

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

CABANATUAN BYPASS - CONTRACT PACKAGE III

(INITIAL STAGE)

STA. 119+000.000 TO STA. 121+600.000

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GENERAL

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

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JICA JAPAN INTERNATIONAL COOPERATION AGENCY	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	CHECKED		M. RUCIF TEAM LEADER		Submitted By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		INDEX OF DRAWINGS (INITIAL STAGE) Sheet 1 of 3	GC-01
	SUBMITTED				DANILO C. TRAJANO Project Director	Reviewed By:	BUREAU OF DESIGN	FULL SIZE A1	
KATAHIRA & ENGINEERS INTERNATIONAL	YEO YACHIYO ENGINEERING CO., LTD.			OFFICE OF THE SECRETARY Recommended By:	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMON A. DATUMANONG Secretary	

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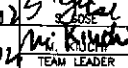


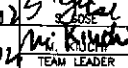



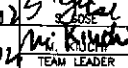

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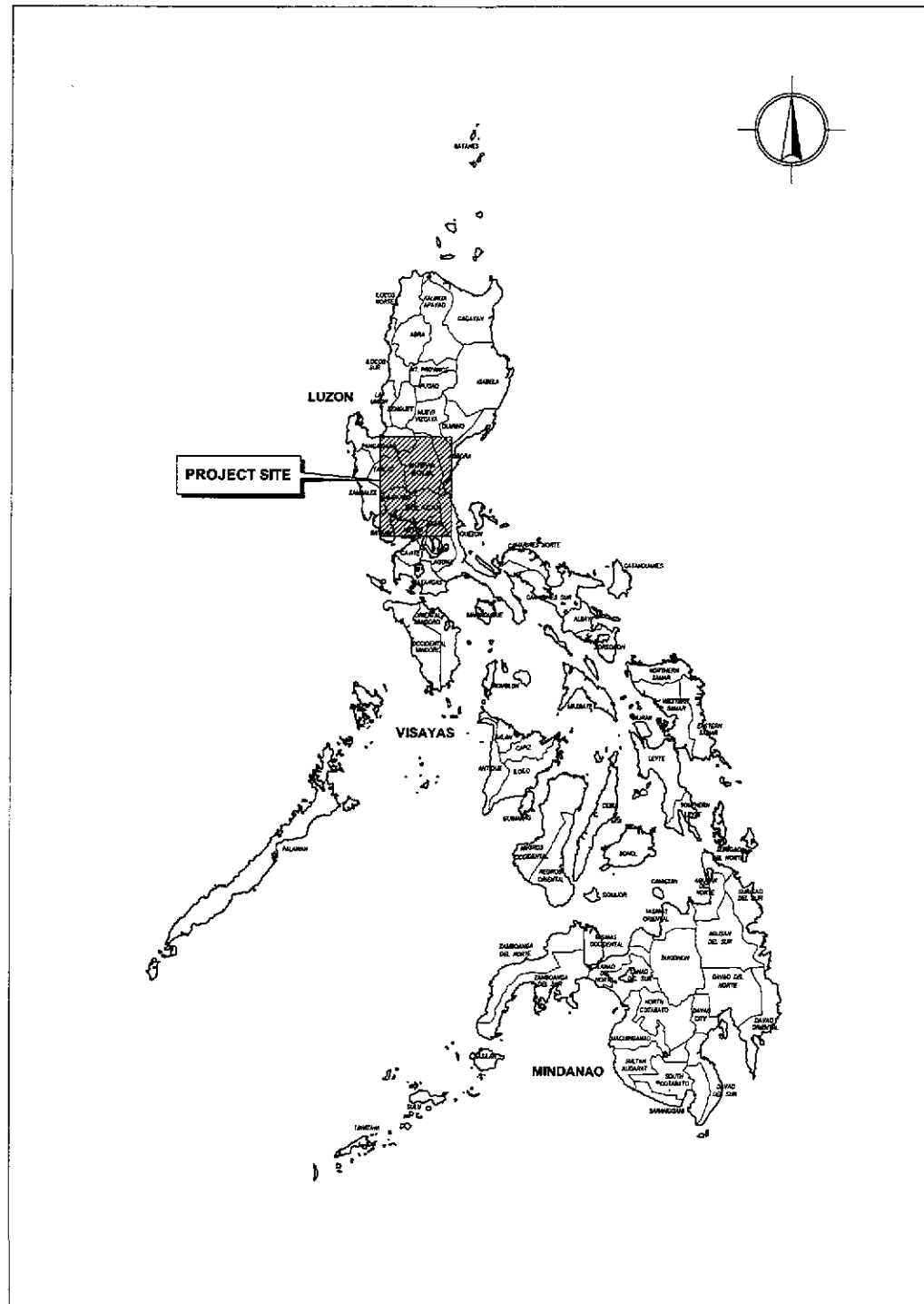
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	SUBMITTED				Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALACAR Chief, Highways Division				

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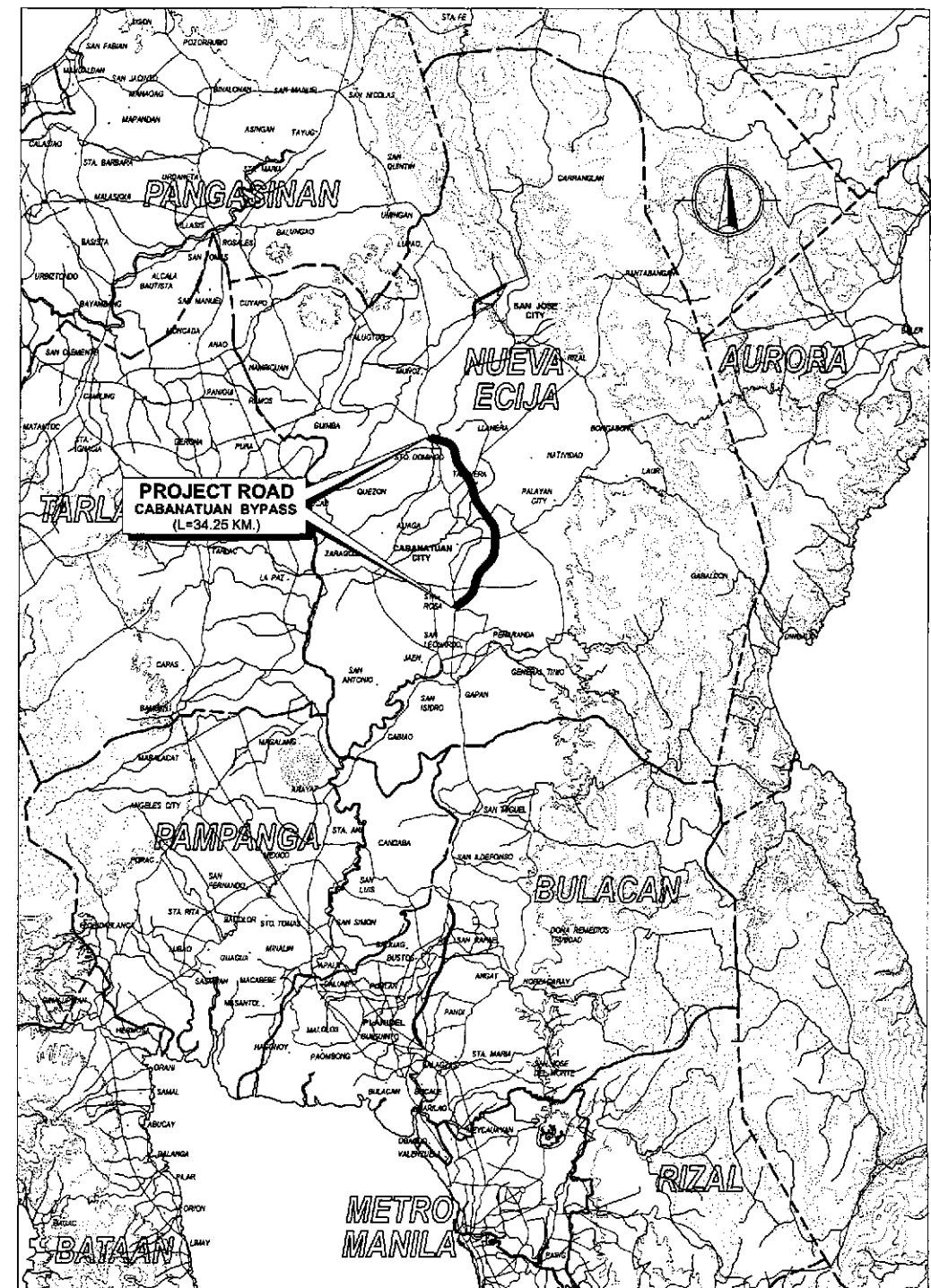
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FA-12	ROOF FRAMING PLAN, SCHEMATIC DIAGRAM, PURLIN CONNECTION AND CROSS BRACING CONNECTION				
ELECTRICAL					
FE-01	ENGR'S FIELD OFFICE / LABORATORY - LIGHTING LAYOUT, POWER LAYOUT & ELECTRICAL SYMBOLS AND GENERAL NOTES				
FE-02	ENGR'S LIVING QTRS - LIGHTING LAYOUT, POWER LAYOUT & ELECTRICAL SYMBOLS AND GENERAL NOTES				
FE-03	ENGR'S FIELD OFFICE & LIVING QUARTERS - SCHEDULE OF LOADS AND COMPUTATIONS & ELECTRICAL RISER DIAGRAM				
PLUMBING					
FP-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEWER AND WATER LINE LAYOUT AND ISOMETRIC DIAGRAM				
FP-02	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEPTIC TANK DETAILS				
EXTERNAL					
FX-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - PLOT PLAN, ELEVATION OF FENCE & GATE AND TYPICAL FOUNDATION DETAIL				
OTHERS					
ELECTRICAL					
UTILITY RELOCATION REFERENCE LAYOUT PLAN					
OE-01	LAYOUT PLAN, STA. 119 + 000.000 TO STA. 119 + 800.000				
OE-02	LAYOUT PLAN, STA. 119 + 800.000 TO STA. 121 + 200.000				
OE-03	LAYOUT PLAN, STA. 121 + 200.000 TO STA. 121 + 600.000				
CONE PENETRATION TEST (CPT)					
OC-01	PROFILE, STA. 119 + 254.000 TO STA. 121 + 434.000				

 JAPAN INTERNATIONAL COOPERATION AGENCY  KATAHIRA & ENGINEERS INTERNATIONAL  YEO YACHIYO ENGINEERING CO., LTD.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>DESIGNED</th> <th>DATE</th> <th>SIGNATURE</th> </tr> <tr> <td></td> <td>10/19/02</td> <td></td> </tr> <tr> <th>CHECKED</th> <th>DATE</th> <th>SIGNATURE</th> </tr> <tr> <td></td> <td>10/17/02</td> <td></td> </tr> <tr> <th>SUBMITTED</th> <th>DATE</th> <th>SIGNATURE</th> </tr> <tr> <td></td> <td>10/19/02</td> <td></td> </tr> </table>	DESIGNED	DATE	SIGNATURE		10/19/02		CHECKED	DATE	SIGNATURE		10/17/02		SUBMITTED	DATE	SIGNATURE		10/19/02		 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN	PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : FULL SIZE A1	SHEET CONTENTS : INDEX OF DRAWINGS (INITIAL STAGE) Sheet 3 of 3	SHEET NO. : GC-03
	DESIGNED	DATE	SIGNATURE																					
		10/19/02																						
CHECKED	DATE	SIGNATURE																						
	10/17/02																							
SUBMITTED	DATE	SIGNATURE																						
	10/19/02																							
Submitted By: DANILO C. TRAJANO <small>Project Director</small>		Reviewed By: JOSEFINA M. ALAGAR <small>Chief, Highways Division</small>		Recommended By: GILBERTO S. REYES <small>Dir. Director IV</small>		Recommended By: MANUEL M. BONOAN <small>Undersecretary</small>		Approved By: SIMEON A. DATUMANONG <small>Secretary</small>																



2 KEY MAP
GC-04 NOT TO SCALE



1 VICINITY MAP
GC-04 NOT TO SCALE

	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 (Paridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : FULL SIZE A1	SHEET CONTENTS : KEY AND VICINITY MAP	SHEET NO. : GC-04
	CHECKED	10/17/02	<i>[Signature]</i>							
	SUBMITTED	10/17/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:				
			<i>[Signature]</i>	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONOAN Undersecretary	SIMEDON A. DATUMANONG Secretary		



LEGEND AND SYMBOLS

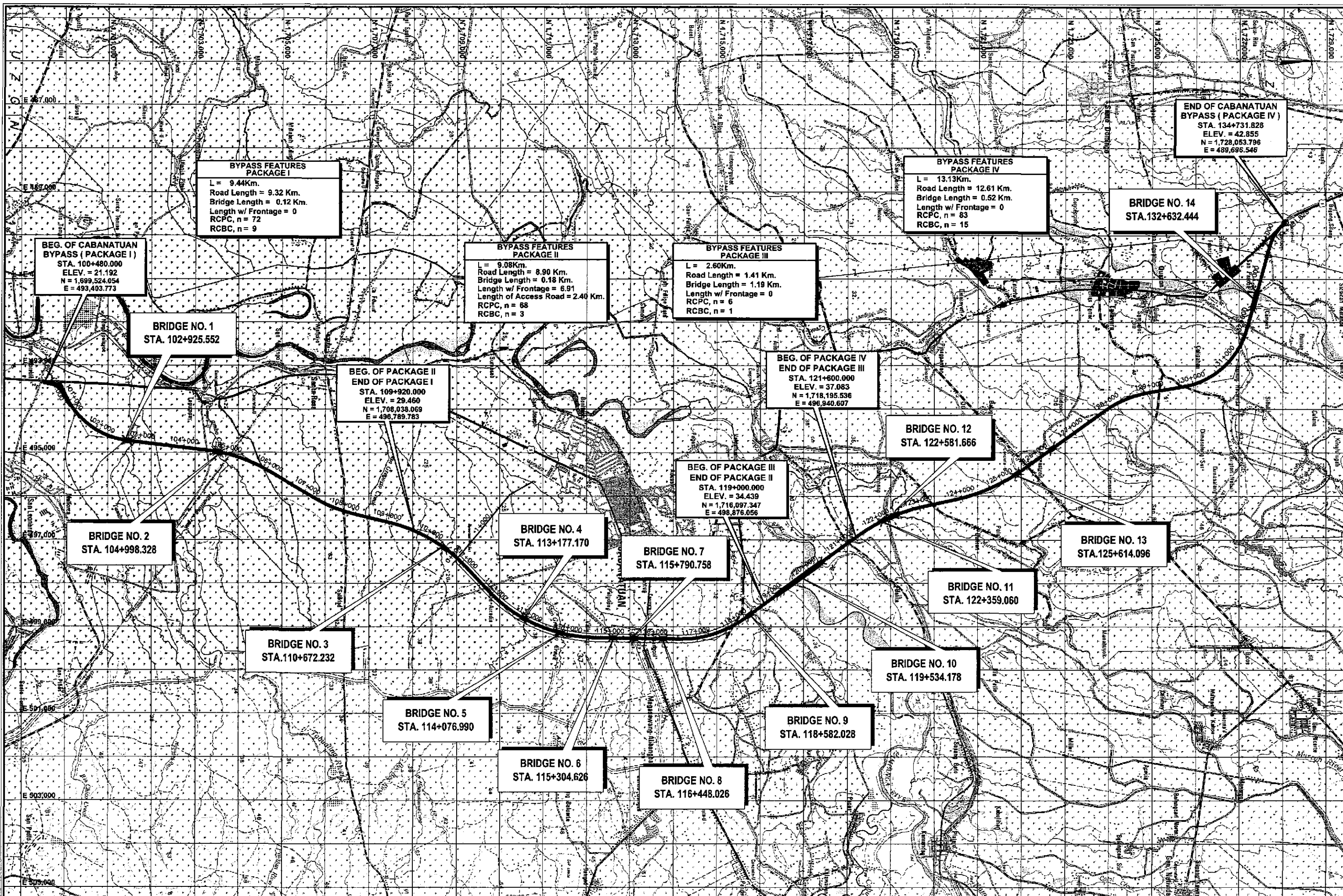
EXISTING FEATURES	
ROAD	
CONTOUR	
ORIGINAL GROUND	
CONCRETE FENCE	
BARBED WIRE FENCE	
HOUSE	
TREES	
BRIDGE	
SINGLE PIPE CULVERT	
DOUBLE PIPE CULVERT	
BOX CULVERT	
DITCH LINE/ IRRIGATION LINE	
IRRIGATION LINE	
RIVER/CREEK	
ELECTRIC POST	
KILOMETER POST	
TRAVERSE STATION POINT	
BENCHMARK	
FISH POND	
NATIONAL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

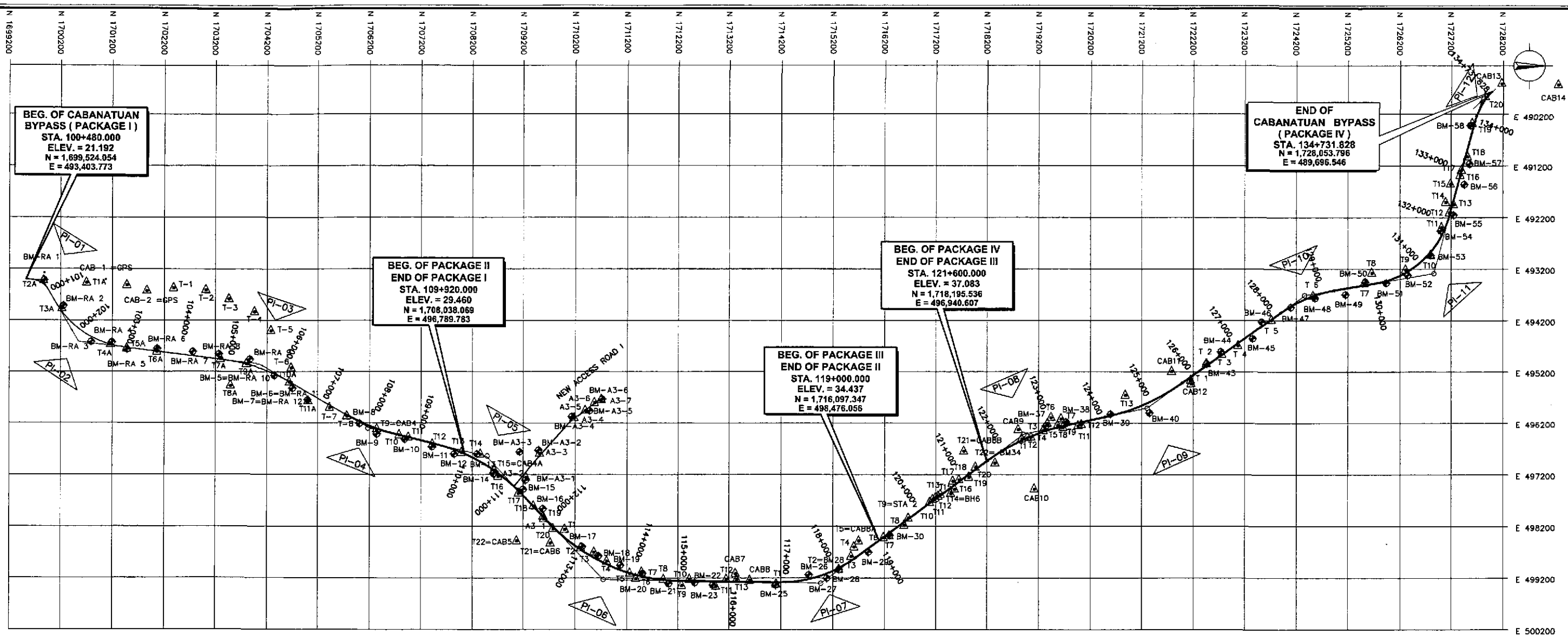
ABBREVIATIONS

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	LONGT.	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		

 JAPAN INTERNATIONAL COOPERATION AGENCY	 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 : NOT TO SCALE	SHEET CONTENTS : ABBREVIATIONS	SHEET NO. : GC-06
	BUREAU OF DESIGN	OFFICE OF THE SECRETARY			
	Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV	(See cover sheet for Signatures)	Approved By: MANUEL M. BONDAN Undersecretary



