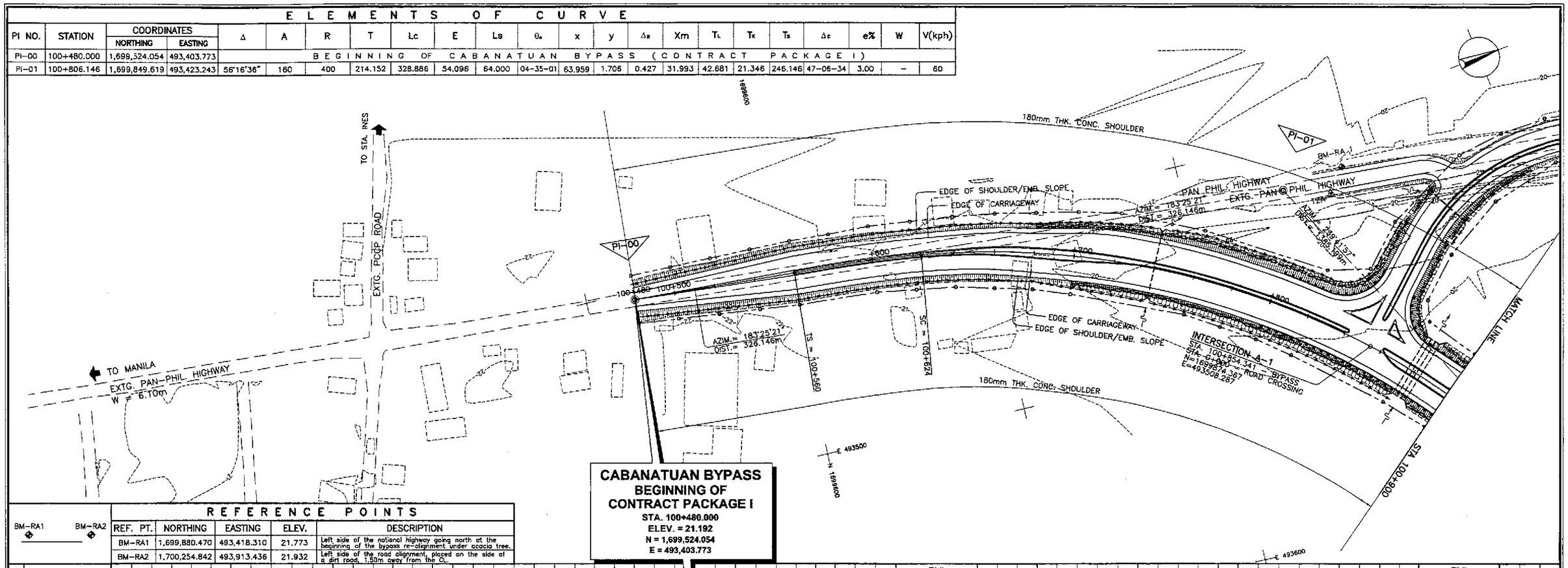
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	A	R	T	Lc	E	Ls	θs	x	y	Δs	Xm	TL	Tx	Ts	Δc	e%	W	V(kph)
PI-00	100+480.000	1,699,524.054	493,403.773	BEGINNING OF CABANATUAN BYPASS (CONTRACT PACKAGE I)																		
PI-01	100+806.146	1,699,849.619	493,423.243	56°16'36"	160	400	214.152	328.886	54.096	64.000	04-35-01	63.959	1.706	0.427	31.993	42.681	21.346	246.146	47-06-34	3.00	–	60

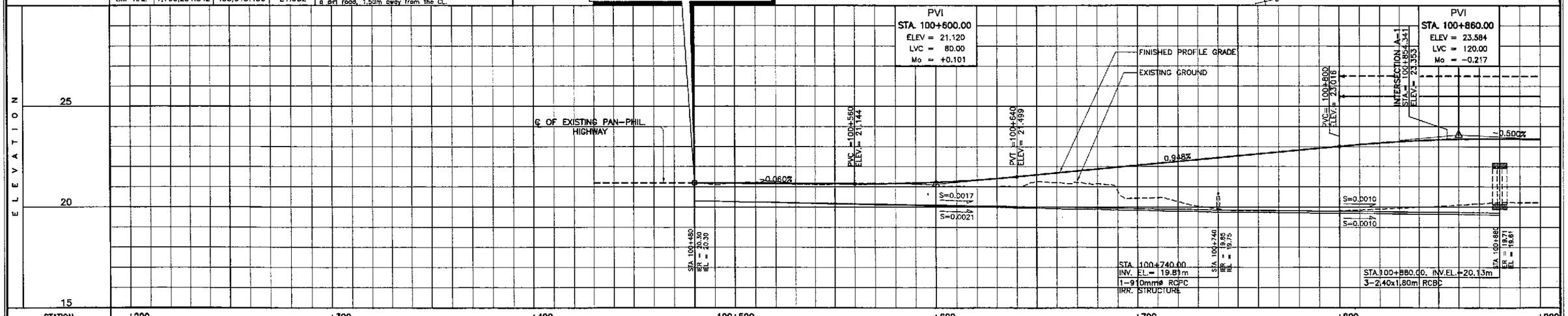


CABANATUAN BYPASS
BEGINNING OF CONTRACT PACKAGE I
STA. 100+480.000
ELEV. = 21.192
N = 1,699,524.054
E = 493,403.773

BM-RA1 BM-RA2

REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA1	1,699,880.470	493,418.310	21.773	Left side of the national highway going north at the beginning of the bypass re-alignment under acacia tree.
BM-RA2	1,700,254.842	493,913.436	21.932	Left side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.



STATION	+200	+300	+400	100+500	+600	+700	+800	+900
FINISHED PROFILE GRADE BYPASS	21.192	21.180	21.168	21.156	21.144	21.157	21.221	21.335
EXISTING GROUND BYPASS	21.192	21.201	21.260	21.109	21.139	21.155	21.029	21.021

STATION	100+500	+600	+700	+800	+900
FINISHED PROFILE GRADE BYPASS	21.499	21.689	21.878	22.068	22.257
EXISTING GROUND BYPASS	21.014	21.203	21.152	20.433	20.265

STATION	+900	+900	+900	+900	+900	+900	+900	+900
FINISHED PROFILE GRADE BYPASS	22.447	22.637	22.826	23.015	23.181	23.298	23.357	23.368
EXISTING GROUND BYPASS	19.910	19.807	19.809	19.809	19.895	19.988	20.088	20.223

STATION	+900	+900	+900	+900	+900	+900	+900	+900
FINISHED PROFILE GRADE BYPASS	23.350							
EXISTING GROUND BYPASS	20.216							

HORIZONTAL CURVATURE: 100+480.000 R=∞ 100+560.000 A=160 100+624.000 R=400

VERTICAL CURVATURE: g=-0.060% L=80 Mo=+0.101 g=0.948% L=120 Mo=-0.217

SUPERELEVATION: N.C. 100+560.000 100+585.600 100+611.200 100+624.000 e=±3% e=-3%

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

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ACACIO
CHECKED	10/15/02	S. GOOSE
SUBMITTED	10/16/02	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 I

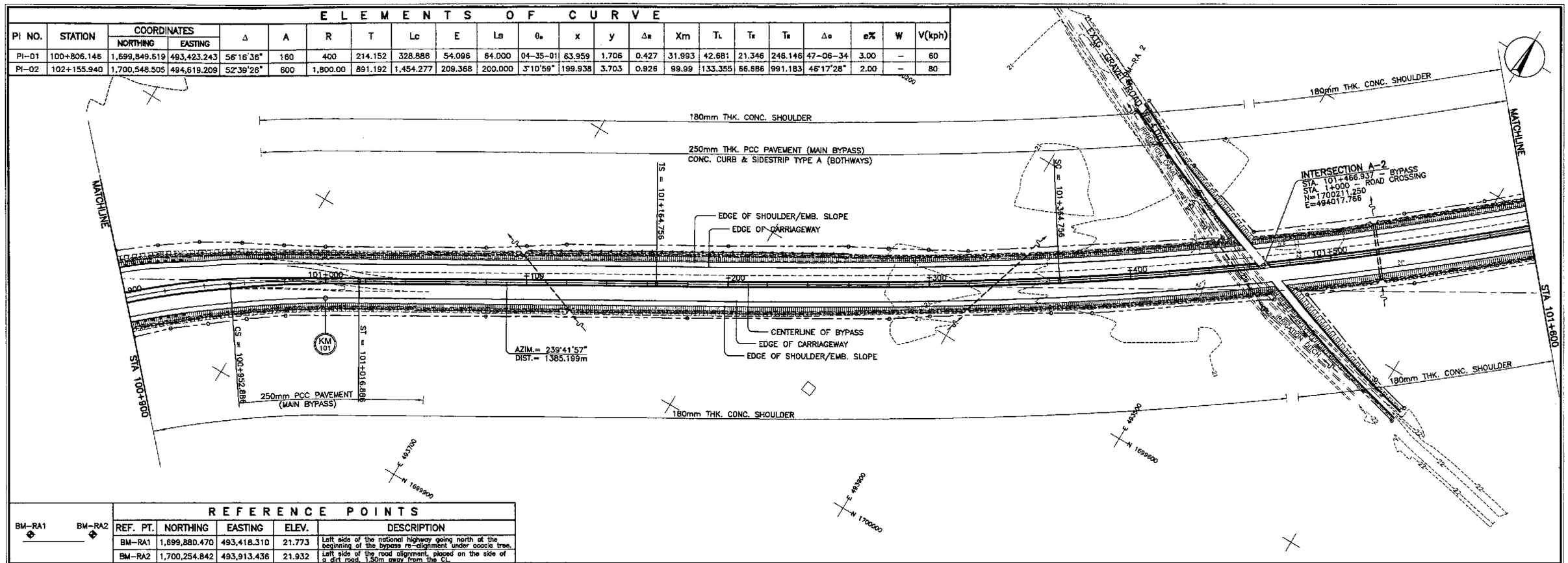
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 100+480 - STA. 100+900

SHEET NO. :
RP-01

ELEMENTS OF CURVE

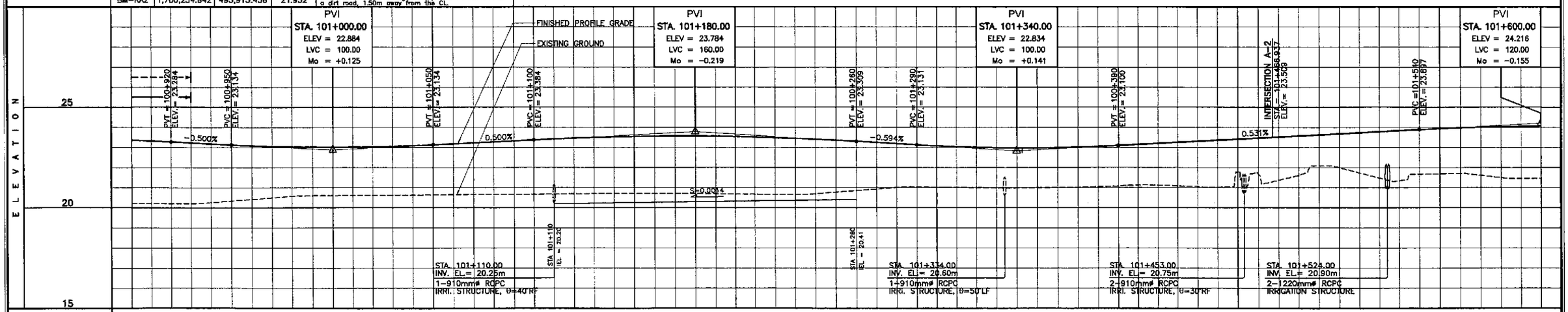
PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	A	R	T	Lc	E	Ls	θs	x	y	Δs	Xm	TL	TS	TE	Δc	e%	W	V(kph)
PI-01	100+806.146	1,699,849.619	493,423.243	56°16'36"	160	400	214.152	328.886	54.096	64.000	04-35-01	63.959	1.706	0.427	31.993	42.681	21.346	246.146	47-06-34	3.00	–	60
PI-02	102+155.940	1,700,548.505	494,619.209	52°39'26"	600	1,800.00	891.192	1,454.277	209.368	200.000	3°10'59"	199.938	3.703	0.926	99.99	133.355	66.686	991.183	46°17'28"	2.00	–	80



REFERENCE POINTS

BM-RA1 BM-RA2

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA1	1,699,880.470	493,418.310	21.773	Left side of the national highway going north at the beginning of the bypass re-alignment under acacia tree.
BM-RA2	1,700,254.842	493,913.436	21.932	Left side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.



STATION	+900	101+000	+100	+200	+300	+400	101+500	+600

FINISHED PROFILE GRADE BYPASS																																				
23.360	23.284	23.184	23.089	23.029	23.009	23.029	23.089	23.184	23.284	23.384	23.470	23.529	23.561	23.565	23.542	23.492	23.414	23.309	23.190	23.077	23.003	22.975	22.991	23.052	23.153	23.259	23.365	23.472	23.578	23.684	23.791	23.897	23.988	24.041	24.061

EXISTING GROUND BYPASS																																				
20.216	20.210	20.286	20.419	20.570	20.599	20.610	20.631	20.646	20.659	20.673	20.688	20.699	20.699	20.698	20.679	20.661	20.694	20.853	21.008	21.022	20.995	20.981	21.001	21.046	21.132	21.089	21.022	21.875	21.613	21.991	21.477	21.665	21.699	21.499	21.450

HORIZONTAL CURVATURE: R=400 | 100+952.886 | A=160 | 101+016.886 | R=∞ | 101+164.756 | A=600 | 101+364.756 | R=1800

VERTICAL CURVATURE: q=−0.500% | L=100 Mo=+0.125 | q=0.500% | L=160 Mo=−0.219 | q=−0.594% | L=100 Mo=+0.141 | q=0.531% | L=120 Mo=−0.155

SUPERELEVATION: 100+952.886 | 100+991.286 | 100+965.686 | 101+016.886 | N.C. | 101+364.756 | e=+2% | 101+304.756 | 101+334.756 | e=−2%

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

	DATE	SIGNATURE
DESIGNED	10/15/02	A. ACACIO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. INOUE 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 I

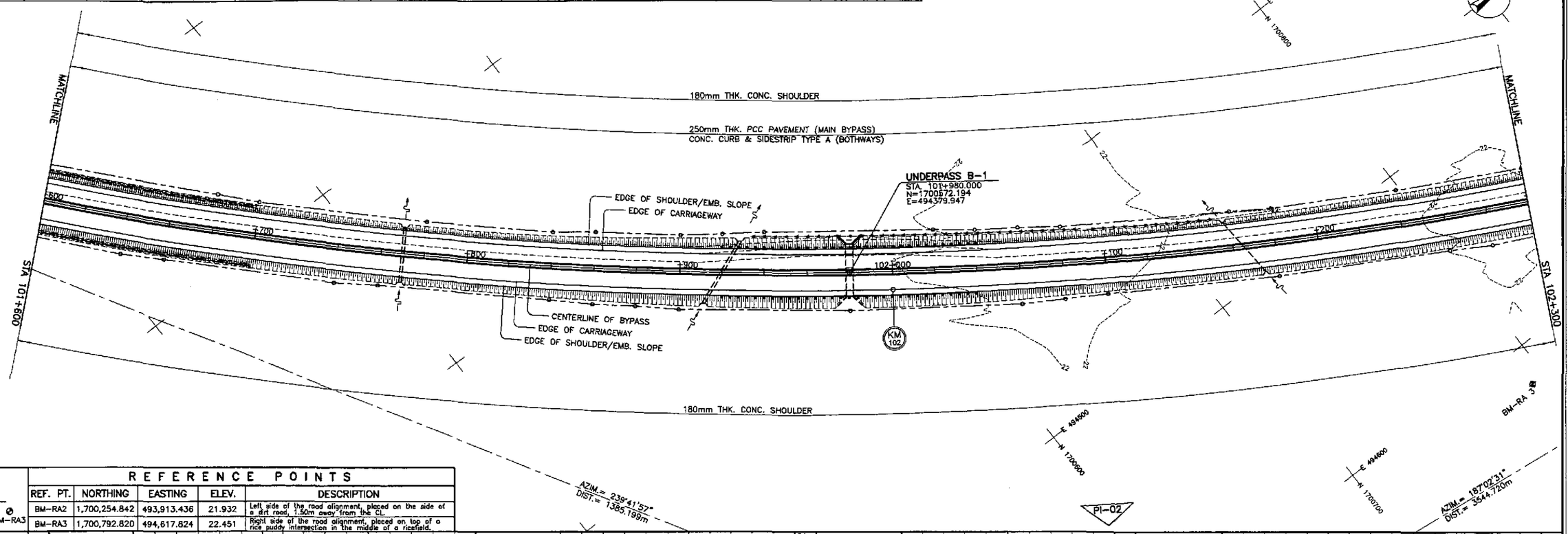
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 100+900 - STA. 101+600

SHEET NO. :
RP-02

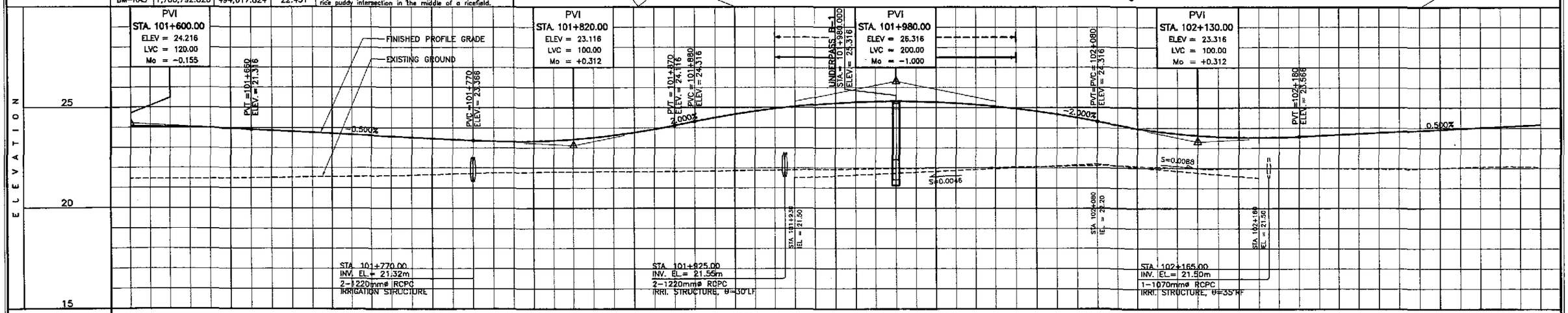
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	A	R	T	Lc	E	Ls	θs	x	y	Δs	Xm	TL	TR	TS	Δc	e%	W	V(kph)
PI-02	102+155.940	1,700,548.503	494,619.209	52°39'26"	600	1,800.00	891.192	1,454.277	209.368	200.000	3°10'59"	199.938	3.703	0.926	99.99	133.355	65.686	991.183	46°17'28"	20	–	80



REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA2	1,700,254.842	493,913.436	21.932	Left side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.
BM-RA3	1,700,792.820	494,617.824	22.451	Right side of the road alignment, placed on top of a rice puddy intersection in the middle of a ricefield.



STATION	+600		+700								+800								+900								102+000								+100								+200								+300
FINISHED PROFILE GRADE BYPASS	24.061		24.047		23.998		23.916		23.816		23.716		23.616		23.516		23.416		23.328		23.328		23.428		23.628		23.928		24.316		24.676		24.956		25.156		25.276		25.316		25.276		25.156		24.956		24.676		24.316		23.986		23.716		23.566		23.516		23.566		23.666		23.766		23.866		23.966		24.066		24.166
EXISTING GROUND BYPASS	21.450		21.453		21.467		21.499		21.533		21.559		21.599		21.633		21.697		21.749		21.779		21.801		21.813		21.806		21.826		21.858		21.888		21.913		21.941		21.969		21.994		22.018		22.047		22.086		22.127		22.084		22.013		21.963		21.980		21.984		21.972		21.958		21.965		22.032		22.084		22.048		24.166

HORIZONTAL CURVATURE: R=1800

VERTICAL CURVATURE: L=120, Mo=-0.155 — g=-0.500% — L=100, Mo=+0.0312 — g=2.000% — L=200, Mo=-1.000 — g=-2.000% — L=100, Mo=+0.312% — g=0.500%

SUPERELEVATION: e=+2% / e=-2%

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

	DATE	SIGNATURE
DESIGNED	10/5/02	R. ACACIO
CHECKED	10/5/02	S. GOSE
SUBMITTED	10/16/02	M. KOSHI 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 I

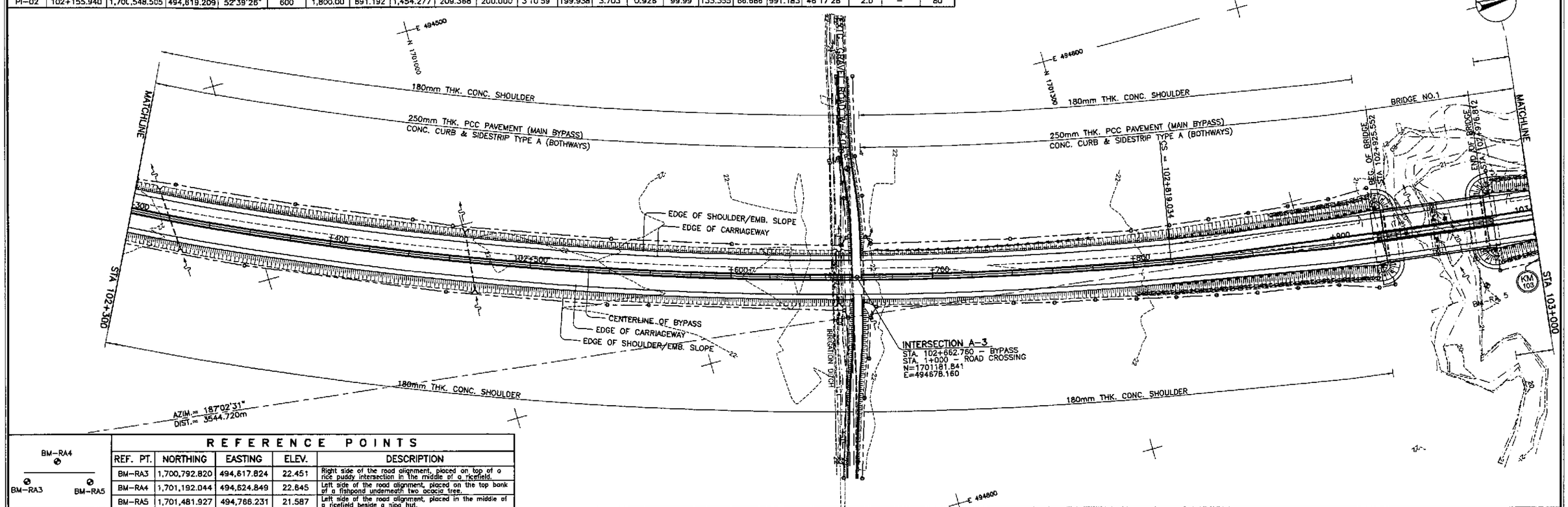
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 101+600 - 102+300

SHEET NO. :
RP-03

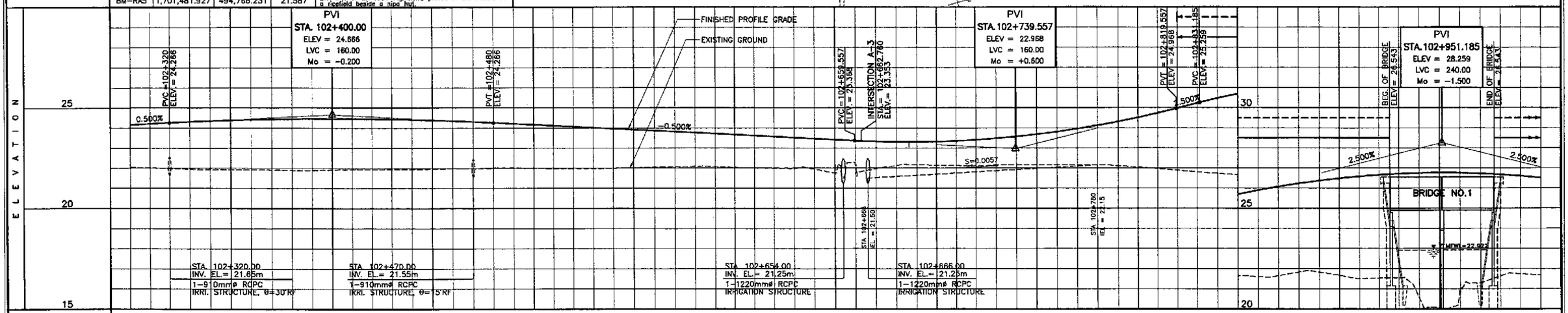
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	A	R	T	Lc	E	Ls	θs	x	y	Δs	Xm	TL	TS	TS	Δc	e%	W	V(kph)
PI-02	102+155.940	1,700,548.505	494,619.209	52°39'26"	600	1,800.00	891.192	1,454.277	209.368	200.000	3°10'59"	199.938	3.703	0.926	99.99	133.355	66.686	991.183	46°17'28"	2.0	–	80



REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA3	1,700,792.820	494,617.824	22.451	Right side of the road alignment, placed on top of a rice puddy intersection in the middle of a ricefield.
BM-RA4	1,701,192.044	494,624.849	22.845	Left side of the road alignment, placed on the top bank of a fishpond underneath two acacia tree.
BM-RA5	1,701,481.927	494,766.231	21.587	Left side of the road alignment, placed in the middle of a ricefield beside a nipa hut.



