

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
(ULTIMATE STAGE)
STA. 119+000.000 TO STA. 121+600.000**



December 2002

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

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GENERAL

INDEX OF DRAWINGS

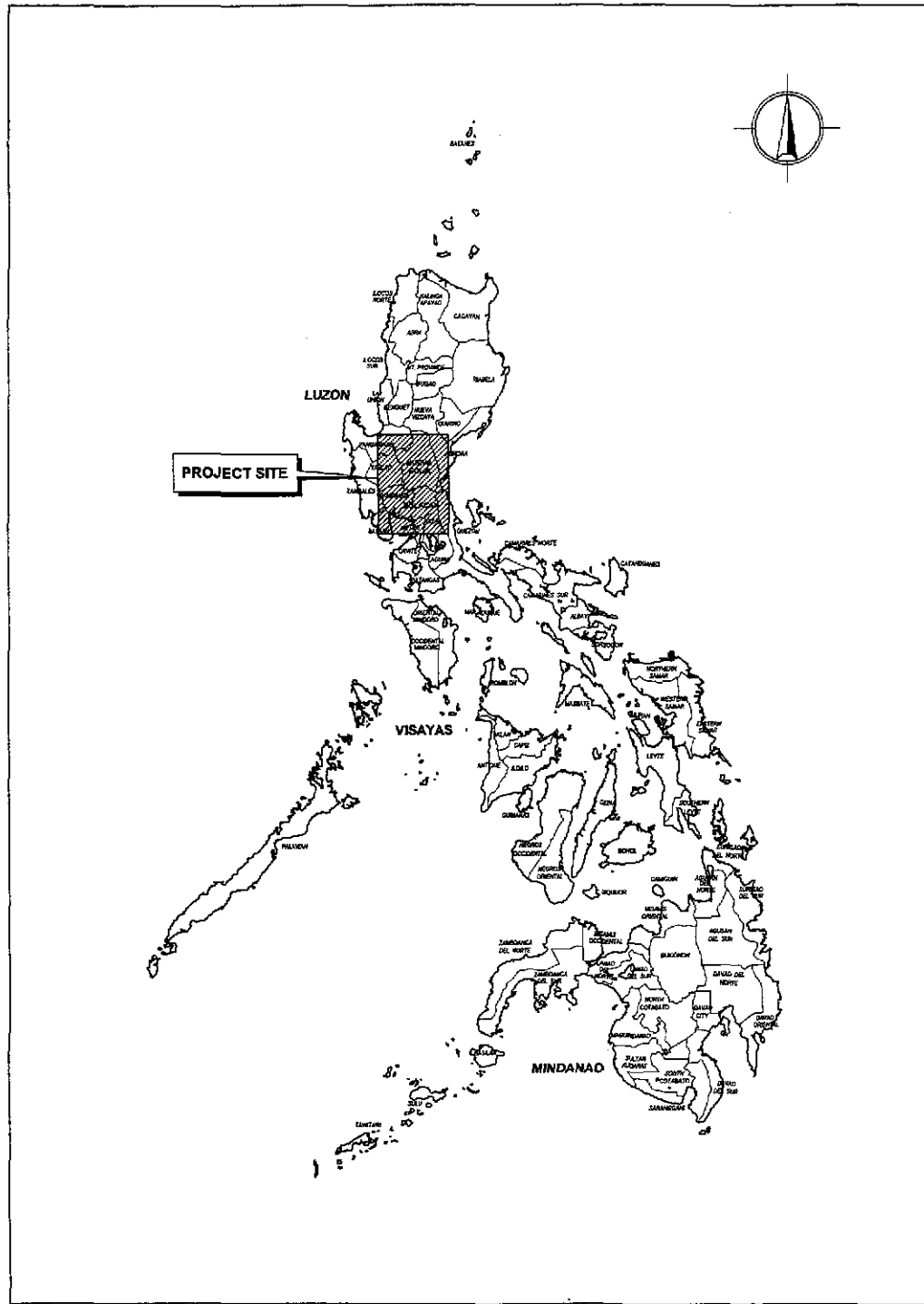
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CABANATUAN BYPASS - PACKAGE III

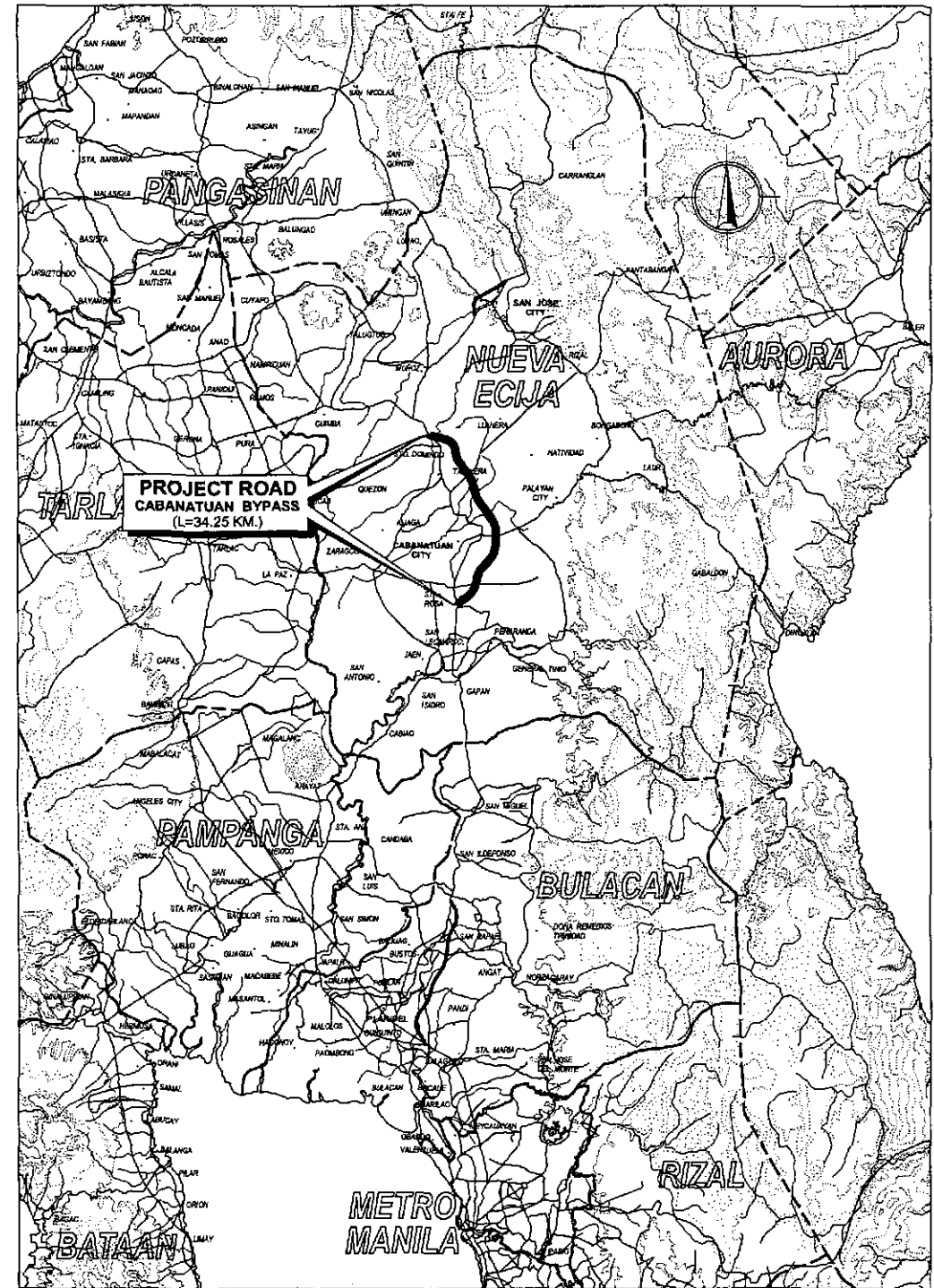
(ULTIMATE STAGE)

SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING
B10M-41	CAST-IN-SITU DECK SLAB REINFORCEMENT (PIER 15-L)	B10A-03	GIRDER LAYOUT PLAN (ABUT. A1 TO PIER 6 & PIER 15 TO ABUT. A2)	ES-02	SERVICE POLE DETAILS
B10M-42	CAST-IN-SITU DECL. SLAB REINFORCEMENT (PIER 11-L)	B10A-04	AASHTO GIRDER TYPE V LAYOUT AND DIMENSIONS	ES-03	STREET LIGHT POLE DETAILS
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	SUBSTRUCTURE	B10A-06	PIER LAYOUT AND DIMENSIONS (P1 TO P5, P16 TO P20 & P22 TO P26)	EI-01	LAYOUT PLAN AND LOAD SCHEDULE, INTERSECTION A-21 (STA 121+361.056)
B10M-51	PIER LAYOUT AND DIMENSIONS (P6 & P15)	B10A-07	ABUTMENT LAYOUT AND DIMENSIONS (ABUT. A1 & ABUT. A2)		ROADWAY LIGHTING LAYOUT FOR BRIDGE NO.10 PAMPANGA RIVER BRIDGE
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B10M-53	PIER LAYOUT AND DIMENSIONS (P7 TO P10, P12 TO P14)	B10A-09	COPING LAYOUT AND DIMENSIONS (P1 TO P5, P16 TO P20 & P22 TO P26)	EB-02	ROADWAY LIGHTING PLAN AND LOAD SCHEDULE
B10M-54	COPING LAYOUT AND DIMENSIONS (P6 & P15)		SUPERSTRUCTURE		ENGINEER'S FIELD OFFICE & LIVING QUARTERS
B10M-55	COPING LAYOUT AND DIMENSIONS (P11)	B10A-21	TYPICAL SLAB REINFORCEMENT DETAILS 1 OF 3		ARCHITECTURAL
B10M-56	COPING LAYOUT AND DIMENSIONS (P7 TO P10, P12 TO P14)	B10A-22	TYPICAL SLAB REINFORCEMENT DETAILS 2 OF 3	FA-01	PERSPECTIVE AND TABLE OF CONTENTS
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B10M-58	COLUMN REINF. DETAILS (P7 & P14)	B10A-24	DETAILS OF AASHTO GIRDER TYPE V (FIX - FIX) - 1 OF 2	FA-03	ENGR'S LIVING QTRS - FLOOR PLAN, ELEVATIONS, CROSS-SECTIONS AND REFLECTED CEILING PLAN
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B10M-60	COPING REINF. DETAILS (P7 & P14)	B10A-26	DETAILS OF AASHTO GIRDER TYPE V PRESTRESSING CABLE (FIX - FIX)	FA-05	ENGR'S LIVING QUARTERS - ROOF PLAN, CROSS-SECTION AND SCHEDULE OF DOORS & WINDOWS
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B10M-62	PILE CAP REINF. DETAILS (P6 TO P15) - 2 OF 2	B10A-28	DETAILS OF AASHTO GIRDER TYPE V (EXP - FIX) - 2 OF 2	FA-07	ENGR'S FIELD OFFICE / LABORATORY - FRONT & RIGHT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
B10M-63	PILE CAP REINF. DETAILS (P7 TO P14) - 1 OF 2	B10A-29	DETAILS OF AASHTO GIRDER TYPE V PRESTRESSING CABLE (EXP - FIX)	FA-08	ENGR'S LIVING QTRS - REAR & LEFT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
B10M-64	PILE CAP REINF. DETAILS (P7 TO P14) - 2 OF 2	B10A-30	REINFORCEMENT DETAILS OF CONTINUITY, END & INTERMEDIATE DIAPHRAGMS	FA-09	ENGR'S FIELD OFFICE - FRONT & RIGHT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
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B10M-71	TEMPORARY CRANEWAY BRIDGE & COFFERDAMS - 1 OF 2	B10A-43	COLUMN REINFORCEMENT DETAILS TYPE CL-2 (P2, P4, P17, P19, P23, P25 & P26)		ELECTRICAL
B10M-72	TEMPORARY CRANEWAY BRIDGE & COFFERDAMS - 2 OF 2	B10A-44	COLUMN REINFORCEMENT DETAILS TYPE CL-3 (P3, P18, P21 & P24)	FE-01	ENGR'S FIELD OFFICE / LABORATORY - LIGHTING LAYOUT, POWER LAYOUT & ELECTRICAL SYMBOLS AND GENERAL NOTES
B10M-73	CONSTRUCTION SEQUENCE	B10A-45	PILE CAP REINFORCEMENT DETAILS (P1, P2, P4, P5, P16, P20 & P22) - 1 OF 2	FE-02	ENGR'S LIVING QTRS - LIGHTING LAYOUT, POWER LAYOUT & ELECTRICAL SYMBOLS AND GENERAL NOTES
B10M-74	CONSTRUCTION PLAN, ELEVATION & SCHEDULE	B10A-46	PILE CAP REINFORCEMENT DETAILS (P1, P2, P4, P5, P16, P20 & P22) - 2 OF 2	FE-03	ENGR'S FIELD OFFICE & LIVING QUARTERS - SCHEDULE OF LOADS AND COMPUTATIONS & ELECTRICAL RISER DIAGRAM
	MISCELLANEOUS	B10A-47	PILE CAP REINFORCEMENT DETAILS (P3, P17, TO P19, P21, P23 TO P26) - 1 OF 2		PLUMBING
B10M-81	ELASTOMERIC BEARING DETAILS (TYPE 1)	B10A-48	PILE CAP REINFORCEMENT DETAILS (P3, P17, TO P19, P21, P23 TO P26) - 2 OF 2	FP-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEWER AND WATER LINE LAYOUT AND ISOMETRIC DIAGRAM
B10M-82	ELASTOMERIC BEARING DETAILS (TYPE 2)	B10A-49	BORED PILE REINFORCEMENT DETAILS FOR 1200mmØ (TYPE BP-1)	FP-02	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEPTIC TANK DETAILS
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B10M-84	EXPANSION JOINT DETAILS	B10A-51	BORED PILE REINFORCEMENT DETAILS FOR 1000mmØ (ABUT. A1 & ABUT. A2)	FX-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - PLOT PLAN, ELEVATION OF FENCE & GATE AND TYPICAL FOUNDATION DETAIL
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	APPROACH SPANS				
	LAYOUT AND DIMENSIONS				
B10A-01	DECK SLAB LAYOUT PLAN (ABUT. A1 TO PIER 6 & PIER 15 TO ABUT. A2) - 1 OF 2				
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JICA JAPAN INTERNATIONAL COOPERATION AGENCY	KATAHIRA & ENGINEERS INTERNATIONAL	YEO YACHIYO ENGINEERING CO., LTD.	DATE	SIGNATURE	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :						
			DESIGNED	10/14/02						<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 (Pinaridel, Cabanatuan and San Jose Bypasses)	FULL SIZE A1	INDEX OF DRAWINGS (ULTIMATE STAGE) Sheet 2 of 2	GC-02
			CHECKED	10/17/02						<i>[Signature]</i>	Submitted By: DANILO C. TRAJANO Project Director				



1 KEY MAP
GC-03 NOT TO SCALE



2 VICINITY MAP
GC-03 NOT TO SCALE

<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p> <p> KATAHIRA & ENGINEERS INTERNATIONAL YACHIO ENGINEERING CO., LTD.</p>	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :	
	CHECKED	12/17/02	ACACIO GOSE		Submitted By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinaridel, Cabanatuan and San Jose Bypasses)					NOT TO SCALE
	SUBMITTED	12/19/02	Mr. Kuchi		DANILLO C. TRAJANO Project Director JOSEFINA M. ALADAR Chief, Highways Division GILBERTO S. REYES OIC, Director IV MANUEL M. BONDAN Undersecretary SIMEON A. DATUMANDING Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE III					FULL SIZE A1
BUREAU OF DESIGN OFFICE OF THE SECRETARY BATAAN METRO MANILA BULACAN RIZAL											



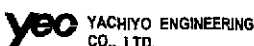

LEGEND AND SYMBOLS

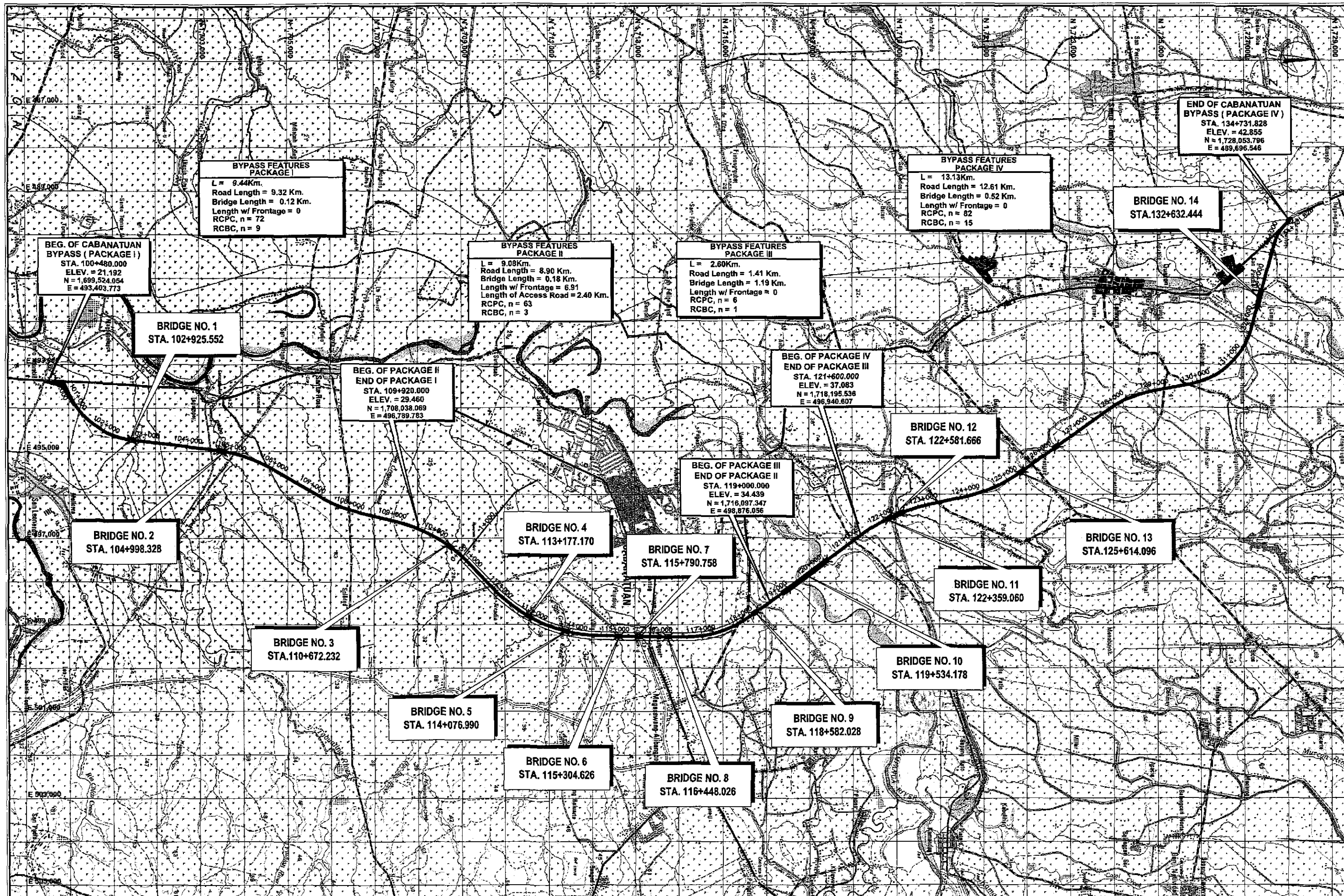
EXISTING FEATURES	
ROAD	
CONTOUR	
ORIGINAL GROUND	
CONCRETE FENCE	
BARBED WIRE FENCE	
HOUSE	
TREES	
BRIDGE	
SINGLE PIPE CULVERT	
DOUBLE PIPE CULVERT	
BOX CULVERT	
DITCH LINE/ IRRIGATION LINE	
IRRIGATION LINE	
RIVER/CREEK	
ELECTRIC POST	
KILOMETER POST	
TRAVERSE STATION POINT	
BENCHMARK	
FISH POND	
NATIONAL 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	Ta	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 CULVER	⊔	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  KATAHIRA & ENGINEERS INTERNATIONAL  YACHIO ENGINEERING CO., LTD.	DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/14/02	<i>[Signature]</i>	BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinarid, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	ABBREVIATIONS	GC-05
	CHECKED	10/17/02	<i>[Signature]</i>	OFFICE OF THE SECRETARY	CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		
	SUBMITTED	10/19/02	<i>[Signature]</i>	Submitted By: DANILO C. TRAJANO <i>Project Director</i> Reviewed By: JOSEFINA M. ALAGAR <i>Chief, Highways Division</i> Recommended By: GILBERTO S. REYES <i>Dir. Director N</i> (See cover sheet for Signature/Approval) Approved By: MANUEL M. BONDAN <i>Undersecretary</i> SIMON A. DATUMANDIG <i>Secretary</i>				



	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	12/19/02	S. GOS	BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:40,000	PROJECT ROAD GENERAL ALIGNMENT / FEATURES	GC-06
	SUBMITTED	10/14/02	Mr. Kishu	Submitted By:	Reviewed By:	Recommended By:	Office of the Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		
				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			

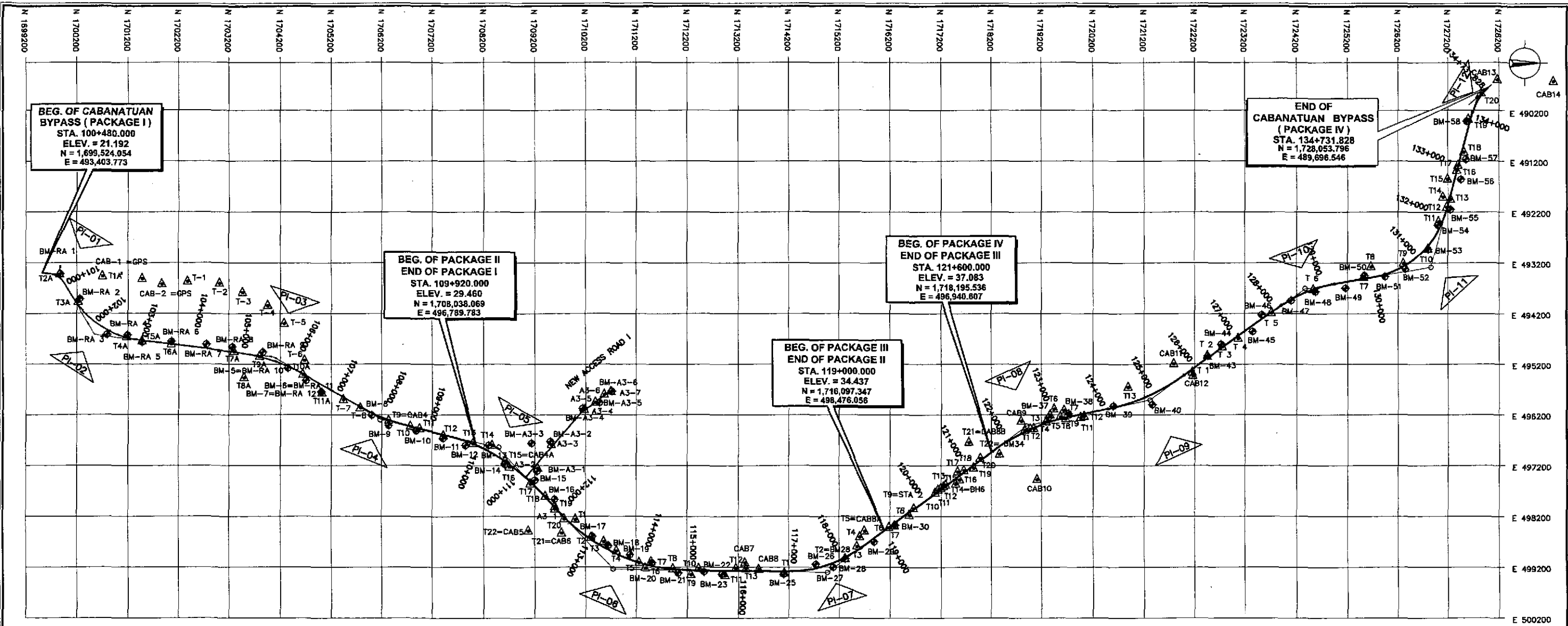


TABLE OF HORIZONTAL AND VERTICAL CONTROL			
POLYGON POINT	COORDINATES	ELEV.	REMARKS
	NORTHING EASTING		
BM-RA 1	1,699,880.470 493,418.310	21.773	It is located on the left side of the national highway going north of the beginning of the bypass re-alignment under an acacia tree near the steel fence corner 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. Tagumpay, San Leonardo.
BM-RA 5	1,701,481.927 494,766.231	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. Tagumpay, San Leonardo.
BM-RA 6	1,702,062.462 494,751.855	22.910	It is located on the left side of the road alignment placed on the side of a road 2 m. from its centerline beside an electric post in Brgy. Tagumpay, 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 eucalypt tree in Brgy. Tagumpay, San Leonardo.
BM-RA 8	1,703,271.267 494,855.750	23.741	It is located on the left side of the alignment placed on the side of a road (gravel) 2 m. away from the centerline and 4 m. from the top bank of an irrigation canal in Brgy. Tabunayan, Sta. Rosa.
BM-RA 9	1,703,867.668 494,960.590	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	25.605	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 60 cm. from the toe of an irrigation canal.
BM-RA 10	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. Tagumpay, 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-RA 12	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 3 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 shades 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. Arlo Vilard in Brgy. Tagpas, 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 phalanx of trees in Brgy. Tagpas, Sta. Rosa.
BM-14	1,708,628.284 497,180.516	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 from the side of a road in Brgy. Tagpas, Sta. Rosa.
BM-15	1,709,200.415 497,484.887	28.688	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	29.530	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 at Brgy. Sta. Arcadia, Cabanatuan City.
BM-17	1,710,336.115 498,592.643	31.009	It is located on the left side of the alignment placed on the side of road (gravel) 1.80 m. away from its centerline in Brgy. Sta. Arcadia.
BM-18	1,710,649.187 498,773.128	30.505	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	1,711,076.165 498,651.653	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	COORDINATES	ELEV.	REMARKS
	NORTHING EASTING		
BM-20	1,711,512.317 499,109.668	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	32.657	It is located on the right side of the alignment placed on the side of a road 1.80 m. away from its centerline and 3.50 m. away from the top bank of an irrigation canal in Brgy. Valle Cruz.
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	1,712,881.186 499,335.652	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 Roja.
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 Roja.
BM-28	1,715,321.684 499,037.069	34.467	It is located on the right side of the alignment placed on the side of the barangay road 2 m. away from the centerline of Brgy. Cruz Roja at the side of an electric post.
BM-29	1,715,891.768 498,699.775	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 in Brgy. Cruz Roja.
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. Obrero, 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. Cruz Roja.
BM-36	- -	37.133	It is located on the left side of the alignment placed underneath a mango tree in the middle of a ricefield in Brgy. Cruz Roja.
BM-37	1,719,342.548 496,251.677	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 of 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 at Brgy. Pula, Cabanatuan City.
BM-39	1,720,595.956 496,023.421	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 of Brgy. Homestead 1, Talavera.
BM-43	1,722,462.946 495,042.546	38.534	It is located on the left side of the alignment placed on the side of a road (dirt) 1.50 m. away from its centerline beside a concrete pillar with marking BM-43-1-B.
BM-44	1,722,735.654 494,806.172	38.406	It is located on the left side of the alignment placed on the side of a dirt road intersection 1.50 m. away from its centerline beside a barangay sidewalk Brgy. Paludpo, Talavera.
BM-45	1,723,535.448 494,225.815	38.229	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 nipa hut at Brgy. Paludpo, Talavera.
BM-46	1,723,535.448 494,225.815	38.229	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 concrete pillar with marking BM-46-1-B.
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. Dimasplang Sur, Talavera.
BM-48	1,724,565.996 493,762.388	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. Dimasplang Sur, Talavera.
BM-49	1,725,157.190 493,693.946	42.110	It is located on the right side of the alignment placed on the side of a road 3 m. away from its centerline and 1 m. away from a canal, Brgy. Gidag, 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. Gidag, Talavera.

TABLE OF HORIZONTAL AND VERTICAL CONTROL			
POLYGON POINT	COORDINATES	ELEV.	REMARKS
	NORTHING EASTING		
BM-51	1,725,936.648 493,468.459	43.274	It is located on the right side of the alignment placed in the intersection of a rice paddy in the middle of a ricefield 150 m. away from the centerline of a concrete barangay road, Brgy. Gidag, 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. Bantig 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	1,727,002.842 492,466.434	43.780	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	1,727,466.793 491,560.117	42.069	It is located on the left side of the alignment 70 m. away underneath a mango tree in Brgy. Campos, Talavera.
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. Lombay, 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. Lombay, Talavera.

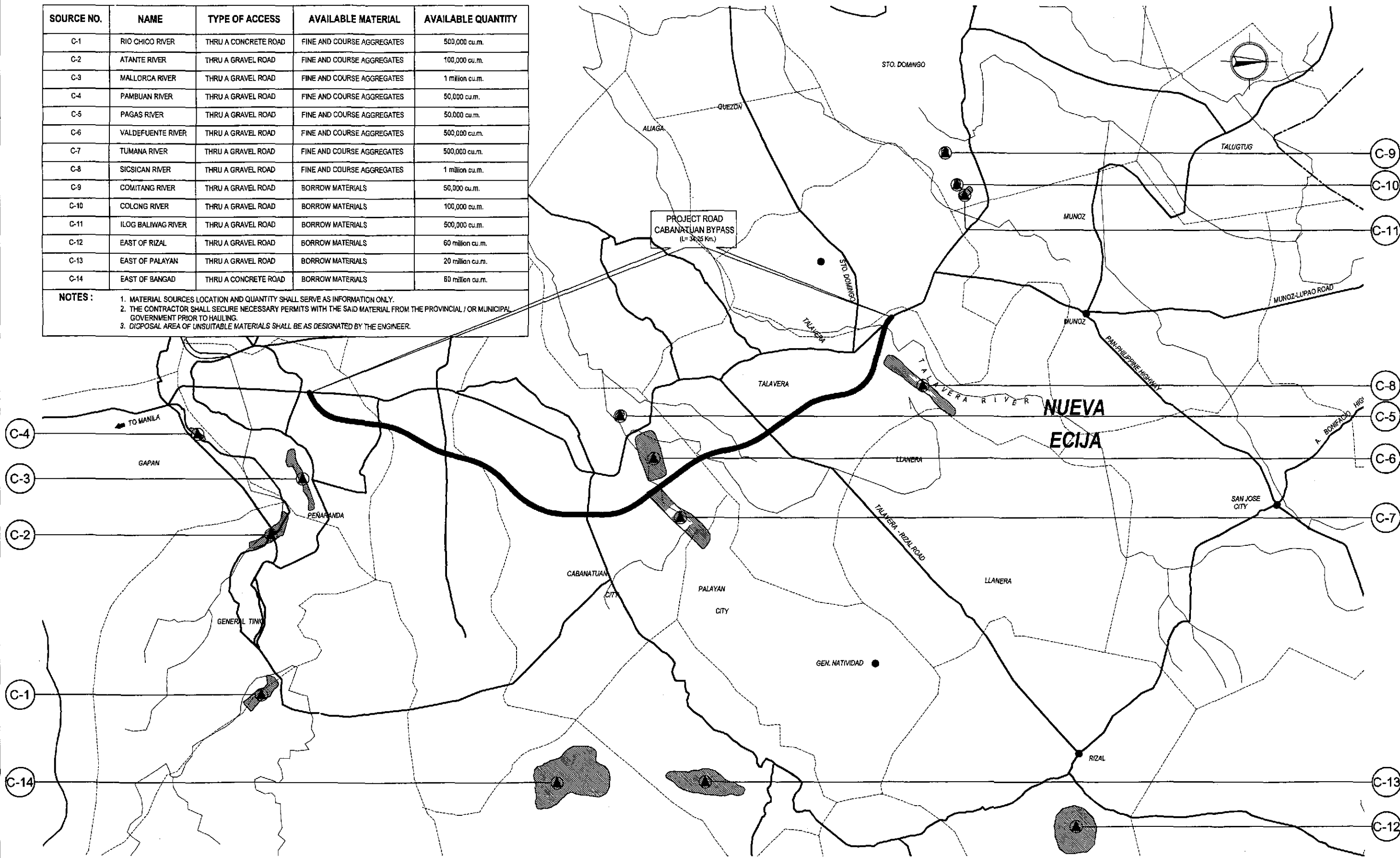
NEW ACCESS ROAD 1 - TABLE OF HORIZONTAL AND VERTICAL CONTROL			
POLYGON POINT	COORDINATES	ELEV.	REMARKS
	NORTHING EASTING		
BM-A3-1	1,709,244.998 497,307.583	27.574	It is located on the right side of the access road placed on the side of the access road 60 m. away from its centerline between 2 coconut trees near a dirt 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 narrow tree 3 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	26.369	It is located on the right side of the access road placed on the top bank of an irrigation canal beside an irrigation canal 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	1,710,716.368 495,728.628	28.698	It is located on the right side of the road alignment near Bato bridge on its gutter 15 m. away from its 1st approach in Brgy.

	DESIGNED: 10/14/02 CHECKED: 10/17/02 SUBMITTED: 10/19/02	DATE: 10/14/02 DRAWN: S. GARCIA CHECKED: M. GONZALEZ TEAM LEADER: M. GONZALEZ		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: 1:40,000 FULL SIZE A1	SHEET CONTENTS: HORIZONTAL AND VERTICAL CONTROL MONUMENTS Sheet 2 of 2	SHEET NO.: GC-08
	PUHL - PMO Submitted By: DANILLO C. TRAJANO, Project Director Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division Recommended By: GILBERTO S. REYES, DIC, Director IV Office of the Secretary Recommended By: MANUEL M. BONDAN, Undersecretary Approved By: SIMEON 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	SICSICAN 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-09 SCALE 1:80,000

	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : 1:80,000 FULL SIZE A1	SHEET CONTENTS : LOCATION OF MATERIAL SOURCES	SHEET NO. : GC-09
	CHECKED	10/17/09	S. GOSCE	BUREAU OF DESIGN OFFICE OF THE SECRETARY						
	SUBMITTED	10/19/09	Ms. KUCAN	Submitted By:	Reviewed By:	Recommended By:				
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary			

SUMMARY OF QUANTITIES (ULTIMATE STAGE)

ITEM NO.	DESCRIPTION	UNIT	QUANTITY					REMARKS
			BYPASS	A-21	A-21a	BRIDGE #10	TOTAL	
PART C - EARTHWORKS								
100(1)	Clearing and Grubbing	ha	1.40	-	-	-	2.00	
101(1)	Removal of Existing Structures and Obstructions	L.S.	1.00	-	-	-	1.00	
101(3)a	Removal of Existing PCC Pavement	m ²	947.00	-	-	-	947.00	
101(5)b	Relocation of Existing Guardrails	m	854.00	-	-	-	854.00	
101(7)	Removal of Existing Slope Protection	m ³	-	-	-	97.27	98.00	
101(8)	Removal of Existing Slope Protection (Hand-laid Rock)	m ³	-	-	-	42.85	43.00	
101(9)	Removal of Existing Gabion	m ³	-	-	-	189.00	189.00	
101(11)	Removal of Existing Combination Concrete Curb & Gutter/Side Strip	m	700.00	-	-	-	700.00	
101(12)	Relocation of Existing Road Signs	each	5.00	-	-	-	6.00	
101(13)	Removal of Existing Road Signs	each	2.00	-	-	-	2.00	
103(1)	Structure Excavation	m ³	75.39	-	-	787.50	863.00	
103(2)a	Bridge Excavation above OWL (Common Soil)	m ³	-	-	-	5,522.71	5,523.00	
103(2)c	Bridge Excavation below OWL (Common Soil)	m ³	-	-	-	9,845.98	9,846.00	
103(3)a	Gravel Foundation Fill	m ³	9.23	-	-	-	10.00	
104(1)	Embankment from Roadway Excavation	m ³	2,441.99	-	-	-	2,442.00	
104(3)	Embankment from Borrow Pit	m ³	5,468.31	-	-	508.62	6,977.00	
104(4)	Embankment from Borrow (Selected Granular Material) for Bridge	m ³	-	-	-	597.34	598.00	
105(1)	Subgrade Preparation (Common Soil)	m ²	9,437.86	-	-	-	9,438.00	
PART D - BASE AND SUBBASE COURSE								
200(1)	Aggregate Subbase Course	m ³	4,345.00	-	-	25.76	4,371.00	
PART E - SURFACE COURSES								
300(1)	Gravel Surface Course	m ³	13.53	-	-	-	14.00	
310(2)	Asphalt Mixture Wearing Course (t=50mm) for bridge pavement, including tack coat	m ²	-	-	-	9,281.25	9,282.00	
SPL 310(3)	Waterproofing Layer for Pampanga Deck Slab	m ²	-	-	-	4,826.25	4,827.00	
311(1)b	PCC Pavement (Plain), t=250mm	m ²	9,634.22	-	-	-	9,635.00	
311(1)d	PCC Pavement (Plain), t=180mm	m ²	7,379.55	-	-	-	7,380.00	
311(2)	PCC Pavement (Reinforced) t=300mm Approach Slab	m ²	-	-	-	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)	High Strain Dynamic Pile Test for Ø 1000mm Bored Piles	each	-	-	-	1.00	1.00	
SPL 400(23)c	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 Taisavera 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)b	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 (250 t) in Pampanga Bridge	each	-	-	-	8.00	8.00	
403(8)b	Bearing Shoe for Steel Plate Girder Type 2 (650 t) in Pampanga Bridge	each	-	-	-	8.00	8.00	
403(8)c	Bearing Shoe for Steel Plate Girder Type 3 (650 t) in Pampanga Bridge	each	-	-	-	6.00	6.00	
404(1)	Reinforcing Steel (Grade 40)	kg	-	-	-	396,708.89	396,709.00	
404(2)	Reinforcing Steel (Grade 60)	kg	7,958.00	-	-	1,378,074.77	1,386,033.00	
405(1)a	Structural Concrete Class A (f _c =21MPa, max. aggregate 38mm) for heavily reinforced structures	m ³	94.43	-	-	42.88	138.00	

ITEM NO.	DESCRIPTION	UNIT	QUANTITY					REMARKS
			BYPASS	A-21	A-21a	BRIDGE #10	TOTAL	
405(1)e	Structural Concrete Class AA1 (f _c =28MPa, max. aggregate 25) for long bridge substructures	m ³	-	-	-	6,640.77	6,641.00	
405(1)f	Structural Concrete Class AA2 (f _c =28MPa, max. aggregate 20mm) for long bridge superstructures	m ³	-	-	-	1,543.35	1,544.00	
405(2)	Structural Concrete Class B (f _c =17MPa, max. aggregate 50mm) for plain or lightly reinforced structures	m ³	-	-	-	12.00	12.00	
405(3)	Structural Concrete Class C (f _c =21MPa, max. aggregate 12mm) for thin reinforced members	m ³	-	-	-	822.29	823.00	
405(6)	Lean Concrete (f _c =17MPa, max. aggregate 38mm)	m ³	4.66	-	-	203.03	208.00	
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	
406(1)p	Precast Prestressed Structural Concrete (PC Deck Slab, 280 x 2000 x 9650mm)	m ²	-	-	-	5,643.32	5,644.00	
407(1)b	Electrometric Bearing Pad, Duro 60 (600x300x50mm)	each	-	-	-	144.00	144.00	
407(2)b	Expansion Joint, t= 50mm Movement)	m	-	-	-	20.00	20.00	
407(2)c	Expansion Joint, t= 70mm Movement)	m	-	-	-	10.00	10.00	
407(2)f	Expansion Joint, t= 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)b	Pier Protection Concrete Blocks for Pampanga Bridge	m ²	-	-	-	840.00	840.00	
SPL 420(4)d	Temporary Craneway for Pampanga Bridge Construction	m	-	-	-	320.00	320.00	
SPL 420(5)b	Temporary Access Road (Causeway) for Pampanga Bridge Construction	m	-	-	-	880.00	880.00	
SPL 420(6)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								
504(5)	Grouted Riprap Class A	m ³	-	-	-	14.16	15.00	
506(1)	Hand Laid Rock Apron (Loose Boulder Apron)	m ³	-	-	-	30.15	31.00	
507(2)b	Steel Sheet Piles (400x85x8mm), furnished & driven	m	-	-	-	1,296.00	1,296.00	
509(1)	Gabions	m ³	-	-	-	301.50	302.00	
510(1)	Rubble Concrete Slope Protection	m ³	-	-	-	171.63	172.00	
PART H - MISCELLANEOUS STRUCTURES								
600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x364mm)	m	2,859.00	103.52	-	-	2,963.00	
605(2)a	Regulatory Signs (Triangular 1039mm)	each	2.00	-	-	-	2.00	
605(2)d	Regulatory Signs (Rectangular 450x750mm)	each	-	2.00	-	-	2.00	
608(1)	Furnishing and Paving Top Soil	m ³	447.26	-	-	-	448.00	
610(1)	Sodding	m ²	4,472.62	-	-	-	4,473.00	
611(1)a	Trees (Furnishing and Transplanting) Low Tree H = 1.5m	each	4,780.00	-	-	-	4,780.00	
611(1)b	Trees (Furnishing and Transplanting) Medium Tree 1.5m < H = 3.0m	each	352.00	-	-	-	352.00	
611(1)c	Trees (Furnishing and Transplanting) High Tree (Young Tree) 1.5m < H = 3.0m	each	16.00	-	-	-	16.00	
612(1)a	ReflectORIZED Thermoplastic Pavement Markings (White)	m ²	846.93	40.30	-	-	888.00	
SPL 612(2)	Removal of Existing Thermoplastic Pavement Markings	m ²	87.24	-	-	-	88.00	
SPL 620(5)b	Relocation of 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)c	Street Lighting Service Pole with Panel	each	-	-	-	2.00	2.00	

	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 (Pinarid, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : FULL SIZE A1	SHEET CONTENTS : SUMMARY OF QUANTITIES (ULTIMATE STAGE)	SHEET NO. : GC-10
	CHECKED				BUREAU OF DESIGN							
	SUBMITTED				OFFICE OF THE SECRETARY							
					Submitted By:	Reviewed By:	Recommended By:	Recommended By:	Approved By:			
					DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highway Division	GILBERTO S. REYES OC, Director IV	MANUEL M. BONGHAN Undersecretary	SIMEON A. DATUMAMONG Secretary			

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 Tamba Bridge's first approach, about 0.05 cm. above the bridge's concrete sidewalk.
CAB-2	1,701,869.179	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 x 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. mans. 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	26.289	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 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	33.467	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.
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	496,746.848	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. Bullran, 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	497,481.812	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	1,721,785.048	495,184.942	39.469	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpangan 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 Pinagpangan 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	489,626.485	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 ECJA, 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 OWNERS, OR THE DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS PRIOR TO CONSTRUCTION.

10.0 ROAD CONNECTIONS AND PRIVATE ENTRANCES

- 10.1 OPENINGS FOR DRIVEWAYS OR PRIVATE ENTRANCES SHALL BE CONSTRUCTED ONLY ALONG SECTIONS OF THE PROJECT ROAD WHERE FRONTAGE ROADS AND/OR TURNOUTS ARE TO BE PROVIDED. SUCH CONNECTIONS SHALL BE DETERMINED BY THE ENGINEER AND SHALL BE CONSTRUCTED IN SUCH A MANNER AS TO INSURE PROPER CONNECTION AND RIDING QUALITY.
- 10.2 ROAD CONNECTIONS SHALL BE CONSTRUCTED AS SHOWN ON PLANS. THE ROAD STRUCTURE OF EACH CONNECTION SHALL BE AS RECOMMENDED IN THE DRAWING.
- 10.3 THE INTERSECTIONS NOT SHOWN ON THE DRAWINGS SHALL REQUIRE PLANS SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTIONS.
- 10.4 THE LIMIT OF CONSTRUCTION FOR ROAD CONNECTIONS AND PRIVATE ENTRANCES SHALL BE AS SHOWN IN THE DRAWING OR AS 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 THE CLEANING, UNBLOCKING AND/OR RELAYING OF REINFORCED CONCRETE PIPES, CONSTRUCTION OF CHANNELS AND DITCHES AS DIRECTED BY THE ENGINEER TO ENSURE AN OPERATIONAL TEMPORARY DRAINAGE SYSTEM DURING THE CONSTRUCTION PERIOD SHALL BE UNDERTAKEN BY THE CONTRACTOR WITHOUT ANY COMPENSATION.

12.0 ACCESSIBILITY LAW:

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

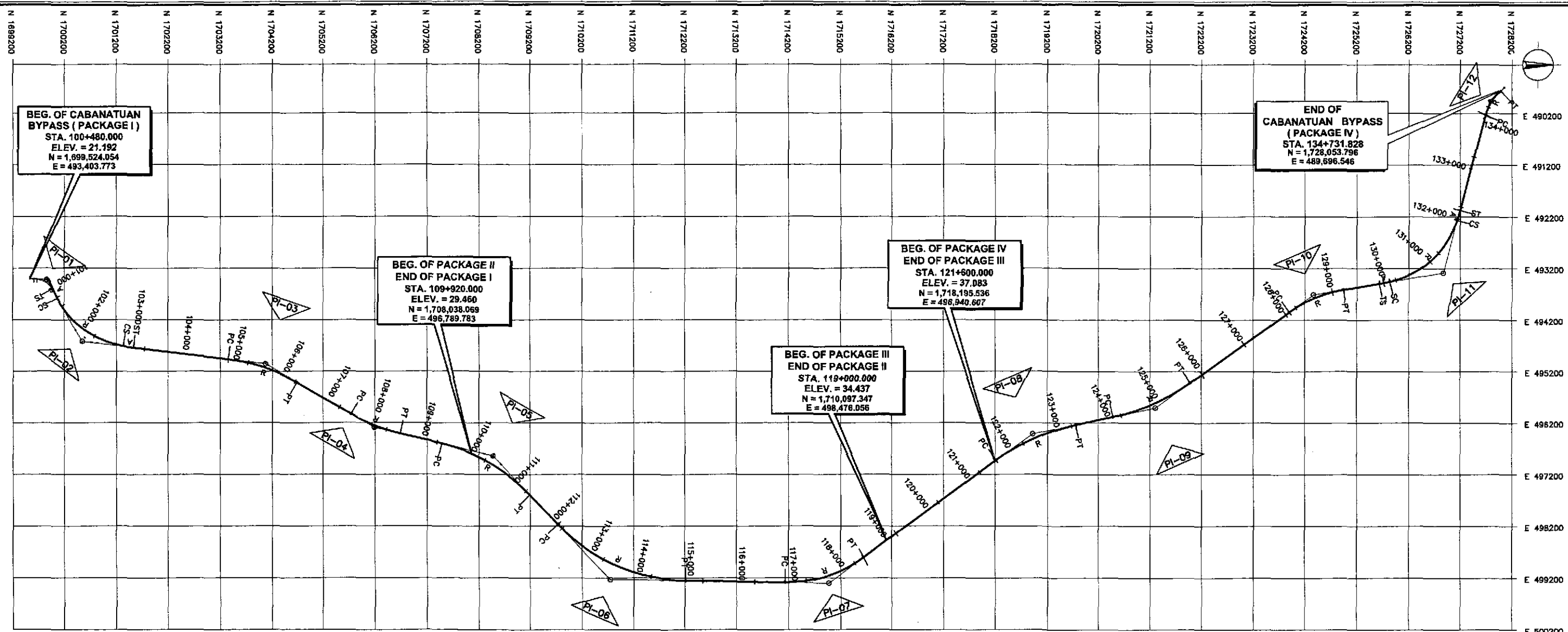
13.0 TREE PLANTING ALONG NATIONAL ROADS

- 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.

	DATE: 10/14/01 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 : FULL SIZE A1	SHEET CONTENTS : GENERAL NOTES HIGHWAY/CIVIL AND DRAINAGE	SHEET NO. : RG-01
	DESIGNED: 10/14/01 CHECKED: 10/17/01 SUBMITTED: 10/19/01	PUHL - PMD Submitted By: DANILLO C. TRAJAND Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highway Division	Recommended By: GILBERTO S. REYES OIC, Director IV	Office of the Secretary Recommended By: MANUEL M. BONONAN Undersecretary	Approved By: SIMEON A. DATUMANGONG Secretary			
	CABANATUAN BYPASS - CONTRACT PACKAGE III								



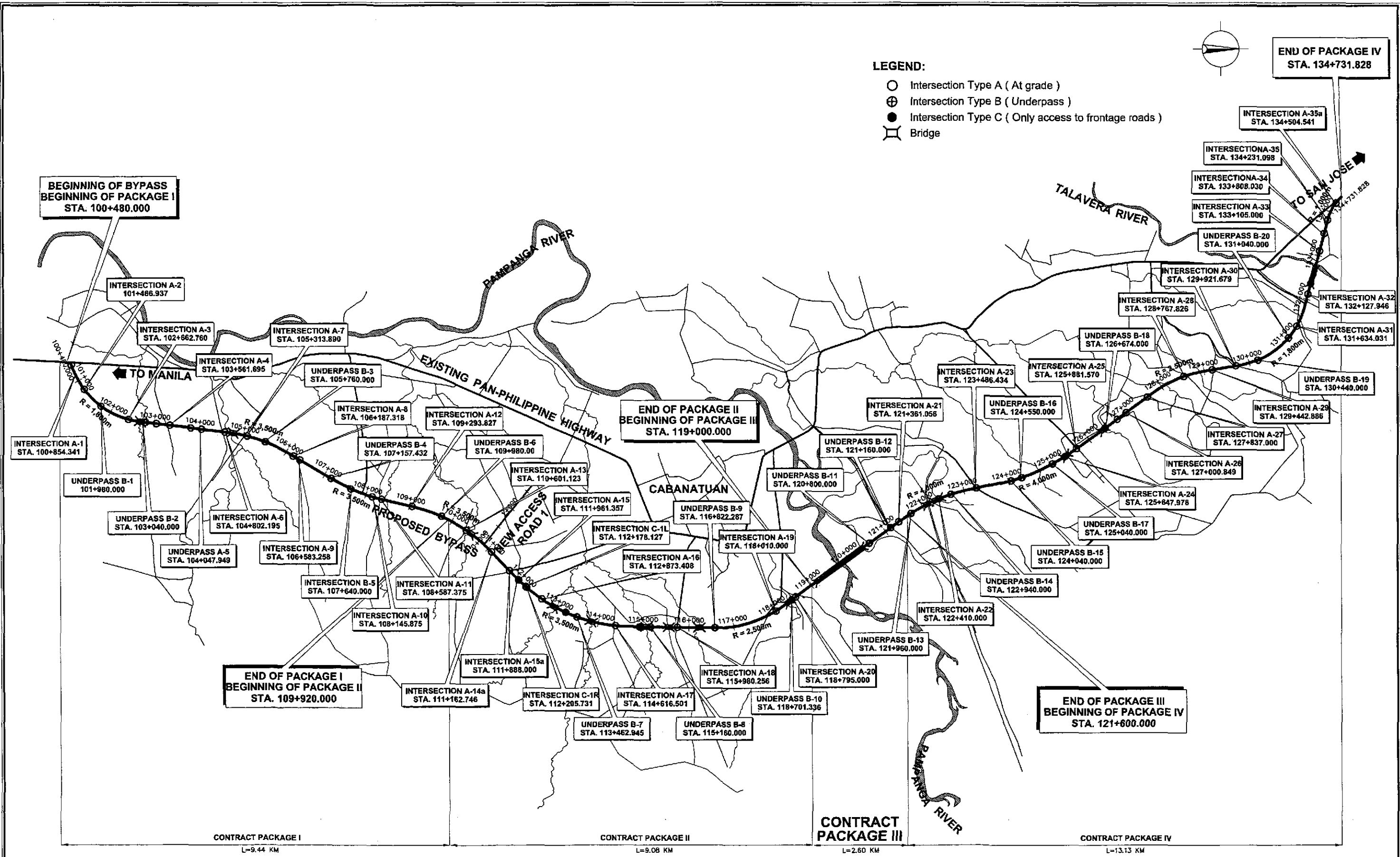
P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT Θ_B	DEFLECTION ANGLE	A R	Ls Lc	STATION
BEG.	100+480.00							
01	100+806.148	326.146	183°25'21"	246.146	56°18'36"	150.000	84.000	TS=100+560.000 SC=100+624.000 CS=100+952.888
		1,385.199	239°41'57"	435°01"		400.000	328.888	ST=101+018.888 TS=101+184.756 SC=101+364.756
02	102+185.940	3,544.720	187°02'31"	147.870	52°39'28"	600.000	200.000	TS=102+819.034 SC=103+019.034
						1,800.000	1,454.277	
03	105+572.571			720.109	23°15'08"			PC=104+852.462 PT=106+272.858
		2,451.020	210°17'39"	514.528	18°43'34"	3,500.000	1,420.397	
04	108+003.789	2,363.853	193°34'05"			3,500.000	1,021.737	PC=107+489.241 PT=108+510.979
				1,035.121				PC=109+325.183 PT=111+338.048
05	110+380.304	3,288.872	226°31'09"			3,500.000	2,012.865	
				1,489.788	45°33'32"			PC=112+122.011 PT=114+905.048
06	113+591.799	4,225.528	180°57'37"			3,500.000	2,783.035	
				840.295				PC=118+820.490 PT=118+441.783
07	117+860.785	4,885.881	143°48'12"			2,500.000	1,821.273	

P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT Θ_B	DEFLECTION ANGLE	A R	Ls Lc	STATION
08	122+487.349	4,885.881	143°48'12"	856.892	24°11'07"			PC=121+630.358 PT=123+318.815
		2,447.505	167°59'20"			4,000.000	1,888.459	
09	124+908.328			837.385	23°38'52"			PC=124+071.944 PT=125+722.871
		3,773.512	144°20'28"			4,000.000	1,850.927	
10	128+858.998			577.297	28°00'20"			PC=128+081.701 PT=129+216.405
		2,530.124	170°20'47"			2,500.000	1,134.704	
11	131+189.232			1,250.689	65°09'11"			TS=129+918.543 SC=130+118.543
		3,450.454	105°11'37"	310°59"		1,800.000	1,846.841	CS=131+985.384 ST=132+185.384
12	134+365.149			292.954	32°39'25"			PC=134+072.198 PT=134+842.155
		382.827	137°50'54"			1,000.000	589.980	
END	134+731.823							

P.I. No.	NORTHING	EASTING	NORTHING	EASTING	
02	1,700,548.505	494,819.208	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	494,965.486
			PT	1,704,888.282	495,417.031
			PC	1,705,738.544	496,030.823
			PT	1,706,682.980	496,410.880
04	1,708,182.811	495,290.171	PC	1,707,474.461	496,601.893
			PT	1,708,192.973	497,595.822
			PC	1,708,732.427	498,164.670
			PT	1,712,213.387	499,255.788
05	1,710,743.806	499,231.154	PC	1,714,128.581	499,287.887
			PT	1,715,985.384	499,805.727
			PC	1,718,220.033	496,922.679
			PT	1,719,748.852	496,238.234
06	1,714,968.738	499,301.970	PC	1,720,486.493	496,081.506
			PT	1,721,985.820	495,419.082
			PC	1,723,802.473	494,043.979
			PT	1,724,940.649	493,610.832
07	1,718,911.822	496,416.576	TS	1,725,632.845	493,482.891
			SC	1,725,828.332	493,455.713
			CS	1,727,137.832	492,268.171
			ST	1,727,193.605	492,076.192
08	1,721,305.544	485,807.244	PC	1,727,893.343	490,238.031
			PT	1,727,987.313	489,756.723
			PC	1,728,802.473	494,043.979
			PT	1,729,840.649	493,610.832
09	1,724,371.527	493,707.438	TS	1,725,632.845	493,482.891
			SC	1,725,828.332	493,455.713
			CS	1,727,137.832	492,268.171
			ST	1,727,193.605	492,076.192
10	1,727,770.121	489,853.318	PC	1,728,802.473	494,043.979
			PT	1,729,840.649	493,610.832
			PC	1,730,738.544	496,030.823
			PT	1,732,185.384	496,410.880
11	1,728,885.824	493,283.184	TS	1,729,918.543	499,255.788
			SC	1,730,118.543	499,287.887
			CS	1,731,985.384	499,805.727
			ST	1,732,185.384	499,805.727
12	1,731,189.232	495,053.779	PC	1,732,185.384	499,805.727
			PT	1,733,185.384	499,805.727
			PC	1,733,185.384	499,805.727
			PT	1,734,185.384	499,805.727
END	1,734,731.823	493,707.438	TS	1,735,731.823	493,707.438
			SC	1,735,731.823	493,707.438
			CS	1,735,731.823	493,707.438
			ST	1,735,731.823	493,707.438

P.I. No.	NORTHING	EASTING	NORTHING	EASTING	
BEG.	1,899,524.054	493,403.773			
01	1,699,849.819	493,423.243	TS	1,699,603.912	493,408.549
			SC	1,699,687.655	493,414.070
			CS	1,699,840.068	493,581.402
			ST	1,699,873.809	493,635.763

	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 : 1:40,000 FULL SIZE A1	SHEET CONTENTS : ALIGNMENT TECHNICAL DESCRIPTION	SHEET NO. : RG-02
	CHECKED	10/17/00	SIGNATURE		Submitted By:	Reviewed By:	Recommended By:	Approved By:				
	SUBMITTED	10/19/00	SIGNATURE		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES Dir. Director IV	MANUEL M. BONDAN Undersecretary				



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

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

	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/19/00	<i>[Signature]</i>		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 / UNDERPASSES ALONG BYPASS	RG-03
	SUBMITTED	10/19/00	<i>[Signature]</i>		CABANATUAN BYPASS - CONTRACT PACKAGE III			FULL SIZE A1		
Submitted By:		Reviewed By:		Recommended By:		Approved By:				
DANILO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONDAN Undersecretary		SIMEON A. DATUMANONG Secretary		

**SCHEDULE OF TRAFFIC SIGNS
RELOCATION OF EXISTING GUARDRAILS
AND PLANTINGS
CONTRACT PACKAGE III (ULTIMATE STAGE)**

ITEM 605 (1) WARNING SIGNS (TRIANGULAR 900mm)		
STATION	REF. NO.	REMARKS
121+240	W3-1	RIGHTSIDE MAIN BYPASS
121+420	W4-2(R)*	RIGHTSIDE MAIN BYPASS
121+490	W3-1	LEFT SIDE MAIN BYPASS

ITEM 605 (2)a REGULATORY SIGNS (TRIANGULAR 1039mm)		
STATION	REF. NO.	REMARKS
121+347	R1-2*	RIGHT SIDE MAIN BYPASS
121+375	R1-2*	LEFT SIDE MAIN BYPASS

ITEM 605 (2)c REGULATORY SIGNS (RECTANGULAR 450x750mm)		
STATION	REF. NO.	REMARKS
121+344	R2-7(L)**	CENTER ISLAND MAIN BYPASS
121+378	R2-7(L)**	CENTER ISLAND MAIN BYPASS
00+981	R2-7(L)*	CENTER ISLAND INTERSECTION A-21
01+020	R2-7(L)*	CENTER ISLAND INTERSECTION A-21

ITEM 605 (2)d REGULATORY SIGNS (CIRCULAR 600mm DIA.)		
STATION	REF. NO.	REMARKS
119+529	R6-4	RIGHT SIDE MAIN BYPASS
120+665	R6-4**	LEFT SIDE MAIN BYPASS
121+344	R3-15**	CENTER ISLAND MAIN BYPASS
121+378	R3-15**	CENTER ISLAND MAIN BYPASS
00+981	R3-15	CENTER ISLAND INTERSECTION A-21
01+020	R3-15	CENTER ISLAND INTERSECTION A-21

ITEM 605 (3) INFORMATORY SIGNS		
STATION	REF. NO.	REMARKS
a. 2209 x 1630		
121+190	GS-20	RIGHT SIDE MAIN BYPASS
121+520	GS-21**	LEFT SIDE MAIN BYPASS
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

SCHEDULE OF RELOCATION OF EXISTING GUARDRAILS AND PLANTINGS CONTRACT PACKAGE III (ULTIMATE STAGE)					
STATION	REF. NO.	1-A(3)	1-A(4)	1-A(6)	1-A(8)
118+400	119+100	0	0	0	0
119+100	119+800	0	0	0	146
119+800	120+500	0	0	0	0
120+500	121+200	0	0	0	51
121+200	121+900	70	66	66	38

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

REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS (WHITE)
1. EDGE LINE:

1.1 LEFT SIDE, OUTER EDGE			
STATION		LENGTH (m)	REMARKS
FROM	TO		
119+000.00	121+327.59	2,327.59	MAIN BYPASS
121+327.59	00+962.69	28.70	MAIN BYPASS TO RT. OF A-21
00+960.850	121+392.140	49.12	LT. OF A-21 TO MAIN BYPASS
121+392.14	121+600.00	207.86	MAIN BYPASS

1.2 RIGHT SIDE, OUTER EDGE			
STATION		LENGTH (m)	REMARKS
FROM	TO		
121+240.00	121+329.97	89.97	MAIN BYPASS
121+329.97	01+039.24	49.12	MAIN BYPASS TO RT. OF A-21
01+037.41	121+394.32	28.70	LEFT OF A-21 TO MAIN BYPASS
121+394.32	121+500.000	105.68	MAIN BYPASS

1.3 LEFT SIDE, INNER EDGE			
STATION		LENGTH (m)	REMARKS
FROM	TO		
119+000.00	121+345.57	2,345.57	MAIN BYPASS
121+377.07	121+600.00	222.93	MAIN BYPASS

1.4 RIGHT SIDE, INNER EDGE			
STATION		LENGTH (m)	REMARKS
FROM	TO		
121+140.00	121+345.57	205.57	MAIN BYPASS
121+377.07	121+600.000	222.93	MAIN BYPASS

2.0 LANE LINE			
STATION		LENGTH (m)	REMARKS
FROM	TO		
119+000.00	119+017.43	17.43	(LS) 150mm. x 3.0m @ 4.50m. GAP
119+017.43	121+145.57	2,128.14	(LS) 150mm. x 3.0m @ 9.00m. GAP
121+145.57	121+345.57	200.00	(LS) 150mm. x 3.0m @ 4.50m. GAP
121+281.75	121+345.57	63.82	(LS) OUTER 150mmx3.0m @ 4.50m GAP
119+000.00	119+017.43	17.43	(RS) 150mm. x 3.0m @ 4.50m. GAP
121+145.57	121+315.57	170.00	(RS) 150mm. x 3.0m @ 4.50m. GAP
121+281.75	121+315.57	33.82	(RS) INNER 150mmx3.0m @ 4.50m GAP
121+281.75	121+315.57	33.82	(RS) OUTER 150mmx3.0m @ 4.50m GAP
121+315.57	121+345.57	90.00	(RS) 3-150mm UNBROKEN
121+377.07	121+407.07	90.00	(LS) 3-150mm UNBROKEN
121+407.07	121+577.07	170.00	(LS) 150mm x 3.0 @ 4.50m. GAP
121+407.07	121+440.37	33.30	(LS) INNER, 150mm x 3.0m @ 4.50m GAP
121+407.07	121+440.37	33.30	(LS) OUTER, 150mm x 3.0m @ 4.50m GAP
121+577.07	121+600.00	22.93	(LS) 150mm. x 3.0m @ 9.00m. GAP
121+377.07	121+577.07	200.00	(RS) 150mm. x 3.0m @ 4.50m. GAP
121+377.07	121+440.37	63.30	(RS) OUTER 150mmx3.0m @ 4.50m GAP
121+577.07	121+600.00	22.93	(RS) 150mm. x 3.0m @ 9.00m. GAP
49+450.00	49+625.00	175.00	(LS) FRONTAGE, 150mm x 3.0m @ 4.50m GAP
49+450.00	49+625.00	175.00	(LS) FRONTAGE, 150mm x 3.0m @ 4.50m GAP
00+961.65	00+981.65	20.00	(RS) 100mm. UNBROKEN (A-21)
01+018.35	01+038.35	20.00	(LS) 100mm. UNBROKEN (A-21)

REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS (WHITE)
3.0 CONTINUITY LANE

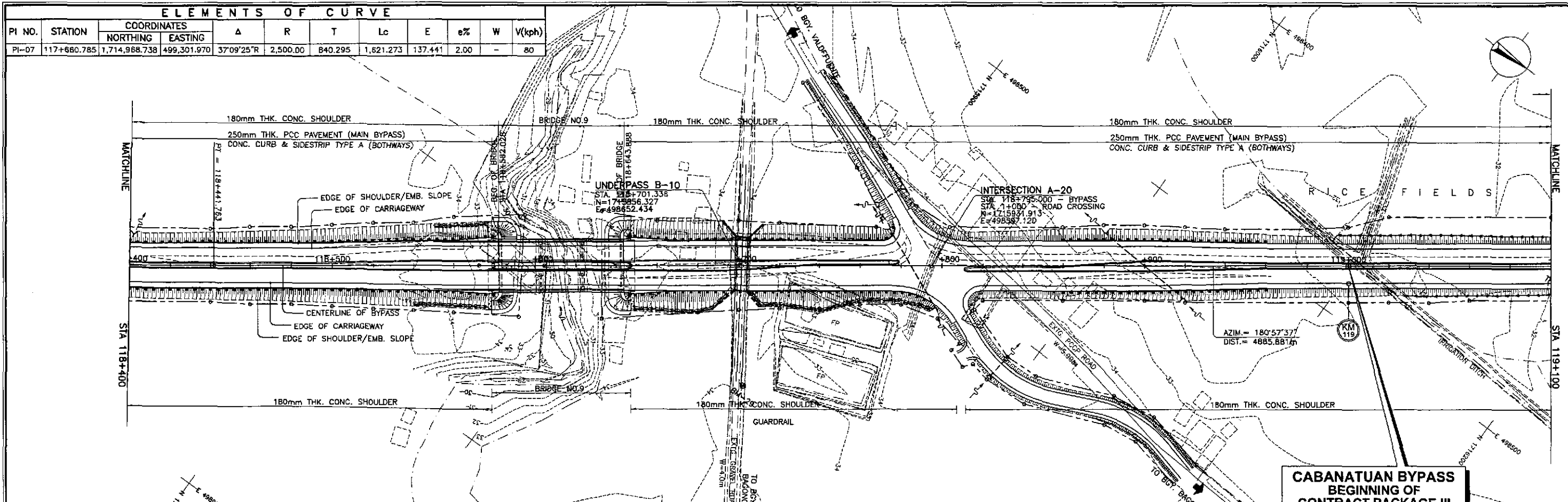
STATION		LENGTH (m)	REMARKS
FROM	TO		
121+237.25	121+281.875	44.50	(LS) 150mm x 1.0m @ 3.0m GAP
121+237.25	121+281.75	89.00	(RS) 2-150mm x 1.0m. @ 3.0m GAP
121+440.37	121+485.37	90.00	(LS) 2-150mm x 1.0m. @ 3.0m GAP
121+440.37	121+485.37	45.00	(RS) 2-150mm x 1.0m. @ 3.0m GAP
00+920.42	00+961.65	41.23	(RS) 100mm x 1.0m @ 3.0m. GAP A-21
01+038.35	01+079.35	41.00	(LS) 100mm x 1.0m @ 3.0m. GAP (A-21)

4.0 ARROWS			
ARROW TYPE	NUMBER OF ARROWS	AREA/ARROW	LOCATION
A	6	1.46	APPROACHING INTERSECTION A-21
B	2	2.04	APPROACHING INTERSECTION A-21
C	4	1.21	APPROACHING INTERSECTION A-21

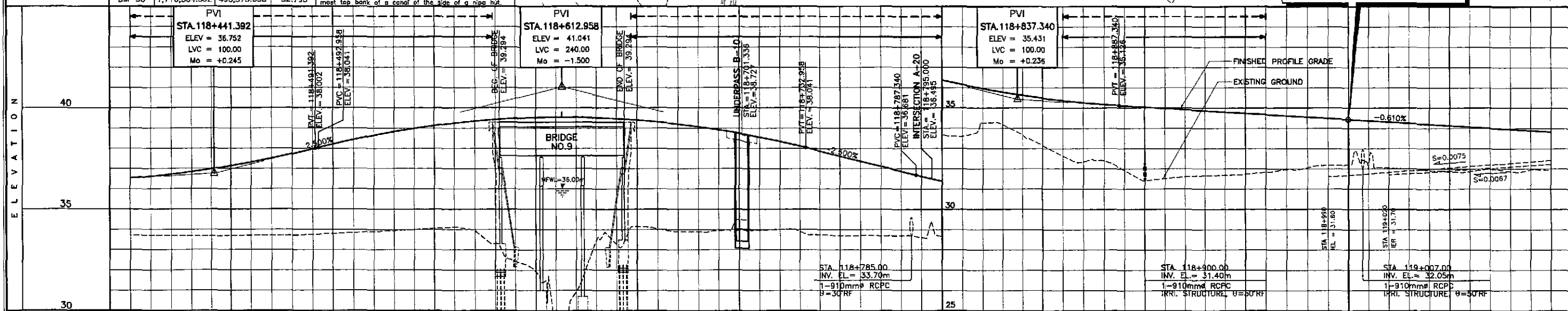
5.0 PEDESTRIAN		
LOCATION	REMARKS	
INT. A-21	MAIN BYPASS	SIGNALIZED

6.0 STOP LINES		
LOCATION	REMARKS	
INT. A-21	MAIN BYPASS	SIGNALIZED

<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p> <p>KATAHIRA & ENGINEERS YACHIOI ENGINEERING CO., LTD.</p>	<p>DESIGNED: 10/14/07</p> <p>CHECKED: 10/19/07</p> <p>SUBMITTED: 10/19/07</p>	<p>DATE: 10/14/07</p> <p>SIGNATURE: [Signature]</p>	<p>REPUBLIC OF THE PHILIPPINES</p> <p>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p> <p>BUREAU OF DESIGN</p> <p>OFFICE OF THE SECRETARY</p>	<p>PROJECT AND LOCATION:</p> <p>THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)</p>	<p>SCALE: FULL SIZE A1</p>	<p>SHEET CONTENTS:</p> <p>SCHEDULE OF TRAFFIC SIGN, RELOCATION OF EXTG. GUARDRAILS AND PLANTINGS</p>	<p>SHEET NO.: RG-04</p>
	<p>Submitted By: DANIL C. TRAJANO Project Director</p>	<p>Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division</p>	<p>Recommended By: GILBERTO S. REYES OIC, Director IV</p>	<p>Recommended By: MANUEL M. BONDAN Undersecretary</p>	<p>Approved By: SIMEON A. DATUMANONG Secretary</p>		
	<p>CABANATUAN BYPASS - CONTRACT PACKAGE III</p>						



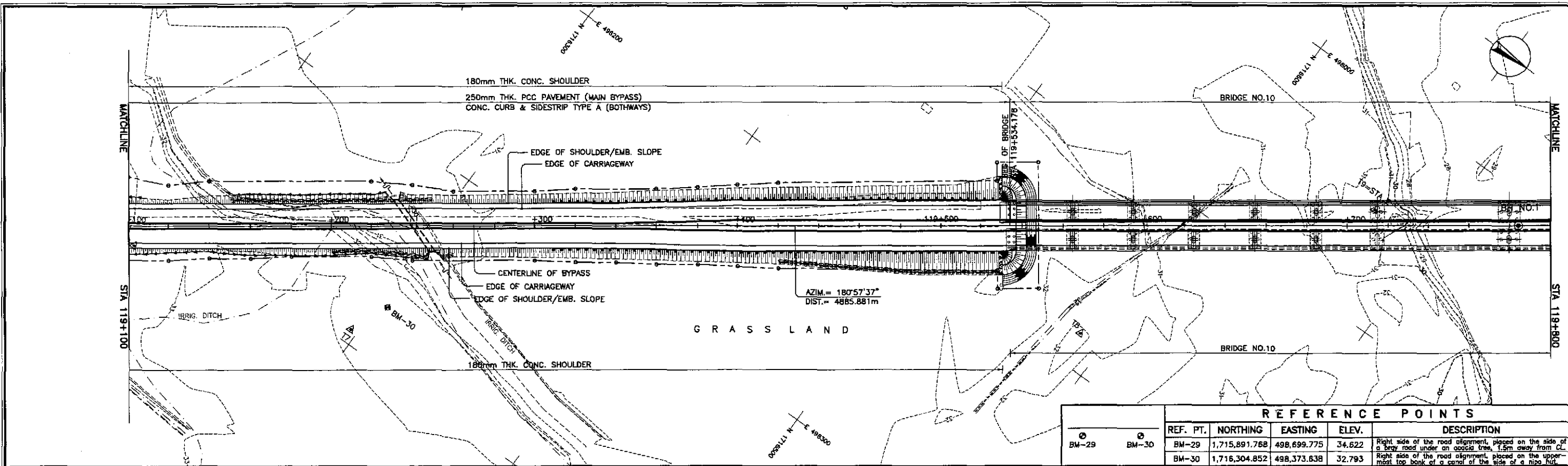
ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-07	117+660.785	1,714,968.738	499,301.970	37°09'25"R	2,500.00	840.295	1,621.273	137.441	2.00	-	80



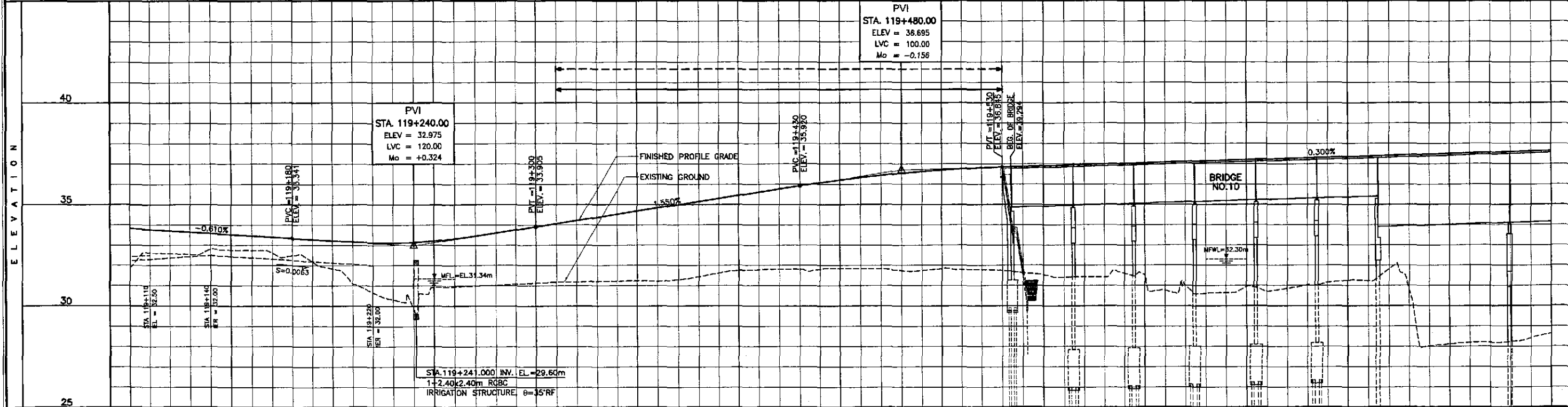
STATION	+400	118+500	+600	+700	+800	+900	119+000	+1000
FINISHED PROFILE GRADE BYPASS	36.536	36.717	36.976	37.314	37.730	38.212	38.641	39.087
EXISTING GROUND BYPASS	33.714	33.695	33.685	33.701	33.717	33.796	33.892	33.996
HORIZONTAL CURVATURE	R=2500		R=∞		R=∞		R=∞	
VERTICAL CURVATURE	L=100 Mo=+0.245		L=240 Mo=-1.500		L=100 Mo=+0.236		L=100 Mo=-0.610%	
SUPERELEVATION	118+431.763		N.C.		N.C.		N.C.	

**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

<p>JICA JAPAN INTERNATIONAL COOPERATION AGENCY KAI KATAHIRA & ENGINEERS INTERNATIONAL YEO YACHIYO ENGINEERING CO., LTD.</p>	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :		SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/10/00	<i>[Signature]</i>		BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)			
SUBMITTED	10/10/00	<i>[Signature]</i>	OFFICE OF THE SECRETARY	CABANATUAN BYPASS - CONTRACT PACKAGE III					

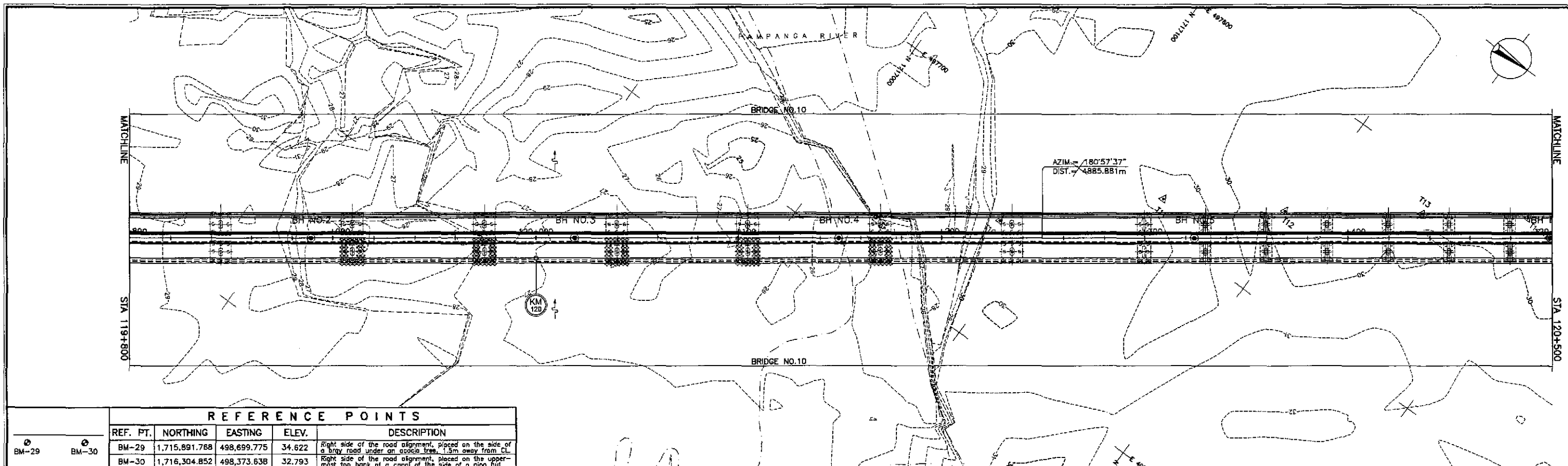


REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-29	1,715,891.768	498,699.775	34.622	Right side of the road alignment, placed on the side of a bry road under an occise tree, 1.5m away from CL.
BM-30	1,716,304.852	498,373.638	32.793	Right side of the road alignment, placed on the uppermost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

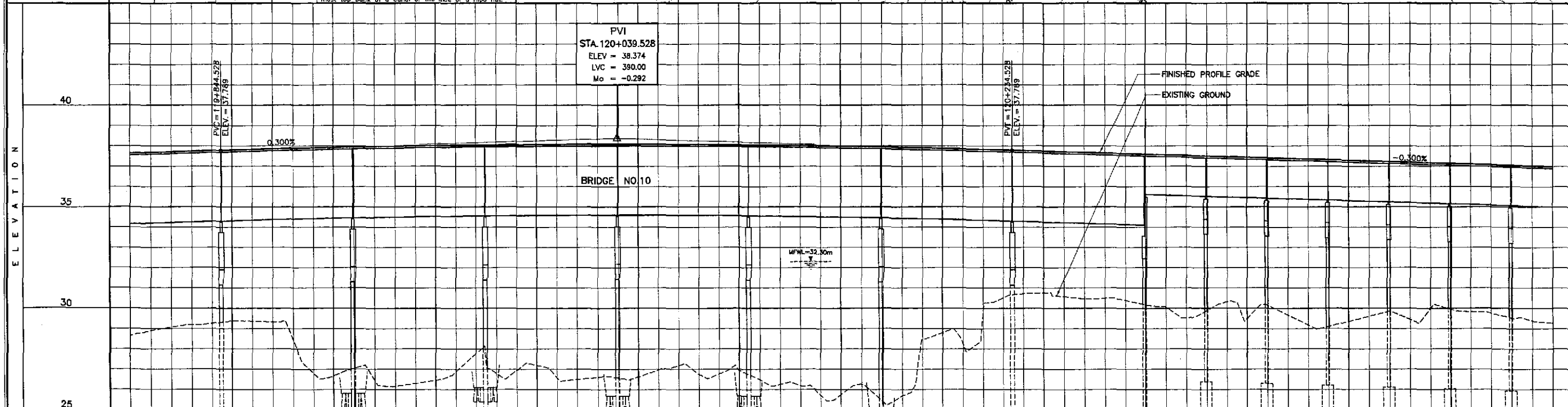


STATION	+100	+200	+300	+400	119+500	+600	+700	+800
FINISHED PROFILE GRADE BYPASS	31.939	33.829	33.707	33.585	33.463	33.341	33.255	33.141
EXISTING GROUND BYPASS	31.939	33.829	33.707	33.585	33.463	33.341	33.255	33.141
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	g=-0.610%		L=120 Mo=+0.324		g=+1.550%		L=100 Mo=-0.156	
SUPERELEVATION	N.C.							

	DESIGNED	DATE	SIGNATURE		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN OFFICE OF THE SECRETARY				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	S. G. G. G.		Submitted By:	Reviewed By:	Recommended By:	Recommended By:	Approved By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridol, Cabanatuan and San Jose Bypasses)	HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	PLAN AND PROFILE ALONG BYPASS (ULTIMATE STAGE) STA. 119+100 - STA. 119+800
	SUBMITTED	10/19/02	M. M. BONDAN		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANGING Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE III		



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, 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 rice field.

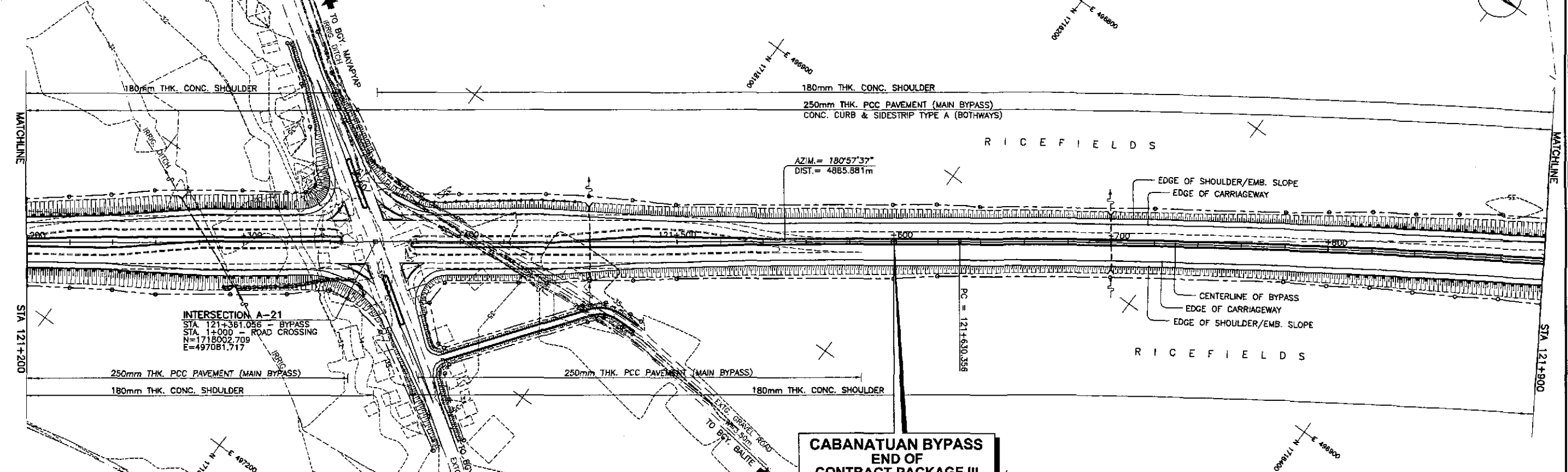


STATION	+800	+900	120+000	+100	+200	+300	+400	120+500
FINISHED PROFILE GRADE BYPASS	28.651, 37.655	29.081, 37.715	29.250, 37.775	29.356, 37.834	29.397, 37.886	26.670, 37.932	26.445, 37.972	26.301, 38.005
EXISTING GROUND BYPASS	28.651	29.081	29.250	29.356	29.397	26.670	26.445	26.301

HORIZONTAL CURVATURE	R=∞											
VERTICAL CURVATURE	g=0.300%				L=390 Mo=-0.292				g=-0.300%			
SUPERELEVATION	N.C.											

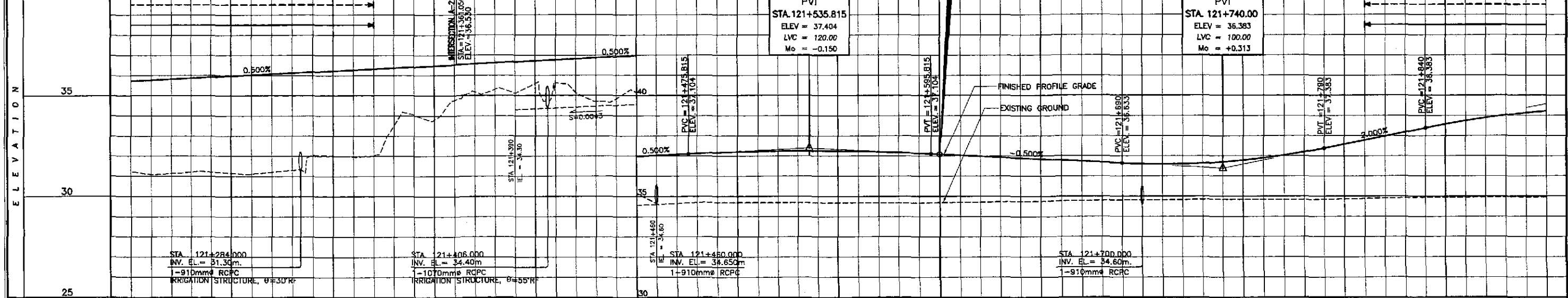
	DESIGNED	DATE	SIGNATURE		PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III				SCALE :	SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (ULTIMATE STAGE) STA. 119+800 - STA. 120+500	SHEET NO. : RP-03
	CHECKED	10/17/02	S. G. JOSE		BUREAU OF DESIGN Submitted By: DANILLO C. TRAJANO (Project Director) Reviewed By: JOSEFINA M. ALAGAR (Chief, Highways Division) Recommended By: GILBERTO S. REYES (OIC, Director N) Recommended By: MANUEL M. BONDAN (Undersecretary) Approved By: SIMEON A. DATUMANONG (Secretary)				HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1		
	SUBMITTED	11/19/02	M. S. RIVERA								

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



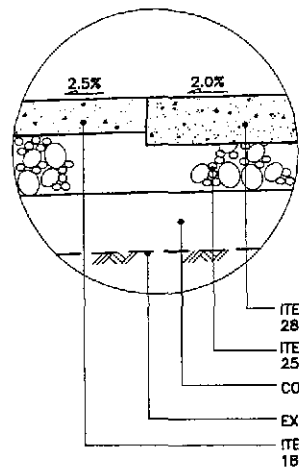
REFERENCE POINTS

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 or the side of a pipe but
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 PC

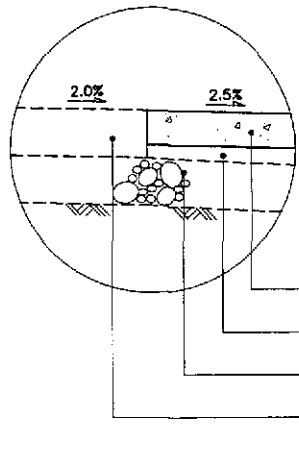


STATION	+200	+300	+400	121+500	+600	+700	+800	+900
FINISHED PROFILE GRADE BYPASS	35.725	35.825	35.925	36.025	36.125	36.225	36.325	36.425
EXISTING GROUND BYPASS	31.235	31.137	31.218	31.117	31.301	32.015	32.033	34.044
HORIZONTAL CURVATURE	R=C				R=4000			
VERTICAL CURVATURE	g=+0.500%				g=-0.500%			
SUPERELEVATION	N.C.							

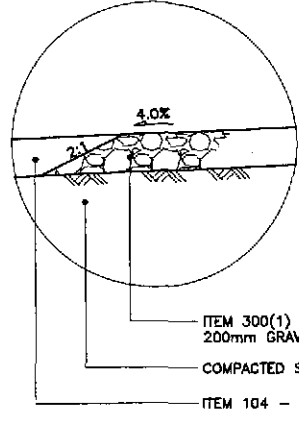
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (ULTIMATE STAGE) STA. 121+200 - STA. 121+600	SHEET NO. : RP-05
	CHECKED	10/17/02	[Signature]		BUREAU OF DESIGN							
	SUBMITTED	10/19/02	[Signature]		Submitted By: DANILD C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES D/C, Director IV	Recommended By: MANUEL M. BONDAN Undersecretary				



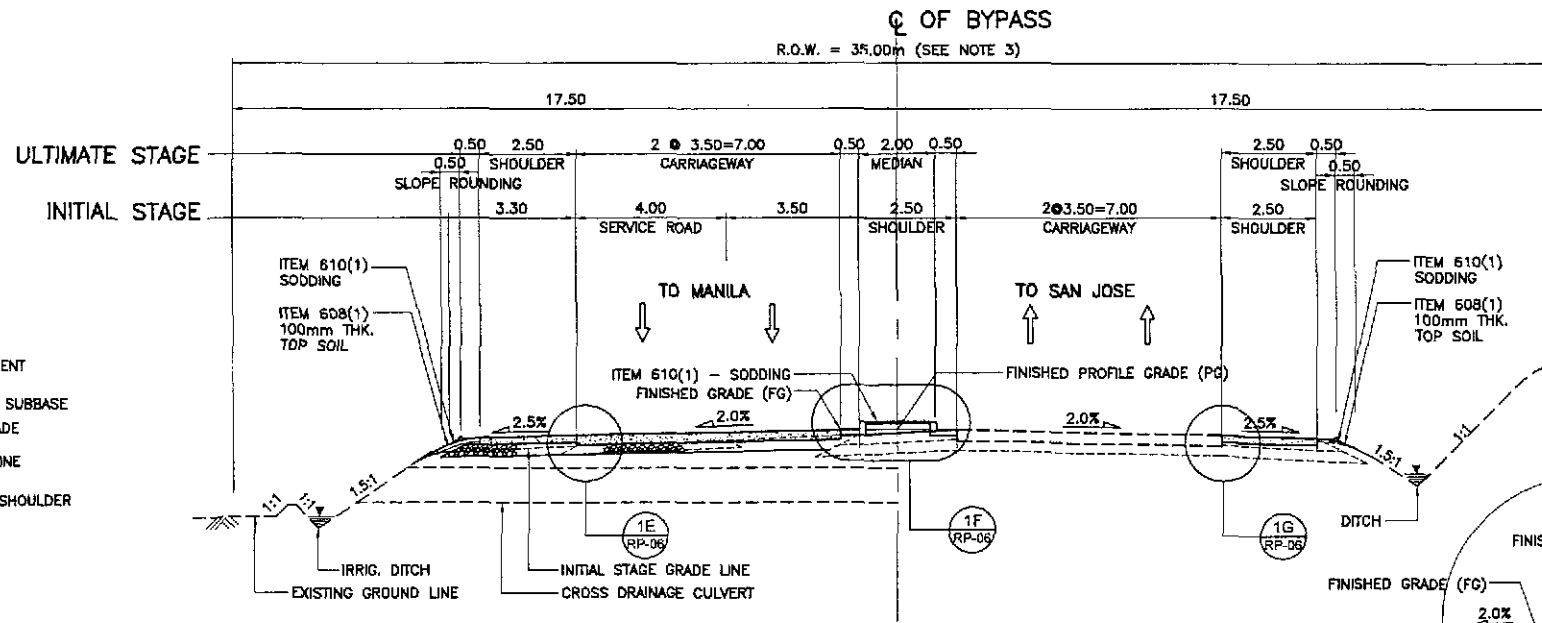
1E DETAIL
SCALE 1:20



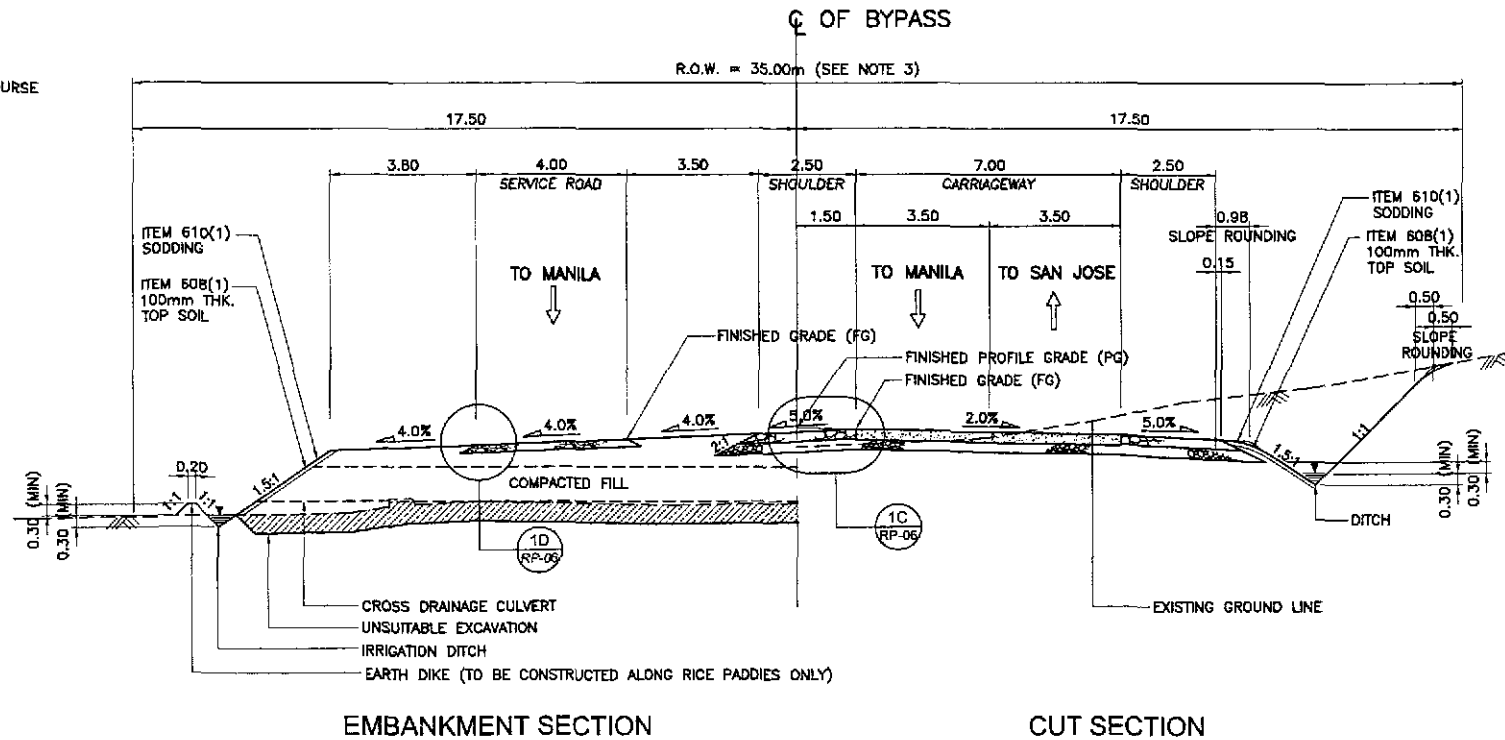
1G DETAIL
SCALE 1:20



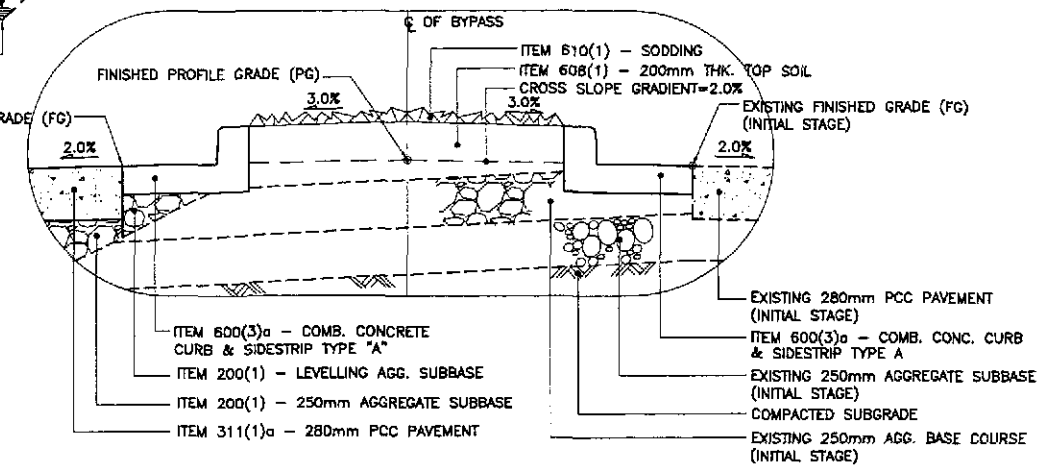
1D DETAIL
SCALE 1:20



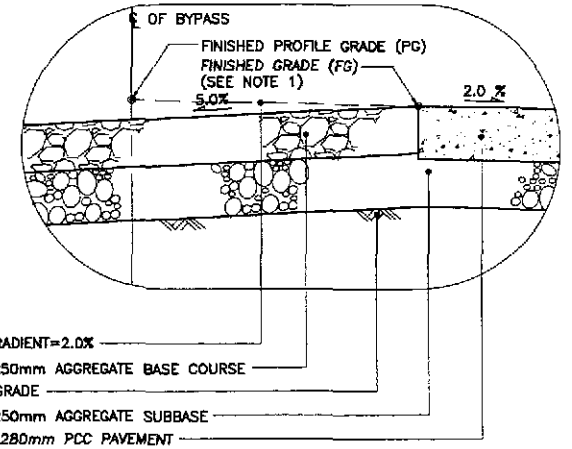
1B NORMAL SECTION - ULTIMATE STAGE
SCALE 1:100



1A NORMAL SECTION - INITIAL STAGE
SCALE 1:100



1F DETAIL
SCALE 1:20



1C DETAIL
SCALE 1:20

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.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
yeo YACHINO ENGINEERING CO., LTD.

DESIGNED	CHECKED	SUBMITTED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
			10/12/02	[Signature]	BUREAU OF DESIGN OFFICE OF THE SECRETARY
			10/19/02	[Signature]	
			10/19/02	[Signature]	
Submitted By: DANILLO 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: SIMON A. DATUMANONG Secretary					

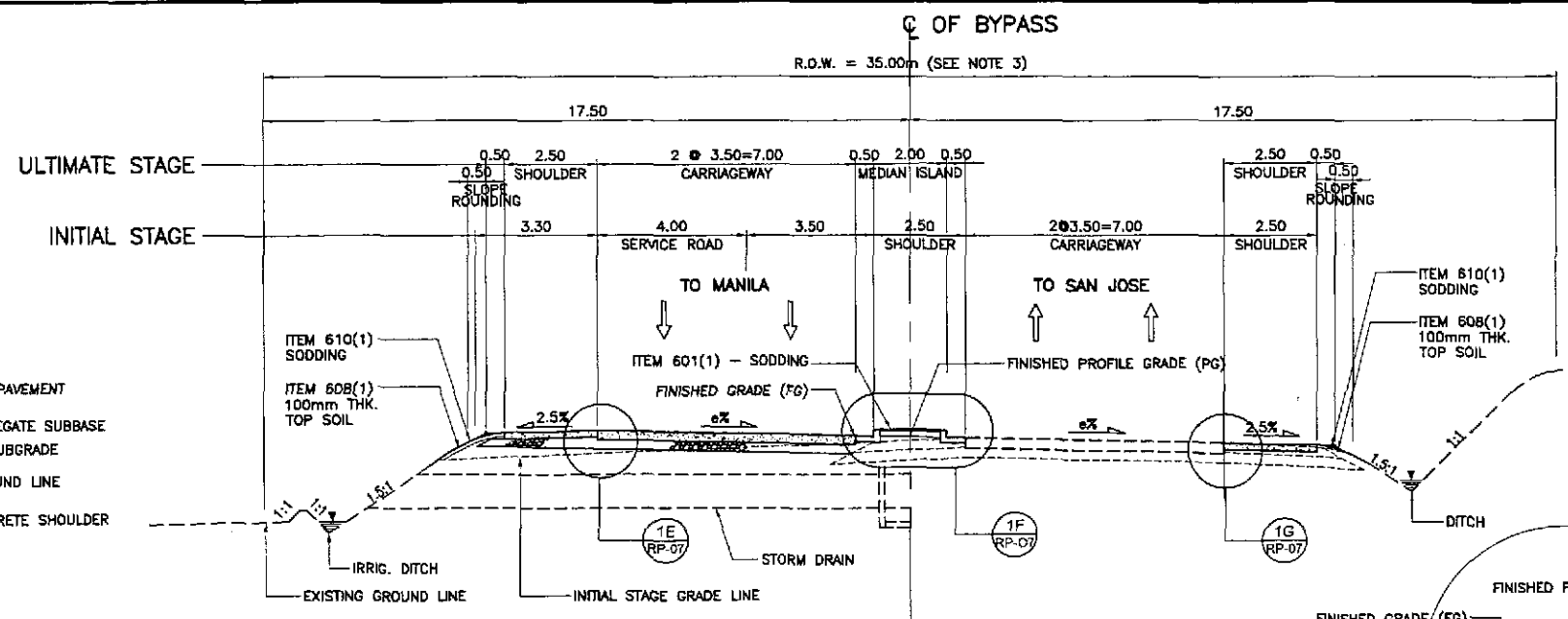
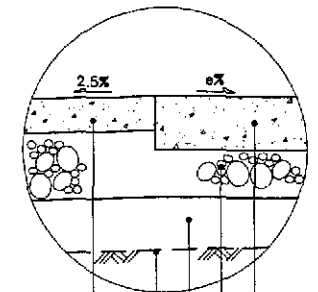
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE III

SCALE :
AS SHOWN
FULL SIZE A1

SHEET CONTENTS :
TYPICAL ROADWAY SECTIONS
NORMAL SECTIONS
WITHOUT FRONTAGE ROAD
(INITIAL AND ULTIMATE STAGE)
(1 of 2)

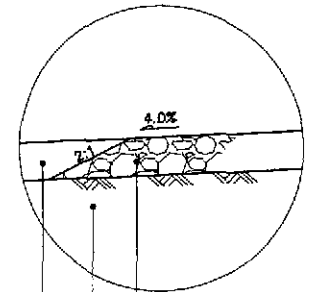
SHEET NO. :
RP-06

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 MR Esb Esb	5,500 psi = 37.92 MPa 13,000 psi = 89.64 MPa 23,000 psi = 158.58 MPa	5,500 psi = 37.92 MPa 13,000 psi = 89.64 MPa 23,000 psi = 158.58 MPa
4. PERFORMANCE CRITERIA Δ PSI	2	2
5. DESIGN RELIABILITY Zr So	50 % 0.35	50 % 0.35
6. DRAINAGE COEFFICIENT RIGID	1	1
7. LAYER COEFFICIENT a1 (FOR AC) a2 (FOR BASE) a3 (FOR SUBBASE)	0.39 0.105 0.095	0.39 0.105 0.095
8. PAVEMENT CONSTRUCTION THICKNESS PCCP SUBBASE	280mm THK 250mm THK	280mm THK 250mm THK

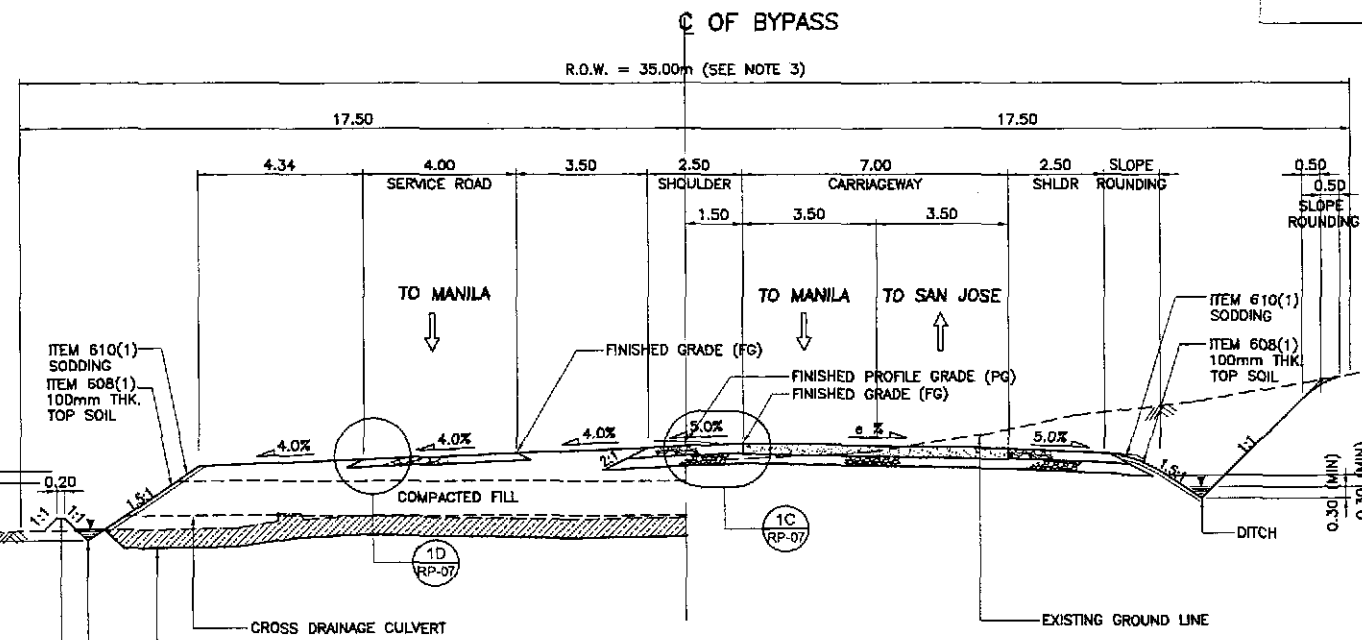


1E DETAIL
SCALE 1:20

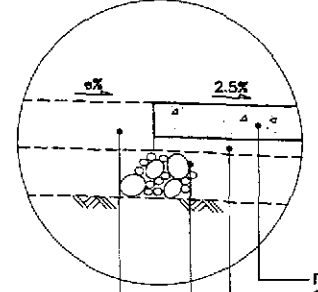
1B SUPERELEVATED SECTION - ULTIMATE STAGE
SCALE 1:100



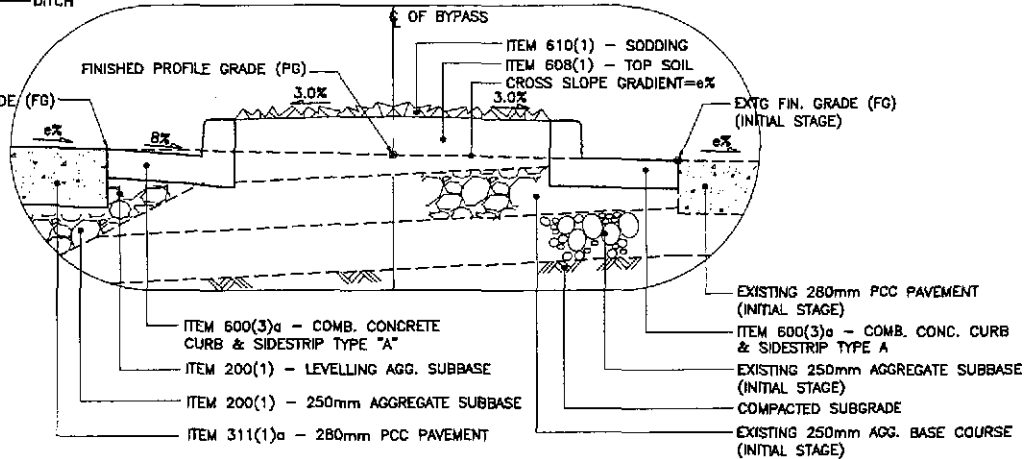
1D DETAIL
SCALE 1:20



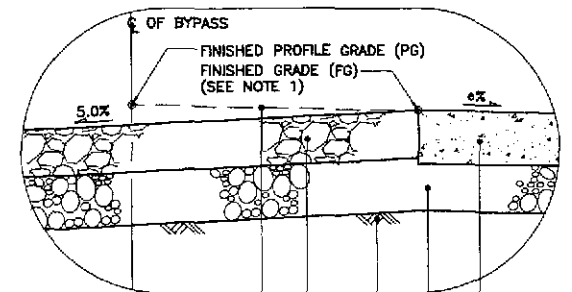
1A SUPERELEVATED SECTION - INITIAL STAGE
SCALE 1:100



1G DETAIL
SCALE 1:20



1F DETAIL
SCALE 1:20



1C DETAIL
SCALE 1:20

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

	DESIGNED: 10/10/02 CHECKED: 10/17/02 SUBMITTED: 10/19/02	DATE: 10/10/02 SIGNATURE: [Signature] NAME: A. ACACIO NAME: G. GOSSE NAME: M. [Signature]	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: AS SHOWN FULL SIZE A1	SHEET CONTENTS: TYPICAL ROADWAY SECTIONS SUPERELEVATED SECTIONS WITHOUT FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (2 of 2)	SHEET NO.: RP-07
	Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV	Recommended By: MANUEL M. BONONAN Undersecretary	Approved By: SIMON A. DATUMANONG Secretary		