

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 I  
(ULTIMATE STAGE)  
STA. 100+480.000 TO STA. 109+920.000



December 2002

KATAHIRA & ENGINEERS INTERNATIONAL  
YACHIYO ENGINEERING CO., LTD

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# **GENERAL**

**INDEX OF DRAWINGS**  
**THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM**  
**ALONG THE PAN-PHILIPPINE HIGHWAY**  
**CABANATUAN BYPASS - PACKAGE I**  
**(ULTIMATE STAGE)**

SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING
	<b>GENERAL</b>		<b>INTERSECTION A-7 (STA 105+313.890)</b>	RS-23	TYPICAL PLANTING LAYOUT - WITHOUT FRONTAGE ROAD
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GC-02	INDEX OF DRAWINGS - 2 OF 2	RI-09	PAVING AND GRADING PLAN		<b>DRAINAGE</b>
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GC-07	HORIZONTAL AND VERTICAL CONTROL MONUMENTS - 1 OF 2	RI-13	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT		<b>ALONG BYPASS</b>
GC-08	HORIZONTAL AND VERTICAL CONTROL MONUMENTS - 2 OF 2	RI-14	TRAFFIC SIGNAL LIGHT LAYOUT		
GC-09	LOCATION OF MATERIAL SOURCES		<b>ROADWAY MISCELLANEOUS DRAWINGS</b>	DC-01	DRAINAGE CROSS-SECTION, STA. 100 + 740.000 TO STA. 101 + 334.000
GC-10	SUMMARY OF QUANTITIES - 1 OF 2		<b>TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT</b>	DC-02	DRAINAGE CROSS-SECTION, STA. 101 + 453.000 TO STA. 101 + 925.000
GC-11	SUMMARY OF QUANTITIES - 2 OF 2	RM-01	LAYOUT PLAN, STA. 100 + 480.000 TO STA. 101 + 600.000	DC-03	DRAINAGE CROSS-SECTION, STA. 102 + 165.000 TO STA. 102 + 654.000
	<b>ROADWAY</b>	RM-02	LAYOUT PLAN, STA. 101 + 600.000 TO STA. 103 + 000.000	DC-04	DRAINAGE CROSS-SECTION, STA. 102 + 666.000 TO STA. 103 + 550.000
	<b>GENERAL ROADWAY</b>	RM-03	LAYOUT PLAN, STA. 103 + 000.000 TO STA. 104 + 400.000	DC-05	DRAINAGE CROSS-SECTION, STA. 103 + 566.000 TO STA. 103 + 894.000
RG-01	GENERAL NOTES HIGHWAY/ CIVIL AND DRAINAGE	RM-04	LAYOUT PLAN, STA. 104 + 400.000 TO STA. 105 + 800.000	DC-06	DRAINAGE CROSS-SECTION, STA. 104 + 039.000 TO STA. 104 + 294.000
RG-02	ALIGNMENT TECHNICAL DESCRIPTION	RM-05	LAYOUT PLAN, STA. 105 + 800.000 TO STA. 107 + 200.000	DC-07	DRAINAGE CROSS-SECTION, STA. 104 + 334.000 TO STA. 104 + 812.000
RG-03	LOCATION OF INTERSECTIONS / UNDERPASSES	RM-06	LAYOUT PLAN, STA. 107 + 200.000 TO STA. 108 + 600.000	DC-08	DRAINAGE CROSS-SECTION, STA. 105 + 305.000 TO STA. 105 + 954.000
RG-04	SCHEDULE OF TRAFFIC SIGNS, RELOCATION OF EXISTING GUARDRAILS AND PLANTINGS	RM-07	LAYOUT PLAN, STA. 108 + 600.000 TO STA. 109 + 920.000	DC-09	DRAINAGE CROSS-SECTION, STA. 106 + 176.000 TO STA. 106 + 364.000
RG-05	SCHEDULE OF PAVEMENT MARKINGS		<b>RELOCATION OF EXISTING GUARDRAILS AND PLANTINGS LAYOUT</b>	DC-10	DRAINAGE CROSS-SECTION, STA. 106 + 509.000 TO STA. 106 + 800.000
	<b>PLAN AND PROFILE</b>	RM-08	LAYOUT PLAN, STA. 100 + 480.000 TO STA. 101 + 600.000	DC-11	DRAINAGE CROSS-SECTION, STA. 107 + 000.000 TO STA. 107 + 494.000
	<b>ALONG BYPASS</b>	RM-09	LAYOUT PLAN, STA. 101 + 600.000 TO STA. 103 + 000.000	DC-12	DRAINAGE CROSS-SECTION, STA. 107 + 560.000 TO STA. 108 + 040.000
RP-01	PLAN AND PROFILE, STA. 100 + 480.000 TO STA. 100 + 900.000	RM-10	LAYOUT PLAN, STA. 103 + 000.000 TO STA. 104 + 400.000	DC-13	DRAINAGE CROSS-SECTION, STA. 108 + 134.000 TO STA. 108 + 500.000
RP-02	PLAN AND PROFILE, STA. 100 + 900.000 TO STA. 101 + 600.000	RM-11	LAYOUT PLAN, STA. 104 + 400.000 TO STA. 105 + 800.000	DC-14	DRAINAGE CROSS-SECTION, STA. 108 + 582.000 TO STA. 108 + 940.000
RP-03	PLAN AND PROFILE, STA. 101 + 600.000 TO STA. 102 + 300.000	RM-12	LAYOUT PLAN, STA. 105 + 800.000 TO STA. 107 + 200.000	DC-15	DRAINAGE CROSS-SECTION, STA. 109 + 120.000 TO STA. 109 + 534.000
RP-04	PLAN AND PROFILE, STA. 102 + 300.000 TO STA. 103 + 000.000	RM-13	LAYOUT PLAN, STA. 107 + 200.000 TO STA. 108 + 600.000	DC-16	DRAINAGE CROSS-SECTION, STA. 109 + 574.000 TO STA. 109 + 912.000
RP-05	PLAN AND PROFILE, STA. 103 + 000.000 TO STA. 103 + 700.000	RM-14	LAYOUT PLAN, STA. 108 + 600.000 TO STA. 109 + 920.000		<b>DRAINAGE STANDARD DRAWINGS AND DETAILS</b>
RP-06	PLAN AND PROFILE, STA. 103 + 700.000 TO STA. 104 + 400.000		<b>ROADWAY STANDARD DRAWINGS AND DETAILS</b>	DS-01	STANDARD DETAILS OF REINFORCED CONCRETE BOX CULVERT (RCBC)
RP-07	PLAN AND PROFILE, STA. 104 + 400.000 TO STA. 105 + 100.000	RS-01	GEOMETRIC DESIGN STANDARD-1 (HOR. ALIGNMENT/CURVE EASEMENTS)	DS-02	STANDARD DETAILS OF REINFORCED CONCRETE BOX CULVERT (RCBC) BARRELS
RP-08	PLAN AND PROFILE, STA. 105 + 100.000 TO STA. 105 + 800.000	RS-02	GEOMETRIC DESIGN STANDARD-2 (HORIZONTAL AND VERTICAL CURVES)	DS-03	STANDARD DETAILS OF RCBC WINGWALLS
RP-09	PLAN AND PROFILE, STA. 105 + 800.000 TO STA. 106 + 500.000	RS-03	GEOMETRIC DESIGN STANDARD-3 (SUPERELEVATION ATTAINMENT)	DS-04	STANDARD LOW DEPTH TYPE BOX CULVERT - 1 OF 2
RP-10	PLAN AND PROFILE, STA. 106 + 500.000 TO STA. 107 + 200.000	RS-04	STANDARD PORTLAND CEMENT CONCRETE PAVEMENT DETAILS	DS-05	STANDARD LOW DEPTH TYPE BOX CULVERT - 2 OF 2
RP-11	PLAN AND PROFILE, STA. 107 + 200.000 TO STA. 107 + 900.000	RS-05	CONCRETE CURB AND GUTTER DETAILS	DS-06	STD RCPC, METHOD OF PIPE INSTALL. & TYP. BEDDING FOR CONDUITS
RP-12	PLAN AND PROFILE, STA. 107 + 900.000 TO STA. 108 + 600.000	RS-06	CURB CUT RAMP DETAILS (FOR THE PHYSICALLY HANDICAPPED)	DS-07	STANDARD REINFORCED CONCRETE HEADWALL FOR RCPC
RP-13	PLAN AND PROFILE, STA. 108 + 600.000 TO STA. 109 + 300.000	RS-07	STANDARD KILOMETER POST AND RIGHT-OF-WAY MARKERS	DS-08	STANDARD DRAINAGE DITCHES
RP-14	PLAN AND PROFILE, STA. 109 + 300.000 TO STA. 109 + 920.000	RS-08	STANDARD STEEL BEAM GUARDRAIL	DS-09	STANDARD COMBINATION CURB INLET MANHOLE
RP-15	TYPICAL ROADWAY SECTIONS - 1 OF 2	RS-09	EMBANKMENT PROTECTION WALLS AND MASONRY RETAINING WALLS	DS-10	SPECIAL JUNCTION BOX MANHOLE
RP-16	TYPICAL ROADWAY SECTIONS - 2 OF 2	RS-10	SIDE ROAD APPROACHES AND PRIVATE DRIVEWAY ACCESS	DS-11	STANDARD REINFORCED CONCRETE CATCH BASIN FOR RCPC
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	<b>INTERSECTION A-1 (STA 100+854.341)</b>	RS-12	STANDARD TRAFFIC SIGN	DS-13	STANDARD MAINTENANCE MARKERS
RI-01	GEOMETRIC DESIGN LAYOUT	RS-13	ADVANCE DIRECTION SIGN DETAILS		<b>SURFACE DRAINAGE PLAN AND PROFILE</b>
RI-02	PAVING AND GRADING PLAN	RS-14	MOUNTING/SUPPORT FOR ROAD SIGN - TYP. SIGN MOUNTING DETAILS - 1 OF 2	DP-01	PLAN AND PROFILE, STA. 100 + 480.000 TO STA. 100 + 900.000
RI-03	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT	RS-15	MOUNTING/SUPPORT FOR ROAD SIGN - TYP. SIGN MOUNTING DETAILS - 2 OF 2	DP-02	PLAN AND PROFILE, STA. 100 + 900.000 TO STA. 101 + 600.000
RI-04	TRAFFIC SIGNAL LIGHT LAYOUT	RS-16	STANDARD PAVEMENT MARKING - 1 OF 2	DP-03	PLAN AND PROFILE, STA. 101 + 600.000 TO STA. 102 + 300.000
	<b>INTERSECTION A-6 (STA 104+802.195)</b>	RS-17	STANDARD PAVEMENT MARKING - 2 OF 2	DP-04	PLAN AND PROFILE, STA. 102 + 300.000 TO STA. 103 + 000.000
RI-05	GEOMETRIC DESIGN LAYOUT	RS-18	REFLECTIVE ROAD STUD AND CONCRETE CHATTER BAR AND DETAILS		<b>UNDERPASS CROSSING (BOX CULVERT)</b>
RI-06	PAVING AND GRADING PLAN	RS-19	TRAFFIC SIGNAL POLE TYPE A & FOUNDATION DETAILS	UP-01	SITE DEVELOPMENT PLAN
RI-07	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT	RS-20	TRAFFIC SIGNAL POLE TYPE B, C & D	UP-02	GEN. PLAN, ELEVATION & SECTION, B-1 UNDERPASS (STA. 101+980.000)
		RS-21	TRAFFIC SIGNAL POLE FOUNDATION DETAILS (TYPE B, C & D)	UP-03	GEN. PLAN, ELEVATION & SECTION, B-2 UNDERPASS (STA. 103+040.000)
		RS-22	TYPICAL PLANTING LAYOUT - WITH FRONTAGE ROAD		