STATION	+300		+400		102+500		+600		+700		+800		+900		103+000
FINISHED PROFILE GRADE BYPASS	24.166	24.266	24.353	24.416	24.453	24.466	24.453	24.416	24.353	24.266	24.166	24.066	23.966	23.866	23.766
EXISTING GROUND BYPASS	22.048	21.983	21.933	21.924	21.896	21.915	21.934	21.946	21.965	21.988	21.992	21.983	21.994	22.042	22.086

STATION	102+600	102+700	102+800	102+900	103+000
FINISHED PROFILE GRADE BYPASS	23.666	23.566	23.466	23.366	23.305
EXISTING GROUND BYPASS	22.033	21.988	21.946	22.178	22.123

STATION	103+000	103+100	103+200	103+300	103+400	103+500	103+600	103+700	103+800	103+900	104+000	104+100	104+200	104+300	104+400
FINISHED PROFILE GRADE BYPASS	23.319	23.408	23.572	23.812	24.126	24.515	24.979	25.471	25.892	26.231	26.486	26.657	26.746	26.751	26.672
EXISTING GROUND BYPASS	22.145	22.125	22.165	22.150	22.154	22.041	21.885	21.728	21.601	21.832	21.665	21.530	20.552	21.014	21.636

STATION	104+500
FINISHED PROFILE GRADE BYPASS	26.510
EXISTING GROUND BYPASS	21.672

HORIZONTAL CURVATURE: R=1800 (102+819.034) A=600

VERTICAL CURVATURE: g=0.500% L=160 Mo=-0.200; g=-0.500% L=160 Mo=+0.600; g=2.500% L=240 Mo=-1.500

SUPERELEVATION: e=+2% (102+819.034); e=-2% (102+849.034 – 102+879.034)

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

	DATE	SIGNATURE
DESIGNED	10/3/02	R. ACACIO
CHECKED	10/8/02	S. JOSE
SUBMITTED	10/16/02	M. ABOCH 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. BONDAN	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 I

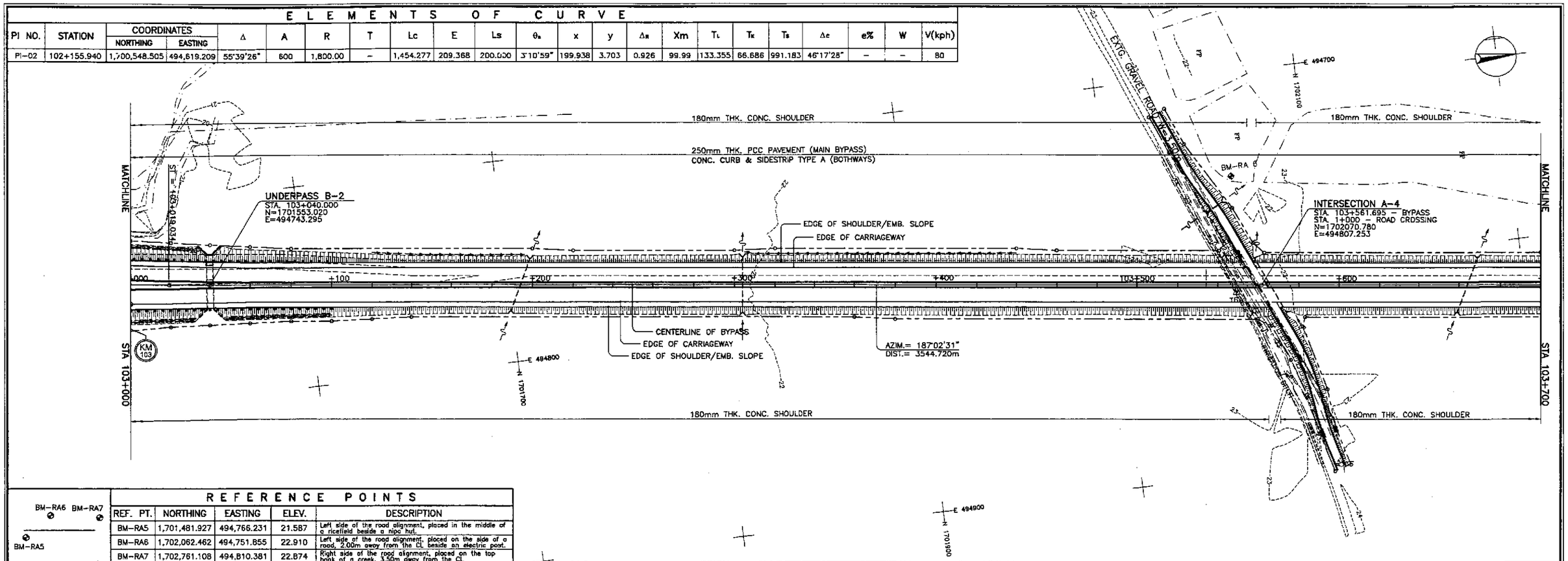
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 102+300 - STA. 103+000

SHEET NO. :
RP-04

ELEMENTS OF CURVE

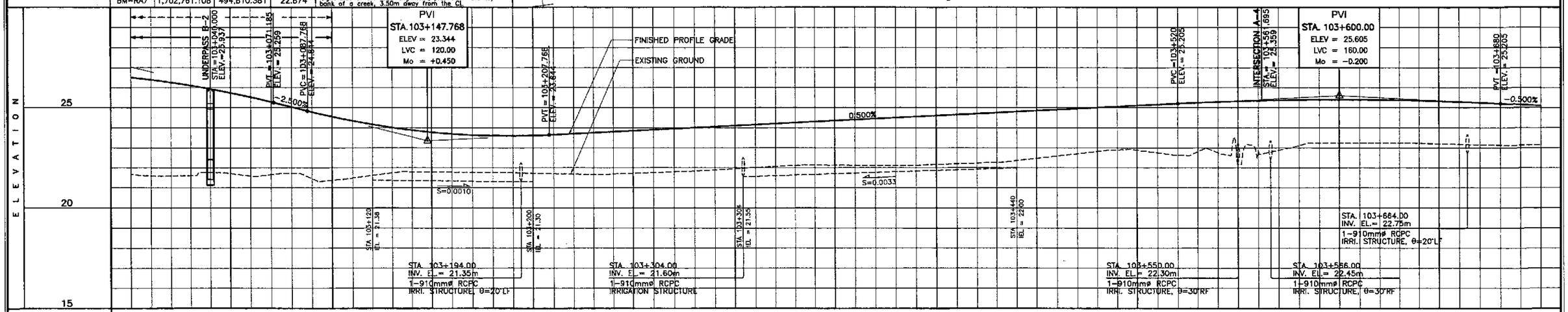
PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	A	R	T	Lc	E	Ls	θs	x	y	Δs	Xm	TL	TK	TS	Δc	e%	W	V(kph)
PI-02	102+155.940	1,700,548.505	494,619.209	55°39'26"	600	1,800.00	–	1,454.277	209.368	200.000	3°10'59"	199.938	3.703	0.926	99.99	133.355	66.686	991.183	46°17'28"	–	–	80



REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA5	1,701,481.927	494,766.231	21.587	Left side of the road alignment, placed in the middle of a ricefield beside a nipa hut.
BM-RA6	1,702,062.462	494,751.855	22.910	Left side of the road alignment, placed on the side of a road, 2.00m away from the CL beside an electric post.
BM-RA7	1,702,761.108	494,810.381	22.874	Right side of the road alignment, placed on the top bank of a creek, 3.50m away from the CL

BM-RA6 BM-RA7
BM-RA5



STATION	103+000					+100					+200					+300					+400					103+500					+600					+700
FINISHED PROFILE GRADE BYPASS	26.510		26.265		25.937		25.525		25.038		24.557		24.168		23.879		23.690		23.602		23.613		23.705		23.805		23.905		24.005		24.105		24.205		24.305	
EXISTING GROUND BYPASS	21.672		21.594		21.765		21.585		21.720		21.377		21.617		21.793		21.784		21.768		21.727		21.688		21.686		21.758		21.834		21.951		22.070		22.145	

STATION	103+405		103+505		103+605		103+705
FINISHED PROFILE GRADE BYPASS	24.405	24.505	24.605	24.705	24.805	24.905	25.005
EXISTING GROUND BYPASS	22.129	22.113	22.167	22.241	22.361	22.589	22.817

STATION	103+805		103+905		104+005		104+105		104+205		104+305		104+405		104+505		104+605		104+705
FINISHED PROFILE GRADE BYPASS	25.105	25.205	25.293	25.355	25.383	25.405	25.393	25.355	25.293	25.205	25.105
EXISTING GROUND BYPASS	22.883	22.630	22.767	22.855	23.110	23.240	23.240	23.225	23.173	23.125	23.147

HORIZONTAL CURVATURE: 103+019.034 — R=∞

VERTICAL CURVATURE: g=-2.500% — L=120, Mo=+0.450 — g=0.500% — L=160, Mo=-0.200 — g=-0.500%

SUPERELEVATION: N.C.

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

	DATE	SIGNATURE
DESIGNED	10/15/22	A. ACACIO
CHECKED	10/15/22	S. ROSE
SUBMITTED	10/16/22	M. KUCHI, TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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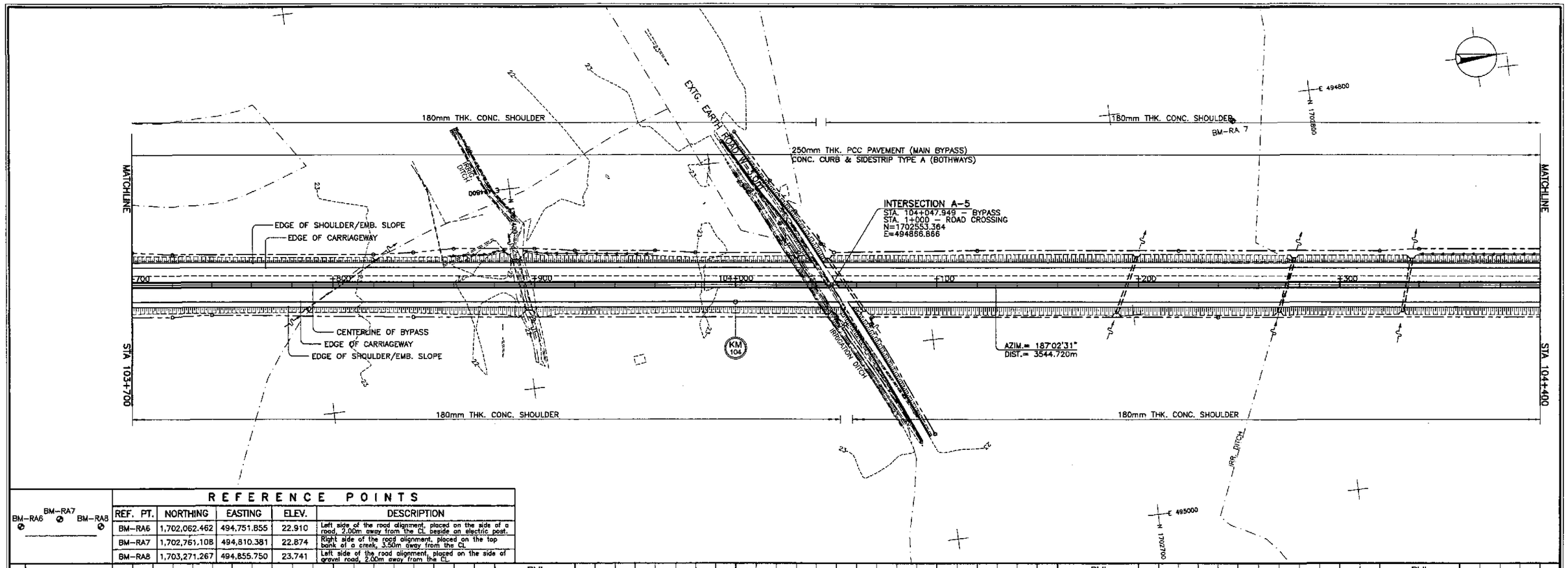
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	JOSEFINA M. ALAGAR, Chief, Highways Division	GILBERTO S. REYES, OIC, Director IV	MANUEL M. BONDAN, Undersecretary	SIMEON 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 I

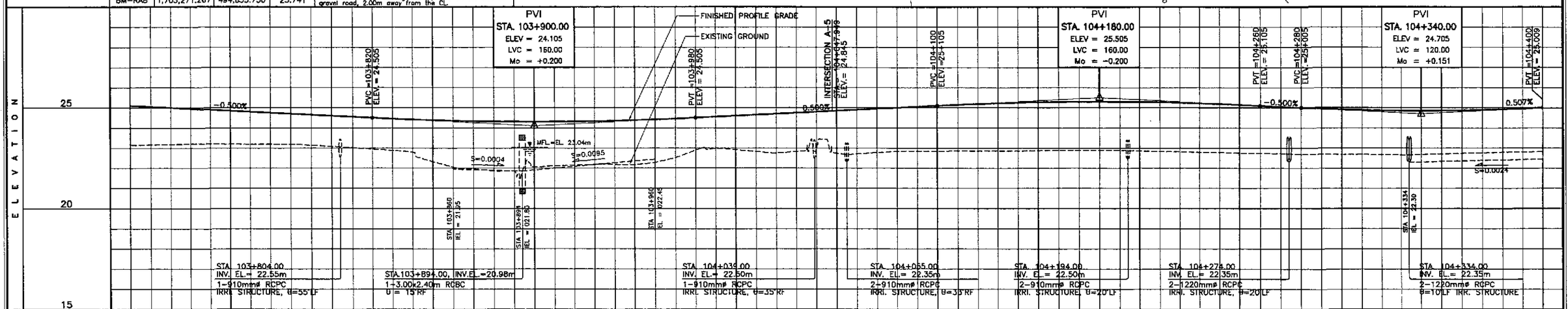
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 103+000 - STA. 103+700

SHEET NO. :
RP-05



REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA6	1,702,062.462	494,751.855	22.910	Left side of the road alignment, placed on the side of a road, 2.00m away from the CL beside an electric post.
BM-RA7	1,702,761.108	494,810.381	22.874	Right side of the road alignment, placed on the top bank of a creek, 3.50m away from the CL
BM-RA8	1,703,271.267	494,855.750	23.741	Left side of the road alignment, placed on the side of gravel road, 2.00m away from the CL.



STATION	+700					+800					+900					104+000					+100					+200					+300					+400
FINISHED PROFILE GRADE BYPASS	25.105	25.005	24.905	24.805	24.705	24.605	24.505	24.418	24.355	24.318	24.305	24.318	24.355	24.418	24.505	24.605	24.705	24.805	24.905	25.005	25.105	25.193	25.255	25.293	25.305	25.293	25.255	25.193	25.105	25.005	24.922	24.872	24.856	24.874	24.925	25.009
EXISTING GROUND BYPASS	23.147	23.187	23.211	23.197	23.183	23.076	22.950	22.793	22.050	21.860	22.067	22.156	22.189	22.286	22.890	22.921	22.757	22.920	22.717	22.833	22.858	22.860	22.866	22.855	22.897	22.862	22.818	22.780	22.743	22.703	22.689	22.679	22.668	22.742	22.794	22.824

HORIZONTAL CURVATURE: R=∞

VERTICAL CURVATURE: g=−0.500% | L=160 Mo=+0.200 | g=0.500% | L=160 Mo=−0.200 | g=−0.500% | L=120 Mo=+0.151

SUPERELEVATION: N.C.

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

	DATE	SIGNATURE
DESIGNED	10/15/02	A. ACACIO
CHECKED	10/15/02	S. GOCE
SUBMITTED	10/16/02	M. KOBAYASHI
		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. BONDAN	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 I

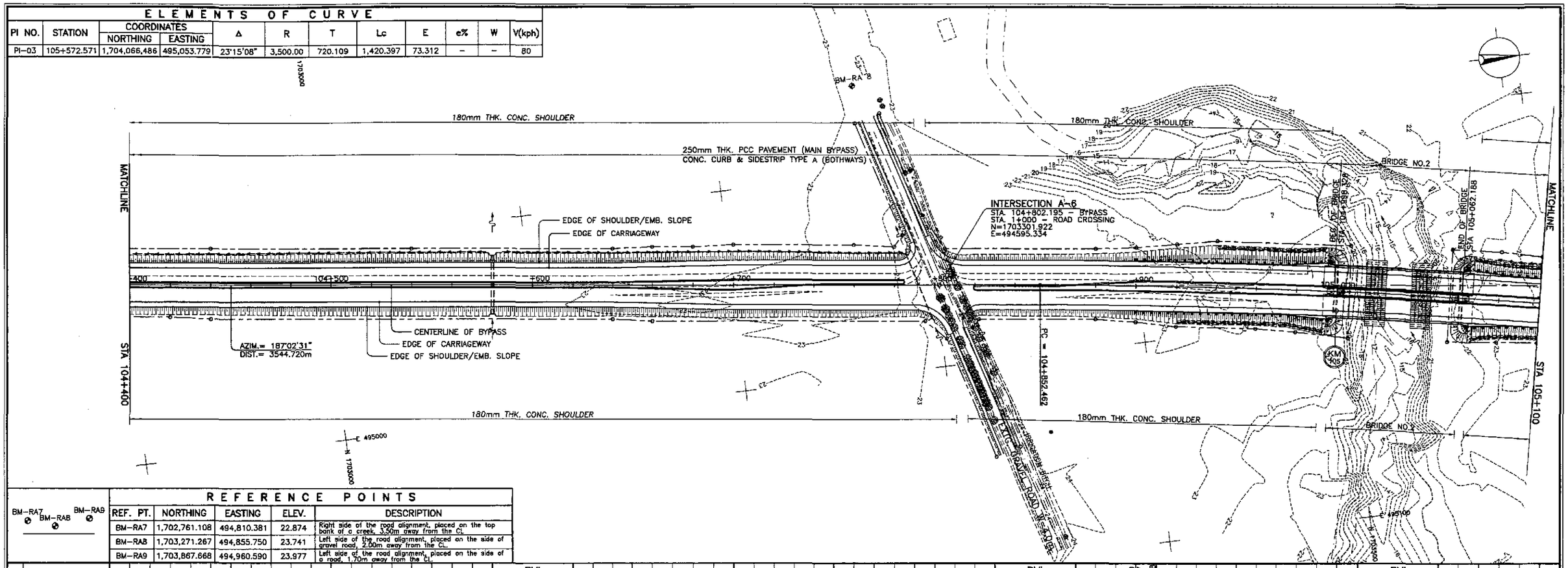
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 103+700 - STA. 104+400

SHEET NO. :
RP-06

ELEMENTS OF CURVE

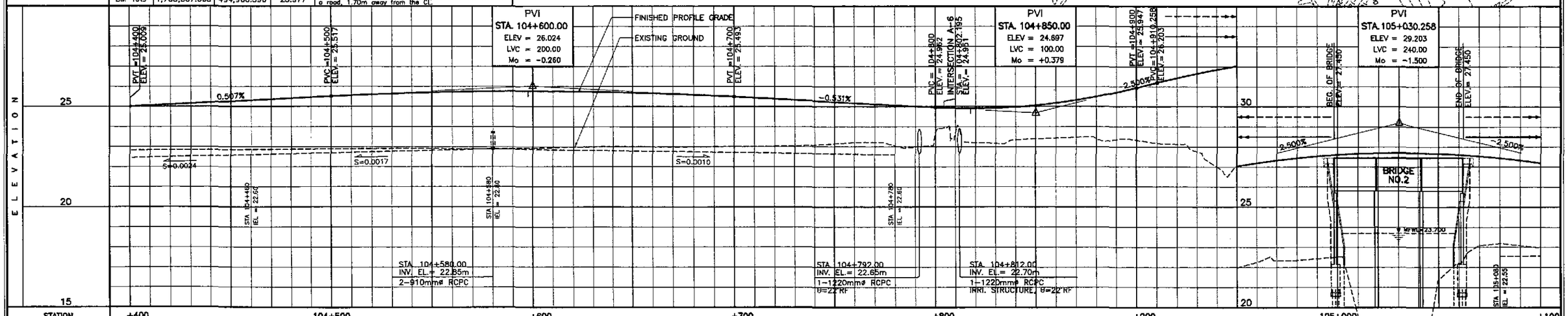
PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	R	T	Lc	E	e%	W	V(kph)
PI-03	105+572.571	1,704,066.486	495,053.779	23°15'08"	3,500.00	720.109	1,420.397	73.312	–	–	80



REFERENCE POINTS

BM-RA7 BM-RA8 BM-RA9

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA7	1,702,761.108	494,810.381	22.874	Right side of the road alignment, placed on the top bank of a creek, 3.50m away from the CL
BM-RA8	1,703,271.267	494,855.750	23.741	Left side of the road alignment, placed on the side of gravel road, 2.00m away from the CL.
BM-RA9	1,703,867.668	494,960.590	23.977	Left side of the road alignment, placed on the side of a road, 1.70m away from the CL.



STATION	+400				104+500						+600						+700						+800						+900						105+000						+100
FINISHED PROFILE GRADE BYPASS	25.009		25.111		25.212		25.314		25.415		25.517		25.608		25.678		25.727		25.756		25.764		25.751		25.718		25.664		25.589		25.493		25.387		25.281		25.174		25.068		24.962
EXISTING GROUND BYPASS	22.824		22.844		22.858		22.880		22.868		22.883		22.901		22.912		22.900		22.896		22.930		22.974		23.003		22.995		22.991		23.012		23.036		23.086		23.217		23.045		23.723

STATION	+900						105+000						+100
FINISHED PROFILE GRADE BYPASS	24.917	24.992	25.189	25.507	25.947	26.437	26.855	27.189	27.440	27.608	27.692	27.683	27.611
EXISTING GROUND BYPASS	23.213	23.348	23.438	23.410	23.331	23.124	22.005	22.249	22.346	22.513	16.044	15.891	22.199

STATION	105+100	
FINISHED PROFILE GRADE BYPASS	27.446	27.197
EXISTING GROUND BYPASS	23.193	22.978

HORIZONTAL CURVATURE: R=∞ (to 104+852.462); R=3500

VERTICAL CURVATURE: g=0.507%; L=200, Mo=-0.260; g=-0.531%; L=100, Mo=+0.379; g=2.500%; L=240, Mo=-1.500

SUPERELEVATION: N.C.

