

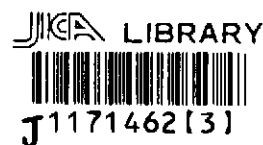
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
REPUBLIC OF THE PHILIPPINES**

**THE DETAILED DESIGN STUDY
ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(PLARIDEL, CABANATUAN AND SAN JOSE BYPASSES)**

FINAL REPORT

**PLARIDEL BYPASS - CONTRACT PACKAGE IV
(INITIAL STAGE)
STA. 49+625.000 TO STA. 55+672.457**



December 2002

**KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD**

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GENERAL

INDEX OF DRAWINGS

THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY PLARIDEL BYPASS - PACKAGE IV (INITIAL STAGE)

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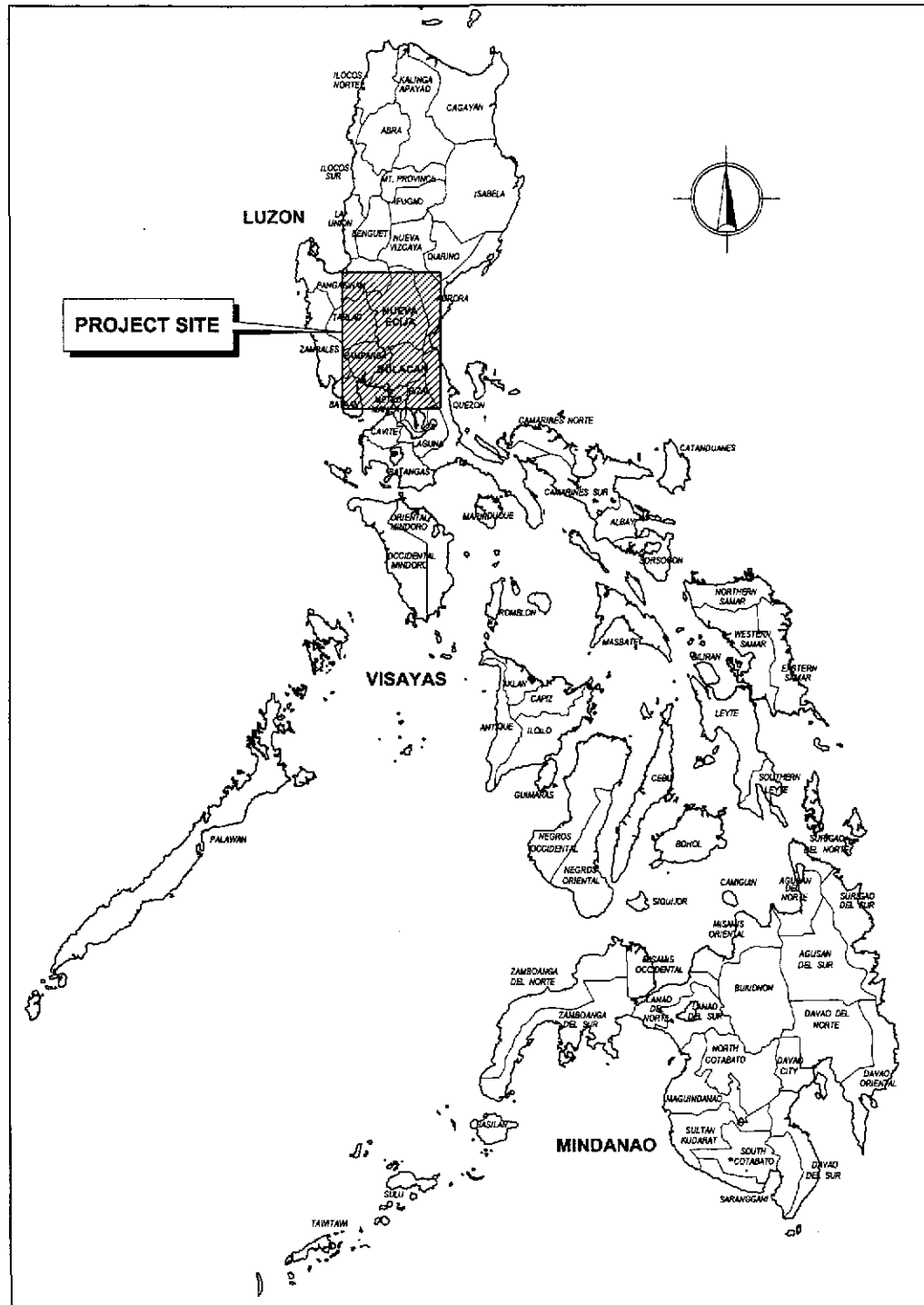
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :					
	CHECKED	9/27/07	<i>[Signature]</i>		BUREAU OF DESIGN	OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)									
	SUBMITTED	10/16/07	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:					Approved By:	PLARIDEL BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1	INDEX OF DRAWINGS (INITIAL STAGE) Sheet 1 of 2	GP-01
					DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OC, Director IV					MANUEL M. BONGAN Undersecretary				

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THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY PLARIDEL BYPASS - PACKAGE IV (INITIAL STAGE)

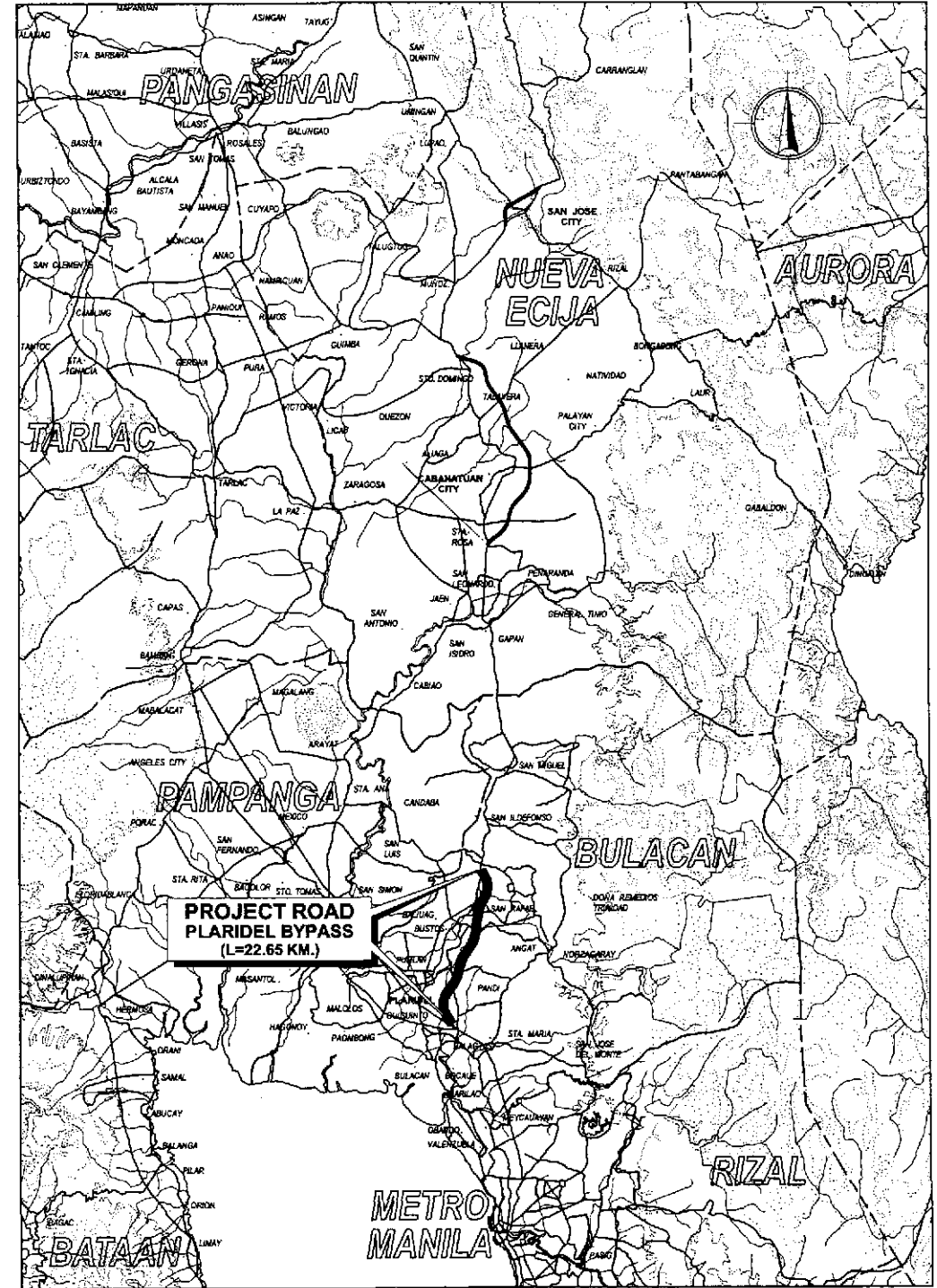
SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING
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		OE-02	LAYOUT PLAN, STA. 50 + 800.000 TO STA. 52 + 200.000		
		OE-03	LAYOUT PLAN, STA. 52 + 200.000 TO STA. 53 + 600.000		
		OE-04	LAYOUT PLAN, STA. 53 + 600.000 TO STA. 55 + 000.000		
		OE-05	LAYOUT PLAN, STA. 55 + 000.000 TO STA. 55 + 672.457		
			CONE PENETRATION TEST (CPT)		
		OC-01	PROFILE, STA. 34 + 113.50 - STA. 39+513.00		

		DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :		
	DESIGNED	9/24/20			PJHL - PMD	BUREAU OF DESIGN	OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)					
	CHECKED	9/27/20			Submitted By:	Reviewed By:	Recommended By:	Approved By:	PLARIDEL BYPASS - CONTRACT PACKAGE IV				
	SUBMITTED	10/16/20			DANIEL C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES Dir. Director IV	MANUEL M. BONGAN Undersecretary					



PROJECT SITE

2 KEY MAP
GP-03 NOT TO SCALE



PROJECT ROAD
PLARIDEL BYPASS
(L=22.65 KM.)

1 VICINITY MAP
GP-03 NOT TO SCALE

JICA JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL YEO YACHIYO ENGINEERING CO., LTD.	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :	
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	SUBMITTED	10/16/02			Reviewed By:	PLARIDEL BYPASS - CONTRACT PACKAGE IV			FULL SIZE A1		
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES O.C. Director IV	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary				

LEGEND AND SYMBOLS

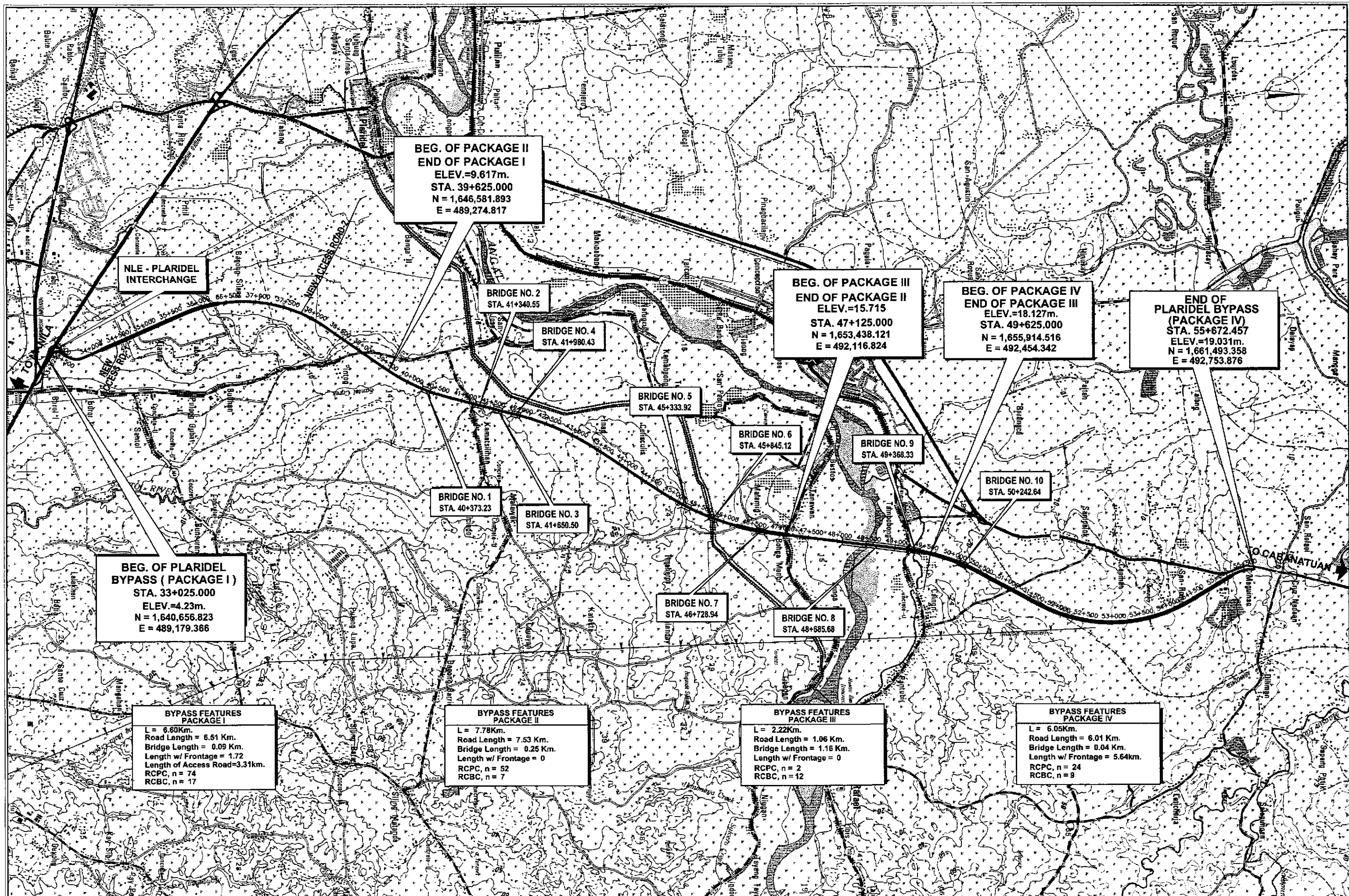
EXISTING FEATURES	
ROAD	
CONTOUR	
ORIGINAL GROUND	
CONCRETE FENCE	
BARBED WIRE FENCE	
HOUSE	
TREES	
BRIDGE	
SINGLE PIPE CULVERT	
DOUBLE PIPE CULVERT	
BOX CULVERT	
DITCH LINE/ IRRIGATION LINE	
IRRIGATION LINE	
RIVER/CREEK	
ELECTRIC POST	
KILOMETER POST	
TRAVERSE STATION POINT	
BENCHMARK	
FISH POND	
NATIONAL POWER CORP. TRANSMISSION LINE	

NEW DESIGN FEATURES	
PROJECT ROAD	
SERVICE OR FRONTAGE ROAD ALONG BYPASS	
CONTOUR	
RIGHT-OF-WAY LIMIT	
POINT OF INTERSECTION	
POINT OF INTERSECTION NO.	
☉ OF PROJECT ROAD	
FINISHED GRADE ON PROFILE	
BRIDGE	
SINGLE RC PIPE CULVERT	
DOUBLE RC PIPE CULVERT	
BOX CULVERT	
EARTH DITCH FLOW	
DIRECTION OF FLOW	
MANHOLE	
GUARDRAIL ON PLAN	
GUARDRAIL ON PROFILE	
GROUTED RIPRAP ON SLOPE	
EMBANKMENT	
EXCAVATION	
SECTION IN WATER	
SECTION IN EARTH	
SECTION IN CONCRETE	
SECTION IN GRAVEL	
SECTION IN STRUCTURAL STEEL	
SOFT BED MATERIALS TO BE EXCAVATED	
STONE MASONRY RETAINING WALL / REVETMENT / REINF. CONCRETE RETAINING WALL	
NORTH SIGN	
GRID COORDINATES	
AGGREGATE SOURCE	
LINE SYMMETRY	
SECTION TARGET	
ELEVATION TARGET	
TITLE TARGET	
SUB-TITLE TARGET	
DETAIL REF TARGET	
BOREHOLE	
STREET LIGHTING POLE	
KILOMETER POST	
STATION GRID	
LINED IRRIG. CANAL	
CHAIN LINK FENCE	
SODDING ON PLAN	
LOW TREES	
MIDDLE TREE	
HIGH TREE	

ABBREVIATIONS

A	PARAMETER (CLOTHOID)	DIST.	DISTANCE	Lo	SUPERELEVATION RUN-OFF	NIC	NOT INCLUDED IN CONTRACT
ABAN	ABANDON	DIV.	DIVISION	LG	LONG	MPa	MEGA PASCAL
ABT	ABOUT	DRWG./DWG.	DRAWING	LLV	LONG LEG VERTICAL	MC	MANHOLE COVER
ABUT	ABUTMENT	DWY.	DRIVEWAY	LM	LINEAR METER	RP	REFERENCE POINT
AC	ASPHALT CONCRETE	e%	DESIGN SUPERELEVATION	LONGIT.	LONGITUDINAL	RSP	ROCK SLOPE PROTECTION
AGG	AGGREGATE	E	EASTING	LP	LIGHT POLE	RT.	RIGHT
AH	AHEAD	EA	EACH	LS	LUMP SUM ; LEFT SIDE	S	SOUTH
APP	APPROACH	ECC/CS/PF	END OF CIRCULAR CURVE	LT	LEFT	SECT.	SECTION
ASPH	ASPHALT	E	EXTERNAL DISTANCE	m	METER	SDWK.	SIDEWALK
ASTM	AMERICAN STANDARD FOR TESTING & MATERIALS	EF	EACH FACE	mm	MILLIMETER	SHT.	SHEET
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS	EG	EDGE OF GUTTER	MAX	MAXIMUM	SL	SLOPE
AVE	AVENUE	ELEV./EL.	ELEVATION	MFL	MAXIMUM FLOOD LEVEL	SQ.M./m ²	SQUARE METER
AZIM.	AZIMUTH	EMB.	EMBANKMENT	MFWL	MAXIMUM FLOOD WATER LEVEL	SMH	SEWER MANHOLE
BCC/SC/PC	BEGINNING OF CIRCULAR CURVE	ENGR.	ENGINEER	MH	MANHOLE	SP	SPIRAL
BDRY LN	BOUNDARY LINE	EP	EDGE OF PAVEMENT	MIN.	MINIMUM	SPCD.	SPACED
BEG.	BEGINNING	EQ	EQUAL ; EQUATION	MISC.	MISCELLANEOUS	SPCS.	SPACES
BET.	BETWEEN	EQN.	EQUATION	MO	MIDDLE ORDINATE	SPL	SPECIAL
BGY./BRGY.	BARANGAY	ESMT	EASMENT	MPa	MEGA PASCAL	SPECS.	SPECIFICATIONS
BH	BOREHOLE	ETC/ST	END OF TRANSITION CURVE	MSL	MEAN SEA LEVEL	SQ.	SQUARE
BK	BACK	EW	EACH WAY	MT	METRIC TON	ST.	STREET
BLDG.	BUILDING	EXC.	EXCAVATION	DPWH	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	STA.	STATION
BLVD.	BOULEVARD	EXIST./EXTG.	EXISTING	MWSS	METROPOLITAN WATERWORKS & SEWERAGE SYSTEM	STD.	STANDARD
BM	BENCH MARK	EXP.	EXPANSION BEARING	N	NORTH / NEWTON	STIFF.	STIFFENERS
BMSL	BELOW MEAN SEA LEVEL	EXT.	EXTERIOR	N/A	NOT APPLICABLE	STIRR./STIR	STIRRUP(S)
BOT./BOTT	BOTTOM	EXTN.	EXTENSION	NC	NORMAL CROWN	STR.	STRAIGHT
BR.	BRIDGE	FF	FAR FILL/FAR FACE	NF	NEAR FACE	STRUC./STRUCT	STRUCTURAL
BRG	BEARING	FG	FINISHED GRADE	NO./No.	NUMBER	SURVY.	SURVEY
BS	BACK STATION ; BOTH SIDES	FIN.	FINISHED	OC/O.C.	ON CENTER	SYMM.	SYMMETRY
BST	BITUMINOUS SURFACE TREATMENT	FPL	FINISHED PAVEMENT LEVEL	OD	OUTSIDE DIAMETER	T	TANGENT
BTC/TS	BEGINNING OF TRANSITION CURVE	FTG.	FOOTING	OGL	ORIGINAL GROUND LEVEL	TBM	TEMPORARY BENCHMARK
BW	BOTHWAYS	FH	FIRE HYDRANT	OUT INV.	OUTLET INVERT	TEMP.	TEMPORARY
C	CURVE	FWL	FLOOD WATER LEVEL	OWL	ORDINARY WATER LEVEL	THK.	THICK
CAB	CRUSHED AGGREGATE BASE	g	GRADIENT IN PERCENT	PCC	PORTLAND CEMENT CONCRETE	Tk	SHORT TANGENT OF SPIRAL
CALC.	CALCULATED	GALV.	GALVANIZED	PEJ	PREMOULDED EXPANSION JOINT	TL	LONG TANGENT OF SPIRAL
CB	CATCH BASIN	GEN.	GENERAL	PHIL.	PHILIPPINE(S)	TRANS.	TRANSVERSE
c / c	CENTER TO CENTER	GIP	GALVANIZED IRON PIPE	PI	POINT OF INTERSECTION	Ts	TOTAL TANGENT DISTANCE
CEM	CEMENT	GPS	GLOBAL POSITIONING SYSTEM	PJHL	PHILIPPINE-JAPAN HIGHWAY LOAN	TYP.	TYPICAL OR TYPE
CEP	CONCRETE ELECTRIC POST	GL	GROUND LEVEL	PL	PROPERTY LINE/ PLATE	V	DESIGN SPEED
cm.	CENTIMETER	GRD.	GRADE	PLDT	PHILIPPINE LONG DISTANCE TELEPHONE COMPANY	VAR.	VARIABLE/VARIES
Cu M/m ³	CUBIC METER	HDWL	HEADWALL	PMO	PROJECT MANAGEMENT OFFICE	VC	VERTICAL CURVE
CHB	CONCRETE HOLLOW BLOCK	HFL	HIGH FLOOD LEVEL	POC	POINT ON CURVE	VER.	VERIFIED
CIM	CURB INLET MANHOLE	HOR.	HORIZONTAL	POT	POINT OF TANGENT	VERT.	VERTICAL
CI	CURB INLET	HSE	HOUSE	PP	POWER POLE	VOL	VOLUME
CL	CENTERLINE	HT.	HEIGHT	PR	PROJECT ROAD	W	WIDENING
CLR	CLEAR	HTL	HIGH TIDE LEVEL	PRC	POINT OF REVERSE CURVE	w	WIDTH
COL(S)	COLUMN(S)	HWL/HW	HIGH WATER LEVEL/HIGH WATER	PROJ.	PROJECT	W/	WITH
COMB. CONC.	COMBINE CONCRETE	HWY.	HIGHWAY	PROP.	PROPOSED	W/o	WITHOUT
CONC.	CONCRETE	I	INTERSECTION ANGLE	PVC	POLYVINYL CHLORIDE	WEP	WOODEN ELECTRIC POST
CONC. MON.	CONCRETE MONUMENT	ID	INSIDE DIAMETER	PVI	POINT OF VERTICAL INTERSECTION	WK	WALK
CONST.	CONSTRUCTION	IN.	INCHES	PVMT.	PAVEMENT	WT	WATER TANK
CONST. JT.	CONSTRUCTION JOINT	INC.	INCORPORATED	QTY	QUANTITY	X,Y	COORDINATE OF BCC AND ECC WITH RESPECT TO TANGENT
CONT.	CONTINUOUS	IN. INV.	INLET INVERT	R	RADIUS	&	AND
CORP.	CORPORATION	INT.	INTERIOR	RC	REINFORCED CONCRETE	⊙	AT
CP	CROSS PIPE	INTERM.	INTERMEDIATE	RCBC	REINFORCED CONCRETE BOX CULVERT	⊔	BASELINE
C & G	CURB AND GUTTER	IRRIG.	IRRIGATION	RCBG	REINFORCED CONCRETE BOX GIRDER	⊥	CENTERLINE
CULV.	CULVERT	JT.	JOINT	RCDG	REINFORCED CONCRETE DECK GIRDER	∞	INFINITY
C/WAY	CARRIAGEWAY	kg.	KILOGRAM	RCPC	REINFORCED CONCRETE PIPE CULVERT	%	PERCENT
CYL.	CYLINDRICAL	KN	KILO NEWTON	RD	ROAD	+/-	PLUS / MINUS
CTR	CENTER	KPa	KILO PASCAL	RDWY.	ROADWAY	∅	DIAMETER
DEPT.	DEPARTMENT	FIX	FIX BEARING	REINF.	REINFORCED	⊠	SQUARE
DET.	DETAIL	KM	KILOMETER	REP	RELOCATED ELECTRIC POST	CP	CONTROL POINT
DIA./DIAM	DIAMETER	KPH	KILOMETER PER HOUR	RET. WALL	RETAINING WALL	L	ANGLE SHAPE
DIAPH.	DIAPHRAGM	L	LENGTH	ROW	RIGHT-OF-WAY		
		Lc	LENGTH OF CIRCULAR ARC	RS	RIGHT SIDE		

