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 IV
(ULTIMATE STAGE)
STA. 121+600.000 TO STA. 134+731.828

December 2002

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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KATAHIRA & ENGINEERS INTERNATIONAL
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GENERAL

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

CABANATUAN BYPASS - PACKAGE IV

(ULTIMATE STAGE)

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RM-15	LAYOUT PLAN, STA. 126 + 800.000 TO STA. 128 + 200.000
RM-16	LAYOUT PLAN, STA. 128 + 200.000 TO STA. 129 + 600.000
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JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/02	ACADO
CHECKED	10/19/02	S. GOSE
SUBMITTED	10/21/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PUHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONDAD	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1	INDEX OF DRAWINGS (ULTIMATE STAGE) Sheet 1 of 3	GC-01

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CABANATUAN BYPASS - PACKAGE IV

(ULTIMATE STAGE)

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JICA JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL — YEC YACHIYO ENGINEERING CO., LTD.

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REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	JOSEFINA M. ALAGAR, Chief, Highways Division	GILBERTO S. REYES, OIC, Director IV	MANUEL M. BONOAN, Undersecretary	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 IV

SCALE : FULL SIZE A1

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CABANATUAN BYPASS - PACKAGE IV

(ULTIMATE STAGE)

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B14S-71	PILE CAP REINF. DETAILS FOR FIX PIERS (PIER 3 & PIER 6) - 1 OF 2
B14S-72	PILE CAP REINF. DETAILS FOR FIX PIERS (PIER 3 & PIER 6) - 2 OF 2
B14S-73	REINFORCEMENT DETAILS FOR ABUTMENT A1 & A2 - 1 OF 2
B14S-74	REINFORCEMENT DETAILS FOR ABUTMENT A1 & A2 - 2 OF 2
B14S-75	BORED PILE REINF. DETAILS, Ø1000mm (ABUTMENT A1 & A2)
B14S-76	BORED PILE REINF. DETAILS, Ø1500mm (PIER 1 PIER 2)
B14S-77	BORED PILE REINF. DETAILS, Ø1500mm (PIERS P4, P5, P7 & P8)
B14S-78	BORED PILE REINF. DETAILS, Ø1500mm (PIER 3)
B14S-79	BORED PILE REINF. DETAILS, Ø1500mm (PIER 6)
	SUBSTRUCTURE REINFORCING DETAIL
B14M-81	ANCHOR BAR AND BEARING DETAILS FOR FIX PIERS
B14M-82	RISER REINFORCEMENT AND BEARING PAD DETAILS
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B14M-84	EXPANSION JOINT DETAILS AT ABUTMENT AND PIERS
B14M-85	REINF. DETAILS OF SHEAR KEY (ABUT. A1 & A2)
B14M-86	REINF. DETAILS OF SHEAR KEY (PIERS P3 & P6, EXP. - EXP. PIERS)
B14M-87	REINF. DETAILS OF SHEAR KEY (PIERS P1 & P2, FIX - FIX PIERS)
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B14M-90	DETAILS OF SIDEWALK, RAILING AND DRAIN
B14M-91	SIDEWALK AND LIGHT POLE BASE REINF. DETAILS, RAILING DIMENSIONS
B14M-92	DETAILS OF ABUTMENT SLOPE PROTECTION (ABUT. A1) - 1 OF 3
B14M-93	DETAILS OF ABUTMENT SLOPE PROTECTION (ABUT. A1) - 2 OF 3
B14M-94	DETAILS OF ABUTMENT SLOPE PROTECTION (SECTION DETAILS) - 3 OF 3
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B14M-96	DETAILS OF RIVER SLOPE PROTECTION
	CONSTRUCTION WORKS
B14C-101	TEMPORARY CRANEWAY BRIDGE AND COFFERDAM LAYOUT
B14C-102	DETAILS OF COFFERDAM AND CRANEWAY BRIDGE
B14C-103	TENTATIVE CONSTRUCTION PLAN, ELEVATION, AND SCHEDULE
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ES-01	NOTES & LEGENDS, SCHEMATIC CONTROL DIAG. & DUCT SECTION
ES-02	SERVICE POLE DETAILS
ES-03	STREET LIGHT POLE DETAILS

SHEET NO.	TITLE OF DRAWING
	ROADWAY LIGHTING PLAN AND LOAD SCHEDULE FOR INTERSECTION
EI-01	LAYOUT PLAN AND LOAD SCHEDULE, INTERSECTION A-25 (STA 125+881.570)
EI-02	LAYOUT PLAN AND LOAD SCHEDULE, INTERSECTION A-30 (STA 129+921.679)
EI-03	LAYOUT PLAN AND LOAD SCHEDULE, INTERSECTION A-35 (STA 134+231.098)
EI-04	ROADWAY LIGHTING PLAN AND LOAD SCHEDULE
	ENGINEER'S FIELD OFFICE & LIVING QUARTERS
	ARCHITECTURAL
FA-01	PERSPECTIVE AND TABLE OF CONTENTS
FA-02	ENGR'S FIELD OFFICE - FLOOR PLAN, ELEVATIONS, CROSS-SECTIONS AND REFLECTED CEILING PLAN
FA-03	ENGR'S LIVING QTRS - FLOOR PLAN, ELEVATIONS, CROSS-SECTIONS AND REFLECTED CEILING PLAN
FA-04	ENGR'S FIELD OFFICE / LABORATORY - ROOF PLAN, CROSS-SECTION AND SCHEDULE OF DOORS & WINDOWS
FA-05	ENGR'S LIVING QUARTERS - ROOF PLAN, CROSS-SECTION AND SCHEDULE OF DOORS & WINDOWS
FA-06	ENGR'S FIELD OFFICE & LIVING QUATERS - FOUNDATION PLAN, R.C. RAMP DETAIL, DETAIL OF F-1, P-1, WF1 & DESIGN CRITERIA
FA-07	ENGR'S FIELD OFFICE / LABORATORY - FRONT & RIGHT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
FA-08	ENGR'S LIVING QTRS - REAR & LEFT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
FA-09	ENGR'S FIELD OFFICE - FRONT & RIGHT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
FA-10	ENGR'S LIVING QTRS - REAR & LEFT SIDE ELEVATION OF STEEL STUD FRAMES AND SCHEMATIC DIAGRAMS
FA-11	ENGR'S FIELD OFFICE & LIVING QUARTERS - DETAILS OF CONNECTIONS, DETAILS 1 TO 15
FA-12	ROOF FRAMING PLAN, SCHEMATIC DIAGRAM, PURLIN CONNECTION AND CROSS BRACING CONNECTION
	ELECTRICAL
FE-01	ENGR'S FIELD OFFICE / LABORATORY - LIGHTING LAYOUT, POWER LAYOUT & ELECTRICAL SYMBOLS AND GENERAL NOTES
FE-02	ENGR'S LIVING QTRS - LIGHTING LAYOUT, POWER LAYOUT & ELECTRICAL SYMBOLS AND GENERAL NOTES
FE-03	ENGR'S FIELD OFFICE & LIVING QUARTERS - SCHEDULE OF LOADS AND COMPUTATIONS & ELECTRICAL RISER DIAGRAM
	PLUMBING
FP-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEWER AND WATER LINE LAYOUT AND ISOMETRIC DIAGRAM
FP-02	ENGR'S FIELD OFFICE & LIVING QUARTERS - SEPTIC TANK DETAILS
	EXTERNAL
FX-01	ENGR'S FIELD OFFICE & LIVING QUARTERS - PLOT PLAN, ELEVATION OF FENCE & GATE AND TYPICAL FOUNDATION DETAIL

SHEET NO.	TITLE OF DRAWING

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

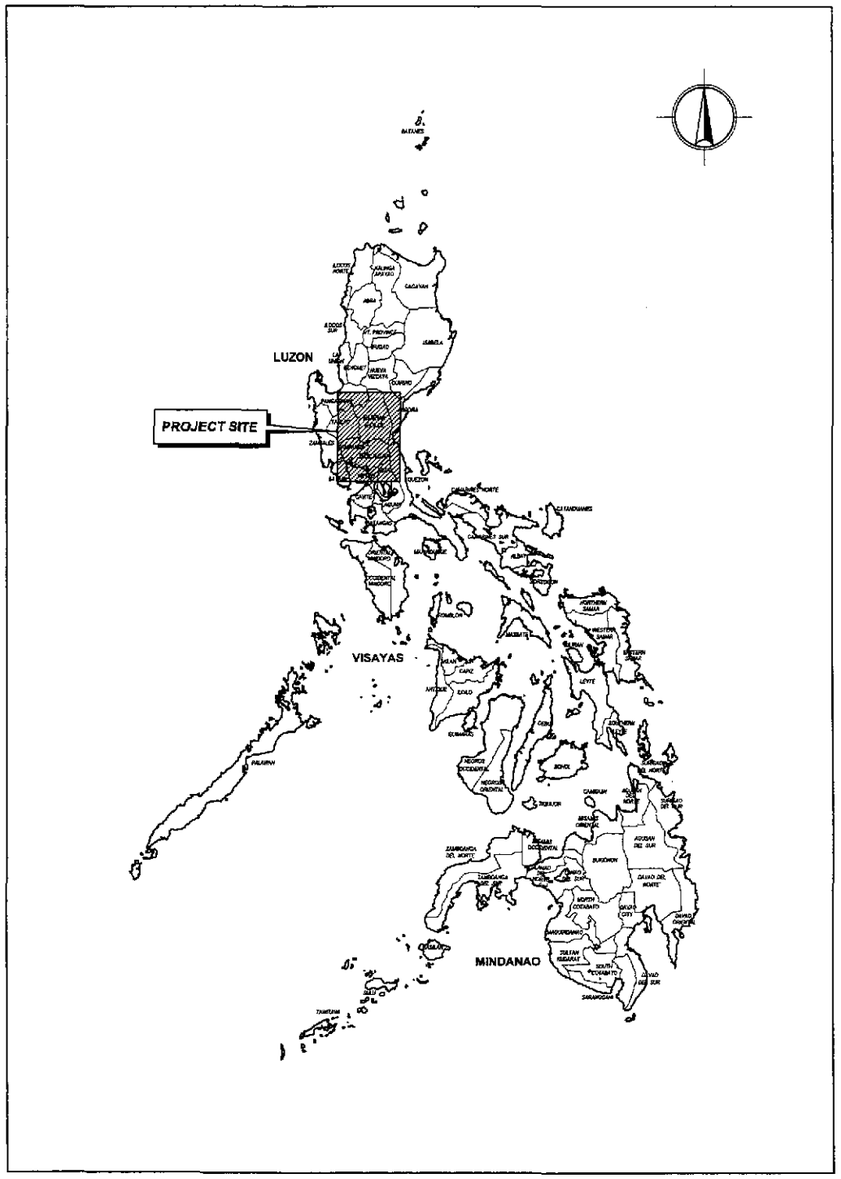
KEI KATAHIRA & ENGINEERS INTERNATIONAL — YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10-17-02	A. ACADIO
CHECKED	10-19-02	J. JOSE
SUBMITTED	10-21-02	M. KUSUDA TEAM LEADER

