

TABLE OF COORDINATES			
CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
1	1717858.992	497197.422	EDGE OF 3.50m WIDE PAVEMENT
2	1717908.15	497162.997	EDGE OF 3.50m WIDE PAVEMENT
3	1717906.023	497180.215	BEG. OF TAPER
4	1717940.331	497130.773	END OF TAPER, PAVEMENT WIDTH 7.00m
5	1717983.435	497088.077	BEG. OF MEDIAN RADIUS 4.50
6	1717988.75	497095.34	END OF MEDIAN RADIUS 4.50
7	1717998.45	497096.915	BEG. OF CORNER RADIUS 12
8	1718012.276	497096.67	END OF CORNER RADIUS 12
9	1718031.243	497109.544	LIMIT OF 2.50m WIDE SHOULDER/BEG. OF TAPER
10	1718066.558	497128.739	END OF TAPER, LANE WIDTH 3.05m
10a	1718085.450	497137.876	LIMIT OF CONSTRUCTION
11	1718068.271	497126.216	LIMIT OF CONSTRUCTION
12	1718035.174	497103.752	END OF MEDIAN RADIUS 1.25
13	1718016.855	497091.318	END OF MEDIAN RADIUS 1.25
14	1718015.451	497093.387	END OF MEDIAN RADIUS 1.25
15	1718033.77	497105.821	END OF MEDIAN RADIUS 1.25
16	1718089.984	497123.692	BEG. OF TAPER, LANE WIDTH 3.05m
17	1718060.703	497116.028	BEG. OF CORNER RADIUS 6
18	1718059.726	497107.797	END OF CORNER RADIUS 6
19	1718060.126	497107.266	LIMIT OF 1.50m WIDE SHOULDER
20	1718129.332	497043.060	LIMIT OF CONSTRUCTION
21	1718058.127	497105.784	BEG. OF CORNER RADIUS 6/LIMIT OF 1.50m WIDE SHOULDER
22	1718049.51	497106.786	END OF RADIUS 6
23	1718039.004	497098.11	LIMIT OF 2.50m WIDE SHOULDER
24	1718037.514	497098.88	END OF TAPER, PAVEMENT WIDTH 7.00m
25	1718029.01	497091.108	BEG. OF CORNER RADIUS 10
26	1718028.72	497074.764	END OF CORNER RADIUS 10
27	1718016.668	497068.094	BEG. OF MEDIAN RADIUS 4.50
28	1718021.983	497075.357	END OF CORNER RADIUS 4.50
29	1718108.784	497016.173	EDGE OF 3.50m WIDE PAVEMENT
30	1718156.486	496979.731	EDGE OF 3.50m WIDE PAVEMENT
31	1718186.678	496953.285	END OF TRANSITION/CENTER OF TWO LANE PAVEMENT
32	1718154.538	496974.946	CENTER OF MEDIAN RADIUS 1.00

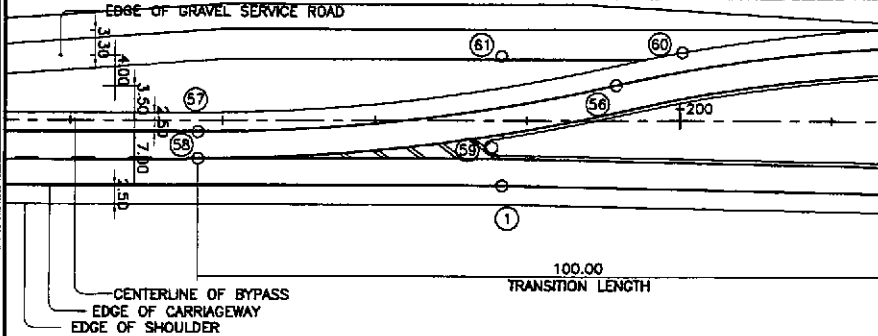
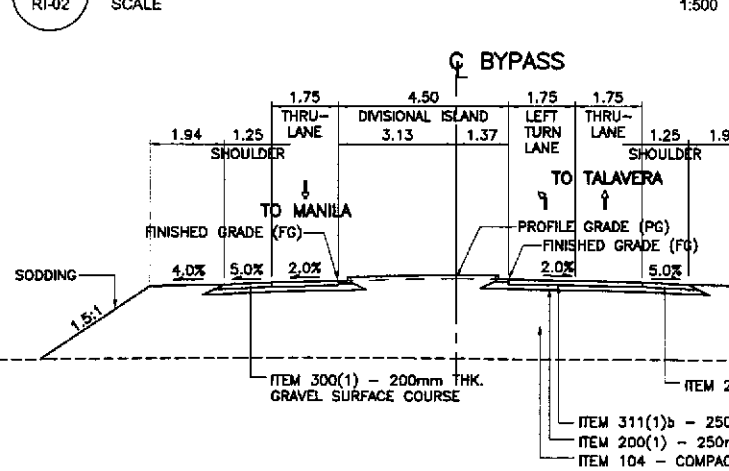
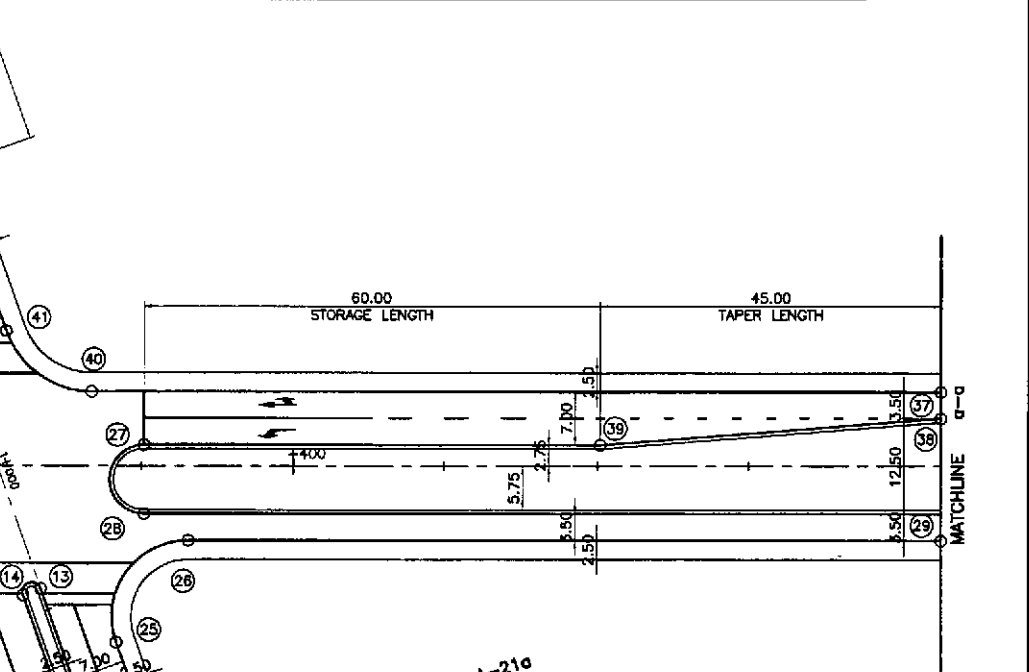
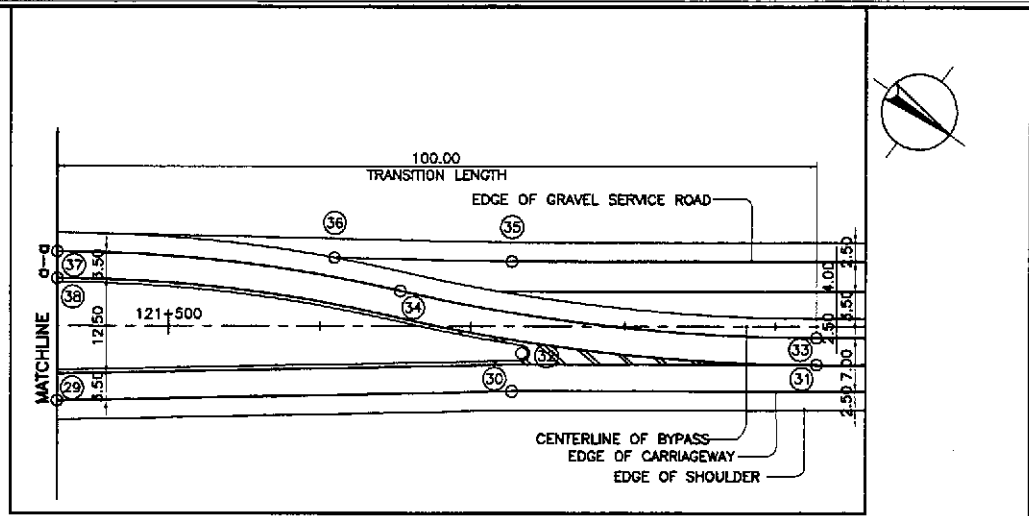


TABLE OF COORDINATES			
CONTROL POINT	COORDINATES		REMARKS
	NORTHING	EASTING	
33	1718184.612	496950.46	EDGE OF PAVEMENT 1.50m FROM THE CENTERLINE W/ RADIUS 246.50
34	1718136.774	496977.832	INTERSECTION OF RADIUS 246.50 & 203.57
35	1718146.426	496966.012	EDGE OF 4.00m WIDE FRONTAGE
36	1718127.184	496979.487	INTERSECTION OF SERVICE & SHOULDER
37	1718097.268	497000.437	EDGE OF 3.50m WIDE PAVEMENT
38	1718099.335	497003.261	BEG. OF TAPER
39	1718065.087	497032.661	END OF TAPER/BEG. OF STORAGE
40	1718006.968	497066.518	BEG. OF CORNER RADIUS 12
41	1717993.142	497066.764	END OF CORNER RADIUS 12
42	1717974.175	497053.89	LIMIT OF 2.50m WIDE SHOULDER
43	1717938.86	497034.694	END OF TAPER
44	1717919.967	497025.558	LIMIT OF CONSTRUCTION
45	1717937.147	497037.218	CENTERLINE INTERSECTION
46	1717971.648	497057.613	BEG. OF TAPER
47	1717970.244	497059.682	BEG. OF TAPER
48	1717989.967	497070.047	END OF MEDIAN RADIUS 1.25
49	1717988.561	497072.114	END OF MEDIAN RADIUS 1.25
50	1717935.434	497039.742	BEG. OF TAPER
51	1717966.414	497065.324	LIMIT OF 2.50m WIDE SHOULDER
52	1717967.904	497066.554	END OF TAPER
53	1717976.408	497072.326	BEG. OF RADIUS 10
54	1717976.698	497088.67	END OF RADIUS 10
55	1717896.634	497147.261	BEG. OF TRANSITION RADIUS 203.57
56	1717863.138	497178.078	INTERSECTION OF TRANSITION RADIUS 203.57 & 246.50
57	1717822.578	497215.395	END OF TRANSITION RADIUS 246.50
58	1717824.645	497218.219	CENTERLINE INTERSECTION
59	1717855.014	497194.137	CENTER OF MEDIAN RADIUS 1.00
60	1717867.624	497169.431	INTERSECTION OF EDGE OF SERVICE ROAD & SHOULDER
61	1717848.893	497183.746	EDGE OF SERVICE ROAD

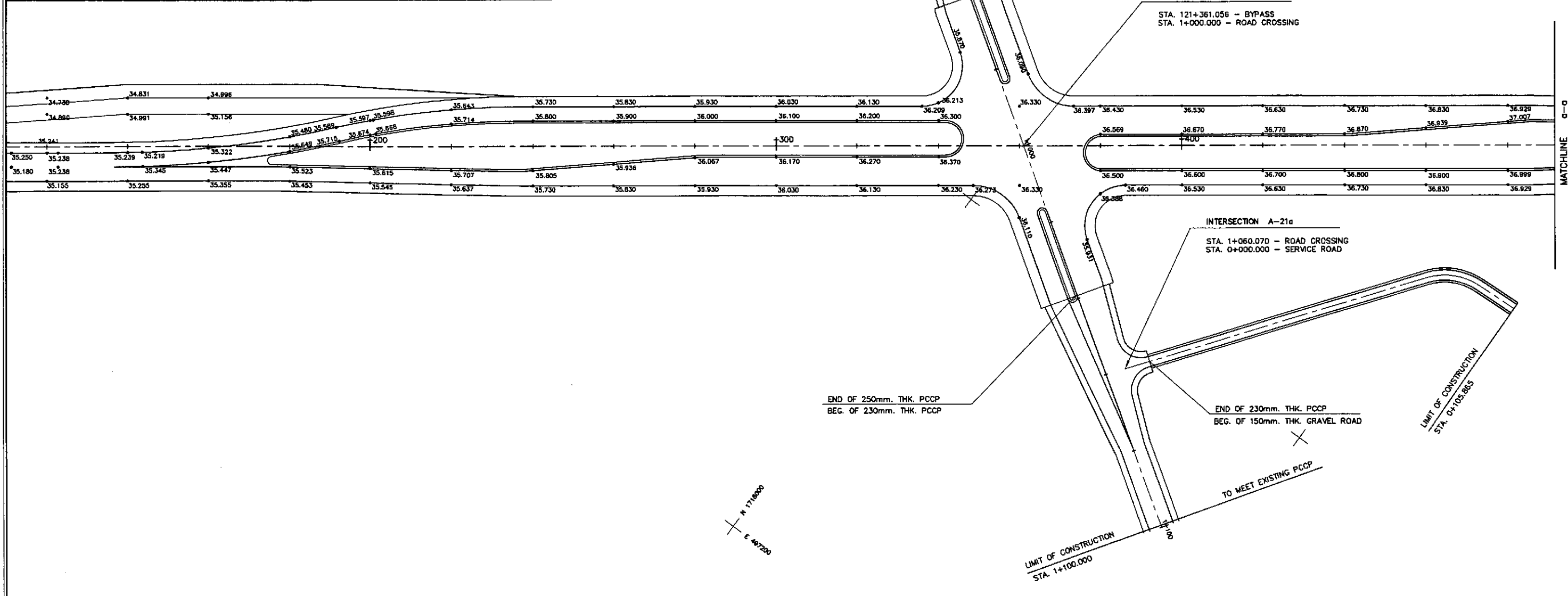
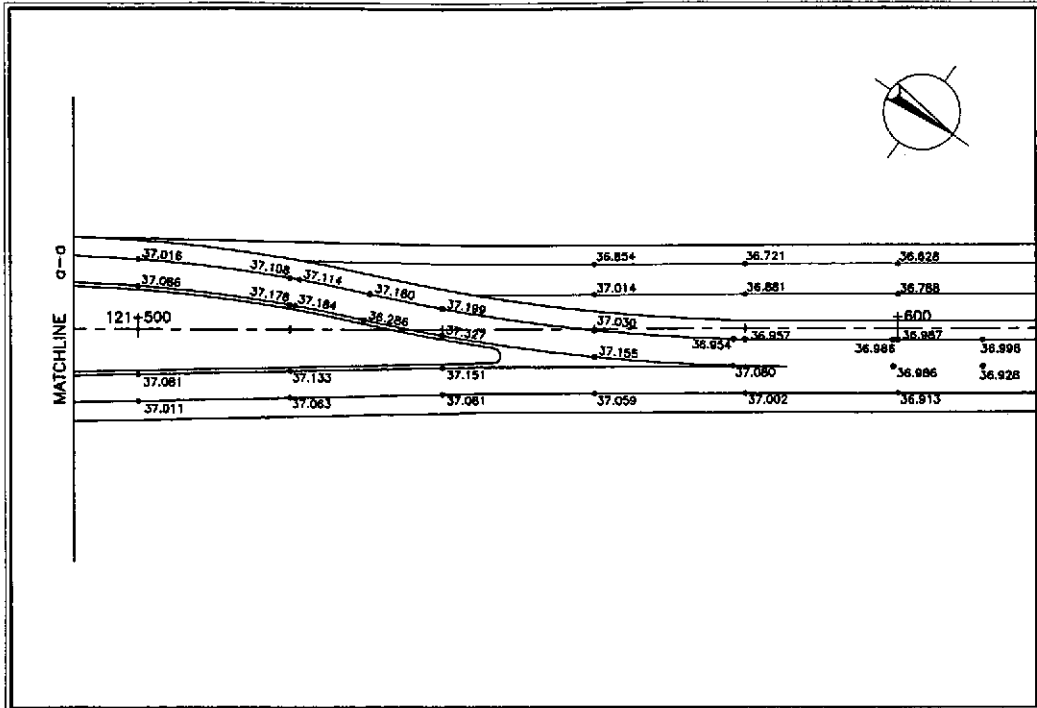
**GEOMETRIC DESIGN LAYOUT
INTERSECTION A-21 (STA. 121+361.056)
A-21a (STA. 1+060.070) - INITIAL STAGE**



1a SECTION
RI-02 SCALE 1:200



<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p>		<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</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>SCALE : 1:500 FULL SIZE A1</p>	<p>SHEET CONTENTS : INTERSECTION DETAIL GEOMETRIC DESIGN LAYOUT INTERSECTION A-21 & A-21a (INITIAL STAGE)</p>	<p>SHEET NO. : RI-02</p>
DESIGNED	DATE	SIGNATURE	PJHL - PMO	BUREAU OF DESIGN	OFFICE OF THE SECRETARY		
CHECKED	10/17/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:		
SUBMITTED	10/19/02	<i>[Signature]</i>	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
RI-03

PAVING AND GRADING PLAN
INTERSECTION A-21 (STA. 121+361.056) - INITIAL STAGE

SCALE

1:500

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

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

DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				
DESIGNED 10/18/02	[Signature]	BUREAU OF DESIGN		OFFICE OF THE SECRETARY		
CHECKED 10/14/02	[Signature]	Submitted By:	Reviewed By:	Recommended By:	Recommended By:	Approved By:
SUBMITTED 10/19/02	[Signature]	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONGAN Undersecretary	SIMEDON A. DATUMANONG Secretary

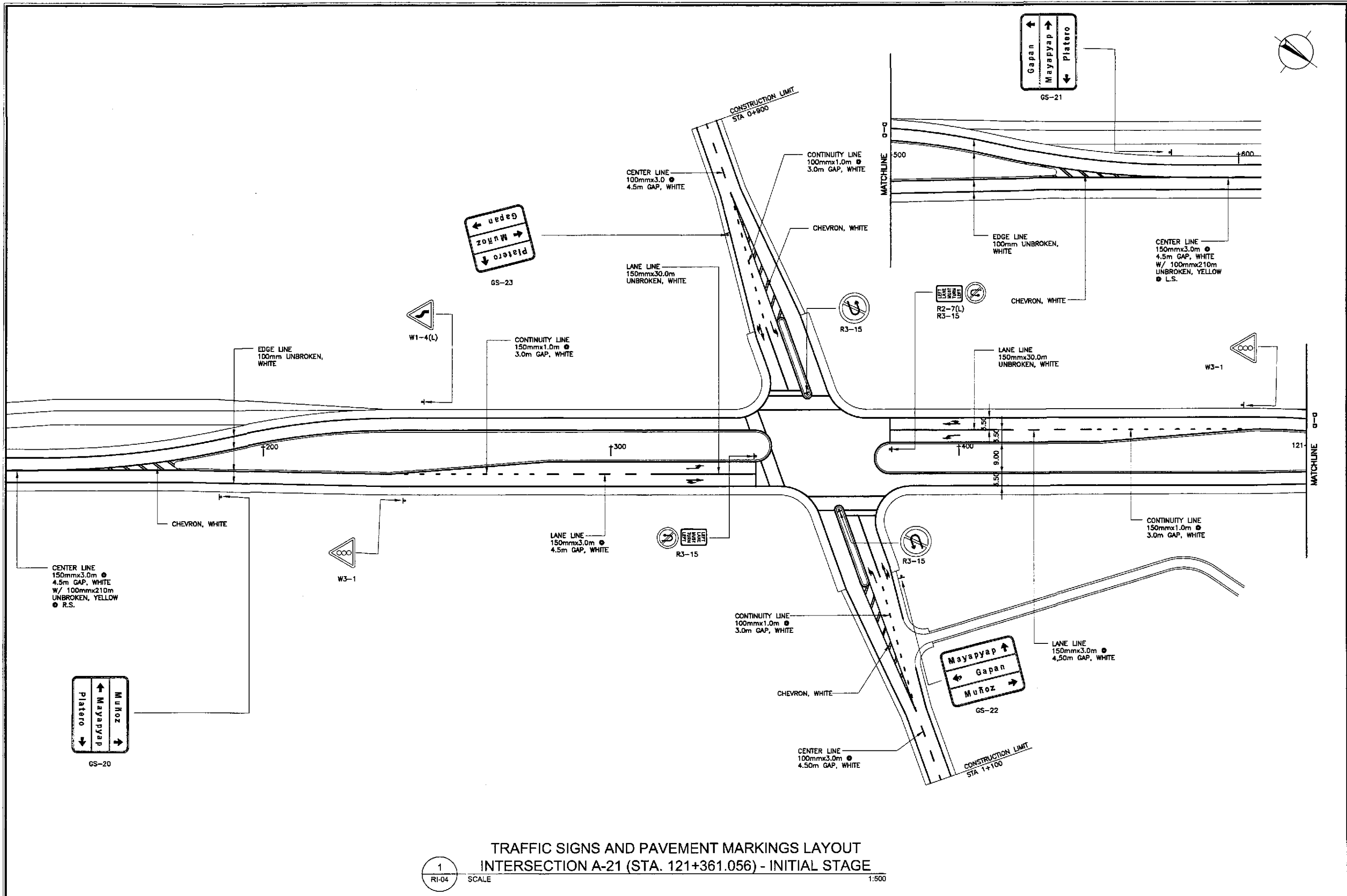
PROJECT AND LOCATION :
THE DETAILED DESIGN STUDY ON
UPGRADING INTER-URBAN HIGHWAY SYSTEM
ALONG THE PAN-PHILIPPINE HIGHWAY
(Plaridel, Cabanatuan and San Jose Bypasses)

CABANATUAN BYPASS - CONTRACT PACKAGE III

SCALE :
1:500
FULL SIZE A1

SHEET CONTENTS :
INTERSECTION DETAIL
PAVING AND GRADING PLAN
INTERSECTION A-21 (INITIAL STAGE)

SHEET NO. :
RI-03



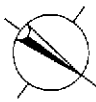
TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT
 INTERSECTION A-21 (STA. 121+361.056) - INITIAL STAGE

1
RI-04

SCALE

1:500

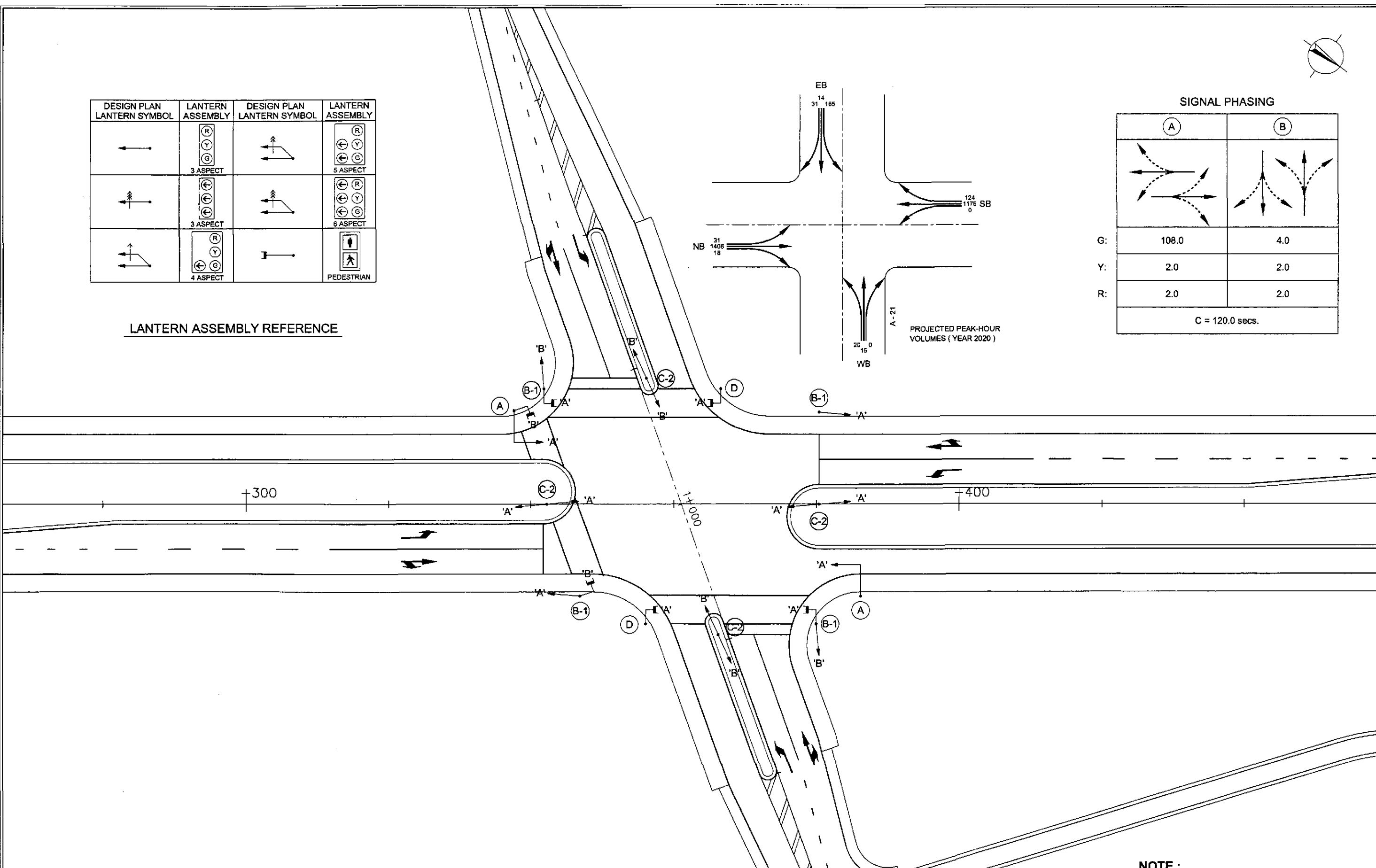
	DESIGNED	10/8/02	<i>[Signature]</i> S. LUNA		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : 1:500 FULL SIZE A1	SHEET CONTENTS : TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT INTERSECTION A-21 (INITIAL STAGE)	SHEET NO. : RI-04	
	CHECKED	10/14/02	<i>[Signature]</i> S. ROSE		Submitted By:	Reviewed By:	Recommended By:					Office of the Secretary
	SUBMITTED	10/14/02	<i>[Signature]</i> M. BONDAN		Project Director	Chief, Highways Division	Undersecretary					Secretary



DESIGN PLAN LANTERN SYMBOL	LANTERN ASSEMBLY	DESIGN PLAN LANTERN SYMBOL	LANTERN ASSEMBLY

LANTERN ASSEMBLY REFERENCE

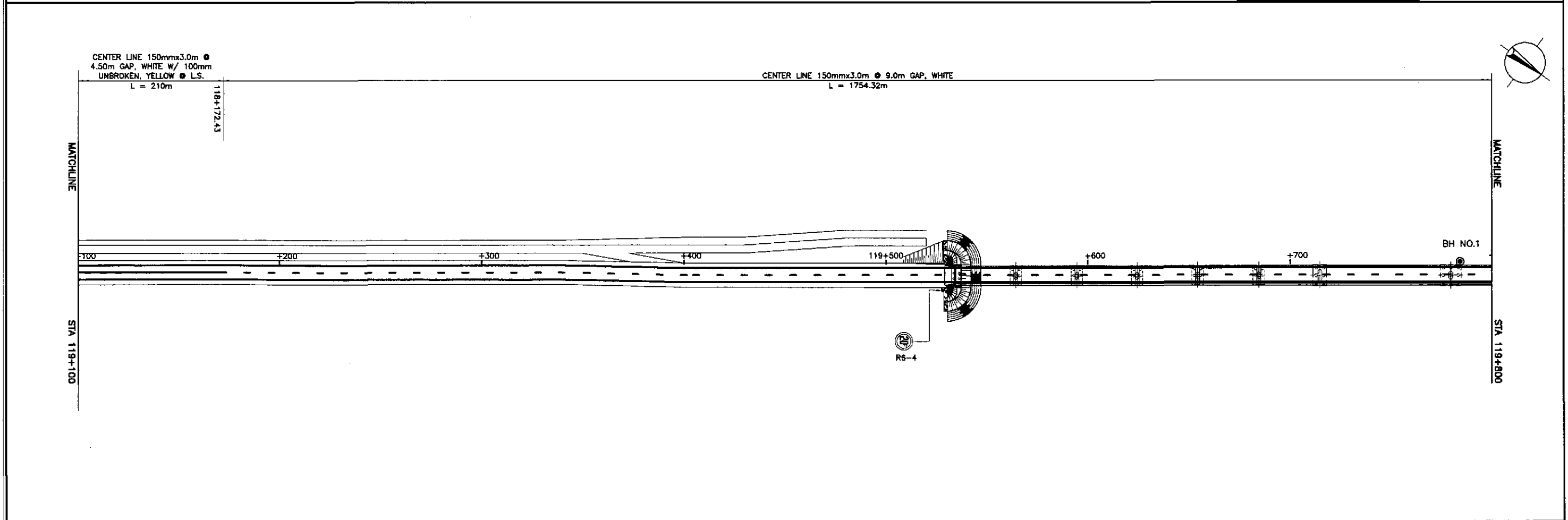
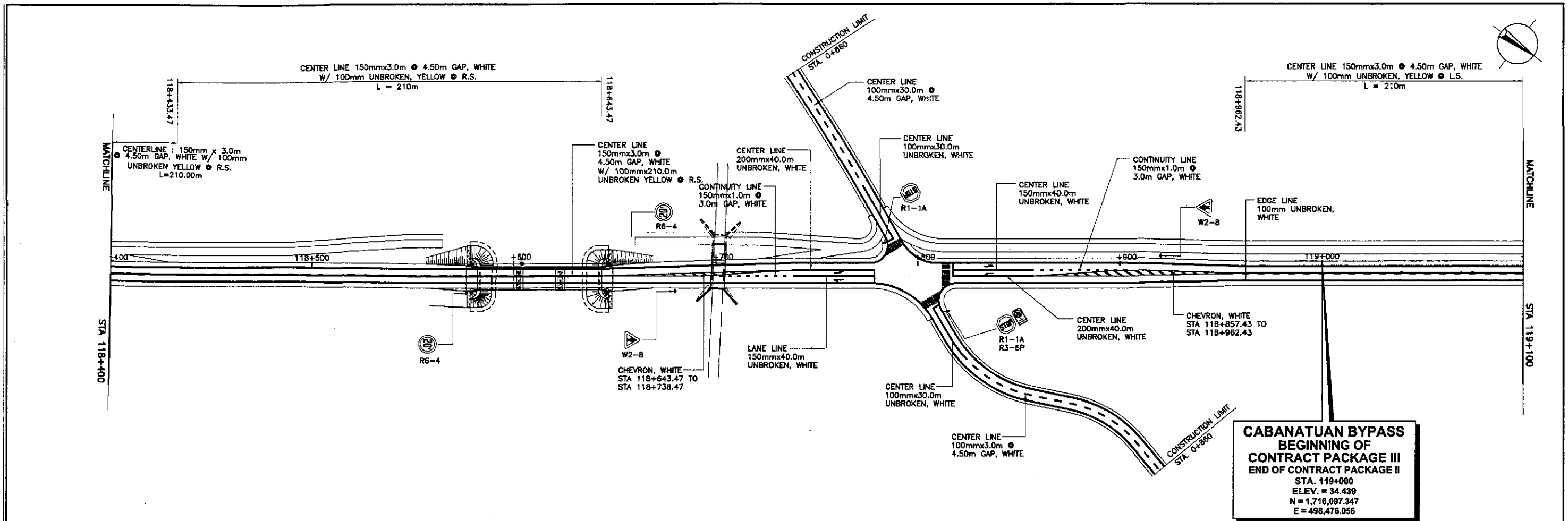
SIGNAL PHASING	
(A)	(B)
G: 108.0	4.0
Y: 2.0	2.0
R: 2.0	2.0
C = 120.0 secs.	