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

	DATE	SIGNATURE
DESIGNED	10/15/02	M. ACACIO
CHECKED	10/15/02	S. JOSE
SUBMITTED	10/16/02	M. RUCHI (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. 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 I

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

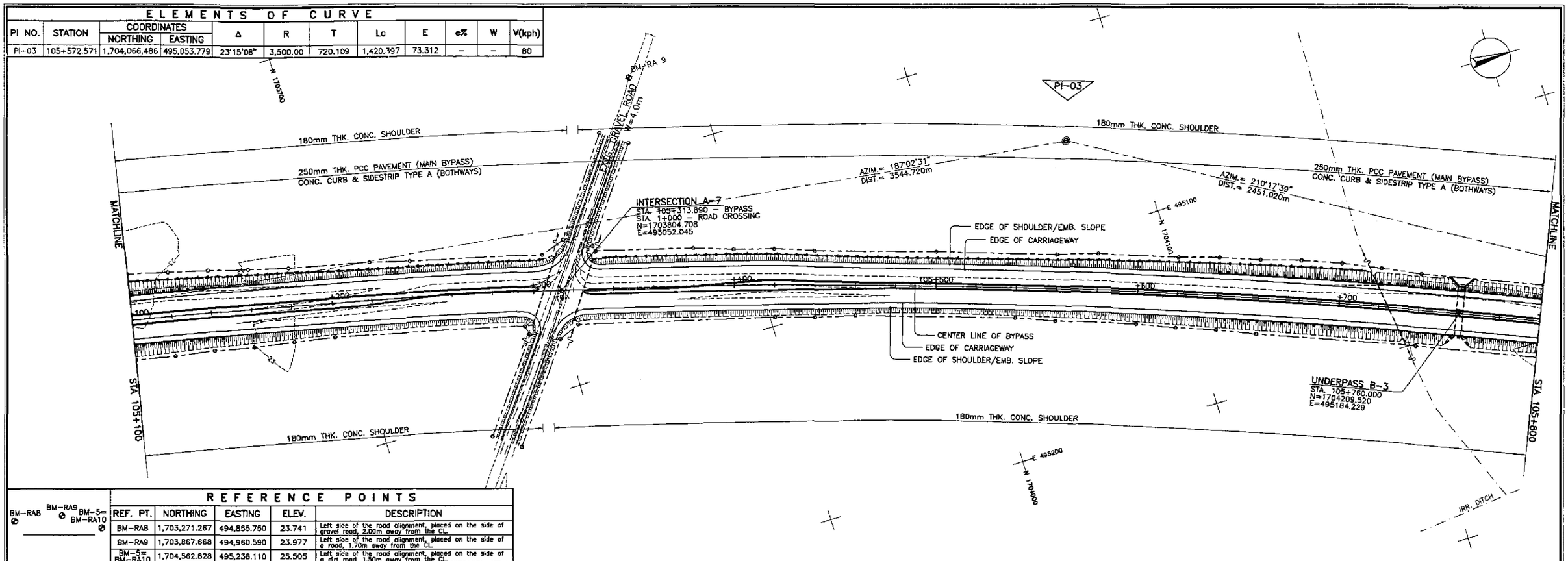
SHEET CONTENTS : PLAN AND PROFILE ALONG BYPASS (ULTIMATE STAGE) STA. 104+400 - 105+100

SHEET NO. : RP-07

Sheet 7 of 50

ELEMENTS OF CURVE

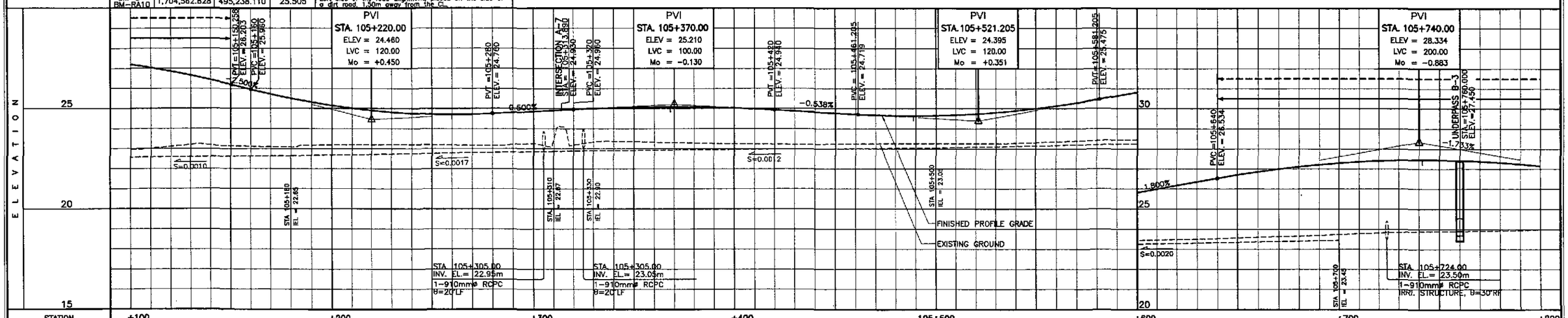
PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	R	T	Lc	E	e%	W	V(kph)
PI-03	105+572.571	1,704,066.486	495,053.779	23°15'08"	3,500.00	720.109	1,420.397	73.312	–	–	80



REFERENCE POINTS

BM-RA8 BM-RA9 BM-5= BM-RA10

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA8	1,703,271.267	494,855.750	23.741	Left side of the road alignment, placed on the side of gravel road, 2.00m away from the CL.
BM-RA9	1,703,867.668	494,960.590	23.977	Left side of the road alignment, placed on the side of a road, 1.70m away from the CL.
BM-5= BM-RA10	1,704,562.828	495,238.110	25.505	Left side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.



STATION	+100	+200	+300	+400	105+500	+600	+700	+800
FINISHED PROFILE GRADE BYPASS	27.197, 26.864, 26.449, 25.950, 25.510, 25.160, 24.910, 24.760	24.710, 24.760, 24.860, 24.960, 25.039, 25.077, 25.073, 25.027	24.940, 24.833, 24.725, 24.652, 24.658, 24.739, 24.898, 25.138	25.454, 25.814, 26.174, 26.534, 26.858, 27.112, 27.296, 27.408	27.450, 27.422, 27.322, 27.152			
EXISTING GROUND BYPASS	22.978, 23.109, 23.192, 23.116, 23.080, 23.181, 23.194, 23.197	23.184, 23.160, 23.248, 23.180, 23.373, 23.328, 23.280, 23.251	23.229, 23.223, 23.250, 23.262, 23.265, 23.265, 23.284, 23.352	23.416, 23.449, 23.482, 23.531, 23.602, 23.658, 23.740, 23.819	23.878, 23.906, 23.926, 23.974			
HORIZONTAL CURVATURE	R=3500							
VERTICAL CURVATURE	g=-2.500 L=120 Mo=+0.450	g=0.500% L=100 Mo=-0.130	g=-0.538% L=120 Mo=+0.351	g=1.800% L=200 Mo=-0.883				
SUPERELEVATION	N.C.							

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

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ACACIO
CHECKED	10/15/02	S. JOSE
SUBMITTED	10/16/02	M. KUBURI 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. BONDAN	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 I

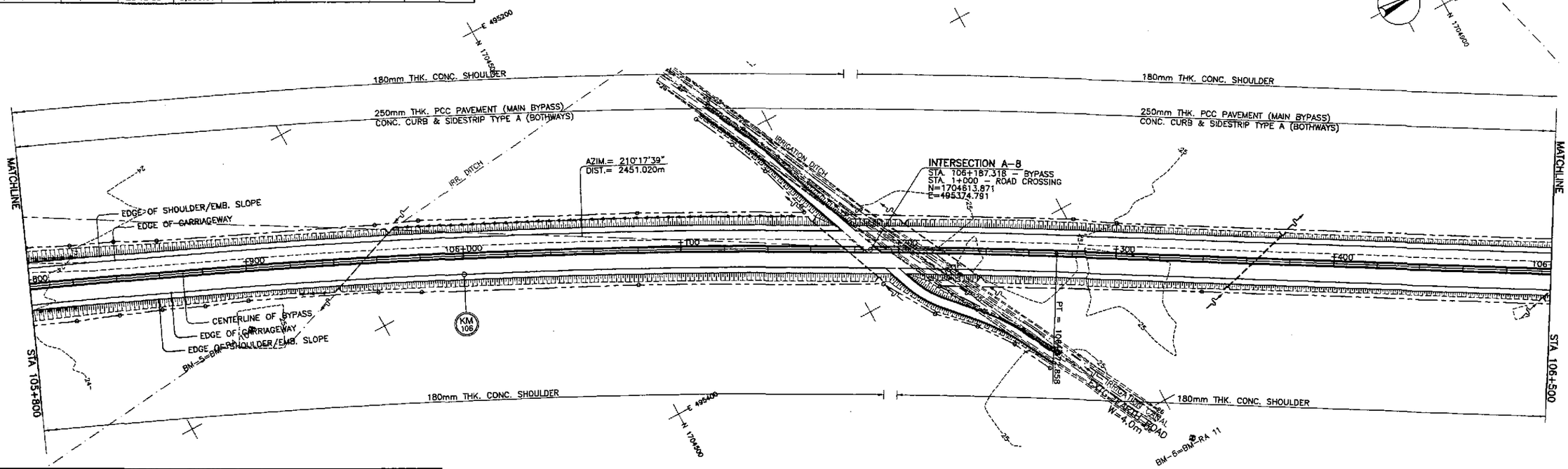
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 105+100 - 105+800

SHEET NO. :
RP-08
Sheet 8 of 50

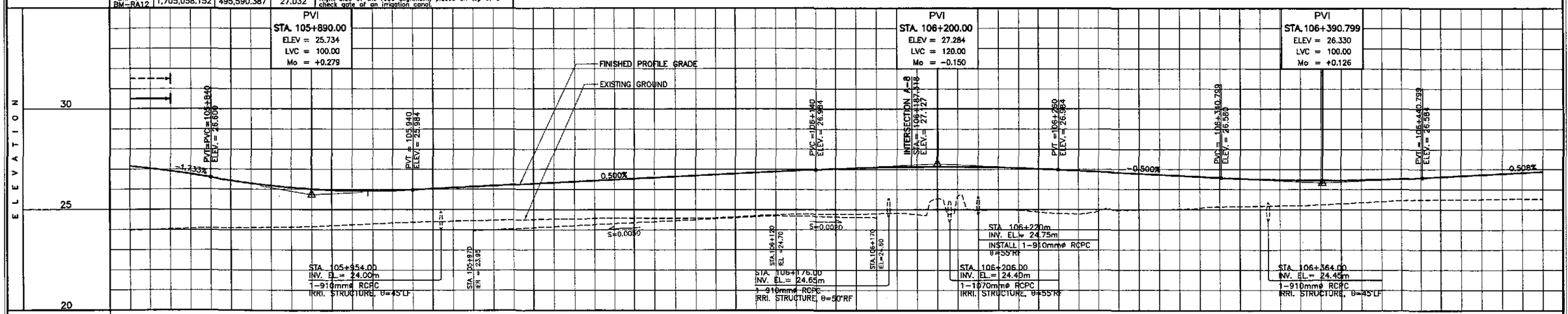
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	R	T	Lc	E	e%	W	V(kph)
PI-03	105+572.571	1,704,066.486	495,053.779	23°15'08"	3,500.00	720.109	1,420.397	73.312	–	–	80



REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-5= BM-RA10	1,704,562.828	495,238.110	25.505	Left side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.
BM-6= BM-RA11	1,704,703.014	495,521.310	25.723	Left side of the road alignment, placed on top of a rice puddy intersection in the middle of a ricefield.
BM-7= BM-RA12	1,705,058.152	495,590.387	27.032	Right side of the road alignment, placed on top of a check gate of an irrigation canal.



STATION	+800	+900	106+000	+100	+200	+300	+400	106+500

FINISHED PROFILE GRADE BYPASS	27.152	26.912	26.600	26.298	26.086	25.962	25.928	25.984	26.084	26.184	26.284	26.384	26.484	26.584	26.684	26.784	26.884	26.984	27.067	27.117	27.134	27.117	27.067	26.984	26.884	26.784	26.684	26.584	26.502	26.461	26.460	26.500	26.580	26.681	26.783	26.885
EXISTING GROUND BYPASS	23.974	24.034	24.086	24.106	24.126	24.203	24.293	24.370	24.422	24.470	24.505	24.539	24.565	24.565	24.569	24.642	24.743	24.775	24.771	24.830	25.542	24.958	24.975	24.816	24.936	24.984	25.024	25.140	25.176	25.212	25.302	25.406	25.486	25.506	25.528	25.517

HORIZONTAL CURVATURE: R=3500 | 106+272.858 | R=∞

VERTICAL CURVATURE: g=-1.733% | L=100, Mo=+0.279 | g=0.500% | L=120, Mo=-0.150 | g=-0.500% | L=100, Mo=+0.126 | g=0.508%

SUPERELEVATION: N.C. | N.

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

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ACACIO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. KURODA
		TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

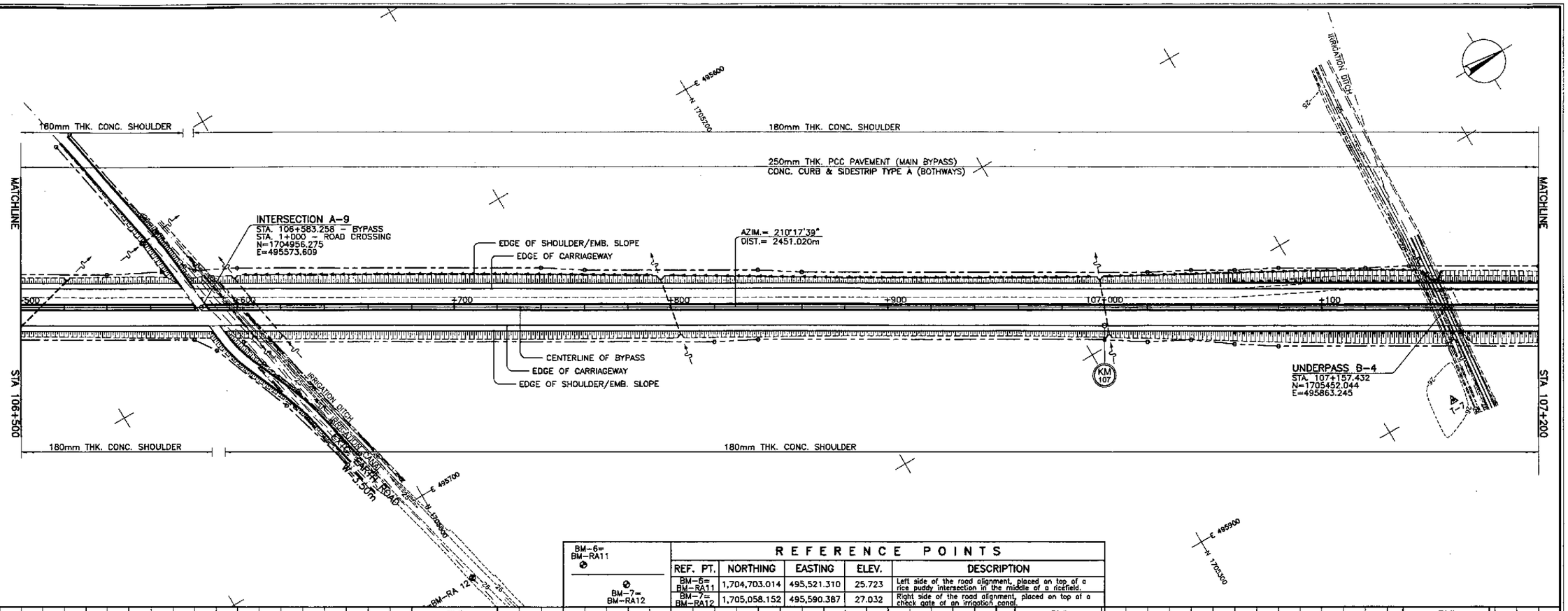
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONOAN	SIMEON A. DATUMANONG
Project Director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

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

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 105-800 - STA. 106+500

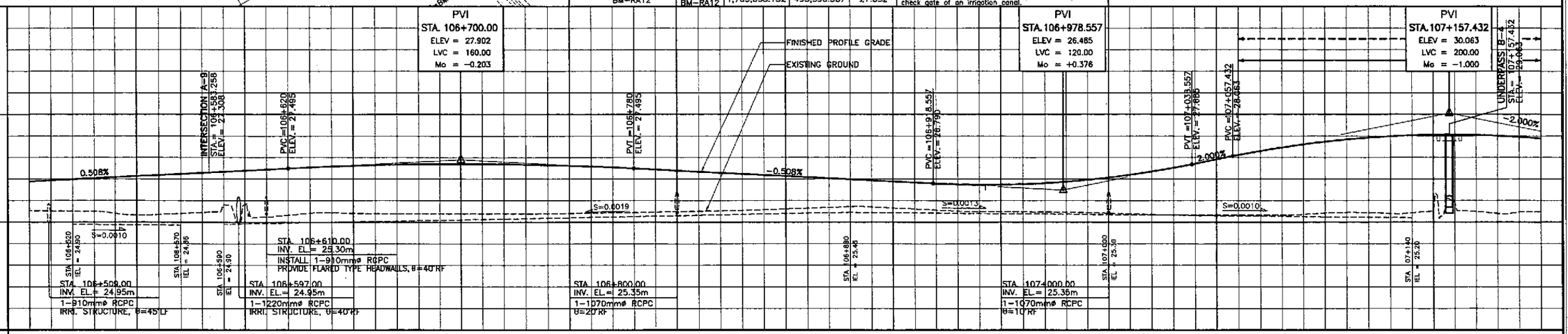
SHEET NO. :
RP-09



BM-6= BM-RA11	BM-7= BM-RA12

REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-6= BM-RA11	1,704,703.014	495,521.310	25.723	Left side of the road alignment, placed on top of a rice puddy intersection in the middle of a ricefield.
BM-7= BM-RA12	1,705,058.152	495,590.387	27.032	Right side of the road alignment, placed on top of a check gate of an irrigation canal.



STATION	106+500	+600	+700	+800	+900	107+000	+100	+200

FINISHED PROFILE GRADE BYPASS	26.885	26.986	27.088	27.190	27.292	27.393	27.495	27.584	27.647	27.686	27.698	27.686	27.647	27.584	27.495	27.393	27.292	27.190	27.088	26.986	26.885	26.783	26.729	26.759	26.873	27.070	27.350	27.714	28.114	28.463	28.733	28.923	29.032	29.082	29.012	28.882
EXISTING GROUND BYPASS	25.517	25.501	25.408	25.354	25.450	25.798	25.321	25.433	25.396	25.381	25.380	25.380	25.388	25.416	25.444	25.482	25.522	25.571	25.643	25.715	25.654	25.558	25.485	25.469	25.453	25.409	25.357	25.320	25.320	25.320	25.415	25.436	25.429	25.904	25.405	25.456

HORIZONTAL CURVATURE: R=∞

VERTICAL CURVATURE: g=0.508% L=160 Mo=-0.203 g=-0.508% L=120 Mo=+0.376 g=2.000% L=200 Mo=-1.000

SUPERELEVATION: C. N.C.

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

	DATE	SIGNATURE
DESIGNED	10/15/02	A. ACACIO
CHECKED	10/15/02	S. SOSE
SUBMITTED	10/16/02	M. FAUCHE 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 I

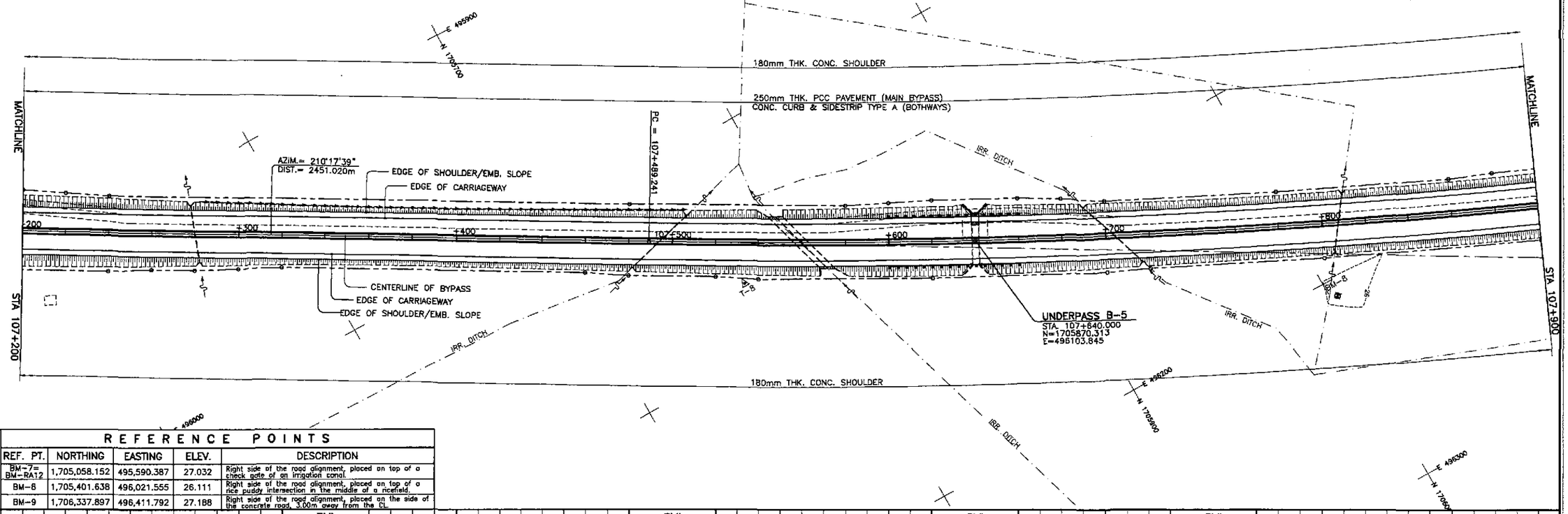
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 106+500 - STA. 107+200.

SHEET NO. :
RP-10

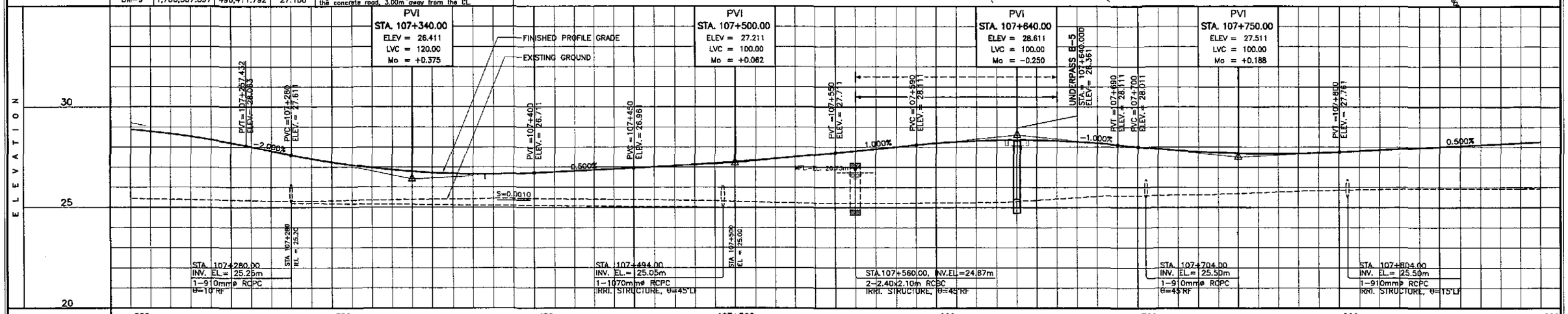
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	R	T	Lc	E	e%	W	V(kph)
PI-04	108+003.769	1,706,182.811	496,290.171	16°43'34"	3,500.00	514.528	1,021.737	37.618	–	–	80



REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-7= BM-RA12	1,705,058.152	495,590.387	27.032	Right side of the road alignment, placed on top of a check gate of an irrigation canal.
BM-8	1,705,401.638	496,021.555	26.111	Right side of the road alignment, placed on top of a rice puddy intersection in the middle of a ricefield.
BM-9	1,706,337.897	496,411.792	27.188	Right side of the road alignment, placed on the side of the concrete road, 3.00m away from the CL.