<p style="text-align: center;">JAPAN INTERNATIONAL COOPERATION AGENCY</p>		DATE	SIGNATURE	<p style="text-align: center;">REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	9/24/02	[Signature]	<p style="text-align: center;">BUREAU OF DESIGN</p> <p style="text-align: center;">Submitted By: DANILLO C. TRAJANO, Project Director</p>				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	FULL SIZE A1	ABBREVIATIONS	GP-05
	CHECKED	9/27/02	[Signature]	<p style="text-align: center;">OFFICE OF THE SECRETARY</p> <p style="text-align: center;">Recommended By: JOSEFINA M. ALAGAR, Chief, Highways Division</p>				PLARIDEL BYPASS - CONTRACT PACKAGE IV			



NLE - PLARIDEL INTERCHANGE

**BEG. OF PACKAGE II
END OF PACKAGE I**
ELEV.=9.617m
STA. 39+625.000
N = 1,646,581.893
E = 489,274.817

**BEG. OF PACKAGE III
END OF PACKAGE II**
ELEV.=15.715
STA. 47+125.000
N = 1,653,438.121
E = 492,116.824

**BEG. OF PACKAGE IV
END OF PACKAGE III**
ELEV.=18.127m
STA. 49+625.000
N = 1,655,914.516
E = 492,454.342

**END OF PLARIDEL BYPASS
(PACKAGE IV)**
STA. 55+672.457
ELEV.=19.031m
N = 1,661,493.358
E = 492,753.876

BEG. OF PLARIDEL BYPASS (PACKAGE I)
STA. 33+025.000
ELEV.=4.23m
N = 1,640,656.823
E = 489,179.366

BYPASS FEATURES PACKAGE I
L = 6.60Km.
Road Length = 6.51 Km.
Bridge Length = 0.09 Km.
Length w/ Frontage = 1.72
Length of Access Road=3.31km.
RCPC, n = 74
RCBC, n = 17

BYPASS FEATURES PACKAGE II
L = 7.78Km.
Road Length = 7.53 Km.
Bridge Length = 0.25 Km.
Length w/ Frontage = 0
RCPC, n = 52
RCBC, n = 7

BYPASS FEATURES PACKAGE III
L = 2.22Km.
Road Length = 1.06 Km.
Bridge Length = 1.16 Km.
Length w/ Frontage = 0
RCPC, n = 2
RCBC, n = 12

BYPASS FEATURES PACKAGE IV
L = 6.05Km.
Road Length = 6.01 Km.
Bridge Length = 0.04 Km.
Length w/ Frontage = 5.64km.
RCPC, n = 24
RCBC, n = 9

BRIDGE NO. 2
STA. 41+340.55

BRIDGE NO. 4
STA. 41+980.43

BRIDGE NO. 5
STA. 45+333.92

BRIDGE NO. 6
STA. 45+845.12

BRIDGE NO. 9
STA. 49+368.33

BRIDGE NO. 10
STA. 50+242.64

BRIDGE NO. 1
STA. 40+373.23

BRIDGE NO. 3
STA. 41+650.50

BRIDGE NO. 7
STA. 46+728.94

BRIDGE NO. 8
STA. 48+685.68

<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p>		<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>				<p>PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)</p>		<p>SCALE : 1:30,000</p>	<p>SHEET CONTENTS : PROJECT ROAD GENERAL ALIGNMENT & FEATURES</p>	<p>SHEET NO. : GP-06</p>
DESIGNED	DATE	SIGNATURE	PURL - PMO		BUREAU OF DESIGN		OFFICE OF THE SECRETARY			
CHECKED	DATE	SIGNATURE	Submitted By:	Reviewed By:	Recommended By:	Recommended By:	Approved By:			
SUBMITTED	DATE	SIGNATURE	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONICAN Undersecretary	SIMEON A. DATUMANONG Secretary			
								<p>PLARIDEL BYPASS - CONTRACT PACKAGE IV</p>		<p>FULL SIZE A1</p>

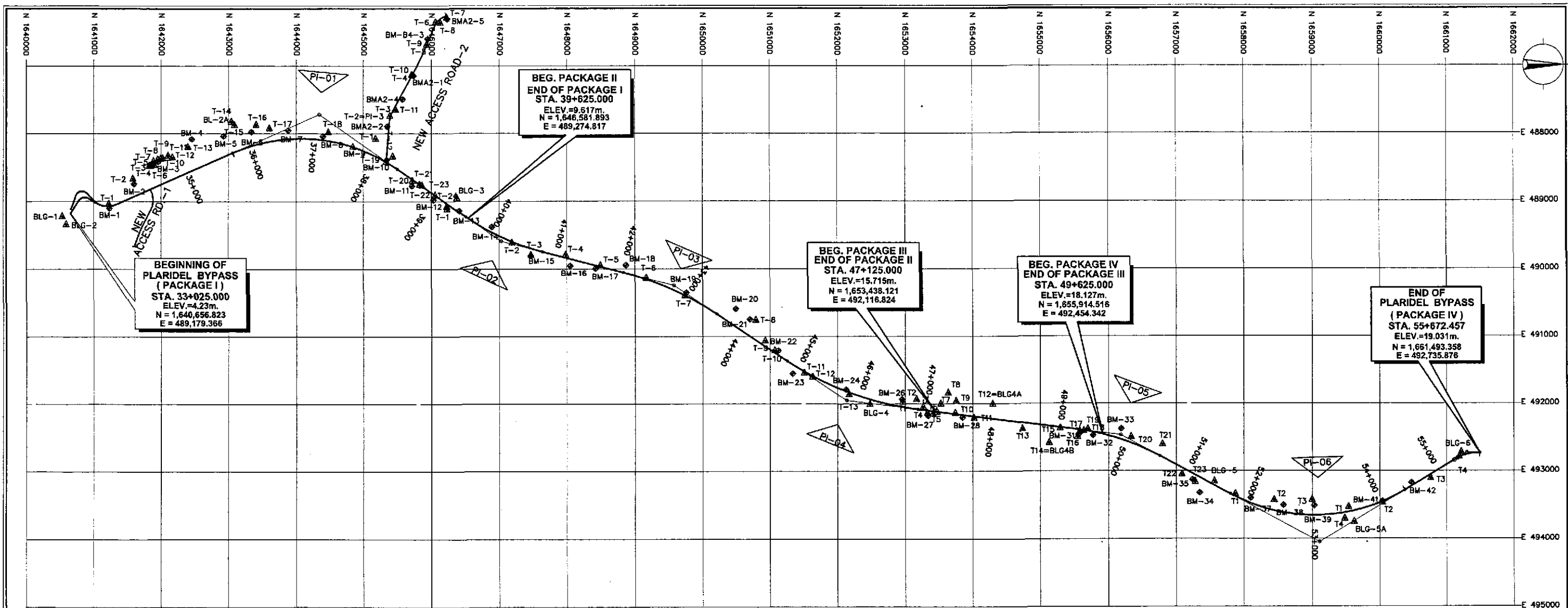


TABLE OF HORIZONTAL AND VERTICAL CONTROL

CONTROL POINT	COORDINATES		ELEV.	REMARKS
	NORTHING	EASTING		
BM-1	1,641,232.641	489,100.464	3.537	It is loc. on a rice paddy int. on left of the alignment in Bgy. Buntol 2, Gurguinto, Bulacan. It is 20m. from end of dirt rd.
BM-2	1,641,598.368	488,743.032	3.855	It is loc. on a rice paddy intersection on the left of the alignment in Bgy. Pulung Gubal, Plaridel.
BM-3	1,641,958.977	488,414.108	5.523	It is loc. on top of intersection of a rice paddy dike on left side of the alignment in Bgy. Pulung Gubal, Plaridel.
BM-4	1,642,460.780	488,080.530	2.085	It is loc. on the intersection of a rice paddy dike on the left side of the alignment in Bgy. Pulung Gubal, Plaridel.
BM-5	1,642,928.376	488,037.023	3.065	It is loc. on the rice paddy dike on the left side of the alignment in Bgy. Cuyeto, Plaridel.
BM-6	1,643,338.598	487,976.161	3.339	It is loc. on the side of a concrete road near an electric post in Bgy. Cuyeto, Plaridel.
BM-7	1,643,883.348	487,952.887	3.883	It is loc. on top of the intersection of a rice paddy dike on the left side of the alignment in Bgy. Cuyeto, Plaridel.
BM-8	1,644,402.499	488,038.520	5.178	It is loc. on a rice paddy dike on the left side of the alignment in Bgy. Buhitan, Plaridel.
BM-9	1,644,847.404	488,197.025	6.382	It is loc. on a rice paddy dike along the alignment in Bgy. Buhitan, Plaridel.
BM-10	1,645,345.307	488,388.233	6.802	It is loc. on the side of a dirt road near a fence concrete post on left side of the align. in Bgy. Buhitan, Plaridel.
BM-11	1,645,714.384	488,771.939	6.317	It is loc. on the disk of a fishpond on the right side of the alignment in Bgy. Buhitan, Plaridel.
BM-12	1,646,032.378	488,978.696	8.415	It is loc. on the side of the prov'l road on the right side of align. near the corner of a wall in Bgy. Buhitan, Plaridel.
BM-13	1,646,416.622	489,145.127	7.859	It is loc. on the back of a college on the left side of the alignment in Bgy. Buhitan, Plaridel.
BM-14	1,646,892.978	489,377.904	8.484	It is loc. on a rice paddy dike on the left side of the align. surrounded by banana in Bgy. Buhitan, Plaridel.
BM-15	1,647,467.925	489,802.574	8.801	It is loc. on the center of a dirt road on the right side of the alignment in Bgy. San Jose, Balweg.
BM-16	1,648,054.174	489,953.321	10.601	It is loc. on the int. of the bgy. road & the prov'l road on the left side of the align. in Bgy. San Jose, Balweg.
BM-17	1,648,424.838	489,984.453	10.582	It is loc. on the side of the dirt road where an irr. canal is on the right side of the align. in Bgy. San Jose, Balweg.
BM-18	1,648,870.652	489,943.559	10.265	It is loc. under a tree on the side of the road where an irr. canal is on the left side of align. in Bgy. Malamp, Bustos.
BM-19	1,649,757.184	490,350.187	11.391	It is loc. under a tree on the side of a creek on the left side of the alignment in Bgy. Malamp, Bustos.
BM-20	1,650,493.060	490,591.189	11.615	It is loc. under a tree near an unlined house on the left side of the alignment in Bgy. Malamp, Bustos.
BM-21	1,650,705.071	490,746.236	12.246	It is loc. on the side of the rd. near a culvert about a meter from the int. on the left side of the alignment in Bustos.
BM-22	1,651,121.786	491,211.136	12.593	It is loc. on the side of the road near an irrigation draft on the left side of the alignment in Bgy. Malamp, Bustos.
BM-23	1,651,339.268	491,553.289	18.706	It is loc. on the side of the road near an irrigation draft on the left side of the alignment in Bgy. Malamp, Bustos.
BM-24	1,652,126.811	491,790.544	14.480	It is loc. on the side of a wall on a fishpond dike about 40m. from the road on the left side of the align. in Bustos.
BM-26	1,652,961.730	491,935.264	17.018	It is loc. on the side of the dirt road near a coconut tree on the left side of the align. in Bgy. Malamp, Bustos.
BM-27	1,653,326.791	492,180.066	16.372	It is loc. on the side of the rd. opposite the cor. of a wall nr. allied post on the left side of the align. in Bustos.
BM-28	1,653,845.433	492,207.423	12.908	It is loc. on a rice paddy dike on the right side of the alignment in Bgy. Bonja Manor, Bustos.
BM-31	1,655,556.301	492,461.715	17.903	It is loc. on the side of the prov'l road under an acacia tree on the right side of the align. in Bgy. Tambobong, Sar. Rafael.
BM-32	1,655,771.208	492,471.912	17.367	It is loc. on the side of a dirt road near an elec. post on the right side of the align. in Bgy. Tambobong, Sar. Rafael.

TABLE OF HORIZONTAL AND VERTICAL CONTROL

CONTROL POINT	COORDINATES		ELEV.	REMARKS
	NORTHING	EASTING		
BM-33	1,656,186.911	492,373.317	16.036	It is loc. under an acacia tree on a private lot on the left side of the alignment in Bgy. Tambobong, San Rafael.
BM-34	1,657,343.337	493,325.087	16.228	It is loc. on top of a rice paddy dike on the left side of the alignment in San Rafael, Bulacan.
BM-35	1,657,235.065	493,124.978	19.335	It is loc. on a rice paddy dike near the intersection on the left side of the alignment in San Rafael, Bulacan.
BM-37	1,658,087.133	493,462.758	25.474	It is loc. on the intersection of the rice paddy dike on the left side of the alignment in San Rafael, Bulacan.
BM-38	1,658,577.840	493,506.635	25.298	It is loc. on a rice paddy int. near a fence concrete post on the right side of the align. in San Rafael, Bulacan.
BM-39	1,659,026.390	493,512.322	25.137	It is loc. on the side of a dirt road on the right side of the alignment in San Rafael, Bulacan.
BM-41	1,660,037.271	493,451.999	28.680	It is loc. on the rice paddy intersection on the right side of the alignment in San Rafael, Bulacan.
BM-42	1,660,472.819	493,175.599	18.805	It is loc. on a rice paddy dike on the right side of the alignment in San Rafael, Bulacan.
BM-A2-1	1,646,237.686	486,306.250	6.524	It is located on side of concrete road bet. two guavas 70m. from end of conc. wall of Oratex Comp., Plaridel.
BM-A2-2	1,645,946.661	486,593.542	6.120	It is loc. under a coconut tree on backyard about 3m. from house, 70m. from conc. road in Plaridel.
BM-A2-3	1,645,739.141	487,142.838	7.237	It is loc. near an abandoned elec. post at rice paddy int. outside the fence of property, Buhitan, Plaridel.
BM-A2-4	1,645,576.228	487,490.381	5.555	It is loc. beside the foot of an elec. tower, about 10m. from Ct. of a dirt road in Bgy. Buhitan, Plaridel.
BM-A2-5	1,645,351.778	487,893.272	4.749	

TABLE OF GPS STATION POINTS

CONTROL POINT	COORDINATES		ELEV.	REMARKS
	NORTHING	EASTING		
BLG-1	1,640,585.729	489,225.487	8.931	Loc. at the left guardrail going to Tabang Exit. Drilled on top of the guardrail in an iron steel 1/4x2" about 40 m. from the last approach of the bridge.
BLG-2	1,640,582.279	489,340.024	10.835	It is loc. under a tree on the side of the road where an irr. canal is on the left side of align. in Bgy. Malamp, Bustos.
BLG-2A	1,643,045.047	487,830.179	3.777	Loc. in Bgy. Daungar, Gurguinto, Bulacan. It is embedded beside an irr. canal, about 150 m. from inter., about 15 m. from an elec. post, 50 m. from BM-18 and about 15 m. from the fence of the house on the other side of the road.
BLG-3	1,646,381.832	488,957.118	8.646	Loc. in Bgy. Matias, Sampaloc, Buhitan, Plaridel, Bulacan. It is loc. on the head of an irrigation check valve, outside the Colegio de Inmortalidad Concepcion, about 10 m. from the shed and 4 m. from road centerline.
BLG-4	1,652,474.952	492,013.344	16.125	Loc. in Bgy. Malamp, Bustos, Bulacan. It is on the side of an irrigation canal, about 5 m. from the road opening, 150 m. from a rd. fork, and about 5 m. from the new house loc. in Bgy. Tambobong, San Rafael, Bulacan. It is emb. on the rd. about 600 m. from inter., 20 m. from the house.
BLG-4B	1,655,132.400	492,583.981	9.310	Loc. in Bgy. Samp. San Ral, Bulacan. It is emb. on r. side of the rd. going to Royal Northwoods 30 m. from the inter.
BLG-5	1,657,566.872	493,155.992	22.517	
BLG-5A	1,659,619.893	493,753.421	29.885	Loc. in Bgy. San Roque, Hulo, San Rafael, Bulacan. It is embedded on the paddy dike 20 m. from the dirt road centerline.

TABLE OF TRAVERSE STATION POINTS

CONTROL POINT	COORDINATES		ELEV.
	NORTHING	EASTING	
T-1	1,641,225.254	489,045.710	3.380
T-2	1,641,583.179	488,689.897	4.030
T-3	1,641,830.464	488,477.896	4.930
T-4	1,641,839.683	488,483.095	5.050
T-5	1,641,867.816	488,474.488	5.120
T-6	1,641,901.421	488,463.363	5.380
T-7	1,641,892.449	488,410.158	5.540
T-8	1,641,957.897	488,384.675	5.080
T-9	1,642,000.969	488,371.561	4.660
T-10	1,642,028.410	488,367.580	5.150
T-11	1,642,108.886	488,330.691	4.630
T-12	1,642,173.014	488,355.198	4.970
T-13	1,642,403.881	488,200.615	4.000
T-14	1,643,045.237	487,829.752	3.700
T-15	1,643,090.558	487,878.132	3.470
T-16	1,643,408.710	487,873.117	2.580
T-17	1,643,604.945	487,925.855	2.930
T-18	1,643,483.188	487,964.415	5.410
T-19	1,645,338.877	488,418.165	6.870
T-20	1,645,721.458	488,700.217	8.030
T-21	1,645,829.207	488,757.963	7.960
T-22	1,645,865.037	488,769.278	8.350
T-23	1,648,058.318	488,913.983	8.080
T-24	1,646,234.573	489,081.303	8.050
T-1	1,646,237.677	489,119.964	7.800
T-2	1,646,190.511	489,613.241	8.530
T-3	1,647,472.147	489,797.550	9.180
T-4	1,647,987.901	489,794.855	9.910
T-5	1,648,499.124	489,951.678	10.960

TABLE OF TRAVERSE STATION POINTS

CONTROL POINT	COORDINATES		ELEV.
	NORTHING	EASTING	
T-6	1,648,171.515	490,135.688	10.900
T-7	1,649,736.908	490,396.363	11.280
T-8	1,650,793.468	490,761.338	12.560
T-9	1,650,932.296	491,070.927	14.680
T-10	1,651,073.140	491,213.182	13.180
T-11	1,651,511.858	491,544.594	18.780
T-12	1,651,634.116	491,604.256	16.560
T-13	1,652,171.172	491,865.395	15.670
T1	1,652,963.172	491,975.061	17.150
T2	1,653,166.711	491,937.097	16.340
T3	1,653,264.574	492,049.187	16.440
T4	1,653,327.487	492,142.734	16.240
T5	1,653,411.651	492,150.335	16.880
T6	1,653,472.407	492,130.939	17.350
T7	1,653,525.530	492,004.044	17.430
T8	1,653,637.260	491,842.625	15.430
T9	1,653,754.181	491,964.051	12.460
T10	1,653,738.630	494,141.877	14.840
T11	1,654,020.437	492,214.607	14.240
T13	1,654,737.523	492,379.170	11.600
T15	1,655,293.248	492,368.349	9.550
T16	1,655,545.515	492,498.513	17.830
T17	1,655,576.842	492,417.335	18.020
T18	1,655,635.552	492,409.403	17.620
T19	1,655,697.300	492,385.182	17.490
T20	1,656,337.537	492,498.250	15.870
T21	1,656,799.655	492,608.090	20.950
T22	1,657,085.668	493,052.405	19.510
T23	1,657,280.628	493,163.137	19.630

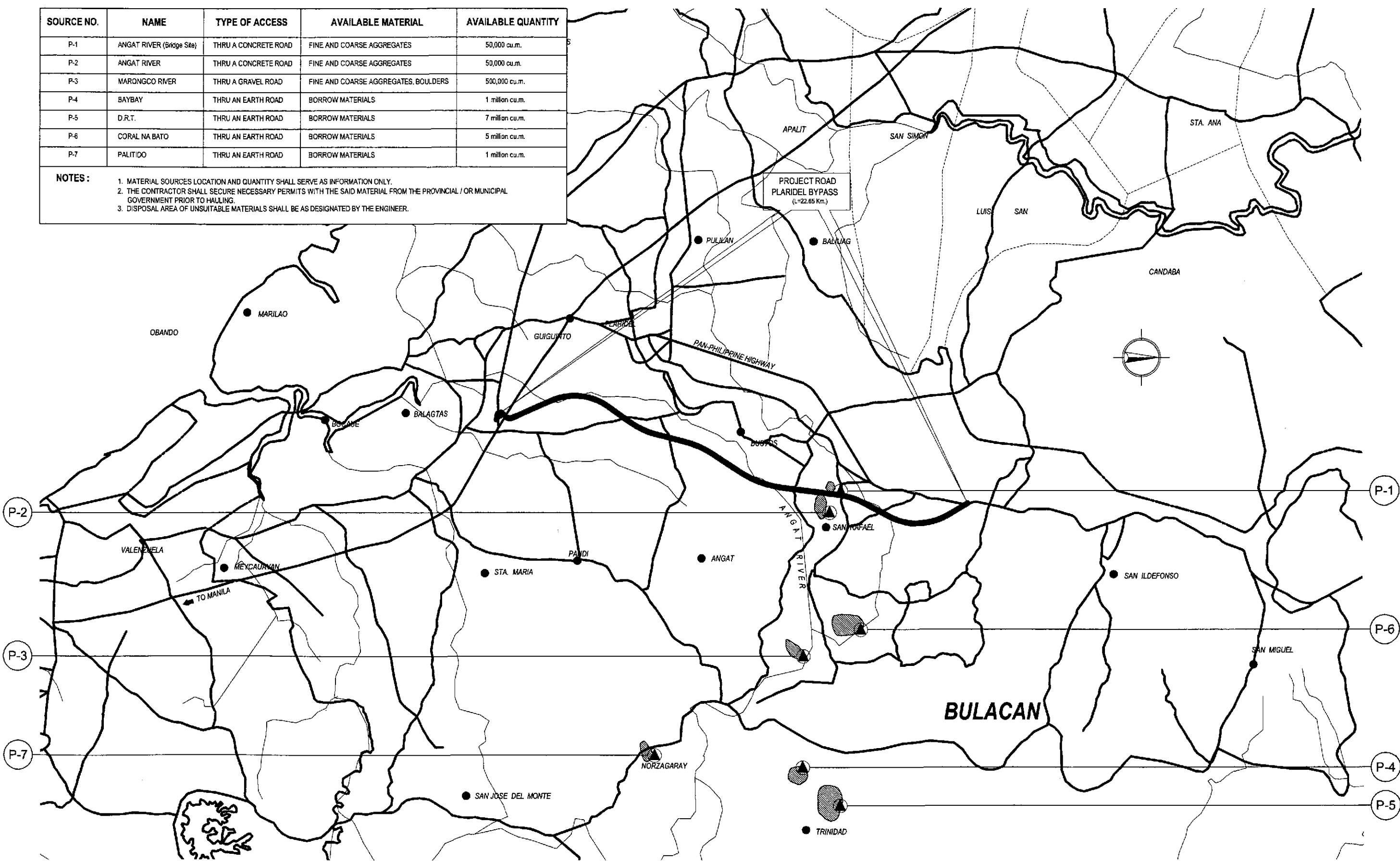
TABLE OF TRAVERSE STATION POINTS

CONTROL POINT	COORDINATES		ELEV.
	NORTHING	EASTING	
T1	1,657,875.550	493,344.564	25.030
T2	1,658,442.470	493,433.175	25.310
T3	1,658,998.440	493,432.436	25.400
T4	1,659,476.800	493,708.043	28.820
T1	1,659,535.000	493,536.684	25.000
T2	1,660,040.390	493,471.255	28.680
T3	1,660,794.170	493,109.355	12.960
T4	1,661,191.210	492,796.889	13.460
T-1	1,645,182.814	488,080.020	6.740
T-2-PI-3	1,645,392.696	487,741.560	4.900
T-3	1,645,474.803	487,648.546	5.950
T-4	1,646,710.343	487,137.423	7.460
T-5	1,645,931.256	486,882.762	6.100
T-6	1,648,065.278	486,350.560	7.130
T-7	1,648,230.317	486,282.965	8.960
T-8	1,646,137.594	486,360.509	7.750
T-9	1,645,932.065	486,685.036	8.280
T-10	1,645,718.320	487,138.070	7.500
T-11	1,645,478.867	487,551.111	6.040
T-12	1,645,434.836	488,340.248	7.060

	DESIGNED: 9/24/02 CHECKED: 9/27/02 SUBMITTED: 10/16/02	DATE: 9/24/02 SIGNATURE: [Signature] PROJECT DIRECTOR	P.J.M. - P.M.O. SUBMITTED BY: [Signature] DANILLO C. TRAJANO Project Director	BUREAU OF DESIGN REVIEWED BY: [Signature] JOSEFINA M. ALACAR Chief, Highways Division	OFFICE OF THE SECRETARY RECOMMENDED BY: [Signature] MANUEL M. BONDAN Undersecretary	APPROVED BY: [Signature] SIMEON A. DATUMANONG Secretary	PROJECT AND LOCATION: THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE IV	SCALE: 1:30,000 FULL SIZE A1	SHEET CONTENTS: HORIZONTAL AND VERTICAL CONTROL MONUMENT	SHEET NO.: GP-07
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SOURCE NO.	NAME	TYPE OF ACCESS	AVAILABLE MATERIAL	AVAILABLE QUANTITY
P-1	ANGAT RIVER (Bridge Site)	THRU A CONCRETE ROAD	FINE AND COARSE AGGREGATES	50,000 cu.m.
P-2	ANGAT RIVER	THRU A CONCRETE ROAD	FINE AND COARSE AGGREGATES	50,000 cu.m.
P-3	MARONGCO RIVER	THRU A GRAVEL ROAD	FINE AND COARSE AGGREGATES, BOULDERS	500,000 cu.m.
P-4	BAYBAY	THRU AN EARTH ROAD	BORROW MATERIALS	1 million cu.m.
P-5	D.R.T.	THRU AN EARTH ROAD	BORROW MATERIALS	7 million cu.m.
P-6	CORAL NA BATO	THRU AN EARTH ROAD	BORROW MATERIALS	5 million cu.m.
P-7	PALITIDO	THRU AN EARTH ROAD	BORROW MATERIALS	1 million cu.m.