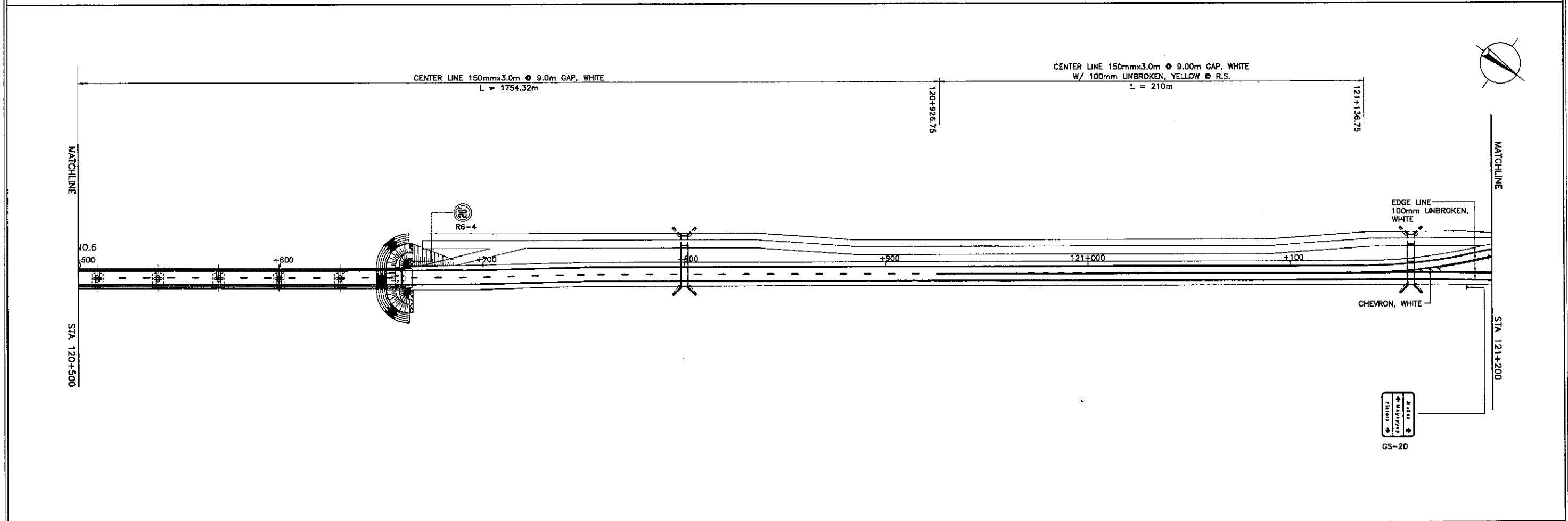
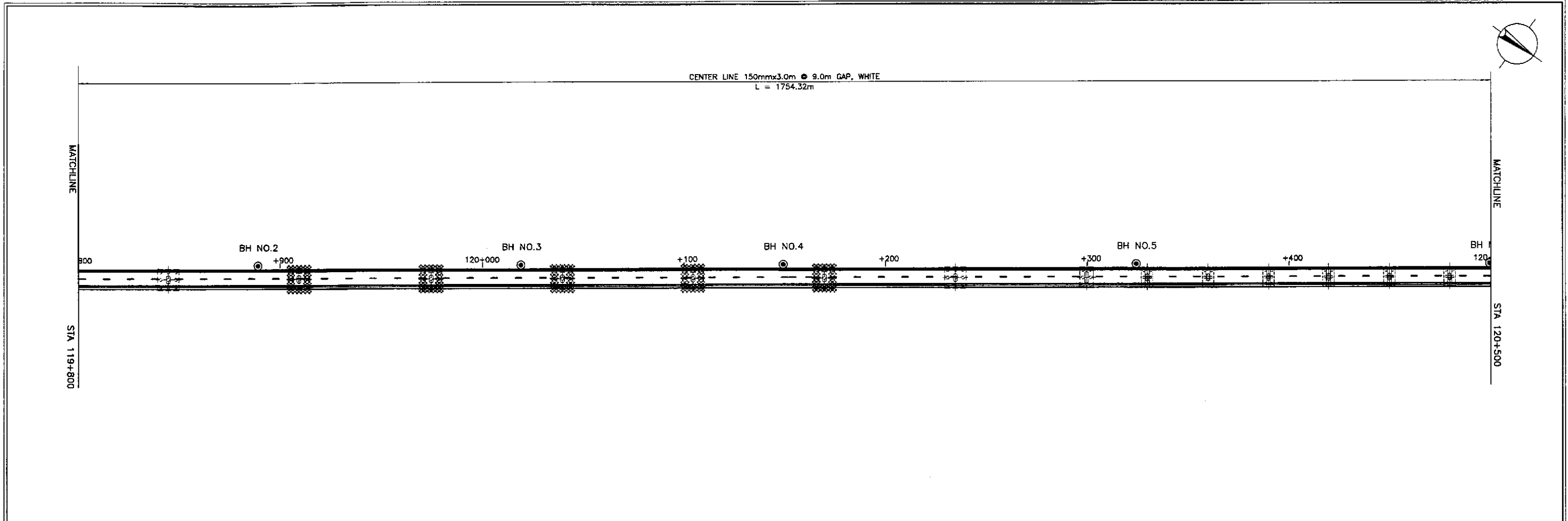
1 INTERSECTION A-21 (STA. 121+361.056) - INITIAL STAGE
RI-05 SCALE 1:250

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

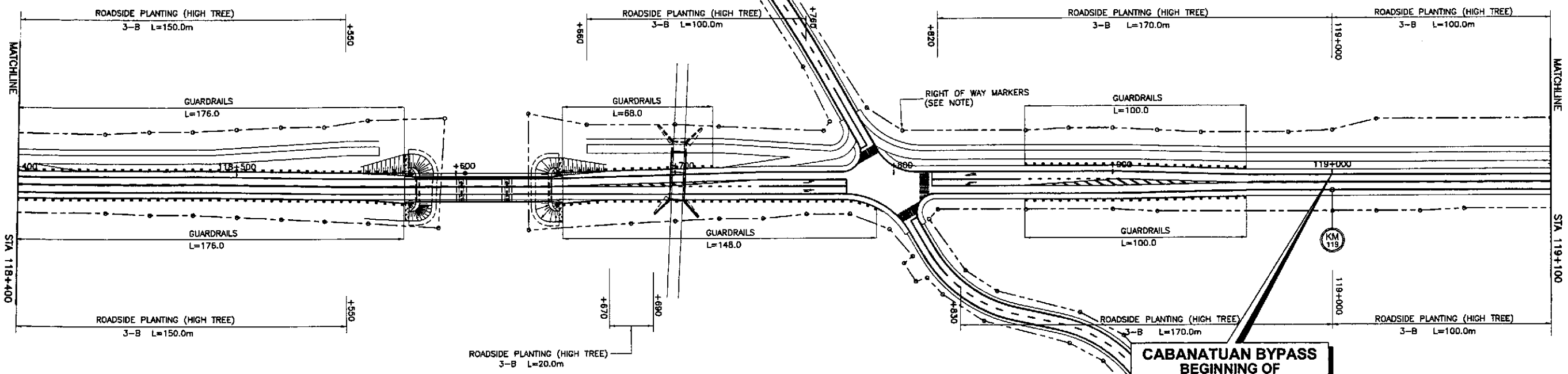
	DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/8/02		Submitted By:	Reviewed By:	Recommended By:	Recommended By:	1:250	TRAFFIC SIGNAL LIGHT LAYOUT INTERSECTION A-21 (INITIAL STAGE)	RI-05
CHECKED	10/17/02		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	CILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	FULL SIZE A1			
SUBMITTED	10/19/02		SIMEON A. DATUMANONG Secretary				CABANATUAN BYPASS - CONTRACT PACKAGE III			



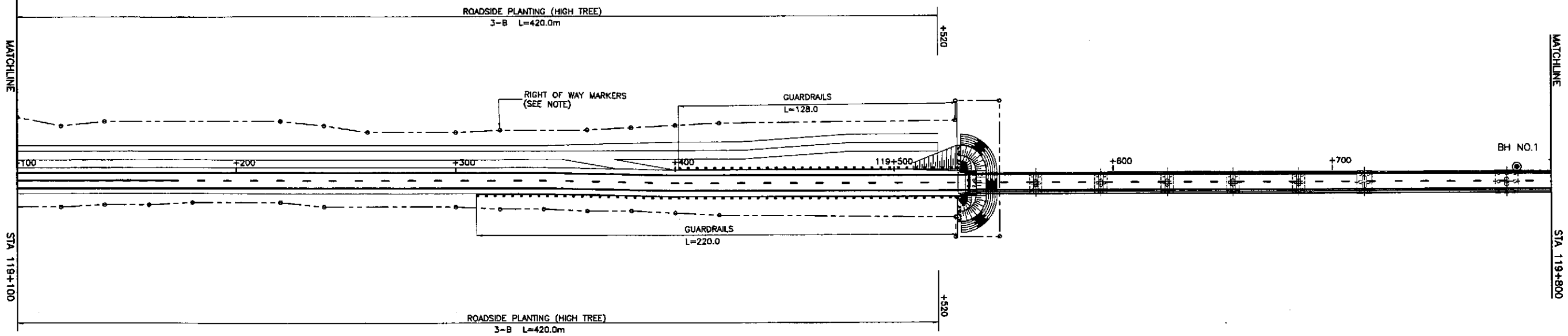
	DESIGNED	10/18/02	<i>[Signature]</i>		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : 1:1000 FULL SIZE A1	SHEET CONTENTS : TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT (INITIAL STAGE) STA. 119+000 - STA. 119+800	SHEET NO. : RM-01
	CHECKED	10/17/02	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:				
	SUBMITTED	10/19/02	<i>[Signature]</i>		DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV				



	DATE	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/8/02	S. LUNA	BUREAU OF DESIGN		OFFICE OF THE SECRETARY		1:1000 FULL SIZE A1	TRAFFIC SIGNS AND PAVEMENT MARKINGS LAYOUT (INITIAL STAGE) STA. 119+800 - STA. 121+200	RM-02
	CHECKED	10/17/02	S. GOSE	Submitted By:	Reviewed By:	Recommended By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)			
	SUBMITTED	10/19/02	M. KUBO	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	CABANATUAN BYPASS - CONTRACT PACKAGE III			
						Approved By: (See cover sheet for Signature/Approval) SIMEON A. DATUMANONG Secretary				

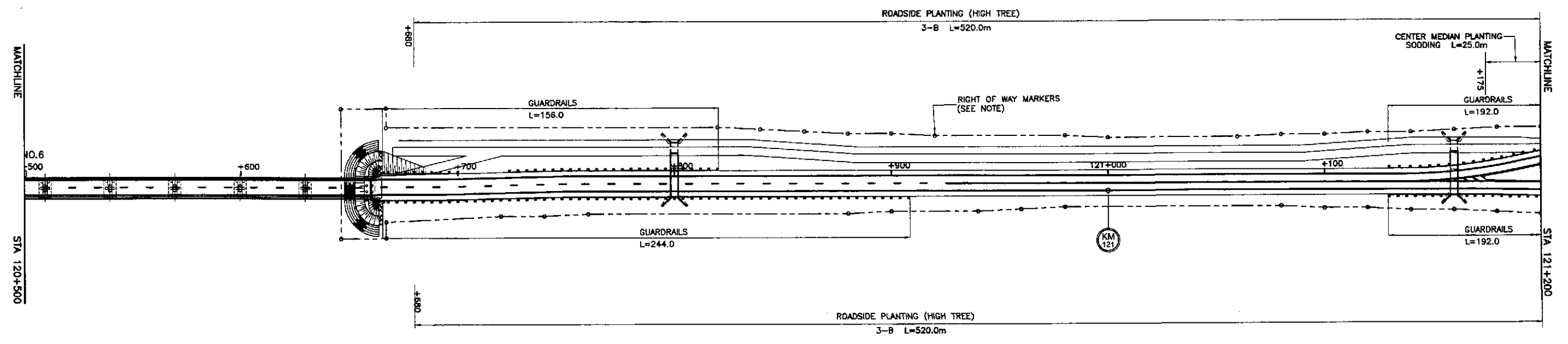
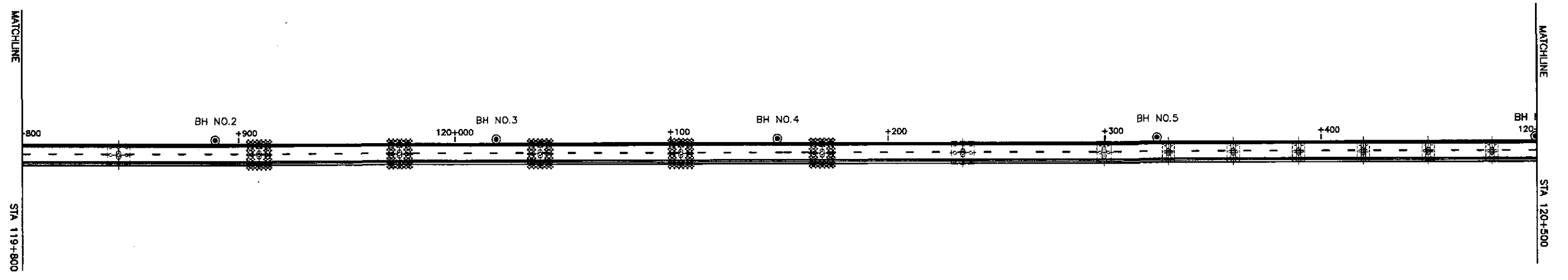


CABANATUAN BYPASS
BEGINNING OF
CONTRACT PACKAGE III
END OF CONTRACT PACKAGE II
 STA. 119+000
 ELEV. = 34.439
 N = 1,716,097.347
 E = 498,476.056



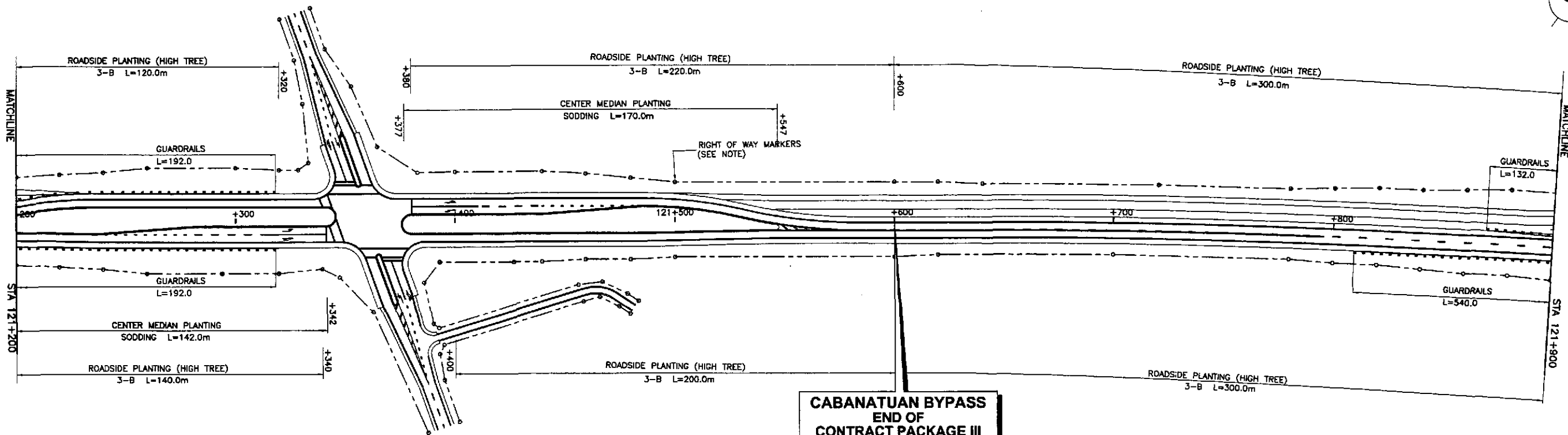
NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
 SEE SHEET NO. RG-06

 JAPAN INTERNATIONAL COOPERATION AGENCY KATAHIRA & ENGINEERS INTERNATIONAL YEO YACHIYO ENGINEERING CO., LTD.	DATE	SIGNATURE	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	DESIGNED	10/8/02		<i>S. Luna</i>	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)			1:1000	PLANTINGS, GUARDRAILS, RIGHT-OF-WAY KM. POSTS LAYOUT (INITIAL STAGE) STA. 119+000 - STA. 119+800
CHECKED	10/17/02	<i>S. Rose</i>	BUREAU OF DESIGN Submitted By: DANILD C. TRAJANO (Project Director) Reviewed By: JOSEFINA M. ALAGAR (Chief, Highways Division) Recommended By: GILBERTO S. REYES (DC, Director IV) Recommended By: MANUEL M. BONDAN (Undersecretary) Approved By: SIMEDN A. DATUMANONG (Secretary)			FULL SIZE A1			
SUBMITTED	10/19/02	<i>M. K. K.</i>	CABANATUAN BYPASS - CONTRACT PACKAGE III						

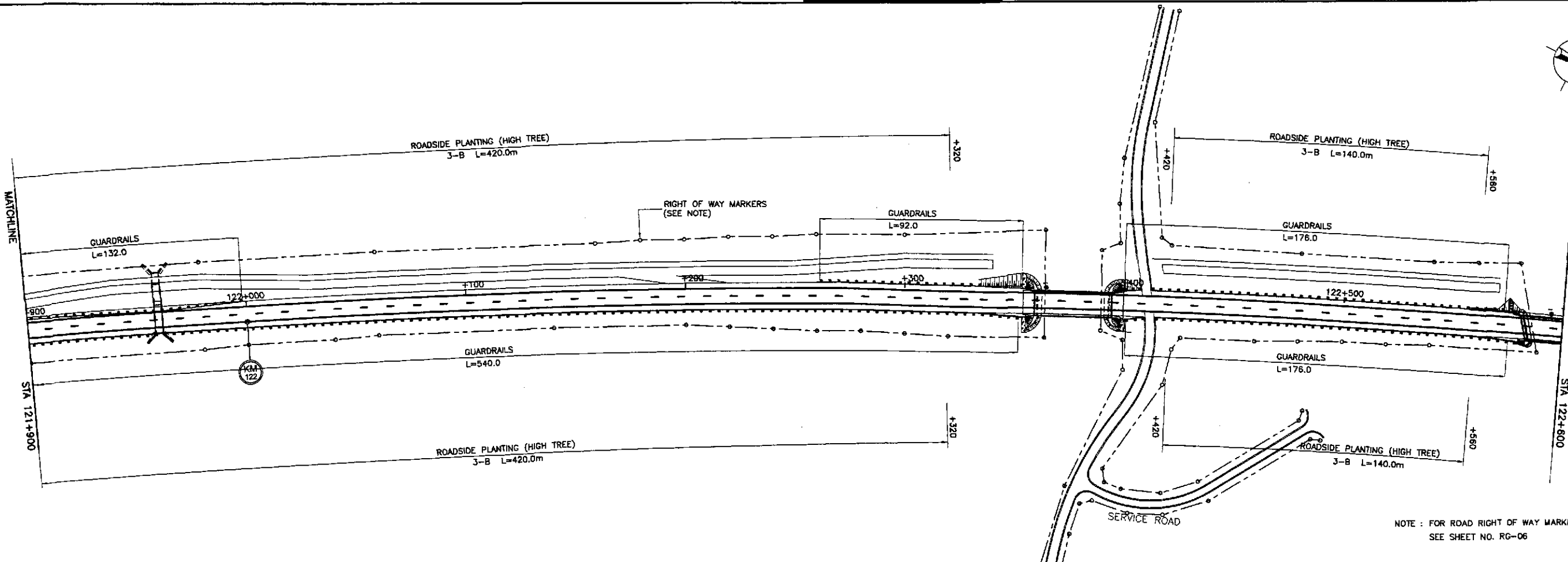


NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
SEE SHEET NO. RG-06

	DESIGNED	10/8/02		<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)			1:1000	PLANTINGS, GUARDRAILS, RIGHT-OF-WAY- & KM. POSTS LAYOUT (INITIAL STAGE) STA. 119+800 - STA. 121+200	RM-05
	SUBMITTED	10/19/02			CABANATUAN BYPASS - CONTRACT PACKAGE III			FULL SIZE A1		
<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, DKS, Director IV</p> <p>Recommended By: MANUEL M. BONOAN, Undersecretary</p> <p>Approved By: SIMEON A. DATUMANONG, Secretary</p>										

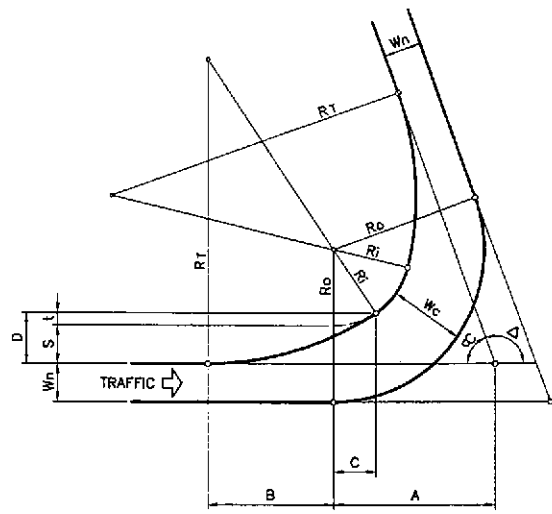


CABANATUAN BYPASS
END OF
CONTRACT PACKAGE III
BEG. OF CONTRACT PACKAGE IV
 STA. 121+600
 ELEV. = 37.083
 N = 1,718,195.536
 E = 496,940.607



NOTE : FOR ROAD RIGHT OF WAY MARKERS SCHEDULE
 SEE SHEET NO. RG-06

<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p> <p>KATAHIRA & ENGINEERS INTERNATIONAL</p> <p>YACHYO ENGINEERING CO., LTD.</p>	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :	
	DESIGNED	14/8/02		[Signature]	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)			1:1000	PLANTINGS, GUARDRAILS RIGHT-OF-WAY & KM. POSTS LAYOUT (INITIAL STAGE) STA. 121+200 - STA. 121+600	RM-06
	CHECKED	10/17/02		[Signature]	CABANATUAN BYPASS - CONTRACT PACKAGE III			FULL SIZE A1		
SUBMITTED	10/19/02	[Signature]	P.H.L. - PMD Submitted By: DANILO C. TRAJANO Project Director	BUREAU OF DESIGN Reviewed By: JOSEFINA M. ALAGAR Chief, Highways Division	OFFICE OF THE SECRETARY Recommended By: GILBERTO S. REYES OIC, Director IV	Approved By: MANUEL M. BONDAN Undersecretary	Approved By: SIMEDN 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.
- 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:

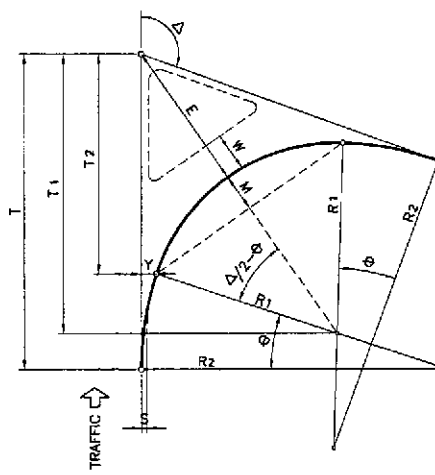
- W_n = LANE WIDTH (NORMAL)
- W_c = LANE WIDTH (TURNING)
- Δ = INTERSECTION ANGLE
- R_o = OUTER RADIUS
- R_i = INNER RADIUS
- R_T = TRANSITION RADIUS
- c = 180° -

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 c/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 RADI (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:

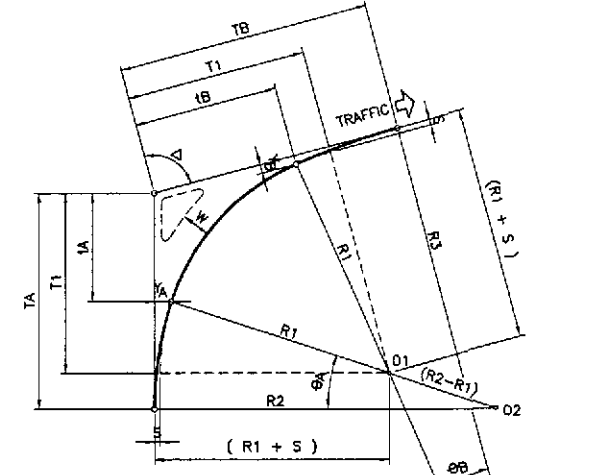
- Δ = INTERSECTION ANGLE
- R₁ = INNER RADIUS
- R₂ = TRANSITION RADIUS
- S = OFFSET OF INNER CIRCULAR CURVE FROM TANGENTS

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:

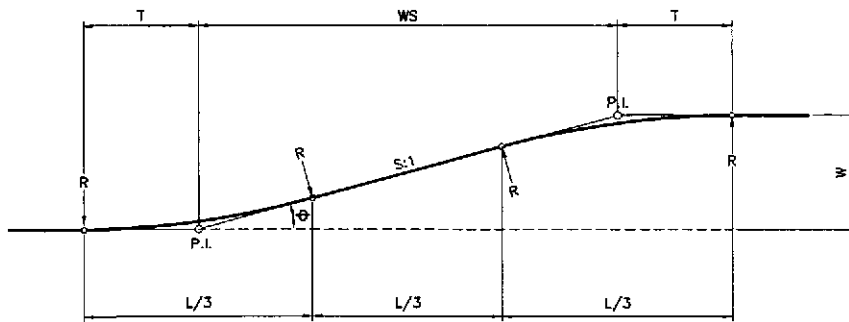
- R₁ = RADIUS OF INTERMEDIATE CIRCULAR ARC
- R₂ = RADIUS OF CIRCULAR ARC ON APPROACH LEG (1.5 x R₁)
- R₃ = RADIUS OF CIRCULAR ARC ON DEPARTURE LEG (3 x R₁)
- S = OFFSET OF INNER CIRCULAR CURVE FROM TANGENTS
- Δ = INTERSECTION ANGLE

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
- t_A = T₁ - R₁ SIN θ_A = T_A - R₂ SIN θ_A
- t_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 :

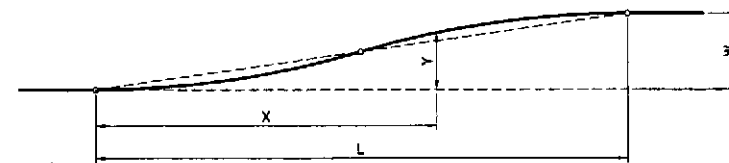
- θ = TAN⁻¹ 1/3 (TAPER RATE S:1)
- T = WS / (3 COS θ + 1)
- L/3 = T (COS θ + 1)
- R = T / TAN θ/2
- APPROX. T = L/6
- θ = TAN⁻¹ W/4T

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:

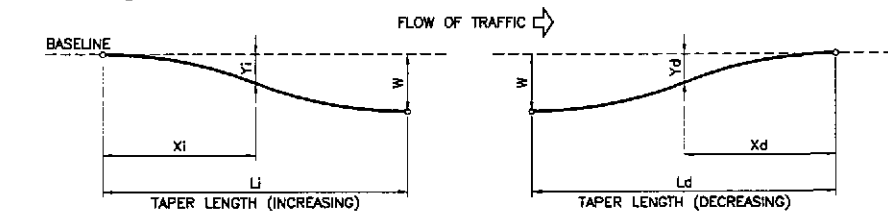
- L = LENGTH OF FLARE
- W = WIDENING (MAX. OFFSET)
- S = TAPER RATE (HOR:VER)
- X = DISTANCE ALONG BASELINE
- Y = OFFSET FROM BASELINE

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



INCREASING			
X _i / L _i	K	X _d / L _d	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	0.0750	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	0.2151	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		

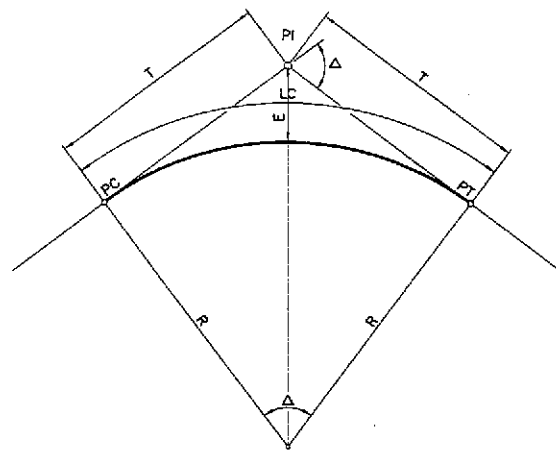
WHERE:

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

DECREASING			
X _d / L _d	K	X _d / L _d	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



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:

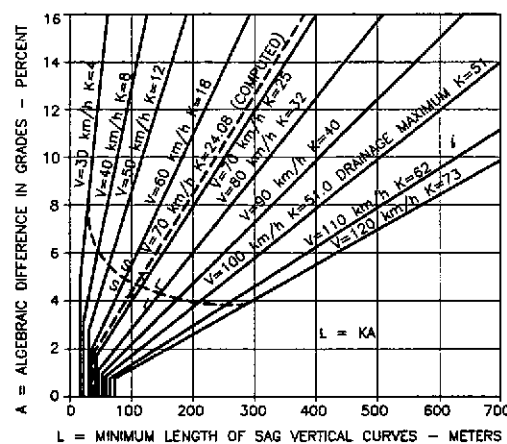
$$T = R (\tan \Delta / 2)$$

$$LC = \frac{\pi R \Delta}{180}$$

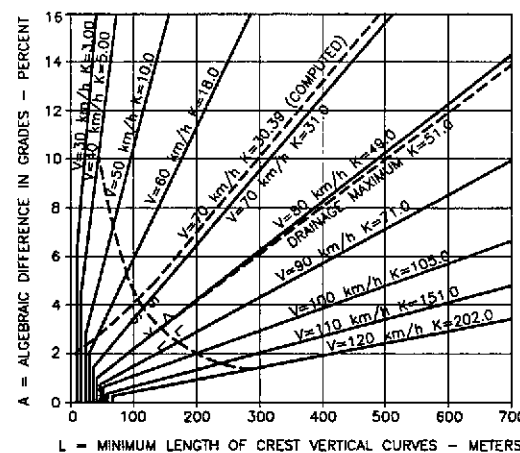
$$E = T (\sec \Delta / 4)$$

NOTE :

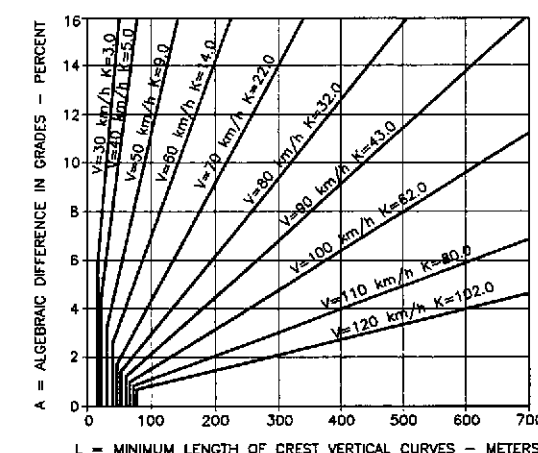
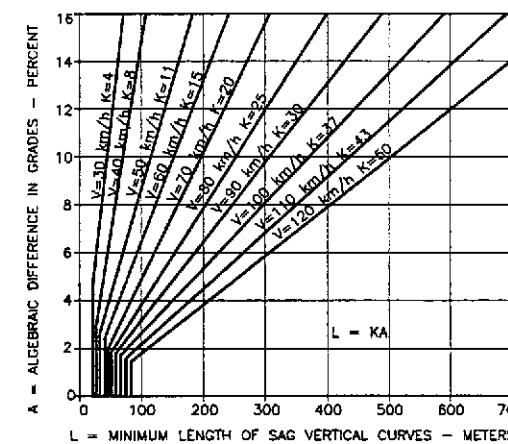
NO HORIZONTAL CURVE IS REQUIRED WHEN THE INTERSECTION ANGLE IS LESS THAN ONE DEGREE (1°)



