APPENDIX 7-2-3

SUBSOIL INVESTIGATION WORK AT THE METRO MANILA OUTER MAJOR ROAD PROJECT
FINAL BOREHOLE LOG AND SUMMARY OF TEST RESULTS (~~TEST PIT~~/AUGER BORING)

SAMPLE NUMBER	DEPTH METERS	LOG SYMBOL	DESCRIPTION OF MATERIAL	CLASSIFICATION	NATURAL MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SIEVE ANALYSIS SIEVE SIZE 4	10	40	100	200	MOIST. DENS. RELATION MDD kg/cm²	OMC %	CBR @ 95% MDD	FIELD DENSITY kg/cm²	%
AH-16 DATE: 4 Nov. 1982 STA: ____ DEPTH, M: 0.35 GRD. ELEV. ____ WATER TABLE: ____ DATE: ____ ELEV. ____ GAGED: ____																	
S-1	0.00		SILTY SAND, WITH TRACES OF GRAVEL, GRAYISH BLACK, WET, NON PLASTIC.	A-4 (SM)	33		NP	98	86	53	42	37					
	0.50		HARD STRATA														
	1.00																
	1.50																
AH-17 DATE: 4 Nov. 1982 STA: ____ DEPTH, M: 1.50 GRD. ELEV. ____ WATER TABLE: ____ DATE: ____ ELEV. ____ GAGED: ____																	
S-1	0.00		SILTY SAND, SOME GRAVEL, BROWN TO LIGHT BROWN, WET, HIGH PLASTICITY.	A-7-5(4) (MH)	21	76	43	84	55	45	42	35*					
S-2	0.50			A-7-5(11) (MH)	34	73	29	94	71	56	52	50*					
	1.00																
	1.50																
AH-18 DATE: 5 Nov. 1982 STA: ____ DEPTH, M: 1.50 GRD. ELEV. ____ WATER TABLE: ____ DATE: ____ ELEV. ____ GAGED: ____																	
S-1	0.00		INORGANIC CLAY, SOME SAND, DARK BROWN, WET, HIGH PLASTICITY.	A-7-6(20) (CH)	37	85	57	99	93	90	86	83*					
S-2	0.50		CLAYEY SAND, WITH TRACES OF GRAVEL, LIGHT YELLOWISH GRAY, WET, HIGH PLASTICITY.	A-7-5(7) (CH)	52	81	51	97	84	72	67	64*					
S-3	1.00			A-7-6(13) (CH)	47	83	55	91	79	60	53	50*					
	1.50																

* with Hydrometer Analysis

SHEET 6 OF 9

MRG/ELA

APPENDIX 7.2-3

SUBSOIL INVESTIGATION WORK AT THE METRO MANILA OUTER MAJOR ROAD PROJECT
FINAL BOREHOLE LOG AND SUMMARY OF TEST RESULTS (~~TEST PIT~~/AUGER BORING)

SAMPLE NUMBER	DEPTH METERS	LOG SYMBOL	DESCRIPTION OF MATERIAL	CLASSIFICATION	NATURAL MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SIEVE ANALYSIS — SIEVE SIZE 4	10	40	100	200	MOIST. DENS. RELATION MDD kg/cm²	OMC %	CBR @ 95% MDD	FIELD DENSITY kg/cm²	%
AH-19 DATE: 6 Nov. 1982 STA: ____ DEPTH, M: 1.10 GRD. ELEV. ____ WATER TABLE: ____ DATE: ____ ELEV. ____ GAGED: ____																	
S-1	0.00		SANDY CLAY, WITH TRACES OF GRAVEL, LIGHT YELLOWISH BROWN, WET, HIGH PLASTICITY.	A-7-6(1) (CH)	48	72	40	91	87	75	59	48*					
S-2	1.00			A-7-5(6) (CH)	48	68	38	92	81	68	47	38					
	1.10		ADOBE														
AH-20 DATE: 5 Nov. 1982 STA: ____ DEPTH, M: 0.30 GRD. ELEV. ____ WATER TABLE: ____ DATE: ____ ELEV. ____ GAGED: ____																	
S-1	0.00		SAND-SILT-GRAVEL MIXTURE, DARK BROWN, WET, NON PLASTIC.	A-1-b(0) (SM)	36			57	46	34	25	22					
	1.00		HARD STRATA														
	1.30																
A-2 DATE: 13 Nov. 1982 STA: ____ DEPTH, M: 1.15 GRD. ELEV. ____ WATER TABLE: ____ DATE: ____ ELEV. ____ GAGED: ____																	
S-1	0.00		CLAYEY SAND, WITH TRACES OF GRAVEL, BROWN TO BROWNISH GRAY, WET, HIGH PLASTICITY.	A-7-6(17) (CH)	20	66	40	94	87	72	68	64*					
S-2	1.00			A-7-5(16) (CH)	48	94	56	89	79	67	62	61*					
	1.30		HARD STRATA														

* with Hydrometer Analysis

APPENDIX 7.2-3

SUBSOIL INVESTIGATION WORK AT THE METRO MANILA OUTER MAJOR ROAD PROJECT
FINAL BOREHOLE LOG AND SUMMARY OF TEST RESULTS (~~TEST PIT~~/ AUGER BORING)

SAMPLE NUMBER	DEPTH METERS	LOG SYMBOL	DESCRIPTION OF MATERIAL	CLASSIFICATION	NATURAL MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SIEVE ANALYSIS SIEVE SIZE 4	10	40	100	200	MOIST. DENS. RELATION MDD kg/cm²	OMC %	CBR @ 95% MDD	FIELD DENSITY kg/cm²	%
A-3			DATE: 13 Nov. 1982 STA:		DEPTH, M: 1.35			GRD. ELEV.					WATER TABLE: ELEV.		DATE: GAGED:		
S-1	0.00		CLAYEY SAND, WITH TRACES OF GRAVEL, LIGHT BROWN, WET, HIGH PLASTICITY.	A-7-6(5) (CL)	44	54	29	98	94	78	67	60					
S-2	1.00		SAND, SOME SILT, WITH TRACES OF GRAVEL, GRAYISH BROWN, MOIST, NON PLASTIC.	A-1-b(0) (SP)	13		NP	90	63	32	23	20					
	1.50		BOULDERS														
A-4			DATE: 15 Nov. 1982 STA:		DEPTH, M: 1.30			GRD. ELEV.					WATER TABLE: ELEV.		DATE: GAGED:		
S-1	0.00		CLAY, SOME SAND, BROWNISH GRAY TO LIGHT YELLOWISH BROWN, MOIST, HIGH PLASTICITY.	A-7-6(20) (CH)	44	122	87	100	98	94	90	87*					
S-2	0.50			A-7-5(20) (CH)	42	89	54	100	99	95	90	86*					
	1.00		BOULDER														
A-5			DATE: 13 Nov. 1982 STA:		DEPTH, M: 1.25			GRD. ELEV.					WATER TABLE: ELEV. 1.20		DATE: GAGED: 11/13/82		
S-1	0.00		CLAYEY SAND, DARK BROWN, WET, HIGH PLASTICITY.	A-7-6(5) (CH)	35	53	30	99	93	77	67	60*					
S-2	1.00		SILT, SOME SAND, DARK BROWN, WET, HIGH PLASTICITY. ▽ W.T. 11/13/82	A-7-5(20) (MH)	46	70	36	100	99	95	85	79*					
	1.50																

* with Hydrometer Analysis

SHEET 8 OF 9 MRO/ELA

APPENDIX 7.2-3

SUBSOIL INVESTIGATION WORK AT THE METRO MANILA OUTER MAJOR ROAD PROJECT
FINAL BOREHOLE LOG AND SUMMARY OF TEST RESULTS (~~TEST PIT~~/AUGER BORING)

SAMPLE NUMBER	DEPTH METERS	LOG SYMBOL	DESCRIPTION OF MATERIAL	CLASSIFICATION	NATURAL MOISTURE CONTENT	LIQUID LIMIT	PLASTICITY INDEX	SIEVE ANALYSIS % PASSING SIEVE SIZE 4	10	40	100	200	MOIST. DENS. RELATION MDD kg/cm²	OMC %	CBR @ 95% MDD	FIELD DENSITY kg/cm²	%
A-1 DATE: 15 Nov. 1982 STA: DEPTH, M: 1.50 GRD. ELEV. WATER TABLE: DATE GAGED: ELEV.																	
S-1	0.00		CLAYEY SAND, WITH TRACES OF GRAVEL, DARK BROWN, WET TO MOIST, HIGH PLASTICITY.	A-7-6(17) (CH)	53	69	37	97	94	85	73	65*					
S-2	1.00			A-7-6(16) (CH)	20	60	36	94	86	72	67	63*					
1.50																	
DATE: STA: DEPTH, M: GRD. ELEV. WATER TABLE: DATE GAGED: ELEV.																	
0.00																	
1.00																	
1.50																	
DATE: STA: DEPTH, M: GRD. ELEV. WATER TABLE: DATE GAGED: ELEV.																	
0.00																	
1.00																	
1.50																	

* with Hydrometer Analysis

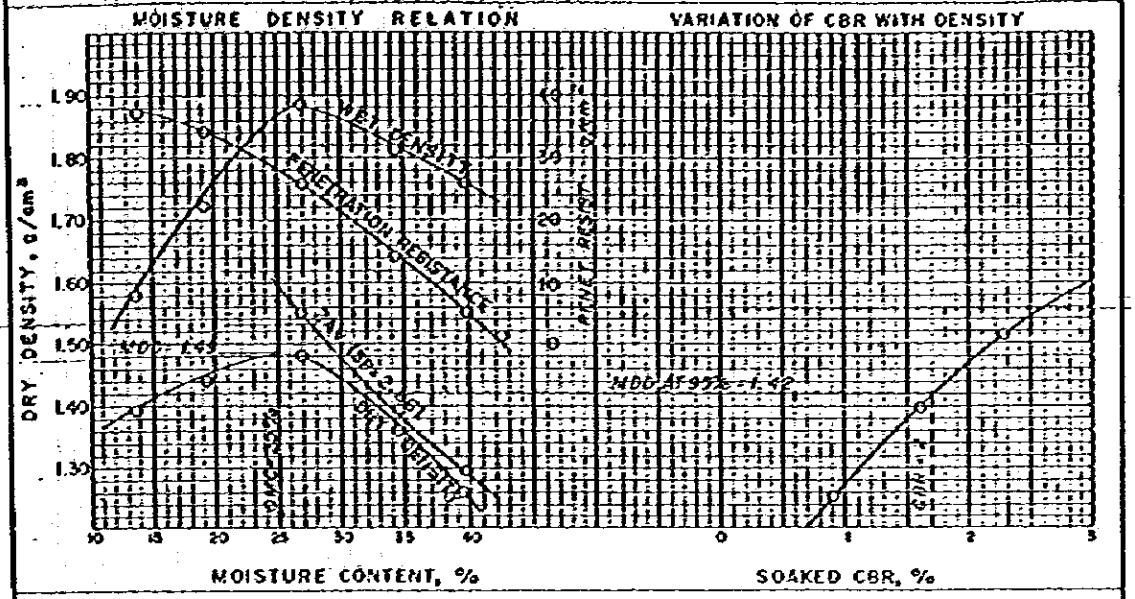
SHEET 2 OF 2

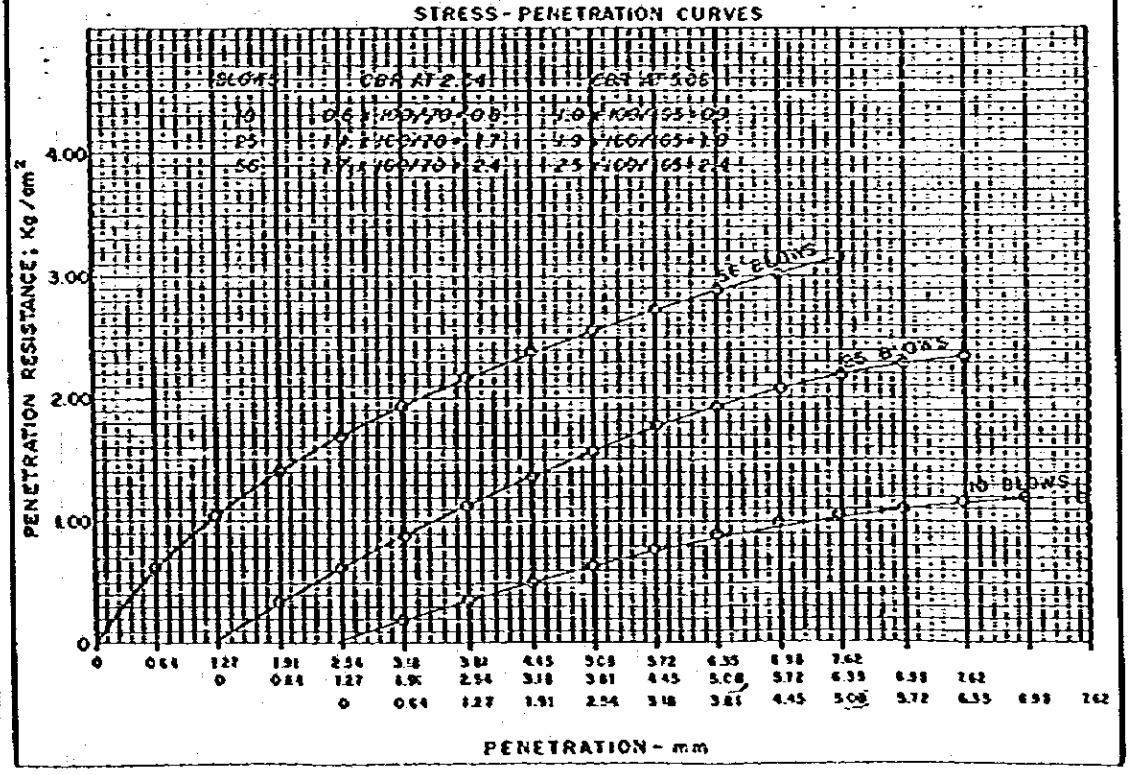
MRO/ELA

APPENDIX 7.2-4
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST

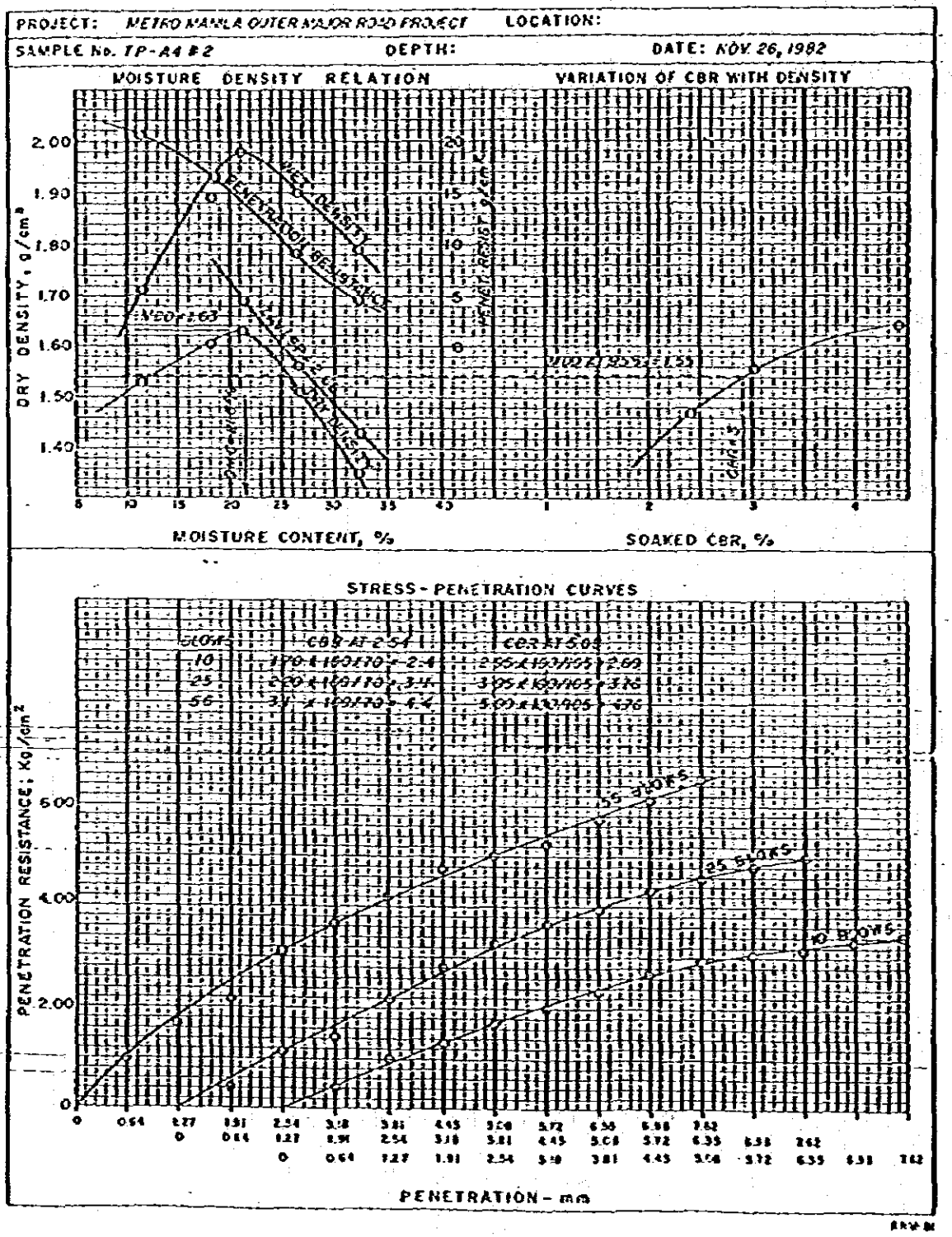
PROJECT: METRO MANILA OUTER MAJOR ROAD PROJECT LOCATION:

SAMPLE No. TP-1 # 2 DEPTH: DATE; NOV. 19, 1992





APPENDIX 7.2-4
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST

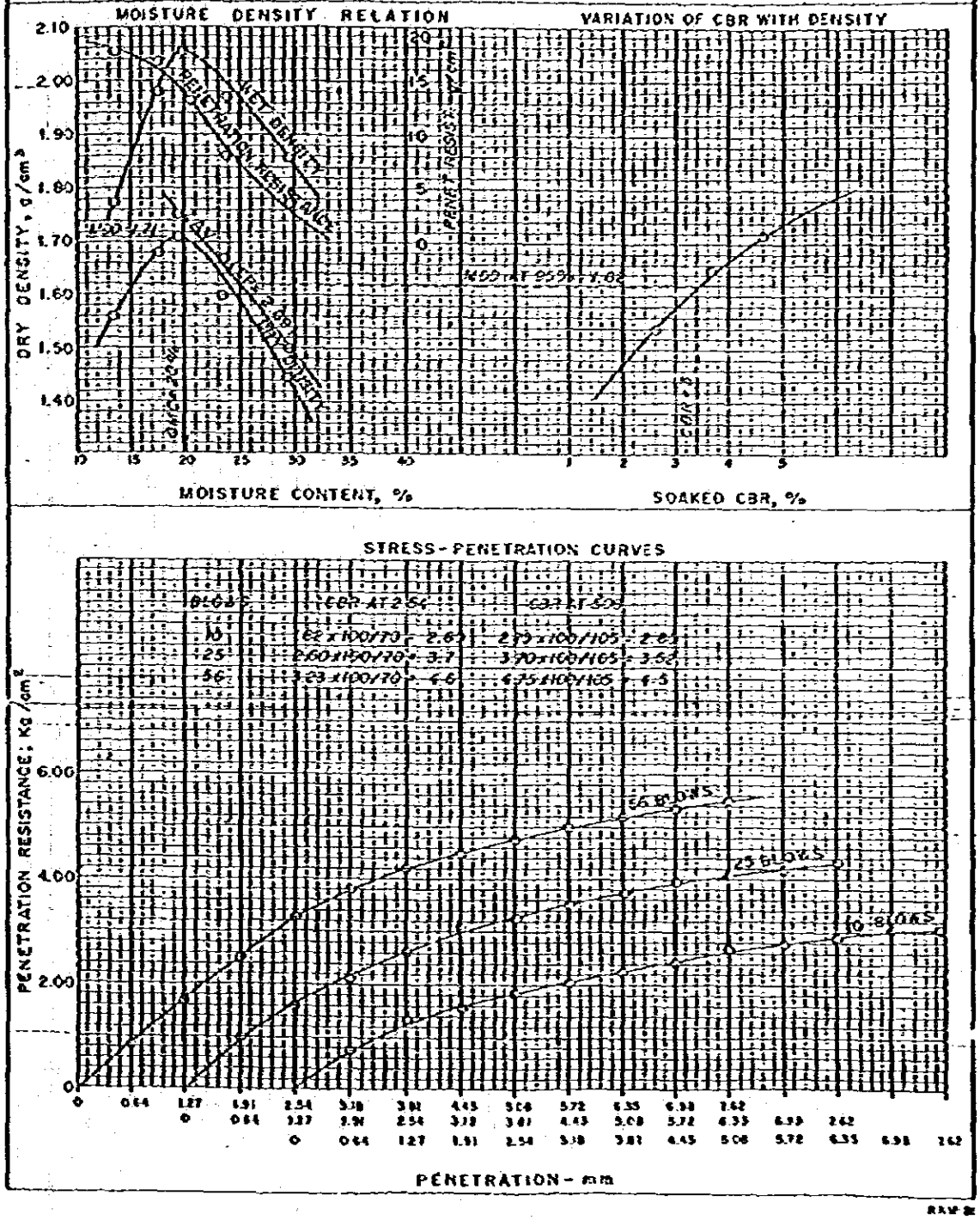


APPENDIX 7.2-4

MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST

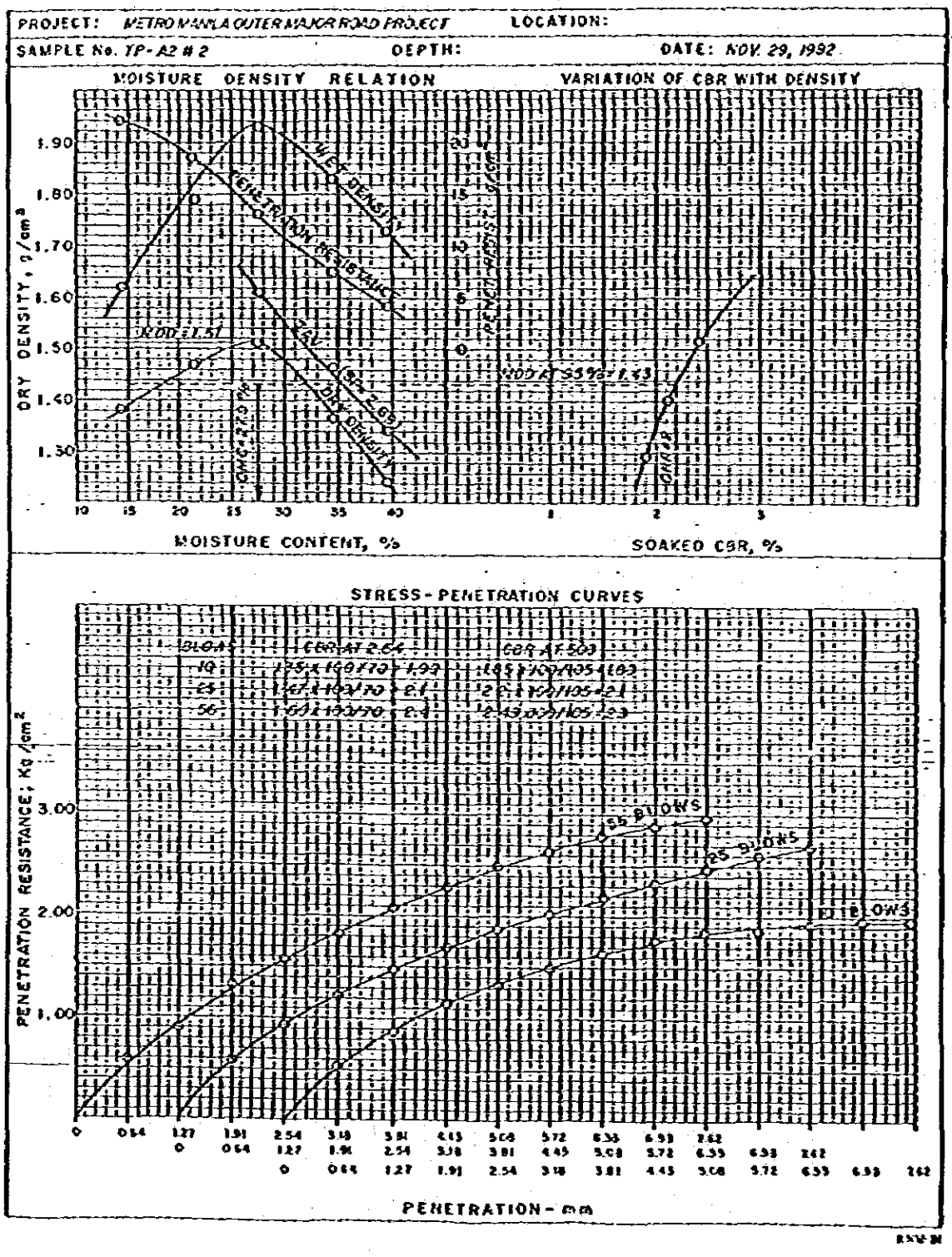
PROJECT: METRO MANILA OUTER MAJOR ROAD PROJECT LOCATION:

SAMPLE No. TP-A3 #2 DEPTH: DATE: NOV. 30, 1992

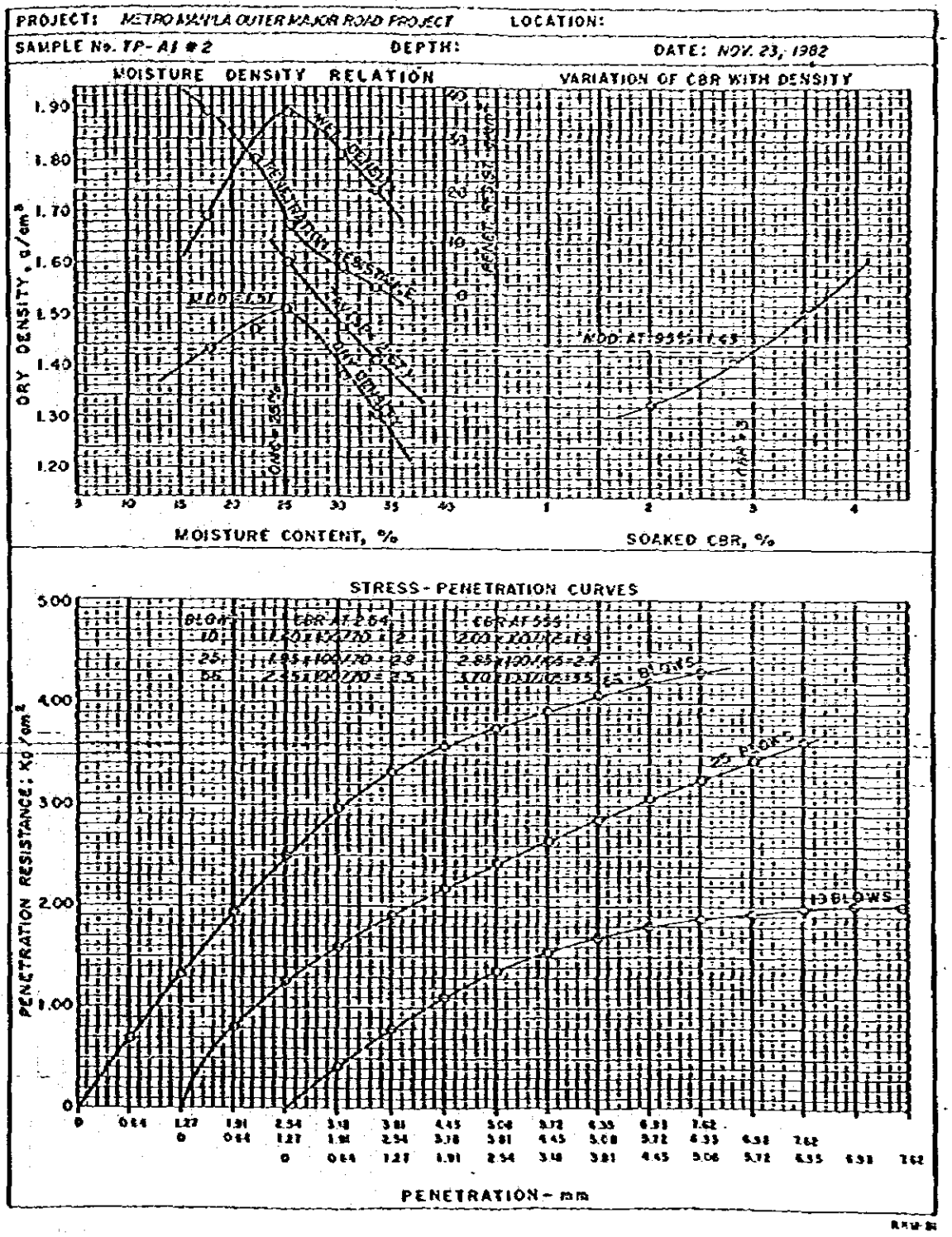


APPENDIX 7.2-4

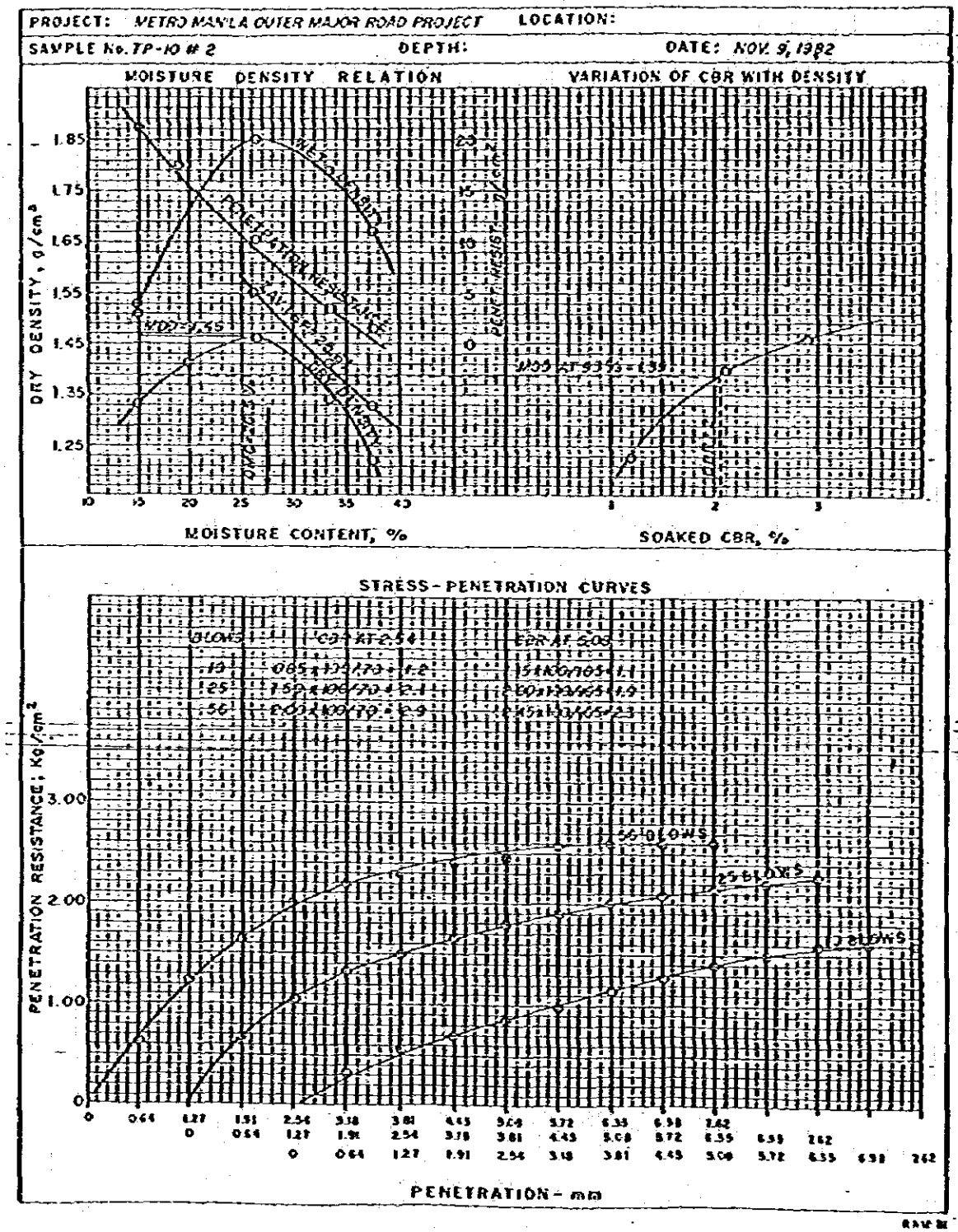
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST



APPENDIX 7.2-4
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST

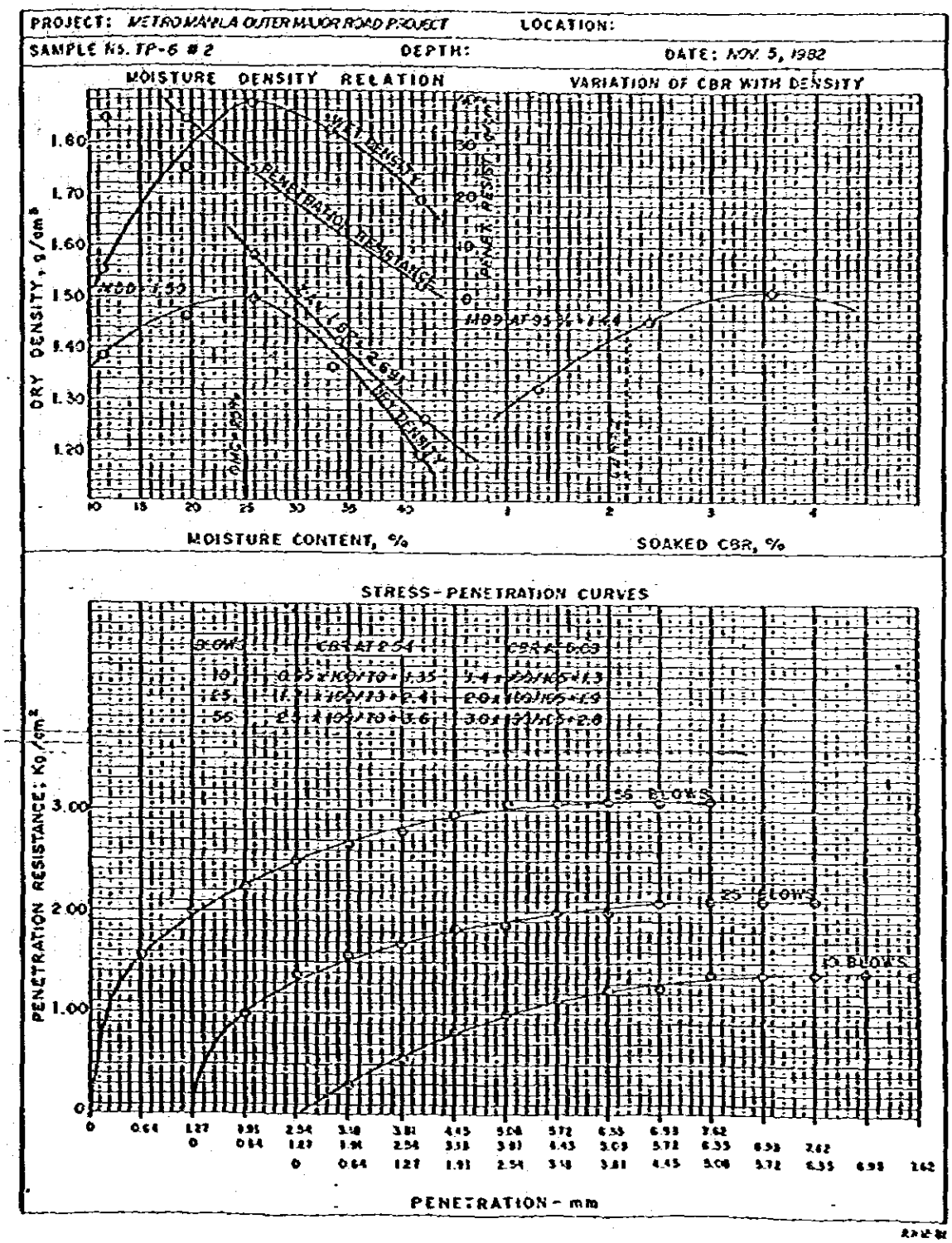


APPENDIX 7.2-4
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST



APPENDIX 7.2-4

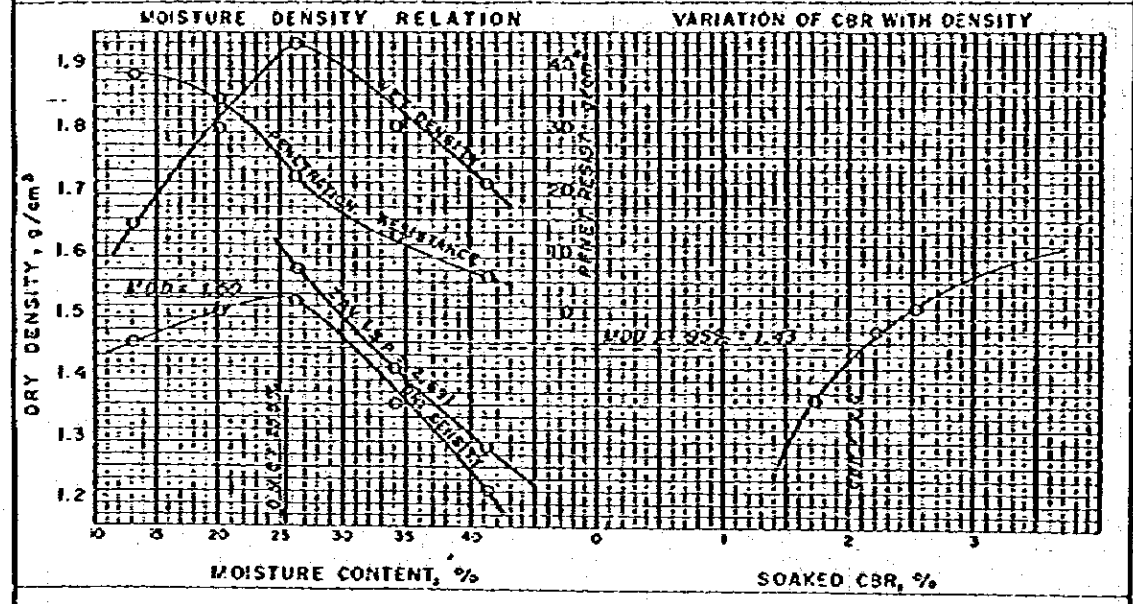
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST

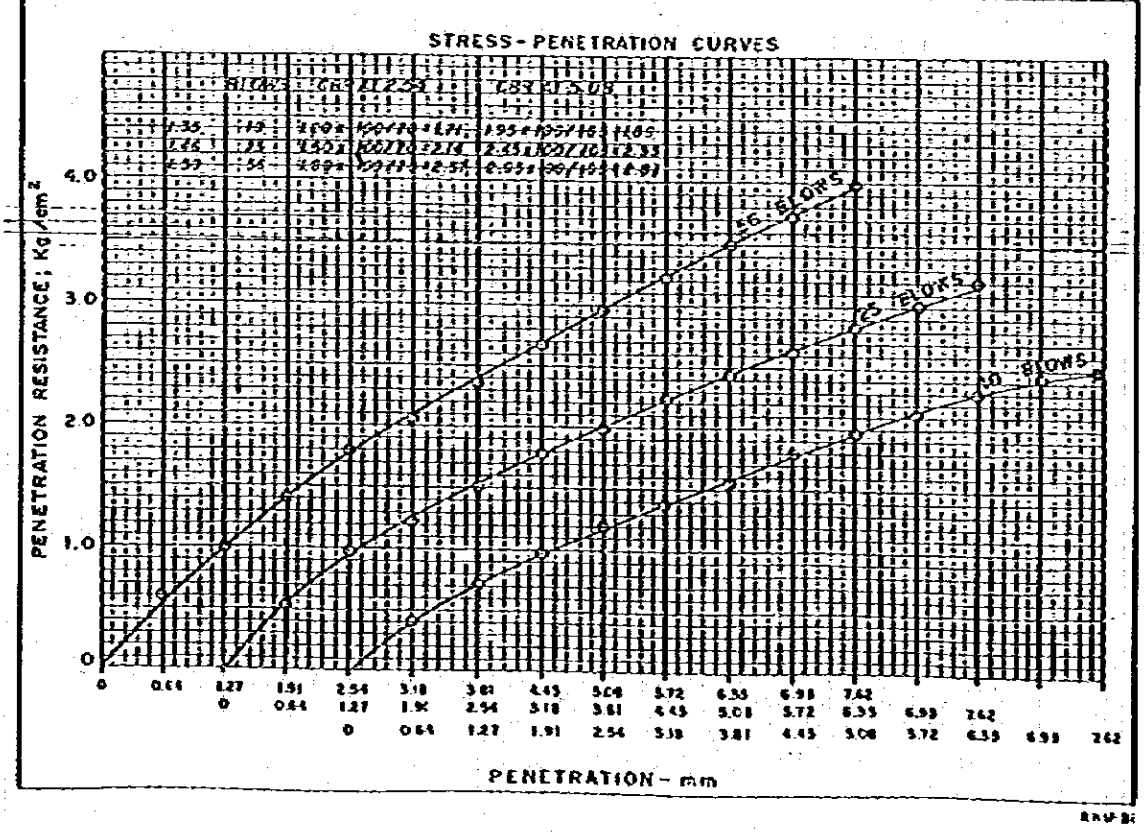


APPENDIX 7.2-4
MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST

PROJECT: METRO MANILA OUTER MAJOR ROAD PROJECT LOCATION:

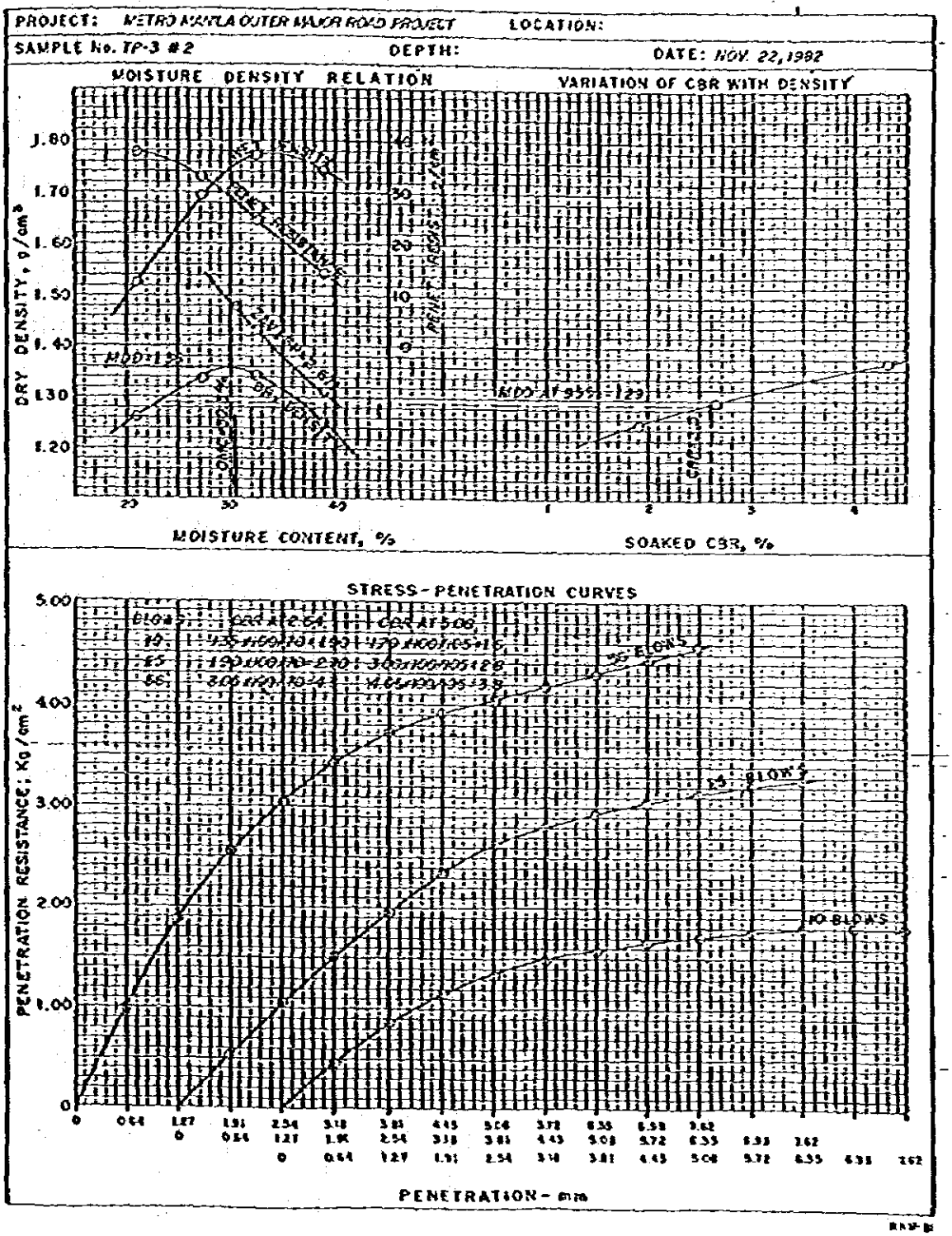
SAMPLE No. TP - 5 # 2 DEPTH: DATE: NOV. 11, 1982



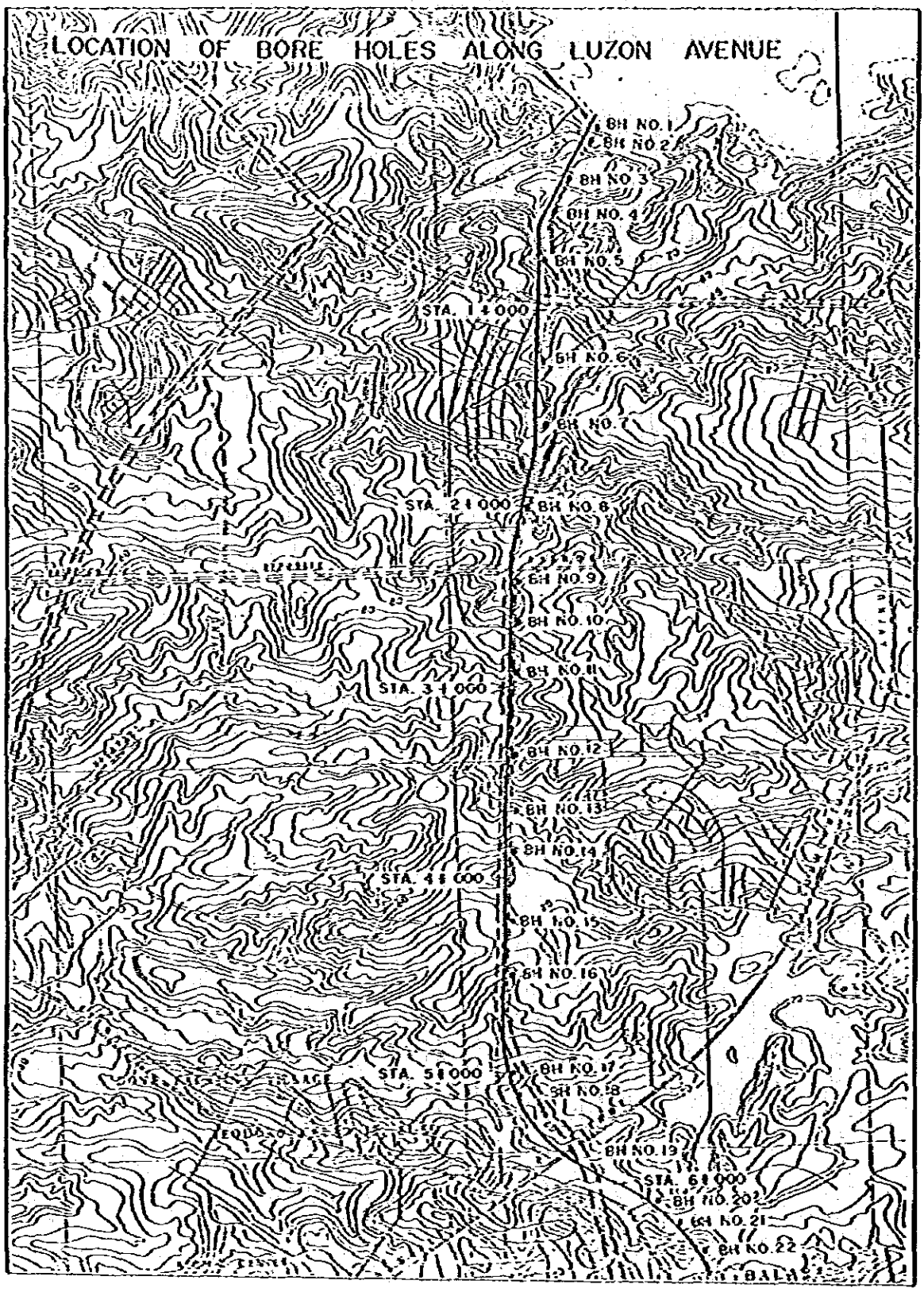


APPENDIX 7.2-4

MOISTURE DENSITY RELATION / CALIFORNIA BEARING RATIO TEST



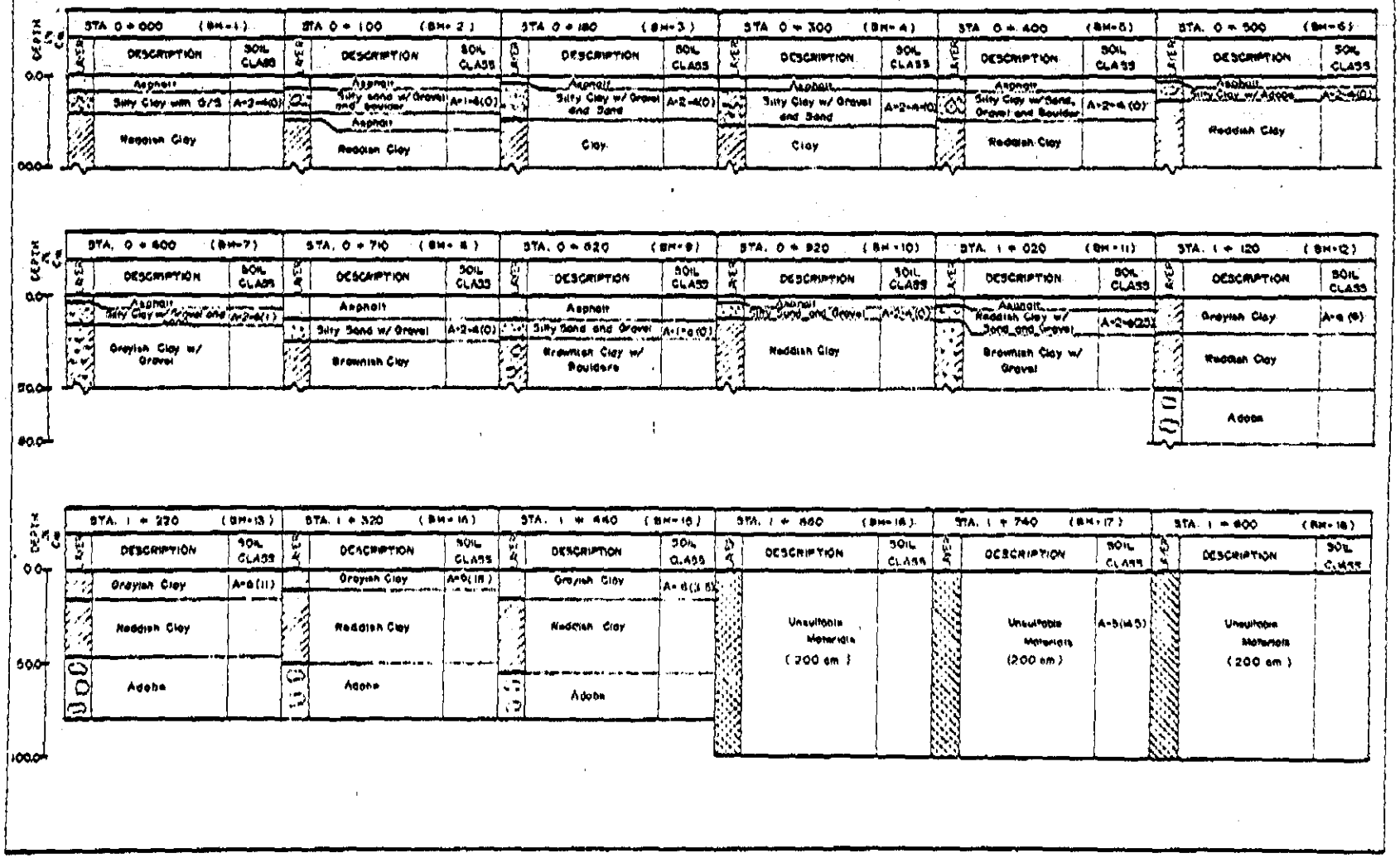
APPENDIX 7.2-5



BORING LOGS ALONG LUZON AVENUE
SCALE: HORIZONTAL 1:10,000
VERTICAL 1:100
ELEVATION IN METERS
75.0
70.0
65.0
60.0
55.0
50.0

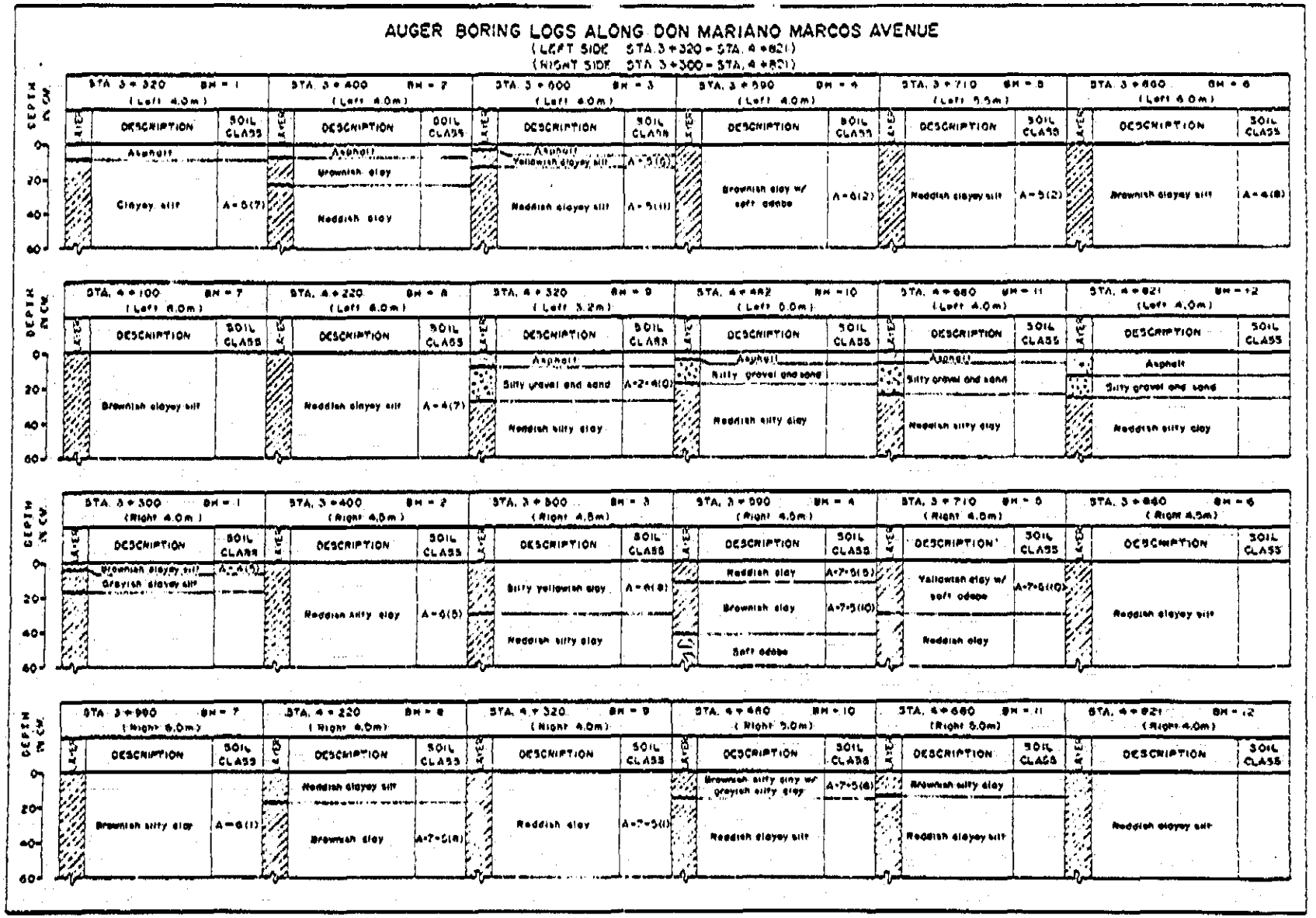
APPENDIX 7.2-6

AUGER BORING LOGS ALONG DON MARIANO MARCOS AVENUE
(STA. 0 + 000 - STA. 1 + 800)

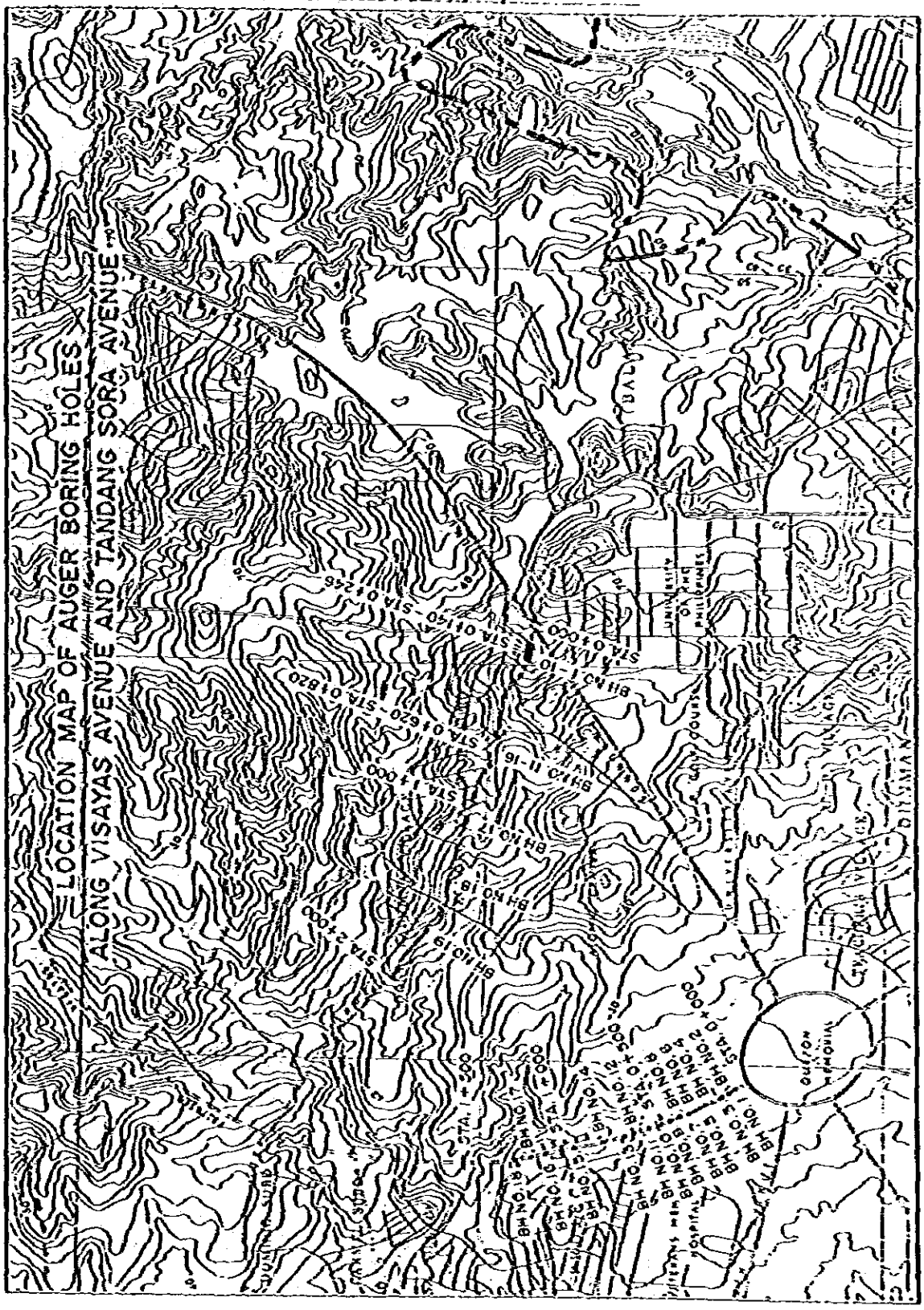


AUGER BORING LOGS ALONG DON MARIANO MARCOS AVENUE

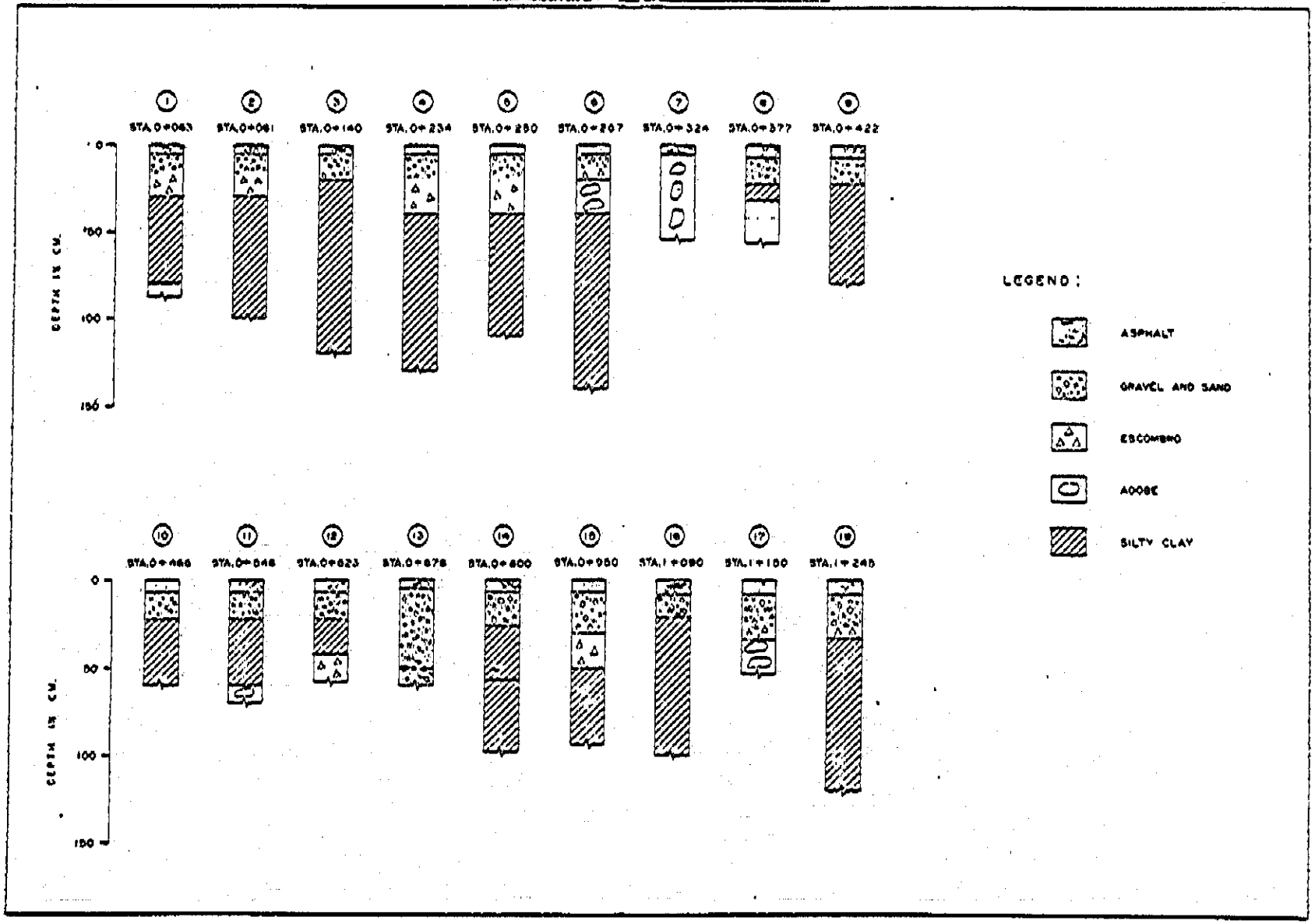
(LEFT SIDE STA. 3+320 – STA. 4+821)
(RIGHT SIDE STA. 3+300 – STA. 4+821)



