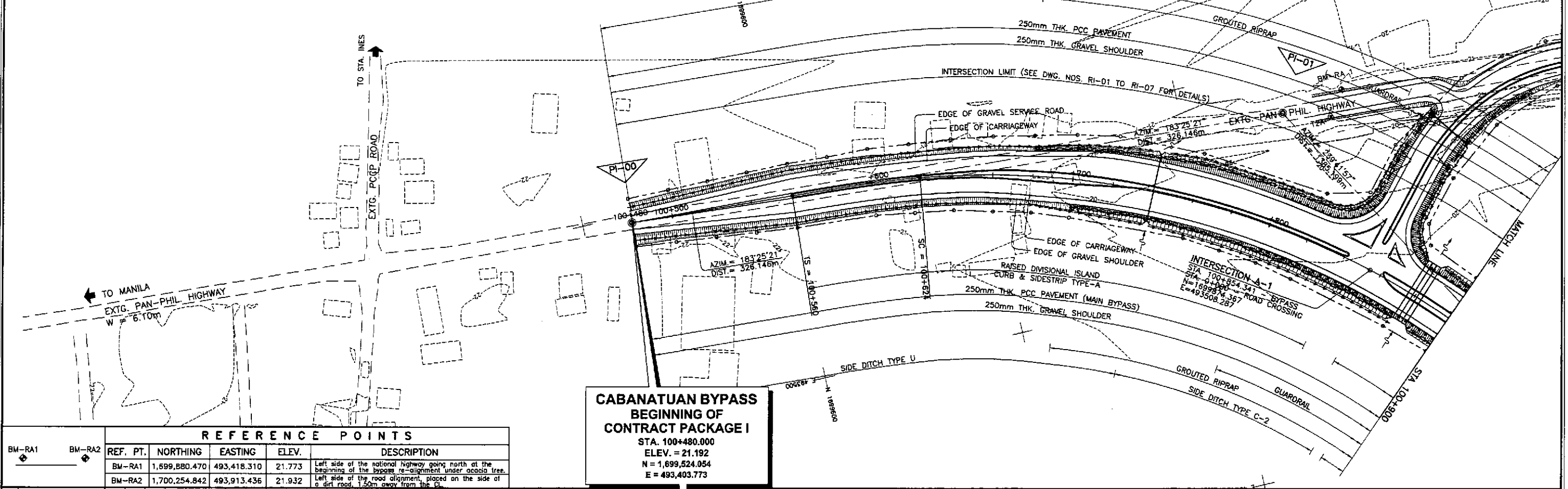
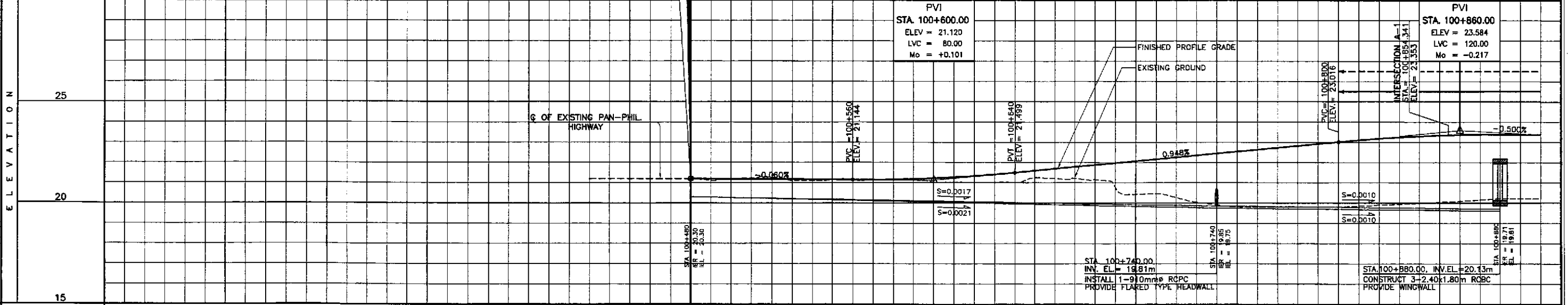


ELEMENTS OF CURVE																							
PI NO.	STATION	COORDINATES		Δ	A	R	T	Lc	E	Ls	θ <sub>s</sub>	x	y	Δ <sub>a</sub>	X <sub>m</sub>	T <sub>L</sub>	T <sub>K</sub>	T <sub>a</sub>	Δ <sub>c</sub>	e%	W	V(kph)	
		NORTHING	EASTING																				
PI-00	100+480.000	1,699,524.054	493,403.773																				
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	1.708	0.427	31.993	42.881	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

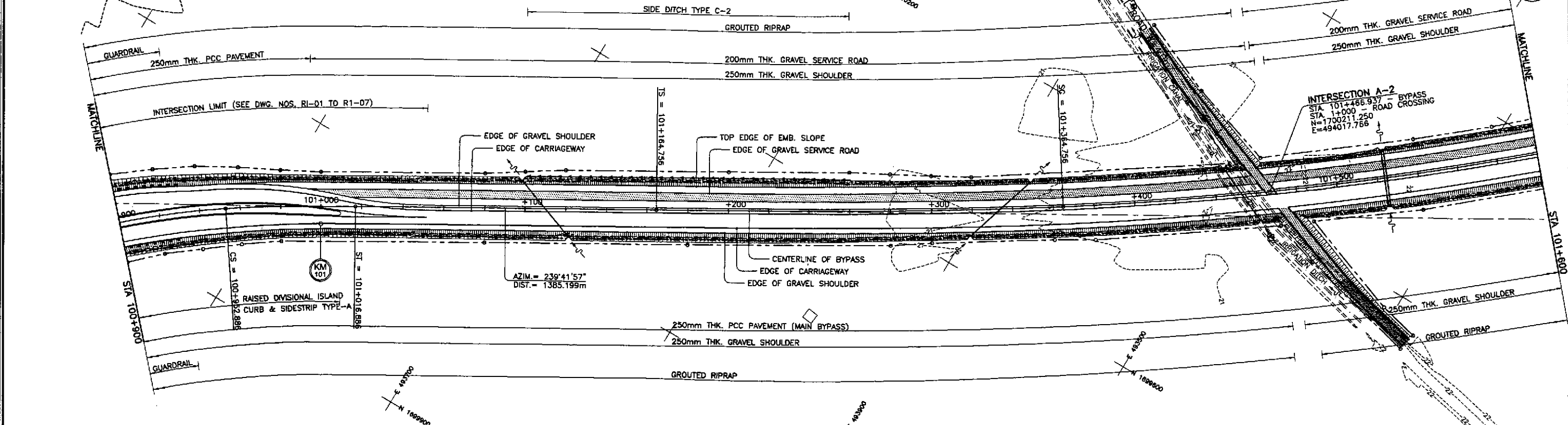
REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-RA1	1,699,880.470	493,418.310	21.773	Left side of the national highway going north at the beginning of the bypass re-alignment under acacia tree.
BM-RA2	1,700,254.842	493,913.436	21.932	Left side of the road alignment, placed on the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



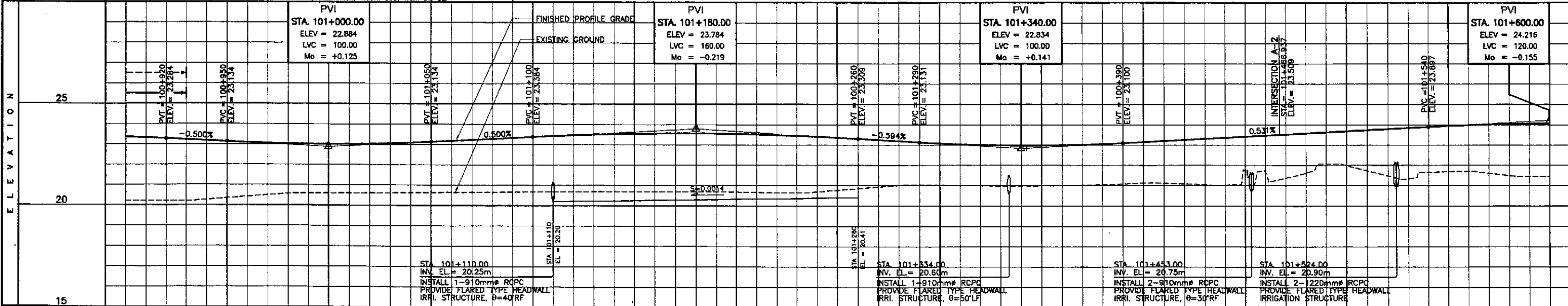
STATION	+200	+300	+400	100+500	+600	+700	+800	+900
FINISHED PROFILE GRADE BYPASS				21.192	21.180	21.168	21.156	21.144
EXISTING GROUND BYPASS				21.201	21.180	21.168	21.156	21.144
HORIZONTAL CURVATURE				R=∞	R=∞	R=∞	R=400	R=400
VERTICAL CURVATURE				g=-0.060%	Mo=+0.101	g=0.948%	Mo=-0.217	g=-0.500%
SUPERELEVATION				N.C.	N.C.	N.C.	e=-3%	e=-3%

	DESIGNED: 9/27/02 CHECKED: 10/13/02 SUBMITTED: 10/16/02	DATE: 9/27/02 SIGNATURE: [Signature] NAME: A. ACACIO		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION: THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) <b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>	SCALE: HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS: <b>PLAN AND PROFILE</b> ALONG BYPASS (INITIAL STAGE) STA. 100+480 - STA. 100+900	SHEET NO.: <b>RP-01</b>		
	SUBMITTED BY: DANILLO C. TRAJANO, Project Director				REVIEWED BY: JOSEFINA M. ALAGAR, Chief, Highways Division				OFFICE OF THE SECRETARY: SIMON A. DATUMANONG, Secretary	
	SUBMITTED BY: [Signature], TEAM LEADER				REVIEWED BY: GILBERTO S. REYES, Chief, Director IV				OFFICE OF THE SECRETARY: [Signature], Secretary	

PI NO.	STATION	COORDINATES		ELEMENTS OF CURVE																		
		NORTHING	EASTING	Δ	A	R	T	Lc	E	Ls	θ <sub>a</sub>	x	y	Δ <sub>n</sub>	X <sub>m</sub>	T <sub>L</sub>	T <sub>c</sub>	T <sub>S</sub>	Δ <sub>c</sub>	e%	W	V(kph)
PI-01	100+806.146	1,899,849.619	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	-	80
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				
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 CI.

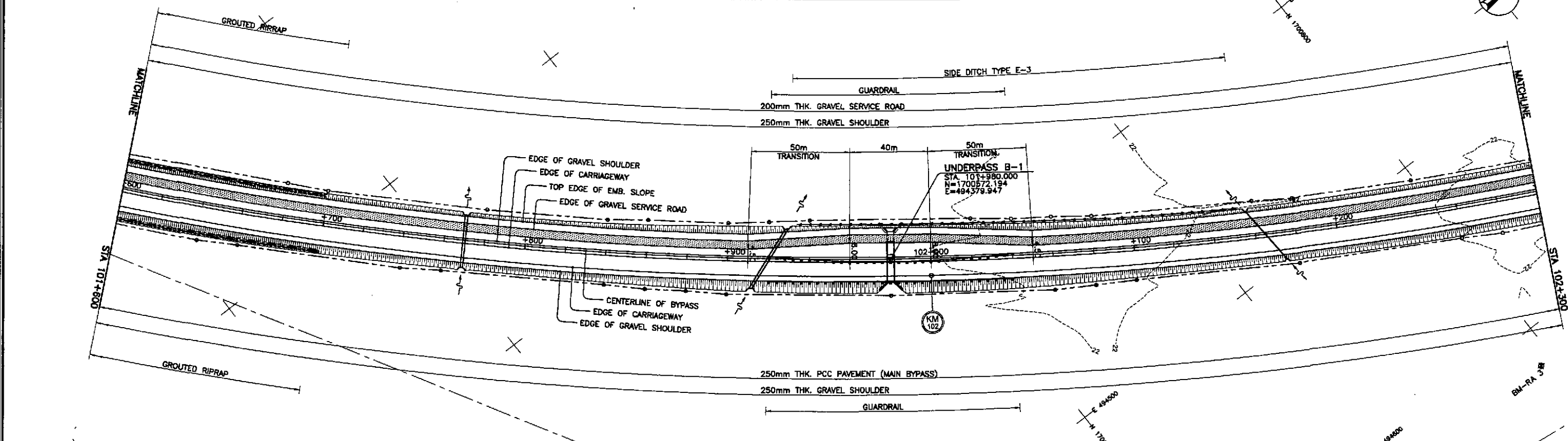
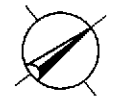