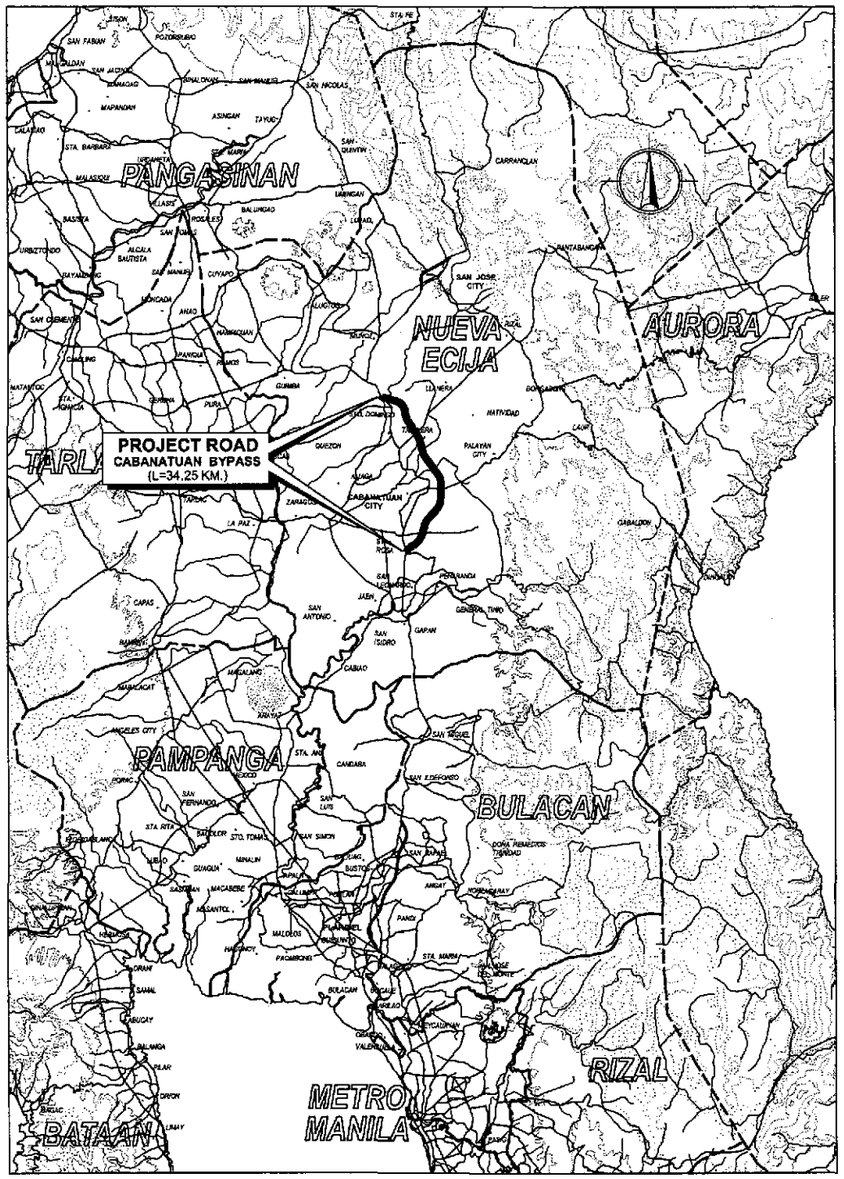
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL -- PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	DIC, Director IV	Undersecretary	Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		INDEX OF DRAWINGS (ULTIMATE STAGE) Sheet 3 of 3	GC-03
CABANATUAN BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		



1 GC-04 KEY MAP
NOT TO SCALE



2 GC-04 VICINITY MAP
NOT TO SCALE

JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL

YACHIYO ENGINEERING CO., LTD.

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CABANATUAN BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		

LEGEND AND SYMBOLS

EXISTING FEATURES

ROAD	BARANGAY ROAD
CONTOUR	
ORIGINAL GROUND	
CONCRETE FENCE	
BARBED WIRE FENCE	
HOUSE	
TREES	
BRIDGE	PLAN / PROFILE
SINGLE PIPE CULVERT	PLAN / PROFILE
DOUBLE PIPE CULVERT	PLAN / PROFILE
BOX CULVERT	PLAN / PROFILE
DITCH LINE/ IRRIGATION LINE	
IRRIGATION LINE	
RIVER/CREEK	
ELECTRIC POST	TP, CEP, WEP
KILOMETER POST	KM 156
TRAVERSE STATION POINT	
BENCHMARK	
FISH POND	FP
NATIONAL POWER CORP. TRANSMISSION LINE	NPC TOWER

NEW DESIGN FEATURES

PROJECT ROAD	
SERVICE OR FRONTAGE ROAD ALONG BYPASS	
CONTOUR	
RIGHT-OF-WAY LIMIT	
POINT OF INTERSECTION	
POINT OF INTERSECTION NO.	PI-00
℄ OF PROJECT ROAD	
FINISHED GRADE ON PROFILE	g=2.500%
BRIDGE	PLAN / PROFILE
SINGLE RC PIPE CULVERT	PLAN / PROFILE
DOUBLE RC PIPE CULVERT	PLAN / PROFILE
BOX CULVERT	PLAN / PROFILE
EARTH DITCH FLOW	
DIRECTION OF FLOW	
MANHOLE	
GUARDRAIL ON PLAN	
GUARDRAIL ON PROFILE	LEFT / RIGHT
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	E496,000 N1747600
AGGREGATE SOURCE	
LINE SYMMETRY	
SECTION TARGET	1B D-03
ELEVATION TARGET	1A D-04
TITLE TARGET	Z RS-02 — IDENTIFICATION SYMBOL, SHEET NO.
SUB-TITLE TARGET	2A RS-02
DETAIL REF TARGET	2b RI-05
BOREHOLE	
STREET LIGHTING POLE	
KILOMETER POST	Km
STATION GRID	162+000
LINED IRRIG. CANAL	
CHAIN LINK FENCE	
SODDING ON PLAN	
LOW TREES	
MIDDLE TREE	
HIGH TREE	

JAPAN INTERNATIONAL COOPERATION AGENCY

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ABBREVIATIONS

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

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

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REPUBLIC OF THE PHILIPPINES
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PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
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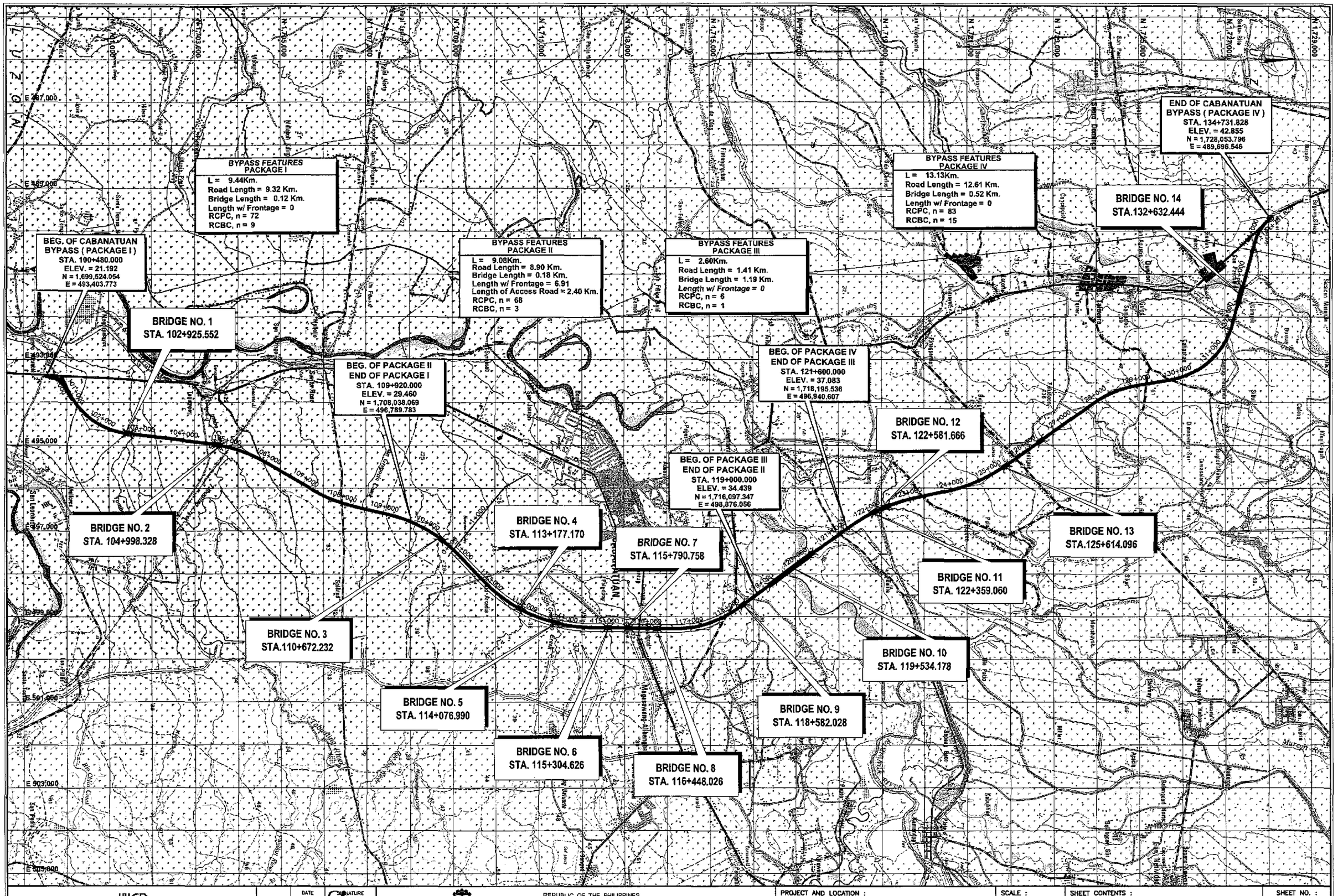

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PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
CABANATUAN BYPASS - CONTRACT PACKAGE IV

