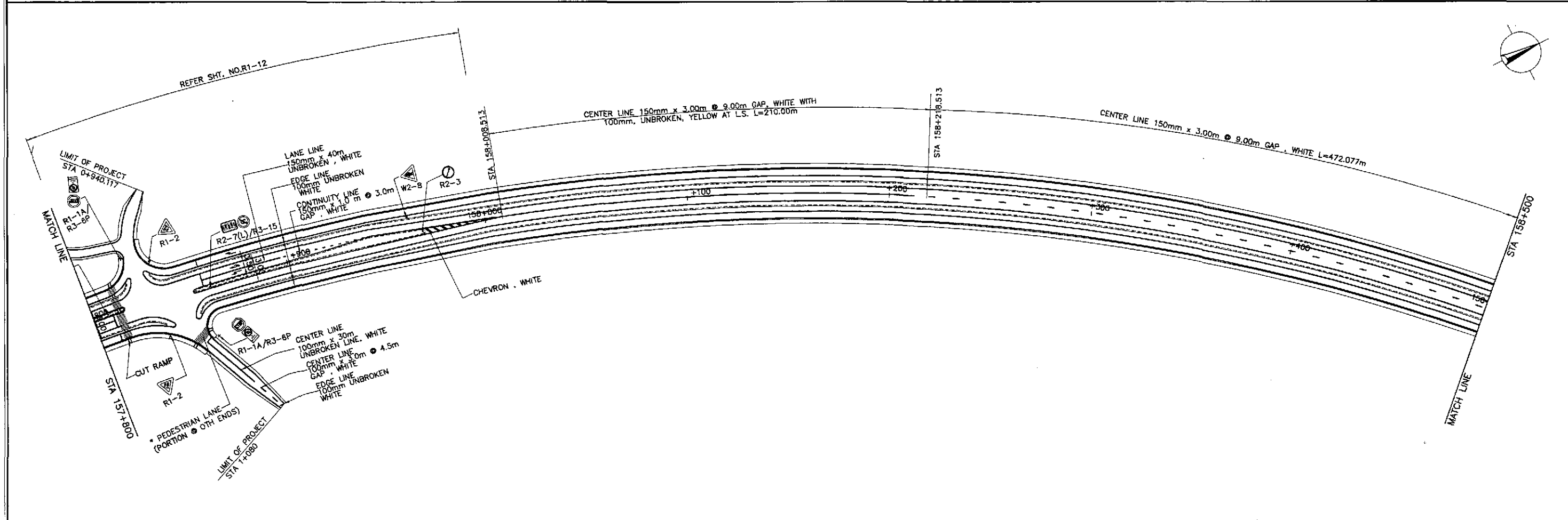
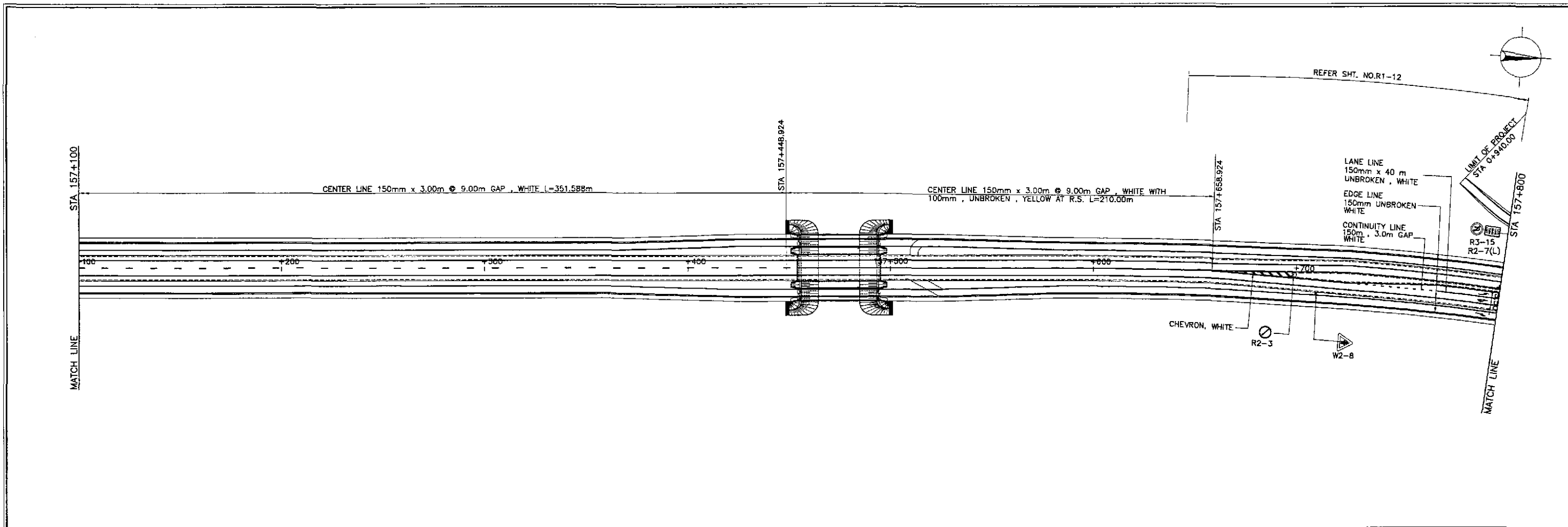
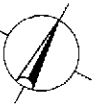


	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/10/12	<i>[Signature]</i>		BUREAU OF DESIGN OFFICE OF THE SECRETARY			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	1:1000	SAN JOSE BYPASS TRAFFIC SIGNS, PAVEMENT MARKINGS AND CUT RAMPS LAYOUT (ULTIMATE STAGE) STA. 155+828.866 - STA. 157+100	RM-01
	SUBMITTED	9/11/12	<i>[Signature]</i>		Submitted By: DANILLO C. TRAJANO Project Director			SAN JOSE BYPASS	FULL SIZE A1		
					Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division						
			Recommended By: GILBERTO S. REYES OIC, Director IV								

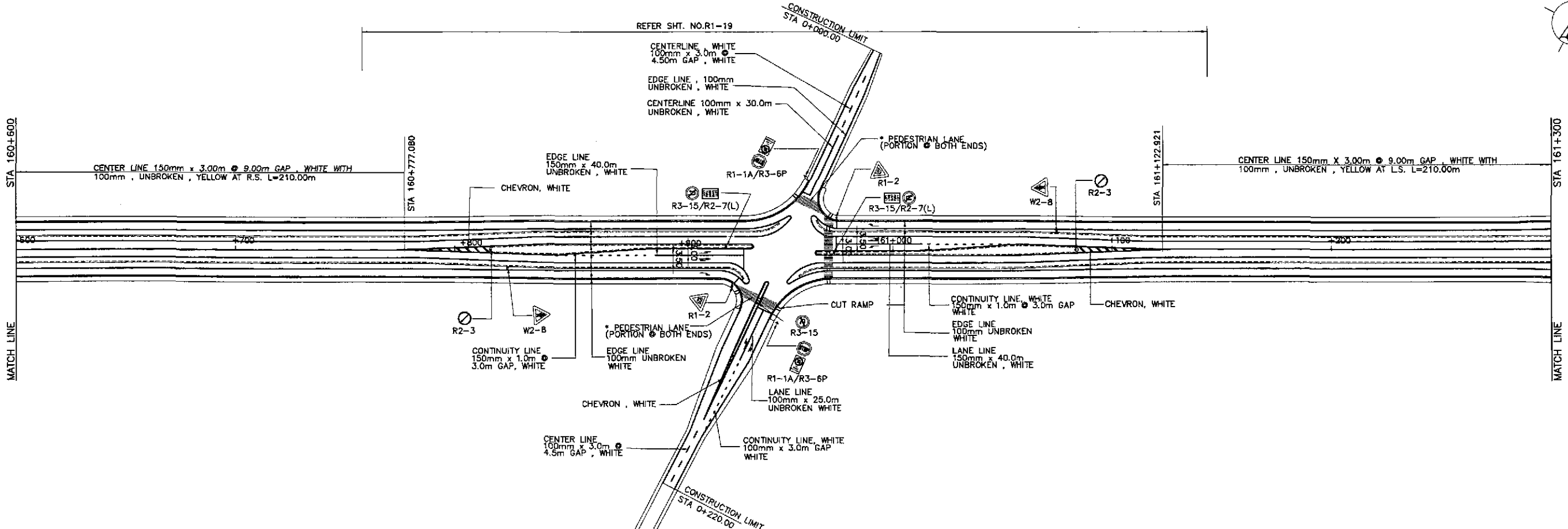
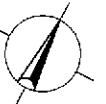
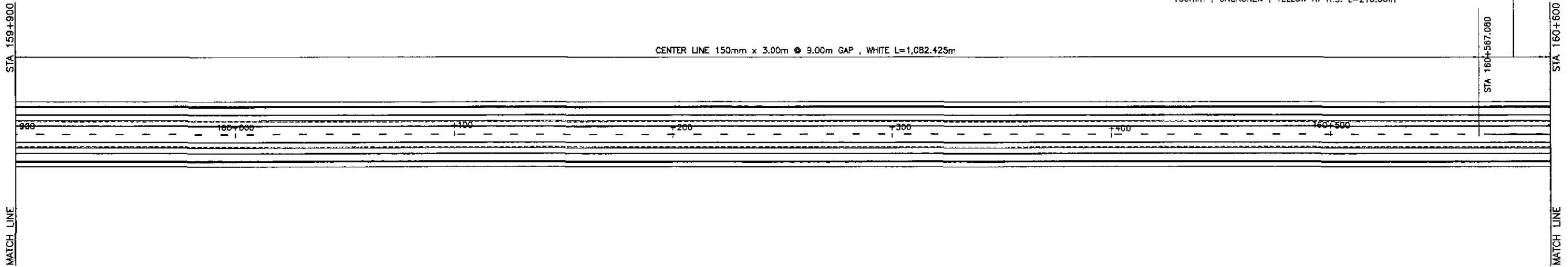


	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/19/02	S. JOSE	BUREAU OF DESIGN Submitted By: DANILLO C. TRAJANO, Project Director Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division Recommended By: GILBERTO S. REYES, Dir., 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)	1:1000	SAN JOSE BYPASS TRAFFIC SIGNS, PAVEMENT MARKINGS AND CUT RAMP LAYOUT (ULTIMATE STAGE) STA. 157+100 - STA. 158+500	RM-02
	SUBMITTED	9/11/02	M. BONDAN					SAN JOSE BYPASS	FULL SIZE A1		

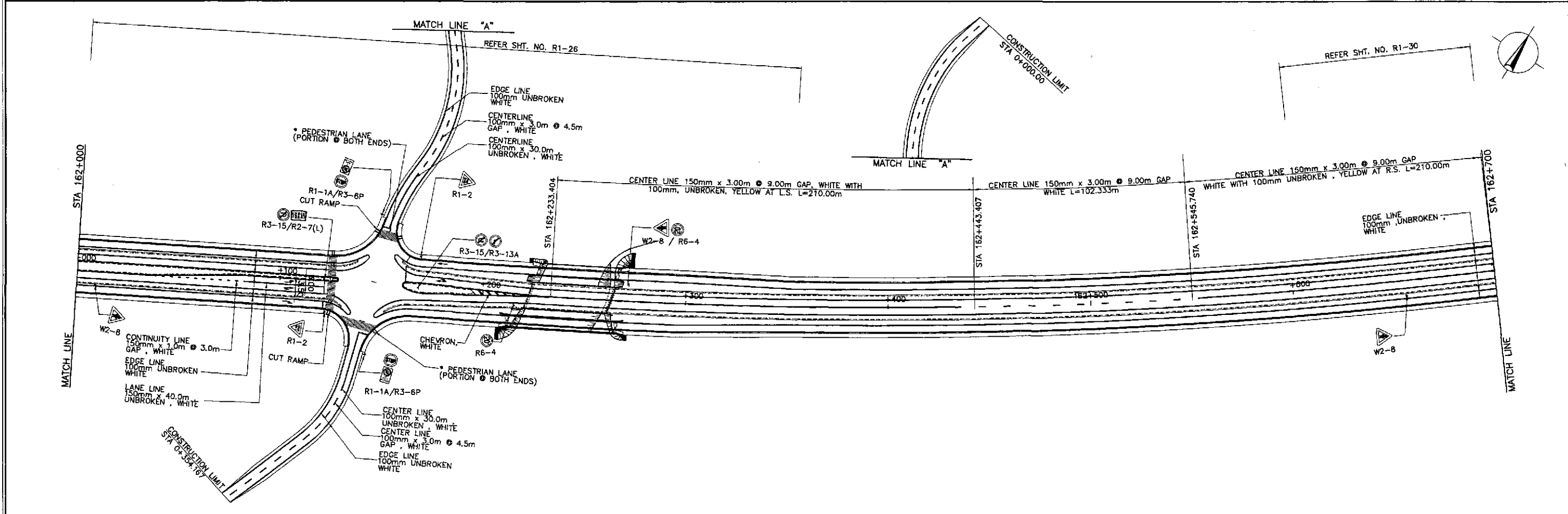
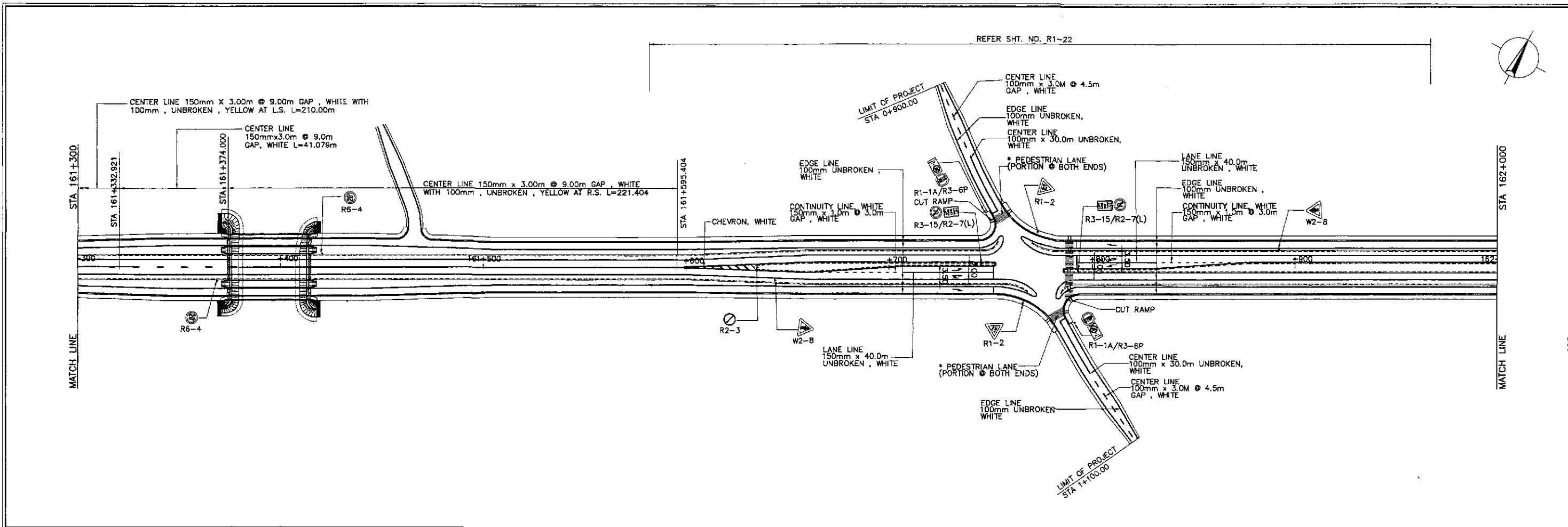


CENTER LINE 150mm x 3.00m @ 9.00m GAP , WHITE WITH
100mm , UNBROKEN , YELLOW AT R.S. L=210.00m

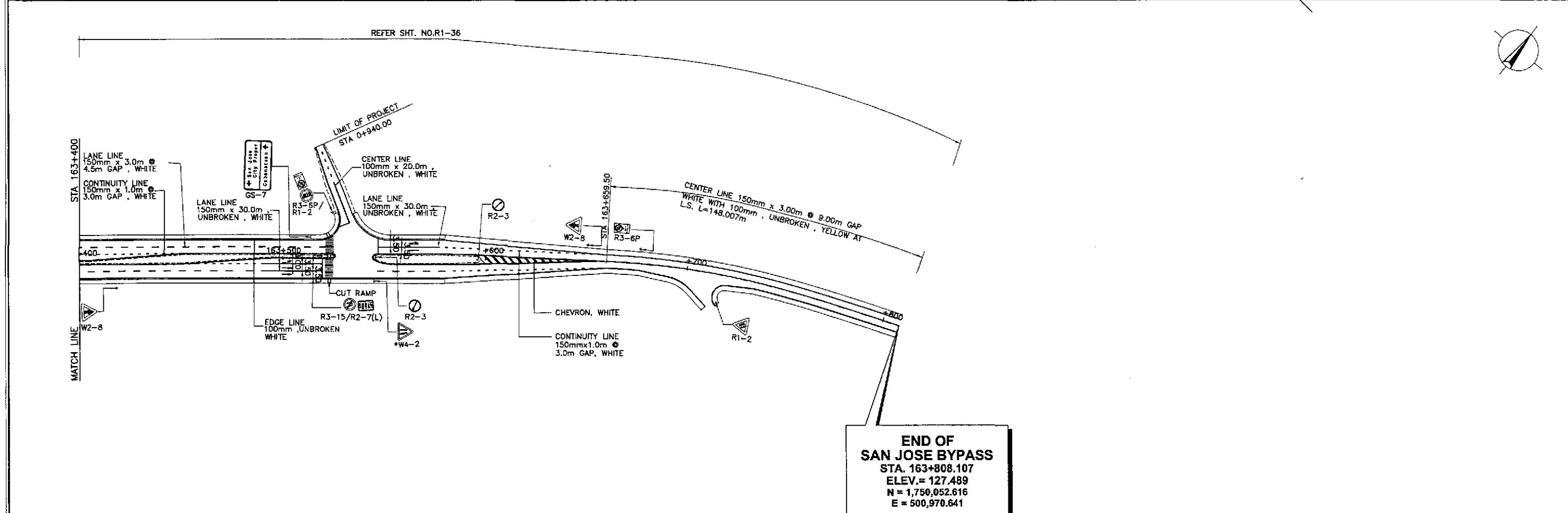
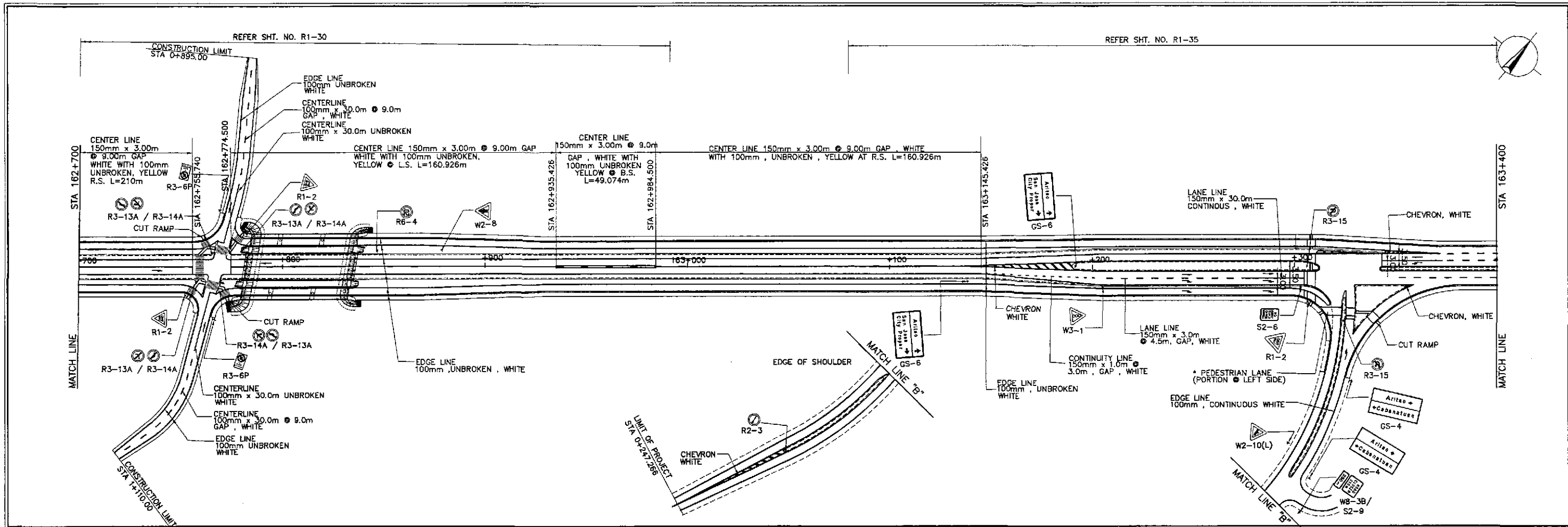
CENTER LINE 150mm x 3.00m @ 9.00m GAP , WHITE L=1,082.425m



	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :		
	DESIGNED	9/7/02	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) SAN JOSE BYPASS	1:1000	SAN JOSE BYPASS TRAFFIC SIGNS, PAVEMENT MARKINGS AND CUT RAMPS LAYOUT (ULTIMATE STAGE) STA. 159+900 - STA. 161+300	RM-04	
	CHECKED	9/9/02	J. JOSE	Submitted By:	Reviewed By:	Recommended By:					Approved By:
	SUBMITTED	9/10/02	M. LOUIS	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV					MANUEL M. BONDAN Undersecretary
			OFFICE OF THE SECRETARY (See cover sheet for Signature/Approval)								

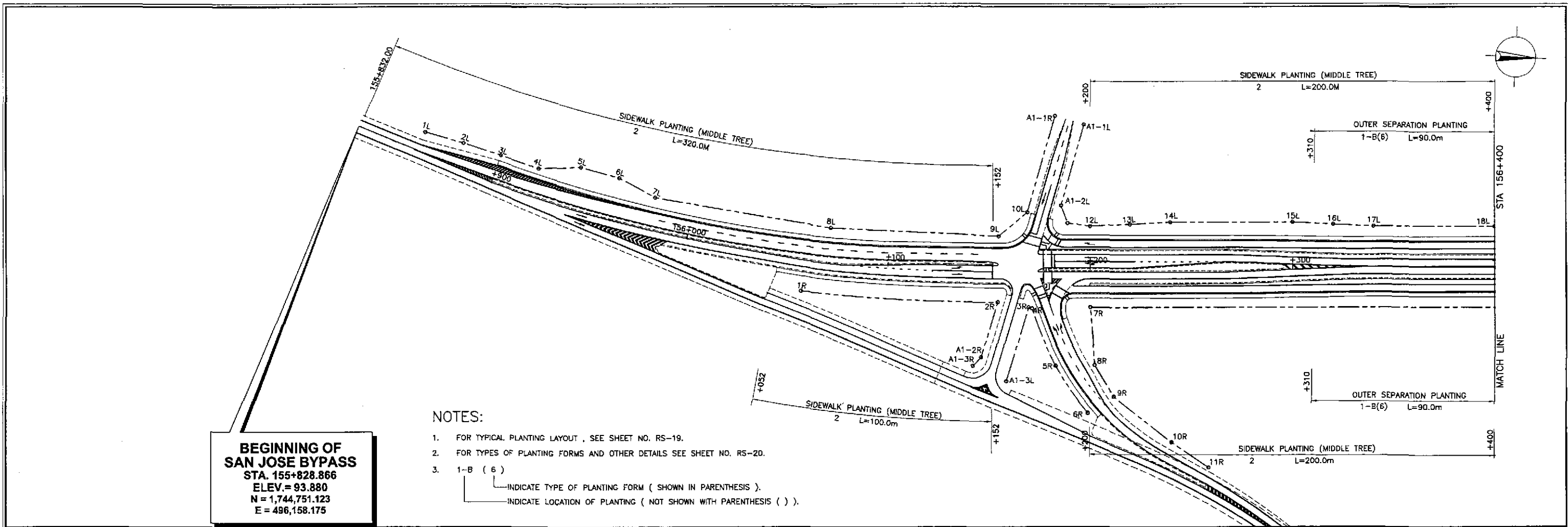


	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :		
	DESIGNED	9/9/02	S. LUNA	BUREAU OF DESIGN			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) SAN JOSE BYPASS	1:1000	SAN JOSE BYPASS TRAFFIC SIGNS, PAVEMENT MARKINGS AND CUT RAMP LAYOUT (ULTIMATE STAGE) STA. 161+300 - STA. 162+700	RM-05	
	CHECKED	9/9/02	S. ROSE	Submitted By:	Reviewed By:	Recommended By:					Approved By:
	SUBMITTED	9/10/02	M. K. ROSE	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV					MANUEL M. BONDAN Undersecretary
			(See cover sheet for Signatures/Approvals)								
							FULL SIZE A1				



**END OF
SAN JOSE BYPASS**
 STA. 163+808.107
 ELEV. = 127.489
 N = 1,750,052.616
 E = 500,970.641

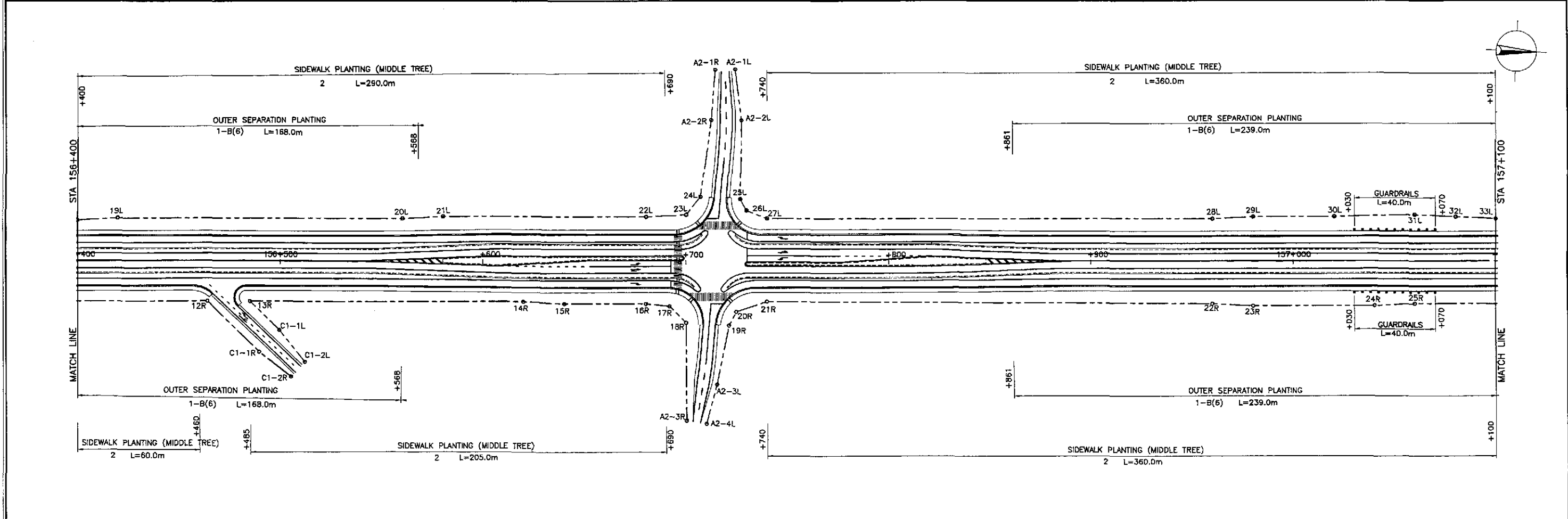
	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/7/02	S. LUNA	BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) SAN JOSE BYPASS	1:1000	SAN JOSE BYPASS TRAFFIC SIGNS, PAVEMENT MARKINGS AND CUT RAMPS LAYOUT (ULTIMATE STAGE) STA. 162+700 - STA. 163+808.107	RM-06
	CHECKED	9/9/02	S. BOSE	Submitted By:	Reviewed By:	Recommended By:	Office of the Secretary				
SUBMITTED	9/11/02	M. KANOK	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary				



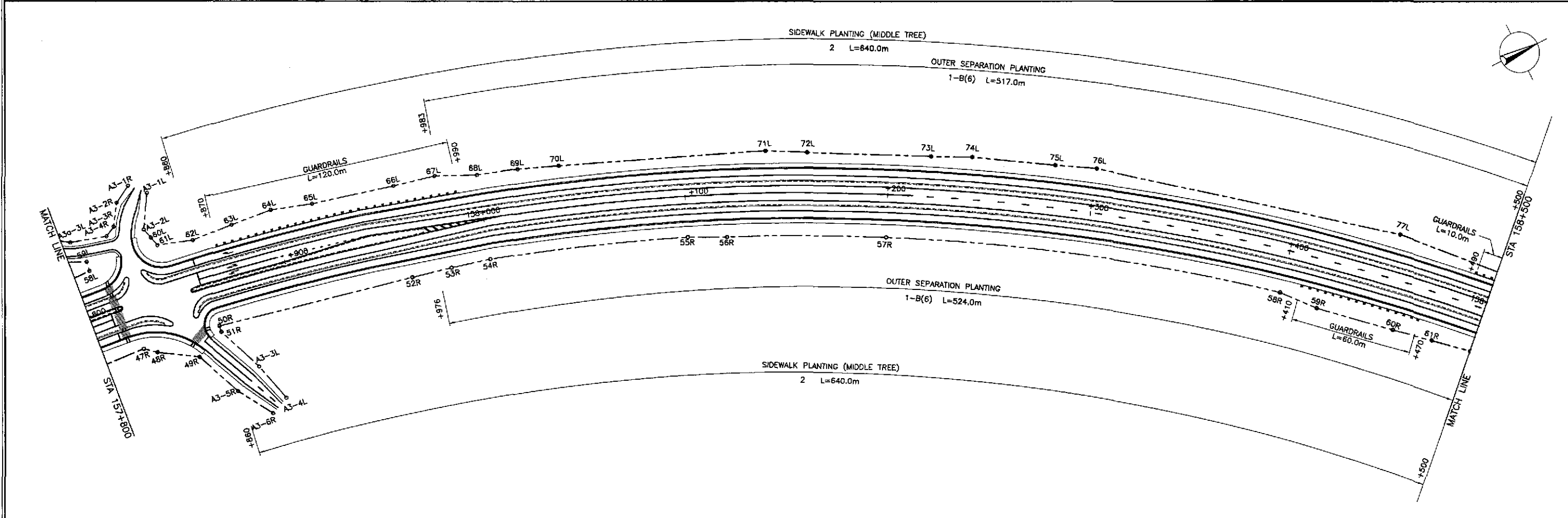
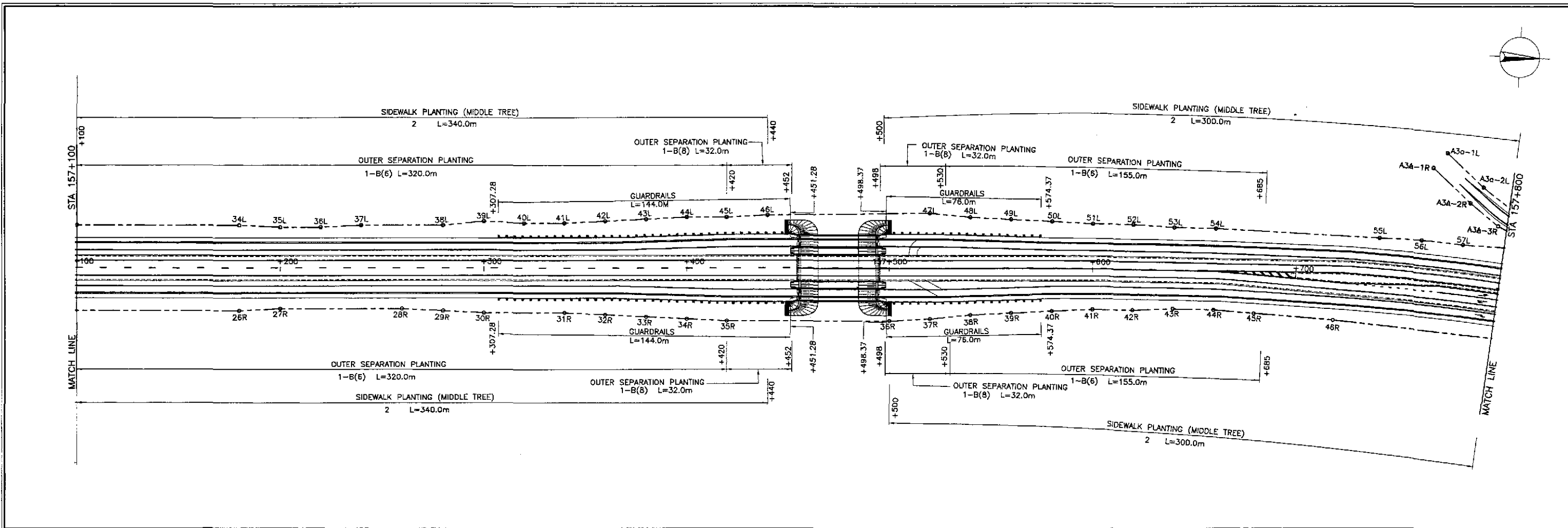
BEGINNING OF SAN JOSE BYPASS
 STA. 155+828.866
 ELEV. = 93.880
 N = 1,744,751.123
 E = 496,158.175

NOTES:

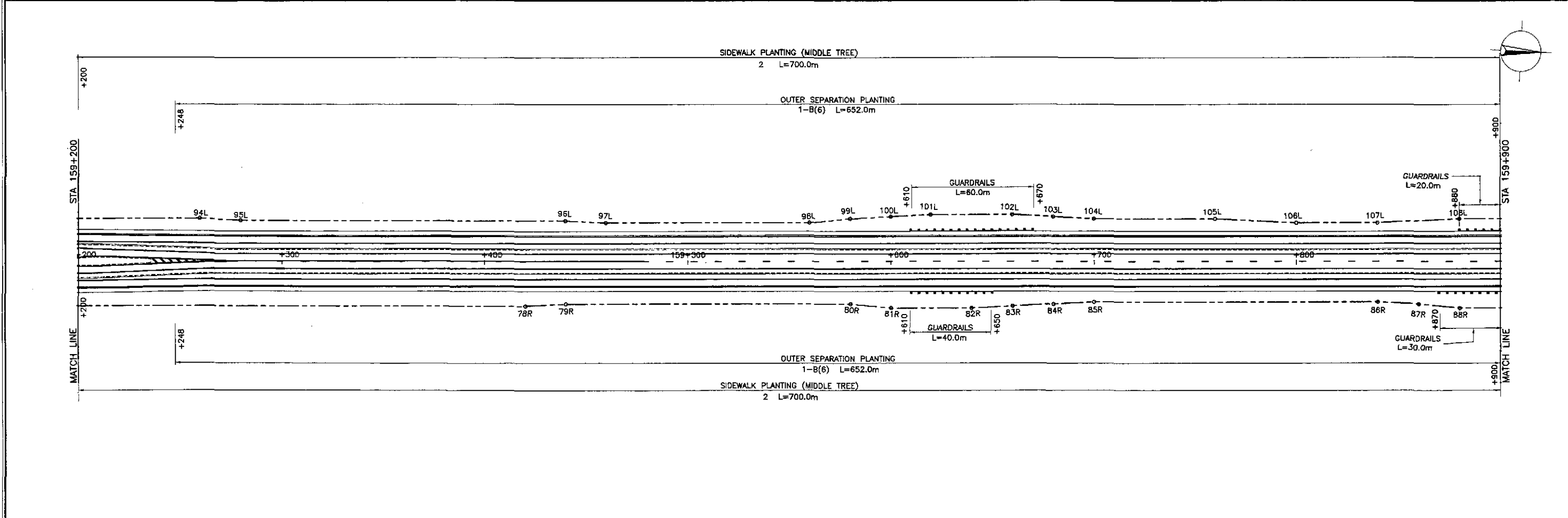
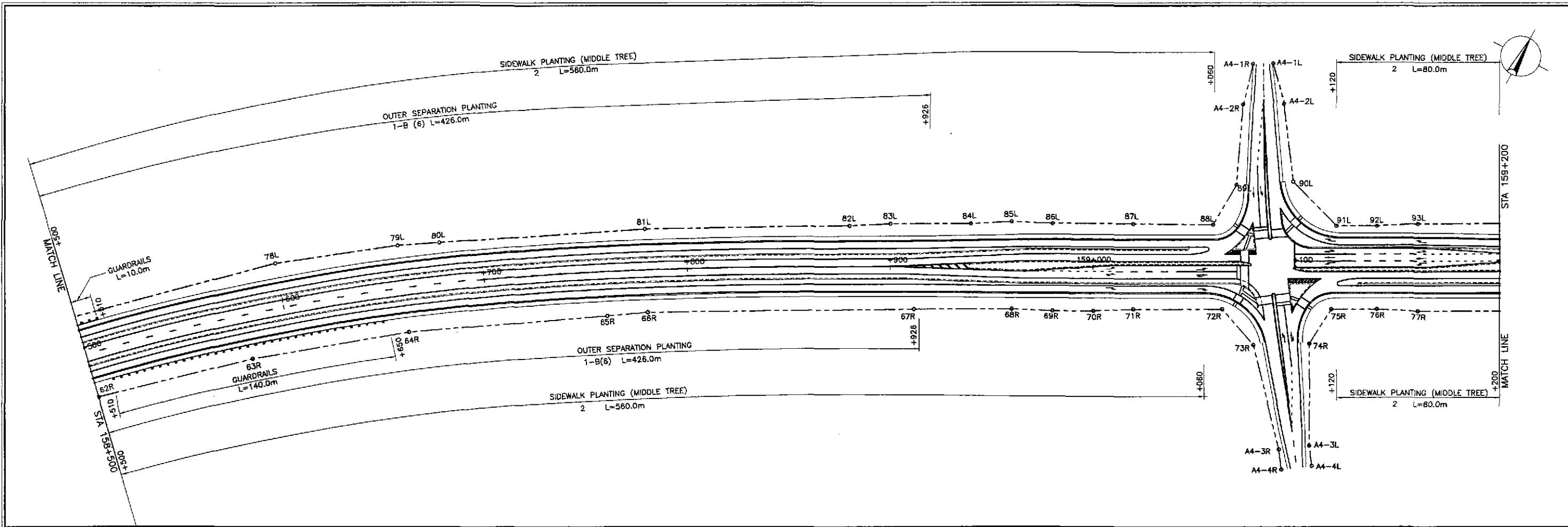
1. FOR TYPICAL PLANTING LAYOUT, SEE SHEET NO. RS-19.
2. FOR TYPES OF PLANTING FORMS AND OTHER DETAILS SEE SHEET NO. RS-20.
3. 1-B (6)
 ——— INDICATE TYPE OF PLANTING FORM (SHOWN IN PARENTHESIS).
 () INDICATE LOCATION OF PLANTING (NOT SHOWN WITH PARENTHESIS ()).



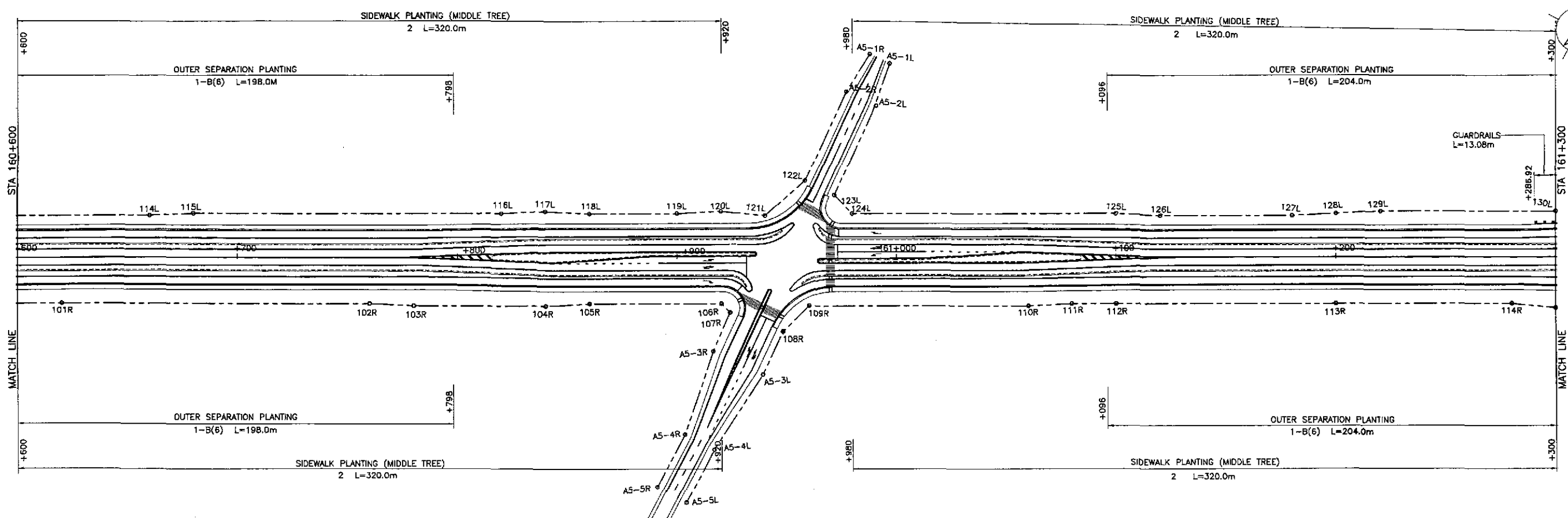
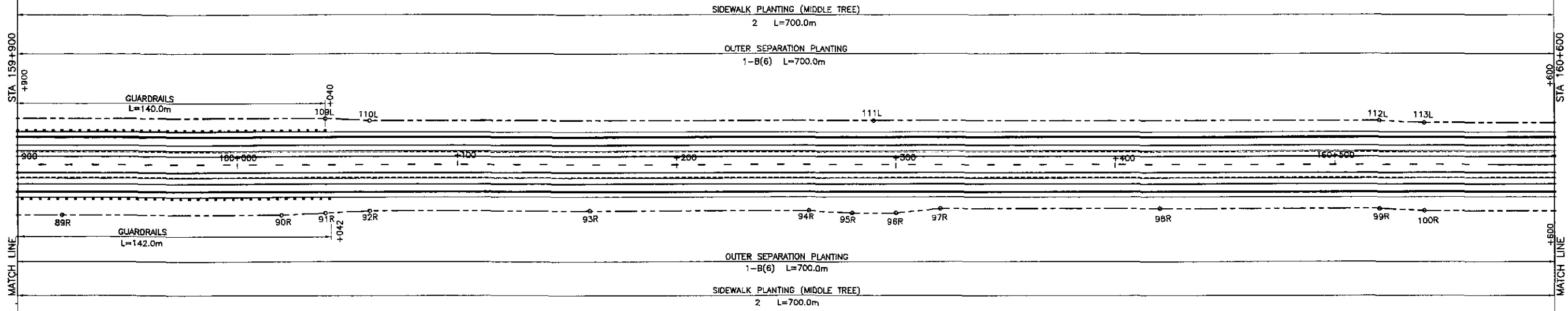
	DATE: 9/4/02 DESIGNED: S. LUNA CHECKED: S. LUNA SUBMITTED: 9/10/02	SIGNATURE: <i>S. Luna</i> S. LUNA TEAM LEADER	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PUHL - PMO Submitted By: DANILLO C. TRAJANO Project Director	BUREAU OF DESIGN Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	OFFICE OF THE SECRETARY Recommended By: GILBERTO S. REYES OIC, Director IV	Approved By: MANUEL M. BONDAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary	PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Piradel, Cabanatuan and San Jose Bypasses) SAN JOSE BYPASS	SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : SAN JOSE BYPASS PLANTINGS & GUARDRAILS LAYOUT (ULTIMATE STAGE) STA. 155+828.866 - STA. 157+100	SHEET NO. : RM-07
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	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) SAN JOSE BYPASS	SCALE :	SHEET CONTENTS : SAN JOSE BYPASS PLANTINGS & GUARDRAILS LAYOUT (ULTIMATE STAGE) STA. 157+100 - STA. 158+500	SHEET NO. :
	CHECKED	9/9/02	<i>[Signature]</i>	BUREAU OF DESIGN OFFICE OF THE SECRETARY				1:1000		RM-08
	SUBMITTED	9/11/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:		Approved By:		
			DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary		SIMEDN A. DATUMANONG Secretary		



	DESIGNED	9/7/02	S. LUNA		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN			PROJECT AND LOCATION : SAN JOSE BYPASS THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : SAN JOSE BYPASS PLANTINGS & GUARDRAILS LAYOUT (ULTIMATE STAGE) STA. 158+500 - STA. 159+900	SHEET NO. : RM-09		
	CHECKED	9/9/02	ROSE		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: (See cover sheet for Signature/Approval) MANUEL M. BONDAN Undersecretary	Approved By: (See cover sheet for Signature/Approval) SIMEON A. DATUMANONG Secretary
	SUBMITTED	9/11/02	MANUEL M. BONDAN		TEAM LEADER								



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

	DATE	SIGNATURE
DESIGNED	9/7/02	S. LUNA
CHECKED	9/9/02	S. JOSE
SUBMITTED	9/11/02	M. R. RIVERA

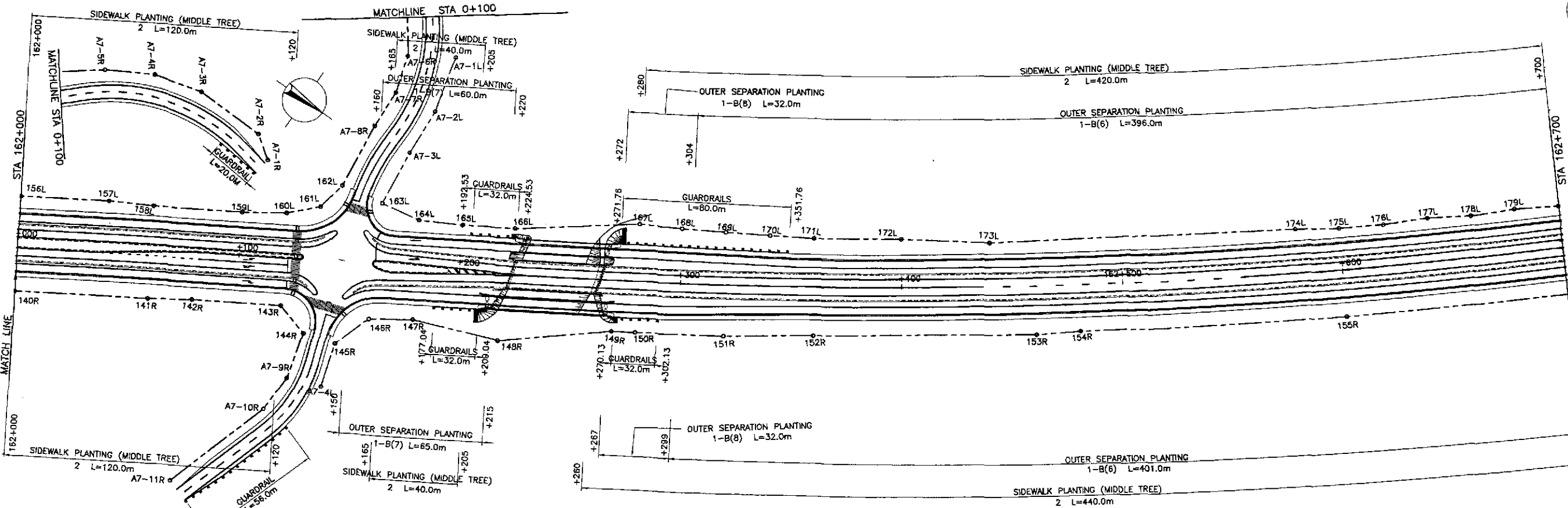
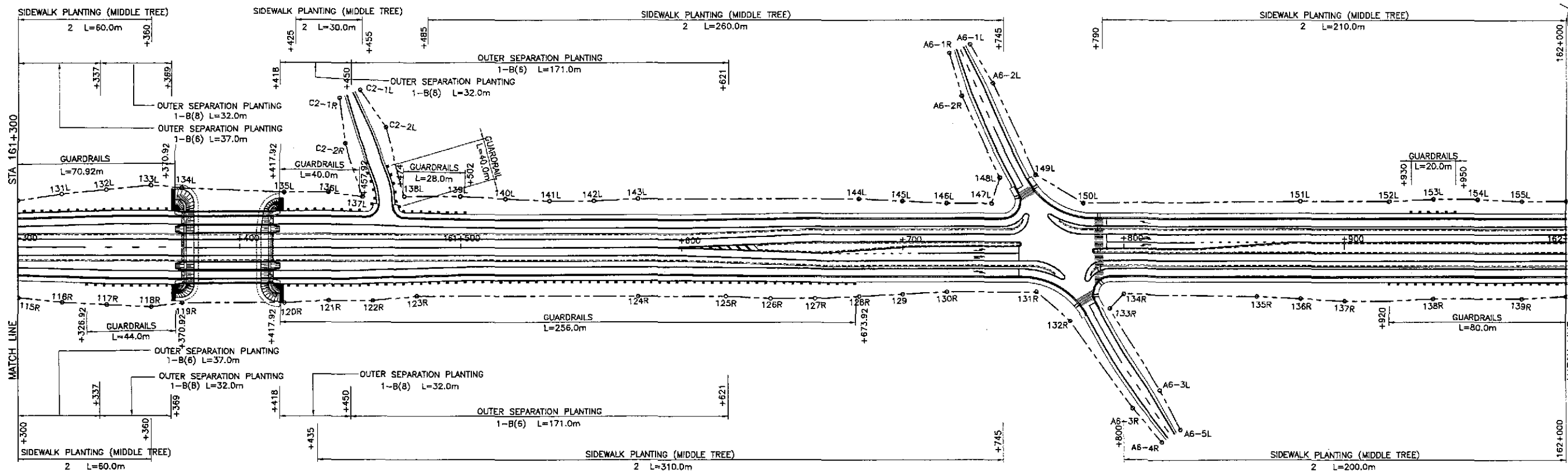
BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
Submitted By:	Reviewed By:	Recommended By:	Approved By:
DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONCAN Undersecretary

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

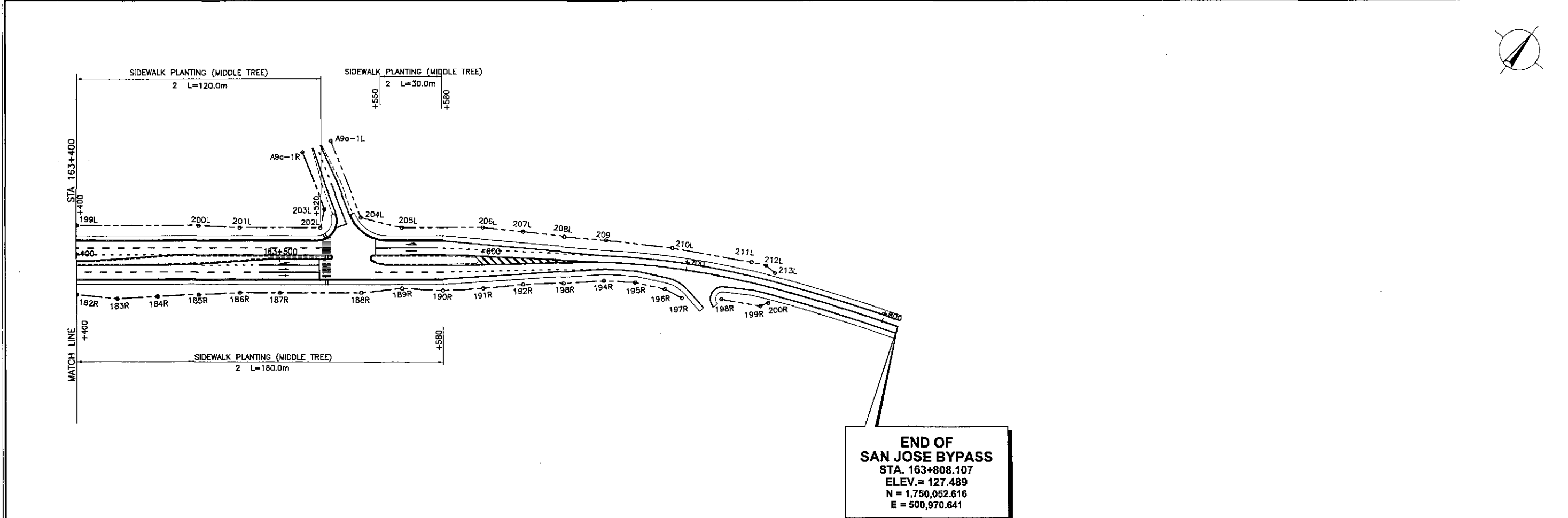
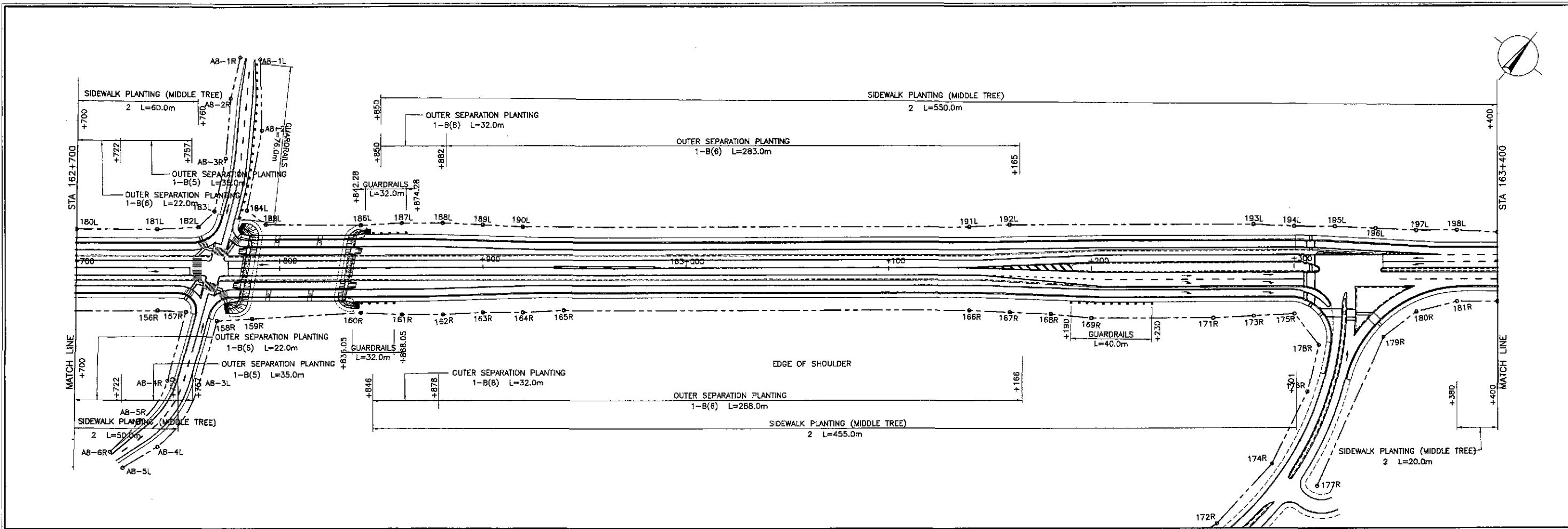
SCALE :
 1:1000
 FULL SIZE A1

SHEET CONTENTS :
**SAN JOSE BYPASS
 PLANTINGS & GUARDRAILS LAYOUT
 (ULTIMATE STAGE)**
 STA. 159+900 - STA. 161+300

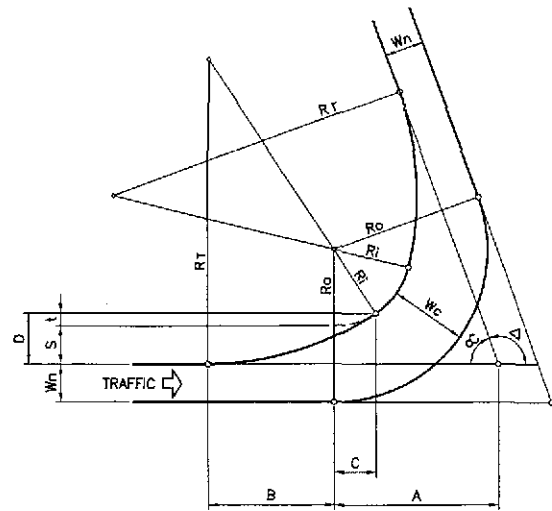
SHEET NO. :
RM-10



	DESIGNED	DATE	SIGNATURE		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 :	SHEET CONTENTS : SAN JOSE BYPASS PLANTINGS & GUARDRAILS LAYOUT (ULTIMATE STAGE) STA. 161+300 - STA. 162+700	SHEET NO. : RM-11
	CHECKED	9/9/02	S. LUNA		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN OFFICE OF THE SECRETARY					1:1000		
	SUBMITTED	9/11/02	M. KILAN		P.J.H. - P.M.O. Submitter: 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: SIMEON A. DATUMANONG Secretary	FULL SIZE A1		



	DATE	SIGNATURE					PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/8/02	S. LOPEZ	REPUBLIC OF THE PHILIPPINES 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) SAN JOSE BYPASS	1:1000 FULL SIZE A1	SAN JOSE BYPASS PLANTINGS & GUARDRAILS LAYOUT (ULTIMATE STAGE) STA. 162+700 - STA. 163+808.107	RM-12
	CHECKED	9/9/02	S. LOPEZ	BUREAU OF DESIGN OFFICE OF THE SECRETARY							
SUBMITTED	9/11/02	M. BONDAN	Submitted By:	Reviewed By:	Recommended By:	Approved By:					
		TEAM LEADER	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				



NOTES:

- RELATIVE PATHS OF LEFT TURNING VEHICLES ARE IMAGINARY ONLY; OVERALL, THESE WILL DETERMINE THE CONFIGURATION OF CHANNELIZATION ISLANDS IN INTERSECTION DESIGN.
- Ro AS DEFINED BY CONDITION OBTAINING AND Wc IN CONFORMANCE WITH DESIGN VEHICLES AND Ro.

(ADOPTED FROM JAPANESE STANDARDS USE IN OTHER PROJECTS.)

WHERE:

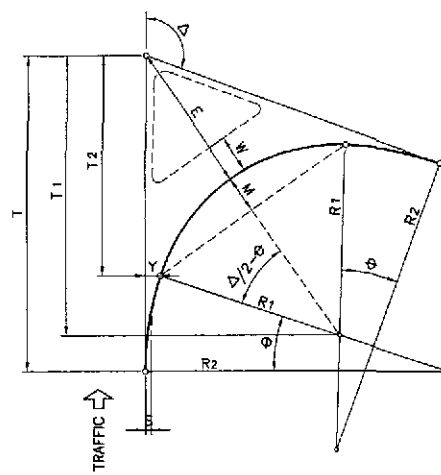
Wn = LANE WIDTH (NORMAL)
 Wc = LANE WIDTH (TURNING)
 Δ = INTERSECTION ANGLE
 Ro = OUTER RADIUS
 Ri = INNER RADIUS
 RT = TRANSITION RADIUS
 α = 180° -

FORMULAS :

Ri = Ro - Wc
 RT = nRi (n=3)
 S = Wc - Wn
 t = S / (n-1)
 A = (Ri + S) cot α/2
 B = √[2(RT - Ri) S - S²]
 C = B / (n-1)
 D = S + t

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

RS-01



WHERE:

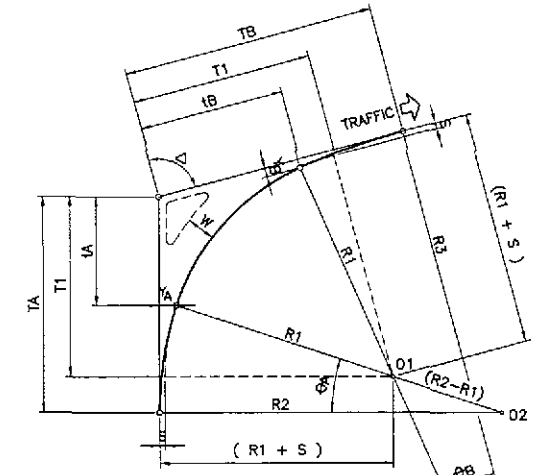
Δ = INTERSECTION ANGLE
 R1 = INNER RADIUS
 R2 = TRANSITION RADIUS
 S = OFFSET OF INNER CIRCULAR CURVE FROM TANGENTS

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) / (R2 - R1)]

5 RIGHT TURN/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:

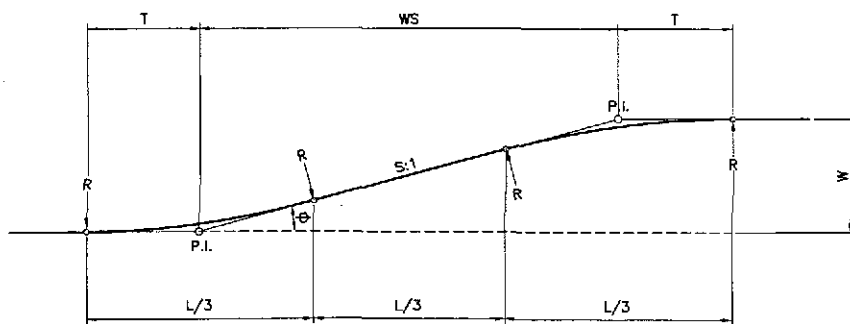
R1 = RADIUS OF INTERMEDIATE CIRCULAR ARC
 R2 = RADIUS OF CIRCULAR ARC ON APPROACH LEG (1.5 x R1)
 R3 = RADIUS OF CIRCULAR ARC ON DEPARTURE LEG (3 x R1)
 S = OFFSET OF INNER CIRCULAR CURVE FROM TANGENTS
 Δ = INTERSECTION ANGLE

FORMULAS :

θA = COS⁻¹ [(R2 - (R1 + S)) / (R2 - R1)]
 θB = COS⁻¹ [(R3 - (R1 + S)) / (R3 - R1)]
 T1 = (R1 + S) TAN Δ/2
 TA = T1 + (R2 - R1) SIN θA
 TB = T1 + (R3 - R1) SIN θB
 TA' = T1 - R1 SIN θA = TA - R2 SIN θA
 TB' = T1 - R1 SIN θB = TB - R3 SIN θB
 YA = (R1 + S) - R1 COS θA
 YB = (R1 + S) - R1 COS θB

6 RIGHT TURN/S ELEMENTS THREE CENTERED CURVE-ASYMMETRICAL

RS-01



FORMULAS :

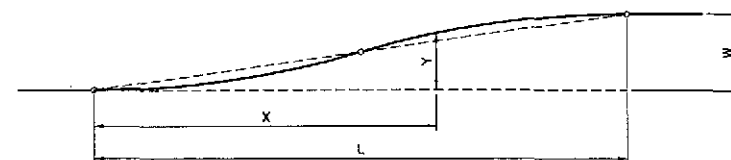
θ = TAN⁻¹ 1/S (TAPER RATE S:1)
 T = WS / (3 COS θ + 1)
 L/3 = T (COS θ + 1)
 R = T / TAN θ/2
 APPROX.
 T = L/6
 θ = TAN⁻¹ W/4T

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-L/3 TAN SECTION (CIRCULAR CURVE ROUNDING)

RS-01



FORMULAS :

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

WHERE:

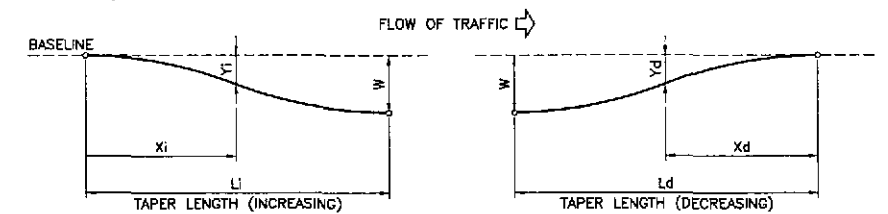
L = LENGTH OF FLARE
 W = WIDENING (MAX. OFFSET)
 S = TAPER RATE (HORIZONTAL)
 X = DISTANCE ALONG BASELINE
 Y = OFFSET FROM BASELINE

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	0.043	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



INCREASING

Xi/Li	K	Xi/Li	K
0.00	0.000	0.52	0.5103
0.02	0.0010	0.54	0.5470
0.04	0.0020	0.56	0.5836
0.06	0.0047	0.58	0.6194
0.08	0.0077	0.60	0.6548
0.10	0.0114	0.62	0.6888
0.12	0.0156	0.64	0.7217
0.14	0.0217	0.66	0.7522
0.16	0.0300	0.68	0.7789
0.18	0.0390	0.70	0.8050
0.20	0.0499	0.72	0.8286
0.22	0.0612	0.74	0.8521
0.24	0.0780	0.76	0.8741
0.26	0.0908	0.78	0.8947
0.28	0.1110	0.80	0.9128
0.30	0.1315	0.82	0.9293
0.32	0.1574	0.84	0.9440
0.34	0.1849	0.86	0.9580
0.36	0.2161	0.88	0.9691
0.38	0.2496	0.90	0.9775
0.40	0.2846	0.92	0.9849
0.42	0.3215	0.94	0.9903
0.44	0.3586	0.96	0.9952
0.46	0.3965	0.98	0.9982
0.48	0.4344	1.00	1.0000
0.50	1.4724		

WHERE:

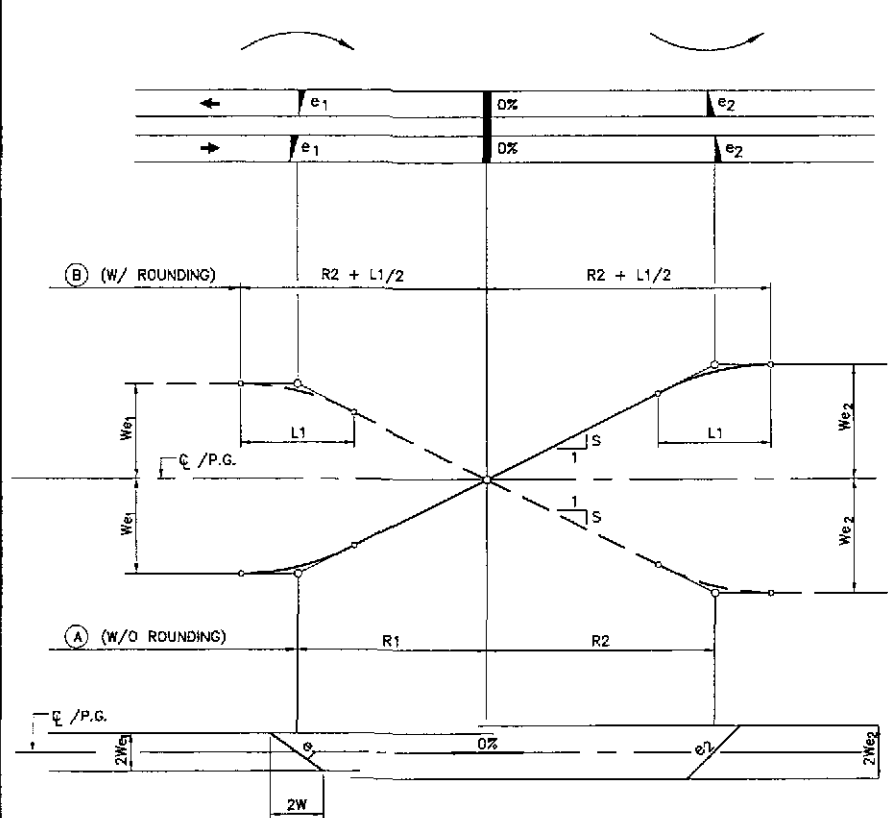
W = FULL WIDENING
 L = LENGTH OF TAPERING/ TRANSITION
 Y = WIDENING/OFFSET FROM BASELINE @ X DISTANCE
 FOR X/L : Y = KW

DECREASING

Xd/Ld	K	Xd/Ld	K
0.00	1.0000	0.52	0.1967
0.02	0.9964	0.54	0.1784
0.04	0.9905	0.56	0.1613
0.06	0.9810	0.58	0.1453
0.08	0.9680	0.60	0.1304
0.10	0.9438	0.62	0.1162
0.12	0.9200	0.64	0.1034
0.14	0.8920	0.66	0.0916
0.16	0.8602	0.68	0.0807
0.18	0.8238	0.70	0.0708
0.20	0.7816	0.72	0.0622
0.22	0.7324	0.74	0.0543
0.24	0.6822	0.76	0.0473
0.26	0.6340	0.78	0.0407
0.28	0.5848	0.80	0.0348
0.30	0.5365	0.82	0.0288
0.32	0.4912	0.84	0.0236
0.34	0.4478	0.86	0.0190
0.36	0.4092	0.88	0.0150
0.38	0.3748	0.90	0.0116
0.40	0.3443	0.92	0.0082
0.42	0.3144	0.94	0.0052
0.44	0.2868	0.96	0.0026
0.46	0.2610	0.98	0.0012
0.48	0.2373	1.00	0.0000
0.50	0.2163		

3 ROADWAY TAPERING REVERSED PARABOLIC CURVE ASYMMETRICAL (BY OFFSET)

RS-01

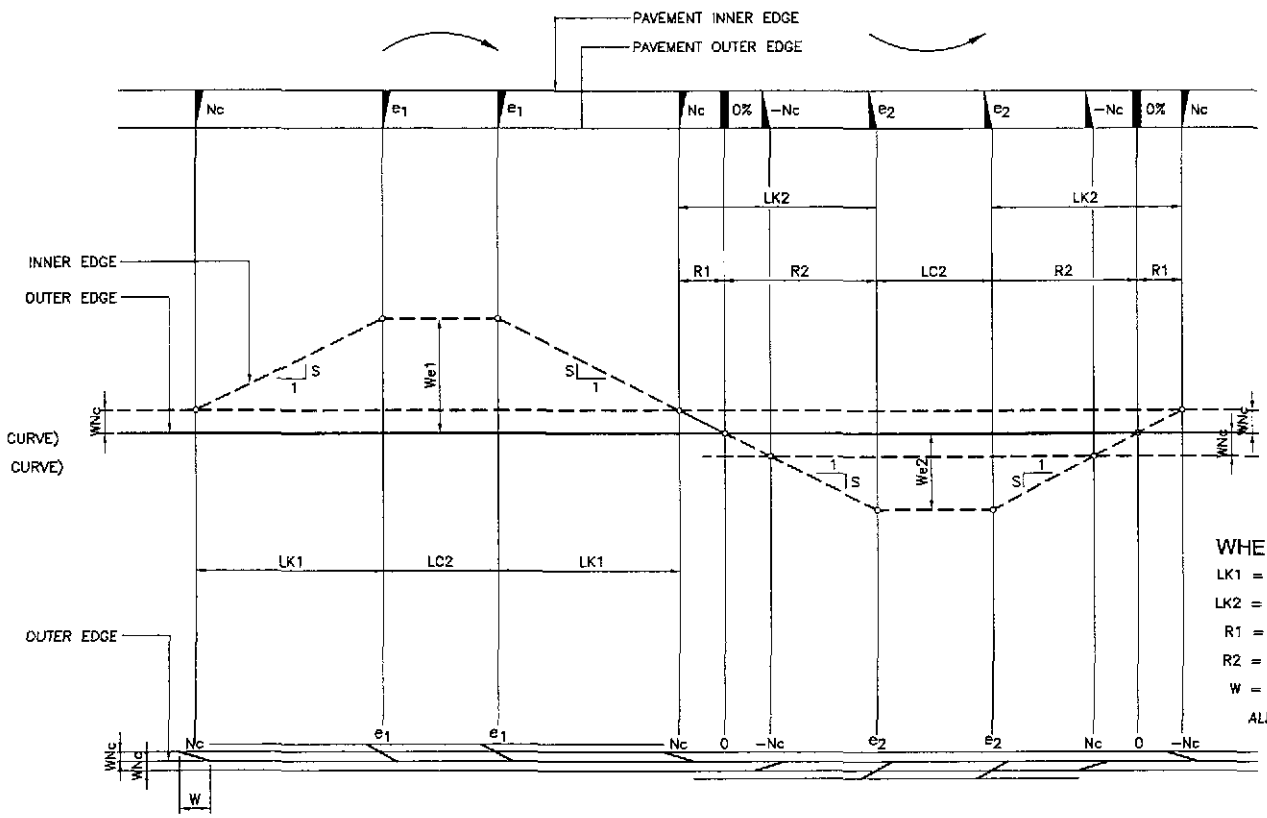


$$R1 = \frac{We_1}{S}$$

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

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

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



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

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

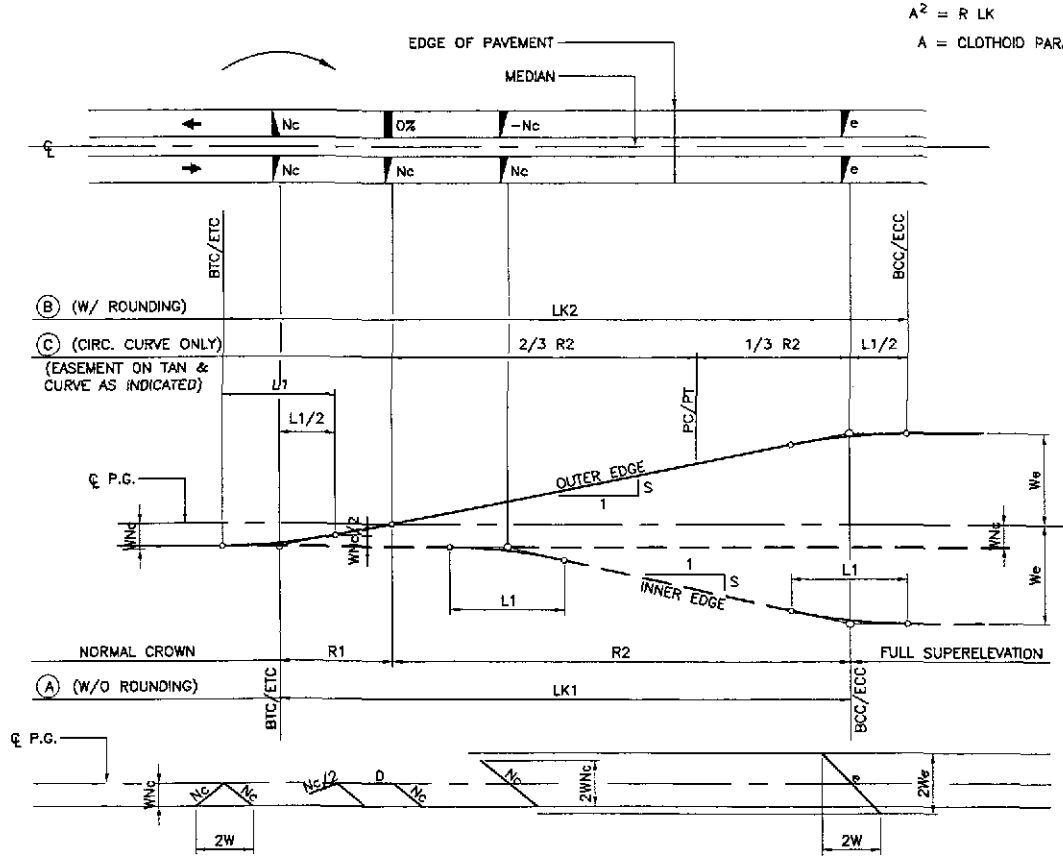
$$R2 = \frac{We_2}{S}$$

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

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)
 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/ S

* 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

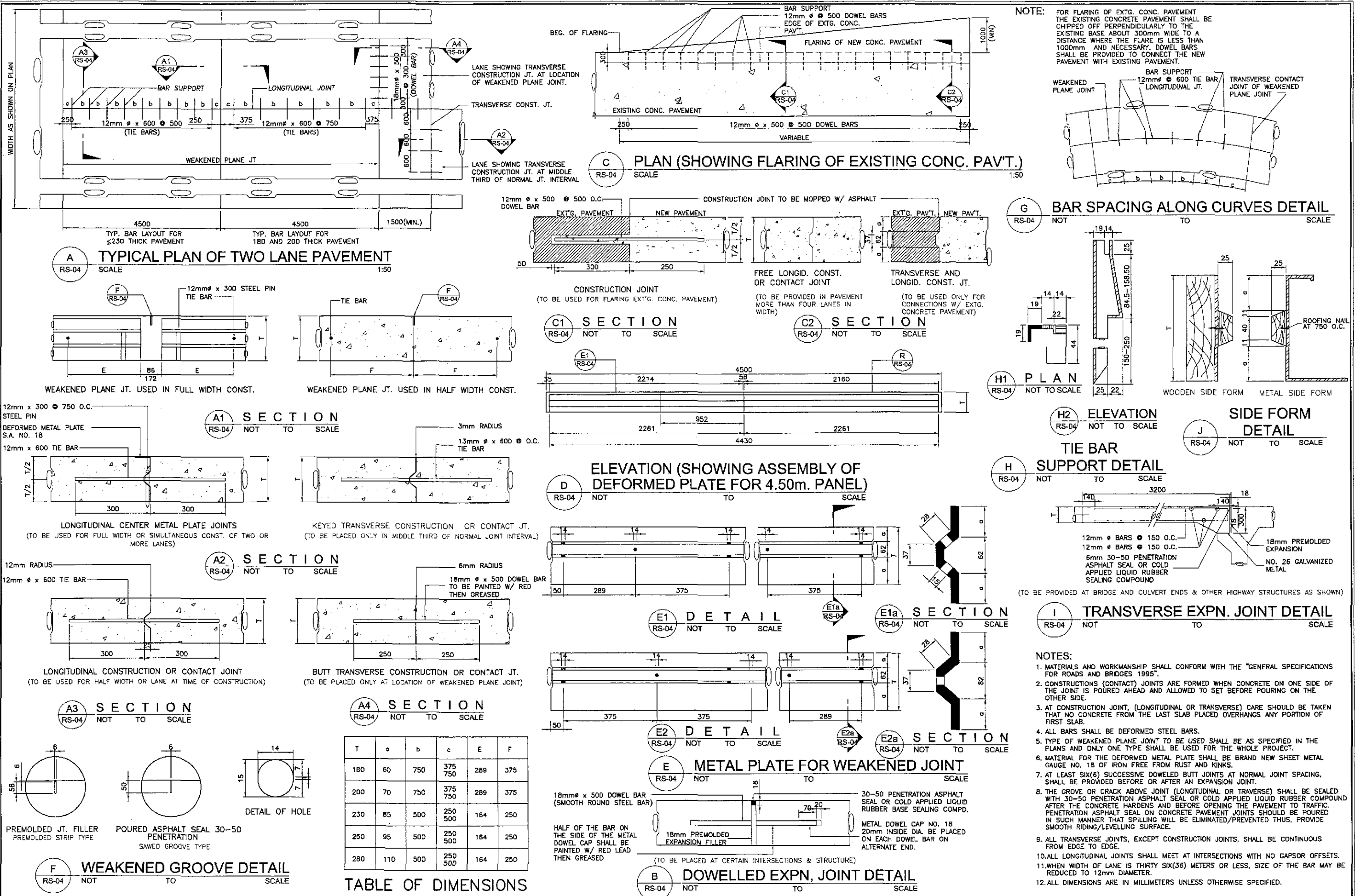
SUPERELEVATION "e" RATES

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	882.21	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	0.046
-20	491.11	0.046	-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 NARROWER 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.

NC = NORMAL CROWN SLOPE (0.020)
 (WHERE THEORETICAL e ≤ NC/2)
 RC = REMOVE ADVERSE CROWN & SUPERELEVATE AT NC
 (WHERE THEORETICAL e > NC/2)

1 SUPERELEVATION TRANSITION (MAIN ROAD)
 RS-03

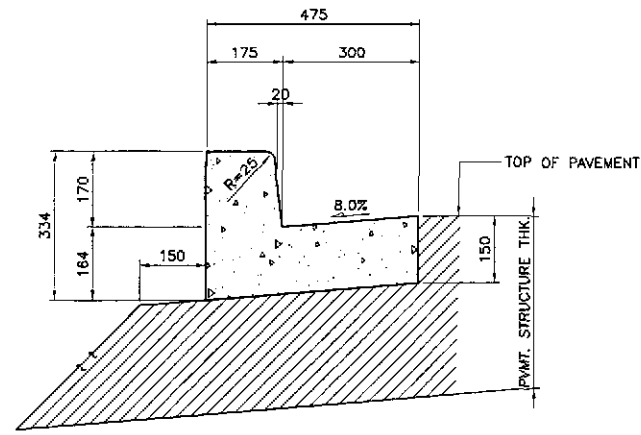


T	a	b	c	E	F
180	60	750	375 750	289	375
200	70	750	375 750	289	375
230	85	500	250 500	164	250
250	95	500	250 500	164	250
280	110	500	250 500	164	250

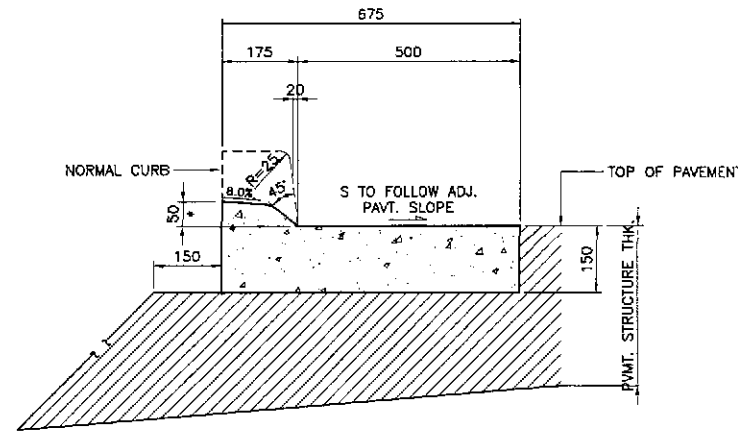
TABLE OF DIMENSIONS

- 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 TRVERSE) 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.

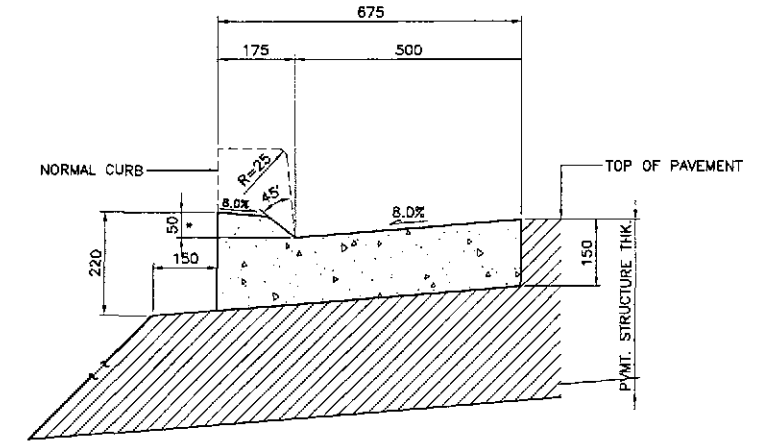
<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p> <p>KATAHIRA & ENGINEERS INTERNATIONAL</p> <p>yeo YACHIYO ENGINEERING CO., LTD.</p>		<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p> <p>PJHL - PMO BUREAU OF DESIGN</p> <p>Office of the Secretary</p> <p>Submitted By: DANILLO C. TRAJANO Project Director</p> <p>Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division</p> <p>Recommended By: GILBERTO S. REYES O/C, Director IV</p> <p>Recommended By: MANUEL M. BONDAN Undersecretary</p> <p>Approved By: SIMON A. DATUMANONG Secretary</p>				<p>PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)</p> <p>SAN JOSE BYPASS</p>		<p>SCALE : NOT TO SCALE FULL SIZE A1</p>	<p>SHEET CONTENTS : STANDARD PORTLAND CEMENT CONCRETE PAVEMENT</p>	<p>SHEET NO. : RS-04</p>
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1c TYPE "C"
RS-05

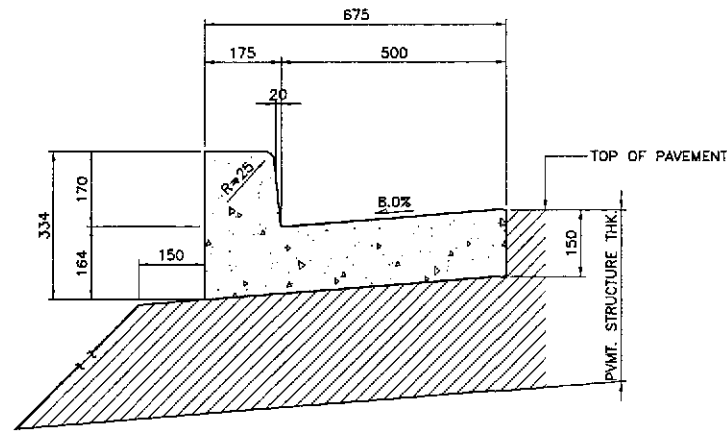


2c TYPE "B"
RS-05

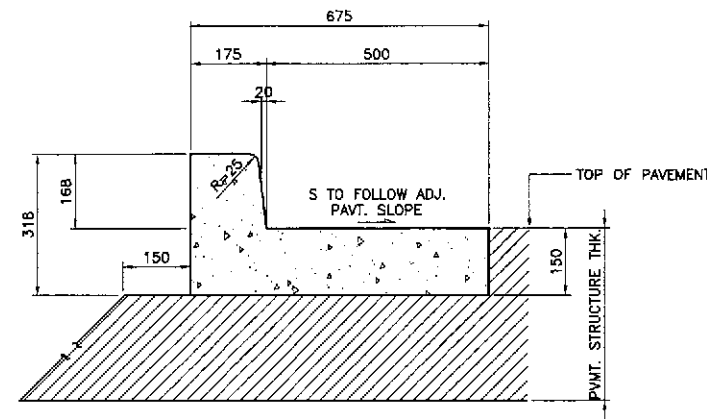


30 FOR RAMPS FOR PHYSICALLY HANDICAPPED

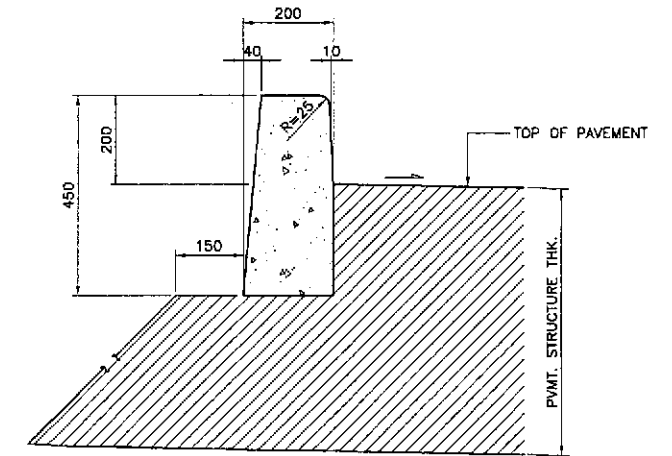
3 CONCRETE DROP CURB AND GUTTER (MODIFIED)
RS-05 NOT TO SCALE



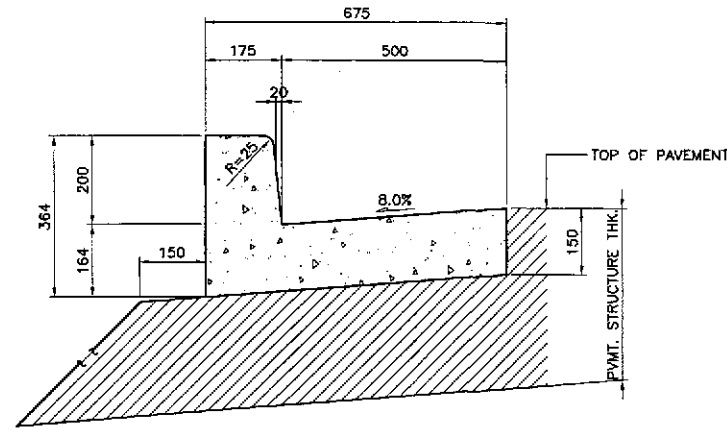
1b TYPE "B"
RS-05



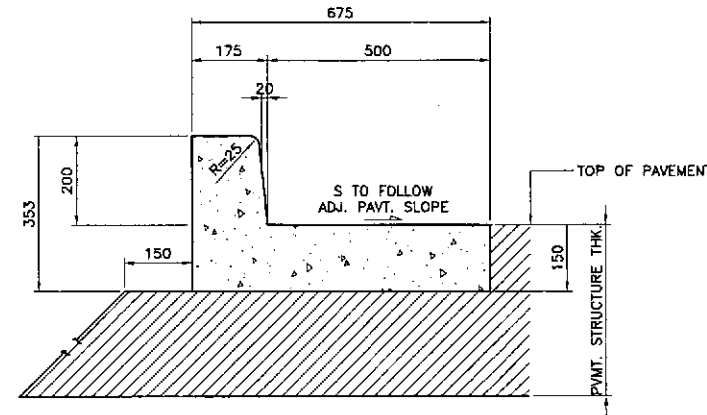
2b TYPE "B"
RS-05



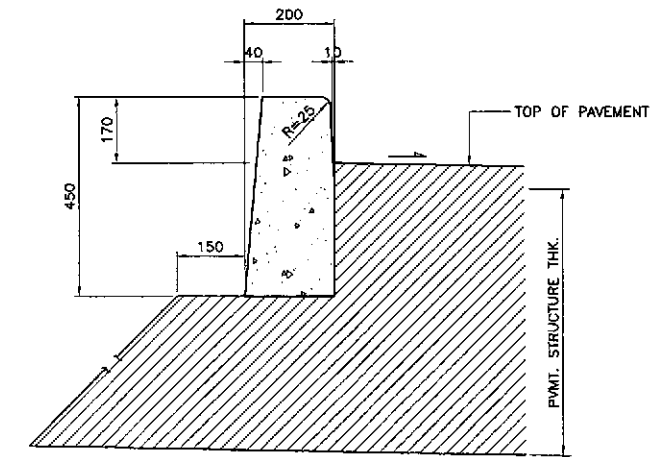
4a TYPE "A"
RS-05



1a TYPE "A"
RS-05



2a TYPE "A"
RS-05



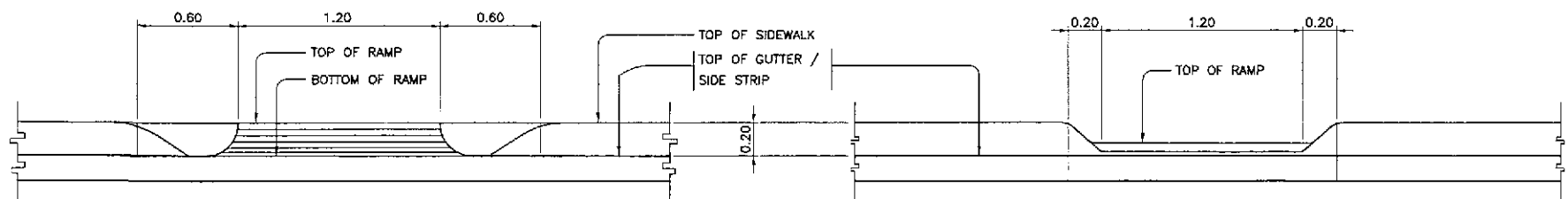
4b TYPE "B"
RS-05

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

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

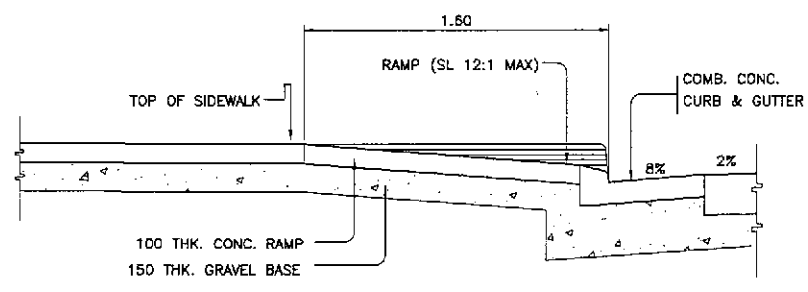
4 CONCRETE CURB
RS-05 NOT TO SCALE

	DATE	SIGNATURE					PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/2/01	ACACIO	REPUBLIC OF THE PHILIPPINES 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) SAN JOSE BYPASS	NOT TO SCALE FULL SIZE A1	CONCRETE CURB AND GUTTER DETAILS	RS-05
	CHECKED	9/4/01	S. GARCIA	BUREAU OF DESIGN OFFICE OF THE SECRETARY							
	SUBMITTED	9/16/01	M. M. BONDAN	Submitted By:	Reviewed By:	Recommended By:	Approved By:				
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary				

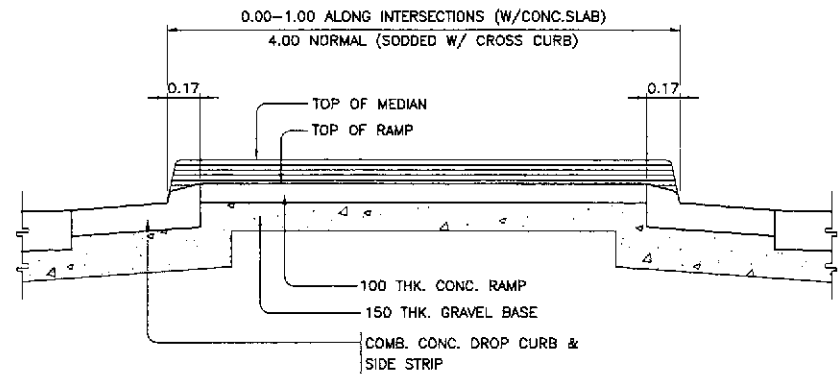


A2 ELEVATION
RS-06 SCALE 1:20

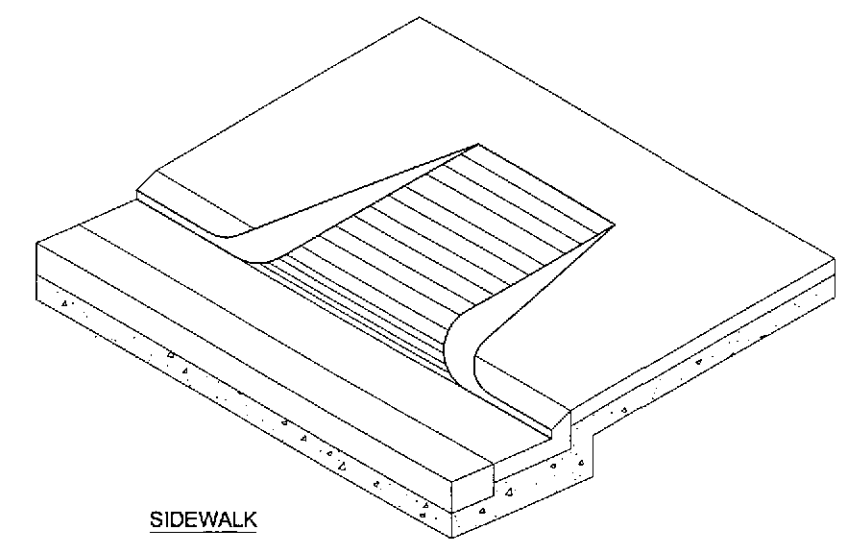
B2 ELEVATION
RS-06 SCALE 1:20



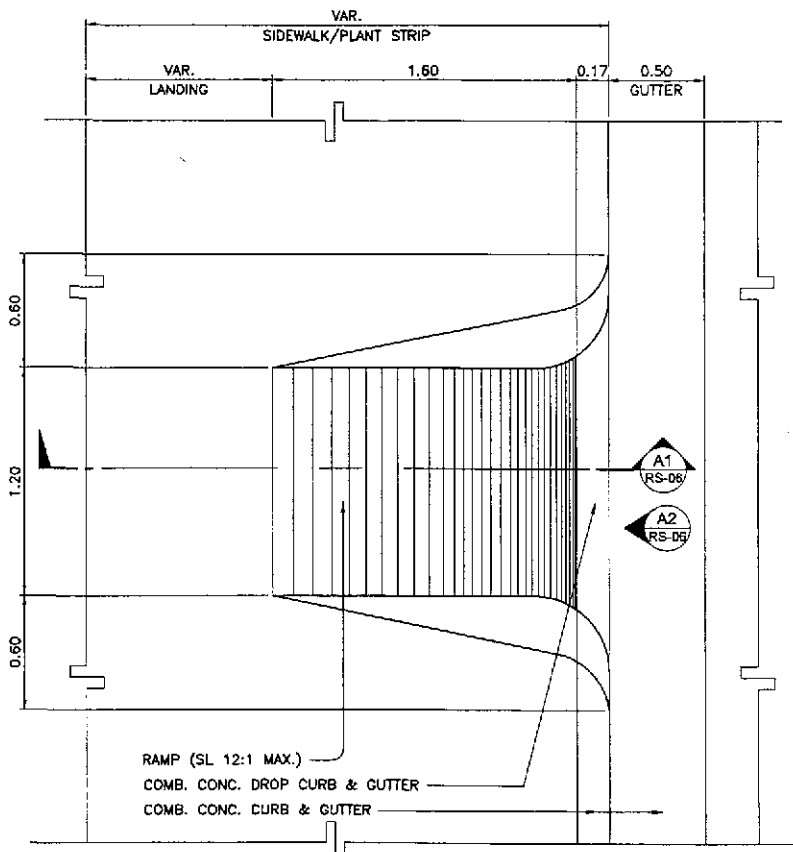
A1 SECTION
RS-06 SCALE 1:20



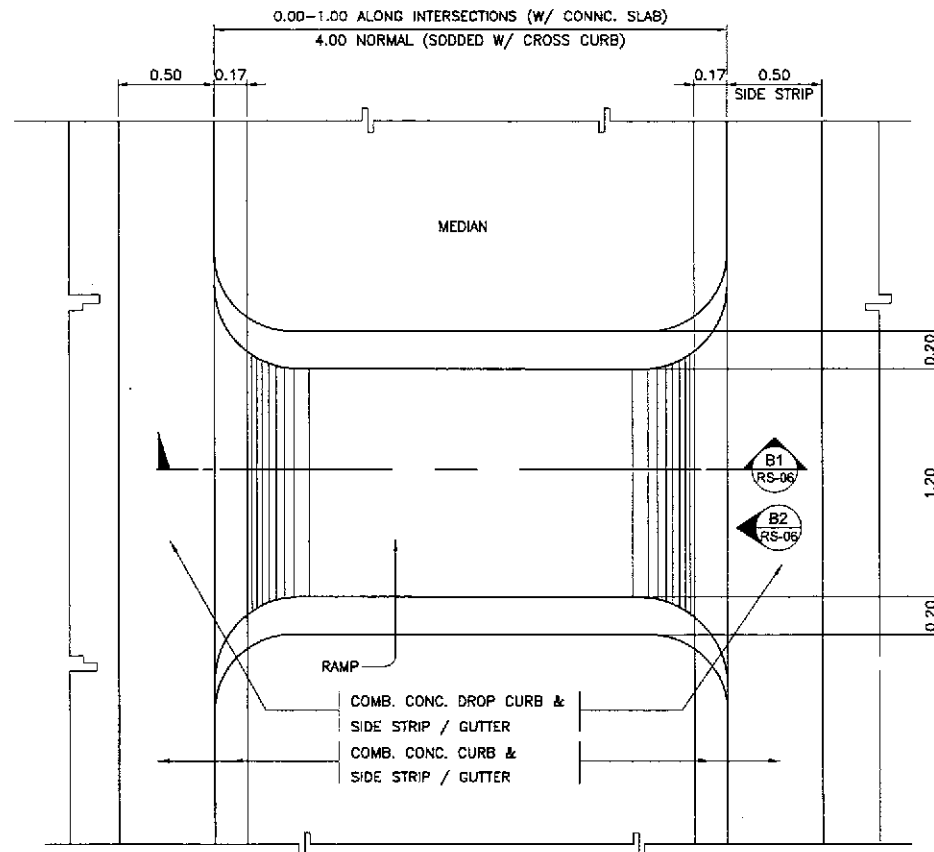
B1 SECTION
RS-06 SCALE 1:20



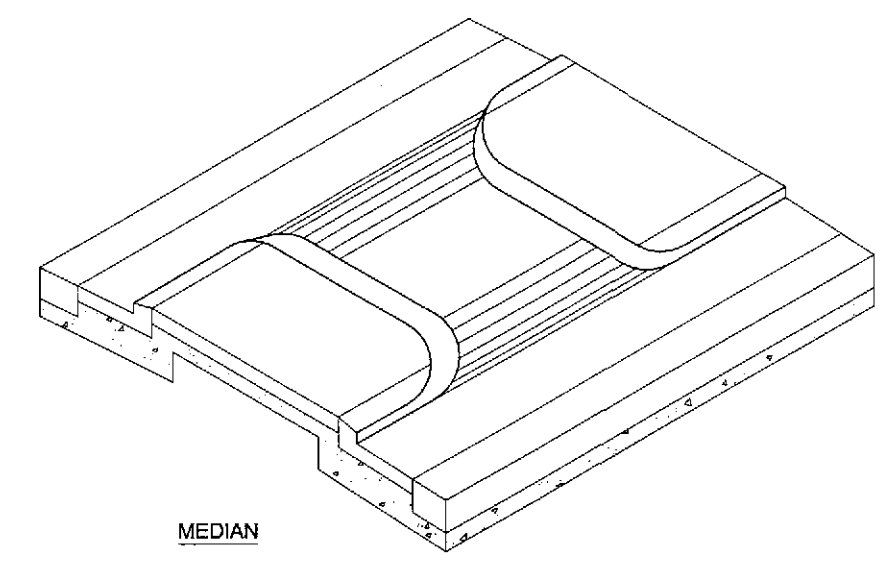
SIDEWALK



A PLAN
RS-06 SCALE 1:20



B PLAN
RS-06 SCALE 1:20

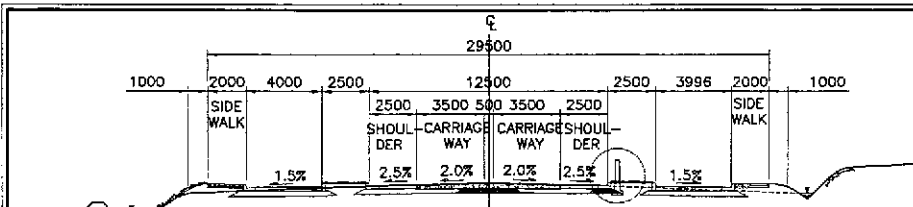


MEDIAN

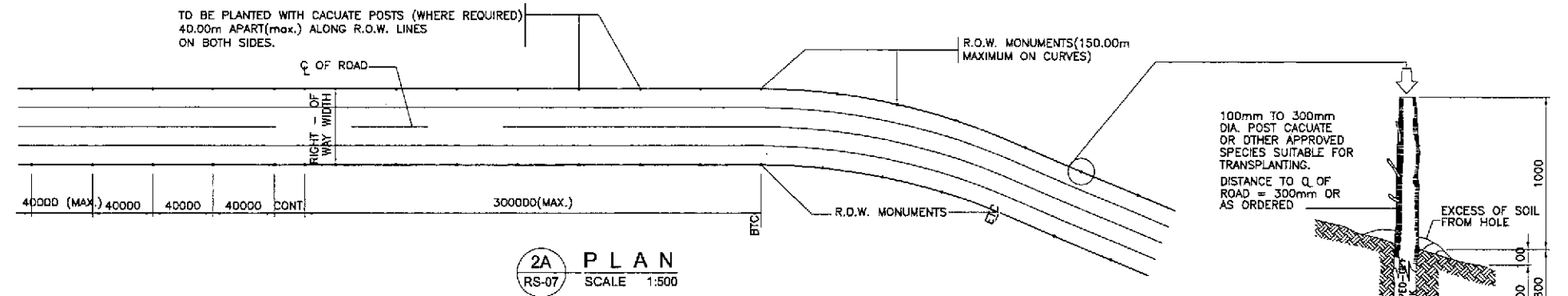
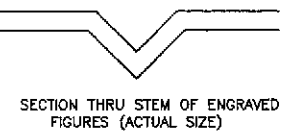
C ISOMETRIC VIEW
RS-06 NOT TO SCALE

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

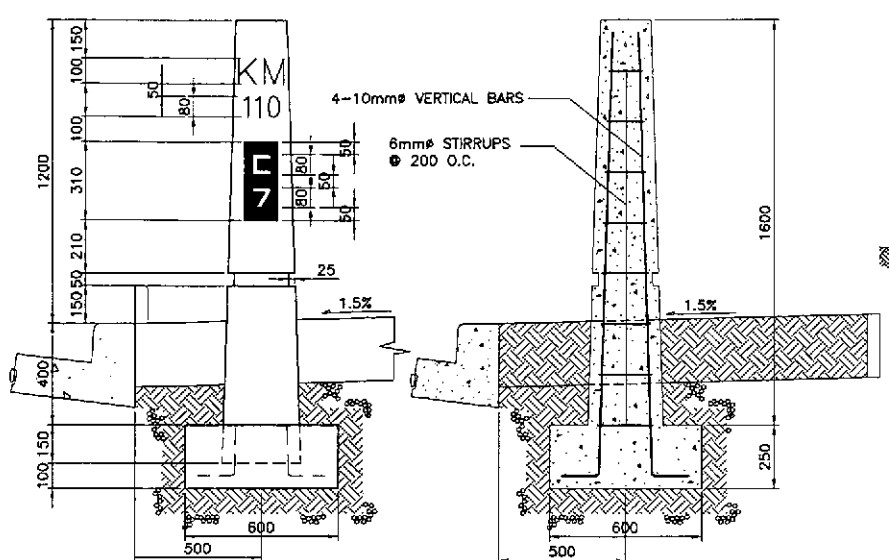
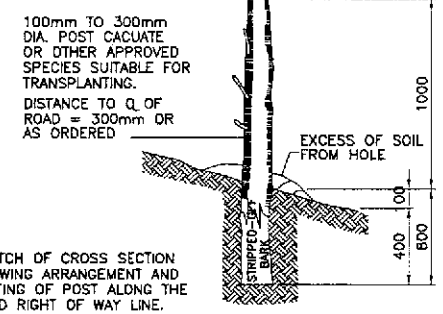
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) SAN JOSE BYPASS	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/3/02	<i>[Signature]</i>		BUREAU OF DESIGN					AS SHOWN	CURB-CUT RAMP DETAILS (FOR THE PHYSICALLY HANDICAPPED)	RS-06
	SUBMITTED	9/11/02	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:	Approved By:		FULL SIZE A1		
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMON A. DATUMANONG Secretary					



1A LOCATION OF KILOMETER POST
RS-07 SCALE 1:200

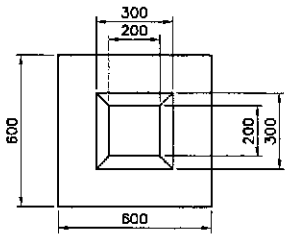


2A PLAN
RS-07 SCALE 1:500

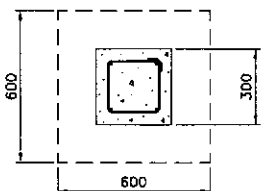


1B ELEVATION
RS-07 SCALE 1:15

1D SECTION
RS-07 SCALE 1:15



1C PLAN
RS-07 SCALE 1:15



1E SECTION
RS-07 SCALE 1:15

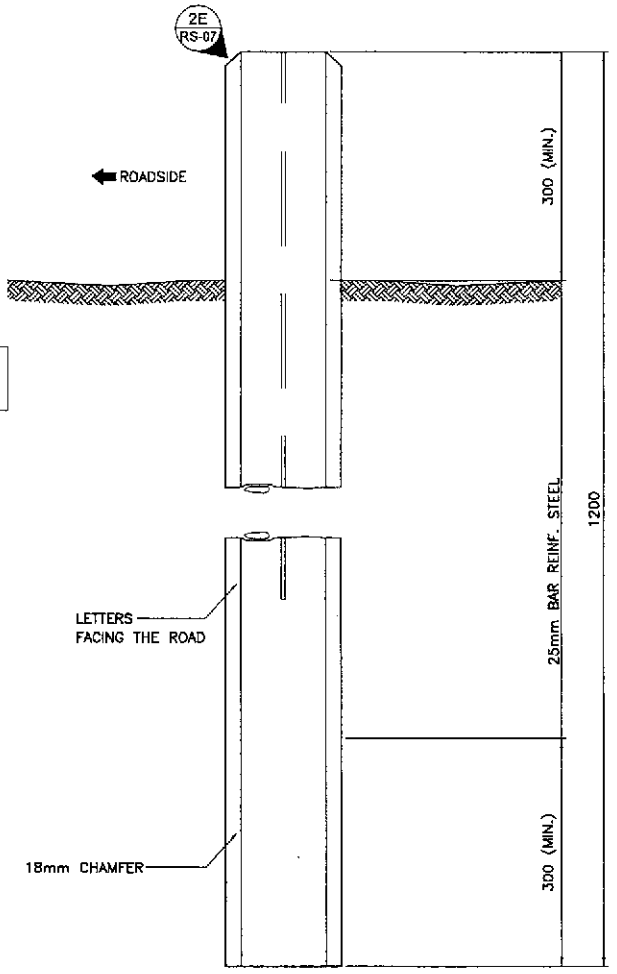
NOTES:

- CONCRETE MIXTURE TO BE USED SHOULD BE CLASS "A" MIX (1:2:4). 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.

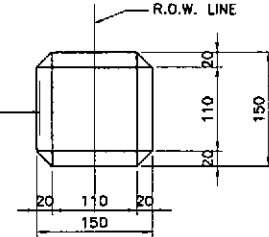
CONDITIONS:

- 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.

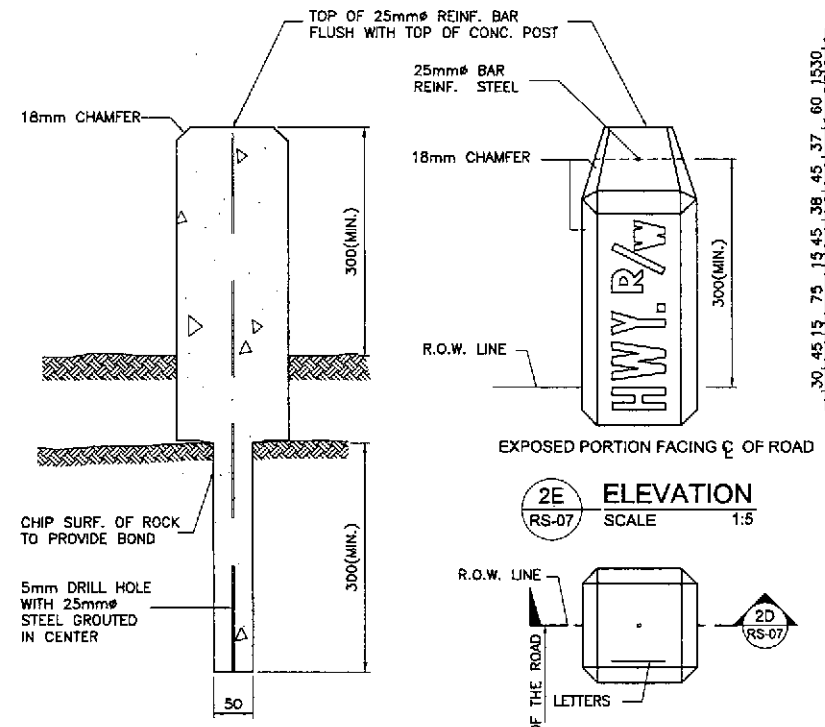
1 KILOMETER POST
RS-07 SCALE AS SHOWN



2B SIDE ELEVATION
RS-07 SCALE 1:5

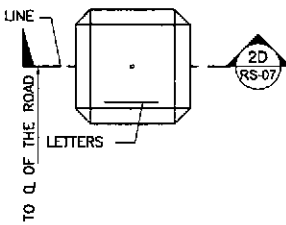


2C PLAN
RS-07 SCALE 1:5

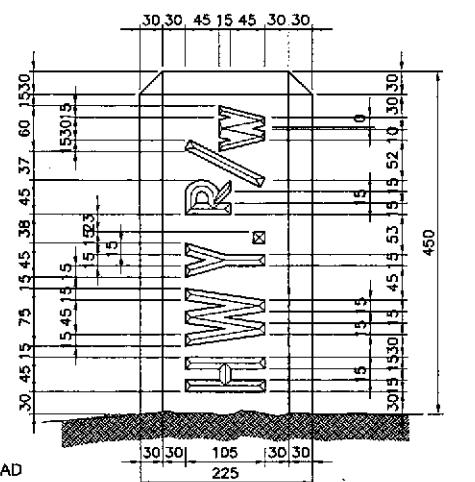


2D SECTION
RS-07 SCALE 1:5

2E ELEVATION
RS-07 SCALE 1:5



2F PLAN
RS-07 SCALE 1:5



2G DETAIL OF LETTERS
RS-07 SCALE 1:5

GENERAL NOTES

- CONCRETE MONUMENTS SHALL BE PLACED OPPOSITE ALL P.I., B.T.C., E.T.C., 150.00m (MAX.) INTERVAL ON FLAT CURVES AND 300.00m (MAX.) INTERVAL ON TANGENTIAL ALIGNMENTS ALONG THE RIGHT OF WAY LINE.
- RIGHT-OF-WAY MONUMENTS SHALL BE SET ALONG THE RIGHT OF WAY LINES WITH THE LETTERED FACE, FACING THE CENTERLINE OF THE ROAD.
- THE LETTERS SHALL BE 0.005m DEEP FROM FACE OF CONCRETE, INDENTED.
- PHIL. CACUATE OR APPROVED SPECIES SUITABLE TO MAKE ROOTS UPON PLANTING OF 0.10m TO 0.30m DIA. SHALL BE PLANTED OPPOSITE EACH OTHER ALONG THE RIGHT OF WAY LINES TO A MAXIMUM DISTANCE OF 40.00m FROM POST TO POST CONSIDERING ALSO THE CONCRETE MONUMENTS EXPENSES SHALL BE CHARGED ALSO AGAINST CONSTRUCTION ENGINEERING.

NOTE:

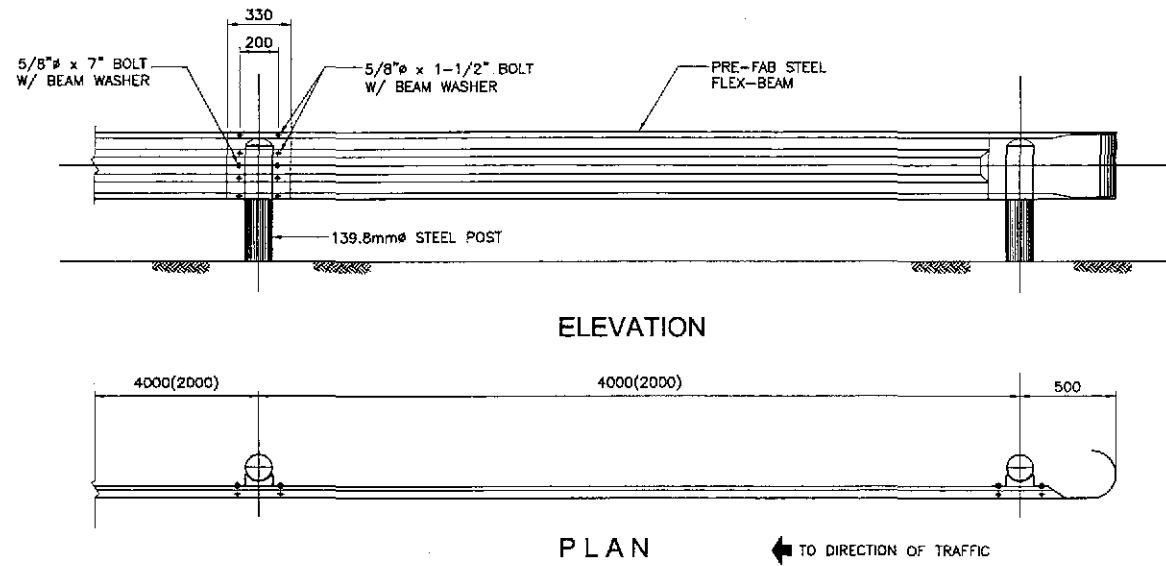
ALL CONCRETE TO BE CLASS "A".

CONSTRUCTION NOTES:

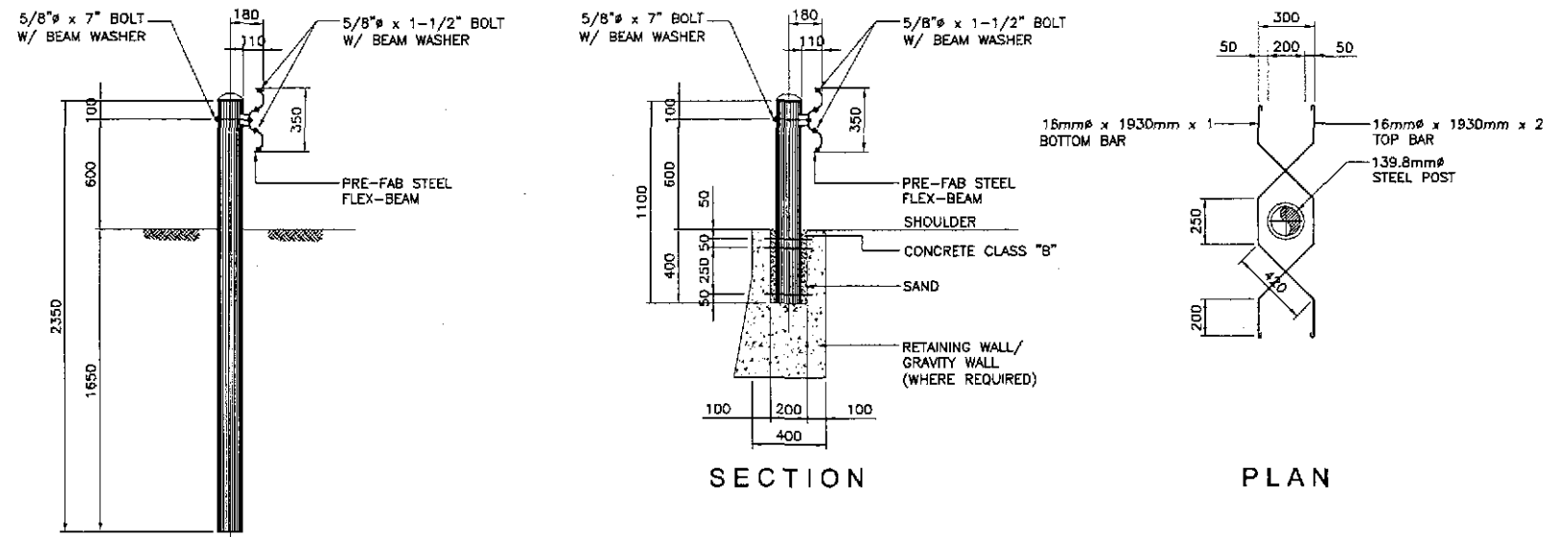
ACTUAL LOCATIONS OF RIGHT-OF-WAY MONUMENTS SHALL BE ADJUSTED AS DETERMINED BY THE ENGINEER.

2 RIGHT OF WAY MARKER
RS-07 SCALE AS SHOWN

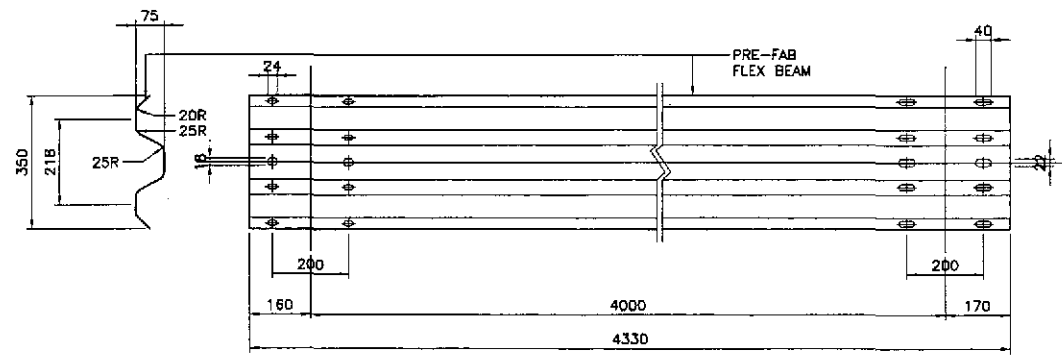
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :			
	CHECKED	7/9/02	S. GASE		BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Piardel, Cabanatuan and San Jose Bypasses)				AS SHOWN	STANDARD KILOMETER POST AND RIGHT OF WAY MARKERS	RS-07
	SUBMITTED	7/11/02	U. R. R. R.		Submitted By:	Reviewed By:	Recommended By:	Approved By:	SAN JOSE BYPASS				FULL SIZE A1		



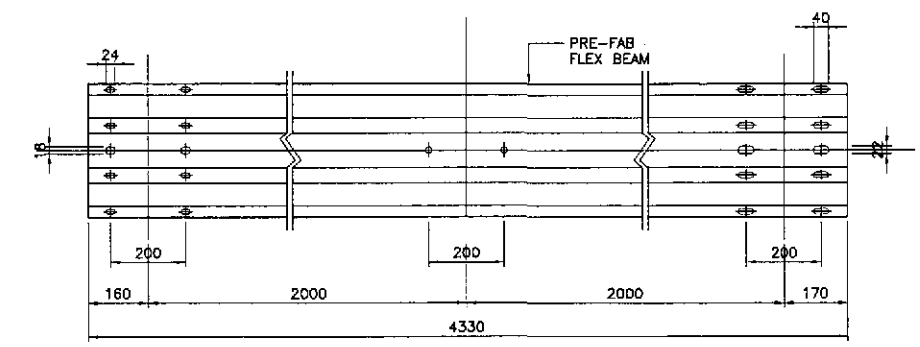
1 GUARDRAIL DETAIL
RS-08 SCALE 1:20



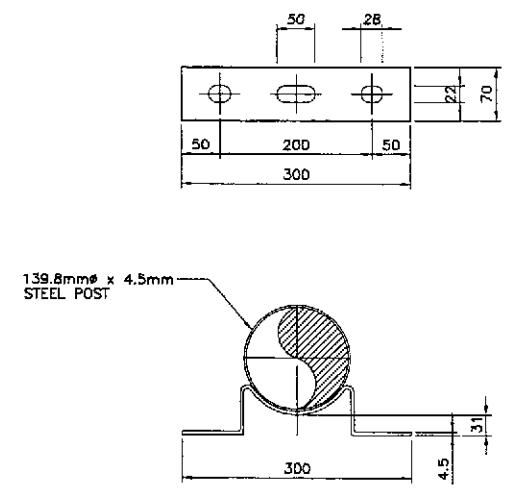
2 STEEL POST DETAIL
RS-08 SCALE 1:20



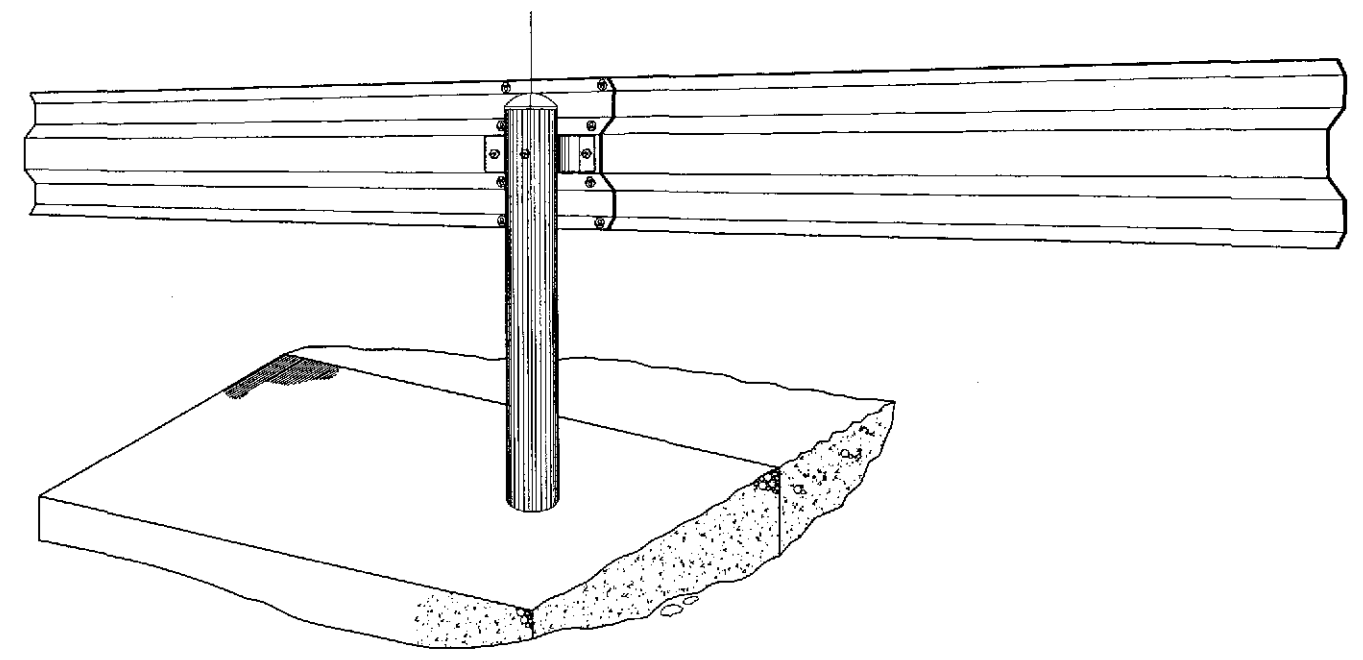
3 BEAM TYPE GUARDRAIL (TYPE "GR-A")
RS-08 SCALE 1:10



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



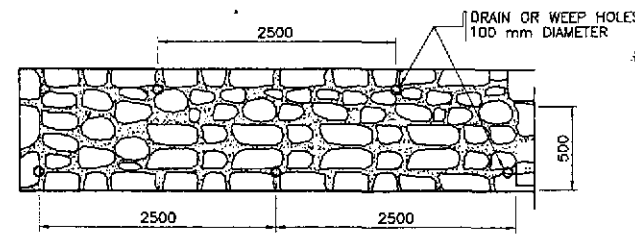
5 BRACKET DETAIL
RS-08 SCALE 1:5



PERSPECTIVE

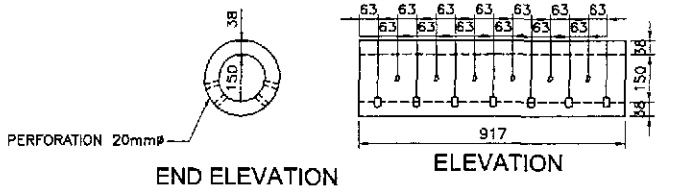
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Palaridel, Cabanatuan and San Jose Bypasses) SAN JOSE BYPASS	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/7/02	<i>[Signature]</i>		BUREAU OF DESIGN				AS SHOWN	STANDARD STEEL BEAM GUARDRAIL (TYPE GR-A & GR-B)	RS-08
	SUBMITTED	9/11/02	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:		Approved By:		
				DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES O/C, Director IV	MANUEL M. BONDAN 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.

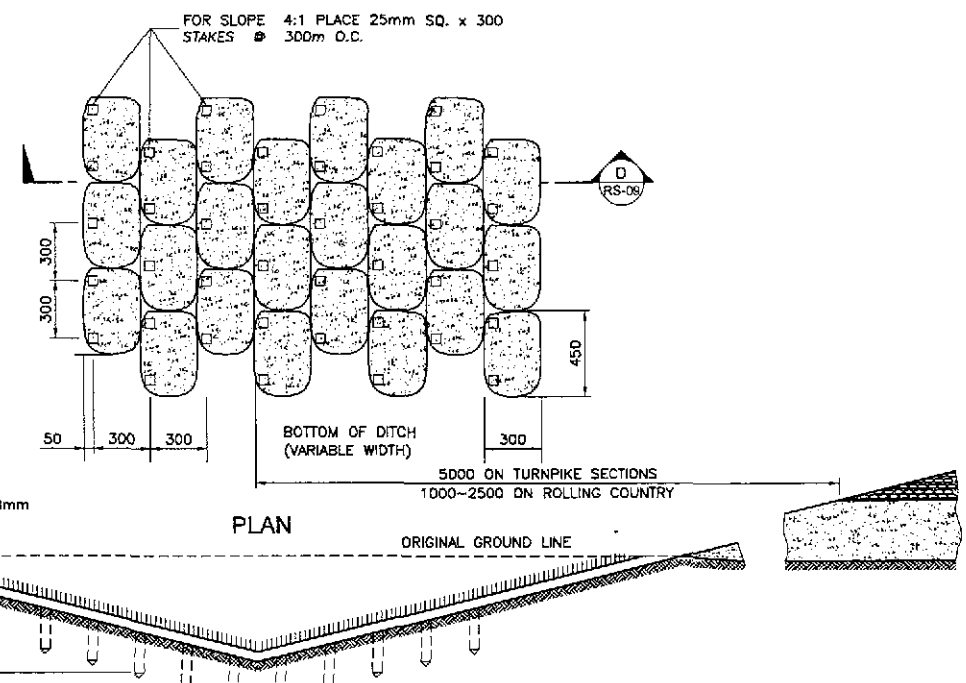


2A ELEVATION OF GROUDED RIP-RAP
RS-09 NOT TO SCALE

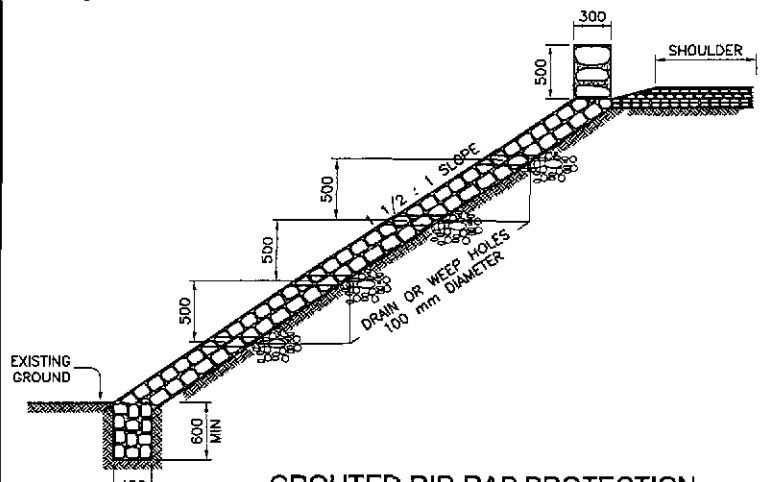
NOTE :
WHERE COMMON BORROW CONSIST OF CLAY OR OTHER IMPERVIOUS MATERIALS, SHOULDER DRAINS SHALL BE INSTALLED 20.00 M. APART ON EACH SHOULDER AND ARRANGED IN SUCH A WAY THAT THE DRAINS ON EACH SHOULDERS ARE STAGGERED AND NOT EXACTLY OPPOSITE EACH OTHER. THEY SHOULD BE CONSTRUCTED AT LOWEST POINT OF SAG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



1C 150mmØ UNREINFORCED CONCRETE PIPE UNDERDRAIN
RS-09 NOT TO SCALE

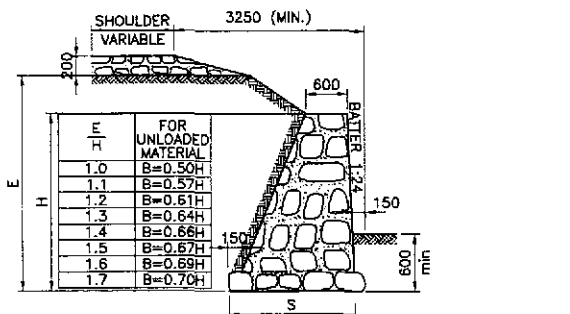
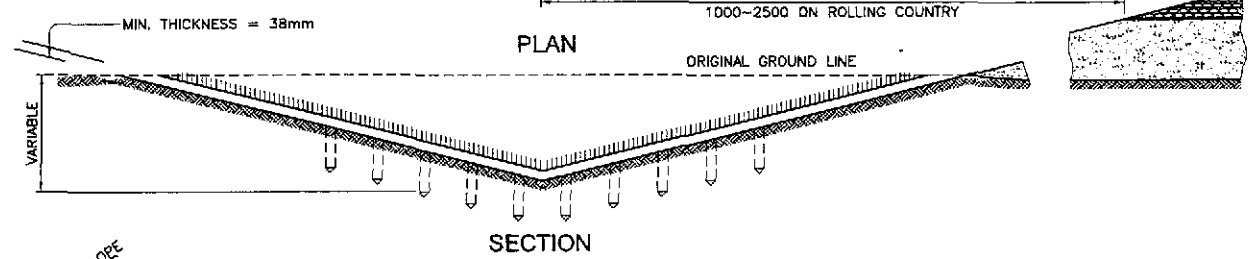
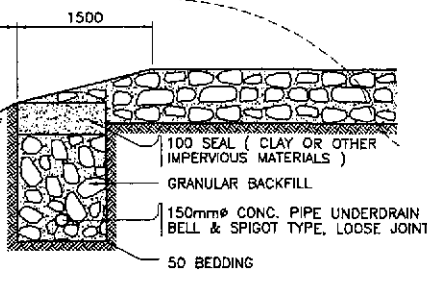


D DETAIL OF SODDING
RS-09 NOT TO SCALE

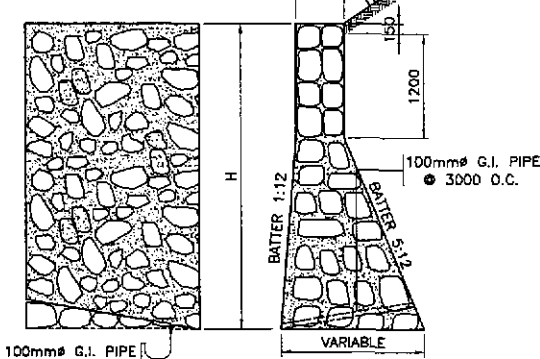


1A GROUDED RIP-RAP PROTECTION FOR SLOPE OF EMBANKMENT
RS-09 NOT TO SCALE

C DETAIL OF UNDERDRAIN
RS-09 NOT TO SCALE

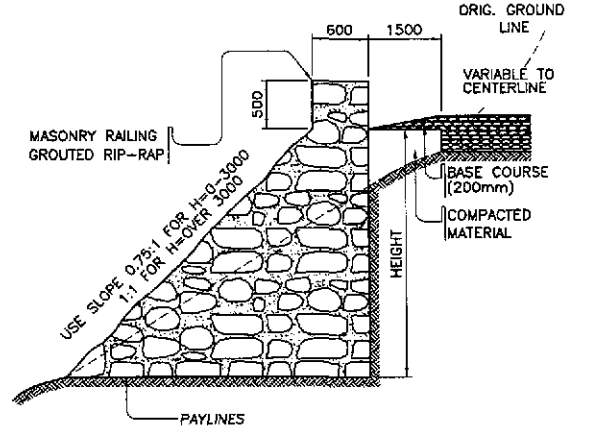


1B RUBBLE MASONRY RETAINING WALL
RS-09 NOT TO SCALE

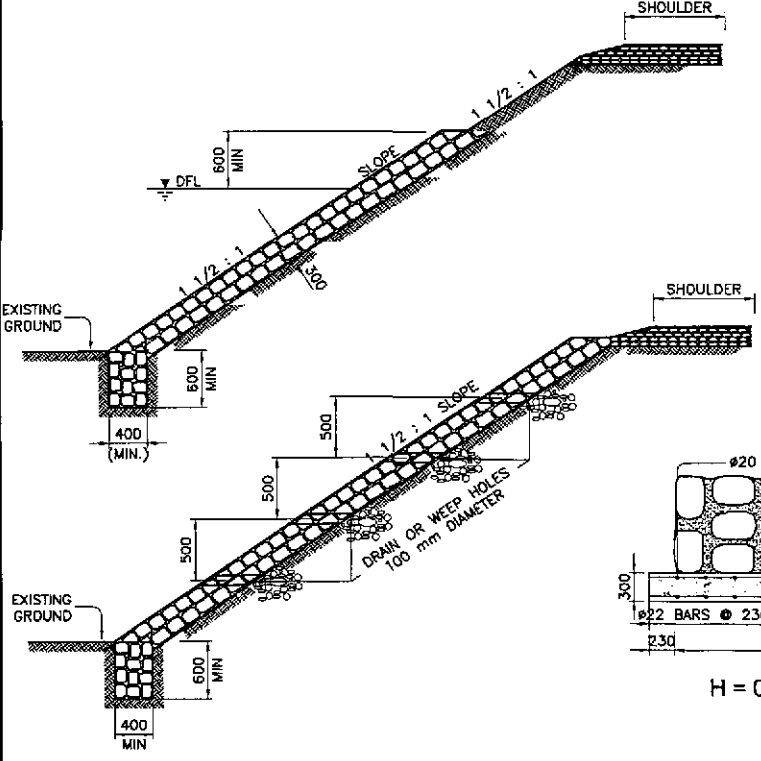


3B STONE MASONRY RETAINING WALL
RS-09 NOT TO SCALE

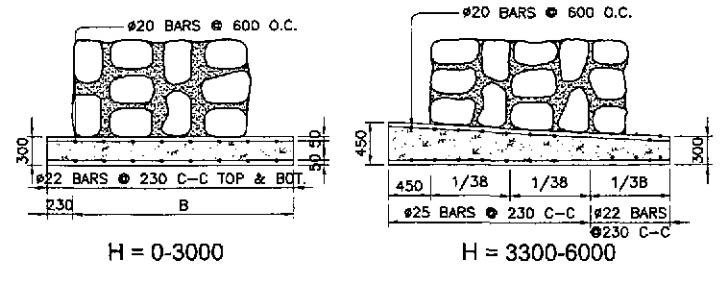
NOTE :
EMBANKMENT WILL BE CONSTRUCTED ONLY ON A FOUNDATION BED SATISFACTORY TO THE ENGINEER. THE STONES SHALL NOT BE LESS THAN 0.15 CU.M. IN VOLUME WITH 75% OF STONES AT LEAST 0.03 CU.M. IN VOLUME AND LAID OFF TO THE LINES AND DIMENSIONS REQUIRED. THE STONES SHALL BE BONDED TO SAME EXTENT AND SECURELY BEDDED. SPALLS SHALL BE USED TO FILL VOIDS. ANY SPACE BACK TO HAND-LAID ROCK EMBANKMENT SHALL BE FILLED ENTIRELY WITH COMPACTED MATERIAL.



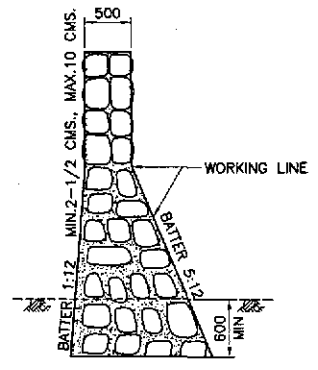
5B HAND LAID ROCK EMBANKMENT
RS-09 NOT TO SCALE



A EMBANKMENT PROTECTION WALLS
RS-09 NOT TO SCALE



2B FOOTING FOR WALL
RS-09 NOT TO SCALE



B MASONRY RETAINING WALL
RS-09 NOT TO SCALE

SECTION SHOWING WORKING LINES FOR BULGE AND PAYMENTS

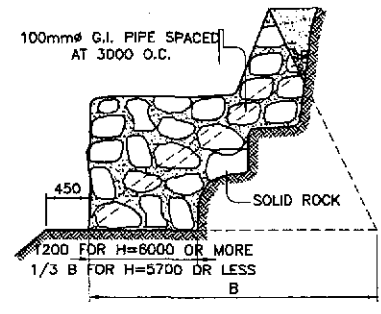
TABLE

HEIGHT IN METERS	QUANTITIES PER LINEAR M OF WALL IN CU. METER
0.90	0.15
1.20	0.23
1.50	0.31
1.90	0.38
2.10	0.46
2.40	0.54
2.70	0.69
3.00	0.77
3.30	0.92

TABLE

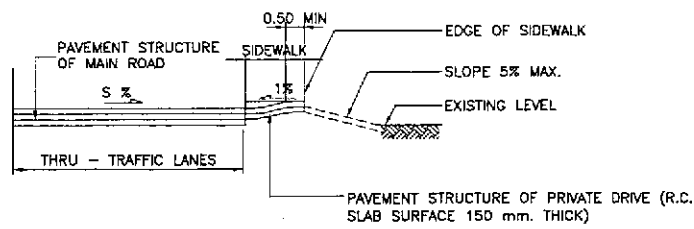
HEIGHT IN METERS	QUANTITIES PER LINEAR M OF WALL IN CU. METER
3.60	1.15
3.90	1.30
4.20	1.45
4.50	1.68
4.80	1.91
5.10	2.14
5.40	2.37
5.60	2.68
6.00	2.91

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.

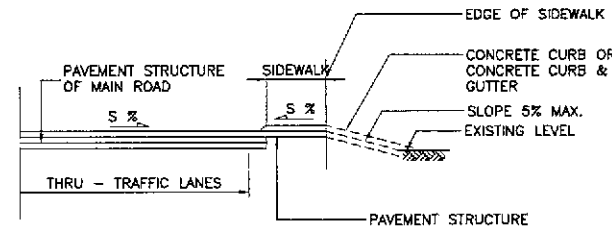


4B METHOD OF STEPPING FOOTING
RS-09 NOT TO SCALE

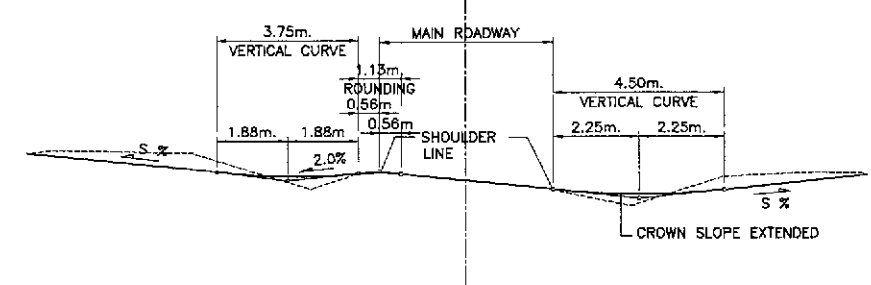
NOTE :
CONCRETE CLASS "A" FOOTING FOR WALL WHEN ORDERED BY THE ENGINEER. DEPTH OF FOOTING : FOOTING SHALL BE CARRIED DOWN TO A FIRM FOUNDATION AS DIRECTED BY THE ENGINEER. MORTAR : TO BE ONE (1) PART CEMENT AND THREE (3) PARTS SAND. MORTAR : JOINTS WITH GENERALLY 2.50 TO 4 CMS., MIN. 2 CMS., MAX. 6.50 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.



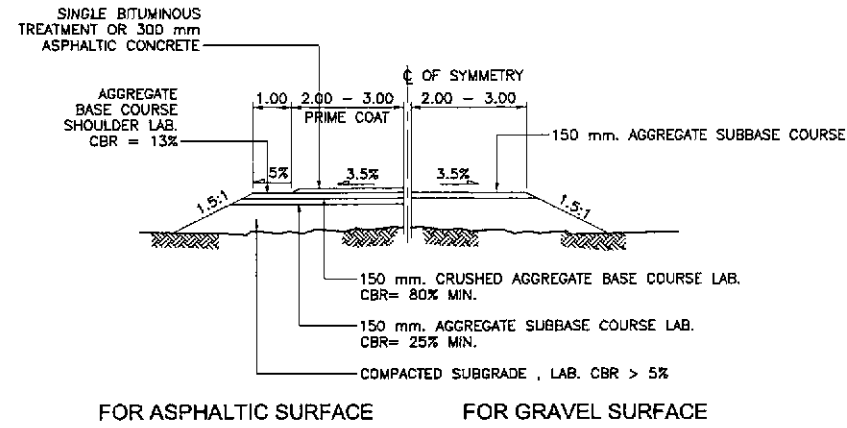
4 TYPICAL PRIVATE DRIVEWAY AT SIDE WALK (PROFILE)
RS-10 NOT TO SCALE



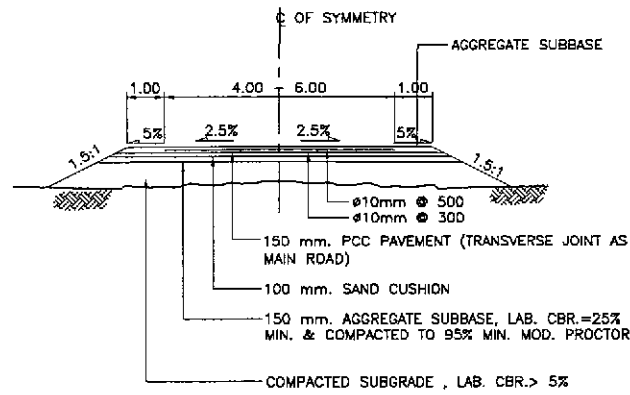
5 TYPICAL SIDE ROAD AT SIDE WALK (PROFILE)
RS-10 NOT TO SCALE



6C SUPERELEVATED CUT SECTION
RS-10 NOT TO SCALE

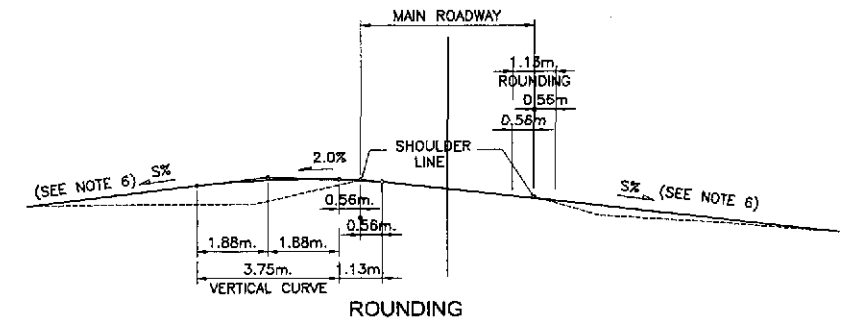


FOR ASPHALTIC SURFACE FOR GRAVEL SURFACE

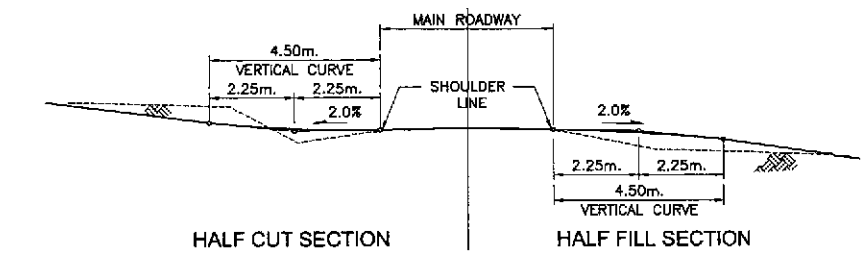


FOR R.C. CONCRETE PAVEMENT FOR PRIVATE DRIVEWAY

3 TYPICAL CROSS - SECTION
RS-10 NOT TO SCALE

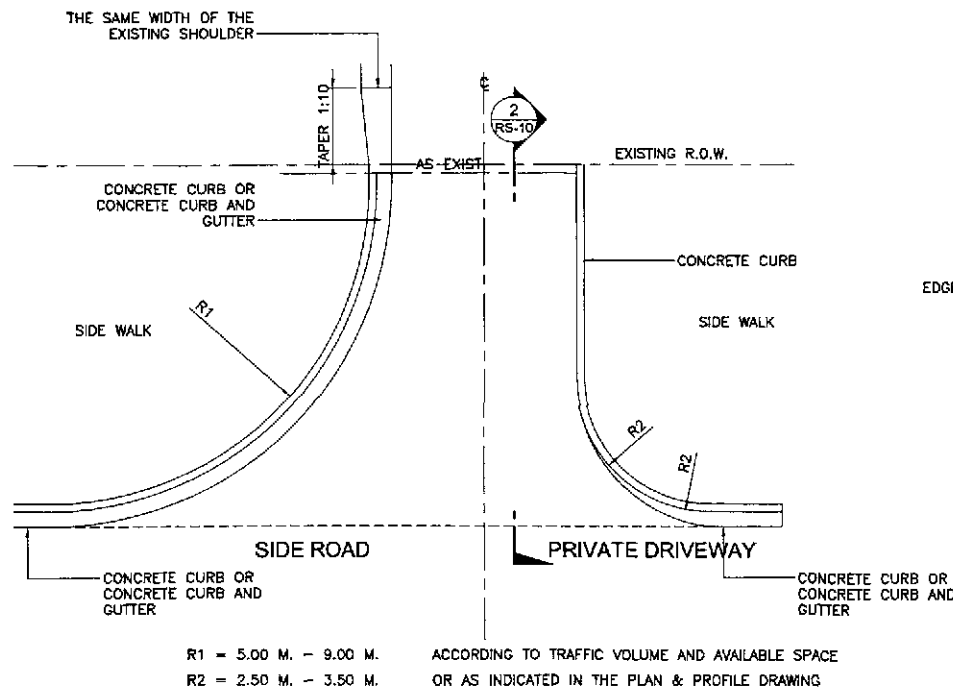


6B SUPERELEVATED FILL SECTION
RS-10 NOT TO SCALE



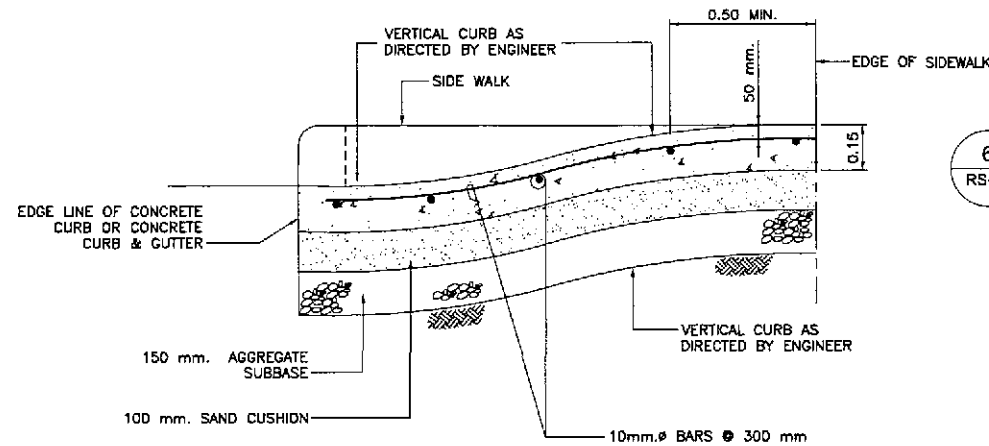
HALF CUT SECTION HALF FILL SECTION

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



SECTION OF R.C. CONCRETE PAVEMENT OF SIDE ROAD & PRIVATE DRIVEWAY

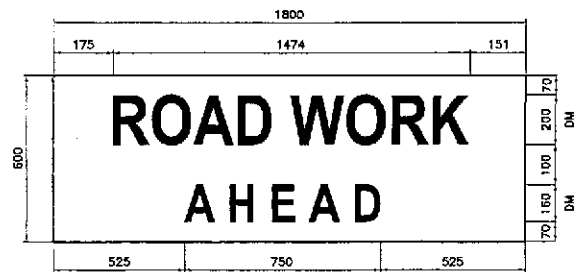
2 RS-10 NOT TO SCALE

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

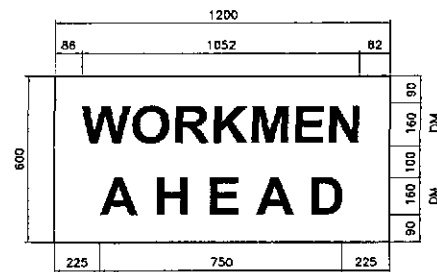
NOTES:

1. 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.
2. 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.
3. 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.
4. USE 4:1 OF FLATTER SIDE SLOPE IN THE APPROACH RADII AREA.
5. 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.
6. SIDE CROSS DRAINS SHALL BE LOCATED 10.00m OR AS SHOWN IN THE PLAN.
7. 15m. RADII TO BE USED ON INTERSECTION ROADS, EXCEPT RESIDENTIAL DRIVES, UNLESS OTHERWISE SPECIFIED ON PLANS.
8. RADII MAY BE VARIED TO SUIT FIELD CONDITIONS.
9. TANGENT SLOPE NOT STEEPER THAN 10% BEYOND VERTICAL CURVE, THE SLOPE MAY BE STEEPER, IF REQUIRED, TO MEET EXISTING APPROACH SLOPE.
10. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN METERS.

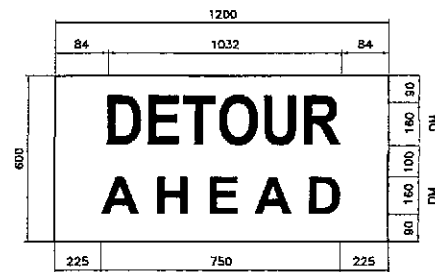
		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinaridel, Cabanatuan and San Jose Bypasses)		SCALE : NOT TO SCALE	SHEET CONTENTS : SIDE ROAD APPROACHES AND PRIVATE DRIVE ACCESS	SHEET NO. : RS-10	
DESIGNED	DATE	SIGNATURE	PUHL - PMO BUREAU OF DESIGN		OFFICE OF THE SECRETARY		SAN JOSE BYPASS				
CHECKED	DATE	SIGNATURE	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: SIMEON A. DATUMANONG Secretary	FULL SIZE A1			



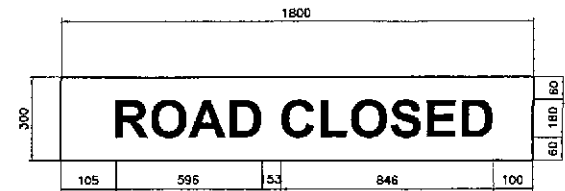
T1 - 1



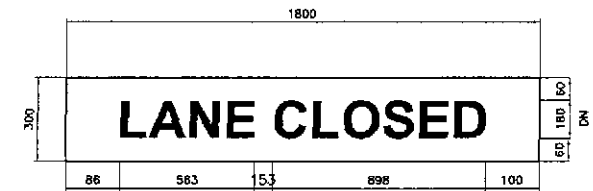
T1 - 5



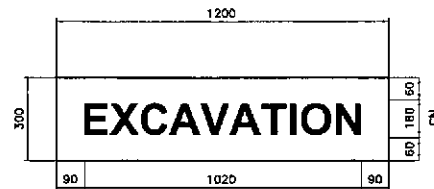
T1 - 6



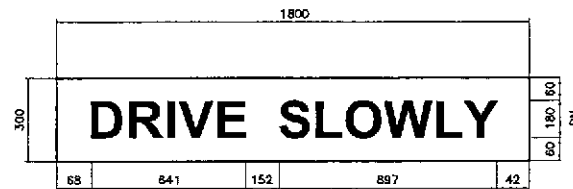
T2 - 2



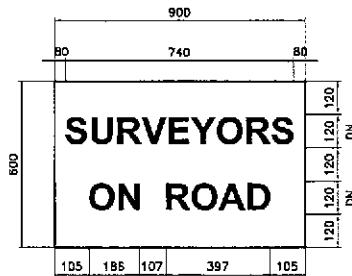
T2 - 4



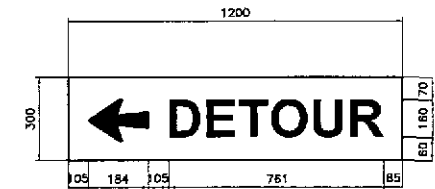
T2 - 6



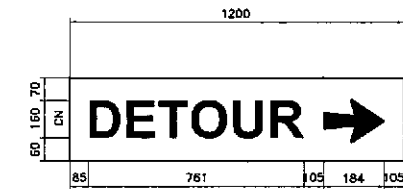
T2 - 7



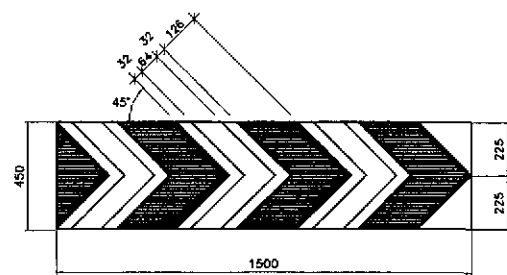
T2 - 8



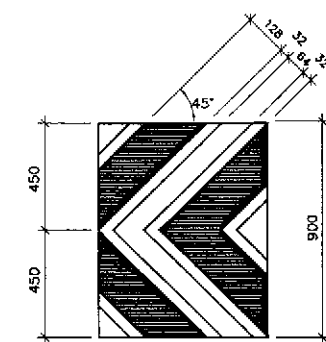
T4 - 1L



T4 - 1R



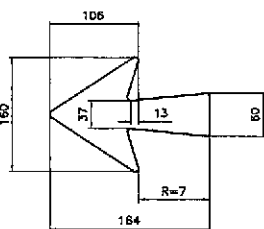
T4 - 2



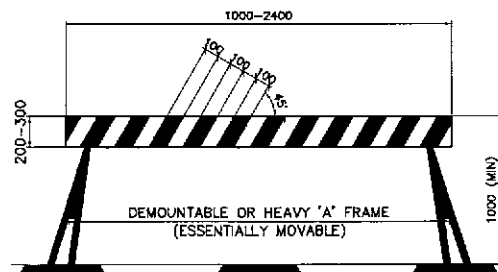
T4 - 3

NOTES :

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



DETAIL OF ARROW



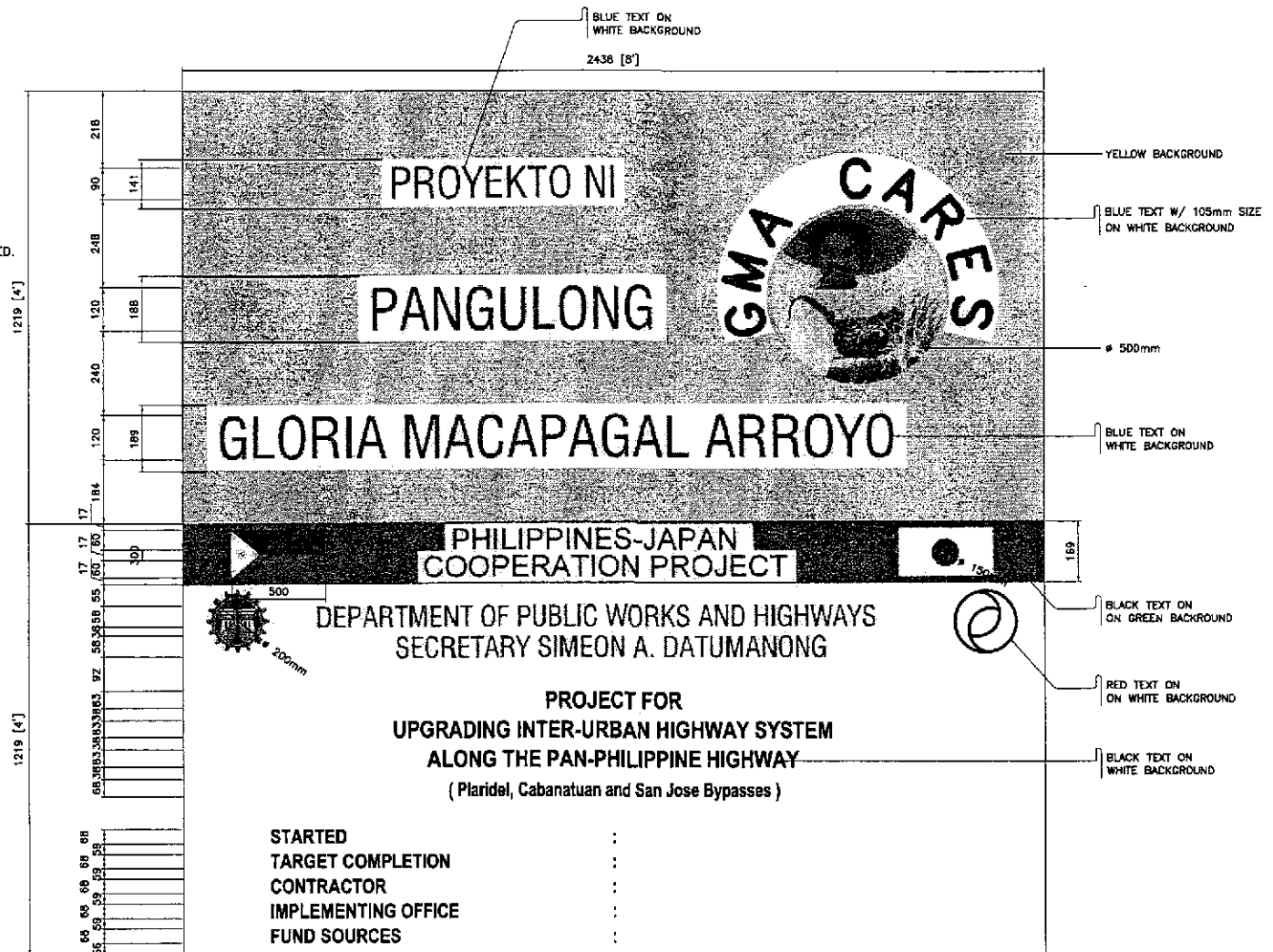
TYPE 1 BARRICADE

NOTES :

1. ADVANCE SIGNS (T1) AND POSITION SIGNS (T2) SHALL HAVE BLACK LETTERS ON YELLOW REFLECTORIZED BACKGROUND.
2. TRAFFIC DIVERSION SIGNS (T4-1) SHALL HAVE BLACK LETTERS AND ARROW ON YELLOW REFLECTORIZED BACKGROUND.
3. 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.



1 ROAD WORK SIGN DETAILS
RS-11 NOT TO SCALE

2 PROJECT SIGN BOARD DETAILS
RS-11 NOT TO SCALE

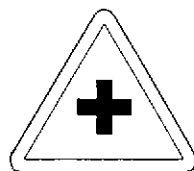
	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	9/7/02	[Signature]	BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	STANDARD ROAD WORK SIGN AND PROJECT SIGN BOARD DETAILS
CHECKED	9/7/02	[Signature]	Submitted By:	Reviewed By:	Recommended By:	Office of the Secretary	SAN JOSE BYPASS	FULL SIZE A1		
SUBMITTED	9/10/02	[Signature]	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary			



1
W1-1(L or R)



2
W1-4 (L)



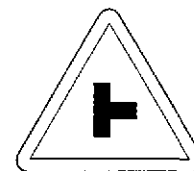
3
W2-1



4
W2-4



5
W2-5



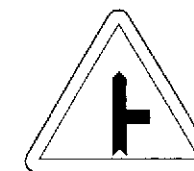
6
W2-6 (L or R)



7
W2-7



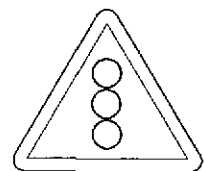
8
W2-8



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



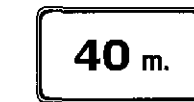
17
W5-10



18
W6-1



19
W6-2



20
W8-3A



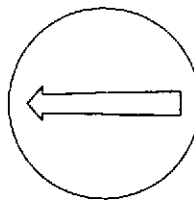
21
W8-3B



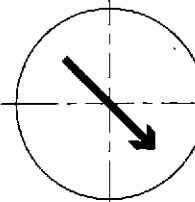
22
R1-1A



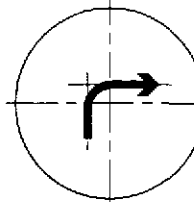
23
R1-2A



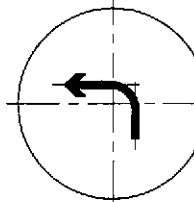
24
R2-2L



25
R2-3



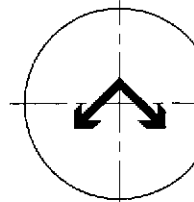
26
R2-4A (R)



27
R2-4A (L)



28
R2-4P



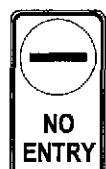
29
R2-5



30
R2-6A



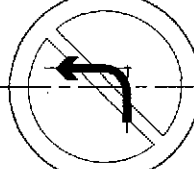
31
R2-7A (L)



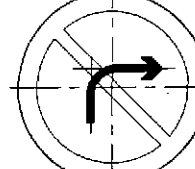
32
R3-1PA



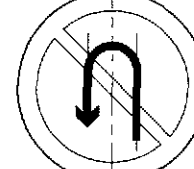
33
R3-6P



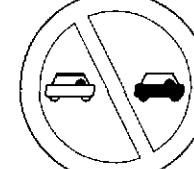
34
R3-13A



35
R3-14A



36
R3-15A



37
R3-16



38
R4-1B(80)



39
R4-3B (40)



40
R6-4

LEGEND:

A. WARNING SIGNS

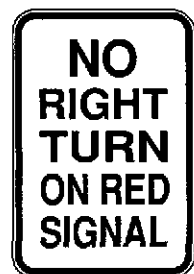
- SHARP TURN (W1-1)
- REVERSE CURVE (W1-4) (L)
- CROSS ROAD (W2-1)
- T JUNCTION (W2-4)
- Y JUNCTION (W2-5)
- SIDE ROAD JUNCTION (W2-6)
- ROUNDABOUT (W2-7)
- PRIORITY ROAD (W2-8)
- PRIORITY ROAD (W2-9) (R)
- PRIORITY ROAD (W2-10)
- SIGNALS AHEAD (W3-1)
- ROAD NARROWS (W4-2)
- ROAD NARROWED (W4-2) (R)
- DIVIDED ROAD (W4-3)
- HUMPS (W5-3)
- SLIPPERY ROAD (W5-9)
- CATTLE CROSSING (W5-10)
- PEDESTRIANS (W6-1)
- CHILDREN (W6-2)
- (DISTANCE)...m. (W8-3a)
- (DISTANCE)...m. (W8-3b)

B. REGULATORY SIGNS

- STOP (R1-1A)
- GIVE WAY (R1-2)(A)
- 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 (R2-6)(A)
- DIRECTION TO BE FOLLOWED (R2-7A)(L)
- NO ENTRY (R3-1P)(A)
- 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)
- LOAD RESTRICTION (R6-4)
- TURN RIGHT AT ANY TIME W/ CARE (S2-3)
- NO RIGHT TURN ON RED SIGNAL (S2-6)
- ROAD CLOSED (S2-9)
- HAZARD MARKERS (T4-3)



41
S2-3



42
S2-6



43
S2-9



44
T4-3 (L OR R)

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.

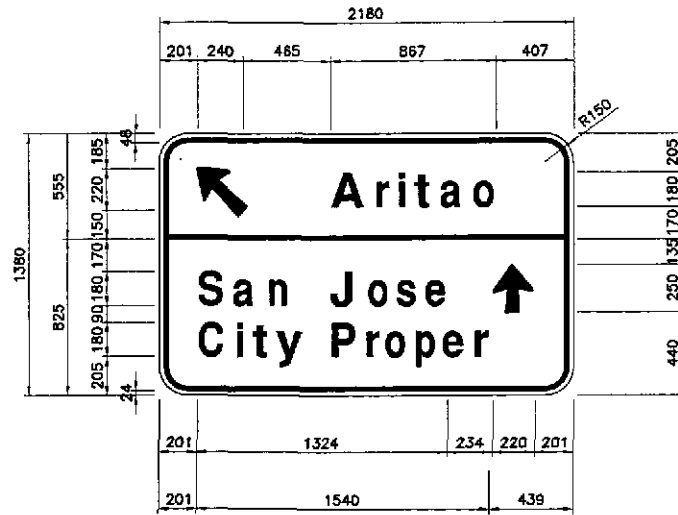
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	CHECKED	9/7/02	ACACIO		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pilaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	STANDARD TRAFFIC SIGNS SIGN INDEX	RS-12
	SUBMITTED	9/11/02	ACACIO		OFFICE OF THE SECRETARY							
Submitted By:		Reviewed By:		Recommended By:		Approved By:						
DANILO C. TRAJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONDAN Undersecretary		SIMEON A. DATUMANONG Secretary				

Aritao
182 00 34 91 115 118
48 42 31 41 55
867

San Jose
148 115 115 130 110 112 115
42 09 218 80 35 38
1324

City Proper
144 34 91 145 149 85 119 115 115 88
44 35 24 178 38 30 41 30 42
1340

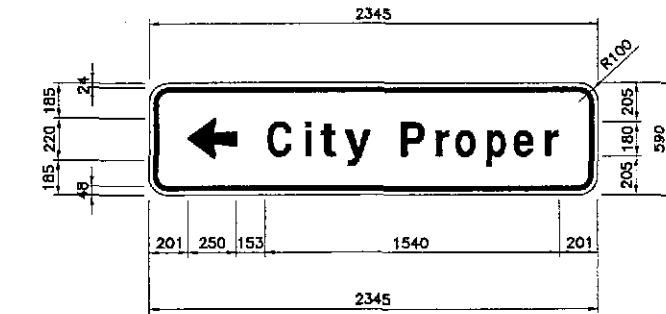
Cabanatuan
144 115 118 115 115 115 91 115 115 115
48 09 30 09 55 01 04 55 00
1667



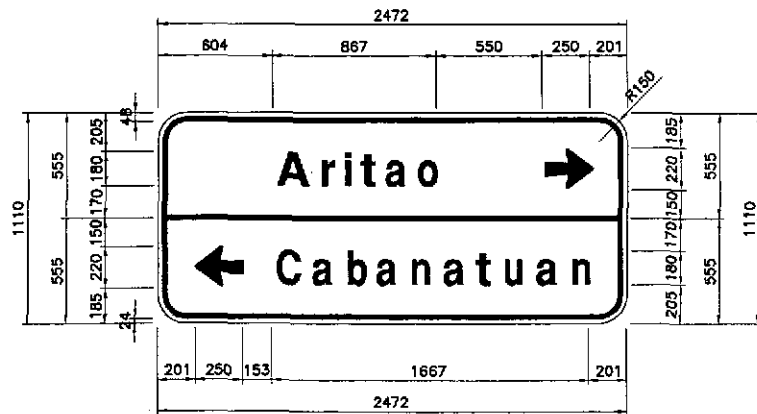
GS-1



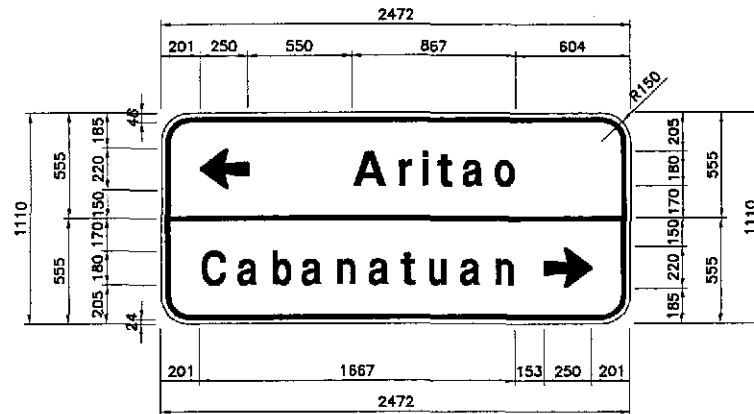
GS-2



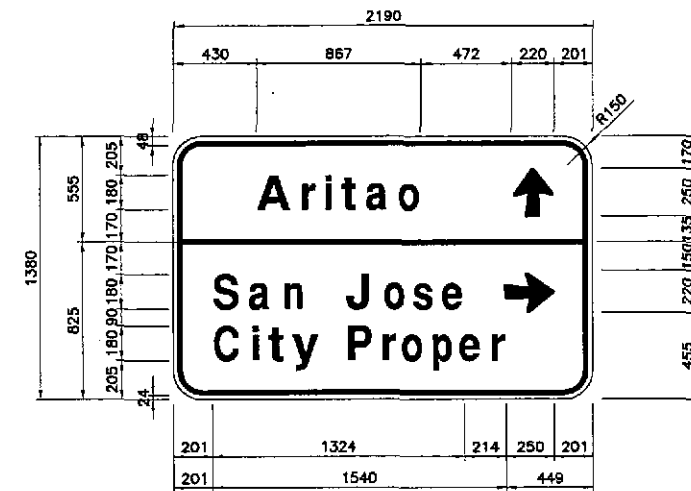
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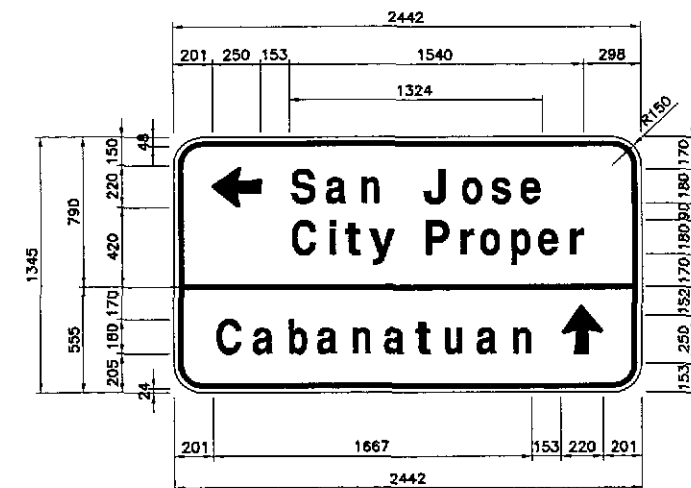
GS-4



GS-5



GS-6



GS-7

1 ADVANCE DIRECTION SIGN DETAILS
RS-13 NOT TO SCALE

	DESIGNED	DATE	SIGNATURE		PROJECT AND LOCATION :					SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/7/02	S. LUNA		THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)					AS SHOWN	ADVANCED DIRECTION SIGN DETAILS	RS-13
	SUBMITTED	2/11/02	S. LUNA		SAN JOSE BYPASS					FULL SIZE A1		
	Submitted By: DANILLO C. TRAJANO, Project Director				Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division			Recommended By: GILBERTO S. REYES, OC, Director IV			Approved By: MANUEL M. BONGAN, Undersecretary; SIMEON A. DATUMANONG, Secretary	

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 800	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.

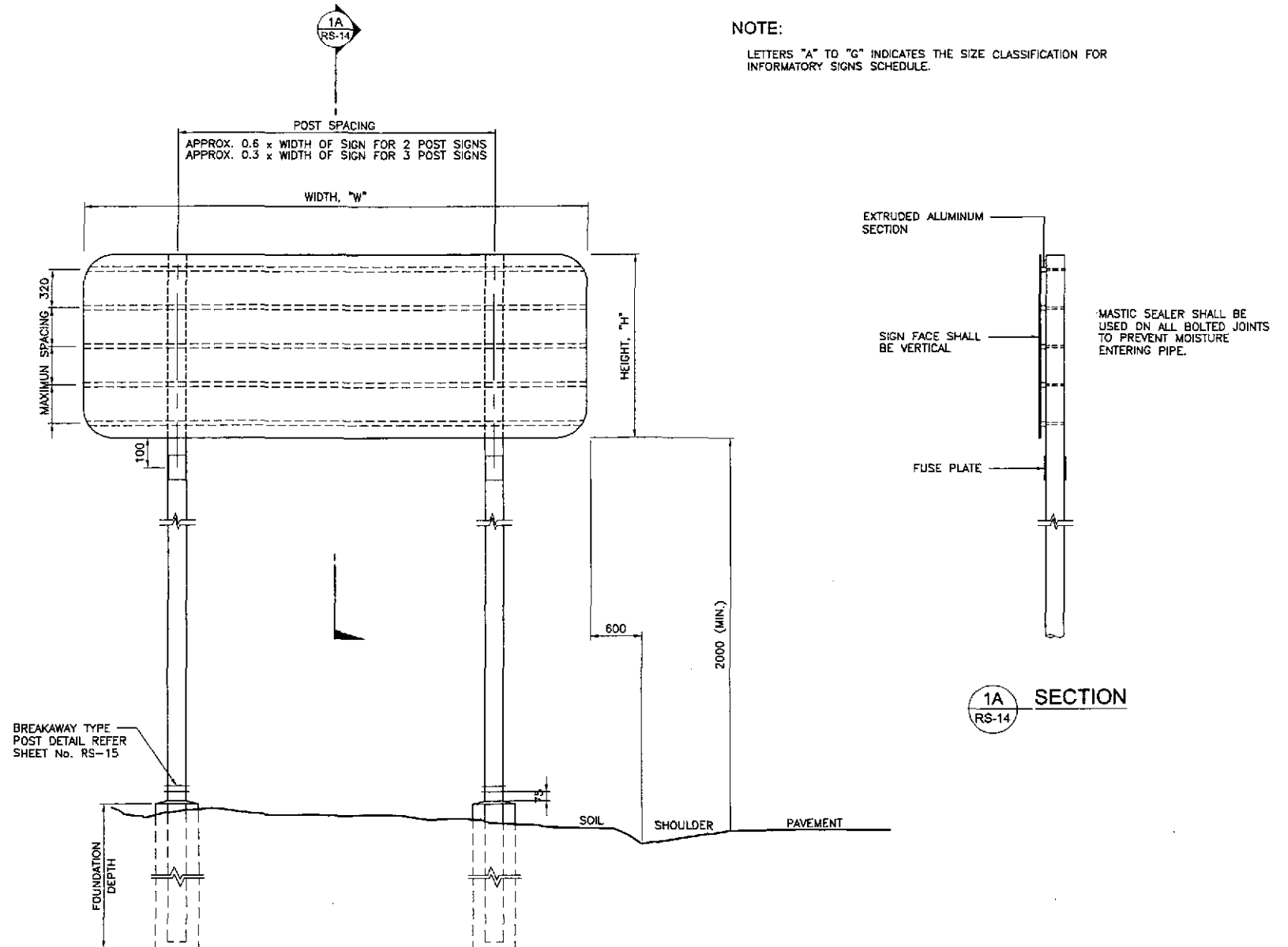
SIGN POST FOUNDATION TABLE

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

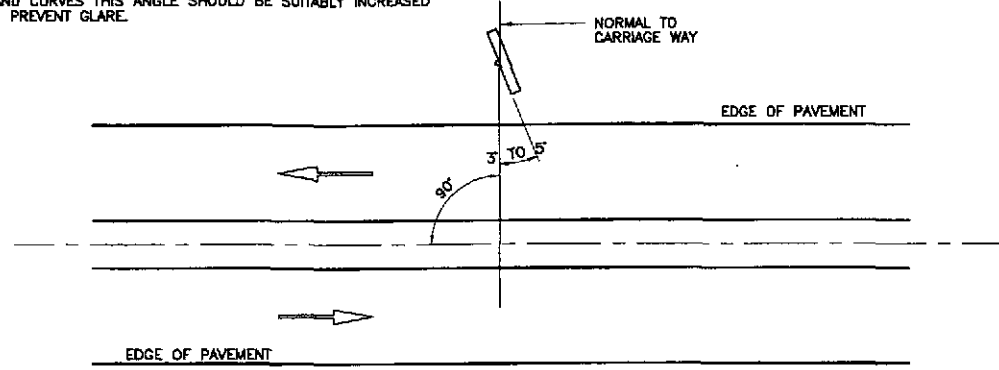
NOTE:
 LETTERS "A" TO "G" INDICATES THE SIZE CLASSIFICATION FOR INFORMATORY SIGNS SCHEDULE.



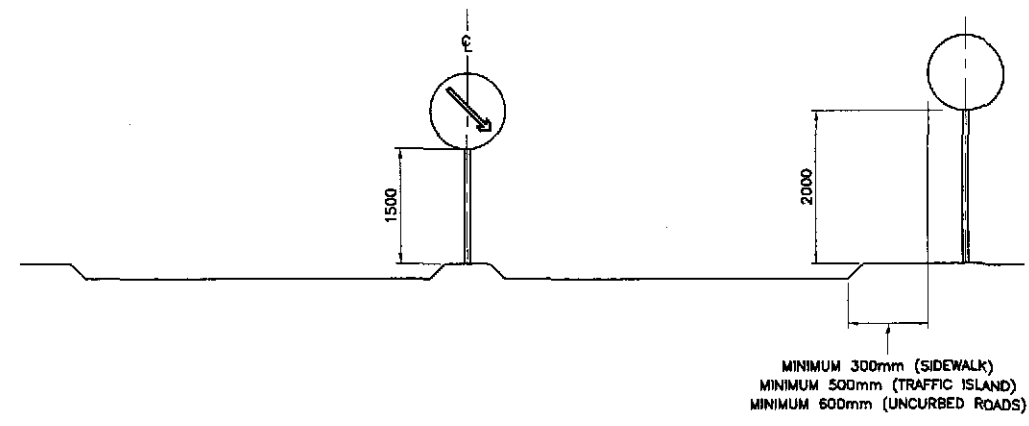
1 TYPICAL SIGN MOUNTING
 RS-14 NOT TO SCALE

	DESIGNED	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	9/7/02	A. LUNA	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	MOUNTING/SUPPORT FOR ROAD SIGN TYPICAL SIGN MOUNTING DETAILS (1 OF 2)	RS-14
	SUBMITTED	9/11/02	TEAM LEADER	Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV	Recommended By: MANUEL M. BONGAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary	FULL SIZE A1		

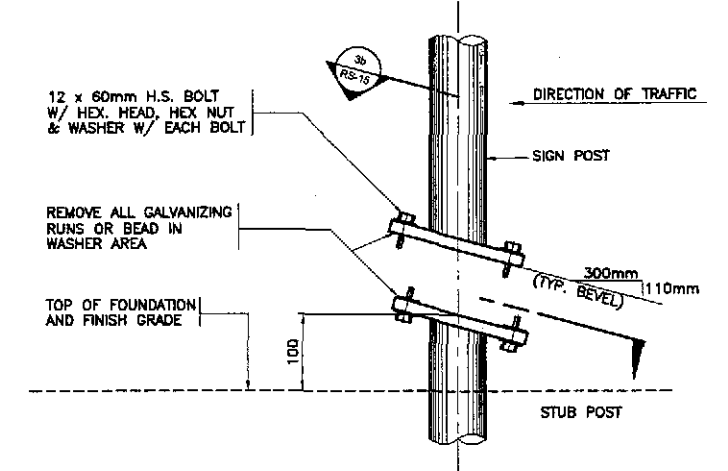
NOTE:
SIGN SHALL BE TURNED 3° TO 5° FROM ONCOMING TRAFFIC ON STRAIGHT SECTIONS AND RIGHT HAND CURVES. ON LEFT HAND CURVES THIS ANGLE SHOULD BE SUITABLY INCREASED TO PREVENT GLARE.



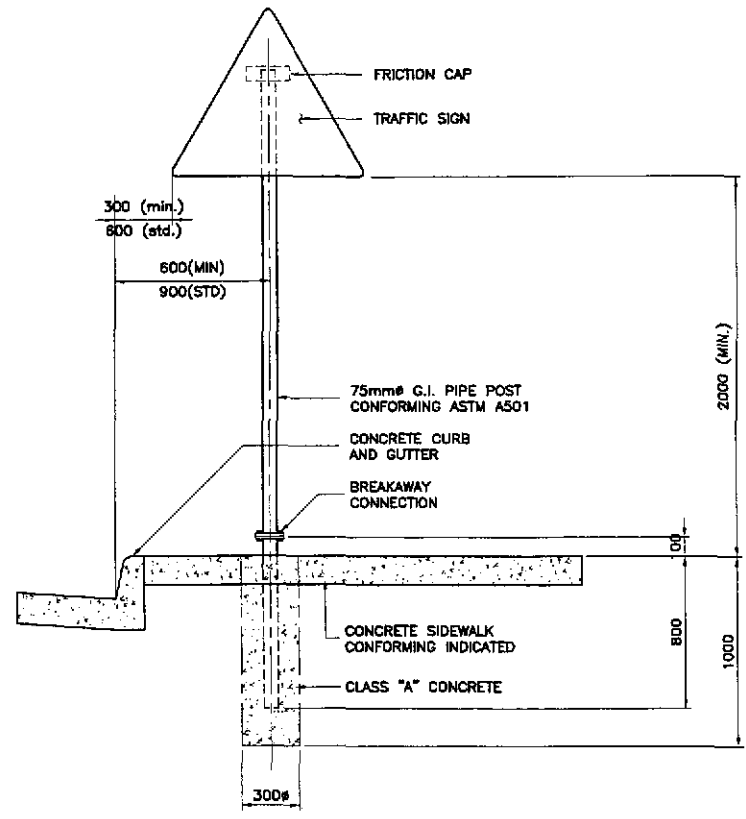
1 PLAN VIEW
RS-15



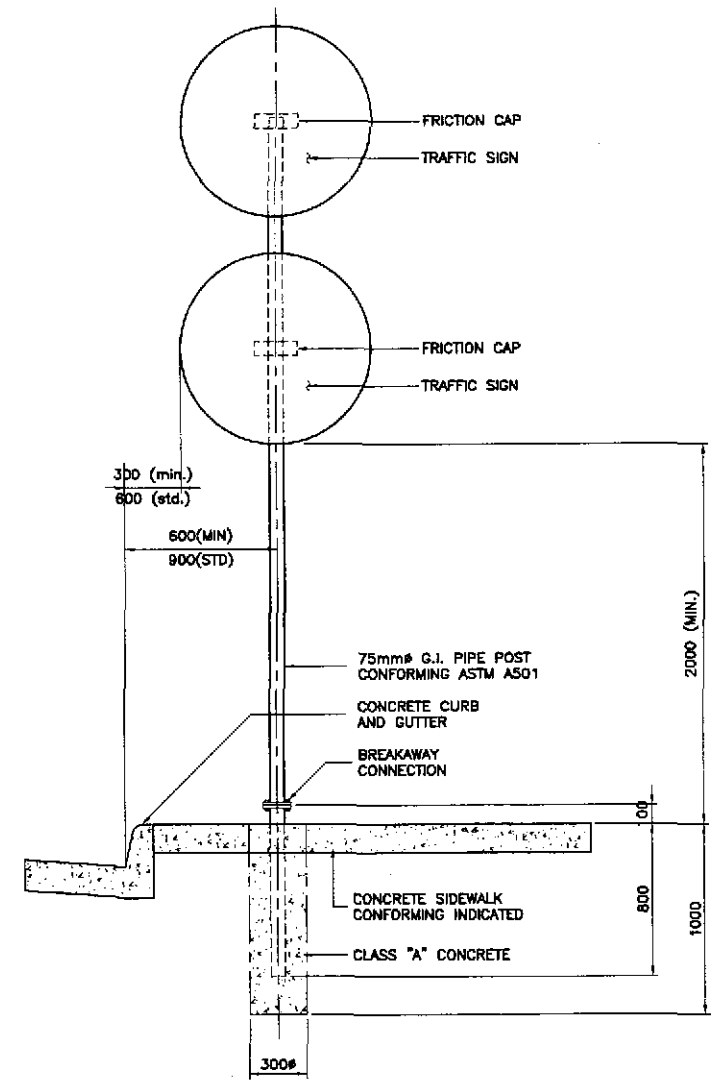
2 SIGN POSITIONS
RS-15 NOT TO SCALE



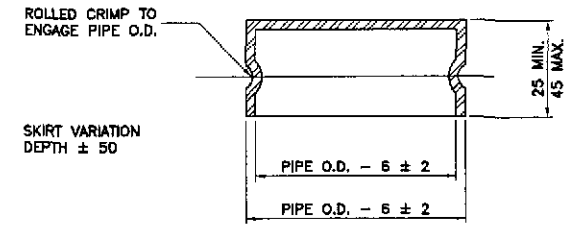
3a ELEVATION
RS-15



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



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

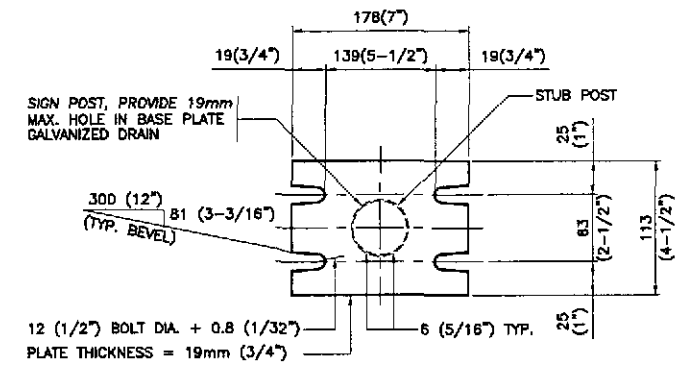


4 FRICTION CAP DETAIL
RS-15

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 10⁻³ 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.

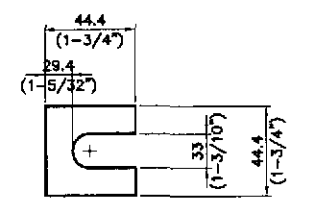
TYPICAL SIGN MOUNTING DETAILS
NOT TO SCALE



3b SECTION
RS-15

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

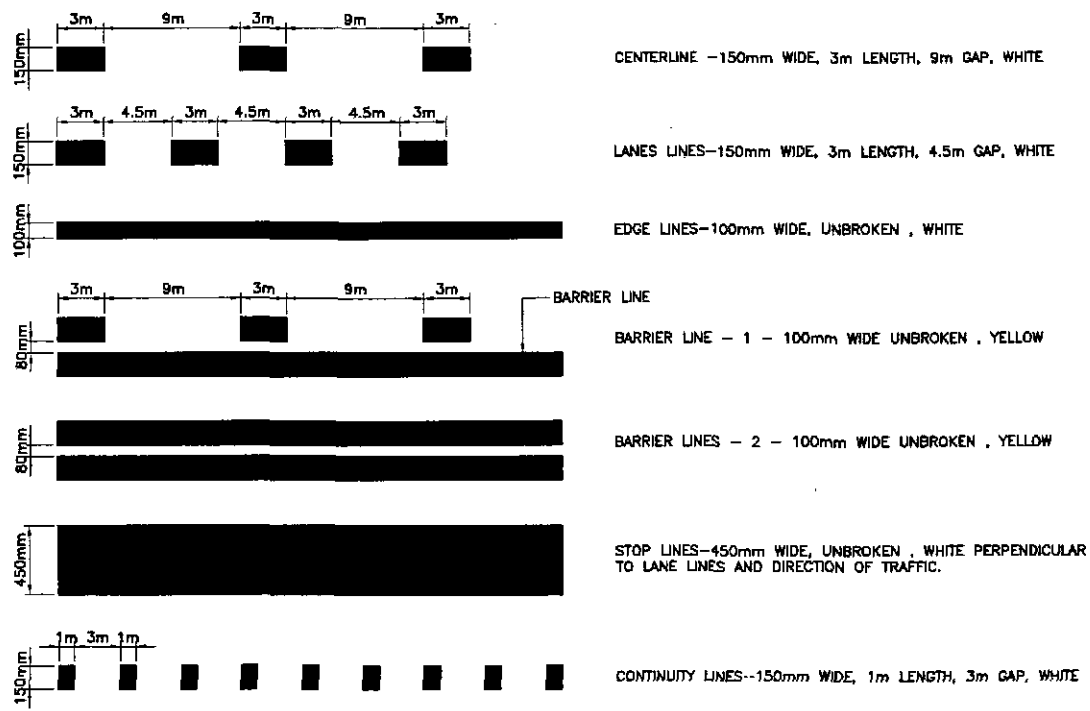
3 SIGN POST & STUB POST DETAIL
RS-15



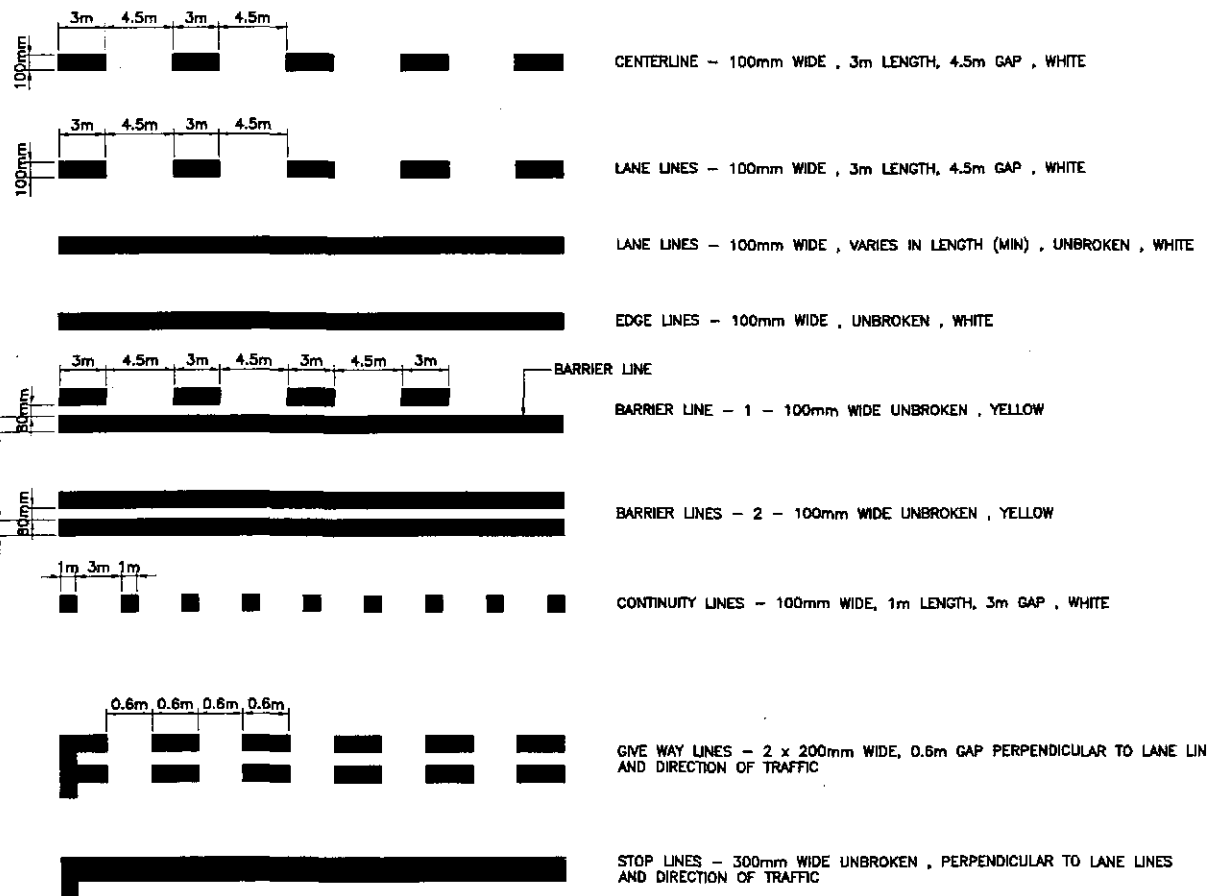
5 SHIM DETAIL
RS-15

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(266.016x10⁻³KN-m)

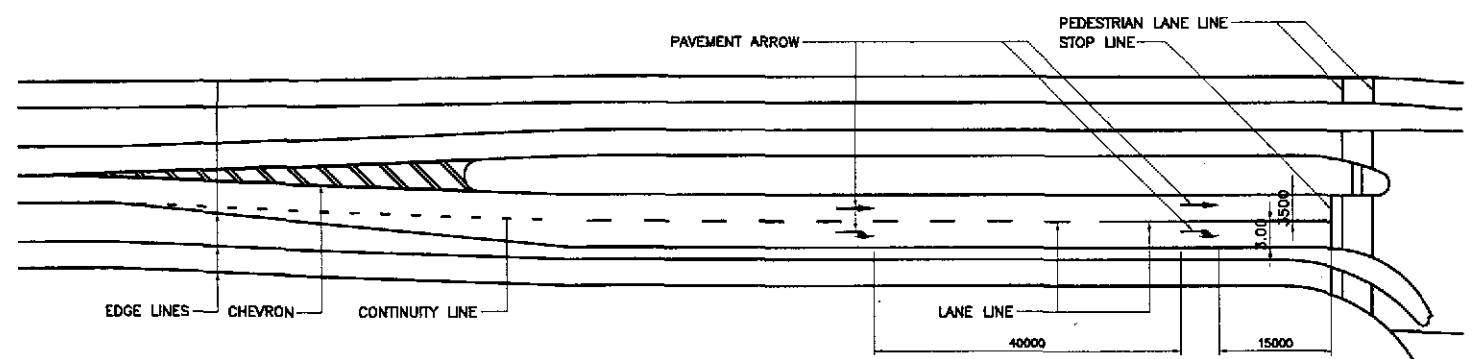
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	CHECKED	DATE	SIGNATURE		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS							THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	MOUNTING / SUPPORT FOR ROAD SIGN TYPICAL SIGN MOUNTING DETAILS (2 OF 2)	RS-15
	SUBMITTED	DATE	SIGNATURE		PUHL - PMO BUREAU OF DESIGN OFFICE OF THE SECRETARY	Recommended By: (See cover sheet for Signature/Approval) MANUEL M. BONDAN Undersecretary	Approved By: (See cover sheet for Signature/Approval) SIMON A. DATUMANONG Secretary								



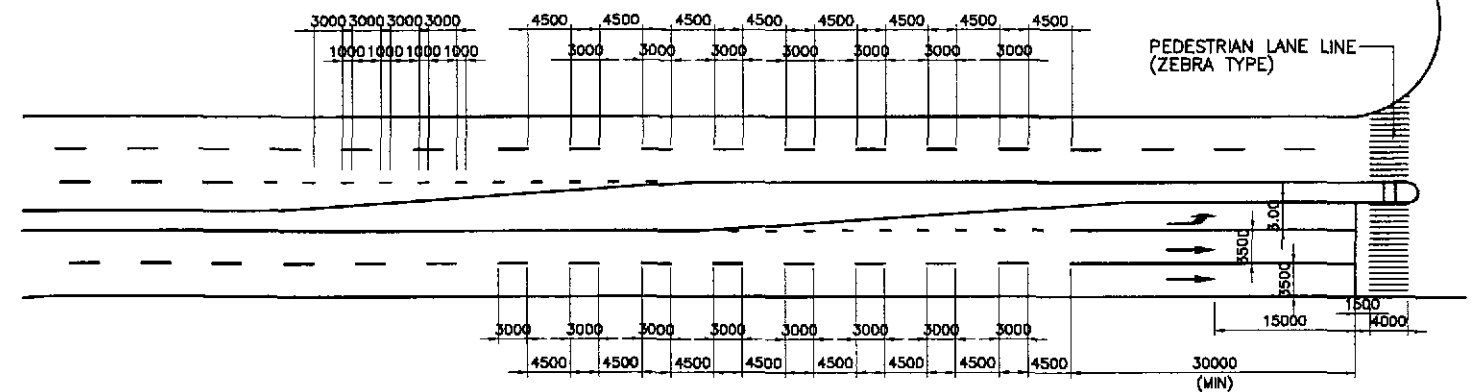
1B BYPASS MAIN LINE
RS-17 NOT TO SCALE



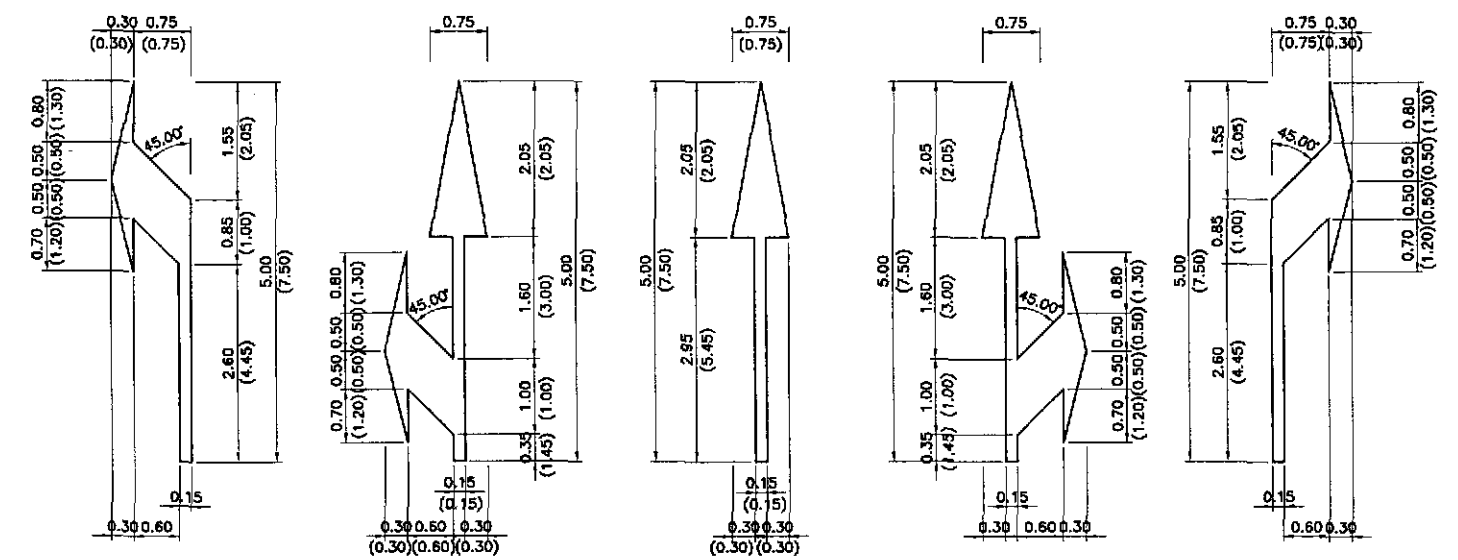
1A RAMP AND CROSS ROADS
RS-16 NOT TO SCALE



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



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

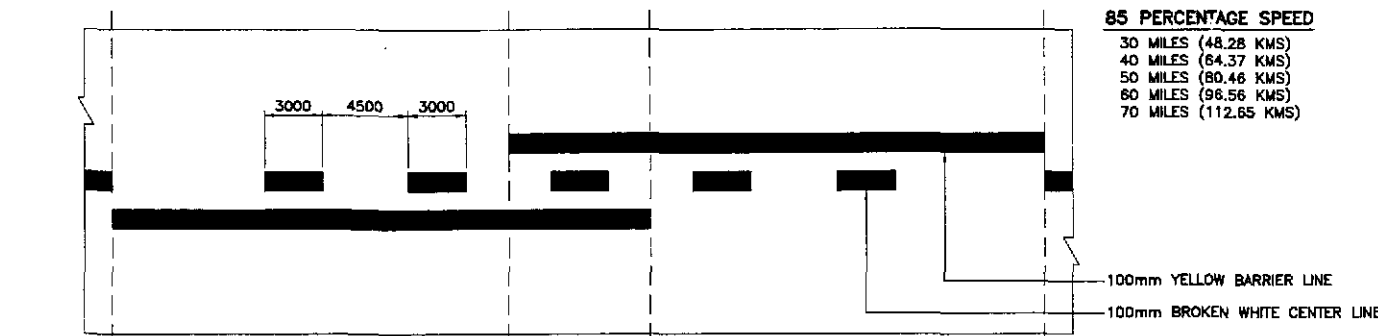


1C STANDARD PAVEMENT ARROWS
RS-16 NOT TO SCALE

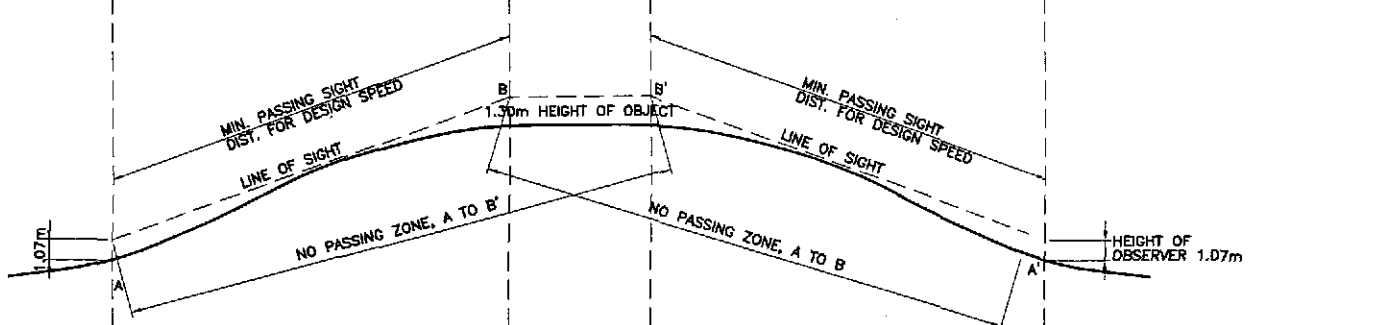
NOTE:
VALUES IN PARENTHESIS () ARE FOR SPEED LIMIT OVER 60 KPH.
MATERIALS, DIMENSIONS AND COLOR OF STANDARD PAVEMENT ARROWS SHALL CONFORM IN ACCORDANCE WITH THE SPECIFICATION DEFINED IN THE DPWH MANUAL OF PAVEMENT MARKINGS, 1980 EDITION.

1 STANDARD PAVEMENT MARKINGS
RS-16 NOT TO SCALE

	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/7/02	[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) SAN JOSE BYPASS	NOT TO SCALE	STANDARD PAVEMENT MARKINGS (1 OF 2)	RS-16
	CHECKED	9/9/02	[Signature]	OFFICE OF THE SECRETARY							
	SUBMITTED	9/10/02	[Signature]	Submitted By:	Reviewed By:	Recommended By:	Approved By:				
			DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONOAN Undersecretary	SIMEON A. DATUMANONG Secretary				



85 PERCENTAGE 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)



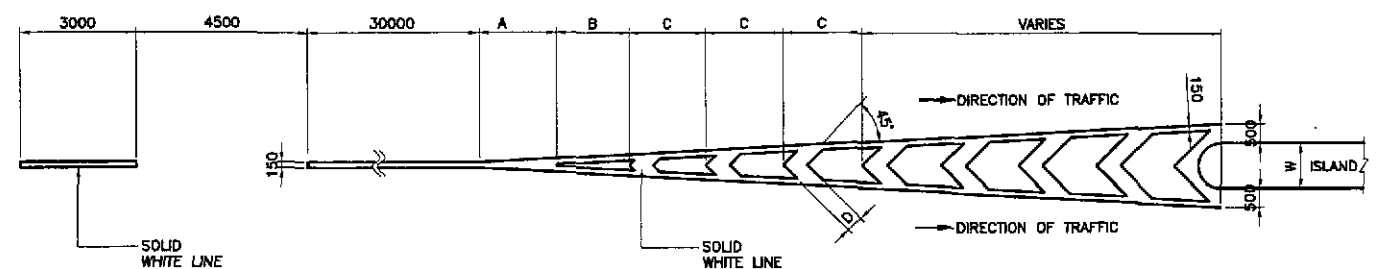
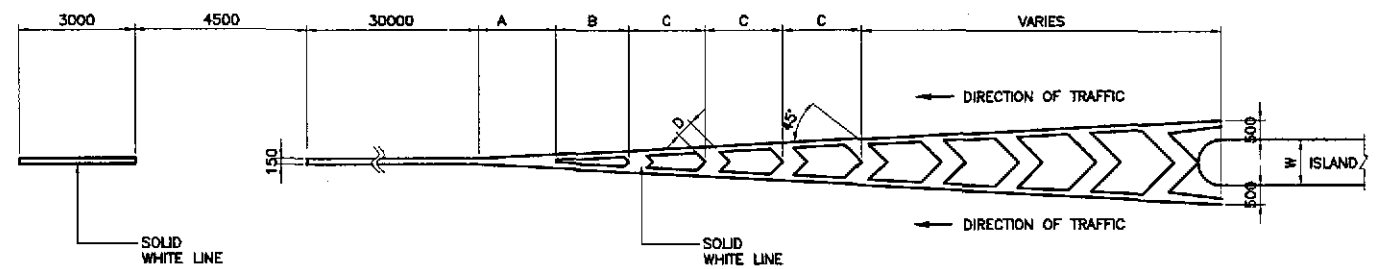
AA' BEGIN NO PASSING ZONE
 SIGHT DISTANCE BECOMES LESS THAN MIN. MEASURED BETWEEN POINTS 1.30 METER ABOVE PAVEMENT.

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

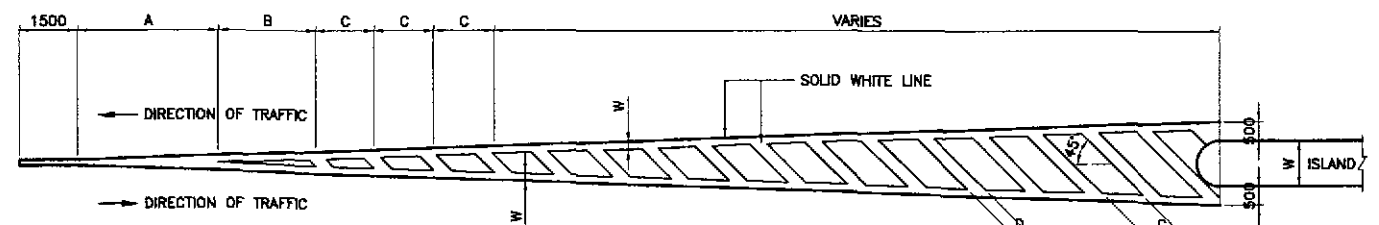
NOTE:
 NO PASSING ZONE IN OPPOSITE DIRECTION MAY OR MAY NOT OVERLAP DEPENDING ON VERTICAL ALIGNMENT AND DESIGN SPEED. FOR NO OVERLAPPING TYPE, REFER TO FIGURE 6 OF DPWH MANUAL ON PAVEMENT MARKINGS (1980), IF REQUIRED.

85 PERCENTILE SPEED (Kmh)	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

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



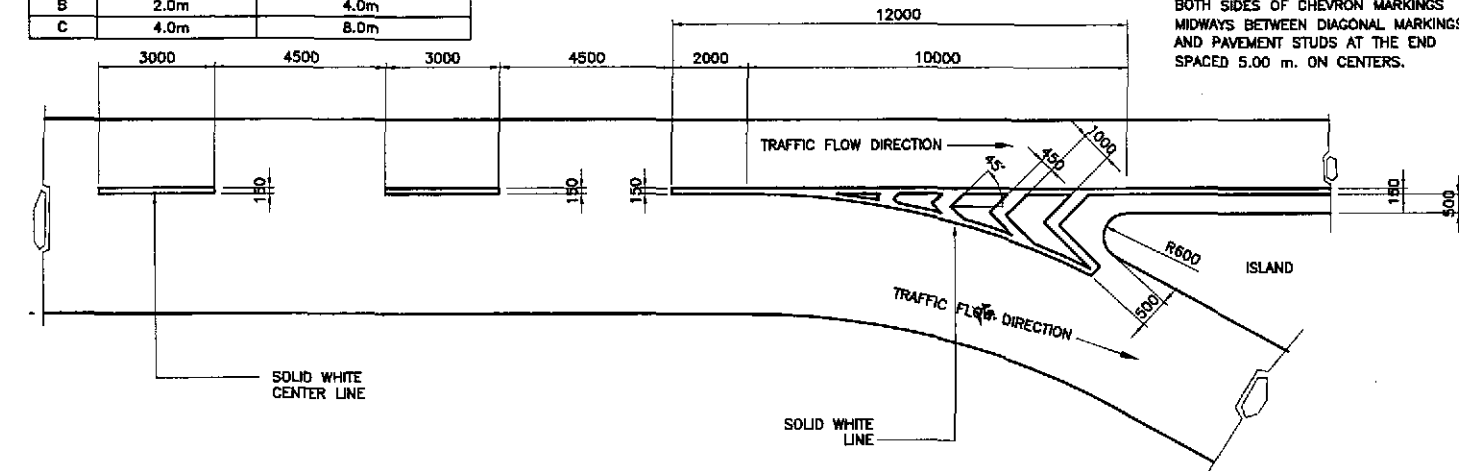
1E CHEVRON MARKINGS
 RS-17 NOT TO SCALE



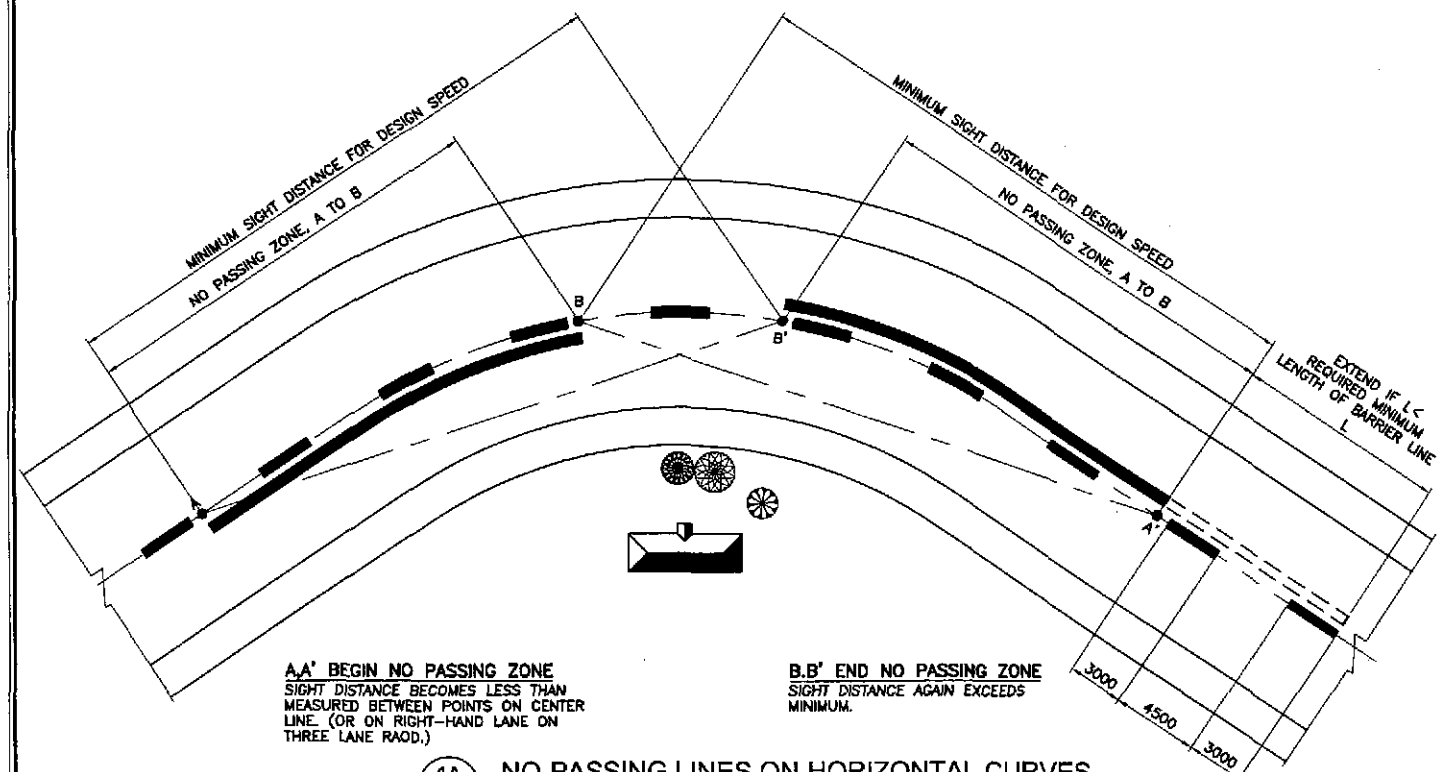
1D CHEVRON MARKINGS NEAR OBSTRUCTION
 RS-17 NOT TO SCALE

	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



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

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

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

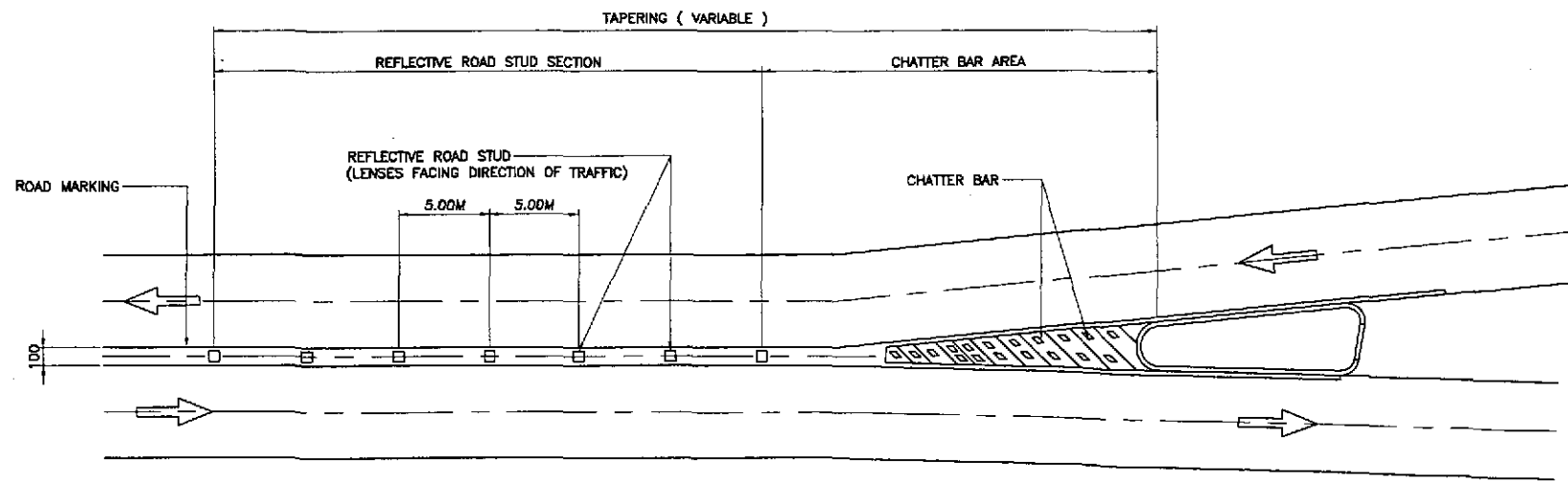
1 STANDARD PAVEMENT MARKINGS
 RS-17 NOT TO SCALE

JICA
 JAPAN INTERNATIONAL COOPERATION AGENCY

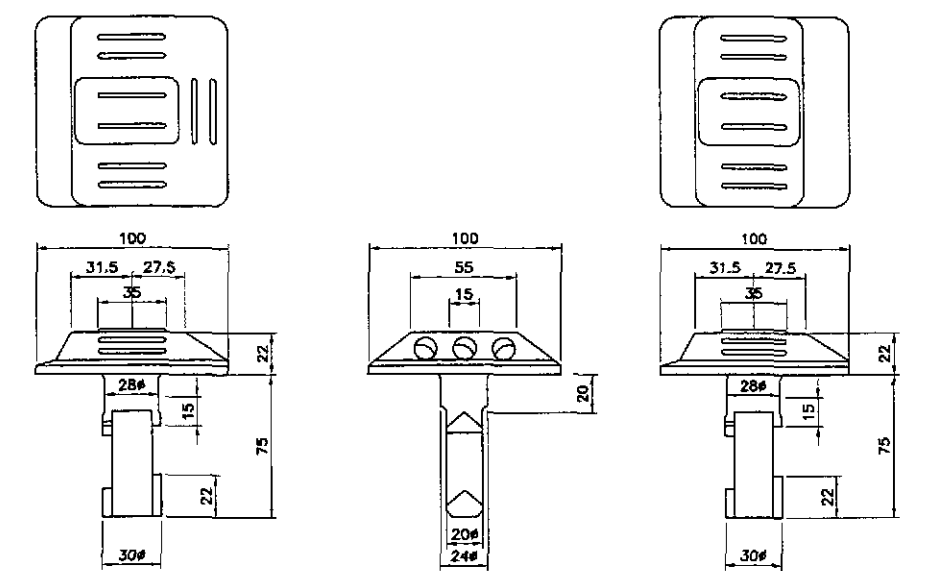
KATAHIRA & ENGINEERS
YEO YACHIYO ENGINEERING CO., LTD.

DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES	DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
DESIGNED 7/7/01	S. LUNA	PJHL - PMO	BUREAU OF DESIGN
CHECKED 7/9/02	S. GARCIA	Submitted By:	Reviewed By:
SUBMITTED 7/10/02	M. R. GARCIA	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division
		GILBERTO S. REYES OC, Director IV	Recommended By:
		MANUEL M. BONDAN Undersecretary	Approved By:
		SMEON 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 (Pilaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	STANDARD PAVEMENT MARKINGS (2 OF 2)	RS-17
SAN JOSE BYPASS	FULL SIZE A1		



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

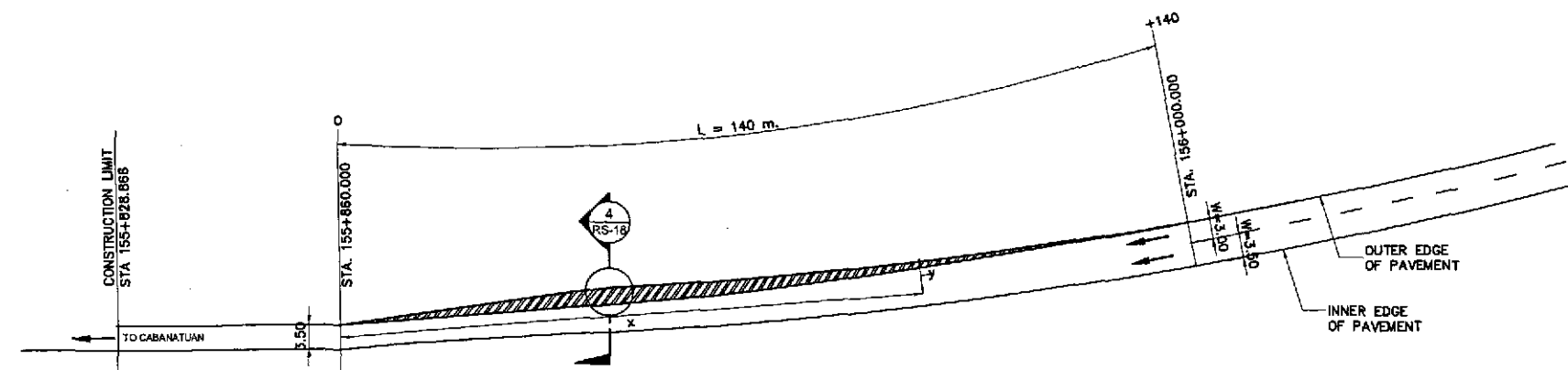


WITH LENS ON ONE SIDE WITH LENSES ON TWO SIDES

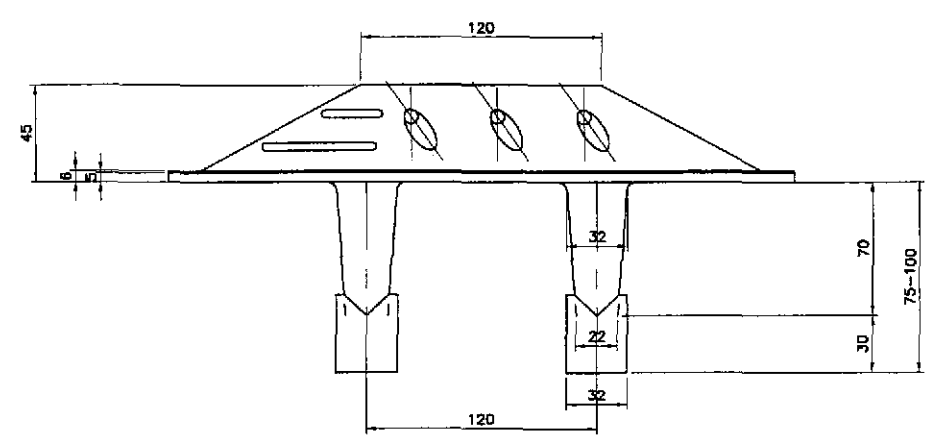
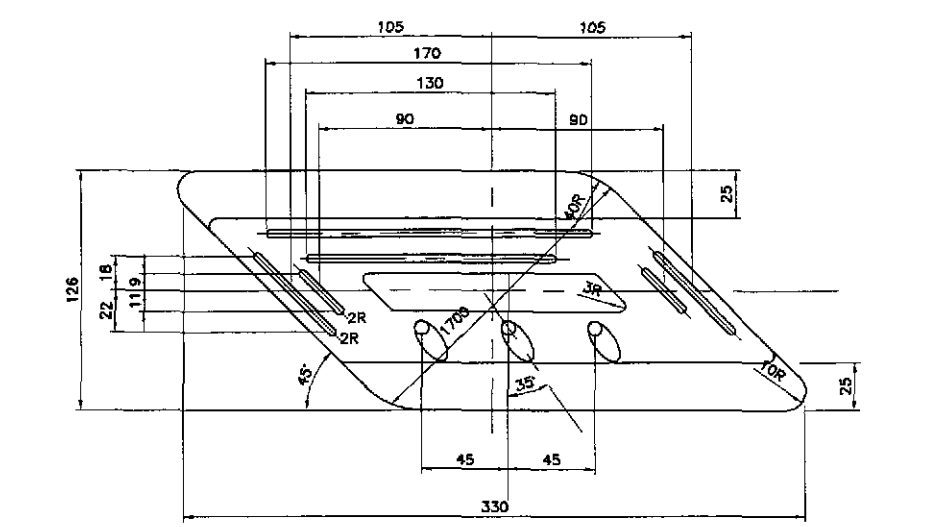
TABLE OF OFFSETS FOR CHEVRON ALONG STA. 155+860.00 TO STA. 156+000.00
(BASED FROM ROAD WAY TAPERING, REVERSED PARABOLIC CURVE, SYMMETRICAL SHEET NO. RS-01)

DIST. (m) (x)	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
OFFSET (m) (y)	0	0.033	0.123	0.278	0.494	0.768	1.104	1.500	1.893	2.232	0.251	2.721	2.874	2.964	3.00

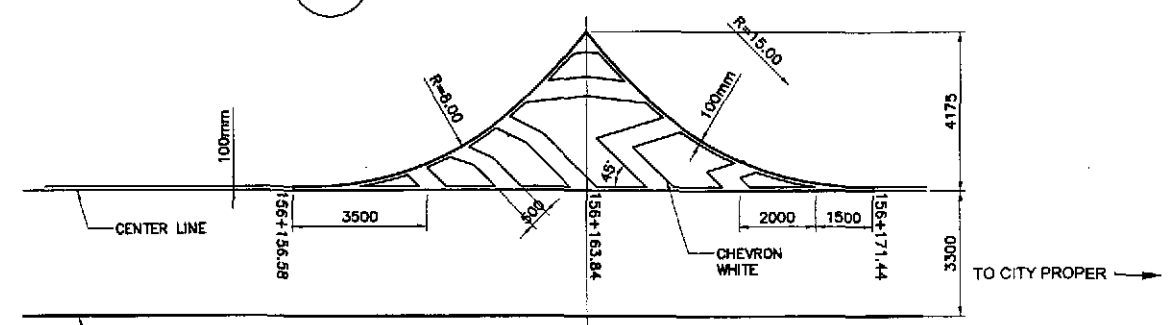
6 REFLECTIVE ROAD STUDS FOR CONCRETE
(WITH LENSES ON ONE-SIDE/TWO SIDED)
RS-18 NOT TO SCALE



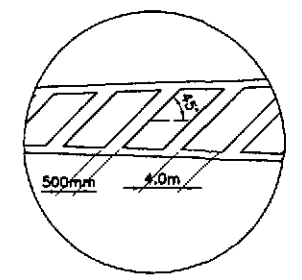
2 DETAILED LAYOUT OF CHEVRON MARKING
RS-18 NOT TO SCALE



5 CHATTER BAR (WITH LENSES ON ONE-SIDE)
RS-18 NOT TO SCALE



1 CHEVRON DETAILS ALONG A1-1
RS-18 NOT TO SCALE

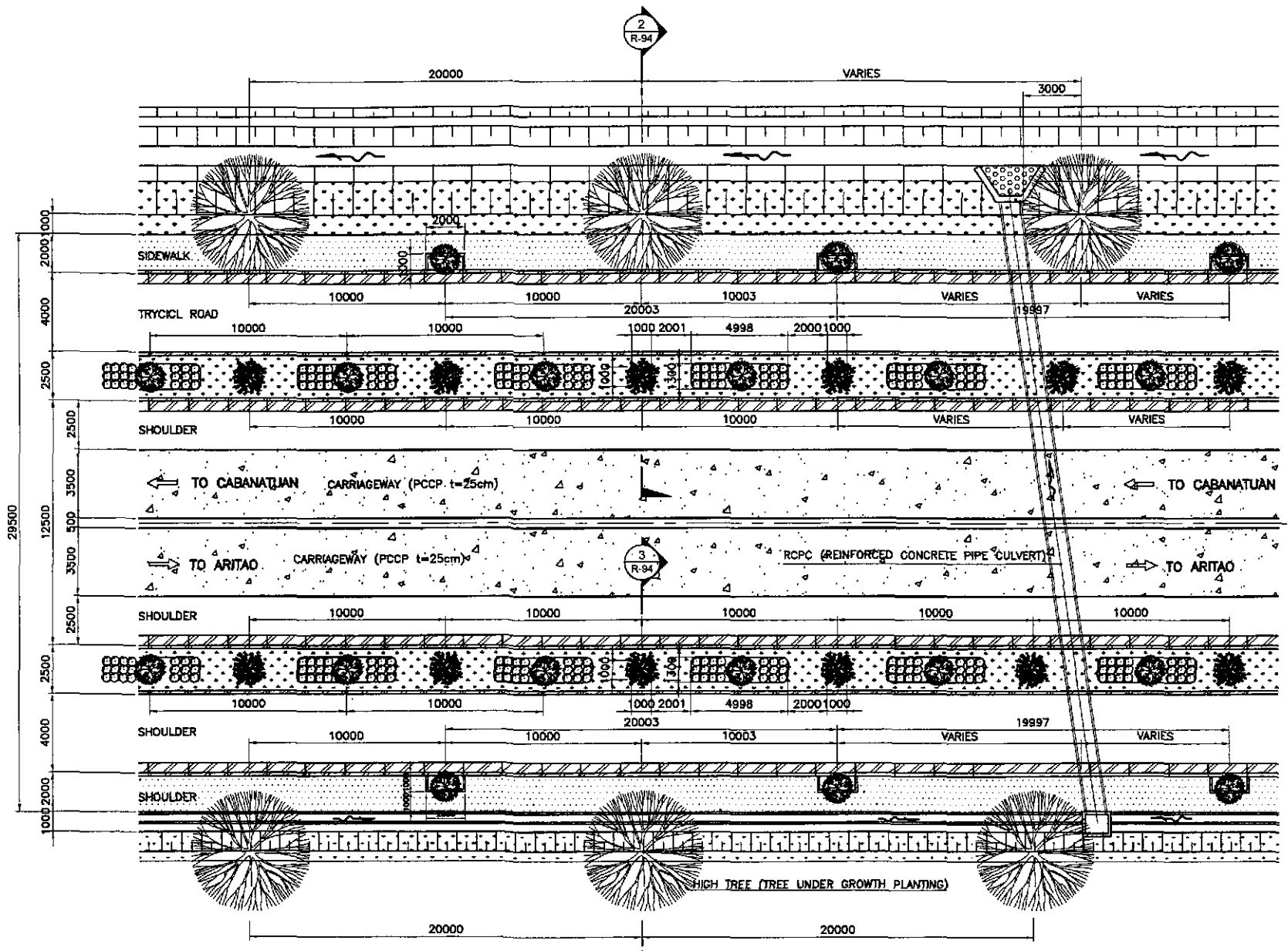


4 DETAIL
RS-18 NOT TO SCALE

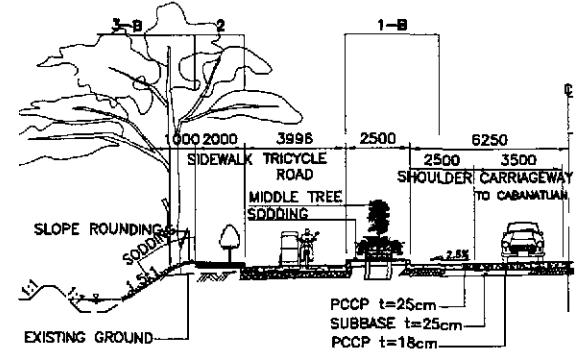
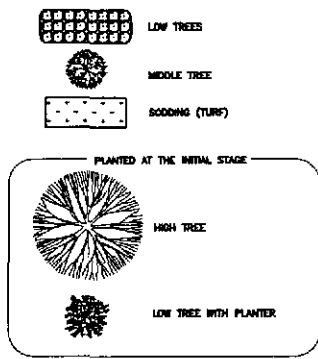
JICA
JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS
YEO YACHIYO ENGINEERING CO., LTD.

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
BUREAU OF DESIGN
OFFICE OF THE SECRETARY
DESIGNED: 9/6/02
CHECKED: 9/9/02
SUBMITTED: 9/10/02
DATE: 9/10/02
SIGNATURE: [Signatures]
PROJECT DIRECTOR: DANILO C. TRAJANO
CHIEF, HIGHWAYS DIVISION: JOSEFINA M. ALAGAR
DC, DIRECTOR IV: GILBERTO S. REYES
RECOMMENDED BY: MANUEL M. BONGAN
UNDERSECRETARY: SIMEON A. DATUMANONG
SECRETARY

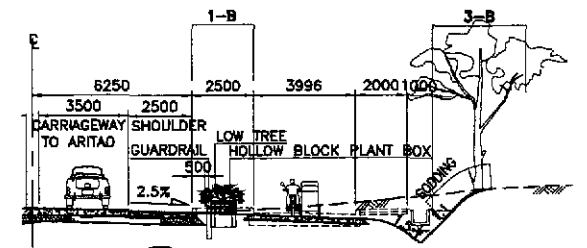
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)
SAN JOSE BYPASS
SCALE : AS SHOWN
SHEET CONTENTS : REFLECTIVE ROAD STUDS AND CONCRETE CHATTER BAR AND DETAILS
SHEET NO. : RS-18



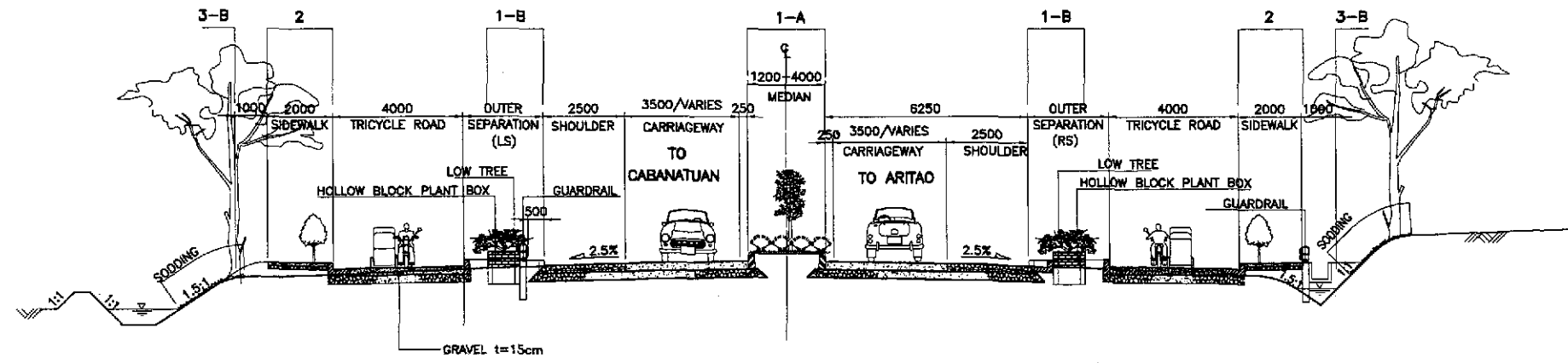
1 TYPICAL PLANTING LAYOUT
SCALE: 1:150



2 EMBANKMENT SECTION
SCALE: NOT TO SCALE



3 CUT SECTION
SCALE: NOT TO SCALE



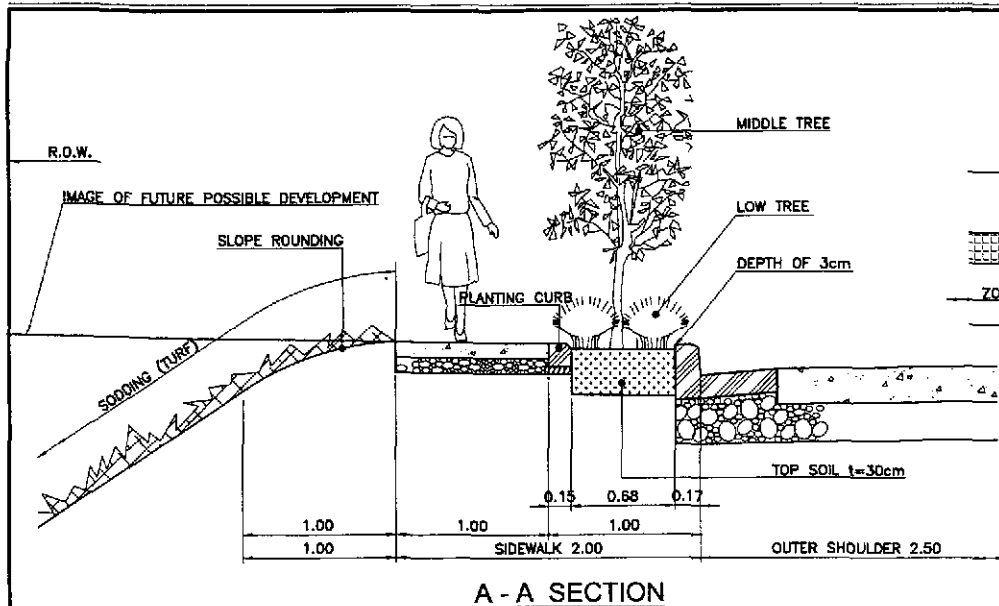
4 GENERAL PLANTING LOCATION (ALONG INTERSECTION)
SCALE: NOT TO SCALE

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

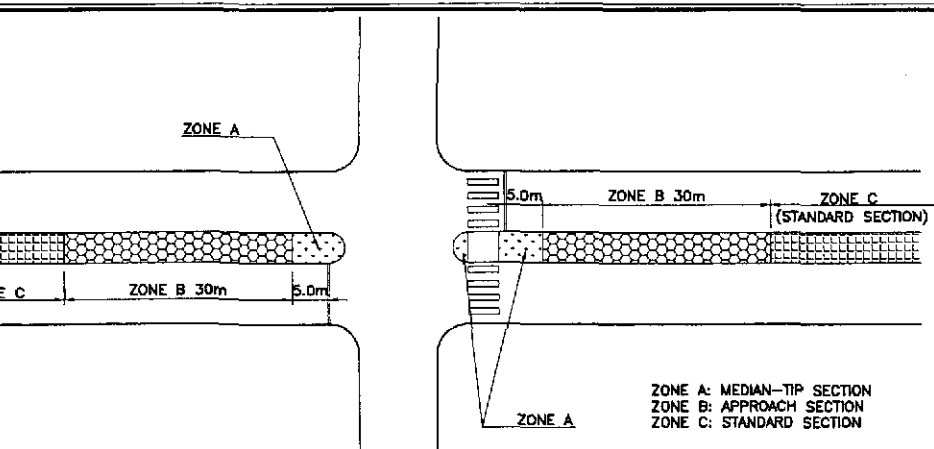
DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			
DESIGNED 9/2/01	S. DIAZ	BUREAU OF DESIGN		OFFICE OF THE SECRETARY	
CHECKED 9/9/01	S. DIAZ	Submitted By:	Reviewed By:	Recommended By:	Approved By:
SUBMITTED 9/11/01	M. KILGUS TEAM LEADER	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highway Division	GILBERTO S. REYES Dir. Director IV	SIMEON A. DATUMANONG Secretary

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

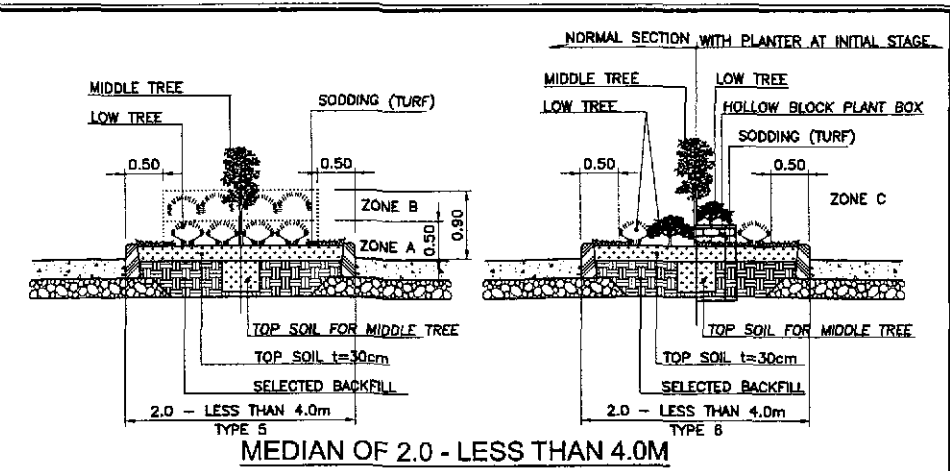
SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : TYPICAL PLANTING LAYOUT (ULTIMATE STAGE)	SHEET NO. : RS-19
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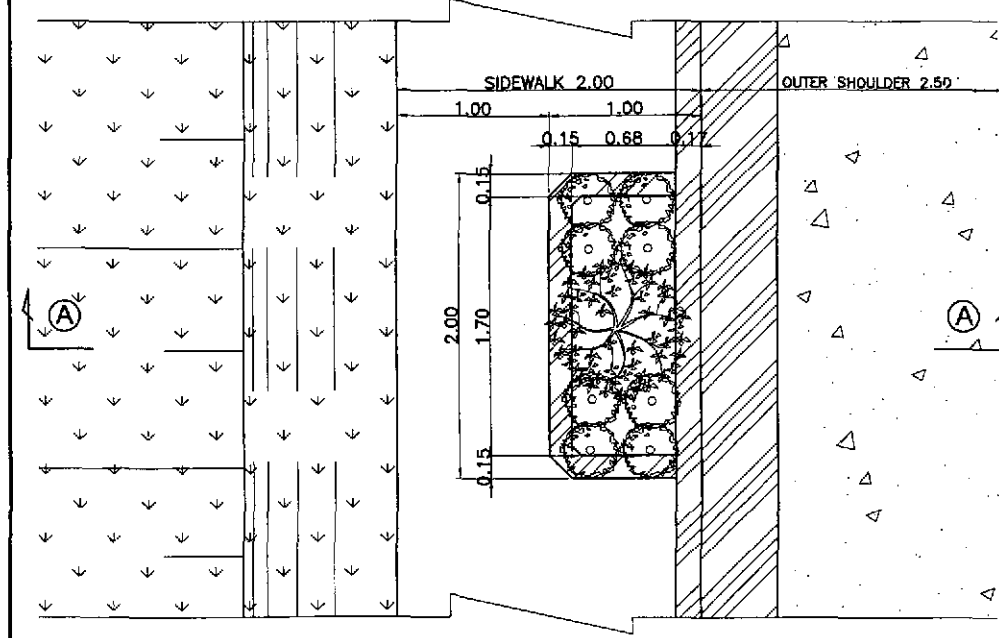
A - A SECTION



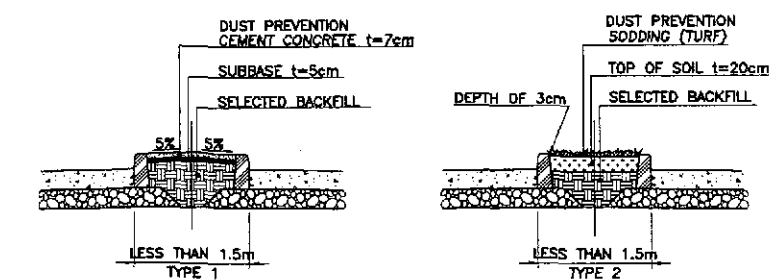
DISTRICT CHART OF PLANTING ARRANGEMENT IN THE MEDIAN



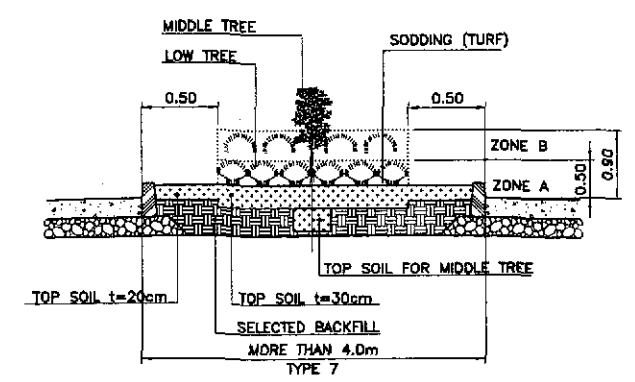
MEDIAN OF 2.0 - LESS THAN 4.0M



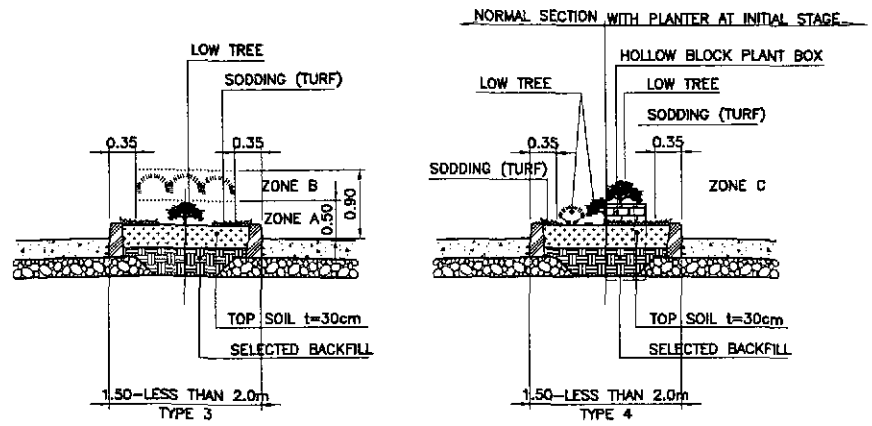
(ARRANGEMENT OF LOW TREES AND MIDDLE TREE)



MEDIAN OF LESS THAN 1.5M



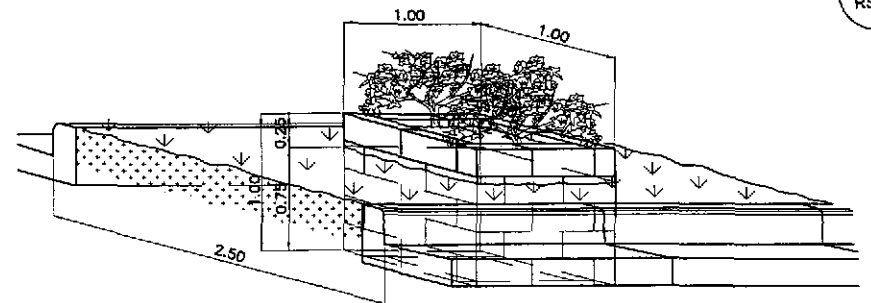
MEDIAN OF MORE THAN 4.0M



MEDIAN OF 1.5 - LESS THAN 2.0M

1 PLAN OF SIDEWALK PLANTATION
RS-20 NOT TO SCALE

2 STANDARD PLANTING FORM
ACCORDING TO MEDIAN WIDTH
RS-20 NOT TO SCALE



3 ISOMETRIC VIEW OF HOLLOW BLOCK PLANT BOX
RS-20 NOT TO SCALE

	DATE	SIGNATURE				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	9/2/02	S. LUNA	REPUBLIC OF THE PHILIPPINES 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) SAN JOSE BYPASS	AS SHOWN FULL SIZE A1	TYPES OF PLANTING FORMS AND OTHER DETAILS (ULTIMATE STAGE)	RS-20
	CHECKED	9/9/02	S. JOSE	BUREAU OF DESIGN OFFICE OF THE SECRETARY						
SUBMITTED	9/11/02	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				