APPENDIX 7.2-7



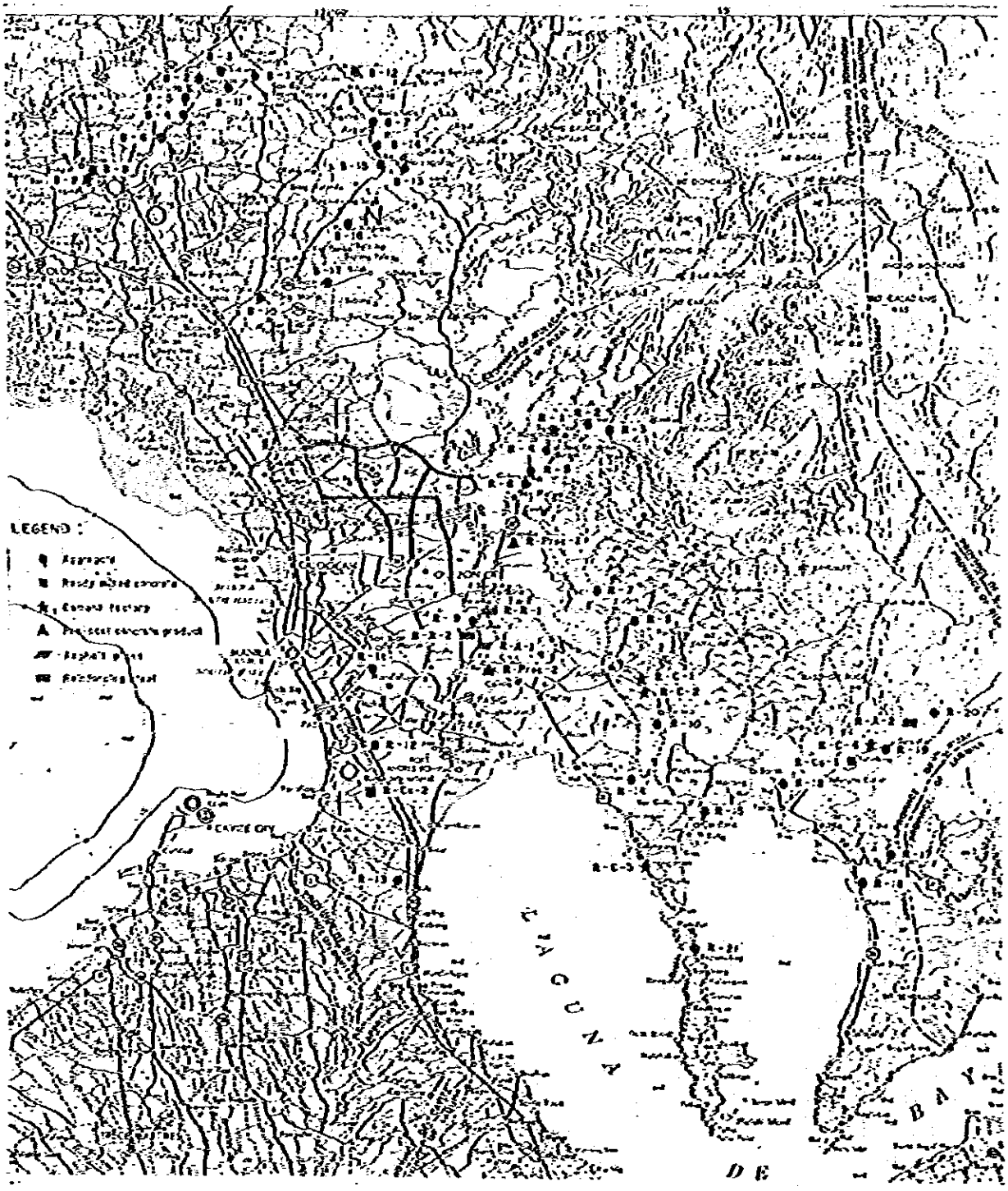
SOIL PROFILE ALONG VISAYAS AVE.



SOIL PROFILE ALONG TANDANG SORA AVENUE
LEGEND:
ASPHALT
SILT
SAND
SILTY GRAVEL AND SAND
CLAY
ADOBE
SILTY GRAVEL
SILTY CLAY
ESCOMBRO
UNSUITABLE
DEPTH IN CM
0
100
200

APPENDIX 7.2-8 MATERIALS SOURCES MAP

SCALE 1 : 250,000



MATERIALS SOURCES LIST

Source Number	Name of Source	Location	Kind of Materials and Item Number
	BULACAN PROVINCE		
B-1	Caingin Gravel Pit	Km. 54.50 right of Baliwag-San Rafael +0.90 Km. (Caingin, San Rafael)	Aggregate sub-base, aggregate base course (types "A" and "B") to concrete aggregate
B-2	Tanawan Gravel Pit	Km. 53.6 left of Plaridel-Bustos Road +2.5 Km. (Tanawan, Bustos)	Aggregate sub-base; aggregate base course (types "A" and "B")
B-3	Sabang Gravel Pit	Km. 53.05 right of CVR +0.7 Km. (Sabang, Baliwag)	Aggregate sub-base; aggregate base course (types "A" and "B") to concrete aggregate
B-4	San Pedro Gravel Pit	Km. 53.30 left of Plaridel-Bustos Old Road +1.2 Km. (San Pedro, Bustos)	Washed sand and washed gravel aggregates
B-5	Tiaong Gravel Pit	Km. 48.42 right of CVR +0.15 Km. (Sto. Cristo, Pulilan)	Aggregate sub-base; aggregate base course (types "A" and "B", G-I, S-I and 3/4)
B-6	Makinabang Gravel Pit	Km. 46.43 right of CVR +0.64 Km. (Makinabang, Baliwag)	Aggregate sub-base; aggregate base course (types "A" and "B") to concrete aggregate
B-7	Angat River	Km. 43.84 right of CVR +0.15 Km. (Sto. Cristo, Pulilan)	Washed sand

MATERIALS SOURCES LIST

Source Number	Name of Source	Location	Kind of Materials and Item Number
B-8	Longos Quarry	Km. 43.3 left of Pulilan-Calumpit Road +0.8 Km. (Longos, Pulilan)	Common borrow; aggregate base course
B-9	Pulilan Quarry	Km. 44.8 left of Pulilan-Calumpit Road +1.2 Km. (Poblacion, Pulilan)	Sand
B-10	Sta. Maria Gravel Pit	Km. 32.85 right of Bocaue-Sta. Maria Road via Taal (Sta. Clara-Sta. Maria)	Aggregate sub-base; aggregate base course
B-11	Guiller Aggregate Co., Inc.	Km. 55.83 right of Plaridel-Bustos-Norzagaray Road (Bonga Menor, Bustos)	Concrete aggregate (G-I, S-I and 2/3"); dense graded aggregate
B-12	Pulo Gravel Pit	Km. 64.84 right of Baliwag-San Rafael Road +0.4 Km. (Pulo, San Rafael)	Aggregate sub-base; aggregate base course (types "A" and "B")
B-13	Luzon Aggregates, Inc.	Km. 72.15 + 1.6 Km. left of Norzagaray-Bigte Road (Norzagaray)	Concrete aggregate (G-I, S-I and 2/3"); dense graded aggregate
B-14	Uni-Rock Aggregates	Km. 69.20 left of Angat-Norzagaray Road +0.10 Km. (Sta. Cruz, Angat)	Aggregate base course (S-I, G-I and 3/4")

MATERIALS SOURCES LIST

Source Number	Name of Source	Location	Kind of Materials and Item Number
B-15	Sta. Ana Aggregates	Km. 70.70, 1.3 Km. from the junction of Sta. Maria-Angat Road	Aggregate base course (S-I, G-I, and 3/4")
B-16	Kaybalat Quarry	Km. 52.30 right of Sta. Maria-Norzagaray Road +2.7 Km. (Pulong, Buhangin-Sta. Maria)	Aggregate sub-base and aggregate base course
B-17	Catmon Quarry	Km. 38.50 left of Sta. Maria-San Jose Road +1.5 Km. (Catmon, Sta. Maria)	Aggregate sub-base and aggregate base course

MATERIALS SOURCES LIST

Source Number	Name of Source	Location	Kind of Materials and Item Number
	RIZAL PROVINCE		
R-1	San Jose, Montalban	Km. 28 + 200	Aggregate for Items 108, 200
R-2	Phil Rock Prods., Inc.	Km. 29 + 000	Aggregate for Items 108, 200, 308 or 312 Fine aggregate - coarse aggregate for Items 310, 316 or 405
R-3	Wawa, Montalban		Aggregate for tems 108, 200, 308 or 312 Fine aggregate - coarse aggregate for Items 310, 316 or 405
R-4	Burgos, Montalban	Km. 26 + 500	Aggregate for Items 108 and 200
R-5	Rizal Consolidated Investments	Km. 25 + 850	Aggregate for Items 108, 200, 308 or 312 Fine aggregate - coarse aggregate for Items 310, 316 or 405
R-6	Dulong Bayan, San Mateo	Km. 24	Aggregate for Items 108, 200
R-7 & R-8	Mayamot, Antipolo		Adobe stone spalls; Aggregate for Items 107, 108
R-9	Concrete Aggregates Inc.	Longos, Quezon City	Fine aggregate - coarse aggregate for Items 308, 309, 310, 316 or 405
R-10	Teresa Quarry		Aggregate for Items 107, 108, 200
R-11	Phil. Rock Products	Mandaluyong	Fine aggregate - coarse aggregate for Items 308, 309, 310, 316 or 405
R-12	Supreme Aggregates, Inc.	Taguig	Fine aggregate - coarse aggregate for Items 316 or 405

MATERIALS SOURCES LIST

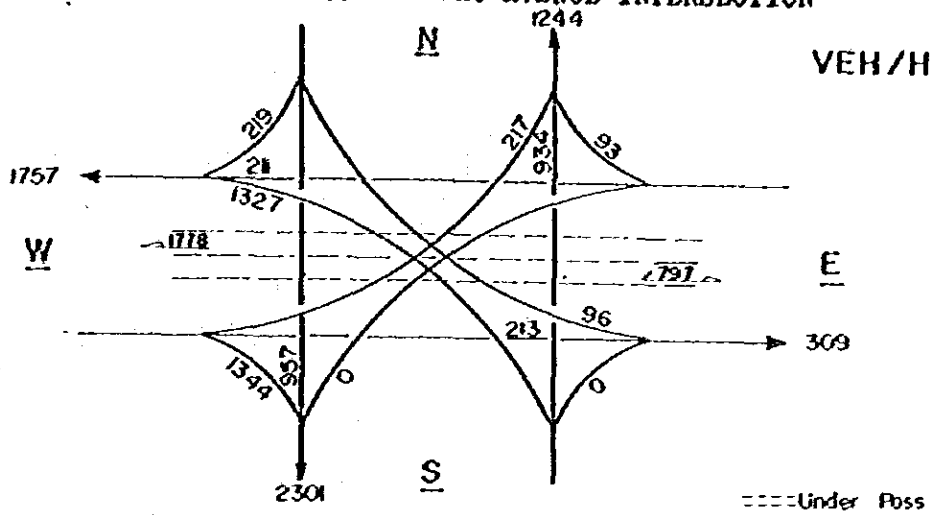
Source Number	Name of Source	Location	Kind of Materials and Item Number
R-13	Pecorp.	Muntinlupa	Aggregate for Items 107, 108, 200
R-14	Concrete Aggregates, Inc	Angono	Aggregate for Items 108, 200, 308 or 312 Fine aggregate - coarse aggregate for Items 310, 316 or 405
R-15	Cardona		Aggregate for Items 107, 108
R-16	Quisao, Pililla		Aggregate for Items 107, 108
R-17	Bugarin, Pililla, Rizal		Aggregate for Items 108, 200
R-18	Bukal	Tanay	Aggregate for Items 108, 200
R-19	A.P. Sacramento	Tanay	Aggregate for Items 108, 200
R-20	Rivas	Tanay	Aggregate for Items 108, 200
R-21	Navotas, Talim Island, Cardona		For all items involving crush rock and by-products
R-Co-1	Genrock	Tanay	Fine aggregate for Items 310, 316 or 405 Items 316 or 405; Item 201
R-Co-2	Bentonval Ready Cement	Km. 16	Item 316 or 405;
R-C-1	Island Cements		Portland Cement
R-C-2	Filipinas Cement		Portland Cement
R-C-3	Rizal Cement	Binangonan	Portland Cement
R-C-4	Midland Cement	Tanay	Portland Cement

MATERIALS SOURCES LIST

Source Number	Name of Source	Location	Kind of Materials and Item Number
R-Prec-1	Philstress	Marikina	Item 405-A Pre-Fab concrete products
R-Prec-2	Constress	Pasig	Item 405-A Pre-Fab concrete products
R-R-1	Pag-asa Steel Corp.	Pasig	Item 406 Reinforcing Steel bars
R-R-2	Phil. Blooming Mills	Pasig	Item 406 Reinforcing steel bars
R-A-1	Asphalt Trade and Rizcon		Items 309, 310 or 413
R-A-2	Supreme Aggregate Asphalt Plant	Tanay	Items 302, 310

APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS

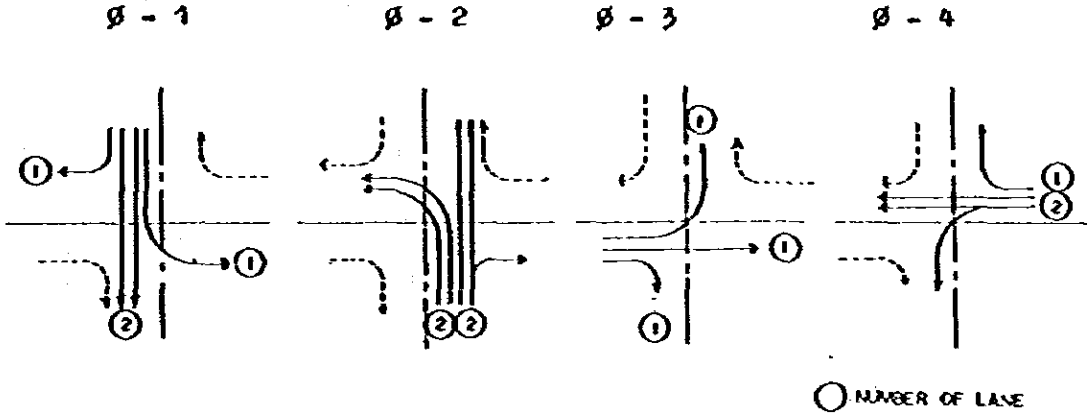
C-5/MINDANAO AVENUE INTERSECTION



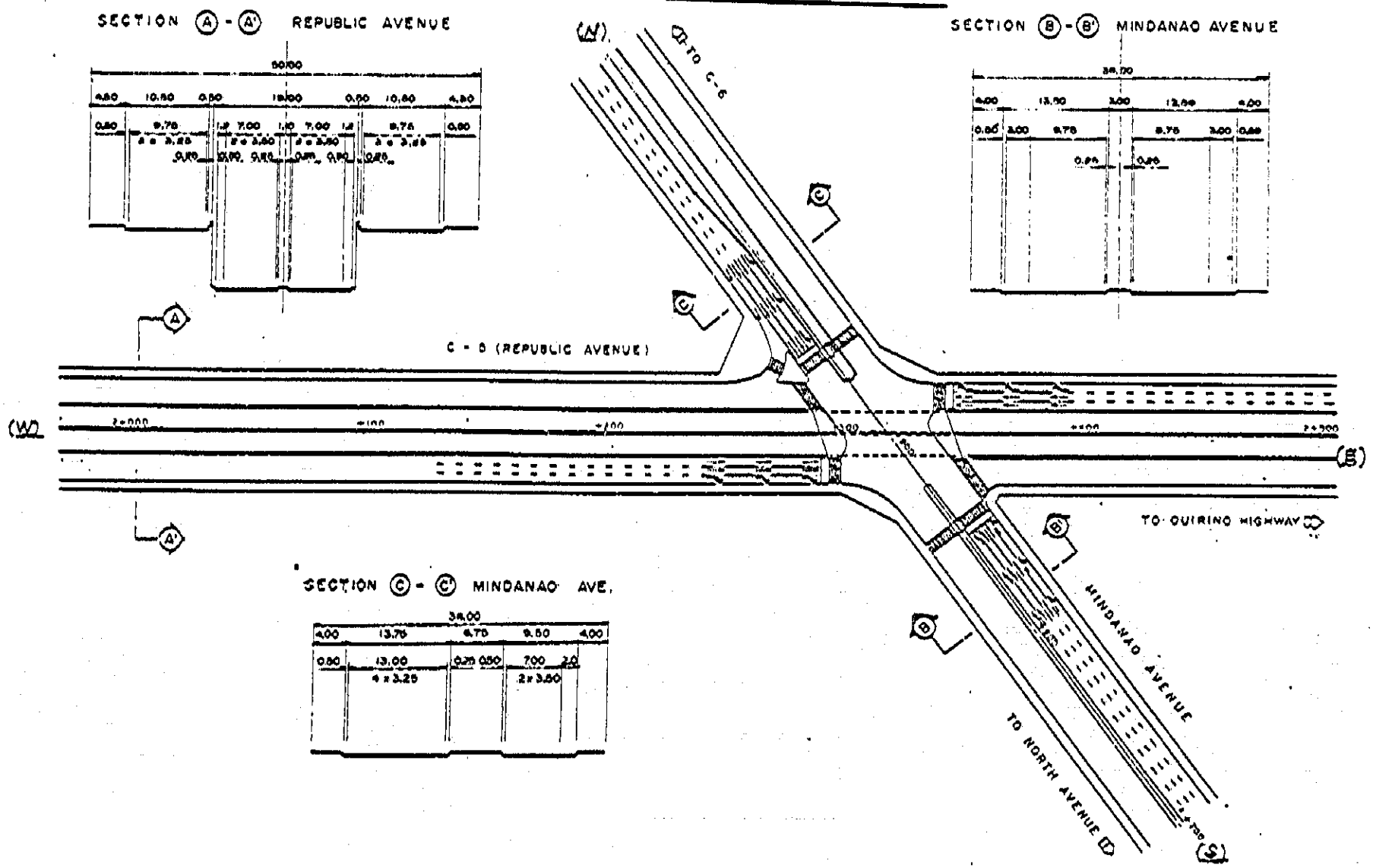
Under Poss

TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	957	2 x 2000 = 4000	0.239	29	38 + 3	1086
	N→E	96	1 x 1800 = 1800	0.053			
2	S→N	934	2 x 2000 = 4000	0.234	44	59 + 3	1517
	S→W	1327	2 x 1800 = 3600	0.369			
3	W→E	213	1 x 2000 = 2000	0.107	14	17 + 3	218
	W→N	217	1 x 1800 = 1800	0.121			
4	E→W	211	2 x 2000 = 4000	0.106	13	14 + 3	400
	E→S	0					
			T O T A L	0.835	100%	140	

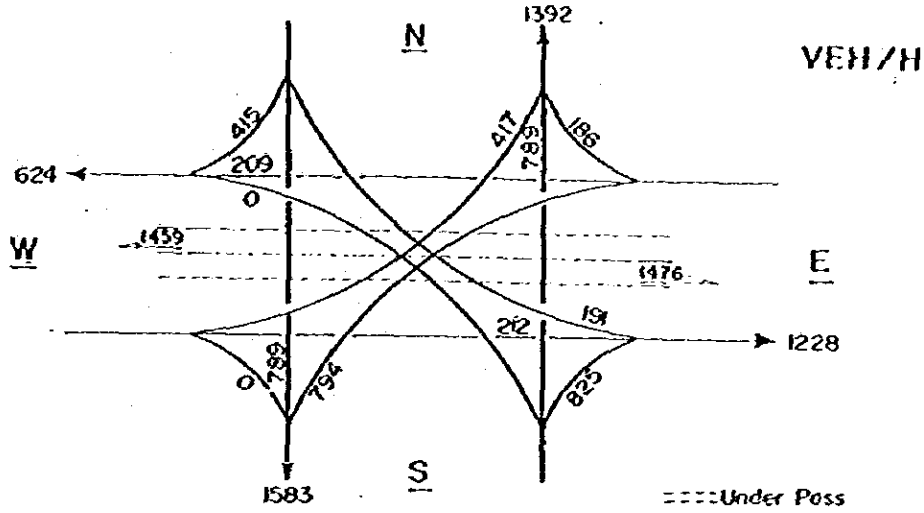
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5 / MINDANAO AVENUE INTERCHANGE

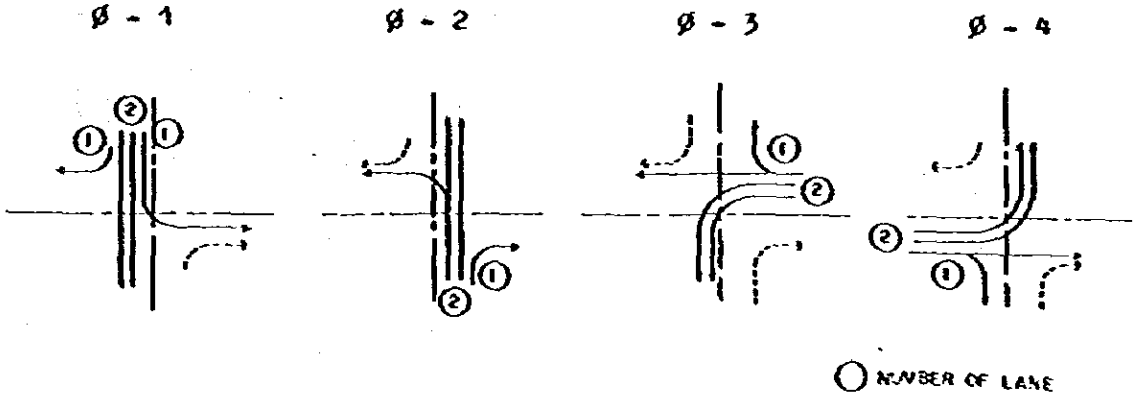


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5/QUIRINO AVENUE INTERSECTION

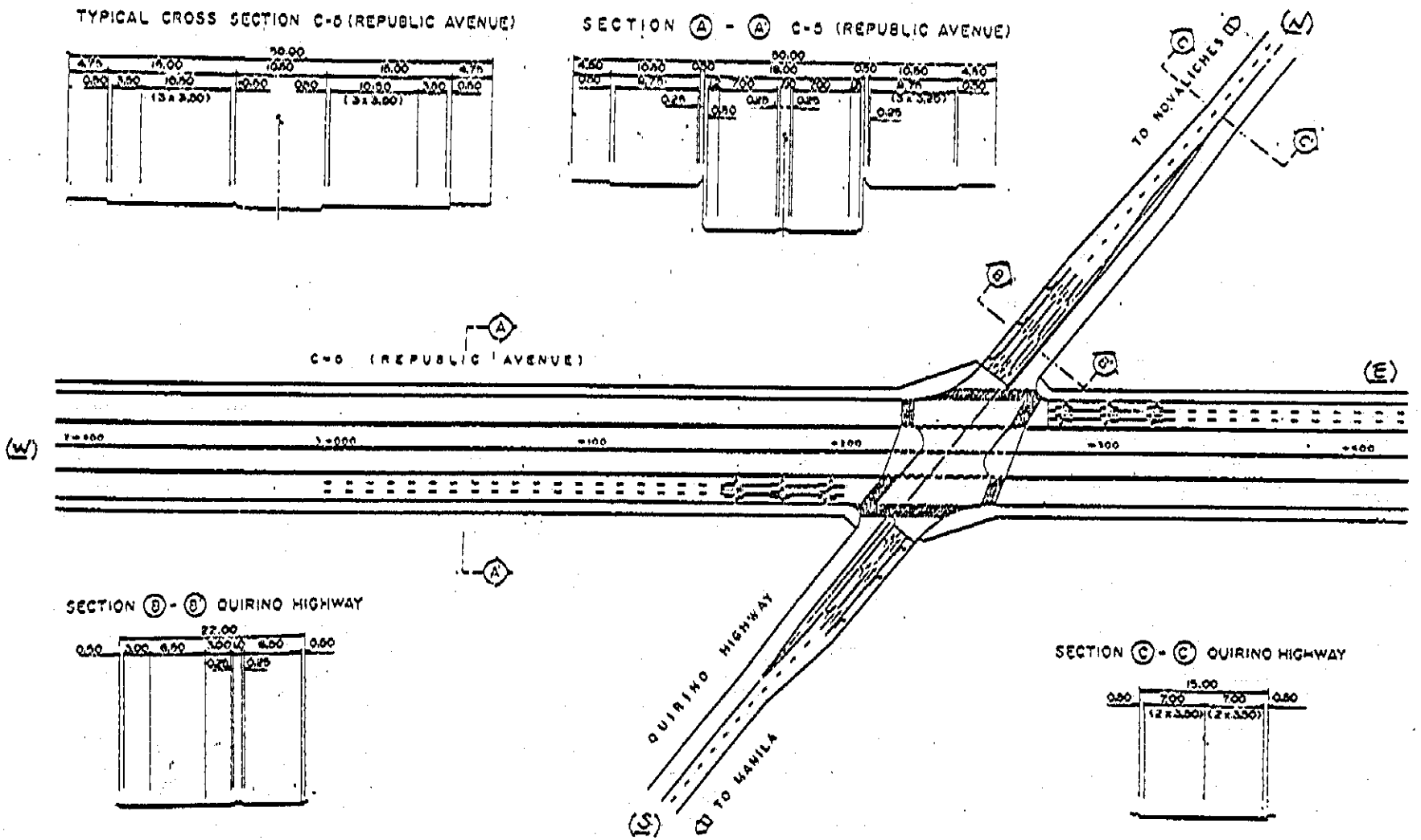


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	789	2 x 2000 = 4000	0.197	27	21 + 3	933
	N→E	191	1 x 1800 = 1800	0.106			
2	S→N	789	2 x 2000 = 4000	0.197	27	21 + 3	933
	S→W	0					
3	E→W / E→N	395	1 x 2000 = 2000	0.198	30	24 + 3	960
	E→S	794	2 x 1800 = 3600	0.221			
4	W→E	212	1 x 2000 = 2000	0.106	16	12 + 3	480
	W→N	417	2 x 1800 = 3600	0.116			
TOTAL				0.731	100%	90	

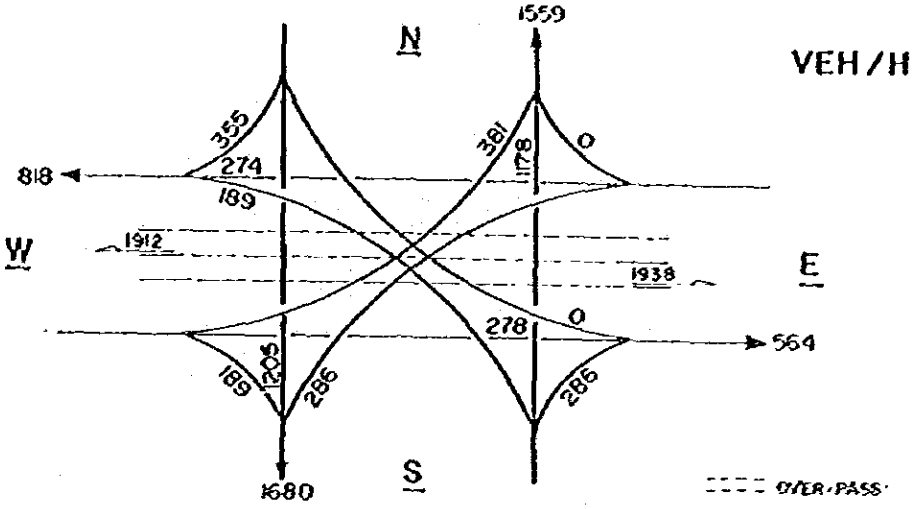
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5 / QUIRINO HIGHWAY INTERCHANGE