NOTES :
1. MATERIAL SOURCES LOCATION AND QUANTITY SHALL SERVE AS INFORMATION ONLY.
2. THE CONTRACTOR SHALL SECURE NECESSARY PERMITS WITH THE SAID MATERIAL FROM THE PROVINCIAL / OR MUNICIPAL GOVERNMENT PRIOR TO HAULING.
3. DISPOSAL AREA OF UNSUITABLE MATERIALS SHALL BE AS DESIGNATED BY THE ENGINEER.



A LOCATION OF MATERIAL SOURCES
GP-08 SCALE AS SHOWN

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KAI KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				
CHECKED	DATE	SIGNATURE	BUREAU OF DESIGN				
SUBMITTED	DATE	SIGNATURE	OFFICE OF THE SECRETARY				
Submitted By: DANILLO C. TRAJANO Project Director			Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division		Recommended By: GILBERTO S. REYES O.C. Director IV		
Team Leader: <i>[Signature]</i>			Recommended By: MANUEL M. BONDAN Undersecretary		Approved By: SIMEON A. DATUMANONG Secretary		




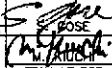

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:80,000	LOCATION OF MATERIAL SOURCES	GP-08
PLARIDEL BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		

SUMMARY OF QUANTITIES (INITIAL STAGE)

ITEM NO	DESCRIPTION	UNIT	QUANTITY													REMARKS
			BYPASS	RCBC	A-18	A-19	A-19a	A-20	C-4L	C-4R	A-21	A-22	A-22a	A-22b	BRIDGE No. 10	
PART C - EARTHWORKS																
100(1)	Clearing and Grubbing	ha	30.90	-	-	-	-	-	-	-	-	-	-	-	-	31.00
100(3)	Individual removal of trees, small (150mm$\leq\phi\leq 900\text{mm}$)	each	117.00	-	-	-	-	-	-	-	-	-	-	-	-	117.00
100(4)	Individual removal of trees, large (>900mm)	each	28.00	-	-	-	-	-	-	-	-	-	-	-	-	28.00
101(1)	Removal of Existing Structures and Obstructions	L.S.	1.00	-	-	-	-	-	-	-	-	-	-	-	-	1.00
101(3)a	Removal of Existing PCC Pavement	m ²	549.00	-	600.00	793.00	-	-	-	-	-	-	-	-	-	1,942.00
102(1)	Unsuitable Excavation	m ³	113,107.87	-	-	-	-	-	-	-	-	-	-	-	-	113,108.00
103(1)	Structure Excavation	m ³	89.61	1,093.05	-	1.27	0.27	-	0.99	0.99	0.99	218.65	124.67	0.99	-	1,532.00
103(2)a	Bridge Excavation above OWL (Common Soil)	m ³	-	-	-	-	-	-	-	-	-	-	-	-	323.00	323.00
103(3)a	Gravel Foundation Fill	m ³	-	93.00	-	-	-	-	-	-	-	22.88	16.12	-	-	132.00
103(6)	Pipe Culverts and Drain Excavation	m ³	3,608.75	-	-	106.22	26.58	-	25.34	25.34	72.40	-	-	39.82	-	3,905.00
103(7)	Granular Backfill for Pipe Culvert	m ³	1,648.08	-	-	59.30	15.28	-	14.01	14.01	40.02	-	-	22.01	-	1,813.00
104(1)	Embankment from Roadway Excavation	m ³	71,830.44	-	434.45	346.58	700.72	81.57	870.29	820.34	553.01	984.08	-	116.16	-	76,748.00
104(3)	Embankment from Borrow Pit	m ³	181,281.26	-	719.20	418.65	268.30	69.57	-	-	495.97	2,404.63	-	74.00	-	185,732.00
104(4)	Embankment from Borrow (Selected Granular Materials) for Bridge	m ³	-	-	-	-	-	-	-	-	-	-	-	-	-	942.00
105(1)	Subgrade Preparation (Common Soil)	m ²	25,424.55	-	1,058.56	1,253.99	641.02	122.31	340.26	240.18	-	2,987.36	-	514.45	-	32,593.00
PART D - BASE AND SUBBASE COURSE																
200(1)	Aggregate Subbase Course	m ³	23,510.33	-	385.23	611.33	-	-	-	-	-	1,245.93	-	182.72	-	25,936.00
201(1)	Aggregate Base Course	m ³	8,575.07	-	-	-	-	-	-	-	-	-	-	-	-	8,575.00
PART E - SURFACE COURSES																
300(1)	Gravel Surface Course	m ³	9,537.12	-	-	-	50.38	71.13	51.00	48.00	206.12	-	-	-	-	9,964.00
311(1)b	PCC Pavement (Plain), t=250mm	m ²	51,221.81	-	-	-	-	-	-	-	-	-	-	-	-	51,222.00
311(1)c	PCC Pavement (Plain), t=230mm	m ²	-	-	930.82	1,476.87	-	-	-	-	-	2,837.30	-	630.00	-	5,975.00
311(2)	PCC Pavement (Reinforced) t=300mm Approach Slab	m ²	-	-	-	-	-	-	-	-	-	-	-	-	120.00	120.00
PART F - BRIDGE CONSTRUCTION																
400(4)b	Precast Concrete Piles (450mmx450mm), furnished	m	-	-	-	-	-	-	-	-	-	-	-	-	1,582.00	1,582.00
400(13)b	Precast Concrete Piles (450mmx450mm), driven	m	-	-	-	-	-	-	-	-	-	-	-	-	1,496.00	1,496.00
400(15)b	Test Piles (Conc. Pile 450mmx450mm), furnished & driven	m	-	-	-	-	-	-	-	-	-	-	-	-	50.50	51.00
400(19)b	Pile shoes for 450mmx450mm Piles	each	-	-	-	-	-	-	-	-	-	-	-	-	70.00	70.00
401(1)a	Concrete Railing Type A (Concrete Posts and Precast Beams)	m	-	-	-	-	-	-	-	-	-	-	-	-	72.00	72.00
404(1)	Reinforcing Steel (Grade 40)	kg	2,233.70	73,132.69	-	348.60	72.92	-	137.84	137.84	275.68	16,473.96	10,244.10	137.84	25,513.00	128,709.00
404(2)	Reinforcing Steel (Grade 60)	kg	-	-	-	-	-	-	-	-	-	-	-	-	25,623.00	25,623.00
405(1)a	Structural Concrete Class A (f'c=21MPa, max. aggregate 38mm) for heavily reinforced structures	m ³	50.51	700.15	-	7.84	1.64	-	3.10	3.10	6.20	162.24	103.15	3.10	-	1,042.00
405(1)b	Structural Concrete Class A (f'c=21MPa, max. aggregate 38mm) for small & medium bridges substructures	m ³	-	-	-	-	-	-	-	-	-	-	-	-	378.00	378.00
405(1)d	Structural Concrete Class A1 (f'c=21MPa, max. aggregate 20mm) for small & medium bridges PCDG superstructures	m ³	-	-	-	-	-	-	-	-	-	-	-	-	118.00	118.00
405(2)	Structural Concrete Class B (f'c=17MPa, max. aggregate 50mm) for plain or lightly reinforced structures	m ³	625.94	-	20.92	4.84	-	-	5.12	5.12	14.62	-	-	8.04	-	685.00
405(3)	Structural Concrete Class C (f'c=21MPa, max. aggregate 12mm) for thin reinforced members	m ³	-	-	-	-	-	-	-	-	-	-	-	-	19.00	19.00
405(6)	Lean Concrete (f'c=17MPa, max. aggregate 38mm)	m ³	-	66.06	-	-	-	-	-	-	-	-	-	-	66.00	125.00
406(1)k	Precast Prestressed Structural Concrete Member (AASHTO Girder Type V, L=36m)	each	-	-	-	-	-	-	-	-	-	-	-	-	5.00	5.00
407(1)c	Elastomeric Bearing Pad, Duro 50 (800x350x50mm)	each	-	-	-	-	-	-	-	-	-	-	-	-	10.00	10.00
407(2)a	Expansion Joint, t=40mm Movement	m	-	-	-	-	-	-	-	-	-	-	-	-	20.00	20.00
407(2)b	Expansion Joint, 30mm for bridge sidewalk	m	-	-	-	-	-	-	-	-	-	-	-	-	4.00	4.00
407(4)	G.I. Drain Pipe ϕ 150mm for Bridge Drainage	m	-	-	-	-	-	-	-	-	-	-	-	-	3.00	3.00
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES																
500(1)b4	RCPC Standard Strength (32MPa), ϕ 610mm (24")	m	66.00	-	-	-	-	-	-	-	-	-	-	-	-	66.00
500(1)c4	RCPC Extra Strength (32MPa), ϕ 610mm (24")	m	-	-	-	11.00	11.00	-	-	-	-	-	-	-	-	22.00
500(1)c6	RCPC Extra Strength (32MPa), ϕ 910mm (36")	m	296.00	-	-	22.00	-	-	7.00	7.00	20.00	-	-	11.00	-	363.00
500(1)c7	RCPC Extra Strength (32MPa), ϕ 1070mm (42")	m	388.00	-	-	-	-	-	-	-	-	-	-	-	-	388.00
500(1)c8	RCPC Extra Strength (32MPa), ϕ 1220mm (48")	m	48.00	-	-	-	-	-	-	-	-	-	-	-	-	48.00
502(2)b1	Special Junction Box Manhole for RCPC 1- ϕ 660 x 1- ϕ 460	each	20.00	-	-	-	-	-	-	-	-	-	-	-	-	20.00
502(2)b2	Special Junction Box Manhole for RCPC 1- ϕ 610 x 1- ϕ 460	each	20.00	-	-	-	-	-	-	-	-	-	-	-	-	20.00
502(2)b14	Special Junction Box Manhole for RCPC 1- ϕ 910 x 1- ϕ 610	each	12.00	-	-	-	-	-	-	-	-	-	-	-	-	12.00
502(2)b15	Special Junction Box Manhole for RCPC 1- ϕ 1070 x 1- ϕ 810	each	12.00	-	-	-	-	-	-	-	-	-	-	-	-	12.00
502(2)b34	Special Junction Box Manhole for RCPC 2- ϕ 910 x 1- ϕ 610	each	5.00	-	-	-	-	-	-	-	-	-	-	-	-	5.00
502(2)b35	Special Junction Box Manhole for RCPC 2- ϕ 1070 x 1- ϕ 810	each	4.00	-	-	-	-	-	-	-	-	-	-	-	-	4.00
502(3)a4	Catch Basin for RCPC 1- ϕ 910mm	each	1.00	-	-	-	-	-	-	-	-	-	-	-	-	1.00
502(3)a5	Catch Basin for RCPC 1- ϕ 1070mm	each	2.00	-	-	-	-	-	-	-	-	-	-	-	-	2.00
502(4)a1	U-shaped Concrete Ditch W=0.50m x H=0.50m	m	6,762.00	-	-	-	-	-	-	-	-	-	-	-	-	6,762.00
502(6)b	V-shaped Lined Ditch H=500mm, 1:1.00	m	5,270.00	-	-	-	-	-	-	-	-	-	-	-	-	5,270.00
502(7)a	Trapezoidal Lined Ditch B=450mm, H=500mm, 1:1.00	m	994.00	-	-	-	-	-	-	-	-	-	-	-	-	994.00
502(7)b	Trapezoidal Lined Ditch B=1000mm, H=500mm, 1:1.00	m	3,764.00	-	-	-	-	-	-	-	-	-	-	-	-	3,764.00
504(5)	Grouted Riprap Class A	m ³	708.57	-	-	-	-	-	-	-	-	-	-	-	61.00	770.00
506(1)	Hand Laid Rock Apron (Loose Boulder Apron)	m ³	-	-	-	-	-	-	-	-	-	-	-	-	127.00	127.00
510(1)	Rubble Concrete Slope Protection	m ³	-	-	-	-	-	-	-	-	-	-	-	-	163.00	163.00

SUMMARY OF QUANTITIES (INITIAL STAGE)

ITEM NO	DESCRIPTION	UNIT	QUANTITY													REMARKS
			BYPASS	RCBC	A-18	A-19	A-19a	A-20	C-4L	C-4R	A-21	A-22	A-22a	A-22b	BRIDGE No. 10	
PART H - MISCELLANEOUS STRUCTURES																
600(1)a	Concrete Curb, Type A (200x450mm)	m	38.49													39.00
600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (875x364mm)	m	1,055.53										410.36			1,466.00
602(1)	Right-of-Way Concrete Monuments	each	286.00		10.00	7.00	3.00	6.00	6.00	6.00	8.00	13.00		6.00		351.00
602(2)	Maintenance Marker Posts for Drainage Structure	each	29.00			5.00	2.00		2.00	2.00	4.00	2.00	2.00	2.00		51.00
602(3)	Kilometer Posts	each	6.00													6.00
603(3)a	Metal Guardrails (Metal Beam) Type A (Embedded in soil)	m	680.00													680.00
605(1)a	Warning Signs (Triangular 900mm)	each	16.00									1.00				17.00
605(2)a	Regulatory Signs (Triangular 1039mm)	each	1.00													1.00
605(2)b	Regulatory Signs (Octagonal 600mm)	each		2.00	2.00		1.00			2.00						7.00
605(2)c	Regulatory Signs (Circular Ø600mm)	each	9.00									2.00				11.00
605(2)d	Regulatory Signs (Rectangular 450x750mm)	each	4.00	2.00	2.00		1.00			2.00						11.00
605(3)c	Informatory Signs (Type B, double post)	each	1.00													1.00
605(3)d	Informatory Signs (Type C, double post)	each	1.00													1.00
605(3)e	Informatory Signs (Type D, double post)	each	1.00													1.00
607(2)a	Reflectorized Pavement Studs (Raised Profile Type, one face reflective)	each	28.00													28.00
607(2)b	Reflectorized Pavement Studs (Raised Profile Type, two faces reflective)	each	105.00									7.00				112.00
607(3)	Chatter Bars (one face reflective)	each	234.00									26.00				260.00
608(1)	Furnishing and Placing Top Soil	m3	26,445.33	70.76	68.32	196.32	65.32	105.12	84.29	94.42	297.70		56.09			27,485.00
610(1)	Sodding	m2	132,226.66	353.82	341.58	991.61	326.61	525.62	421.47	472.11	1,488.49		280.43			137,429.00
611(1)c	Trees (Furnishing and Transplanting) High Tree (Young Tree) 1.5m < H < 3.0m	each	556.00													556.00
612(1)a	Reflectorized Thermoplastic Pavement Markings (White)	m2	2,081.60	187.44	69.30					2.32	117.08		19.77			2,478.00
612(1)b	Reflectorized Thermoplastic Pavement Markings (Yellow)	m2	140.73													141.00
SPL 620(1)a	Traffic Signal Pole Type A (Mast Arm Post H=6.7m)	each	2.00													2.00
SPL 620(1)c	Traffic Signal Pole Type B (Ø114.3mm x 4.2m)	each	4.00													4.00
SPL 620(1)d	Traffic Signal Pole Type C (Ø114.3mm x 3.4m)	each	4.00													4.00
SPL 620(1)e	Traffic Signal Pole Type D (Ø114.3mm x 3.0m)	each	2.00													2.00
SPL 620(2)a	Traffic Signal Lamps Type A (6 vehicle lamps)	each	3.00													3.00
SPL 620(2)b	Traffic Signal Lamps Type B (3 vehicle lamps)	each	11.00													11.00
SPL 620(2)c	Traffic Signal Lamps Type C (2 pedestrian lamps)	each	6.00													6.00
SPL 620(4)a	Street Lighting Poles (Single Lamp)	each									2.00					2.00
SPL 620(4)b	Street Lighting Poles (Dual Lamp)	each	18.00								6.00					24.00
SPL 620(4)d	Street Lighting Service Pole with Panel	each									1.00					1.00

		DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/24/02		P.W.H. - P.W.O.	BUREAU OF DESIGN	OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pilaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	SUMMARY OF QUANTITIES (INITIAL STAGE) (2 of 2)	GP-10
	CHECKED	7/27/02		Submitted By:	Reviewed By:	Recommended By:	PLARIDEL BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		
SUBMITTED	10/16/02		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OC, Director IV	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary			

R O A D W A Y

GENERAL NOTES

HIGHWAY / CIVIL AND DRAINAGE NOTES

1.0 DESIGN STANDARDS / SPECIFICATIONS

- 1.1 ALL GEOMETRIC DESIGN STANDARDS SHALL COMPLY WITH THE VALUES PRESCRIBED IN "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS", 1994 EDITION OF THE AMERICAN ASSOCIATION OF STATE HIGHWAYS AND TRANSPORTATION OFFICIALS (AASHTO), AND "DESIGN GUIDELINES CRITERIA AND STANDARDS" ISSUED BY THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS (DPWH).
- 1.2 ALL WORKS SHALL COMPLY WITH THE DPWH STANDARD SPECIFICATIONS, 1985 EDITION, VOLUME II, HIGHWAYS, BRIDGES, AND AIRPORTS, AND THE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.

2.0 SURVEY CONTROLS AND REFERENCES

- 2.1 HORIZONTAL CONTROL IS BASED THROUGH GLOBAL POSITIONING SYSTEM (GPS) ESTABLISHED BY THE ACRE SURVEYING. CORRESPONDING GPS STATIONS ARE AS FOLLOWS:

GPS STA.	NORTHING	EASTING	ELEVATIONS	DESCRIPTION
BLG-1	1640535.729	489225.487	8.931	LOCATED AT THE LEFT GUARDRAIL GOING TO TABANG EXIT. DRILLED ON TOP OF THE GUARDRAIL IS AN IRON STEEL 1/4"x2" ABOUT 40m. FROM THE LAST APPROACH OF THE BRIDGE.
BLG-2	1640592.279	489340.024	10.635	LOCATED AT THE WALL RAILING AT THE END OF THE BRIDGE'S FIRST APPROACH. DRILLED ON TOP OF THE WALL RAILING IS AN IRON STEEL 1/4"x 2".
BLG-2A	1643045.047	487830.179	3.777	LOCATED IN BGY. DAUNGAN, GUIGUINTO, BULACAN. IT IS EMBEDDED BESIDE AN IRRIGATION CANAL, ABOUT 150m. FROM INTERSECTION, ABOUT 15m. FROM AN ELECT. POST 50m. FROM BBM 16 AND ABOUT 15m. FROM THE FENCE OF THE HOUSE ON THE OTHER SIDE OF THE ROAD.
BLG-3	1646381.832	488957.118	8.646	LOCATED IN BGY. MATAAS, SAMPALOK, BULIHAN, PLARIDEL BULACAN. IT IS ON THE HEAD OF AN IRRIGATION CHECK VALVE, OUTSIDE THE COLEGIO DE IMMACULADA CONCEPCION, ABOUT 10m. FROM THE SHED AND 4.00m. FROM ROAD CENTERLINE.
BLG-4	1652474.952	492013.344	16.125	LOCATED IN BGY. MALAMIG, BUSTOS, BULACAN. IT IS ON THE SIDE OF IRRIG. CANAL, ABOUT 5m. FROM THE ROAD CENTERLINE 150m. FROM FORK, AND ABOUT 5m. FROM THE NEW HOUSE.
BLG-4B	1655132.400	492583.981	9.310	LOCATED IN BGY. TAMBOBONG, SAN RAFAEL, BULACAN. IT IS EMBEDDED ON A ROAD GROUND ABOUT 600m. FROM INTERSECTION, 20m. FROM THE HOUSE.
BLG-5	1657566.872	493155.992	22.017	LOCATED IN BGY. SAMPALOK, SAN RAFAEL, BULACAN. IT IS EMBEDDED ON THE RIGHT SIDE OF THE ROAD GOING TO ROYAL NORTHWOODS 30m. FROM THE INTERSECTION.
BLG-5A	1659619.893	493753.421	29.185	LOCATED IN BGY. SAN ROQUE, HULO, SAN RAFAEL BULACAN. IT IS EMBEDDED ON THE RICE PADDY DIKE 20m. FROM THE DIRT ROAD CENTERLINE.

- 2.2 VERTICAL CONTROL IS REFERRED TO BM BL-12 ESTABLISHED BY THE BLGS WITH ELEVATION 14.935m. ABOVE MEAN SEA LEVEL LOCATED IN BARIO SABANG, PLARIDEL BULACAN. ALONG NATIONAL HIGHWAY NO.5 ABOUT 120m. NORTH OF KM POST NO 52. IT IS EMBEDDED IN A HOLE DRILLED ON TOP OF THE SOUTH SIDE OF THE FOOTING OF THE MARIANO PONCE MONUMENT. ABOUT 18m. NORTH OF THE CENTERLINE OF THE NATIONAL HIGHWAY, INSIDE THE SABANG ELEMENTARY SCHOOL GROUNDS. MARKED PC & GS BL 12, 1952, ELEV.=14.935.

3.0 ALIGNMENT CONTROLS AND REFERENCES

- 3.1 PROJECT IMPLEMENTATION OF ALL BYPASSES SHALL BE DONE IN TWO(2) CONSTRUCTION STAGES, THE FIRST STAGE IS THE INITIAL STAGE THAT CONSIST OF CONSTRUCTING TWO LANE-TWO WAY HIGHWAY (NORTHBOUND), GRAVEL SURFACE FRONTAGE ROAD AND GRAVEL SURFACE SERVICE ROAD AS SHOWN IN THE TYPICAL SECTIONS. IN THE SECTION WITH FRONTAGE ROAD, A GRAVEL SURFACE FRONTAGE ROAD WILL BE INITIALLY CONSTRUCTED EACH SIDE OF THE HIGHWAY. GRAVEL SURFACE SERVICE ROAD WILL BE PROVIDED IN THE SECTION WITHOUT FRONTAGE ROAD. THE SECOND STAGE IS THE ULTIMATE STAGE THAT INVOLVES THE CONSTRUCTION OF THE TWO LANE PAVEMENT (SOUTH BOUND) CONCRETING OF FRONTAGE ROADS AND CONSTRUCTION OF MEDIAN ISLAND AND OTHER HIGHWAY FACILITIES NOT INCLUDED IN THE INITIAL STAGE.
- 3.2 THE FOLLOWING MAJOR POINTS CONTROLLED THE DESIGN OF HORIZONTAL AND VERTICAL ALIGNMENT:
- 3.2.3 ALONG PLARIDEL BYPASS
- NORTH LUZON EXPRESSWAY AND BUROL INTECHANGE AT START OF BYPASS.
 - CONSTRUCTION OF AN 18 HECTARE SUBDIVISION (LEFT SIDE OF STA.35+000.00 CENTERLINE).
 - FLOODED SECTION AT INTERSECTION WITH SAN JOSE-CAMACHILIHAN ROAD (STA. 41+166.00 CENTERLINE).
 - A NEWLY BUILT CHURCH AT INTERSECTION WITH BALIUAG-SAN RAFAEL ROAD.
- 3.3 SIMPLE CIRCULAR CURVES, THREE-CENTERED CIRCULAR CURVES AND CLOTHOID CURVES WERE USED FOR HORIZONTAL CURVATURES, AND PARABOLIC CURVES WERE USED TO SMOOTHEN GRADE BREAKS.
- 3.4 DESIGN OF VERTICAL ALIGNMENT WAS CONTROLLED BY THE DESIGN MAXIMUM FLOODLEVEL, 25-YEAR RETURN PERIOD FOR EMBANKMENT. 50-YEAR RETURN PERIOD FOR BRIDGE AND DRAINAGE STRUCTURES MINIMUM COVERING AS INDICATED IN THE PROFILES.
- 3.5 EXISTING PAVEMENT GRADES OF PAN-PHILIPPINE HIGHWAY.

4.0 DIMENSIONS

- 4.1 DISTANCES AND ELEVATIONS SHOWN ON THE PLANS ARE IN METERS (m) AND IN MILLIMETERS (mm) UNLESS OTHERWISE SPECIFIED. OTHER UNITS OF MEASUREMENT ARE EXPRESSED IN THE MORE APPROPRIATE UNITS OF THE S.I. SYSTEM AS ADOPTED IN THE DPWH STANDARD SPECIFICATIONS, 1995 (VOLUME II).

5.0 STATIONINGS

- 5.1 CENTERLINE STATIONINGS OF THE PROJECT WERE BASED FROM THE NEAREST KILOMETER STATION ALONG THE NORTH LUZON EXPRESSWAY WHICH IS KM 33.
- 5.2 ROAD STATIONS AND ELEMENTS OF CURVE, BOTH HORIZONTAL AND VERTICAL ALIGNMENTS, ARE RELATIVE TO THE ROAD CENTERLINE/BASELINE UNLESS OTHERWISE INDICATED ON PLANS.

6.0 ELEVATION AND GRADES

- 6.1 ELEVATIONS AND GRADES AS DESCRIBED IN THE PROFILE GRADE ARE TOP OF CROWN ALONG THE CENTERLINE. FINISHED GRADE AS SHOWN WILL BE REFERRED BASE FROM PAVEMENT SLOPE

7.0 HORIZONTAL TRANSITIONS

- 7.1 HORIZONTAL TRANSITIONS FOR ROADWAY TAPERINGS/WIDENINGS ARE DESIGNED TO BE STAKED OUT BY THE OFFSETS FROM THE BASELINE INCREASING OR DECREASING ALONG THE DIRECTION OF TRAFFIC.

8.0 UTILIZATION OF GRAVEL MATERIALS

- 8.1 GRAVEL MATERIALS ALONG THE GRAVEL CROSS ROAD IN THE INITIAL STAGE SHALL BE EXCAVATED AND RECONSTRUCTED AS SUBBASE MATERIALS TO THICKNESS AS SHOWN AND INDICATED ON THE TYPICAL SECTIONS FOR THE ULTIMATE STAGE. RECONSTRUCTION OF THE SUBBASE MENTIONED SHALL BE DONE, FOLLOWING THE NORMAL REQUIREMENT IN SUBGRADE PREPARATION.

9.0 REMOVAL OF EXISTING STRUCTURES AND OBSTRUCTIONS

- 9.1 ARTICLE 4.7 OF THE "GENERAL REQUIREMENTS AND COVENANTS" IS HEREBY AMENDED AS FOLLOWS :

THE REMOVAL OF BUILDINGS, HOUSES, FENCES, UTILITY POLES AND OTHER PUBLIC UTILITIES WILL NOT BE THE RESPONSIBILITY OF THE CONTRACTOR BUT WILL BE REMOVED BY THE RESPECTIVE OWNERS, OR THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS PRIOR TO CONSTRUCTION.

10.0 ROAD CONNECTIONS AND PRIVATE ENTRANCES

- 10.1 OPENINGS FOR DRIVEWAYS OR PRIVATE ENTRANCES SHALL BE CONSTRUCTED ONLY ALONG SECTIONS OF THE PROJECT ROAD WHERE FRONTAGE ROADS AND/OR TURNOUTS ARE TO BE PROVIDED. SUCH CONNECTIONS SHALL BE DETERMINED BY THE ENGINEER AND SHALL BE CONSTRUCTED IN SUCH A MANNER AS TO INSURE PROPER CONNECTION AND RIDING QUALITY.
- 10.2 ROAD CONNECTIONS SHALL BE CONSTRUCTED AS SHOWN ON PLANS. THE ROAD STRUCTURE OF EACH CONNECTION SHALL BE AS RECOMMENDED IN THE DRAWING.
- 10.3 THE INTERSECTIONS NOT SHOWN ON THE DRAWINGS SHALL REQUIRE PLANS SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTIONS.
- 10.4 THE LIMIT OF CONSTRUCTION FOR ROAD CONNECTIONS AND PRIVATE ENTRANCES SHALL BE AS SHOWN IN THE DRAWING OR AS INDICATED BY THE ENGINEER.

11.0 DRAINAGE STRUCTURES

- 11.1 EXACT LOCATIONS, SLOPES, OUTFALLS, AND INVERT ELEVATIONS OF DRAINAGE STRUCTURES SHALL BE CHECKED IN THE FIELD BY THE ENGINEER. MINOR ADJUSTMENTS MAY BE MADE TO SUIT ACTUAL FIELD CONDITIONS UPON APPROVAL OF THE ENGINEER.
- 11.2 EXISTING DRAINAGE STRUCTURES THAT ARE FAULTY, BROKEN DOWN, OR NOT IN GOOD WORKING CONDITION SHALL BE DETERMINED IN THE FIELD. RECONSTRUCTION, REPAIR AND/OR REPLACEMENT OF SAME SHALL BE DIRECTED BY THE ENGINEER, AND SHALL CONFORM TO THE STANDARDS AS SHOWN IN THE DRAWINGS.
- 11.3 EXISTING DRAINAGE STRUCTURES OR PARTS THEREOF REMOVED BY THE CONTRACTOR THAT ARE STILL SERVICEABLE SHALL BE TURNED OVER TO THE GOVERNMENT AND SHALL BE DEPOSITED AT A PLACE DESIGNATED BY THE ENGINEER WITHOUT ANY COMPENSATION. EXTREME PRECAUTIONS SHALL BE EXERCISED BY THE CONTRACTOR NOT TO DAMAGE THESE MATERIALS DURING THE REMOVAL AND HANDLING OPERATION.
- 11.4 THE CLEANING, UNBLOCKING AND/OR RELAYING OF REINFORCED CONCRETE PIPES, CONSTRUCTION OF CHANNELS AND DITCHES AS DIRECTED BY THE ENGINEER TO ENSURE AN OPERATIONAL TEMPORARY DRAINAGE SYSTEM DURING THE CONSTRUCTION PERIOD SHALL BE UNDERTAKEN BY THE CONTRACTOR WITHOUT ANY COMPENSATION.

12.0 ACCESSIBILITY LAW:



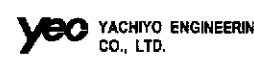

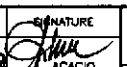
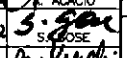

- 12.1 STRICT COMPLIANCE WITH BATAS PAMBANSA BILANG 344 AND ITS IMPLEMENTING RULES AND REGULATIONS SHALL BE IMPOSED.

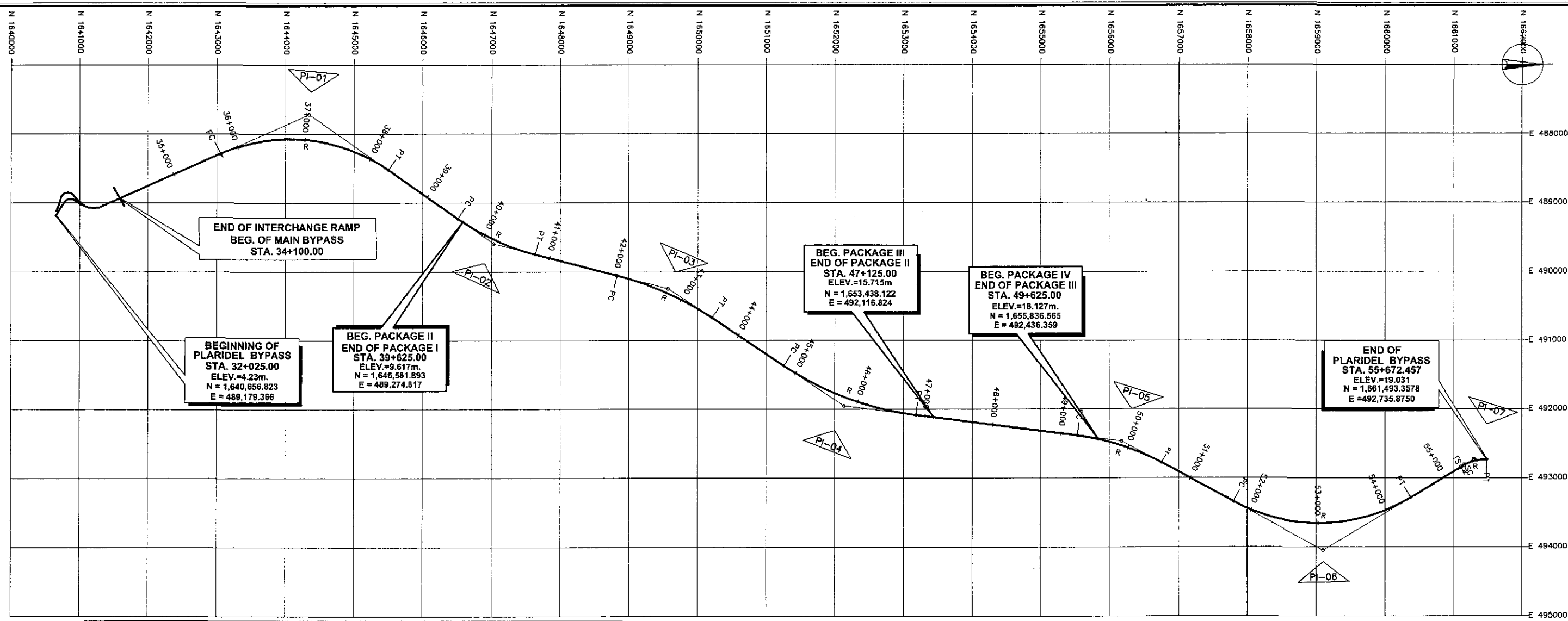
13.0 TREE PLANTING ALONG NATIONAL ROADS

- 13.1 DPWH DEPARTMENT ORDER NO. 15, SERIES OF 2000 AND ITS REQUIREMENTS SHALL BE IMPOSED. THE PLANTING OF TREES ALONG NATIONAL ROADS SHALL BE MADE A STANDARD COMPONENT OF ALL ROAD CONSTRUCTION AND IMPROVEMENT PROJECTS TO ENHANCE QUALITY OF ENVIRONMENT.

14.0 DESIGN DATA / REFERENCES

- 14.1 REPORTS
- FEASIBILITY STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHIL. HIGHWAY (PLARIDEL, CABANATUAN AND SAN JOSE BYPASSES), FINAL REPORT, NOVEMBER 1999.
 - DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY, BASIC DESIGN REPORT, SEPTEMBER 2001.
- 14.2 DRAWINGS
- FEASIBILITY STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHIL. HIGHWAY (PLARIDEL, CABANATUAN AND SAN JOSE BYPASSES).
 - DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY, BASIC DESIGN DRAWINGS, SEPTEMBER 2001.

 JAPAN INTERNATIONAL COOPERATION AGENCY  KATAHIRA & ENGINEERS INTERNATIONAL  YACHIO ENGINEERING CO., LTD.	DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	9/24/02			BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	
CHECKED	9/27/02		OFFICE OF THE SECRETARY	PLARIDEL BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		
SUBMITTED	10/16/02		Submitted By: DANILO C. TRAJANO Project Director Recommended By: JOSEFINA M. ALAGAR Chief, Highways Division Recommended By: GILBERTO S. REYES Dir. Director IV Approved By: MANUEL M. BONDAN Undersecretary Approved By: SIMEDON A. DATUMANONG Secretary				



ELEMENTS OF CURVES

P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT	DEFLECTION	A	Ls	STATION
				Os	ANGLE			
BEG.	34+100.00							
01	37+150.085	3,050.085	156°12'23"	1,405.622	58°41'37"			PC=35+744.463 PT=38+305.456
		3,270.517	214°54'01"	631.471		2,500.000	2,560.993	
02	40+170.351				20°27'17"			PC=39+538.880 PT=40+788.381
		2,627.362	194°26'44"	762.251		3,500.000	1,249.501	
03	42+784.272				19°13'42"			PC=42+022.011 PT=43+532.197
		3,079.935	213°40'26"	1,055.870		4,500.000	1,510.187	
04	45+849.871				26°24'35"			PC=44+794.002 PT=46+868.219
		4,076.071	187°15'51"	653.242		4,500.000	2,074.218	
05	49+888.421				21°08'39"			PC=49+235.179 PT=50+526.802
		3,324.430	208°24'30"	1,481.484		3,500.000	1,291.623	
06	53+197.990				59°20'57"			PC=51+716.506 PT=54+409.683
		2,563.432	149°03'33"	217.897		2,600.000	2,693.177	
07	55+491.631				32°44'53"	188.072	54.417	TS=55+273.735 SC=55+328.152 PT=55+672.457
		191.336	02°23'54"			650.000	344.305	
END	55+672.457							

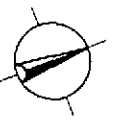
TABLE OF COORDINATES

P.I. No.	NORTHING	EASTING	NORTHING	EASTING
BEG.	1,641,555.403	488,947.023		
01	1,644,346.248	487,716.493	PC 1,643,060.096	488,283.579
			PT 1,645,499.069	488,520.712
02	1,647,028.564	489,587.713	PC 1,646,510.662	489,226.418
			PT 1,647,640.071	489,745.240
03	1,649,572.862	490,243.134	PC 1,648,834.700	490,052.981
			PT 1,650,207.221	490,665.781
04	1,652,135.007	491,950.849	PC 1,651,257.304	491,365.407
			PT 1,653,183.402	492,084.356
05	1,656,179.303	492,466.239	PC 1,655,531.364	492,383.641
			PT 1,656,753.942	492,777.019

TABLE OF COORDINATES

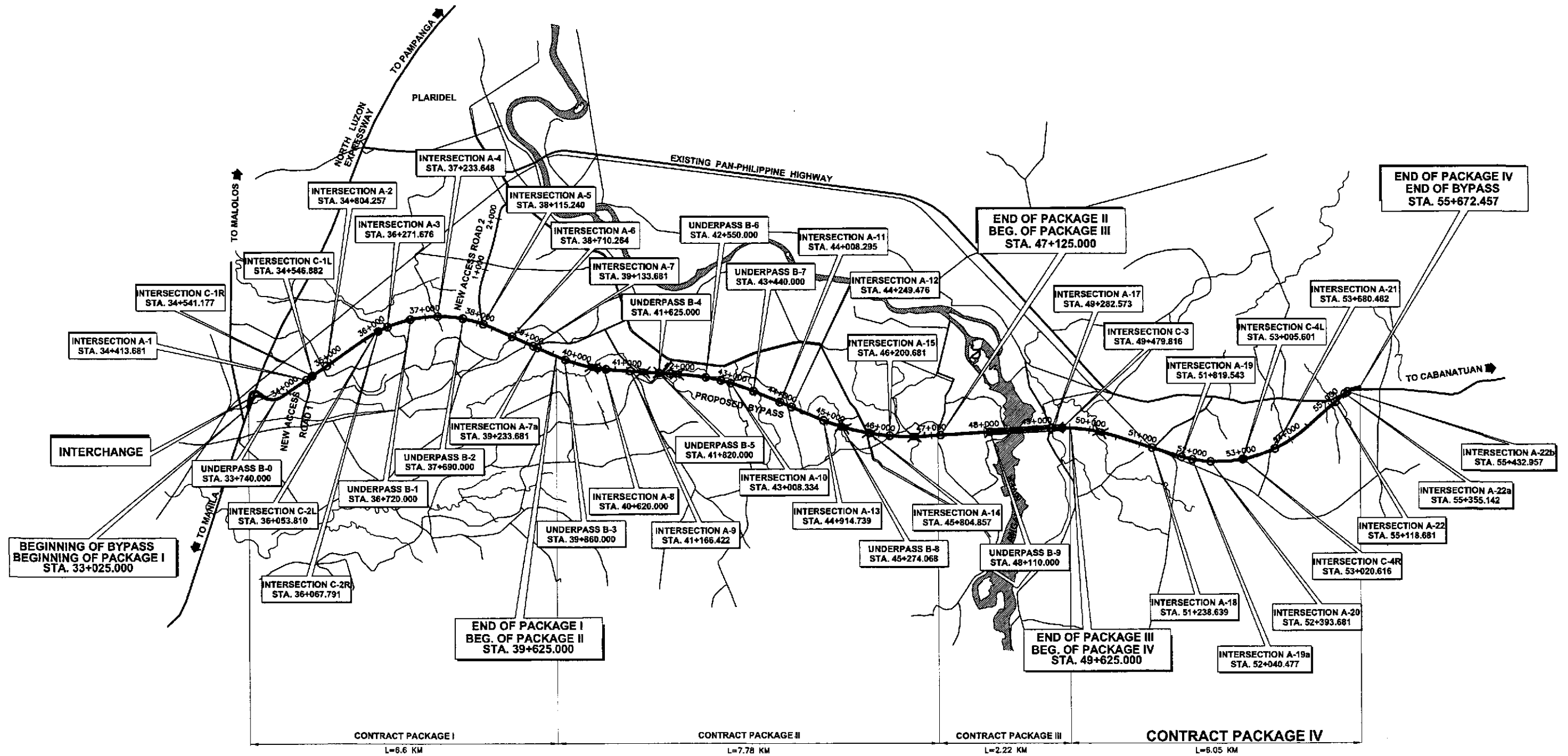
P.I. No.	NORTHING	EASTING	NORTHING	EASTING
06	1,659,103.466	494,047.839	PC 1,657,800.382	493,343.022
			PT 1,660,374.132	493,286.129
07	1,661,302.117	492,729.842	TS 1,661,115.228	492,841.874
			SC 1,661,162.283	492,814.552
			PT 1,661,493.358	492,735.876
END	1,661,493.358	492,735.876		

	DATE: 9/24/02 SIGNATURE: [Signature] DESIGNED: ACACIO		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN OFFICE OF THE SECRETARY				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	SCALE : 1:30,000	SHEET CONTENTS : ALIGNMENT TECHNICAL DESCRIPTION	SHEET NO. : RG-02	
	CHECKED: 9/27/02 SIGNATURE: [Signature] SUBMITTED: 10/16/02 SIGNATURE: [Signature]		Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES O.C. Director	Recommended By: MANUEL M. BONDAN Undersecretary	Approved By: SIMEDON A. DATUMANONG Secretary	PLARIDEL BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		
	JICA JAPAN INTERNATIONAL COOPERATION AGENCY										



LEGEND:

- Intersection Type A (At grade)
- ⊕ Intersection Type B (Underpass)
- Intersection Type C (Only access to frontage roads)
- ▭ Bridge



A LOCATION OF PROPOSED INTERSECTIONS ALONG BYPASS
 RG-03 SCALE 1:40,000

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS					PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE IV	SCALE : 1:40,000 FULL SIZE A1	SHEET CONTENTS : LOCATION OF INTERSECTIONS ALONG BYPASS	SHEET NO. : RG-03
	CHECKED	9/27/02	<i>[Signature]</i>		BUREAU OF DESIGN								
	SUBMITTED	10/16/02	<i>[Signature]</i>		Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES D/C, Director IV	Recommended By: MANUEL M. BONGJAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary				

SCHEDULE OF PAVEMENT MARKINGS
CONTRACT PACKAGE IV (INITIAL STAGE)
ITEM 612(1) - REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS

1.0 CENTER LINE				2.2 LEFT SIDE, INNER EDGE				3.0 LANE LINES				6.0 BARRIER LINES			
STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS
FROM	TO			FROM	TO			FROM	TO			FROM	TO		
49+625.00	50+866.27	1241.27	150mm x 3.0m @ 9.0m GAP	54+975.37	55+103.82	128.45	APPROACH TO A-22	51+181.21	51+221.21	40.00	(RS) LANE LINE 150mm UNBROKEN	50+866.27	51+076.27	210.00	RIGHT SIDE
50+866.27	51+076.27	210.00	150mm x 3.0m @ 4.50m GAP	55+144.48	55+427.02	282.54	APPROACH TO A-22	51+255.24	51+295.24	40.00	(LS) LANE LINE 150mm UNBROKEN	51+400.27	51+665.10	264.83	LEFT SIDE
51+181.21	51+221.21	40.00	200mm UNBROKEN LINE	55+448.88	55+528.55	79.67	APPROACH TO A-22b	51+768.63	51+808.63	40.00	(RS) LANE LINE 150mm UNBROKEN	51+980.00	52+190.00	210.00	LEFT SIDE
51+255.24	51+295.24	40.00	200mm UNBROKEN LINE	00+861.95	00+981.71	119.76	INTERSECTION A-22	51+834.99	51+874.99	40.00	(LS) LANE LINE 150mm UNBROKEN	53+289.13	53+499.13	210.00	RIGHT SIDE
51+400.27	51+665.10	264.83	150mm x 3.0m @ 4.50m GAP	01+011.91	01+040.00	28.09	INTERSECTION A-22	53+604.09	53+634.09	30.00	(RS) LANE LINE 150mm UNBROKEN	53+861.69	54+071.69	210.00	LEFT SIDE
51+768.63	51+808.63	40.00	200mm UNBROKEN LINE					53+695.93	53+726.93	30.00	(LS) LANE LINE 150mm UNBROKEN	54+707.07	54+917.07	210.00	RIGHT SIDE
51+834.99	51+874.99	40.00	200mm UNBROKEN LINE					53+726.93	53+756.74	29.81	(LS) LANE LINE 150mmx3.0m@4.50m GAP	55+580.00	55+672.46	92.46	LEFT SIDE
51+980.00	52+353.72	373.72	150mm x 3.0m @ 4.50m GAP					54+998.53	55+073.53	75.00	(RS) LANE LINE 150mmx3.0m@4.50m GAP				
52+353.72	52+383.72	30.00	200mm UNBROKEN LINE					55+043.49	55+073.53	30.04	(RS) LANE LINE 150mmx3.0m@4.50m GAP				
52+408.60	52+438.60	30.00	200mm UNBROKEN LINE					55+073.53	55+103.53	60.00	(RS) 2 - LANE LINE 150mm UNBROKEN				
52+438.60	53+289.13	850.53	150mm x 3.0m @ 9.0m GAP					55+043.49	55+103.53	60.04	(LS) LANE LINE 150mmx3.0m@4.50m GAP				
53+289.13	53+499.13	210.00	150mm x 3.0m @ 4.50m GAP					55+145.78	55+202.27	274.49	(RS) LANE LINE 150mmx3.0m@4.50m GAP				
53+604.09	53+664.09	60.00	200mm UNBROKEN LINE					55+145.78	55+185.78	80.00	(LS) 2 - LANE LINE 150mm UNBROKEN				
53+696.93	53+756.93	60.00	200mm UNBROKEN LINE					55+185.78	55+347.84	162.06	(LS) LANE LINE 150mmx3.0m@4.50m GAP				
53+861.69	54+071.69	210.00	150mm x 3.0m @ 4.50m GAP					55+380.27	55+420.27	40.00	(RS) LANE LINE 150mmx3.0m@4.50m GAP				
54+071.69	54+707.07	635.38	150mm x 3.0m @ 9.0m GAP					00+861.95	00+950.45	88.50	(RS)LANE LINE 100mmx3.0m@4.50m GAP(A-22)				
54+707.07	54+917.07	210.00	150mm x 3.0m @ 4.50m GAP					00+950.45	00+980.45	30.00	(RS) LANE LINE 100mm UNBROKEN(A-22)				
55+580.00	55+672.46	92.46	150mm x 3.0m @ 4.50m GAP					00+894.89	00+973.94	79.05	(RS)LANE LINE 100mmx3.0m@4.50m GAP(A-22)				
00+905.00	00+954.50	49.50	A-18: 100mm x 3.0m @ 4.5m GAP	49+625.00	51+214.77	1589.77	MAIN BYPASS								
00+954.50	00+974.50	20.00	A-18: 100mm UNBROKEN LINE	51+214.77	01+127.74	17.91	MAIN BYPASS TO RT OF A-18								
01+026.62	01+046.62	20.00	A-18: 100mm UNBROKEN LINE	01+127.74	01+150.00	22.26	RIGHT OF A-18								
01+046.62	01+150.00	103.38	A-18: 100mm x 3.0m @ 4.5m GAP	01+018.16	01+150.00	131.84	LEFT OF A-18								
00+800.00	00+984.21	184.21	A-19: 100mm x 3.0m @ 4.5m GAP	01+018.16	01+245.19	15.76	LEFT OF A-18 TO MAIN BYPASS								
00+964.21	00+984.21	20.00	A-19: 100mm UNBROKEN LINE	51+245.19	51+806.59	561.40	MAIN BYPASS								
01+022.67	01+042.67	20.00	A-19: 100mm UNBROKEN LINE	51+806.59	01+019.72	15.74	MAIN BYPASS TO RT OF A-19								
01+042.67	01+110.00	67.33	A-19: 100mm x 3.0m @ 4.5m GAP	01+019.72	01+110.00	90.28	RIGHT OF A-19								
54+935.88	54+980.00	44.12	PAN-PHIL HIGHWAY: 100mmx3.0m@4.5m GAP	01+110.00	01+110.00	90.28	LEFT OF A-19								
01+080.31	01+160.00	79.69	A-22: 100mm x 3.0m @ 4.5m GAP	01+019.72	51+832.50	15.74	LEFT OF A-19 TO MAIN BYPASS								
01+006.54	01+026.54	20.00	A-22b: 100mm UNBROKEN LINE	51+832.50	52+380.73	548.23	MAIN BYPASS								
01+026.54	01+090.00	63.46	A-22b: 100mm x 3.0m @ 4.5m GAP	52+380.73	01+019.93	15.95	MAIN BYPASS TO RT OF A-20								
				01+022.70	52+409.59	20.42	RIGHT OF A-20 TO MAIN BYPASS								
				52+409.59	53+654.75	1245.16	MAIN BYPASS								
				53+654.75	01+029.77	20.81	MAIN BYPASS TO RT OF A-21								
				01+018.26	01+029.77	11.51	LEFT OF A-21								
				01+018.26	53+687.25	15.93	LEFT OF A-21 TO MAIN BYPASS								
				53+687.25	55+098.12	1410.87	MAIN BYPASS								
				55+098.12	01+038.71	29.00	MAIN BYPASS TO RT OF A-22								
				01+038.71	01+160.00	121.29	RIGHT OF A-22								
				01+024.75	01+160.00	135.25	LEFT OF A-22								
				01+024.75	55+139.68	23.64	LEFT OF A-22 TO MAIN BYPASS								
				55+139.68	55+672.45	532.77	MAIN BYPASS								