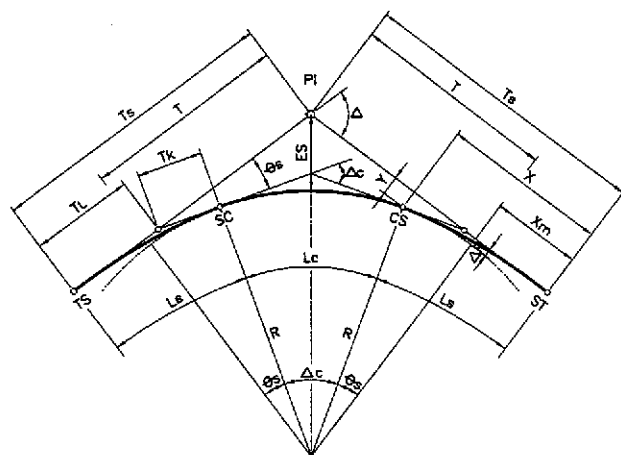
5a MAIN BYPASS



5b ACCESS ROADS



2 HORIZONTAL CURVE (CIRCULAR)



FORMULAS:

$$A^2 = R(Ls)$$

$$\theta_s = Ls(D/40)$$

$$x = Ls \left(1 - \frac{Ls^2}{40R^2} \right)$$

$$y = \frac{Ls^3}{6R} \left(1 - \frac{Ls^2}{56R^2} \right)$$

$$\Delta R = y + R \cos \theta_s - R$$

$$x_m = x - R \sin \theta_s$$

$$T = (R + \Delta R) \tan \Delta / 2$$

$$T_s = x_m + T$$

$$\Delta c = \Delta - 2\theta_s$$

$$L_c = \pi R \Delta c / 180$$

$$T_l = x - (y / \tan \theta_s)$$

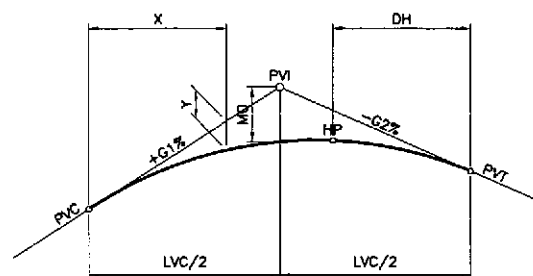
$$T_r = \frac{y}{\sin \theta_s}$$

$$E_s = \left[R + \frac{y}{4} \right] \sec \frac{\Delta}{2} - R$$

WHERE :

- PI = POINT OF INTERSECTION
- Δ = INTERSECTION ANGLE
- R = CURVE RADIUS
- Es = EXTERNAL DISTANCE
- Ls = LENGTH OF SPIRAL
- A = PARAMETER OF CLOTHOID
- θs = 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

5 DESIGN CONTROLS FOR VERTICAL CURVES



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 :

$$MO = \frac{(G1-G2)}{100} \cdot \frac{L}{8}$$

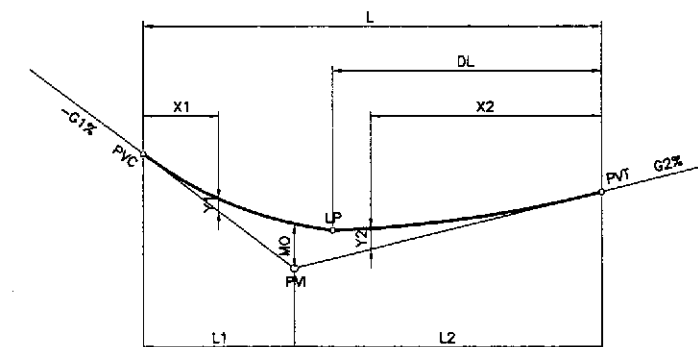
$$Y_x = \frac{(G1-G2)}{100} \cdot \frac{y^2}{2LVC}$$

$$DH = \frac{GLVC}{(G1-G2)}$$

(WHERE G IS THE LESSER GRADE)

NOTES :

1. SIMILARLY APPLIES TO LP (LOW POINT) OF SAG VERTICAL CURVES
2. 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 :

$$MO = \frac{(G1-G2)}{100} \cdot \frac{L1 \cdot L2}{2L} \quad Y_2 = \frac{x^2}{L^2} \cdot MO$$

$$Y_1 = \frac{x_1^2}{L1^2} \cdot MO \quad \text{(FLATTER GRADE SIDE VALUES FOR NUMERATOR & VICE VERSA)}$$

$$DL = \frac{G2 \cdot L2}{L1} \cdot K$$

$$K = \frac{L}{G1-G2}$$

NOTES :

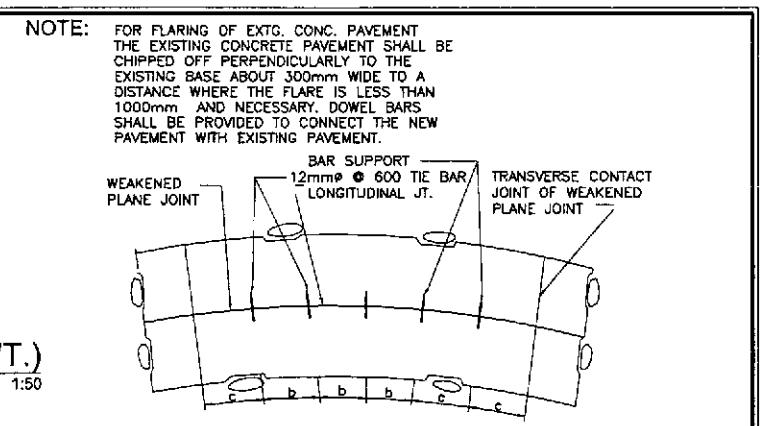
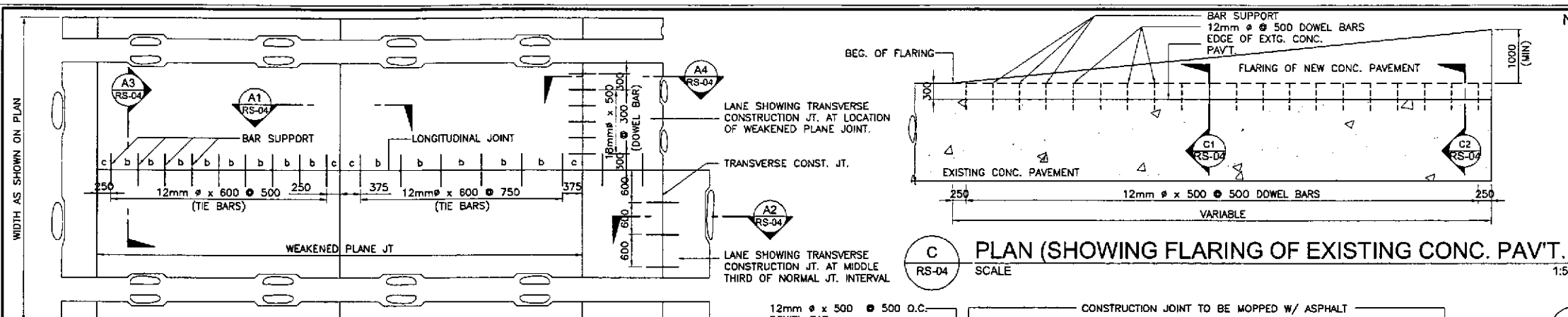
1. SIMILARLY APPLIES TO LP (LOW POINT) OF SAG VERTICAL CURVES
2. NO VERTICAL CURVE IS REQUIRED WHERE THE ALGEBRAIC DIFFERENCE IN GRADE IS 0.50% OR LESS

1 HORIZONTAL CURVE WITH TRANSITION (CLOTHOID SPIRAL)

3 VERTICAL PARABOLIC CURVE (SYMMETRICAL)

4 VERTICAL PARABOLIC CURVE (ASYMMETRICAL)

	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 (Paridel, Cabanatuan and San Jose Bypasses)	SCALE : NOT TO SCALE FULL SIZE A1	SHEET CONTENTS : GEOMETRIC DESIGN STANDARD - 2 HORIZONTAL AND VERTICAL CURVES	SHEET NO. : RS-02
	CHECKED	10/17/02	S. ROSE		PUHL - PMO Submitted By:	BUREAU OF DESIGN Reviewed By:	OFFICE OF THE SECRETARY Recommended By:				
SUBMITTED	10/19/02	M. RIVERA	TEAM LEADER	DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMON A. DATUMANONG Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1	SHEET NO. : RS-02



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

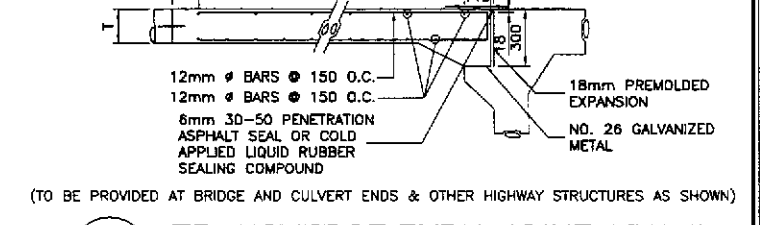
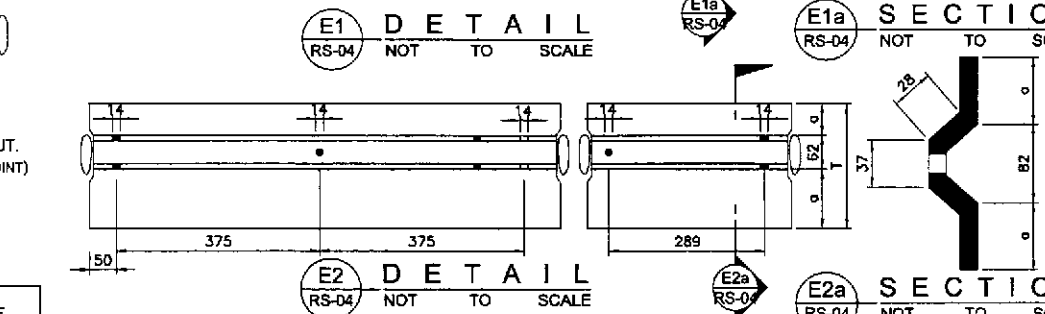
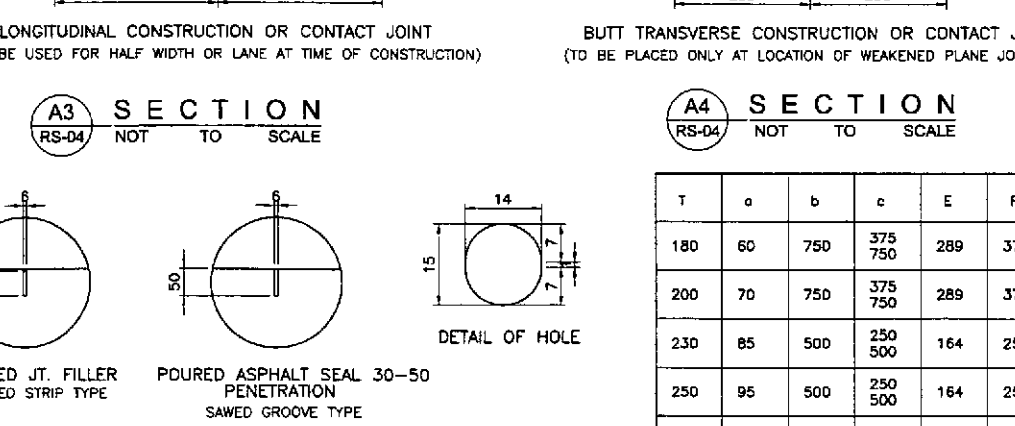
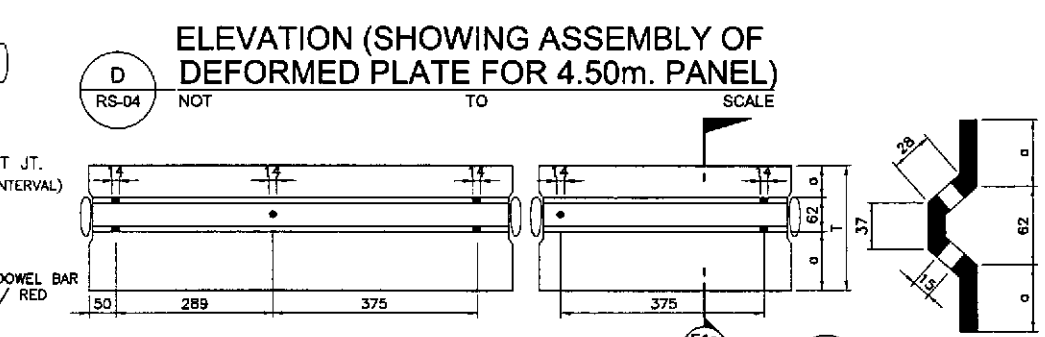
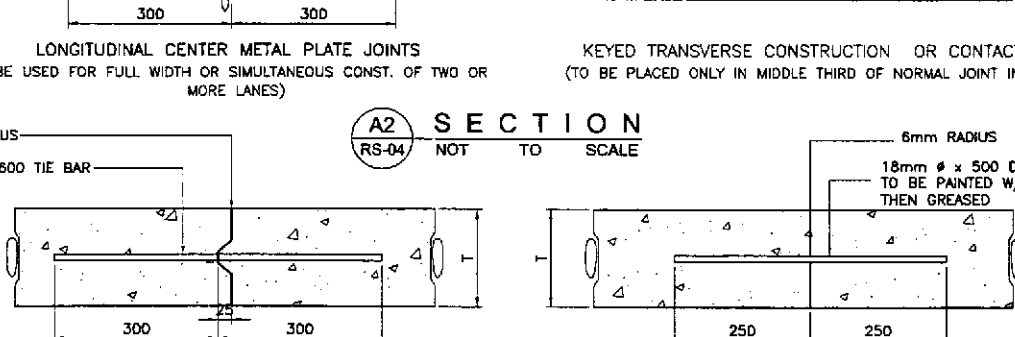
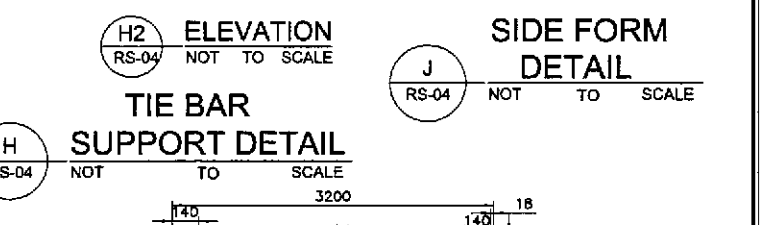
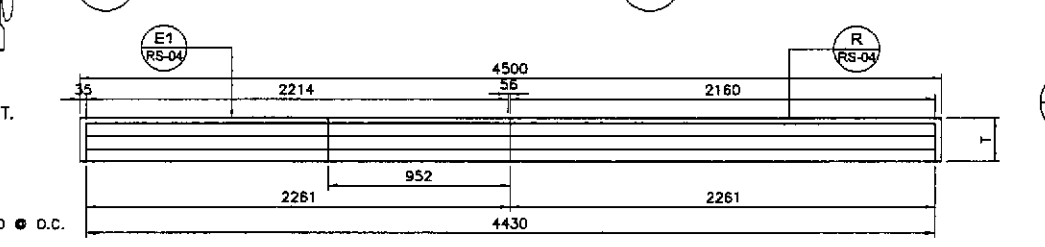
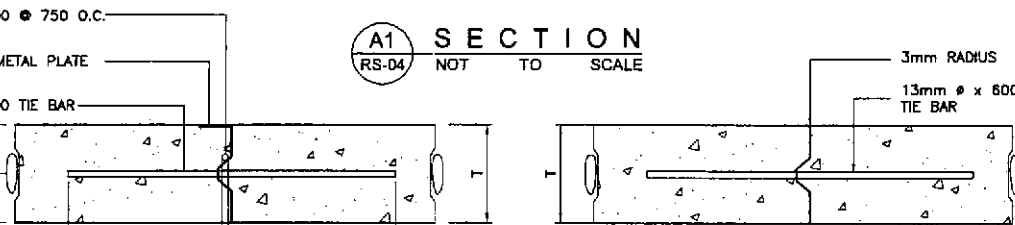
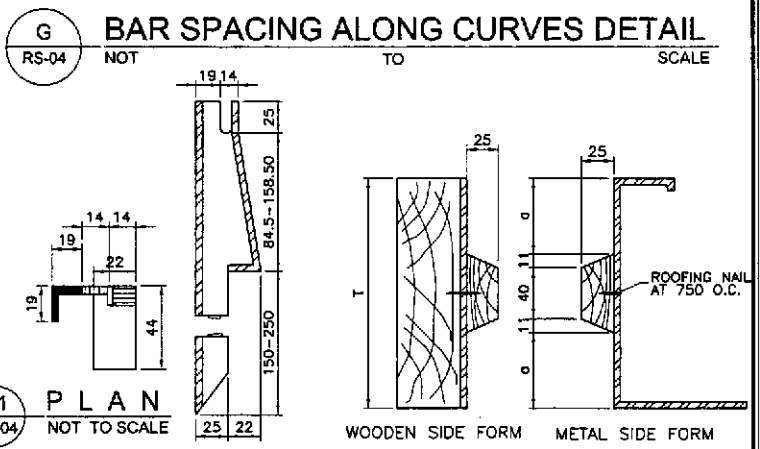
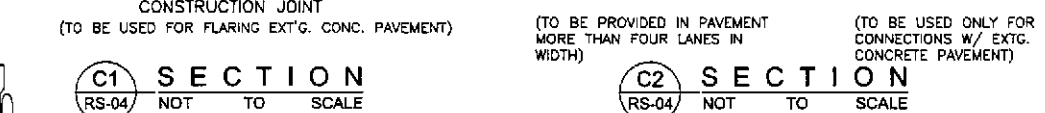
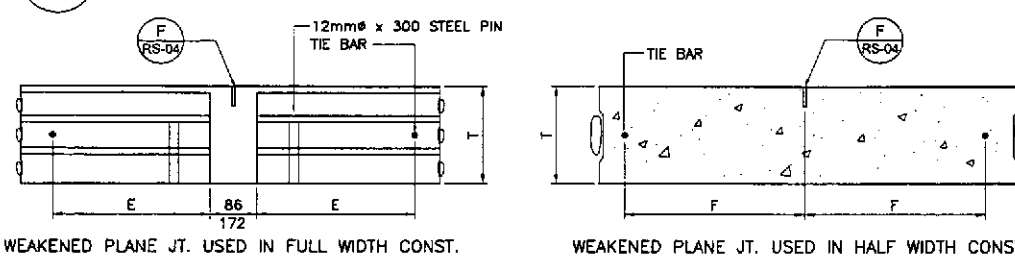
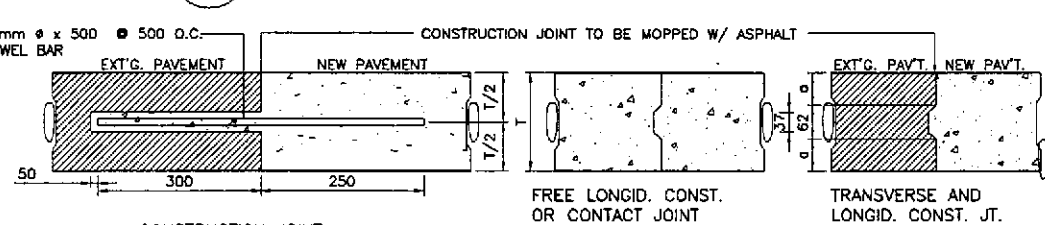
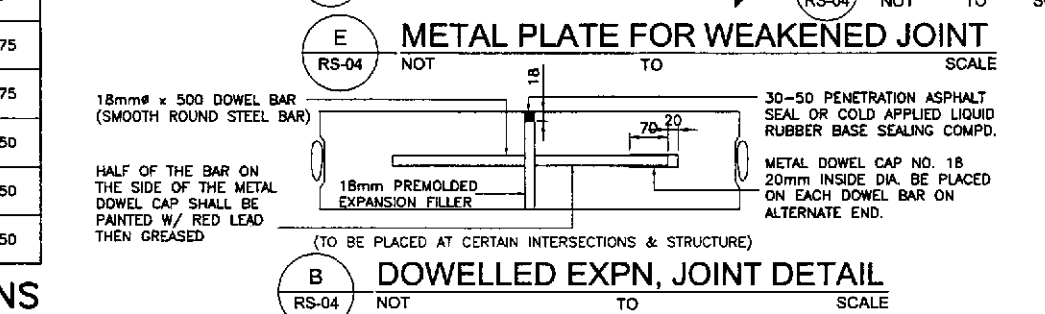
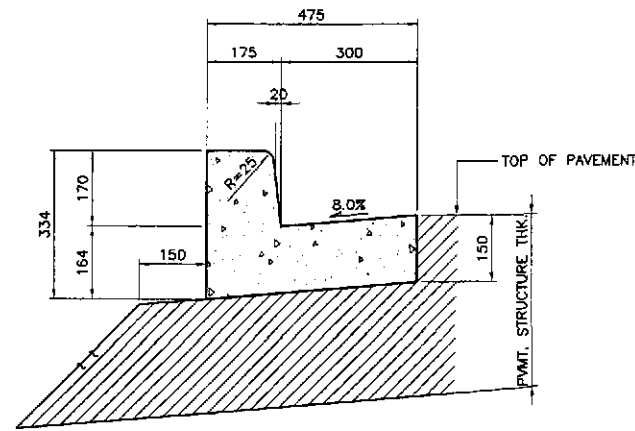


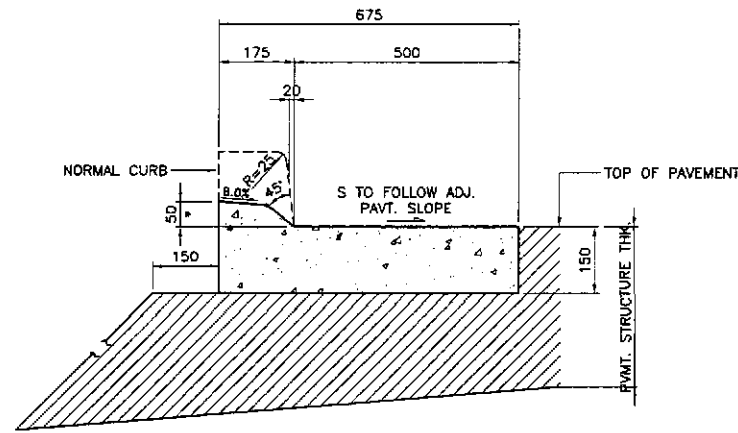
TABLE OF DIMENSIONS

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

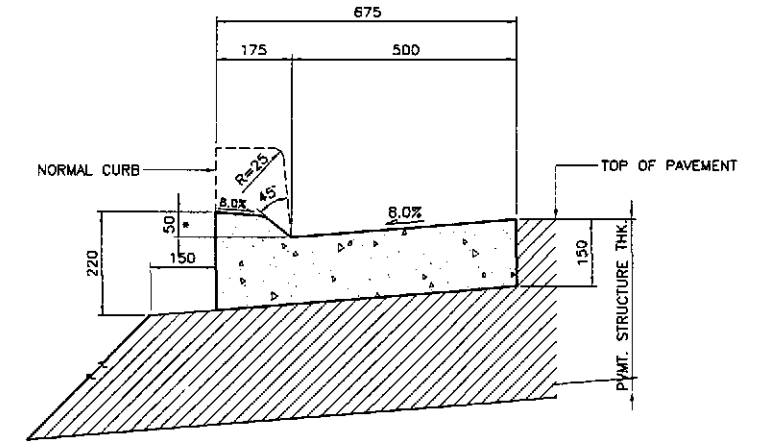




1c TYPE "C"
RS-05

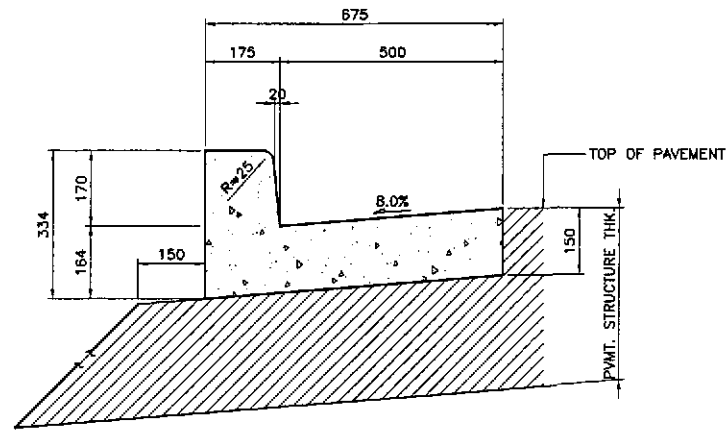


2c TYPE "B"
RS-05

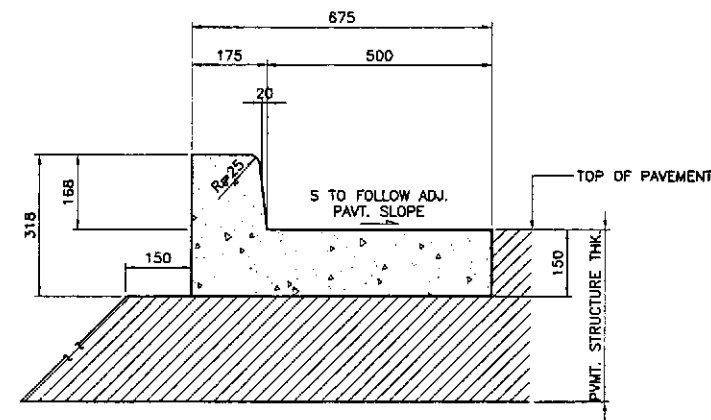


• 30 FOR RAMPS FOR PHYSICALLY HANDICAPPED

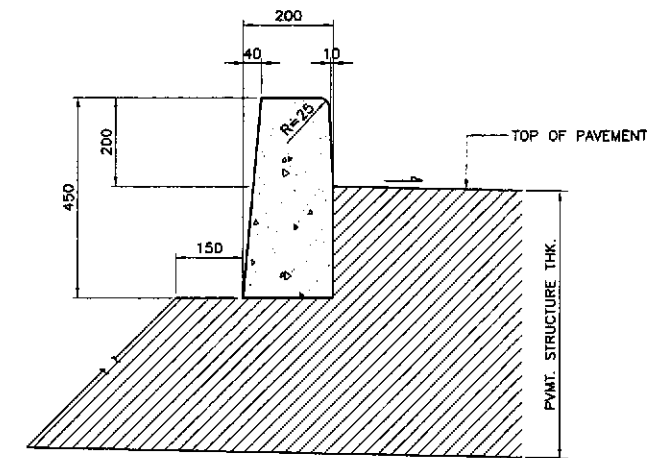
3 CONCRETE DROP CURB AND GUTTER (MODIFIED)
RS-05 NOT TO SCALE



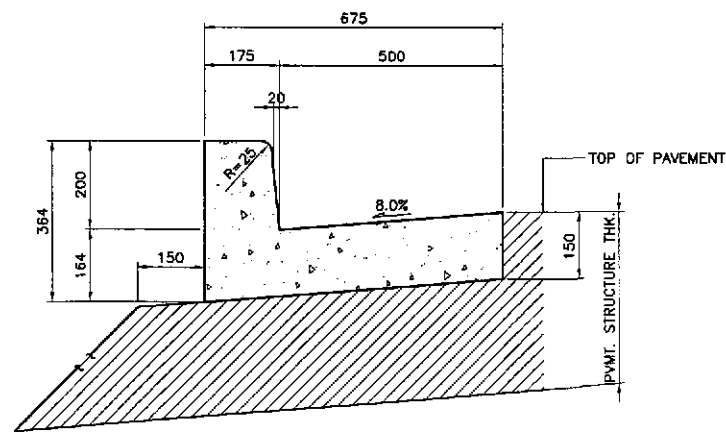
1b TYPE "B"
RS-05



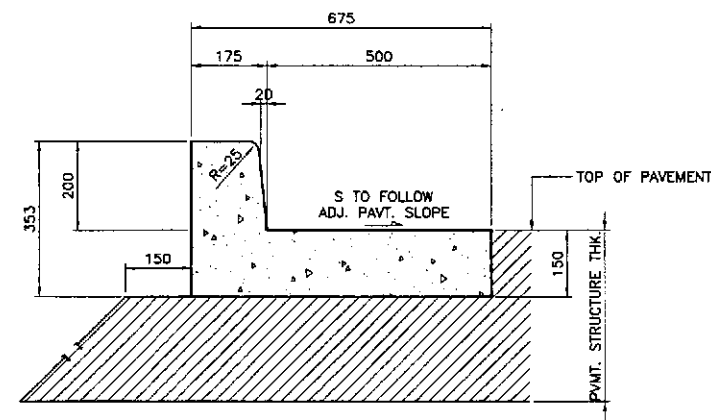
2b TYPE "B"
RS-05



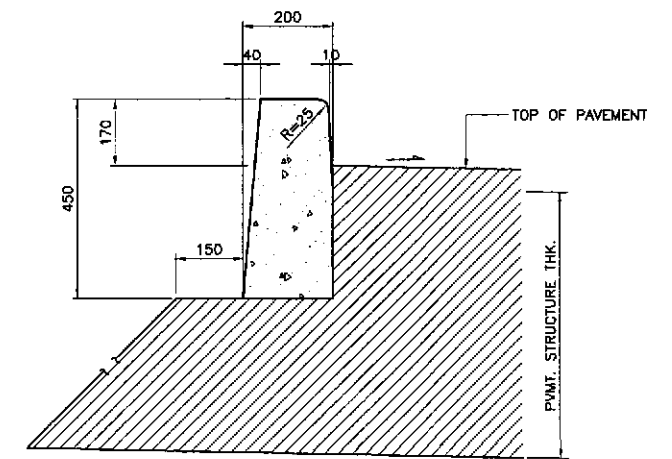
4a TYPE "A"
RS-05



1a TYPE "A"
RS-05



2a TYPE "A"
RS-05



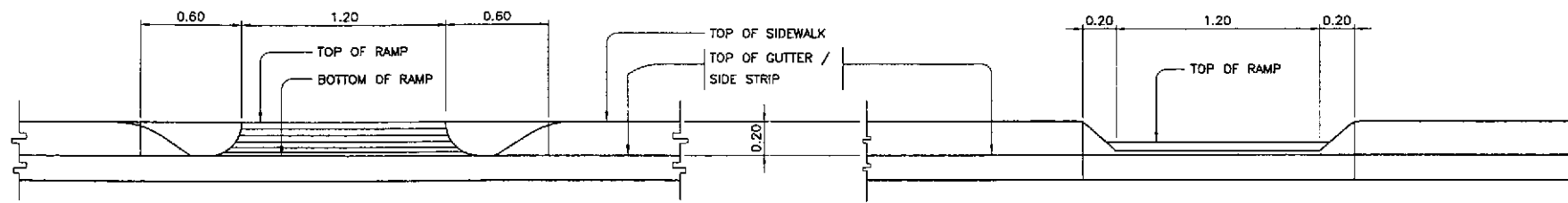
4b TYPE "B"
RS-05

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

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

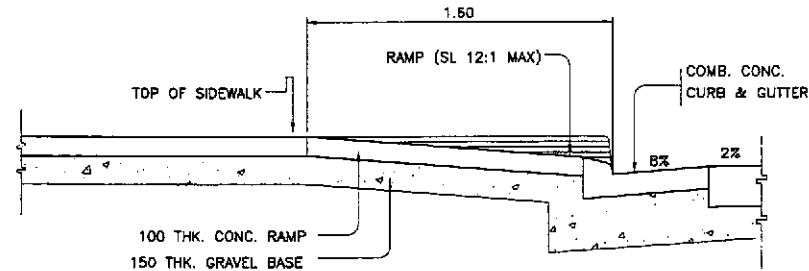
4 CONCRETE CURB
RS-05 NOT TO SCALE

	DESIGNED	DATE	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 III	SCALE :	SHEET CONTENTS : CONCRETE CURB AND GUTTER DETAILS	SHEET NO. : RS-05
	CHECKED	SIGNATURE	BUREAU OF DESIGN			NOT TO SCALE		
	SUBMITTED	DATE	OFFICE OF THE SECRETARY			FULL SIZE A1		
		TEAM LEADER						
		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. BONGAN Undersecretary	Approved By: SIMEON A. DATUMANONG Secretary		