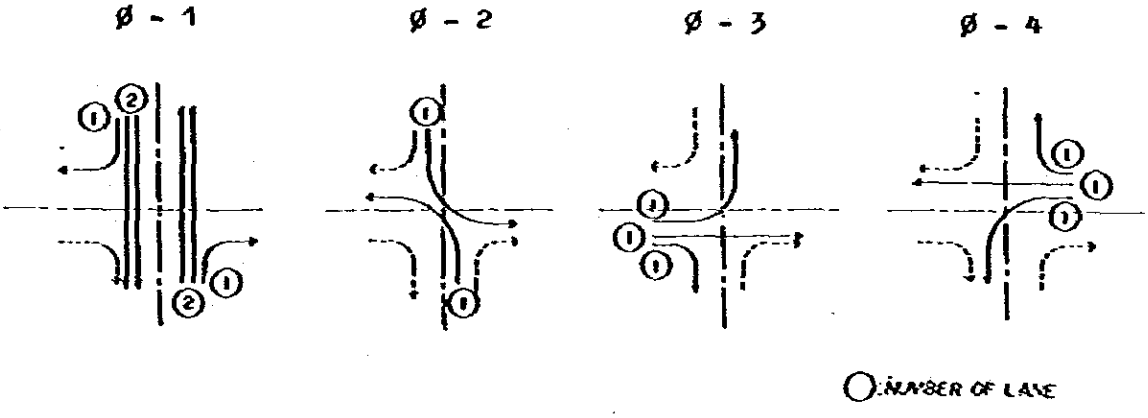


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5/VISAYAS AVENUE INTERSECTION

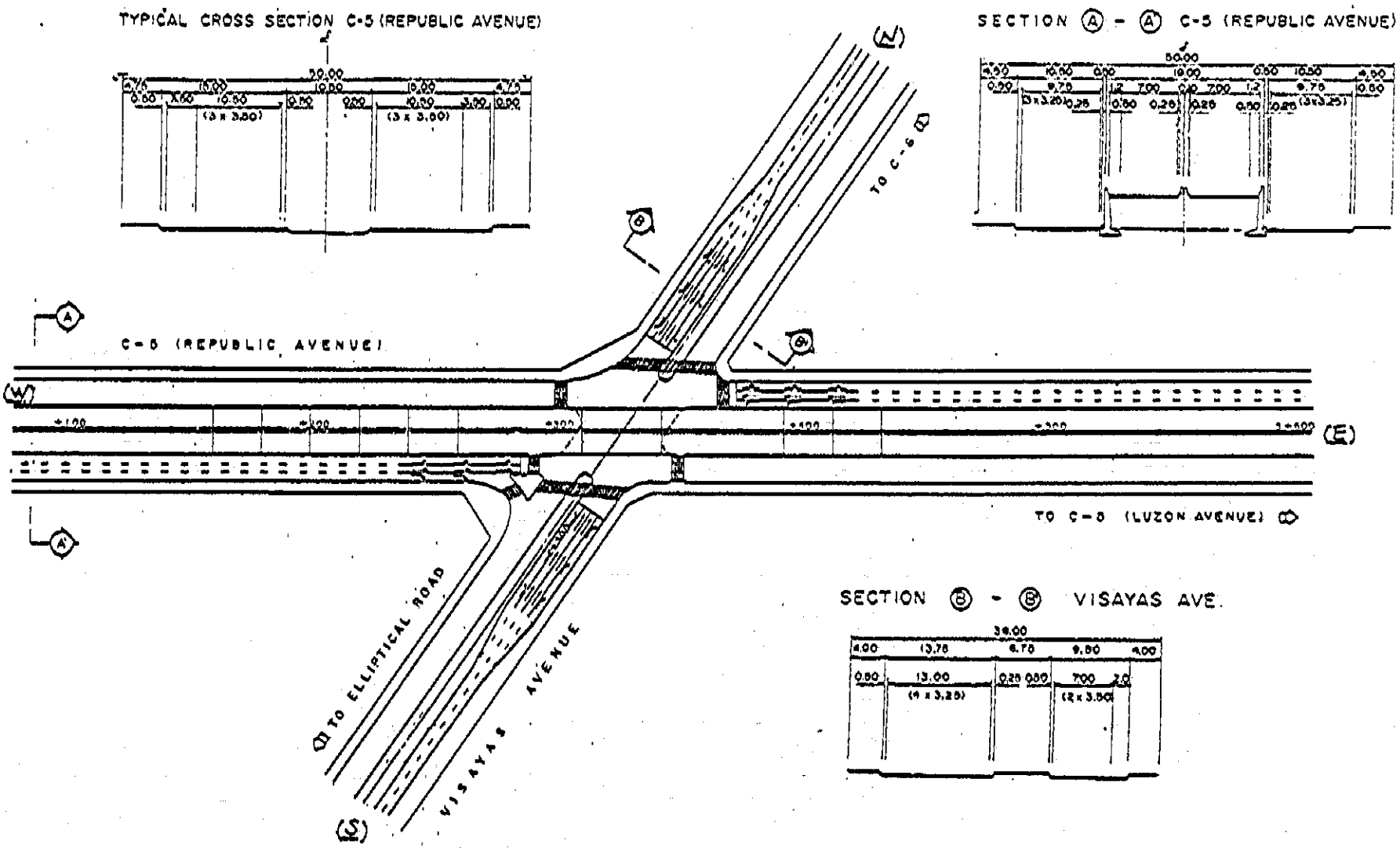


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	1205	2 x 2000 = 4000	0.301	39	40 + 3	1455
	S→N	1175		0.295			
2	S→W	189	1 x 1800 = 1800	0.105	14	12 + 3	196
3	W→E	278	1 x 2000 = 2000	0.139	27	27 + 3	441
	W→N	381	1 x 1800 = 1800	0.212			
4	E→W	274	1 x 2000 = 2000	0.137	20	19 + 3	311
	E→S	286	1 x 1800 = 1800	0.159			
TOTAL				0.777	100%	110	

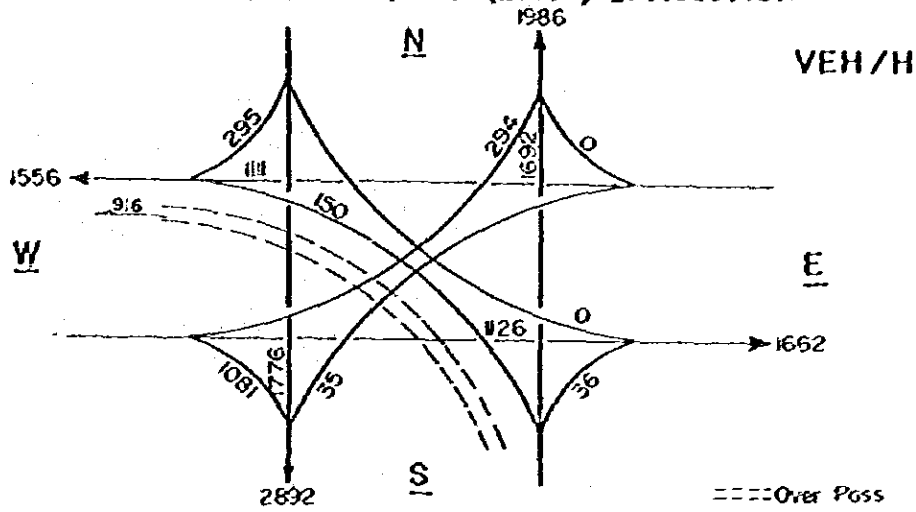
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5 / VISAYAS AVE. INTERCHANGE

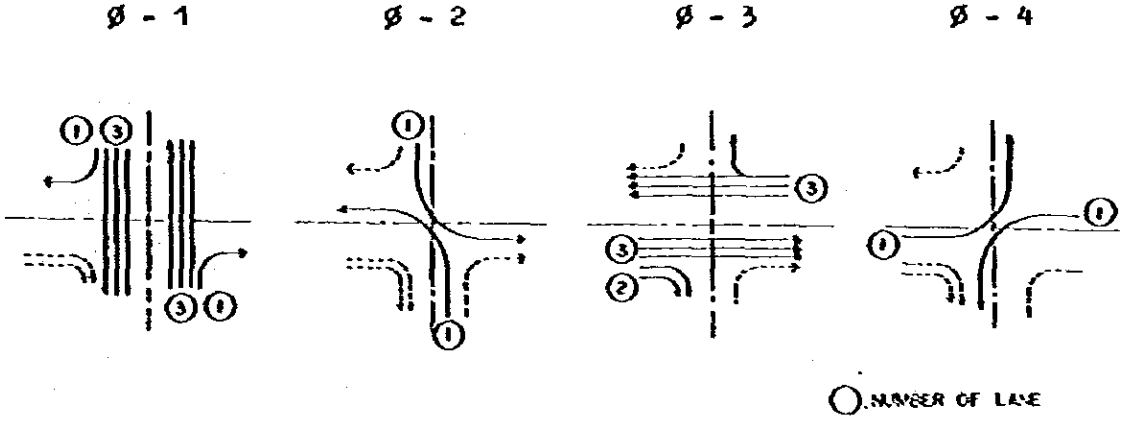


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5 (Republic)/C-5 (Luzon) Intersection

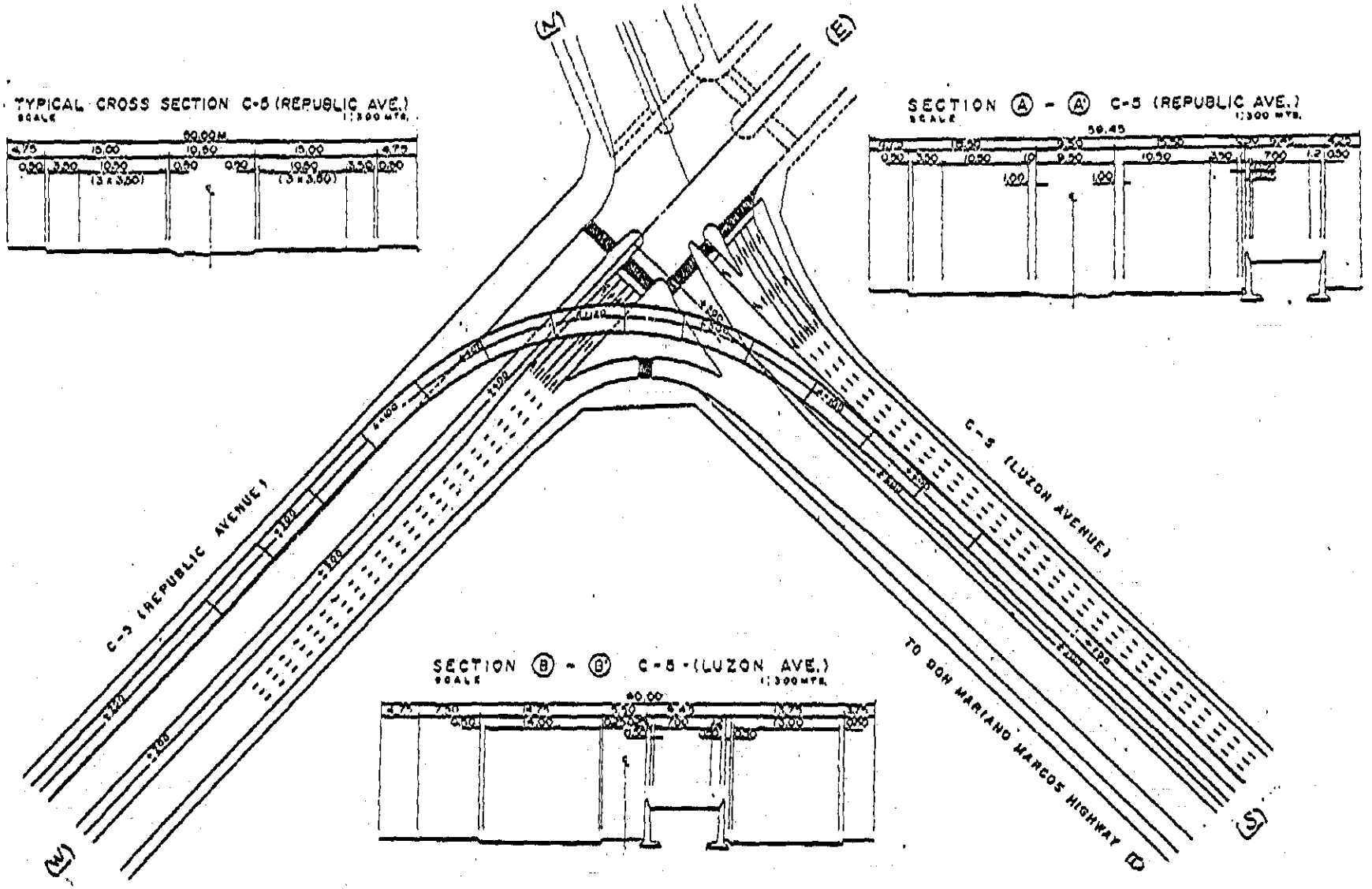


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	1776	3 x 2000 = 6000	0.296	41	33 + 3	2200
	S→N	1692		0.282			
2	N→E	0	1 x 1800 = 1800		11	8 + 3	160
	S→W	150		0.083			
3	W→E	1126	3 x 2000 = 6000	0.188	26	20 + 3	1333
	E→W	1111		0.185			
4	W→N	294	1 x 1800 = 1800	0.163	22	17 + 3	339
	E→S	35		0.019			
TOTAL				0.73	100%	90	

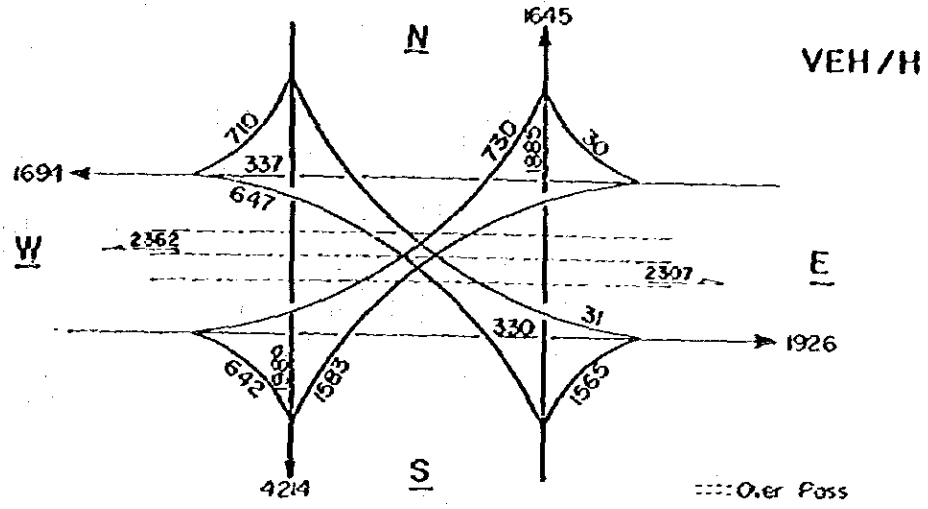
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5 (REPUBLIC AVE) / C-5 (LUZON AVE) INTERCHANGE

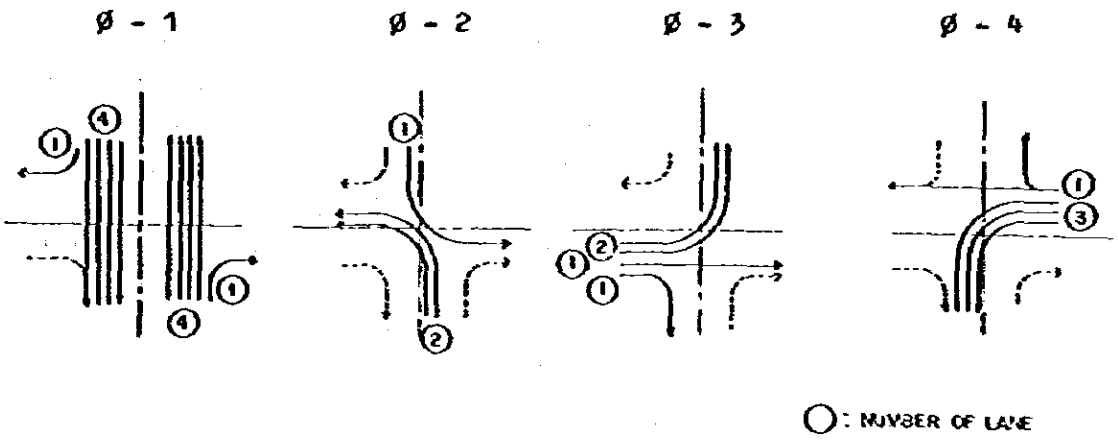


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5/DON MARIANO MARCOS AVENUE INTERSECTION

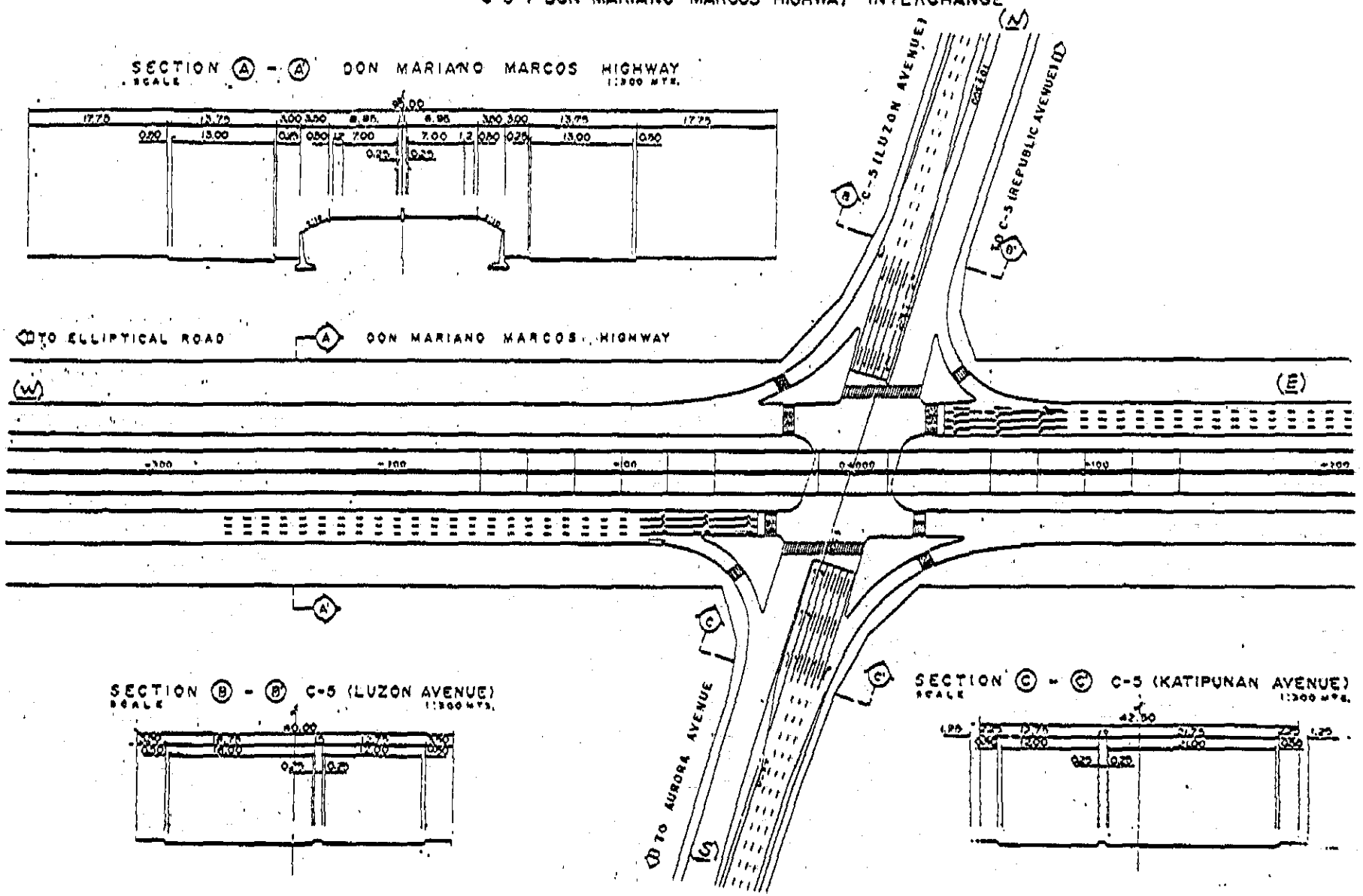


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y = V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	1989	4 x 2000 = 8000	0.249	27	44 + 3	1956
	S→N	1885		0.236			
2	N→E	31	1 x 1800 = 1800	0.017	19	33 + 3	660
	S→W	647	2 x 1800 = 3600	0.180			
3	W→E	330	1 x 2000 = 2000	0.165	22	37 + 3	740
	W→N	730	2 x 1800 = 3600	0.203			
4	E W/E N	367	1 x 2000 = 2000	0.184	32	54 + 3	1620
	E→S	583	3 x 1800 = 5400	0.293			
TOTAL				0.925	100%	180	

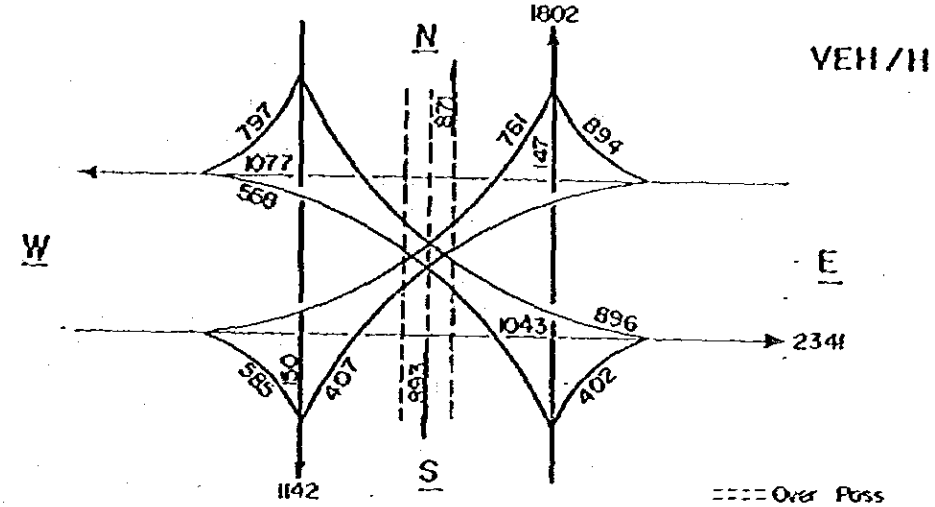
TRAFFIC STREAM LINE



APPENDIX 7.3-4 INTERSECTON TRAFFIC CAPACITY ANALYSIS
C-5 / DON MARIANO MARCOS HIGHWAY INTERCHANGE

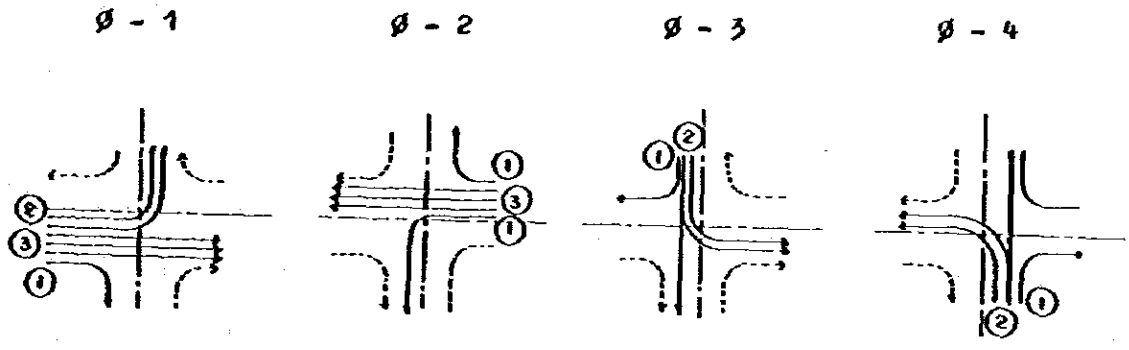


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5/AURORA AVENUE INTERSECTION

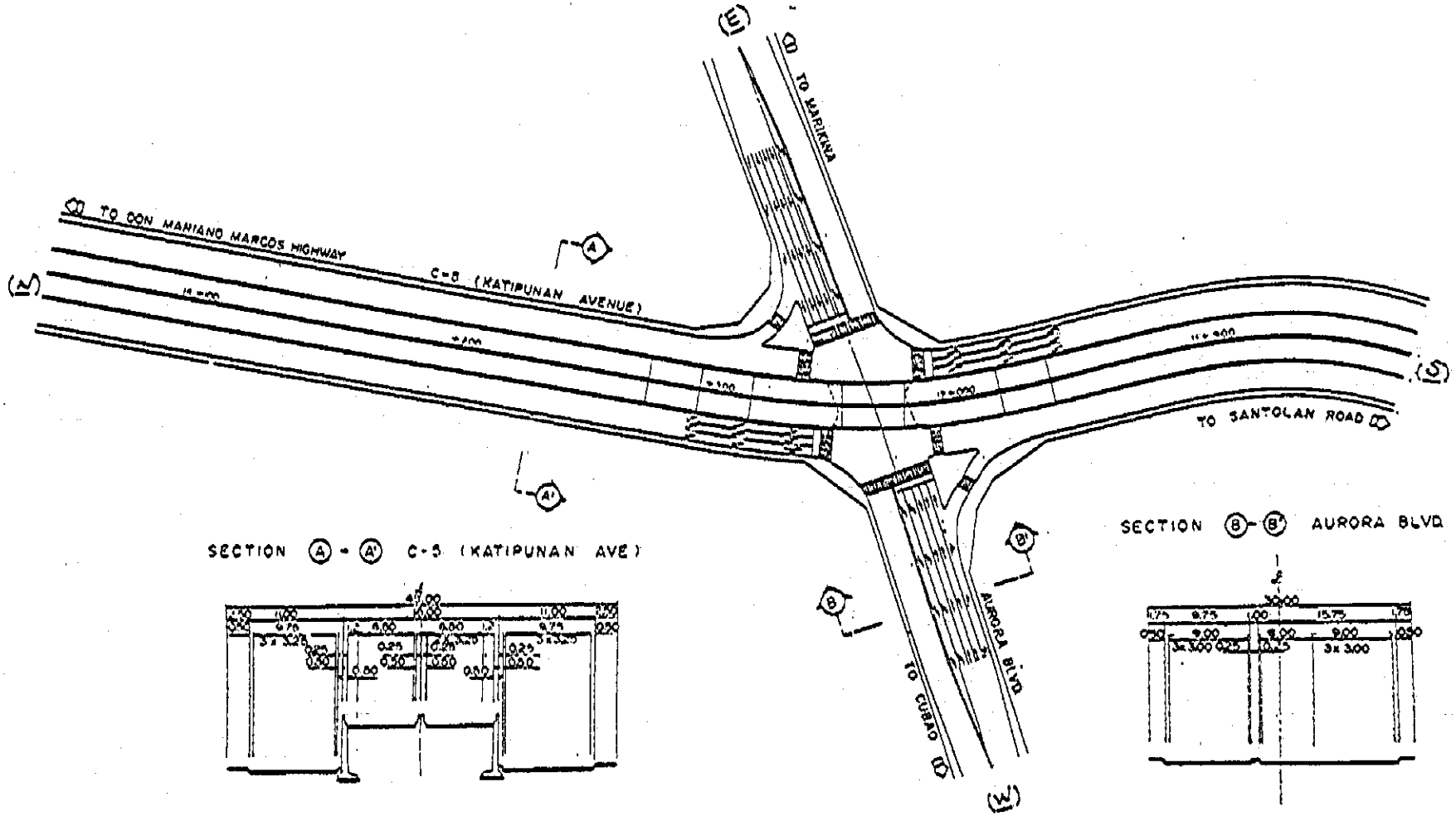


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E	1043	3 x 2000 = 6000	0.174	23	38 + 3	1267
	W→N	761	2 x 1800 = 3600	0.211			760
2	E→W	1077	3 x 2000 = 6000	0.180	24	41 + 3	1367
	E→S	407	1 x 1800 = 1800	0.226			410
3	N E/N S	1042	2 x 1800 = 3600	0.291	32	53 + 3	1060
4	S→N/S→W	705	2 x 1800 = 3600	0.196	21	36 + 3	720
			TOTAL	0.924	100%	180	

TRAFFIC STREAM LINE



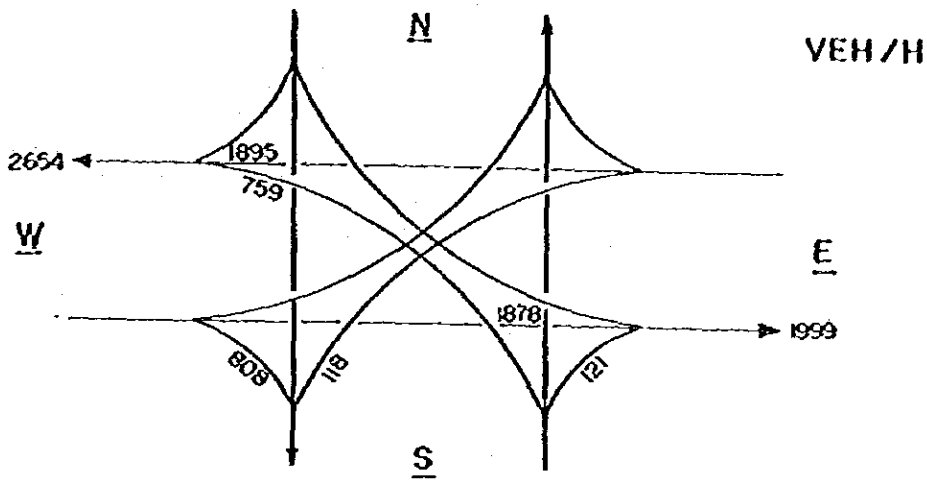
APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-5 / AURORA BOULEVARD INTERCHANGE



SECTION (A) - (A') C-5 (KATIPUNAN AVE)

