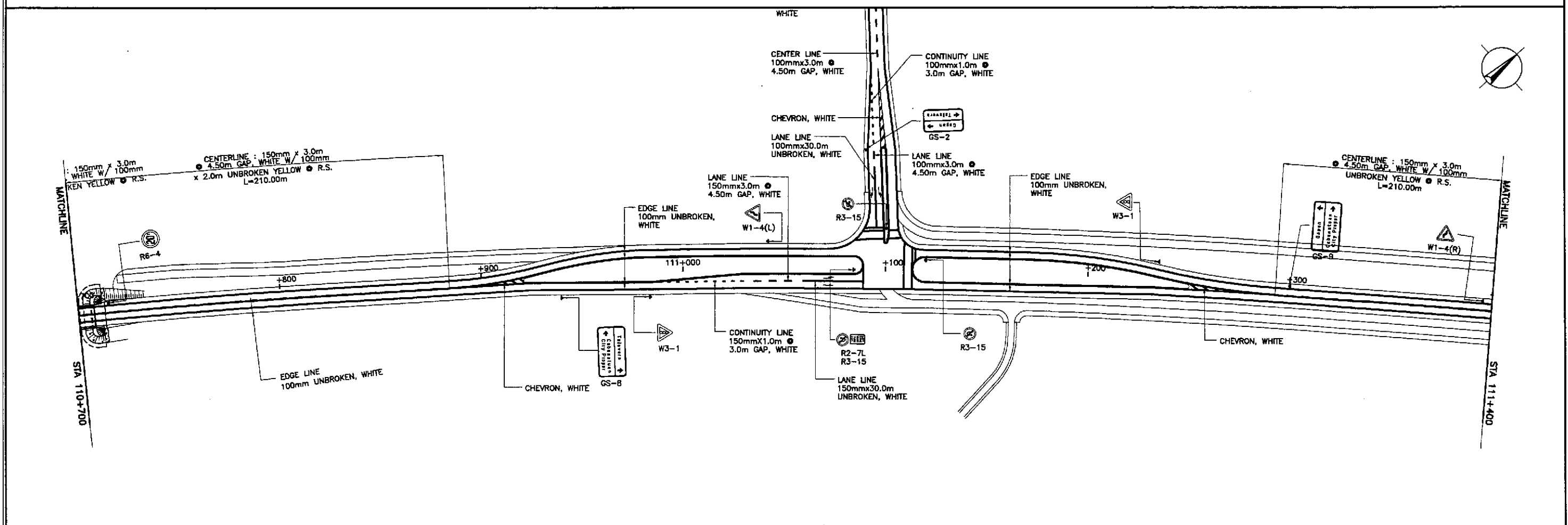
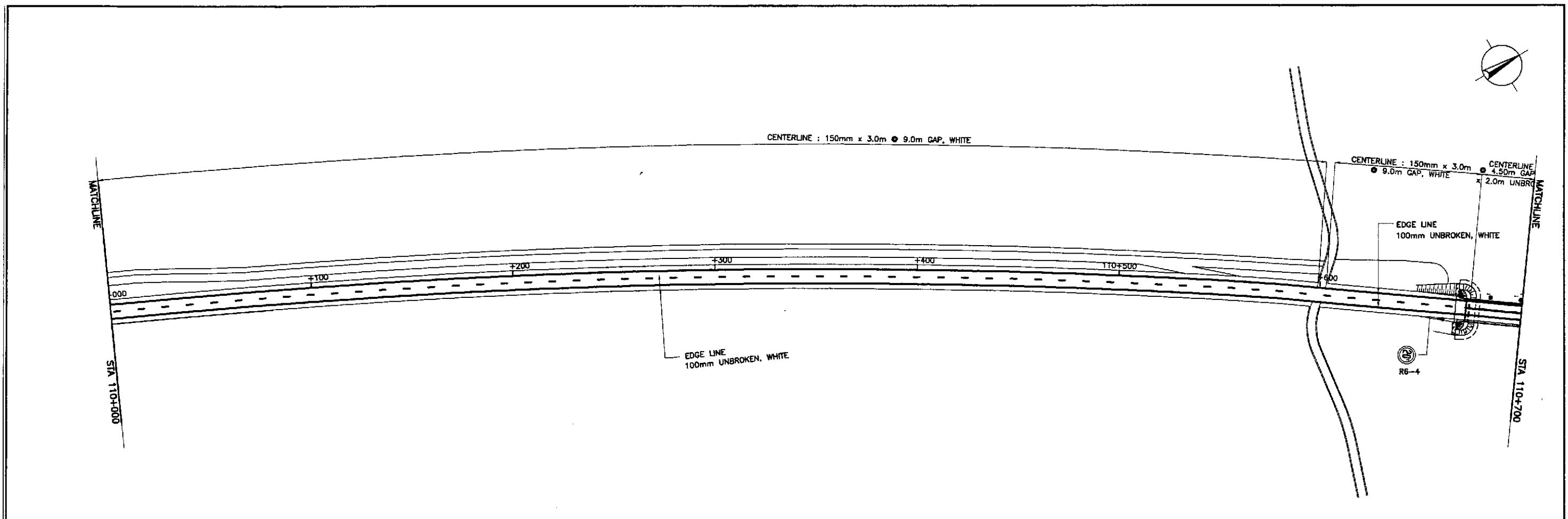
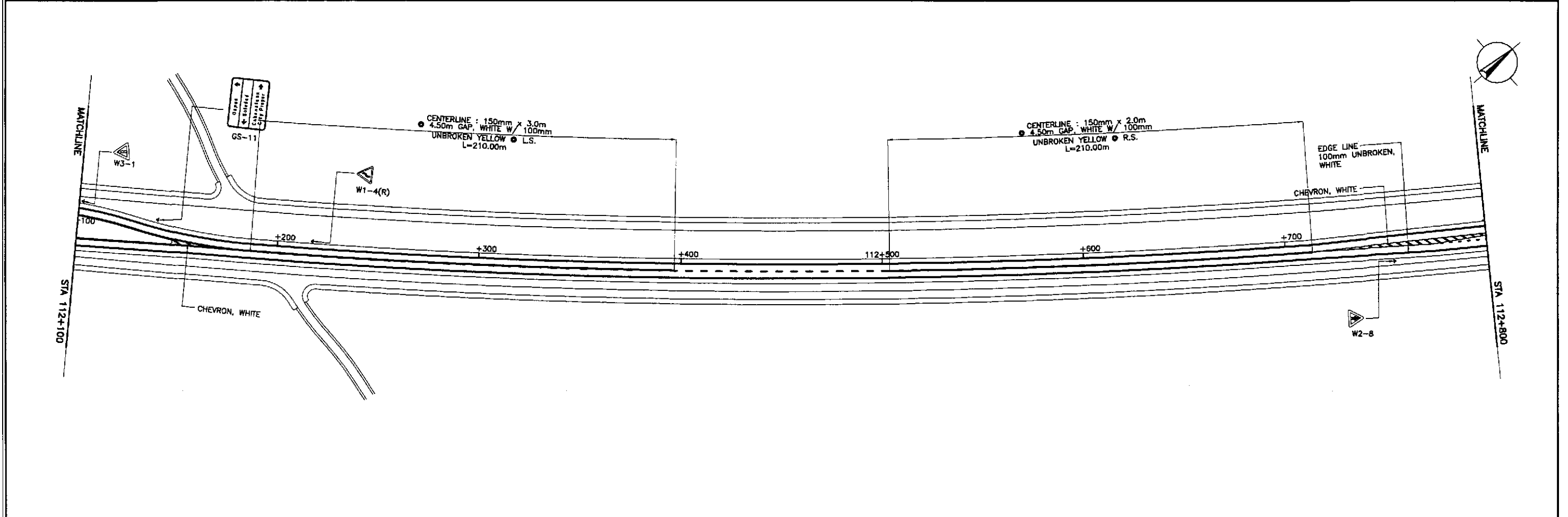
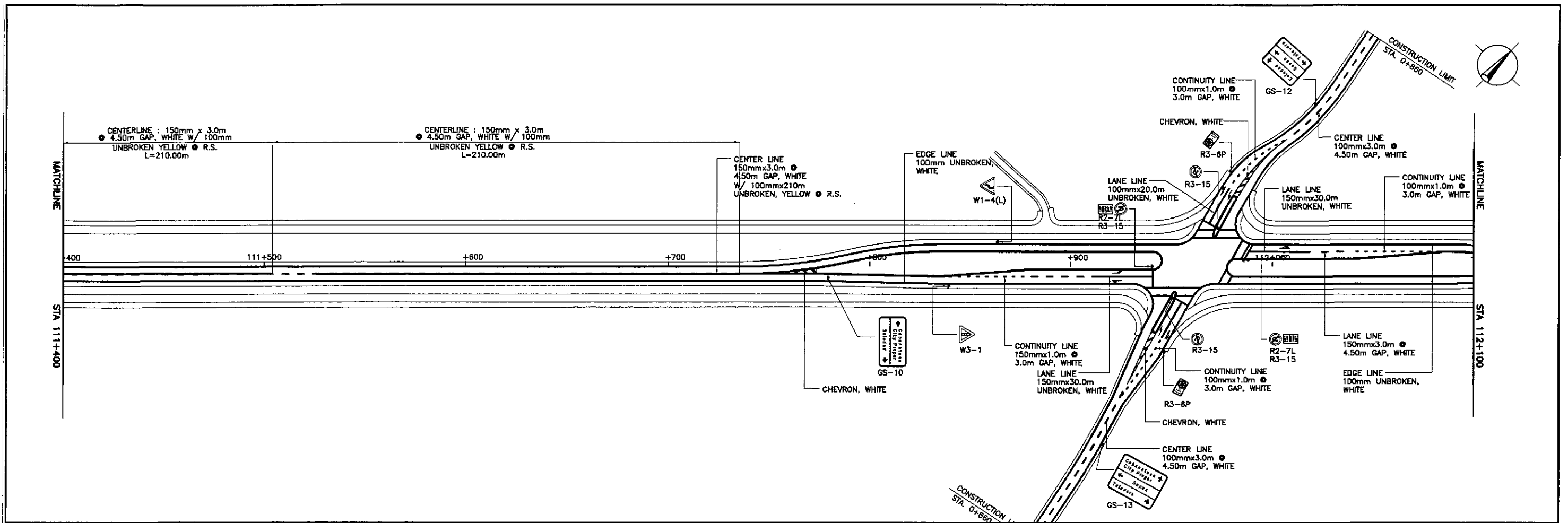


**CABANATUAN BYPASS
BEGINNING OF
CONTRACT PACKAGE II
END OF CONTRACT PACKAGE I**
STA. 109+920
ELEV. = 29.46
N = 1,708,038.069
E = 496,789.783

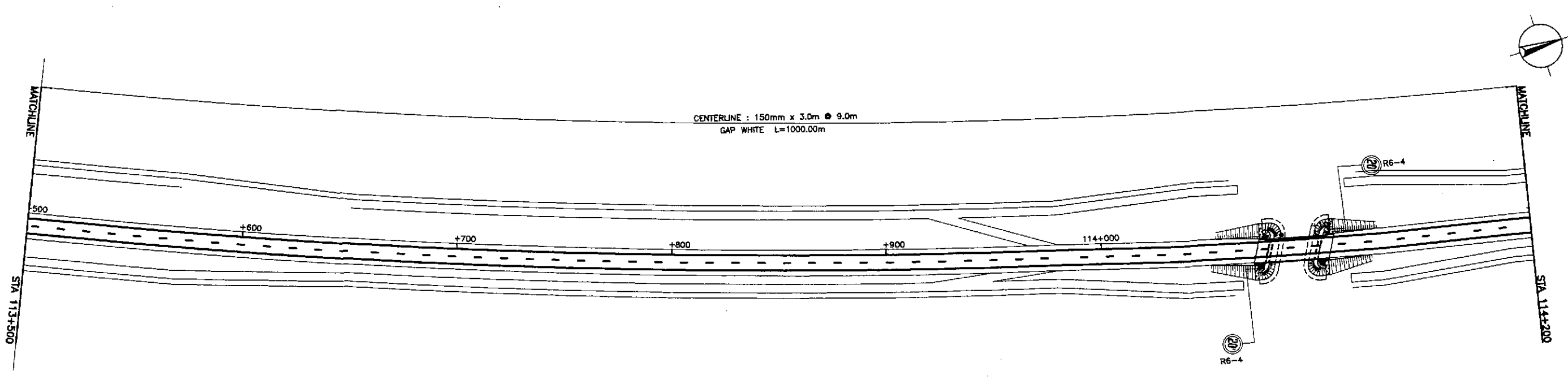
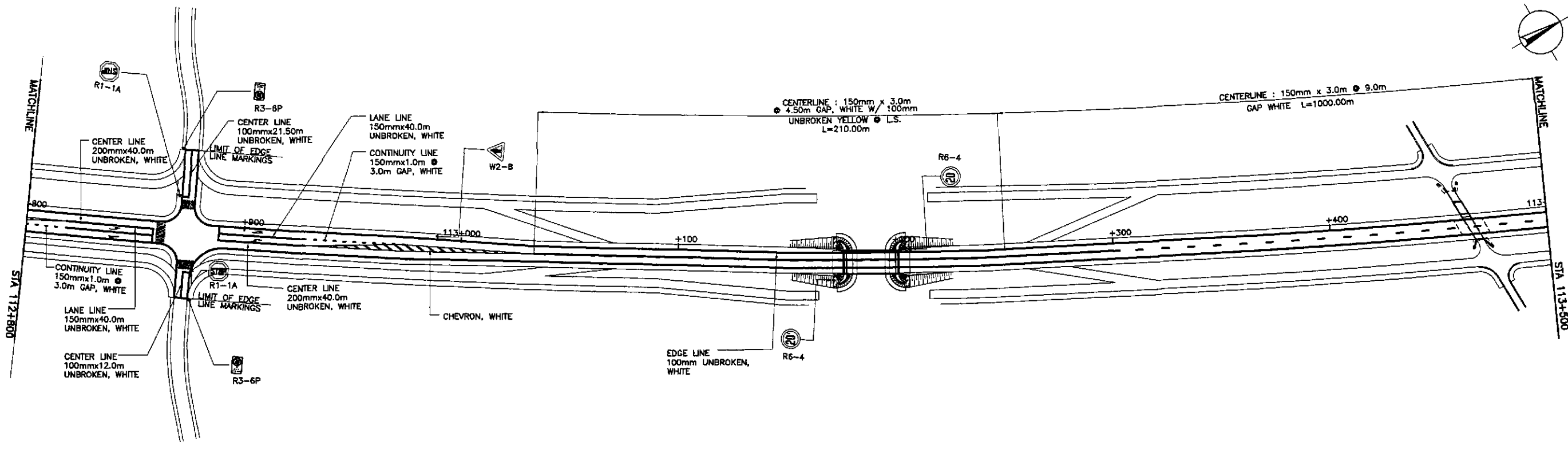
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	CHECKED	10/16/02			Submitted By:	Reviewed By:	Recommended By:	Approved By:				
	SUBMITTED	10/18/02			DANILO C. TRAJAND Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary				



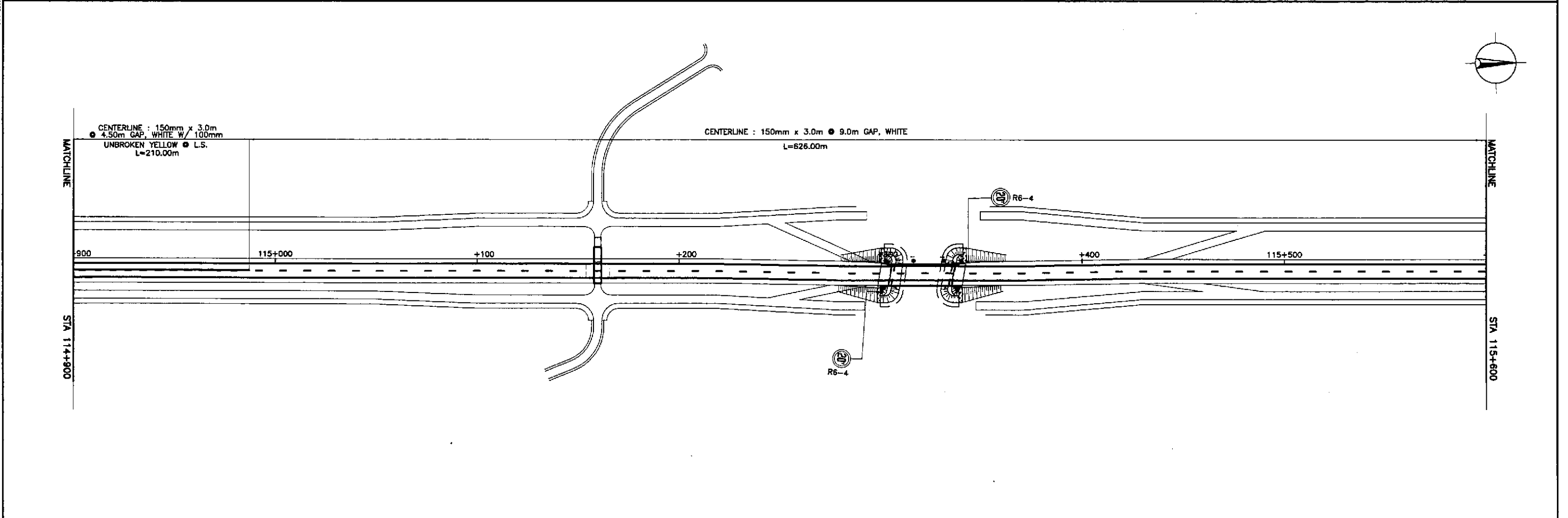
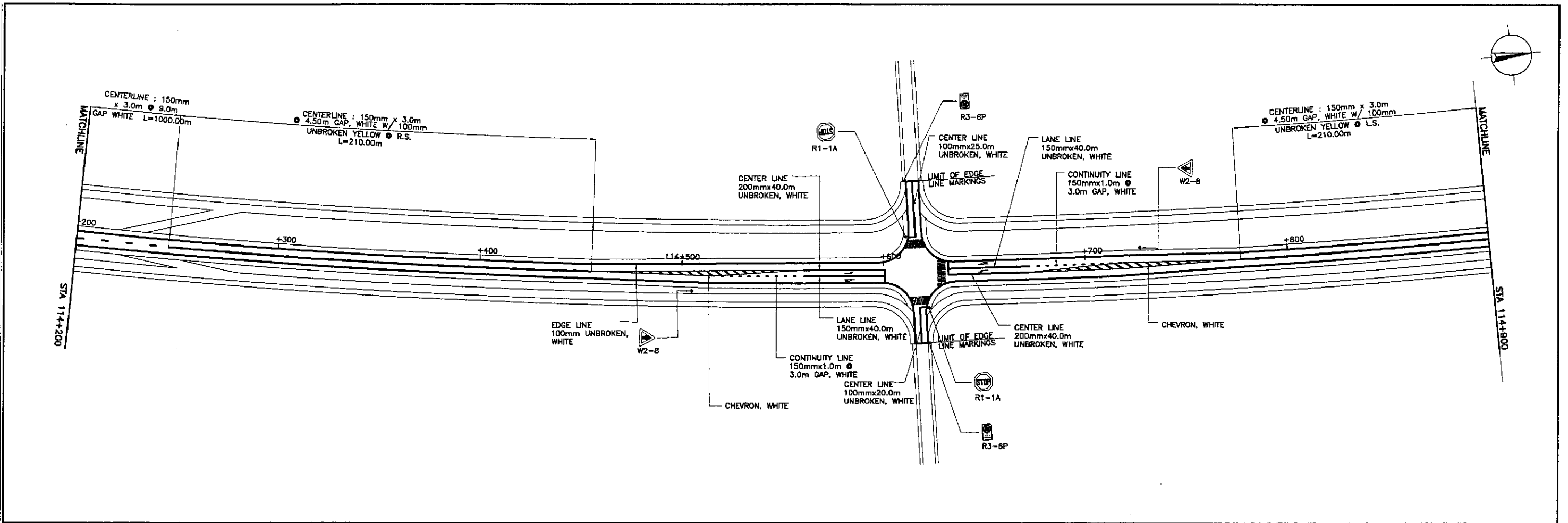
	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridei, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT (INITIAL STAGE) STA. 110+000 - STA. 111+400	SHEET NO. : RM-02
	CHECKED	10/14/02	S. LUNA	Submitted By:	Reviewed By:	Recommended By:				
	SUBMITTED	10/17/02	S. GUSE	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES Dir., Director IV				
			TEAM LEADER		Approved By:	Approved By:				



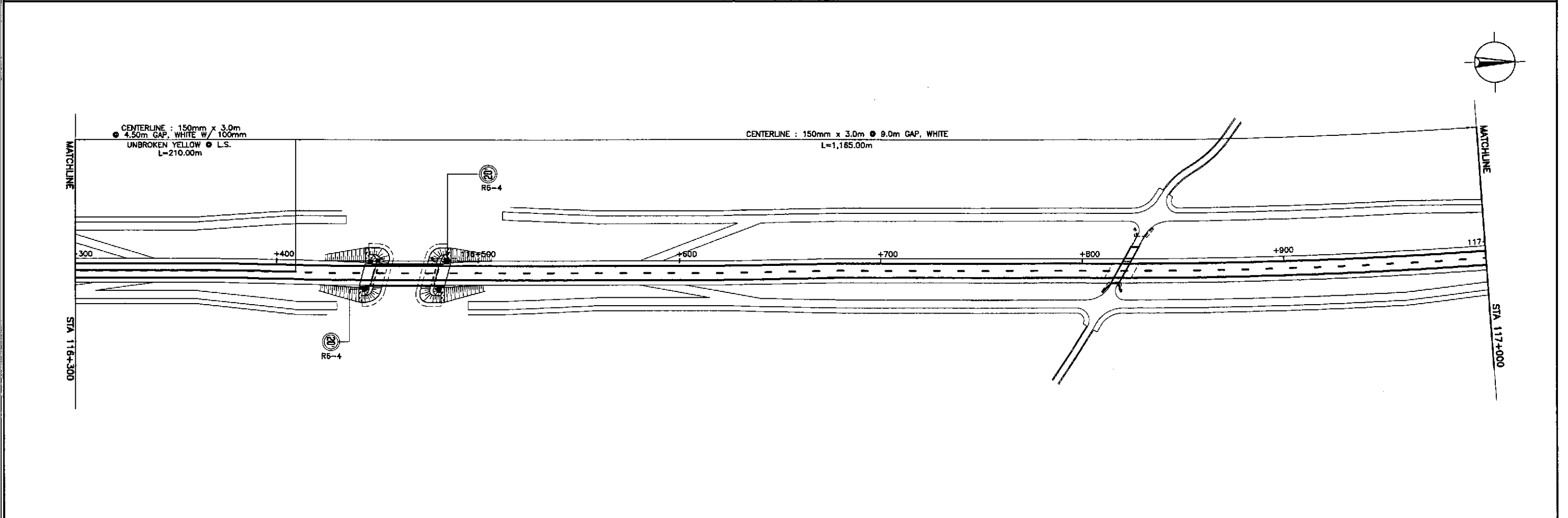
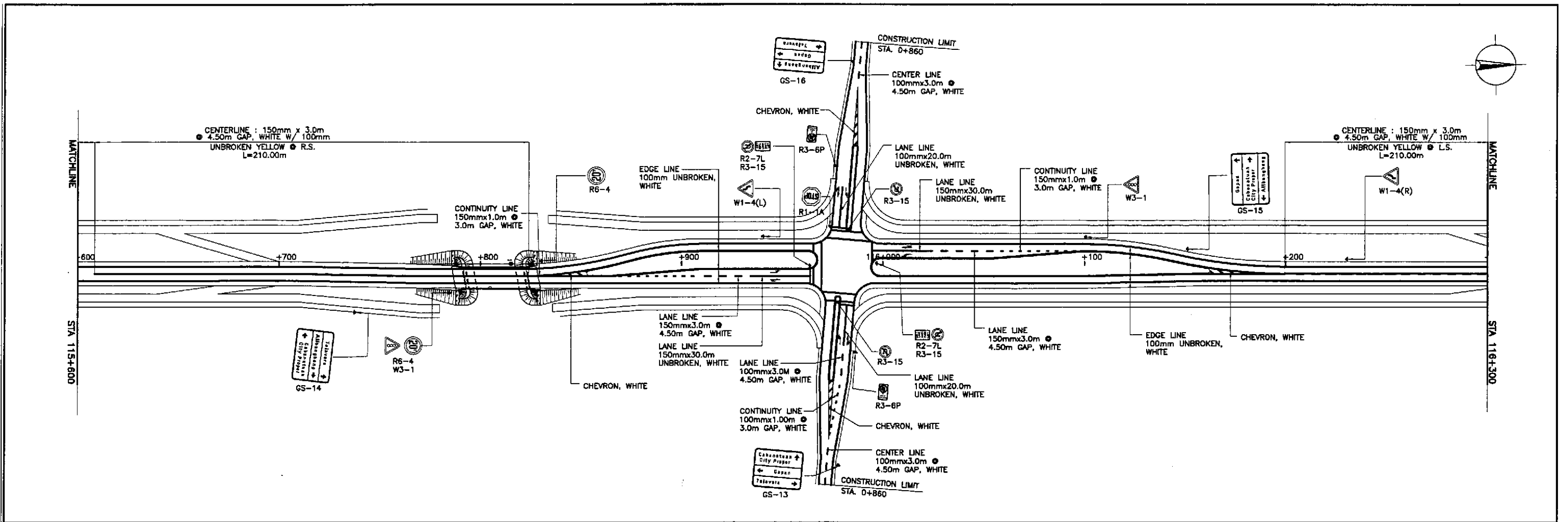
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	CHECKED	10/16/02	<i>S. Gese</i>		Submitted By:	Reviewed By:	Recommended By:	Approved By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	1:1000	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT (INITIAL STAGE) STA. 111+400 - STA. 112+800	RM-03
	SUBMITTED	10/18/02	<i>M. B. ...</i>		DAHILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highway Division	GILBERTO S. REYES Dir. Director IV	MANUEL M. BONGAN Undersecretary				



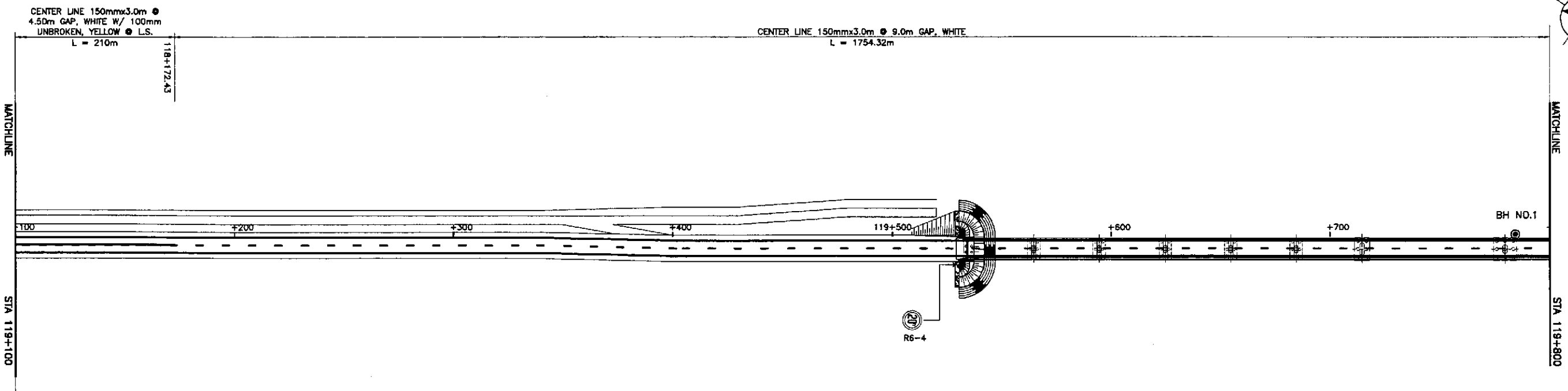
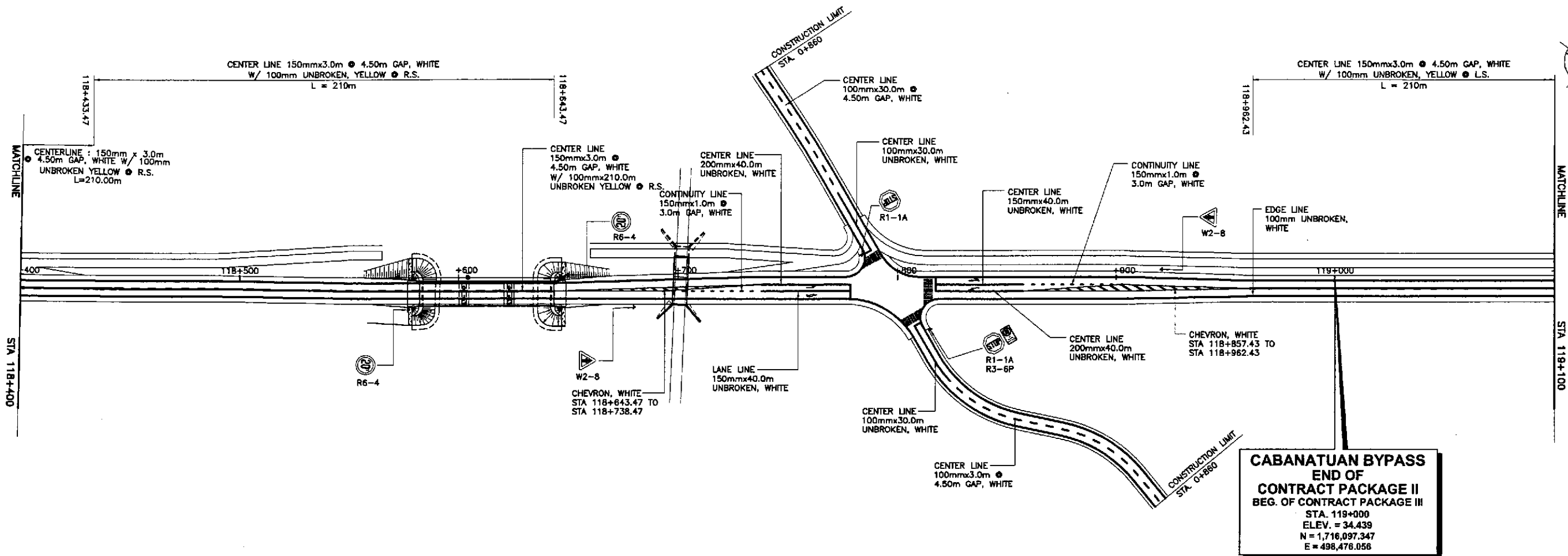
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	CHECKED	10/16/02	<i>[Signature]</i>								
	SUBMITTED	10/18/02	<i>[Signature]</i>	OFFICE OF THE SECRETARY Approved By: SIMEON A. DATUMANONG, Secretary							



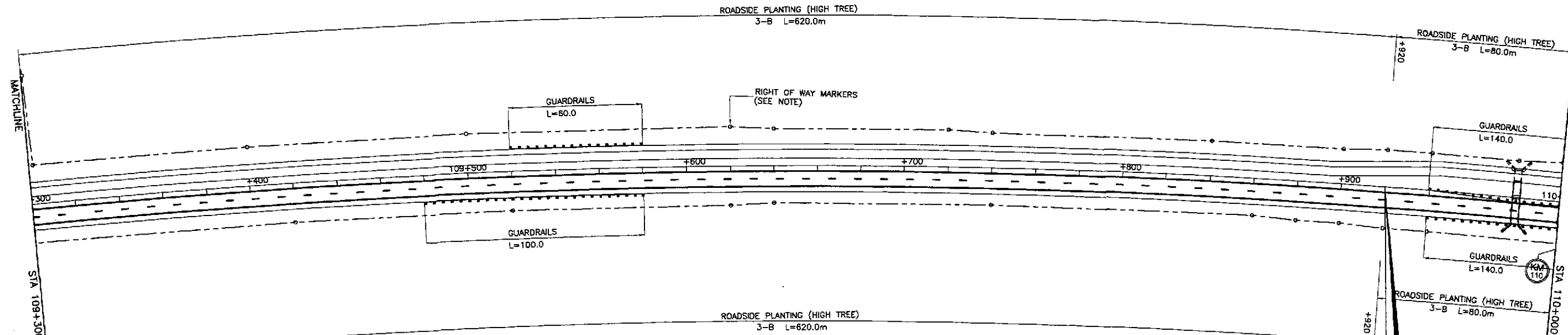
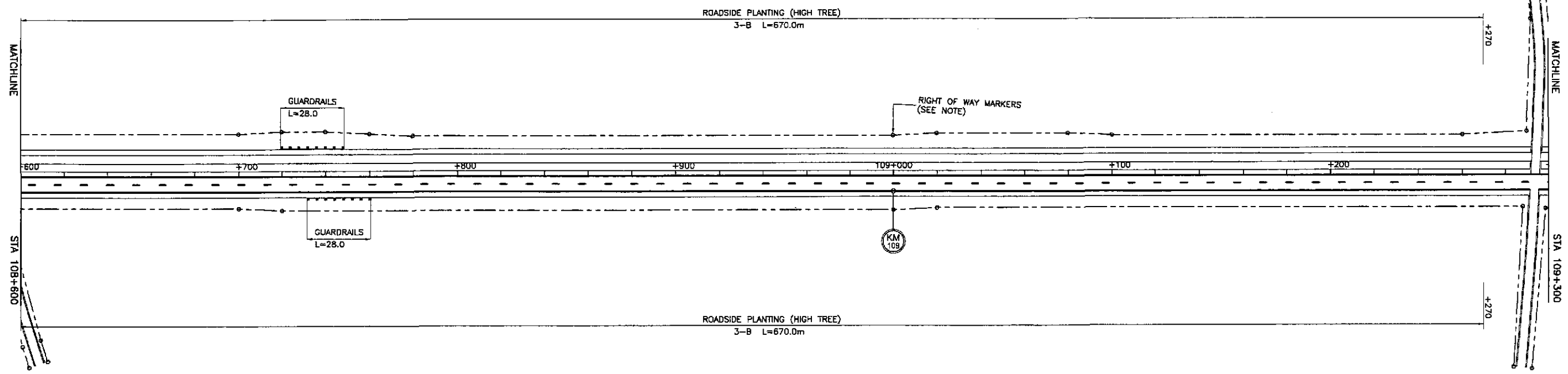
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	CHECKED	10/16/02	<i>[Signature]</i>		P.J.H. - PMO Submitted By:	BUREAU OF DESIGN Reviewed By:	OFFICE OF THE SECRETARY Recommended By:				
	SUBMITTED	10/19/02	<i>[Signature]</i>		DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV				



	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	<i>S. GASE</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)	1:1000	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT (INITIAL STAGE) STA. 115+600 - STA. 117+000	RM-06
	SUBMITTED	10/18/02	<i>M. BONDAN</i>	OFFICE OF THE SECRETARY			CABANATUAN BYPASS - CONTRACT PACKAGE II			
Submitted By:		Reviewed By:		Recommended By:		Approved By:				
DANILO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES Dir., Director IV		MANUEL M. BONDAN Undersecretary		SIMEON A. DATUMANONG Secretary		



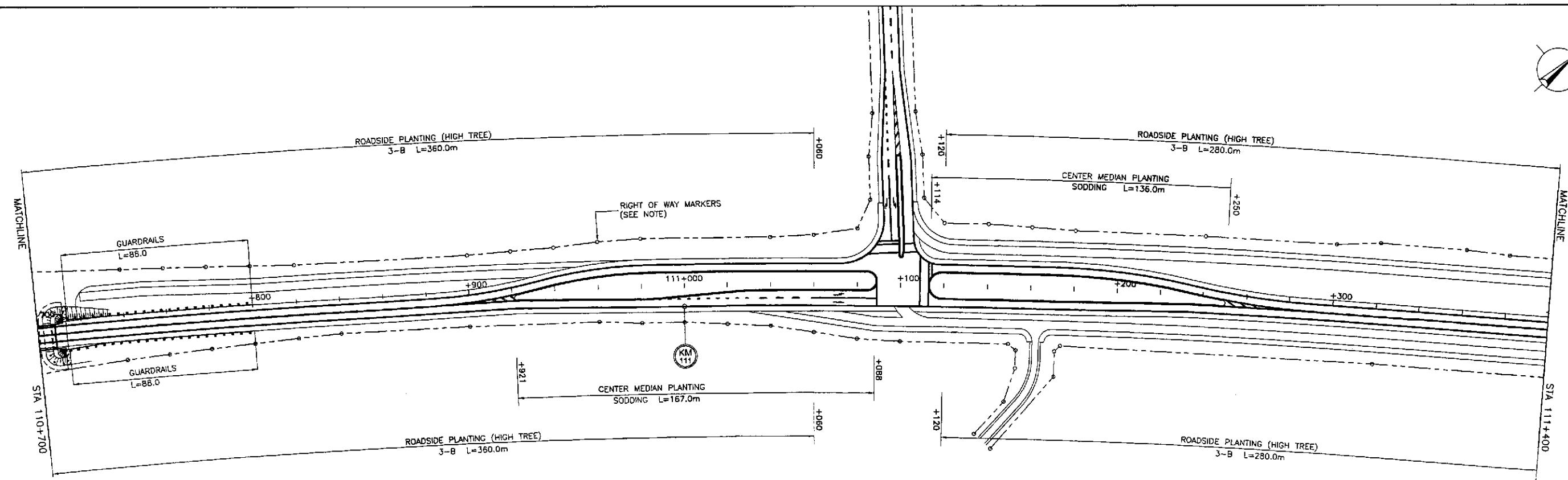
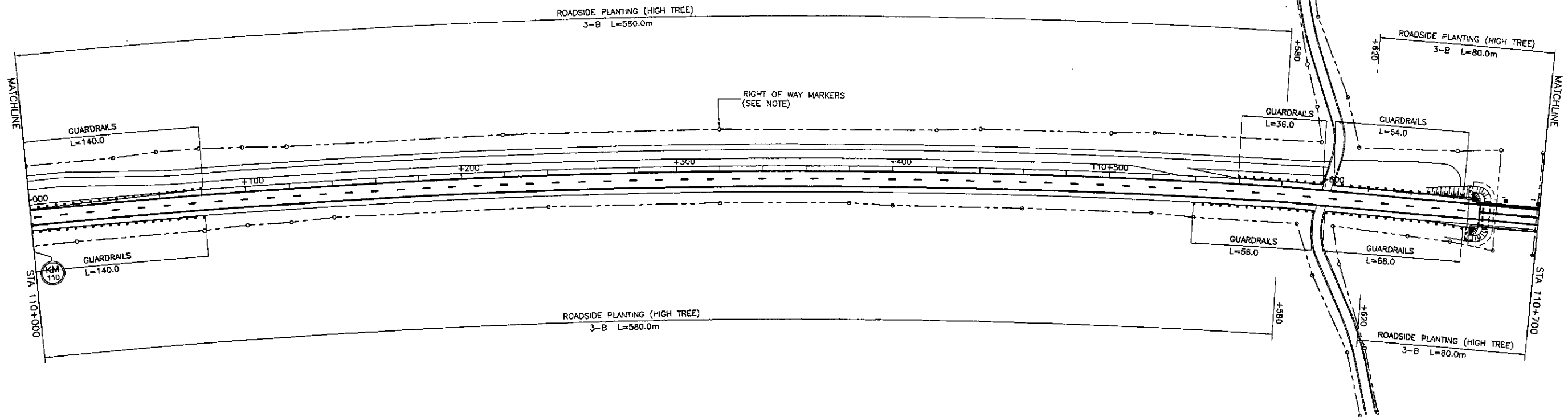
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	CHECKED	10/16/02	S. LUNA	BUREAU OF DESIGN			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:1000	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT (INITIAL STAGE) STA. 118+400 - STA. 119+000	RM-08
	SUBMITTED	10/18/02	M. YUICHI	Submitted By:	Reviewed By:	Recommended By:	CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANGONG Secretary			



**CABANATUAN BYPASS
BEGINNING OF
CONTRACT PACKAGE II
END OF CONTRACT PACKAGE I**
 STA. 109+920
 ELEV. = 29.46
 N = 1,708,038.069
 E = 496,789.783

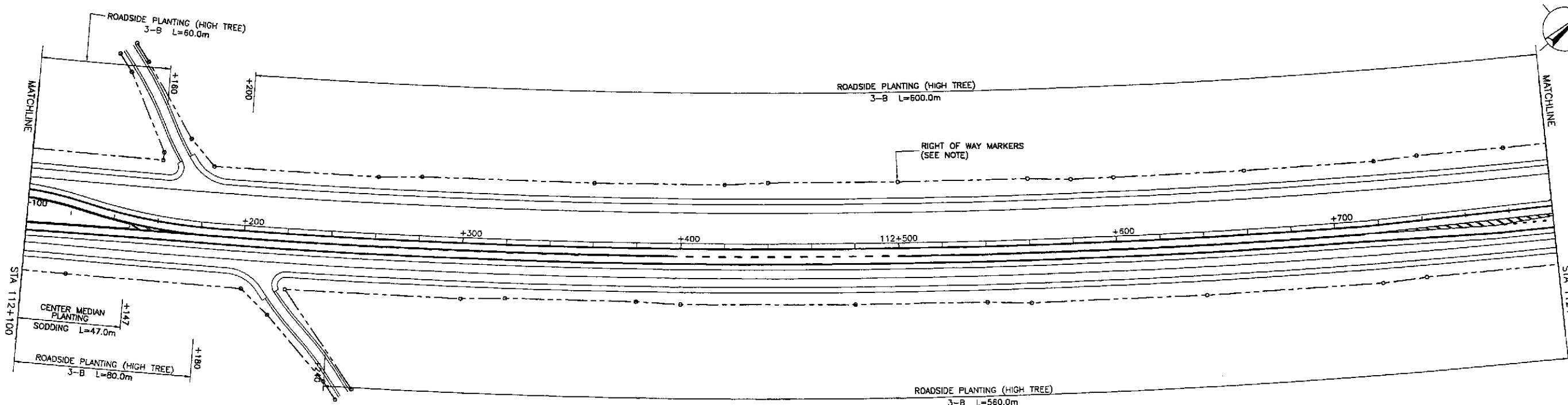
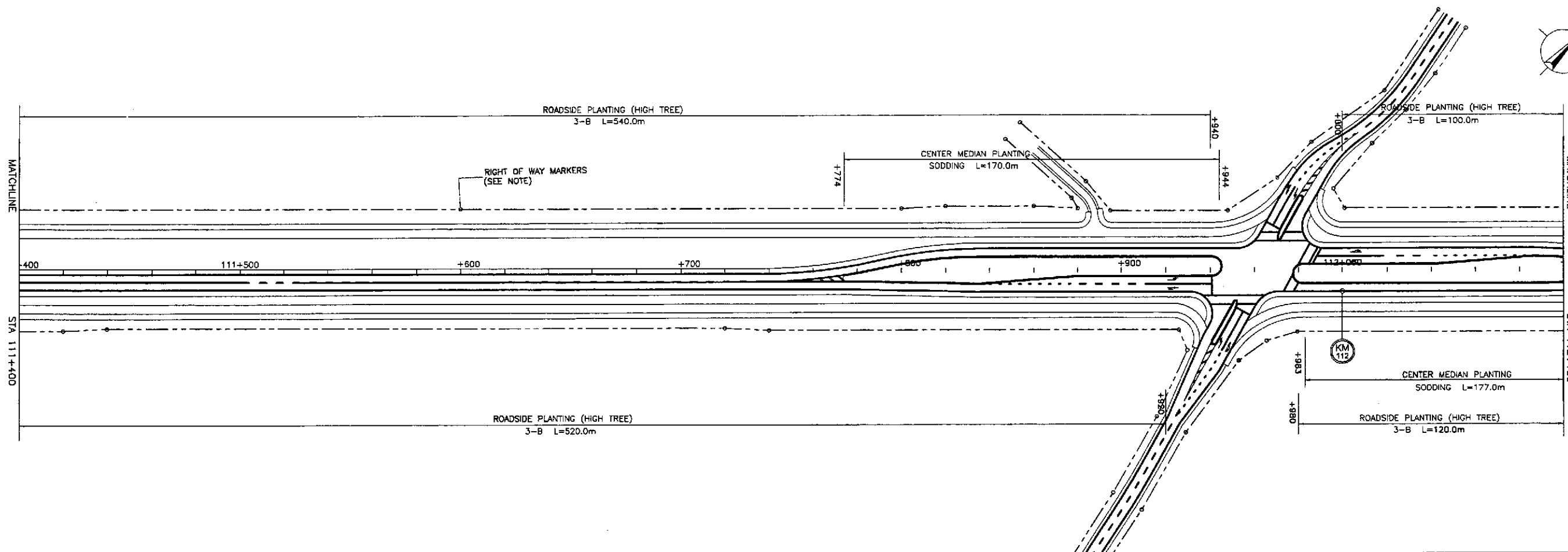
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/11/02	S. LUNA	BUREAU OF DESIGN				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 II	1:1000	PLANTINGS, GUARDRAILS, RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 109+920 - STA. 110+000	RM-09
	CHECKED	10/16/02	S. ROSE	Submitted By:	Reviewed By:	Recommended By:	Office of the Secretary				
	SUBMITTED	10/23/02	M. RIVERA	DANILO C. TRAJAND Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES DIC, Director IV	MANUEL M. BONDAN Undersecretary				
			PROJECT AND LOCATION : CABANATUAN BYPASS - CONTRACT PACKAGE II				FULL SIZE A1				



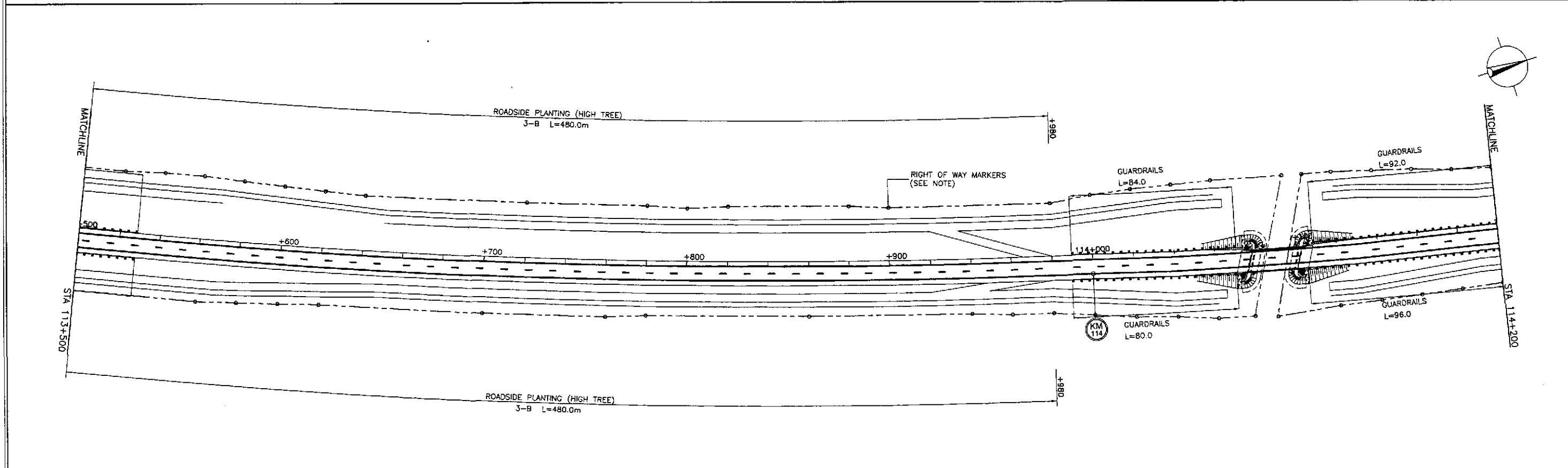
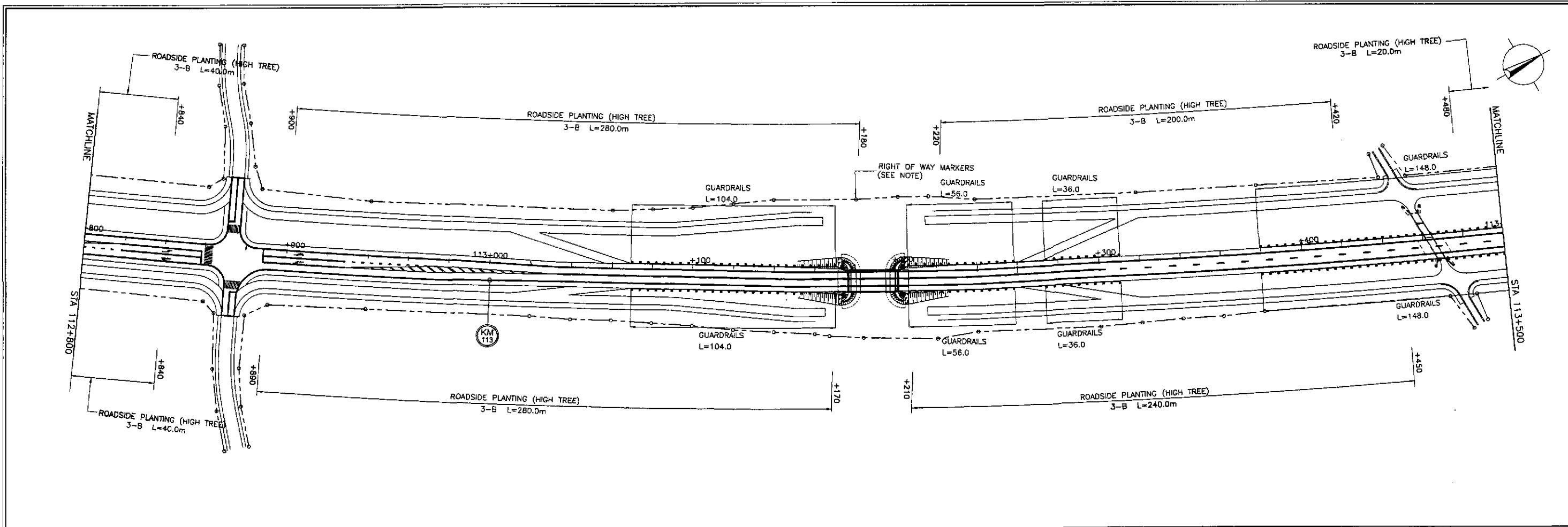
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

