

## 6.2 地質調査結果

### 6.2.1 概要

地質調査は現地再委託により実施し、橋梁基礎形式の検討、支持層の検討に必要な地質・地層状況を把握するためにボーリング掘削、標準貫入試験、土質資料採取及び室内試験を行った。これらの試験により基本設計に必要な地質縦断図、土質柱状図、室内試験結果が収集された。以下に地質調査結果を整理する。

表6.2 地質調査内容

種類	調査内容・数量	
ボーリング調査	<u>ボーリング本数</u>	地上部 3本 水中部 5本 合計 8本
	<u>標準貫入試験</u> <u>サンプリング</u>	全ボーリング位置で実施 乱した試料および不攪乱試料 岩のコア採取
室内試験	<u>物理試験</u>	密度試験 含水比試験 粒度試験 液性限界・塑性限界試験
	<u>圧密試験</u> <u>せん断試験</u>	土の圧密試験 一軸圧縮試験（岩および粘性土）



図 地質調査状況（水上部）



図 採取資料

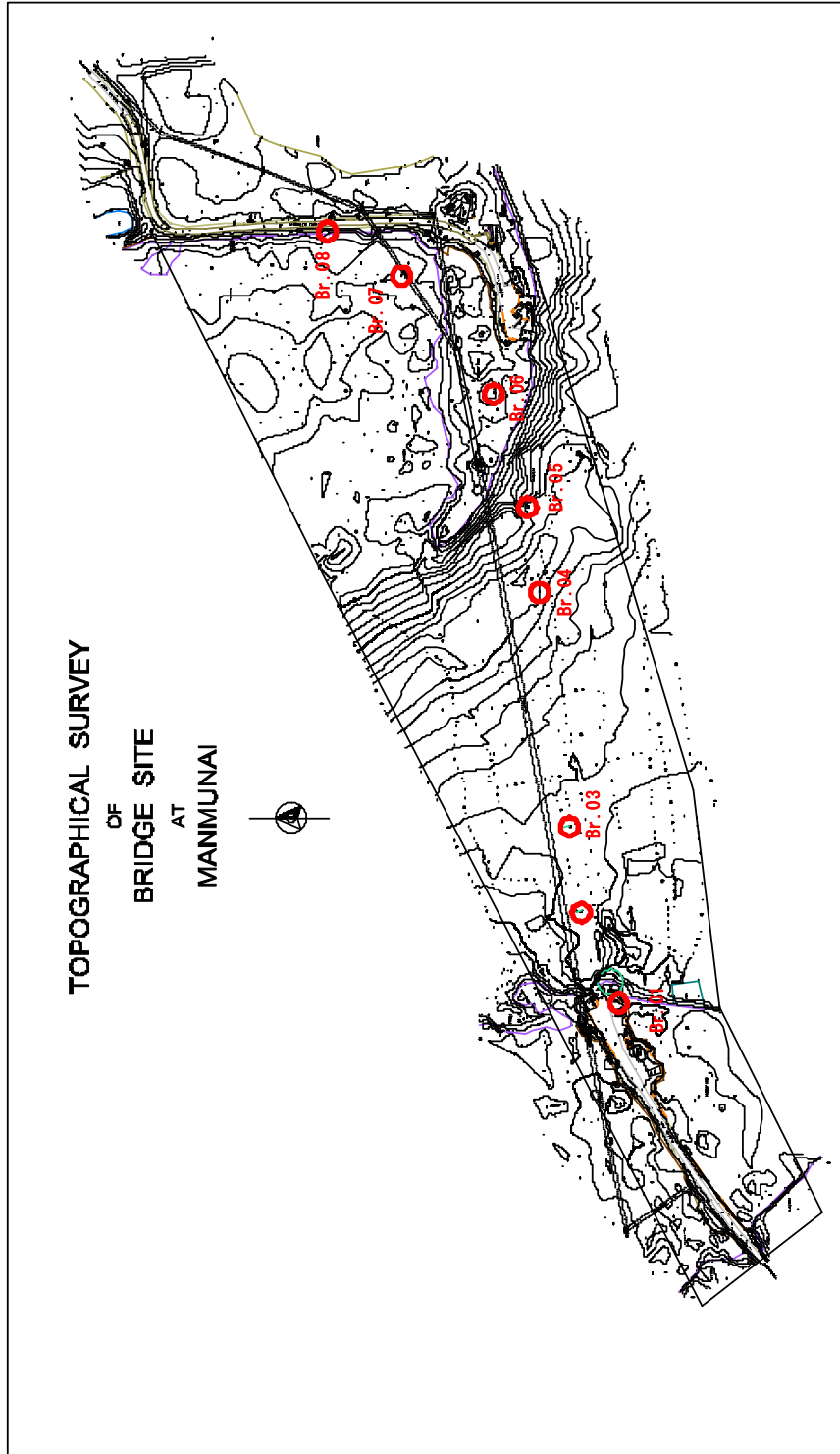
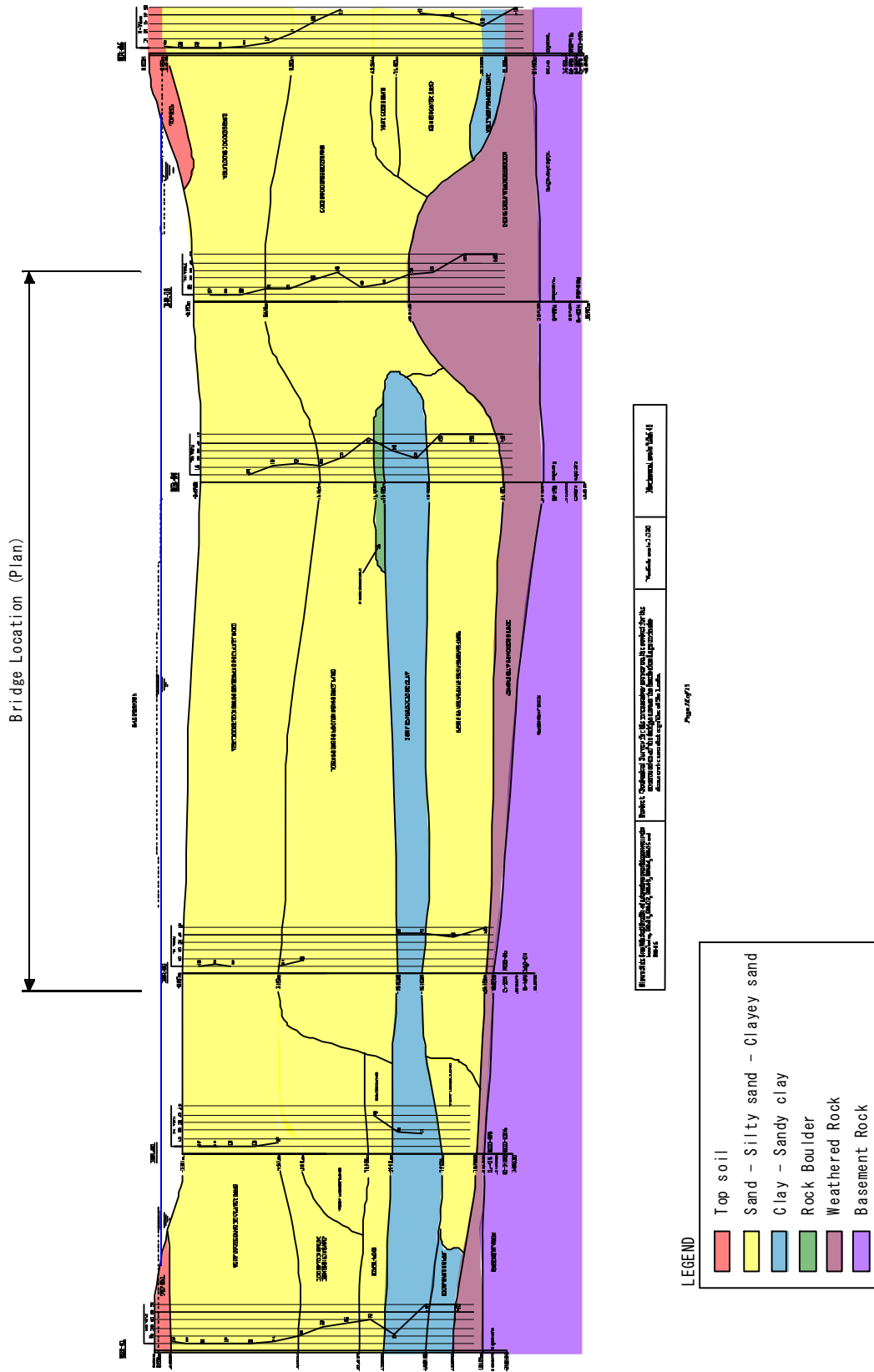


図 地質調査位置概念図

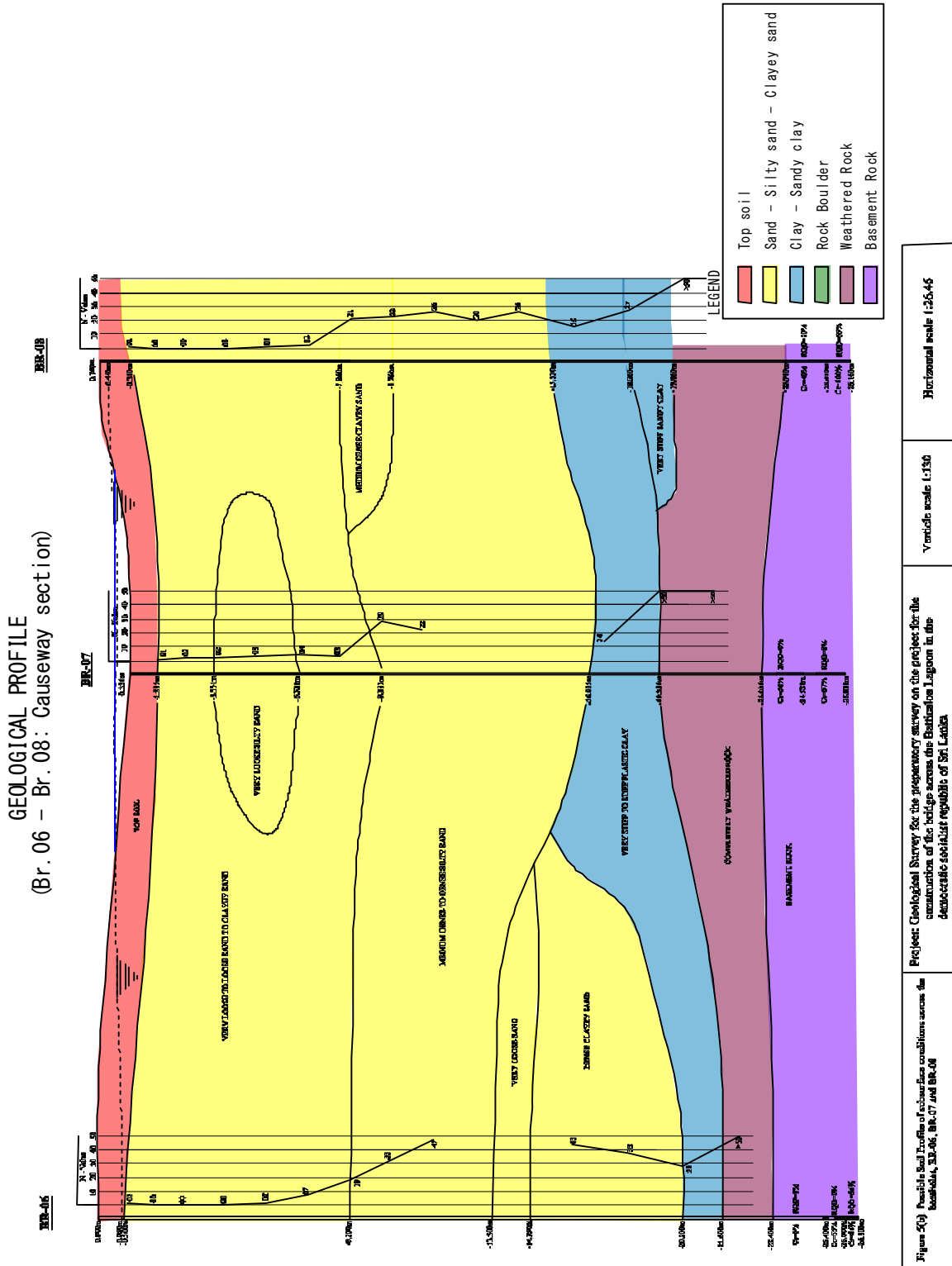
6.2.2 想定地質縦断面図

Br.01~Br.06 (西側~橋梁区間)

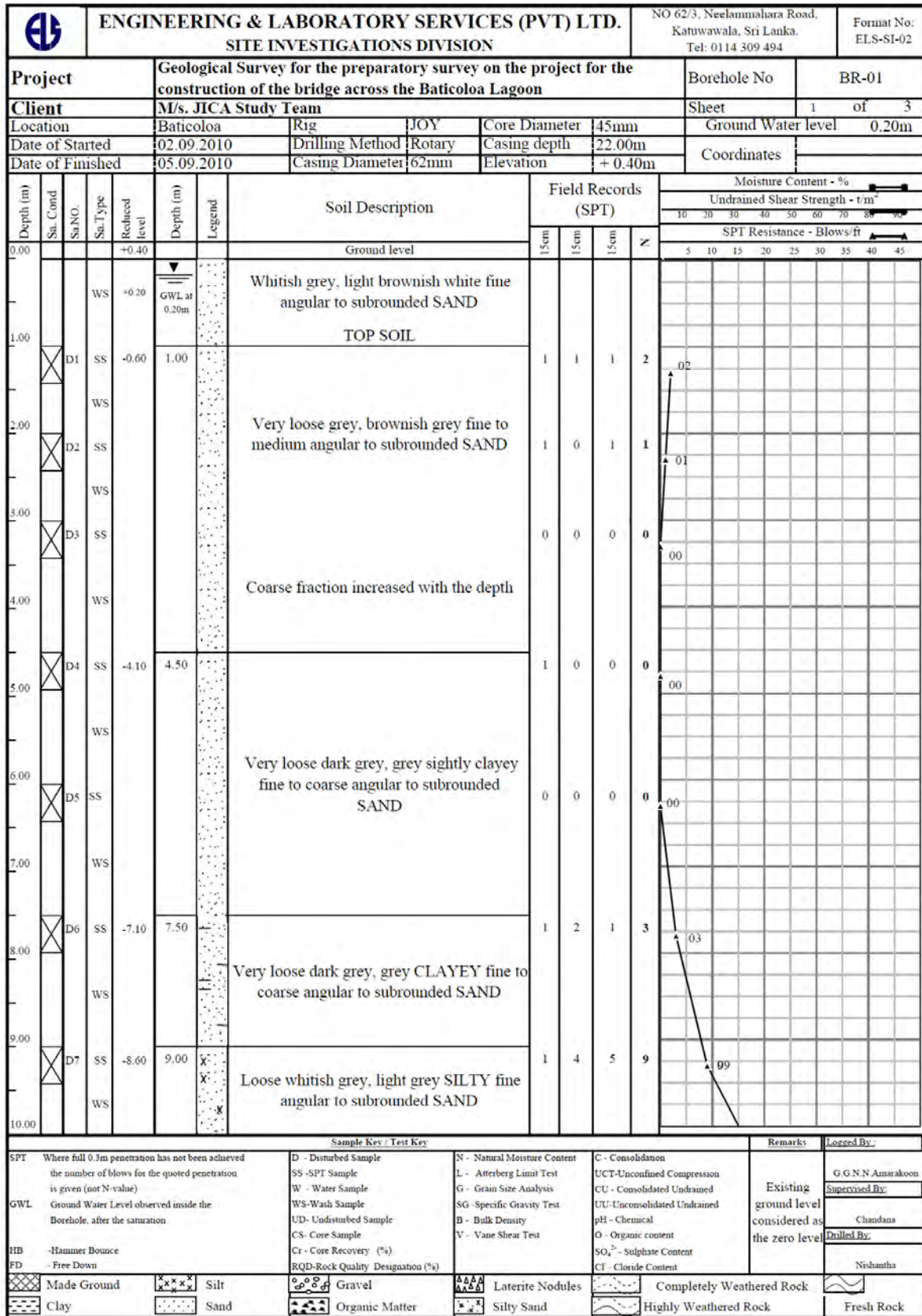
GEOLOGICAL PROFILE  
(Br.01 - Br.06: Bridge section)



Br.06～Br.08（東側コースウェイ区間）












6.2.3 ボーリング柱状図





ENGINEERING & LABORATORY SERVICES (PVT) LTD. SITE INVESTIGATIONS DIVISION		NO 62/3, Neelamahara Road, Katuwawala, Sri Lanka. Tel: 0114 309 494		Format No: ELS-SI-02															
Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No		BR-01											
Client		M/s. JICA Study Team				Sheet		2 of 3											
Location		Baticoloa		Rig		JOY		Core Diameter		45mm		Ground Water level		0.20m					
Date of Started		02.09.2010		Drilling Method		Rotary		Casing depth		22.00m		Coordinates							
Date of Finished		05.09.2010		Casing Diameter		62mm		Elevation		+ 0.40m									
Depth (m)	So. Cond.	So. NO.	So. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft			
								15cm	15cm	15cm	N	5	10	15	20	25	30	35	40
10.00				-9.60			Continue from Page 1												
11.00	D8		SS	-10.10	10.50	X	Same as previous description	6	10	12	22								
12.00			WS			X	Medium dense light greenish white, whitish grey SILTY fine angular to subrounded SAND												
13.00	D9		SS	-12.40	12.80	X	Dense light brown, brown fine to coarse angular to subrounded SAND with rock fragments	8	12	14	26								
14.00			WS			X													
15.00	D10		SS	-13.90	14.30	X	Stiff yellowish brown, grey slightly silty PLASTIC CLAY	6	20	12	32								
16.00			WS			X													
17.00	D11		SS	-16.60	17.00	X	Hard yellowish brown, grey fine to medium angular to subrounded SANDY CLAY with some sand	4	5	8	13								
18.00			WS			X													
19.00	D12		SS	-18.30	18.70	X	Light brown, grey, yellowish brown fine to coarse angular to subrounded SAND with weathered rock fragments	20	30	20	50								
20.00			WS			X	COMPLETELY WEATHERED ROCK	50	HB		>50								
Sample Key / Test Key														Remarks		Logged By:			
SPT Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)				D - Disturbed Sample				N - Natural Moisture Content				C - Consolidation				Existing ground level considered as the zero level		G.G.N.N. Amarakoon	
GWL Ground Water Level observed inside the Borehole, after the saturation				SS - SPT Sample				L - Atterberg Limit Test				UCT - Unconfined Compression						Supervised By:	
HB - Hammer Bounce				W - Water Sample				G - Grain Size Analysis				CU - Consolidated Undrained				Chandana			
FD - Free Down				WS - Wash Sample				SG - Specific Gravity Test				UU - Unconsolidated Undrained				Drilled By:			
				UD - Undisturbed Sample				B - Bulk Density				pH - Chemical				Nishantha			
				CS - Core Sample				V - Vane Shear Test				O - Organic content							
				Cr - Core Recovery (%)				RQD - Rock Quality Designation (%)				SO <sub>4</sub> <sup>2-</sup> - Sulphate Content							
				X X X X Silt				Gravel				Laterite Nodules				Completely Weathered Rock			
				X X X X Sand				Organic Matter				Silty Sand				Highly Weathered Rock			
				X X X X Clay												Fresh Rock			

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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No		BR-01																											
Client		M/s. JICA Study Team				Sheet		3 of 3																											
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Ground Water level		0.20m																										
Date of Started		02.09.2010	Drilling Method	Rotary	Casing depth	22.00m	Coordinates																												
Date of Finished		05.09.2010	Casing Diameter	62mm	Elevation	+ 0.40m																													
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description				Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft																
							15cm	15cm	15cm	N	5	10	15	20	25	30	35	40	45																
20.00				-19.60			Continue from Page 2																												
							Same as previous description <b>ROCK LEVEL</b>																												
21.00			CS	-20.10	20.50		Pinkish brown, blackish grey medium grained, highly fractured, discoloured <b>GRANITIC GNEISS</b>				Cr=100%	RQD=95%																							
22.00				-21.60	22.00		The borehole was terminated at a depth of 22.00m																												
23.00																																			
24.00																																			
25.00																																			
26.00																																			
27.00																																			
28.00																																			
29.00																																			
30.00																																			
Sample Key / Test Key										Remarks		Logged By:																							
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)			D - Disturbed Sample	SS - SPT Sample	W - Water Sample	WS - Wash Sample	UD - Undisturbed Sample	CS - Core Sample	Cr - Core Recovery (%)	FD - Free Down	D - Disurbed Sample	SS - SPT Sample	W - Water Sample	WS - Wash Sample	UD - Undisturbed Sample	CS - Core Sample	Cr - Core Recovery (%)	N - Natural Moisture Content	L - Atterberg Limit Test	G - Grain Size Analysis	SG - Specific Gravity Test	B - Bulk Density	V - Vane Shear Test	C - Consolidation	UCT - Unconfined Compression	CU - Consolidated Undrained	UU - Unconsolidated Undrained	pH - Chemical	O - Organic content	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content	Cl - Chloride Content	Existing ground level considered as the zero level	Supervised By:	
GWL	Ground Water Level observed inside the Borehole, after the saturation																																	Chandana	
HB	- Hammer Bounce																																	Drilled By:	
FD	- Free Down																																	Nishantha	
	Made Ground				Silt		Gravel		Organic Matter		Laterite Nodules		Silty Sand		Completely Weathered Rock		Highly Weathered Rock		Fresh Rock																







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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No	BR-02													
Client		M/s. JICA Study Team				Sheet	2 of 3													
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Water Column Height	1.50m												
Date of Started		17.09.2010	Drilling Method	Rotary	Casing depth	18.00m	Coordinates													
Date of Finished		18.09.2010	Casing Diameter	62mm	Elevation	-1.361m														
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description				Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
							15cm	15cm	15cm	N	5	10	15	20	25	30	35	40	45	
10.00				-11.361			Continue from Page 1													
11.00							Same as previous description				SAND BOILED									
12.00			WS	-12.961	11.60		Dense whitish grey, light grey fine to coarse angular to subrounded SAND with coral rock parts				8	16	23	39						
13.00			WS	-14.461	13.10		Very stiff yellowish brown, grey, brownish grey slightly silty PLASTIC CLAY				1	6	12	18						
14.00			D7				Washed Sample: Very loose yellowish brown, light brown fine to coarse angular to subrounded SAND				5	8	9	17						
15.00			D8								Washed Sample: Blackish grey, brown fine to coarse angular to subrounded SAND with mica traces and weathered rock fragments COMPLETELY WEATHERED ROCK ROCK LEVEL									
16.00			WS	-17.661	16.30		Black, blackish grey medium grained, fractured, fairly discoloured BIOTITE GNEISS													
17.00			D9								Black, blackish grey medium grained, fractured, fairly discoloured BIOTITE GNEISS									
18.00			WS	-19.761	18.40		Black, blackish grey medium grained, fractured, fairly discoloured BIOTITE GNEISS								Cr=41%			RQD=41%		
19.00				-20.261	18.90						Black, blackish grey medium grained, fractured, fairly discoloured BIOTITE GNEISS									
20.00			CS	-21.061	19.70										Cr=100%			RQD=100%		

**Sample Key / Test Key**

SPT - Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation
GWL - Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression
HB - Hammer Bounce	W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained
FD - Free Down	WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained
	UD - Undisturbed Sample	B - Bulk Density	pH - Chemical
	CS - Core Sample	V - Vane Shear Test	O - Organic content
	Cr - Core Recovery (%)		SO <sub>4</sub> <sup>2-</sup> - Sulphate Content
	RQD - Rock Quality Designation (%)		Cl - Chloride Content

**Remarks**

Existing ground level considered as the zero level

**Logged By:**  
G.G.N.N. Amarakoon

**Supervised By:**  
Chandana

**Drilled By:**  
Nishantha

Made Ground	Silt	Gravel	Laterite Nodules	Completely Weathered Rock
Clay	Sand	Organic Matter	Silty Sand	Highly Weathered Rock
				Fresh Rock

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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No	BR-02											
Client		M/s. JICA Study Team			Sheet	3 of 3											
Location		Baticoloa	Rig	JOY	Core Diameter	45mm											
Date of Started		17.09.2010	Drilling Method	Rotary	Casing depth	18.00m											
Date of Finished		18.09.2010	Casing Diameter	62mm	Elevation	-1.361m											
Coordinates																	
Depth (m)	So. Cond.	So. NO.	So. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
								15cm	15cm	15cm	N						
20.00			CS	-21.361			Continue from Page 2										
21.00				-22.061	20.70		The borehole was terminated at a depth of 20.70m										
22.00																	
23.00																	
24.00																	
25.00																	
26.00																	
27.00																	
28.00																	
29.00																	
30.00																	

Sample Key / Test Key				Remarks	Logged By:
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample SS - SPT Sample W - Water Sample WS - Wash Sample UD - Undisturbed Sample CS - Core Sample Cr - Core Recovery (%) RQD - Rock Quality Designation (%)	N - Natural Moisture Content L - Atterberg Limit Test G - Grain Size Analysis SG - Specific Gravity Test B - Bulk Density V - Vane Shear Test	C - Consolidation UCT - Unconfined Compression CU - Consolidated Undrained UU - Unconsolidated Undrained pH - Chemical O - Organic content SO <sub>4</sub> <sup>2-</sup> - Sulphate Content Cl - Chloride Content	G. G. N. N. Amarakoon Supervised By: Chandana Drilled By: Nishantha
GWL	Ground Water Level observed inside the borehole, after the saturation			Existing ground level considered as the zero level	
HB	- Hammer Bounce				
FD	- Free Down				
	Made Ground		Silt		Gravel
	Clay		Sand		Organic Matter
			Laterite Nodules		Silty Sand
			Completely Weathered Rock		Highly Weathered Rock
			Fresh Rock		





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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No BR-03														
Client		M/s. JICA Study Team			Sheet 2 of 3														
Location		Baticoloa	Rig	JOY	Core Diameter	45mm													
Date of Started		10.09.2010	Drilling Method	Rotary	Casing depth	19.00m													
Date of Finished		12.09.2010	Casing Diameter	62mm	Elevation	-1.361m													
					Coordinates														
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft			
								15cm	15cm	15cm	N	10	20	30	40	50	60	70	80
10.00				-11.361			Continue from Page 1												
11.00			WS			X	Washed Sample: Very loose light grey, whitish grey SILTY fine angular to subrounded SAND with some mica traces												
12.00			WS			X													
13.00			WS			X													
14.00		D6	SS	-14.861	13.50	X	Hard yellowish brown, brownish grey, grey slightly silty PLASTIC CLAY	18	20	21	41							41	
15.00			WS			X													
16.00		D7	SS	-16.361	15.00	X	Dense yellowish brown, grey slightly clayey SILTY fine to medium angular to subrounded SAND	18	19	22	41							41	
17.00			WS			X													
18.00		D8	SS	-18.361	17.00	X	Washed Sample: Dense whitish grey, light grey fine to medium angular to subrounded SAND with some mica traces	17	18	18	36							36	
19.00			WS			X	Washed Sample: Yellowish brown, brownish grey fine to medium angular to subrounded sand with large amount of mica traces												
19.00		D9	SS	-20.361	19.00	X	COMPLETELY WEATHERED ROCK	10	HB		>50							>50	
19.00							ROCK LEVEL												
20.00				-20.861	19.50		Same as next description												
Sample Key / Test Key																			
SPT		Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)		D - Disturbed Sample		SS - SPT Sample		W - Water Sample		WS - Wash Sample		UD - Undisturbed Sample		CS - Core Sample		Cr - Core Recovery (%)		RQD - Rock Quality Designation (%)	
GWL		Ground Water Level observed inside the Borehole, after the saturation		N - Natural Moisture Content		L - Atterberg Limit Test		G - Grain Size Analysis		SG - Specific Gravity Test		B - Bulk Density		V - Vane Shear Test		C - Consolidation		UCT - Unconfined Compression	
HB		- Hammer Bounce		CU - Consolidated Undrained		UU - Unconsolidated Undrained		pH - Chemical		O - Organic content		SO <sub>4</sub> <sup>2-</sup> - Sulphate Content		Cl - Chloride Content		Existing ground level considered as the zero level		G.G.N.N. Amarakoon	
FD		- Free Down		Laterite Nodules		Completely Weathered Rock		Highly Weathered Rock		Fresh Rock		Supervised By:		Dhanmika Prasad		Drilled By:		R.M. Rohana	
Made Ground		Silt		Gravel		Organic Matter		Silty Sand											