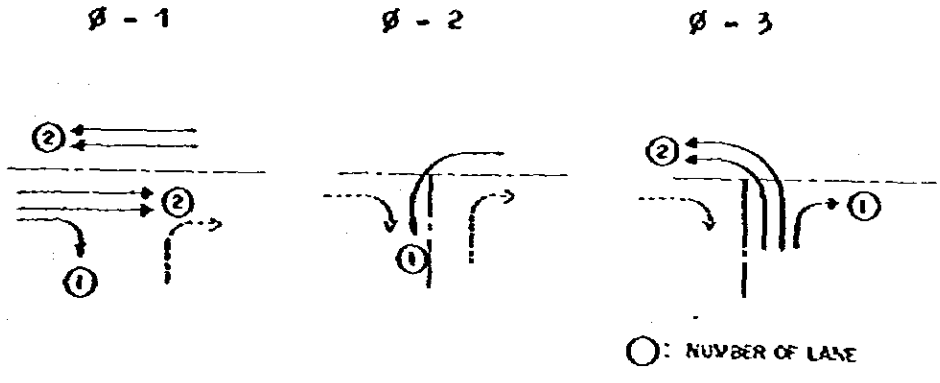
SECTION (B) - (B') AURORA BLVD

APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6/MINDANAO AVENUE INTERSECTION

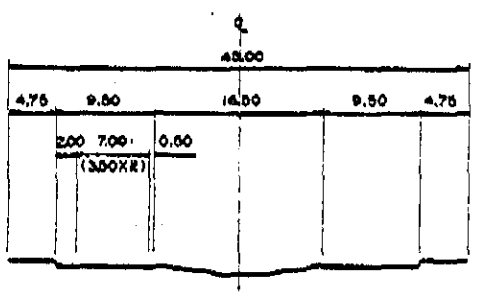


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED DANGES - TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W←E	1878	2 x 2000 = 4000	0.470	63	45 + 3	2250
	E→W	1895		0.474			
2	E→S	118	1 x 1800 = 1800	0.066	9	7 + 3	158
3	S→W	759	2 x 1800 = 3600	0.211	28	19 + 3	1855
			T O T A L	0.751	100%	80	

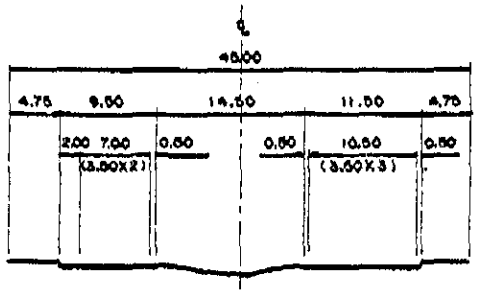
TRAFFIC STREAM LINE



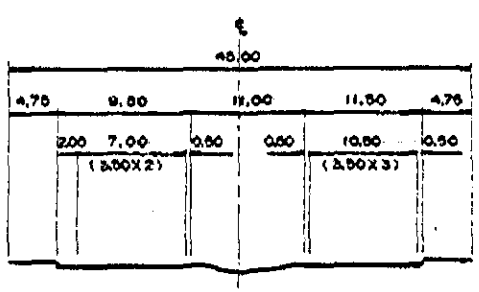
APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6 / MINDANAO AVENUE INTERSECTION



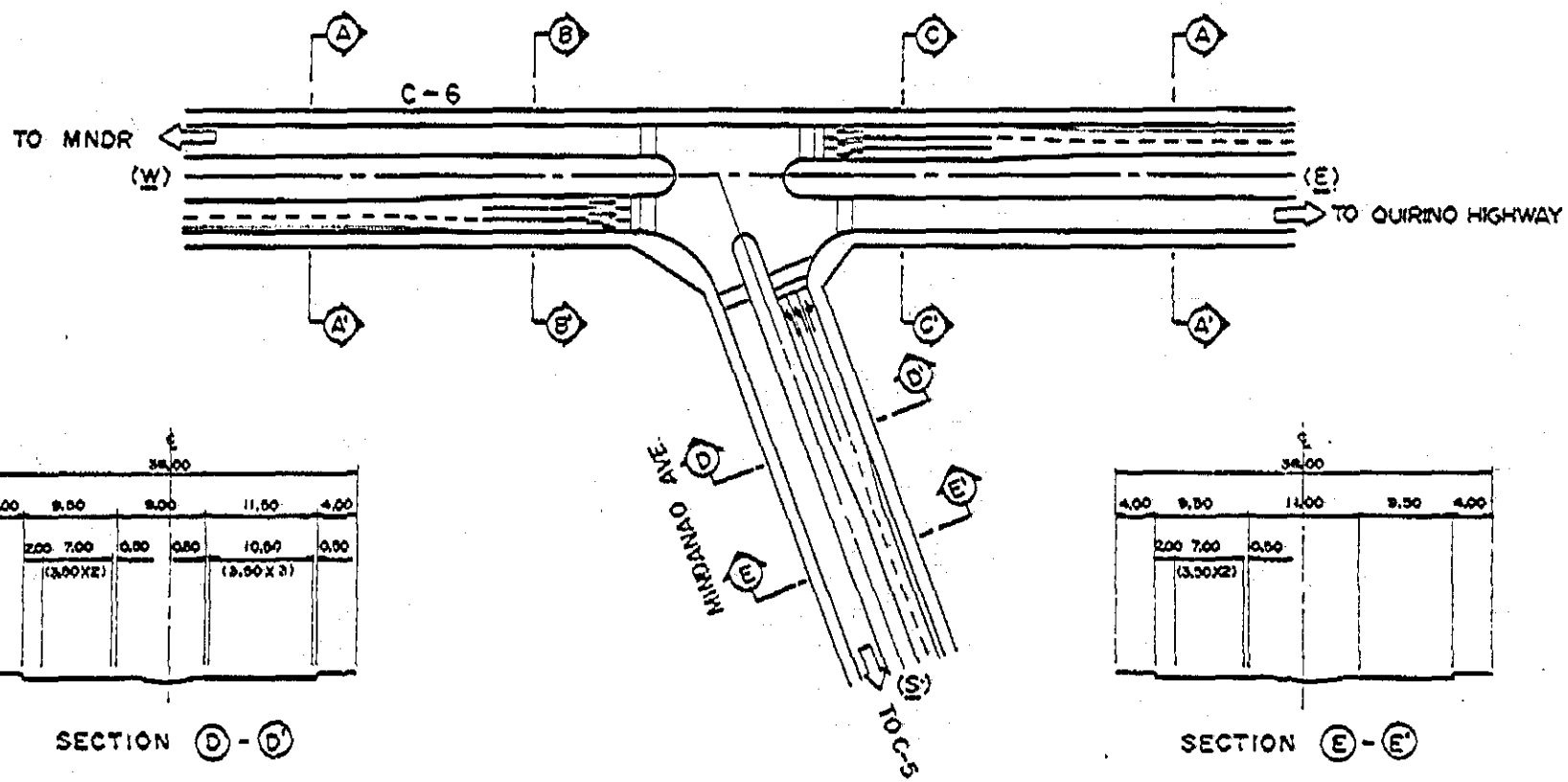
SECTION (A) - (A')



SECTION (B) - (B')



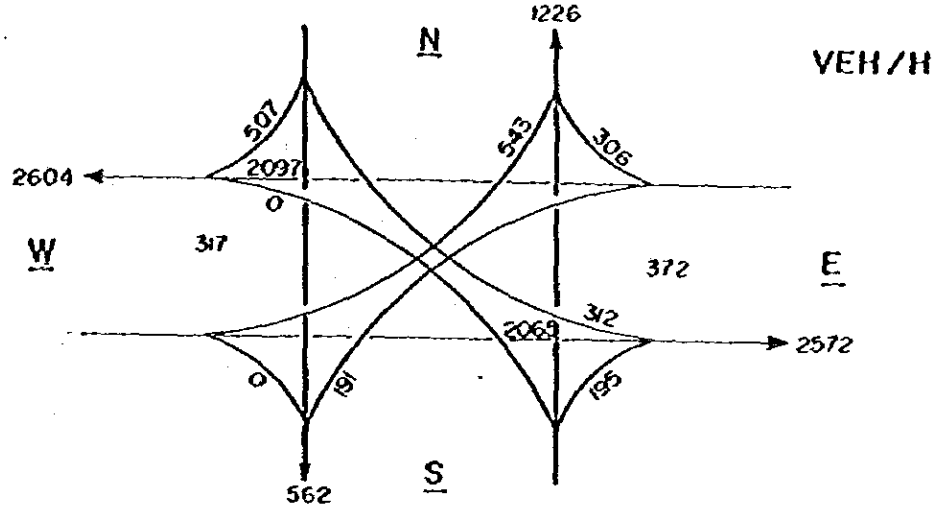
SECTION (C) - (C')



SECTION (D) - (D')

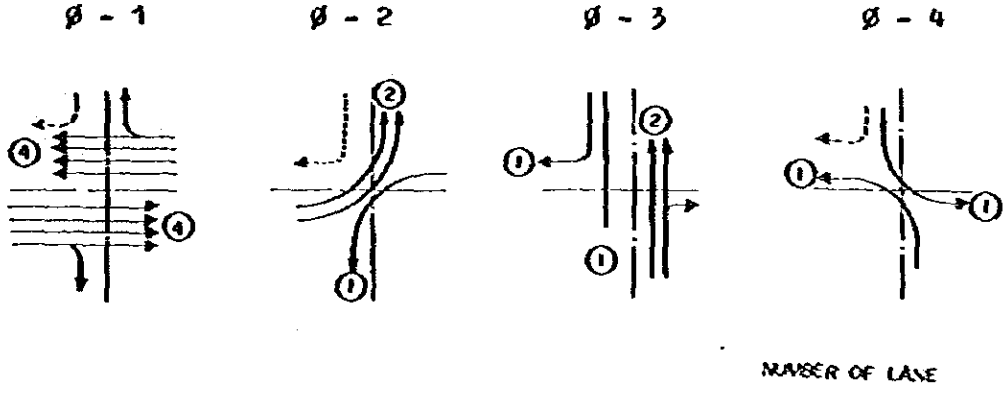
SECTION (E) - (E')

APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6/QUIRINO HIGHWAY INTERSECTION

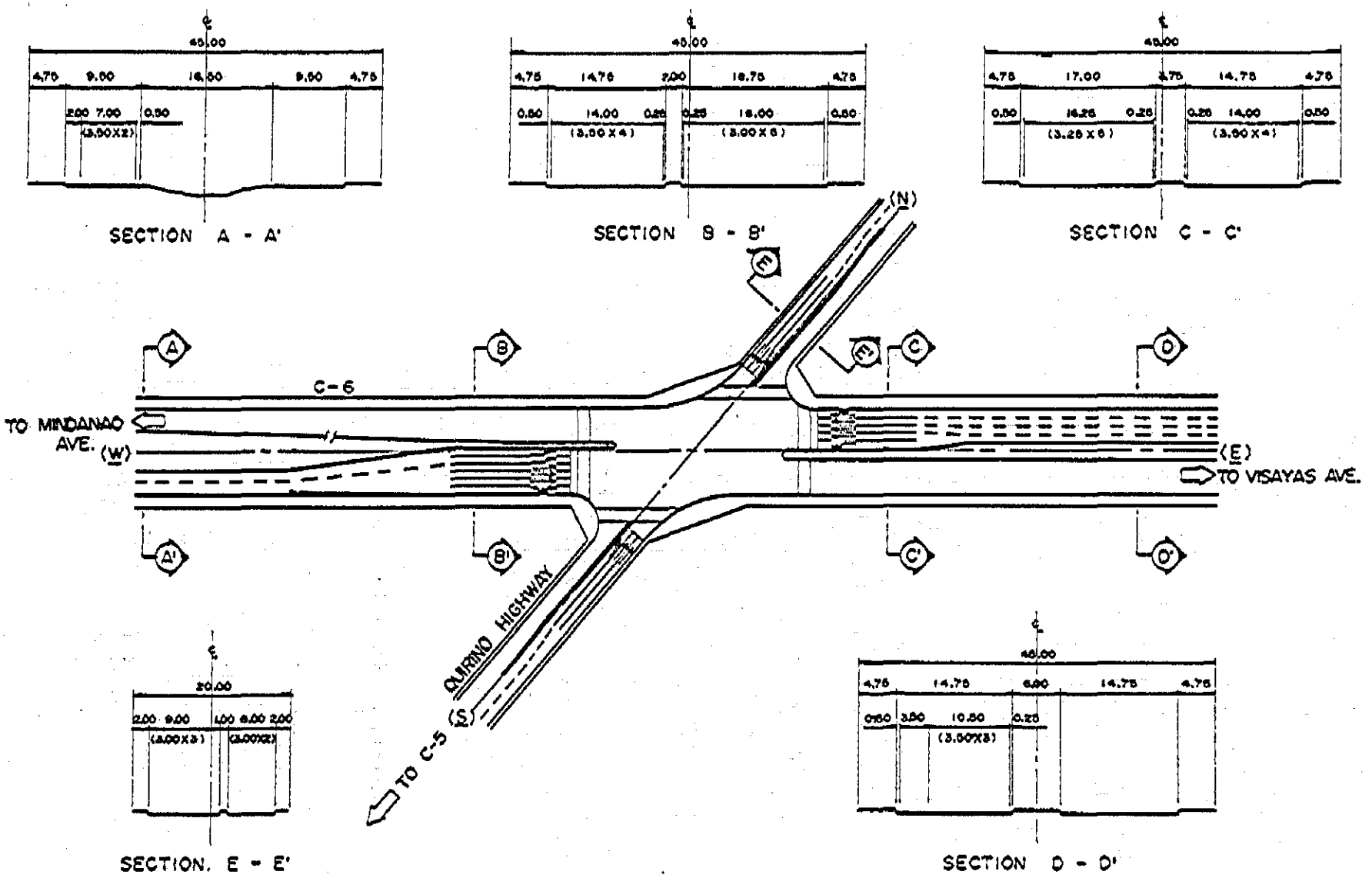


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W E/E N	2403	4 x 2000 = 8000	0.300	37	43 x 3	2646
	E→W	2065		0.258			
2	W→N	548	2 x 1800 = 3600	0.152	19	21 + 3	581
	E→S	191	1 x 1800 = 1800	0.106			
3	N→S	371	1 x 2000 = 2000	0.186	23	27 + 3	415
	S→N/S→E	567	2 x 2000 = 4000	0.142			
4	N→E	312	1 x 1800 = 1800	0.173	21	24 + 3	332
	S→W	0					
			T O T A L	0.811	100%	130	

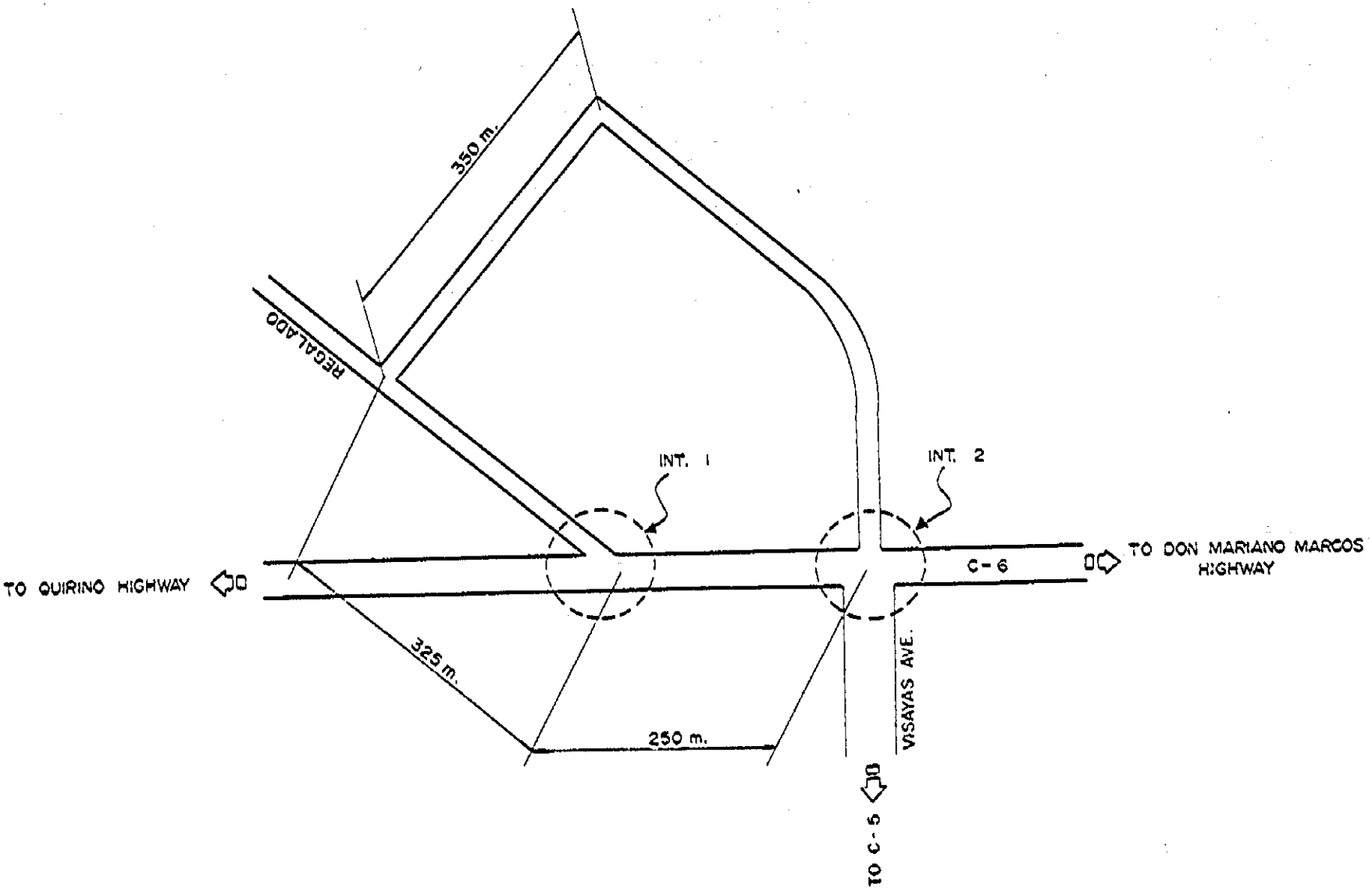
TRAFFIC STREAM LINE



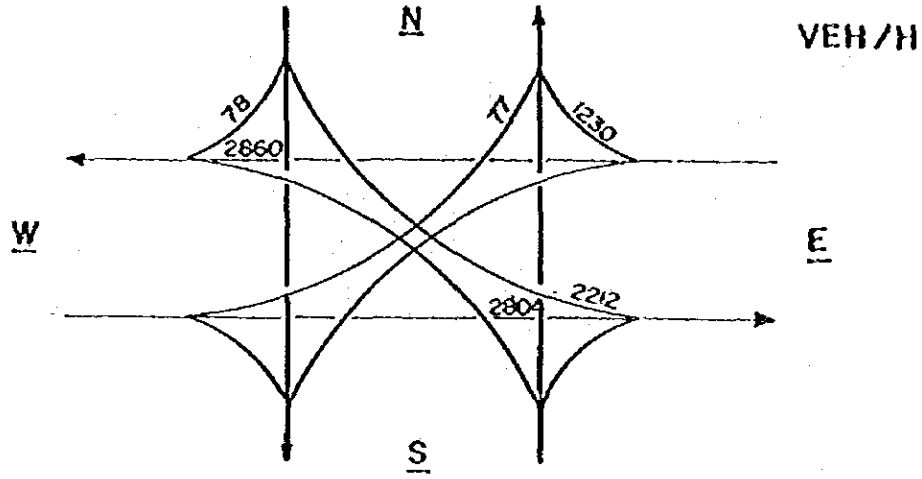
APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6 / QUIRINO HIGHWAY INTERSECTION



LOCATION OF C-6 / VISAYAS / REGALADO INTERSECTION

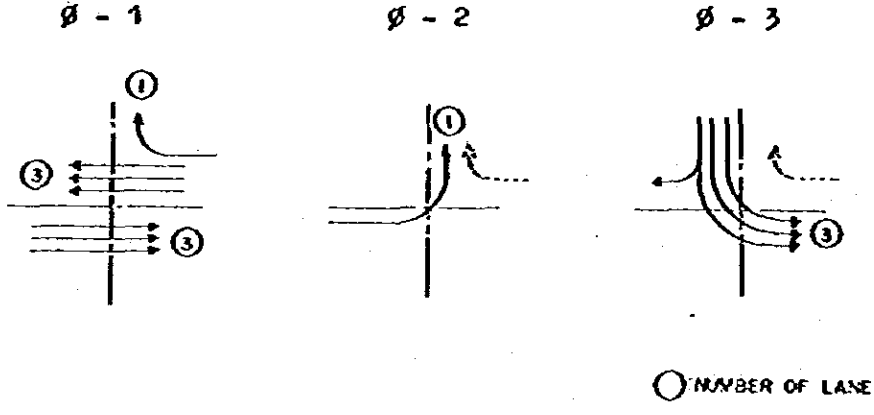


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6/VISAYAS AVENUE INTERSECTION (INT. - 1)

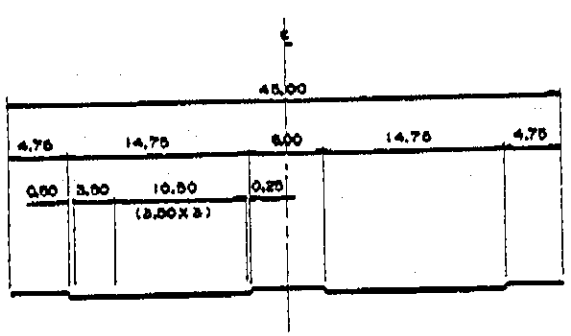


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES - TION RATIO Y = V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E	2804	3 x 2000 = 6000	0.467	53	80 + 3	3000
	E→W	2860		0.477			
2	W→N	77	1 x 1800 = 1800	0.043	5	7 + 3	79
3	N→E/N→W	2280	3 x 2000 = 6000	0.380	42	64 + 3	2400
TOTAL				0.900	100%	160	

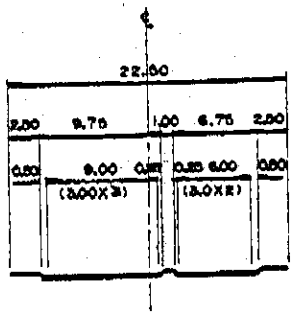
TRAFFIC STREAM LINE



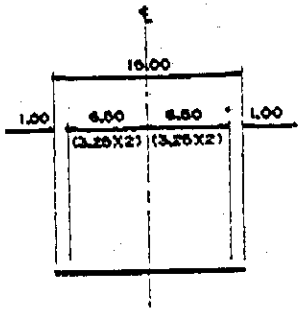
APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6 / VISAYAS AVENUE INTERSECTION (INT.1)



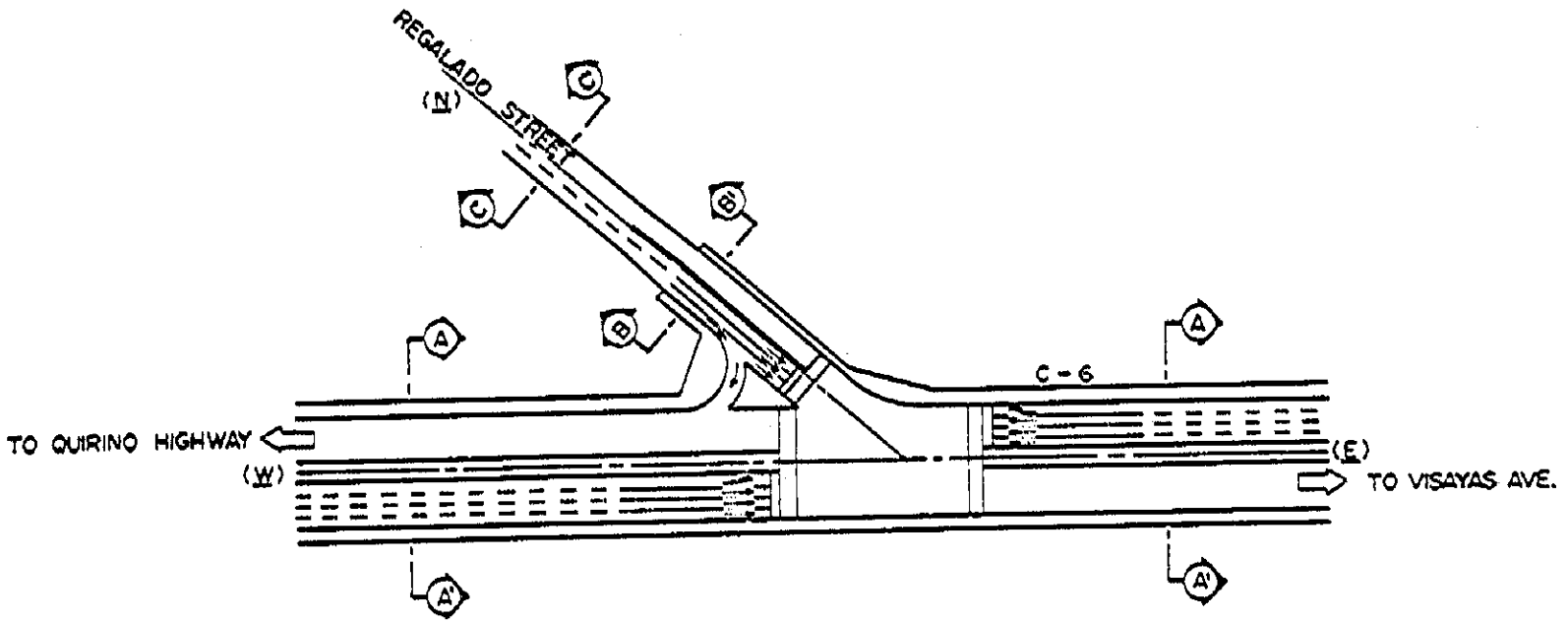
SECTION (A) - (A')



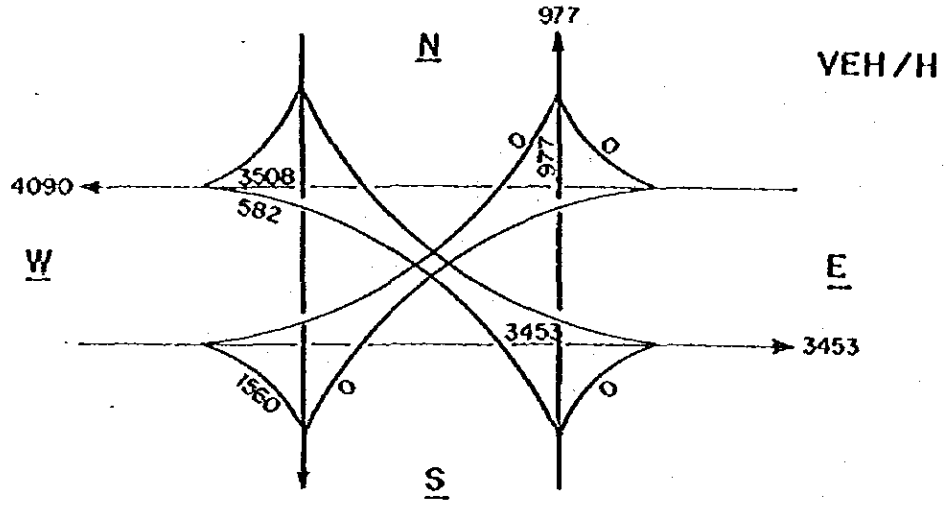
SECTION (B) - (B')



SECTION (C) - (C')

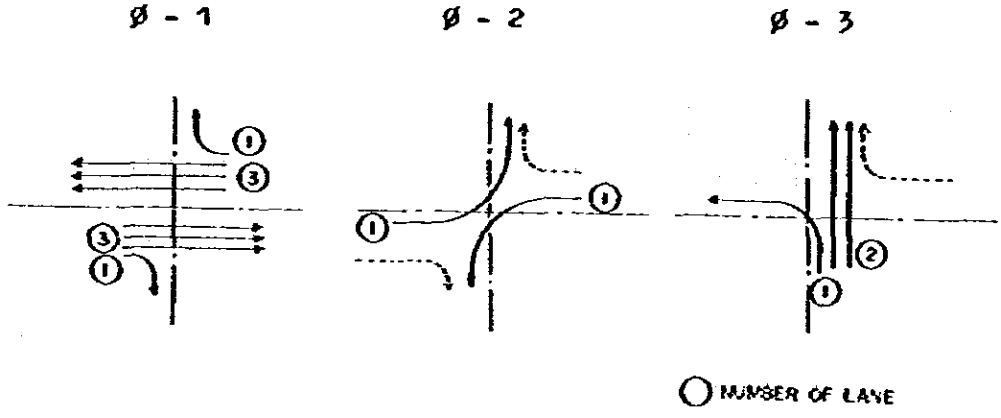


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6/VISAYAS AVENUE INTERSECTION (INT. - 2)

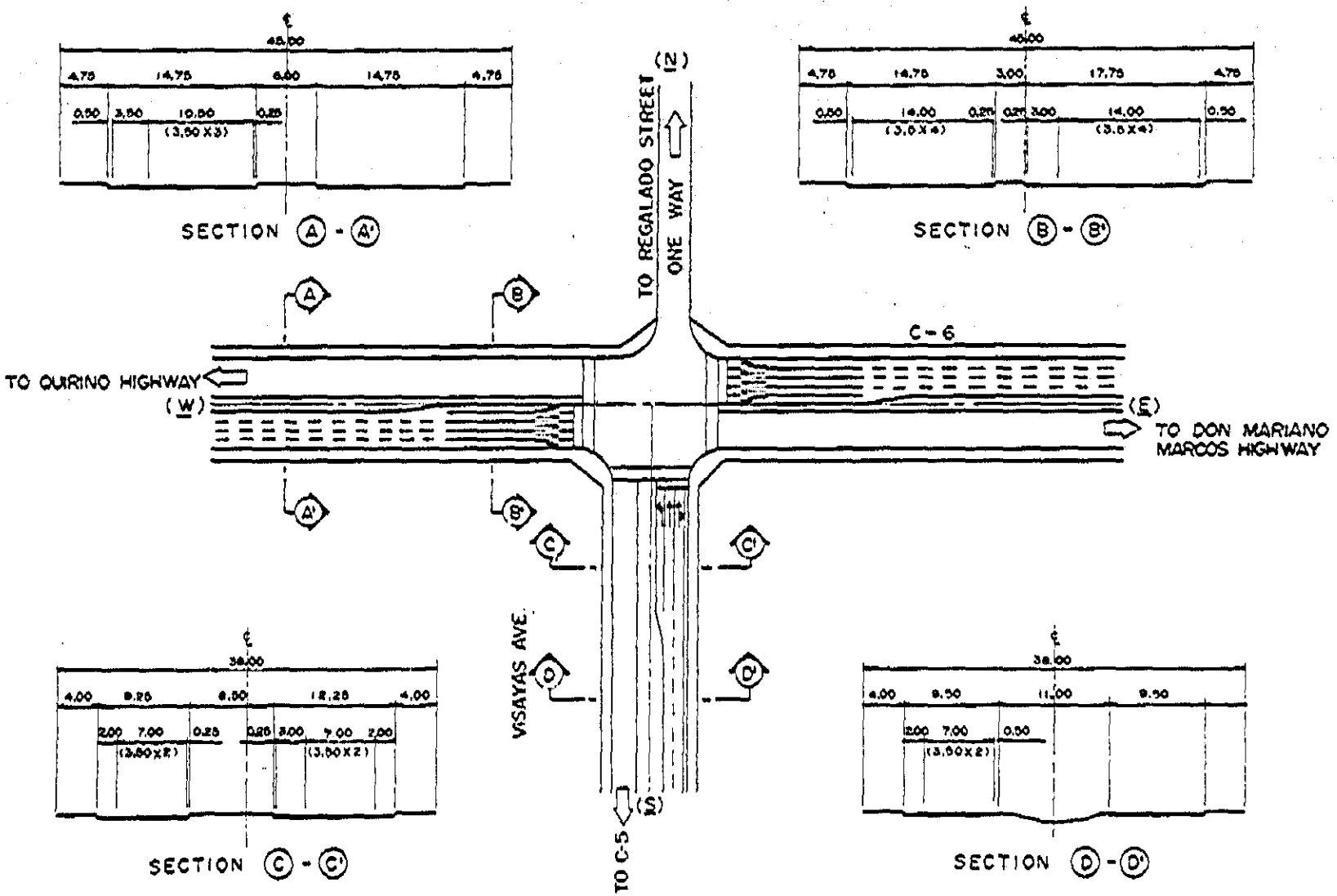


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E	3453	3 x 2000 = 6000	0.576	65	89 + 3	3560
	E→W	3508		0.585			
2	W→N	-	1 x 1800 = 1800	-		3 + 3	36
	E→S	-	1 x 1800 = 1800	-			
3	S→N	977	2 x 2000 = 4000	0.244	35	49 + 3	1307
	S→W	582	1 x 1800 = 1800				588
TOTAL				0.908	100%	150	