 JAPAN INTERNATIONAL COOPERATION AGENCY	 KATAHIRA & ENGINEERS INTERNATIONAL	 YACHIYO ENGINEERING CO., LTD.	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
			DESIGNED	10/15/16		ACACIO	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	INDEX OF DRAWINGS (ULTIMATE STAGE) Sheet 1 of 2	GC-01
			CHECKED	10/15/16		GOSE	Submitted By:	Reviewed By:	Recommended By:	Approved By:				
			SUBMITTED	10/16/16		TRINIDAD	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONOAN Undersecretary				

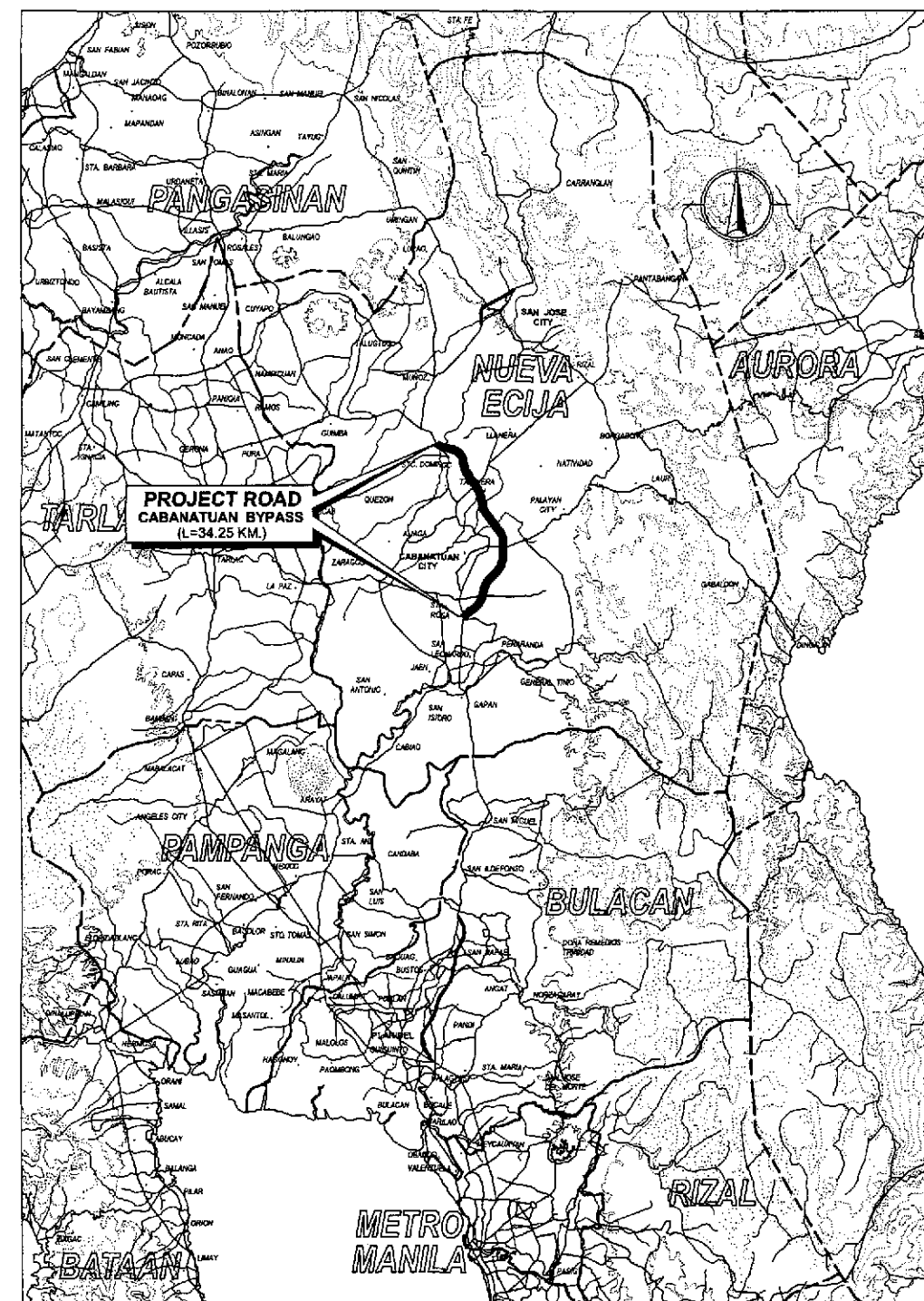
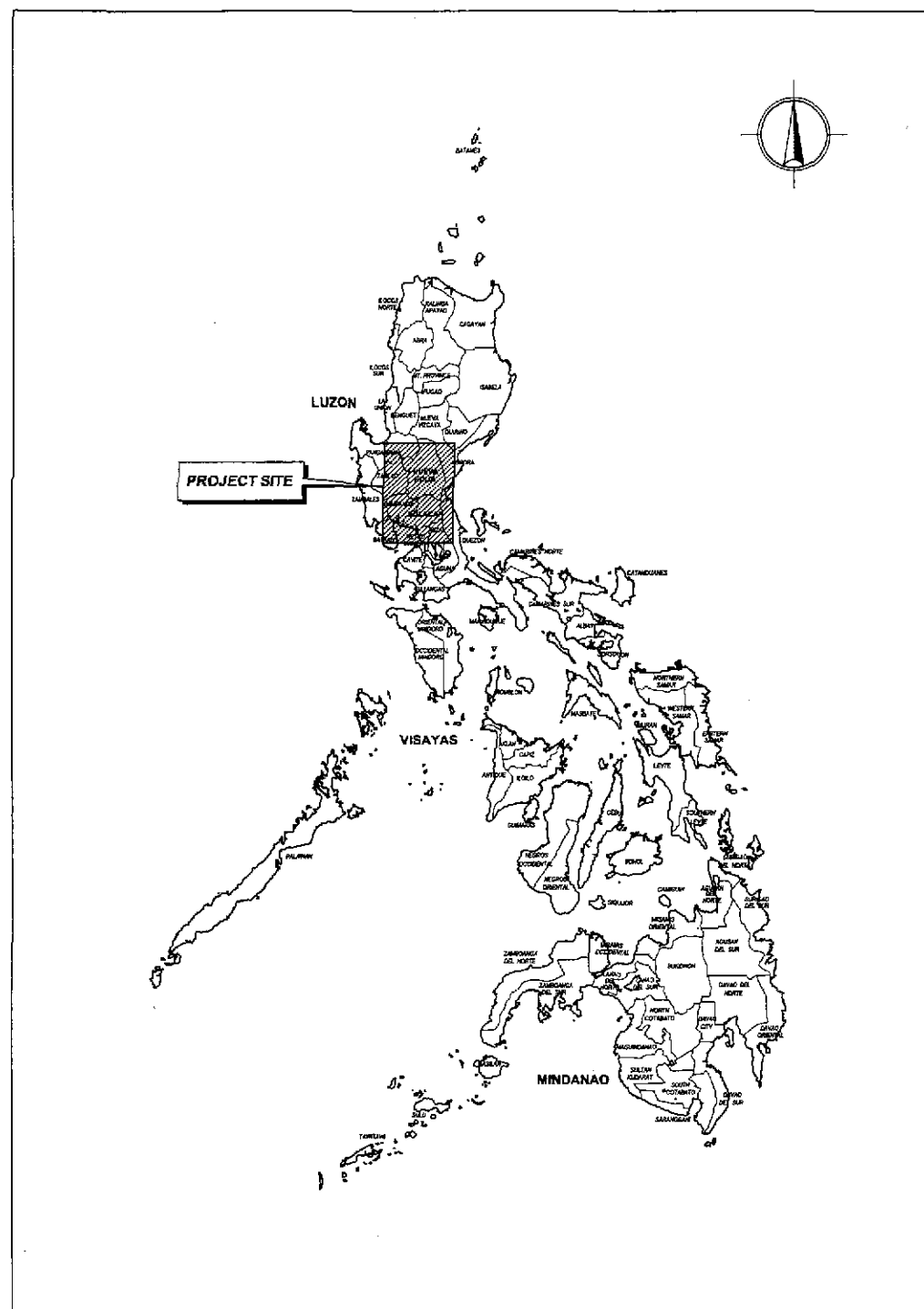
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## THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY

### CABANATUAN BYPASS - PACKAGE I (ULTIMATE STAGE)

SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING	SHEET NO.	TITLE OF DRAWING
UP-04	GEN. PLAN, ELEVATION & SECTION, B-3 UNDERPASS (STA. 105+760.000)		<b>ELECTRICAL</b>		
UP-05	GEN. PLAN, ELEVATION & SECTION, B-4 UNDERPASS (STA. 107+157.432)		<b>ELECTRICAL STANDARD DRAWINGS AND DETAILS</b>		
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UP-07	SPECIAL RCBC BARREL DETAILS	ES-02	STREET LIGHT POLE DETAILS		
UP-08	BOX CULVERT BARREL BAR SCHEDULE		<b>ROADWAY LIGHTING LAYOUT FOR INTERSECTION</b>		
UP-09	WINGWALL DETAILS	EI-01	LAYOUT PLAN AND LOAD SCHEDULE, INTERSECTION A-1 (STA 100+854.341)		
UP-10	APPROACH SLAB DETAIL	EI-02	LAYOUT PLAN AND LOAD SCHEDULE, INTERSECTION A-10 (STA 108+145.875)		
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BG-02	GENERAL NOTES FOR BRIDGES - 1 of 2	FA-02	ENGR'S FIELD OFFICE - FLOOR PLAN, ELEVATIONS, CROSS-SECTIONS AND REFLECTED CEILING PLAN		
BG-03	GENERAL NOTES FOR BRIDGES - 2 of 2		ENGR'S LIVING QTRS - FLOOR PLAN, ELEVATIONS, CROSS-SECTIONS AND REFLECTED CEILING PLAN		
BG-04	SUMMARY OF QUANTITIES	FA-03	ENGR'S FIELD OFFICE / LABORATORY - ROOF PLAN, CROSS-SECTION AND SCHEDULE OF DOORS & WINDOWS		
	<b>BRIDGE NO. 1 (STA 102+925.552 TO STA 102+976.812)</b>	FA-04	ENGR'S LIVING QUARTERS - ROOF PLAN, CROSS-SECTION AND SCHEDULE OF DOORS & WINDOWS		
B1-01	GEN. PLAN, ELEVATION & SECTIONS	FA-05	ENGR'S FIELD OFFICE & LIVING QUARTERS - FOUNDATION PLAN, R.C. RAMP DETAIL, DETAIL OF F-1, P-1, WF1 & DESIGN CRITERIA		
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B1-03	AASHTO TYPE IV GIRDER	FA-07	ENGR'S LIVING QTRS - REAR & LEFT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS		
B1-04	CONCRETE POURING SEQUENCE AND DIAPHRAGM DETAILS	FA-08	ENGR'S FIELD OFFICE - FRONT & RIGHT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS		
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B1-06	ABUTMENT A1 & A2 WINGWALL REINFORCEMENT DETAILS	FA-10	ENGR'S FIELD OFFICE & LIVING QUARTERS - DETAILS OF CONNECTIONS, DETAILS 1 TO 15		
B1-07	APPROACH SLAB PLAN, SECTIONS AND DETAILS (SAME AS B2-10)	FA-11	ROOF FRAMING PLAN, SCHEMATIC DIAGRAM, PURLIN CONNECTION AND CROSS BRACING CONNECTION		
B1-08	ABUTMENT SHEAR KEY & RISER DETAILS (SAME AS B2-11)	FA-12			
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B2-02	DECK FRAMING PLAN AND SECTIONS	FP-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEWER AND WATER LINE LAYOUT AND ISOMETRIC DIAGRAM		
B2-03	AASHTO TYPE IV GIRDER ( EXTERIOR SPAN)	FP-02	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEPTIC TANK DETAILS		
B2-04	AASHTO TYPE IV GIRDER (INTERIOR SPAN)		<b>EXTERNAL</b>		
B2-05	CONCRETE POURING SEQUENCE AN DIAPHRAGM DETAILS	FX-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - PLOT PLAN, ELEVATION OF FENCE & GATE AND TYPICAL FOUNDATION DETAIL		
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B2-07	ABUTMENT A1 WINGWALL REINFORCEMENT DETAILS				
B2-08	ABUTMENT A2 MAINWALL REINFORCEMENT DETAILS				
B2-09	APPROACH SLAB PLAN, SECTIONS AND DETAILS				
B2-10	APPROACH SLAB PLAN, SECTIONS AND DETAILS (SAME AS B1-07)				
B2-11	ABUTMENT SHEAR KEY & RISER DETAILS (SAME AS B1-08)				
B2-12	PIER P1 AND P2 BAR ARRANGEMENT				
B2-13	PIER SHEAR KEY & RISER DETAILS (SAME AS B1-10)				
B2-14	ABUTMENT PROTECTION AND SIDE DRAIN DETAILS				
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BS-02	TYPICAL SIDEWALK, RAILING AND DRAIN DETAILS				
BS-03	TYPICAL REINFORCED CONCRETE DETAILS				

 <b>JICA</b> JAPAN INTERNATIONAL COOPERATION AGENCY		DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
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	CHECKED	10/15/02	[Signature]	BUREAU OF DESIGN	CABANATUAN BYPASS - CONTRACT PACKAGE I			
	SUBMITTED	10/16/02	[Signature]	OFFICE OF THE SECRETARY				



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CABANATUAN BYPASS - CONTRACT PACKAGE I															FULL SIZE A1																																																												

# 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	

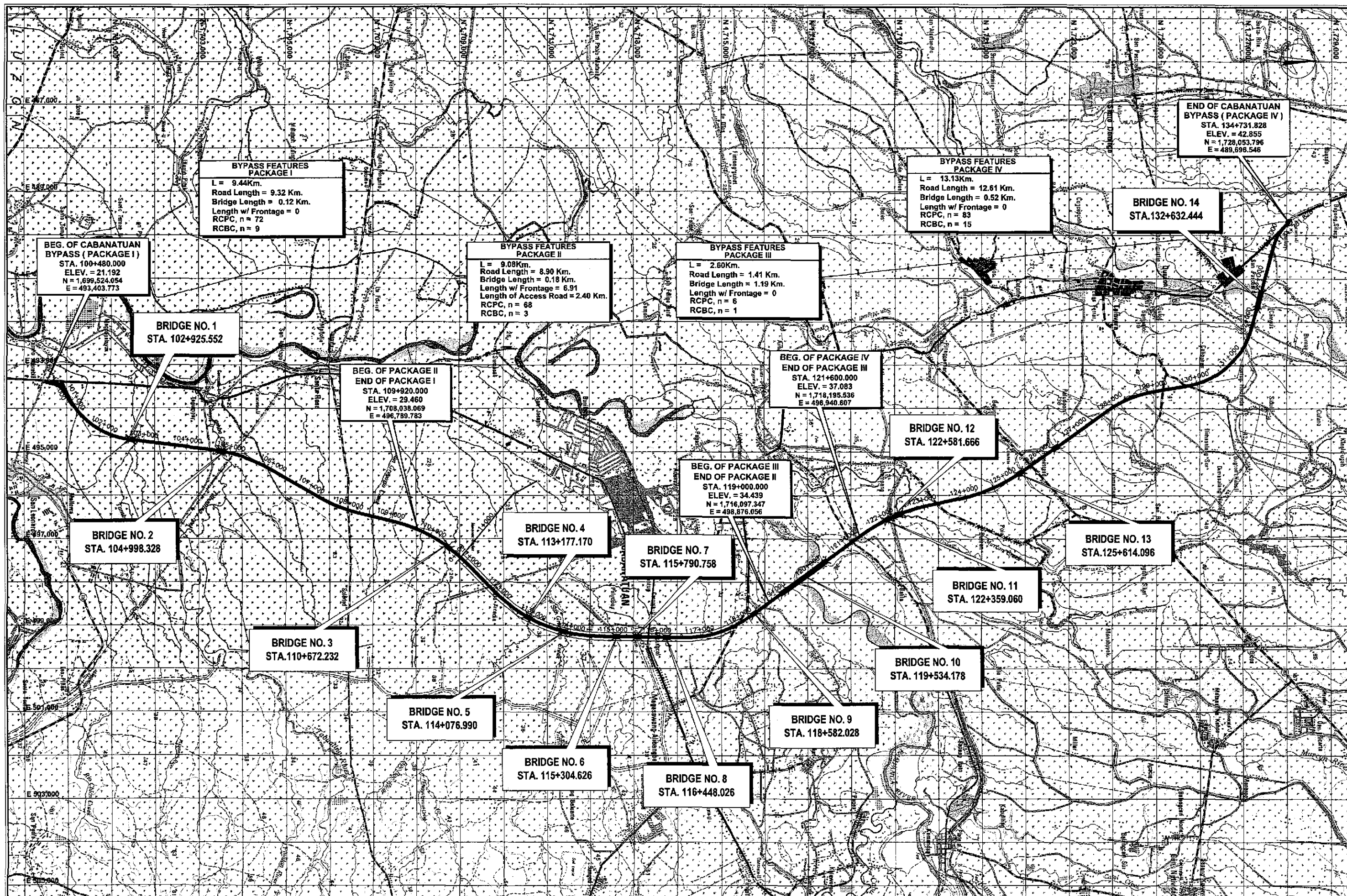
NEW DESIGN FEATURES	
PROJECT ROAD	
SERVICE OR FRONTAGE ROAD ALONG BYPASS	
CONTOUR	
RIGHT-OF-WAY LIMIT	
POINT OF INTERSECTION	
POINT OF INTERSECTION NO.	
Q OF PROJECT ROAD	
FINISHED GRADE ON PROFILE	
BRIDGE	
SINGLE RC PIPE CULVERT	
DOUBLE RC PIPE CULVERT	
BOX CULVERT	
EARTH DITCH FLOW	
DIRECTION OF FLOW	
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	



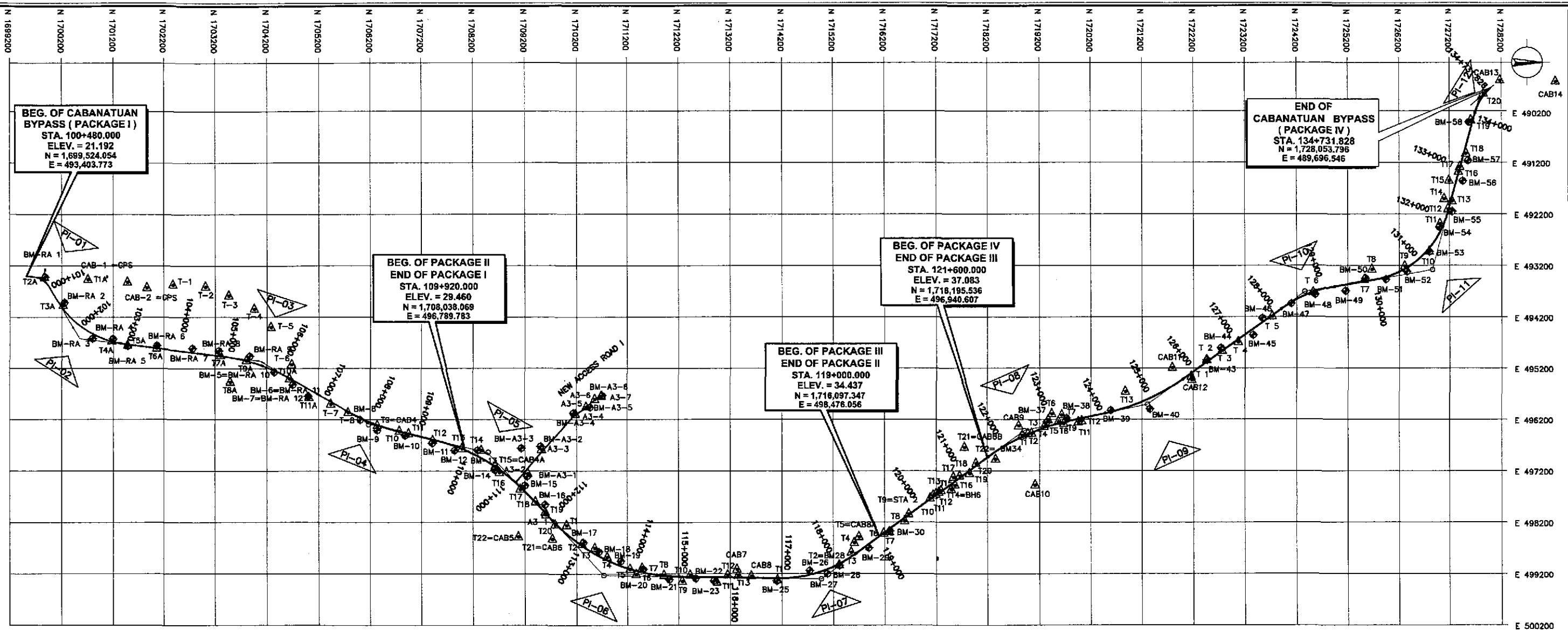
# ABBREVIATIONS

A	PARAMETER (CLOTHOID)	DIST.	DISTANCE	L <sub>0</sub>	SUPERELEVATION RUN-OFF	NIC	NOT INCLUDED IN CONTRACT
ABAN	ABANDON	DIV.	DIVISION	LG	LONG	MPa	MEGA PASCAL
ABT	ABOUT	DRWG./DWG.	DRAWING	LLV	LONG LEG VERTICAL	MC	MANHOLE COVER
ABUT	ABUTMENT	DWY.	DRIVEWAY	LM	LINEAR METER	RP	REFERENCE POINT
AC	ASPHALT CONCRETE	e%	DESIGN SUPERELEVATION	LONGIT.	LONGITUDINAL	RSP	ROCK SLOPE PROTECTION
AGG	AGGREGATE	E	EASTING	LP	LIGHT POLE	RT.	RIGHT
AH	AHEAD	EA	EACH	LS	LUMP SUM ; LEFT SIDE	S	SOUTH
APP	APPROACH	ECC/CS/PF	END OF CIRCULAR CURVE	LT	LEFT	SECT.	SECTION
ASPH	ASPHALT	E	EXTERNAL DISTANCE	m	METER	SDWK.	SIDEWALK
ASTM	AMERICAN STANDARD FOR TESTING & MATERIALS	EF	EACH FACE	mm	MILLIMETER	SHT.	SHEET
AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS	EG	EDGE OF GUTTER	MAX	MAXIMUM	SL	SLOPE
AVE	AVENUE	ELEV./EL.	ELEVATION	MFL	MAXIMUM FLOOD LEVEL	SQ.M./m <sup>2</sup>	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	BEGINING 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 <sup>3</sup>	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		
		L <sub>0</sub>	LENGTH OF CIRCULAR ARC	RS	RIGHT SIDE		