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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No BR-03													
Client		M/s. JICA Study Team			Sheet 3 of 3													
Location		Baticoloa	Rig	JOY	Core Diameter	45mm												
Date of Started		10.09.2010	Drilling Method	Rotary	Casing depth	19.00m												
Date of Finished		12.09.2010	Casing Diameter	62mm	Elevation	-1.361m												
Coordinates																		
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft		
								15cm	15cm	15cm	N			10	20	30	40	50
20.00				-21.361			Continue from Page 2											
21.00			CS				Pinkish brown, whitish yellow, greenish grey medium grained, highly fractured, strongly discoloured GRANITIC GNEISS	Cr=50%		RQD=6%								
22.00			CS	-22.361	21.00		Pinkish brown, whitish yellow, greenish grey medium grained, highly fractured, strongly discoloured GRANITIC GNEISS	Cr=85%		RQD=0%								
23.00				-23.361	22.00		The borehole was terminated at a depth of 22.00m											
24.00																		
25.00																		
26.00																		
27.00																		
28.00																		
29.00																		
30.00																		

Sample Key / Test Key				Remarks	Logged By:
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample SS - SPT Sample W - Water Sample WS - Wash Sample UD - Undisturbed Sample CS - Core Sample Cr - Core Recovery (%) RQD - Rock Quality Designation (%)	N - Natural Moisture Content L - Atterberg Limit Test G - Grain Size Analysis SG - Specific Gravity Test B - Bulk Density V - Vane Shear Test	C - Consolidation UCT - Unconfined Compression CU - Consolidated Undrained UU - Unconsolidated Undrained pH - Chemical O - Organic content SO <sub>4</sub> <sup>2-</sup> - Sulphate Content Cl - Chloride Content	G.G.N.N. Amarakoon Supervised By: Dhanmika Prasad Drilled By: R.M. Rohana
GWL	Ground Water Level observed inside the Borehole, after the saturation			Existing ground level considered as the zero level	
HB	- Hammer Bounce				
FD	- Free Down				
	Made Ground		Silt		Gravel
	Clay		Sand		Organic Matter
	Laterite Nodules		Silty Sand		Completely Weathered Rock
	Highly Weathered Rock		Fresh Rock		

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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No		BR-04										
Client		M/s. JICA Study Team			Sheet		1 of 3										
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Water Column Height 2.40m										
Date of Started		05.09.2010	Drilling Method	Rotary	Casing depth	21.00m	Coordinates										
Date of Finished		08.09.2010	Casing Diameter	62mm	Elevation	-2.481m											
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
								15cm	15cm	15cm	N						
0.00				-2.481			Ground level										
1.00			WS				Whashed Sample:										
2.00							Very loose whitish grey, whitish brown fine to coarse angular to subrounded SAND										
3.00			D1 SS					0	0	0	0						
4.00			WS					FREE DOWN									
5.00			D2 SS	-6.981	4.50		Medium dense whitish grey, light brown fine to coarse SAND	4	4	8	12						
6.00			WS														
7.00			D3 SS				(6.45-7.50)m sample colour changed to whitish brown, light whitish grey colour	7	6	7	13						
8.00			WS														
9.00			D4 SS	-9.981	7.50	X	Medium dense whitish grey, light grey SILTY fine angular to subrounded SAND with shell fragments	5	7	5	12						
10.00			WS			X											
			D5 SS			X	(9.00-9.45)m sample consisted with some mica traces	5	10	13	23						
			WS			X											

Sample Key / Test Key				Remarks	Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test		Supervised By:	Dhanmika Prasad
HB	-Hammer Bounce	W - Water Sample	G - Grain Size Analysis		Drilled By:	R.M. Rohana
FD	-Free Down	WS - Wash Sample	SG - Specific Gravity Test			
		UD - Undisturbed Sample	B - Bulk Density			
		CS - Core Sample	V - Vane Shear Test			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)			
		X	Gravel			
		X	Laterite Nodules			
		X	Organic Matter			
		X	Silty Sand			
		X	Completely Weathered Rock			
		X	Highly Weathered Rock			
		X	Fresh Rock			



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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No	BR-04					
Client		M/s. JICA Study Team				Sheet	2 of 3					
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Water Column Height	2.40m				
Date of Started		05.09.2010	Drilling Method	Rotary	Casing depth	21.00m	Coordinates					
Date of Finished		08.09.2010	Casing Diameter	62mm	Elevation	-2.481m						
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Field Records (SPT)				Moisture Content - %	
							15cm	15cm	15cm	N	Undrained Shear Strength - t/m <sup>2</sup>	
10.00				-12.481			Continue from Page 1				10 20 30 40 50 60 70 80 90	
11.00	D6		SS				7	13	34	47		
				-13.481	11.00		Rock Boulder: Grey, yellowish brown ROCK BOULDER				47	
				-13.981	11.50		Very stiff grey, brown slightly silty PLASTIC CLAY				30	
12.00	D7		SS				8	13	17	30		
13.00							Very stiff grey, brown slightly silty PLASTIC CLAY				20	
14.00	D8		SS				6	10	10	20		
15.00				-16.781	14.30		Very dense dark grey, blackish grey slightly clayey SILTY fine to coarse angular to subrounded SAND				>50	
16.00	D9		SS				9	21	34	>50		
17.00							Very dense dark grey, blackish grey slightly clayey SILTY fine to coarse angular to subrounded SAND				>50	
18.00	D10		SS				HB			>50		
19.00				-21.481	19.00		Same as next description				>50	
20.00	D11		SS				50	HB		>50		
Sample Key / Test Key							Remarks		Logged By:			
SPT Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)		D - Disturbed Sample		SS -SPT Sample		N - Natural Moisture Content		C - Consolidation		Existing ground level considered as the zero level		
GWL Ground Water Level observed inside the Borehole, after the saturation		W - Water Sample		WS-Wash Sample		L - Atterberg Limit Test		UCT-Unconfined Compression		G.G.N.N.Amarakoon		
HB -Hammer Bounce		UD- Undisturbed Sample		CS- Core Sample		G - Grain Size Analysis		CU - Consolidated Undrained		Supervised By:		
FD - Free Down		Cr - Core Recovery (%)		RQD-Rock Quality Designation (%)		SG - Specific Gravity Test		UU-Unconsolidated Undrained		Dhanmika Prasad		
Made Ground		Silt		Gravel		B - Bulk Density		pH - Chemical		Drilled By:		
Clay		Sand		Organic Matter		V - Vane Shear Test		O - Organic content		R.M.Rohana		
						Laterite Nodules		SO <sub>4</sub> <sup>2-</sup> - Sulphate Content				
						Silty Sand		Cl - Chloride Content				
								Completely Weathered Rock				
								Highly Weathered Rock				
								Fresh Rock				

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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No		BR-04										
Client		M/s. JICA Study Team				Sheet		3 of 3										
Location		Baticoloa		Rig		JOY		Core Diameter		45mm		Water Column Height		2.40m				
Date of Started		05.09.2010		Drilling Method		Rotary		Casing depth		21.00m		Coordinates						
Date of Finished		08.09.2010		Casing Diameter		62mm		Elevation		-2.481m								
Depth (m)	So. Cond	So. NO.	So. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft		
								15cm	15cm	15cm	N	5	10	15	20	25	30	35
20.00				-22.481			Continue from Page 2											
21.00			WS				Yellowish brown, grey medium to coarse angular to subrounded sand with mica and weathered rock fragments Mica content increased with the depth <b>COMPLETELY WEATHERED ROCK</b> <b>ROCK LEVEL</b>											
22.00			CS	-23.981	21.50		Yellowish brown, whitish grey, blackish grey medium grained, highly fractured, strongly discoloured BIOTITE GNEISS	Cr=35%			RQD=0%							
23.00			CS	-25.481	23.00		Yellowish brown, whitish grey, blackish grey medium grained, highly fractured, strongly discoloured BIOTITE GNEISS	Cr=60%			RQD=0%							
24.00				-26.481	24.00		The borehole was terminated at a depth of 24.00m											
25.00																		
26.00																		
27.00																		
28.00																		
29.00																		
30.00																		
Sample Key / Test Key														Remarks		Logged By:		
SPT		Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)				D - Disturbed Sample		N - Natural Moisture Content		C - Consolidation		Existing ground level considered as the zero level		G.G.N.N. Amarakoon				
GWL		Ground Water Level observed inside the Borehole, after the saturation				SS - SPT Sample		L - Atterberg Limit Test		UCT - Unconfined Compression				Supervised By:				
HB		- Hammer Bounce				W - Water Sample		G - Grain Size Analysis		CU - Consolidated Undrained		Dhanmika Prasad						
FD		- Free Down				WS - Wash Sample		SG - Specific Gravity Test		UU - Unconsolidated Undrained		Drilled By:						
						UD - Undisturbed Sample		B - Bulk Density		pH - Chemical		R.M. Rohana						
						CS - Core Sample		V - Vane Shear Test		O - Organic content								
						Cr - Core Recovery (%)		RQD - Rock Quality Designation (%)		SO <sub>4</sub> <sup>2-</sup> - Sulphate Content								
						RQD - Rock Quality Designation (%)				Cl - Chloride Content								
Made Ground		Silt		Gravel		Laterite Nodules		Completely Weathered Rock		Fresh Rock								
Clay		Sand		Organic Matter		Silty Sand		Highly Weathered Rock										



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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No BR-05								
Client		M/s. JICA Study Team				Sheet 1 of 3								
Location		Baticoloa	Rig	JOY	Core Diameter	54mm								
Date of Started		02.09.2010		Drilling Method	Rotary		Water Column Height							
Date of Finished		04.09.2010		Casing Diameter	76mm		Elevation							
						Coordinates								
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		
								15cm	15cm	15cm	N	Undrained Shear Strength - t/m <sup>2</sup>		
0.00				-2.031			Ground level							
1.00			WS				Washed Sample: Grey, brownish grey fine to coarse angular to subrounded SAND TOP SOIL	1	0	0	0			
2.00			WS				Very loose grey, brownish grey CLAYEY fine to coarse angular to subrounded SAND	0	0	0	0			
3.00			WS					FREE DOWN						
4.00			WS					1	0	0	0			
5.00			SS	-6.531	4.50	X	Loose whitish grey, light grey slightly clayey SILTY fine angular to subrounded SAND with small amount of shell fragments	2	3	3	6			
6.00			WS			X								
7.00			WS			X		7	3	3	6			
8.00			SS	-9.531	7.50	X	Medium dense grey, greenish grey SILTY fine angular to subrounded SAND with some mica traces and shell fragments	4	7	11	18			
9.00			WS			X								
10.00			WS			X		12	13	15	28			

Sample Key / Test Key				Remarks	Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test		Supervised By:	Dhanmika Prasad
HB	- Hammer Bounce	W - Water Sample	G - Grain Size Analysis		Drilled By:	R.M. Rohana
FD	- Free Down	WS - Wash Sample	SG - Specific Gravity Test			
		UD - Undisturbed Sample	B - Bulk Density			
		CS - Core Sample	V - Vane Shear Test			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)			
		X	Gravel			
		X	Silt			
		X	Sand			
		X	Organic Matter			
		X	Laterite Nodules			
		X	Silty Sand			
		X	Completely Weathered Rock			
		X	Highly Weathered Rock			
		X	Fresh Rock			





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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No BR-05											
Client		M/s. JICA Study Team				Sheet 3 of 3											
Location		Baticoloa	Rig	JOY	Core Diameter	54mm											
Date of Started		02.09.2010		Drilling Method	Rotary		Water Column Height										
Date of Finished		04.09.2010		Casing Diameter	76mm		Elevation										
						-2.031m											
						Coordinates											
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
								15cm	15cm	15cm	N						
20.00				-22.031			Continue from Page 2										
21.00			WS				Same as previous description										
							<b>ROCK LEVEL</b>										
22.00			CS	-23.711	21.68		Black, whitish grey medium grained, highly fractured, discoloured BIOTITE GNEISS	Cr=50%		RQD=15%							
23.00																	
24.00			CS	-25.711	23.68		Black, whitish grey medium grained, highly fractured, discoloured BIOTITE GNEISS	Cr=100%		RQD=22%							
25.00				-26.711	24.68		The borehole was terminated at a depth of 24.00m										
26.00																	
27.00																	
28.00																	
29.00																	
30.00																	

Sample Key / Test Key				Remarks	Logged By:
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample SS -SPT Sample W - Water Sample WS-Wash Sample UD- Undisturbed Sample CS- Core Sample Cr - Core Recovery (%) RQD-Rock Quality Designation (%)	N - Natural Moisture Content L - Atterberg Limit Test G - Grain Size Analysis SG -Specific Gravity Test B - Bulk Density V - Vane Shear Test	C - Consolidation UCT-Unconfined Compression CU - Consolidated Undrained UU-Unconsolidated Undrained pH - Chemical O - Organic content SO <sub>4</sub> <sup>2-</sup> - Sulphate Content Cl - Chloride Content	G.G.N.N.Amarakoon Supervised By: Dhanmika Prasad Drilled By: R.M.Rohana
GWL	Ground Water Level observed inside the Borehole, after the saturation				Existing ground level considered as the zero level
HD	-Hammer Bounce				
FD	-Free Down				
	Made Ground		Silt		Gravel
	Clay		Sand		Organic Matter
			Laterite Nodules		Silty Sand
			Completely Weathered Rock		Highly Weathered Rock
			Fresh Rock		

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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No	BR-06													
Client		M/s. JICA Study Team				Sheet	1 of 3													
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Ground Water level	0.85m												
Date of Started		08.09.2010	Drilling Method	Rotary	Casing depth	18.00m	Coordinates													
Date of Finished		15.09.2010	Casing Diameter	62mm	Elevation	+ 0.80m														
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description				Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
							15cm	15cm	15cm	N	5	10	15	20	25	30	35	40	45	
0.00				+0.80			Ground level													
			WS				Whitish grey, light brownish white fine to coarse SAND with some coral rock fragments													
							TOP SOIL													
1.00			D1	-0.10	0.90					3	2	0	2							
			WS																	
2.00			D2							0	0	0	0							
			WS																	
3.00			D3							1	0	0	0							
			WS																	
4.00			D4	-3.80	4.60					1	0	0	0							
			WS																	
5.00			D5							1	1	1	2							
			WS																	
6.00			D6	-6.70	7.50					2	3	4	7							
			WS																	
7.00			D7	-8.20	9.00					7	9	9	18							
			WS																	
8.00																				
9.00																				
10.00																				

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
HB	- Hammer Bounce	W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained	Chandana		
FD	- Free Down	WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained	Drilled By:		
		UD - Undisturbed Sample	B - Bulk Density	pH - Chemical	Nishantha		
		CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
				Cl - Chloride Content			
		⊗ ⊗ ⊗ ⊗ ⊗ Silt	⊙ ⊙ ⊙ ⊙ Gravel	⊠ ⊠ ⊠ ⊠ Laterite Nodules	⊡ ⊡ ⊡ ⊡ Completely Weathered Rock	⊢ ⊢ ⊢ ⊢ Fresh Rock	
		⊠ ⊠ ⊠ ⊠ Clay	⊡ ⊡ ⊡ ⊡ Organic Matter	⊢ ⊢ ⊢ ⊢ Silty Sand	⊣ ⊣ ⊣ ⊣ Highly Weathered Rock		



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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No	BR-06											
Client		M/s. JICA Study Team				Sheet	2 of 3											
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Ground Water level	0.85m										
Date of Started		08.09.2010	Drilling Method	Rotary	Casing depth	18.00m	Coordinates											
Date of Finished		15.09.2010	Casing Diameter	62mm	Elevation	+ 0.80m												
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft		
								15cm	15cm	15cm	N	5	10	15	20	25	30	35
10.00				-9.20			Continue from Page 1											
11.00	D8		SS	-9.70	10.50	X	Same as previous description	22	16	17	33							
12.00			WS			X	Dense whitish grey, light grey, off white SILTY fine angular to subrounded SAND with some mica traces											
13.00	D9		SS			X	From a depth of 12.00m, sample colour changed to greenish grey, whitish grey colour	10	23	24	47							
14.00			WS			X												
15.00			WS	-13.30	14.10	X	Washed Sample: Yellowish brown, grey fine to medium SAND with strong coral rock fragments											
16.00			WS	-14.20	15.00	X	Washed Sample: Very loose greenish grey, grey fine to coarse SAND with some shell fragments											
17.00	D10		SS	-14.75	15.55	X		7	21	22	43							
18.00			WS			X	Dense grey, brownish grey, yellowish brown CLAYEY fine to medium angular to subrounded SAND with shell fragments											
19.00	D11		SS			X		10	18	20	38							
20.00						X												

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
HB	- Hammer Bounce	W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained		Chandana	
FD	- Free Down	WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained		Drilled By:	
		UD - Undisturbed Sample	B - Bulk Density	pH - Chemical	Nishantha		
		CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
		X X X X Silt	Gravel	CI - Chloride Content			
		X X X X Sand	Laterite Nodules				
		X X X X Organic Matter	Silty Sand				
		X X X X Completely Weathered Rock					
		X X X X Highly Weathered Rock					
		X X X X Fresh Rock					

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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No		BR-06										
Client		M/s. JICA Study Team				Sheet		3 of 3										
Location		Baticoloa		Rig		JOY		Core Diameter		45mm		Ground Water level		0.85m				
Date of Started		08.09.2010		Drilling Method		Rotary		Casing depth		18.00m		Coordinates						
Date of Finished		15.09.2010		Casing Diameter		62mm		Elevation		+ 0.80m								
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft		
								15cm	15cm	15cm	N	5	10	15	20	25	30	35
20.00				-19.20			Continue from Page 2											
21.00			WS				Same as previous description											
			D12 SS	-20.20	21.00		Very stiff grey, brownish grey, brown slightly silty PLASTIC CLAY	8	11	17	28							
22.00			WS															
				-21.60	22.40		Yellowish brown, brown fine to medium angular to subrounded sand with mica traces	50	HB		>50							
23.00			D13 SS				COMPLETELY WEATHERED ROCK											
24.00			WS				ROCK LEVEL											
				-23.40	24.20		Greenish black, yellowish brown silty fine sand with large amount of mica traces and rock fragments	Cr=3%			RQD=0%							
25.00			CS				HIGHLY WEATHERED ROCK											
				-25.40	26.20			Cr=55%			RQD=0%							
27.00			CS				Black, blackish grey medium grained, highly fractured, discoloured BIOTITE GNEISS	Cr=86%			RQD=56%							
				-26.00	26.80													
28.00			CS				Black, blackish grey medium grained, highly fractured, discoloured BIOTITE GNEISS											
				-26.50	27.30		The borehole was terminated at a depth of 27.30m											
29.00																		
30.00																		

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
		W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained		Chandana	
		WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained		Drilled By:	
HB	- Hammer Bounce	UD - Undisturbed Sample	B - Bulk Density	pH - Chemical	Nishantha		
FD	- Free Down	CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
				Cl - Chloride Content			
	Made Ground		Silt		Gravel		Completely Weathered Rock
	Clay		Sand		Organic Matter		Highly Weathered Rock
			Laterite Nodules		Silty Sand		Fresh Rock



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Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No	BR-07													
Client		M/s. JICA Study Team				Sheet	1 of 3													
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Water Column Height	0.50m												
Date of Started		22.09.2010	Drilling Method	Rotary	Casing depth	19.00m	Coordinates													
Date of Finished		23.09.2010	Casing Diameter	62mm	Elevation	-0.331m														
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description				Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
							15cm	15cm	15cm	N	5	10	15	20	25	30	35	40	45	
0.00				-0.331			Ground level													
1.00			WS				Grey, dark grey slightly clayey fine to coarse angular to subrounded SAND													
							TOP SOIL													
2.00	D1		SS	-1.331	1.00		Very loose dark grey, grey CLAYEY fine to coarse angular to subrounded SAND				0	0	1	1						
3.00	D2		SS				Very loose dark grey, grey CLAYEY fine to coarse angular to subrounded SAND				1	1	1	2						
4.00	D3		SS	-3.331	3.00	X	Very loose dark grey, grey slightly clayey SILTY fine to coarse angular to subrounded SAND				1	1	1	2						
5.00	D4		SS			X	Clay content decreased with the depth				0	1	2	3						
6.00	D5		SS	-6.331	6.00	X	Loose dark grey, grey CLAYEY fine to medium angular to subrounded SAND				2	2	2	4						
7.00			UD				UD SAMPLE													
8.00	D6		SS	-7.831	7.50		Very loose dark grey, grey CLAYEY fine to medium angular to subrounded SAND				2	2	1	3						
9.00	D7		SS	-9.331	9.00	X	Medium dense greenish grey, light grey SILTY fine to medium angular to subrounded SAND				8	11	18	29						
10.00			WS			X														

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
HB	- Hammer Bounce	W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained		Dhanmika Prasad	
FD	- Free Down	WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained		Drilled By:	
		UD - Undisturbed Sample	B - Bulk Density	pH - Chemical		R.M. Rohana	
		CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
		X X X X Silt	Gravel	Cl - Chloride Content			
		X X X X Sand	Laterite Nodules	Completely Weathered Rock			
		X X X X Organic Matter	Silty Sand	Highly Weathered Rock			
				Fresh Rock			



ENGINEERING & LABORATORY SERVICES (PVT) LTD. SITE INVESTIGATIONS DIVISION		NO 62/3, Neelamahara Road, Katuwawala, Sri Lanka. Tel: 0114 309 494			Format No: ELS-SI-02											
Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon				Borehole No	BR-07									
Client		M/s. JICA Study Team				Sheet	2 of 3									
Location		Baticoloa	Rig	JOY	Core Diameter	45mm	Water Column Height	0.50m								
Date of Started		22.09.2010	Drilling Method	Rotary	Casing depth	19.00m	Coordinates									
Date of Finished		23.09.2010	Casing Diameter	62mm	Elevation	-0.331m										
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
							15cm	15cm	15cm	N	10	20	30	40	50	60
10.00				-10.331			Continue from Page 1									
11.00	D8		SS	-10.831	10.50	X	9	11	11	22						
12.00			WS			X	SAND BOILED									
13.00			WS			X	SAND BOILED									
14.00	D9		SS	-13.831	13.50	X	5	6	7	13						
15.00			WS			X	NO SAMPLE									
16.00			WS			X	SAND BOILED									
17.00			WS			X	SAND BOILED									
18.00	D10		SS	-15.831	15.00	X	4	6	8	14						
19.00			WS			X	SAND BOILED									
20.00	D11		SS	-19.331	19.00	X	10	HB		>50						
						X	NO SAMPLE									

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
		W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained		Dhanmika Prasad	
		WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained		Drilled By:	
HB	- Hammer Bounce	UD - Undisturbed Sample	B - Bulk Density	pH - Chemical	R.M. Rohana		
FD	- Free Down	CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
				Cl - Chloride Content			
		X X X X Silt	Gravel	Laterite Nodules	Completely Weathered Rock		
		X X X X Sand	Organic Matter	Silty Sand	Highly Weathered Rock		
					Fresh Rock		

ENGINEERING & LABORATORY SERVICES (PVT) LTD. SITE INVESTIGATIONS DIVISION		NO 62/3, Neelamahara Road, Katuwawala, Sri Lanka. Tel: 0114 309 494		Format No: ELS-SI-02													
Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No	BR-07											
Client		M/s. JICA Study Team			Sheet	3 of 3											
Location		Baticoloa	Rig	JOY	Core Diameter	45mm											
Date of Started		22.09.2010	Drilling Method	Rotary	Casing depth	19.00m											
Date of Finished		23.09.2010	Casing Diameter	62mm	Elevation	-0.331m											
Coordinates																	
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft	
								15cm	15cm	15cm	N						
20.00				-20.331			Continue from Page 2										
21.00			WS				Blackish grey, dark grey, yellowish brown fine to medium angular to subrounded sand with large amount of mica traces										
			D12 SS					HB									>50
22.00			WS				COMPLETELY WEATHERED ROCK										
							ROCK LEVEL										
23.00				-23.031	22.70		Yellowish brown, cream, black medium grained, highly fractured, strongly fractured BIOTITE GNEISS										
			CS					Cr=54%									
24.00					24.20		Yellowish brown, cream, black medium grained, highly fractured, strongly fractured BIOTITE GNEISS										
			CS					Cr=67%									
25.00					26.031		The borehole was terminated at a depth of 25.70m										
26.00																	
27.00																	
28.00																	
29.00																	
30.00																	

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
HB	- Hammer Bounce	W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained		Dhanmika Prasad	
FD	- Free Down	WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained		Drilled By:	
		UD - Undisturbed Sample	B - Bulk Density	pH - Chemical		R.M. Rohana	
		CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
				Cl - Chloride Content			
	Made Ground		Silt		Gravel		Laterite Nodules
	Clay		Sand		Organic Matter		Silty Sand
					Completely Weathered Rock		Highly Weathered Rock
					Fresh Rock		







ENGINEERING & LABORATORY SERVICES (PVT) LTD. SITE INVESTIGATIONS DIVISION		NO 62/3, Neelamahara Road, Katuwawala, Sri Lanka. Tel: 0114 309 494		Format No: ELS-SI-02														
<b>Project</b>		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No	BR-08												
<b>Client</b>		M/s. JICA Study Team			Sheet	2 of 3												
<b>Location</b>		Baticoloa	Rig	JOY	Core Diameter	45mm												
<b>Date of Started</b>		26.08.2010	Drilling Method	Rotary	Casing depth	22.00m												
<b>Date of Finished</b>		27.08.2010	Casing Diameter	62mm	Elevation	+ 0.74m												
					Coordinates													
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Soil Description	Field Records (SPT)				Moisture Content - %		Undrained Shear Strength - t/m <sup>2</sup>		SPT Resistance - Blows/ft		
								15cm	15cm	15cm	N	5	10	15	20	25	30	35
10.00				-9.26			Continue from Page 1											
11.00	D9		SS	-9.76	10.50	X	Same as previous description	6	11	11	22							
12.00			WS			X												
13.00	D10		SS			X	Medium dense greenish grey, whitish brown, light grey SILTY fine angular to subrounded SAND	10	12	14	26							
14.00			WS			X												
15.00	D11		SS			X	Medium dense greenish grey, grey SILTY fine angular to subrounded SAND with some mica and weathered rock fragments	7	9	11	20							
16.00			WS			X												
17.00	D12		SS	-14.26	15.00	X	Stiff grey, brown slightly fine sandy PLASTIC CLAY	8	11	15	26							
18.00			WS			X												
19.00	D13		SS	-15.51	16.25	X	Very stiff yellowish brown, brown fine to coarse angular to subrounded SANDY CLAY	3	7	8	15							
20.00			WS			X												
	D14		SS	-18.26	19.00	X		12	13	14	27							

Sample Key / Test Key				Remarks		Logged By:	
SPT	Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)	D - Disturbed Sample	N - Natural Moisture Content	C - Consolidation	Existing ground level considered as the zero level	G.G.N.N. Amarakoon	
GWL	Ground Water Level observed inside the Borehole, after the saturation	SS - SPT Sample	L - Atterberg Limit Test	UCT - Unconfined Compression		Supervised By:	
HB	- Hammer Bounce	W - Water Sample	G - Grain Size Analysis	CU - Consolidated Undrained		Chandana	
FD	- Free Down	WS - Wash Sample	SG - Specific Gravity Test	UU - Unconsolidated Undrained		Drilled By:	
		UD - Undisturbed Sample	B - Bulk Density	pH - Chemical	Nishantha		
		CS - Core Sample	V - Vane Shear Test	O - Organic content			
		Cr - Core Recovery (%)	RQD - Rock Quality Designation (%)	SO <sub>4</sub> <sup>2-</sup> - Sulphate Content			
		X X X X Silt	Gravel	CI - Chloride Content			
		X X X X Sand	Organic Matter				
		X X X X Laterite Nodules					
		X X X X Silty Sand					
		X X X X Completely Weathered Rock					
		X X X X Highly Weathered Rock					
		X X X X Fresh Rock					

ENGINEERING & LABORATORY SERVICES (PVT) LTD. SITE INVESTIGATIONS DIVISION		NO 62/3, Neelamahara Road, Katuwawala, Sri Lanka. Tel: 0114 309 494		Format No: ELS-SI-02																																																							
Project		Geological Survey for the preparatory survey on the project for the construction of the bridge across the Baticoloa Lagoon			Borehole No	BR-08																																																					
Client		M/s. JICA Study Team			Sheet	3 of 3																																																					
Location		Baticoloa	Rig	JOY	Core Diameter	45mm																																																					
Date of Started		26.08.2010	Drilling Method	Rotary	Casing depth	22.00m																																																					
Date of Finished		27.08.2010	Casing Diameter	62mm	Elevation	+ 0.74m																																																					
Coordinates																																																											
Depth (m)	Sa. Cond	Sa. NO.	Sa. Type	Reduced level	Depth (m)	Legend	Field Records (SPT)				Moisture Content - %																																																
							15cm	15cm	15cm	N	Undrained Shear Strength - t/m <sup>2</sup>																																																
20.00				-19.26			Continue from Page 2				10 20 30 40 50 60 70 80 90																																																
21.00			WS	-19.86	20.60		50	HB		>50																																																	
22.00			WS																																																								
23.00			SS				50	HB		>50																																																	
24.00			WS																																																								
25.00			CS	-23.91	24.65																																																						
26.00			CS	-25.41	26.15																																																						
27.00				-26.16	26.90																																																						
28.00																																																											
29.00																																																											
30.00																																																											
Sample Key / Test Key													Remarks		Logged By:																																												
SPT		Where full 0.3m penetration has not been achieved the number of blows for the quoted penetration is given (not N-value)		D - Disturbed Sample		SS -SPT Sample		W - Water Sample		WS-Wash Sample		UD- Undisturbed Sample		CS- Core Sample		Cr - Core Recovery (%)		RQD-Rock Quality Designation (%)		N - Natural Moisture Content		L - Atterberg Limit Test		G - Grain Size Analysis		SG - Specific Gravity Test		B - Bulk Density		V - Vane Shear Test		C - Consolidation		UCT-Unconfined Compression		CU - Consolidated Undrained		UU-Unconsolidated Undrained		pH - Chemical		O - Organic content		SO <sub>4</sub> <sup>2-</sup> - Sulphate Content		Cl - Chloride Content		Existing ground level considered as the zero level		G.G.N.N.Amarakoon		Supervised By:		Chandana		Drilled By:		Nishantha	
GWL		Ground Water Level observed inside the Borehole, after the saturation		HB - Hammer Bounce		FD - Free Down		Made Ground		Clay		Silt		Gravel		Organic Matter		Laterite Nodules		Silty Sand		Completely Weathered Rock		Highly Weathered Rock		Fresh Rock																																	

### 6.3 地形測量結果

本調査では、計画道路の基本道路線形、橋梁位置を検討するために現地の地物状況および河床高の調査を実施した。調査開始時点で道路線形が確定していなかったため、調査範囲および標高測量地点数が不足しないように配慮した。これらの測量にはトータルステーション・GPS 測量機器を使用して実施した。

架橋位置に基準となる仮ベンチマークを調査団の指示のもと設置した。ベンチマークは見通しが良く、乱される可能性の低い場所に設置・埋設した。

表6.3 ベンチマーク一覧

	Control Point No.	Description	Final Values		
			Northing (m)	Easting (m)	Elevation (m)
1.	GPS - M1	Conc. Nail driven in Pier surface and painted	570,588.428	605,806.904	1.123
2.	GPS - M2	Conc. Nail driven in cemented area around Pulleyar Kovil and painted	570,524.669	605,325.452	1.199
3.	MM - 1	Iron Bolt in Concrete Block	570,782.785	605,852.242	0.747
4.	MM - 2	-do-	570,606.550	605,863.097	0.471
5.	MM - 3	Iron Bolt in Concrete Base of High Tension Electric Tower	570,550.437	605,331.517	1.157



ベンチマーク詳細

Topographic Survey for The Preparatory Survey (Outline Design Study) on  
The Project for the Construction of the Bridge across the Batticoloa Lagoon at Manmunai

SURVEY MARKER DESCRIPTION - PHOTOGRAPHS

Station No: GPS M-1	N: 570588.428	Height: 1.123	Surveyed by: Cha.
Type: Conc. Nail	E: 605806.904	Date: Aug. 2010	Checked by: Mutu



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Land Surveyors

Topographic Survey for The Preparatory Survey (Outline Design Study) on  
The Project for the Construction of the Bridge across the Batticoloa Lagoon at Manmunai

SURVEY MARKER DESCRIPTION - PHOTOGRAPHS

Station No: MM-1	N: 570782.785	Height: 0.747	Surveyed by: Cho.
Type: Iron Bolt	E: 605852.242	Date: Aug. 2010	Checked by: Muku



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Topographic Survey for The Preparatory Survey (Outline Design Study) on  
The Project for the Construction of the Bridge across the Batticoloa Lagoon at Manmunai

SURVEY MARKER DESCRIPTION - PHOTOGRAPHS

Station No: MM-2	N: 570606.550	Height: 0.471	Surveyed by: Cha.
Type: Iron Bolt	E: 605863.097	Date: Aug. 2010	Checked by: Mutu



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Topographic Survey for The Preparatory Survey (Outline Design Study) on  
The Project for the Construction of the Bridge across the Batticaloa Lagoon at Mammunai

SURVEY MARKER DESCRIPTION - PHOTOGRAPHS

Station No: GPS M-2	N: 570524.664	Height: 1.199	Surveyed by: Cha.
Type: Conc. Nail	E: 605325.452	Date: Aug. 20/0	Checked by: Muku



Gamini B Dodanwela Associates (Pvt) Ltd.

Land Surveyors

Topographic Survey for The Preparatory Survey (Outline Design Study) on  
The Project for the Construction of the Bridge across the Batticaloa Lagoon at Manmunai

SURVEY MARKER DESCRIPTION - PHOTOGRAPHS

Station No: <i>MM-3</i>	N: <i>570550.437</i>	Height: <i>1.157</i>	Surveyed by: <i>Cha.</i>
Type: <i>Iron Bolt</i>	E: <i>605331.517</i>	Date: <i>Aug. 2010</i>	Checked by: <i>Mutis</i>



Gamini B Dodanwela Associates (Pvt) Ltd.  
Land Surveyors

## 6.4 交通量調査結果

2009年予備調査時からの交通実態の変化の有無を把握するため、今回調査において再度交通調査を実施した。調査は準備調査との整合性を図るため調査地点は6か所同じ(フェリー:3地点、橋梁:3地点)とした。

以下に調査位置図を示す。

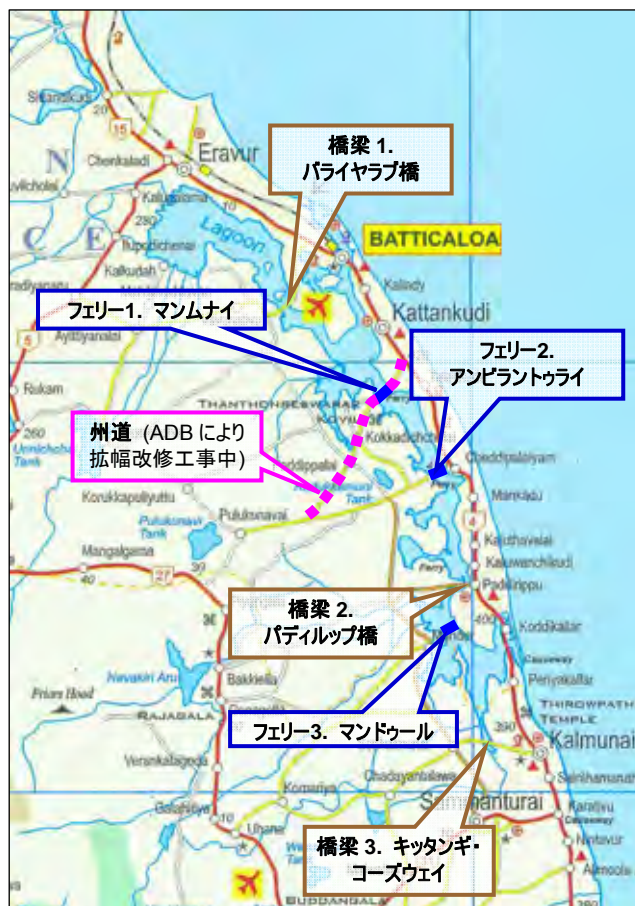


図 交通量調査位置図



図 交通調査の様子(その1)



図 交通調査の様子(その2)

次頁以降に交通量調査結果を示す。



交通量調査結果集計(橋梁)  
平日 (Fri 3/Sep 2010) 6:00~18:00 (12時間)

	人力				自動車								小計	
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	中型バス	大型バス	小型貨物車	中型貨物車	大型貨物車	農耕作業車	自動二輪・	大型車のみ + 自転車
-> to Batticaloa	6	323	526	20	25	22	8	10	22	25	0	29	687	35
<- to Vavunativu	5	323	563	21	57	17	10	9	27	45	1	7	757	55
計	11	646	1089	41	82	39	18	19	49	70	1	36	1444	90
PCU係数	-	0.33	0.50	0.75	1.00	1.00	2.00	2.40	1.50	2.00	2.00	2.00		
PCU			544.5	30.75	82	39	36	45.6	73.5	140	2			1065.35

	人力				自動車								小計	
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	中型バス	大型バス	小型貨物車	中型貨物車	大型貨物車	農耕作業車	自動二輪・	大型車のみ + 自転車
-> to Kalawanchikudi	0	451	729	421	16	36	24	11	45	8	0	30	1320	19
<- to Vellavali	4	436	714	412	7	29	15	11	47	5	1	41	1282	17
計	4	887	1443	833	23	65	39	22	92	13	1	71	2602	36
PCU係数	-	0.33	0.50	0.75	1.00	1.00	2.00	2.40	1.50	2.00	2.00	2.00		
PCU			721.5	624.75	23	65	78	52.8	138	26	2	142		1873.05

	人力				自動車								小計	
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	中型バス	大型バス	小型貨物車	中型貨物車	大型貨物車	農耕作業車	自動二輪・	大型車のみ + 自転車
-> to Mandur	309	396	708	132	23	35	2	11	14	12	2	17	956	25
<- to Kalmunai	250	336	1003	261	47	39	3	13	19	15	1	25	1426	29
計	559	732	1711	393	70	74	5	24	33	27	3	42	2382	54
PCU係数	-	0.33	0.50	0.75	1.00	1.00	2.00	2.40	1.50	2.00	2.00	2.00		
PCU			855.5	294.75	70	74	10	57.6	49.5	54	6	84		1555.35

交通量調査結果集計(橋梁)  
休日 (Sun 5/Sep 2010) 6:00~18:00 (12時間)

	人力				自動車							小計			
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	中型バス	大型バス	小型貨物車	中型貨物車	大型貨物車	農耕作業車	自動二輪・	大型車のみ	自転車+自動車
Bridge 1: Valaiyaravu Bridge															
-> to Batticaloa	7	382	701	81	19	49	4	13	34	16	7	25	949	36	1331
<- to Vavunativu	9	364	775	90	29	35	11	15	31	21	4	15	1026	40	1390
計	16	746	1476	171	48	84	15	28	65	37	11	40	1975	76	2721
PCU係数	-	0.33	0.50	0.75	1.00	1.00	2.00	2.40	1.50	2.00	2.00	2.00			
PCU			738	128.25	48	84	30	67.2	97.5	74	22	80			1368.95

	人力				自動車							小計			
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	中型バス	大型バス	小型貨物車	中型貨物車	大型貨物車	農耕作業車	自動二輪・	大型車のみ	自転車+自動車
Bridge 2: Paddiruppu Bridge															
-> to Kalawanchikudi	0	468	916	548	13	37	22	10	62	5	0	28	1641	15	2109
<- to Vellavai	4	388	690	329	7	29	16	6	48	4	0	39	1168	10	1556
計	4	856	1606	877	20	66	38	16	110	9	0	67	2809	25	3665
PCU係数	-	0.33	0.50	0.75	1.00	1.00	2.00	2.40	1.50	2.00	2.00	2.00			
PCU			803	657.75	20	66	76	38.4	165	18	0	134			1978.15

	人力				自動車							小計			
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	中型バス	大型バス	小型貨物車	中型貨物車	大型貨物車	農耕作業車	自動二輪・	大型車のみ	自転車+自動車
Bridge 3: Kittangi Causeway															
-> to Mandur	15	348	791	192	4	17	14	9	46	14	0	8	1095	23	1443
<- to Kaimunai	5	621	1309	146	14	22	14	8	25	67	0	17	1622	75	2243
計	20	969	2100	338	18	39	28	17	71	81	0	25	2717	98	3686
PCU係数	-	0.33	0.50	0.75	1.00	1.00	2.00	2.40	1.50	2.00	2.00	2.00			
PCU			1050	253.5	18	39	56	40.8	106.5	162	0	50			1775.8

交通量調査結果集計(フェリー)  
 平日 (Fri 3/Sep 2010) 6:00~18:00 (12時間)

Ferry 1: Mannunai	人力			自動							小計	
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	小型貨物車	農耕作業車	その他車両	自動二輪	自転車+自動車	
												その他
Mannunai Ferry 1	359	254	357	15	4	8	3	4	2	393	647	
Mannunai Ferry 2	382	247	412	15	4	4	2	5	1	443	690	
計	741	501	769	30	8	12	5	9	3	836	1337	
PCU係数	-	0.33	0.50	0.75	1.00	1.00	1.50	2.00	1.00			
PCU			384.5	22.5	8	12	7.5	18	3			
利用者数									455.5			
									2323			

Ferry 2: Ambilanthurai	人力			自動							小計	
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	小型貨物車	農耕作業車	その他車両	自動二輪	自転車+自動車	
												その他
Ambilanthurai Ferry	385	159	73	4	0	0	0	3	0	80	239	
PCU係数	-	0.33	0.50	0.75	1.00	1.00	1.50	2.00	1.00			
PCU			36.5	3	0	0	0	6	0			
利用者数									45.5			
									656			

Ferry 3: Mandur	人力			自動							小計	
	歩行者	自転車	自動二輪	自動三輪	乗用車	バン	小型貨物車	農耕作業車	その他車両	自動二輪	自転車+自動車	
												その他
Mandur Ferry	797	214	238	0	0	0	0	0	0	238	452	
PCU係数	-	0.33	0.50	0.75	1.00	1.00	1.50	2.00	1.00			
PCU			119	0	0	0	0	0	0			
利用者数									119			
									1311			



交通量調査結果集計(フェリー)  
休日 (Sun 5/Sep 2010) 6:00~18:00 (12時間)

Ferry 1: Mannunai	人力			自動						小計		
	歩行者	自転車	自転車	自動二輪	自動三輪	乗用車	バン	小型貨物車	農耕作業車	その他車両	自動二輪・	自転車+自動車
Mannunai Ferry 1	473	222	222	272	24	2	6	3	6	0	313	535
Mannunai Ferry 2	371	199	199	270	19	0	4	5	8	0	306	505
計	844	421	421	542	43	2	10	8	14	0	619	1040
PCU係数	-	0.33	0.33	0.50	0.75	1.00	1.00	1.50	2.00	1.00		
PCU				271	32.25	2	10	12	28	0		
利用者数										355.25		
										2074		

Ferry 2: Ambilanthurai	人力			自動						小計		
	歩行者	自転車	自転車	自動二輪	自動三輪	乗用車	バン	小型貨物車	農耕作業車	その他車両	自動二輪・	自転車+自動車
Ambilanthurai Ferry	394	136	136	82	11	0	0	0	2	0	95	231
PCU係数	-	0.33	0.33	0.50	0.75	1.00	1.00	1.50	2.00	1.00		
PCU				41	8.25	0	0	0	4	0		
利用者数										53.25		
										662		

Ferry 3: Mandur	人力			自動						小計		
	歩行者	自転車	自転車	自動二輪	自動三輪	乗用車	バン	小型貨物車	農耕作業車	その他車両	自動二輪・	自転車+自動車
Mandur Ferry	982	331	331	208	0	0	0	0	0	0	208	539
PCU係数	-	0.33	0.33	0.50	0.75	1.00	1.00	1.50	2.00	1.00		
PCU				104	0	0	0	0	0	0		
利用者数										104		
										1591		