STATION	+900	101+000										+100	+200										+300	+400										101+500	+600																																					
FINISHED PROFILE GRADE BYPASS	23.360	23.284	23.184	23.089	23.029	23.009	23.029	23.089	23.184	23.284	23.384	23.470	23.529	23.561	23.565	23.542	23.492	23.414	23.309	23.190	23.077	23.003	22.975	22.991	23.052	23.153	23.259	23.365	23.472	23.578	23.684	23.791	23.897	23.986	24.041	24.061																																				
EXISTING GROUND BYPASS	20.216	20.210	20.266	20.419	20.570	20.599	20.610	20.631	20.646	20.659	20.673	20.686	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	21.675	21.613	21.991	21.477	21.665	21.899	21.489	21.401	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	g=-0.500%		L=100 Mo=+0.125										g=0.500%										L=160 Mo=-0.219										g=-0.594%										L=100 Mo=+0.141										g=0.531%										L=120 Mo=-0.155									
SUPERELEVATION	100+952.886		100+991.286										N.C.										101+364.756										e=+2%										e=-2%																													

	DESIGNED	9/27/02			REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :		SCALE :		SHEET CONTENTS :		SHEET NO. :	
	CHECKED	10/15/02			BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		HORIZONTAL 1:1000		PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 100+900 - STA. 101+600		RP-02	
	SUBMITTED	10/16/02			OFFICE OF THE SECRETARY				CABANATUAN BYPASS - CONTRACT PACKAGE I		VERTICAL 1:100		FULL SIZE A1			

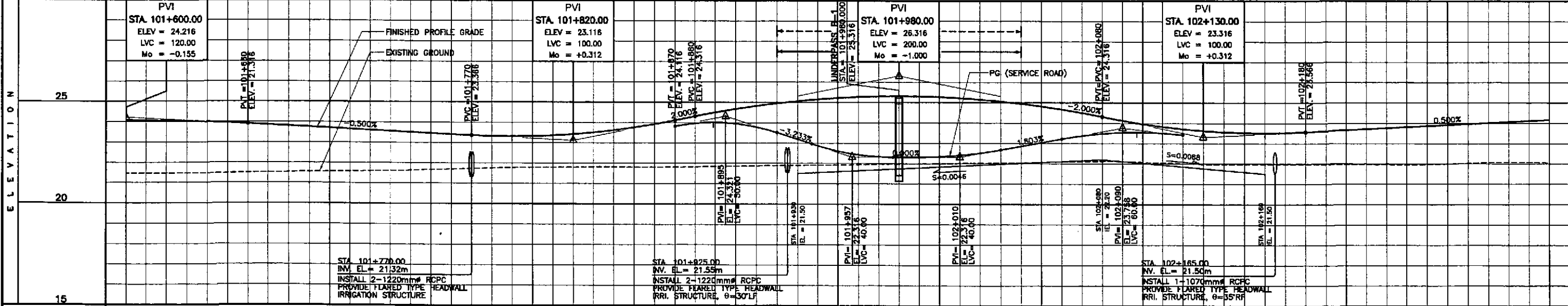
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES		Δ	A	R	T	Lc	E	Ls	θs	x	y	Δs	Xm	Tc	Tt	Tb	Δs	e%	W	V(kph)
		NORTHING	EASTING																			
PI-02	102+155.940	1,700,548.505	+94,819.209	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"	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 paddy intersection in the middle of a displaced

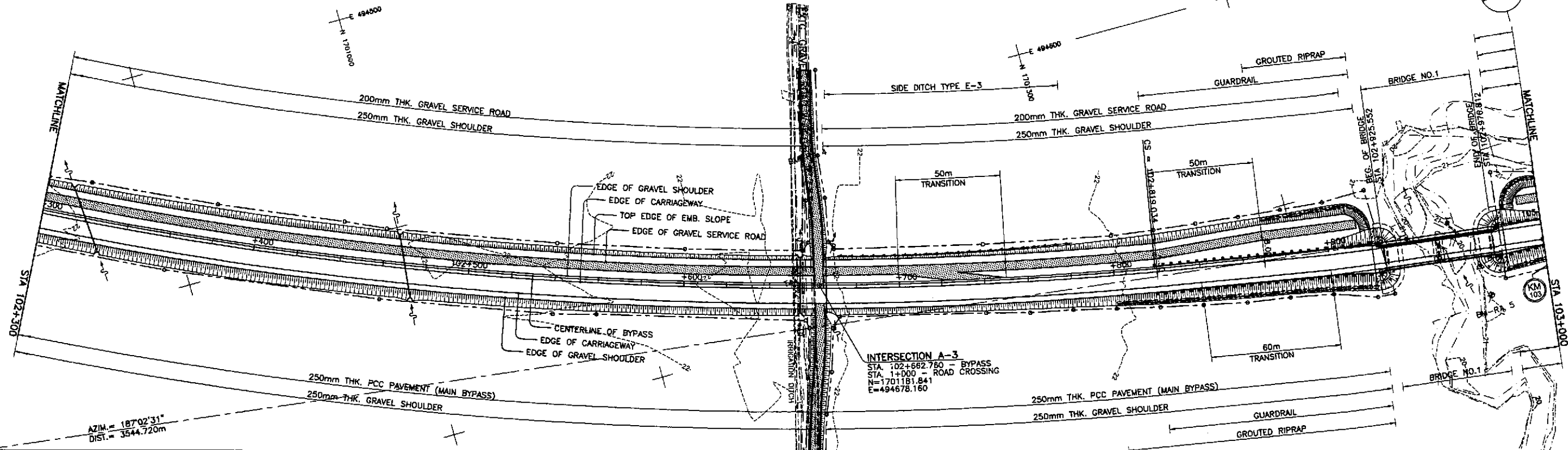


STATION	+600	+700	+800	+900	102+000	+100	+200	+300
FINISHED PROFILE GRADE BYPASS \ SERVICE ROAD	24.061	24.047	23.988	23.916	23.818	23.718	23.616	23.516
EXISTING GROUND BYPASS	21.450	21.453	21.467	21.499	21.533	21.559	21.589	21.633
HORIZONTAL CURVATURE	R=1800							
VERTICAL CURVATURE	L=120 Mo=-0.155		L=100 Mo=+0.0312		L=200 Mo=-1.000		L=100 Mo=+0.312%	
SUPERELEVATION	e=+2% e=-2%							

	DESIGNED	9/27/02			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/15/02			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Palarid, Cabanatuan and San Jose Bypasses)	HORIZONTAL 1:1000	PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 101+600 - 102+300	RP-03
	SUBMITTED	10/16/02			CABANATUAN BYPASS - CONTRACT PACKAGE I	VERTICAL 1:100		

ELEMENTS OF CURVE

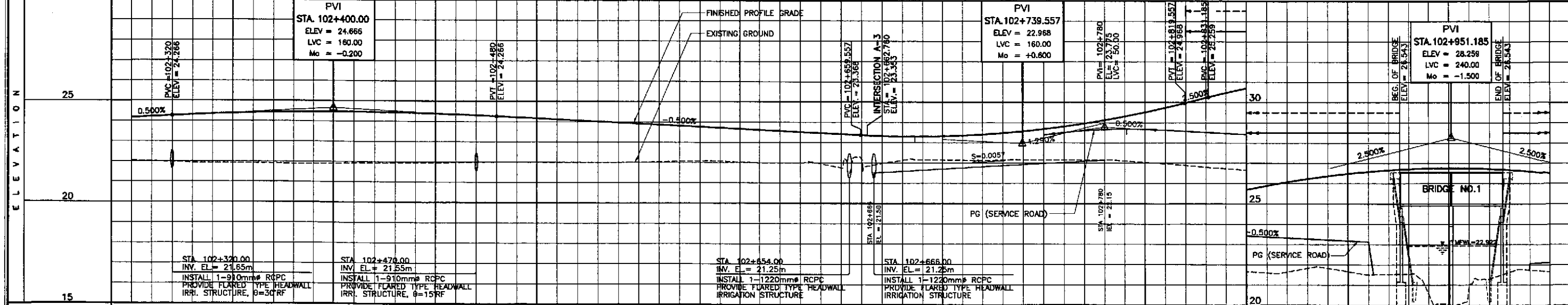
PI NO.	STATION	COORDINATES		Δ	A	R	T	Lc	E	Ls	θ <sub>a</sub>	x	y	Δ <sub>R</sub>	Xm	T <sub>L</sub>	T <sub>C</sub>	T <sub>S</sub>	Δ <sub>e</sub>	e%	W	V(kph)
		NORTHING	EASTING																			
PI-02	102+155.940	1,700,548.505	494,619.209	52°39'26"	600	1,800.00	891.192	1,454.277	209.368	200.000	3°10'59"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



AZIM. = 187°02'31"  
DIST. = 3544.720m

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 paddy intersection in the middle of a ricefield.
BM-RA4	1,701,192.044	494,624.849	22.645	Left side of the road alignment, placed on the top bank of a fishpond underneath two coccol trees.
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 rice hut.

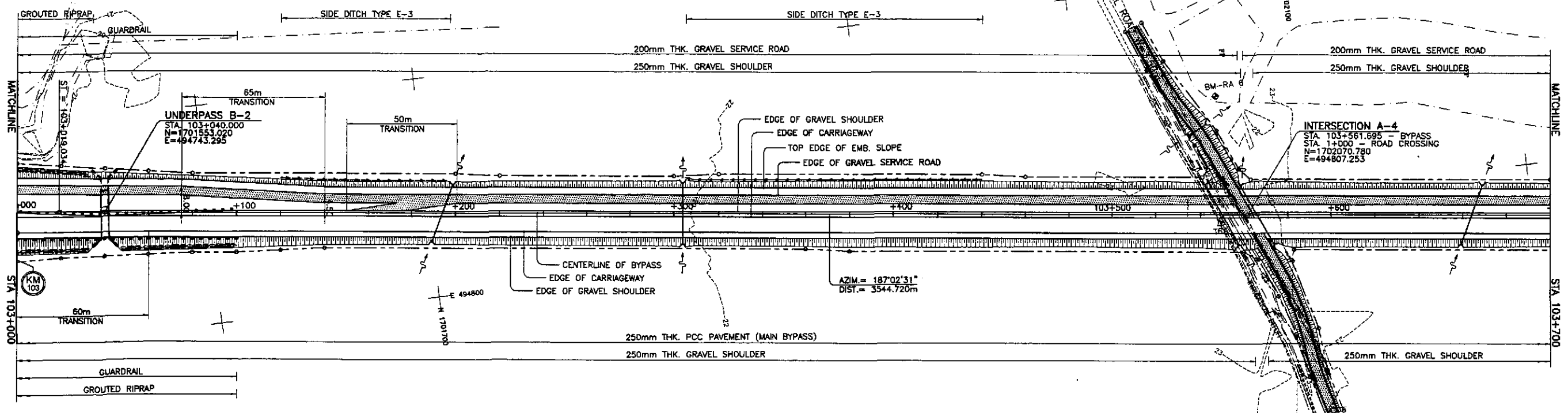


STATION	+300	+400	102+500	+600	+700	+800	+900	103+000
FINISHED PROFILE GRADE BYPASS \ SERVICE ROAD	22.048	24.166	24.266	24.353	24.416	24.453	24.466	24.453
EXISTING GROUND BYPASS	21.983	24.266	24.353	24.416	24.453	24.466	24.453	24.416
HORIZONTAL CURVATURE	R=1800							
VERTICAL CURVATURE	g=0.500%		L=160 Mo=-0.200		g=-0.500%		L=160 Mo=+0.800	
SUPERELEVATION	e=+2%				e=-2%			

	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/27/02	<i>[Signature]</i>	BUREAU OF DESIGN			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) <b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>	HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 102+300 - STA. 103+000	<b>RP-04</b>
	CHECKED	10/15/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:				
SUBMITTED	10/16/02	<i>[Signature]</i>	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV					

