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Investigation for Nadi River Project Drilling Works	DATE	: 13 October 2015
SITE ADDRESS	: BH 02, Navo Nadi Town	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	Fine to medium SANDSTONE : with trace of gravel, grey green, weak to very weak	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N521 BH02 18.50m - 19.00m

Moisture Content		%	
Container No.	g	50	54
Mass of Container	g	3.61	3.55
Mass of Container + Wet Soil	g	15.20	13.36
Mass of Container + Dry Soil	g	13.57	11.90
Mass of Dry Soil	g	9.96	8.35
Mass of Moisture	g	1.63	1.46
Moisture Content	%	16.37	17.49

 Tested By:LN
 Date: 13 October 2015

 Q.A. Checked By: TL
 Date:15 October 2015

 Approved By: IG
 Date:18 November 2015

**Determination of Permeability of a Soil
Constant Head Method for Remoulded Sample**

PRINCIPAL : Japan International Cooperation Agency (JICA)	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Investigation for Nadi River Basin Drilling Works	DATE : 15 October 2015
SITE ADDRESS : BH02, Navo Nadi Town	TECHNOLOGIST : IG
MATERIAL TYPE & DESCRIPTION : Highly to completely weathered conglomerate, extremely weak to very weak, brown (silty fine to medium sand with some fine to medium gravel, subangular)	TEST METHOD : AS 1289.6.7.3-2001
	SAMPLE No. : N520 (BH02 15.50m - 16.00m)

Total Weight : -
Weight Retained on 19mm : -
Percentage retained : -

MOISTURE CONTENT

Container No.		14
Mass of Container	g	53.55
Mass of Container + Wet	g	89.42
Mass of Container + Dry	g	84.14
Mass of Dry Soil	g	30.59
Mass of Moisture	g	5.28
Moisture Content	%	17.26
Optimum moisture content	%	-
Laboratory moisture ratio	%	-

DENSITY

Mass of Specimen	g	1550
Volume of Specimen	cm ³	869.59
Wet Density	t/m ³	1.78
Dry Density	t/m ³	1.52
Maximum Dry Density	t/m ³	-
Laboratory Density ratio	%	-

Area of stand pipe (dia. 12mm)	mm ²	113.10
Cross sectional area of soil	cm ²	50.27
Length of soil specimen	cm	17.30

TEST #	Constant Head h (cm)	Elapsed Time (t)min	Out Flow Volume Q (cm ³)	Water temp T(°C)	KT cm/min	K ₂₀ cm/min
1	120	5.00	22	26	0.013	0.011
2	120	5.00	21	26	0.012	0.011
3	120	5.00	20	26	0.011	0.010
4	110	5.00	15	26	0.009	0.008
5	110	5.00	14	26	0.009	0.008
6	110	5.00	14	26	0.009	0.008
7	100	5.00	11	26	0.008	0.007
8	100	5.00	10	26	0.007	0.006
9	100	5.00	8	26	0.006	0.005
10	95	5.00	5	26	0.004	0.003
11	95	5.00	4	26	0.003	0.003
12	95	5.00	3	26	0.002	0.002

Average K₂₀ m/s : 1.11E-06

Tested By: IG
Date: 15 October 2015

Q.A. Check By: UM
Date: 16 October 2015

Approved By: IG
Date: 18 November 2015

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL : Japan International Cooperation Agency (JICA)	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Investigation for Nadi River Basin Drilling Works	DATE / : 13 October 2015
SITE ADDRESS : Site 2, Navo Nadi Town	TECHNOLOGIST : KB
SAMPLE LOCATION : BH 02 1.00m - 1.50m	MATERIAL TYPE & LOCATION : Gravel, SILT traces of clay, soft, most, low to medium plasticity
TEST NUMBER : N 511	

SAMPLE HISTORY : NATURAL-/AIR-DRIED-/OVEN-DRIED-/UNKNOWN

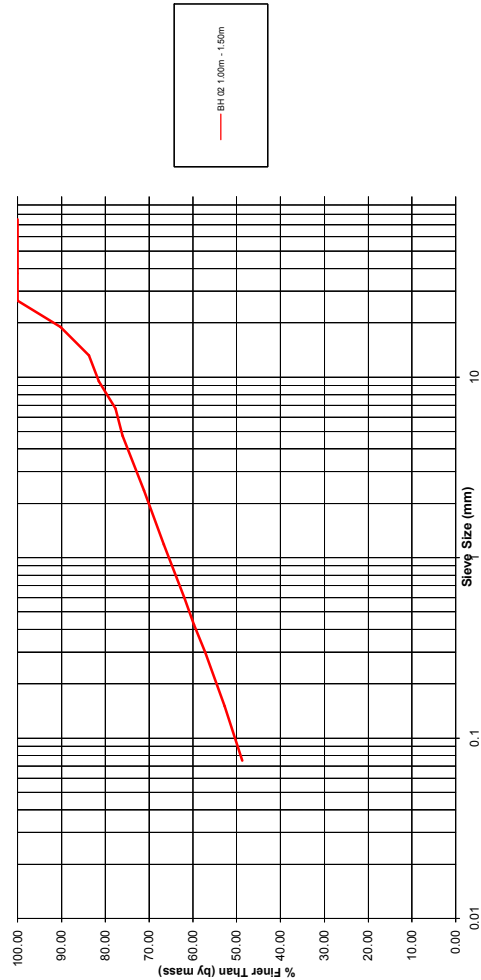
Moisture Content (Material passing 19mm)	Container No.	-	76	62	SPLIT SAMPLE
Mass of Container	g	86.28	72.21		Mass Passing Last Sieve: - gM _s
Mass of Container + Wet Soil	g	115.27	116.84		Mass after Splitting: - gM _t
Mass of Container + Dry Soil	g	108.45	106.74		Splitting Factor = $\frac{M_s}{M_t}$
Mass of Dry Soil	g	22.17	34.53		
Mass of Moisture	g	6.82	10.10		
Moisture Content	%	30.76	29.25		
Average Moisture Content	%		30.01		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _s)	g	Nil
	Total Wet Weight (M _w)	g	330.98
	Total Mass of dry sample (M _t)	M _t = $\frac{100M_w}{100 + w}$	
		M _t =	254.59

Test Sieve Size mm	Mass of Dry Soil Retained (M _s)	Corrected Mass	Percentage Retained = $\frac{M_s}{M_t} \times 100$	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g		%	%	g	mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	24.62	N/A	9.67	90.33		200
13.2 mm	16.75	N/A	6.58	83.75	600	300
9.50 mm	5.83	N/A	2.29	81.46	450	300
6.70 mm	9.51	N/A	3.74	77.72	300	300
4.75 mm	4.21	N/A	1.65	76.07	250	200
2.36 mm	12.33	N/A	4.84	71.23	150	200
1.18 mm	11.68	N/A	4.59	66.64	100	200
0.600 mm	11.74	N/A	4.61	62.03	80	200
425 µm	5.79	N/A	2.27	59.75	70	200
300 µm	6.50	N/A	2.55	57.20	60	200
150 µm	11.29	N/A	4.43	52.77	40	200
75 µm	10.36	N/A	4.07	48.70	25	200
Passing 75 µm	123.98	N/A	48.70	0.00	-	-
Pan Total	254.59	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: KB	Q.A. Checked by: TL	Approved by: IG
Date: 13 October 2015	Date: 15 October 2015	Date: 18 November 2015



LOCATION: BH 02 1.00m - 1.50m
DATE OF TEST: 13 October 2015
DESCRIPTION: Gravel, SILT traces of clay, soft, moist, low to medium plasticity
SAMPLE No: N 511

Form GEL-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL : Japan International Cooperation Agency (JICA)	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Investigation for Nadi River Basin Drilling Works	DATE / : 14 October 2015
SITE ADDRESS : Site 2, Navo Nadi Town	TECHNOLOGIST : RK
SAMPLE LOCATION : BH 02 3.50 - 4.00m	MATERIAL TYPE & LOCATION : Silty, CLAY traces of root fibres, brown, firm, moist, high plasticity.
TEST NUMBER : N 513	

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	10	6	SPLIT SAMPLE
Mass of Container	g	52.26	53.04	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	109.91	119.98	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	93.83	101.23	Splitting Factor = $\frac{M_3}{M_4}$	
Mass of Dry Soil	g	41.57	48.19		
Mass of Moisture	g	16.08	18.75		
Moisture Content	%	38.68	38.91		
Average Moisture Content	%	38.80			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g	195.95	
Total Mass of dry sample (M _t)	M _t = $\frac{100M_w}{100 + w}$		
	M _t =	141.18	

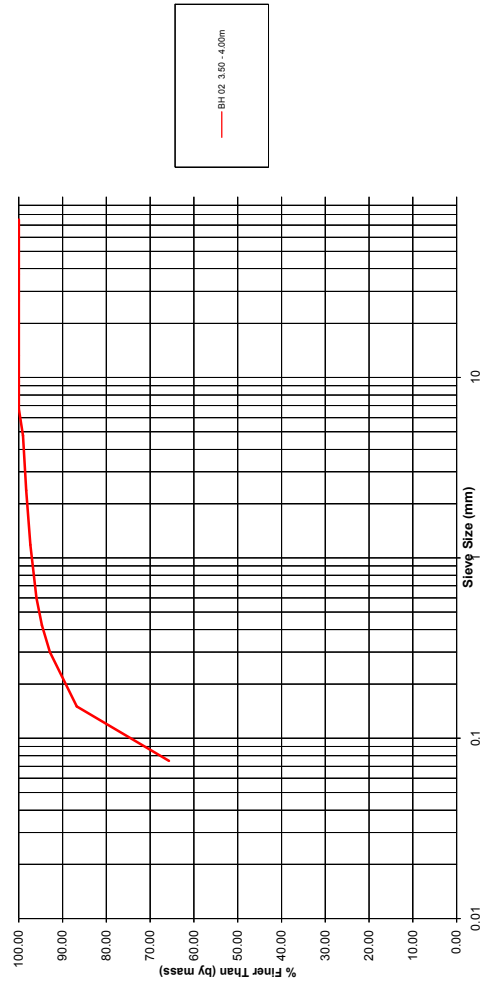
Test Sieve Size mm	Mass of Dry Soil Retained (M _r) g	Corrected Mass %	Percentage Retained = $\frac{\text{Mass}_r}{M_t} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	0.00	100.00			300
50.0mm	N/A	0.00	100.00			300
37.5mm	N/A	0.00	100.00			300
26.5mm	N/A	0.00	100.00			300
19.0mm	N/A	0.00	100.00			200
13.2 mm	N/A	0.00	100.00		600	300
9.50 mm	N/A	0.00	100.00		450	300
6.70 mm	N/A	0.00	100.00		300	300
4.75 mm	1.27	N/A	0.90	99.10	250	200
2.36 mm	1.06	N/A	0.75	98.35	150	200
1.18 mm	1.44	N/A	1.02	97.33	100	200
0.600 mm	1.87	N/A	1.32	96.01	80	200
425 µm	1.84	N/A	1.30	94.70	70	200
300 µm	2.54	N/A	1.80	92.90	60	200
150 µm	8.63	N/A	6.11	86.79	40	200
75 µm	29.78	N/A	21.09	65.70	25	200
Passing 75 µm	92.75	N/A	65.70	0.00	-	-
Pan Total	141.18	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: TL	Approved by: IG
Date: 14 October 2015	Date: 15 October 2015	Date: 18 November 2015

Form GEL-06

Page 1 of 2



LOCATION: BH 02: 3.50 - 4.00m
DATE OF TEST: 14 October 2015
DESCRIPTION: SILTY CLAY (trace of root fibres, brown, firm, moist, high plasticity)
SAMPLE No: N 513

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Investigation for Nadi River Basin Drilling Works	DATE / :	14 October 2015
SITE ADDRESS :	Site2 , Navo Nadi Town	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH 02 6.50m - 7.00m	MATERIAL TYPE & LOCATION :	Clayey organic SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity
TEST NUMBER :	N 515		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content (Material passing 19mm)	Container No.	-	5	7	SPLIT SAMPLE	
Mass of Container	g	53.34	52.76	Mass Passing Last Sieve:		gM ₁
Mass of Container + Wet Soil	g	87.27	90.12	Mass after Splitting:		gM ₂
Mass of Container + Dry Soil	g	74.50	76.35	Splitting Factor		M ₂
Mass of Dry Soil	g	21.16	23.59	=		M ₁
Mass of Moisture	g	12.77	13.77			
Moisture Content	%	60.35	58.37			
Average Moisture Content	%	59.36				

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	335.45
	Total Mass of dry sample (M _T)	M _T =	$\frac{100M_w}{100 + w}$
		M _T =	210.50

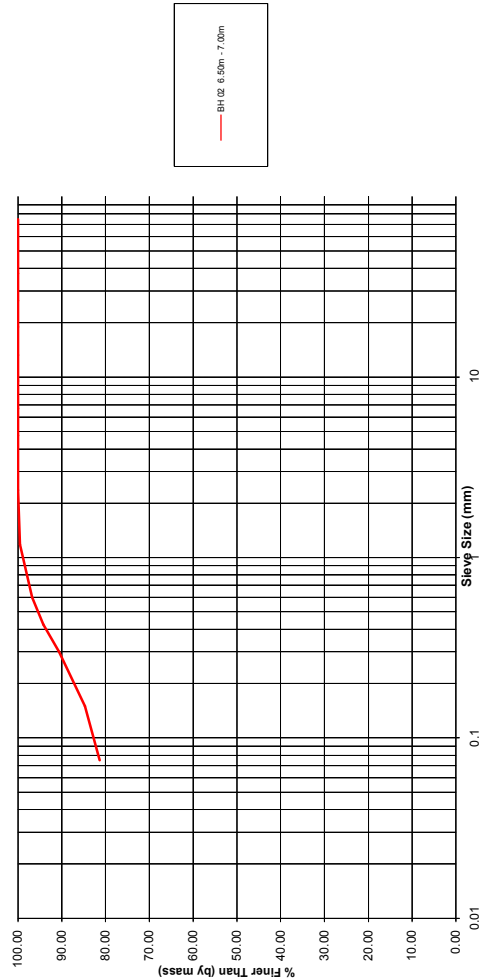
Test Sieve Size mm	Mass of Dry Soil Retained (M _s) g	Corrected Mass g	Percentage Retained (Mass/M _T) x 100 %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	N/A	N/A	0.00	100.00	250	200
2.36 mm	N/A	N/A	0.00	100.00	150	200
1.18 mm	0.93	N/A	0.44	99.56	100	200
0.600 mm	5.86	N/A	2.78	96.77	80	200
425 µm	5.36	N/A	2.55	94.23	70	200
300 µm	7.57	N/A	3.60	90.63	60	200
150 µm	12.58	N/A	5.98	84.66	40	200
75 µm	6.91	N/A	3.28	81.37	25	200
Passing 75 µm	171.29	N/A	81.37	0.00	-	-
Pan Total	210.50	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: TL	Approved by: IG
Date: 14 October 2015	Date: 15 October 2015	Date: 18 November 2015

Form GE-L-06

Page 1 of 2



BH 02 6.50m - 7.00m

LOCATION: BH 02, 6.50m - 7.00m
DATE OF TEST: 14 October 2015
DESCRIPTION: Clayey organic SILT with trace of organics, dark grey, very soft to soft, low to medium plasticity
SAMPLE No.: NF15

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL : Japan International Cooperation Agency (JICA) Drilling Works	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Investigation for Nadi River Basin Drilling Works	DATE / : 13 October 2015
SITE ADDRESS : Site 2, Navo, Nadi Town.	TECHNOLOGIST : RK
SAMPLE LOCATION : BH 02 11.00m - 11.50m	MATERIAL TYPE & LOCATION : Silty CLAY, red brown, mottled grey, medium to high plasticity
TEST NUMBER : N 517	

SAMPLE HISTORY : NATURAL/AIR-DRIED/OVEN-DRIED/UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	69	83	SPLIT SAMPLE
Mass of Container	g		90.25	71.20	Mass Passing Last Sieve: - gM ₃
Mass of Container + Wet Soil	g		116.28	108.05	Mass after Splitting: - gM ₄
Mass of Container + Dry Soil	g		109.74	98.75	Splitting Factor = $\frac{M_3}{M_4}$
Mass of Dry Soil	g		19.49	27.55	
Mass of Moisture	g		6.54	9.30	
Moisture Content	%		33.56	33.76	
Average Moisture Content	%		33.66		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g		279.76
Total Mass of dry sample (M _t)	M _t = $\frac{100M_w}{100 + w}$		
	M _t =	209.31	

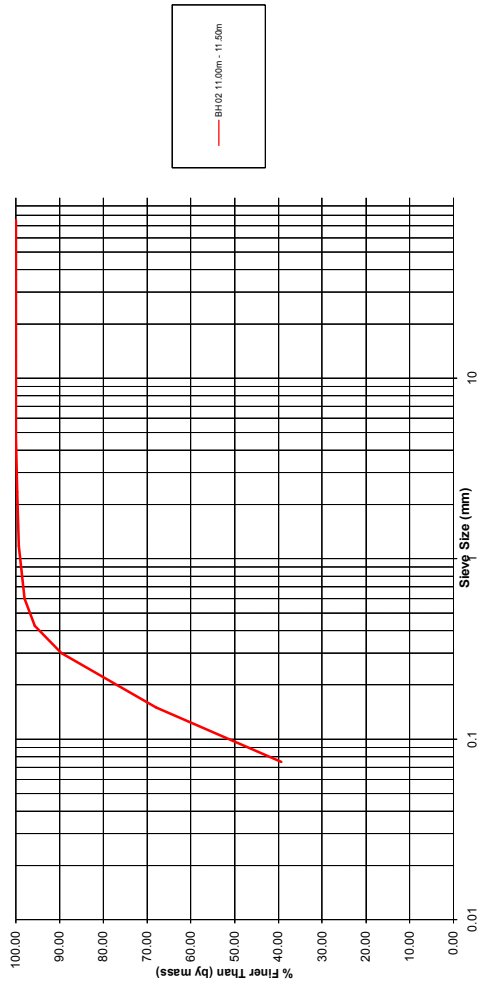
Test Sieve Size mm	Mass of Dry Soil Retained (M _r) g	Corrected Mass %	Percentage Retained = (Mass/M _t) × 100 %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	0.00	100.00			300
50.0mm	N/A	0.00	100.00			300
37.5mm	N/A	0.00	100.00			300
26.5mm	N/A	0.00	100.00			300
19.0mm	N/A	0.00	100.00			200
13.2 mm	N/A	0.00	100.00		600	300
9.50 mm	N/A	0.00	100.00		450	300
6.70 mm	N/A	0.00	100.00		300	300
4.75 mm	N/A	0.00	100.00		250	200
2.36 mm	0.58	N/A	0.28	99.72	150	200
1.18 mm	0.83	N/A	0.40	99.33	100	200
0.600 mm	2.78	N/A	1.33	98.00	80	200
425 µm	5.02	N/A	2.40	95.60	70	200
300 µm	12.58	N/A	6.01	89.59	60	200
150 µm	45.41	N/A	21.69	67.89	40	200
75 µm	59.72	N/A	28.53	39.36	25	200
Passing 75 µm	82.39	N/A	39.36	0.00	-	-
Pan Total	209.31	-	100.00	-	-	-

- NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: TL	Approved by: IG
Date: 13 October 2015	Date: 15 October 2015	Date: 18 November 2015

Form GE-L-06

Page 1 of 2



BH 02 11.00m - 11.50m

LOCATION: BH 02 11.00m - 11.50m
DATE OF TEST: 13 October 2015
DESCRIPTION: Silty CLAY, red brown, mottled grey, medium to high plasticity
SAMPLE No: N517

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL : Japan International Cooperation Agency (JICA)	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Investigation for Nadi River Basin Drilling Works	DATE / : 13 October 2015
SITE ADDRESS : Site2 , Navo Nadi Town	TECHNOLOGIST : RK
SAMPLE LOCATION : BH 02 14.00m - 14.50m	MATERIAL TYPE & LOCATION : Clayey fine to medium SAND with trace of some gravel, brown black
TEST NUMBER : N 519	

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	87	89	SPLIT SAMPLE
Mass of Container	g	116.49	121.19		Mass Passing Last Sieve: - gM _s
Mass of Container + Wet Soil	g	182.52	183.59		Mass after Splitting: - gM _t
Mass of Container + Dry Soil	g	171.45	172.46		Splitting Factor = $\frac{M_s}{M_t}$
Mass of Dry Soil	g	54.96	51.27		
Mass of Moisture	g	11.07	11.13		
Moisture Content	%	20.14	21.71		
Average Moisture Content	%	20.93			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _s)	g	Nil
Total Wet Weight (M _w)	g	269.81	
Total Mass of dry sample (M _t)	M _t = $\frac{100M_w}{100 + w}$		
	M _t =	223.12	

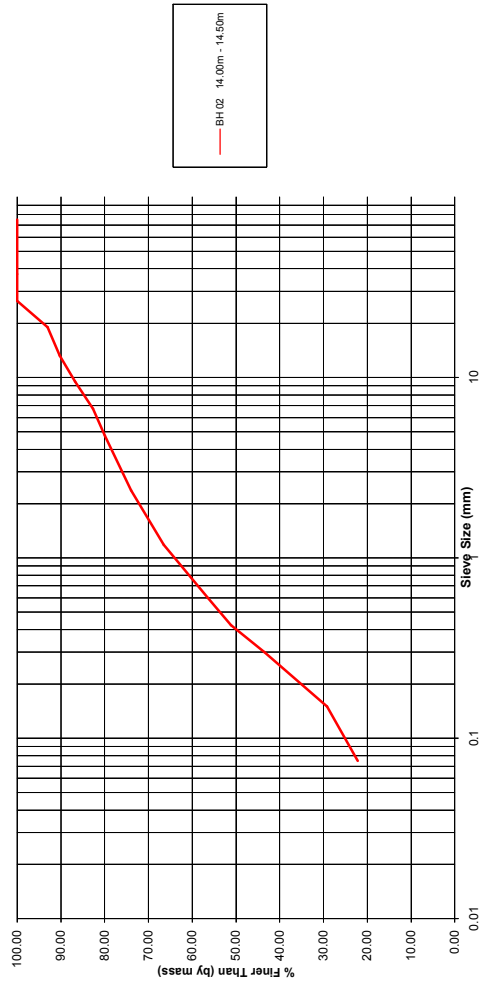
Test Sieve Size mm	Mass of Dry Soil Retained (M _s) g	Corrected Mass g	Percentage Retained = $\frac{M_s}{M_t} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	15.45	N/A	6.92	93.08		200
13.2 mm	6.23	N/A	2.79	90.28	600	300
9.50 mm	7.79	N/A	3.49	86.79	450	300
6.70 mm	9.19	N/A	4.12	82.67	300	300
4.75 mm	6.05	N/A	2.71	79.96	250	200
2.36 mm	13.28	N/A	5.95	74.01	150	200
1.18 mm	16.63	N/A	7.45	66.56	100	200
0.600 mm	22.68	N/A	10.16	56.39	80	200
425 µm	11.67	N/A	5.23	51.16	70	200
300 µm	16.96	N/A	7.60	43.56	60	200
150 µm	31.94	N/A	14.32	29.24	40	200
75 µm	15.80	N/A	7.08	22.16	25	200
Passing 75 µm	49.45	N/A	22.16	0.00	-	-
Pan Total	223.12	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: TL	Approved by: IG
Date: 13 October 2015	Date: 15 October 2015	Date: 18 November 2015

Form GE-L-06

Page 1 of 2



LOCATION: BH 02 14.00m - 14.50m
 DATE OF TEST: 13 October 2015
 DESCRIPTION: Clayey fine to medium SAND with trace of some gravel, brown black
 SAMPLE No.: N520

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.6.1)

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Investigation for Nadi River Basin Drilling Works	DATE / :	13 October 2015
SITE ADDRESS :	Site2 , Navo Nadi Town	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH 02 15.50m - 16.00m	MATERIAL TYPE & LOCATION :	Highly to completely weathered conglomerate, extremely weak to very weak, brown (silty fine to medium sand with some fine to medium gravel, subangular)
TEST NUMBER :	N 520		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content (Material passing 19mm)	Container No.	-		8		12		SPLIT SAMPLE	
		Mass of Container	g	53.04	53.13	Mass Passing Last Sieve:	-	gM ₃	-
Mass of Container + Wet Soil	g	75.40	74.86	Mass after Splitting:	-	gM ₄	-	gM ₄	
Mass of Container + Dry Soil	g	72.23	71.76	Splitting Factor	M ₃				
Mass of Dry Soil	g	19.19	18.63	=	M ₄				
Mass of Moisture	g	3.17	3.10						
Moisture Content	%	16.52	16.64						
Average Moisture Content	%	16.58							

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g	267.89	
Total Mass of dry sample (M _T)	M _T =	100M _w	
		100 + w	
	M _T =	229.79	

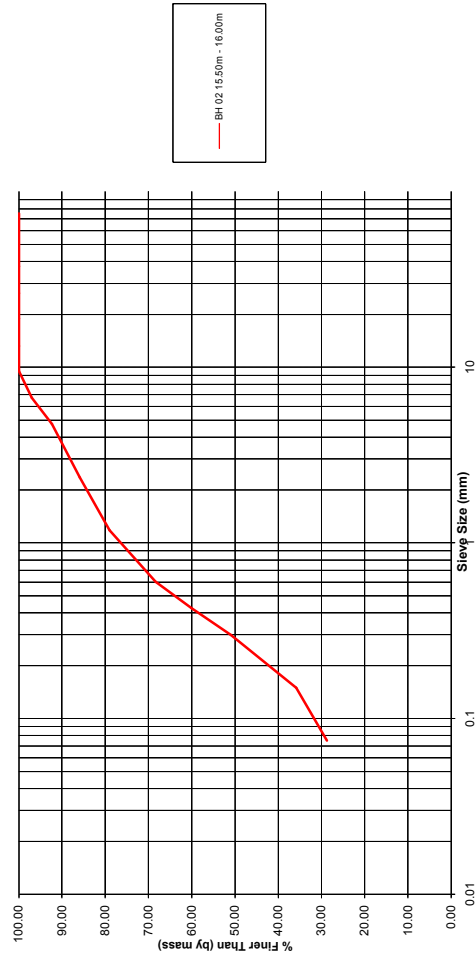
Test Sieve Size mm	Mass of Dry Soil Retained (M _s)	Corrected Mass	Percentage Retained = (Mass/M _T) × 100	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g	g	%	%	g	mm
75.0mm	N/A	0.00	100.00			300
50.0mm	N/A	0.00	100.00			300
37.5mm	N/A	0.00	100.00			300
26.5mm	N/A	0.00	100.00			300
19.0mm	N/A	0.00	100.00			200
13.2 mm	N/A	0.00	100.00		600	300
9.50 mm	N/A	0.00	100.00		450	300
6.70 mm	7.01	N/A	3.05	96.95	300	300
4.75 mm	10.56	N/A	4.60	92.35	250	200
2.36 mm	14.86	N/A	6.47	85.89	150	200
1.18 mm	15.82	N/A	6.88	79.00	100	200
0.600 mm	24.54	N/A	10.68	68.32	80	200
425 µm	19.17	N/A	8.34	59.98	70	200
300 µm	20.82	N/A	9.06	50.92	60	200
150 µm	34.56	N/A	15.04	35.88	40	200
75 µm	16.40	N/A	7.14	28.74	25	200
Passing 75 µm	66.05	N/A	28.74	0.00	-	-
Pan Total	229.79	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
 2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : TL	Approved by : IG
Date : 15 October 2015	Date : 16 October 2015	Date : 18 November 2015

Form GE-L-06

Page 1 of 2




LOCATION: BH 02 15.50m - 16.00m
DATE OF TEST: 13 October 2015
DESCRIPTION: Highly to completely weathered conglomerate, extremely weak to very weak, brown (silly fine to medium sand with some fine to medium gravel, subangular.
SAMPLE No. N520

Form G.E.L-06

Page 2 of 2

Oedometer Settlement Test


Sample Details  sketch showing specimen location in original sample	Depth	3.5 - 4.0m		
	Description Type	Silty medium to coarse SAND, grey black.		
Initial Height	L ₀	(mm)	20.0	
Initial Diameter	D ₀	(mm)	50.0	
Initial Weight	W ₀	(gr)	63.0	
Bulk Density	ρ ₀	(Mg/m ³)	1.60	
Particle Density	ρ _s	(Mg/m ³)	2.65	

Initial Conditions			
Settlement Input	L _{IP}	(mm)	CH 3
Initial Moisture	ω _i %	(%)	34
Initial Dry Density	ρ _{di}	(Mg/m ³)	1.19
Initial Voids Ratio	e _i	.	1.220
Initial Degree of Saturation	S _i	(%)	74.7
Initial Swelling	S _s	(kPa)	0