STATION	+200		+300		+400		107+500		+600		+700		+800		+900
FINISHED PROFILE GRADE BYPASS	28.882	28.671	28.381	28.011	27.611	27.253	26.978	26.786	26.678	26.653	26.711	26.811	26.911	27.014	27.134
EXISTING GROUND BYPASS	25.456	25.398	25.371	25.339	25.307	25.325	25.357	25.387	25.411	25.435	25.427	25.411	25.393	25.369	25.345

STATION	107+500		+600		+700		+800		+900
FINISHED PROFILE GRADE BYPASS	27.274	27.434	27.614	27.811	28.011	28.201	28.321	28.361	28.321
EXISTING GROUND BYPASS	25.299	25.247	25.210	25.209	25.210	25.226	25.246	25.296	25.420

STATION	+700		+800		+900
FINISHED PROFILE GRADE BYPASS	28.201	28.011	27.841	27.731	27.681	27.691	27.761	27.861	27.961	28.061	28.161	28.261
EXISTING GROUND BYPASS	25.644	25.589	25.613	25.653	25.733	25.811	25.858	25.895	25.920	25.925	25.928	25.936

HORIZONTAL CURVATURE: R=∞ | 107+489.241 | R=3500

VERTICAL CURVATURE: L=200, Mo=−1.000 | g=−2.000% | L=120, Mo=+0.375 | g=0.500% | L=100, Mo=+0.062 | g=1.000% | L=100, Mo=−0.250 | g=−1.000% | L=100, Mo=+0.188 | g=0.500%

SUPERELEVATION: N.C.

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

	DATE	SIGNATURE
DESIGNED	10/5/02	R. ACACIO
CHECKED	10/15/02	S. GOCE
SUBMITTED	10/14/02	M. KUDO 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, Project Director	JOSEFINA M. ALAGAR, Chief, Highways Division	GILBERTO S. REYES, DIC, 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 I

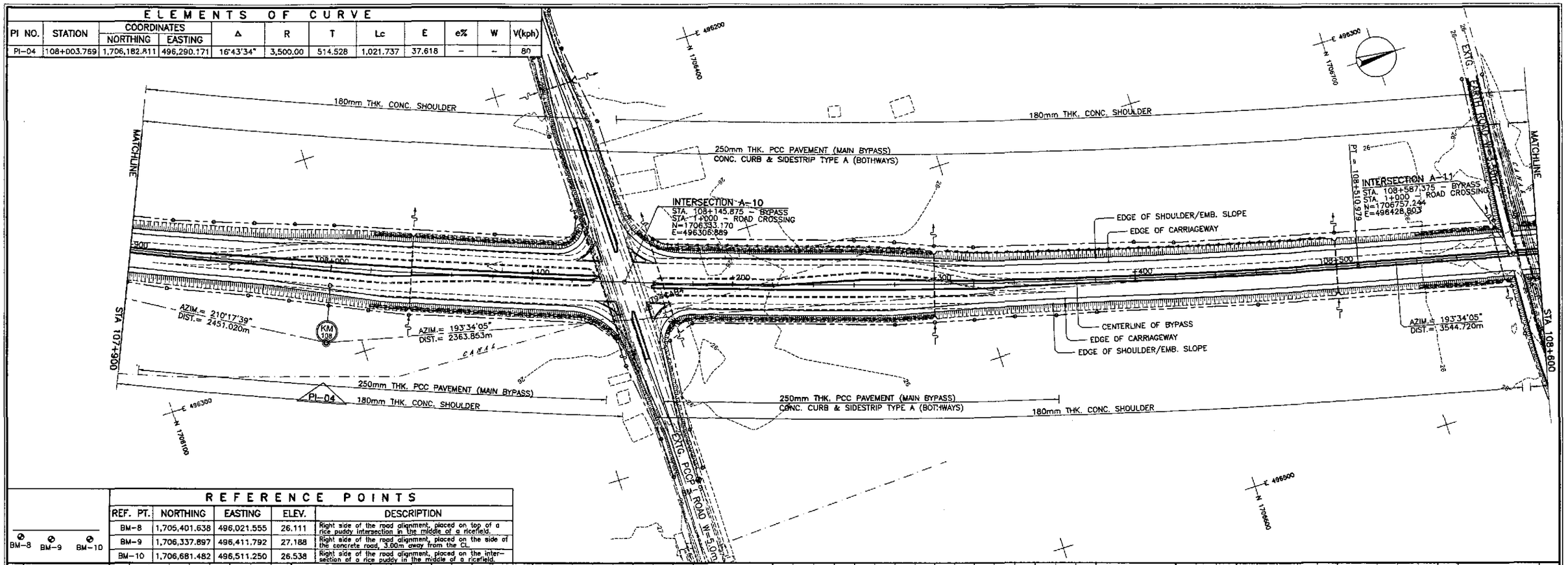
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 107+200 - STA. 107+900

SHEET NO. :
RP-11

ELEMENTS OF CURVE

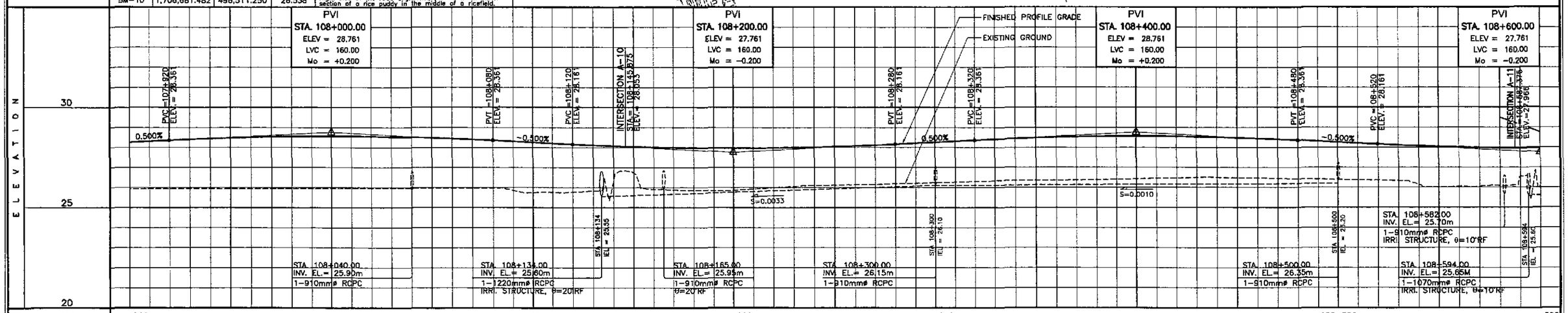
PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	R	T	Lc	E	e%	W	V(kph)
PI-04	108+003.759	1,706,182.811	496,290.171	16°43'34"	3,500.00	514.528	1,021.737	37.618	–	–	80



REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-8	1,705,401.638	496,021.555	26.111	Right side of the road alignment, placed on top of a rice puddy intersection in the middle of a ricefield.
BM-9	1,706,337.897	496,411.792	27.188	Right side of the road alignment, placed on the side of the concrete road, 3.00m away from the CL.
BM-10	1,706,681.482	496,511.250	26.538	Right side of the road alignment, placed on the intersection of a rice puddy in the middle of a ricefield.

BM-8 BM-9 BM-10



STATION	+900	108+000	+100	+200	+300	+400	108+500	+600
FINISHED PROFILE GRADE BYPASS	28.261, 28.361, 28.449, 28.511, 28.549, 28.561, 28.549, 28.511, 28.449, 28.361, 28.261, 28.161, 28.074, 28.011, 27.974, 27.961, 27.974, 28.011, 28.074, 28.161, 28.261, 28.361, 28.449, 28.511, 28.549, 28.561, 28.549, 28.511, 28.449, 28.361, 28.261, 28.161, 28.074, 28.011, 27.974, 27.961							
EXISTING GROUND BYPASS	25.936, 25.944, 25.949, 25.944, 25.939, 25.946, 25.954, 25.963, 25.975, 25.987, 25.751, 25.775, 26.365, 25.905, 25.857, 25.852, 25.985, 26.092, 26.137, 26.180, 26.237, 26.297, 26.346, 26.356, 26.385, 26.428, 26.476, 26.499, 26.464, 26.427, 26.392, 26.356, 28.153, 26.045, 26.088, 26.015							
HORIZONTAL CURVATURE	R=3500						108+510.979	
VERTICAL CURVATURE	g=0.500%	L=160 Mo=+0.200	g=0.500%	L=160 Mo=–0.200	g=–0.500%	L=160 Mo=+0.200	g=–0.500%	L=160 Mo=–0.200
SUPERELEVATION	N.C.							

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

	DATE	SIGNATURE
DESIGNED	10/15/02	A. ACACIO
CHECKED	10/15/02	S. LOSE
SUBMITTED	10/16/02	M. KUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

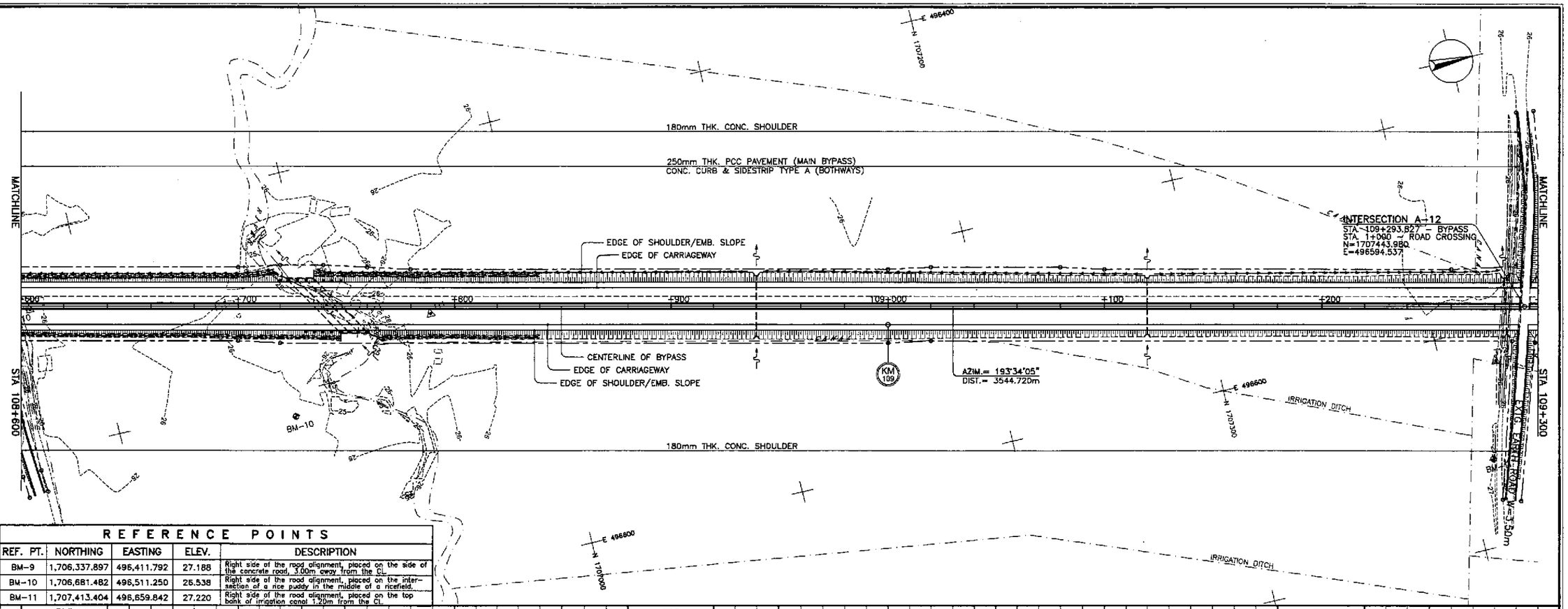
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO, Project Director	JOSEFINA M. ALAGAR, Chief, Highways Division	GILBERTO S. REYES, OIC,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

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

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 107+900 - STA. 108+600

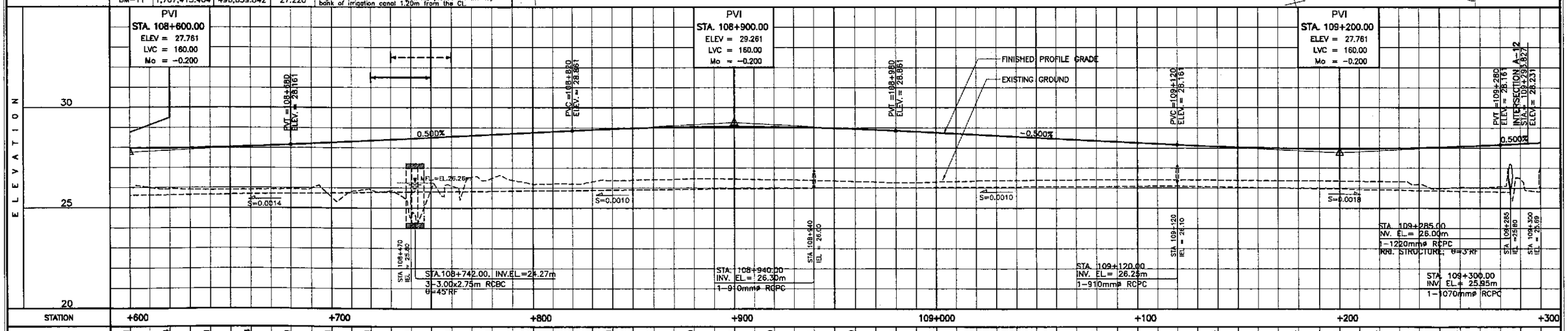
SHEET NO. :
RP-12



BM-9 BM-10 BM-11

REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-9	1,706,337.897	496,411.792	27.188	Right side of the road alignment, placed on the side of the concrete road, 3.00m away from the CL.
BM-10	1,706,681.482	496,511.250	26.538	Right side of the road alignment, placed on the intersection of a nice puddy in the middle of a ricefield.
BM-11	1,707,413.404	496,659.842	27.220	Right side of the road alignment, placed on the top bank of irrigation canal 1.20m from the CL.



STATION	+600		+700		+800		+900		109+000		+100		+200		+300
FINISHED PROFILE GRADE BYPASS	27.961	27.974	28.011	28.074	28.161	28.261	28.361	28.461	28.561	28.661	28.761	28.861	28.949	29.011	29.049
EXISTING GROUND BYPASS	26.015	25.944	25.886	25.922	25.945	25.538	25.906	24.500	26.109	26.480	26.202	26.207	25.389	25.418	26.461

STATION															
FINISHED PROFILE GRADE BYPASS	29.061	29.049	29.011	28.949	28.861	28.761	28.661	28.561	28.461	28.361	28.261	28.161	28.074	28.011	27.974
EXISTING GROUND BYPASS	26.448	26.420	26.384	26.328	26.272	26.301	26.353	26.392	26.400	26.408	26.407	26.403	26.385	26.379	26.363

STATION													
FINISHED PROFILE GRADE BYPASS	27.961	27.874	28.011	28.074	28.161	28.261	28.361	28.461	28.561	28.661	28.761	28.861	28.949
EXISTING GROUND BYPASS	26.347	26.331	26.185	26.035	26.072	25.825	25.906	25.538	25.945	25.922	25.886	25.944	26.015

HORIZONTAL CURVATURE: R=∞

VERTICAL CURVATURE: L=160, Mo=-0.200 — q=0.500% — L=160, Mo=-0.200 — q=-0.500% — L=160, Mo=-0.200 — q=0.500%

SUPERELEVATION: N.C.

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

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ACACIO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	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. BONDAN	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 I

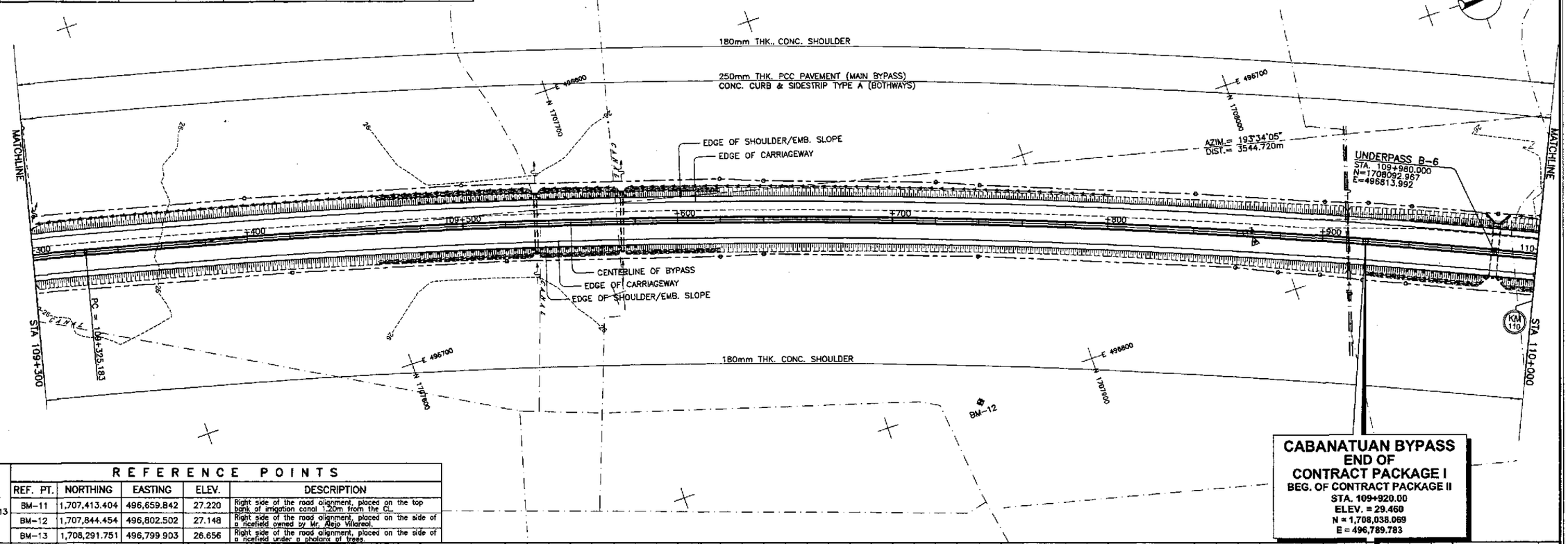
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 108+600 - STA. 109+300

SHEET NO. :
RP-13

ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES NORTHING	COORDINATES EASTING	Δ	R	T	Lc	E	e%	e%	V(kph)
PI-05	110+360.304	1,708,480.693	496,844.734	32°57'04"	3,500.00	1,035.121	2,012.865	149.860	~	~	80

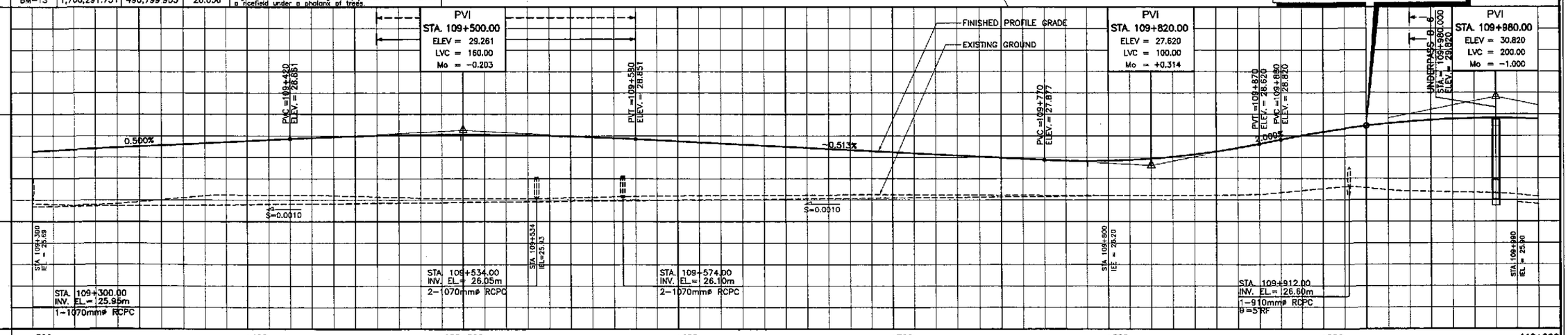


REFERENCE POINTS

REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-11	1,707,413.404	496,659.842	27.220	Right side of the road alignment, placed on the top bank of irrigation canal 1.20m from the CL.
BM-12	1,707,844.454	496,802.502	27.148	Right side of the road alignment, placed on the side of a ricefield owned by Mr. Alejo Villareal.
BM-13	1,708,291.751	496,799.903	26.656	Right side of the road alignment, placed on the side of a ricefield under a phalanx of trees.

BM-11 BM-12 BM-13

CABANATUAN BYPASS
END OF
CONTRACT PACKAGE I
BEG. OF CONTRACT PACKAGE II
STA. 109+920.00
ELEV. = 29.460
N = 1,708,038.069
E = 496,789.783



STATION	+300										109+500										+600										+700										+800										+900										110+000
FINISHED PROFILE GRADE BYPASS	28.261		28.361		28.461		28.561		28.661		28.761		28.861		28.949		29.011		29.048		29.059		29.045		29.006		28.941		28.851		28.749		28.646		28.543		28.441		28.338		28.236		28.133		28.030		27.928		27.838		27.836		27.934		28.133		28.433		28.820		29.180		29.460		29.680		29.780		29.820		29.780
EXISTING GROUND BYPASS	25.825		25.759		25.828		26.019		26.210		26.241		26.229		26.204		26.148		26.092		26.077		26.073		26.084		26.132		26.180		26.199		26.211		26.223		26.235		26.247		26.247		26.243		26.238		26.230		26.222		26.217		26.213		26.217		26.235		26.345		26.533		26.561		26.416		26.368		26.320		26.158

HORIZONTAL CURVATURE: 109+325.183 — R=3500

VERTICAL CURVATURE: g=0.500% — L=160, Mo=-0.203 — g=-0.513% — L=100, Mo=+0.314 — g=2.000% — L=200, Mo=-1.000

SUPERELEVATION: N.C.