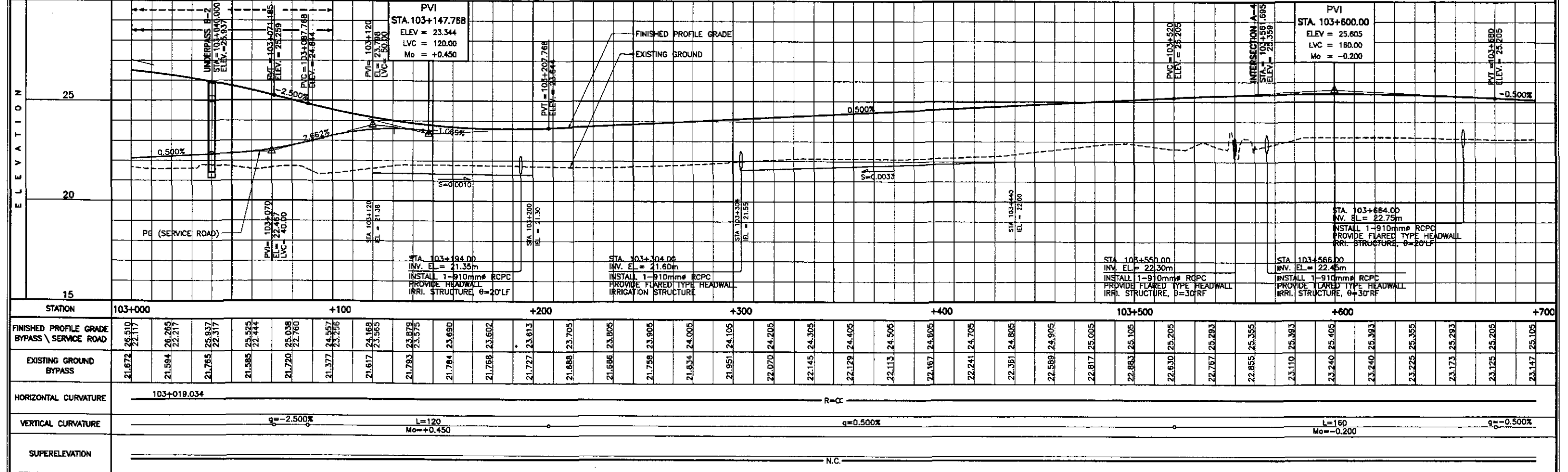
ELEMENTS OF CURVE

PI NO.	STATION	COORDINATES		Δ	A	R	T	Lc	E	Ls	θ <sub>s</sub>	x	y	Δ <sub>s</sub>	X <sub>m</sub>	T <sub>L</sub>	T <sub>c</sub>	T <sub>S</sub>	Δ <sub>c</sub>	e%	W	V(kph)
		NORTHING	EASTING																			
PI-02	102+155.940	1,700,548.505	494,819.209	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 ridge hwy.
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.



STATION	103+000	+100	+200	+300	+400	103+500	+600	+700
FINISHED PROFILE GRADE BYPASS / SERVICE ROAD	21.672	21.594	21.785	21.588	21.720	21.377	21.617	21.793
EXISTING GROUND BYPASS	21.672	21.594	21.785	21.588	21.720	21.377	21.617	21.793
HORIZONTAL CURVATURE	103+019.034							
VERTICAL CURVATURE	g = -2.500%				g = 0.500%			
SUPERELEVATION	N.C.							

**JICA**  
JAPAN INTERNATIONAL COOPERATION AGENCY

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

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

DESIGNED: 9/27/02  
CHECKED: 10/15/02  
SUBMITTED: 10/16/02

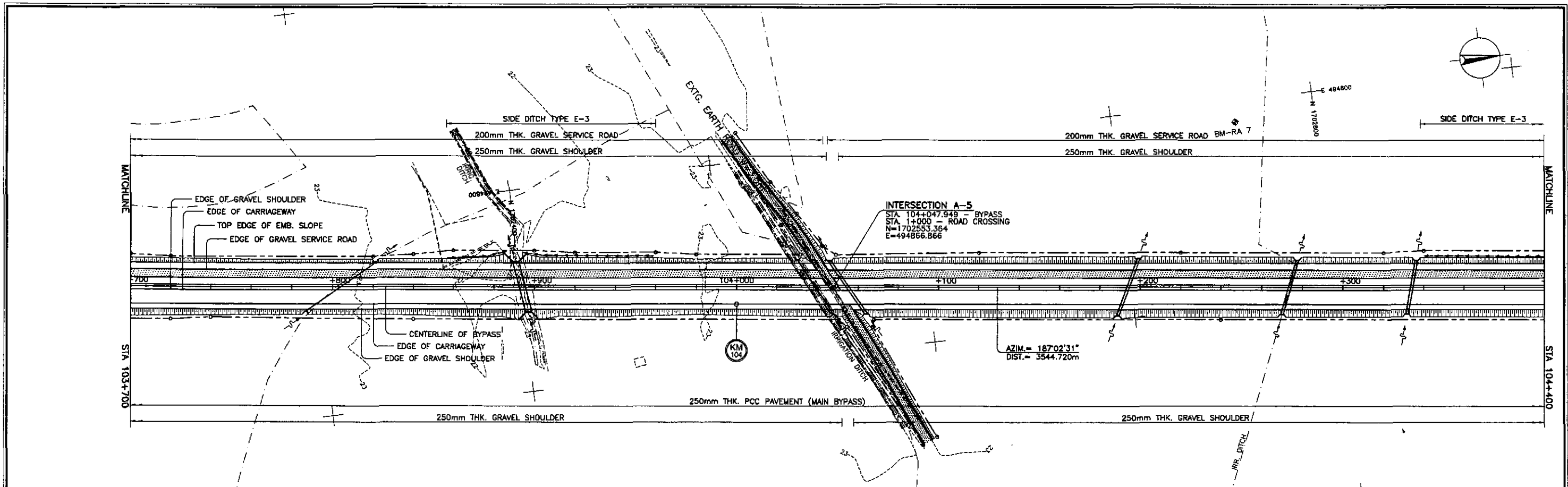
PROJECT DIRECTOR: DANILO C. TRAJANO  
CHIEF, HIGHWAYS DIVISION: JOSEFINA M. ALAGAR  
O.C. DIRECTOR: GILBERTO S. REYES

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

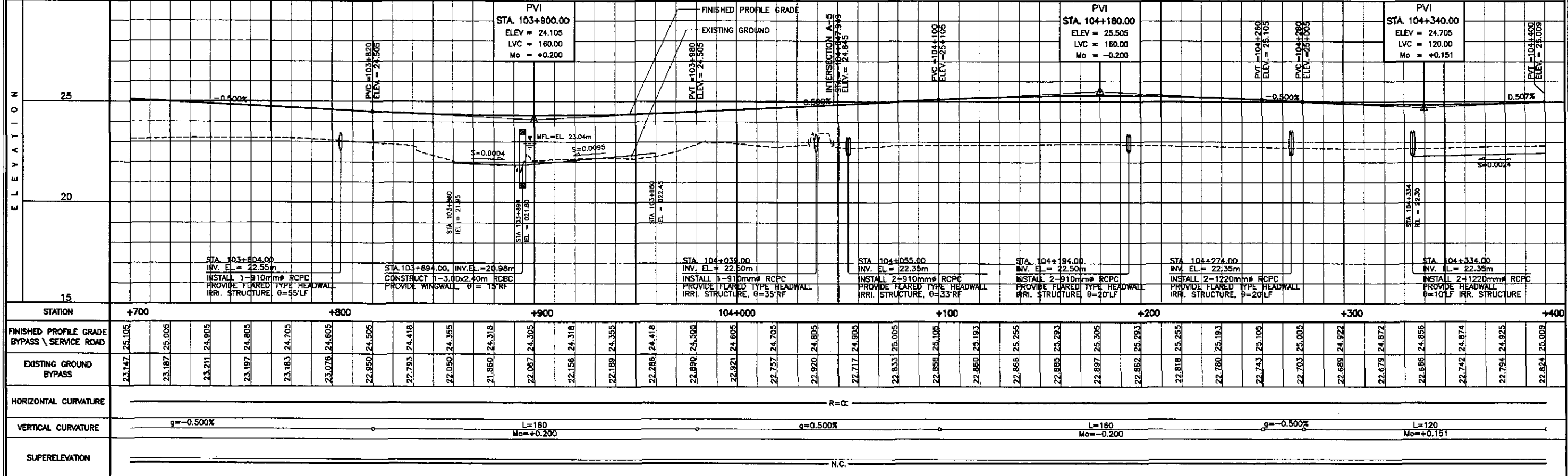
SCALE: HORIZONTAL 1:1000, VERTICAL 1:100, FULL SIZE A1

SHEET CONTENTS: PLAN AND PROFILE ALONG BYPASS (INITIAL 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 \ SERVICE ROAD	23.147	23.187	23.211	23.241	23.265	23.285	23.293	23.305
EXISTING GROUND BYPASS	23.147	23.187	23.211	23.241	23.265	23.285	23.293	23.305
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	g = -0.500%		L=180 Mo = +0.200		q = 0.500%		L=120 Mo = +0.151	
SUPERELEVATION	N.C.							

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JAPAN INTERNATIONAL COOPERATION AGENCY

**KAI** KATAHRA & ENGINEERS INTERNATIONAL  
**YEO** YACHIYO ENGINEERING CO., LTD.

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

BUREAU OF DESIGN  
OFFICE OF THE SECRETARY

DESIGNED: 9/27/02  
CHECKED: 10/15/02  
SUBMITTED: 10/16/02

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

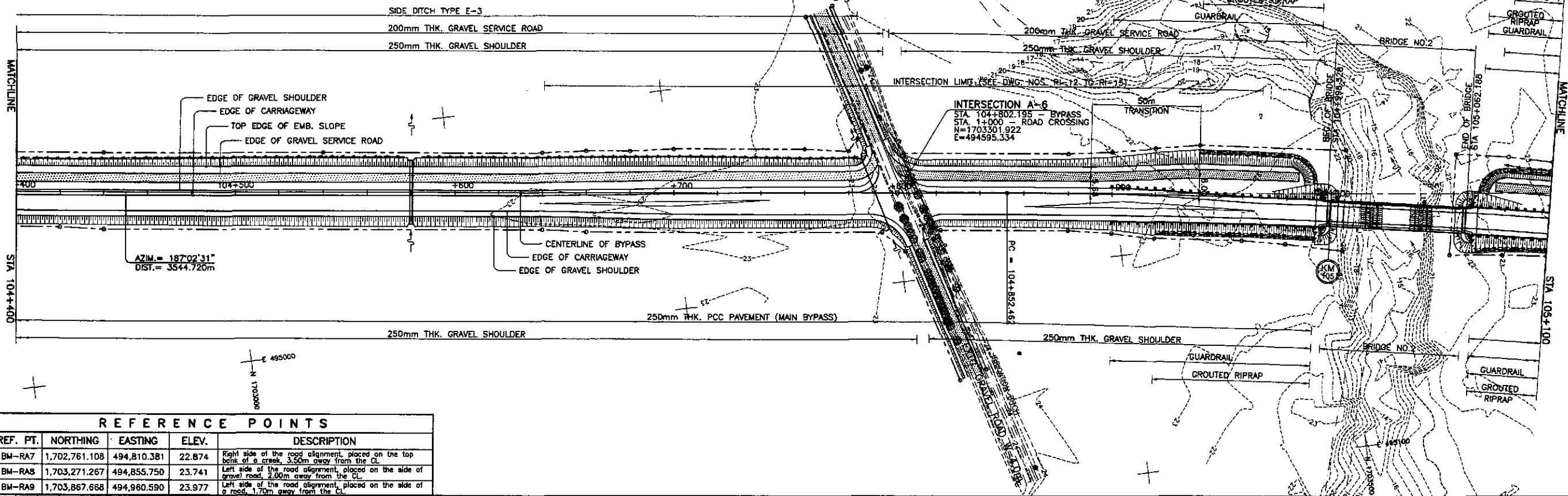
PROJECT AND LOCATION :  
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)