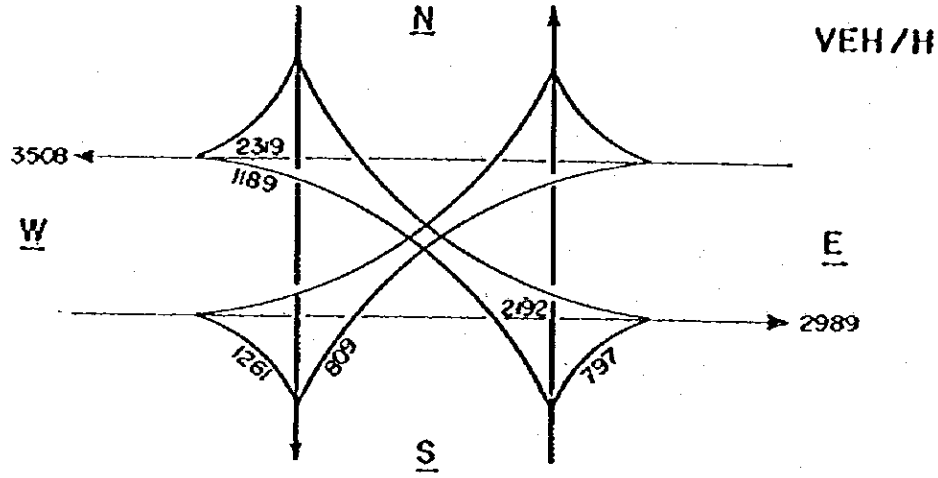
TRAFFIC STREAM LINE



APPENDIX 7.3-4 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6 / VISAYAS AVENUE INTERSECTION (INT. 2)

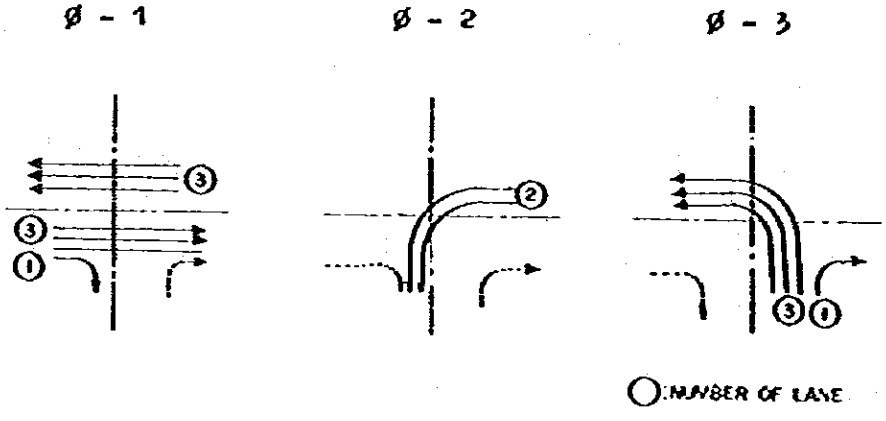


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6/LUZON AVENUE EXTENSION INTERSECTION

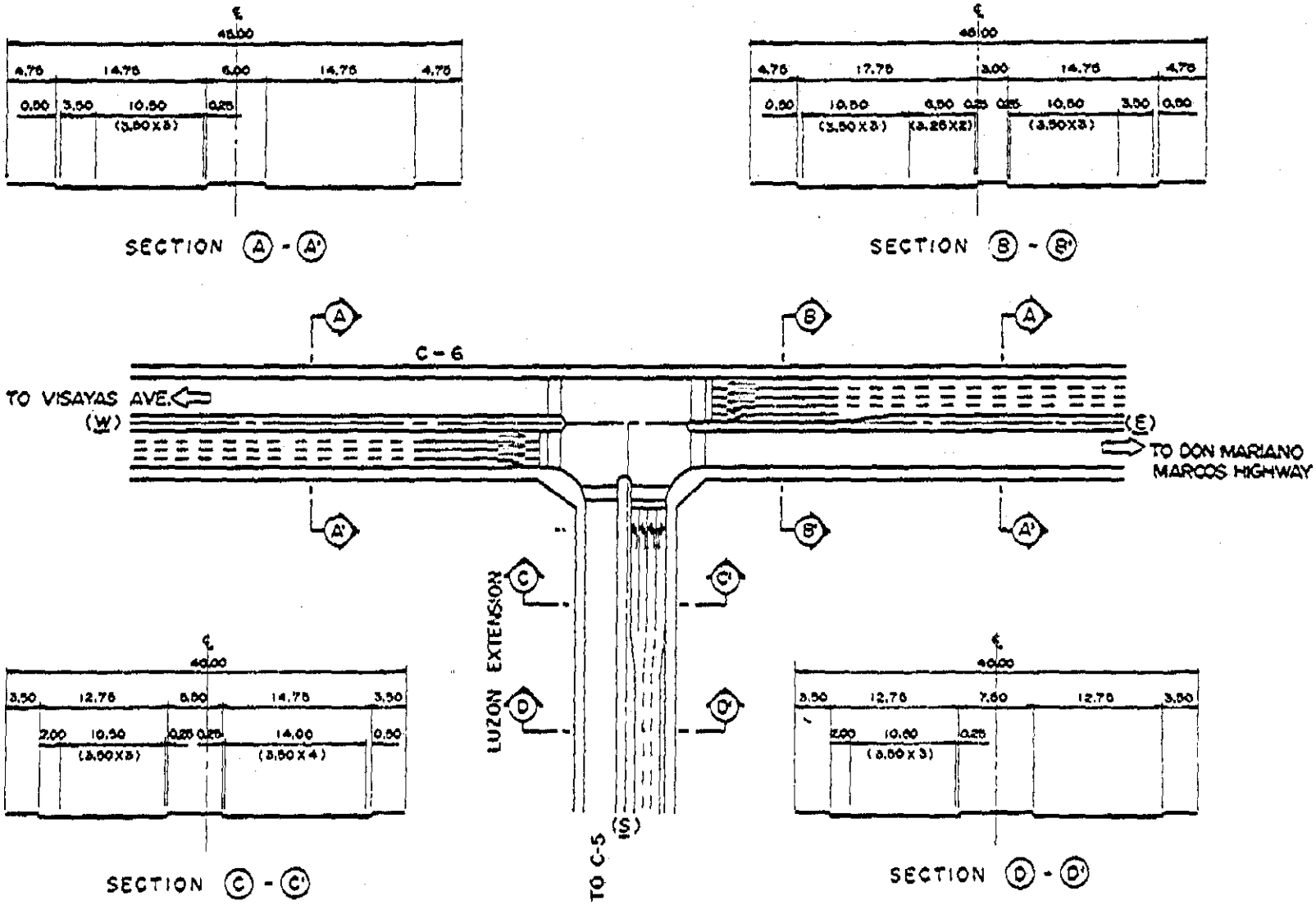


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E	2192	3 x 2000 = 6000	0.365	47	53 + 3	2650
	E→W	2319		0.387			
2	E→S	809	2 x 1800 = 3600	0.225	27	29 + 3	870
3	S→W	1189	3 x 1800 = 5400	0.220	26	29 + 3	1305
TOTAL				0.832	100%	120	

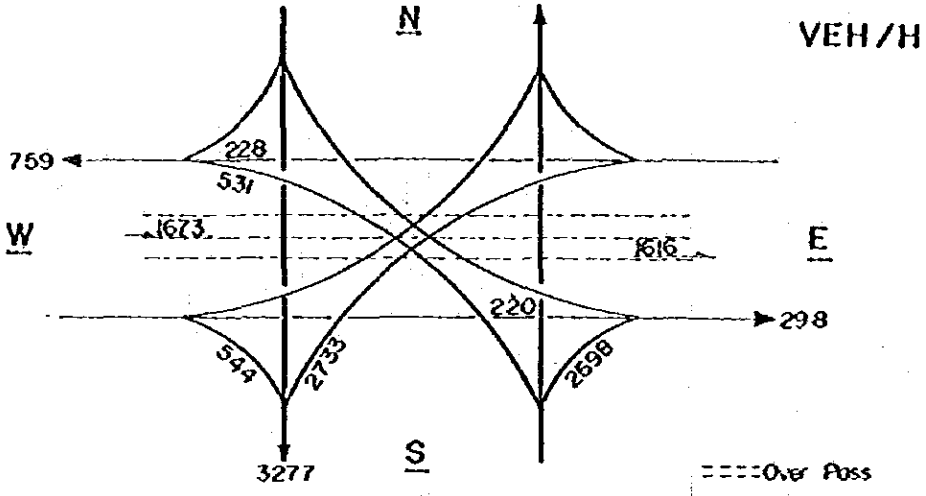
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6 / LUZON EXTENSION INTERSECTION

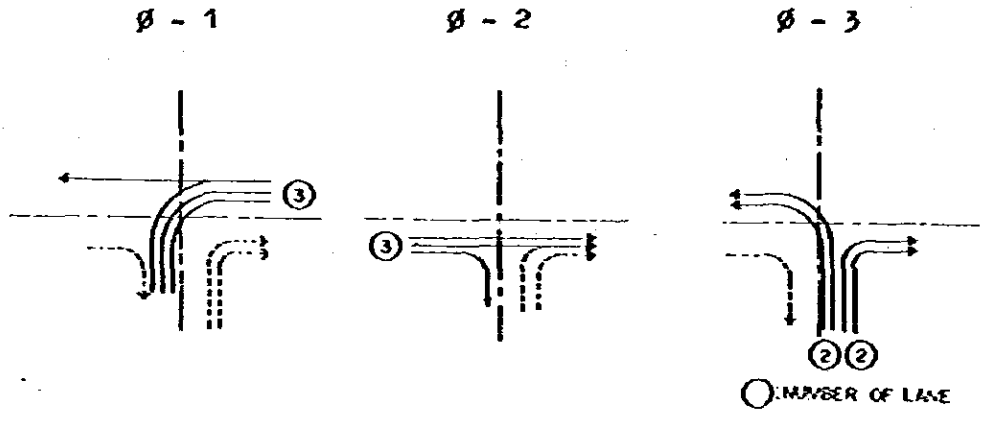


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6/DON MARIANO MARCOS AVENUE INTERSECTION



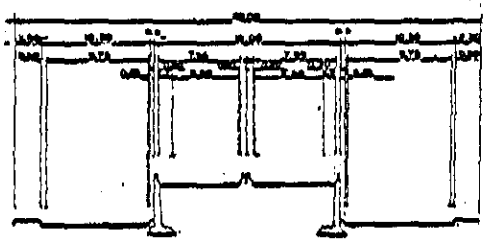
TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	E→S/E→W	2961	3 x 1800 = 5400	0.543	73	53 + 3	3578
2	N→E	220	2 x 2000 = 4000	0.055	7	5 + 3	250
3	S→W	531	2 x 1800 = 3600	0.148	20	13 + 3	585
			T O T A L	0.751	100%	80	

TRAFFIC STREAM LINE

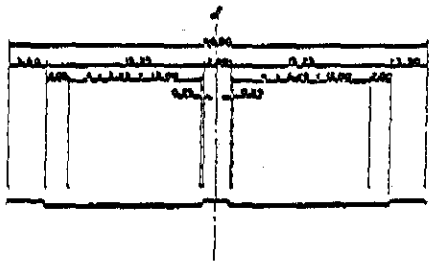


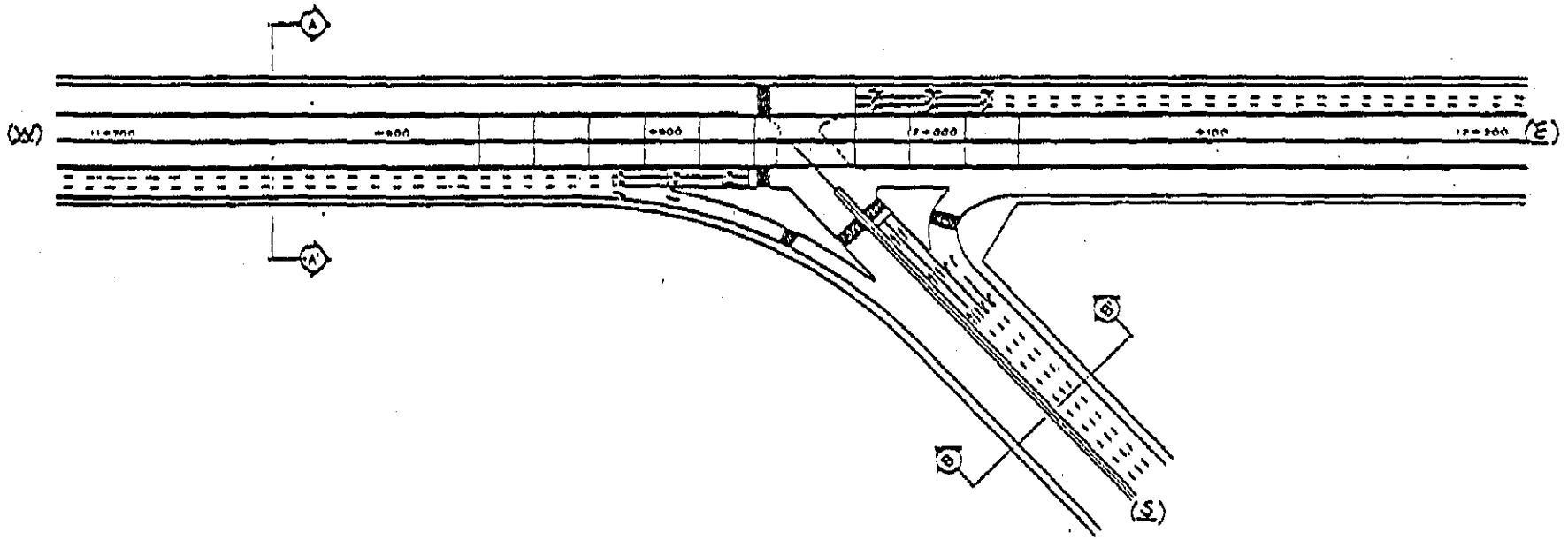
APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
C-6 / DON MARIANO MARCOS HIGHWAY

SECTION Ⓐ - Ⓐ C-6
SCALE 1:300 MTS.

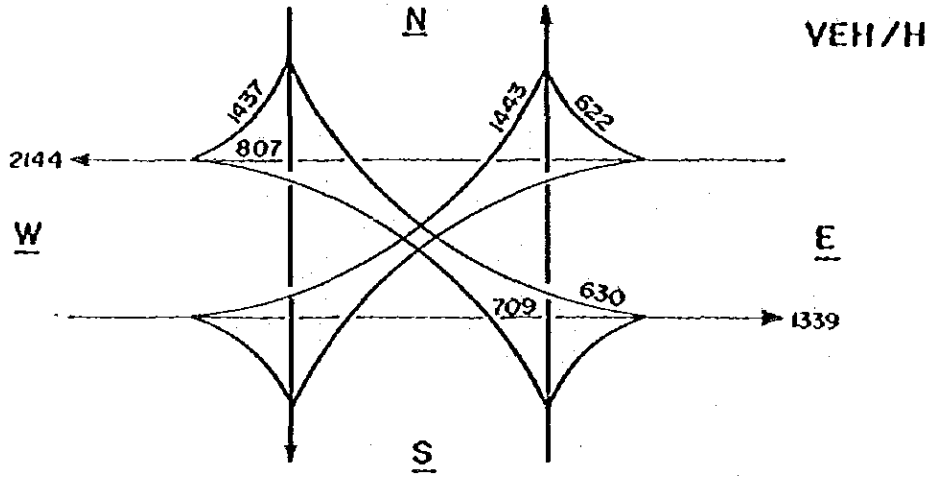


SECTION Ⓑ - Ⓑ DON MARIANO MARCOS HIGHWAY
SCALE 1:300 MTR.



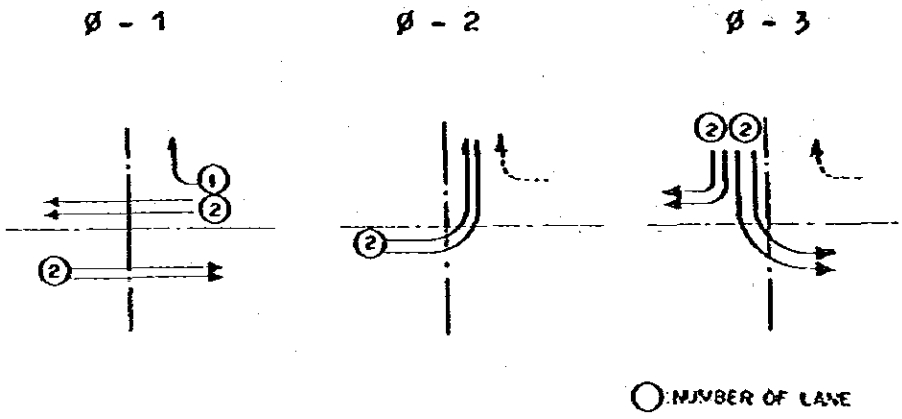


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVENUE/NORTH AVENUE INTERSECTION



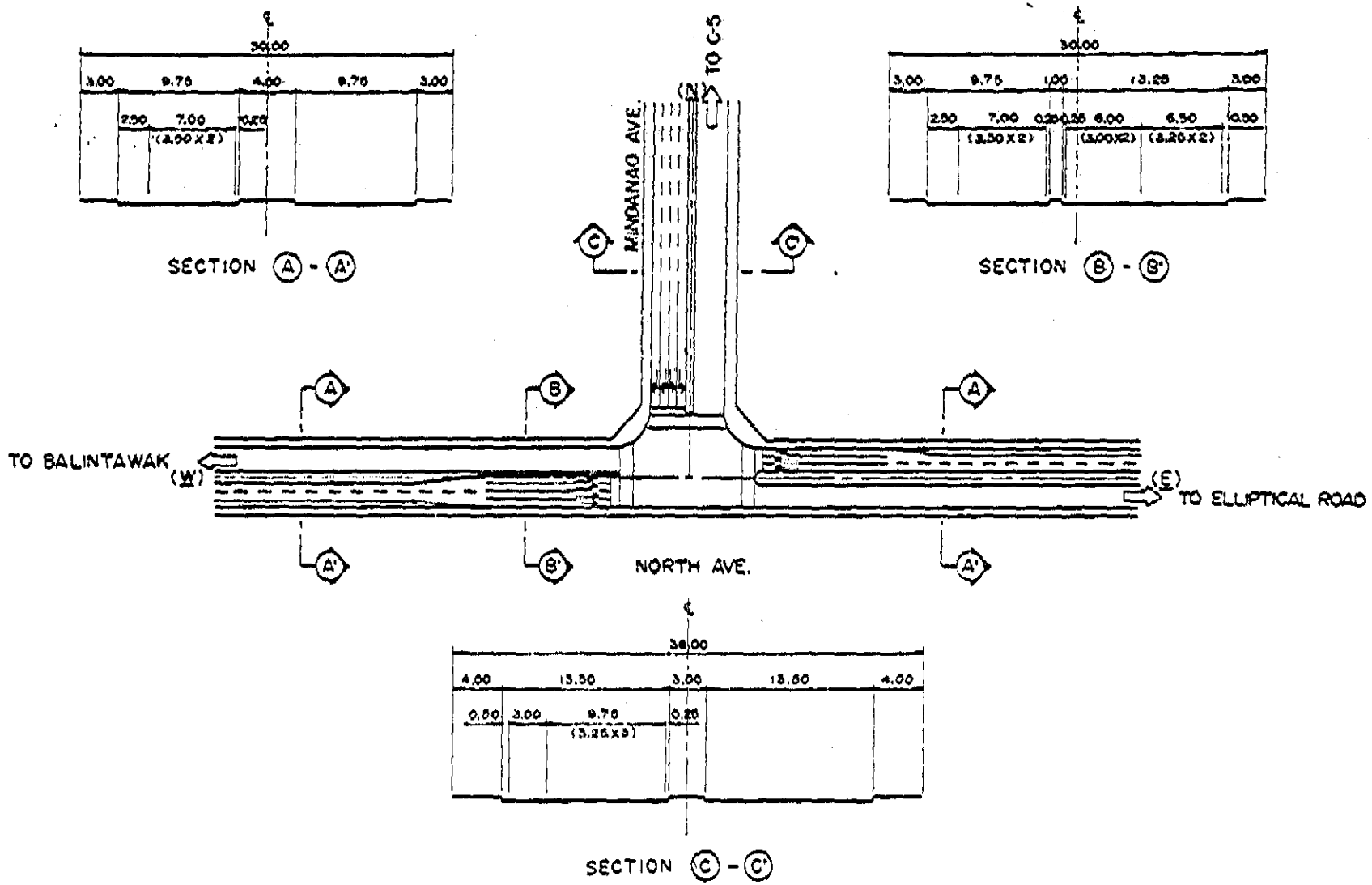
TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E E→W	709 807	2 x 2000 = 4000	0.177 0.202	26	20 + 3	889
2	W→N	1443	2 x 1800 = 3600	0.401	52	44 + 3	1760
3	N→E	630	2 x 1800 = 3600	0.175	22	17 + 3	680
TOTAL				0.778	100%	90	

TRAFFIC STREAM LINE

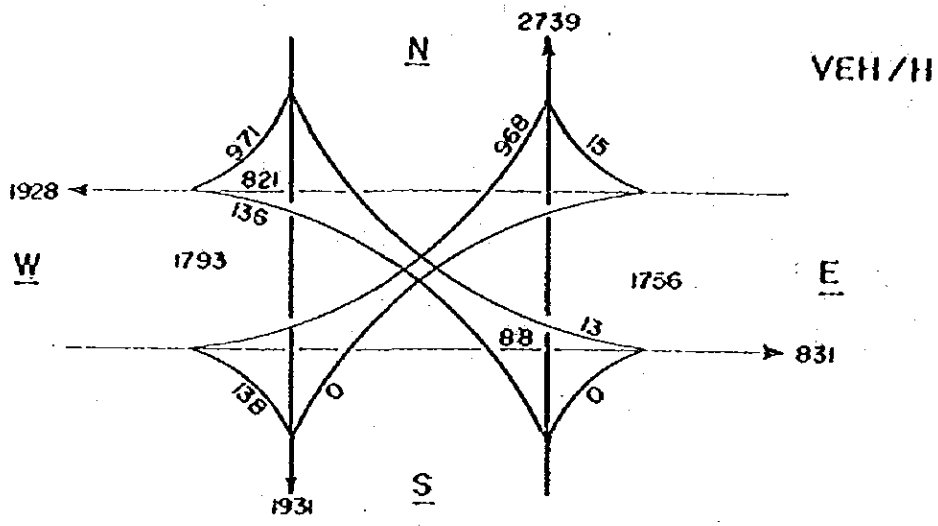


○: NUMBER OF LANE

APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVE. / NORTH AVE. INTERSECTION

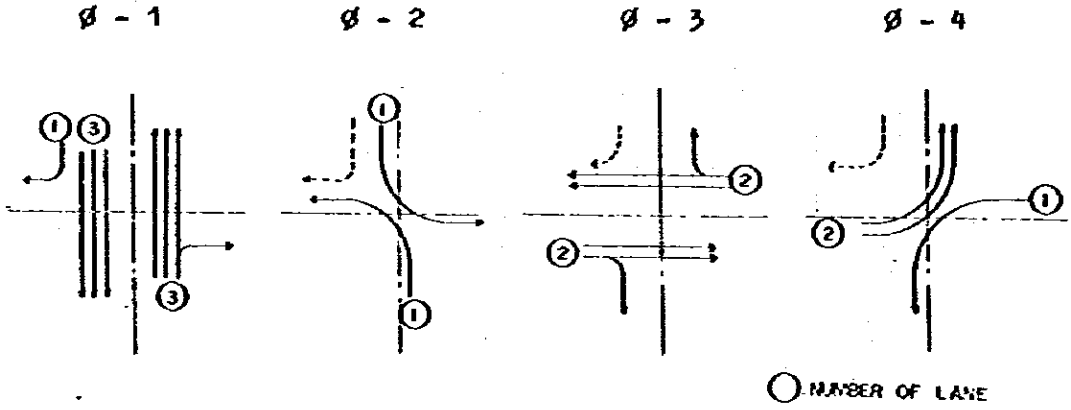


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVENUE/CONGRESSIONAL AVENUE INTERSECTION

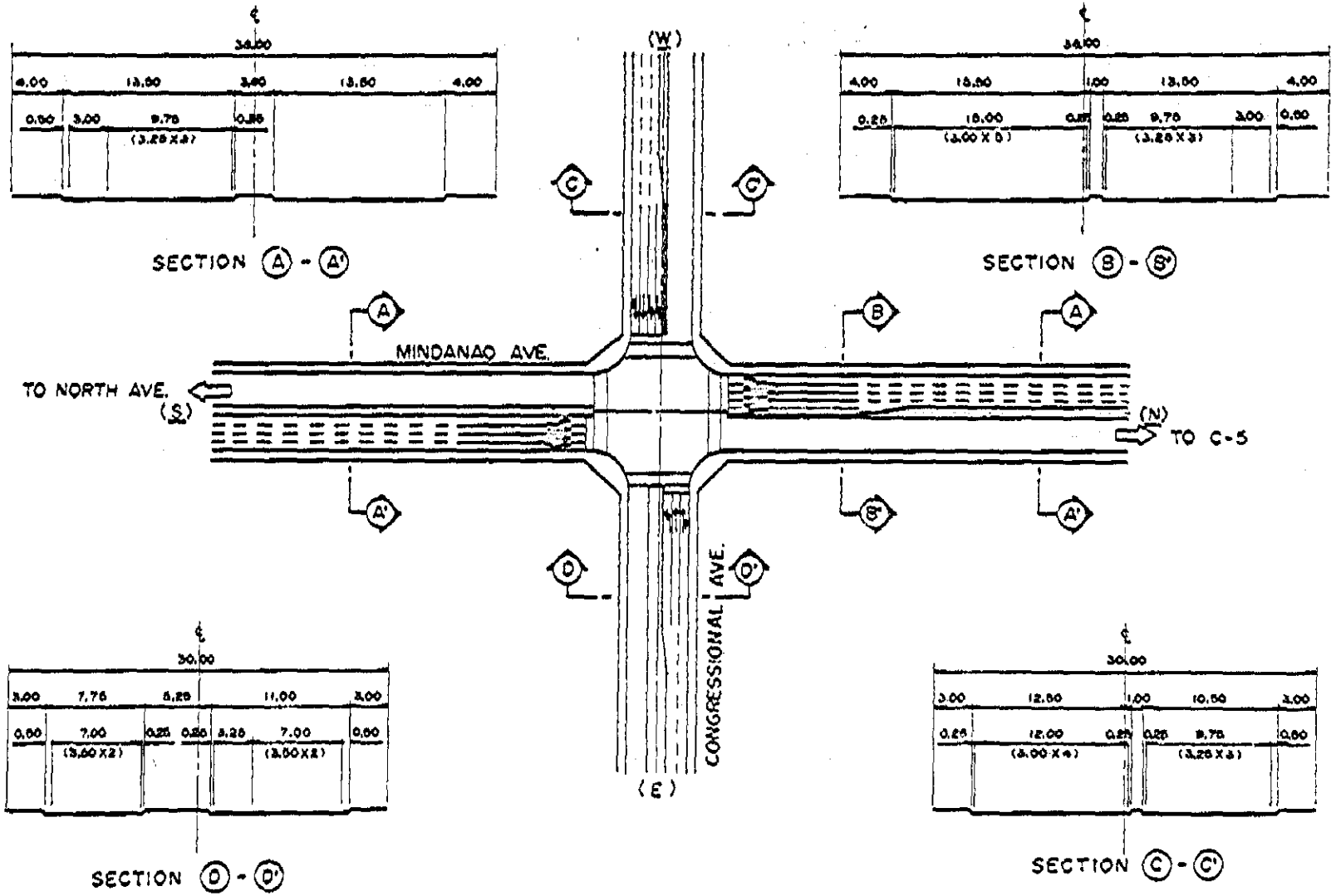


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	1793	3 x 2000 = 6000	0.299	34	58 + 3	1933
	S→N	1756		0.293			
2	N→E	13	1 x 1800 = 1800	0.007	9	14 + 3	140
	S→W	136		0.076			
3	W→E/W→S	956	2 x 2000 = 4000	0.239	27	45 + 3	1000
	E→W/E→N	836		0.269			
4	E→S	0	2 x 1800 = 3600		30	51 + 3	1020
	W→N	968		0.269			
TOTAL				0.884	100%	180	

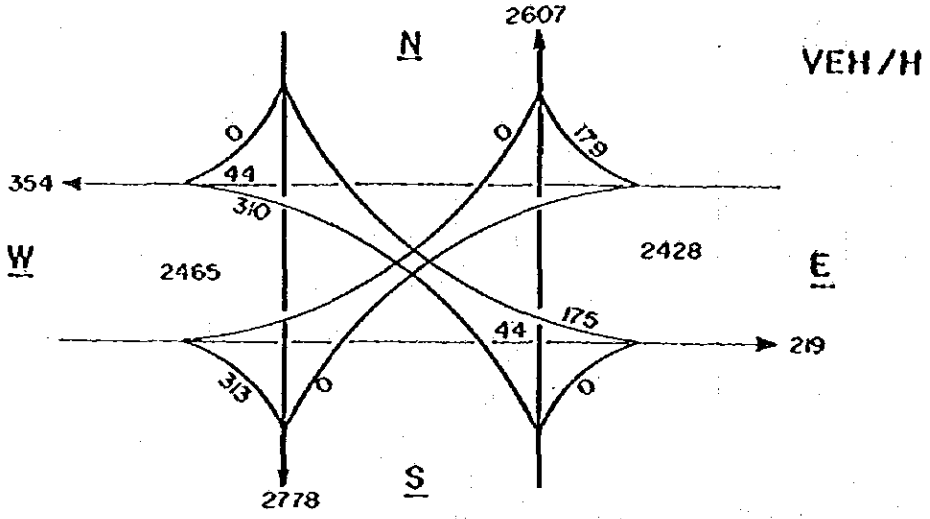
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVE. / CONGRESSIONAL AVE. INTERSECTION

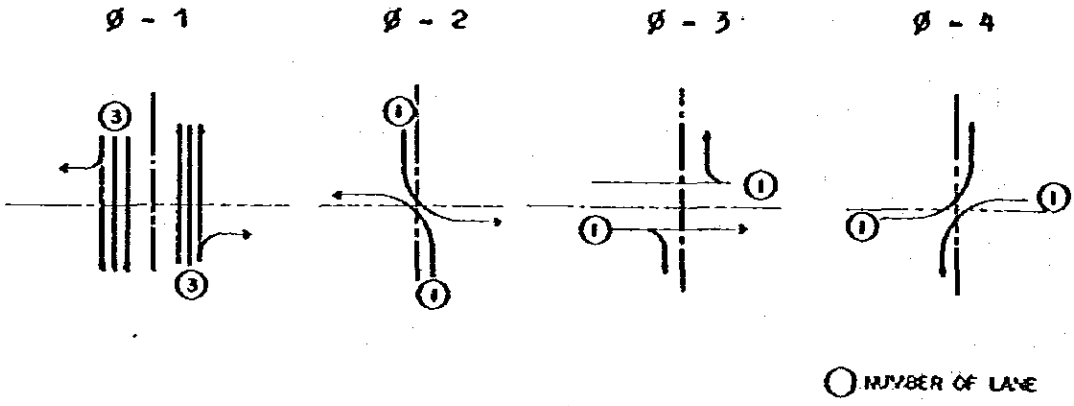


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVENUE/TANDANG SORA AVENUE INTERSECTION

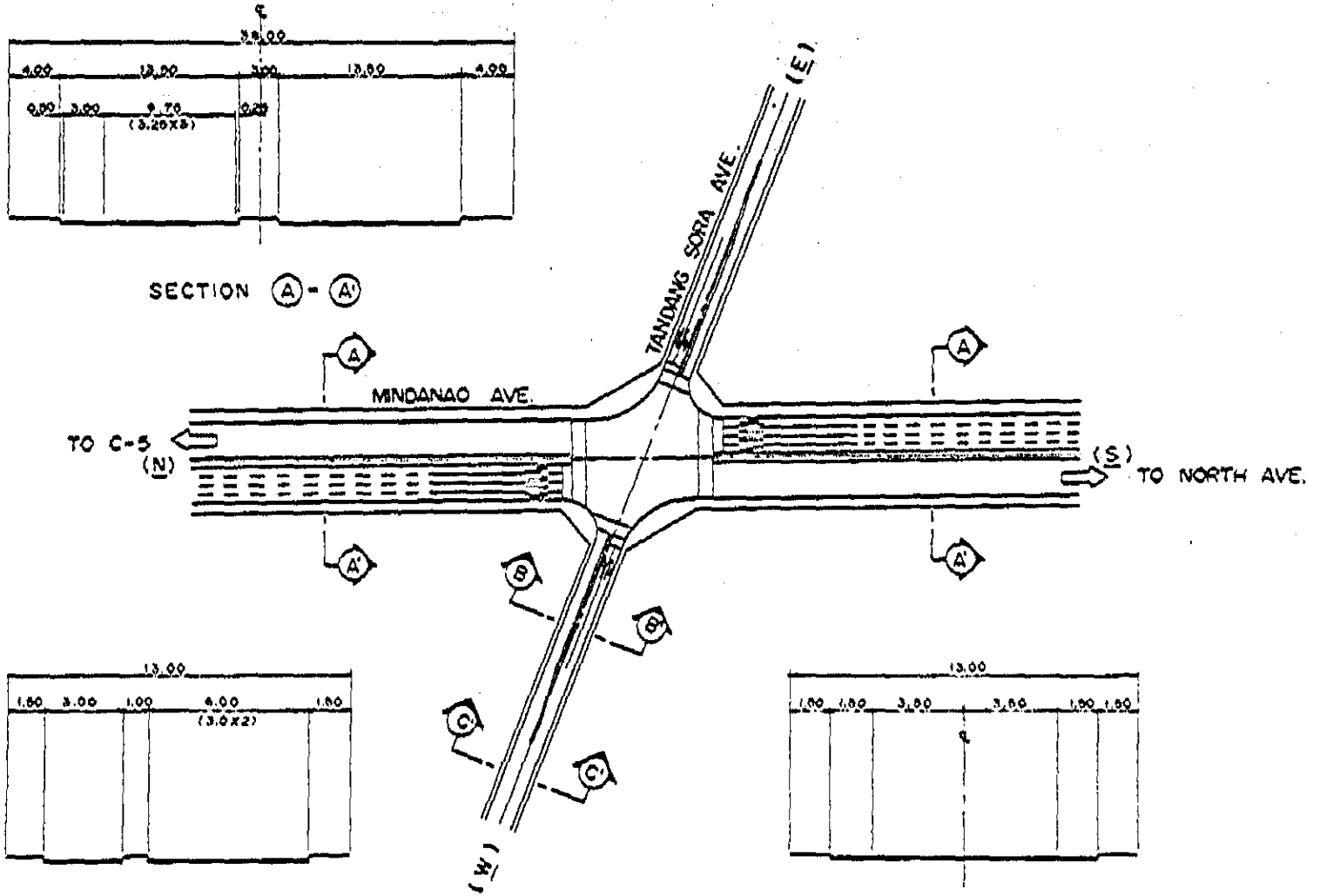


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGES-TION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S	2465	3 x 2000 = 6000	0.411	54	34 + 3	2550
	S→N	2428		0.405			
2	N→E	175	1 x 1800 = 1800	0.097	23	15 + 3	338
	S→W	310		0.172			
3	W→E/W→S	357	1 x 2000 = 2000	0.179	23	16 + 3	400
	E→W/E→S	223		0.112			
4	W→N	-	1 x 1800 = 1800	-	-	3 + 3	68
	E→S	-		-			
TOTAL				0.762	100%	80	

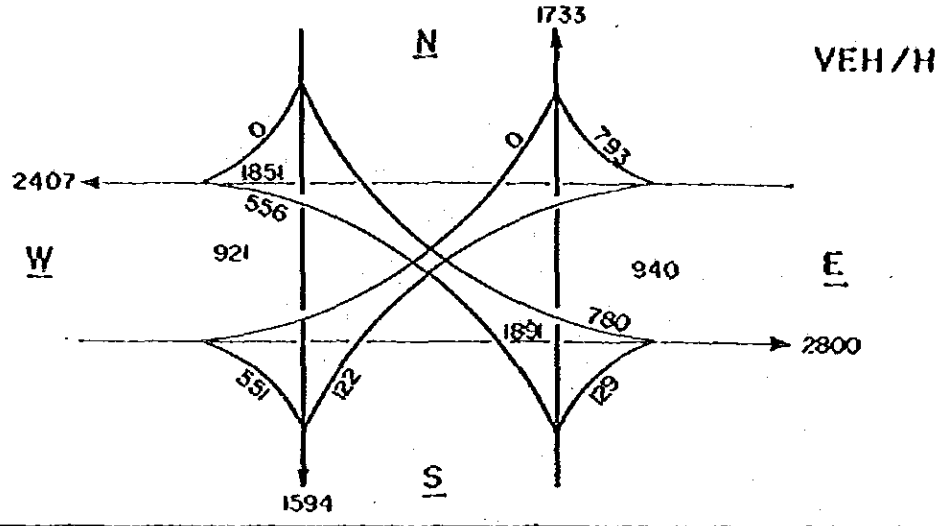
TRAFFIC STREAM LINE



APPENDIX 7.3-4 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVE./ TANDANG SORA AVE. INTERSECTION

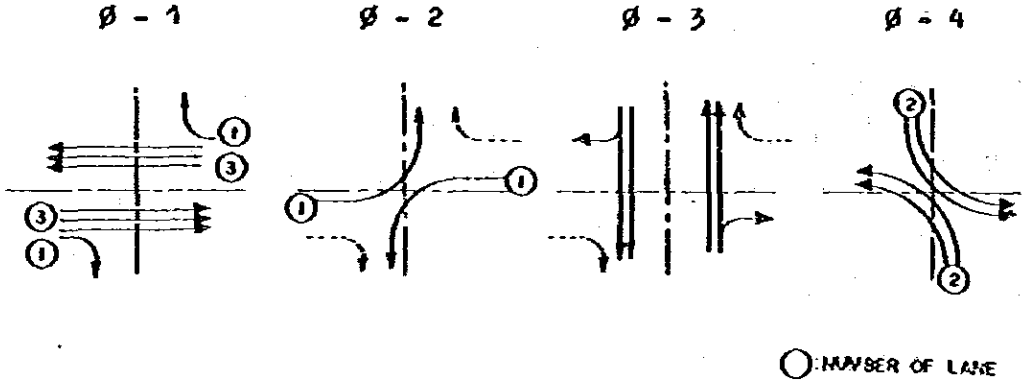


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVENUE/QUIRINO HIGHWAY INTERSECTION



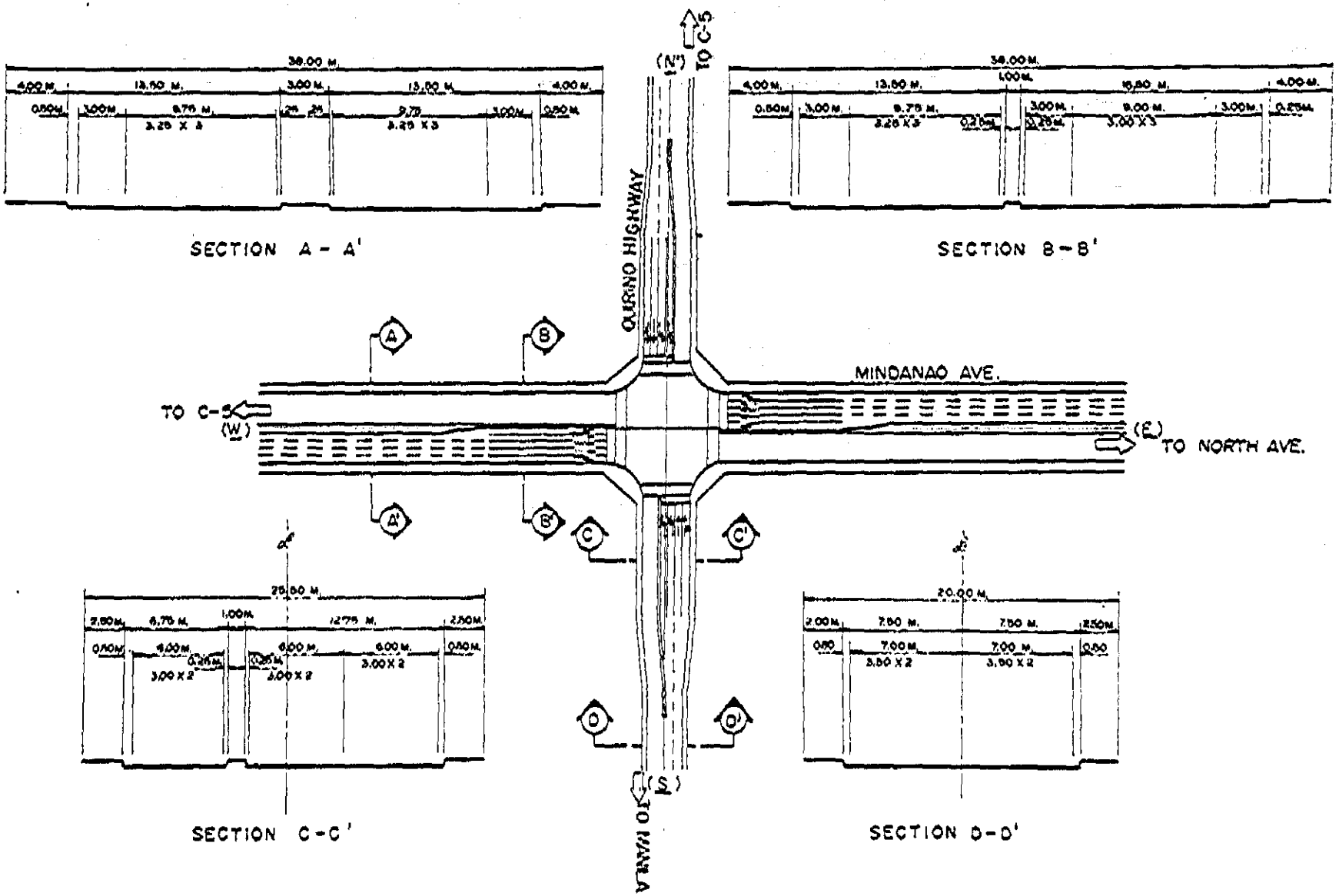
TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y = V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E	1891	3 x 2000 = 6000	0.315	36	61 + 3	2033
	E→W	1851		0.309			
2	W→N	0	1 x 1800 = 1800		8	13 + 3	130
	E→S	122		0.068			
3	N→S	921	2 x 2000 = 4000	0.230	36	52 + 3	1156
	S→N/S→E	1069		0.267			
4	N→E	780	2 x 1800 = 3600	0.217	25	42 + 3	840
	S→W	556		0.154			
TOTAL				0.867	100%	180	

TRAFFIC STREAM LINE

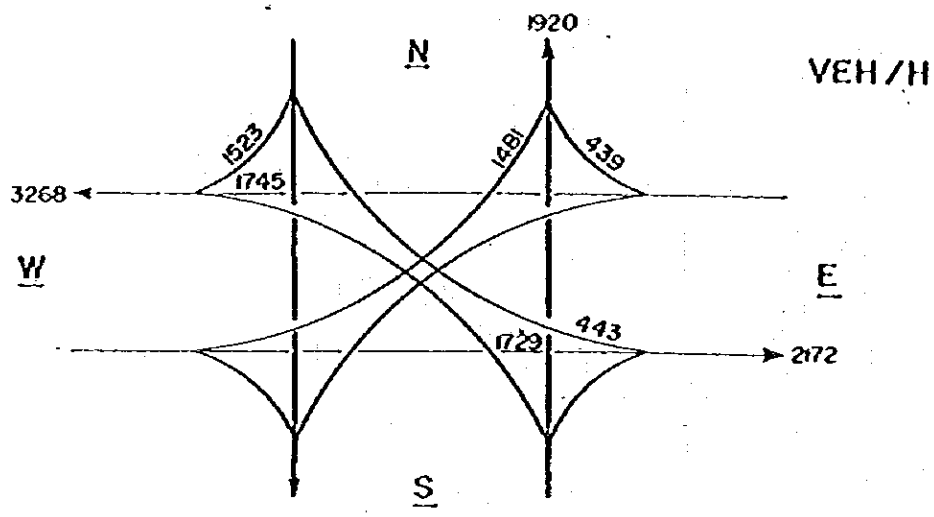


○: NUMBER OF LANE

APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
MINDANAO AVENUE / QUIRINO HIGHWAY INTERSECTION

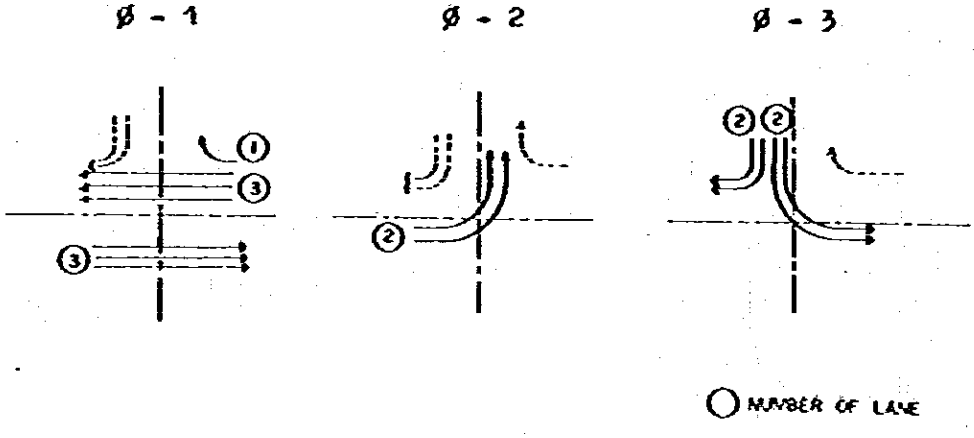


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
VISAYAS AVENUE/ELLIPTICAL ROAD INTERSECTION

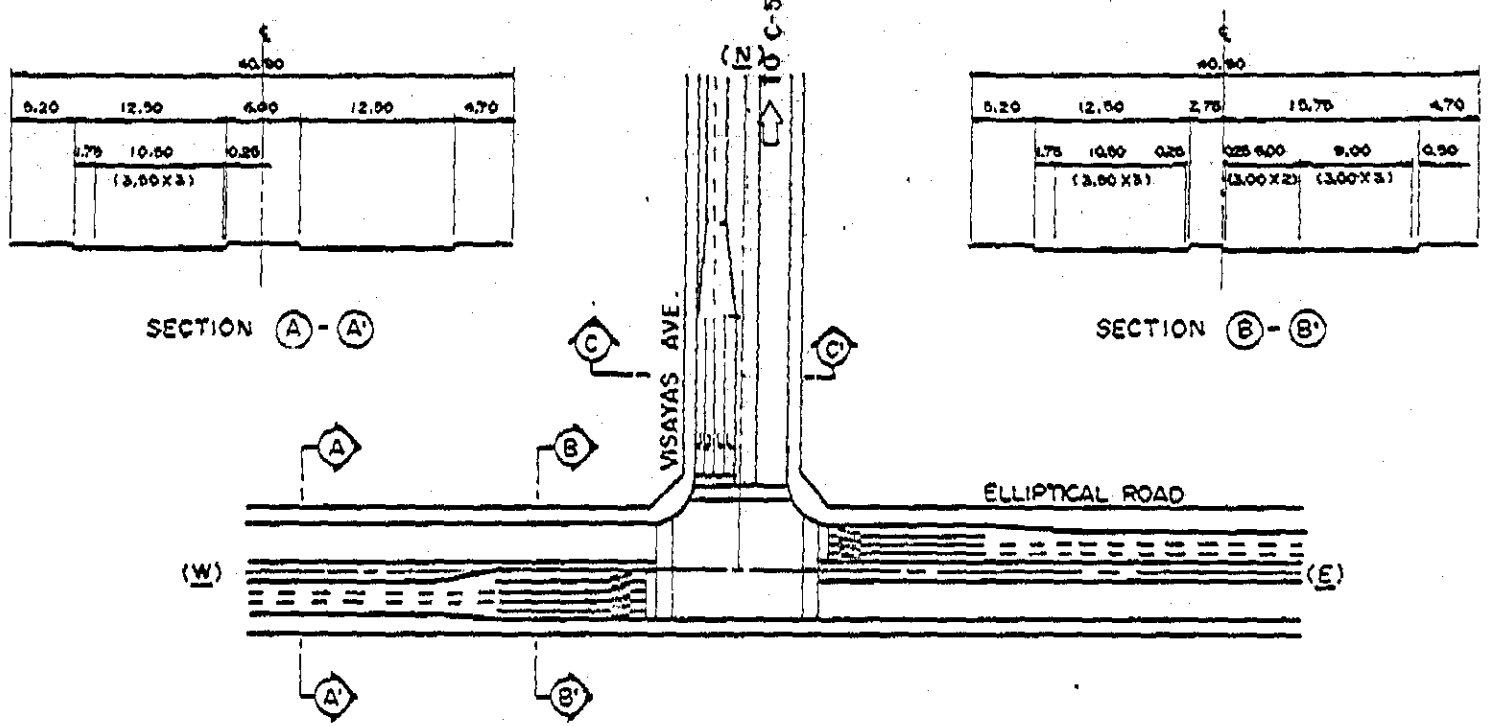


TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	W→E	1729	3 x 2000 = 6000	0.288	35	35 + 3	1909
	E→W	1745		0.291			
2	N→E	443	2 x 1800 = 3600	0.123	15	14 + 3	458
3	W→N	1481	2 x 1800 = 3600	0.411	50	52 + 3	1702
			TOTAL	0.825	100%	110	

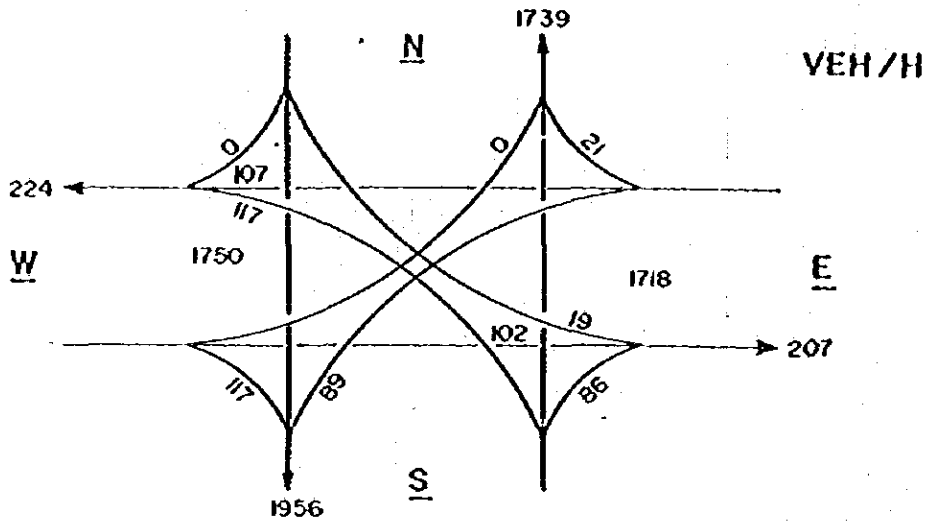
TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
VISAYAS AVE. / ELLIPTICAL ROAD INTERSECTION

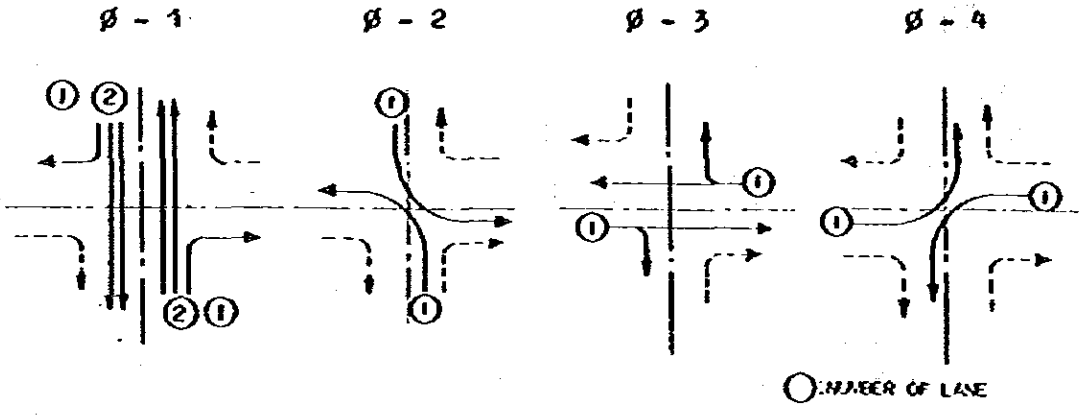


APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS
VISAYAS AVENUE/TANDANG SORA AVENUE INTERSECTION



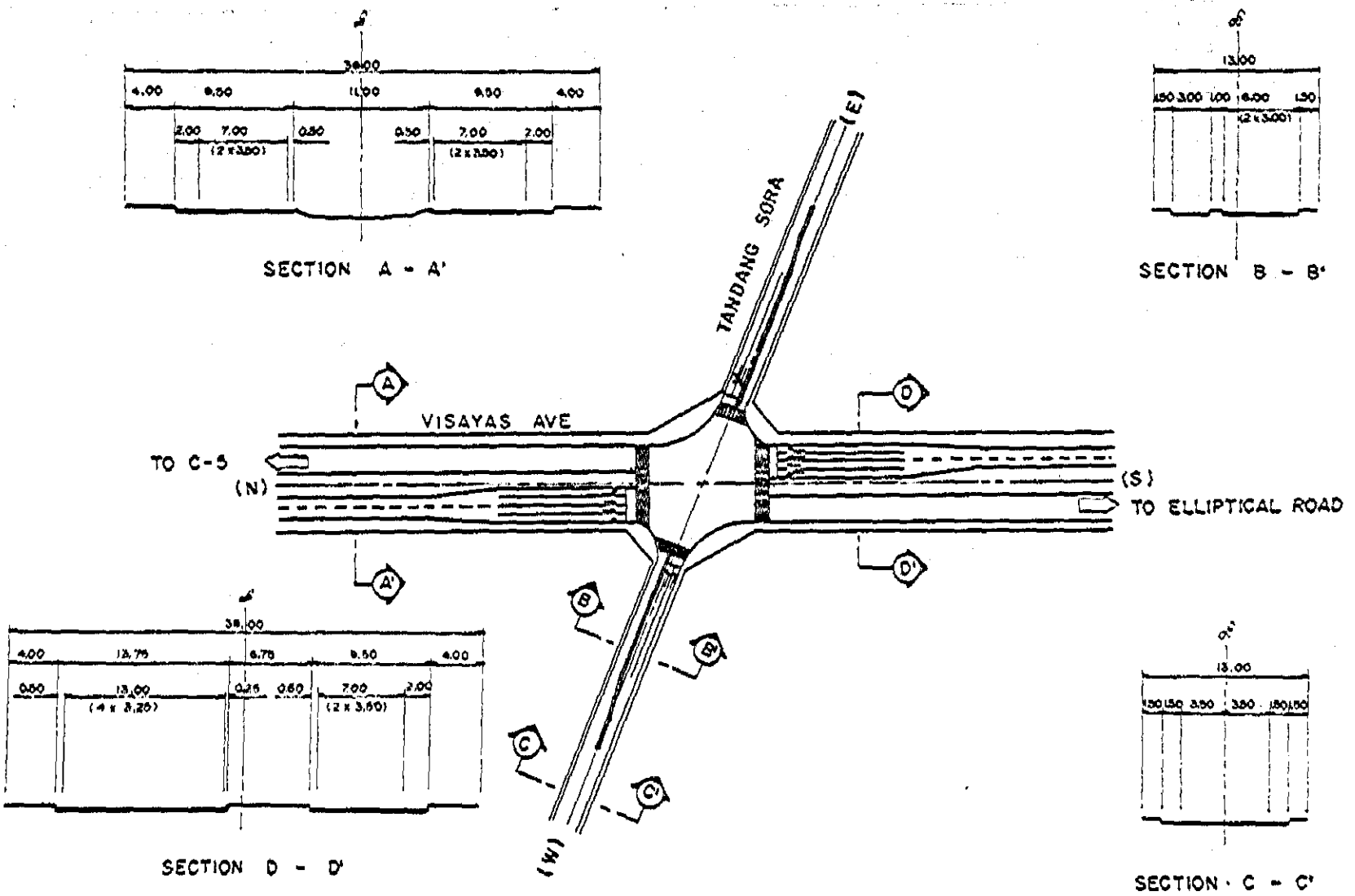
TRAFFIC PHASE		TRAFFIC VOLUME V (PCU/H)	POSSIBLE CAPACITY Cp (PCU/H)	INTEGRATED CONGESTION RATIO Y= V/Cp	MODIFIED	PHASE TIME (SEC)	TRAFFIC CAPACITY (PCU/H)
1	N→S/N→W	1750	2 x 2000 = 4000	0.348	67	46 + 3	2300
	S→N/S→E	1804		0.451			
2	N→E	19	1 x 1800 = 1800	0.011	10	7 + 3	157
	S→W	117		0.065			
3	W→E/W→S	219	1 x 2000 = 2000	0.110	16	10 + 3	250
	E→W/E→W	128		0.064			
4	W→N	0	1 x 1800 = 1800		7	5 + 3	112
	E→S	89		0.049			
TOTAL				0.675	100%	80	

TRAFFIC STREAM LINE



APPENDIX 7.3-1 INTERSECTION TRAFFIC CAPACITY ANALYSIS

VISAYAS AVE / TANDANG SORA INTERSECTION

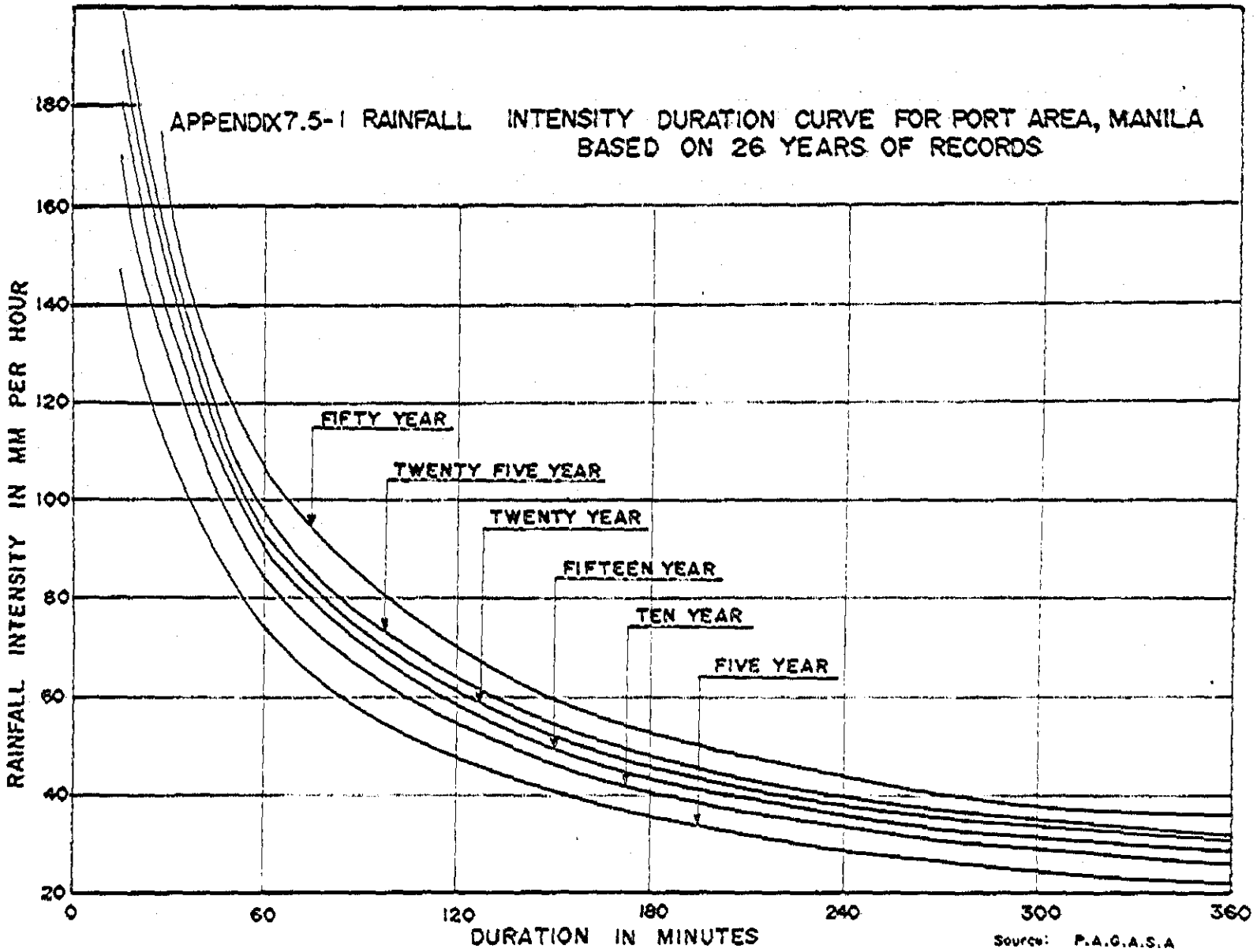


APPENDIX 7.4-1 TRAFFIC LOAD

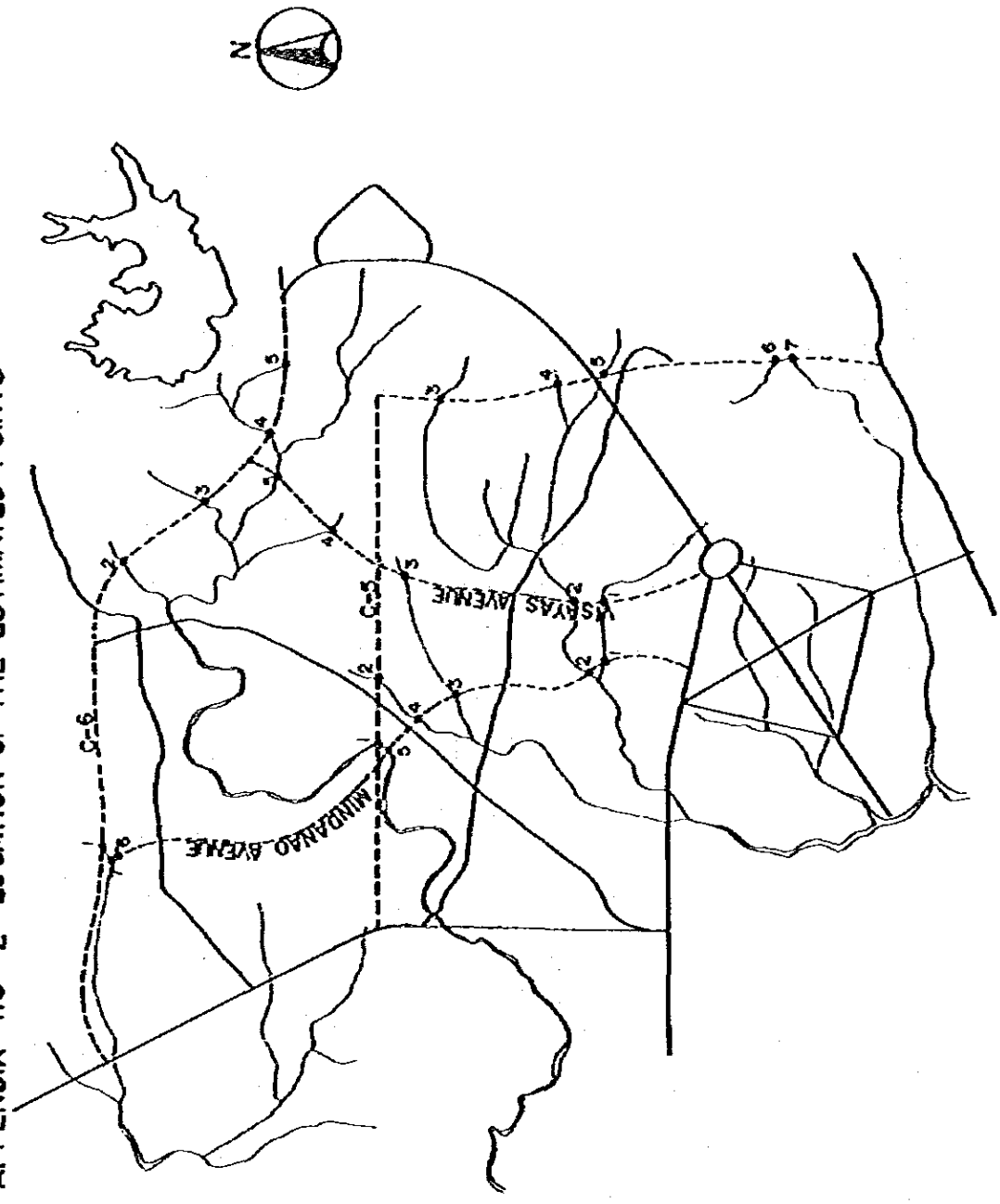
ROUTE	NO. OF LANE	AVE. TRAFFIC VOLUME IN YEARS 2000 (Veh / Day)	EQUIVALENT 18 KIPS SINGLE AXLE LOAD FREQUENCY (IN YEARS 1989-2008)
C-5			
MNDR - MINDANAO AVE.	6	76,400	13,700,000
MINDANAO AVENUE - DON MARIANO MARCOS HIGHWAY	6	56,300	9,400,000
DON MARIANO MARCOS HIGHWAY - AURORA BLVD.	6	88,300	16,000,000
C-6			
MNDR - MINDANAO AVE.	4	62,200	11,400,000
MINDANAO AVENUE - QUIRINO HIGHWAY	4	43,800	9,100,000
QUIRINO HIGHWAY - DON MARIANO MARCOS HIGHWAY	6	51,100	9,200,000
MINDANAO AVENUE	4	53,600	9,300,000
VISAYAS AVENUE	4	34,200	6,300,000

APPENDIX 7.4-2 EFFECT OF UNTREATED SUBBASE ON k VALUES

SUBGRADE k VALUE	SUBBASE k VALUE			
	4 in.	6 in.	9 in.	12 in.
50	65	75	85	110
100	130	140	160	190
200	220	230	270	320
300	320	330	370	430


APPENDIX 7.5-1 RAINFALL INTENSITY DURATION CURVE FOR PORT AREA, MANILA
BASED ON 26 YEARS OF RECORDS
RAINFALL INTENSITY IN MM PER HOUR
180
160
140
120
100
80
60
40
20
FIFTY YEAR
TWENTY FIVE YEAR
TWENTY YEAR
FIFTEEN YEAR
TEN YEAR
FIVE YEAR
0
60
120
180
240
300
360
DURATION IN MINUTES
Source: P.A.G.A.S.A

APPENDIX 7.5-2 LOCATION OF THE ESTIMATED POINTS

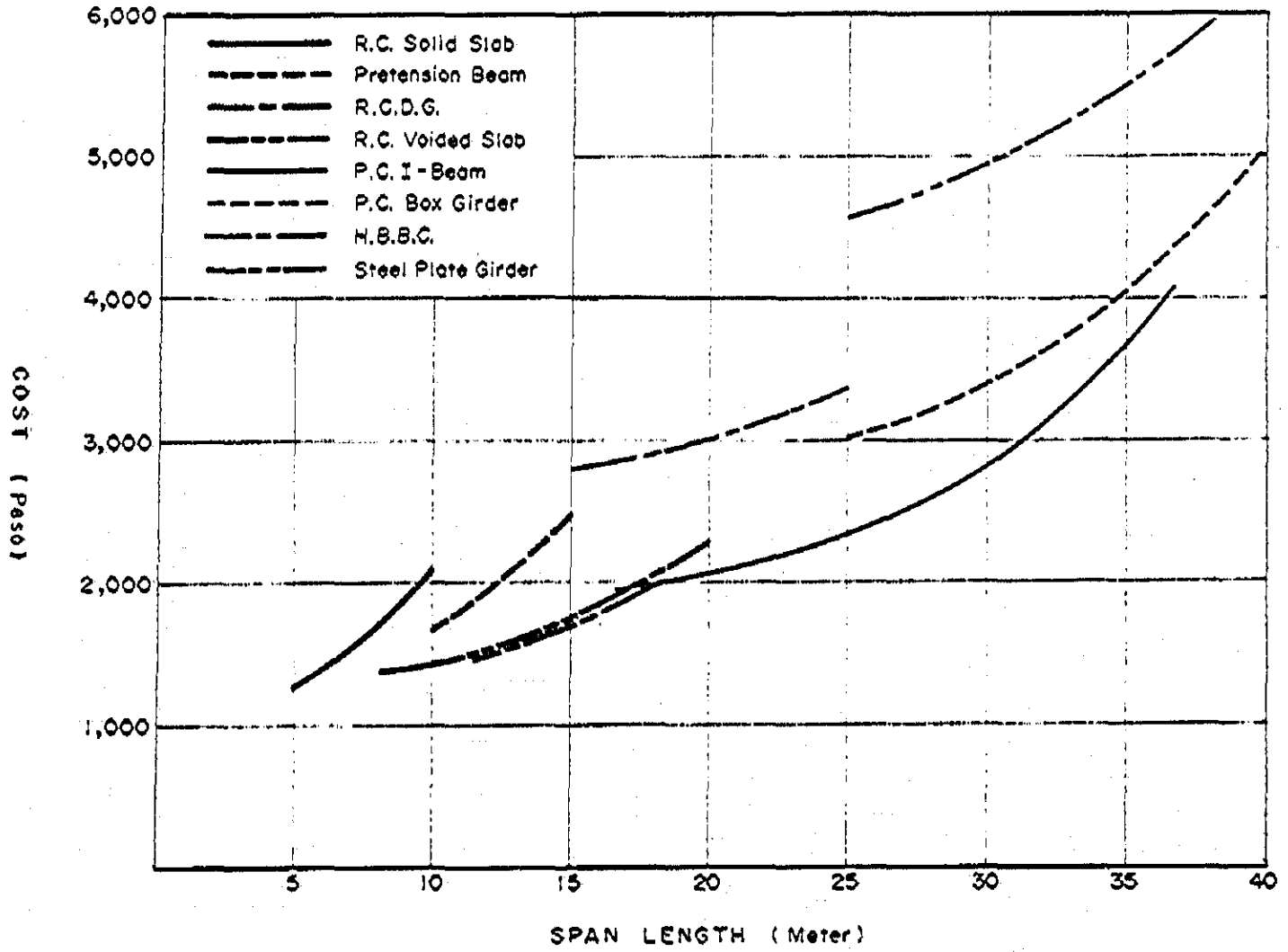


APPENDIX TABLE 7.5-3 MAXIMUM WATER DISCHARGE

		TYPE	DRAINAGE AREA (Km^2)	LENGTH OF WATERWAY (M)	SLOPE OF RIVER	VELOCITY (M/S)	FLOW TIME (Min)	INLET TIME (Min)	TOTAL TIME (Min)	RAINFALL INTENSITY (MM/H)	MAXIMUM DISCHARGE (M^2/S)
C-5	1	B	29.1	14.1	1/240	2.1	112	20	132	65	420 (551)
	2	C	1.3	1.7	1/140	3.0	9	10	19	185	53
	3	B	1.8	2.0	1/110	3.0	11	10	21	205	82
	4	C	0.6	2.2	1/160	3.0	7	10	17	190	25
	5	C	1.3	2.2	1/160	3.0	12	10	22	180	52
	6	C	0.9	1.5	1/220	2.1	12	10	22	180	36
	7	C	2.0	2.4	1/220	2.1	19	10	29	150	62
C-6	1	C	0.4	1.0	1/50	3.5	5	10	15	200	18
	2	C	0.8	1.3	1/90	3.5	6	10	16	195	35
	3	B	3.7	2.7	1/80	3.5	13	10	23	180	148
	4	B	3.0	2.2	1/130	3.0	12	10	22	200	133 (264)
	5	C	0.4	0.9	1/80	3.5	4	10	14	200	18
MINDANAO	1	B	4.1	5.2	1/160	3.0	29	10	39	150	137
	2	B	14.7	9.0	1/180	3.0	50	20	70	95	310
	3	B	2.6	2.8	1/130	3.0	16	10	26	175	101
	4	C	2.0	2.5	1/220	2.1	20	10	30	150	62
	5	B	29.1	14.2	1/240	2.1	112	20	132	65	420 (551)
	6	C	1.0	1.8	1/60	3.5	9	10	19	185	41
	7	C	0.6	1.4	1/60	3.5	7	10	17	190	25
VISAYAS	1	B	3.8	4.4	1/160	3.0	74	10	34	155	131
	2	B	13.6	7.6	1/180	3.0	47	20	62	100	302
	3	C	0.4	0.9	1/50	3.5	4	10	14	200	27
	4	C	0.9	1.4	1/70	3.5	7	10	17	190	38
	5	B	7.9	5.0	1/110	3.0	28	20	48	125	219 (350)

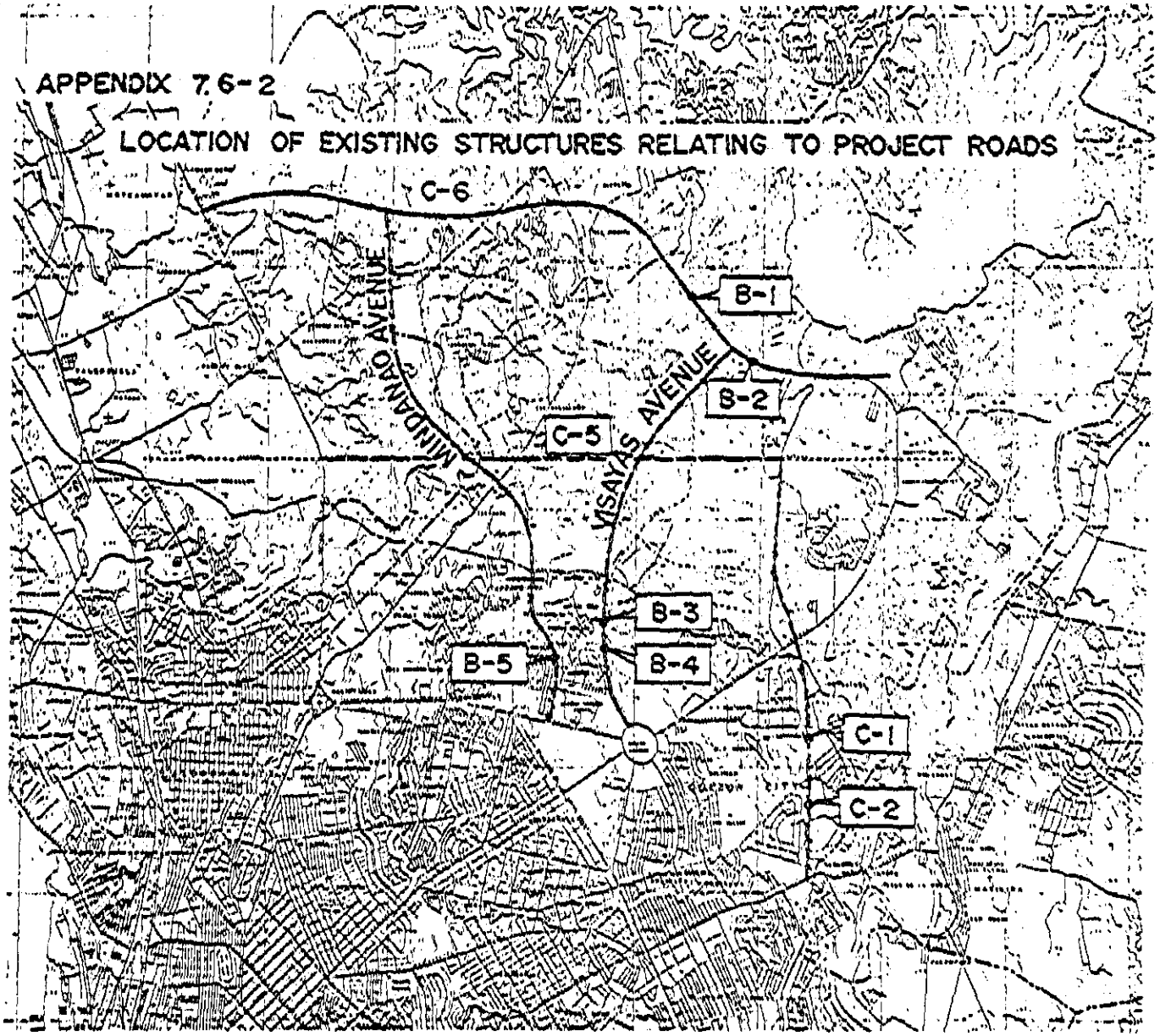
B : Bridge C : Box Culvert ( ) Indicates the discharge including La Mesa Dam

APPENDIX 7.6 – 1 CONSTRUCTION COST PER SQUARE METER FOR SUPERSTRUCTURE



APPENDIX 7.6-2

LOCATION OF EXISTING STRUCTURES RELATING TO PROJECT ROADS



APPENDIX TABLE 7.6-3 INVENTORY OF EXISTING STRUCTURES ALONG PROPOSED ROADS

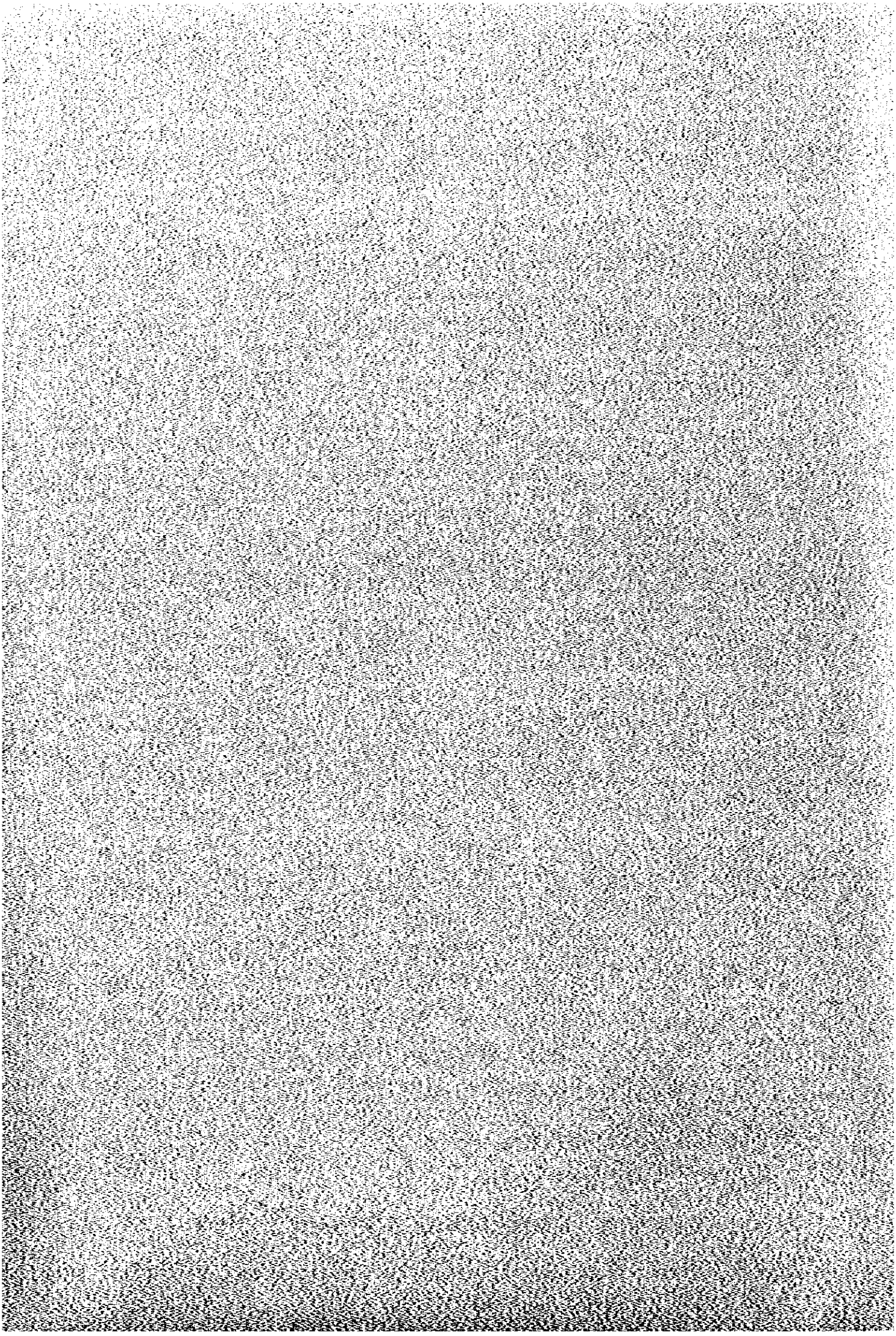
Bridge

	Bridge Length (m)	Span Length (m)	No. of Span	Width (Effective) (m)	Type of Structure	
					Superstructure	Substructure
B-1	17.30	17.30	1.	12.750	PCI - Beam	Spread Footing
B-2	41.34	10.0+21.34 +10.0	3.	12.750	Channel Beam, PCI - Beam	Spread Footing
B-3	22.0	22.0	1.	7.32	PCI - Beam	Spread Footing
B-4	10.85	10.85	1.	7.32	Channel Beam	Spread Footing
B-5	8.65	8.65	1.	3.3	Timber	Spread Footing

Box Culvert

	Section (m)		No. of Cell	Length (m)
	Width	Height		
C-1	2.4	2.4	1	25.2
C-2	2.4	2.4	1	34.0

APPENDICES FOR CHAPTER 8



APPENDIX TABLE 8.2.-1 ESTIMATED NOISE BY ROAD AND NECESSARY DISTANCE FOR ATTENUATION TO STANDARD NOISE LEVEL

1. MORNING TIME

(PCU/day)	NOISE LEVEL AT ROADSIDE* (MORNING) (dB)	STANDARD IN CLASS A* (MORNING) (db A)	DISTANCE FOR ATTENUATION TO THE STANDARD LEVEL*
C-6			
60,000	61.8		5 M.
70,000	62.4	60	5 M.
80,000	63.0		10 M.
C-5 (1) (Republic Avenue)			
50,000	61.0		Less 5 M.
60,000	61.8	60	5 M.
70,000	62.4		Less 10 M.
90,000	63.5		10 M.
C-5 (2) (Luzon Avenue)			
70,000	62.3	60	5 M.
(Katipunan Avenue)			
110,000	66.0	60	25 M.
Mindanao Avenue			
30,000	60.0		-
60,000	63.2	60	Less 10 M.
70,000	63.8		10 M.
Visayas Avenue			
40,000	61.3	60	5 M.

* - In case of Class A residential area

Source: Metro Manila Outer Major Roads Project, Northern Package

2. DAY TIME

(PCU/day)	NOISE LEVEL AT ROADSIDE* (DAY) (dB)	STANDARD IN CLASS A* (DAY) (GB A)
C-6		
60,000	62.0	
70,000	62.7	65
80,000	63.2	
C-5 (1) (Republic Avenue)		
50,000	61.1	
60,000	61.9	65
70,000	62.5	
90,000	63.6	
C-5 (2) (Luzon Avenue)		
70,000	62.4	65
(Avenue)		
110,000	66.2	65
Mindanao Avenue		
30,000	60.0	
60,000	63.3	65
70,000	63.9	
Visayas Avenue		
40,000	61.3	65

* - Incese of Class A residential area

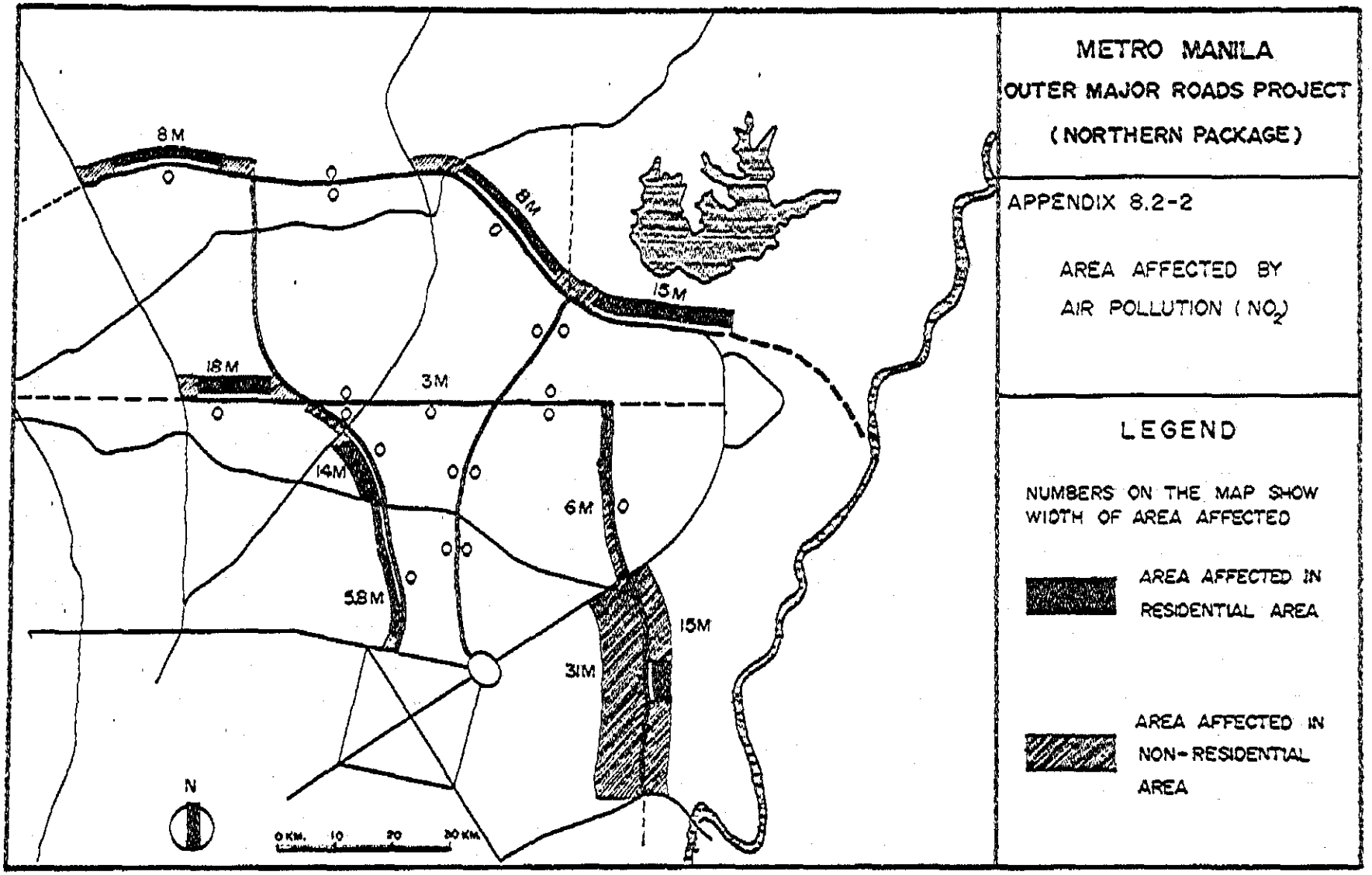
Source: Metro Manila Outer Major Roads Project, Northern Package

3. EVENING TIME

(PCU/day)	NOISE LEVEL AT ROADSIDE* (EVENING) (dB)	STANDARD IN CLASS A* (EVENING) (dB A)	DISTANCE FOR ATTENUATION TO THE STANDARD LEVEL*
C-6			
60,000	62.0		5 M.
70,000	61.7	60	5 M.
80,000	62.3		5 M.
C-5 (1) (Republic Avenue)			
50,000	60.2		-
60,000	61.0	60	Less 5 M.
70,000	61.7		5 M.
90,000	62.8		10 M.
C-5 (2) (Luzon Avenue)			
70,000	61.0	60	5 M.
(Katipunan Avenue)			
110,000	65.3	60	25 M.
Mindanao Avenue			
30,000	58.5		-
60,000	62.3	60	5 M.
70,000	63.0		Less 10 M.
Visayas Avenue			
40,000	60.2	60	-

* - In case of Class A residential area

Source: Metro Manila Outer Major Roads Project, Northern Package


8M
8M
15M
18M
3M
14M
6M
5.8M
15M
31M
N
0KM. 10 20 30KM
METRO MANILA
OUTER MAJOR ROADS PROJECT
(NORTHERN PACKAGE)
APPENDIX 8.2-2
AREA AFFECTED BY
AIR POLLUTION (NO_2)
LEGEND
NUMBERS ON THE MAP SHOW
WIDTH OF AREA AFFECTED
AREA AFFECTED IN
RESIDENTIAL AREA
AREA AFFECTED IN
NON-RESIDENTIAL
AREA

APPENDIX 8.2-3 ESTIMATED CONCENTRATION OF AIR POLLUTANTS AND EVALUATION BY PROPOSED ROAD

PROPOSED ROAD	TRAFFIC VOLUME (PCU/DAY)	NITROGEN DIOXIDE (NO_2) ESTIMATED CONCENTRATION (PPM)	NITROGEN DIOXIDE (NO_2) EVALUATION	CARBON MONOXIDE (CO) ESTIMATED CONCENTRATION (PPM)	CARBON MONOXIDE (CO) EVALUATION
C-6	60,000	0.05	Almost no problem	0.03	No problem
	70,000	0.06	15 M.	0.04	
	80,000	0.07	25 M.	0.04	
C-5 (1) (Republic Avenue)	50,000			0.02	No problem
	60,000	0.03	No problem	0.02	
	70,000	0.04	No problem	0.02	
	90,000	0.06	Almost no problem	0.03	
C-5 (2) (Luzon Avenue)	70,000	0.05	No problem	0.03	
C-5 (3) (Katipunan Avenue)	110,000	0.08	40 M.	0.03	
Mindanao/ Visayas Avenues	30,000	0.03	No problem	0.02	No problem
	40,000	0.04	No problem	0.02	
	60,000	0.06	15 M.	0.03	
	70,000	0.07	20 M.	0.04	
		Background concentration observed in Malacañang 0.004 PPM STANDARD: 0.1 PPM Equivalent to 0.0497 PPM (annual average)		Background concentration observed in Malacañang 1.4 PPM STANDARD: 9 PPM	

Source: Metro Manila Outer Major Roads Project, Northern Package