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

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ACACIO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. KAUCHI 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. 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 I

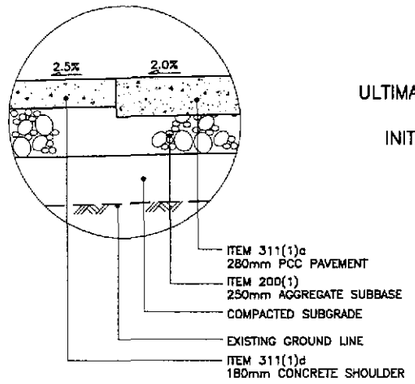
SCALE :
HORIZONTAL 1:1000
VERTICAL 1:100
FULL SIZE A1

SHEET CONTENTS :
PLAN AND PROFILE
ALONG BYPASS (ULTIMATE STAGE)
STA. 109+300 - STA. 109+920

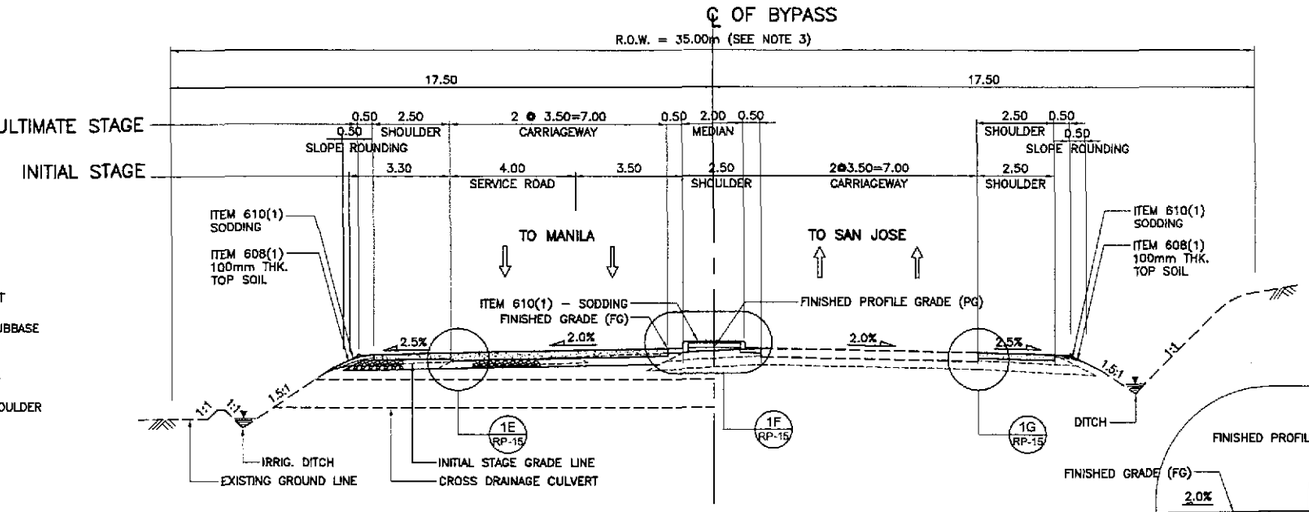
SHEET NO. :
RP-14

NOTES:

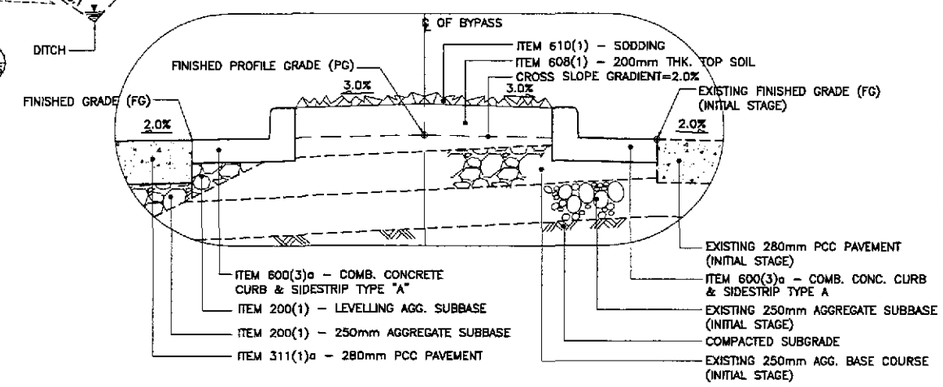
1. FINISHED PROFILE GRADE (PG) ALONG BYPASS IS TAKEN FROM THE CENTERLINE WHEREAS FINISHED GRADE (FG) IS RECKONED FROM THE PROFILE GRADE RELATIVE TO THE PAVEMENT CROSS SLOPE.
2. FOR SCHEDULE OF QUANTITIES, SEE SHEET NOS. GC-10 TO GC-11.
3. ROAD RIGHT-OF-WAY (R.O.W.) WIDTH SHALL BE VARIED DUE TO HORIZONTAL TRANSITION OF SERVICE ROAD, MEDIAN\DIVISIONAL ISLANDS, OUTER SEPERATIONS AND DUE TO HEIGHT OF EMBANKMENT. SEE SCHEDULE OF R.O.W.; SHTS. NOS. RG-06 TO RG-07.
4. SIDESLOPES OF 1:5:1 OR FLATTER SHALL BE PROTECTED BY SODDING. SIDESLOPES ALONG AREAS PRONE TO FLOODING SHALL BE PROTECTED BY GROUTED RIPRAP AT 300mm MINIMUM THICKNESS. SIDESLOPES ALONG BUILT-UP AREAS SHALL BE PROTECTED BY STONE MASONRY AND/OR RETAINING WALLS OR AS DIRECTED BY THE ENGINEER.
5. SEE SHEET NO. RG-04 FOR UNSUITABLE EXCAVATION SCHEDULE.



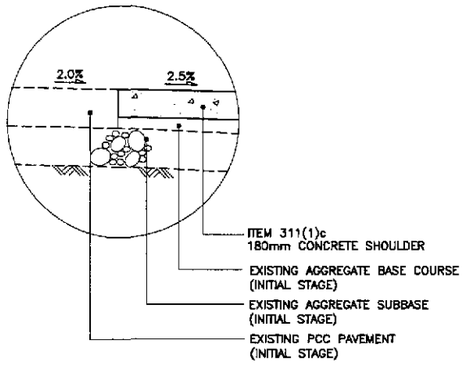
1E RP-15 DETAIL
SCALE 1:20



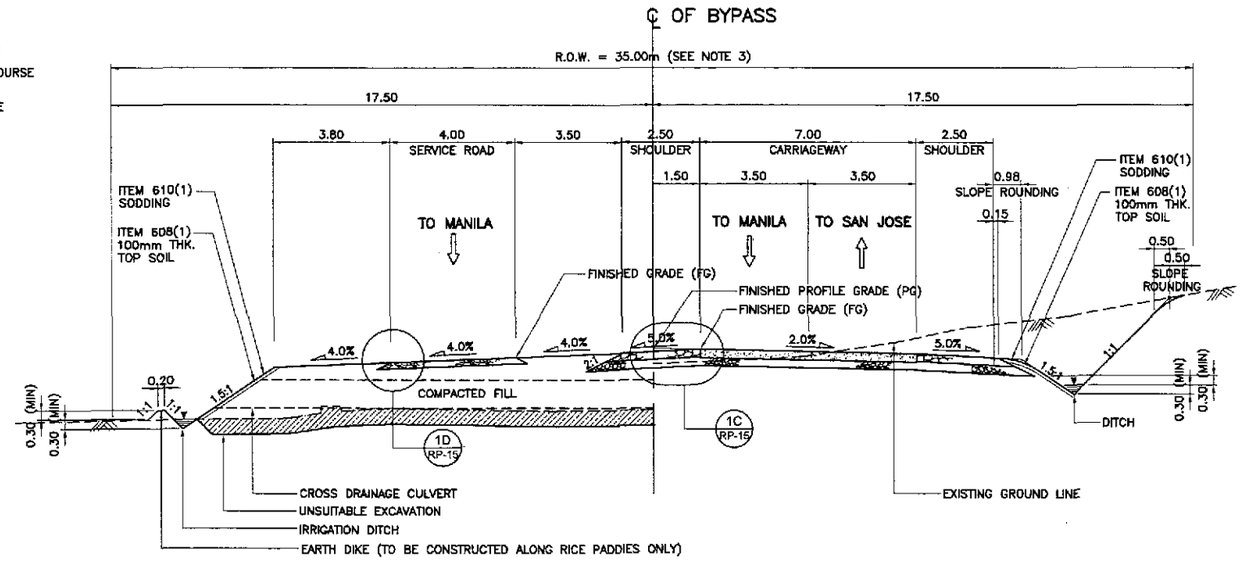
1B RP-15 NORMAL SECTION - ULTIMATE STAGE
SCALE 1:100



1F RP-15 DETAIL
SCALE 1:20



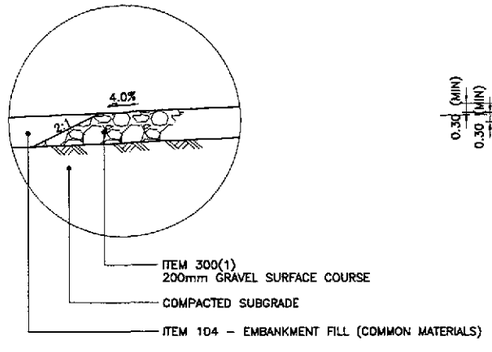
1G RP-15 DETAIL
SCALE 1:20



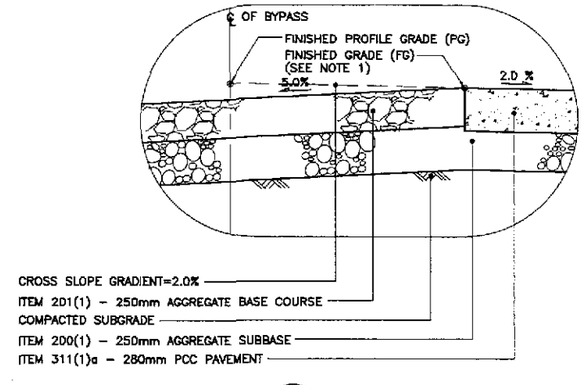
EMBANKMENT SECTION

CUT SECTION

1A RP-15 NORMAL SECTION - INITIAL STAGE
SCALE 1:100



1D RP-15 DETAIL
SCALE 1:20



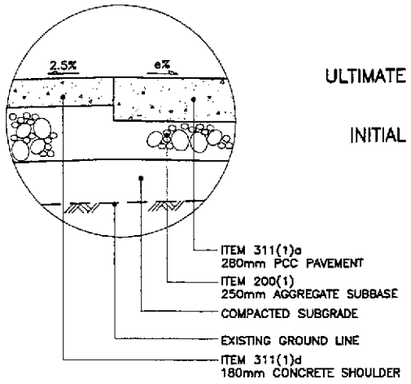
1C RP-15 DETAIL
SCALE 1:20

1 RP-15 TYPICAL ROADWAY SECTIONS - WITHOUT FRONTAGE ROAD
SCALE 1:100

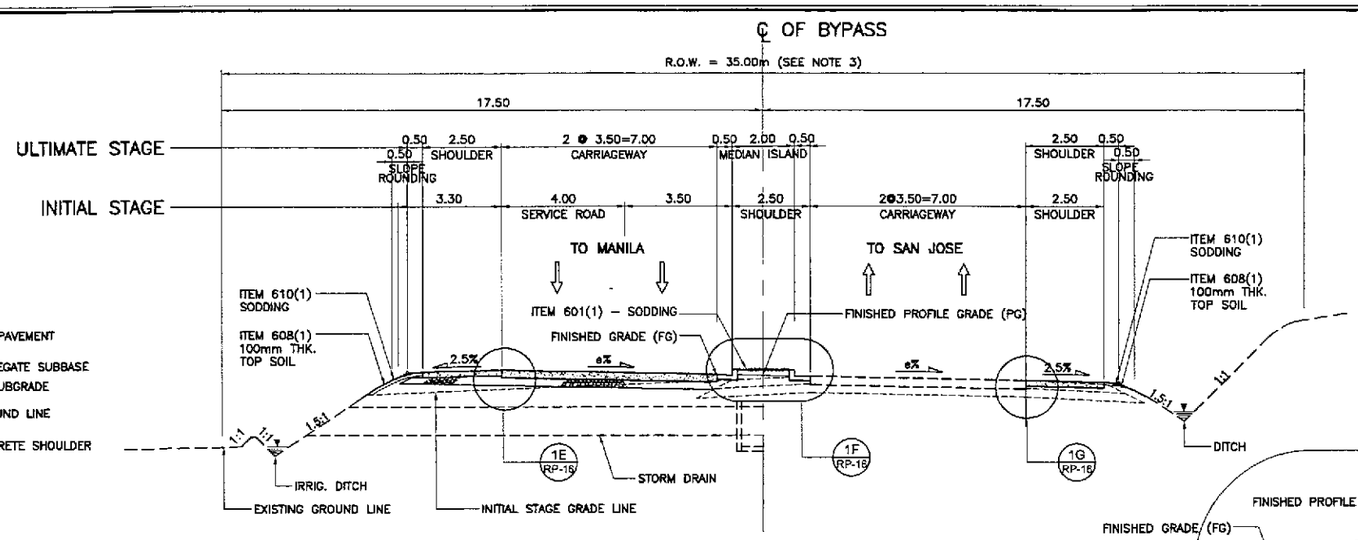
JICA JAPAN INTERNATIONAL COOPERATION AGENCY		DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			
KEI KATAHIRA & ENGINEERS INTERNATIONAL / YEC YACHIYO ENGINEERING CO., LTD.	DESIGNED	10/5/02	A. ACACIO	PJHL – PMO	BUREAU OF DESIGN	OFFICE OF THE SECRETARY	
	CHECKED	10/15/02	S. GOSE	Submitted By:	Reviewed By: / Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
	SUBMITTED	10/16/02	M. MIKUCHI TEAM LEADER	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 :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	TYPICAL ROADWAY SECTIONS NORMAL SECTIONS WITHOUT FRONTAGE ROAD (INITIAL AND ULTIMATE STAGE) (1 of 2)	RP-15
CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		

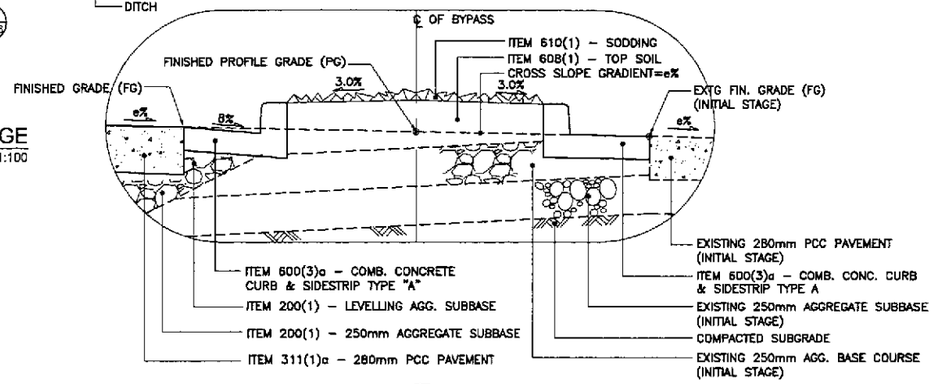
PAVEMENT DESIGN PARAMETERS	
	BEFORE PAMPANGA BRIDGE
1. TRAFFIC (FOR 25 YEARS DESIGN LIFE) DESIGN ESAL	2.30×10^6
2. DESIGN CBR SUBGRADE CBR	5.00 %
3. ROADBED RESILIENT MODULUS M_R E_{SB} E_{BS}	5,500 psi = 37.92 MPa 13,000 psi = 89.64 MPa 23,000 psi = 158.58 MPa
4. PERFORAMNCE CRITERIA Δ PSI	2
5. DESIGN RELIABILITY Z_R S_D	50 % 0.35
6. DRAINAGE COEFFICIENT RIGID	1
7. LAYER COEFFICIENT a_1 (FOR AC) a_2 (FOR BASE) a_3 (FOR SUBBASE)	0.39 0.105 0.095
8. PAVEMENT CONSTRUCTION THIKNESS PCCP SUBBASE	280mm THK 250mm THK



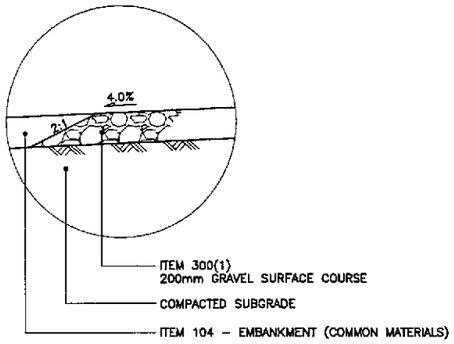
1E RP-16 DETAIL
SCALE 1:20



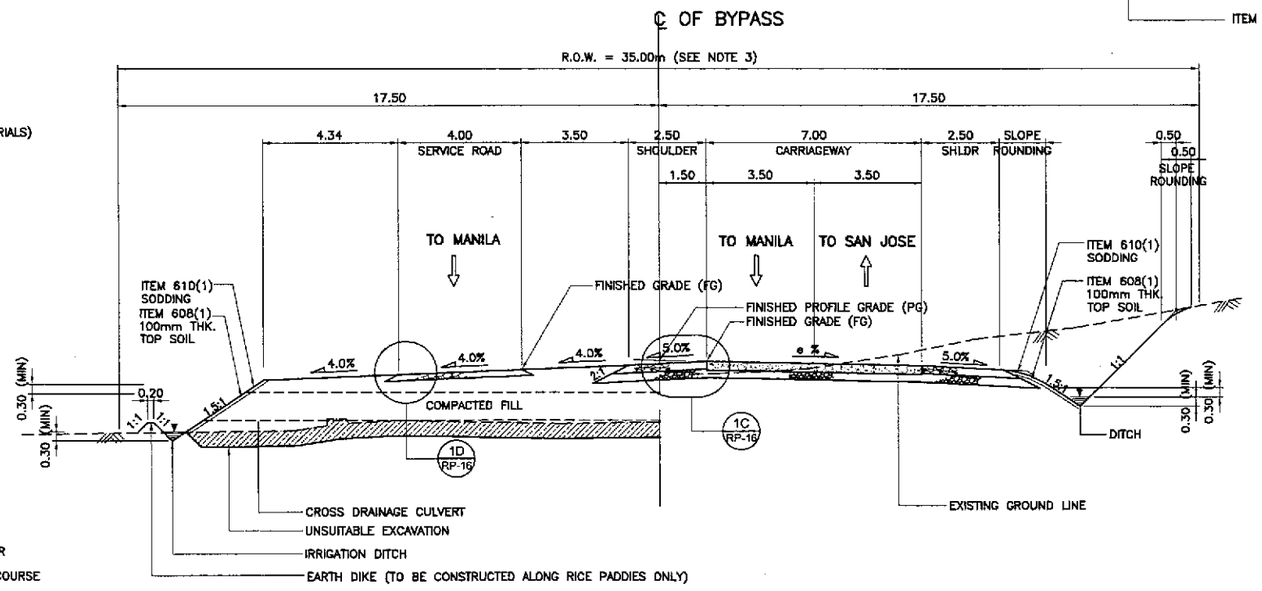
1B RP-16 SUPERELEVATED SECTION - ULTIMATE STAGE
SCALE 1:100



1F RP-16 DETAIL
SCALE 1:20

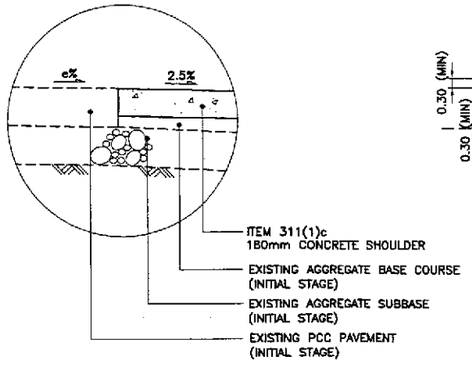


1D RP-16 DETAIL
SCALE 1:20

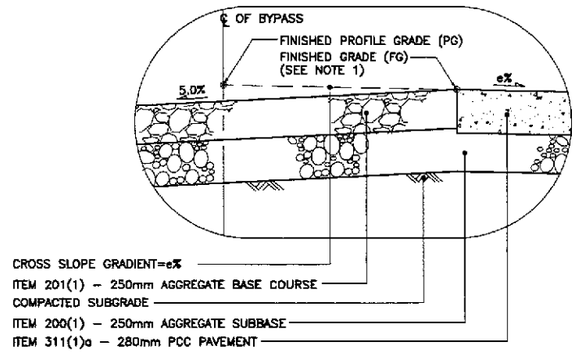


EMBANKMENT SECTION CUT SECTION

1A RP-16 SUPERELEVATED SECTION - INITIAL STAGE
SCALE 1:100



1G RP-16 DETAIL
SCALE 1:20



1C RP-16 DETAIL
SCALE 1:20

NOTES:

1. FINISHED PROFILE GRADE (PG) ALONG BYPASS IS TAKEN FROM THE CENTERLINE WHEREAS FINISHED GRADE (FG) IS RECKONED FROM THE PROFILE GRADE RELATIVE TO THE PAVEMENT CROSS SLOPE.
2. FOR SCHEDULE OF QUANTITIES, SEE SHEET NOS. GC–10 TO GC–11.
3. ROAD RIGHT–OF–WAY (R.O.W.) WIDTH SHALL BE VARIED DUE TO HORIZONTAL TRANSITION OF SERVICE ROAD, MEDIAN\DIVISIONAL ISLANDS, OUTER SEPERATIONS AND DUE TO HEIGHT OF EMBANKMENT. SEE SCHEDULE OF R.O.W.; SHTS. NOS. RG–05 TO RG–07.
4. SIDESLOPES OF 1:5:1 OR FLATTER SHALL BE PROTECTED BY SODDING. SIDESLOPES ALONG AREAS PRONE TO FLOODING SHALL BE PROTECTED BY GROUTED RIPRAP AT 300mm MINIMUM THICKNESS. SIDESLOPES ALONG BUILT–UP AREAS SHALL BE PROTECTED BY STONE MASONRY AND/OR RETAINING WALLS OR AS DIRECTED BY THE ENGINEER.
5. SEE SHEET NO. RG–04 FOR UNSUITABLE EXCAVATION SCHEDULE.