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

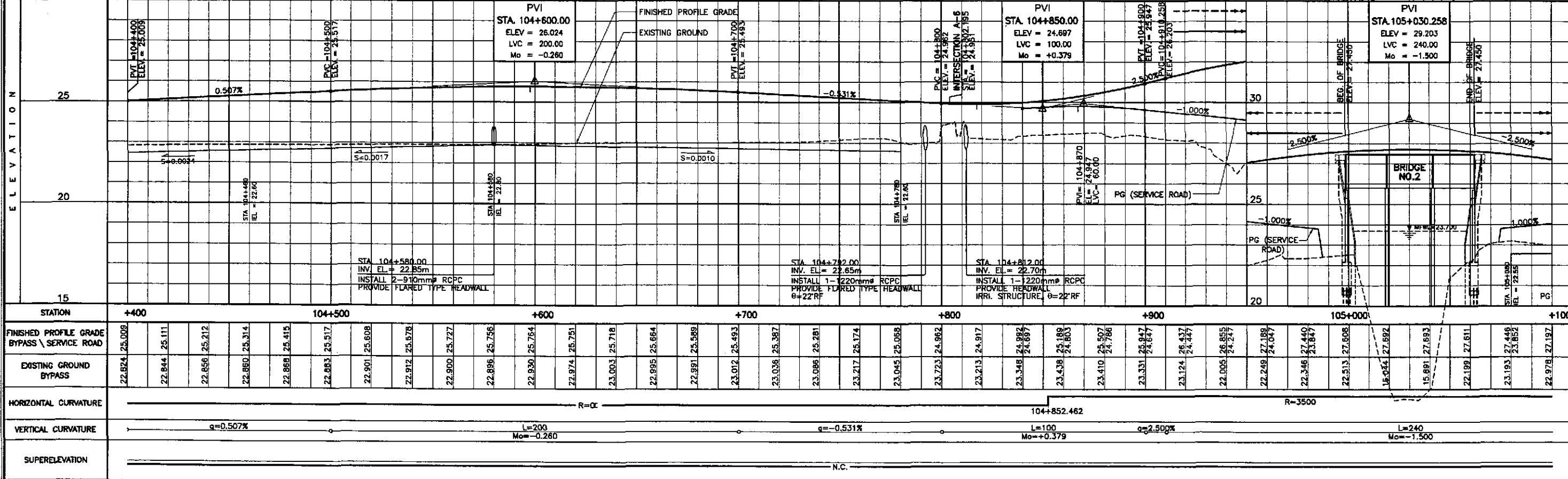
SHEET CONTENTS :  
PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 103+700 - STA. 104+400

SHEET NO. :  
RP-06

PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
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



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	494,980.590	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 \ SERVICE ROAD	22.824	25.008	25.111	25.212	25.314	25.415	25.517	25.618
EXISTING GROUND BYPASS	22.844	25.111	25.212	25.314	25.415	25.517	25.618	25.719
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	q=0.507%		L=200, Mo=-0.260		q=-0.531%		L=100, Mo=+0.379	
SUPERELEVATION	N.C.							

**JICA**  
JAPAN INTERNATIONAL COOPERATION AGENCY

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

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

DESIGNED: 9/27/02  
CHECKED: 10/15/02  
SUBMITTED: 10/16/02

DATE: 9/27/02  
SIGNATURE: [Signature]  
NAME: A. KACIC  
TITLE: PROJECT DIRECTOR

REVIEWED BY: DANILLO C. TRAMANO (Project Director), JOSEFINA M. ALAGAR (Chief, Highways Division), GILBERTO S. REYES (D/C, Director N)

RECOMMENDED BY: MANUEL M. BONDAN (Undersecretary), SIMEON A. DATUMANONG (Secretary)

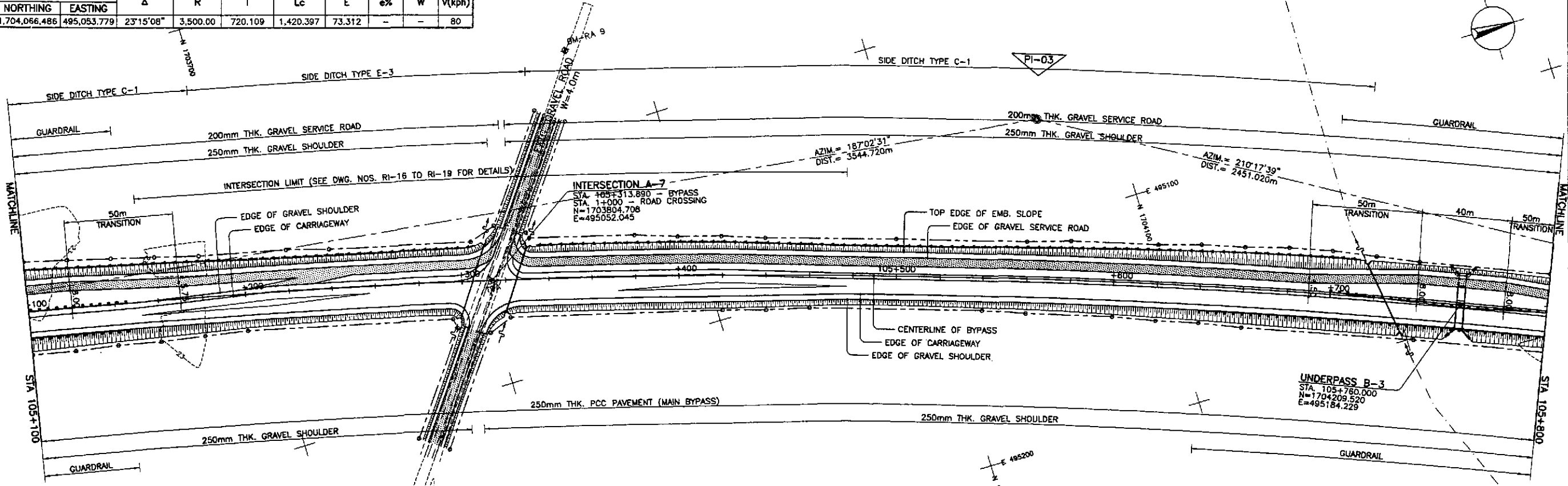
PROJECT AND LOCATION :  
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinarid, Cabanatuan and San Jose Bypasses)

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

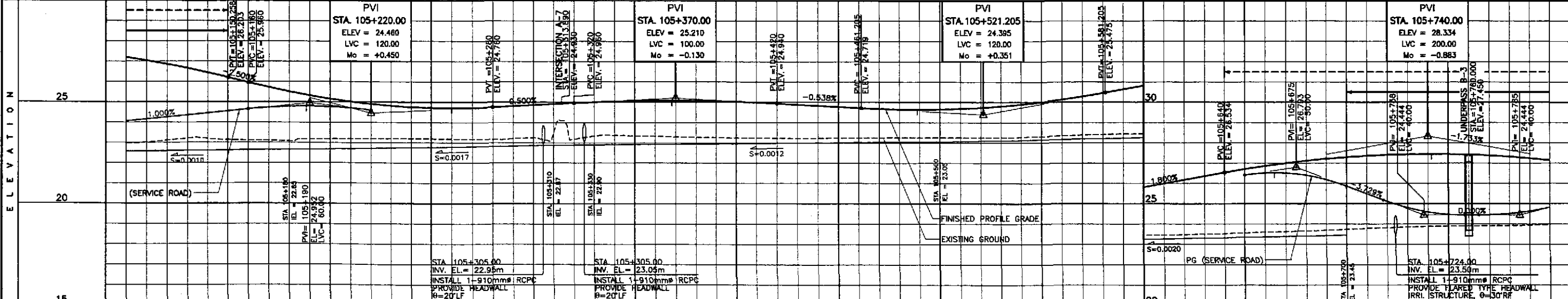
SHEET CONTENTS :  
PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 104+400 - 105+100

SHEET NO. :  
RP-07

PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
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-RAB	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	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 \ SERVICE ROAD	27.197 24.052	26.864 24.252	26.449 24.452	25.960 24.832	25.510 24.782	25.160 24.769	24.910 24.615	24.760
EXISTING GROUND BYPASS	24.976	23.109	23.192	23.116	23.080	23.181	23.194	23.197
HORIZONTAL CURVATURE	R=3500							
VERTICAL CURVATURE	g=-2.500 L=120 Mo=-0.450		g=0.500%		g=-0.538%		g=1.800%	
SUPERELEVATION	N.C.							

KATAHIRA & ENGINEERS  
YEO YACHIYO ENGINEERING CO., LTD.

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

BUREAU OF DESIGN      OFFICE OF THE SECRETARY

Submitted By: DANILLO C. TRAJANO, Project Director  
Reviewed By: JOSEFINA M. ALACAR, Chief, Highways Division  
Recommended By: GILBERTO S. REYES, GIC Director IV  
Approved By: MANUEL M. BONGAN, Undersecretary

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

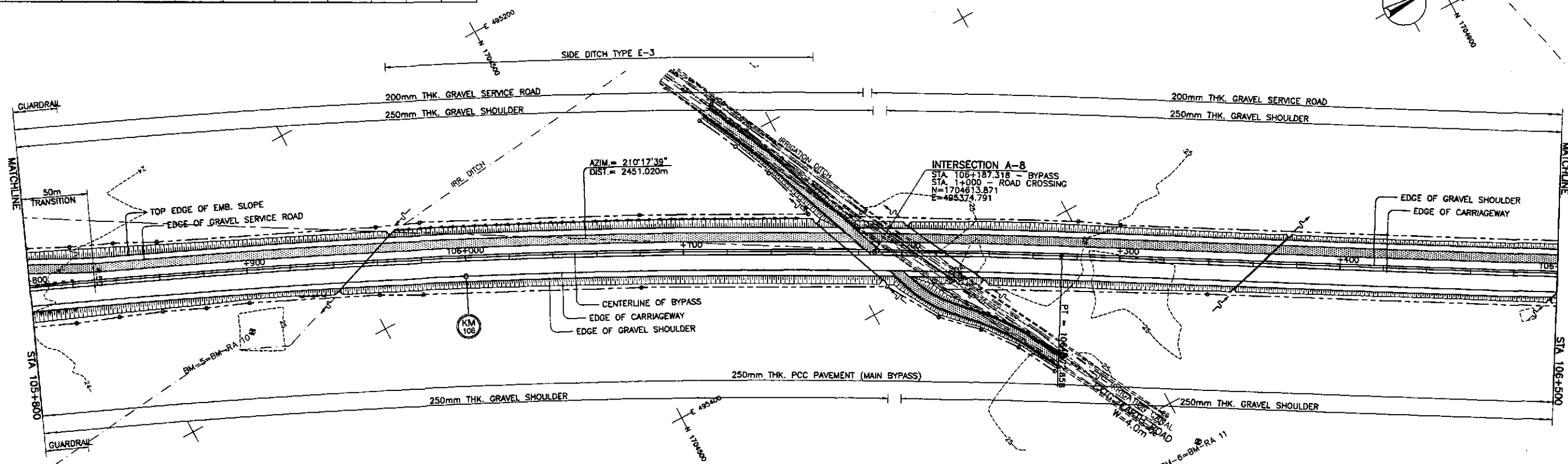
SHEET CONTENTS :  
PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 105+100 - 105+800

SHEET NO. :  
**RP-08**

Sheet 8 of 50

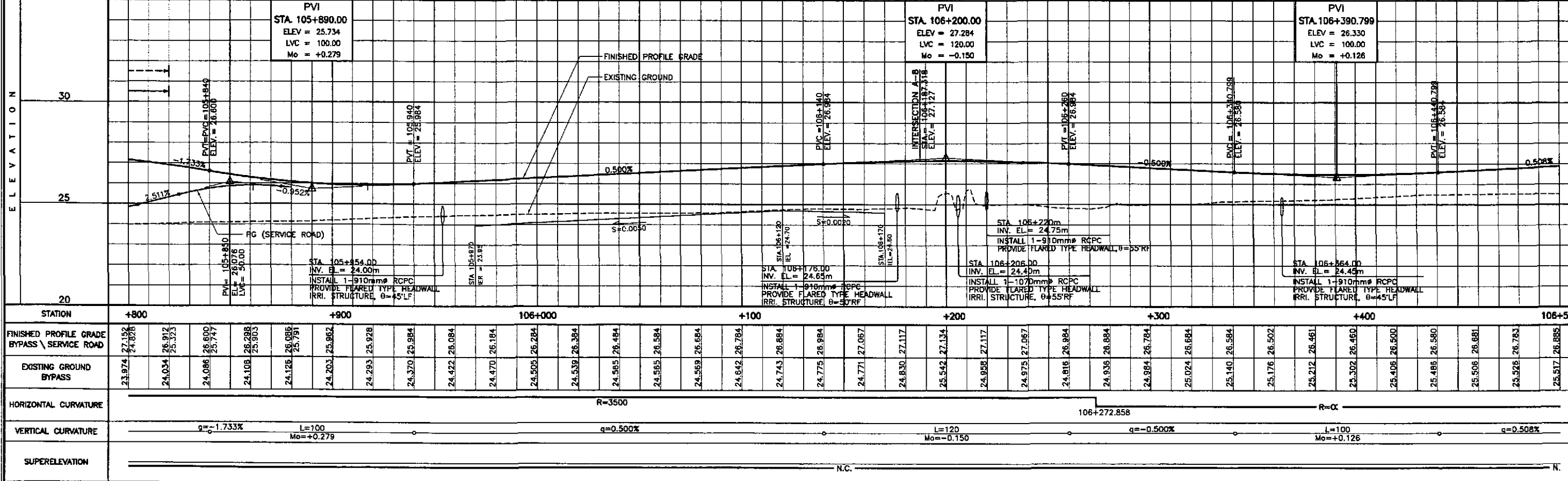


PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-03	105+572.571	1,704,066.486	495,053.779	23°15'08"	3,500.00	720.109	1,420.197	73.312	-	-	80



