REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS & HIGHWAYS

Feasibility Study of the Road Improvement Project on the Pan-Philippine Highway (Philippines-Japan Friendship Highway)

FINAL REPORT

DRAWINGS

(VOLUME Ⅳ)

SEPTEMBER, 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS & HIGHWAYS

Feasibility Study of the Road Improvement Project on the Pan-Philippine Highway (Philippines-Japan Friendship Highway)

FINAL REPORT

DRAWINGS

(VOLUME Ⅳ)

SEPTEMBER, 1987

JAPAN INTERNATIONAL COOPERATION AGENCY

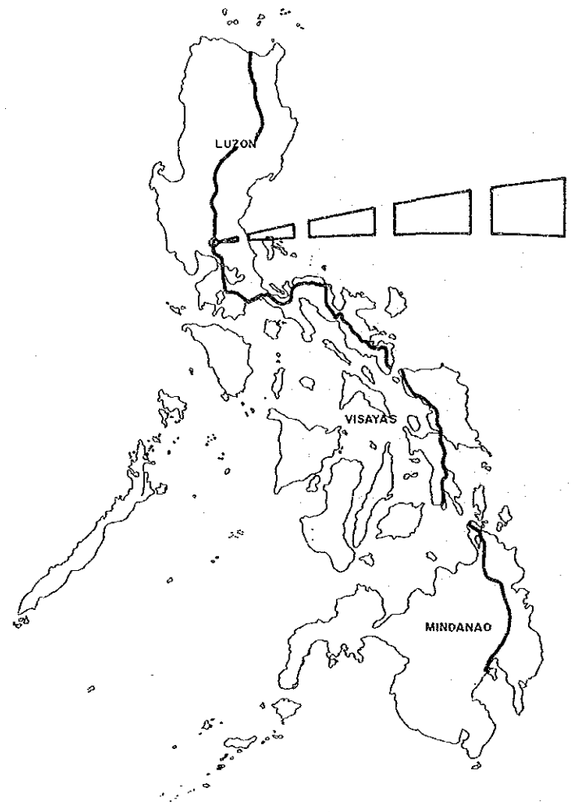
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

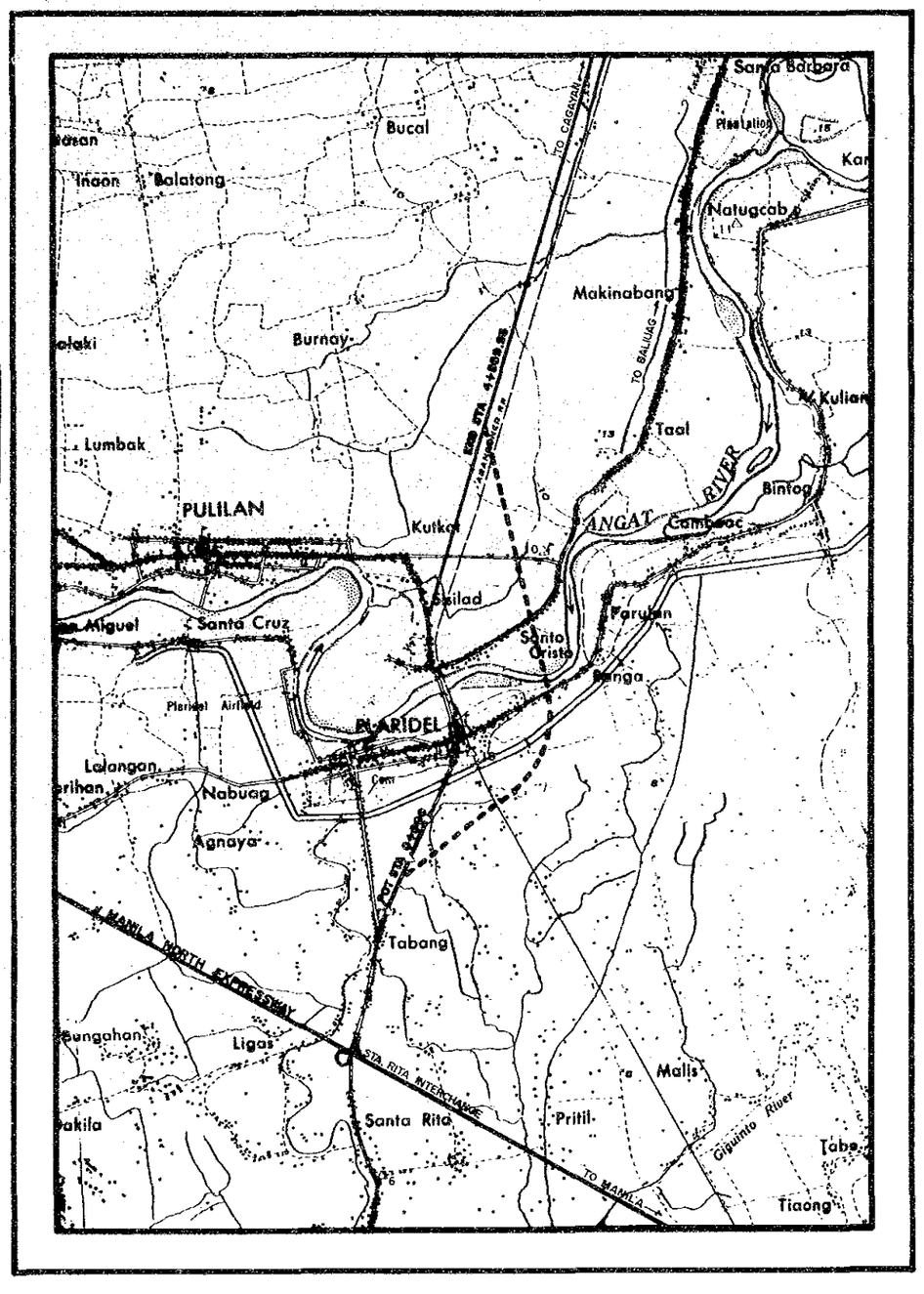
SCALE:	TABLE OF CONTENTS	DRAWING NO.

TABLE OF CONTENTS

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS LOCATION MAP	DRAWING NO. 1/43



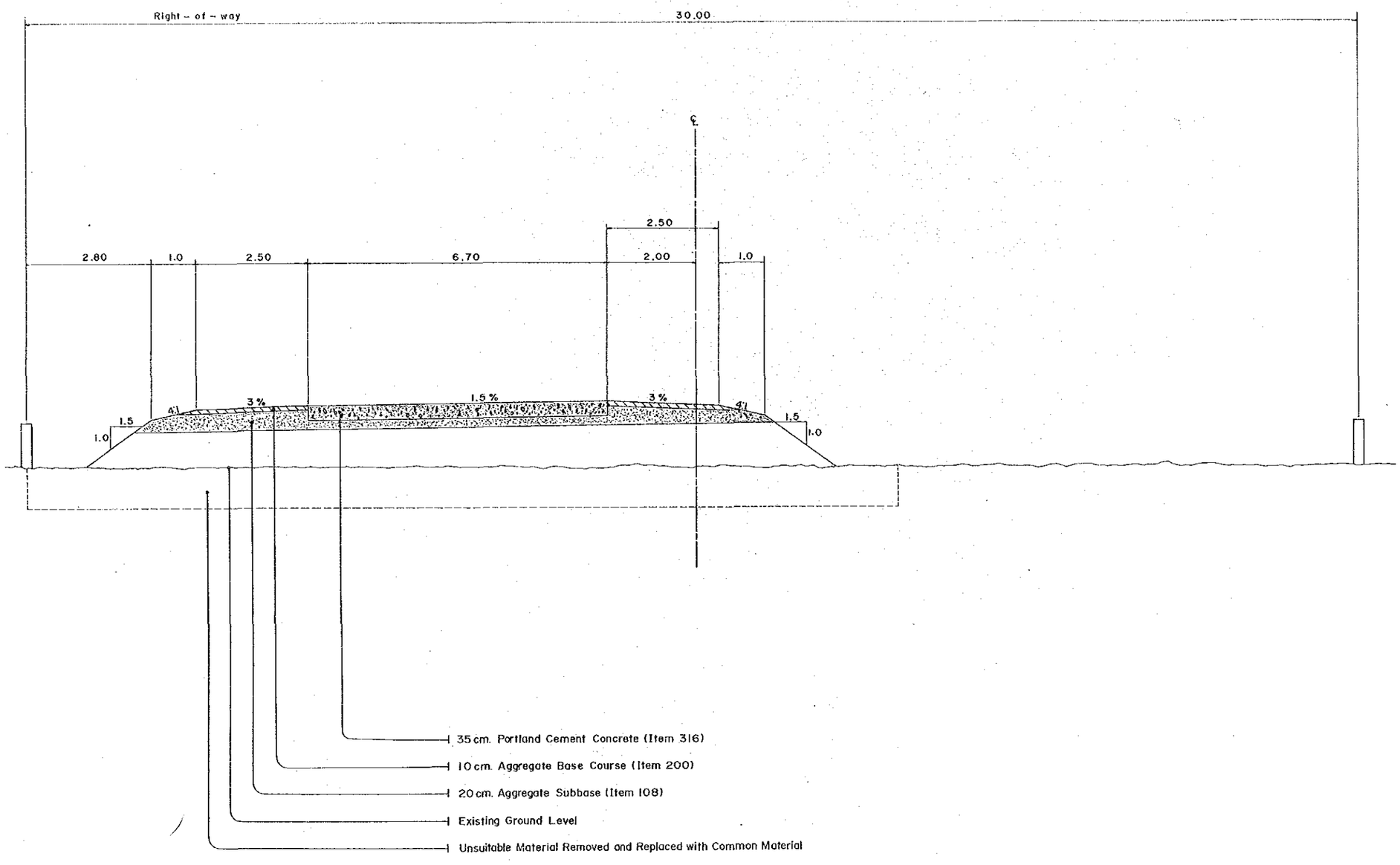


LEGEND:

Proposed Bypass Route

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	TYPICAL CROSS-SECTION	DRAWING NO.
1:50	– PLARIDEL BYPASS –	2/43

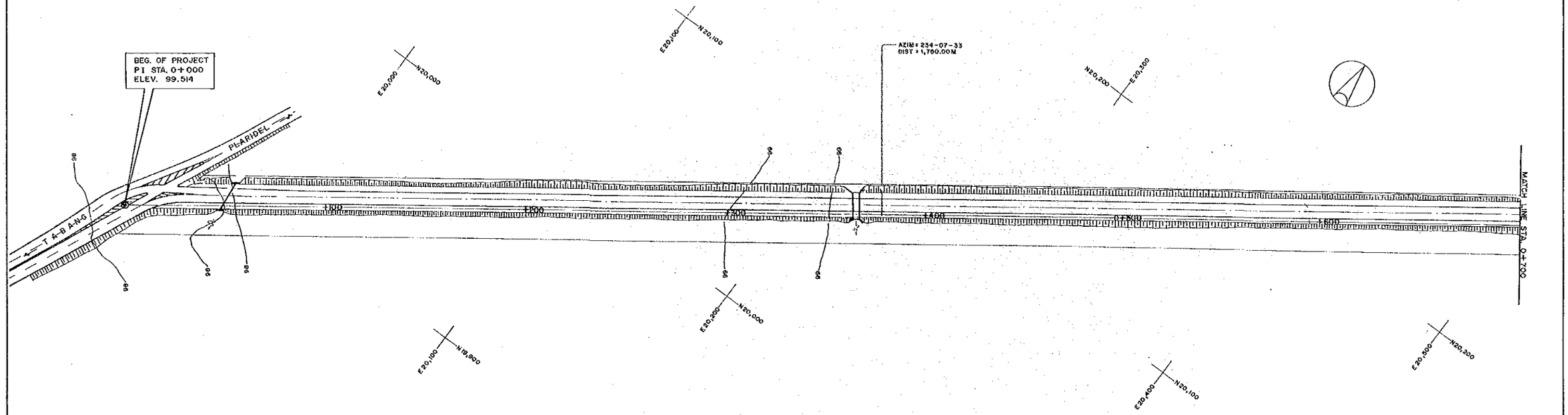


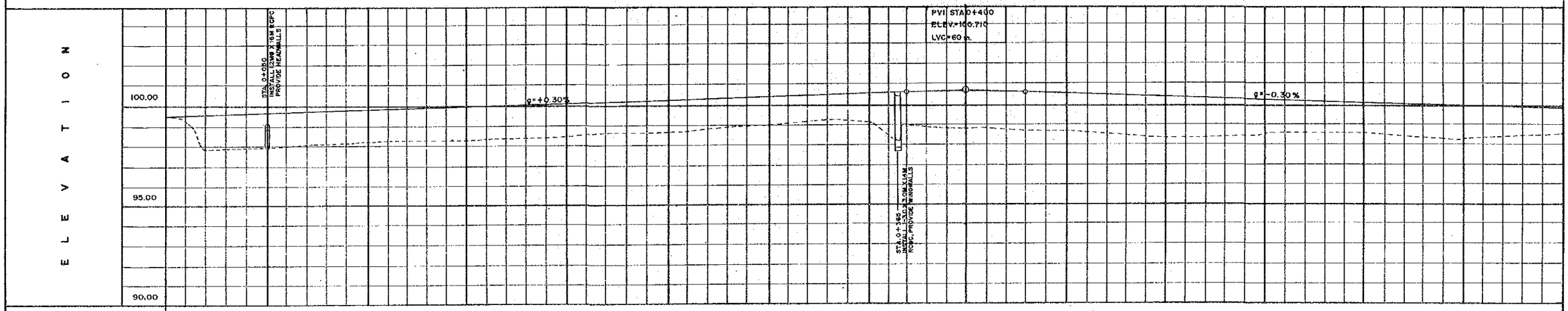
TYPICAL CROSS-SECTION
– PLARIDEL BYPASS –

(Same Cross-Section is proposed for Cabanatuan City Alternative Route)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 0+000 – STA. 0+700	3/43

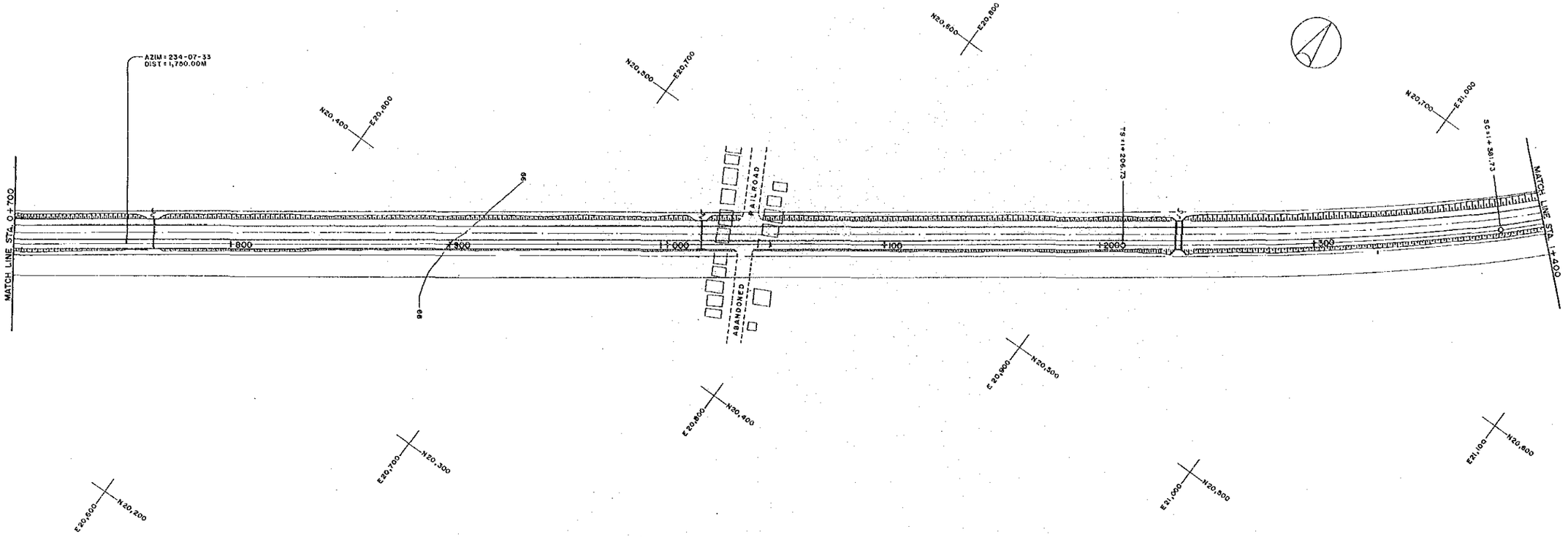


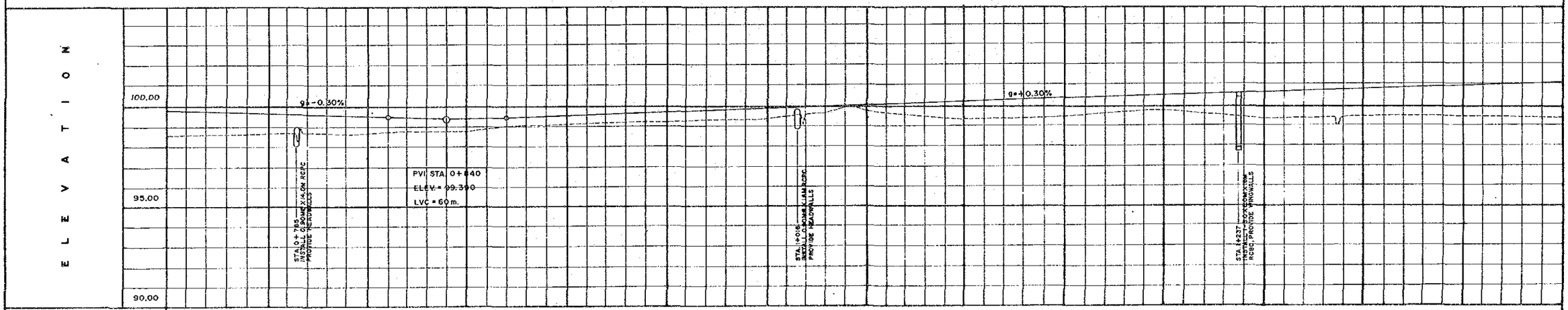


STATION	0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700
FINISHED GRADE	99.51	99.66	99.81	99.96	100.11	100.26	100.41	100.56	100.66	100.56	100.41	100.26	100.11	99.96	99.81
ORIGINAL GROUND	99.51	97.69	98.18	98.28	98.47	98.69	98.00	99.13	98.00	98.64	98.35	98.56	98.55	98.25	98.53
HOR. CURVATURE	NC														
VERT. CURVATURE	+370 LVC = 60M R=10,000 +430														

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS	DRAWING NO
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 0+700 – STA. 1+400	4/43

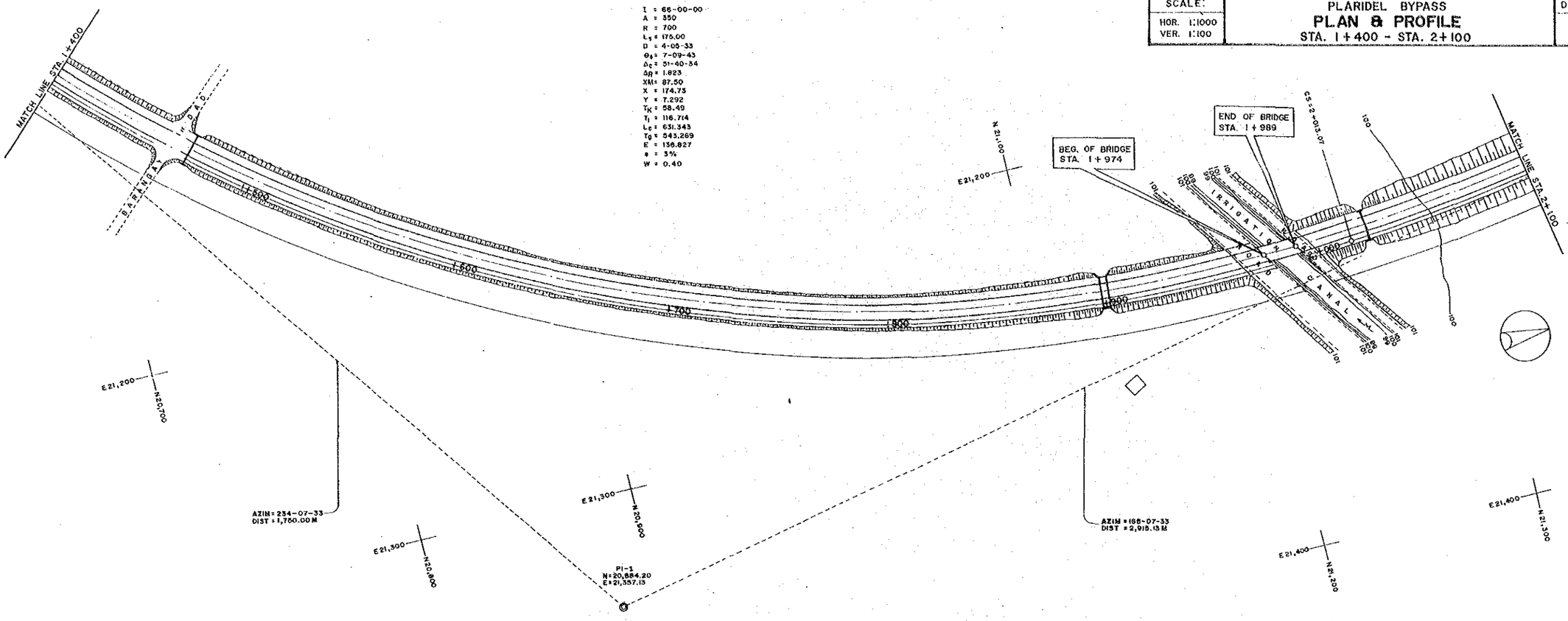


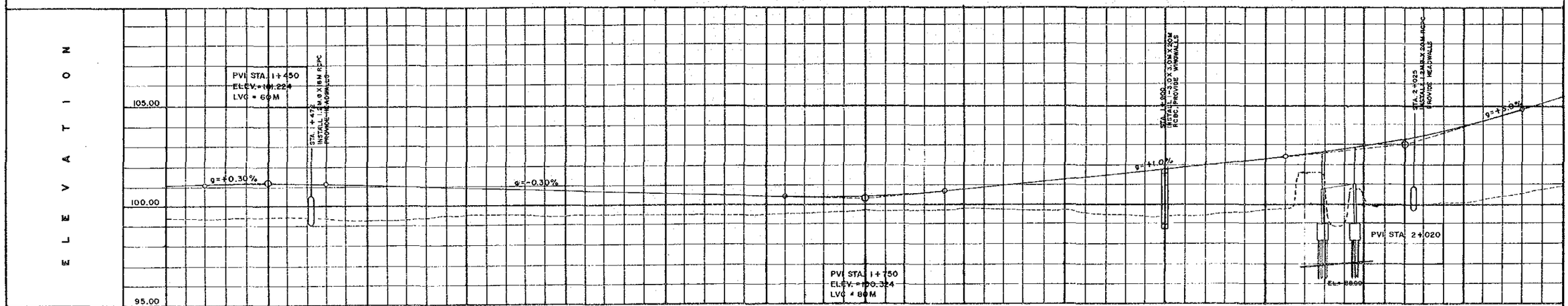


STATION	0+700	0+800	0+900	1+000	1+100	1+200	1+300	1+400
FINISHED GRADE	99.81	99.66	99.51	99.44	99.57	99.72	99.87	100.02	100.17	100.32	100.47	100.62	100.77	100.92	101.07
ORIGINAL GROUND	98.53	98.65	98.67	98.79	99.08	99.20	99.40	99.76	99.38	99.46	99.73	99.36	99.46	99.45	99.41
HOR. CURVATURE							+206.73								
VERT. CURVATURE			+810 LVC=60M R=10,000 +670												

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 1+400 - STA. 2+100	5/43

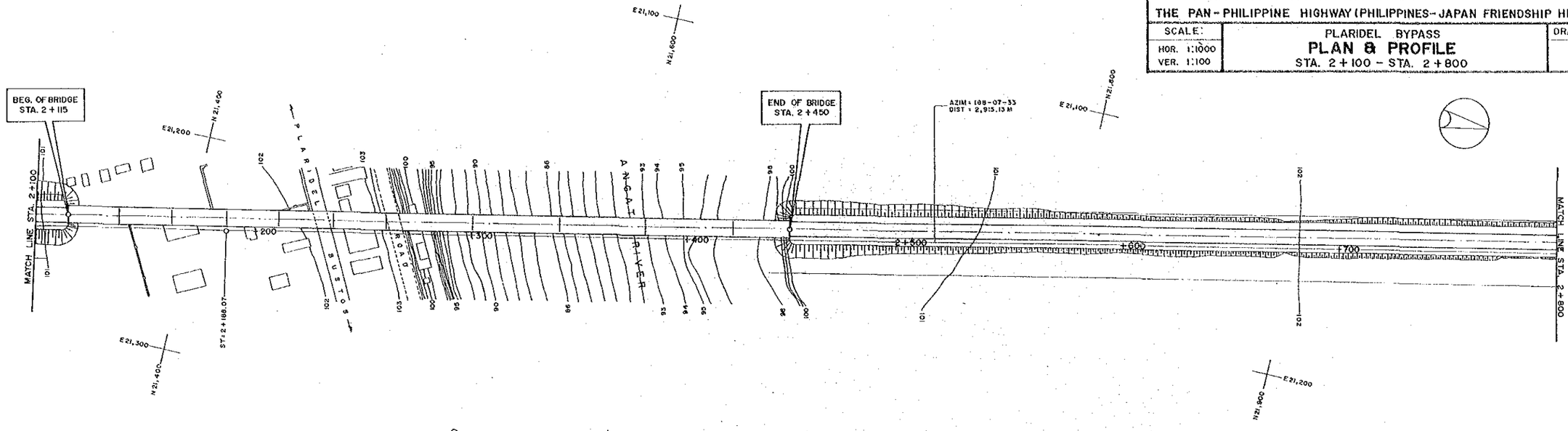


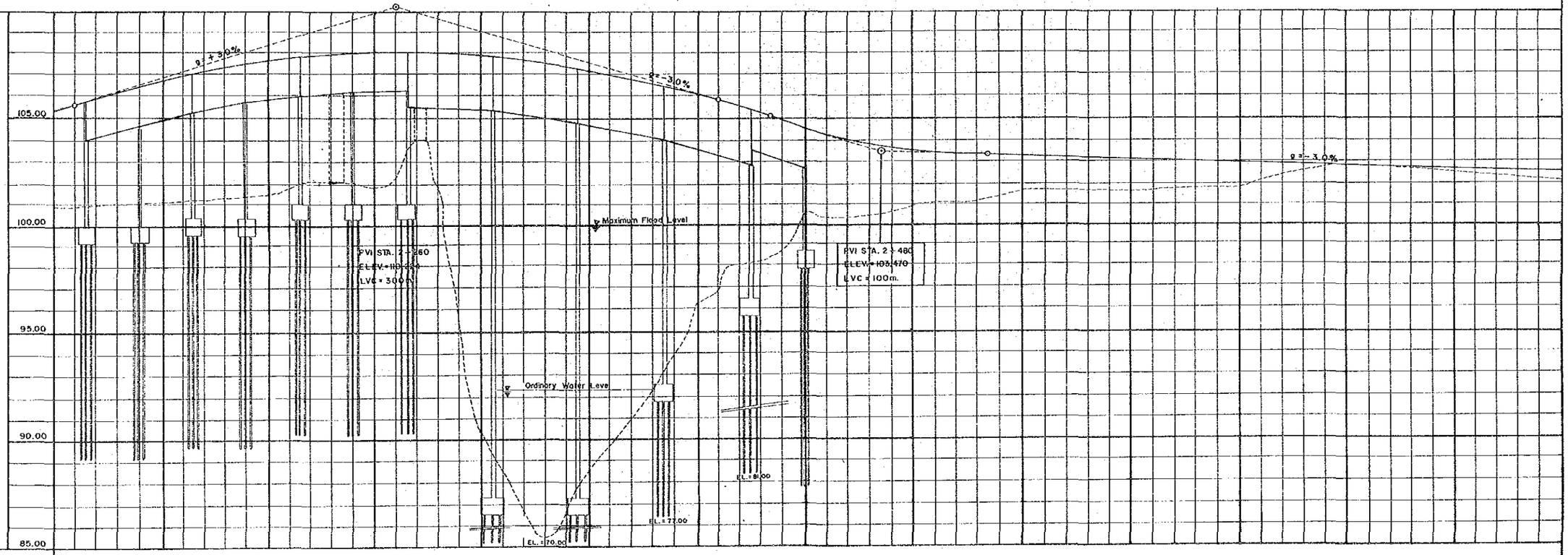


STATION	1+400	1+500	1+600	1+700	1+800	1+900	2+000	2+100
FINISHED GRADE	101.07	101.18	101.07	100.92	100.77	100.62	100.47	100.45	100.82	101.32	101.82	102.32	102.98	104.01	105.42
ORIGINAL GROUND	99.41	99.43	99.29	99.50	99.45	99.48	99.53	99.70	99.79	99.70	99.43	99.70	99.92	100.09	100.69
HOR. CURVATURE	NC														
VERT. CURVATURE	+420 LVC = 60 M R = 10,000 +480						+710 LVC = 80 M R = 8,153.85 +790				+960 LVC = 140 M R = 3,000 +1080				

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 2+100 – STA. 2+800	6/43





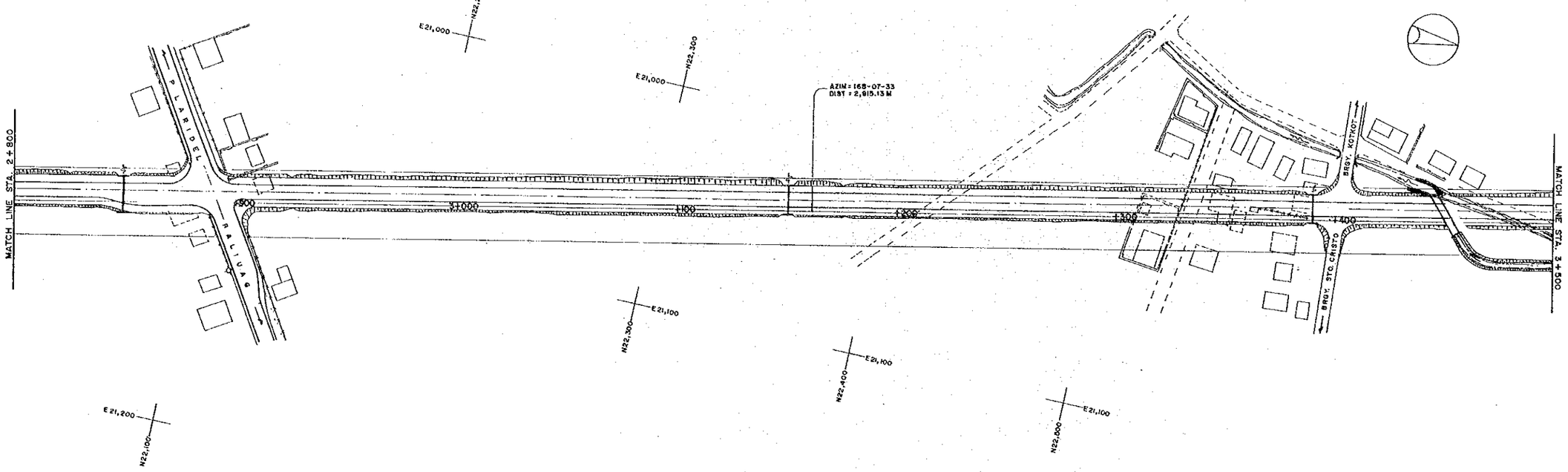
STATION	2+100	2+200	2+300	2+400	2+500	2+600	2+700	2+800
FINISHED GRADE	105.42	106.80	107.65	108.00	107.85	107.20	106.05	104.55
	103.80	103.28	103.13	102.98	102.83	102.68	102.53	
ORIGINAL GROUND	100.89	101.09	101.39	101.96	90.30	88.80	96.30	100.36
	100.98	101.62	101.56	101.70	102.74	102.51	102.13	
HOR. CURVATURE								
VERT. CURVATURE								

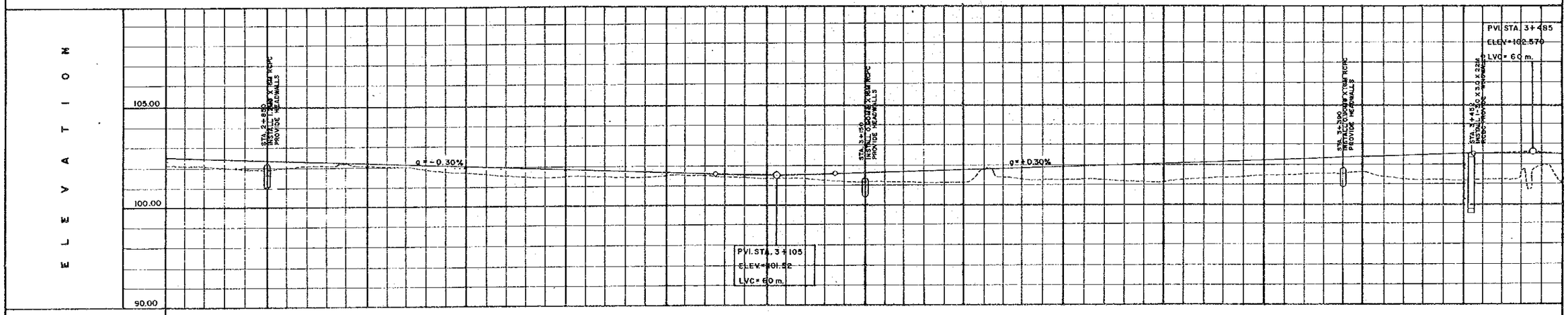
HOR. CURVATURE: I 88.07

VERT. CURVATURE: +110; LVC = 300.00, R = 5,000; +410; +435; LVC = 100.00, R = 3,030; +535

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 2+800 – STA. 3+500	7/43

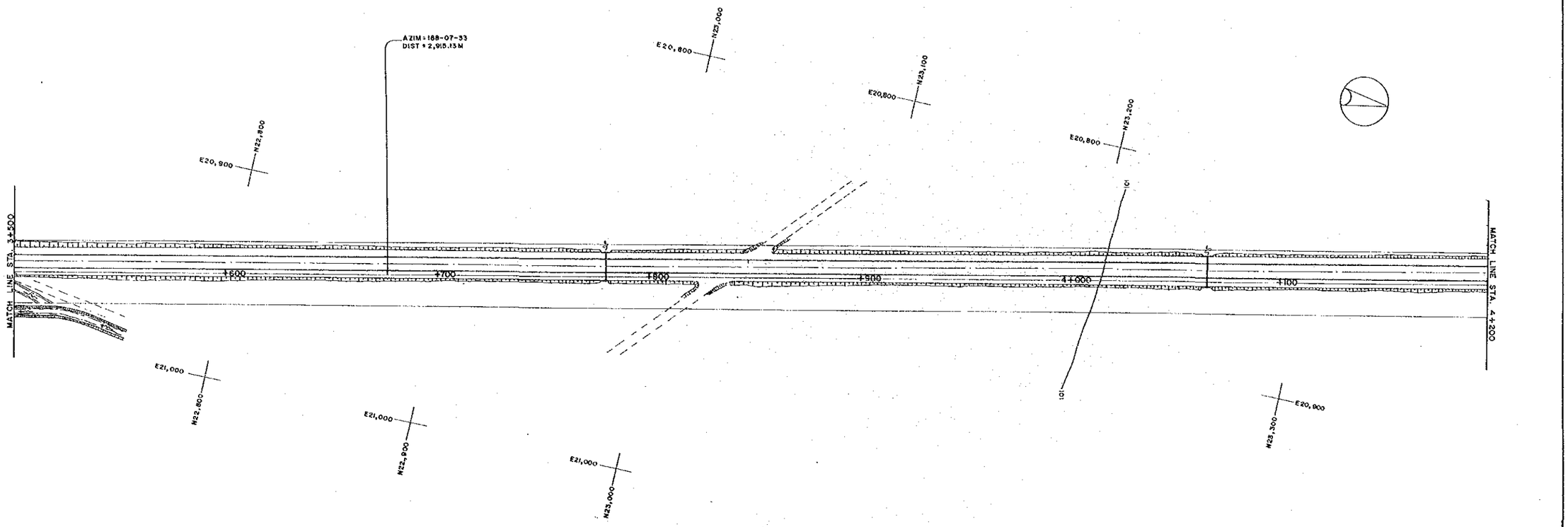


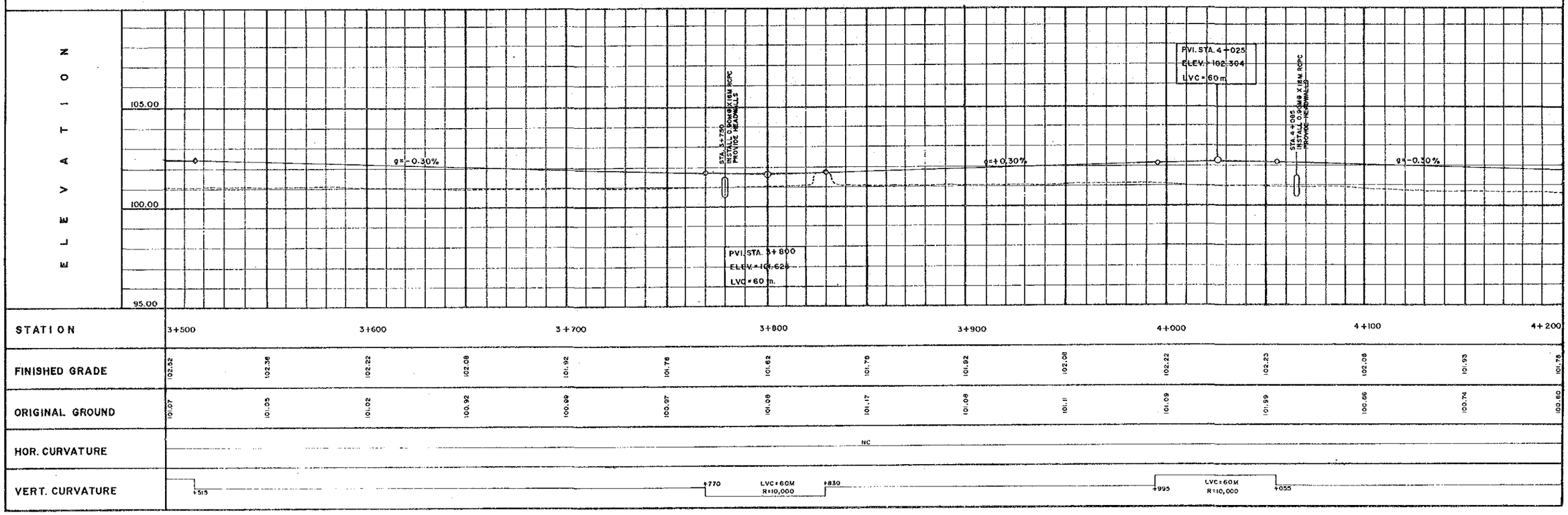


STATION	2+800	2+900	3+000	3+100	3+200	3+300	3+400	3+500
FINISHED GRADE	102.53	102.38	102.23	102.08	101.93	101.77	101.63	101.58	101.72	101.86	102.02	102.16	102.32	102.48	102.62
ORIGINAL GROUND	102.15	101.88	102.17	101.73	101.49	101.53	101.37	101.19	101.12	101.27	101.18	101.46	101.64	101.19	101.07
HOR. CURVATURE	NC														
VERT. CURVATURE				+078 LVC=60.00 R=10,000 +135										+455 LVC=60M R=10,000	

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PLARIDEL BYPASS	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 3+500 - STA. 4+200	8/43

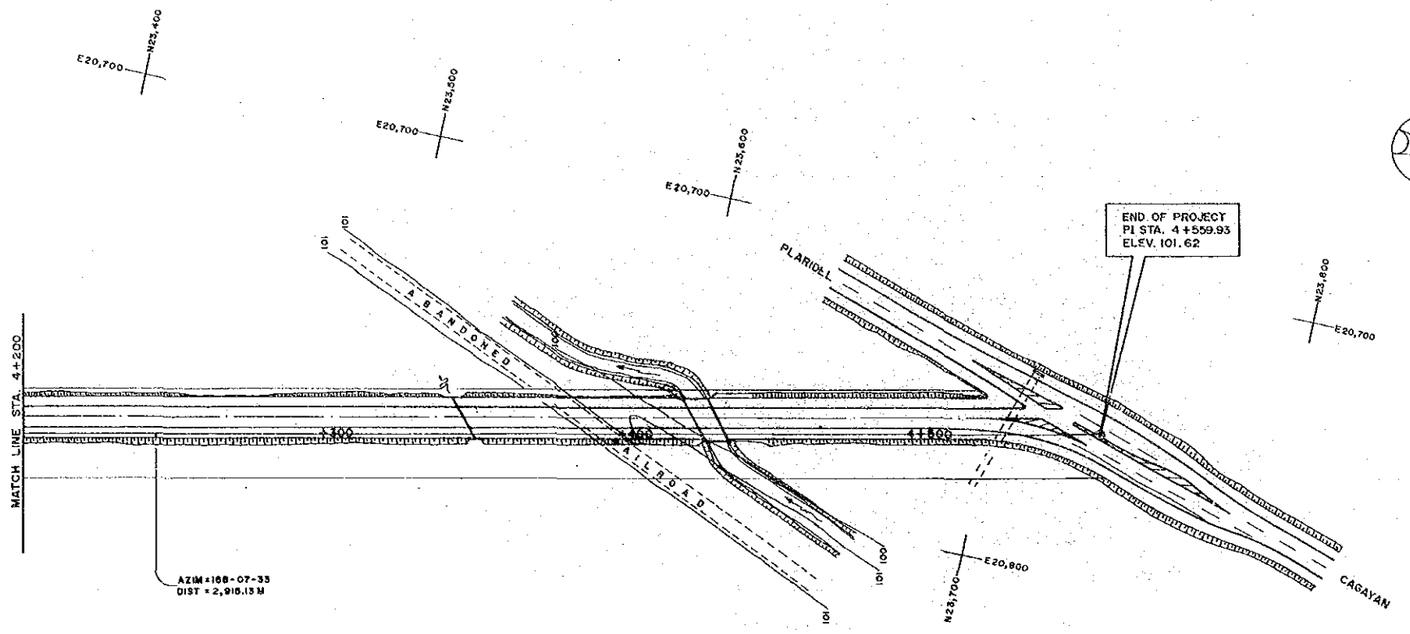




STATION	3+500	3+600	3+700	3+800	3+900	4+000	4+100	4+200
FINISHED GRADE	102.52	102.38	102.22	102.08	101.92	101.78	101.62	101.79	101.92	102.08	102.22	102.23	102.08	101.93	101.75
ORIGINAL GROUND	101.07	101.05	101.02	100.92	100.89	100.97	101.08	101.17	101.08	101.11	101.09	101.99	100.86	100.74	100.60
HOR. CURVATURE	NC														
VERT. CURVATURE	+515			+770 LVC = 60M R=10,000 +830							+995 LVC = 60M R=10,000 +055				

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

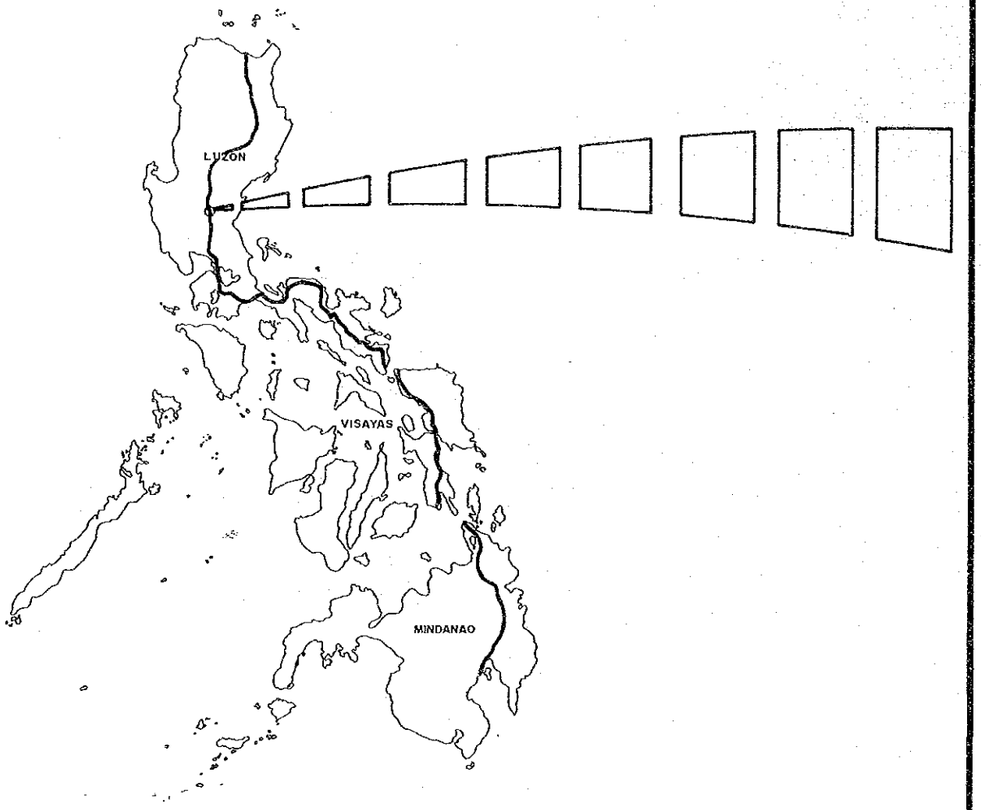
SCALE:	PLARIDEL BYPASS	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 4+200 – STA. 4+559.93	9/43

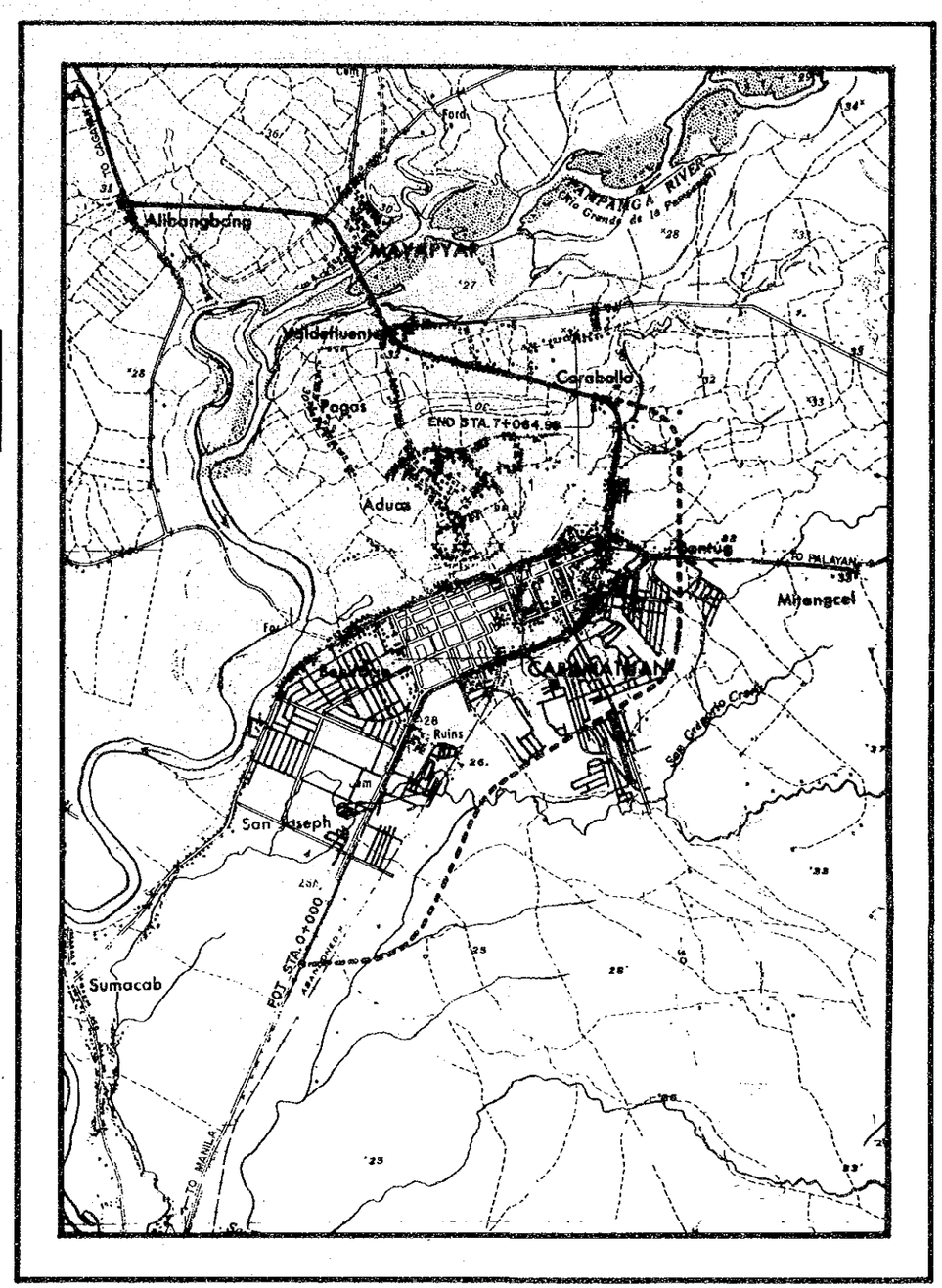


STATION	4+200		4+300		4+400		4+500	4+559.93
FINISHED GRADE	101.78	101.63	101.48	101.33	101.22	101.32	101.47	101.61
ORIGINAL GROUND	100.60	100.46	100.09	100.12	99.97	100.07	100.06	101.60
HOR. CURVATURE	NC							
VERT. CURVATURE	+370 LVC=60M R=10,000 +430							

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE LOCATION MAP	DRAWING NO. 10/43



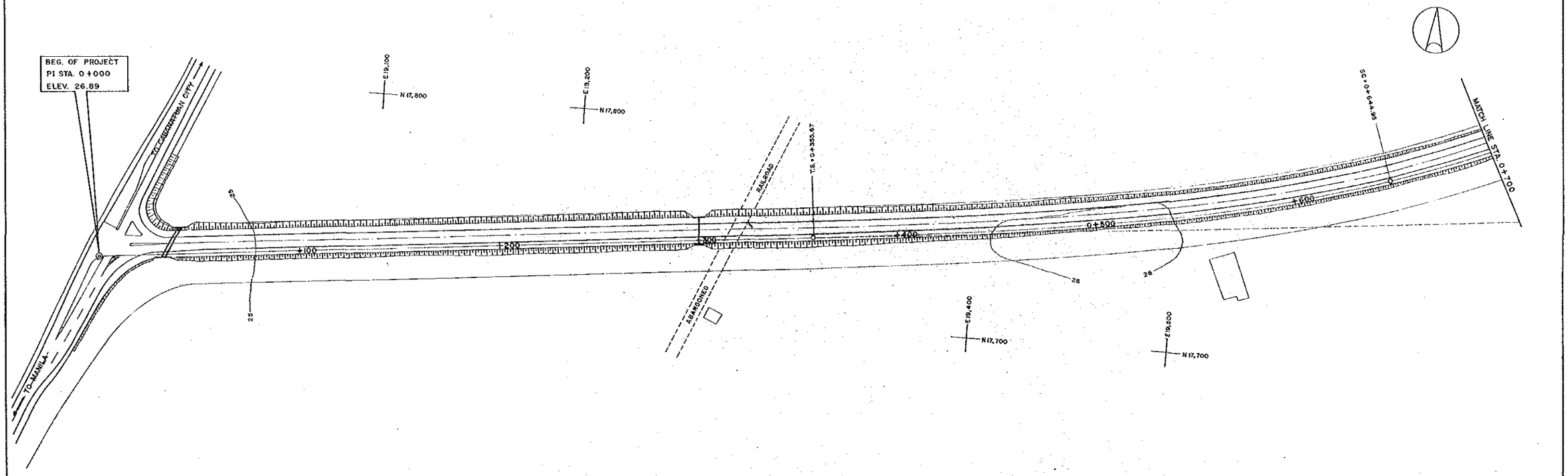


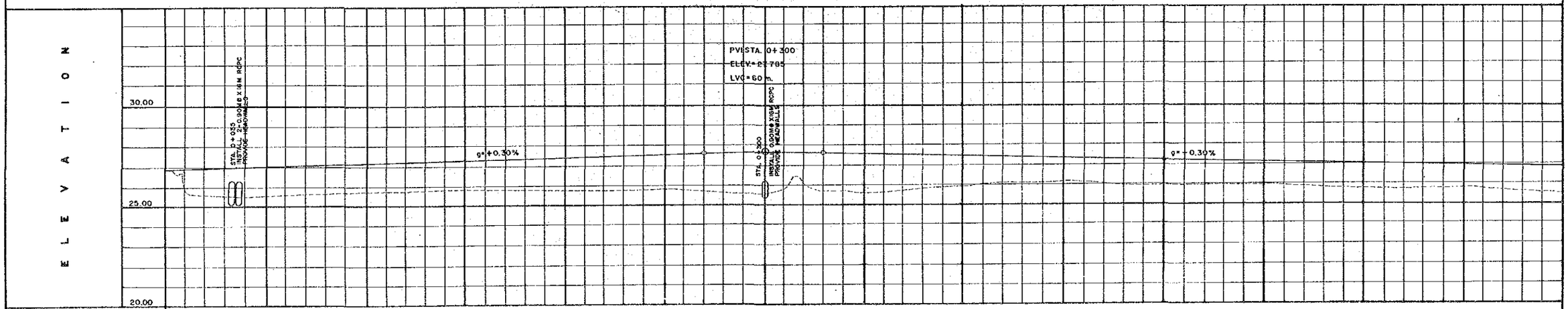
LEGEND:

Proposed Bypass Route

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 0+000 – STA. 0+700	11/43

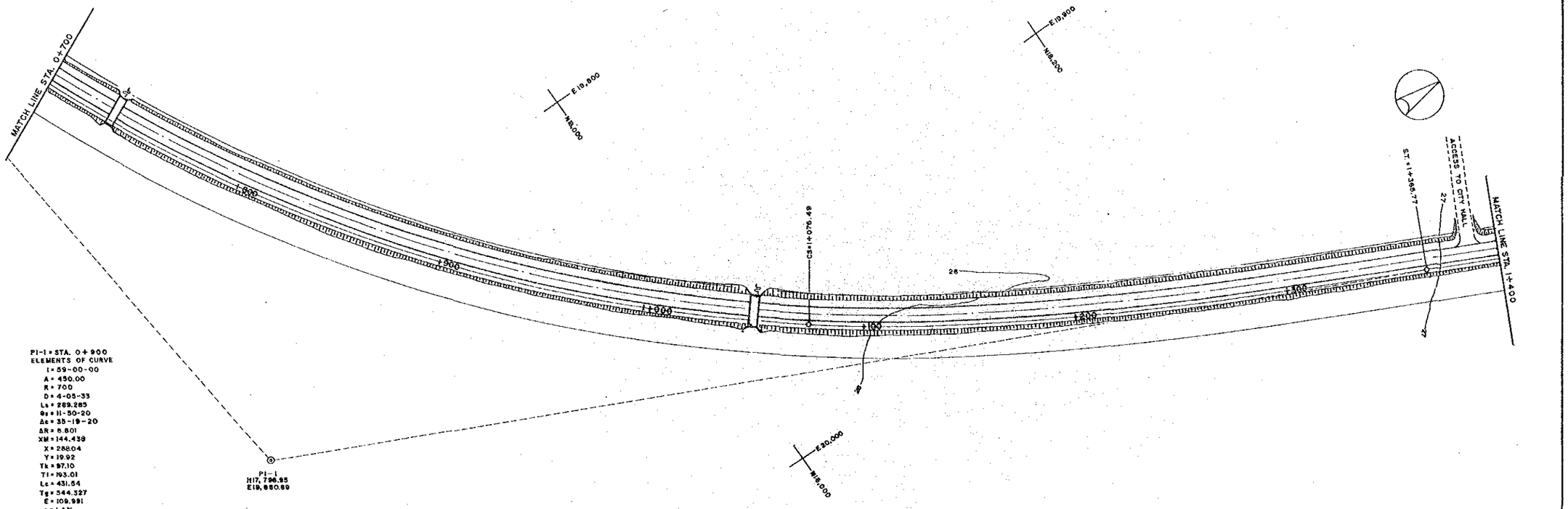


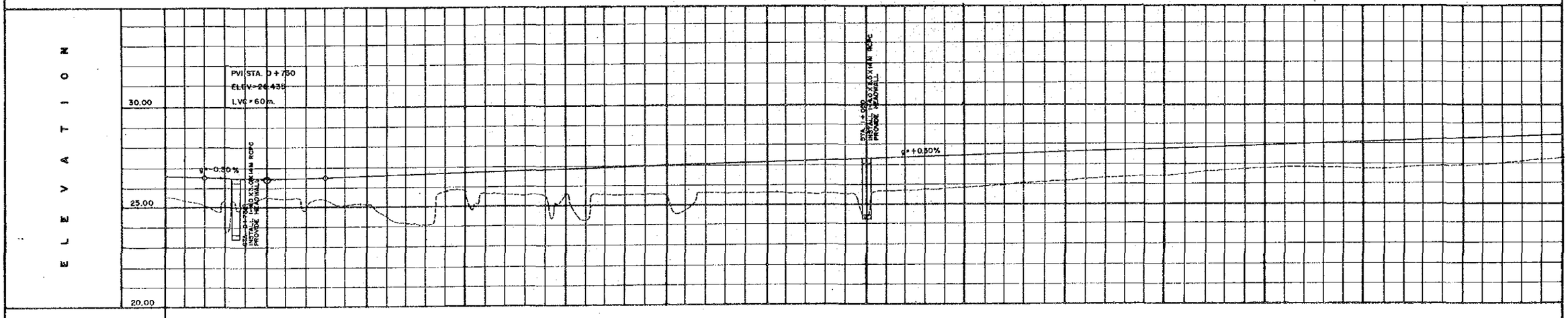


STATION	0+000	0+100	0+200	0+300	0+400	0+500	0+600	0+700
FINISHED GRADE	26.885	27.04 27.18 27.34 27.48 27.64	27.74	27.64 27.48 27.34 27.18 27.04	26.88	26.74	26.58	
ORIGINAL GROUND	26.885	25.663 25.713 25.803 25.773 25.793	25.585	25.815 25.928 26.128 25.098 25.948	25.766	25.781	25.511	
HOR. CURVATURE	+355.67 R=700							
VERT. CURVATURE	+270 R=10,000 LVC=60m. +330							