SCALE : 1:40,000 FULL SIZE A1

SHEET CONTENTS :
PROJECT ROAD
GENERAL ALIGNMENT / FEATURES

SHEET NO. : GC-07

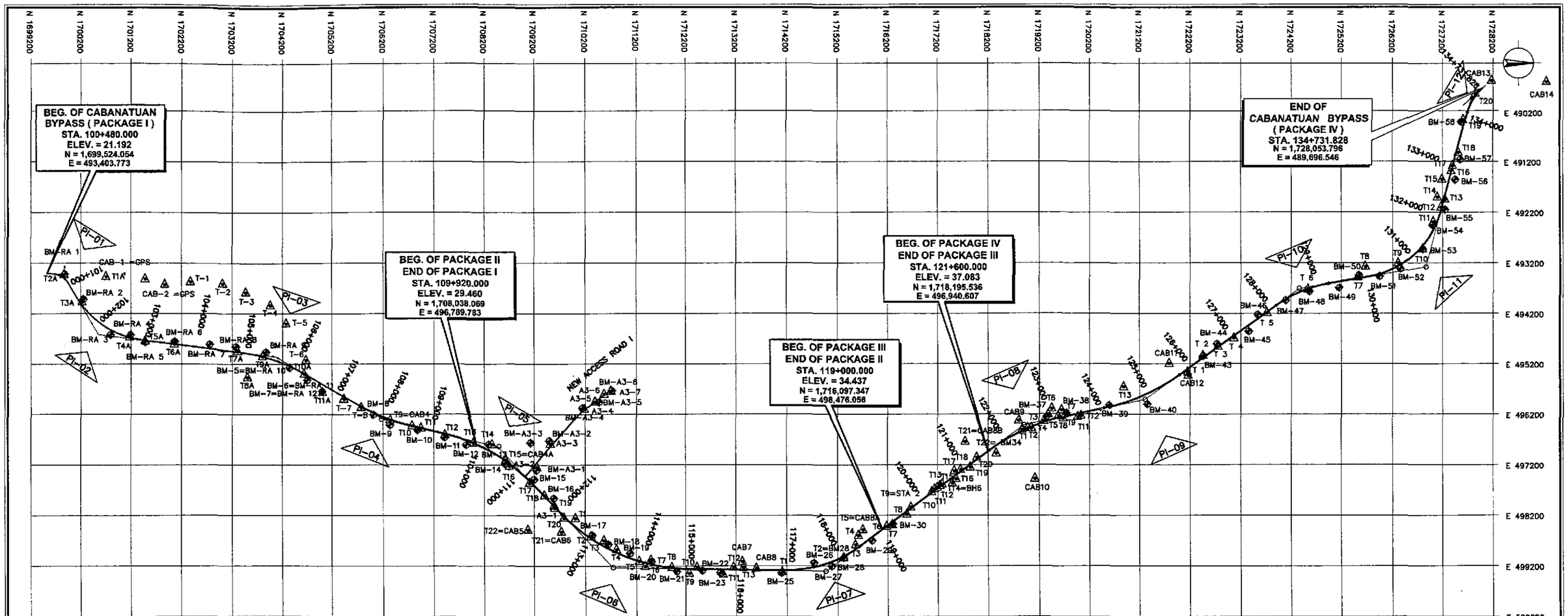


TABLE OF GPS STATION

POLYGON POINT	COORDINATES NORTHING	COORDINATES 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 Tambo Bridge's first approach, about 0.05 cm. 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 & 0.05cm above the ground.
CAB-3= GPS	1,706,316.913	495,963.410	25.984	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embeded on a 40cm x 40cm conc mons. beside an irri. canal about 8m from rd. CL & 3 km. from the highway intersec. of Fort Magsaysay & Cabanatuan City.
T9=CAB4	1,706,340.784	496,322.453	26.299	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embedded on a 40 cm x 40 cm conc. mons. 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
T15= CAB4A	1,708,634.191	497,109.919	27.917	Located in Brgy. Tagpos, Sta. Rosa, Nueva Ecija on Diaz property. From the highway northbound take a right turn on Mobini extension, an 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	1,709,079.199	498,487.150	31.478	Located in Brgy. Sta. Arcadia, Cabanatuan, Nueva Ecija. From the highway northbound take a right turn on Mobini 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 Mobini extension road centerline.
T22= CAB6	1,709,731.929	498,528.334	31.285	Located in Brgy. Sta. Arcadia, Cabanatuan, Nueva Ecija. From the highway northbound take a right turn on Mobini 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 Mobini extension road centerline.
CAB7	1,713,329.137	499,115.491	33.348	Located in Brgy. San Isidro, Cabanatuan, Nueva Ecija. It is embedded on the sidewalk of the DPWH 3rd Engineering District driveway, about 20 m. from the centerline of the road.
CAB8	1,713,603.208	499,247.649	33.467	Located in Urban Poor Housing Project, San Isidro, Cabanatuan, Nueva Ecija. Going to Palayan City take a left turn to the dirt road beside the DPWH compound leading to the site of the housing project, then turn right. It is embedded on the right side of the dirt road near the electric post 400 m. from the centerline of the highway.
TS=CAB8A	1,715,705.803	498,487.077	34.234	Located in Brgy. Roja, 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.
T21= CAB8B	1,717,749.623	496,746.648	34.436	Location in Brgy. Sapang, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a rt. turn on Maharlika highway after the Valdefuente br., to road going to Brgy. Sapang. It is emb. on the left side of the road.
CAB9	1,718,805.446	496,330.000	37.709	Located in Brgy. Buliran, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway after the Valdefuerte 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. Bolite. It is embedded near an irrigation dike 800 m. from the bridge.
CAB10	1,719,118.959	497,481.612	37.713	Located in Brgy. Dalampang, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway after the Valdefuerte 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. Bolite. It is embedded near an irrigation dike on the right side, 1.9 km. from the bridge.
CAB11	1,721,785.245	495,194.632	39.469	Located in Homestead 1, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpanaon intersection to the highway going to Pantabangan. 4.3 km. from the intersection turn right to a dirt road. It is embedded on the right beside an irrigation canal 70 m. from the centerline of the highway.
CAB12	1,722,164.049	495,433.809	37.949	Located in Homestead 1, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpanaon intersection to the highway going to Pantabangan. 4.8 km. from the intersection on the right side 50 m. from the centerline of the hughway.
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	1,729,259.352	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 puddy dike on the right side of the road 500 m. from the highway.

TABLE OF TRAVERSE STATION POINTS

POLYGON POINT	COORDINATES NORTHING	COORDINATES 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	493,784.846	25.158
T-4	1,703,956.942	494,041.357	23.064
T-5	1,704,279.497	494,398.825	24.467
T-6	1,704,678.169	495,126.982	24.858
T-7	1,705,433.273	495,901.932	26.581
T-8	1,705,767.749	496,069.357	25.809
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	498,615.719	27.154
T13	1,707,989.215	496,773.054	26.251
T14	1,708,364.430	496,806.236	26.328
T16	1,708,712.024	497,235.901	26.873
T17	1,709,113.730	497,562.109	28.882
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	30.560
T2	1,710,312.116	498,622.485	31.125
T3	1,710,565.610	498,702.707	30.008
T4	1,710,812.097	498,879.255	31.231
T5	1,711,258.554	499,111.169	31.158
T6	1,711,382.787	499,215.210	30.671
T7	1,711,497.776	499,088.057	31.048
T8	1,711,921.739	499,233.113	32.252

TABLE OF TRAVERSE STATION POINTS

POLYGON POINT	COORDINATES NORTHING	COORDINATES 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	1,715,613.303	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	1,716,868.328	498,048.549	31.202
T10	1,717,083.859	497,743.553	30.319
T11	1,717,142.345	497,687.576	29.731
T12	1,717,194.108	497,657.056	29.770
T13	1,717,249.207	497,618.454	29.818
T14=BH6	1,717,292.610	497,589.139	29.351
T15	1,717,492.542	497,567.432	31.652
T16	1,717,586.385	497,485.342	31.862
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	497,264.912	32.957
T20	1,717,877.354	497,061.014	35.155
T22=BM34	1,716,360.331	496,980.373	35.518
T1	1,718,871.960	496,509.328	38.125

TABLE OF TRAVERSE STATION POINTS

POLYGON POINT	COORDINATES NORTHING	COORDINATES EASTING	ELEV.
T2	1,718,982.811	496,484.723	37.303
T3	1,719,054.242	496,476.454	38.039
T4	1,719,293.514	496,344.148	37.628
T5	1,719,371.611	496,212.892	36.581
T6	1,719,441.686	496,095.508	36.377
T7	1,719,634.286	496,119.715	36.135
T8	1,719,568.715	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	495,657.578	35.285
T1	1,722,152.496	495,368.651	40.547
T2	1,722,482.939	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	1,724,530.996	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	492,109.850	44.051
T13	1,727,252.558	491,953.012	45.106
T14	1,727,099.751	491,908.990	44.528

TABLE OF TRAVERSE STATION POINTS

POLYGON POINT	COORDINATES NORTHING	COORDINATES 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	491,028.905	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	494,751.688	21.417
T6A	1,702,058.314	494,809.178	23.519
T7A	1,703,307.889	494,952.040	23.864
T8A	1,703,499.259	495,470.561	23.820
T9A	1,703,804.341	495,951.975	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	27.906
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	27.081

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/02	A. ACACIO
CHECKED	10/19/02	S. GOSE
SUBMITTED	10/21/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE IV	1:40,000 FULL SIZE A1	HORIZONTAL AND VERTICAL CONTROL MONUMENTS Sheet 1 of 2	GC-08

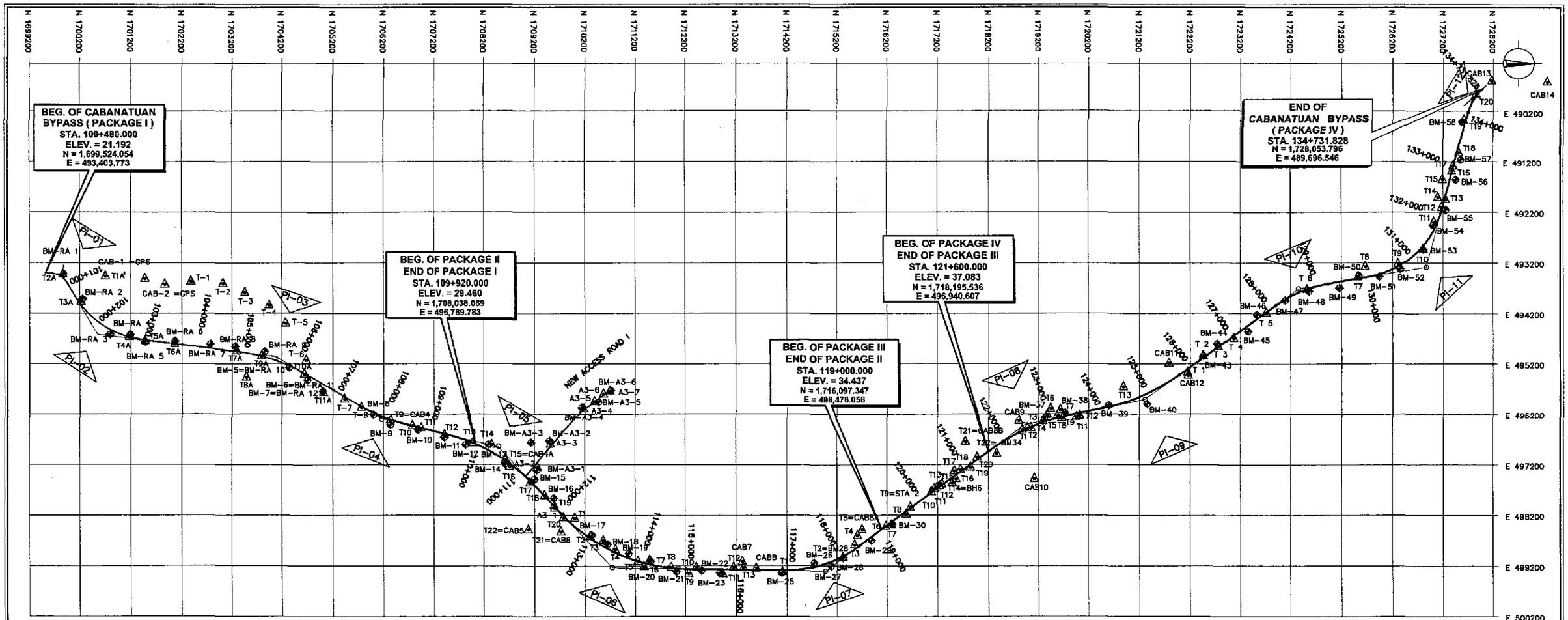


TABLE OF HORIZONTAL AND VERTICAL CONTROL

POLYGON POINT	COORDINATES NORTHING	COORDINATES EASTING	ELEV.	REMARKS
BM-RA 1	1,699,880.470	493,418.310	21.773	It is located on the left side of the national highway going north at the beginning of the bypass re-alignment under an accia 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 puddy 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 tree 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 duhat tree in Brgy. Tagumpay, San Leonardo.
BM-RA 8	1,703,271.267	494,955.750	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 Bray. Tabuating, 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-6= 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 60 cm. from the toe of an irrigation canal.
BM-6= BM-RA11	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 puddy intersection in the middle of a ricefield in Bray. Tagumpay, Sta. Rosa.
BM-7= BM-RA12	1,705,058.152	495,590.387	27.032	It is located on the left side of the alignment placed on top of a check gate of an irrigation canal in Bray. Soledad, Sta. Rosa.
BM-8	1,705,401.638	496,021.555	26.111	It is located on the right side of the alignment placed on top of a rice puddy intersection in the middle of a ricefield in Bray. 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 Bray. 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 puddy in the middle of a ricefield in Bray. 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 Bray. 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. Alejo Villareal in Bray. Tagpos, Sta. Rosa.
BM-13	1,708,291.751	496,799.903	26.666	It is located on the right side of the alignment placed on the side of a ricefield under a phoienx of trees in Bray. Tagpos, Sta. Rosa.
BM-14	1,708,620.284	497,180.515	28.714	It is located on the right side of the road alignment placed on the top bank of irrigation canal 1.50 m. from its centerline and 3 m. away the side of a road in Bray. Tagpos, 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 at Bray. Sto. Arcadio, 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 Bray. Sto. Arcadio, 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 Bray. Sto. Arcadio.
BM-18	1,710,649.187	498,773.128	30.565	It is locatedon the left side of the alignment placed on the intersection of rice puddy in the middle of ricefield in the side of Bray. Valle Cruz.
BM-19	1,711,076.165	498,851.653	31.218	It is located on the left side of the alignment placed on the side of a ricefield underneath two mango trees in Bray. Valle Cruz.