 <b>JAPAN INTERNATIONAL COOPERATION AGENCY</b>		 <b>KATAHIRA &amp; ENGINEERS INTERNATIONAL</b>		 <b>YACHIO ENGINEERING CO., LTD.</b>		 <b>REPUBLIC OF THE PHILIPPINES</b> <b>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</b>		<b>PROJECT AND LOCATION :</b> <b>THE DETAILED DESIGN STUDY ON</b> <b>UPGRADING INTER-URBAN HIGHWAY SYSTEM</b> <b>ALONG THE PAN-PHILIPPINE HIGHWAY</b> <b>(Paridel, Cabanatuan and San Jose Bypasses)</b> <b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>		<b>SCALE :</b> NOT TO SCALE FULL SIZE A1	<b>SHEET CONTENTS :</b> <b>ABBREVIATIONS</b>	<b>SHEET NO. :</b> <b>GC-05</b>	
DESIGNED	10/5/20	SIGNATURE		Submitted By:	DANILO C. TRAJANO Project Director	Reviewed By:	JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By:	GILBERTO S. REYES OIC, Director IV	Approved By:	MANUEL M. BONGAN Undersecretary	Approved By:	SIMEON A. DATUMANONG Secretary



 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) CABANATUAN BYPASS - CONTRACT PACKAGE I		SCALE : 1:40,000 FULL SIZE A1	SHEET CONTENTS : PROJECT ROAD GENERAL ALIGNMENT / FEATURES	SHEET NO. : GC-06
DESIGNED 10/5/02 ACACIO	CHECKED 10/15/02 S. JOSE	SUBMITTED 10/16/02 TEAM LEADER	SUBMITTED BY DANILLO C. TRAJANO Project Director	REVIEWED BY JOSEFINA M. ALAGAR Chief, Highways Division	RECOMMENDED BY GILBERTO S. REYES DIC, Director IV	RECOMMENDED BY MANUEL M. BONAJO Undersecretary	APPROVED BY SIMEON A. DATUMANONG Secretary	



POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
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 lambo bridge's first approach, about 0.05 m. above the bridge's concrete sidewalk.
CAB-2=GPS	1,701,869.365	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 ostrich farm, about 40cm x 40cm x 0.05m 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. mns. beside an irrigation canal about 8m from rd. Cl. & 3 km. from the highway intersec. of Fort Macaranga & Cabanatuan City.
T5=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. mns. on the left side of the rd. going to Fort Macaranga & about 370 m. from GPS Sta. CAB-3, about 4 m from rd. Cl.
T15=CAB4A	1,708,634.191	497,109.919	27.917	Located in Brgy. Tagumpay, San Leonardo, Nueva Ecija. 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.
T21=CAB5	1,708,079.199	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. 3.2 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.
T22=CAB6	1,708,731.929	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 dike 500 m. from the Mabini extension 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	33.487	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 Valdefuente bridge. 3 km. from the highway, turn left to a bridge.
T21=CAB8B	1,717,749.623	496,746.648	34.438	Location in Brgy. Soyoan, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway after the Valdefuente bridge to a road going to Brgy. Soyoan. 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.
CAB9	1,718,805.446	496,330.000	37.709	Located in Brgy. Buiron, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway after the Valdefuente bridge to a road going to Brgy. Soyoan. 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. Dalampangan, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharika highway after the Valdefuente bridge to a road going to Brgy. Dalampangan. 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.
CAB11	1,721,785.245	495,194.632	39.469	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharika highway to Muñoz, turn right on Pinagpanan 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.
CAB12	1,722,164.049	495,433.809	37.949	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharika highway to Muñoz, turn right on Pinagpanan 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	1,718,173.536	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	1,728,259.352	489,628.485	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.

POLYGON POINT	NORTHING	EASTING	ELEV.
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	493,784.640	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	1,705,767.749	496,069.357	25.609
T10	1,706,773.219	496,434.404	26.138
T11	1,706,952.708	496,479.420	26.405
T12	1,707,425.044	496,615.719	27.154
T13	1,707,989.215	496,773.054	26.251
T14	1,708,364.430	496,806.298	26.328
T16	1,708,712.024	497,235.901	26.873
T17	1,709,113.730	497,562.109	26.882
T18	1,709,405.603	497,811.664	28.874
T19	1,709,594.615	498,010.441	29.779
T20	1,709,784.151	498,252.284	30.803
T1	1,710,005.112	498,263.122	30.580
T2	1,710,312.116	498,622.485	31.125
T3	1,710,585.610	498,702.707	30.038
T4	1,710,812.097	498,879.255	31.231
T5	1,711,258.554	498,111.169	31.156
T6	1,711,382.787	498,215.210	30.671
T7	1,711,497.776	498,089.057	31.048
T8	1,711,921.739	499,233.113	32.252

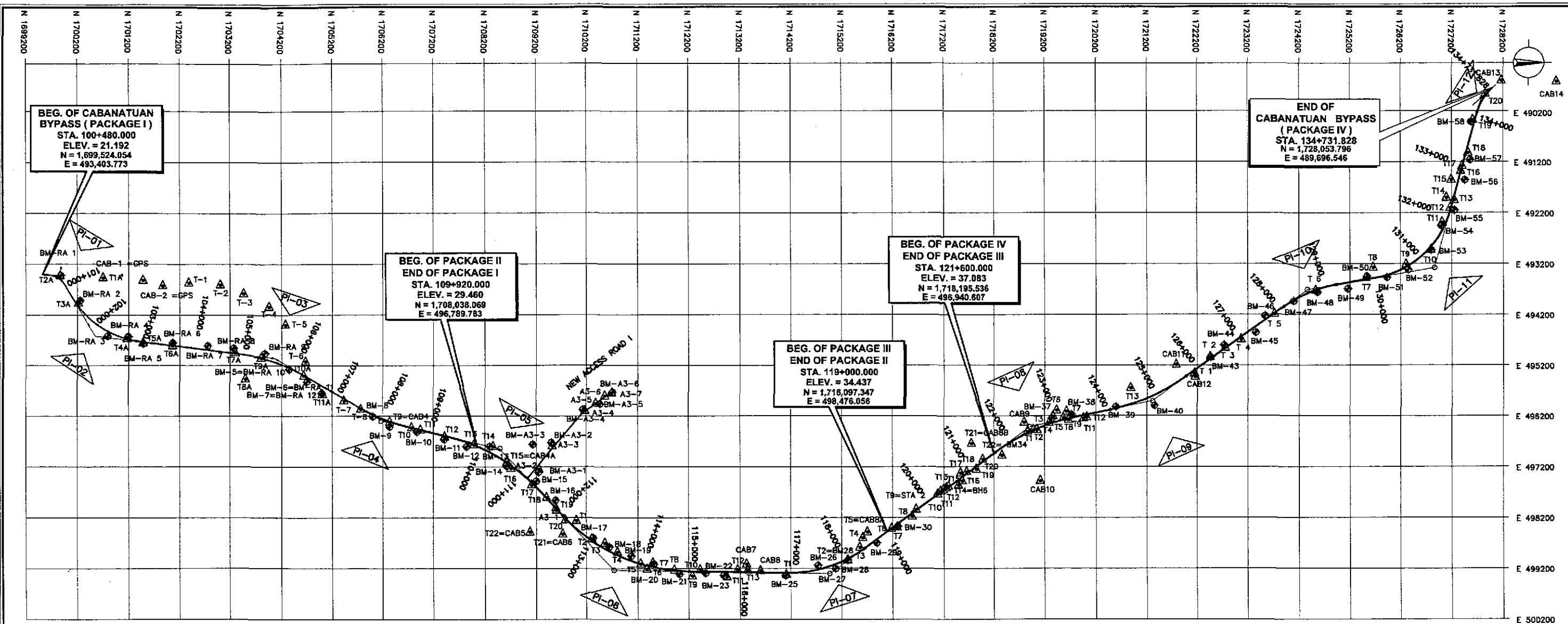
POLYGON POINT	NORTHING	EASTING	ELEV.
T9	1,712,273.907	499,348.863	32.889
T10	1,712,426.453	499,228.114	31.587
T11	1,712,945.026	499,366.723	31.508
T12	1,713,152.194	499,229.016	32.291
T13	1,713,350.716	499,234.593	32.273
T1	1,714,114.133	499,323.114	34.149
T2=BM28	1,715,321.664	499,037.069	34.467
T3	1,715,556.979	498,787.732	33.774
T4	1,715,813.303	498,602.331	33.848
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	1,717,083.859	497,743.553	30.319
T11	1,717,142.345	497,887.576	29.731
T12	1,717,194.108	497,857.056	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	1,717,566.385	497,485.342	31.662
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	497,254.912	32.957
T20	1,717,977.354	497,061.014	35.155
T22=BM34	1,718,380.331	496,980.373	35.518
T1	1,718,871.960	496,509.328	38.125

POLYGON POINT	NORTHING	EASTING	ELEV.
T2	1,718,982.811	496,484.723	37.303
T3	1,719,054.242	496,478.454	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	1,719,634.285	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	1,720,886.498	495,857.578	35.285
T1	1,722,152.496	495,368.651	40.547
T2	1,722,462.939	495,042.525	38.470
T3	1,722,757.770	494,860.054	37.788
T4	1,723,072.308	494,693.817	39.520
T5	1,723,722.544	494,191.279	39.407
T6	1,724,530.896	493,726.864	41.610
T7	1,725,515.859	493,486.477	43.192
T8	1,725,664.133	493,279.741	41.739
T9	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	492,109.859	44.051
T13	1,727,252.558	491,953.012	45.106
T14	1,727,099.751	491,908.990	44.528

POLYGON POINT	NORTHING	EASTING	ELEV.
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	491,028.906	44.649
T19	1,727,612.787	490,382.069	43.759
T20	1,717,856.316	489,865.741	42.999
T1A	1,700,708.564	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	1,703,307.869	494,952.040	23.664
T8A	1,703,499.259	495,470.561	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	495,771.069	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	27.908
A3-4	1,710,182.293	496,102.911	26.914
A3-5	1,710,393.491	495,956.847	26.810
A3-6	1,710,571.283	495,803.951	27.141
A3-7	1,710,701.618	495,743.236	27.061

 <b>JAPAN INTERNATIONAL COOPERATION AGENCY</b>		 <b>REPUBLIC OF THE PHILIPPINES</b> <b>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</b>		<b>PROJECT AND LOCATION :</b> <b>THE DETAILED DESIGN STUDY ON</b> <b>UPGRADING INTER-URBAN HIGHWAY SYSTEM</b> <b>ALONG THE PAN-PHILIPPINE HIGHWAY</b> <b>(Plaridel, Cabanatuan and San Jose Bypasses)</b>		<b>SCALE :</b> 1:40,000 FULL SIZE A1		<b>SHEET CONTENTS :</b> <b>HORIZONTAL AND VERTICAL</b> <b>CONTROL MONUMENTS</b> Sheet 1 of 2		<b>SHEET NO. :</b> <b>GC-07</b>	
DESIGNED	10/15/02	CHECKED	10/15/02	SUBMITTED	10/15/02	PUHL - PMD Submitted By: DANILLO 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. BONJAN Undersecretary		Approved By: SIMEON A. DATUMANONG Secretary			





POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-RA 1	1,699,860.470	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	494,817.824	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	494,824.849	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	494,786.231	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 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 dahan 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. Tagumpay, San Leonardo.
BM-RA 9	1,703,867.868	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=BM-RA10	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 top of an irrigation canal.
BM-5=BM-RA11	1,704,703.014	495,521.310	25.723	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. Tagumpay, Sta. Rosa.
BM-7=BM-RA12	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	496,021.565	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	496,859.842	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. Aeo Villalora in Brgy. Tagapos, 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 pholana.
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. Tagapos, 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	1,709,554.212	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 of 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	30.565	It is located on the left side of the alignment placed on the intersection of rice paddy in the middle of a ricefield in Brgy. Sta. Arcadia.
BM-19	1,711,076.165	498,651.693	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.

POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-20	1,711,512.317	499,109.686	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 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	1,712,881.166	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 at 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	499,037.089	34.467	It is located on the left side of the alignment placed on the side of the barangay road 2 m. away from its 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 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. Concha, 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 and about 50 m. away from the top bank of an irrigation canal in Brgy. San Isidro.
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 at 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	38.238	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	38.396	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. Pula, Cabanatuan City.
BM-43	1,722,482.946	495,042.545	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 poles with marking BM-43=1-8.
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 subdivision Brgy. Pundod, 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 nipa hut at Brgy. Pundod, 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. Dimasigang 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. Dimasigang 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. 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.

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 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. 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. Santa Hacienda, Talavera.
BM-53	1,726,804.440	492,931.296	42.900	It is located on the right side of the alignment right 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 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.

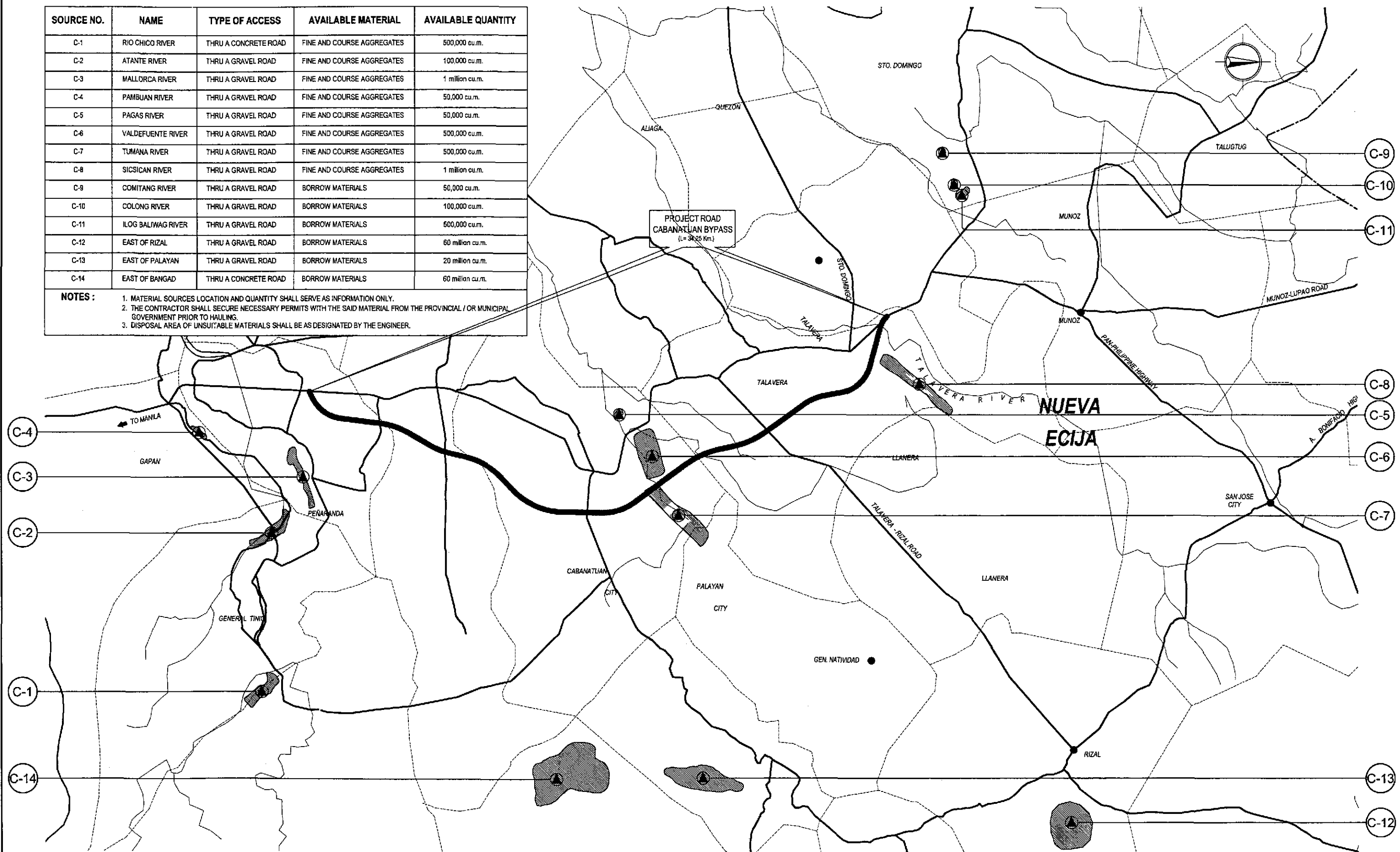
POLYGON POINT	NORTHING	EASTING	ELEV.	REMARKS
BM-A3-1	1,709,244.996	497,307.583	27.574	It is located on the right side of the access road placed on the side of the access road 60 m. away from its centerline between 2 coconut trees along exco. farm road in Brgy. Sta. Arcadia, Cabanatuan City.
BM-A3-2	1,709,500.218	496,724.144	26.740	It is located on the left side of the access road placed on the side of a narrow tree 5 m. away from existing irrigation road near a house in Brgy. Sta. Arcadia, Cabanatuan City.
BM-A3-3	1,709,193.419	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 ipil-tilip 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	26.098	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	26.896	It is located on the right side of the road alignment near Bata bridge on its gutter 15 m. away from its 1st approach in Brgy.

 <b>JAPAN INTERNATIONAL COOPERATION AGENCY</b>		 <b>REPUBLIC OF THE PHILIPPINES</b> <b>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</b>		<b>PROJECT AND LOCATION :</b> THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses) <b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>		<b>SCALE :</b> 1:40,000 FULL SIZE A1	<b>SHEET CONTENTS :</b> <b>HORIZONTAL AND VERTICAL CONTROL MONUMENTS</b> Sheet 2 of 2	<b>SHEET NO. :</b> <b>GC-08</b>
<b>DESIGNED</b> 10/5/02 	<b>CHECKED</b> 10/15/02 	<b>SUBMITTED</b> 10/16/02 	<b>DATE</b> 10/16/02 <b>SIGNATURE</b> 	<b>DESIGNED BY</b> DANILLO C. TRAJANO Project Director	<b>REVIEWED BY</b> JOSEFINA M. ALAGAR Chief, Highway Division	<b>RECOMMENDED BY</b> GILBERTO S. REYES OIC, Director IV	<b>RECOMMENDED BY</b> MANUEL M. BONDAN Undersecretary	<b>APPROVED BY</b> 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	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.






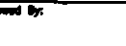

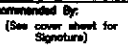



**A** LOCATION OF MATERIAL SOURCES  
GC-09 SCALE 1:80,000

<b>JICA</b> JAPAN INTERNATIONAL COOPERATION AGENCY <b>KATAHIRA &amp; ENGINEERS</b> INTERNATIONAL <b>YEO</b> YACHIYO ENGINEERING CO., LTD.		DESIGNED: 10/5/02 CHECKED: 10/15/02 SUBMITTED: 10/16/02 DATE: 10/16/02 SIGNATURE: [Signature] TEAM LEADER	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN OFFICE OF THE SECRETARY Submitted By: DANIL C. TRAJANO Project Director Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division Recommended By: GILBERTO S. REYES OIC, Director IV Recommended By: MANUEL M. BONGAN Undersecretary Approved By: SIMEON A. DATUMANONG Secretary	PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE I	SCALE : 1:80,000 FULL SIZE A1	SHEET CONTENTS : LOCATION OF MATERIAL SOURCES	SHEET NO. : GC-09
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# SUMMARY OF QUANTITIES (ULTIMATE STAGE)

ITEM NO.	DESCRIPTION	UNIT	QUANTITY																	REMARKS
			BYPASS	A-1	A-1a	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	BRIDGE #1	BRIDGE #2	TOTAL	
PART C - EARTHWORKS																				
100(1)	Clearing and Grubbing	ha	7.09	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.00	
101(1)	Removal of Existing Structures and Obstructions	L.S.	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00	
101(3)a	Removal of Existing PCC Pavement	m2	2,589.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,589.00	
101(5)b	Relocation of Existing Guardrails	m	984.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	984.00	
101(7)	Removal of Existing Slope Protection	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	82.00	71.00	153.00		
101(8)	Removal of Existing Slope Protection (Hand-laid Rock)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	44.00	-	44.00		
101(9)	Removal of Existing Gabion	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.00	24.00		
101(11)	Removal of Existing Combination Concrete Curb & Gutter/Side Strip	m	822.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	822.00		
101(12)	Relocation of Existing Road Signs	each	10.00	-	-	-	-	-	-	-	1.00	-	-	-	-	-	-	11.00		
101(13)	Removal of Existing Road Signs	each	1.00	-	-	-	-	-	-	2.00	2.00	-	-	-	-	-	-	5.00		
103(1)	Structure Excavation	m3	210.74	-	-	-	-	-	-	-	-	-	-	-	-	-	-	211.00		
103(2)a	Bridge Excavation above OWL (Common Soil)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	230.00	234.00	464.00		
103(2)c	Bridge Excavation below OWL (Common Soil)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	155.00	428.00	583.00		
103(3)a	Gravel Foundation Fill	m3	23.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.00		
103(6)	Pipe Culverts and Drain Excavation	m3	1,048.53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,049.00		
103(7)	Granular Backfill for Pipe Culvert	m3	540.71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	541.00		
104(1)	Embankment from Roadway Excavation	m3	11,968.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11,969.00		
104(3)	Embankment from Borrow Pit	m3	15,313.95	-	-	-	-	-	-	-	-	-	-	-	-	714.00	608.00	16,635.00		
104(4)	Embankment from Borrow (Selected Granular Material) for Bridge	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	592.00	533.00	1,125.00		
105(1)	Subgrade Preparation (Common Soil)	m2	77,237.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77,237.00		
PART D - BASE AND SUBBASE COURSE																				
200(1)	Aggregate Subbase Course	m3	25,517.00	-	-	-	-	-	-	-	-	-	-	-	-	30.00	30.00	25,577.00		
PART E - SURFACE COURSES																				
300(1)	Gravel Surface Course	m3	34.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	35.00		
311(1)b	PCC Pavement (Plain), t=250mm	m2	70,660.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70,661.00		
311(1)d	PCC Pavement (Plain), t=180mm	m2	46,652.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	46,653.00		
311(2)	PCC Pavement (Reinforced) t=300mm Approach Slab	m2	159.20	-	-	-	-	-	-	-	-	-	-	-	-	118.00	118.00	395.00		
PART F - BRIDGE CONSTRUCTION																				
400(4)b	Precast Concrete Piles (450mmx450mm), furnished	m	-	-	-	-	-	-	-	-	-	-	-	-	-	638.00	810.00	1,448.00		
400(13)b	Precast Concrete Piles (450mmx450mm), driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	547.00	686.00	1,233.00		
400(15)b	Test Piles (Conc. Pile 450mmx450mm), furnished & driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	32.75	41.00	74.00		
400(19)b	Pile shoes for 450mmx450mm Piles	each	-	-	-	-	-	-	-	-	-	-	-	-	-	75.00	102.00	177.00		
401(1)a	Concrete Railing Type A (Concrete Posts and Precast Beams)	m	-	-	-	-	-	-	-	-	-	-	-	-	-	102.00	127.00	229.00		
404(1)	Reinforcing Steel (Grade 40)	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	34,784.00	44,152.00	78,936.00		
404(2)	Reinforcing Steel (Grade 60)	kg	22,268.00	-	-	-	-	-	-	-	-	-	-	-	-	36,738.00	59,677.00	118,683.00		
405(1)a	Structural Concrete Class A (f'c=21MPa, max. aggregate 38mm) for heavily reinforced structures	m3	226.91	-	-	-	-	-	-	-	-	-	-	-	-	-	-	227.00		
405(1)b	Structural Concrete Class A (f'c=21MPa, max. aggregate 38mm) for small & medium bridges substructures	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	413.00	576.00	989.00		
405(1)d	Structural Concrete Class A1 (f'c=21MPa, max. aggregate 20mm) for small & medium bridges PCDG superstructures	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	165.00	213.00	378.00		
405(2)	Structural Concrete Class B (f'c=17MPa, max. aggregate 50mm) for plain or lightly reinforced structures	m3	154.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	154.00		
405(3)	Structural Concrete Class C (f'c=21MPa, max. aggregate 12mm) for thin reinforced members	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	30.00	35.00	65.00		
405(6)	Lean Concrete (f'c=17MPa, max. aggregate 38mm)	m3	11.84	-	-	-	-	-	-	-	-	-	-	-	-	20.00	55.00	97.00		
406(1)a	Precast Prestressed Structural Concrete Member (AASHTO Girder Type IV L=20m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	10.00		
406(1)b	Precast Prestressed Structural Concrete Member (AASHTO Girder Type IV L=22m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	5.00		
406(1)d	Precast Prestressed Structural Concrete Member (AASHTO Girder Type IV L=25m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	-	10.00		
407(1)c	Elastomeric Bearing Pad, Duro 60 (800x350x50mm)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	30.00	40.00		
407(2)a	Expansion Joint, (t=40mm Movement)	m	-	-	-	-	-	-	-	-	-	-	-	-	-	20.00	20.00	40.00		
407(2)g	Expansion Joint, 30mm for bridge sidewalk	m	-	-	-	-	-	-	-	-	-	-	-	-	-	4.00	4.00	8.00		
407(4)	G.I. Drain Pipe Ø150mm for Bridge Drainage	m	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	6.00	11.00		
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES																				
500(1)c3	RCPC Extra Strength (32MPa), Ø 460mm (18")	m	492.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	492.00		
502(2)a1	Drop Inlet Manhole for RCPC 1-Ø 460 x 1-Ø 460	each	41.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.00		
504(5)	Grouted Riprap Class A	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	164.00	36.00	200.00		
506(1)	Hand Laid Rock Apron (Loose Boulder Apron)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	88.00	-	88.00		
507(2)b	Steel Sheet Piles (400x85x9mm), furnished & driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	611.00	611.00		
509(1)	Gabions	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	146.00	146.00		
510(1)	Rubble Concrete Slope Protection	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90.00	90.00		

 <b>JAPAN INTERNATIONAL COOPERATION AGENCY</b>		 <b>KATAHIRA &amp; ENGINEERS INTERNATIONAL</b>		 <b>YACHIYO ENGINEERING CO., LTD.</b>		<div style="text-align: center;">               REPUBLIC OF THE PHILIPPINES              DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS           </div>						<b>PROJECT AND LOCATION :</b> THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		<b>SCALE :</b> FULL SIZE A1	<b>SHEET CONTENTS :</b> SUMMARY OF QUANTITIES (ULTIMATE STAGE) 1 of 2	<b>SHEET NO. :</b> GC-10
DESIGNED	10/5/02	SIGNATURE	 <b>DANILO C. TRAJANO</b> Project Director		<b>BUREAU OF DESIGN</b> Submitted By:  <b>JOSEFINA M. ALAGAR</b> Chief, Highway Division		<b>OFFICE OF THE SECRETARY</b> Recommended By:  <b>GILBERTO S. REYES</b> OIC, Director IV		Recommended By:  <b>MANUEL M. BONIFACIO</b> Undersecretary		Approved By:  <b>SIMEON A. DATUMANONG</b> Secretary		<b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>			

SUMMARY OF QUANTITIES  
(ULTIMATE STAGE)

ITEM NO.	DESCRIPTION	UNIT	DESCRIPTION																	REMARKS
			BYPASS	A-1	A-1a	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	BRIDGE #1	BRIDGE #2	TOTAL	
PART H - MISCELLANEOUS STRUCTURES																				
600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x384mm)	m	17,710.00	-	-	-	-	-	-	-	-	-	-	91.46	-	-	-	-	17,802.00	
603(3)a	Metal Guardsrails (Metal Beam) Type A (Embedded in Soil)	m	181.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	181.00	
605(1)a	Warning Signs (Triangular 900mm)	each	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00	
605(2)c	Regulatory Signs (Circular Ø 800mm)	each	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.00	
605(2)d	Regulatory Signs (Rectangular 450x750mm)	each	3.00	-	-	-	-	-	-	-	-	-	-	-	2.00	-	-	-	5.00	
608(1)	Furnishing and Placing Top Soil	m3	2,255.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,256.00	
610(1)	Sodding	m2	22,550.42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22,551.00	
611(1)a	Trees (Furnishing and Transplanting) Low Tree H = 1.5m	each	28,080.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28,080.00	
611(1)b	Trees (Furnishing and Transplanting) Medium Tree 1.5m < H = 3.0m	each	1,630.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,630.00	
611(1)c	Trees (Furnishing and Transplanting) High Tree (Young Tree) 1.5m < H = 3.0m	each	36.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	36.00	
612(1)a	Reflectorized Thermoplastic Pavement Markings (White)	m2	2,664.78	13.30	-	-	-	-	-	52.09	49.57	-	-	66.80	-	-	-	-	2,847.00	
SPL 612(2)	Removal of Existing Thermoplastic Pavement Markings	m2	317.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	318.00	
SPL 620(5)b	Relocation of Street Lighting Poles (Dual Lamp)	each	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.00	

**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	493,518.281	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	1,701,869.179	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 orchard 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. mone. beside an Irr. canal about 8m from rd. CL & 3 km. from the highway Intersec. of Fort Magaysay & 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. mone. on the left side of the rd. going to Fort Magaysay & 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. Tagpoa, 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	1,709,079.189	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	1,713,803.208	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	1,717,749.823	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. Bulliron, 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	497,461.812	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	1,721,785.046	495,184.942	39.469	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Mufoz, 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	495,433.639	37.949	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Mufoz, 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	489,626.465	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 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 ANY CLEANING, UNCLOGGING 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:



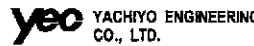
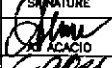
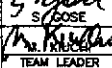
- 12.1 STRICT COMPLIANCE WITH BATAS PAMBANSA BILANG 344 AND ITS IMPLEMENTING RULES AND REGULATIONS SHALL BE IMPOSED.


### 13.0 TREE PLANTING ALONG NATIONAL ROADS

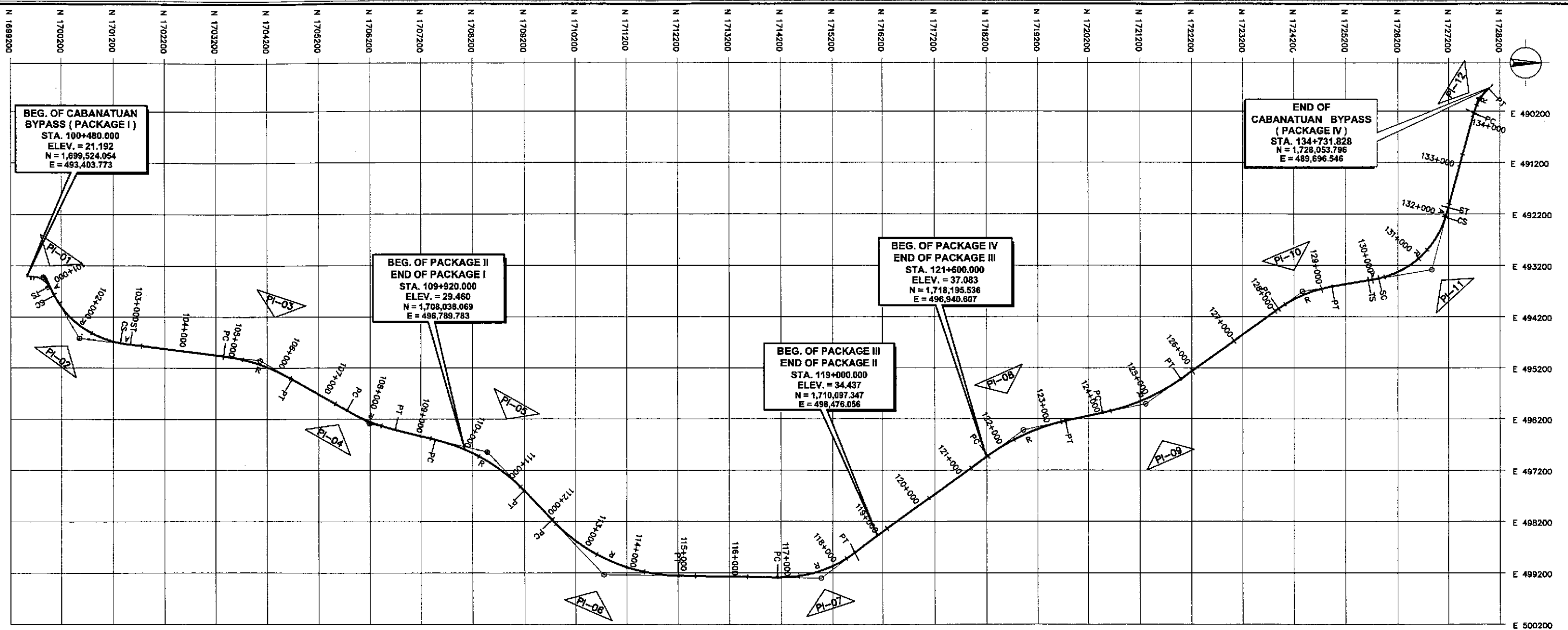
- 13.1 DPWH DEPARTMENT ORDER NO. 15, SERIES OF 2000 AND ITS REQUIREMENTS SHALL BE IMPOSED. THE PLANTING OF TREES ALONG NATIONAL ROADS SHALL BE MADE A STANDARD COMPONENT OF ALL ROAD CONSTRUCTION AND IMPROVEMENT PROJECTS TO ENHANCE QUALITY OF ENVIRONMENT.

### 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.	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/5/01		PJHL - PMO				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		GENERAL NOTES HIGHWAY/ CIVIL AND DRAINAGE	RG-01
	CHECKED	10/15/01		BUREAU OF DESIGN				CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		

SUBMITTED	10/16/01		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highway Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONGAON Undersecretary	SIMEON A. DATUMANONG Secretary
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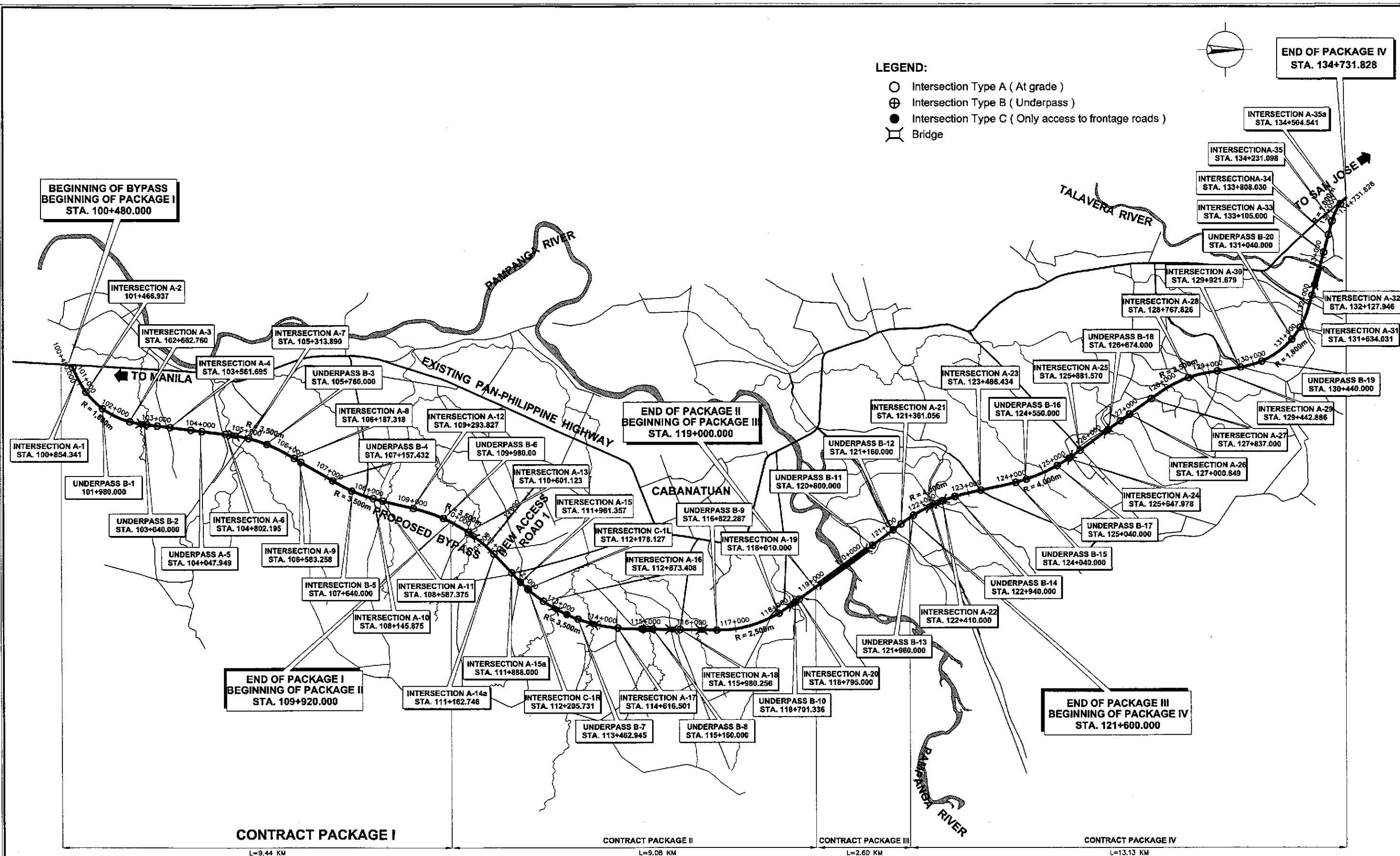
ELEMENTS OF CURVES								
P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT $\Theta_s$	DEFLECTION ANGLE	A R	Ls Lc	STATION
BEG.	100+480.00							
01	100+806.146	326.146	183°25'21"	246.146	56°16'36"	160.000	84.000	TS=100+580.000 SC=100+824.000 CS=100+952.888 ST=101+018.888
		1,385.199	238°41'57"	4°35'01"		400.000	328.888	TS=101+018.888 SC=101+184.756 ST=102+384.756
02	102+155.840			147.870	52°39'26"	600.000	200.000	TS=102+384.756 SC=103+019.034
		3,544.720	187°02'31"	3°10'59"		1,800.000	1,454.277	SC=103+019.034
03	105+572.571			720.109	23°15'08"	-	-	PC=104+852.482 PT=106+272.858
		2,451.020	210°17'39"	-		3,500.000	1,420.397	
04	108+003.789			514.528	16°43'34"	-	-	PC=107+489.241 PT=108+510.979
		2,363.853	183°34'05"	-		3,500.000	1,021.737	
05	110+380.304			1,035.121	32°57'04"	-	-	PC=108+325.183 PT=111+338.048
		3,288.872	228°31'06"	-		3,500.000	2,012.865	
06	113+591.799			1,489.788	45°33'32"	-	-	PC=112+122.011 PT=114+905.048
		4,225.528	180°57'37"	-		3,500.000	2,783.035	
07	117+660.785			840.295	37°09'25"	-	-	PC=118+820.490 PT=118+441.763
		4,885.881	143°48'12"	-		2,500.000	1,821.273	

ELEMENTS OF CURVES								
P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT $\Theta_s$	DEFLECTION ANGLE	A R	Ls Lc	STATION
08	122+487.349	4,885.881	143°48'12"	856.992	24°11'07"	-	-	PC=121+630.356 PT=123+318.815
		2,447.505	167°59'20"	-		4,000.000	1,888.459	
09	124+809.328			837.385	23°38'52"	-	-	PC=124+071.844 PT=125+722.871
		3,773.512	144°20'28"	-		4,000.000	1,850.827	
10	128+658.988			577.297	26°00'20"	-	-	PC=128+081.701 PT=129+218.405
		2,530.124	170°20'47"	-		2,500.000	1,134.704	
11	131+189.232			1,250.689	85°08'11"	600.000	200.000	TS=129+918.543 SC=130+118.543
		3,450.454	105°11'37"	3°10'59"		1,800.000	1,846.841	CS=131+965.384 ST=132+185.384
12	134+385.148			292.954	32°39'23"	-	-	PC=134+072.196 PT=134+642.155
		382.827	137°50'54"	-		1,000.000	569.980	
END	134+731.823							

TABLE OF COORDINATES				
P.I. No.	NORTHING	EASTING	NORTHING	EASTING
BEG.	1,899,524.054	493,403.773		
01	1,899,849.619	493,423.243	TS 1,899,803.912	493,408.549
			SC 1,899,667.655	493,414.070
			CS 1,899,840.088	493,581.402
			ST 1,899,973.809	493,635.763

TABLE OF COORDINATES				
P.I. No.	NORTHING	EASTING	NORTHING	EASTING
02	1,700,548.505	494,618.209	TS 1,700,048.415	493,763.432
			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 1,704,868.282	495,417.031
			PT 1,705,738.544	495,030.823
04	1,706,182.811	496,290.171	PC 1,708,682.980	496,410.880
			PT 1,707,474.461	496,601.893
05	1,708,480.893	496,844.734	PT 1,709,192.973	497,595.822
			PC 1,709,732.427	498,164.670
06	1,710,743.806	498,231.154	PT 1,712,213.387	498,255.786
			PC 1,714,128.561	499,287.887
07	1,714,968.738	499,301.970	PT 1,715,846.852	499,605.727
			PC 1,718,220.033	499,922.679
08	1,718,911.822	499,416.576	PT 1,719,748.852	499,238.234
			PC 1,720,486.493	499,081.508
09	1,721,305.544	499,807.244	PT 1,721,985.820	499,418.082
			PC 1,723,902.473	499,043.979
10	1,724,371.527	493,707.438	PT 1,724,940.649	493,610.632
			TS 1,725,632.845	493,492.891
11	1,726,885.824	493,283.164	SC 1,725,829.332	493,455.713
			CS 1,727,137.632	492,288.171
			ST 1,727,193.605	492,076.192
12	1,727,770.121	489,953.318	PC 1,727,893.343	490,238.031
			PT 1,727,987.313	489,756.723
END				

 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 : 1:40,000	SHEET CONTENTS : ALIGNMENT TECHNICAL DESCRIPTION	SHEET NO. : RG-02	
KATAHIRA & ENGINEERS INTERNATIONAL		YACHIO ENGINEERING CO., LTD.		CABANATUAN BYPASS - CONTRACT PACKAGE I		FULL SIZE A1			
DESIGNED	10/5/02	SIGNATURE	DATE	DESIGNED	10/5/02	SIGNATURE	DATE		
CHECKED	10/15/02	SIGNATURE	DATE	CHECKED	10/15/02	SIGNATURE	DATE		
SUBMITTED	10/16/02	SIGNATURE	DATE	SUBMITTED	10/16/02	SIGNATURE	DATE		
DAIHO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONDAN Undersecretary		SIMEDON A. DATUMANONG Secretary	



LOCATION OF PROPOSED INTERSECTIONS / UNDERPASSES ALONG BYPASS

SCALE

1:40,000

<b>JICA</b> 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 : 1:40,000 FULL SIZE A1	SHEET CONTENTS : LOCATION OF INTERSECTIONS / UNDERPASSES ALONG BYPASS	SHEET NO. : RG-03
DESIGNED 10/15/02 CHECKED 10/15/02 SUBMITTED 10/16/02	DATE 10/15/02 10/15/02 10/16/02	SIGNATURE S. ACACIO S. BOSE M. KUCHI	SUBMITTED BY: DANILLO C. TRAJANO Project Director	REVIEWED BY: JOSEFINA M. ALAGAR Chief, Highways Division	RECOMMENDED BY: GILBERTO S. REYES DE, Director IV	RECOMMENDED BY: MANUEL M. BONGAN Undersecretary	APPROVED BY: SIMEON A. DATUMANONG Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE I		



# SCHEDULE OF PAVEMENT MARKINGS

## CONTRACT PACKAGE I (ULTIMATE STAGE)

### ITEM 612(1) - REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS

1. EDGE LINES				1.4 RIGHT SIDE, INNER EDGE				4.0 CONTINUITY LINE				6.0 ARROWS				
1.1 LEFT SIDE, OUTER EDGE				STATION				STATION				ARROW TYPE	NUMBER OF ARROWS	LOCATION		
STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS					
FROM	TO			FROM	TO			FROM	TO			FROM	TO	FROM	TO	
100+480.00	100+823.94	343.94	MAIN BYPASS	100+560.00	100+841.69	281.69	MAIN BYPASS	100+480.00	100+560.00	80.00	(LS) 150mm x 1.0m @ 3.0m GAP	A	4	APPROACHING INTERSECTION A-1		
100+823.93	00+036.48	37.37	MAIN BYPASS TO LT OF A-1	100+860.60	101+464.53	603.93	MAIN BYPASS	100+480.00	100+560.00	80.00	(RS) 150mm x 1.0m @ 3.0m GAP	C	4	APPROACHING INTERSECTION A-1		
00+036.48	00+080.98	44.50	LEFT OF A-1	101+468.34	102+660.76	1191.42	MAIN BYPASS	100+678.93	100+723.93	45.00	(LS) 150mm x 1.0m @ 3.0m GAP	A	2	APPROACHING INTERSECTION A-6		
00+080.98	00+020.00	12.51	LT OF A-1 TO LT OF PAN-PHIL HIGHWAY	102+664.76	103+559.38	894.62	MAIN BYPASS	100+875.70	100+740.70	65.00	(RS) 150mm x 1.0m @ 3.0m GAP	B	2	APPROACHING INTERSECTION A-6		
00+020.00	00+080.00	60.00	LEFT OF PAN-PHIL HIGHWAY	103+604.01	104+045.57	441.56	MAIN BYPASS	100+898.69	100+941.69	45.00	(LS) 150mm x 1.0m @ 3.0m GAP	C	2	APPROACHING INTERSECTION A-6		
00+013.69	00+080.00	66.31	RIGHT OF PAN-PHIL HIGHWAY	104+050.33	104+785.17	734.84	MAIN BYPASS	104+698.97	104+743.97	45.00	(RS) 150mm x 1.0m @ 3.0m GAP	A	2	APPROACHING INTERSECTION A-7		
00+013.69	00+100.86	11.63	RT OF PAN-PHIL HIGHWAY TO LT OF A-1	104+819.17	105+302.45	483.28	MAIN BYPASS	104+860.42	104+905.42	45.00	(LS) 150mm x 1.0m @ 3.0m GAP	B	2	APPROACHING INTERSECTION A-7		
00+100.86	00+227.57	126.71	LEFT OF A-1	105+325.22	106+184.25	859.03	MAIN BYPASS	105+212.25	105+257.04	44.79	(RS) 150mm x 1.0m @ 3.0m GAP	C	2	APPROACHING INTERSECTION A-7		
00+033.93	00+227.57	193.64	RIGHT OF A-1	106+190.39	106+580.79	390.40	MAIN BYPASS	105+371.91	105+417.34	45.43	(LS) 150mm x 1.0m @ 3.0m GAP	A	6	APPROACHING INTERSECTION A-10		
00+033.93	100+878.97	33.20	RIGHT OF A-1 TO MAIN BYPASS	106+585.73	108+132.02	1546.29	MAIN BYPASS	107+966.88	108+011.97	45.09	(LS) 150mm x 1.0m @ 3.0m GAP	B	2	APPROACHING INTERSECTION A-10		
100+878.97	104+781.92	3902.95	MAIN BYPASS	108+158.91	108+585.34	426.43	MAIN BYPASS	107+966.88	108+027.02	60.14	(RS) 150mm x 1.0m @ 3.0m GAP	C	4	APPROACHING INTERSECTION A-10		
104+781.92	00+975.29	16.76	MAIN BYPASS TO RT OF A-6	108+589.41	109+291.82	702.41	MAIN BYPASS	108+027.02	108+071.83	44.81	(RS) 150mm x 1.0m @ 3.0m GAP					
00+910.00	00+975.29	65.29	RIGHT OF A-6	109+295.83	109+920.00	624.17	MAIN BYPASS	108+219.70	108+264.70	45.00	(LS) 150mm x 1.0m @ 3.0m GAP					
00+910.00	00+977.46	67.46	LEFT OF A-6	00+014.53	00+147.57	133.04	INTERSECTION A-1	108+264.70	108+324.70	60.00	(LS) 150mm x 1.0m @ 3.0m GAP					
00+977.46	104+814.62	23.40	LEFT OF A-6 TO MAIN BYPASS	00+920.65	00+984.81	64.16	INTERSECTION A-10	108+278.95	108+324.13	45.18	(RS) 150mm x 1.0m @ 3.0m GAP					
104+814.62	105+300.99	486.37	MAIN BYPASS	01+015.16	01+039.31	24.15	INTERSECTION A-10	00+147.50	00+227.57	80.07	(LS) 100mmx1.0m@3.0m GAP(A-1)					
105+300.99	00+977.17	23.79	MAIN BYPASS TO RT OF A-7	2.0 CENTERLINE												
00+920.00	00+977.17	57.17	RIGHT OF A-7	STATION		LENGTH (m)	REMARKS									
00+920.00	00+975.84	55.84	LEFT OF A-7	FROM	TO											
00+975.84	105+333.43	16.51	LEFT OF A-7 TO MAIN BYPASS	00+910.00	00+946.73	36.73	A-6: 100mm x 3.0m @ 4.50m GAP									
105+333.43	108+111.97	2776.54	MAIN BYPASS	00+946.73	00+976.73	30.00	A-6: 100mm UNBROKEN LINE									
108+111.97	00+962.24	28.97	MAIN BYPASS TO RT OF A-10	01+024.44	01+054.44	30.00	A-6: 100mm UNBROKEN LINE									
00+860.00	00+962.24	102.24	RIGHT OF A-10	01+054.44	01+090.00	35.56	A-6: 100mm x 3.0m @ 4.50m GAP									
00+860.00	00+964.41	104.41	LEFT OF A-10	00+920.00	00+945.84	25.84	A-7: 100mm x 3.0m @ 4.50m GAP									
00+964.41	108+173.76	42.98	LEFT OF A-10 TO MAIN BYPASS	00+945.84	00+975.84	30.00	A-7: 100mm UNBROKEN LINE									
108+173.76	109+920.00	1746.24	MAIN BYPASS	01+024.28	01+054.28	30.00	A-7: 100mm UNBROKEN LINE									
				01+054.28	01+080.00	25.72	A-7: 100mm x 3.0m @ 4.50m GAP									
1.2 RIGHT SIDE, OUTER EDGE				3.0 LANE LINE				5.0 CHEVRON				7.0 PEDESTRIAN AND STOP LINES				
STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS	STATION		LENGTH (m)	REMARKS	LOCATION		AREA (m <sup>2</sup> )		REMARKS
FROM	TO			FROM	TO			FROM	TO			PEDESTRIAN	STOP LINE			
100+480.00	104+789.77	4309.77	MAIN BYPASS	100+560.00	100+840.70	280.70	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP	100+480.00	100+559.17	79.17	CENTER OF MAIN BYPASS	INT. A-1	MAIN BYPASS	9.91	7.89	SIGNALIZED
104+789.77	01+022.54	23.40	MAIN BYPASS TO RT OF A-6	100+840.70	100+840.70	116.77	(LS) OUTER LANE LINE 150mmx3.0m @ 4.50m GAP	00+148.32	00+227.57	79.25	CENTER OF A-1	A-1	11.96	1.05		
01+022.54	01+090.00	67.46	RIGHT OF A-6	100+560.00	100+810.70	250.70	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP	00+880.65	00+920.00	39.35	CENTER OF A-10	MAIN BYPASS	46.68	9.00	UNSIGNALIZED	
01+024.71	01+090.00	65.29	LEFT OF A-6	100+810.70	100+840.70	30.00	(RS) 2 - LANE LINE 150mm UNBROKEN	01+040.56	01+079.31	38.75	CENTER OF A-10	A-6	34.80	1.87		
01+024.71	104+822.47	16.76	LEFT OF A-6 TO MAIN BYPASS	100+840.70	100+810.70	70.00	(RS) INNER LANE LINE 150mmx3.0m @ 4.50m GAP					INT. A-6	MAIN BYPASS	40.00	9.33	UNSIGNALIZED
104+822.47	105+294.09	471.62	MAIN BYPASS	100+866.69	100+896.69	30.00	(LS) 2 - LANE LINE 150mm UNBROKEN					INT. A-7	MAIN BYPASS	32.32	1.83	UNSIGNALIZED
105+294.09	01+024.28	16.61	MAIN BYPASS TO RT OF A-7	100+896.69	101+066.69	170.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP					INT. A-10	MAIN BYPASS	12.45	9.79	SIGNALIZED
01+024.28	01+080.00	55.72	RIGHT OF A-7	101+066.69	104+583.97	3517.28	(LS) LANE LINE 150mm x 3.0m @ 9.0m GAP						A-7	31.09	4.20	
01+022.89	01+080.00	57.11	LEFT OF A-7	104+583.97	104+783.97	200.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
01+022.89	105+326.98	23.94	LEFT OF A-7 TO MAIN BYPASS	100+866.69	101+066.69	200.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
105+326.98	108+118.95	2791.97	MAIN BYPASS	101+066.69	104+583.97	3517.28	(RS) LANE LINE 150mm x 3.0m @ 9.0m GAP									
108+118.95	01+035.37	42.44	MAIN BYPASS TO RT OF A-10	104+583.97	104+743.97	160.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
01+035.37	01+100.00	64.63	RIGHT OF A-10	104+743.97	104+783.97	40.00	(RS) 2 - LANE LINE 150mm UNBROKEN									
01+037.43	01+100.00	62.57	LEFT OF A-10	104+820.42	104+860.42	40.00	(LS) 2 - LANE LINE 150mm UNBROKEN									
01+037.43	108+179.13	28.68	LEFT OF A-10 TO MAIN BYPASS	104+860.42	105+297.04	436.62	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
108+179.13	109+920.00	1740.87	MAIN BYPASS	104+820.42	105+257.04	436.62	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
				105+257.04	105+297.04	40.00	(RS) 2 - LANE LINE 150mm UNBROKEN									
1.3 LEFT SIDE, INNER EDGE				105+331.91	105+371.91	40.00	(LS) 2 - LANE LINE 150mm UNBROKEN									
STATION		LENGTH (m)	REMARKS	105+371.91	105+531.91	160.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
FROM	TO			105+531.91	107+932.02	2400.11	(LS) LANE LINE 150mm x 3.0m @ 9.0m GAP									
100+560.00	100+841.69	281.69	MAIN BYPASS	107+932.02	108+132.02	200.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP									
100+860.60	101+464.53	603.93	MAIN BYPASS	108+011.97	108+132.02	120.05	(LS) OUTER LANE LINE 150mmx3.0m @ 4.50m GAP									

NOTE:  
 A - LEFT/RIGHT ARROW  
 COMBINATION OF STRAIGHT AND LEFT ARROWS OR  
 B - STRAIGHT AND RIGHT ARROWS  
 C - STRAIGHT ARROW