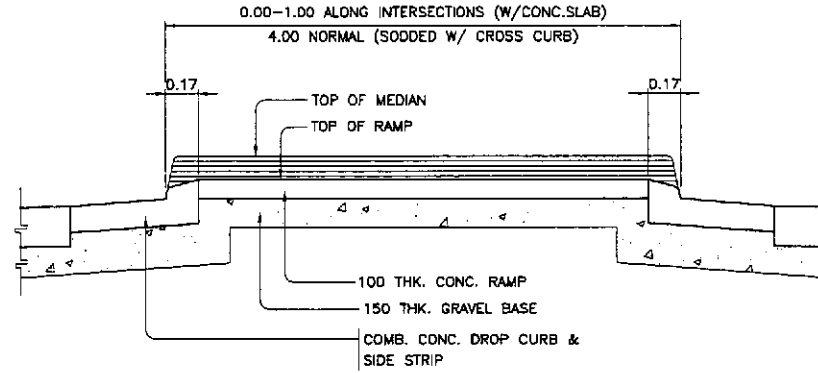


A2 ELEVATION
RS-06 SCALE 1:20

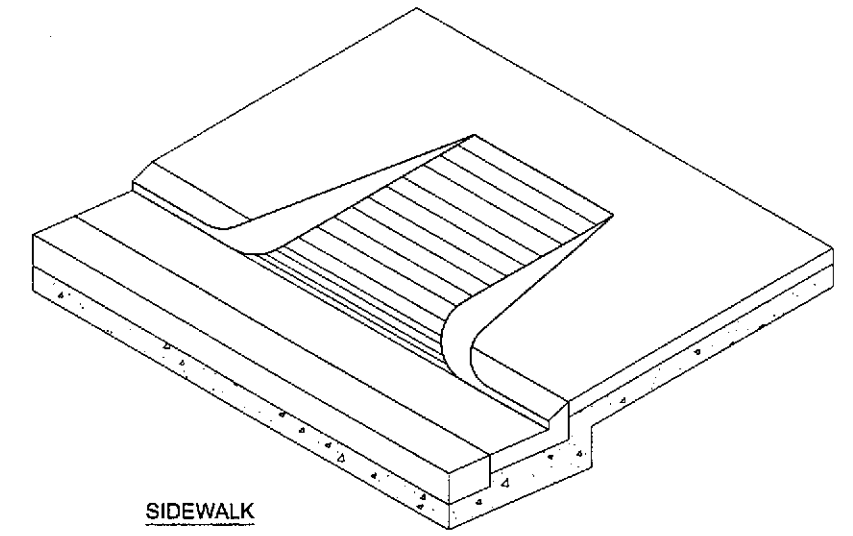
B2 ELEVATION
RS-06 SCALE 1:20



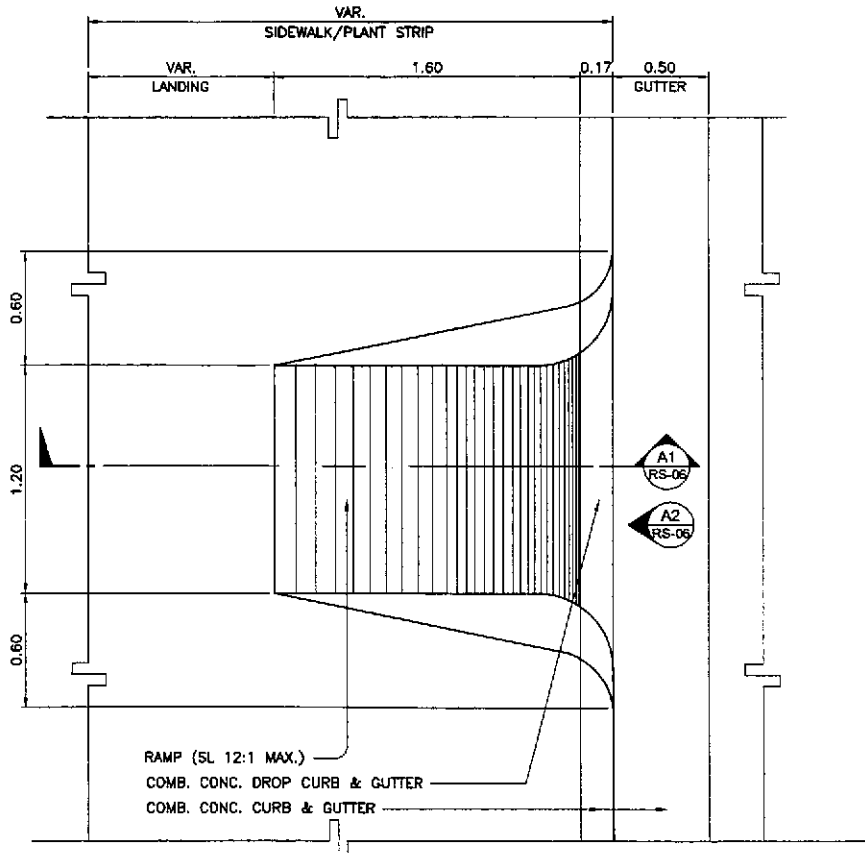
A1 SECTION
RS-06 SCALE 1:20



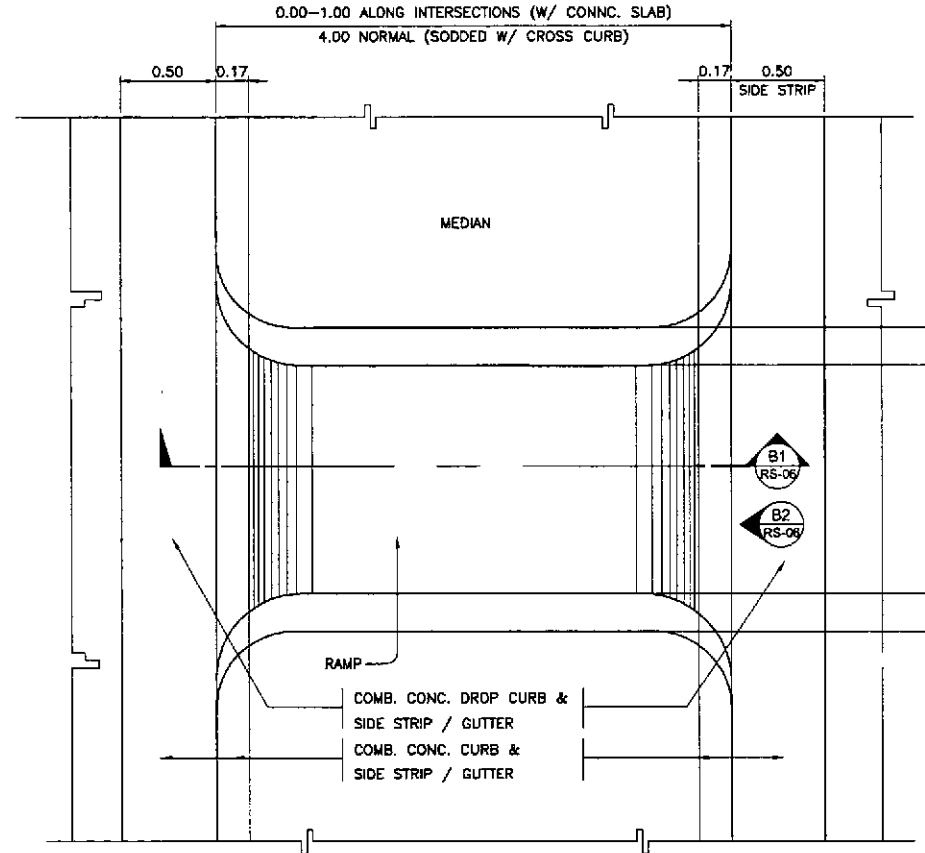
B1 SECTION
RS-06 SCALE 1:20



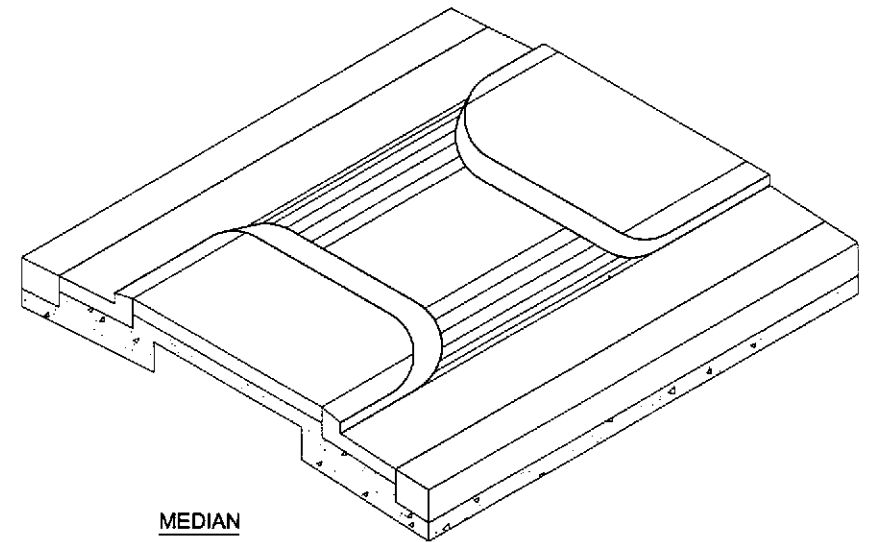
SIDEWALK



A PLAN
RS-06 SCALE 1:20



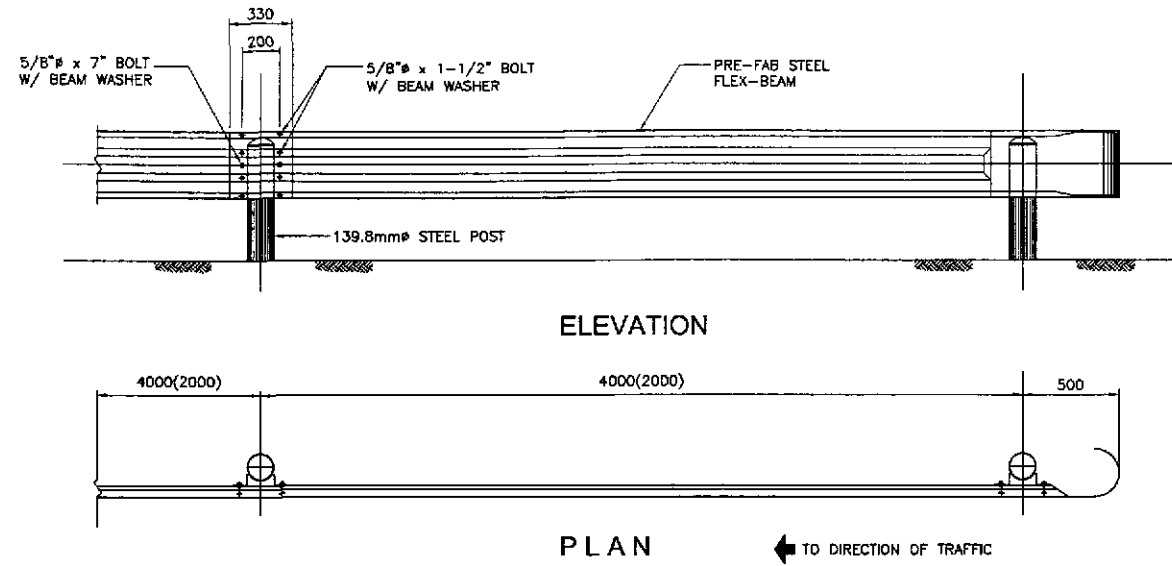
B PLAN
RS-06 SCALE 1:20



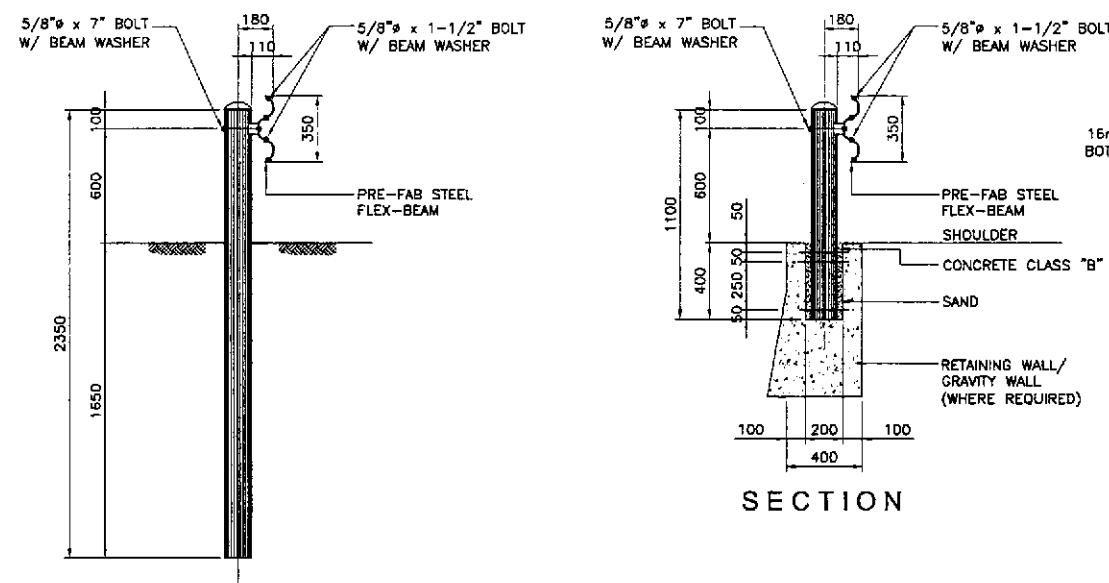
MEDIAN

C ISOMETRIC VIEW
RS-06 NOT TO SCALE

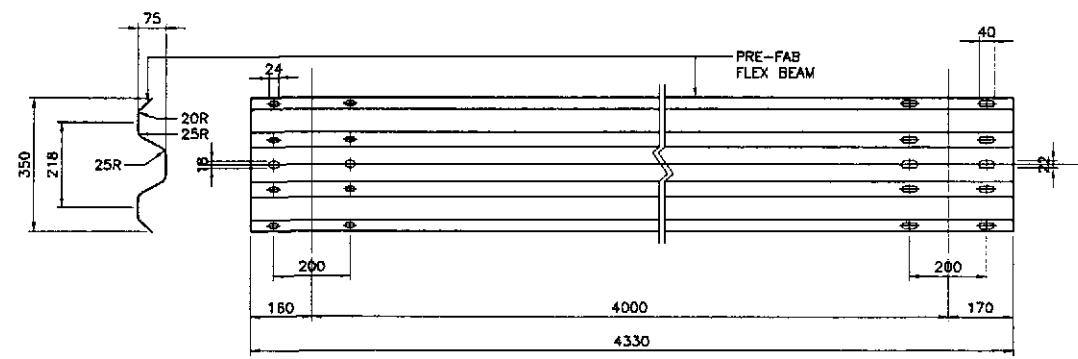
1 CURB-CUT RAMP DETAILS
RS-06 SCALE AS SHOWN



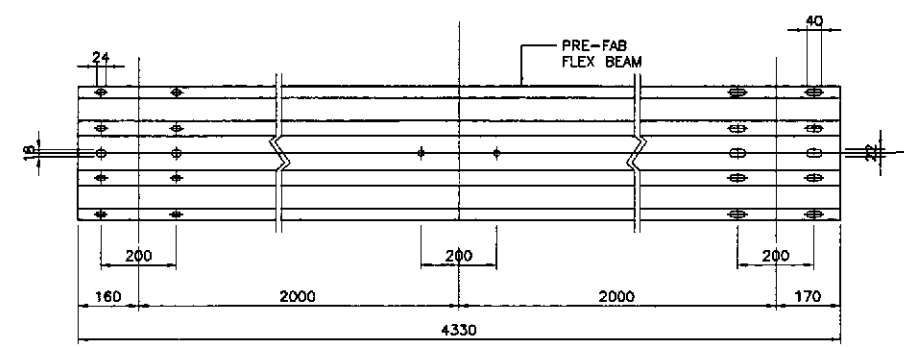
1 GUARDRAIL DETAIL
RS-08 SCALE 1:20



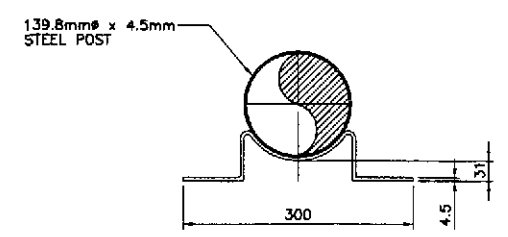
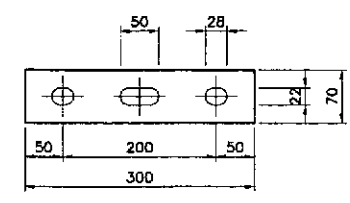
2 STEEL POST DETAIL
RS-08 SCALE 1:20



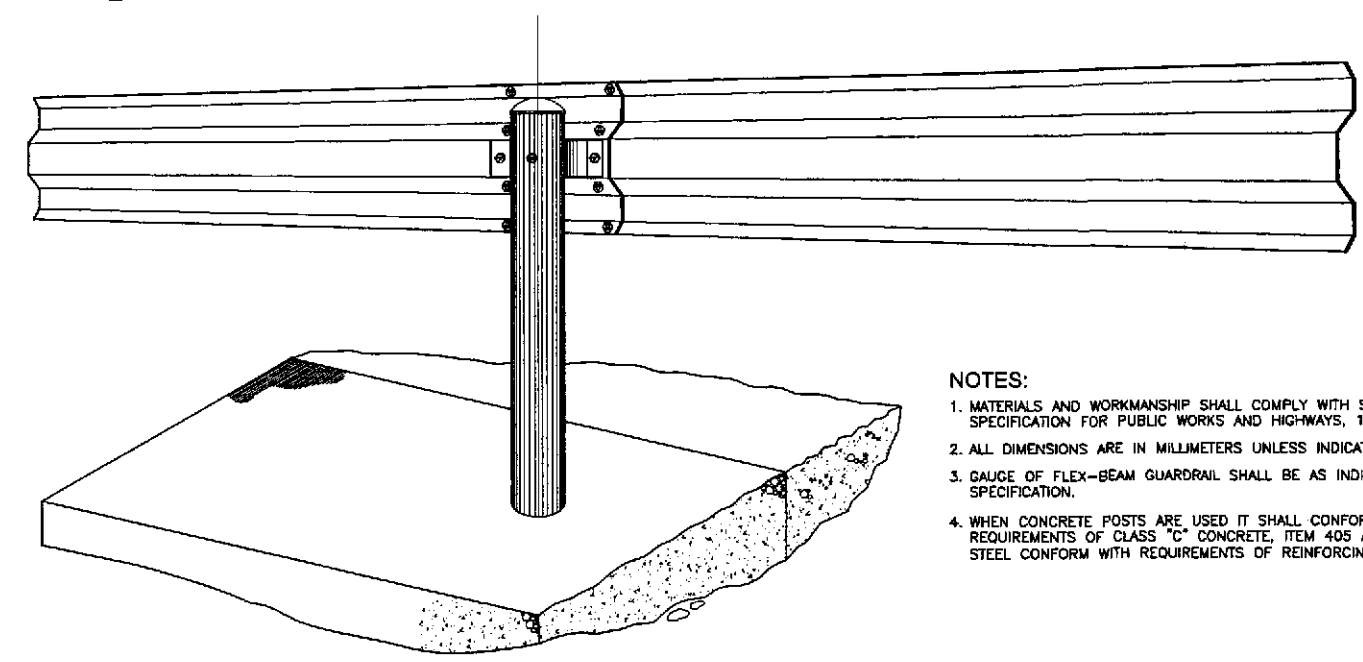
3 BEAM TYPE GUARDRAIL (TYPE "GR-A")
RS-08 SCALE 1:10



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



5 BRACKET DETAIL
RS-08 SCALE 1:5



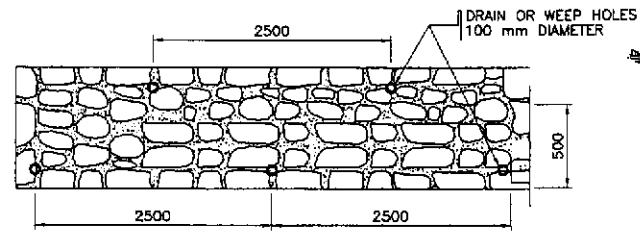
PERSPECTIVE

- 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 POSTS 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		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 (Iparid, Cabanatuan and San Jose Bypasses)	SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : STANDARD STEEL BEAM GUARDRAIL (TYPE GR-A & GR-B)	SHEET NO. : RS-08
	CHECKED	10/17/07	S. ROSE		PJHL - PMO	BUREAU OF DESIGN	OFFICE OF THE SECRETARY				
SUBMITTED	10/19/07	MANUEL M. BONDAN	MANUEL M. BONDAN	DANILLO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary			

NOTE:

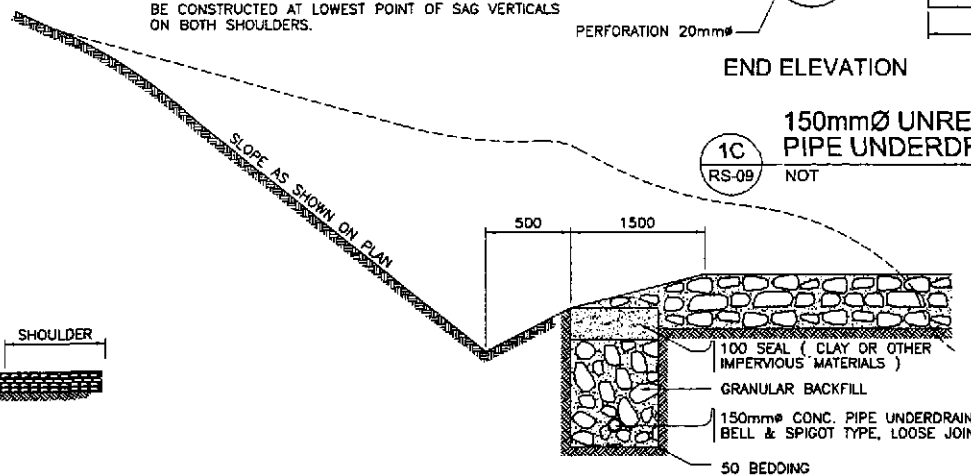
DRAIN OR WEEP HOLES SHALL BE PROVIDED IN SLOPE EMBANKMENT AT LOCATIONS SHOWN ON THE PLANS. GRAVEL BACKING NOT LESS THAN 0.057 CUBIC METER SHALL BE PROVIDED AT EACH DRAIN OR WEEP HOLES TO INSURE PROPER OPERATION OF THE DRAIN. ROCK BACKING SHALL EXTEND TO AT LEAST ONE (1) FOOT ABOVE THE DRAIN OR WEEP HOLES.



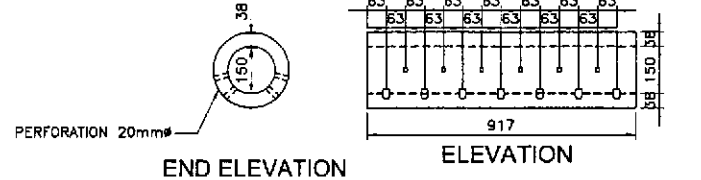
2A ELEVATION OF GROUDED RIP-RAP
RS-09 NOT TO SCALE

NOTE:

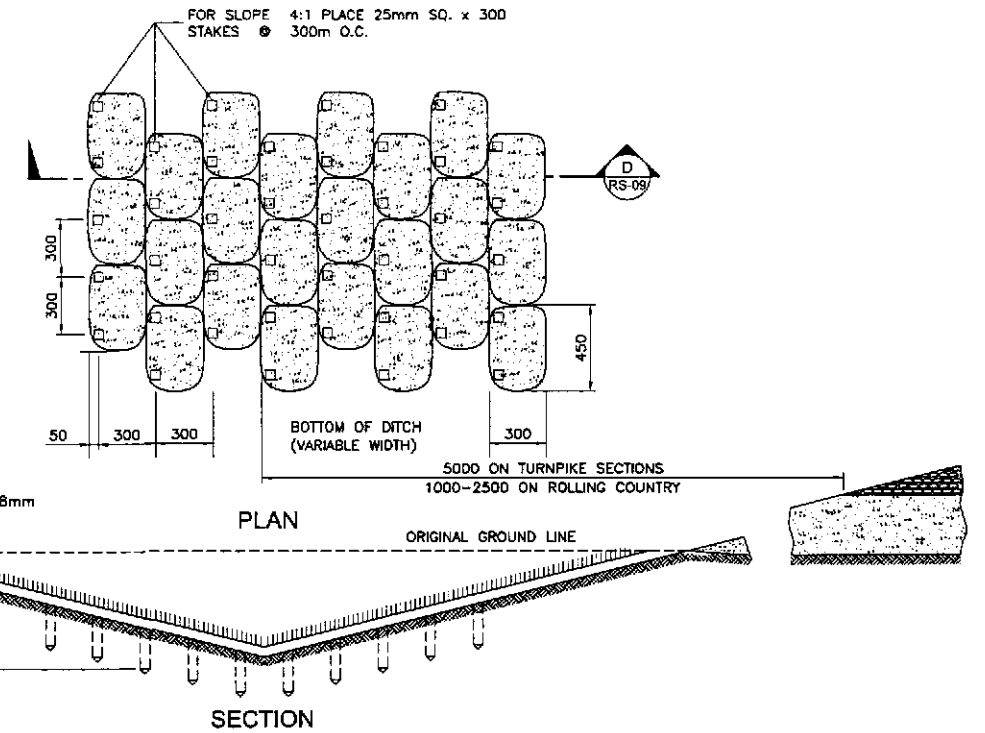
WHERE COMMON BORROW CONSIST OF CLAY OR OTHER IMPERVIOUS MATERIALS, SHOULDER DRAINS SHALL BE INSTALLED 20.00 M. APART ON EACH SHOULDER AND ARRANGED IN SUCH A WAY THAT THE DRAINS ON EACH SHOULDERS ARE STAGGERED AND NOT EXACTLY OPPOSITE EACH OTHER. THEY SHOULD BE CONSTRUCTED AT LOWEST POINT OF SAG VERTICALS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



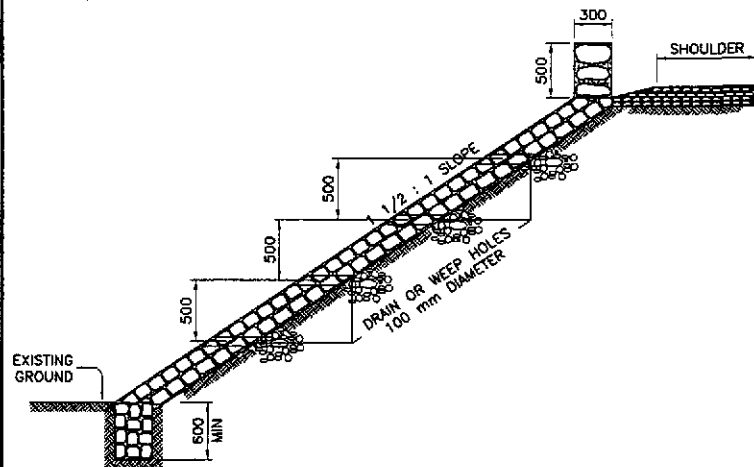
C DETAIL OF UNDERDRAIN
RS-09 NOT TO SCALE



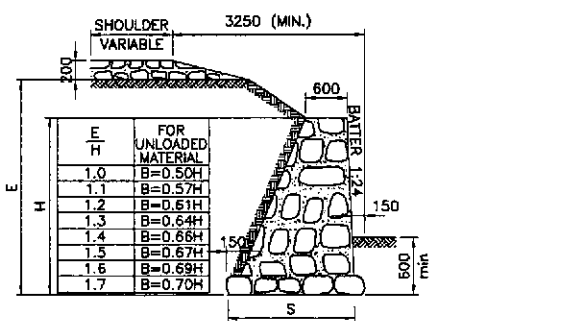
150mmØ UNREINFORCED CONCRETE PIPE UNDERDRAIN
RS-09 NOT TO SCALE



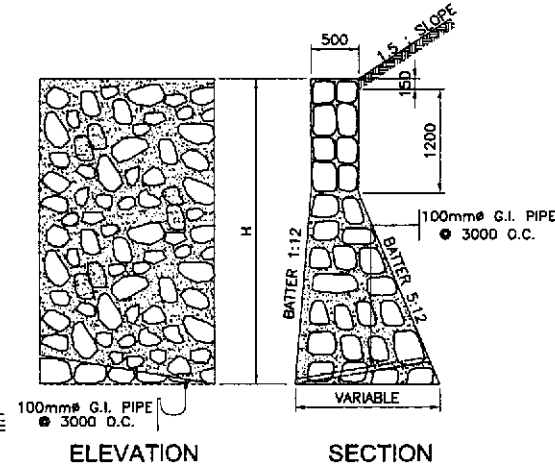
D DETAIL OF SODDING
RS-09 NOT TO SCALE



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

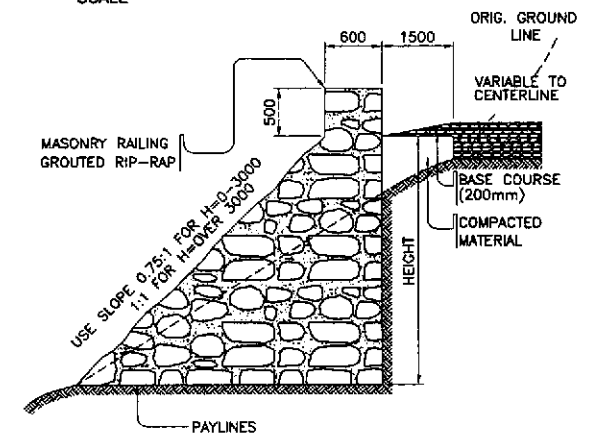


1B RUBBLE MASONRY RETAINING WALL
RS-09 NOT TO SCALE



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

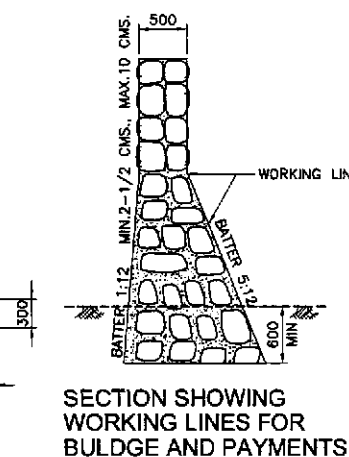
NOTE:
EMBANKMENT WILL BE CONSTRUCTED ONLY ON A FOUNDATION BED SATISFACTORY TO THE ENGINEER. THE STONES SHALL NOT BE LESS THAN 0.15 CU.M. IN VOLUME WITH 75% OF STONES AT LEAST 0.03 CU.M. IN VOLUME AND LAID OFF TO THE LINES AND DIMENSIONS REQUIRED. THE STONES SHALL BE BONDED TO SAME EXTENT AND SECURELY 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

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.