**REFERENCE POINTS**

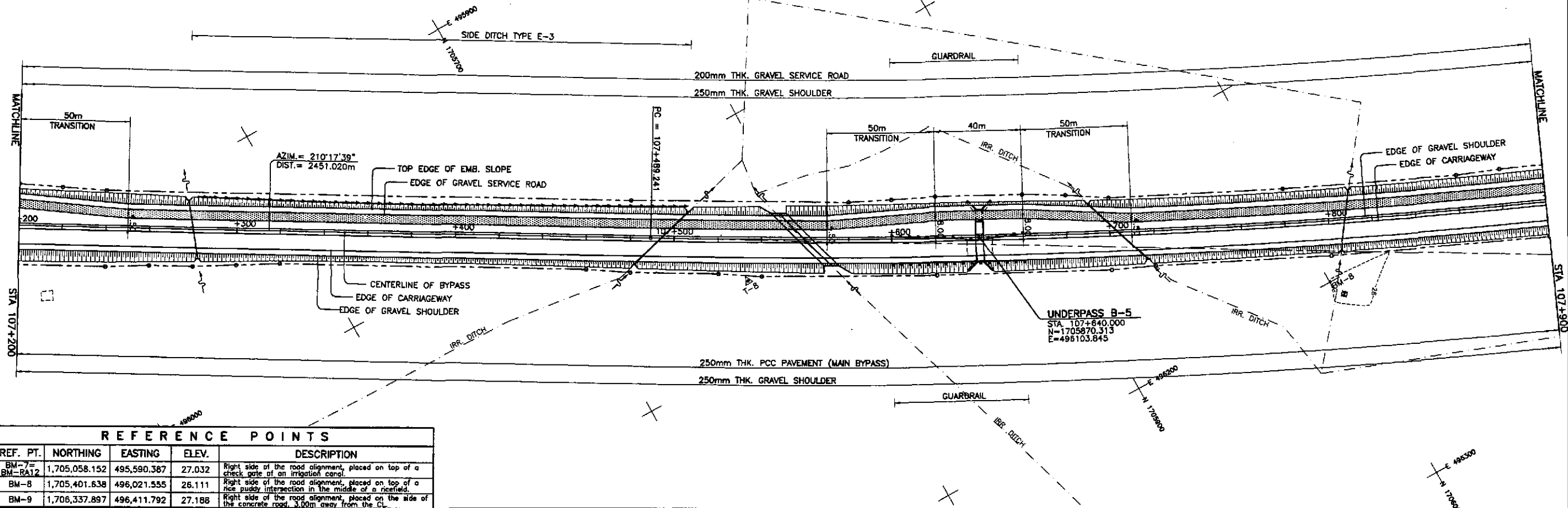
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-5	1,704,562.828	495,238.110	25.505	Left side of the road alignment, placed on the side of a dirt road, 1.50m away from the CL.
BM-6	1,704,703.014	495,521.310	25.723	Left side of the road alignment, placed on top of a rice paddy intersection in the middle of a ricefield.
BM-7	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.



	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION : <b>THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paralid, Cabanatuan and San Jose Bypasses)</b> <b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>	SCALE : HORIZONTAL 1:1000 VERTICAL 1:100 FULL SIZE A1	SHEET CONTENTS : <b>PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE)</b> STA. 105-800 - STA. 106+500	SHEET NO. : <b>RP-09</b>	
	CHECKED	19/15/02	[Signature]						BUREAU OF DESIGN Submitted By: DANILLO C. TRAJANO, Project Director Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division Recommended By: GILBERTO S. REYES, OIC, Director IV Recommended By: MANUEL M. BONGUAN, Undersecretary Approved By: SIMCEON A. DATUMANDANG, Secretary
	SUBMITTED	10/14/02	[Signature]						

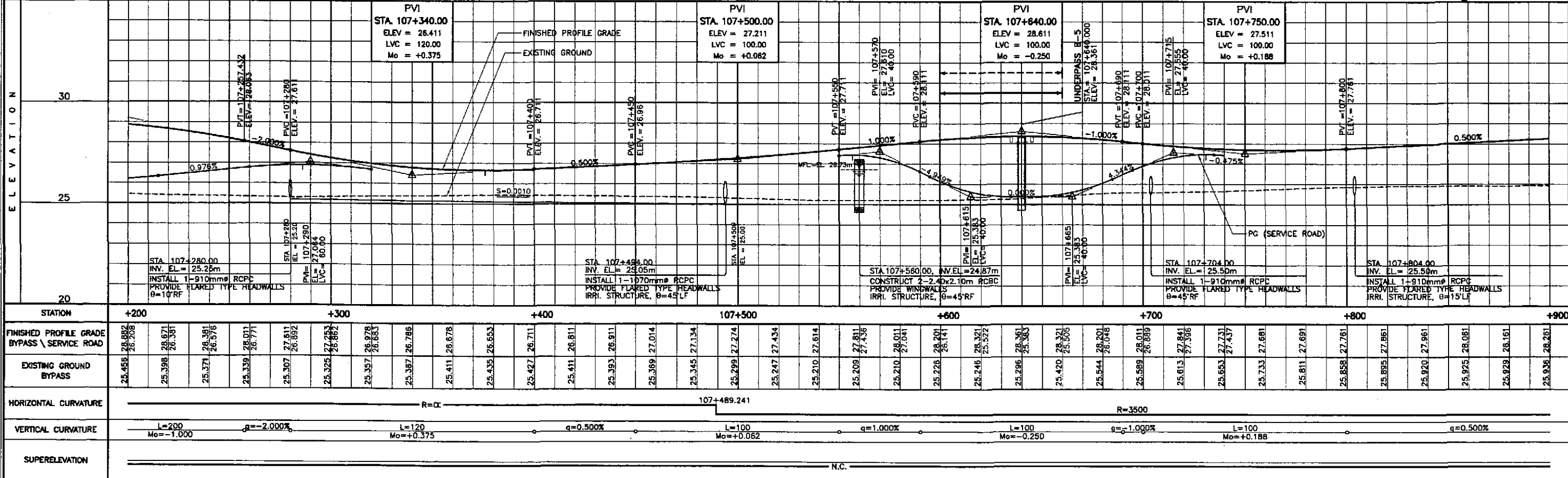


ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-04	108+003.769	1,706,182.811	496,290.171	16°43'34"	3,500.00	514.528	1,021.737	37.618	-	-	80



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 irrigated canal.
BM-8	1,705,401.638	496,021.555	26.111	Right side of the road alignment, placed on top of a rice paddy 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 \ SERVICE ROAD	28.052 26.208	28.671 26.361	28.391 26.976	28.011 26.771	27.611 26.892	27.253 26.862	26.978 26.663	26.786
EXISTING GROUND BYPASS	28.455	25.398	25.371	25.339	25.307	25.325	25.357	25.387
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	L=200 Mo=-1.000		L=120 Mo=+0.375		L=100 Mo=-0.062		L=100 Mo=+0.188	
SUPERELEVATION	N.C.							

**JICA**  
JAPAN INTERNATIONAL COOPERATION AGENCY

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

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

BUREAU OF DESIGN OFFICE OF THE SECRETARY

Submitted By: DANILLO C. TRAJANO, Project Director

Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division

Recommended By: GILBERTO S. REYES, OIC, Director IV

Approved By: MANUEL M. BONDAN, Undersecretary

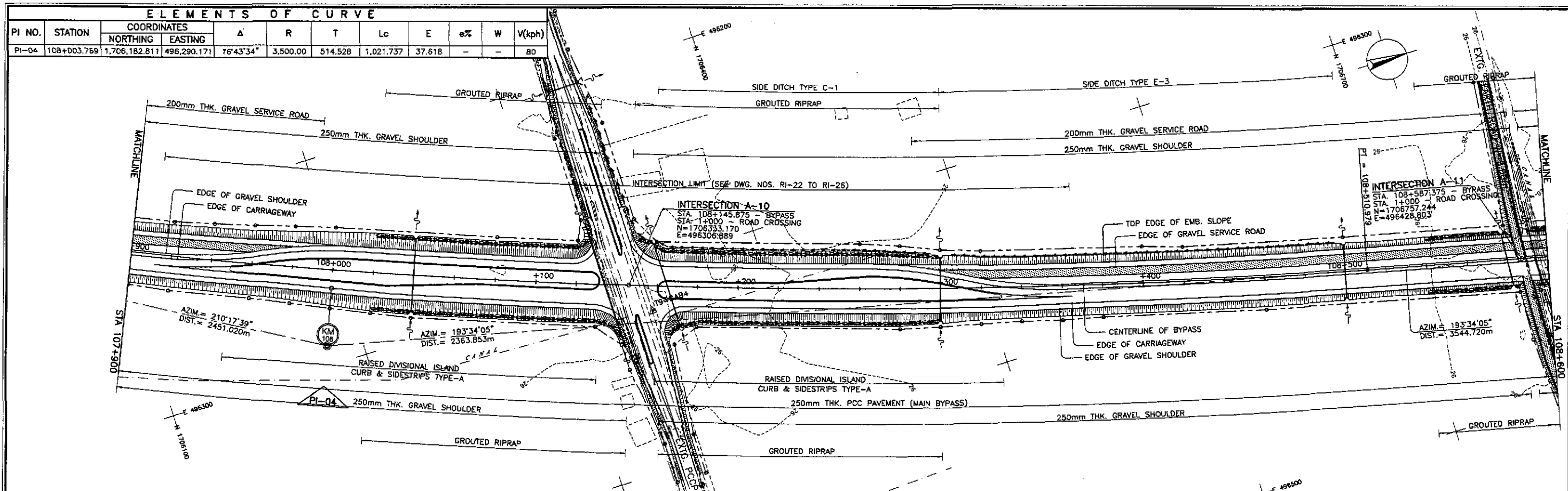
Approved By: SIMEDON A. DATUMANONG, Secretary

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

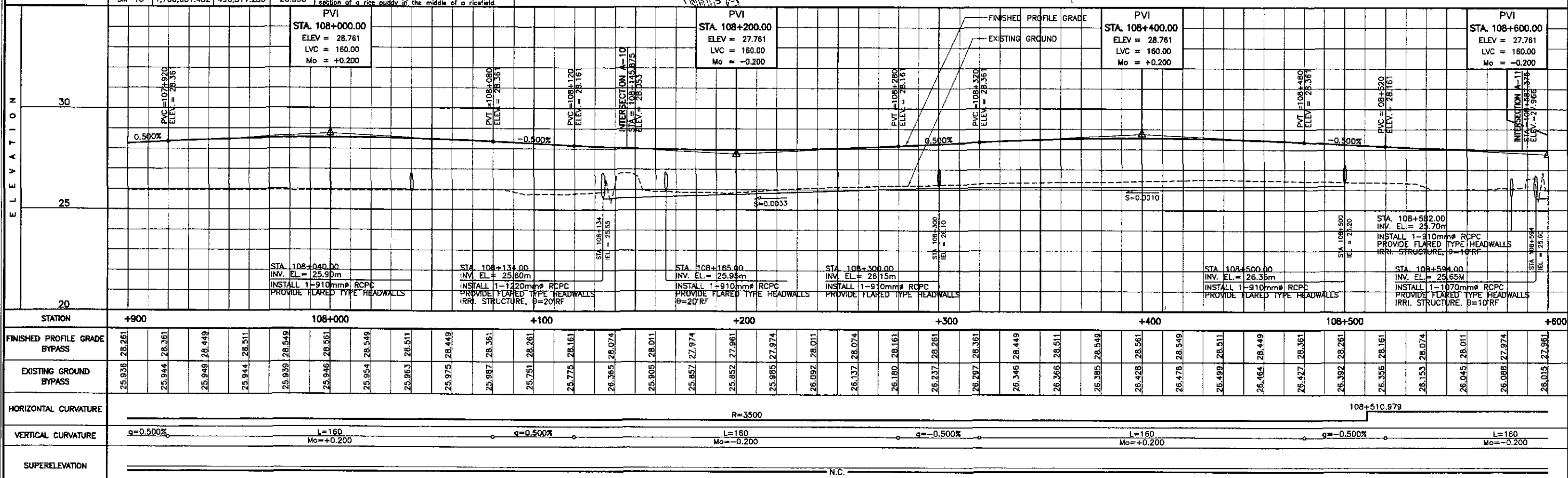
SCALE :  
HORIZONTAL 1:1000  
VERTICAL 1:100  
FULL SIZE A1

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

SHEET NO. :  
RP-11



ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	W	V(kph)
		NORTHING	EASTING								
PI-04	108+003.769	1,706,182.811	496,290.171	76°43'34"	3,500.00	514.528	1,021.737	37.618	-	-	80



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	28.361	28.449	28.511	28.549	28.561	28.549
EXISTING GROUND BYPASS	25.936	25.944	25.949	25.944	25.939	25.946	25.954	25.951	25.975	25.987	25.975	25.957	25.952	25.985	25.975	25.948	25.927	25.915
HORIZONTAL CURVATURE	R=3500																	
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.																	