1 RP-16 TYPICAL ROADWAY SECTIONS - WITHOUT FRONTAGE ROAD
SCALE 1:100

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

	DATE	SIGNATURE
DESIGNED	10/5/02	J. ADACIO
CHECKED	10/5/02	S. GOSE
SUBMITTED	10/16/02	M. MIUCHI 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. 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 I

SCALE : AS SHOWN
FULL SIZE A1

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

SHEET NO. : RP-16

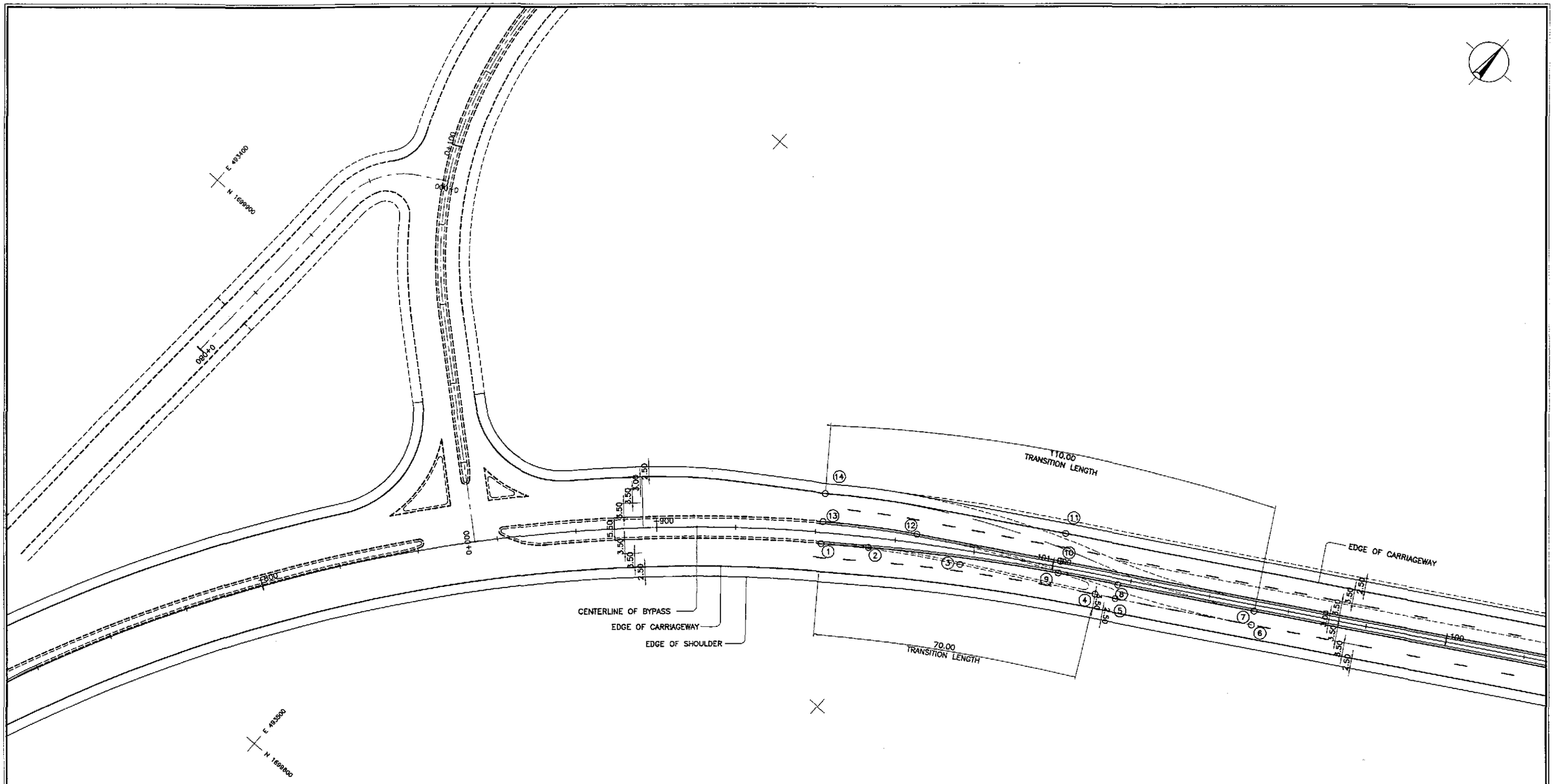


TABLE OF COORDINATES			
CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
1	1699931.297	493573.907	INNER EDGE OF 7.00m WIDE PAVEMENT TO MEET EXISTING
2	1699938.293	493583.364	INNER EDGE OF PAVEMENT W/ RADIUS 463.91
3	1699950.205	493603.441	EDGE OF EXISTING PAVEMENT
4	1699966.847	493633.761	EDGE OF EXISTING PAVEMENT
5	1699969.492	493638.285	CENTER OF TWO LANE PAVEMENT TO MEET EXISTING
6	1699987.028	493668.294	CENTER OF TWO LANE PAVEMENT TO MEET EXISTING
7	1699990.05	493666.528	INNER EDGE OF TWO LANE PAVEMENT TO MEET EXISTING
8	1699972.29	493638.845	INNER EDGE OF TWO LANE PAVEMENT TO MEET EXISTING
9	1699964.805	493623.376	END OF TRANSITION, 1.50m FROM THE CENTERLINE
10	1699967.39	493621.851	BEG. OF TRANSITION, 1.50m FROM THE CENTERLINE
11	1699973.417	493618.291	OUTER EDGE OF 7.00m WIDE PAVEMENT
12	1699948.832	493590.426	BEG. OF TRANSITION RADIUS 229.45
13	1699935.718	493570.635	END OF TRANSITION RADIUS 229.45
14	1699941.345	493566.472	OUTER EDGE OF 7.00m WIDE PAVEMENT TO MEET EXISTING

1
RI-01

GEOMETRIC DESIGN LAYOUT
INTERSECTION A-1 (STA. 100+854.341) - ULTIMATE STAGE

SCALE 1:500

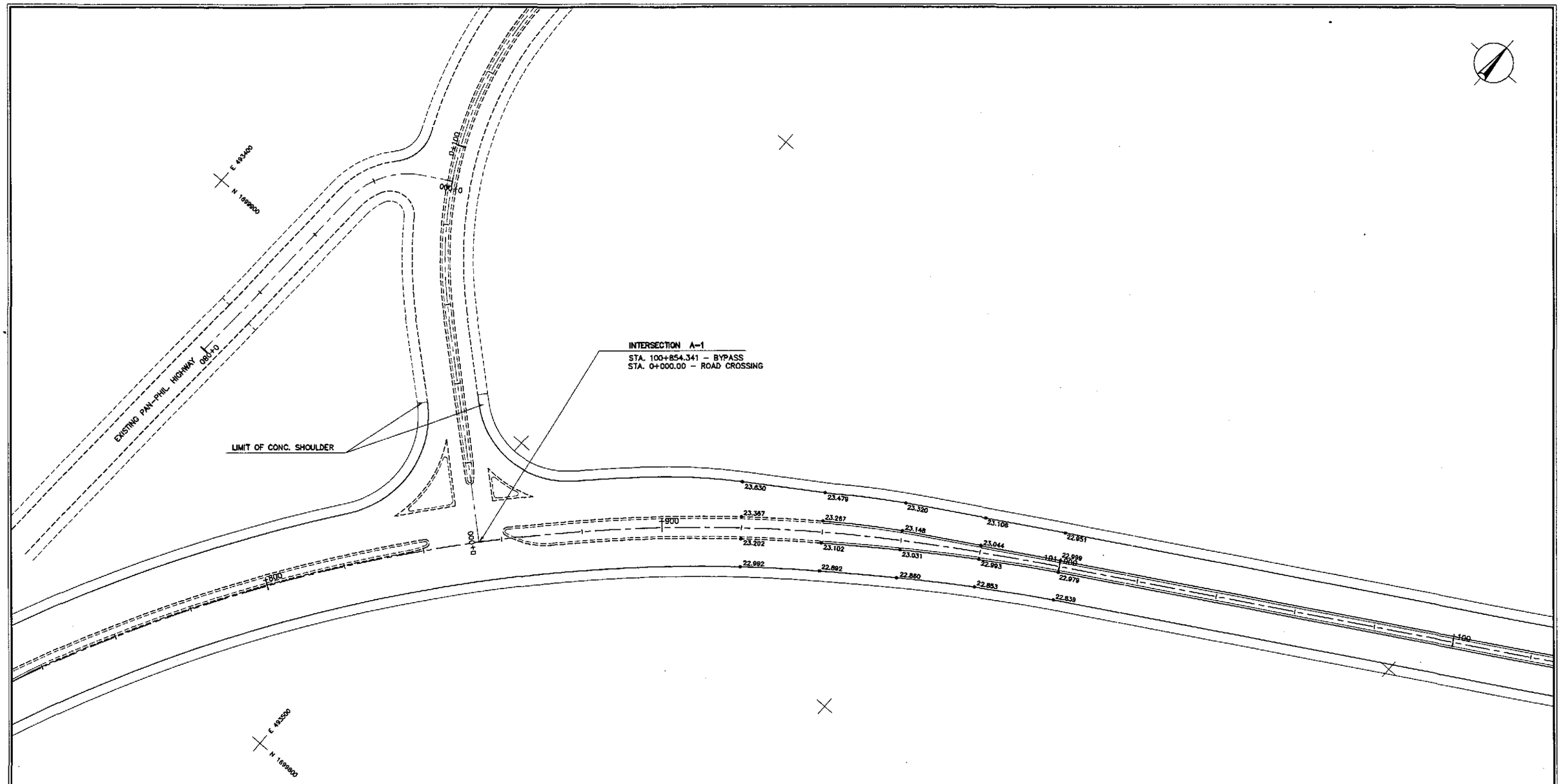
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ORONCE
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. KIKUCHI 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/Approved)
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)	1:500	INTERSECTION DETAIL GEOMETRIC DESIGN LAYOUT INTERSECTION A-1 (ULTIMATE STAGE)	RI-01
CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		



PAVING AND GRADING PLAN

1 / RI-02 INTERSECTION A-1 (STA. 100+854.341) - ULTIMATE STAGE

SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/5/02	R. GO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. KUROI (TEAM LEADER)

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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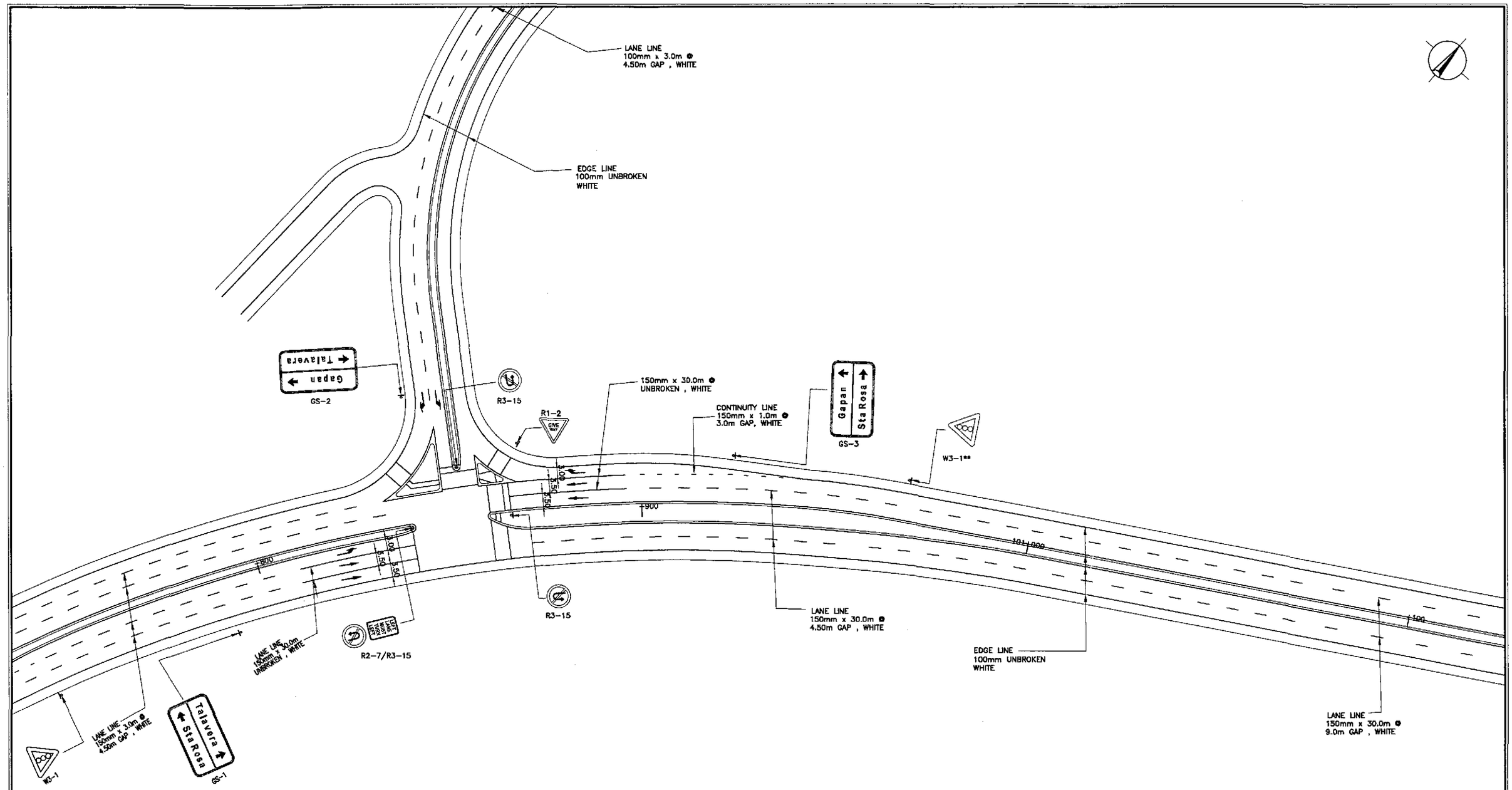
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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) CABANATUAN BYPASS - CONTRACT PACKAGE I	1:500 FULL SIZE A1	INTERSECTION DETAIL PAVING AND GRADING PLAN INTERSECTION A-1 (ULTIMATE STAGE)	RI-02



TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT
INTERSECTION A-1 (STA. 100+854.341) - ULTIMATE STAGE

1 / RI-03

SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/5/02	S. LUNA
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. MUCHI
		TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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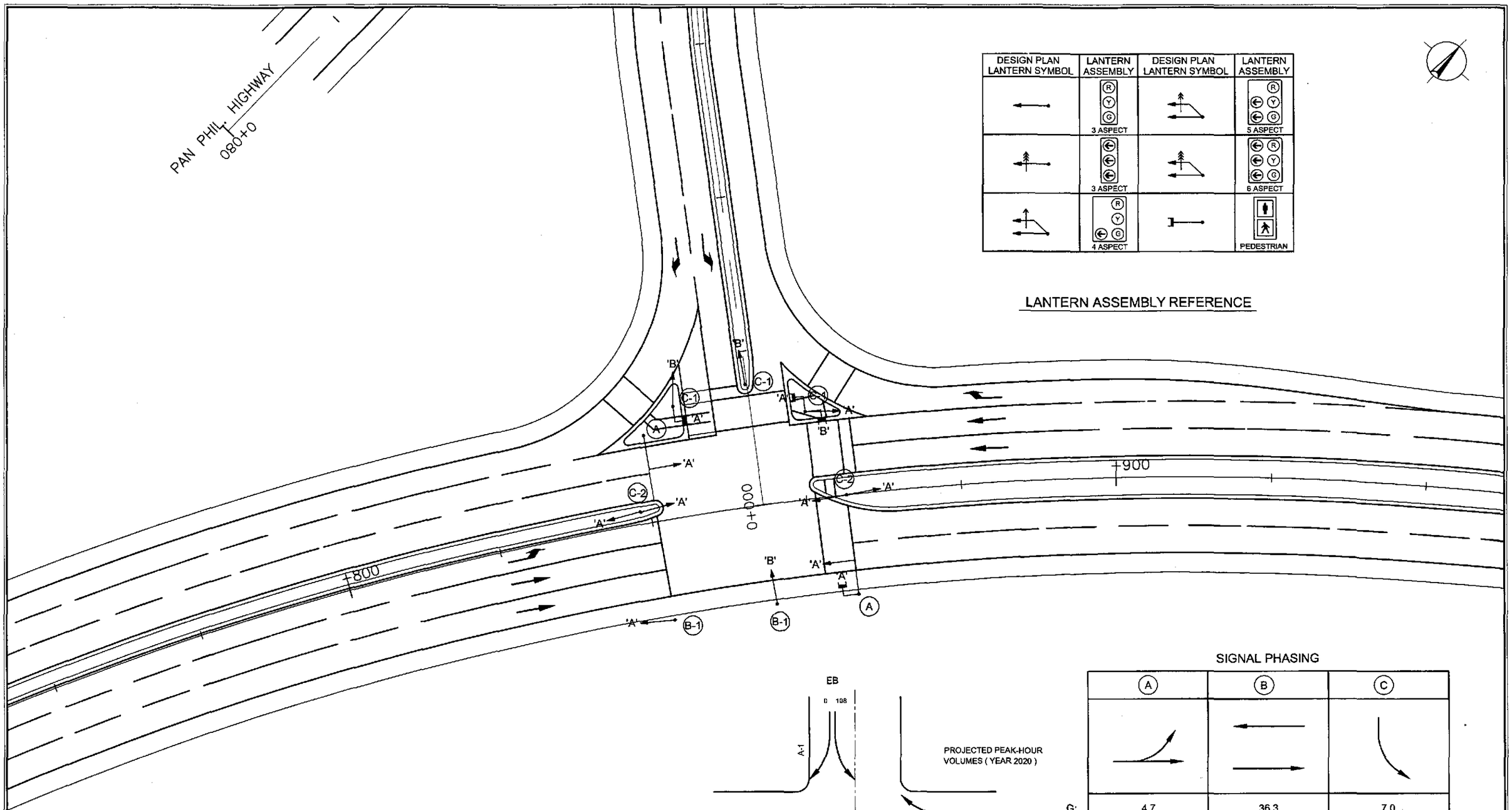
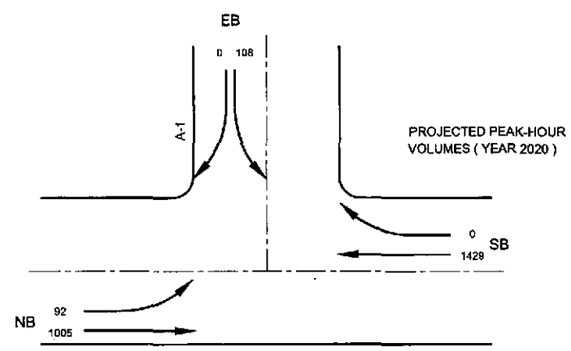
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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) CABANATUAN BYPASS - CONTRACT PACKAGE I	1:500 FULL SIZE A1	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT INTERSECTION A-1 (ULTIMATE STAGE)	RI-03



DESIGN PLAN LANTERN SYMBOL	LANTERN ASSEMBLY	DESIGN PLAN LANTERN SYMBOL	LANTERN ASSEMBLY
	3 ASPECT		5 ASPECT
	3 ASPECT		6 ASPECT
	4 ASPECT		PEDESTRIAN

LANTERN ASSEMBLY REFERENCE



SIGNAL PHASING

	(A)	(B)	(C)
G:	4.7	36.3	7.0
Y:	2.0	2.0	2.0
R:	2.0	2.0	2.0
	C = 60.0 secs.		

NOTE :

ENCIRCLED FIGURES (I.E., (A), (B-1), ETC.)
INDICATE TRAFFIC SIGNAL POST TYPE

(1) RI-04 INTERSECTION A-1 (STA. 100+854.341) - ULTIMATE STAGE

SCALE 1:250

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

	DATE	SIGNATURE
DESIGNED	10/5/02	J. CATBAGAN
CHECKED	10/15/02	S. SOSE
SUBMITTED	10/16/02	M. KUDAKA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
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Project Director	Chief, Highways Division	DIC, 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 I

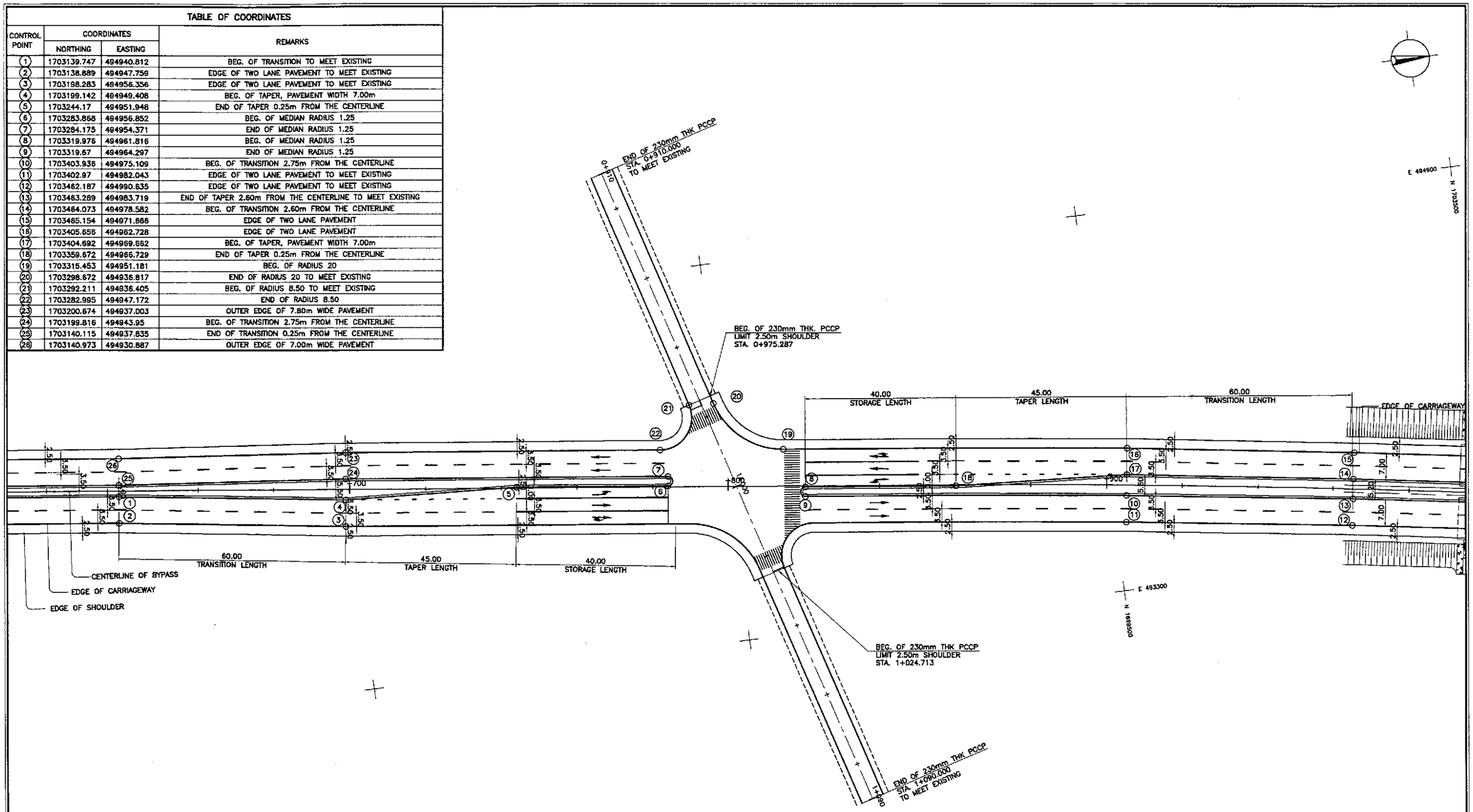
SCALE : 1:250 FULL SIZE A1

SHEET CONTENTS :
TRAFFIC SIGNAL LIGHT LAYOUT
INTERSECTION A-1 (ULTIMATE STAGE)

SHEET NO. : RI-04

TABLE OF COORDINATES

CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
1	1703139.747	494940.812	BEG. OF TRANSITION TO MEET EXISTING
2	1703138.889	494947.759	EDGE OF TWO LANE PAVEMENT TO MEET EXISTING
3	1703198.283	494956.356	EDGE OF TWO LANE PAVEMENT TO MEET EXISTING
4	1703199.142	494949.408	BEG. OF TAPER, PAVEMENT WIDTH 7.00m
5	1703244.17	494951.948	END OF TAPER 0.25m FROM THE CENTERLINE
6	1703283.868	494956.852	BEG. OF MEDIAN RADIUS 1.25
7	1703284.175	494954.371	END OF MEDIAN RADIUS 1.25
8	1703319.976	494961.816	BEG. OF MEDIAN RADIUS 1.25
9	1703319.67	494964.297	END OF MEDIAN RADIUS 1.25
10	1703403.936	494975.109	BEG. OF TRANSITION 2.75m FROM THE CENTERLINE
11	1703402.97	494982.043	EDGE OF TWO LANE PAVEMENT TO MEET EXISTING
12	1703462.187	494990.635	EDGE OF TWO LANE PAVEMENT TO MEET EXISTING
13	1703463.269	494983.719	END OF TAPER 2.60m FROM THE CENTERLINE TO MEET EXISTING
14	1703464.073	494978.582	BEG. OF TRANSITION 2.60m FROM THE CENTERLINE
15	1703465.154	494971.866	EDGE OF TWO LANE PAVEMENT
16	1703405.656	494962.728	EDGE OF TWO LANE PAVEMENT
17	1703404.692	494969.652	BEG. OF TAPER, PAVEMENT WIDTH 7.00m
18	1703359.672	494966.729	END OF TAPER 0.25m FROM THE CENTERLINE
19	1703315.453	494951.181	BEG. OF RADIUS 20
20	1703298.672	494936.817	END OF RADIUS 20 TO MEET EXISTING
21	1703292.211	494936.405	BEG. OF RADIUS 8.50 TO MEET EXISTING
22	1703282.995	494947.172	END OF RADIUS 8.50
23	1703200.674	494937.003	OUTER EDGE OF 7.80m WIDE PAVEMENT
24	1703199.816	494943.95	BEG. OF TRANSITION 2.75m FROM THE CENTERLINE
25	1703140.115	494937.835	END OF TRANSITION 0.25m FROM THE CENTERLINE
26	1703140.973	494930.887	OUTER EDGE OF 7.00m WIDE PAVEMENT



GEOMETRIC DESIGN LAYOUT

INTERSECTION A-6 (STA. 104+802.195) - ULTIMATE STAGE

1 / RI-05

SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ORONCE
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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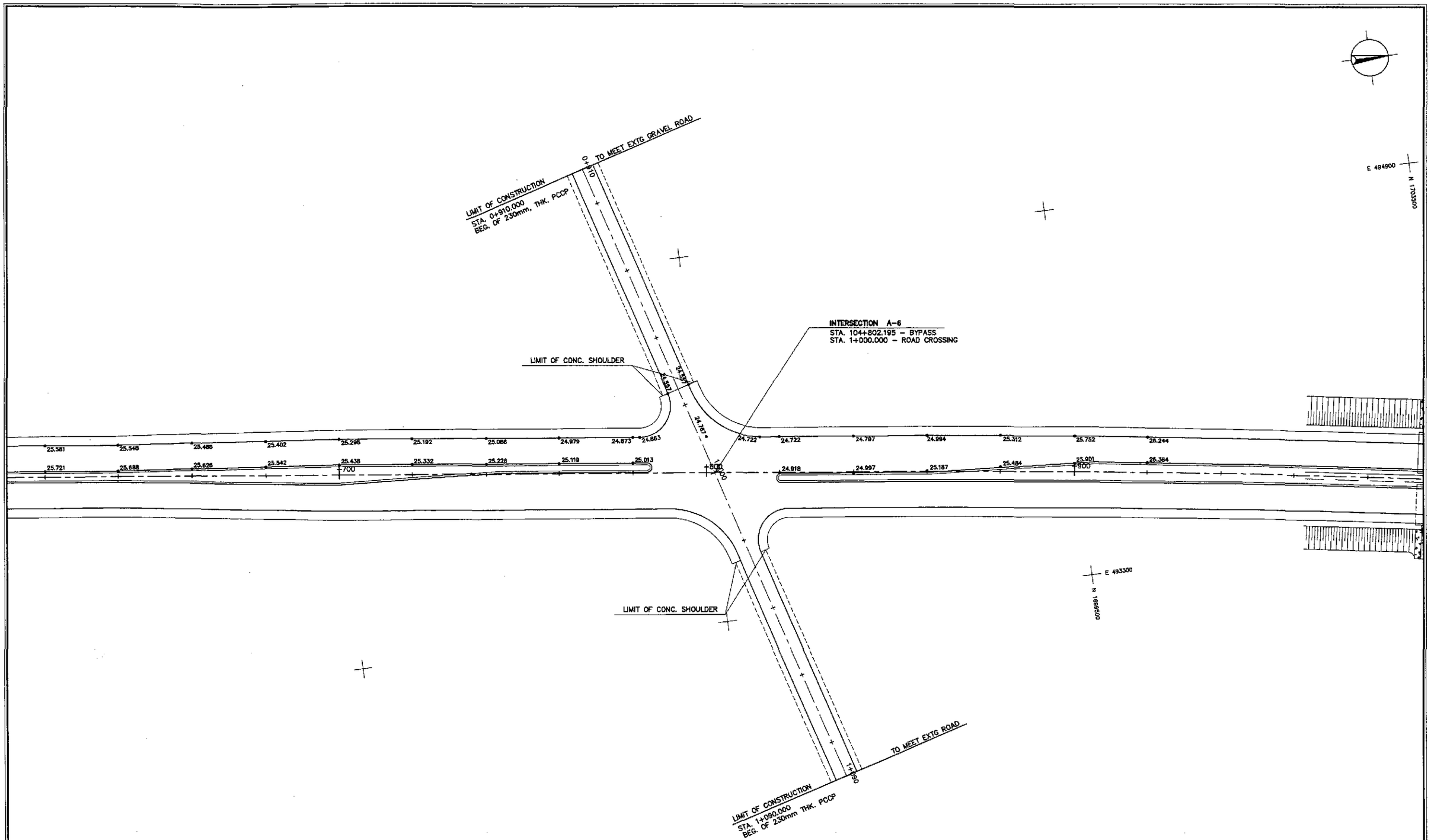
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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 I

SCALE : 1:500 FULL SIZE A1

SHEET CONTENTS :
INTERSECTION DETAIL
GEOMETRIC DESIGN LAYOUT
INTERSECTION A-6 (ULTIMATE STAGE)

SHEET NO. : RI-05



PAVING AND GRADING PLAN

INTERSECTION A-6 (STA. 104+802.195) - ULTIMATE STAGE

1 / RI-06 SCALE 1:500

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

	DATE	SIGNATURE
DESIGNED	10/5/02	R. GO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. KIKUCHI (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

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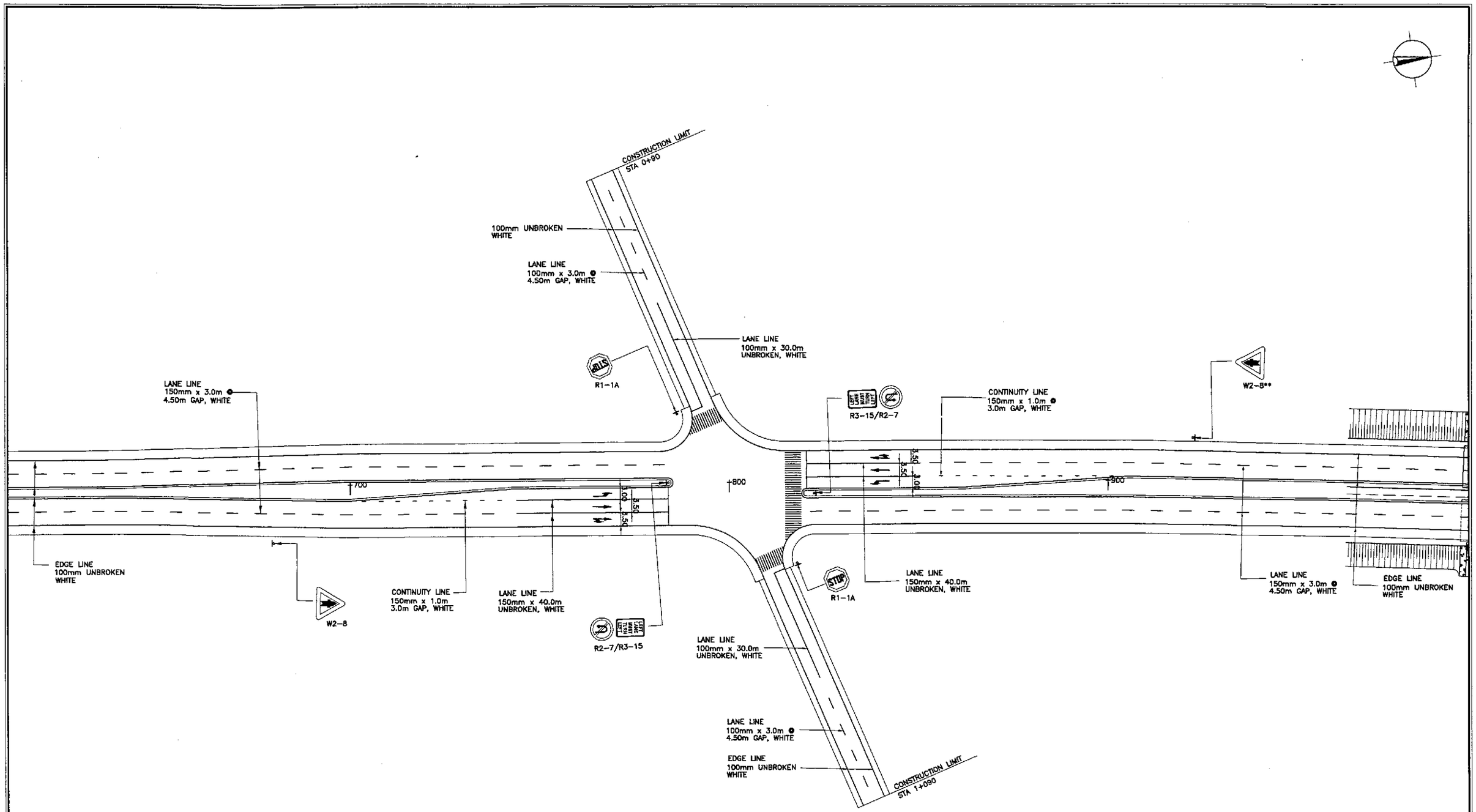
CABANATUAN BYPASS - CONTRACT PACKAGE I

SCALE : 1:500 FULL SIZE A1

SHEET CONTENTS :
INTERSECTION DETAIL
PAVING AND GRADING PLAN
INTERSECTION A-6 (ULTIMATE STAGE)

SHEET NO. : RI-06



TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT
INTERSECTION A-6 (STA. 104+802.195) - ULTIMATE STAGE

1 / RI-07

SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/15/02	
CHECKED	10/15/02	S. JOSE
SUBMITTED	10/16/02	M. DATUMANONG TEAM LEADER

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

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CABANATUAN BYPASS - CONTRACT PACKAGE I

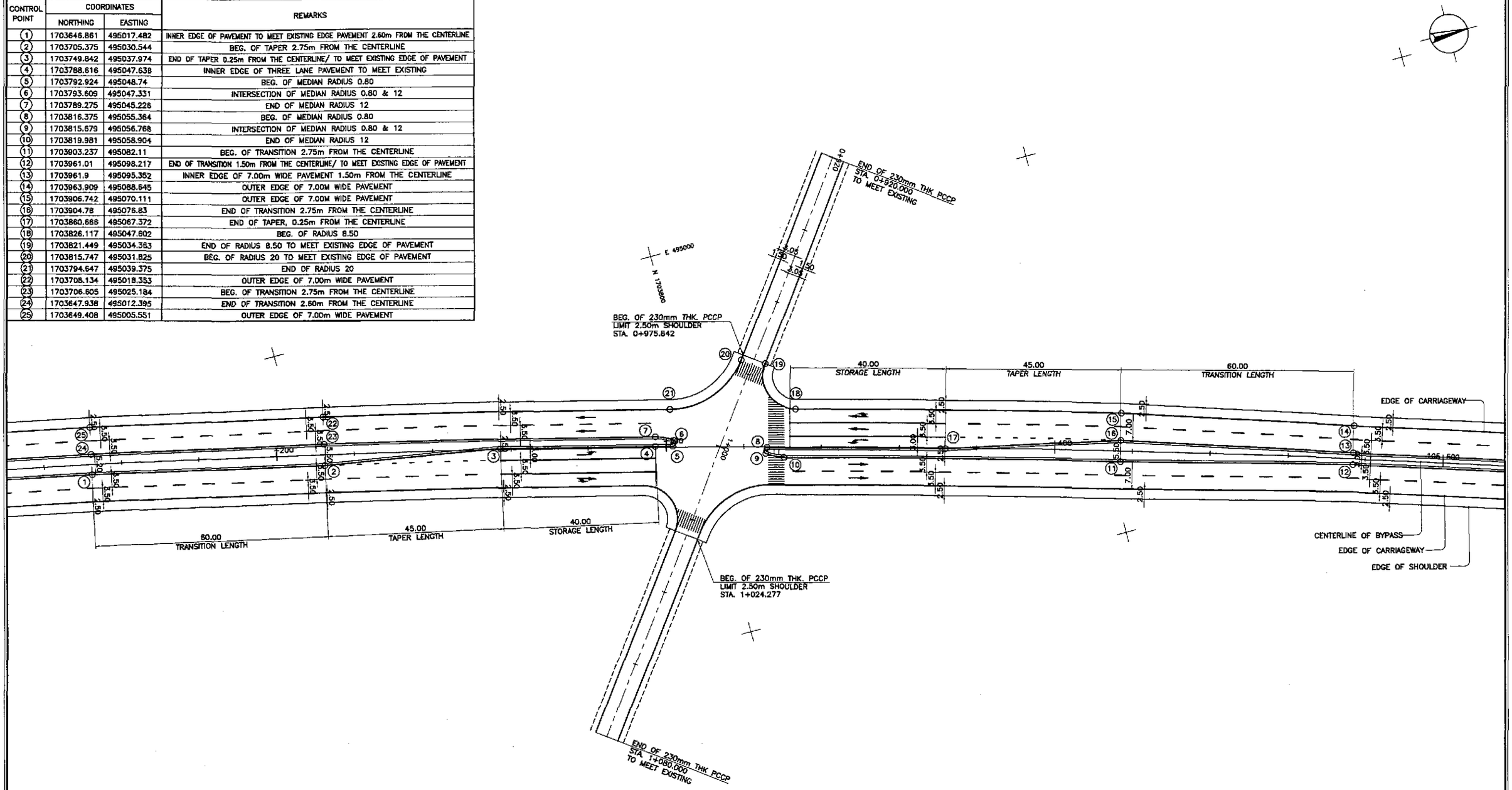
SCALE : 1:500 FULL SIZE A1

SHEET CONTENTS :
TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT
INTERSECTION A-6 (ULTIMATE STAGE)

SHEET NO. : RI-07

TABLE OF COORDINATES

CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
1	1703646.861	495017.482	INNER EDGE OF PAVEMENT TO MEET EXISTING EDGE PAVEMENT 2.60m FROM THE CENTERLINE
2	1703705.375	495030.544	BEG. OF TAPER 2.75m FROM THE CENTERLINE
3	1703749.842	495037.974	END OF TAPER 0.25m FROM THE CENTERLINE/ TO MEET EXISTING EDGE OF PAVEMENT
4	1703788.616	495047.638	INNER EDGE OF THREE LANE PAVEMENT TO MEET EXISTING
5	1703792.924	495048.74	BEG. OF MEDIAN RADIUS 0.80
6	1703793.609	495047.331	INTERSECTION OF MEDIAN RADIUS 0.80 & 12
7	1703789.275	495045.228	END OF MEDIAN RADIUS 12
8	1703816.375	495055.364	BEG. OF MEDIAN RADIUS 0.80
9	1703815.679	495056.768	INTERSECTION OF MEDIAN RADIUS 0.80 & 12
10	1703819.981	495058.904	END OF MEDIAN RADIUS 12
11	1703903.237	495082.11	BEG. OF TRANSITION 2.75m FROM THE CENTERLINE
12	1703961.01	495098.217	END OF TRANSITION 1.50m FROM THE CENTERLINE/ TO MEET EXISTING EDGE OF PAVEMENT
13	1703961.9	495095.352	INNER EDGE OF 7.00m WIDE PAVEMENT 1.50m FROM THE CENTERLINE
14	1703963.909	495088.645	OUTER EDGE OF 7.00M WIDE PAVEMENT
15	1703906.742	495070.111	OUTER EDGE OF 7.00M WIDE PAVEMENT
16	1703904.78	495076.83	END OF TRANSITION 2.75m FROM THE CENTERLINE
17	1703860.868	495067.372	END OF TAPER, 0.25m FROM THE CENTERLINE
18	1703826.117	495047.602	BEG. OF RADIUS 8.50
19	1703821.449	495034.363	END OF RADIUS 8.50 TO MEET EXISTING EDGE OF PAVEMENT
20	1703815.747	495031.825	BEG. OF RADIUS 20 TO MEET EXISTING EDGE OF PAVEMENT
21	1703794.647	495039.375	END OF RADIUS 20
22	1703708.134	495018.353	OUTER EDGE OF 7.00m WIDE PAVEMENT
23	1703706.605	495025.184	BEG. OF TRANSITION 2.75m FROM THE CENTERLINE
24	1703647.938	495012.395	END OF TRANSITION 2.60m FROM THE CENTERLINE
25	1703649.408	495005.551	OUTER EDGE OF 7.00m WIDE PAVEMENT



GEOMETRIC DESIGN LAYOUT
INTERSECTION A-7 (STA. 105+313.890) - ULTIMATE STAGE

1 / RI-08 SCALE 1:500

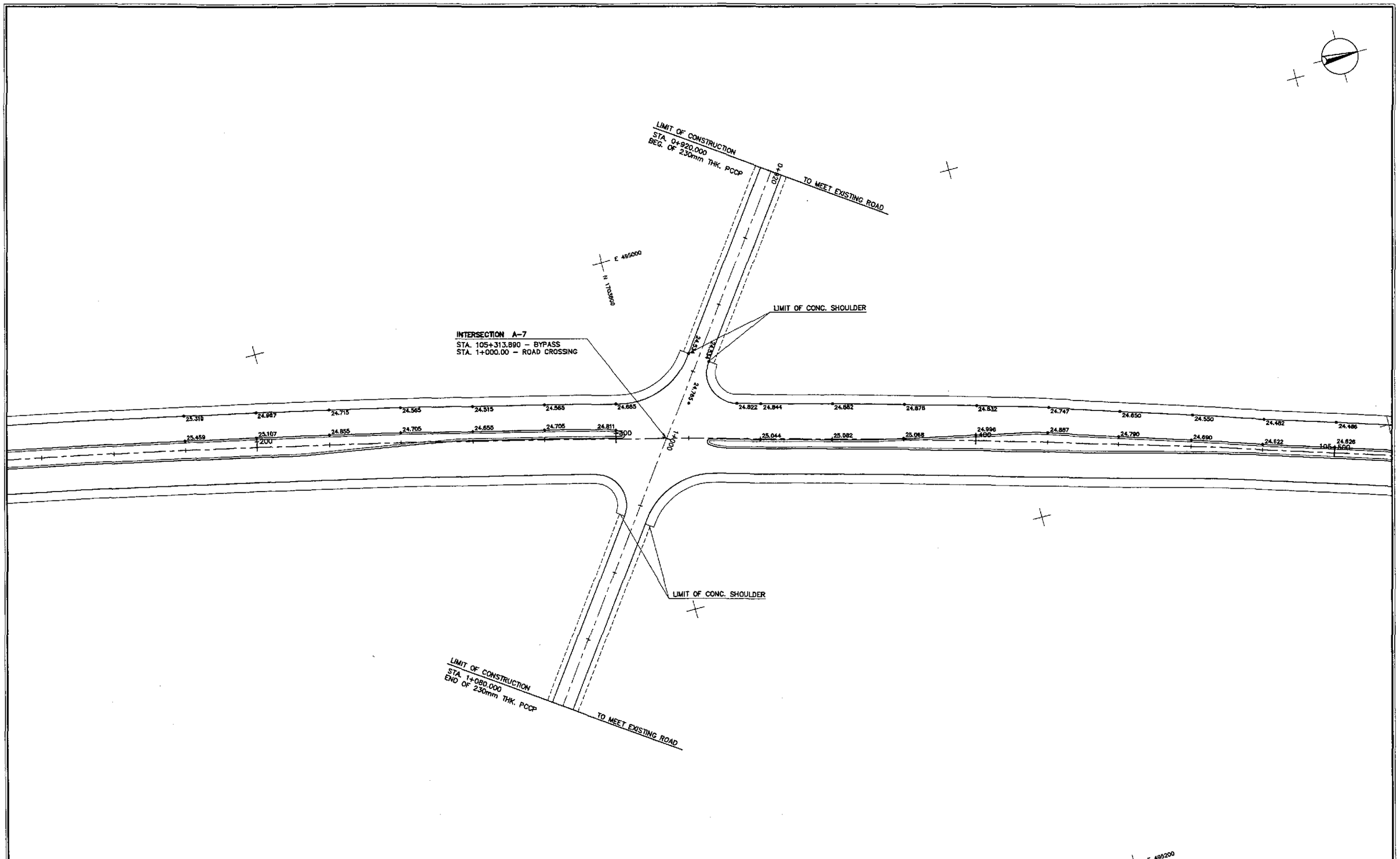
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KEI KATAHIRA & ENGINEERS INTERNATIONAL
YEC YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/5/02	A. ORONCE
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. UKUCHI 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. BONGAN	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)	1:500	INTERSECTION DETAIL GEOMETRIC DESIGN LAYOUT INTERSECTION A-7 (ULTIMATE STAGE)	RI-08
CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		



PAVING AND GRADING PLAN

INTERSECTION A-7 (STA. 105+313.890) - ULTIMATE STAGE

1 / RI-09 SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

	DATE	SIGNATURE
DESIGNED	10/5/02	R. GO
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. MIYOSHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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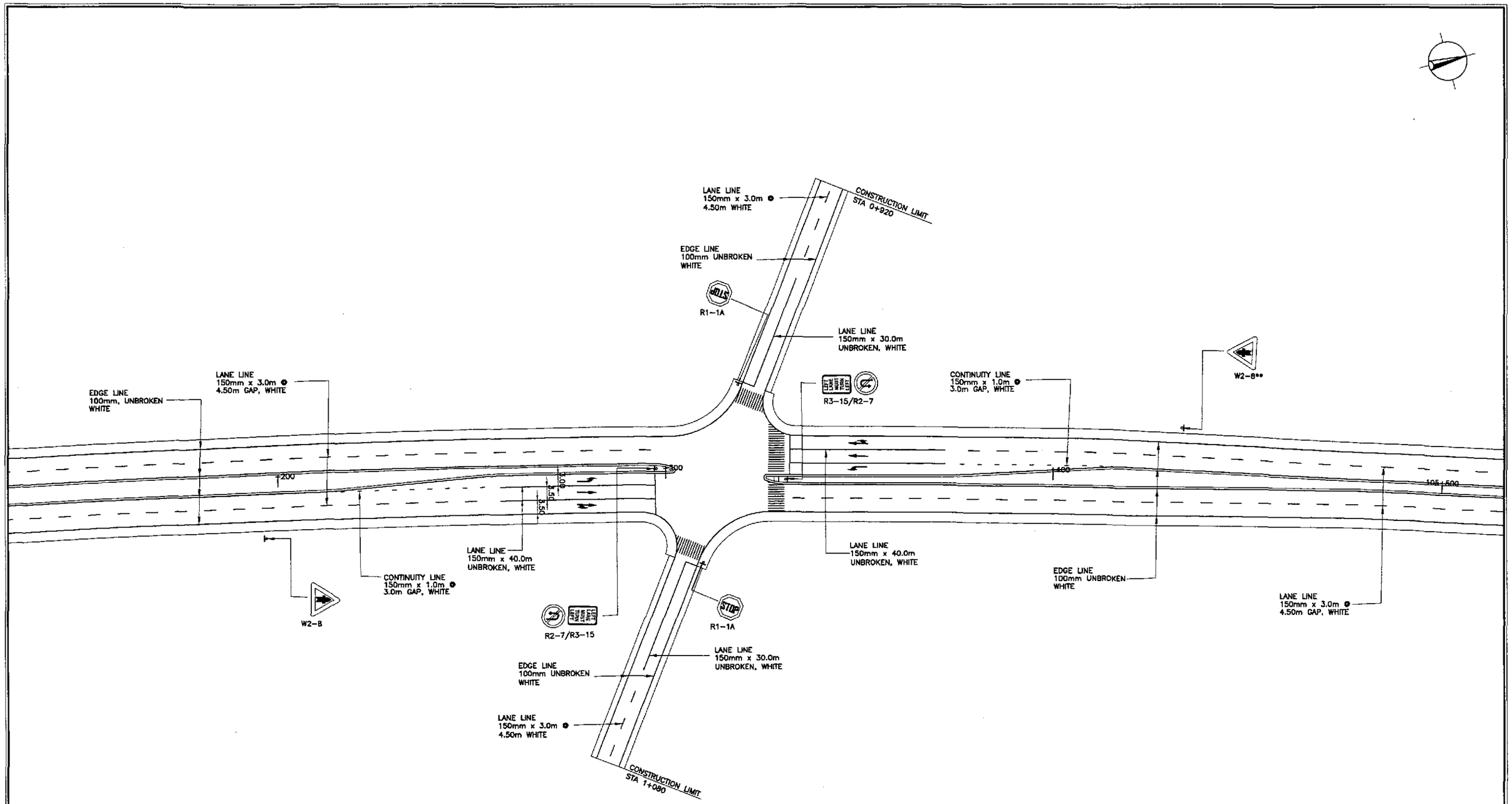
Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary

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)	1:500	INTERSECTION DETAIL PAVING AND GRADING PLAN INTERSECTION A-7 (ULTIMATE STAGE)	RI-09
CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		



1
RI-10

TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT
INTERSECTION A-7 (STA. 105+313.890) - ULTIMATE STAGE

SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/5/02	
CHECKED	10/16/02	S. GOSE
SUBMITTED	10/16/02	M. SHUCHI
		TEAM LEADER

REPUBLIC OF THE PHILIPPINES
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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)	1:500	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT INTERSECTION A-7 (ULTIMATE STAGE)	RI-10
CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		

TABLE OF COORDINATES

CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
1	1706113.54	496225.921	CENTER OF TWO LANE PAVEMENT TO MEET EXISTING
2	1706114.929	496222.708	INNER EDGE OF TWO LANE PAVEMENT 1.50m FROM THE CENTERLINE/TO MEET EXISTING
3	1706165.654	496244.159	BEG. OF INNER TRANSITION 1.50m FROM THE CENTERLINE
4	1706164.355	496247.411	CENTER OF TWO LANE PAVEMENT TO MEET EXISTING
5	1706163.045	496250.657	BEG. OF OUTER EDGE TRANSITION TO MEET EXISTING
6	1706217.194	496277.095	OUTER EDGE OF 10.00m WIDE PAVEMENT
7	1706220.857	496267.79	BEG. OF TAPER 2.75m FROM THE CENTERLINE
8	1706263.93	496281.214	END OF TAPER 0.25m FROM THE CENTERLINE
9	1706315.38	496300.251	BEG. OF MEDIAN RADIUS 15
10	1706320.656	496301.141	INTERSECTION OF MEDIAN RADIUS 15 & 0.80
11	1706320.917	496299.588	END OF MEDIAN RADIUS 0.80
12	1706316.181	496311.159	ISLAND INTERSECTION
13	1706326.247	496314.772	ISLAND INTERSECTION
14	1706326.325	496322.958	ISLAND INTERSECTION
15	1706303.473	496309.763	BEG. OF RADIUS 35
16	1706326.509	496342.322	END OF RADIUS 35 TO MEET EXISTING EDGE OF PAVEMENT
17	1706350.811	496313.361	BEG. OF MEDIAN RADIUS 15
18	1706345.547	496312.527	INTERSECTION OF MEDIAN RADIUS 15 & 0.80
19	1706345.3	496314.081	END OF MEDIAN RADIUS 0.80
20	1706340.295	496319.743	ISLAND INTERSECTION
21	1706352.14	496323.883	ISLAND INTERSECTION
22	1706340.395	496330.271	ISLAND INTERSECTION
23	1706340.528	496344.243	BEG. OF RADIUS 15
24	1706360.411	496329.918	END OF RADIUS 15
25	1706455.587	496361.18	OUTER EDGE OF 10.00m WIDE PAVEMENT/BEG. OF TAPER
26	1706499.81	496371.581	OUTER EDGE OF 7.00m WIDE PAVEMENT/END OF TAPER
27	1706501.813	496364.854	INNER EDGE OF TWO LANE PAVEMENT 2.75m FROM THE CENTERLINE
28	1706541.056	496375.327	INNER EDGE OF 7.00m WIDE PAVEMENT TO MEET EXISTING
29	1706540.093	496378.692	CENTER OF TWO LANE PAVEMENT TO MEET EXISTING
30	1706503.584	496360.947	BEG. OF INNER TRANSITION 1.50m FROM THE CENTERLINE

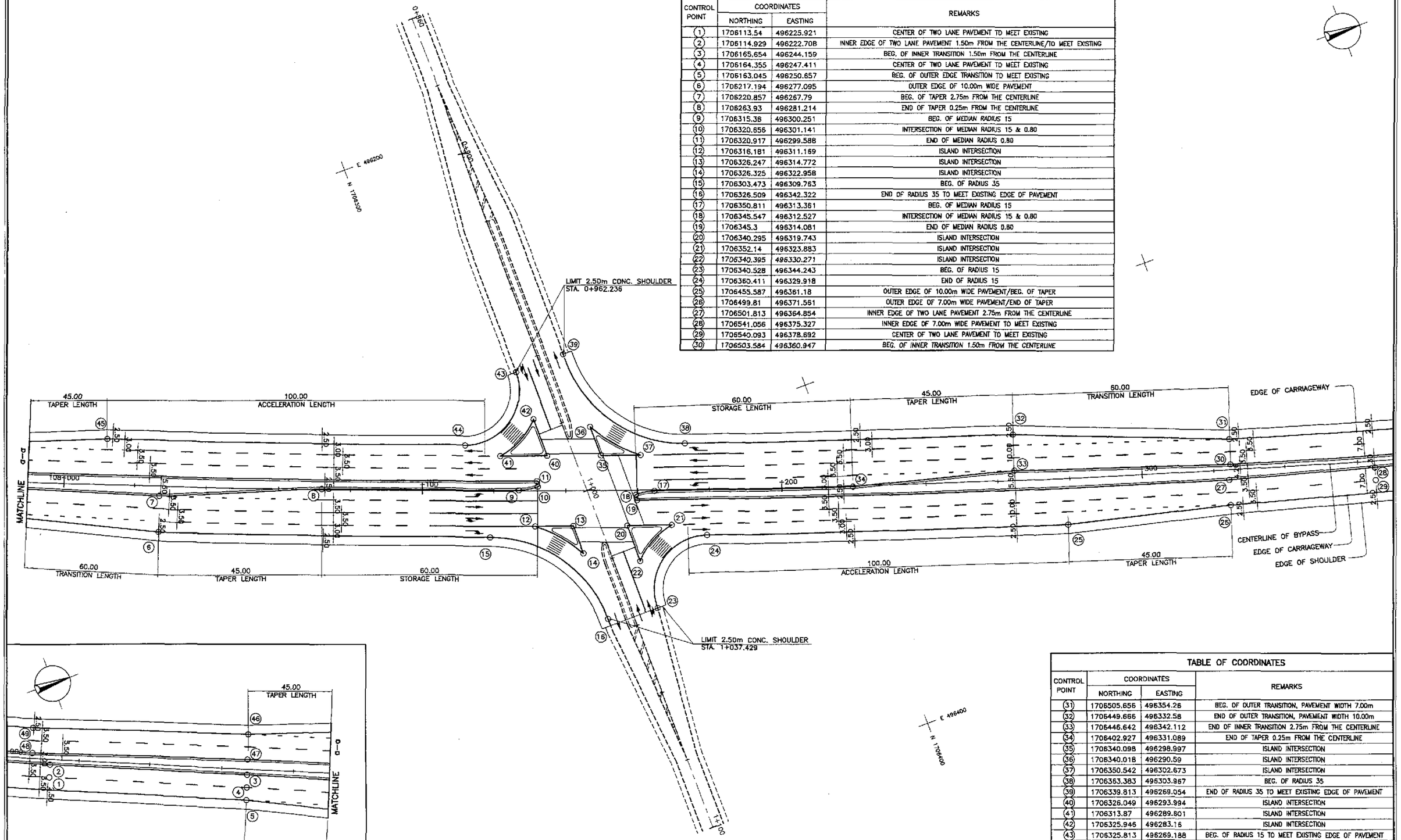


TABLE OF COORDINATES

CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
31	1706505.656	496354.26	BEG. OF OUTER TRANSITION, PAVEMENT WIDTH 7.00m
32	1706449.666	496332.58	END OF OUTER TRANSITION, PAVEMENT WIDTH 10.00m
33	1706446.642	496342.112	END OF INNER TRANSITION 2.75m FROM THE CENTERLINE
34	1706402.927	496331.089	END OF TAPER 0.25m FROM THE CENTERLINE
35	1706340.098	496298.997	ISLAND INTERSECTION
36	1706340.018	496290.59	ISLAND INTERSECTION
37	1706350.542	496302.673	ISLAND INTERSECTION
38	1706363.383	496303.967	BEG. OF RADIUS 35
39	1706339.813	496269.054	END OF RADIUS 35 TO MEET EXISTING EDGE OF PAVEMENT
40	1706326.049	496293.994	ISLAND INTERSECTION
41	1706313.87	496289.601	ISLAND INTERSECTION
42	1706325.946	496283.16	ISLAND INTERSECTION
43	1706325.813	496269.188	BEG. OF RADIUS 15 TO MEET EXISTING EDGE OF PAVEMENT
44	1706305.659	496283.417	END OF RADIUS 15
45	1706212.594	496247.844	BEG. OF TAPER, PAVEMENT WIDTH 10.00m
46	1706169.849	496233.719	END OF TAPER, PAVEMENT WIDTH 7.00m
47	1706167.231	496240.212	INNER EDGE OF PAVEMENT 2.75m FROM THE CENTERLINE
48	1706111.533	496217.968	INNER EDGE OF PAVEMENT 1.50m FROM THE CENTERLINE
49	1706114.129	496211.467	OUTER EDGE OF 7.00m WIDE PAVEMENT

GEOMETRIC DESIGN LAYOUT
INTERSECTION A-10 (STA. 108+145.875) - ULTIMATE STAGE

1 / RI-11 SCALE 1:500

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

	DATE	SIGNATURE
DESIGNED	10/15/02	ORONCE
CHECKED	10/15/02	S. JOSE
SUBMITTED	10/16/02	M. KURODA TEAM LEADER

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

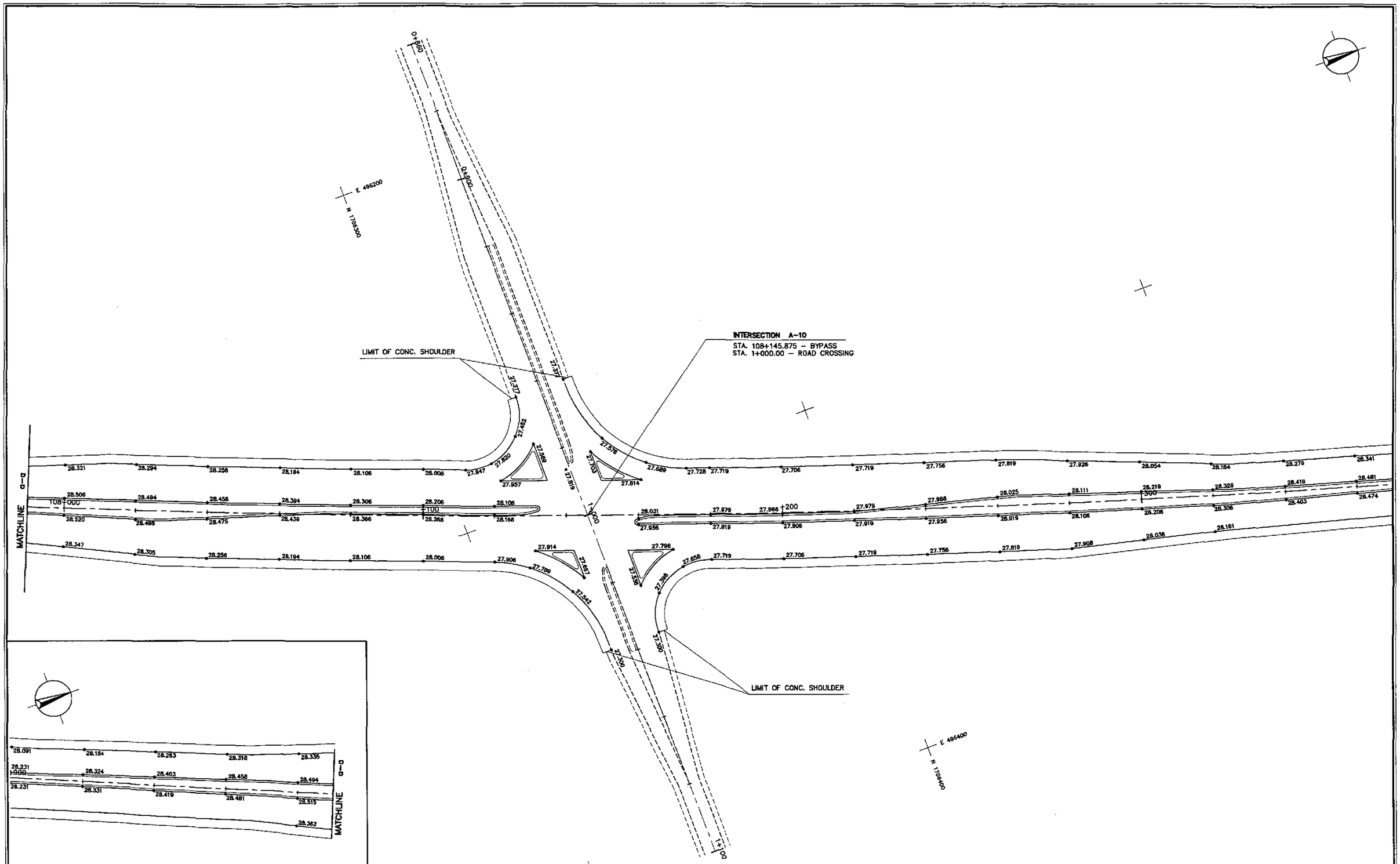
PJHL – PMO	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Recommended By: (See cover sheet for Signature)	Approved By: (See cover sheet for Signature/Approval)
DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONDAN	SIMEON A. DATUMANONG
Project Director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

SCALE : 1:500 FULL SIZE A1

SHEET CONTENTS :
INTERSECTION DETAIL
GEOMETRIC DESIGN LAYOUT
INTERSECTION A-10 (ULTIMATE STAGE)

SHEET NO. : RI-11



PAVING AND GRADING PLAN

1 / RI-12 INTERSECTION A-10 (STA. 108+145.875) - ULTIMATE STAGE

SCALE 1:500

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

	DATE	SIGNATURE
DESIGNED	10/15/02	
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	TEAM LEADER

REPUBLIC OF THE PHILIPPINES
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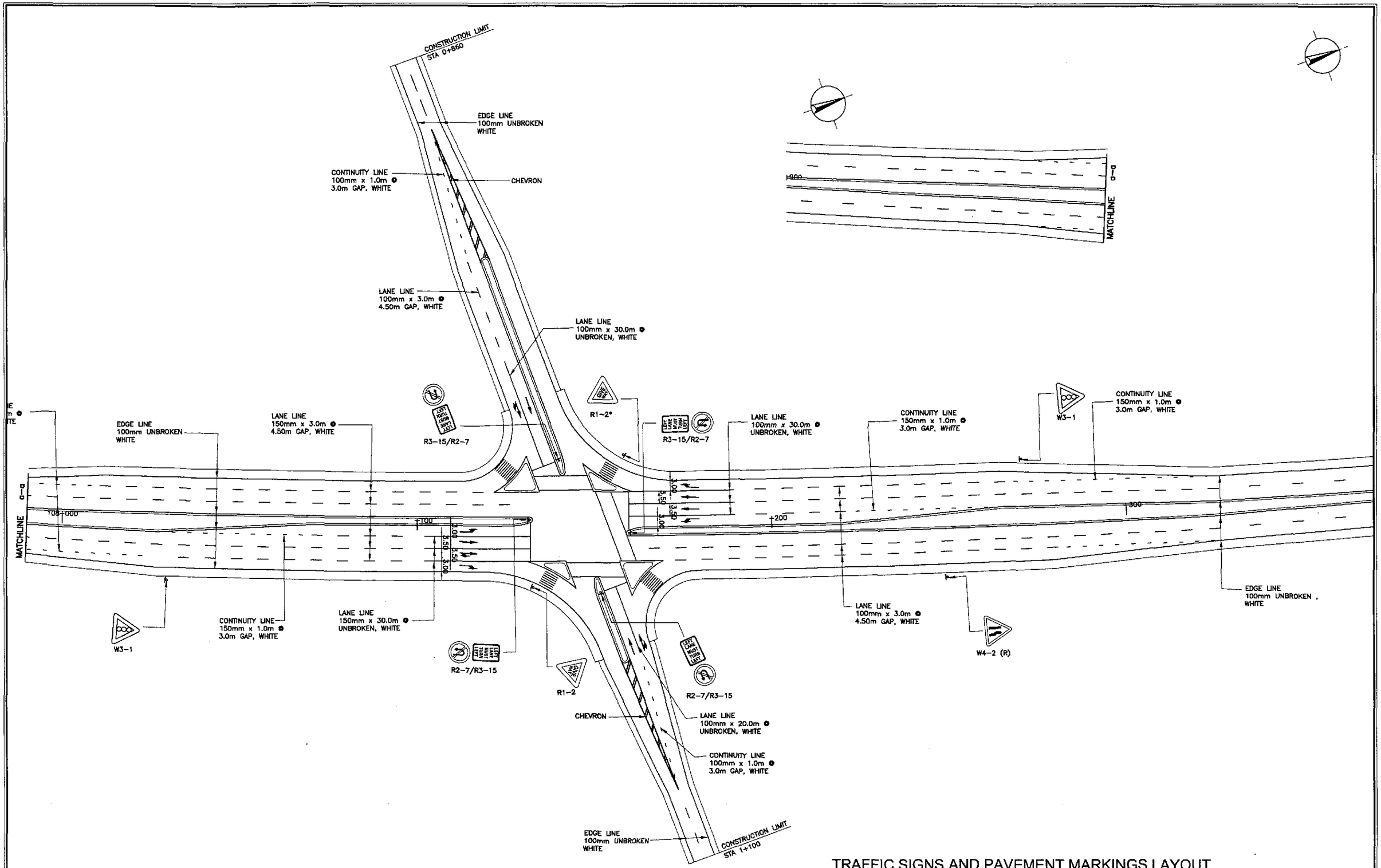
DANILO C. TRAJANO, Project Director	JOSEFINA M. ALAGAR, Chief, Highways Division	GILBERTO S. REYES, OIC, Director IV	MANUEL M. BONGAN, Undersecretary	SIMEON A. DATUMANONG, Secretary

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 I

SCALE : 1:500 FULL SIZE A1

SHEET CONTENTS :
INTERSECTION DETAIL
PAVING AND GRADING PLAN
INTERSECTION A-10 (ULTIMATE STAGE)

SHEET NO. : RI-12



1
RI-13

TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT
INTERSECTION A-10 (STA. 108+145.875) - ULTIMATE STAGE

SCALE 1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.

	DATE	SIGNATURE
DESIGNED	10/5/02	S. LUNA
CHECKED	10/15/02	S. GOSE
SUBMITTED	10/16/02	M. KOUCHI (TEAM LEADER)

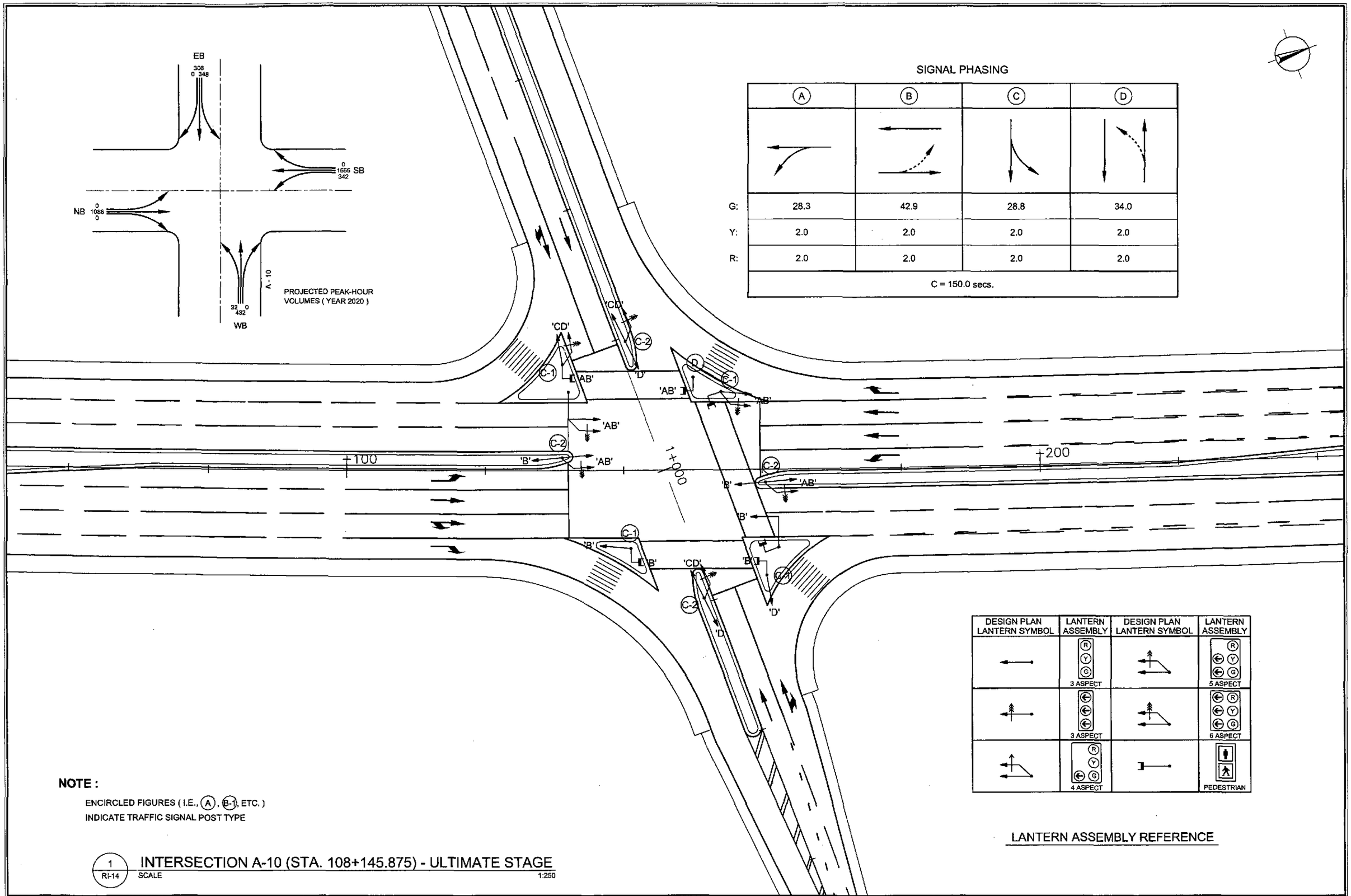
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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. BONGAN	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)	1:500	TRAFFIC SIGNS AND PAVEMENT MARKINGSS LAYOUT INTERSECTION A-10 (ULTIMATE STAGE)	RI-13
CABANATUAN BYPASS - CONTRACT PACKAGE I	FULL SIZE A1		

SIGNAL PHASING

	A	B	C	D
G:	28.3	42.9	28.8	34.0
Y:	2.0	2.0	2.0	2.0
R:	2.0	2.0	2.0	2.0
	C = 150.0 secs.			



DESIGN PLAN LANTERN SYMBOL	LANTERN ASSEMBLY	DESIGN PLAN LANTERN SYMBOL	LANTERN ASSEMBLY
	3 ASPECT		5 ASPECT
	3 ASPECT		6 ASPECT
	4 ASPECT		PEDESTRIAN

LANTERN ASSEMBLY REFERENCE

NOTE :

ENCIRCLED FIGURES (I.E., (A), (B-1), ETC.)
INDICATE TRAFFIC SIGNAL POST TYPE

(1 / RI-14) INTERSECTION A-10 (STA. 108+145.875) - ULTIMATE STAGE

SCALE 1:250

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

	DATE	SIGNATURE
DESIGNED	10/15/02	CATBAGAN
CHECKED	10/15/02	SOGOSE
SUBMITTED	10/16/02	MIYKUCHI TEAM LEADER

REPUBLIC OF THE PHILIPPINES
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Project Director	Chief, Highways Division	DIC, 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 I

SCALE : 1:250 FULL SIZE A1

SHEET CONTENTS :
TRAFFIC SIGNAL LIGHT LAYOUT
INTERSECTION A-10 (ULTIMATE STAGE)

SHEET NO. : RI-14