 JAPAN INTERNATIONAL COOPERATION AGENCY		 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II		SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : PLANTINGS, GUARDRAILS, RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 110+000 - STA. 111+400	SHEET NO. : RM-10	
DESIGNED	DATE: 10/11/02 SIGNATURE: S. LUM	Submitted By: DANILLO C. TRAJANO Project Director		Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division		Recommended By: GILBERTO S. REYES DE, Director IV		Recommended By: MANUEL M. BONDAN Undersecretary		Approved By: SIMEON A. DATUMANONG Secretary	
CHECKED	DATE: 10/12/02 SIGNATURE: S. LUM	Submitted By: DANILLO C. TRAJANO Project Director		Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division		Recommended By: GILBERTO S. REYES DE, Director IV		Recommended By: MANUEL M. BONDAN Undersecretary		Approved By: SIMEON A. DATUMANONG Secretary	
SUBMITTED	DATE: 10/12/02 SIGNATURE: S. LUM	Submitted By: DANILLO C. TRAJANO Project Director		Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division		Recommended By: GILBERTO S. REYES DE, Director IV		Recommended By: MANUEL M. BONDAN Undersecretary		Approved By: SIMEON A. DATUMANONG Secretary	



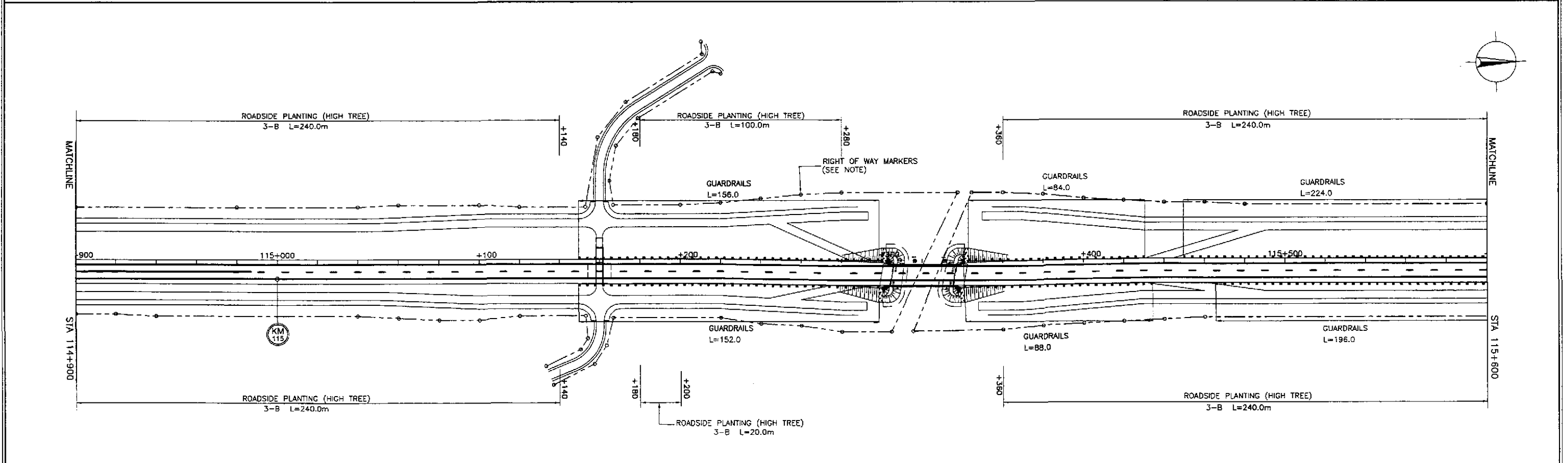
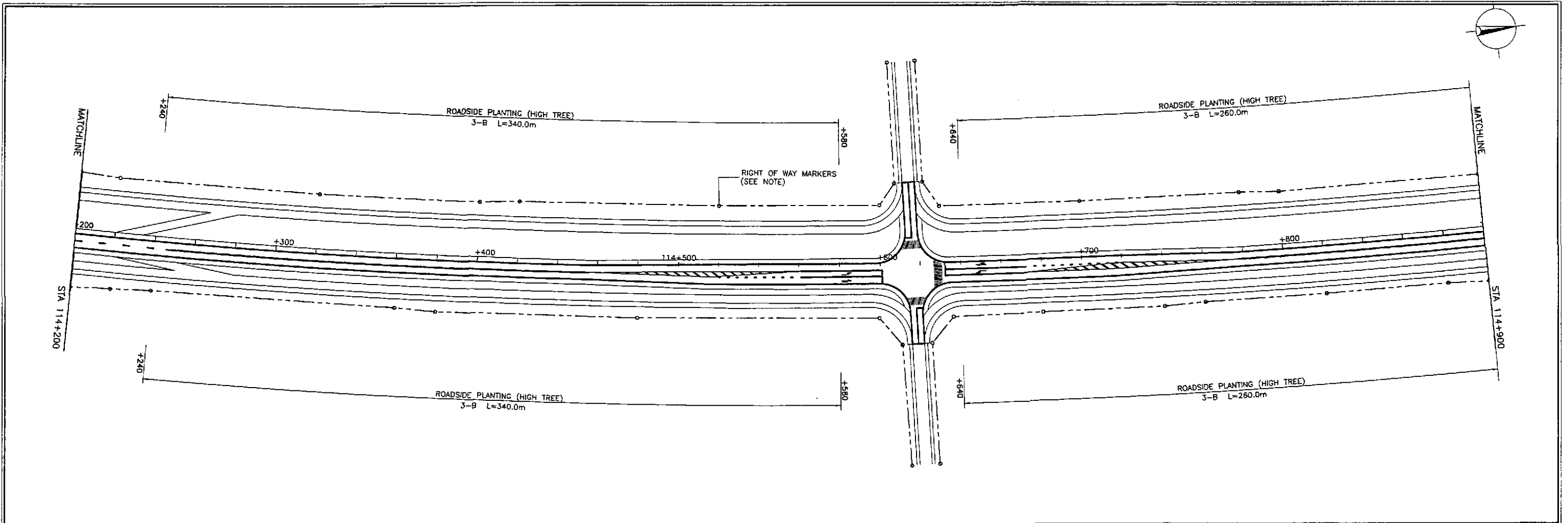
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/4/02	S. LUM	BUREAU OF DESIGN				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 II	1:1000	PLANTINGS, GUARDRAILS, RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 111+400 - STA. 112+800	RM-11
	CHECKED	10/16/02	S. JOSE	Submitted By:	Reviewed By:	Recommended By:	Office of the Secretary				
	SUBMITTED	10/18/02	M. RIVERA	DANILO C. TRAJANO	JOSEFINA M. ALAGAR	GILBERTO S. REYES	MANUEL M. BONGAN				
			Project Director	Chief, Highways Division	OIC, Director IV	Undersecretary	Secretary				
							FULL SIZE A1				



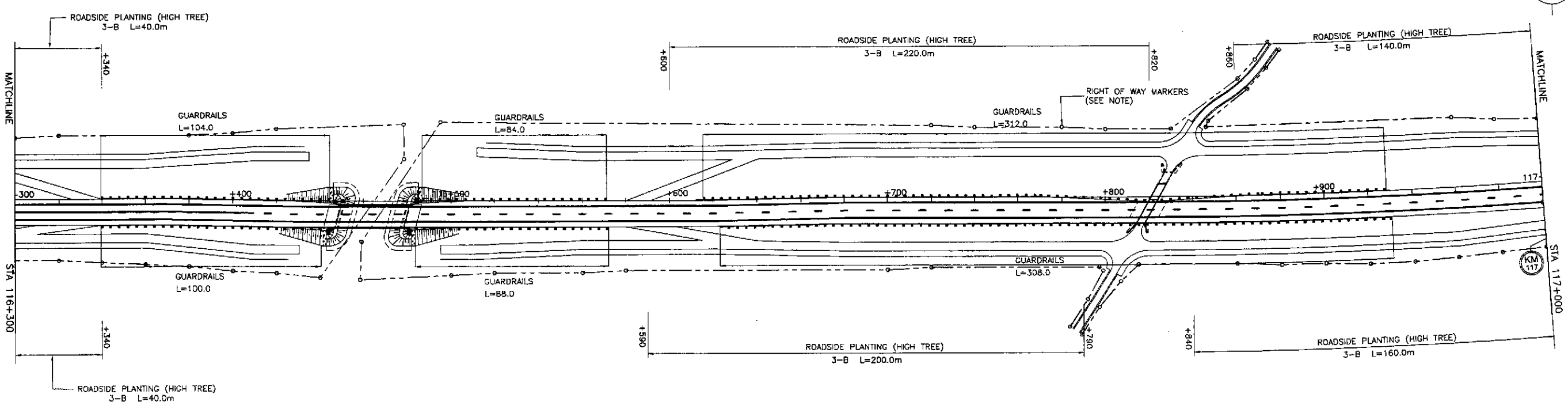
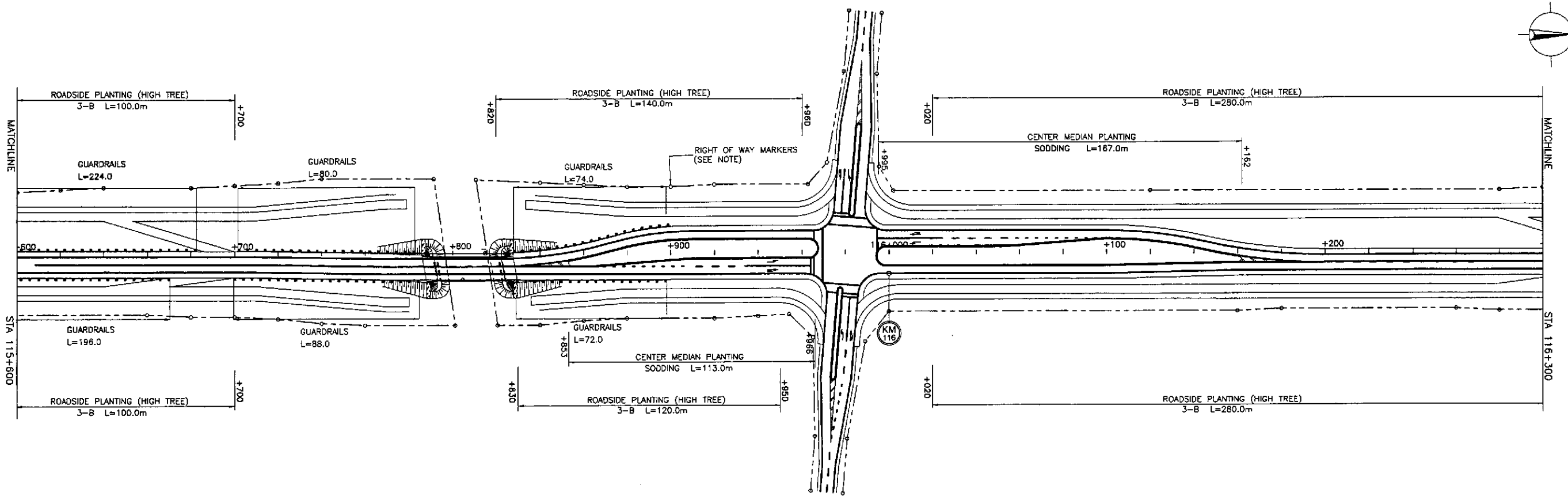
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

 JICA JAPAN INTERNATIONAL COOPERATION AGENCY		 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II		SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : PLANTINGS, GUARDRAILS, RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 112+800 - STA. 114+200	SHEET NO. : RM-12
DESIGNED	DATE	SIGNATURE	BUREAU OF DESIGN Submitted By: DANILLO C. TRAJANO Project Director		OFFICE OF THE SECRETARY Recommended By: JOSEFINA M. ALAGAR Chief, Highways Division					
CHECKED					Reviewed By: GILBERTO S. REYES OIC, Director IV					
SUBMITTED					Recommended By: MANUEL M. BONGAN Undersecretary					
					Approved By: SIMEON A. DATUMANONG Secretary					



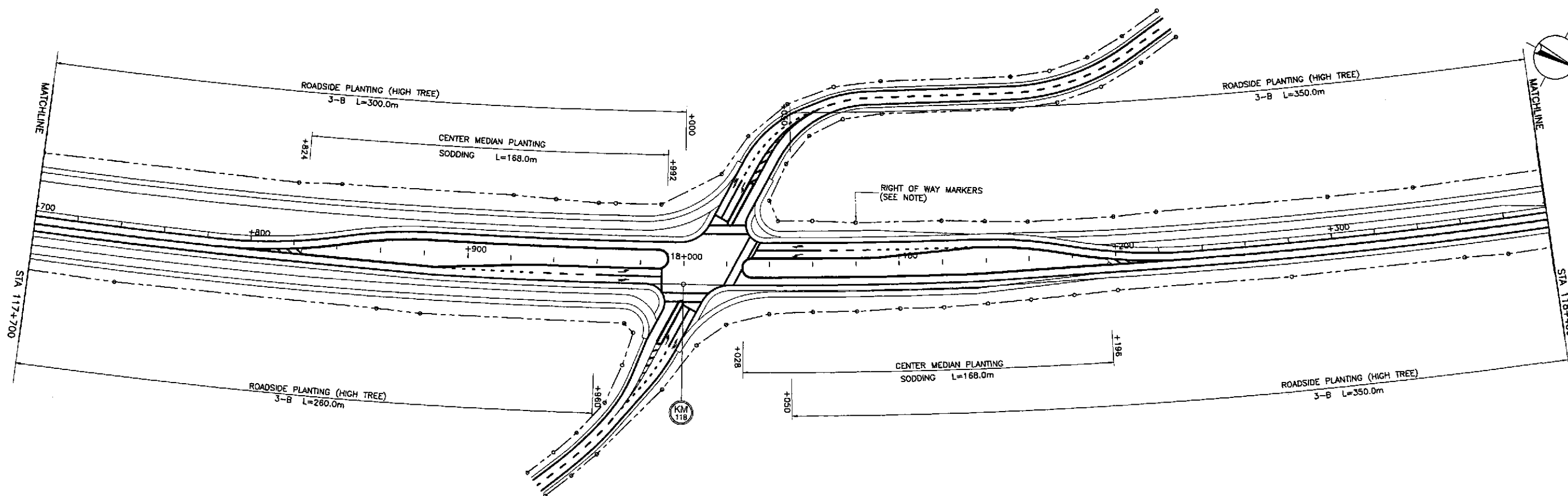
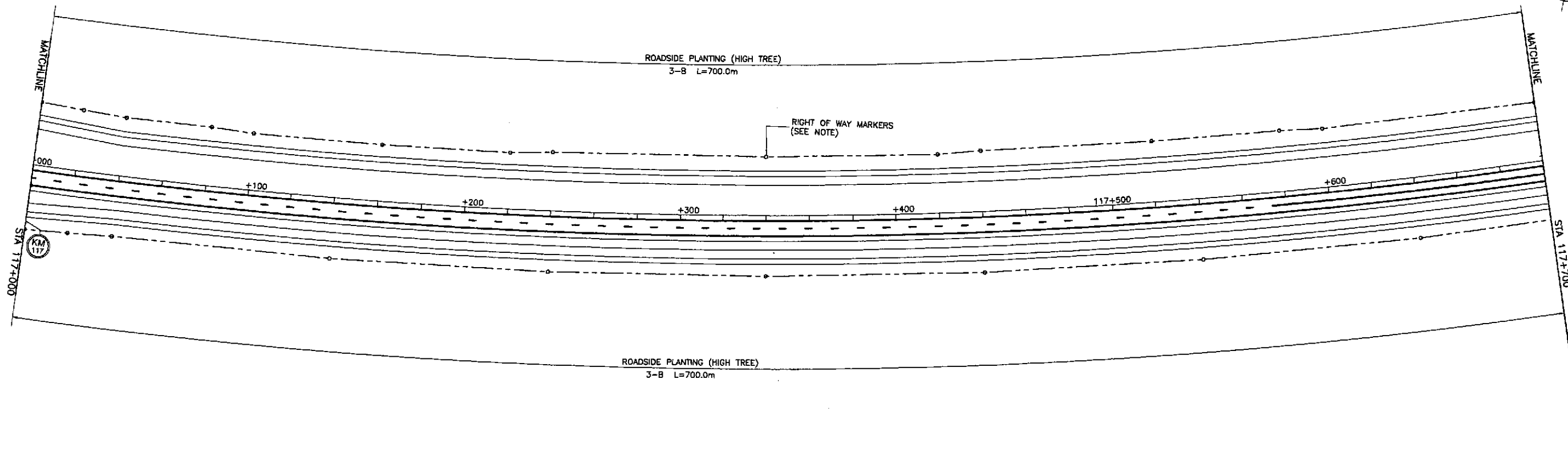
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

 JICA JAPAN INTERNATIONAL COOPERATION AGENCY		 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Palaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II		SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : PLANTINGS, GUARDRAILS RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 114+200 - STA. 115+600	SHEET NO. : RM-13					
DESIGNED	10/11/02	SIGNATURE	<i>[Signature]</i>	Submitted By:	PJHL - PMO	Reviewed By:	JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By:	GILBERTO S. REYES D/C, Director IV	Recommended By:	MANUEL M. BONOAN Undersecretary	Approved By:	SIMEON A. DATUMANONG Secretary
CHECKED	10/16/02	SIGNATURE	<i>[Signature]</i>	Submitted By:	DANILO C. TRAJANO Project Director	Reviewed By:	JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By:	GILBERTO S. REYES D/C, Director IV	Recommended By:	MANUEL M. BONOAN Undersecretary	Approved By:	SIMEON A. DATUMANONG Secretary
SUBMITTED	10/18/02	SIGNATURE	<i>[Signature]</i>	Submitted By:	DANILO C. TRAJANO Project Director	Reviewed By:	JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By:	GILBERTO S. REYES D/C, Director IV	Recommended By:	MANUEL M. BONOAN Undersecretary	Approved By:	SIMEON A. DATUMANONG Secretary



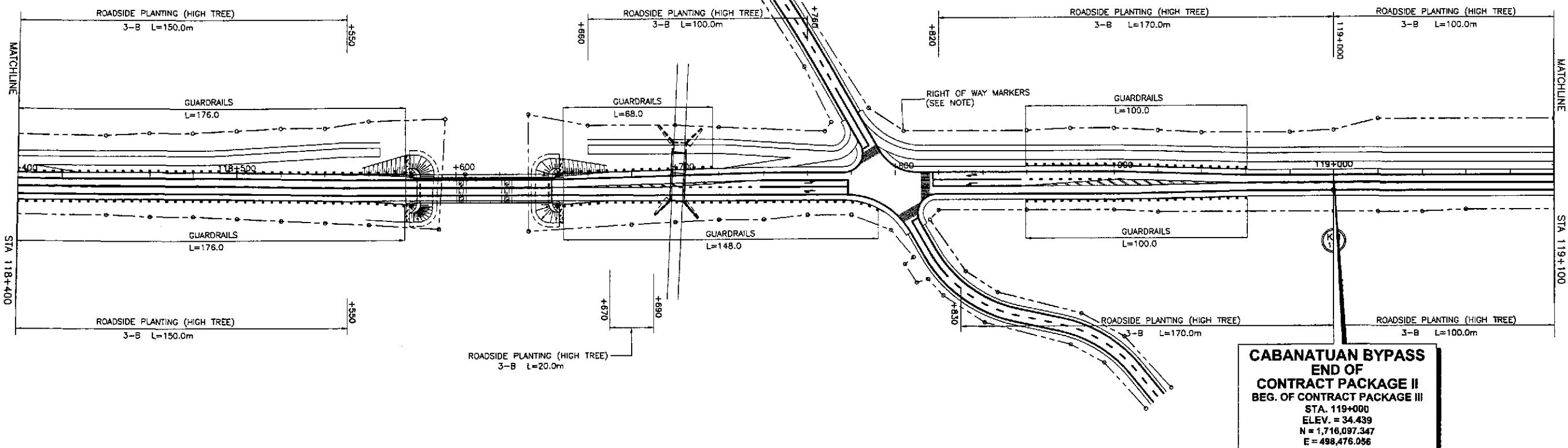
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

	DESIGNED	10/4/02	<i>[Signature]</i>		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : PLANTINGS, GUARDRAILS, RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 115+600 - STA. 117+000	SHEET NO. : RM-14		
	CHECKED	10/16/02	<i>[Signature]</i>		Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV					Recommended By: MANUEL M. BONOAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary
	SUBMITTED	10/18/02	<i>[Signature]</i>		Submitted By: DANILO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV					Recommended By: MANUEL M. BONOAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary

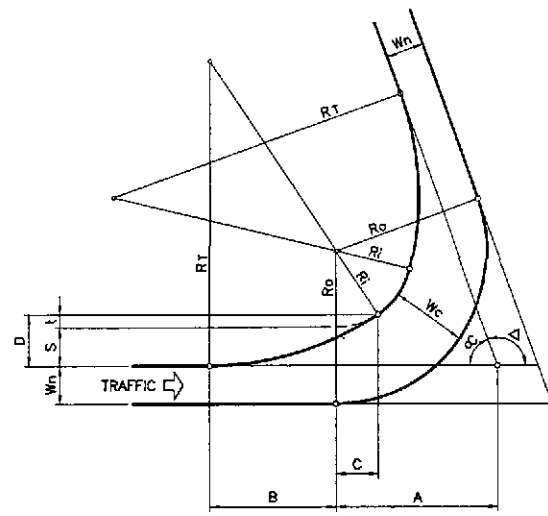


NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NOS. RG-06 TO RG-08

 JICA JAPAN INTERNATIONAL COOPERATION AGENCY		 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II		SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : PLANTINGS, GUARDRAILS, RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 117+000 - STA. 118+400	SHEET NO. : RM-15
DESIGNED	DATE: 10/1/02	SIGNATURE: [Signature]	BUREAU OF DESIGN Submitted By: P.JHL - PMO Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division Recommended By: GILBERTO S. REYES, OC, Director IV Recommended By: MANUEL M. BONGAN, Undersecretary Approved By: SIMEON A. DATUMANONG, Secretary					
CHECKED	DATE: 10/16/02	SIGNATURE: [Signature]	DANILLO C. TRAJANO, Project Director TEAM LEADER					
SUBMITTED	DATE: 10/18/02	SIGNATURE: [Signature]						



	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :		
	DESIGNED	10/1/02	S. LUINA	BUREAU OF DESIGN			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 II	1:1000	PLANTINGS, GUARDRAILS RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 118+400 - STA. 119+000	RM-16	
	CHECKED	10/6/02	S. JOSE	Submitted By:	Reviewed By:	Recommended By:					Office of the Secretary
	SUBMITTED	10/18/02	M. RIVERA	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV					MANUEL M. BONGAN Undersecretary
			Approved By: (See cover sheet for Signature/Approval) SIMEON A. DATUMANONG Secretary								
							FULL SIZE A1				

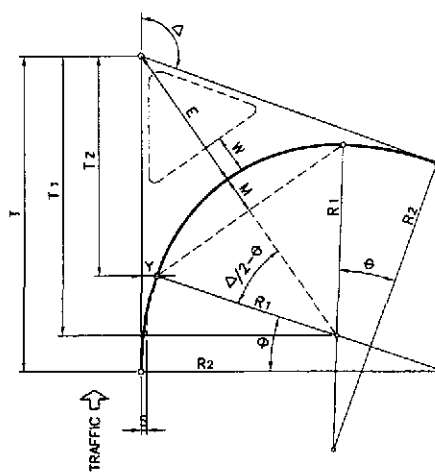


NOTES:
 * RELATIVE PATHS OF LEFT TURNING VEHICLES ARE IMAGINARY ONLY; OVERALL, THESE WILL DETERMINE THE CONFIGURATION OF CHANNELIZATION ISLANDS IN INTERSECTION DESIGN.
 * R_o AS DEFINED BY CONDITION OBTAINING AND W_c IN CONFORMANCE WITH DESIGN VEHICLES AND R_o.
 (ADOPTED FROM JAPANESE STANDARDS USE IN OTHER PROJECTS.)

WHERE:
 W_n = LANE WIDTH (NORMAL)
 W_c = LANE WIDTH (TURNING)
 Δ = INTERSECTION ANGLE
 R_o = OUTER RADIUS
 R_i = INNER RADIUS
 R_T = TRANSITION RADIUS
 α = 180° -

FORMULAS:
 R_i = R_o - W_c
 R_T = nR_i (n=3)
 S = W_c - W_n
 t = S/(n-1)
 A = (R_i+S) cot α/2
 B = √[2(R_T-R_i)S-S²]
 C = B/(n-1)
 D = S + t

4 LEFT TURN LANE/S ELEMENTS THREE CENTERED CURVE-SYMMETRICAL RS-01

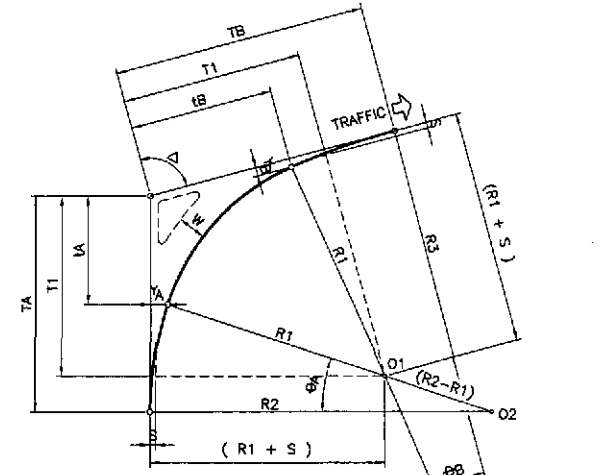


NOTES:
 * FORMULAS DERIVED BELOW ARE FOR FIELD LAYOUT PURPOSE (DRAWING LAYOUT BY GRAPHICAL SOLUTION ONLY.)
 * DESIGN RADII (R₁, R₂ & R₃) AND OFFSET S AS WELL AS LANE WIDTH W (WHERE CORNER ISLANDS ARE REQUIRED UNDER CONDITIONS OBTAINING) AS BASED ON VALUES SET BY THE TEAM'S 'A GUIDE TO TRAFFIC ENGINEERING AND MANAGEMENT TECHNIQUES'.

WHERE:
 Δ = INTERSECTION ANGLE
 R₁ = INNER RADIUS
 R₂ = TRANSITION RADIUS
 S = OFFSET OF INNER CIRCULAR CURVE FROM TANGENTS

FORMULAS:
 T₁ = (R₁+S) TAN Δ/2
 T = T₁ + (R₂-R₁) SIN θ
 T₂ = T₁ - R₁ SIN θ
 Y = (R₁+S) - R₁ COS θ
 E = (R₁+S) / COS Δ/2 - R₁
 M = R₁ - R₁ COS (Δ/2-θ)
 θ = COS⁻¹ [(R₂-R₁-S) / (R₂-R₁)]

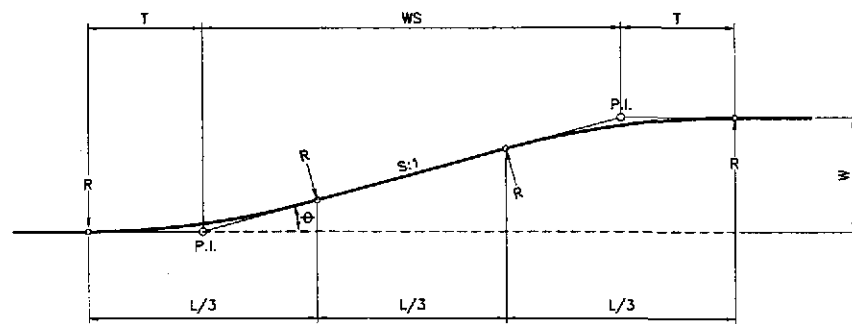
5 RIGHT TURN/S ELEMENTS THREE CENTERED CURVE-SYMMETRICAL RS-01



WHERE:
 R₁ = RADIUS OF INTERMEDIATE CIRCULAR ARC
 R₂ = RADIUS OF CIRCULAR ARC ON APPROACH LEG (1.5 x R₁)
 R₃ = RADIUS OF CIRCULAR ARC ON DEPARTURE LEG (3 x R₁)
 S = OFFSET OF INNER CIRCULAR CURVE FROM TANGENTS
 Δ = INTERSECTION ANGLE

FORMULAS:
 θ_A = COS⁻¹ [(R₂-(R₁+S)) / (R₂-R₁)]
 θ_B = COS⁻¹ [(R₃-(R₁+S)) / (R₃-R₁)]
 T₁ = (R₁+S) TAN Δ/2
 T_A = T₁ + (R₂-R₁) SIN θ_A
 T_B = T₁ + (R₃-R₁) SIN θ_B
 L_A = T₁ - R₁ SIN θ_A = T_A - R₂ SIN θ_A
 L_B = T₁ - R₁ SIN θ_B = T_B - R₃ SIN θ_B
 Y_A = (R₁+S) - R₁ COS θ_A
 Y_B = (R₁+S) - R₁ COS θ_B

6 RIGHT TURN/S ELEMENTS THREE CENTERED CURVE-ASYMMETRICAL RS-01

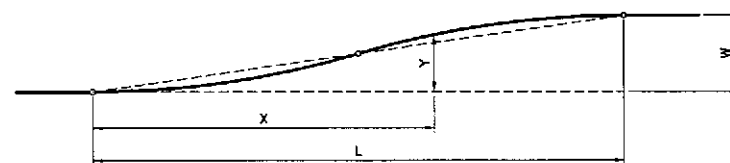


FORMULAS:
 θ = TAN⁻¹ 1/S (TAPER RATE S:1)
 T = WS / (3 COS θ + 1)
 L/3 = T (COS θ + 1)
 R = T / TAN θ/2
 APPROX.
 T = L/6
 θ = TAN⁻¹ W/4T

OPERATING SPEED	S VALUE
50 KPH	8
60 KPH	(10)
70 KPH	(12.5)
80 KPH	15
PARKING TURNOUT (ENTRANCE / EXIT)	2
BUS TURNOUT (DESIRABLE MIN)	4

(S VALUE SHOWN IN PARENTHESIS WERE INTERPOLATED FROM AASHTO)

1 ROADWAY TAPERING-1/3 TAN SECTION (CIRCULAR CURVE ROUNDING) RS-01



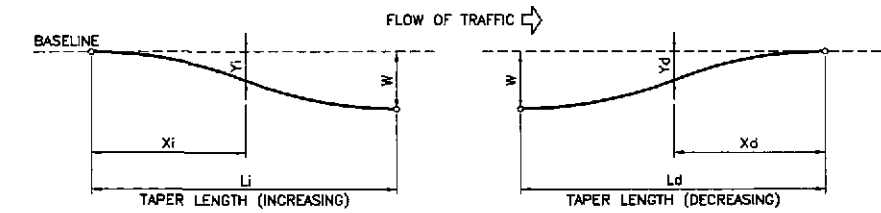
FORMULAS:
 L = CWS
 (C=1 MINIMUM)
 (C=2 DESIRABLE)
 Y = KW

WHERE:
 L = LENGTH OF FLARE
 W = WIDENING (MAX. OFFSET)
 S = TAPER RATE (HOR:VER)
 X = DISTANCE ALONG BASELINE
 Y = OFFSET FROM BASELINE

LAYOUT BY OFFSET

X/L	0.00	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	1.00
K	0.000	0.005	0.020	0.045	0.080	0.125	0.180	0.245	0.320	0.405	0.500	0.595	0.680	0.755	0.820	0.875	0.920	0.955	0.980	0.995	1.000

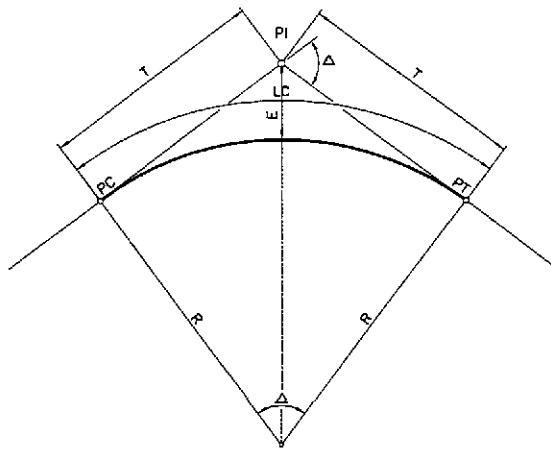
2 ROADWAY TAPERING REVERSED PARABOLIC CURVE FLARES-SYMMETRICAL (BY OFFSET) RS-01



WHERE:
 W = FULL WIDENING
 L = LENGTH OF TAPERING/TRANSITION
 Y = WIDENING/OFFSET FROM BASELINE @ X DISTANCE
 FOR X/L : Y = KW

INCREASING				DECREASING			
X _i /L _i	K	X _d /L _d	K	X _d /L _d	K	X _d /L _d	K
0.00	0.000	0.52	0.5103	0.00	1.0000	0.52	0.1967
0.02	0.0010	0.54	0.5470	0.02	0.9964	0.54	0.1784
0.04	0.0020	0.56	0.5836	0.04	0.9905	0.56	0.1613
0.06	0.0047	0.58	0.6194	0.06	0.9810	0.58	0.1453
0.08	0.0077	0.60	0.6548	0.08	0.9680	0.60	0.1304
0.10	0.0114	0.62	0.6888	0.10	0.9438	0.62	0.1162
0.12	0.0156	0.64	0.7217	0.12	0.9200	0.64	0.1034
0.14	0.0217	0.66	0.7522	0.14	0.8920	0.66	0.0916
0.16	0.0300	0.68	0.7789	0.16	0.8602	0.68	0.0807
0.18	0.0390	0.70	0.8050	0.18	0.8238	0.70	0.0708
0.20	0.0499	0.72	0.8286	0.20	0.7816	0.72	0.0622
0.22	0.0612	0.74	0.8521	0.22	0.7324	0.74	0.0543
0.24	0.0750	0.76	0.8741	0.24	0.6822	0.76	0.0473
0.26	0.0908	0.78	0.8947	0.26	0.6340	0.78	0.0407
0.28	0.1110	0.80	0.9128	0.28	0.5848	0.80	0.0348
0.30	0.1315	0.82	0.9293	0.30	0.5365	0.82	0.0288
0.32	0.1574	0.84	0.9440	0.32	0.4912	0.84	0.0236
0.34	0.1849	0.86	0.9580	0.34	0.4478	0.86	0.0190
0.36	0.2161	0.88	0.9691	0.36	0.4052	0.88	0.0150
0.38	0.2496	0.90	0.9775	0.38	0.3748	0.90	0.0116
0.40	0.2846	0.92	0.9849	0.40	0.3443	0.92	0.0082
0.42	0.3215	0.94	0.9903	0.42	0.3144	0.94	0.0052
0.44	0.3586	0.96	0.9952	0.44	0.2868	0.96	0.0026
0.46	0.3965	0.98	0.9982	0.46	0.2610	0.98	0.0012
0.48	0.4344	1.00	1.0000	0.48	0.2373	1.00	0.0000
0.50	1.4724			0.50	0.2163		

3 ROADWAY TAPERING REVERSED PARABOLIC CURVE ASYMMETRICAL (BY OFFSET) RS-01



WHERE :

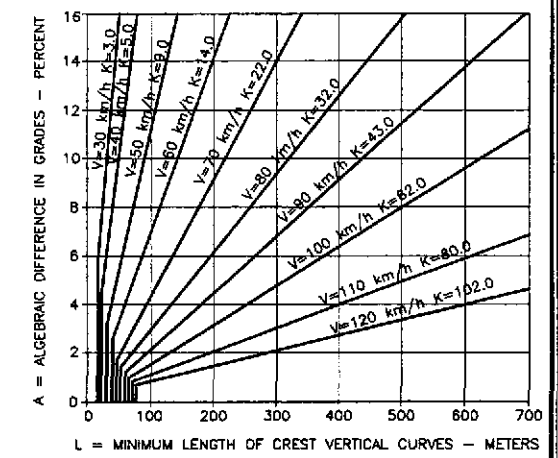
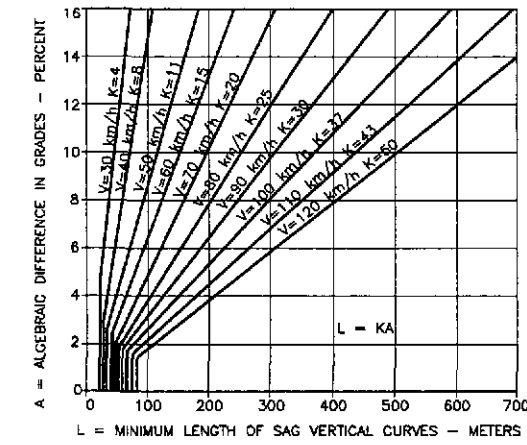
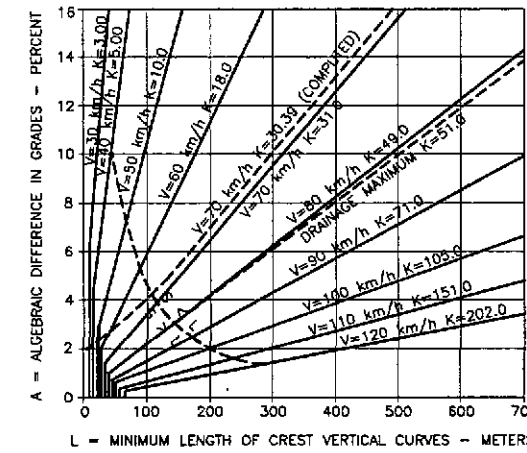
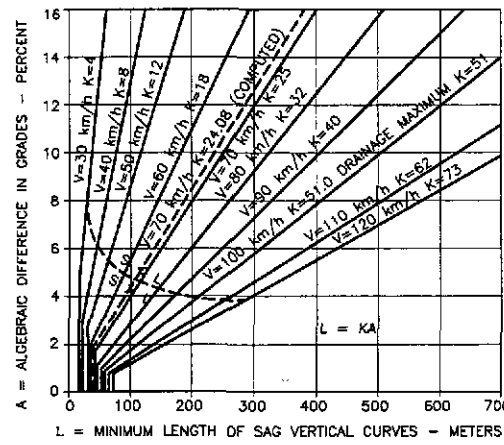
PI = POINT OF INTERSECTION
 Δ = INTERSECTION ANGLE
 R = CURVE RADIUS
 T = TANGENT LENGTH
 LC = CURVE LENGTH
 E = EXTERNAL DISTANCE
 PC = BEGINNING OF CIRCULAR CURVE
 PT = END OF CIRCULAR CURVE

FORMULAS:

$T = R (\tan \Delta / 2)$
 $LC = \frac{\pi R \Delta}{180}$
 $E = T (\tan \Delta / 4)$

NOTE :

NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION ANGLE IS LESS THAN ONE DEGREE (1')

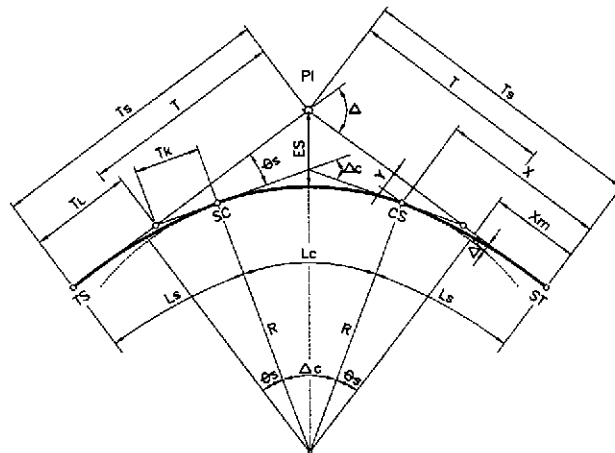


5a MAIN BYPASS
RS-02

5b ACCESS ROADS
RS-02

2 HORIZONTAL CURVE (CIRCULAR)
RS-02

5 DESIGN CONTROLS FOR VERTICAL CURVES
RS-02

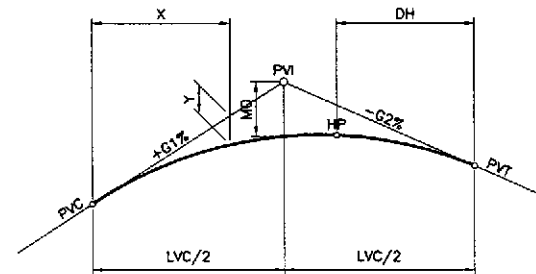


FORMULAS:

$A^2 = R(L_s)$
 $\Delta_s = L_s(D/40)$
 $x = L_s \left(1 - \frac{L_s^2}{40R^2}\right)$
 $y = \frac{L_s^2}{6R} \left(1 - \frac{L_s^2}{56R^2}\right)$
 $\Delta R = y + R \cos \Delta_s - R$
 $X_m = x - R \sin \Delta_s$
 $T = (R + \Delta R) \tan \Delta / 2$
 $T_s = X_m + T$
 $\Delta c = \Delta - 2\Delta_s$
 $L_c = \pi R \Delta c / 180$
 $T_L = x - (y / \tan \Delta_s)$
 $T_r = \frac{y}{\sin \Delta_s}$
 $E_s = \left[R + \frac{y}{4} \right] \sec \frac{\Delta}{2} - R$

WHERE :

PI = POINT OF INTERSECTION
 Δ = INTERSECTION ANGLE
 R = CURVE RADIUS
 Es = EXTERNAL DISTANCE
 Ls = LENGTH OF SPIRAL
 A = PARAMETER OF CLOTHOID
 Δs = SPIRAL ANGLE
 X, Y = COORDINATES OF POINTS SC AND CS WITH RESPECT TO MAIN TANGENTS
 ΔR = OFFSET BETWEEN CIRCULAR CURVE AND MAIN TANGENT ("THROW" OF SPIRAL)
 Xm = DISTANCE FROM TS OR ST TO POINT OF "THROW"
 Ts = TOTAL TANGENT DISTANCE
 TL = LONG TANGENT OF SPIRAL
 Tk = SHORT TANGENT OF SPIRAL
 Ls = LENGTH OF SPIRAL
 Δc = CENTRAL ANGLE OF CIRCULAR CURVE
 Lc = LENGTH OF CIRCULAR CURVE
 TS = BEGINNING OF TRANSITION CURVE
 SC = BEGINNING OF CIRCULAR CURVE
 CS = END OF CIRCULAR CURVE
 ST = END OF TRANSITION CURVE



WHERE :

PVI = VERTICAL POINT OF INTERSECTION
 PVC = VERTICAL POINT OF CURVATURE
 PVT = VERTICAL POINT OF TANGENCY
 LVC = LENGTH OF VERTICAL CURVE
 G1, G2 = TANGENT GRADES IN PERCENT
 MO = MIDDLE ORDINATE
 X = DISTANCE FROM PVC TO PVT TO ANY POINT OF CURVE
 Y = VERTICAL OFFSET AT SAID DISTANCE "X"
 HP = HIGH POINT OF CURVE
 DH = DISTANCE OF "HP" FROM CURVE END RECKONED FROM FLATTER GRADE

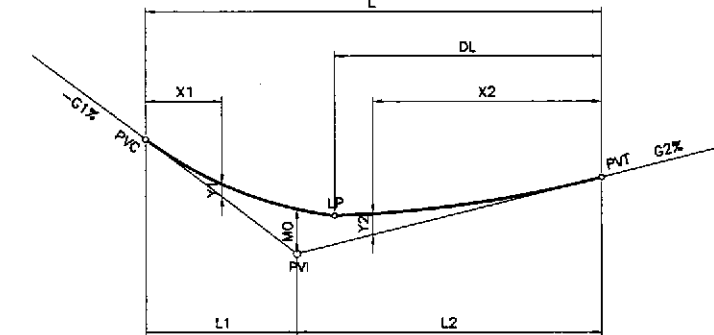
FOR SYMMETRICAL VERTICAL PARABOLIC CURVES :

$MO = \frac{(G1 - G2)}{100} \cdot \frac{L}{8}$
 $Y_x = \frac{(G1 - G2)}{100} \cdot \frac{x^2}{2LVC}$
 $DH = \frac{GLVC}{(G1 - G2)}$

(WHERE G IS THE LESSER GRADE)

NOTES :

- SIMILARLY APPLIES TO LP (LOW POINT) OF SAG VERTICAL CURVES
- NO VERTICAL CURVE IS REQUIRED WHERE THE ALGEBRAIC DIFFERENCE IN GRADE IS 0.50% OR LESS



WHERE :

L1 = SHORT SIDE OF VERTICAL CURVE LENGTH
 L2 = LONG SIDE OF VERTICAL CURVE LENGTH
 LP = LOW POINT OF CURVE
 DL = DISTANCE OF LP FROM CURVE END RECKONED FROM FLATTER GRADE
 ALL OTHER NOMENCLATURE SAME AS SYMMETRICAL PARABOLIC CURVE

FOR ASYMMETRICAL VERTICAL PARABOLIC CURVES :

$MO = \frac{(G1 - G2)}{100} \cdot \frac{L1 \cdot L2}{2L}$
 $Y1 = \frac{x1^2}{L1^2} \cdot MO$
 $DL = \frac{G2 \cdot L2}{L1} \cdot K$
 $K = \frac{L}{G1 - G2}$

NOTES :

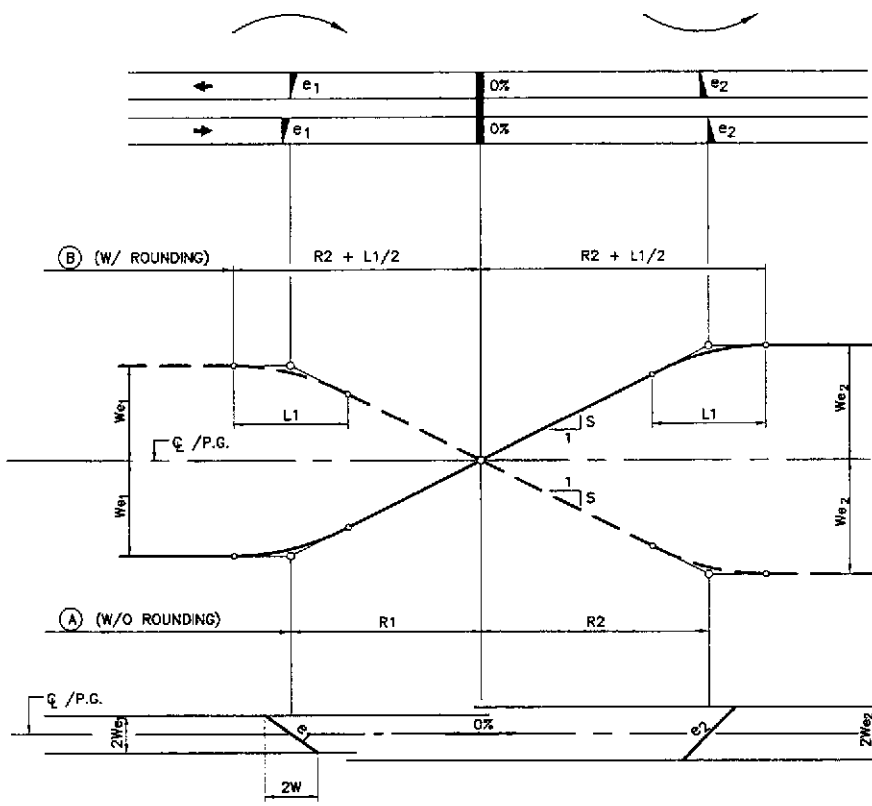
- SIMILARLY APPLIES TO LP (LOW POINT) OF SAG VERTICAL CURVES
- NO VERTICAL CURVE IS REQUIRED WHERE THE ALGEBRAIC DIFFERENCE IN GRADE IS 0.50% OR LESS