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JAPAN INTERNATIONAL COOPERATION AGENCY

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

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

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

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

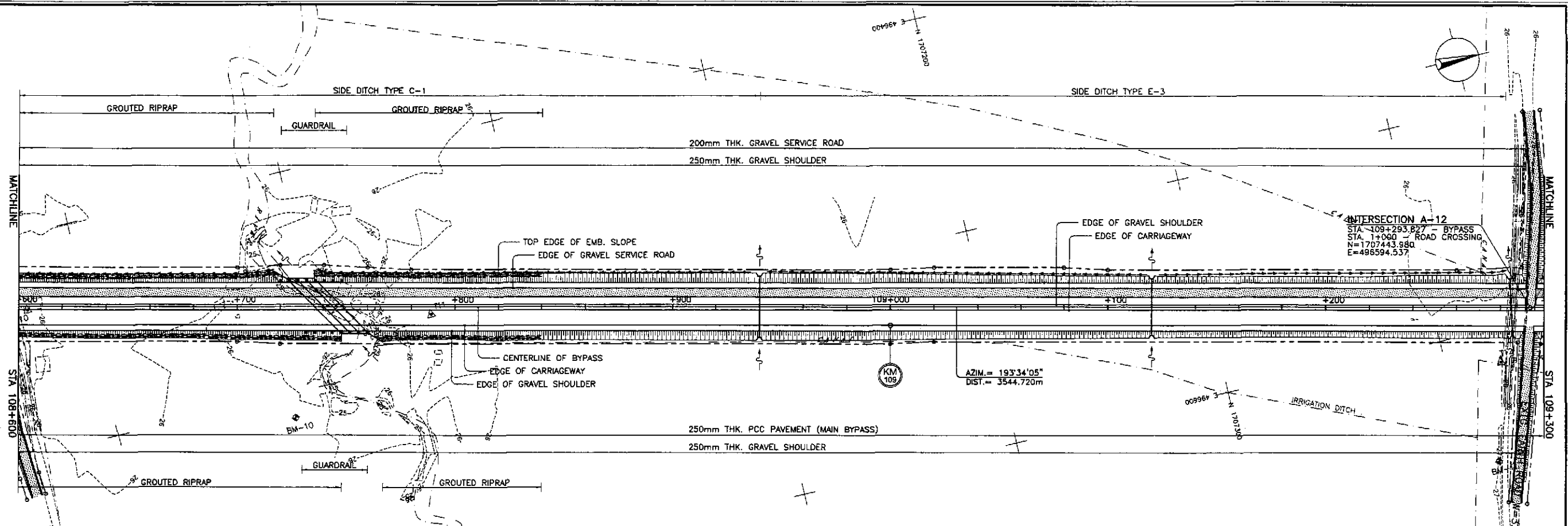
SHEET CONTENTS: PLAN AND PROFILE ALONG BYPASS (INITIAL STAGE) STA. 107+900 - STA. 108+600

SHEET NO.: RP-12

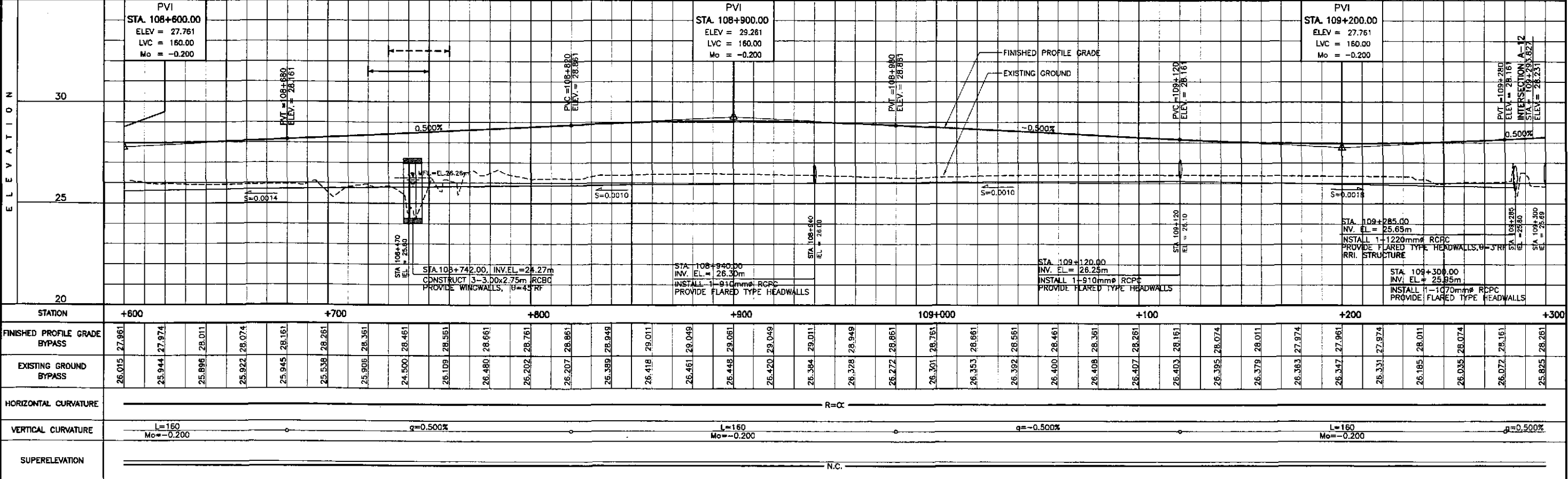
DESIGNED: 9/27/02  
CHECKED: 10/15/02  
SUBMITTED: 10/16/02

DATE: 9/27/02  
SIGNATURE: S. G. G. G.

PROJECT DIRECTOR: DANILO C. TRAJANO  
CHIEF, HIGHWAYS DIVISION: JOSEFINA M. ALAGAR  
D/C, DIRECTOR IV: GILBERTO S. REYES  
UNDERSECRETARY: MANUEL M. BONDAN  
SECRETARY: SIMEON A. DATUMANONG



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 rice paddy 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
EXISTING GROUND BYPASS	26.015	25.944	25.896	25.922	25.945	25.938	25.906	25.825
HORIZONTAL CURVATURE	R=∞							
VERTICAL CURVATURE	L=160 Mo=-0.200		q=0.500%		L=160 Mo=-0.200		q=-0.500%	
SUPERELEVATION	N.C.							

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INTERNATIONAL

**YEO**  
YACHIYO ENGINEERING CO., LTD.

REPUBLIC OF THE PHILIPPINES  
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

BUREAU OF DESIGN

OFFICE OF THE SECRETARY

Submitted By: **DANLO C. TRAJANO**, Project Director

Reviewed By: **JOSEFINA M. ALAGAR**, Chief, Highways Division

Recommended By: **GILBERTO S. REYES**, OIC, Director IV

Approved By: **MANUEL M. BONDUAN**, Undersecretary

Approved By: **SIMEON A. DATUMANONG**, Secretary

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

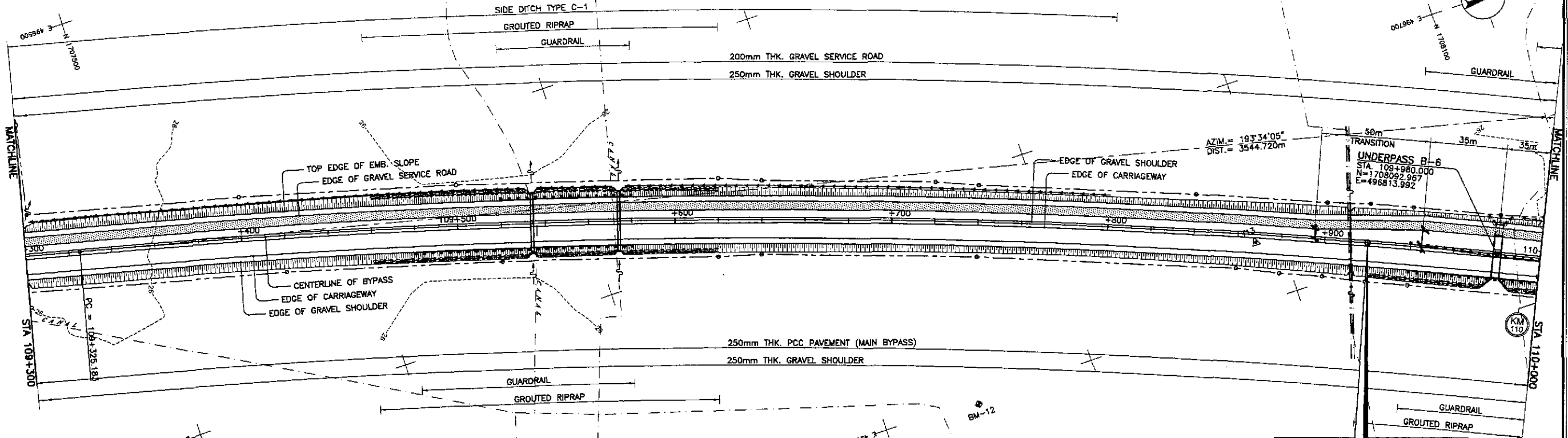
**CABANATUAN BYPASS - CONTRACT PACKAGE I**

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

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

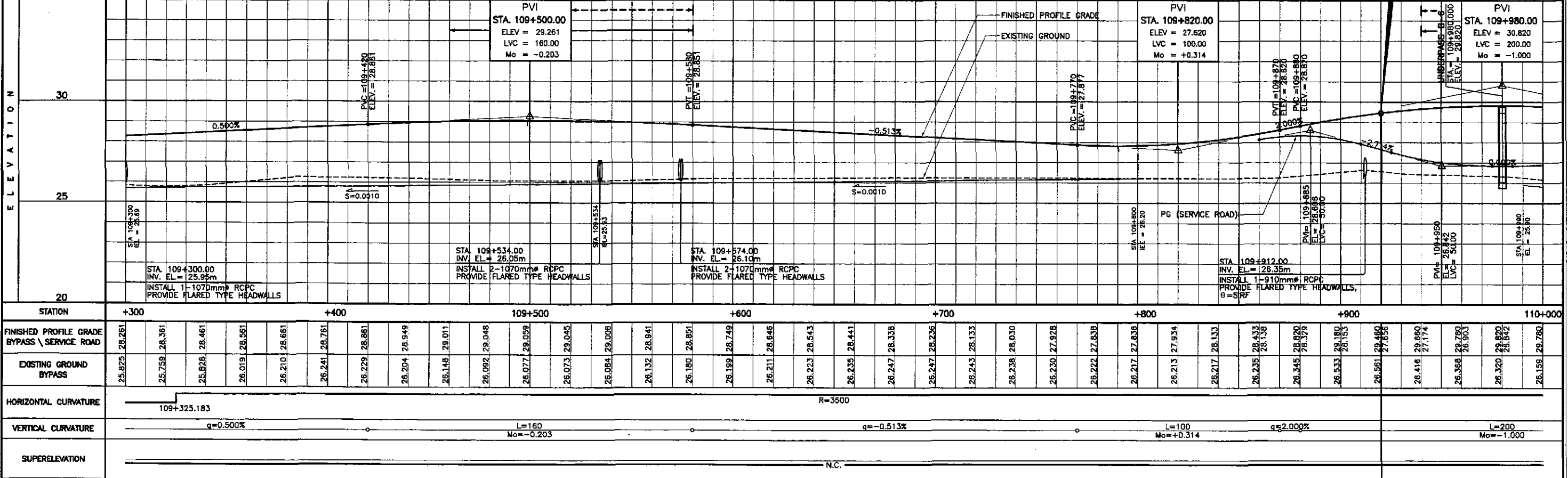
SHEET NO. :  
**RP-13**

ELEMENTS OF CURVE											
PI NO.	STATION	COORDINATES		Δ	R	T	Lc	E	e%	e%	V(kph)
		NORTHING	EASTING								
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

