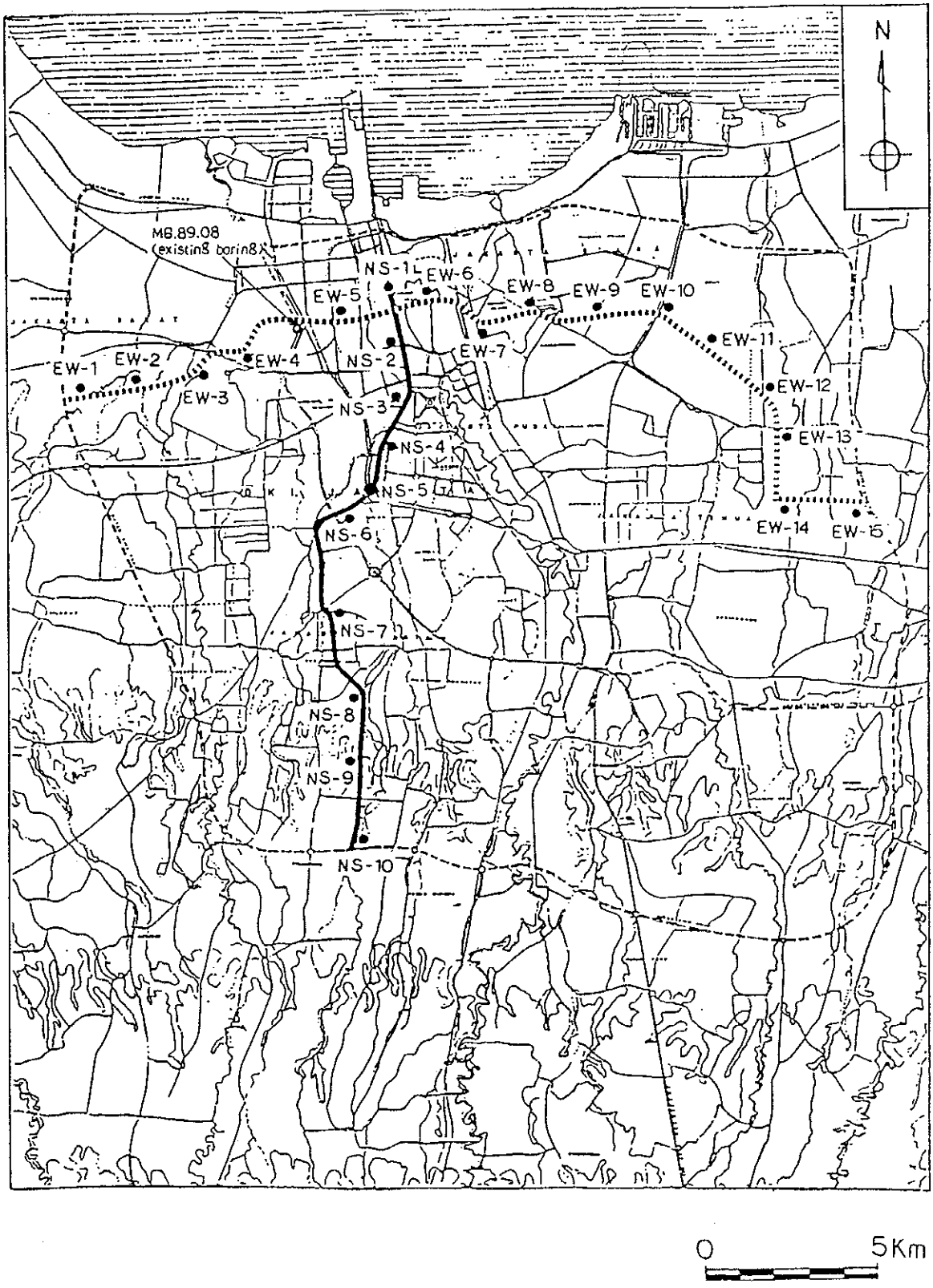
10A-1 SOIL INVESTIGATION



FEASIBILITY STUDY ON URBAN ARTERIAL ROAD SYSTEM DEVELOPMENT PROJECT IN JAKARTA METROPOLITAN AREA	Boring Location Map

PT. Wira Nusantarabumi

SOIL & MAT INVESTIGATIONS - TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-01

LOCATION	Jl. Hayam Wuruk	DATE COMMENCED	January 25th 1994
COORDINATES		DATE COMPLETED	January 27th 1994
GROUND ELEVATION	0.76	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	40.65	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
1	1.50		TOPSOIL		Soft , Sandy **Clay** with a little gravels , medium to high plasticity , CH , Clay = 80% , fine sand = 15% , gravels = 5%	Reddish brown to Grey		1.50	1				
2			COAST ALLUVIUM					S.1	2	2	2	4	6
3	3.50				Very loose-loose ; **Sand** , fine to medium grain , poorly graded , SP , with mollucs Sand = 90% , mollucs = 10%.	Blackish yeloow		1.95 3.00	3				
4								S.2	4	1	1	2	3
5								S.3	5	1	1	2	3
6	2.00	6.50			Loose ; Silty **Sand** (organic), fine sand , with mollucs , poorly graded , SP , fine Sand = 80% , Silt = 15% , mollucs = 5%.	Blackish grey		4.95 6.00	6				
7								S.4	7	1	1	2	3
8	1.60				Soft ; Organic **Clay** with a little Sand and mollucs , high plasticity , CH , Clay = 85% , Sand = 10% , mollucs = 5%.	Blackish grey	8.00 UD.1 8.50	6.45	8				
9								S.5	9	1	2	3	5
10								8.95 10.00	10				
11								S.6	11	3	3	3	6
12	6.40		YOUNG VULCANIC ROCK		Soft ; Organic **Clay** with a little Sand and mollucs , high plasticity , CH , Clay = 85% , Sand = 10% , mollucs = 5%.	Yellowish grey to Reddish grey	11.50 UD.2 12.00	10.45	12				
13								S.7	13	1	2	3	5
14								12.45 13.50	14				
15								S.8	15	1	2	3	5
16								13.95 15.00	16				
17	3.45				Very stiff to Hard ; Tuffaceous Sandy **Silt** , medium to low plasticity , ML , Silt = 80% , fine sand = 20%.	Yellowish grey to Yellowish brown		S.9	17	4	7	10	17
18								15.45 16.50	18				
19								S.10	19	6	8	12	20
20								16.95 18.00	20				
21	5.55		GENTENG FORMATION		Very dense ; **Sandstone** , fine to coarse grain , SW , weak to medium cemented.	Yellowish grey		S.11	21	8	17	24	41
22								18.45 19.50	22				
23								S.12	23	7	16	26	42
24								19.95 21.00	24				
25								S.13	25	60	-	-	>60
								21.15 22.50					
								S.14		29	55	-	>60
								22.75 24.0					
								S.15		11	15	18	33
								24.45					

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SOIL & MAT INVESTIGATIONS - TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-01

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26	3.00		GENTENG FORMATION		Very Stiff to Hard ; Tuffaceous Clayey **Silt**, medium plasticity, ML, Clay = 75%, Silt = 25%	Grey		25.50 S.16 25.95 27.00	26	8	12	14	26	
27									27					
28	3.45				Dense ; **Sandstone** , fine to medium grain , poorly graded , SP , medium to strongly cemented.	Yellowish grey		S.17 27.45 28.50	28	12	17	31	48	
29								S.18 28.95 30.0	29	16	22	25	47	
30								S.19 30.45 31.50	30	10	14	16	30	
31								S.20 31.95 33.0	31					
32								S.21 33.45 34.50	32	10	17	22	39	
33								S.22 34.95 36.0	33	10	14	16	30	
34								S.23 36.45 37.50	34					
35	10.25				Very Stiff to Hard ; Tuffaceous **Clay** , high plasticity , CH , the bottom with a little sand , Clay = 90 % , Sand = 10 %.	Yellowish grey		S.24 37.95 39.0	35	9	12	17	29	
36								S.25 39.45 40.50	36					
37								S.26 40.65	37	9	15	21	36	
38									38	12	16	25	41	
39									39					
40									40	18	24	30	54	
41					END OF BORE HOLE (- 40.65 m)				41	35	-	-	>60	
42									42					
43									43					
44									44					
45									45					
46									46					
47									47					
48									48					
49									49					
50									50					

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SOIL & MAT INVESTIGATIONS - TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-02

LOCATION	Jl. Hayam Wuruk	DATE COMMENCED	February 5th 1994
COORDINATES		DATE COMPLETED	February 7th 1994
GROUND ELEVATION	2.36	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	32.40	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)

STANDARD PENETRATION TEST (ASTM - D.1586)

DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)	N VALUE 15 Cm	30 Cm	45 Cm	N
1									1				
2	5.00	2.50	RESIDUAL SOIL		Soft to medium ; Sandy **Silt** with a little Clay , medium to high plasticity , MH , Silt = 60 % , Sand = 25 % , Clay = 15 %.	Brownish grey to Blackish grey	1.95 UD.1	S.1	2	1	2	4	6
3							2.50 UD.2	S.2	3	1	1	3	4
4							3.50	S.3	4	2	3	4	7
5							5.00 UD.3	S.4	5	1	2	3	5
6	6.95				Medium to stiff ; Silty **Clay** , high plasticity , CH , Clay = 65 % , Silt = 30 % , Sand = 5 %.	Reddish brown to Yellowish brown	5.45	S.5	6	2	3	4	7
7								S.6	7	1	1	2	3
8								S.7	8	3	6	9	15
9								S.8		4	5	7	12
10								S.9	9	2	2	4	6
11								S.10		5	6	8	14
12								S.11	10	3	5	8	13
13	3.05		ALLUVIUM		Stiff to hard ; Tuffaceous Silty **Clay** , medium to high plasticity , CH , Clay = 75 % , Silt = 20 % , Sand = 5 %.	Grey to Yellowish grey		S.12		4	5	8	13
14								S.13	11	3	4	6	10
15								S.14		3	5	9	14
16	4.00				Very dense ; **Gravels** with mixed cobble and Sand , well graded , GW , gravels = 60 % , cobble = 30 % , Sand = 10 %.	Blackish grey		S.15	12	2	2	3	5
17								S.16		1	1	3	4
18								S.17	13	5	8	11	19
19								S.18		3	3	8	11
20	4.20				Very dense ; gravelly coarse **Sand** , Angular to sub angular, Sand = 90 % , Gravel = 10 %.	Black		S.19	14	2	3	6	9
21								S.20		3	3	11	14
22								S.21	15	6	14	22	36
23								S.22		7	13	20	33
24								S.23	16	8	12	16	28
25								S.24		8	11	15	26
								S.25	17	4	8	16	24
								S.26		14	32	35	>60
								S.27	18	52/8			>60
								S.28		55/5			>60
								S.29	19	51/5			>60
								S.30		50/3			>60
								S.31	20	25/2			>60
								S.32		57/5			>60
								S.33	21	35/2			>60
								S.34		45	52/10		>60
								S.35	22	40	54		>60
								S.36		47	51		>60
								S.37	23	35	54		>60
									24				
									25				

NUMBER OF BLOWS 10 20 30 40 50

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-02

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26	4.80		ALLUVIUM		Very dense ; Silty **Sand** , fine grain , poorly graded , SP , angular to sub rounded grain shape , Sand = 70 % , Silt = 30 %	Black		S.38	26	22	31	22	53	
27								S.39	27	25	40	21	>60	
28								S.40	28	41	54		>60	
29	3.00				Hard ; Tuffaceous Silty **Clay** , medium plasticity , CL with a little mollucs , Clay = 70 %, Silt = 25% , mollucs = 5%	Grey		S.41	29	43	50		>60	
30								S.42	30	25	35	20	55	
31								S.43	31	47	52/10		>60	
32	1.40				Hard ; Organic **Clay** , high plasticity , CH , Clay = 100%	Black		S.44	32	12	17	18	35	
								S.45		17	22	34	56	
33					END OF BORE HOLE (- 28.60 m)				33					
34									34					
35									35					
36									36					
37									37					
38									38					
39									39					
40									40					
41									41					
42									42					
43									43					
44									44					
45									45					
46									46					
47									47					
48									48					
49									49					
50									50					

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SOIL & MAT INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-03

LOCATION	Jl. Abdul Muis	DATE COMMENCED	February 8th 1994
COORDINATES		DATE COMPLETED	February 10th 1994
GROUND ELEVATION	1.84	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	32.40	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10				
DEPTH (- m)	THICKNESS (m)	G.W.L. (- m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (- m)	STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.45	1.13	TOP SOIL		Stiff ; Sandy **Silt**, low plasticity, ML, Silt=80%, fine sand=20%	Brownish black		S.1	1	5	5	6	11	
2								S.2		5	5	6	11	
							2.00	S.3	2	2	2	3	5	
3	1.65		ALLUVIUM		Medium ; Silty **Clay** , high plasticity, CH , organic characteristic , Clay = 70% , Silt = 30 %.	Black	UD.1							
							2.50	S.4	3	2	3	5	8	
4								S.5		2	3	4	7	
								S.6	4	5	6	8	14	
5	3.35				Medium to stiff ; Tuffaceous Silty **Clay** , high plasticity , CH , Clay = 80 % , Silt = 20 %.	Yellowih grey to Reddish grey		S.7		2	3	4	7	
							5.00	S.8	5	2	3	4	7	
							UD.2							
6							5.50	S.9	6	2	2	4	6	
								S.10		3	3	4	7	
7								S.11	7	1	2	4	6	
								S.12		2	3	7	10	
8	4.05				Medium to very stiff ; Tuffaceous Clayey **Silt** , low plasticity , ML , Silt = 70 % , Clay = 30 %.	Yellowih grey to Blackish grey		S.13	8	3	7	8	15	
9								S.14		3	8	8	16	
								S.15	9	3	7	8	15	
10								S.16		11	20	28	48	
								S.17	10	11	23	27	50	
11								S.18		8	8	13	21	
								S.19	11	10	13	15	28	
12								S.20		9	11	12	23	
								S.21	12	15	52		>60	
13								S.22		24	53/10		>60	
								S.23	13	29	51		>60	
14								S.24		47	48	20	>60	
								S.25	14	15	56/10		>60	
15								S.26		22	52/5		>60	
								S.27	15	58			>60	
16	11.50		YOUNG VULCANIC ROCK		Medium to very dense , Tuffaceous Silty **Sand** , poorly graded , SP , fine to coarse grain , locally cemented , Sand = 70 % , Silt = 30 %.	Black to Yellowish grey		S.28		60			>60	
								S.29	16	55/10			>60	
17								S.30		53/10			>60	
									17					
18								S.31		51/5			>60	
									18					
19								S.32		20	52		>60	
									19					
20								S.33		15	39	20	59	
									20					
21								S.34		10	29	23/10	>60	
									21					
22								S.35		20	33	27/5	>60	
									22					
23								S.36		15	20	25	45	
									23					
24								S.37		7	15	12	27	
	5.00				Stiff to hard ; Organic Clayey **Silt** , medium to low plasticity , ML , Silt = 70% , Clay = 30%	Black			24					
25								S.38		8	9	12	21	
									25					

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-03

1	2	3	4	5	6	7	8	9	10
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT / SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)	STANDARD PENETRATION TEST (ASTM - D.1586)

DEPTH (-m)	S.P.T. No.	N VALUE 15 Cm	30 Cm	45 Cm	N
26	S.39	3	6	8	14
27	S.40	6	8	10	18
28	S.41	9	9	12	21
29	S.42	15	22	24	46
30	S.43	13	23	24	47
31	S.44	15	25	30	55
32	S.45	25	40	18	58
	S.46	27	41	21/10	>60

NUMBER OF BLOWS: 10 20 30 40 50

YOUNG VULCANIC ROCK

Very Stiff to hard ; Tuffaceous **Clay** , with a little organic , high plasticity , CH , Clay = 100 %.

Blackish grey to Greensih grey

5.40

(6)

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SOIL & MAT INVESTIGATIONS · TOPOGRAPHIC CURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-04

LOCATION	Tanah Abang	DATE COMMENCED	January 20th 1994
COORDINATES		DATE COMPLETED	January 22th 1994
GROUND ELEVATION	3.91	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	28.60	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
1	0.50		COAST ALLUVIUM		Loose , Gravelly **Sand** , well graded , SW , Sand = 80% , gravel = 20%	Black Brownish black		1.50	1				
2	1.00				Soil and organic matter			S.1	2	1	1	1	2
3							2.50	1.95	3				
4	4.50				Soft to stiff ; Tuffaceous **Clay** , high plasticity , CH , Clay = 100 %	Grey to Brownish grey	UD.1 3.00	S.2 3.45	4	2	2	3	5
5								4.50 S.3	5	4	5	6	11
6								4.95 6.00	6				
7		6.70						S.4 6.45	7	1	1	2	3
8	4.10				Soft to medium ; Organic **Clay** with a little Sand , high plasticity , CH , Clay = 95 % , Sand = 5 %.	Greyish black		7.50 S.5 7.95	8	1	2	3	5
9								9.00	9				
10								S.6 9.45 10.50	10	1	1	3	4
11					Stiff to very stiff ; Tuffaceous Sandy **Silt** , low plasticity , ML , Silt = 80 % , fine Sand = 20 %.	Blackish grey		S.7 10.95	11	2	3	5	8
12	4.90							12.00	12				
13								S.8 12.45 13.50	13	4	6	10	16
14								S.9 13.95	14	8	12	17	29
15								15.00	15				
16					Medium to dense ; fine **Sand** , poorly graded , SP , Sand = 100% , grain size rounded to sub rounded	Black		S.10 15.45 16.55	16	17	21	26	47
17	2.50							S.11 17.00	17	16	7	9	16
18								18.00	18				
19	2.00				Medium , Silty **Sand** , coarse grain , well graded , SW , Sand = 80% , Silt = 20%	Grey		S.12 18.45 19.50	19	12	14	15	29
20								S.13 19.95	20	15	12	27	39
21	2.50				Hard ; Tuffaceous Sandy **Clay** , high plasticity , CH , Clay = 90% , Sand = 10%	Yellowish grey		21.00	21				
22								S.14 21.45 22.50	22	13	15	20	35
23					Hard ; Tuffaceous Sandy **Silt** , medium to high plasticity , Silt = 70% , Sand = 30%	Yellow to Yellowish grey		S.15 22.95	23	10	18	20	38
24	3.00							24.0	24				
25			YOUNG VULCANIC ROCK					S.16 24.45	25	10	20	28	48

NUMBER OF BLOWS 10 20 30 40 50

CONTINUED

PT. Wira Nusantarabumi

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-04

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26								25.50	26					
								S.17		65			>60	
27	3.60				Very dense ; **Sandstone** , medium to strongly cemented	Blackish grey to black		25.65 27.00	27					
								S.18		60			>60	
28								27.15 28.50	28					
29								S.19	29	50/10			>60	
					END OF BORE HOLE (- 28.60 m)			28.6						
30									30					
31									31					
32									32					
33									33					
34									34					
35									35					
36									36					
37									37					
38									38					
39									39					
40									40					
41									41					
42									42					
43									43					
44									44					
45									45					
46									46					
47									47					
48									48					
49									49					
50									50					

PT. Wira Nusantarabumi

SOIL & MAT INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-05

LOCATION	Jl. Tenaga Listrik (Pintu Air)	DATE COMMENCED	January 22th 1994
COORDINATES		DATE COMPLETED	January 23th 1994
GROUND ELEVATION	5.18	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	S U P E R V I S O R	Yosuke Sasaki
TOTAL DEPTH (- m)	30.25	C A S S I N G	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.00		ALLUVIUM		Soft ; Clayey **Silt** , medium to high plasticity , CH , Silt = 70% , Clay = 30%.	Blackish brown		1.50	1					
2								S.1	2	3	4	3	7	
3	5.00				Soft - medium ; **Clay** with a little gravels , high plasticity , CH , Clay = 98 % , gravel = 2 %.	Reddish brown	3.00 UD.1 3.55	1.95 3.55 S.2 4.00 5.50	3					
4									4	2	2	4	6	
5		6.00							5					
6								S.3	6	1	1	2	3	
7	4.00				Medium ; Sandy **Silt** with a little Clay , low to medium plasticity , ML , Silt = 70 % , Sand = 20 % , Clay = 10 %.	Reddish brown to Blackish brown		5.95 7.50 S.4 7.95 9.00 S.5 9.45 10.50	7					
8									8	2	3	5	8	
9									9					
10									10	2	3	5	8	
11								S.6	11	3	4	8	12	
12	3.50				Medium to dense ; Silty **Sand** , poorly graded , SP , Sand = 80% , Silt = 20%.	Brown		10.95 12.00 S.7 12.45 13.50	12					
13									13	5	15	16	31	
14								S.8	14	6	13	22	35	
15								13.95 15.00 S.9 15.45 16.50	15					
16	4.50				Very stiff to hard ; Sandy **Silt** , low to medium plasticity , ML , Silt = 80 % , fine Sand = 20 %.	Brownish yellow			16	4	5	7	12	
17								S.10	17	4	7	9	16	
18								16.95 18.00	18					
19	3.00		YOUNG VULCANIC ROCK		Dense to very dense ; Tuffaceous Silty **Sand** , locally cemented , poorly graded , fine-medium grain , SP , Sand = 80% , Silt = 20%	Yellowish grey		S.11 18.45 19.50 S.12 19.95 21.00	19	10	10	13	23	
20									20	10	25	36	>60	
21									21					
22	3.60				Dense - Very dense ; **Sand** , fine-coarse grain , well graded , SW , locally cemented (Sandstone) , Sand = 100 %.	Black		S.13 21.45 22.55	22	14	21	30	51	
23								S.14 23.0 24.0	23	25	23	25	48	
24									24					
25					CONTENUED			S.15 24.45	25	10	18	30	48	

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SOIL & MAT INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project in Jakarta Metropolitan Area

MB No : NS . 94-05

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26	3.40		YOUNG VULCANIC		Hard ; Silty **Clay** (Organic) , medium to high plasticity , CH , Clay = 70% , Silt = 30%.	Blackish grey		25.50 S.16 25.95 27.00 S.17 27.45 28.50	26	10	16	20	36	
27									27					
28									28	8	13	23	36	
29	2.25				Hard ; **Claystone** , medium cemented.	Blackish grey		S.18 28.6 30.0	29	60	-	-	>60	
30									30					
								0.10		26	65		>60	
31					END OF BORE HOLE (- 30.25 m)			30.25	31					
32									32					
33									33					
34									34					
35									35					
36									36					
37									37					
38									38					
39									39					
40									40					
41									41					
42									42					
43									43					
44									44					
45									45					
46									46					
47									47					
48									48					
49									49					
50									50					

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SOIL & MAT INVESTIGATIONS - TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-06

LOCATION	Manggala Wanabkati Buliding	DATE COMMENCED	February 11th 1994
COORDINATES		DATE COMPLETED	February 12th 1994
GROUND ELEVATION	11.99	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	30.25	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10
DEPTH (- m)	THICKNESS (m)	G.W.L. (- m)	UNIT / SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (- m)	STANDARD PENETRATION TEST (ASTM - D.1586)

DEPTH (- m)	S.P.T. No.	N VALUE 15 Cm	30 Cm	45 Cm	N
1	S.1	10	20	25	45
	S.2	11	10	10	20
2	S.3	7	8	10	18
	S.4	4	5	6	11
3	UD.1				
	S.5	3	3	6	9
4	S.6	4	6	7	13
	S.7	2	2	3	5
5	UD.2				
	S.8	2	3	3	6
6	S.9	2	3	4	7
	S.10	3	4	8	12
7	S.11	3	4	6	10
	S.12	3	4	4	8
8	S.13	3	8	12	20
	S.14	3	6	10	16
9	S.15	7	12	15	27
	S.16	4	6	15	21
10	S.17	12	16	13	29
	S.18	11	13	14	27
11	S.19	13	15	17	32
	S.20	15	40	20	60
12	S.21	20	56/10		>60
	S.22	25	56/12		>60
13	S.23	27	52/10		>60
	S.24	35	50/10		>60
14	S.25	37	52/10		>60
	S.26	55			>60
15	S.27	58			>60
	S.28	46	30/2		>60
16	S.29	44	51		>60
	S.30	47	52/12		>60
17	S.31	60			>60
18	S.32	55/10			>60
19	S.33	53/15			>60
20	S.34	45	40/3		>60
21	S.35	18	35	18/5	>60
22	S.36	17	19	35	>60
23	S.37	21	42	15/3	>60
24	S.38	40	52		>60
25					

Depth	Thickness	Unit	Visual Description & Classification	Color	Thin-Walled Tube
1 – 6	6.00	YOUNG VULCANIC ROCK	Medium to Hard ; **Clay** , medium to high plasticity , CH , Clay = 100 %.	Reddish brown	2.50 UD.1 ; 3.00 ; 4.50 UD.2 ; 5.00
6 – 16	9.17	YOUNG VULCANIC ROCK	Medium to Hard ; Tuffaceous Sandy **Silt** , low plasticity , ML , Silt = 60 % , fine Sand = 40 %	Brownish yellow	
16 – 17	1.83	YOUNG VULCANIC ROCK	Very dense ; **Sand** , fine to coarse grain , well graded , SW , Sand = 100%	Yeelowish grey	
18 – 20	3.00	GENTENG FORMATION	Very dense , Tuffaceous Silty **Sandstone** , Sand = 75 % , Silt = 25 %.	Yellowih grey to Blackish grey	
20 – 21	1.35	GENTENG FORMATION	Very dense ; **Sand** , medium grain , poorly graded , SP , angular to sub angular grain shape , Sand = 100 %.	Black	
22 – 25	7.90	GENTENG FORMATION	Hard ; Sandy **Silt** , low plasticity , ML , Silt = 60 % , fine Sand = 40 %.	Brownish yellow	

Continued

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-06

1	2	3	4	5	6	7	8	9	10
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)

STANDARD PENETRATION TEST (ASTM - D.1586)

S.P.T. No.	N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
S.39	25	52/10		>60	
S.40	20	50/10		>60	
S.41	22	53/13		>60	
S.42	19	51/15		>60	
S.43	17	31	22/5	>60	
S.44	21	51/10		>60	

DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.
26			GENTENG FORMATION		Hard ; Sandy Silt , low plasticity , ML , Silt = 60 % , fine Sand = 40 %.	Brownish yellow		S.39
27								S.40
28								S.41
29					Very dense ; Sand , well graded , SW , rounded to angular grain shape , Sand = 100 %.			S.42
30	1.00					Black		S.43
								S.44
31					END OF BORE HOLE (- 30.25 m)			
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project in Jakarta Metropolitan Area

MB No : NS . 94-07

LOCATION	Jl. Pattimura	DATE COMMENCED	February 13th 1994
COORDINATES		DATE COMPLETED	February 14th 1994
GROUND ELEVATION	17.05	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	24.10	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10				
DEPTH (- m)	THICKNESS (m)	G.W.L. (- m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (- m)	STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	0.50		ALLUVIUM		Very soft ; Organic Sandy **Clay**	Black		S.1	1	1	1	1	2	
1					, medium-high plasticity , Clay = 80% , Sand = 20%	Reddish brown		S.2		10	7	8	15	
2		1.90						S.3	2	5	8	14	22	
2	2.95				Soft to very Stiff ; **Clay** , high plasticity , CH , Clay = 100 %	to Yellowish grey	2.50 UD.1 3.00	S.4		4	9	10	19	
3									3					
4			YOUNG VULCANIC ROCK					S.5		7	11	13	24	
4								S.6	4	4	10	12	22	
5								S.7		6	8	9	17	
5								S.8		5	6	10	16	
6	5.85				Medium to Hard ; Tuffaceous Sandy **Silt** , low plasticity , ML , Silt = 65 % , Sand = 35 %.	Yellowish grey		S.9		7	15	20	35	
6								S.10	6	6	13	18	31	
7								S.11		4	4	6	10	
7								S.12		8	10	17	27	
8								S.13		6	9	20	29	
8								S.14		10	13	16	29	
9								S.15		5	6	8	14	
9								S.16		3	3	2	5	
10			GENTENG FORMATION					S.17		3	15	50	>60	
10	2.02				Very dense ; **Sandstone** , poorly graded , medium grain , weakly to medium cemented , Sand = 100%	Black		S.18		11	25	27	>60	
11								S.19		65			>60	
11														
12	1.13				Hard ; Sandy **Siltstone** , medium plasticity , ML , weakly to medium cemented , Silt = 90% , fine Sand = 10%	Blackish brown		S.20		18	40	15/12	>60	
12														
13	0.85					Grey		S.21		20	31	35	>60	
13														
14					Hard ; Tuffaceous Silty **Clay** medium to high plasticity, CH, Clay = 70% , Silt = 30%	Black		S.22		20	55		>60	
14														
15	2.80							S.23		53			>50	
15														
16					Very dense ; Silty **Sandstone** , medium to strongly cemented , Sand = 65% , Silt = 35%			S.24		51/10			>50	
16														
17								S.25		55/10			>50	
17														
18								S.26		56			>50	
18														
19								S.27		52/13			>50	
19	5.90				Hard ; Sandy **Siltstone** , low plasticity , ML , Silt = 70 % , Sand = 30 %.	Blackish brown to Blackish grey		S.28		53/10			>50	
20														
20								S.29		51/8			>50	
21														
21								S.30		28	51/10		>60	
22														
22								S.31		30	53/10		>60	
23	2.10				Very dense , **Sandstone**, poorly graded, fine to medium grain , medium to strongly cemented, Sand = 100%	Black								
23								S.32		35	53/13		>60	
24														
24								S.33		54/10			>50	
25					END OF BORE HOLE (-24.10 m)				25					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project in Jakarta Metropolitan Area

MB No : NS . 94-08

LOCATION	Jl. Prapanca	DATE COMMENCED	February 11th 1994
COORDINATES		DATE COMPLETED	February 11th 1994
GROUND ELEVATION	18.16	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	16.07	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
1	4.00	3.25	ALLUVIUM		Soft to Stiff ; **Clay** , high plasticity , CH , Clay = 100 % (Embankment)	Reddish brown		S.1	1	7	8	7	15
2								S.2	2	2	2	3	5
3								S.3	3	4	4	4	8
4								S.4	4	1	1	2	3
5	2.00				Soft ; Sandy **Clay** with a little gravel , high plasticity , CH , Clay = 70% , Sand = 25% , gravels = 5%	Reddish brown	5.50 UD.1	S.5	5	1/30	2/20		2
6			YOUNG VULCANIC ROCK				6.10	S.6	6	2	2	4	6
7					Medium to Hard ; Tuffaceous Sandy **Silt** , low plasticity , ML , locally cemented , Silt = 70% , fine Sand = 30%.	Yellowish grey to BLackish grey		S.7	7	2	3	4	7
8	6.00							S.8	8	12	22	34	56
9								S.9	9	7	14	18	32
10								S.10	10	11	23	27	50
11								S.11	11	57	21/2		>60
12					Very dense ; **Sandstone** , medium to well graded , SW , locally medium to strongly cemented (at depth 12.00-14.00 m) Sand = 100%.			S.12	12	20	15	17	32
13	2.00		GENTENG FORMATION			Greyish black		S.13	13	29	30	20	50
14								S.14	14	50/10			>60
15	2.07				Very dense ; **Sand** , fine to coarse grain , well graded , SW , angular to sub rounded , grain shape , Sand = 100%.	Black		S.15	15	50/13			>60
16								S.16	16	50/7			>60
17					END OF BORE HOLE (- 16.07 m)				17				
18									18				
19									19				
20									20				
21									21				
22									22				
23									23				
24									24				
25									25				

NUMBER OF BLOWS: 10 20 30 40 50

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-09

LOCATION	Jl. Cipete	DATE COMMENCED	February 15th 1994
COORDINATES		DATE COMPLETED	February 15th 1994
GROUND ELEVATION	27.57	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	16.16	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT / SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
1			TOP SOIL				S.1	1	1	1	2	3
2							S.2	2	3	3	6	9
3		3.00		Soft to stiff ; Tuffaceous Silty **Clay** , high plasticity , CH , Clay = 80 % , Silt = 20 % , at the top is consist pebble and sand		2.50 UD.1 3.00	S.3	3	3	4	6	10
4	7.50				Reddish brown		S.4	4	3	4	4	8
5							S.5	5	2	2	2	4
6							S.6	6	1	2	3	5
7							S.7	7	1	2	3	5
8			YOUNG VULCANIC ROCK				S.8	8	1	1	3	4
9								9				
10	5.50			Soft to Stiff ; Tuffaceous Clayey **Silt** , low to medium plasticity , ML , with a little Sand , Silt = 70 % , Clay = 20 % , Sand = 10 %.	Yellowish brown		S.9	10	3	4	6	10
11							S.10	11	1	5	5	10
12							S.11		3	5	5	10
13							S.12	12	2	4	8	12
14				Medium to very dense , silty **Sand** , poorly graded, SP , locally cemented , Sand = 60 % , Silt = 40 %.	Yellowish brown		S.13	13	10	20	36	56
15	3.00						S.14	14	12	15	18	33
16							S.15	15	6	9	11	20
17				END OF BORE HOLE (- 16.16 m)			S.16	16	40	10/1		>00
18								17				
19								18				
20								19				
21								20				
22								21				
23								22				
24								23				
25								24				
								25				

NUMBER OF BLOWS 10 20 30 40 50

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : NS . 94-10

LOCATION	Jl. Arteri Cilandak	DATE COMMENCED	January 18th 1994
COORDINATES		DATE COMPLETED	January 19th 1994
GROUND ELEVATION		SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	19.00	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT / SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.50	1.00		Embankment ; Sandy **Clay** , high plasticity , CH , Soft , Clay = 95% , Sand = 5%	Brownish red		1.50	1					
2	0.80				Grey		**S.1**	2	1	2	3	5	
3	0.70			Medium ; Tuffaceous Sandy **Clay** , high plasticity , CH.	Blackish grey	2.50 UD.1 3.00	1.95 2.80	3					
4	0.60			Dense ; **Sandstone** , strongly cemented.			**S.2** 3.25 4.50	4	16	16	14	30	
5	0.90			Dense ; **Sand** , well graded , sub rounded - rounded grain shape , SW.	Greyish black		**S.3** 4.85 6.00	5	19	40	23	>60	
6					Blackish brown			6					
7				Hard ; **Siltstone** , medium to strongly cemented.			**S.4** 6.40 7.85	7	16	25	31	>60	
8							**S.5** 8.00 9.00	8	60	-	-	>60	
9								9					
10							**S.6** 9.30 10.50	10	30	60	-	>60	
11							**S.7** 10.95 12.00	11	20	25	8	33	
12								12					
13	14.50		GENTENG FORMATION	Very dense ; **Sandstone** , with intercalated Siltstone , medium to strongly cemented , fine - medium grain size.	Blackish brown to black		**S.8** 12.35 13.50	13	16	40	25	>60	
14							**S.9** 13.95 15.00	14	15	30	32	>60	
15								15					
16							**S.10** 15.40 16.50	16	22	34	30	>60	
17							**S.11** 16.80	17	38	62	-	>60	
18							**S.12** 17.80	18	28	61	-	>60	
19								19					
20				END OF BORE HOLE (- 19.00 m)				20					
21								21					
22								22					
23								23					
24								24					
25								25					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Development Project in Jakarta Metropolitan Area

MB No : EW . 94-01

LOCATION	Rawa Buaya	DATE COMMENCED	February 11th 1994
COORDINATES		DATE COMPLETED	February 14th 1994
GROUND ELEVATION	4.37	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	40.45	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
	0.50				Soft, Sandy **Clay** ; High Plasticity , CH ; Clay = 80 % , Sand = 20 %	Brown		S.01	1	2	3	5	8	
1								S.02		4	6	8	14	
2						Redish Grey		S.03	2	3	7	8	15	
3	4.50				Stiff, Sandy Tuffaceous **Clay** ; High Plasticity , CH ; Clay = 100 % .	To Yellowish Grey	3.00 UD.1 3.60	S.04		5	7	10	17	
4								S.05	3	2	5	6	11	
5								S.06	4	3	3	5	8	
6								S.07		2	3	4	7	
7		7.30						S.08	5	2	4	5	9	
8								S.09		4	10	25	36	
9	8.0				Hard, Sandy **Silt (Silt Stone)** ; Locally Cemented ; Medium Plasticity , ML ; Clay = 70 % . Silt = 30 % .	Yellowish Grey		S.10	6	12	32	35/10	>60	
10								S.11		25	56		>60	
11								S.12	7	22	60		>60	
12								S.13		39	53		>60	
13								S.14	8	31	40	15/3	>60	
14								S.15		10	30	30/10	>60	
15								S.16	9	25	40	18/5	>60	
16								S.17		25	60		>60	
17								S.18	10	24	41	22/10	>60	
18								S.19		15	22	40/10	>60	
19								S.20	11	12	22	30	52	
20	13.0				Very Stiff to Hard ; Tuffaceous **Clay** ; High Plasticity , CH ; Clay = 100 % .	Yellowish Grey		S.21		34	31	35	>60	
21								S.22	12	20	29	35	>60	
22								S.23		9	18	28	46	
23								S.24	13	8	12	12	24	
24								S.25		6	10	13	23	
25								S.26	14	7	8	12	20	
								S.27		7	8	12	20	
								S.28	15	5	7	11	18	
								S.29		10	18	20	38	
								S.30	16	12	30	35	>60	
								S.31		20	35	30	>60	
								S.32	17	18	30	37	>60	
								S.33		6	10	13	23	
								S.34	18	9	11	13	24	
								S.35		8	12	14	26	
									19					
								S.36		7	11	14	25	
									20					
								S.37		6	10	14	26	
									21					
								S.38		8	12	15	27	
									22					
								S.39		8	12	17	29	
									23					
								S.40		6	13	14	27	
									24					
								S.41		7	12	18	30	
									25					

YOUNG VULCANIC ROCK

Continued

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SOIL & MAT. INVESTIGATIONS - TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-01

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26			YOUNG VULCANIC ROCK		Very Stiff to Hard ; Tuffaceous **Clay** ; High Plasticity , CH ; Clay = 100 % .			S.42	26	10	13	20	33	
27	2.00					Yellowish Grey		S.43	27	13	16	20	36	
28					Very Dense , **Sand** Poorly Graded , SP ; Sand = 100 %			S.44	28	18	25	36	>60	
29								S.45	29	25	62		>60	
30	4.00				Very Hard , Tuffaceous Sady **Silt** , Medium Plasticity , ML ; Silt = 70 % , Sand = 30 % .	Yellowish Grey to Blackish Yellow		S.46	30	11	18	22	40	
31								S.47	31	18	25	38	>60	
32								S.48	32	15	18	40	58	
33								S.49	33	9	14	21	35	
34								S.50	34	11	17	22	39	
35								S.51	35	13	16	23	39	
36	8.45				Very Hard , Tuffaceous **Clay** , High Plasticity , CH ; Clay = 100 % .	Yellowish Grey		S.52	36	10	15	19	34	
37								S.53	37	11	14	19	33	
38								S.54	38	7	12	18	30	
39								S.55	39	7	13	20	33	
40								S.56	40	8	13	22	35	
								S.57		11	19	22	41	
41					**END OF BORE HOLE (40.45 m)**				41					
42									42					
43									43					
44									44					
45									45					
46									46					
47									47					
48									48					
49									49					
50									50					

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SOIL & MAT. INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Development Project In Jakarta Metropolitan Area

MB No : EW . 94-02

LOCATION	Cengkareng (Kembangan Village)	DATE COMMENCED	February 07th 1994
COORDINATES		DATE COMPLETED	February 10th 1994
GROUND ELEVATION	3.6	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	40.45	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1		0.80	TOP SOIL					S.01	1	1	1	2	3	
2								S.02		1	1	1	2	
								S.03	2	0	1		1	
3	5.50		ALLUVIUM		Very to Medium Soft , **Clay** with a little Gravel , High Plasticity , CH ; Clay 97 % , Gravel = 3 %	Brownish Grey		S.04		0/50			0	
								S.05	3	0/50			0	
							3.45	S.06		0	1		1	
4							UD.1		4					
							4.05	S.07		2	3	3	6	
5								S.08	5	1	2	2	4	
								S.09		1	1	1	2	
6								S.10	6	1	2	2	4	
								S.11		1	2	3	5	
7	2.50				Loose, Silty **Sand** with a little Gravel , poorly graded , SP , Sand = 80 % , Silt = 15 % , Gravel = 5 %.	Black		S.12	7	2	3	4	7	
								S.13		4	8	12	20	
8								S.14	8	4	7	12	19	
								S.15		4	4	6	10	
9								S.16	9	4	6	11	17	
							9.45	S.17		5	7	9	16	
10							UD.2		10					
							9.90	S.18		5	8	12	20	
11	6.00		YOUNG VULCANIC ROCK		Stiff to hard ; Tuffaceous sandy **Silt** , low plasticity , ML , locally cemented , Silt = 75 % , find Sand = 20 % , Garvel = 5 %.	Blackish Grey		S.19	11	12	15	22	37	
								S.20		12	16	24	40	
12								S.21	12	8	19	25	44	
								S.22		8	12	36	48	
13								S.23	13	10	11	13	24	
								S.24		8	10	12	22	
14								S.25	14	10	16	14	30	
								S.26		4	8	12	20	
15	3.00				Very stiff to hard , Tuffaceous , sandy **Clay** , medium to high plasticity , CH , Clay = 90 % , fine Sand = 10 %.	Light Grey		S.27	15	6	7	9	16	
								S.28		4	4	10	14	
16								S.29	16	5	7	10	17	
								S.30		7	15	18	33	
17								S.31	17	6	9	19	28	
								S.32		20	30	36	>60	
18								S.33	18	42	65		>60	
19	4.00		GENTENG FORMATION		Very dense , **Sand stone** , medium to strongly cemented , angular to sub roended grain shape.	Blackish Grey		S.34	19	60			>60	
20								S.35	20	25	25/10		>60	
21								S.36	21	32	65		>60	
22								S.37	22	22	28	36	>60	
	3.00				Very dense , Gravelly **Sand** , poorly graded , SP , Sand = 80 % , gravel = 20 %.	Grey								
23								S.38	23	20	60		>60	
24								S.39	24	30	62		>60	
25									25					

Continue

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-02

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26								S.40	26	10	12	16	28	
27								S.41	27	9	12	17	29	
28								S.42	28	7	9	13	22	
29								S.43	29	10	13	20	33	
30								S.44	30	14	19	24	43	
31	16.50		GENTENG FORMATION		Very stiff to hard ; Clay to medium high plasticity , CH , Clay = 100 %.	Greyish Brown		S.45	31	13	20	25	45	
32								S.46	32	11	17	24	41	
33								S.47	33	8	13	18	31	
34								S.48	34	10	18	25	43	
35								S.49	35	10	16	23	39	
36								S.50	36	10	13	17	30	
37								S.51	37	9	10	13	23	
38								S.52	38	9	11	13	23	
39								S.53	39	8	10	16	26	
40								S.54	40	10	16	19	35	
								S.55		11	20	27	47	
41					END OF BORE HOLE (40.45)				41					
42									42					
43									43					
44									44					
45									45					
46									46					
47									47					
48									48					
49									49					
50									50					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-03

LOCATION	Green Garden	DATE COMMENCED	February 04 th 1994
COORDINATES		DATE COMPLETED	February 06th 1994
GROUND ELEVATION	2.05	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	35.45	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1								S.01	1	3	3	4	7	
2		2.00						S.02		1	1	1	2	
								S.03	2	1	1	1	2	
3	5.50		RESIDUAL SOIL		Very soft to medium ; Gravelly **Clay** , high plasticity , CH , Clay = 95 % , gravels = 5 % , at the top with dirt and gravels thickness at 0.30 metre.	Brownish grey to Yellowish grey	2.35	S.04		2	2	3	5	
							UD.1		3					
4							2.95	S.05		2	3	4	7	
								S.06	4	1	1	2	3	
5								S.07		1	1		1	
								S.08	5	1	1		1	
6								S.09		1	1		1	
								S.10	6	1	1		1	
7								S.11		0/50			0	
								S.12	7	0/50			0	
8								S.13		0/50			0	
					Very soft , Organic **Clay** , high plasticity , CH , Clay = 100 %.	Blackish grey to Black	8.00	S.14	8	0/50			0	
9	6.80						UD.2							
							8.60	S.15	9	0/30	1		1	
10								S.16		0/50			0	
								S.17	10	0/50			0	
11								S.18	11	0/30	1		1	
12								S.19	12	1	1	1	2	
13								S.20	13	1	2	3	5	
14	3.20				Soft to medium , Peat layers , fine.	Black		S.21	14	1	1	2	3	
15								S.22	15	1	2	2	4	
16								S.23	16	1	1	2	3	
17								S.24	17	1	1	1	2	
18								S.25	18	1	1	1	2	
19	7.00				Soft to medium ; Organic **Clay** , medium to high plasticity, CH , Clay = 100 %.	Blackish grey to Grey		S.26	19	1	1	1	2	
20								S.27	20	1	1	2	3	
21								S.28	21	1	2	2	4	
22								S.29	22	1	2	3	5	
23								S.30	23	1	3	3	6	
24								S.31	24	4	4	5	9	
25								S.32	25	4	5	8	13	

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-03

1	2	3	4	5	6	7	8	9	10				
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)	STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
26	7.00		YOUNG VULCANIC ROCK		Stiff to hard ; Tuffaceous sandy **Clay** , high plasticity , CH , Clay = 80 % , Sand = 20 % , the depth 28.00 - 28.55 is hard	Yellowish grey to Brownish grey		S.33	26	4	6	10	16
27								S.34	27	10	14	18	32
28								S.35	28	12	18	27	45
29								S.36	29	9	13	16	29
30								S.37	30	9	12	15	27
31	5.45				Hard , Tuffaceous **Clay** , high plasticity , CH , Clay = 100 %.	Yellowish grey		S.38	31	9	13	17	30
32								S.39	32	10	15	18	33
33								S.40	33	10	15	26	41
34								S.41	34	10	17	24	41
35								S.42	35	11	18	25	43
								S.43		10	19	21	40
36					**END OF BORE HOLE (35.45 m)**				36				
37									37				
38									38				
39									39				
40									40				
41									41				
42									42				
43									43				
44									44				
45									45				
46									46				
47									47				
48									48				
49									49				
50									50				

NUMBER OF BLOWS 10 20 30 40 50

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project in Jakarta Metropolitan Area

MB No : EW . 94-04

LOCATION	Prima Indah	DATE COMMENCED	February 01th 1994
COORDINATES		DATE COMPLETED	February 03th 1994
GROUND ELEVATION	2.45	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	35.45	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10				
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)	STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.00		RESIDUAL SOIL		Soft ; **Clay** with alitlle Sand ; High Plasticity , CH ; Clay = 95 % , Sand = 5 %.	Redish Brown		1.50	1					
2	2.10	3.15			Medium stiff to stiff ; **Clay** ; High Plasticity , CH ; Clay = 100 %.	Brownish Grey	2.50 UD.1 3.10	S.01 1.95	2	3	4	5	9	
3							3.10	S.02 3.55	3	2	2	3	5	
4								4.50	4					
5								S.03 4.95	5	2	2	3	5	
6							6.00		6					
7	7.90				Medium dense to dense ; Tuffaceous Clayey **Silt** ; Medium Plasticity , MH ; Silt = 70 % Clay = 30 %.	Blackish & Yellowish Grey	UD.2 6.60	S.04 7.05	7	1	1	2	3	
8							6.60	8.00	8					
9								S.05 8.45	9	9	12	12	24	
10								9.50	10					
11								S.06 9.95	11	12	14	17	31	
12	1.80				Very dense ; **Sand** ; Poorly Graded , SP ; Sand = 100 %	Black		11.00 S.07 11.36	12	25	35	25/6	>60	
13								S.08 12.45	13	21	26	38	>60	
14								S.09 13.30	14	25	60		>60	
15								S.10 14.45	15	12	36	29	>60	
16								S.11 15.45	16	18	25	25	50	
17	8.15		CAOST ALLUVIUM		Very dense ; Tuffaceous Sandy Silt ; Low Plasticity , ML ; Silt = 80 % , Sand = 20 %	Yellowish Grey		S.12 16.45	17	12	18	25	43	
18								S.13 17.30	18	35	60		>60	
19								S.14 18.45	19	10	23	30	53	
20								S.15 19.45	20	12	14	14	28	
21								S.16 20.45	21	7	15	15	30	
22								S.17 21.45	22	6	8	11	19	
23	3.50				Very Stiff ; Silty **Clay** with a litlle Organic ; High Plasticity , CH ; Clay = 70 % , Silt = 30 %	Greyish Black		S.18 22.45	23	6	8	10	18	
24								S.19 23.45	24	8	10	13	23	
25					Dense			S.20 24.45	25	11	15	119	34	

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-04

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26	1.85				Dense ; **Fine Sand** ; Poorly Graded , SP ; Sand = 100 %	Grey		S.21 23.45	26	10	15	19	34	
27			YOUNG VULCANIC ROCK					S.22 26.45	27	10	16	20	36	
28								S.23 27.45	28	17	21	30	51	
29								S.24 28.45	29	10	18	22	40	
30								S.25 29.45	30	7	10	14	24	
31	9.15				Hard to Very Hard ; Tuffaceous **Clay** ; High Plasticity , CH ; Clay = 100 %	Yellowish Grey		S.26 30.45	31	8	11	13	24	
32								S.27 31.45	32	6	10	13	23	
33								S.28 32.45	33	7	9	13	22	
34								S.29 33.45	34	7	10	14	24	
35								S.30 34.45	35	8	10	16	26	
								S.31		10	15	19	34	
36					END OF BORE HOLE (-35.45 m)			35.45	36					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project in Jakarta Metropolitan Area

MB No : EW . 94-05

LOCATION	Jembatan Besi	DATE COMMENCED	January 28th 1994
COORDINATES		DATE COMPLETED	January 30th 1994
GROUND ELEVATION	2.44	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	YBM - YSO.1HE	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	50.45	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
1	0.50		COAST ALLUVIUM		Loose , **Sand** , gravels and pebble , poorly graded , SP , Sand = 70 % , gravels = 20 % , pebble = 10 %.	Brownish black			1				
2		2.50					2.50	S.01	2	1	2	3	5
3	5.50						UD.1 3.10		3				
4					Soft to medium ; Organic **Clay** with a little mollucs , high plasticility, CH , locally intercalated by fine Sand , Clay = 90 % , Sand = 10 %.	Greyish black		S.02	4	1	1	1	2
5								S.03	5	1	1	2	3
6							6.00		6				
7	3.95				Stiff , Sandy **Silt** , low plasticity , ML , Silt = 70 % , fine Samnd = 30 %.	Brownish black	UD.2 6.60	S.04	7	3	4	6	10
8									8				
9								S.05	9	2	5	6	11
10								S.06	10	3	7	7	14
11	2.05				Very stiff ; Tuffaceous **Clay** , high plasticity , CH , Clay = 100 %.	Yellowish grey		S.07	11	7	9	10	19
12									12				
13	3.00				Very stiff to hard ; clayey **Silt** with a little sand , locally cemented , Silt = 60 % , clay = 35 % , sand = 5 %.	Yellowish grey		S.08	13	7	8	11	19
14									14				
15								S.09	15	12	19	26	45
16			YOUNG VULCANIC ROCK		Dense to very dense ; **Sand stone** intercalated with siltstone , weakly medium cemented , medium to fine grain size.	Yellowish grey			16				
17								S.10	17	25	30	30	60
18	5.95							S.11	18	19	32	32	>60
19									19				
20								S.12	20	23	35	37	>60
21								S.13	21	14	17	25	42
22					Very stiff to hard ; Silty organic **Clay** , high plasticity , CH , locally cemented , Clay = 70 % , Silt = 30 %.	Blackish grey			22				
23	4.05							S.14	23	9	14	22	36
24								S.15	24	8	12	18	30
25									25				

NUMBER OF BLOWS 10 20 30 40 50

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EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-05

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
26			YOUNG VULCANIC ROCK					S.016	26	5	8	12	30	
27	5.00				Very stiff , Organic **Clay** , high plasticity , CH , Clay = 100 %.	Black			27					
28								S.17	28	7	10	12	22	
29								S.18	29	6	9	11	20	
30									30					
31								S.19	31	9	10	11	21	
32								S.20	32	7	10	12	22	
33	7.00				Very stiff to hard , Sandy organic **Clay** , high plasticity , CH , Clay = 85 % , Sand = 15 %	Grey to Blackish grey			33					
34								S.21	34	9	14	18	32	
35								S.22	35	8	12	18	30	
36									36					
37								S.23	37	11	16	21	37	
38	3.15				Hard ; Tuffaceous Silty **Clay** , high plasticity , CH , locally compacted , Clay = 70% , Silt = 30 %.	Grey to Yellowish grey		S.24	38	11	19	22	41	
39									39					
40								S.25	40	18	26	35	>60	
41	0.75				Hard, **Claystone** , medium to strongly cemented.	Blackish grey			41					
42								S.26	42	14	23	27	50	
43									43					
44								S.27	44	14	21	29	50	
45									45					
46	9.55				Hard ; Tuffaceous Silty **Clay** , medium plasticity , CL , locally cemented , Clay = 65 % , Silt = 35 %.	Yellowish grey		S.28	46	17	22	30	52	
47								S.29	47	17	23	29	52	
48									48					
49								S.30	49	20	30	32	>60	
50									50					
51					END OF BORE HOLE (50.45)			S.31	51	18	24	30	54	
52									52					

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SOIL & MAT INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Aterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-06

LOCATION	Jl. Mangga Besar	DATE COMMENCED	January 21th 1994
COORDINATES		DATE COMPLETED	January 22th 1994
GROUND ELEVATION	0.52	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	KOKEN - OE.8L	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	22.70	CASSING	Ø 89 mm

1	2	3		4	5	6	7	8	9	10				
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	SPT. No. & Depth	DEPTH (-m)	STANDARD PENETRATION TEST (ASTM - D.1586)				
										N VALUE				NUMBER OF BLOWS
										15 Cm	30 Cm	45 Cm	N	10 20 30 40 50
1	0.50		CAOST ALLUVIUM		Embankment (Made Ground)	Brown			1					
	1.0				Soft ; Sandy **Silt** ; Medium plasticity , ML ; Silt = 75 % , Sand = 25 %	Dark Brown		1.55						
2								S.1	2	2	3	4	7	
3	2.5	3.0			Soft to mediu stiff ; Tuffaceous **Clay** with a little Sand ; High plasticity , CH ; Clay = 95 % , Sand = 5 %	Grey to Brownish Grey	2.50 UD.1 3.00	2.00 3.00	3					
4								S.2	4	1	2	2	4	
5	1.0					Blackish Brown		3.45 4.55	5					
								S.3		2	3	4	7	
6					Loose ; Silty **Sand** ; Poorly graded , SP ; Sand = 60 % , Silt = 40 %			5.00 6.00	6					
7	3.5					Grey		S.4		1	1	1	2	
								6.45 7.55	7					
8					Very soft to soft ; Sandy **Clay** with a little Gravel ; High plasticity , CH ; Clay = 70 % , Sand = 20 % , Gravel = 10 %			S.5	8	1	1	1	2	
								8.00 9.00						
9								S.6	9	3	5	7	12	
10								9.45 10.50	10					
11			YOUNG VULCANIC ROCK					S.7	11	4	5	7	12	
12	8.2				Medium to very stiff ; Tuffaceous **Clay** with a little Sand and Shell Fragment ; High plasticity , CH ; Clay = 90 % , Sand & Shell Fragment = 10 %	Grey to Brownish Grey		10.95 12.00	12					
								S.8		1	3	3	6	
13								12.45 13.50	13					
14								S.9	14	3	5	7	12	
15								13.95 15.00	15					
								S.10		6	9	12	21	
16								15.45 16.50	16					
17								S.11	17	8	17	47	>60	
18	1.10		GENTENG FORMATION		Very dense ; **Sand** ; Poorly graded , SP ;	Black		16.95 18.00	18					
19	1.3				Very dense ; **Sand Stone** ; Medium to strongly cemented	Brownish Black		S.12 18.45 19.50	19	2	3	4	7	
20								S.13	20	14	31	25/5	>60	
21	3.6				Very dense ; **Coarse Sand** ; Poorly graded , SP ;	Blackish Grey		19.85 21.00	21					
								S.14		60/10			>60	
22								21.10	22					
								S.15		31	55/5		>60	
23									23					
24					END OF BORE HOLE (- 22.70 m)				24					
25									25					

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SOIL & MAT. INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-07

LOCATION	Jl. Rajawali	DATE COMMENCED	January 23th 1994
COORDINATES		DATE COMPLETED	January 23th 1994
GROUND ELEVATION	0.38	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	14.00	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	0.50		ALLUVIUM		Soft , Embankmemt ; Sandy **Clay** with a little gravel	Reddish grey			1					
2		2.00						S.1	2	2	3	5	8	
3	4.45				Medium ; Sandy **Clay** , high plasticity , CH , Clay = 95 % , Sand = 5 %.	Yellowish grey	2.50 UD.1 3.00	S.2	3	2	3	4	7	
4									4					
5								S.3	5	1	2	3	5	
6	2.55				Medium ; Sandy **Clay** with a little molusca , medium to high plasticity , CH , Clay = 90 % , Sand = 7 % , molusca = 3 %.	Blackish grey		S.4	6	1	1	2	3	
7									7					
8					Very stiff to hard ; Sandy **Clay** with a little gravel , medium to high plasticity , Clay = 80 % , Sand = 15 %, gravel = 5 %.	Reddish grey		S.5	8	5	8	11	19	
9	2.00								9					
10								S.6	10	10	14	18	32	
11	2.65		CIPUTAT BEDS FORMATION		Very dense ; **Sandstone** , medium to strongly cemented.	Greyish black		S.7	11	60			>60	
12									12					
13	1.85				Hard ; Tuffaceous silty **Sand** , poorly graded , SP , Sand = 75 % , Silt = 25 %.	Grey		S.8	13	65			>60	
14								S.9	14	18	37	35/10	>60	
15					**EN OF BORE HOLE (- 14.00 m)**				15					
16									16					
17									17					
18									18					
19									19					
20									20					
21									21					
22									22					
23									23					
24									24					
25									25					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Development Project In Jakarta Metropolitan Area

MB No : EW . 94-08

LOCATION	Kemayoran	DATE COMMENCED	January 24th 1994
COORDINATES		DATE COMPLETED	January 25th 1994
GROUND ELEVATION	1.12	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	15.41	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.00				Hard , Concrete	Grey			1					
2								1.55 S.01 2.00	2	2	6	7	13	
3	3.50	2.70	COAST ALLUVIUM		Medium to stiff, Sandy Silt with molusca , medium to low plasticity , ML , Silt = 50 % , Sand = 35 % , molusca = 15 %	Blackish Grey		3.00 S.02 3.45	3					
4							4.00 UD.1	4.50	4	2	3	4	7	
5					Soft to stiff , Sandy Clay with molusca , medium to high plasticity , CH , Clay = 70 % , fine sand = 25 % , molusca = 5 %.	Blackish Grey	4.50	S.03 4.95	5	1	1		1	
6								6.00 S.04 6.45	6					
7	4.50								7	1	1	1	2	
8								S.05 7.95	8	4	6	8	14	
9								9.00	9					
10					Very dense , Sand stone , fine grain , medium strongly cemented.	Brownish yellow		S.06 9.30	10	15	55/15		>60	
11	4.30		GENTENG FORMATION					11.00 S.07 11.12	11	55/15			>60	
12								S0.8 12.30	12	40	60/15		>60	
13					Very dense , Sand , medium to fine sand , SP , poorly graded, shape of grain is rounded , Sand = 100 %.	Black		13.50	13					
14								S.09 13.70	14	32	55/5		>60	
15								15.00 S.10	15	33	30	30	60	
16					END OF BORE HOLE (15.41 m)			15.41	16					
17									17					
18									18					
19									19					
20									20					
21									21					
22									22					
23									23					
24									24					
25									25					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-09

LOCATION	Jl. Taman Sunter Indah	DATE COMMENCED	January 26th 1994
COORDINATES		DATE COMPLETED	January 26th 1994
GROUND ELEVATION	1.34	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	21.65	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.00		COAST ALLUVIUM		Loose, cable , pebble and sand.	Black			1					
2	0.40	▼			Medium , Gravelly **Clay** , high plasticity , CH , Clay = 90 % , gravel = 10 %.	Reddish brown		S.1	2	1	2	4	6	
3							2.50 UD.1 3.00		3					
4								S.2	4	2	2	3	5	
5	7.20				Soft to stiff , Silty **Clay** with a little sand , organic matter and molluscs , Clay = 60 % , Silt = 30 % , fine sand = 10 %.	Blackish grey to Yellowish grey		S.3	5	2	2	3	5	
6									6					
7								S.4	7	1	1	1	2	
8								S.5	8	5	7	8	15	
9			YOUNG VULCANIC ROCK		Medium ; Tuffaceous clayey **Silt** with a little sand , low to medium plasticity , ML , Silt = 55% , Clay = 25% , Sand = 20%.	Yellowish white		S.6	9	0	2	3	5	
10	1.90								10					
11	1.10					Yellowish brown		S.7	11	4	8	13	21	
12					Medium , Silty **Sand** (fine), poorly graded , SP , Sand = 80 % , fine sand = 20 %.			S.8	12	12	12	15	27	
13	2.40					Yellowish brown			13					
14					Very stiff to hard ; Tuffaceous clayey **Silt** with a little sand , low to medium plasticity , ML , Silt = 55 % , clay = 25 % , sand = 20 % , the bottom intercalated with fine sand (thickness 10-15 cm).			S.9	14	6	28	36	>60	
15									15					
16	2.65					Yellowish grey		S.10	16	28	50/6		>60	
17			GENTENG FORMATION					S.11	17	55			>60	
18					Hard ; Tuffaceous Silty **Clay** with a little sand , low medium plasticity , CL , Clay = 60 % , Silt = 30 % , Sand = 10 %.				18					
19									19					
20	5.00					Black to Greyish black			20					
21					Very dense ; **sandstone** intercalated with silt stone , fine grain , poorly graded , SP , medium to strongly cemented.				21					
22									22					
23					END OF BORE HOLE (- 21.65 m)				23					
24									24					
25									25					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-10

LOCATION	Jl. Yos Sudarso	DATE COMMENCED	January 27th 1994
COORDINATES		DATE COMPLETED	January 27th 1994
GROUND ELEVATION	1.86	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	S U P E R V I S O R	Yosuke Sasaki
TOTAL DEPTH (- m)	18.40	C A S S I N G	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	1.00	1.25	YOUNG VULCANIC ROCK		Soft ; Tuffaceous **Clay** with a little sand , high plasticity , CH , Clay = 95 % , Sand = 5 %.	Brownish black to Blackish grey			1					
2	0.80							S.1	2	4	8	13	21	
3					Medium ; Silty **Sand** , poorly graded , SP , fine to medium grain , Sand = 80% , Silt = 20%	Black	2.50 UD.1 3.10		3					
4	2.65							S.2	4	2	4	6	10	
5					Stiff ; **Clay** intercalated with fine sand , high plasticity , CH , Clay = 100 % , thickness of fine sand 10-15 cm.	Brownish black		S.3	5	1	1	2	3	
6									6					
7	4.60							S.4	7	1	1	1	2	
8					Soft ; Tuffaceous organic **Clay** , high plasticity , CH , Clay = 100 %.	Blackish grey		S.5	8	1	2	2	4	
9									9					
10								S.6	10	4	9	14	23	
11	3.55		GENTENG FORMATION		Medium to very dense ; Fine **Sand** intercalated with Silt poorly graded , SP , Sand = 80 % , Silt = 20 %.	Brown		S.7	11	10	20	35	55	
12									12					
13								S.8	13	30	50/5		>60	
14								S.9	14	50/10			>60	
15					Very dense , **Sandstone** , weakly to medium cemented , fine to medium grain , poorly graded , SP , locally not cemented , angular to sub angular grain shape	Black			15					
16	5.80								16					
17									17					
18									18					
19					END OF BORE HOLE (-18.40 m)				19					
20									20					
21									21					
22									22					
23									23					
24									24					
25									25					

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-11

LOCATION	Kelapa Gading	DATE COMMENCED	January 29th 1994
COORDINATES		DATE COMPLETED	January 30th 1994
GROUND ELEVATION	2.35	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	24.15	CASSING	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N
1		1.00			Soft to medium , **Clay** , high plasticity , CH , Clay = 100 %, at the top with organic meter (0.60 m)	Reddish brown			1				
2	2.30							S.1	2	2	3	4	7
3			ALLUVIUM		Stiff, Tuffaceous organic **Clay** , high plasticity , CH , Clay = 100 %.	Yellowih grey to Blackish grey	2.50 UD.1 3.00		3				
4	1.70							S.2	4	2	4	6	10
5	1.00				Very loose , Silty **Sand** (fine), poorly graded , SP , Sand = 70 % , Silt = 30 %.	Yellowish grey		S.3	5	1	1	1	2
6									6				
7	3.30				Very soft to medium ; Sandy **Silt** , low plasticity , ML , Silt = 70m % , fine sand = 30 %.	Blackish grey		S.4	7	0	-	1	1
8								S.5	8	2	3	3	6
9									9				
10	4.30				Very stiff to hard ; Tuffaceous sandy **Silt** , low plasticity , ML , Silt = 60 % , fine sand = 40 %.	Yellowish brown		S.6	10	5	13	16	29
11								S.7	11	12	14	20	34
12									12				
13								S.8	13	32	43	15/5	>60
14								S.9	14	57/10		-	>60
15	4.40		GENTENG FORMATION		Hard ; **Siltstone** , weakly to medium cemented.	Brownish black			15				
16								S.10	16	55	-	-	>60
17								S.11	17	21	27	35	>60
18	1.10				Very dense ; **Sandstone** , weakly to medium cemented	Black			18				
19								S.12	19	57	-	-	>60
20								S.13	20	18	41	20	>60
21	6.05				Hard ; Sandy **Siltstone** , weakly to medium cemented , Silt = 60 % , fine sand = 40 %.	Greyish black			21				
22								S.14	22	17	58/10		>60
23									23				
24								S.15	24	19	40	20/10	>60
25					END OF BORE HOLE (24.15 m)			S.16	25	60/15		-	>60

NUMBER OF BLOWS 10 20 30 40 50

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SOIL & MAT INVESTIGATIONS TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-12

LOCATION	Kelapa Gading	DATE COMMENCED	January 28th 1994
COORDINATES		DATE COMPLETED	January 29th 1994
GROUND ELEVATION	2.45	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	20.10	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10
DEPTH (- m)	THICKNESS (m)	G.W.L. (- m)	UNIT / SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (- m)	STANDARD PENETRATION TEST (ASTM - D.1586)

DEPTH	THICKNESS	G.W.L.	UNIT	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH	N VALUE 15 Cm	30 Cm	45 Cm	N
1	1.75	1.00	ALLUVIUM	Soft to medium ; Silty **Clay** with a little sand , high plasticity , CH , Clay = 70% , Silt = 25% , Sand = 5%	Reddish brown			1				
2							S.1	2	1	2	3	5
3						2.50 UD.1 3.00		3				
4	4.05			Soft to medium ; organic **Clay** with a little mollucs , high plasticity , CH to the bottom with Silt , Clay = 80 % , Silt = 15 % , mollucs = 5 %.	Greyish black		S.2	4	1	1	1	2
5							S.3	5	1	1	1	2
6								6				
7	3.40		YOUNG VULCANIC ROCK	Very stiff , Tuffaceous **Clay** , high plasticity , Clay = 100 %.	Whitish grey to Yellowish grey		S.4	7	3	8	10	18
8							S.5	8	3	6	12	18
9				Very stiff ; Sandy **Silt** , low to medium plasticity , ML , Silt = 70 % , fine sand = 30 %	Yellowish grey		S.6	9	6	15	13	28
10	0.80							10				
11				Very dense ; **Sand** with a little Silt , poorly graded , SP , fine to medium grain , Sand = 95 % , Silt = 5 %.	Greyish black		S.7	11	15	28	30	58
12	4.00							12				
13							S.8	13	15	28	30	58
14							S.9	14	28	52/5		>60
15	1.60			Hard ; Sandy **Clay** , locally cemented , Clay = 75% , Sand = 25%	Blackish brown		S.10	15	50/15		-	>60
16							S.11	16	50/15		-	>60
17			CENTENG FORMATION	Very dense ; **Sandstone** , medium to strongly cemented , fine to medium grain , angular to sub angular grain shape.	Brownish black to black		S.12	17	53/15		-	>60
18	5.00						S.13	18	55/10		-	>60
19							S.14	19	55/10		-	>60
20							S.15	20	55/10		-	>60
21				END OF BORE HOLE (- 20.15 m)				21				
22								22				
23								23				
24								24				
25								25				

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EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-13

LOCATION	Pulo Gadung	DATE COMMENCED	February 01th 1994
COORDINATES		DATE COMPLETED	February 01th 1994
GROUND ELEVATION	3.72	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	S U P E R V I S O R	Yosuke Sasaki
TOTAL DEPTH (- m)	21.30	C A S S I N G	Ø 89 mm

1 DEPTH (-m)	2 THICKNESS (m)	3 G.W.L. (-m)	4 UNIT	4 SYMBOL	5 VISUAL DESCRIPTION & CLASSIFICATION	6 COLOR	7 Thin-Walled Tube	8 S.P.T. No.	9 DEPTH (-m)	10 STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1	0.60		ALLUVIUM		Loose ; **Sand** with gravels and pebble.	Grey			1					
								S.1		2	3	4	7	
2									2					
3								S.2	3	2	2	4	6	
4	6.90				Medium to stiff ; **Clay** , high plasticity , CH , Clay = 100 % , at the top is reddish brown.	Brownish grey to Blackish grey	4.00 UD.1 4.50		4					
5								S.3	5	2	3	4	7	
6									6					
7								S.4	7	3	4	7	11	
8		8.00						S.5	8	8	8	10	11	
9									9					
10	4.20				Medium to very dense ; **Sandstone** , fine medium grain , medium to strongly cemented.	Black		S.6	10	10	15	22	37	
11								S.7	11	26	55	-	>60	
12									12					
13			GENTENG FORMATION					S.8	13	15	30	25/5	>60	
14								S.9	14	14	40	20/5	>60	
15									15					
16	9.60				Hard ; Tuffaceous **Siltstone** with a little Sand , weakly to medium cemented , Silt = 70 % , Sand = 30 %.	Grey		S.10	16	53/1	-	-	>60	
17									17					
18									18					
19									19					
20									20					
21								S.11	21	20	55/5		>60	
22					END OF BORE HOLE (- 21.30 m)				22					
23									23					
24									24					
25									25					

PT. Wira Nusantarabumi

SOIL & MAT INVESTIGATIONS · TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project In Jakarta Metropolitan Area

MB No : EW . 94-14

LOCATION	Penggilingan	DATE COMMENCED	February 02nd 1994
COORDINATES		DATE COMPLETED	February 02nd 1994
GROUND ELEVATION	4.93	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	20.22	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10					
DEPTH (- m)	THICKNESS (m)	G.W.L. (- m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (- m)	STANDARD PENETRATION TEST (ASTM - D.1586)				
										N VALUE				NUMBER OF BLOWS
										15 Cm	30 Cm	45 Cm	N	10 20 30 40 50
1								1.00	1					
2	4.50				Stiff ; Tuffaceous **Clay** , high plasticity , CH , Clay = 100 %.	Blackish grey		UD.1 1.50	2	3	5	7	12	
3		3.50					S.1		3					
4							S.2	3.00 UD.2 3.50	4	5	6	9	15	
5	1.50				Very dense ; **Sandstone** , weakly to strongly cemented , poorly graded , SP , medium grain size , Sand = 100 %.	Brown	S.3		5	16	30	25	55	
6									6					
7	3.35					Brownish grey	S.4		7	40	52/5	-	>60	
8					Hard , Tuffaceous **Clay** Stone , weakly to medium cemented , Clay = 100 %.		S.5		8	25	40	25	>60	
9							S.6		9	10	17	35	52	
10							S.7		10	35	55/1	-	>60	
11	5.75		GENTENG FORMATION		Very dense ; **Sandstone** , medium to strongly cemented , poorly graded , SP , medium grain size , Sand = 100 %.	Black	S.8		11	55/15		-	>60	
12							S.9		12	57/15		-	>60	
13									13					
14							S.10		14	52/15		-	>60	
15									15					
16	2.10				Very dense ; **Sandstone** , medium grain size , poorly graded , SP , Sand = 100 % , angular to sub rounded grain shape.	Black	S.11		16	41	50/5		>60	
17									17					
18							S.12		18	35	55/10		>60	
19	3.02				Hard ; Tuffaceous **Siltstone** , medium to strongly cemented.	Blackish grey			19					
20							S.13		20	32	52/7		>60	
21					**END OF BORE HOLE (- 20.22 m)**				21					
22									22					
23									23					
24									24					
25									25					

PT. Wira Nusantarabumi

SOIL & MAT. INVESTIGATIONS - TOPOGRAPHIC SURVEY AND ENGINEERING CONSULTANTS

EXPLORATION BOR LOG

F.S. On Urban Arterial Road System Devolopment Project in Jakarta Metropolitan Area

MB No : EW . 94 - 15

LOCATION	Penggilingan	DATE COMMENCED	February 04th 1994
COORDINATES		DATE COMPLETED	February 04th 1994
GROUND ELEVATION	4.98	SOIL & MAT. ENGINEER	D. Sukarta Ir.
METHODE OF BORING	Rotary Core Drilling	BOR MASTER / DRILLER	Ismail / Uhen
BOR MACHINE TIPE	Koken	SUPERVISOR	Yosuke Sasaki
TOTAL DEPTH (- m)	25.35	CASSING	Ø 89 mm

1	2	3	4	5	6	7	8	9	10				
DEPTH (-m)	THICKNESS (m)	G.W.L. (-m)	UNIT	SYMBOL	VISUAL DESCRIPTION & CLASSIFICATION	COLOR	Thin-Walled Tube	S.P.T. No.	DEPTH (-m)	STANDARD PENETRATION TEST (ASTM - D.1586) N VALUE 15 Cm	30 Cm	45 Cm	N	NUMBER OF BLOWS 10 20 30 40 50
1		1.25	ALLUVIUM		Stiff , Sandy **Clay** , high plasticity , CH at the top with organic matter (0.20 m) , Clay = 90% , Sand = 10%	Brwon to Greyish brown	1.45	S.1	1				
2	2.45								2	9	4	8	12
3							UD.1 2.00	S.2	3	4	6	11	17
4	1.55				Very stiff , Tuffaceous **Clay** , high plasticity , CH , Clay = 100 %.	Grey to Brwonish grey	3.00 UD.2 3.50	S.3	4	4	6	10	16
5			YOUNG VULCANIC					S.4		4	6	9	15
6	3.35				Hard ; Tuffaceous **Silt** , low plasticity , ML , Silt = 100 %.	Brownish grey		S.5	5	5	14	36	50
7								S.6		14	33	20	53
8								S.7		20	30	37	>60
9								S.8	6	13	32	16	48
10								S.9		10	21	32	53
11								S.10	7	17	23	28	51
12								S.11		13	40	25	>60
13	9.88		GENTENG FORMATION		Very dense ; Silty **Sandstone** , medium to strongly cemented , Sand = 70 % , Silt = 30 %.	Brownish grey to Blackish grey		S.12	8	25	55/15		>60
14								S.13		27	56/10		>60
15								S.14	9	40	51/5		>60
16								S.15		53/10			>60
17								S.16	10	60/15			>60
18								S.17		60/13			>60
19	3.82				Very dense ; Tuffaceous **Claystone** , medium to strongly cemented , Clay = 100 %.	Blackish grey to Black		S.18	11	58/15			>60
20								S.19	12	40	50		>60
21								S.20	13	35	52/10		>60
22	2.00				Very dense ; **Sandstone** , medium to strongly cemented , poorly graded, SP, Sand = 100%	Black		S.21	14	40	60		>60
23								S.22	15	32	38	23	>60
24	2.30				Very dense , **Sand** , medium grain size , poorly graded , SP , Sand = 100 %.	Black		S.23	16	43	54		>60
25								S.24	17	34	54/8		>60
								S.25	18	27	56		>60
								S.26	19	40	58/10		>60
								S.27	20	45	55/10		>60
								S.28	21	47	57/15		>60
								S.29	22	49	51/10		>60
								S.30	23	45	50/5		>60
								S.31	24	25	55		>60
								C.32	25	32	40	15/5	>60
26					END OF BORE HOLE (- 25.35 m)				26				

NORTH

SOUTH

F.S. ON URBAN ARTERI

LEGEND

- CLAY
- GRAVELY CLAY
- SANDY CLAY
- ORGANIC CLAY
- SANDY SILT
- CLAYEY SILT
- TUFFACEOUS SILTY CL
- TUFFACEOUS SILT
- SILTSTONE
- SILTY SAND
- SAND AND GRAVELS
- SILTY SAND
- PEAT
- SANDSTONE
- HARD SOIL S

HARD

SOIL

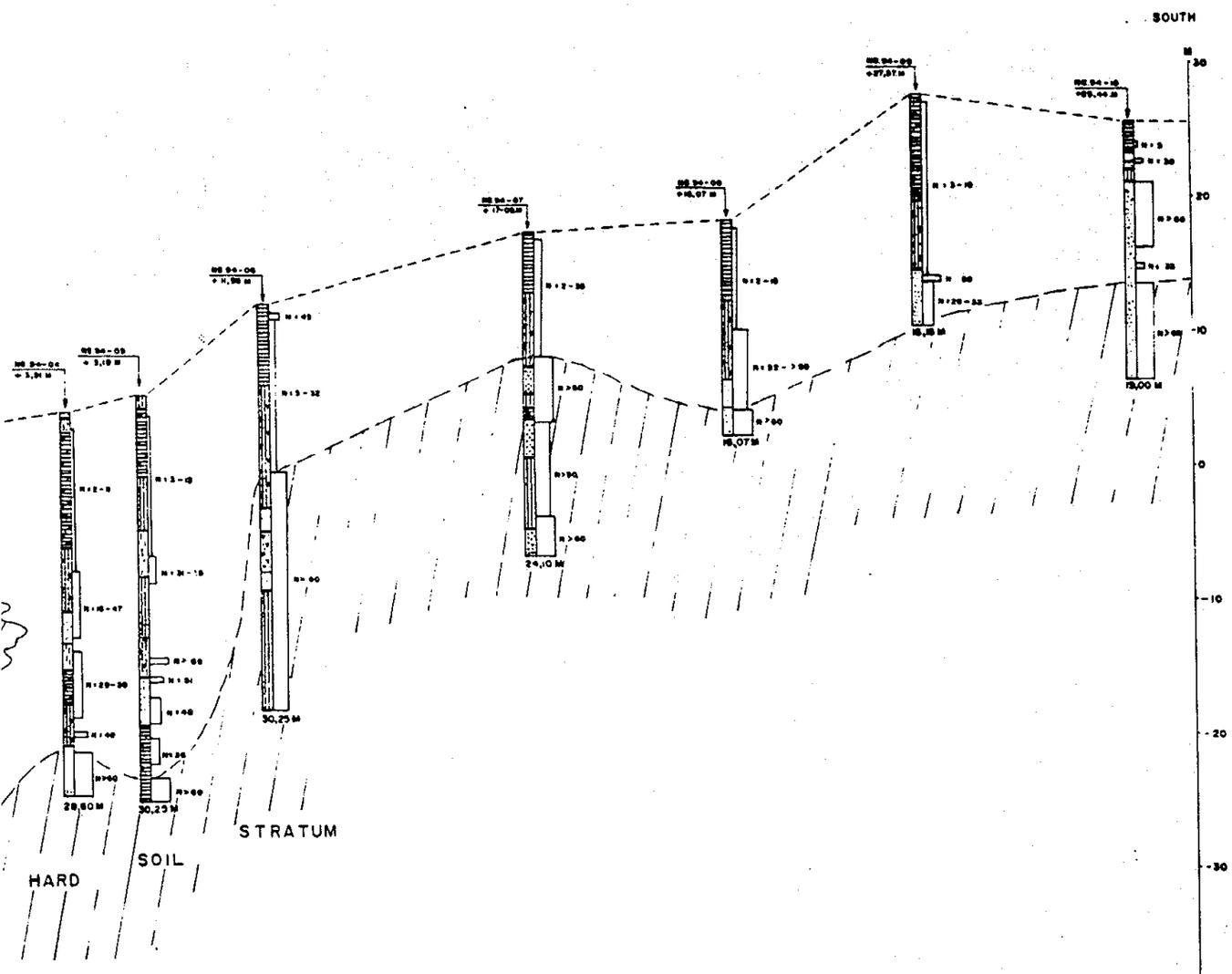
STRATUM

N>50~60

HARD

SOIL

STRATUM



SOIL PROFIL AT THE LONG AXIS NORTH - SOUTH
F.S.ON URBAN ARTERIAL ROAD SYSTEM DEVELOPMENT PROJECT IN JAKARTA METROPOLITAN AREA

HORIZONTAL SCALE 1 : 30.000
VERTICAL SCALE 1 : 2.000

LEGEND

- CLAY
- GRAVELY CLAY
- SANDY CLAY
- ORGANIC CLAY
- SANDY SILT
- CLAYEY SILT
- TUFFACEOUS SILTY CLAY
- TUFFACEOUS SILT
- SILTSTONE
- SILTY SAND
- SAND AND GRAVELS
- SILTY SAND
- PEAT
- SANDSTONE
- HARD SOIL STRATUM (N >50)

Fig.10.8.8 Geological Profile N-S Axis

EAST

HARD SOIL STR

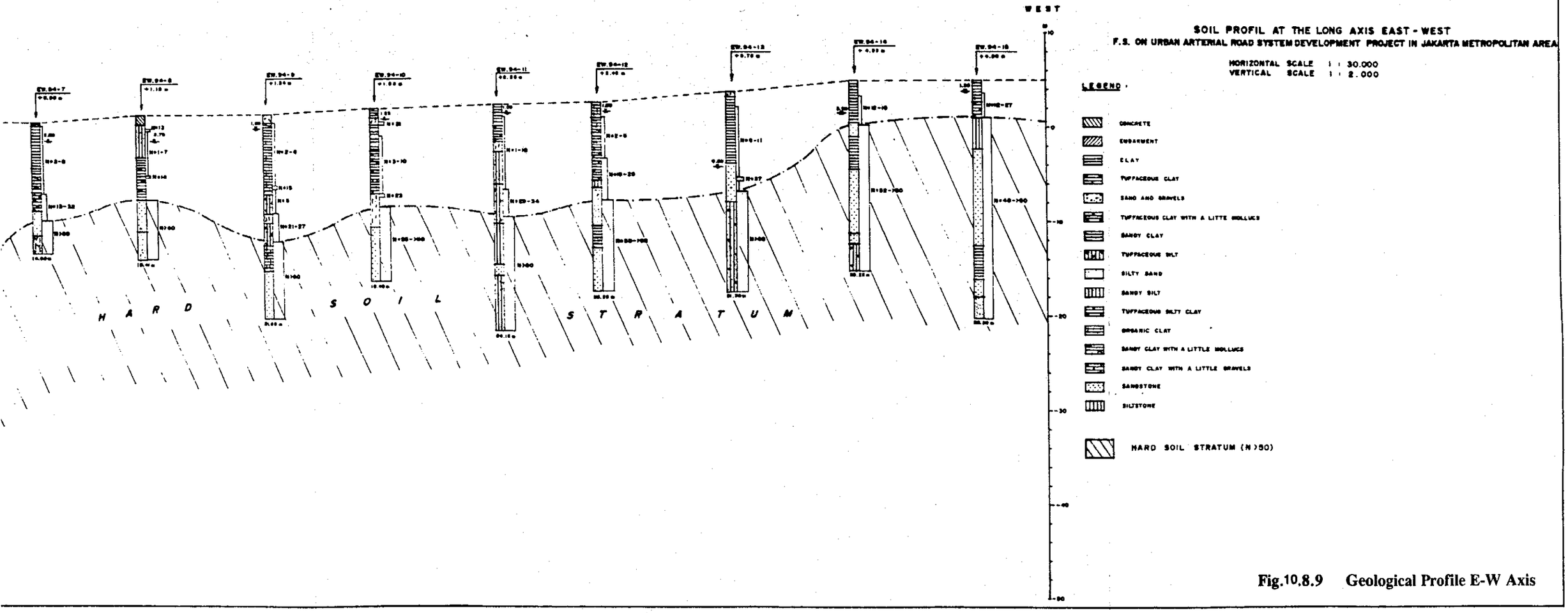


Fig.10.8.9 Geological Profile E-W Axis

10A-2 ROUTE DESCRIPTION

(1) Route Description of the North-South Axis

The selected route for North-South Axis starts in Kota where Jl. Pintu Besar/Jl. Gajah Mada/Hayam Wuruk and Jl. Moch. Mansyur work existing north-southward arterial roads. No direct connection to Jakarta Harbour Road is provided due to preservation of historical monuments in Kota and deliberation on traffic manoeuvre scheme of successive interchanges on Jakarta Harbour Road. To prevent missing link of tollway network, a north-southward arterial road with depressed structure should be taken into consideration in the future to increase traffic capacity in this section. Jl. Gajah Mada/Hayam Wuruk is located in the CBD with 60 m ROW and which is divided by the 15 m wide Kali Ciliwung in the center namely the north bound is Jl. Gajah Mada and the south bound is Jl. Hayam Wuruk. Since there exist densely developed commercial area along the road and the widening was taken place in a few decades ago, it is rather difficult to acquire additional land for the Project in the whole stretch. However, the space above the Kali Ciliwung seems available provided that the consent is obtained from the agencies concerned. It seems to be possible to acquire a localized area where a toll gate is deemed necessary. Nevertheless, an elevated toll gate would be constructed on viaduct.

The bed rock in Kota area lies 40 to 50 m in depth, according to soil investigations conducted through projects in Kota area such as Jakarta Harbour Road, Northern Extension of S-W Arc and Pasar Pagi Viaduct. However, 6 m to 8 m thick sandy soil strata with N-value of 40 sometimes are found 20 m in depth and such geological condition is regarded as structural bearing strata. Even though no intermediate bearing strata exists, cast-in-place concrete pile will be able to be constructed as bearing pile on the bed rock. East-westward arterial roads in the north of Monas are Jl. Bandengan from Teluk Gong, Jl. Pangeran Tubagus Angke/Jl. Mangga Dua, Jl. Mangga Besar, Jl. Zainul Arifin/Jl. Sukarjo Wiryopranoto, Jl. Kyai Tapa/Jl. Hasyim Asyhari from Grogol, Jl. Tomang Raya/Jl. Suryo Pranoto/Jl. Juanda/Veteran from Tomang to Pasar Baru.

The route runs southward in the west of Monas to cover the area where Jl. M.H. Thamrin and Jl. Mas Mansyur work existing north-southward arterial roads.
Jl. Abdul Muis is 4-lane undivided road and has the 10 m wide Kali Krukut and 20 m wide frontage road in the east. The land use along Jl. Abdul Muis is of governmental and institutional offices. A reconstruction of Jl. Abdul Muis will be able to create the space for elevated toll road and at-grade arterial road with On and Off ramps within the existing ROW.

Jl. Kebon Sirih is also 4-lane undivided road and has the 10 m wide Kali Cideng. This road will become a main access to and egress from Jl. M.H. Thamrin. A reconstruction of Jl. Kebon Sirih will be able to provide additional space for On and Off ramps, provided that the consent to utilize space above the Kali Cideng is obtained from the agencies concerned.

In the vicinity of intersection between Jl. Fakhrudin and Jl. Jati Baru, there are several plans of grade separation structure, such as Jl. Fakhrudin underpass and Jl. Jati Baru flyover. The eastern part of Jl. Jati Baru has been widened while the western in widening and

Tanah Abang flyover which is overpassing Western Railway Line is under construction. In the west of Jl. Jati Baru, the Western Banjir Kanal, high voltage power transmission line and Western Railway Line disrupt community and densely urbanized area with low cost housing are found along its corridor. Both Western Railway Line and Serpong Railway Line have overhead structures including recent Slipi flyover and on-going Tanah Abang flyover and it seems rational that no elevated railway is planned in future.

In the south of Kali Malang/Banjir Kanal, the route covers the area where Jl. Aipda K. Sasuit Tubun and Jl. Jend. Sudirman encompass. Jl. Pejompongan/Jl. Matraman is being improved and recently opened Jl. Mas Mansyur with Sudirman Flyover are designated east-westward arterial roads and are supposed to be main access to North-South Axis.

The existing Pejompongan IC has presently at-grade railway crossing and a railway flyover will be provided by DKI's improvement plan. This flyover will create open space adjoining railway and make it available for On and Off ramps in the east of Jl. Gatot Subroto. In the west of Jl. Gatot Subroto, Simprug Bypass runs southward in both sides of the railway and Pal Merah railway station is located nearby the intersection with Jl. Gelora. In this stretch, the toll road will be strictly controlled by severe physical constraints such as Parliament Complex and relevant facilities. If the space above the railway is made available partially it will manage to pass this stretch by an elevated road on viaduct.

To encompass Senayan sports complex and Gelora legislative and administrative complex, the route crosses Jl. Gatot Subroto and toward Kebayoran Baru Subcenter. Existing north-southward arterial roads are Jl. Pejompongan-Pondok Pinang (Simpruk Bypass), Jl. Asia Afrika and Jl. Jend. Sudirman.

There exist senior high school, firing range and other institutional facilities along Jl. Gelora. The firing range has a plan to expand their field toward Graha Pemuda and it will make Jl. Gelora underpass. The toll road will also pass there by an elevated road on viaduct.

Statue Senayan is located in the center of the intersection between Jl. Jend. Sudirman and Jl. Senopati. This intersection is of socalled "round-about with multi legs" and seven connecting road links are Jl. Jend. Sudirman, Jl. Senopati, Jl. Pattimura, Jl. Singamangaraja, Jl. Hang Tuah, Jl. Hang Lekir and Jl. Asia Afrika clockwise. Furthermore, a new link is planned to connect this intersection with Simprug Bypass. The round-about has enough wide area and it is possible to form a modern channelized intersection in case that the statue shall be able to be relocated. In the surrounding, governmental offices and commercial buildings are found with sufficient setback.

In the vicinity of Kebayoran Baru Subcenter, Jl. Singamangaraja/Jl. Panglima Polim and Jl. Pattimura/Jl. Prapanca are the north-south arterial roads and Jl. Kyai Maja/Jl. Trunojoyo/Jl. Wolter Monginsidi is the east-westward arterial road. These cross arterial roads are connected each other by Jl. Senopati, Jl. Wijaya, Jl. Gandaria/Jl. Kramat Pela and Jl. Pakubuwono 6 clockwise to form a circumferential road.

Kebayoran Baru is established as Subcenter in Jakarta South, having Blok-M commercial center encompassed by residential area. Recent Kebayoran Baru is changing its structure as Metropolitan Jakarta commands its wider conurbation. Blok-M commercial center no more remains within Blok-M and expands toward its surrounding. Resulting convertion from residence to business and commercial building is ceaselessly in progress. Along Jl. Pattimura and Jl. Sultan Iskandarsyah, there are many offices converted from residence. Even along Jl. Prapanca new high-rise apartments with department store are under construction in residential area.

In the south of Kebayoran Baru Subcenter, four arterial roads are related to the route, namely Jl. Ciputat Raya, Jl. Metro Pondok Indah, Jl. Fatmawati and Jl. Pangeran Antasari from west. No major arterial road except Jl. Kemang exists in the east-westward connection.

Jl. Pangeran Antasari is a divided 4-lane arterial road and has a future ROW of 30 m wide. The landuse along the road is few developed because it is either controlled by administration or discouraged physically due to its terrain. Therefore new development is limited outside of future ROW.

The terminus of route will be located at the intersection between Jakarta Outer Ring Road and Jl. Pangeran Antasari. In the east of the intersection, the Kali Krukut flows northward and its river side forms depressed wide area where open space remains undeveloped. Frontage roads of Jakarta Outer Ring Road have been open to public and are congested constantly. A toll road of Jakarta Outer Ring Road is scheduled to be completed by 1995. There will be two interchanges on Jakarta Outer Ring Road in the vicinity of the terminus, namely Fatmawati East IC and Ampera West IC. Both ICs are planned to be On and Off ramp type interchange and are distant enough far from the intersection between Jl. Pangeran Antasari and Jakarta Outer Ring Road. On the contrary, Jl. Metro Pondok Indah and Jl. Fatmawati are supposed to be main access roads and On/Off ramps of JORR are planned in short interval.

(2) Route Description of the East-West Axis

The selected route for the East-West Axis starts in the western section of Jakarta Outer Ring Road (JORR), of which the frontage roads have been completed and are open to the public but the toll road is not constructed yet. It will be completed by the year 1996. To keep good access to West primary center and to follow the city planning road (Route K) in principle, the corridor is located in the north of built-up housing complex of Taman Permata Buana, where the expansion of Taman Permata Buana is planned.

Future Taman Permata Buana housing complex will have the same ROW for this city planning road as that of Kosambi Baru housing complex in the north of existing Taman Permata Buana housing complex. As future ROW of Route K is supposed to be of 26 m wide, certain countermeasure to incorporate the scheme of East-West Axis is deemed necessary. Although the city planning road comes to an end at Jl. Kedoya Raya, the East-West Axis should find its own route to avert number of established housing complex in Kec. Kebon Jeruk.

Generally, mixed landuse of industry and commerce is predominant along Jl. Daan Mogot and densely developed residential landuse is widely spread in the corridor.
In the east of the Cengkareng Drain, there are many large-scaled established housing complex such as Green Garden, Sunrise Garden and Taman Ratu Indah. Although the masterplan of Jakarta 2005 has an arterial road to penetrate these housing complex to connect with Jl. S. Parman, the city planning road terminates on Jl. Kedoya Raya (Route F), according to District Plan (RBWK) of Kec. Kebon Jeruk and city planning road map in 2005 issued by City Planning Bureau of DKI Jakarta. Therefore, the East-West Axis should find its own route in this area.

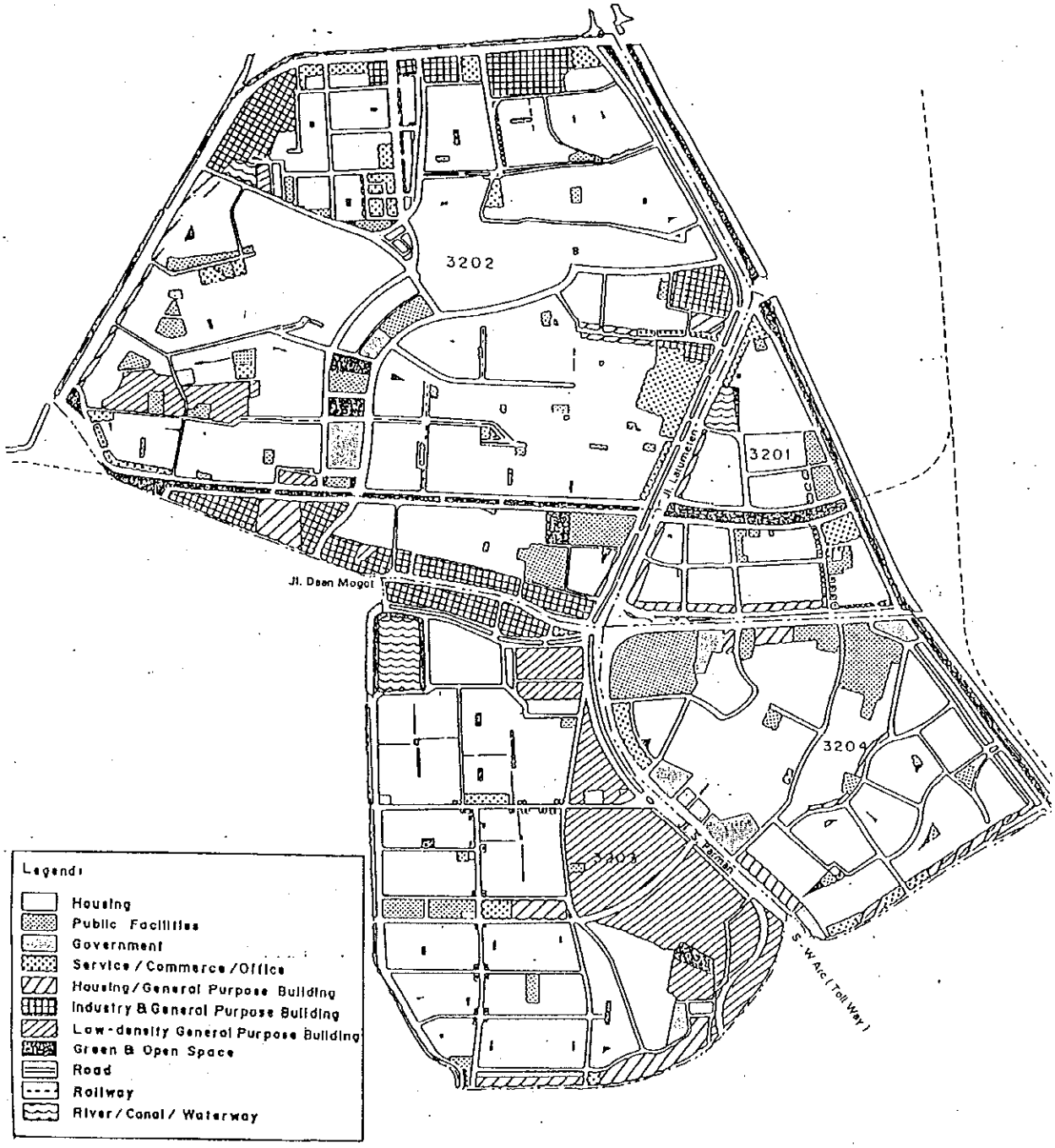
There are five north-southward arterial roads in between JORR and South-West Arc (S-W Arc). Among them, Jl. Perjuangan (Route D) which connects Jl. Daan Mogot with Jakarta-Merak Freeway (Tollway) and Kebayoran Baru sub-center is designated as north-southward major arterial road. No major arterial road except Jl. Daan Mogot and Jakarta-Merak Freeway exists in the east-westward direction.

Jl. Daan Mogot which is classified primary arterial road caters considerable volume of east-westward traffic together with Jakarta-Merak Freeway.
Since Grogol intersection on Jl. Daan Mogot and Tomang intersection at the terminus of Jakarta-Merak Freeway are located close each other, chronic traffic congestion take place on Jl. S. Parman.

In the vicinity of Grogol intersection, number of public facilities such as universities, hospital, hotels shopping centers governmental buildings and bus terminal exist to spur traffic congestion.
City planning roads are planned in both sides of the Tangerang railway line to collect and distribute local traffic.

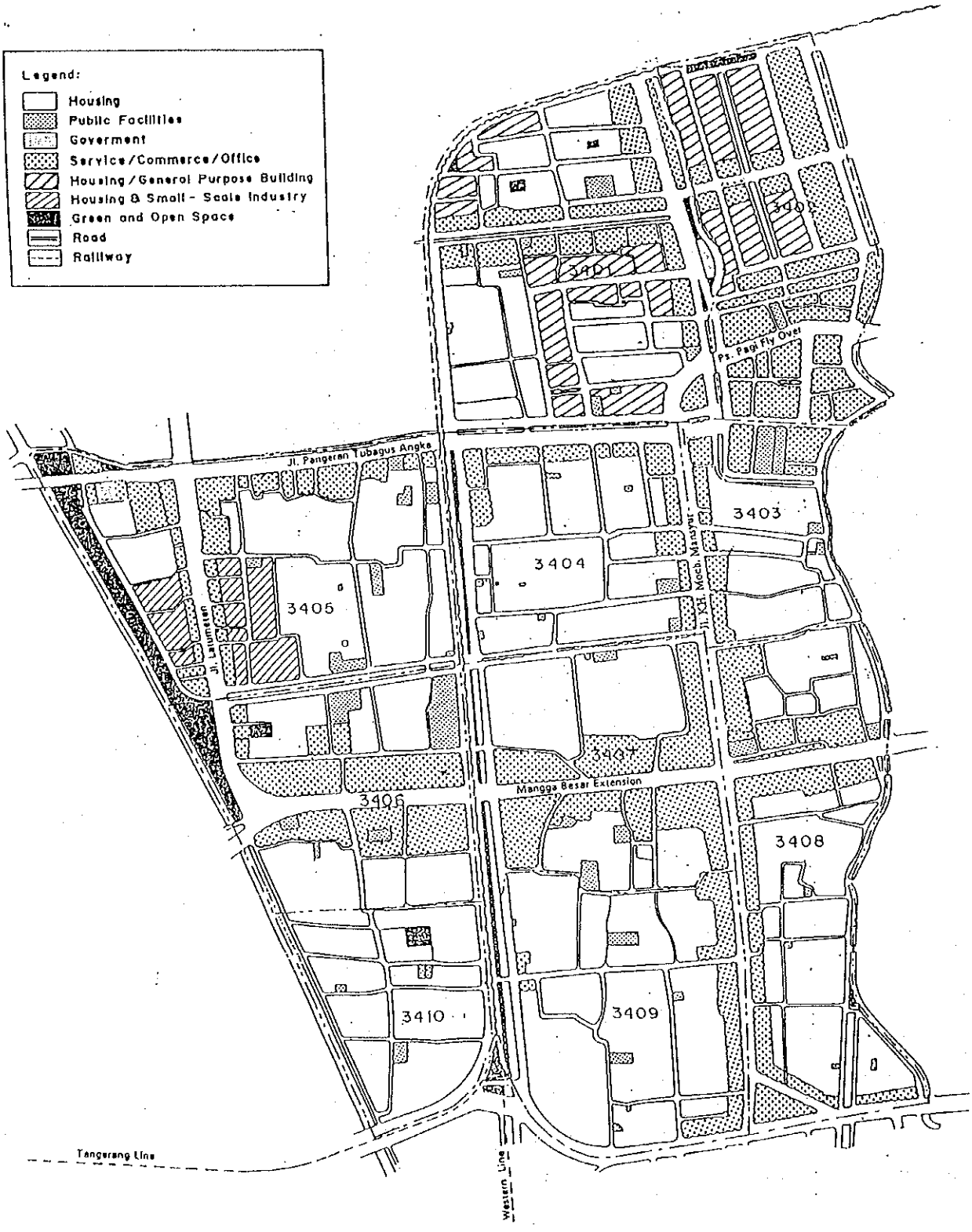
There are rather old housing complex with poor public facilities in Kec. Grogol Petamburan (Fig. 10A-1). However, the Jakarta 2005 categorizes the landuse along the corridor as urban betterment with the first priority and a city planning road is planned to pass the center of this area to connect Jl. Daan Mogot with Jl. Latumeten. Some redevelopment of old housing complex are found along Jl. Pangeran Tubagus Angke.

The route is planned to pass densely populated area in Kec. Tambora on Mangga Besar Extension. However, the District Plan of Kec. Tambora presented in Fig. 10A-2 claims public space and facilities, commerce and office buildings so much that it is very necessary to create such land area by certain land readjustment techniques.



FEASIBILITY STUDY ON
URBAN ARTERIAL ROAD SYSTEM DEVELOPMENT PROJECT
IN JAKARTA METROPOLITAN AREA

Fig. 10A-1 District Plan of Kecamatan Grogol Petamburan



FEASIBILITY STUDY ON
URBAN ARTERIAL ROAD SYSTEM DEVELOPMENT PROJECT
IN JAKARTA METROPOLITAN AREA

Fig. 10A-2 District Plan of Kecamatan Tambora

The DKI's road improvement plan in Kota area consists of widening of existing roads, construction of new links and flyovers. According to the simulation of future traffic, the East-West Axis, Jl. Mangga Besar, Jl. Mangga Dua, Jl. Pangeran Tubagus Angke and Jl. Bandengan Utara/Selatan will become major arterial roads in the east-westward direction and Jl. Jembatan Dua, the new road link along the Western railway line, Jl. KH. Moch. Mansyur, Jl. Gajah Mada/Hayam Wuruk, the new road link along the Central railway line and Jl. Gunung Sahari will work as major arterial roads in Kota area. In particular, the East-West Axis including Jl. Mangga Besar will cater heavy traffic in the east-westward.

The central railway line has been elevated in the section from Kota to Manggarai but city planning roads along the railway are not developed yet. The Northern Extension of S-W Arc is to be completed by 1998 and simultaneously the improvement of Jl. Latumeten is planned.

Ex-Kemayoran Airport is designated the special area to be developed as an intensive sub-center of commerce and housing complex where north-south and east-west runways are converted to arterial roads and 120,000 population will work and live in the area of 454 ha. In the east of Ex-Kemayoran Airport, large-scaled housing complex of Sunter Agung in the north and Sunter Jaya in the south are established. A city planning road is located in the north of Sunter Jaya housing complex and is partially developed such as Jl. Taman Sunter Indah and Jl. Danau Indah Raya.

Jl. Taman Sunter Indah and Jl. Danau Indah Raya which are city planning roads and have 36 m wide ROW have been partially completed but the remaining section is in densely populated area.

Elevated North-South Link (N-S Link) and its On/Off ramps are located at the intersecting point between Jl. Danau Indah Raya/Raya Barat Boulevard and Jl. Yos Sudarso.
The routine passes Kelapa Gading housing development on Raya Barat/Timur Boulevard. The road has enough wide ROW and commercial buildings along the road have been set back. In the east of Kelapa Gading housing development, medium industry has been settled along Jl. Pegangsaan Dua. High voltage transmission line and its pylons are also located along Jl. Pegangsaan Dua.

There are two city planning roads in the east of Pulogadung Industrial Estate, namely a new road along new freight railway line and the northern extension of Jl. Buaran Indah Raya (Route EE). Existing divided Jl. Pulogadung has 40 m ROW and large-scaled factories have been established along the road, while the extension of Jl. Buaran Indah Raya is partially under construction and will be located along Jl. Swadaya where densely populated area and large-scaled factories exist. High voltage transmission line and its pylons along Jl. Pegangsaan Dua run southward in parallel to Jl. Pulogadung in undeveloped industrial estate. According to the District Plan of Kec. Cakung, a new freight railway line was planned along the transmission line but no plan is given in the masterplan of Jakarta 2005.

The original purpose of new railway line between Tg. Priok and Cibinong was solely for cement transport and the original location of route was located in the eastern end of Pulogadung Industrial Estate and ran parallel to Jl. Pegangsaan Dua northward. However, the revised scheme of this railway aims to be multipurpose operation such as commuting, inter regional traveling and freight transporting because the capacity of existing Bogor and Bekasi lines in Jabotabek is saturated by the commuter train operation. Simultaneously, the route location is revised to be located along JORR in order to avert industrial and residential development along the original route. Though the present district plans (RBWK) of Kec. Cakung and Kec. Cilincing present the scheme of this new railway, it is reasonable that the E-W Axis is able to select its own route in this area on the assumption that the route location of new railway presented in the district plans has already been set aside.

Along east-westward transmission lines towards Bekasi, two city planning roads (Route AA) are planned in both sides of the transmission line. These city planning roads will pass in between Taman Pulo Indah and Concord 2000.

The eastern section of Jakarta Outer Ring Road (JORR) is operating temporary two ways on north-bound lanes of toll road in the stretch between Cikunir IC on Jakarta-Cikampek Freeway and Cakung IC with Jl. Bekasi Raya.

At the intersecting point with JORR, the selected corridor of East-West Axis will end. In the vicinity of intersecting point, a new bus terminal is planned to relocate the present Pulogadung bus terminal located at the intersection between Jl. Bekasi Raya and Jl. Perintis Kemerdekaan. The East primary center is located at the corner encompassed by JORR and Jl. I. Gusti Ngurah Rai and has own access road to JORR in the north. To keep good access to the East Primary Center, existing Jl. Penggilingan and frontage roads of JORR will be utilized.

10A-3 PRELIMINARY DESIGN OF PAVEMENT

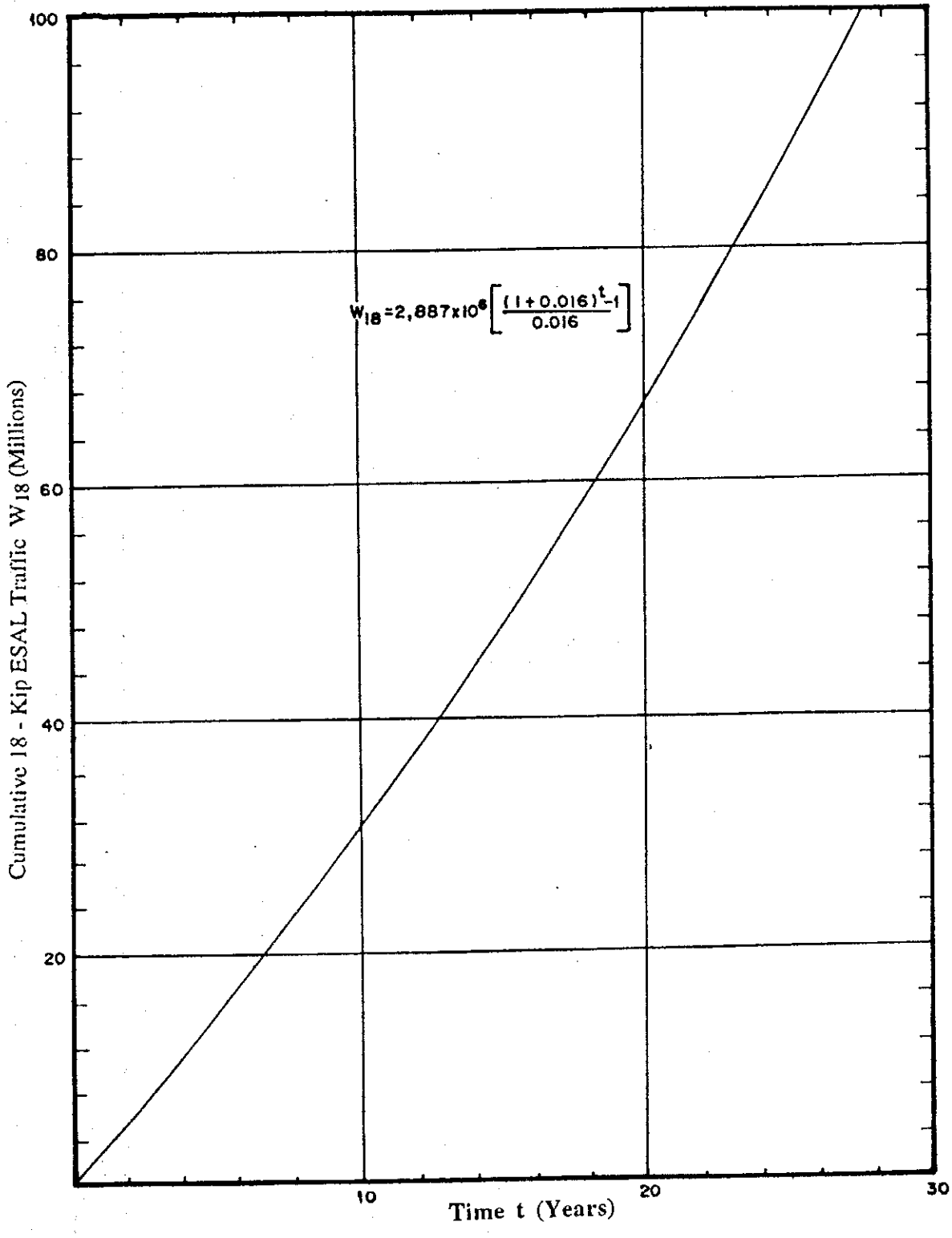


Figure 10A-3-1	Cumulative 18 - KIP ESAL TRAFFIC
EAST WEST AXIS	

NOMOGRAPH SOLVES :

$$\text{Log10 W18} = Z_r * S_o + 9.36 * \text{Log10 (SN +1)} - 0.2 + \frac{\text{Log10}\frac{\Delta PSI}{4.2 - 1.5}}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \text{Log10 Mr} - 8.07$$

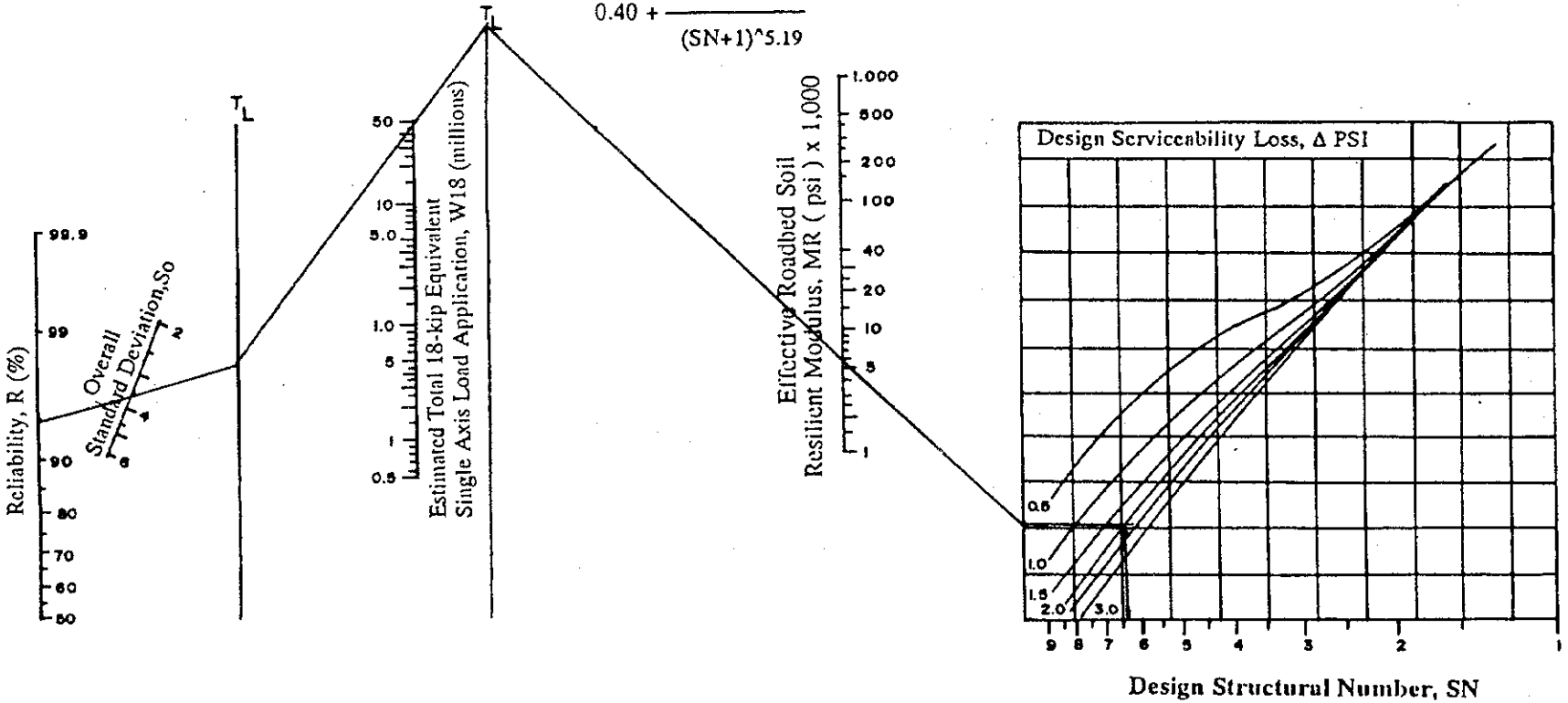
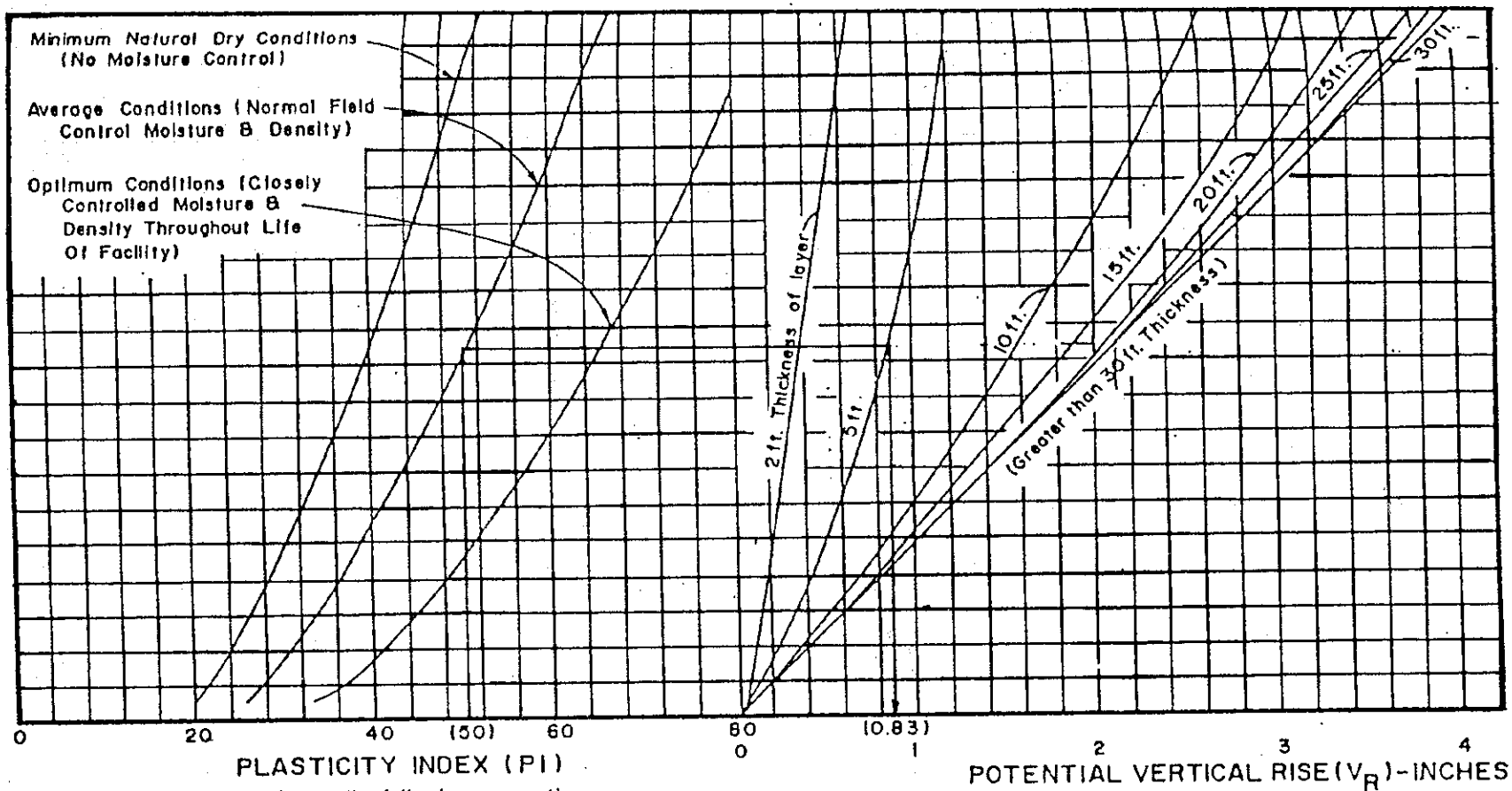


Figure 10A-3-2	Design Chart for flexible pavement based on using mean values for each input
EAST WEST AXIS	



1. This figure is predicated upon the following assumptions:
   a. The subgrade soils for the thickness shown all pass the No. 40 mesh sieve
   b. The subgrade soil has a uniform moisture content and plasticity index throughout the layer thickness for the conditions shown.
   c. A surcharge pressure from 20 inches of overburden (± 10 inches will have no material effect)
2. Calculations are required to determine V_R for other surcharge pressures.

Figure 10A-3-3

Chart for estimating the approximate potential vertical rise of natural soils

EAST WEST AXIS

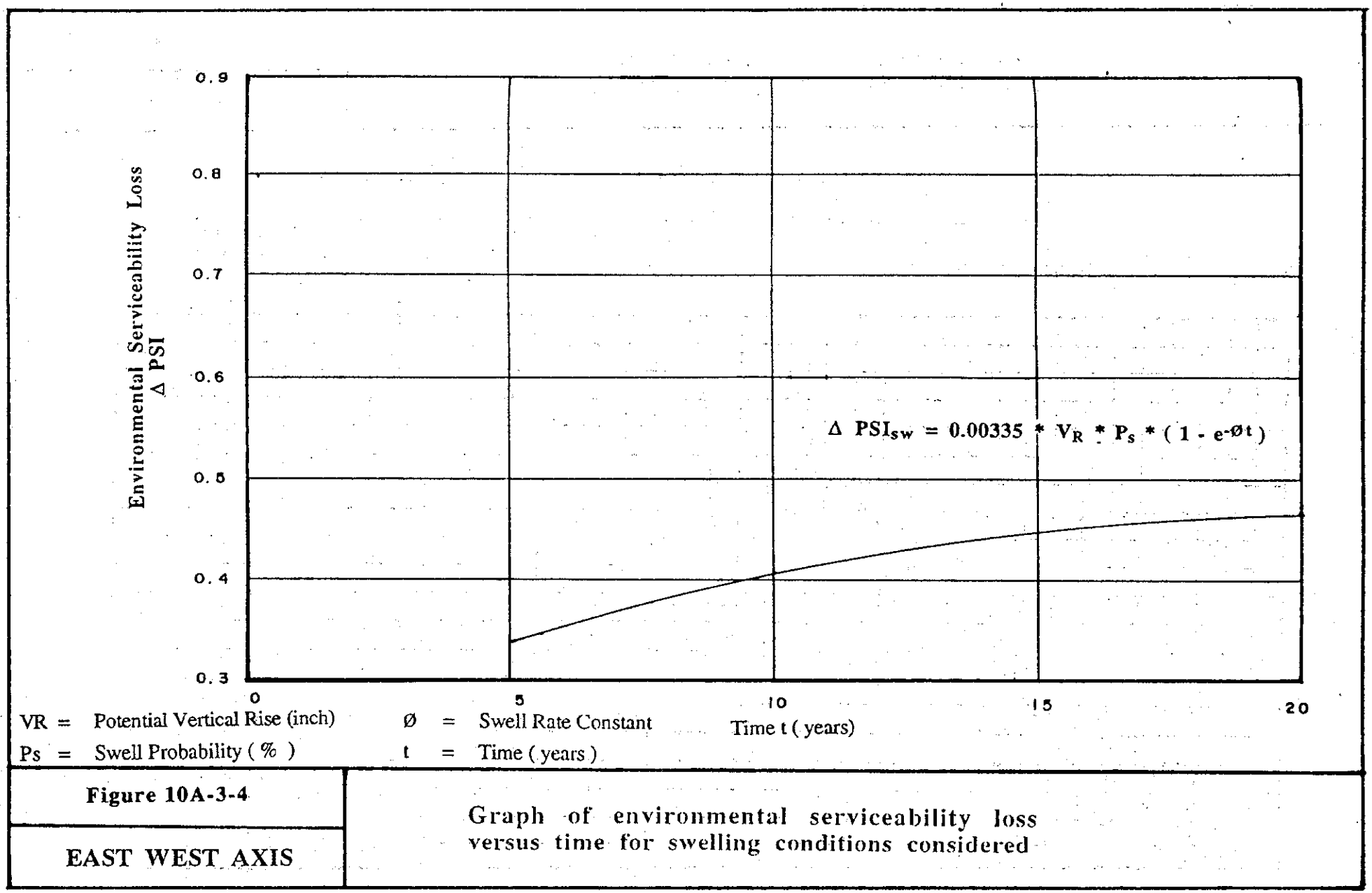


Figure 10A-3-4

Graph of environmental serviceability loss versus time for swelling conditions considered

EAST WEST AXIS

NOMOGRAPH SOLVES :

$$\text{Log10 W18} = Zr * So + 9.36 * \text{Log10 (SN +1)} - 0.2 + \frac{\text{Log10}\left(\frac{\Delta PSI}{4.2 - 1.5}\right)}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \text{Log10 Mr} - 8.07$$

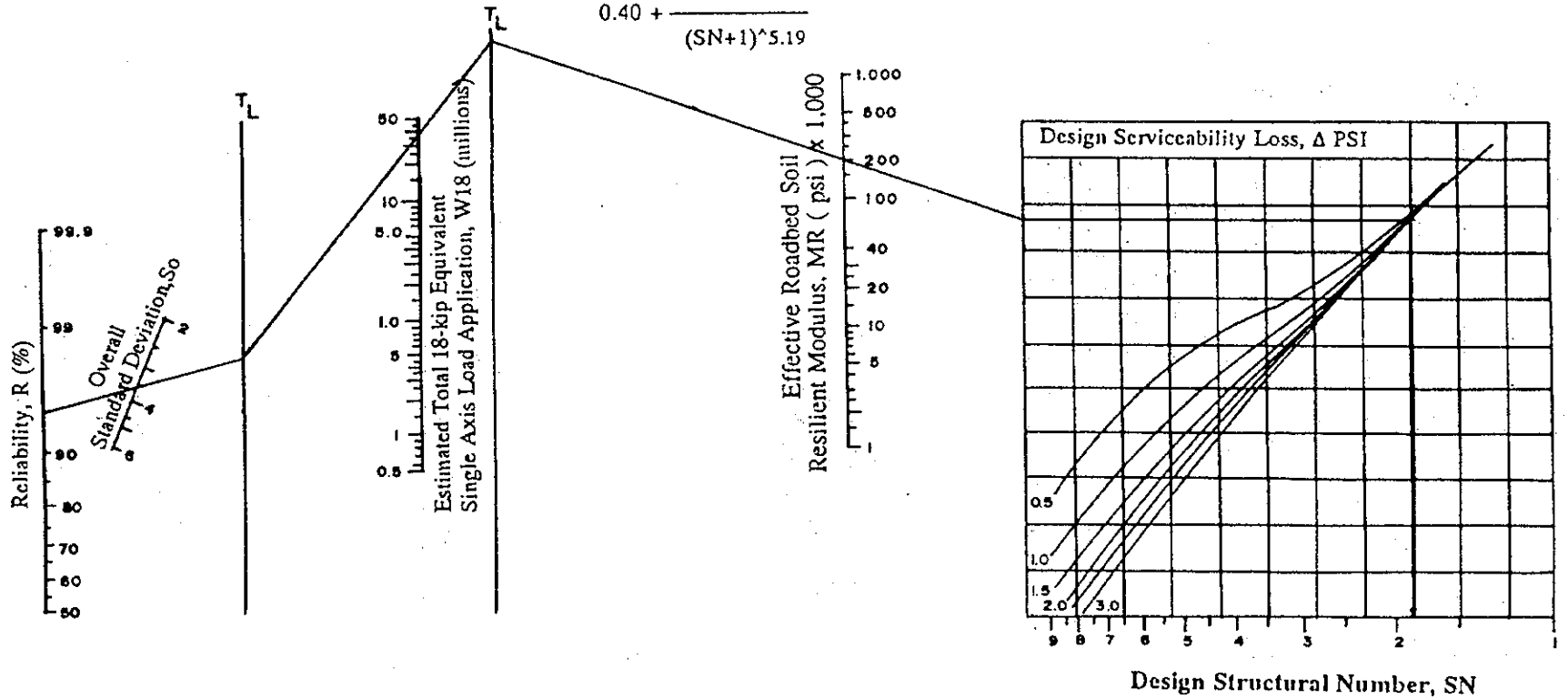


Figure 10A-3-5	Design Chart for flexible pavement based on using mean values for each input
EAST WEST AXIS	

NOMOGRAPH SOLVES :

$$\text{Log10 W18} = Z_r * S_o + 9.36 * \text{Log10 (SN +1)} - 0.2 + \frac{\text{Log10}\frac{\Delta PSI}{4.2 - 1.5}}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \text{Log10 Mr} - 8.07$$

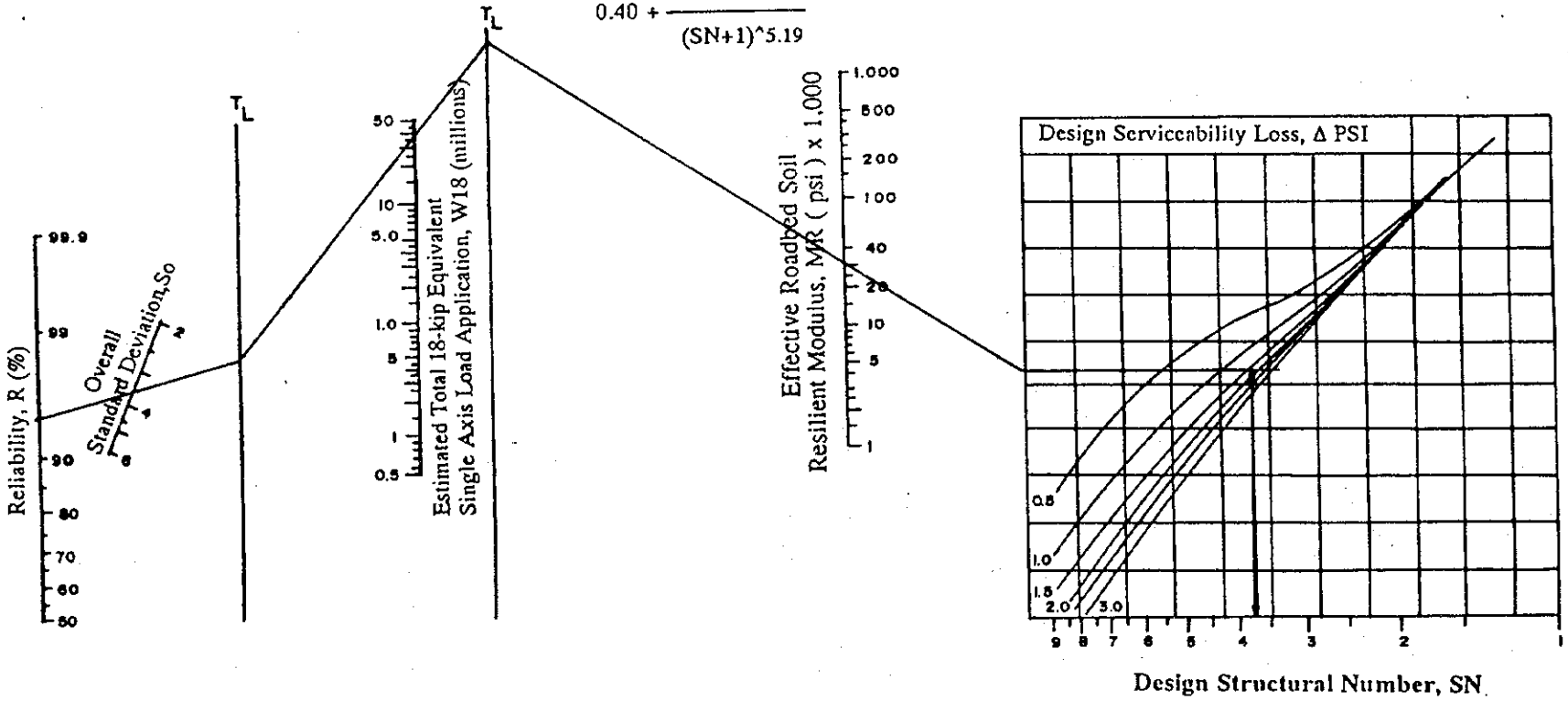


Figure 10A-3-6	Design Chart for flexible pavement based on using mean values for each input
EAST WEST AXIS	

NOMOGRAPH SOLVES :

$$\text{Log10 W18} = Zr * So + 9.36 * \text{Log10 (SN +1)} - 0.2 + \frac{\text{Log10}\frac{\Delta PSI}{4.2 - 1.5}}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \text{Log10 Mr} - 8.07$$

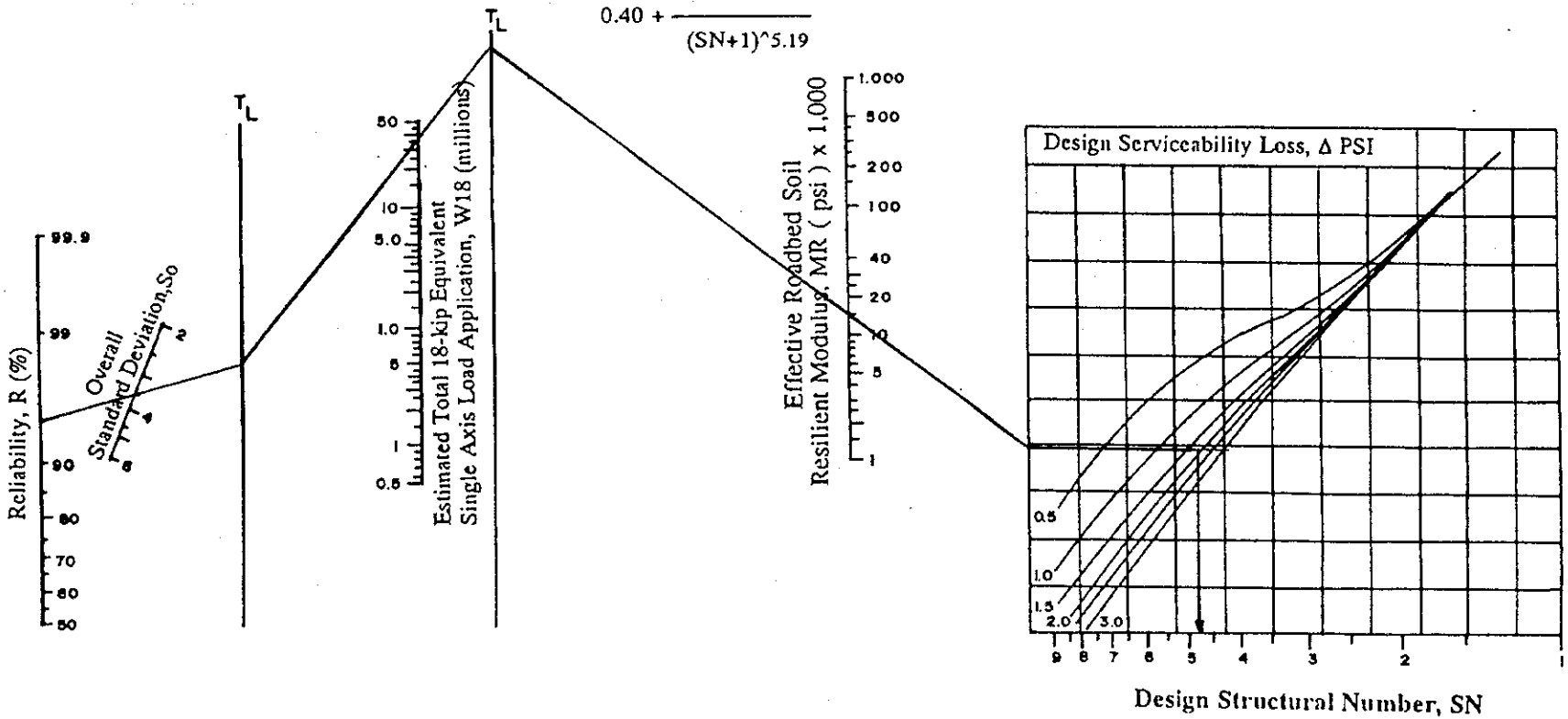


Figure 10A-3-7

EAST WEST AXIS

Design Chart for flexible pavement based on using mean values for each input

NOMOGRAPH SOLVES :

$$\log_{10} W_{18} = Z_r * S_o + 9.36 * \log_{10}(SN+1) - 0.2 + \frac{\log_{10}\frac{\Delta PSI}{4.2-1.5}}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 * \log_{10} M_r - 8.07$$

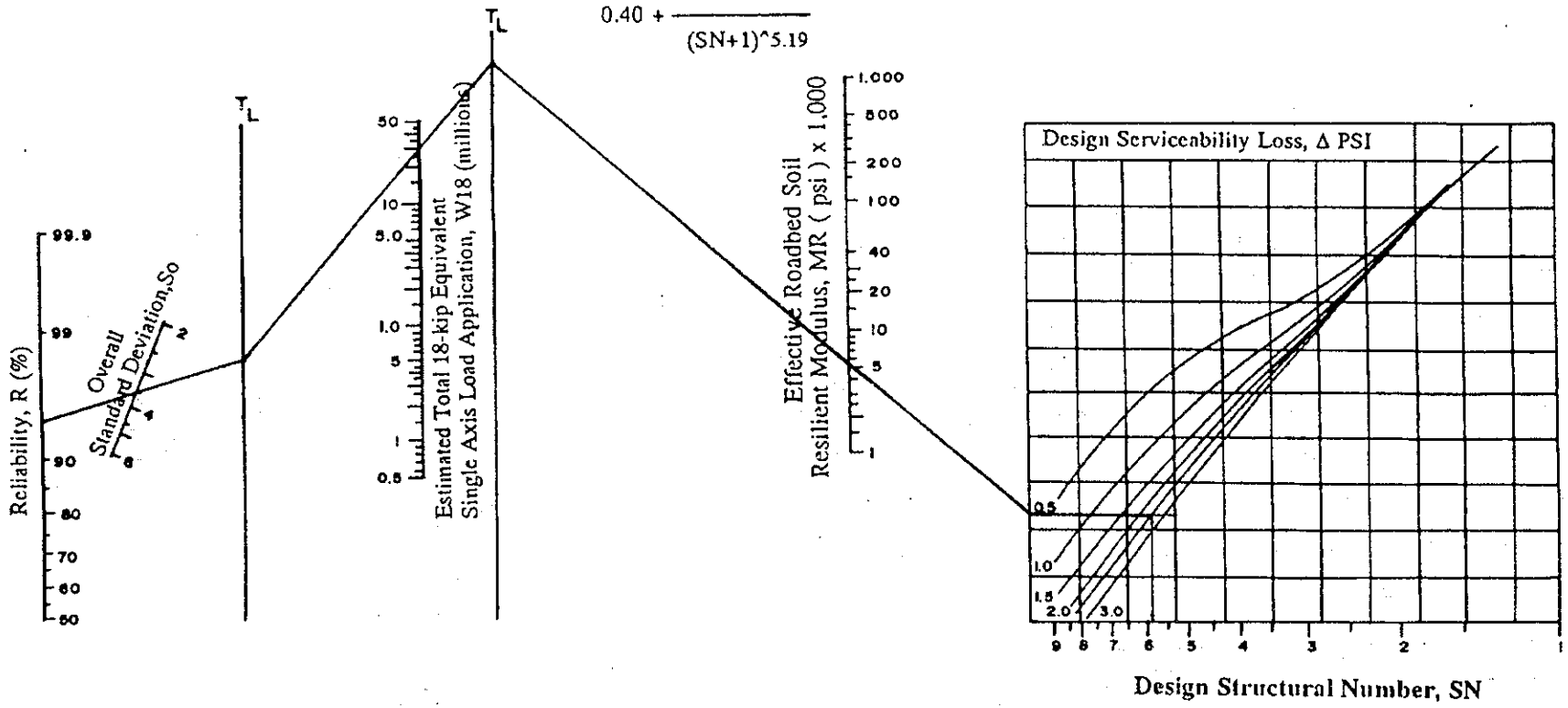


Figure 10A-3-8	Design Chart for flexible pavement based on using mean values for each input
EAST WEST AXIS	

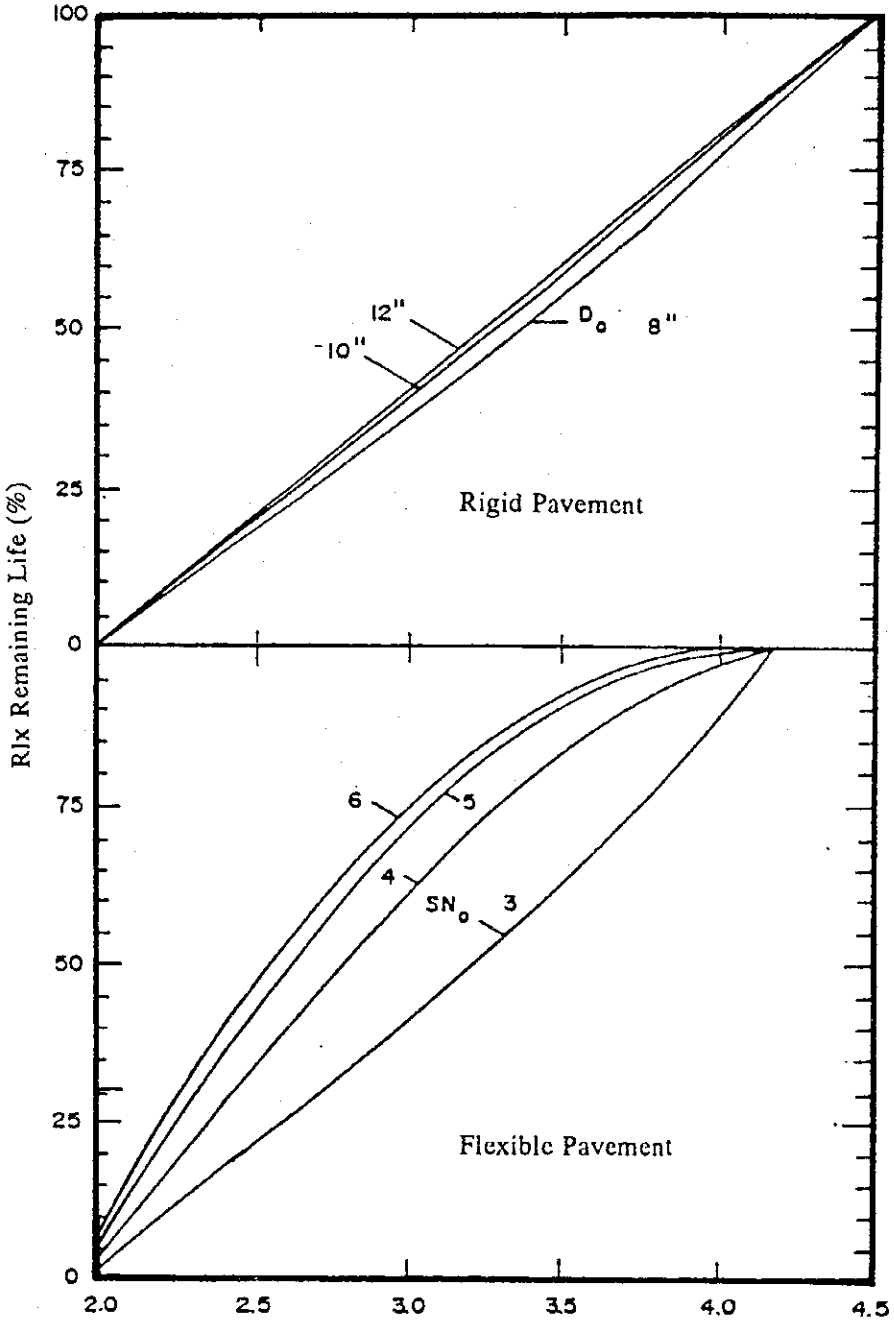


Figure 10A-3-9	Remaining life estimated based on present serviceability value and pavement cross section
EAST WEST AXIS	

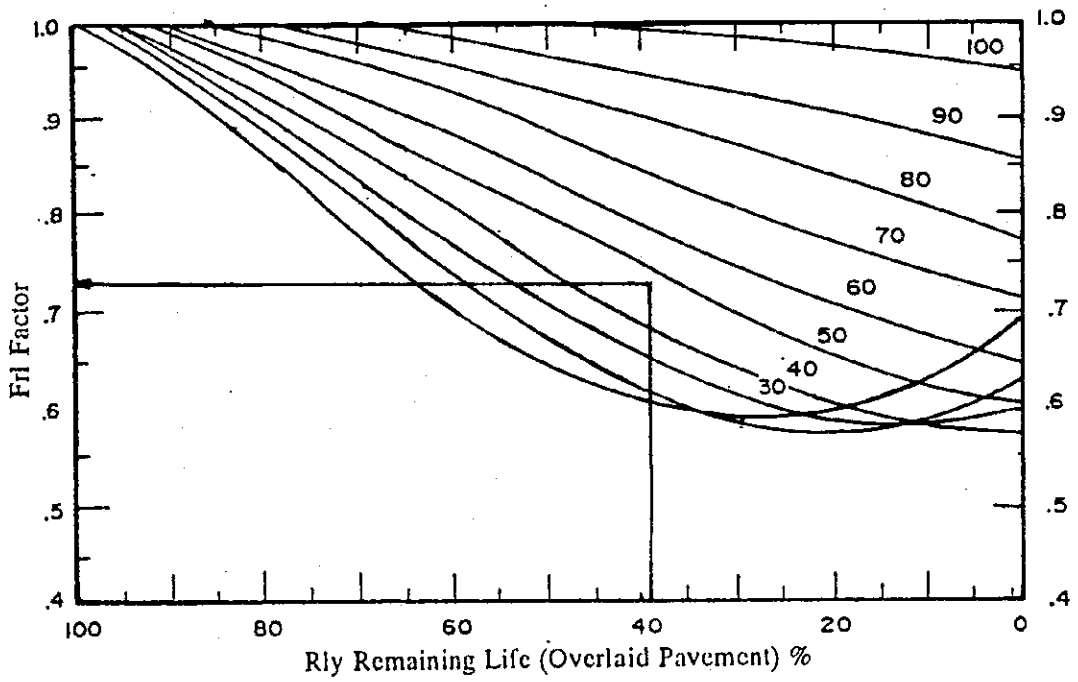


Figure 10A-3-10	**Remaining life factor as a function of remaining life of existing and overlaid pavements**
EAST WEST AXIS	

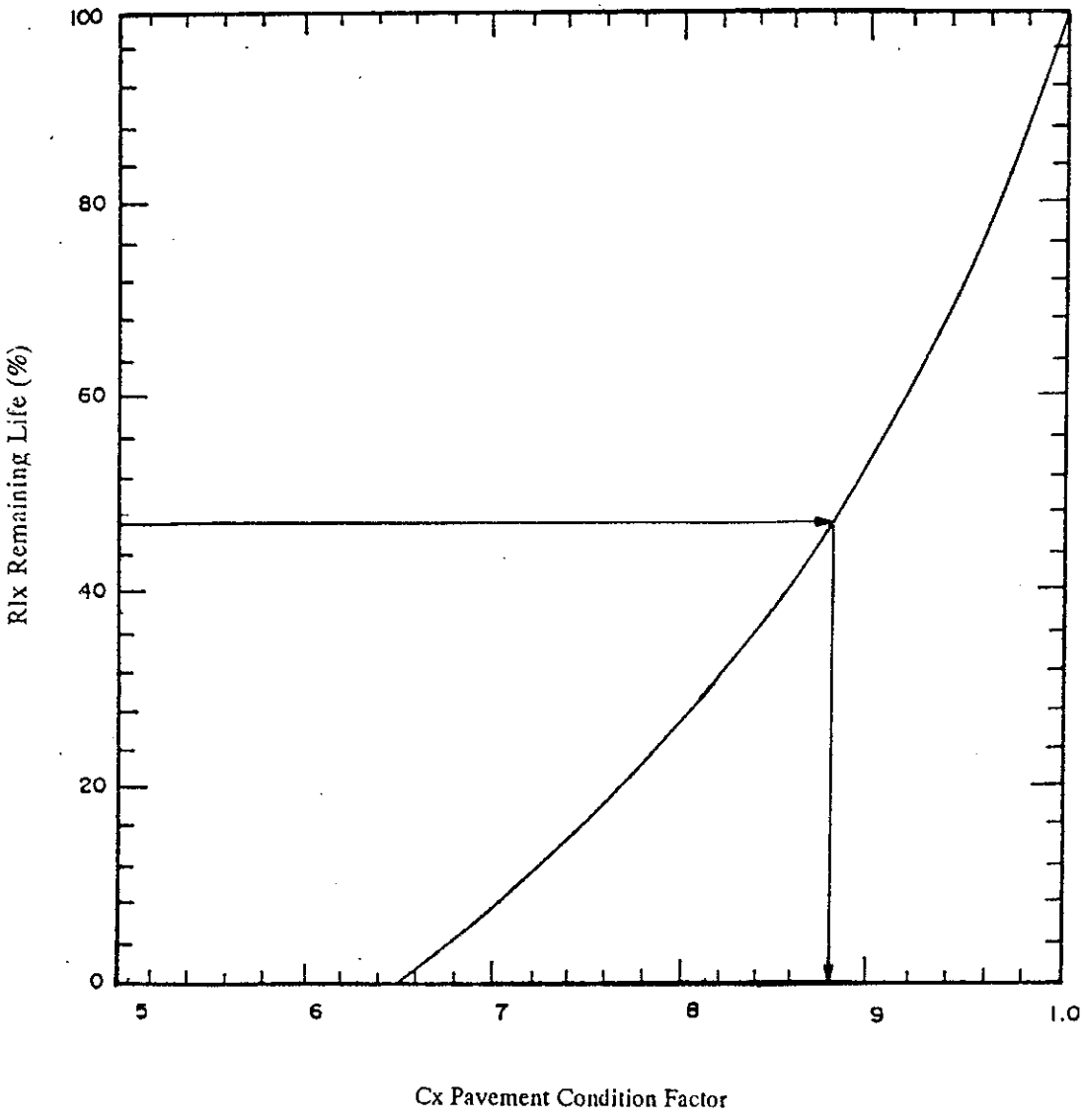


Figure 10A-3-11	**Remaining life estimated predicted from pavement condition factor**
EAST WEST AXIS	

10A-4 SUMMARY OF STRUCTURES

Table 10A-4 (1) Summary of Design Features of Bridges and Viaducts

EW-Axis Throughway

Name	Station	Length (m)	Width (m)	Super Structure Type	Sub Structure Type	Span Arrengement
Bridge	0+960～ 1+099	139.0	2x16.25	PC-I	RC-D.PCP	17+3@35+17
Bridge	1+428～ 1+472	44.0	25.50	PC-I	RC-D.PCP	22+22
Bridge	3+370～ 3+655	285.0	2x12.75	PC-I	RC-D.PCP	5@35+40+2@35
Bridge	4+600～ 5+075	475.0	2x12.75	PC-I	RC-D.PCP	3@35+45+2@40+7@35
Bridge	5+225～ 5+258	33.0	25.50	PC-I	RC-D.PCP	33
Bridge	5+480～ 5+810	330.0	2x12.75	PC-I	RC-D.PCP	2@30+2@35+30+35+30+3@35
Bridge	6+040～ 6+083	43.0	25.50	PC-I	RC-D.PCP	10+23+10
Bridge	6+250～ 6+550	300.0	2x12.75	PC-I	RC-D.PCP	10@30
Bridge	6+970～ 7+255	285.0	2x12.75	PC-I	RC-D.PCP	3@40+45+3@40
Bridge	8+215～ 8+490	275.0	2x12.75	PC-I	RC-D.PCP	4@30+35+4@30
Bridge	9+320～ 9+802	482.0	25.50	PC-I	RC-D.PCP	10@35+40+27+30+35
Bridge	9+802～ 9+857	55.0	25.50	St-I	RC-D.PCP	55
Bridge	9+857～10+137	280.0	25.50	PC-I	RC-D.PCP	8@35
Bridge	10+405～10+710	305.0	2x12.75	PC-U	RC-B.PCP	4@35+25+4@35
Bridge	11+170～11+455	285.0	2x12.75	PC-U	RC-B.PCP	2@30+35+40+5@30
Bridge	11+744～11+766	22.0	25.50	PC-I	RC-B.PCP	22
Viaduct	11+958～12+253	295.0	18.50	PC-U	RC-CCP	5@35+4@30
Viaduct	12+253～12+418	165.0	18.50	St-B	RC-CCP	55+60+50
Viaduct	12+418～12+748	330.0	18.50	PC-U	RC-CCP	3@35+4@30+3@35
Viaduct	12+748～13+435	687.0	18.50	PC-U	RC-B.PCP	12@35+5@30+3@29+30
Viaduct	13+435～14+693	1258.0	18.50	PC-U	RC-B.PCP	2@29+5@30+14@35+4@30+2@40+8@35+2@40
Viaduct	14+693～15+908	1215.0	18.50	PC-U	RC-B.PCP	24@35+3@30+40+7@35
Viaduct	16+640～18+450	1810.0	18.50	PC-I	RC-D.PCP	7@35+40+3@30+41@35
Viaduct	18+450～20+633	2183.0	18.50	PC-I	RC-D.PCP	60@35+40+43
Viaduct	20+633～22+685	2052.0	18.50	PC-I	RC-D.PCP	56@35+30+2@31
Viaduct	22+685～24+450	1765.0	18.50	PC-I	RC-D.PCP	3@35+3@30+42@35+30+2@35
Bridge	25+767～26+057	290.0	2x12.75	PC-I	RC-D.PCP	3@30+35+40+35+3@30
Bridge	28+313～28+488	175.0	2x12.75	PC-I	RC-D.PCP	5@35
Bridge	28+720～28+748	28.0	2x12.75	PC-I	RC-D.PCP	28
Bridge	29+435～29+680	245.0	2x12.75	PC-I	RC-D.PCP	7@35
Bridge	30+610～31+150	540.0	2x12.75	PC-I	RC-D.PCP	25+30+2@37+30+7@35+2@40+30+26

PC-I	12,081.0m
PC-U	4,375.0m
St-I	55.0m
St-B	165.0m
Total	16,676.0m

Table 10A-4 (2) Summary of Design Features of Bridges and Viaducts

EW-Axis Frontage Road

Name	Station	Length (m)	Width (m)	Super Structure Type	Sub Structure Type	Span Arrengement
U-Turn Flyover	W-JORR(North)	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
U-Turn Flyover	W-JORR(South)	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Bridge	1+428～ 1+472	44.0	2x10.50	PC-I	RC-D.PCP	2@22
U-Turn Flyover	1+610	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	1+900	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	2+100	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	2+450	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	2.800	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	3+150	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Bridge	3+490～ 3+520	30.0	2x10.50	PC-I	RC-D.PCP	30
Bridge	3+538～ 3+598	60.0	2x10.50	PC-I	RC-D.PCP	15+30+15
Pedestrian Bridge	3+900	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	4+150	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	4+350	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Bridge	5+225～ 5+258	33.0	2x10.5	PC-I	RC-D.PCP	33
Pedestrian Bridge	5+300	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	5+970	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Bridge	6+040～ 6+083	43.0	2x10.50	PC-I	RC-D.PCP	10+23+10
Pedestrian Bridge	6+800	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	7+500	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	7+750	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	8+000	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	8+750	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	9+030	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Bridge	9+641～ 9+673	32.0	2x10.50	PC-I	RC-D.PCP	32
Bridge	9+728～ 9+786	58.0	2x10.5	PC-I	RC-D.PCP	14+30+14
Pedestrian Bridge	10+270	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	11+000	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	11+720	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Bridge	11+744～11+766	22.0	2x10.5	PC-I	RC-B.PCP	22
Bridge	13+940～13+970	30.0	2x13.5	PC-I	RC-B.PCP	30
Bridge	14+265～14+300	35.0	2x13.5	PC-I	RC-B.PCP	35
Bridge	15+130～15+145	15.0	2x13.5	PC-I	RC-B.PCP	15
Bridge	17+366～17+394	28.0	2x13.5	PC-I	RC-D.PCP	28
Bridge	20+633～20+664	31.0	2x13.5	PC-I	RC-D.PCP	31
Bridge	22+440～22+455	15.0	2x13.5	PC-I	RC-D.PCP	15
Pedestrian Bridge	24+750	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	25+100	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	25+430	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	26+430	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	26+800	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Pedestrian Bridge	27+150	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
U-Turn Flyover	27+500	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
Bridge	28+720～28+748	28.0	2x10.50	PC-I	RC-D.PCP	28
Pedestrian Bridge	28+950	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Pedestrian Bridge	30+230	62.0	2.00	PC-I	RC-D.PCP	14+17+17+14
Bridge	30+610～30+797	187.0	2x10.50	PC-I	RC-D.PCP	25+30+2@37+30+28
U-Turn Flyover	W-JORR(North)	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
U-Turn Flyover	W-JORR(South)	59.4	12.00	PC-I	RC-D.PCP	13.2+33+13.2
	Bridge	16 Locations	691m			
	U-Turn Flyover	13 Locations				
	Pedestrian Bridge	20 Locations				

Table 10A-4 (3) Summary of Design Features of Bridges and Viaducts

EW－Axis Ramp Way

Name	Station	Length (m)	Width (m)	Super Structure Type	Sub Structure Type	Span Arrengement
Latumeten I.C Ramp	0+259～ 0+554	295.0	8.50	PC-I	RC-D.PCP	2@30+5@35+2@30
Latumeten I.C Ramp	0+259～ 0+699	145.0	8.50	St-B	RC-D.PCP	50+45+50
Latumeten I.C Ramp	0+699～ 1+030	331.0	8.50	PC-I	RC-D.PCP	6@35+3@30+31
Mangga Besar I.C C-Ramp	0+208～ 0+443	235.0	7.00	PC-U	RC-CCP	5@35+2@30
Mangga Besar I.C C-Ramp	0+443～ 0+532	89.0	7.00	St-B	RC-CCP	55+34
Mangga Besar I.C C-Ramp	0+532～ 0+678	146.0	7.00	St-B	RC-CCP	50+46+50
Mangga Besar I.C D-Ramp	0+020～ 0+280	260.0	7.00	PC-U	RC-CCP	35+4@30+3@35
Mangga Besar I.C D-Ramp	0+280～ 0+368	88.0	7.00	St-B	RC-CCP	48+40
Mangga On Ramp TYPE-2	12+500	210.0	7.00	PC-U	RC-CCP	6@35
Mangga Off Ramp TYPE-2	12+500	200.0	7.00	PC-U	RC-CCP	2@30+4@35
Gunung On Ramp TYPE-2	13+900	210.0	7.00	PC-U	RC-B.PCP	6@35
Gunung Off Ramp TYPE-2	13+900	200.0	7.00	PC-U	RC-B.PCP	2@30+4@35
Gunung Sahari Ramp	0+085～ 0+295	210.0	8.50	PC-U	RC-B.PCP	6@35
Gunung Sahari Ramp	0+295～ 0+450	155.0	8.50	St-B	RC-B.PCP	50+60+45
Gunung Sahari Ramp	0+450～ 0+660	210.0	8.50	PC-U	RC-B.PCP	6@35
Gunung On Ramp TYPE-2	14+500	210.0	7.00	PC-U	RC-B.PCP	6@35
Gunung Off Ramp TYPE-2	14+500	200.0	7.00	PC-U	RC-B.PCP	2@30+4@35
Kemayor On Ramp TYPE-2	15+400	210.0	7.00	PC-U	RC-B.PCP	6@35
Kemayor Off Ramp TYPE-2	15+400	200.0	7.00	PC-U	RC-B.PCP	2@30+4@35
Kemayor On Ramp TYPE-2	17+200	210.0	7.00	PC-I	RC-D.PCP	6@35
Kemayor Off Ramp TYPE-2	17+200	200.0	7.00	PC-I	RC-D.PCP	2@30+4@35
Sunter On Ramp TYPE-2	20+150	210.0	7.00	PC-I	RC-D.PCP	6@35
Sunter Off Ramp TYPE-2	20+150	200.0	7.00	PC-I	RC-D.PCP	2@30+4@35
Sunter On Ramp TYPE-2	21+000	210.0	7.00	PC-I	RC-D.PCP	6@35
Sunter Off Ramp TYPE-2	21+000	200.0	7.00	PC-I	RC-D.PCP	2@30+4@35
Kelapa On Ramp TYPE-2	24+000	210.0	7.00	PC-I	RC-D.PCP	6@35
Keiapa Off Ramp TYPE-2	24+000	200.0	7.00	PC-I	RC-D.PCP	2@30+4@35

PC-I	2,266.0m
PC-U	2,555.0m
St-B	623.0m
Total	5,444.0m

Table 10A-4 (4) Summary of Design Features of Bridges and Viaducts

NS-Axis Throughway

Name	Station	Length (m)	Width (m)	Super Structure Type	Sub Structure Type	Span Arrengement
VIADUCT	1+118～ 1+293	175.0	18.50	PC-U	RC-CCP	5@35
VIADUCT	1+293～ 1+348	55.0	18.50	St-B	RC-CCP	55
VIADUCT	1+348～ 1+765	417.0	2x12.75	St-I	St-CCP	32+50+35+6@50
VIADUCT	1+765～ 1+990	225.0	2x 9.25	PC-U (R)	RC-CCP	4@30+3@35
VIADUCT	1+990～ 3+110	1120.0	2x 9.25	PC-U (R)	RC-B.PCP	32@35
VIADUCT	3+110～ 4+670	1560.0	18.50	PC-U	RC-B.PCP	42@35+3@30
VIADUCT (SOUTH BOUND)	4+670～ 5+365	695.0	9.25	PC-U	RC-B.PCP	13@35+30+6@35
VIADUCT (SOUTH BOUND)	5+365～ 5+560	195.0	12.75	PC-U	RC-B.PCP	4@35+25+30
VIADUCT (NORTH BOUND)	4+670～ 5+560	890.0	9.25	PC-U	RC-B.PCP	23@35+27+28+30
VIADUCT	5+560～ 7+133	1573.0	25.50	PC-I	RC-D.PCP	20@35+3@30+35+4@30+12@35+26+45+32+35+2@35
VIADUCT	7+133～ 7+930	797.0	25.50	PC-I	RC-D.PCP	4@35+45+5@35+45+42+10@35
VIADUCT	7+930～ 8+510	580.0	25.50	PC-I	RC-D.PCP	7@35+2@45+7@35
VIADUCT	8+510～ 8+710	200.0	25.50	St-B	RC-D.PCP	60+80+60
VIADUCT	8+710～ 9+480	770.0	25.50	PC-I	RC-D.PCP	22@35
VIADUCT	9+480～11+453	1973.0	25.50	PC-U	RC-B.PCP	11@35+3@30+2@35+30+18@35+33+21@35
VIADUCT	11+453～12+058	605.0	2x12.75	PC-U	RC-B.PCP	17@35.6
VIADUCT	12+058～12+520	462.0	25.50	PC-U	RC-B.PCP	6@35+38+2@37+4@35
VIADUCT	12+520～14+120	1600.0	2x12.75	St-I (R)	St-B.PCP	32@50
VIADUCT	14+120～17+470	3350.0	2x12.75	St-I (R)	St-D.PCP	67@50
VIADUCT	17+470～17+995	525.0	2x12.75	PC-I	RC-D.PCP	15@35

VIADUCT	PC-I	4,245m
	PC-U	7,010m
	St-I	5,367m
	St-B	255m
	Total	16,877m

Table 10A-4 (5) Summary of Design Features of Bridges and Viaducts

NS－Axis Ramp Way

Name	Station	Length (m)	Width (m)	Super Structure Type	Sub Structure Type	Span Arrengement
Mangga Besar I.C A-Ramp	0+150～ 0+265	115.0	7.0	St-B	RC-CCP	58+57
Mangga Besar I.C A-Ramp	0+265～ 0+460	195.0	7.0	PC-U	RC-CCP	3@30+3@35
Mangga Besar I.C B-Ramp	0+252～ 0+307	55.0	7.0	St-B	RC-CCP	55
Mangga Besar I.C B-Ramp	0+307～ 0+435	128.0	7.0	St-B	RC-CCP	35+53+40
Mangga Besar I.C B-Ramp	0+435～ 0+548	113.0	7.0	St-B	RC-CCP	37+39+37
Mangga Besar I.C B-Ramp	0+548～ 0+708	160.0	7.0	St-B	RC-CCP	50+60+50
Mangga Besar I.C B-Ramp	0+708～ 0+743	35.0	7.0	PC-U	RC-CCP	35
Sukarjo On Ramp TYPE-2		210.0	7.0	PC-U	RC-B.PCP	6@35
Sukarjo Off Ramp TYPE-2		200.0	7.0	PC-U	RC-B.PCP	2@30+4@35
Abdul Mu On Ramp TYPE-2		210.0	7.0	PC-U	RC-B.PCP	6@35
Abdul Mu Off Ramp TYPE-2		200.0	7.0	PC-U	RC-B.PCP	2@30+4@35
Kubon Sirih I.C On Ramp		317.0	7.0	PC-U	RC-B.PCP	3@35+40+3@35+32+35
Kubon Sirih I.C Off Ramp	0+137～ 0+793	658.0	7.0	PC-U	RC-B.PCP	33+2@30+8@35+40+7@35
Kubon Kacang IC On Ramp		735.0	7.0	PC-I	RC-D.PCP	3@35+40+30+12@35+33+20+3@25+30
Kubon Kacang IC Off Ramp	0+197～ 0+310	113.0	7.0	PC-I	RC-D.PCP	3@30+23
Kubon Kacang IC Off Ramp	0+310～ 0+490	180.0	7.0	St-B	RC-D.PCP	55+70+55
Kubon Kacang IC Off Ramp	0+490～ 1+120	630.0	7.0	PC-I	RC-D.PCP	13@35+30+40+3@35
Pal Merah On Ramp TYPE1		140.0	7.0	PC-I	RC-D.PCP	4@35
Pal Merah Off Ramp TYPE1		105.0	7.0	PC-I	RC-D.PCP	3@35
Senayan I.C On Ramp		400.0	7.0	PC-U	RC-B.PCP	3@35+5@25+30+4@35
Senayan I.C Off Ramp	0+347～ 0+452	105.0	7.0	PC-U	RC-B.PCP	30+3@25
Senayan I.C Off Ramp	0+452～ 0+647	195.0	7.0	St-B	RC-B.PCP	60+75+60
Senayan I.C Off Ramp	0+647～ 0+847	200.0	7.0	PC-U	RC-B.PCP	2@30+4@35
Senayan On Ramp TYPE-1		140.0	7.0	PC-U	RC-B.PCP	4@35
Senayan Off Ramp TYPE-1		105.0	7.0	PC-U	RC-B.PCP	3@35
Kemang On Ramp TYPE-2		210.0	7.0	St-I	RC-B.PCP	3@50+2@30
Kemang Off Ramp TYPE-2		370.0	7.0	St-I	RC-B.PCP	6@50+2@35
South JORR I.C A-Ramp	0+280～ 0+420	140.0	8.5	PC-I	RC-D.PCP	4@35
South JORR I.C A-Ramp	0+420～ 0+580	160.0	8.5	St-B	RC-D.PCP	2@80
South JORR I.C A-Ramp	0+580～ 0+708	128.0	8.5	PC-I	RC-D.PCP	28+30+2@35
South JORR I.C A-Ramp	0+708～ 1+030	322.0	17.0	PC-I	RC-D.PCP	3@30+6@35+22
South JORR I.C B-Ramp	0+448～ 0+518	70.0	8.5	PC-I	RC-D.PCP	2@35
South JORR I.C B-Ramp	0+518～ 0+672	154.0	8.5	St-B	RC-D.PCP	50+54+50
South JORR I.C B-Ramp	0+672～ 0+742	70.0	8.5	PC-I	RC-D.PCP	2@35
South JORR I.C C-Ramp	0+090～ 0+520	430.0	7.0	PC-I	RC-D.PCP	23+30+4@35+27+6@35
South JORR I.C C-Ramp	0+520～ 0+720	200.0	7.0	St-B	RC-D.PCP	60+80+60
South JORR I.C C-Ramp	0+720～ 1+070	350.0	7.0	PC-I	RC-D.PCP	2@30+25+45+30+35+2@30 2@23+35+14
South JORR I.C D-Ramp	0+350～ 0+450	100.0	7.0	St-B	RC-D.PCP	2@50
South JORR I.C D-Ramp	0+450～ 0+660	210.0	7.0	PC-I	RC-D.PCP	6@35
	PC-I	3,443.0m				
	PC-U	2,975.0m				
	St-I	580.0m				
	St-B	1,560.0m				
	Total	8,558.0m				

Table 10A-4 (6) List of Box Culverts

Project Road	Station	Type	Width x Height (m)	Length (m)	Remarks
N-S Axis	0+920～ 1+118	Double	6.4x2.8	198.0	Kali Ciliwung
	3+185～ 3+250	Double	6.4x2.8	80.0	Kali Ciliwung
	3+580～ 3+670	Single	8.0x4.0	90.0	Kali Krukut
	Kebon Sirih I.C	Double	7.7x3.6	450.0	Kali Cideng
E-W Axis	0+895	Single	7.0x6.0	8.0	Ramp
	1+155	Single	7.0x6.0	8.0	Ramp
	23+070	Single	6.0x2.5	10.0	Drainage
	23+850	Single	6.0x2.5	50.0	Drainage
	26+340	Single	4.0x2.0	70.0	Drainage
	27+025	Single	8.0x2.5	70.0	Drainage
	27+545	Single	8.0x2.5	70.0	Kali Cakung

W	7.7x3.6	1 Location	450.0m
w	6.4x2.8	2 Locations	278.0m
	8.0x4.0	1 Location	90.0m
	8.0x2.5	2 Locations	140.0m
	7.0x6.0	2 Locations	16.0m
	6.0x2.5	2 Locations	60.0m
	4.0x2.0	1 Location	70.0m