	DATE	SIGNATURE					PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/8/02	[Signature]	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				1:40,000	PROJECT ROAD GENERAL ALIGNMENT / FEATURES	GC-07	
	CHECKED	10/17/02	[Signature]	BUREAU OF DESIGN							
	SUBMITTED	10/19/02	[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 Dir. Director IV		Approved By: MANUEL M. BONOAN Undersecretary		Approved By: SIMEON A. DATUMANONG Secretary		



BEG. OF CABANATUAN BYPASS (PACKAGE I)
 STA. 100+480.000
 ELEV. = 21.192
 N = 1,699,524.054
 E = 493,403.773

**BEG. OF PACKAGE II
 END OF PACKAGE I**
 STA. 109+920.000
 ELEV. = 29.460
 N = 1,708,038.069
 E = 496,789.783

**BEG. OF PACKAGE III
 END OF PACKAGE II**
 STA. 119+000.000
 ELEV. = 34.437
 N = 1,716,097.347
 E = 498,476.056

**BEG. OF PACKAGE IV
 END OF PACKAGE III**
 STA. 121+600.000
 ELEV. = 37.083
 N = 1,718,195.536
 E = 498,940.607

END OF CABANATUAN BYPASS (PACKAGE IV)
 STA. 134+731.828
 N = 1,728,053.796
 E = 489,695.546

TABLE OF GPS STATION				
POLYGON POINT	COORDINATES		ELEV.	REMARKS
	NORTHING	EASTING		
CAB-1=GPS	1,701,482.713	493,518.261	23.777	Located in Brgy. Tagumpay, San Leonardo, Nueva Ecija. It is drilled on the left side of the Lombo Bridge's first approach, about 0.05 cm. above the bridge's concrete sidewalk.
CAB-2=GPS	1,701,889.365	493,628.461	22.525	Located in Brgy. Tagumpay, San Leonardo, Nueva Ecija. It is embedded in an open space 80 m. from highway, 15 m. from dirt road going to an irrigation canal, about 40cm x 40cm x 0.05cm above the ground.
CAB-3=GPS	1,706,316.913	495,963.410	25.984	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embedded on a 40cm x 40cm conc. mans. beside an irrigation canal about 6m from rd. C1 & 3 km. from the highway intersect. of Fort Magosayog & Cabanatuan City.
T9=CAB4	1,706,340.784	496,322.453	26.299	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embedded on a 40 cm x 40 cm conc. mans. on the left side of the rd. going to Fort Magosayog & about 370 m. from GPS Sta. CAB-3, about 4 m. from rd. C1.
T15=CAB4A	1,708,634.191	497,109.919	27.917	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija on Boz property. From the highway northbound take a right turn on Mabini extension, Mercury Drugstore going to Brgy. Sta. Arcadia, 4.5 km. from the highway take a right turn on the intersection of the dirt road after the one-way bridge with a water pipe rail. It is 1.4 km. from the intersection beside an irrigation canal on the left side.
T21=CAB5	1,709,079.199	498,487.150	31.478	Located in Brgy. Sta. Arcadia, Cabanatuan, Nueva Ecija. From the highway northbound take a right turn on Mabini extension, Mercury Drugstore going to Brgy. Sta. Arcadia, 3.9 km. from the intersection highway, take a left turn to a dirt road it is embedded on the right side of the road 200 m. from the Mabini extension road centerline.
T22=CAB6	1,709,731.929	498,528.334	31.285	Located in Brgy. Sta. Arcadia, Cabanatuan, Nueva Ecija. From the highway northbound take a right turn on Mabini extension, Mercury Drugstore going to Brgy. Sta. Arcadia, 3.2 km. from the intersection highway, take a left turn to a dirt road it is embedded on the left side of the road near an irrigation canal road centerline.
CAB7	1,713,329.137	499,115.491	33.346	Located in Brgy. San Isidro, Cabanatuan, Nueva Ecija. It is embedded on the sidewalk of the DPWH 3rd Engineering District driveway, about 20 m. from the centerline of the road.
CAB8	1,713,603.208	499,247.649	33.467	Located in Urban Poor Housing Project, San Isidro, Cabanatuan, Nueva Ecija. Going to Palayan City take a left turn to the dirt road beside the DPWH compound leading to the site of the housing project, then turn right. It is embedded on the right side of the dirt road near the electric post 400 m. from the centerline of the highway.
T5=CAB8A	1,715,705.803	498,487.077	34.234	Located in Brgy. Raja, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway to a road before the Valdehue bridge, 3 km. from the highway, turn left to a bridge.
T21=CAB8B	1,717,749.623	496,746.648	34.436	Location in Brgy. Soping, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway after the Valdehue bridge to road going to Brgy. Soping. It is emb. on the left side of the road.
CAB9	1,718,805.446	496,330.000	37.709	Located in Brgy. Buliran, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway after the Valdehue bridge to a road going to Brgy. Dolampang, 2.5 km. from the highway taking the left fork turn right at the intersection to a dirt road leading to Brgy. Balite. It is embedded near an irrigation dike 800 m. from the bridge.
CAB10	1,719,118.959	497,481.612	37.713	Located in Brgy. Dolampang, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway after the Valdehue bridge to a road going to Brgy. Dolampang, 2.5 km. from the highway taking the left fork turn right at the intersection to a dirt road leading to Brgy. Balite. It is embedded near an irrigation dike on the right side, 1.9 km. from the bridge.
CAB11	1,721,785.245	495,194.832	39.469	Located in Homestead 1, Talavera, Nueva Ecija. Taking the Maharika highway to Muñoz, turn right on Pinaopanan intersection to the highway going to Pantabangan, 4.3 km. from the intersection turn right to a dirt road. It is embedded on the right beside an irrigation canal 70 m. from the centerline of the highway.
CAB12	1,722,164.049	495,433.809	37.949	Located in Homestead 1, Talavera, Nueva Ecija. Taking the Maharika highway to Muñoz, turn right on Pinaopanan intersection to the highway going to Pantabangan, 4.8 km. from the intersection on the right side 50 m. from the centerline of the highway.
CAB13	1,718,173.538	489,601.897	44.230	Located in Brgy. San Pascual, Talavera, Nueva Ecija. It is embedded on the right side of the bridge 2.3 km. from San Pascual market going to San Jose.
CAB14	1,729,259.352	489,626.485	43.627	Located in Brgy. Bagong Slang, Talavera, Nueva Ecija. Take a right turn 3.4 km. from San Pascual market going to San Jose to a dirt road. It is embedded on a rice paddy dike on the right side of the road 500 m. from the highway.

TABLE OF TRAVERSE STATION POINTS				
POLYGON POINT	COORDINATES		ELEV.	
	NORTHING	EASTING		
T-1	1,702,384.687	493,573.021	24.120	
T-2	1,703,019.008	493,611.093	25.138	
T-3	1,703,468.521	493,784.648	25.158	
T-4	1,703,958.942	494,041.357	23.064	
T-5	1,704,279.497	494,398.825	24.467	
T-6	1,704,678.169	495,128.982	24.858	
T-7	1,705,433.273	495,901.932	26.581	
T-8	1,705,767.745	496,069.357	25.809	
T-9	1,706,773.218	496,434.404	26.138	
T-10	1,707,958.942	494,041.357	23.064	
T-11	1,706,952.708	496,479.420	26.405	
T-12	1,707,425.044	496,615.719	27.154	
T-13	1,707,989.215	496,773.054	26.251	
T-14	1,708,364.430	496,806.236	26.328	
T-15	1,708,712.024	497,235.901	26.873	
T-16	1,709,113.730	497,582.109	28.882	
T-17	1,709,405.603	497,811.864	28.874	
T-18	1,709,594.615	498,010.441	29.779	
T-19	1,709,784.151	498,252.284	30.803	
T-20	1,710,005.112	498,263.122	30.560	
T-21	1,710,312.116	498,622.485	31.125	
T-22	1,710,565.810	498,702.707	30.008	
T-23	1,710,812.097	498,879.255	31.231	
T-24	1,711,258.554	499,111.169	31.156	
T-25	1,711,382.787	499,215.210	30.671	
T-26	1,711,497.776	499,088.057	31.048	
T-27	1,711,921.739	499,233.113	32.252	

TABLE OF TRAVERSE STATION POINTS				
POLYGON POINT	COORDINATES		ELEV.	
	NORTHING	EASTING		
T9	1,712,273.907	499,348.863	32.889	
T10	1,712,426.453	499,228.114	31.587	
T11	1,712,945.026	499,366.723	31.508	
T12	1,713,152.194	499,229.016	32.291	
T13	1,713,350.716	499,234.593	32.273	
T1	1,714,114.133	499,323.114	34.149	
T2=BM28	1,715,321.864	499,037.069	34.467	
T3	1,715,556.979	498,787.732	33.774	
T4	1,715,613.303	498,602.331	33.846	
T6	1,716,185.924	498,423.235	32.543	
T7	1,716,296.557	498,393.392	32.834	
T8	1,716,587.270	498,183.256	31.879	
T9=STA 2	1,716,668.328	498,048.549	31.202	
T10	1,717,063.858	497,743.553	30.319	
T11	1,717,142.345	497,687.576	29.731	
T12	1,717,194.108	497,657.056	29.770	
T13	1,717,249.207	497,618.454	29.818	
T14=BH6	1,717,292.610	497,589.139	29.351	
T15	1,717,492.542	497,567.432	31.652	
T16	1,717,568.385	497,485.342	31.682	
T17	1,717,532.758	497,327.722	31.782	
T18	1,717,656.358	497,304.011	32.472	
T19	1,717,849.166	497,294.912	32.957	
T20	1,717,977.354	497,061.014	35.155	
T22=BM34	1,718,360.331	496,980.373	35.518	
T1	1,718,871.960	496,509.328	38.125	

TABLE OF TRAVERSE STATION POINTS				
POLYGON POINT	COORDINATES		ELEV.	
	NORTHING	EASTING		
T2	1,718,982.811	496,484.723	37.303	
T3	1,719,054.242	496,476.454	38.039	
T4	1,719,293.514	496,344.148	37.628	
T5	1,719,371.611	496,212.892	36.581	
T6	1,719,441.686	496,095.508	36.377	
T7	1,719,634.286	496,119.715	36.135	
T8	1,719,568.716	496,246.851	36.718	
T9	1,719,673.577	496,284.730	36.732	
T10	1,719,757.867	496,199.702	36.226	
T11	1,719,963.319	496,252.503	36.847	
T12	1,720,028.618	496,233.536	37.259	
T13	1,720,896.498	495,657.578	35.285	
T 1	1,722,152.496	495,368.651	40.547	
T 2	1,722,462.939	495,042.525	38.470	
T 3	1,722,757.770	494,860.054	37.788	
T 4	1,723,072.308	494,893.817	39.520	
T 5	1,723,722.544	494,191.279	39.407	
T 6	1,724,530.996	493,726.864	41.610	
T 7	1,725,684.133	493,486.477	43.192	
T 8	1,725,684.133	493,279.741	41.739	
T 9	1,726,312.522	493,216.325	42.257	
T10	1,726,804.440	492,931.296	42.526	
T11	1,727,019.693	492,394.752	43.547	
T12	1,727,173.457	492,109.850	44.051	
T13	1,727,252.558	491,953.012	45.106	
T14	1,727,099.751	491,908.990	44.528	

TABLE OF TRAVERSE STATION POINTS				
POLYGON POINT	COORDINATES		ELEV.	
	NORTHING	EASTING		
T15	1,727,194.658	491,558.623	42.159	
T16	1,727,379.509	491,385.263	41.621	
T17	1,727,406.036	491,287.074	44.865	
T18	1,727,520.276	490,382.906	44.649	
T19	1,727,612.787	490,382.069	43.759	
T20	1,717,856.318	489,865.741	42.999	
T1A	1,700,708.664	493,470.328	21.763	
T2A	1,699,872.437	493,429.951	21.248	
T3A	1,700,225.955	493,971.425	21.778	
T4A	1,701,172.767	494,669.142	22.334	
T5A	1,701,480.491	494,751.888	21.417	
T6A	1,702,058.314	494,809.178	23.519	
T7A	1,703,307.889	494,952.040	23.664	
T8A	1,703,499.259	495,470.551	23.820	
T9A	1,703,804.341	495,051.975	24.100	
T10A	1,704,643.472	495,403.742	25.612	
T11A	1,705,012.234	495,771.089	26.653	
A3-1	1,709,604.105	498,057.325	30.283	
A3-2	1,709,258.422	497,255.095	27.497	
A3-3	1,709,521.785	496,792.013	27.906	
A3-4	1,710,182.293	496,102.911	28.914	
A3-5	1,710,393.491	495,956.847	28.810	
A3-6	1,710,571.283	495,803.951	27.141	
A3-7	1,710,701.618	495,743.236	27.081	

 JAPAN INTERNATIONAL COOPERATION AGENCY		 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 : 1:40,000 FULL SIZE A1		SHEET CONTENTS : HORIZONTAL AND VERTICAL CONTROL MONUMENTS Sheet 1 of 2		SHEET NO. : GC-08				
DESIGNED	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE	SIGNATURE	DATE			
CHECKED	10/17/02	<i>[Signature]</i>	10/17/02	<i>[Signature]</i>	10/17/02	<i>[Signature]</i>	10/17/02	<i>[Signature]</i>	10/17/02	<i>[Signature]</i>	10/17/02			
SUBMITTED	10/19/02	<i>[Signature]</i>	10/19/02	<i>[Signature]</i>	10/19/02	<i>[Signature]</i>	10/19/02	<i>[Signature]</i>	10/19/02	<i>[Signature]</i>	10/19/02			
PHL - PMO Submitted By: DANILO C. TRAJANO Project Director			BUREAU OF DESIGN Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division			OFFICE OF THE SECRETARY Recommended By: GILBERTO S. REYES OIC, Director IV			Approved By: MANUEL M. BONJAN Undersecretary			Approved By: SIMON A. DATUMANONG Secretary		

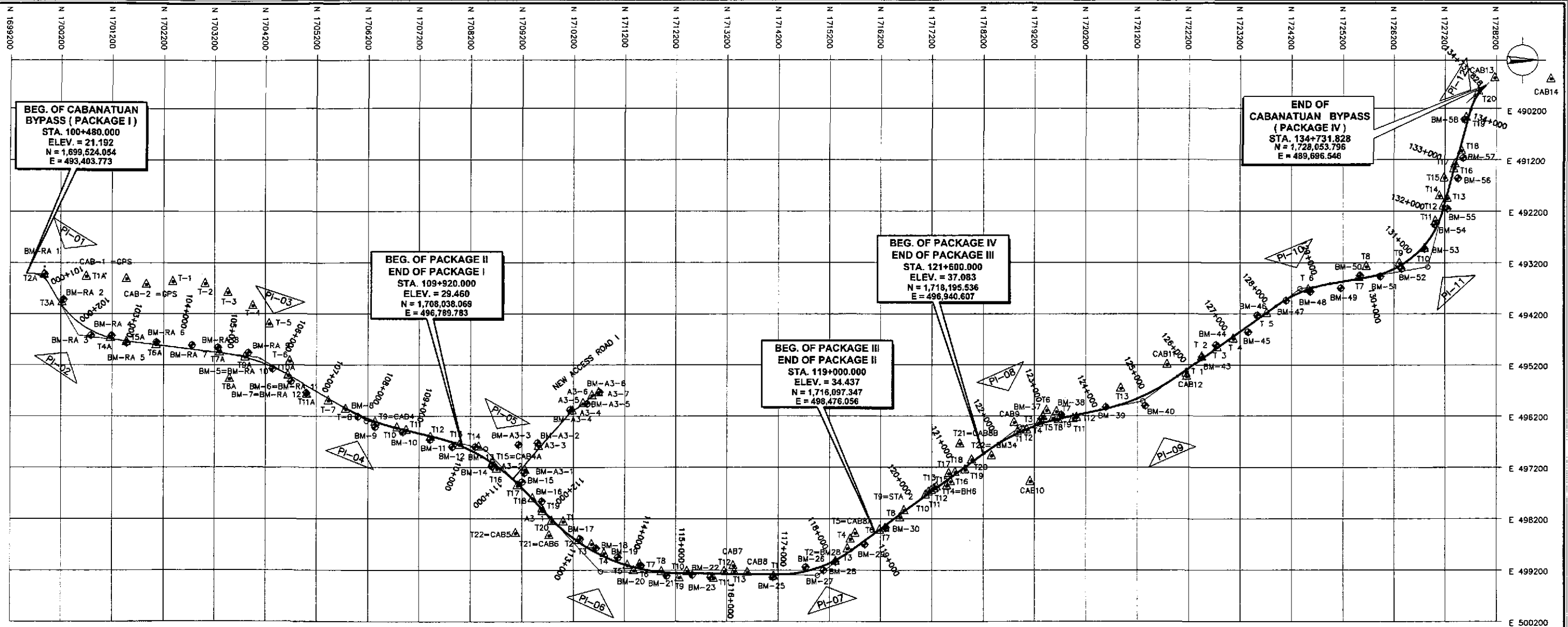


TABLE OF HORIZONTAL AND VERTICAL CONTROL				
POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-RA 1	1,699,880.470	493,418.310	21.773	It is located on the left side of the national highway going north at the beginning of the bypass re-alignment under an acacia tree near the steel fence corner of a building in San Leonardo.
BM-RA 2	1,700,254.842	493,913.436	21.932	It is located on the left side of the road alignment placed on the side of a road (dirt) 1.50 m. from its centerline and approximately 3 m. away from the top bank of an irrigation canal beside an acacia tree.
BM-RA 3	1,700,792.820	494,617.824	22.451	It is located on the right side of the bypass alignment placed on top of a rice paddy intersection in the middle of a ricefield.
BM-RA 4	1,701,192.044	494,624.849	22.645	It is located on the left side of the alignment placed on the top bank of a fishpond underneath two acacia trees in Brgy. Tagumpuy, San Leonardo.
BM-RA 5	1,701,481.927	494,751.231	21.587	It is located on the left side of the alignment placed in the middle of a ricefield beside a nipa hut in Brgy. Tagumpuy, San Leonardo.
BM-RA 6	1,702,062.482	494,751.856	22.910	It is located on the right side of the road alignment placed on the side of a road 2 m. from its centerline beside an electric post in Brgy. Tagumpuy, San Leonardo.
BM-RA 7	1,702,761.108	494,810.381	22.874	It is located on the right side of the road alignment placed on the top bank of a creek 3.50 m. from its centerline and under a durian tree in Brgy. Tagumpuy, San Leonardo.
BM-RA 8	1,703,271.287	494,855.750	23.741	It is located on the left side of the alignment placed on the side of a road (grove) 2 m. away from the centerline and 4 m. from the top bank of an irrigation canal in Brgy. Tabuquina, Sta. Rosa.
BM-RA 9	1,703,867.668	494,900.590	23.977	It is located on the left side of the alignment placed on the side of a road 1.70 m. away from the centerline.
BM-5	1,704,562.828	495,238.110	25.505	It is located on the left side of the alignment placed on the side of a dirt road 1.50 m. away from its centerline and 50 cm. from the toe of an irrigation canal.
BM-6	1,704,703.014	495,521.310	25.723	It is located on the left side of the alignment placed on top of a rice paddy intersection in the middle of a ricefield in Brgy. Tagumpuy, Sta. Rosa.
BM-7	1,705,058.152	495,590.387	27.032	It is located on the right side of the alignment placed on top of a check gate of an irrigation canal in Brgy. Soledad, Sta. Rosa.
BM-8	1,705,401.638	496,021.555	26.111	It is located on the right side of the alignment placed on top of a rice paddy intersection in the middle of a ricefield in Brgy. Soledad, Sta. Rosa.
BM-9	1,706,337.897	496,411.792	27.188	It is located on the right side of the alignment placed on the side of the concrete road 5 m. away from its centerline in Brgy. Soledad, Sta. Rosa.
BM-10	1,706,881.482	496,511.250	26.538	It is located on the right side of the alignment placed on the intersection of a rice paddy in the middle of a ricefield in Brgy. Soledad, Sta. Rosa.
BM-11	1,707,413.404	496,659.842	27.220	It is located on the right side of the road alignment placed on the top bank of irrigation canal 1.20 m. from its centerline under the shade of an acacia tree in Brgy. Soledad, Sta. Rosa.
BM-12	1,707,844.454	496,802.502	27.148	It is located on the right side of the alignment placed on the side of a ricefield owned by Mr. Ajejo Villora in Brgy. Loapas, Sta. Rosa.
BM-13	1,708,291.751	496,799.903	26.656	It is located on the right side of the alignment placed on the side of a ricefield under a phoenix tree in Brgy. Loapas, Sta. Rosa.
BM-14	1,708,620.284	497,180.515	28.714	It is located on the right side of the road alignment placed on the top bank of irrigation canal 1.50 m. from its centerline and 3 m. away the side of a road in Brgy. Loapas, Sta. Rosa.
BM-15	1,709,200.415	497,484.887	28.668	It is located on the right side of the alignment placed on the side of a dirt road 1.50 m. away from the centerline of Brgy. Sta. Arcadia, Cabanatuan City.
BM-16	1,709,584.212	497,862.962	28.930	It is located on the right side of the alignment placed on the side of a dirt road 1.50 m. away from the centerline of Brgy. Sta. Arcadia, Cabanatuan City.
BM-17	1,710,336.115	498,592.843	31.009	It is located on the right side of the alignment placed on the side of road (grove) 1.80 m. away from its centerline in Brgy. Sta. Arcadia.
BM-18	1,710,649.187	498,773.128	30.565	It is located on the left side of the alignment placed on the intersection of rice paddy in the middle of a ricefield in the side of Brgy. Valle Cruz.
BM-19	1,711,076.165	498,651.553	31.218	It is located on the left side of the alignment placed on the side of a ricefield underneath two mango trees in Brgy. Valle Cruz.