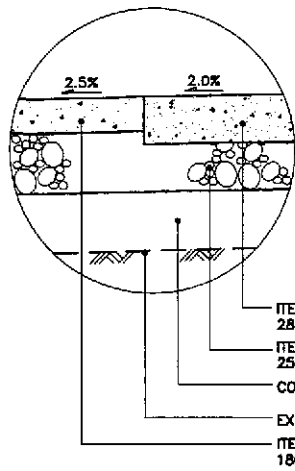


**CABANATUAN BYPASS**  
**END OF**  
**CONTRACT PACKAGE I**  
**BEG. OF CONTRACT PACKAGE II**  
 STA. 109+920.00  
 ELEV. = 29.460  
 N = 1,708,038.069  
 E = 496,789.783

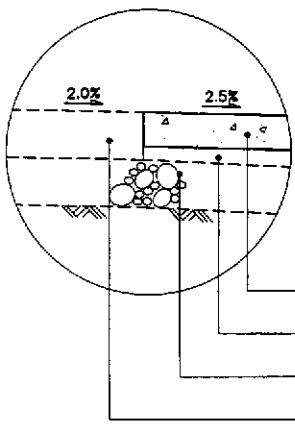
REFERENCE POINTS				
REF. PT.	NORTHING	EASTING	ELEV.	DESCRIPTION
BM-11	1,707,413.404	496,659.842	27.220	Right side of the road alignment, placed on the top bank of irrigation canal 1.20m from the CL.
BM-12	1,707,844.454	496,802.502	27.148	Right side of the road alignment, placed on the side of a ricefield owned by Mr. Alejo Villarreal.
BM-13	1,708,291.751	496,799.903	26.856	Right side of the road alignment, placed on the side of a ricefield under a pholans of trees.



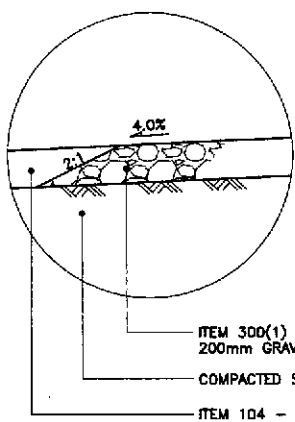
	DATE: 9/27/02 DESIGNED: [Signature] CHECKED: 10/15/02 SUBMITTED: 10/16/02	P.I.H.L. - PMO Submitted By: DANILO C. TRAJANO Project Director	BUREAU OF DESIGN Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	OFFICE OF THE SECRETARY Recommended By: GILBERTO S. REYES D.C., Director IV	PROJECT AND LOCATION: THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinarid, Cabanatuan and San Jose Bypasses) <b>CABANATUAN BYPASS - CONTRACT PACKAGE I</b>	SCALE: HORIZONTAL: 1:1000 VERTICAL: 1:100 FULL SIZE A1	SHEET CONTENTS: <b>PLAN AND PROFILE</b> ALONG BYPASS (INITIAL STAGE) STA. 109+300 - STA. 109+920	SHEET NO.: <b>RP-14</b>
	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				Approved By: MANUEL M. BONDAN Undersecretary	Approved By: SIMEDN A. DATUMANONG Secretary		
	JICA JAPAN INTERNATIONAL COOPERATION AGENCY				PROJECT AND LOCATION: CABANATUAN BYPASS - CONTRACT PACKAGE I			



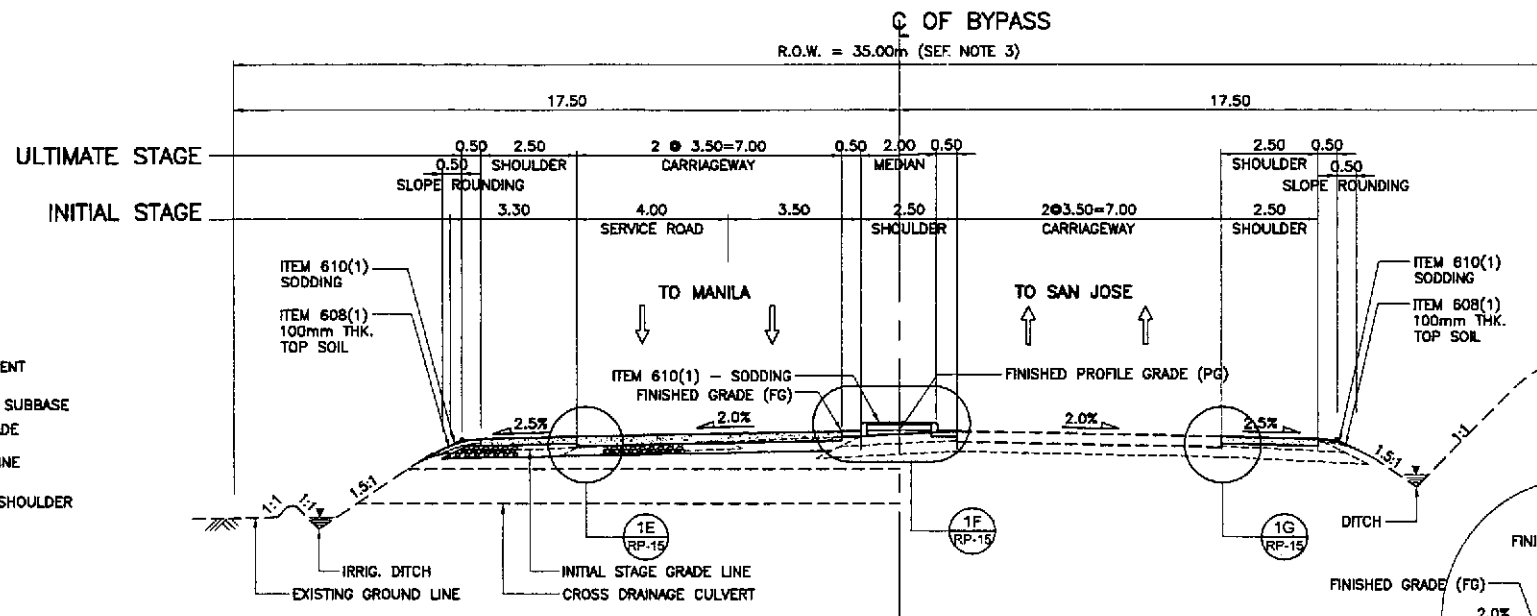
1E DETAIL  
RP-15 SCALE 1:20



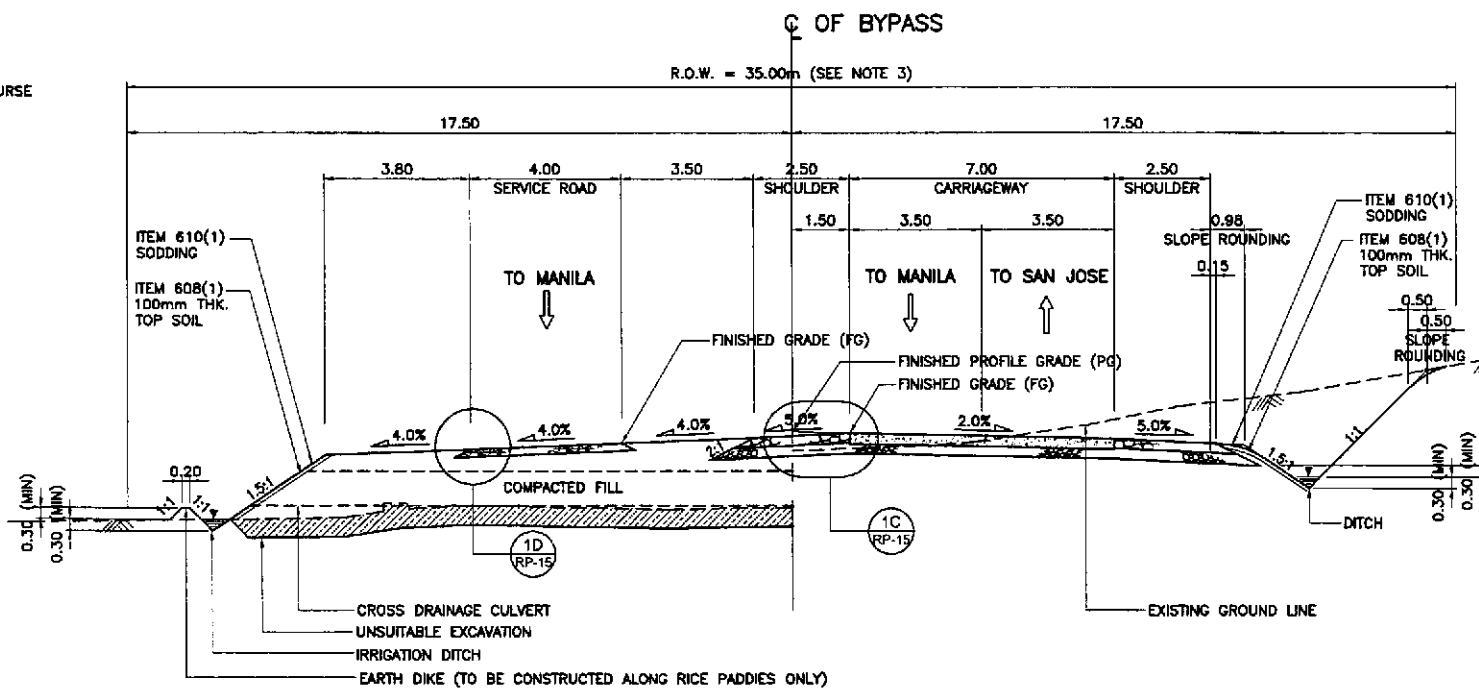
1G DETAIL  
RP-15 SCALE 1:20



1D DETAIL  
RP-15 SCALE 1:20



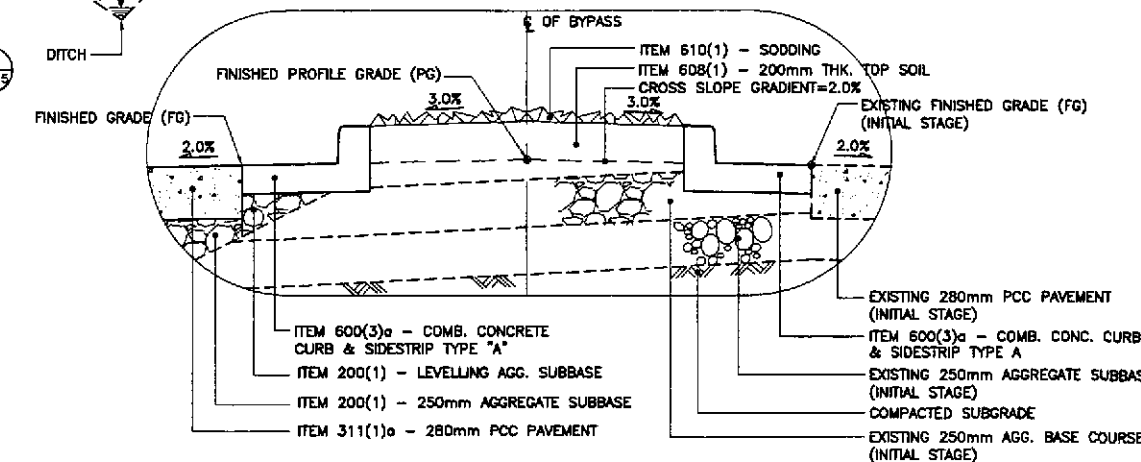
1B NORMAL SECTION - ULTIMATE STAGE  
RP-15 SCALE 1:100



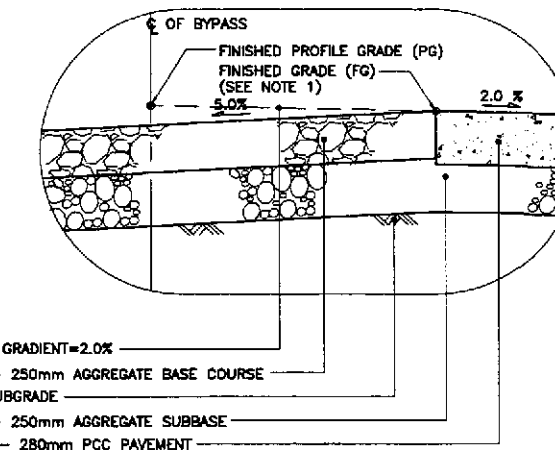
1A NORMAL SECTION - INITIAL STAGE  
RP-15 SCALE 1:100