TABLE OF HORIZONTAL AND VERTICAL CONTROL

POLYGON POINT	COORDINATES NORTHING	COORDINATES 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 puddy intersection in the middle of a ricefield in Bray. Valle Cruz.
BM-21	1,712,021.897	499,309.940	32.657	It is located on the rt. side of the alignment placed on the side of a road 1.80 m. away from its centerline & almost 3.50 m. away from the top bank of an irri. canal in Bray. 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 Bray. 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 Bray. 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 Bray. 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, Bray. 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 puddy in the middle of a ricefield in Bray. Cruz Roja.
BM-28	1,715,321.664	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 its centerline at Bray. 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 Bray. 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 Bray. 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 CL between 2 camachile tree in Bray. Sapang, Cabanatuan City 3 m. away from an irri. canal's top bank.
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 Bray. 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 Bray. 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 Bray. 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 puddy in the middle of a ricefield in Bray. 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 Bray. Homestead I, Talavera.
BM-43	1,722,462.948	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 poles with marking : BM-43=T-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 sideboard Bray. Paludpod, Talavera.
BM-45	1,723,356.627	494,564.149	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 Bray. Paludpod, 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 puddy in the middle of a ricefield and about 50 m. away from the top bank of a creek at Bray. Dimasalang Sur, Talavera.
BM-48	1,724,585.996	493,762.388	42.048	It is located on the right side of the alignment placed on the side of a dirt road 2 m. away from its centerline and 4 m. away from the top bank of an irrigation canal, Bray. Dimasalang Sur, Talavera.
BM-49	1,725,157.190	493,693.946	42.110	It is located on the left side of the alignment placed on the side of a road 3 m. away from its centerline and 1 m. away from a canal, Bray. Guiod, 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, Bray. Guiod, Talavera.

TABLE OF HORIZONTAL AND VERTICAL CONTROL

POLYGON POINT	COORDINATES NORTHING	COORDINATES 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 puddy in the middle of a ricefield 150 m. away from the Centerline of a concrete barangay road, Bray. Guiod, 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 Bray. Bantug Hacienda, Talavera.
BM-53	1,726,804.440	492,931.286	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 puddy 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 Bray. 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 Bray. Campos, Talavera.
BM-57	1,727,567.279	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 Bray. Lamboy, 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 Bray. Lamboy, Talavera.

NEW ACCESS ROAD 1 - TABLE OF HORIZONTAL AND VERTICAL CONTROL

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 extg. farm road in Bray. Sto. Arcadio, Cabanatuan City.
BM-A3-2	1,709,500.218	498,724.144	26.740	It is located on the left side of the access road placed on the side of a narra tree 5 m. away from existing irrigation road near a house in Bray. Sto. Arcadio, Cabanatuan City.
BM-A3-3	1,709,133.419	496,759.539	26.389	It is located on the right side of the access road placed on the top bank of an irrigation canal beside an ipil-ipil and 40 m. away from its centerline in Bray. Sto. Arcadio, 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 Bray. Arcadio, 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 puddy near a barbed wire fence 30 m. away from the centerline of a dirt road in Bray.
BM-A3-6	1,710,716.368	495,728.826	28.696	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 Bray.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/02	ACACIO
CHECKED	10/19/02	GOSE
SUBMITTED	10/21/02	KIUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

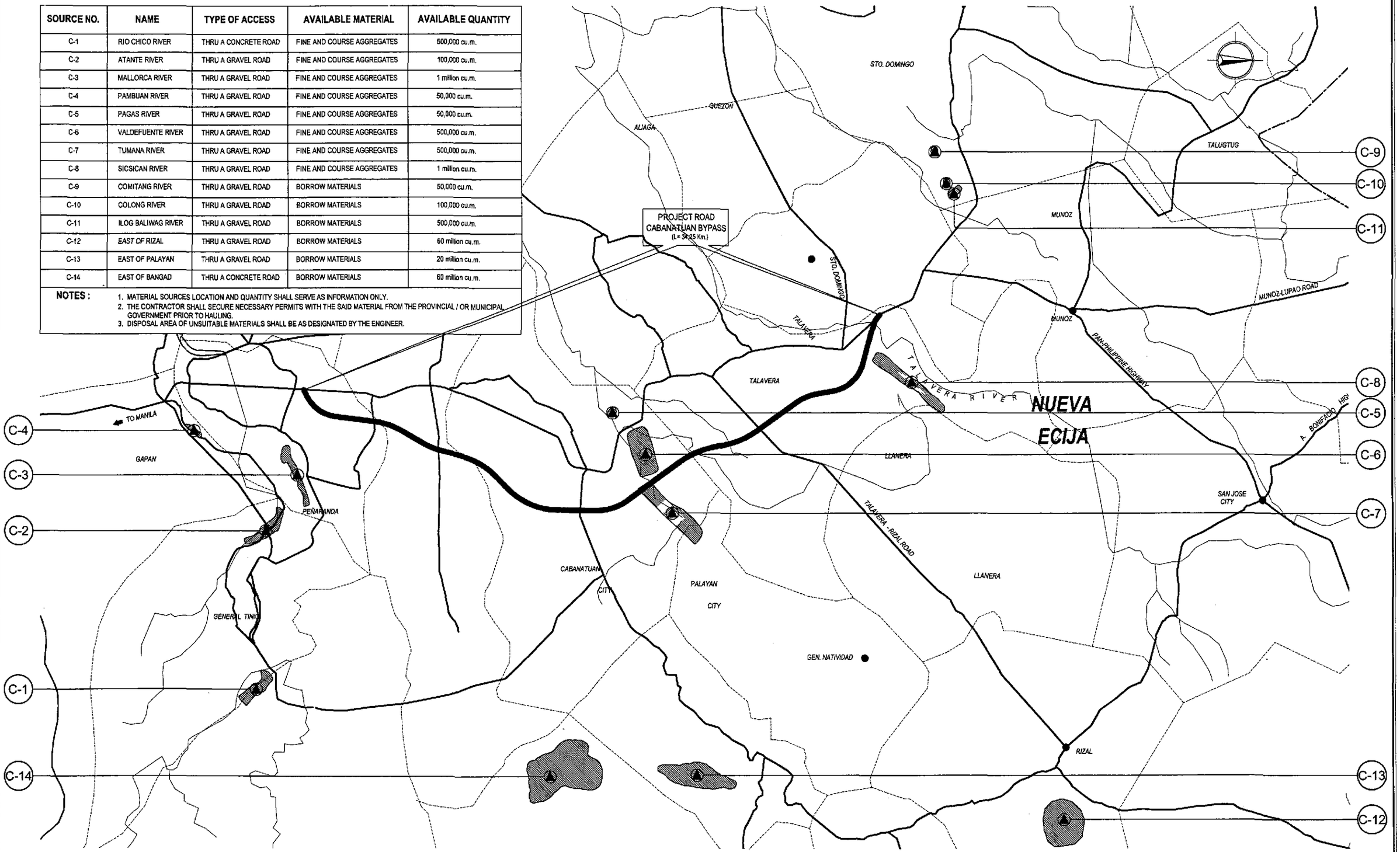
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:40,000	HORIZONTAL AND VERTICAL CONTROL MONUMENTS Sheet 2 of 2	GC-09
CABANATUAN BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		

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 / GC-10 LOCATION OF MATERIAL SOURCES

SCALE 1:80,000

JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
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CHECKED	10/19/02	S. GOZE SUGOSE
SUBMITTED	10/21/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:80,000	LOCATION OF MATERIAL SOURCES	GC-10
CABANATUAN BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1		

SUMMARY OF QUANTITIES
(ULTIMATE STAGE)

ITEM NO.	DESCRIPTION	UNIT	QUANTITY																				REMARKS
			BYPASS	A-22	A-23	A-24	A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-35a	BRIDGE #11	BRIDGE #12	BRIDGE #13	BRIDGE #14	TOTAL	
PART C - EARTHWORKS																							
100(1)	Clearing and Grubbing	ha	9.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	
101(1)	Removal of Existing Structures and Obstruction	L.S.	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00	
101(3)a	Removal of Existing PCC Pavement	m2	4,612.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,612.00	
101(5)b	Relocation of Existing Guardrails	m	1,318.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,318.00	
101(7)	Removal of Existing Slope Protection	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	53.00	49.00	52.00	-	154.00	
101(9)	Removal of Existing Gabion	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.00	-	-	24.00	
101(11)	Removal of Existing Combination Concrete Curb & Gutter/Side Strip	m	1,568.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,568.00	
101(12)	Relocation of Existing Road Signs	each	20.00	-	-	-	4.00	-	-	-	2.00	2.00	-	-	1.00	1.00	-	-	-	-	-	-	30.00	
101(13)	Removal of Existing Road Signs	each	4.00	-	2.00	-	-	-	-	-	2.00	-	-	2.00	2.00	2.00	-	-	-	-	-	-	14.00	
103(1)	Structure Excavation	m3	281.81	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	363.00	645.00	
103(2)a	Bridge Excavation above OWL (Common Soil)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-			227.00	285.00	188.00	2,126.43	2,827.00	
103(2)c	Bridge Excavation below OWL (Common Soil)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-				626.00	-	2,507.46	3,134.00	
103(3)a	Gravel Foundation Fill	m3	40.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.00	
103(6)	Pipe Culverts and Drain Excavation	m3	1,918.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,919.00	
103(7)	Granular Backfill for Pipe Culvert	m3	989.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	990.00	
104(1)	Embankment from Roadway Excavation	m3	15,761.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16,762.00	
104(3)	Embankment from Borrow Pit	m3	25,708.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	330.00	362.00	342.00	382.65	27,125.00	
104(4)	Embankment from Borrow (Selected Granular Material) for Bridge	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	452.00	369.00	428.00	681.40	1,931.00	
105(1)	Subgrade Preparation (Common Soil)	m2	100,182.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100,183.00	
PART D - BASE AND SUBBASE COURSE																							
200(1)	Aggregate Subbase Course	m3	35,072.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30.00	30.00	30.00	30.34	35,193.00	
PATR E - SURFACE COURSES																							
300(1)	Gravel Surface Course	m3	57.68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58.00	
310(2)	Asphalt Mixture Wearing Course (t=50mm) for bridge pavement, including tack coat	m2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,970.00	2,970.00	
311(1)b	PCC Pavement (Plain), t=250mm	m2	101,735.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	101,736.00	
311(1)d	PCC Pavement (Plain), t=180mm	m2	60,964.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	60,965.00	
311(2)	PCC Pavement (Reinforced) t=300mm Approach Slab	m2	317.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118.00	120.00	118.00	91.24	765.00	
PART F - BRIDGE CONSTRUCTION																							
400(3)a	Steel H Piles (450mmx260mm), furnished	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	772.00	-	-	772.00	
400(4)b	Precast Concrete Piles (450mmx450mm), furnished	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	503.00	-	890.00	-	1,393.00	
400(10)a	Steel H Piles (450mmx260), driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	772.00	-	-	772.00	
400(13)b	Precast Concrete Piles (450mmx450mm), driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	441.00	-	840.00	-	1,281.00	
400(15)b	Test Piles (Conc. Pile 450mmx450mm), furnished & driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.50	-	48.50	-	73.00	
400(15)c	Test Piles (Steel H Piles 450mmx260), furnished & driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.00	-	-	40.00	
400(16)a	Cast-in-place Concrete Bored Piles Ø 1000mm	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	448.00	448.00	
400(16)c	Cast-in-place Concrete Bored Piles Ø 1500mm	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,155.00	1,155.00	
400(19)b	Pile shoes for 450mmx450mm Piles	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51.00	-	42.00	-	93.00	
400(21)	Static Pile Load Test for Ø 1500mm Bored Piles	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.00	2.00	
SPL 400(23)a	High Strain Dynamic Pile Test for Ø 1000mm Bored Piles	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00	1.00	
SPL 400(24)	Pile Integrity Test for Bored Piles of various diameter	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.00	22.00	
401(1)a	Concrete Railing Type A (Concrete Posts and Precast Beams)	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	70.00	204.00	40.00	-	314.00	
401(2)a	Steel Railing Type A for (Angat and Talavera Bridge, and Approach of Pampanga Bridge)	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	720.00	720.00	
SPL 401(3)c	Bridge Name Plate, 1000 x 600mm for Talavera Bridge	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.00	2.00	
404(1)	Reinforcing Steel (Grade 40)	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24,151.00	68,963.00	16,520.00	230,497.00	340,131.00	
404(2)	Reinforcing Steel (Grade 60)	kg	31,386.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	15,793.00	81,522.00	14,224.00	581,231.00	724,156.00	
405(1)a	Structural Concrete Class A (fc'=21MPa, max. aggregate 38mm) for heavily reinforced structures	m3	346.64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	30.51	378.00	
405(1)b	Structural Concrete Class A (fc'=21MPa, max. aggregate 38mm) for small & medium bridges substructures	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	240.00	626.00	216.00	-	1,082.00	
405(1)d	Structural Concrete Class A1 (fc'=21MPa, max. aggregate 20mm) for small & medium bridges PCDG superstructures	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	118.00	334.00	67.00	-	519.00	
405(1)e	Structural Concrete Class AA1 (fc'=28MPa, max. aggregate 25) for long bridge substructures	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,160.28	2,161.00	
405(1)f	Structural Concrete Class AA2 (fc'=28MPa, max. aggregate 20mm) for long bridge superstructures	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	979.69	980.00	
405(2)	Structural Concrete Class B (fc'=17MPa, max. aggregate 50mm) for plain or lightly reinforced structures	m3	281.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.47	300.00	
405(3)	Structural Concrete Class C (fc'=21MPa, max. aggregate 12mm) for thin reinforced members	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.00	52.00	17.00	315.36	410.00	
405(6)	Lean Concrete (fc'=17MPa, max. aggregate 38mm)	m3	20.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.00	59.00	12.00	70.87	175.00	
406(1)a	Precast Prestressed Structural Concrete Member (AASHTO Girder Type IV L=20m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	-	5.00	
406(1)d	Precast Prestressed Structural Concrete Member (AASHTO Girder Type IV L=25m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.00	-	-	20.00	
406(1)j	Precast Prestressed Structural Concrete Member (AASHTO Girder Type VI L=35m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.00	-	-	-	5.00	
406(1)l	Precast Prestressed Structural Concrete Member (AASHTO Girder Type VI modified L=39.4m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.00	12.00	
406(1)m	Precast Prestressed Structural Concrete Member (AASHTO Girder Type VI modified L=39.55m)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.00	24.00	
407(1)c	Elastomeric Bearing Pad, Duro 60 (600x350x50mm)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	40.00	10.00		60.00	
407(1)e	Elastomeric Bearing Pad, Duro 60 (600x400x50mm)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72.00	72.00	
407(2)a	Expansion Joint, (± 40mm Movement)	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.00	20.00	20.00	-	60.00	
407(2)b	Expansion Joint, (± 50mm Movement)	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.80	41.00	
407(2)g	Expansion Joint, 30mm for bridge sidewalk	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.00	4.00	4.00	-	12.00	

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KATAHIRA & ENGINEERS INTERNATIONAL
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	DATE	SIGNATURE
DESIGNED	10/13/06	C. TAPIA
CHECKED	10/19/06	S. KOSE
SUBMITTED	10/20/06	M. KIUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
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Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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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 IV	FULL SIZE A1	SUMMARY OF QUANTITIES (ULTIMATE STAGE) 1 of 2	GC-11

SUMMARY OF QUANTITIES
(ULTIMATE STAGE)

ITEM NO.	DESCRIPTION	UNIT	QUANTITY																				REMARKS
			BYPASS	A-22	A-23	A-24	A-25	A-26	A-27	A-28	A-29	A-30	A-31	A-32	A-33	A-34	A-35	A-35a	BRIDGE #11	BRIDGE #12	BRIDGE #13	BRIDGE #14	TOTAL	
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.00	12.00	
407(4)	G.I. Drain Pipe Ø 150mm for Bridge Drainage	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.00	9.00	3.00	154.98	170.00	
SPL 407(5)c	Pier Protection Concrete Blocks for Talavera Bridge	m2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	896.00	896.00	
SPL 420(4)c	Temporary Craneway for Talavera Bridge Construction	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	80.00	80.00	
SPL 420(5)c	Temporary Access Road (Causeway) for Talavera Bridge Construction	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	300.00	300.00	
SPL 420(6)d	Temporary Cofferdam for Pier Construction (Talavera Bridge)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.00	3.00	
SPL 900(3)	Provisional Sum for Geotechnical Investigation	*L.S.*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00	1.00	
PART G - DRAINAGE AND SLOPE PROTECTION STRUCTURES																								
503(1)c3	RCPC Extra Strength (32MPa), Ø 460mm (18")	m	900.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	900.00	
502(2)a1	Drop Inlet Manhole for RCPC 1-Ø 460 x 1-Ø 460	each	75.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	75.00	
504(5)	Grouted Riprap Class A	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	106.00	28.00	104.00	7.03	246.00	
505(1)	Stone Masonry	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40.51	41.00	
506(1)	Hand Laid Rock Apron (Loose Boulder Apron)	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.92	24.00	
507(2)b	Steel Sheet Piles (400x85x8mm), furnished & driven	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	560.00	-	756.00	1,316.00	
509(1)	Gabions	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	146.00	-	204.30	351.00	
510(1)	Rubble Concrete Slope Protection	m3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	71.00	-	101.22	173.00	
PART H - MISCELLANEOUS STRUCTURES																								
600(3)a	Combination Concrete Curb & Gutter/Side Strip, Type A (675x364mm)	m	24,720.62	-	-	-	111.92	-	-	-	-	152.70	-	-	-	-	-	-	-	-	-	-	24,986.00	
601(1)	PCC Pavement for Sidewalk (t=100mm)	m2	1,658.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,659.00	
603(3)a	Metal Guardrails (Metal Beam) Type A (Embedded in Soil)	m	1,258.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,258.00	
605(2)a	Regulatory Signs (Triangular 1039mm)	each	4.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.00	
605(2)c	Regulatory Signs (Circular Ø 600mm)	each	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	
605(2)d	Regulatory Signs (Rectangular 450x750mm)	each	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.00	
608(1)	Furnishing and Placing Top Soil	m3	3,227.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,228.00	
610(1)	Sodding	m2	32,272.59	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	32,273.00	
611(1)a	Trees (Furnishing and Transplanting) Low Tree H = 1.5m	each	40,417.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	40,417.00	
611(1)b	Trees (Furnishing and Transplanting) Medium Tree 1.5m < H = 3.0m	each	2,521.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,757.00	
611(1)c	Trees (Furnishing and Transplanting) High Tree (Young Tree) 1.5m < H = 3.0m	each	69.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	69.00	
612(1)a	Reflectorized Thermoplastic Pavement Markings (White)	m2	5,116.56	-	86.00	-	63.80	-	-	-	118.80	68.04	-	64.24	77.40	68.20	-	-	-	-	-	-	5,644.00	
SPL 612(2)	Removal of Existing Thermoplastic Pavement Markings	m2	513.56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	514.00	
SPL 620(5)b	Relocation of Street Lighting Poles (Dual Lamp)	each	9.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.00	
SPL 620(4)c	Bridge Lighting Poles (Single Lamp)	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.00	12.00	
SPL 620(4)d	Street Lighting Service Pole with Panel	each	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00	1.00	

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/7/02	V. TAPIA
CHECKED	10/19/02	S. GEE
SUBMITTED	10/21/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	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 IV

SCALE : FULL SIZE A1

SHEET CONTENTS :
SUMMARY OF QUANTITIES
(ULTIMATE STAGE)
2 of 2

SHEET NO. :
GC-12

ROADWAY

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 SPEICIFICATIONS, 1995 EDITION, VOLUME II, HIGHWAYS, BRIDGES, AND AIRPORTS, AND THE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS FOR THIS PROJECT.

2.0 SURVEY CONTROLS AND REFERENCES

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

GPS STA.	NORTHING	EASTING	ELEVATIONS	DESCRIPTION
CAB-1	1,701,482.713	493,518.261	23.777	Located in Brgy. Tagumpay, San Leonardo, Nueva Ecija. It is drilled on the left side of the Tambo Bridge's first approach, about 0.05 cm. above the bridge's concrete sidewalk.
CAB-2	1,701,869.179	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 & 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 embeded on a 40cm x 40cm conc mons. beside an irri. canal about 8m from rd. CL & 3 km. from the highway intersec. of Fort Magsaysay & Cabanatuan City.
CAB-4	1,706,340.784	496,322.453	26.299	Located in Brgy. Soledad, Sta. Rosa, Nueva Ecija. It is embedded on a 40 cm x 40 cm conc. mons. 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, Nuevo 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 CAB8B	1,715,705.803 1,717,749.623	498,487.077 498,746.648	34.234 34.436	Located in Brgy. Roja, 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. 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. Buliran, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway after the Valdefuerte 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	1,719,116.959	497,481.612	37.713	Located in Brgy. Dalampang, Cabanatuan, Nueva Ecija. From Cabanatuan City proper take a right turn on Maharlika highway after the Valdefuerte bridge to a road going to Brgy. Dalampang. 2.5 km. from the highway taking the left fork turn right at the intersection to a dirt road leading to Brgy. Balite. It is embedded near an irrigation dike on the right side, 1.9 km. from the bridge.
CAB11	1,721,785.046	495,194.942	39.469	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpanaan intersection to the highway going to Pantabangan. 4.3 km. from the intersection turn right to a dirt road. It is embedded on the right beside an irrigation canal 70 m. from the centerline of the highway.
CAB12	1,722,163.770	495,433.939	37.949	Located in Homestead I, Talavera, Nueva Ecija. Taking the Maharlika highway to Muñoz, turn right on Pinagpanaan intersection to the highway going to Pantabangan. 4.8 km. from the intersection on the right side 50 m. from the centerline of the hughway.
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 puddy 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 ECIJA, 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, UNCLOGGING AND/OR RELAYING OF REINFORCED CONCRETE PIPES, CONSTRUCTION OF CHANNELS AND DITCHES AS DIRECTED BY THE ENGINEER TO ENSURE AN OPERATIONAL TEMPORARY DRAINAGE SYSTEM DURING THE CONSTRUCTION PERIOD SHALL BE UNDERTAKEN BY THE CONTRACTOR WITHOUT ANY COMPENSATION.

12.0 ACCESSIBILITY LAW:

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

13.0 TREE PLANTING ALONG NATIONAL ROADS

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

14.0 DESIGN DATA / REFERENCES

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

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

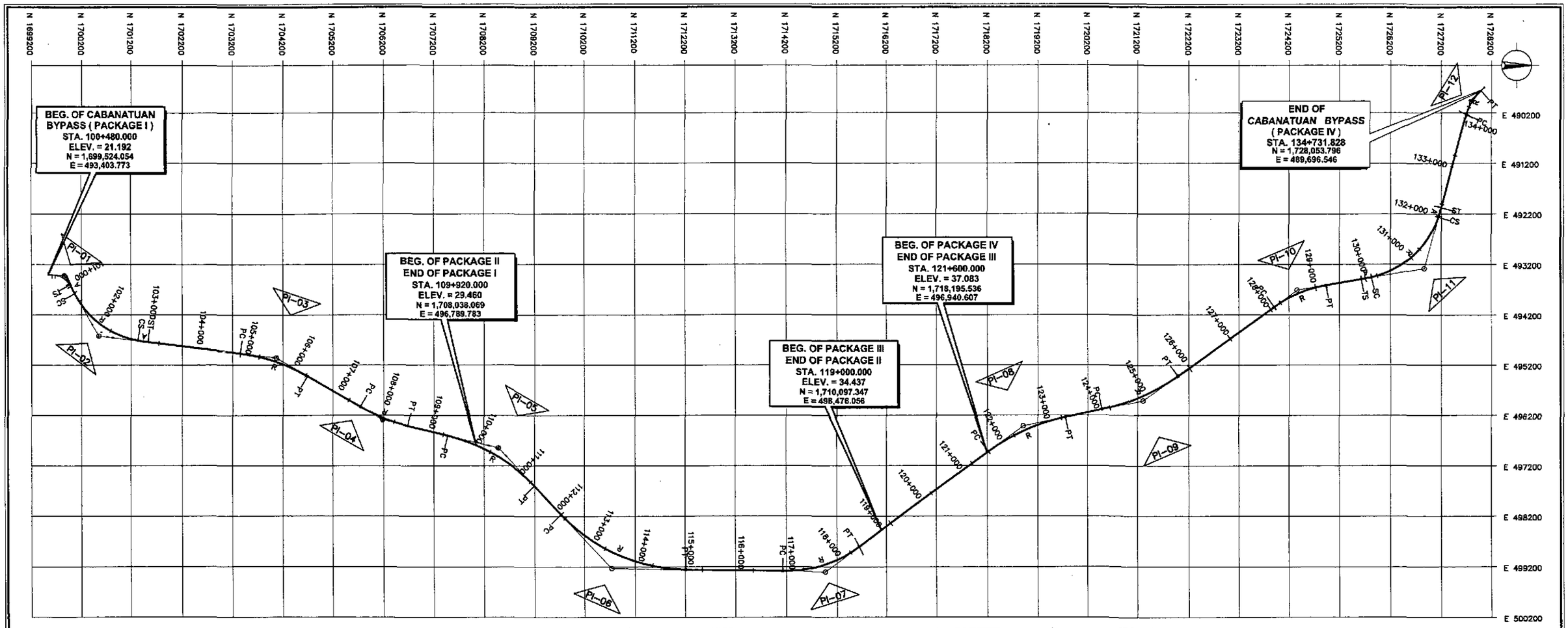
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/02	A. ACACIO
CHECKED	10/19/02	S. GOSE
SUBMITTED	10/21/02	M. KIUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONOAN Undersecretary	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 IV
SCALE : FULL SIZE A1
SHEET CONTENTS : GENERAL NOTES HIGHWAY/ CIVIL AND DRAINAGE
SHEET NO. : RG-01



ELEMENTS OF CURVES

P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT Θ_s	DEFLECTION ANGLE	A / R	Ls / Lc	STATION
BEG.	100+480.00							
		326.146	183°25'21"	248.148	58°16'36"	180.000	64.000	TS=100+580.000
01	100+806.148							SC=100+624.000
		1,385.199	239°41'57"	4°35'01"		400.000	328.886	CS=100+952.886
								ST=101+016.886
02	102+155.940			147.870	52°39'26"	600.000	200.000	TS=101+184.756
								SC=101+384.756
		3,544.720	187°02'31"	3°10'59"		1,800.000	1,454.277	TS=102+819.034
								SC=103+019.034
03	105+572.571			720.109	23°15'08"	-	-	PC=104+852.462
		2,451.020	210°17'39"	-		3,500.000	1,420.397	PT=106+272.858
04	108+003.789			514.528	18°43'34"	-	-	PC=107+489.241
		2,363.653	193°34'05"	-		3,500.000	1,021.737	PT=108+510.979
05	110+360.304			1,035.121	32°57'04"	-	-	PC=109+325.183
		3,288.872	226°31'09"	-		3,500.000	2,012.865	PT=111+338.048
06	113+591.799			1,469.788	45°33'32"	-	-	PC=112+122.011
		4,225.526	180°57'37"	-		3,500.000	2,783.035	PT=114+905.048
07	117+660.785			840.295	37°09'25"	-	-	PC=116+820.490
		4,885.881	143°48'12"	-		2,500.000	1,621.273	PT=118+441.763

ELEMENTS OF CURVES

P.I. No.	STATION	DISTANCE	AZIMUTH	TANGENT Θ_s	DEFLECTION ANGLE	A / R	Ls / Lc	STATION
		4,885.881	143°48'12"	856.892	24°11'07"	-	-	
08	122+487.349							PC=121+630.356
		2,447.505	167°59'20"	-		4,000.000	1,888.459	PT=123+318.815
09	124+909.328			837.385	23°38'52"	-	-	PC=124+071.944
		3,773.512	144°20'28"			4,000.000	1,650.927	PT=125+722.871
10	128+858.998			577.297	26°00'20"	-	-	PC=128+081.701
		2,530.124	170°20'47"	-		2,500.000	1,134.704	PT=129+216.405
11	131+189.232			1,250.689	65°09'11"	600.000	200.000	TS=129+918543
								SC=130+118.543
		3,450.454	105°11'37"	310°59"		1,800.000	1,848.841	CS=131+985.384
								ST=132+185.384
12	134+365.149			292.954	32°39'23"	-	-	
		382.827	137°50'54"			1,000.000	589.960	PC=134+072.196
								PT=134+642.155
END	134+731.823							

TABLE OF COORDINATES

P.I. No.	NORTHING	EASTING		NORTHING	EASTING
BEG.	1,699,524.054	493,403.773			
			TS	1,699,603.912	493,408.549
01	1,699,849.619	493,423.243	SC	1,699,667.655	493,414.070
			CS	1,699,940.068	493,561.402
			ST	1,699,973.809	493,635.783

TABLE OF COORDINATES

P.I. No.	NORTHING	EASTING		NORTHING	EASTING
			TS	1,700,048.415	493,783.432
02	1,700,548.505	494,619.209	SC	1,700,152.489	493,934.189
			CS	1,701,334.238	494,712.538
			ST	1,701,532.212	494,740.724
			PC	1,703,361.810	494,965.496
03	1,704,066.486	495,053.779	PT	1,704,588.262	495,417.031
			PC	1,705,738.544	496,030.623
04	1,706,182.811	496,280.171	PT	1,706,682.980	496,410.880
			PC	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	498,184.670
06	1,710,743.806	499,231.154	PT	1,712,213.387	499,255.786
			PC	1,714,128.561	499,287.887
07	1,714,968.738	498,301.970	PT	1,715,646.852	498,805.727
			PC	1,718,220.033	496,922.679
08	1,718,911.822	496,416.576	PT	1,719,749.852	496,238.234
			PC	1,720,486.493	496,081.508
09	1,721,305.544	495,907.244	PT	1,721,985.920	495,419.082
			PC	1,723,902.473	494,043.979
10	1,724,371.527	493,707.436	PT	1,724,940.649	493,610.632
			TS	1,725,632.845	493,492.891
11	1,726,685.824	493,283.164	SC	1,725,829.332	493,455.713
			CS	1,727,137.632	492,288.171
			ST	1,727,193.805	492,076.192
			PC	1,727,893.343	490,238.031
12	1,727,770.121	489,953.318	PT	1,727,887.313	489,758.723
END					

JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/17/02	R. ACACIO
CHECKED	10/19/02	S. GOSE
SUBMITTED	10/21/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

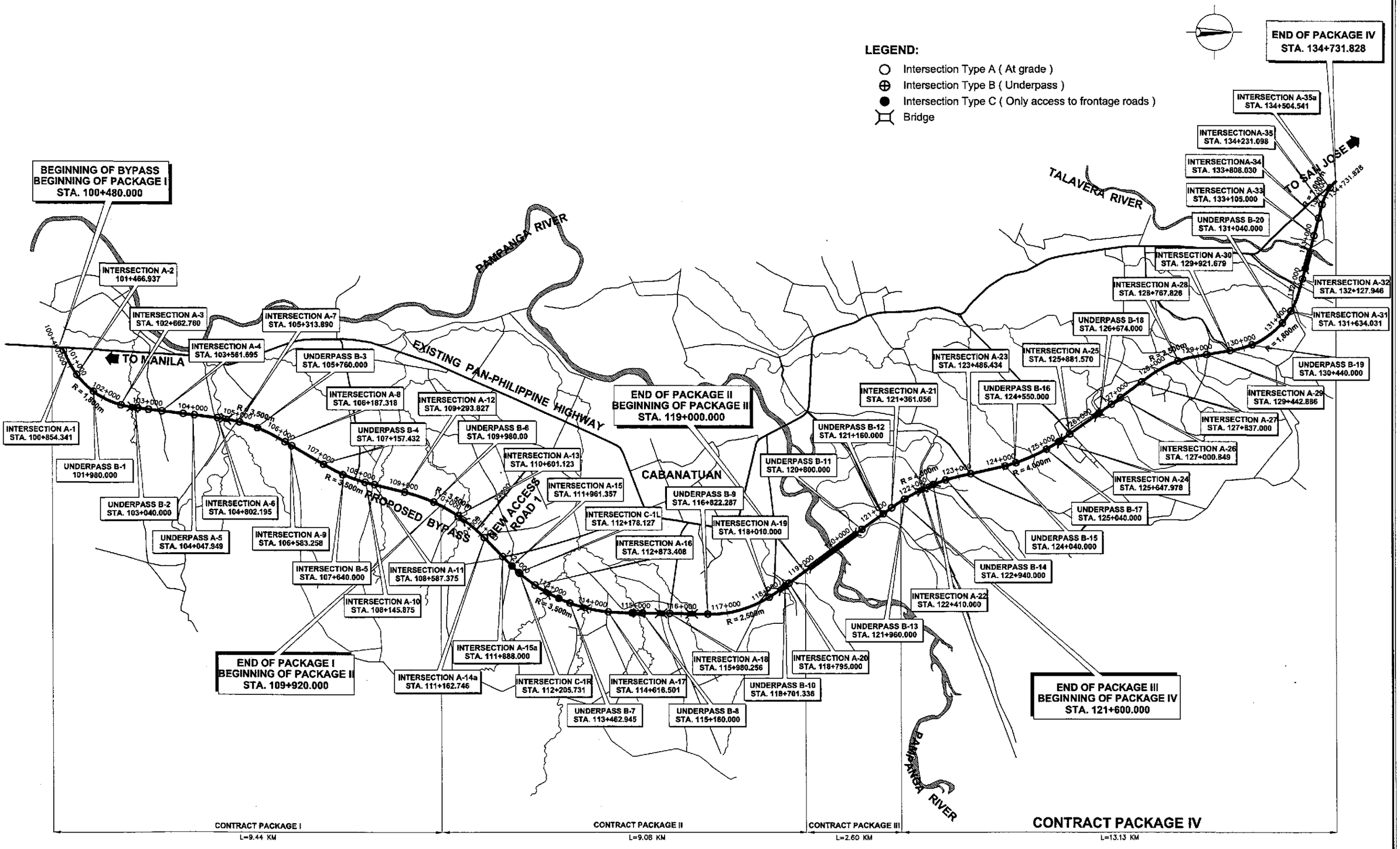
P.H.L – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	JOSEFINA M. ALAGAR, Chief, Highways Division	GILBERTO S. REYES, OIC, Director IV	MANUEL M. BONDAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

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 IV

SCALE : 1:40,000 FULL SIZE A1

SHEET CONTENTS : ALIGNMENT TECHNICAL DESCRIPTION

SHEET NO. : RG-02



A RG-03 LOCATION OF PROPOSED INTERSECTIONS / UNDERPASSES ALONG BYPASS

SCALE 1:40,000

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

KEI KATAHIRA & ENGINEERS INTERNATIONAL — YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/02	A. ACACIO
CHECKED	10/19/02	S. GOSE
SUBMITTED	10/21/02	H. MUCHI, TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE IV	1:40,000 FULL SIZE A1	LOCATION OF INTERSECTIONS / UNDERPASSESS ALONG BYPASS	RG-03

SCHEDULE OF PAVEMENT MARKINGS

(ULTIMATE STAGE)

ITEM 612(1) - REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS

1.0 CENTER LINE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
00+900.00	00+944.31	44.31	A-23: 100mm x 3.0m @ 4.50m GAP
00+944.31	00+974.31	30.00	A-23: 100mm UNBROKEN LINE
01+029.19	01+059.19	30.00	A-23: 100mm UNBROKEN LINE
01+059.19	01+080.00	20.81	A-23: 100mm x 3.0m @ 4.50m GAP
00+890.00	00+952.04	62.04	A-29: 100mm x 3.0m @ 4.50m GAP
00+952.04	00+982.04	30.00	A-29: 100mm UNBROKEN LINE
01+019.03	01+049.03	30.00	A-29: 100mm UNBROKEN LINE
01+049.03	01+110.00	60.97	A-29: 100mm x 3.0m @ 4.50m GAP
00+840.00	00+921.02	81.02	A-30: 100mm x 3.0m @ 4.50m GAP
01+016.12	01+100.00	83.88	A-30: 100mm x 3.0m @ 4.50m GAP
00+910.00	00+948.53	38.53	A-32: 100mm x 3.0m @ 4.50m GAP
00+948.53	00+978.53	30.00	A-32: 100mm UNBROKEN LINE
01+021.33	01+051.33	30.00	A-32: 100mm UNBROKEN LINE
01+051.33	01+080.00	28.67	A-32: 100mm x 3.0m @ 4.50m GAP
00+860.00	00+951.75	91.75	A-33: 100mm x 3.0m @ 4.50m GAP
00+951.75	00+981.75	30.00	A-33: 100mm UNBROKEN LINE
01+018.25	01+048.25	30.00	A-33: 100mm UNBROKEN LINE
01+048.25	01+150.00	101.75	A-33: 100mm x 3.0m @ 4.50m GAP
00+770.00	00+941.59	171.59	A-34: 100mm x 3.0m @ 4.50m GAP
00+941.59	00+971.59	30.00	A-34: 100mm UNBROKEN LINE
01+026.64	01+056.64	30.00	A-34: 100mm UNBROKEN LINE
01+056.64	01+090.00	33.36	A-34: 100mm x 3.0m @ 4.50m GAP

2.0 EDGE LINES

2.1 LEFT SIDE, OUTER EDGE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
121+600.00	123+464.85	1864.85	MAIN BYPASS
123+464.85	00+974.31	16.99	MAIN BYPASS TO RT OF A-23
00+900.00	00+974.31	74.31	RIGHT OF A-23
00+900.00	00+974.31	74.31	LEFT OF A-23
00+974.31	123+500.74	28.56	LT OF A-23 TO MAIN BYPASS
123+500.74	125+850.23	2349.49	MAIN BYPASS
125+850.23	00+963.56	33.92	MAIN BYPASS TO RT OF A-25
00+900.00	00+963.56	63.56	RIGHT OF A-25
00+900.00	00+961.58	61.58	LEFT OF A-25
00+961.58	125+913.47	43.36	LEFT OF A-25 TO MAIN BYPASS
125+913.47	129+431.95	3518.48	MAIN BYPASS
129+431.95	00+979.80	18.85	MAIN BYPASS TO RT OF A-29
00+890.00	00+979.80	89.80	RIGHT OF A-29
00+890.00	00+977.02	87.02	LEFT OF A-29
00+977.02	129+460.96	16.02	LEFT OF A-29 TO MAIN BYPASS
129+460.96	129+878.91	417.95	MAIN BYPASS
129+878.91	00+946.38	37.68	MAIN BYPASS TO RT OF A-30
00+840.00	00+946.38	106.38	RIGHT OF A-30
00+840.00	00+959.75	119.75	LEFT OF A-30
00+959.75	129+958.16	58.80	LEFT OF A-30 TO MAIN BYPASS
129+958.16	132+114.72	2156.56	MAIN BYPASS
132+114.72	00+978.52	20.44	MAIN BYPASS TO RT OF A-32
00+910.00	00+978.52	68.52	RIGHT OF A-32
00+910.00	00+978.87	68.87	LEFT OF A-32
00+978.87	132+143.66	15.14	LEFT OF A-32 TO MAIN BYPASS
132+143.66	133+093.45	949.79	MAIN BYPASS
133+093.45	00+981.75	13.35	MAIN BYPASS TO RT OF A-33
00+860.00	00+981.75	121.75	RIGHT OF A-33
00+860.00	00+981.75	121.75	LEFT OF A-33

2.1 LEFT SIDE, OUTER EDGE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
00+981.75	133+116.55	13.35	LEFT OF A-33 TO MAIN BYPASS
133+116.55	133+798.58	682.03	MAIN BYPASS
133+798.59	00+978.96	20.94	MAIN BYPASS TO RT OF A-34
00+770.00	00+978.96	208.96	RIGHT OF A-34
00+770.00	00+978.96	208.96	LEFT OF A-34
00+978.96	133+831.99	18.27	LEFT OF A-34 TO MAIN BYPASS
133+831.99	134+200.39	368.40	MAIN BYPASS
134+200.39	00+035.71	32.99	MAIN BYPASS TO LT OF A-35
00+035.71	00+219.69	183.98	LEFT OF A-35
134+256.68	00+219.69	114.68	LEFT OF PAN-PHIL TO RT OF A-35
134+215.77	134+256.68	40.91	RIGHT OF PAN-PHIL HIGHWAY
134+215.77	00+070.78	24.43	RIGHT OF PAN-PHIL TO RT OF A-35
00+024.52	00+070.78	46.26	RIGHT OF A-35
00+083.35	00+108.21	24.86	RIGHT OF A-35
00+024.52	134+250.32	23.24	RIGHT OF A-35 TO MAIN BYPASS
134+250.32	134+484.63	234.31	MAIN BYPASS
134+175.50	134+204.82	29.32	RIGHT OF PAN-PHIL HIGHWAY
134+204.82	00+083.35	16.32	RIGHT OF PAN-PHIL TO RT OF A-35
134+357.89	134+416.59	58.70	RIGHT OF PAN-PHIL HIGHWAY
134+357.89	134+731.83	373.94	LEFT OF PAN-PHIL HIGHWAY
134+416.59	134+484.63	68.04	RIGHT OF PAN-PHIL HIGHWAY

2.2 RIGHT SIDE, OUTER EDGE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
121+600.00	123+474.65	1874.65	MAIN BYPASS
123+474.65	01+022.50	24.64	MAIN BYPASS TO RT OF A-23
01+022.50	01+080.00	57.50	RIGHT OF A-23
01+029.19	01+080.00	50.81	LEFT OF A-23
123+510.92	125+849.67	2338.75	MAIN BYPASS
125+849.67	01+038.42	43.36	MAIN BYPASS TO RT OF A-25
01+038.42	01+090.00	51.58	RIGHT OF A-25
01+036.41	01+090.00	53.59	LEFT OF A-25
01+036.41	125+912.84	33.92	LEFT OF A-25 TO MAIN BYPASS
125+912.84	129+424.81	3511.97	MAIN BYPASS
129+424.81	01+022.89	16.02	MAIN BYPASS TO RT OF A-29
01+022.89	01+110.00	87.11	RIGHT OF A-29
01+020.11	01+110.00	89.89	LEFT OF A-29
01+020.11	129+453.82	18.85	LEFT OF A-29 TO MAIN BYPASS
129+453.82	129+887.10	433.28	MAIN BYPASS
129+887.10	01+042.00	58.14	MAIN BYPASS TO RT OF A-30
01+042.00	01+100.00	58.00	RIGHT OF A-30
01+044.18	01+100.00	55.82	LEFT OF A-30
01+044.18	129+962.55	32.21	LEFT OF A-30 TO MAIN BYPASS
129+962.55	132+112.09	2149.54	MAIN BYPASS
132+112.09	01+021.26	15.20	MAIN BYPASS TO RT OF A-32
01+021.26	01+080.00	58.74	RIGHT OF A-32
01+021.26	01+080.00	58.74	LEFT OF A-32
01+021.26	132+140.90	20.26	LEFT OF A-32 TO MAIN BYPASS
132+140.90	133+093.45	952.55	MAIN BYPASS
133+093.45	01+018.25	13.35	MAIN BYPASS TO RT OF A-33
01+018.25	01+150.00	131.75	RIGHT OF A-33
01+018.25	01+150.00	131.75	LEFT OF A-33
01+018.25	133+116.55	13.35	LEFT OF A-33 TO MAIN BYPASS
133+116.55	133+784.16	667.61	MAIN BYPASS

2.2 RIGHT SIDE, OUTER EDGE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
133+784.16	01+027.74	17.80	MAIN BYPASS TO RT OF A-34
01+027.74	01+090.00	62.26	RIGHT OF A-34
01+021.05	01+090.00	68.95	LEFT OF A-34
01+021.05	133+817.47	20.94	LEFT OF A-34 TO MAIN BYPASS
133+817.47	134+731.83	914.36	MAIN BYPASS

2.3 LEFT SIDE, INNER EDGE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
121+600.00	122+407.98	807.98	MAIN BYPASS
122+412.02	123+472.80	1060.78	MAIN BYPASS
123+501.72	125+645.98	2144.26	MAIN BYPASS
125+649.98	125+869.08	219.10	MAIN BYPASS
125+900.00	126+998.55	1098.55	MAIN BYPASS
127+003.15	127+834.70	831.55	MAIN BYPASS
127+839.29	128+765.09	925.80	MAIN BYPASS
128+770.56	129+430.78	660.22	MAIN BYPASS
129+454.00	129+904.00	450.00	MAIN BYPASS
129+940.00	131+631.32	1691.32	MAIN BYPASS
131+636.75	132+116.75	480.00	MAIN BYPASS
132+139.13	133+094.25	955.12	MAIN BYPASS
133+115.77	133+796.60	680.83	MAIN BYPASS
133+819.48	134+222.21	402.73	MAIN BYPASS
134+237.66	134+474.14	236.48	MAIN BYPASS
134+486.26	134+642.15	155.89	MAIN BYPASS
00+961.58	00+984.30	22.72	INTERSECTION A-25
01+015.70	01+039.70	24.00	INTERSECTION A-25
00+957.98	00+981.42	23.44	INTERSECTION A-30
01+018.54	01+042.00	23.46	INTERSECTION A-30
00+012.30	00+140.59	128.29	INTERSECTION A-35

2.4 RIGHT SIDE, INNER EDGE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
121+600.00	122+407.98	807.98	MAIN BYPASS
122+412.02	123+472.80	1060.78	MAIN BYPASS
123+501.72	125+645.98	2144.26	MAIN BYPASS
125+649.98	125+869.08	219.10	MAIN BYPASS
125+900.00	126+998.55	1098.55	MAIN BYPASS
127+003.15	127+834.70	831.55	MAIN BYPASS
127+839.29	128+765.09	925.80	MAIN BYPASS
128+770.56	129+430.78	660.22	MAIN BYPASS
129+454.00	129+904.00	450.00	MAIN BYPASS
129+940.00	131+631.32	1691.32	MAIN BYPASS
131+636.75	132+116.75	480.00	MAIN BYPASS
132+139.13	133+094.25	955.12	MAIN BYPASS
133+115.77	133+796.60	680.83	MAIN BYPASS
133+819.48	134+222.21	402.73	MAIN BYPASS
134+237.66	134+474.14	236.48	MAIN BYPASS
134+486.26	134+642.15	155.89	MAIN BYPASS
00+961.58	00+984.30	22.72	INTERSECTION A-25
01+015.70	01+039.70	24.00	INTERSECTION A-25
00+957.98	00+981.42	23.44	INTERSECTION A-30
01+018.54	01+042.00	23.46	INTERSECTION A-30
00+012.30	00+140.59	128.29	INTERSECTION A-35

3.0 LANE LINES

STATION FROM	STATION TO	LENGTH (m)	REMARKS
121+600.00	123+270.03	1670.03	(LS) LANE LINE 150mm x 3.0m @ 9.0m GAP
123+270.03	123+470.03	200.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
121+600.00	123+270.03	1670.03	(RS) LANE LINE 150mm x 3.0m @ 9.0m GAP
123+270.03	123+430.03	160.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
123+430.03	123+470.03	80.00	(RS) 2 - LANE LINE 150mm UNBROKEN
123+501.72	123+541.72	80.00	(LS) 2 - LANE LINE 150mm UNBROKEN
123+541.72	123+701.72	160.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
123+701.72	125+669.25	1967.53	(LS) LANE LINE 150mm x 3.0m @ 9.0m GAP
125+669.25	125+869.25	200.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
125+803.74	125+869.25	65.51	(LS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
123+501.72	123+701.72	200.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
123+701.72	125+669.25	1967.53	(RS) LANE LINE 150mm x 3.0m @ 9.0m GAP
125+669.25	125+839.25	170.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
125+839.25	125+869.25	90.00	(RS) 3 - LANE LINE 150mm UNBROKEN
125+803.74	125+839.25	35.51	(RS)INNER LANE LINE 150mmx3.0m @ 4.50m GAP
125+803.74	125+839.25	35.51	(RS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
125+899.56	125+929.56	90.00	(LS) 3 - LANE LINE 150mm UNBROKEN
125+929.56	126+099.56	170.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
126+099.56	129+229.71	3130.15	(LS) LANE LINE 150mm x 3.0m @ 9.0m GAP
129+229.71	129+429.71	200.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
125+929.56	125+959.56	30.00	(LS)INNER LANE LINE 150mmx3.0m @ 4.50m GAP
125+929.56	125+959.56	30.00	(LS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
125+899.56	126+099.56	200.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
126+099.56	129+229.71	3130.15	(RS) LANE LINE 150mm x 3.0m @ 9.0m GAP
129+229.71	129+389.71	160.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
129+389.71	129+429.71	80.00	(RS) 2 - LANE LINE 150mm UNBROKEN
125+899.56	125+959.56	60.00	(RS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
129+456.25	129+496.25	80.00	(LS) 2 - LANE LINE 150mm UNBROKEN
129+496.25	129+904.05	407.80	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
129+778.91	129+904.05	125.14	(LS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
129+456.25	129+874.05	417.80	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
129+874.05	129+904.05	90.00	(RS) 3 - LANE LINE 150mm UNBROKEN
129+778.91	129+839.41	60.50	(RS)INNER LANE LINE 150mmx3.0m @ 4.50m GAP
129+778.91	129+839.41	60.50	(RS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
129+940.86	129+970.86	90.00	(LS) 3 - LANE LINE 150mm UNBROKEN
129+970.86	130+140.86	170.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
130+140.86	131+915.51	1774.65	(LS) LANE LINE 150mm x 3.0m @ 9.0m GAP
131+915.51	132+115.51	200.00	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
129+970.86	130+003.94	33.08	(LS)INNER LANE LINE 150mmx3.0m @ 4.50m GAP
129+970.86	130+003.94	33.08	(LS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
129+940.86	130+140.86	200.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
130+140.86	131+915.51	1774.65	(RS) LANE LINE 150mm x 3.0m @ 9.0m GAP
131+915.51	132+075.51	160.00	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
132+075.51	132+115.51	80.00	(RS) 2 - LANE LINE 150mm UNBROKEN
129+940.86	130+062.41	121.55	(RS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
132+142.79	132+182.79	80.00	(LS) 2 - LANE LINE 150mm UNBROKEN
132+182.79	133+093.00	910.21	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
132+142.79	133+053.00	910.21	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
133+053.00	133+093.00	80.00	(RS) 2 - LANE LINE 150mm UNBROKEN
133+116.99	133+156.99	80.00	(LS) 2 - LANE LINE 150mm UNBROKEN
133+156.99	133+794.48	637.49	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
133+116.99	133+754.48	637.49	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
133+754.48	133+794.48	80.00	(RS) 2 - LANE LINE 150mm UNBROKEN
133+826.92	133+866.92	80.00	(LS) 2 - LANE LINE 150mm UNBROKEN
133+866.92	134+216.42	349.50	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP

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KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/19/16	A. PAPA
CHECKED	10/19/16	S. GOSE
SUBMITTED	10/21/16	M. KUCHI, TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL - PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	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 IV

SCALE : FULL SIZE A1

SHEET CONTENTS :
SCHEDULE OF PAVEMENT MARKINGS
Sheet 1 of 2

SHEET NO. :
RG-04

SCHEDULE OF PAVEMENT MARKINGS

(ULTIMATE STAGE)

ITEM 612(1) - REFLECTORIZED THERMOPLASTIC PAVEMENT MARKINGS

3.0 LANE LINES

STATION FROM	STATION TO	LENGTH (m)	REMARKS
134+100.39	134+216.42	116.03	(LS)OUTER LANE LINE 150mmx3.0m @ 4.50m GAP
133+826.92	134+186.42	359.50	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
134+186.42	134+216.42	60.00	(RS) 2 – LANE LINE 150mm UNBROKEN
134+245.75	134+275.75	30.00	(LS) LANE LINE 150mm UNBROKEN
134+275.75	134+462.81	187.06	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
134+245.75	134+432.81	187.06	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
134+432.81	134+462.81	30.00	(RS) LANE LINE 150mm UNBROKEN
134+487.29	134+517.29	60.00	(LS) 2 – LANE LINE 150mm UNBROKEN
134+517.29	134+642.15	124.86	(LS) LANE LINE 150mm x 3.0m @ 4.50m GAP
134+487.29	134+642.15	154.86	(RS) LANE LINE 150mm x 3.0m @ 4.50m GAP
00+963.03	00+983.03	20.00	(RS) LANE LINE 100mm UNBROKEN (A–25)
01+016.95	01+036.95	20.00	(LS) LANE LINE 100mm UNBROKEN (A–25)
00+957.50	00+977.50	20.00	(RS) LANE LINE 100mm UNBROKEN (A–30)
01+022.00	01+042.00	20.00	(LS) LANE LINE 100mm UNBROKEN (A–30)
00+017.75	00+047.75	60.00	(LS) 2 – LANE LINE 100mm UNBROKEN (A–35)
00+047.75	00+140.60	92.85	(LS)LANE LINE 100mmx3.0m @ 4.50m GAP(A–35)
00+047.75	00+095.61	47.86	(LS)LANE LINE 100mmx3.0m @ 4.50m GAP(A–35)

4.0 CONTINUITY LINE

STATION FROM	STATION TO	LENGTH (m)	REMARKS
123+391.07	123+430.03	38.96	(RS) 150mm x 1.0m @ 3.0m GAP
123+541.72	123+581.95	40.23	(LS) 150mm x 1.0m @ 3.0m GAP
125+758.58	125+803.74	45.16	(LS) 150mm x 1.0m @ 3.0m GAP
125+758.58	125+803.74	90.32	(RS) 2 – 150mm x 1.0m @ 3.0m GAP
125+959.56	126+004.56	90.00	(LS) 2 – 150mm x 1.0m @ 3.0m GAP
125+959.56	126+004.56	45.00	(RS) 150mm x 1.0m @ 3.0m GAP
129+344.52	129+389.71	45.19	(RS) 150mm x 1.0m @ 3.0m GAP
129+496.25	129+541.25	45.00	(LS) 150mm x 1.0m @ 3.0m GAP
129+733.91	129+778.91	45.00	(LS) 150mm x 1.0m @ 3.0m GAP
129+794.91	129+839.41	89.00	(RS) 2 – 150mm x 1.0m @ 3.0m GAP
130+003.94	130+048.94	90.00	(LS) 2 – 150mm x 1.0m @ 3.0m GAP
130+062.41	130+107.41	45.00	(RS) 150mm x 1.0m @ 3.0m GAP
132+030.51	132+075.51	45.00	(RS) 150mm x 1.0m @ 3.0m GAP
132+182.79	132+225.39	42.60	(LS) 150mm x 1.0m @ 3.0m GAP
133+028.00	133+053.00	25.00	(RS) 150mm x 1.0m @ 3.0m GAP
133+156.99	133+201.99	45.00	(LS) 150mm x 1.0m @ 3.0m GAP
133+710.35	133+754.48	44.13	(RS) 150mm x 1.0m @ 3.0m GAP
133+866.92	133+908.31	41.39	(LS) 150mm x 1.0m @ 3.0m GAP
134+055.39	134+100.39	45.00	(LS) 150mm x 1.0m @ 3.0m GAP
134+111.42	134+156.42	45.00	(RS) 150mm x 1.0m @ 3.0m GAP
134+517.29	134+562.28	44.99	(LS) 150mm x 1.0m @ 3.0m GAP
134+642.16	134+722.16	160.00	(BS) 150mm x 1.0m @ 3.0m GAP
00+921.58	00+963.03	41.45	(RS) 100mmx1.0m@3.0mGAP(A–25)
01+036.95	01+078.42	41.47	(LS) 100mmx1.0m@3.0mGAP(A–25)
00+921.02	00+957.50	36.48	(RS) 100mmx1.0m@3.0mGAP(A–30)
01+042.00	01+076.12	34.12	(LS) 100mmx1.0m@3.0mGAP(A–30)
00+095.61	00+138.68	43.07	(LS) 100mmx1.0m@3.0mGAP(A–35)
00+140.60	00+219.69	79.09	(LS) 100mmx1.0m@3.0mGAP(A–35)

5.0 CHEVRON

STATION FROM	STATION TO	LENGTH (m)	REMARKS
00+921.58	00+961.58	40.00	CENTER OF A–25
01+039.70	01+078.42	38.72	CENTER OF A–25
00+921.02	00+957.98	36.96	CENTER OF A–30
01+042.00	01+076.12	34.12	CENTER OF A–30
134+168.85	134+175.50	6.65	CENTER OF PAN–PHIL HIGHWAY
134+642.16	134+722.16	80.00	CENTER OF MAIN BYPASS
134+484.63	134+504.54	19.91	CENTER OF A–35
00+140.59	00+219.69	79.10	CENTER OF A–35

7.0 ARROWS

ARROW TYPE	NUMBER OF ARROWS	LOCATION
A	2	APPROACHING INTERSECTION A–23
B	2	APPROACHING INTERSECTION A–23
C	2	APPROACHING INTERSECTION A–23
A	6	APPROACHING INTERSECTION A–25
B	2	APPROACHING INTERSECTION A–25
C	4	APPROACHING INTERSECTION A–25
A	2	APPROACHING INTERSECTION A–29
B	2	APPROACHING INTERSECTION A–29
C	2	APPROACHING INTERSECTION A–29
A	6	APPROACHING INTERSECTION A–30
B	2	APPROACHING INTERSECTION A–30
C	4	APPROACHING INTERSECTION A–30
A	2	APPROACHING INTERSECTION A–32
B	2	APPROACHING INTERSECTION A–32
C	2	APPROACHING INTERSECTION A–32
A	2	APPROACHING INTERSECTION A–33
B	2	APPROACHING INTERSECTION A–33
C	2	APPROACHING INTERSECTION A–33
A	2	APPROACHING INTERSECTION A–34
B	2	APPROACHING INTERSECTION A–34
C	2	APPROACHING INTERSECTION A–34
A	7	APPROACHING INTERSECTION A–35
B	1	APPROACHING INTERSECTION A–35
C	3	APPROACHING INTERSECTION A–35
A	1	APPROACHING INTERSECTION A–35a
C	4	APPROACHING INTERSECTION A–35a

NOTE:

A – LEFT/RIGHT ARROW
COMBINATION OF STRAIGHT AND LEFT ARROWS OR
B – STRAIGHT AND RIGHT ARROWS
C – STRAIGHT ARROW

8.0 PEDESTRIAN AND STOP LINES

LOCATION		AREA (m^2) PEDESTRIAN	AREA (m^2) STOP LINE	REMARKS
INT. A–23	MAIN BYPASS	48.00	10.67	UNSIGNALIZED
	A–23	30.00	1.80	
INT. A–25	MAIN BYPASS	11.70	9.18	SIGNALIZED
	A–25	28.80	4.20	
INT. A–29	MAIN BYPASS	48.00	9.94	UNSIGNALIZED
	A–29	56.40	2.09	
INT. A–30	MAIN BYPASS	13.28	10.03	SIGNALIZED
	A–30	31.07	4.20	
INT. A–32	MAIN BYPASS	49.20	9.44	UNSIGNALIZED
	A–32	27.62	1.83	
INT. A–33	MAIN BYPASS	44.40	9.00	UNSIGNALIZED
	A–33	37.20	1.83	
INT. A–34	MAIN BYPASS	55.20	11.18	UNSIGNALIZED
	A–34	31.10	1.83	
INT. A–35	MAIN BYPASS	10.53	7.98	SIGNALIZED
	A–35	11.61	2.10	
INT. A–35a	MAIN BYPASS	33.00	7.86	UNSIGNALIZED
	A–35a	22.30	0.91	

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YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/17/12	TEAM LEADER
CHECKED	10/19/12	
SUBMITTED	10/21/12	

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE IV	FULL SIZE A1	SCHEDULE OF PAVEMENT MARKINGS Sheet 2 of 2	RG-05