1 HORIZONTAL CURVE WITH TRANSITION (CLOTHOID SPIRAL)
RS-02

3 VERTICAL PARABOLIC CURVE (SYMMETRICAL)
RS-02

4 VERTICAL PARABOLIC CURVE (ASYMMETRICAL)
RS-02

	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/14/01	[Signature]	BUREAU OF DESIGN			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 II	NOT TO SCALE	GEOMETRIC DESIGN STANDARD - 2 HORIZONTAL AND VERTICAL CURVES	RS-02
	CHECKED	10/16/01	[Signature]	Submitted By:	Reviewed By:	Recommended By:				
YEO	10/16/01	[Signature]	DANILO C. TRAJANO Project Director	JOSEFINA M. ALADAR Chief, Highway Division	GILBERTO S. REYES DC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary	FULL SIZE A1		

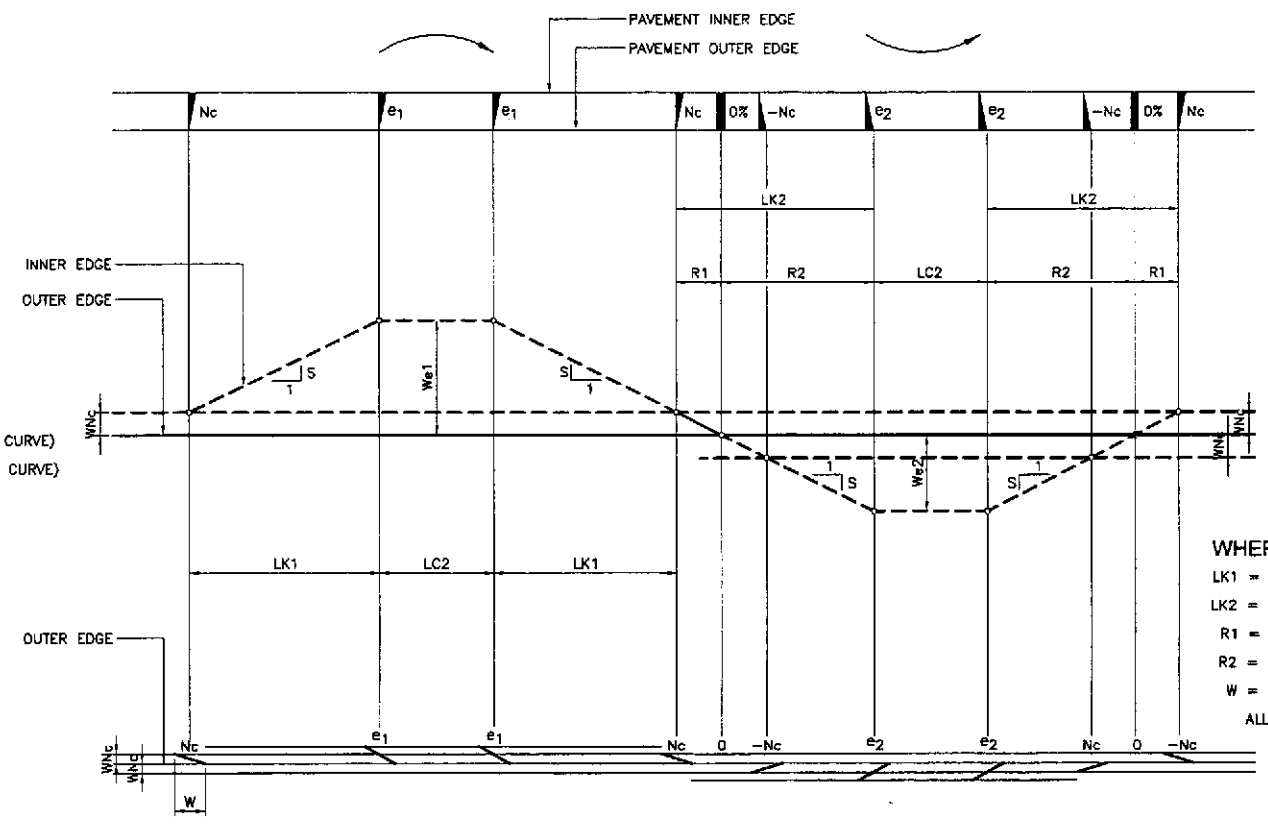


$$R1 = \frac{We_1}{S}$$

$$R2 = \frac{We_2}{S}$$

$$L1 = \frac{Wnc}{S}$$

WHERE:
 R1 = LENGTH OF SUPERELEV. RUNOFF (1st CURVE)
 R2 = LENGTH OF SUPERELEV. RUNOFF (2nd CURVE)
 L1 = LENGTH OF ROUNDING
 ALL OTHER NOMENCLATURE THE SAME



$$LK1 = \frac{W}{S} (e_1 - NC)$$

$$R1 = \frac{Wnc}{S}$$

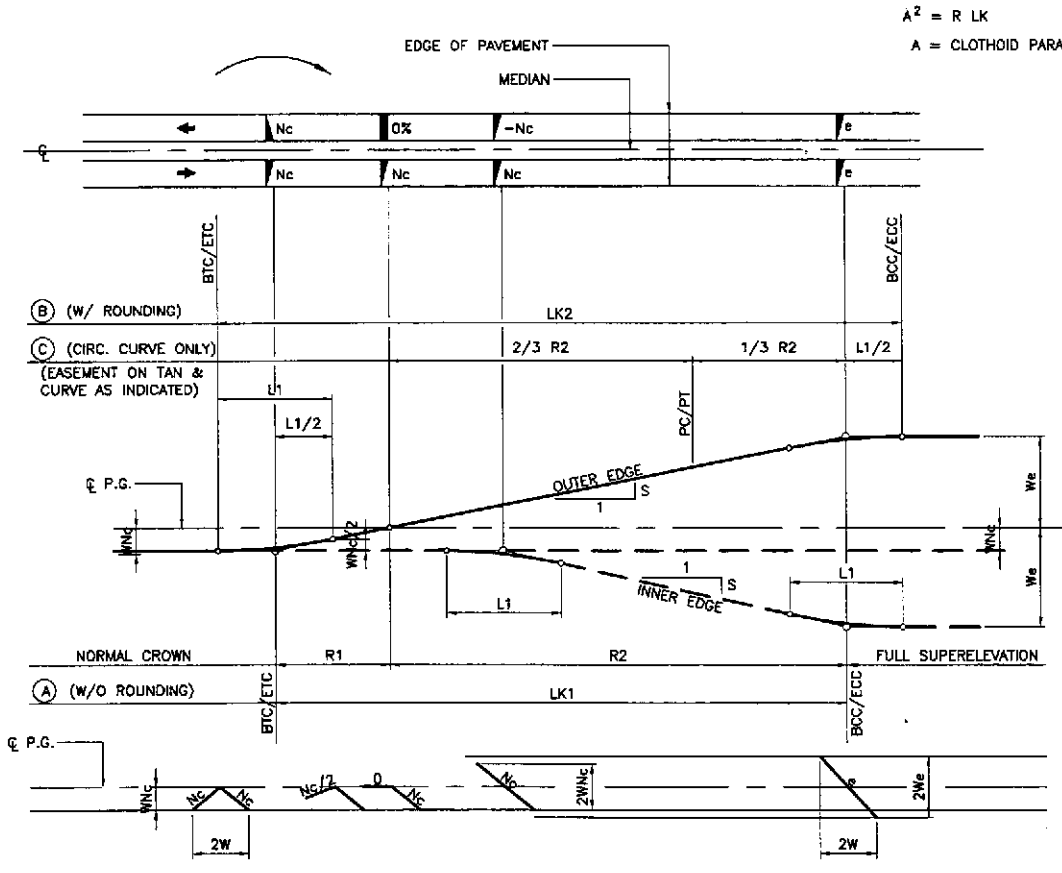
$$R2 = \frac{We_2}{S}$$

$$LK2 = R1 + R2 = \frac{W}{S} (Nc + e_2)$$

WHERE:
 LK1 = MIN. LENGTH OF EASEMENT/CLOTHOID (1st CURVE)
 LK2 = MIN. LENGTH OF EASEMENT/CLOTHOID (2nd CURVE)
 R1 = LENGTH OF SUPERELEVATION RUNOFF
 R2 = LENGTH OF SUPERELEVATION RUNOFF (2nd CURVE)
 W = CARRIAGEWAY (NORMAL)
 ALL OTHER NOMENCLATURE THE SAME

2 SUPERELEVATION TRANSITION-REVERSE CURVE (MAIN ROAD)
 RS-03

3 SUPERELEVATION TRANSITION-(RAMPS)
 PAVEMENT REVOLVED ABOUT OUTER EDGE
 RS-03



$$A^2 = R LK$$

A = CLOTHOID PARAMETER

$$R1 = \frac{Wnc}{S}$$

$$R2 = \frac{We}{S}$$

$$L1 = \frac{Wnc}{S}$$

$$LK1 = R1 + R2 = \frac{W}{S} (Nc + e) \quad (A)$$

$$LK2 = L1 + LK1 = \frac{W}{S} (2Nc + e) \quad (B)$$

WHERE:
 LK1 = MIN. LENGTH OF EASEMENT/CLOTHOID (W/O ROUNDING L1)
 LK2 = MIN. LENGTH OF EASEMENT/CLOTHOID (W/ ROUNDING)
 R1 = SUPERELEVATION RUNOFF LENGTH (WITHIN CLOTHOID) *
 R2 = SUPERELEVATION RUNOFF LENGTH
 L1 = LENGTH OF ROUNDING
 W = CARRIAGEWAY (ONE DIRECTION)
 e = SUPERELEVATION RATE
 Nc = NORMAL CROWN SLOPE
 S = RELATIVE SLOPE OF EDGES W/ C

* OTHER AUTHORITIES PLACE R1 ALONG THE TANGENT

S VALUE
(INTERPOLATED FROM AASHTO)

DESIGN SPEED Km/h	40	50	60	70	80	90	100	110	120
100 S	0.70	0.65	0.60	0.55	0.50	0.48	0.45	0.42	0.40

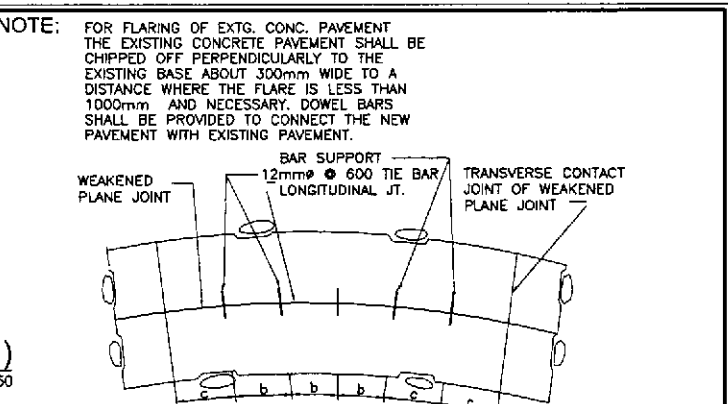
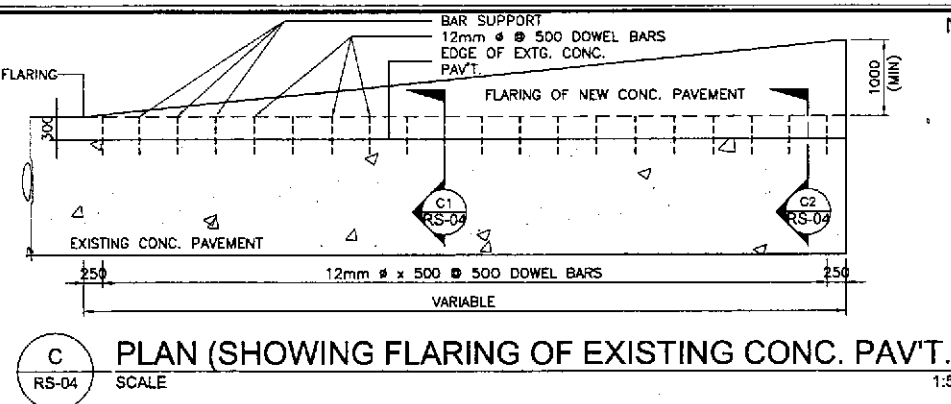
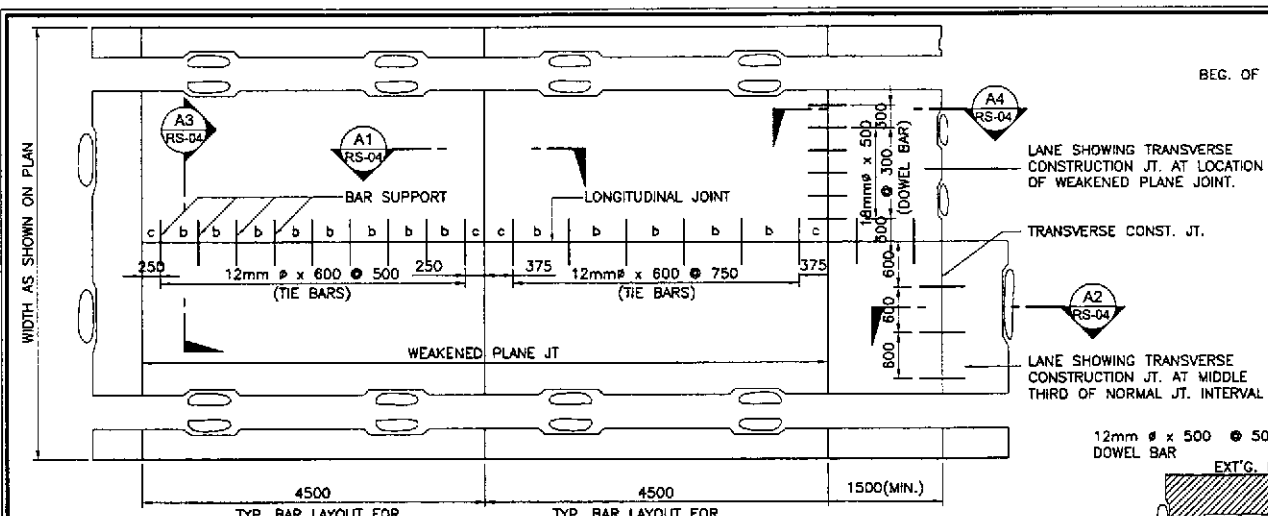
SUPERELEVATION "e" RATES

MAIN ROAD			RAMPS		
D	R	V=80 KPH e _{max} = 0.060	D	R	V=40 KPH e _{max} = 0.070
0'-10'	6,875.36	NC (0.004)	0'-30'	2,291.83	NC (0.003)
-20	3,437.78	NC (0.008)	1'-00'	1,145.92	NC (0.007)
-30	2,291.83	NC (0.013)	-30	763.94	NC (0.010)
-40	1,718.87	RC (0.016)	2'-00'	572.96	RC (0.013)
-50	1,375.10	0.021	-30	458.37	RC (0.016)
1'-00'	1,145.92	0.024	3'-00'	361.97	RC (0.019)
-10	982.21	0.027	-30	327.40	(0.022)
-20	859.44	0.030	4'-00'	286.48	0.024
-30	763.94	0.033	-30	254.65	0.027
-40	687.55	0.036	5'-00'	229.18	0.030
-50	625.05	0.039	6'-00'	190.99	0.035
2'-00'	572.96	0.041	-10	528.68	0.044
-10	528.68	0.044	-20	491.11	0.048
-20	491.11	0.048	-30	458.37	0.048
-30	458.37	0.048	-40	429.72	0.050
-40	429.72	0.050	-50	404.44	0.052
-50	404.44	0.052	3'-00'	381.97	0.053
3'-00'	381.97	0.053	-10	361.87	0.055
-10	361.87	0.055	-20	343.78	0.056
-20	343.78	0.056	-30	327.40	0.057
-30	327.40	0.057	-40	312.52	0.058
-40	312.52	0.058	-50	298.93	0.059
-50	298.93	0.059	4'-00'	286.48	0.059
4'-00'	286.48	0.059	-10	275.02	0.060
-10	275.02	0.060	-20	264.44	0.060
-20	264.44	0.060	-30	254.65	0.060
-30	254.65	0.060			

- NOTES:
- RATE OF SUPERELEVATION "e" AS SHOWN IN TABLE.
 - ROUNDING "L1" IS OPTIONAL AND NECESSARY ONLY IF "S" IS GREATER THAN THAT SHOWN IN TABLE.
 - SIDEWALKS SHALL ALWAYS SLOPE TOWARDS THE TRAVELWAY.
 - SHOULDERS OF THE MAIN ROADS SHALL ALWAYS SLOPE OUTWARD THE TRAVELWAY IRRESPECTIVE OF THE RATE OF "e" NORMAL SHOULDER SLOPE SHALL BE THE SAME AS THE TRAVELWAY.
 - FOR THE INTERCHANGE RAMPS, TREATMENT FOR THE OUTER OR THE RIGHT SIDE SHOULDER SHALL BE THE SAME AS THE ABOVE. THE INNER SHOULDER SHALL ALWAYS SLOPE TOWARDS THE LEFT OR THE INSIDE. WHERE "e" IS IN THE OPPOSITE DIRECTION. THE ALGEBRAIC SUM OF THE SLOPES OF THE SHOULDER AND TRAVELWAY SHALL BE EQUAL TO 8.0%.
 - SUPERELEVATION "e" RATES AS SHOWN IN TABLE ARE BASED ON A PARABOLIC FORM OF DISTRIBUTION.

1 SUPERELEVATION TRANSITION (MAIN ROAD)
 RS-03

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES			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 : NOT TO SCALE FULL SIZE A1	SHEET CONTENTS : GEOMETRIC DESIGN STANDARD - 3 SUPERELEVATION ATTAINMENT/ DETAILS DIAGRAMATIC PROFILES/ SECTIONS	SHEET NO. : RS-03
	CHECKED	10/10/02	S. G. G. G.		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS						
	SUBMITTED	10/18/02	M. R. R. R.	BUREAU OF DESIGN Submitted By: DANILLO C. TRAJANO Project Director	OFFICE OF THE SECRETARY Recommended By: JOSEFINA M. ALAGAR Chief, Highway Division	Recommended By: GILBERTO S. REYES OIC, Director	Approved By: MANUEL M. BONOAN Undersecretary	Approved By: SIMON A. DATUMANONG Secretary			

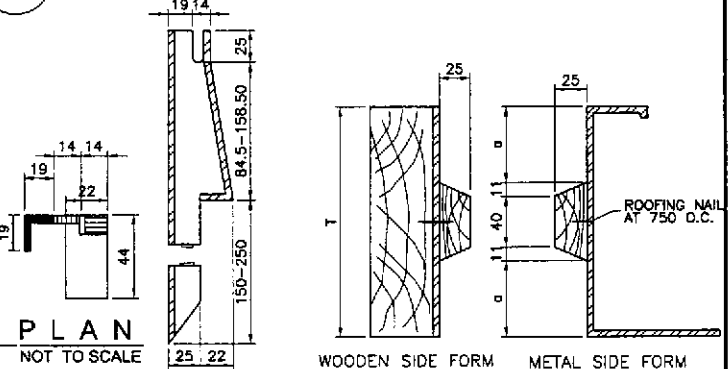
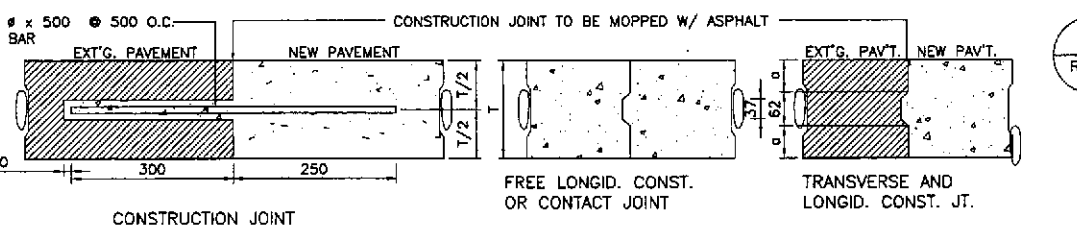
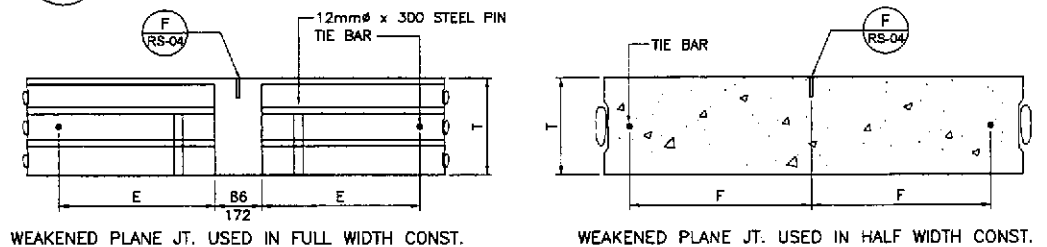


NOTE: FOR FLARING OF EXTG. CONC. PAVEMENT THE EXISTING CONCRETE PAVEMENT SHALL BE CHIPPED OFF PERPENDICULARLY TO THE EXISTING BASE ABOUT 300mm WIDE TO A DISTANCE WHERE THE FLARE IS LESS THAN 1000mm AND NECESSARY DOWEL BARS SHALL BE PROVIDED TO CONNECT THE NEW PAVEMENT WITH EXISTING PAVEMENT.

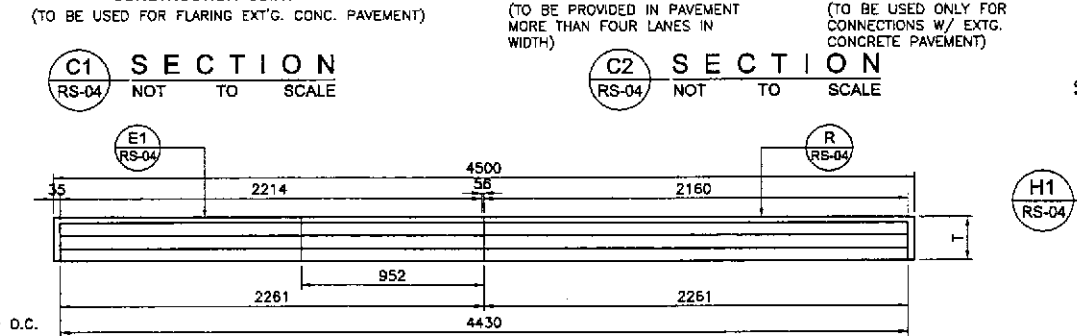
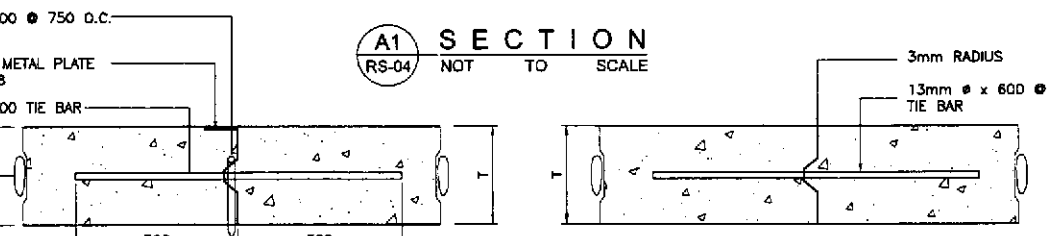
A TYPICAL PLAN OF TWO LANE PAVEMENT
RS-04 SCALE 1:50

C PLAN (SHOWING FLARING OF EXISTING CONC. PAVT.)
RS-04 SCALE 1:50

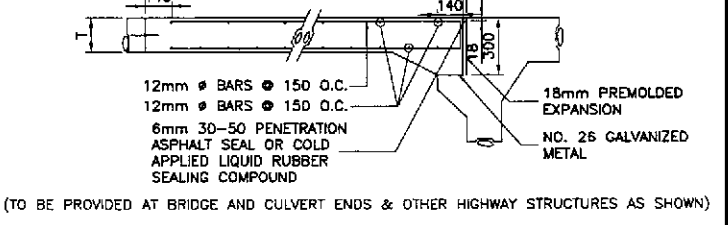
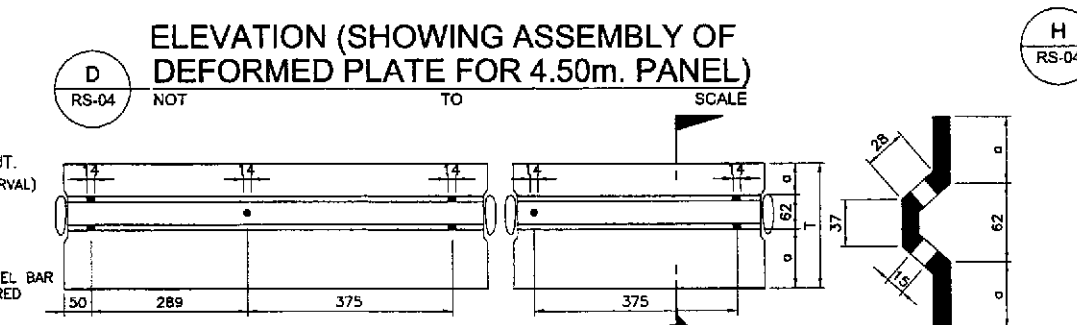
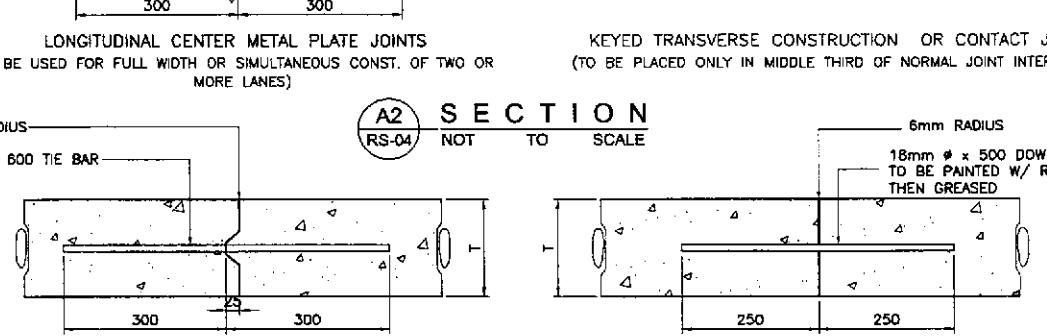
G BAR SPACING ALONG CURVES DETAIL
RS-04 NOT TO SCALE



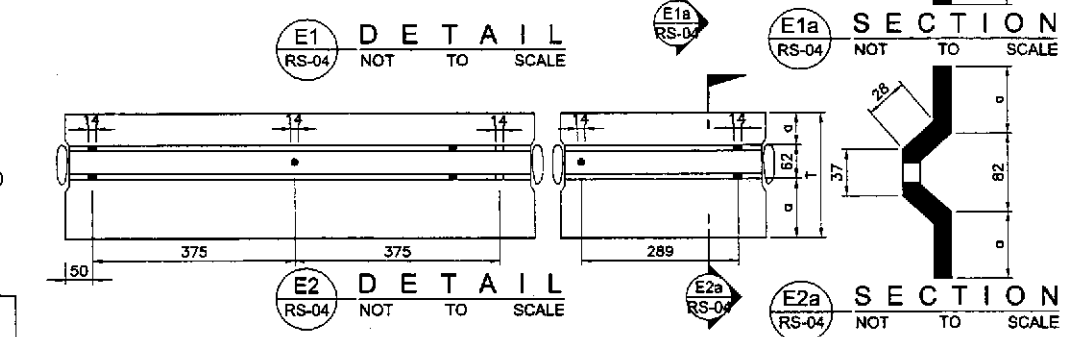
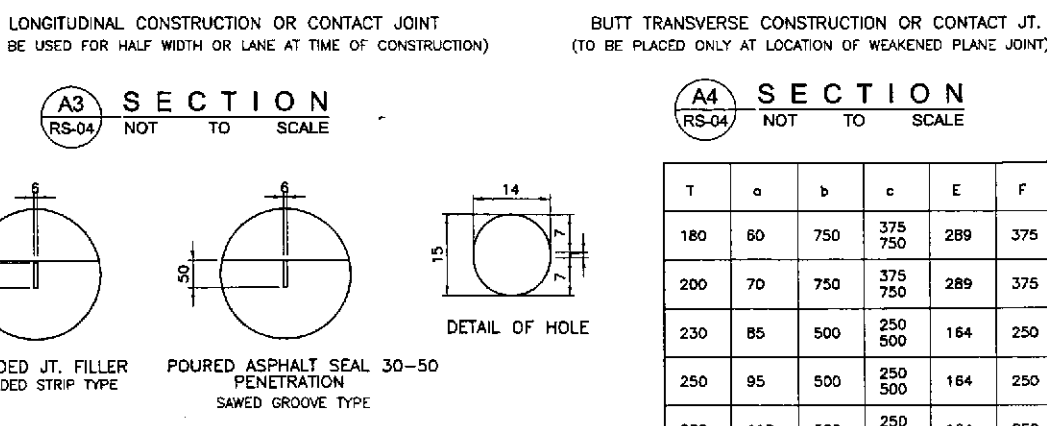
H1 PLAN RS-04 NOT TO SCALE
H2 ELEVATION RS-04 NOT TO SCALE
J SIDE FORM DETAIL RS-04 NOT TO SCALE



H TIE BAR SUPPORT DETAIL RS-04 NOT TO SCALE

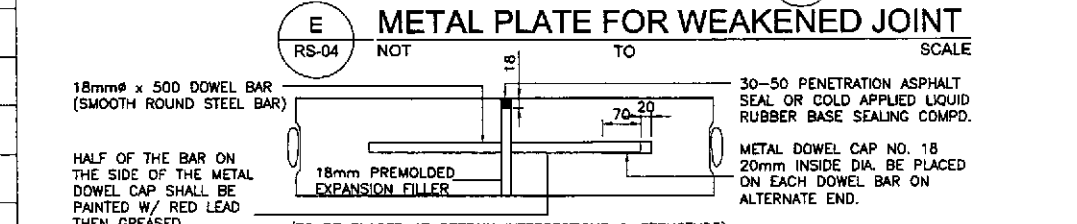


I TRANSVERSE EXPN. JOINT DETAIL RS-04 NOT TO SCALE



NOTES:

- MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE "GENERAL SPECIFICATIONS FOR ROADS AND BRIDGES 1995".
- CONSTRUCTIONS (CONTACT) JOINTS ARE FORMED WHEN CONCRETE ON ONE SIDE OF THE JOINT IS POURED AHEAD AND ALLOWED TO SET BEFORE POURING ON THE OTHER SIDE.
- AT CONSTRUCTION JOINT, (LONGITUDINAL OR TRANSVERSE) CARE SHOULD BE TAKEN THAT NO CONCRETE FROM THE LAST SLAB PLACED OVERHANGS ANY PORTION OF FIRST SLAB.
- ALL BARS SHALL BE DEFORMED STEEL BARS.
- TYPE OF WEAKENED PLANE JOINT TO BE USED SHALL BE AS SPECIFIED IN THE PLANS AND ONLY ONE TYPE SHALL BE USED FOR THE WHOLE PROJECT.
- MATERIAL FOR THE DEFORMED METAL PLATE SHALL BE BRAND NEW SHEET METAL GAUGE NO. 18 OF IRON FREE FROM RUST AND KINKS.
- AT LEAST SIX(6) SUCCESSIVE DOWELED BUTT JOINTS AT NORMAL JOINT SPACING, SHALL BE PROVIDED BEFORE OR AFTER AN EXPANSION JOINT.
- THE GROVE OR CRACK ABOVE JOINT (LONGITUDINAL OR TRAVERSE) SHALL BE SEALED WITH 30-50 PENETRATION ASPHALT SEAL OR COLD APPLIED LIQUID RUBBER COMPOUND AFTER THE CONCRETE HARDENS AND BEFORE OPENING THE PAVEMENT TO TRAFFIC. PENETRATION ASPHALT SEAL ON CONCRETE PAVEMENT JOINTS SHOULD BE POURED IN SUCH MANNER THAT SPILLING WILL BE ELIMINATED/PREVENTED THUS, PROVIDE SMOOTH RIDING/LEVELLING SURFACE.
- ALL TRANSVERSE JOINTS, EXCEPT CONSTRUCTION JOINTS, SHALL BE CONTINUOUS FROM EDGE TO EDGE.
- ALL LONGITUDINAL JOINTS SHALL MEET AT INTERSECTIONS WITH NO GAPSOR OFFSETS.
- WHEN WIDTH OF LANE IS THIRTY SIX(36) METERS OR LESS, SIZE OF THE BAR MAY BE REDUCED TO 12mm DIAMETER.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

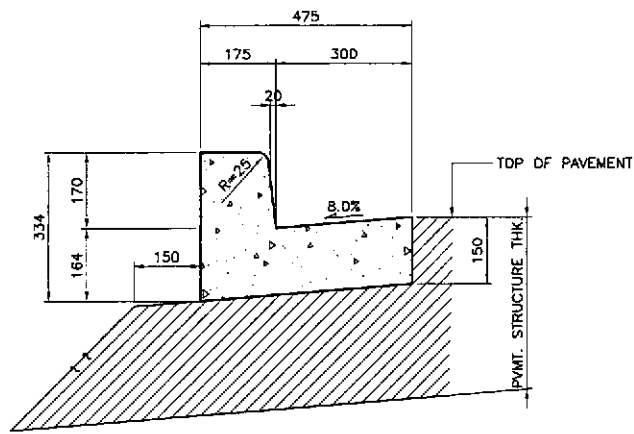


B DOWELLED EXPN. JOINT DETAIL RS-04 NOT TO SCALE

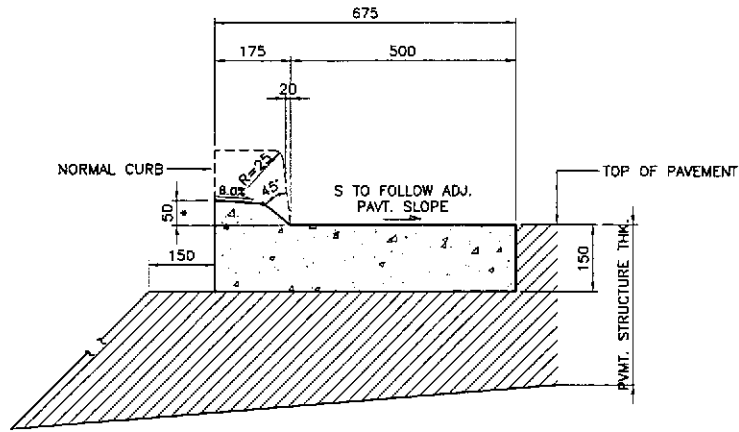
T	a	b	c	E	F
180	60	750	375 750	289	375
200	70	750	375 750	289	375
230	85	500	250 500	164	250
250	95	500	250 500	164	250
280	110	500	250 500	164	250

TABLE OF DIMENSIONS

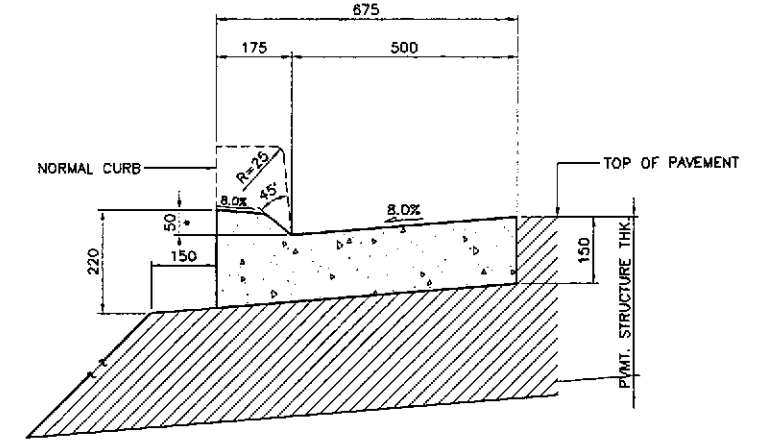
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES	PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	3. S. SEAY		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	BUREAU OF DESIGN	OFFICE OF THE SECRETARY	NOT TO SCALE	STANDARD PORTLAND CEMENT CONCRETE PAVEMENT
SUBMITTED		10/18/02	TEAM LEADER	Submitted By: DANILO C. TRAJANO, Project Director Reviewed By: JOSEFINA M. ALACAR, Chief, Highway Division Recommended By: GILBERTO S. REYES, OIC, Director IV Recommended By: MANUEL M. BONDAN, Undersecretary Approved By: SIMEON A. DATUMANONG, Secretary		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 II	FULL SIZE A1		



1c TYPE "C"
RS-05

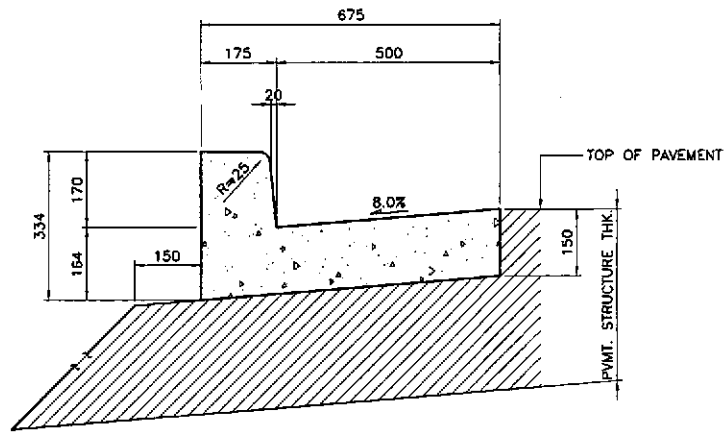


2c TYPE "B"
RS-05

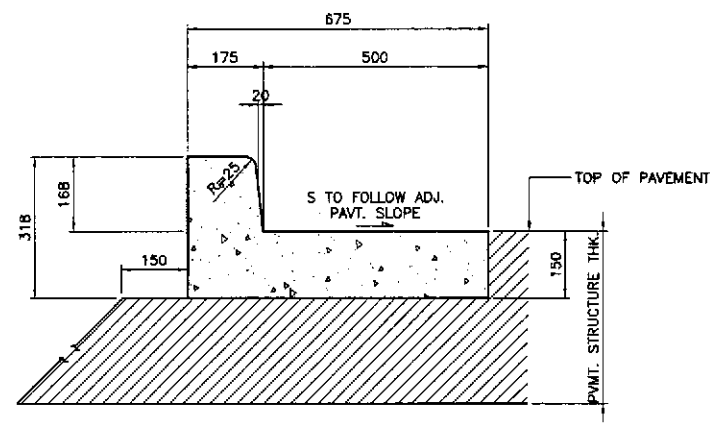


3 CONCRETE DROP CURB AND GUTTER (MODIFIED)
RS-05 NOT TO SCALE

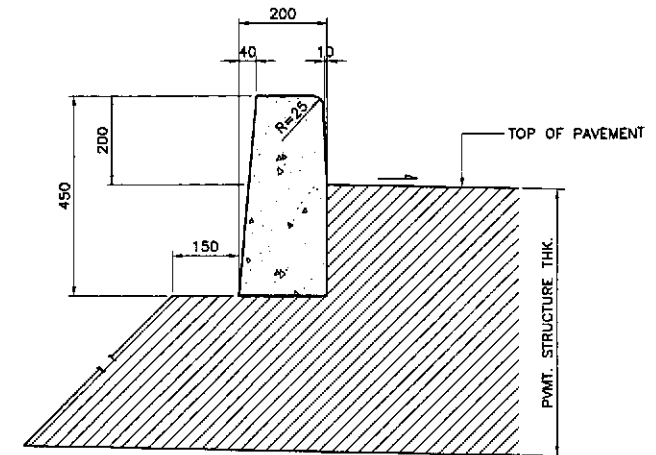
* 30 FOR RAMPS FOR PHYSICALLY HANDICAPPED



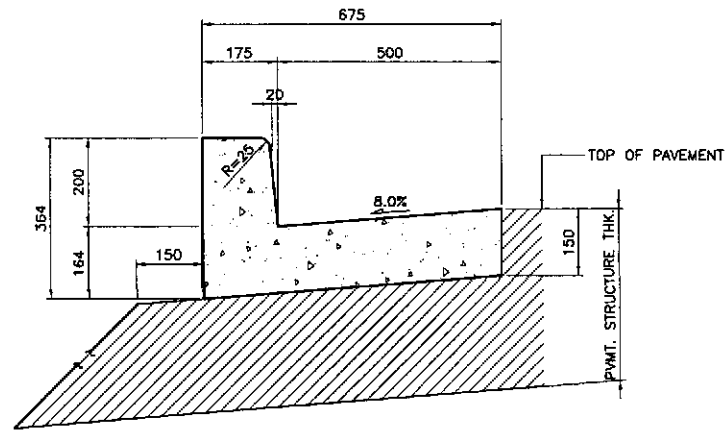
1b TYPE "B"
RS-05



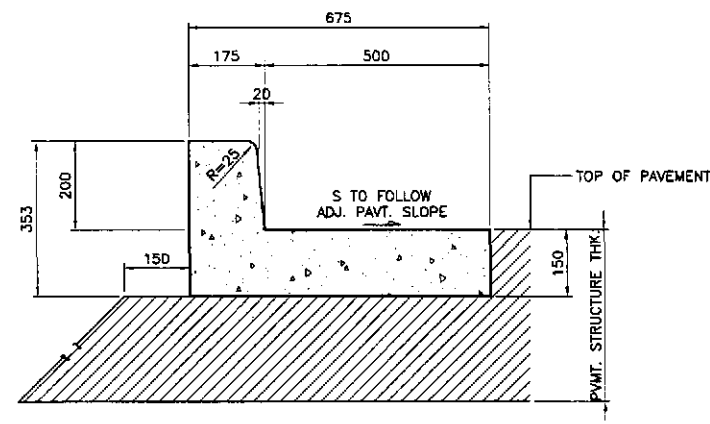
2b TYPE "B"
RS-05



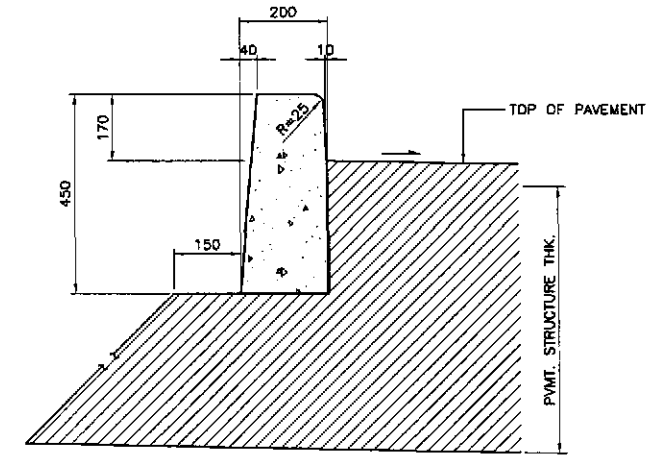
4a TYPE "A"
RS-05



1a TYPE "A"
RS-05



2a TYPE "A"
RS-05



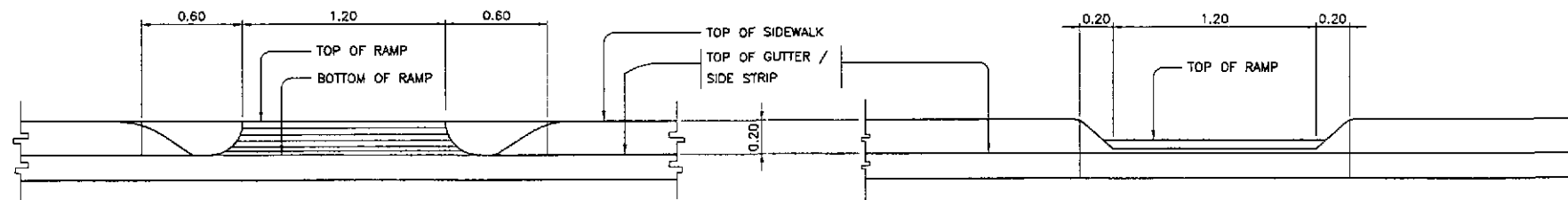
4b TYPE "B"
RS-05

1 COMBINATION CONCRETE CURB AND GUTTER
RS-05 NOT TO SCALE

2 COMBINATION CONCRETE CURB AND SIDE STRIP
RS-05 NOT TO SCALE

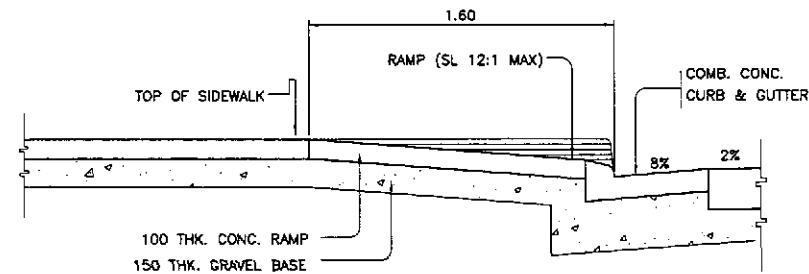
4 CONCRETE CURB
RS-05 NOT TO SCALE

	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	<i>[Signature]</i>	BUREAU OF DESIGN P.J.H. - P.M.D. Submitted By:			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	CONCRETE CURB AND GUTTER DETAILS	RS-05
	SUBMITTED	10/18/02	<i>[Signature]</i>	OFFICE OF THE SECRETARY Reviewed By: JOSEFINA M. ALAGAR (Chief, Highways Division) Recommended By: GILBERTO S. REYES (D.C., Director IV) Approved By: MANUEL M. BONDAN (Undersecretary) SIMEON A. DATUMANONG (Secretary)			CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		

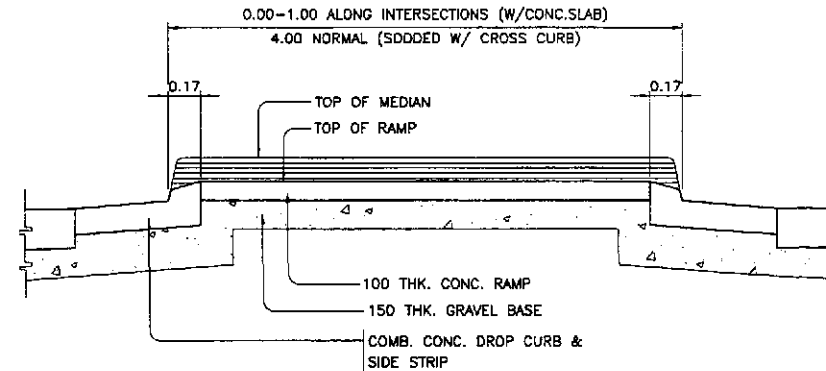


A2 ELEVATION
RS-06 SCALE 1:20

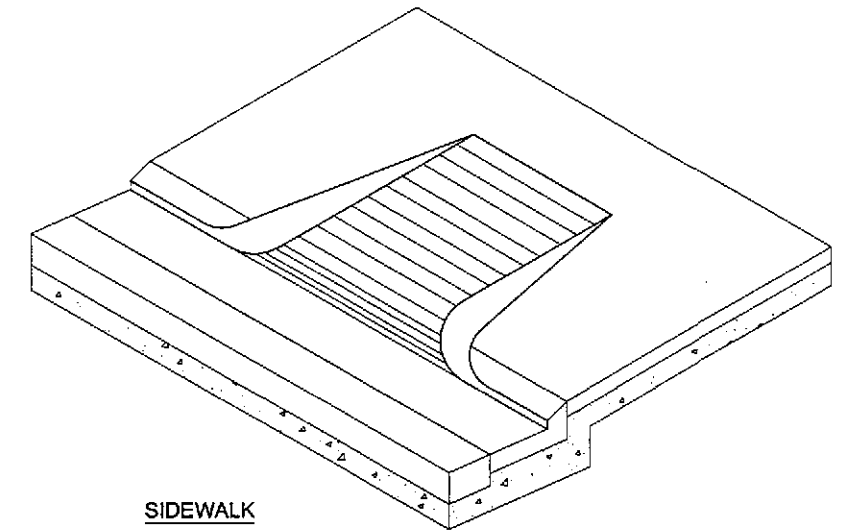
B2 ELEVATION
RS-06 SCALE 1:20



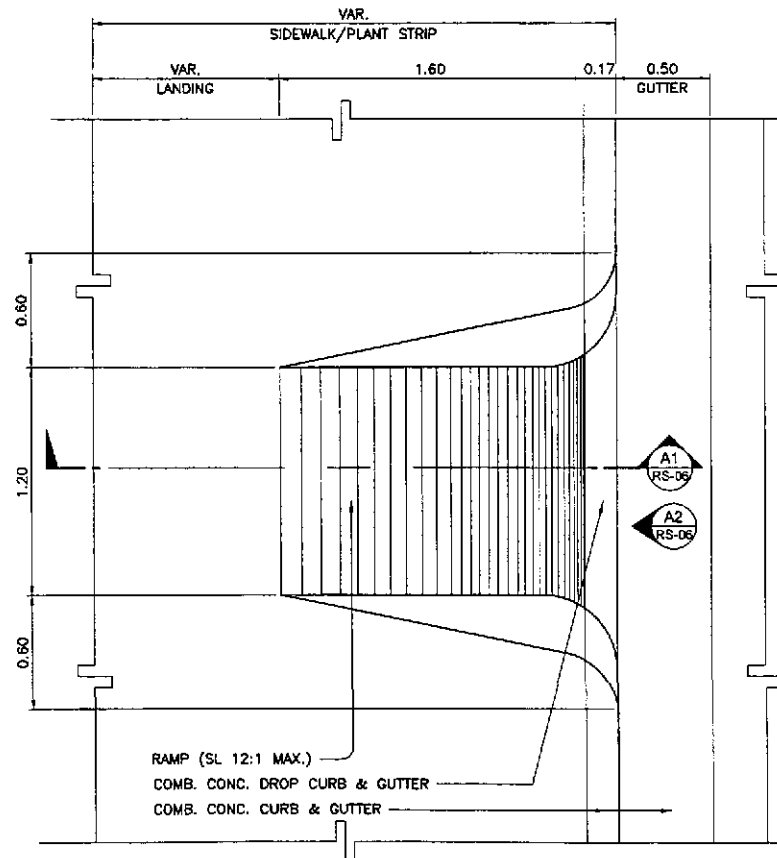
A1 SECTION
RS-06 SCALE 1:20



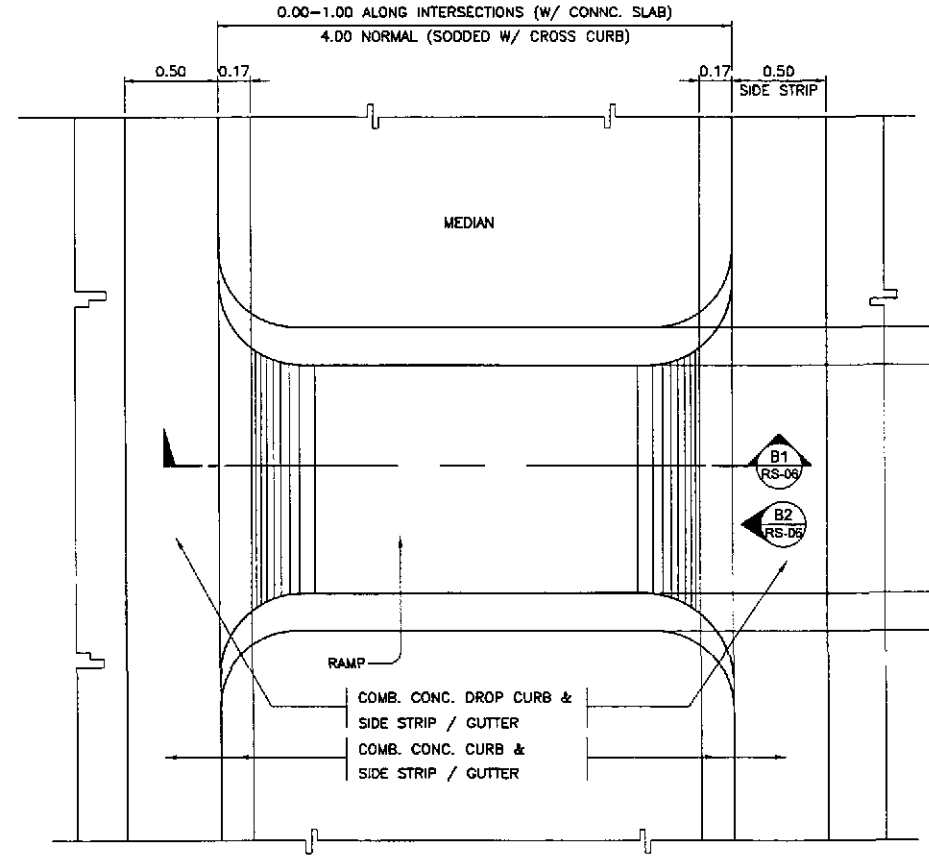
B1 SECTION
RS-06 SCALE 1:20



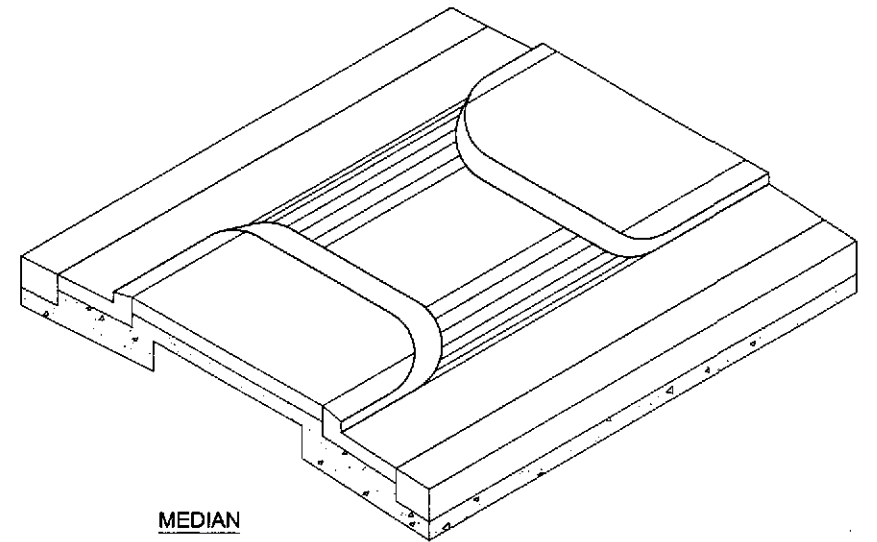
SIDEWALK



A PLAN
RS-06 SCALE 1:20



B PLAN
RS-06 SCALE 1:20

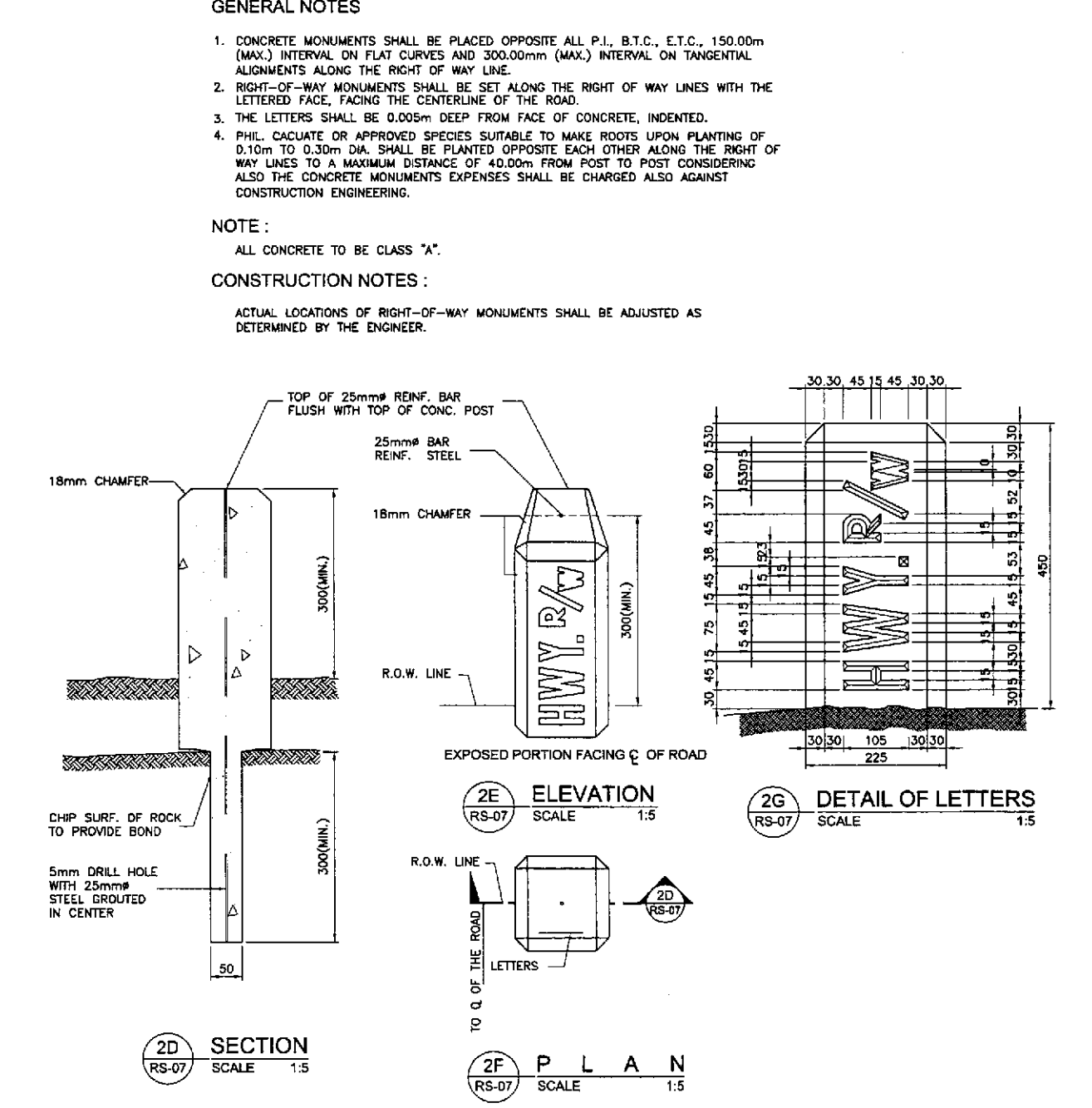
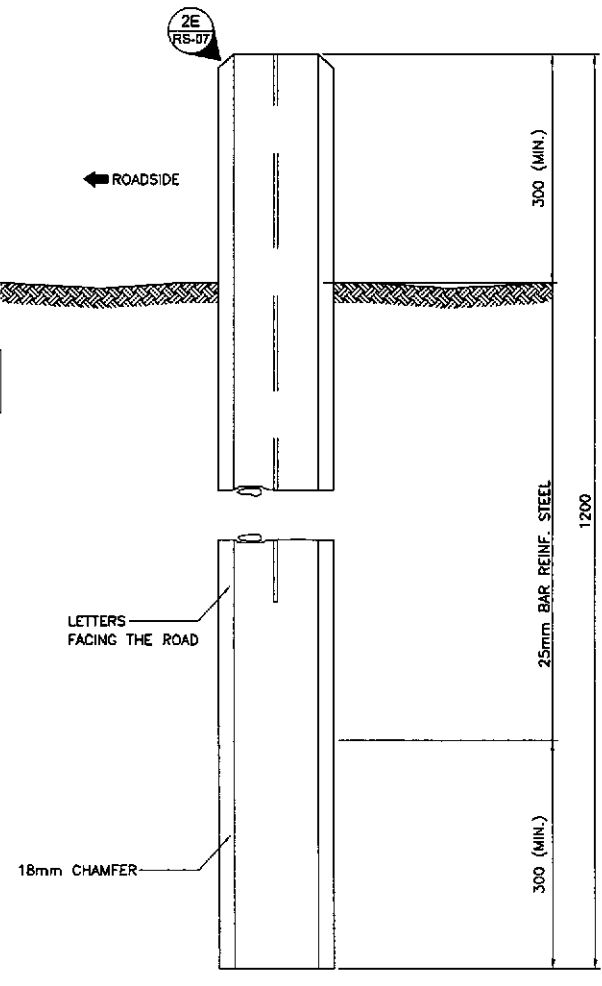
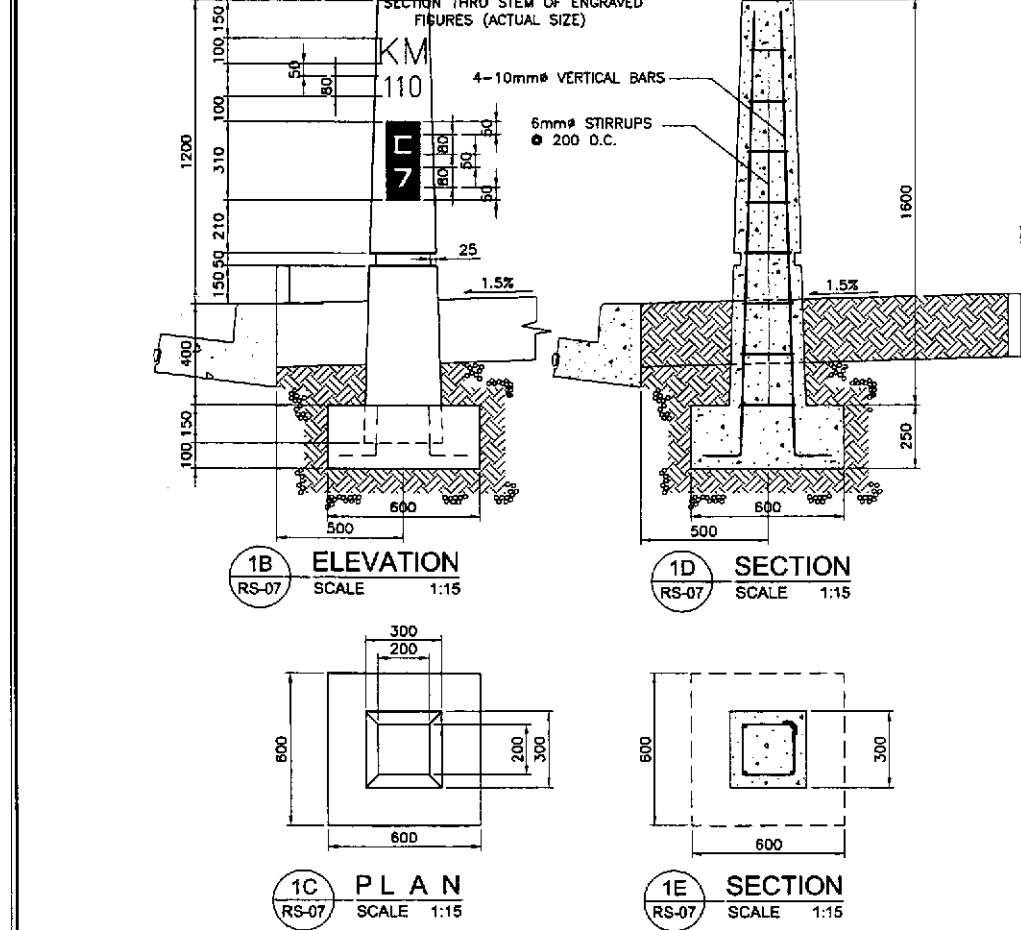
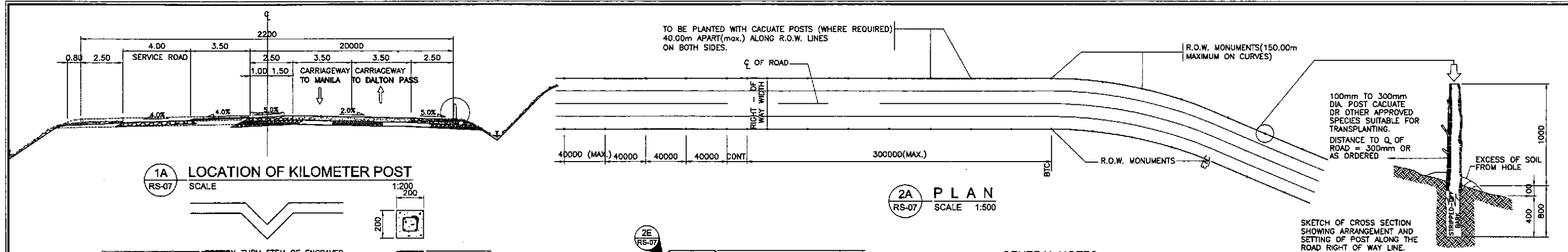


MEDIAN

C ISOMETRIC VIEW
RS-06 NOT TO SCALE

1 CURB-CUT RAMP DETAILS
RS-06 SCALE AS SHOWN

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	<i>[Signature]</i>		Submitted By:	BUREAU OF DESIGN	OFFICE OF THE SECRETARY		AS SHOWN	CURB-CUT RAMP DETAILS (FOR THE PHYSICALLY HANDICAPPED)	RS-06
	SUBMITTED	10/12/02	<i>[Signature]</i>		DANILO C. TRAJANO Project Director	Reviewed By:	Recommended By:		Approved By:		



NOTES:

- CONCRETE MIXTURE TO BE USED SHOULD BE CLASS "A" MIX (1:2:3). ALL CONCRETE SHOULD BE PLAIN CEMENT FINISHED, PAINTED WITH WHITE REFLECTORIZED WHILE LETTERINGS AND NUMERALS SHOULD BE CHROME YELLOW REFLECTORIZED PAINT. BE V-CUT (SEE SECTION DRAWING) POST.
- ALL DIMENSIONS ARE ALL IN MILLIMETERS UNLESS OTHERWISE STATED.

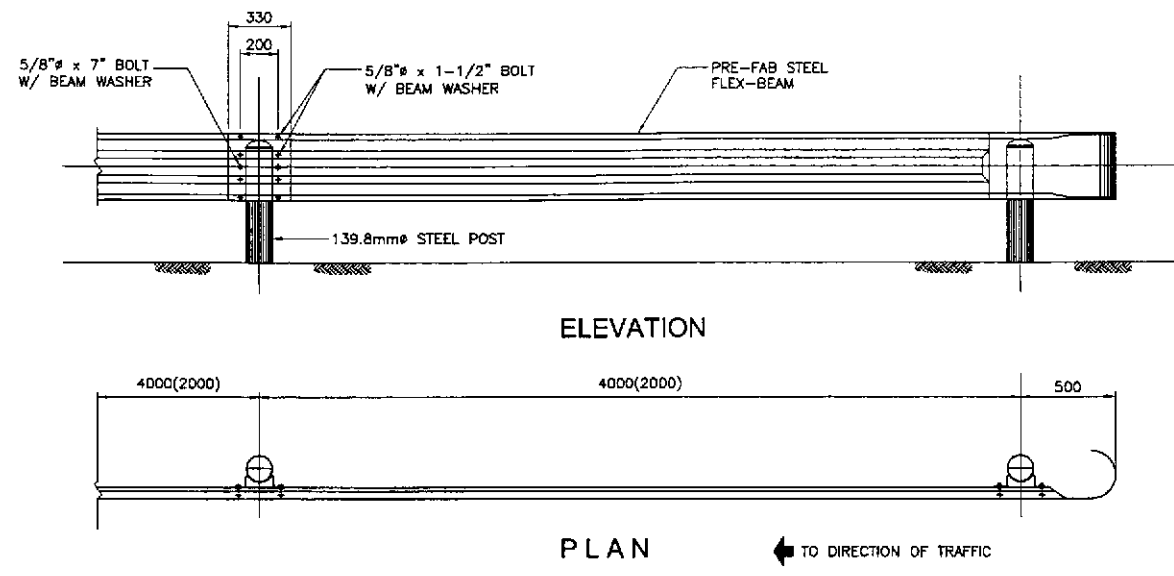
CONDITIONS:

- WHERE THE SHOULDER IS LESS THAN 1.00 TO 2.50 METERS, KILOMETER POST SHALL BE LOCATED AS FAR AS PRACTICABLE BUT NOT LESS THAN 0.50 METER AWAY FROM THE GUTTER THAT CLEAR VISIBILITY WITHIN 25.00 TO 50.00 METERS IS FACILITATED.
- ALL KM. POST TO BE PLACED ON THE RIGHT HAND SIDE OF THE ROAD.

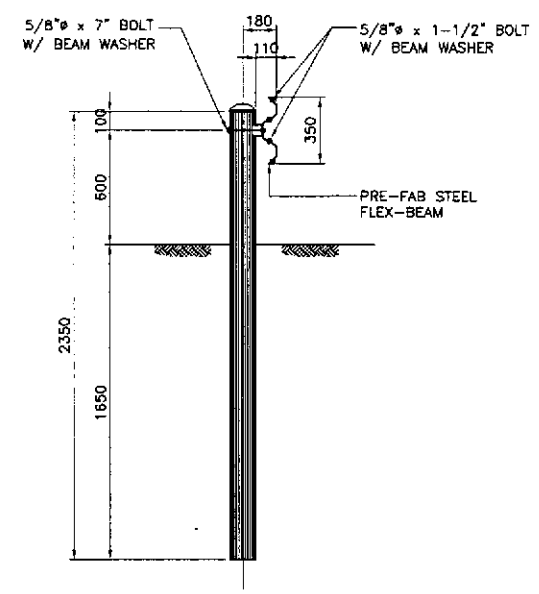
1 KILOMETER POST
SCALE AS SHOWN

2 RIGHT OF WAY MARKER
SCALE AS SHOWN

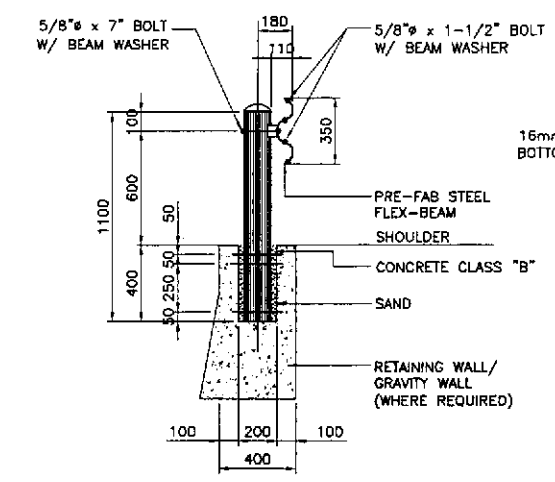
	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/12/02	ACACIO	BUREAU OF DESIGN			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	STANDARD KILOMETER POST AND RIGHT OF WAY MARKERS	RS-07
	SUBMITTED	10/12/02	M. R. RIVERA	OFFICE OF THE SECRETARY			CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		
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:				Recommended By:		MANUEL M. BONDAN Undersecretary	Approved By:		SIMEON A. DATUMANONG Secretary	



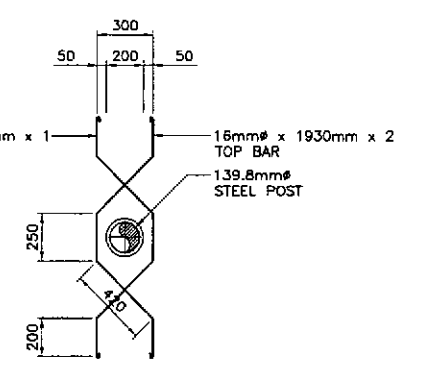
1 GUARDRAIL DETAIL
RS-08 SCALE 1:20



SECTION

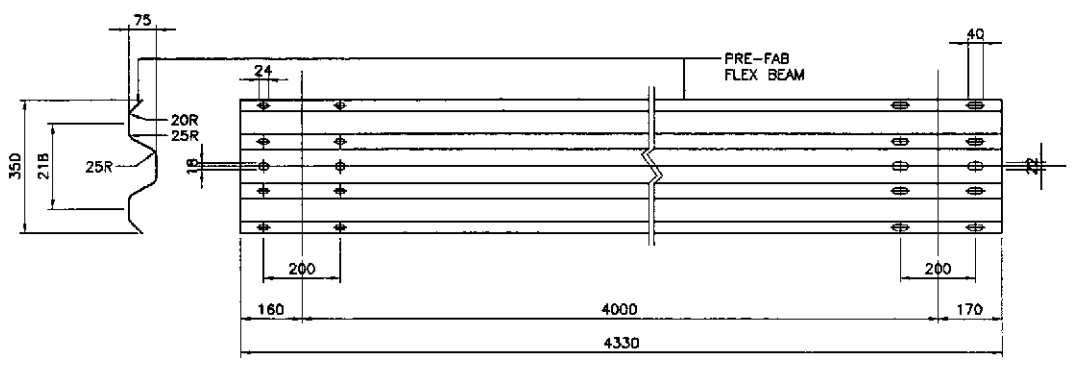


SECTION

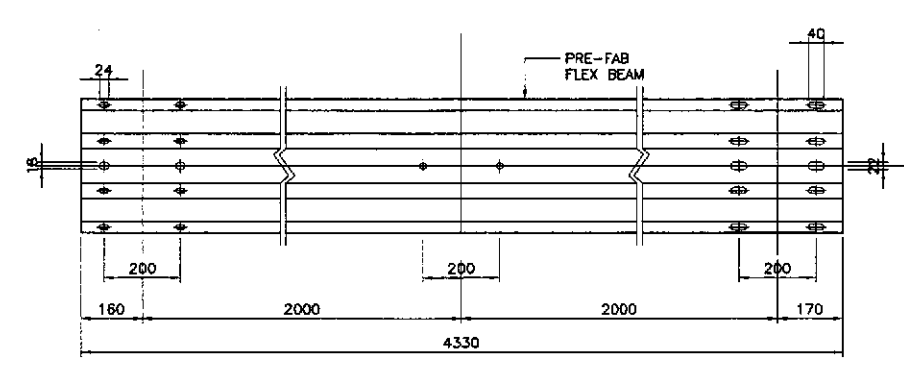


PLAN

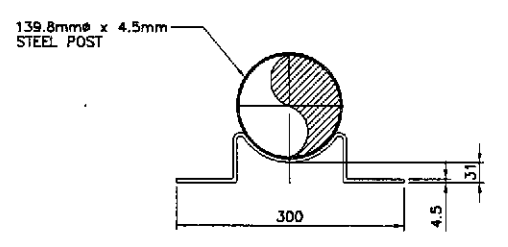
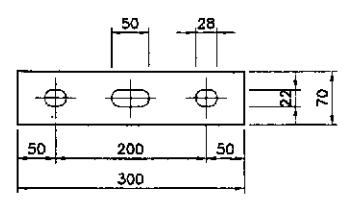
2 STEEL POST DETAIL
RS-08 SCALE 1:20



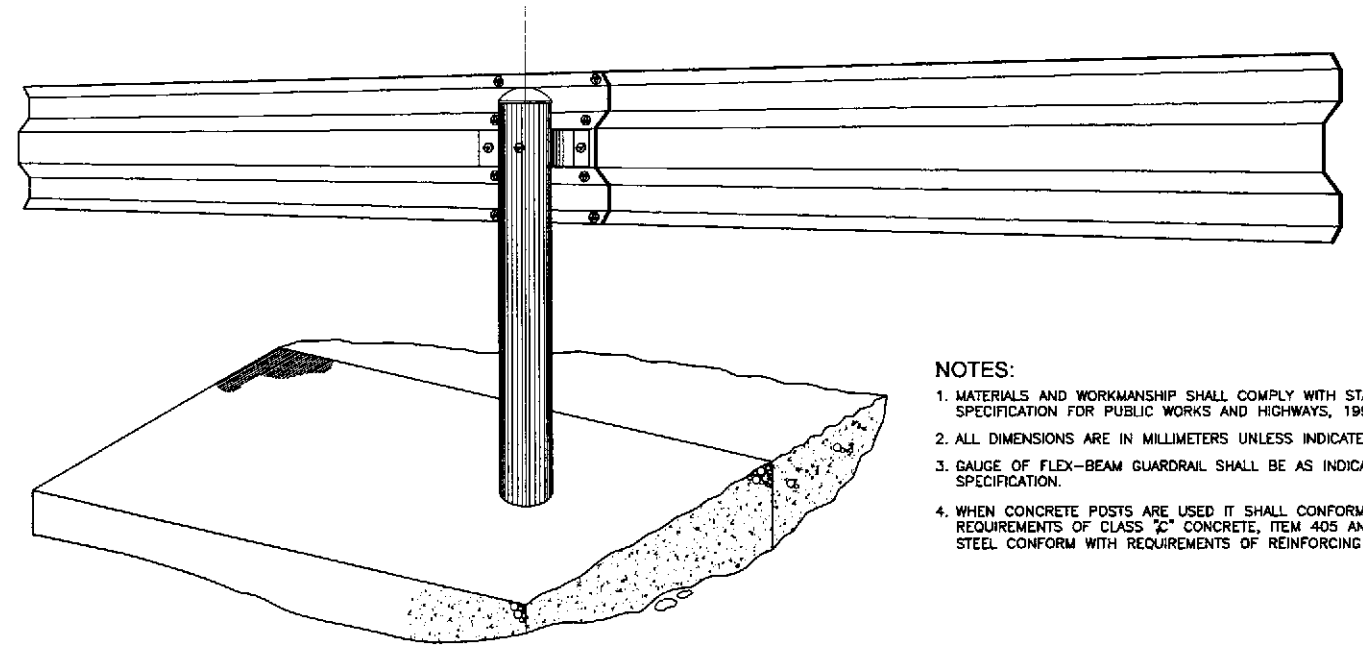
3 BEAM TYPE GUARDRAIL (TYPE "GR-A")
RS-08 SCALE 1:10



4 BEAM TYPE GUARDRAIL ON RETAINING WALL (TYPE "GR-B")
RS-08 SCALE 1:10



5 BRACKET DETAIL
RS-08 SCALE 1:5



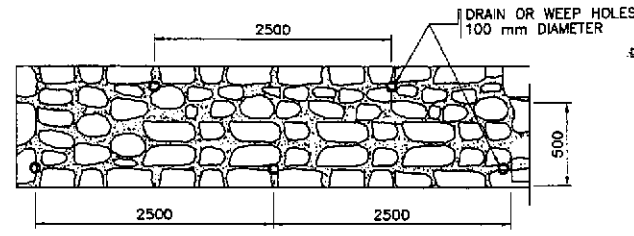
PERSPECTIVE

- NOTES:
1. MATERIALS AND WORKMANSHIP SHALL COMPLY WITH STANDARD SPECIFICATION FOR PUBLIC WORKS AND HIGHWAYS, 1995 EDITION.
 2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS INDICATED OTHERWISE.
 3. GAUGE OF FLEX-BEAM GUARDRAIL SHALL BE AS INDICATED IN SPECIFICATION.
 4. WHEN CONCRETE PDSTS ARE USED IT SHALL CONFORM WITH THE REQUIREMENTS OF CLASS "C" CONCRETE, ITEM 405 AND REINFORCING STEEL CONFORM WITH REQUIREMENTS OF REINFORCING STEEL, ITEM 404.

	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	S. ACACIO		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)			AS SHOWN	STANDARD STEEL BEAM GUARDRAIL (TYPE GR-A & GR-B)	RS-08
	SUBMITTED	10/12/02	M. R. RIVERA		CABANATUAN BYPASS - CONTRACT PACKAGE II			FULL SIZE A1		
Submitted By:		BUREAU OF DESIGN		OFFICE OF THE SECRETARY						
DANILO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONONAN Undersecretary		SIMEON A. DATUMANONG Secretary		

NOTE :

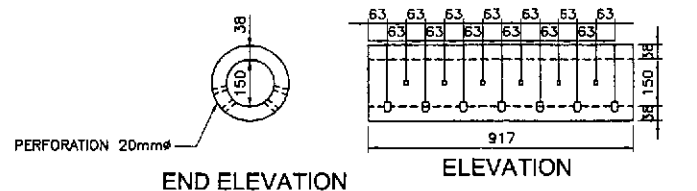
DRAIN OR WEEP HOLES SHALL BE PROVIDED IN SLOPE EMBANKMENT AT LOCATIONS SHOWN ON THE PLANS. GRAVEL BACKING NOT LESS THAN 0.057 CUBIC METER SHALL BE PROVIDED AT EACH DRAIN OR WEEP HOLES TO INSURE PROPER OPERATION OF THE DRAIN. ROCK BACKING SHALL EXTEND TO AT LEAST ONE (1) FOOT ABOVE THE DRAIN OR WEEP HOLES.



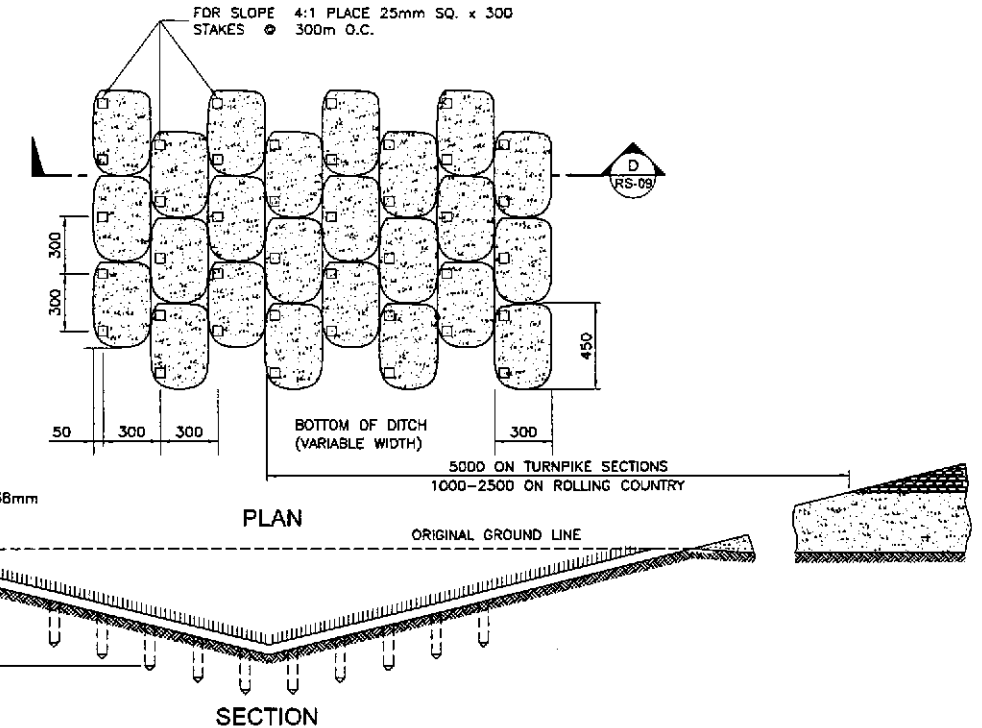
2A ELEVATION OF GROUDED RIP-RAP
RS-09 NOT TO SCALE

NOTE :

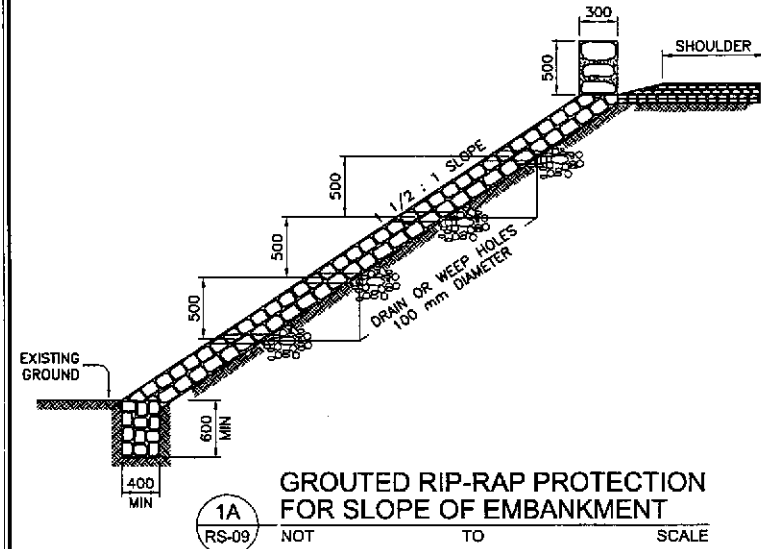
WHERE COMMON BORROW CONSIST OF CLAY OR OTHER IMPERVIOUS MATERIALS, SHOULDER DRAINS SHALL BE INSTALLED 20.00 M. APART ON EACH SHOULDER AND ARRANGED IN SUCH A WAY THAT THE DRAINS ON EACH SHOULDERS ARE STAGGERED AND NOT EXACTLY OPPOSITE EACH OTHER. THEY SHOULD BE CONSTRUCTED AT LOWEST POINT OF SAG VERTICALS ON BOTH SHOULDERS.



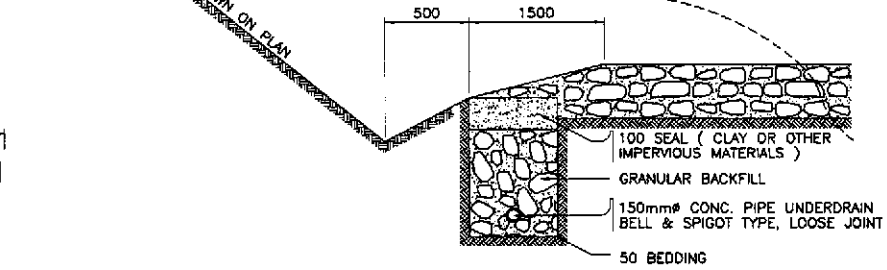
150mmØ UNREINFORCED CONCRETE PIPE UNDERDRAIN
RS-09 NOT TO SCALE



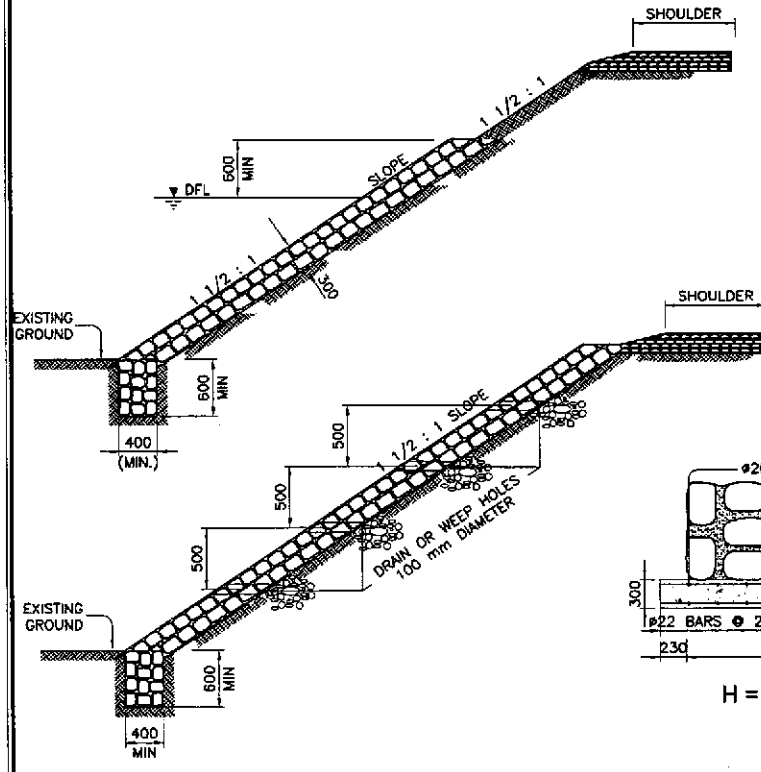
D DETAIL OF SODDING
RS-09 NOT TO SCALE



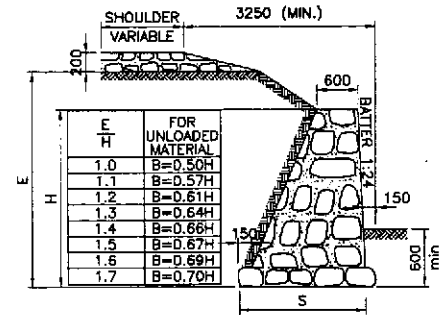
1A GROUDED RIP-RAP PROTECTION FOR SLOPE OF EMBANKMENT
RS-09 NOT TO SCALE



C DETAIL OF UNDERDRAIN
RS-09 NOT TO SCALE

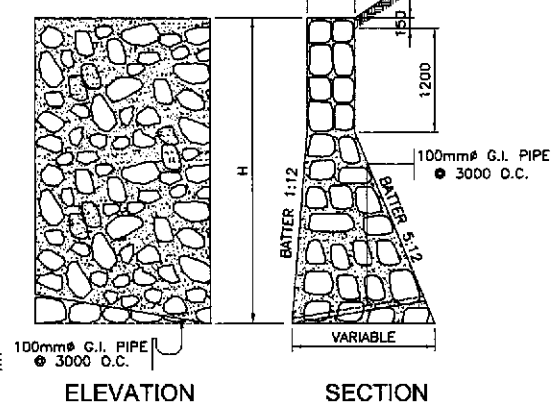


A EMBANKMENT PROTECTION WALLS
RS-09 NOT TO SCALE

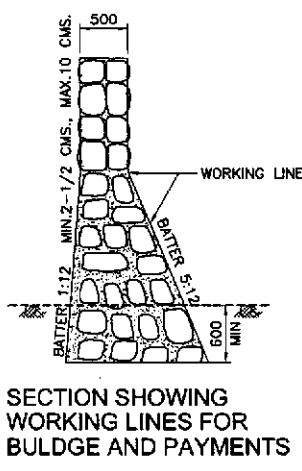


1B RUBBLE MASONRY RETAINING WALL
RS-09 NOT TO SCALE

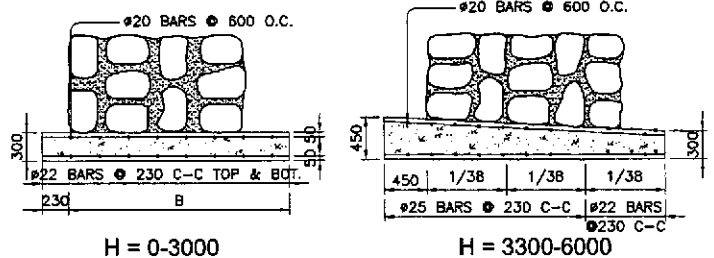
HEIGHT "H" IN METER	QUANTITIES PER LINEAR METER OF WALL	
	CONCRETE CU. M.	STEEL KILOS
3.00	0.153	19
3.60	0.230	30
4.80	0.306	40
6.00	0.383	45



3B STONE MASONRY RETAINING WALL
RS-09 NOT TO SCALE



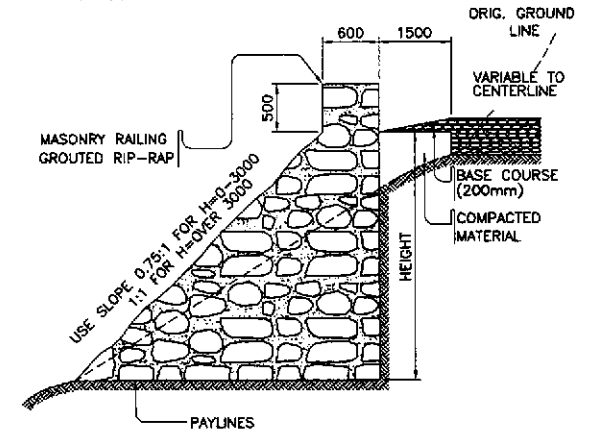
B MASONRY RETAINING WALLS
RS-09 NOT TO SCALE



2B FOOTING FOR WALL
RS-09 NOT TO SCALE

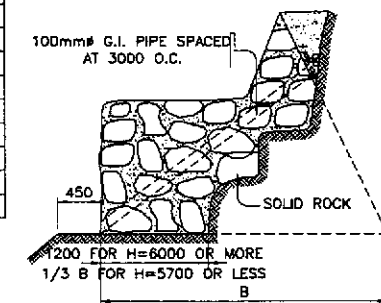
HEIGHT IN METERS	QUANTITIES PER LINEAR M. OF WALL IN CU. METER		HEIGHT IN METERS	QUANTITIES PER LINEAR M. OF WALL IN CU. METER	
	CONCRETE	STEEL		CONCRETE	STEEL
0.90	0.15	19	3.60	1.15	30
1.20	0.23	30	3.90	1.30	35
1.50	0.31	40	4.20	1.45	40
1.90	0.38	45	4.50	1.68	45
2.10	0.46	50	4.80	1.91	50
2.40	0.54	55	5.10	2.14	55
2.70	0.69	60	5.40	2.37	60
3.00	0.77	65	5.60	2.68	65
3.30	0.92	70	6.00	2.91	70

MIN. BULGE 2.50 CMS., MAX. BULGE 10 CMS. FEATHERED TO WORKING LINE AT JOINTS TO BE RAKED TO A DEPTH OF 2.50 TO 5 CMS.

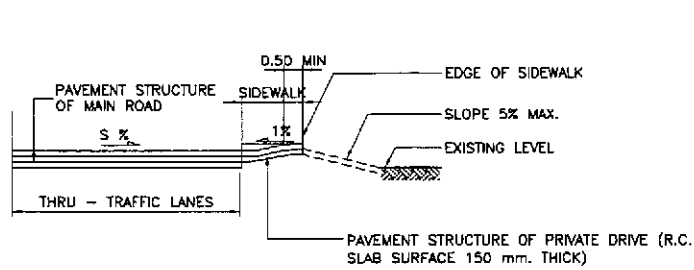


5B HAND LAID ROCK EMBANKMENT
RS-09 NOT TO SCALE

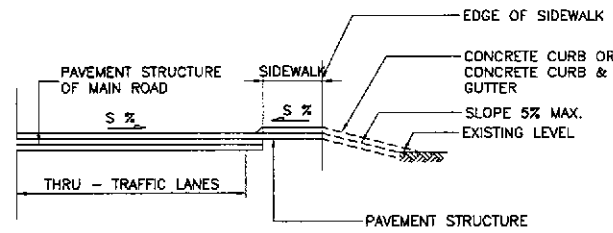
NOTE :
CONCRETE CLASS "A" FOOTING FOR WALL WHEN ORDERED BY THE ENGINEER. DEPTH OF FOOTING : FOOTING SHALL BE CARRIED DOWN TO A FIRM FOUNDATION AS DIRECTED BY THE ENGINEER.
MORTAR : TO BE ONE (1) PART CEMENT AND THREE (3) PARTS SAND.
MORTAR : JOINTS WITH GENERALLY 2.50 TO 4 CMS., MIN. 2 CMS., MAX. 6.50 CMS.
BULGE : THE BULGE OF INDIVIDUAL STONES SHALL VARY BETWEEN 2.50 TO 10 CMS.
SURFACE FINISH : TO BE FREE OF TOOL OR DRILL MARKS.
PAYMENT FOR POROUS TILE DRAIN WITH ROCK BACKFILL AND FOR 150mmØ & GALVANIZED IRON PIPES WITH ROCK BACKING PAYMENT WILL NOT BE MADE DIRECT, BUT WILL BE INCLUDED AS PART OF THE PRICE BID FOR MASONRY QUANTITY TO BE PAID FOR SHALL BE WITHIN THE WORKING LINES AS SHOWN IN SECTIONS. ALL WALL MASONRY SHALL BE "STONE MASONRY" ITEM 505 OF GOVERNMENT STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES.