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

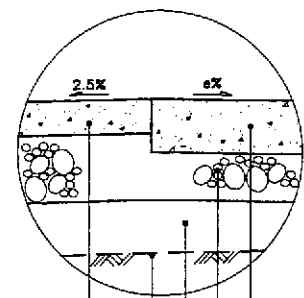
- NOTES:
1. FINISHED PROFILE GRADE (PG) ALONG BYPASS IS TAKEN FROM THE CENTERLINE WHEREAS FINISHED GRADE (FG) IS RECKONED FROM THE PROFILE GRADE RELATIVE TO THE PAVEMENT CROSS SLOPE.
  2. FOR SCHEDULE OF QUANTITIES, SEE SHEET NOS. GC-10 TO GC-11.
  3. ROAD RIGHT-OF-WAY (R.O.W.) WIDTH SHALL BE VARIED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



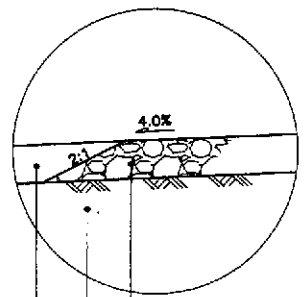
1F DETAIL  
RP-15 SCALE 1:20



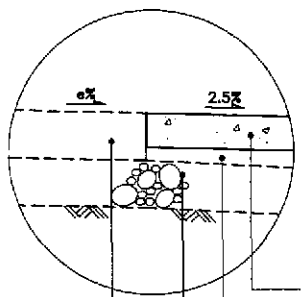
1C DETAIL  
RP-15 SCALE 1:20



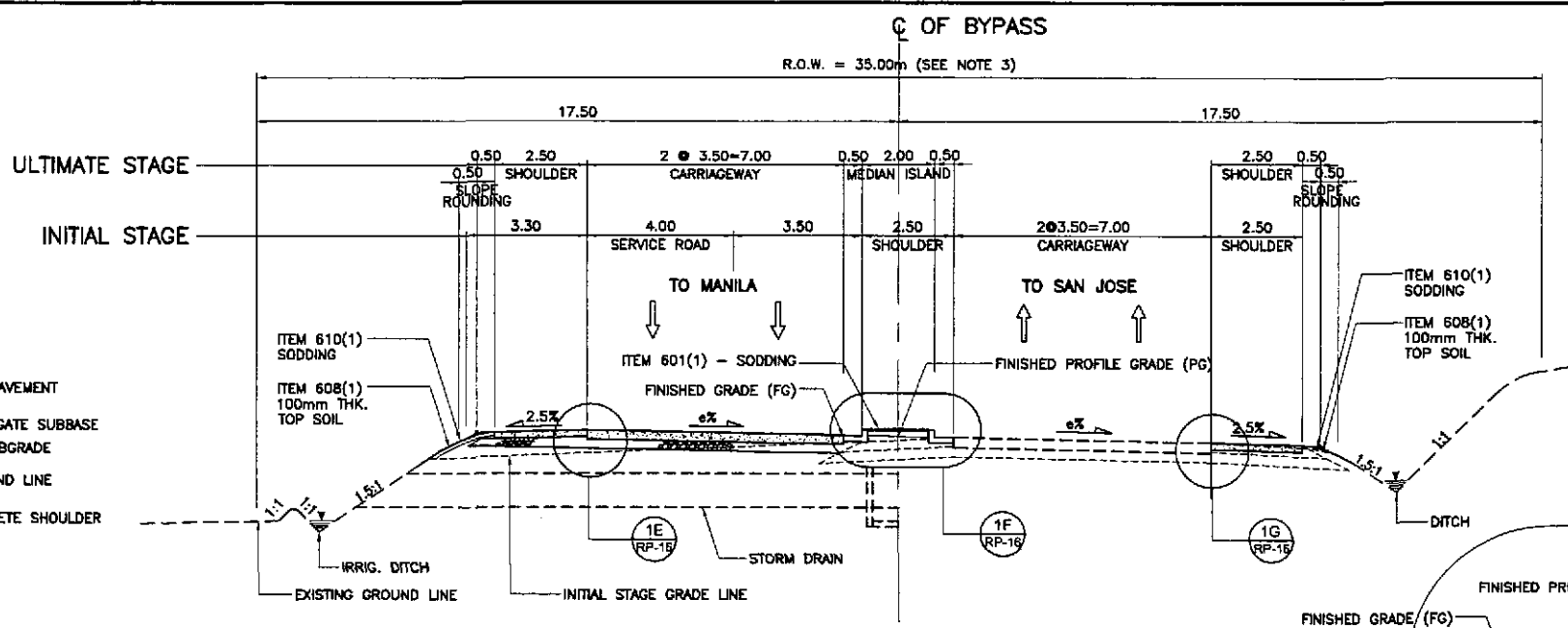
1E DETAIL  
RP-16 SCALE 1:20



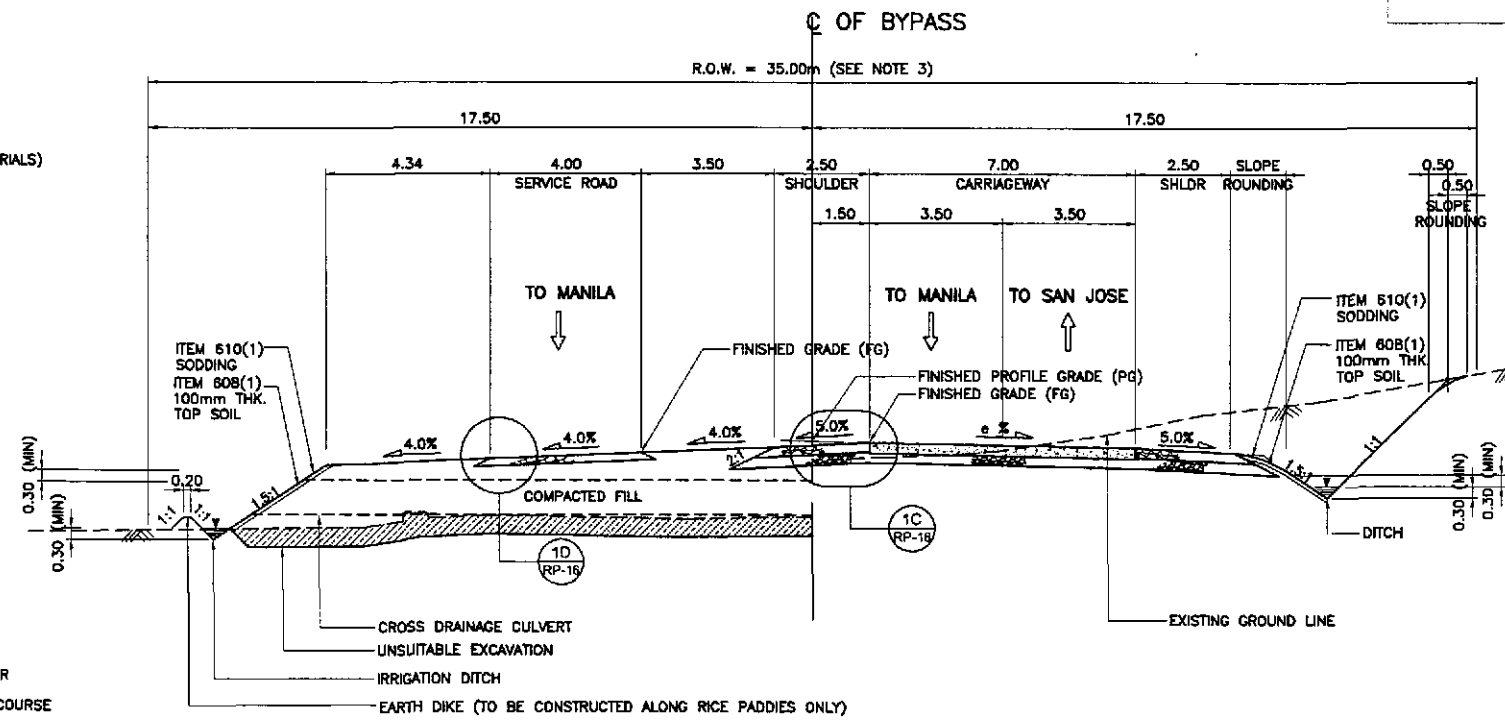
1D DETAIL  
RP-16 SCALE 1:20



1G DETAIL  
RP-16 SCALE 1:20



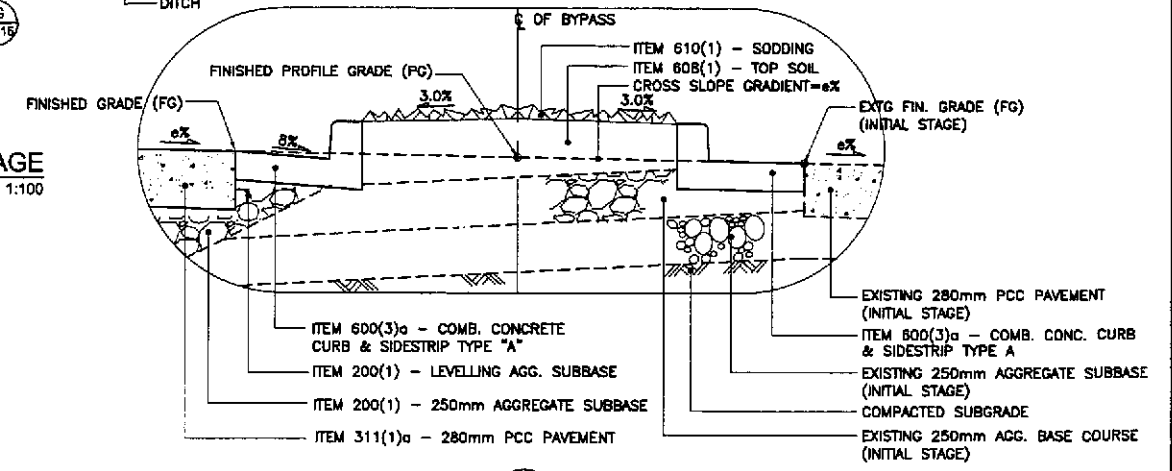
1B SUPERELEVATED SECTION - ULTIMATE STAGE  
RP-16 SCALE 1:100



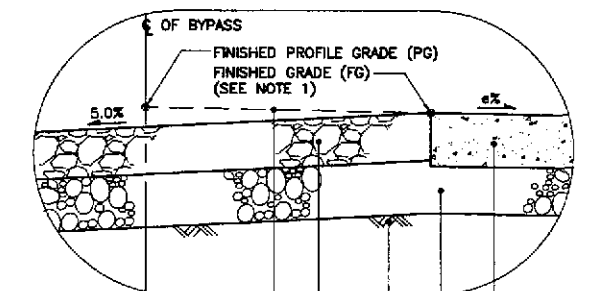
1A SUPERELEVATED SECTION - INITIAL STAGE  
RP-16 SCALE 1:100

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

PAVEMENT DESIGN PARAMETERS	
	BEFORE PAMPANGA BRIDGE
1. TRAFFIC ( FOR 25 YEARS DESIGN LIFE ) DESIGN ESAL	2.30 x 10 <sup>6</sup>
2. DESIGN CBR SUBGRADE CBR	5.00 %
3. ROADBED RESILIENT MODULUS M <sub>R</sub> E <sub>SB</sub> E <sub>BS</sub>	5,500 psi = 37.92 MPa 13,000 psi = 89.64 MPa 23,000 psi = 158.58 MPa
4. PERFORMANCE CRITERIA Δ PSI	2
5. DESIGN RELIABILITY Z <sub>R</sub> S <sub>o</sub>	50 % 0.35
6. DRAINAGE COEFFICIENT RIGID	1
7. LAYER COEFFICIENT a <sub>1</sub> ( FOR AC ) a <sub>2</sub> ( FOR BASE ) a <sub>3</sub> ( FOR SUBBASE )	0.39 0.105 0.095
8. PAVEMENT CONSTRUCTION THICKNESS PCCP SUBBASE	280mm THK 250mm THK



1F DETAIL  
RP-16 SCALE 1:20



1C DETAIL  
RP-16 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 SEPARATIONS 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.

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	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. : <b>RP-16</b>
	CHECKED	10/15/02	S. ROSE		PUBL. - PMD Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV				