Appendix 5 Preparation of Implementation Plan

A5.1 Detailed Cost Breakdown of Consultancy Service

A5.2 Study of STEP Scheme

A5.1

Detailed Cost Breakdown of Consultancy Service

I. ESTIMATED COST FOR DETAILED ENGINEERING DESIGN STAGE

SUMMARY

DESCRIPTION	FOREIGN CURRENCY		LOCAL CURRENCY (PESO)
	YEN COMPONENT	PESO COMPONENT	
FOREIGN CURRENCY PORTION			
A. YEN COMPONENT			
A.1 REMUNERATION COST	**¥ 87,108,000**		
A.1.1 Key Staff (Foreign)	¥ 87,108,000		
A.2 REIMBURSABLE COST	**¥ 13,770,000**		
A.2.1 International Travel Expenses	¥ 750,000		
A.2.2 Per Diem Allowances	¥ 10,200,000		
A.2.3 Communications	¥ 720,000		
A.2.4 Overseas Training	¥ 2,100,000		
B. PESO COMPONENT			
B.1 REMUNERATION COST		**₱ 21,690,000**	
B.1.1 Key Staff (Local)		₱ 10,050,000	
B.1.2 Technical and Administrative Support Staff		₱ 11,640,000	
B.2 REIMBURSABLE COST		**₱ 16,820,000**	
B.2.1 Transport		₱ 5,040,000	
B.2.2 Communications		₱ 720,000	
B.2.3 Office Rental/Operating		₱ 2,520,000	
B.2.4 Office Supplies & Equipment Maintenance		₱ 720,000	
B.2.5 Office Equipment/Furniture		₱ 600,000	
B.2.6 Computer, its related devices and software, etc (L/S)		₱ 1,420,000	
B.2.7 Printing, papers, Reports and Documents		₱ 1,200,000	
B.2.8 Topographic Survey		₱ 1,000,000	
B.2.9 Soil/Geotechnical Survey		₱ 1,200,000	
B.2.10 Environmental Impact Study (L/S)		₱ 2,400,000	
LOCAL CURRENCY PORTION			
C.1 VAT (12% of B.1)			**₱ 2,602,800**
TOTAL	**¥ 100,878,000**	**₱ 38,510,000**	**₱ 2,602,800**

BREAKDOWN OF ESTIMATED COST FOR DETAILED ENGINEERING DESIGN STAGE

FOREIGN CURRENCY PORTION

A. YEN COMPONENT

A.1 REMUNERATION COST

A.1.1 Key Staff (Foreign)	M/M	Billing Rate ¥	AMOUNT (¥)
1 Project Manager	12	¥ 2,562,000	¥ 30,744,000
2 Sr. Bridge Engr	12	2,562,000	30,744,000
3 Sr. Highway Engr	10	2,562,000	25,620,000
Total of A.1	34		**¥ 87,108,000**

A.2 REIMBURSABLE COST

A.2.1 International Travel Expenses		
a) Air Ticket for Expatriate (Japan-Manila-Japan) x 3 round trip x ¥ 200,000/RT	¥	600,000
b) Miscellaneous Travel Expenses in Japan Travelling expenses from airport to origin of Engrs. in Japan and travel processing ¥50,000 x 3 RT	¥	150,000
A.2.2 Per Diem Allowances Subsistence Allowance for Expatriates 34 man-month x 30 days @ ¥10,000	¥	10,200,000
A.2.3 Communications International Communication 12 months @ ¥60,000	¥	720,000
A.2.4 Overseas Training Two (2) Officials of Government and one (1) engineer from Consultant International travel (MNL-Japan-MNL) ¥200,000 x 3 RT	¥	600,000
Expenses in Japan inclusive transportation, accommodation, miscellaneous expenses, allowance, etc. ¥ 50,000/day x 10 days x 3 person	¥	1,500,000
Total of A.2	**¥**	**13,770,000**

BREAKDOWN OF ESTIMATED COST FOR DETAILED ENGINEERING DESIGN STAGE

FOREIGN CURRENCY PORTION

B. PESO COMPONENT

B.1 REMUNERATION COST

B.1.1	Key Staff (Local)	M/M	Billing Rate ₱	AMOUNT (¥)
1	Deputy Project Manager	12	₱ 150,000	₱ 1,800,000
2	Sr. Bridge Engr	12	150,000	1,800,000
3	Sr. Structural Engr	9	150,000	1,350,000
4	Sr. Drainage Engr	10	150,000	1,500,000
5	Sr. Highway Engr.	4	150,000	600,000
6	Sr. Geotechnical Engr.	4	150,000	600,000
7	Sr. Qty/Surveyor Engr.	4	150,000	600,000
8	Sr. Cost Engr.	4	150,000	600,000
9	Sr. Specification Specialist	4	150,000	600,000
10	Sr. Environmental Specialist	4	150,000	600,000
	Total of B.1	**67**		₱ **10,050,000**

B.1.2 Technical and Administrative Support Staff

1	Bridge Engr (Sup)	12	₱ 60,000	₱ 720,000
2	Bridge Engr (Sub)	9	60,000	540,000
3	Structural Engr.	9	60,000	540,000
4	Drainage Engr.	4	60,000	240,000
5	Highway Engr.	10	60,000	600,000
6	Cost Engr.	4	60,000	240,000
7	Specification Engr.	4	60,000	240,000
8	Environmental Engr.	4	60,000	240,000
9	8 - CAD Operator	78	60,000	4,680,000
10	Administrative Officer	12	60,000	720,000
11	Secretary	12	60,000	720,000
12	2 - Encoder	24	60,000	1,440,000
13	Janitor	12	60,000	720,000
	Total of B.1.2	**194**		₱ **11,640,000**
	Total of B.1	**261**		₱ **21,690,000**

B.2 REIMBURSABLE COST

B.2.1 Transport

Service Vehicle

6 vehicle x 12 months @ ₱70.000 ₱ 5,040,000

B.2.2	Communications Domestic Communication 12 months @ P 60,000 (PLDT & Cellular Phone)	₱	720,000
B.2.3	Office Rental/Operating a) Office Rental 300 sq.m. of floor area @ ₱600/sq.m./month for 12 months	₱	2,160,000
	b) Miscellaneous maintenance, utility consumption and security service, etc. All @ ₱30,000/month for 12 months	₱	360,000
B.2.4	Office Supplies & Equipment Maintenance Consumable Materials & Equipment maintenance services, etc. All @ ₱ 60,000/mon for 12 months	₱	720,000
B.2.5	Office Equipment/Furniture Office and technical equipment and furniture, fixture All @ ₱ 50,000/mon for 12 months	₱	600,000
B.2.6	Computer, its related devices and software, etc (L/S)	₱	1,420,000
B.2.7	Printing, papers, Reports and Documents Photocopying, printing, binding, copies, blue print, etc All @ ₱ 100,000/mon for 12 months	₱	1,200,000
B.2.8	Topographic Survey Confirmatory Survey 4 Bridge @ ₱ 250,000	₱	1,000,000
B.2.9	Soil/Geotechnical Survey Confirmatory Survey 4 Bridge @ ₱ 300,000	₱	1,200,000
B.2.10	Environmental Impact Study (L/S) 4 Bridge @ ₱ 600,000	₱	2,400,000
	Total of B.2	**¥**	**16,820,000**

II. ESTIMATED COST FOR PRE-CONSTRUCTION STAGE

SUMMARY

DESCRIPTION	FOREIGN CURRENCY		LOCAL CURRENCY (PESO)
	YEN COMPONENT	PESO COMPONENT	
FOREIGN CURRENCY PORTION			
A. YEN COMPONENT			
A.1 REMUNERATION COST	**¥ 15,372,000**		
A.1.1 Key Staff (Foreign)	¥ 15,372,000		
A.2 REIMBURSABLE COST	**¥ 2,600,000**		
A.2.1 International Travel Expenses	¥ 500,000		
A.2.2 Per Diem Allowances	¥ 1,800,000		
A.2.3 Communications	¥ 300,000		
B. PESO COMPONENT			
B.1 REMUNERATION COST		**₱ 6,330,000**	
B.1.1 Key Staff (Local)		₱ 3,450,000	
B.1.2 Technical and Administrative Support Staff		₱ 2,880,000	
B.2 REIMBURSABLE COST		**₱ 2,760,000**	
B.2.1 Transport		₱ 840,000	
B.2.2 Communications		₱ 240,000	
B.2.3 Office Rental/Operating		₱ 840,000	
B.2.4 Office Supplies & Equipment Maintenance		₱ 120,000	
B.2.5 Office Equipment/Furniture		₱ 120,000	
B.2.6 Printing, papers, Reports and Documents		₱ 600,000	
LOCAL CURRENCY PORTION			
C.1 VAT (12% of B.1)			**₱ 759,600**
TOTAL	**¥ 17,972,000**	**₱ 9,090,000**	**₱ 759,600**

BREAKDOWN OF ESTIMATED COST FOR PRE-CONSTRUCTION STAGE

FOREIGN CURRENCY PORTION

A. YEN COMPONENT

A.1 REMUNERATION COST

A.1.1	Key Staff (Foreign)	**M/M**	**Billing Rate ¥**	**AMOUNT (¥)**
	1 Project Manager	6	¥ 2,562,000	¥ 15,372,000
	Total of A.1	6		**¥ 15,372,000**

A.2 REIMBURSABLE COST

A.2.1	International Travel Expenses		
	a) Air Ticket for Expatriate (Japan-Manila-Japan) x 2 round trip x ¥ 200,000/RT	¥	400,000
	b) Miscellaneous Travel Expenses in Japan Travelling expenses from airport to origin of Engrs. in Japan and travel processing ¥50,000 x 2 RT	¥	100,000
A.2.2	Per Diem Allowances Subsistence Allowance for Expatriates 6 man-month x 30 days @ ¥10,000	¥	1,800,000
A.2.3	Communications International Communication 6 months @ ¥50,000	¥	300,000
	Total of A.2	**¥**	**2,600,000**

B. PESO COMPONENT

B.1 REMUNERATION COST

B.1.1	Key Staff (Local)	**M/M**	**Billing Rate ₱**	**AMOUNT (¥)**
	1 Deputy Project Manager	8	₱ 150,000	₱ 1,200,000
	2 Sr. Cost Engr.	3	150,000	450,000
	3 Sr. Specification Specialist	12	150,000	1,800,000
	Total of B.1	**23**		**₱ 3,450,000**

B.1.2	Technical and Administrative Support Staff					
	1 Administrative Officer	12	₱	60,000	₱	720,000
	2 Secretary	12		60,000		720,000
	3 Encoder	12		60,000		720,000
	4 Janitor	12		60,000		720,000
	Total of B.1.2	**48**			₱	**2,880,000**
	Total of B.1	**71**			₱	**6,330,000**
B.2	**REIMBURSABLE COST**					
B.2.1	Transport Service Vehicle 1 vehicle x 12 months @ P 70,000				₱	840,000
B.2.2	Communications Domestic Communication 12 months @ P 20,000 (PLDT & Cellular Phone)				₱	240,000
B.2.3	Office Rental/Operating a) Office Rental 100 sq.m. of floor area @ ₱600/sq.m./month for 12 months				₱	720,000
	b) Miscellaneous maintenance, utility consumption and security service, etc. All @ ₱10,000/month for 12 months				₱	120,000
B.2.4	Office Supplies & Equipment Maintenance Consumable Materials & Equipment maintenance services, etc. All @ ₱ 10,000/mon for 12 months				₱	120,000
B.2.5	Office Equipment/Furniture Office and technical equipment and furniture, fixture All @ ₱ 10,000/mon for 12 months				₱	120,000
B.2.6	Printing, papers, Reports and Documents Photocopying, printing, binding, copies, blue print, etc All @ ₱ 50,000/mon for 12 months				₱	600,000
	Total of B.2				¥	**2,760,000**

III. ESTIMATED COST FOR CONSTRUCTION SUPERVISION STAGE

SUMMARY

DESCRIPTION	FOREIGN CURRENCY		LOCAL CURRENCY (PESO)
	YEN COMPONENT	PESO COMPONENT	
FOREIGN CURRENCY PORTION			
A. YEN COMPONENT			
A.1 REMUNERATION COST	**¥ 199,836,000**		
A.1.1 Key Staff (Foreign)	¥ 199,836,000		
A.2 REIMBURSABLE COST	**¥ 26,700,000**		
A.2.1 International Travel Expenses	¥ 2,000,000		
A.2.2 Per Diem Allowances	¥ 23,400,000		
A.2.3 Communications	¥ 1,300,000		
B. PESO COMPONENT			
B.1 REMUNERATION COST		**₱ 61,680,000**	
B.1.1 Key Staff (Local)		₱ 49,200,000	
B.1.2 Technical and Administrative Support Staff		₱ 12,480,000	
B.2 REIMBURSABLE COST		**₱ 43,180,000**	
B.2.1 Per Diem/Allowances		₱ 5,250,000	
B.2.2 Transport		₱ 27,920,000	
B.2.3 Communications		₱ 1,560,000	
B.2.4 Office Rental/Operating		₱ 5,850,000	
B.2.5 Printing, papers, Reports and Documents		₱ 2,600,000	
LOCAL CURRENCY PORTION			
C.1 VAT (12% of B.1)			**₱ 7,401,600**
TOTAL	**¥ 226,536,000**	**₱ 104,860,000**	**₱ 7,401,600**

BREAKDOWN OF ESTIMATED COST FOR CONSTRUCTION SUPERVISION STAGE

FOREIGN CURRENCY PORTION

A. YEN COMPONENT

A.1 REMUNERATION COST

A.1.1 Key Staff (Foreign)	M/M	Billing Rate ¥	AMOUNT (¥)
1 Project Manager	26	¥ 2,562,000	¥ 66,612,000
2 Sr. Bridge Engr	26	2,562,000	66,612,000
3 Sr. Highway Engr	26	2,562,000	66,612,000
Total of A.1	78		**¥ 199,836,000**

A.2 REIMBURSABLE COST

A.2.1 International Travel Expenses		
a) Air Ticket for Expatriate (Japan-Manila-Japan) x 8 round trip x ¥ 200,000/RT	¥	1,600,000
b) Miscellaneous Travel Expenses in Japan Travelling expenses from airport to origin of Engrs. in Japan and travel processing ¥50,000 x 8 RT	¥	400,000
	¥	2,000,000
A.2.2 Per Diem Allowances Subsistence Allowance for Expatriates 78 man-month x 30 days @ ¥10,000	¥	23,400,000
A.2.3 Communications International Communication 26 months @ ¥50,000	¥	1,300,000
Total of A.2	**¥**	**26,700,000**

BREAKDOWN OF ESTIMATED COST FOR CONSTRUCTION SUPERVISION STAGE

FOREIGN CURRENCY PORTION

B. PESO COMPONENT

B.1 REMUNERATION COST

B.1.1	Key Staff (Local)	**M/M**	**Billing Rate ₱**	**AMOUNT (¥)**
1	Deputy Project Manager	26	₱ 150,000	₱ 3,900,000
2	Sr. Bridge Engr	26	150,000	3,900,000
3	Sr. Structural Engr	26	150,000	3,900,000
4	Sr. Highway Engr.	26	150,000	3,900,000
5	Sr. Environmental Specialist	14	150,000	2,100,000
6	Resident Engr.	24	150,000	3,600,000
7	Resident Engr.	24	150,000	3,600,000
8	Resident Engr.	22	150,000	3,300,000
9	Sr. Materials Engr.	24	150,000	3,600,000
#	Sr. Materials Engr.	24	150,000	3,600,000
#	Sr. Materials Engr.	22	150,000	3,300,000
#	Sr. Qty/Survey Engr.	24	150,000	3,600,000
#	Sr. Qty/Survey Engr.	24	150,000	3,600,000
#	Sr. Qty/Survey Engr.	22	150,000	3,300,000
	Total of B.1	**328**		₱ **49,200,000**

B.1.2 Technical and Administrative Support Staff

1	Bridge Engr	26	₱ 60,000	₱ 1,560,000
2	Structural Engr.	26	60,000	1,560,000
3	Civil Engr.	26	60,000	1,560,000
4	CAD Operator	26	60,000	1,560,000
5	Administrative Officer	26	60,000	1,560,000
6	Secretary	26	60,000	1,560,000
7	Encoder	26	60,000	1,560,000
8	Janitor	26	60,000	1,560,000
	Total of B.1.2	**208**		₱ **12,480,000**
	Total of B.1	**536**		₱ **61,680,000**

B.2 REIMBURSABLE COST

B.2.1	Per Diem/Allowances		
	Field Allowances for Local Staff		
	379 man-month x 30 days @ P400/day for Key Staff	₱	4,548,000
	78 man-month x 30 days @ P300/day for Support Staff		702,000
			5,250,000
B.2.2	Transport		
	Service Vehicle (Main Office)		
	5 vehicle x 26 months @ P 80,000	₱	10,400,000
	Service Vehicle (Fiel Office)		
	3 vehicle x 24 months @ P 80,000	₱	5,760,000
	3 vehicle x 24 months @ P 80,000		6,480,000
	3 vehicle x 22 months @ P 80,000		5,280,000
			27,920,000
B.2.3	Communications		
	Domestic Communication 26 months @ P 60,000	₱	1,560,000
	(PLDT & Cellular Phone)		
B.2.4	Office Rental/Operating		
	a) Office Rental		
	200 sq.m. of floor area @ ₱600/sq.m./month for 26 months	₱	3,120,000
	b) Miscellaneous maintenance, utility consumption and security service, etc.		
	All @ ₱25,000/month for 26 months	₱	650,000
	c) Office Supplies & Equipment Maintenance		
	Consumable Materials & Equipment maintenance services, etc.		
	All @ ₱ 40,000/mon for 26 months	₱	1,040,000
	d) Office Equipment/Furniture		
	Office and technical equipment and furniture, fixture		
	All @ ₱ 40,000/mon for 26 months	₱	1,040,000
B.2.5	Printing, papers, Reports and Documents		
	Photocopying, printing, binding, copies, blue print, etc		
	All @ ₱ 100,000/mon for 26 months	₱	2,600,000
	Total of B.2	**¥**	**43,180,000**

A5.2

Study of STEP Scheme

A5.2 Study of STEP Scheme

A5.2.1 Estimated Cost and Cash Flow

A5.2.2 Plan and Profile of Proposed Flyover

A5.2.3 Picture of Proposed Flyover

A5.2.4 Bird View of Flyover

A5.2.1 Estimated Cost and Cash Flow

Summary of Civil Work Cost for EDSA/NORTH-WEST (1/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
1.0	**GENERAL REQUIREMENTS**						
A	**FACILITIES FOR THE ENGINEER**	1.00	l.s.	5,000,000.00	5,000,000.00		
	SUB-TOTAL (PART A)				**5,000,000.00**	-	
B	**OTHER GENERAL REQUIREMENTS**						
SPL B.2.1	Construction Health and Safety	1.00	P.s	1,200,000.00	1,200,000.00		
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	6,089,165.41	6,089,165.41		
SPL B.2-3	Traffic Management During Construction	1.00	P.s	2,250,000.00	2,250,000.00		
SPL B.2-4	Dayworks	1.00	P.s	2,000,000.00	2,000,000.00		
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	1,920,000.00	1,920,000.00		
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	1,000,000.00	1,000,000.00		
	SUB-TOTAL (PART B)				**14,459,165.41**	-	
	SUB-TOTAL GENERAL REQUIREMENTS				**19,459,165.41**	-	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**						
C	**EARTHWORKS**						
100(1)	Clearing and Grubbing	0.18	ha.	90,846.53	16,352.38		
100(3)	Individual Removal Trees (Small)	-	ea.	1,013.26	-		
100(4)	Individual Removal Trees (Large)	-	ea.	1,427.27	-		
100(5)	Removal and Earth Balling of Trees	2.00	ea.	1,000.00	2,000.00		
101(1)	Removal of Structures and Obstruction	1.00	l.s.	200,000.00	200,000.00		
101(3)a	Removal of Existing PCCP	10,177.05	sq.m.	245.78	2,501,315.35		
101(3)b	Breaking of Existing PCCP	-	sq.m.	335.00	-		
101(4)a	Removal of Existing Concrete Curb	2,347.83	l.m.	60.00	140,869.80		
101(4)b	Removal of Existing Concrete Curb & Gutter	781.73	l.m.	110.00	85,990.30		
101(4)c	Removal of Existing Sidewalk and Median	3,701.24	sq.m.	120.00	444,148.80		
101(4)d	Removal of Existing RCPC	789.59	l.m.	200.00	157,918.00		
101(4)e	Removal of Existing Covered canal	-	cu.m	586.00	-		
105(1)	Subgrade Preparation	2,714.49	sq.m.	37.18	100,924.74		
	SUB-TOTAL (PART C)				**3,649,519.36**	-	
D	**SUBBASE AND BASE COURSE**						
200	Sub Base Course	3,170.40	cu.m.	879.97	2,789,856.89		
	SUB-TOTAL (PART D)				**2,789,856.89**	-	
E	**SURFACE COURSES**						
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	8.62	tonne	65,971.81	568,677.00		
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	12,312.35	sq.m	924.31	11,380,428.23		
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	2,506.00	sq.m	1,073.00	2,688,938.00		
311(1)a	Portland Cement Concrete Pavement t=300 mm	7,155.21	sq.m	2,887.66	20,661,813.71		
311(1)b	CRC Pavement Reinforced	-	sq.m	4,935.16	-		
	SUB-TOTAL (PART E)				**35,299,856.94**	-	
F	**BRIDGE CONSTRUCTION**						
	Approch Ramp						
103(1)	Structure Excavation	1,919.59	cu.m.	586.00	1,124,879.74		
103(2)	Structural Backfilling	1,502.29	cu.m.	565.00	848,793.85		
104(2)	Embankment, Selected Borrow	7,512.20	cu.m.	984.09	7,392,680.90		
401(a)	Cast in Place Concrete Railing	906.48	l.m.	5,006.92	4,538,672.84		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	68,956.50	kg.	62.70	4,323,572.55	2,944,442.55	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	42,748.50	kg.	68.25	2,917,585.13	1,825,360.95	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	652.86	cu.m.	6,621.00	4,322,586.06	1,263,284.10	
405(1)b	Approach Slab	68.88	cu.m.	6,233.40	429,356.59	133,282.80	
405(1)c	Concrete Leveling Pad	30.44	cu.m.	80,462.16	2,449,268.15		
405(6)	Lean Concrete	119.72	cu.m.	4,111.70	492,252.72		
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-		
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	1,094.02	sq.m.	14,163.00	15,494,605.26	13,560,377.90	

Summary of Civil Work Cost for EDSA/NORTH-WEST (2/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
	Substructure					Cement	Reinforcing steel
400(17)a	Concrete Piles Cast in Drilled Holes, Ø800 mm	-	l.m.	24,592.89	-	-	-
400(17)b	Concrete Piles Cast in Drilled Holes, Ø1000 mm	-	l.m.	35,098.96	-	-	-
400(17)c	Concrete Piles Cast in Drilled Holes, Ø1500 mm	108.00	l.m.	60,716.52	6,557,384.16	369,110.93	1,629,047.70
400(17)d	Concrete Piles Cast in Drilled Holes, Ø2000 mm	-	l.m.	101,704.06	-	-	-
400(17)e	Concrete Piles Cast in Drilled Holes, Ø2500 mm	-	l.m.	146,178.83	-	-	-
400(17)f	Concrete Piles Cast in Drilled Holes, Ø2800 mm	232.00	l.m.	177,476.50	41,174,548.00	2,762,833.25	12,193,589.63
400(17)g	Concrete Piles Cast in Drilled Holes, Ø3000 mm	45.00	l.m.	202,409.64	9,108,433.80	615,184.88	2,715,079.50
400(22)a	Pile Integrity Test	26.00	ea.	43,784.56	1,138,398.56		
400(22)b	Pile Dynamic Test	13.00	ea.	583,087.25	7,580,134.25		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	146.21	kg.	62.70	9,167.49	6,243.25	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	382,089.81	kg.	68.25	26,077,629.53	16,315,234.89	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	1,125.24	cu.m.	6,621.00	7,450,214.04	2,177,339.40	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	39.00	cu.m.	6,621.00	258,219.00	75,465.00	
405(6)	Lean Concrete	8.32	cu.m.	4,111.70	34,209.34		
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	40.00	ea.	1,800.00	72,000.00		
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	30.00	ea.	1,200.00	36,000.00		
408	Structural Steel (Furnished, Fabricated & Erected)	64,240.00	kg.	182.00	11,691,680.00	7,708,800.00	
416	PC Panel	-	sq.m	1,500.00	-		
SPL	Paint for Steel Pier	130.00	sq.m	700.00	91,000.00		
	Superstructure						
401(a)	Cast in Place Concrete Railing	1,322.00	l.m.	5,006.92	6,619,148.24		
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	54,788.00	kg.	62.70	3,435,207.60	2,339,447.60	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	812,729.33	kg.	68.25	55,468,776.77	34,703,542.39	
404(2)c	Prestressing steel	81,272.93	kg.	152.90	12,426,631.00	12,426,631.00	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	4,337.59	cu.m.	16,971.01	73,613,283.27	8,393,236.65	
405(1)c	Structural Concrete Class P 34Mpa for PC Box	-	cu.m.	18,900.00	-	-	
408	Structural Steel (Furnished, Fabricated & Erected)	991,407.10	kg.	182.00	180,436,091.80	118,968,851.74	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	96.00	ea.	14,500.00	1,392,000.00		
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	-	ea.	12,000.00	-		
412(1)c	Rubber Bearing Shoe 2500kN	8.00	ea.	220,000.00	1,760,000.00		
413(1)	Expansion Joint	176.80	l.m.	29,418.63	5,201,213.78		
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-		
SPL 415	Waterproofing	7,965.05	sq.m.	1,800.00	14,337,090.00		
SPL	Paint for Steel Girder	5,990.00	sq.m	700.00	4,193,000.00		
	SUB-TOTAL (PART F)				**514,495,714.43**	**297,451,862.43**	**57,128,155.36**
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**						
404(1)b	Reinforcing steel, Grade 40 (Box Culvert)	-	kg.	62.70	-	-	
405(1)b	Structural Concrete, Class A (Box Culvert) 27.6 Mpa	-	cu.m	8,480.81	-	-	
500(1)a	RCPC, Class II	783.00	l.m.	3,082.45	2,413,558.35		
500(1)b	RCPC, Class IV	8.00	l.m.	7,005.56	56,044.48		
502(2)a	Storm Deck Drain with Grating	66.00	ea.	19,679.57	1,298,851.62		
502(2)b	Curb Inlet Manhole	120.00	ea.	25,000.00	3,000,000.00		
502(3)	Catch Basins	-	ea.	35,000.00	-		
502(4)	Junction Box	-	ea.	5,000.00	-		
SPL 512	Collector Pipe	916.21	l.m.	1,153.20	1,056,573.37		
	SUB-TOTAL (PART G)				**7,825,027.82**	-	
H	**MISCELLANEOUS STRUCTURES**						
600(1)	Concrete Curb	1,591.47	l.m.	1,333.21	2,121,763.72		
600(3)a	Concrete Curb and Gutter	1,223.63	l.m.	1,661.30	2,032,816.52		
600(3)b	Concrete Side Strip	-	sq.m.	350.00	-		
601(1)a	Concrete Sidewalk	2,012.66	sq.m.	1,560.60	3,140,957.20		
601(1)b	Concrete Median	11,290.69	sq.m.	1,560.60	17,620,250.81		
605(1)	Warning Sign	5.00	set	34,912.46	174,562.30		
605(2)	Regulatory Sign	11.00	set	34,912.46	384,037.06		
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36		
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10		
605(3)c	Informatory Sign, Cantilever Support	4.00	set	388,956.44	1,555,825.76		
605(3)d	Informatory Sign, Double Post	4.00	set	42,944.99	171,779.96		
612(1)	Reflectorized Thermoplastic Pavement Markings, White	1,167.03	sq.m.	1,092.83	1,275,365.39		
	SUB-TOTAL (PART H)				**31,151,787.18**	-	
J	**SPECIAL ITEM**						
SPL 1	9m Pole, Single arm complete	109.00	set	86,228.98	9,398,958.82		
SPL 2	9m Pole, Double arm complete	-	set	90,000.00	-		
SPL 3	Lighting system, (under carriageway)	20.00	set	59,290.99	1,185,819.80		
SPL 4	Flood lights	14.00	set	80,000.00	1,120,000.00		
SPL 5	Traffic Signal Light	1.00	P.s	2,000,000.00	2,000,000.00		
	SUB-TOTAL (PART J)				**13,704,778.62**	-	
	TOTAL				**628,375,706.66**		

Summary of Civil Work Cost for EDSA/NORTH-WEST (COST COMPONENT)(1/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT		
						Foreign Currency (FC)	Local Currency (LC)	TAXES
1.0	GENERAL REQUIREMENTS							
A	FACILITIES FOR THE ENGINEER	1.00	l.s.	5,000,000.00	5,000,000.00	1,785,714.29	2,678,571.43	535,714.29
	SUB-TOTAL (PART A)				5,000,000.00	1,785,714.29	2,678,571.43	535,714.29
B	OTHER GENERAL REQUIREMENTS							
SPL B.2.1	Construction Health and Safety	1.00	P.s	1,200,000.00	1,200,000.00	428,571.43	642,857.14	128,571.43
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	6,089,165.41	6,089,165.41	2,174,701.93	3,262,052.90	652,410.58
SPL B.2-3	Traffic Management During Construction	1.00	P.s	2,250,000.00	2,250,000.00	803,571.43	1,205,357.14	241,071.43
SPL B.2-4	Dayworks	1.00	P.s	2,000,000.00	2,000,000.00	714,285.71	1,071,428.57	214,285.71
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	1,920,000.00	1,920,000.00	685,714.29	1,028,571.43	205,714.29
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	1,000,000.00	1,000,000.00	357,142.86	535,714.29	107,142.86
	SUB-TOTAL (PART B)				14,459,165.41	5,163,987.65	7,745,981.47	1,549,196.29
	SUB-TOTAL GENERAL REQUIREMENTS				19,459,165.41	6,949,701.93	10,424,552.90	2,084,910.58
2.0	INTERCHANGE CONSTRUCTION WITH VIADUCT							
C	EARTHWORKS							
100(1)	Clearing and Grubbing	0.18	ha.	90,846.53	16,352.38	5,840.13	8,760.20	1,752.04
100(3)	Individual Removal Trees (Small)	-	ea.	1,013.26	-	-	-	-
100(4)	Individual Removal Trees (Large)	-	ea.	1,427.27	-	-	-	-
100(5)	Removal and Earth Balling of Trees	2.00	ea.	1,000.00	2,000.00	714.29	1,071.43	214.29
101(1)	Removal of Structures and Obstruction	1.00	l.s.	200,000.00	200,000.00	71,428.57	107,142.86	21,428.57
101(3)a	Removal of Existing PCCP	10,177.05	sq.m.	245.78	2,501,315.35	893,326.91	1,339,990.37	267,998.07
101(3)b	Breaking of Existing PCCP	-	sq.m.	335.00	-	-	-	-
101(4)a	Removal of Existing Concrete Curb	2,347.83	l.m.	60.00	140,869.80	50,310.64	75,465.96	15,093.19
101(4)b	Removal of Existing Concrete Curb & Gutter	781.73	l.m.	110.00	85,990.30	30,710.82	46,066.23	9,213.25
101(4)c	Removal of Existing Sidewalk and Median	3,701.24	sq.m.	120.00	444,148.80	158,624.57	237,936.86	47,587.37
101(4)d	Removal of Existing RCPC	789.59	l.m.	200.00	157,918.00	56,399.29	84,598.93	16,919.79
102(2)	Surplus Common Excavation	-	cu.m	586.00	-	-	-	-
105(1)	Subgrade Preparation	2,714.49	sq.m.	37.18	100,924.74	36,044.55	54,066.82	10,813.36
	SUB-TOTAL (PART C)				3,649,519.36	1,303,399.77	1,955,099.66	391,019.93
D	SUBBASE AND BASE COURSE							
200	Sub Base Course	3,170.40	cu.m.	879.97	2,789,856.89	996,377.46	1,494,566.19	298,913.24
	SUB-TOTAL (PART D)				2,789,856.89	996,377.46	1,494,566.19	298,913.24
E	SURFACE COURSES							
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	8.62	tonne	65,971.81	568,677.00	203,098.93	304,648.39	60,929.68
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	12,312.35	sq.m	924.31	11,380,428.23	4,064,438.65	6,096,657.98	1,219,331.60
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	2,506.00	sq.m	1,073.00	2,688,938.00	960,335.00	1,440,502.50	288,100.50
311(1)a	Portland Cement Concrete Pavement t=300 mm	7,155.21	sq.m	2,887.66	20,661,813.71	7,379,219.18	11,068,828.77	2,213,765.75
311(1)b	CRC Pavement Reinforced	-	sq.m	4,935.16	-	-	-	-
	SUB-TOTAL (PART E)				35,299,856.94	12,607,091.76	18,910,637.65	3,782,127.53
F	BRIDGE CONSTRUCTION							
	Approch Ramp							
103(1)	Structure Excavation	1,919.59	cu.m.	586.00	1,124,879.74	401,742.76	602,614.15	120,522.83
103(2)	Structural Backfilling	1,502.29	cu.m.	565.00	848,793.85	303,140.66	454,710.99	90,942.20
104(2)	Embankment, Selected Borrow	7,512.20	cu.m.	984.09	7,392,680.90	2,640,243.18	3,960,364.77	792,072.95
401(a)	Cast in Place Concrete Railing	906.48	l.m.	5,006.92	4,538,672.84	1,620,954.59	2,431,431.88	486,286.38
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	68,956.50	kg.	62.70	4,323,572.55	1,544,133.05	2,316,199.58	463,239.92
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	42,748.50	kg.	68.25	2,917,585.13	1,041,994.69	1,562,992.03	312,598.41
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	652.86	cu.m.	6,621.00	4,322,586.06	1,543,780.74	2,315,671.10	463,134.22
405(1)b	Approach Slab	68.88	cu.m.	6,233.40	429,356.59	153,341.64	230,012.46	46,002.49
405(1)c	Concrete Leveling Pad	30.44	cu.m.	80,462.16	2,449,268.15	874,738.63	1,312,107.94	262,421.59
405(6)	Lean Concrete	119.72	cu.m.	4,111.70	492,252.72	175,804.54	263,706.82	52,741.36
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-	-	-	-
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	1,094.02	sq.m.	14,163.00	15,494,605.26	5,533,787.59	8,300,681.39	1,660,136.28

Summary of Civil Work Cost for EDSA/NORTH-WEST (COST COMPONENT)(1/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT		
						Foreign Currency (FC)	Local Currency (LC)	TAXES
	Substructure							
400(17)a	Concrete Piles Cast in Drilled Holes, Ø800 mm	-	l.m.	24,592.89	-	-	-	-
400(17)b	Concrete Piles Cast in Drilled Holes, Ø1000 mm	-	l.m.	35,098.96	-	-	-	-
400(17)c	Concrete Piles Cast in Drilled Holes, Ø1500 mm	108.00	l.m.	60,716.52	6,557,384.16	2,341,922.91	3,512,884.37	702,576.87
400(17)d	Concrete Piles Cast in Drilled Holes, Ø2000 mm	-	l.m.	101,704.06	-	-	-	-
400(17)e	Concrete Piles Cast in Drilled Holes, Ø2500 mm	-	l.m.	146,178.83	-	-	-	-
400(17)f	Concrete Piles Cast in Drilled Holes, Ø2800 mm	232.00	l.m.	177,476.50	41,174,548.00	14,705,195.71	22,057,793.57	4,411,558.71
400(17)g	Concrete Piles Cast in Drilled Holes, Ø3000 mm	45.00	l.m.	202,409.64	9,108,433.80	3,253,012.07	4,879,518.11	975,903.62
400(22)a	Pile Integrity Test	26.00	ea.	43,784.56	1,138,398.56	406,570.91	609,856.37	121,971.27
400(22)b	Pile Dynamic Test	13.00	ea.	583,087.25	7,580,134.25	2,707,190.80	4,060,786.21	812,157.24
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	146.21	kg.	62.70	9,167.49	3,274.10	4,911.16	982.23
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	382,089.81	kg.	68.25	26,077,629.53	9,313,439.12	13,970,158.68	2,794,031.74
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	1,125.24	cu.m.	6,621.00	7,450,214.04	2,660,790.73	3,991,186.09	798,237.22
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	39.00	cu.m.	6,621.00	258,219.00	92,221.07	138,331.61	27,666.32
405(6)	Lean Concrete	8.32	cu.m.	4,111.70	34,209.34	12,217.62	18,326.43	3,665.29
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	40.00	ea.	1,800.00	72,000.00	25,714.29	38,571.43	7,714.29
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	30.00	ea.	1,200.00	36,000.00	12,857.14	19,285.71	3,857.14
408	Structural Steel (Furnished, Fabricated & Erected)	64,240.00	kg.	182.00	11,691,680.00	4,175,600.00	6,263,400.00	1,252,680.00
416	PC Panel	-	sq.m	1,500.00	-	-	-	-
SPL	Paint for Steel Pier	130.00	sq.m	700.00	91,000.00	32,500.00	48,750.00	9,750.00
	Superstructure							
401(a)	Cast in Place Concrete Railing	1,322.00	l.m.	5,006.92	6,619,148.24	2,363,981.51	3,545,972.27	709,194.45
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	54,788.00	kg.	62.70	3,435,207.60	1,226,859.86	1,840,289.79	368,057.96
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	812,729.33	kg.	68.25	55,468,776.77	19,810,277.42	29,715,416.13	5,943,083.23
404(2)c	Prestressing steel	81,272.93	kg.	152.90	12,426,631.00	4,438,082.50	6,657,123.75	1,331,424.75
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	4,337.59	cu.m.	16,971.01	73,613,283.27	26,290,458.31	39,435,687.46	7,887,137.49
405(1)c	Structural Concrete Class P 34Mpa for PC Box	-	cu.m.	18,900.00	-	-	-	-
408	Structural Steel (Furnished, Fabricated & Erected)	991,407.10	kg.	182.00	180,436,091.80	64,441,461.36	96,662,192.04	19,332,438.41
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	96.00	ea.	14,500.00	1,392,000.00	497,142.86	745,714.29	149,142.86
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	-	ea.	12,000.00	-	-	-	-
412(1)c	Rubber Bearing Shoe 2500kN	8.00	ea.	220,000.00	1,760,000.00	628,571.43	942,857.14	188,571.43
413(1)	Expansion Joint	176.80	l.m.	29,418.63	5,201,213.78	1,857,576.35	2,786,364.53	557,272.91
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-	-	-	-
SPL 415	Waterproofing	7,965.05	sq.m.	1,800.00	14,337,090.00	5,120,389.29	7,680,583.93	1,536,116.79
SPL	Paint for Steel Girder	5,990.00	sq.m	700.00	4,193,000.00	1,497,500.00	2,246,250.00	449,250.00
	SUB-TOTAL (PART F)				**514,495,714.43**	**183,748,469.44**	**275,622,704.16**	**55,124,540.83**
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**							
404(1)b	Reinforcing steel, Grade 40 (Box Culvert)	-	kg.	62.70	-	-	-	-
405(1)b	Structural Concrete, Class A (Box Culvert) 27.6 Mpa	-	cu.m	8,480.81	-	-	-	-
500(1)a	RCPC, Class II	783.00	l.m.	3,082.45	2,413,558.35	861,985.13	1,292,977.69	258,595.54
500(1)b	RCPC, Class IV	8.00	l.m.	7,005.56	56,044.48	20,015.89	30,023.83	6,004.77
502(2)a	Storm Deck Drain with Grating	66.00	ea.	19,679.57	1,298,851.62	463,875.58	695,813.37	139,162.67
502(2)b	Curb Inlet Manhole	120.00	ea.	25,000.00	3,000,000.00	1,071,428.57	1,607,142.86	321,428.57
502(3)	Catch Basins	-	ea.	35,000.00	-	-	-	-
502(4)	Junction Box	-	ea.	5,000.00	-	-	-	-
SPL 512	Collector Pipe	916.21	l.m.	1,153.20	1,056,573.37	377,347.63	566,021.45	113,204.29
	SUB-TOTAL (PART G)				**7,825,027.82**	**2,794,652.79**	**4,191,979.19**	**838,395.84**
H	**MISCELLANEOUS STRUCTURES**							
600(1)	Concrete Curb	1,591.47	l.m.	1,333.21	2,121,763.72	757,772.76	1,136,659.14	227,331.83
600(3)a	Concrete Curb and Gutter	1,223.63	l.m.	1,661.30	2,032,816.52	726,005.90	1,089,008.85	217,801.77
600(3)b	Concrete Side Strip	-	sq.m.	350.00	-	-	-	-
601(1)a	Concrete Sidewalk	2,012.66	sq.m.	1,560.60	3,140,957.20	1,121,770.43	1,682,655.64	336,531.13
601(1)b	Concrete Median	11,290.69	sq.m.	1,560.60	17,620,250.81	6,292,946.72	9,439,420.08	1,887,884.02
605(1)	Warning Sign	5.00	set	34,912.46	174,562.30	62,343.68	93,515.52	18,703.10
605(2)	Regulatory Sign	11.00	set	34,912.46	384,037.06	137,156.09	205,734.14	41,146.83
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36	646,952.27	970,428.41	194,085.68
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10	308,200.75	462,301.13	92,460.23
605(3)c	Informatory Sign, Cantilever Support	4.00	set	388,956.44	1,555,825.76	555,652.06	833,478.09	166,695.62
605(3)d	Informatory Sign, Double Post	4.00	set	42,944.99	171,779.96	61,349.99	92,024.98	18,405.00
612(1)	Reflectorized Thermoplastic Pavement Markings, White	1,167.03	sq.m.	1,092.83	1,275,365.39	455,487.64	683,231.46	136,646.29
	SUB-TOTAL (PART H)				**31,151,787.18**	**11,125,638.28**	**16,688,457.42**	**3,337,691.48**
J	**SPECIAL ITEM**							
SPL 1	9m Pole, Single arm complete	109.00	set	86,228.98	9,398,958.82	3,356,771.01	5,035,156.51	1,007,031.30
SPL 2	9m Pole, Double arm complete	-	set	90,000.00	-	-	-	-
SPL 3	Lighting system, (under carriageway)	20.00	set	59,290.99	1,185,819.80	423,507.07	635,260.61	127,052.12
SPL 4	Flood lights	14.00	set	80,000.00	1,120,000.00	400,000.00	600,000.00	120,000.00
SPL 5	Traffic Signal Light	1.00	P.s	2,000,000.00	2,000,000.00	714,285.71	1,071,428.57	214,285.71
	SUB-TOTAL (PART J)				**13,704,778.62**	**4,894,563.79**	**7,341,845.69**	**1,468,369.14**
	TOTAL				**628,375,706.66**	**224,419,895.23**	**336,629,842.85**	**67,325,968.57**

Summary of Civil Work Cost for EDSA/NORTH-MINDANAO (1/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
1.0	**GENERAL REQUIREMENTS**						
A	**FACILITIES FOR THE ENGINEER**	1.00	l.s.	5,000,000.00	5,000,000.00		
	SUB-TOTAL (PART A)				**5,000,000.00**	-	
B	**OTHER GENERAL REQUIREMENTS**						
SPL B.2.1	Construction Health and Safety	1.00	P.s	1,200,000.00	1,200,000.00		
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	5,621,582.25	5,621,582.25		
SPL B.2-3	Traffic Management During Construction	1.00	P.s	2,250,000.00	2,250,000.00		
SPL B.2-4	Dayworks	1.00	P.s	2,000,000.00	2,000,000.00		
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	1,920,000.00	1,920,000.00		
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	1,000,000.00	1,000,000.00		
	SUB-TOTAL (PART B)				**13,991,582.25**	-	
	SUB-TOTAL GENERAL REQUIREMENTS				**18,991,582.25**	-	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**						
C	**EARTHWORKS**						
100(1)	Clearing and Grubbing	0.51	ha.	90,846.53	46,331.73		
100(3)	Individual Removal Trees (Small)	-	ea.	1,013.26	-		
100(4)	Individual Removal Trees (Large)	-	ea.	1,427.27	-		
100(5)	Removal and Earth Balling of Trees	14.00	ea.	1,000.00	14,000.00		
101(1)	Removal of Structures and Obstruction	1.00	l.s.	500,000.00	500,000.00		
101(3)a	Removal of Existing PCCP	8,286.30	sq.m.	245.78	2,036,606.81		
101(3)b	Breaking of Existing PCCP	-	sq.m.	335.00	-		
101(4)a	Removal of Existing Concrete Curb	2,137.73	l.m.	60.00	128,263.80		
101(4)b	Removal of Existing Concrete Curb & Gutter	1,626.10	l.m.	110.00	178,871.00		
101(4)c	Removal of Existing Sidewalk and Median	5,105.89	sq.m.	120.00	612,706.80		
101(4)d	Removal of Existing RCPC	712.82	l.m.	200.00	142,564.00		
101(4)e	Removal of Existing Covered canal	19,773.01	cu.m	586.00	11,586,983.86		
105(1)	Subgrade Preparation	7,199.57	sq.m.	37.18	267,680.01		
	SUB-TOTAL (PART C)				**15,514,008.02**	-	
D	**SUBBASE AND BASE COURSE**						
200	Sub Base Course	2,829.97	cu.m.	879.97	2,490,288.70		
	SUB-TOTAL (PART D)				**2,490,288.70**	-	
E	**SURFACE COURSES**						
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	2.78	tonne	65,971.81	183,401.63		
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	3,982.06	sq.m	924.31	3,680,657.88		
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	1,440.00	sq.m	1,073.00	1,545,120.00		
311(1)a	Portland Cement Concrete Pavement t=300 mm	4,516.02	sq.m	2,887.66	13,040,730.31		
311(1)b	CRC Pavement Reinforced	3,071.50	sq.m	4,935.16	15,158,343.94		
	SUB-TOTAL (PART E)				**33,608,253.76**	-	

Summary of Civil Work Cost for EDSA/NORTH-MINDANAO (2/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
F	**BRIDGE CONSTRUCTION**						
	Approch Ramp						
103(1)	Structure Excavation	2,631.24	cu.m.	586.00	1,541,906.64		
103(2)	Structural Backfilling	1,857.47	cu.m.	565.00	1,049,470.55		
104(2)	Embankment, Selected Borrow	1,645.77	cu.m.	984.09	1,619,585.80		
401(a)	Cast in Place Concrete Railing	398.30	l.m.	5,006.92	1,994,256.24		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	34,120.50	kg.	62.70	2,139,355.35	1,456,945.35	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	19,633.00	kg.	68.25	1,339,952.25	838,329.10	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	327.45	cu.m.	6,621.00	2,168,046.45	633,615.75	
405(1)b	Approach Slab	23.18	cu.m.	6,233.40	144,490.21	44,853.30	
405(1)c	Concrete Leveling Pad	15.06	cu.m.	80,462.16	1,211,760.13		
405(6)	Lean Concrete	60.64	cu.m.	4,111.70	249,333.49		
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-		
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	313.26	sq.m.	14,163.00	4,436,701.38	3,882,857.70	
	Substructure					Cement	Reinforcing steel
400(17)a	Concrete Piles Cast in Drilled Holes, Ø800 mm	7,800.00	l.m.	24,592.89	191,824,542.00	7,582,723.20	33,465,868.80
400(17)b	Concrete Piles Cast in Drilled Holes, Ø1000 mm	54.00	l.m.	35,098.96	1,895,343.84	82,024.65	362,010.60
400(17)c	Concrete Piles Cast in Drilled Holes, Ø1500 mm	-	l.m.	60,716.52	-	-	-
400(17)d	Concrete Piles Cast in Drilled Holes, Ø2000 mm	135.00	l.m.	101,704.06	13,730,048.10	820,246.50	3,620,106.00
400(17)e	Concrete Piles Cast in Drilled Holes, Ø2500 mm	45.00	l.m.	146,178.83	6,578,047.35	427,211.72	1,885,471.88
400(17)f	Concrete Piles Cast in Drilled Holes, Ø2800 mm	-	l.m.	177,476.50	-	-	-
400(17)g	Concrete Piles Cast in Drilled Holes, Ø3000 mm	-	l.m.	202,409.64	-	-	-
400(22)a	Pile Integrity Test	22.00	ea.	43,784.56	963,260.32		
400(22)b	Pile Dynamic Test	11.00	ea.	583,087.25	6,413,959.75		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	192,616.80	kg.	62.70	12,077,073.36	8,224,737.36	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	180,491.25	kg.	68.25	12,318,527.81	7,706,976.38	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	2,077.75	cu.m.	6,621.00	13,756,782.75	4,020,446.25	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	-	cu.m.	6,621.00	-	-	
405(6)	Lean Concrete	138.70	cu.m.	4,111.70	570,292.79		
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	11.00	ea.	1,800.00	19,800.00		
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	8.00	ea.	1,200.00	9,600.00		
408	Structural Steel (Furnished, Fabricated & Erected)	29,200.00	kg.	182.00	5,314,400.00	3,504,000.00	
416	PC Panel	7,729.91	sq.m	1,500.00	11,594,865.00		
SPL	Paint for Steel Pier	65.00	sq.m	700.00	45,500.00		
	Superstructure						
401(a)	Cast in Place Concrete Railing	396.00	l.m.	5,006.92	1,982,740.32		
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	10,978.42	kg.	62.70	688,346.93	468,778.53	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	275,215.21	kg.	68.25	18,783,438.08	11,751,689.47	
404(2)c	Prestressing steel	23,483.92	kg.	152.90	3,590,691.37	3,590,691.37	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	1,430.97	cu.m.	16,971.01	24,285,006.18	2,768,926.95	
405(1)c	Structural Concrete Class P 34Mpa for PC Box	-	cu.m.	18,900.00	-	-	
408	Structural Steel (Furnished, Fabricated & Erected)	547,200.00	kg.	182.00	99,590,400.00	65,664,000.00	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	30.00	ea.	14,500.00	435,000.00		
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	-	ea.	12,000.00	-		
412(1)c	Rubber Bearing Shoe 2500kN	6.00	ea.	220,000.00	1,320,000.00		
413(1)	Expansion Joint	46.20	l.m.	29,418.63	1,359,140.71		
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-		
SPL 415	Waterproofing	2,766.60	sq.m.	1,800.00	4,979,880.00		
SPL	Paint for Steel Girder	2,495.83	sq.m	700.00	1,747,081.00		
	SUB-TOTAL (PART F)				**453,768,626.15**	**297,451,862.43**	**57,128,155.36**

Summary of Civil Work Cost for EDSA/NORTH-MINDANAO (3/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**						
404(1)b	Reinforcing steel, Grade 40 (Box Culvert)	-	kg.	62.70	-	-	
405(1)b	Structural Concrete, Class A (Box Culvert) 27.6 Mpa	-	cu.m	8,480.81	-	-	
500(1)a	RCPC, Class II	1,947.87	l.m.	3,082.45	6,004,211.88		
500(1)b	RCPC, Class IV	-	l.m.	7,005.56	-		
502(2)a	Storm Deck Drain with Grating	32.00	ea.	19,679.57	629,746.24		
502(2)b	Curb Inlet Manhole	238.00	ea.	25,000.00	5,950,000.00		
502(3)	Catch Basins	-	ea.	35,000.00	-		
502(4)	Junction Box	-	ea.	5,000.00	-		
SPL 512	Collector Pipe	429.84	l.m.	1,153.20	495,691.49		
	SUB-TOTAL (PART G)				**13,079,649.61**	-	
H	**MISCELLANEOUS STRUCTURES**						
600(1)	Concrete Curb	2,789.91	l.m.	1,333.21	3,719,535.91		
600(3)a	Concrete Curb and Gutter	2,287.94	l.m.	1,661.30	3,800,954.72		
600(3)b	Concrete Side Strip	-	sq.m.	350.00	-		
601(1)a	Concrete Sidewalk	3,037.49	sq.m.	1,560.60	4,740,306.89		
601(1)b	Concrete Median	3,827.78	sq.m.	1,560.60	5,973,633.47		
605(1)	Warning Sign	7.00	set	34,912.46	244,387.22		
605(2)	Regulatory Sign	15.00	set	34,912.46	523,686.90		
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36		
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10		
605(3)c	Informatory Sign, Cantilever Support	5.00	set	388,956.44	1,944,782.20		
605(3)d	Informatory Sign, Double Post	7.00	set	42,944.99	300,614.93		
612(1)	Reflectorized Thermoplastic Pavement Markings, White	1,244.88	sq.m.	1,092.83	1,360,442.21		
	SUB-TOTAL (PART H)				**25,282,772.92**	-	
J	**SPECIAL ITEM**						
SPL 1	9m Pole, Single arm complete	174.00	set	86,228.98	15,003,842.52		
SPL 2	9m Pole, Double arm complete	-	set	90,000.00	-		
SPL 3	Lighting system, (under carriageway)	13.00	set	59,290.99	770,782.87		
SPL 4	Flood lights	8.00	set	80,000.00	640,000.00		
SPL 5	Traffic Signal Light	1.00	P.s	2,000,000.00	2,000,000.00		
	SUB-TOTAL (PART J)				**18,414,625.39**	-	
	TOTAL				**581,149,806.79**		

Summary of Civil Work Cost for EDSA/NORTH-MINDANAO (COST COMPONENT) (1/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
1.0	**GENERAL REQUIREMENTS**								
A	**FACILITIES FOR THE ENGINEER**	1.00	l.s.	5,000,000.00	5,000,000.00	1,785,714.29	2,678,571.43	535,714.29	
	SUB-TOTAL (PART A)				**5,000,000.00**	**1,785,714.29**	**2,678,571.43**	**535,714.29**	
B	**OTHER GENERAL REQUIREMENTS**								
SPL B.2.1	Construction Health and Safety	1.00	P.s	1,200,000.00	1,200,000.00	428,571.43	642,857.14	128,571.43	
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	5,621,582.25	5,621,582.25	2,007,707.94	3,011,561.92	602,312.38	
SPL B.2-3	Traffic Management During Construction	1.00	P.s	2,250,000.00	2,250,000.00	803,571.43	1,205,357.14	241,071.43	
SPL B.2-4	Dayworks	1.00	P.s	2,000,000.00	2,000,000.00	714,285.71	1,071,428.57	214,285.71	
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	1,920,000.00	1,920,000.00	685,714.29	1,028,571.43	205,714.29	
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	1,000,000.00	1,000,000.00	357,142.86	535,714.29	107,142.86	
	SUB-TOTAL (PART B)				**13,991,582.25**	**4,996,993.66**	**7,495,490.49**	**1,499,098.10**	
	SUB-TOTAL GENERAL REQUIREMENTS				**18,991,582.25**	**6,782,707.94**	**10,174,061.92**	**2,034,812.38**	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**								
C	**EARTHWORKS**								
100(1)	Clearing and Grubbing	0.51	ha.	90,846.53	46,331.73	16,547.05	24,820.57	4,964.11	
100(3)	Individual Removal Trees (Small)	-	ea.	1,013.26	-	-	-	-	
100(4)	Individual Removal Trees (Large)	-	ea.	1,427.27	-	-	-	-	
100(5)	Removal and Earth Balling of Trees	14.00	ea.	1,000.00	14,000.00	5,000.00	7,500.00	1,500.00	
101(1)	Removal of Structures and Obstruction	1.00	l.s.	500,000.00	500,000.00	178,571.43	267,857.14	53,571.43	
101(3)a	Removal of Existing PCCP	8,286.30	sq.m.	245.78	2,036,606.81	727,359.58	1,091,039.36	218,207.87	
101(3)b	Breaking of Existing PCCP	-	sq.m.	335.00	-	-	-	-	
101(4)a	Removal of Existing Concrete Curb	2,137.73	l.m.	60.00	128,263.80	45,808.50	68,712.75	13,742.55	
101(4)b	Removal of Existing Concrete Curb & Gutter	1,626.10	l.m.	110.00	178,871.00	63,882.50	95,823.75	19,164.75	
101(4)c	Removal of Existing Sidewalk and Median	5,105.89	sq.m.	120.00	612,706.80	218,823.86	328,235.79	65,647.16	
101(4)d	Removal of Existing RCPC	712.82	l.m.	200.00	142,564.00	50,915.71	76,373.57	15,274.71	
102(2)	Surplus Common Excavation	19,773.01	cu.m	586.00	11,586,983.86	4,138,208.52	6,207,312.78	1,241,462.56	
105(1)	Subgrade Preparation	7,199.57	sq.m.	37.18	267,680.01	95,600.00	143,400.01	28,680.00	
	SUB-TOTAL (PART C)				**15,514,008.02**	**5,540,717.15**	**8,311,075.72**	**1,662,215.14**	
D	**SUBBASE AND BASE COURSE**								
200	Sub Base Course	2,829.97	cu.m.	879.97	2,490,288.70	889,388.82	1,334,083.23	266,816.65	
	SUB-TOTAL (PART D)				**2,490,288.70**	**889,388.82**	**1,334,083.23**	**266,816.65**	
E	**SURFACE COURSES**								
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	2.78	tonne	65,971.81	183,401.63	65,500.58	98,250.87	19,650.17	
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	3,982.06	sq.m	924.31	3,680,657.88	1,314,520.67	1,971,781.01	394,356.20	
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	1,440.00	sq.m	1,073.00	1,545,120.00	551,828.57	827,742.86	165,548.57	
311(1)a	Portland Cement Concrete Pavement t=300 mm	4,516.02	sq.m	2,887.66	13,040,730.31	4,657,403.68	6,986,105.52	1,397,221.10	
311(1)b	CRC Pavement Reinforced	3,071.50	sq.m	4,935.16	15,158,343.94	5,413,694.26	8,120,541.40	1,624,108.28	
	SUB-TOTAL (PART E)				**33,608,253.76**	**12,002,947.77**	**18,004,421.66**	**3,600,884.33**	

Summary of Civil Work Cost for EDSA/NORTH-MINDANAO (COST COMPONENT) (2/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
F	**BRIDGE CONSTRUCTION**								
	Approch Ramp								
103(1)	Structure Excavation	2,631.24	cu.m.	586.00	1,541,906.64	550,680.94	826,021.41	165,204.28	
103(2)	Structural Backfilling	1,857.47	cu.m.	565.00	1,049,470.55	374,810.91	562,216.37	112,443.27	
104(2)	Embankment, Selected Borrow	1,645.77	cu.m.	984.09	1,619,585.80	578,423.50	867,635.25	173,527.05	
401(a)	Cast in Place Concrete Railing	398.30	l.m.	5,006.92	1,994,256.24	712,234.37	1,068,351.56	213,670.31	
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	34,120.50	kg.	62.70	2,139,355.35	764,055.48	1,146,083.22	229,216.64	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	19,633.00	kg.	68.25	1,339,952.25	478,554.38	717,831.56	143,566.31	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	327.45	cu.m.	6,621.00	2,168,046.45	774,302.30	1,161,453.46	232,290.69	
405(1)b	Approach Slab	23.18	cu.m.	6,233.40	144,490.21	51,603.65	77,405.47	15,481.09	
405(1)c	Concrete Leveling Pad	15.06	cu.m.	80,462.16	1,211,760.13	432,771.47	649,157.21	129,831.44	
405(6)	Lean Concrete	60.64	cu.m.	4,111.70	249,333.49	89,047.67	133,571.51	26,714.30	
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-	-	-	-	
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	313.26	sq.m.	14,163.00	4,436,701.38	1,584,536.21	2,376,804.31	475,360.86	
	Substructure								
400(17)a	Concrete Piles Cast in Drilled Holes, Ø800 mm	7,800.00	l.m.	24,592.89	191,824,542.00	68,508,765.00	102,763,147.50	20,552,629.50	
400(17)b	Concrete Piles Cast in Drilled Holes, Ø1000 mm	54.00	l.m.	35,098.96	1,895,343.84	676,908.51	1,015,362.77	203,072.55	
400(17)c	Concrete Piles Cast in Drilled Holes, Ø1500 mm	-	l.m.	60,716.52	-	-	-	-	
400(17)d	Concrete Piles Cast in Drilled Holes, Ø2000 mm	135.00	l.m.	101,704.06	13,730,048.10	4,903,588.61	7,355,382.91	1,471,076.58	
400(17)e	Concrete Piles Cast in Drilled Holes, Ø2500 mm	45.00	l.m.	146,178.83	6,578,047.35	2,349,302.63	3,523,953.94	704,790.79	
400(17)f	Concrete Piles Cast in Drilled Holes, Ø2800 mm	-	l.m.	177,476.50	-	-	-	-	
400(17)g	Concrete Piles Cast in Drilled Holes, Ø3000 mm	-	l.m.	202,409.64	-	-	-	-	
400(22)a	Pile Integrity Test	22.00	ea.	43,784.56	963,260.32	344,021.54	516,032.31	103,206.46	
400(22)b	Pile Dynamic Test	11.00	ea.	583,087.25	6,413,959.75	2,290,699.91	3,436,049.87	687,209.97	
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	192,616.80	kg.	62.70	12,077,073.36	4,313,240.49	6,469,860.73	1,293,972.15	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	180,491.25	kg.	68.25	12,318,527.81	4,399,474.22	6,599,211.33	1,319,842.27	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	2,077.75	cu.m.	6,621.00	13,756,782.75	4,913,136.70	7,369,705.04	1,473,941.01	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	-	cu.m.	6,621.00	-	-	-	-	
405(6)	Lean Concrete	138.70	cu.m.	4,111.70	570,292.79	203,676.00	305,513.99	61,102.80	
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	11.00	ea.	1,800.00	19,800.00	7,071.43	10,607.14	2,121.43	
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	8.00	ea.	1,200.00	9,600.00	3,428.57	5,142.86	1,028.57	
408	Structural Steel (Furnished, Fabricated & Erected)	29,200.00	kg.	182.00	5,314,400.00	1,898,000.00	2,847,000.00	569,400.00	
416	PC Panel	7,729.91	sq.m.	1,500.00	11,594,865.00	4,141,023.21	6,211,534.82	1,242,306.96	
SPL	Paint for Steel Pier	65.00	sq.m	700.00	45,500.00	16,250.00	24,375.00	4,875.00	
	Superstructure								
401(a)	Cast in Place Concrete Railing	396.00	l.m.	5,006.92	1,982,740.32	708,121.54	1,062,182.31	212,436.46	
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	10,978.42	kg.	62.70	688,346.93	245,838.19	368,757.29	73,751.46	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	275,215.21	kg.	68.25	18,783,438.08	6,708,370.74	10,062,556.12	2,012,511.22	
404(2)c	Prestressing steel	23,483.92	kg.	152.90	3,590,691.37	1,282,389.77	1,923,584.66	384,716.93	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	1,430.97	cu.m.	16,971.01	24,285,006.18	8,673,216.49	13,009,824.74	2,601,964.95	
405(1)c	Structural Concrete Class P 34Mpa for PC Box	-	cu.m.	18,900.00	-	-	-	-	
408	Structural Steel (Furnished, Fabricated & Erected)	547,200.00	kg.	182.00	99,590,400.00	35,568,000.00	53,352,000.00	10,670,400.00	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	30.00	ea.	14,500.00	435,000.00	155,357.14	233,035.71	46,607.14	
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	-	ea.	12,000.00	-	-	-	-	
412(1)c	Rubber Bearing Shoe 2500kN	6.00	ea.	220,000.00	1,320,000.00	471,428.57	707,142.86	141,428.57	
413(1)	Expansion Joint	46.20	l.m.	29,418.63	1,359,140.71	485,407.40	728,111.09	145,622.22	
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-	-	-	-	
SPL 415	Waterproofing	2,766.60	sq.m.	1,800.00	4,979,880.00	1,778,528.57	2,667,792.86	533,558.57	
SPL	Paint for Steel Girder	2,495.83	sq.m	700.00	1,747,081.00	623,957.50	935,936.25	187,187.25	
	SUB-TOTAL (PART F)				**453,768,626.15**	**162,060,223.62**	**243,090,335.44**	**48,618,067.09**	

Summary of Civil Work Cost for EDSA/NORTH-MINDANAO (COST COMPONENT) (3/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**								
404(1)b	Reinforcing steel, Grade 40 (Box Culvert)	-	kg.	62.70	-	-	-	-	
405(1)b	Structural Concrete, Class A (Box Culvert) 27.6 Mpa	-	cu.m	8,480.81	-	-	-	-	
500(1)a	RCPC, Class II	1,947.87	l.m.	3,082.45	6,004,211.88	2,144,361.39	3,216,542.08	643,308.42	
500(1)b	RCPC, Class IV	-	l.m.	7,005.56	-	-	-	-	
502(2)a	Storm Deck Drain with Grating	32.00	ea.	19,679.57	629,746.24	224,909.37	337,364.06	67,472.81	
502(2)b	Curb Inlet Manhole	238.00	ea.	25,000.00	5,950,000.00	2,125,000.00	3,187,500.00	637,500.00	
502(3)	Catch Basins	-	ea.	35,000.00	-	-	-	-	
502(4)	Junction Box	-	ea.	5,000.00	-	-	-	-	
SPL 512	Collector Pipe	429.84	l.m.	1,153.20	495,691.49	177,032.67	265,549.01	53,109.80	
	SUB-TOTAL (PART G)				**13,079,649.61**	**4,671,303.43**	**7,006,955.15**	**1,401,391.03**	
H	**MISCELLANEOUS STRUCTURES**								
600(1)	Concrete Curb	2,789.91	l.m.	1,333.21	3,719,535.91	1,328,405.68	1,992,608.52	398,521.70	
600(3)a	Concrete Curb and Gutter	2,287.94	l.m.	1,661.30	3,800,954.72	1,357,483.83	2,036,225.74	407,245.15	
600(3)b	Concrete Side Strip	-	sq.m.	350.00	-	-	-	-	
601(1)a	Concrete Sidewalk	3,037.49	sq.m.	1,560.60	4,740,306.89	1,692,966.75	2,539,450.12	507,890.02	
601(1)b	Concrete Median	3,827.78	sq.m.	1,560.60	5,973,633.47	2,133,440.52	3,200,160.79	640,032.16	
605(1)	Warning Sign	7.00	set	34,912.46	244,387.22	87,281.15	130,921.73	26,184.35	
605(2)	Regulatory Sign	15.00	set	34,912.46	523,686.90	187,031.04	280,546.55	56,109.31	
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36	646,952.27	970,428.41	194,085.68	
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10	308,200.75	462,301.13	92,460.23	
605(3)c	Informatory Sign, Cantilever Support	5.00	set	388,956.44	1,944,782.20	694,565.07	1,041,847.61	208,369.52	
605(3)d	Informatory Sign, Double Post	7.00	set	42,944.99	300,614.93	107,362.48	161,043.71	32,208.74	
612(1)	Reflectorized Thermoplastic Pavement Markings, White	1,244.88	sq.m.	1,092.83	1,360,442.21	485,872.22	728,808.33	145,761.67	
	SUB-TOTAL (PART H)				**25,282,772.92**	**9,029,561.76**	**13,544,342.63**	**2,708,868.53**	
J	**SPECIAL ITEM**								
SPL 1	9m Pole, Single arm complete	174.00	set	86,228.98	15,003,842.52	5,358,515.19	8,037,772.78	1,607,554.56	
SPL 2	9m Pole, Double arm complete	-	set	90,000.00	-	-	-	-	
SPL 3	Lighting system, (under carriageway)	13.00	set	59,290.99	770,782.87	275,279.60	412,919.39	82,583.88	
SPL 4	Flood lights	8.00	set	80,000.00	640,000.00	228,571.43	342,857.14	68,571.43	
SPL 5	Traffic Signal Light	1.00	P.s	2,000,000.00	2,000,000.00	714,285.71	1,071,428.57	214,285.71	
	SUB-TOTAL (PART J)				**18,414,625.39**	**6,576,651.93**	**9,864,977.89**	**1,972,995.58**	
	TOTAL				**581,149,806.79**	**207,553,502.42**	**311,330,253.64**	**62,266,050.73**	

Summary of Civil Work Cost for C5/GREEN MEADOWS (3/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
1.0	**GENERAL REQUIREMENTS**						
A	**FACILITIES FOR THE ENGINEER**	1.00	l.s.	20,000,000.00	20,000,000.00		
	SUB-TOTAL (PART A)				**20,000,000.00**	-	
B	**OTHER GENERAL REQUIREMENTS**						
SPL B.2.1	Construction Health and Safety	1.00	P.s	2,400,000.00	2,400,000.00		
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	11,997,168.48	11,997,168.48		
SPL B.2-3	Traffic Management During Construction	1.00	P.s	8,000,000.00	8,000,000.00		
SPL B.2-4	Dayworks	1.00	P.s	10,000,000.00	10,000,000.00		
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	15,000,000.00	15,000,000.00		
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	4,000,000.00	4,000,000.00		
	SUB-TOTAL (PART B)				**51,397,168.48**	-	
	SUB-TOTAL GENERAL REQUIREMENTS				**71,397,168.48**	-	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**						
C	**EARTHWORKS**						
100(1)	Clearing and Grubbing	0.50	ha.	90,846.53	45,423.27		
100(3)	Individual Removal Trees (Small)	10.00	ea.	1,013.26	10,132.60		
100(4)	Individual Removal Trees (Large)	5.00	ea.	1,427.27	7,136.35		
100(5)	Removal and Earth Balling of Trees	96.00	ea.	1,000.00	96,000.00		
101(1)	Removal of Structures and Obstruction	1.00	l.s.	500,000.00	500,000.00		
101(3)a	Removal of Existing PCCP	2,997.09	sq.m.	245.78	736,624.78		
101(3)b	Breaking of Existing PCCP	12,291.56	sq.m.	335.00	4,117,672.60		
101(4)a	Removal of Existing Concrete Curb	2,469.80	l.m.	60.00	148,188.00		
101(4)b	Removal of Existing Concrete Curb & Gutter	2,546.85	l.m.	110.00	280,153.50		
101(4)c	Removal of Existing Sidewalk	454.87	sq.m.	120.00	54,584.40		
101(4)d	Removal of Existing RCPC	100.00	l.m.	200.00	20,000.00		
101(4)e	Removal of Existing Covered canal	42.02	l.m.	150.00	6,303.00		
105(1)	Subgrade Preparation	438.61	sq.m.	37.18	16,307.52		
	SUB-TOTAL (PART C)				**6,038,526.02**	-	
D	**SUBBASE AND BASE COURSE**						
200	Sub Base Course	2,824.20	cu.m.	879.97	2,485,211.27		
	SUB-TOTAL (PART D)				**2,485,211.27**	-	
E	**SURFACE COURSES**						
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	14.82	tonne	65,971.81	977,702.22		
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	21,165.91	sq.m	924.31	19,563,862.27		
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	5,520.00	sq.m	1,073.00	5,922,960.00		
311	Portland Cement Concrete Pavement t=300 mm	4,514.68	sq.m	2,887.66	13,036,860.85		
	SUB-TOTAL (PART E)				**39,501,385.35**	-	

Summary of Civil Work Cost for C5/GREEN MEADOWS (3/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
F	**BRIDGE CONSTRUCTION**						
	Approch Ramp						
103(1)	Structure Excavation	1,201.60	cu.m.	586.00	704,137.60		
103(2)	Structural Backfilling	939.65	cu.m.	565.00	530,902.25		
104(2)	Embankment, Selected Borrow	6,616.99	cu.m.	984.09	6,511,713.69		
401(a)	Cast in Place Concrete Railing	552.82	l.m.	5,006.92	2,767,925.51		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	44,722.05	kg.	62.70	2,804,072.66	1,909,631.62	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	30,055.40	kg.	68.25	2,051,281.05	1,283,365.58	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	432.00	cu.m.	9,548.08	4,124,724.73	835,910.71	
405(1)b	Approach Slab	51.40	cu.m.	6,233.40	320,396.76		
405(1)c	Concrete Leveling Pad	19.16	cu.m.	80,462.16	1,541,654.99		
405(6)	Lean Concrete	70.02	cu.m.	4,111.70	287,901.23		
SPL 414	Concrete Barrier	276.41	l.m.	4,660.55	1,288,222.63		
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	791.42	sq.m.	14,163.00	11,208,881.46	9,809,650.90	
	Substructure					(Cement)	(Re-Bar)
400(17)a	Concrete Piles Cast in Drilled Holes, Ø1200 mm	198.00	l.m.	44,668.80	8,844,422.40	433,090.15	1,911,415.97
400(17)b	Concrete Piles Cast in Drilled Holes, Ø2500 mm	585.00	l.m.	106,248.81	62,155,553.85	5,553,752.34	24,511,134.38
400(17)c	Concrete Piles Cast in Drilled Holes, Ø3000 mm	72.00	l.m.	164,602.64	11,851,390.08	984,295.80	4,344,127.20
400(22)a	Pile Integrity Test	58.00	ea.	43,784.56	2,539,504.48		
400(22)b	Pile Dynamic Test	29.00	ea.	583,087.25	16,909,530.25		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	550.75	kg.	62.70	34,532.21	23,517.15	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	833,880.32	kg.	68.25	56,912,331.98	35,606,689.75	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	1,590.15	cu.m.	14,057.94	22,354,205.18	3,076,936.38	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	210.00	cu.m.	6,621.00	1,390,410.00		
405(6)	Lean Concrete	5.88	cu.m.	4,111.70	24,176.80		
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	32.00	ea.	1,800.00	57,600.00		
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	208.00	ea.	1,200.00	249,600.00		
408	Structural Steel (Furnished, Fabricated & Erected)	149,900.00	kg.	182.00	27,281,800.00	17,988,000.00	
SPL	Paint for Steel Pier	341.00	sq.m	700.00	238,700.00		
	Superstructure						
401(a)	Cast in Place Concrete Railing	2,196.00	l.m.	5,006.92	10,995,196.32		
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	152,745.84	kg.	62.70	9,577,164.17	6,522,247.37	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	2,061,752.89	kg.	68.25	140,714,634.74	88,036,848.40	
404(2)c	Prestressing steel	-	kg.	152.90	-	-	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	11,072.49	cu.m.	16,971.01	187,911,338.51	21,425,268.15	
408	Structural Steel (Furnished, Fabricated & Erected)	2,192,800.00	kg.	182.00	399,089,600.00	263,136,000.00	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	216.00	ea.	14,500.00	3,132,000.00		
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	36.00	ea.	12,000.00	432,000.00		
412(1)c	Rubber Bearing Shoe 2500kN	8.00	ea.	220,000.00	1,760,000.00		
413(1)	Expansion Joint	450.80	l.m.	29,418.63	13,261,918.40		
SPL 414	Concrete Barrier	1,098.00	l.m.	4,660.55	5,117,283.90		
SPL 415	Waterproofing	18,775.80	sq.m.	1,800.00	33,796,440.00		
SPL	Paint for Steel Girder	19,139.00	sq.m	700.00	13,397,300.00		
	SUB-TOTAL (PART F)				**1,064,170,447.83**	**456,625,204.31**	**30,766,677.54**

Summary of Civil Work Cost for C5/GREEN MEADOWS (3/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**						
500(1)a	RCPC, Class II	50.00	l.m.	3,082.45	154,122.50		
500(1)b	RCPC, Class IV	549.00	l.m.	7,005.56	3,846,052.44		
502(2)a	Storm Deck Drain with Grating	220.00	ea.	19,679.57	4,329,505.40		
502(2)b	Curb Inlet Manhole	131.00	ea.	25,000.00	3,275,000.00		
502(3)	Catch Basins	57.00	ea.	35,000.00	1,995,000.00		
502(4)	Junction Box	25.00	ea.	5,000.00	125,000.00		
SPL 512	Collector Pipe	3,281.96	l.m.	1,153.20	3,784,756.27		
	SUB-TOTAL (PART G)				**17,509,436.61**	-	
H	**MISCELLANEOUS STRUCTURES**						
600(1)	Concrete Curb	2,668.03	l.m.	1,333.21	3,557,044.28		
600(3)a	Concrete Curb and Gutter	2,615.90	l.m.	1,661.30	4,345,794.67		
600(3)b	Concrete Side Strip	1,352.16	sq.m.	350.00	473,256.00		
601(1)a	Concrete Sidewalk	1,698.25	sq.m.	1,560.60	2,650,288.95		
601(1)b	Concrete Median	11,493.99	sq.m.	1,560.60	17,937,514.55		
SPL	Noise Barrier	200.00	lm	48,456.58	9,691,316.01		
605(1)	Warning Sign	3.00	set	34,912.46	104,737.38		
605(2)	Regulatory Sign	29.00	set	34,912.46	1,012,461.34		
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36		
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10		
605(3)c	Informatory Sign, Cantilever Support	3.00	set	388,956.44	1,166,869.32		
605(3)d	Informatory Sign, Double Post	6.00	set	42,944.99	257,669.94		
612(1)	Reflectorized Thermoplastic Pavement Markings, White	1,888.54	sq.m.	1,092.83	2,063,853.17		
	SUB-TOTAL (PART H)				**45,935,234.06**	-	
J	**SPECIAL ITEM**						
SPL 1	9m Pole, Single arm complete	140.00	set	86,228.98	12,072,057.20		
SPL 2	9m Pole, Double arm complete	72.00	set	90,000.00	6,480,000.00		
SPL 3	Lighting system, (under carriageway)	50.00	set	59,290.99	2,964,549.50		
SPL 4	Flood lights	7.00	set	80,000.00	560,000.00		
SPL 5	Traffic Signal Light	1.00	P.s	2,000,000.00	2,000,000.00		
	SUB-TOTAL (PART J)				24,076,606.70	-	
	TOTAL				**1,271,114,016.32**	**487,391,881.85**	**38.34%**

Summary of Civil Work Cost for C5/GREEN MEADOWS (COST COMPONENT) (1/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
1.0	**GENERAL REQUIREMENTS**								
A	**FACILITIES FOR THE ENGINEER**	1.00	l.s.	20,000,000.00	20,000,000.00	7,142,857.14	10,714,285.71	2,142,857.14	
	SUB-TOTAL (PART A)				**20,000,000.00**	**7,142,857.14**	**10,714,285.71**	**2,142,857.14**	
B	**OTHER GENERAL REQUIREMENTS**								
SPL B.2.1	Construction Health and Safety	1.00	P.s	2,400,000.00	2,400,000.00	857,142.86	1,285,714.29	257,142.86	
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	11,997,168.48	11,997,168.48	4,284,703.03	6,427,054.54	1,285,410.91	
SPL B.2-3	Traffic Management During Construction	1.00	P.s	8,000,000.00	8,000,000.00	2,857,142.86	4,285,714.29	857,142.86	
SPL B.2-4	Dayworks	1.00	P.s	10,000,000.00	10,000,000.00	3,571,428.57	5,357,142.86	1,071,428.57	
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	15,000,000.00	15,000,000.00	5,357,142.86	8,035,714.29	1,607,142.86	
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	4,000,000.00	4,000,000.00	1,428,571.43	2,142,857.14	428,571.43	
	SUB-TOTAL (PART B)				**51,397,168.48**	**18,356,131.60**	**27,534,197.40**	**5,506,839.48**	
	SUB-TOTAL GENERAL REQUIREMENTS				**71,397,168.48**	**25,498,988.74**	**38,248,483.11**	**7,649,696.62**	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**								
C	**EARTHWORKS**								
100(1)	Clearing and Grubbing	0.50	ha.	90,846.53	45,423.27	16,222.59	24,333.89	4,866.78	
100(3)	Individual Removal Trees (Small)	10.00	ea.	1,013.26	10,132.60	3,618.79	5,428.18	1,085.64	
100(4)	Individual Removal Trees (Large)	5.00	ea.	1,427.27	7,136.35	2,548.70	3,823.04	764.61	
100(5)	Removal and Earth Balling of Trees	96.00	ea.	1,000.00	96,000.00	34,285.71	51,428.57	10,285.71	
101(1)	Removal of Structures and Obstruction	1.00	l.s.	500,000.00	500,000.00	178,571.43	267,857.14	53,571.43	
101(3)a	Removal of Existing PCCP	2,997.09	sq.m.	245.78	736,624.78	263,080.28	394,620.42	78,924.08	
101(3)b	Breaking of Existing PCCP	12,291.56	sq.m.	335.00	4,117,672.60	1,470,597.36	2,205,896.04	441,179.21	
101(4)a	Removal of Existing Concrete Curb	2,469.80	l.m.	60.00	148,188.00	52,924.29	79,386.43	15,877.29	
101(4)b	Removal of Existing Concrete Curb & Gutter	2,546.85	l.m.	110.00	280,153.50	100,054.82	150,082.23	30,016.45	
101(4)c	Removal of Existing Sidewalk	454.87	sq.m.	120.00	54,584.40	19,494.43	29,241.64	5,848.33	
101(4)d	Removal of Existing RCPC	100.00	l.m.	200.00	20,000.00	7,142.86	10,714.29	2,142.86	
101(4)e	Removal of Existing Covered canal	42.02	l.m.	150.00	6,303.00	2,251.07	3,376.61	675.32	
105(1)	Subgrade Preparation	438.61	sq.m.	37.18	16,307.52	5,824.11	8,736.17	1,747.23	
	SUB-TOTAL (PART C)				**6,038,526.02**	**2,156,616.43**	**3,234,924.65**	**646,984.93**	
D	**SUBBASE AND BASE COURSE**								
200	Sub Base Course	2,824.20	cu.m.	879.97	2,485,211.27	887,575.46	1,331,363.18	266,272.64	
	SUB-TOTAL (PART D)				**2,485,211.27**	**887,575.46**	**1,331,363.18**	**266,272.64**	
E	**SURFACE COURSES**								
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	14.82	tonne	65,971.81	977,702.22	349,179.37	523,769.05	104,753.81	
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	21,165.91	sq.m	924.31	19,563,862.27	6,987,093.67	10,480,640.50	2,096,128.10	
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	5,520.00	sq.m	1,073.00	5,922,960.00	2,115,342.86	3,173,014.29	634,602.86	
311	Portland Cement Concrete Pavement t=300 mm	4,514.68	sq.m	2,887.66	13,036,860.85	4,656,021.73	6,984,032.60	1,396,806.52	
	SUB-TOTAL (PART E)				**39,501,385.35**	**14,107,637.62**	**21,161,456.43**	**4,232,291.29**	
F	**BRIDGE CONSTRUCTION**								
	Approch Ramp								
103(1)	Structure Excavation	1,201.60	cu.m.	586.00	704,137.60	251,477.71	377,216.57	75,443.31	
103(2)	Structural Backfilling	939.65	cu.m.	565.00	530,902.25	189,607.95	284,411.92	56,882.38	
104(2)	Embankment, Selected Borrow	6,616.99	cu.m.	984.09	6,511,713.69	2,325,612.03	3,488,418.05	697,683.61	
401(a)	Cast in Place Concrete Railing	552.82	l.m.	5,006.92	2,767,925.51	988,544.83	1,482,817.24	296,563.45	
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	44,722.05	kg.	62.70	2,804,072.66	1,001,454.52	1,502,181.78	300,436.36	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	30,055.40	kg.	68.25	2,051,281.05	732,600.38	1,098,900.56	219,780.11	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	432.00	cu.m.	9,548.08	4,124,724.73	1,473,115.97	2,209,673.96	441,934.79	
405(1)b	Approach Slab	51.40	cu.m.	6,233.40	320,396.76	114,427.41	171,641.12	34,328.22	
405(1)c	Concrete Leveling Pad	19.16	cu.m.	80,462.16	1,541,654.99	550,591.07	825,886.60	165,177.32	
405(6)	Lean Concrete	70.02	cu.m.	4,111.70	287,901.23	102,821.87	154,232.80	30,846.56	
SPL 414	Concrete Barrier	276.41	l.m.	4,660.55	1,288,222.63	460,079.51	690,119.26	138,023.85	
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	791.42	sq.m.	14,163.00	11,208,881.46	4,003,171.95	6,004,757.93	1,200,951.59	
	Substructure								
400(17)a	Concrete Piles Cast in Drilled Holes, Ø1200 mm	198.00	l.m.	44,668.80	8,844,422.40	3,158,722.29	4,738,083.43	947,616.69	
400(17)b	Concrete Piles Cast in Drilled Holes, Ø2500 mm	585.00	l.m.	106,248.81	62,155,553.85	22,198,412.09	33,297,618.13	6,659,523.63	
400(17)c	Concrete Piles Cast in Drilled Holes, Ø3000 mm	72.00	l.m.	164,602.64	11,851,390.08	4,232,639.31	6,348,958.97	1,269,791.79	
400(22)a	Pile Integrity Test	58.00	ea.	43,784.56	2,539,504.48	906,965.89	1,360,448.83	272,089.77	
400(22)b	Pile Dynamic Test	29.00	ea.	583,087.25	16,909,530.25	6,039,117.95	9,058,676.92	1,811,735.38	
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	550.75	kg.	62.70	34,532.21	12,332.93	18,499.40	3,699.88	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	833,880.32	kg.	68.25	56,912,331.98	20,325,832.85	30,488,749.27	6,097,749.85	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	1,590.15	cu.m.	14,057.94	22,354,205.18	7,983,644.71	11,975,467.06	2,395,093.41	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	210.00	cu.m.	6,621.00	1,390,410.00	496,575.00	744,862.50	148,972.50	
405(6)	Lean Concrete	5.88	cu.m.	4,111.70	24,176.80	8,634.57	12,951.86	2,590.37	
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	32.00	ea.	1,800.00	57,600.00	20,571.43	30,857.14	6,171.43	
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	208.00	ea.	1,200.00	249,600.00	89,142.86	133,714.29	26,742.86	
408	Structural Steel (Furnished, Fabricated & Erected)	149,900.00	kg.	182.00	27,281,800.00	16,076,775.00	8,281,975.00	2,923,050.00	
SPL	Paint for Steel Pier	341.00	sq.m	700.00	238,700.00	85,250.00	127,875.00	25,575.00	

Summary of Civil Work Cost for C5/GREEN MEADOWS (COST COMPONENT) (1/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
	Superstructure								
401(a)	Cast in Place Concrete Railing	2,196.00	l.m.	5,006.92	10,995,196.32	3,926,855.83	5,890,283.74	1,178,056.75	
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	152,745.84	kg.	62.70	9,577,164.17	3,420,415.77	5,130,623.66	1,026,124.73	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	2,061,752.89	kg.	68.25	140,714,634.74	50,255,226.69	75,382,840.04	15,076,568.01	
404(2)c	Prestressing steel	-	kg.	152.90	-	-	-	-	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	11,072.49	cu.m.	16,971.01	187,911,338.51	67,111,192.33	100,666,788.49	20,133,357.70	
408	Structural Steel (Furnished, Fabricated & Erected)	2,192,800.00	kg.	182.00	399,089,600.00	235,177,800.00	121,152,200.00	42,759,600.00	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	216.00	ea.	14,500.00	3,132,000.00	1,118,571.43	1,677,857.14	335,571.43	
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	36.00	ea.	12,000.00	432,000.00	154,285.71	231,428.57	46,285.71	
412(1)c	Rubber Bearing Shoe 2500kN	8.00	ea.	220,000.00	1,760,000.00	628,571.43	942,857.14	188,571.43	
413(1)	Expansion Joint	450.80	l.m.	29,418.63	13,261,918.40	4,736,399.43	7,104,599.15	1,420,919.83	
SPL 414	Concrete Barrier	1,098.00	l.m.	4,660.55	5,117,283.90	1,827,601.39	2,741,402.09	548,280.42	
SPL 415	Waterproofing	18,775.80	sq.m.	1,800.00	33,796,440.00	12,070,157.14	18,105,235.71	3,621,047.14	
SPL	Paint for Steel Girder	19,139.00	sq.m	700.00	13,397,300.00	4,784,750.00	7,177,125.00	1,435,425.00	
	SUB-TOTAL (PART F)				**1,064,170,447.83**	**479,039,949.22**	**471,112,236.34**	**114,018,262.27**	
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**								
500(1)a	RCPC, Class II	50.00	l.m.	3,082.45	154,122.50	55,043.75	82,565.63	16,513.13	
500(1)b	RCPC, Class IV	549.00	l.m.	7,005.56	3,846,052.44	1,373,590.16	2,060,385.24	412,077.05	
502(2)a	Storm Deck Drain with Grating	220.00	ea.	19,679.57	4,329,505.40	1,546,251.93	2,319,377.89	463,875.58	
502(2)b	Curb Inlet Manhole	131.00	ea.	25,000.00	3,275,000.00	1,169,642.86	1,754,464.29	350,892.86	
502(3)	Catch Basins	57.00	ea.	35,000.00	1,995,000.00	712,500.00	1,068,750.00	213,750.00	
502(4)	Junction Box	25.00	ea.	5,000.00	125,000.00	44,642.86	66,964.29	13,392.86	
SPL 512	Collector Pipe	3,281.96	l.m.	1,153.20	3,784,756.27	1,351,698.67	2,027,548.00	405,509.60	
	SUB-TOTAL (PART G)				**17,509,436.61**	**6,253,370.22**	**9,380,055.33**	**1,876,011.07**	
H	**MISCELLANEOUS STRUCTURES**								
600(1)	Concrete Curb	2,668.03	l.m.	1,333.21	3,557,044.28	1,270,372.96	1,905,559.43	381,111.89	
600(3)a	Concrete Curb and Gutter	2,615.90	l.m.	1,661.30	4,345,794.67	1,552,069.53	2,328,104.29	465,620.86	
600(3)b	Concrete Side Strip	1,352.16	sq.m.	350.00	473,256.00	169,020.00	253,530.00	50,706.00	
601(1)a	Concrete Sidewalk	1,698.25	sq.m.	1,560.60	2,650,288.95	946,531.77	1,419,797.65	283,959.53	
601(1)b	Concrete Median	11,493.99	sq.m.	1,560.60	17,937,514.55	6,406,255.20	9,609,382.80	1,921,876.56	
SPL	Noise Barrier	200.00	lm	48,456.58	9,691,316.01	3,461,184.29	5,191,776.43	1,038,355.29	
605(1)	Warning Sign	3.00	set	34,912.46	104,737.38	37,406.21	56,109.31	11,221.86	
605(2)	Regulatory Sign	29.00	set	34,912.46	1,012,461.34	361,593.34	542,390.00	108,478.00	
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36	646,952.27	970,428.41	194,085.68	
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10	308,200.75	462,301.13	92,460.23	
605(3)c	Informatory Sign, Cantilever Support	3.00	set	388,956.44	1,166,869.32	416,739.04	625,108.56	125,021.71	
605(3)d	Informatory Sign, Double Post	6.00	set	42,944.99	257,669.94	92,024.98	138,037.47	27,607.49	
612(1)	Reflectorized Thermoplastic Pavement Markings, White	1,888.54	sq.m.	1,092.83	2,063,853.17	737,090.42	1,105,635.63	221,127.13	
	SUB-TOTAL (PART H)				**45,935,234.06**	**16,405,440.74**	**24,608,161.11**	**4,921,632.22**	
J	**SPECIAL ITEM**								
SPL 1	9m Pole, Single arm complete	140.00	set	86,228.98	12,072,057.20	4,311,449.00	6,467,173.50	1,293,434.70	
SPL 2	9m Pole, Double arm complete	72.00	set	90,000.00	6,480,000.00	2,314,285.71	3,471,428.57	694,285.71	
SPL 3	Lighting system, (under carriageway)	50.00	set	59,290.99	2,964,549.50	1,058,767.68	1,588,151.52	317,630.30	
SPL 4	Flood lights	7.00	set	80,000.00	560,000.00	200,000.00	300,000.00	60,000.00	
SPL 5	Traffic Signal Light	1.00	P.s	2,000,000.00	2,000,000.00	714,285.71	1,071,428.57	214,285.71	
	SUB-TOTAL (PART J)				24,076,606.70	8,598,788.11	12,898,182.16	2,579,636.43	
	TOTAL				**1,271,114,016.32**	**552,948,366.54**	**581,974,862.31**	**136,190,787.46**	

Summary of Civil Work Cost for EDSA/ EDSA-ROOSEVELT(1/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
1.0	**GENERAL REQUIREMENTS**						
A	**FACILITIES FOR THE ENGINEER**	1.00	l.s.	10,000,000.00	10,000,000.00		
	SUB-TOTAL (PART A)				**10,000,000.00**	-	
B	**OTHER GENERAL REQUIREMENTS**						
SPL B.2.1	Construction Health and Safety	1.00	P.s	2,400,000.00	2,400,000.00		
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	6,464,932.12	6,464,932.12		
SPL B.2-3	Traffic Management During Construction	1.00	P.s	5,000,000.00	5,000,000.00		
SPL B.2-4	Dayworks	1.00	P.s	5,000,000.00	5,000,000.00		
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	10,000,000.00	10,000,000.00		
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	2,000,000.00	2,000,000.00		
	SUB-TOTAL (PART B)				**30,864,932.12**	-	
	SUB-TOTAL GENERAL REQUIREMENTS				**40,864,932.12**	-	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**						
C	**EARTHWORKS**						
100(1)	Clearing and Grubbing	-	ha.	90,846.53	-		
100(3)	Individual Removal Trees (Small)	-	ea.	1,013.26	-		
100(4)	Individual Removal Trees (Large)	-	ea.	1,427.27	-		
100(5)	Removal and Earth Balling of Trees	-	ea.	1,000.00	-		
101(1)	Removal of Structures and Obstruction	1.00	l.s.	500,000.00	500,000.00		
101(3)a	Removal of Existing PCCP	1,605.68	sq.m.	245.78	394,644.03		
101(3)b	Breaking of Existing PCCP	11,971.40	sq.m.	335.00	4,010,419.00		
101(4)a	Removal of Existing Concrete Curb	1,030.00	l.m.	60.00	61,800.00		
101(4)b	Removal of Existing Concrete Curb & Gutter	-	l.m.	110.00	-		
101(4)c	Removal of Existing Sidewalk	-	sq.m.	120.00	-		
101(4)d	Removal of Existing RCPC	-	l.m.	200.00	-		
101(4)e	Removal of Existing Covered canal	-	l.m.	150.00	-		
105(1)	Subgrade Preparation	-	sq.m.	37.18	-		
	SUB-TOTAL (PART C)				**4,966,863.03**	-	
D	**SUBBASE AND BASE COURSE**						
200	Sub Base Course	1,903.42	cu.m.	879.97	1,674,952.50		
	SUB-TOTAL (PART D)				**1,674,952.50**	-	
E	**SURFACE COURSES**						
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	9.45	tonne	65,971.81	623,433.60		
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	13,501.78	sq.m	924.31	12,479,830.27		
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	2,506.67	sq.m	1,073.00	2,689,656.91		
311	Portland Cement Concrete Pavement t=300 mm	4,530.64	sq.m	2,887.66	13,082,947.90		
	SUB-TOTAL (PART E)				**28,875,868.69**	-	

Summary of Civil Work Cost for EDSA/ EDSA-ROOSEVELT(2/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
F	**BRIDGE CONSTRUCTION**						
	Approch Ramp						
103(1)	Structure Excavation	1,792.56	cu.m.	586.00	1,050,440.16		
103(2)	Structural Backfilling	1,583.04	cu.m.	565.00	894,417.60		
104(2)	Embankment, Selected Borrow	2,711.73	cu.m.	984.09	2,668,586.38		
401(a)	Cast in Place Concrete Railing	776.88	l.m.	5,006.92	3,889,776.01		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	58,068.45	kg.	62.70	3,640,891.82	2,479,522.82	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	15,906.00	kg.	68.25	1,085,584.50	679,186.20	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	387.12	cu.m.	9,548.08	3,696,281.37	749,083.01	
405(1)b	Approach Slab	72.30	cu.m.	6,233.40	450,674.82	139,900.50	
405(1)c	Concrete Leveling Pad	-	cu.m.	80,462.16	-		
405(6)	Lean Concrete	143.90	cu.m.	4,111.70	591,673.63		
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-		
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	724.00	sq.m.	14,163.00	10,254,012.00	8,973,980.00	
	Substructure						
400(17)a	Concrete Piles Cast in Drilled Holes, Ø1000 mm	160.00	l.m.	35,098.96	5,615,833.60	243,036.00	1,544,578.56
400(17)b	Concrete Piles Cast in Drilled Holes, Ø2500 mm	288.00	l.m.	146,178.83	42,099,503.04	2,734,155.00	12,067,020.00
400(17)c	Concrete Piles Cast in Drilled Holes, Ø3000 mm	72.00	l.m.	202,409.64	14,573,494.08	984,295.80	4,344,127.20
400(22)a	Pile Integrity Test	14.00	ea.	43,784.56	612,983.84		
400(22)b	Pile Dynamic Test	5.00	ea.	583,087.25	2,915,436.25		
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	724.68	kg.	62.70	45,437.44	30,943.84	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	653,696.88	kg.	68.25	44,614,812.06	27,912,856.78	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	1,550.96	cu.m.	14,057.94	21,803,302.62	3,001,107.60	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	39.00	cu.m.	6,621.00	258,219.00		
405(6)	Non Shrink Grout 41Mpa including wiremesh for Girder Riser	1.30	cu.m.	80,462.16	104,600.81		
405(6)	Lean Concrete	8.34	cu.m.	4,111.70	34,291.58		
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	-	ea.	1,800.00	-		
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	-	ea.	1,200.00	-		
408	Structural Steel (Furnished, Fabricated & Erected)	64,240.00	kg.	182.00	11,691,680.00	7,708,800.00	
SPL	Paint for Steel Pier	130.00	sq.m	700.00	91,000.00		
	Superstructure						
401(a)	Cast in Place Concrete Railing	1,464.00	l.m.	5,006.92	7,330,130.88		
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	-	kg.	62.70	-	-	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	1,330,876.72	kg.	68.25	90,832,336.14	56,828,435.94	
404(2)c	Prestressing steel	-	kg.	152.90	-	-	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	5,323.51	cu.m.	16,971.01	90,345,341.45	10,300,991.85	
408	Structural Steel (Furnished, Fabricated & Erected)	990,200.00	kg.	182.00	180,216,400.00	118,824,000.00	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	60.00	ea.	14,500.00	870,000.00		
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	-	ea.	12,000.00	-		
412(1)c	Rubber Bearing Shoe 2500kN	8.00	ea.	220,000.00	1,760,000.00		
413(1)	Expansion Joint	192.80	l.m.	29,418.63	5,671,911.86		
SPL 414	Concrete Barrier	1,098.00	l.m.	4,660.55	5,117,283.90		
SPL 415	Waterproofing	8,820.60	sq.m.	1,800.00	15,877,080.00		
SPL	Paint for Steel Girder	5,990.00	sq.m	700.00	4,193,000.00		
	SUB-TOTAL (PART F)				**574,896,416.83**	**241,590,295.33**	**17,955,725.76**

Summary of Civil Work Cost for EDSA/ EDSA-ROOSEVELT(3/3)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	Japanese Contents	Remarks
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**						
500(1)a	RCPC, Class II	-	l.m.	3,082.45	-		
500(1)b	RCPC, Class IV	1,000.00	l.m.	7,005.56	7,005,560.00		
502(2)a	Storm Deck Drain with Grating	74.00	ea.	19,679.57	1,456,288.18		
502(2)b	Curb Inlet Manhole	56.00	ea.	25,000.00	1,400,000.00		
502(3)	Catch Basins	28.00	ea.	35,000.00	980,000.00		
502(4)	Junction Box	-	ea.	5,000.00	-		
SPL 512	Collector Pipe	958.35	l.m.	1,153.20	1,105,169.22		
	SUB-TOTAL (PART G)				**11,947,017.40**	-	
H	**MISCELLANEOUS STRUCTURES**						
600(1)	Concrete Curb	1,416.00	l.m.	1,333.21	1,887,825.36		
600(3)a	Concrete Curb and Gutter	243.00	l.m.	1,661.30	403,695.90		
600(3)b	Concrete Side Strip	-	sq.m.	350.00	-		
601(1)a	Concrete Sidewalk	-	sq.m.	1,560.60	-		
601(1)b	Concrete Median	7,295.00	sq.m.	1,560.60	11,384,577.00		
605(1)	Warning Sign	4.00	set	34,912.46	139,649.84		
605(2)	Regulatory Sign	8.00	set	34,912.46	279,299.68		
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36		
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10		
605(3)c	Informatory Sign, Cantilever Support	2.00	set	388,956.44	777,912.88		
605(3)d	Informatory Sign, Double Post	6.00	set	42,944.99	257,669.94		
612(1)	Reflectorized Thermoplastic Pavement Markings, White	806.37	sq.m.	1,092.83	881,225.33		
	SUB-TOTAL (PART H)				**18,686,284.39**	-	
J	**SPECIAL ITEM**						
SPL 1	9m Pole, Single arm complete	36.00	set	86,228.98	3,104,243.28		
SPL 2	9m Pole, Double arm complete	-	set	90,000.00	-		
SPL 3	Lighting system, (under carriageway)	26.00	set	59,290.99	1,541,565.74		
SPL 4	Flood lights	10.00	set	80,000.00	800,000.00		
SPL 5	Traffic Signal Light	-	P.s	2,000,000.00	-		
	SUB-TOTAL (PART J)				**5,445,809.02**	-	
	TOTAL				**687,358,143.97**	**259,546,021.09**	**37.76%**

Summary of Civil Work Cost for EDSA/ EDSA-ROOSEVELT (COST COMPONENT) (1/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
1.0	**GENERAL REQUIREMENTS**								
A	**FACILITIES FOR THE ENGINEER**	1.00	ls.	10,000,000.00	10,000,000.00	3,571,428.57	5,357,142.86	1,071,428.57	
	SUB-TOTAL (PART A)				**10,000,000.00**	**3,571,428.57**	**5,357,142.86**	**1,071,428.57**	
B	**OTHER GENERAL REQUIREMENTS**								
SPL B.2.1	Construction Health and Safety	1.00	P.s	2,400,000.00	2,400,000.00	857,142.86	1,285,714.29	257,142.86	
SPL B.2.2	Mobilization / Demobilization (1.0% of Civil Works)	1.00	P.s	6,464,932.12	6,464,932.12	2,308,904.33	3,463,356.49	692,671.30	
SPL B.2-3	Traffic Management During Construction	1.00	P.s	5,000,000.00	5,000,000.00	1,785,714.29	2,678,571.43	535,714.29	
SPL B.2-4	Dayworks	1.00	P.s	5,000,000.00	5,000,000.00	1,785,714.29	2,678,571.43	535,714.29	
SPL B.2-5	Removal, Relocation of Utilities	1.00	P.s	10,000,000.00	10,000,000.00	3,571,428.57	5,357,142.86	1,071,428.57	
SPL B.3.1	Environmental Monitoring Action Plan	1.00	P.s	2,000,000.00	2,000,000.00	714,285.71	1,071,428.57	214,285.71	
	SUB-TOTAL (PART B)				**30,864,932.12**	**11,023,190.04**	**16,534,785.06**	**3,306,957.01**	
	SUB-TOTAL GENERAL REQUIREMENTS				**40,864,932.12**	**14,594,618.61**	**21,891,927.92**	**4,378,385.58**	
2.0	**INTERCHANGE CONSTRUCTION WITH VIADUCT**								
C	**EARTHWORKS**								
100(1)	Clearing and Grubbing	-	ha.	90,846.53	-	-	-	-	
100(3)	Individual Removal Trees (Small)	-	ea.	1,013.26	-	-	-	-	
100(4)	Individual Removal Trees (Large)	-	ea.	1,427.27	-	-	-	-	
100(5)	Removal and Earth Balling of Trees	-	ea.	1,000.00	-	-	-	-	
101(1)	Removal of Structures and Obstruction	1.00	l.s.	500,000.00	500,000.00	178,571.43	267,857.14	53,571.43	
101(3)a	Removal of Existing PCCP	1,605.68	sq.m.	245.78	394,644.03	140,944.30	211,416.44	42,283.29	
101(3)b	Breaking of Existing PCCP	11,971.40	sq.m.	335.00	4,010,419.00	1,432,292.50	2,148,438.75	429,687.75	
101(4)a	Removal of Existing Concrete Curb	1,030.00	l.m.	60.00	61,800.00	22,071.43	33,107.14	6,621.43	
101(4)b	Removal of Existing Concrete Curb & Gutter	-	l.m.	110.00	-	-	-	-	
101(4)c	Removal of Existing Sidewalk	-	sq.m.	120.00	-	-	-	-	
101(4)d	Removal of Existing RCPC	-	l.m.	200.00	-	-	-	-	
101(4)e	Removal of Existing Covered canal	-	l.m.	150.00	-	-	-	-	
105(1)	Subgrade Preparation	-	sq.m.	37.18	-	-	-	-	
	SUB-TOTAL (PART C)				**4,966,863.03**	**1,773,879.65**	**2,660,819.48**	**532,163.90**	
D	**SUBBASE AND BASE COURSE**								
200	Sub Base Course	1,903.42	cu.m.	879.97	1,674,952.50	598,197.32	897,295.98	179,459.20	
	SUB-TOTAL (PART D)				**1,674,952.50**	**598,197.32**	**897,295.98**	**179,459.20**	
E	**SURFACE COURSES**								
302(2)	Bituminous Tack Coat, Emulsified Asphalt, SS-1 (0.45 L/m2)	9.45	tonne	65,971.81	623,433.60	222,654.86	333,982.29	66,796.46	
310 (2)	Bituminous Concrete Wearing Course, Hot Laid (t=50mm)	13,501.78	sq.m	924.31	12,479,830.27	4,457,082.24	6,685,623.36	1,337,124.67	
310 (3)	Rubber Asphalt Binder Course, Hot Laid (t=30mm)	2,506.67	sq.m	1,073.00	2,689,656.91	960,591.75	1,440,887.63	288,177.53	
311	Portland Cement Concrete Pavement t=300 mm	4,530.64	sq.m	2,887.66	13,082,947.90	4,672,481.39	7,008,722.09	1,401,744.42	
	SUB-TOTAL (PART E)				**28,875,868.69**	**10,312,810.25**	**15,469,215.37**	**3,093,843.07**	
F	**BRIDGE CONSTRUCTION**								
	Approch Ramp								
103(1)	Structure Excavation	1,792.56	cu.m.	586.00	1,050,440.16	375,157.20	562,735.80	112,547.16	
103(2)	Structural Backfilling	1,583.04	cu.m.	565.00	894,417.60	319,434.86	479,152.29	95,830.46	
104(2)	Embankment, Selected Borrow	2,711.73	cu.m.	984.09	2,668,586.38	953,066.56	1,429,599.84	285,919.97	
401(a)	Cast in Place Concrete Railing	776.88	l.m.	5,006.92	3,889,776.01	1,389,205.72	2,083,808.58	416,761.72	
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	58,068.45	kg.	62.70	3,640,891.82	1,300,318.51	1,950,477.76	390,095.55	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	15,906.00	kg.	68.25	1,085,584.50	387,708.75	581,563.13	116,312.63	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	387.12	cu.m.	9,548.08	3,696,281.37	1,320,100.49	1,980,150.74	396,030.15	
405(1)b	Approach Slab	72.30	cu.m.	6,233.40	450,674.82	160,955.29	241,432.94	48,286.59	
405(1)c	Concrete Leveling Pad	-	cu.m.	80,462.16	-	-	-	-	
405(6)	Lean Concrete	143.90	cu.m.	4,111.70	591,673.63	211,312.01	316,968.02	63,393.60	
SPL 414	Concrete Barrier	-	l.m.	4,660.55	-	-	-	-	
SPL 417	Earthquake Resistant Type Mechanically Stabilized Earthwall	724.00	sq.m.	14,163.00	10,254,012.00	3,662,147.14	5,493,220.71	1,098,644.14	

Summary of Civil Work Cost for EDSA/ EDSA-ROOSEVELT (COST COMPONENT) (2/2)

PAY ITEM NO.	DESCRIPTION	QUANTITY	UNIT	Unit Cost	Civil Work Cost	COST COMPONENT			Remarks
						Foreign Currency (FC)	Local Currency (LC)	TAXES	
	Substructure								
400(17)a	Concrete Piles Cast in Drilled Holes, Ø1000 mm	160.00	l.m.	35,098.96	5,615,833.60	2,005,654.86	3,008,482.29	601,696.46	
400(17)b	Concrete Piles Cast in Drilled Holes, Ø2500 mm	288.00	l.m.	146,178.83	42,099,503.04	15,035,536.80	22,553,305.20	4,510,661.04	
400(17)c	Concrete Piles Cast in Drilled Holes, Ø3000 mm	72.00	l.m.	202,409.64	14,573,494.08	5,204,819.31	7,807,228.97	1,561,445.79	
400(22)a	Pile Integrity Test	14.00	ea.	43,784.56	612,983.84	218,922.80	328,384.20	65,676.84	
400(22)b	Pile Dynamic Test	5.00	ea.	583,087.25	2,915,436.25	1,041,227.23	1,561,840.85	312,368.17	
404(1)a	Reinforcing steel, Grade 40 (Minor/Substructure)	724.68	kg.	62.70	45,437.44	16,227.66	24,341.48	4,868.30	
404(2)a	Reinforcing steel, Grade 60 (Minor/Substructure)	653,696.88	kg.	68.25	44,614,812.06	15,933,861.45	23,900,792.18	4,780,158.44	
405(1)a	Structural Concrete, Class A (Minor/Substructure) 27.6 Mpa	1,550.96	cu.m.	14,057.94	21,803,302.62	7,786,893.79	11,680,340.69	2,336,068.14	
405(1)b	Structural Concrete, Class A (Steel Pier) 27.6 Mpa	39.00	cu.m.	6,621.00	258,219.00	92,221.07	138,331.61	27,666.32	
405(6)	Non Shrink Grout 41Mpa including wiremesh for Girder Riser	1.30	cu.m.	80,462.16	104,600.81	37,357.43	56,036.15	11,207.23	
405(6)	Lean Concrete	8.34	cu.m.	4,111.70	34,291.58	12,246.99	18,370.49	3,674.10	
407(1)a	Anchor Bar Ø36mm x 1500mm long, complete	-	ea.	1,800.00	-	-	-	-	
407(1)b	Anchor Bar Ø36mm x 1000mm long, complete	-	ea.	1,200.00	-	-	-	-	
408	Structural Steel (Furnished, Fabricated & Erected)	64,240.00	kg.	182.00	11,691,680.00	6,889,740.00	3,549,260.00	1,252,680.00	
SPL	Paint for Steel Pier	130.00	sq.m	700.00	91,000.00	32,500.00	48,750.00	9,750.00	
	Superstructure								
401(a)	Cast in Place Concrete Railing	1,464.00	l.m.	5,006.92	7,330,130.88	2,617,903.89	3,926,855.83	785,371.17	
404(1)b	Reinforcing steel, Grade 40 (Superstructure)	-	kg.	62.70	-	-	-	-	
404(2)b	Reinforcing steel, Grade 60 (Superstructure)	1,330,876.72	kg.	68.25	90,832,336.14	32,440,120.05	48,660,180.08	9,732,036.02	
404(2)c	Prestressing steel	-	kg.	152.90	-	-	-	-	
405(1)b	Structural Concrete, Class A (Hollow Slab) 27.6 Mpa	5,323.51	cu.m.	16,971.01	90,345,341.45	32,266,193.37	48,399,290.06	9,679,858.01	
408	Structural Steel (Furnished, Fabricated & Erected)	990,200.00	kg.	182.00	180,216,400.00	106,198,950.00	54,708,550.00	19,308,900.00	
412(1)a	Elastomeric Bearing Pad (500 x 400 x 60 mm)	60.00	ea.	14,500.00	870,000.00	310,714.29	466,071.43	93,214.29	
412(1)b	Elastomeric Bearing Pad (400 x 400 x 50 mm)	-	ea.	12,000.00	-	-	-	-	
412(1)c	Rubber Bearing Shoe 2500kN	8.00	ea.	220,000.00	1,760,000.00	628,571.43	942,857.14	188,571.43	
413(1)	Expansion Joint	192.80	l.m.	29,418.63	5,671,911.86	2,025,682.81	3,038,524.21	607,704.84	
SPL 414	Concrete Barrier	1,098.00	l.m.	4,660.55	5,117,283.90	1,827,601.39	2,741,402.09	548,280.42	
SPL 415	Waterproofing	8,820.60	sq.m.	1,800.00	15,877,080.00	5,670,385.71	8,505,578.57	1,701,115.71	
SPL	Paint for Steel Girder	5,990.00	sq.m	700.00	4,193,000.00	1,497,500.00	2,246,250.00	449,250.00	
	SUB-TOTAL (PART F)				**574,896,416.83**	**249,870,238.87**	**263,430,133.30**	**61,596,044.66**	
G	**DRAINAGE AND SLOPE PROTECTION STRUCTURES**								
500(1)a	RCPC, Class II	-	l.m.	3,082.45	-	-	-	-	
500(1)b	RCPC, Class IV	1,000.00	l.m.	7,005.56	7,005,560.00	2,501,985.71	3,752,978.57	750,595.71	
502(2)a	Storm Deck Drain with Grating	74.00	ea.	19,679.57	1,456,288.18	520,102.92	780,154.38	156,030.88	
502(2)b	Curb Inlet Manhole	56.00	ea.	25,000.00	1,400,000.00	500,000.00	750,000.00	150,000.00	
502(3)	Catch Basins	28.00	ea.	35,000.00	980,000.00	350,000.00	525,000.00	105,000.00	
502(4)	Junction Box	-	ea.	5,000.00	-	-	-	-	
SPL 512	Collector Pipe	958.35	l.m.	1,153.20	1,105,169.22	394,703.29	592,054.94	118,410.99	
	SUB-TOTAL (PART G)				**11,947,017.40**	**4,266,791.93**	**6,400,187.89**	**1,280,037.58**	
H	**MISCELLANEOUS STRUCTURES**								
600(1)	Concrete Curb	1,416.00	l.m.	1,333.21	1,887,825.36	674,223.34	1,011,335.01	202,267.00	
600(3)a	Concrete Curb and Gutter	243.00	l.m.	1,661.30	403,695.90	144,177.11	216,265.66	43,253.13	
600(3)b	Concrete Side Strip	-	sq.m.	350.00	-	-	-	-	
601(1)a	Concrete Sidewalk	-	sq.m.	1,560.60	-	-	-	-	
601(1)b	Concrete Median	7,295.00	sq.m.	1,560.60	11,384,577.00	4,065,920.36	6,098,880.54	1,219,776.11	
605(1)	Warning Sign	4.00	set	34,912.46	139,649.84	49,874.94	74,812.41	14,962.48	
605(2)	Regulatory Sign	8.00	set	34,912.46	279,299.68	99,749.89	149,624.83	29,924.97	
605(3)a	Informatory Sign, Gantry Support	2.00	set	905,733.18	1,811,466.36	646,952.27	970,428.41	194,085.68	
605(3)b	Informatory Sign, Butterfly Support	2.00	set	431,481.05	862,962.10	308,200.75	462,301.13	92,460.23	
605(3)c	Informatory Sign, Cantilever Support	2.00	set	388,956.44	777,912.88	277,826.03	416,739.04	83,347.81	
605(3)d	Informatory Sign, Double Post	6.00	set	42,944.99	257,669.94	92,024.98	138,037.47	27,607.49	
612(1)	Reflectorized Thermoplastic Pavement Markings, White	806.37	sq.m.	1,092.83	881,225.33	314,723.33	472,085.00	94,417.00	
	SUB-TOTAL (PART H)				**18,686,284.39**	**6,673,673.00**	**10,010,509.49**	**2,002,101.90**	
J	**SPECIAL ITEM**								
SPL 1	9m Pole, Single arm complete	36.00	set	86,228.98	3,104,243.28	1,108,658.31	1,662,987.47	332,597.49	
SPL 2	9m Pole, Double arm complete	-	set	90,000.00	-	-	-	-	
SPL 3	Lighting system, (under carriageway)	26.00	set	59,290.99	1,541,565.74	550,559.19	825,838.79	165,167.76	
SPL 4	Flood lights	10.00	set	80,000.00	800,000.00	285,714.29	428,571.43	85,714.29	
SPL 5	Traffic Signal Light	-	P.s	2,000,000.00	-	-	-	-	
	SUB-TOTAL (PART J)				**5,445,809.02**	**1,944,931.79**	**2,917,397.69**	**583,479.54**	
	TOTAL				**687,358,143.97**	**290,035,141.42**	**323,677,487.13**	**73,645,515.43**	

I. ESTIMATED COST FOR PRE-CONSTRUCTION STAGE

SUMMARY

DESCRIPTION	FOREIGN CURRENCY		LOCAL CURRENCY (PESO)
	YEN COMPONENT	PESO COMPONENT	
FOREIGN CURRENCY PORTION			
A. YEN COMPONENT			
A.1 REMUNERATION COST	**¥ 20,496,000**		
A.1.1 Key Staff (Foreign)	¥ 20,496,000		
A.2 REIMBURSABLE COST	**¥ 3,140,000**		
A.2.1 International Travel Expenses	¥ 500,000		
A.2.2 Per Diem Allowances	¥ 2,400,000		
A.2.3 Communications	¥ 240,000		
B. PESO COMPONENT			
B.1 REMUNERATION COST		**₱ 8,310,000**	
B.1.1 Key Staff (Local)		₱ 4,950,000	
B.1.2 Technical and Administrative Support Staff		₱ 3,360,000	
B.2 REIMBURSABLE COST		**₱ 3,220,000**	
B.2.1 Transport		₱ 980,000	
B.2.2 Communications		₱ 280,000	
B.2.3 Office Rental/Operating		₱ 980,000	
B.2.4 Office Supplies & Equipment Maintenance		₱ 140,000	
B.2.5 Office Equipment/Furniture		₱ 140,000	
B.2.6 Printing, papers, Reports and Documents		₱ 700,000	
LOCAL CURRENCY PORTION			
C.1 VAT (12% of B.1)			**₱ 997,200**
TOTAL	**¥ 23,636,000**	**₱ 11,530,000**	**₱ 997,200**

BREAKDOWN OF ESTIMATED COST FOR PRE-CONSTRUCTION STAGE

FOREIGN CURRENCY PORTION

A. YEN COMPONENT

A.1 REMUNERATION COST

A.1.1	Key Staff (Foreign)	**M/M**	**Billing Rate ¥**	**AMOUNT (¥)**
	1 Project Manager	8	¥ 2,562,000	¥ 20,496,000
	Total of A.1	8		**¥ 20,496,000**

A.2 REIMBURSABLE COST

A.2.1	International Travel Expenses	
	a) Air Ticket for Expatriate (Japan-Manila-Japan) x 2 round trip x ¥ 200,000/RT	¥ 400,000
	b) Miscellaneous Travel Expenses in Japan Travelling expenses from airport to origin of Engrs. in Japan and travel processing ¥50,000 x 2 RT	¥ 100,000
A.2.2	Per Diem Allowances Subsistence Allowance for Expatriates 8 man-month x 30 days @ ¥10,000	¥ 2,400,000
A.2.3	Communications International Communication 8 months @ ¥30,000	¥ 240,000
	Total of A.2	**¥ 3,140,000**

B. PESO COMPONENT

B.1 REMUNERATION COST

B.1.1	Key Staff (Local)	**M/M**	**Billing Rate ₱**	**AMOUNT (¥)**
	1 Deputy Project Manager	14	₱ 150,000	₱ 2,100,000
	2 Sr. Cost Engr.	5	150,000	750,000
	3 Sr. Specification Specialist	14	150,000	2,100,000
	Total of B.1	**33**		**₱ 4,950,000**

B.1.2	Technical and Administrative Support Staff				
	1 Administrative Officer	14	₱ 60,000	₱	840,000
	2 Secretary	14	60,000		840,000
	3 Encoder	14	60,000		840,000
	4 Janitor	14	60,000		840,000
	Total of B.1.2	**56**		₱	**3,360,000**
	Total of B.1	**89**		₱	**8,310,000**
B.2	**REIMBURSABLE COST**				
B.2.1	Transport Service Vehicle 1 vehicle x 14 months @ P 70,000			₱	980,000
B.2.2	Communications Domestic Communication 14 months @ P 20,000 (PLDT & Cellular Phone)			₱	280,000
B.2.3	Office Rental/Operating a) Office Rental 100 sq.m. of floor area @ ₱700/sq.m./month for 14 months			₱	980,000
B.2.4	Office Supplies & Equipment Maintenance Consumable Materials & Equipment maintenance services, etc. All @ ₱ 10,000/mon for 14 months			₱	140,000
B.2.5	Office Equipment/Furniture Office and technical equipment and furniture, fixture All @ ₱ 10,000/mon for 14 months			₱	140,000
B.2.6	Printing, papers, Reports and Documents Photocopying, printing, binding, copies, blue print, etc All @ ₱ 50,000/mon for 14 months			₱	700,000
	Total of B.2			₱	**3,220,000**

II. ESTIMATED COST FOR CONSTRUCTION SUPERVISION STAGE

SUMMARY

DESCRIPTION	FOREIGN CURRENCY		LOCAL CURRENCY (PESO)
	YEN COMPONENT	PESO COMPONENT	
FOREIGN CURRENCY PORTION			
A. YEN COMPONENT			
A.1 REMUNERATION COST	**¥ 179,340,000**		
A.1.1 Key Staff (Foreign)	¥ 179,340,000		
A.2 REIMBURSABLE COST	**¥ 24,250,000**		
A.2.1 International Travel Expenses	¥ 2,000,000		
A.2.2 Per Diem Allowances	¥ 21,000,000		
A.2.3 Communications	¥ 1,250,000		
B. PESO COMPONENT			
B.1 REMUNERATION COST		**₱ 58,350,000**	
B.1.1 Key Staff (Local)		₱ 46,950,000	
B.1.2 Technical and Administrative Support Staff		₱ 11,400,000	
B.2 REIMBURSABLE COST		**₱ 41,172,000**	
B.2.1 Per Diem/Allowances		₱ 4,377,000	
B.2.2 Transport		₱ 25,920,000	
B.2.3 Communications		₱ 1,500,000	
B.2.4 Office Rental/Operating		₱ 5,625,000	
B.2.5 Printing, papers, Reports and Documents		₱ 3,750,000	
LOCAL CURRENCY PORTION			
C.1 VAT (12% of B.1)			**₱ 7,002,000**
TOTAL	**¥ 203,590,000**	**₱ 99,522,000**	**₱ 7,002,000**

BREAKDOWN OF ESTIMATED COST FOR CONSTRUCTION SUPERVISION STAGE

FOREIGN CURRENCY PORTION

A. YEN COMPONENT

A.1 REMUNERATION COST

		M/M	Billing Rate ¥	AMOUNT (¥)
A.1.1	Key Staff (Foreign)			
	1 Project Manager	24	¥ 2,562,000	¥ 61,488,000
	2 Sr. Bridge Engr	23	2,562,000	58,926,000
	3 Sr. Highway Engr	23	2,562,000	58,926,000
	Total of A.1	70		**¥ 179,340,000**

A.2 REIMBURSABLE COST

A.2.1	International Travel Expenses	
	a) Air Ticket for Expatriate (Japan-Manila-Japan) x 8 round trip x ¥ 200,000/RT	¥ 1,600,000
	b) Miscellaneous Travel Expenses in Japan Travelling expenses from airport to origin of Engrs. in Japan and travel processing ¥50,000 x 8 RT	¥ 400,000
		¥ 2,000,000
A.2.2	Per Diem Allowances Subsistence Allowance for Expatriates 70 man-month x 30 days @ ¥10,000	¥ 21,000,000
A.2.3	Communications International Communication 25 months @ ¥50,000	¥ 1,250,000
	Total of A.2	**¥ 24,250,000**

BREAKDOWN OF ESTIMATED COST FOR CONSTRUCTION SUPERVISION STAGE

FOREIGN CURRENCY PORTION

B. PESO COMPONENT

B.1 REMUNERATION COST

B.1.1	Key Staff (Local)	M/M	Billing Rate ₱	AMOUNT (¥)
	1 Deputy Project Manager	25	₱ 150,000	₱ 3,750,000
	2 Sr. Bridge Engr	23	150,000	3,450,000
	3 Sr. Structural Engr	23	150,000	3,450,000
	4 Sr. Highway Engr.	23	150,000	3,450,000
	5 Sr. Environmental Specialist	12	150,000	1,800,000
	6 Resident Engr.	25	150,000	3,750,000
	7 Resident Engr.	25	150,000	3,750,000
	8 Resident Engr.	23	150,000	3,450,000
	9 Sr. Materials Engr.	23	150,000	3,450,000
	# Sr. Materials Engr.	23	150,000	3,450,000
	# Sr. Materials Engr.	21	150,000	3,150,000
	# Sr. Qty/Survey Engr.	23	150,000	3,450,000
	# Sr. Qty/Survey Engr.	23	150,000	3,450,000
	# Sr. Qty/Survey Engr.	21	150,000	3,150,000
	Total of B.1	**313**		₱ **46,950,000**