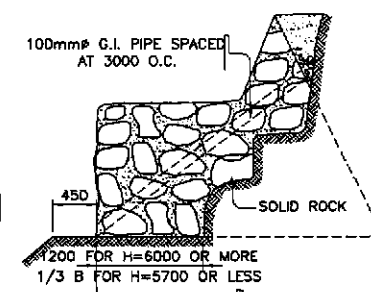
HEIGHT "H" IN METER	QUANTITIES PER LINEAR METER OF WALL	
	CONCRETE CU. M.	STEEL KILOGS
3.00	0.153	19
3.60	0.230	30
4.80	0.306	40
6.00	0.383	45



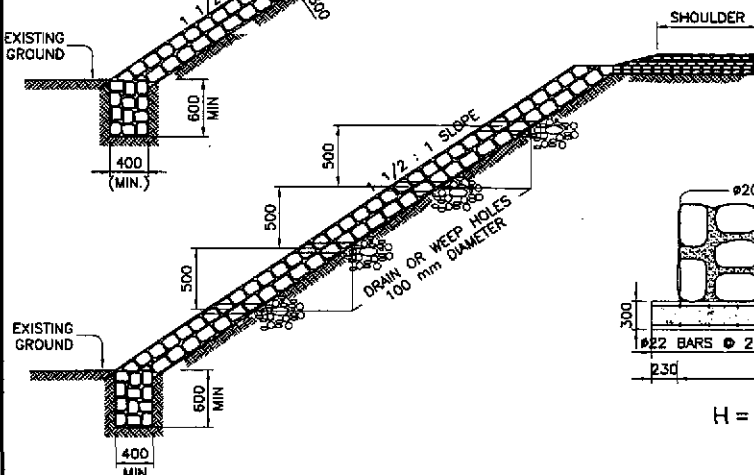
SECTION SHOWING WORKING LINES FOR BULGE AND PAYMENTS

TABLE		TABLE	
HEIGHT IN METERS	QUANTITIES PER LINEAR M OF WALL IN CU. METER	HEIGHT IN METERS	QUANTITIES PER LINEAR M OF WALL IN CU. METER
0.90	0.15	3.60	1.15
1.20	0.23	3.90	1.30
1.50	0.31	4.20	1.45
1.90	0.38	4.50	1.68
2.10	0.46	4.80	1.91
2.40	0.54	5.10	2.14
2.70	0.69	5.40	2.37
3.00	0.77	5.60	2.68
3.30	0.92	6.00	2.91

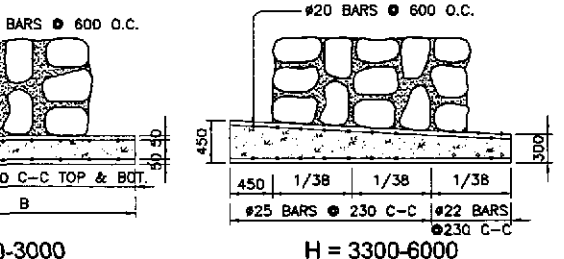
MIN. BULGE 2.50 CMS., MAX. BULGE 10 CMS. FEATHERED TO WORKING LINE AT JOINTS TO BE RAKED TO A DEPTH OF 2.50 TO 5 CMS.



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



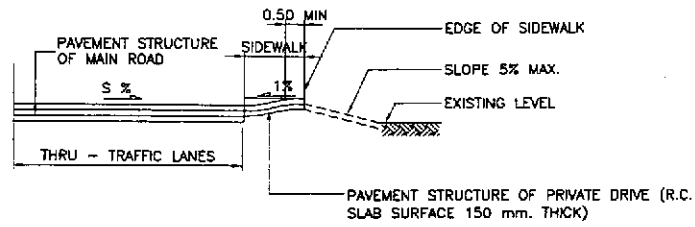
A EMBANKMENT PROTECTION WALLS
RS-09 NOT TO SCALE



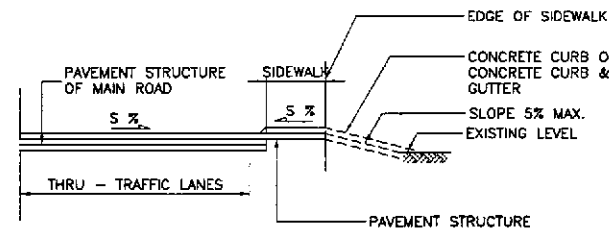
2B FOOTING FOR WALL
RS-09 NOT TO SCALE

B MASONRY RETAINING WALLS
RS-09 NOT TO SCALE

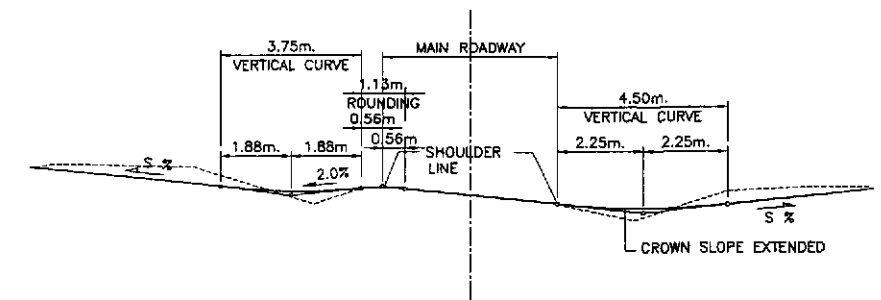
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	[Signature]		BUREAU OF DESIGN	OFFICE OF THE SECRETARY	AS SHOWN				
	SUBMITTED	10/19/02	[Signature]	Submitted By: DANILLO C. TRAJANO Project Director	Reviewed By: JOSEFINA M. ALACAR Chief, Highways Division	Recommended By: GILBERTO S. REYES OIC, Director IV	Recommended By: MANUEL M. BONDAN Undersecretary	Approved By: SIMON A. DATUMANONG Secretary	FULL SIZE A1		



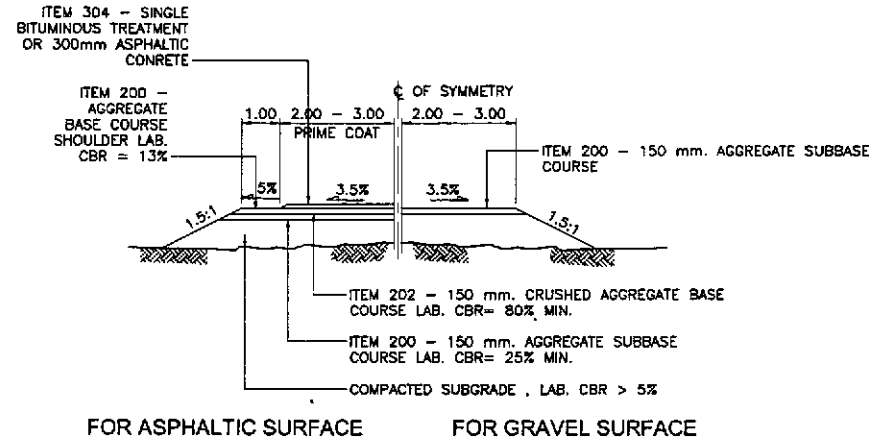
4 TYPICAL PRIVATE DRIVEWAY AT SIDE WALK (PROFILE)
RS-10 NOT TO SCALE



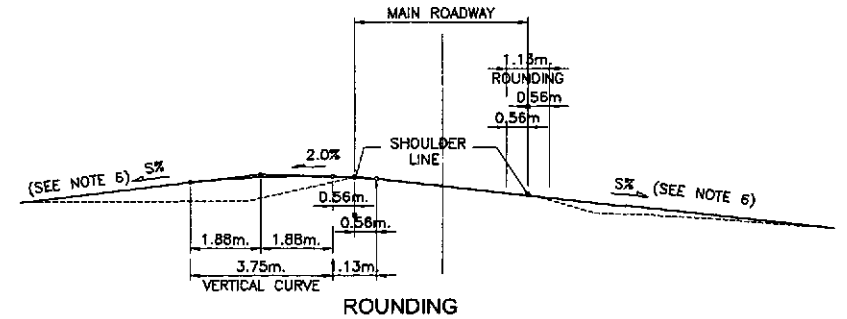
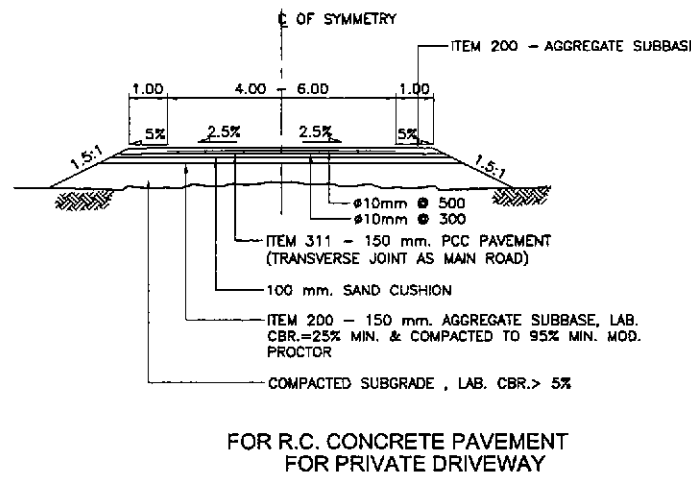
5 TYPICAL SIDE ROAD AT SIDE WALK (PROFILE)
RS-10 NOT TO SCALE



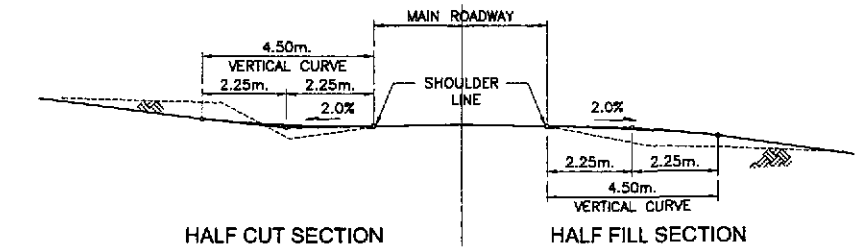
6C SUPERELEVATED CUT SECTION
RS-10 NOT TO SCALE



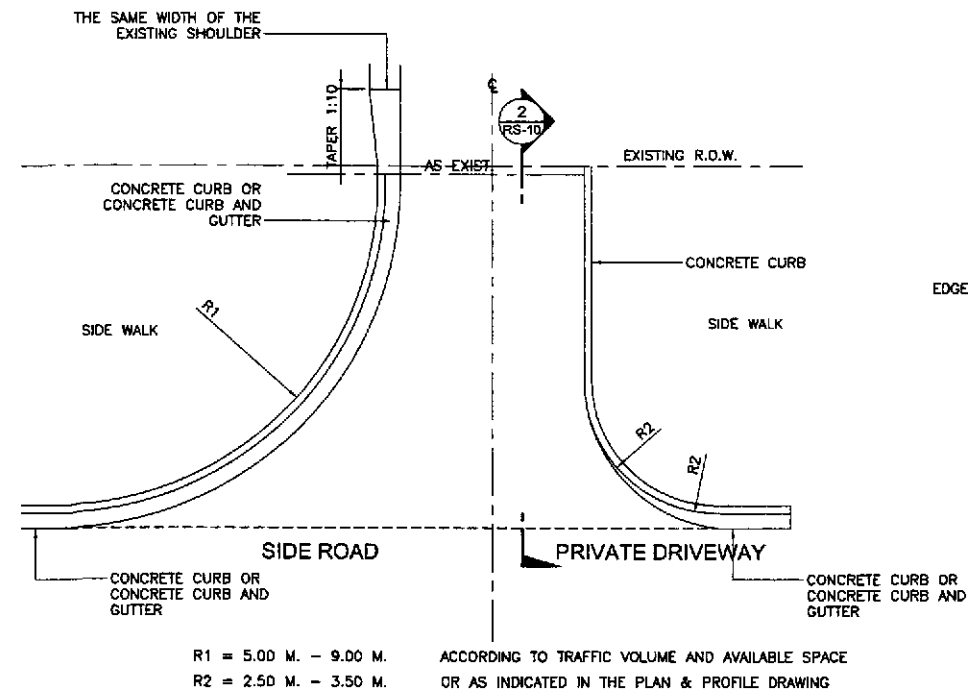
3 TYPICAL CROSS - SECTION
RS-10 NOT TO SCALE



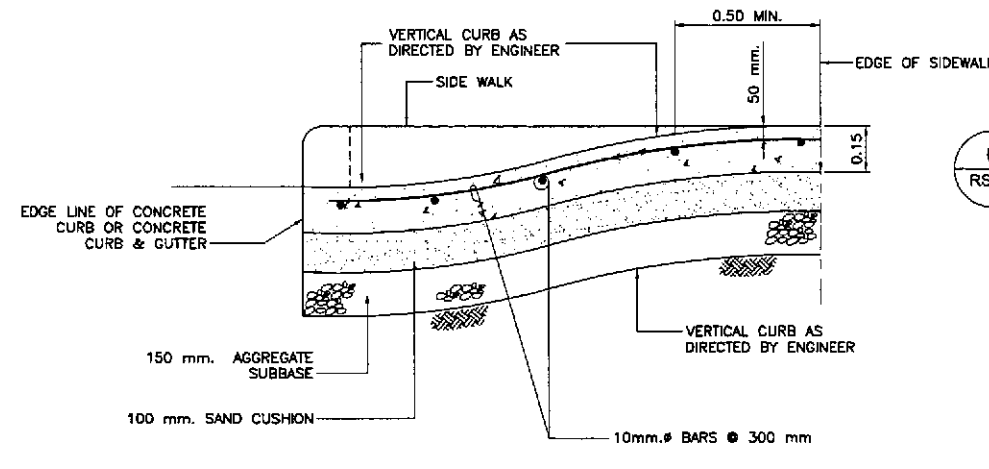
6B SUPERELEVATED FILL SECTION
RS-10 NOT TO SCALE



6A STANDARD CROWNED SECTION
RS-10 NOT TO SCALE



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

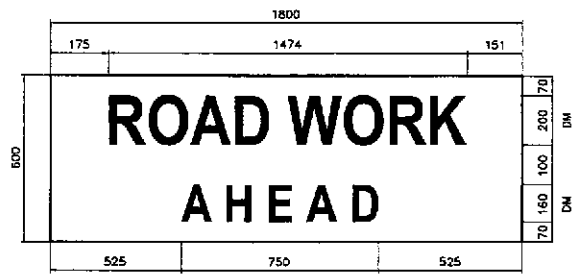


2 SECTION OF R.C. CONCRETE PAVEMENT OF SIDE ROAD & PRIVATE DRIVEWAY
RS-10 NOT TO SCALE

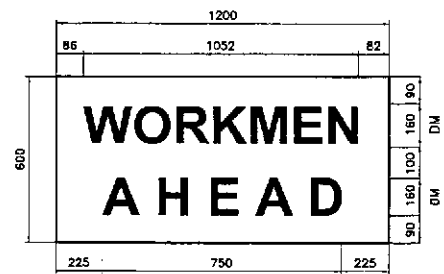
6 VERTICAL ALIGNMENT OF ACCESS ROAD APPROACHES TO MINOR INTERSECTION
RS-10 NOT TO SCALE

- NOTES:
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.

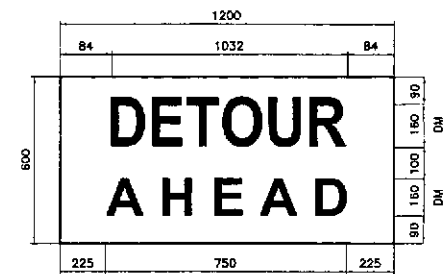
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	S. ROSE		DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	SIDE ROAD APPROACHES AND PRIVATE DRIVEWAY ACCESS	RS-10
	SUBMITTED	10/19/02	THEO. TRUJANO		BUREAU OF DESIGN			CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		
		P.J.H.L. - PMO		OFFICE OF THE SECRETARY							
		Submitted By:		Reviewed By:		Recommended By:					
		DANILO C. TRUJANO Project Director		JOSEFINA M. ALAGAR Chief, Highways Division		GILBERTO S. REYES OIC, Director IV		MANUEL M. BONDAN Undersecretary		SIMEON A. DATUMANONG Secretary	



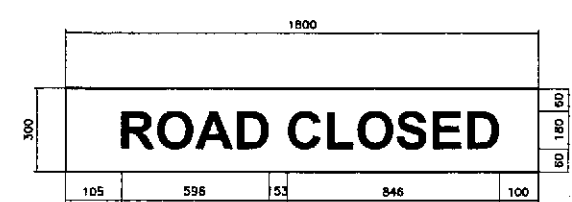
T1 - 1



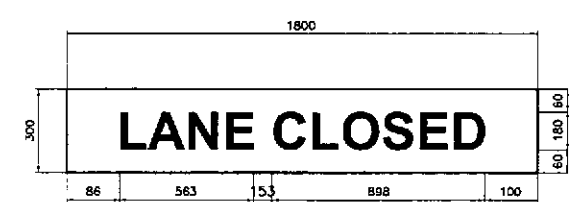
T1 - 5



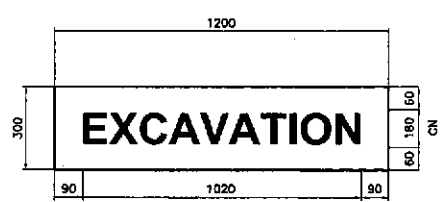
T1 - 6



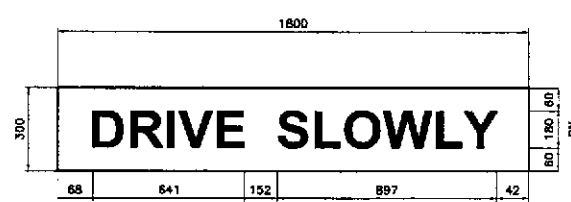
T2 - 2



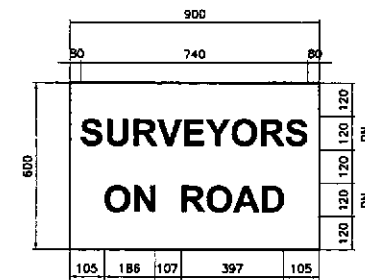
T2 - 4



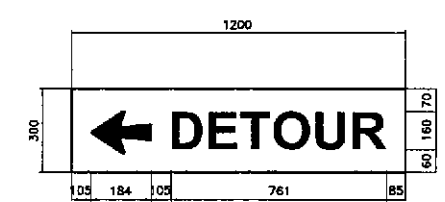
T2 - 6



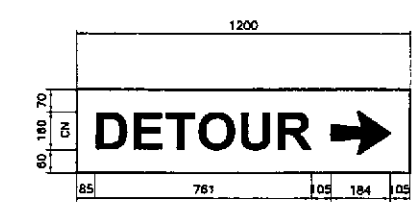
T2 - 7



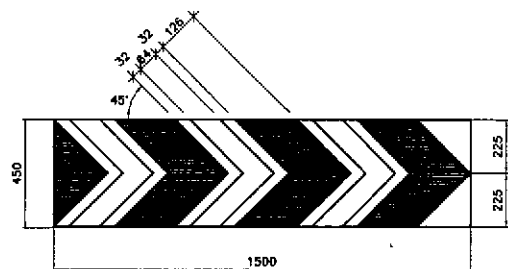
T2 - 8



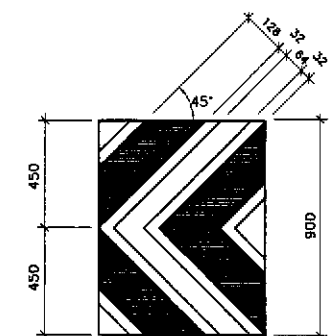
T4 - 1L



T4 - 1R



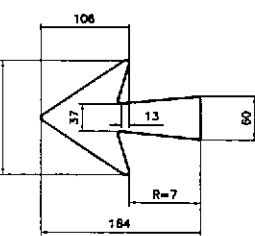
T4 - 2



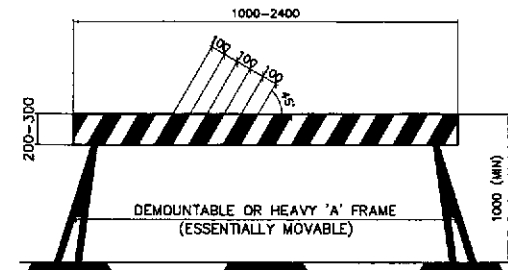
T4 - 3

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

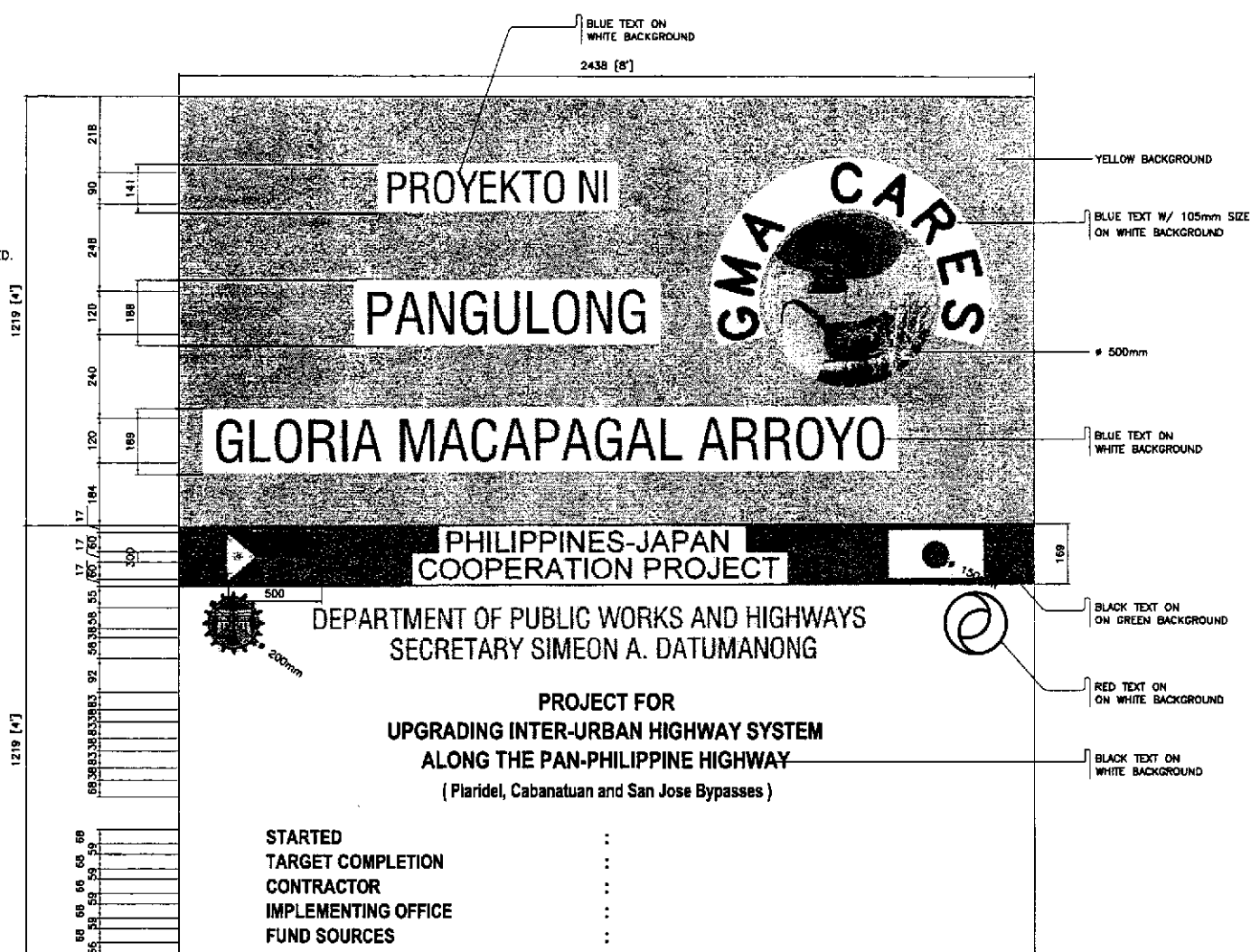


TYPE 1 BARRICADE

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.

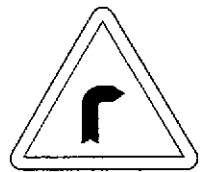
ROAD SIGNS, (LOCATION AND INSTALLATION)
 BARRICADES (TYPE I, TYPE II, TYPE III) SHOULD CONFORM WITH SPECIFICATIONS MENTIONED IN PHILIPPINES, ROAD SHOWS MANUAL (REVISED EDITION MPWH, TRAFFIC ENG'G. AND MANAGEMENT PROJECT SERIES OF 1982.



1 ROAD WORK SIGN DETAILS
 RS-11 NOT TO SCALE

2 PROJECT SIGN BOARD DETAILS
 RS-11 NOT TO SCALE

	DESIGNED	10/15/02	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS		PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	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)	AS SHOWN	STANDARD ROAD WORK SIGN AND PROJECT SIGN BOARD DETAILS	RS-11
	SUBMITTED	10/19/02	Submitted By: DANILLO C. TRAJANO Project Director Recommended 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		CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		



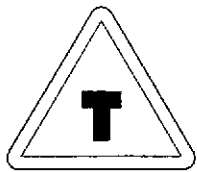
1
W1-1(L or R)



2
W1-4 (L)



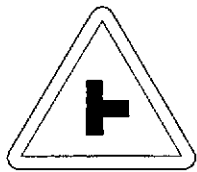
3
W2-1



4
W2-4



5
W2-5



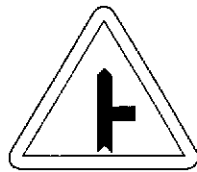
6
W2-6 (L or R)



7
W2-7



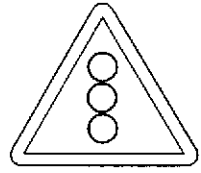
8
W2-8



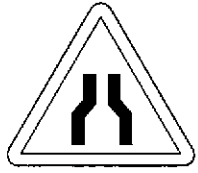
9
W2-9 (R)



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
W8-3A



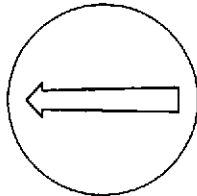
21
W8-3B



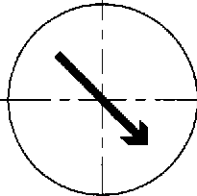
22
R1-1A



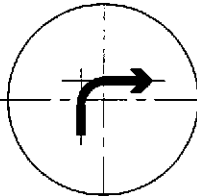
23
R1-2A



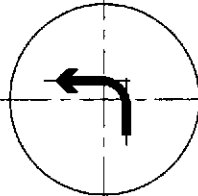
24
R2-2L



25
R2-3



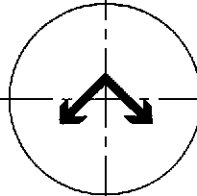
26
R2-4A (R)



27
R2-4A (L)



28
R2-4P



29
R2-5



30
R2-6A



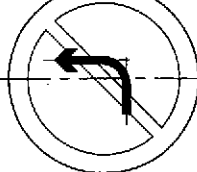
31
R2-7A (L)



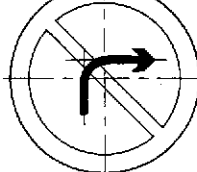
32
R3-1PA



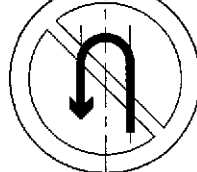
33
R3-6P



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

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

B. REGULATORY SIGNS

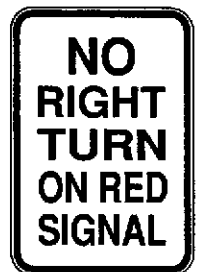
22. STOP (R1-1A)
23. GIVE WAY (R1-2)(A)
24. DIRECTION TO BE FOLLOWED (R2-2)(L)
25. DIRECTION TO BE FOLLOWED (R2-3)
26. DIRECTION TO BE FOLLOWED (R2-4A)(R)
27. DIRECTION TO BE FOLLOWED (R2-4A)(L)
28. DIRECTION TO BE FOLLOWED (R2-4P)
29. DIRECTION TO BE FOLLOWED (R2-5)
30. TWO WAY (R2-6)(A)
31. DIRECTION TO BE FOLLOWED (R2-7A)(L)
32. NO ENTRY (R3-1P)(A)
33. NO ENTRY (R3-6P)
34. TURNING PROHIBITION (R3-13A)
35. TURNING PROHIBITION (R3-14A)
36. TURNING PROHIBITION (R3-15A)
37. PROHIBITION OF OVERTAKING (R3-16)
38. SPEED RESTRICTION (R4-1B)(80)
39. SPEED RESTRICTION (R4-3B)(40)
40. SPEED RESTRICTION (R6-4)
41. TURN RIGHT AT ANY TIME W/ CARE (S2-3)
42. NO RIGHT TURN ON RED SIGNAL (S2-6)
43. ROAD CLOSED (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.



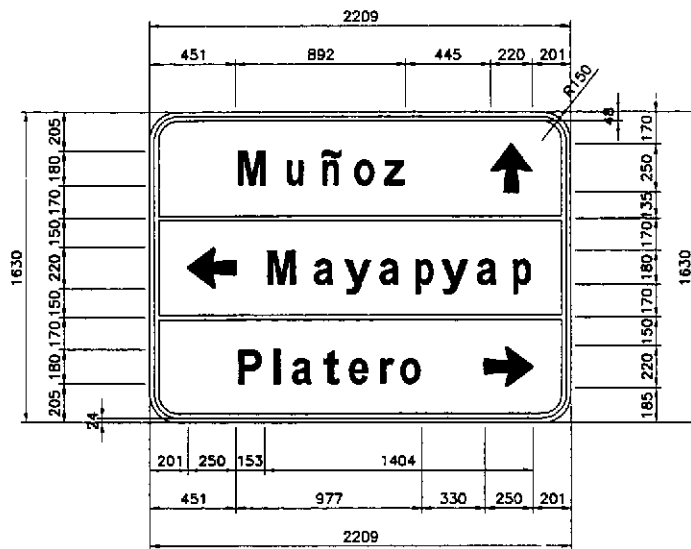
41
S2-3



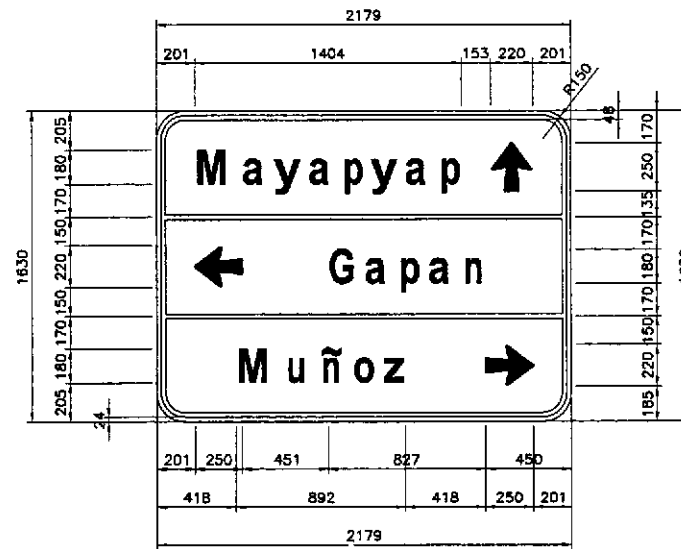
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S2-6



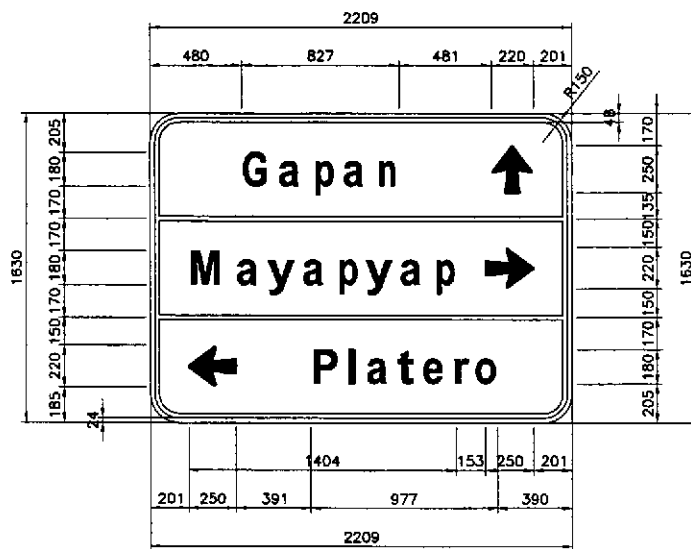
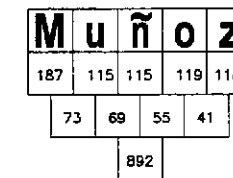
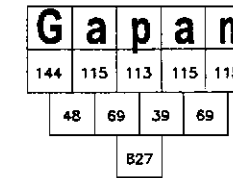
43
S2-9



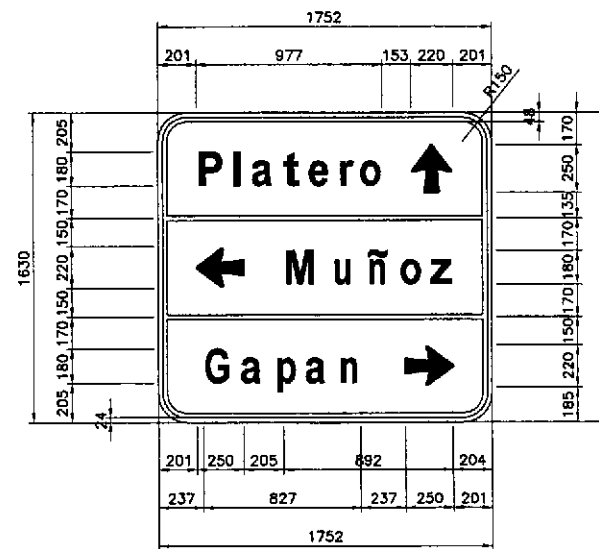
GS-20



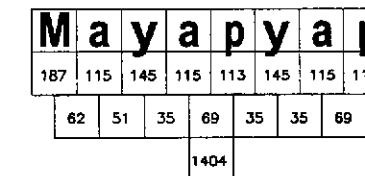
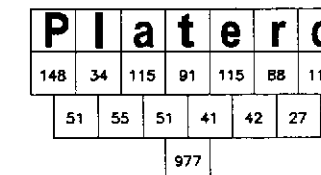
GS-22



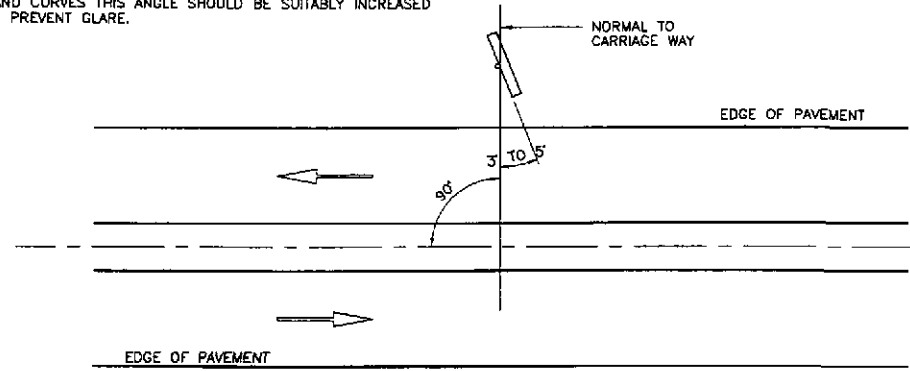
GS-21



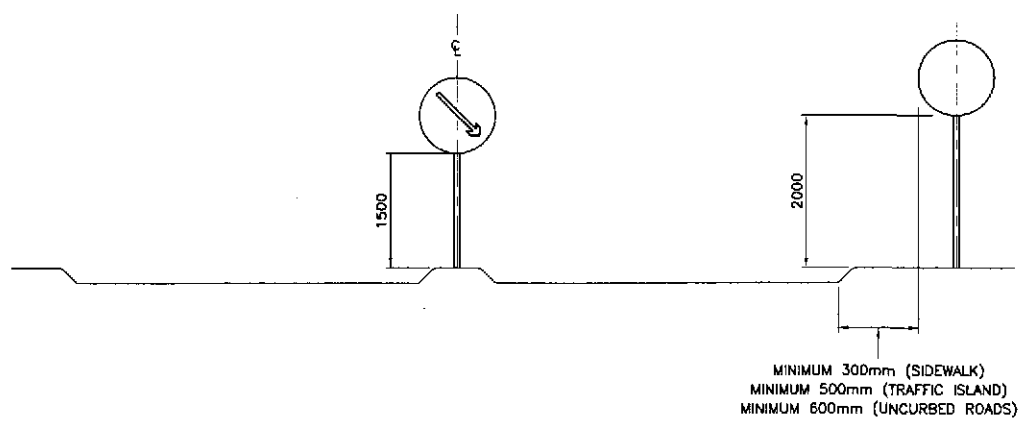
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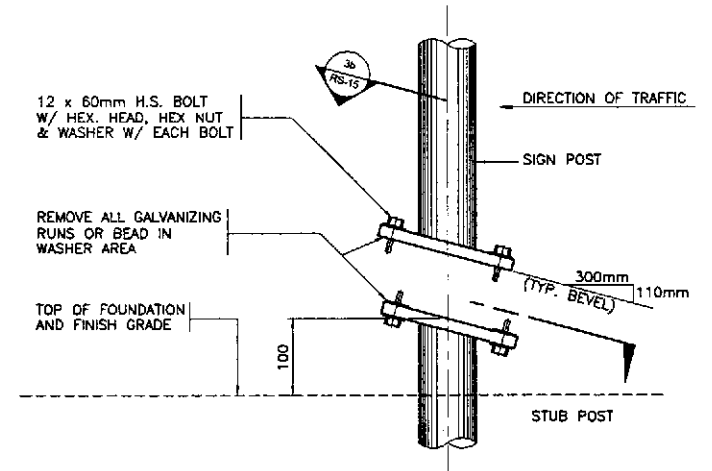
NOTE:
SIGN SHALL BE TURNED 3° TO 5° FROM ONCOMING TRAFFIC ON STRAIGHT SECTIONS AND RIGHT HAND CURVES. ON LEFT HAND CURVES THIS ANGLE SHOULD BE SUITABLY INCREASED TO PREVENT GLARE.



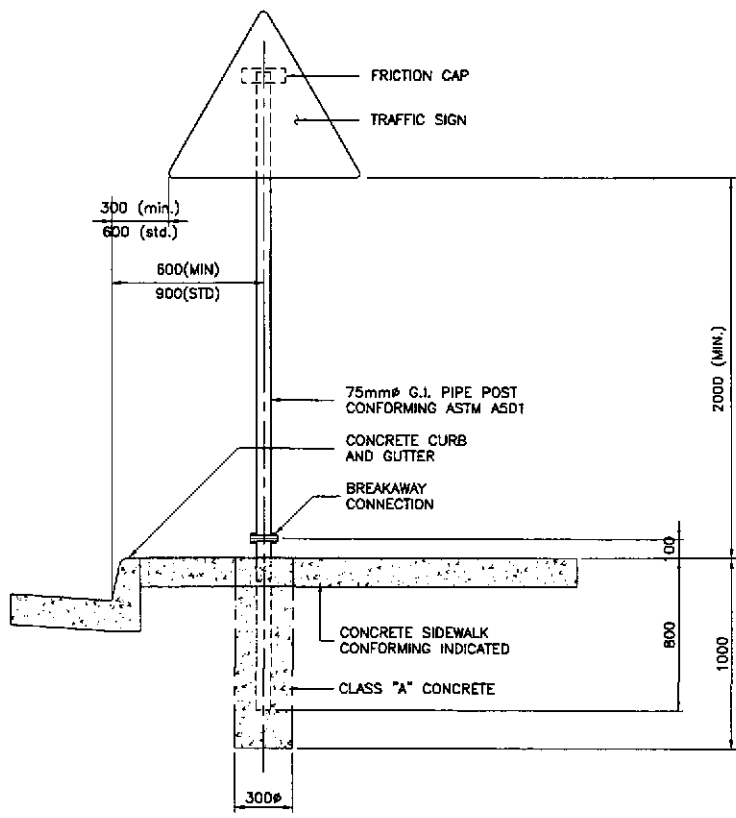
1 PLAN VIEW
RS-15



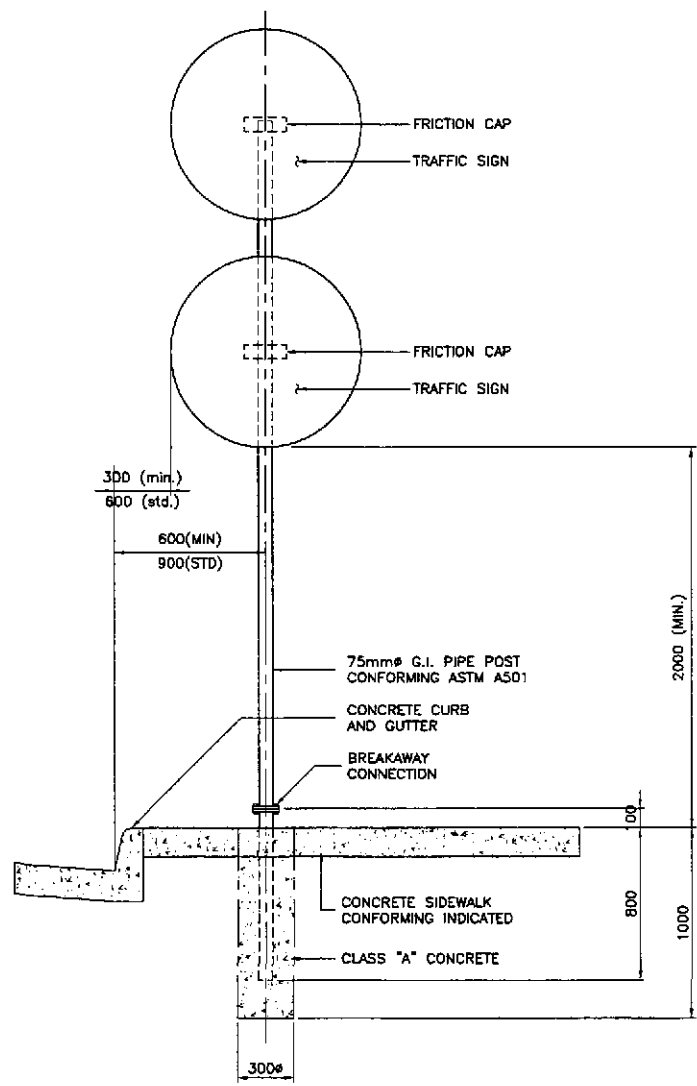
2 SIGN POSITIONS
RS-15 NOT TO SCALE



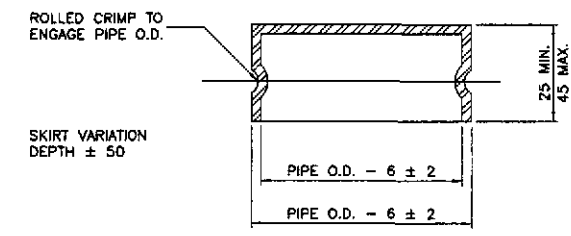
3a ELEVATION
RS-15



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



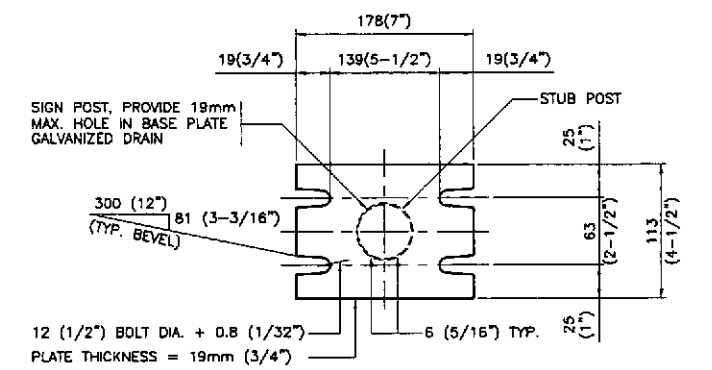
7 INSTALLATION DETAILS (TYPE 'B')
RS-15



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.

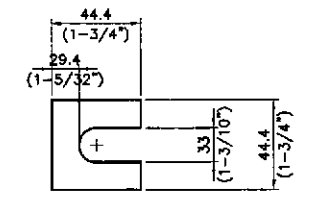
PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:
1. ASSEMBLE POST TO STUB WITH BOLTS AND ONE FLAT WASHER ON EACH BOLT BETWEEN PLATES.
2. SHIM AS REQUIRED TO PLUMB POST.
3. TIGHTEN ALL BOLTS THE MAXIMUM POSSIBLE WITH 300 TO 380mm WRENCH TO BED WASHER AND SHIMS AND CLEAN BOLT TRENDS THEN LOOSEN.
4. RETIGHTEN 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 TRENDS AT JUNCTION WITH NUT USING A CENTER PUNCH TO PREVENT NUT LOOSENING.



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

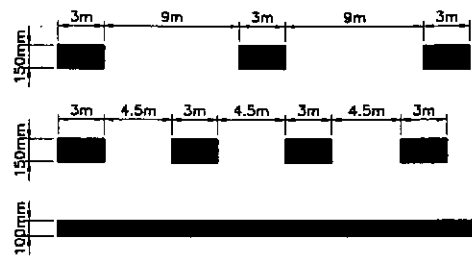


5 SHIM DETAIL
RS-15

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(266.016x10⁻⁴KN-m)

TYPICAL SIGN MOUNTING DETAILS
NOT TO SCALE

	DESIGNED	10/18/02	SIGNATURE	S. LUNA		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS				PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	SIGNATURE	S. ROSE		BUREAU OF DESIGN				THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	MOUNTING / SUPPORT FOR ROAD SIGN TYPICAL SIGN MOUNTING DETAILS (2 OF 2)	RS-15
	SUBMITTED	10/19/02	SIGNATURE	JOCH		OFFICE OF THE SECRETARY				FULL SIZE A1			
					Submitted By: DANILLO C. TRAJANO, Project Director Reviewed By: JOSEFINA M. ALAGAR, Chief, Highways Division Recommended By: GILBERTO S. REYES, OIC, Director IV Approved By: MANUEL M. BONDAN, Undersecretary Approved By: SIMEDON A. DATUMANDONG, Secretary				CABANATUAN BYPASS - CONTRACT PACKAGE III				

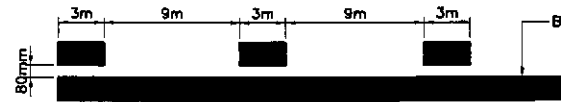


CENTERLINE - 150mm WIDE, 3m LENGTH, 9m GAP, WHITE

LANES LINES - 150mm WIDE, 3m LENGTH, 4.5m GAP, WHITE



EDGE LINES - 100mm WIDE, UNBROKEN, WHITE



BARRIER LINE

BARRIER LINE - 1 - 100mm WIDE UNBROKEN, YELLOW



BARRIER LINES - 2 - 100mm WIDE UNBROKEN, YELLOW

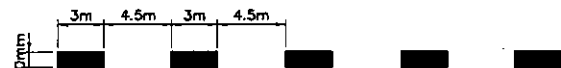


STOP LINES - 450mm WIDE, UNBROKEN, WHITE PERPENDICULAR TO LANE LINES AND DIRECTION OF TRAFFIC.

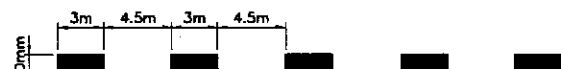


CONTINUITY LINES - 150mm WIDE, 1m LENGTH, 3m GAP, WHITE

1B BYPASS MAIN LINE
RS-16 NOT TO SCALE



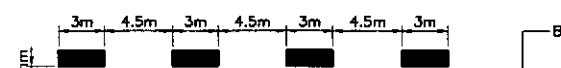
CENTERLINE - 100mm WIDE, 3m LENGTH, 4.5m GAP, WHITE



LANE LINES - 100mm WIDE, 3m LENGTH, 4.5m GAP, WHITE



LANE LINES - 100mm WIDE, VARIES IN LENGTH (MIN), UNBROKEN, WHITE



EDGE LINES - 100mm WIDE, UNBROKEN, WHITE



BARRIER LINE

BARRIER LINE - 1 - 100mm WIDE UNBROKEN, YELLOW



BARRIER LINES - 2 - 100mm WIDE UNBROKEN, YELLOW



CONTINUITY LINES - 100mm WIDE, 1m LENGTH, 3m GAP, WHITE

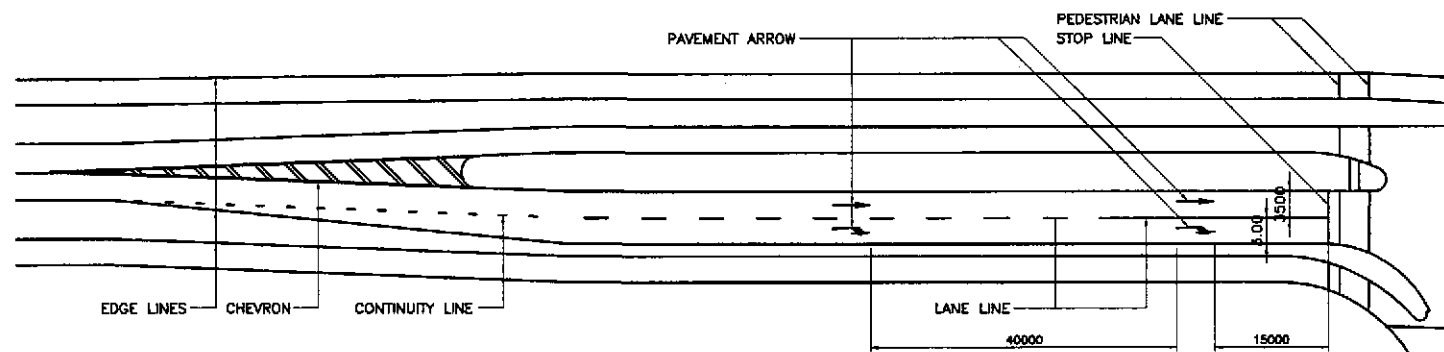


GIVE WAY LINES - 2 x 200mm WIDE, 0.6m GAP PERPENDICULAR TO LANE LINES AND DIRECTION OF TRAFFIC

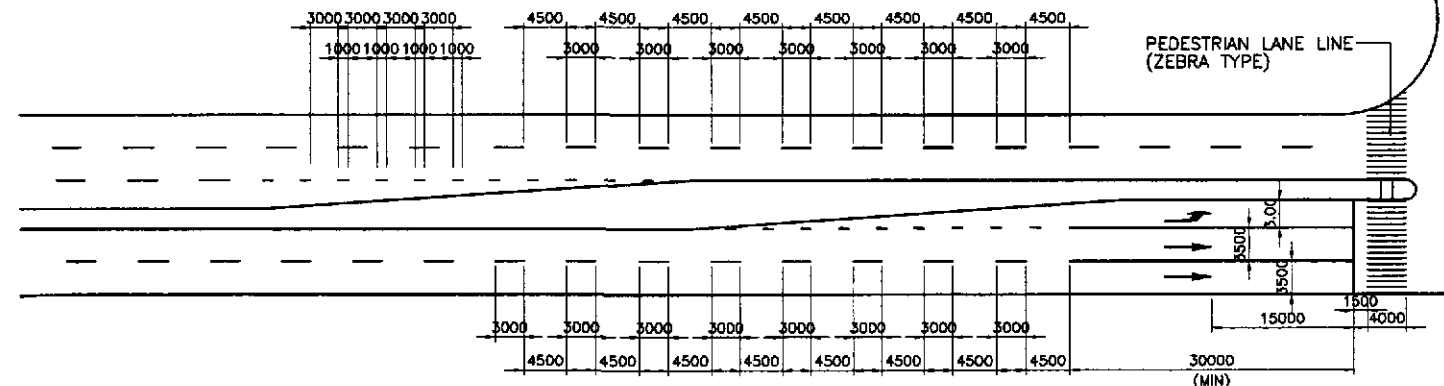


STOP LINES - 300mm WIDE UNBROKEN, PERPENDICULAR TO LANE LINES AND DIRECTION OF TRAFFIC

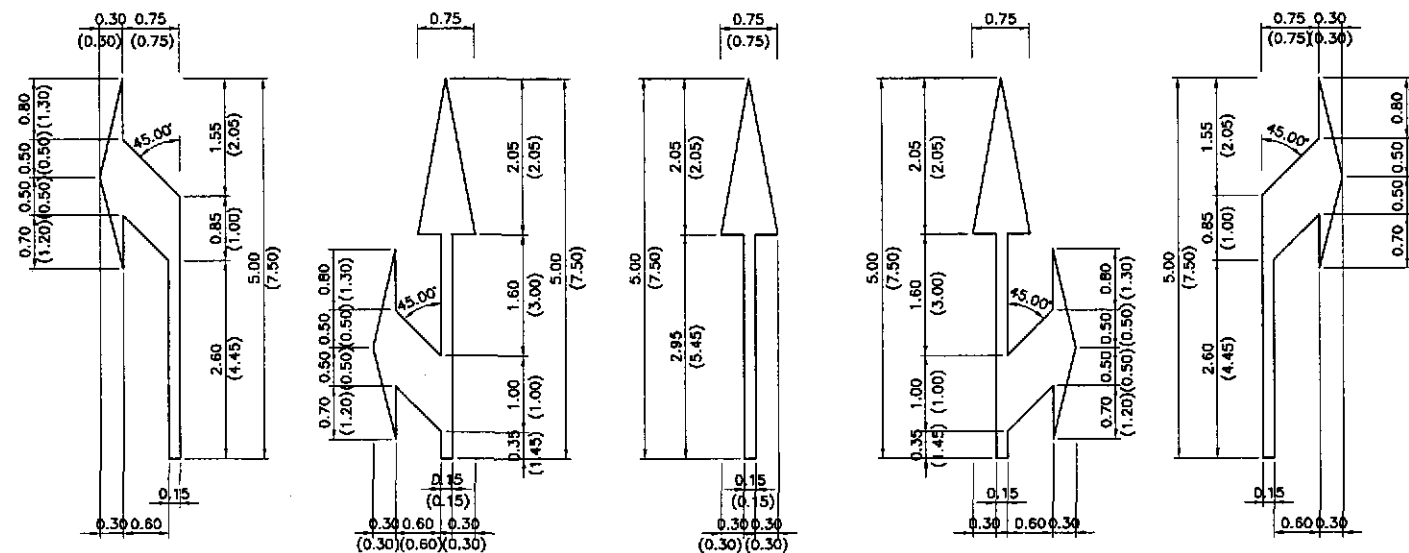
1A RAMPS AND CROSS ROADS
RS-16 NOT TO SCALE



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.

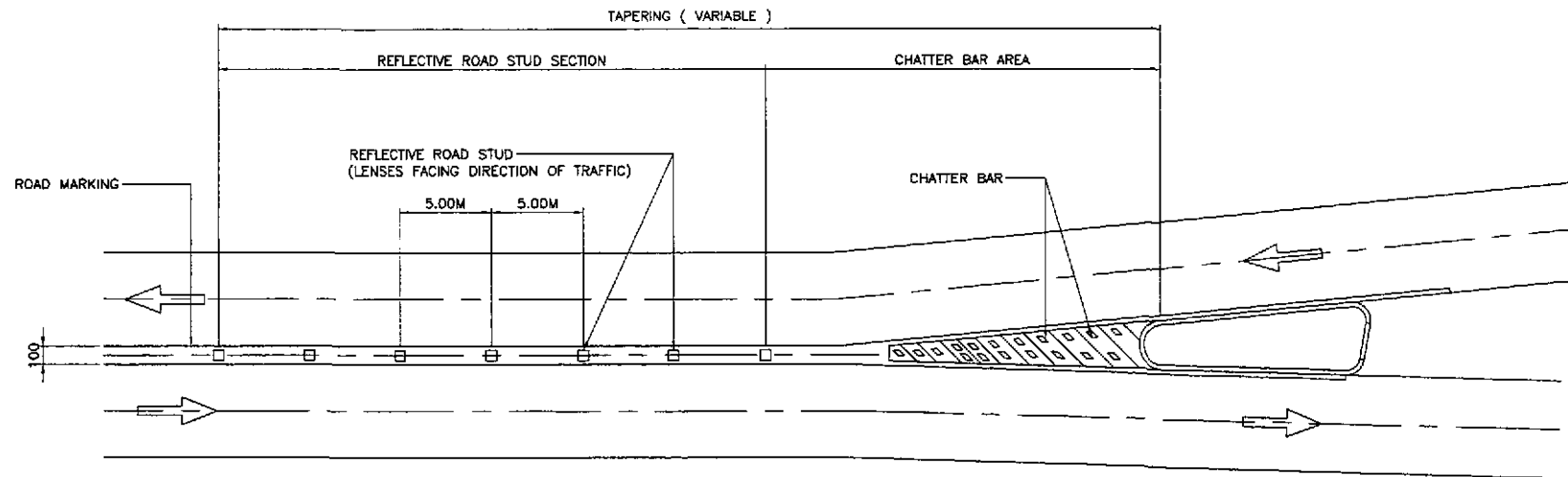
1 STANDARD PAVEMENT MARKINGS
RS-16 NOT TO SCALE

JICA
JAPAN INTERNATIONAL COOPERATION AGENCY

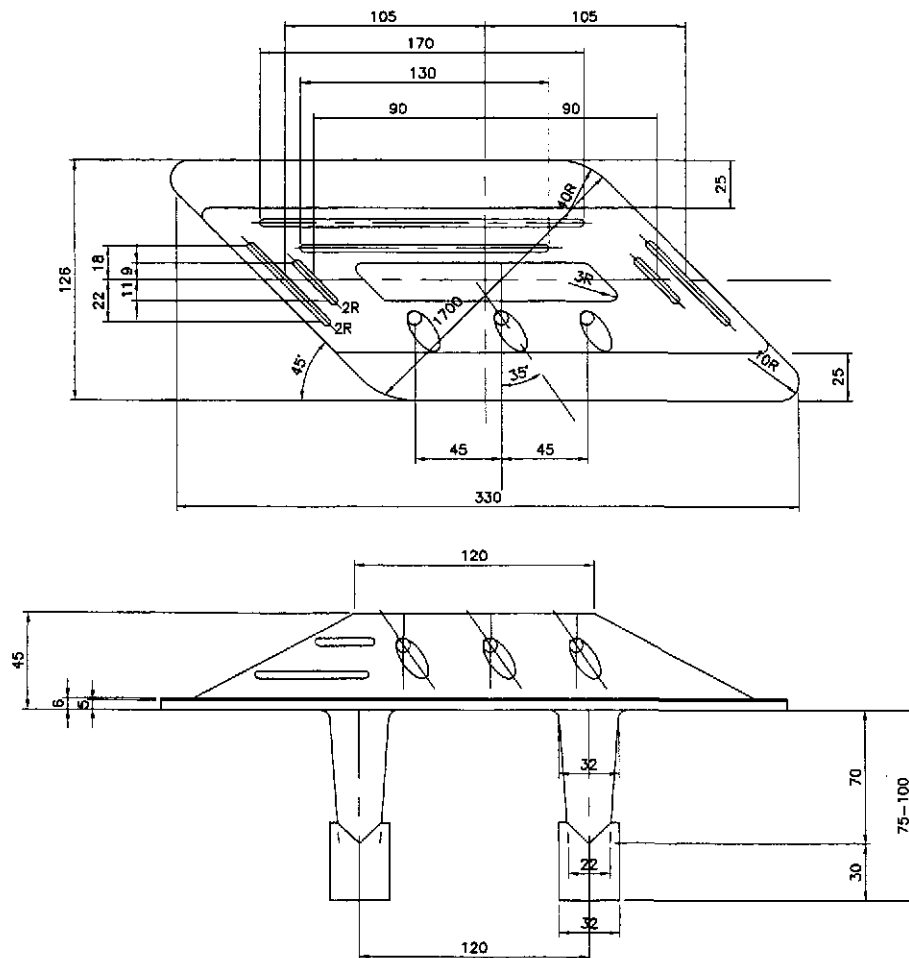
KAI KATAHIRA & ENGINEERS INTERNATIONAL
YEO YACHIYO ENGINEERING CO., LTD.

DESIGNED	10/18/02	SIGNATURE	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	
CHECKED	10/17/02	SIGNATURE	BUREAU OF DESIGN	
SUBMITTED	10/19/02	SIGNATURE	OFFICE OF THE SECRETARY	
SUBMITTED BY: DANILLO C. TRAJANO, Project Director			MANUEL M. BONDAN, Undersecretary	
REVIEWED BY: JOSEFINA M. ALAGAR, Chief, Highways Division			SIMEON A. DATUMANONG, Secretary	

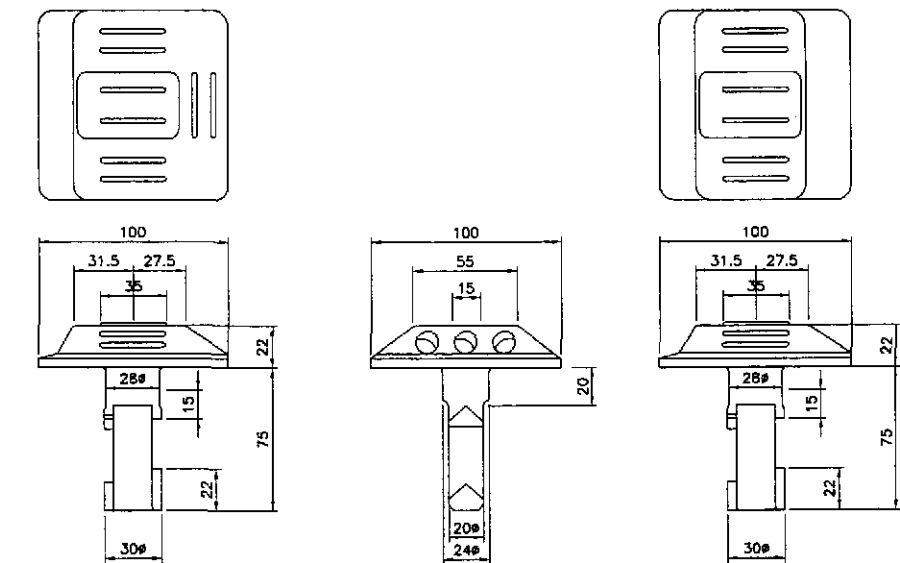
PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Pinarid, Cabanatuan and San Jose Bypasses)	NOT TO SCALE	STANDARD PAVEMENT MARKINGS Sheet 1 OF 2	RS-16
CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		



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

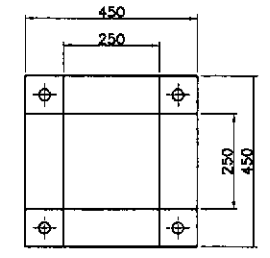
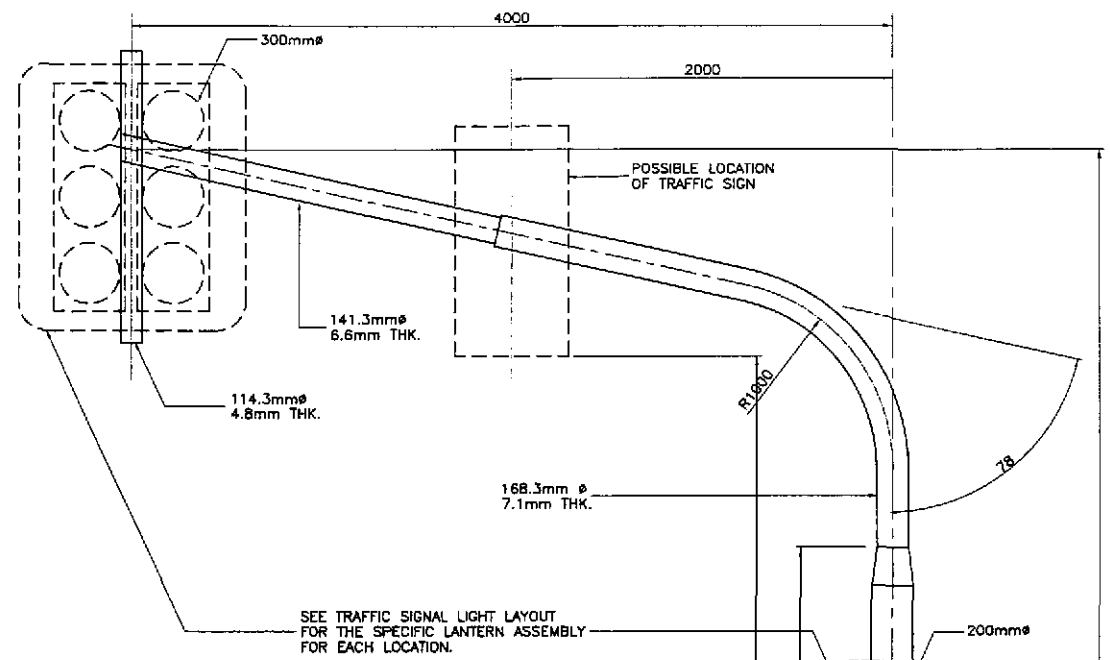


1 CHATTER BAR
 (WITH LENSES ON 1 - SIDE)
 RS-18 SCALE 1:20 M

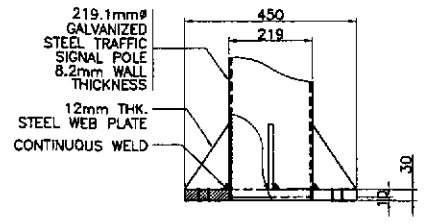


2 REFLECTIVE ROAD STUDS FOR CONCRETE
 (WITH LENSES ON ONE - SIDE / TWO SIDES)
 RS-18 SCALE 1:20

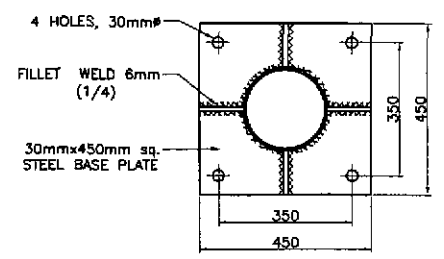
	DESIGNED	10/8/02	 DANILO C. TRAJANO Project Director	 REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS	PROJECT AND LOCATION :			SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02			Submitted By:	BUREAU OF DESIGN	OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	REFLECTIVE ROAD STUDS AND CONCRETE CHATTER BAR AND DETAILS
SUBMITTED	10/19/02	Team Leader	Reviewed By:	Recommended By:	Recommended By:	CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1			



3A ANCHOR FRAME DETAIL
SCALE 1:10

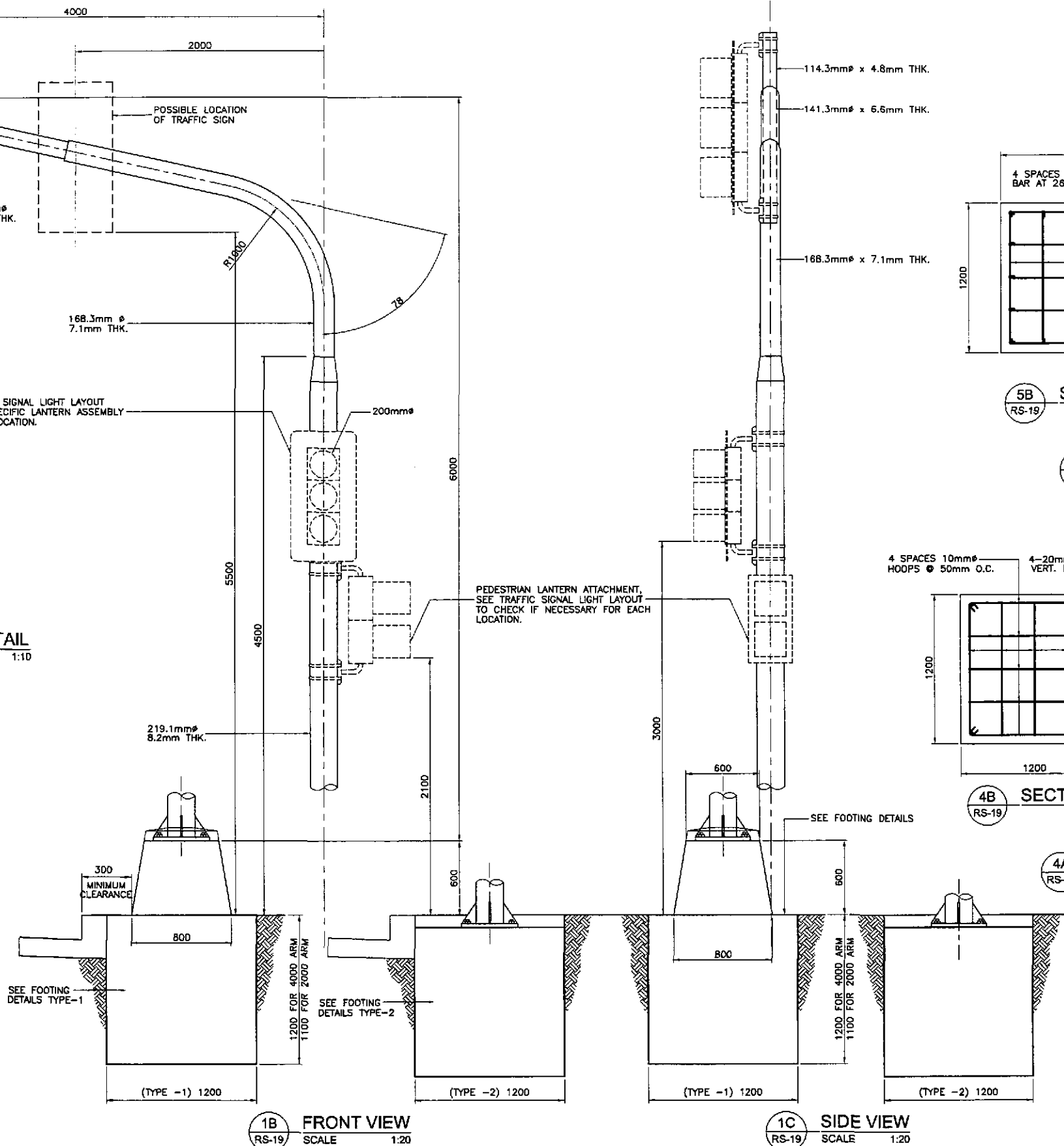


2C ELEVATION
SCALE 1:10



2B PLAN
SCALE 1:10

2A BASE PLATE DETAIL
SCALE 1:10

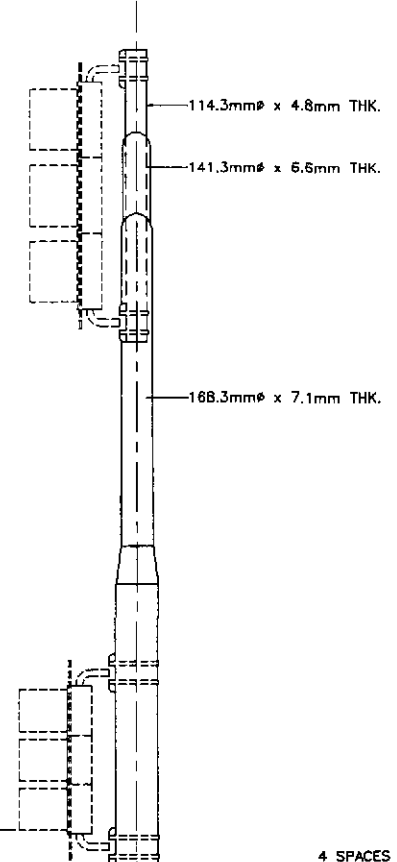


1B FRONT VIEW
SCALE 1:20

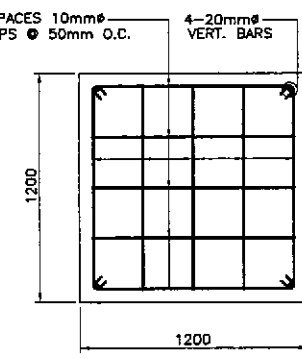
1C SIDE VIEW
SCALE 1:20

1A MAST ARM VEHICLE SIGNAL POST
SCALE 1:20

A TRAFFIC SIGNAL POST TYPE A
SCALE 1:20

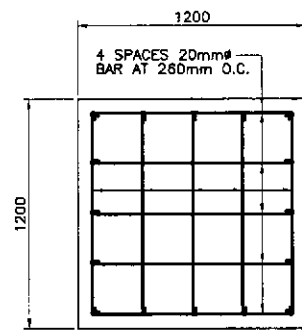


5B SECTION
SCALE 1:20

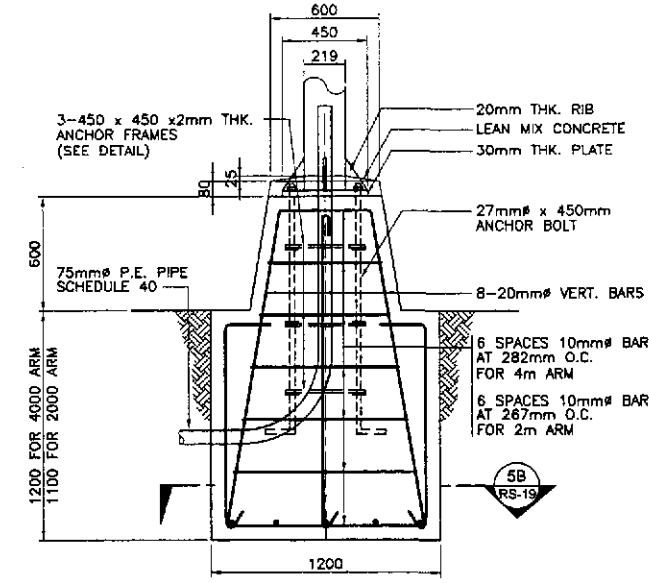


4B SECTION
SCALE 1:20

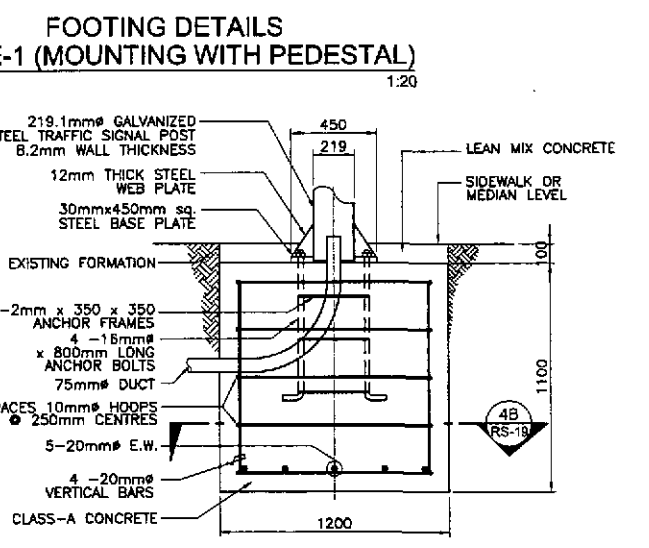
4A TYPE-2 (MOUNTING AT SIDEWALK LEVEL)
SCALE 1:20



5B SECTION
SCALE 1:20



5C SECTION THROUGH FOOTING
SCALE 1:20

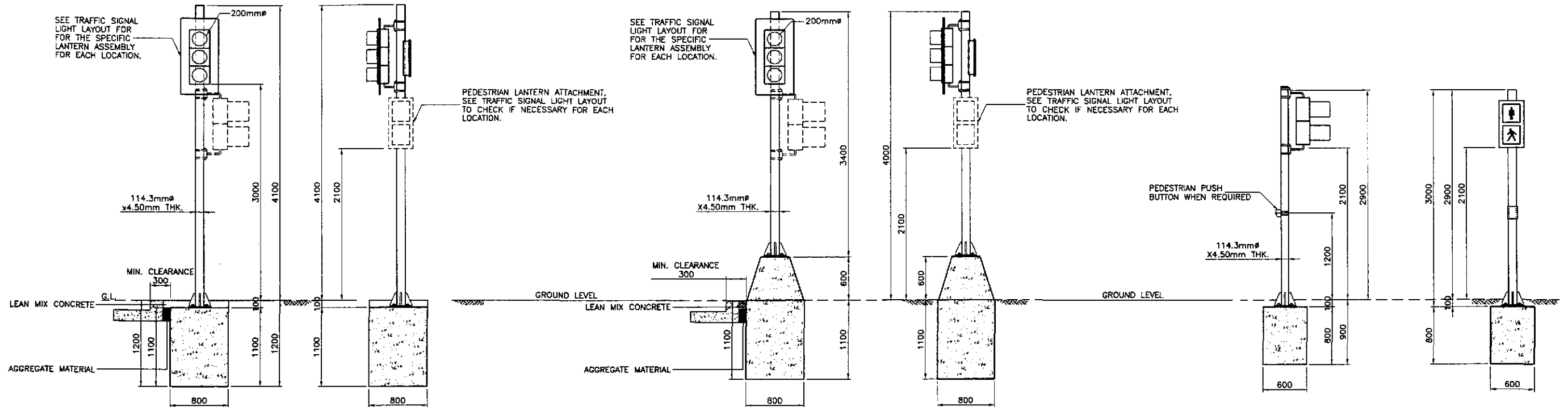


4C SECTION THROUGH FOOTING
SCALE 1:20

FOOTING DETAILS 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.

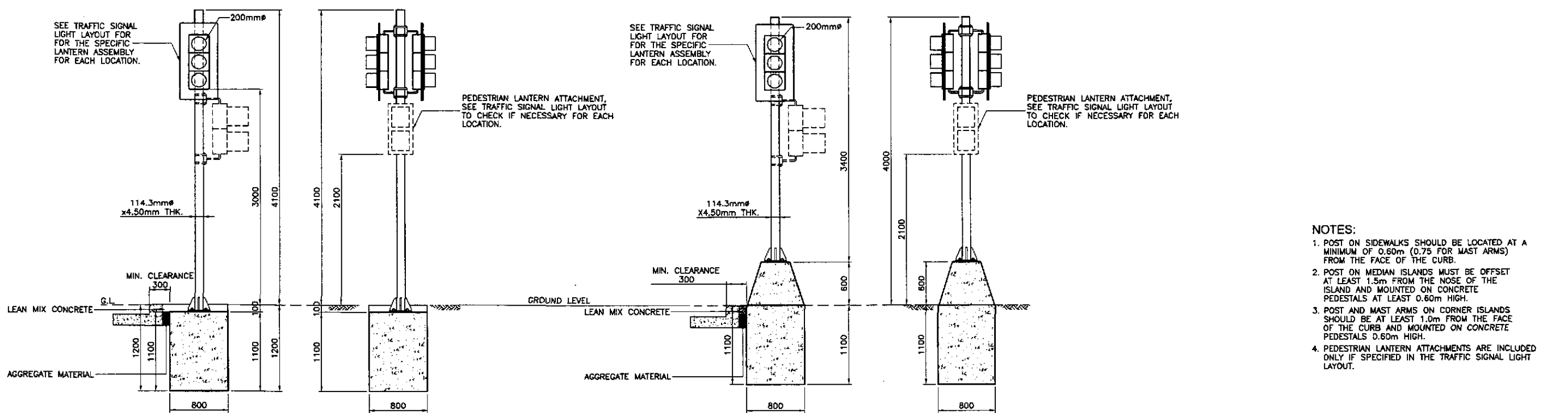
	DESIGNED	DATE	SIGNATURE		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Palaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : TRAFFIC SIGNAL POST TYPE 'A' AND FOUNDATION DETAILS	SHEET NO. : RS-19
	CHECKED	10/17/02	<i>[Signature]</i>		P.W. - PWD	BUREAU OF DESIGN	OFFICE OF THE SECRETARY				
	SUBMITTED	10/19/02	<i>[Signature]</i>		Submitted By:	Reviewed By:	Recommended By:				
			<i>[Signature]</i>	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			



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

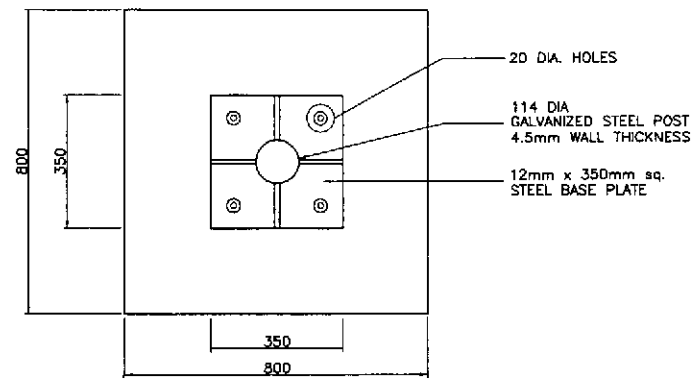
2B TYPE C-2
RS-20 SCALE 1:30

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

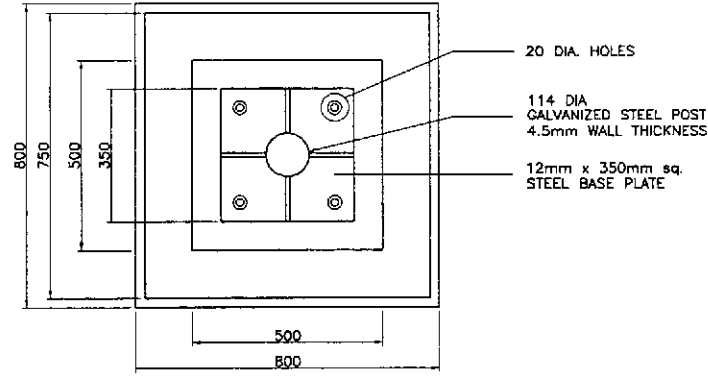
2 TRAFFIC SIGNAL POST TYPE C
RS-20 SCALE 1:30

- NOTES:
- POST ON SIDEWALKS SHOULD BE LOCATED AT A MINIMUM OF 0.60m (0.75 FOR MAST ARMS) FROM THE FACE OF THE CURB.
 - 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.
 - 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.
 - PEDESTRIAN LANTERN ATTACHMENTS ARE INCLUDED ONLY IF SPECIFIED IN THE TRAFFIC SIGNAL LIGHT LAYOUT.

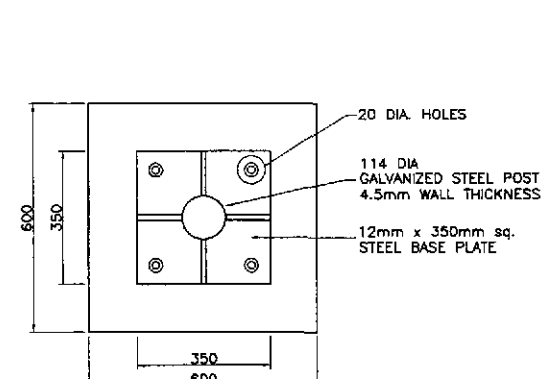
	DESIGNED	10/10/02	<i>[Signature]</i>		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses) CABANATUAN BYPASS - CONTRACT PACKAGE III	SCALE : AS SHOWN FULL SIZE A1	SHEET CONTENTS : TRAFFIC SIGNAL POST TYPES 'B', 'C' & 'D'	SHEET NO. : RS-20	
	CHECKED	10/11/02	<i>[Signature]</i>		BUREAU OF DESIGN							
	SUBMITTED	10/19/02	<i>[Signature]</i>		OFFICE OF THE SECRETARY							
			P.W. - PMO	BUREAU OF DESIGN								
			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. DATUMANDONG Secretary					



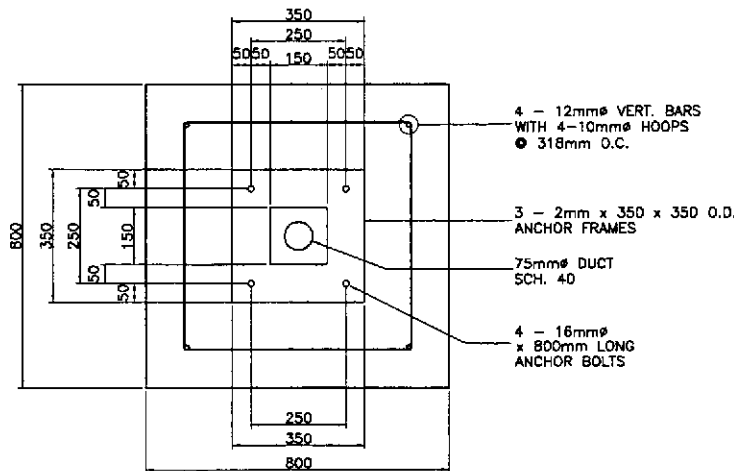
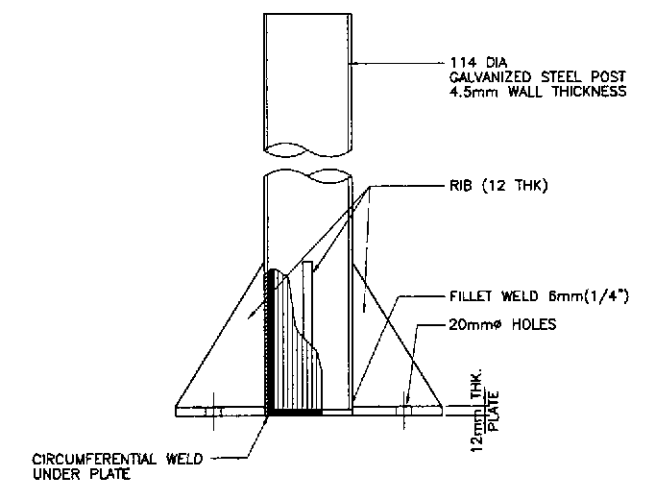
PLAN OF FOOTING



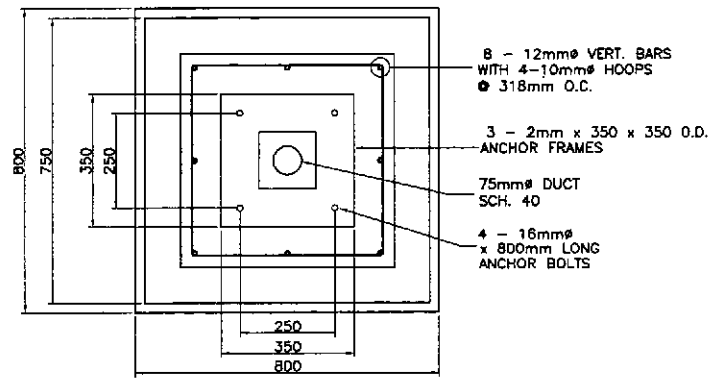
PLAN OF FOOTING



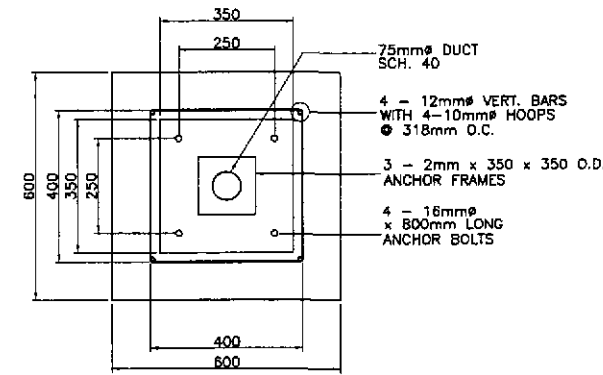
PLAN OF FOOTING



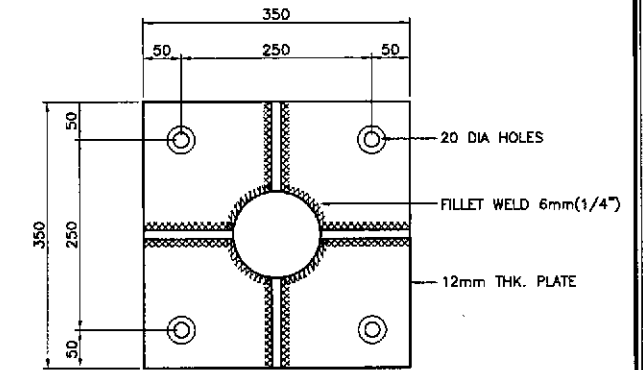
SECTION THRU A OF TYPE B



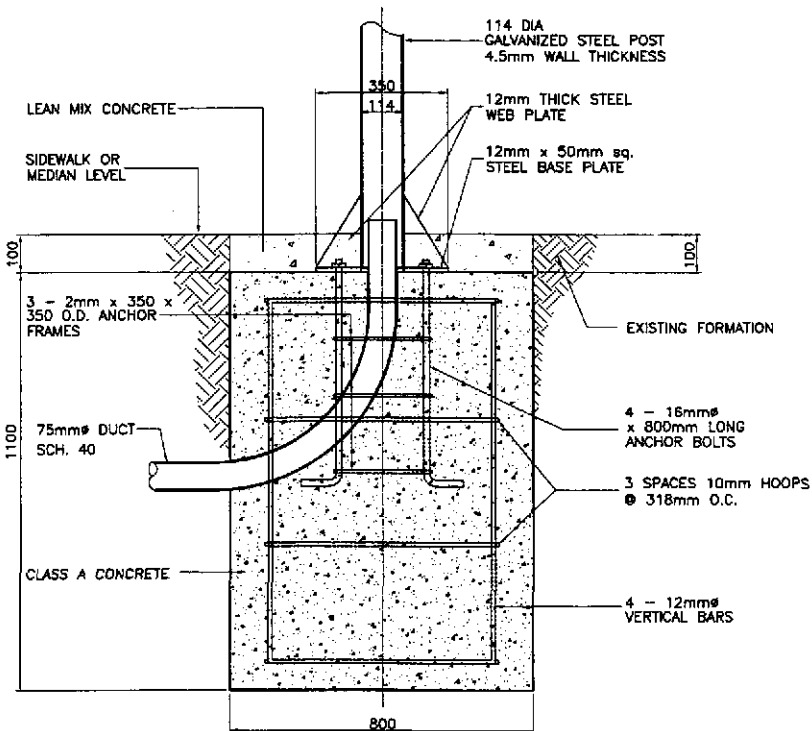
SECTION THRU A OF TYPE C



SECTION THRU A OF TYPE D



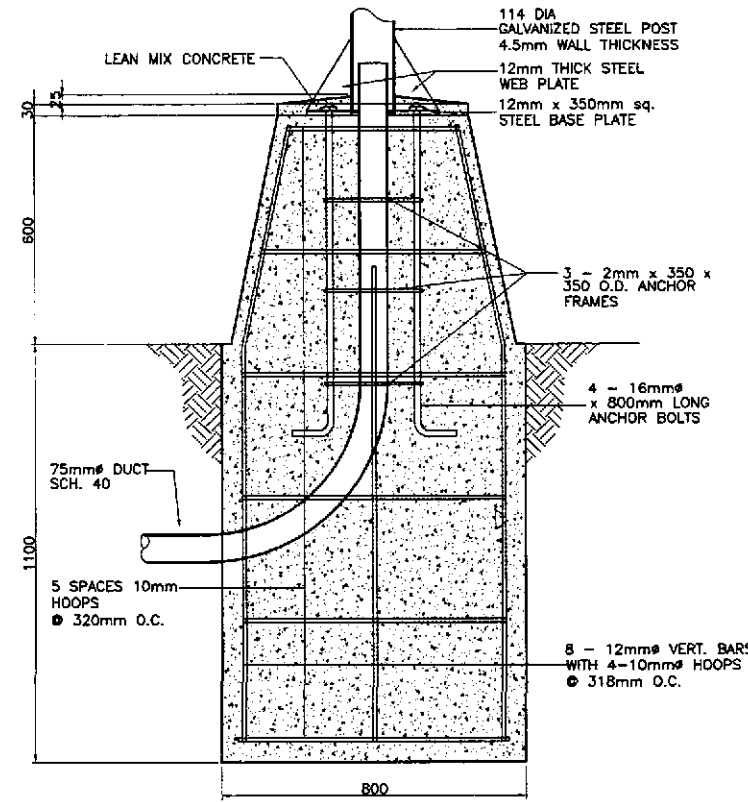
5 POST AND BASE PLATE SCALE 1:5



SECTION THROUGH FOUNDATION (4.1 SIGNAL POST)

VEHICLE SIGNAL POST FOUNDATION (TYPE B)

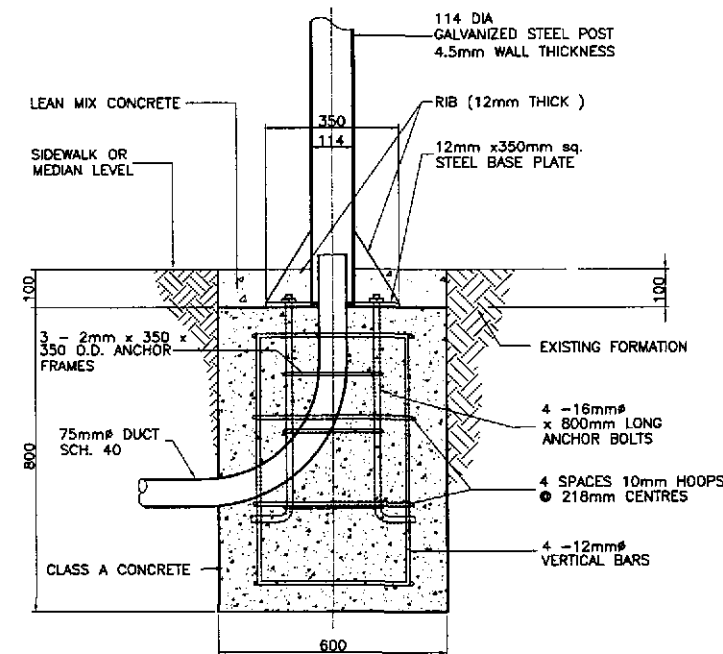
1 RS-21 SCALE 1:10



SECTION THROUGH FOUNDATION (4.1 SIGNAL POST)

VEHICLE SIGNAL POST FOUNDATION (TYPE C)

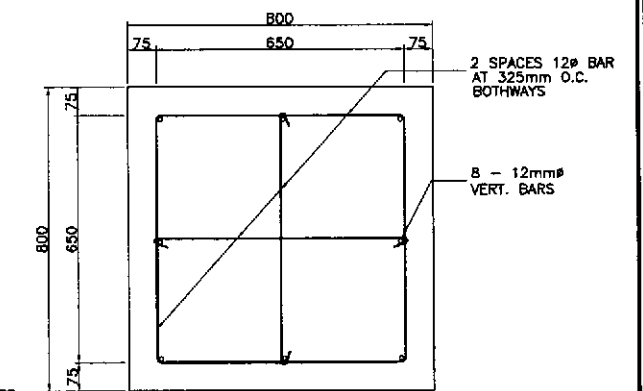
2 RS-21 SCALE 1:10



SECTION THROUGH FOUNDATION (4.1 SIGNAL POST)

PEDESTRIAN SIGNAL POST FOUNDATION (TYPE D)

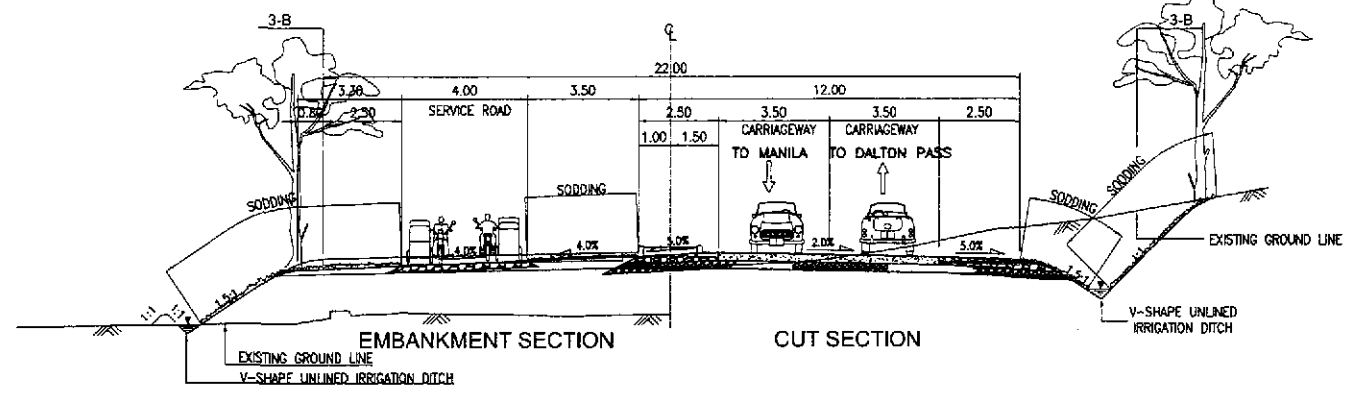
3 RS-21 SCALE 1:10



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

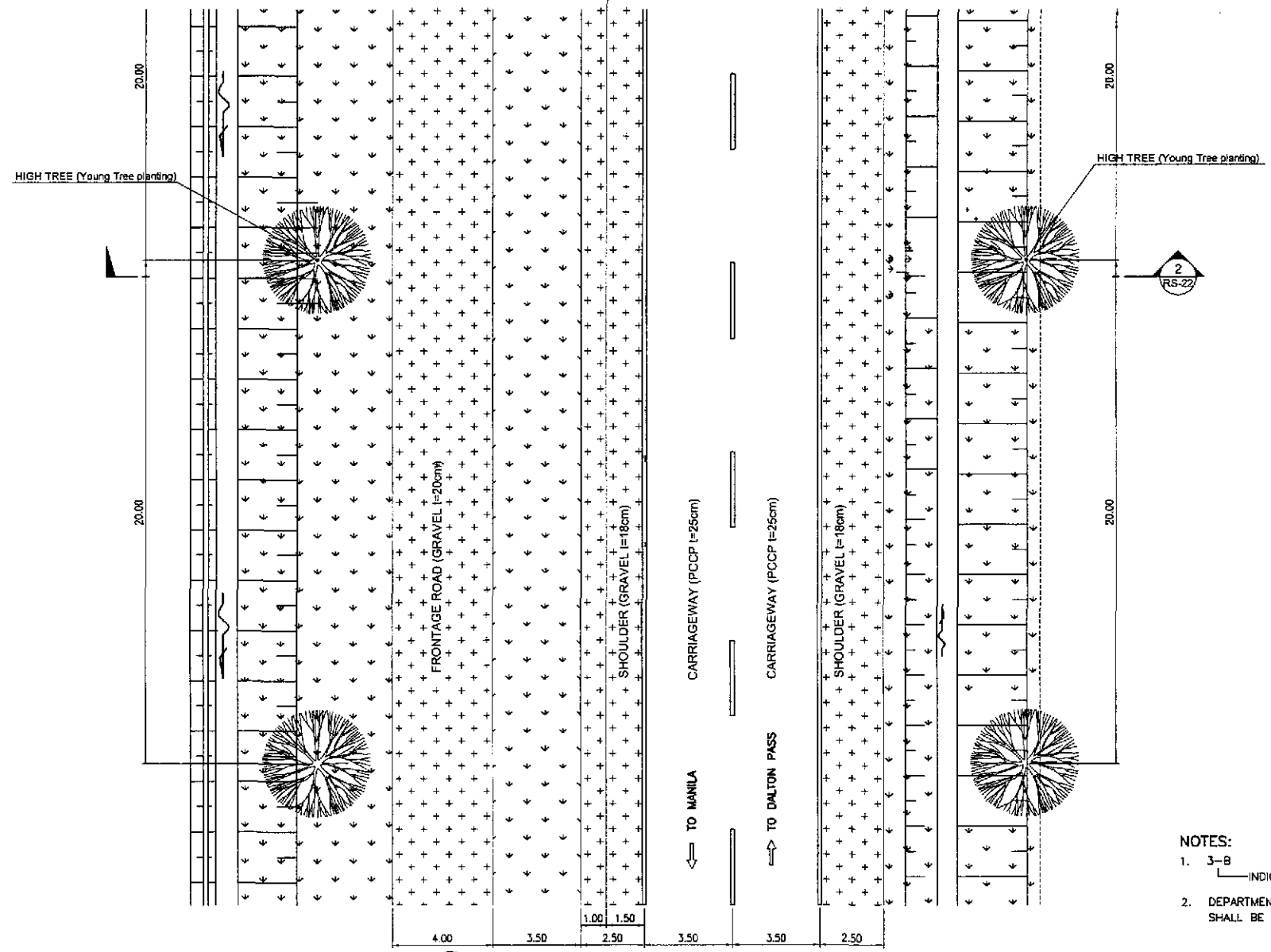
NOTES:
 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
 2. POST AND FOUNDATION DESIGN BASED ON TRAFFIC ENGINEERING CENTER DRAWING NO. 1033.

	DESIGNED	DATE	SIGNATURE		PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	<i>[Signature]</i>		REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS BUREAU OF DESIGN OFFICE OF THE SECRETARY	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Piaridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	TRAFFIC SIGNAL POST TYPE B, C & D FOUNDATION DETAILS
SUBMITTED	10/19/02	<i>[Signature]</i>	DANILLO C. TRAJANO Chief, Highways Division	DANILLO C. TRAJANO Project Director	GILBERTO S. REYES OIC, Director IV	MANUEL M. BONDAN Undersecretary	SIMEON A. DATUMANONG Secretary	CABANATUAN BYPASS - CONTRACT PACKAGE III FULL SIZE A1



2 GENERAL PLANTING LOCATION
RS-22 SCALE 1:120

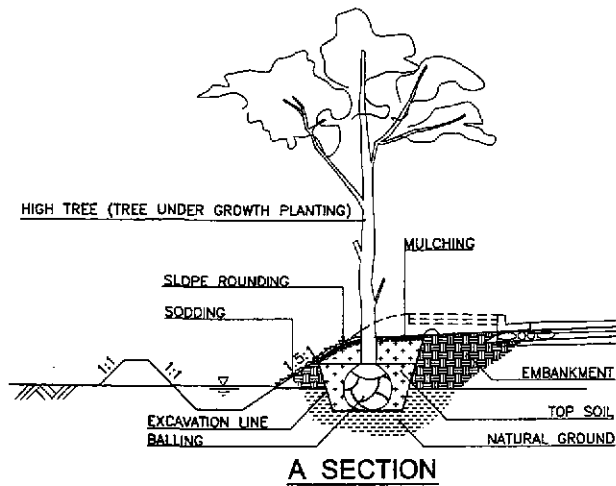
SURFACE	EXISTING GROUND	SIDE DRAIN		PAVEMENT				SIDE DRAIN		EXISTING GROUND
		SLOPE PROTECTION	SOIL DUST PREVENTION	PAVEMENT	SOIL DUST PREVENTION	PAVEMENT	PAVEMENT	SLOPE PROTECTION		
DISCRIPTION	NATURE	SODDING	SODDING	GRAVEL	SODDING	GRAVEL	PCC	GRAVEL	SODDING	NATURE



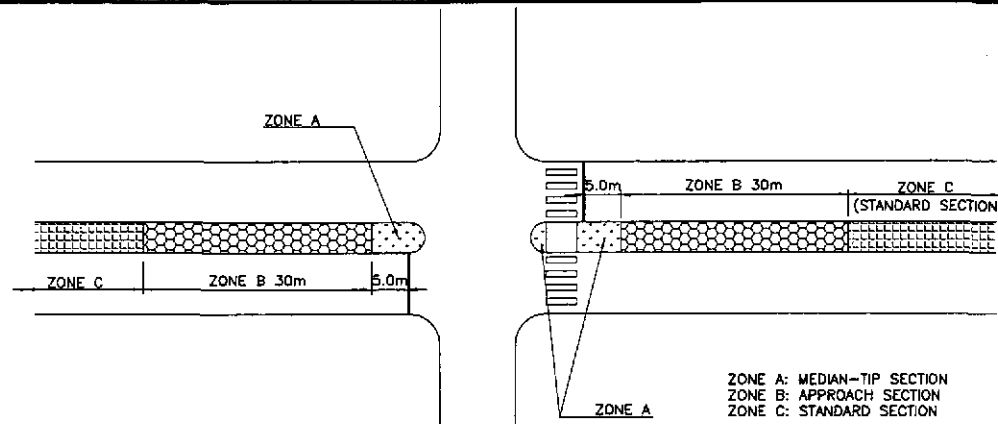
1 TYPICAL PLANTING LAYOUT
RS-22 SCALE 1:120

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

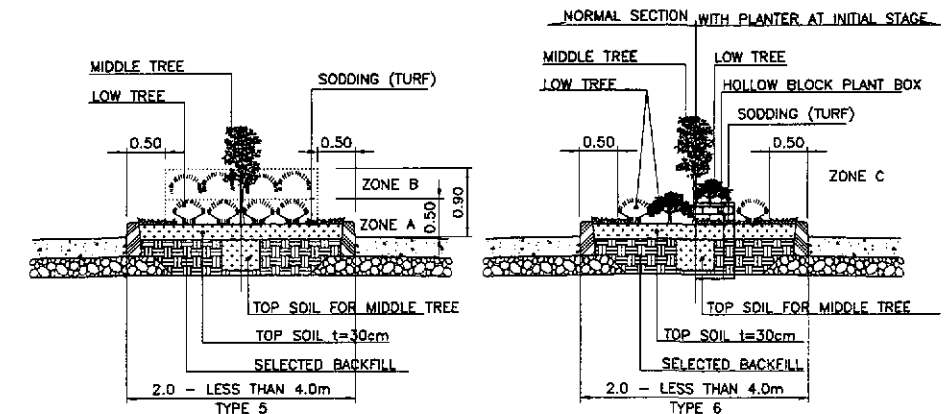
	DESIGNED	10/8/02	<i>[Signature]</i>	REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS			PROJECT AND LOCATION :	SCALE :	SHEET CONTENTS :	SHEET NO. :
	CHECKED	10/17/02	<i>[Signature]</i>	Submitted By:	Reviewed By:	Recommended By:	THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Paridel, Cabanatuan and San Jose Bypasses)	AS SHOWN	TYPICAL PLANTING LAYOUT WITHOUT FRONTAGE ROAD (INITIAL STAGE)	RS-22
	SUBMITTED	10/17/02	<i>[Signature]</i>	DANILO C. TRAJANO Project Director	JOSEFINA M. ALAGAR Chief, Highways Division	GILBERTO S. REYES Dir. Director IV	CABANATUAN BYPASS - CONTRACT PACKAGE III	FULL SIZE A1		



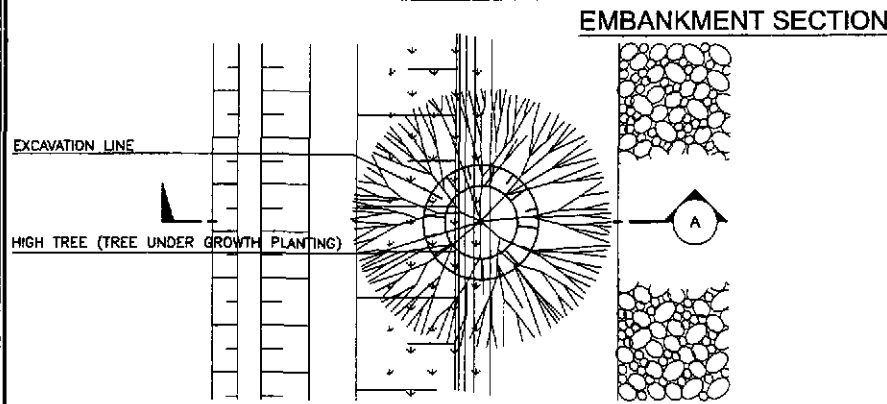
A SECTION



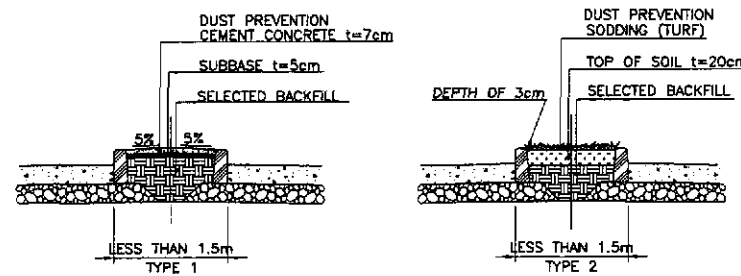
DISTRICT CHART OF PLANTING ARRANGEMENT IN THE MEDIAN



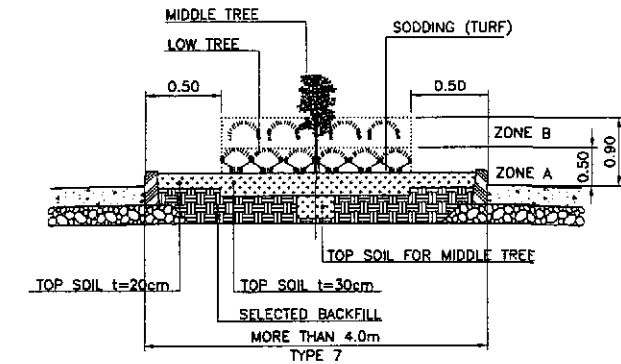
MEDIAN OF 2.0 - LESS THAN 4.0M



EMBANKMENT SECTION

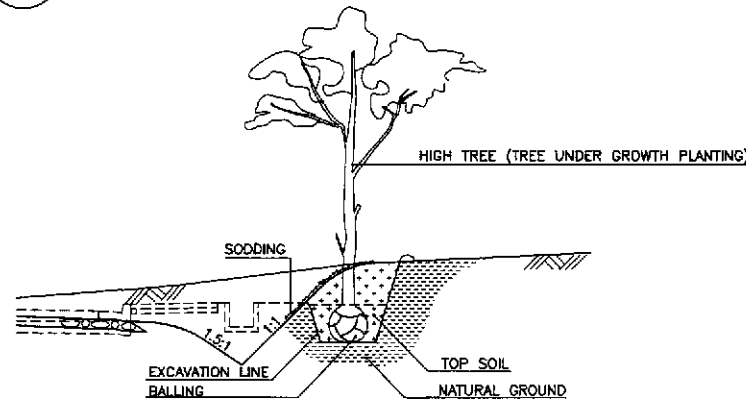


MEDIAN OF LESS THAN 1.5M

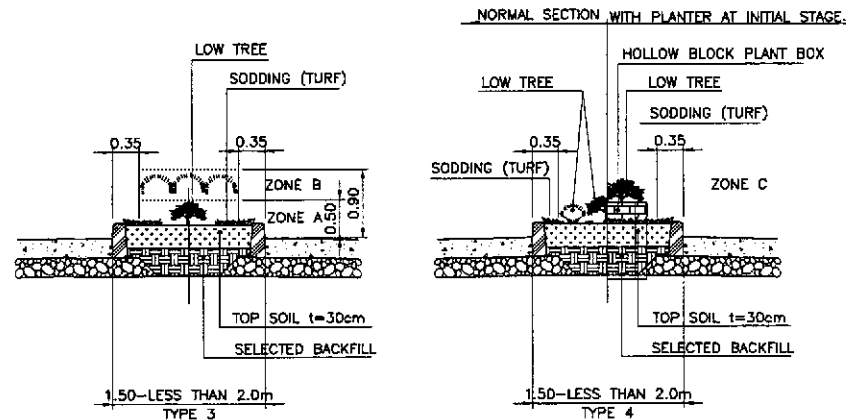


TYPE 7

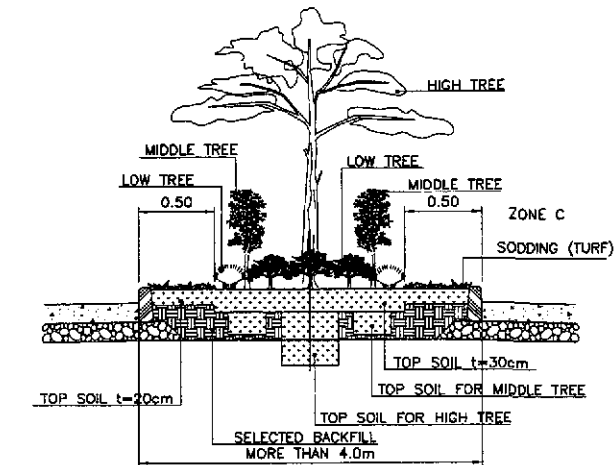
1 PLAN OF ROAD SIDE PLANTATION (OUTSIDE EMBANKMENT SECTION) RS-23 NOT TO SCALE



A-A SECTION



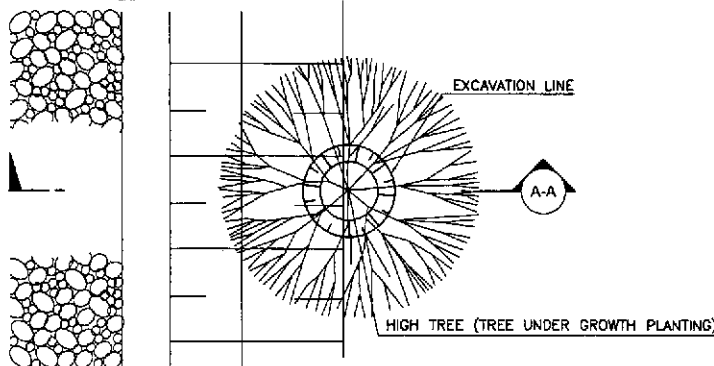
MEDIAN OF 1.5 - LESS THAN 2.0M



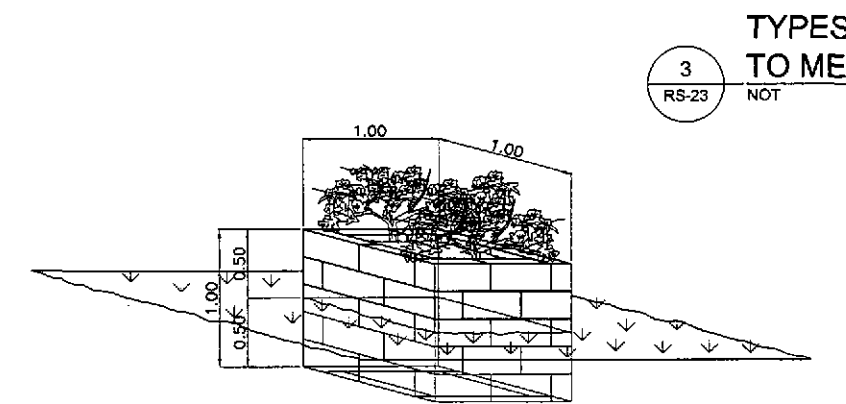
TYPE 8

MEDIAN OF MORE THAN 4.0M

EMBANKMENT SECTION



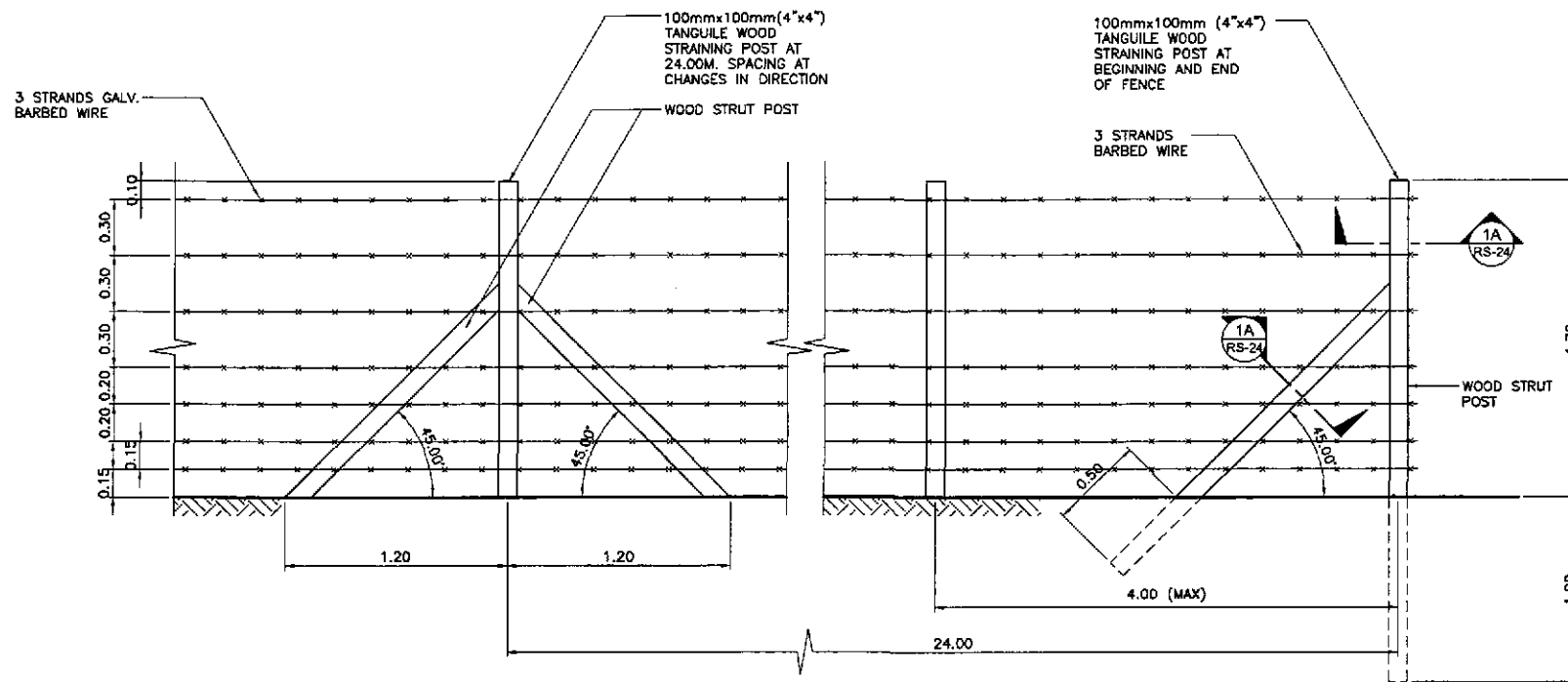
2 PLAN OF ROAD SIDE PLANTATION (OUTSIDE EMBANKMENT SECTION) RS-23 NOT TO SCALE



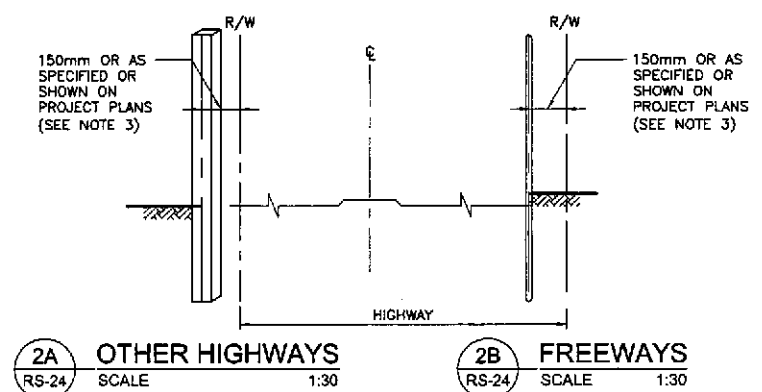
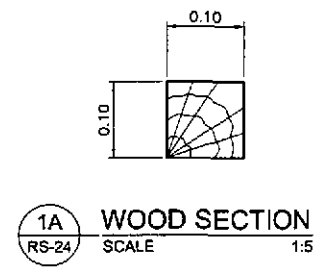
4 ISOMETRIC VIEW OF HOLLOW BLOCK PLANT BOX RS-23 NOT TO SCALE

3 TYPES OF PLANTING FORMS ACCORDING TO MEDIAN/OUTER SEPARATION WIDTH RS-23 NOT TO SCALE

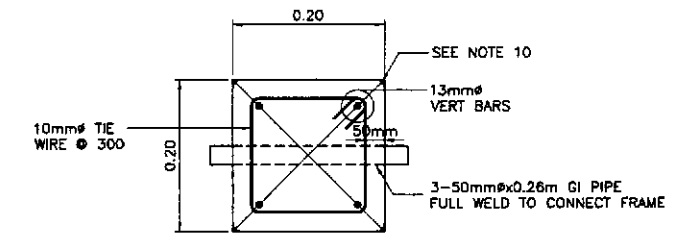
	DESIGNED	DATE	SIGNATURE	<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</p>	<p>PROJECT AND LOCATION : THE DETAILED DESIGN STUDY ON UPGRADING INTER-URBAN HIGHWAY SYSTEM ALONG THE PAN-PHILIPPINE HIGHWAY (Plaridel, Cabanatuan and San Jose Bypasses)</p>	SCALE :	SHEET CONTENTS :	SHEET NO. :			
	CHECKED	10/17/02	[Signature]			BUREAU OF DESIGN			NOT TO SCALE	TYPES OF PLANTING FORMS AND OTHER DETAILS (INITIAL STAGE)	RS-23
	SUBMITTED	10/19/02	[Signature]			OFFICE OF THE SECRETARY			FULL SIZE A1		
	Submitted By:	Reviewed By:	Recommended By:			Approved By:			CABANATUAN BYPASS - CONTRACT PACKAGE III		
				<p>DANILO C. TRAJANO Project Director</p> <p>JOSEFINA M. ALAGAR Chief, Highways Division</p> <p>GILBERTO S. REYES OC, Director IV</p> <p>MANUEL M. BONDAN Undersecretary</p> <p>SIMEON A. DATUMANONG Secretary</p>							



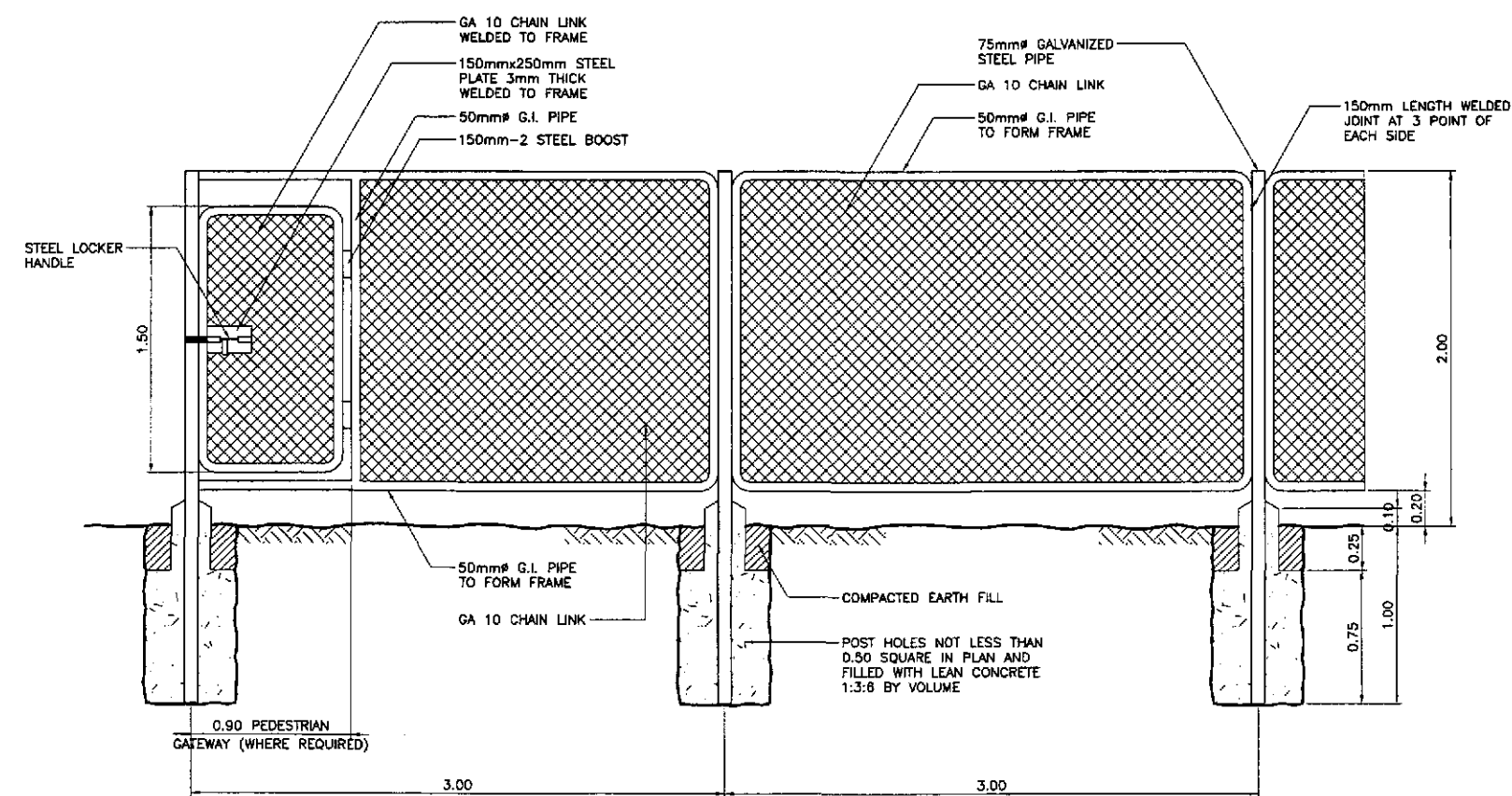
1 FENCE TYPE - I (BARBED WIRE FENCE) INSTALLATION FOR WOOD FENCES
RS-24 SCALE 1:20



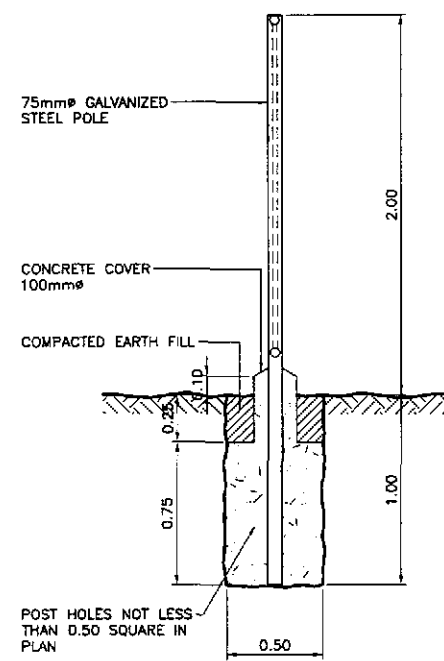
2 FENCE LOCATION
RS-24 SCALE 1:30



5 CONCRETE POST SECTION
RS-24 SCALE 1:5



3 FENCE TYPE - II (CHAIN LINK FENCE) FOR EITHER STEEL OR CONCRETE POST FENCES
RS-24 SCALE 1:20



4 SIDE VIEW
RS-24 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.

<p>JAPAN INTERNATIONAL COOPERATION AGENCY</p>		<p>REPUBLIC OF THE PHILIPPINES DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS</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>SCALE : AS SHOWN</p>	<p>SHEET CONTENTS : TYPICAL FENCING DETAILS</p>	<p>SHEET NO. : RS-24</p>
<p>DESIGNED: 10/18/02</p> <p>CHECKED: 10/17/02</p> <p>SUBMITTED: 10/14/02</p>	<p>DATE: 10/18/02</p> <p>SIGNATURE: [Signature]</p>	<p>DESIGNED: 10/18/02</p> <p>CHECKED: 10/17/02</p> <p>SUBMITTED: 10/14/02</p>	<p>DATE: 10/18/02</p> <p>SIGNATURE: [Signature]</p>	<p>PROJECT AND LOCATION : CABANATUAN BYPASS - CONTRACT PACKAGE III</p>	<p>SCALE : FULL SIZE A1</p>		
<p>YOSHIO YAMAMOTO Team Leader</p>		<p>DANILO C. TRAJANO Project Director</p>		<p>JOSEFINA M. ALAGAR Chief, Highways Division</p>		<p>GILBERTO S. REYES OIC, Director IV</p>	
<p>YOSHIO YAMAMOTO Team Leader</p>		<p>DANILO C. TRAJANO Project Director</p>		<p>JOSEFINA M. ALAGAR Chief, Highways Division</p>		<p>GILBERTO S. REYES OIC, Director IV</p>	