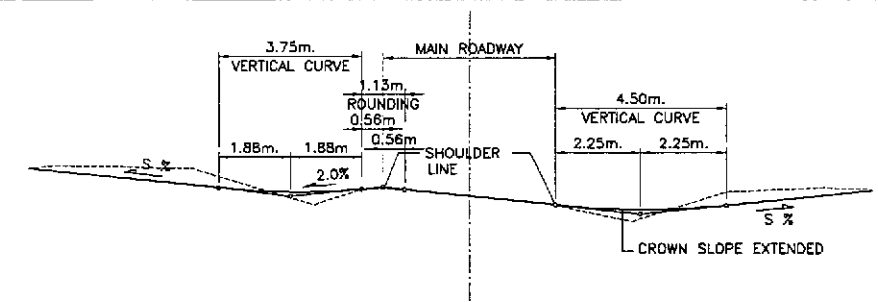
4B METHOD OF STEPPING FOOTING
RS-09 NOT TO SCALE



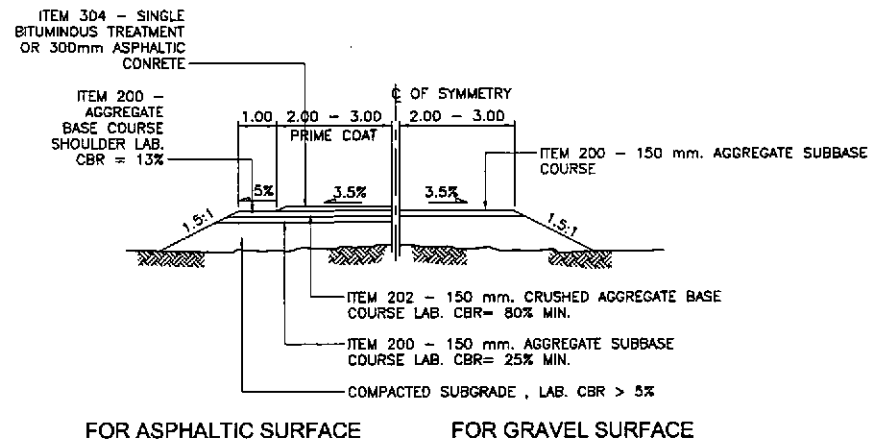
4 TYPICAL PRIVATE DRIVEWAY AT SIDE WALK (PROFILE)
RS-10 NOT TO SCALE



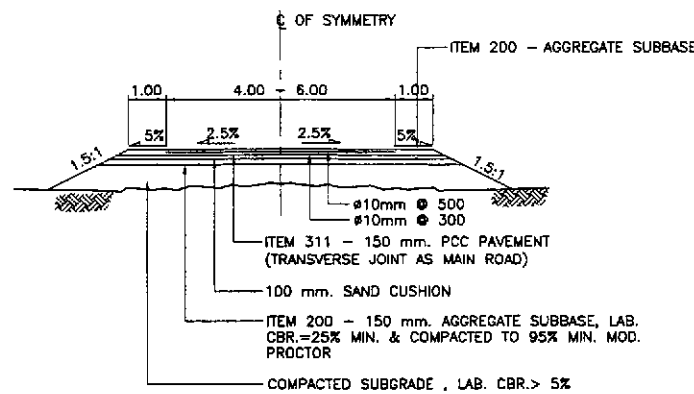
5 TYPICAL SIDE ROAD AT SIDE WALK (PROFILE)
RS-10 NOT TO SCALE



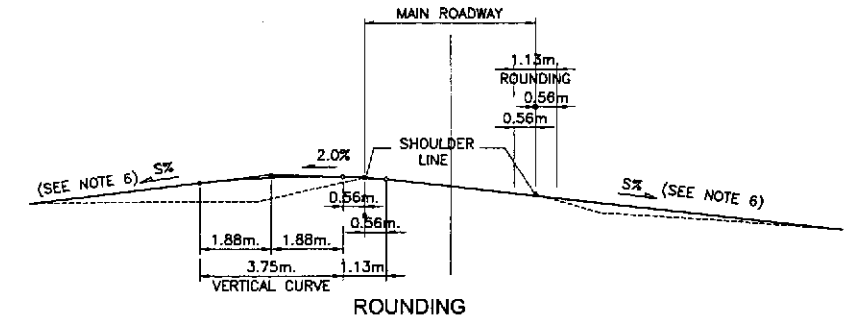
6C SUPERELEVATED CUT SECTION
RS-10 NOT TO SCALE



FOR ASPHALTIC SURFACE FOR GRAVEL SURFACE

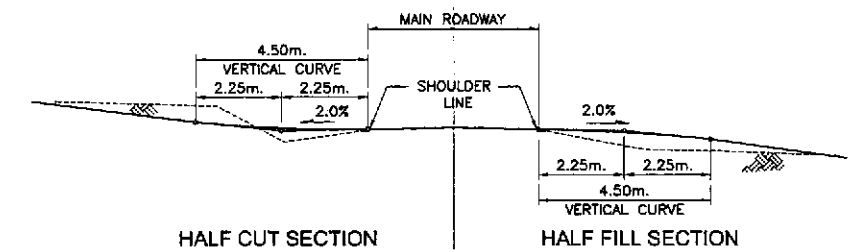


FOR R.C. CONCRETE PAVEMENT FOR PRIVATE DRIVEWAY



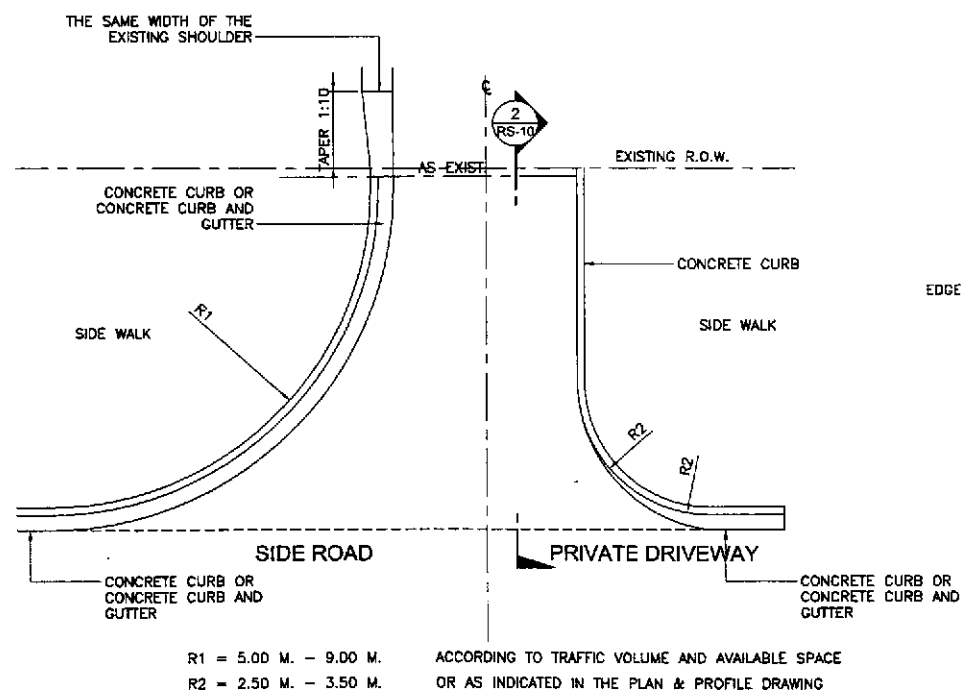
6B SUPERELEVATED FILL SECTION
RS-10 NOT TO SCALE

3 TYPICAL CROSS - SECTION
RS-10 NOT TO SCALE



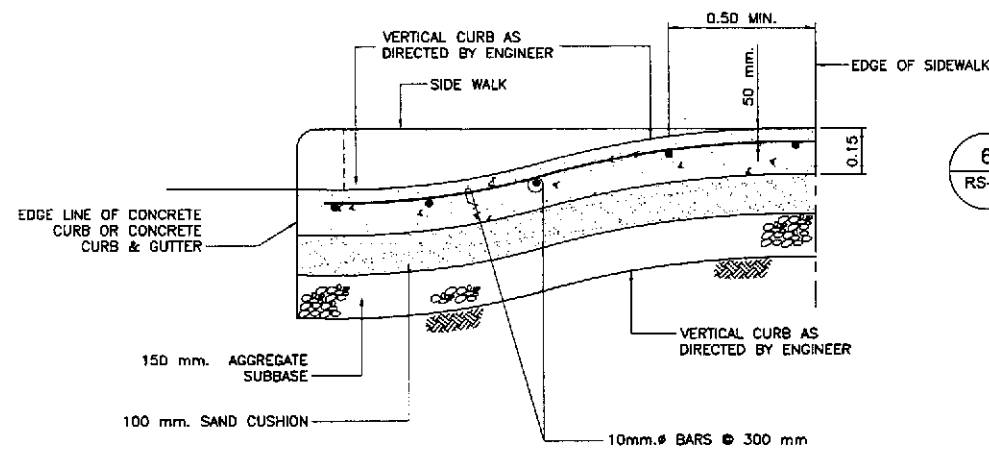
HALF CUT SECTION HALF FILL SECTION

6A STANDARD CROWNED SECTION
RS-10 NOT TO SCALE



R1 = 5.00 M. - 9.00 M. ACCORDING TO TRAFFIC VOLUME AND AVAILABLE SPACE
R2 = 2.50 M. - 3.50 M. OR AS INDICATED IN THE PLAN & PROFILE DRAWING

1 PLAN OF SIDE ROAD & PRIVATE DRIVEWAY AT SIDE WALK
RS-10 NOT TO SCALE



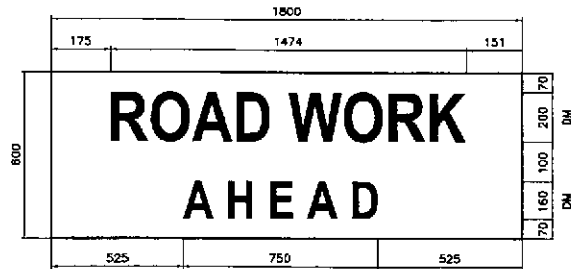
2 SECTION OF R.C. CONCRETE PAVEMENT OF SIDE ROAD & PRIVATE DRIVEWAY
RS-10 NOT TO SCALE

6 VERTICAL ALIGNMENT OF ACCESS ROAD APPROACHES TO MINOR INTERSECTION
RS-10 NOT TO SCALE

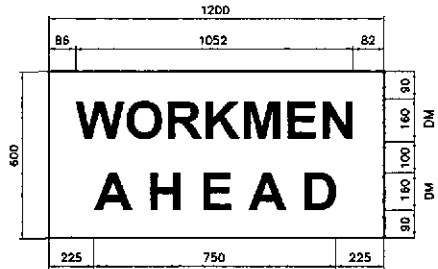
NOTES:

- THE ENGINEER SHALL DIRECT THE LISTING OF CONNECTION SIDE ROAD/ PRIVATE DRIVEWAY APPROACHES, THE ARRANGEMENT OF THE DRAINAGE STRUCTURES (IF ANY), THE LIMIT OF WORK FOR THE CONNECTION ROADS AND THE TYPE AND QUANTITIES OF PAVEMENT STRUCTURE.
- THE WORD "SIDE ROAD" IN THIS DRAWING REFER TO THE ROAD CONNECTING TO THE HIGHWAY SIDE ROAD LEADS TO THE BARANGAY, PUBLIC PLACE ETC., WHILE "PRIVATE DRIVEWAY" IS THE PRIVATE CONNECTION ROAD FOR PRIVATE HOUSE.
- SIDE ROAD (PUBLIC) APPROACHES AND PRIVATE DRIVEWAY TO BUILDINGS OR RESIDENCE SHALL BE PAVED 1.5 m OUT FROM EDGE OF SHOULDER OR TO THE RIGHT-OF-WAY LINE, WHICHEVER IS LESS. PAVEMENT THICKNESSES SHALL BE AS SHOWN ON THE PLANS.
- USE 4:1 OF FLATTER SIDE SLOPE IN THE APPROACH RADIUS AREA.
- THE SIDE SLOPES IN THE MAIN ROADWAY AND THE APPROACH ROADWAY IF STEEPER THE 4:1 SHALL BE SMOOTHLY TRANSITIONED INTO THE 4:1 AREA.
- SIDE CROSS DRAINS SHALL BE LOCATED 10.00m OR AS SHOWN IN THE PLAN.
- 15m. RADIUS TO BE USED ON INTERSECTION ROADS, EXCEPT RESIDENTIAL DRIVES, UNLESS OTHERWISE SPECIFIED ON PLANS.
- RADIUS MAY BE VARIED TO SUIT FIELD CONDITIONS.
- TANGENT SLOPE NOT STEEPER THAN 10% BEYOND VERTICAL CURVE, THE SLOPE MAY BE STEEPER, IF REQUIRED, TO MEET EXISTING APPROACH SLOPE.
- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN METERS.

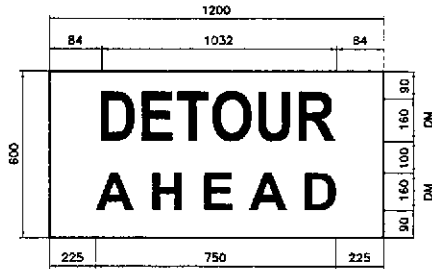
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	S. GUSE		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	SIDE ROAD APPROACHES AND PRIVATE DRIVEWAY ACCESS	RS-10
SUBMITTED	11/10/02	M. BILAGA	TEAM LEADER	BUREAU OF DESIGN Submitted By: DANILDO C. TRAJANO (Project Director) Recommended By: JOSEFINA M. ALAGAR (Chief, Highways Division) Recommended By: GILBERTO S. REYES (D.C. Director IV) Recommended By: MANUEL M. BONDAN (Undersecretary) Approved By: SIMEON A. DATUMANDING (Secretary)	CABANATUAN BYPASS - CONTRACT PACKAGE II			FULL SIZE A1			



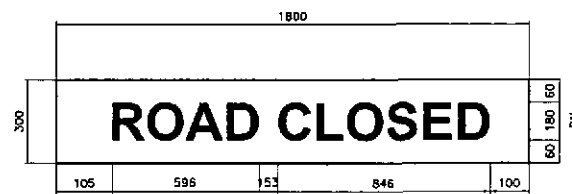
T1 - 1



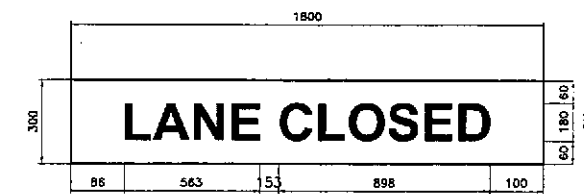
T1 - 5



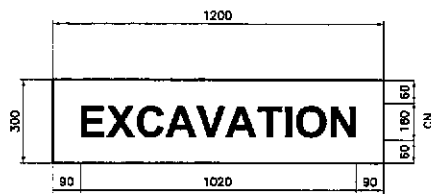
T1 - 6



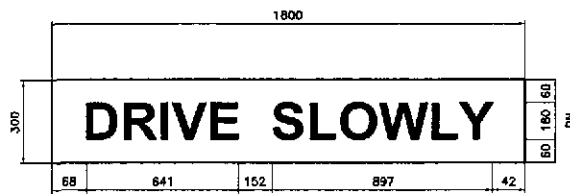
T2 - 2



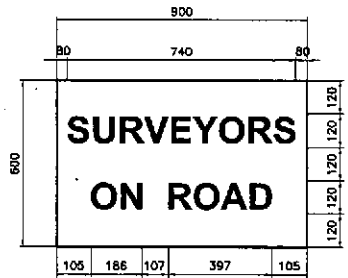
T2 - 4



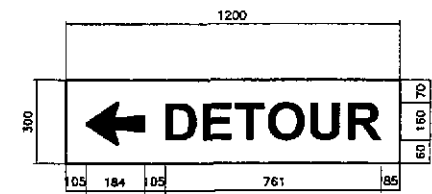
T2 - 6



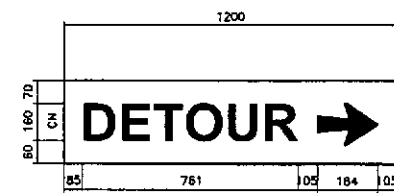
T2 - 7



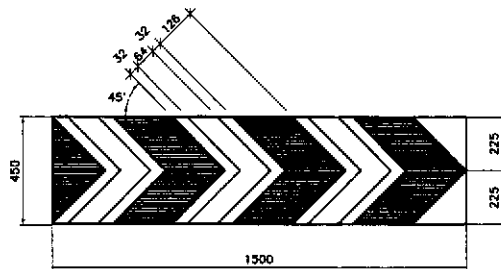
T2 - 8



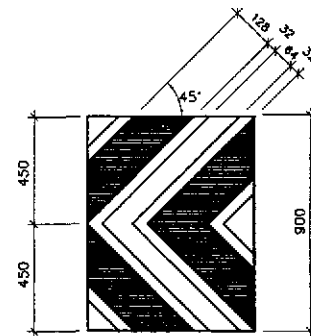
T4 - 1L



T4 - 1R



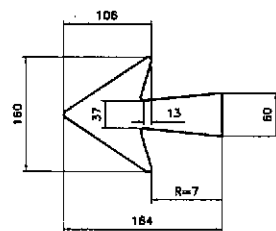
T4 - 2



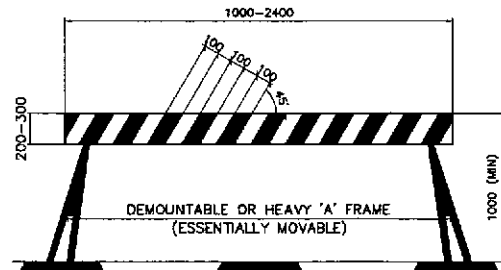
T4 - 3

NOTES :

- BARRIER SHALL HAVE AN ALTERNATE DIAGONAL BLACK AND YELLOW STRIPES. THE YELLOW BANDS SHALL BE REFLECTORIZED.
- BARRIER POINTS SHALL BE PRINTED YELLOW.
- PROVISION SHALL BE MADE FOR THE HANDLING OF SIGNS BELOW THE BARRIER BARS.



DETAIL OF ARROW



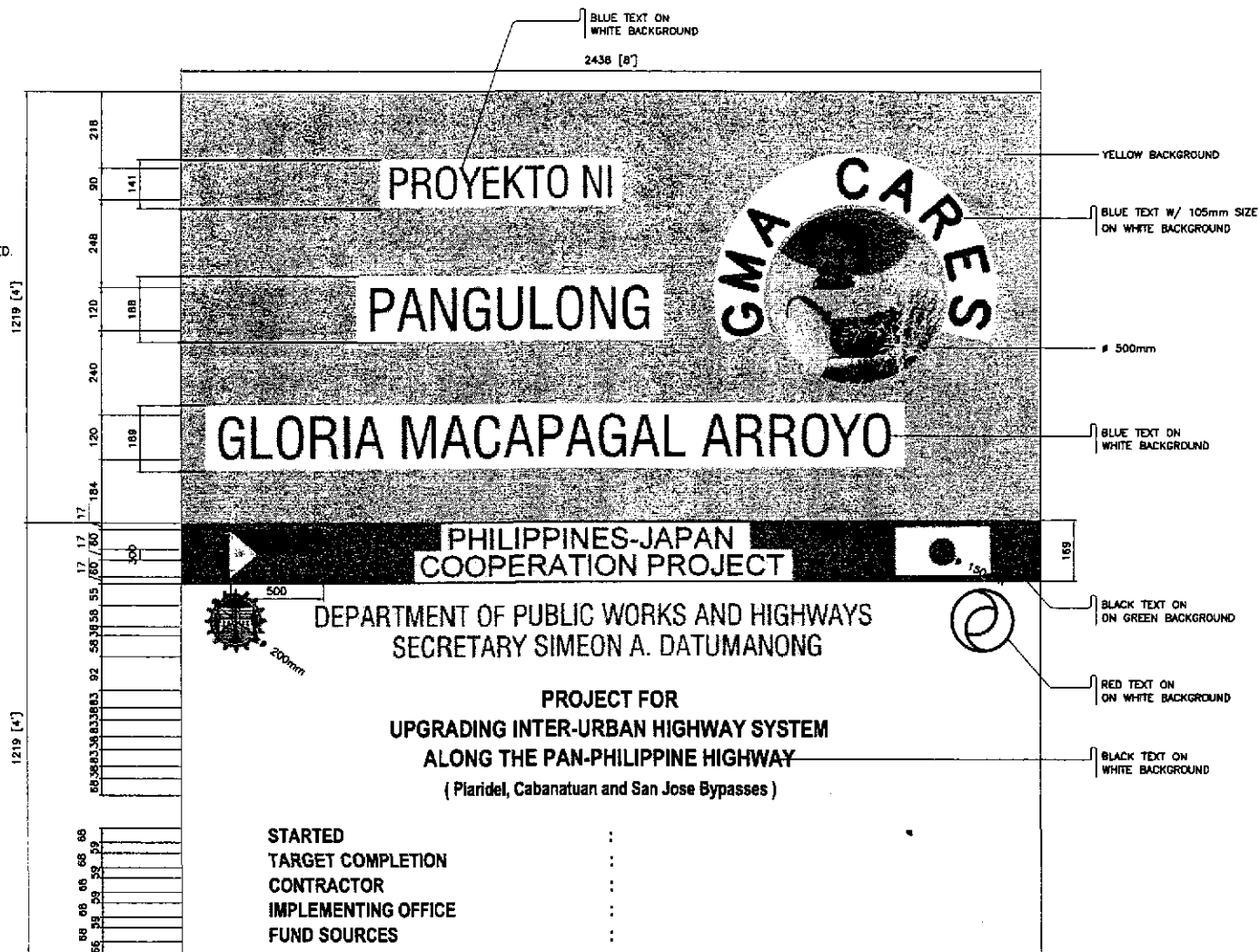
TYPE 1 BARRICADE

NOTES :

- ADVANCE SIGNS (T1) AND POSITION SIGNS (T2) SHALL HAVE BLACK LETTERS ON YELLOW REFLECTORIZED BACKGROUND.
- TRAFFIC DIVERSION SIGNS (T4-1) SHALL HAVE BLACK LETTERS AND ARROW ON YELLOW REFLECTORIZED BACKGROUND.
- TRAFFIC DIVERSION SIGNS (T4-2) & (T4-3) SHALL HAVE WHITE CHEVRONS ON BLACK BACKGROUND. WHITE REFLECTIVE MATERIAL 64mm. WIDE TO BE CENTRALLY PLACED ON WHITE BANDS.

ROAD SIGNS, (LOCATION AND INSTALLATION)

BARRICADES (TYPE I, TYPE II, TYPE III) SHOULD CONFORM WITH SPECIFICATIONS MENTIONED IN PHILIPPINES ROAD SHOWS MANUAL (REVISED EDITION MPWH, TRAFFIC ENG'G. AND MANAGEMENT PROJECT SERIES OF 1962.



(Two(2) at every Contract Package)

1 ROAD WORK SIGN DETAILS RS-11 NOT TO SCALE

2 PROJECT SIGN BOARD DETAILS RS-11 NOT TO SCALE

	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES			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 II	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	S. G. ACACIO		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				AS SHOWN		
SUBMITTED	10/19/02	Mr. R. R. R.	PJHL - PMO DANILLO C. TRAJANO Project Director	BUREAU OF DESIGN JOSEFINA M. ALAGAR Chief, Highways Division	OFFICE OF THE SECRETARY Recommended By: GILBERTO S. REYES OIC, Director IV	Approved By: MANUEL M. BONOAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary	FULL SIZE A1			



1
W1-1(L or R)



2
W1-4 (L)



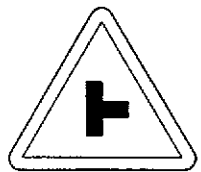
3
W2-1



4
W2-4



5
W2-5



6
W2-6 (L or R)



7
W2-7



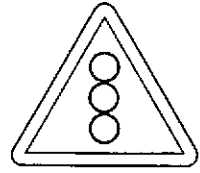
8
W2-8



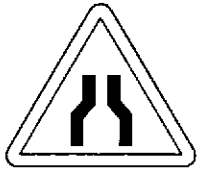
9
W2-9 (R)



10
W2-10 (L or R)



11
W3-1



12
W4-2



13
W4-2 (R)



14
W4-3



15
W5-3



16
W5-9



17
W5-10



18
W6-1



19
W6-2



20
WB-3A



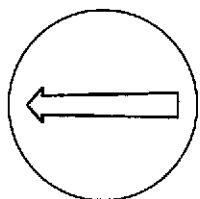
21
WB-3B



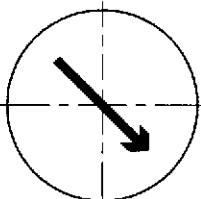
22
R1-1A



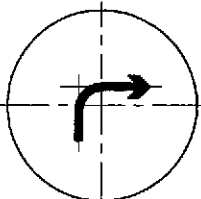
23
R1-2A



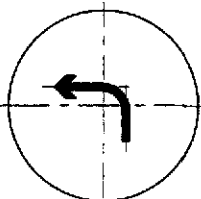
24
R2-2L



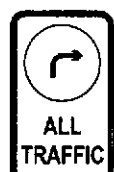
25
R2-3



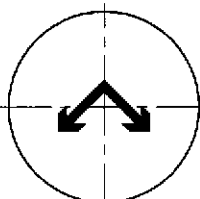
26
R2-4A (R)



27
R2-4A (L)



28
R2-4P



29
R2-5



30
R2-6A



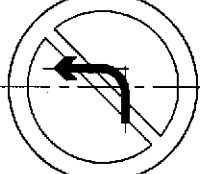
31
R2-7A (L)



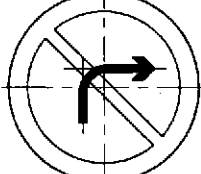
32
R3-1PA



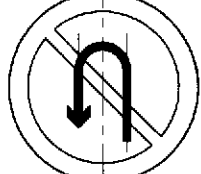
33
R3-6P



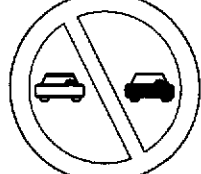
34
R3-13A



35
R3-14A



36
R3-15A



37
R3-16



38
R4-1B(80)



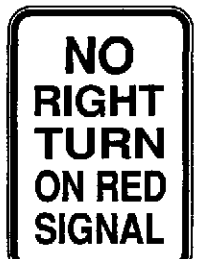
39
R4-3B (40)



40
R6-4



41
S2-3



42
S2-6



43
S2-9

NOTE:

THE MATERIALS, DIMENSIONS, SIZES OF LETTERS AND NUMERALS, SHAPE, COLOR AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS OF DPWH'S, PHILIPPINE ROAD SIGNS MANUAL, REVISED EDITION, 1982.

LEGEND:

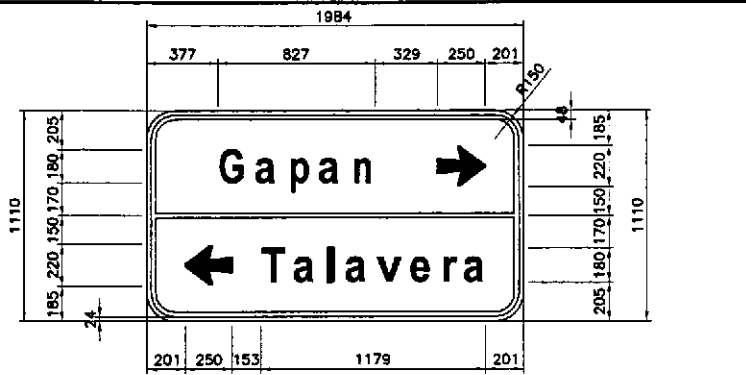
A. WARNING SIGNS

- SHARP TURN (W1-1)
- REVERSE CURVE (W1-4) (L)
- CROSS ROAD (W2-1)
- T JUNCTION (W2-4)
- Y JUNCTION (W2-5)
- SIDE ROAD JUNCTION (W2-6)
- ROUNDABOUT (W2-7)
- PRIORITY ROAD (W2-8)
- PRIORITY ROAD (W2-9) (R)
- PRIORITY ROAD (W2-10)
- SIGNALS AHEAD (W3-1)
- ROAD NARROWED (W4-2)
- DIVIDED ROAD (W4-3)
- HUMPS (W5-3)
- SLIPPERY ROAD (W5-9)
- CATTLE CROSSING (W5-10)
- PEDESTRIANS (W6-1)
- CHILDREN (W6-2)
- (DISTANCE)...m. (WB-3a)
- (DISTANCE)...m. (WB-3b)

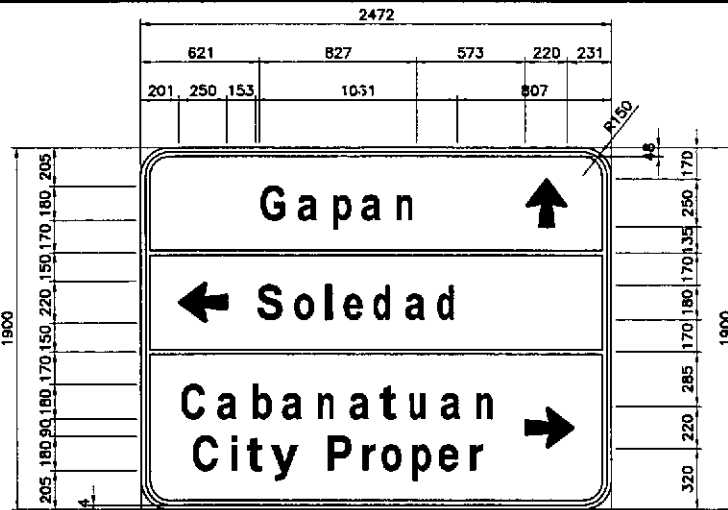
B. REGULATORY SIGNS

- STOP (R1-1A)
- GIVE WAY (R1-2A)
- DIRECTION TO BE FOLLOWED (R2-2)(L)
- DIRECTION TO BE FOLLOWED (R2-3)
- DIRECTION TO BE FOLLOWED (R2-4A)(R)
- DIRECTION TO BE FOLLOWED (R2-4A)(L)
- DIRECTION TO BE FOLLOWED (R2-4P)
- DIRECTION TO BE FOLLOWED (R2-5)
- TWO WAY (R2-6A)
- DIRECTION TO BE FOLLOWED (R2-7A)(L)
- NO ENTRY (R3-1PA)
- NO ENTRY (R3-6P)
- TURNING PROHIBITION (R3-13A)
- TURNING PROHIBITION (R3-14A)
- TURNING PROHIBITION (R3-15A)
- PROHIBITION OF OVERTAKING (R3-16)
- SPEED RESTRICTION (R4-1B)(80)
- SPEED RESTRICTION (R4-3B)(40)
- SPEED RESTRICTION (R6-4)
- TURN RIGHT AT ANY TIME W/ CARE (S2-3)
- NO RIGHT TURN ON RED SIGNAL (S2-6)
- ROAD CLOSED (S2-9)

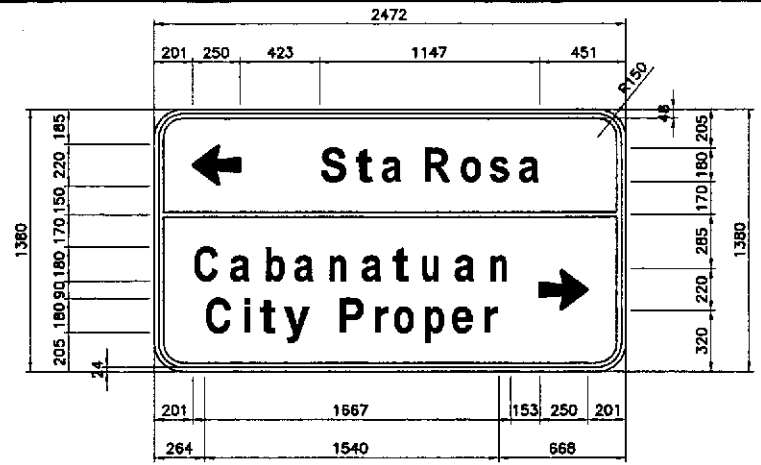
 JAPAN INTERNATIONAL COOPERATION AGENCY		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)		SCALE : NOT TO SCALE	SHEET CONTENTS : STANDARD TRAFFIC SIGNS SIGN INDEX	SHEET NO. : RS-12
DESIGNED 10/19/82	CHECKED 10/16/82	SUBMITTED 10/19/82	Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highway Division	Recommended By: GILBERTO S. REYES OIC, Director IV	Recommended By: MANUEL M. BONGAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE II FULL SIZE A1		



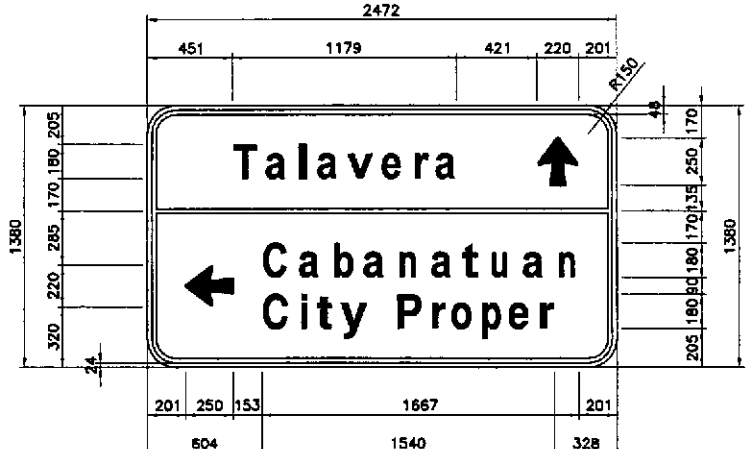
GS-2



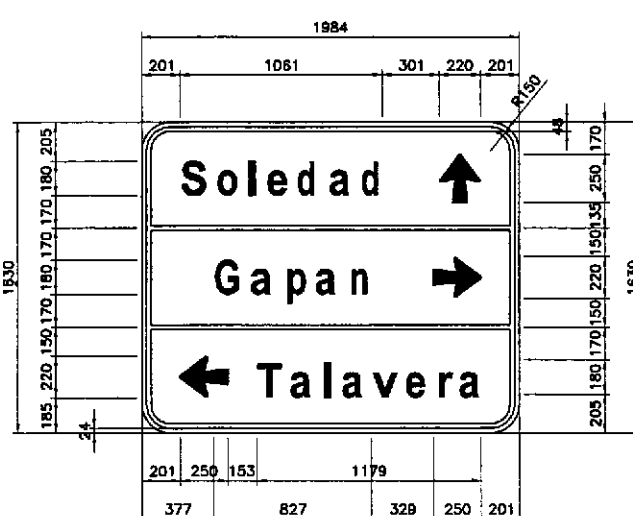
GS-11



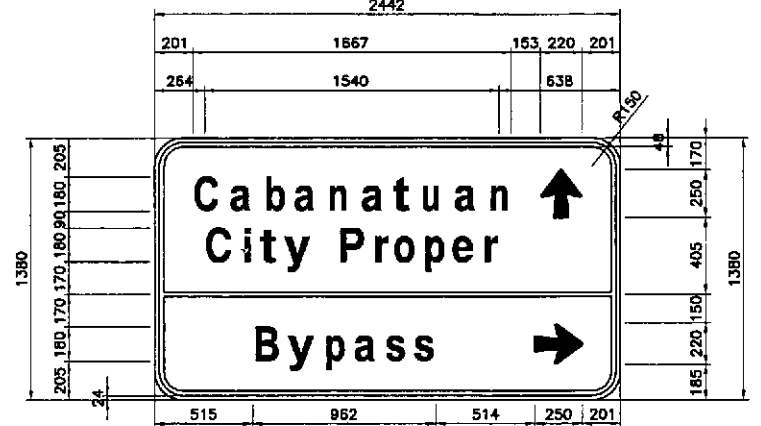
GS-36



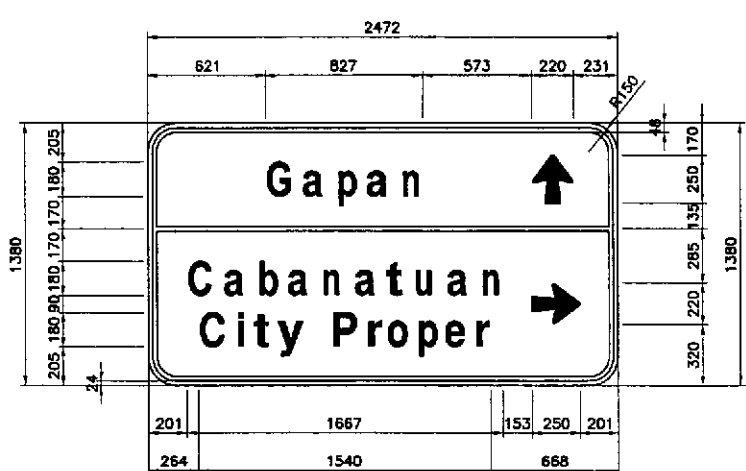
GS-8



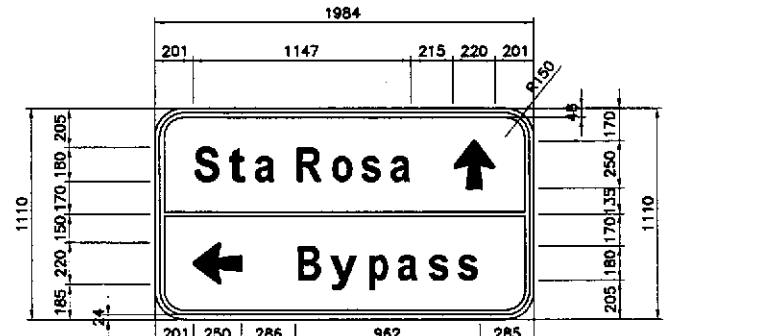
GS-12



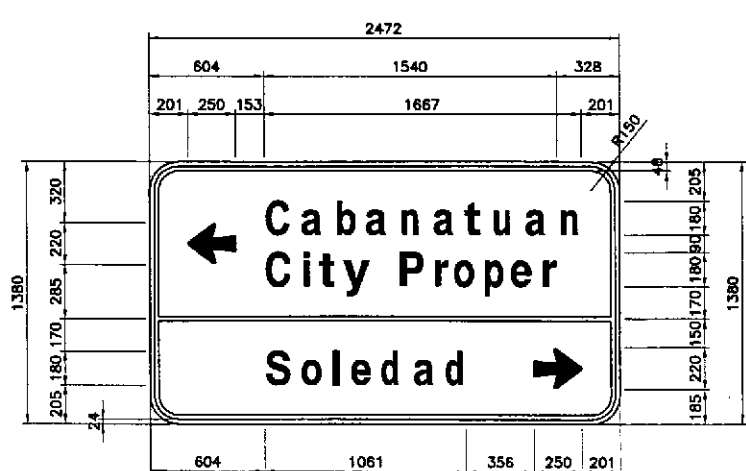
GS-37



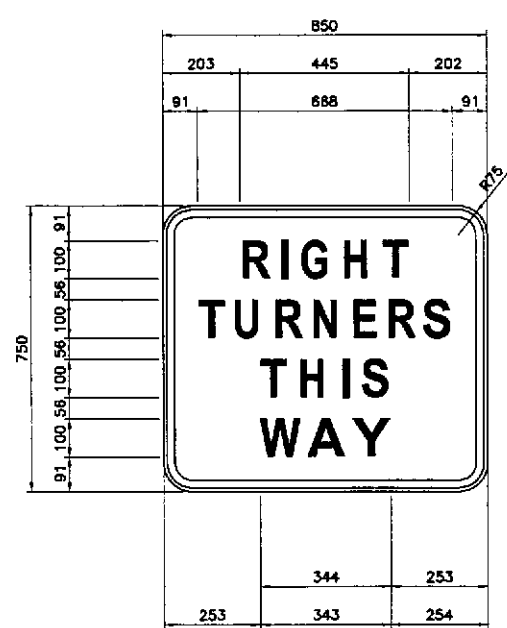
GS-9



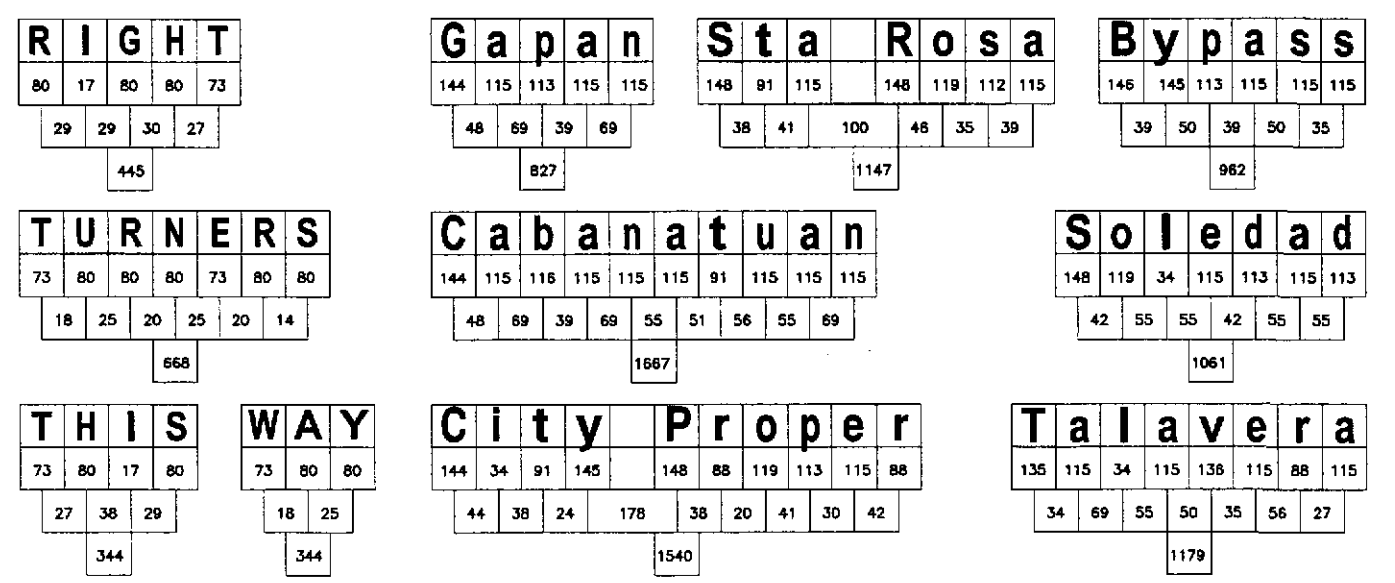
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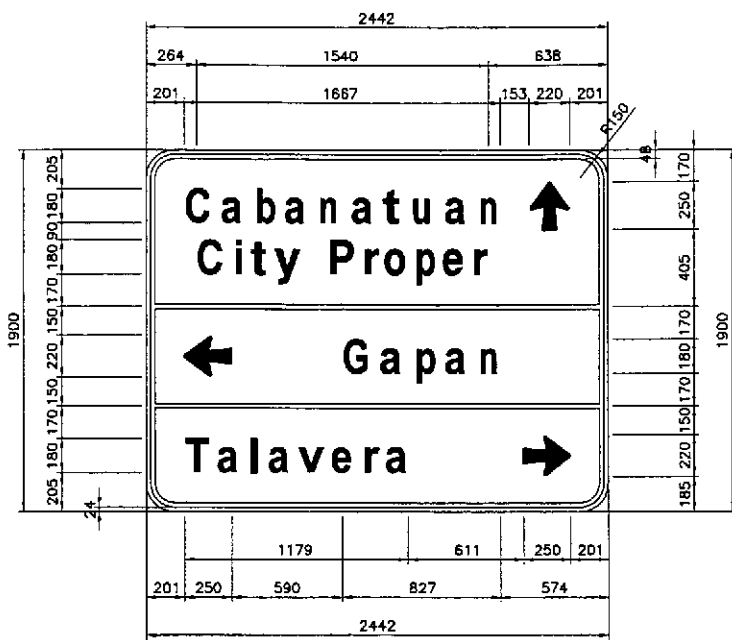


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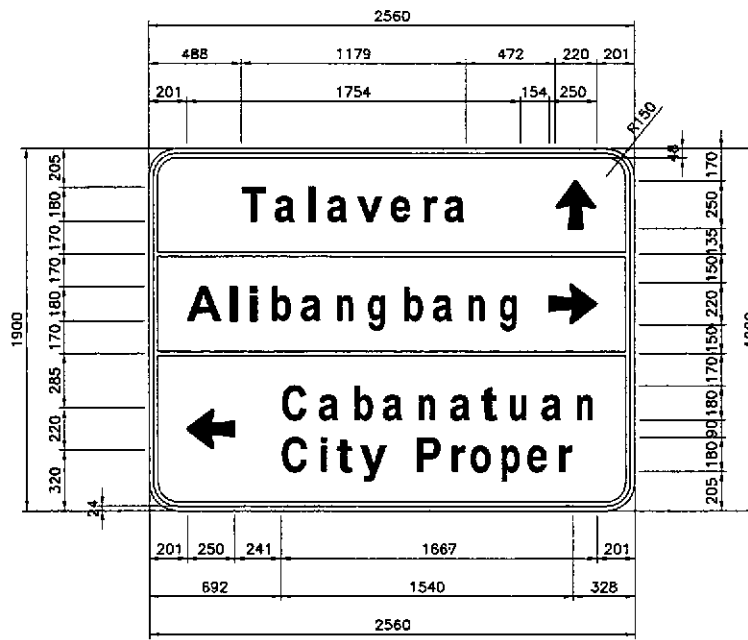


S2-11

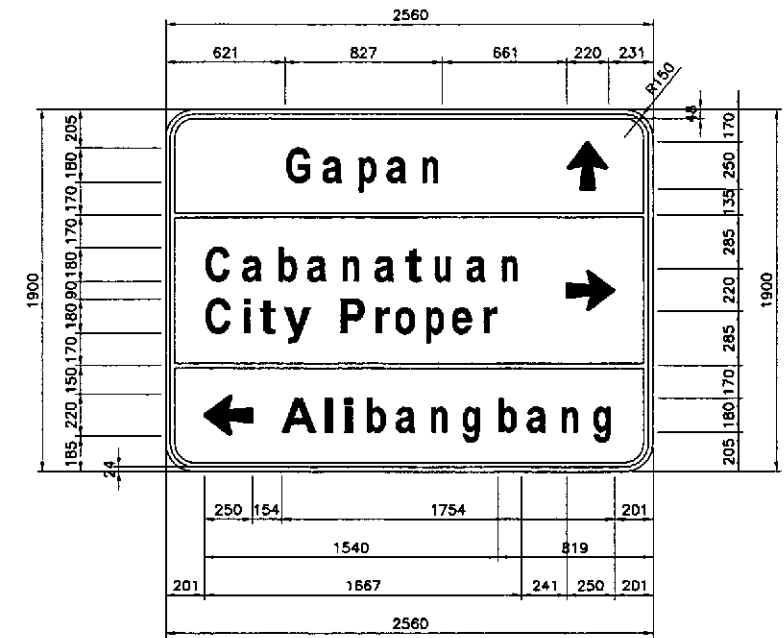




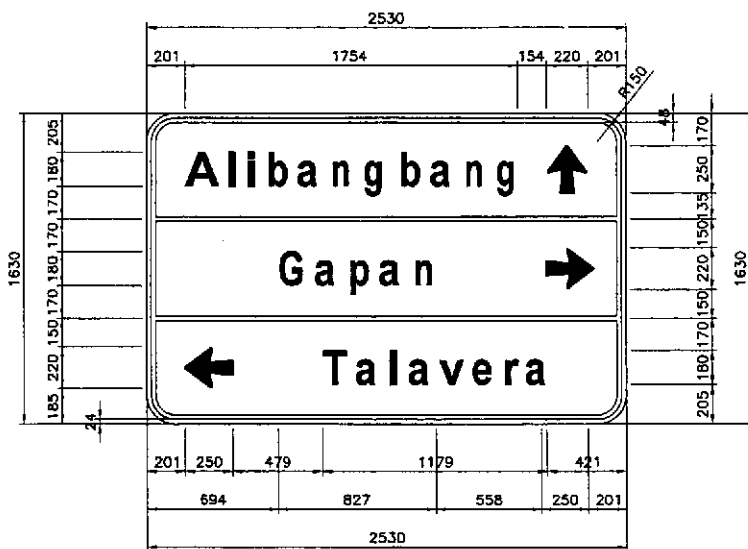
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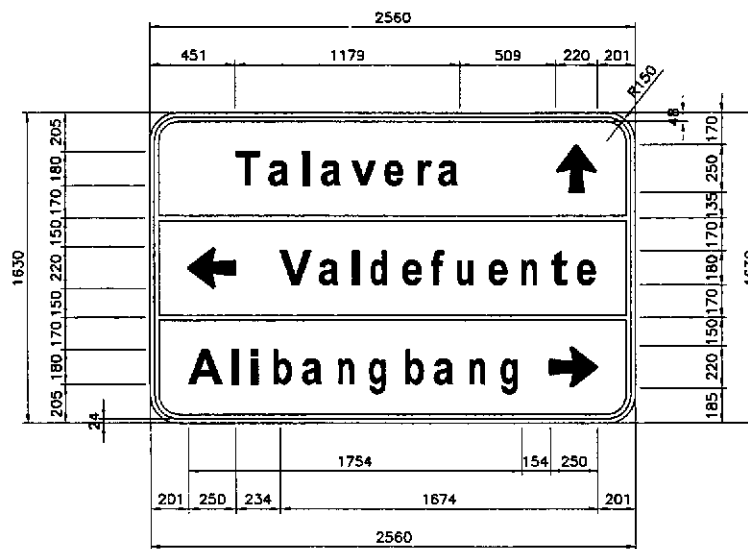
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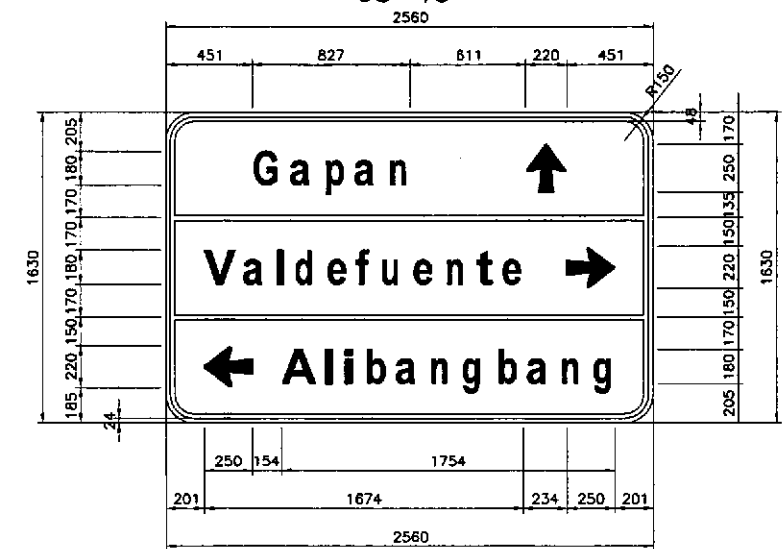
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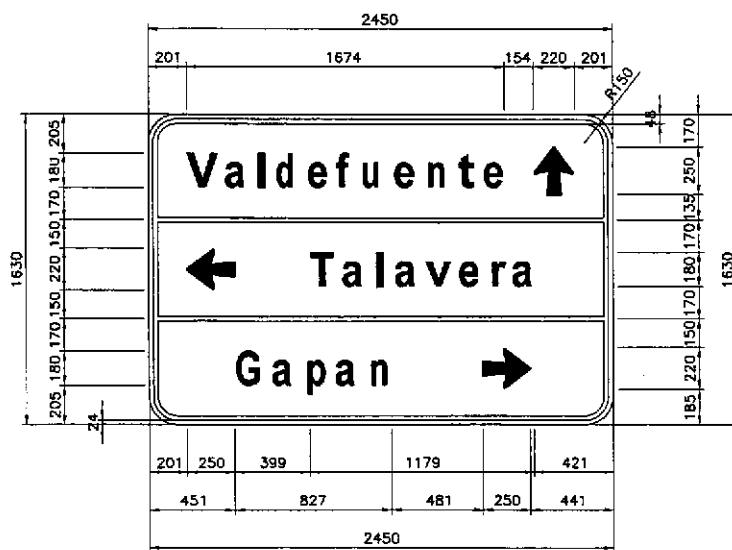
GS-16



GS-17



GS-18



GS-19

Cabanatuan
 144 115 116 115 115 115 91 115 115 115
 48 69 39 69 55 51 56 55 69
 1567

Gapan
 144 115 113 115 115
 48 69 39 69
 827

Valdefuente
 166 115 34 113 155 74 115 115 115 91 115
 31 69 55 55 39 55 55 56 50 41
 1674

City Proper
 144 34 91 145 148 88 119 113 115 88
 44 38 24 178 38 20 41 30 42
 1540

Talavera
 135 115 34 115 136 115 88 115
 34 69 55 50 35 56 27
 1179

Alibangbang
 183 34 34 116 155 155 115 116 115 115 115
 48 69 69 39 69 55 69 39 69 55
 1754

ROADSIDE SIGNS - MOUNTING SELECTION TABLE

SIGN SIZE WIDTH x DEPTH (mm)	NUMBER AND DIAMETER (mm) OF GALVANIZED PIPE POSTS
1200 x 600	2 x 65
1800 x 600	2 x 65
1800 x 1200	2 x 100
2400 x 600	2 x 100
2400 x 1200	2 x 125
2400 x 1800	2 x 125
3000 x 600	2 x 100
3000 x 1200	2 x 125
3000 x 1800	2 x 150
3000 x 2400	2 x 150
3700 x 600	2 x 100
3700 x 1200	2 x 125
3700 x 1800	2 x 150
3700 x 2400	3 x 150
4300 x 600	2 x 100
4300 x 1200	2 x 125
4300 x 1800	3 x 150
4900 x 600	3 x 100
4900 x 1200	3 x 125
4900 x 1800	3 x 150
5500 x 600	3 x 100
5500 x 1200	3 x 125
5500 x 1800	3 x 150
6100 x 600	3 x 100
6100 x 1200	3 x 125
6100 x 1800	3 x 150

FOR INTERMEDIATE SIGN SIZES :

(a.) TAKE DIMENSIONS OF SIGN TO NEAREST 300mm.

(b.) FOR AN ODD DIMENSION TAKE THE NEAREST EVEN HIGHER DIMENSION IN TABLE E.G.:

NOTES:

- THIS TABLE GIVES NUMBER AND SIZE OF GALVANIZED PIPE POSTS REQUIRED FOR SIGN SIZES SHOWN. ASSUMING UNDERSIDE OF SIGN IS 2.0m CLEAR ABOVE ROAD PAVEMENT. FOR SIGNS WITH CLEARANCES GREATER THAN 2.0m THE WIDTH USED IN THIS TABLE SHOULD BE THE ACTUAL WIDTH INCREASED BY A PERCENTAGE EQUAL TO THE PERCENTAGE INCREASE IN HEIGHT ABOVE 2.0m.
- 12mm DIAMETER CADMIUM - PLATED BOLTS, NUTS AND WASHERS SHALL BE USED FOR ATTACHING SIGN TO POSTS.
- TOP OF PIPE TO BE SUITABLY CAPPED AND PIPE BASES SHALL BE SEALED AGAINST MOISTURE.
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

SIGN POST FOUNDATION TABLE

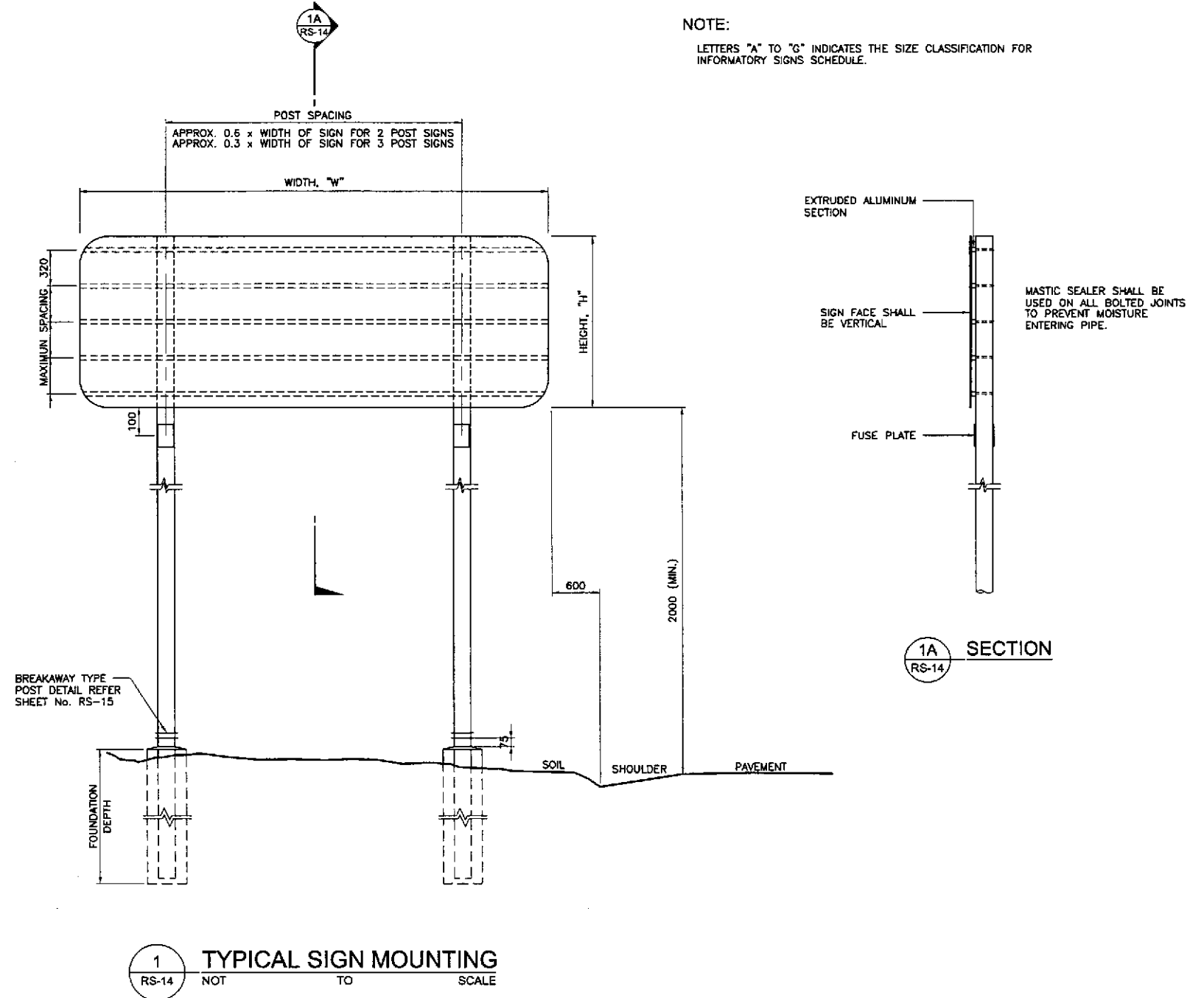
POST PROFILE Ø (mm)	FOUNDATION DIAMETER (mm)	FOUNDATION DEPTH (mm)
≤ 100	400	1000
125	425	1200
150	450	1500

CLASSIFICATION FOR INFORMATORY SIGN

	H ≥ 900	H ≤ 1500	H ≤ 2100	H > 2100
W ≤ 2100	A	B	B	-
W ≤ 2700	B	C	C	-
W ≤ 3350	B	C	D	D
W ≤ 4000	B	C	D	G
W ≤ 4600	B	C	G	G
W ≥ 4600	E	F	G	G

NOTE:

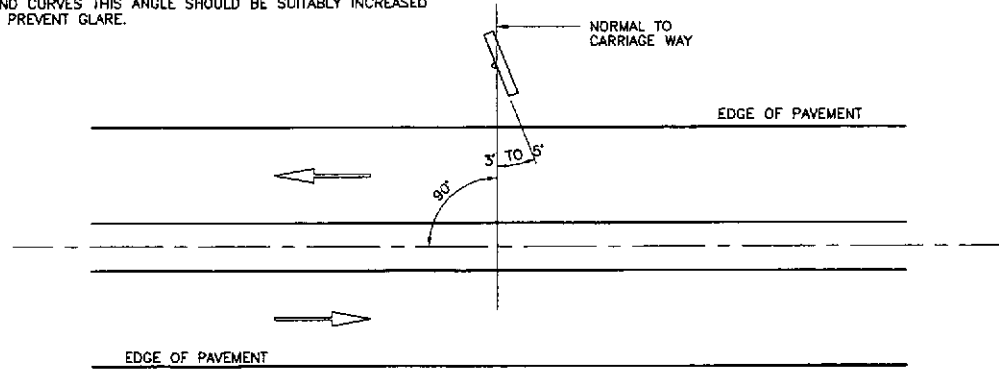
LETTERS "A" TO "G" INDICATES THE SIZE CLASSIFICATION FOR INFORMATORY SIGNS SCHEDULE.



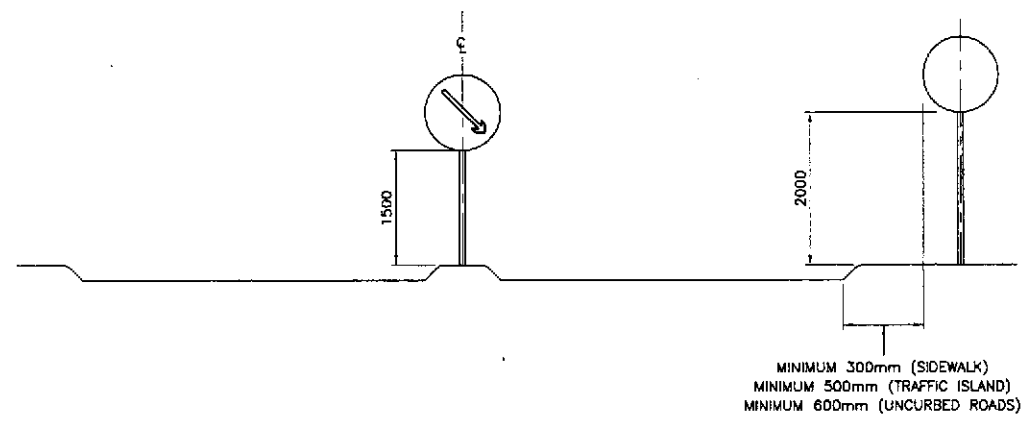
1 RS-14 NOT TO SCALE

	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :	
	CHECKED	10/16/02	S. JOSE		Submitted By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Piaridel, Cabanatuan and San Jose Bypasses)			NOT TO SCALE	MOUNTING/SUPPORT FOR ROAD SIGN TYPICAL SIGN MOUNTING DETAILS (1 OF 2)	RS-14
	SUBMITTED	10/18/02	M. RUIZ		Reviewed By:	CABANATUAN BYPASS - CONTRACT PACKAGE II			FULL SIZE A1		
		BUREAU OF DESIGN		OFFICE OF THE SECRETARY							
		Submitted By:		Recommended By:							
		DANILO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES DIC, Director IV		MANUEL M. BONDAN Undersecretary		SIMEON A. DATUMANONG Secretary	

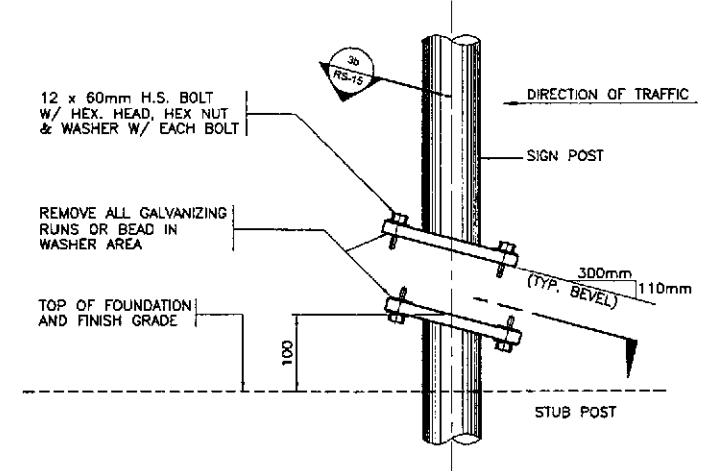
NOTE:
SIGN SHALL BE TURNED 3' TO 5' FROM ONCOMING TRAFFIC ON STRAIGHT SECTIONS AND RIGHT HAND CURVES. ON LEFT HAND CURVES THIS ANGLE SHOULD BE SUITABLY INCREASED TO PREVENT GLARE.



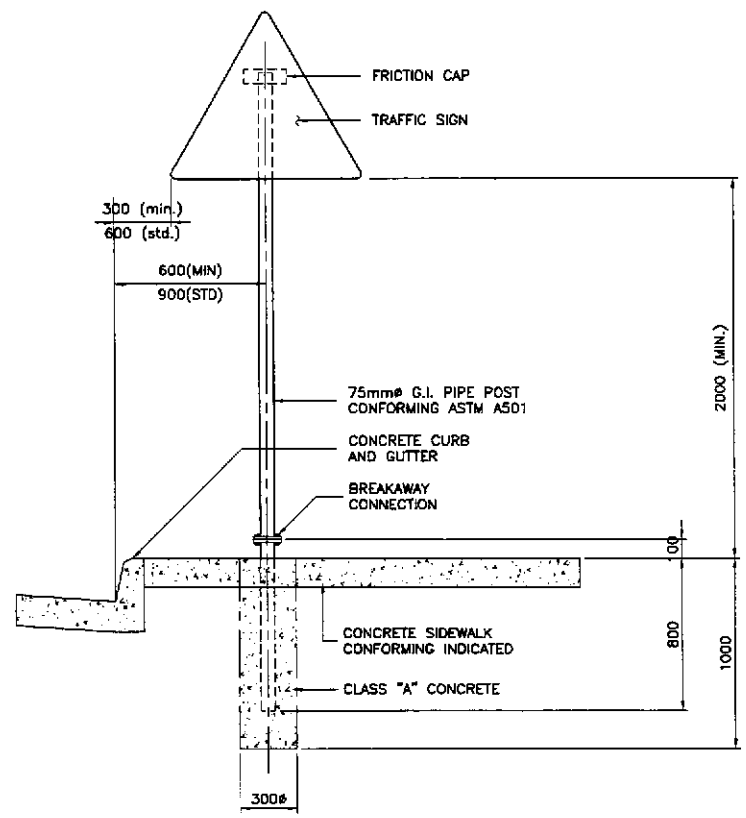
1 PLAN VIEW
RS-15



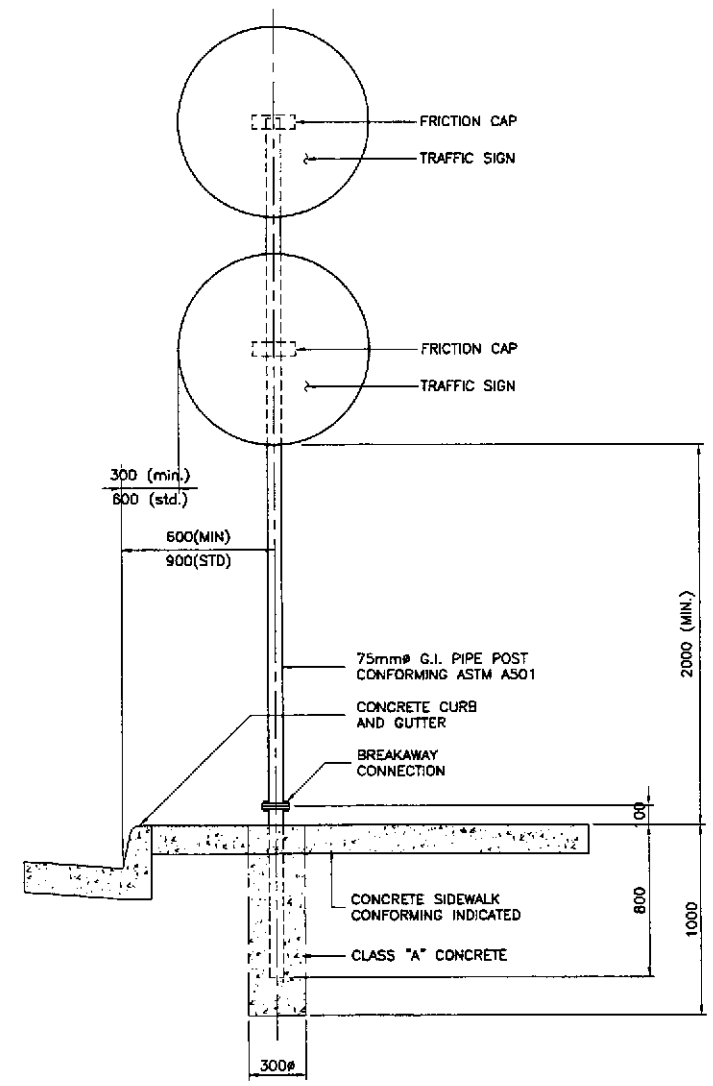
2 SIGN POSITIONS
RS-15 NOT TO SCALE



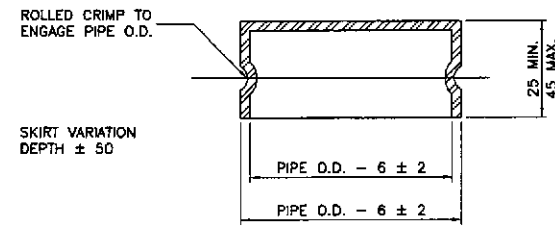
3a ELEVATION
RS-15



6 INSTALLATION DETAILS (TYPE 'A')
RS-15



7 INSTALLATION DETAILS (TYPE 'B')
RS-15

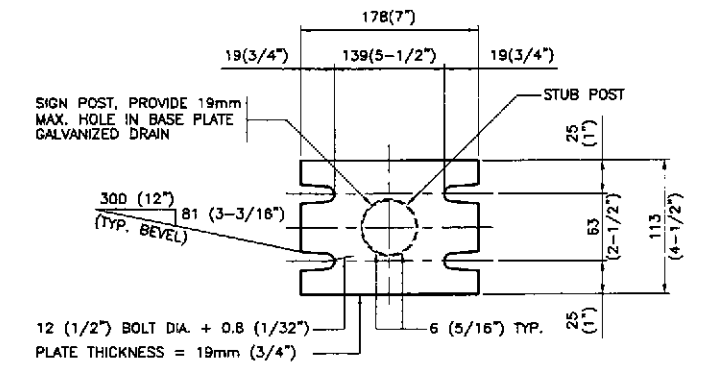


4 FRICTION CAP DETAIL
RS-15

NOTES:
FRICTION CAPS MAY BE MANUFACTURED FROM EITHER HOT ROLLED OR COLD ROLLED STEEL SHEETS MINIMUM SHEET THICKNESS SHALL BE GAUGE 24.
THE RIM EDGE SHALL BE REASONABLY STRAIGHT AND SMOOTH.
CAPS SHALL BE SIZED AND FORMED IN SUCH MANNER AS TO PRODUCE A DRIVE-ON FRICTION FIT AND HAVE NO TENDENCY TO ROCK WHEN SEATED ON THE PIPE. THE DEPTH SHALL BE SUFFICIENT TO GIVE POSITIVE PROTECTION AGAINST THE ENTRANCE OF RAIN WATER. THEY SHALL BE FREE OF SHARP CREASES OR INDENTATION AND SHOW NO EVIDENCE OF METAL FAILURE.
CAPS SHALL HAVE AN ELECTRO DEPOSITED COATING OF ZINC IN ACCORDANCE WITH REQUIREMENTS OF ASTM SPECS. A164, TYPE G.S.

- PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:
1. ASSEMBLE POST TO STUB WITH BOLTS AND ONE FLAT WASHER ON EACH BOLT BETWEEN PLATES.
 2. SHIM AS REQUIRED TO PLUMB POST.
 3. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 300 TO 380mm WRENCH TO BED WASHER AND SHIMS AND CLEAN BOLT TREADS THEN LOOSEN.
 4. RETIGHTEN BOLT IN A SYSTEMATIC ORDER TO A TORQUE OF 200in-lb (266.016 x 10⁻⁴ KN-m).
 5. LOOSEN EACH BOLT AND RETIGHTEN TO THE PRESCRIBED TORQUE IN THE SAME ORDER AS INITIAL TIGHTENING.
 6. BURR TREADS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.

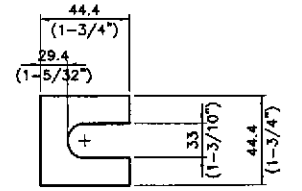
TYPICAL SIGN MOUNTING DETAILS
NOT TO SCALE



3b SECTION
RS-15

SECTION SHOWN ARE FOR INSTALLATIONS ON RIGHT SHOULDER AND IN CORE. PLATE SLOTS BEVELS ARE OPPOSITE HAND FROM THAT SHOW FOR INSTALLATIONS ON LEFT SHOULDER. PLATES FOR BASE CONNECTION SHALL CONFORM W/ THE REQ'S OF ASTM A 36.

3 SIGN POST & STUB POST DETAIL
RS-15

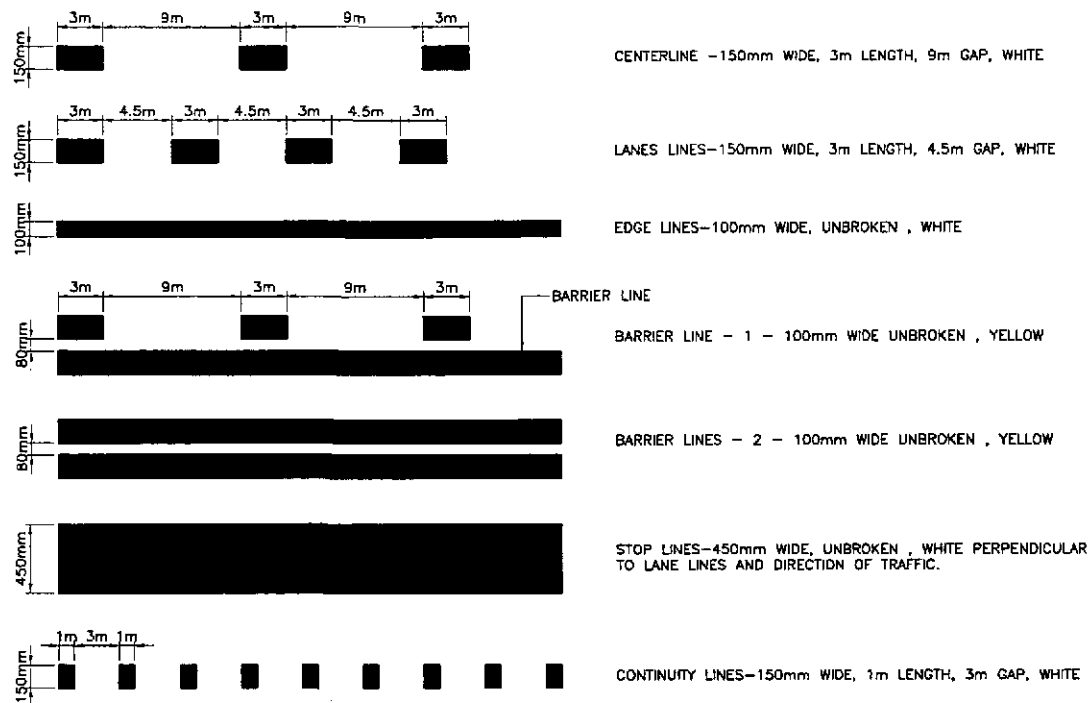


FURNISH 2~012" ± THICK & 2~032" ± THICK SHIMS POST. SHIMS SHALL BE FABRICATED FROM BRASS SHIM STOCK OR STRIP CONFORMING TO ASTM B 36.

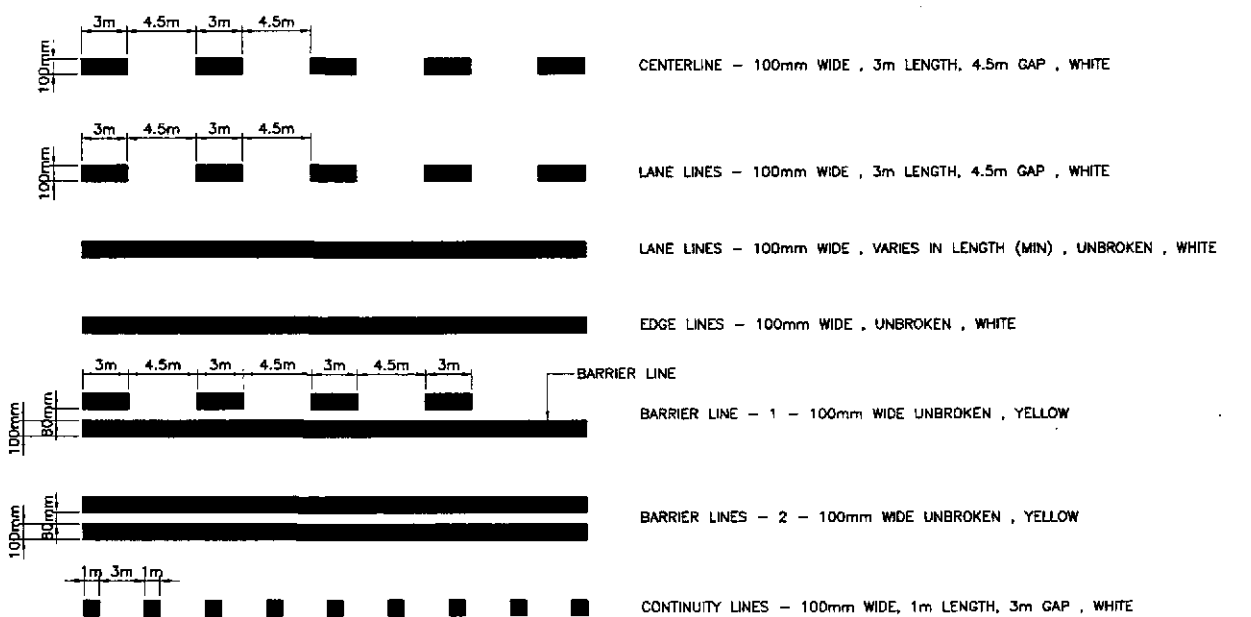
5 SHIM DETAIL
RS-15

NOTES:
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.
MATERIAL AND FABRICATION SHALL CONFORM TO THE REQUIREMENTS OF GENERAL SPECIFICATIONS.
ALL PIPE POST, STRUCTURAL STEEL, BOLTS AND WASHER SHALL BE GALVANIZED AS PER AASHTO M III.
ALL HIGH STRENGTH BOLTS AND WASHER SHALL CONFORM TO ASTM-325 AND ALL HIGH STRENGTH NUTS SHALL BE OF SUCH CAPACITY AS TO DEVELOP THE BOLT STRENGTH.
TIGHTEN THE HIGH STRENGTH BOLTS IN THE BASE CONNECTION BY THE USE OF TORQUE, DO NOT OVERTIGHTEN.
DESIGN TORQUE EQUALS TO 200in-lb(266.016x10⁻⁴KN-m)

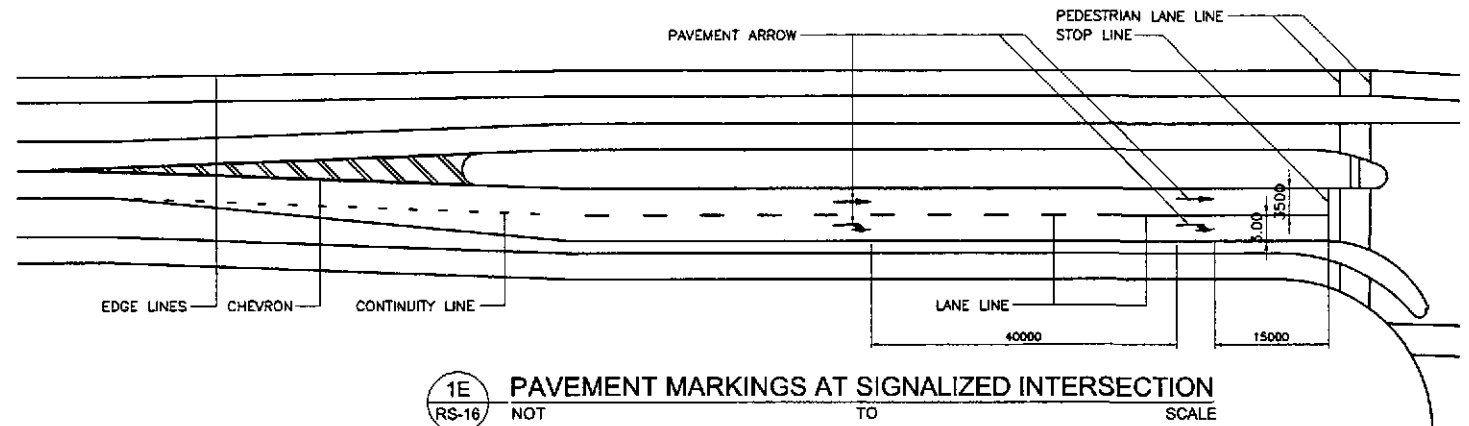
	DESIGNED	10/1/02	S. LUNA	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :	
	CHECKED	10/16/02	S. JOSE		BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)			NOT TO SCALE	MOUNTING / SUPPORT FOR ROAD SIGN TYPICAL SIGN MOUNTING DETAILS (2 OF 2)	RS-15
	SUBMITTED	10/18/02	M. RUCIF		OFFICE OF THE SECRETARY	CABANATUAN BYPASS - CONTRACT PACKAGE II			FULL SIZE A1		
				Submitted By:	Reviewed By:	Recommended By:	Approved By:				
				DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OC, Director IV	MANUEL M. BONGAON Undersecretary	SIMON A. DATUMANONG Secretary			



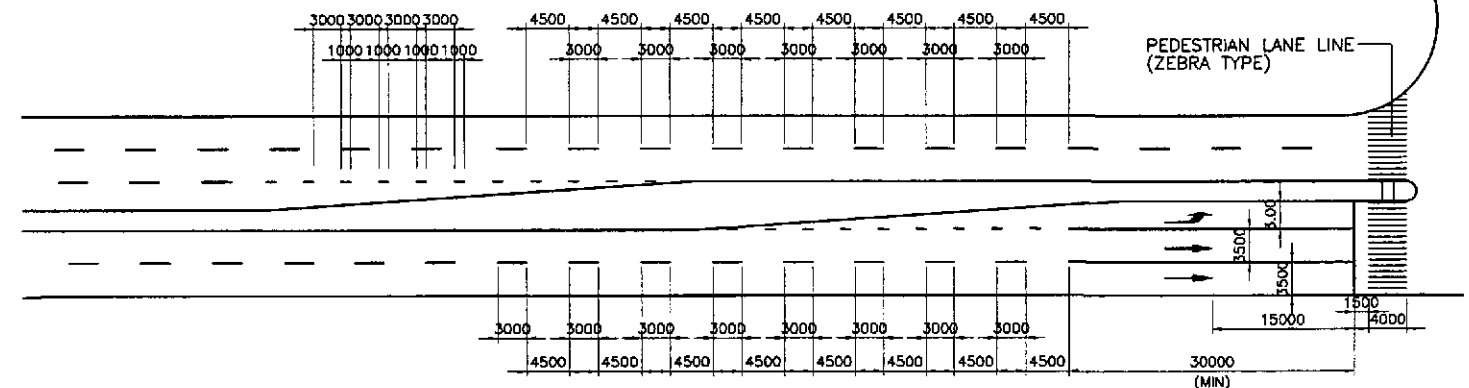
1B BYPASS MAIN LINE
RS-17 NOT TO SCALE



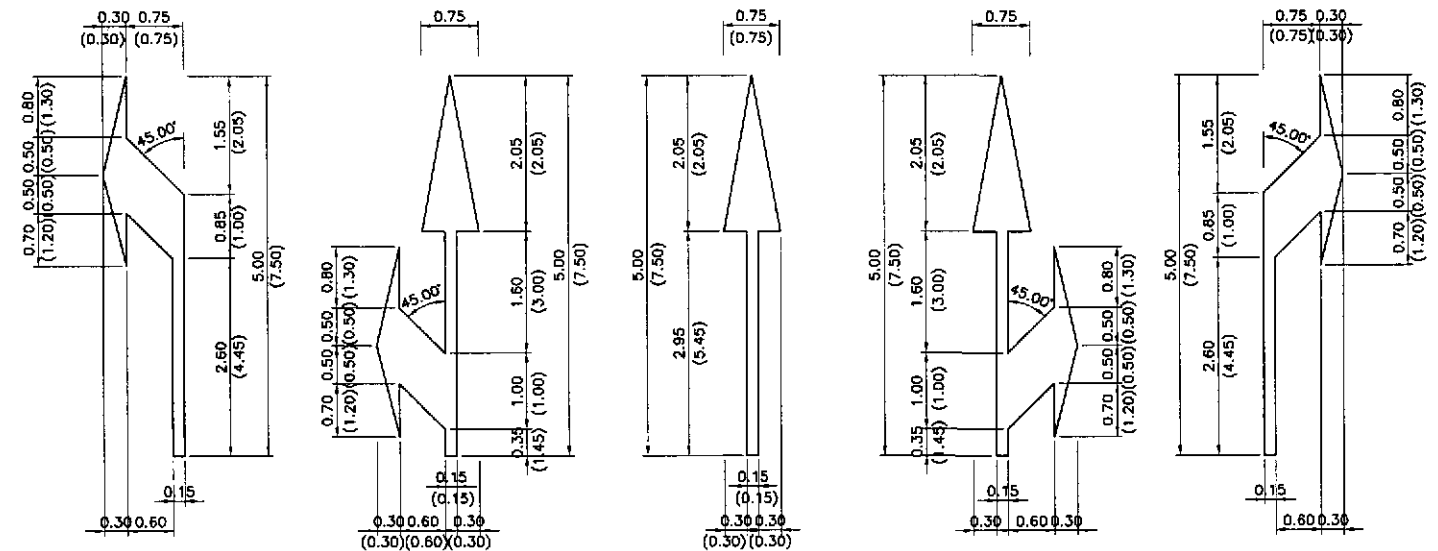
1A RAMPS AND CROSS ROADS
RS-16 NOT TO SCALE



1E PAVEMENT MARKINGS AT SIGNALIZED INTERSECTION
RS-16 NOT TO SCALE



1D PAVEMENT MARKINGS AT UNSIGNALIZED INTERSECTION
RS-16 NOT TO SCALE

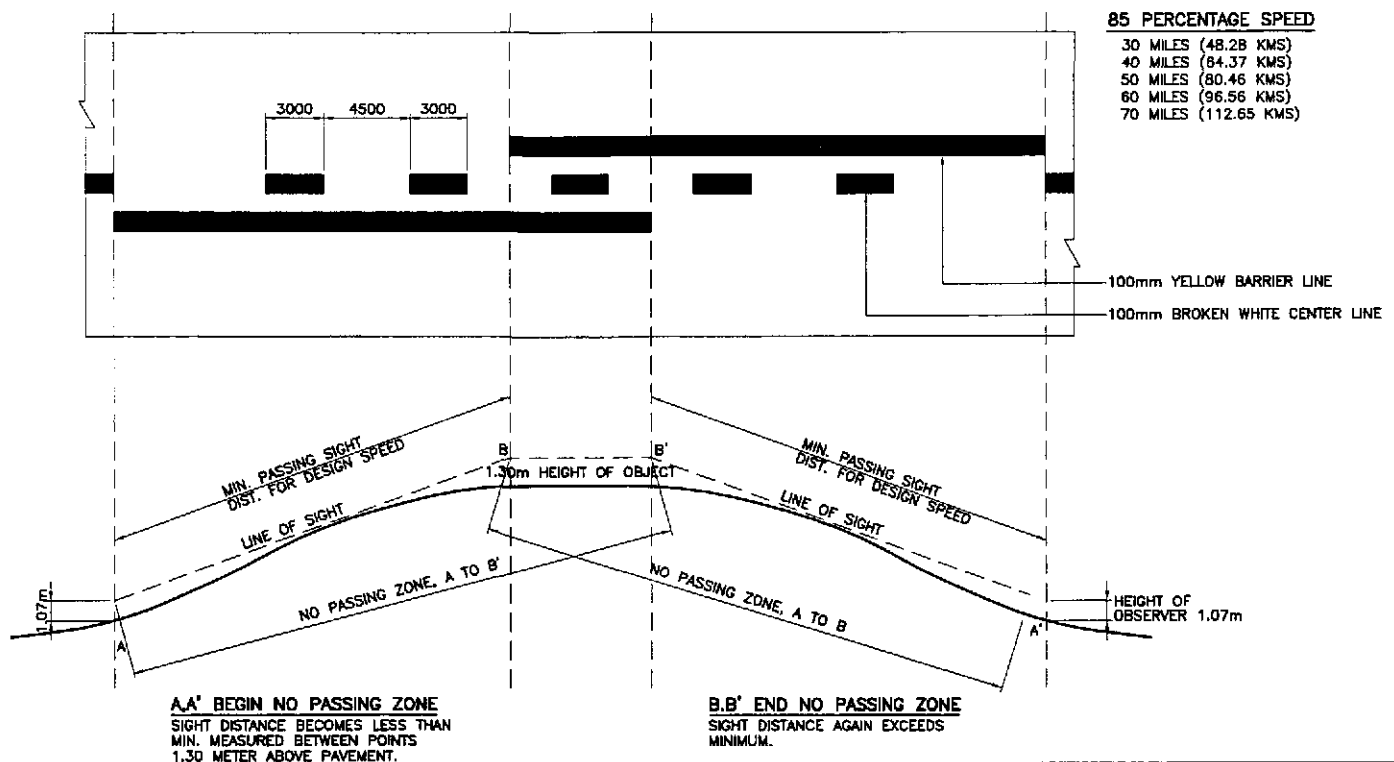


1C STANDARD PAVEMENT ARROWS
RS-16 NOT TO SCALE

NOTE:
VALUES IN PARENTHESIS () ARE FOR SPEED LIMIT OVER 60 KPH.
MATERIALS, DIMENSIONS AND COLOR OF STANDARD PAVEMENT ARROWS SHALL CONFORM IN ACCORDANCE WITH THE SPECIFICATION DEFINED IN THE DPWH MANUAL OF PAVEMENT MARKINGS, 1980 EDITION.

1 STANDARD PAVEMENT MARKINGS
RS-16 NOT TO SCALE

		<p>DESIGNED: 10/4/02</p> <p>CHECKED: 10/16/02</p> <p>SUBMITTED: 10/18/02</p>	<p>DATE: 10/4/02</p> <p>SIGNATURE: S. LUNA</p> <p>SIGNATURE: M. CRUZ</p> <p>TEAM LEADER</p>	<p>REPUBLIC OF THE PHILIPPINES</p> <p>DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p> <p>BUREAU OF DESIGN</p> <p>OFFICE OF THE SECRETARY</p> <p>Submitted By: DANILLO C. TRAJANO (Project Director)</p> <p>Reviewed By: JOSEFINA M. ALAGAR (Chief, Highways Division)</p> <p>Recommended By: GILBERTO S. REYES (OIC, Director IV)</p> <p>Approved By: MANUEL M. BONDAN (Undersecretary)</p> <p>Approved By: SIMON A. DATUMANDING (Secretary)</p>	<p>PROJECT AND LOCATION:</p> <p>THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)</p> <p>CABANATUAN BYPASS - CONTRACT PACKAGE II</p>	<p>SCALE:</p> <p>NOT TO SCALE</p> <p>FULL SIZE A1</p>	<p>SHEET CONTENTS:</p> <p>STANDARD PAVEMENT MARKINGS</p> <p>Sheet 1 OF 2</p>	<p>SHEET NO.:</p> <p>RS-16</p>
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A.A' BEGIN NO PASSING ZONE
SIGHT DISTANCE BECOMES LESS THAN
MIN. MEASURED BETWEEN POINTS
1.30 METER ABOVE PAVEMENT.

B.B' END NO PASSING ZONE
SIGHT DISTANCE AGAIN EXCEEDS
MINIMUM.

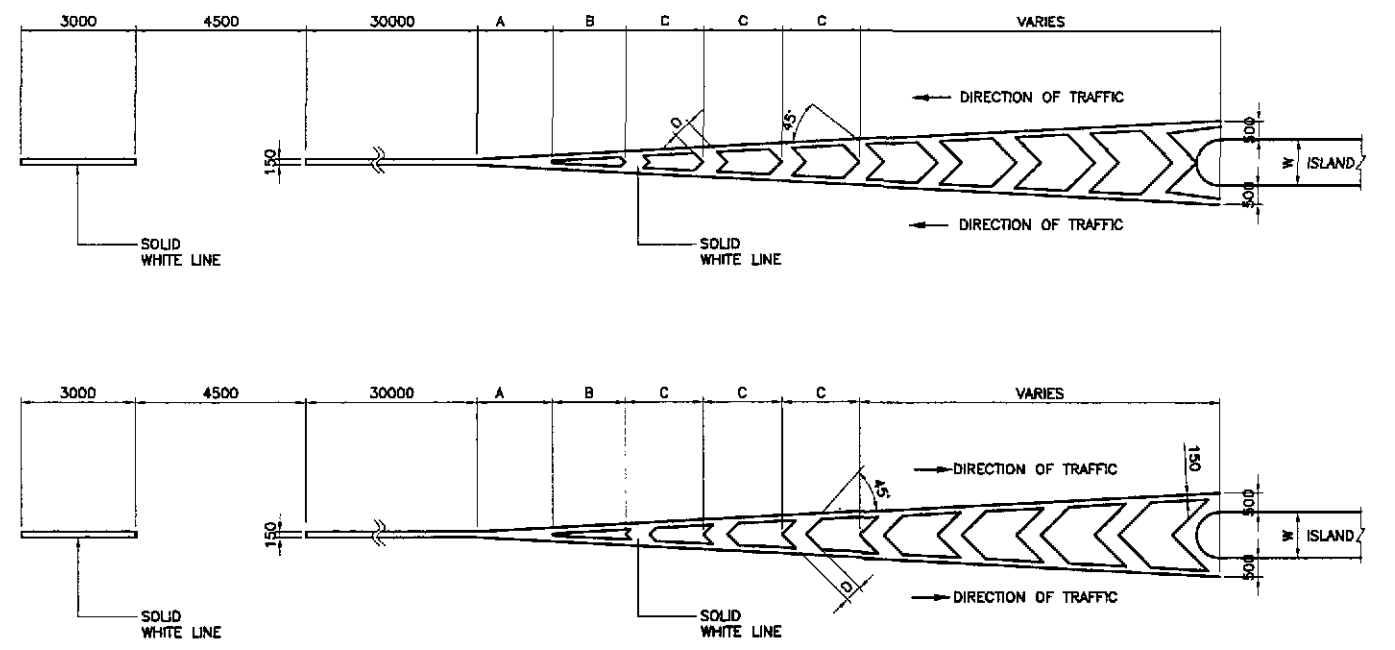
NOTE:
NO PASSING ZONE IN OPPOSITE DIRECTION MAY OR MAY NOT
OVERLAP DEPENDING ON VERTICAL ALIGNMENT AND DESIGN SPEED.
FOR NO OVERLAPPING TYPE REFER TO FIGURE 8 OF DPWH
MANUAL ON PAVEMENT MARKINGS (1980), IF REQUIRED.

1B NO-PASSING LINES ON HORIZONTAL CURVES
(OVERLAPPING TYPE)
RS-17 NOT TO SCALE

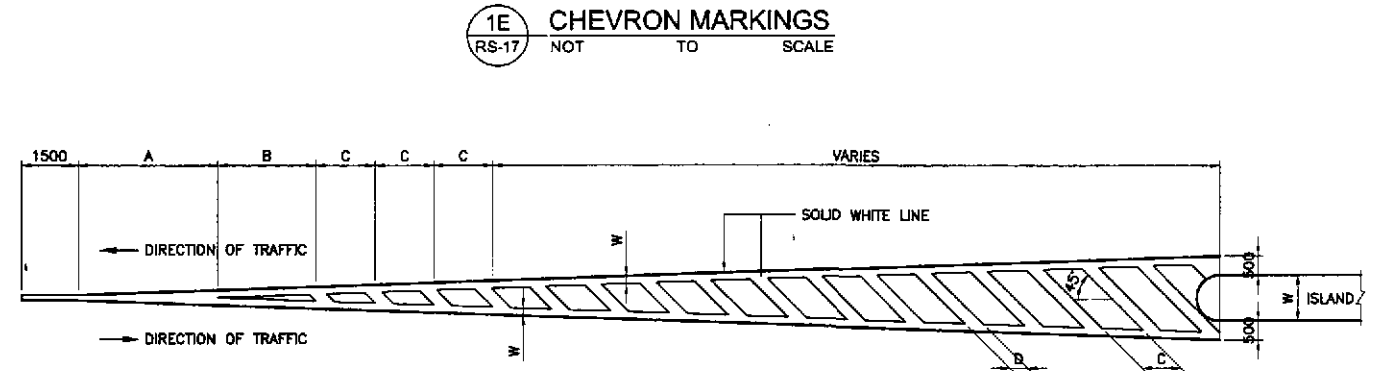
85 PERCENTILE SPEED

30 MILES (48.28 KMS)
40 MILES (64.37 KMS)
50 MILES (80.46 KMS)
60 MILES (96.56 KMS)
70 MILES (112.65 KMS)

85 PERCENTILE SPEED (Kmph)	MIN. SIGHT DISTANCE (1.15m to 1.15m) (m)	MIN. LENGTH OR BARRIER LINE L (m)	MIN. DISTANCE BETWEEN BARRIER LINE (m)
50	150	75	150
60	180	90	175
70	210	105	200



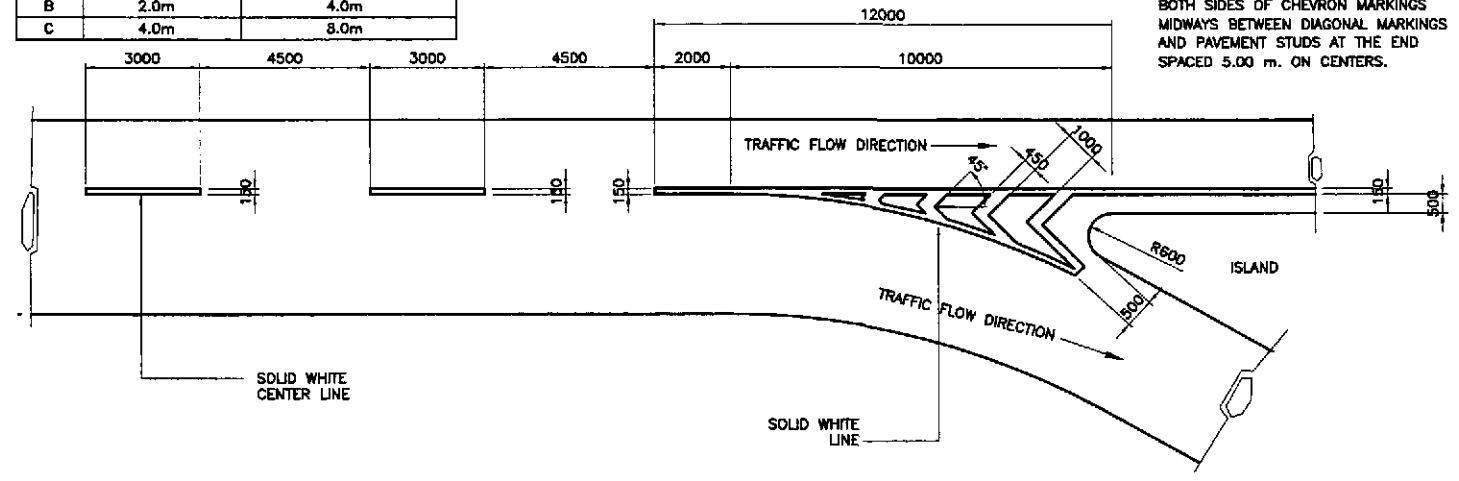
1E CHEVRON MARKINGS
RS-17 NOT TO SCALE



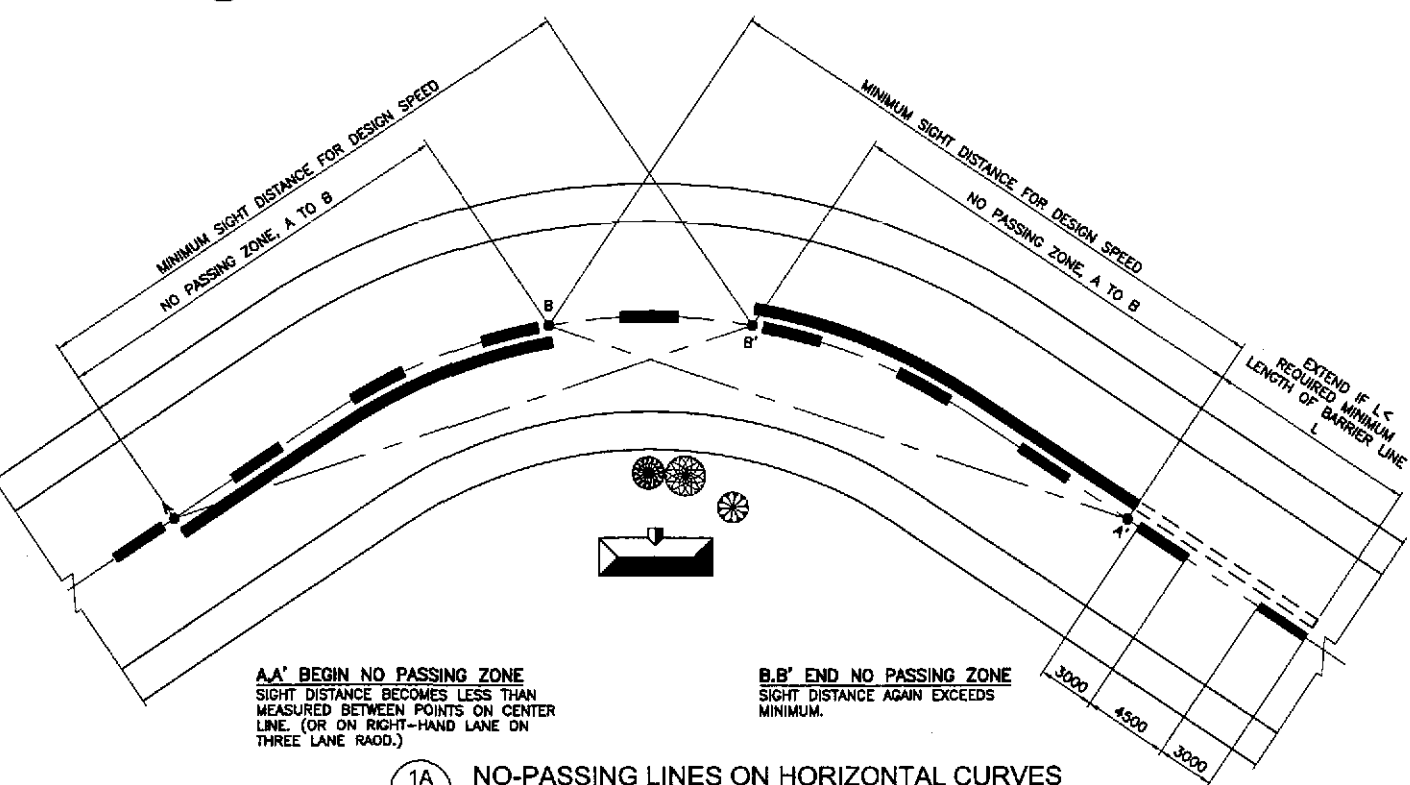
1D CHEVRON MARKINGS NEAR OBSTRUCTION
RS-17 NOT TO SCALE

	RAMPS & OTHER ROADS (60 KPH OR LESS)	BYPASS MAINLINE (GREATER THAN 60 KPH)
W	150mm	150mm
D	500mm	1000mm
A	1.5m	3.0m
B	2.0m	4.0m
C	4.0m	8.0m

NOTE:
PROVIDE CONCRETE CHATTER BARS AT BOTH SIDES OF CHEVRON MARKINGS
MIDWAYS BETWEEN DIAGONAL MARKINGS
AND PAVEMENT STUDS AT THE END
SPACED 5.00 m. ON CENTERS.



1C CHEVRON MARKINGS AT INTERSECTION
RS-17 NOT TO SCALE



A.A' BEGIN NO PASSING ZONE
SIGHT DISTANCE BECOMES LESS THAN
MEASURED BETWEEN POINTS ON CENTER
LINE. (OR ON RIGHT-HAND LANE ON
THREE LANE ROAD.)

B.B' END NO PASSING ZONE
SIGHT DISTANCE AGAIN EXCEEDS
MINIMUM.

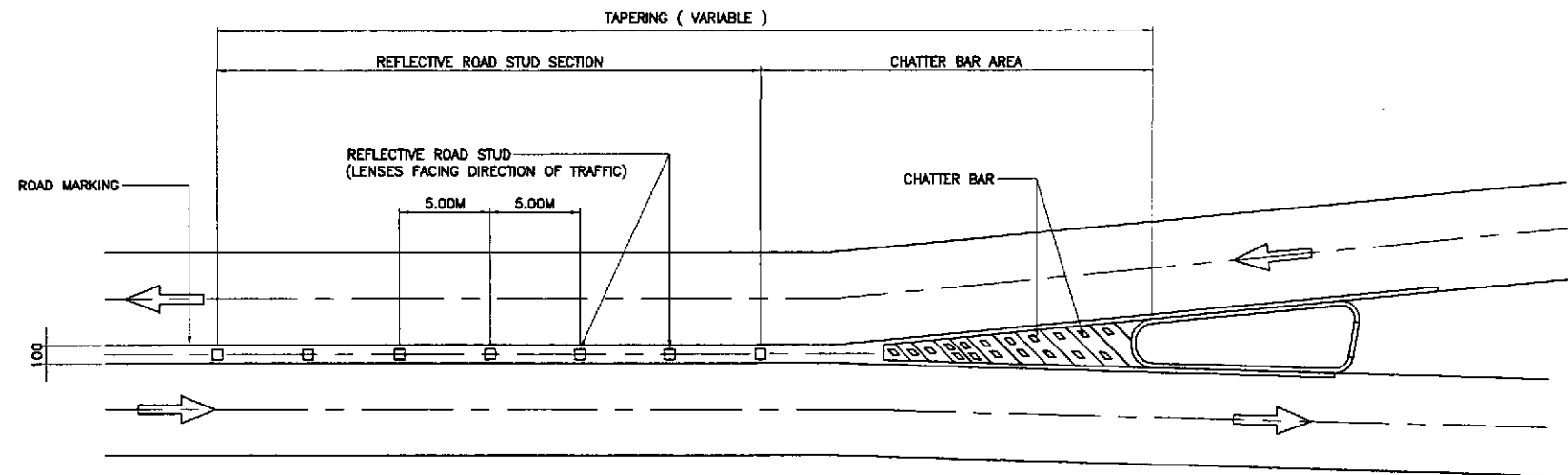
1A NO-PASSING LINES ON HORIZONTAL CURVES
RS-17 NOT TO SCALE

1 STANDARD PAVEMENT MARKINGS
RS-17 NOT TO SCALE

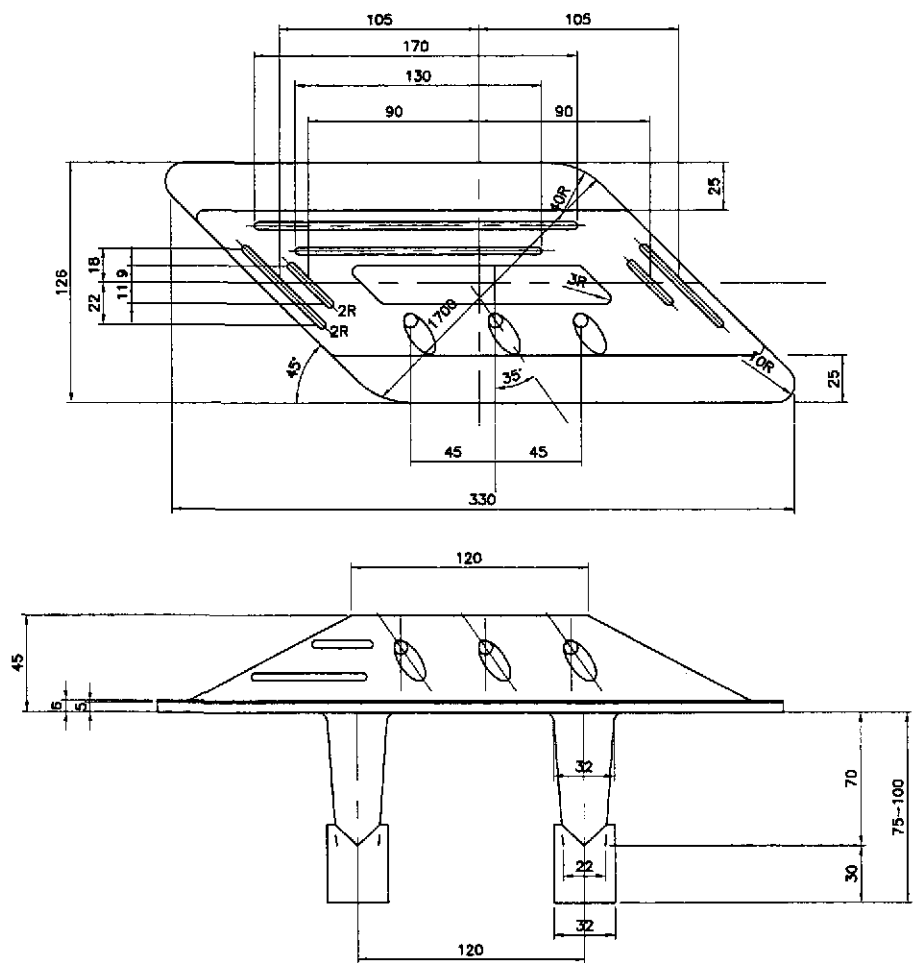
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		
CHECKED	10/14/02	S. G. G. G.	BUREAU OF DESIGN		
SUBMITTED	10/14/02	M. S. G. G.	OFFICE OF THE SECRETARY		
			P.J.H. - P.W.O.	Reviewed By:	Recommended By:
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV
				Recommended By:	Approved By:
				MANUEL M. BONGAN Undersecretary	SIMEON A. DATUMANONG Secretary

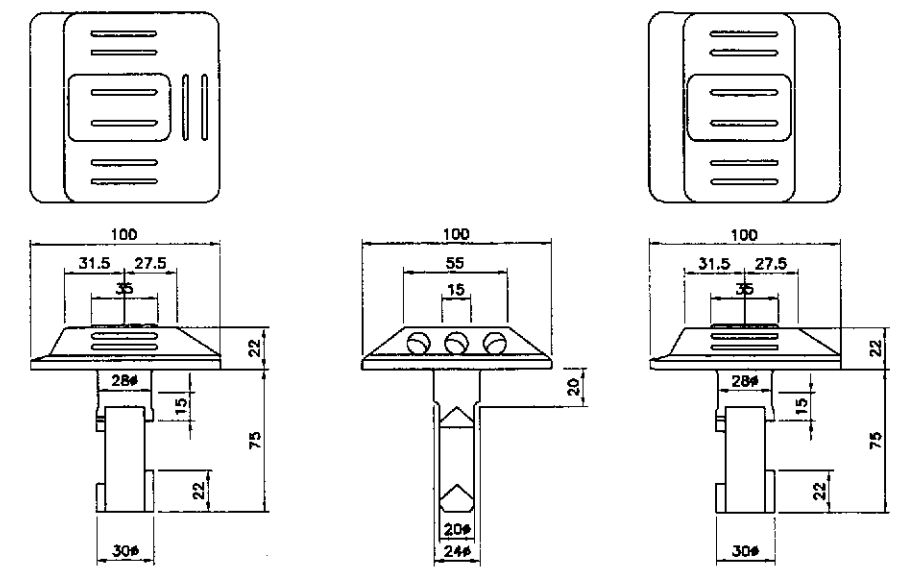
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	STANDARD PAVEMENT MARKINGS SHEET 2 OF 2	RS-17
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		



3 LOCATION OF ROAD STUDS AND CHATTER BARS
 RS-18 NOT TO SCALE

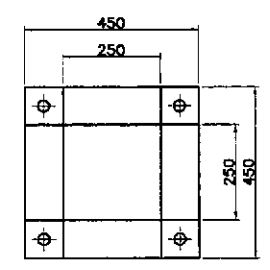
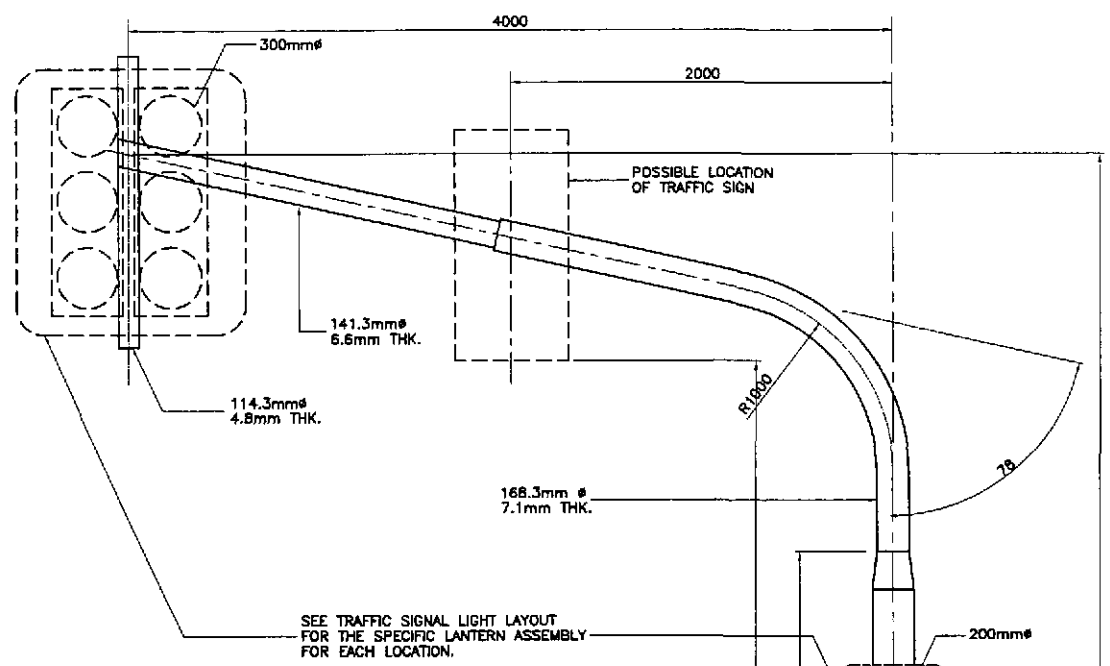


1 CHATTER BAR
 (WITH LENSES ON 1 - SIDE)
 RS-18 SCALE 1:20 M

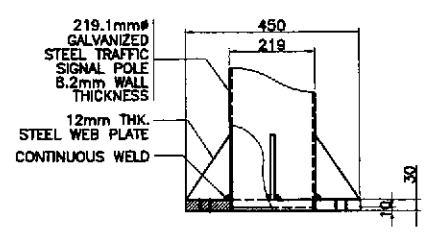


2 REFLECTIVE ROAD STUDS FOR CONCRETE
 (WITH LENSES ON ONE - SIDE / TWO SIDES)
 RS-18 SCALE 1:20

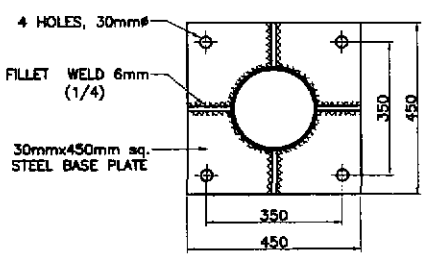
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	DESIGNED	10/14/02	S. LUNA	PUHL - PMO BUREAU OF DESIGN		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pilaridel, Cabanatuan and San Jose Bypasses)		AS SHOWN	REFLECTIVE ROAD STUDS, CHATTER BAR AND DETAILS	RS-18
	CHECKED	10/16/02	S. GUSE	Submitted By:	Reviewed By:	Recommended By:	Approved By:	FULL SIZE A1		
SUBMITTED	10/18/02	J. BARRERA	DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONGAN Undersecretary	SIMEON A. DATUMANONG Secretary			



3A ANCHOR FRAME DETAIL
SCALE 1:10

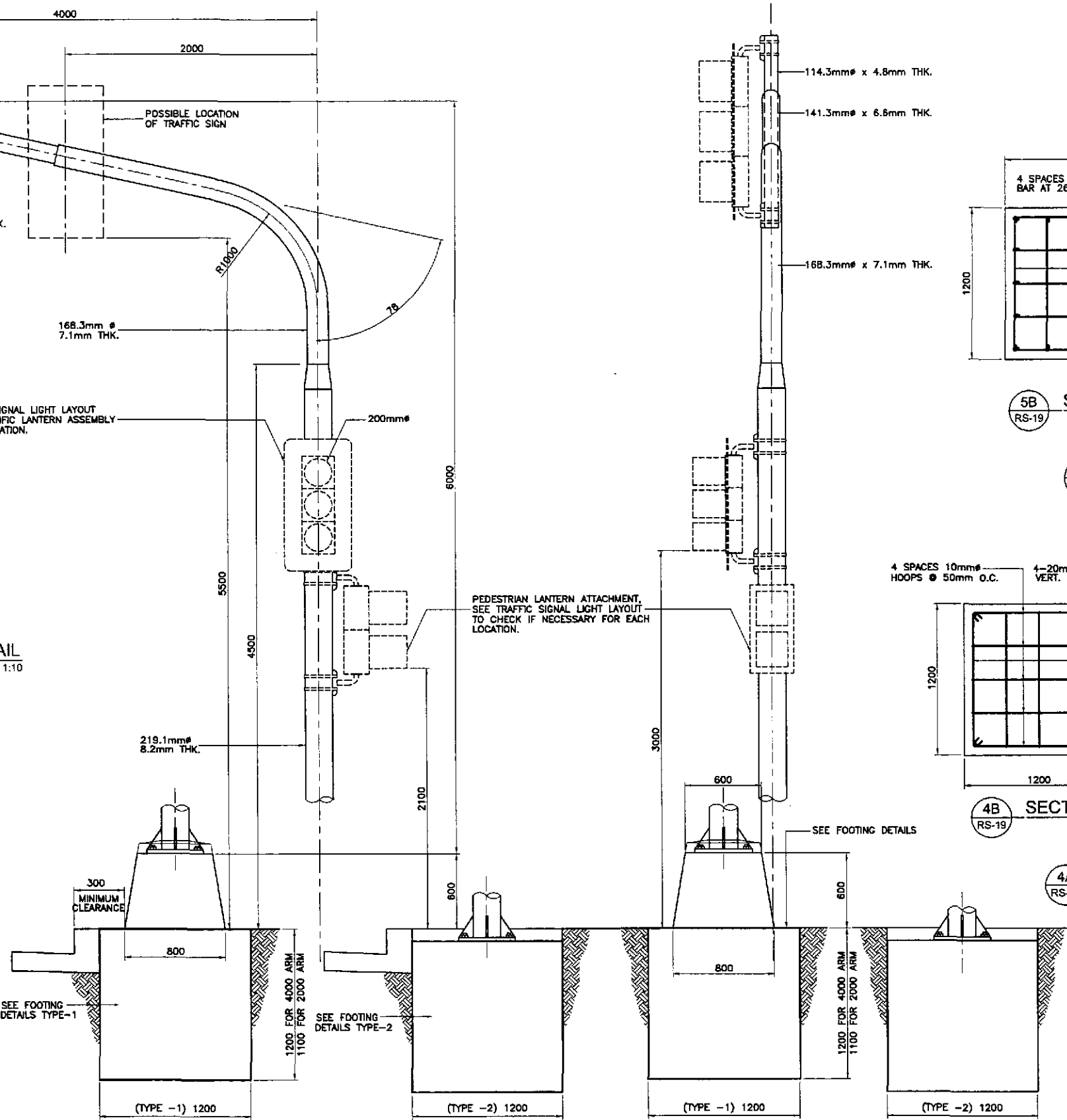


2C ELEVATION
SCALE 1:10



2B PLAN
SCALE 1:10

2A BASE PLATE DETAIL
SCALE 1:10

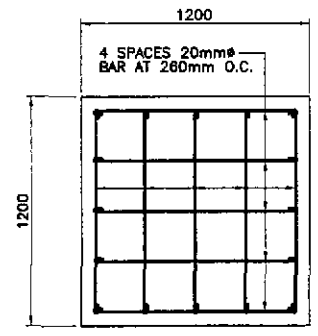


1B FRONT VIEW
SCALE 1:20

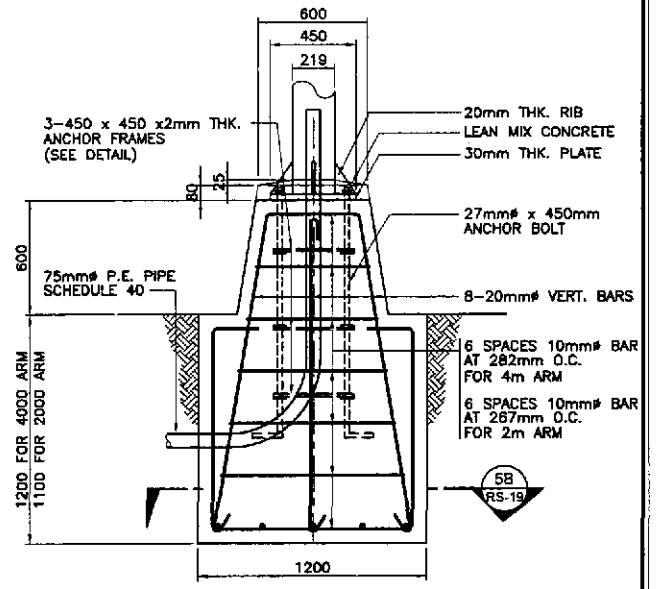
1C SIDE VIEW
SCALE 1:20

1A MAST ARM VEHICLE SIGNAL POST
SCALE 1:20

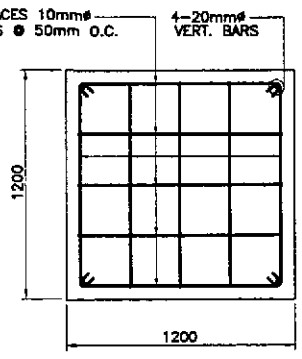
A TRAFFIC SIGNAL POST TYPE A
SCALE 1:20



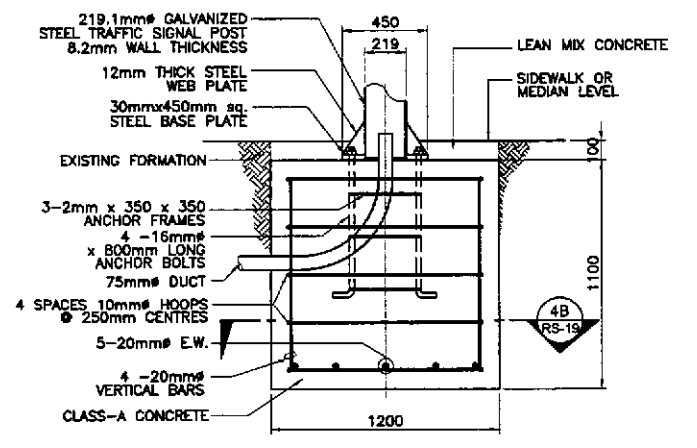
5B SECTION
SCALE 1:20



5C SECTION THROUGH FOOTING
SCALE 1:20



4B SECTION
SCALE 1:20

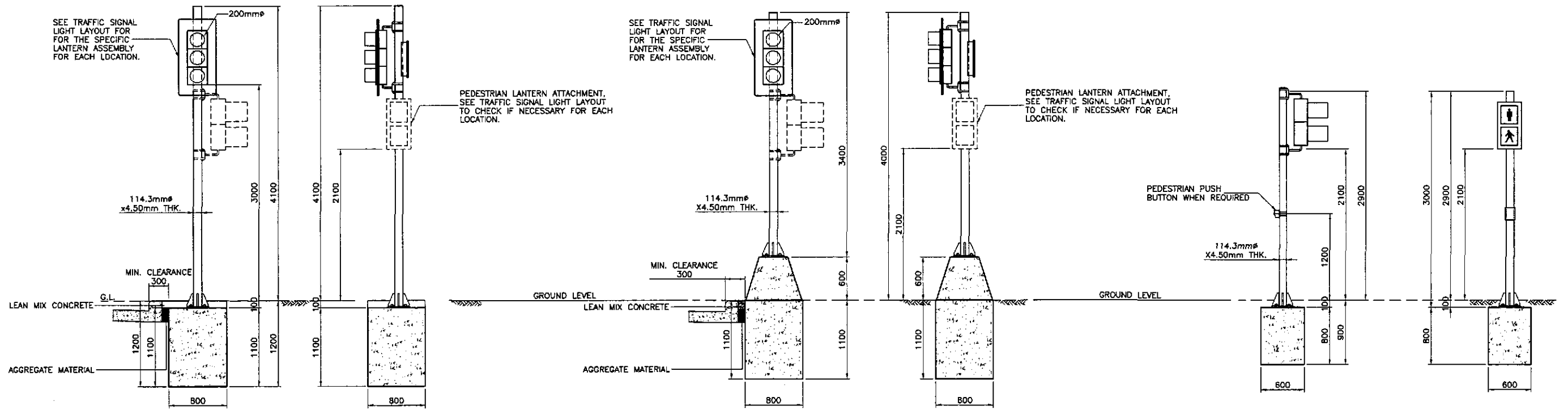


4C SECTION THROUGH FOOTING
SCALE 1:20

4A TYPE-2 (MOUNTING AT SIDEWALK LEVEL)
SCALE 1:20

- NOTES:
- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 - TYPE-1 POST SHALL BE USED FOR POSTS LOCATED ON MEDIAN AND CORNER ISLANDS. TYPE-2 POSTS SHALL BE USED FOR POSTS LOCATED ON SIDEWALKS.
 - STANDARD TRAFFIC SIGNAL POST DESIGN (TYPE A, B, C & D) BASED ON MANUAL FOR THE DESIGN AND LAYOUT OF TRAFFIC SIGNALS IN THE PHILIPPINES, TRAFFIC ENGINEERING CENTER, JANUARY 1983.

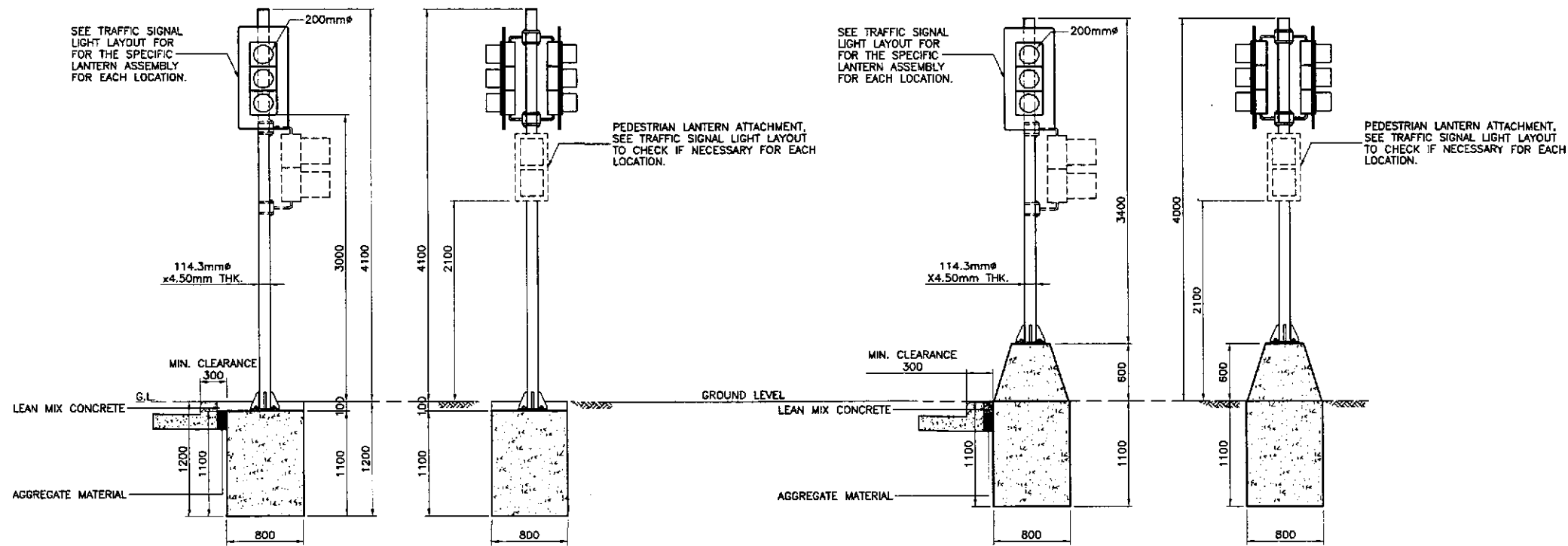
	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	<p>PROJECT AND LOCATION :</p> <p>THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridei, Cabanatuan and San Jose Bypasses)</p> <p>CABANATUAN BYPASS - CONTRACT PACKAGE II</p>	<p>SCALE :</p> <p>AS SHOWN</p> <p>FULL SIZE A1</p>	<p>SHEET CONTENTS :</p> <p>TRAFFIC SIGNAL POST TYPE 'A' AND FOUNDATION DETAILS</p>	<p>SHEET NO. :</p> <p>RS-19</p>	
	CHECKED	DATE	SIGNATURE						<p>BUREAU OF DESIGN</p> <p>OFFICE OF THE SECRETARY</p>
	SUBMITTED	DATE	SIGNATURE						<p>Recommended By:</p> <p>MANUEL M. BONDAN</p> <p>Undersecretary</p>
<p>Submitted By: DANILO C. TRAJANO, Project Director</p> <p>Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division</p> <p>Recommended By: GILBERTO S. REYES, OIC, Director IV</p> <p>Approved By: SIMEON A. DATUMANONG, Secretary</p>									



1A TYPE B-1
RS-20 SCALE 1:30

2A TYPE C-1
RS-20 SCALE 1:30

3 TRAFFIC SIGNAL POST TYPE D
RS-20 SCALE 1:30



1B TYPE B-2
RS-20 SCALE 1:30

2B TYPE C-2
RS-20 SCALE 1:30

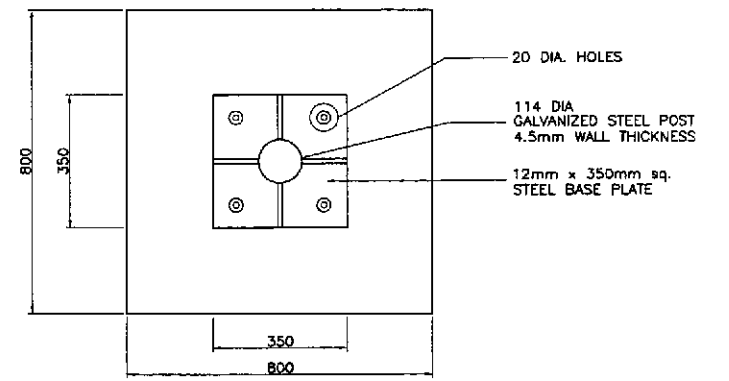
1 TRAFFIC SIGNAL POST TYPE B
RS-20 SCALE 1:30

2 TRAFFIC SIGNAL POST TYPE C
RS-20 SCALE 1:30

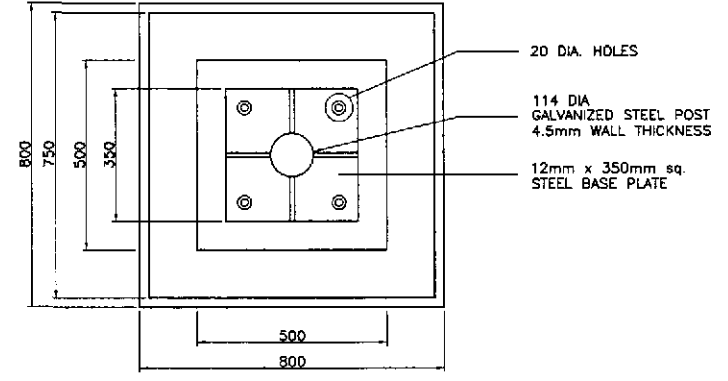
NOTES:

1. POST ON SIDEWALKS SHOULD BE LOCATED AT A MINIMUM OF 0.60m (0.75 FOR MAST ARMS) FROM THE FACE OF THE CURB.
2. POST ON MEDIAN ISLANDS MUST BE OFFSET AT LEAST 1.5m FROM THE NOSE OF THE ISLAND AND MOUNTED ON CONCRETE PEDESTALS AT LEAST 0.60m HIGH.
3. POST AND MAST ARMS ON CORNER ISLANDS SHOULD BE AT LEAST 1.0m FROM THE FACE OF THE CURB AND MOUNTED ON CONCRETE PEDESTALS 0.60m HIGH.
4. PEDESTRIAN LANTERN ATTACHMENTS ARE INCLUDED ONLY IF SPECIFIED IN THE TRAFFIC SIGNAL LIGHT LAYOUT.

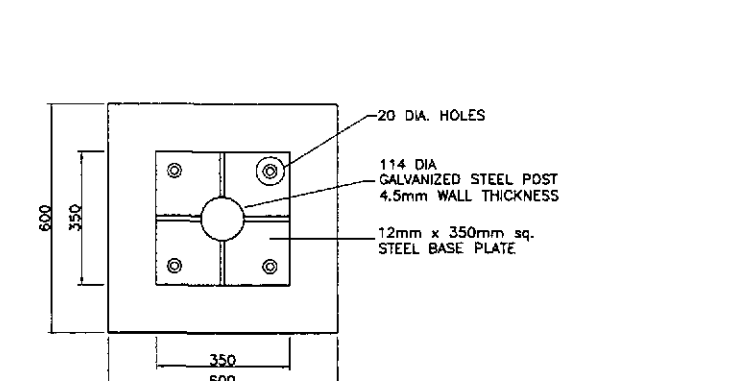
	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :	
	CHECKED	10/16/02	<i>[Signature]</i>		BUREAU OF DESIGN	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)			AS SHOWN	TRAFFIC SIGNAL POST TYPES 'B', 'C' & 'D'	RS-20
	SUBMITTED	10/14/02	<i>[Signature]</i>		OFFICE OF THE SECRETARY	CABANATUAN BYPASS - CONTRACT PACKAGE II			FULL SIZE A1		
Submitted By:		Reviewed By:		Recommended By:		Approved By:					
DANILO C. TRAJANO Project Director		JOSEFINA M. ALACAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONICAN Undersecretary		SIMEON A. DATUMANDONG Secretary			



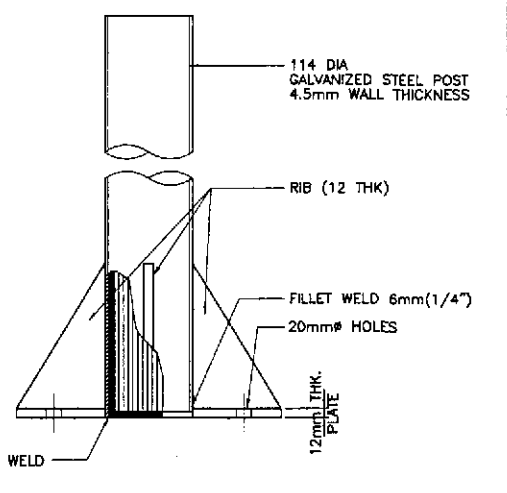
PLAN OF FOOTING



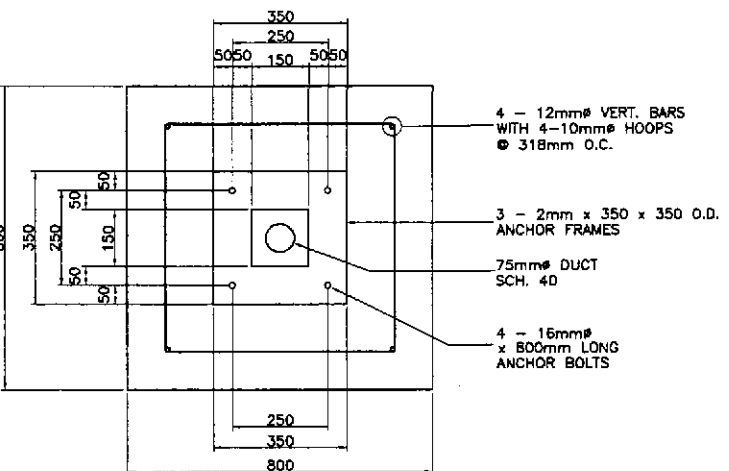
PLAN OF FOOTING



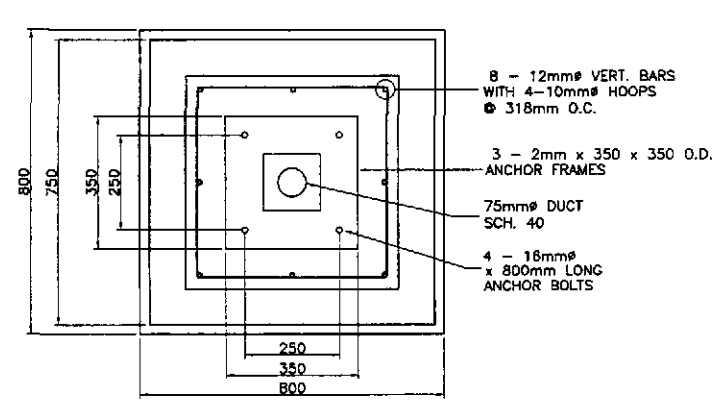
PLAN OF FOOTING



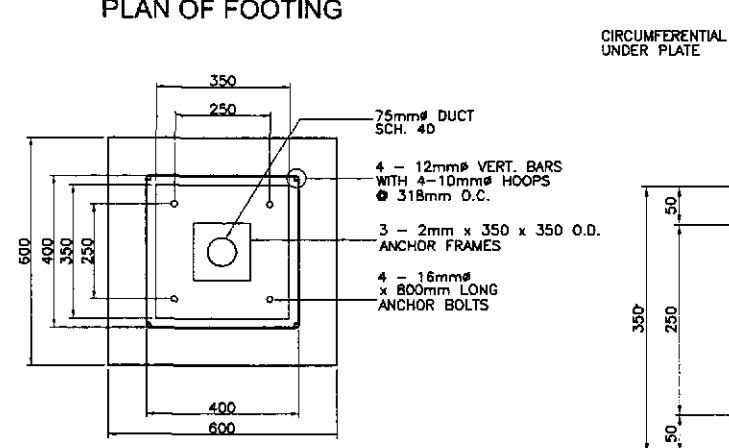
CIRCUMFERENTIAL WELD UNDER PLATE



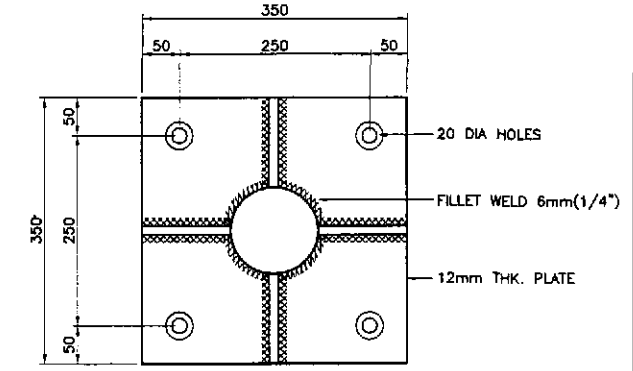
SECTION THRU A OF TYPE B



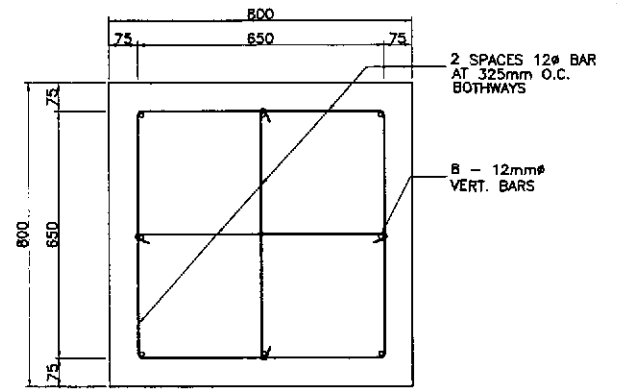
SECTION THRU A OF TYPE C



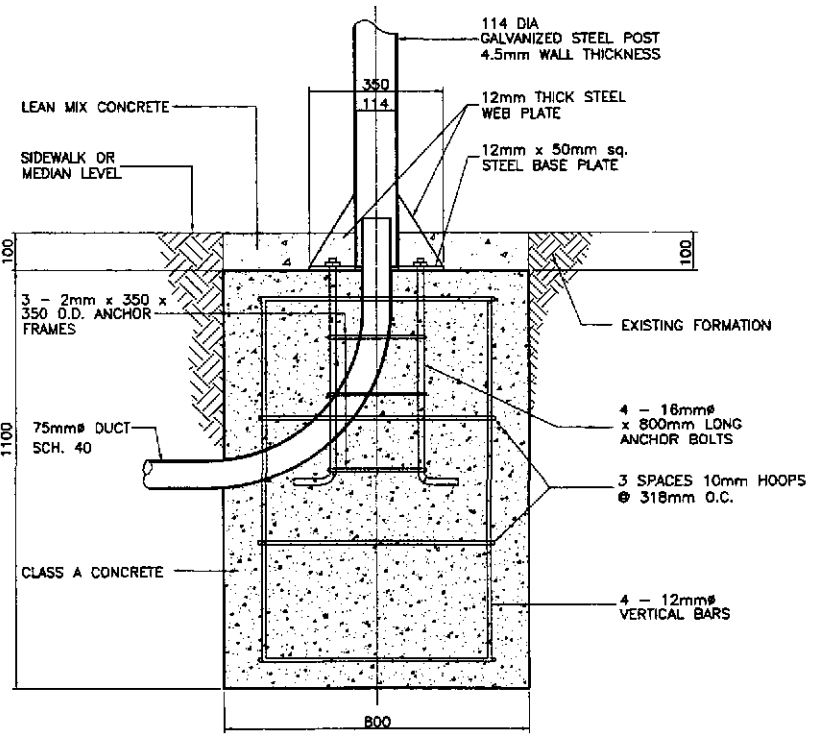
SECTION THRU A OF TYPE D



5 POST AND BASE PLATE SCALE 1:5



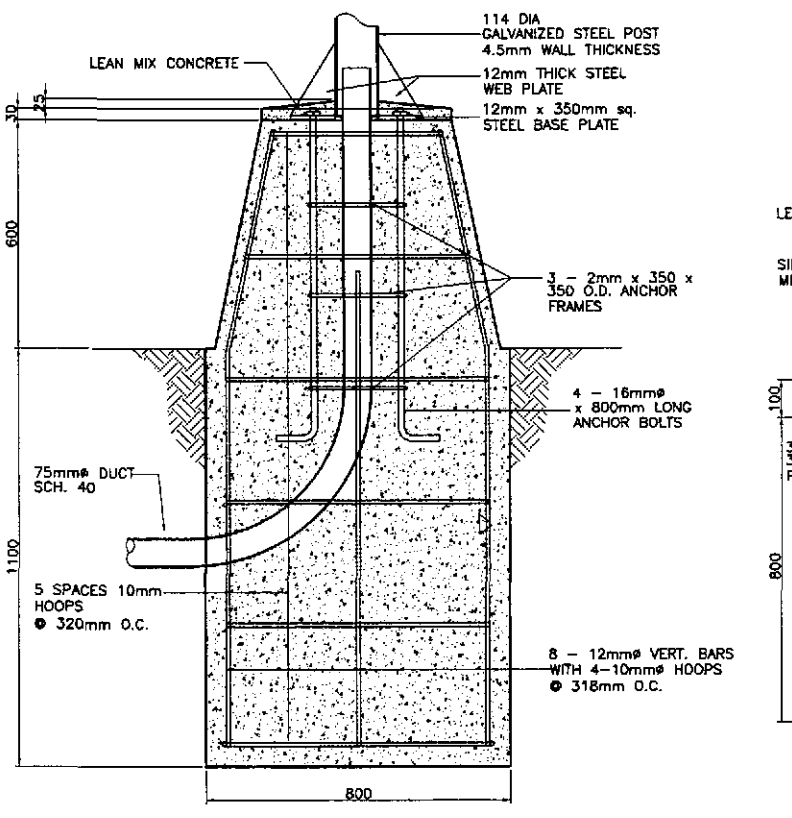
4 TYPICAL BOTTOM SECTION OF FOOTING - TYPE C SCALE 1:10



SECTION THROUGH FOUNDATION (4.1 SIGNAL POST)

VEHICLE SIGNAL POST FOUNDATION (TYPE B)

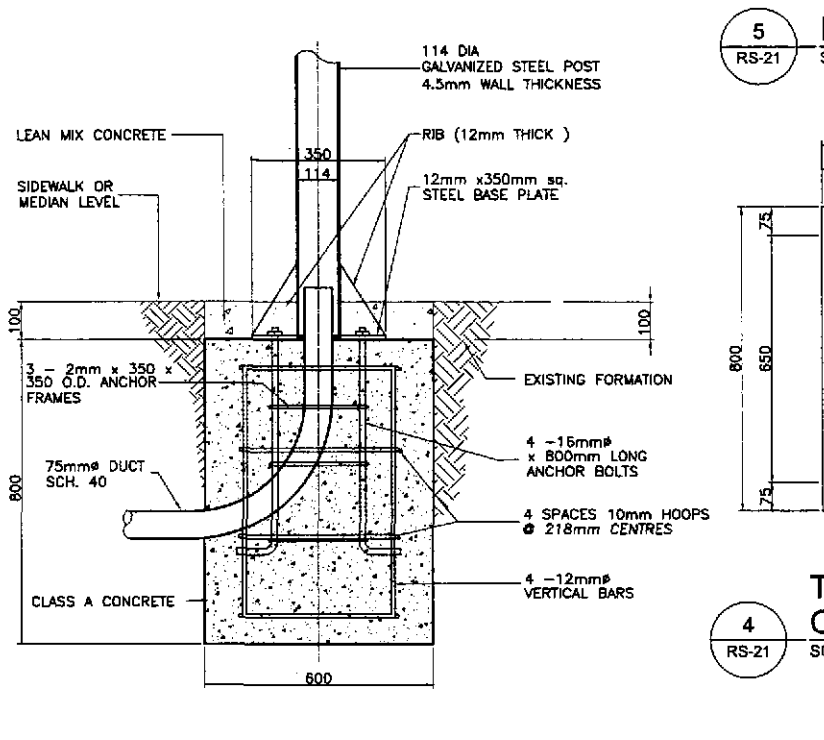
1 RS-21 SCALE 1:10



SECTION THROUGH FOUNDATION (4.1 SIGNAL POST)

VEHICLE SIGNAL POST FOUNDATION (TYPE C)

2 RS-21 SCALE 1:10



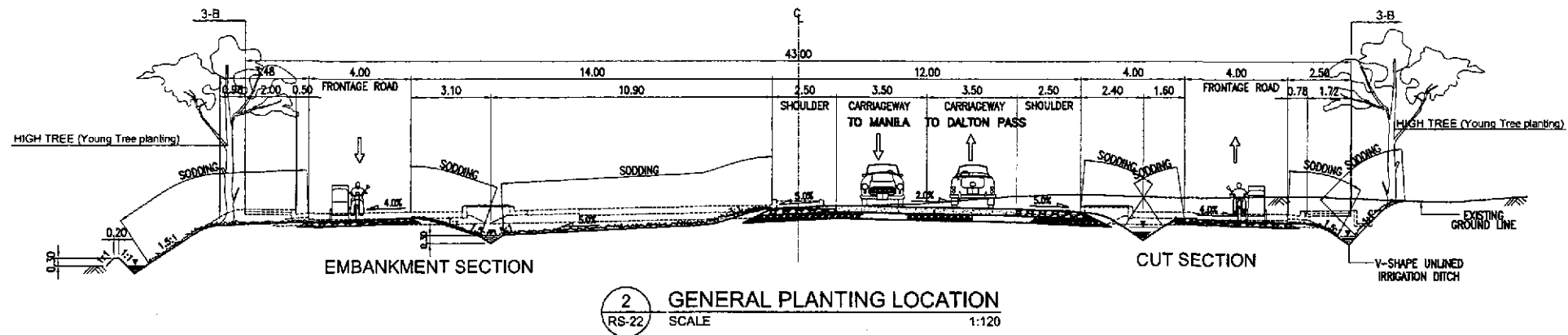
SECTION THROUGH FOUNDATION (4.1 SIGNAL POST)

PEDESTRIAN SIGNAL POST FOUNDATION (TYPE D)

3 RS-21 SCALE 1:10

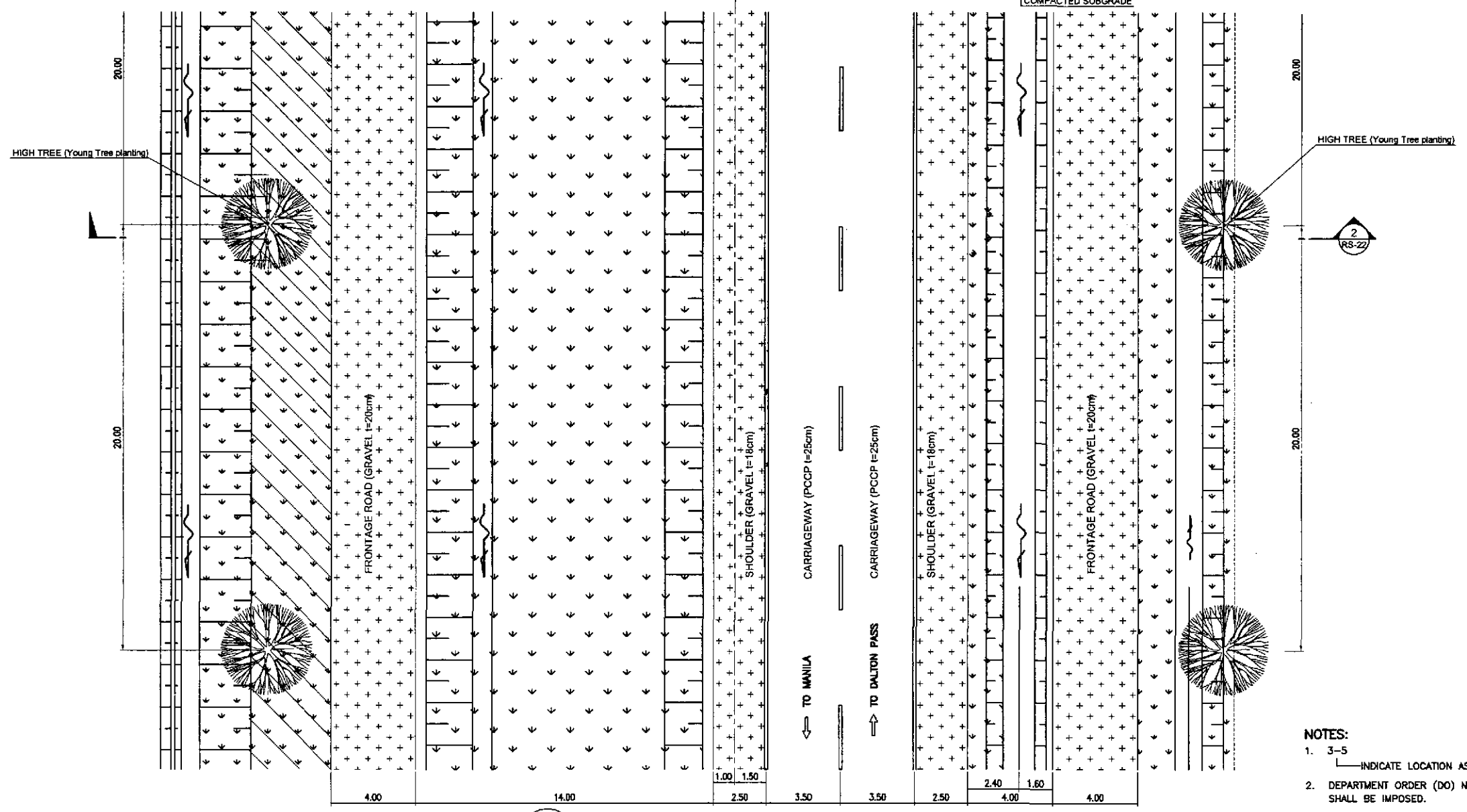
NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 2. POST AND FOUNDATION DESIGN BASED ON TRAFFIC ENGINEERING CENTER DRAWING NO. 1033.

	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 (Palaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : TRAFFIC SIGNAL POST TYPE B, C & D FOUNDATION DETAILS	SHEET NO. : RS-21
	CHECKED	10/16/02	SIGNATURE		BUREAU OF DESIGN Submitted By: DANILO C. TRAJANO Project Director Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division Recommended By: GILBERTO S. REYES OIC, Director IV Recommended By: MANUEL M. BONDAN Undersecretary Approved By: SIMON A. DATUMANONG Secretary						



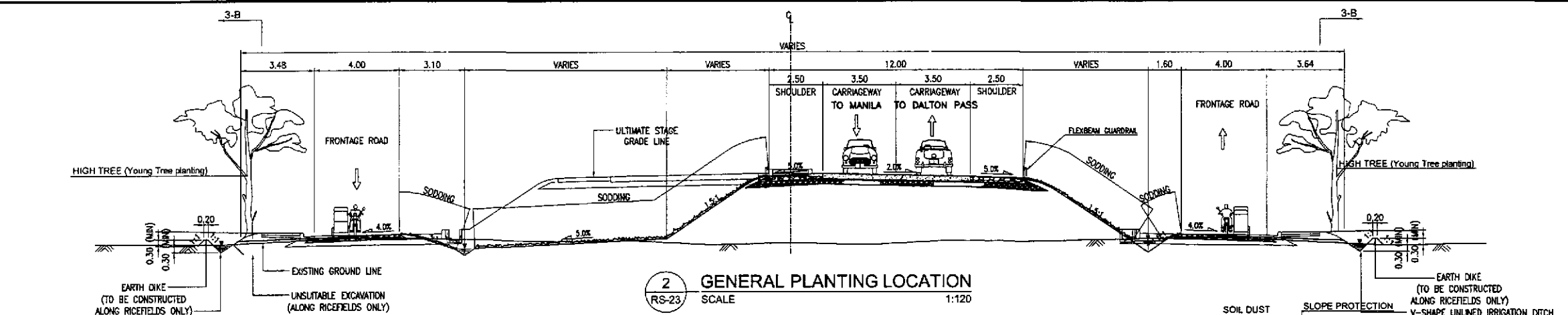
2 GENERAL PLANTING LOCATION
RS-22 SCALE 1:120

	FOOT PATH	SIDE DRAIN	SLOPE PROTECTION	SLOPE PROTECTION	SLOPE PROTECTION	SLOPE PROTECTION	SLOPE PROTECTION	SIDE DRAIN	SOIL DUST PREVENTION	SLOPE PROTECTION	SIDE DRAIN	SLOPE PROTECTION	
SURFACE	EXISTING GROUND		SOIL DUST PREVENTION	PAVEMENT	SOIL DUST PREVENTION	PAVEMENT	PAVEMENT	PAVEMENT	PAVEMENT	SOIL DUST PREVENTION	SOIL DUST PREVENTION	SOIL DUST PREVENTION	EXISTING GROUND
DISCRIPTION	NATURE		SODDING	GRAVEL	SODDING	SODDING	PCCP	+GRAVEL	PCCP	+GRAVEL	SODDING	SODDING	NATURE
	SODDING	COMPACTED SUBGRADE		COMPACTED SUBGRADE		SODDING		SODDING	COMPACTED SUBGRADE		COMPACTED SUBGRADE		COMPACTED SUBGRADE



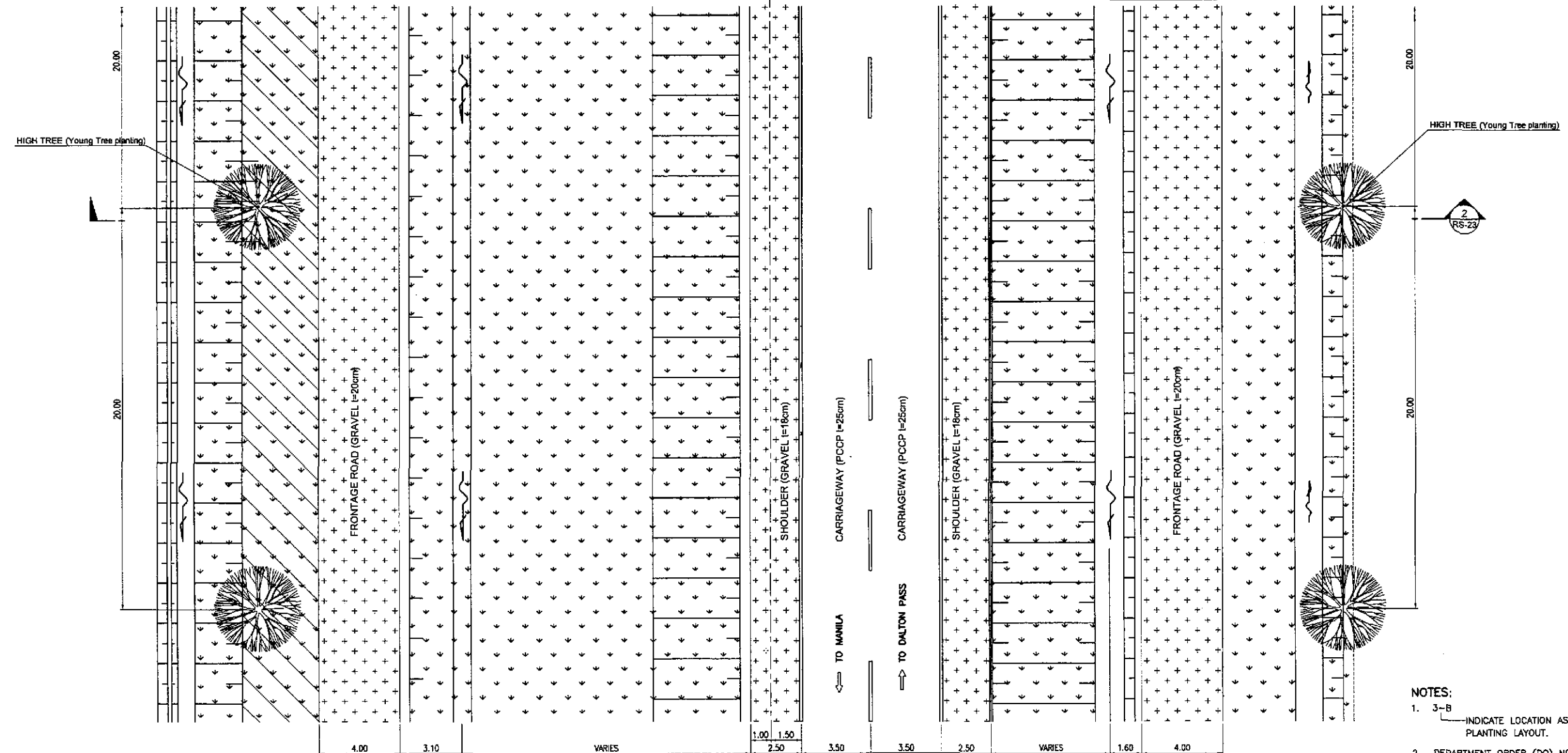
1 TYPICAL PLANTING LAYOUT
RS-22 SCALE 1:120

NOTES:
 1. 3-5 INDICATE LOCATION AS SPECIFIED IN THE PLANTING LAYOUT.
 2. DEPARTMENT ORDER (DO) NO.15, S 2000 AND ITS REQUIREMENTS SHALL BE IMPOSED.



2 GENERAL PLANTING LOCATION
RS-23 SCALE 1:120

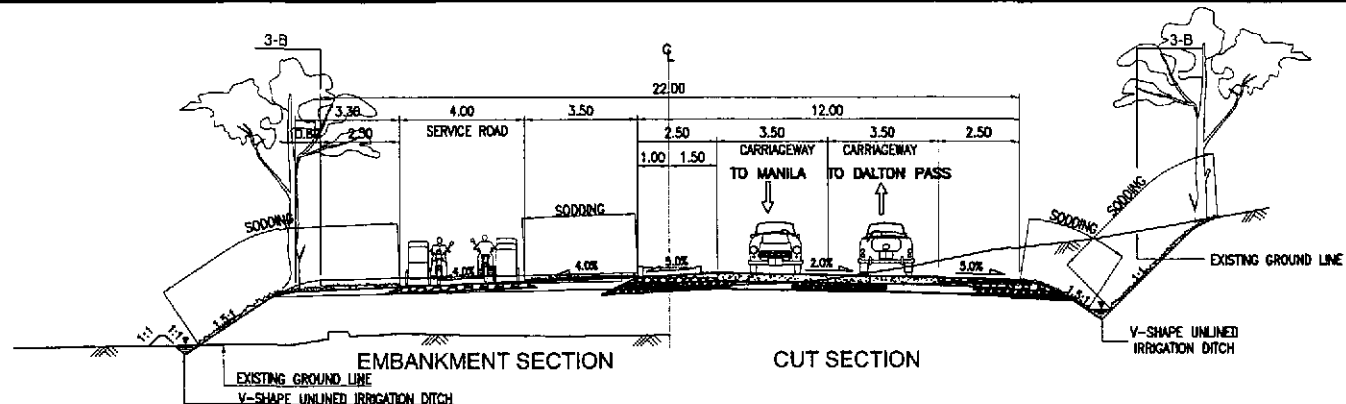
SURFACE	EXISTING GROUND	SOIL DUST PREVENTION	PAVEMENT	SOIL DUST PREVENTION	PAVEMENT	SOIL DUST PREVENTION	PAVEMENT	EXISTING GROUND
DISCRIPTION	NATURE	SODDING	GRAVEL	SODDING	SODDING	GRAVEL	PCCP	NATURE
		COMPACTED SUBGRADE		COMPACTED SUBGRADE				COMPACTED SUBGRADE



1 GENERAL PLANTING IMAGE ALONG UNDERPASS APPROACH (B TYPE INTERSECTION)
RS-23 SCALE 1:120

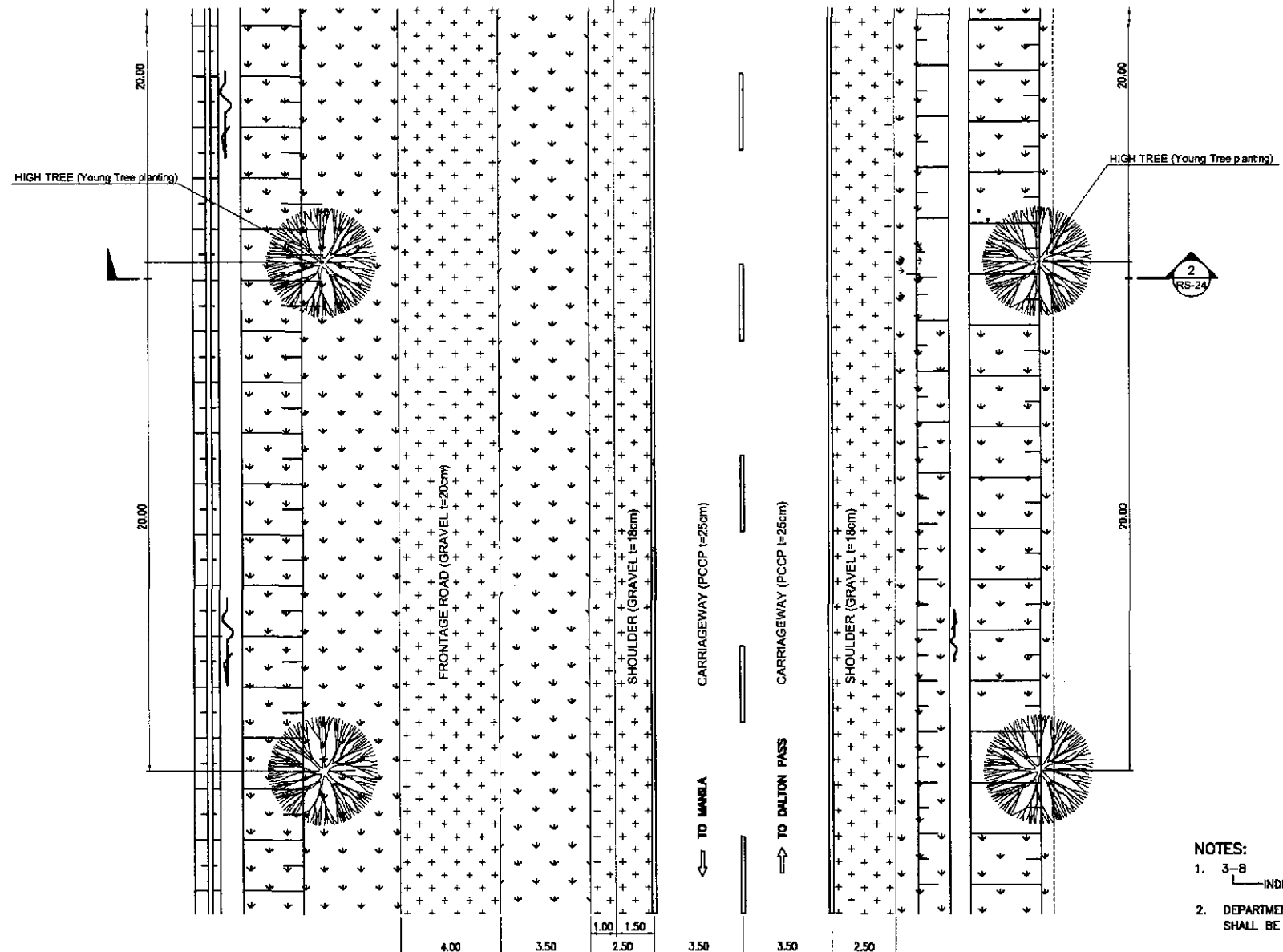
- NOTES:
- 3-B INDICATE LOCATION AS SPECIFIED IN THE PLANTING LAYOUT.
 - DEPARTMENT ORDER (DO) NO.15, S 2000 AND ITS REQUIREMENTS SHALL BE IMPOSED.

	DESIGNED	DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE II	SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : TYPICAL PLANTING LAYOUT ALONG UNDERPASS APPROACH (INITIAL STAGE)	SHEET NO. : RS-23
	CHECKED	10/16/02	S. LUNA	BUREAU OF DESIGN OFFICE OF THE SECRETARY							
	SUBMITTED	10/18/02	M. BONDAN	Submitted By:	Reviewed By:	Recommended By:	Approved By:				
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES DIC, Director N	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary				



2 GENERAL PLANTING LOCATION
RS-24 SCALE 1:120

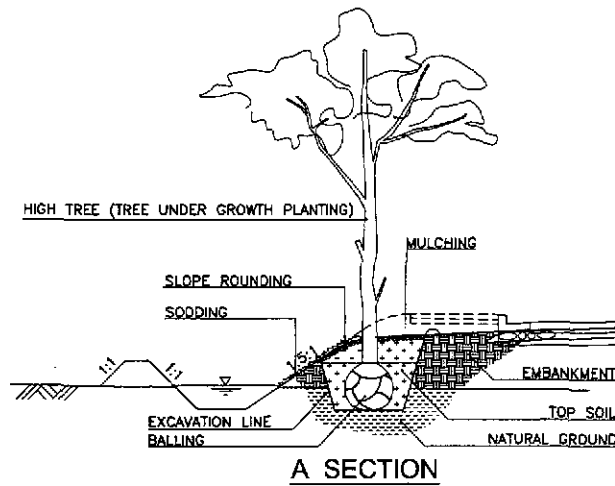
SURFACE	EXISTING GROUND	SIDE DRAIN		PAVEMENT	SOIL DUST PREVENTION	PAVEMENT			SIDE DRAIN		EXISTING GROUND
		FOOT PATH	SLOPE PROTECTION			SLOPE PROTECTION	EXISTING GROUND				
DISCRIPTION	NATURE		SODDING	GRAVEL	SODDING	GRAVEL	PCC	GRAVEL	SODDING	SODDING	NATURE
		SODDING	COMPACTED SUBGRADE							COMPACTED SUBGRADE	



1 TYPICAL PLANTING LAYOUT
RS-24 SCALE 1:120

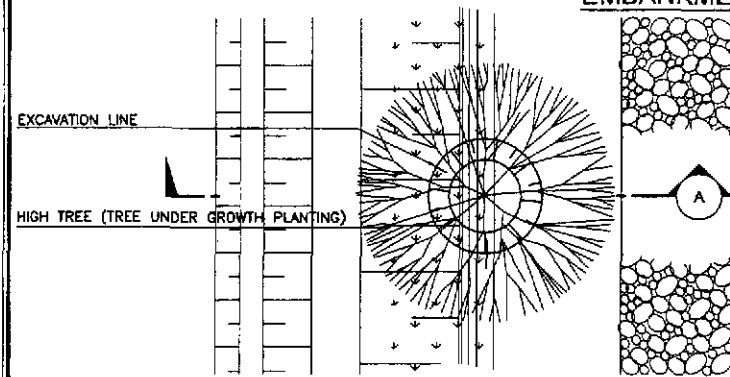
- NOTES:
- 3-B — INDICATE LOCATION AS SPECIFIED IN THE PLANTING LAYOUT.
 - DEPARTMENT ORDER (DO) NO.15, S 2000 AND ITS REQUIREMENTS SHALL BE IMPOSED.

	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	10/4/02	<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)	AS SHOWN	TYPICAL PLANTING LAYOUT WITHOUT FRONTAGE ROAD (INITIAL STAGE)	RS-24
	CHECKED	10/16/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:	CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		
	SUBMITTED	10/18/02	<i>[Signature]</i>	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OC, Director IV	MANUEL M. BONGAN Undersecretary	SIMEDIN A. DATUMANONG Secretary		



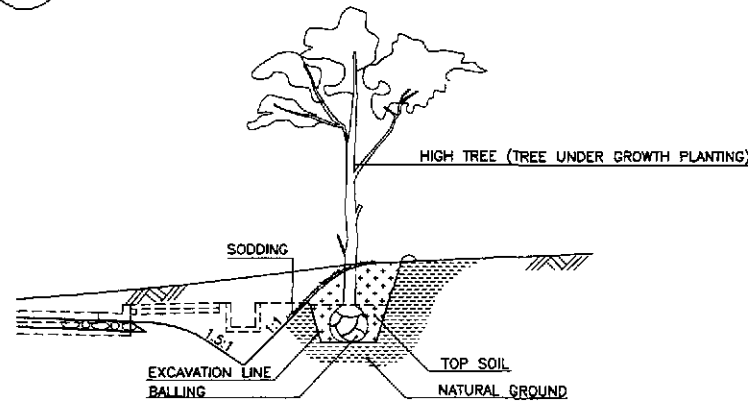
A SECTION

EMBANKMENT SECTION



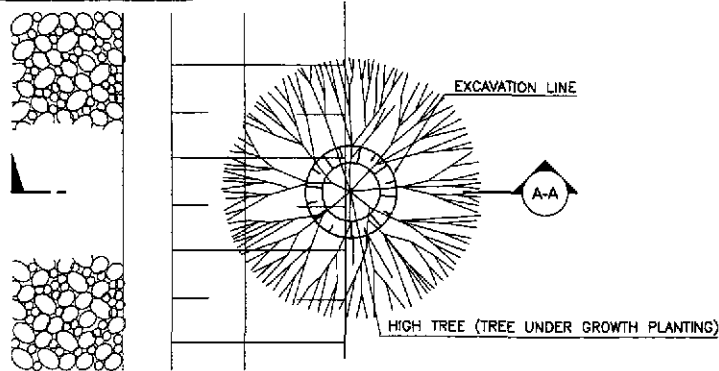
PLAN OF ROAD SIDE PLANTATION (OUTSIDE EMBANKMENT SECTION)

1 RS-25 NOT TO SCALE



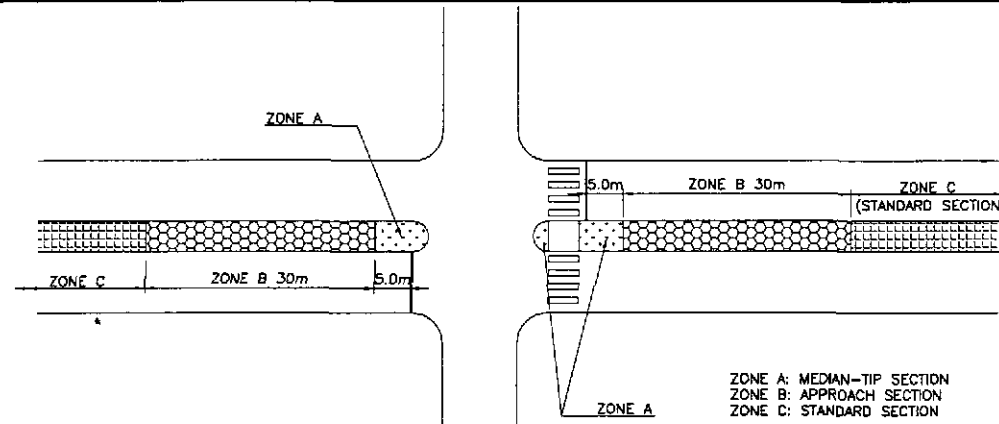
A-A SECTION

EMBANKMENT SECTION

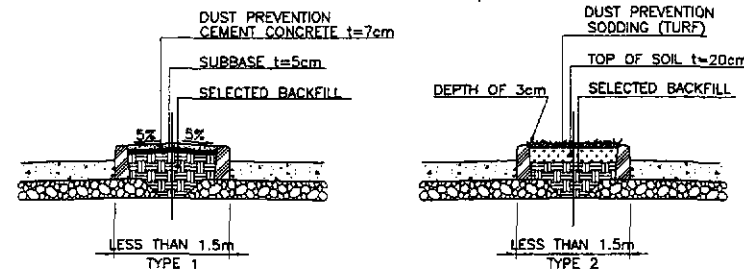


PLAN OF ROAD SIDE PLANTATION (OUTSIDE EMBANKMENT SECTION)

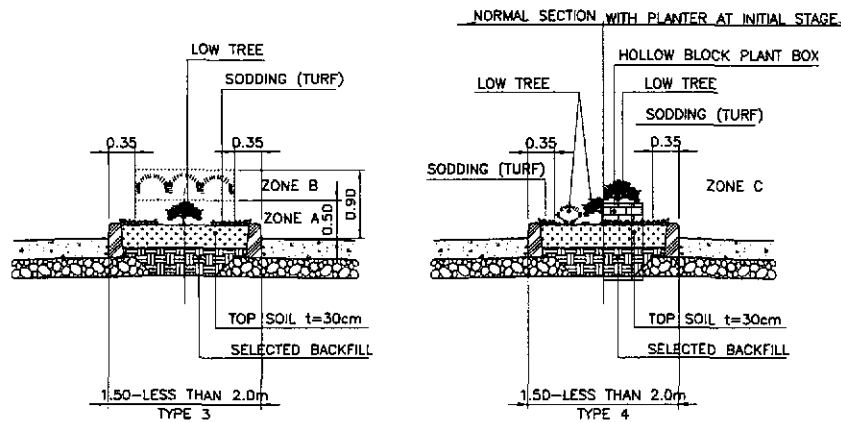
2 RS-25 NOT TO SCALE



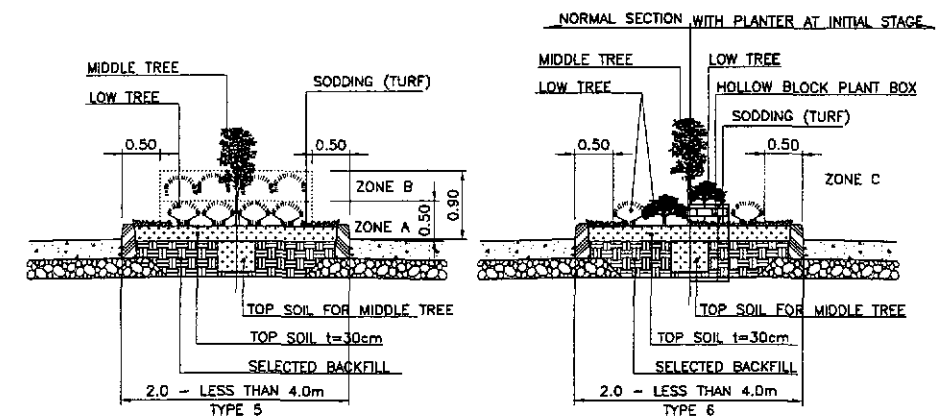
DISTRICT CHART OF PLANTING ARRANGEMENT IN THE MEDIAN



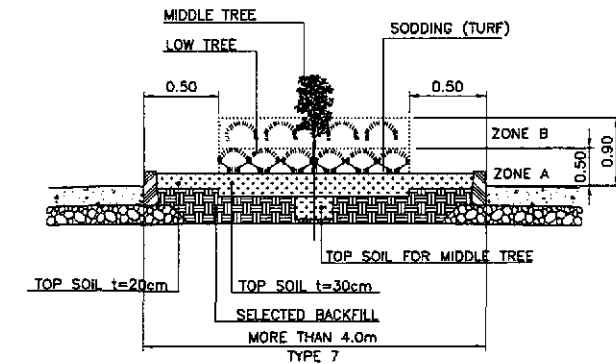
MEDIAN OF LESS THAN 1.5M



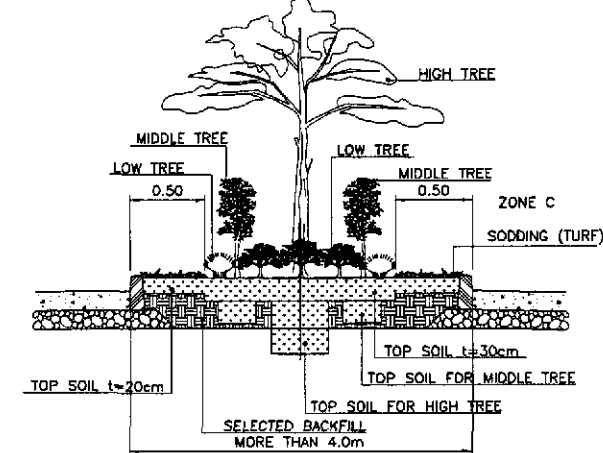
MEDIAN OF 1.5 - LESS THAN 2.0M



MEDIAN OF 2.0 - LESS THAN 4.0M

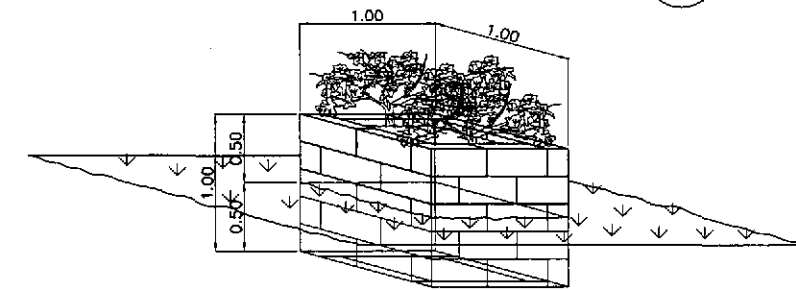


MEDIAN OF MORE THAN 4.0M



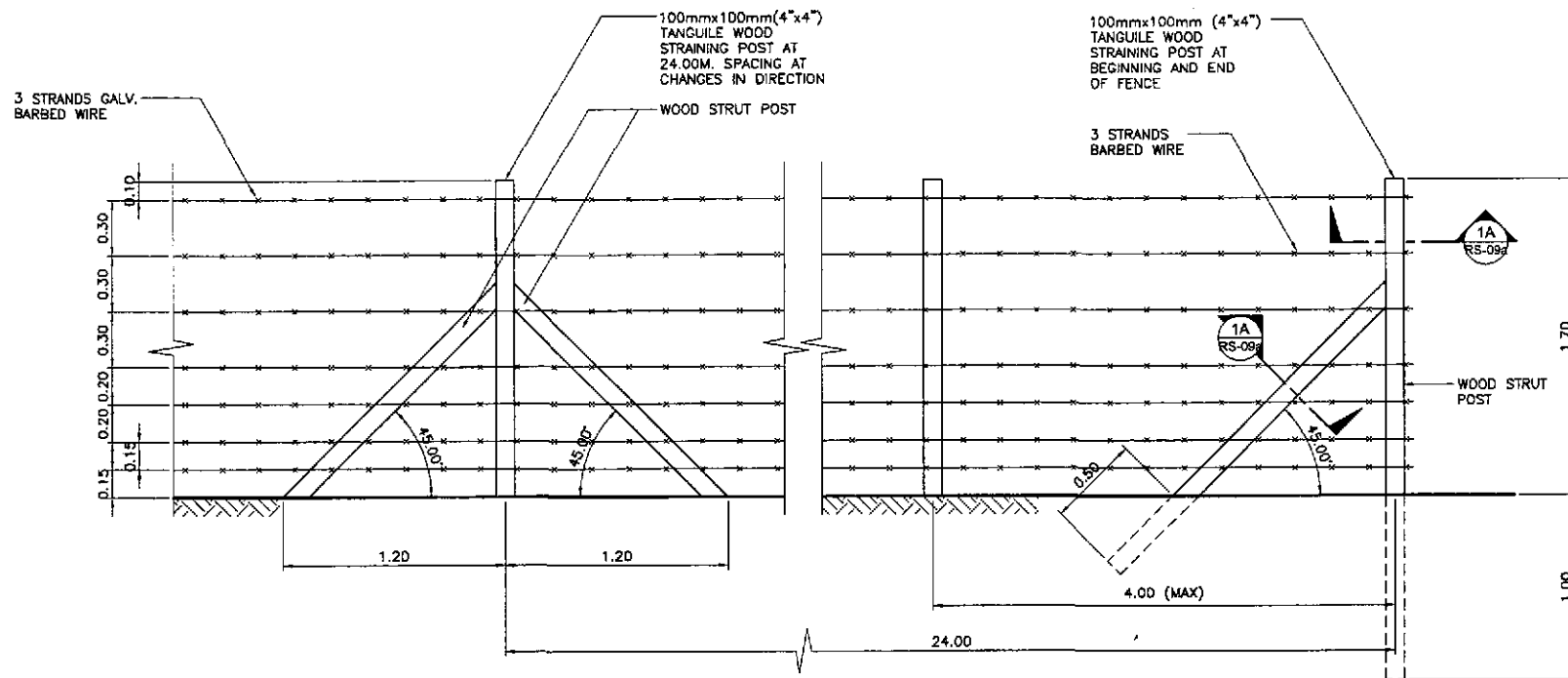
MEDIAN OF MORE THAN 4.0M

3 TYPES OF PLANTING FORMS ACCORDING TO MEDIAN/OUTER SEPARATION WIDTH NOT TO SCALE



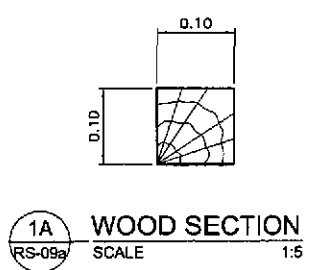
4 ISOMETRIC VIEW OF HOLLOW BLOCK PLANT BOX NOT TO SCALE

	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/16/02	S. LINA	BUREAU OF DESIGN OFFICE OF THE SECRETARY			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	TYPES OF PLANTING FORMS AND OTHER DETAILS (INITIAL STAGE)	RS-25
	SUBMITTED	10/16/02	M. BONDAN	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: SIMEDN A. DATUMANONG Secretary		

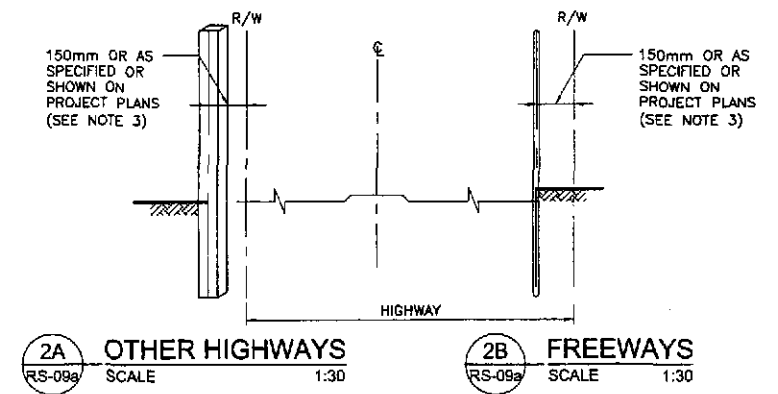


FENCE TYPE - I (BARBED WIRE FENCE) INSTALLATION FOR WOOD FENCES

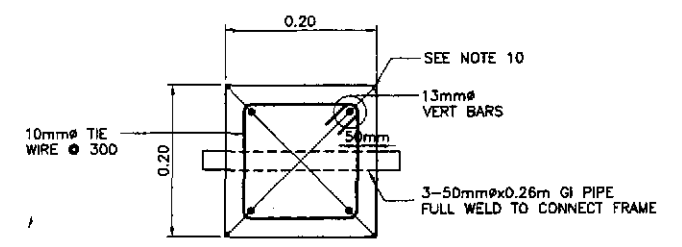
1 RS-09a SCALE 1:20



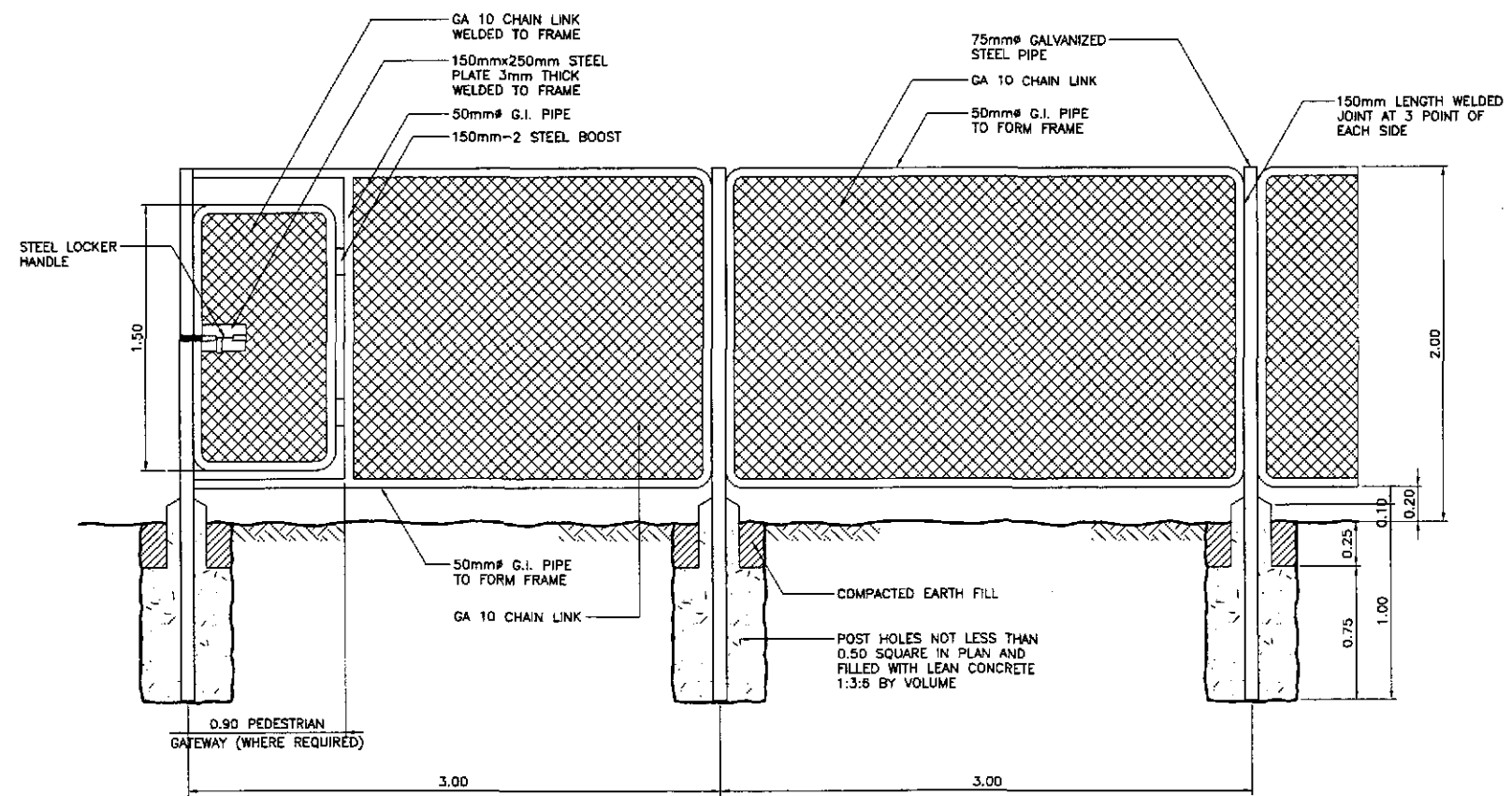
1A WOOD SECTION SCALE 1:5



2 FENCE LOCATION SCALE 1:30

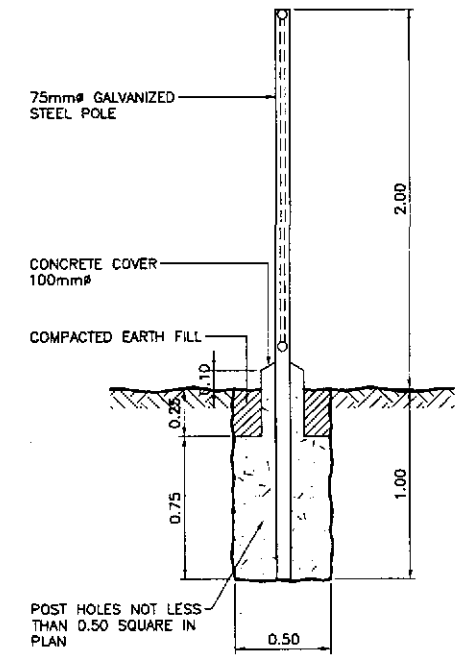


5 CONCRETE POST SECTION SCALE 1:5



FENCE TYPE - II (CHAIN LINK FENCE) FOR EITHER STEEL OR CONCRETE POST FENCES

3 RS-09a SCALE 1:20



4 SIDE VIEW SCALE 1:20

NOTES:

- MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE REQUIREMENTS OF THE GENERAL SPECIFICATIONS
- CONSTRUCTION LOCATION OF FENCES ARE SHOWN ON LAYOUT PLAN OR AS DIRECTED BY THE ENGINEER.
- OFFSET TO BE 0.5m AT MONUMENT LOCATIONS. MEASURED AT RIGHT ANGLES TO R/W LINES. TAPER TO ACHIEVE OFFSET TO BE AT LEAST 6m LONG.
- STRAINED BARBED WIRE SHALL BE GALVANIZED AS SPECIFIED BY IN ITEM 711
- 50mm# AND 75mm# STEEL PIPE SHALL BE GALVANIZED.
- THE COST OF FENCE TYPE I SHALL INCLUDE THE COST OF WOOD/RC STRUT POST AND ITS FOUNDATION.
- THE COST OF FENCE TYPE II SHALL INCLUDE THE COST OF 0.90x1.50 EXIT-ENTRANCE OF FENCE GATE, INSTALLATION EQUIPMENT AND ITS FOUNDATION.
- LOCATION OF EXIT-ENTRANCE OF FENCE GATE TYPE II SHALL BE AS DIRECTED BY THE PROJECT ENGINEER.
- CONCRETE FOUNDATION OF STEEL POST TO BE CLASS "C".
- CONCRETE POST SHALL BE CLASS "A" CONCRETE, RUBBER FINISH OR CASTED IN SMOOTH SURFACE FORMS WITH EXPOSED CORNERS ROUNDED OR CHAMFERED 12mm.
- CONCRETE POST REINFORCING STEEL EXCEPT THE WIRES SHALL BE DEFORMED STEEL BARS OF INTERMEDIATE GRADE.
- WOOD POSTS FENCES SHALL CONFORM AS SPECIFIED IN ITEM 711 OF STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGES.
- MATERIAL FOR CHAIN LINK FENCE POST ARE SUBJECT TO CHANGE TO SUIT FIELD CONDITIONS. CHANGES SHALL BE PREPARED BY CONTRACTOR AND SHALL BE APPROVED BY THE ENGINEER.
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

KATAHIRA & ENGINEERS
YACHIYO ENGINEERING CO., LTD.

DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			
10/1/02	10/1/02	[Signature]	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
CHECKED	10/1/02	[Signature]	Submitted By:	Reviewed By:	Recommended By:	Approved By:
SUBMITTED	10/1/02	[Signature]	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES D/C, Director IV	MANUEL M. BONGAN 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 FENCING DETAILS	RS-26
CABANATUAN BYPASS - CONTRACT PACKAGE II	FULL SIZE A1		