TABLE OF HORIZONTAL AND VERTICAL CONTROL				
POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-20	1,711,512.317	499,109.688	31.389	It is located on the left side of the alignment placed on a rice paddy intersection in the middle of a ricefield in Brgy. Valle Cruz.
BM-21	1,712,021.897	499,309.940	32.857	It is located on the left side of the alignment placed on the side of a road 1.80 m. away from its centerline and almost 3.50 m. away from the top bank of an irrigation canal in Brgy. Valle Cruz at the side of an elec. post.
BM-22	1,712,529.312	499,291.424	32.692	It is located on the right side of the alignment placed on the higher portion on the side of a dirt road 4 m. away from its centerline in Brgy. Valle Cruz.
BM-23	1,712,881.106	499,335.652	32.766	It is located on the right side of the alignment placed on a bank of a creek approximately 3 m. away from its top bank in Brgy. San Isidro, Cabanatuan City.
BM-25	1,714,097.795	499,338.845	34.013	It is located on the right side of the alignment placed on the side of a road (dirt) 1.50 m. away from its centerline and approximately 3 m. from the top bank of an irrigation canal in Brgy. San Isidro.
BM-26	1,714,739.668	499,138.544	33.408	It is located on the left side of the alignment placed on the side of a road intersection 2 m. away from its centerline adjacent to a subdivision known as Grand Victoria Estate, Brgy. Cruz Raja.
BM-27	1,715,085.051	499,202.403	33.926	It is located on the right side of the alignment placed on the intersection of a rice paddy in the middle of a ricefield in Brgy. Cruz Raja.
BM-28	1,715,321.664	499,037.069	34.487	It is located on the right side of the alignment placed on the side of the barangay road 2 m. away from its centerline at Brgy. Cruz Raja at the side of an electric post.
BM-29	1,715,891.768	498,699.776	34.622	It is located on the right side of the alignment placed on the side of a barangay road under an acacia tree 1.50 m. away from its centerline Brgy. Cruz Raja.
BM-30	1,716,304.852	498,373.638	32.793	It is located on the right side of the alignment placed on the uppermost top bank of a canal at the side of a nipa hut in Brgy. Obispo, Cabanatuan City.
BM-34	1,718,360.331	496,980.373	35.518	It is located on the right side of the alignment placed on the side of a dirt road 1.50 m. away from its centerline in Brgy. Soledad, Cabanatuan City.
BM-36	-	-	37.133	It is located on the left side of the alignment placed underneath a mango tree in the middle of a vegetable plantation of Brgy. Pula, Cabanatuan City.
BM-37	1,719,342.545	496,251.677	37.437	It is located on the left side of the alignment placed on the side of a ricefield underneath a mango tree near a house at Brgy. Pula, Cabanatuan City.
BM-38	1,719,727.496	496,175.032	36.238	It is located on the left side of the alignment placed on the side of a dirt road 1.50 m. away from its centerline and about 1/2 m. away from an irrigation canal's top bank in Brgy. Pula, Cabanatuan City.
BM-39	1,720,598.956	496,023.421	36.396	It is located on the left side of the alignment placed on the intersection of a rice paddy in the middle of a ricefield at Brgy. Pula, Cabanatuan City.
BM-40	1,721,353.720	495,998.525	36.993	It is located on the right side of the alignment placed underneath a group of coconut tree in the middle of a ricefield at Brgy. Hinasang, Talavera.
BM-43	1,722,462.948	495,042.546	38.534	It is located on the right side of the alignment placed on the side of a dirt road 2 m. away from its centerline beside a concrete poles with marking: BM-43-1-8.
BM-44	1,722,735.654	494,806.172	38.406	It is located on the right side of the alignment placed on the side of a dirt road intersection 1.50 m. away from its centerline beside a barangay sideboard Brgy. Paludod, Talavera.
BM-45	1,723,356.627	494,554.149	40.327	It is located on the right side of the alignment placed on the side of a dirt road 1.50 m. away from its centerline beside a mango tree at Brgy. Paludod, Talavera.
BM-46	1,723,535.448	494,225.815	39.229	It is located on the left side of the alignment placed on the side of a road 2 m. away from its centerline beside a camachile tree.
BM-47	1,724,094.093	493,940.197	39.500	It is located on the right side of the alignment placed on the intersection of a rice paddy in the middle of a ricefield and about 50 m. away from the top bank of a creek at Brgy. Dimagsana, Sur. Talavera.
BM-48	1,724,585.996	493,762.388	42.048	It is located on the right side of the alignment placed on the side of a dirt road 2 m. away from its centerline and 4 m. away from the top bank of an irrigation canal, Brgy. Dimagsana, Sur. Talavera.
BM-49	1,725,157.180	493,693.948	42.110	It is located on the right side of the alignment placed on the side of a road 5 m. away from its centerline and 1 m. away from a canal, Brgy. Gulod, Talavera.
BM-50	1,725,535.580	493,447.698	43.895	It is located on the left side of the alignment placed on the side of a road 8 m. away from its centerline beside an electric post, Brgy. Gulod, Talavera.

TABLE OF HORIZONTAL AND VERTICAL CONTROL				
POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-51	1,725,936.648	493,468.459	43.274	It is located on the right side of the alignment placed at the intersection of a rice paddy in the middle of a ricefield 150 m. away from the centerline of a concrete barangay road, Brgy. Gulod, Talavera.
BM-52	1,726,352.052	493,319.807	43.317	It is located on the right side of the alignment placed at the side of a dirt road 1.5 m. away from the centerline of the dirt road at Brgy. Bantug Hacienda, Talavera.
BM-53	1,726,804.440	492,931.296	42.900	It is located on the right side of the alignment placed in the middle of a ricefield at the side of a well placed in the rice paddy intersection.
BM-54	1,727,002.842	492,456.434	43.790	It is located on the left side of the alignment 3 m. away from the dirt road centerline and 6 m. away from the toe of an irrigation canal beneath a camachile tree.
BM-55	1,727,251.355	492,153.048	44.219	It is located on the right side of the alignment near the corner of concrete wall/fence. It is 3 m. away from the centerline of an existing road 5 m. wide at Brgy. Campos, Talavera.
BM-56	1,727,456.793	491,560.117	42.069	It is located on the left side of the alignment 70 m. away underneath a mango tree.
BM-57	1,727,557.279	491,163.464	45.294	It is located on the right side of the alignment placed on the toe of a ricefield near the side of a road under a coconut tree in Brgy. Lambay, Talavera.
BM-58	1,727,578.123	490,416.550	43.530	It is located on the right side of the alignment placed on the side of a ricefield under a row of coconut trees in Brgy. Lambay, Talavera.

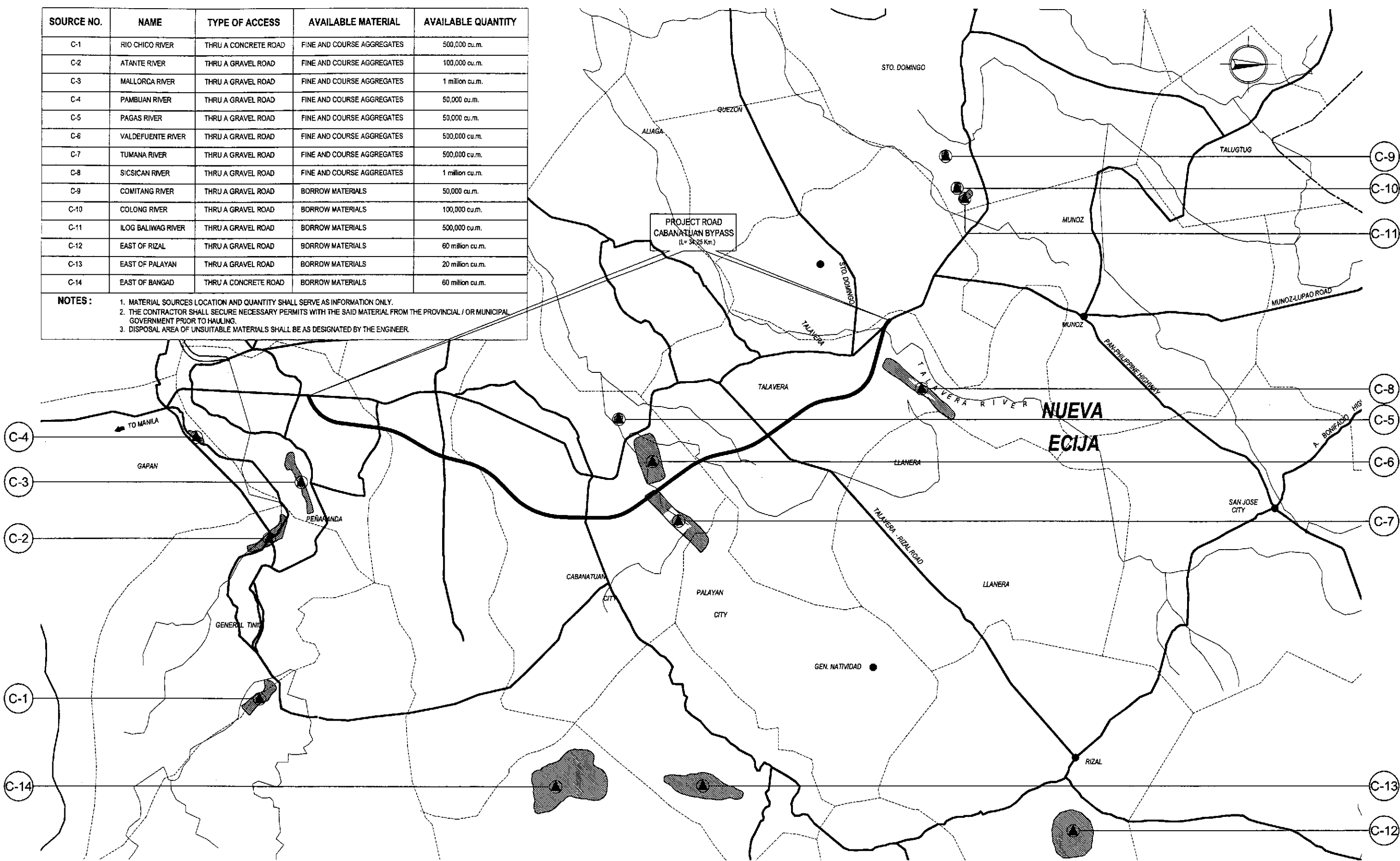
NEW ACCESS ROAD 1 - TABLE OF HORIZONTAL AND VERTICAL CONTROL				
POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-A3-1	1,709,244.996	497,307.583	27.574	It is located on the right side of the access road placed on the side of the access road 50 m. away from its centerline between 2 coconut trees along extg. farm road in Brgy. Sta. Arcadia, Cabanatuan City.
BM-A3-2	1,709,500.218	496,724.144	26.740	It is located on the left side of the access road placed on the side of a narra tree 5 m. away from existing irrigation road near a house in Brgy. Sta. Arcadia, Cabanatuan City.
BM-A3-3	1,709,133.419	496,759.539	26.389	It is located on the right side of the access road placed on the top bank of an irrigation canal beside an irrigation canal and 40 m. away from its centerline in Brgy. Sta. Arcadia, Cabanatuan City.
BM-A3-4	1,710,136.779	496,074.308	26.388	It is located on the left side of the access road alignment beside an acacia tree placed on the side of a dirt road 4 m. away from its centerline in Brgy. Arcadia, Cabanatuan City.
BM-A3-5	1,710,471.747	495,959.612	26.096	It is located on the right side of the access road alignment placed on the intersection of a rice paddy near a barbed wire fence 30 m. away from the centerline of a dirt road in Brgy.
BM-A3-6	1,710,716.368	495,728.826	28.695	It is located on the right side of the road alignment near Boto bridge on its gutter 15 m. away from its 1st approach in Brgy.

		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 (Pardiel, Cabanatuan and San Jose Bypasses)	SCALE : 1:40,000 FULL SIZE A1	SHEET CONTENTS : HORIZONTAL AND VERTICAL CONTROL MONUMENTS Sheet 2 of 2	SHEET NO. : GC-09
DESIGNED : 10/10/02 CHECKED : 10/17/02 SUBMITTED : 10/19/02	DATE : SIGNATURE : TEAM LEADER	PJHL - PMO Submitted By: DANIL C. TRAJANO Project Director	BUREAU OF DESIGN Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	OFFICE OF THE SECRETARY Recommended By: GILBERTO S. REYES OC, Director IV	Recommended By: MANUEL M. BONDAN Undersecretary	Approved By: SIMEDN A. DATUMANONG Secretary			

SOURCE NO.	NAME	TYPE OF ACCESS	AVAILABLE MATERIAL	AVAILABLE QUANTITY
C-1	RIO CHICO RIVER	THRU A CONCRETE ROAD	FINE AND COURSE AGGREGATES	500,000 cu.m.
C-2	ATANTE RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	100,000 cu.m.
C-3	MALLORCA RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	1 million cu.m.
C-4	PAMBUAN RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	50,000 cu.m.
C-5	PAGAS RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	50,000 cu.m.
C-6	VALDEFUENTE RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	500,000 cu.m.
C-7	TUMANA RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	500,000 cu.m.
C-8	SICSIKAN RIVER	THRU A GRAVEL ROAD	FINE AND COURSE AGGREGATES	1 million cu.m.
C-9	COMITANG RIVER	THRU A GRAVEL ROAD	BORROW MATERIALS	50,000 cu.m.
C-10	COLONG RIVER	THRU A GRAVEL ROAD	BORROW MATERIALS	100,000 cu.m.
C-11	ILOG BALIWAG RIVER	THRU A GRAVEL ROAD	BORROW MATERIALS	500,000 cu.m.
C-12	EAST OF RIZAL	THRU A GRAVEL ROAD	BORROW MATERIALS	60 million cu.m.
C-13	EAST OF PALAYAN	THRU A GRAVEL ROAD	BORROW MATERIALS	20 million cu.m.
C-14	EAST OF BANGAD	THRU A CONCRETE ROAD	BORROW MATERIALS	60 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
GC-08 SCALE AS SHOWN

	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) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE :	SHEET CONTENTS : LOCATION OF MATERIAL SOURCES	SHEET NO. : GC-10	
	CHECKED	10/17/02	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:		Approved By:			1:80,000
	SUBMITTED	10/19/02	<i>[Signature]</i>		DANILO C. TRAJANO Project Director	JOSEFINA M. ALACAR Chief, Highways Division	GILBERTO S. REYES O/C, Director IV		MANUEL M. BONDAN Undersecretary			SIMEON A. DATUMANONG Secretary

SUMMARY OF QUANTITIES (INITIAL STAGE)

ITEM NO.	DESCRIPTION	QUANTITY(BRIDGE)					QUANTITY BRIDGE # 10	TOTAL QUANTITY	REMARKS
		UNIT	BYPASS	RCBC	A-21	A-21a			
PART C - EARTHWORKS									
100(1)	Clearing and Grubbing	ha	5.58	-	-	-	-	6.00	-
100(3)	Individual removal of trees, small (150mm<D<900mm)	each	44.00	-	-	-	-	44.00	-
100(4)	Individual removal of trees, large (D>900mm)	each	6.00	-	-	-	-	6.00	-
101(1)	Removal of Existing Structures and Obstructions	L.S.	1.00	-	-	-	-	1.00	-
101(3)a	Removal of Existing PCC Pavement	m2	-	-	840.00	-	-	840.00	-
102(1)	Unsuitable Excavation	m3	7,847.51	-	-	-	-	7,848.00	-
103(1)	Structure Excavation	m3	178.50	164.95	2.54	-	1,257.00	1,604.00	-
103(2)a	Bridge Excavation above OWL (Common Soil)	m3	-	-	-	-	5,522.71	5,523.00	-
103(2)c	Bridge Excavation below OWL (Common Soil)	m3	-	-	-	-	9,845.98	9,846.00	-
103(3)a	Gravel Foundation Fill	m3	21.38	14.75	-	-	-	37.00	-
103(6)	Pipe Culverts and Drain Excavation	m3	794.00	-	26.00	-	-	820.00	-
103(7)	Granular Backfill for Pipe Culvert	m3	437.00	-	14.14	-	-	452.00	-
104(1)	Embankment from Roadway Excavation	m3	50.04	-	435.36	5.48	-	495.00	-
104(3)	Embankment from Borrow Pit	m3	98,083.63	-	44.48	228.85	829.74	98,197.00	-
104(4)	Embankment from Borrow (Selected Granular Material) for Bridge	m3	-	-	-	-	597.34	598.00	-
105(1)	Subgrade Preparation (Common Soil)	m2	427.80	-	1,232.75	10.53	-	1,672.00	-
PART D - BASE AND SUBBASE COURSE									
200(1)	Aggregate Subbase Course	m3	5,308.52	-	362.38	-	25.76	5,697.00	-
201(1)	Aggregate Base Course	m3	1,911.46	-	-	-	-	1,912.00	-
PART E - SURFACE COURSES									
300(1)	Gravel Surface Course	m3	990.30	-	-	39.17	-	1,030.00	-
310(2)	Asphalt Mixture Wearing Course (t=50mm) for bridge pavement, including tack coat	m2	-	-	-	-	9,281.25	9,282.00	-
SPL 310(3)	Waterproofing Layer for Pampanga Deck Slab	m2	-	-	-	-	4,826.25	4,827.00	-
311(1)b	PCC Pavement (Plain), t=250mm	m2	21,745.36	-	-	-	-	21,746.00	-
311(1)c	PCC Pavement (Plain), t=230mm	m2	-	-	1,049.86	-	-	1,050.00	-
311(2)	PCC Pavement (Reinforced) t=300mm Approach Slab	m2	-	-	-	-	91.04	92.00	-
PART F - BRIDGE CONSTRUCTION									
400(16)a	Cast-in-place Concrete Bored Piles Ø 1000mm	m	-	-	-	-	320.00	320.00	-
400(16)b	Cast-in-place Concrete Bored Piles Ø 1200mm	m	-	-	-	-	1,626.00	1,626.00	-
400(16)c	Cast-in-place Concrete Bored Piles Ø 1500mm	m	-	-	-	-	1,512.00	1,512.00	-
400(21)	Static Pile Load Test for Ø 1500mm Bored Piles	each	-	-	-	-	2.00	2.00	-
SPL 400(23)a	High Strain Dynamic Pile Test for Ø 1000mm Bored Piles	each	-	-	-	-	1.00	1.00	-
SPL 400(23)b	High Strain Dynamic Pile Test for Ø 1200mm Bored Piles	each	-	-	-	-	2.00	2.00	-
SPL 400(24)	Pile Integrity Test for Bored Piles of various diameter	each	-	-	-	-	66.00	66.00	-
401(2)a	Steel Railing Type A for (Angat and Talavera Bridge, and Approach of Pampanga Bridge)	m	-	-	-	-	1,080.00	1,080.00	-
401(2)b	Steel Railing Type B for Pampanga Main Bridge	m	-	-	-	-	1,170.00	1,170.00	-
SPL 401(3)a	Bridge Name Plate, 1000 x 600mm for Pampanga Bridge	each	-	-	-	-	2.00	2.00	-
403(3)	Structural Steel for Pampanga River Bridge, furnished and fabricated	kg	-	-	-	-	1,707,861.88	1,707,862.00	-
403(5)	Structural Steel for Pampanga River Bridge, erected	kg	-	-	-	-	1,707,861.88	1,707,862.00	-
403(8)a	Bearing Shoe for Steel Plate Girder Type 1 (870x870x296mm) in Pampanga Bridge	each	-	-	-	-	8.00	8.00	-
403(8)b	Bearing Shoe for Steel Plate Girder Type 2 (1000x1000x229.60mm) in Pampanga Bridge	each	-	-	-	-	8.00	8.00	-
403(8)c	Bearing Shoe for Steel Plate Girder Type 3 (1000x1000x229.60mm) in Pampanga Bridge	each	-	-	-	-	6.00	6.00	-
404(1)	Reinforcing Steel (Grade 40)	kg	766.56	11,091.33	214.20	-	396,708.89	408,780.00	-
404(2)	Reinforcing Steel (Grade 60)	kg	24,338.00	-	-	-	1,378,074.77	1,402,463.00	-
405(1)a	Structural Concrete Class A (f'c=21MPa, max. aggregate 38mm) for heavily reinforced structures	m3	581.39	95.14	4.76	-	63.65	745.00	-
405(1)c	Structural Concrete Class AA1 (f'c=28MPa, max. aggregate 25) for long bridge substructures	m3	-	-	-	-	8,640.77	8,641.00	-
405(1)f	Structural Concrete Class AA2 (f'c=28MPa, max. aggregate 20mm) for long bridge superstructures	m3	-	-	-	-	1,543.35	1,544.00	-
405(2)	Structural Concrete Class B (f'c=17MPa, max. aggregate 50mm) for plain or lightly reinforced structures	m3	162.00	-	5.45	-	16.50	184.00	-
405(3)	Structural Concrete Class C (f'c=21MPa, max. aggregate 12mm) for thin reinforced members	m3	-	-	-	-	822.29	823.00	-
405(6)	Lean Concrete (f'c=17MPa, max. aggregate 38mm)	m3	10.68	7.38	-	-	203.03	222.00	-
406(1)g	Precast Prestressed Structural Concrete Member (AASHTO Girder Type V L=29.4m)	each	-	-	-	-	48.00	48.00	-
406(1)h	Precast Prestressed Structural Concrete Member (AASHTO Girder Type V L=29.55m)	each	-	-	-	-	24.00	24.00	-

ITEM NO.	DESCRIPTION	QUANTITY(BRIDGE)					QUANTITY BRIDGE # 10	TOTAL QUANTITY	REMARKS
		UNIT	BYPASS	RCBC	A-21	A-21a			
406(1)p	Precast Prestressed Structural Concrete (PC Deck Slab, 280 x 2000 x 9650mm)	m2	-	-	-	-	5,643.32	5,644.00	-
407(1)b	Elastomeric Bearing Pad, Duro 60 (600x300x50mm)	each	-	-	-	-	144.00	144.00	-
407(2)b	Expansion Joint, § 50mm Movement	m	-	-	-	-	20.00	20.00	-
407(2)c	Expansion Joint, § 70mm Movement	m	-	-	-	-	10.00	10.00	-
407(2)f	Expansion Joint, § 165mm Movement	m	-	-	-	-	30.00	30.00	-
SPL 407(3)a	Restraining Bar Ø 32 x 1495mm	each	-	-	-	-	12.00	12.00	-
SPL 407(3)b	Restraining Bar Ø 32 x 1900mm	each	-	-	-	-	6.00	6.00	-
SPL 407(3)c	Restraining Cable Ø 65 x 4121mm (PC 7-Ø 15)	each	-	-	-	-	8.00	8.00	-
SPL 407(3)d	Restraining Cable Ø 65 x 4224mm (PC 7-Ø 15)	each	-	-	-	-	4.00	4.00	-
407(4)	G.I. Drain Pipe Ø 150mm for Bridge Drainage	m	-	-	-	-	552.60	553.00	-
SPL 407(5)a	Pier Protection Concrete Blocks for Pampanga Bridge	m2	-	-	-	-	840.00	840.00	-
SPL 420(2)	Realignment of River/Stream	L.S.	-	-	-	-	1.00	1.00	-
SPL 420(4)a	Temporary Craneway for Pampanga Bridge Construction	m	-	-	-	-	320.00	320.00	-
SPL 420(5)a	Temporary Access Road (Causeway) for Pampanga Bridge Construction	m	-	-	-	-	880.00	880.00	-
SPL 420(5)c	Temporary Cofferdam for Pier Construction (Pampanga Bridge)	each	-	-	-	-	5.00	5.00	-
SPL 900(3)	Provisional Sum for Geotechnical Investigation	L.S.	-	-	-	-	1.00	1.00	-
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES									
500(1)c6	RCPC Extra Strength (32MPa), Ø 910mm (36")	m	163.00	-	-	-	-	163.00	-
500(1)c7	RCPC Extra Strength (32MPa), Ø 1070mm (42")	m	47.00	-	5.00	-	-	53.00	-
502(4)a1	U-shaped Concrete Ditch W=0.50m x H=0.50m	m	-	-	90.00	-	-	90.00	-
502(6)a	V-shaped Lined Ditch H=500mm, 1:1.50	m	150.00	-	-	-	-	150.00	-
502(7)a	Trapezoidal Lined Ditch B=450mm, H=500mm, 1:1.00	m	240.00	-	-	-	-	240.00	-
502(7)b	Trapezoidal Lined Ditch B=1000mm, H=500mm, 1:1.00	m	100.00	-	30.00	-	-	130.00	-
504(5)	Grouted Riprap Class A	m3	347.73	-	-	-	-	28.32	377.00
506(1)	Hand Laid Rock Apron (Loose Boulder Apron)	m3	-	-	-	-	-	48.15	49.00
507(2)b	Steel Sheet Piles (400x85x8mm), furnished & driven	m	-	-	-	-	-	1,920.00	1,920.00
508(1)	Gabions	m3	-	-	-	-	-	481.50	482.00
510(1)	Rubble Concrete Slope Protection	m3	-	-	-	-	-	239.81	240.00
PART H - MISCELLANEOUS STRUCTURES									
600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x384mm)	m	696.17	-	97.99	-	-	797.00	-
602(1)	Right-of-Way Concrete Monuments	each	98.00	-	18.00	8.00	-	124.00	-
602(2)	Maintenance Marker Posts for Drainage Structure	each	12.00	-	-	2.00	-	14.00	-
602(3)	Kilometer Posts	each	2.00	-	-	-	-	2.00	-
603(3)a	Metal Guardrails (Metal Beam) Type A (Embedded in soil)	m	1,310.00	-	-	-	-	1,310.00	-
605(1)a	Warning Signs (Triangular 900mm)	each	4.00	-	-	-	-	4.00	-
605(2)c	Regulatory Signs (Circular Ø 800mm)	each	4.00	-	2.00	-	-	6.00	-
605(2)d	Regulatory Signs (Rectangular 450x750mm)	each	2.00	-	-	-	-	2.00	-
605(3)c	Informatory Signs (Type B, double post)	each	-	-	1.00	-	-	1.00	-
605(3)d	Informatory Signs (Type C, double post)	each	2.00	-	1.00	-	-	3.00	-
607(2)b	ReflectORIZED Pavement Studs (Raised Profile Type, two faces reflective)	each	10.00	-	10.00	-	-	20.00	-
607(3)	Chatter Bars (one face reflective)	each	32.00	-	32.00	-	-	64.00	-
608(1)	Furnishing and Placing Top Soil	m3	5,033.86	-	30.17	33.78	-	5,098.00	-
610(1)	Sodding	m2	25,169.31	-	301.73	337.79	-	25,809.00	-
611(1)c	Trees (Furnishing and Transplanting) High Tree (Young Tree) 1.5m < H < 3.0m	each	110.00	-	-	-	-	110.00	-
612(1)a	ReflectORIZED Thermoplastic Pavement Markings (White)	m2	800.50	-	115.50	-	-	917.00	-
612(1)b	ReflectORIZED Thermoplastic Pavement Markings (Yellow)	m2	39.71	-	-	-	-	40.00	-
SPL 620(1)b	Traffic Signal Pole Type A (Mast Arm Post H=6.0m)	each	2.00	-	-	-	-	2.00	-
SPL 620(1)c	Traffic Signal Pole Type B (Ø 114.3mm x 4.2m)	each	4.00	-	-	-	-	4.00	-
SPL 620(1)d	Traffic Signal Pole Type C (Ø 114.3mm x 3.4m)	each	4.00	-	-	-	-	4.00	-
SPL 620(1)e	Traffic Signal Pole Type D (Ø 114.3mm x 3.0m)	each	2.00	-	-	-	-	2.00	-
SPL 620(2)a	Traffic Signal Lamps Type B (3 vehicle lamps)	each	14.00	-	-	-	-	14.00	-
SPL 620(2)c	Traffic Signal Lamps Type C (2 pedestrian lamps)	each	5.00	-	-	-	-	6.00	-
SPL 620(4)a	Street Lighting Poles (Single Lamp)	each	-	-	4.00	-	-	4.00	-
SPL 620(4)b	Street Lighting Poles (Dual Lamp)	each	-	-	2.00	-	-	2.00	-
SPL 620(4)c	Bridge Lighting Poles (Single Lamp)	each	-	-	-	-	37.00	37.00	-
SPL 620(4)d	Street Lighting Service Pole with Panel	each	-	-	1.00	-	-	2.00	3.00

	DESIGNED	10/18/20			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 : FULL SIZE A1	SHEET CONTENTS : SUMMARY OF QUANTITIES (INITIAL STAGE)	SHEET NO. : GC-11
	CHECKED	10/17/20			BUREAU OF DESIGN Submitted By:	OFFICE OF THE SECRETARY Reviewed By:	Recommended By:				
	SUBMITTED	10/19/20			DANIL C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highway Division	GILBERTO S. REYES OIC, Director IV				

R O A D W A Y

GENERAL NOTES

HIGHWAY / CIVIL AND DRAINAGE

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, 1995 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
CAB-1	1,701,482.713	493,518.261	23.777	Located in Brgy. Tagumpay, San Leonardo, Nueva Ecija. It is drilled on the left side of the Tambo Bridge's first approach, about 0.05 cm. above the bridge's concrete sidewalk.
CAB-2	1,701,889.179	493,628.408	22.525	Located in Brgy. Tagumpay, San Leonardo, Nueva Ecija. It is embedded in an open space 80 m. from highway, 15 m. from dirt road going to an ostrich farm, about 40cm x 40cm & 0.05cm above the ground.
CAB-3	1,706,316.913	495,963.410	25.984	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embedded on a 40cm x 40cm conc. mon. beside an irri. canal about 8m from rd. CL & 3 km. from the highway intersec. of Fort Magsaysay & Cabanatuan City.
CAB-4	1,706,340.784	496,322.453	26.299	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embedded on a 40 cm x 40 cm conc. mon. on the left side of the rd. going to Fort Magsaysay & about 370 m. from GPS Sta. CAB-3, about 4 m from rd. CL.
CAB-4A	1,708,633.059	497,110.500	27.917	Located in Brgy. Tagpos, Sta. Rosa, Nueva Ecija on Diaz property. From the highway northbound take a right turn on Mabini extension, on Mercury Drugstore going to Brgy. Sta. Arcadia. 4.9 km. from the highway take a right turn on the intersection of the dirt road after the one-way bridge with a water pipe rail. It is 1.4 km. from the intersection beside an irrigation canal on the left side.
CAB-5	1,709,079.199	498,487.150	31.478	Located in Brgy. Sta. Arcadia, Cabanatuan, Nueva Ecija. From the highway northbound take a right turn on Mabini extension, Mercury Drugstore going to Brgy. Sta. Arcadia. 3.9 km. from the intersection highway, take a left turn to a dirt road it is embedded on the right side of the road 200 m. from the Mabini extension road centerline.
CAB-6	1,709,731.859	498,528.332	31.285	Located in Brgy. Sta. Arcadia, Cabanatuan, Nueva Ecija. From the highway northbound take a right turn on Mabini extension, Mercury Drugstore going to Brgy. Sta. Arcadia. 3.2 km. from the intersection highway, take a left turn to a dirt road it is embedded on the left side of the road near an irrigation dike 500 m. from the Mabini extension road centerline.
CAB-7	1,713,329.143	499,115.186	33.346	Located in Brgy. San Isidro, Cabanatuan, Nueva Ecija. It is embedded on the sidewalk of the DPWH 3rd Engineering District driveway, about 20 m. from the centerline of the road.
CAB-8	1,713,603.208	499,247.649	33.457	Located in Urban Poor Housing Project, San Isidro, Cabanatuan, Nueva Ecija. Going to Palayan City take a left turn to the dirt road beside the DPWH compound leading to the site of the housing project, then turn right. It is embedded on the right side of the dirt road near the electric post 400 m. from the centerline of the highway.
CAB8A	1,715,705.803	498,487.077	34.234	Located in Brgy. Raja, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway to a road before the Valdefuente bridge, 3 km. from the highway, turn left to a bridge.
CAB8B	1,717,749.623	496,746.648	34.436	Location in Brgy. Sapang, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a rt. turn on Maharlika highway after the Valdefuente br. to road going to Brgy. Sapang. It is emb. on the left side of the road.
CAB9	1,718,805.446	496,330.000	37.709	Located in Brgy. Bulliran, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway after the Valdefuente bridge to a road going to Brgy. Dalampang, 2.5 km. from the highway taking the left fork turn right at the intersection to a dirt road leading to Brgy. Balite. It is embedded near an irrigation dike 800 m. from the bridge.
CAB10	1,719,118.959	497,481.612	37.713	Located in Brgy. Dalampang, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway after the Valdefuente bridge to a road going to Brgy. Dalampang, 2.5 km. from the highway taking the left fork turn right at the intersection to a dirt road leading to Brgy. Balite. It is embedded near an irrigation dike on the right side, 1.9 km. from the bridge.
CAB11	1,721,785.046	495,194.942	39.469	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpanaan intersection to the highway going to Pantabangan, 4.3 km. from the intersection turn right to a dirt road. It is embedded on the right beside an irrigation canal 70 m. from the centerline of the highway.
CAB12	1,722,163.770	495,433.939	37.949	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpanaan intersection to the highway going to Pantabangan, 4.8 km. from the intersection on the right side 50 m. from the centerline of the highway.
CAB13	1,718,173.662	489,601.903	44.230	Located in Brgy. San Pascual, Talavera, Nueva Ecija. It is embedded on the right side of the bridge 2.3 km. from San Pascual market going to San Jose.
CAB14	1,729,259.352	489,626.465	43.627	Located in Brgy. Bagong Silang, Talavera, Nueva Ecija. Take a right turn 3.4 km. from San Pascual market going to San Jose to a dirt road. It is embedded on a rice paddy dike on the right side of the road 500 m. from the highway.

- 2.2 VERTICAL CONTROL IS REFERRED TO BM DEJ-7 ESTABLISHED BY THE CAB'S WITH ELEVATION 46.695m. ABOVE MEAN SEA LEVEL, LOCATED IN THE BARRIO OF CABU, CABANATUAN CITY, IN THE PROVINCE OF NUEVA ECIA, ALONG THE ROAD TO LAUR. IT IS A DRILLED HOLE ON THE NORTH SIDE OF THE BRIDGE FROM THE SW ENTRANCE OF THE ROAD. STATION MARK IS A BRASS ROD ABOUT 1 CM. DIA. SET IN A DRILLED HOLE MARKED DEJ-7 1982.

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 CABANATUAN BYPASS
- FLOODING OCCURENCE ALONG PAN-PHIL. HIGHWAY FROM KM POST 102 TO KM POST 104. (LEFT SIDE, KM 100+480 TO KM 102+000)
 - NATIONAL POWER CORPORATION TRANSMISSION TOWER (NEAR BEG. AND END OF BYPASS)
 - EXISTING LANDFILL AREA (LEFT SIDE, KM 115+700 CENTERLINE)
- 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 FLOOD LEVEL, 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 POST STATION ALONG THE PAN-PHILIPPINE HIGHWAY WHICH IS KM.100 NEAR THE START OF BYPASS.
- 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 ARE TOP OF CROWN ALONG THE CENTERLINE. FINISHED GRADE AS SHOWN IN THE TYPICAL SECTION WILL BE REFERRED FROM TOP OF CROWN AND 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 OWNER, 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 DETERMINED 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 ANY CLEANING, UNBLOCKING AND/OR RE-LAYING OF EXISTING DRAINAGE STRUCTURES AS DIRECTED BY THE ENGINEER TO SUIT ACTUAL FIELD CONDITION SHALL BE UNDERTAKEN BY THE CONTRACTOR TO INSURE AN OPERATIONAL DRAINAGE SYSTEM FOR THE PROJECT, AND SHALL BE WITHOUT COMPENSATION.

12.0 ACCESSIBILITY LAW:






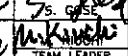
- 12.1 STRICT COMPLIANCE WITH BATAS PAMBANSA BILANG 344 AND ITS IMPLEMENTING RULES AND REGULATIONS SHALL BE IMPOSED.

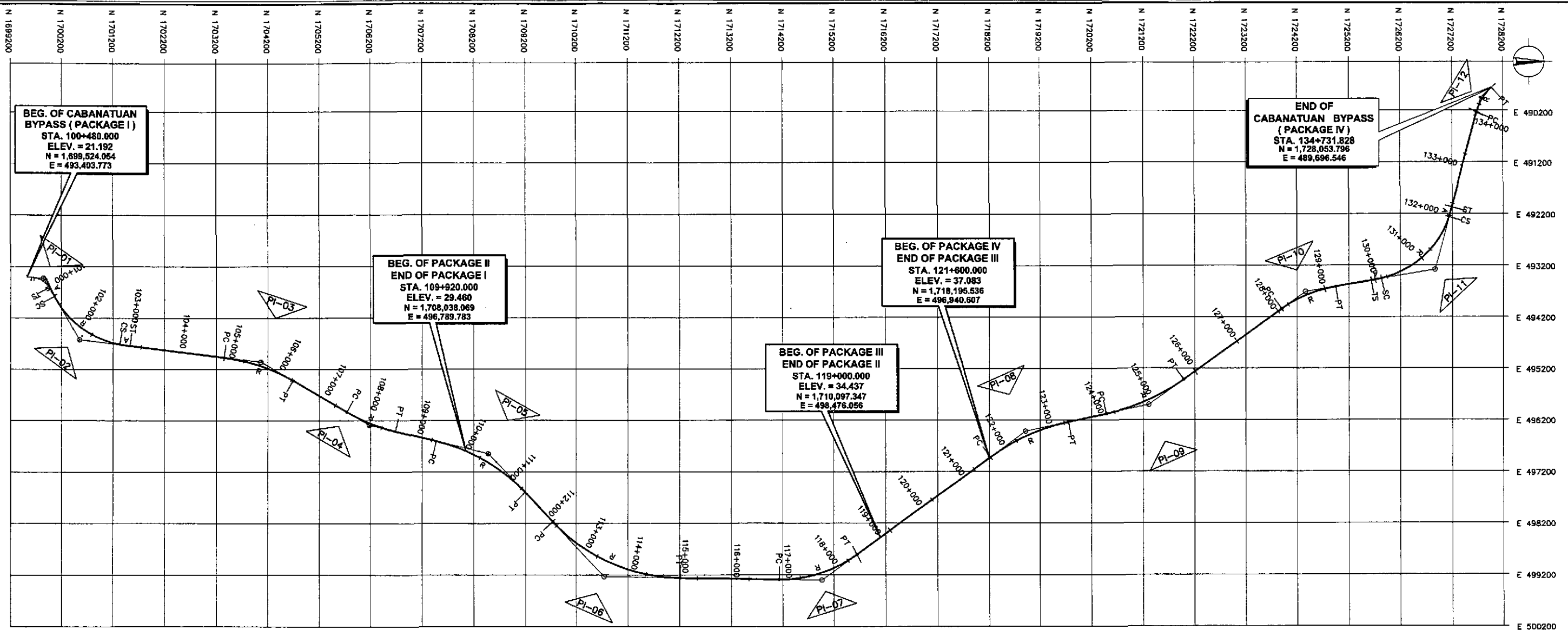
13.0 TREE PLANTING ALONG NATIONAL ROADS

- 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  YACHIYO ENGINEERING CO., LTD.	DESIGNED	DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED SUBMITTED	10/18/02 10/17/02 10/19/02	10/18/02 10/17/02 10/19/02	  S. S. G. S. M. B. B. TEAM LEADER	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	GENERAL NOTES HIGHWAY/ CIVIL AND DRAINAGE



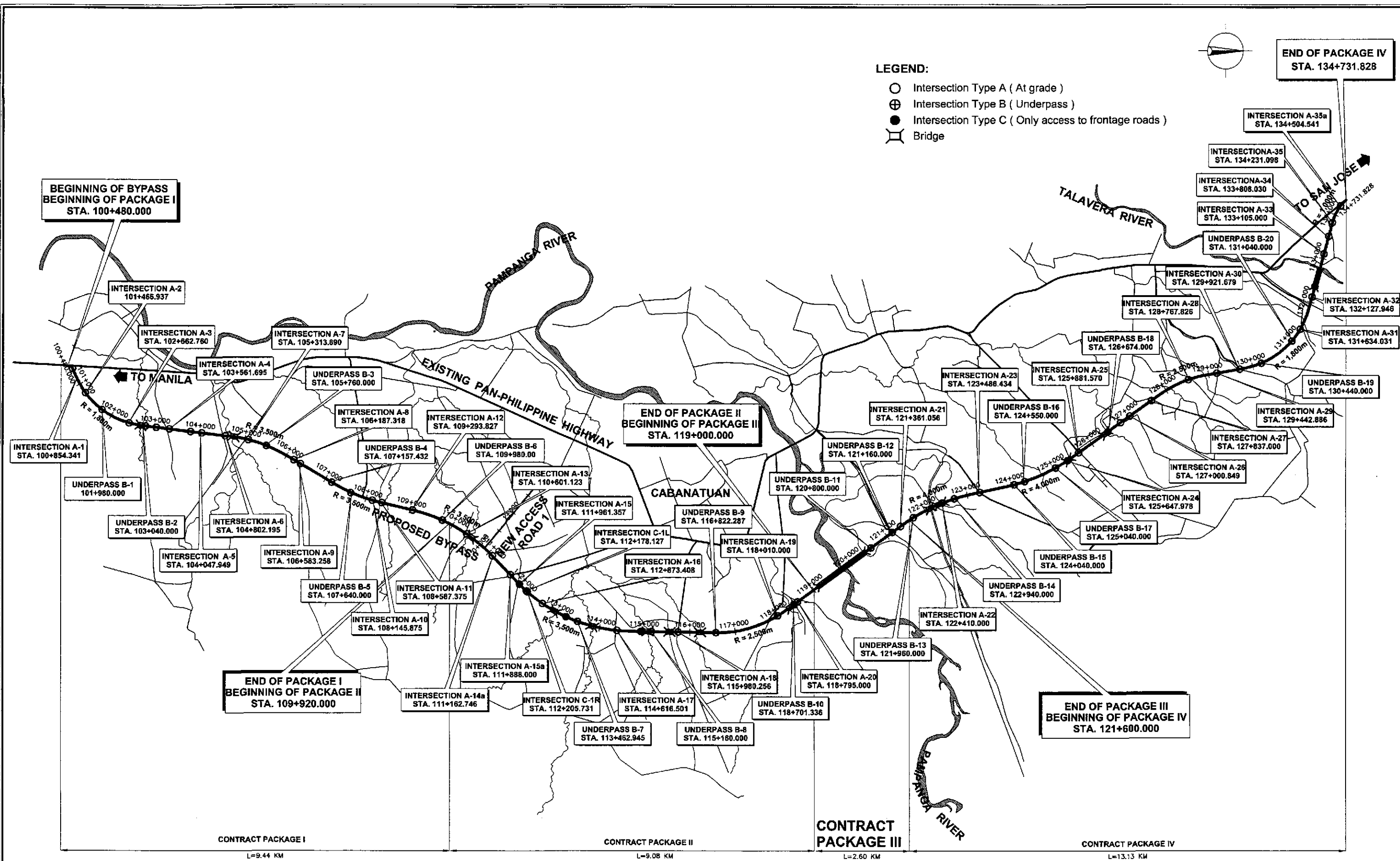
P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT Θ_B	DEFLECTION ANGLE	A R	Ls Lc	STATION
BEG.	100+480.00							
01	100+806.146	326.146	183°25'21"	246.146	56°16'36"	180.000	84.000	TS=100+560.000 SC=100+824.000 CS=100+952.886 ST=101+016.886
02	102+155.940	1,385.199	239°41'57"	4°35'01"	52°39'26"	400.000	328.886	TS=101+164.756 SC=101+364.756 CS=101+519.034 ST=102+019.034
03	105+572.571	3,544.720	187°02'31"	37°0'59"	23°15'08"	1,800.000	1,454.277	PC=104+852.462 PT=106+272.858
04	108+003.769	2,451.020	210°17'39"	720.109	18°43'34"	3,500.000	1,420.397	PC=107+489.241 PT=108+510.979
05	110+360.304	2,363.853	193°34'05"	514.528	32°57'04"	3,500.000	2,012.865	PC=109+325.183 PT=111+338.048
06	113+591.799	3,288.872	226°31'09"	1,035.121	45°33'32"	3,500.000	2,783.035	PC=112+122.011 PT=114+905.046
07	117+660.785	4,225.526	180°57'37"	1,469.788	37°09'25"	2,500.000	1,621.273	PC=116+820.490 PT=118+441.763
		4,885.881	143°48'12"	840.295		2,500.000	1,621.273	

P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT Θ_S	DEFLECTION ANGLE	A R	Ls Lc	STATION
08	122+487.349	4,885.881	143°48'12"	856.992	24°11'07"	4,000.000	1,688.459	PC=121+630.356 PT=123+318.815
09	124+909.328	2,447.505	167°59'20"	837.385	23°38'52"	4,000.000	1,650.927	PC=124+071.944 PT=125+722.871
10	128+658.998	3,773.512	144°20'28"	577.297	26°00'20"	2,500.000	1,134.704	PC=128+081.701 PT=129+216.405
11	131+189.232	2,530.124	170°20'47"	1,250.689	65°09'11"	600.000	200.000	TS=129+918.543 SC=130+118.543 CS=131+965.384 ST=132+185.384
12	134+365.149	3,450.454	105°11'37"	310°59'	32°39'23"	1,800.000	1,846.841	PC=134+072.196 PT=134+642.155
END	134+731.823	382.627	137°50'54"	292.954		1,000.000	569.960	

P.I. No.	NORTHING	EASTING	NORTHING	EASTING
BEG.	1,699,524.054	493,403.773		
01	1,699,849.619	493,423.243	TS 1,699,603.912	493,408.549
			SC 1,699,667.655	493,414.070
			CS 1,699,940.068	493,581.402
			ST 1,699,973.809	493,635.763

P.I. No.	NORTHING	EASTING	NORTHING	EASTING
02	1,700,548.505	494,619.209	TS 1,700,048.415	493,783.432
			SC 1,700,152.489	493,934.189
			CS 1,701,334.236	494,712.538
			ST 1,701,532.212	494,740.724
03	1,704,066.486	495,053.779	PC 1,703,351.810	494,965.496
			PT 1,704,688.262	495,417.031
			PC 1,705,738.544	496,030.623
04	1,706,182.811	495,290.171	PT 1,706,682.980	496,410.880
			PC 1,707,474.461	496,601.893
05	1,708,480.693	496,844.734	PT 1,709,192.973	497,595.622
			PC 1,709,732.427	498,164.670
06	1,710,743.806	499,231.154	PT 1,712,213.387	499,255.786
			PC 1,714,128.561	499,287.887
			PT 1,715,646.852	498,805.727
07	1,714,968.738	499,301.970	PC 1,718,220.033	496,922.679
			PT 1,719,749.852	496,238.234
08	1,718,911.622	496,416.576	PC 1,720,486.493	496,081.506
			PT 1,721,985.920	495,419.082
09	1,721,305.544	495,907.244	PC 1,723,902.473	494,043.979
			PT 1,724,940.649	493,610.632
			TS 1,725,632.845	493,492.891
			SC 1,725,829.332	493,455.713
			CS 1,727,137.632	492,268.171
			ST 1,727,193.605	492,076.192
10	1,724,371.527	493,707.438	PC 1,727,693.343	490,236.031
			PT 1,727,987.313	489,756.723
11	1,726,865.824	493,283.164		
12	1,727,770.121	489,953.318		
END	1,728,053.796	489,696.546		

	DATE	10/18/02	SIGNATURE			REPUBLIC OF THE PHILIPPINES	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/18/02	ACACIO			DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	THE DETAILED DESIGN STUDY ON	1:40,000	ALIGNMENT TECHNICAL	RG-02
	CHECKED	10/17/02	S. G. G. G.			BUREAU OF DESIGN	UPGRADING INTER-URBAN HIGHWAY SYSTEM	FULL SIZE A1	DESCRIPTION	
	SUBMITTED	10/19/02	M. R. R. R.			OFFICE OF THE SECRETARY	ALONG THE PAN-PHILIPPINE HIGHWAY			
			PROJECT DIRECTOR	DANILO C. TRAJANO	Chief, Highways Division		CABANATUAN BYPASS - CONTRACT PACKAGE III			
			REVIEWED BY	JOSEFINA M. ALAGAR	Chief, Highways Division					
			RECOMMENDED BY	GILBERTO S. REYES	DC, Director IV					
			RECOMMENDED BY	MANUEL M. BONDAN	Undersecretary					
			APPROVED BY	SIMEON A. DATUMANONG	Secretary					



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 :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/18/02	<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 (Paridel, Cabanatuan and San Jose Bypasses)	1:40,000	LOCATION OF INTERSECTIONS/ UNDERPASS ALONG BYPASS	RG-03
	SUBMITTED	10/19/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:	Approved By:	CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1			
			TEAM LEADER	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONJAN Undersecretary	SIMEON A. DATUMANONG Secretary				

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

SCHEDULE OF TRAFFIC SIGNS
CONTRACT PACKAGE III (INITIAL STAGE)




**SCHEDULE OF ROADSIDE PLANTING,
 GROUTED RIPRAP AND
 UNSUITABLE EXCAVATIONS**
CONTRACT PACKAGE III (INITIAL STAGE)

1. EDGE LINES				7.0 ARROWS			ITEM 605 (1) WARNING SIGNS (TRIANGULAR 900mm)			A. ROADSIDE PLANTING (HIGH TREE)				
1.1 LEFT SIDE, OUTER EDGE				ARROW TYPE	NUMBER OF ARROWS	LOCATION	STATION	REF. NO.	REMARKS	STATION		LENGTH (L.M.)		
FROM	TO	LENGTH (m)	REMARKS							FROM	TO	LEFT	RIGHT	
119+000.00	121+335.96	2335.96	MAIN BYPASS	A	4	APPROACHING INTERSECTION A-21	121+240	W3-1	RIGHTSIDE MAIN BYPASS	118+400	119+100	100	100	
121+335.96	00+972.96	19.14	MAIN BYPASS TO RT OF A-21	B	4	APPROACHING INTERSECTION A-21	121+240	W1-4(L)	LEFT SIDE MAIN BYPASS	119+100	119+800	420	420	
00+900.00	00+972.96	72.96	RIGHT OF A-21	NOTE:				121+490	W3-1	LEFT SIDE MAIN BYPASS	119+800	120+500	0	0
00+900.00	00+983.69	83.69	LEFT OF A-21	A - LEFT/RIGHT ARROW				121+590	W1-4(R)	LEFT SIDE MAIN BYPASS	120+500	121+200	520	520
00+983.69	121+373.47	14.74	LT OF A-21 TO MAIN BYPASS	B - COMBINATION OF STRAIGHT AND LEFT ARROWS OR STRAIGHT AND RIGHT ARROWS							121+200	121+900	340	340
121+373.47	121+600.00	226.53	MAIN BYPASS											
1.2 RIGHT SIDE, OUTER EDGE				8.0 PEDESTRIAN AND STOP LINES				ITEM 605 (2)c REGULATORY SIGNS (RECTANGULAR 450x750mm)			GROUTED RIPRAP			
FROM	TO	LENGTH (m)	REMARKS	LOCATION	AREA (m ²)		REMARKS	STATION	REF. NO.	REMARKS	STATION		LENGTH (m)	VOLUME (m ³)
119+000.00	121+348.64	2348.64	MAIN BYPASS		PEDESTRIAN	STOP LINE		121+341	R2-7(L)	CENTER ISLAND MAIN BYPASS	FROM	TO	FROM	TO
121+348.64	01+016.31	14.74	MAIN BYPASS TO RT OF A-21	INT. A-21	A-21	9.18	6.30	121+380	R2-7(L)	CENTER ISLAND MAIN BYPASS	119+150	119+250	100	126.17
01+016.31	01+100.00	83.69	RIGHT OF A-21			22.76	5.32							
01+027.04	01+100.00	72.96	LEFT OF A-21											
01+027.04	121+386.15	19.13	LEFT OF A-21 TO MAIN BYPASS											
121+386.15	121+600.00	213.85	MAIN BYPASS											
1.3 LEFT SIDE, INNER EDGE								ITEM 605 (2)d REGULATORY SIGNS (CIRCULAR 600mm DIA.)			RIGHT SIDE			
FROM	TO	LENGTH (m)	REMARKS					STATION	REF. NO.	REMARKS	FROM	TO	LENGTH (m)	VOLUME (m ³)
121+175.32	121+345.74	170.42	APPROACH TO A-21					119+529	R6-4	RIGHT SIDE MAIN BYPASS	119+200	119+260	60	75.70
121+376.22	121+546.79	170.57	APPROACH TO A-21					120+665	R6-4	LEFT SIDE MAIN BYPASS	119+420	119+528	108	83.69
00+960.00	00+984.11	24.11	INTERSECTION A-21					121+341	R3-15	CENTER ISLAND MAIN BYPASS	120+665	120+740	75	62.17
01+015.84	01+039.24	23.40	INTERSECTION A-21					121+380	R3-15	CENTER ISLAND MAIN BYPASS				
								00+961	R3-15	CENTER ISLAND INTERSECTION A-21				
								01+020	R3-15	CENTER ISLAND INTERSECTION A-21				
1.4 RIGHT SIDE, INNER EDGE								ITEM 605 (3) INFORMATORY SIGNS			UNSUITABLE EXCAVATION			
FROM	TO	LENGTH (m)	REMARKS					STATION	REF. NO.	REMARKS	FROM	TO	THICKNESS (m)	
121+175.32	121+345.74	170.42	APPROACH TO A-21					a. 2209 x 1630			119+034.23	119+414.23	0.2	
121+376.22	121+546.79	170.57	APPROACH TO A-21					121+190	GS-20	RIGHT SIDE MAIN BYPASS	120+654.23	121+034.23	0.1	
00+960.00	00+984.11	24.11	INTERSECTION A-21					121+520	GS-21	LEFT SIDE MAIN BYPASS	121+034.23	121+634.23	0.2	
01+015.84	01+039.24	23.40	INTERSECTION A-21					b. 1752 x 1630						
								00+940	GS-23	RIGHT SIDE INTERSECTION A-21				
								c. 2179 x 1630						
								01+040	GS-22	LEFT SIDE INTERSECTION A-21				
2.0 CENTERLINE								GUARDRAIL						
FROM	TO	LENGTH (m)	REMARKS					STATION	LENGTH (m)	LOCATION				
119+000.00	119+172.43	172.43	150mm x 3.0m @ 4.50m GAP					119+402.00	119+530.00	128	LEFT SIDE of MAIN BYPASS			
119+172.43	120+926.75	1754.32	150mm x 3.0m @ 9.0m GAP					120+665.00	120+821.00	156	LEFT SIDE of MAIN BYPASS			
120+926.75	121+136.75	210.00	150mm x 3.0m @ 4.50m GAP					121+130.00	121+322.00	192	LEFT SIDE of MAIN BYPASS			
121+585.36	121+600.00	14.64	150mm x 3.0m @ 4.50m GAP					122+399.00	122+577.00	178	LEFT SIDE of MAIN BYPASS			
00+900.00	00+920.76	20.76	100mm x 3.0m @ 4.50m GAP					119+310.00	119+530.00	220	RIGHT SIDE of MAIN BYPASS			
01+079.13	01+100.00	20.87	100mm x 3.0m @ 4.50m GAP					120+664.00	120+908.00	244	RIGHT SIDE of MAIN BYPASS			
								121+130.00	121+322.00	192	RIGHT SIDE of MAIN BYPASS			
3.0 LANE LINE														
FROM	TO	LENGTH (m)	REMARKS											
121+281.75	121+311.75	30.00	(RS) LANE LINE 150mmx3.0m @ 4.50m GAP											
121+311.75	121+341.75	30.00	(RS) LANE LINE 150mm UNBROKEN											
121+380.36	121+410.36	30.00	(LS) LANE LINE 150mm UNBROKEN											
121+410.36	121+440.40	30.04	(LS) LANE LINE 150mmx3.0m @ 4.50m GAP											
00+961.31	00+981.31	20.00	(RS) LANE LINE 100mm UNBROKEN											
01+019.38	01+039.38	20.00	(LS) LANE LINE 100mm UNBROKEN											
4.0 CONTINUITY LINE														
FROM	TO	LENGTH (m)	REMARKS											
121+236.68	121+281.75	45.07	(RS) 150mm x 1.0m @ 3.0m GAP											
121+440.40	121+485.40	45.00	(LS) 150mm x 1.0m @ 3.0m GAP											
00+920.76	00+961.31	40.55	(RS) 100mm x 1.0m @ 3.0m GAP											
01+039.38	01+079.13	39.75	(LS) 100mm x 1.0m @ 3.0m GAP											
5.0 CHEVRON														
FROM	TO	LENGTH (m)	REMARKS											
121+136.75	121+175.32	38.57	CENTER OF MAIN BYPASS											
121+546.79	121+585.36	38.57	CENTER OF MAIN BYPASS											
00+920.76	00+960.00	39.24	CENTER OF A-21											
01+039.24	01+079.13	39.89	CENTER OF A-21											

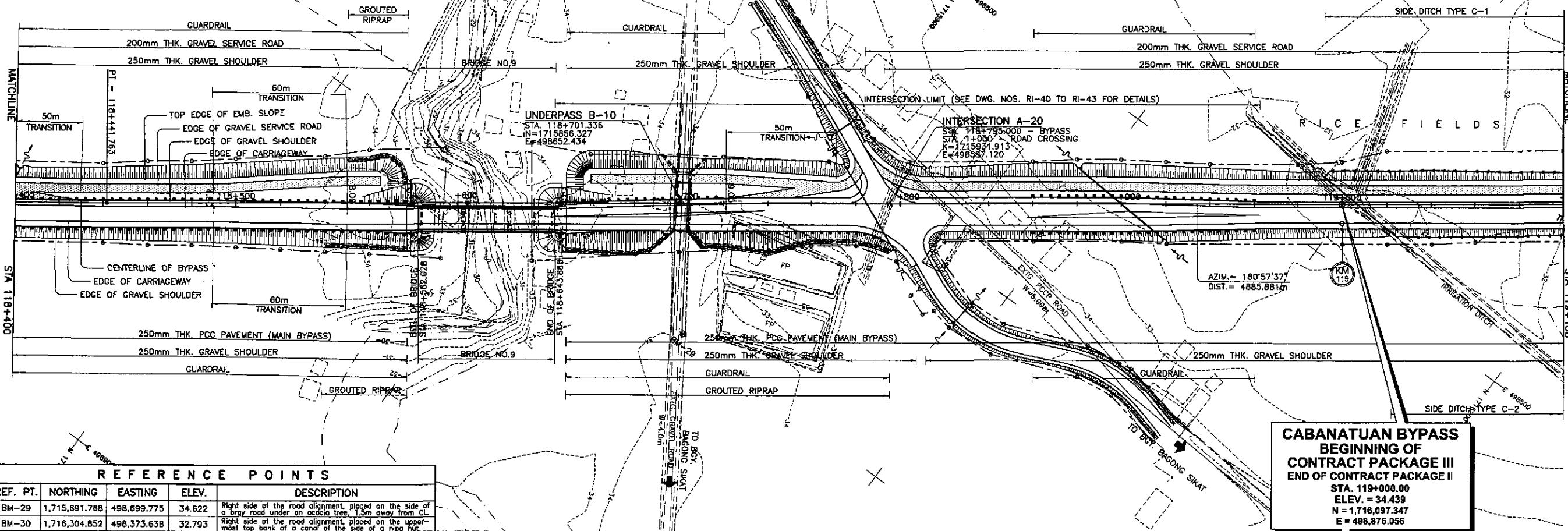
	DESIGNED	10/12/02	SIGNATURE	[Signature]	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	SIGNATURE	[Signature]	BUREAU OF DESIGN				OFFICE OF THE SECRETARY		CABANATUAN BYPASS - CONTRACT PACKAGE III	SCHEDULE OF PAVEMENT MARKINGS, TRAFFIC SIGNS, GUARDRAILS, RIPRAP & UNSUITABLE EXCAVATION	RG-04
	SUBMITTED	10/19/02	SIGNATURE	[Signature]	Submitted By:		Reviewed By:		Recommended By:				
	DANILLO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES D.C., Director IV		MANUEL M. BONGAN Undersecretary		SIMEDON A. DATUMANONG Secretary				
FULL SIZE A1											FULL SIZE A1		

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 SIDE					406R	119+140	16.000	1,716,219.776	498,406.290	463L	121+060	-16.000	1,717,750.309	497,246.596	436R	121+160	18.000	1,717,851.088	497,214.978	A21-1R	0+900	7.500	1,717,915.755	497,031.763
436L	119+020	-24.000	1,716,099.314	498,444.877	407R	119+160	16.000	1,716,235.916	498,394.479	464L	121+080	-17.000	1,717,765.859	497,233.978	437R	121+180	19.000	1,717,867.818	497,203.974	A21-2R	0+920	7.500	1,717,932.304	497,042.995
437L	119+100	-24.000	1,716,163.874	498,397.632	408R	119+180	15.000	1,716,251.465	498,381.861	465L	121+100	-17.000	1,717,781.999	497,222.166	438R	121+200	20.000	1,717,884.549	497,192.970	A21-3R	0+940	10.500	1,717,947.167	497,056.709
438L	119+120	-20.000	1,716,182.376	498,389.049	409R	119+220	15.000	1,716,283.745	498,358.238	466L	121+120	-18.000	1,717,797.546	497,209.548	439R	121+220	21.000	1,717,901.279	497,181.865	A21-4R	0+966	17.000	1,717,965.030	497,076.689
439L	119+140	-22.000	1,716,197.335	498,375.624	410R	119+240	17.000	1,716,301.066	498,348.041	467L	121+140	-18.000	1,717,813.688	497,197.737	440R	121+240	22.000	1,717,918.010	497,170.961	A21-5R	1+020	21.000	1,718,007.464	497,110.324
440L	119+220	-22.000	1,716,261.894	498,328.380	411R	119+300	17.000	1,716,349.486	498,312.608	468L	121+160	-19.000	1,717,829.237	497,185.119	441R	121+260	24.000	1,717,935.331	497,160.764	A21-6R	1+040	12.000	1,718,029.066	497,114.110
441L	119+240	-20.000	1,716,279.215	498,318.182	412R	119+320	18.000	1,716,366.216	498,301.604	469L	121+180	-20.000	1,717,844.787	497,172.501	442R	121+294	24.000	1,717,962.769	497,140.685	A21-7R	1+100	7.500	1,718,081.238	497,144.082
442L	119+260	-17.000	1,716,297.127	498,308.792	413R	119+340	18.000	1,716,382.356	498,289.792	470L	121+200	-20.000	1,717,860.927	497,160.890	443R	121+320	24.000	1,717,983.751	497,125.331	INTERSECTION A-21a				
443L	119+300	-17.000	1,716,329.407	498,285.170	414R	119+360	19.000	1,716,399.086	498,278.788	471L	121+220	-21.000	1,717,876.476	497,148.072	444R	121+340	22.000	1,717,998.709	497,111.905	A21a-1L	0+080	-4.000	1,718,097.271	497,049.092
444L	119+320	-18.000	1,716,344.956	498,272.552	415R	119+380	19.000	1,716,415.226	498,266.977	472L	121+240	-22.000	1,717,892.025	497,135.453	445R	121+393	19.000	1,718,039.708	497,078.185	A21a-2L	0+089.153	-4.000	1,718,105.171	497,041.691
445L	119+360	-18.000	1,716,377.236	498,248.929	416R	119+400	20.000	1,716,431.957	498,255.873	473L	121+260	-24.000	1,717,906.984	497,122.028	446R	121+427	19.000	1,718,067.146	497,058.106	A21a-3L	0+100	-4.000	1,718,117.462	497,039.432
446L	119+380	-19.000	1,716,392.785	498,236.311	417R	119+420	21.000	1,716,448.687	498,244.969	474L	121+300	-24.000	1,717,939.264	497,098.406	447R	121+440	19.000	1,718,077.637	497,050.429	A21a-4L	0+105.865	-4.000	1,718,123.324	497,039.247
447L	119+400	-20.000	1,716,408.334	498,223.693	418R	119+528	22.000	1,716,536.433	498,181.996	475L	121+320	-23.000	1,717,955.994	497,087.402	448R	121+460	18.000	1,718,093.187	497,037.811	A21a-1R	0+080	4.000	1,718,103.667	497,053.898
448L	119+420	-21.000	1,716,423.884	498,211.075	419R	119+528	31.000	1,716,541.748	498,189.259	476L	121+329	-23.000	1,717,963.257	497,082.067	449R	121+480	18.000	1,718,109.326	497,025.999	A21a-2R	0+089.153	3.000	1,718,108.398	497,047.904
449L	119+527.833	-22.057	1,716,510.280	498,146.540	420R	119+548	31.000	1,716,557.888	498,177.447	477L	121+383	-21.850	1,718,007.632	497,051.286	450R	121+500	17.000	1,718,124.876	497,013.381	A21a-3R	0+100	3.000	1,718,117.683	497,046.429
450L	119+528	-31.000	1,716,505.134	498,139.225	421R	120+645.878	30.000	1,717,443.280	497,528.280	478L	121+400	-22.000	1,718,021.145	497,040.964	451R	121+600	17.000	1,718,205.575	496,954.326	A21a-4R	0+105.865	3.000	1,718,123.544	497,046.244
451L	119+548	-31.000	1,716,521.274	498,127.414	422R	120+667	30.000	1,717,460.326	497,515.807	479L	121+440	-22.000	1,718,053.424	497,017.342	INTERSECTION A-21									
452L	120+645.878	-30.000	1,717,407.847	497,479.851	423R	120+667	22.650	1,717,455.985	497,509.875	480L	121+460	-21.000	1,718,070.155	497,006.338	A21-1L	0+900	-7.500	1,717,924.179	497,019.352					
453L	120+667	-30.000	1,717,424.892	497,467.387	424R	120+720	20.000	1,717,497.191	497,476.437	481L	121+480	-19.000	1,718,087.476	496,996.141	A21-2L	0+920	-7.500	1,717,940.728	497,030.584					
454L	120+667	-21.000	1,717,430.207	497,474.650	425R	120+740	20.000	1,717,513.331	497,464.626	482L	121+500	-17.000	1,718,104.797	496,985.943	A21-3L	0+940	-13.000	1,717,960.385	497,037.265					
455L	120+820	-21.000	1,717,553.678	497,384.295	426R	120+760	19.000	1,717,528.880	497,452.008	483L	121+600	-17.000	1,718,185.496	496,926.888	A21-4L	0+970	-15.000	1,717,986.310	497,052.458					
456L	120+840	-20.000	1,717,570.408	497,373.290	427R	120+880	19.000	1,717,625.720	497,381.141	BYPASS - RIGHT SIDE					A21-5L	1+035	-14.000	1,718,039.531	497,089.789					
457L	120+860	-19.000	1,717,587.139	497,362.286	428R	120+900	18.000	1,717,641.269	497,368.523	402R	119+020	18.000	1,716,124.117	498,478.771	A21-6L	1+054	-11.500	1,718,053.848	497,102.528					
458L	120+880	-18.000	1,717,603.869	497,351.282	429R	120+940	18.000	1,717,673.549	497,344.900	403R	119+040	18.000	1,716,140.257	498,466.960	A21-7L	1+056.699	-13.177	1,718,057.023	497,102.656					
459L	120+900	-18.000	1,717,620.009	497,339.471	430R	120+960	17.000	1,717,689.098	497,332.282	404R	119+060	17.000	1,716,155.807	498,454.342	A21-8L	1+064.690	-12.793	1,718,063.418	497,107.461					
460L	120+920	-17.000	1,717,636.739	497,328.467	431R	120+980	16.000	1,717,704.648	497,319.664	405R	119+120	17.000	1,716,204.228	498,418.908	A21-9L	1+068	-9.500	1,718,064.308	497,112.045					
461L	120+980	-17.000	1,717,685.159	497,293.033	432R	121+080	16.000	1,717,785.347	497,260.608	434R	121+120	17.000	1,717,818.218	497,237.793	A21-10L	1+080	-7.500	1,718,073.114	497,120.439					
462L	121+000	-16.000	1,717,701.890	497,282.029	433R	121+100	17.000	1,717,802.078	497,249.604	435R	121+140	18.000	1,717,834.948	497,226.789	A21-11L	1+100	-7.500	1,718,089.682	497,131.671					

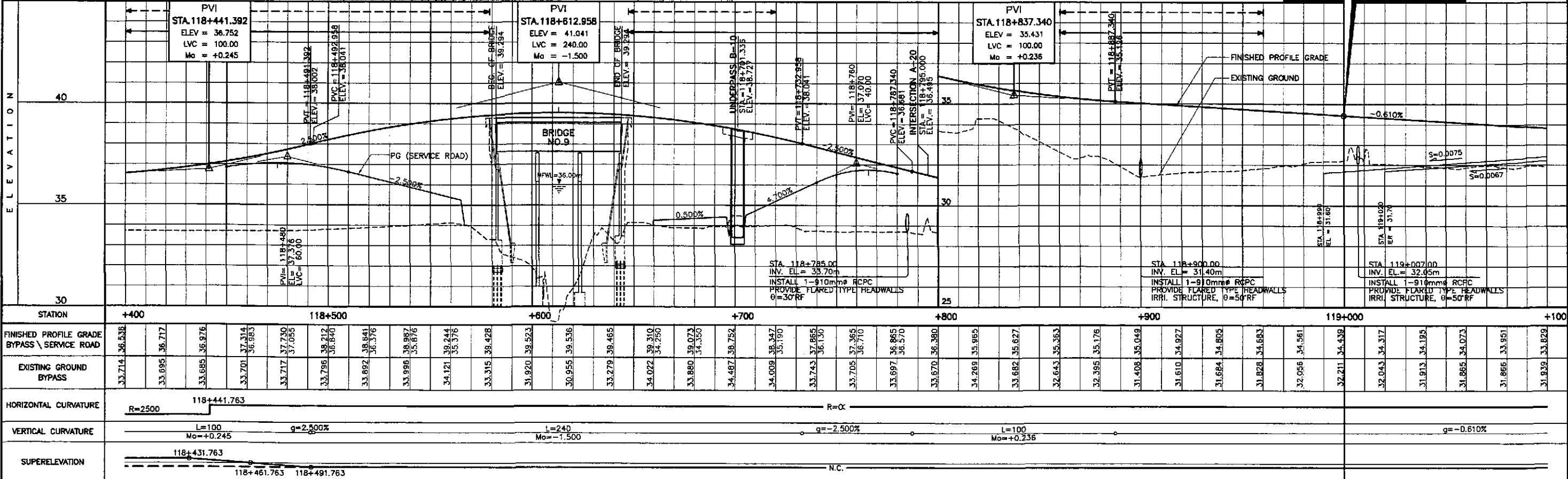
 JAPAN INTERNATIONAL COOPERATION AGENCY 	DESIGNED	10/18/02	SIGNATURE	<i>[Signature]</i>	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :				SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	Submitted By:	<i>[Signature]</i>		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)				NOT TO SCALE	SCHEDULE OF ROAD RIGHT-OF-WAY MARKERS	RG-05
	SUBMITTED	10/10/02	Reviewed By:	<i>[Signature]</i>		CABANATUAN BYPASS - CONTRACT PACKAGE III				FULL SIZE A1		
		DANILLO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONOAN Undersecretary		SIMEON A. DATUMANONG Secretary		

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-07	117+880.785	1,714,968.738	499,301.970	37°09'25"R	2,500.00	840.295	1,621.273	137.441	2.00	-	80

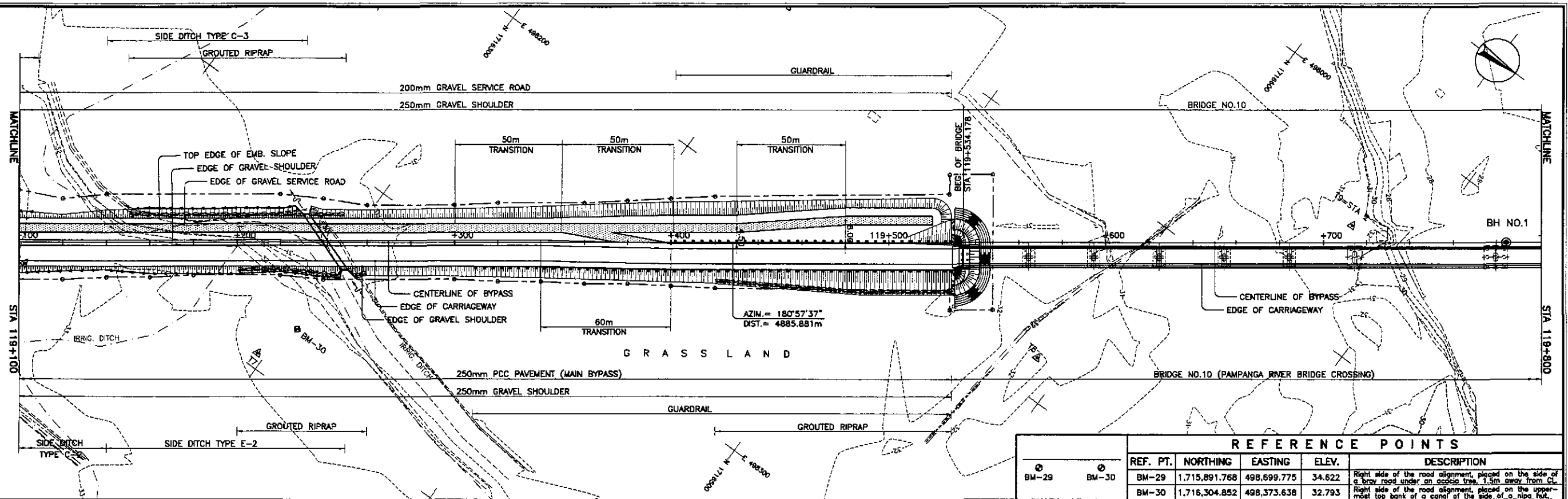


CABANATUAN BYPASS
BEGINNING OF
CONTRACT PACKAGE III
END OF CONTRACT PACKAGE II
 STA. 119+000.00
 ELEV. = 34.439
 N = 1,716,097.347
 E = 498,876.056

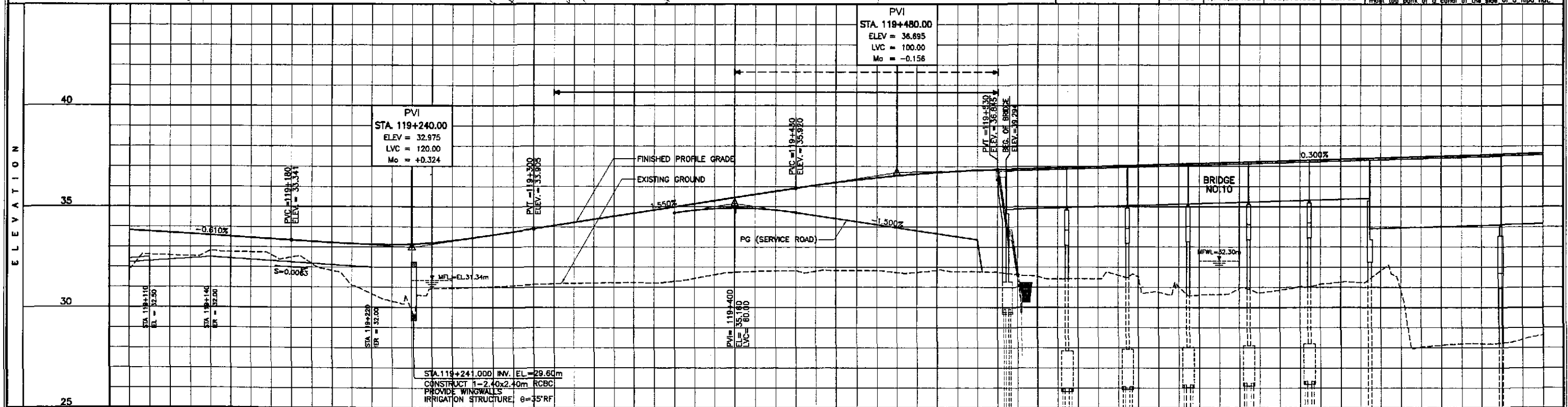
REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-29	1,715,891.768	498,699.775	34.622	Right side of the road alignment, placed on the side of a banyan tree under an acacia tree, 1.5m away from CL
BM-30	1,716,304.852	498,373.638	32.793	Right side of the road alignment, placed on the uppermost top bank of a canal on the side of a banyan tree



	DESIGNED	DATE	SIGNATURE		PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	S. ROSE		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. 119+000 - STA. 119+100	RP-01
	SUBMITTED	11/19/02	M. MOCHI		CABANATUAN BYPASS - CONTRACT PACKAGE III	VERTICAL 1:100		

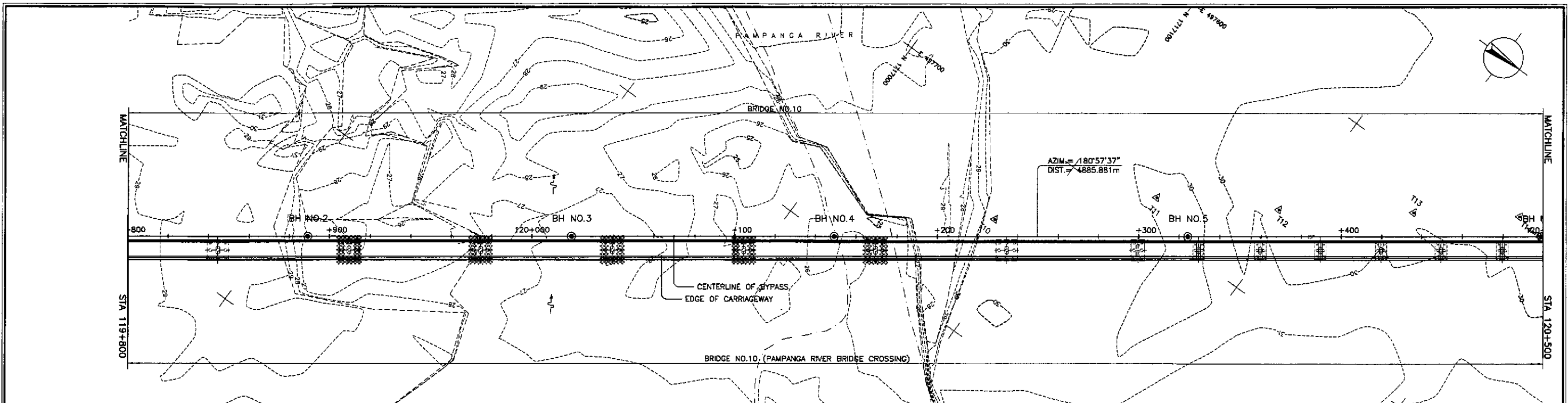


REFERENCE POINTS				DESCRIPTION
REF. PT.	NORTHING	EASTING	ELEV.	
BM-29	1,715,891.768	498,699.775	34.622	Right side of the road alignment, placed on the side of a bray road under an acacia tree, 1.5m away from CL
BM-30	1,716,304.852	498,373.638	32.793	Right side of the road alignment, placed on the uppermost top bank of a canal on the side of a riprap pad.



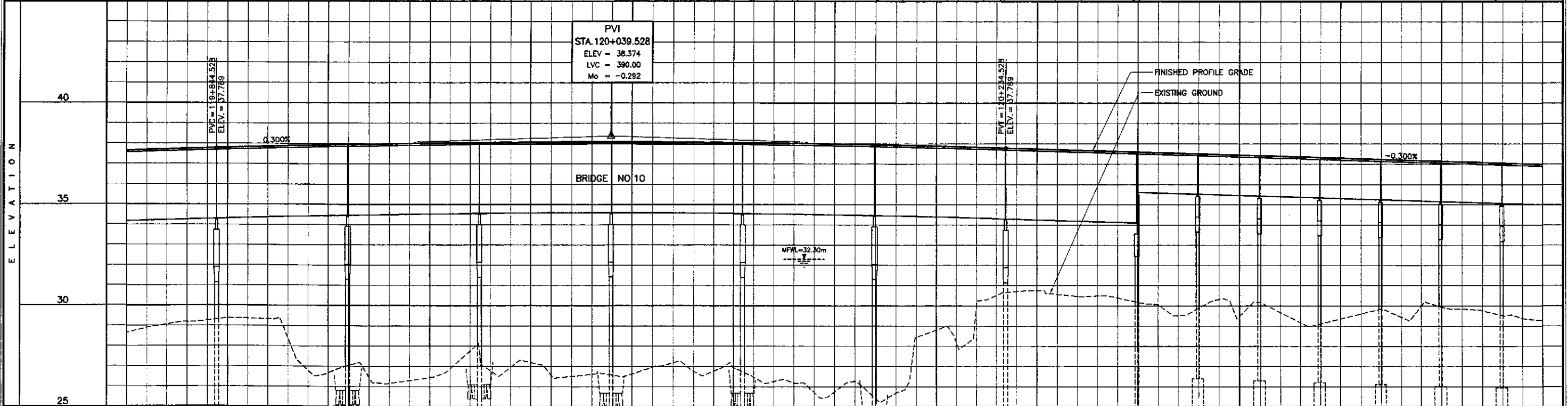
STATION	+100	+200	+300	+400	119+500	+600	+700	+800
FINISHED PROFILE GRADE BYPASS / SERVICE ROAD	31.939 33.829	32.583 33.707	32.822 33.585	32.741 33.463	32.488 33.341	31.836 33.255	30.671 33.241	28.828 33.289
EXISTING GROUND BYPASS	31.939 33.829	32.583 33.707	32.822 33.585	32.741 33.463	32.488 33.341	31.836 33.255	30.671 33.241	28.828 33.289
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	g=-0.610%		L=120 Mo=+0.324		g=+1.550%		L=100 Mo=-0.156	
SUPERELEVATION	N.C.							

	DESIGNED	10/9/02		PROJECT AND LOCATION :		SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pilaridel, Cabanatuan and San Jose Bypasses)		HORIZONTAL 1:1000	PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 119+100 - STA. 119+800	RP-02
	SUBMITTED	10/19/02		CABANATUAN BYPASS - CONTRACT PACKAGE III		VERTICAL 1:100		



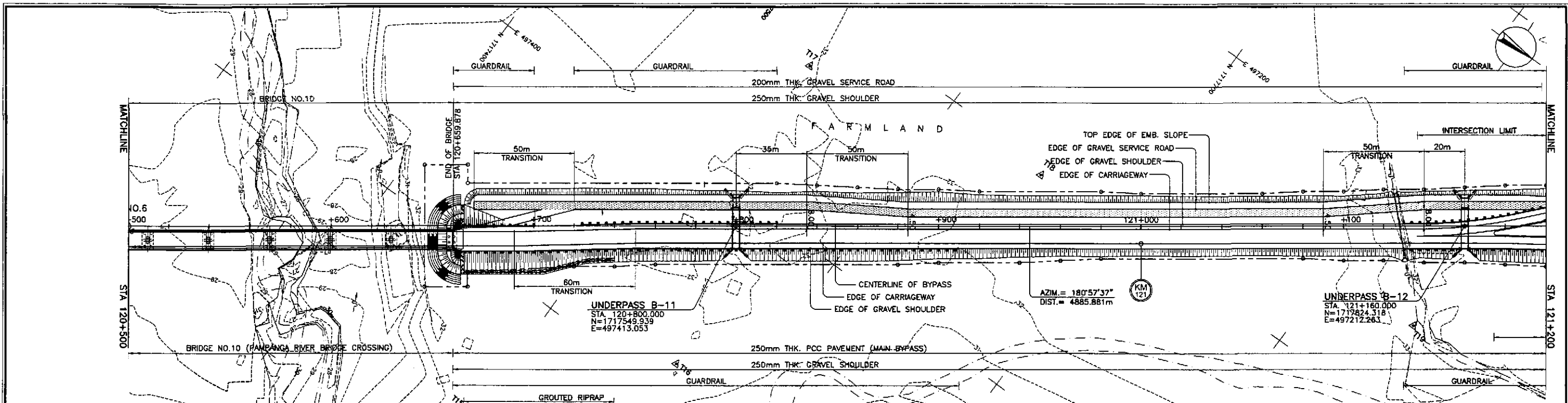
REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-29	1,715,891.768	498,699.775	34.622	Right side of the road alignment, placed on the side of a bray road under an acacia tree, 1.5m away from CL.
BM-30	1,716,304.852	498,373.638	32.793	Right side of the road alignment, placed on the uppermost top bank of a canal on the side of a pipe cul.



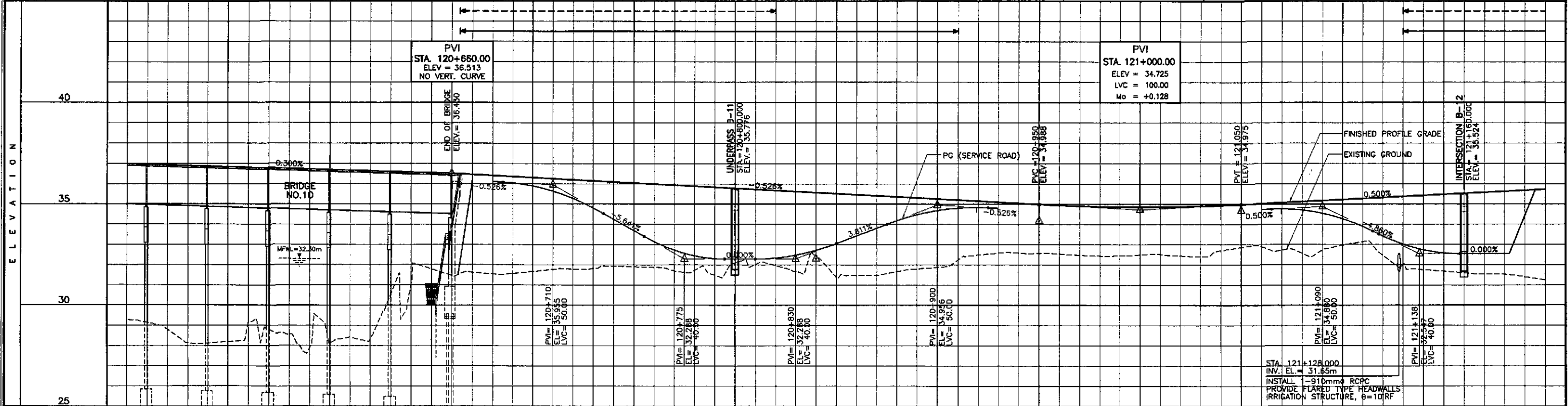
STATION	+800	+900	120+000	+100	+200	+300	+400	120+500																												
FINISHED PROFILE GRADE BYPASS	28.651	29.061	29.290	29.356	29.397	29.670	29.445	29.301	29.880	29.796	27.194	26.501	26.571	26.964	26.756	26.944	26.252	25.723	26.257	25.700	28.802	29.911	30.712	30.572	30.489	30.174	29.523	30.318	30.162	29.170	29.355	29.855	29.866	29.832	29.525	29.271
EXISTING GROUND BYPASS	28.651	29.061	29.290	29.356	29.397	29.670	29.445	29.301	29.880	29.796	27.194	26.501	26.571	26.964	26.756	26.944	26.252	25.723	26.257	25.700	28.802	29.911	30.712	30.572	30.489	30.174	29.523	30.318	30.162	29.170	29.355	29.855	29.866	29.832	29.525	29.271
HORIZONTAL CURVATURE	R=∞																																			
VERTICAL CURVATURE	g = 0.300% L = 390 Mo = -0.292 g = -0.300%																																			
SUPERELEVATION	N.C.																																			

	DESIGNED: 10/18/02 CHECKED: 10/17/02 SUBMITTED: 10/19/02	SIGNATURE: [Signature] TEAM LEADER		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) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 119+800 - STA. 120+500	SHEET NO. : RP-03
	Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV	Recommended By: MANUEL M. BONDAN Undersecretary	Approved By: SIMÉON A. DATUMANONG Secretary			
	JICA KATAHIRA & ENGINEERS YEO YACHIYO ENGINEERING CO., LTD. REI INTERNATIONAL							



REFERENCE POINTS

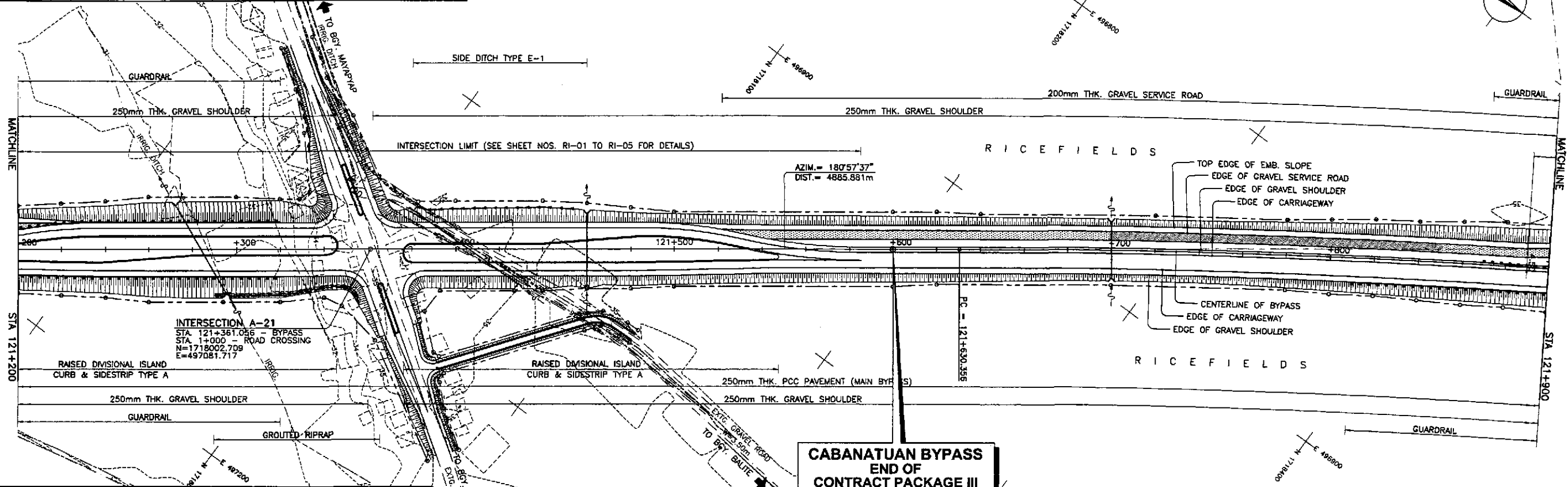
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-30	1,716,304.852	498,373.638	32.793	Right side of the road alignment, placed on the upper-most top bank of a canal on the side of a nipa hut.
BM-34	1,718,360.331	496,980.373	35.518	Right side of the road alignment, placed on the side of a dirt road, 1.50m away from the P.



STATION	120+500	+600	+700	+800	+900	121+000	+100	+200	
FINISHED PROFILE GRADE BYPASS \ SERVICE ROAD	29.271, 36.993	28.798, 36.933	28.121, 36.873	29.168, 36.813	28.545, 36.753	28.115, 36.693	28.381, 36.633	31.046, 36.573	
EXISTING GROUND BYPASS	29.271, 36.993	28.798, 36.933	28.121, 36.873	29.168, 36.813	28.545, 36.753	28.115, 36.693	28.381, 36.633	31.046, 36.573	
HORIZONTAL CURVATURE	R=∞								
VERTICAL CURVATURE	g=-0.300%		NO VERTICAL CURVE			g=-0.526%		L=100, Mo=+0.128, g=+0.500%	
SUPERELEVATION	N.C.								

	DESIGNED: <i>[Signature]</i> CHECKED: <i>[Signature]</i> SUBMITTED: <i>[Signature]</i>	DATE: 10/10/02 10/17/02 10/19/02	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 (Paridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE: HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS: PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 120+500 - STA. 121+200	SHEET NO.: RP-04	
	PJHL - PMO Submitted By: DANILDO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OC, Director IV	Recommended By: MANUEL M. BONGAN Undersecretary	Approved By: SIMON A. DATUMANONG Secretary			
	JICA KATAHIRA & ENGINEERS INTERNATIONAL YEO YACHIYO ENGINEERING CO., LTD.							

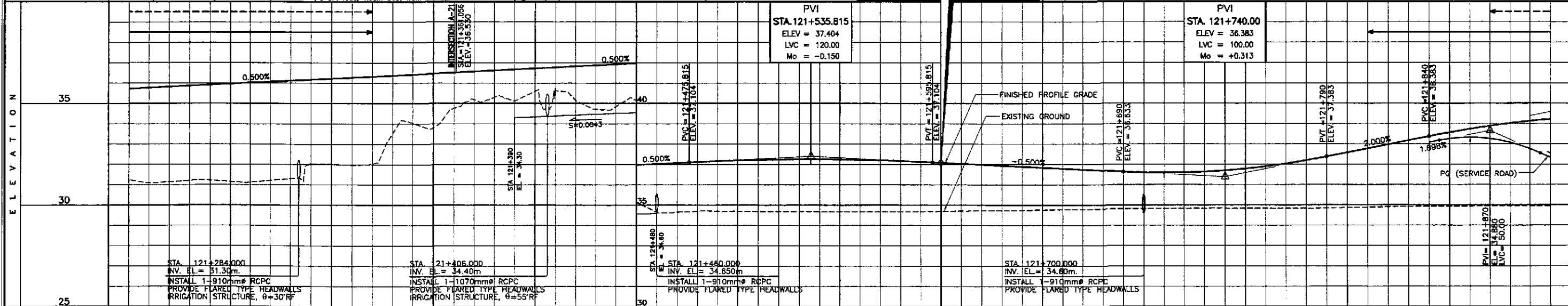
ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-08	122+487.349	1,718,911.622	496,416.576	24°11'07"	4,000.00	856.992	1,688.459	90.774	-	-	80



**CABANATUAN BYPASS
END OF
CONTRACT PACKAGE III
BEG. OF CONTRACT PACKAGE IV**
 STA. 121+600.00
 ELEV. = 37.083m
 N = 1,653,710.915
 E = 492,151.596

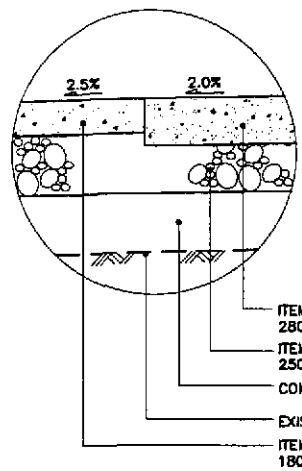
REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-30	1,716,304.852	498,373.638	32.793	Right side of the road alignment, placed on the uppermost top bank of a canal of the side of a ripa fut.
BM-34	1,718,360.331	496,980.373	35.518	Right side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.

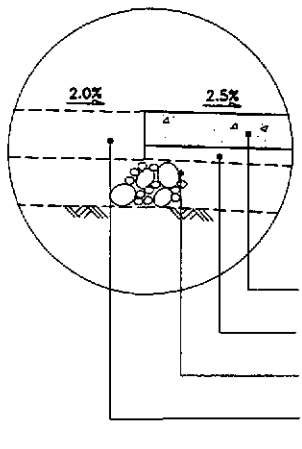


STATION	+200	+300					+400					121+500					+600					+700					+800					+800																																										
FINISHED PROFILE GRADE	31.235	35.725	31.137	35.825	31.216	35.925	31.117	36.025	31.301	36.125	32.015	36.225	32.033	36.325	34.044	36.425	34.764	36.525	35.298	36.625	35.597	36.725	35.137	36.825	34.842	36.925	34.645	37.025	34.698	37.124	34.690	37.200	34.684	37.243	34.679	37.253	34.675	37.229	34.671	37.172	34.689	37.083	34.713	36.893	34.738	36.883	34.766	36.793	34.794	36.683	34.813	36.595	34.829	36.585	34.840	36.695	34.835	36.895	34.831	37.195	34.862	37.583	34.902	37.983	34.932	38.383	34.948	38.023	34.941	38.743	34.948	39.023	34.947	39.223
EXISTING GROUND	31.235	35.725	31.137	35.825	31.216	35.925	31.117	36.025	31.301	36.125	32.015	36.225	32.033	36.325	34.044	36.425	34.764	36.525	35.298	36.625	35.597	36.725	35.137	36.825	34.842	36.925	34.645	37.025	34.698	37.124	34.690	37.200	34.684	37.243	34.679	37.253	34.675	37.229	34.671	37.172	34.689	37.083	34.713	36.893	34.738	36.883	34.766	36.793	34.794	36.683	34.813	36.595	34.829	36.585	34.840	36.695	34.835	36.895	34.831	37.195	34.862	37.583	34.902	37.983	34.932	38.383	34.948	38.023	34.941	38.743	34.948	39.023	34.947	39.223
HORIZONTAL CURVATURE	R=∞										R=4000																																																															
VERTICAL CURVATURE	g=+0.500%										L=120 Mo=-0.150					g=-0.500%					L=100 Mo=+0.313					g=2.000%																																																
SUPERELEVATION	N.C.																																																																									

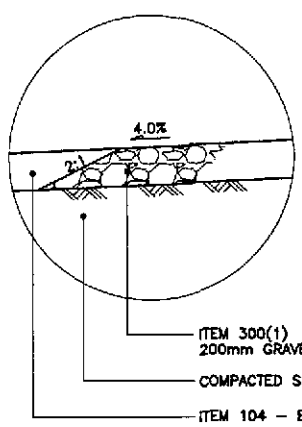
	DESIGNED	10/18/02	<i>[Signature]</i>		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :				SCALE :		SHEET CONTENTS :		SHEET NO. :	
	CHECKED	10/17/02	<i>[Signature]</i>		BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)				HORIZONTAL 1:1000		PLAN ANF PROFILE		RP-05	
	SUBMITTED	10/16/02	<i>[Signature]</i>		OFFICE OF THE SECRETARY				CABANATUAN BYPASS - CONTRACT PACKAGE III				VERTICAL 1:100		ALONG BYPASS (INITIAL STAGE) STA. 121+200 - STA. 121+600			
PUBL. - PMO		Submitted By:		Reviewed By:		Recommended By:		Approved By:		FULL SIZE A1		STA. 121+200 - STA. 121+600						
DANILO C. TRAJANO Project Director		JOSEFINA W. ALAGAR Chief, Highways Division		GILBERTO S. REYES OC, Director IV		MANUEL M. BONDAN Undersecretary		SIMEON A. DATUMANG Secretary										



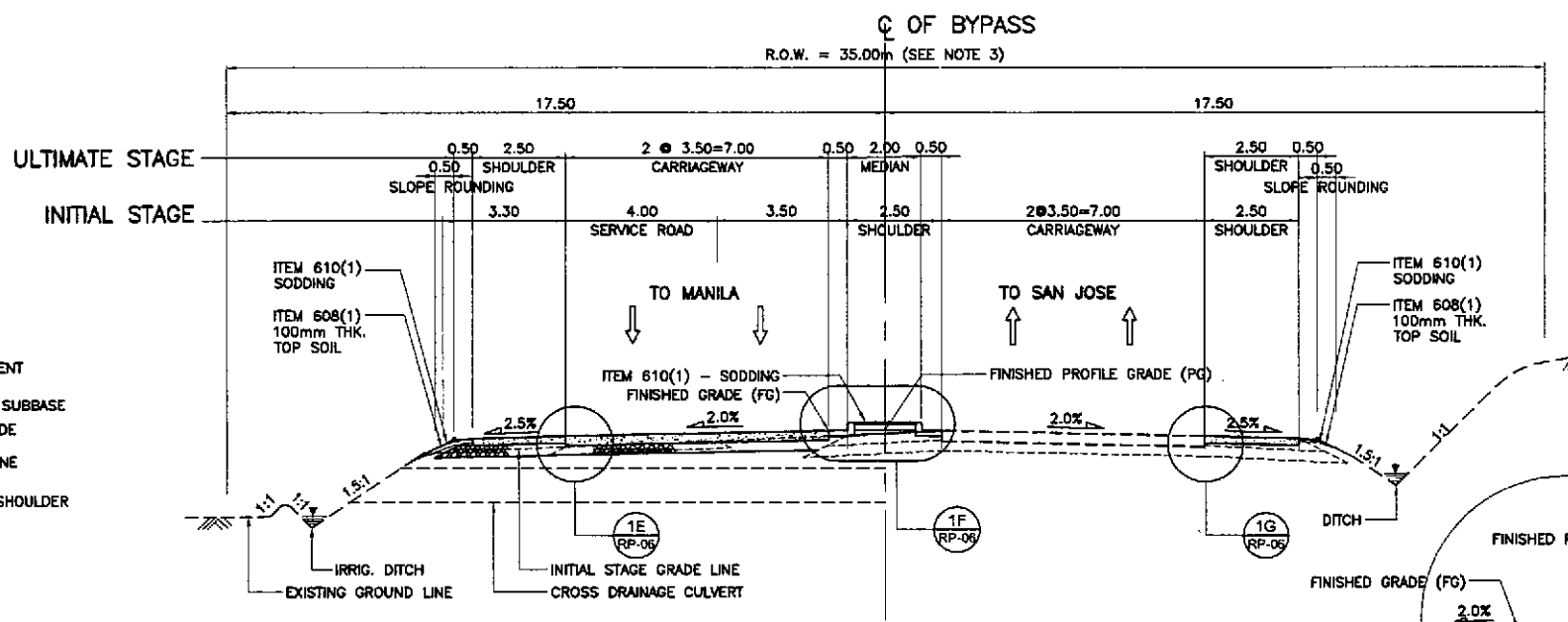
1E DETAIL
SCALE 1:20



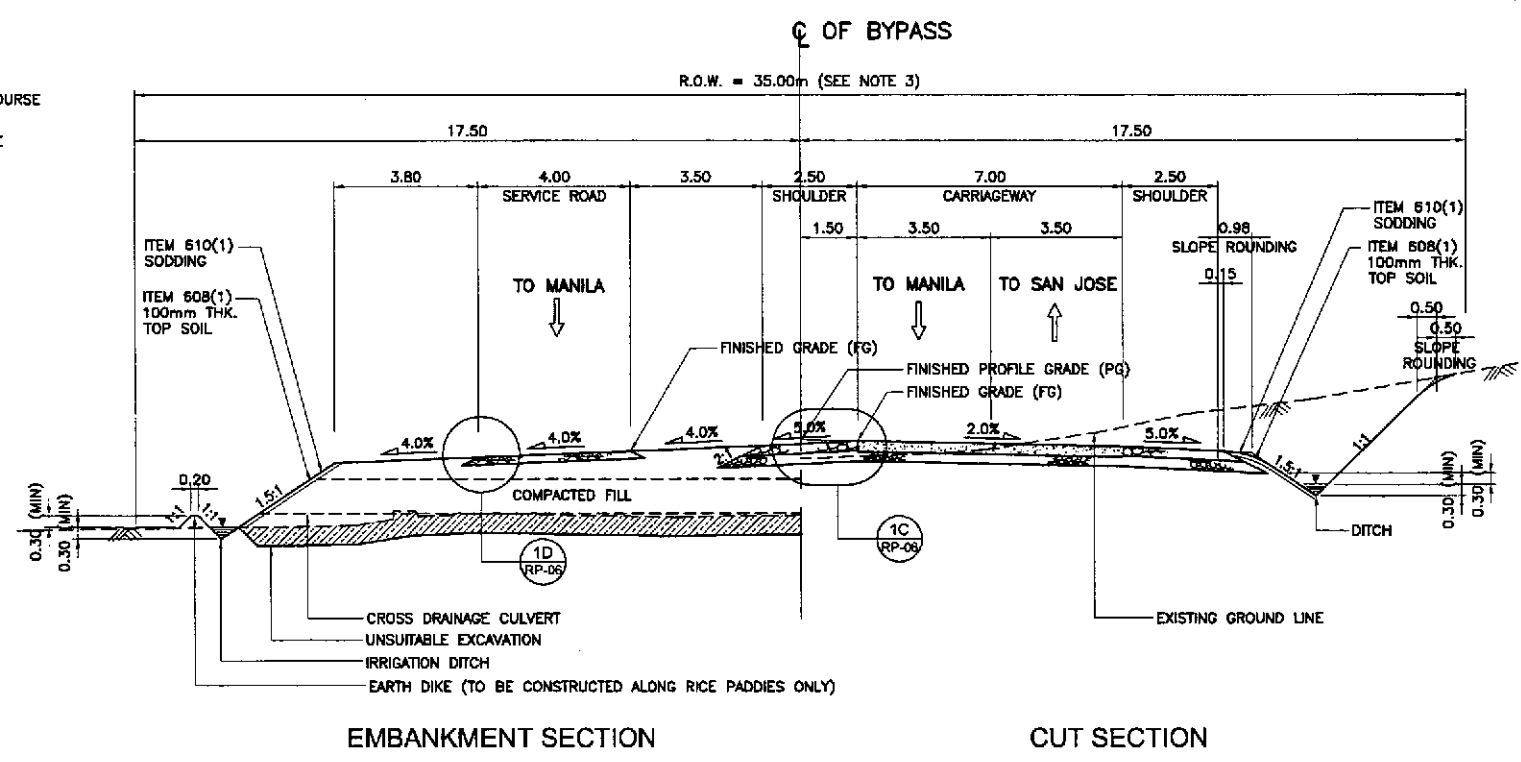
1G DETAIL
SCALE 1:20



1D DETAIL
SCALE 1:20



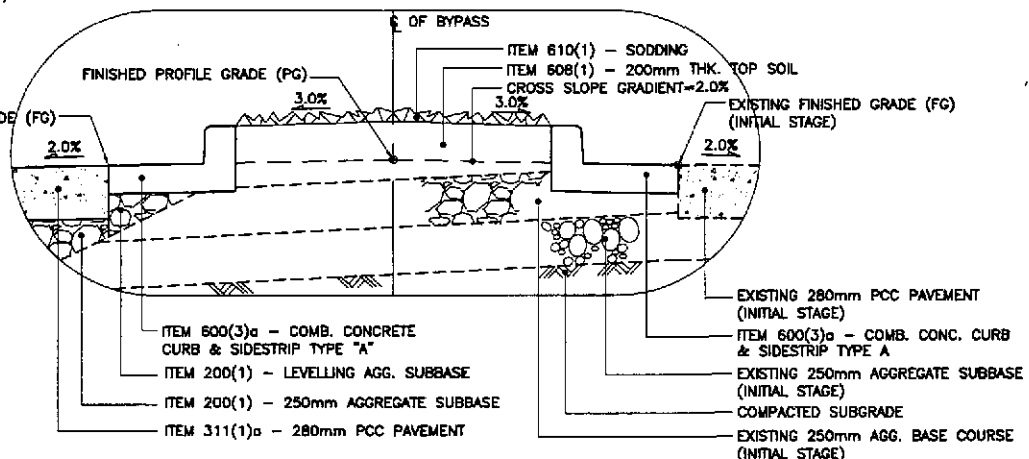
1B NORMAL SECTION - ULTIMATE STAGE
SCALE 1:100



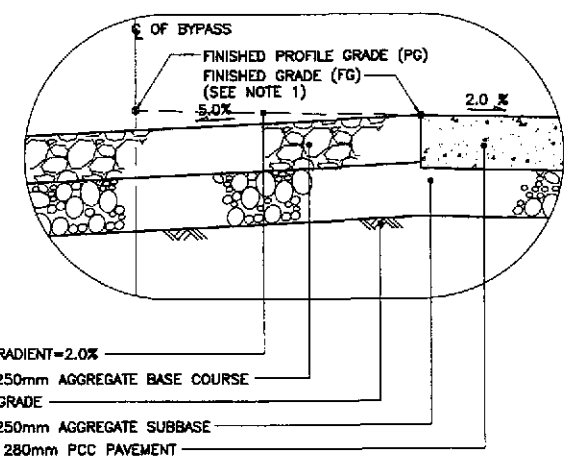
1A NORMAL SECTION - INITIAL STAGE
SCALE 1:100

1 TYPICAL ROADWAY SECTIONS - WITHOUT FRONTAGE ROAD
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.
 2. FOR SCHEDULE OF QUANTITIES, SEE SHEET NOS. RG-04 TO RG-05.
 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.; (SHT. NO. RG-05).
 4. SIDESLOPES OF 1:5:1 OR FLATTER SHALL BE PROTECTED BY SODDING. SIDESLOPES ALONG AREAS PRONE TO FLOODING SHALL BE PROTECTED BY GROUDED 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.



1F DETAIL
SCALE 1:20

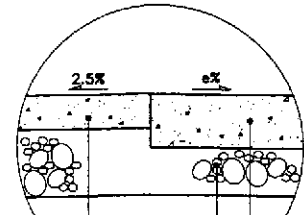


1C DETAIL
SCALE 1:20

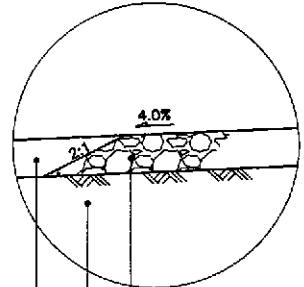
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS
YEO YACHIO ENGINEERING CO., LTD.

DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		
CHECKED	10/17/02	A. ADACIO	BUREAU OF DESIGN		
SUBMITTED	10/19/02	M. RUCHI	OFFICE OF THE SECRETARY		
			Submitted By:	Reviewed By:	Recommended By:
			DANIEL C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES
			Project Director	Chief, Highways Division	Dir., Director IV
				Manuel M. Bondan	Simeon A. Datumanong
				Undersecretary	Secretary

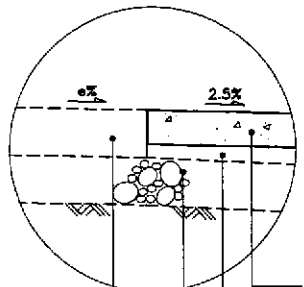
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	TYPICAL ROADWAY SECTIONS NORMAL SECTIONS WITHOUT FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (1 of 2)	RP-06
CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		



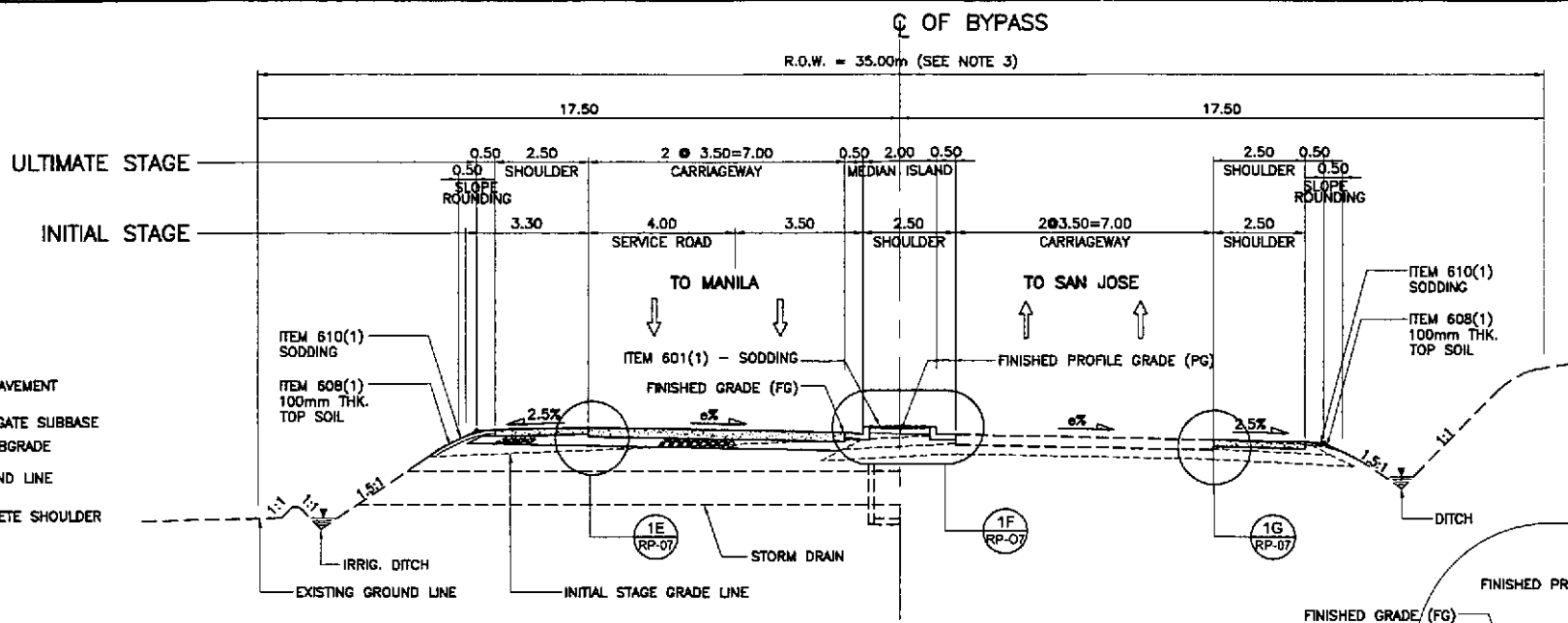
1E DETAIL
SCALE 1:20



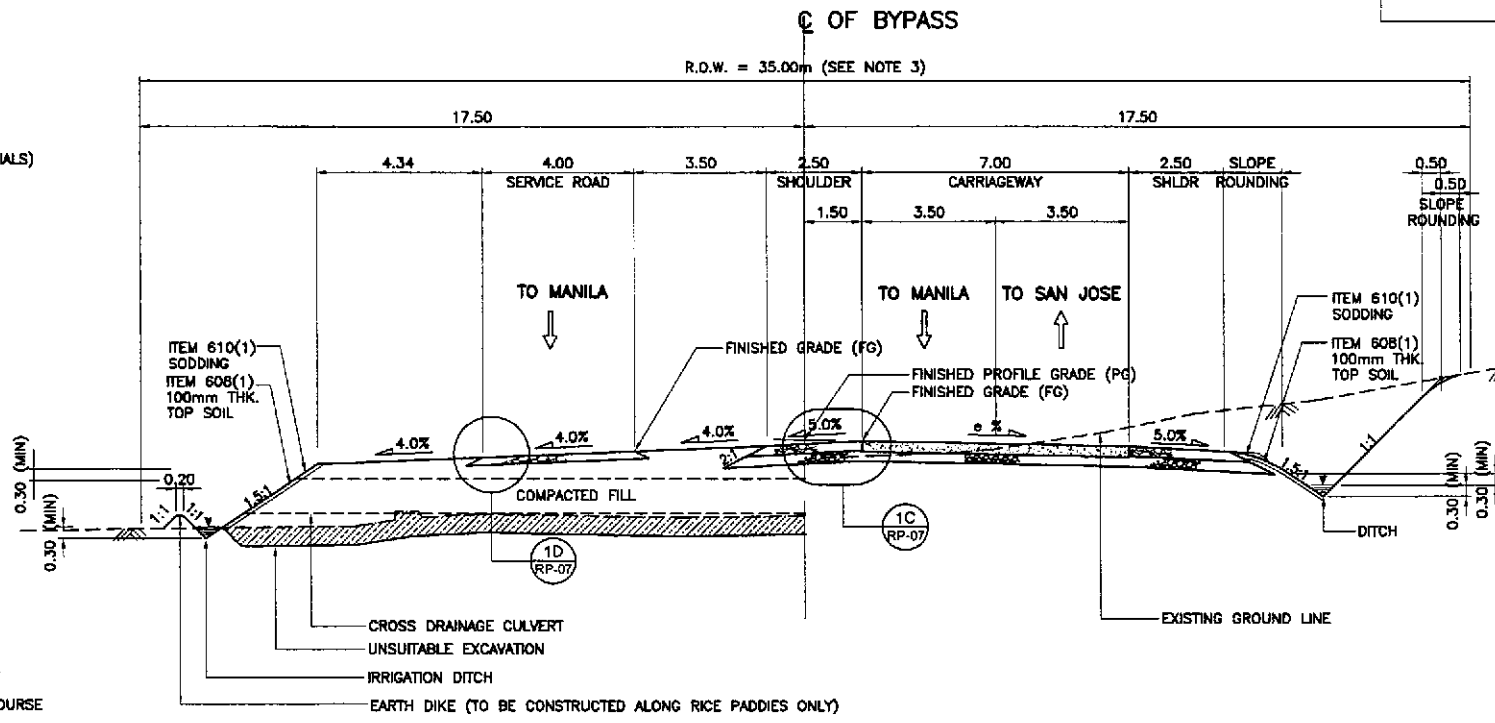
1D DETAIL
SCALE 1:20



1G DETAIL
SCALE 1:20



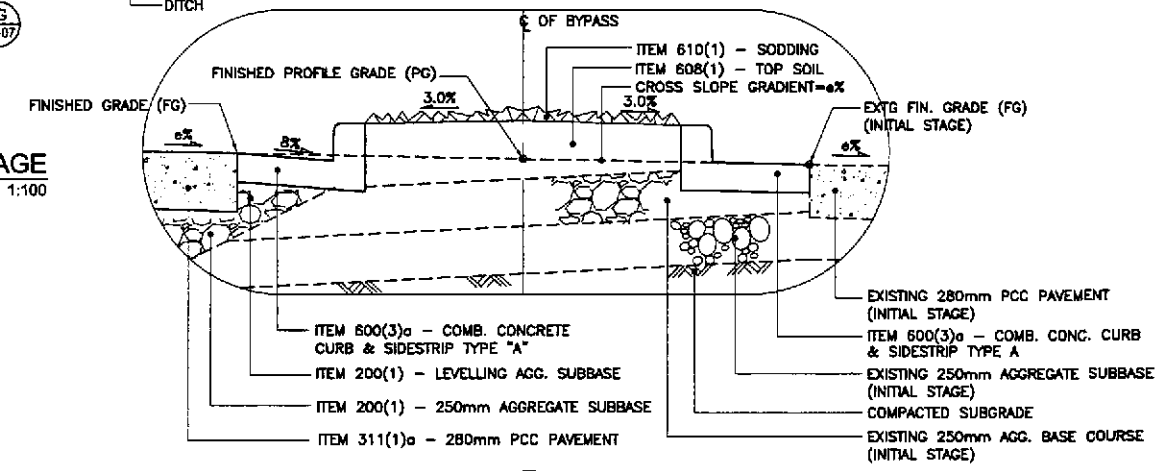
1B SUPERELEVATED SECTION - ULTIMATE STAGE
SCALE 1:100



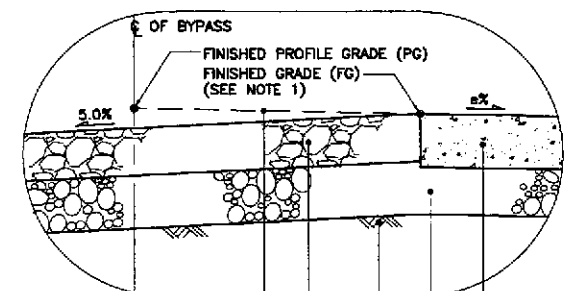
1A SUPERELEVATED SECTION - INITIAL STAGE
SCALE 1:100

1 TYPICAL ROADWAY SECTIONS - WITHOUT FRONTAGE ROAD
SCALE 1:100

PAVEMENT DESIGN PARAMETERS		
	BEFORE PAMPANGA BRIDGE	AFTER PAMPANGA BRIDGE
1. TRAFFIC (FOR 25 YEARS DESIGN LIFE) DESIGN ESAL	2.30 x 10 ⁶	1.70 x 10 ⁶
2. DESIGN CBR SUBGRADE CBR	5.00 %	5.00 %
3. ROADBED RESILIENT MODULUS		
M _r	5,500 psi = 37.92 MPa	5,500 psi = 37.92 MPa
E _{sb}	13,000 psi = 89.64 MPa	13,000 psi = 89.64 MPa
E _{bs}	23,000 psi = 158.58 MPa	23,000 psi = 158.58 MPa
4. PERFORMANCE CRITERIA Δ PSI	2	2
5. DESIGN RELIABILITY		
Z _R	50 %	50 %
S _D	0.35	0.35
6. DRAINAGE COEFFICIENT RIGID	1	1
7. LAYER COEFFICIENT		
a ₁ (FOR AC)	0.39	0.39
a ₂ (FOR BASE)	0.105	0.105
a ₃ (FOR SUBBASE)	0.095	0.095
8. PAVEMENT CONSTRUCTION THICKNESS		
PCP	280mm THK	280mm THK
SUBBASE	250mm THK	250mm THK



1F DETAIL
SCALE 1:20



1C DETAIL
SCALE 1:20

- 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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