Final Conditions			
Final Moisture	ω _f %	(%)	33
Dry Density	ρ _{df}	(Mg/m ³)	1.03
Voids Ratio	e _f	.	1.564
Saturation	S _f	(%)	55
Height Settlement	ΔL _s	(mm)	-3.104

Vertical Stress σ' _i (kPa)	Voids Ratio e _f	Height ΔL _s (mm)	Consolidation C _v (m ² /year)	Compressibility m _v (m ² /MN)	Initial T _i (°C)	Final T _f (°C)	t ₅₀ Time t ₅₀ (min)	t ₉₀ Time t ₉₀ (min)	Secondary C _{SEC} (m ² /MN)
30	1.133	0.778	23.8	1.297	27.0	0.0		1.797	0.0087
60	1.564	-3.104	16571.3	6.732	27.0	0.0		0.003	0.0087
120	1.564	-3.104	278.2		27.0	0.0		0.213	0.0087
240	1.117	0.921	257.2	1.452	27.0	0.0		0.192	0.0087
480	1.086	1.201	169.4	0.061	27.0	0.0		0.235	0.0087
120	1.564	-3.104			27.0	0.0			
30	1.564	-3.104			27.0	0.0			

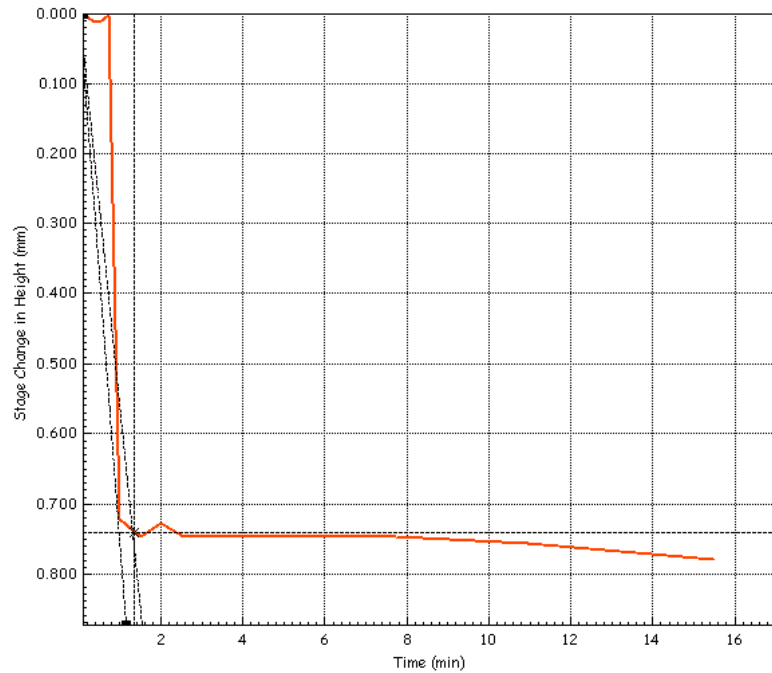
Notes

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
Checked	DMC	Approved	DMC	

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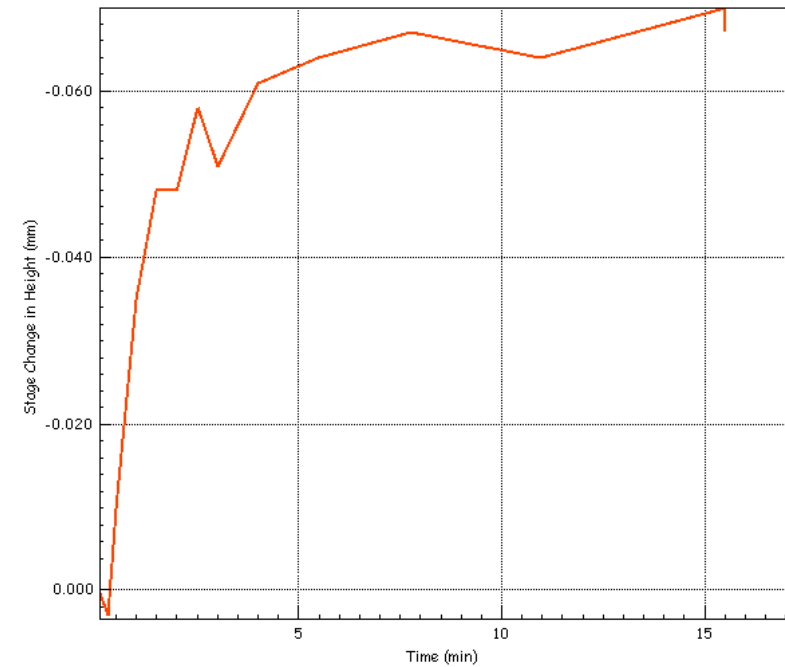
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	30
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	0.778
Voids Ratio	e_f	.	1.133
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	1.797
Consolidation	C_v	(m ² /year)	23.8
Compressibility	m_v	(m ² /MN)	1.297
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	30
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-3.101
Voids Ratio	e_f	.	1.564
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

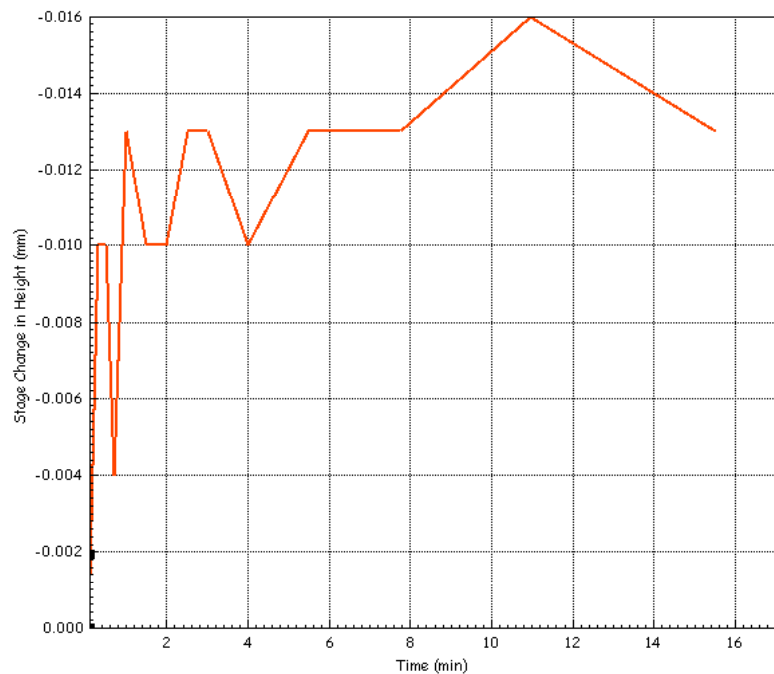
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

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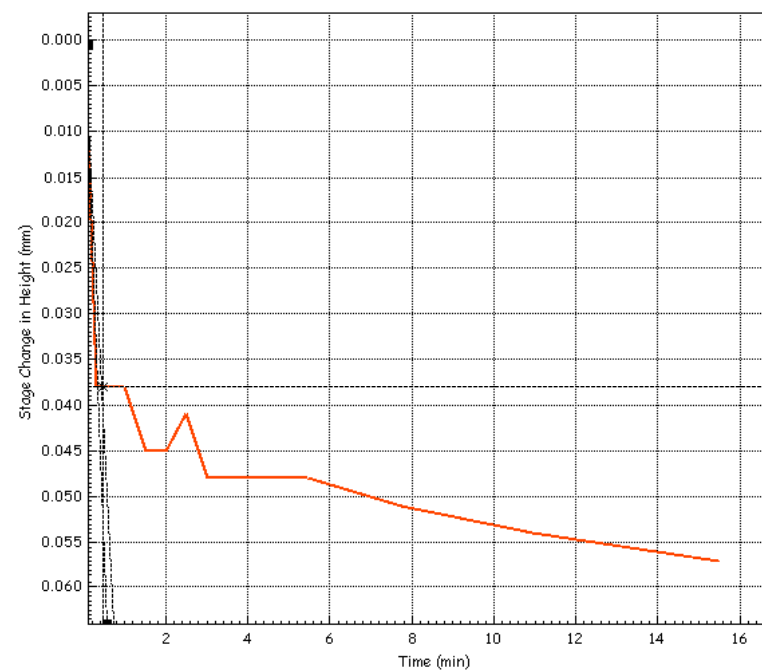
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	60
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-3.097
Voids Ratio	e_f	.	1.563
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.003
Consolidation	C_v	(m ² /year)	16565.8
Compressibility	m_v	(m ² /MN)	6.720
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	120
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-3.097
Voids Ratio	e_f	.	1.563
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.213
Consolidation	C_v	(m ² /year)	278.0
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

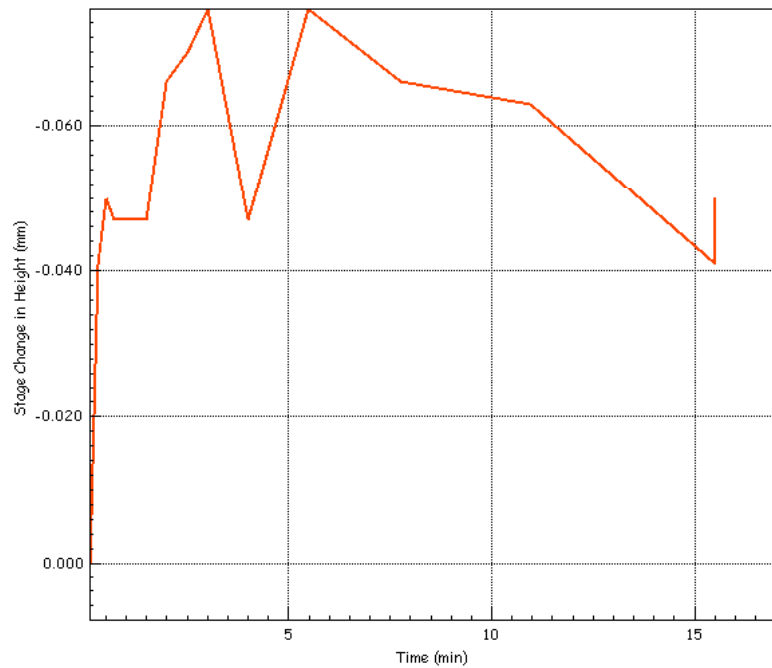
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

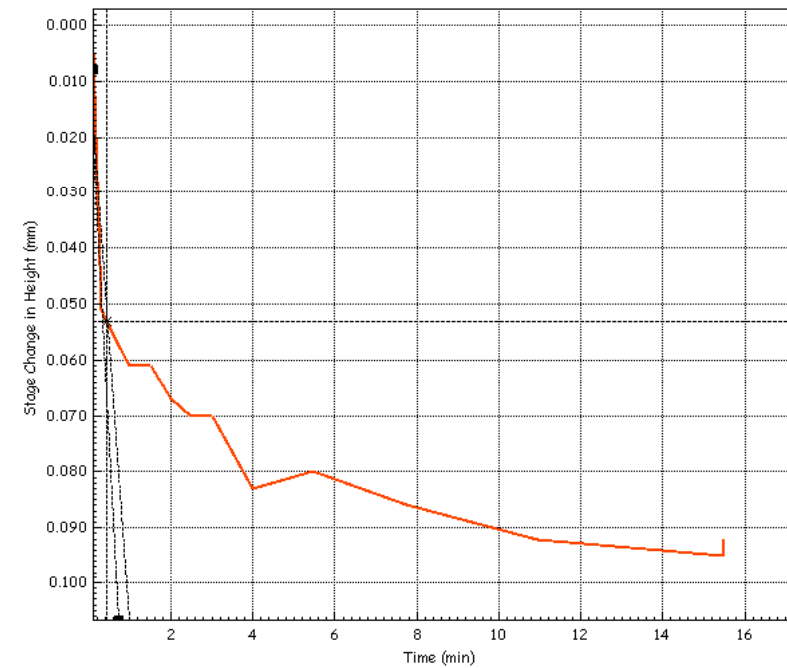
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	120
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-3.097
Voids Ratio	e_f	.	1.563
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	240
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	0.921
Voids Ratio	e_f	.	1.117
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.192
Consolidation	C_v	(m ² /year)	257.1
Compressibility	m_v	(m ² /MN)	1.451
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

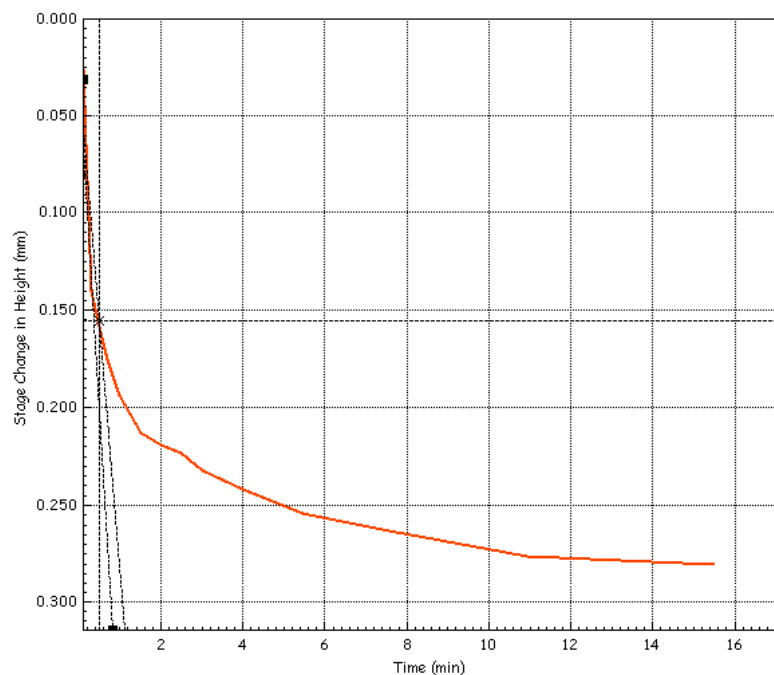
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	480
Initial Temperature	T_i	(oC)	27.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.201
Voids Ratio	e_f	.	1.086
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.235
Consolidation	C_v	(m ² /year)	169.4
Compressibility	m_v	(m ² /MN)	0.061
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Settlement Test

Sample Details <p style="font-size: small;">sketch showing specimen location in original sample</p>	Depth	15.5 - 16.0m	
	Description Type	Silty medium to coarse SAND , black brown grey.	
	Initial Height	L ₀	(mm) 20.0
	Initial Diameter	D ₀	(mm) 50.0
	Initial Weight	W ₀	(gr) 63.0
	Bulk Density	ρ_0	(Mg/m ³) 1.60
	Particle Density	ρ_s	(Mg/m ³) 2.65

Initial Conditions			
Settlement Input	L _{IP}	(mm)	CH 3
Initial Moisture	ω_i %	(%)	40
Initial Dry Density	ρ_{di}	(Mg/m ³)	1.14
Initial Voids Ratio	e_i	.	1.321
Initial Degree of Saturation	S_i	(%)	81.2
Initial Swelling	S_s	(kPa)	0

Final Conditions			
Final Moisture	ω_f %	(%)	31
Dry Density	ρ_{df}	(Mg/m ³)	1.34
Voids Ratio	e_f	.	0.973
Saturation	S_f	(%)	83
Height Settlement	ΔL_s	(mm)	2.993

Vertical Stress σ'_{i} (kPa)	Voids Ratio e_f	Height ΔL_s (mm)	Consolidation C_v (m ² /year)	Compressibility m_v (m ² /MN)	Initial T_i (oC)	Final T_f (oC)	t50 Time t ₅₀ (min)	t90 Time t ₉₀ (min)	Secondary C_{SEC} (m ² /MN)
50	1.247	0.631	152.0	0.631	29.0	0.0		0.283	0.0087
100	1.195	1.082	236.5	0.466	29.0	0.0		0.172	0.0087
200	1.137	1.586	159.8	0.266	29.0	0.0		0.242	0.0087
400	1.054	2.297	162.3	0.193	29.0	0.0		0.223	0.0087
800	1.651	-2.851	223.7	0.727	29.0	0.0		0.204	0.0087
200	0.955	3.148			29.0	0.0			
50	0.973	2.993			29.0	0.0			

Notes

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-06_002
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/23/2015
	Client	Japan International Cooperation	Sample	N567
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

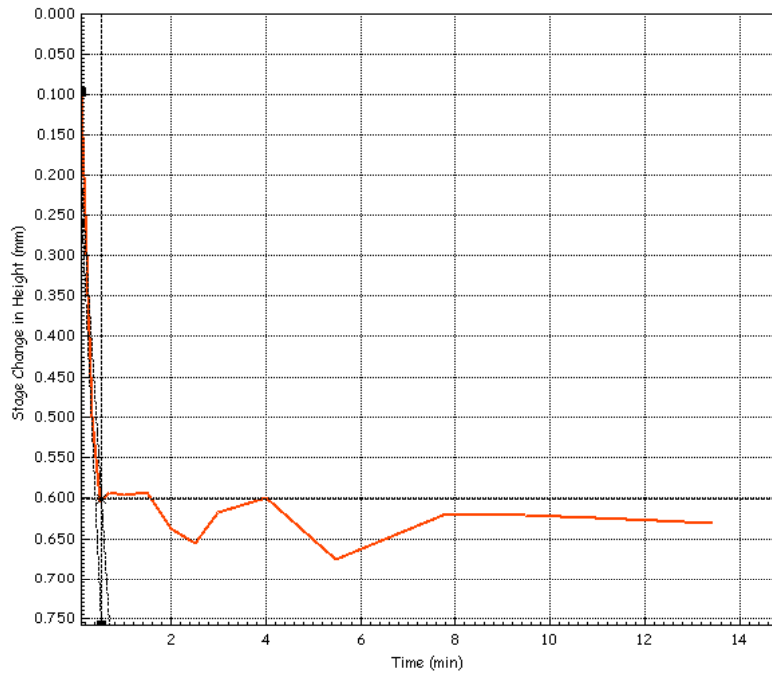
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

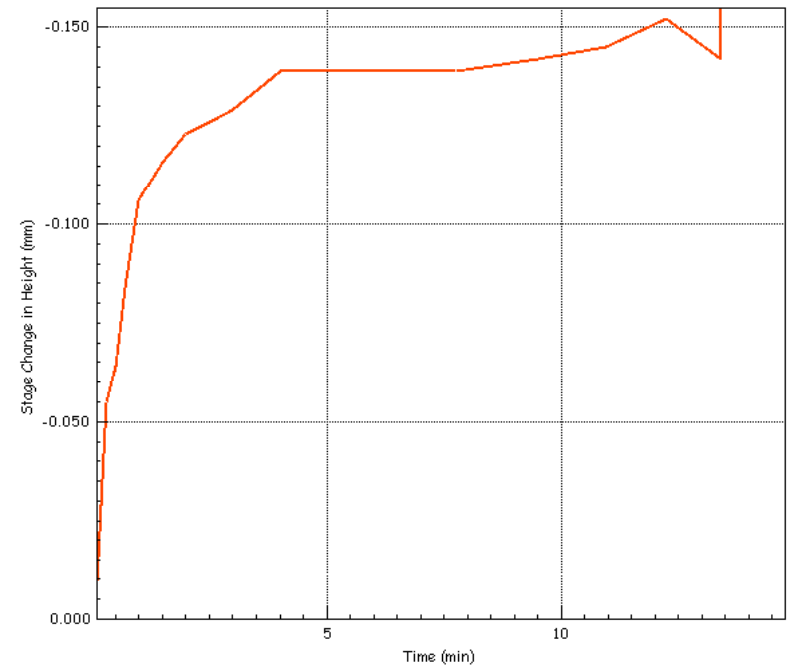
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	50
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	0.631
Voids Ratio	e_f	.	1.247
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.283
Consolidation	C_v	(m ² /year)	152.0
Compressibility	m_v	(m ² /MN)	0.631
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	50
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.993
Voids Ratio	e_f	.	0.973
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
Checked	DMC	Approved	DMC	

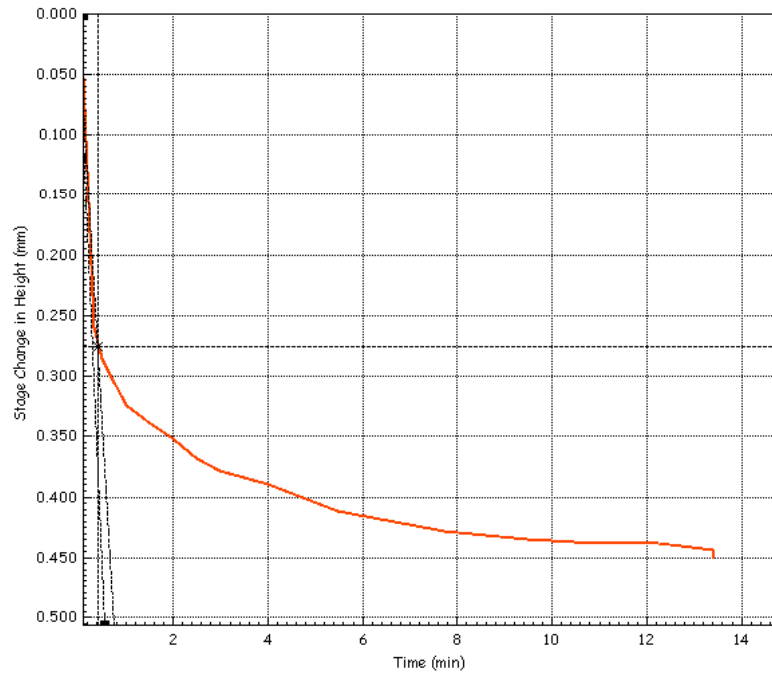
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

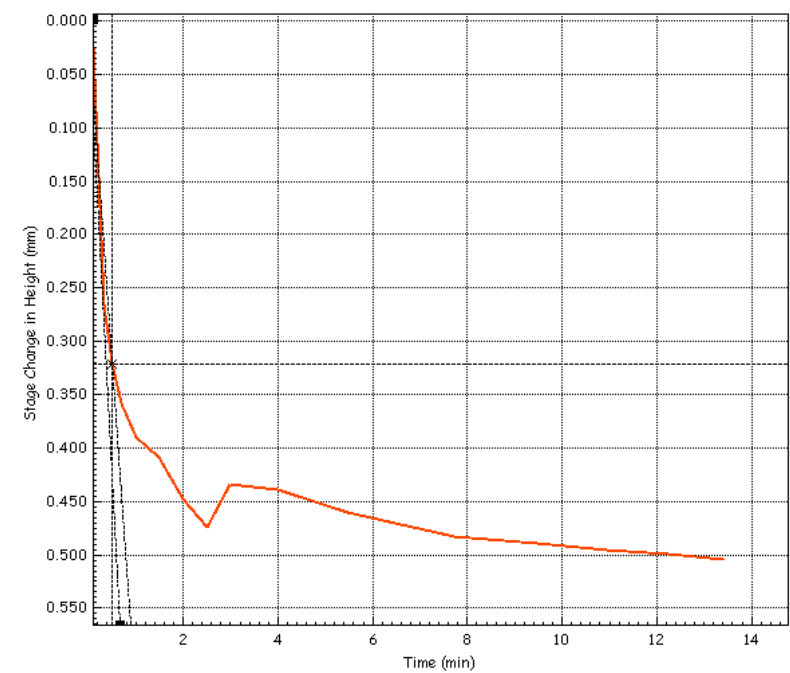
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	100
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.082
Voids Ratio	e_f	.	1.195
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.172
Consolidation	C_v	(m ² /year)	236.5
Compressibility	m_v	(m ² /MN)	0.466
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	200
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	1.586
Voids Ratio	e_f	.	1.137
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.242
Consolidation	C_v	(m ² /year)	159.8
Compressibility	m_v	(m ² /MN)	0.266
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

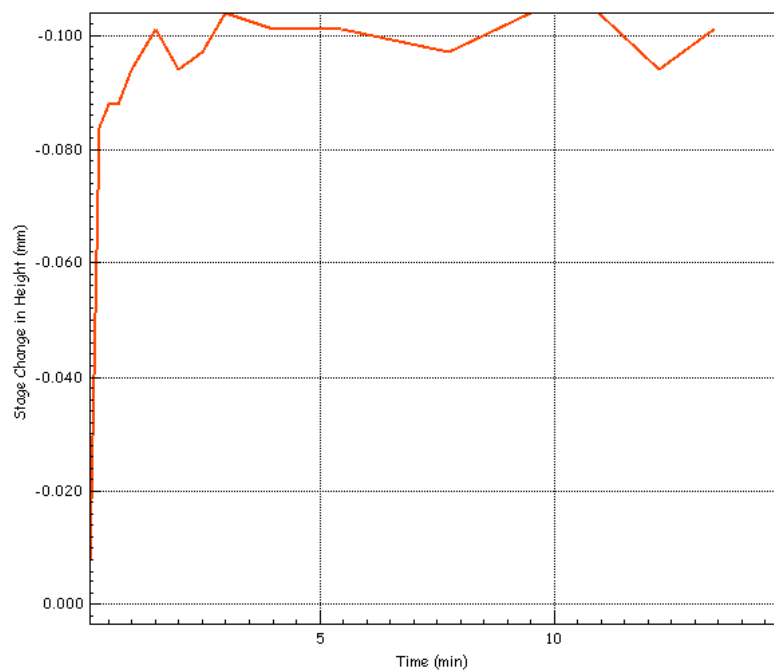
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

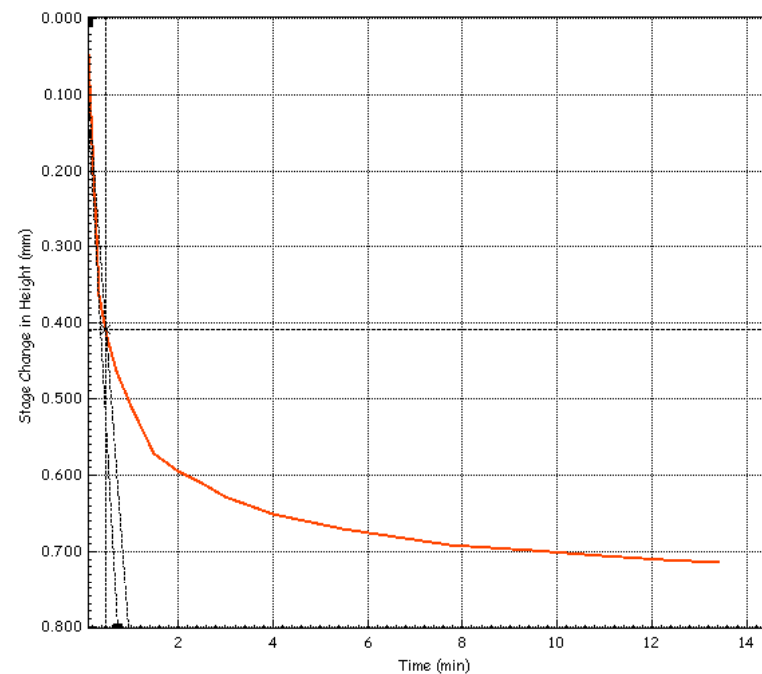
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	200
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.148
Voids Ratio	e_f	.	0.955
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	400
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.297
Voids Ratio	e_f	.	1.054
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.223
Consolidation	C_v	(m ² /year)	162.3
Compressibility	m_v	(m ² /MN)	0.193
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

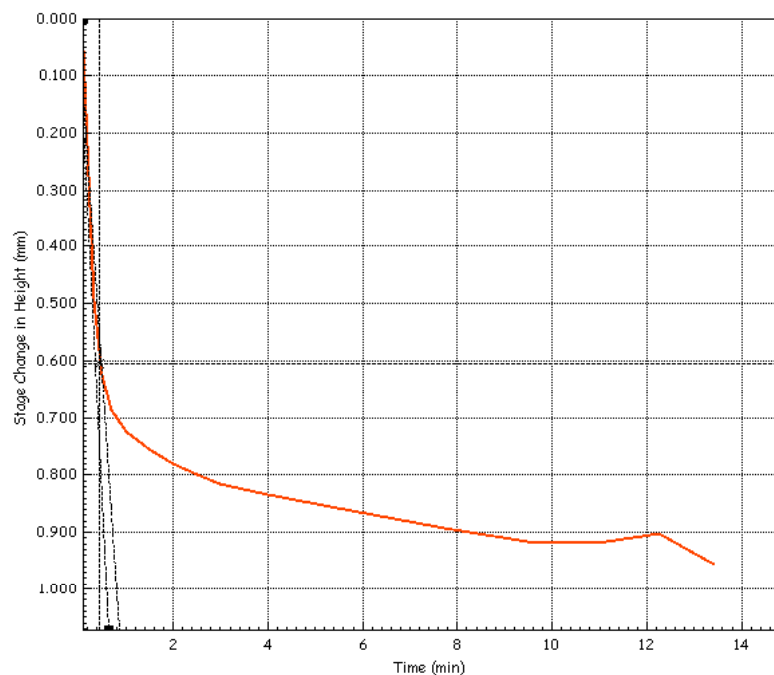
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-07_004
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/25/2015
	Client	Japan International Cooperation	Sample	N572
	Operator	IG/MK	Borehole	BH06
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i1}	(kPa)	800
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L_{CORR}	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-2.851
Void Ratio	e_f		1.651
Final Temperature	T_f	(oC)	0.0
t50 Time	t50	(min)	
t90 Time	t90	(min)	0.204
Consolidation	C_v	(m ² /year)	223.7
Compressibility	m_v	(m ² /MN)	0.727
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



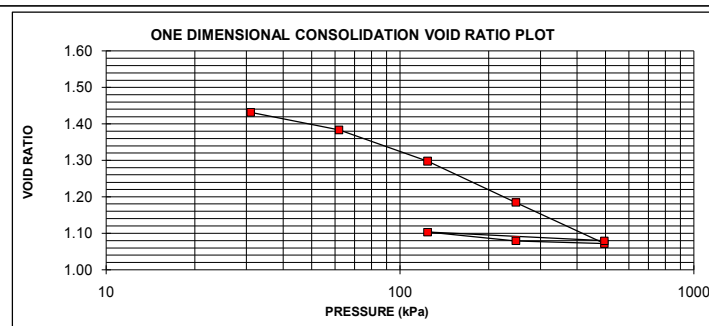
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	Client	Japan International Cooperation	Sample	N572	
Operator	IG/MK	Checked	DMC	Borehole	BH06
		Approved	DMC		

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

ENTEC LIMITED **Determination of The One-Dimensional Consolidation Properties** ENGINEERING & SCIENCE CONSULTANTS NZS 4402 : 1986 Test 7.1

Project Name:	Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	Sample No:	N 570
Client Name:	Japan International Cooperation Agency (JICA)	Depth:	12.5m - 13.0m
Job No:	1920815	Tested By:	IG
Site Address :	Nadi Back Road Farm (opposite Saunaka Village)	Date Tested:	29 November 2015
Sample Location:	BH 06		

Sample Description: Silty CLAY trace of siltstone nodules and organic, green grey, firm to stiff, moist medium plasticity
Sample History: Undisturbed / Remoulded / Compacted / Slurried / Unknown
Date Sample Collected: 08/10/15 **Temperature:** Max: 27°C Min: 25°C
Loading Cycle: 24 hrs 0 mins **Height of ring:** 23.8 mm
Diameter of ring (D): 44.96 mm **Area of ring (A):** 1587.61 mm²
Solid density of soil particles (Q_s): 2.65 t/m³ (Measured / Assumed)
Method used: Square root of time fitting method



		Initial	Final
Measured thickness of specimen, H	mm	H_i 23.8	H_f 19.99
Mass of ring + watch glass + wet specimen	g	M_3 264.4	M_4 263.48
Mass of ring + watch glass + dry specimen	M_5 g	246.52	
Mass of ring	M_1 g	206.07	
Mass of watch glass	M_2 g	0	
Mass of dry specimen	$M_s = M_5 - M_1 - M_2$ g	40.45	
Mass of water	g	$M_3 - M_5$ 17.88	$M_4 - M_5$ 16.96
Water content, w	%	w_i 44.20	w_f 41.93
Dry density, Q_d	t/m ³	Q_{di} 1.07	Q_{df} 1.27
Height of soil particles, H_s	mm	9.61	
Void ratio, e		e_i 1.48	e_f 1.08
Degree of saturation, S		S_i 79.39	S_f 102.92

Applied Pressure kPa	Incremental deflection (ΔH) mm	Thickness of specimen mm	% Change in thickness %	Height of voids mm	Void ratio	Coefficient of consolidation C_v (m ² /yr)	Coefficient of compressibility M_v (m ² /MN)
31	0.424	23.376	0.018	13.76	1.43	361.04	
62	0.884	22.916	0.039	13.30	1.38	288.57	1.20
124	1.710	22.090	0.077	12.48	1.30	338.53	1.16
248	2.798	21.002	0.133	11.39	1.18	145.72	0.95
496	3.884	19.916	0.195	10.30	1.07	305.75	0.66
248	3.814	19.986	0.191	10.37	1.08	0.00	-0.65
124	3.578	20.222	0.177	10.61	1.10	0.00	-1.21
496	3.806	19.994	0.190	10.38	1.08	19.72	0.43
0	0.00	23.800	0.000	14.19	1.48	0.00	

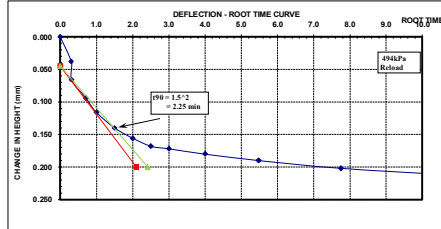
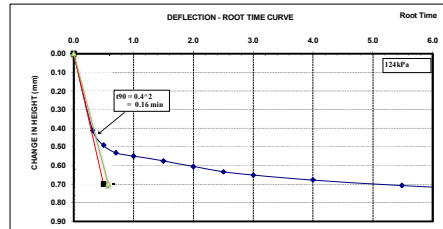
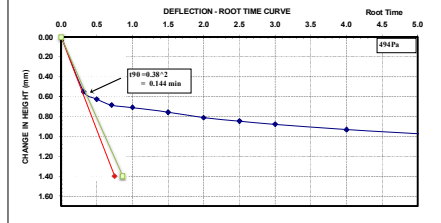
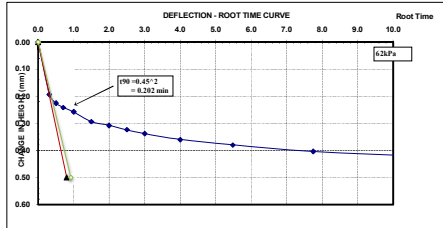
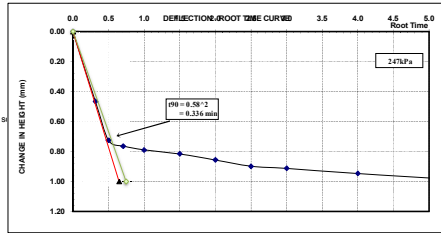
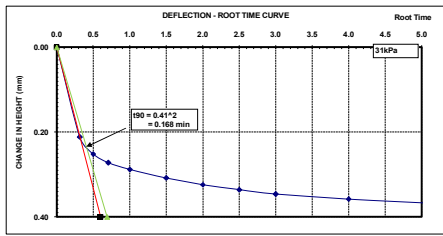
Tested by: IG/KB
Date: 21 November 2015

Q.A. Check By: UM
Date: 01 December 2015

Approved By: IG
Date: 01 December 2015

Loading Date & Time				30/11/2015 @ 8:13hrs			01/12/2015 @ 8:15hrs			02/12/2015 @ 8:17hrs			03/12/2015 @ 08:20hrs			04/12/2015 @ 08:23hrs			05/12/2015 @ 08:25hrs											
Hanger Load				500g			1000g			2000g			4000g			8000g			4000g											
Effective Pressure				31kPa			62kPa			124kPa			247kPa			494kPa			247kPa											
Time Elapsed				Clock			Dial			H			Clock			Dial			H			Clock			Dial			H		
hrs	min	sec	t min	√t min	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm	Time/4	Gauge	x10 mm		
			0	0.00	08:13:00	2036	0.000	08:15:00	1823	0.000	08:17:00	1586	0.000	08:20:00	1163	0.000	08:23:00	1647	0.000	08:25:00	1049	0.000								
			6	0.100	08:13:06	1930	0.212	08:15:06	1726	0.194	08:17:06	1380	0.412	08:20:06	930	0.466	08:23:06	1372	0.550	08:25:06	1068	0.038								
			15	0.250	08:13:15	1910	0.252	08:15:15	1710	0.226	08:17:15	1340	0.492	08:20:15	800	0.726	08:23:15	1335	0.624	08:25:15	1072	0.046								
			30	0.500	08:13:30	1900	0.272	08:15:30	1702	0.242	08:17:30	1320	0.532	08:20:30	781	0.764	08:23:30	1305	0.684	08:25:30	1074	0.050								
	1		1.000	1.000	08:14:00	1892	0.288	08:16:00	1694	0.258	08:18:00	1311	0.550	08:21:00	768	0.790	08:24:00	1293	0.708	08:26:00	1075	0.052								
	2	15	2.250	1.500	08:15:15	1882	0.308	08:17:15	1676	0.294	08:19:15	1298	0.576	08:22:15	755	0.816	08:25:15	1269	0.756	08:27:15	1077	0.056								
	4		4.000	2.000	08:17:00	1874	0.324	08:19:00	1669	0.308	08:21:00	1283	0.606	08:24:00	735	0.856	08:27:00	1242	0.810	08:29:00	1078	0.058								
	6	15	6.250	2.500	08:19:15	1868	0.336	08:21:15	1661	0.324	08:23:15	1269	0.634	08:26:15	714	0.898	08:29:15	1224	0.846	08:31:15	1079	0.060								
	9		9.000	3.000	08:22:00	1863	0.346	08:24:00	1654	0.338	08:26:00	1260	0.652	08:29:00	707	0.912	08:32:00	1209	0.876	08:34:00	1080	0.062								
	16		16.00	4.000	08:29:00	1857	0.358	08:31:00	1643	0.360	08:33:00	1247	0.678	08:36:00	690	0.946	08:39:00	1182	0.930	08:41:00	1081	0.064								
	30		30.00	5.480	08:43:00	1851	0.370	08:45:00	1633	0.380	08:47:00	1232	0.708	08:50:00	670	0.986	08:53:00	1153	0.988	08:55:00	1082	0.066								
	1		60.00	7.750	09:13:00	1846	0.380	09:15:00	1621	0.404	09:17:00	1217	0.738	09:20:00	654	1.018	09:23:00	1125	1.044	09:25:00	1083	0.068								
	2		120.0	10.950	10:13:00	1841	0.390	10:15:00	1612	0.422	10:17:00	1203	0.766	10:20:00	640	1.046	10:23:00	1100	1.094	10:25:00	1084	0.070								
	4		240.0	15.49	12:13:00	1835	0.402	12:15:00	1603	0.440	12:17:00	1190	0.792	12:20:00	624	1.078	12:23:00	1082	1.130	12:25:00	1084.5	0.071								
	8		480.0	21.91	16:13:00	1828	0.416	16:15:00	1594	0.458	16:17:00	1178	0.816	16:20:00	609	1.108	16:23:00	1066	1.162	16:25:00	1085	0.072								
	24		1440	37.95	08:13:00	1823	0.426	08:15:00	1586	0.474	08:17:00	1163	0.846	08:20:00	595	1.136	08:23:00	1049	1.196	08:25:00	1086	0.074								
					UNLOADING																									
Machine Correction					0.002			0.014			0.02			0.048			0.110			0.004										
Δ H (Corrected)					0.424			0.460			0.826			1.088			1.086			0.070										
Net Total Settlement					0.424			0.884			1.710			2.798			3.884			3.814										

Loading Date and Time				07/12/2015 @ 08:00hrs			08/12/2015 @ 08:03hrs																					
Hanger Load				1000g			8000g																					
Effective Pressure				124kPa			494kPa																					
Time Elapsed				Clock			Dial			H			Clock			Dial			H									
hrs	min	sec	t min	√t min	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm	ΔTime/4	Gauge	x10 mm
								0	0	08:00:00	1086	0.000	08:03:00	1209	0.000													
			6	0.100	08:00:06	1123	0.074	08:03:06	1190	0.038																		
			15	0.250	08:00:15	1133	0.094	08:03:15	1176	0.066																		
			30	0.500	08:00:30	1140	0.108	08:03:30	1162	0.094																		
	1		1.000	1.000	08:01:00	1145	0.118	08:04:00	1151	0.116																		
	2	15	2.250	1.500	08:02:15	1151	0.130	08:05:15	1139	0.140																		
	4		4.000	2.000	08:04:00	1159	0.146	08:07:00	1131	0.156																		
	6	15	6.250	2.500	08:06:15	1163	0.154	08:09:15	1125	0.168																		
	9		9.000	3.000	08:09:00	1168	0.164	08:12:00	1123	0.172																		
	16		16.00	4.000	08:16:00	1174	0.176	08:19:00	1119	0.180																		
	30		30.00	5.480	08:30:00	1181	0.190	08:33:00	1114	0.190																		
	1		60.00	7.750	09:00:00	1188	0.204	09:03:00	1108	0.202																		
	2		120.0	10.950	10:00:00	1195	0.218	10:03:00	1103	0.212																		
	4		240.0	15.49	12:00:00	1193	0.214	12:03:00	1098	0.222																		
	8		480.0	21.91	16:00:00	1203	0.234	16:03:00	1092	0.234																		
	24		1440	37.95	08:00:00	1209	0.246	08:03:00	1084	0.250																		
					UNLOADING			RELOADING																				
Machine Correction					0.01			0.022																				
Δ H (Corrected)					0.236			0.228																				
Net Total Settlement					3.578			3.806																				



APPENDIX 6d Site Photos




APPENDIX 7
**SITE 7 – Old Nadi Back Road Bridge (south west),
Nadi, Fiji.**

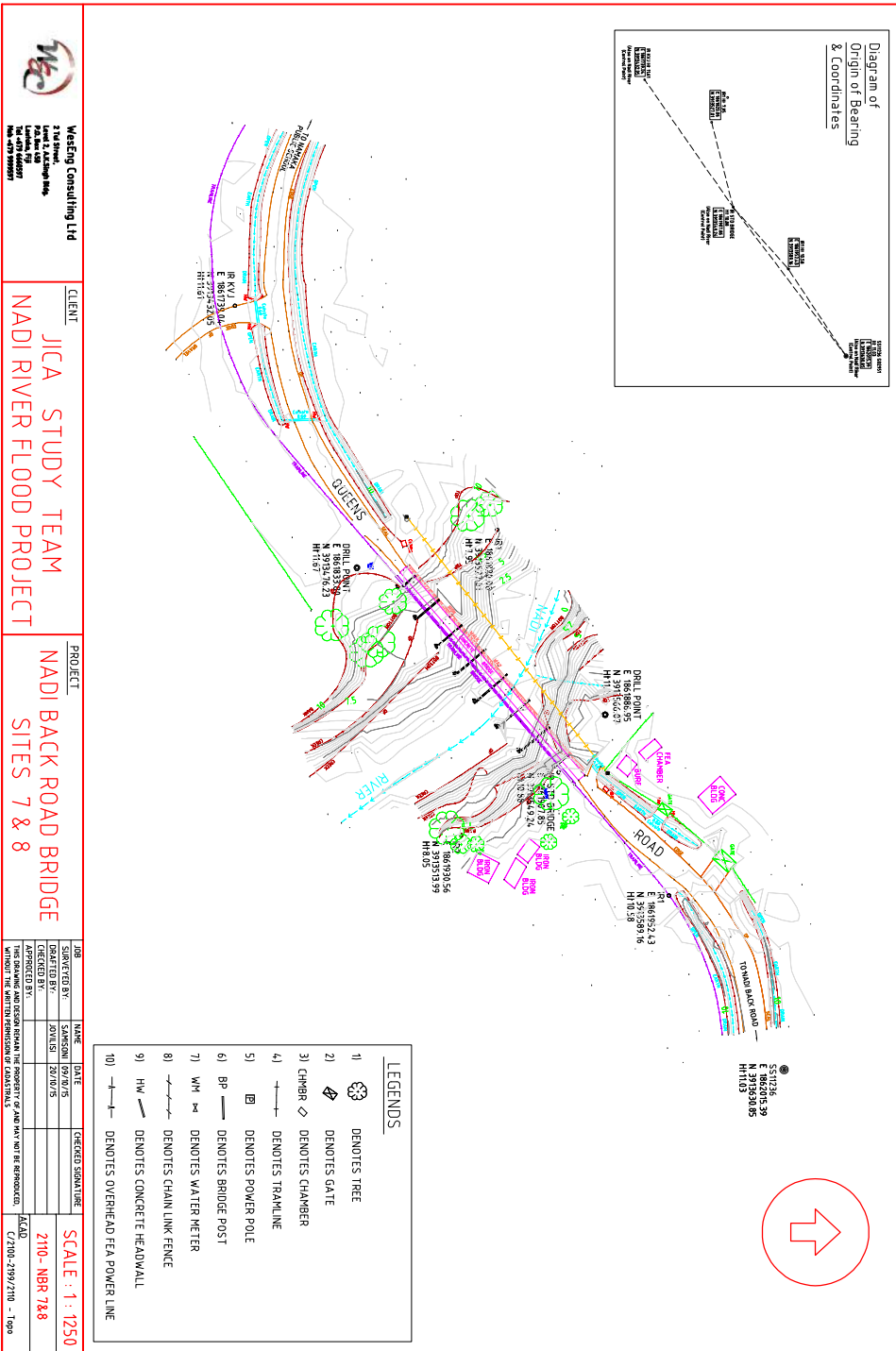


APPENDIX 7a Test Locality Plan



	ENTEC LIMITED Level 2, Mid City Plaza Cor. Canning St & Victoria Road P.O. Box 12309 Suva, Fiji	ENGINEERING AND SCIENCE CONSULTANTS Unit 2, VT Solutions 24, Gawa Road P.O. Box 12309 Nadi, Fiji	Phone (679) 331 0300	Fax (679) 331 8618	Email info@entecfiji.com	CLIENT: Japan International Cooperation Agency (JICA) Nadi River Basin Project	NOTE: THIS DRAWING HAS BEEN REPRODUCED BY ENTEC TO SHOW THE APPROXIMATE BOREHOLE LOCATION.	DRAWN BY: ISS CHECKED BY: KC APPROVED BY: JD	ISSUE DATE: November 2015	A3
	PROJECT:	SHEET TITLE: TEST LOCALITY PLAN	SCALE: NTS	PROJECT NO.: 1920815	DRAWING NO.: 1 of 1					

APPENDIX 7b Engineering Borehole Log and Core Photos



DRILL HOLE LOG																	
Project: Nadi River Basin Drilling Works			Feature		Location: Old Queens Road Bridge		No.: BH07										
Job No.: 1920815	Start Date: 14-10-2015 Finish Date: 14-10-2015		Ground Level (m): 11.67	Co-Ordinates (°): E 1861833.8 N 3913476.2													
Client: JICA Study Team			Hole Depth: 20.00 m			Sheet: 1 of 5											
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests
				Clayey SILT with some fine to medium sand and trace of fine sub-rounded gravel, dark brown, firm to stiff, most, low plasticity				+10.67	1		500 100						
				Silty CLAY, dark brown, soft to firm, moist, medium to high plasticity				+9.67	2								
				Clayey SILT with trace of root fibres, dark brown, soft to firm, moist, medium plasticity				+8.17	3								
				SILT with some fine sand, dark brown, soft, moist, low to medium plasticity				+7.17	4								
				SILT with fine sand and trace of iron staining, light brown, stiff, moist, low to medium plasticity				+6.67									
Explanations:				Remarks													
Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered				N = Standard Penetration Test													
Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong				Logged to NZGS 'Field description of soil & rock' December 2005													
TCR - Total Core Recovery				● Small Disturbed Sample													
SCR - Solid Core Recovery				○ Large Disturbed Sample													
ROD - Rock Quality Designation				□ Scale Penetrometer - blows/100mm													
Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				↓ Permeability Test													
				■ U100 Undisturbed Sample													
				◀ Insitu Vane Shear Strength (kPa)													
				UTP = Unable to penetrate													
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC									

DRILL HOLE LOG																	
Project: Nadi River Basin Drilling Works			Feature		Location: Old Queens Road Bridge		No.: BH07										
Job No.: 1920815	Start Date: 14-10-2015 Finish Date: 14-10-2015		Ground Level (m): 11.67	Co-Ordinates (°): E 1861833.8 N 3913476.2													
Client: JICA Study Team			Hole Depth: 20.00 m			Sheet: 2 of 5											
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests
				Clayey SILT with trace of fine sand and fine sub-angular gravel, pale brown				+6.17	6								
				Fine to coarse SAND with fine to medium sub-rounded to subangular gravel with trace of silt (highly to completely weathered SANDSTONE, very weak to weak)				+5.47	7								
				SILT with fine to medium sand with trace of medium sub-angular gravel, dark brown				+4.67	7								
				Clay SILT with trace of silt stone nodules and iron staining, light brown, firm to stiff, medium to high plasticity					8								
									8								
									8.00								
									100								
									100								
									100								
									100								
Explanations:				Remarks													
Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered				N = Standard Penetration Test													
Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong				Logged to NZGS 'Field description of soil & rock' December 2005													
TCR - Total Core Recovery				● Small Disturbed Sample													
SCR - Solid Core Recovery				○ Large Disturbed Sample													
ROD - Rock Quality Designation				□ Scale Penetrometer - blows/100mm													
Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				↓ Permeability Test													
				■ U100 Undisturbed Sample													
				◀ Insitu Vane Shear Strength (kPa)													
				UTP = Unable to penetrate													
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC									

DRILL HOLE LOG																		
Project: Nadi River Basin Drilling Works			Feature		Location: Old Queens Road Bridge		No.: BH07											
Job No.: 1920815	Start Date: 14-10-2015 Finish Date: 14-10-2015		Ground Level (m): 11.67	Co-Ordinates ('): E 1861833.8 N 3913476.2														
Client: JICA Study Team			Hole Depth: 20.00 m		Sheet: 3 of 5													
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests	
				Clayey SILT with trace of silt stone nodules and iron staining, light brown, firm to stiff, medium to high plasticity (highly to completely weathered SILTSTONE, light brown, weak to very weak) (continued)					11		500 100						P= 193 kPa P= 223 kPa P= 266,5 kPa SPT 11,00 m N=40 P= 173 kPa P= 136 kPa	
				Silty CLAY with trace of fine gravel and silt stone nodules, light brown, firm to stiff, low to medium plasticity				-0,83	12								P= 165 kPa SPT 12,50 m N=36 P= 106,5 kPa	
				Silty CLAY with some silt fragments and fine to medium subangular to subrounded gravel and trace of sand				-1,63	13								P= 166,5 kPa	
				Fine to coarse sub angular to sub rounded GRAVEL with trace of coarse sand				-2,33	14								SPT 14,00 m N=51	
Explanations:				<p>Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered</p> <p>Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong</p> <p>TCR - Total Core Recovery</p> <p>SCR - Solid Core Recovery</p> <p>ROD - Rock Quality Designation</p> <p>Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge</p> <p>● Small Disturbed Sample</p> <p>○ Large Disturbed Sample</p> <p>Scale Penetrometer - blows/100mm</p> <p>↓ Permeability Test</p> <p>U100 Undisturbed Sample</p> <p>Institu Vane Shear Strength (kPa)</p> <p>UTP = Unable to penetrate</p>														
Remarks				<p>N = Standard Penetration Test</p> <p>Logged to NZGS 'Field description of soil & rock' December 2005</p>														
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC										

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DRILL HOLE LOG																		
Project: Nadi River Basin Drilling Works			Feature		Location: Old Queens Road Bridge		No.: BH07											
Job No.: 1920815	Start Date: 14-10-2015 Finish Date: 14-10-2015		Ground Level (m): 11.67	Co-Ordinates ('): E 1861833.8 N 3913476.2														
Client: JICA Study Team			Hole Depth: 20.00 m		Sheet: 4 of 5													
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests	
				Fine to coarse sub angular to sub rounded GRAVEL with trace of coarse sand (continued)					16								SPT 15,50 m N=50	
				Silty fine SAND with some fine to medium subangular gravel				-5,33	17								SPT 17,00 m N=50 P= 188 kPa	
				Clayey SILT with trace of coarse sand, pale grey, stiff, low to medium plasticity (highly to completely weathered SILTSTONE, pale grey, weak to very weak)				-6,03	18								SPT 18,50 m N=56 P= 181,5 kPa	
				Fine to coarse SAND with some fine to medium subangular to rounded gravel and trace of silt, reddish brown				-7,33	19								P= 181,5 kPa	
				Fine to coarse SAND with some medium to coarse unrounded gravel, light grey brown				-7,83										
Explanations:				<p>Hole Terminated at 20.00 m N = Standard Penetration Test</p> <p>Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered</p> <p>Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong</p> <p>TCR - Total Core Recovery</p> <p>SCR - Solid Core Recovery</p> <p>ROD - Rock Quality Designation</p> <p>Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge</p> <p>● Small Disturbed Sample</p> <p>○ Large Disturbed Sample</p> <p>Scale Penetrometer - blows/100mm</p> <p>↓ Permeability Test</p> <p>U100 Undisturbed Sample</p> <p>Institu Vane Shear Strength (kPa)</p> <p>UTP = Unable to penetrate</p>														
Remarks				<p>N = Standard Penetration Test</p> <p>Logged to NZGS 'Field description of soil & rock' December 2005</p>														
All dimensions in metres Scale 1:31		Contractor: GDISL		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: DMC										

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6.20m to 9.20m



9.20m to 11.20m



11.20m to 13.30m



13.30m to 17.80m



APPENDIX 7c Laboratory Test Schedule and Test Results

PRINCIPAL : JICA
PROJECT NAME : Near River Project Drilling Works
SITE ADDRESS: Site 7, (BH 07)
DATE: 25 October 2015
TEST RESULTS REQUIRED BY:

Date: _____
SAMPLES SENT BY: _____
Notes: _____

Lab Test Schedule

Project No.	Site	Soil Type	Sample Type	SPT N Value	Depth (m)	Permeability	Density	Moisture Content	PSD	Atterberg	UCS	Consolidation	Remarks
1920815	Site 7, (BH 07)	Clayey SILT	SPT		1.0-1.4								
		Sandy SILT	SPT		1.4-2.0								
		Sandy SILT	SPT		2.0-3.4								
		Sandy SILT	SPT		3.4-5.0								
		Silty CLAY	SPT		5.0-5.8								
		Silty CLAY	SPT		6.5-7.0								
		Silty CLAY	SPT		8.0-8.4								
		Silty CLAY	SPT		9.5-10.0								
		Clayey SILT	SPT		11.0-11.5								
		Sandy GRAVEL	SPT		12.5-13.0								
		Heavy SAND	SPT		14.0-14.5								
		HPH washed SANDSTONE	SPT		15.5-16.0								
		Silty SAND	SPT		17.0-17.50								
Silty SAND	SPT		18.5-19.0										
Silty SAND	SPT		20.0-20.5										
TOTALS						1	1	10	6	3	1	1	0
Bill of Quantity						1	3	10	6	3	3	3	

Lab Testing Schedule to be sent with samples
Lab Test Schedule checked by: DMC
Date: _____

Turn around time for results - Two Bore hole results per week except consolidation test results

Atterberg Limit Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 25 October 2015
SITE ADDRESS	: Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST	: TL
MATERIAL TYPE & DESCRIPTION	: Clayey SILT trace of root fibres, dark brown, soft to firm, moist, medium plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N 576 BH 07 2.0m - 2.35m

NATURAL MOISTURE CONTENT						
TEST No.	1	2				Average
Container No.	g 50	51				
Mass of Container	g 3.62	3.54				
Mass of Container + Wet Soil	g 12.18	12.87				
Mass of Container + Dry Soil	g 10.45	11.01				
Mass of Dry Soil	g 6.83	7.47				
Mass of Moisture	g 1.73	1.86				
Moisture Content	% 25.33	24.90				25.11

PLASTIC LIMIT						
TEST No.	1	2				Average
Container No.	99	97				
Mass of Container	g 11.84	11.56				
Mass of Container + Wet Soil	g 17.11	16.94				
Mass of Container + Dry Soil	g 15.94	15.77				
Mass of Dry Soil	g 4.10	4.21				
Mass of Moisture	g 1.17	1.17				
Moisture Content	% 28.54	27.79				28.16

LIQUID LIMIT						
TEST No.	1	2	3	4	5	6
Number of Blows	40	35	30	26	21	15
Container No.	98	133	134	135	136	137
Mass of Container	g 11.90	11.30	11.27	11.62	11.78	11.32
Mass of Container + Wet Soil	g 23.10	21.96	23.91	21.47	21.82	20.12
Mass of Container + Dry Soil	g 19.78	18.72	20.09	18.42	18.70	17.32
Mass of Dry Soil	g 7.88	7.42	8.82	6.80	6.92	6.00
Mass of Moisture	g 3.32	3.24	3.82	3.05	3.12	2.80
Moisture Content	% 42.13	43.67	43.31	44.85	45.09	46.67

LINEAR SHRINKAGE TEST						
Mould No.	1	2	3	4	5	Average
Initial length of Sample	140.00					
Final length of Sample after Shrinkage	124.00					
% Shrinkage	11.43					11.43

Sample Preparation
as received
washed/sieved on 425 µm sieve
air dried/oven dried 105°C
after making a paste cured for 12-16 hrs

Liquid Limit	44.20 %
Plastic Limit	28.16 %
Plasticity Index	16.04 %
Shrinkage Limit	11.43 %

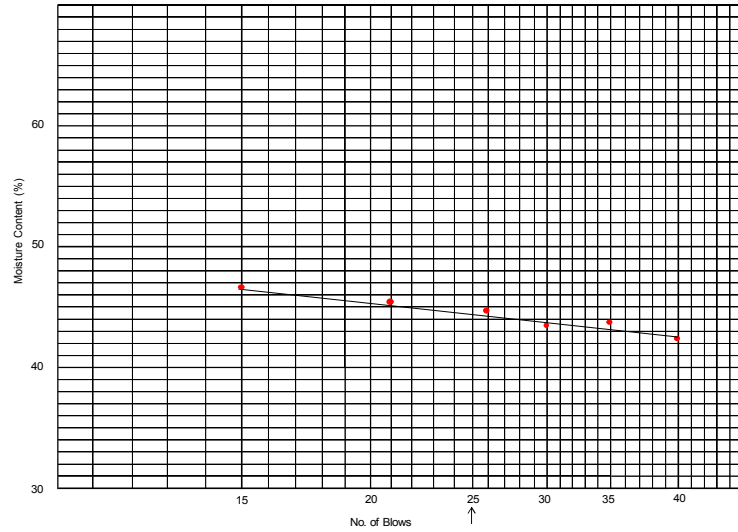
Tested By: TL
Date: 25 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE :	24 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	UM
SAMPLE LOCATION :	BH07 6.5m - 7.0m	MATERIAL TYPE & LOCATION :	SILT with fine to medium sand trace of medium sub angular gravel, dark brown
TEST NUMBER :	N579		

Graph of Moisture Content vs No. of Blows



Project No: 1920815
Sample No: N576

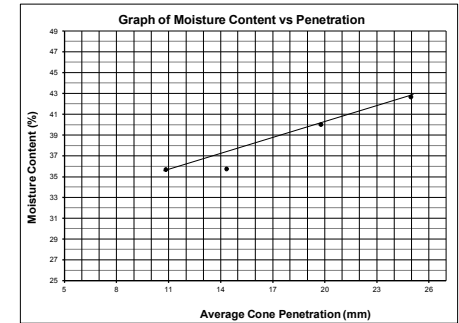
DETERMINATION OF THE CONE PENETRATION LIMIT AND WATER CONTENT						
TEST No.	1		2		3	
Initial Dial Gauge Reading	mm	0	0	0	0	0
Final Dial Gauge Reading	mm	14.50	14.20	20.42	19.55	19.37
Cone Penetration	mm	14.50	14.20	20.42	19.55	19.37
Average Cone Penetration	mm	14.35	19.78	24.98	10.86	
Container No.		155	110	146	144	
Mass of Container	g	11.70	11.89	11.77	11.99	
Mass of Container + Wet Soil	g	22.03	24.94	18.39	22.37	
Mass of Container + Dry Soil	g	19.31	21.21	16.41	19.64	
Mass of Dry Soil	g	7.61	9.32	4.64	7.65	
Mass of Moisture	g	2.72	3.73	1.98	2.73	
Moisture Content	%	35.74	40.02	42.67	35.69	

LINEAR SHRINKAGE TEST						
Mould No.	1	2	3	4	5	Average
Initial length of Sample				125.00		
Final length of Sample after shrinkage				111.00		
%Shrinkage				11.20		11.20

DETERMINATION OF THE WATER CONTENT			
Container No.	120	100	
Mass of Container	g	11.74	11.78
Mass of Container + Wet Soil	g	22.02	21.02
Mass of Container + Dry Soil	g	19.62	18.87
Mass of Dry Soil	g	7.88	7.09
Mass of Moisture	g	2.40	2.15
Moisture Content	%	30.46	30.32
Average Moisture Content	%	30.39	

DETERMINATION OF THE PLASTIC LIMIT			
Container No.	154	108	
Mass of Container	g	11.26	11.27
Mass of Container + Wet Soil	g	21.15	18.79
Mass of Container + Dry Soil	g	18.85	17.04
Mass of Dry Soil	g	7.59	6.77
Mass of Moisture	g	2.30	1.75
Moisture Content	%	30.30	30.33
Average Moisture Content	%	30.32	

Water Content	=	30.39
Cone Penetration Limit	=	38.53
Plastic Limit	=	30.32
Plasticity Index	=	8.21
Shrinkage Limit	=	11.20



Tested By: UM
Date: 24 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 07	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Silty CLAY trace of fine gravel and silt stone nodules, light brown, firm to stiff, low to medium plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N581 BH07 (12.5-13.0m)

NATURAL MOISTURE CONTENT						
TEST No.		1	2			Average
Container No.	g	46	34			
Mass of Container	g	14.71	14.89			
Mass of Container + Wet Soil	g	25.85	26.28			
Mass of Container + Dry Soil	g	22.33	22.71			
Mass of Dry Soil	g	7.62	7.82			
Mass of Moisture	g	3.52	3.57			
Moisture Content	%	46.19	45.65			45.92

PLASTIC LIMIT						
TEST No.		1	2			Average
Container No.		125	127			
Mass of Container	g	11.89	11.56			
Mass of Container + Wet Soil	g	17.44	17.84			
Mass of Container + Dry Soil	g	15.63	15.80			
Mass of Dry Soil	g	3.74	4.24			
Mass of Moisture	g	1.81	2.04			
Moisture Content	%	48.40	48.11			48.25

LIQUID LIMIT							
TEST No.		1	2	3	4	5	6
Number of Blows		40	35	29	24	20	15
Container No.		166	132	161	156	121	126
Mass of Container	g	11.72	11.78	11.74	11.86	11.65	12.83
Mass of Container + Wet Soil	g	22.82	20.20	21.28	21.63	23.97	23.90
Mass of Container + Dry Soil	g	18.75	16.98	17.58	17.74	18.94	19.34
Mass of Dry Soil	g	7.03	5.20	5.84	5.88	7.29	6.51
Mass of Moisture	g	4.07	3.22	3.70	3.89	5.03	4.56
Moisture Content	%	57.89	61.92	63.36	66.16	69.00	70.05

LINEAR SHRINKAGE TEST							
Mould No.		1	2	3	4	5	Average
Initial length of Sample						125.00	
Final length of Sample after Shrinkage						108.00	
% Shrinkage						13.60	13.60

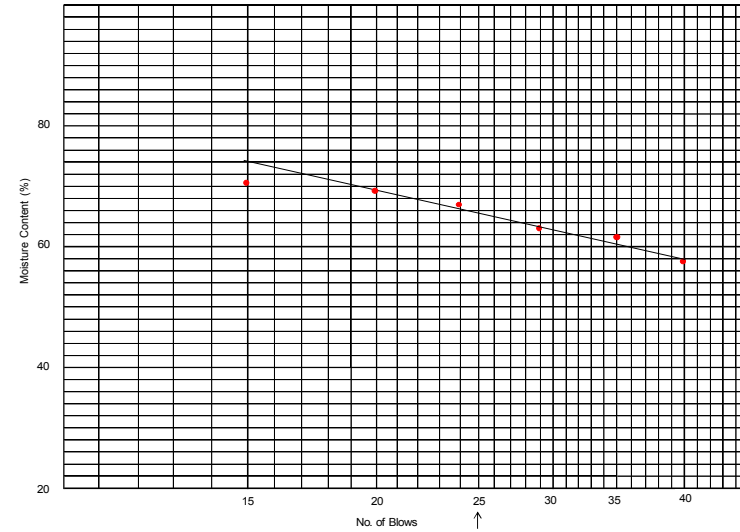
Sample Preparation as received	Liquid Limit	65.70 %
washed/sieved on 425 µm sieve	Plastic Limit	48.25 %
air dried/oven dried 105°C	Plasticity Index	17.45 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	13.60 %

Tested By: LN
Date :23 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By:IG
Date: 02 December 2015

Graph of Moisture Content vs. No. of Blows



Project No: 1920815
Sample No:N581

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE / TESTED :	23 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	KB
SAMPLE LOCATION :	BH07 3.5-4.0m	MATERIAL TYPE :	SILT with some fine sand dark brown, soft, moist, low to medium plasticity
TEST NUMBER :	N577		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	76	68
	Mass of Container	g	86.31	74.09
	Mass of Container + Wet Soil	g	165.62	167.87
	Mass of Container + Dry Soil	g	148.43	147.46
	Mass of Dry Soil	g	62.12	73.37
	Mass of Moisture	g	17.19	20.41
	Moisture Content	%	27.67	27.82
				27.75

Bulk Density	Sample No.	-	N577
	Diameter of Specimen	mm	53.50
	Initial area of specimen A_0 ($\pi/4 d^2$)	mm ²	2246.87
	Initial length of specimen L_0	mm	56.36
	Initial mass of specimen M_i	g	245.54
	Bulk Density ρ	t/m ³	1.94
	Dry Density ρ_d	t/m ³	1.52

Tested by : KB	Q.A. Check by : KB	Approved by : IG
Date : 23 October 2015	Date : 02 December 2015	Date : 02 December 2015

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE :	22 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
MATERIAL TYPE & DESCRIPTION :	Silty CLAY, dark brown, soft to firm, moist, medium to high plasticity	TEST METHOD :	NZS 4402:1986
		SAMPLE No. :	N575 BH07 1.0m - 1.4m

Moisture Content	%					
Container No.	g	10	11			
Mass of Container	g	52.26	52.88			
Mass of Container + Wet Soil	g	94.43	94.43			
Mass of Container + Dry Soil	g	85.95	86.13			
Mass of Dry Soil	g	33.69	33.25			
Mass of Moisture	g	8.48	8.30			
Moisture Content	%	25.17	24.96			25.07

Tested By: RK
Date: 22 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road : bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	SILT with some fine sand dark : brown, soft, moist, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N577 BH07 3.5m - 4.0m

Moisture Content	%					
Container No.	g	66	96			
Mass of Container	g	90.99	101.36			
Mass of Container + Wet Soil	g	137.59	126.86			
Mass of Container + Dry Soil	g	127.55	121.28			
Mass of Dry Soil	g	36.56	19.92			
Mass of Moisture	g	10.04	5.58			
Moisture Content	%	27.46	28.01			27.74

 Tested By: RK
 Date: 22 October 2015

 Q.A. Checked By: KB
 Date: 02 December 2015

 Approved By: IG
 Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road : bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	Clay SILT with trace of fine : sand and fine sub-angular gravel, pale brown	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N578 BH07 5.0m - 5.5m

Moisture Content	%					
Container No.	g	93	94			
Mass of Container	g	88.63	88.07			
Mass of Container + Wet Soil	g	106.08	106.11			
Mass of Container + Dry Soil	g	101.43	101.40			
Mass of Dry Soil	g	12.80	13.33			
Mass of Moisture	g	4.65	4.71			
Moisture Content	%	36.33	35.33			35.83

 Tested By: RK
 Date: 22 October 2015

 Q.A. Checked By: KB
 Date: 02 December 2015

 Approved By: IG
 Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road : bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	SILT with fine to medium sand : trace of medium sub angular gravel, dark brown	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N579 BH07 6.5m - 7.0m

Moisture Content	%					
Container No.	g	122	123			
Mass of Container	g	11.71	11.60			
Mass of Container + Wet Soil	g	20.50	20.51			
Mass of Container + Dry Soil	g	18.77	18.74			
Mass of Dry Soil	g	7.06	7.14			
Mass of Moisture	g	1.73	1.77			
Moisture Content	%	24.50	24.79			24.65

 Tested By: RK
 Date: 22 October 2015

 Q.A. Checked By: KB
 Date: 02 December 2015

 Approved By: IG
 Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road : bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	Clay SILT with trace of silt stone nodules and iron staining, light, brown, firm to stiff, medium to : high plasticity (highly to completely weathered, SILT STONE, light brown, weak to very weak	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N580 BH07 9.5m - 10.0m

Moisture Content	%					
Container No.	g	111	100			
Mass of Container	g	11.67	11.71			
Mass of Container + Wet Soil	g	23.14	23.18			
Mass of Container + Dry Soil	g	20.47	20.53			
Mass of Dry Soil	g	8.80	8.82			
Mass of Moisture	g	2.67	2.65			
Moisture Content	%	30.34	30.05			30.19

 Tested By: RK
 Date: 22 October 2015

 Q.A. Checked By: KB
 Date: 02 December 2015

 Approved By: IG
 Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	Silty CLAY trace of fine gravel and silt stone nodules, light brown, firm to stiff, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N581 BH07 12.5m - 13.0m

Moisture Content	%					
Container No.	g	126	127			
Mass of Container	g	12.82	11.56			
Mass of Container + Wet Soil	g	25.10	25.47			
Mass of Container + Dry Soil	g	21.28	21.17			
Mass of Dry Soil	g	8.46	9.61			
Mass of Moisture	g	3.82	4.30			
Moisture Content	%	45.15	44.75			44.95

 Tested By: RK
 Date: 22 October 2015

 Q.A. Checked By: KB
 Date: 02 December 2015

 Approved By: IG
 Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	Fine to coarse sub-angular to sub-rounded GRAVEL with trace of coarse sand	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N583 BH07 15.5m - 16.0m

Moisture Content	%					
Container No.	g	116	120			
Mass of Container	g	11.71	11.68			
Mass of Container + Wet Soil	g	26.83	26.83			
Mass of Container + Dry Soil	g	24.69	24.75			
Mass of Dry Soil	g	12.98	13.07			
Mass of Moisture	g	2.14	2.08			
Moisture Content	%	16.49	15.91			16.20

 Tested By: RK
 Date: 22 October 2015

 Q.A. Checked By: KB
 Date: 02 December 2015

 Approved By: IG
 Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road : bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	: Silty fine SAND with some fine to medium sub-angular gravel	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N584 BH07 17.0m - 17.50m

Moisture Content	%					
Container No.	g	125	108			
Mass of Container	g	11.87	11.28			
Mass of Container + Wet Soil	g	19.50	19.52			
Mass of Container + Dry Soil	g	17.63	17.50			
Mass of Dry Soil	g	5.76	6.22			
Mass of Moisture	g	1.87	2.02			
Moisture Content	%	32.47	32.48			32.47

Tested By: RK
Date: 22 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering : Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road : bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	: Clay SILT with trace of coarse sand, pale grey, stiff, low to medium plasticity (highly to completely weathered, SILTSTONE, pale grey, weak to very weak)	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N585 BH07 18.5m - 19.0m

Moisture Content	%					
Container No.	g	166	169			
Mass of Container	g	11.70	11.37			
Mass of Container + Wet Soil	g	20.06	20.07			
Mass of Container + Dry Soil	g	17.75	17.69			
Mass of Dry Soil	g	6.05	6.32			
Mass of Moisture	g	2.31	2.38			
Moisture Content	%	38.18	37.66			37.92

Tested By: RK
Date: 22 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	SAND fine to coarse with some : medium sub-angular to sub-rounded gravel, light grey brown	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N586 BH07 20.0m - 20.5m

Moisture Content	%					
Container No.	g	67	81			
Mass of Container	g	72.11	87.47			
Mass of Container + Wet Soil	g	120.39	120.42			
Mass of Container + Dry Soil	g	111.88	114.87			
Mass of Dry Soil	g	39.77	27.40			
Mass of Moisture	g	8.51	5.55			
Moisture Content	%	21.40	20.26			20.83

Tested By: RK
Date: 22 October 2015

Q.A. Checked By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

Unconfined Compressive Strength
NZS 4402:1986 (Test 6.3.1)

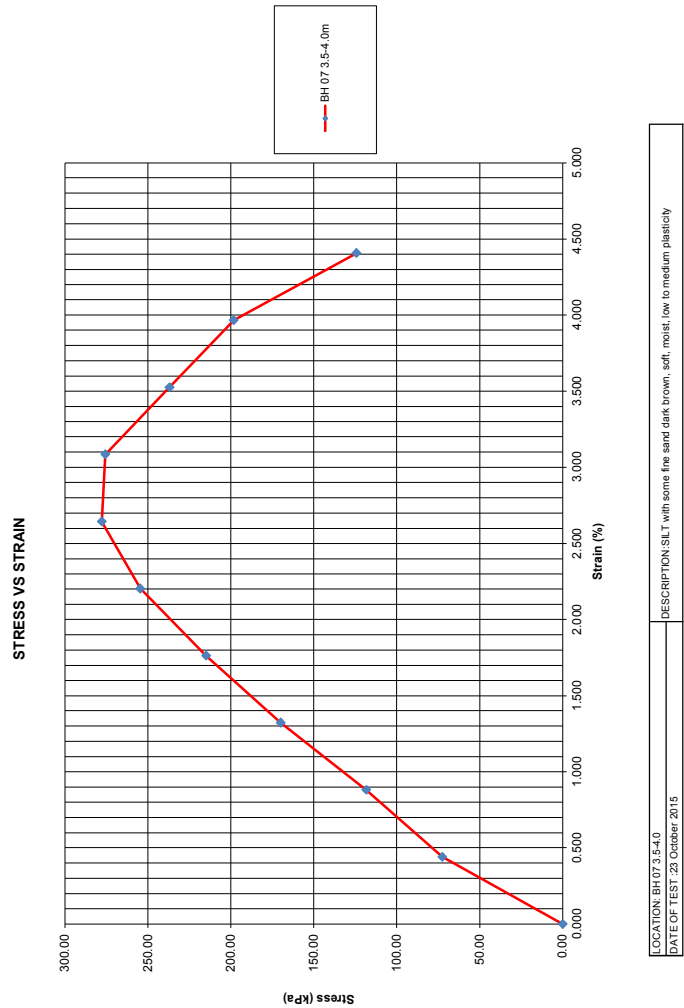
PRINCIPAL	: Japan International Cooperation Agency	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works.	DATE TESTED	: 23 October 2015
SITE ADDRESS	: Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST	: KB
SAMPLE LOCATION	: BH 07 3.5-4.0m	MATERIAL TYPE	: SILT with some fine sand dark brown, soft, moist, low to medium plasticity
TEST NUMBER	: N577		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content			
Container No.	-		95
Mass of Container	g		89.90
Mass of Container + Wet Soil	g		268.81
Mass of Container + Dry Soil	g		237.22
Mass of Dry Soil	g		147.32
Mass of Moisture	g		31.59
Moisture Content	%		21.44

Bulk Density			
Sample No.	-		N577
Diameter of Specimen	mm		53.96
Initial area of specimen A_0 ($\pi/4 d^2$)	mm ²		2285.67
Initial length of specimen L_0	mm		113.45
Initial mass of specimen M_i	g		502.79
Bulk Density ρ	t/m ³		1.94
Dry Density ρ_d	t/m ³		1.60

Compression Gauge Reading	Load Gauge Reading	Load	Strain $\epsilon = \frac{C_n - C_0}{L_0}$	Corrected Area $A = A_0 / (1 - \epsilon)$	Principal Stress Difference $\sigma_1 - \sigma_3 = 1000P/A$
mm		(kN)	%	m ²	kPa
0.00	0	0	0.000	0.002286	0.00
0.50	83	0.1666	0.441	0.002296	72.57
1.00	136.0	0.2730	0.881	0.002306	118.39
1.50	196.0	0.3935	1.322	0.002316	169.88
2.00	249.0	0.5000	1.763	0.002327	214.90
2.50	297.0	0.5948	2.204	0.002337	254.50
3.00	326.0	0.6521	2.644	0.002348	277.75
3.50	325.0	0.6501	3.085	0.002358	275.65
4.00	280.0	0.5612	3.526	0.002369	236.87
4.50	235.0	0.4718	3.967	0.002380	198.23
5.00	148.0	0.2971	4.407	0.002391	124.26



Form GE-L-10

Page 2 of 2

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	21 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH07 3.5-4.0m	MATERIAL TYPE & LOCATION :	SILT with some fine sand dark brown, soft, moist, low to medium plasticity
TEST NUMBER :	N577		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	10	11	SPLIT SAMPLE
Mass of Container	g	52.29	52.89		Mass Passing Last Sieve: - g _{M₃}
Mass of Container + Wet Soil	g	64.57	63.14		Mass after Splitting: - g _{M₄}
Mass of Container + Dry Soil	g	62.40	61.34		Splitting Factor $\frac{M_3}{M_4}$
Mass of Dry Soil	g	10.11	8.45		= $\frac{M_3}{M_4}$
Mass of Moisture	g	2.17	1.80		
Moisture Content	%	21.46	21.30		
Average Moisture Content	%		21.38		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g		300.67
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$		
	M _T =	247.70	

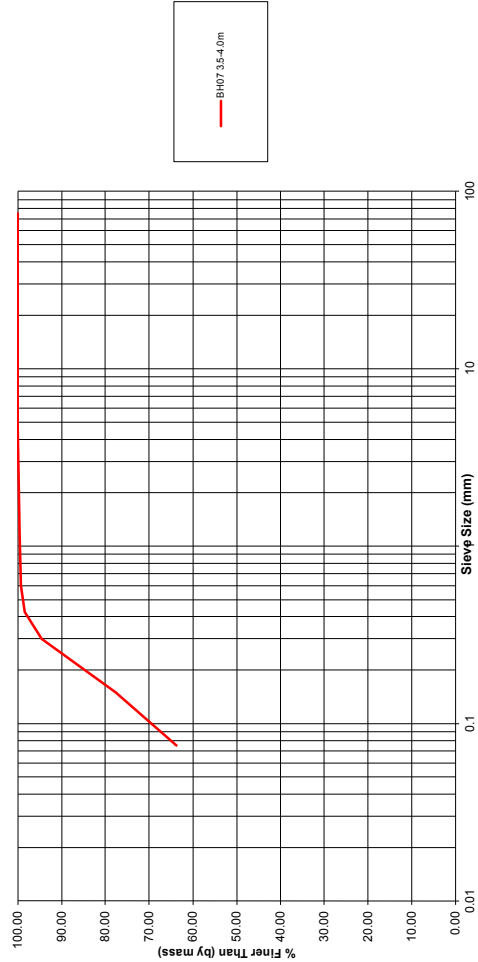
Test Sieve Size mm	Mass of Dry Soil Retained (M _c) g	Corrected Mass g	Percentage Retained $\frac{(M_c/M_r) \times 100}{100}$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	N/A	N/A	0.00	100.00	250	200
2.36 mm	0.42	N/A	0.17	99.83	150	200
1.18 mm	0.60	N/A	0.24	99.59	100	200
600 µm	0.71	N/A	0.29	99.30	80	200
425 µm	2.13	N/A	0.86	98.44	70	200
300 µm	9.77	N/A	3.94	94.50	60	200
150 µm	41.71	N/A	16.84	77.66	40	200
75 µm	34.36	N/A	13.87	63.79	25	200
Passing 75 µm	158.00	N/A	63.79	0.00	-	-
Pan Total	247.70	-	100.00	-	-	-

- NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	O.A. Checked by: KB	Approved by: IG
Date: 21 October 2015	Date: 02 December 2015	Date: 02 December 2015

Form GE-L-06

Page 1 of 2



LOCATION: BH07 3.5-4.0m
DATE OF TEST: 21 October 2015
DESCRIPTION: SILT, with some fine sand dark brown, soft, moist, low to medium plasticity
SAMPLE No: N577

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	22 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH07 5.0-5.50m	MATERIAL TYPE & LOCATION :	Clay SILT with trace of fine sand and fine sub-angular gravel, pale brown
TEST NUMBER :	N578		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	8	6	SPLIT SAMPLE
Mass of Container	g		53.06	53.08	Mass Passing Last Sieve: - gM ₃
Mass of Container + Wet Soil	g		71.79	72.18	Mass after Splitting: - gM ₄
Mass of Container + Dry Soil	g		67.76	68.36	Splitting Factor = $\frac{M_3}{M_4}$
Mass of Dry Soil	g		14.70	15.28	
Mass of Moisture	g		4.03	3.82	
Moisture Content	%		27.41	25.00	
Average Moisture Content	%		26.21		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g		318.36
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$		
	M _T =	252.25	

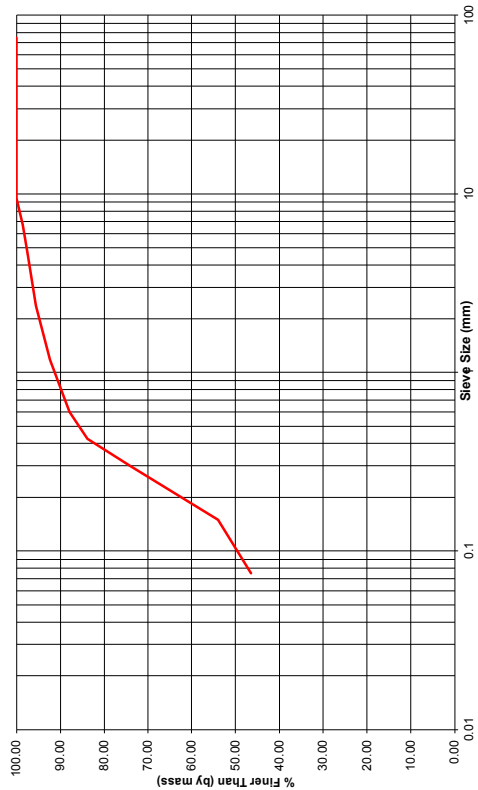
Test Sieve Size mm	Mass of Dry Soil Retained (M _s)	Corrected Mass	Percentage Retained = $\frac{(Mass M_s)}{100} \times 100$	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g	g	%	%	g	mm
75.0mm	N/A		0.00	100.00		300
50.0mm	N/A		0.00	100.00		300
37.5mm	N/A		0.00	100.00		300
26.5mm	N/A		0.00	100.00		300
19.0mm	N/A		0.00	100.00		200
13.2 mm	N/A		0.00	100.00	600	300
9.50 mm	N/A		0.00	100.00	450	300
6.70 mm	3.55	N/A	1.41	98.59	300	300
4.75 mm	2.73	N/A	1.08	97.51	250	200
2.36 mm	4.75	N/A	1.88	95.63	150	200
1.18 mm	8.44	N/A	3.35	92.28	100	200
600 µm	11.03	N/A	4.37	87.91	80	200
425 µm	10.49	N/A	4.16	83.75	70	200
300 µm	24.57	N/A	9.74	74.01	60	200
150 µm	50.46	N/A	20.00	54.01	40	200
75 µm	18.89	N/A	7.49	46.52	25	200
Passing 75 µm	117.34	N/A	46.52	0.00	-	-
Pan Total	252.25	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by :RK	Q.A. Checked by : KB	Approved by : IG
Date : 22 October 2015	Date :02 December 2015	Date :02 December 2015

Form GE-L-06

Page 1 of 2



BH07 5.0-5.50m

LOCATION: BH07 5.0-5.50m
DATE OF TEST: 22 October 2015
DESCRIPTION: Clay SILT with trace of fine sand and fine sub-angular gravel, pale brown.
SAMPLE No: N578

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	22 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH07 9.5-10.0m	MATERIAL TYPE & LOCATION :	Clay SILT with trace of silt stone nodules and iron staining, light, brown, firm to stiff, medium to high plasticity (highly to completely weathered, SILT STONE, light brown, weak to very weak
TEST NUMBER :	N580		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content (Material passing 19mm)	Container No.	-	113	112	SPLIT SAMPLE
Mass of Container	g	11.89	11.77	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	18.75	19.08	Mass after Splitting:	- + gM ₄
Mass of Container + Dry Soil	g	16.60	16.93	Splitting Factor	M ₃ / M ₄
Mass of Dry Soil	g	4.71	5.16	=	M ₃
Mass of Moisture	g	2.15	2.15		
Moisture Content	%	45.65	41.67		
Average Moisture Content	%	43.66			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	396.94
	Total Mass of dry sample (M _T)	M _T =	100M _w / (100 + w)
		M _T =	276.31

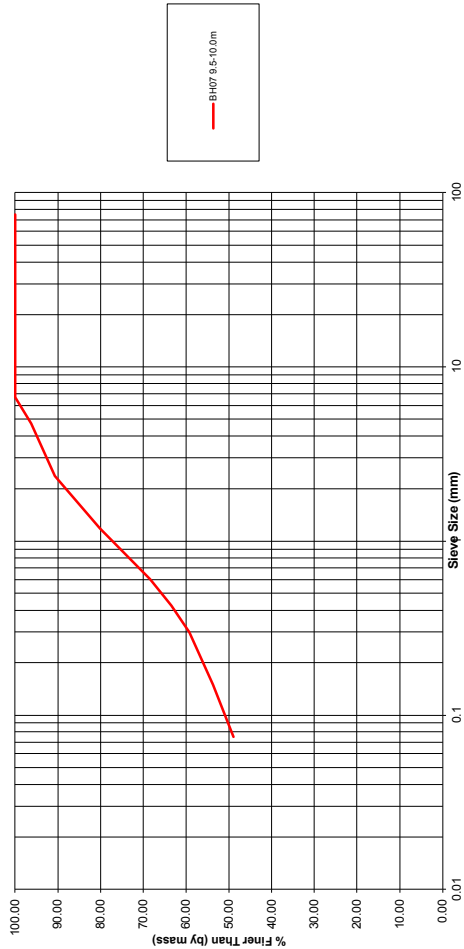
Test Sieve Size mm	Mass of Dry Soil Retained (M ₂)	Corrected Mass	Percentage Retained = (Mass M ₂) x 100	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g		%	%	g	mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	10.45	N/A	3.78	96.22	250	200
2.36 mm	15.41	N/A	5.58	90.64	150	200
1.18 mm	29.02	N/A	10.50	80.14	100	200
600 µm	32.62	N/A	11.81	68.33	80	200
425 µm	13.40	N/A	4.85	63.48	70	200
300 µm	11.68	N/A	4.23	59.26	60	200
150 µm	15.28	N/A	5.53	53.73	40	200
75 µm	13.39	N/A	4.85	48.88	25	200
Passing 75 µm	135.06	N/A	48.88	0.00	-	-
Pan Total	276.31	-	100.00	-	-	-

- NOTES:
- 1) Testing performed on fraction passing/retained on 19mm sieve
 - 2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: KB	Approved by: IG
Date: 22 October 2015	Date: 02 December 2015	Date: 02 December 2015

Form GE-L-06

Page 1 of 2



BH07 9.5-10.0m

LOCATION:	BH07 9.5-10.0m
DATE OF TEST:	22 October 2015
DESCRIPTION:	Clay SILT with trace of silt stone nodules and iron staining, light brown, firm to stiff, medium to high plasticity (highly to completely weathered SILT STONE, light brown, weak to very weak
SAMPLE No:	NS80

Form GE-L-06

Page 2 of 2

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	22 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH07 14.0-14.5m	MATERIAL TYPE & LOCATION :	Fine to coarse sub-angular to sub-rounded GRAVEL with trace of coarse sand
TEST NUMBER :	N582		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content (Material passing 19mm)	Container No.	-	12	15	SPLIT SAMPLE
Mass of Container	g	53.11	52.69	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	88.82	89.49	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	83.69	84.07	Splitting Factor = $\frac{M_3}{M_4}$	
Mass of Dry Soil	g	30.58	31.38		
Mass of Moisture	g	5.13	5.42		
Moisture Content	%	16.78	17.27		
Average Moisture Content	%	17.02			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g	393.74	
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$		
	M _T =	336.46	

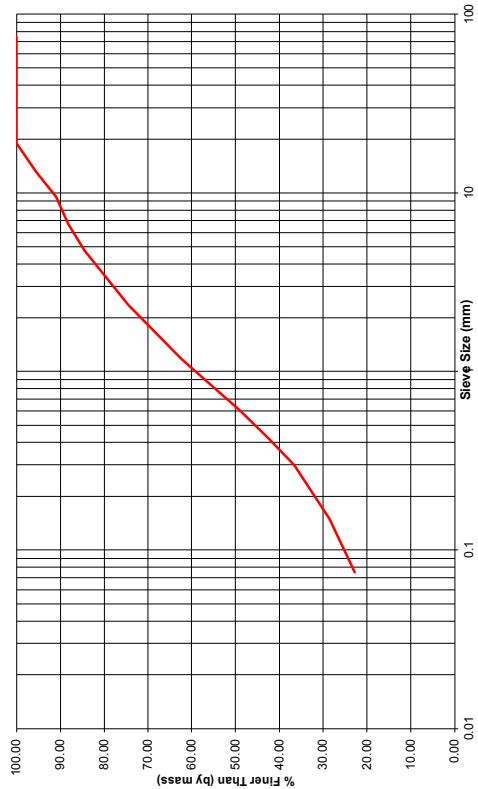
Test Sieve Size mm	Mass of Dry Soil Retained (M _s) g	Corrected Mass g	Percentage Retained = $\frac{(Mass M_s)}{100} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	15.17	N/A	4.51	95.49	600	300
9.50 mm	15.01	N/A	4.46	91.03	450	300
6.70 mm	9.49	N/A	2.82	88.21	300	300
4.75 mm	12.55	N/A	3.73	84.48	250	200
2.36 mm	33.45	N/A	9.94	74.54	150	200
1.18 mm	40.99	N/A	12.18	62.36	100	200
600 µm	45.34	N/A	13.48	48.88	80	200
425 µm	21.02	N/A	6.25	42.63	70	200
300 µm	20.28	N/A	6.03	36.60	60	200
150 µm	27.07	N/A	8.05	28.56	40	200
75 µm	19.47	N/A	5.79	22.77	25	200
Passing 75 µm	76.62	N/A	22.77	0.00	-	-
Pan Total	336.46	-	100.00	-	-	-

- NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: KB	Approved by: IG
Date: 22 October 2015	Date: 02 December 2015	Date: 02 December 2015

Form GE-L-06

Page 1 of 2



BH07 14.0-14.5m

LOCATION: BH07 14.0-14.5m
DATE OF TEST: 22 October 2015
DESCRIPTION: Fine to coarse, sub-angular to sub-rounded GRAVEL with trace of coarse sand
SAMPLE No: N582

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	23 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH06 17.0-17.50m	MATERIAL TYPE & LOCATION :	Silty fine SAND with some fine to medium sub-angular gravel
TEST NUMBER :	N584		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content (Material passing 19mm)	Container No.	-	42	44	SPLIT SAMPLE
Mass of Container	g	14.57	14.58	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	33.45	34.36	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	29.00	29.57	Splitting Factor	$\frac{M_3}{M_4}$
Mass of Dry Soil	g	14.43	14.99	=	$\frac{M_3}{M_4}$
Mass of Moisture	g	4.45	4.79		
Moisture Content	%	30.84	31.95		
Average Moisture Content	%	31.40			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	334.93
	Total Mass of dry sample (M _T)	M _T =	$\frac{100M_w}{100 + w}$
		M _T =	254.90

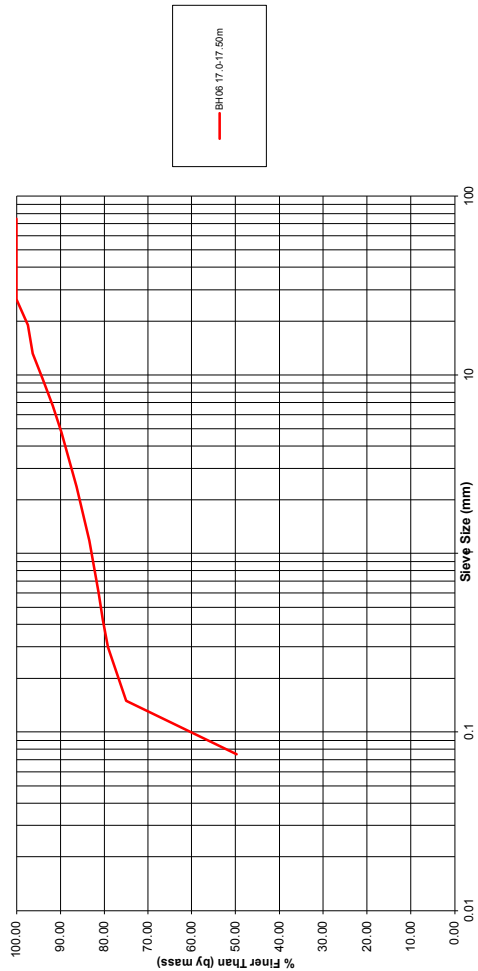
Test Sieve Size mm	Mass of Dry Soil Retained (M ₁) g	Corrected Mass g	Percentage Retained = $\frac{(M_1 - M_2)}{100} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
25.0mm	N/A	N/A	0.00	100.00		300
19.0mm	6.78	N/A	2.66	97.34		200
13.2 mm	2.50	N/A	0.98	96.36	600	300
9.50 mm	5.92	N/A	2.32	94.04	450	300
6.70 mm	6.10	N/A	2.39	91.64	300	300
4.75 mm	4.95	N/A	1.94	89.70	250	200
2.36 mm	8.88	N/A	3.48	86.22	150	200
1.18 mm	7.11	N/A	2.79	83.43	100	200
600 µm	5.33	N/A	2.09	81.34	80	200
425 µm	2.62	N/A	1.03	80.31	70	200
300 µm	3.14	N/A	1.23	79.08	60	200
150 µm	10.57	N/A	4.15	74.93	40	200
75 µm	64.43	N/A	25.28	49.65	25	200
Passing 75 µm	126.57	N/A	49.65	0.00	-	-
Plan Total	254.90	-	100.00	-	-	-

- NOTES:
- 1) Testing performed on fraction passing/retained on 19mm sieve
 - 2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	O.A. Checked by: KB	Approved by: IG
Date: 22 October 2015	Date: 02 December 2015	Date: 02 December 2015

Form GE-L-06

Page 1 of 2



LOCATION: BH06 17.0-17.50m
DATE OF TEST: 22 October 2015
DESCRIPTION: Silty fine SAND with some fine to medium sub-angular gravel
SAMPLE No: N584

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
(NZS 4407:1991 (Test 3.8.1

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	22 October 2015
SITE ADDRESS :	Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH07 18.5-19.0m	MATERIAL TYPE & LOCATION :	Clay SILT with trace of coarse sand, pale grey, stiff, low to medium plasticity (highly to completely weathered, SILTSTONE, pale grey, weak to very weak)
TEST NUMBER :	N585		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content (Material passing 19mm)	Container No.	-	36	23	SPLIT SAMPLE
Mass of Container	g	14.09	14.72		Mass Passing Last Sieve: - gM ₃
Mass of Container + Wet Soil	g	32.35	33.06		Mass after Splitting: - + gM ₄
Mass of Container + Dry Soil	g	28.09	28.79		Splitting Factor = $\frac{M_3}{M_4}$
Mass of Dry Soil	g	14.00	14.07		
Mass of Moisture	g	4.26	4.27		
Moisture Content	%	30.43	30.35		
Average Moisture Content	%	30.39			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	200.21
	Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$	
	M _T =	153.55	

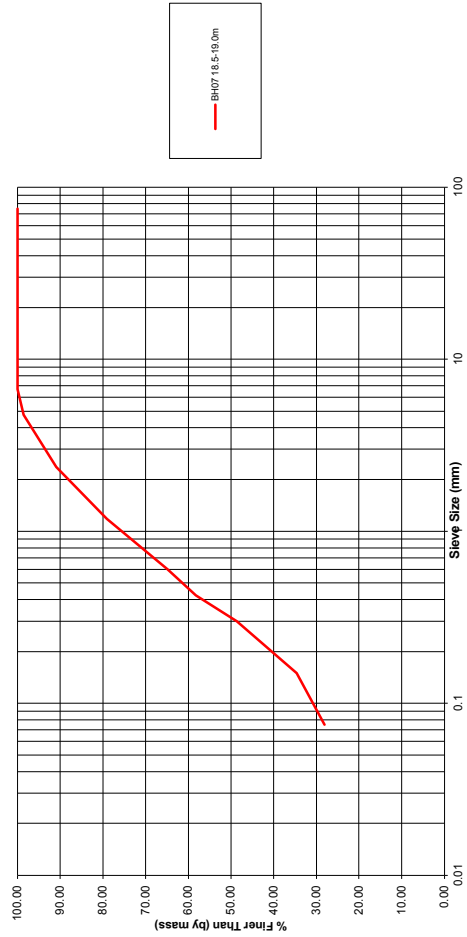
Test Sieve Size mm	Mass of Dry Soil Retained (M ₂)	Corrected Mass	Percentage Retained = $\frac{(Mass M_2)}{100} \times 100$	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g	g	%	%	g	mm
75.0mm	N/A	0.00	100.00			300
50.0mm	N/A	0.00	100.00			300
37.5mm	N/A	0.00	100.00			300
26.5mm	N/A	0.00	100.00			300
19.0mm	N/A	0.00	100.00			200
13.2 mm	N/A	0.00	100.00		600	300
9.50 mm	N/A	0.00	100.00		450	300
6.70 mm	N/A	0.00	100.00		300	300
4.75 mm	2.08	N/A	1.35	98.65	250	200
2.36 mm	11.75	N/A	7.65	90.99	150	200
1.18 mm	18.35	N/A	11.95	79.04	100	200
600 µm	21.77	N/A	14.18	64.86	80	200
425 µm	10.17	N/A	6.62	58.24	70	200
300 µm	14.77	N/A	9.62	48.62	60	200
150 µm	21.53	N/A	14.02	34.60	40	200
75 µm	10.01	N/A	6.52	28.08	25	200
Passing 75 µm	43.12	N/A	28.08	0.00	-	-
Pan Total	153.55	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : KB	Approved by : IG
Date : 21 October 2015	Date : 02 November 2015	Date : 02 November 2015

Form GE-L-06

Page 1 of 2



LOCATION:	BH07 18.5-19.0m	DESCRIPTION:	Clay SILT with trace of coarse sand, pale grey, - stiff, low to medium plasticity (highly to completely weathered, SILTSTONE, pale gray, weak to very weak)
DATE OF TEST :	22 October 2015	SAMPLE No:	NS85

Form GE-L-06

Page 2 of 2

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 30 October 2015
SITE ADDRESS	: Site 07, Old Queens Road bridge - Left Bank	TECHNOLOGIST	: IG/TL
MATERIAL TYPE & DESCRIPTION	: Fine to coarse sub-angular to sub-rounded GRAVEL with trace of coarse sand	TEST METHOD	: AS 1289.6.7.3-2001
		SAMPLE No.	: NS82 (BH07 14.0m - 14.5m)

Total Weight : -
Weight Retained on : -
Percentage retained: : -

MOISTURE CONTENT		
Container No.		35
Mass of Container	g	14.29
Mass of Container + Wet	g	27.62
Mass of Container + Dry	g	25.49
Mass of Dry Soil	g	11.20
Mass of Moisture	g	2.13
Moisture Content	%	19.02
Optimum moisture content	%	-
Laboratory moisture ratio	%	-

DENSITY		
Mass of Specimen	g	1460
Volume of Specimen	cm ³	703.72
Wet Density	t/m ³	2.07
Dry Density	t/m ³	1.74
Maximum Dry Density	t/m ³	-
Laboratory Density ratio	%	-

Area of stand pipe (dia. 12mm)	mm ²	113.10
Cross sectional area of soil	cm ²	50.27
Length of soil specimen	cm	14.00

TEST #	Constant Head h (cm)	Elapsed Time (tmin)	Out Flow Volume Q (cm ³)	Water temp T(°c)	KT cm/min	K ₉₀ cm/min
1	104	4.00	380	26	0.254	0.226
2	104	4.00	380	26	0.254	0.226
3	104	4.00	370	26	0.248	0.220
4	95	4.00	290	26	0.213	0.189
5	95	4.00	290	26	0.213	0.189
6	95	4.00	280	26	0.205	0.183
7	84	4.00	220	26	0.182	0.162
8	84	4.00	210	26	0.174	0.155
9	84	4.00	210	26	0.174	0.155
10	76	4.00	190	26	0.174	0.155
11	76	4.00	190	26	0.174	0.155
12	76	4.00	190	26	0.174	0.155


Average K₉₀ m/s : 3.01E-05

Tested By: IG/TL
Date: 30 October 2015

Q.A. Check By: KB
Date: 02 December 2015

Approved By: IG
Date: 02 December 2015

Oedometer Settlement Test


Sample Details	Depth	3.5m - 4.0m		
 <i>sketch showing specimen location in original sample</i>	Description	Silt with some fine sand, dark brown, firm, moist, low plasticity.		
	Initial Height	L ₀	(mm)	20.0
	Initial Diameter	D ₀	(mm)	50.0
	Initial Weight	W ₀	(gf)	63.0
	Bulk Density	ρ ₀	(Mg/m ³)	1.60
	Particle Density	ρ _s	(Mg/m ³)	2.65

Initial Conditions				
Settlement Input	L _{1P}	(mm)	CH 3	
Initial Moisture	ω _i %	(%)	24	
Initial Dry Density	ρ _{di}	(Mg/m ³)	1.29	
Initial Voids Ratio	e _i	.	1.053	
Initial Degree of Saturation	S _i	(%)	61.1	
Initial Swelling	S _s	(kPa)	0	

Final Conditions				
Final Moisture	ω _f %	(%)	19	
Dry Density	ρ _{df}	(Mg/m ³)	1.53	
Voids Ratio	e _f	.	0.730	
Saturation	S _f	(%)	70	
Height Settlement	ΔL _s	(mm)	3.148	

Vertical Stress σ' _i (kPa)	Voids Ratio e _f	Height ΔL _s (mm)	Consolidation C _v (m ² /year)	Compressibility m _v (m ² /MN)	Initial T _i (oC)	Final T _f (oC)	t ₅₀ Time t ₅₀ (min)	t ₉₀ Time t ₉₀ (min)	Secondary C _{SEC} (m ² /MN)
100	0.992	0.597	215.4	0.299	29.0	0.0		0.200	0.0087
200	0.730	3.148	155.2	1.315	29.0	0.0		0.235	0.0087
400	0.730	3.148	48.7		29.0	0.0		0.647	0.0087
800	0.730	3.148	65.9		29.0	0.0		0.478	0.0087
1600	0.730	3.148	69.7		29.0	0.0		0.452	0.0087
400	0.730	3.148			29.0	0.0			
100	0.730	3.148			29.0	0.0			

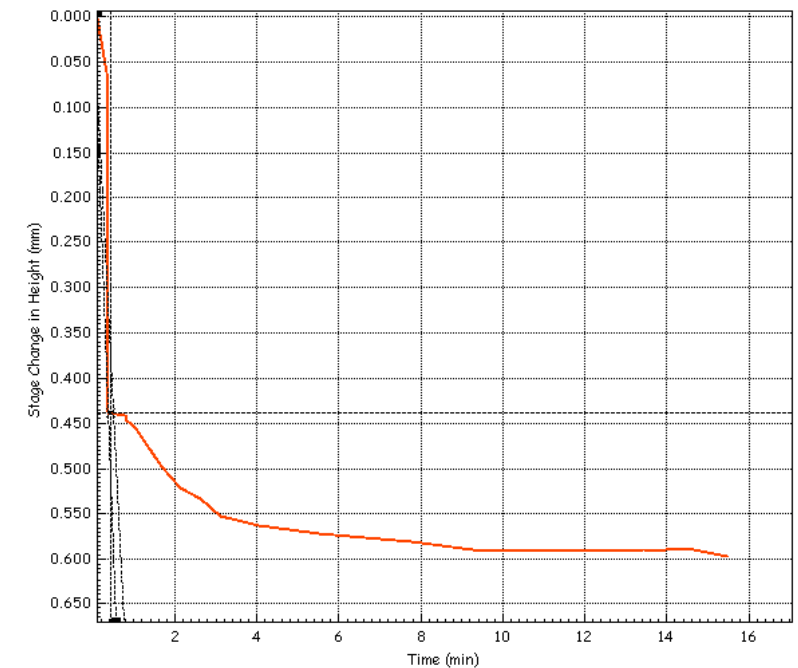
Notes


	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
Checked	DMC	Approved	DMC	

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

Oedometer Consolidation Settlement Report

Vertical Stress	σ' _i	(kPa)	100
Initial Temperature	T _i	(oC)	29.0
Frame Correction	L _{CORR}	(mm)	0.000
Height Settlement	ΔL _s	(mm)	0.597
Voids Ratio	e _f	.	0.992
Final Temperature	T _f	(oC)	0.0
t ₅₀ Time	t ₅₀	(min)	
t ₉₀ Time	t ₉₀	(min)	0.200
Consolidation	C _v	(m ² /year)	215.4
Compressibility	m _v	(m ² /MN)	0.299
Secondary Compression	C _{SEC}	(m ² /MN)	0.0087

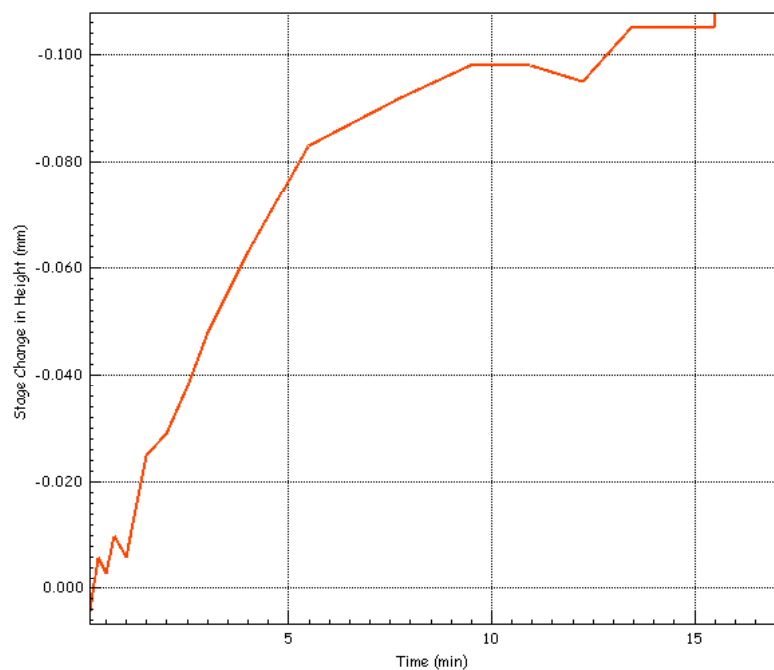


	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
Checked	DMC	Approved	DMC	

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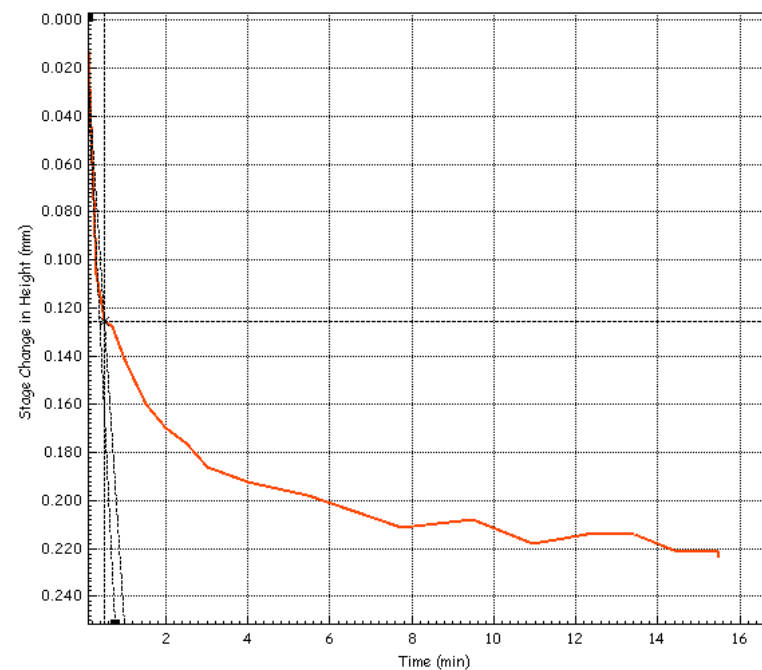
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	100
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.142
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	200
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.135
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.235
Consolidation	C_v	(m ² /year)	155.3
Compressibility	m_v	(m ² /MN)	1.308
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
	Checked	DMC	Approved	DMC

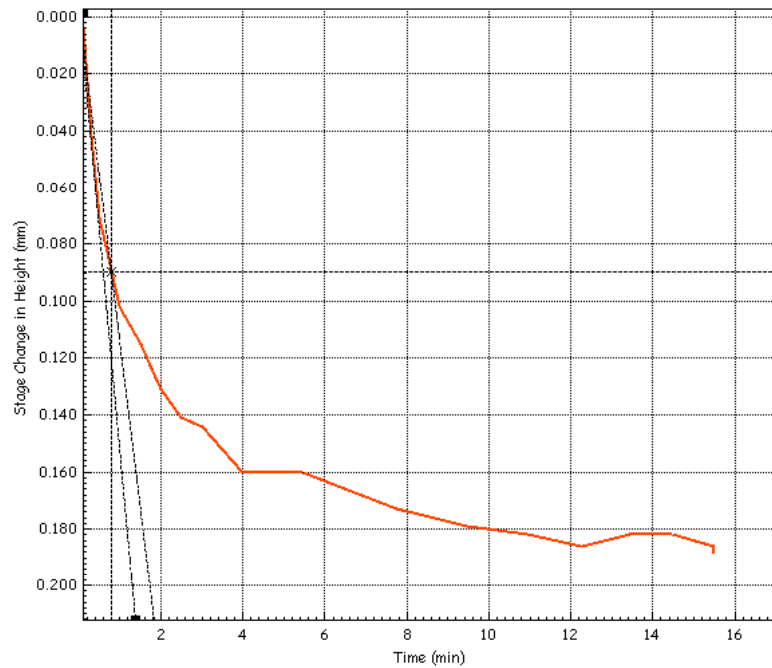
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

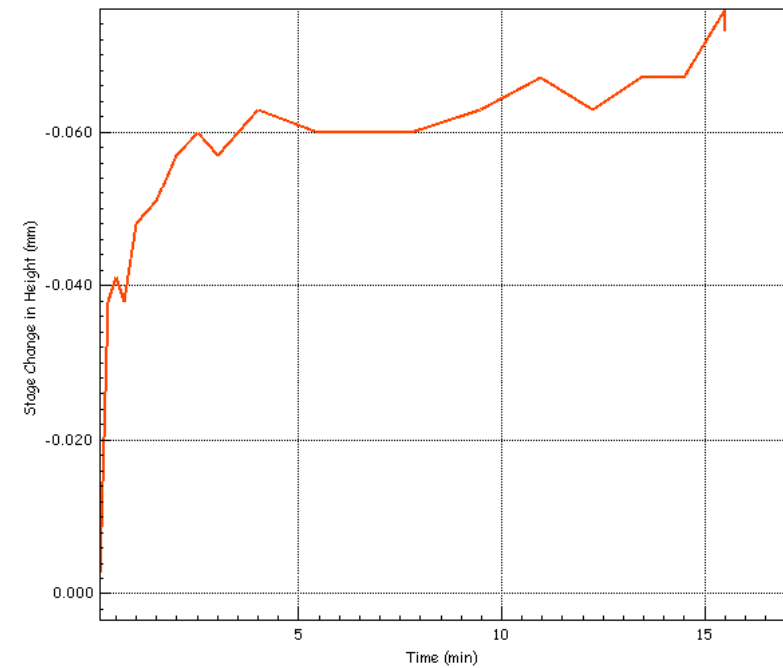
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	400
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.139
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.647
Consolidation	C_v	(m ² /year)	48.8
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	400
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.139
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
	Checked	DMC	Approved	DMC

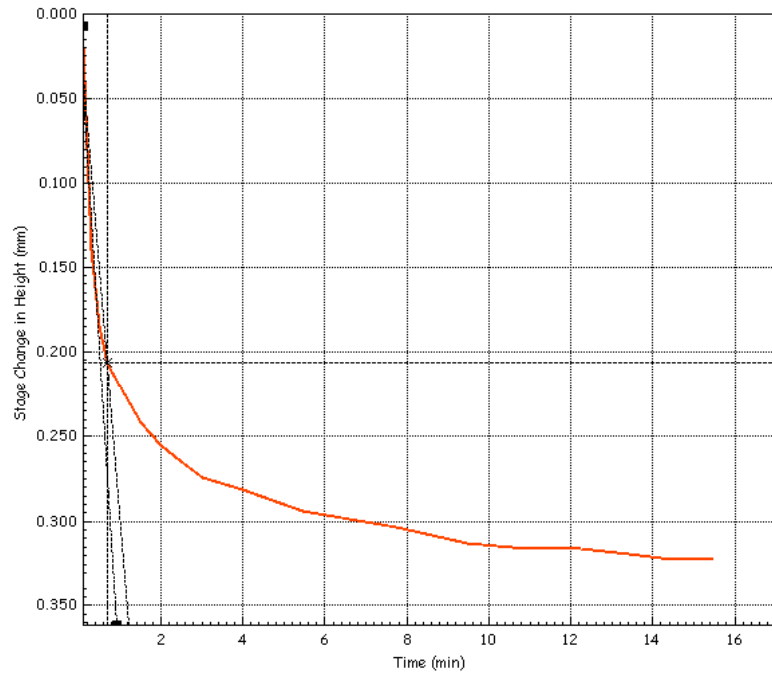
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

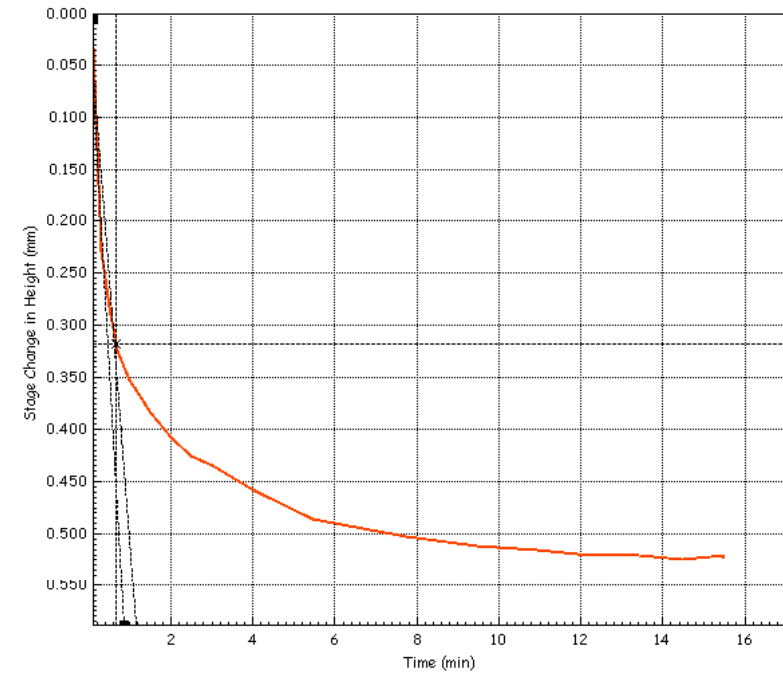
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	800
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.139
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.478
Consolidation	C_v	(m ² /year)	66.0
Compressibility	m_v	(m ² /MN)	0.000
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	1600
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	3.139
Voids Ratio	e_f	.	0.731
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.452
Consolidation	C_v	(m ² /year)	69.8
Compressibility	m_v	(m ² /MN)	0.000
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-08_005
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/26/2015
	Client	Japan International Cooperation	Sample	N577
	Operator	IG/MK	Borehole	BH07
	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

APPENDIX 7d
Site Photos



APPENDIX 8

**SITE 8 – Old Nadi Back Road Bridge (north east),
Nadi, Fiji.**

APPENDIX 8a

Test Locality Plan

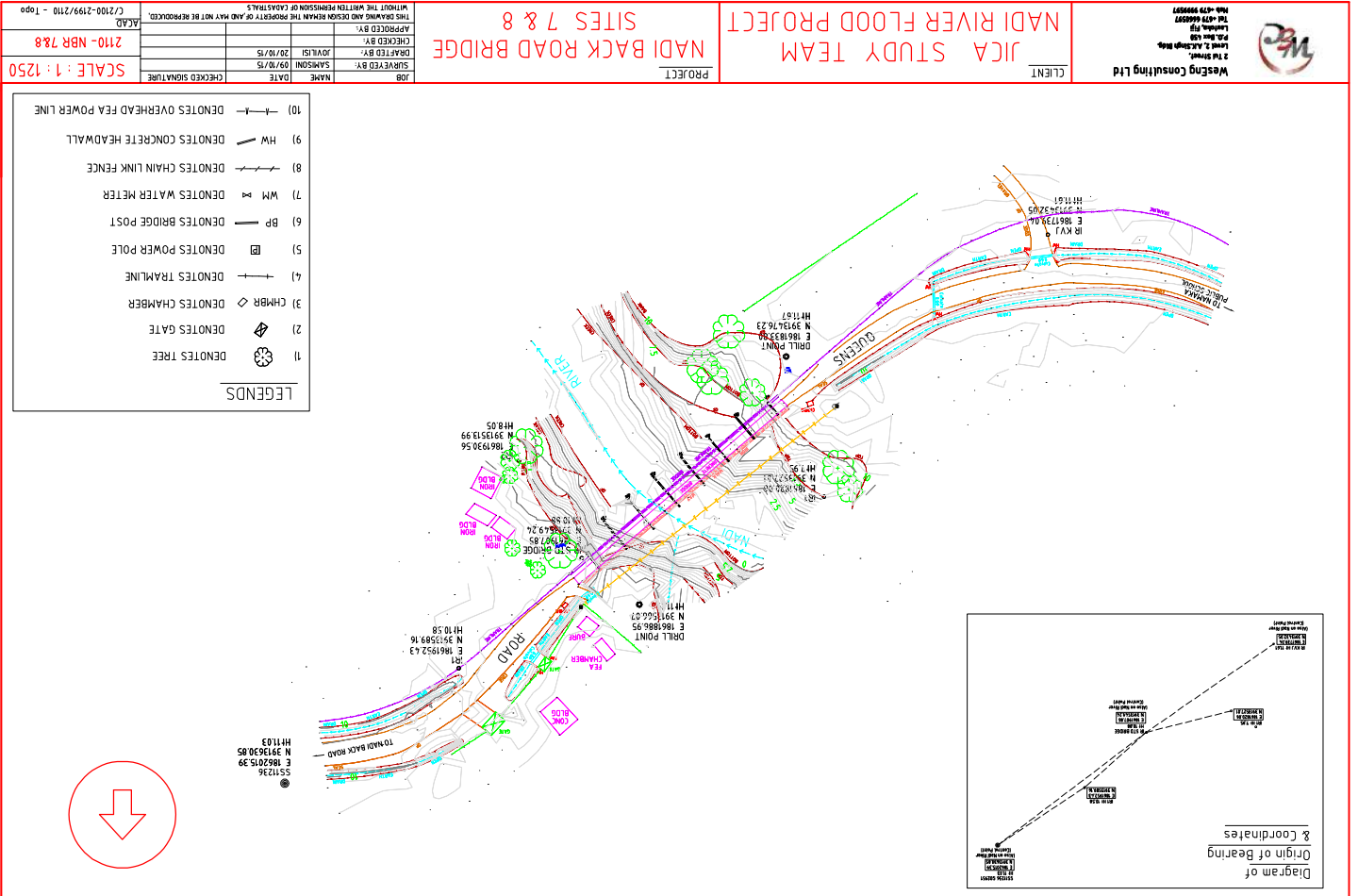


LEGEND
- BOREHOLE



	ENTEC LIMITED	ENGINEERING AND SCIENCE CONSULTANTS	CLIENT:	Japan International Cooperation Agency (JICA)	NOTE: THIS DRAWING HAS BEEN REPRODUCED BY ENTEC TO SHOW THE APPROXIMATE BOREHOLE LOCATION.	DRAWN BY	SS	A3	
	Level 2, Mid City Plaza Cnr. Cumming St & Renwick Road P.O. Box 12309 Suva, Fiji	Unit 2, VT Solutions 24 Cawa Road Marina P.O. Box 12309 Nadi, Fiji	Phone (679) 330 0300 Fax (679) 331 8618 Email info@entecfiji.com	PROJECT:		Nadi River Basin Project	CHECKED BY		KC
						APPROVED BY	JD	SHEET TITLE	TEST LOCALITY PLAN
						SCALE	NTS	DRAWING NO.	1 of 1
						ISSUE DATE	November 2015		

D15-247



WITHOUT THE WRITTEN PERMISSION OF CLIENTS THIS DRAWING AND DESIGN REMAIN THE PROPERTY OF ENTEC AND MAY NOT BE REPRODUCED. C/2100-2199/2110 - Top SCALE: 1:1250 2110-NBR 7&8 CHECKED SIGNATURE DATE NAME JOB	APPROVED BY: CHECKED BY: DRAFTER BY: SLAVEYER BY:	JOYALISI 20/10/15 SAMSONI 09/10/15	PROJECT NADI BACK ROAD BRIDGE SITES 7 & 8	CLIENT JICA STUDY TEAM NADI RIVER FLOOD PROJECT	WESTING CONSULTING LTD 2 The Strand Level 2, Kaitiaki Place Lambing, Fiji Tel: +679 6699977 Fax: +679 6699977 Email: info@westing.com.fj
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APPENDIX 8b

Engineering Borehole Log and Core Photos

DRILL HOLE LOG															
Project: Nadi River Basin Drilling Works					Feature			Location: Old Queens Road Bridge		No.: BH08					
Job No.: 1920815		Start Date: 14-10-2014 Finish Date: 15-10-2015		Ground Level (m): 11.19		Co-Ordinates (): E 1861857.0 N 3913566.1									
Client: JICA Study Team					Hole Depth: 23.00 m			Sheet: 1 of 5							
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR SCR ROD (%)	Samples	Tests
				Sandy GRAVEL with trace of silt, black, medium to coarse, loosely packed, CONCRETE				+10.19	1						
				CONCRETE with coarse gravel				+7.68	2						
				Clayey SILT, dark brown, soft to firm, moist, low to medium plasticity				+7.19	4						
				SILT with trace of fine sand and root fibres, stiff, moist, low to medium plasticity				+6.19							
<p>Explanations:</p> <ul style="list-style-type: none"> Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge ● Small Disturbed Sample ○ Large Disturbed Sample ▬ Scale Penetrometer - blows/100mm ⬇ Permeability Test ■ U100 Undisturbed Sample ◁ Insitu Vane Shear Strength (kPa) UTP = Unable to penetrate 													<p>Remarks</p> <p>N = Standard Penetration Test</p> <p>Logged to NZGS 'Field description of soil & rock' December 2005</p>		
All dimensions in metres Scale 1:31					Contractor:					Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL	Checked by: MK		

DRILL HOLE LOG																			
Project: Nadi River Basin Drilling Works			Feature		Location: Old Queens Road Bridge		No.: BH08												
Job No.: 1920815		Start Date: 14-10-2014 Finish Date: 15-10-2015		Ground Level (m): 11.19	Co-Ordinates (°): E 1861857.0 N 3913566.1														
Client: JICA Study Team				Hole Depth: 23.00 m			Sheet: 2 of 5												
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests		
				SILT with some fine to coarse sand, dark brown, soft, moist, low plasticity							500 100						SPT 5.00 m N=9 P=78 kPa		
				SILT with coarse sand trace of root fibres, dark brown, stiff, low to medium plasticity				+4.69									P=275 kPa		
				Silty fine to coarse SAND, dark brown				+3.19									P=51.5 kPa		
				Medium to coarse SAND with some coarse sub-angular to sub-rounded gravel				+1.69									P=173 kPa SPT 8.00 m N=14		
								+1.19									SPT 9.50 m N=35		
Explanations:				Remarks															
Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered				N = Standard Penetration Test															
Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong				Logged to NZGS 'Field description of soil & rock' December 2005															
TCR - Total Core Recovery				● Small Disturbed Sample															
SCR - Solid Core Recovery				○ Large Disturbed Sample															
ROD - Rock Quality Designation				□ Scale Penetrometer - blows/100mm															
Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				⬇ Permeability Test															
				⬇ U100 Undisturbed Sample															
				⬇ Insitu Vane Shear Strength (kPa)															
				⬇ UTP = Unable to penetrate															
All dimensions in metres Scale 1:31		Contractor:		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: MK											

DRILL HOLE LOG																			
Project: Nadi River Basin Drilling Works			Feature		Location: Old Queens Road Bridge		No.: BH08												
Job No.: 1920815		Start Date: 14-10-2014 Finish Date: 15-10-2015		Ground Level (m): 11.19	Co-Ordinates (°): E 1861857.0 N 3913566.1														
Client: JICA Study Team				Hole Depth: 23.00 m			Sheet: 3 of 5												
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests		
				Fine to medium sub-angular to sub-rounded GRAVEL with some coarse sand							500 100						SPT 11.00 m N=26		
				Coarse SAND with fine to medium sub-angular to sub-rounded gravel				+0.19									P=11.00 kPa		
				Silty fine to coarse SAND, brown moist, low plasticity				-1.31									SPT 12.50 m N=41		
				Highly to completely weathered SANDSTONE, brownish, weak to very weak, (fine to medium SAND with some silt and trace of iron stain brown)				-1.81									P=300 kPa		
				SILT with some siltstone nodules and fine sub-angular gravel with trace of clay, pale brown, soft to firm, low to medium plasticity (highly to completely weathered, SILTSTONE, pale brown, weak to very weak)				-2.81									P=150 kPa SPT 14.00 m N=47		
								-3.81									P=93.5 kPa		
Explanations:				Remarks															
Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered				N = Standard Penetration Test															
Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong				Logged to NZGS 'Field description of soil & rock' December 2005															
TCR - Total Core Recovery				● Small Disturbed Sample															
SCR - Solid Core Recovery				○ Large Disturbed Sample															
ROD - Rock Quality Designation				□ Scale Penetrometer - blows/100mm															
Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				⬇ Permeability Test															
				⬇ U100 Undisturbed Sample															
				⬇ Insitu Vane Shear Strength (kPa)															
				⬇ UTP = Unable to penetrate															
All dimensions in metres Scale 1:31		Contractor:		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: MK											

DRILL HOLE LOG																	
Project: Nadi River Basin Drilling Works			Feature			Location: Old Queens Road Bridge		No.: BH08									
Job No.: 1920815		Start Date: 14-10-2014 Finish Date: 15-10-2015		Ground Level (m): 11.19		Co-Ordinates (): E 1861857.0 N 3913566.1											
Client: JICA Study Team			Hole Depth: 23.00 m			Sheet: 4 of 5											
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests
				SILT with some shell fragments and minor fine sub-angular gravel, brown, stiff, low plasticity (highly to completely weathered SILTSTONE, brown, very weak)				-4.31	16		100						P= 223 kPa
				Silty fine to medium sub-angular GRAVEL with trace of coarse sand, brown													SPT 15.50 m N=50
				Coarse SAND with some fine sub-rounded gravel, pale grey brown				-5.81	17								SPT 17.00 m N=50
				SILT with trace of fine sand and fine sub-angular gravels and shell fragments, light brown, soft, moist, low to medium plasticity				-7.31	18								SPT 18.50 m N=50
				SILT with some coarse sand and minor fine to medium sub-angular to sub rounded gravel with trace of shell fragments, grey, wet, low to medium plasticity				-7.81	19								
								-8.81									
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005				<ul style="list-style-type: none"> ● Small Disturbed Sample ○ Large Disturbed Sample □ Scale Penetrometer - blows/100mm ↓ Permeability Test ◻ U100 Undisturbed Sample ◼ Insitu Vane Shear Strength (kPa) UTP = Unable to penetrate 									
All dimensions in metres Scale 1:31		Contractor:		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: MK									

DRILL HOLE LOG																	
Project: Nadi River Basin Drilling Works			Feature			Location: Old Queens Road Bridge		No.: BH08									
Job No.: 1920815		Start Date: 14-10-2014 Finish Date: 15-10-2015		Ground Level (m): 11.19		Co-Ordinates (): E 1861857.0 N 3913566.1											
Client: JICA Study Team			Hole Depth: 23.00 m			Sheet: 5 of 5											
Type	Run	Fluid & Water	Piezometer	Geological Description	Legend	Weathering	Field Strength	Elevation (m)	Depth (m)	Symbolic Log	Defect Spacing (mm)	Defect Description	TCR	SCR	ROD (%)	Samples	Tests
				SILT with some coarse sand and trace of fine sub-angular gravel and shell fragments, grey, stiff to hard, moist, low to medium plasticity (highly to completely weathered SILTSTONE, grey green, weak to very weak)				-10.31	21								
				SILT with trace of fine to coarse sand and siltstone nodules, grey green, stiff to hard, most, low to medium plasticity (highly to completely weathered SILTSTONE, grey green, weak to very weak)				-10.31	22								P= 105 kPa SPT 21.50 m N=50 P= 233 kPa
								-11.81	23								SPT 23.00 m N=50
				Hole Terminated at 23.00 m N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005													
Explanations: Rock Mass Weathering - unweathered, slightly weathered, moderately weathered, highly weathered, completely weathered, residually weathered Relative Rock Strength - extremely weak, very weak, weak, moderately strong, strong, very strong TCR - Total Core Recovery SCR - Solid Core Recovery ROD - Rock Quality Designation Altitude of discontinuities displayed as Dip/Dip Direction and Trend/Plunge				Remarks N = Standard Penetration Test Logged to NZGS 'Field description of soil & rock' December 2005				<ul style="list-style-type: none"> ● Small Disturbed Sample ○ Large Disturbed Sample □ Scale Penetrometer - blows/100mm ↓ Permeability Test ◻ U100 Undisturbed Sample ◼ Insitu Vane Shear Strength (kPa) UTP = Unable to penetrate 									
All dimensions in metres Scale 1:31		Contractor:		Rig/Plant Used: Drill Rig - Triple Tube		Logged by: KC/TL		Checked by: MK									

Borehole 8 Core Photos (0.00m to 23.00m)



0.00m to 4.40m



4.40m to 8.60m



8.690m to 13.50m

13.50m to 17.00m



17.00m to 21.90m



21.90m to 23.00m

APPENDIX 8c Laboratory Test Schedule and Test Results

Project No.	Site	Soil Type	Sample type	Depth (m)	Lab Tests Required						Remarks		
					Permeability	Density	Moisture Content	PSD	Atterberg	UCS		Consolidation	
1920815	Site 8, (BH 08)	Concrete with coarse gravel	SPT	1.0 - 1.5			1						
		Concrete with coarse gravel	SPT	2.0 - 2.5			1						
		Silty Sand	SPT	5.0-5.5			1						
		Silty Sand	U	6.5-7.0								1	
		Sand	SPT	8.0 - 8.3			1						
		Gravel	SPT	9.5 - 10.0			1						
		Sandy Gravel	SPT	11.0-11.5			1						
		Silty Sand	SPT	12.5-13.0			1						
		Silty Sand /Sandy Silt	SPT	14.0-14.5			1						
		Silty GRAVEL	SPT	15.5 - 16.0			1						
		Clayey Silt	SPT	18.5 - 19.0			1						
		Silty Sand	SPT	21.5 - 21.90			1						
		Clayey Silt	SPT	23.0 - 23.4			1						
TOTALS					1	1	10	6	3	1	3	Total	
Bill of Quantity					1	3	10	6	3	1	3	23	

Lab Test Schedule checked by: DMG

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 22 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: Silty fine to medium sub-angular GRAVEL trace of coarse sand, brown	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N596 BH08 15.5m -16.0m

NATURAL MOISTURE CONTENT						
TEST No.		1	2			Average
Container No.	g	24	44			
Mass of Container	g	14.61	14.60			
Mass of Container + Wet Soil	g	27.28	26.13			
Mass of Container + Dry Soil	g	24.88	24.04			
Mass of Dry Soil	g	10.27	9.44			
Mass of Moisture	g	2.40	2.09			
Moisture Content	%	23.37	22.14			22.75

PLASTIC LIMIT						
TEST No.		1	2			Average
Container No.		110	111			
Mass of Container	g	11.92	11.65			
Mass of Container + Wet Soil	g	19.33	18.98			
Mass of Container + Dry Soil	g	17.22	16.89			
Mass of Dry Soil	g	5.30	5.24			
Mass of Moisture	g	2.11	2.09			
Moisture Content	%	39.81	39.89			39.85

LIQUID LIMIT							
TEST No.		1	2	3	4	5	6
Number of Blows		40	35	29	26	19	14
Container No.		129	134	144	153	155	163
Mass of Container	g	11.53	11.26	11.96	11.23	11.70	11.72
Mass of Container + Wet Soil	g	24.65	18.04	21.42	20.86	21.20	26.03
Mass of Container + Dry Soil	g	20.06	15.58	17.89	17.17	17.45	20.17
Mass of Dry Soil	g	8.53	4.32	5.93	5.94	5.75	8.45
Mass of Moisture	g	4.59	2.46	3.53	3.69	3.75	5.86
Moisture Content	%	53.81	56.94	59.53	62.12	65.22	69.35

LINEAR SHRINKAGE TEST							
Mould No.		1	2	3	4	5	Average
Initial length of Sample					125.00		
Final length of Sample after Shrinkage					102.00		
% Shrinkage					18.40		18.40

Sample Preparation		
as received	Liquid Limit	61.00 %
washed/sieved on 425 µm sieve	Plastic Limit	39.85 %
air dried/oven dried 105°C	Plasticity Index	21.15 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	18.40 %

Tested By: LN
Date: 26 October 2015

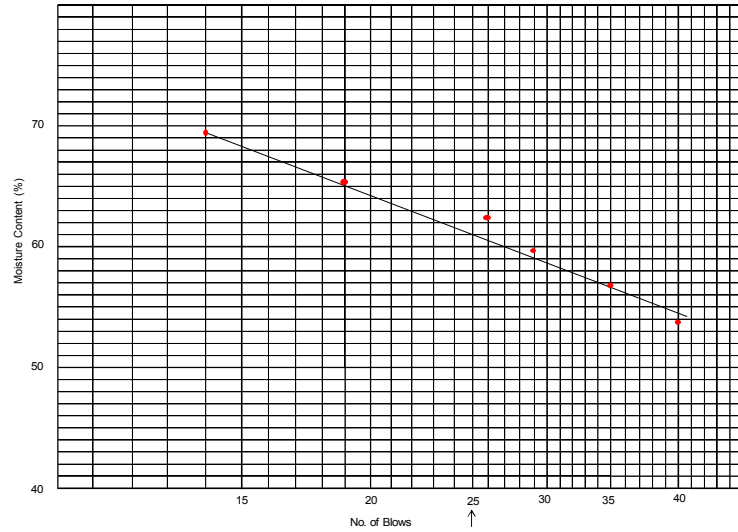
Q.A. Checked By: KB
Date: 03 December 2015

Approved By: IG
Date: 03 December 2015

Form: GE-L-03

Page 1 of 2

Graph of Moisture Content vs No. of Blows



Project No: 1920815
Sample No:N596

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE	: 26 October 2015
SITE ADDRESS	: BH08 Old Queens Road Bridge- Right Bank	TECHNOLOGIST	: LN
MATERIAL TYPE & DESCRIPTION	: SILT with trace of fine sand and fine sub-angular gravels and shell fragments, light brown, soft, moist, low to medium plasticity	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N597 BH08 18.5-19.0m

NATURAL MOISTURE CONTENT		1	2				Average
TEST No.							
Container No.	g	111	122				
Mass of Container	g	11.66	11.75				
Mass of Container + Wet Soil	g	26.68	27.91				
Mass of Container + Dry Soil	g	22.39	23.26				
Mass of Dry Soil	g	10.73	11.51				
Mass of Moisture	g	4.29	4.65				
Moisture Content	%	39.98	40.40				40.19

PLASTIC LIMIT		1	2				Average
TEST No.							
Container No.		38	39				
Mass of Container	g	14.74	14.18				
Mass of Container + Wet Soil	g	18.63	18.19				
Mass of Container + Dry Soil	g	17.59	17.09				
Mass of Dry Soil	g	2.85	2.91				
Mass of Moisture	g	1.04	1.10				
Moisture Content	%	36.49	37.80				37.15

LIQUID LIMIT		1	2	3	4	5	6
TEST No.							
Number of Blows		40	36	30	25	20	16
Container No.		19	18	25	28	29	33
Mass of Container	g	14.85	14.61	14.44	13.98	14.29	14.46
Mass of Container + Wet Soil	g	20.41	20.18	21.01	20.72	22.03	21.99
Mass of Container + Dry Soil	g	18.56	18.33	18.69	18.29	19.14	19.08
Mass of Dry Soil	g	3.71	3.72	4.25	4.31	4.85	4.62
Mass of Moisture	g	1.85	1.85	2.32	2.43	2.89	2.91
Moisture Content	%	49.87	49.73	54.59	56.38	59.59	62.99

LINEAR SHRINKAGE TEST		1	2	3	4	5	Average
Mould No.							
Initial length of Sample					125		
Final length of Sample after Shrinkage					110		
% Shrinkage					12.00		12.00

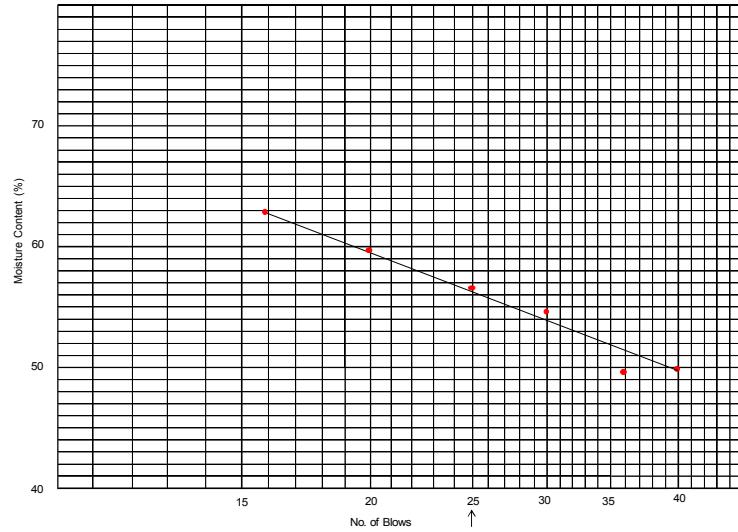
Sample Preparation		
as received	Liquid Limit	56.20 %
washed/sieved on 425 µm sieve	Plastic Limit	37.15 %
air dried/oven dried 105°C	Plasticity Index	19.05 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	12.00 %

Tested By:RK
Date: 26 October 2015

Q.A. Checked By: KB
Date: 03 December 2015

Approved By:IG
Date: 03 December 2015

Graph of Moisture Content vs No. of Blows



Project No: 1920815
Sample No: N597

PRINCIPAL	Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	Geotechnical Engineering : Investigation for Nadi River Basin Drilling Works	DATE	: 26 October 2015
SITE ADDRESS	BH08 Old Queens Road : Bridge- Right Bank	TECHNOLOGIST	: RK
MATERIAL TYPE & DESCRIPTION	SILT with trace of fine to coarse sand and silt stone nodules, grey green, stiff to hard, moist, low to medium plasticity (highly to completely weathered, SILTSTONE, grey green, weak to very weak)	TEST METHOD	: NZS 4402:1986 (amended version)
		SAMPLE No.	: N599 BH09 23.0-23.4m

NATURAL MOISTURE CONTENT		1	2				Average
TEST No.							
Container No.	g	117	153				
Mass of Container	g	11.12	11.21				
Mass of Container + Wet Soil	g	20.46	22.11				
Mass of Container + Dry Soil	g	17.92	19.12				
Mass of Dry Soil	g	6.80	7.91				
Mass of Moisture	g	2.54	2.99				
Moisture Content	%	37.35	37.80				37.58

PLASTIC LIMIT		1	2				Average
TEST No.							
Container No.		35	30				
Mass of Container	g	14.27	13.45				
Mass of Container + Wet Soil	g	20.13	19.00				
Mass of Container + Dry Soil	g	18.41	17.41				
Mass of Dry Soil	g	4.14	3.96				
Mass of Moisture	g	1.72	1.59				
Moisture Content	%	41.55	40.15				40.85

LIQUID LIMIT		1	2	3	4	5	6
TEST No.							
Number of Blows		40	36	31	24	20	15
Container No.		20	45	23	42	32	24
Mass of Container	g	14.12	14.47	14.75	14.55	14.55	14.62
Mass of Container + Wet Soil	g	23.26	23.49	25.60	29.71	25.69	27.43
Mass of Container + Dry Soil	g	19.97	20.22	21.62	24.12	21.41	22.54
Mass of Dry Soil	g	5.85	5.75	6.87	9.57	6.86	7.92
Mass of Moisture	g	3.29	3.27	3.98	5.59	4.28	4.89
Moisture Content	%	56.24	56.87	57.93	58.41	62.39	61.74

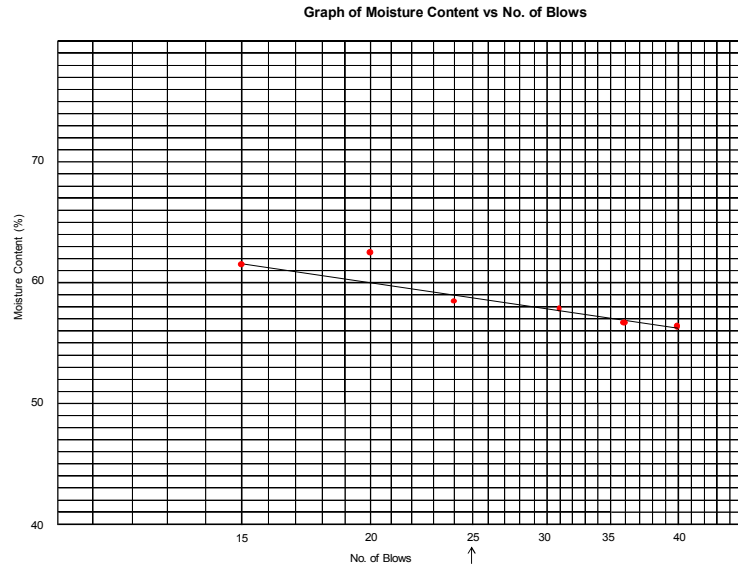
LINEAR SHRINKAGE TEST		1	2	3	4	5	Average
Mould No.							
Initial length of Sample				140.00			
Final length of Sample after Shrinkage				127.00			
% Shrinkage				9.29			9.29

Sample Preparation		
as received	Liquid Limit	58.80 %
washed/sieved on 425 µm sieve	Plastic Limit	40.85 %
air dried/oven dried 105°C	Plasticity Index	17.95 %
after making a paste cured for 12-16 hrs	Shrinkage Limit	9.29 %

Tested By: RK
Date: 26 October 2015

Q.A. Checked By: KB
Date: 03 December 2015

Approved By: IG
Date: 03 December 2015



Project No: 1920815
Sample No: N599

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Basin Drilling Works	DATE / TESTED :	24 October 2015
SITE ADDRESS :	Site 08, RHS of the Bridge.	TECHNOLOGIST :	KB/LN
SAMPLE LOCATION :	BH08 6.50m - 7.00m	MATERIAL TYPE :	SILT with coarse sand trace of root fibre, dark brown, stiff, low to medium plasticity
TEST NUMBER :	N590		
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN			

Moisture Content	Container No.	-	75	65
	Mass of Container	g	89.77	87.18
Mass of Container + Wet Soil	g	199.56	173.75	
Mass of Container + Dry Soil	g	176.83	156.26	
Mass of Dry Soil	g	87.06	69.08	
Mass of Moisture	g	22.73	17.49	
Moisture Content	%	26.11	25.32	25.71

Bulk Density	Sample No.	-	N590
	Diameter of Specimen	mm	53.63
Initial area of specimen A_0 (πr^2)	mm ²	2257.80	
Initial length of specimen L_0	mm	46.84	
Initial mass of specimen M_i	g	196.50	
Bulk Density ρ	t/m ³	1.86	
Dry Density ρ_d	t/m ³	1.48	

Tested by : LN/KB	Q.A. Check by : KB	Approved by : IG
Date : 24 October 2015	Date : 03 December 2015	Date : 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: CONCRETE with coarse gravel	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N587 BH08 1.0m - 1.5m

Moisture Content	%					
Container No.	g	82	77			
Mass of Container	g	90.21	99.35			
Mass of Container + Wet Soil	g	130.54	139.18			
Mass of Container + Dry Soil	g	125.25	133.80			
Mass of Dry Soil	g	35.04	34.45			
Mass of Moisture	g	5.29	5.38			
Moisture Content	%	15.10	15.62			15.36

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: SILT with some fine to coarse sand, dark brown, soft moist low plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N589 BH08 5.0m - 5.5m

Moisture Content	%					
Container No.	g	70	73			
Mass of Container	g	90.08	70.13			
Mass of Container + Wet Soil	g	111.45	104.85			
Mass of Container + Dry Soil	g	107.12	97.70			
Mass of Dry Soil	g	17.04	27.57			
Mass of Moisture	g	4.33	7.15			
Moisture Content	%	25.41	25.93			25.67

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: Silty fine to coarse SAND dark brown	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N591 BH08 8.0m - 8.3m

Moisture Content	%					
Container No.	g	62	69			
Mass of Container	g	72.22	90.26			
Mass of Container + Wet Soil	g	112.30	127.42			
Mass of Container + Dry Soil	g	103.55	119.46			
Mass of Dry Soil	g	31.33	29.20			
Mass of Moisture	g	8.75	7.96			
Moisture Content	%	27.93	27.26			27.59

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: Coarse SAND with fine to medium sub-angular to sub rounded gravel	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N593 BH08 11.0m - 11.5m

Moisture Content	%					
Container No.	g	71	85			
Mass of Container	g	86.30	88.73			
Mass of Container + Wet Soil	g	140.37	135.09			
Mass of Container + Dry Soil	g	132.52	128.84			
Mass of Dry Soil	g	46.22	40.11			
Mass of Moisture	g	7.85	6.25			
Moisture Content	%	16.98	15.58			16.28

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: Silty fine to coarse SAND, brown moist, low plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N594 BH08 12.5m - 13.0m

Moisture Content	%					
Container No.	g	79	78			
Mass of Container	g	87.12	78.52			
Mass of Container + Wet Soil	g	118.20	114.70			
Mass of Container + Dry Soil	g	109.03	103.90			
Mass of Dry Soil	g	21.91	25.38			
Mass of Moisture	g	9.17	10.80			
Moisture Content	%	41.85	42.55			42.20

Tested By: KB
Date: 23 October 2015

Q.A. Checked By: KB
Date: 03 December 2015

Approved By: IG
Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	: SILT with some silt stone nodules and fine sub angular gravel with trace clay, pale brown, soft to firm, low to medium plasticity, (highly to completely weathered, SILT STONE, pale brown, weak to very weak)	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N595 BH08 14.0m - 14.5m

Moisture Content	%					
Container No.	g	57	59			
Mass of Container	g	63.46	63.71			
Mass of Container + Wet Soil	g	86.97	87.87			
Mass of Container + Dry Soil	g	81.89	82.84			
Mass of Dry Soil	g	18.43	19.13			
Mass of Moisture	g	5.08	5.03			
Moisture Content	%	27.56	26.29			26.93

Tested By: KB
Date: 23 October 2015

Q.A. Checked By: KB
Date: 03 December 2015

Approved By: IG
Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	Silty fine to medium sub-angular GRAVEL trace of coarse sand, brown	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N596 BH08 15.5m - 16.0m

Moisture Content	%					
Container No.	g	64	83			
Mass of Container	g	82.04	71.20			
Mass of Container + Wet Soil	g	121.56	120.50			
Mass of Container + Dry Soil	g	113.01	109.64			
Mass of Dry Soil	g	30.97	38.44			
Mass of Moisture	g	8.55	10.86			
Moisture Content	%	27.61	28.25			27.93

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	SILT with trace of fine sand and fine sub-angular gravels and shell fragments, light brown, soft, moist, low to medium plasticity	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N597 BH07 18.5m - 19.0m

Moisture Content	%					
Container No.	g	61	56			
Mass of Container	g	62.16	62.57			
Mass of Container + Wet Soil	g	81.28	80.31			
Mass of Container + Dry Soil	g	75.93	75.18			
Mass of Dry Soil	g	13.77	12.61			
Mass of Moisture	g	5.35	5.13			
Moisture Content	%	38.85	40.68			39.77

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	SILT with trace of fine to coarse sand and silt stone nodules, grey green, stiff to hard, moist, low to medium plasticity (highly to completely weathered, SILTSTONE, grey green, weak to very weak)	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N598 BH08 21.5m - 21.9m

Moisture Content	%				
Container No.	g	1	16		
Mass of Container	g	52.73	52.76		
Mass of Container + Wet Soil	g	74.65	73.31		
Mass of Container + Dry Soil	g	69.86	68.76		
Mass of Dry Soil	g	17.13	16.00		
Mass of Moisture	g	4.79	4.55		
Moisture Content	%	27.96	28.44		28.20

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

Moisture Content Test Results

PRINCIPAL	: Japan International Cooperation Agency (JICA)	PROJECT No.	: 1920815
PROJECT NAME	: Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE	: 23 October 2015
SITE ADDRESS	: Site 08, RHS of the Bridge	TECHNOLOGIST	: KB
MATERIAL TYPE & DESCRIPTION	SILT with trace of fine to coarse sand and silt stone nodules, grey green, stiff to hard, moist, low to medium plasticity (highly to completely weathered, SILTSTONE, grey green, weak to very weak)	TEST METHOD	: NZS 4402:1986
		SAMPLE No.	: N599 BH08 23.0m - 23.4m

Moisture Content	%				
Container No.	g	9	3		
Mass of Container	g	53.51	52.42		
Mass of Container + Wet Soil	g	74.38	74.92		
Mass of Container + Dry Soil	g	68.74	68.94		
Mass of Dry Soil	g	15.23	16.52		
Mass of Moisture	g	5.64	5.98		
Moisture Content	%	37.03	36.20		36.62

 Tested By: KB
 Date: 23 October 2015

 Q.A. Checked By: KB
 Date: 03 December 2015

 Approved By: IG
 Date: 03 December 2015

**Determination of Permeability of a Soil
Constant Head Method for Remoulded Sample**

PRINCIPAL :	Japan International Cooperation Agency (JICA)	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works	DATE :	28 October 2015
SITE ADDRESS :	Site 08, RHS of the Bridge	TECHNOLOGIST :	IG
MATERIAL TYPE & DESCRIPTION :	Silty fine to coarse SAND dark brown	TEST METHOD :	AS 1289.6.7.3-2001
		SAMPLE No. :	N591 (BH08 8.0m - 8.5m)

Total Weight : -
Weight Retained on 19mm : -
Percentage retained: -

MOISTURE CONTENT

Container No.		g	
Mass of Container	g	53.50	
Mass of Container + Wet	g	72.59	
Mass of Container + Dry	g	68.63	
Mass of Dry Soil	g	15.13	
Mass of Moisture	g	3.96	
Moisture Content	%	26.17	
Optimum moisture content	%	-	
Laboratory moisture ratio	%	-	

DENSITY

Mass of Specimen	g	1650
Volume of Specimen	cm ³	824.35
Wet Density	t/m ³	2.00
Dry Density	t/m ³	1.59
Maximum Dry Density	t/m ³	-
Laboratory Density ratio	%	-

Area of stand pipe (dia. 12mm)	mm ²	113.10
Cross sectional area of soil	cm ²	50.27
Length of soil specimen	cm	18.40

TEST #	Constant Head h (cm)	Elapsed Time (t)min	Out Flow Volume Q (cm ³)	Water temp T(°C)	KT cm/min	K ₂₀ cm/min
1	110	5.00	15	26	0.009	0.008
2	110	5.00	15	26	0.009	0.008
3	110	5.00	15	26	0.009	0.008
4	104	5.00	14	26	0.009	0.008
5	104	5.00	14	26	0.009	0.008
6	104	5.00	14	26	0.009	0.008
7	98	5.00	14	26	0.009	0.008
8	98	5.00	14	26	0.009	0.008
9	98	5.00	14	26	0.009	0.008
10	94	5.00	14	26	0.010	0.009
11	94	5.00	13	26	0.009	0.008
12	94	5.00	14	26	0.010	0.009

Average K₂₀ m/s : 1.35E-06

Tested By: IG
Date: 28 October 2015

Q.A. Check By: UM
Date: 03 December 2015

Approved By: IG
Date: 03 December 2015

Unconfined Compressive Strength
NZS 4402:1986 (Test 6.3.1)

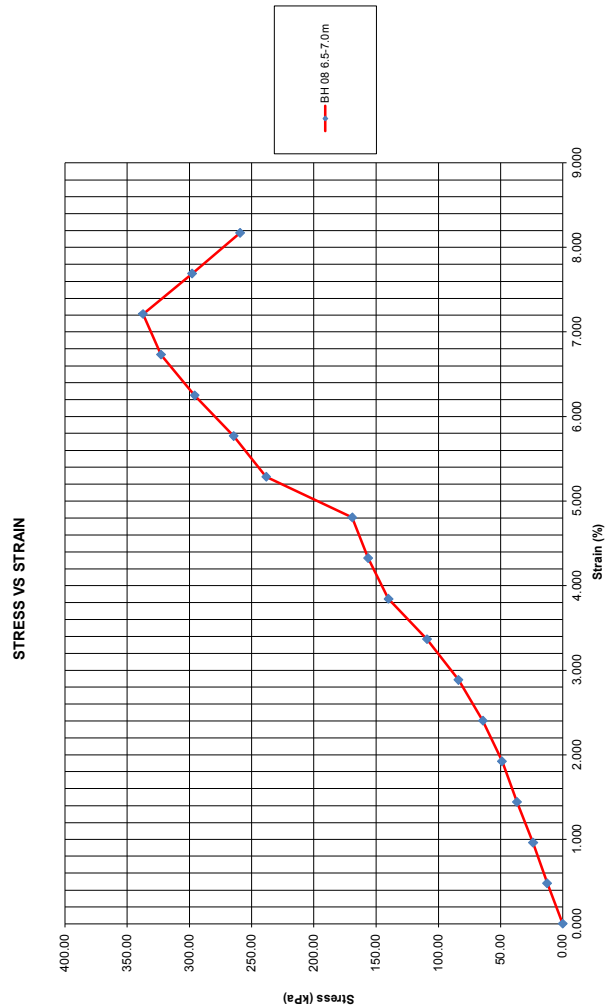
PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling Works.	DATE TESTED :	24 October 2015
SITE ADDRESS :	Site 08, RHS of the Bridge.	TECHNOLOGIST :	KB
SAMPLE LOCATION :	BH 08 6.5-7.0m	MATERIAL TYPE :	SILT with coarse sand trace of root fibre, dark brown, stiff, low to medium plasticity
TEST NUMBER :	N590		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

Moisture Content	Container No.	-	92
	Mass of Container	g	91.39
	Mass of Container + Wet Soil	g	506.85
	Mass of Container + Dry Soil	g	429.63
	Mass of Dry Soil	g	338.24
	Mass of Moisture	g	77.22
	Moisture Content	%	22.83

Bulk Density	Sample No.	-	N590
	Diameter of Specimen	mm	53.67
	Initial area of specimen A ₀ (π/4 d ²)	mm ²	2261.17
	Initial length of specimen L ₀	mm	104.00
	Initial mass of specimen M _i	g	426.64
	Bulk Density ρ	t/m ³	1.81
	Dry Density ρ_d	t/m ³	1.48

Compression Gauge Reading	Load Gauge Reading	Load	Strain ε = C _n - C _o / L _o	Corrected Area A = A _o / (1-ε)	Principal Stress Difference σ ₁ - σ ₃ = 1000P/A
mm		(kN)	%	m ²	kPa
0.00	0	0	0.000	0.002261	0.00
0.50	14	0.0281	0.481	0.002272	12.37
1.00	27.0	0.0542	0.962	0.002283	23.74
1.50	41.0	0.0843	1.442	0.002294	36.74
2.00	56.0	0.1124	1.923	0.002306	48.75
2.50	74.0	0.1485	2.404	0.002317	64.10
3.00	97.0	0.1947	2.885	0.002328	83.62
3.50	127.0	0.2550	3.365	0.002340	108.98
4.00	164.0	0.3293	3.846	0.002352	140.03
4.50	184.0	0.3694	4.327	0.002363	156.30
5.00	200.0	0.4016	4.808	0.002375	169.07
5.50	284.0	0.5691	5.288	0.002387	238.37
6.00	317.0	0.6343	5.769	0.002400	264.33



LOCATION: BH 08 6.5-7.0m
DATE OF TEST: 24 October 2015
DESCRIPTION: SILT with coarse sand trace of root fibre, dark brown, stiff, low to medium plasticity

PRINCIPAL : Japan International Cooperation Agency	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / : 23 October 2015
SITE ADDRESS : Site 08, RHS of the Bridge.	TECHNOLOGIST : RK
SAMPLE LOCATION : BH08 2.0-2.5m	MATERIAL TYPE & LOCATION : CONCRETE with coarse gravel
TEST NUMBER : N588	
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN	

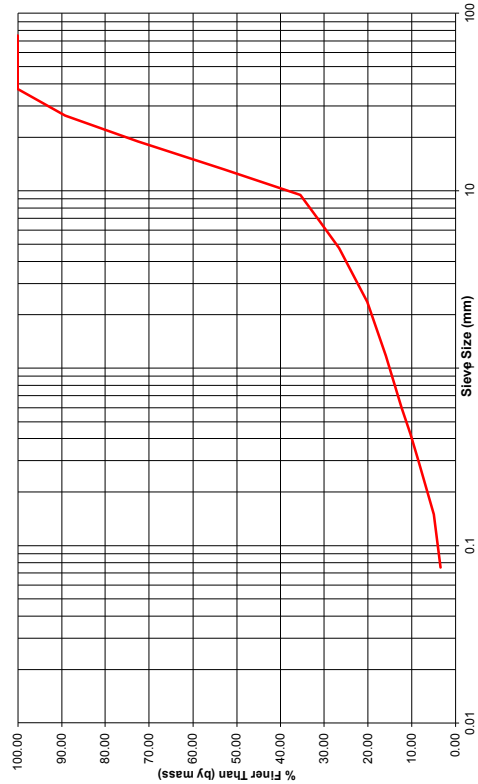
Moisture Content (Material passing 19mm)	Container No.	-	13	14	SPLIT SAMPLE
Mass of Container	g	52.90	53.57	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	77.13	75.84	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	71.98	71.31	Splitting Factor	M ₃
Mass of Dry Soil	g	19.08	17.74	=	M ₄
Mass of Moisture	g	5.15	4.53		
Moisture Content	%	26.99	25.54		
Average Moisture Content	%	26.26			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g	228.67	
Total Mass of dry sample (M _T)	M _T =	100M ₄	
	M _T =	100 + w	
		181.11	

Test Sieve Size mm	Mass of Dry Soil Retained (M ₂) g	Corrected Mass g	Percentage Retained = (Mass/M _T) x 100 %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	0.00	100.00			300
50.0mm	N/A	0.00	100.00			300
37.5mm	N/A	0.00	100.00			300
26.5mm	19.41	N/A	10.72	89.28		300
19.0mm	30.29	N/A	16.73	72.56		200
13.2 mm	35.47	N/A	19.59	52.97	600	300
9.50 mm	31.83	N/A	17.58	35.40	450	300
6.70 mm	7.98	N/A	4.41	30.99	300	300
4.75 mm	7.99	N/A	4.41	26.58	250	200
2.36 mm	11.68	N/A	6.45	20.13	150	200
1.18 mm	7.66	N/A	4.23	15.90	100	200
600 µm	6.38	N/A	3.52	12.38	80	200
425 µm	3.71	N/A	2.05	10.33	70	200
300 µm	3.40	N/A	1.88	8.45	60	200
150 µm	6.25	N/A	3.45	5.00	40	200
75 µm	2.78	N/A	1.54	3.46	25	200
Passing 75 µm	6.28	N/A	3.46	0.00	-	-
Pan Total	181.11	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	O.A. Checked by : KB	Approved by : IG
Date : 23 October 2015	Date : 03 December 2015	Date : 03 December 2015



LOCATION: BH08 2.0-2.1m
DATE OF TEST: 23 October 2015
DESCRIPTION: CONCRETE with coarse gravel
SAMPLE No: N588

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
(NZS 4407:1991 (Test 3.8.1

PRINCIPAL : Japan International Cooperation Agency	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / : 23 October 2015
SITE ADDRESS : Site 08, RHS of the Bridge.	TECHNOLOGIST : RK
SAMPLE LOCATION : BH08 5.0-5.5m	MATERIAL TYPE & LOCATION : SILT with some fine to coarse sand, dark brown, soft moist low plasticity
TEST NUMBER : N589	
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN	

Moisture Content (Material passing 19mm)	Container No.	-	115	168	SPLIT SAMPLE
Mass of Container	g	11.74	11.55		Mass Passing Last Sieve: - gM ₃
Mass of Container + Wet Soil	g	21.44	21.45		Mass after Splitting: - gM ₄
Mass of Container + Dry Soil	g	19.28	19.25		Splitting Factor = $\frac{M_3}{M_4}$
Mass of Dry Soil	g	7.54	7.70		
Mass of Moisture	g	2.16	2.20		
Moisture Content	%	28.65	28.57		
Average Moisture Content	%	28.61			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	266.03
	Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$	
		M _T =	206.85

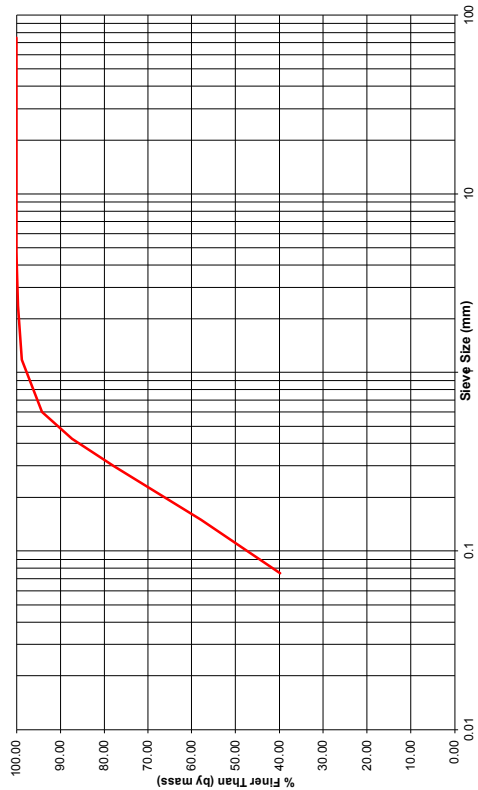
Test Sieve Size mm	Mass of Dry Soil Retained (M _c) g	Corrected Mass g	Percentage Retained (Mass/M _T) x 100 %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	N/A	0.00	100.00		300
50.0mm	N/A	N/A	0.00	100.00		300
37.5mm	N/A	N/A	0.00	100.00		300
26.5mm	N/A	N/A	0.00	100.00		300
19.0mm	N/A	N/A	0.00	100.00		200
13.2 mm	N/A	N/A	0.00	100.00	600	300
9.50 mm	N/A	N/A	0.00	100.00	450	300
6.70 mm	N/A	N/A	0.00	100.00	300	300
4.75 mm	N/A	N/A	0.00	100.00	250	200
2.36 mm	0.65	N/A	0.31	99.69	150	200
1.18 mm	1.86	N/A	0.90	98.79	100	200
600 µm	9.54	N/A	4.61	94.17	80	200
425 µm	14.01	N/A	6.77	87.40	70	200
300 µm	19.76	N/A	9.55	77.85	60	200
150 µm	41.30	N/A	19.97	57.88	40	200
75 µm	37.29	N/A	18.03	39.86	25	200
Passing 75 µm	82.44	N/A	39.86	0.00	-	-
Pan Total	206.85	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	O.A. Checked by : KB	Approved by : IG
Date : 23 October 2015	Date : 03 December 2015	Date : 03 December 2015

Form GE-L-06

Page 1 of 2



BH08 5.0-5.5m

LOCATION: BH08 5.0-5.5m
DATE OF TEST: 23 October 2015
DESCRIPTION: SILT with some fine to coarse sand, dark brown, soft moist low plasticity
SAMPLE No: N591

Form GE-L-06

Page 2 of 2

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	23 October 2015
SITE ADDRESS :	Site 08, RHS of the Bridge.	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH08 8.0-8.3m	MATERIAL TYPE & LOCATION :	Silty fine to coarse SAND dark brown
TEST NUMBER :	N591		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

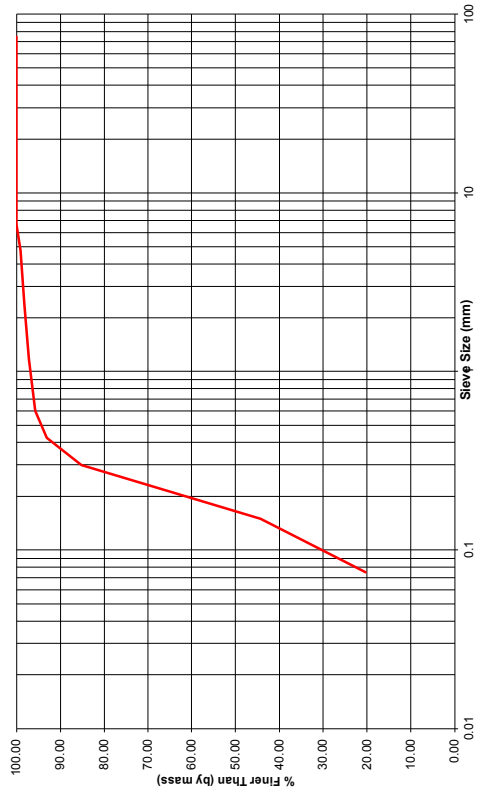
Moisture Content (Material passing 19mm)	Container No.	-	62	69	SPLIT SAMPLE
Mass of Container	g	72.22	90.26	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	112.30	127.42	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	103.55	119.46	Splitting Factor = $\frac{M_3}{M_4}$	
Mass of Dry Soil	g	31.33	29.20		
Mass of Moisture	g	8.75	7.96		
Moisture Content	%	27.93	27.26		
Average Moisture Content	%	27.59			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g	255.80	
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$	200.48	

Test Sieve Size mm	Mass of Dry Soil Retained (M ₁) g	Corrected Mass	Percentage Retained = $\frac{\text{Mass}(M_1) \times 100}{M_T}$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm	N/A	0.00	100.00			300
50.0mm	N/A	0.00	100.00			300
37.5mm	N/A	0.00	100.00			300
26.5mm	N/A	0.00	100.00			300
19.0mm	N/A	0.00	100.00			200
13.2 mm	N/A	0.00	100.00		600	300
9.50 mm	N/A	0.00	100.00		450	300
6.70 mm	N/A	0.00	100.00		300	300
4.75 mm	1.84	N/A	0.92	99.08	250	200
2.36 mm	1.76	N/A	0.88	98.20	150	200
1.18 mm	2.12	N/A	1.06	97.15	100	200
600 µm	2.95	N/A	1.47	95.68	80	200
425 µm	5.03	N/A	2.51	93.17	70	200
300 µm	15.96	N/A	7.96	85.21	60	200
150 µm	82.12	N/A	40.96	44.24	40	200
75 µm	47.97	N/A	23.93	20.32	25	200
Passing 75 µm	40.73	N/A	20.32	0.00	-	-
Pan Total	200.48	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by: RK	Q.A. Checked by: KB	Approved by: IG
Date: 23 October 2015	Date: 03 December 2015	Date: 03 December 2015



BH08 8.0-8.3m

LOCATION:	BH08 8.0-8.3m
DATE OF TEST:	23 October 2015
DESCRIPTION:	Silty fine to coarse SAND (dark brown)
SAMPLE NO.:	N591

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
(NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	23 October 2015
SITE ADDRESS :	Site 08, RHS of the Bridge.	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH08 9.5-10.0m	MATERIAL TYPE & LOCATION :	Medium to coarse SAND with some coarse sub-angular to sub-rounded gravel
TEST NUMBER :	N592		

SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN

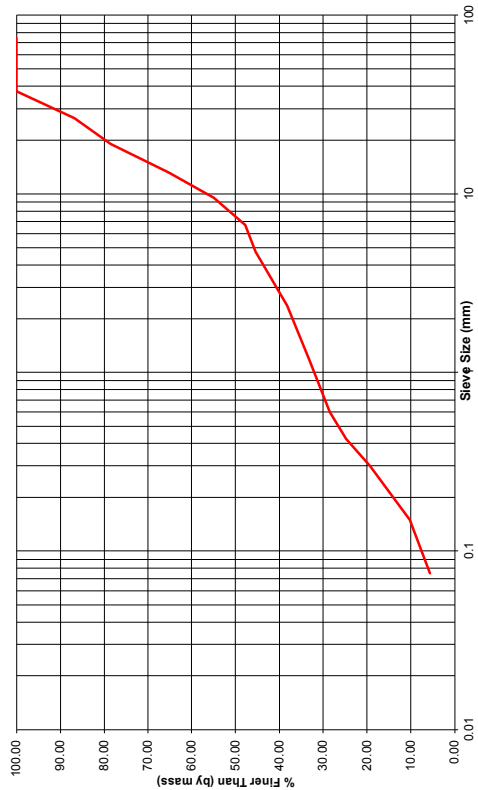
Moisture Content (Material passing 19mm)	Container No.	-	131	139	SPLIT SAMPLE
Mass of Container	g	11.65	11.33		Mass Passing Last Sieve: - gM ₃
Mass of Container + Wet Soil	g	27.16	27.83		Mass after Splitting: - gM ₄
Mass of Container + Dry Soil	g	24.90	25.58		Splitting Factor $\frac{M_3}{M_4}$
Mass of Dry Soil	g	13.25	14.25		=
Mass of Moisture	g	2.26	2.25		
Moisture Content	%	17.06	15.79		
Average Moisture Content	%		16.42		

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
Total Wet Weight (M _w)	g		383.51
Total Mass of dry sample (M _T)	M _T = $\frac{100M_w}{100 + w}$		
	M _T =	329.41	

Test Sieve Size mm	Mass of Dry Soil Retained (M ₁) g	Corrected Mass g	Percentage Retained = $\frac{\text{Mass}(M_1)}{\text{Total}} \times 100$ %	Total Percentage Passing %	Maximum Sieve Load (Sieve Diameter 200mm) g	Sieve Diameter mm
75.0mm		N/A	0.00	100.00		300
50.0mm		N/A	0.00	100.00		300
37.5mm		N/A	0.00	100.00		300
26.5mm	43.35	N/A	13.16	86.84		300
19.0mm	27.75	N/A	8.42	78.42		200
13.2 mm	43.58	N/A	13.23	65.19	600	300
9.50 mm	33.67	N/A	10.22	54.97	450	300
6.70 mm	23.57	N/A	7.16	47.81	300	300
4.75 mm	7.76	N/A	2.36	45.45	250	200
2.36 mm	23.87	N/A	7.25	38.21	150	200
1.18 mm	16.54	N/A	5.02	33.19	100	200
600 µm	15.40	N/A	4.68	28.51	80	200
425 µm	12.21	N/A	3.71	24.81	70	200
300 µm	18.03	N/A	5.47	19.33	60	200
150 µm	30.12	N/A	9.14	10.19	40	200
75 µm	15.12	N/A	4.59	5.60	25	200
Passing 75 µm	18.44	N/A	5.60	0.00	-	-
Pan Total	329.41	-	100.00	-	-	-

- NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : KB	Approved by : IG
Date : 23 October 2015	Date : 03 December 2015	Date : 03 December 2015



BH08 9.5-10.0m

LOCATION: BH08 9.5-10.0m
DATE OF TEST: 23 October 2015
DESCRIPTION: Medium to coarse SAND with some coarse sub-angular to sub-rounded gravel.
SAMPLE No: N592

Form GE-L-06

Page 2 of 2

Wet Sieve Analysis
NZS 4407:1991 (Test 3.8.1)

PRINCIPAL :	Japan International Cooperation Agency	PROJECT No. :	1920815
PROJECT NAME :	Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / :	23 October 2015
SITE ADDRESS :	Site 08, RHS of the Bridge.	TECHNOLOGIST :	RK
SAMPLE LOCATION :	BH08 11.0-11.5m	MATERIAL TYPE & LOCATION :	Coarse SAND with fine to medium sub-angular to sub rounded gravel
TEST NUMBER :	N593	SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN	

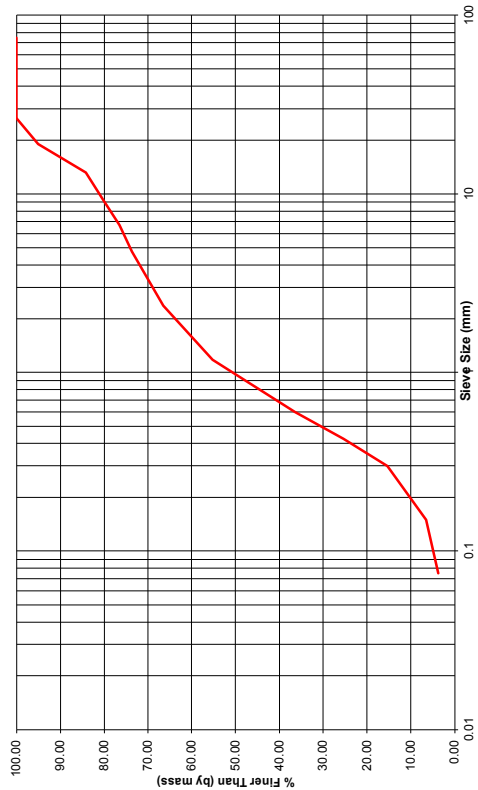
Moisture Content (Material passing 19mm)	Container No.	-	142	148	SPLIT SAMPLE
Mass of Container	g	11.82	11.74	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	24.53	24.05	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	22.64	22.02	Splitting Factor	M ₃
Mass of Dry Soil	g	10.82	10.28	=	M ₄
Mass of Moisture	g	1.89	2.03		
Moisture Content	%	17.47	19.75		
Average Moisture Content	%	18.61			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M _r)	g	Nil
Total Wet Weight (M _w)	g	286.06	
Total Mass of dry sample (M _t)	M _r =	100M _w	
	M _t =	100 + w	
		241.18	

Test Sieve Size mm	Mass of Dry Soil Retained (M ₂)	Corrected Mass	Percentage Retained = (Mass/M _t) x 100	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g	g	%	%	g	mm
75.0mm	N/A		0.00	100.00		300
50.0mm	N/A		0.00	100.00		300
37.5mm	N/A		0.00	100.00		300
26.5mm	N/A		0.00	100.00		300
19.0mm	11.81	N/A	4.90	95.10		200
13.2 mm	26.40	N/A	10.95	84.16	600	300
9.50 mm	8.70	N/A	3.61	80.55	450	300
6.70 mm	9.68	N/A	4.01	76.54	300	300
4.75 mm	6.88	N/A	2.85	73.68	250	200
2.36 mm	17.22	N/A	7.14	66.54	150	200
1.18 mm	27.43	N/A	11.37	55.17	100	200
600 µm	45.17	N/A	18.73	36.44	80	200
425 µm	26.74	N/A	11.09	25.36	70	200
300 µm	24.08	N/A	9.98	15.37	60	200
150 µm	21.34	N/A	8.85	6.52	40	200
75 µm	6.94	N/A	2.88	3.65	25	200
Passing 75 µm	8.79	N/A	3.65	0.00	-	-
Pan Total	241.18	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : KB	Approved by : IG
Date : 23 October 2015	Date : 03 December 2015	Date : 03 December 2015



BH08 11.0-11.5m

LOCATION: BH08 11.0-11.5m
DATE OF TEST: 23 October 2015
DESCRIPTION: Coarse SAND with fine to medium sub-angular to sub-rounded gravel
SAMPLE No: N593

Form GE-L-06

Page 2 of 2

PRINCIPAL : Japan International Cooperation Agency	PROJECT No. : 1920815
PROJECT NAME : Geotechnical Engineering Investigation for Nadi River Project Drilling	DATE / : 23 October 2015
SITE ADDRESS : Site 08, Old Queens Road Bridge - Right Bank	TECHNOLOGIST : RK
SAMPLE LOCATION : BH08 15.5-16.0m	MATERIAL TYPE & LOCATION : Silty fine to medium sub-angular GRAVEL trace of coarse sand, brown
TEST NUMBER : N596	
SAMPLE HISTORY : NATURAL / AIR-DRIED / OVEN-DRIED / UNKNOWN	

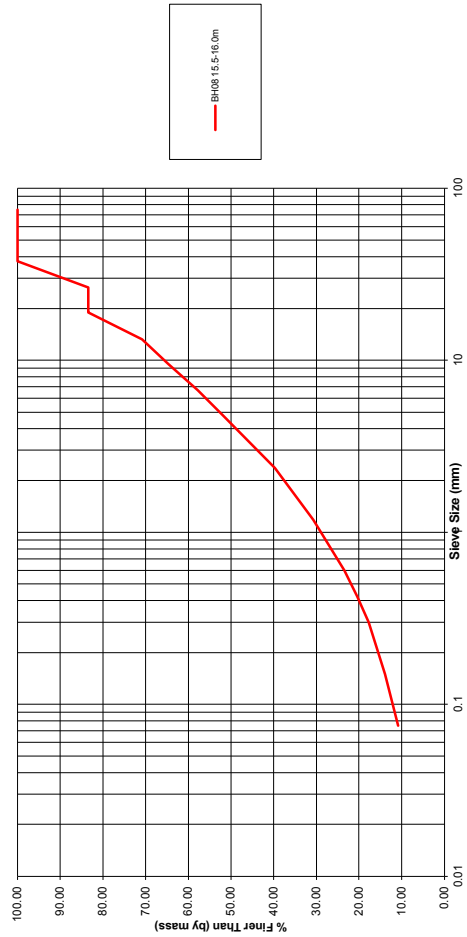
Moisture Content (Material passing 19mm)	Container No.	-	118	129	SPLIT SAMPLE
Mass of Container	g	11.76	11.55	Mass Passing Last Sieve:	- gM ₃
Mass of Container + Wet Soil	g	19.71	19.35	Mass after Splitting:	- gM ₄
Mass of Container + Dry Soil	g	18.05	17.64	Splitting Factor	M ₃
Mass of Dry Soil	g	6.29	6.09	=	M ₄
Mass of Moisture	g	1.66	1.71		
Moisture Content	%	26.39	28.08		
Average Moisture Content	%	27.23			

Total Mass of Dry Sample	Mass of dry sample retained on 19mm test sieve (M ₁)	g	Nil
	Total Wet Weight (M _w)	g	401.70
	Total Mass of dry sample (M ₁)	M ₁ =	100M _w
		M ₁ =	315.72

Test Sieve Size mm	Mass of Dry Soil Retained (M ₂)	Corrected Mass	Percentage Retained = (Mass/M ₁) x 100	Total Percentage Passing	Maximum Sieve Load (Sieve Diameter 200mm)	Sieve Diameter
	g	g	%	%	g	mm
75.0mm	N/A		0.00	100.00		300
50.0mm	N/A		0.00	100.00		300
37.5mm	N/A		0.00	100.00		300
26.5mm	52.22	N/A	16.54	83.46		300
19.0mm		N/A	0.00	83.46		200
13.2 mm	39.99	N/A	12.67	70.79	600	300
9.50 mm	19.52	N/A	6.18	64.61	450	300
6.70 mm	21.53	N/A	6.82	57.79	300	300
4.75 mm	18.92	N/A	5.99	51.80	250	200
2.36 mm	38.11	N/A	12.07	39.73	150	200
1.18 mm	28.43	N/A	9.00	30.72	100	200
600 µm	22.92	N/A	7.26	23.46	80	200
425 µm	9.40	N/A	2.98	20.49	70	200
300 µm	8.69	N/A	2.75	17.73	60	200
150 µm	12.26	N/A	3.88	13.85	40	200
75 µm	9.60	N/A	3.04	10.81	25	200
Passing 75 µm	34.13	N/A	10.81	0.00	-	-
Pan Total	315.72	-	100.00	-	-	-

NOTES: 1) Testing performed on fraction passing/retained on 19mm sieve
2) The percentage passing the finest sieve was obtained by difference

Tested by : RK	Q.A. Checked by : KB	Approved by : IG
Date : 23 October 2015	Date : 03 December 2015	Date : 03 December 2015




LOCATION:	BH08 15.5-16.0m	DESCRIPTION: Silty fine to medium sub-angular GRAVEL trace of coarse sand, brown
DATE OF TEST:	23 October 2015	SAMPLE No: N596

Form GE-L-06

Page 2 of 2

Oedometer Settlement Test

 sketch showing specimen location in original sample	Depth	6.5 - 7.0m		
	Description Type	Silt with coarse sand trace of root fibre, dark brown, stiff, low to medium		
Initial Height	L ₀	(mm)	20.0	
Initial Diameter	D ₀	(mm)	50.0	
Initial Weight	W ₀	(gr)	60.5	
Bulk Density	ρ ₀	(Mg/m ³)	1.54	
Particle Density	ρ _s	(Mg/m ³)	2.65	


Initial Conditions			
Settlement Input	L _{IP}	(mm)	CH 3
Initial Moisture	ω _i %	(%)	30
Initial Dry Density	ρ _{di}	(Mg/m ³)	1.19
Initial Voids Ratio	e _i	.	1.228
Initial Degree of Saturation	S _i	(%)	63.7
Initial Swelling	S _s	(kPa)	0

Final Conditions			
Final Moisture	ω _f %	(%)	27
Dry Density	ρ _{df}	(Mg/m ³)	1.43
Voids Ratio	e _f	.	0.858
Saturation	S _f	(%)	84
Height Settlement	ΔL _s	(mm)	3.323

Vertical Stress σ' _v (kPa)	Voids Ratio e _f	Height ΔL _s (mm)	Consolidation C _v (m ² /year)	Compressibility m _v (m ² /MN)	Initial T _i (°C)	Final T _f (°C)	t ₅₀ Time t ₅₀ (min)	t ₉₀ Time t ₉₀ (min)	Secondary C _{SEC} (m ² /MN)
50	1.230	-0.022	5556.1	0.022	29.0	0.0		0.008	0.0087
100	0.858	3.323	144.9	3.341	29.0	0.0		0.258	0.0087
200	0.858	3.323	64.2		29.0	0.0		0.481	0.0087
400	0.858	3.323	109.5		29.0	0.0		0.282	0.0087
800	0.858	3.323	109.5		29.0	0.0		0.282	0.0087
1600	0.858	3.323	72.3		29.0	0.0		0.427	0.0087
400	0.858	3.323			29.0	0.0			
100	0.858	3.323			29.0	0.0			

Notes

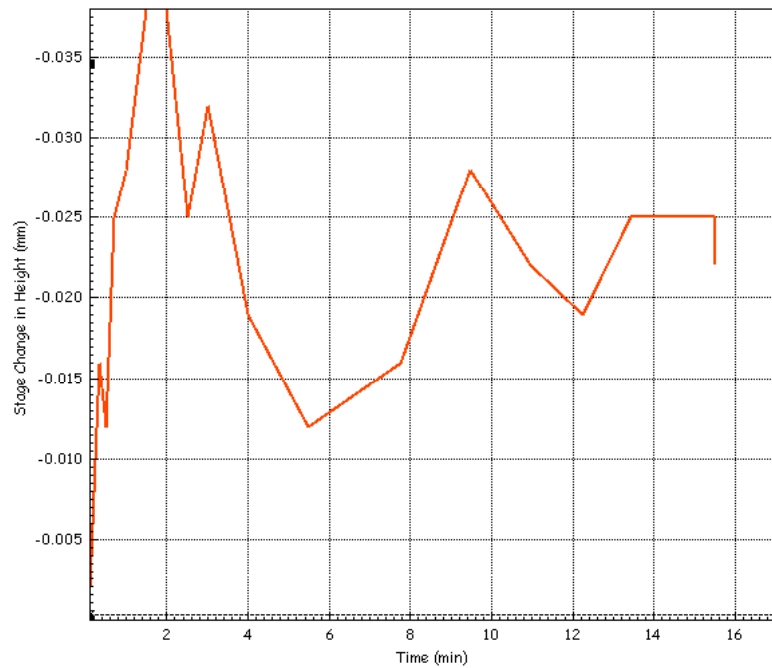
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	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	.\SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
Checked	DMC	Approved	DMC	

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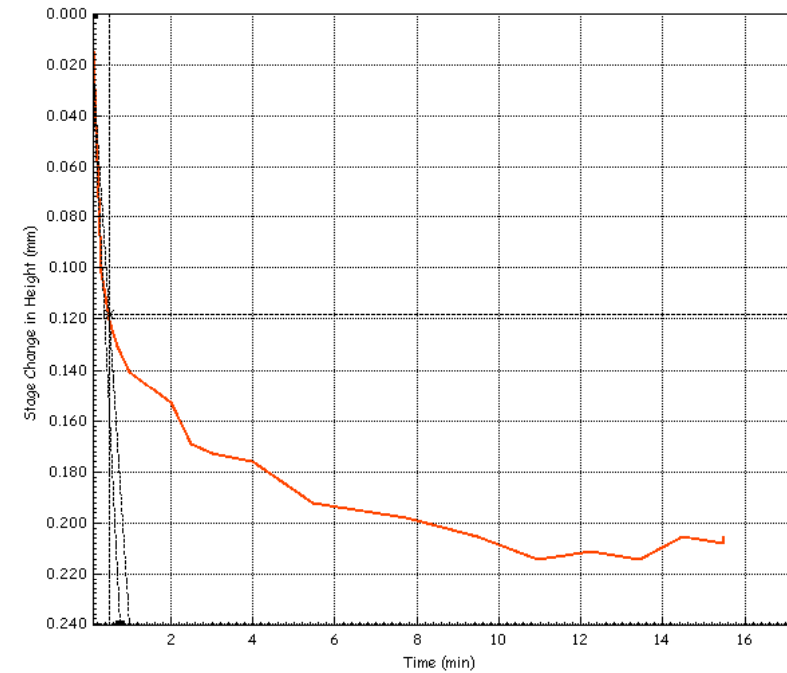
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	50
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	-0.022
Voids Ratio	e_f	.	1.033
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.008
Consolidation	C_v	(m ² /year)	4805.9
Compressibility	m_v	(m ² /MN)	0.024
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	100
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.164
Voids Ratio	e_f	.	0.794
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.258
Consolidation	C_v	(m ² /year)	132.2
Compressibility	m_v	(m ² /MN)	2.348
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	..SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
	Checked	DMC	Approved	DMC

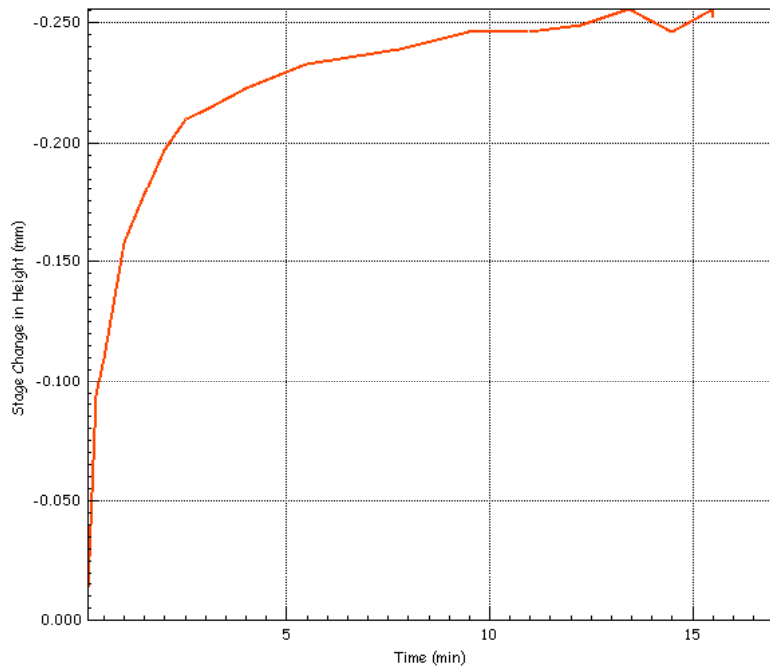
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	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	..SQLEXPRESS \ ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
	Checked	DMC	Approved	DMC

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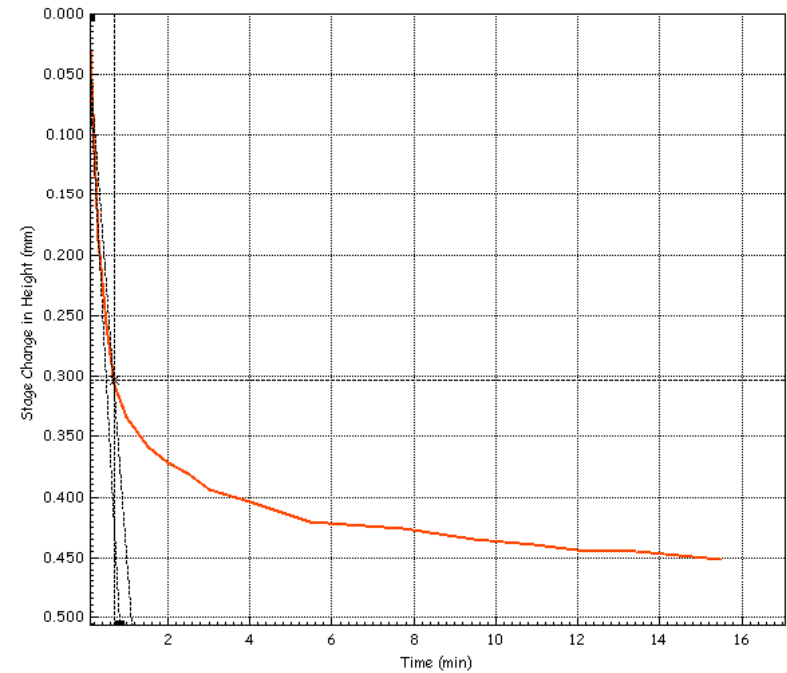
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	100
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.171
Voids Ratio	e_f	.	0.794
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	200
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.161
Voids Ratio	e_f	.	0.795
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.481
Consolidation	C_v	(m ² /year)	62.4
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
Checked	DMC	Approved	DMC	

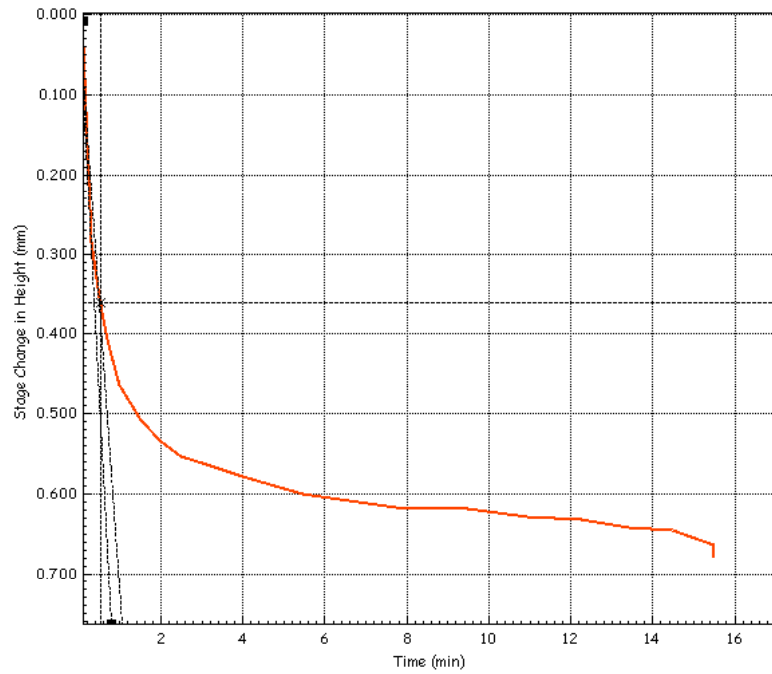
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	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
Checked	DMC	Approved	DMC	

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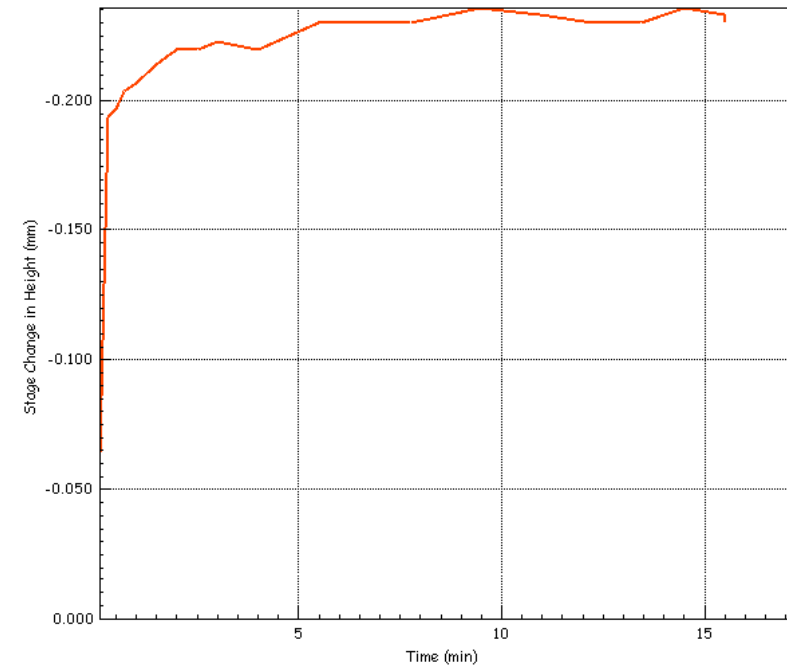
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	400
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.161
Voids Ratio	e_f	.	0.795
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.282
Consolidation	C_v	(m ² /year)	106.4
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	400
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.164
Voids Ratio	e_f	.	0.794
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	
Consolidation	C_v	(m ² /year)	
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
	Checked	DMC	Approved	DMC

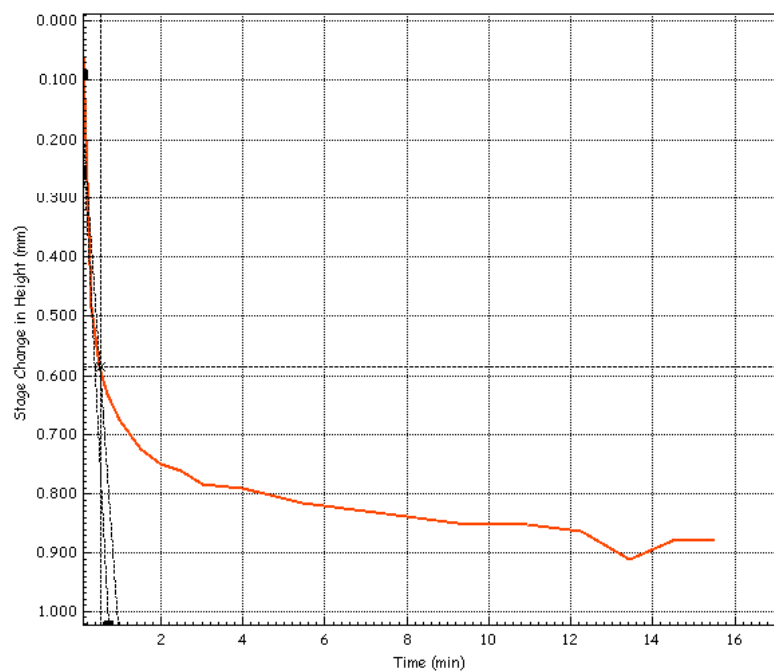
Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006
	Site Reference	1920815	Database:	.\SQLEXPRESS\ENTEC
	Jobfile	Geotechnical Engineering	Test Date	11/27/2015
	Client	Japan International Cooperation	Sample	N590
	Operator	IG/MK	Borehole	BH08
	Checked	DMC	Approved	DMC

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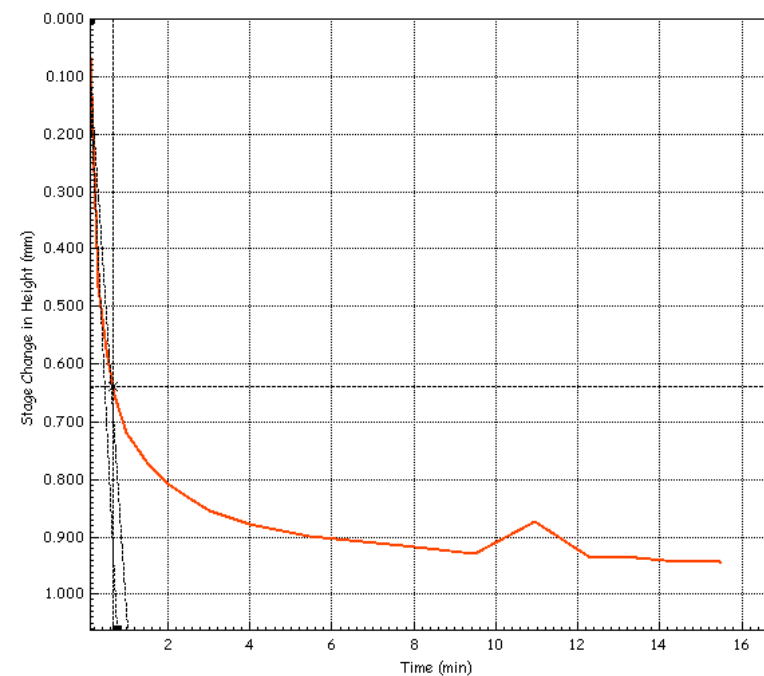
Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	800
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.164
Voids Ratio	e_f	.	0.794
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.282
Consolidation	C_v	(m ² /year)	106.3
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



Oedometer Consolidation Settlement Report

Vertical Stress	σ'_{i}	(kPa)	1600
Initial Temperature	T_i	(oC)	29.0
Frame Correction	L CORR	(mm)	0.000
Height Settlement	ΔL_s	(mm)	2.168
Voids Ratio	e_f	.	0.794
Final Temperature	T_f	(oC)	0.0
t50 Time	t ₅₀	(min)	
t90 Time	t ₉₀	(min)	0.427
Consolidation	C_v	(m ² /year)	70.2
Compressibility	m_v	(m ² /MN)	
Secondary Compression	C_{SEC}	(m ² /MN)	0.0087



	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006	
			Database:	.\SQLEXPRESS\ENTEC	
	Site Reference	1920815	Test Date	11/27/2015	
	Jobfile	Geotechnical Engineering	Sample	N590	
	Client	Japan International Cooperation	Borehole	BH08	
Operator	IG/MK	Checked	DMC	Approved	DMC

Entec Limited, Level 2 Mid City, Cnr Cumming Street & Renwick Road, Suva

	Test Method	AS 1289.6.6.1-1998	Test Name	ODO-09_006	
			Database:	.\SQLEXPRESS\ENTEC	
	Site Reference	1920815	Test Date	11/27/2015	
	Jobfile	Geotechnical Engineering	Sample	N590	
	Client	Japan International Cooperation	Borehole	BH08	
Operator	IG/MK	Checked	DMC	Approved	DMC

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