B.1.2	Technical and Administrative Support Staff			
	1 Bridge Engr	23	₱ 60,000	₱ 1,380,000
	2 Structural Engr.	23	60,000	1,380,000
	3 Civil Engr.	23	60,000	1,380,000
	4 CAD Operator	25	60,000	1,500,000
	5 Administrative Officer	25	60,000	1,500,000
	6 Secretary	25	60,000	1,500,000
	7 Encoder	23	60,000	1,380,000
	8 Janitor	23	60,000	1,380,000
	Total of B.1.2	**190**		₱ **11,400,000**
	Total of B.1	**503**		₱ **58,350,000**

B.2 REIMBURSABLE COST

B.2.1	Per Diem/Allowances	
	Field Allowances for Local Staff	
	313 man-month x 30 days @ P400/day for Key Staff	₱ 3,756,000
	69 man-month x 30 days @ P300/day for Support Staff	621,000
		4,377,000

B.2.2 Transport
Service Vehicle (Main Office)

	5 vehicle x 24 months @ P 80,000	₱	9,600,000
	Service Vehicle (Fiel Office)		
	3 vehicle x 25 months @ P 80,000	₱	6,000,000
	3 vehicle x 22 months @ P 80,000		5,280,000
	3 vehicle x 21 months @ P 80,000		5,040,000
			25,920,000
B.2.3	Communications		
	Domestic Communication 25 months @ P 60,000	₱	1,500,000
	(PLDT & Cellular Phone)		
B.2.4	Office Rental/Operating		
	a) Office Rental		
	200 sq.m. of floor area @ P725/sq.m./month for 25 months	₱	3,625,000
	b) Office Supplies & Equipment Maintenance		
	Consumable Materials & Equipment maintenance services, etc.		
	All @ ₱ 40,000/mon for 25 months	₱	1,000,000
	c) Office Equipment/Furniture		
	Office and technical equipment and furniture, fixture		
	All @ ₱ 40,000/mon for 25 months	₱	1,000,000
B.2.5	Printing, papers, Reports and Documents		
	Photocopying, printing, binding, copies, blue print, etc		
	All @ ₱ 150,000/mon for 25 months	₱	3,750,000
	Total of B.2	**¥**	**41,172,000**

DETAILED ANNUAL FUND REQUIREMENT
MANILA INTERCHANGE CONSTRUCTION PROJECT
(Manila IC Summary STEP Loan)

Base Year : 2012 Unit : Million

Cost Item	Component	Unit	Year							TOTAL
			2012	2013	2014	2015	2016	2017	2018	
Base Construction Cost		Peso	0.000	0.000	0.000	950.399	1,900.799	316.800	0.000	3,167.998
Foreign Costs	40.24%	Peso	0.000	0.000	0.000	382.487	764.974	127.496	0.000	1,274.957
Local Costs	49.04%	Peso	0.000	0.000	0.000	466.084	932.167	155.361	0.000	1,553.612
Tax Component	10.71%	Peso	0.000	0.000	0.000	101.828	203.657	33.943	0.000	339.428
Price Contingencies		Peso	0.000	0.000	0.000	70.065	189.123	39.884	0.000	299.073
Foreign Costs	2.10%	Peso	0.000	0.000	0.000	24.606	66.310	13.961	0.000	104.878
Local Costs	2.60%	Peso	0.000	0.000	0.000	37.308	100.792	21.275	0.000	159.375
Tax Component	2.60%	Peso	0.000	0.000	0.000	8.151	22.021	4.648	0.000	34.820
Physical Contingencies		Peso	0.000	0.000	0.000	19.008	38.016	6.336	0.000	63.360
Foreign Costs	2.00%	Peso	0.000	0.000	0.000	7.650	15.299	2.550	0.000	25.499
Local Costs	2.00%	Peso	0.000	0.000	0.000	9.322	18.643	3.107	0.000	31.072
Tax Component	2.00%	Peso	0.000	0.000	0.000	2.037	4.073	0.679	0.000	6.789
Total Construction Cost		Peso	0.000	0.000	0.000	1,039.472	2,127.938	363.020	0.000	3,530.430
Foreign Costs		Peso	0.000	0.000	0.000	414.743	846.584	144.007	0.000	1,405.334
Local Costs		Peso	0.000	0.000	0.000	512.713	1,051.603	179.743	0.000	1,744.060
Tax Component		Peso	0.000	0.000	0.000	112.016	229.751	39.270	0.000	381.037
Consultant Base Cost		Peso	0.000	85.214	40.827	67.834	135.668	22.611	0.000	352.154
Foreign Costs	55.10%	Peso	0.000	53.211	22.602	35.464	70.928	11.821	0.000	194.027
Local Costs	42.26%	Peso	0.000	30.179	17.175	30.437	60.874	10.146	0.000	148.810
Tax Component	2.65%	Peso	0.000	1.824	1.050	1.933	3.866	0.644	0.000	9.317
Price Contingencies		Peso	0.000	1.950	1.919	4.873	13.148	2.772	0.000	24.662
Foreign Costs	2.10%	Peso	0.000	1.117	0.959	2.281	6.148	1.294	0.000	11.801
Local Costs	2.60%	Peso	0.000	0.785	0.905	2.436	6.582	1.389	0.000	12.097
Tax Component	2.60%	Peso	0.000	0.047	0.055	0.155	0.418	0.088	0.000	0.764
Physical Contingencies		Peso	0.000	1.704	0.817	1.357	2.713	0.452	0.000	7.043
Foreign Costs	2.00%	Peso	0.000	1.064	0.452	0.709	1.419	0.236	0.000	3.881
Local Costs	2.00%	Peso	0.000	0.604	0.343	0.609	1.217	0.203	0.000	2.976
Tax Component	2.00%	Peso	0.000	0.036	0.021	0.039	0.077	0.013	0.000	0.186
Total Consultant Cost		Peso	0.000	88.868	43.563	74.063	151.529	25.836	0.000	383.858
Foreign Costs		Peso	0.000	55.392	24.013	38.455	78.495	13.352	0.000	209.708
Local Costs		Peso	0.000	31.567	18.423	33.482	68.673	11.738	0.000	163.883
Tax Component		Peso	0.000	1.908	1.126	2.126	4.361	0.745	0.000	10.267
Land Acquisition Cost										
Local Costs		Peso	0.000	0.000	0.000	4.000	0.000	0.000	0.000	4.000
Administration Cost										
Local Costs		Peso	0.000	11.088	11.088	22.176	33.264	33.264	0.000	110.880
Total Cost (Peso)		**Peso**	0.000	99.956	54.651	1,139.711	2,312.731	422.119	0.000	4,029.169
Foreign Costs		**Peso**	0.000	55.392	24.013	453.198	925.079	157.359	0.000	1,615.042
Local Costs		**Peso**	0.000	42.655	29.511	572.371	1,153.540	224.745	0.000	2,022.823
Tax Component		**Peso**	0.000	1.908	1.126	114.142	234.112	40.015	0.000	391.303

DETAILED ANNUAL FUND REQUIREMENT
MANILA INTERCHANGE CONSTRUCTION PROJECT
(EDSA/North/West STEP Loan)

Base Year : 2012 Unit : Million

Cost Item	Component	Unit	Year							TOTAL
			2012	2013	2014	2015	2016	2017	2018	
Base Construction Cost		Peso	0.000	0.000	0.000	188.513	377.025	62.838	0.000	628.376
Foreign Costs	35.71%	Peso	0.000	0.000	0.000	67.326	134.652	22.442	0.000	224.420
Local Costs	53.57%	Peso	0.000	0.000	0.000	100.989	201.978	33.663	0.000	336.630
Tax Component	10.71%	Peso	0.000	0.000	0.000	20.198	40.396	6.733	0.000	67.326
Price Contingencies		Peso	0.000	0.000	0.000	14.032	37.879	7.989	0.000	59.900
Foreign Costs	2.10%	Peso	0.000	0.000	0.000	4.331	11.672	2.457	0.000	18.461
Local Costs	2.60%	Peso	0.000	0.000	0.000	8.084	21.839	4.610	0.000	34.533
Tax Component	2.60%	Peso	0.000	0.000	0.000	1.617	4.368	0.922	0.000	6.907
Physical Contingencies		Peso	0.000	0.000	0.000	3.770	7.541	1.257	0.000	12.568
Foreign Costs	2.00%	Peso	0.000	0.000	0.000	1.347	2.693	0.449	0.000	4.488
Local Costs	2.00%	Peso	0.000	0.000	0.000	2.020	4.040	0.673	0.000	6.733
Tax Component	2.00%	Peso	0.000	0.000	0.000	0.404	0.808	0.135	0.000	1.347
Total Construction Cost		Peso	0.000	0.000	0.000	206.315	422.445	72.083	0.000	700.843
Foreign Costs		Peso	0.000	0.000	0.000	73.004	149.017	25.348	0.000	247.369
Local Costs		Peso	0.000	0.000	0.000	111.092	227.857	38.946	0.000	377.895
Tax Component		Peso	0.000	0.000	0.000	22.218	45.571	7.789	0.000	75.579
Consultant Base Cost		Peso	0.000	16.902	8.098	13.455	26.910	4.485	0.000	69.850
Foreign Costs	55.10%	Peso	0.000	10.554	4.483	7.034	14.069	2.345	0.000	38.485
Local Costs	42.26%	Peso	0.000	5.986	3.407	6.037	12.074	2.012	0.000	29.517
Tax Component	2.65%	Peso	0.000	0.362	0.208	0.383	0.767	0.128	0.000	1.848
Price Contingencies		Peso	0.000	0.387	0.381	0.966	2.608	0.550	0.000	4.892
Foreign Costs	2.10%	Peso	0.000	0.222	0.190	0.453	1.220	0.257	0.000	2.341
Local Costs	2.60%	Peso	0.000	0.156	0.179	0.483	1.306	0.276	0.000	2.399
Tax Component	2.60%	Peso	0.000	0.009	0.011	0.031	0.083	0.017	0.000	0.151
Physical Contingencies		Peso	0.000	0.338	0.162	0.269	0.538	0.090	0.000	1.397
Foreign Costs	2.00%	Peso	0.000	0.211	0.090	0.141	0.281	0.047	0.000	0.770
Local Costs	2.00%	Peso	0.000	0.120	0.068	0.121	0.241	0.040	0.000	0.590
Tax Component	2.00%	Peso	0.000	0.007	0.004	0.008	0.015	0.003	0.000	0.037
Total Consultant Cost		Peso	0.000	17.627	8.641	14.690	30.056	5.125	0.000	76.139
Foreign Costs		Peso	0.000	10.987	4.763	7.628	15.570	2.648	0.000	41.596
Local Costs		Peso	0.000	6.261	3.654	6.641	13.621	2.328	0.000	32.506
Tax Component		Peso	0.000	0.378	0.223	0.422	0.865	0.148	0.000	2.036
Land Acquisition Cost										
Local Costs		Peso	0.000	0.000	0.000	4.000	0.000	0.000	0.000	4.000
Administration Cost										
Local Costs		Peso	0.000	2.199	2.199	4.399	6.598	6.598	0.000	21.993
Total Cost (Peso)		**Peso**	0.000	19.826	10.840	229.404	459.099	83.806	0.000	802.975
Foreign Costs		**Peso**	0.000	10.987	4.763	80.631	164.587	27.997	0.000	288.965
Local Costs		**Peso**	0.000	8.461	5.854	126.132	248.076	47.872	0.000	436.395
Tax Component		**Peso**	0.000	0.378	0.223	22.640	46.436	7.937	0.000	77.615

DETAILED ANNUAL FUND REQUIREMENT
MANILA INTERCHANGE CONSTRUCTION PROJECT
(North/Mindanao STEP Loan)

Base Year : 2012 Unit : Million

Cost Item	Component	Unit	Year							TOTAL
			2012	2013	2014	2015	2016	2017	2018	
Base Construction Cost		Peso	0.000	0.000	0.000	174.345	348.690	58.115	0.000	581.150
Foreign Costs	35.71%	Peso	0.000	0.000	0.000	62.266	124.532	20.755	0.000	207.554
Local Costs	53.57%	Peso	0.000	0.000	0.000	93.399	186.798	31.133	0.000	311.330
Tax Component	10.71%	Peso	0.000	0.000	0.000	18.680	37.360	6.227	0.000	62.266
Price Contingencies		Peso	0.000	0.000	0.000	12.977	35.032	7.389	0.000	55.398
Foreign Costs	2.10%	Peso	0.000	0.000	0.000	4.006	10.795	2.273	0.000	17.073
Local Costs	2.60%	Peso	0.000	0.000	0.000	7.476	20.198	4.263	0.000	31.937
Tax Component	2.60%	Peso	0.000	0.000	0.000	1.495	4.040	0.853	0.000	6.387
Physical Contingencies		Peso	0.000	0.000	0.000	3.487	6.974	1.162	0.000	11.623
Foreign Costs	2.00%	Peso	0.000	0.000	0.000	1.245	2.491	0.415	0.000	4.151
Local Costs	2.00%	Peso	0.000	0.000	0.000	1.868	3.736	0.623	0.000	6.227
Tax Component	2.00%	Peso	0.000	0.000	0.000	0.374	0.747	0.125	0.000	1.245
Total Construction Cost		Peso	0.000	0.000	0.000	190.809	390.696	66.666	0.000	648.171
Foreign Costs		Peso	0.000	0.000	0.000	67.517	137.818	23.443	0.000	228.778
Local Costs		Peso	0.000	0.000	0.000	102.743	210.732	36.019	0.000	349.494
Tax Component		Peso	0.000	0.000	0.000	20.549	42.146	7.204	0.000	69.899
Consultant Base Cost		Peso	0.000	15.632	7.489	12.444	24.887	4.148	0.000	64.600
Foreign Costs	55.10%	Peso	0.000	9.761	4.146	6.506	13.011	2.169	0.000	35.593
Local Costs	42.26%	Peso	0.000	5.536	3.151	5.583	11.167	1.861	0.000	27.298
Tax Component	2.65%	Peso	0.000	0.335	0.193	0.355	0.709	0.118	0.000	1.709
Price Contingencies		Peso	0.000	0.358	0.352	0.894	2.412	0.509	0.000	4.524
Foreign Costs	2.10%	Peso	0.000	0.205	0.176	0.419	1.128	0.237	0.000	2.165
Local Costs	2.60%	Peso	0.000	0.144	0.166	0.447	1.207	0.255	0.000	2.219
Tax Component	2.60%	Peso	0.000	0.009	0.010	0.028	0.077	0.016	0.000	0.140
Physical Contingencies		Peso	0.000	0.313	0.150	0.249	0.498	0.083	0.000	1.292
Foreign Costs	2.00%	Peso	0.000	0.195	0.083	0.130	0.260	0.043	0.000	0.712
Local Costs	2.00%	Peso	0.000	0.111	0.063	0.112	0.223	0.037	0.000	0.546
Tax Component	2.00%	Peso	0.000	0.007	0.004	0.007	0.014	0.002	0.000	0.034
Total Consultant Cost		Peso	0.000	16.302	7.991	13.586	27.797	4.739	0.000	70.416
Foreign Costs		Peso	0.000	10.161	4.405	7.054	14.399	2.449	0.000	38.470
Local Costs		Peso	0.000	5.791	3.380	6.142	12.598	2.153	0.000	30.063
Tax Component		Peso	0.000	0.350	0.207	0.390	0.800	0.137	0.000	1.883
Land Acquisition Cost										
Local Costs		Peso	0.000	0.000	0.000	4.000	0.000	0.000	0.000	4.000
Administration Cost										
Local Costs		Peso	0.000	2.034	2.034	4.068	6.102	6.102	0.000	20.340
Total Cost (Peso)		**Peso**	0.000	18.336	10.025	212.463	424.595	77.507	0.000	742.928
Foreign Costs		**Peso**	0.000	10.161	4.405	74.571	152.217	25.893	0.000	267.248
Local Costs		**Peso**	0.000	7.825	5.414	116.953	229.432	44.274	0.000	403.898
Tax Component		**Peso**	0.000	0.350	0.207	20.939	42.946	7.341	0.000	71.782

DETAILED ANNUAL FUND REQUIREMENT
MANILA INTERCHANGE CONSTRUCTION PROJECT
(C5/Green Meadows STEP Loan)

Base Year : 2012 Unit : Million

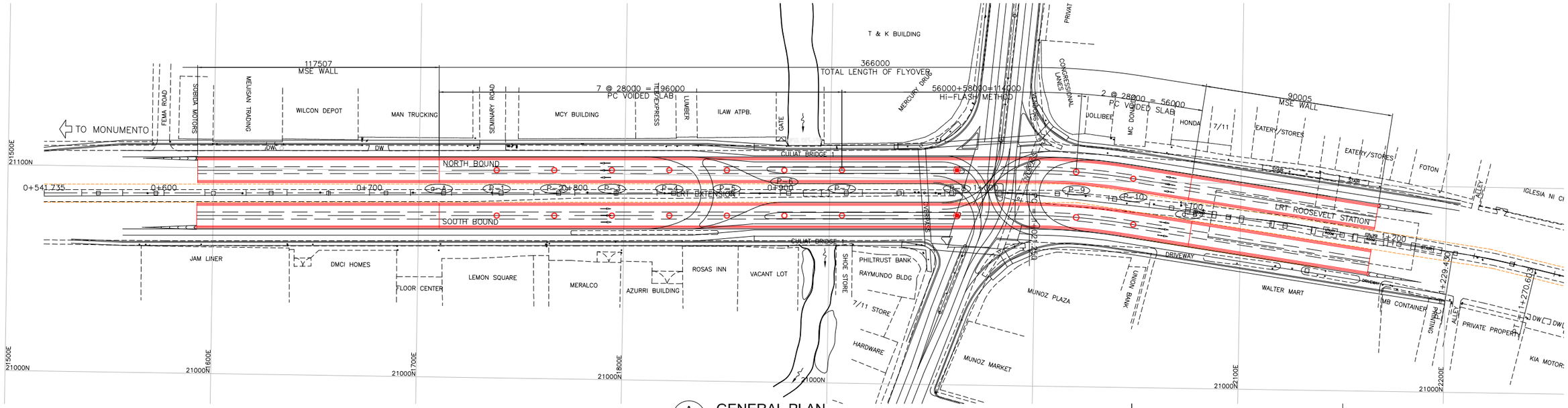
Cost Item	Component	Unit	Year							TOTAL
			2012	2013	2014	2015	2016	2017	2018	
Base Construction Cost		Peso	0.000	0.000	0.000	381.334	762.668	127.111	0.000	1,271.114
Foreign Costs	43.50%	Peso	0.000	0.000	0.000	165.885	331.769	55.295	0.000	552.948
Local Costs	45.78%	Peso	0.000	0.000	0.000	174.592	349.185	58.197	0.000	581.975
Tax Component	10.71%	Peso	0.000	0.000	0.000	40.857	81.714	13.619	0.000	136.191
Price Contingencies		Peso	0.000	0.000	0.000	27.918	75.351	15.889	0.000	119.157
Foreign Costs	2.10%	Peso	0.000	0.000	0.000	10.672	28.759	6.055	0.000	45.486
Local Costs	2.60%	Peso	0.000	0.000	0.000	13.975	37.756	7.969	0.000	59.701
Tax Component	2.60%	Peso	0.000	0.000	0.000	3.270	8.836	1.865	0.000	13.971
Physical Contingencies		Peso	0.000	0.000	0.000	7.627	15.253	2.542	0.000	25.422
Foreign Costs	2.00%	Peso	0.000	0.000	0.000	3.318	6.635	1.106	0.000	11.059
Local Costs	2.00%	Peso	0.000	0.000	0.000	3.492	6.984	1.164	0.000	11.639
Tax Component	2.00%	Peso	0.000	0.000	0.000	0.817	1.634	0.272	0.000	2.724
Total Construction Cost		Peso	0.000	0.000	0.000	416.878	853.272	145.543	0.000	1,415.694
Foreign Costs		Peso	0.000	0.000	0.000	179.874	367.163	62.456	0.000	609.493
Local Costs		Peso	0.000	0.000	0.000	192.060	393.925	67.331	0.000	653.315
Tax Component		Peso	0.000	0.000	0.000	44.945	92.184	15.756	0.000	152.886
Consultant Base Cost		Peso	0.000	34.191	16.381	27.217	54.435	9.072	0.000	141.297
Foreign Costs	55.10%	Peso	0.000	21.350	9.069	14.229	28.459	4.743	0.000	77.850
Local Costs	42.26%	Peso	0.000	12.109	6.891	12.212	24.425	4.071	0.000	59.708
Tax Component	2.65%	Peso	0.000	0.732	0.421	0.776	1.551	0.259	0.000	3.738
Price Contingencies		Peso	0.000	0.782	0.770	1.955	5.276	1.112	0.000	9.895
Foreign Costs	2.10%	Peso	0.000	0.448	0.385	0.915	2.467	0.519	0.000	4.735
Local Costs	2.60%	Peso	0.000	0.315	0.363	0.978	2.641	0.557	0.000	4.854
Tax Component	2.60%	Peso	0.000	0.019	0.022	0.062	0.168	0.035	0.000	0.306
Physical Contingencies		Peso	0.000	0.684	0.328	0.544	1.089	0.181	0.000	2.826
Foreign Costs	2.00%	Peso	0.000	0.427	0.181	0.285	0.569	0.095	0.000	1.557
Local Costs	2.00%	Peso	0.000	0.242	0.138	0.244	0.488	0.081	0.000	1.194
Tax Component	2.00%	Peso	0.000	0.015	0.008	0.016	0.031	0.005	0.000	0.075
Total Consultant Cost		Peso	0.000	35.657	17.479	29.717	60.799	10.366	0.000	154.018
Foreign Costs		Peso	0.000	22.225	9.635	15.429	31.495	5.357	0.000	84.142
Local Costs		Peso	0.000	12.666	7.392	13.434	27.554	4.710	0.000	65.756
Tax Component		Peso	0.000	0.766	0.452	0.853	1.750	0.299	0.000	4.119
Land Acquisition Cost										
Local Costs		Peso	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Administration Cost										
Local Costs		Peso	0.000	4.449	4.449	8.898	13.347	13.347	0.000	44.489
Total Cost (Peso)		**Peso**	0.000	40.106	21.928	455.493	927.418	169.256	0.000	1,614.200
Foreign Costs		**Peso**	0.000	22.225	9.635	195.303	398.658	67.813	0.000	693.635
Local Costs		**Peso**	0.000	17.115	11.841	214.392	434.826	85.387	0.000	763.560
Tax Component		**Peso**	0.000	0.766	0.452	45.798	93.934	16.056	0.000	157.005

DETAILED ANNUAL FUND REQUIREMENT
MANILA INTERCHANGE CONSTRUCTION PROJECT
(EDSA/Roosevelt STEP Loan)

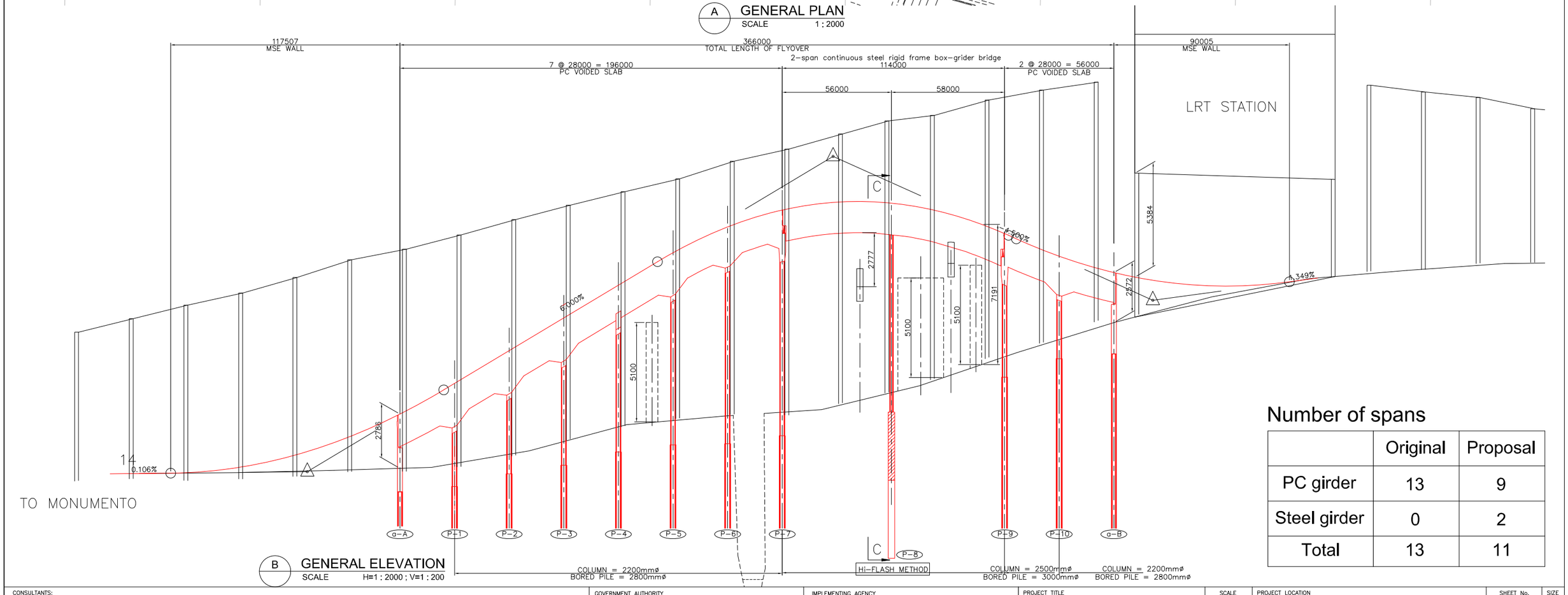
Base Year : 2012 Unit : Million

Cost Item	Component	Unit	Year							TOTAL
			2012	2013	2014	2015	2016	2017	2018	
Base Construction Cost		Peso	0.000	0.000	0.000	206.207	412.415	68.736	0.000	687.358
Foreign Costs	42.20%	Peso	0.000	0.000	0.000	87.011	174.021	29.004	0.000	290.035
Local Costs	47.09%	Peso	0.000	0.000	0.000	97.103	194.206	32.368	0.000	323.677
Tax Component	10.71%	Peso	0.000	0.000	0.000	22.094	44.187	7.365	0.000	73.646
Price Contingencies		Peso	0.000	0.000	0.000	15.139	40.861	8.617	0.000	64.617
Foreign Costs	2.10%	Peso	0.000	0.000	0.000	5.598	15.085	3.176	0.000	23.858
Local Costs	2.60%	Peso	0.000	0.000	0.000	7.773	20.999	4.432	0.000	33.204
Tax Component	2.60%	Peso	0.000	0.000	0.000	1.768	4.778	1.008	0.000	7.555
Physical Contingencies		Peso	0.000	0.000	0.000	4.124	8.248	1.375	0.000	13.747
Foreign Costs	2.00%	Peso	0.000	0.000	0.000	1.740	3.480	0.580	0.000	5.801
Local Costs	2.00%	Peso	0.000	0.000	0.000	1.942	3.884	0.647	0.000	6.474
Tax Component	2.00%	Peso	0.000	0.000	0.000	0.442	0.884	0.147	0.000	1.473
Total Construction Cost		Peso	0.000	0.000	0.000	225.470	461.525	78.727	0.000	765.722
Foreign Costs		Peso	0.000	0.000	0.000	94.348	192.586	32.760	0.000	319.694
Local Costs		Peso	0.000	0.000	0.000	106.818	219.090	37.447	0.000	363.355
Tax Component		Peso	0.000	0.000	0.000	24.304	49.849	8.520	0.000	82.673
Consultant Base Cost		Peso	0.000	18.489	8.858	14.718	29.436	4.906	0.000	76.406
Foreign Costs	55.10%	Peso	0.000	11.545	4.904	7.695	15.389	2.565	0.000	42.098
Local Costs	42.26%	Peso	0.000	6.548	3.726	6.604	13.208	2.201	0.000	32.287
Tax Component	2.65%	Peso	0.000	0.396	0.228	0.419	0.839	0.140	0.000	2.021
Price Contingencies		Peso	0.000	0.423	0.416	1.057	2.853	0.601	0.000	5.351
Foreign Costs	2.10%	Peso	0.000	0.242	0.208	0.495	1.334	0.281	0.000	2.560
Local Costs	2.60%	Peso	0.000	0.170	0.196	0.529	1.428	0.301	0.000	2.625
Tax Component	2.60%	Peso	0.000	0.010	0.012	0.034	0.091	0.019	0.000	0.166
Physical Contingencies		Peso	0.000	0.370	0.177	0.294	0.589	0.098	0.000	1.528
Foreign Costs	2.00%	Peso	0.000	0.231	0.098	0.154	0.308	0.051	0.000	0.842
Local Costs	2.00%	Peso	0.000	0.131	0.075	0.132	0.264	0.044	0.000	0.646
Tax Component	2.00%	Peso	0.000	0.008	0.005	0.008	0.017	0.003	0.000	0.040
Total Consultant Cost		Peso	0.000	19.282	9.452	16.069	32.877	5.606	0.000	83.285
Foreign Costs		Peso	0.000	12.018	5.210	8.344	17.031	2.897	0.000	45.500
Local Costs		Peso	0.000	6.849	3.997	7.265	14.900	2.547	0.000	35.558
Tax Component		Peso	0.000	0.414	0.244	0.461	0.946	0.162	0.000	2.228
Land Acquisition Cost										
Local Costs		Peso	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Administration Cost										
Local Costs		Peso	0.000	2.406	2.406	4.812	7.217	7.217	0.000	24.058
Total Cost (Peso)		**Peso**	0.000	21.687	11.858	246.351	501.619	91.550	0.000	873.065
Foreign Costs		**Peso**	0.000	12.018	5.210	102.692	209.617	35.657	0.000	365.194
Local Costs		**Peso**	0.000	9.255	6.403	118.894	241.207	47.211	0.000	422.970
Tax Component		**Peso**	0.000	0.414	0.244	24.765	50.795	8.682	0.000	84.901

A5.2.2 Plan and Profile of Proposed Flyover



A GENERAL PLAN
SCALE 1 : 2000

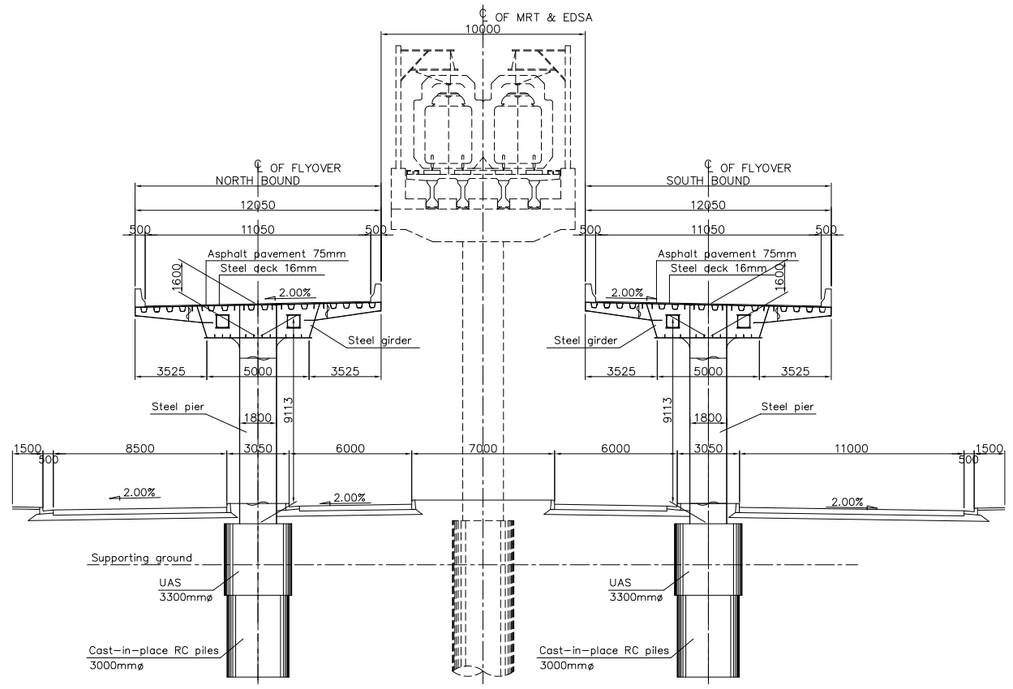


B GENERAL ELEVATION
SCALE H=1 : 2000 ; V=1 : 200

Number of spans

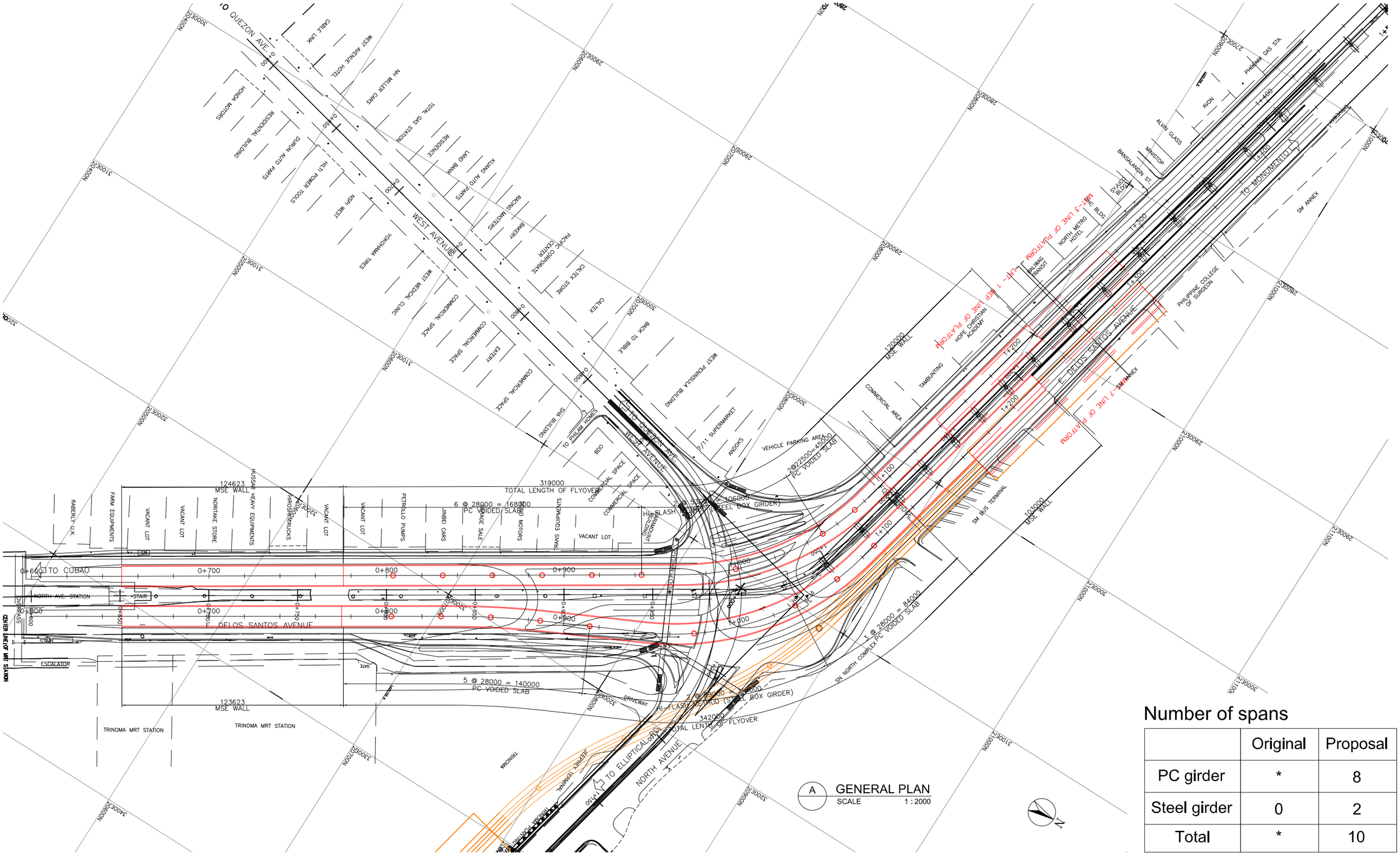
	Original	Proposal
PC girder	13	9
Steel girder	0	2
Total	13	11

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI		METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI EDSA/ROOSEVELT AVENUE QUEZON CITY		A1
							DRAWING TITLE	DRAWING No.	
							GENERAL PLAN, ELEVATION AND SECTIONS SCHEME 2 - (Hi-FLASH METHOD)		



C SECTION ,STA. 0+980
SCALE 1 : 300

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI		METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI EDSA/ROOSEVELT AVENUE QUEZON CITY		A1
							DRAWING TITLE	DRAWING No.	
							GENERAL PLAN, ELEVATION AND SECTIONS SCHEME 2 - (Hi-FLASH METHOD)		



GENERAL PLAN

A
SCALE 1 : 2000

Number of spans

	Original	Proposal
PC girder	*	8
Steel girder	0	2
Total	*	10

CONSULTANTS:

KATAHIRA & ENGINEERS INTERNATIONAL

ORIENTAL CONSULTANTS COMPANY, LIMITED

NIPPON ENGINEERING CONSULTANTS

GOVERNMENT AUTHORITY

DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

IMPLEMENTING AGENCY

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

PROJECT TITLE

PREPARATORY SURVEY
ON
METRO MANILA INTERCHANGE
CONSTRUCTION PROJECT
PHASE -VI

SCALE

AS SHOWN

PROJECT LOCATION

EDSA/NORTH AVENUE
QUEZON CITY

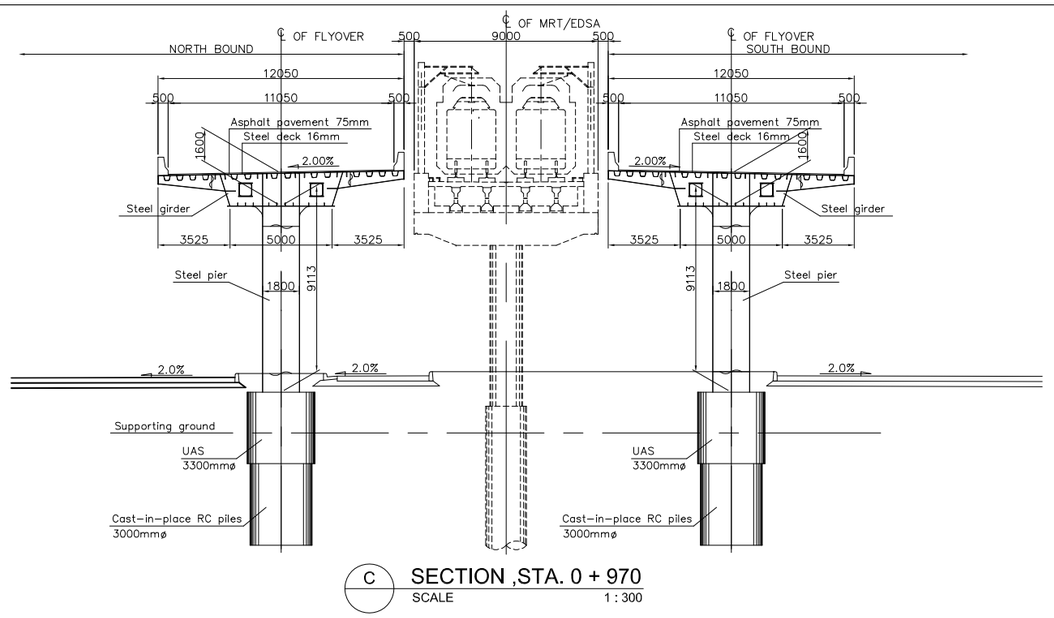
DRAWING TITLE

GENERAL PLAN, ELEVATION AND SECTIONS
SCHEME 1 - FLYOVER ALONG EDSA

SHEET No.

SIZE

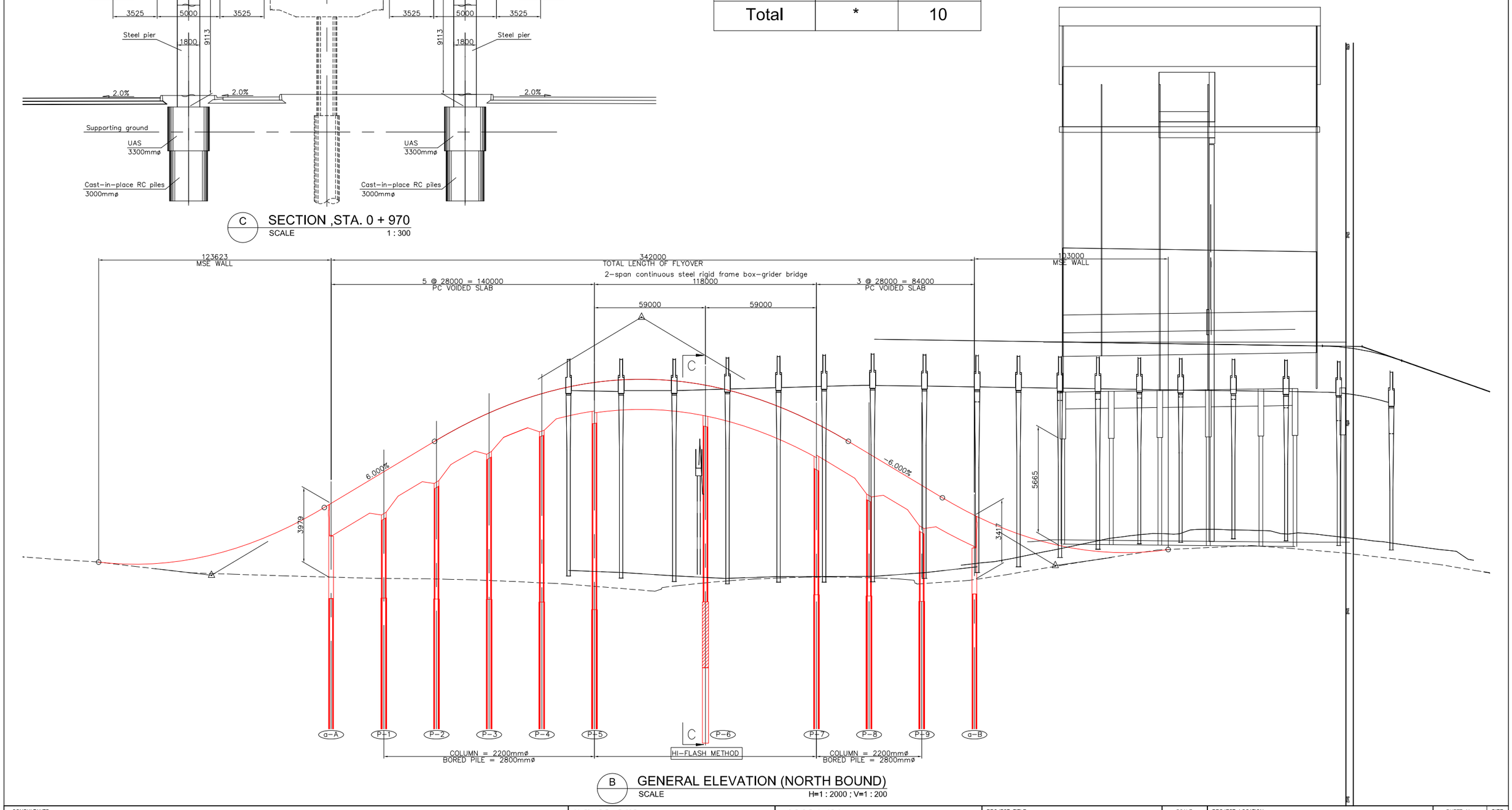
DRAWING No.



C SECTION ,STA. 0 + 970
SCALE 1 : 300

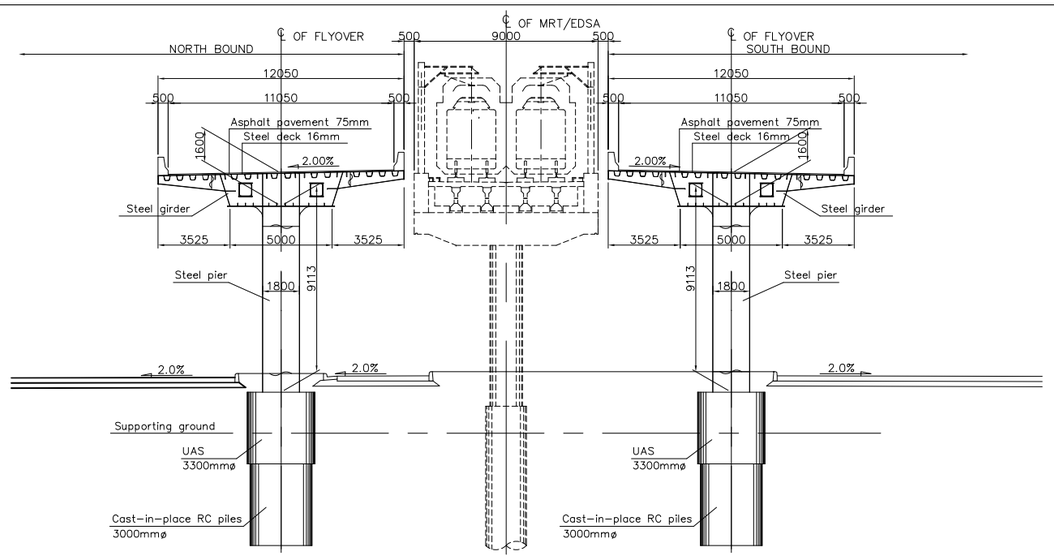
Number of spans

	Original	Proposal
PC girder	*	8
Steel girder	0	2
Total	*	10



B GENERAL ELEVATION (NORTH BOUND)
SCALE H=1 : 2000 ; V=1 : 200

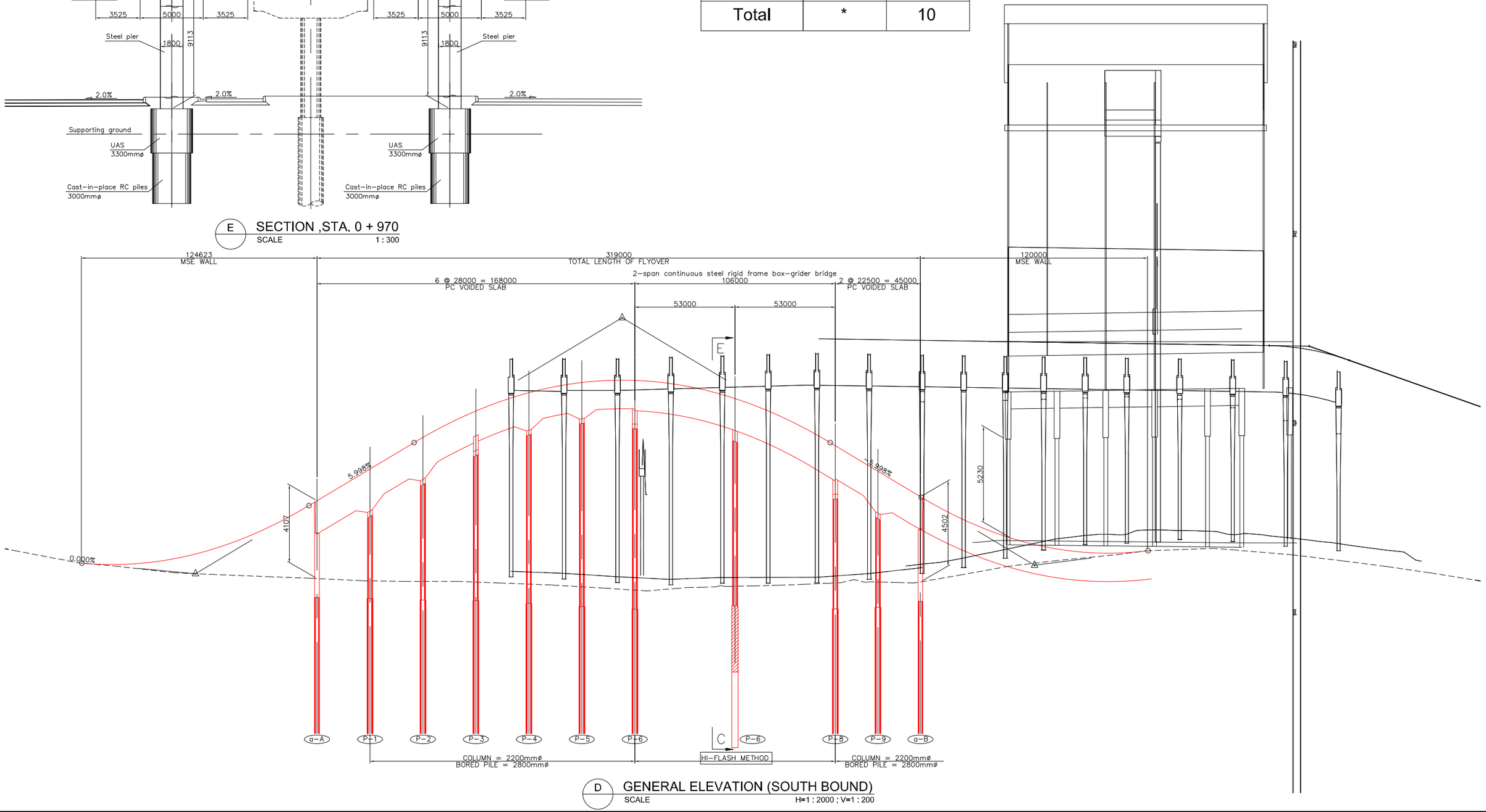
CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	AS SHOWN	EDSA/NORTH AVENUE QUEZON CITY		
							DRAWING TITLE	DRAWING No.	
							GENERAL PLAN, ELEVATION AND SECTIONS SCHEME 1 - FLYOVER ALONG EDSA (NORTH BOUND FLYOVER)		



E SECTION ,STA. 0 + 970
SCALE 1 : 300

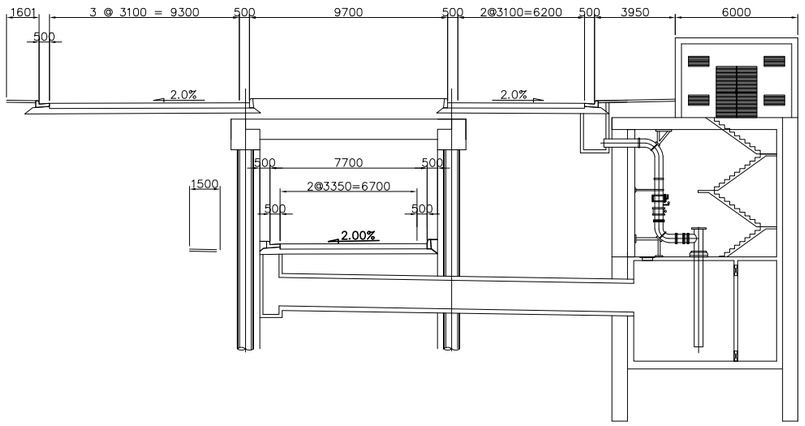
Number of spans

	Original	Proposal
PC girder	*	8
Steel girder	0	2
Total	*	10

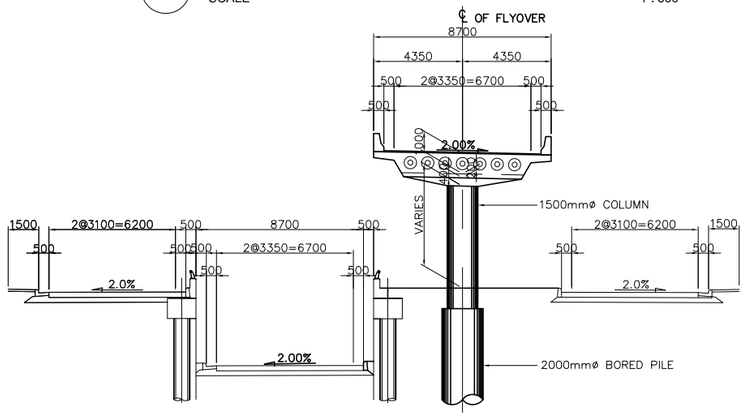


D GENERAL ELEVATION (SOUTH BOUND)
SCALE H=1 : 2000 ; V=1 : 200

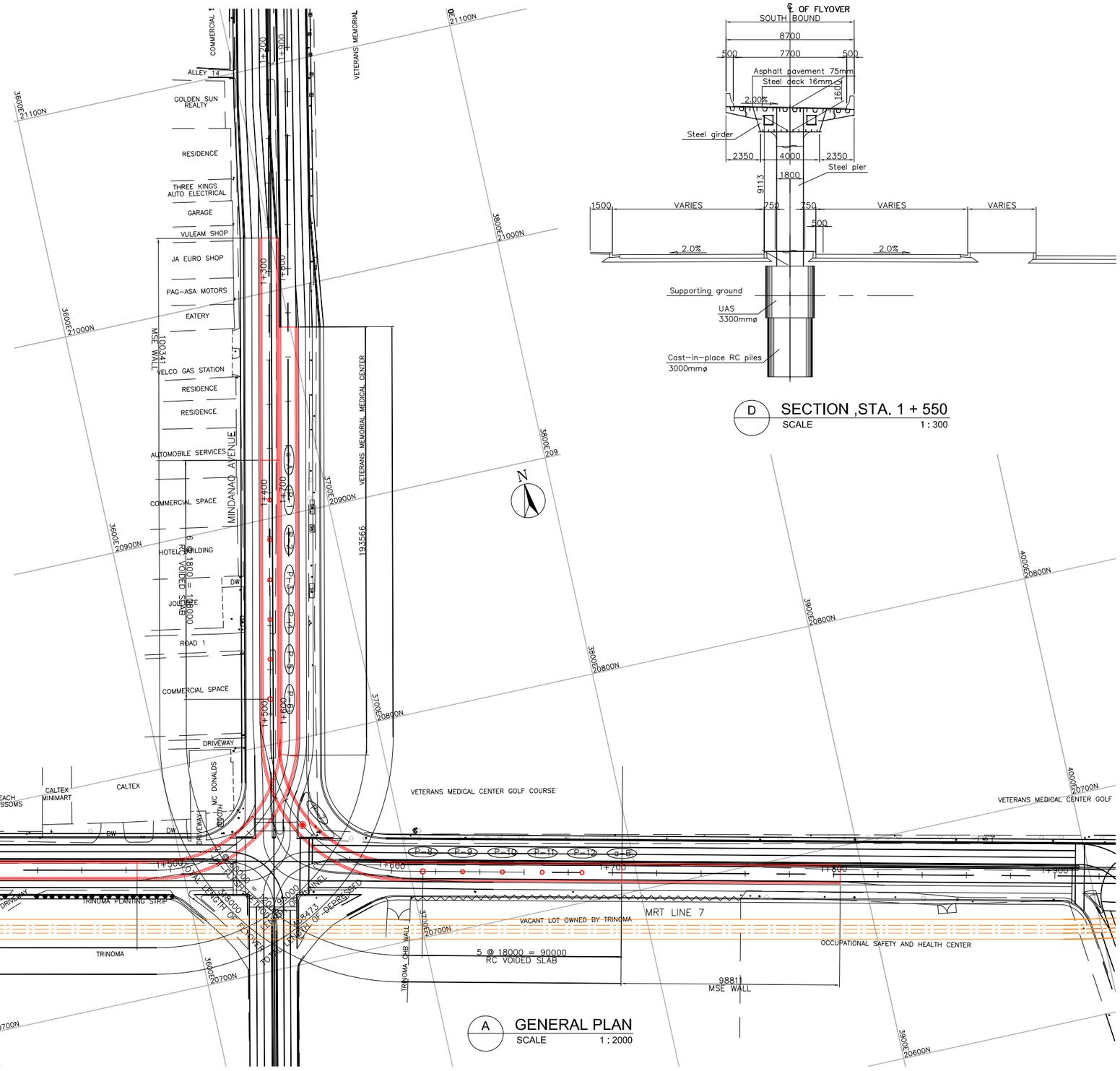
CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	AS SHOWN	EDSA/NORTH AVENUE QUEZON CITY		
							DRAWING TITLE	DRAWING No.	
							GENERAL PLAN, ELEVATION AND SECTIONS SCHEME 1 - FLYOVER ALONG EDSA (SOUTH BOUND FLYOVER)		



B SECTION NEAR STA. 1 + 500.00 (DEPRESSED)
SCALE 1 : 300



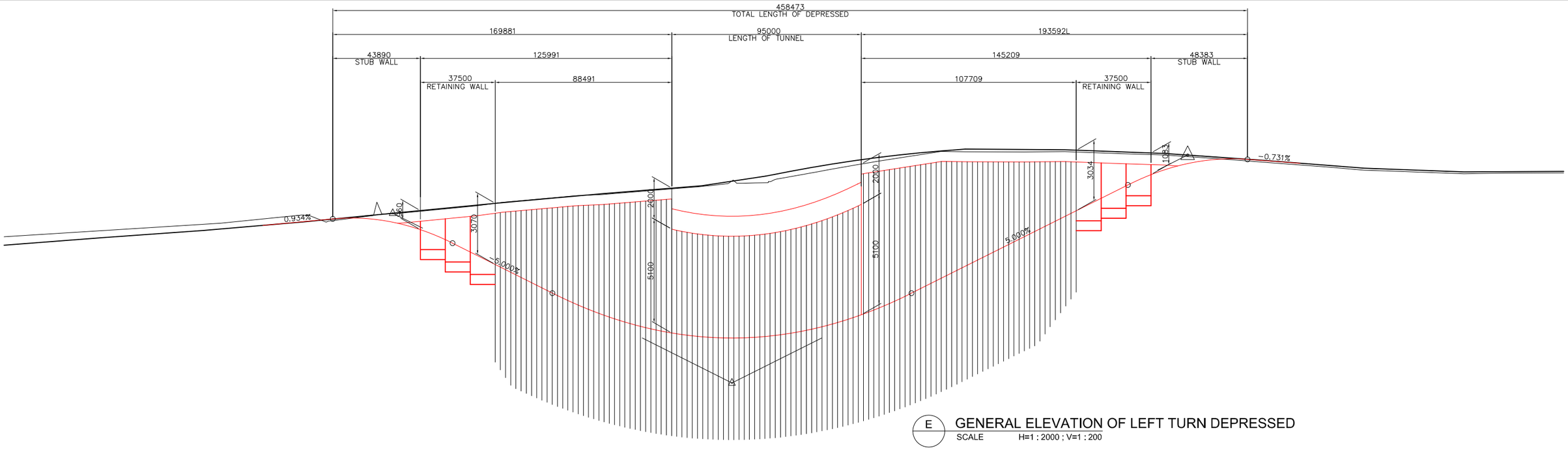
C SECTION NEAR STATION 1 + 500.00 (FLYOVER)
SCALE 1 : 300



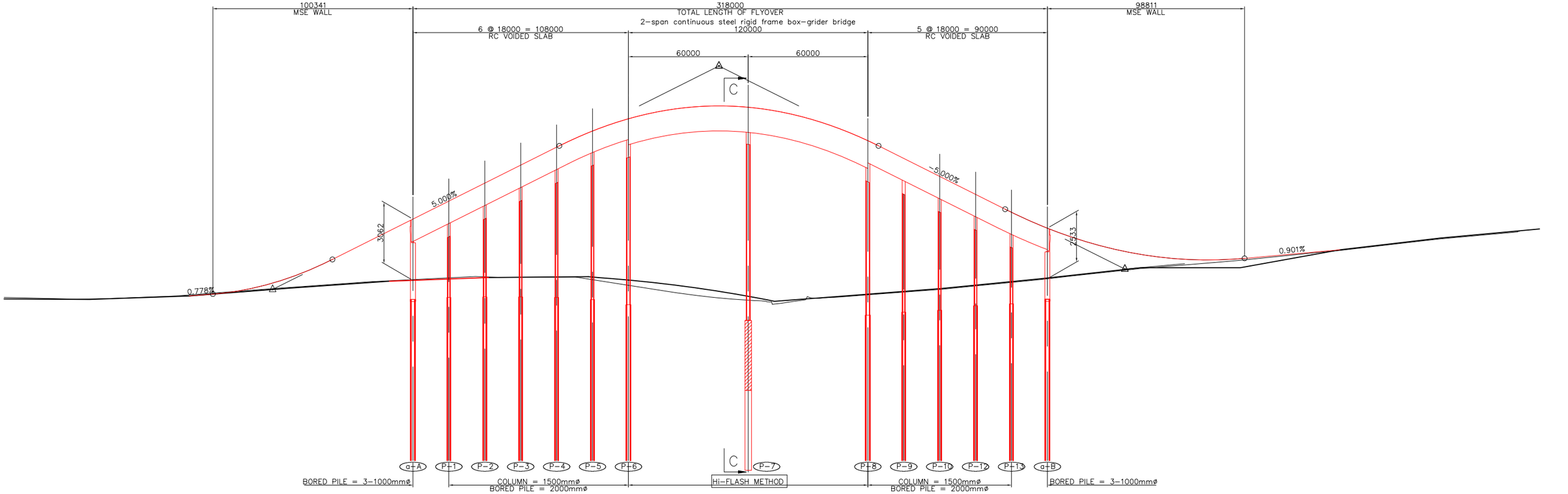
A GENERAL PLAN
SCALE 1 : 2000

D SECTION ,STA. 1 + 550
SCALE 1 : 300

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	AS SHOWN	MINDANAO/NORTH AVENUE QUEZON CITY		
							DRAWING TITLE	DRAWING No.	
							GENERAL PLAN, ELEVATION AND SECTIONS SCHEME 2 - FLYOVER FROM MINDANAO AVE. TO NORTH AVE.		

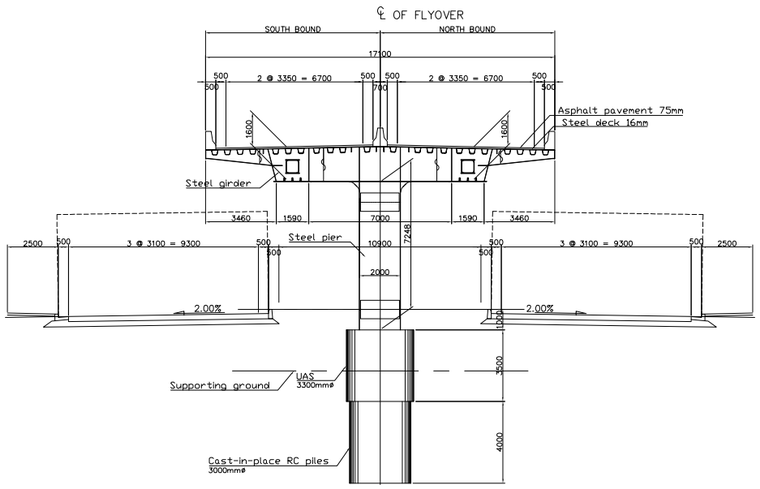


E GENERAL ELEVATION OF LEFT TURN DEPRESSED
SCALE H=1 : 2000 ; V=1 : 200

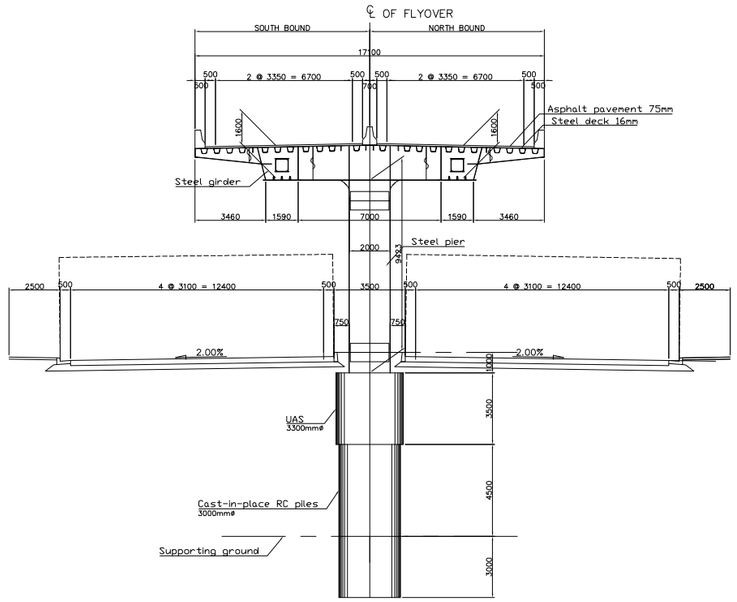


F GENERAL ELEVATION OF FLYOVER
SCALE H=1 : 2000 ; V=1 : 200

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	AS SHOWN	MINDANAO/NORTH AVENUE QUEZON CITY		
							DRAWING TITLE	DRAWING No.	
							GENERAL PLAN, ELEVATION AND SECTIONS SCHEME 2 - LEFT TURN DEPRESSED FLYOVER FROM MINDANAO AVE. TO NORTH AVE.		



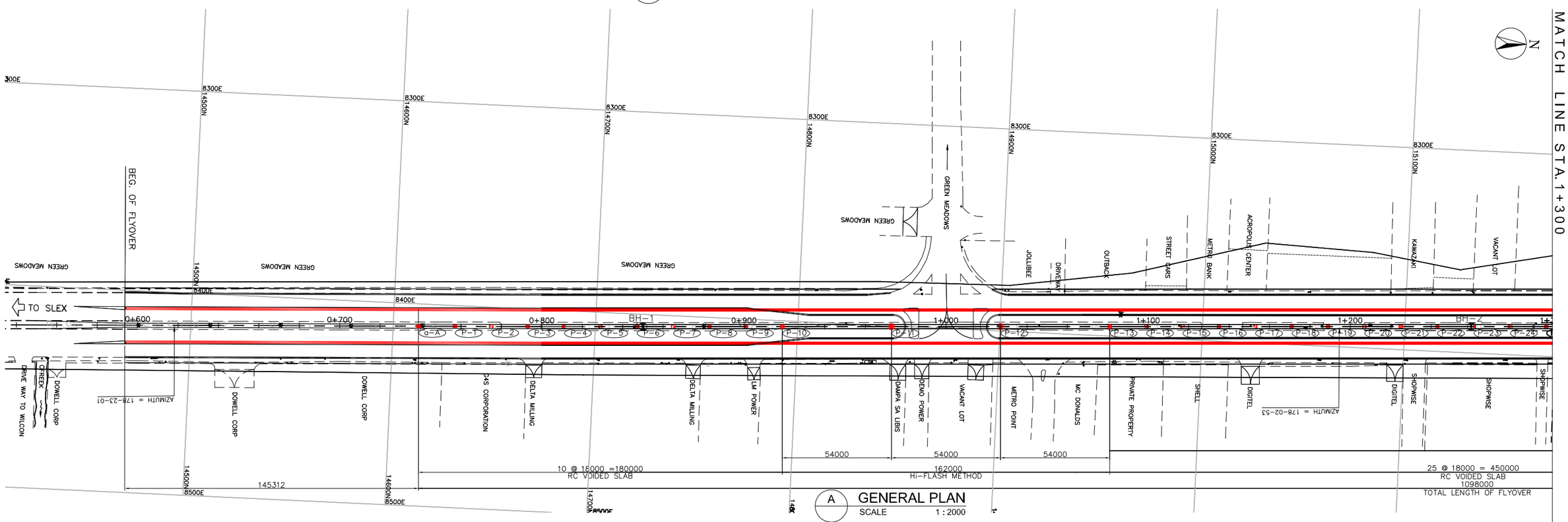
C SECTION , STA. 1+30
SCALE 1 : 300



D SECTION , STA. 1+680
SCALE 1 : 300

Number of spans

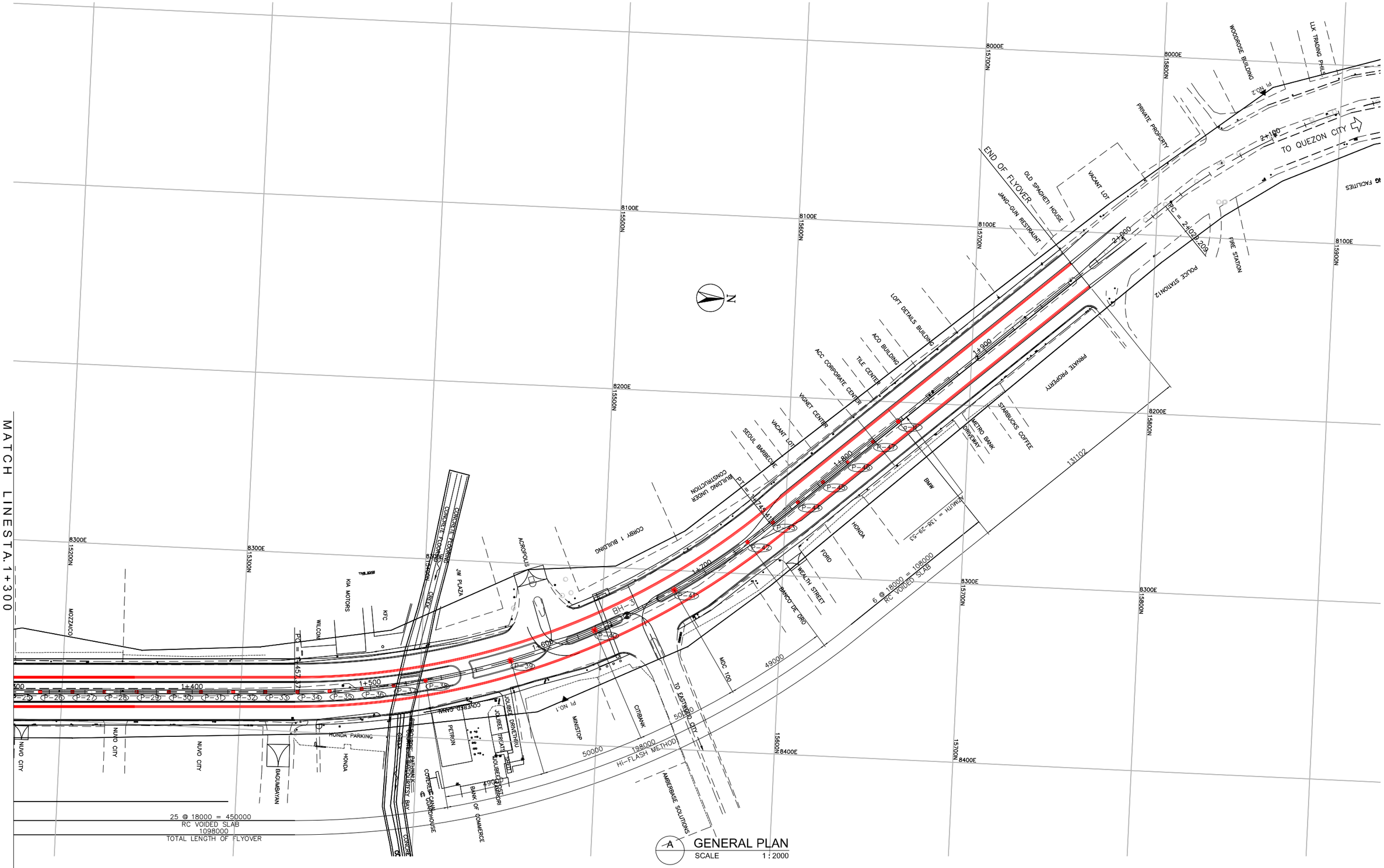
	Original	Proposal
RC girder	57	41
Steel girder	0	7
Total	57	48



A GENERAL PLAN
SCALE 1 : 2000

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	REVISIONS			SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Rev.	Date	Description	NTS	METRO MANILA INTERCHANGE CONSTRUCTION PROJECT -VI C5/GREEN MEADOWS AVENUE, PASIG CITY		
									DRAWING TITLE	DRAWING No.	
									GENERAL PLAN, ELEVATION AND SECTIONS PROPOSAL-FLYOVER (Hi-FLASH METHOD)		

MATCH LINE STA. 1+300

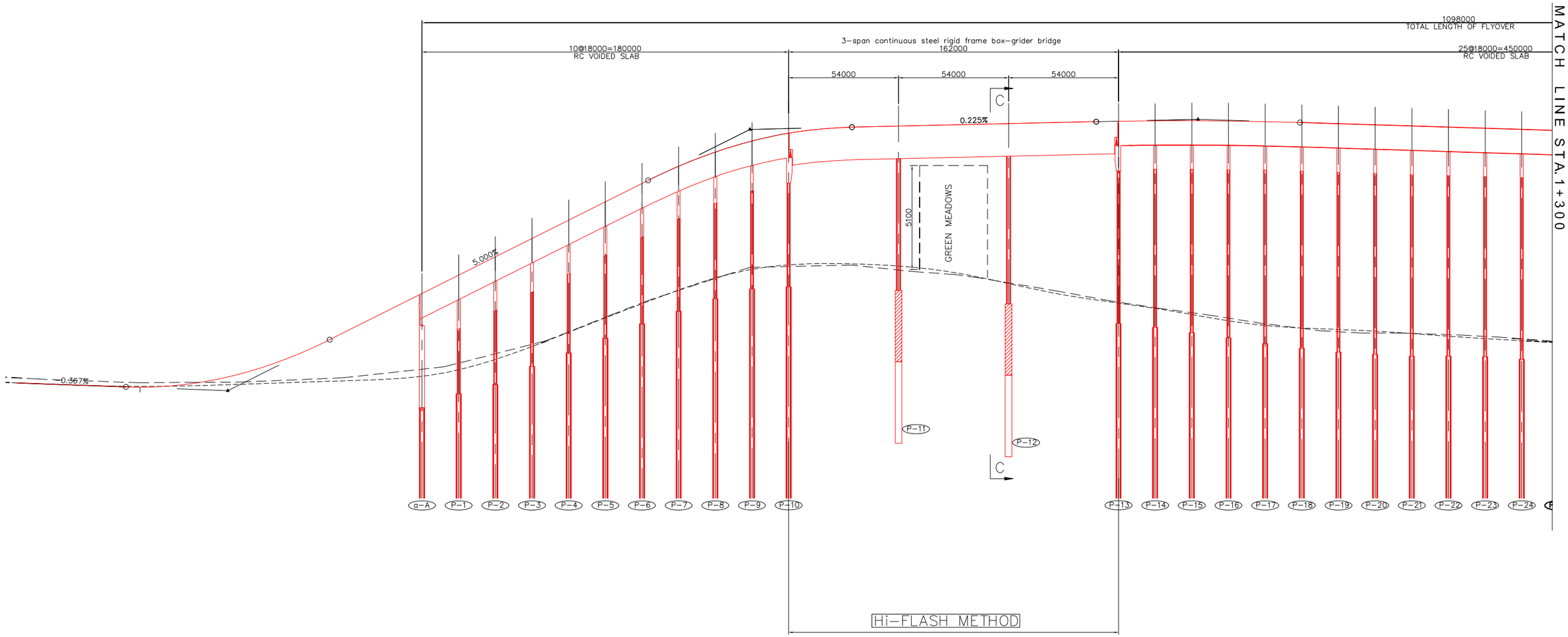


A GENERAL PLAN
SCALE 1 : 2000

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	REVISIONS			SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Rev.	Date	Description	NTS	METRO MANILA INTERCHANGE CONSTRUCTION PROJECT -VI C5/GREEN MEADOWS AVENUE, PASIG CITY		
									DRAWING TITLE	DRAWING No.	
									GENERAL PLAN, ELEVATION AND SECTIONS PROPOSAL-FLYOVER (HI-FLASH METHOD)		

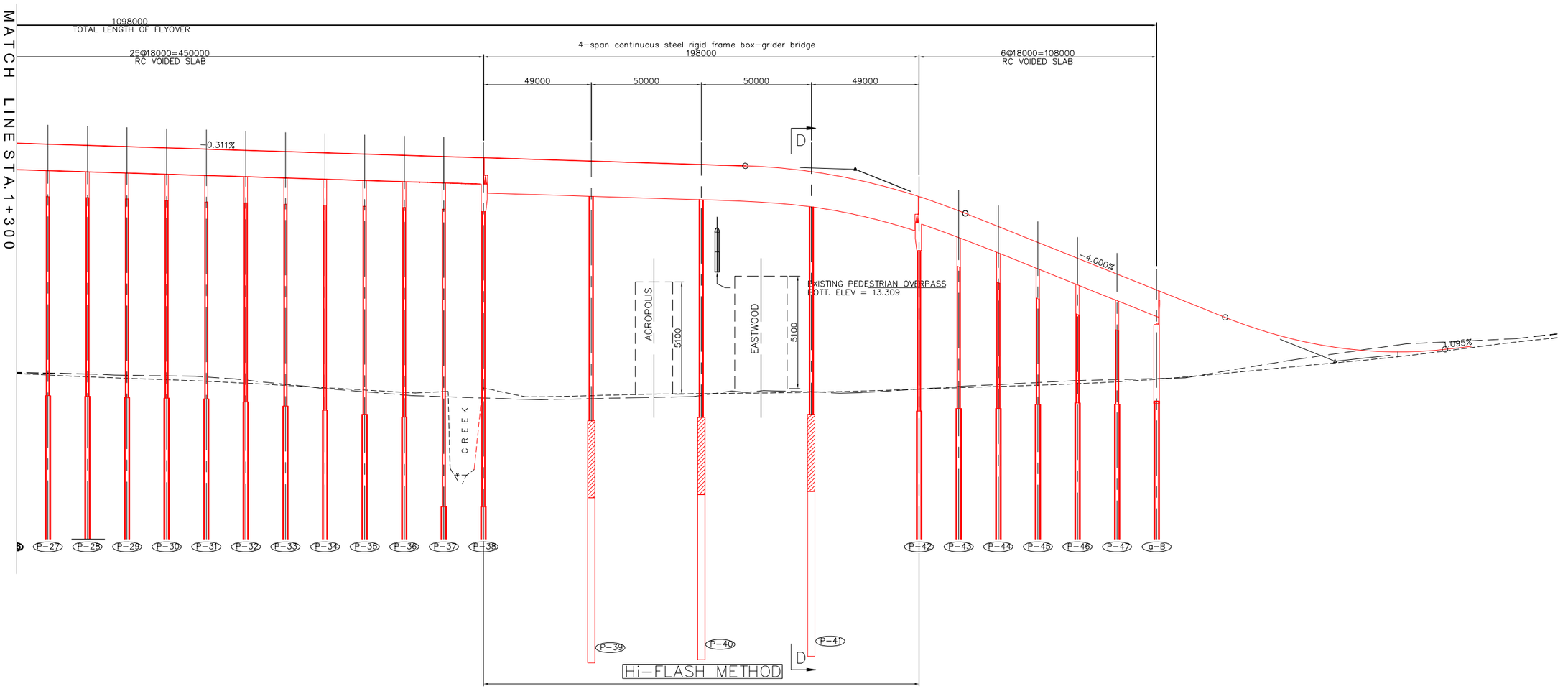
Number of spans

	Original	Proposal
RC girder	57	41
Steel girder	0	7
Total	57	48



B GENERAL ELEVATION
SCALE H=1 : 2000 ; V=1 : 200

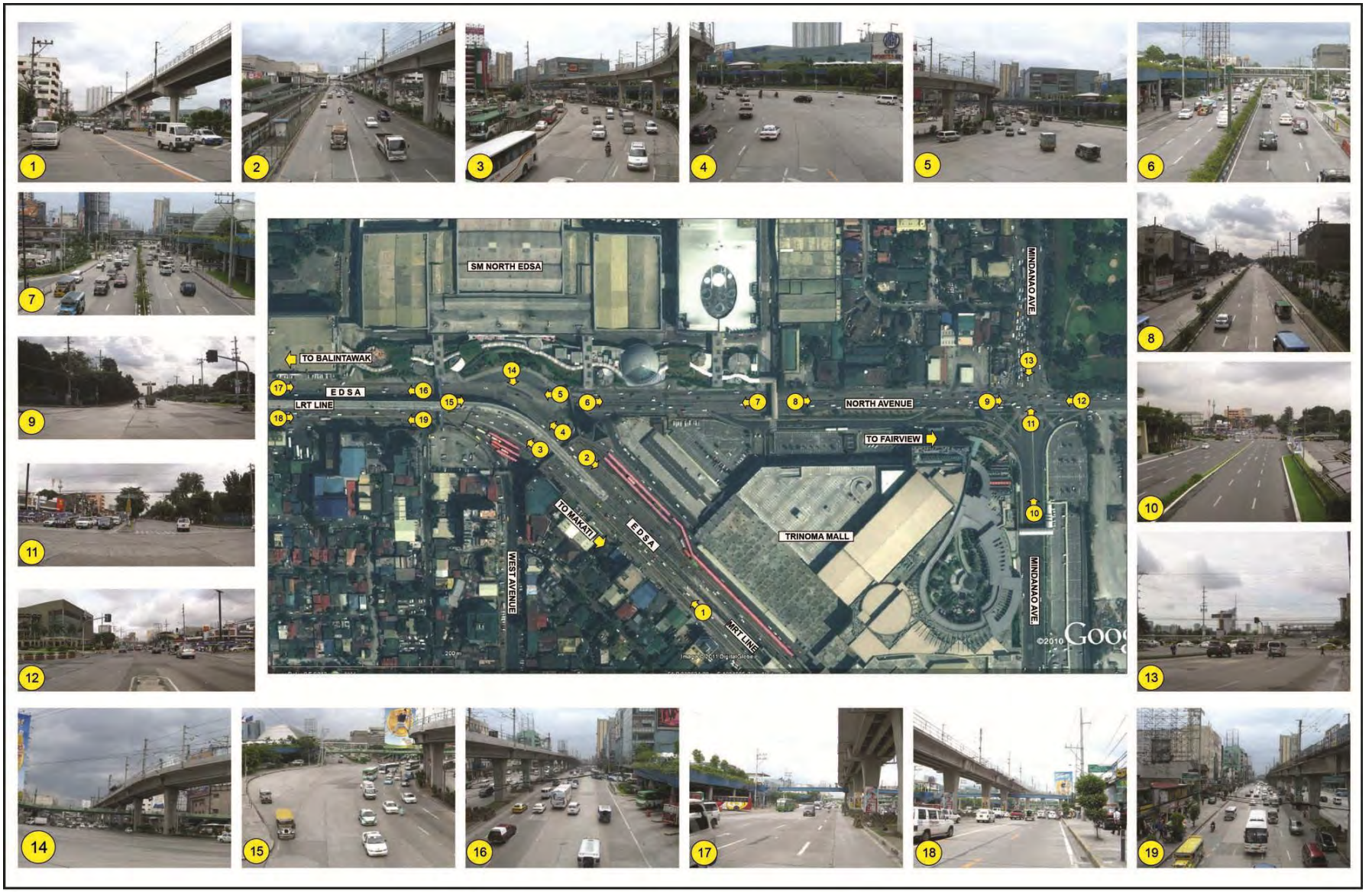
CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	REVISIONS			SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Rev.	Date	Description	NTS	METRO MANILA INTERCHANGE CONSTRUCTION PROJECT -VI C5/GREEN MEADOWS AVENUE, PASIG CITY		
									DRAWING TITLE	DRAWING No.	
									GENERAL PLAN, ELEVATION AND SECTIONS PROPOSAL-FLYOVER (Hi-FLASH METHOD)		



B GENERAL ELEVATION
SCALE H=1 : 2000 ; V=1 : 200

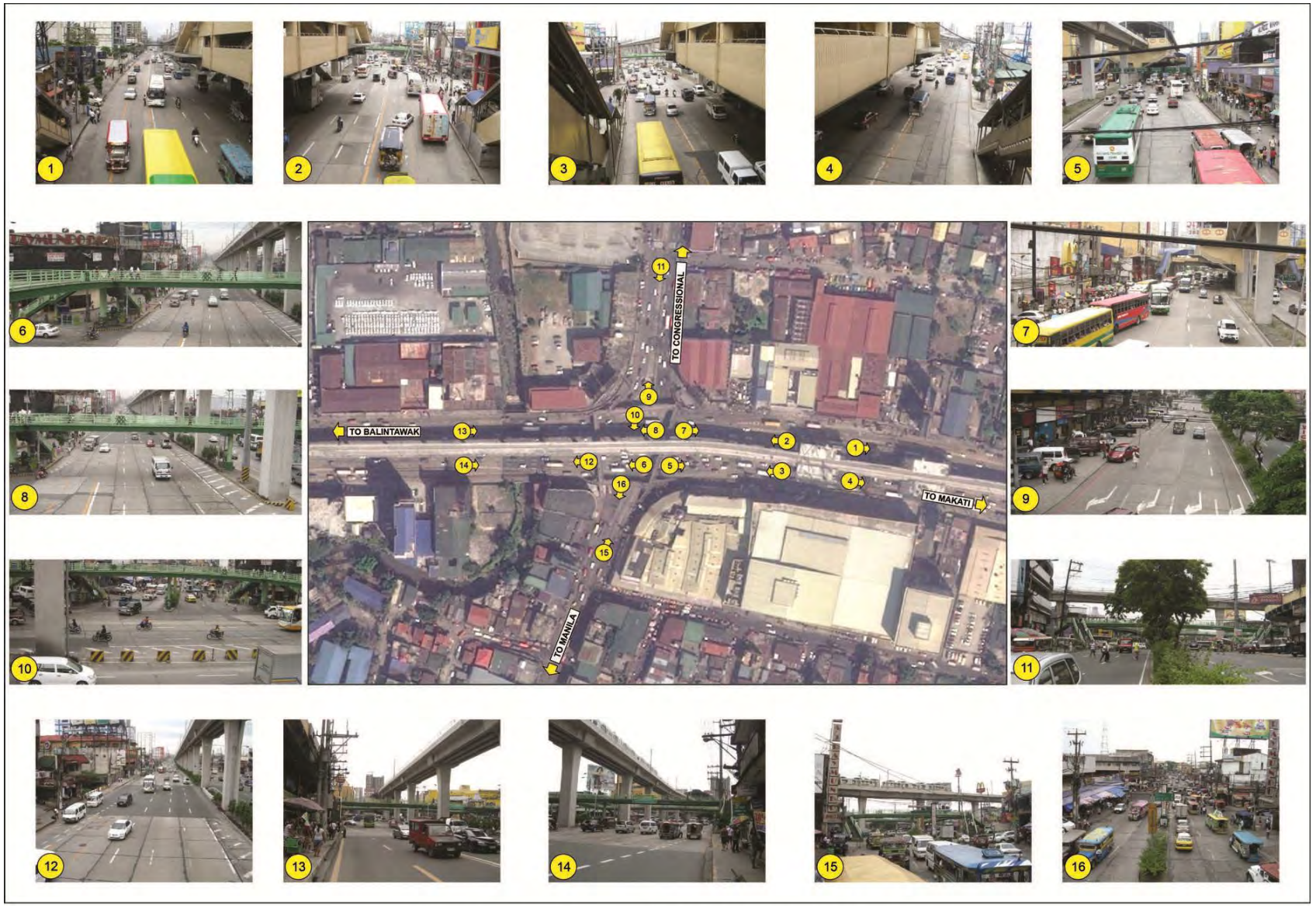
CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	REVISIONS			SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	Rev.	Date	Description	NTS	METRO MANILA INTERCHANGE CONSTRUCTION PROJECT -VI C5/GREEN MEADOWS AVENUE, PASIG CITY		
									DRAWING TITLE	DRAWING No.	
									GENERAL PLAN, ELEVATION AND SECTIONS PROPOSAL-FLYOVER (Hi-FLASH METHOD)		

A5.2.3 Picture of Proposed Flyover



1 - EDSA / NORTH / WEST / MINDANAO AVE. INTERCHANGE

C5 / Green Meadows / Calle Industria



2 - EDSA / ROOSEVELT / CONGRESSIONAL AVE. INTERCHANGE

A5.2.4 Bird View of Flyover

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	NTS	EDSA/NORTH AVENUE/MINDANAO AVENUE QUEZON CITY		A1
							DRAWING TITLE	DRAWING No.	
							PERSPECTIVE	G-00A	

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	NTS	EDSA/NORTH AVENUE/MINDANAO AVENUE QUEZON CITY		A1
							DRAWING TITLE	DRAWING No.	
							PERSPECTIVE	G-00B	

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	NTS	C5/GREEN MEADOWS /ACROPOLIS/ CALLE INDUSTRIA/EASTWOOD, PASIG CITY		A1
							DRAWING TITLE	DRAWING No.	
							INDEX OF DRAWINGS AND LOCATION MAP	G-00	

CONSULTANTS:			GOVERNMENT AUTHORITY	IMPLEMENTING AGENCY	PROJECT TITLE	SCALE	PROJECT LOCATION	SHEET No.	SIZE
KATAHIRA & ENGINEERS INTERNATIONAL	ORIENTAL CONSULTANTS COMPANY, LIMITED	NIPPON ENGINEERING CONSULTANTS	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	PREPARATORY SURVEY ON METRO MANILA INTERCHANGE CONSTRUCTION PROJECT PHASE -VI	NTS	EDSA/ROOSEVELT AVENUE QUEZON CITY		A1
							DRAWING TITLE	DRAWING No.	
							PERSPECTIVE	G-00	

Appendix 6 Debt Analysis for GC and STEP Loans

A6.1 Debt Analysis for GC and STEP Loans

A6.1

Debt Analysis for GC and STEP Loans

APPENDIX 6

DEBT ANALYSIS FOR GC AND STEP LOANS

6.1 DEBT ANALYSIS

DPWH would be liable to pay back principal and interest to JICA once the Government of the Philippines (GOP) had borrowed Japan's ODA loan under the scheme of either General Condition (GC) or STEP loans. This section numerates debt burden GOP would have to bear to compare pecuniary size in both cases of GC and STEP loans.

6.1.1 Indicative Loan Amounts and Terms and Condition

Loan amounts presumably set for the analysis are 6239.7 JPY million and 7,502.7 JPY million for respective of GC and STEP Loans. The estimates of assumptive loan amount are the aggregate of lesser amounts of either eligible portion[1] or 85 percent of total financial costs. **(Table A6.1.1-1**)

Table A6.1.1-1 Assumptive Loan Amounts by Scheme (JPY Million)

	GC Loan			STEP Loan		
	Financial Cost	Eligible Portion	85 % of Total Cost	Financial Cost	Eligible Portion	85 % of Total Cost
Total Cost excluding Rodriguez	6,239.7	6,052.6	5,303.1	7,502.7	6,529.2	6,377.3

Source JICA Study Team

Of the 85 percent worth cost estimates of JPY 5,303.1 million and JPY 6,377.3 million for respective of General Condition (GC) and STEP loans, indicative loan amounts for the current analysis have, by rounding down and up, been set at JPY 5,300 million and JPY 6,400 million for respective of GC and STTEP loans. In the meantime, Terms and conditions of JPN ODA lending by category are summarized herewith. (**Table A6.1.1-2)**

Table A6.1.1-2 Middle Income Countries Terms and Conditions by Loan Type

	GC	STEP
Loan Amount (JPY mil)	5,300	6,400
Disbursement Period (years)	6	5
Repayment Period	25	40
Of which Grace Period	7	10
Interest Rate (%)[2]	1.4	0.2
Commitment Charge (%)	0.1	0.1

Source JICA Study Team

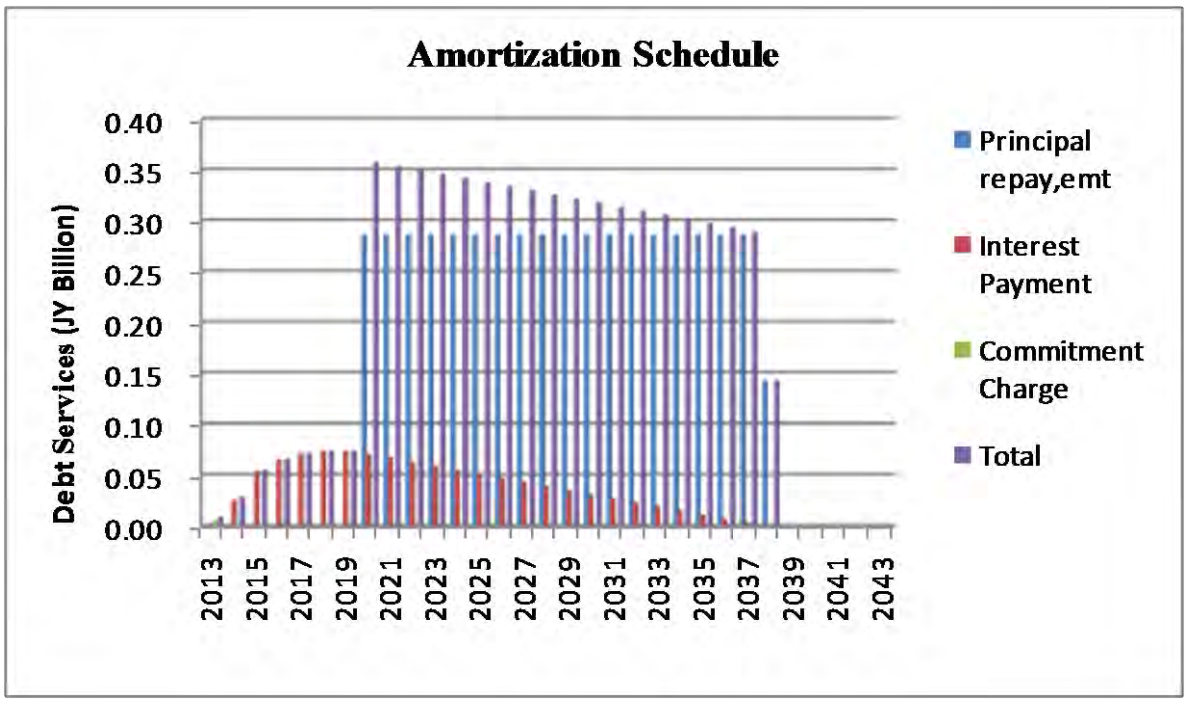
[1] Eligible portion of JICA loan eradicates, by rule, land acquisition, taxes and duties, an administration costs from total financial costs.

[2] While the interest rate applicable to consultant cost is 0.01%, current analysis applies unit interest rates of 1.4 percent and 0.2 percent for GC and STEP loans to provide with conservative estimation.

6.1.2 Results

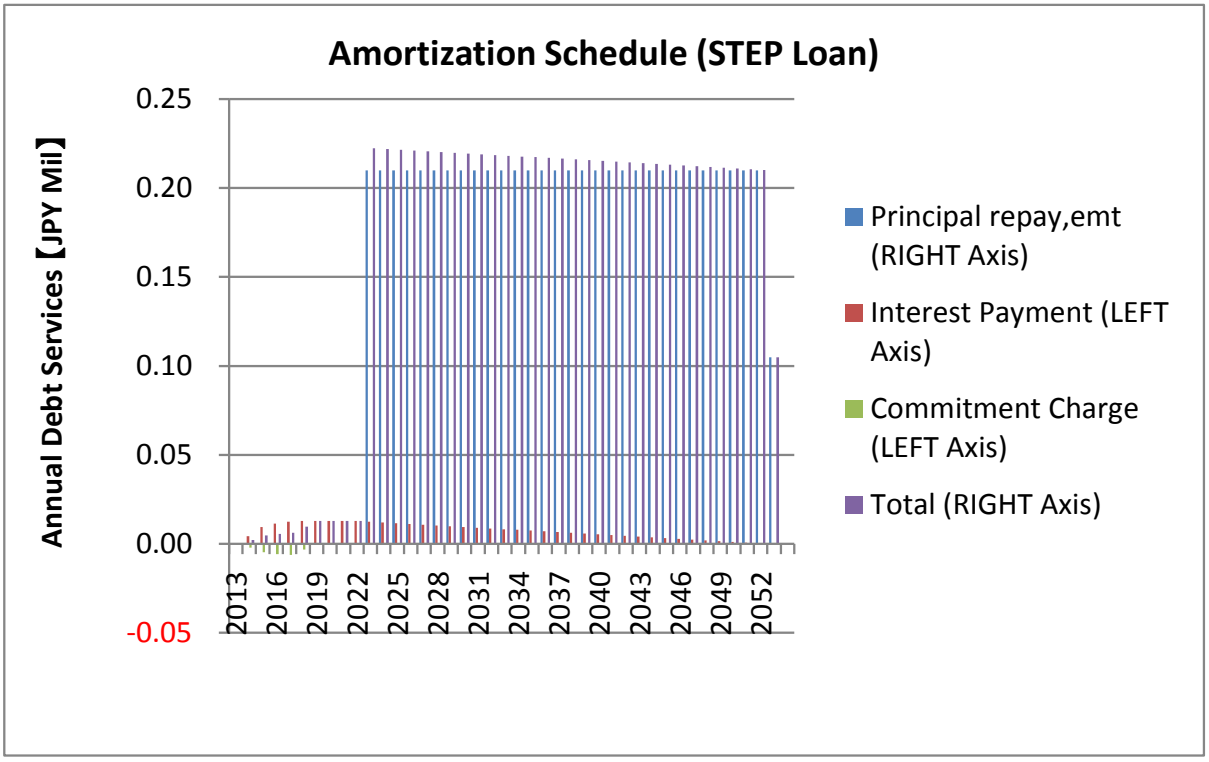
In the light of borrowings of JPY 5,300 million (GC loan) and JPY 6,400 million (STEP loan) by loan alternative, the aggregate amount of debt services stand at JPY 6,350 million and JPY 6,670 million for GC and STEP loans, respectively. The largest debt payments of loans take place in the 8th and 11th year of amortization schedule, with JPY 357.0 million and JPY 222.3. million for GC and STEP loans, respectively. It would be noteworthy that the present value of the aggregate of principal repayment, commitment charge and interest payment incurred to STEP loan accounts only for 39.6 percent of that of GC loan (discount rate at 15 %).

Amortization schedules of GC and STEP loans are depicted as **Figures A6.1.1-1, A6.1.1-2,** as well as that of comparison of two type of loans in **A6.1.1-3**.



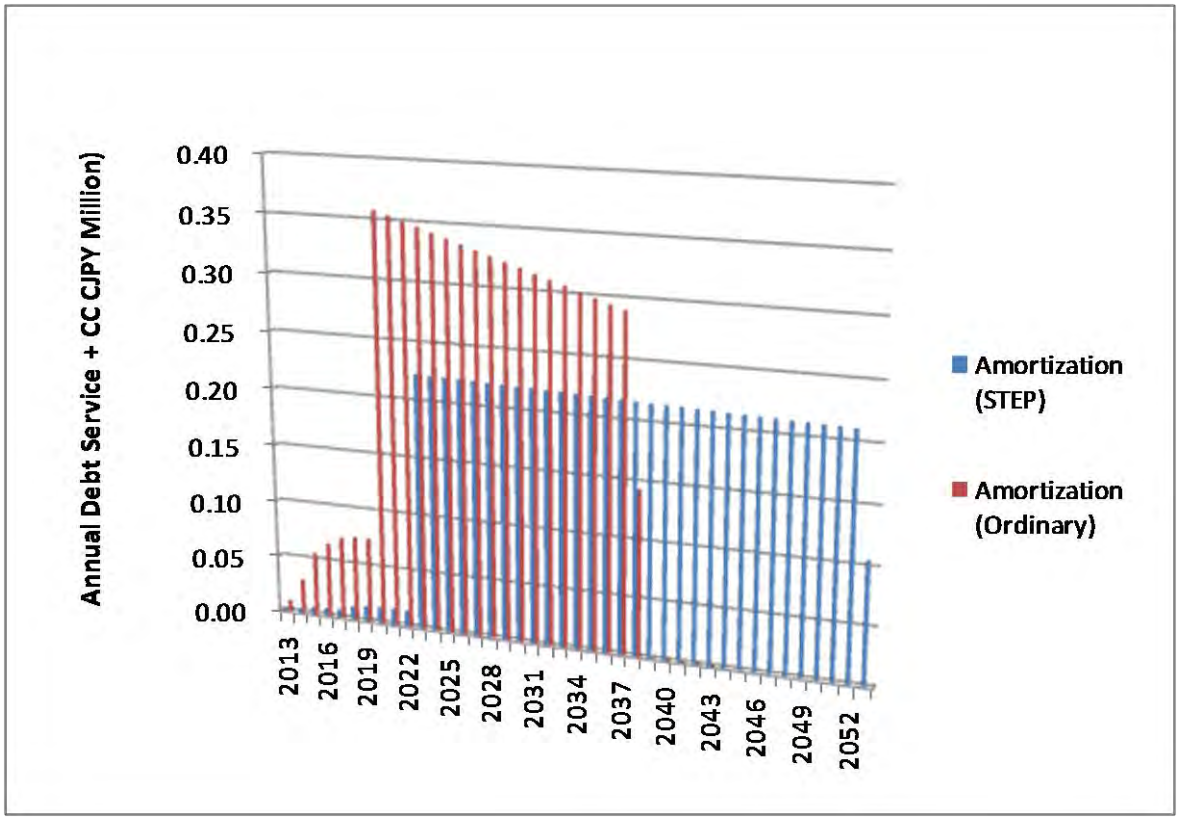
Source JICA Study Team

Figure 6.1.1-1 Amortization Schedule (GC Loan)



Source JICA Study Team

Figure 6.1.1-2 Amortization Schedule (STEP Loan)



Source JICA Study Team

Figure 6.1.1-3 Annual Debt Burden by Loan Sscheme

Appendix 7

Study of Environmental and Social Conditions

A7.1 Environmental Monitoring Plan

JICA Monitoring Form

A7.2 Records of Public Consultation Meetings

A7.3 JICA Environmental Checklist

A7.1

Environmental Monitoring Plan

JICA Monitoring Form

Appendix 7.1-1 Environmental Monitoring Plan JICA Monitoring Form -Construction Phase

Project Activity	Potential Environmental Impact	Mitigation Measures (Proposed/Implemented)	Parameters to be Monitored	Location	Methods, equipment and frequency of Measurement (Date and/or time of Measurement)	Measured Value (Average/Max/Total, etc)	Philippine Standards/ Standard for Contract/Referred International Value	Input (e.g. cost, M/M)	Responsible Institution	Reporting
Construction of flyover, underpass and approach road	Local economy (Employment)	Hire unskilled labor (>50%) and skilled labor (>30%) from the vicinity of the project sites	Employment rate	Barangays in the vicinity of I/Cs	Employment record		RA 6685 and DPWH Department Order 51 series of 1990		DPWH	・Quarterly Monitoring Report submitted to DPWH and JICA.
Construction of flyover, underpass and approach road	Traffic congestion	Traffic Management Plan	Continuous flow of traffic	All construction sites	Daily monitoring for a construction period				DPWH/ MMDA	・Quarterly Monitoring Report submitted to DPWH and JICA.
Construction of flyover and underpass	Community Health and Safety	Public Meetings	Opinions, grievance	Barangays in the vicinity of I/Cs	For a construction period of each package				DPWH/ MMDA/LGUs	・Quarterly Monitoring Report submitted to DPWH and JICA.
Labor Camp	Occupational Health and Safety	Supply the works: -clean water and safe food -toilets/sewage treatment facilities -domestic solid waste management	Camp conditions	All camps	Weekly inspection		The Philippines Occupational Safety and Health Standards (As Amended), 1992		DPWH	・Quarterly Monitoring Report submitted to DPWH and JICA.
Construction of flyover, underpass and approach roads	Loss of trees	Tree replanting should be implemented Regular monitoring of replanted trees	Cutting trees and progress of replanting	Central reserves and sidewalks	Visual inspection				DPWH/LGUs DENR	・Quarterly Monitoring Report submitted to DPWH and JICA.
Construction of flyover, underpass and approach road	Air pollution	Dust control measures: sprinkling of water; covers of the trucked material during transportation Pollutant emission control measures: low emission construction vehicles, maintenance and inspection.	Ambient air quality PM_{10}, NO_2, SO_2, CO	Road sides	Methods specified by the Implementing Rules and Regulations of the Philippine Clean Air Act of 1999		The Implementing Rules and Regulations of the Philippine Clean Air Act of 1999 WHO Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, Global Update 2005		DPWH/ DENR	・Quarterly Monitoring Report submitted to DPWH and JICA.
Construction of flyover, underpass and approach road	Noise and vibrations	Proper service of equipment; installation of sound barriers for pile driving activity; construction activities to be restricted during day time hours only. Plant trees in sidewalks.	Noise level: L_{Aeq} (day and night)	Road sides	Methods specified by the National Pollution Control Commission (NPCC) Memorandum Circular No. 002 Series of 1980, Section 78-Ambient Noise Quality and Emission Standards for Noise		NPCC Memorandum Circular No. 002 Series of 1980, Section 78-Ambient Noise Quality and Emission Standards for Noise General EHS Guidelines; Environmental Noise Management, IFC 2007		DPWH/ DENR	・Quarterly Monitoring Report submitted to DPWH and JICA.
			Vibration acceleration	Road sides	Methods specified by the 2002/44/EC (EC Vibration Directive) or American Conference of Industrial Hygienists (ACGIH)		2002/44/EC (EC Vibration Directive) or American Conference of Industrial Hygienists (ACGIH)		DPWH/ DENR	・Quarterly Monitoring Report submitted to DPWH and JICA.
Construction of flyover, underpass and approach road	Waste generation	Project Waste Management Plan To promote segregation and recycling (3R: Reduce, Re-use and Recycle)	Site conditions and cleanliness	All construction sites and labor camp	(Refer to the Project Waste Management Plan)				DPWH/ LGUs	・Quarterly Monitoring Report submitted to DPWH and JICA.

Appendix A7.1-2 Environmental Monitoring Plan JICA Monitoring Form - Operation Phase

Project Activity	Potential Environmental Impact	Mitigation Measures (Proposed/Implemented)	Parameters to be Monitored	Location	Methods, equipment and frequency of Measurement (Date and/or time of Measurement)	Measured Value (Average/Max/Total, etc)	Philippine Standards/ Standard for Contract/Referred International Value	Input (e.g. cost, M/M)	Responsible Institution	Reporting
Construction of bridges and roads Road traffic	Loss of trees	Monitor the growth of replanting trees	Trees' height and diameter	Central reserves and sidewalks	Once a year				DPWH/LGUs	・Annual Monitoring Report submitted to JICA.
Interchange traffic	Air pollution	Pollutant emission control measures	Ambient air quality PM_{10}, NO_2, SO_2, CO	Road sides	Methods specified by the Implementing Rules and Regulations of the Philippine Clean Air Act of 1999 2times per year		The Implementing Rules and Regulations of the Philippine Clean Air Act of 1999 WHO Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide, Global Update 2005		DPWH/ DENR	・Biannual Monitoring Report submitted to JICA.
Interchange traffic	Noise and vibration	Noise and vibration control measures	Noise level: L_{Aeq} (day and night)	Road sides	Methods specified by the National Pollution Control Commission (NPCC) Memorandum Circular No. 002 Series of 1980, Section 78-Ambient Noise Quality and Emission Standards for Noise 2times per year		NPCC Memorandum Circular No. 002 Series of 1980, Section 78-Ambient Noise Quality and Emission Standards for Noise General EHS Guidelines; Environmental Noise Management, IFC 2007		DPWH/ DENR	・Biannual Monitoring Report submitted to JICA.
			Vibration acceleration	Road sides	Methods specified by the 2002/44/EC (EC Vibration Directive) or American Conference of Industrial Hygienists (ACGIH) 2times per year		2002/44/EC (EC Vibration Directive) or American Conference of Industrial Hygienists (ACGIH)		DPWH/ DENR	・Biannual Monitoring Report submitted to JICA.

A7.2

Records of Public Consultation Meetings

Appendix 7.2 Records of Public Consultation Meetings

Appendix 7.2.1 C-3/Rodriguez Interchange

1) First Public Consultation Meeting
2) Second Public Consultation Meeting
3) Third Public Consultation Meeting

Appendix 7.2.2 EDSA/Roosevelt/Congressional Interchange

1) First Public Consultation Meeting
2) Second Public Consultation Meeting
3) Third Public Consultation Meeting

Appendix 7.2.3 EDSA/North/West/Mindanao Interchange

1) First Public Consultation Meeting
2) Second Public Consultation Meeting
3) Third Public Consultation Meeting

Appendix 7.2.4 C-5/Green Meadows/Acropolis/Calle Industria Interchange

1) First Public Consultation Meeting
2) Second Public Consultation Meeting
3) Third Public Consultation Meeting

Appendix 7.2.1 C-3/Rodriguez Interchange

1) First Public Consultation Meeting

Barangay	Tatalon
Date	January 20, 2012 / 01:00PM-02:30PM
Venue	Barangay Hall, Tatalon, Quezon City

Attendees

No	Name	Designation	No	Name	Designation
1	Dick Bañega	Punong Barangay	8	Beverly A. Mina	
2	Noel Estrella	Brgy. Kagawad	9	Arnold Nacuspag	DJMV Management Consultancy
3	Eric Olaguer	Brgy. Kagawad	10	Abigail E. Desear	DJMV Management Consultancy
4	Edwin Abano	Brgy. Kagawad	11	Daniel Manazano	DJMV Management Consultancy
5	Ofelia Ortiz		12	David Gange	DJMV Management Consultancy
6	Achilles E. Bidar		13	Dolly Viloria	DPWH-ESSO
7	Berlin Bañega				

Photographs Taken During The 1st Public Consultation in Brgy Dona Imelda

Barangay	Doña Imelda
Date	January 20, 2012 / 03:00PM-04:30PM
Venue	Office of the Punong Barangay, Doña Imelda

Attendees

No	Name	Designation	No	Name	Designation
1	Concepcion S. Malañgen	Punong Barangay	6	Atty. Marissa Magdusal	
2	Erlinda G. Amor	Brgy. Kagawad	7	Abigail E. Desear	DJMV Management Consultancy
3	Joey F. Mocorro	Brgy. Kagawad	8	Daniel Manazano	DJMV Management Consultancy
4	Wilfred F. Lee	Brgy. Kagawad	9	Arnold Nacuspag	DJMV Management Consultancy
5	Roy DP Doronila	Brgy. Kagawad	10	Dolly Viloria	DPWH-ESSO


Photographs Taken During The 1st Public Consultation in Brgy Dona Imelda

2) Second Public Consultation Meeting

Barangay	Tatalon
Date	March 03, 2012, 03:00-05:00PM
Venue	Barangay Conference Hall, Tatalon, Quezon City

Attendees

No	Name	Designation	No	Name	Designation
1	Victor Del Rosario	Brgy. Kagawad	21	Leticia Gelato	
2	Rene Boy G. Santos	Brgy. Kagawad	22	Winifredo L. Agoncillo	
3	Joey F. Mocorro	Brgy. Kagawad	23	Dolores M. Tolentino	
4	Eric Olaguer	Brgy. Kagawad	24	Teresita Puque	
5	Roy DP Doronila	Brgy. Kagawad	25	Eufracia D. Palaje	
6	Edwin Abano	Brgy. Kagawad	26	Linda G. Macatao	
7	Danilo Otayde		27	Armando S. Mejia	
8	Carlos Costelo		28	Nelly Panganiban	
9	Wilfredo Reyes		29	Teresita N. Monforte	
10	Gerry B. Del Monte		30	Evelyn P. Maglaque	
11	Richard Rosal		31	Adoracion T. Paragas	
12	Louie G. Ladines		32	Rosalyn Arguelles	
13	Erldin Convocar		33	Engr. Roy Cruz	DPWH-UPRO
14	Lucia Borra		34	Dolores M. Viloria	DPWH-ESSO
15	Ester Galoso		35	Masami Kimishima	JICA Study Team
16	Violita P. Catabay		36	Koyo Ogasawara	JICA Study Team
17	Loreta Albay		37	Francisco A. Kalalo Jr.	JICA Study Team
18	Lypia Riototar		38	Daniel L. Manzano	DJMV Management Consultancy
19	Alicia Del Rosario		39	Arnold A. Nacuspag	DJMV Management Consultancy
20	Thelma Manlapaz		40	Abigail J. Espejo	DJMV Management Consultancy




Photographs of The 2nd Public Consultation in Brgy Tatalon Conference Hall

Presentation Materials for the 2nd Level Public Consultation Meeting
C3/Rodriguez Ave.

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

03 March 2012
Barangay Tatalon, Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   2.1 Alternative Schemes of Interchange
   2.2 Environmental and Social Considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the outline of F/S conducted by JICA Study Team;
- To explain the alternative schemes of Interchange;
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

C-3(G. Araneta Ave.)/ E. Rodriguez Ave. Interchange

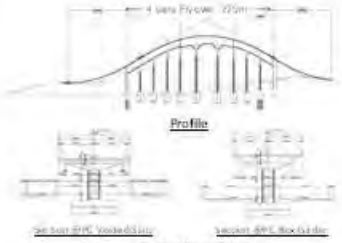
Three Alternatives of Flyover

- Scheme 1
  - Thru Flyover and Elevated Thru Road Plus Service Road
- Scheme 2:
  - Thru Flyover Only
- Scheme 3:
  - Thru Flyover and Elevated Thru Road - Service Road No Change

C-3/Rodriguez Ave. Interchange

Scheme-1: Flyover

(Thru Flyover and Elevated Thru Road Plus Service Road)



Scheme-1: Flyover

C-3 (Araneta Ave)
At Grade

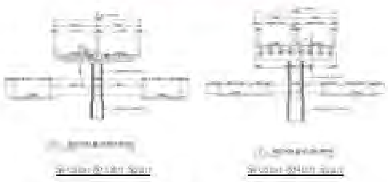
Scheme-2: Flyover

(Thru Flyover Only)

Profile

Scheme-2: Flyover

(Thru Flyover Only)



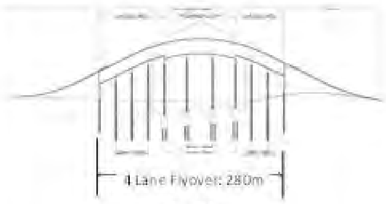
Typical Cross Section

Scheme-3: Flyover

(Lower Elevation of Flyover and Elevated Thru Road)

Scheme-3: Flyover

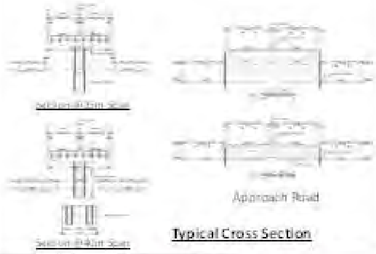
(Lower Elevation of Flyover and Elevated Thru Road)



Profile

Scheme-3: Flyover

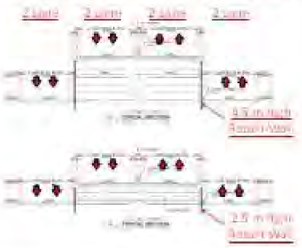
(Thru Flyover and Elevated Thru Road - Service Road No Change)



Typical Cross Section

Scheme-3: Flyover

(Thru Flyover and Elevated Thru Road - Service Road No Change)



Comparison of Alternatives

	Scheme 1	Scheme 2	Scheme 3
Cost	Expensive ([illegible])	Cheapest ([illegible])	Most expensive ([illegible])
Construction Duration	Longest ([illegible] months)	Shortest ([illegible] months)	Short ([illegible] months)
Construction Performance	Elevated service road greatest impact on traffic during construction	Less impact on traffic during construction	Traffic management during construction more difficult than S2
Traffic Condition	* No access for vehicle to frontage properties * No access to side road [illegible]	* No improvement against flood (overflow)	*No overflow *No side road access, but vehicle access to frontage properties
Environment and Social Conditions	*Land acquisition and building demolition *People each side of C-1 disconnected *Poor access for residents to frontage properties	*Minimal land acquisition	*Minimal land acquisition *People each side of C-3 disconnected from each other
Recommend	△	○	◎

Schedule of Project Implementation

- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012

In case projects are implemented, the following is scheduled:

- Loan Agreement in March 2013.
- Selection of Consultant will start in April 2013.
- Detailed Design will start in the End of 2013.
- Construction will start in the Middle of 2016.

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental Considerations

Environmental Impact Assessment (EIA)

- In accordance with Philippines Environmental Impact Assessment System (PD No.1586 (1978)), documents such as Environmental Impact Statement or Initial Environmental Examination Report required for Environmental Compliance Certificate (ECC) will be prepared by DPWH with assistance of JICA Study Team.
- In addition, because of requirement of Japanese ODA Loan, JICA requests DPWH to comply with "JICA Guidelines for Environmental and Social Considerations (2010)".

JICA Guidelines for Environmental and Social Considerations (April 2010)

- Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.
- Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.

Process of EIA/RAP Study for Interchange Project

- Proposal of Alternative Schemes

↓

- Analysis of Alternatives
- Evaluation of Potential Impacts

Scoping

Today

↓ Public Consultation Meeting

- Final Proposed Scheme of Interchange
- EIA & RAP study results
  - Mitigation measures and monitoring plan
  - Eligibility & Compensation: Entitlement matrix

↓ Public Consultation Meeting

- Final EIA & RAP Reports

End of March

Potential Impacts: Positive(+) Negative(-)

Natural Environment & Human Health		
Items	Potential Impacts	Mitigation Measures
Flora & Fauna	(-) Cutting trees where necessary	Replant trees
Landscape	(-) Deteriorate local aesthetic views	Design consideration
Flooding	(+) Elevated road: No overflow during flooding due to heavy storms	Drain pipe culverts under the road
Air quality	(+) Reduction of traffic congestion → Abatement of air pollutants emission	Estimated by future traffic volume
Noise & Vibration	(-) Noise emitted from vehicles	Noise barriers, Plant trees
Waste	(-) Constructed waste	Reduce, Reuse, Recycle
Water & Soil pollution	(-) Discharge and leakage from construction machines and vehicles	Strictly control

Potential Impacts: Positive(+) Negative(-)

Social Environment		
Items	Potential Impacts	Mitigation Measures
Land Acquisition	(-) Minimal ROW acquisition due to improvement of I/C (no need for demolition & resettlement)	Minimal ROW acquisition by design consideration
Local Economy	(+) Workers are locally employed (-) Business activity temporarily disturbed	To be surveyed
Local Conflict	(-) Misallocation of benefit and damage among communities	Consultation with Barangays
Pedestrian access	(-) [illegible]	[illegible]
Traffic Safety	(-) Construction: Congestion, accident increase (+) [illegible]	[illegible]
Sanitation	(-) Unfavorable sanitary condition of construction workers	Provision of toilets & Training campaign

Baseline Environmental Surveys

- In order to predict and assess the impacts, and consider the mitigation measures, the following surveys are carrying out to understand the present conditions:
  1) Ambient air quality
  2) Noise level

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Resettlement Action Plan (RAP)

- The Social Impact Assessment in the form of RAP (Resettlement Action Plan) will be undertaken based on the LARRIPP (Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy) which is applied to all infrastructure projects implemented by the DPWH, whether foreign or locally funded.
- LARRIPP includes: a) legal framework; b) eligibility, compensation & other entitlements; c) public participation & consultation; d) institutional arrangements; and e) monitoring mechanism
- Also RAP shall comply with "JICA Guidelines (2010)".

Socio-economic Survey

- There will be no demolition of buildings and involuntary resettlement due to the I/C project.

However,

- Business activities are likely to be affected during construction.

↓

- Socio-economic surveys shall be conducted.

Socio-economic Survey

Type of Survey	Contents
Census Survey	All occupants in construction area shall be counted to confirm the number of PAPs.
Assets & Land Survey	Item and magnitude of PAPs assets affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production system, labor, household, baseline information on livelihoods and standard of living shall be surveyed.

Socio-economic Survey

- Socio-economic Survey has been undertaken since First day of February, 2012
- This date is the Cut-off Date.

  Persons not covered at the time of census-taking will not eligible for claims of compensation entitlements.

- Your cooperation to the surveys will be much appreciated.

Next Public Consultation Meeting

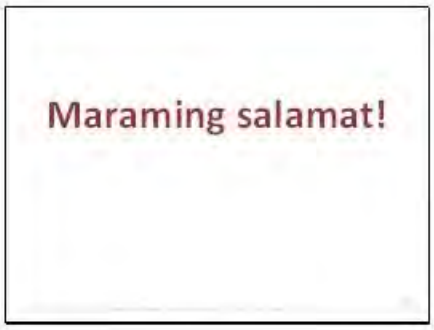
Objectives

To explain:

1) Final Scheme of the Interchange
2) Main Results of the EIA & RAP Study

Date

End of March



3) Third Public Consultation Meeting

Barangay	Tatalon
Date	March 28, 2012 / 03:00PM-04:30PM
Venue	Barangay Conference Hall, Tatalon, Quezon City

Attendees

No	Name	Designation	No	Name	Designation
1	Dick Banega	Punong Barangay	25	Carmen Carino	Pook Leader/Hilltop
2	Victor Del Rosario	Brgy. Kagawad	26	Josephine A. Gerones	Pres.-Villa Espana TODA
3	Evelina P. Maglaque	Brgy. Kagawad	27	Isidro Lozada	Kitanlad St
4	Alexis Reynaldo G. Santos	Brgy. Kagawad	28	Rolando Cabaluna	Victory Ave
5	Eric Olaguer	Brgy. Kagawad	29	Abeth Baltazar	Pook Leader/Victory
6	Noel Estrella	Brgy. Kagawad	30	Evelyn A. Gracilla	Pook Leader/Kitanlad
7	Edwin B. Abano	Brgy. Kagawad	31	Elsa B. Luyami	Pook Leader/Cahalata
8	Rodrigo I. Labicaet	Brgy. Coordinator	32	Eduardo S. Magay, Jr.	Araneta Ave
9	Jun U. Pangilinan	Villa Espana	33	Rosie A. Reyes	Araneta Ave
10	Chung Wai Lee	TAJODAI-President/ELGA	34	Ricky M. Dela Cruz	Araneta Ave
11	Antonio Dela Cruz	COOP President	35	Josie M. Lalu	Araneta Ave
12	Carlos Costelo	COOP BOD	36	Jose Malome	Araneta Ave
13	Amador Carino	Pook Leader/Hilltop VI	37	Prudencio Liclican	Araneta Ave
14	Flor P. Jusayan	Pook Leader/Pinatag Area VI	38	Antonio B. Gatpo	MMDA
15	Eusie Antonio	KANAI Treasurer	39	Nordy Q. Pimentel	PO II, MMDA
16	Ellen E. Guillermo	KANAI President	40	Engr. Roy Cruz	DPWH-UPRO
17	Renato Y. Tanquintic	Funeraria Paz-AVP Marketing	41	Dolores M. Viloria	DPWH-ESSO
18	George A. Esteban	Funeraria Paz-DIV. Head	42	Masami Kimishima	JICA Study Team
19	William L. Magbago	Funeraria Paz-Bldg. Admin.	43	Koyo Ogasawara	JICA Study Team
20	Jun Pangilinan	Pook Leader/Villa Espana Area V	44	Francisco A. Kalalo Jr.	JICA Study Team
21	Antonio Dela Cruz	Tatalon Transport	45	Daniel L. Manzano	DJMV Management Consultancy
22	Carlos Costelo	Tatalon Transport	46	Arnold A. Nacuspag	DJMV Management Consultancy
23	Rito Kinkito Sr.	Araneta Ave.	47	Clarette Estranero	DJMV Management Consultancy
24	Amador Carino	Pook Leader/Hilltop			

Photographs of The 3rd Public Consultation in Brgy Tatalon Conference Hall

Barangay	Doña Imelda
Date	March 29, 2012, 4:00pm
Venue	Barangay Hall, Doña Imelda

Attendees

No	Name	Designation	No	Name	Designation
1	Wilfred F. Lee	Brgy. Kagawad	14	Ruben E. Nieva	BPSO
2	Roy DP Doronila	Br gy. Kagawad	15	Julius John Subido	BPSO
3	E. Alarcio	Kapiligan St.	16	Jay Lopez	TODA
4	Myrna D. Anover	Kapiligan St.	17	Susan Luha	
5	Vicky Barrameda	Kapiligan St.	18	Celestino C. Ronsaino	MMDA
6	Shorely J. Matulac	Brgy. Imelda	19	Nordy Q. Pimentel	MMDA
7	AF Morales	Brgy. Imelda	20	Engr. Roy Cruz	DPWH-UPRO
8	Imee E. Alas	Araneta Ave.	21	Dolores M. Viloria	DPWH-ESSO
9	Helen Mogilay	Guirayan St.	22	Koyo Ogasawara	JICA Study Team
10	Reina Marie Compay	Guirayan St.	23	Francisco A. Kalalo Jr.	JICA Study Team
11	Carlina Batidong	Kapiligan St.	24	Daniel L. Manzano	DJMV Management Consultancy
12	Joel Astada	Palanza St	25	Arnold A. Nacuspag	DJMV Management Consultancy
13	Yolanda Canonce	BPSO	26	Clarette Estranero	DJMV Management Consultancy

Photographs of The 3rd Public Consultation in Dona Imelda Barangay Hall

Presentation Materials for the 3rd Level Public Consultation Meeting
C3/Rodriguez Ave.

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

28 March 2012
Barangay Dona Imelda, Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. Results of Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   2.1 Selected Scheme of Interchange
   2.2 Environmental and Social Considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the selected scheme of interchange;
- To comply with PEISS and JICA Guidelines
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

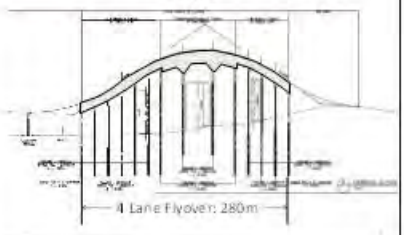
C-3(G. Araneta Ave.)/
E. Rodriguez Ave. Interchange

Selected Scheme:
Flyover with 4 Lanes Additional Approach

Flyover & 4-Lanes Additional Approach

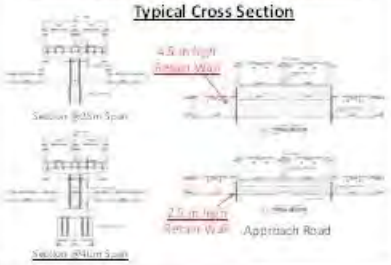
Flyover & 4-Lanes Additional Approach

Profile



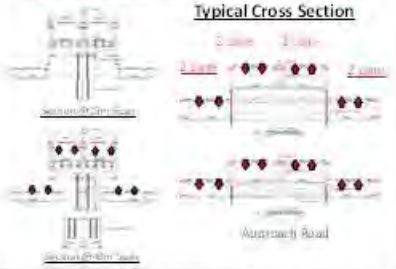
Flyover & 4-Lanes Additional Approach

Typical Cross Section

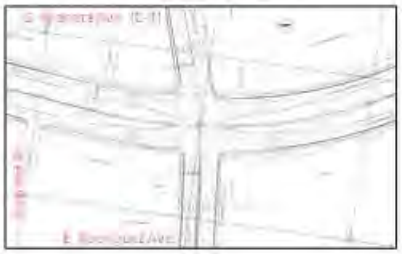


Flyover & 4-Lanes Additional Approach

Typical Cross Section



Intersection Plan



Schedule of Project Implementation

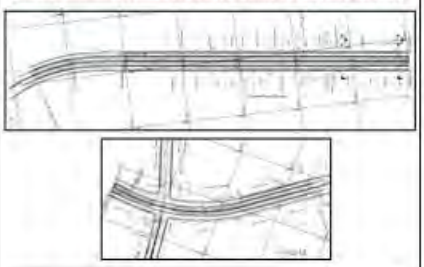
- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012

In case project is implemented in the following schedule

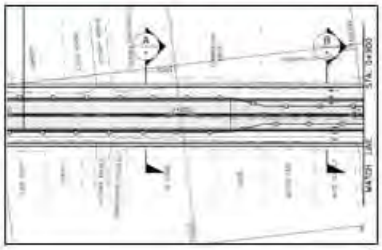
JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Traffic Management Plan

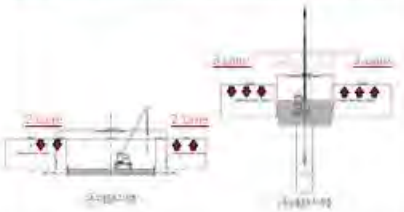
Traffic Management Plan During Construction



Traffic Management Plan During Construction



Traffic Management Plan During Construction



JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental Considerations

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Trees	• Pay careful attention to trees on central islands/roadsides. • Plant native species of trees along the roadsides.
Air quality	• Provide proper construction machines and heavy vehicles in order to reduce the emission of exhaust gas. • Maintain construction machines and heavy vehicles properly. Stop unnecessary idling. • Keep down dust by watering during the dry season. • Reduce the emission of air pollutants by utilizing low-emission construction machines and vehicles.
Noise & Vibration	• Inform construction schedule to resident in advance. • Control construction works at night. • Use low-noise construction machines and heavy vehicles.

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Waste	• Prepare proper construction plan to minimize waste generated from construction work. • Implement proper management and disposal of construction waste. • Train construction workers on environmental conservation.
Water & Soil pollution	• Provide proper construction machines and heavy vehicles and maintain them properly. • Avoid the improper land mound to prevent soil erosion from the construction sites, especially during rainy season. • Install a protector and drainage facilities to prevent soil erosion caused by surface runoff during a storm. • Treat properly wastewater from asphalt washing and concrete pavement work.

Mitigation/Enhancement Measures

II. Operation Phase

Natural Environment & Human Health	
Trees	•Monitor the growth of trees and plants on central reserves and sidewalks.
Air quality	•Due to increase of travel speed and decrease of travel distance of vehicles, the flyover would reduce air pollutant (NO2, SO2, TSP) emissions if compared to the without project case.
Noise & Vibration	•Install noise barriers where necessary. •Plant trees on sidewalks. •To consider traffic regulations on controlling the lane for heavy vehicles to reduce noise and vibration.

Mitigation/Enhancement Measures

Typical Noise Mitigation Measures

Mitigation measures	Function	Effectiveness
Noise Barriers	Noise barriers reduce noise by diffraction.	About 10 dB
Low Noise pavement	Small porous in the asphalt pavement surface absorb the noise generated by friction between the car tires and road surface.	About 3dB
Environmental Buffer Zone (Vegetation)	Trees are planted to create green spaces and reduce noise by distance from noise sources.	5~10dB

Source: [illegible]

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Social Environment	
Land Acquisition	• Minimize ROW acquisition by design consideration
Local Economy	• (+) Hire unskilled labor (>50%) and skilled labor (>30%) • (-) Disturbance on business activities: Disseminate information on a construction plan (schedule, traffic management plan) and compensate if necessary
Traffic Safety	• Traffic Management Plan • Provide adequate education and training to construction workers regarding traffic safety. • Deploy the traffic control men and install information boards at appropriate position to avoid traffic jam/accident.
Sanitation	• Portable toilets & training campaign for construction workers to prevent infectious diseases

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Other Structures/Facilities

No	Kinds of Posts	Brgy.Dona Imelda	Brgy. Tatalon	TOTAL
1	Utility Post [illegible]	24	7	31
2	Utility Post [illegible]	9	19	28
3	Lamp Post [illegible]	3	11	14
4	Street Marker [illegible]	4		4
5	Signboard		2	2
6	Traffic Light	3	1	4
7	Waiting Shed	4	1	5
8	[illegible]	24	2	26

Affected Trees

Baranguy Dona Imelda

Species	No. of Trees	Diameter (cms)	Height (m)	Volume (cu.m)	Amount
[illegible]	3				
Mahogany (s)	24				
Mahogany (Pb)	1				
Fire Tree	2				
Papaya (s)	5				0.00

Baranguy Tatalon

Species	No. of Trees	Diameter (cms)	Height (m)	Volume (cu.m)	Amount
[illegible]	8				
[illegible]	1				
[illegible]	2				
[illegible]	1				
[illegible]	9				
[illegible]	1				
[illegible]	1				[illegible]

Entitlement Matrix (Draft) (1/2)

Type of Loss: STRUCTURES (Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
More than 20% of the total [illegible] where less than 20% [illegible] remaining structure no longer functional [illegible] continued use	AF with TCT or tax declaration (Tax declaration can be [illegible] to full title)	AF will be entitled to: • Cash compensation for entire structure at 100% of replacement cost • Rental subsidy for the time between the submission of complete documents and the release of payment on land
	AF without TCT	AF will be entitled to: • Cash compensation for entire structure at 100% of replacement cost • Rental subsidy for the time between the submission of complete documents and the release of payment on land

DPWH (2007) Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy, 3rd edition

Entitlement Matrix (Draft) (2/2)

Type of Loss: STRUCTURES (Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
Less than 20% of the total [illegible] where the remaining structure can still function and is viable for continued use	AF with TCT or tax declaration (Tax declaration can be [illegible] to full title)	• Compensation for affected portion of the structure
	AF without TCT	• Compensation for affected portion of the structure

DPWH (2007) Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy, 3rd edition

Socio-Economic Survey

Type of Survey	Contents
Census Survey	All occupants in project area shall be counted in order to confirm the number of PAPs.
Assets & Land Survey	Item and magnitude of PAPs asset affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production systems, labor, household, baseline information on livelihoods and standard of living shall be surveyed.

Environmental Impact Assessment (EIA)

- Initial Environmental Examination (IEE) Report will be prepared including:
  - ✓Environmental Management Plan
  - ✓Social Development Program
  - ✓Abbreviated Resettlement Action Plan
- Final IEE Report will be submitted to DENR, in order to obtain the Environmental Compliance Certificate (ECC).

Maraming salamat!

Discussion

Comments / suggestions will be much appreciated

Appendix 7.2.2 EDSA/Roosevelt/Congressional Interchange

1) First Public Consultation Meeting

Barangay	Bahay Toro, Katipunan
Date	January 19, 2012, 2:30PM - 4:00PM
Venue	Barangay Bahay Toro Barangay Hall

Attendees

No	Name	Designation
1	Amelita Laida	Kagawad Secretary/ Brgy. Bahay Toro
2	Annalyn Gonzales	Kgwd Secretary/Sinagtala, Proj 8, Q.C
3	Grace G. Rosario	Womens Desk, Sitio Militar
4	Virginia Dela Cruz	Women's Desk Head/ Bahay Toro
5	Gina Dela Pena	Women's Desk/Sitio Bathala
6	Petrus P. Pepito	Head traffic/Sitio Militar
7	Marites A. Delos Santos	Census Section
8	Girlie M. Regoso	Clean & Green Section/Bahay Toro
9	Thelma L. Tan	Census section/Bahay Toro
10	Erlinda E. Delos Santos	Senior Citizen
11	Lourdes B. Dela Cruz	Urban Poor
12	Rebecca F. Buen	Census Section
13	Rose C. Macan	Census Section
14	Ammie Baltan	Disaster Section
15	Leticia B. Lingco	Census Head
16	Julius C. Secillano	Punong Barangay/Brgy Katipunan
17	Elmer S. Baral	Brgy Kagawad/Brgy katipunan
18	Rogelio Tamo	Brgy Kagawad/Brgy Katipunan
19	Reynaldo Diaz	Brgy Kagawad/Brgy Katipunan
20	Soliman V. Omolida	Brgy Kagawad/Brgy Katipunan
21	Dolores M. Viloria	DPWH-ESSO
22	Francisco A. Kalalo Jr.	JICA Study Team
23	Abigail E. Desaer	DJMV Management Consultancy
24	Daniel L. Manzano	DJMV Management Consultancy
25	Arnold A. Nacuspag	DJMV Management Consultancy

Photos of First Public Consultation Meeting

2) Second Public Consultation Meeting

Barangay	Bahay Toro
Date	March 03, 2012, 10:00AM - 12:00NN
Venue	Brgy. Bahay Toro Covered Court

Attendees

No	Name	Designation	No	Name	Designation
1	Norma D. Gana		44	Jesus Cabang	
2	Rochie Anne Mariquit		45	Marites Soliman	
3	Maryann Erabon		46	Perla Farior	
4	Milan A. Dela Rosa		47	Hokotatci Kioka	
5	Isidro		48	Joeven B. Cueto	
6	Joseph A. Castillejo		49	Eduardo Desitte	
7	Ramon G. Del Mundo		50	Eco Ronald	
8	Felicidad F. Valdez		51	Pepito Petrus	
9	Nena M. Libatique		52	Thelma C. Tan	
10	Lita F. Aquino		53	Lolita O. Aldefulla	
11	Rodolofo Supangan		54	Pedro M. Rodriguez Jr.	
12	Rodolfo Gutierrez		55	Marc Jovero	
13	Ramon Villamir		56	Rick Joven Mamaril	
14	Rosario SV		57	John Paul Baluga	
15	Fernando Capones		58	Evaristo T. Tri	
16	Mercedita A. Cenzon		59	Theodosia Ines B. Ragodon	
17	Criselda Sablayan		60	Rose C. Macam	
18	Gerlie Negoso		61	Marites A. Delos Santos	
19	Ramela Gana		62	Jean E. De Pedro	
20	Fernan Gana		63	Rocely N. Guion	
21	Rowena Gutierrez		64	Joy Galang	
22	Eufemia Delos Santos		65	Norma Espena	
23	Elizabeth Bongcales		66	Rusella Pineda	
24	Ritchelda G. Ramonez		67	Dennis Corpuz	
25	Remedios B. Mag		68	Maribeth Ancheta	

26	Rizalyn Mempin		69	Victor Lopez	
27	Grace Garganta		70	Dante Maldo	
28	Lourdes Dela Cruz		71	Arnel Agbal	
29	Bert Laurenciano		72	Glen Valerio	
30	Ann Margaret Racadio		73	Leo Joaquin	
31	Erlinda E. Delos Santos		74	Reynaldo F. Nebrida	
32	Annalyn A. Gonzales		75	Francisco Isidro	
33	Rowena C. Sirahon		76	John Carlo Carlos	
34	Virginia Babis		77	Nicko Casiple	
35	Leticia V. Lingco		78	Rockwell F. Chavez	
36	Irma Grace P. Alfon		79	Engr. Roy Cruz	DPWH-UPRO
37	Enna Idan Santiago		80	Dolores M. Viloria	DPWH-ESSO
38	Lewelyn Menodiano		81	Masami Kimishima	JICA Study Team
39	Israel P. Abedin		82	Koyo Ogasawara	JICA Study Team
40	Rodolfo Sta Juana Jr.		83	Francisco A. Kalalo Jr.	JICA Study Team
41	Rodolfo C. Llegue		84	Daniel L. Manzano	DJMV Management Consultancy
42	Benjamin Ramos		85	Arnold A. Nacuspag	DJMV Management Consultancy
43	Laurenciana M. Abarra		86	Keng Estranero	DJMV Management Consultancy

Photos of Second Public Consultation Meeting

Presentation Materials for the 2nd Level Public Consultation Meeting
EDSA/Roosevelt Ave./Congressional Ave.

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

03 March 2012
Barangay Bahay Toro, Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   - 2.1 Alternative Schemes of Interchange
   - 2.2 Environmental and Social Considerations
3. Discussion
   - Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the outline of F/S conducted by JICA Study Team;
- To explain the alternative schemes of interchange;
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

EDSA - Roosevelt/Congressional Interchange

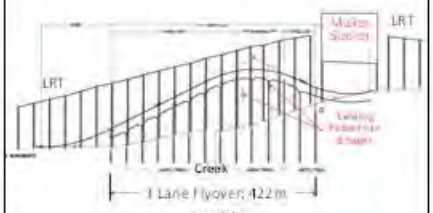
Three Alternatives of Flyover

- Scheme 1:
  - Maintain Vertical Clearance of all Pedestrian Bridge)
- Scheme 2:
  - No Pedestrian Bridge near Muñoz Station
- Scheme 3:
  - Crosses at High Level above LRT Station

EDSA - Roosevelt/Congressional I/C

Scheme-1: Flyover

(Maintain Vertical Clearance of All Pedestrian Bridges)



Profile

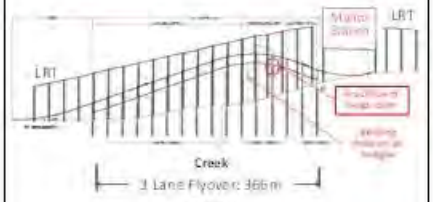
Scheme-1: Flyover

(Maintain Vertical Clearance of All Pedestrian Bridges)

Typical Cross Section

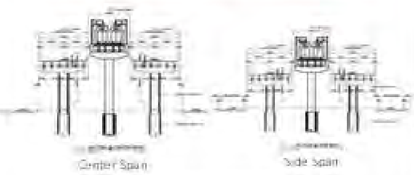
Scheme-2: Flyover

(No Pedestrian Bridge near Muñoz Station)



Profile

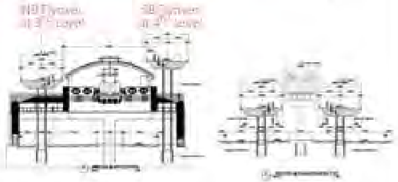
Scheme-2: Flyover
(No Pedestrian Bridge near Muñoz Station)



Scheme-3: Flyover
(Crosses at High Level above LRT Station)

Scheme-3: Flyover
(Crosses at High Level above LRT Station)

Scheme-3: Flyover
(Crosses at High Level above LRT Station)



Comparison of Alternatives

	Scheme 1	Scheme 2	Scheme 3
Cost	Expensive [illegible]	Cheapest [illegible]	Most Expensive [illegible]
Construction Duration	Long [illegible]	Shortest [illegible]	Longest [illegible]
# pedestrian bridges	Demolish 4 & Reconstruct 4	Demolish 4 & Reconstruct only 3 (a new Muñoz Sta.)	Demolish 4 & Reconstruct 4
Operation & Maintenance	[illegible]	[illegible]	[illegible]
Traffic Condition	[illegible]		
Environmental and Social Conditions	No additional ROW [illegible]	No additional ROW	No additional ROW [illegible]
Recommendation	○	◎	△

Schedule of Project Implementation

- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012

In case projects are implemented, the following is scheduled:

- Loan Agreement in March 2013.
- Selection of Consultant will start in April 2013.
- Detailed Design will start in the End of 2013.
- Construction will start in the Middle of 2016.

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental Considerations

Environmental Impact Assessment (EIA)

- In accordance with Philippines Environmental Impact Assessment System (PD No.1586 (1978)), documents such as Environmental Impact Statement or Initial Environmental Examination Report required for Environmental Compliance Certificate (ECC) will be prepared by DPWH with assistance of JICA Study Team.
- In addition, because of requirement of Japanese ODA Loan, JICA requests DPWH to comply with "JICA Guidelines for Environmental and Social Considerations (2010)".

JICA Guidelines for Environmental and Social Considerations (April 2010)

- Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.
- Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.

Process of EIA/RAP Study for Interchange Project

- Proposal of Alternative Schemes

↓

- Analysis of Alternatives
- Evaluation of Potential Impacts

Scoping

Today

↓ Public Consultation Meeting

- Final Proposed Scheme of Interchange
- EIA & RAP study results
  - Mitigation measures and monitoring plan
  - Eligibility & Compensation, Entitlement matrix

↓ Public Consultation Meeting

End of March

- Final EIA & RAP Reports

Potential Impacts: Positive(+) Negative(-)

Natural Environment & Human Health		
Items	Potential Impacts	Mitigation Measures
Flora & Fauna	(-) Cutting a few trees, where necessary	Replant trees
Landscape	(-) Deteriorate local aesthetics values	[illegible]
Air quality	(+) Reduction of traffic congestion → Abatement of air pollutants emission	[illegible] traffic volume
Noise & Vibration	(-) Noise emitted from vehicles	Noise barriers, Plant trees
Waste	(-) Construction waste	3R (Reduce, Reuse, Recycle)
Water & Soil pollution	(-) Discharge and leakage from construction machines and vehicles	[illegible]

Potential Impacts: Positive(+) Negative(-)

Social Environment		
Items	Potential Impacts	Mitigation Measures
Local Economy	(+) Employment: workers are locally employed (-) Business activity: temporary disturbed	[illegible]
Local Conflict	[illegible]	Consultation with [illegible]
Pedestrian access	[illegible]	[illegible]
Traffic Safety	(-) Construction: congestion/ accident [illegible] (+) Operation: improve traffic safety	[illegible]
Sanitation	[illegible]	[illegible]

Baseline Environmental Surveys

- In order to predict and assess the impacts, and consider the mitigation measures, the following surveys are carrying out to understand the present conditions:
  1) Ambient air quality
  2) Noise level

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Resettlement Action Plan (RAP)

- The Social Impact Assessment in the form of RAP (Resettlement Action Plan) will be undertaken based on the LARRIPP (Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy) which is applied to all infrastructure projects implemented by the DPWH, whether foreign or locally funded.
- LARRIPP includes: a) legal framework; b) eligibility, compensation & other entitlements; c) public participation & consultation; d) institutional arrangements; and e) monitoring mechanism
- Also RAP shall comply with "JICA Guidelines (2010)".

Socio-economic Survey

- There will be no land acquisition and resettlement due to the I/C project.

However,

- Business activities are likely to be affected during construction.

↓

- Socio-economic surveys shall be conducted.

Socio-economic Survey

Type of Survey	Contents
Census Survey	All occupants in construction area shall be counted to confirm the number of PAPs.
Assets & Land Survey	Item and magnitude of PAPs asset affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production system, labor, household baseline information on livelihoods and standard of living shall be surveyed.

Socio-economic Survey

- Socio-economic Survey has been undertaken since First day of February, 2012.
- This date is the Cut-off Date.
  Persons not covered at the time of census taking will not eligible for claims of compensation entitlements.
- Your cooperation to the surveys will be much appreciated.

Next Public Consultation Meeting

Objectives

To explain:

1) Final Scheme of the Interchange
2) Main Results of the EIA & RAP Study

Date

End of March

Maraming salamat!

3) Third Public Consultation Meeting

Barangay	Bahay Toro
Date	March 28, 2012, 9:00AM - 12:00NN
Venue	Brgy. Bahay Toro Covered Court

Attendees

No	Name	Designation
1	Casiano S. Dela Cruz-	Punong Brgy./Brgy. A. Samson
2	Evaristo T. Trinidad	Co-Rep/Congressional Lanes
3	Beth M. Gonzales	Market Inspector/354 EDSA
4	Sheryll P. Minon	Office Staff/354 Roosevelt
5	Ritchelda G. Ramones	Census/Bahay Toro
6	Elizabeth Bongcales	Street Sweeper/Bahay Toro
7	Amelita D. Tumaquip	Disaster/Sitio Militar
8	Gerlie Rigos	Clean and Green/Proj. 8
9	Criselda Sablayan	Clean & Green/Bahay Toro
10	Lenier Cuadra	Pook Masagana
11	Ophelia Torrijas	Disaster/Sitio Militar
12	Evangeline M. Bareo	Disaster/Sitio Militar
13	Benita V. Jenplonuevo	Disaster/Sitio Militar
14	Theodoria B. Lagusla	Census/Proj. 8
15	Jojo T. de Guzman	General Manager/Walter Mart
16	Ferdie Gasin	Manager/Walter Mart
17	Rogelio Oliveros	Kagawad/Brgy. A. Samson
18	Danilo Baetiong	Kagawad/Brgy. A. Samson
19	Brenda Aguilar	Bahay Toro
20	Randolph N. Soliman	Service Manager/Bahay Toro
21	Erlinda T. Umipig	Street Sweeper/Bahay Toro
22	Francisco Jutba Jr.	Villarica
23	Danilo Agustin	Pres.-ABCON/Congressional
24	Roberto Laurenciano	Bahay Toro
25	Fernando Gana	Head,HR Dept./Bahay Toro
26	Rowena Dorosan	Bahay Toro
27	Dante Maldo	Bahay Toro
28	Art Castillo	Manager/EDSA Congressional
29	Conrad Benalde	Employee/EDSA-Congressional
30	Rey Oliveros	Kagawad/Brgy. A. Samson
31	Allan Alday	Kagawad/Brgy. R. Magsaysay
32	Rudolf Francis Macorol	Office Clerk/Congressional Lanes
33	Engr. Roy Cruz	DPWH-UPRO
34	Dolores M. Viloria	DPWH-ESSO
35	Koyo Ogasawara	JICA Study Team
36	Francisco A. Kalalo Jr.	JICA Study Team
37	Keng Estranero	DJMV Management Consultancy
38	Daniel L. Manzano	DJMV Management Consultancy
39	Arnold A. Nacuspag	DJMV Management Consultancy

Photos of Third Public Consultation Meeting

Presentation Materials for the 3rd Level Public Consultation Meeting
EDSA/Roosevelt Ave./Congressional Ave.

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

28 March 2012
Barangay Bahay Toro, Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. Results of Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   2.1 Selected Scheme of Interchange
   2.2 Environmental and Social Considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the selected scheme of interchange;
- To comply with PEISS and JICA Guidelines
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

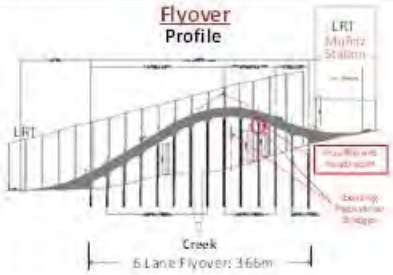
Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study.

EDSA - Roosevelt/Congressional Interchange

Selected Scheme: Flyover
No Pedestrian Bridge near Muñoz Station

EDSA - Roosevelt/Congressional I/C

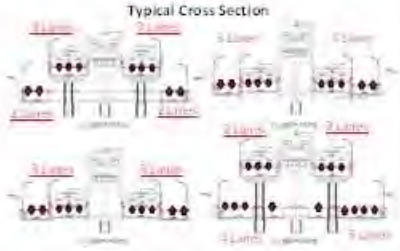
Flyover
Profile



Flyover
Typical Cross Section

Flyover

Typical Cross Section



Intersection Plan

Schedule of Project Implementation

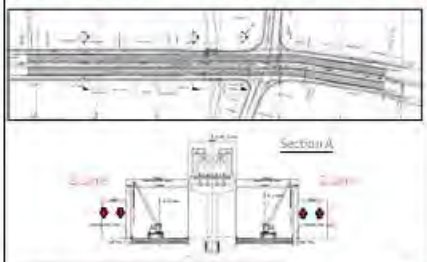
- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012

In case project is implemented, the following is scheduled:

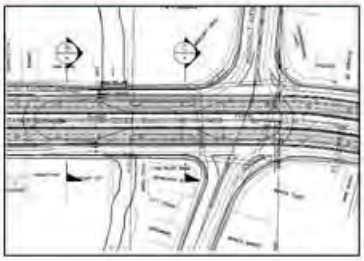
JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Traffic Management Plan

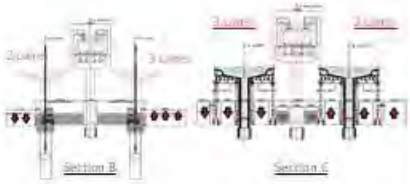
Traffic Management Plan During Construction



Traffic Management Plan During Construction



Traffic Management Plan During Construction



JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental Considerations

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Trees	• Pay careful attention to trees on central islands, roadsides. • Plant native species of trees along the roadsides.
Air quality	• Provide proper construction machines and heavy vehicles in order to reduce the emission of exhaust gas. • Maintain construction machines and heavy vehicles properly. Stop unnecessary idling. • Keep down dust by watering during the dry season. • Reduce the emission of air pollutants by utilizing low-emission construction machines and vehicles.
Noise & Vibration	• Inform construction schedule to resident in advance. • Control construction work at night. • Use low-noise construction machines and heavy vehicles.

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Waste	• Prepare proper construction plan to minimize waste generated from construction work. • Implement proper management and disposal of construction waste. • Train construction workers on environmental conservation.
Water & Soil pollution	• Provide proper construction machines and heavy vehicles and maintain them properly. • Avoid the improper land mound to prevents soil erosion from the construction sites, especially during rainy season. • Install a protector and drainage facilities to prevents soil erosion caused by surface runoff during a storm. • Treat properly wastewater from asphalt washing and concrete pavement work.

Mitigation/Enhancement Measures

II. Operation Phase

Natural Environment & Human Health	
Trees	• Monitor the growth of trees and plants on central reserves and sidewalks.
Air quality	• Due to increase of travel speed and decrease of travel distance of vehicles, the flyover would reduce air pollutant (NO2, SO2, TSP) emissions if compared to the without project case.
Noise & Vibration	• Install noise barriers where necessary. • Plant trees on sidewalks. • To consider traffic regulations on controlling the lane for heavy vehicles to reduce noise and vibration.

Mitigation/Enhancement Measures

Typical Noise Mitigation Measures

Mitigation measures	Function	Effectiveness
Noise Barriers	Noise barriers reduce noise by diffraction.	About 10 dB
Low Noise pavement	Small porous in the asphalt pavement surface absorb the noise generated by friction between the car tires and road surface.	About 3 dB
Environmental Buffer Zone (Vegetation)	Trees are planted to create green spaces and reduce noise by distance from noise sources.	5~10 dB

Source: [illegible]

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Social Environment	
Land Acquisition	• Minimize ROW acquisition by design consideration
Local Economy	• (+) Hire unskilled labor (>50%) and skilled labor (>30%) • (-) Disturbance on business activities: Disseminate information on a construction plan (schedule, traffic management plan) and compensate if necessary
Traffic Safety	• Traffic Management Plan • Provide adequate education and training to construction workers regarding traffic safety • Deploy the traffic control men and install information boards at appropriate position to avoid traffic jam/accident
Sanitation	• Portable toilets & training campaign for construction workers to prevent infectious diseases

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Project Affected Persons (PAPs)

Project Affected Structure

No	Baranguy	Name	Type of Stalls	
			Fruits Stand	Merchandise
1	Katipunan	Pol Marcillan		√
2	Katipunan	Josie Cayabyab		√
3	Katipunan	Bobby Millar	√	
4	Katipunan	Rey Madabo	√	√
5	Katipunan	Gemalyn Rogel	√	√

Note:
The Cut-off Date for eligibility for compensation was set on 1st February 2012.

Other Structures/Facilities

No	Kinds of Posts	Brgy. Katipunan	Brgy. Ramon Magsaysay	TOTAL
1	Utility Post (inside pink line)	62		62
2	Utility Post (outside pink line)	28		28
3	Lamp Post (outside pink line)	3	3	6
4	Control Board	3	3	6
5	Signboard	1		1
6	Foot Bridge	2	2	4
7	Informative Sign	2		2
8	Extension [illegible]	13		13
9	Brgy. Outpost	1	1	2
10	Bridge		1	1
11	Bus/Jeepney Bay	1		1
12	Marker Post	2	2	4
13	Billboard (ST)		2	2

Affected Trees

Baranguy Katipunan

Species	No. of Trees	Diameter (cms)	Height (m)	Volume (cu.m)	Amount
Balite (inside pink line) (s)	19				-
Bonggangvilla (s) Center Island	26				-
TOTAL	45				0.00

Baraguy Ramon Magsaysay

Species	No. of Trees	Diameter (cms)	Height (m)	Volume (cu.m)	Amount
Bongambilia (m)	25				-
Mahogany (m)	4				-
Mahogany (FG)	1				-
Balete (s)	14				-
TOTAL	44				0.00

Entitlement Matrix (Draft) (1/2)

Type of Loss: STRUCTURES
(Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
More than 20% of the total landholding loss or where less than 20% loss but the remaining structure no longer function as intended or no longer viable for continued use	AF with TCT or tax declaration (Tax declaration can be legalized to full title)	AF will be entitled to: • Cash compensation for entire structure at 100% of replacement cost • Rental subsidy for the time between the submission of complete documents and the release of payment on land
	AF without TCT	AF will be entitled to: • Cash compensation for entire structure at 100% of replacement cost • Rental subsidy for the time between the submission of complete documents and the release of payment on land

DPWH (2007)
[illegible]

Entitlement Matrix (Draft) (2/2)

Type of Loss: STRUCTURES
(Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
Less than 20% of the total landholding loss where the remaining structure can still function and is viable for continued use	AF with TCT or tax declaration (Tax declaration can be legalized to full title)	• Compensation for affected portion of the structure
	AF without TCT	• Compensation for affected portion of the structure

DPWH (2007)
[illegible]

Socio-Economic Survey

Type of Survey	Contents
Census Survey	All occupants in project area shall be counted in order to confirm the number of PAPs.
Assets & Land Survey	Item and magnitude of PAPs asset affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production system, labor, household, baseline information on livelihoods and standard of living shall be surveyed.

Environmental Impact Assessment (EIA)

- Initial Environmental Examination (IEE) Report will be prepared including:
  - ✓Environmental Management Plan
  - ✓Social Development Program
  - ✓Abbreviated Resettlement Action Plan
- Final IEE Report will be submitted to DENR, in order to obtain the Environmental Compliance Certificate (ECC).

Maraming salamat!

Discussion

Comments / suggestions will be much appreciated

Appendix 7.2.3 EDSA/North/West/Mindanao Interchange

1) First Public Consultation Meeting

Barangay	Pag-asa, Sto. Cristo, Phil-Am, Ramon Magsaysay
Date	January 19, 2012, 10:00AM - 12:00NN
Venue	Barangay Pag-asa Brgy. Hall, Bungad

Attendees

No	Name	Designation
1	Jose A. Diaz	Punong Barangay, Brgy. Phil-Am
2	Rey Felix	LTM, Brgy. Phil-Am
3	Fiorello Miranda	Kagawad, Brgy. Phil-Am
4	Reymark John Navarro	Kagawad, Brgy. Sto. Cristo
5	Edgardo O. Porras	Kagawad, Brgy. Ramon Magsaysay
6	Rudy Palma	Kagawad, Brgy. Pag-Asa
7	Baby Villafranca	Kagawad, Brgy. Phil-Am
8	Lina Tuczon	Kagawad, Brgy. Phil-Am
9	Sabrina E. Kintanar	Kagawad, Brgy. Phil-Am
10	Edwin Alcantara	Kagawad, Brgy. Sto. Cristo
11	June Gallanosa	Kagawad, Brgy. Sto. Cristo
12	Nino C. Bolofer	Brgy. Secretary, Brgy. Ramon Magsaysay
13	Ricardo B. Corpuz	Punong Barangay, Brgy. Bungad
14	Manny Dela Rosa	Kagawad, Brgy. Phil-Am
15	Dolly Viloria	DPWH-ESSO
16	Francisco A. Kalalo Jr.	JICA Study Team
17	Arnold Nacuspag	DJMV Management Consultancy
18	Abigail E. Desear	DJMV Management Consultancy
19	Daniel Manazano	DJMV Management Consultancy
20	David V. Gange	DJMV Management Consultancy

Photographs of the First Public Consultation Meeting

2) Second Public Consultation Meeting

Barangay	Pag-asa, Sto. Cristo, Phil-Am, Ramon Magsaysay
Date	March 24, 2012 at 10:00AM - 12:00NN
Venue	Brgy. Pag-asa Conference Hall

Attendees

No	Name	Designation	No	Name	Designation
1	Anwar Abdulhawid	Pag-Asa	23	Ramon Mangalindan	Traffic (Pag-Asa)
2	Romeo B. Pacu	Brgy. Secretary (Pag-Asa)	24	Wilma L. Lumpar	Pag-Asa
3	Lily Jaramilla	Secretary,SC (Pag-Asa)	25	Edgar Romero	Traffic (Pag-Asa)
4	Josefina Q. Jaramilla	Board Member,SC (Pag-Asa)	26	Antonio V. Paras	Kgd. Phil-Am
5	Mark Tomas	Rep.	27	Roderick Guevarra	Traffic (Pag-Asa)
6	Promencio Abunaga	P.R.O. (Pag-Asa)	28	Josie Ublate	PO V, MMDA
7	Alberto Canceran	Bldg. Maintenance (Pag-Asa)	29	Rebecca A. Dela Cruz	PO IV, MMDA
8	Ally Peralta	Bldg. Electrician (Pag-Asa)	30	M. Mendoza	Server
9	Noly Pelaez	Kgd. Pag-Asa	31	R. Frias	Pag-Asa
10	Jennifer Villagorin	BenCom Pacific (Phil-Am)	32	S. Rubinal	PB OS, Pag-Asa
11	Francisco Kalalo Jr.	Env'tl Sp., JICA Team	33	Zaldy Nepomuceno	PB
12	Relly Miranda	Kgd. Phil-Am	34	Marilou Baclig	Kgd. Sto. Cristo
13	Manny Dela Rosa	Kgd. Phil-Am	35	Tony Panlilio	Sto. Cristo
14	Simplicio Hermogene	Phai President (Phil-Am)	36	Engr. Roy Cruz	DPWH-UPRO
15	Jose A. Diaz	P.B. (Brgy. Phil-Am)	37	Dolores M. Viloria	DPWH-ESSO
16	Alex Ranada	Traffic (Pag-Asa)	38	Masami Kimishima	JICA Study Team
17	Teddie Abogadie	B.P.S.O. (Pag-Asa)	39	Koyo Ogasawara	JICA Study Team
18	Bernabe Depasuchi	Traffic (Pag-Asa)	40	David Gange	DJMV Management Consultancy
19	Tolentino	Pag-Asa	41	Daniel L. Manzano	DJMV Management Consultancy
20	L. Guillermo	Traffic (Pag-Asa)	42	Arnold A. Nacuspag	DJMV Management Consultancy
21	Joneth M. Sibunga	Brgy. Police	43	Clarette Estranero	DJMV Management Consultancy
22	Bonifacio C. Du-Ag	B.P.S.O. (Pag-Asa)			

Photographs of the Second Public Consultation Meeting

Presentation Materials for the 2nd Level Public Consultation Meeting
EDSA/North Ave./West Ave./Mindanao Ave.

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

24 March 2012
Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   2.1 Alternative Schemes of Interchange
   2.2 Environmental and Social Considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the alternative schemes of interchange;
- To explain the JICA Guidelines for Environmental and Social Considerations and the potential impacts due to the project (scoping of EIA)
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study.

EDSA-North/West/Mindanao I/C

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

EDSA-North/West/Mindanao Ave. I/C

EDSA-North/West I/C
- **Two Alternatives**
- Scheme 1: Flyover
- Scheme 2: Cut & Cover Tunnel

North-Mindanao I/C
- **Two Alternatives**
- Scheme 1: Flyover & Flyover
- Scheme 2: Flyover & Tunnel

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

EDSA-North/West/Mindanao Ave. I/C

EDSA-North/West I/C
- Two Alternatives
- Scheme 1: Flyover
- Scheme 2: Cut & Cover Tunnel

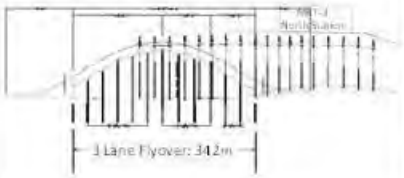
North-Mindanao I/C
- Two Alternatives
- [illegible]

EDSA-North/West Interchange

EDSA-North/West
Two Alternatives
- Scheme 1: Flyover
- Scheme 2: Cut & Cover Tunnel

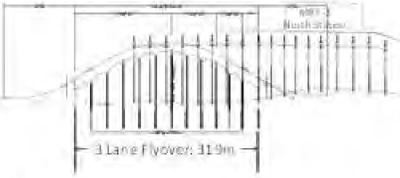
Scheme-1: Flyover

North Bound: Profile



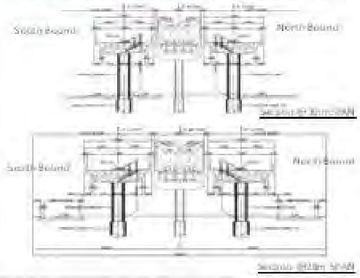
Scheme-1: Flyover

South Bound: Profile



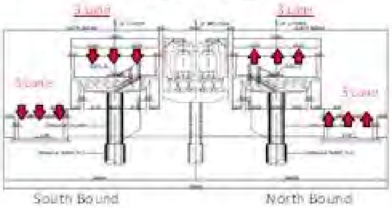
Scheme-1: Flyover

Typical Cross Section



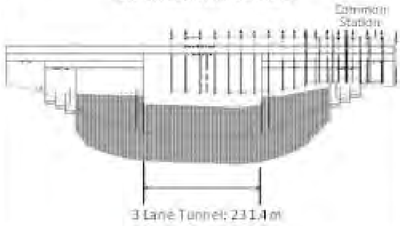
Scheme-1: Flyover

Typical Cross Section



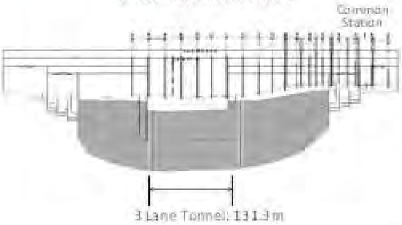
Scheme-2: Cut & Covered Tunnel

North Bound: Profile



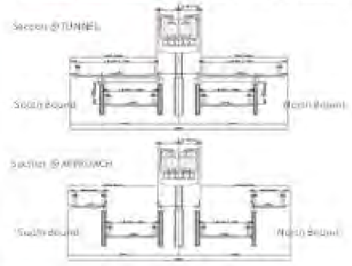
Scheme-2: Cut & Covered Tunnel

South Bound: Profile



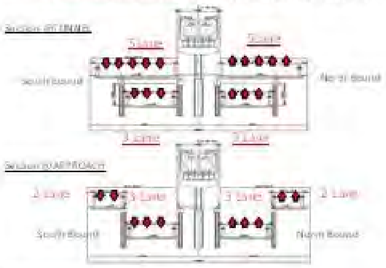
Scheme-2: Tunnel

Typical Cross Section



Scheme-2: Tunnel

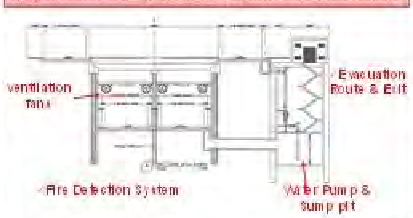
Typical Cross Section



Scheme-2: Tunnel

Typical Cross Section

Require Periodic Inspection and Operation & Maintenance



Comparison of Alternatives for EDSA

	Scheme 1	Scheme 2
Cost	Cheap (100%)	Expensive (155%)
Construction Duration	Short (20 months)	Long (24 months)
Construction Performance	*Standard	[illegible]
Traffic Condition	*Easier traffic management *Provide at least 2-lane traffic per direction	*Provide 1.5-lane traffic per direction
Operation & Maintenance	*No specific O&M required	*Required periodic inspection and O& M for pump and sump pit
Environment & Social Conditions	*No ROW acquisition	[illegible]
Recommend	◎	△

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

EDSA-North/West/Mindanao Ave. I/C

North-Mindanao I/C

- Two Alternatives

➢Scheme1: Flyover & Flyover

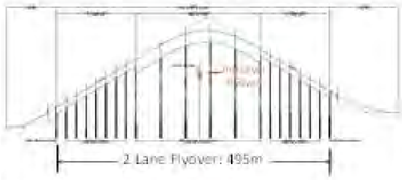
➢Scheme2: Flyover & Tunnel

North-Mindanao Ave. Interchange

Scheme-1: Left Turn Flyover

North to Mindanao Ave: 3rd Level Flyover

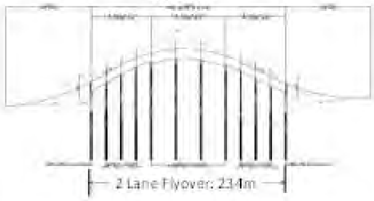
Profile



Scheme-1: Left Turn Flyover

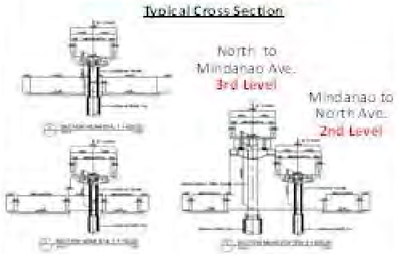
Mindanao to North Ave: 2nd Level Flyover

Profile



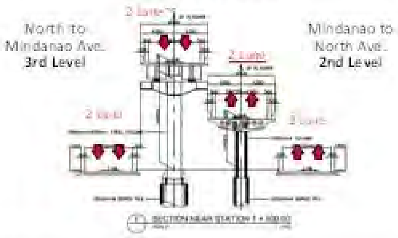
Scheme-1: Left Turn Flyover

Typical Cross Section



Scheme-1: Left Turn Flyover

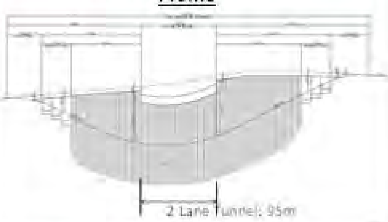
Typical Cross Section



Scheme-2: Left Turn Flyover & Underpass

North to Mindanao Ave

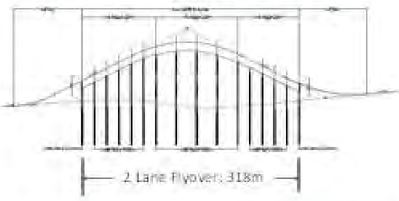
Profile



Scheme-2: Left Turn Flyover & Underpass

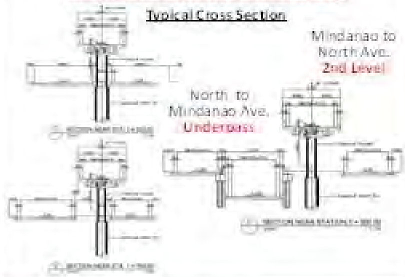
Mindanao to North Ave

Profile



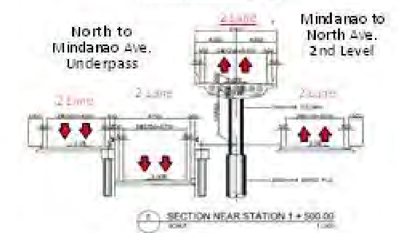
Scheme-2: Flyover & Underpass

Typical Cross Section



Scheme-2: Flyover & Underpass

Typical Cross Section



Comparison of Alternatives for N/M

	Scheme 1	Scheme 2
Cost	Expensive (127%)	Cheap (100%)
Construction Duration	[illegible] months	[illegible] months
Construction Performance	*Double flyover complicated *Steel box girder	*2 layer construction complicated *Require special construction method & procedure [illegible]
Traffic Condition at grade	* Close access to SM The Block	*Restriction section is shorter than Sch.1
Operation & Maintenance	*Painting for steel members	*Required periodic inspection and O&M [illegible]
Environ and Social Conditions	*ROW acquisition *Noise/Fumes more emission than Sch.2	*No ROW acquisition *Aesthetic view is better than Sch1 *Dumping site for excavated soil
Recommend	○	◎

Schedule of Project Implementation

- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012

In case project is implemented, the following is scheduled

- Loan Agreement in March 2013.
- Selection of Consultant will start in April 2013.
- Detailed Design will start in the End of 2013.
- Construction will start in the Middle of 2016.

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental Considerations

Environmental Impact Assessment (EIA)

- In accordance with Philippines Environmental Impact Assessment System (PD No.1586 (1978)), documents such as Environmental Impact Statement or Initial Environmental Examination Report required for Environmental Compliance Certificate (ECC) will be prepared by DPWH with assistance of JICA Study Team.
- In addition, because of requirement of Japanese ODA Loan, JICA requests DPWH to comply with "JICA Guidelines for Environmental and Social Considerations (2010)".

JICA Guidelines for Environmental and Social Considerations (April 2010)

- Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.
- Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.

Process of EIA/RAP Study for Interchange Project

- Proposal of Alternative Schemes

↓

- Analysis of Alternatives
- Evaluation of Potential Impacts

Scoping

Today

↓ Public Consultation Meeting

- Final Proposed Scheme of Interchange
- EIA & RAP study results
  - Mitigation measures and monitoring plan
  - Eligibility & Compensation, Entitlement matrix

↓ Public Consultation Meeting

Early April

- Final EIA & RAP Reports

Potential Impacts: Positive(+) Negative(-)

Natural Environment & Human Health		
Items	Potential Impacts	Mitigation Measures
Flora & Fauna	(-) Cutting trees where necessary	Replant trees
Air quality	(+) Reduction of traffic congestion → Abatement of air pollutants emission	Estimated by future traffic flow
Noise & Vibration	(-) Noise emitted from vehicles: Tunnel, boundary, [illegible]	Install noise barrier, Plant trees
Landscape	(-) Flyover: Deteriorate aesthetic view	Design consideration
Flooding	(-) Tunnel: Flooding during heavy storms	Pump and sump pit
Waste	(-) Construction waste (-) Tunnel: excavated waste soil	Reduce/Reuse, Proper Disposal
Water & Soil pollution	(-) Discharge and leakage from construction machines and vehicles	Strictly control

Baseline Environmental Surveys

- In order to predict and assess the impacts, and consider the mitigation measures, the following surveys are carrying out to understand the present conditions:
  1) Ambient air quality
  2) Noise level

Potential Impacts: Positive(+) Negative(-)

Social Environment		
Items	Potential Impacts	Mitigation Measures
Land Acquisition	(-) Minimal ROW acquisition due to improvement of IC (but No demolition & resettlement) (-) EDSA Tunnel: Require ROW (400m²) for pump drainage system	Minimize ROW acquisition by design consideration
Local Economy	(+) Workers are locally employed (-) Business activity temporary disturbed	To be assessed
Local Conflict	(-) Ill redistribution of benefits and damage among communities	Consultation with Barangays
Traffic Safety	(-) Construction: Congestion/accident increase (+) Operation: improve traffic safety	• Traffic Management Plan • Advance notice
Sanitation	(-) Unfavorable due to increase of construction workers	Portable toilets & Training Campaign

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Resettlement Action Plan (RAP)

- The Social Impact Assessment in the form of RAP (Resettlement Action Plan) will be undertaken based on the LARRIPP (Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy) which is applied to all infrastructure projects implemented by the DPWH, whether foreign or locally funded.
- LARRIPP includes: a) legal framework; b) eligibility, compensation & other entitlements; c) public participation & consultation; d) institutional arrangements; and e) monitoring mechanism.
- Also RAP shall comply with "JICA Guidelines (2010)".

Socio-economic Survey

- There will be no demolition of buildings and involuntary resettlement due to the I/C projects, although required additional ROW.

However,

- Business activities are likely to be affected during construction.

↓

- Socio-economic surveys shall be conducted.

Socio-economic Survey

Type of Survey	Contents
Census Survey	All occupants in construction area shall be counted to confirm the number of PAPs.
Assets & Land Survey	Item and magnitude of PAPs asset affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production system, labor, household, baseline information on livelihoods and standard of living shall be surveyed.

Socio-economic Survey

- Socio-economic Survey has been undertaken since First day of February, 2012.
- This date is the Cut-off Date.

  Persons not covered at the time of census taking will not eligible for claims of compensation entitlements.

- Your cooperation to the surveys will be much appreciated.

Next Public Consultation Meeting

Objectives

To explain:

1) Final Scheme of the Interchange
2) Main Results of the EIA & RAP Study

Date

Early April

Maraming salamat!

Discussion

Comments / suggestions will be much appreciated

3) Third Public Consultation Meeting

Barangay	Pag-asa
Date	April 17,2012
Venue	Barangay Pag-asa Brgy. Hall

Attendees

No	Name	Designation	No	Name	Designation
1	Noly Pelaez	Kagawad	7	Engr. Roy Cruz	DPWH-UPRO
2	Lily Jaramilla	Brgy. Pag-asa	8	Dolores M. Viloria	DPWH-ESSO
3	Alberto Canceran	Brgy. Pag-asa	9	Clarette Estranero	DJMV Management Consultancy
4	Josefina Jaramilla	Brgy. Pag-asa	10	Daniel L. Manzano	DJMV Management Consultancy
5	Engr. Ron Manalo	Operation Manager, SM City	11	Arnold A. Nacuspag	DJMV Management Consultancy
6	Miguel Emmanuel B. Gaspi	Bldg. Admin OfficerSM City			

Photographs of the Third Public Consultation Meeting

Presentation Materials for the 3rd Level Public Consultation Meeting
EDSA/North Ave./West Ave./Mindanao Ave.

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

April2012
Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. Results of Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   2.1 Selected Scheme of Interchange
   2.2 Environmental and Social Considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the selected scheme of interchange;
- To comply with PEISS and JICA Guidelines
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

EDSA-North/West/Mindanao I/C

EDSA-North/West I/C
- Selected Scheme: Flyover

North-Mindanao I/C
- Selected Scheme: Flyover & Tunnel

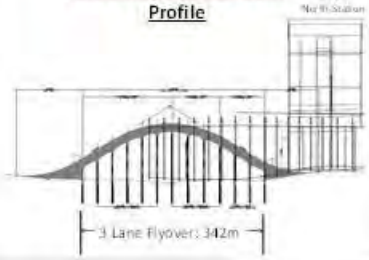
EDSA-North/West Interchange

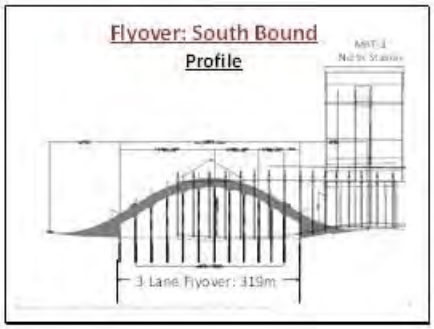
EDSA-North/West Interchange

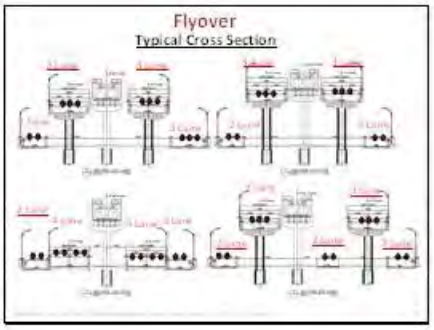
EDSA-North/West Interchange

Flyover: North Bound

Profile

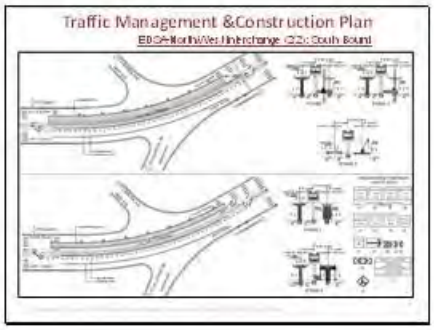



Flyover: South Bound
Profile
3 Lane Flyover: 319m


Flyover
Typical Cross Section


Intersection Plan
EDSA
North Ave
West Ave
EDSA


Traffic Management &Construction Plan


Traffic Management &Construction Plan


North-Mindanao Ave. Interchange


North-Mindanao Ave. Interchange


North-Mindanao Ave. Interchange

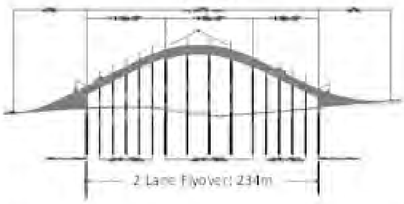

North-Mindanao Ave. Interchange


Left Turn Flyover & Underpass
North to Mindanao Ave
Profile
2 Lane Tunnel: 95m

Left Turn Flyover & Underpass

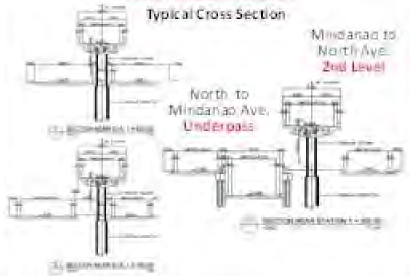
Mindanao to North Ave

Profile



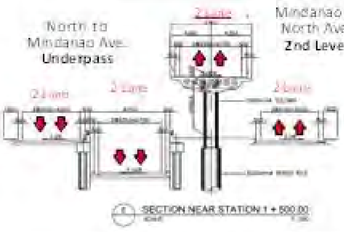
Flyover & Underpass

Typical Cross Section



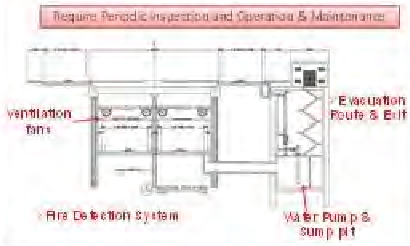
Scheme-2: Flyover & Underpass

Typical Cross Section

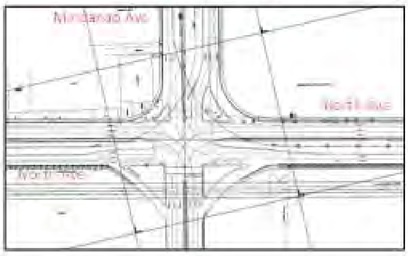


Scheme -2: Tunnel

Typical Cross Section

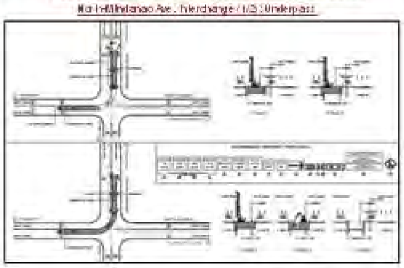


Intersection Plan



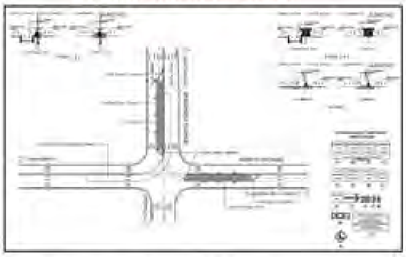
Traffic Management &Construction Plan

North-Mindanao Ave. Interchange (1/3): Underpass



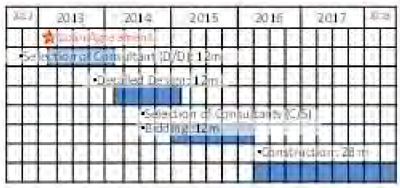
Traffic Management &Construction Plan

North-Mindanao Ave. Interchange (2/3): Flyover



Schedule of Project Implementation

- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012



JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental Considerations

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Trees	•Pay careful attention to trees on central islands/roadsides. •Plant native species of trees along the roadsides.
Air quality	•Provide proper construction machines and heavy vehicles in order to reduce the emission of exhaust gas. •Maintain construction machines and heavy vehicles properly. Stop unnecessary idling. •Keep down dust by watering during the dry season. •Reduce the emission of air pollutants by utilizing low-emission construction machines and vehicles.
Noise & Vibration	•Inform construction schedule to residents in advance. •Control construction works at night. •Use low-noise construction machines and heavy vehicles.

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Waste	• Prepare proper construction plan to minimize waste generated from construction work. • Implement proper management and disposal of construction waste. • Train construction workers on environmental conservation.
Water & Soil pollution	• Provide proper construction machines and heavy vehicles and maintain them properly. • Avoid the improper land moving to prevent soil erosion from the construction sites, especially during rainy season. • Install a protector and drainage facilities to prevent soil erosion caused by surface runoff during a storm. • Treat properly wastewater from asphalt wearing and concrete pavement work.

Mitigation/Enhancement Measures

II. Operation Phase

Natural Environment & Human Health	
Trees	• Monitor the growth of trees and plants on central reserves and sidewalks.
Air quality	• Due to increase of travel speed and decrease of travel distance of vehicles, the flyover would reduce air pollutant (NO_2, SO_2, TSP) emissions if compared to the without project case.
Noise & Vibration	• Install noise barriers where necessary. • Plant trees on sidewalks. • To consider traffic regulations on controlling the lane for heavy vehicles to reduce noise and vibration.

Mitigation/Enhancement Measures

Typical Noise Mitigation Measures

Mitigation measures	Function	Effectiveness
Noise Barriers	Noise barriers reduce noise by diffraction	About 10 dB
Low Noise pavement	Small porous in the asphalt pavement surface absorb the noise generated by friction between the car tires and road surface.	About 3 dB
Environmental Buffer Zone (Vegetation)	Trees are planted to create green spaces and reduce noise by distance from noise sources.	5~10 dB

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Social Environment	
Land Acquisition	• Minimize ROW acquisition by design consideration.
Local Economy	• (+) Hire unskilled labor (>90%) and skilled labor (>30%). • (-) Disturbance to business activities. Disseminate information on a construction plan (schedule, traffic management plan) and compensate if necessary.
Traffic Safety	• Traffic Management Plan • Provide adequate education and training to construction workers regarding traffic safety. • Deploy the traffic control men and install information boards at appropriate position to avoid traffic jam/accident.
Sanitation	• Portable toilets & training campaign for construction workers to prevent infectious diseases.

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Land Acquisition

- Additional ROW requirement for Sump pit : About 50 sq.m within the Veterans Medical Center Golf Course.

Project Affected Structures

Marginally Affected Extension (Pavement) in Brgy. Pag-Asa

No	Name	Owner
1	[illegible]	
2	[illegible]	
3	[illegible]	
4	[illegible]	
5	[illegible]	
6	[illegible]	[illegible]
7	[illegible]	
8	[illegible]	
9	[illegible]	
10	[illegible]	
11	[illegible]	
12	[illegible]	

No	Name	Owner
13	[illegible]	
14	[illegible]	
15	[illegible]	
16	[illegible]	
17	[illegible]	
18	[illegible]	[illegible]
19	Stall # 10	[illegible]
20	[illegible]	[illegible]
21	Stall # 11	[illegible]
22	[illegible]	
23	[illegible]	
24	[illegible]	[illegible]
25	[illegible]	

Note:
The Cut-off date for eligibility for compensation was set on 1st February 2012.

Affected Other Structures

No	Kind of Posts	Brgy. [illegible]	Brgy. [illegible]	Brgy. Pag-Asa	TOTAL
1	Utility Post (inside the pink line)			22	22
2	Utility Post (outside the pink line)	12	6		18
3	Lamp Post (outside the pink line)	10	9	18	37
4	Street Marker/Signage (inside)				4
5	Ground Board				1
6	Train Light			1	1
7	Waiting Shed			1	1
8	Foot Bridge				7
9	[illegible]			8	8
10	Brgy. Outpost				1
11	Bridge				1

Affected Trees

Baragay. Pag-Asa

Species	No. of Trees	Diameter (cm)	Height (m)	Volume (cu.m)	Amount
[illegible]	1				
[illegible]	7				
[illegible]	4				
[illegible]	1				
[illegible]	1				
[illegible]	6				
[illegible]	2				
[illegible]	1				
[illegible]	6				
[illegible]	40				
[illegible]	1				
[illegible]	2				
[illegible]	22				
[illegible]	22				
[illegible]	1				
[illegible]	1				
TOTAL	146				[illegible]

Entitlement Matrix (Draft) (1/2)

Type of Loss: STRUCTURES
(Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
More than 20% of the total (residential) loss or where less than 20% loss but the remaining structure no longer function as intended or no longer viable for continued use	AF with TCT or tax declaration (Tax declaration can be legalized to full title)	AF will be entitled to: • Cash compensation for entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment for land.
	AF without TCT	AF will be entitled to: • Cash compensation for entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land.

Entitlement Matrix (Draft) (2/2)

Type of Loss: STRUCTURES
(Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
[illegible]	AP with TCT or tax declaration [illegible]	• Compensation for affected portion of the structure
	AP without TCT	• Compensation for affected portion of the structure

[illegible]

Socio-Economic Survey

Type of Survey	Contents
Census Survey	All occupants in project area shall be counted in order to confirm the number of PAPs
Assets & Land Survey	Item and magnitude of PAPs asset affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production system, labor, household, baseline information on livelihoods and standard of living shall be surveyed.

Environmental Impact Assessment (EIA)

- Initial Environmental Examination (IEE) Report will be prepared including:
  - ✓Environmental Management Plan
  - ✓Social Development Program
  - ✓Abbreviated Resettlement Action Plan
- Final IEE Report will be submitted to DENR, in order to obtain the Environmental Compliance Certificate (ECC).

Maraming salamat!

Discussion

Comments / suggestions will be much appreciated

Appendix 7.2.4 C-5/Green Meadows/Acropolis/Calle Industria Interchange

1) First Public Consultation Meeting

Barangay	Bagumbayan, Ugong Norte
Date	January 20, 2012, 10:00AM -12:00N
Venue	Brgy Bagumbayan Conference Hall

Attendees

No	Name	Designation	No	Name	Designation
1	Dr. Elmer Maturan	Punong Barangay	8	Nellie A. Cruz	Brgy Secretary
2	Marcos Mejia	Kagawad	9	Rachelle Bernadez	
3	Vener Mejia	Kagawad	10	Jessie D. Borgonia	Brgy secretary/Ugong Norte
4	Rolando Alvarez	Kagawad	11	Dolores M. Viloria	DPWH-ESSO
5	Efren R. Taguibao	Kagawad	12	Abigail E. Desaer	DJMV Management Consultancy
6	Joel Victorino	Kagawad	13	Daniel L. Manzano	DJMV Management Consultancy
7	Alfie Mejia	Kagawad	14	Arnold A. Nacuspag	DJMV Management Consultancy

Photographs of the First Public Consultation Meeting

2) Second Public Consultation Meeting

Barangay	Bagumbaya
Date	February 22, 2011 / 10:00AM-12:30PM
Venue	Brgy. Bagumbayan Covered Court

Attendees

No	Name	Designation	No	Name	Designation
1	Let Puno		41	Robert Rosita	
2	Geraldine Malik		42	Josefa Altajade	
3	Grace Sumbillo		43	Rachelle Bernandez	
4	Jackie Colico		44	Danilo Cajailaw	
5	Antonio Miranda		45	Theya Javier	
6	Victor Fulla		46	Yancy Lavarcas	
7	Jojo Sanchez		47	Bhong Tamayao	
8	Porti Vencer		48	Amon David	
9	Dr. Nick Gomez		49	Bea Marzan	
10	Tes Remular		50	Ferdie Gavino	
11	Rose Jandog		51	Phillip Mercado	
12	Edwin Payot		52	Gellen Gahator	
13	Gene Yarte		53	D.R. Reyes	
14	Jun Bernal		54	Ding Solina	
15	Alex Lim		55	Adorina Lawan	
16	ALCOS		56	Nancy Concepcion	
17	Dan Herrera		57	Evelyn Velasco	
18	Michael Arguelles		58	Flora Mejia	
19	Jose Gamorot		59	Susan Sevin	
20	Raymond Tiu		60	Milett Gabriel	
21	RJ Rodriguez		61	Penafrancia Mendoza	
22	Daisy Alejado		62	Crescencia Canilana	
23	Eloy Estanislao		63	Emely Doroteo	
24	Macktrene Navarro		64	Clatilde Bautista	
25	Victor Custodio		65	Florentina Lising	
26	Cora Apena		66	Jomarie Magnilat	
27	Caloy Ramirez		67	Nina M. Cruz	
28	Gilbert Guevarra		68	Ram Roquez	
29	PO3 Alfredo Saplan		69	Ed Berina	
30	Shirley Caganda		70	Amalia Manalohan	
31	Elmer Maletu		71	Dick Montes	
32	Lando Alvarez		72	Ron Escobar	
33	Nelly Cay		73	Engr. Roy Cruz	DPWH-UPRO
34	Dennis Montalbo		74	Dolores M. Viloria	DPWH-ESSO
35	Elsie Marino		75	Masami Kimishima	JICA Study Team
36	Argil Salmar		76	Koyo Ogasawara	JICA Study Team
37	Sherwin Lacuna		77	Francisco A. Kalalo Jr.	JICA Study Team
38	Christopher De Guzman		78	Daniel L. Manzano	DJMV Management Consultancy
39	Sheryl Bernal		79	Arnold A. Nacuspag	DJMV Management Consultancy
40	Clarita Diones		80	Abigail E. Desaer	DJMV Management Consultancy

Photographs of the Second Public Consultation Meeting at Brgy. Bagumbayan

Barangay	Ugong Norte
Date	March 13, 2012 5:00 – 6:30 pm
Venue	Green Meadows Clubhouse, Brgy. Ugong Norte

Attendees

No	Name	Designation	No	Name	Designation
1	Alex Yabut		22	Yong Garcia	Kagawad
2	Eric Ruiz		23	Yasi Wells Jorge	
3	Ding Salipsip		24	Jacky King	
4	Ed Lecanienta		25	Hiyasmin Carayag	
5	Alvin Pino		26	Jessie Bongonca	
6	Alex A. Quizon		27	Steven Tan	
7	Cristine Baneco		28	Dulce Baretto	

8	L. Herrera		29	Miriam G. Orellano	
9	Manolo Dayrit		30	Aloha Abellera	
10	Sofia Villasenor		31	Aljun Supetran	
11	Carlos Alindada		32	Chuckie Antonio	
12	Leoncio Siy		33	Jessie Py	
13	Jorge Santos		34	Jose Mapusao	
14	Joey Campos		35	Ronald S. Elellina	
15	Mariano Ho		36	Engr. Roy Cruz	DPWH-UPRO
16	Ann Poa		37	Dolores M. Viloria	DPWH-ESSO
17	JC Bautista		38	Masami Kimishima	JICA Study Team
18	R.E. Lirio		39	Koyo Ogasawara	JICA Study Team
19	Ray E. Punzalan		40	Francisco A. Kalalo Jr.	JICA Study Team
20	Evelyn Sajonia		41	Daniel L. Manzano	DJMV Management Consultancy
21	Mike Teng		42	Abigail E. Desaer	DJMV Management Consultancy
22	Jose Gamorot				

Photographs of the Second Public Consultation Meeting at Brgy. Ugong Norte

Presentation Materials for the 2nd Level Public Consultation Meeting
C-5/Green Meadows/Acropolis/Calle Industria

Preparatory Survey for
Metro Manila Interchange Construction
Project (VI)

Public Consultation Meeting

13 March 2012
Barangay Ugong Norte, Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team

Agenda

1. Opening of the Meeting
2. JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   - 2.1 Alternative Schemes of Interchange
   - 2.2 Environmental and Social considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the outline of F/S conducted by JICA Study Team;
- To explain the alternative schemes of Interchange;
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

C-5/Green Meadows/ Acropolis/Calle Industria

Three Alternatives:

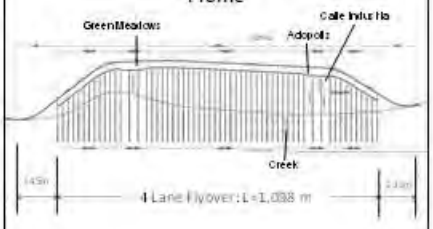
- Scheme 1: Flyover
- Scheme 2: Tunnel
- Scheme 3: Flyover and Tunnel

Scheme-1: Flyover

4 Lane Flyover: 1,098 m
Approach Road: 276.4 m

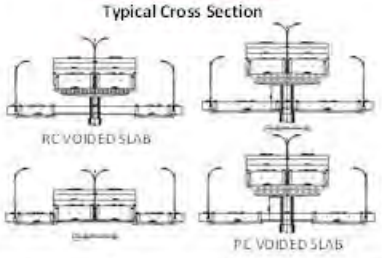
Scheme-1: Flyover

Profile



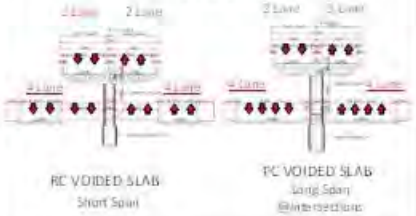
Scheme-1: Flyover

Typical Cross Section



Scheme-1: Flyover

Typical Cross Section

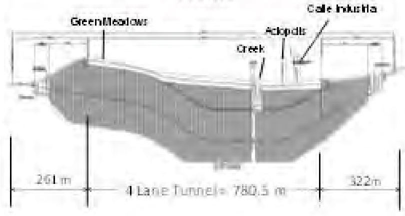


Scheme-2: Tunnel

4 Lane Tunnel: 780.5 m
Approach Road: 583.5 m

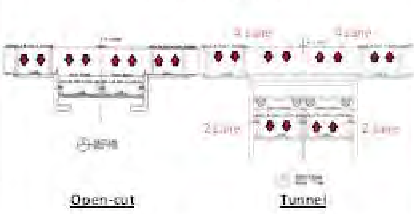
Scheme-2: Tunnel

Profile



Scheme-2: Tunnel

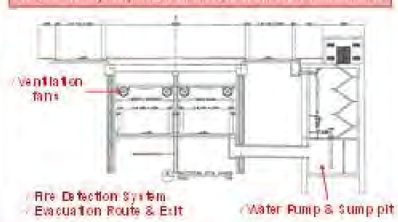
Typical Cross Section



Scheme-2: Tunnel

Typical Cross Section: Tunnel

Require Daily Inspection and Operation & Maintenance

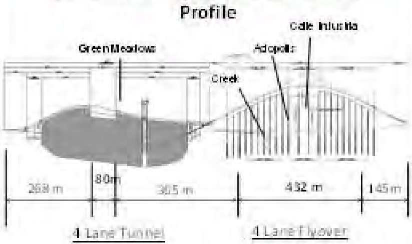


Scheme -3: Flyover and Tunnel

4 Lane Flyover : 432 m
Approach Road: 314 m
4 Lane Tunnel: 80 m
Underpass section : 465 m

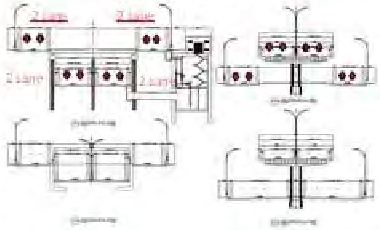
Scheme-3: Flyover and Tunnel

Profile



Scheme-3: Flyover and Tunnel

Typical Cross Section



Scheme -3: Flyover and Tunnel

Typical Cross Section

Require Periodical Inspection and O & M

Comparison of Alternatives

	Scheme 1 Flyover	Scheme 2 Tunnel	Scheme 3 Flyover & Tunnel
Cost	Cheap (103%)	Most expensive (276%)	Cheapest (100%)
Construction Duration	Short (24 months)	Longer (33 months)	Short (24 months)
Construction performance	Easier	Harder due to existing roads & excavated waste soil	Construction of Tunnel and Flyover Simultaneously
Operation & Maintenance	No need for O&M	Permanent O&M system is required	Periodic O&M system is required
Traffic Condition	Can provide 4-lanes each at grade	Can provide 4-lanes each at grade	Only provide 2-lanes, Longer vertical alignment
Environment and Social Conditions	Noisy	*Noise & exhaust fumes [illegible] *Aesthetic view is preserved *Extra ROW for Sump pit	Noisy Extra ROW for sump pit
Recommendation	◎	△	○

Schedule of Project Implementation

- Preparatory survey: Nov. 2011 to Nov. 2012
- Project Evaluation by GOJ: from Dec. 2012

In case projects are implemented, the following is scheduled:

- Loan Agreement in March 2013.
- Selection of Consultant will start in April 2013.
- Detailed Design will start in the End of 2013.
- Construction will start in the Middle of 2016.

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental and Social Considerations

Environmental Impact Assessment (EIA)

- In accordance with Philippines Environmental Impact Assessment System (PD No.1586 (1978)), documents such as Environmental Impact Statement or Initial Environmental Examination Report required for Environmental Compliance Certificate (ECC) will be prepared by DPWH with assistance of JICA Study Team.
- In addition, because of requirement of Japanese ODA Loan, JICA requests DPWH to comply with "JICA Guidelines for Environmental and Social Considerations (2010)".

JICA Guidelines for Environmental and Social Considerations (April 2010)

- Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.
- Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.

Process of EIA Study for Interchange Project

- Proposal of Alternative Schemes

↓

- Analysis of Alternatives
- Evaluation of Potential Impacts

Scoping

Today

↓ Public Consultation Meeting

- Final Proposed Scheme of Interchange
- EIA study results
  - Environmental Management Program
    - Mitigation Measures and Monitoring Plans

↓ Public Consultation Meeting

- Final EIA Report

End of March

Potential Impacts: Positive(+) Negative(-)

Natural Environment & Human Health		
Items	Potential Impacts	Mitigation Measures
Flora & Fauna	(-) Cutting 3 trees on the central reserve	Plant trees
Air quality	(+) Reduction of traffic congestion → Abatement of air pollutants emission	Predicted by [illegible] traffic flow
Noise & Vibration	(-) Noise emitted from vehicles; Tunnel: less noisy [illegible]	Noise barriers; [illegible]
Landscape	(-) Flyover: Obstructing aesthetic view	Design consideration
Flooding	(-) Tunnel: flooding due to heavy storms	Pumps and sump pit
Waste	(-) Construction waste; Tunnel: Excavated waste soil	3R (Reduce, Reuse, Recycle)
Water & Soil pollution	(-) Drainage and leakage from construction machines and vehicles	Strictly control

Potential Impacts: Positive(+) Negative(-)

Social Environment		
Items	Potential Impacts	Mitigation Measures
Land Acquisition	(-) Tunnel: Require ROW (400 sq.m) for pump station and sump pit	To be surveyed
Local Economy	(+) Workers are locally employed	
Local Conflict	(-) If misdistribution of benefit and damage among communities	Consultation with Barangays officials
Traffic Safety	(-) Construction: Congested and accident increase (+) Operation: improve traffic safety	Advance notice on construction plan and detour routes
Sanitation	(-) Unfavorable due to increase of construction workers	Portable toilets & Training Campaign

Baseline Environmental Surveys

- In order to predict and assess the impacts, and consider the mitigation measures, the following surveys are carrying out to understand the present conditions:
  1) Ambient air quality
  2) Noise level

Maraming salamat!

Discussion

Comments / suggestions will be much appreciated

3) Third Public Consultation Meeting

Barangay	Bagumbayan, San Roque
Date	March 29, 2012 at 10:00AM-12:30 PM
Venue	Brgy. Bagumbayan Covered Court

Attendees

No	Name	Designation	No	Name	Designation
1	Dr. Elmer Maturan	Punong Barangay	29	Marites P. Semian	San Roque
2	Marites P. Semian	San Roque	30	Lourdes Cog	
3	Sumen C. Matora	San Roque	31	Paulino Orcales	
4	Lilia Concepcion	BH V4/San Roque	32	Lita Orcales	
5	Richard Aquino	San Roque	33	Lyn Orcales Yu	
6	Angelito Z. Mejia	San Roque	34	Roley Saldana	
7	Dickven Beltran	San Roque	35	Adelisay Saldana	
8	Rodrigo Jocson	San Roque	36	Russel Saldana	
9	Emelita Escarnula	San Roque	37	Reynald Saldana	
10	Gloria C. De Guzman	San Roque	38	Rommel Saldana	
11	Cezar M. Remia	San Roque	39	Elmer Matuno	
12	Precy Balganio	San Roque	40	Cesar San Juan	
13	Donna Concepcion	San Roque	41	Randolph Cruz	
14	Domeng Reyes	San Roque	42	Ric Trinidad	
15	Letty D. Diano	San Roque	43	Raquel Ramos	
16	D. Cruz	San Roque	44	Christopher C. De Guzman	
17	Alfie Z. Mejia	Kagawad/Bagumbayan	45	Jonard L. Dilabayao	
18	Mila Aquino	San Roque	46	Joshua Weaverling	
19	Alicia Giron	BPSO	47	Donato Maturan	
20	G. Asuncion	San Roque	48	Melvin Ebdane	KSLI, Kalinisan
21	Mildred Ambon	San Roque	49	Rey Narvaez	Mercury
22	Marivic Cruz	San Roque	50	Engr. Roy Cruz	DPWH-UPRO
23	Richard Dela Cruz	San Roque	51	Dolores M. Viloria	DPWH-ESSO
24	Maricris Cacalda	San Roque	52	Francisco A. Kalalo Jr.	JICA Study Team
25	Glicerio S. Cog	San Roque	53	Clarette Estranero	DJMV Management Consultancy
26	Olen Greg	San Roque	54	David Ganje	DJMV Management Consultancy
27	Mark Joseph Cog	San Roque	55	Abigail E. Desaer	DJMV Management Consultancy
28	Catherine G. Cruz	San Roque	56	Arnold Nacuspag	DJMV Management Consultancy

Photographs of the Third Public Consultation Meeting at Brgy. Bagumbayan

Presentation Materials for the 3rd Level Public Consultation Meeting
C-5/Green Meadows/Acropolis/Calle Industria

Preparatory Survey for
Metro Manila Interchange Construction Project (VI)

Public Consultation Meeting

31 March 2012
Barangay Bagumbayan, Quezon City

Department of Public Works and Highways (DPWH)

JICA Study Team
Katahira & Engineers International
Oriental Consultants
Nippon Engineering Consultants

Agenda

1. Opening of the Meeting
2. Results of Preparatory Survey for Metro Manila Interchange Construction Project (VI)
   2.1 Selected Scheme of Interchange
   2.2 Environmental and Social Considerations
3. Discussion
   Comments and suggestions by stakeholders
4. Closing of the Meeting

Objective of This Meeting

- To explain the selected scheme of interchange;
- To comply with PEISS and JICA Guidelines
- To obtain comments/suggestion of stakeholders on the Project and Environmental and Social considerations.

Comments/suggestion of stakeholders will be taken into account in the Project and the ESIA study

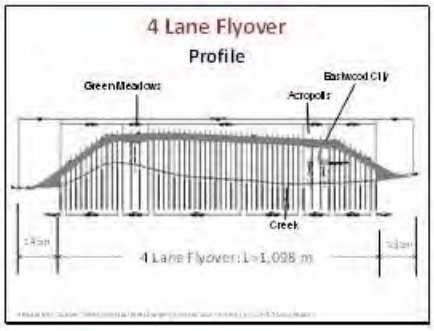
JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

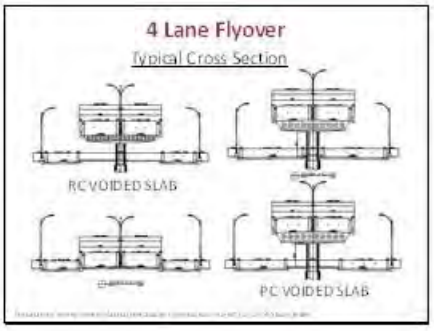
C-5/Green Meadows/ Acropolis/Calle Industria Interchange

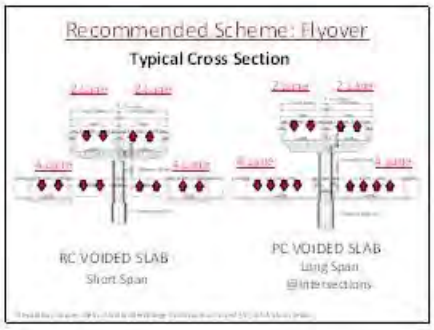
Selected Scheme:
Flyover & 4-Lanes Additional Approach

4 Lane Flyover

4 Lane Flyover: 1,098 m
Approach Road: 276.4 m

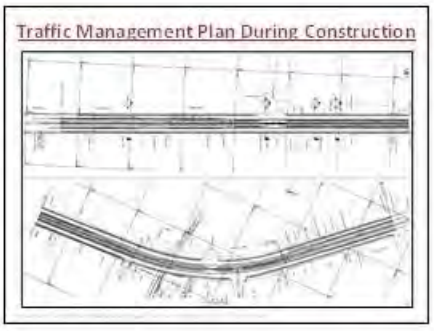




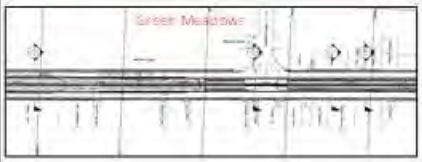


JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

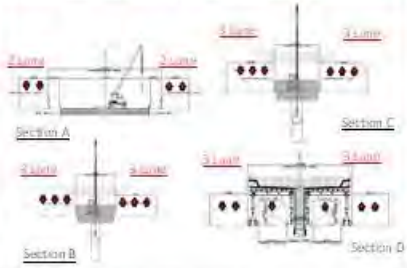
Traffic Management Plan



Traffic Management Plan During Construction



Traffic Management Plan During Construction



JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Environmental & Social Considerations

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Trees	• Pay careful attention to trees on central island/roadsides. • Plant native species if there along the roadsides.
Air quality	• Provide proper construction machines and heavy vehicles in order to reduce the emission of exhaust gas. • Maintain construction machines and heavy vehicles properly. Stop unnecessary idling. • Keep down dust by watering during the dry season. • Reduce the emission of air pollutants by utilizing low emission construction machines and vehicles.
Noise & Vibration	• Inform construction schedule to residents in advance. • Control construction works at night. • Use low-noise construction machines and heavy vehicles.

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Natural Environment & Human Health	
Waste	• Prepare proper construction plan to minimize waste generated from construction work. • Implement proper management and disposal of construction waste. • Train construction workers on environmental conservation.
Water & Soil pollution	• Provide proper construction machines and heavy vehicles and maintain them properly. • Avoid the improper land mound to prevent soil erosion from the construction site, especially during rainy season. • Install a protector and drainage facilities to prevent soil erosion caused by surface runoff during a storm. • Treat properly wastewater from asphalt wearing and concrete pavement work.

Mitigation/Enhancement Measures

II. Operation Phase

Natural Environment & Human Health	
Trees	• Monitor the growth of trees and plants on central reserves and sidewalks.
Air quality	• Due to increase of travel speed and decrease of travel distance of vehicles, the flyover would reduce air pollutant (NO_x, SO_2, TSP) emissions if compared to the without project case.
Noise & Vibration	• Install noise barriers where necessary. • Plant trees on sidewalks. • To consider traffic regulations on controlling the level for heavy vehicles to reduce noise and vibration.

Mitigation/Enhancement Measures

Typical Noise Mitigation Measures

Mitigation measures	Function	Effectiveness
Noise Barriers	Noise barriers reduce noise by diffraction.	About 10 dB
Low Noise pavement	Small porous in the asphalt pavement surface absorb the noise generated by friction between the car tires and road surface.	About 3 dB
Environmental Buffer Zone (Vegetation)	Trees are planted to create green spaces and reduce noise by distance from noise sources.	5~10 dB

Mitigation/Enhancement Measures

I. Pre-Construction and Construction Phases

Social Environment	
Land Acquisition	• Minimize ROW acquisition by design consideration.
Local Economy	• (-) Hire unskilled labor (>50%) and skilled labor (>30%). • (-) Disturbance on business activities. Disseminate information on a construction plan (schedule, traffic management plan) and compensate if necessary.
Traffic Safety	• Traffic Management Plan. • Provide adequate education and training to construction workers regarding traffic safety. • Deploy the traffic control men and install information boards at appropriate position to avoid traffic jam/accident.
Sanitation	• Portable toilets & training campaign for construction workers to prevent infectious diseases.

JICA Preparatory Survey for Metro Manila Interchange Construction Project (VI)

Social Considerations

Affected Other Structures/Facilities

No	Kinds of Posts	Bgy. Ugong Norte	Bgy. Bagumbayan	TOTAL
1	Utility Pole (inside pavement)	5	100	105
2	Utility Pole (outside pavement)	3	83	86
3	Electrical Post (inside pavement)	3	2	5
4	Street Marker / Sign pole (Inside)		4	4
5	Street Marker / Sign pole (Outside)		4	4
6	Control Board	1		1
7	Signboard	4	3	7
8	Traffic Light		4	4
9	Waiting Shed	1	3 (Inside)	4
10	Fire Hydrant		2	2
11	Fire Hydrant		1	1
12	Fence		1 (Inside)	1
13	Bridge		1	1

Affected Trees

Barangay Ugong Norte

Species	No. of Trees	Diameter (cms)	Height (m)	Volume (cu.m)	Amount
Mahogany (s)	1				
Bougainvilla	1				
Total	2				0.00

Affected Trees

Barangay Bagumbayan

Species	No. of Trees	Diameter (cms)	Height (m)	Volume (cu.m)	Amount
Indian Tree (FG)	26				
Bougainvilla	234				
Mahogany (s)	3				
Mahogany (m)	15				
Mahogany (FG)	23				
Banaba	66				
Acacia	5				
Alibangbang	4				
Narra (s)	2				
Rosa	6				
Fire Tree (s)	2				
Camachile (FG)	1				
Ipil-ipil (FG)	2				
Banaba (newly planted)	6				
Balete	2				
TOTAL	388				[illegible]

Entitlement Matrix (Draft) (1/2)

Type of Loss: STRUCTURES
(Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
More than 20% of the total landholding loss or where less than 20% loss but the remaining structure is no longer functional as intended or no longer viable for continued use	AP with TCT or tax declaration (Tax declaration can be legalized to full title)	AP will be entitled to: • Cash compensation for entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land.
	AP without TCT	AP will be entitled to: • Cash compensation for entire structure at 100% of replacement cost. • Rental subsidy for the time between the submission of complete documents and the release of payment on land.

DPWH (2007)
Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy, 3rd edition

Entitlement Matrix (Draft) (2/2)

Type of Loss: STRUCTURES
(Classified as residential/Commercial/Industrial)

Application	Entitled Person	Compensation/ Entitlements
Less than 20% of the total landholding lost or where the remaining structures can still function and is viable for continued use	AP with TCT or tax declaration (Tax declaration can be legalized to full title)	• Compensation for affected portion of the structure
	AP without TCT	• Compensation for affected portion of the structure

DPWH (2007)
Land Acquisition, Resettlement, Rehabilitation and Indigenous Peoples' Policy, 3rd edition

Socio-Economic Survey

Type of Survey	Contents
Census Survey	All occupants in project area shall be counted in order to confirm the number of PAPs
Assets & Land Survey	Item and magnitude of PAPs asset affected by the project physically and economically shall be evaluated.
Livelihood & Living Survey	Standard characteristics of the household including description of production system, labor, household, baseline information on livelihoods and standard of living shall be surveyed.

Environmental Impact Assessment (EIA)

- Initial Environmental Examination (IEE) Report will be prepared including:
  - ✓Environmental Management Plan
  - ✓Social Development Program
- Final IEE Report will be submitted to DENR, in order to obtain the Environmental Compliance Certificate (ECC).

Maraming salamat!

Discussion

Comments / suggestions will be much appreciated

A7.3

JICA Environmental Checklist

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) Y (b) N (c) - (d) -	(a) The Initial Environmental Examination (IEE) report for each interchange project has been prepared in June 2012. (b) DPWH will submit the IEEs to the Environmental Management Bureau (EMB) in August 2012 to obtain the Environmental Compliance Certificate (ECC) by the middle of September 2012. (c) Not yet. (d) Not yet. The ECC may prescribe the required permits/documents.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders? (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a) Three rounds of public consultation meetings were held at each project site of proposed interchanges. The objectives of 3 round meetings were as follows. • 1st round: To disseminate the outline of the interchange projects; • 2nd round: To explain the alternative schemes of interchange, draft scoping of EIA and RAP preparation; • 3rd round: To explain the selected scheme of interchange and the main results of EIA and RAP studies (b) Comments raised by local communities and stakeholders in the public consultation meetings had been recorded and carefully considered during the preparation of IEE reports and also Abbreviated Resettlement Action Plans (ARAPs).
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Project alternatives for four interchanges were analyzed. The alternatives including a zero option (without-the-project) case were comparatively evaluated not only from the viewpoints of environmental and social considerations but also from technical and economical viewpoints.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
2 Pollution Control	(1) Air Quality	(a) Is there a possibility that air pollutants emitted from the project related sources, such as vehicles traffic will affect ambient air quality? Does ambient air quality comply with the country's air quality standards? Are any mitigating measures taken? (b) Where industrial areas already exist near the route, is there a possibility that the project will make air pollution worse?	(a) Y (b) N	(a) As the traffic flow will increase due to the opening of the C-3 Missing Link in 2018, emissions of air pollutants (TSP, SO_2, NO_2) will increase in the without-project case. However, the emissions of air pollutants will decrease if the flyover is installed. The present air pollutant concentrations are below the maximum limits of the National Ambient Air Quality Guideline Values of the Philippine Clean Air Act of 1999. Therefore, ambient air quality in the future will comply with the Philippine air quality standards. (b) Refer to (a).
	(2) Water Quality	(a) Is there a possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water areas? (b) Is there a possibility that surface runoff from roads will contaminate water sources, such as groundwater? (c) Do effluents from various facilities, such as parking areas/service areas comply with the country's effluent standards and ambient water quality standards? Is there a possibility that the effluents will cause areas not to comply with the country's ambient water quality standards?	(a) N (b) N (c) -	(a) The flyover will be installed over the existing intersection. There will be no risk of water quality degradation due to the soil runoff from the bare lands. (b) The flyover will be installed over the existing intersection. Groundwater is not locally utilized. Pile driving will not affect groundwater flow. (c) No parking areas/service areas are planned in the interchanges.
	(3) Wastes	(a) Are wastes generated from the project facilities, such as parking areas/service areas, properly treated and disposed of in accordance with the country's regulations?	(a) Y	(a) There will be no parking areas/service areas in these interchange projects. Road garbage will be properly treated and disposed of in accordance with the regulations of the Philippines.
	(4) Noise and Vibration	(a) Do noise and vibrations from the vehicle and train traffic comply with the country's standards?	(a) N	(a) Reduction of traffic congestion is expected to contribute to noise abatement. As the traffic flow will increase, noise level will increase in the vicinity of the interchange. Therefore, the proper noise abatement measures should be

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
				taken into account along the roads close to the residential areas • Trees should be planted in the central reserves and sidewalks where possible. • Based on the monitoring results of noise levels after opening the flyover, installation of noise barriers should be considered where necessary. • Regular monitoring of noise levels along the interchange should be conducted. • Install warning signs on road for horn ban, speed control and lane restriction. • Regular maintenance on road to keep road surface good condition. • Develop a mechanism to record and respond to monitoring results and complaints.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a) N	1) There are no protected areas in the vicinity of the project areas.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Are adequate protection measures taken to prevent impacts, such as disruption of migration	(a) N (b) N (c) N (d) N (e) N (f) N	(a) The project sites are located at the existing intersections in the urbanized areas. There are no ecologically valuable habitats. (b) The project sites are located at the existing intersections in the urbanized areas. There are no habitats of the protected species. (c) Refer to (a). (d) Refer to (a). (e) Native plant species will be used for re-vegetation, where necessary. (f) Not applicable.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		routes, habitat fragmentation, and traffic accident of wildlife and livestock? (e) Is there a possibility that installation of roads will cause impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystems due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered? (f) In cases the project site is located at undeveloped areas, is there a possibility that the new development will result in extensive loss of natural environments?		
	(3) Hydrology	(a) Is there a possibility that alteration of topographic features and installation of structures, such as tunnels will adversely affect surface water and groundwater flows?	(a) N	(a) Impacts on surface water and groundwater flows caused by the interchange projects will be negligible.
	(4) Topography and Geology	(a) Is there any soft ground on the route that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed? (b) Is there a possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides? (c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	(a) N (b) N (c) Y	(a) There is no soft ground at the interchange project sites. (b) There is no large-scale filling and cutting work. (c) Proper mitigation measures will prevent soil runoff. Mitigation measures: The proper design of road drainage system; Stabilization of the soil along the roadside and in the road reserve through re-vegetation; Use of diversion channels and silt traps to minimize erosion of soil materials into waterway; and etc. Furthermore, All excavations and earth movements should be done in the dry seasons, as far as possible.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(1) Resettlement	(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? (b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement? (c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? (d) Are the compensations going to be paid prior to the resettlement? (e) Are the compensation policies prepared in document? (f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? (g) Are agreements with the affected people obtained prior to resettlement? (h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan? (i) Are any plans developed to monitor the impacts of resettlement? (j) Is the grievance redress mechanism established?	(a) Y (b) Y (c) Y (d) Y (e) Y (f) Y (g) - (h) Y (i) Y (j) Y	(a) ARAPs were prepared for each interchange project. ➢ C-3/E. Rodriguez Avenue: No land acquisition and resettlement. ➢ EDSA/Roosevelt/Congressional Interchange: No land acquisition and resettlement. ➢ EDSA-North/West/Mindanao Interchange: About 50 sq. m of ROW is required for sump pit within the Veterans Medical Center Golf Course in order to avoid flooding of the underpass from North to Mindanao Ave. ➢ C-5/Green Meadows/Acropolis/Calle Industria Interchange: No land acquisition and resettlement. (b) Three rounds of public consultation meetings were held for the communities at each interchange project sites. (c) ARAPs were prepared based on JICA Guidelines and World Bank OP 4.12 for each interchange project. (d) The compensations will be paid according to the implementation schedule shown in ARAP. (e) Eligibility and entitlement matrix were presented in ARAPs. (f) Vulnerable groups and persons were identified based on the socioeconomic studies and countermeasures for them are prepared respectively. (g) There will be no resettlement at all four interchange projects. (h) The organization framework was prepared in ARAPs. PMO and DPWH/ESSO plays a key role to implement the resettlement and has experience in handling resettlements work properly assisted by World Bank etc. Also DPWH has a lot of sociologists who are familiar with resettlement (i) Proper internal and external monitoring plan are prepared in ARAPs. (j) The grievance redress mechanism was established in ARAPs.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(2) Living and Livelihood	(a) Where roads are newly installed, is there a possibility that the project will affect the existing means of transportation and the associated workers? Is there a possibility that the project will cause significant impacts, such as extensive alteration of existing land uses, changes in sources of livelihood, or unemployment? Are adequate measures considered for preventing these impacts? (b) Is there any possibility that the project will adversely affect the living conditions of the inhabitants other than the target population? Are adequate measures considered to reduce the impacts, if necessary? (c) Is there any possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary? (d) Is there any possibility that the project will adversely affect road traffic in the surrounding areas (e.g., increase of traffic congestion and traffic accidents)? (e) Is there any possibility that roads will impede the movement of inhabitants? (f) Is there any possibility that structures associated with roads (such as bridges) will cause a sun shading and radio interference?	(a) N (b) N (c) N (d) N (e) Y (f) Y	(a) The project sites are located at the existing intersections in the urbanized areas and the flyovers and underpasses will be built. Therefore, the project will not affect any existing public transportation, and also not cause any significant changes in sources of livelihood and unemployment. (b) The project may not adversely affect the living conditions of the inhabitants other than the target population (c) Since workers will be locally employed in accordance with Republic Act No. 6685, no influx of workers from other areas is expected. (d) Since the interchange projects will improve the traffic of the existing intersections, any adverse impacts are not anticipated after opening the interchanges. (e) The traffic improvement projects contribute to improving safety and convenience of the communities. ➢ C-3/E. Rodriguez Avenue: Community severance due to the elevated thru road might not be anticipated because several pedestrian accesses will be provided along the additional approach. ➢ EDSA/Roosevelt/Congressional Interchange: Pedestrian access might be become slightly inconvenient because of the permanent removal of one bridge near the Muñoz station. Monitoring and consultations with local community should be conducted after opening the interchanges. (f) The flyovers may cause partial sunlight blocking. However, sun shading is considered to be minor impact. There will be no interference of radio waves due to the interchange projects.
	(3) Heritage	(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures	(a) N	(a) There are no local archeological, historical, cultural, and religious heritages.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		considered to protect these sites in accordance with the country's laws?		
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) Y	(a) The flyovers may cause deterioration of local aesthetic view. Mitigation measures are as follows: • Design consideration to avoid heavy-looking structure of flyover, and; • Plant trees where possible.
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples? (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources to be respected?	(a) N (b) -	(a) There are no ethnic minorities and indigenous peoples in the project areas. (b) Not Applicable.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project? (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials? (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.? (d) Are appropriate measures being taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) Y (b) Y (c) Y (d) Y	(a) DPWH shall observe the Philippines Occupational Safety and Health Standards (As Amended), 1992 associated with the working condition in the project. On the contrary, such laws and regulations shall be strictly observed and implemented. (b) DPWH shall ensure safety measures for the individuals involved in the project; this provision shall be incorporated in the Health and Safety Management Plan that shall be established as part of the contracts between the proponent and the contractor. (c) Safety instruction for new recruits, safety meetings and safety patrols shall be undertaken periodically. (d) DPWH shall ensure that security guards shall not violate the safety of other individuals involved or local residents; this provision shall also be incorporated as part of the Health and Safety Management Plan to be established by the contractor with approval of the project proponent.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? (b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? (c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	(a) Y (b) Y (c) Y	(a) Noise, turbid water and wastes are expected to generate during construction. Adequate measures against these impacts should be adopted consistent with the Impact Management Plan in IEERs. On the other hand, there is no standard regarding vibration in the Philippines. The adoption of low vibration methods shall be considered in the selection of construction equipment and construction methods. (b) The proposed interchanges will be built on the present intersections. The present land use in the area along proposed railway is mainly residential and commercial area. No negative impact on natural environment is expected. (c) Road safety measures during the construction and operation phases to control road accidents are proposed. • The routes for construction vehicles shall be determined through the meeting with stakeholders, MMDA and LGUs. • Disseminate information on a construction plan (schedule, traffic restriction section, and etc.) through the media such as radio and paper. • Provide adequate education and training to construction workers regarding traffic safety. • Deploy the traffic enforcers and flagmen at critical construction points to ensure safety of motorists. • Illuminated warning signs and barricades shall be installed along the construction area to prevent untoward accidents. • Adequate lighting shall be installed within the construction area to provide illumination during nighttime. • Perimeter fence shall be installed within the construction area, especially around excavation areas to prevent untoward accidents. • Personnel will be assigned at every detour road's points of entry and exit to regulate traffic flow.

Environmental Checklist: 7. Roads

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) Y (c) Y (d) Y	(a) A Environmental Monitoring Plan (EMP) has been drawn up for each interchange project for construction and operation as stipulated in Department of Environment and Natural Resources (DENR) Administrative Order No. 30, Series of 2003 (DAO 2003-30). (b) DPWH shall conduct regular self-monitoring of specific parameters indicated in the EMP through its environmental unit (ESSO). The ESSO shall submit a semi-annual monitoring report within January and July of each year. (c)&(d) A Multi-Partite Monitoring Team (MMT) must be formed immediately after the issuance of the ECC in the Detail Design Stage. The Compliance Monitoring and Validation Report (CMVR) shall be submitted semi-annually to the concerned EMB Regional Office, with the Proponent's CMR/SMR as attachment. Moreover, the second CMVR shall preferably present a qualitative desk-validation of the trend analysis report and cumulative environmental performance of the Proponent.
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Forestry Projects checklist should also be checked (e.g., projects including large areas of deforestation). (b) Where necessary, pertinent items described in the Power Transmission and Distribution Lines checklist should also be checked (e.g., projects including installation of power transmission lines and/or electric distribution facilities).	(a) Y (b)Y	(a) There will be no large areas of deforestation. However, a permit to cut shall be secured by the Contractor from the DENR prior to cutting of trees along the road sides and in the central reserve. (b) The interchange projects do not include installation of power transmission lines and/or electric distribution facilities.
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, if necessary (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a) N	(a) All the interchange projects will contribute in mitigating CO_2 emission. When the C-3 Missing Link opens in 2018, CO_2 emissions of the without MMICP cases will increase from 15% to 108% due to the increase in traffic volume at the intersections. However, annual CO2 emissions in the with-project cases will become about 6 to 24% smaller than the without cases.

1) Regarding the term “Country's Standards” mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made. In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).
2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Appendix 8 C-3 Missing Link

A8.1 DPWH Comparative Study

A8.2 Updated Alignment Routes and Photographs

A8.3 PAPs Cutting Sheets (Google Map)

A8.1

DPWH Comparative Study

COMPARATIVE COST

Alignment	Length (meters)	Number of Lane	COST ROW	COST CIVIL WORKS	TOTAL COST	If All Viaduct Cost (B) (300,000.00/m/lane)	
1) Original	5,500	6 lane at grade	LAND 4.788 IMPV'T. 4.000	3.704	12.492	4 lanes 6 lanes	6.60 9.90
2) 1st Alignment	7,300	4 lanes combination at grade/viaduct	LAND 5.482 IMPV'T. 4.500	5.500 (including double decker)	15.482	4 lanes 6 lanes	8.76 13.14
3) a.1) 2nd Alignment waterway along San Juan & Pasig River	5,400	4 lanes combination at grade/viaduct	LAND 2.560 IMPV'T. 2.200	6.000	10.760	4 lanes 6 lanes	6.48 9.72
a.2) Same with a.1 but will pass the river bank of San Juan and Pasig River	5,400	4 lanes combination at grade/viaduct	LAND 3.328 IMPV'T. 2.860	6.000	12.188	4 lanes 6 lanes	6.48 9.72
b.1) PIOC-TPLEX (up to J.P. Rizal St.)	4,800	4 lanes combination at grade/viaduct	LAND 3.400 IMPV'T. 2.300	5.400	11.100	4 lanes 6 lanes	5.76 8.64
b.2) PIOC-TPLEX (Connecting to South Ave.)	5,400	4 lanes combination at grade/viaduct	LAND 3.800 IMPV'T. 2.600	6.000	12.400	4 lanes 6 lanes	6.48 9.72

NOTE: In the absence of detailed Criteria, "2nd alignment a.2" is recommended.

A8.1-1

COMPARATIVE ANALYSIS

Alignment	Advantage	Disadvantage
1) Original	1. Less curvature on the alignment. 2. Ramp is accessible in Shaw Blvd., Boni Ave. and J.P. Rizal St. if viaduct/at grade interchange will be required. 3. Less construction duration.	1. Bigger cost on ROW with lesser existing road to be widened. 2. No support yet from the local Government and RDC.
2) 1st Alignment	1. Longer existing road to be widened minimizing effect on properties to be affected. 2. Ramp is accessible in Shaw Blvd. Boni Ave and J. P. Rizal St. if Viaduct/at grade interchange will be required. 3. With support of Local Government on the MOA signed then by the Mayors' concerned.	1. Bigger maintenance cost on structure. 2. Bigger civil works cost in view of its length (longest among the alternatives). 3. Very near the Makati-Mandaluyong bridge at Coronado St. which has shorter access going to Makati via Makati Ave. to Buendia Ave.

COMPARATIVE ANALYSIS

Alignment	Advantage	Disadvantage
3) a.1) 2nd Alignment along waterway of San Juan & Pasig River	1. Lesser ROW cost, majority of the alignment will pass the waterway of San Juan and Pasig Rivers. 2. Limited access (through traffic) highway from N. Domingo St. to J.P. Rizal St.	1. Bigger civil works cost, the river will be used as access in the construction. 2. The alignment will have many curvatures that will affect the design speed, safety for a standard highway with limited access. 3. Viable access ramp in Shaw Blvd. & J.P. Rizal St only.
a.2) Same with a.1 but will pass the river bank of San Juan and Pasig River.	1. Alignment will pass the river bank which will not obstruct the river. 2. River easement could be used, the Government shall exercise Easement Law.	1. May require anchoring if the foundation will be near the river. 2. More properties to be affected.
b.1) PIOC-TPLEX (up to J.P. Rizal St.)	1. Less ROW and civil works Cost, being the shortest among the alternatives. 2. Utilize the existing roads to minimize disturbance to affected properties.	1. Up to J.P. Rizal & Pasong Tamo intersection only not utilizing South Avenue defined as the alignment for C-3. 2. The alignment will have many curvatures that will affect the design speed, safety etc. for a standard highway with limited access.
b.2) PIOC-TPLEX (Connecting to Gil Puyat Ave.)	1. It will connect with Gil Puyat Avenue via part of Pasong Tamo Ave. & Kalayaan Avenue 2. It will utilize the widen part of A.P Reyes Avenue.	1. It will pass highly urbanized area in Pasong Tamo Avenue. 2. Sharp Curve at Pasong Tamo Kalayaan, South Avenue.

file

C-3 SOUTHERN SECTION

The project will connect the missing links of C-3 at the cities of San Juan, Mandaluyong, and Makati to complete the existing C-3 Corridor
It will greatly contribute in relieving the traffic congestion in EDSA and our major road network

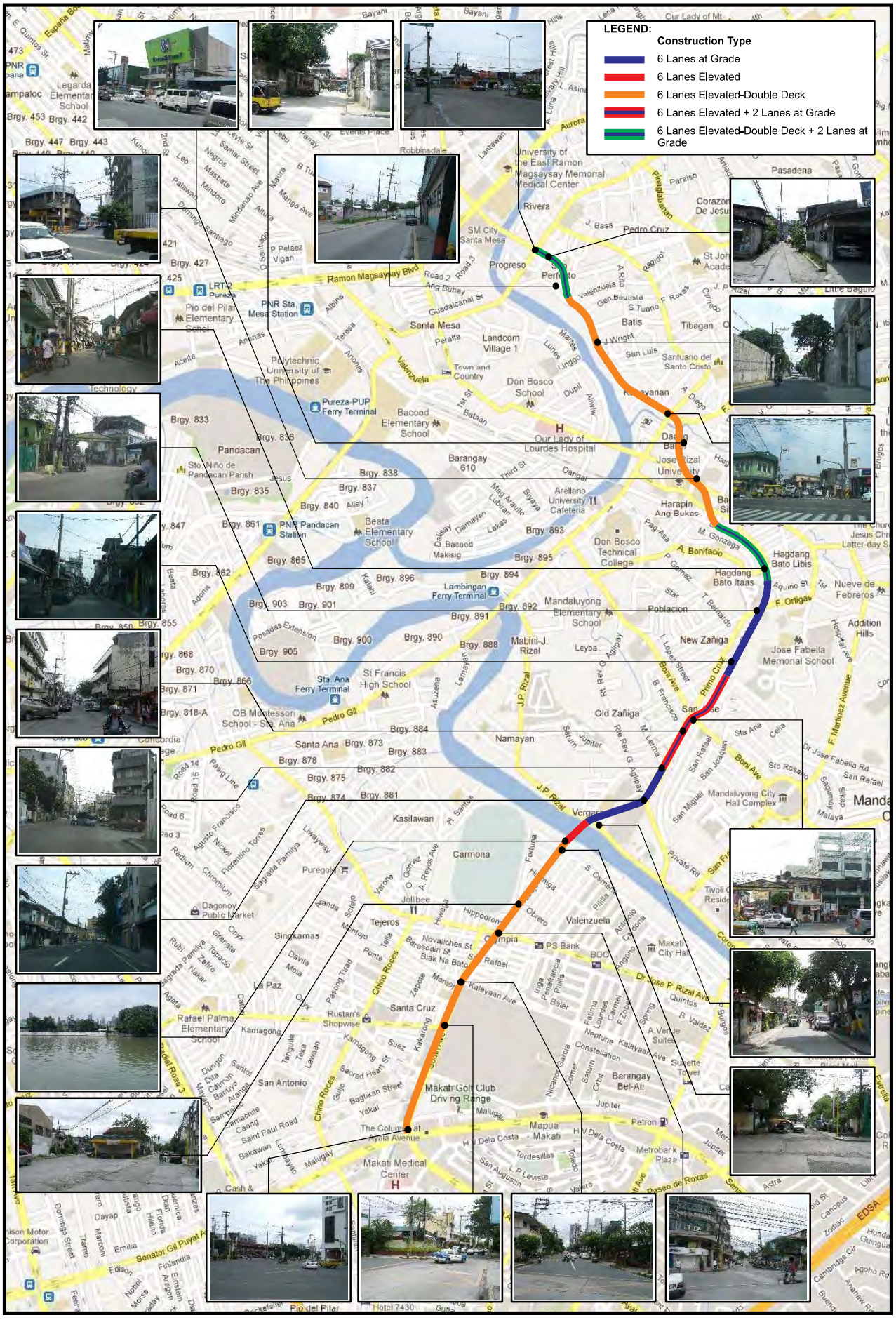
ALIGNMENT	LENGTH (METERS)	ROW ACQUISITION (AREA IN SQ.M.)	DETAILED DESCRIPTION	ESTIMATED PROJECT COST (In Billion Pesos) ROW	CIVIL WORKS	TOTAL PROJECT	ADVANTAGE	DISADVANTAGE	ALL VIADUCT (300,000.00/ lM/Lane)	COST (B)
1. ORIGINAL ALIGNMENT The project starts from Buendia Ave./Ayala Ave. Intersection in Makati City goes northward utilizing South Avenue Trabajo St. crosses Pasig River J.P. Rizal St. P. Cruz St., follows Gilang Bakal, crosses Shaw Blvd. in Mandaluyong City then connect to F. Manalo St. and ends at N. Domingo/G. Araneta Intersection in San Juan City.	5,500	187,000.00	Six lanes divided at grade Highway	LAND 4,788 IMPROVEMENT 4,809	3,704	12,482	1. Less curvature on the alignment 2. Ramp is accessible in Shaw Blvd., Boni Ave., and J.P. Rizal St. If viaduct/at grade interchange will be required. 3. Less construction duration.	1. Bigger cost on ROW with heavier polluting road to be widened. 2. No Support yet from the Local Government Unit and RDC. (Regional Development Council)	4 lanes 6 lanes	6.6 9.9
2. 1ST REVISED ALIGNMENT The plan is for the adoption of the original alignment from N. Domingo St. To Katerlong St. in San Juan City then in a new alignment running elevated over Maytunas creek to connect with 9 de Febrero St. then passes San Francisco St., turn right to Coronado St. and will follow the original plan crossing Pasig River up to the intersection at Buendia Ave./ Ayala Ave. Intersection via Trabajo St. and South Ave. in Makati City.	7,300	219,000	Four lanes divided at grade with double deck along Maytunas creek.	LAND 5,482 IMPROVEMENT 4,500	5.9 (including double decker)	15,882	1. Longer existing road to be widened minimizing row cost. 2. Ramp is accessible in Shaw Blvd., Boni Ave. and J.P.Rizal St. If Viaducted/at grade interchange will be required. 3. With support of Local Government on the MOA signed by then Mayor's concerned. 4. Ramp is accessible in Shaw Blvd., Boni Ave., and J.P. Rizal St.	1. Bigger maintenance cost on structure. 2. Bigger civil works cost in view of its length (longest) among the alternatives). 3. Very near the Makati-Mandaluyong bridge at Coronado St. which has shorter access going to Makati via Makati Ave. to Buendia Ave.	4 lanes 6 lanes	6.76 13.14
3. 2ND REALIGNMENT a.1 This alignment will be a viaduct that starts at Buendia Ave. towards South Ave. and Trabajo St. adjacent to the perimeter of the previous Santa Ana racetrack and utilize the waterway at Pasig River then crosses the Pasig River near Lambingan Bridge and passes the waterway of San Juan river near Near Paradores in San Juan City and turns left near F. Manalo St. towards the end of the project at N. Domingo St. and G. Araneta. On and off ramps will be provided in the design to all major streets that will cross this alignment.	7,400	100,900	Four lanes divided combination of at grade and viaduct along water way of Juan and Pasig River	LAND 2,560 IMPROVEMENT 2,200	6.48 (VIADUCT)	11.24	1. Lesser ROW cost, majority of the alignment will pass the river bank of San Juan and Pasig Rivers. 2. Limited access. (through traffic) highway from N. Domingo St. to J.P. Rizal St.	1. Bigger civil works cost, the river will be used as access in the construction. 2. The alignment will have many curvatures that will affect the design speed, safety for a standard highway with limited access. 3. Viable access ramp in Shaw Blvd. & J.P. Rizal St only. 4. May require river dredging	4 lanes 6 lanes	6.48 9.72
a.2 Same alignment with a 1 but will pass the river bank of San Juan and Pasig River.	5,400	130,000.00		LAND 3,328 IMPROVEMENT 2,880	6.48 (VIADUCT)	12.688	1. Alignment will pass the river bank which will not obstruct the river 2. River easement could be used, the Government shall exercise Easement Law.	1. May require anchoring if the foundation will be near the river 2. More properties to be affected.	4 lanes 6 lanes	6.48 9.72
b. This alignment as proposed by PNCC-TPLEX, will start in the intersection with J.P. Rizal St./Quirino Rocas Ave. (Pasong Tamo)/A.P. Reyes Ave. at the eastern side of the previous Santa Ana Racetrack in Makati City and along side the southern bank of Pasig river in Santa Ana, City of Manila cross Pasig River near Lambingan Bridge and Old Paradores Extension, follows F. Blumentritt St. in San Juan City then turn left at N. Domingo St. And ends at the intersection with G. Araneta Avenue.	4,600	82,000	Four lanes divided combination of at grade and viaduct along bank of San Juan and Pasig Rivers.	LAND 3.20 IMPROVEMENT 1.90	5.76	10.86	1. Less ROW and civil works cost, being the shortest among the alternatives. 2. Utilize the existing roads to minimize disturbance to affected properties.	1. Up to J.P. Rizal & Pasong Tamo intersection only not utilizing South Avenue defined as the alignment for C-3. 2. The alignment will have many curvatures that will affect the design speed, safety etc. for a standard highway with limited access.	4 lanes 6 lanes	5.76 8.64

NOTE : In the absence of detailed Criteria, "2nd alignment a.2" is recommended.

A8.1-4

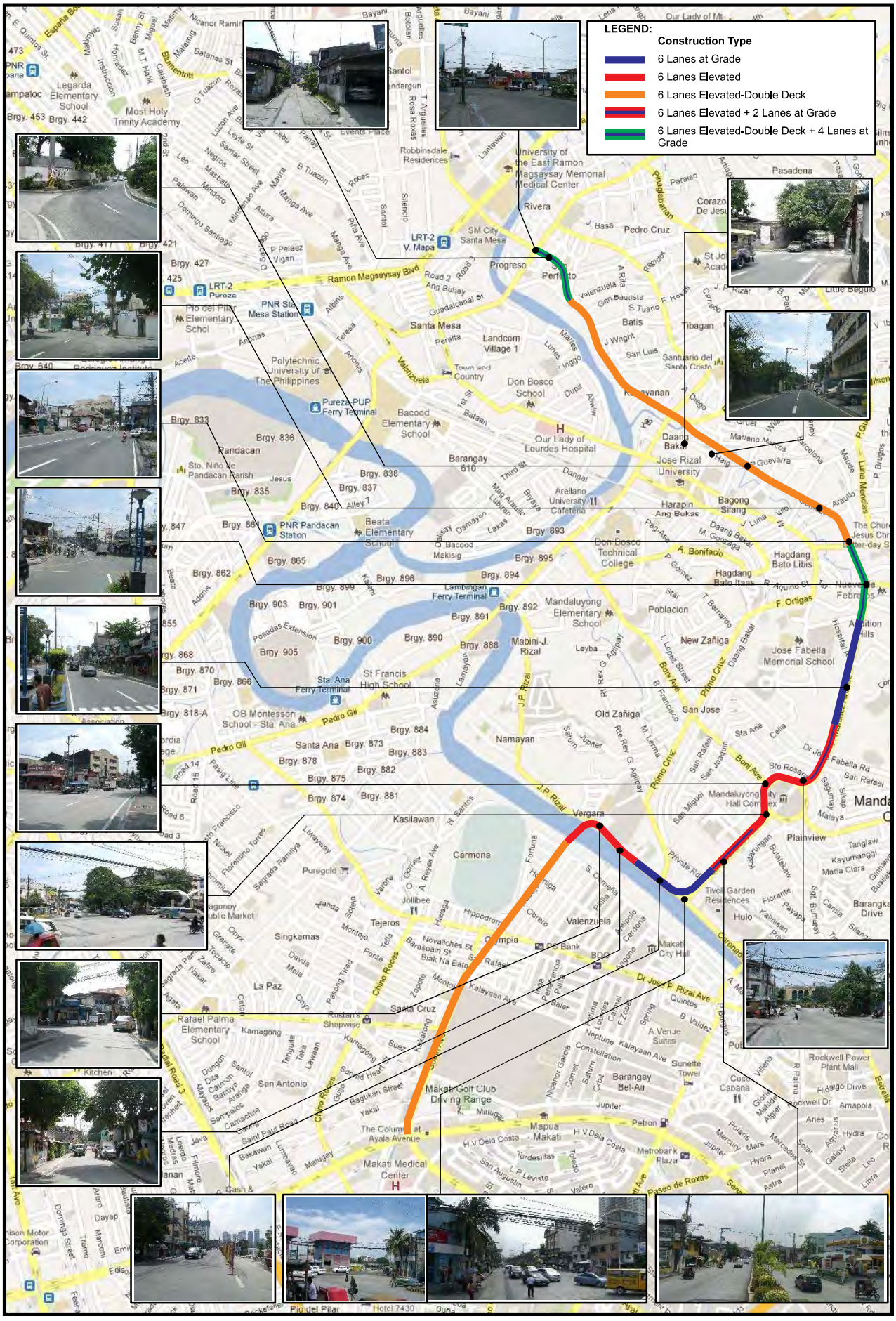
A8.2

Updated Alignment Routes and Photograph



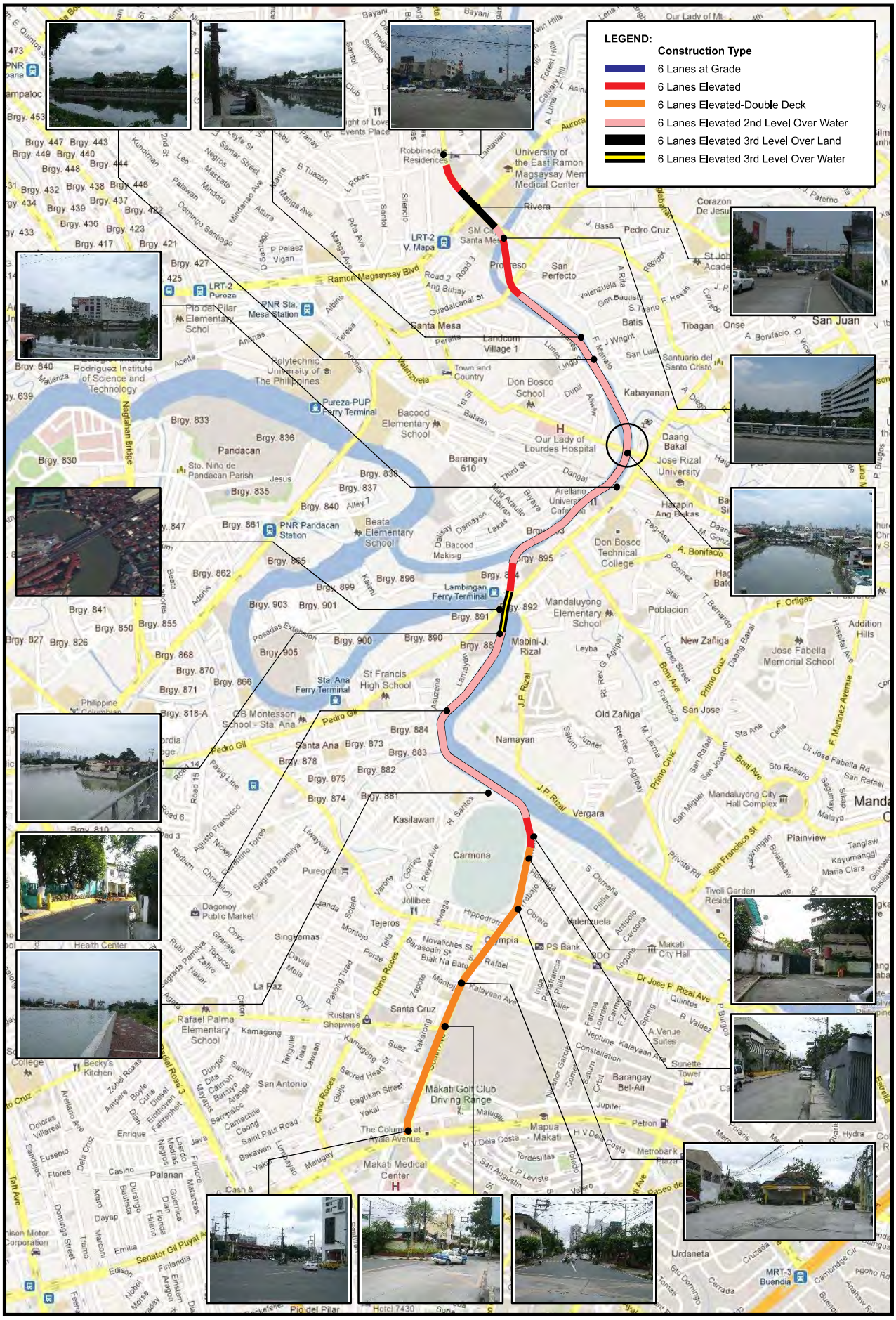
C-3 Southern Section Alternative Alignment

Original Alignment



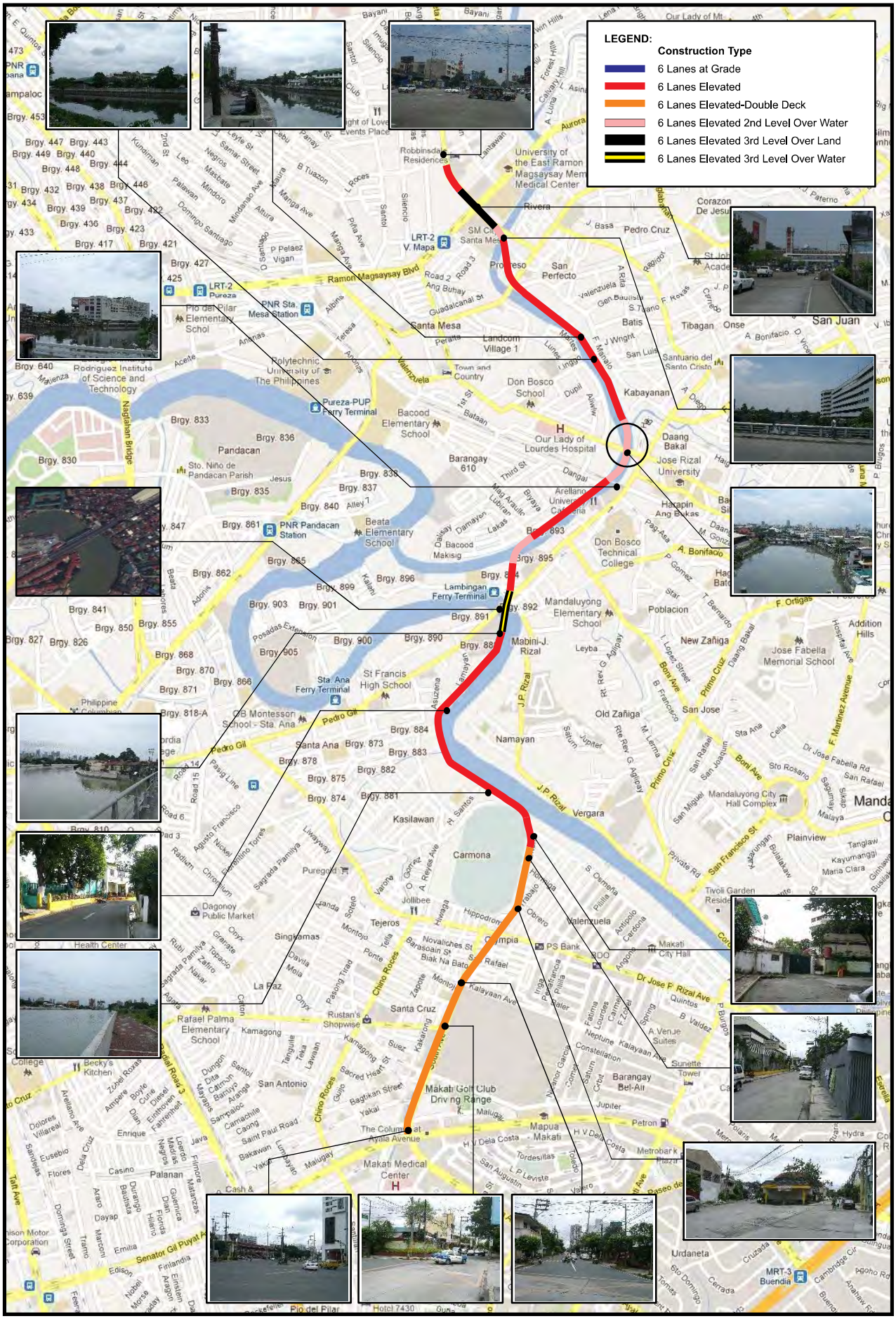
C-3 Southern Section Alternative Alignment

1st Revised Alignment



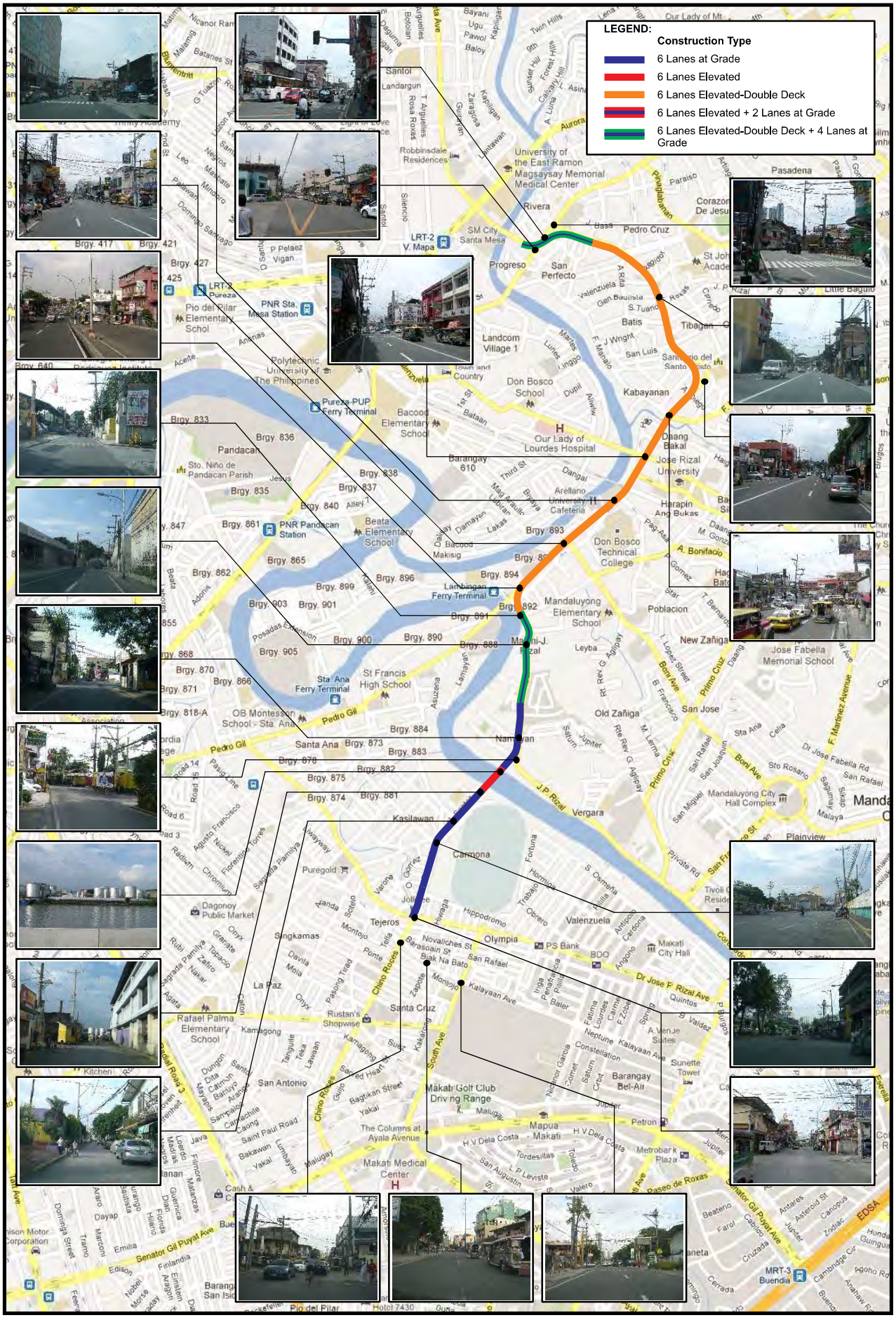
C-3 Southern Section Alternative Alignment

2nd Revised Alignment (a1-In the River)



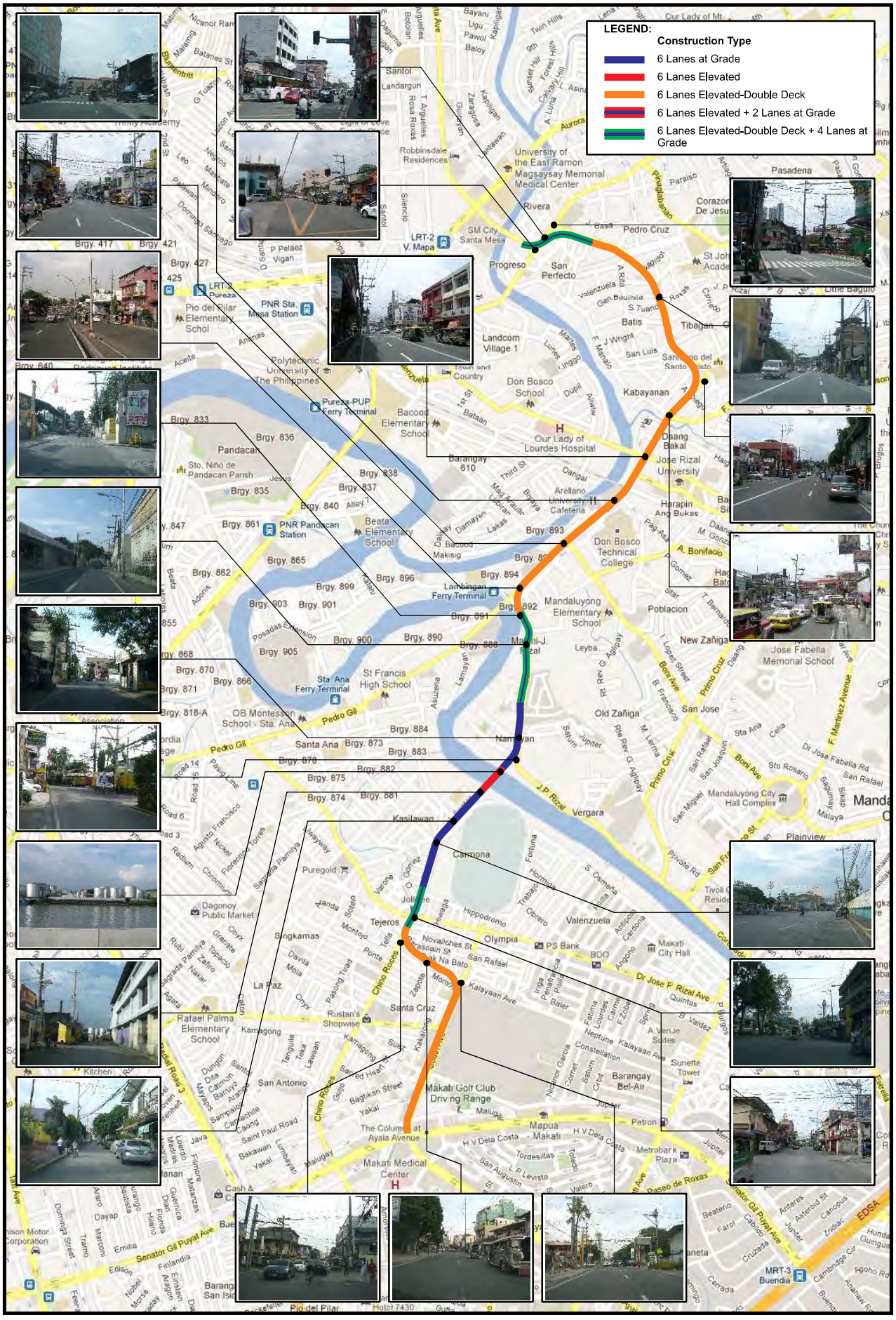
C-3 Southern Section Alternative Alignment

2nd Revised Alignment (a2-River Bank)



C-3 Southern Section Alternative Alignment

PIDC-TPLEX Alignment (b1)

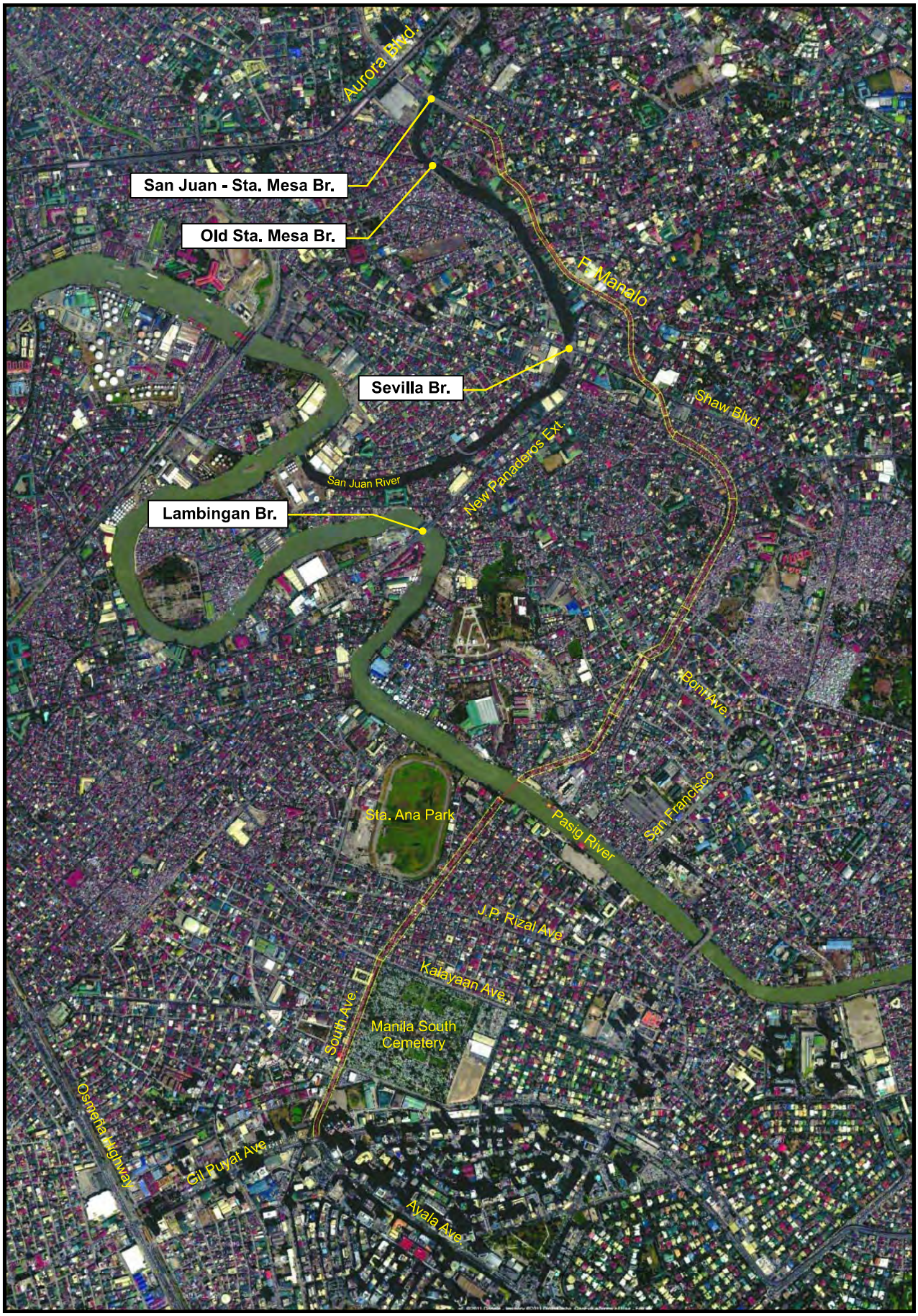


C-3 Southern Section Alternative Alignment

PIDC-TPLEX Alignment (b2-Extended)

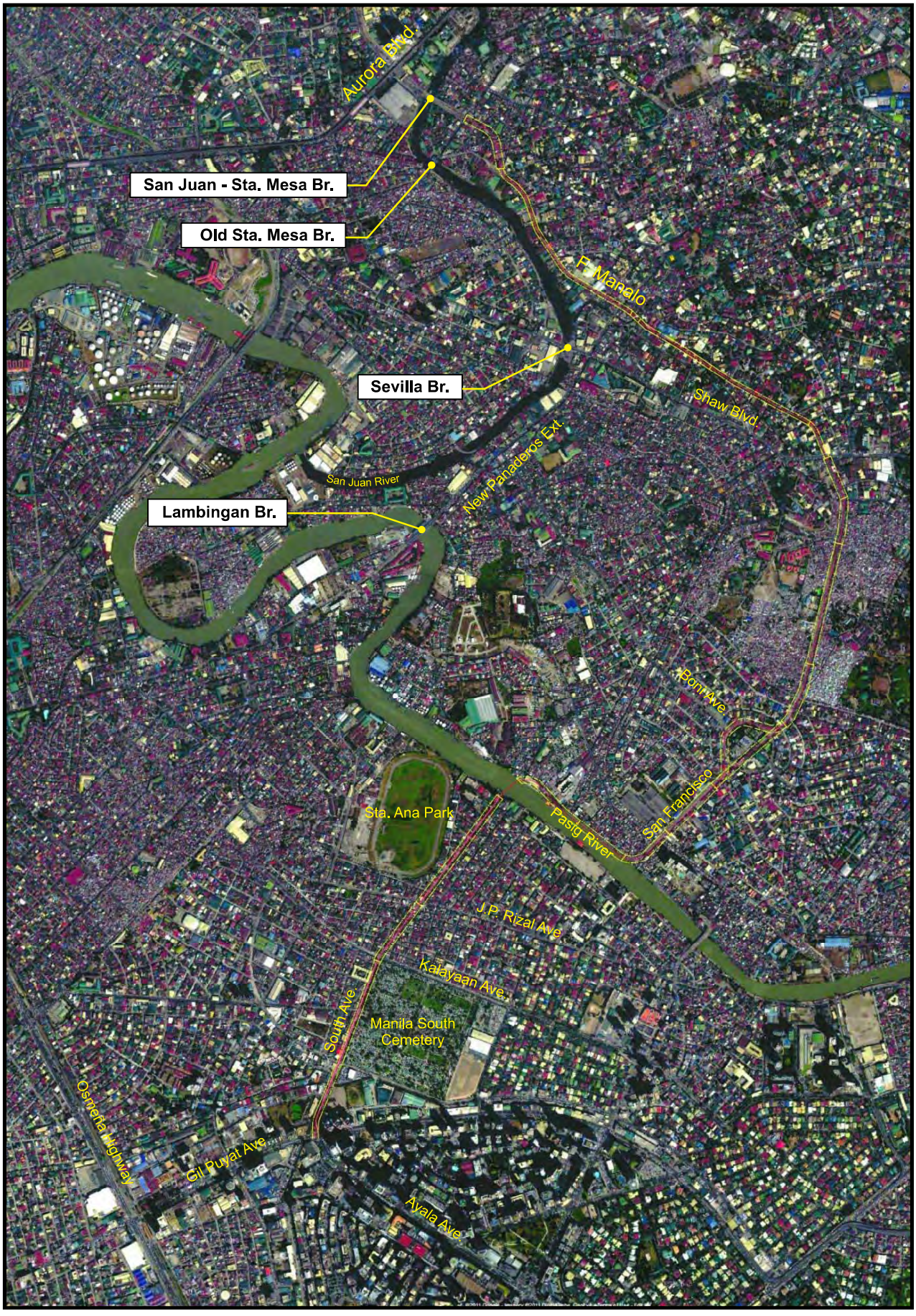
A8.3

PAPs Cutting Sheets (Google Map)



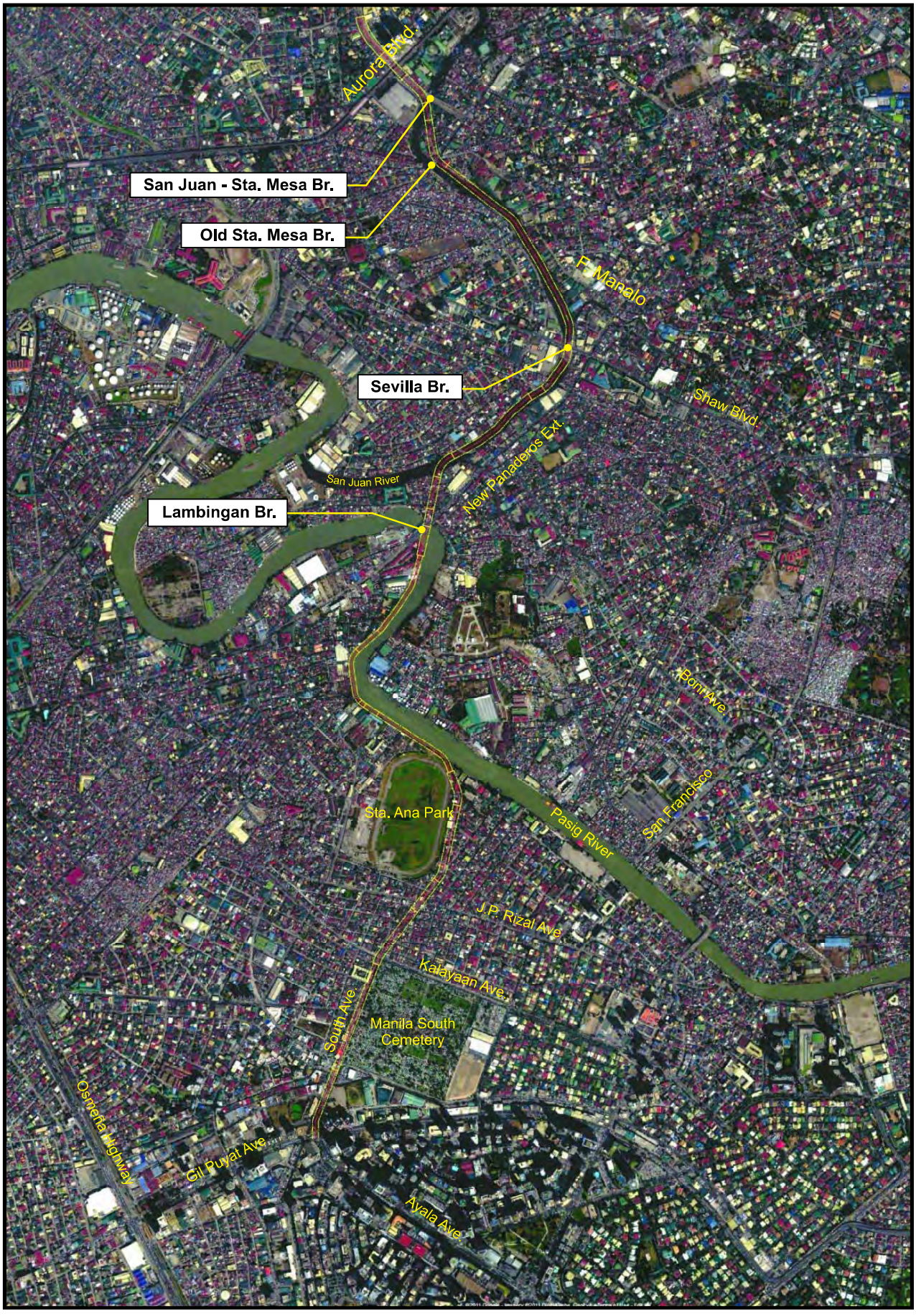
C-3 Southern Section Alternative Alignment

Original Alignment



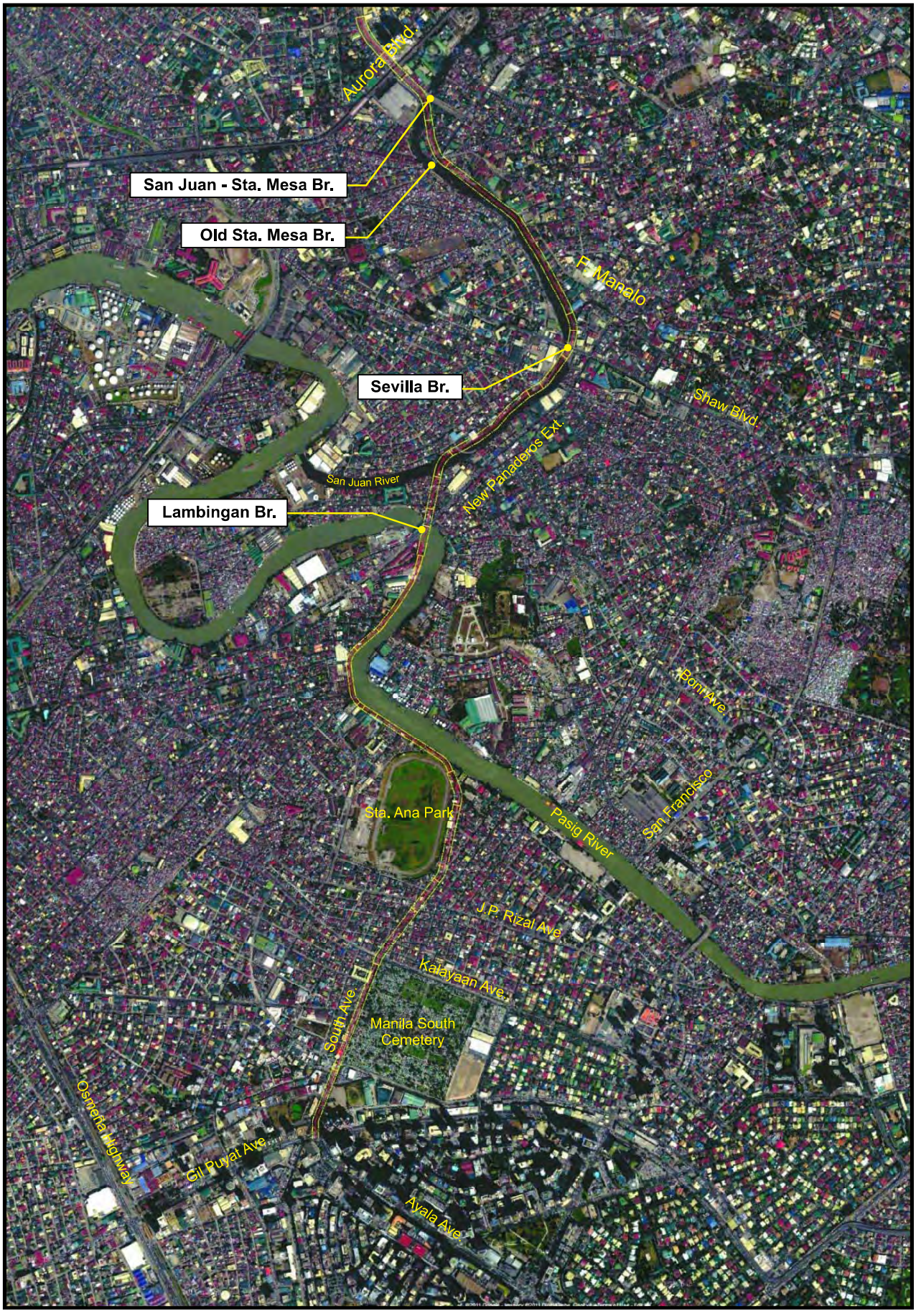
C-3 Southern Section Alternative Alignment

1st Revised Alignment



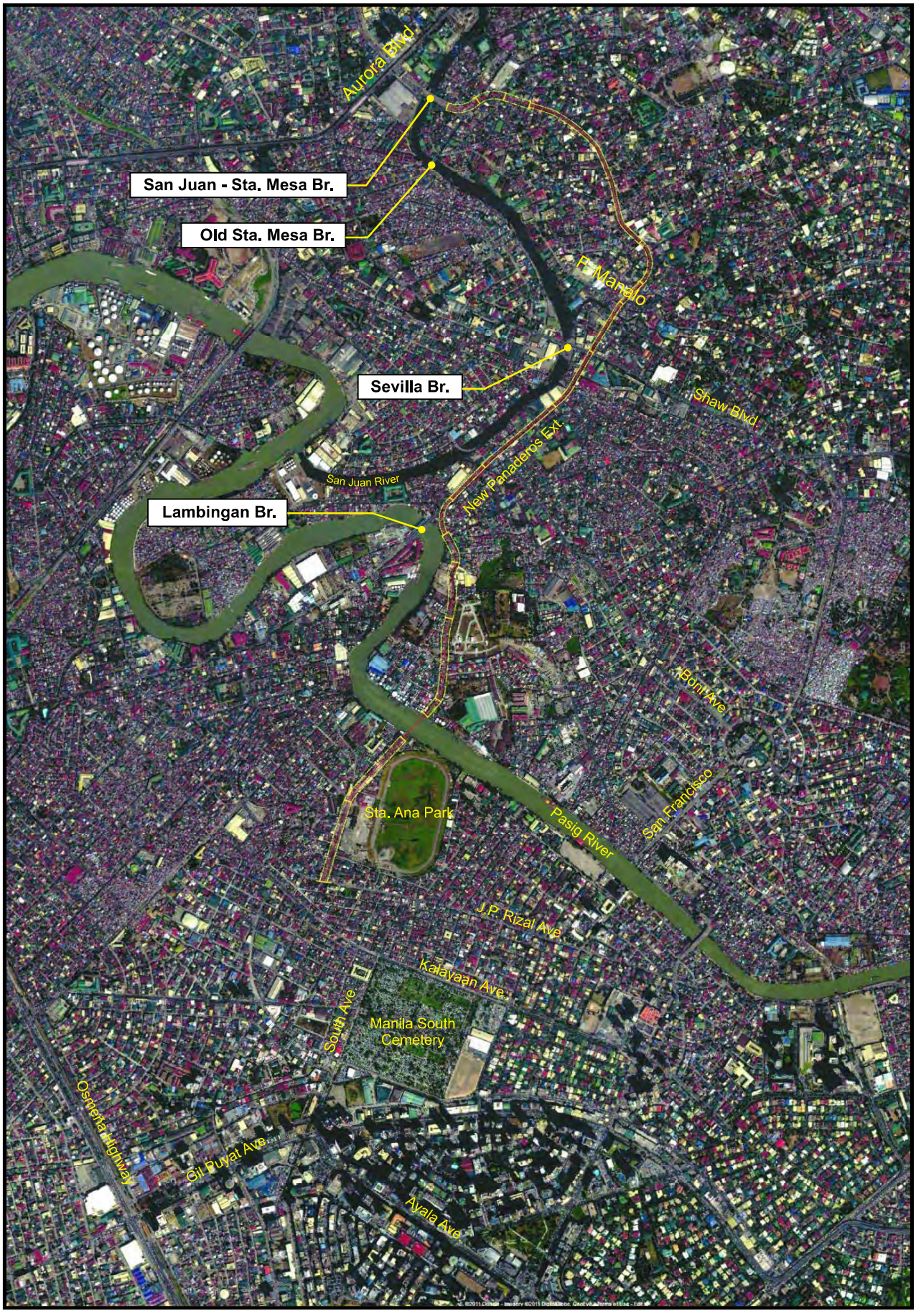
C-3 Southern Section Alternative Alignment

2nd Revised Alignment (a1-In the River)



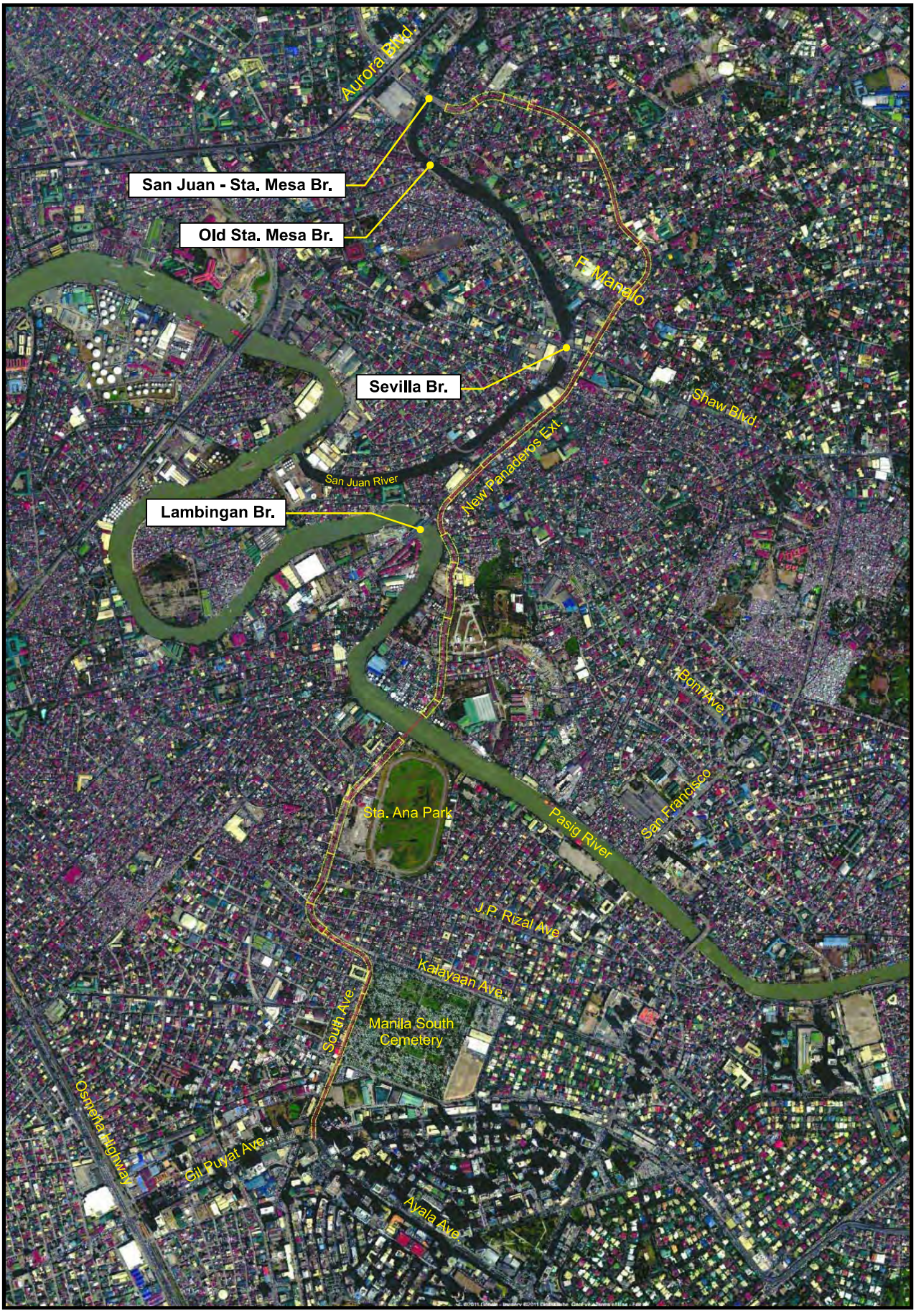
C-3 Southern Section Alternative Alignment

2nd Revised Alignment (a2-River Bank)



C-3 Southern Section Alternative Alignment

PIDC-TPLEX Alignment (b1)



C-3 Southern Section Alternative Alignment

PIDC-TPLEX Alignment (b2-Extended)

Appendix 9

C-4 The Conceptual Study for the Traffic Capacity Expansion along EDSA

A9.1 Level of Service Computation

A9.2 Proposed Viaduct Plan Layout and Elevation Profile

A9.3 Structure Elevation and Typical Cross Section

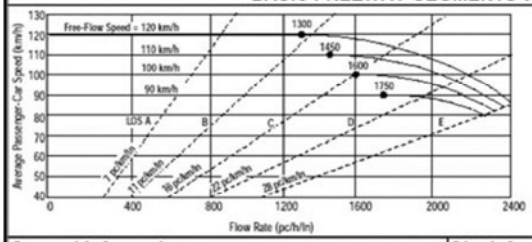
A9.4 Detailed Cost Breakdown of Viaduct

A9.5 Detailed Cost Breakdown of Tunnel

A9.1

Level of Service Computation

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Oper. (LOS)	FFS, N, v_p	LOS, S, D
Des. (N)	FFS, LOS, v_p	N, S, D
Plan. (LOS)	FFS, N, AADT	LOS, S, D
Plan. (N)	FFS, LOS, AADT	N, S, D

General Information		***Site Information***	
Analyst		Highway/Direction of Travel	
Agency or Company		From/To	
Date Performed	2/28/2012	Jurisdiction	
Analysis Time Period		Analysis Year	

Project Description

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs			
Volume, V	200000 veh/h	Peak-Hour Factor, PHF	0.90
AADT	veh/day	%Trucks and Buses, P_T	10
Peak-Hr Prop. of AADT, K		%RVs, P_R	0
Peak-Hr Direction Prop, D		General Terrain:	Level
DDHV = AADT x K x D	veh/h	Grade % Length	km
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments			
f_p	1.00	E_R	1.2
E_T	2.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.870

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	3.6	m	f_{LW}		km/h
Rt-Shoulder Lat. Clearance	1.8	m	f_{LC}		km/h
Interchange Density	0.30	I/km	f_{ID}		km/h
Number of Lanes, N	10		f_N		km/h
FFS (measured)	90.0	km/h	FFS	90.0	km/h
Base free-flow Speed, BFFS		km/h			

LOS and Performance Measures			**Design (N)**		
Operational (LOS)			Design (N)		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	25556	pc/h/ln	Design LOS		
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S		km/h	S		km/h
D = v_p / S		pc/km/ln	D = v_p / S		pc/km/ln
LOS	F		Required Number of Lanes, N		

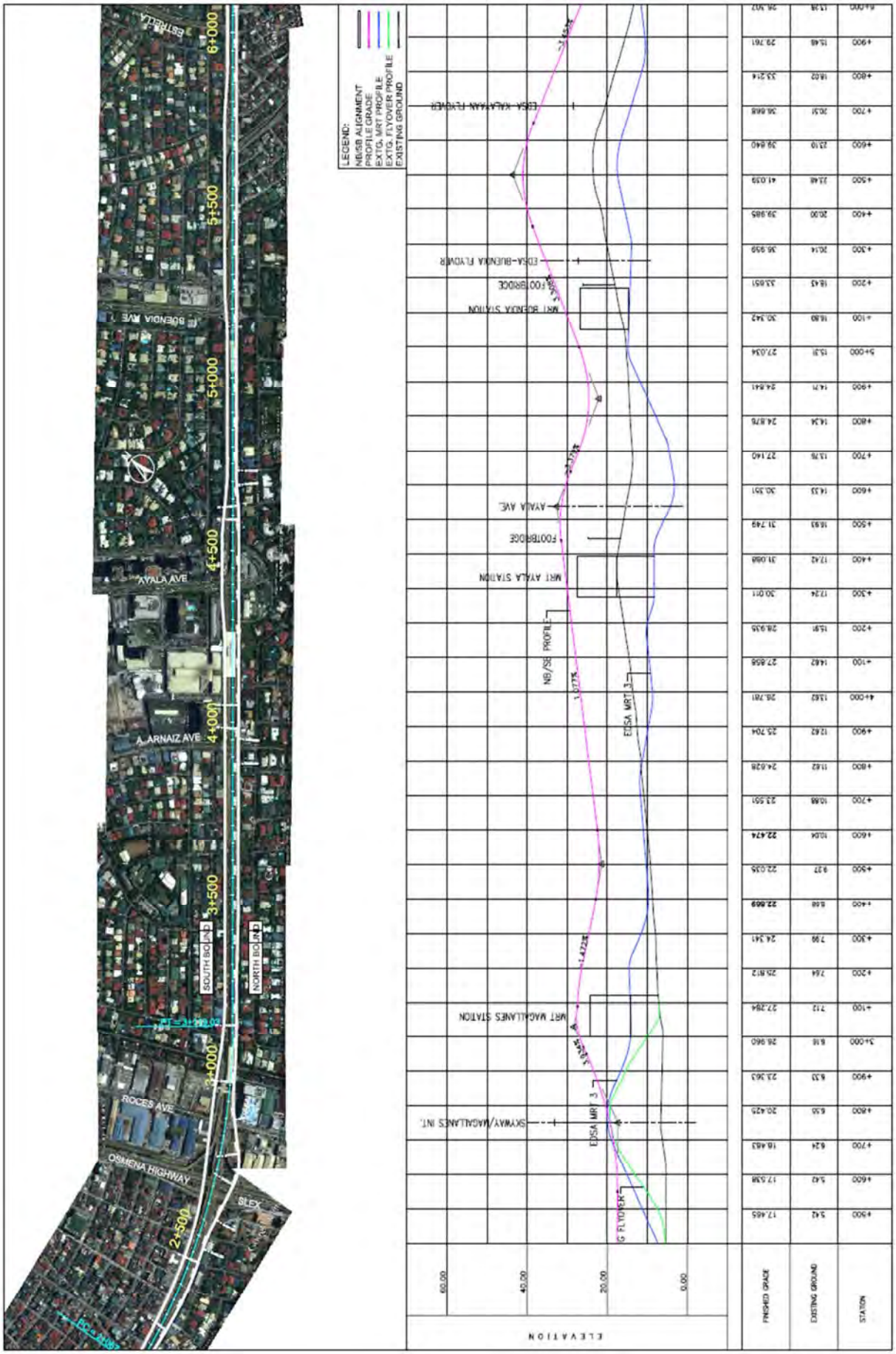
Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 23-4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit 23-5
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 23-6
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 23-7
DDHV - Directional design hour volume			

LOS	Description
A	Free flow, with low volumes and high speeds. Drivers are virtually unaffected by the presence of others. Little or no restriction in maneuverability and speed.
B	The level of comfort and convenience provided is somewhat less that at LOS A. Zone of stable flow with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers will have reasonable freedom to maneuver within the traffic stream from LOS A.
C	Still in zone of stable flow, but speed and maneuverability are most closely controlled by higher volumes. Most of the drivers are restricted in the freedom to select their own speed, lane changing, or overtaking maneuvers. The level of comfort and convenience declines noticeably at this level.
D	Approaches unstable flow. Speed and freedom to maneuver are severely restricted, and driver experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems.
E	Flow is unstable, and there may be stoppages of momentary condition. Represents operating conditions at or near capacity level. All speeds are reduced to allow but relatively uniform value. Freedom to maneuver within the traffic stream is extremely restricted, and it is generally accomplished by forcing a vehicle to “give way” to accommodate such maneuver.
F	Forced or breakdown flow. The amount of traffic approaching a point exceeds the amount that can traverse the points. Queues form behind such locations. Operation within the queue is characterized by stop-and-go waves, and is extremely unstable. It is the point at which arrival flow causes the queue to form

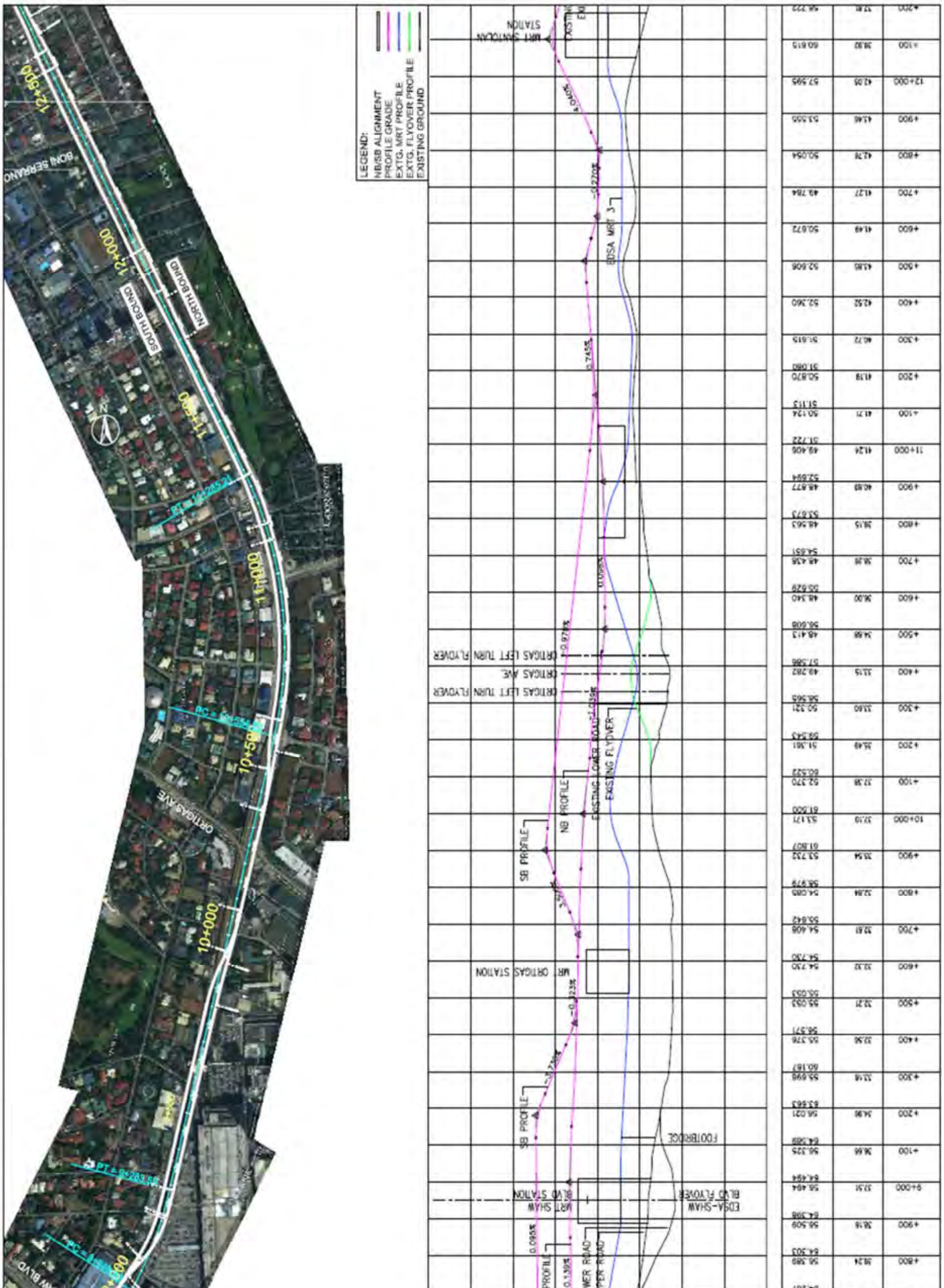
A9.2

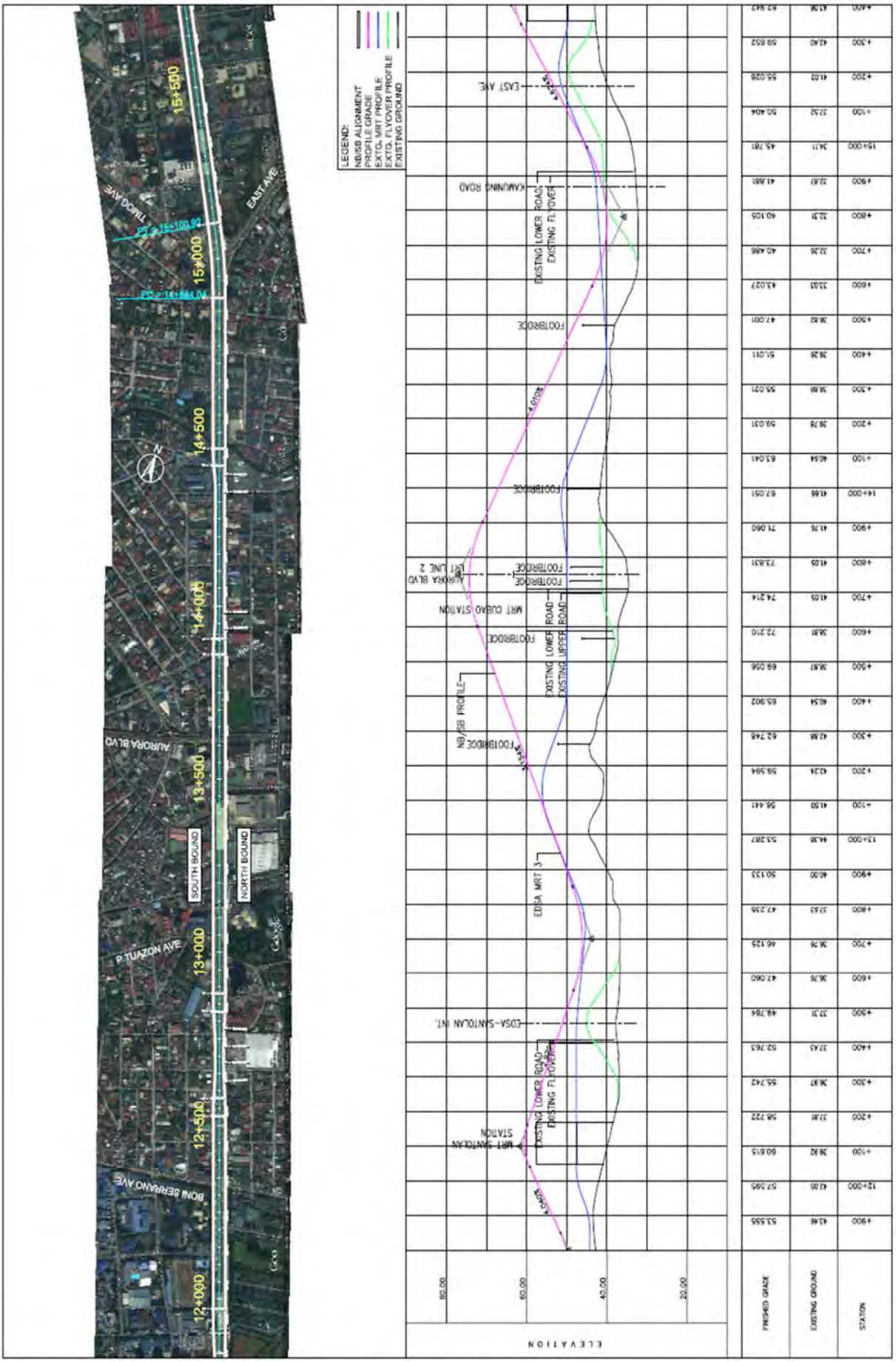
Proposed Viaduct Plan Layout and Elevation Profile

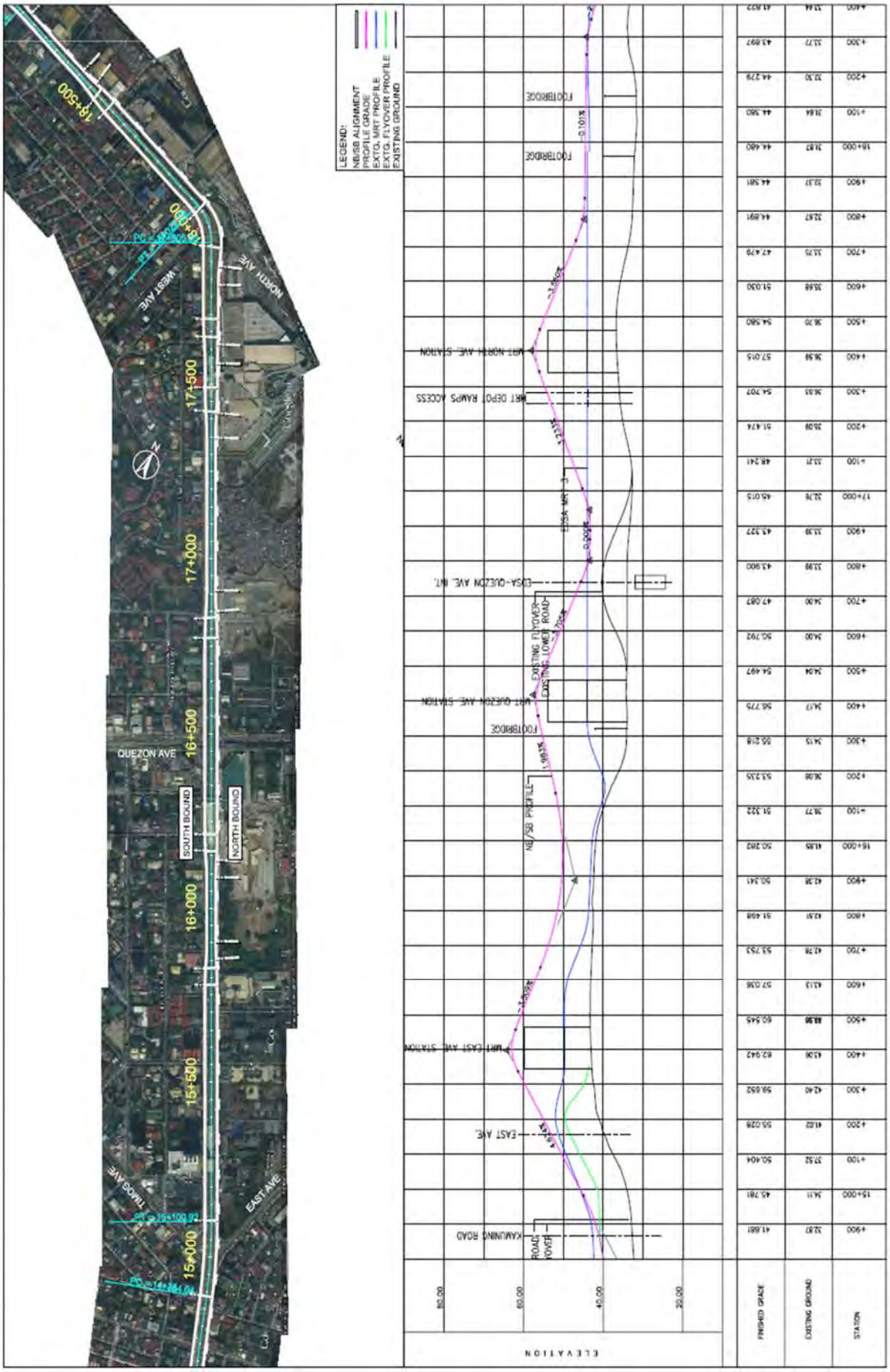

ROCES AVE
OSMENA HIGHWAY
SLEX
EDSA
SOUTH BOUND
NORTH BOUND
ROXAS BLVD
MACAPAGAL AVE
0+000
0+500
1+000
1+500
2+000
2+500
LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
EXISTING FLYOVER
NB/SB PROFILE
EDSA MRT 3
FOOTBRIDGE
TRANO LEFT TURN FLYOVER
MRT 3/PT STATION
LRT LINE 1 TAFT AVE.
ROXAS BLVD. FLYOVER
STATE
MACAPAGAL AVE.
ELEVATION
FINISHED GRADE
EXISTING GROUND
STATION


LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
EDSA-KALAYAAN FLYOVER
EDSA-BUENDIA FLYOVER
MRT BUENDIA STATION
FOOTBRIDGE
AYALA AVE
MRT AYALA STATION
NB/SB PROFILE
EDSA MRT 3
MRT MAGALLANES STATION
SKYWAY/MAGALLANES INT.
G FLYOVER
ELEVATION
FINISHED GRADE
EXISTING GROUND
STATION
AYALA AVE
A. ARNAIZ AVE
ROCES AVE
OSMENA HIGHWAY
SLEX
SOUTH BOUND
NORTH BOUND

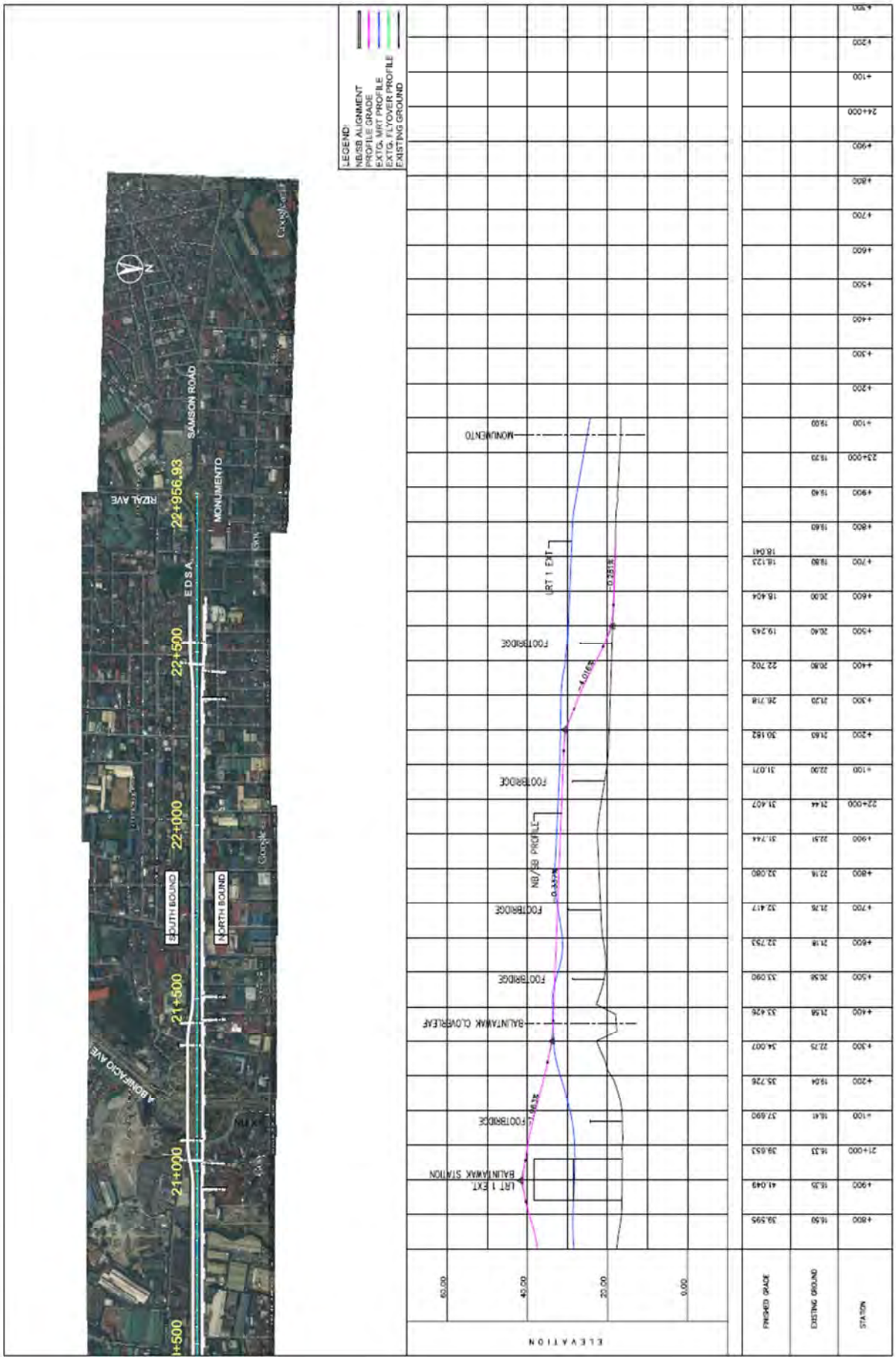

LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
NB PROFILE
SB PROFILE
EXISTING LOWER ROAD
EXISTING UPPER ROAD
MRT GUADALUPE STATION
MRT BONI AVE. STATION
EDSA MRT
EDSA-SHAW BLVD FLYOVER
SHAW BLVD
BONI AVE
PASIG RIVER
SOUTH BOUND
NORTH BOUND
ESTRELLA
ELEVATION
PROFILED GRADE
EXISTING GROUND
STATION


LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
SOUTH BOUND
NORTH BOUND
BONI SERRANO
ORTIGAS AVE
SHAW BLVD
MRT SANTOLAN STATION
MRT ORTIGAS STATION
MRT SHAW BLVD STATION
EDSA-SHAW BLVD FLYOVER
ORTIGAS LEFT TURN FLYOVER
FOOTBRIDGE
SB PROFILE
NB PROFILE
EDSA MRT 3
ELEVATION
FINISHED GRADE
EXISTING GROUND
STATION


LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
EAST AVE
TIMOG AVE
AURORA BLVD
P. TUAZON AVE
BONI SERRANO AVE
SOUTH BOUND
NORTH BOUND
EDSA MRT 3
EDSA-SANTOLAN INT.
MRT SANTOLAN STATION
MRT QUEAO STATION
EXISTING LOWER ROAD
EXISTING FLYOVER
EXISTING UPPER ROAD
FOOTBRIDGE
ELEVATION
STATION
EXISTING GROUND
FINISHED GRADE

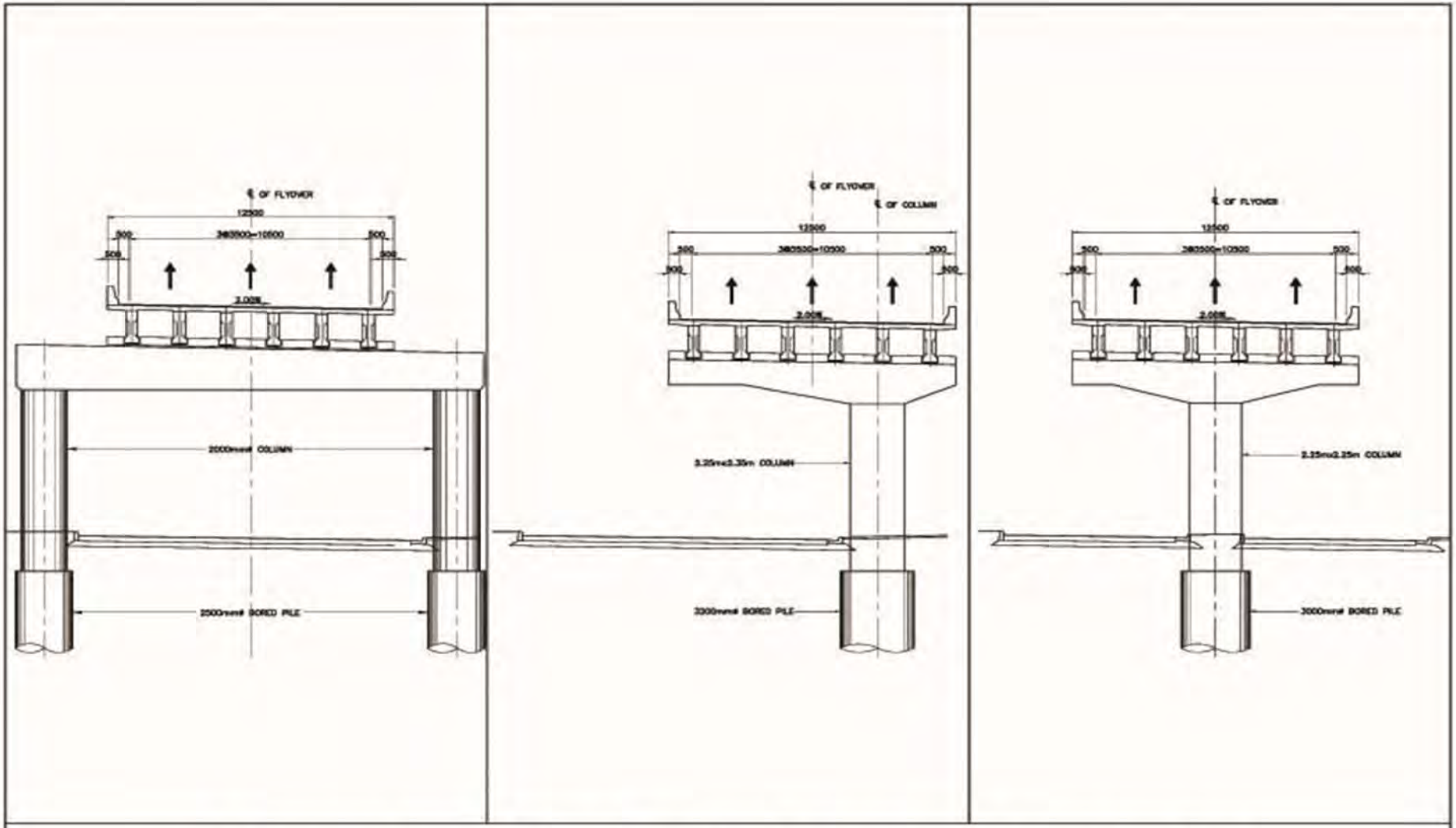

LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
NORTH AVE
WEST AVE
EAST AVE
TIMOG AVE
QUEZON AVE
SOUTH BOUND
NORTH BOUND
17+500
17+000
16+500
16+000
15+500
15+000
FOOTBRIDGE
MRT NORTH AVE. STATION
MRT DEPOT RAMPS ACCESS
EDSA MRT-3
EDSA-QUEZON AVE. INT.
EXISTING FLYOVER
EXISTING LOWER ROAD
MRT QUEZON AVE. STATION
NB/SB PROFILE
MRT EAST AVE. STATION
EAST AVE
KAMUNING ROAD
ROAD OVER
ELEVATION
80.00
60.00
40.00
20.00
STATION
EXISTING GROUND
FINISHED GRADE


LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
BALINTAWAK CLOVERLEAF
FOOTBRIDGE
BALINTAWAK STATION
LRT 1 EXT
NB/SB PROFILE
ROOSEVELT STATION
NORTH AVE
WEST AVE
ROOSEVELT AVE
A BONIFACIO AVE
SOUTH BOUND
NORTH BOUND
21+500
21+000
20+500
20+000
19+500
19+000
18+500
18+000
17+500
ELEVATION
60.00
40.00
20.00
0.00
STATION
EXISTING GROUND
FINISHED GRADE

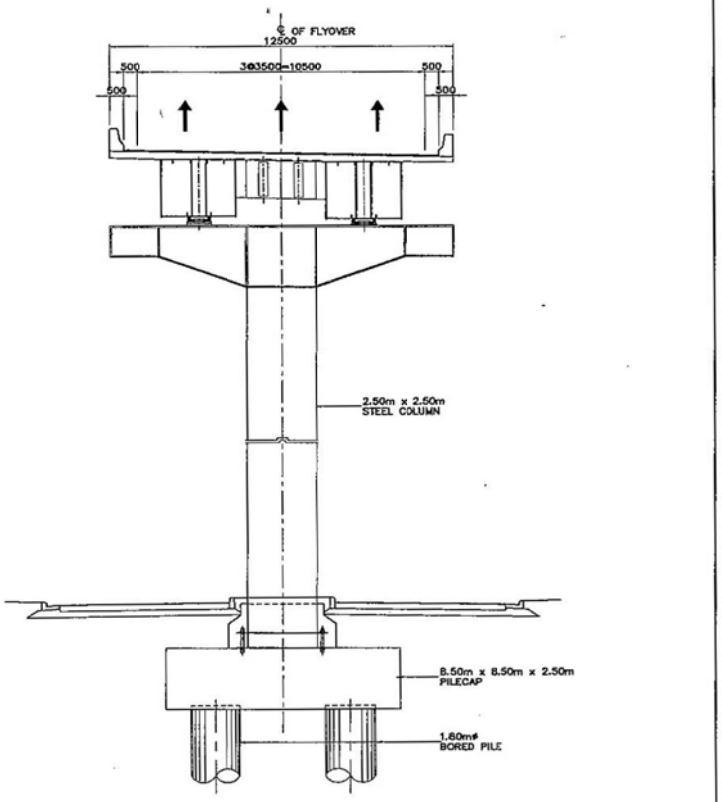

LEGEND:
NB/SB ALIGNMENT
PROFILE GRADE
EXTG. MRT PROFILE
EXTG. FLYOVER PROFILE
EXISTING GROUND
SAMSON ROAD
RIZAL AVE
MONUMENTO
EDSA
SOUTH BOUND
NORTH BOUND
A BONIFACIO AVE
22+956.93
22+500
22+000
21+500
21+000
MONUMENTO
LRT 1 EXT
FOOTBRIDGE
NB/SB PROFILE
BALINTAWAK CLOVERLEAF
BALINTAWAK STATION
ELEVATION
60.00
40.00
20.00
0.00
STATION
EXISTING GROUND
FINISHED GRADE

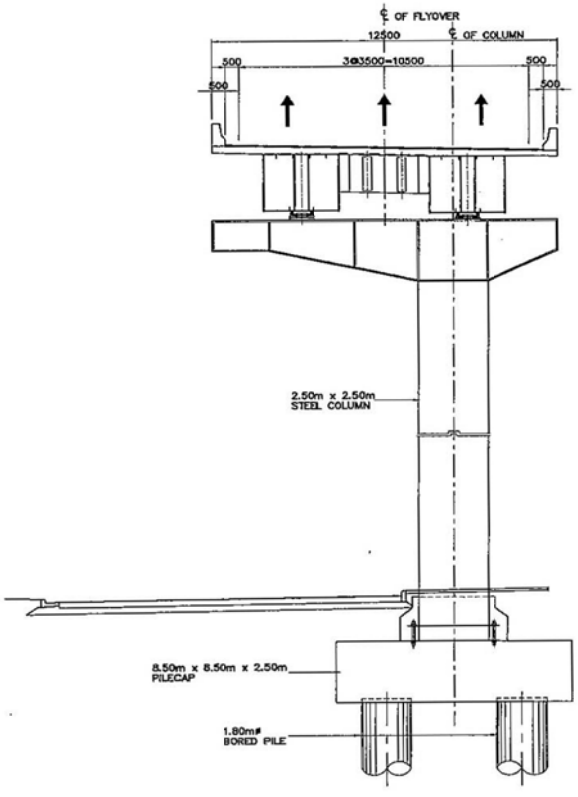
A9.3

Structure Elevation and Typical Cross Section

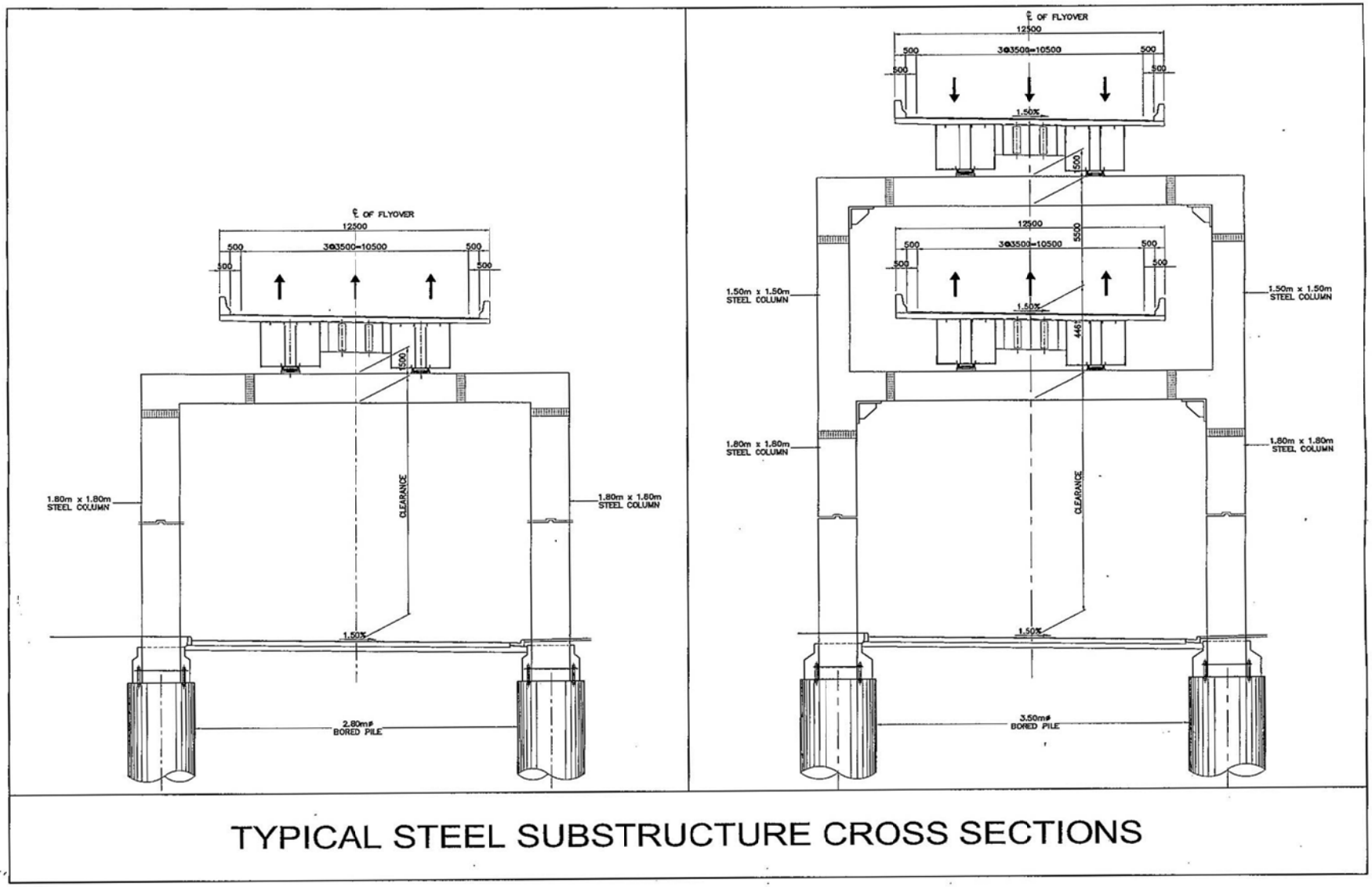


TYPICAL CONCRETE SUBSTRUCTURE CROSS SECTIONS





TYPICAL STEEL SUBSTRUCTURE CROSS SECTIONS



TYPICAL STEEL SUBSTRUCTURE CROSS SECTIONS

A9.4

Detailed Cost Breakdown of Viaduct

EDSA CAPACITY EXPANSION PROJECT

ESTIMATED PROJECT COST

ITEM NO.	DESCRIPTION	Unit	Qty.	Cost (Php)	Remarks
A.	**Direct Construction Cost**				
A.1	Facilities for the Engineer (1% of A.3 - A.7)	l.s.	1.0	890,307,914.00	
A.2	Other General Requirements (3% of A.3 - A.7)	l.s.	1.0	2,670,923,742.00	
A.3	At-Grade Road Improvement	l.s.	1.0	1,271,868,449.00	
A.4	Bridge and Other Structures				
	Approach Ramp (MSE Wall Type)	l.s.	1.0	455,788,288.00	
	Reinforced Concrete / Prestressed Concrete Bridge	l.s.	1.0	55,290,381,935.00	
	Steel Bridge	l.s.	1.0	29,045,059,685.00	
A.5	Miscellaneous Structures	l.s.	1.0	847,912,299.00	
A.6	Street Lighting	l.s.	1.0	1,271,868,449.00	
A.7	Traffic Signal Light	l.s.	1.0	847,912,299.00	
B.	**Traffic Management (1% of A.3 - A.7)**	p.s.	1.0	890,307,914.04	
C.	**Utility Relocation (3% of A.3 - A.7)**	p.s.	1.0	2,670,923,742.12	
D.	**Indirect Construction Cost**				
D.1	OCM (6% of A + B + C)			5,769,195,282.97	
D.2	Profit (8% of A + B + C)			7,692,260,377.29	
D.3	VAT (12% of A + B + C + D.1 + D.2)			13,153,765,245.17	
E.	**Estimated Construction Cost**				
	SUBTOTAL: A + B + C + D			122,768,475,621.59	
F.	**Administrative & Consultancy Cost (Proponent)**				
F.1	Detailed Design (4% of E)	p.s.	1.0	4,910,739,024.86	
F.2	Construction Supervision and Project Management (6% of E)	p.s.	1.0	7,366,108,537.30	
G.	**Contingencies (5% of E+F)**	p.s.	1.0	6,752,266,159.19	
H.	**ROW and Resettlement (Using Zonal Value)**	l.s.	1.0	28,522,358,000.00	
	TOTAL COST			170,319,947,342.94	

Project : EDSA CAPACITY EXPANSION (Elevated Viaduct Scheme)
Location : METRO MANILA
Description :
Date : 4/4/2012

BILL OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY		COST PER SQ.M.	Cost (Php)			
			North Bound	South Bound		Ramp	Concrete Bridge	Steel Bridge	Right of Way & Affected Structures
1.0	Sta. -0+700 to -0+600, (NB,SB)								
	Approach Ramp	sq.m.	1,000.00	1,000.00	32,325.41	64,650,820.00			
2.0	Sta. -0+600 to -0+450, (NB,SB) 2nd Level								
	Substructure	sq.m.	1,687.50	1,687.50	46,692.26		157,586,378.00		
	Superstructure	sq.m.	1,687.50	1,687.50	70,038.40		236,379,600.00		
3.0	Sta. -0+450 to 5+350, (NB,SB) 3rd Level								
	Substructure	sq.m.	72,500.00	72,500.00	56,030.71		8,124,452,950.00		
	Superstructure	sq.m.	72,500.00	72,500.00	70,038.40		10,155,568,000.00		
4.0	Sta. 4+000, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	975.00	2,314.00	46,692.26		153,570,844.00		
	Superstructure, (2nd Level)	sq.m.	975.00	2,314.00	70,038.40		230,356,298.00		
	Substructure, (3rd Level)	sq.m.	1,612.00		56,030.71		90,321,505.00		
	Superstructure, (3rd Level)	sq.m.	1,612.00		70,038.40		112,901,901.00		
5.0	Sta. 5+350 to 5+650, (NB,SB) 4th Level								
	Substructure	sq.m.	3,750.00	3,750.00	80,167.03			601,252,726.00	
	Superstructure	sq.m.	3,750.00	3,750.00	100,208.78			751,565,850.00	
6.0	Sta. 5+500, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	975.00	1,170.00	46,692.26		100,154,898.00		
	Superstructure, (2nd Level)	sq.m.	975.00	1,170.00	70,038.40		150,232,368.00		
	Substructure, (3rd Level)	sq.m.	975.00	1,300.00	56,030.71		127,469,865.00		
	Superstructure, (3rd Level)	sq.m.	975.00	1,300.00	70,038.40		159,337,360.00		
	Substructure, (4th Level)	sq.m.	2,275.00		80,167.03			182,379,993.00	
	Superstructure, (4th Level)	sq.m.	2,275.00		100,208.78			227,974,975.00	
7.0	Sta. 5+650 to 6+200, (NB,SB) 3rd Level								
	Substructure	sq.m.	6,875.00	6,875.00	56,030.71		770,422,262.00		
	Superstructure	sq.m.	6,875.00	6,875.00	70,038.40		963,028,000.00		
8.0	Sta. 6+200 to 6+700, (NB,SB) 2nd Level								
	Substructure	sq.m.	6,250.00	6,250.00	46,692.26		583,653,250.00		
	Superstructure	sq.m.	6,250.00	6,250.00	70,038.40		875,480,000.00		
9.0	Sta. 6+700 to 8+650, (NB) 3rd Level								
	Substructure	sq.m.	24,375.00		56,030.71		1,365,748,556.00		
	Superstructure	sq.m.	24,375.00		70,038.40		1,707,186,000.00		
10.0	Sta. 6+700 to 8+400, (SB) 3rd Level								
	Substructure	sq.m.		21,250.00	56,030.71		1,190,652,588.00		
	Superstructure	sq.m.		21,250.00	70,038.40		1,488,316,000.00		
11.0	Sta. 8+400 to 8+650, (SB) 4th Level								
	Substructure	sq.m.		3,125.00	80,167.03			250,521,969.00	
	Superstructure	sq.m.		3,125.00	100,208.78			313,152,438.00	
12.0	Sta. 8+650 to 9+150, (4th Level NB, 5th Level SB) Double Deck								
	Substructure (4th Level)	sq.m.	6,250.00		133,611.72			835,073,250.00	
	Substructure (5th Level)	sq.m.		6,250.00	66,805.86			417,536,625.00	
	Superstructure	sq.m.	6,250.00	6,250.00	100,208.78			1,252,609,750.00	
13.0	Sta. 9+150 to 9+900, (NB) 4th Level								
	Substructure	sq.m.	9,375.00		80,167.03			751,565,906.00	
	Superstructure	sq.m.	9,375.00		100,208.78			939,457,313.00	

Project : EDSA CAPACITY EXPANSION (Elevated Viaduct Scheme)
Location : METRO MANILA
Description :
Date : 4/4/2012

BILL OF QUANTITIES

14.0	Sta. 9+150 to 9+450, (SB) 5th Level								
	Substructure	sq.m.		3,750.00	93,528.20			350,730,750.00	
	Superstructure	sq.m.		3,750.00	100,208.78			375,782,925.00	
15.0	Sta. 9+450 to 9+900, (SB) 4th Level								
	Substructure	sq.m.		5,625.00	80,167.03			450,939,544.00	
	Superstructure	sq.m.		5,625.00	100,208.78			563,674,388.00	
16.0	Sta. 9+900 to 10+550, (3rd Level NB, 4th Level SB)								
	Substructure (3rd Level)	sq.m.	8,125.00		63,214.14			513,614,888.00	
	Substructure (4th Level)	sq.m.		8,125.00	66,805.86			542,797,613.00	
	Superstructure	sq.m.	8,125.00	8,125.00	100,208.78			1,628,392,676.00	
17.0	Sta. 10+550 to 11+300, (SB) 3rd Level								
	Substructure	sq.m.		9,375.00	56,030.71		525,287,906.00		
	Superstructure	sq.m.		9,375.00	70,038.40		656,610,000.00		
18.0	Sta. 10+550 to 11+300, (NB) 2nd Level								
	Substructure	sq.m.	9,375.00		46,692.26		437,739,938.00		
	Superstructure	sq.m.	9,375.00		70,038.40		656,610,000.00		
19.0	Sta. 10+850, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	1,300.00	1,950.00	46,692.26		151,749,845.00		
	Superstructure, (2nd Level)	sq.m.	1,300.00	1,950.00	70,038.40		227,624,800.00		
20.0	Sta. 11+300 to 11+850, (NB,SB) 2nd Level								
	Substructure	sq.m.	6,875.00	6,875.00	46,692.26		642,018,576.00		
	Superstructure	sq.m.	6,875.00	6,875.00	70,038.40		963,028,000.00		
21.0	Sta. 11+400, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	1,300.00	1,625.00	46,692.26		136,574,861.00		
	Superstructure, (2nd Level)	sq.m.	1,300.00	1,625.00	70,038.40		204,862,320.00		
22.0	Sta. 11+850 to 12+650, (NB,SB) 3rd Level								
	Substructure	sq.m.	10,000.00	10,000.00	56,030.71		1,120,614,200.00		
	Superstructure	sq.m.	10,000.00	10,000.00	70,038.40		1,400,768,000.00		
23.0	Sta. 12+650 to 13+000, (NB,SB) 2nd Level								
	Substructure	sq.m.	4,375.00	4,375.00	46,692.26		408,557,276.00		
	Superstructure	sq.m.	4,375.00	4,375.00	70,038.40		612,836,000.00		
24.0	Sta. 13+000 to 13+300, (NB,SB) 3rd Level								
	Substructure	sq.m.	3,750.00	3,750.00	56,030.71		420,230,326.00		
	Superstructure	sq.m.	3,750.00	3,750.00	70,038.40		525,288,000.00		
25.0	Sta. 13+300 to 13+500, (NB,SB) 4th Level								
	Substructure	sq.m.	2,500.00	2,500.00	80,167.03			400,835,150.00	
	Superstructure	sq.m.	2,500.00	2,500.00	100,208.78			501,043,900.00	
26.0	Sta. 13+500 to 14+000, (NB,SB) 5th Level								
	Substructure	sq.m.	6,250.00	6,250.00	93,528.20			1,169,102,500.00	
	Superstructure	sq.m.	6,250.00	6,250.00	100,208.78			1,252,609,750.00	
27.0	Sta. 14+000 to 14+200, (NB,SB) 4th Level								
	Substructure	sq.m.	2,500.00	2,500.00	80,167.03			400,835,150.00	
	Superstructure	sq.m.	2,500.00	2,500.00	100,208.78			501,043,900.00	
28.0	Sta. 14+200 to 14+600, (NB,SB) 3rd Level								
	Substructure	sq.m.	5,000.00	5,000.00	56,030.71		560,307,100.00		
	Superstructure	sq.m.	5,000.00	5,000.00	70,038.40		700,384,000.00		
29.0	Sta. 14+600 to 14+850, (NB,SB) 2nd Level								
	Substructure	sq.m.	3,125.00	3,125.00	46,692.26		291,826,626.00		
	Superstructure	sq.m.	3,125.00	3,125.00	70,038.40		437,740,000.00		

Project : EDSA CAPACITY EXPANSION (Elevated Viaduct Scheme)
Location : METRO MANILA
Description :
Date : 4/4/2012

BILL OF QUANTITIES

30.0	Sta. 14+850 to 15+200, (NB,SB) 3rd Level								
	Substructure	sq.m.	4,375.00	4,375.00	56,030.71		490,268,712.00		
	Superstructure	sq.m.	4,375.00	4,375.00	70,038.40		612,836,000.00		
31.0	Sta. 15+500, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	1,625.00	975.00	46,692.26		121,399,877.00		
	Superstructure, (2nd Level)	sq.m.	1,625.00	975.00	70,038.40		182,099,840.00		
	Substructure, (3rd Level)	sq.m.		2,275.00	56,030.71		127,469,865.00		
	Superstructure, (3rd Level)	sq.m.		2,275.00	70,038.40		159,337,360.00		
32.0	Sta. 15+200 to 15+650, (NB,SB) 4th Level								
	Substructure	sq.m.	5,625.00	5,625.00	80,167.03			901,879,088.00	
	Superstructure	sq.m.	5,625.00	5,625.00	100,208.78			1,127,348,776.00	
33.0	Sta. 15+650 to 16+150, (NB,SB) 3rd Level								
	Substructure	sq.m.	6,250.00	6,250.00	56,030.71		700,383,876.00		
	Superstructure	sq.m.	6,250.00	6,250.00	70,038.40		875,480,000.00		
34.0	Sta. 16+000, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	1,430.00		46,692.26		66,769,932.00		
	Superstructure, (2nd Level)	sq.m.	1,430.00		70,038.40		100,154,912.00		
35.0	Sta. 16+150 to 16+700, (NB,SB) 4th Level								
	Substructure	sq.m.	6,875.00	6,875.00	80,167.03			1,102,296,662.00	
	Superstructure	sq.m.	6,875.00	6,875.00	100,208.78			1,377,870,726.00	
36.0	Sta. 16+700 to 17+000, (NB,SB) 3rd Level								
	Substructure	sq.m.	3,750.00	3,750.00	56,030.71		420,230,326.00		
	Superstructure	sq.m.	3,750.00	3,750.00	70,038.40		525,288,000.00		
37.0	Sta. 17+000 to 17+650, (NB,SB) 4th Level								
	Substructure	sq.m.	8,125.00	8,125.00	80,167.03			1,302,714,238.00	
	Superstructure	sq.m.	8,125.00	8,125.00	100,208.78			1,628,392,676.00	
38.0	Sta. 17+650 to 18+800, (NB,SB) 3rd Level								
	Substructure	sq.m.	14,375.00	14,375.00	56,030.71		1,610,882,912.00		
	Superstructure	sq.m.	14,375.00	14,375.00	70,038.40		2,013,604,000.00		
39.0	Sta. 18+800 to 18+950, (NB,SB) 4th Level								
	Substructure	sq.m.	1,875.00	1,875.00	80,167.03			300,626,362.00	
	Superstructure	sq.m.	1,875.00	1,875.00	100,208.78			375,782,926.00	
40.0	Sta. 18+950 to 19+300, (NB,SB) 5th Level								
	Substructure	sq.m.	4,375.00	4,375.00	93,528.20			818,371,750.00	
	Superstructure	sq.m.	4,375.00	4,375.00	100,208.78			876,826,826.00	
41.0	Sta. 19+300 to 19+600, (NB,SB) 4th Level								
	Substructure	sq.m.	3,750.00	3,750.00	80,167.03			601,252,726.00	
	Superstructure	sq.m.	3,750.00	3,750.00	100,208.78			751,565,850.00	
42.0	Sta. 19+600 to 19+850, (NB,SB) 3rd Level								
	Substructure	sq.m.	3,125.00	3,125.00	56,030.71		350,191,938.00		
	Superstructure	sq.m.	3,125.00	3,125.00	70,038.40		437,740,000.00		
43.0	Sta. 19+850 to 20+100, (NB,SB) 2nd Level								
	Substructure	sq.m.	3,125.00	3,125.00	46,692.26		291,826,626.00		
	Superstructure	sq.m.	3,125.00	3,125.00	70,038.40		437,740,000.00		

Project : **EDSA CAPACITY EXPANSION (Elevated Viaduct Scheme)**
Location : **METRO MANILA**
Description :
Date : ***4/4/2012***

BILL OF QUANTITIES

44.0	Sta. 20+100 to 20+600, (NB,SB) 3rd Level								
	Substructure	sq.m.	6,250.00	6,250.00	56,030.71		700,383,876.00		
	Superstructure	sq.m.	6,250.00	6,250.00	70,038.40		875,480,000.00		
45.0	Sta. 20+500, (ON & OFF RAMP)								
	Approach Ramp	sq.m.	650.00	650.00	32,325.41	42,023,034.00			
	Substructure, (2nd Level)	sq.m.	1,300.00	1,300.00	46,692.26		121,399,876.00		
	Superstructure, (2nd Level)	sq.m.	1,300.00	1,300.00	70,038.40		182,099,840.00		
	Substructure, (3rd Level)	sq.m.	1,430.00	1,430.00	56,030.71		160,247,830.00		
	Superstructure, (3rd Level)	sq.m.	1,430.00	1,430.00	70,038.40		200,309,824.00		
46.0	Sta. 20+600 to 21+200, (NB,SB) 4th Level								
	Substructure	sq.m.	7,500.00	7,500.00	80,167.03			1,202,505,450.00	
	Superstructure	sq.m.	7,500.00	7,500.00	100,208.78			1,503,131,700.00	
47.0	Sta. 21+200 to 22+250, (NB,SB) 3rd Level								
	Substructure	sq.m.	13,125.00	13,125.00	56,030.71		1,470,806,138.00		
	Superstructure	sq.m.	13,125.00	13,125.00	70,038.40		1,838,508,000.00		
48.0	Sta. 22+250 to 22+400, (NB,SB) 2nd Level								
	Substructure	sq.m.	1,687.50	1,687.50	46,692.26		157,586,378.00		
	Superstructure	sq.m.	1,687.50	1,687.50	70,038.40		236,379,600.00		
49.0	Sta. 22+400 to 22+550, (NB,SB)								
	Approach Ramp	sq.m.	1,500.00	1,500.00	32,325.41	96,976,230.00			
	TOTAL COST								
50.0	Edsa - Pasay Road (ON & OFF Ramp)								
	Affected Structure	sq.m.	2,148.00	5,805.00					
51.0	Edsa -Jupiter (ON & OFF Ramp)								
	Affected Structure	sq.m.	1,834.50	3,277.50					
52.0	Edsa -Corintian/Connecticut (ON & OFF Ramp)								
	Affected Structure	sq.m.		1,207.50					
	TOTAL COST								
50.0	ROW (Main Allignment & Ramps)								
	Right of Way and Affected structures	sq.m.	58,672.95	83,938.84	200,000.00				28,522,358,000.00
	Affected Structure	sq.m.	14,910.00	106,496.03					
	TOTAL COST					**455,788,288.00**	**55,290,381,935.00**	**29,045,059,685.00**	**28,522,358,000.00**

A9.5

Detailed Cost Breakdown of Tunnel

3) Summary of Scheme-1 Entire Section of Both Directions

Main tunnel (3-lane) : 15.5km x 2 directions

Entrance/Exit at both end (2-lane) : 7.3 km x 2-directions

	Quantity	Unit	Unit Price (1,000yen)	Cost (100 million yen)	Cost (100 million peso)	Remarks
1. Construction Cost						
A. Direct cost				4,549	2,431	
Main tunnel 3-lane@31km, 2-lanes @12.6 km)	6,462,000	m3	43	2,779	1,486	
Ramp Tunnel	20	location	4,800,000	960	513	Both end are counted 2 ramp per location due to 2-lane
Shield shaft	12	location	610,000	73	39	
Ventilation shaft	7	location	6,852,000	480	256	
Facilities	1	l.s.		257	137	
B. Genral Cost				90	48	
Traffic Management (1% of A)				45	24	
Utility Relocation (1% of A)				45	24	
C. Indirect cost (30% of A+B)				1,392	744	
D. Sub total (A + B +C)				6,031	3,223	
E. VAT (12% of D)				724	387	
F. Construction cost (D+E)				6,755	3,610	
G. Consultancy Cost (10% of F)				676	361	
H. Land acquisition including compensation	1	l.s.		586	313	
for structures						
I. Contingency Cost (5% of F+G)				372	199	
Total Cost (F+G+H+I)				**8,389**	**4,483**	

3-1 Shied

① Established unit cost is 56.00 yen / m3 based on table below which includes indirect cost.

Convert to direct cost only: 56,000 yen ÷ 1.30 = 43,076 yen/m3 ➔ 43,000 yen/m3

(1.30: rate of indirect cost)

Description	Area (m2)		Length (m)	Volume of excavation (m3)	Unit Cost (1,000 yen)	Cost (1,000 yen)
3 lane tunnel	7.31x7.31x3.141	167.84	31,000	5,203,126	43	223,734,418
2 lane tunnel	5.64x5.64x 3.141	99.91	12,600	1,258,916	43	54,133,388
Total	-	-	-	6,462,042	-	277,867,806

② Reference Projects in Japan

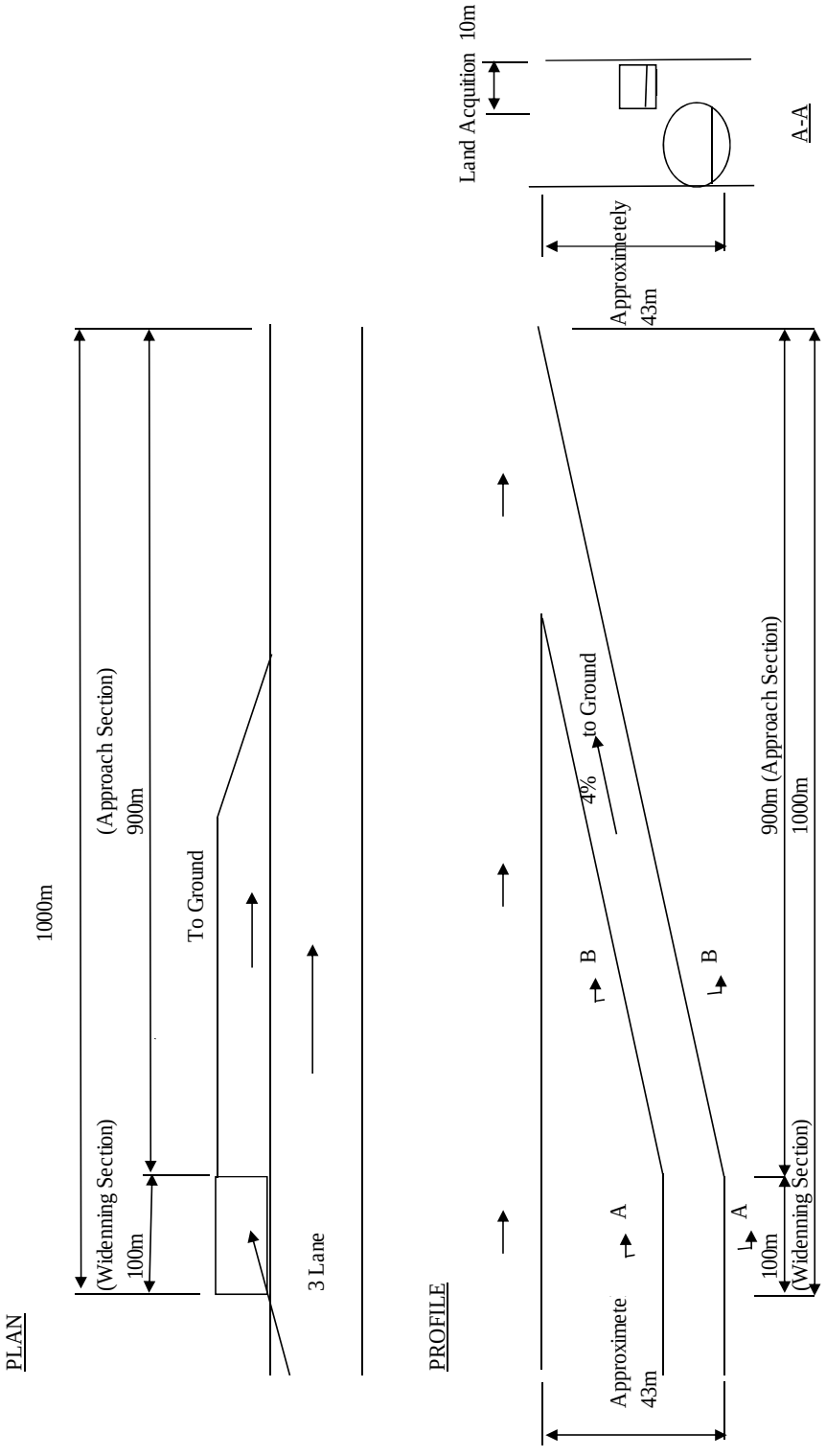
Reference projects in Japan for establishment of unit cost of tunnel are based on Tunnel Annual Book in Japan by Tunnel Engineering Association (May 2011) shown in table below.

Unit Cost of excavation by shield.

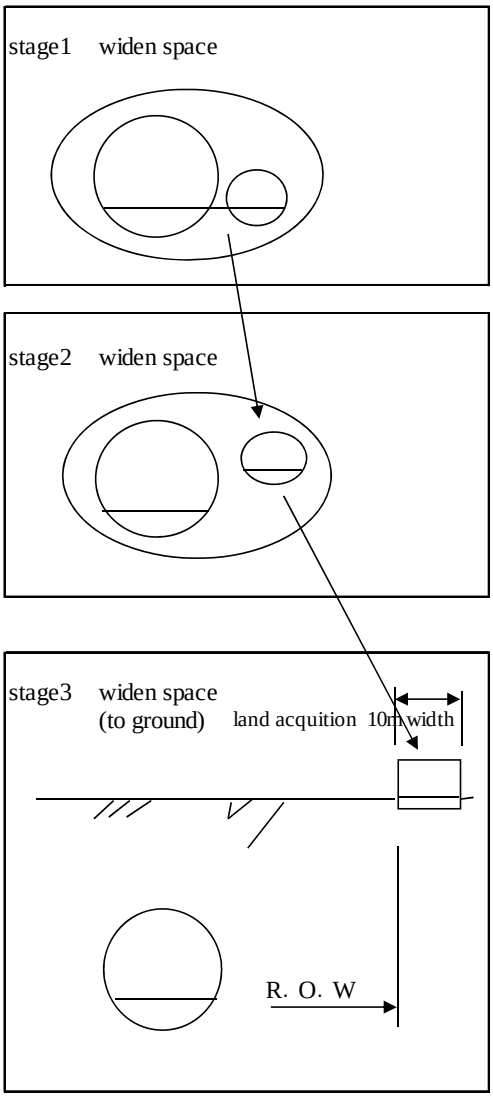
Railway						
Completion Year	**Length (m)**	**Area of excavation (m3)**	**Volume of excavation (m3)**	**Construction Cost (million Yen)**	**Unit Cost (1,000 yen)**	**Remarks**
2013	1,441	86.5	124,647	7,012	56	Soutetsu Line, Nishitani Tunnel Contractor: Taisei
Road						
2013	8,030	123.7	993,311	43,700	44	Tokyo Urban Expressway, Shinagawa line north direction. shield tunnel Contractor: Kajima
2011	7,967	123.7	985,518	45,000	46	Tokyo Urban Expressway Shinagawa-ő́i direction shield tunnel Contractor: Taisei
2012	624	63.3	39,499	4,869	123	Osaka Prefecture Yamatogawa line, ramp shield tunnel Contractor: Morimoto
2013	3,802	123.5	469,547	33,075	70	Osaka Prefecture Yamatogawa line, main shield tunnel Contractor:Daitetsu
Average Unit Cost/m3			3,196,551	180,559	56	-

Source: Tunnel Annual Book of Tunnel Engineering Association in Japan (May 2011)

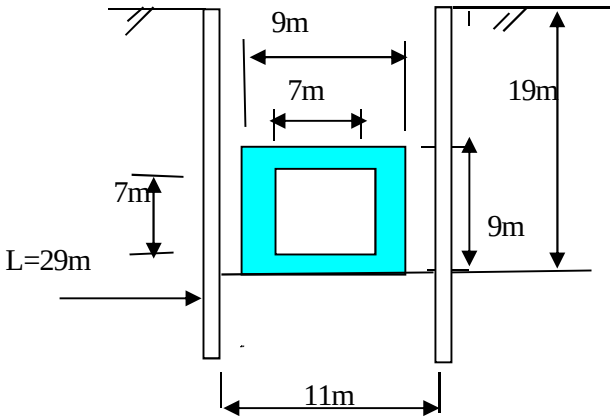
3-2 Ramp Tunnel



A-A



B-B



Quantity

A-A Section

area	length	volume
(m2)	(m)	(m3)
250	100	25,000

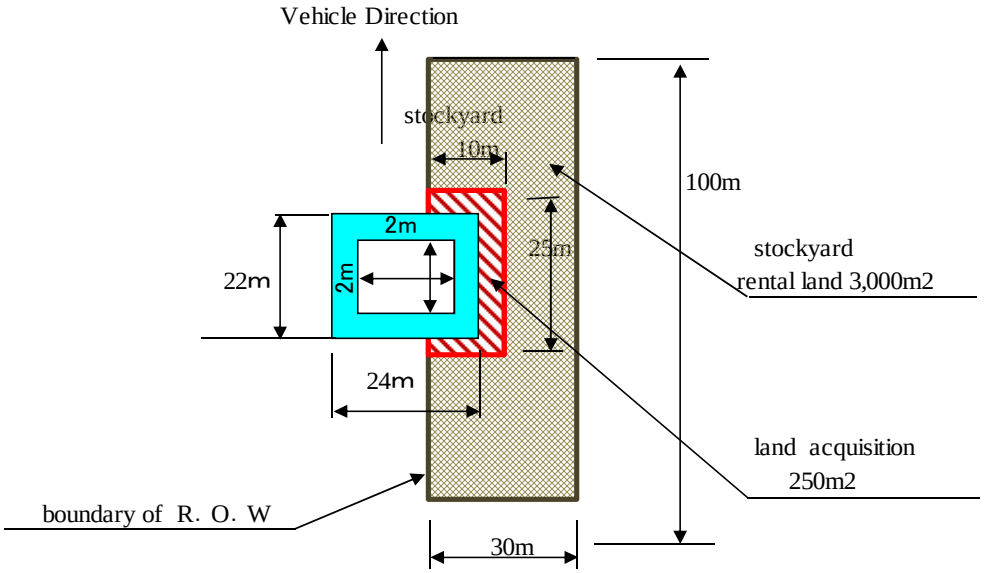
B-B Section

Soil excavation	11m x 19m x 900m	188,100m2
Concrete structure	32m2 x 900m	28,800m2
Protection of soil	29m x 900 m x 2	52,100m2

Estimate Cost

Description	Unit price (~~¥~~)	Quantity	Estimate lost (~~¥~~1,000)
A-A Section	50,000	25,000m3	1,250,000
B-B Section			
Soil excavation	5,400	188,100m3	1,015,740
Concrete structure	30,000	28,800m3	864,000
Protection for soil	32,000	52,200m2	1,670,400
Total estimate cost/1 rump	-		4,800,140
Total estimate cost for 20 rumps	-		96,002,800

3-3 Shield Shaft

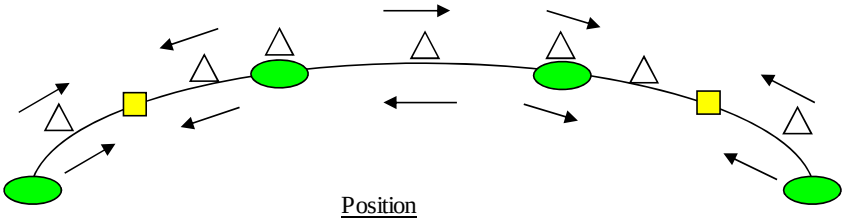


Quantity

Soil excavation (22m x 24 m x 43m)	22,704	m3
Concrete(168m2 x 43m)	7224	m3
Temporary retaining well (24m + 26m) x 2 x 60m)	6,000	m2
Temporary steel deck (24m x 26m)	624	m2

Cost

Description	**Unit Price (~~¥~~)**	**Quantity**	**Estimate Cost (~~¥~~1000)**
Soil excavation	5,400	22,704m3	122,602
Concrete	30,000	7,224m3	216,720
Temporary retaining well	40,000	6,000m2	240,000
Temporary steel deck	50,000	624m2	31,200
Total estimate cost /shaft	-	-	610,552
Total estimate cost for 12 shaft	-	-	7,326,260



Position

	Ventilation Shaft (shield start)	2 x 4=8 Locations
	Ventilation Shaft (shield arrive)	2 x 2=4 Locations
	Ventilation (Shaft)	7 Locations
	Direction of shield machine excavation	

3-4 Ventilation

① Equipment

Unit cost of ventilation will be established based on completed projects in Japan.

770,000,000¥/km (3 lane road ϕ 13.32m)

2 lane and 1 lane tunnel shall be equivalent with area of each tunnel.

Description	Tunnel area (m2)	Actual length	Transfer ration	Length
3lane road (r=6.66)	6.66m x 6.66m x 3.141 = 139.32m2	31.0km	1	31.0km
2lane road (r=5.04)	5.04m x 5.04m x 3.141 = 79.78m2	12.6 km	0.573	7.2 km
1lane road(r=3.36)	3.36m x .6.36m x 3.141 = 35.46m2	16.0km	0.255	4.1 km
Total equivalent length	-			42.3 km
Total of 7-locations	-	-	-	32,561,894,000 yen
1-location	-	-	-	4,651,699,000 yen

② Ventilation and Civil Works Underground

Room for ventilation machine

Room for electrical and high voltage electric

Room for generator

Room for utilities control

Room for communication equipment

Room for fire extinguisher pump

Room for water tank

Room for dust collect facilities

Room for air-condition

And other minor facilities

Civil works are construct duct under tunnels and foundation and wall of ventilation shaft.

Description	Cost (¥ 1,000)
Civil works	900,000
Building construction	800,000
Total (1-locaion)	1,700,000

③ Duct for connection between tunnel and ventilation
Estimate cost per location: 500,000,000 yen

④ Total Estimate Cost per location (million yen)

4,652 + 1,700 + 500 = 6,852 million yen

3-5 Tunnel Facilities

① Facilities

Unit cost of tunnel facilities will be established based on constructed projects in Japan.

(refer to table below)

560,000,000 ¥ /km (3lane road ϕ 13.32m)

2 lane and 1 lane tunnel shall be equivalent with area of each tunnel

Unit: ¥ 1,000

Description	Tunnel Area (m2)	Length (km)	Transfer ration	Length (km)	Unit Cost	Cost
3lane tunnel (r=6.66)	6.66 x 6.66 x 3.141=139.32	31.0	1	31	560,000	17,360,000
2lane tunnel (r=5.04)	5.04x5.04 x3.141=79.78	12.6	0.573	7.2	560,000	4,040,836
1lane tunnel (r=3.36)	3.36x3.36 x3.141=35.46	16.0	0.255	4.1	560,000	2,280,542
Total estimate cost	-	-	-	42.3	-	23,618,378

Summary of Tunnel Facilities

1. Emergency call and warning devices	1. Emergency phone system 2. Push button emergency call unit 3. Fire detector 4. Emergency alarm
2. Fire control equipments	1. Fire extinguisher 2. Fire hydrant
3. Excavation facilities	1. Sign board 2. Smoke ventilation or emergency exit
4. Other facilities	1. Hydrant cock and Siamese connection 2. Radio communication facility 3. Radio repeat or loudspeaker communication facility 4. Water spray system 5. CCTV facility 6. Pipe for utility of tunnel 7. Lightening for tunnel 8. Distributor of electricity 9. Generator of electricity

② Asphalt Pavement

Unit : Yen 1000

Description	Actual length (m)	Width (m)	Area (m2)	Unit cost	Cost
3lane tunnel	31,000	11.0	341,000	4	1,364,000
2lane tunnel	12,600	7.5	94,500	4	378,000
1lane tunnel	16,000	4.0	64,000	4	256,000
Total			499,500		1.998,000

③ Total estimate cost (Million Yen)

23,681+1,998 = 25,679 million yen

3-6 Land Acquisition and Land Rental

① Land acquisition including compensation for building and houses

Unit: P1, 000

Description	Location	Area/location (m2)	Area (m2)	Unit price	cost
Ramp	12	10,000	120,000	200	24,000,000
Shaft for shield	12	250	3,000	200	600,000
Ventilation	7	2,100	14,700	200	2,940,000
Total	31	-	137,700	-	27,540,000

② Rental land including compensation for buildings and houses

Unit: P 1.000

Description	Location	Area/location (m2)	Area (m2)	Unit price	Cost
Shaft for shield	12	3,000	36,000	100	3,600,000

③ Total Rough Estimated Cost

27,540 + 3,600 = 31,140 million pesos ⟶ 58,574 million yen

4) Summary of Scheme-2: Package 1 of Scheme-1

Main tunnel (3-lane) : 4.7km x 2 directions

Entrance/Exit at both end (2-lane) : 3.9 km x 2-directions

	Quantity	Unit	Unit Price (1,000yen)	Cost (100 million yen)	Cost (100 million peso)	Remarks
1. Construction Cost						
A. Direct cost				1,688	902	
Main tunnel 3-lane@4.7km, 2-lanes @3.4 km)	2,257,000	m3	43	971	519	167.84m^2 x 9,400m + 99.91 m^2 x 6,800m = 2,257,084 m^3
Ramp Tunnel	8	location	4,800,000	384	205	Count 4-ramps at south entrance/exit due to 2-lane
Shield shaft	6	location	610,000	37	20	
Ventilation shaft	3	location	6,852,000	206	110	
Facilities	1	l.s.		90	48	
B. Genral Cost				34	18	
Traffic Management (1% of A)				17	9	
Utility Relocation (1% of A)				17	9	
C. Indirect cost (30% of A+B)				517	276	
D. Sub total (A + B +C)				2,239	1,196	
E. VAT (12% of D)				269	144	
F. Construction cost (D+E)				2,508	1,340	
G. Consultancy Cost (10% of F)				251	134	
H. Land acquisition including compensation	1	l.s.		214	114	
for structures						
I. Contingency Cost (5% of F+G)				138	74	
Total Cost (F+G+H+I)				**3,111**	**1,662**	

4.1 Tunnel Facilities

① Unit cost of tunnel facilities will be established based on constructed projects in Japan.
(refer to table below)
560,000,000 ¥/km (3lane road ϕ 13.32m)
2 lane and 1 lane tunnel shall be equivalent with area of each tunnel

Unit: ¥1, 000

Description	Actual length (km)	Transfer ration	Length (km)	Unit Cost	Cost
3lane tunnel (r=6.66)	9.4	1	9.4	560,000	5,264,000
2lane tunnel (r=5.04)	6.8	0.573	3.9	560,000	2,180,768
1lane tunnel (r=3.36)	6.0	0.255	1.5	560,000	855,203
Total			14.8		8,299,972

Summary of Tunnel Facilities

1. Emergency call and warning devices	1. Emergency phone system 2. Push button emergency call unit 3. Fire detector 4. Emergency alarm
2. Fire control equipments	1. Fire extinguisher 2. Fire hydrant
3. Excavation facilities	1. Sign board 2. Smoke ventilation or emergency exit
4. Other facilities	1. Hydrant cock and Siamese connection 2. Radio communication facility 3. Radio repeat or loudspeaker communication facility 4. Water spray system 5. CCTV facility 6. Pipe for utility of tunnel 7. Lightening for tunnel 8. Distributor of electricity 9. Generator of electricity

② Asphalt Pavement Unit: ¥1000

Description	Actual length (m)	Width (m)	Area (m2)	Unit cost	Cost
3lane tunnel	9,400	11.0	103,400	4	413,600
2lane tunnel	6,800	7.5	51,000	4	204,000
1lane tunnel	6,000	4.0	24,000	4	96,000
Total			178,400		713,600

③ Total estimate cost (million yen)

8,300 + 714 = 9,014 million yen

4-2 Land acquisition and Land Rental

① Land acquisition including compensation for building and houses

Unit: P1, 000

Description	Location	Area/location (m2)	Area (m2)	Unit price	Cost
Ramp area	4	10,000	40,000	200	8,000,000
Shaft for shield	6	250	1,500	200	300,000
Ventilation	3	2,100	6,300	200	1,260,000
Total	13	-	47,800		9,560,000

② Rental land including compensation for buildings and houses

Unit: P 1.000

Description	Location	Area/location (m2)	Area (m2)	Unit price	Cost
Shaft for shield	6	3,000	18,000	100	1,800,000

③ Total Rough Estimated Cost (million Peso)

9,560 + 1,800 = 11,360 million peso ⟶ 21,368 million yen

5) Summary of Scheme-3: Only one(1) Direction of Scheme-1

Main tunnel (3-lane) : 15.5km

Entrance/Exit at both end (2-lane) : 7.3 km 1-directions

	Quantity	Unit	Unit Price (1,000yen)	Cost (100 million yen)	Cost (100 million peso)	Remarks
1. Construction Cost						
A. Direct cost				2,377	1,271	
Main tunnel 3-lane@15.5km, 2-lanes @6.3 km)	3,231,000	m3	43	1,389	743	67.84 m^2 x 15,500m + 99.91 m2 x 6,300m
Ramp Tunnel	10	location	4,800,000	480	257	Count 4 ramps at north/south entrance /exit due to 2-lane
Shield shaft	6	location	610,000	37	20	
Ventilation shaft	5	location	6,852,000	343	183	
Facilities	1	l.s.		128	68	
B. Genral Cost				48	26	
Traffic Management (1% of A)				24	13	
Utility Relocation (1% of A)				24	13	
C. Indirect cost (30% of A+B)				728	389	
D. Sub total (A + B +C)				3,153	1,686	
E. VAT (12% of D)				378	202	
F. Construction cost (D+E)				3,531	1,888	
G. Consultancy Cost (10% of F)				353	189	
H. Land acquisition including compensation	1	l.s.		304	162	
for structures						
I. Contingency Cost (5% of F+G)				194	104	
Total Cost (F+G+H+I)				**4,382**	**2,343**	

5-1 Tunnel Facilities

① Facilities

Unit cost of tunnel facilities will be established based on constructed projects in Japan.
(refer to table below)
560,000,000 ¥ /km (3lane road ϕ 13.32m)
2 lane and 1 lane tunnel shall be equivalent with area of each tunnel

Unit: ¥1,000

Description	Actual length (km)	Transfer ration	Length (km)	Unit Cost	Cost
3lane tunnel (r=6.66)	15.5	1	15.5	560,000	8,680,000
2lane tunnel (r=5.04)	6.3	0.573	3.6	560,000	2,020,418
1lane tunnel (r=3.36)	8.0	0.255	2.0	560,000	1,140,271
Total	-	-	21.1		11,840,689

Summary of Tunnel Facilities

1. Emergency call and warning devices	1. Emergency phone system 2. Push button emergency call unit 3. Fire detector 4. Emergency alarm
2. Fire control equipments	1. Fire extinguisher 2. Fire hydrant
3. Excavation facilities	1. Sign board 2. Smoke ventilation or emergency exit
4. Other facilities	1. Hydrant cock and Siamese connection 2. Radio communication facility 3. Radio repeat or loudspeaker communication facility 4. Water spray system 5. CCTV facility 6. Pipe for utility of tunnel 7. Lightening for tunnel 8. Distributor of electricity 9. Generator of electricity

② Asphalt Pavement Unit: ¥1000

Description	Actual length (m)	Width (m)	Area (m2)	Unit cost	Cost
3lane tunnel	15,500	11.0	170,500	4	682,000
2lane tunnel	6,300	7.5	47,250	4	189,000
1lane tunnel	8,000	4.0	32,000	4	128,000
Total			249,750		999,000

③ Total estimate cost (million yen)

11,841 + 999 = 12,840 million yen

5-2 Land acquisition and Land Rental

① Land acquisition including compensation for building and houses

Unit: P1, 000

Description	Location	Area/location (m2)	Area (m2)	Unit price	cost
Ramp	6	10,000	60,000	200	12,000,000
Shaft for shield	6	250	1,500	200	300,000
Ventilation	4.9	2,100	10,290	200	2,058,000
Total	17		71,790		14,358,000

② Rental land including compensation for buildings and houses

Unit: P 1.000

Description	Location	Area/location	Area (m2)	Unit price	Cost
Shaft for shield	6	3,000	18,000	100	1,800,000

③ Total Rough Estimated Cost (million Peso)

14,358 + 1,800 = 16,158 million Peso⟶ 30,393 million yen

6) Summary of Scheme-4: Construct 2-lane Tunnel both direction

Main tunnel (2-lane) : 22.8 km 2-directions

	Quantity	Unit	Unit Price (1,000yen)	Cost (100 million yen)	Cost (100 million peso)	Remarks
1. Construction Cost						
A. Direct cost				3,360	1,797	
Main tunnel 2-lane@22.8km)	4,356,000	m3	43	1,873	1,002	99.91 m2 x 43,600 m
Ramp Tunnel	20	location	4,800,000	960	513	
Shield shaft	6	location	610,000	37	20	
Ventilation shaft	4	location	7,790,000	312	167	
Facilities	1	l.s.		178	95	
B. Genral Cost				68	36	
Traffic Management (1% of A)				34	18	
Utility Relocation (1% of A)				34	18	
C. Indirect cost (30% of A+B)				1,028	550	
D. Sub total (A + B +C)				4,456	2,383	
E. VAT (12% of D)				535	286	
F. Construction cost (D+E)				4,991	2,669	
G. Consultancy Cost (10% of F)				499	267	
H. Land acquisition including compensation	1	l.s.		523	278	
for structures						
I. Contingency Cost (5% of F+G)				275	147	
Total Cost (F+G+H+I)				**6,288**	**3,361**	

6.1 Ventilation

① Equipment

Unit cost of ventilation will be established based on completed projects in Japan.

770,000,000¥/km (3 lane road ϕ 13.32m)

2 lane and 1 lane tunnel shall be equivalent with area of each tunnel.

Unit: ¥1, 000

Description	Actual length(km)	Transfer ration	Length(km)	Unit cost	Unit cost
3lane road	0.0	1	0.0	770,000	.0
2lane road	43.6	0.573	25.0	770,000	19,236,000
1lane road	16.0	0.255	4.1	770,000	3,141,600
Total cost of 4-locations	-	-	29.0		22,377,000
Cost per location	-	-	-		5,590,000

② Ventilation and Civil Works Underground

Room for ventilation machine
Room for electrical and high voltage electric
Room for generator
Room for utilities control
Room for communication equipment
Room for fire extinguisher pump
Room for water tank
Room for dust collect facilities
Room for air-condition
And other minor facilities

Civil works are duct under tunnels and foundation and wall of ventilation shaft

Description	Cost (¥ 1,000)
Civil works	900,000
Building construction	800,000
Total (1-locaion)	1,700,000

③ Duct for connection between tunnel and ventilation

Estimate cost per location: 500,000,000 yen

④ Total Estimate Cost per location (Million Yen)

5,590 + 1,700 + 500 = 7,790 million yen

6-2 Tunnel Facilities

① Facilities

Unit cost of tunnel facilities will be established based on constructed projects in Japan.

(refer to table below)

560,000,000 ₩ /km (3lane road ϕ 13.32m)

2 lane and 1 lane tunnel shall be equivalent with area of each tunnel

Unit: P1, 000

Description	Actual length(km)	Transfer ratio	Length(km)	Unit cost	Unit cost
3lane tunnel (r=6.66)	0.0	1	0.0	560,000	0
2lane tunnel(r=5.04)	43.6	0.573	25.0	560,000	13,983,000
1lane tunnel(r=3.36)	16.0	0.255	4.1	560,000	2,280,000
Total	-	-	29.1	-	16,263,000

Summary of Tunnel Facilities

1. Emergency call and warning devices	1. Emergency phone system 2. Push button emergency call unit 3. Fire detector 4. Emergency alarm
2. Fire control equipments	1. Fire extinguisher 2. Fire hydrant
3. Excavation facilities	1. Sign board 2. Smoke ventilation or emergency exit
4. Other facilities	1. Hydrant cock and Siamese connection 2. Radio communication facility 3. Radio repeat or loudspeaker communication facility 4. Water spray system 5. CCTV facility 6. Pipe for utility of tunnel 7. Lightening for tunnel 8. Distributor of electricity 9. Generator of electricity

② Asphalt Pavement

Unit: Yen 1000

Description	Actual length (m)	Width (m)	Area (m2)	Unit cost	Cost
3lane tunnel	0	11.0	0	4	0
2lane tunnel	43,600	7.5	327,000	4	1,308,000
1lane tunnel	16,00	4.0	64,000	4	256,000
Total			391,000		1,564,000

③ Total estimate cost (million yen)

16,263 + 1,564 = 17,827 million yen

6-3 Land Acquisition and Land Rental

① Land acquisition including compensation for building and houses

Unit: P1, 000

Description	Location	Area/location (m2)	Area (m2)	Unit price	Cost
Ramp	12	10,000	120,000	200	24,000,000
Shaft for shield	6	250	1,500	200	300,000
Ventilation	4	2,100	8,400	200	1,680,000
Total	22	-	129,900	-	25,980,000

② Rental land including compensation for buildings and houses

Unit: P 1.000

Description	Location	Area/location	Area (m2)	Price unit	cost
Shaft for shield	6	3,000	18,000	100	1,800,000

③ Total Rough Estimated Cost

25,980 + 1,800 = 27,780 million peso⟶ 52,254 million yen

7) Summary of Scheme-5: Only one(1) Direction of Scheme 4

Main tunnel (2-lane) : 22.8 km 1-direction

	Quantity	Unit	Unit Price (1,000yen)	Cost (100 million yen)	Cost (100 million peso)	Remarks
1. Construction Cost						
A. Direct cost				1,743	933	
Main tunnel 2-lane@22.8km)	2,178,000	m3	43	937	501	99.91 m2 x 22,800 m
Ramp Tunnel	10	location	4,800,000	480	257	
Shield shaft	3	location	610,000	18	10	
Ventilation shaft	2.8	location	7,790,000	218	117	
Facilities	1	l.s.		90	48	
B. Genral Cost				34	18	
Traffic Management (1% of A)				17	9	
Utility Relocation (1% of A)				17	9	
C. Indirect cost (30% of A+B)				533	285	
D. Sub total (A + B +C)				2,310	1,236	
E. VAT (12% of D)				277	148	
F. Construction cost (D+E)				2,587	1,384	
G. Consultancy Cost (10% of F)				259	138	
H. Land acquisition including compensation	1	l.s.		277	147	
for structures						
I. Contingency Cost (5% of F+G)				142	76	
Total Cost (F+G+H+I)				**3,265**	**1,745**	

7.1 Tunnel Facilities

① Facilities

Unit cost of tunnel facilities will be established based on constructed projects in Japan.

(refer to table below)

560,000,000 ¥ /km (3lane road ϕ 13.62m)

2 lane and 1 lane tunnel shall be equivalent with area of each tunnel

Unit: ¥1,000

Description	Actual length (km)	Transfer ration	Length (km)	Unit Cost	Cost
3lane tunnel (r=6.66)	0.0	1	0	560,000	0
2lane tunnel (r=5.04)	21.8	0.573	12.5	560,000	6,991,287
1lane tunnel (r=3.36)	8.0	0.255	2.0	560,000	1,140,271
Total			14.5		8,131,558

Summary of Tunnel Facilities

1. Emergency call and warning devices	1. Emergency phone system 2. Push button emergency call unit 3. Fire detector 4. Emergency alarm
2. Fire control equipments	1. Fire extinguisher 2. Fire hydrant
3. Excavation facilities	1. Sign board 2. Smoke ventilation or emergency exit
4. Other facilities	1. Hydrant cock and Siamese connection 2. Radio communication facility 3. Radio repeat or loudspeaker communication facility 4. Water spray system 5. CCTV facility 6. Pipe for utility of tunnel 7. Lightening for tunnel 8. Distributor of electricity 9. Generator of electricity

② Asphalt Pavement

Unit: ¥1000

	Actual length (km)	width	Area (m2)	Unit cost	Cost
3lane road	0	11.0	0	4	0
2lane road	21,800	7.5	163.500	4	654,000
1lane road	16,000	4.0	64,000	4	256,000
Total			227,500		910,000

③ Total estimate cost (million yen)

8,131+ 910= 9,042 million yen

7-2 Land acquisition and Land Rental

① Land acquisition including compensation for building and houses

Unit: P1, 000

Description	Location	Area/location (m2)	Area (m2)	Unit price	cost
Ramp	6	10,000	60,000	200	12,000,000
Shaft for shield	3	250	750	200	150,000
Ventilation	4	2,100	8,400	200	1,680,000
Total	13	-	69,150	-	3,830,000

② Rental land including compensation for buildings and houses

Unit: P 1.000

Description	Location	Area/location	Area (m2)	Unit price	Cost
Shaft for shield	3	3,000	9,000	100	900,000

③ Total Rough Estimated Cost (million Peso)

13,830 + 900 = 14,730 million peso⟶ 27,707 million yen