<p style="text-align: center;">JAPAN INTERNATIONAL COOPERATION AGENCY</p>	DESIGNED	DATE	SIGNATURE	<p style="text-align: center;">REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	CHECKED	9/27/02			BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	FULL SIZE A1	SCHEDULE OF PAVEMENT MARKING	RG-05
	SUBMITTED	10/16/02			OFFICE OF THE SECRETARY	PLARIDEL BYPASS - CONTRACT PACKAGE IV			

SCHEDULE OF ROAD RIGHT-OF-WAY MARKERS

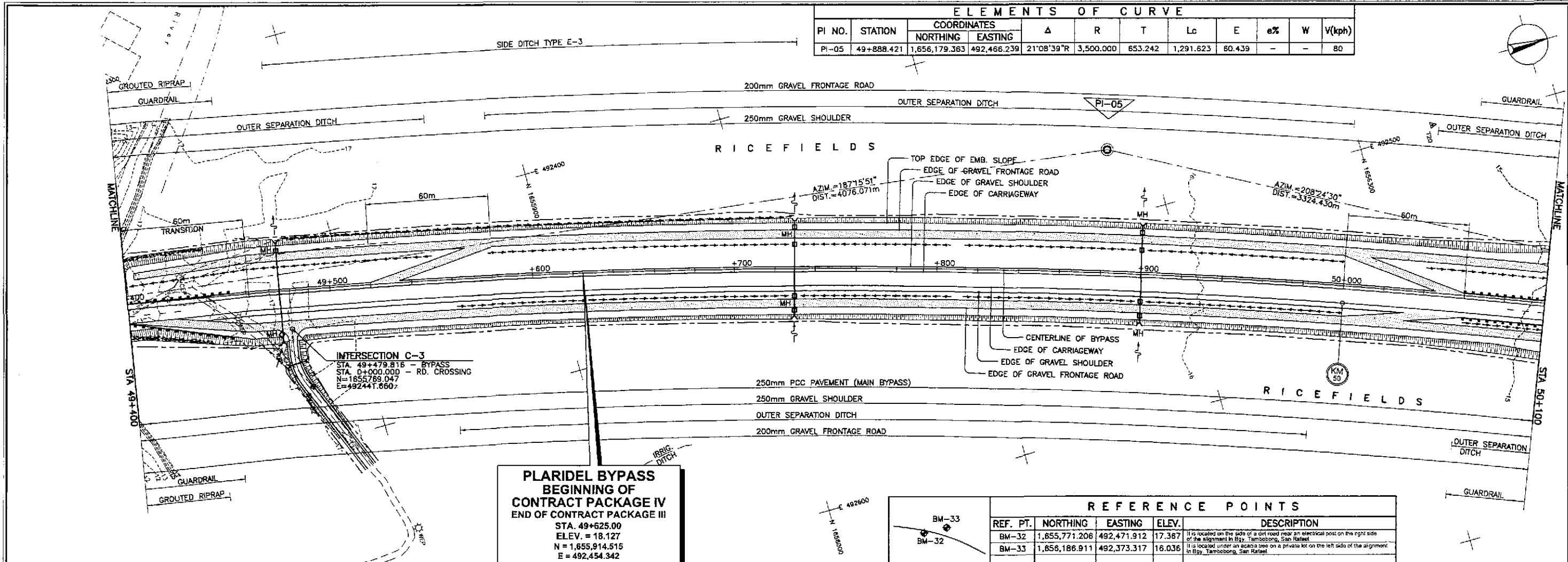
POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING	POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING	POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING	POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING	POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING
BYPASS - LEFT																								
362L	49+640	-27.000	1,655,935.567	492,431.701	415L	51+806.089	-25.230	1,657,891.128	493,361.685	469L	54+360	-26.000	1,660,318.338	493,288.714	411R	50+200	36.000	1,656,445.557	492,668.303	465R	52+820	27.000	1,658,849.934	493,676.421
363L	49+680	-27.000	1,655,974.640	492,441.602	416L	51+833.250	-25.860	1,657,915.551	493,372.961	470L	54+400	-26.000	1,660,352.533	493,268.743	412R	50+226.704	36.000	1,656,469.836	492,678.747	466R	52+920	27.000	1,658,950.829	493,681.689
364L	49+700	-28.000	1,655,994.390	492,445.753	417L	51+940	-26.000	1,658,011.648	493,416.928	471L	54+420	-25.000	1,660,370.127	493,259.382	413R	50+273.564	35.000	1,656,512.854	492,696.609	467R	53+011.268	26.140	1,659,043.027	493,682.243
365L	49+720	-28.000	1,656,013.860	492,450.983	418L	52+040	-26.000	1,658,103.185	493,454.622	472L	54+500	-25.000	1,660,438.743	493,218.250	414R	50+300	35.000	1,656,536.473	492,707.454	468R	53+034.382	26.300	1,659,066.375	493,682.256
366L	49+740	-26.000	1,656,032.764	492,458.252	419L	52+160	-26.000	1,658,214.841	493,495.167	473L	54+520	-26.000	1,660,455.383	493,207.109	415R	50+320	34.000	1,656,554.862	492,714.871	469R	53+100	29.000	1,659,132.734	493,683.382
367L	49+780	-26.000	1,656,071.528	492,469.261	420L	52+180	-27.000	1,658,233.939	493,500.471	474L	54+640	-26.000	1,660,558.307	493,145.411	416R	50+340	32.000	1,656,573.641	492,721.493	470R	53+200	29.000	1,659,233.688	493,677.771
368L	49+800	-27.000	1,656,091.146	492,473.973	421L	52+200	-28.000	1,658,253.071	493,505.627	475L	54+660	-25.000	1,660,575.975	493,135.986	417R	50+360	30.000	1,656,592.392	492,728.226	471R	53+300	29.000	1,659,334.351	493,688.282
369L	49+900	-27.000	1,656,187.340	492,503.988	422L	52+240	-28.000	1,658,290.847	493,517.402	476L	54+740	-25.000	1,660,644.591	493,094.853	418R	50+380	29.000	1,656,610.676	492,735.970	472R	53+320	28.000	1,659,354.315	493,664.927
370L	49+980	-27.000	1,656,263.654	492,529.970	423L	52+260	-27.000	1,658,309.519	493,524.030	477L	54+760	-26.000	1,660,661.230	493,083.713	419R	50+400	28.000	1,656,628.921	492,743.821	473R	53+340	27.000	1,659,374.245	493,661.420
371L	50+040	-27.000	1,656,320.488	492,550.598	424L	52+360	-27.000	1,658,404.954	493,550.191	478L	54+920	-26.000	1,660,798.462	493,001.448	420R	50+440	28.000	1,656,664.382	492,761.625	474R	53+360	27.000	1,659,394.275	493,658.751
372L	50+060	-28.000	1,656,339.708	492,556.755	425L	52+380	-26.000	1,658,423.919	493,555.953	479L	54+940	-27.000	1,660,815.102	492,990.307	421R	50+460	27.000	1,656,682.495	492,769.790	475R	53+380	26.000	1,659,414.141	493,654.939
373L	50+080	-29.000	1,656,358.898	492,563.024	426L	52+480	-26.000	1,658,520.497	493,577.691	480L	54+980	-27.000	1,660,849.410	492,989.741	422R	50+540	27.000	1,656,752.705	492,807.047	476R	53+400	25.000	1,659,433.970	493,650.975
374L	50+100	-30.000	1,656,378.057	492,569.404	427L	52+580	-26.000	1,658,617.839	493,595.700	481L	55+000	-28.000	1,660,866.050	492,958.600	423R	50+560	28.000	1,656,769.821	492,817.442	477R	53+480	25.000	1,659,513.611	493,637.544
375L	50+120	-31.000	1,656,397.184	492,575.896	428L	52+680	-26.000	1,658,715.801	493,609.952	482L	55+020	-28.000	1,660,883.204	492,948.317	424R	50+720	28.000	1,656,910.554	492,893.562	478R	53+500	26.000	1,659,533.643	493,634.786
376L	50+140	-33.000	1,656,416.655	492,581.573	429L	52+700	-27.000	1,658,735.573	493,611.357	483L	55+040	-27.000	1,660,900.872	492,938.892	425R	50+880	28.000	1,657,051.287	492,989.682	479R	53+600	26.000	1,659,632.431	493,613.795
377L	50+160	-35.000	1,656,436.104	492,587.365	430L	52+740	-27.000	1,658,774.918	493,615.697	484L	55+060	-27.000	1,660,918.026	492,928.609	426R	50+900	27.000	1,657,069.354	492,978.317	480R	53+639.117	25.840	1,659,670.805	493,604.399
378L	50+180	-37.000	1,656,455.530	492,593.272	431L	52+760	-28.000	1,658,794.709	493,616.644	485L	55+080	-29.000	1,660,934.151	492,916.610	427R	50+940	27.000	1,657,104.537	492,997.347	481R	53+688.340	24.880	1,659,718.684	493,591.025
379L	50+226.704	-37.000	1,656,498.939	492,611.799	432L	52+860	-28.000	1,658,893.346	493,624.080	486L	55+093.856	-30.390	1,660,945.323	492,908.298	428R	50+960	26.000	1,657,122.605	493,005.983	482R	53+760	25.000	1,659,788.315	493,571.397
380L	50+273.564	-36.000	1,656,541.830	492,631.881	433L	52+940	-28.000	1,658,972.416	493,627.294	487L	55+138.590	-19.000	1,660,989.546	492,895.063	429R	50+980	25.000	1,657,140.672	493,014.618	483R	53+780	26.000	1,659,807.935	493,566.502
381L	50+280	-36.000	1,656,547.755	492,634.558	434L	52+991.299	-28.090	1,659,023.157	493,627.989	488L	55+200	-19.000	1,661,042.217	492,863.489	430R	51+000	25.000	1,657,158.264	493,024.133	484R	53+800	25.000	1,659,826.922	493,559.546
382L	50+300	-35.000	1,656,565.719	492,643.856	435L	53+014.185	-25.950	1,659,045.799	493,629.150	489L	55+281.276	-19.000	1,661,111.940	492,821.693	431R	51+020	24.000	1,657,176.331	493,032.769	485R	53+820	24.000	1,659,845.847	493,552.447
383L	50+320	-34.000	1,656,583.624	492,653.254	436L	53+060	-27.000	1,659,091.134	493,628.551	491L	55+311.535	-27.750	1,661,133.994	492,798.574	432R	51+060	24.000	1,657,211.514	493,051.799	486R	53+860	24.000	1,659,884.155	493,539.714
384L	50+340	-33.000	1,656,601.471	492,662.752	437L	53+080	-28.000	1,659,110.892	493,627.061	492L	55+323.423	-27.980	1,661,144.598	492,792.341	433R	51+080	25.000	1,657,228.630	493,062.193	487R	53+880	25.000	1,659,903.564	493,534.070
385L	50+360	-31.000	1,656,618.824	492,673.250	438L	53+100	-29.000	1,659,130.630	493,625.420	493L	55+340	-22.810	1,661,162.212	492,788.755	434R	51+200	25.000	1,657,334.180	493,119.283	488R	53+900	26.000	1,659,922.937	493,528.275
386L	50+380	-30.000	1,656,636.545	492,682.944	439L	53+200	-29.000	1,659,229.356	493,619.933	494L	55+360	-19.000	1,661,182.372	492,782.910	435R	51+245.019	27.000	1,657,372.826	493,142.460	489R	53+980	26.000	1,659,998.572	493,499.860
387L	50+400	-29.000	1,656,654.205	492,692.736	440L	53+300	-29.000	1,659,327.798	493,610.653	495L	55+380	-16.000	1,661,202.269	492,777.000	436R	51+270.172	27.000	1,657,394.950	493,154.427	490R	54+000	27.000	1,660,017.715	493,493.321
388L	50+420	-29.000	1,656,672.252	492,701.732	441L	53+320	-28.000	1,659,347.560	493,609.336	496L	55+400	-13.000	1,661,222.252	492,771.741	437R	51+280	27.000	1,657,403.595	493,159.102	491R	54+080	27.000	1,660,092.230	493,462.007
389L	50+440	-28.000	1,656,689.795	492,711.723	442L	53+340	-27.000	1,659,367.319	493,607.666	497L	55+420	-13.000	1,661,241.255	492,764.322	438R	51+300	26.000	1,657,421.662	493,167.738	492R	54+100	26.000	1,660,110.297	493,452.908
390L	50+480	-28.000	1,656,725.619	492,730.225	443L	53+360	-26.000	1,659,387.074	493,606.242	498L	55+425.773	-13.120	1,661,246.741	492,762.180	439R	51+340	26.000	1,657,456.845	493,186.768	493R	54+120	25.000	1,660,128.286	493,443.674
391L	50+500	-27.000	1,656,742.982	492,740.512	444L	53+380	-26.000	1,659,406.680	493,603.477	499L	55+454.853	-13.100	1,661,274.852	492,752.705	440R	51+360	28.000	1,657,473.485	493,196.042	494R	54+160	25.000	1,660,164.888	493,426.609
392L	50+540	-27.000	1,656,778.396	492,759.550	445L	53+400	-25.000	1,659,426.415	493,601.549	500L	55+480	-13.000	1,661,299.504	492,745.618	441R	51+500	28.000	1,657,596.627	493,264.647	495R	54+180	25.000	1,660,183.525	493,418.765
393L	50+560	-26.000	1,656,795.512	492,769.944	446L	53+500	-25.000	1,659,524.004	493,584.705	501L	55+500	-13.000	1,661,319.273	492,740.588	442R	51+680	28.000	1,657,754.951	493,350.282	496R	54+200	27.000	1,660,202.109	493,410.775
394L	50+580	-26.000	1,656,813.103	492,779.459	447L	53+520	-26.000	1,659,543.244	493,579.906	502L	55+520	-13.000	1,661,339.187	492,736.168	443R	51+700	29.000	1,657,772.067	493,360.677	497R	54+220	27.000	1,660,220.187	493,401.745
395L	50+600	-25.000	1,656,830.219	492,789.854	448L	53+540	-27.000	1,659,562.438	493,574.961	503L	55+540	-13.000	1,661,359.229	492,732.363	444R	51+760	29.000	1,657,825.442	493,389.128	498R	54+240	28.000	1,660,238.652	493,393.466
396L	50+620	-25.000	1,657,023.727	492,894.519	449L	53+600	-27.000	1,659,620.421	493,582.174	504L	55+560	-10.000	1,661,379.800	492,732.146	445R	51+780	30.000	1,657,842.969	493,399.272	499R	54+260	28.000	1,660,256.596	493,384.156
397L	50+640	-26.000	1,657,041.794	492,903.154	450L	53+620	-26.000	1,659,639.915	493,588.587	505L	55+580	-10.000	1,661,399.946	492,729.593	446R	51+800	30.000	1,657,861.029	493,408.390	500R	54+280	29.000	1,660,274.938	493,375.591
398L	50+680	-26.000	1,657,076.977	492,922.18																				

SCHEDULE OF ROAD RIGHT-OF-WAY MARKERS

POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING	POINT NO.	STATION	OFFSET FROM CENTERLINE	NORTHING	EASTING
519R	55+160	19.000	1,661,027.447	492,916.648	C4L-4R	0+085	5.000	1,659,024.363	493,553.560
520R	55+200	19.000	1,661,061.755	492,896.082	INTERSECTION C-4R				
521R	55+280	19.000	1,661,130.362	492,854.956	C4R-1L	0+014.495	-6.604	1,659,063.895	493,685.935
522R	55+300	18.000	1,661,146.903	492,843.971	C4R-2L	0+060	-5.000	1,659,085.976	493,724.242
523R	55+320	17.000	1,661,163.441	492,833.328	C4R-3L	0+080	-5.000	1,659,097.273	493,740.747
524R	55+360	17.000	1,661,198.004	492,815.339	C4R-1R	0+008.646	7.637	1,659,048.534	493,685.929
525R	55+420	17.000	1,661,251.734	492,792.432	C4R-2R	0+020.077	7.597	1,659,053.340	493,696.961
526R	55+480	17.000	1,661,307.348	492,774.574	C4R-3R	0+080	5.000	1,659,089.020	493,746.395
527R	55+500	15.000	1,661,325.759	492,767.826	INTERSECTION A-21				
528R	55+520	13.000	1,661,344.430	492,761.634	A21-1L	0+786.346	-7.500	1,659,847.715	493,428.828
529R	55+540	12.000	1,661,363.513	492,756.993	A21-2L	0+880	-7.500	1,659,771.453	493,487.678
530R	55+560	10.000	1,661,382.620	492,751.945	A21-3L	0+937.669	-7.500	1,659,728.894	493,513.413
531R	55+580	10.000	1,661,402.156	492,749.470	A21-4L	0+951.729	-15.164	1,659,731.095	493,526.925
532R	55+600	10.000	1,661,421.758	492,747.595	A21-5L	1+044.539	-7.500	1,659,700.866	493,614.038
533R	55+620	10.000	1,661,441.408	492,746.326	A21-6L	1+120	-7.500	1,659,676.321	493,686.345
534R	55+640	10.000	1,661,461.089	492,745.661	A21-1R	0+786.346	7.500	1,659,835.508	493,420.111
535R	55+660	10.000	1,661,480.780	492,745.602	A21-2R	0+880	7.500	1,659,768.265	493,473.020
535R	55+672.457	10.000	1,661,493.042	492,745.871	A21-3R	0+954.724	7.500	1,659,708.568	493,523.223
INTERSECTION A-18					A21-4R	1+046.074	10.850	1,659,682.706	493,610.987
A18-1L	0+905	-7.500	1,657,465.788	493,075.176	A21-5R	1+056.235	7.500	1,659,683.439	493,621.661
A18-2L	0+920	-8.838	1,657,452.979	493,083.096	A21-6R	1+120	7.500	1,659,662.412	493,680.730
A18-3L	0+940	-7.267	1,657,434.847	493,090.786	INTERSECTION A-22				
A18-4L	0+954.311	-7.500	1,657,422.907	493,098.130	A22-1R	0+766.172	10.000	1,660,782.917	492,825.673
A18-5L	1+040.456	-7.500	1,657,349.528	493,143.258	A22-2R	0+879.936	10.823	1,660,891.739	492,853.100
A18-6L	1+150	-7.500	1,657,246.424	493,181.646	A22-3R	0+939.813	16.048	1,660,935.448	492,885.477
A18-1R	0+905	7.500	1,657,459.085	493,061.767	A22-4R	0+957.771	17.094	1,660,945.789	492,897.686
A18-2R	0+960.133	7.500	1,657,410.090	493,088.403	A22-5R	1+037.517	9.498	1,660,993.381	492,958.657
A18-3R	1+045.382	7.500	1,657,337.474	493,133.061	A22-6R	1+060	7.500	1,661,006.655	492,976.914
A18-4R	1+150	7.500	1,657,240.682	493,167.788	A22-7R	1+160	7.500	1,661,041.890	493,063.898
INTERSECTION A-19					A22-1L	0+933.275	-19.273	1,660,953.798	492,854.592
A19-1L	0+800	-7.500	1,657,779.464	493,283.427	A22-2L	0+936.850	-13.926	1,660,953.316	492,861.234
A19-2L	0+968.346	-7.500	1,657,912.781	493,364.632	A22-3L	0+977.188	-13.746	1,660,981.921	492,894.570
A19-3L	1+038.825	-7.500	1,657,882.537	493,427.650	A22-4L	1+029.144	-13.266	1,661,008.602	492,939.771
A19-4L	1+110	-7.500	1,657,885.710	493,494.962	A22-5L	1+060	-7.500	1,661,019.521	492,969.201
A19-1R	0+965.246	7.500	1,657,899.667	493,356.755	A22-6L	1+160	-7.500	1,661,056.890	493,063.981
A19-2R	1+035.988	7.500	1,657,869.333	493,419.998	INTERSECTION A-22b				
A19-3R	1+110	7.500	1,657,870.817	493,496.750	A22b-1L	0+023.722	-9.000	1,661,247.259	492,757.310
INTERSECTION A-19a					A22b-2L	0+062.623	-9.672	1,661,219.178	492,728.742
A19a-1L	0+078.271	-7.500	1,658,157.111	493,532.910	A22b-3L	0+090	-9.000	1,661,204.707	492,704.150
A19a-2L	0+130	-7.500	1,658,200.558	493,560.986	A22b-1R	0+019.182	9.000	1,661,263.278	492,747.930
A19a-1R	0+130	7.500	1,658,192.417	493,573.585	A22b-2R	0+062.623	8.464	1,661,233.568	492,717.704
INTERSECTION A-20					A22b-3R	0+090	9.000	1,661,220.221	492,695.022
A20-1L	1+036.905	-7.500	1,658,429.706	493,622.066					
A20-2L	1+113.714	-7.500	1,658,411.794	493,696.757					
A20-3L	1+121.193	-13.941	1,658,417.892	493,708.596					
A20-1R	1+036.391	7.500	1,658,415.239	493,618.068					
A20-2R	1+111.317	7.500	1,658,397.766	493,690.928					
A20-3R	1+113.287	14.879	1,658,390.132	493,691.124					
INTERSECTION C-4L									
C4L-1L	0+060	-5.000	1,659,018.235	493,579.779					
C4L-2L	0+085	-5.000	1,659,014.477	493,555.063					
C4L-1R	0+009.581	7.328	1,659,040.671	493,625.651					
C4L-2R	0+039.685	6.234	1,659,032.394	493,598.155					
C4L-3R	0+060	5.000	1,659,028.122	493,578.276					

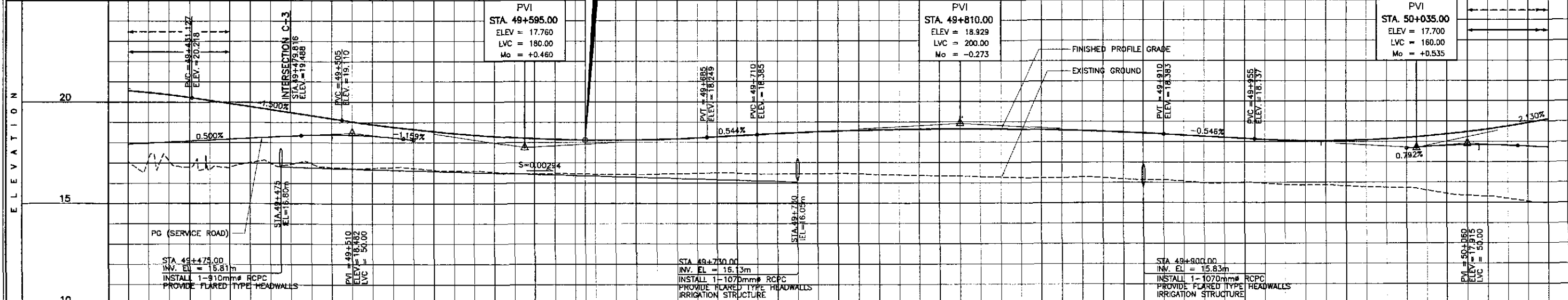
JICA JAPAN INTERNATIONAL COOPERATION AGENCY	DESIGNED	DATE	SIGNATURE	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :		
	CHECKED	9/27/02	<i>[Signature]</i>			P.J.H. - P.W.O. BUREAU OF DESIGN OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	FULL SIZE A1	SCHEDULE OF ROAD RIGHT-OF-WAY MARKERS (2 OF 2)	RG-07
	SUBMITTED	10/16/02	<i>[Signature]</i>			Submitted By: DANILLO C. TRAJANO, Project Director Reviewed By: JOSEFINA M. ALAGAR, Chief, Highway Division Recommended By: GILBERTO S. REYES, OIC, Director IV Recommended By: MANUEL M. BONDAN, Undersecretary Approved By: SIMEON A. DATUMANGONG, Secretary				

PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-05	49+888.421	1,656,179.363	492,466.239	21°08'39"R	3,500.000	653.242	1,291.623	80.439	-	-	80



**PLARIDEL BYPASS
BEGINNING OF
CONTRACT PACKAGE IV
END OF CONTRACT PACKAGE III**
 STA. 49+625.00
 ELEV. = 18.127
 N = 1,655,914.515
 E = 492,454.342

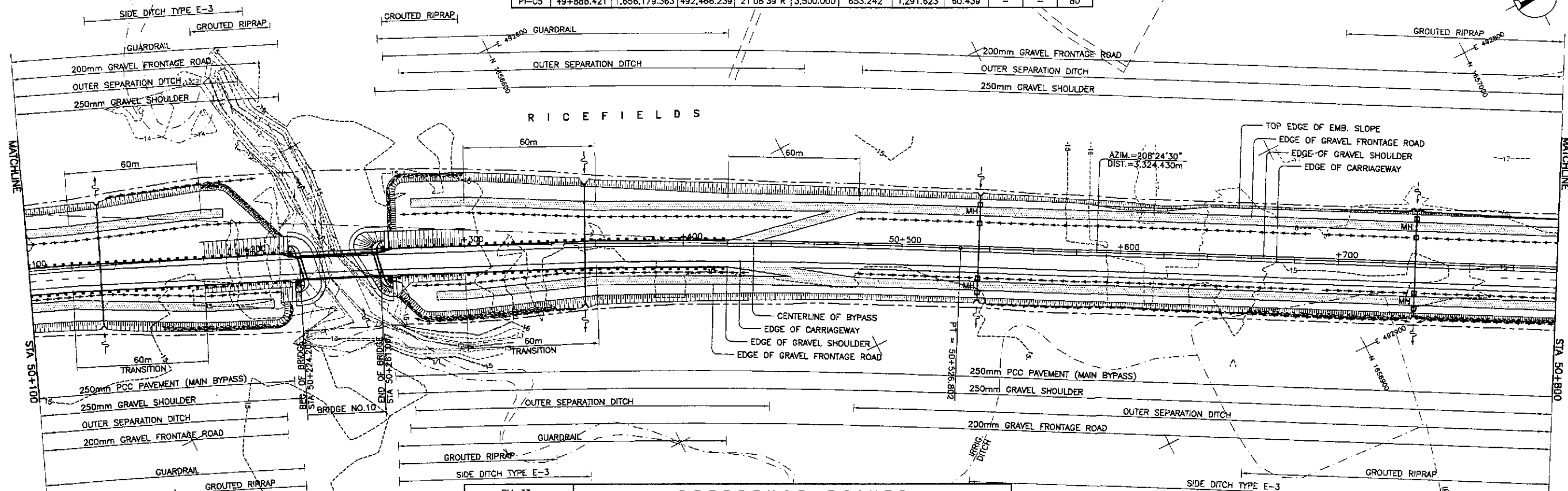
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-32	1,855,771.208	492,471.912	17.387	It is located on the side of a dirt road near an electrical post on the right side of the alignment in Bgy. Tambobong, San Rafael
BM-33	1,856,186.911	492,373.317	16.036	It is located under an acacia tree on a private lot on the left side of the alignment in Bgy. Tambobong, San Rafael



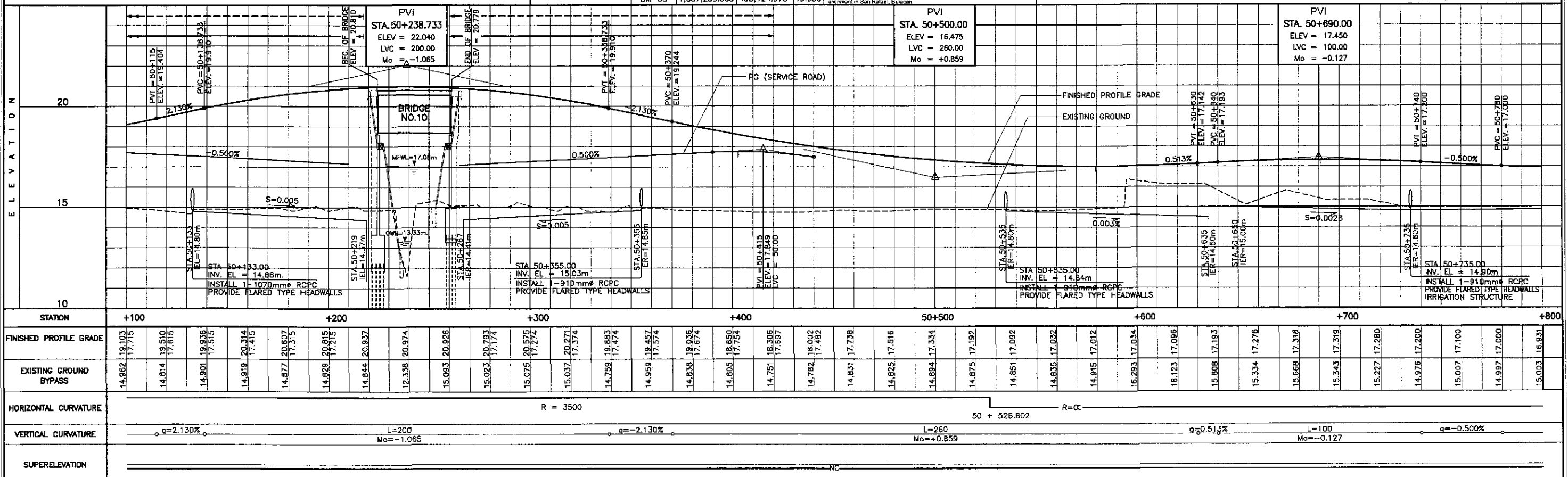
STATION	+400	49+500	+600	+700	+800	+900	50+000	+100																																		
FINISHED PROFILE GRADE	17.066, 17.932	17.120, 18.032, 16.663, 18.132, 17.073, 18.232, 16.939, 18.332, 16.779, 18.393, 16.737, 18.698, 16.732, 18.654, 16.544, 18.304, 16.453, 18.197, 16.481, 18.136, 16.446, 18.127, 16.422, 18.119, 16.433, 18.149, 16.473, 18.223, 16.477, 18.331, 16.432, 18.437, 16.450, 18.524, 16.445, 18.588, 16.381, 18.632, 16.347, 18.654, 16.301, 18.654, 16.250, 18.632, 16.239, 18.522, 16.139, 18.435, 16.060, 18.328, 15.966, 18.219, 15.956, 18.112, 15.857, 18.053, 15.821, 18.081, 15.747, 18.135, 15.612, 18.277, 17.754, 15.349, 18.485, 17.835, 15.192, 18.761, 17.812, 14.982, 18.103																																								
EXISTING GROUND BYPASS	17.066, 17.932	17.120, 18.032	16.663, 18.132	17.073, 18.232	16.939, 18.332	16.779, 18.393	16.737, 18.698	16.732, 18.654	16.544, 18.304	16.453, 18.197	16.481, 18.136	16.446, 18.127	16.422, 18.119	16.433, 18.149	16.473, 18.223	16.477, 18.331	16.432, 18.437	16.450, 18.524	16.445, 18.588	16.381, 18.632	16.347, 18.654	16.301, 18.654	16.250, 18.632	16.239, 18.522	16.139, 18.435	16.060, 18.328	15.966, 18.219	15.956, 18.112	15.857, 18.053	15.821, 18.081	15.747, 18.135	15.612, 18.277	17.754	15.349, 18.485	17.835	15.192, 18.761	17.812	14.982, 18.103				
HORIZONTAL CURVATURE	R = 3500																																									
VERTICAL CURVATURE	g = -1.500%							L = 180 Mo = +0.460							g = 0.544%							L = 200 Mo = -0.273							g = -0.546%							L = 160 Mo = +0.535						
SUPERELEVATION	NC																																									

	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/27/02	<i>S. G. SOSE</i>		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE IV			HORIZONTAL 1:1000	PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 49+625 - STA. 50+100	RP-01
	SUBMITTED	10/6/02	<i>C. M. KALIA</i>		BUREAU OF DESIGN Submitted By: DANILO C. TRAJANO (Project Director) Reviewed By: JOSEFINA M. ALAGAR (Chief, Highways Division) Recommended By: GILBERTO S. REYES (CIC, Director IV) Recommended By: MANUEL M. BONDAN (Undersecretary) Approved By: SIMEON A. DATUMANONG (Secretary)			VERTICAL 1:100		

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-05	49+888.421	1,656,179.363	492,466.239	21°08'39"R	3,500.000	653.242	1,291.623	60.439	-	-	80



REFERENCE POINTS				DESCRIPTION
REF. PT.	NORTHING	EASTING	ELEV.	
BM-33	1,656,186.911	492,373.317	16.036	It is located under an acacia tree on a private lot on the left side of the alignment in Bay, Tambobasa, San Rafael.
BM-34	1,657,343.337	493,325.087	16.228	It is located on top of a rice paddy dike on the left side of the alignment in San Rafael, Bulacan.
BM-35	1,657,239.065	493,124.978	19.935	It is located on a rice paddy dike near the intersection on the left side of the alignment in San Rafael, Bulacan.



STATION	+100	+200	+300	+400	50+500	+600	+700	+800
FINISHED PROFILE GRADE	14.962, 19.103, 17.715	14.814, 19.510, 17.615	14.901, 19.926, 17.515	14.819, 20.314, 17.415	14.877, 20.807, 17.315	14.823, 20.815, 17.215	14.844, 20.937	12.338, 20.974
EXISTING GROUND BYPASS	14.962, 19.103, 17.715	14.814, 19.510, 17.615	14.901, 19.926, 17.515	14.819, 20.314, 17.415	14.877, 20.807, 17.315	14.823, 20.815, 17.215	14.844, 20.937	12.338, 20.974
HORIZONTAL CURVATURE	R = 3500							
VERTICAL CURVATURE	q = 2.130%		L = 200, Mo = -1.065		q = -2.130%		L = 260, Mo = +0.859	
SUPERELEVATION	NC							

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

DESIGNED: 9/24/02
CHECKED: 9/23/02
SUBMITTED: 10/16/02

DATE: 9/24/02
SIGNATURE: [Signature]
SIGNATURE: [Signature]
SIGNATURE: [Signature]

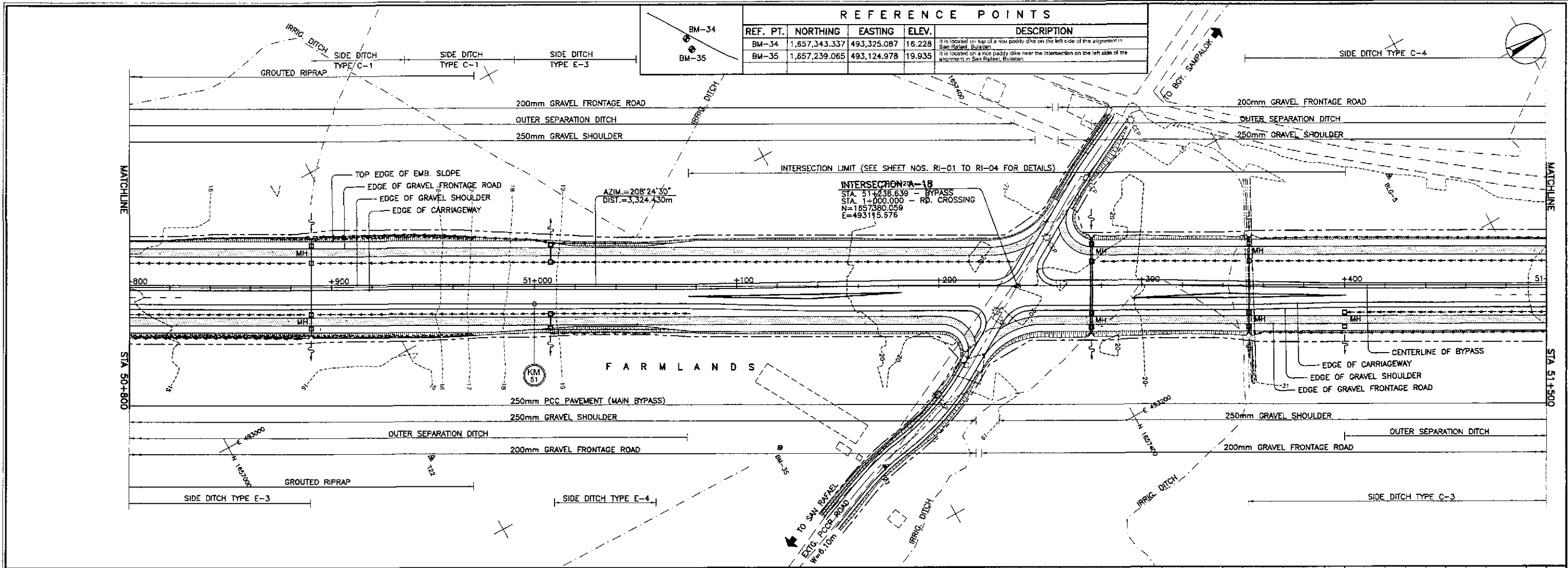
PROJECT DIRECTOR: DANILO C. TRAJANO
CHIEF, HIGHWAYS DIVISION: JOSEFINA M. ALAGAR
D.C. DIRECTOR IV: GILBERTO S. REYES
UNDERSecretary: MANUEL M. BONDAN
Secretary: SIMEON A. DATUMANONG

PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)

SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

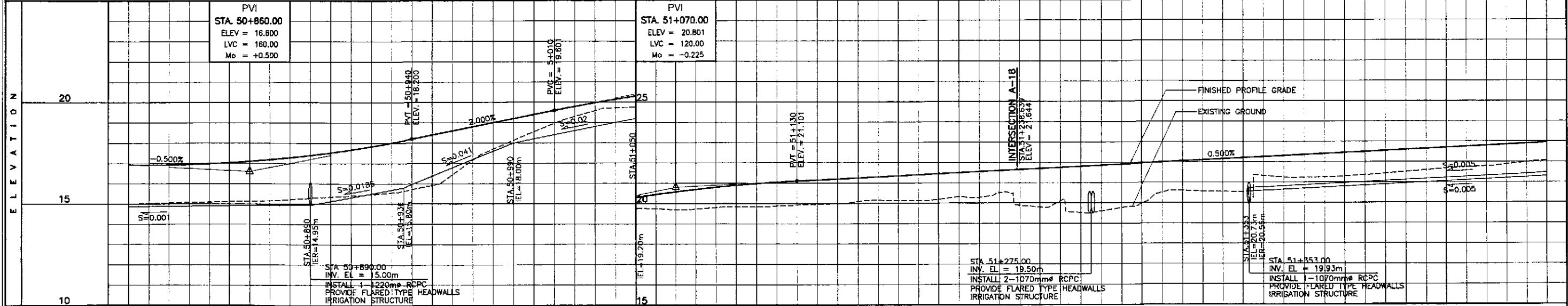
SHEET CONTENTS :
PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 50+100 - STA. 50+800

SHEET NO. :
RP-02



REFERENCE POINTS			
REF. PT.	NORTHING	EASTING	ELEV.
BM-34	1,657,343.337	493,325.087	16.228
BM-35	1,657,239.065	493,124.978	19.935

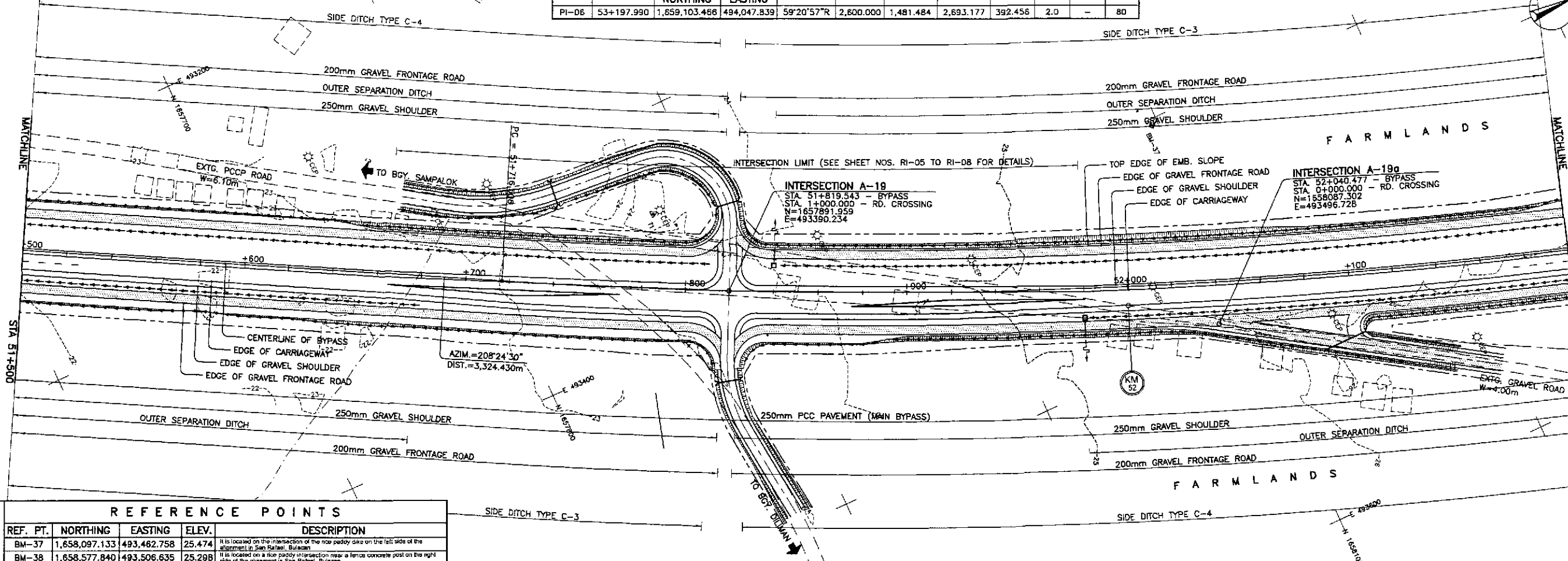
DESCRIPTION:
 BM-34: It is located on top of a soil paddy dike on the left side of the alignment in San Rafael, Bulacan.
 BM-35: It is located on a rice paddy dike near the intersection on the left side of the alignment in San Rafael, Bulacan.



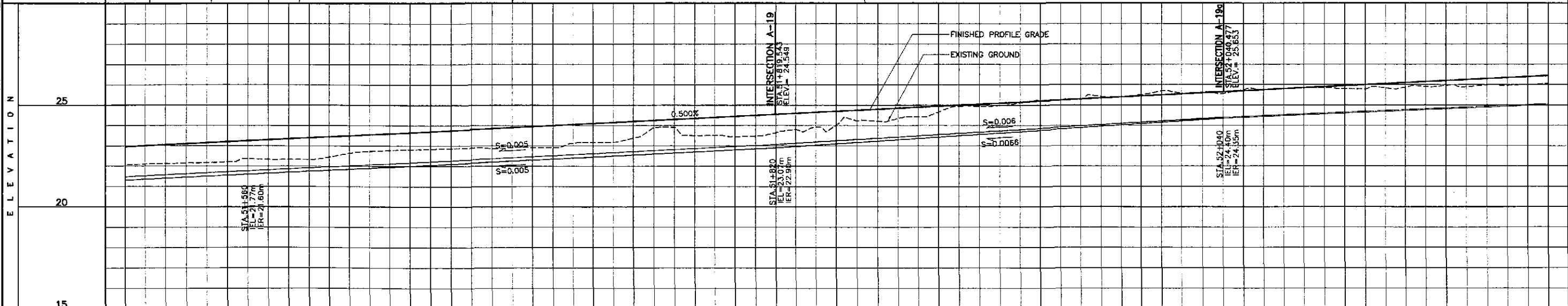
STATION	+800	+900	51+000	+100	+200	+300	+400	51+500																																																		
FINISHED PROFILE GRADE	15.033	16.931	17.400	17.281	17.525	17.832	18.200	18.600	19.001	19.401	19.795	20.145	20.445	20.695	21.045	21.151	21.251	21.351	21.451	21.551	21.651	21.751	21.851	21.951	22.051	22.151	22.251	22.351	22.451	22.551	22.651	22.751	22.851	22.951																								
EXISTING GROUND BYPASS	15.046	16.925	17.891	18.825	19.725	20.595	21.435	22.245	23.015	23.745	24.435	25.085	25.695	26.265	26.795	27.285	27.735	28.145	28.515	28.845	29.135	29.385	29.595	29.765	29.895	30.085	30.235	30.345	30.415	30.445	30.435	30.385	30.295	30.165	29.995	29.785	29.535	29.245	28.915	28.545	28.135	27.685	27.195	26.665	26.095	25.485	24.835	24.145	23.415	22.645	21.835	20.985	20.095	19.165	18.195	17.185	16.135	15.045
HORIZONTAL CURVATURE	R=∞																																																									
VERTICAL CURVATURE	L=160, Mo=+0.500, g=2.000%								L=120, Mo=-0.225, g=2.000%								g=0.500%																																									
SUPERELEVATION	NC																																																									

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE IV	SCALE : HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 50+800 - STA. 51+500	SHEET NO. : RP-03
	CHECKED	DATE	SIGNATURE		PJHL - PMO Submitted By:	BUREAU OF DESIGN Reviewed By:	OFFICE OF THE SECRETARY Recommended By:	Recommended By:				
	SUBMITTED	DATE	SIGNATURE		DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES D.C. Director IV	MANUEL M. BONOAN Undersecretary				

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-06	53+197.990	1,659,103.486	494,047.839	59°20'57"R	2,600.000	1,481.484	2,693.177	392.456	2.0	-	80



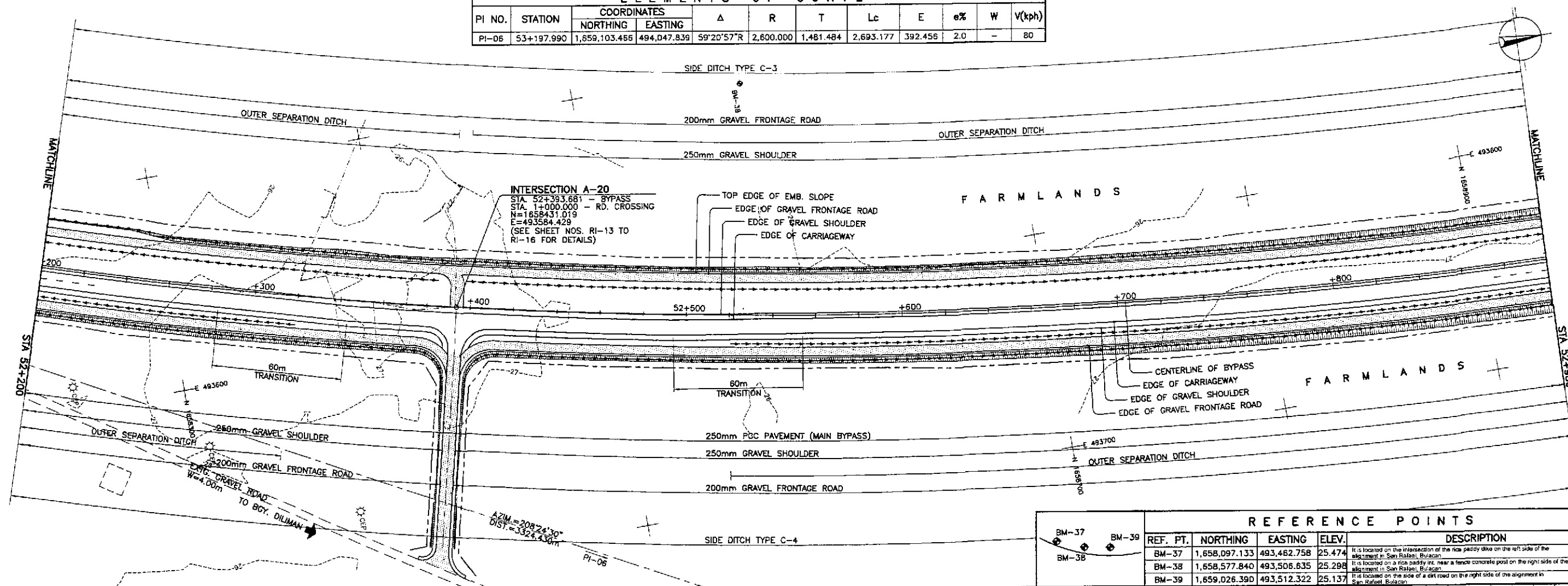
REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-37	1,658,097.133	493,462.758	25.474	It is located on the intersection of the road paddy site on the left side of the alignment in San Rafael, Bulacan.
BM-38	1,658,577.840	493,506.635	25.298	It is located on a rice paddy intersection near a fence concrete post on the right side of the alignment in San Rafael, Bulacan.



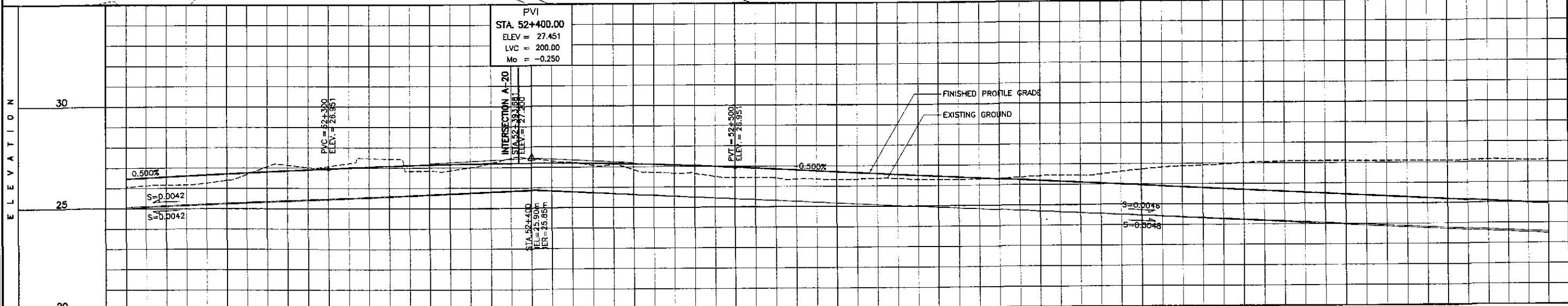
STATION	51+500	+600	+700	+800	+900	52+000	+100	+200
FINISHED PROFILE GRADE	22.055	22.051	22.151	22.251	22.351	22.451	22.551	22.651
EXISTING GROUND BYPASS	22.055	22.119	22.162	22.355	22.351	22.333	22.454	22.451
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	q=0.500%							
SUPERELEVATION	NC							

	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE IV	SCALE : HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 51+500 - 52+200	SHEET NO. : RP-04
	CHECKED	DATE	SIGNATURE	BUREAU OF DESIGN OFFICE OF THE SECRETARY							
	SUBMITTED	DATE	SIGNATURE	Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OC, Director IV	Recommended By: MANUEL M. BONDAN Undersecretary				

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-06	53+197.990	1,659,103.465	494,047.839	59°20'57"R	2,600.000	1,481.484	2,693.177	392.456	2.0	-	80



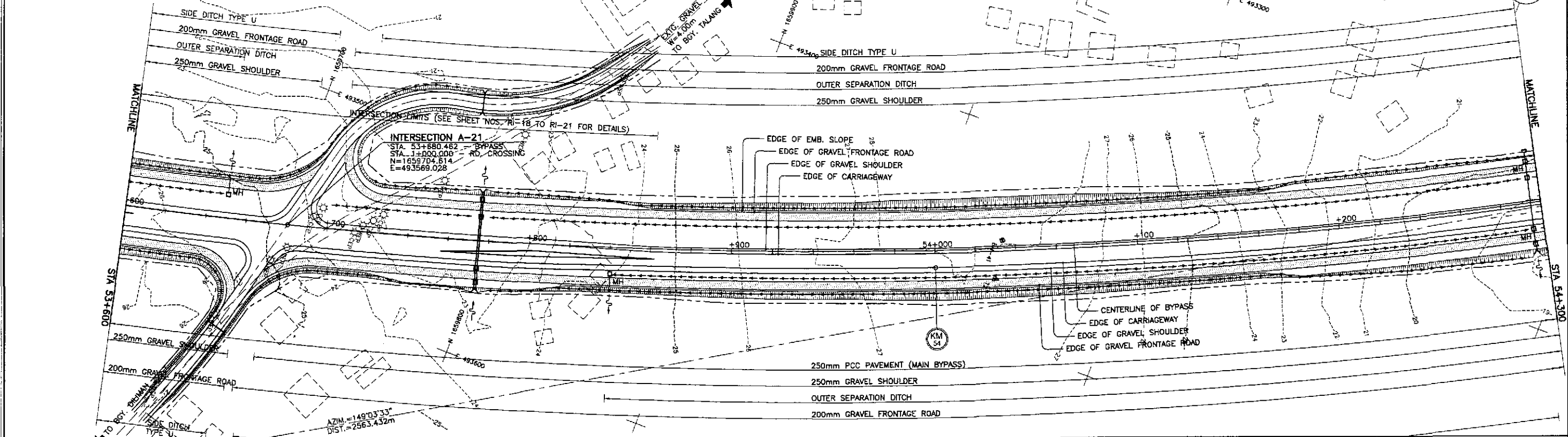
REFERENCE POINTS				DESCRIPTION
REF. PT.	NORTHING	EASTING	ELEV.	
BM-37	1,658,097.133	493,462.758	25.474	It is located on the intersection of the rice paddy dike on the right side of the alignment in San Rafael, Bulacan.
BM-38	1,658,577.840	493,506.635	25.298	It is located on a rice paddy int. near a fence concrete post on the right side of the alignment in San Rafael, Bulacan.
BM-39	1,659,026.390	493,512.322	25.137	It is located on the side of a dirt road on the right side of the alignment in San Rafael, Bulacan.



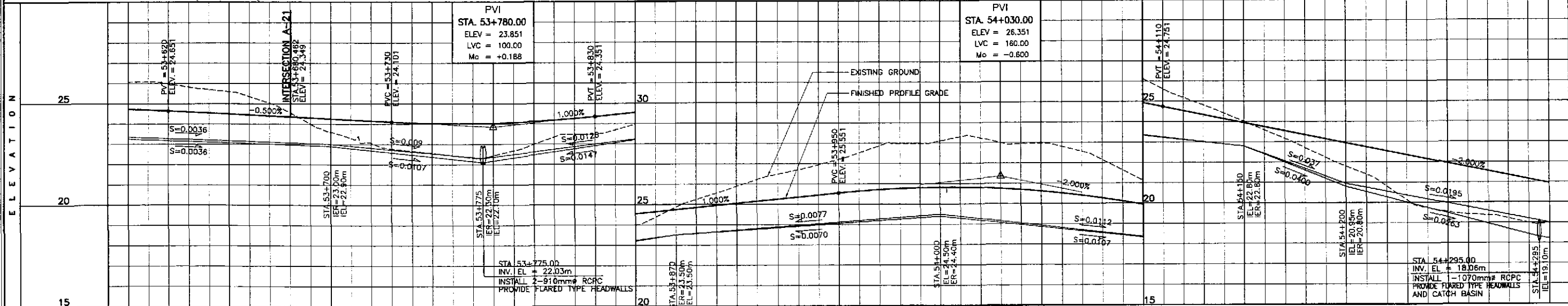
STATION	+200	+300	+400	52+500	+600	+700	+800	+900
FINISHED PROFILE GRADE	26.058	26.451	26.851	27.111	27.111	26.851	26.451	26.058
EXISTING GROUND BYPASS	26.160	26.551	26.951	27.111	27.111	26.851	26.451	26.058
HORIZONTAL CURVATURE	R = 2600							
VERTICAL CURVATURE	L = 200, Mo = -0.250, g = -0.500%							
SUPERELEVATION	e = +2.0%, e = -2.0%							

	DESIGNED	DATE	SIGNATURE		PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/27/02	S. G. BOSE		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	HORIZONTAL 1:1000	PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 52+200 - STA. 52+900	RP-05		
SUBMITTED	10/16/02	M. R. RIVERA	BUREAU OF DESIGN DANILLO C. TRAJANO Project Director	OFFICE OF THE SECRETARY Recommended By: JOSEFINA M. ALAGAR Chief, Highways Division	PLARIDEL BYPASS - CONTRACT PACKAGE IV	VERTICAL 1:100 FULL SIZE A1				

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-06	53+197.990	1,659,103.466	494,047.839	59°20'57"R	2,600.000	1,481.484	2,693.177	392.456	2.0	-	80



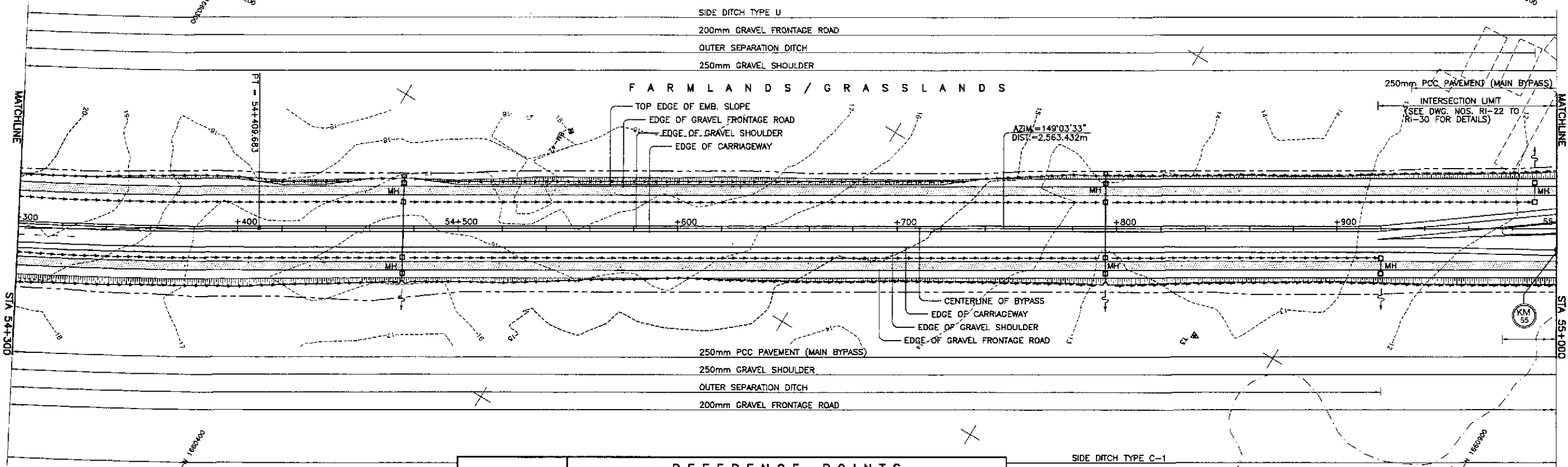
REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-39	1,659,028.390	493,512.322	25.137	It is located on the side of a dirt road on the right side of the alignment in San Rafael, Bulacan.
BM-41	1,660,037.271	493,451.999	28.680	It is located on the rice paddy intersection on the right side of the alignment in San Rafael, Bulacan.
BM-42	1,660,472.819	493,175.599	18.805	It is located on a rice paddy on the right side of the alignment in San Rafael, Bulacan.



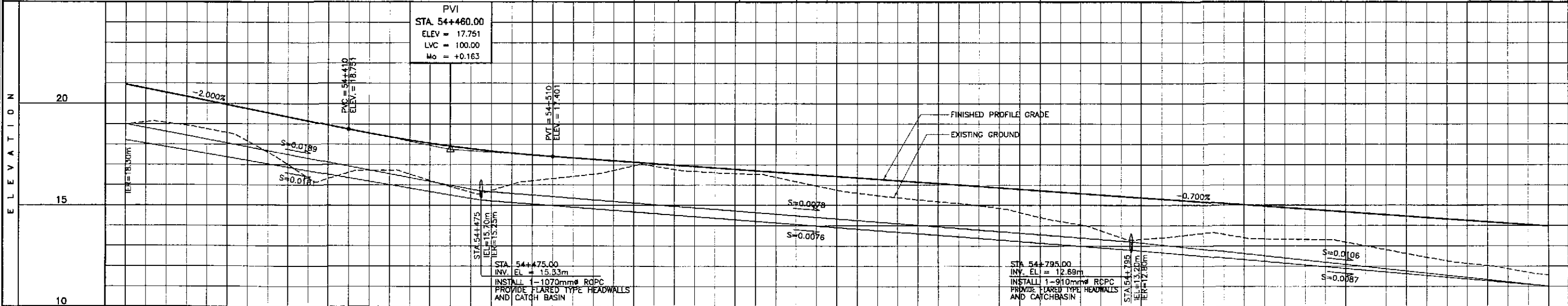
STATION	+800	+700	+800	+900	54+000	+100	+200	+300																																																														
FINISHED PROFILE GRADE BYPASS	26.067	24.731	25.989	24.651	25.703	24.451	24.556	24.351	23.611	24.251	23.087	24.151	22.864	24.058	22.440	24.018	22.434	24.038	22.991	24.118	23.474	24.258	23.697	24.451	24.396	24.651	25.246	24.651	25.882	25.051	26.476	25.251	26.938	25.451	27.521	25.642	27.986	25.767	28.104	25.817	28.238	25.792	27.941	25.892	27.812	25.517	27.148	25.267	28.128	24.842	25.193	24.451	24.450	24.151	23.598	23.751	22.717	23.351	21.802	22.951	20.810	22.551	19.736	22.151	19.430	21.751	19.213	21.351	18.986	20.951
EXISTING GROUND BYPASS	26.067	24.731	25.989	24.651	25.703	24.451	24.556	24.351	23.611	24.251	23.087	24.151	22.864	24.058	22.440	24.018	22.434	24.038	22.991	24.118	23.474	24.258	23.697	24.451	24.396	24.651	25.246	24.651	25.882	25.051	26.476	25.251	26.938	25.451	27.521	25.642	27.986	25.767	28.104	25.817	28.238	25.792	27.941	25.892	27.812	25.517	27.148	25.267	28.128	24.842	25.193	24.451	24.450	24.151	23.598	23.751	22.717	23.351	21.802	22.951	20.810	22.551	19.736	22.151	19.430	21.751	19.213	21.351	18.986	20.951
HORIZONTAL CURVATURE	R = 2600										R = 2600										R = 2600																																																	
VERTICAL CURVATURE	g = -0.500%										g = 1.000%										g = -2.000%																																																	
SUPERELEVATION	e = +2.0%										e = -2.0%										e = +2.0%																																																	

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)				SCALE :	SHEET CONTENTS :		SHEET NO. :
	CHECKED	9/27/02	<i>S. Jose</i>		BUREAU OF DESIGN				PLARIDEL BYPASS - CONTRACT PACKAGE IV				HORIZONTAL 1:1000	PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 53+600 - 54+300		RP-07
	SUBMITTED	10/16/02	<i>M. Kuroki</i>		OFFICE OF THE SECRETARY				MANUEL M. BONDAN Undersecretary				VERTICAL 1:100			
					OFFICE OF THE SECRETARY				SIMEON A. DATUMANONG Secretary				FULL SIZE A1			

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-06	53+197.990	1,659,103.466	494,047.839	59°20'57"R	2,600.000	1,481.484	2,693.177	392.456	2.0	-	80



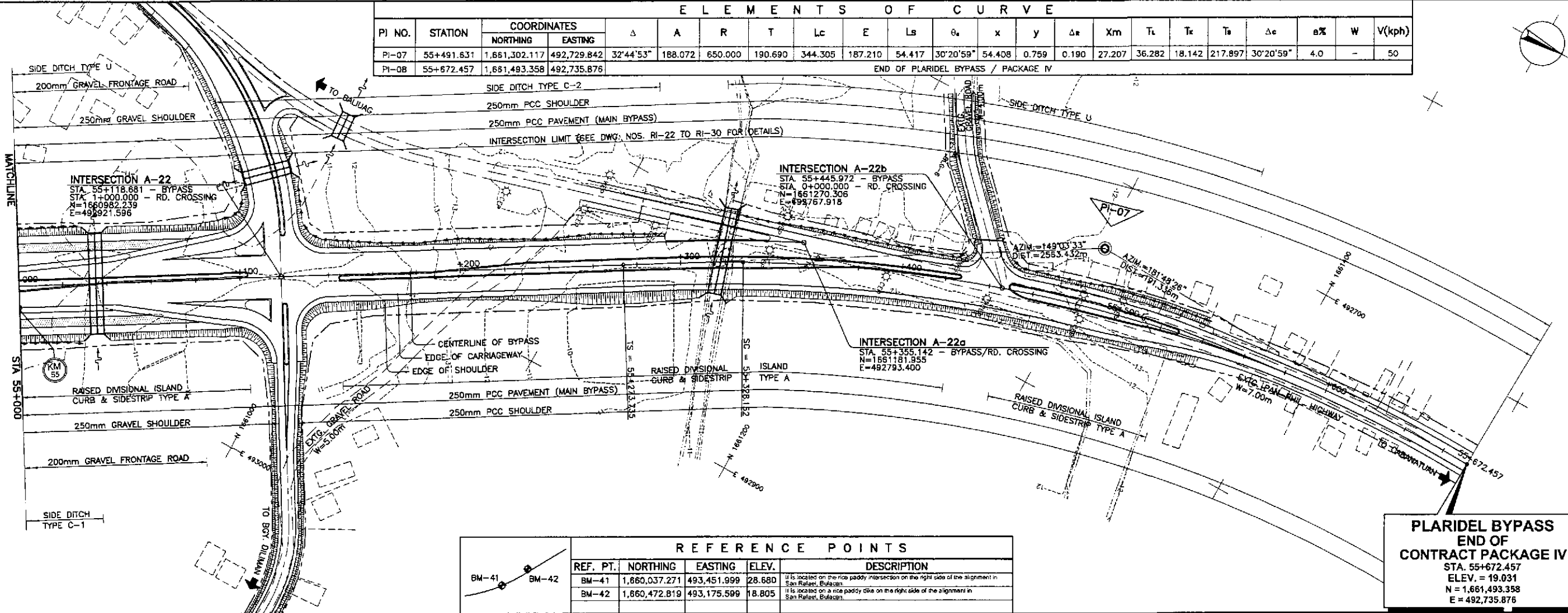
REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-41	1,660,037.271	493,451.999	28.680	It is located on the rice paddy intersection on the right side of the alignment in San Rafael, Bulacan.
BM-42	1,660,472.819	493,175.589	18.805	It is located on a non-paddy area on the right side of the alignment in San Rafael, Bulacan.



STATION	+300	+400	54+500	+600	+700	+800	+900	55+000
FINISHED PROFILE GRADE BYPASS	18.956	18.951	18.951	18.951	18.951	18.951	18.951	18.951
EXISTING GROUND BYPASS	18.956	18.063	18.760	18.751	17.004	16.310	16.723	16.557
HORIZONTAL CURVATURE	R = 2600		R = ∞		R = ∞		R = ∞	
VERTICAL CURVATURE	g = -2.000%		L = 100, Mg = +0.163		g = -0.700%		g = -0.700%	
SUPERELEVATION	S = 0.005		S = 0.005		NC		NC	

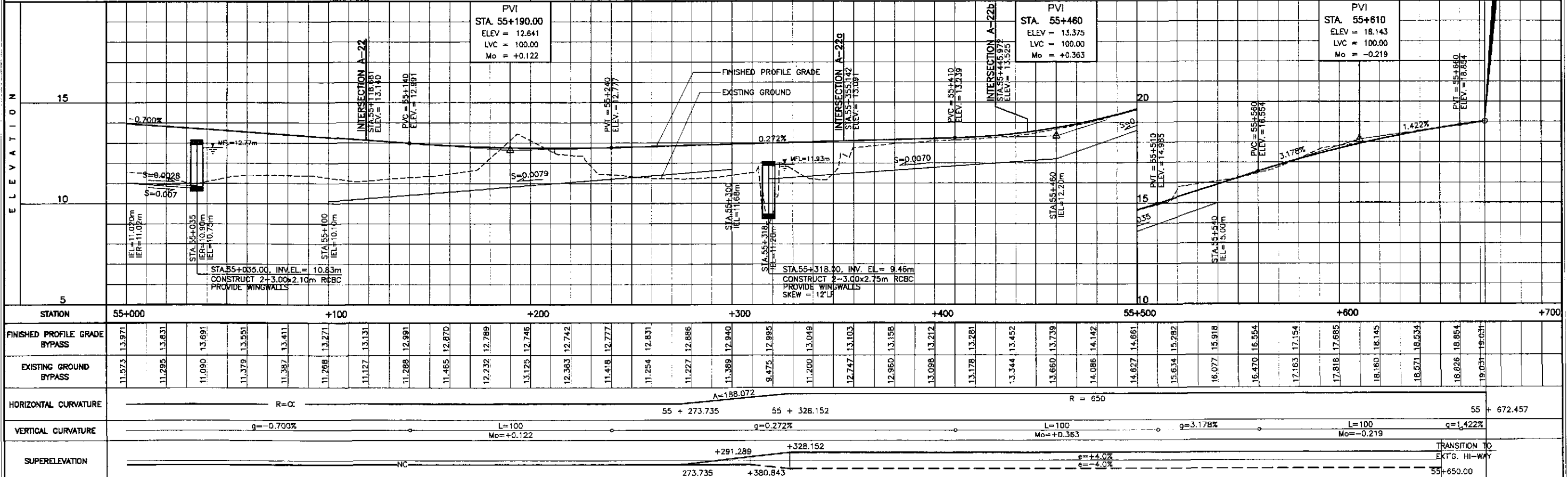
	DESIGNED: <i>[Signature]</i> CHECKED: <i>[Signature]</i> SUBMITTED: <i>[Signature]</i>	DATE: <i>[Date]</i> SIGNATURE: <i>[Signature]</i> TEAM LEADER	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) PLARIDEL BYPASS - CONTRACT PACKAGE IV	SCALE : HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 54+300 - STA. 55+000	SHEET NO. : RP-08	
	P.M.O. - PMO Submitted By: <i>[Signature]</i> DANILLO C. TRAJANO Project Director			OFFICE OF THE SECRETARY Recommended By: <i>[Signature]</i> JOSEFINA M. ALAGAR Chief, Highways Division			Approved By: <i>[Signature]</i> SIMON A. DATUMANONG Secretary	
	BUREAU OF DESIGN			Recommended By: <i>[Signature]</i> GILBERTO S. REYES OIC, Director IV			Recommended By: <i>[Signature]</i> MANUEL M. BONDAN Undersecretary	

PI NO.	STATION	COORDINATES		Δ	A	R	T	Lc	E	Ls	θ _a	x	y	Δe	Xm	T _c	T _k	T _s	Δe	a%	W	V(kph)	
		NORTHING	EASTING																				
PI-07	55+491.631	1,661,302.117	492,729.842	32°44'53"	188.072	650.000	190.690	344.305	187.210	54.417	30°20'59"	54.408	0.759	0.190	27.207	36.282	18.142	217.897	30°20'59"	4.0	-	50	
PI-08	55+672.457	1,661,493.358	492,735.876																				



REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-41	1,660,037.271	493,451.999	28.680	It is located on the rice paddy intersection on the right side of the alignment in San Rafael, Bulacan.
BM-42	1,660,472.819	493,175.599	18.805	It is located on a rice paddy dike on the right side of the alignment in San Rafael, Bulacan.

**PLARIDEL BYPASS
END OF
CONTRACT PACKAGE IV**
 STA. 55+672.457
 ELEV. = 19.031
 N = 1,661,493.358
 E = 492,735.876



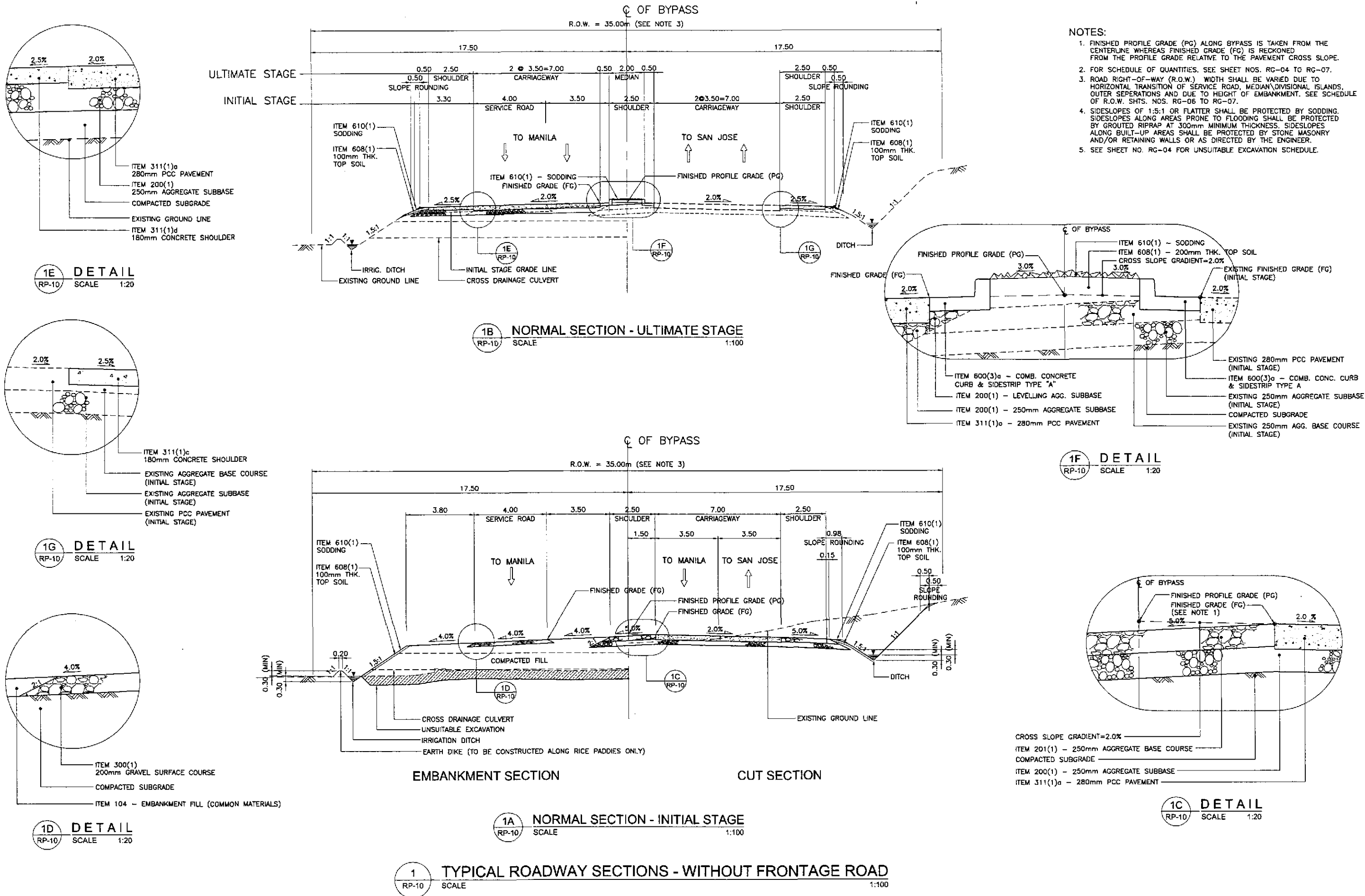
STATION	55+000	+100	+200	+300	+400	55+500	+600	+700
FINISHED PROFILE GRADE BYPASS	11.573	11.295	11.090	11.379	11.287	11.268	11.127	11.313
EXISTING GROUND BYPASS	11.573	11.295	11.090	11.379	11.287	11.268	11.127	11.313
HORIZONTAL CURVATURE	R = ∞							
VERTICAL CURVATURE	g = -0.700%		L = 100 Mo = +0.122		g = 0.272%		L = 100 Mo = +0.363	
SUPERELEVATION	e = +4.0% e = -4.0%							

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KAEI KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

REPUBLIC OF THE PHILIPPINES
 DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
 BUREAU OF DESIGN
 Submitted By: DANILLO C. TRILAND
 Reviewed By: JOSEFINA M. ALAGAR
 Recommended By: GILBERTO S. REYES
 Office of the Secretary
 Recommended By: MANUEL M. BONGAON
 Approved By: SIMEON A. DATUMANGING

PROJECT AND LOCATION :
 THE DETAILED DESIGN STUDY ON
 UPGRADING INTER-URBAN HIGHWAY SYSTEM
 ALONG THE PAN-PHILIPPINE HIGHWAY
 (Plaridel, Cabanatuan and San Jose Bypasses)
 PLARIDEL BYPASS - CONTRACT PACKAGE IV

SCALE :
 HORIZONTAL 1:1000
 VERTICAL 1:100
 FULL SIZE A1
 SHEET CONTENTS :
 PLAN AND PROFILE
 ALONG BYPASS (INITIAL STAGE)
 STA. 55+000 - STA. 55+672.457
 SHEET NO. :
RP-09

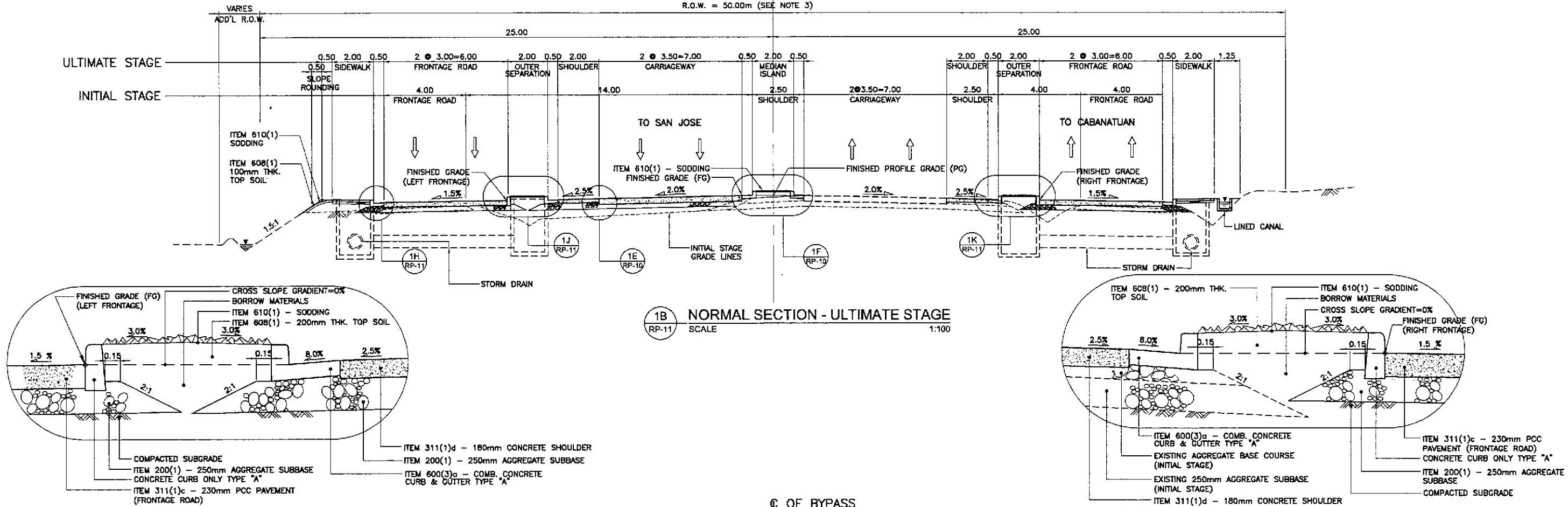


- NOTES:**
1. FINISHED PROFILE GRADE (PG) ALONG BYPASS IS TAKEN FROM THE CENTERLINE WHEREAS FINISHED GRADE (FG) IS RECKONED FROM THE PROFILE GRADE RELATIVE TO THE PAVEMENT CROSS SLOPE.
 2. FOR SCHEDULE OF QUANTITIES, SEE SHEET NOS. RG-04 TO RG-07.
 3. ROAD RIGHT-OF-WAY (R.O.W.) WIDTH SHALL BE VARIED DUE TO HORIZONTAL TRANSITION OF SERVICE ROAD, MEDIAN, DIVISIONAL ISLANDS, OUTER SEPARATIONS AND DUE TO HEIGHT OF EMBANKMENT. SEE SCHEDULE OF R.O.W. SHOTS, NOS. RG-06 TO RG-07.
 4. SIDESLOPES OF 1:1.5 OR FLATTER SHALL BE PROTECTED BY SODDING. SIDESLOPES ALONG AREAS PRONE TO FLOODING SHALL BE PROTECTED BY GROUTED RIPRAP AT 300mm MINIMUM THICKNESS. SIDESLOPES ALONG BUILT-UP AREAS SHALL BE PROTECTED BY STONE MASONRY AND/OR RETAINING WALLS OR AS DIRECTED BY THE ENGINEER.
 5. SEE SHEET NO. RG-04 FOR UNSUITABLE EXCAVATION SCHEDULE.

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :				
	CHECKED	9/27/02	<i>[Signature]</i>		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS							THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	TYPICAL ROADWAY SECTIONS NORMAL SECTIONS WITHOUT FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (1 of 4)	RP-10
	SUBMITTED	10/16/02	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:								
			<i>[Signature]</i>	DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONGAON	SIMEON A. DATUMANONG							

Q OF BYPASS

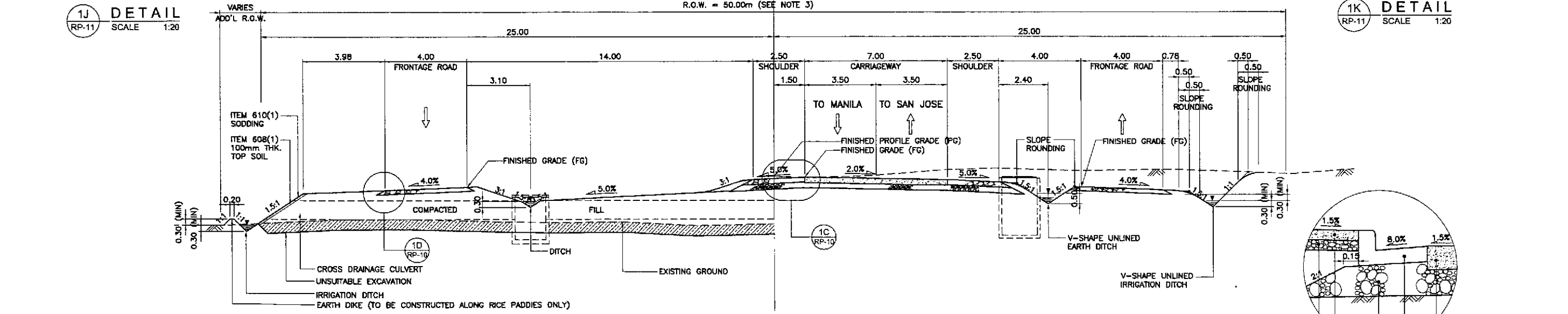
R.O.W. = 50.00m (SEE NOTE 3)



1B NORMAL SECTION - ULTIMATE STAGE
SCALE 1:100

Q OF BYPASS

R.O.W. = 50.00m (SEE NOTE 3)



1A NORMAL SECTION - INITIAL STAGE
SCALE 1:100

1 TYPICAL ROADWAY SECTIONS - WITH FRONTAGE ROAD
SCALE 1:100

- NOTES:
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 5. SEE SHEET NO. RG-04 FOR UNSUITABLE EXCAVATION SCHEDULE.

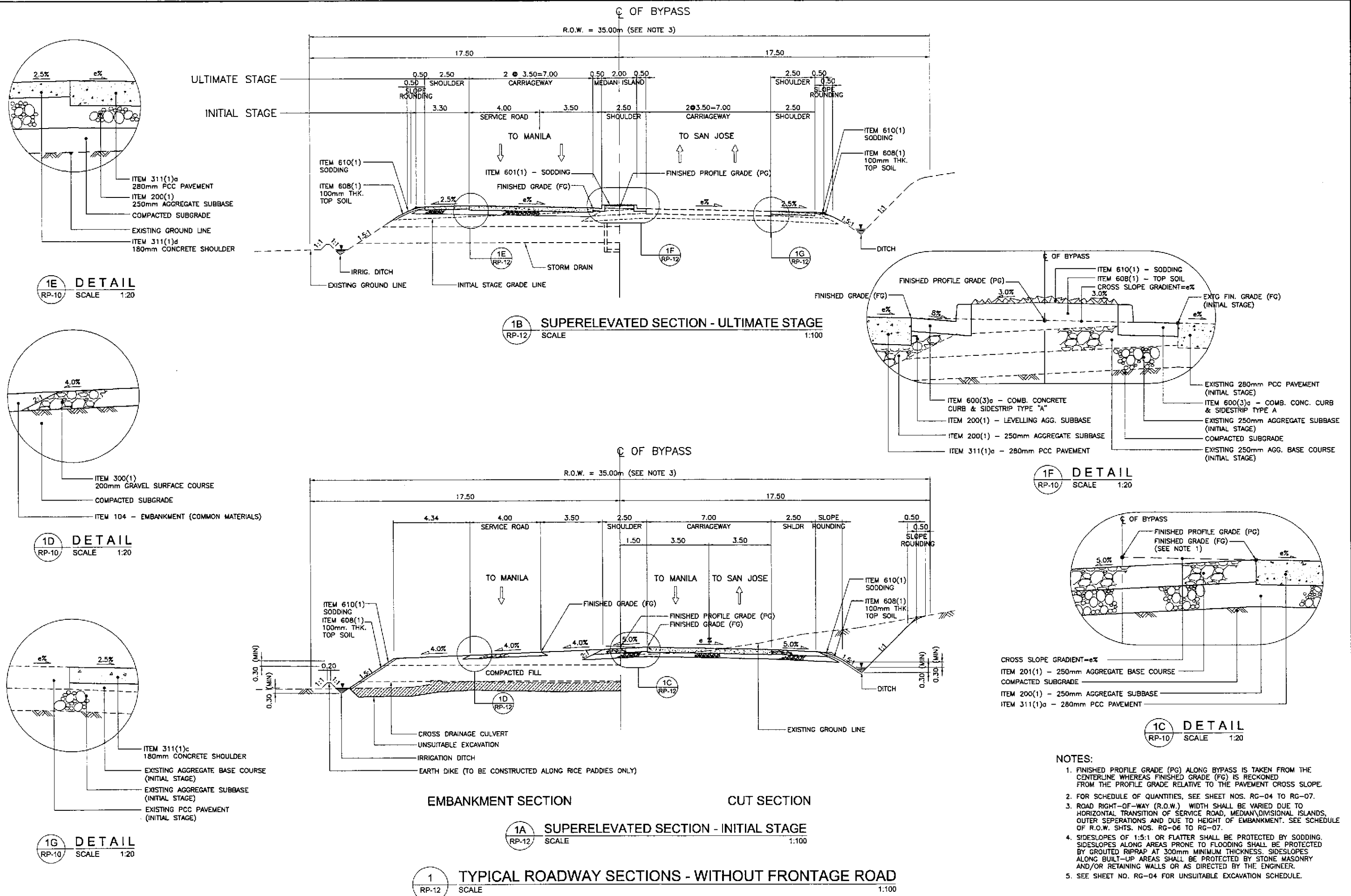
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INTERNATIONAL

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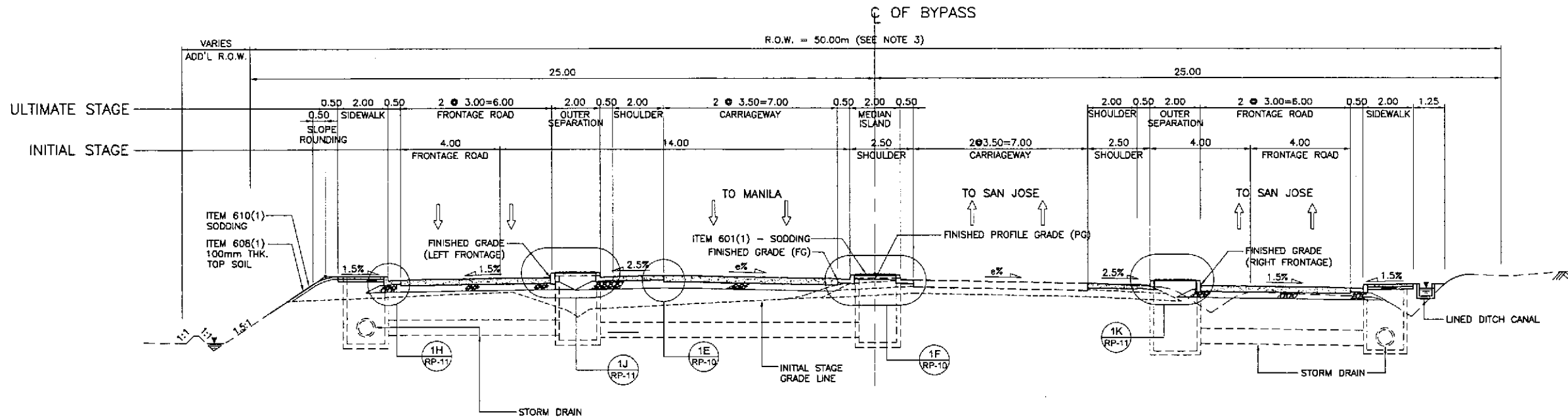
DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		
CHECKED	9/27/02	ADARDO ROSE	BUREAU OF DESIGN		
SUBMITTED	10/16/02	M. RIVERA	OFFICE OF THE SECRETARY		
Submitted By: DANLO C. TRAJANO Project Director			Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OC, Director IV	Approved By: MANUEL M. BONGAN Undersecretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	TYPICAL ROADWAY SECTIONS NORMAL SECTIONS WITH FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (2 of 4)	RP-11
PLARIDEL BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		

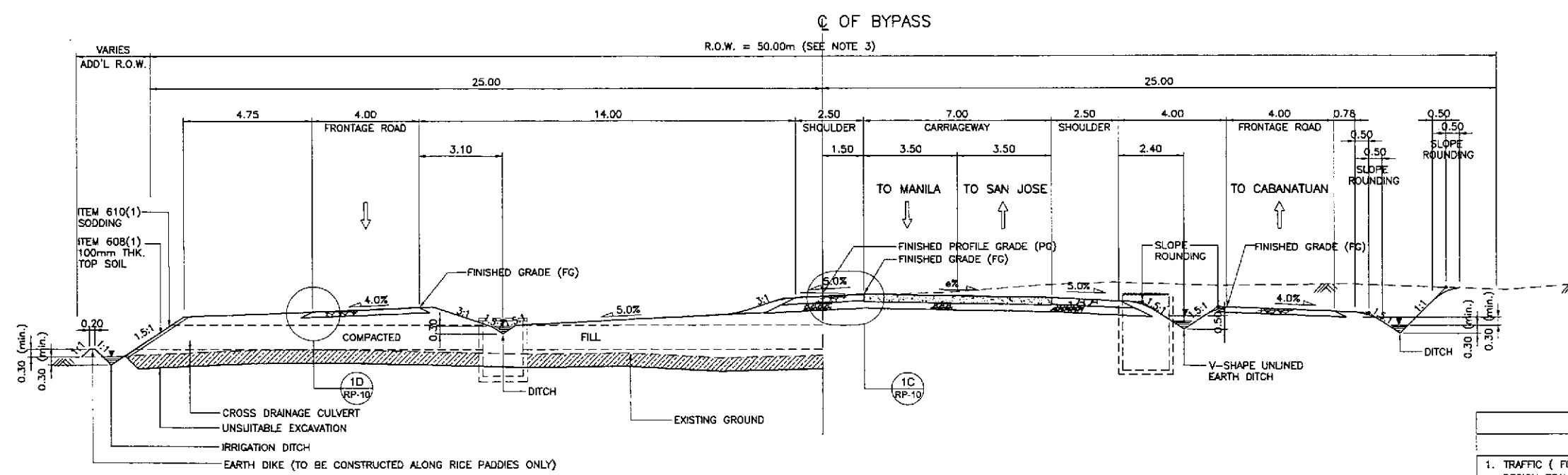


- NOTES:**
1. FINISHED PROFILE GRADE (PG) ALONG BYPASS IS TAKEN FROM THE CENTERLINE WHEREAS FINISHED GRADE (FG) IS RECKONED FROM THE PROFILE GRADE RELATIVE TO THE PAVEMENT CROSS SLOPE.
 2. FOR SCHEDULE OF QUANTITIES, SEE SHEET NOS. RG-04 TO RG-07.
 3. ROAD RIGHT-OF-WAY (R.O.W.) WIDTH SHALL BE VARIED DUE TO HORIZONTAL TRANSITION OF SERVICE ROAD, MEDIAN/DIVISIONAL ISLANDS, OUTER SEPARATIONS AND DUE TO HEIGHT OF EMBANKMENT. SEE SCHEDULE OF R.O.W. SHTS. NOS. RG-06 TO RG-07.
 4. SIDESLOPES OF 1:1.5 OR FLATTER SHALL BE PROTECTED BY SODDING. SIDESLOPES ALONG AREAS PRONE TO FLOODING SHALL BE PROTECTED BY GROUTED RIPRAP AT 300mm MINIMUM THICKNESS. SIDESLOPES ALONG BUILT-UP AREAS SHALL BE PROTECTED BY STONE MASONRY AND/OR RETAINING WALLS OR AS DIRECTED BY THE ENGINEER.
 5. SEE SHEET NO. RG-04 FOR UNSUITABLE EXCAVATION SCHEDULE.

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	SCALE : AS SHOWN	SHEET CONTENTS : TYPICAL ROADWAY SECTIONS WITHOUT FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (3 of 4)	SHEET NO. : RP-12
	CHECKED	DATE	SIGNATURE		BUREAU OF DESIGN						
	SUBMITTED	DATE	SIGNATURE		Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES Dir. Director IV				



1B SUPERELEVATED SECTION - ULTIMATE STAGE
 RP-13 SCALE 1:100



1A SUPERELEVATED SECTION - INITIAL STAGE
 RP-13 SCALE 1:100

1 TYPICAL ROADWAY SECTIONS - WITH FRONTAGE ROAD
 RP-13 SCALE 1:100

- NOTES:**
1. FINISHED PROFILE GRADE (PG) ALONG BYPASS IS TAKEN FROM THE CENTERLINE WHEREAS FINISHED GRADE (FG) IS RECKONED FROM THE PROFILE GRADE RELATIVE TO THE PAVEMENT CROSS SLOPE.
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 5. SEE SHEET NO. RG-04 FOR UNSUITABLE EXCAVATION SCHEDULE.

PAVEMENT DESIGN PARAMETERS	
	AFTER ANGAT BRIDGE
1. TRAFFIC (FOR 25 YEARS DESIGN LIFE) DESIGN ESAL	3.50 x 10 ⁶
2. DESIGN CBR SUBGRADE CBR	5.00 %
3. ROADBED RESILIENT MODULUS M _R E _{SB} E _{BS}	5,500 psi = 37.92 MPa 13,000 psi = 89.64 MPa 23,000 psi = 158.58 MPa
4. PERFORMANCE CRITERIA Δ PSI	2
5. DESIGN RELIABILITY Z _R S _o	50 % 0.35
6. DRAINAGE COEFFICIENT RIGID	1
7. LAYER COEFFICIENT a ₁ (FOR AC) a ₂ (FOR BASE) a ₃ (FOR SUBBASE)	0.39 0.105 0.095
8. PAVEMENT CONSTRUCTION THICKNESS PCCP SUBBASE	250mm THK 250mm THK

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pilaridel, Cabanatuan and San Jose Bypasses)	SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : TYPICAL ROADWAY SECTIONS WITH FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (4 of 4)	SHEET NO. : RP-13
	CHECKED	9/27/02	S. JOSE		BUREAU OF DESIGN						
	SUBMITTED	10/16/02	M. RUCHI		Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV				