資　料　編

7.地質調査結果　（現地再委託）

資料編　７　地質調査結果

７－１　No.93ガンポラ橋地質条件

（１）　地質調査結果

ガンポラ橋の新橋架設地における地盤・地質状況を把握するために、現橋の上・下流側において計６カ所のボーリング調査を実施した。

A－７．１．　ガンポラ橋 支持層（岩盤）深さ一覧表

Bor.No	調査位置	地盤高 (m) M.S.L	掘進長 (m)	岩盤出現深度 (m)	
				G.L	M.S.L
BH-1	左岸橋台上流側	478.44	11.08	- 6.08	472.36
BH-2	橋脚上流側	465.42	8.00	-3.05	462.37
BH-3	右岸橋台上流側	479.46	26.30	-21.30	458.16
BH-4	左岸橋台下流側	474.40	24.60	-19.50	454.90
BH-5	橋脚下流側	467.39	6.65	-1.65	465.74
BH-6	右岸橋台下流側	478.44	33.65	-13.40	465.04

（２）　調査結果に基づく土質定数値

表－A.７．２　ガンポラ橋　土質定数の提案値一覧表

地 点	参照ボーリング孔	地盤高 M.S.L (m)	深 度 G.L- (m)	層 名	土質名/岩石名	平均的なN値	湿潤単位体積重量γ (tf/m3)	粘着力 c (kgf/cm2)	内部摩擦角φ (°)
左岸橋台	BH-1	478.44	0.00 ～ 3.55	砂質土層	粘土質砂～シルト質砂	4	1.7	0	23
			3.55 ～ 6.08	粘性土層	砂質粘土～シルト混り粘土	1	1.6	0.05	15
			6.08 ～ 7.88	強風化土層	粘土質シルト（花崗岩質片麻岩）	10	1.7	0.2	20
			7.88 ～11.08	岩　盤	軟岩Ⅱ（花崗岩質片麻岩）	50以上	2.2	5.0	40
中央橋脚	BH-2	465.42	0.00 ～ 1.20	礫混り砂層	礫混り砂～砂	25	1.9	0	34
			1.20 ～ 3.05	強風化土層	粘土質シルト（花崗岩質片麻岩）	5	1.6	0.15	15
			7.88 ～11.08	岩　盤	硬　岩（花崗岩質片麻岩）	50以上	2.4	15.0	45
右岸橋台	BH-3	479.46	0.00 ～7.20	砂質土層	砂	5	1.8	0	24
			7.20 ～10.91		砂～シルト混り砂	3	1.7	0	21
			10.91 ～13.27	砂質土層	腐植物混り砂	20	1.8	0	32
			13.27 ～20.00	粘性土層	シルト混り粘土	5	1.6	0.15	15

			20.00 ～21.30	強風化土層	粘土質シルト （花崗岩質片麻岩）	7	1.6	0.15	15
			21.30 ～26.30	岩　盤	軟岩Ⅱ～中硬岩 （花崗岩質片麻岩）	50 以上	2.2	5.0	40

備　考

＊上記の土質定数は、日本道路公団設計要領第一集の土質定数の一般値及び下式を参考に提案したものである。　砂の内部摩擦角φは、N値と次式のように関係づけられている。

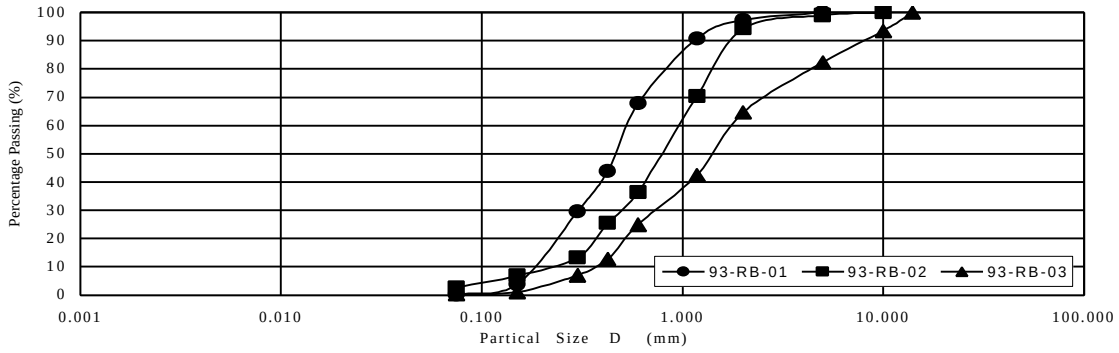
$$\phi = \sqrt{15 \times N} + 15$$

（3）　河床土土質調査結果

新橋建設計画箇所付近に堆積した土砂の土質特性を把握することを目的として、河川内の河床より土質試料の採取を行い、室内土質試験を実施した。その結果は以下のとおりである。

表－A.７.３　ガンポラ橋周辺　河床土の土質試験結果一覧表

試料番号	試料採取位置	土粒子密度	含水比 w (%)	粒度試験
93-RB-01	現橋より200 m 上流地点	2.30	14.95	下図参照
93-RB-02	現橋より200 m 下流地点	2.41	12.56	下図参照
93-RB-03	現橋より600 m 下流地点	2.31	5.36	下図参照



図－A.７.１　ガンポラ橋　河床土の粒径加積曲線

以上より当橋梁付近の50％粒径 D50及び60％粒径 D60は、平均的に以下のようになる。

D50 = 0.80 mm,　　D60 = 1.0 mm

（４）　路盤調査結果

①ＣＢＲ試験結果

現場及び室内のＣＢＲ試験の結果は次表のように要約される。

表－A.７.４　ガンポラ橋　ＣＢＲ試験結果一覧表

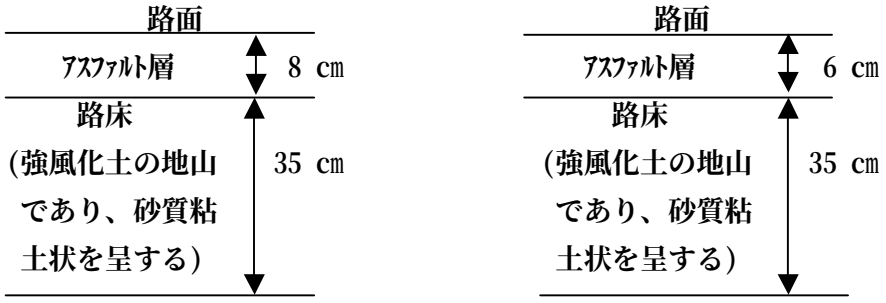
試料番号	試料採取位置	路床土状況	現　場 ＣＢＲ値	室内設計 ＣＢＲ値	試料の自然含水比Wn(%)
93-FCBR-01	左岸側 道路の端部	花崗岩質片麻岩の強風化土の地山であり、砂質粘土状	11.2% (2.5) 12.6% (5.0)	9.9% (2.5) 13.1% (5.0)	15.0
93-FCBR-02	右岸側 道路の端部	花崗岩質片麻岩の強風化土の地山であり、砂質粘土状	10.1% (2.5) 10.6% (5.0)	5.2% (2.5) 6.5% (5.0)	13.0

②　舗装状況

道路の舗装状況の調査結果は以下のとおりである。

表－A.７.５　ガンポラ橋　道路舗装状況調査結果一覧表

調査地点番　号	舗装状況確認位置	路床土状況	舗装構成	舗装厚	備　考
93-FCBR-01	左岸側 道路の端部	花崗岩質片麻岩の強風化土の地山であり、砂質粘土状	ｱｽﾌｧﾙﾄ 路床 （風化土）	8 cm GL-8cm 以深	Kandy側
93-FCBR-02	右岸側 道路の端部	花崗岩質片麻岩の強風化土の地山であり、砂質粘土状	ｱｽﾌｧﾙﾄ 路床 （風化土）	6 cm GL-6cm 以深	Nuwaraeliya側



(93-FCBR-01地点)　　(93-FCBR-02地点)

図－A.７.２　ガンポラ橋　舗装状況図

７－２　No.239 ムワガマ橋地質条件

（１）　地質調査結果

表－A.７.６　ムワガマ橋　支持層（岩盤）深さ一覧表

Bor.No.	調査位置	地盤高 (m) M.S.L	掘進長 (m)	岩盤出現深度 (m) G.L	岩盤出現深度 (m) M.S.L
Ext BH-7	左岸橋台下流側	100.61	21.30	- 16.20	84.41
Ext BH-6	左岸橋脚下流側	98.11	19.75	-16.28	81.83
Ext BH-3	右岸橋脚下流側	96.61	28.85	-27.19	69.42
BH-4	右岸橋台下流側	100.03	26.00	-24.55	75.48

（２）　調査結果に基づく土質定数の提案値

表－A.７.７　ムワガマ橋　土質定数の提案値一覧表

地 点	参照ボーリング孔	地盤高 M.S.L (m)	深 度 G.L- (m)	層　名	土質名/岩石名	平均的なN値	湿潤単位体積重量γ (tf/m3)	粘着力 c (kgf/cm2)	内部摩擦角φ (°)
左岸橋台	Ext BH-7 他	100.61	0.00 ～ 3.90	砂質土層	粘土混り砂～シルト混り砂	5	1.7	0	24
			3.90 ～ 7.40	粘性土層	シルト質粘土	10	1.7	0.2	20
			7.40 ～14.99		砂混じりシルト質粘土	20	1.7	0.3	20
			14.99 ～16.20	砂質土層	粘土混り砂～シルト混り砂	40	2.0	0	39
			16.20 ～21.30	岩　盤	中硬岩（ﾁｬﾙﾉｶｲﾄ片麻岩）	50 以上	2.3	5.0	40
左岸橋脚	Ext BH-6 他	98.11	0.00 ～ 1.50	砂質土層	シルト混り砂	5	1.8	0	24
			1.50 ～12.10	粘性土層	粘土質礫～シルト質粘土	5	1.7	0.15	20
			12.10 ～16.15	強風化土層	粘土質シルト（花崗岩質片麻岩）	10	1.7	0.2	20
			16.15 ～19.75	岩　盤	中硬岩（ﾁｬﾙﾉｶｲﾄ片麻岩）	50 以上	2.3	5.0	40
右岸橋脚	Ext BH-3 他	96.61	0.00 ～10.69	砂質土層	シルト混り砂	5	1.8	0	24
			10.69 ～14.80	砂質土層	シルト混り砂（花崗岩質片麻岩）	25	2.0	0	34
			14.80 ～16.65	粘性土層	シルト質粘土	25	1.7	0.35	20
			16.65 ～25.00	粘性土層	砂混りシルト	25	1.7	0.35	20
			25.00 ～27.19	強風化土層	粘土質シルト（花崗岩質片麻岩）	15	1.7	0.25	20
			27.19 ～28.39	岩　盤	中硬岩（花崗岩質片麻岩）	50 以上	2.3	5.0	40
右岸橋台	BH-4 他	100.03	0.00 ～ 0.82	砂質土層	シルト混り砂	5	1.8	0	24

			0.82 ～ 5.00	粘性土層	砂混り粘土	9	1.7	0.2	20
			5.00 ～7.00	砂質土層	シルト混り砂	3	1.7	0	22
			7.20 ～ 9.81	粘性土層	シルト混り粘土	12	1.7	0.2	20
			9.81 ～15.91	砂質土層	シルト混り砂 ～礫混り砂	35	2.0	0	35
			15.91 ～17.79	粘性土層	砂混り粘土	45	1.7	0.5	20
			17.79 ～24.55	強風化土層	粘土質シルト （花崗岩質片麻岩）	17	1.7	0.25	20
			24.55 ～26.00	岩　盤	軟岩Ⅰ～軟岩Ⅱ （花崗岩質片麻岩）	50 以上	2.2	5.0	40

備　考

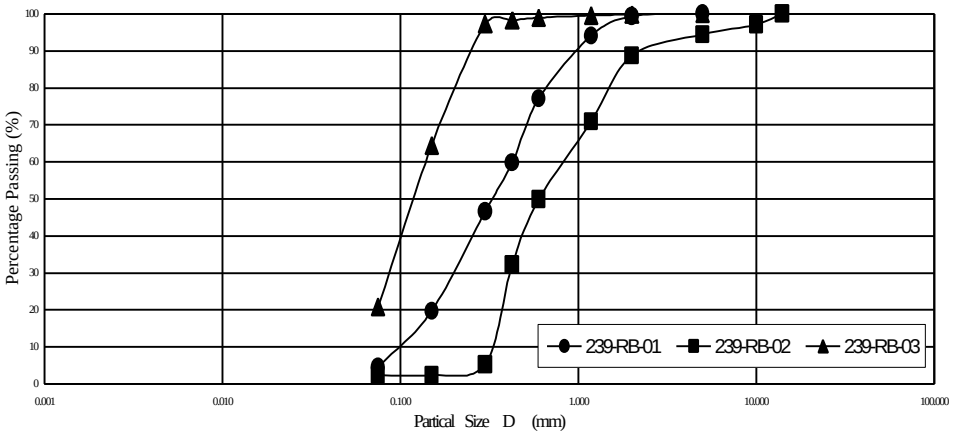
※土質定数選定時の参照試料および参照式は、前術のGampola橋の場合と同じである。

（3）　河床土土質調査結果

新橋建設計画箇所付近に堆積した土砂の土質特性を把握することを目的として、河川内の河床より土質試料の採取を行い、室内土質試験を実施した。その結果は以下のとおりである。

表－A.７.８　ムワガマ橋　河床土の土質試験結果一覧表

試料番号	試料採取位置	土粒子密度	含水比 w (%)	粒度試験
239-RB-01	現橋より500 m上流地点	2.32	15.20	下図参照
239-RB-02	現橋地点	2.26	16.43	下図参照
239-RB-03	現橋より500 m下流地点	2.26	31.33	下図参照



図－A.７.３　ムワガマ橋　河床土の粒径加積曲線

以上より、当橋梁付近の50％粒径 D50及び60％粒径 D60は平均的に以下のようになる。

D50 = 0.30 ㎜,　　D60 = 0.4 ㎜

（4）　路盤調査結果

現道の舗装状況及び路盤・路床の状況を把握することを目的として、現橋に繋がる左岸及び右岸の両側の道路端部を開削し、舗装構成の確認を行うとともに、現場ＣＢＲ試験を実施した。また、路床より採取した試料によって室内ＣＢＲ試験を実施した。その結果を以下に示す。

①　ＣＢＲ試験結果

現場及び室内のＣＢＲ試験の結果は次表のように要約される。

表―A．７．９　ムワガマ橋　ＣＢＲ試験結果一覧表

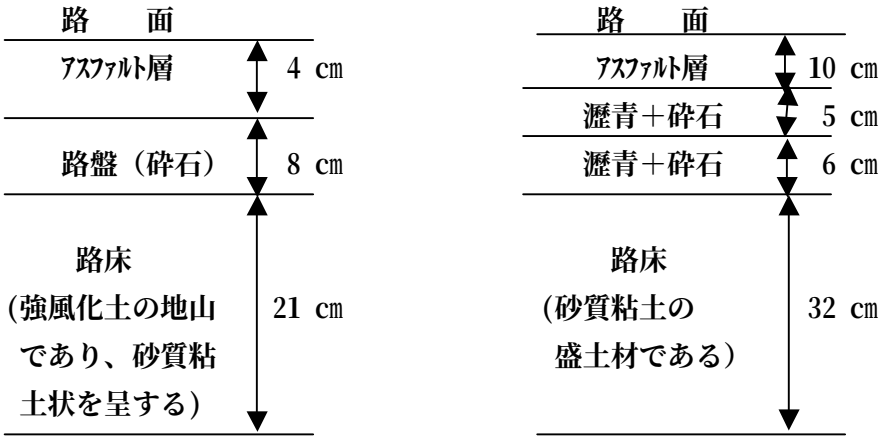
試料番号	試料採取位置	路床土状況	現　場 ＣＢＲ値	室内設計 ＣＢＲ値	試料の自然含水比 Wn(%)
239-FCBR-01	左岸側 道路の端部	片麻岩の強風化土の地山であり、砂質粘土状である	27.2% (2.5) 19.4% (5.0)	4.5% (2.5) 5.4% (5.0)	19.8
239-FCBR-02	右岸側 道路の端部	暗茶灰色を示す砂質粘土の盛土材である	34.1% (2.5) 25.9% (5.0)	10.8% (2.5) 14.6% (5.0)	31.0

②　舗装装状況

道路の舗装状況の調査結果は以下のとおりである。

表―A．７．１０　ムワガマ橋　道路舗装状況調査結果一覧表

調査地点 番　　号	舗装状況 確認位置	路床土状況	舗装構成	舗装厚	備　　考
239-FCBR-01	左岸側 道路の端部	片麻岩の強風化土の地山であり、砂質粘土状である	ｱｽﾌｧﾙﾄ 路盤(砕石) 路床（風化土）	4 ㎝ 10 ㎝ GL-14 ㎝ 以深	Karawita側
239-FCBR-02	右岸側 道路の端部	暗茶灰色を示すし砂質粘土の盛土材である	ｱｽﾌｧﾙﾄ 瀝青+砕石 瀝青+砕石 路床	10 ㎝ 5 ㎝ 6 ㎝ GL-8㎝ 以深	Ratnapura側



図―A．７．４　ムワガマ橋　舗装状況図

No. 93ｶﾞﾝﾎﾟﾗ橋　ﾎﾞｰﾘﾝｸﾞ・CBR調査位置図

GEOLOGICAL RECORD OF BORING

Project : Five weak &narrow bridges (93)
Bore Hole Number : BH 93-01
Ground Elevation : 478.44
Dia. of the hole (mm) : 100 / 72 / 61

Date of Drilling: 23-26 / 07 /2000
Angle from the vertical: 0
Depth of Hole (m): 11.08
Depth to the ground water level: Not encountered
Logged By: BSY

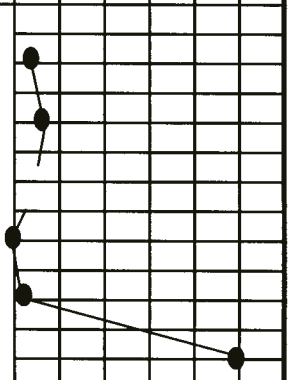
	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test	
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)
0.00	478.44								
0.50	478.01	0.43	0.43		CL / SC	Dark	Loose / soft slightly plastic clayey		
1.00						gray	sand / sandy clay	1.00	03
1.50					ML	Yellowish	loose very fine sand with silt and mica		
2.00	476.44	2.00	1.57			brown		2.00	06
2.50	475.94	2.50	0.50		ML / SM	- do -	Loose fine sand with silt and mica		
3.00						Dark		3.00	
3.50	474.89	3.55	1.05		Rock	gray	Charnockitic gneiss boulder		
4.00					CL / SC	Yeloowish	Very soft / very loose slightly plastic	4.00	<1
4.50						brown	sandy clay / clayey sand		
5.00	473.44	5.00	1.45					5.00	02
5.50					CL / ML	- do -	Very soft slightly plastic clay mixed with		
6.00	472.61	5.83	0.83				silt, mica and small amount of sand	6.00	>50
6.50	472.36	6.08	0.25		ML / SM	Grayish	Completely decomposed rock in the form		8cm
7.00						brown	of Clayey sit mixed with mica & sand	7.00	
7.50					Gr. Gn	Light	Fine to medium grained slightly		
8.00	470.56	7.88	2.05			gray	weathered bed rock. CR=42% RQD=30%	8.00	
8.50					- do -	- do -	- do - CR= 84 RQD=49		
9.00	469.46	8.98	1.10					9.00	
9.50					- do -	- do -	- do - CR = 89% RQD = 44%		
10.00	468.41	10.03	1.05					10.00	
10.50					- do -	- do -	- do - CR = 80% RQD = 36%		
11.00	467.36	11.08	1.05					11.00	

Gr.Gn. - Granulitic / granitic gneiss

No UD samples could be obtained as all the soft / loose strata are sandy and therefore the sample does not retain in the tube

CR of the bed rock is low as several thin completely decomposed rock layers are sandwiched in between the unweathered rock layers. Recovery is very difficult as the thickness of those layers are very small.

Bore hole terminated on the slightly weathered bed rock at 11.08m below the existing ground level



GEOLOGICAL RECORD OF BORING

Project	:	Five weak &narrow bridges (Nr.9	Date of Drilling:	31 / 07 -01 / 08 /2000
			Angle from the vertical:	0
Bore Hole Number	:	BH 93-02	Depth of Hole (m):	8.00
Ground Elevation (m)	:	465.42	Depth to the ground water level:	Drilled under the water
Dia. of the hole (mm)	:	100 / 72	Logged By:	BSY

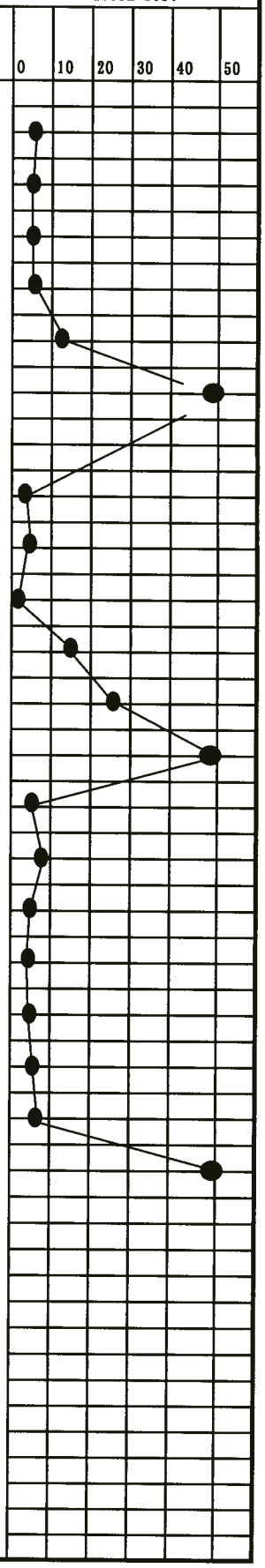
	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test							
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)	0	10	20	30	40	50
0.00	465.42														
0.50						Yellowish	Extremely dense, poorly graded fine to	0.45	>50						
1.00					SP	brown	coarse sand with some gravels		15cm						
1.50	464.22	1.20	1.20					1.45	03						
2.00					ML	Whitish	Completely decomposed rock in the form								
2.50						yellowish	of soft to stiff slightly plastic clayey silt	2.45	07						
3.00	462.52	2.90	1.70			brown	mixed with mica and sand	3.00	>50						
3.50	462.37	3.05	0.15		SM	Yellowish	Completely decomposed rock in the form								
4.00	461.32	4.10	1.05			brown	of very dense fine to coarse sand								
4.50															
5.00	460.32	5.10	1.00		Gr. Gn	Light	Slightly to highly weathered bed rock								
5.50						gray	CR = 50% RQD = 50%								
6.00															
6.50					- do -	- do -	Slightly to highly weathered bed rock								
7.00	458.32	7.10	2.00				CR = 50% RQD = 18%								
7.50															
8.00	457.42	8.00	0.90		- do -	- do -	Slightly to highly weathered bed rock								
8.50							CR = 41% RQD = 37%								
9.00															
9.50					- do -	- do -	Slightly to highly weathered bed rock								
10.00							This depth is drilled but the core could								
10.50							not be recovered beyond 7.10m								
11.00															
11.50															
12.00															
12.50															
13.00															
13.50															
14.00															
14.50															
15.00															
15.50							**Gr.Gn. - Granulitic / granitic gneiss**								
16.00															
16.50							No UD samples could be obtained as								
17.00							all the soft / loose strata are sandy and								
17.50							therefore the sample does not retain								
18.00							in the tube								
18.50															
19.00															
19.50							CR of the bed rock is considerably low								
20.00							as several thin completely decomposed								
20.50							rock layers are sandwiched in between								
21.00							the unweathered rock layers. Recovery								
21.50							is very difficult as the thickness of those								
22.00							layers are very small.								
22.50															
23.00															
23.50															
24.00															
24.50															
25.00															
25.50															
26.00															
26.50															
27.00							Bore hole terminated on the								
27.50							fresh bed rock at 8.00m below the								
28.00							existing ground level								
28.50															

GEOLOGICAL RECORD OF BORING

Project : Five weak &narrow bridges 93
Bore Hole Number : BH 93-03
Ground Elevation : 479.46
Dia. of the hole (mm) : 100 / 61

Date of Drilling: 24-29 / 07 /2000
Angle from the vertical: 0
Depth of Hole (m): 26.30
Depth to the gr. water level (m): 10.22
Logged By: BSY

	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test	
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)
0.00	479.46								
0.50	478.65	0.81	0.81		SP / SW	Yellowish brown	Medium dense fine to coarse sand and gravel	1.00	06
1.00									
1.50									
2.00								2.00	05
2.50									
3.00					SP	Yellowish brown	Loose fine to coarse sand	3.00	05
3.50									
4.00								4.00	05
4.50									
5.00								5.00	12
5.50									
6.00	473.41	6.05	5.24					6.00	>50
6.50					Concrete	Gray	Unreinforced concretecored with NX bit		8cm
7.00	472.26	7.20	1.15					7.00	
7.50									
8.00					SP	Yellowish brown	Very loose fine to coarse sand	8.00	03
8.50									
9.00	470.46	9.00	1.80					9.00	04
9.50									
10.00					ML / SM	Yellowish brown	Very soft / very loose very fine / medium grained sand with silt and mica	10.00	01
10.50									
11.00	468.55	10.91	1.91					11.00	14
11.50					SP	Dark Gray	Medium dense to extremely dense / stiff coarse sand / fine sand with little organic matter		
12.00								12.00	26
12.50									
13.00	466.39	13.07	2.16					13.00	>50
13.50	466.19	13.27	0.20		Gr. Gn.	Gray	Boulder		9cm
14.00								14.00	05
14.50									
15.00								15.00	08
15.50									
16.00					CL / ML	Yellowish brown	Medium stiff slightly plastic clay mixed with silt and mica.	16.00	05
16.50									
17.00								17.00	04
17.50									
18.00								18.00	04
18.50									
19.00								19.00	06
19.50									
20.00	459.46	20.00	6.73					20.00	07
20.50					ML / SM	Yellowish brown	Completely decomposed rock in the form of slightly plastic clayey silt mixed with mica		
21.00	458.16	21.30	1.30					21.00	>51
21.50									8cm
22.00					Gr. Gn.	Light gray	Slightly to moderately weathered bed rock CR = 16% RQD = 0%		
22.50									
23.00									
23.50	456.16	23.30	2.00						
24.00	455.91	23.55	0.25		Brown	ML / SM	Completely decomposed bed rock in the form of clayey silt mixed with mica		
24.50									
25.00									
25.50	454.16	25.30	1.75		Gr. Gn.	Light gray	Slightly to moderately weathered bed rock CR = 31% RQD = 22%		
26.00	453.16	26.30	1.00						
26.50					Gr. Gn.	Light gray	Slightly to moderately weathered bed rock CR = 32% RQD = 0%		
27.00									
27.50							Bore hole terminated on the slightly weathered bed rock at 26.30m below the existing ground level		
28.00									
28.50									



GEOLOGICAL RECORD OF BORING

Project : Five weak &narrow bridges (Nr.93

Bore Hole Number : BH 93-04

Ground Elevation : 474.40

Dia. of the hole (mm) : 100 / 72

Date of Drilling: 09-11 / 08 /2000

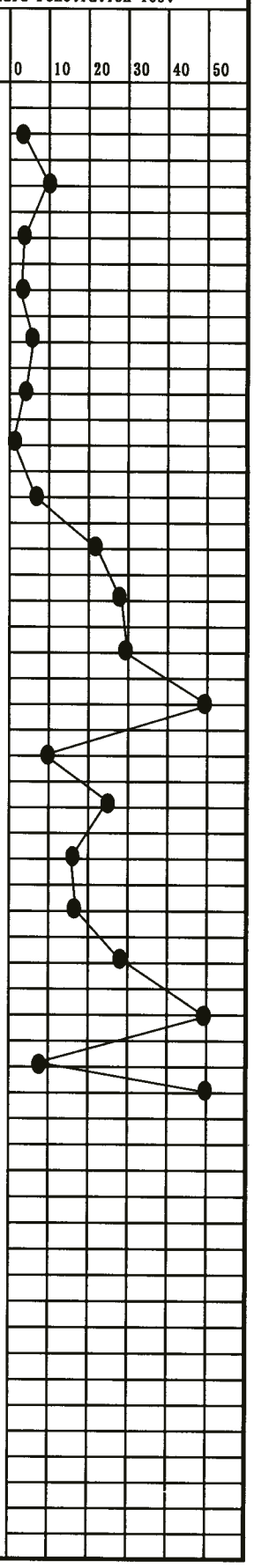
Angle from the vertical: 0

Depth of Hole (m): 24.60

Depth to the gr. water level (m): 3.35

Logged By: BSY

Elevation (m)	Depth (m)	Thickness (m)	Field Observations: Column Section	Soil / Rock Classifn.	Colour	Description	Standard Penetration Test: Depth (m)	(N)
0.00 474.40								
0.50								
1.00						Soft to stiff very fine sand mixed with	1.00	03
1.50				ML	Brown	silt and mica		
2.00							2.00	10
2.50								
3.00	471.65	2.75	2.75				3.00	03
3.50					Brown			
4.00							4.00	03
4.50			4.5			Soft to vbery stiff slightly plastic clay		
5.00			5.0	CL / ML	Brown	mixed with silt, very fine sand and mica	5.00	06
5.50								
6.00							6.00	03
6.50					Grayish			
7.00					brown		7.00	01
7.50	466.85	7.55	4.80					
8.00					Yellowish		8.00	07
8.50					brown			
9.00							9.00	22
9.50								
10.00							10.00	28
10.50								
11.00							11.00	30
11.50					Reddish	Completely decomposed rock in the form		
12.00				ML	brown	opf Medium stiff to hard slightly plastic	12.00	>50
12.50						clayey silt mixed with mica		8cm
13.00					Whitish		13.00	10
13.50					brown			
14.00							14.00	24
14.50								
15.00							15.00	16
15.50					Grayish			
16.00					brown		16.00	17
16.50								
17.00	457.53	16.87	9.32				17.00	29
17.50				CL / ML	Reddish	Completel decomposed rock in the form		
18.00	456.28	18.12	1.25		brown	of very stiff slightly plastic clayey silt	18.00	>50
18.50				ML	Brown	Partially decomposed rock with friable		15cm
19.00	455.54	18.86	0.74			rock fragments	19.00	08
19.50	454.90	19.50	0.64	ML / SM	Yel. brow	Completely decomposed rock in the form	19.50	>50
20.00						of slightly plastic clayey silt mixed with		
20.50						mica and sand		
21.00						SW to fresh bed rock		
21.50	452.90	21.50	2.00			CR = 74% RQD = 23%		
22.00								
22.50					White	Fresh bed rock		
23.00	451.40	23.00	1.50	Gr. Gn.	to light	**CR = 100% RQD = 68%**		
23.50					gray	Fresh bed rock		
24.00	450.40	24.00	1.00			CR = 95% RQD = 68%		
24.50	449.80	24.60	0.60			Fresh bed rock CR = 92% RQD = 90%		
25.00								
25.50								
26.00						**Gr.Gn. - Granulitic / granitic gneiss**		
26.50								
27.00						Bore hole terminated on the slightly		
27.50						weathered bed rock at 24.60m below the		
28.00						existing ground level		
28.50								



GEOLOGICAL RECORD OF BORING

Project : Five weak &narrow bridges (Nr.93

Bore Hole Number : BH 93-05

Ground Elevation : 467.39

Dia. of the hole (mm) : 100 / 72

Date of Drilling: 05-07 / 08 /2000

Angle from the vertical: 0

Depth of Hole (m): 6.65

Depth to the gr. water level (): Drilled under the water

Logged By: BSY

	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test							
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)	0	10	20	30	40	50
0.00	467.39														
0.50					SP /SW	Yellowish	Dense fine to coarse sand	0.00	26						
1.00	466.39	1.00	1.00			brown		1.00	34						
1.50	465.74	1.65	0.65		SW / GW	- do -	Very dense fine to coarse sand with	1.65	>50						
2.00							few gravels								
2.50	465.04	2.35	0.70				MW-HW bed rock CR =81% RQD =37%								
3.00						White									
3.50	463.64	3.75	1.40				SW-HW bed rock CR =69% RQD =60%								
4.00					Gr. Gn.	Light									
4.50	462.84	4.55	0.80			gray	MW-HW bed rock CR =88% RQD =0%								
5.00															
5.50	462.04	5.35	0.85				MW-HW bed rock CR =88% RQD =52%								
6.00						Gray									
6.50	460.75	6.65	1.30				SW-HW bed rock CR =46% RQD =37%								
7.00															
7.50															
8.00															
8.50															
9.00															
9.50															
10.00															
10.50															
11.00															
11.50															
12.00															
12.50															
13.00															
13.50															
14.00															
14.50															
15.00															
15.50															
16.00															
16.50															
17.00															
17.50															
18.00															
18.50															
19.00															
19.50															
20.00							CR in some areas are poor as several								
20.50							thin completely decomposed rock								
21.00							layers are sandwiched in between the								
21.50							unweathered rock layers.								
22.00															
22.50															
23.00															
23.50															
24.00															
24.50															
25.00															
25.50															
26.00							**Gr.Gn. - Granulitic / granitic gneiss**								
26.50															
27.00							Bore hole terminated on the slightly								
27.50							weathered bed rock at 6.65m below the								
28.00							existing ground level								
28.50															

GEOLOGICAL RECORD OF BORING

Project : Five weak &narrow bridges (93)
Bore Hole Number : BH 93 - 06
Ground Elevation : 478.44
Dia. of the hole (mm) : 100 / 72

Date of Drilling: 31/07-03/08 /2000
Angle from the vertical: 0
Depth of Hole (m): 33.65
Depth to the gr. water level (M): 8.30
Logged By: BSY

Elevation (m)	Depth (m)	Thickness (m)	Field Observations: Column Section	Soil / Rock Classifn.	Colour	Description	Standard Penetration Test: Depth (m)	(N)
478.44								
							1.00	07
				ML	Brown	Medium stiff to stiff silt with very fine sand mixed with mica and plastic fines		
							2.00	09
475.44	3.00	3.00					3.00	10
				CL / ML	Brown	Stiff to very stiff slightly plastic clay mixed with lots of sand, silt and mica	4.00	17
473.57	4.87	1.87						
							5.00	16
							6.00	08
				ML / SM	Brown	Soft to very stiff / loose to dense very fine sandy silt / very fine silty sand with mica	7.00	09
							8.00	03
							9.00	14
							10.00	23
467.44	11.00	6.13					11.00	26
466.55	11.89	0.89		SM	Brown	Dense fine to medium grained sand with silt and mica	12.00	>50
465.97	12.47	0.58		SM	Brown	Completely decomposed rock in the form of extremely dense silty sand with mica		8cm
				Gr. Gn.	Light Gray	Moderately to highly weathered bed rock CR = 8% RQD = 0%		
463.04	15.40	2.00						
				- do -	- do -	Moderately to highly weathered bed rock CR = 15% RQD = 0%		
461.04	17.40	2.00						
				- do -	- do -	Slightly to highly weathered bed rock CR = 55% RQD = 40%		
460.04	18.40	1.00						
				- do -	- do -	Slightly to highly weathered bed rock CR = 55% RQD = 40%		
457.04	21.40	3.00						
				- do -	- do -	Moderately to highly weathered bed rock CR = 40% RQD = 23%		
453.64	24.80	3.40						
				- do -	- do -	Moderately to highly weathered bed rock CR = 12% RQD = 0%		
450.14	28.30	3.50						

GEOLOGICAL RECORD OF BORING

Project	: Five weak &narrow bridges (93)	Date of Drilling:	31/07-03/08 /2000
Bore Hole Number	: BH 93 - 06	Angle from the vertical:	0
Ground Elevation	: 478.44	Depth of Hole (m):	33.65
Dia. of the hole (mm)	: 100 / 72	Depth to the gr. water level (M):	8.30
		Logged By:	BSY

29.00	Elevation (m)	Depth (m)	Thickness (m)	Field Observations: Column Section	Soil / Rock Classifn.	Colour	Description	Standard Penetration Test: Depth (m)	(N)	0	10	20	30	40	50
29.50															
30.00															
30.50															
31.00					- do -	- do -	Moderately to highly weathered bed rock								
31.50							CR = 15% RQD = 11%								
32.00															
32.50															
33.00	445.49	32.95	4.65												
33.50	444.79	33.65	0.70		- do -	- do -	Slightly weathered bed rock								
34.00							CR = 95% RQD = 85%								
34.50															
35.00															

Gr.Gn. - Granulitic / granitic gneiss

No UD samples could be obtained as all the soft / loose strata are sandy and therefore the sample does not retain in the tube

CR of the bed rock is considerably low as several thin completely decomposed rock layers are sandwiched in between the unweathered rock layers. Recovery is very difficult as the thickness of those layers are very small.

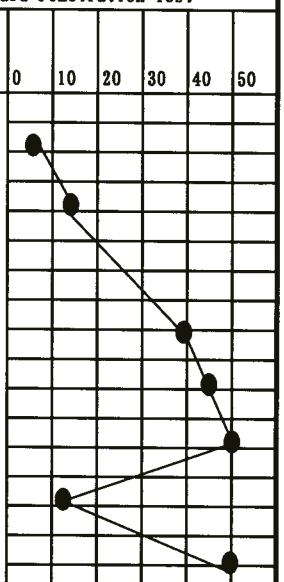
Bore hole terminated on the slightly weathered bed rock at 33.65m below the existing ground level

No. 239ムワガマ橋　ボーリング・CBR試験調査位置図

GEOLOGICAL RECORD OF BORING

Project	: Five weak &narrow bridges (239)	Date of Drilling:	17-25 / 08 /2000
Bore Hole Number	: BH 239 - 01	Angle from the vertical:	0
Ground Elevation	: 100.40	Depth of Hole (m):	11.55
Dia. of the hole (mm)	: 100 / 72 / 61	Depth to the gr. water level (m):	3.61
		Logged By:	BSY

	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test	
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)
0.00	100.40								
0.50	99.79	0.61	0.61		SC	Dark bro.	Loose fine to coarse sand and gravels		
1.00	99.70	0.70	0.09				with small amount of plastic fines	1.00	07
1.50					Concrete	Gray	Concrete debris with steel		
2.00	98.40	2.00	1.30		CL	Yel. bro.	Medium stiff slightly to moderately	2.00	14
2.50							plastic clay mixed with sand and gravels		
3.00	97.40	3.00	1.00		CL / ML	Red Bro	Stiff slightly to moderately plastic clay	3.00	
3.50	96.79	3.61	0.61				mixed with silt and mica		
4.00					Ch. Gn.	Gra-bro	MW-Fresh rock boulder	4.00	40
4.50									
5.00						Reddish		5.00	46
5.50					SM	brown to	Very dense to extremely dense fine to		
6.00						yellowish	coarse sand mixed with silt and mica	6.00	>50
6.50						brown			24cm
7.00	93.40	7.00	3.39					7.00	12
7.50					ML	Yellowish	Completely decomposed rock in the form		
8.00	92.20	8.20	1.20			brown	of stiff slightly plastic clayey silt mixed	8.00	>50
8.50							with mica		6cm
9.00								9.00	
9.50					Ch. Gn.	Gray	SW-Fresh bed rock		
10.00	90.55	9.85	1.65				CR = 100% RQD = 100%		
10.50									
11.00							SW-Fresh bed rock		
11.50	88.85	11.55	1.70				CR = 100% RQD = 100%		
12.00									
12.50									
13.00									
13.50									
14.00									
14.50									
15.00									
15.50									
16.00									
16.50									
17.00									
17.50									
18.00									
18.50									
19.00									
19.50									
20.00									
20.50									
21.00									
21.50									
22.00									
22.50									
23.00									
23.50									
24.00									
24.50									
25.00									
25.50									
26.00									
26.50									
27.00							Bore hole teminated in the fresh bed rock		
27.50							at 11.55m below the existing ground		
28.00							level.		
28.50									

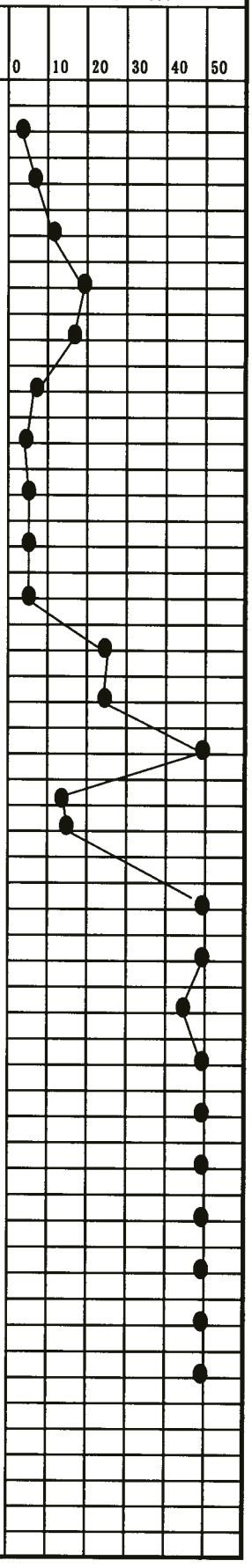


GEOLOGICAL RECORD OF BORING

Project : Five weak &narrow bridges (239)
Bore Hole Number : BH 239 - 02
Ground Elevation : 97.88
Dia. of the hole (mm) : 100 / 61

Date of Drilling: 20-23 / 08 /2000
Angle from the vertical: 0
Depth of Hole (m): 28.80
Depth to the gr. water level (m): 2.60
Logged By: BSY

	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test	
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)
0.00	97.88								
0.50									
1.00					CL / ML	Brown	Soft slightly plastic clay mixed with silt	1.00	03
1.50							mica and small amount of sand		
2.00	95.88	2.00	2.00					2.00	07
2.50	95.23	2.65	0.65		CL	Red. br.	Medium stiff moderately plastic clay		
3.00	94.83	3.05	0.40		Ch.Gn.	Gr. brown	MW-HW rock boulder	3.00	12
3.50									
4.00						Reddish		4.00	20
4.50						brown			
5.00							Very stiff to medium stiff slightly to	5.00	17
5.50					CL / ML		moderately plastic clay mixed with silt		
6.00							and mica	6.00	08
6.50									
7.00						Yellowish		7.00	05
7.50						brown			
8.00	89.88	8.00	4.95					8.00	06
8.50									
9.00						Yellowish	Completely decomposed rock in the form	9.00	06
9.50					ML	brown	of medium stiff slightly plastic clayey		
10.00							silt mixed with mica and sand	10.00	06
10.50									
11.00	86.88	11.00	3.00					11.00	25
11.50					ML / SM	Reddish	Completely decomposed rock in the form		
12.00	85.88	12.00	1.00			brown	of very stiff / dense slightly plastic	12.00	24
12.50							clayey silt / sandy silt		
13.00					SM	Reddish	Completely decomposed rock in the form	13.00	>50
13.50	84.23	13.65	1.65			to yellow	of dense to extremely dense fine to		20cm
14.00						brown	coarse sand with silt, mica and friable	14.00	13
14.50							rock fragments		
15.00					Ch. Gn.	Brown	MW-Fresh bed rock	15.00	14
15.50	82.18	15.70	2.05			to gray	**CR = 70% RQD = 62%**		
16.00								16.00	>50
16.50									8cm
17.00								17.00	>50
17.50							Highly decomposed rock in the form of		9cm
18.00							extremely dense fine to coarse sand	18.00	46
18.50							with silt, mica and black iron minerals		4cm
19.00								19.00	>50
19.50							The SPT tube did not penetrate to a		7cm
20.00					SM	Grayish	sufficient depth to obtain a sample.	20.00	>50
20.50						brown	Coring was also not possible as the		6cm
21.00							sample is totally washed off even with	21.00	>50
21.50							very low water pressure and very low		4cm
22.00							speed of revolution. Therefore, only	22.00	>50
22.50							wash sample is collected after conducting		2cm
23.00							SPT test	23.00	>50
23.50									3cm
24.00								24.00	>50
24.50									3cm
25.00	72.18	25.70	10.00					25.00	>50
25.50									2cm
26.00									
26.50									
27.00									
27.50									
28.00									
28.50									



GEOLOGICAL RECORD OF BORING

Project	: Five weak &narrow bridges (239)	Date of Drilling:	20-23 / 08 /2000
Bore Hole Number	: BH 239 - 02	Angle from the vertical:	0
Ground Elevation	: 97.88	Depth of Hole (m):	28.80
Dia. of the hole (mm)	: 100 / 61	Depth to the gr. water level (m):	2.60
		Logged By:	BSY

Elevation (m)	Depth (m)	Thickness (m)	Field Observations: Column Section	Soil / Rock Classifn.	Colour	Description	Standard Penetration Test: Depth (m)	(N)	0	10	20	30	40	50
27.50 97.88														
28.00						MW-Fresh bed rock								
28.50				Ch. Gn.	Gray	CR = 90% RQD = 82%								
29.00	69.08	28.80	3.10											
29.50														
30.00														
30.50														
31.00														
31.50														
32.00														
32.50														
33.00														
33.50														
34.00														
34.50														
35.00														

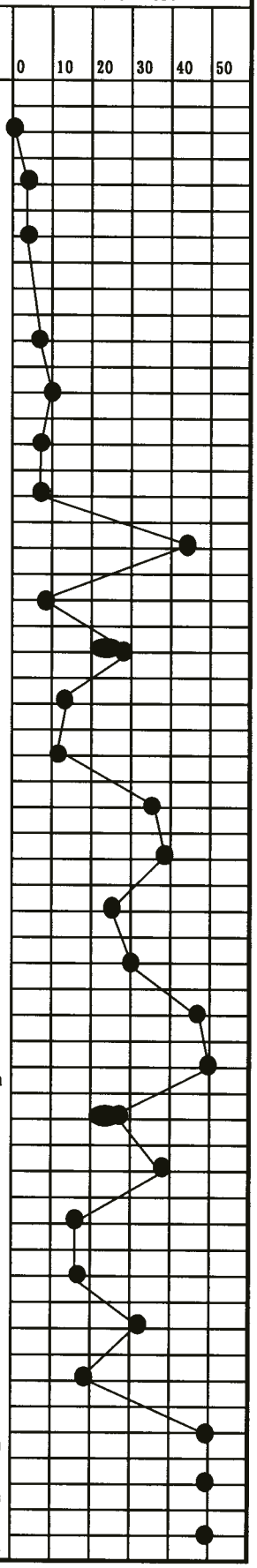
Ch. Gn. - Charnockite biotite gneiss

Bore hole terminated on the fresh bed rock at 28.80m below the existing ground level

GEOLOGICAL RECORD OF BORING

Project	:	Five weak &narrow bridges (239)	Date of Drilling:	15-18 / 07 /2000
			Angle from the vertical:	0
Bore Hole Number	:	BH 239 - 03	Depth of Hole (m):	30.75
Ground Elevation	:	98.19	Depth to the gr. water level (m):	4.20
Dia. of the hole (mm)	:	100 / 72 / 61	Logged By:	BSY

	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test	
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)
0.00	98.19								
0.50									
1.00							Very soft to soft very fine sand mixed	1.00	01
1.50					ML	Brown	with silt and mica		
2.00								2.00	03
2.50									
3.00	95.30	2.89	2.89					3.00	03
3.50									
4.00				4.00				4.00	
4.50				4.93	CL / ML	- do -	Soft to medium stiff slightly plastic clay		
5.00							mixed wtih considerable amount of fine	5.00	06
5.50							sand and silt		
6.00	92.19	6.00	3.11					6.00	10
6.50					ML	Yellowsh	Medium stiff to stiff very fine sand		
7.00						brown	mixed with mica	7.00	07
7.50	90.79	7.40	1.40						
8.00					SP / SW	- do -	Loose fine to coarse sand with few gravels	8.00	06
8.50							and small amount of plastic fines		
9.00	89.19	9.00	1.60					9.00	43
9.50					ML	- do -	Hard sandy silt mixed with mica and little		
10.00	88.12	10.07	1.07				plastic fines	10.00	09
10.50	87.85	10.34	0.27		CL	Gr. brown	Stiff slightly to moderately plastic clay		
11.00							mixed with silt and mica	11.00	29
11.50					ML	Yellowish	Very stiff very fine sand mixed with		
12.00	86.19	12.00	1.66			brown	small amount of coarse sand, and silt	12.00	13
12.50						- do -			
13.00					ML / SW		Stiff / medium dense very fine silty sand	13.00	11
13.50						Brown	mixed with mica / coarse sand mixed with		
14.00	84.19	14.00	2.00				silt, mica and few gravels	14.00	34
14.50					ML	Yellowish			
15.00	83.19	15.00	1.00			brown	Hard sandy silt with mica	15.00	39
15.50									
16.00								16.00	24
16.50									
17.00								17.00	30
17.50									
18.00					SP / SW	- do -	Dense to very dense fine to coarse sand	18.00	46
18.50									
19.00								19.00	>50
19.50									15cm
20.00								20.00	28
20.50									
21.00	77.19	21.00	6.00					21.00	39
21.50					ML / SP	- do -	Hard / very dense sandy silt / coarse		
22.00	76.24	21.95	0.95				sand mixed with mica	22.00	14
22.50									
23.00								23.00	14
23.50					ML	- do -	Completely decomposed rock in the form		
24.00							of stiff to hard slightly plastic clayey silt	24.00	32
24.50							mixed with considerable amount of sand		
25.00	73.19	25.00	3.05				and mica	25.00	19
25.50	72.64	25.55	0.55		ML / SP	- do -	Completely decomposed rock in the form		
26.00							of sandy silt / silty sand	26.00	>50
26.50	71.94	26.25	0.70		Gr. Gn	Gray	SW rock bed rock CR =64% RQD =46%		28cm
27.00								27.00	>50
27.50									20cm
28.00								28.00	>50
28.50									23cm



GEOLOGICAL RECORD OF BORING

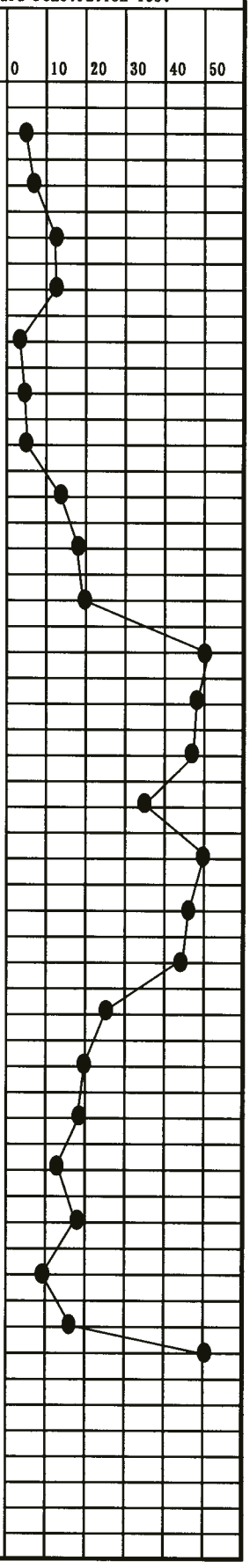
Project	: Five weak &narrow bridges (239)	Date of Drilling:	15-18 / 07 /2000
Bore Hole Number	: BH 239 - 03	Angle from the vertical:	0
Ground Elevation	:	Depth of Hole (m):	30.75
Dia. of the hole (mm)	: 100 / 72 / 61	Depth to the gr. water level (m):	4.20
		Logged By:	BSY

Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test							
			Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)	0	10	20	30	40	50
27.50														
28.00				ML / SM	Yellowish	Hard / extremely dense clayey silt / silty								
28.50	69.79	28.40	2.15		brown	sand mixed with mica								
29.00	69.04	29.15	0.75			MW-HW bed rock CR =83% RQD =0%								
29.50					White									
30.00				Gr. Gn.	to	Fresh bed rock CR =99% RQD =99%								
30.50					light									
31.00	67.44	30.75			gray									
31.50														
32.00														
32.50														
33.00														
33.50														
34.00														
34.50														
35.00														
						Gr.Gn. - Granulitic / granitic gneiss									
						Bore hole terminated on the fresh bed rock at 30.75m below the existing ground level								

GEOLOGICAL RECORD OF BORING

Project	:	Five weak &narrow bridges (239)	Date of Drilling:	20-22 / 07 /2000
			Angle from the vertical:	0
Bore Hole Number	:	BH 239 - 04	Depth of Hole (m):	30.75
Ground Elevation	:	100.03	Depth to the gr. water level (m):	4.20
Dia. of the hole (mm)	:	100 /72	Logged By:	BSY

	Elevation (m)	Depth (m)	Thickness (m)	Field Observations				Standard Penetration Test	
				Column Section	Soil / Rock Classifn.	Colour	Description	Depth (m)	(N)
0.00	100.03								
0.50					ML	Brown	Soft very fine sand mixed with silt, mica		
1.00	99.21	0.82	0.82				and smaal amount of fine sand	1.00	05
1.50									
2.00								2.00	07
2.50									
3.00					CL / ML	- do -	Medium stiff to stiff slightly plastic clay	3.00	12
3.50							mixed with very fine sand and silts		
4.00								4.00	12
4.50									
5.00	95.03	5.00	4.18					5.00	03
5.50				5.50	ML	- do -	Soft very fine sand mixed with silt, mica		
6.00				6.00			and small amount of plastic fines	6.00	04
6.50									
7.00	93.03	7.00	2.00					7.00	05
7.50						Brown			
8.00					CL /ML		Medium stiff to very stiff slightly plastic	8.00	13
8.50							clay mixed with silt, mica and small		
9.00						Yellowish	amount of very fine sand	9.00	19
9.50						brown			
10.00	90.22	9.81	2.81		ML	Brown	Very stiff very fine sand mixed with silt	10.00	20
10.50							mica and small amount of plastic fines		
11.00	89.03	11.00	1.19					11.00	>50
11.50					SP / SW	Yellowish	Extremely dense fine to coarse sand with		25cm
12.00	88.03	12.00	1.00			brown	little amont of plastic fines	12.00	49
12.50									
13.00						- do -		13.00	48
13.50									
14.00					SP		Very dense to extremely dense fine to	14.00	35
14.50							coarse sand with few gravels		
15.00						Dark		15.00	>50
15.50						brown			23cm
16.00	84.12	15.91	3.91					16.00	47
16.50									
17.00					CL / ML	Yellowish	Hard slightly plastic clay mixed with very	17.00	44
17.50						brown	fine sand, slt and mica		
18.00	82.24	17.79	1.88					18.00	26
18.50						Dark			
19.00						brown		19.00	20
19.50									
20.00								20.00	19
20.50									
21.00					ML		Completely decomposed rock in the form	21.00	13
21.50							of very stiff slightly plastic clayey silt		
22.00							mixed with mica and small amount of	22.00	18
22.50							sand		
23.00								23.00	10
23.50						Yellowish			
24.00						brown		24.00	17
24.50	75.48	24.55	6.76					24.55	>50
25.00					Gr. Gn.	White	SW-MW bed rock	25.00	
25.50							CR = 91% RQD = 30%		
26.00	74.03	26.00	1.45						
26.50									
27.00									
27.50							The bore hole terminated in the slightly		
28.00							weathered bed rock at 26.0m below the		
28.50							existing ground level.		



資　料　編

8.ミニッツ

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR REHABILITATION OF NARROW AND WEAK BRIDGES ON NATIONAL HIGHWAYS (PHASE 2) IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
(FIRST FIELD STUDY)

In response to the request from the Government of Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka"), the Government of Japan has decided to conduct a basic design study on the Project for Rehabilitation of Narrow and Weak Bridges on National Highways (Phase 2) (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Sri Lanka a basic study team (hereinafter referred to as "the Team"), which is headed by Mr. Masafumi Nagaishi, Assistant Resident Representative of JICA Sri Lank Office, and is scheduled to stay in the country from June 23 to July 11, 2000.

The Team held discussions with the concerned officials of the Government of Sri Lanka, and conducted a field survey at the project site.

In the course of the discussions and field survey, both parties have confirmed the main items of the Project as described on the attached sheets. The Team will proceed further and prepare the Interim Report.

Colombo, July 11,2000

Mr. Masafumi Nagaishi
Leader, Basic Design Study Team
Japan International Cooperation Agency

Mr. G. HEWAGAMA
Secretary
Ministry of Transport & Highways

Mr.W.A.Jayasinghe
Chairman
Road Development Authority

Mr. J.H.J. Jayamaha
Director, Japan Division
Department of External Resources

ATTACHMENT

1. OBJECTIVE

The objective of the Project is to construct permanent bridges to ensure safe and smooth flow of traffic in the Project area. And in the long-term view, socio-economic activities will be encouraged hence to contribute the development of the Project area.

2. PROPOSED SITES

The proposed sites, which are subjected to the first field survey of the Project, are shown in ANNEX-1.

3. RESPONSIBLE ORGANIZATION AND IMPLEMENTING AGENCY

(1) Responsible Organization: Ministry of Transport & Highways

(2) Implementing Agency: Road Development Authority

The organization chart is shown in ANNEX-2.

4. BRIDGES REQUESTED BY THE GOVERNMENT OF SRI LANKA

As a result of the discussions, Government of Sri Lanka has declined the application for 8 bridges, which have already been constructed and funded by his own fund or another donors among 19 requested bridges. The 11bridges listed in ANNEX-3 (a) are requested for the first field survey by the Sri Lankan side. However, the final selection of bridges and their detail design will be decided after further studies.

5. CRITERIA FOR THE SELECTION AND PRIORITIZATION OF BRIDGES

The criteria for the selection and prioritization of the bridges subjected to the second filed survey are shown in ANNEX-3 (b). The criteria are agreed between the Sri Lankan side and the study team.

The selection of bridges will be considered based on the result of the first field survey in Sri Lanka, and first analysis and study in Japan.

6. JAPAN'S GRANT AID SYSTEM

The Sri Lankan side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Sri Lanka described in ANNEX-4 and ANNEX-5 for the smooth

implementation of the Project, as a condition for the Japanese Grand Aid to be implemented.

7. SCHEDULE OF THE STUDY

(1) The consultants will proceed to first analysis and study in Japan until end of July.

(2) JICA will prepare an Interim Report and dispatch a mission in the early August in order to explain and confirm the contents of the Interim Report, then proceeds the second field survey.

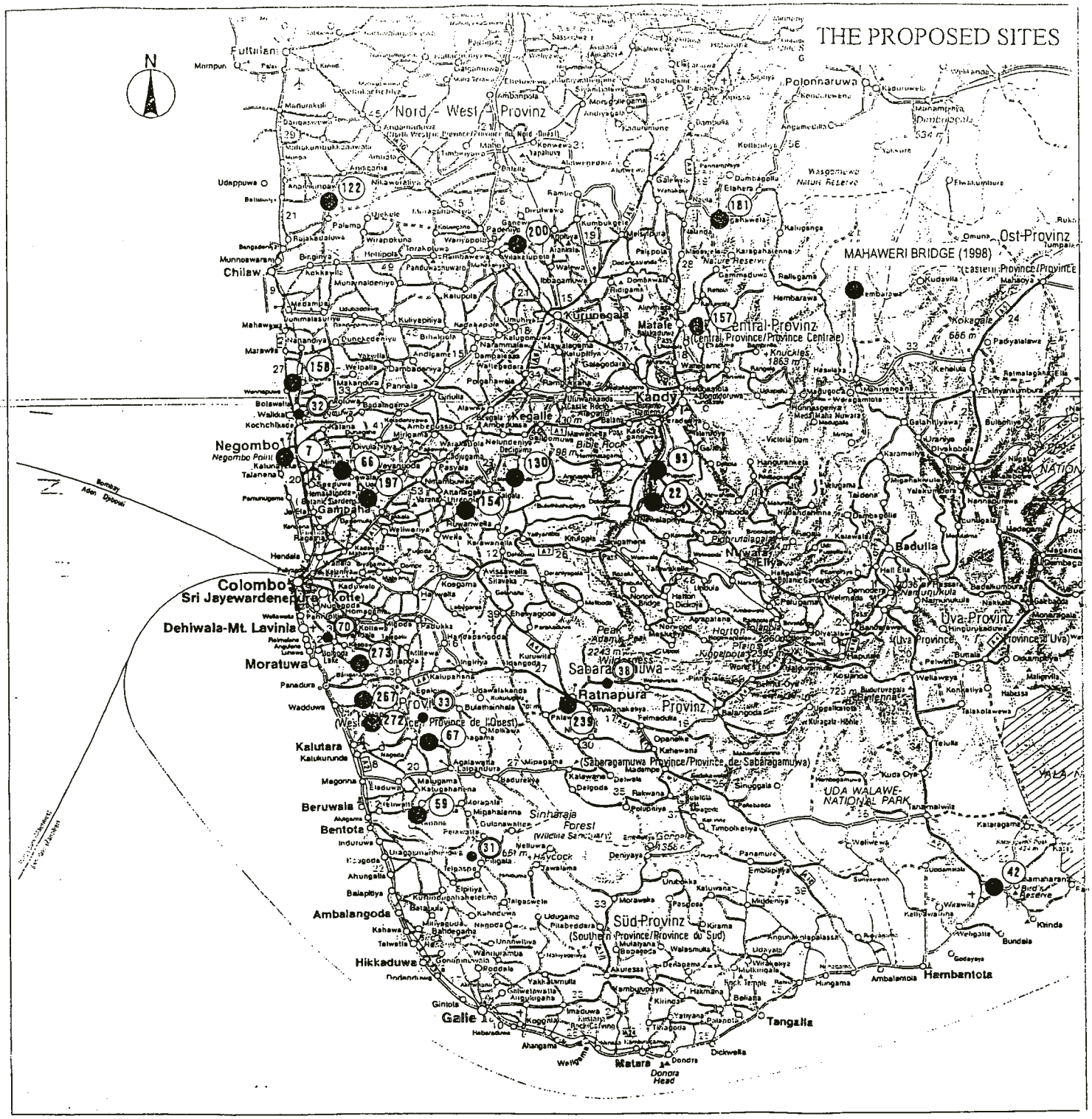
(3) In case that contents of the Report are accepted by the Sri Lankan side in principle, JICA will prepare and explain the Draft Final Report in the end of October 2000, and complete the final report and sent it to Sri Lankan side by February 2001.

8. OTHER RELEVANT ISSUES

(1) The Sri Lankan side shall prepare the full time counterpart and assign the officer in charge of land acquisition for the team in the second field survey.

(2) The procedure of land acquisition on the Project for Rehabilitation of Narrow and Weak Bridges on National Highways (Phase 1) had been delayed. The Sri Lankan side shall take necessary measures for the land acquisition on the Project (Phase 2) without delay to secure smooth implementation of the Project.

(3) An environment impact assessment confirmed not to be included as the requirement for the area around the requested bridges. If it shall occur necessity for environment impact assessment, the Sri Lankan side shall fulfill procedure of the assessment within the schedule.



LGEND

The Proposed Sites on the Project for Rehabilitation of Narrow and Weak Bridges

The Proposed Sites for This Study:

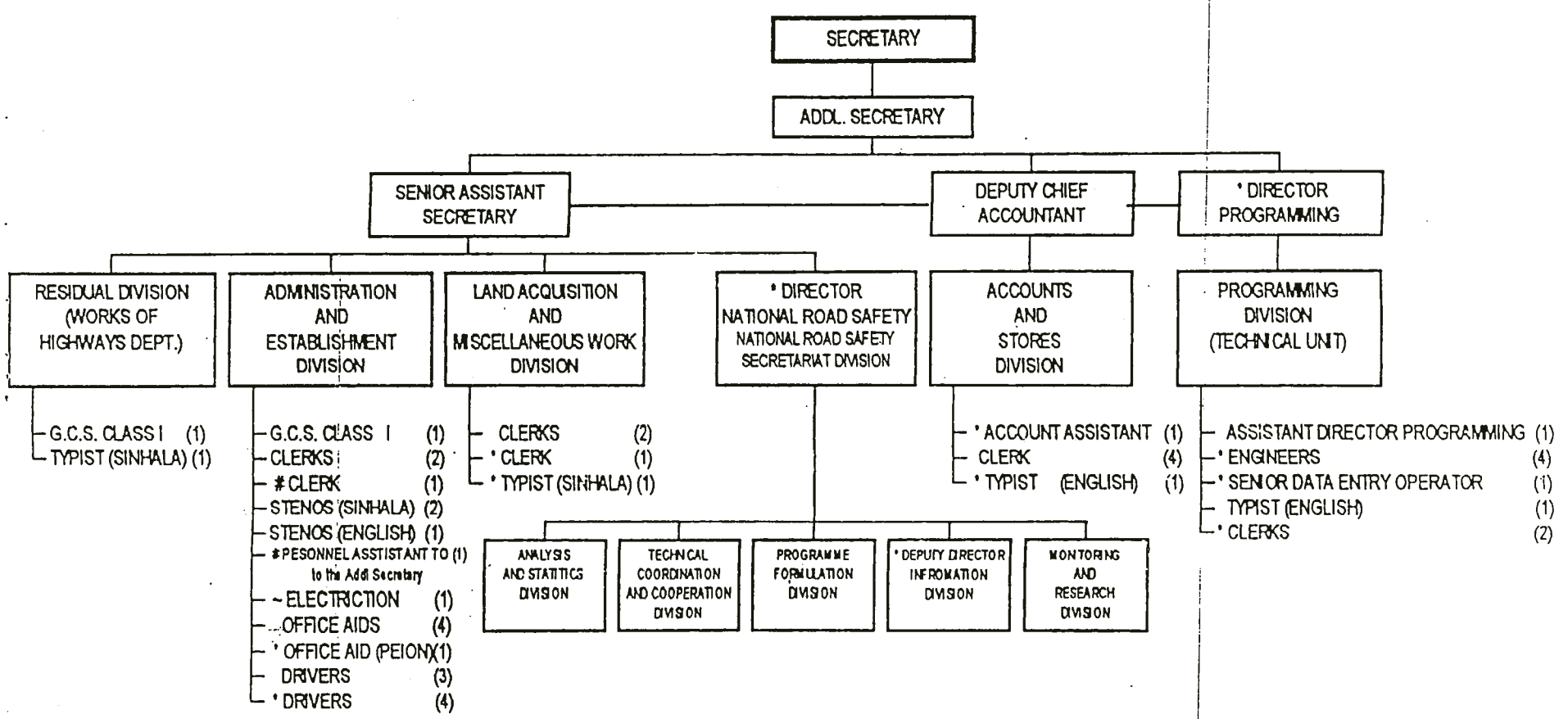
No.7, No.22, No.42, No.59, No.66, No.67, No.93, No.122, No.130, No.154,

No.157, No.158, No.181, No.197, No.200, No.239, No.267, No.272, No.273

The Project for Reconstruction of Five Bridges (Phase1)

(Under Construction): No.31, No.32, No.33, No.38, No.70

ORGANISATION CHART FOR HIGHWAYS DIVISION
MINISTRY OF TRANSPORT AND HIGHWAYS



OFFICE AIDES (4) - Attending to collection and delivery of letters, Roneo, Photocopy Machine, Book binding and Cleaning of office etc.

ELECTRICTION (1) - Overall incharge for day to day maintenance of Air-Conditioners, Telephone System, Libbrery etc.

NATIONAL ROAD SAFETY SECRETARIAT STAFF

* ENGINEERS (4)
* CLERK (1)
* DATA ENTRY OPERATOR(1)
* OFFICE AID (PEON) (1)

[* - All staff release from RDA]

[# - All staff release from RC & DC]

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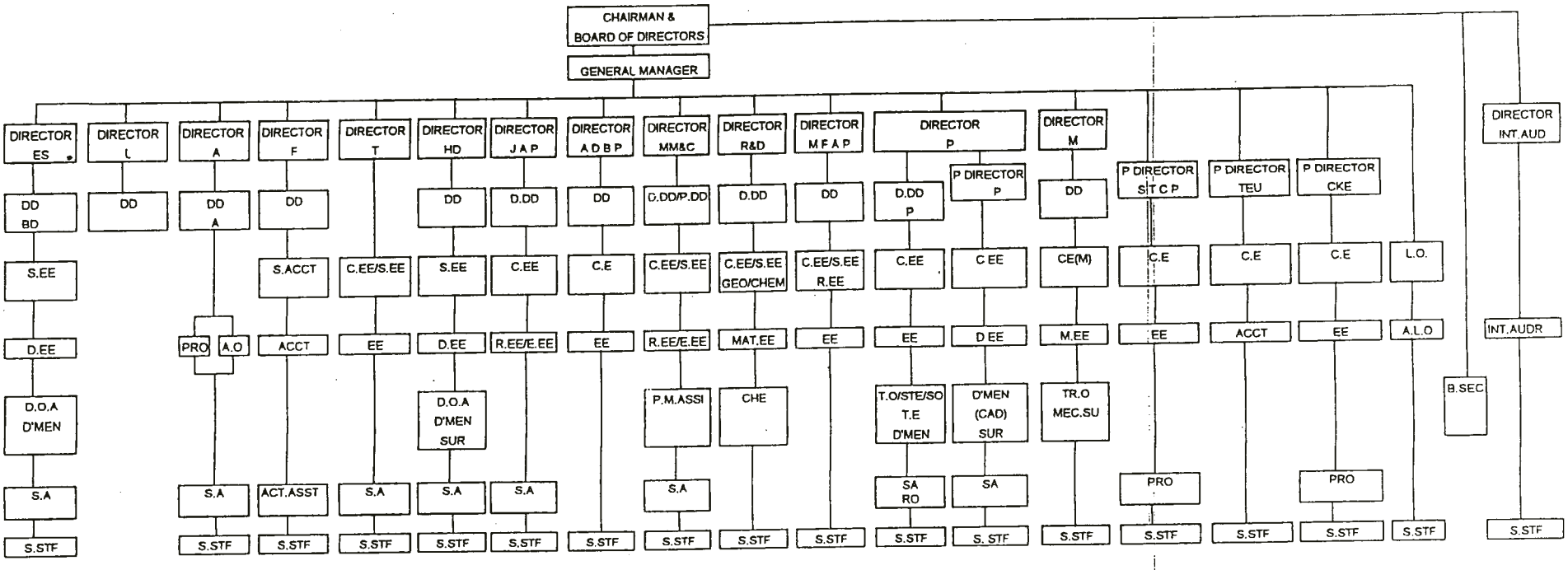
ANNEX-2

ORGANIZATION CHART -RDA



ABBREVIATION

DIRECTORS

A	ADMINISTRATION
P	PLANNING
ES	ENGINEERING SERVICES
F	FINANCE
T	TRAINING
MM&C	MAITENANCE MANAGEMENT & CONTRUCTION
M	MECHANICAL
HD	HIGHWAY DESIGN
INT.AUD	INTERNAL AUDIT
R&D	RESEACH & DEVELOPMENT
L	LANDS
J A P	JAPAN AIDED PROJECTS
A D B P	ASIAN DEVELOPMENT BANK PROJECTS
M F A P	MISCELLANEOUS FORIGN AIDED PROJECTS

PROJECT DIRECTORS

TEU	TENDER EVALUTION
CKE	COLOMBO-KATUNAYAKA EXPRESS WAY
S T C P	SOUTHERN TRANSPORT CORRIDOR PROJECTS

DEPUTY DIRECTORS

D.D	DEPUTY DIRECTOR
D.DD	DEPUTY DIRECTORS
BD	BRIDGES DESIGN
HD	HIGHWAY DESIGN
P	PLANNING
P.DD	PROVINCIAL DIRECTORS
C.EE	CHIEF ENGINEERS
S.EE	SENIOR ENGINEERS
C.E(M)	CHIEF ENGINEER MECHANICAL
D.EE	DESIGN ENGINEERS
GEO	GEOLOGIST
R.EE	RESIDENT ENGINEERS
L.O	LEGAL OFFICER
MAT.EE	MATERIAL ENGINEERS
E.EE	EXECUTIVE ENGINEERS
EE	ENGINEERS
A.L.O	ASSISTANT LEGAL OFFICER

DOA	DRAWING OFFICE ASSISTANT
T.O	TECHNICAL OFFICER
S.O	STATISTICAL OFFICER
TR.O	TRANSPORT OFFICER
MEC.SU	MECHANICAL SUPERINTENDENT
PRO	PUBLIC RELATION OFFICER
AO	ADMINISTRATIVE OFFICER
S.ACCT	SENIOR ACCOUNTANT
ACCT	ACCOUNTANT
SUR	SURVEYORS
P.M.ASSI	PROGRESS MONITORING ASSISTANT
S.A	STAFF ASSISTANT
B.SEC	BOARD SECRETARY
CHE	CHMIST
ACT.ASI	ACCOUNT ASSISTANT
INT.AUDR	INTERNAL AUDITOR
S.T.E	SENIOR TRAFFIC ENUMERATOR
T.E	TRAFFIC ENUMERATOR
R.O	RECORD OFFICER
S.STF	SUPPORT STAFF

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BRIDGE REQUESTED BY THE GOVERNMENT OF SRI LANKA

No.	RDA Inventory No.	Location	Present Situation	Fund
—	No. 7	Gampaha	Under Construction	Sri Lanka
—	No. 22	Kandy	Under Construction	Sri Lanka
1	No. 42	Hambantota		
—	No. 59	Kulutara	Under Construction	Sri Lanka
2	No. 66	Gampaha		
3	No. 67	Kulutara		
4	No. 93	Kandy		
5	No. 122	Chilaw		
—	No. 130	Kegalle	Under Construction	Sri Lanka
6	No. 154	Kegalle		
7	No. 157	Matare		
8	No. 158	Chilaw		
9	No. 181	Matare		
—	No. 197	Gampaha	Commencemnt by end of 2000	Sri Lanka
10	No. 200	Kurunegala		
11	No. 239	Ratnapura		
—	No. 267	Kulutara	On the tender	Sri Lanka
—	No. 272	Kulutara	On the tender	Sri Lanka
—	No. 273	Kulutara	On the tender	Kuwait fund

Note:

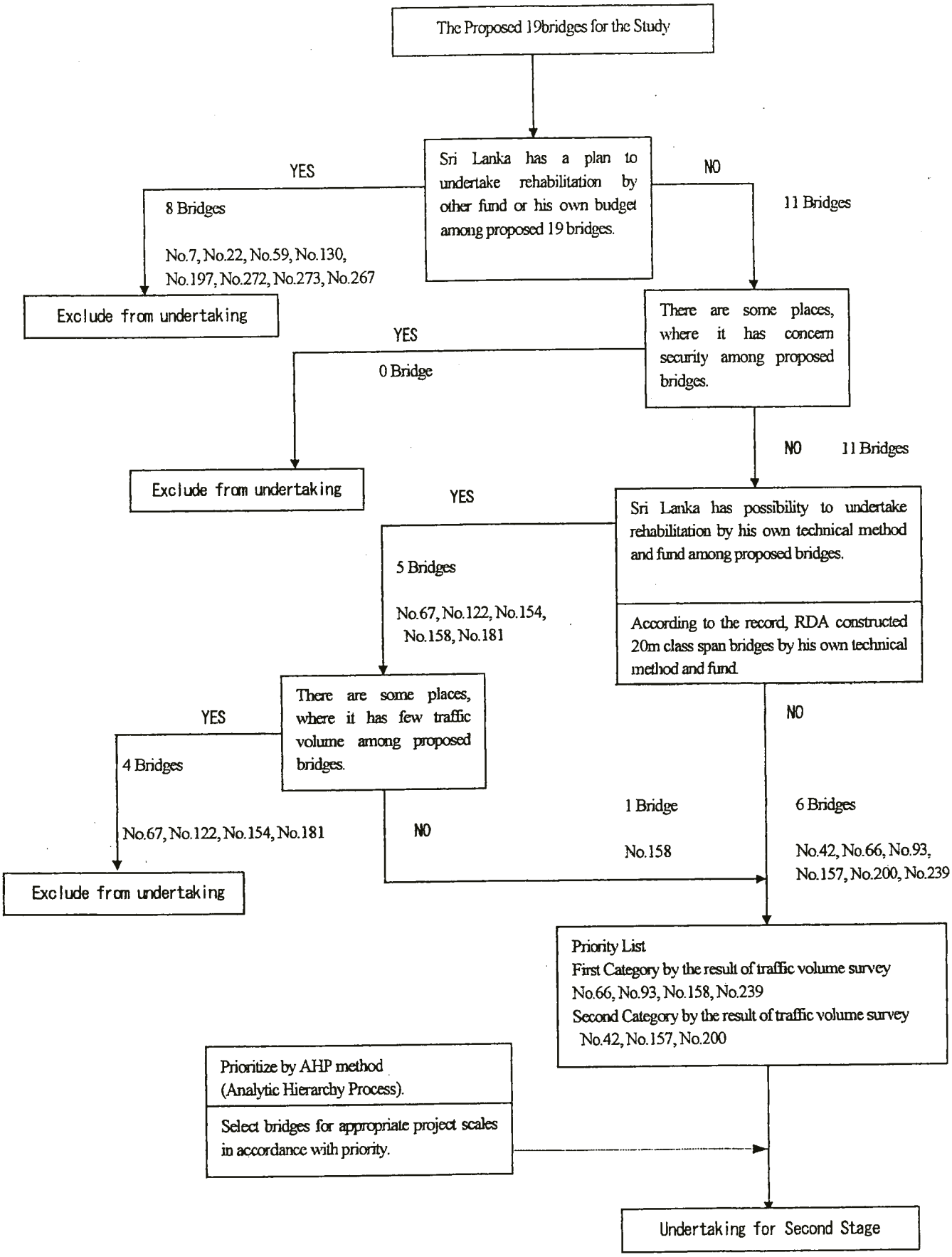
The Government of Sri Lanka declines 8 bridges among 19bridges, which was applied to Grant Aid.

The scope of first site survey is the investigation for the remaindering 11 bridges.

No	SER No.	Route No Bridge No	Name of Road	Type of Bridge Length / Width (m)	Existing Defects	Traffic Volume [/day] (Y)	Remark
1	42	B-464 5/1 km	Weerawila-Tissa-Kataragama (Southern/Hambantota)	RSJ/RCS L=59.20 W=4.29	Narrow/ Poor slab･deck	[1,140] ('90) [1,320] ('96)	
2	66	B-111 7/1km	Ekala-Kotadeniyawa (Western / Gampaha)	ST.TRH L=36.80 W=6.40	Poor alignment/ Narrow/ Poor pier	[6,125] ('94) [10,753] ('99)	
3	67	B-157 23/2 km	Horana-Anguruwatota-Aluthgama (Western / Kalutara)	RSJ/RCS L=19.10 W=3.50	Narrow	[750] ('91) [846] ('99)	
4	93	AA- 005 21/4km	Peradeniya-Badulla-Chenkaladi (Central / Kandy)	ST.TR L=98.30 W=4.85	Narrow Corrosion	[4,699] ('94) [4,910] ('96)	
5	122	B-045 19/1 km	Bangadeniya-Andigama-Anamaduwa (North Western/Chilaw)	RSJ L=18.50 W=5.00	Weak/ Narrow	[470] ('93) [665] ('95)	
6	154	B-445 14/1 km	Veyangoda-Ruwanwella (Sabaragamuwa/kegalle)	RSJ/BUC L=10.35 W=4.60	Weak	[3,192] ('94) [1,024] ('98)	
7	157	B-461 28/2 km	Wattegama-Kandenuwara-Wariyapola (Central / Matale)	RSJ/BUC L=24.80 W=3.20	Weak Corrosion	[50] ('91)	
8	158	B-473 3/2 km	Vennappuwa-Kirimetiyana (North Western / Chilaw)	ST.TR L=19.70 W=5.20	Weak/ Narrow	[3,560] ('95)	
9	181	B-312 11/5 km	Naula-Elahera-Kaluganga (Central / Matale)	RSJ/RCS L=18.90 W=3.80	Narrow	[310] ('91) [363] ('96)	
10	200	B-478 10/1 km	Wilakatupotha-Ganewattha-Kubukgete (NorthWestern/ Kurunegala)	ST.TR/H L=78.60 W=4.25	Narrow Poor slab	[240] ('93)	
11	239	B-390 1/3 km	Ratnapura-Palawela-Karawita (Sabaragamuwa/Ratnapura)	ST.TR/H L=107.00 W=4.30	Weak truss Poor deck Narrow	[5,709] ('97)	

CRITERIA FOR THE SELECTION AND PRIORITIZATION OF BRIDGES

1) The encouragement for Relative Development Plan
2) The Present Situation of Bridges (e.g. damage, traffic flow and so forth)
3) The encouragement for Social and Economic growth
4) The Traffic volume
5) The Availability of Land acquisition
6) The Others



Flowchart of the Selection of the Proposed Bridges

JAPAN'S GRAND AID SCHEME

1. GRAND AID PROCEDURES

1) Japan's Grand Aid Program is executed through the following procedures.

- Application (Request made by the recipient country)
- Study (Basic Design Study conducted by Japan International Cooperation Agency (JICA))
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet)
- Determination of the Implementation (The Note exchanged between the Governments of Japan and Recipient country)

2) Firstly, the application or request for a Grand Aid project submitted by the recipient county is examined by the Government of Japan (Ministry of Foreign Affairs) to determine whether or not it is eligible for Grand Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grand Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the Project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the Project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. BASIC DESIGN STUDY

1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study") conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan.

The contents of the Study are as follows:

a) Confirmation of the background, objectives and benefits of the Project and also institutional

capacity of agencies concerned of the recipient country necessary for the Project's implementation.

b) Evaluation of the appropriateness of the Project to be implemented under the Grand Aid Scheme from a technical, social and economic point of view.

c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.

d) Preparation of a basic design of the Project.

e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grand Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grand Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The selected firm(s) carry(ies) out a Basic Study and write(s) a report, based upon terms of reference set by JICA. The consultant firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. JAPAN'S GRAND AID SCHEME

1) Japan 's Grant Aid

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two

Governments concerned, in which the objectives of the Project, period of execution conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid"

"The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese national." (The term "Japanese nationals" means persons of Japanese nationality of Japanese corporations controlled by persons of Japanese nationality.)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

(1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.

(2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.

(3) To secure buildings prior to the procurement in case the installation of the equipment.

(4) To ensure all the expenses and prompt excursion for unloading, customs clearance at

the port of disembarkation and internal transportation of the products purchased under the Grant Aid.

(5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.

7) "Proper Use"

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

8) "Re-export"

The products purchased under the Grant Aid should not be re-exported from the recipient country.

9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient county in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

ANNEX-5

MAJOR UNDERSTANDINGS TO BE TAKEN BY EACH GOVERNMENT

NO	Items	To be covered by Grant Aid	To be covered by Recipient side
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
5	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
7	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
8	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
9	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities		●

Minutes of Discussions
on the Basic Design Study
on the Project for Rehabilitation of Narrow and Weak Bridges
on National Highways (Phase 2)
in the Democratic Socialist Republic of Sri Lanka
(Second Field Study)

In response to the request from the Government of Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka"), the Government of Japan has decided to conduct a basic design study on the Project for Rehabilitation of Narrow and Weak Bridges on National Highways (Phase 2) (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Sri Lanka a basic design study team (hereinafter referred to as "the Team"), which is headed by Mr. Kenji Kiyomizu, Development Specialist, JICA, and is scheduled to stay in the country from August 1 to August 29, 2000.

The Team held discussions with the concerned officials of the Government of Sri Lanka, and conducted a field survey at the project site.

In the course of the discussions and field survey, both parties have confirmed the main items of the Project as described on the attached sheets. The Team will proceed on project works further and prepare the Draft Basic Design Report.

Colombo, August 8, 2000

清水建二

Mr. Kenji Kiyomizu
Leader
Basic Design Study Team
Japan International Cooperation Agency

Mr.G.Hewagama
Secretary
Ministry of Transport and Highways

Mr.J.H.Jayamaha
Director, Japan Division
Department of External Resources

Mr.W.A.Jayasinghe
Chairman
Road Development Authority
Ministry of Transport and Highways

ATTACHMENT

1. OBJECTIVE

The objective of the Project is to construct permanent bridges to secure safe and smooth traffic movement in the Project area. And in the long-term view, socio-economic activities will be encouraged to contribute to the Project area.

2. PROPOSED SITES

The proposed sites which are subjected to the second field survey of the Project are shown in **Annex-1**.

3. ITEMS SELECTED FOR THE PROJECT

After discussions with the Team, Serial No.239 Muwagama Bridge and No.93 Gampola Bridge were finally agreed upon as the items selected for the Project by the Sri Lankan side. JICA will assess the appropriateness of the selection and will recommend to the Government of Japan for approval.

4. RESPONSIBLE ORGANIZATION AND IMPLEMENTING AGENCY

(1) Responsible Organization: Ministry of Transport and Highways

(2) Implementing Agency: Road Development Authority

The organization charts are shown in **Annex-2.**

5. JAPAN'S GRANT AID SCHEME

The Sri Lankan side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Sri Lanka as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on July 11, 2000.

6.SCHEDULE OF THE STUDY

(1) The consultants will proceed on further studies in Sri Lanka until August 29, 2000 as the second field survey.

(2) The Sri Lankan side was accepted the content of the Interim Report, so that JICA will prepare the Draft Basic Design Report and dispatch a mission in order to explain and confirm the contents in the end of the October, 2000.

(3) In case that the content of the Draft Basic Design Report is accepted by the Sri Lankan side, JICA will finalize the report and send it to the Sri Lankan side by February, 2001.

7. OTHER RELEVANT ISSUES

(1) There has been certain delay in the procedure of land acquisition on the Project for Rehabilitation of Narrow and Weak Bridges on National Highways (Phase 1). As such the Sri Lankan side will take necessary measures for the land acquisition on the Project (Phase 2) to avoid delay to secure smooth implementation of the Project. The Sri Lankan side should define the procedure and the time schedule on the land acquisition during the second field survey. Also, if the land acquisition is concerned with other officials, the Sri lankan side shall obtain the written confirmation from the officials during the second field survey.

(2) It is confirmed that Environment Impact Assessment is not required for the area around the selected bridges as described in **Annex-3**.

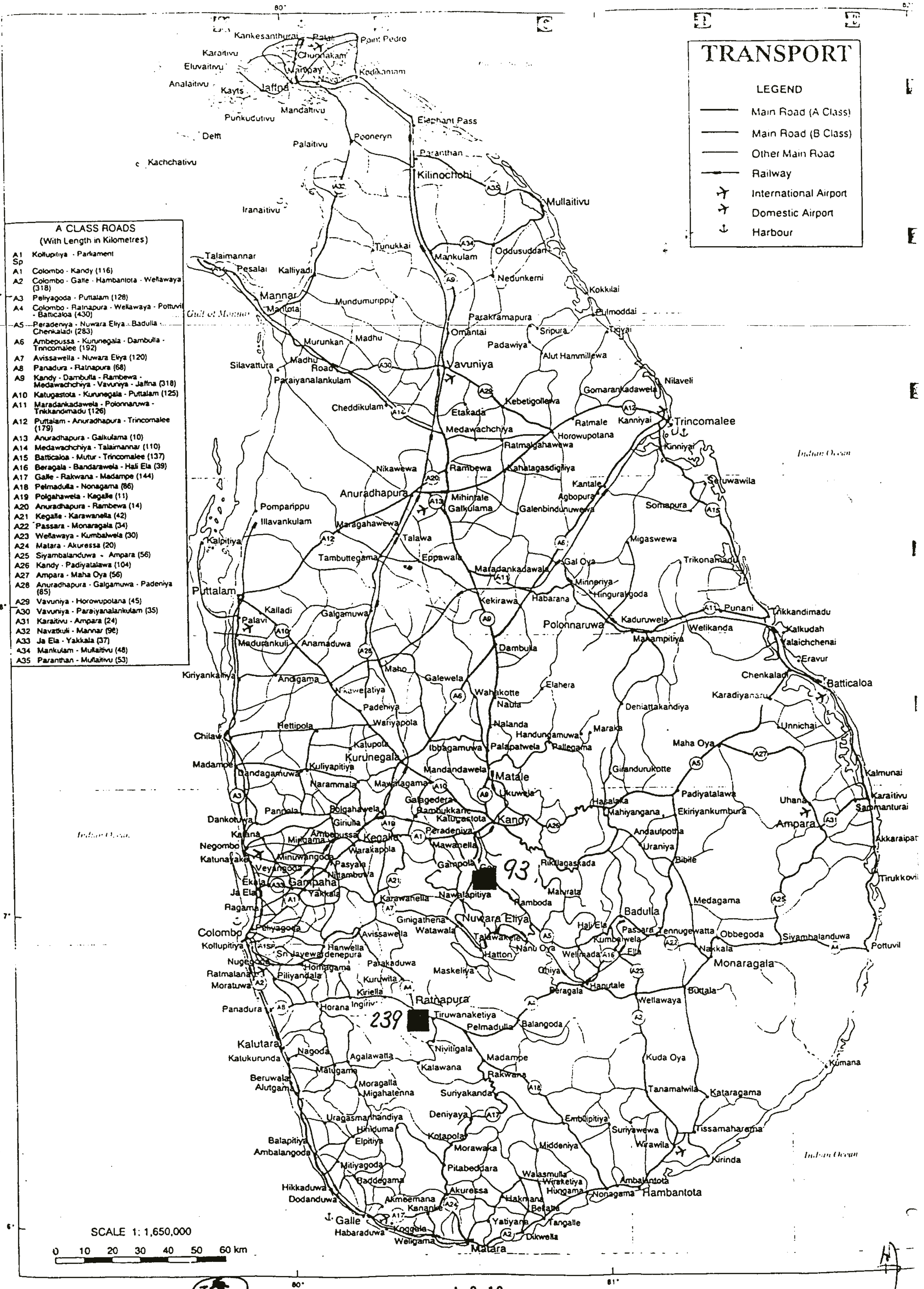
(3) The Sri Lankan side shall allocate the budget for the tax exemption in accordance with the Draft Basic Design Report. Also, the procedure of the tax exemption, particularly, the time schedule should be clarified during the second field survey.

(4) The Sri Lankan side shall be responsible for the removal of the existing bridges, if it is necessary to do so.

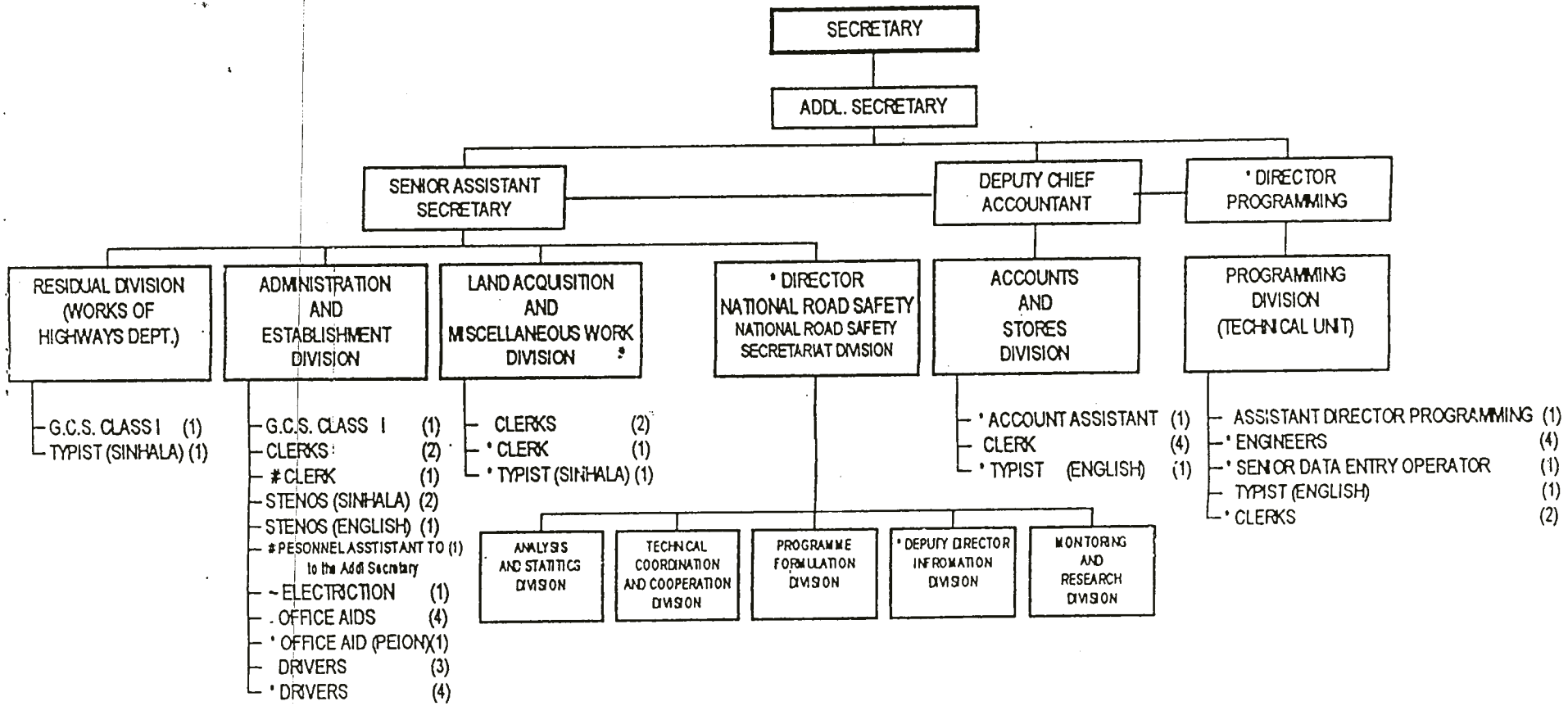
(5) The Sri Lankan side shall be responsible for the relocation of the utilities and also provide the sufficient data to the basic design study team for newly installation.

(6) The name of the Project has been agreed between the Sri Lankan side and the JICA to change as follows:

" The Project for the Rehabilitation of Gampola and Muwagama Bridges"


TRANSPORT
LEGEND
Main Road (A Class)
Main Road (B Class)
Other Main Road
Railway
International Airport
Domestic Airport
Harbour
A CLASS ROADS
(With Length in Kilometres)
A1 Sp Kollupitiya - Parliament
A1 Colombo - Kandy (116)
A2 Colombo - Galle - Hambantota - Wellawaya (318)
A3 Peliyagoda - Puttalam (128)
A4 Colombo - Ratnapura - Wellawaya - Pottuvil - Batticaloa (430)
A5 Peradeniya - Nuwara Eliya - Badulla - Chenkaladi (283)
A6 Ambepussa - Kurunegala - Dambulla - Trincomalee (192)
A7 Avissawella - Nuwara Eliya (120)
A8 Panadura - Ratnapura (68)
A9 Kandy - Dambulla - Rambewa - Medawachchiya - Vavuniya - Jaffna (318)
A10 Katugastota - Kurunegala - Puttalam (125)
A11 Maradankadawela - Polonnaruwa - Trikkandimadu (126)
A12 Puttalam - Anuradhapura - Trincomalee (179)
A13 Anuradhapura - Galkulama (10)
A14 Medawachchiya - Talaimannar (110)
A15 Batticaloa - Mutur - Trincomalee (137)
A16 Beragala - Bandarawela - Hali Ela (39)
A17 Galle - Rakwana - Madampe (144)
A18 Pelmadulla - Nonagama (86)
A19 Polgahawela - Kegalle (11)
A20 Anuradhapura - Rambewa (14)
A21 Kegalle - Karawanella (42)
A22 Passara - Monaragala (34)
A23 Wellawaya - Kumbalwela (30)
A24 Matara - Akuressa (20)
A25 Siyambalanduwa - Ampara (56)
A26 Kandy - Padiyatalawa (104)
A27 Ampara - Maha Oya (56)
A28 Anuradhapura - Galgamuwa - Padeniya (85)
A29 Vavuniya - Horowupotana (45)
A30 Vavuniya - Paraiyanalankulam (35)
A31 Karaitivu - Ampara (24)
A32 Navatkuli - Mannar (96)
A33 Ja Ela - Yakkala (37)
A34 Mankulam - Mullaitivu (48)
A35 Paranthan - Mullaitivu (53)
Jaffna
Kilinochchi
Mullaitivu
Mannar
Vavuniya
Trincomalee
Anuradhapura
Puttalam
Polonnaruwa
Batticaloa
Kurunegala
Matale
Kandy
Negombo
Gampaha
Colombo
Nuwara Eliya
Badulla
Monaragala
Ratnapura
Kalutara
Ampara
Hambantota
Galle
Matara
93
239
SCALE 1: 1,650,000
0 10 20 30 40 50 60 km
80°
81°

ORGANISATION CHART FOR HIGHWAYS DIVISION
MINISTRY OF TRANSPORT AND HIGHWAYS



OFFICE AIDES (4) - Attending to collection and delivery of letters, Roneo, Photocopy Machine, Book binding and Cleaning of office etc.

ELECTRICTION (1) - Overall Incharge for day to day maintenance of

NATIONAL ROAD SAFETY SECRETARIAT STAFF

* ENGINEERS (4)
* CLERK (1)
* DATA ENTRY OPERATOR (1)

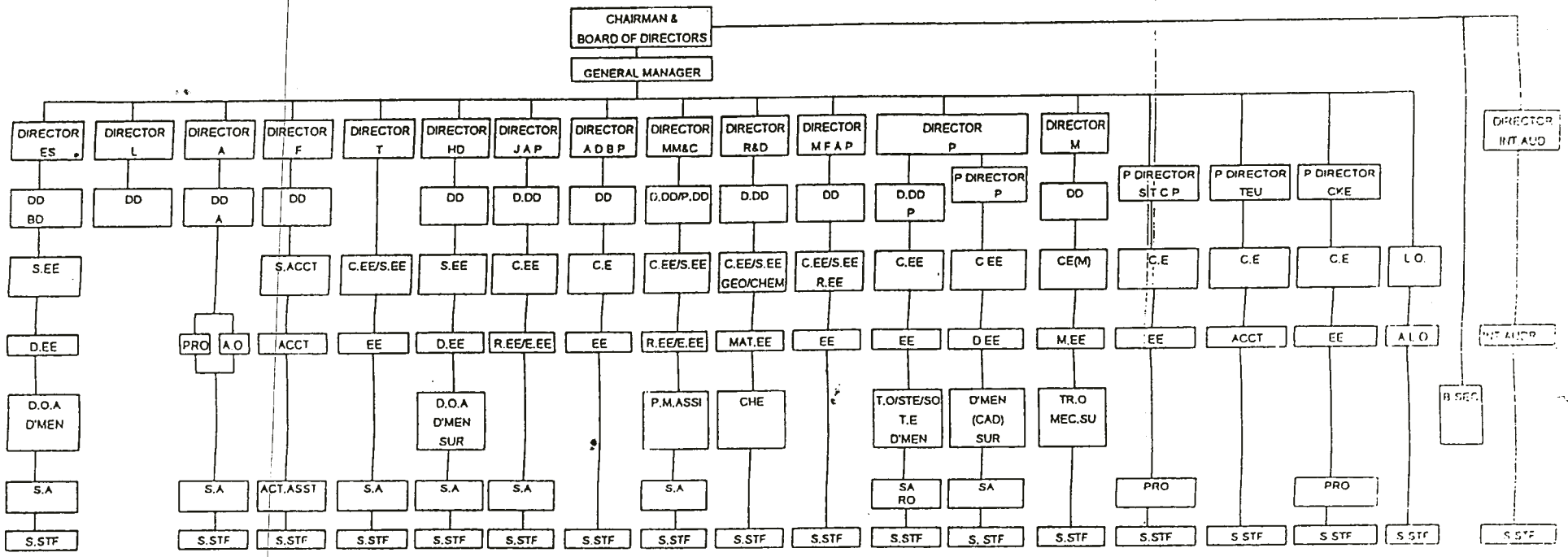
[* - All staff release from RDA]

[# - All staff release from RC & DC]

A-8-20

ANNEX-2

ORGANIZATION CHART -RDA



ABBREVIATION

DIRECTORS

A	ADMINISTRATION
P	PLANNING
ES	ENGINEERING SERVICES
F	FINANCE
T	TRAINING
MM&C	MAITENANCE MANAGEMENT & CONTRUCTION
M	MECHANICAL
HD	HIGHWAY DESIGN
INT.AUD	INTERNAL AUDIT
R&D	RESEACH & DEVELOPMENT
L	LANDS
J A P	JAPAN AIDED PROJECTS
A D B P	ASIAN DEVELOPMENT BANK PROJECTS
M F A P	MISCELLANEOUS FORIGN AIDED PROJECTS

PROJECT DIRECTORS

TEU	TENDER EVALUTION
CKE	COLOMBO-KATUNAYAKA EXPRESS WAY
S T C P	SOUTHERN TRANSPORT CORRIDOR PROJECTS

DEPUTY DIRECTORS

D.D	DEPUTY DIRECTOR
D.DD	DEPUTY DIRECTORS
BD	BRIDGES DESIGN
HD	HIGHWAY DESIGN
P	PLANNING
P.DD	PROVINCIAL DIRECTORS
C.EE	CHIEF ENGINEERS
S.EE	SENIOR ENGINEERS
C.E(M)	CHIEF ENGINEER MECHANICAL
D.EE	DESIGN ENGINEERS
GEO	GEOLOGIST
R.EE	RESIDENT ENGINEERS
L.O	LEGAL OFFICER
MAT.EE	MATERIAL ENGINEERS
E.EE	EXECUTIVE ENGINEERS
EE	ENGINEERS
A.L.O	ASSISTANT LEGAL OFFICER

DOA	DRAWING OFFICE ASSISTANT
T.O	TECHNICAL OFFICER
S.O	STATISTICAL OFFICER
TR.O	TRANSPORT OFFICER
MEC.SU	MECHANICAL SUPERINTENDENT
PRO	PUBLIC RELATION OFFICER
AO	ADMINISTRATIVE OFFICER
S.ACCT	SENIOR ACCOUNTANT
ACCT	ACCOUNTANT
SUR	SURVEYORS
P.M.ASSI	PROGRESS MONITORING ASSISTANT
S.A	STAFF ASSISTANT
B.SEC	BOARD SECRETARY
CHE	CHMIST
ACT.ASI	ACCOUNT ASSISTANT
INT.AUDR	INTERNAL AUDITOR
S.T.E	SENIOR TRAFFIC ENUMERATOR
T.E	TRAFFIC ENUMERATOR
R.O	RECORD OFFICER
S.STF	SUPPORT STAFF

මාර්ග සංවර්ධන අධිකාරිය
வீதி அபிவிருத்தி அதிகாரச்சபை
Road Development Authority

"සෙත්සිරිපාය", බත්තරමුල්ල.
"செத்சிறிபாய", பத்தரமுல்லை.
"Sethsiripaya", Battaramulla,
Sri Lanka.

මගේ අංකය
எனது இல.
My No. RDA/ES/B/G-46

ඔබේ අංකය
உமது இல.
Your No.

දිනය
திகதி
Date 07th Aug., 2000.

The Team Leader,
Basic Design Study Team,
Japan International Cooperation Agency.

Dear Sir,

GRANT AID ASSISTANCE FOR THE REHABILITATION OF GAMPOLA & MUWAGAMA BRIDGES
ENVIRONMENT IMPACT ASSESSMENT CLEARANCE

With reference to your inquiry regarding the need for Environment Impact Assessment for the above bridges, this is to confirm that an Environment Impact Assessment is not necessary for the area around the above two selected bridges.

Yours faithfully,

GENERAL MANAGER
ROAD DEVELOPMENT AUTHORITY

DKRS/n.

දුරකථන
தொலைபேசி
Telephone 862721, 862722, 863101-3

ටෙලෙක්ස්
ரெலெக்ஸ்
Telex 22412 "ROADEV" CE

ෆැක්ස්
பெக்ஸ்
Fax 864801

විදුලි පණිවුඩ
தந்தி
Telegram "F

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY ON THE PROJECT FOR
REHABILITATION OF GAMPOLA BRIDGE AND MUWAGAMA BRIDGE
IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA
(Explanation on Draft Report)

In July 2000, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Rehabilitation of Gampola Bridge and Muwagama Bridge (hereinafter referred to as "the Project") to the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "Sri Lanka"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult on the components of the draft report, JICA sent to Sri Lanka the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Seiji Kaiho, Resident Representative, JICA Sri Lanka Office, from October 23 to October 31, 2000.

As results of discussions, both parties confirmed the main items described on the attached sheets.

Colombo, October 30, 2000

Seiji Kaiho
Leader,
Draft Report Explanation Team
Resident Representative JICA

S.L.Seneviratne
Secretary
Ministry of Highways

J.H.J. Jayamaha
Director, Japan Division
Department of External Resources

W.A.Jayasinghe
Chairman
Road Development Authority
Ministry of Highways

ATTACHMENT

1. Component of the Draft Report

The Sri Lankan side agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid Scheme

The Sri Lankan side understands the Japan's Grant Aid Scheme and necessary measures to be taken by the Sri Lankan side as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on July 11,2000,and this adds some additional measures to be taken by the Government of Sri Lanka.

3. Schedule of the study

JICA will complete the final report in accordance with the confirmed items and send it to the Sri Lankan side by the end of February 2001.

4. Other relevant issues

(1) Ministry of Highways shall be responsible to secure smooth implementation of the Project, as the responsible organization of the Project on behalf of the Government of Sri Lanka.

(2) The Sri Lankan side shall allocate the budget for the taxes in accordance with details of the recommended Project, indicated the Draft Basic Design Report for the smooth implementation of the Project.

(3) The Sri Lankan side will take necessary measures for the safety and security of the Project in order to ensure smooth implementation of the Project.

(4) The Team confirmed that Sri Lankan side would execute the demolition of existing Gampola Bridge and Muwagama Bridge at their own expenses, after completion of the new bridges construction.

(5) Sri Lankan side shall have responsibility for maintenance of new bridges.

(6) Sri Lankan side shall have regulation to prevent sand harvesting around bridge area to maintain riverbed condition and prevent scour.

(7) Sri Lankan side shall have the sites cleared of all the utilities, such as high-tension cables, telephone cables and water pipes etc., which would obstruct the construction works before the implementation of the Project.

(8) Sri Lankan side shall be responsible to complete the acquisition of land required to secure smooth implementation of the Project to avoid delays.

(9) The name of the Project has been agreed between the Sri Lankan side and the JICA to change as follows:
"The Project for Rehabilitation of Gampola Bridge and Muwagama Bridge"

資　料　編

9.事前評価表

事前評価表（基本設計調査結果概要）

１．　協力対象事業名

スリ・ランカ国　ガンポラ橋・ムワガマ橋架け替え計画

２．　我が国が援助することの必要性・妥当性

（１）①　スリ・ランカ国は我が国と伝統的に友好関係にあること、
②　1948 年の独立以来、選挙による政権運営を行っている民主主義国家であり、構造調整を実施し経済改革のために自助努力を行っていること、
③　都市部を中心に開発が進みつつあるが、インフラ整備、地域開発など経済発展に向けた援助需要が大きいこと、
等を踏まえ、我が国は援助を実施することとしている。

（２）スリ・ランカ国は、公共投資計画として５カ年計画を毎年修正を加えながら実施しており、2000 年現在は 1997? 2001 年の５カ年計画を実施中である。

（３）上記５カ年計画及び 1996 年に我が国が実施した開発調査「全国橋梁改修計画調査(M/P)」をもとに、スリ・ランカ国運輸・高速道路省の管轄下にある道路公社(Road Development Authority; RDA) は、「橋梁改修 10 カ年計画」を作成している。1981 年に設置された RDA は本件の実施機関であり、全国国道網の A クラス道路及び B クラス道路の新設や工事、維持管理を使命としており、本案件対象橋梁の整備も前述 10 カ年計画の一環である。

３．　協力対象事業の目的（プロジェクト目標）等

スリ・ランカ国の重要路線である国道 A005 線及び国道 B390 号線周辺地域の社会経済を維持発展させるために、上記２.（３）の「橋梁改修 10 カ年計画」の対象であるガンポラ橋・ムワガマ橋を改修することで、上記国道のボトルネックを解消し、橋梁地点の安全且つ円滑な交通を確保することを目的とする。

４．　協力対象事業の内容

（１）対象地域
セントラル州キャンディ市及びサバルガムワ州ラトナプラ市

（２）アウトプット
①　ガンポラ橋（国道 A005 号線上マハベェリ川上）の架け替え、および拡幅
（9.01m → 11.4m）
②　ムワガマ橋（国道 B390 号線上カル川上）の架け替え、および拡幅
（6.75m → 11.4m）

（３）インプット
①　ガンポラ橋　橋長 99m、取付道路工延長 180m
②　ムワガマ橋　橋長 99m、取付道路工延長 180m

（４）総事業費
総事業費 16.10 億円（日本側負担 15.40 億円、スリ・ランカ国側負担 0.70 億円）

（５）スケジュール
日本政府の無償資金協力によって実施される場合の必要な工期は、31.5 ヶ月（実施設計期間 7.5 ヶ月、工事期間 24.0 ヶ月）が見込まれる。

（６）実施体制
道路開発公社(Road Development Authority; RDA) 、
運輸・高速道路省(Ministry of Transport and Highways)

５．成果の目標

（１） プロジェクトにて裨益を受ける対象の範囲及び規模：

２橋の架け替えにより、ガンポラ橋が位置するセントラル州（人口約 230 万人）及びムワガマ橋が位置するサバルガムワ州（人口約 170 万人）の合計約 400 万人が裨益効果を受ける。

（２） 事業の目的（プロジェクト目標）を示す成果指標：

協力対象橋梁の、10 トン以上車両通行に対する耐用年数の増加

	2000 年（実施前）	2004 年（実施後）
No.93 ガンポラ橋	0 年	100 年
No.239 ムワガマ橋	0 年	100 年

（３） その他の指標

協力対象橋梁地点における、ピーク時の１時間あたり交通量の増加

	2000 年（実施前）
No.93 ガンポラ橋	648 台 (12:00 – 13:00)
No.239 ムワガマ橋	964 台 (7:00 – 8:00)

６．外部要因リスク

上記プロジェクト目標が達成されるために、以下の条件が必要となる。

① 他ドナーによって実施中である、ガンポラ橋の架かる国道 A005 号線の道路改修計画が予定通り実施される。

② 他ドナーによって実施中である、ムワガマ橋のあるラトゥナプラ県への、都市間道路国道 A4 号線の改修状況、及び「ス」国によるラトゥナプラ都市開発計画全体が予定通り実施される。

③ 先方実施機関である RDA による橋梁の維持管理（特にムワガマ橋の 10 年毎の塗り替え塗装の実施）が適正に実施される。

７．今後の評価計画

（１）事業評価に用いる成果指標

対象橋梁の、10 トン以上車両通行に対する耐用年数（年）。

対象橋梁地点における、ピーク時の１時間あたり交通量（台）。

（２） 評価のタイミング

施設共用開始以降、事後評価予定。