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 0+700 ~ STA. 1+400	12/43

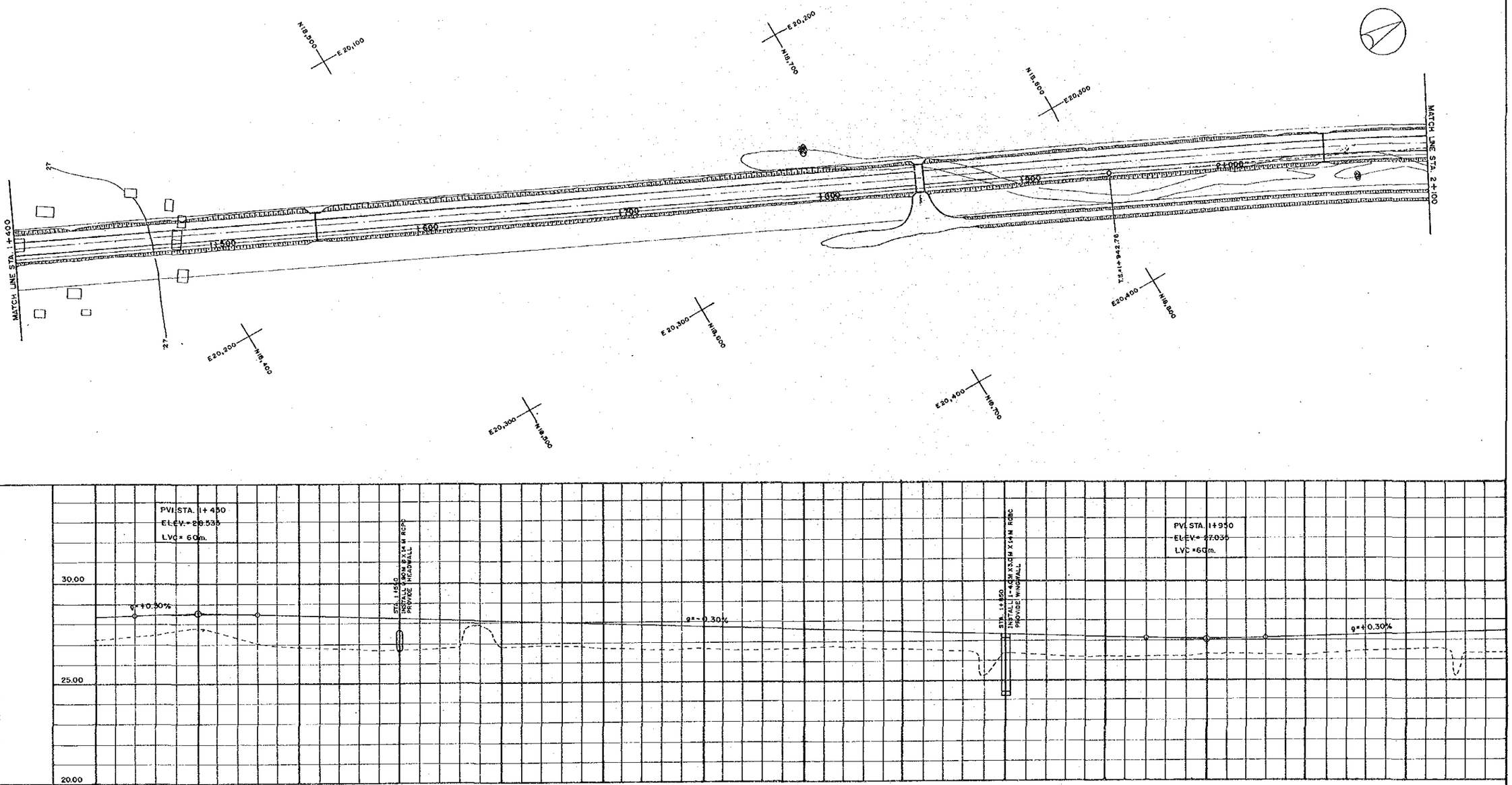




STATION	0+700	0+800	0+900	1+000	1+100	1+200	1+300	1+400
FINISHED GRADE	26.55	26.49	26.59	26.74	26.88	27.04	27.18	27.34	27.48	27.64	27.78	27.94	28.08	28.24	28.38
ORIGINAL GROUND	25.511	25.111	25.067	25.727	25.620	25.464	25.606	24.356	25.886	26.106	26.337	26.607	26.647	26.627	27.257
HOR. CURVATURE	R=700													+368.77	
VERT. CURVATURE	+720 LVC=60m. R=10,000 +780														

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

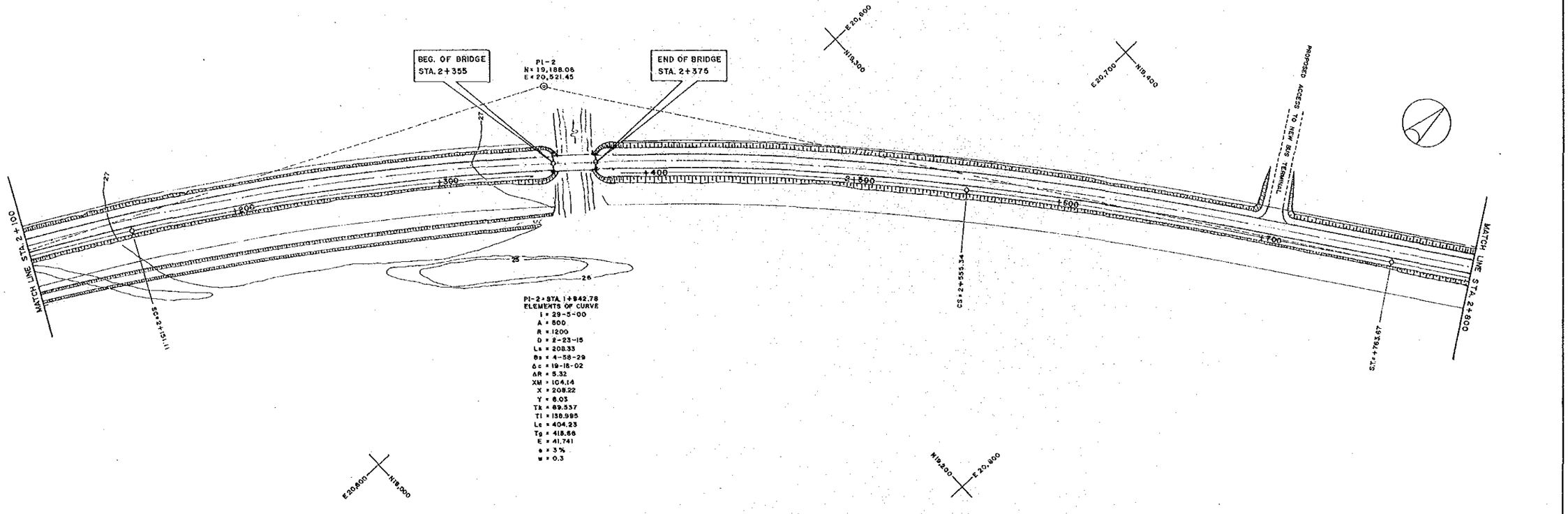
SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 1+400 - STA. 2+100	13/43

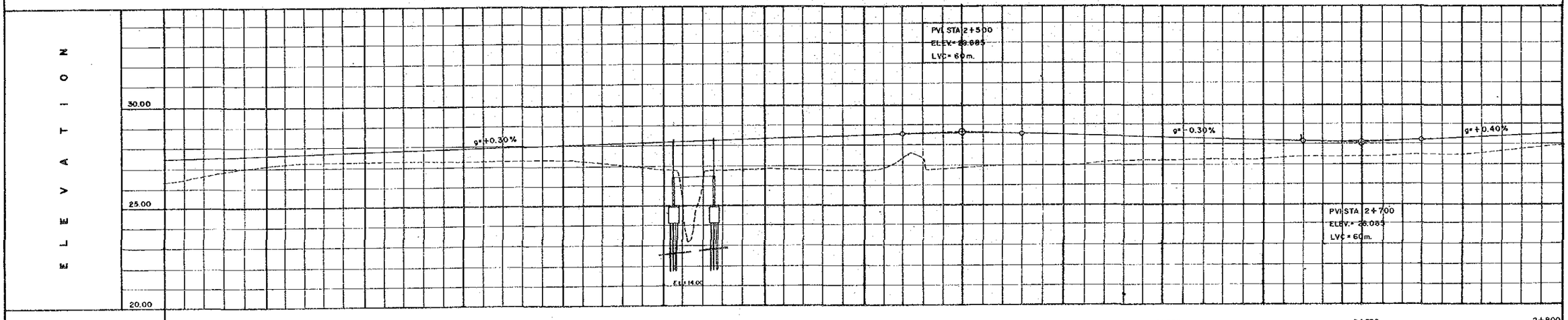


STATION	1+400	1+500	1+600	1+700	1+800	1+900	2+000	2+100
FINISHED GRADE	28.38	28.49	28.38	28.24	28.06	27.94	27.76	27.64	27.48	27.34	27.18	27.08	27.18	27.34	27.48
ORIGINAL GROUND	27.237	27.772	26.831	26.711	26.801	26.711	26.561	26.671	26.591	26.359	26.219	26.303	26.221	26.502	26.291
HOR. CURVATURE												+942.78			
VERT. CURVATURE	+420	R=13,000 LVC=60m.	+480								+920	LVC=60m R=10,000	+980		

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 2+100 – STA. 2+800	14/43

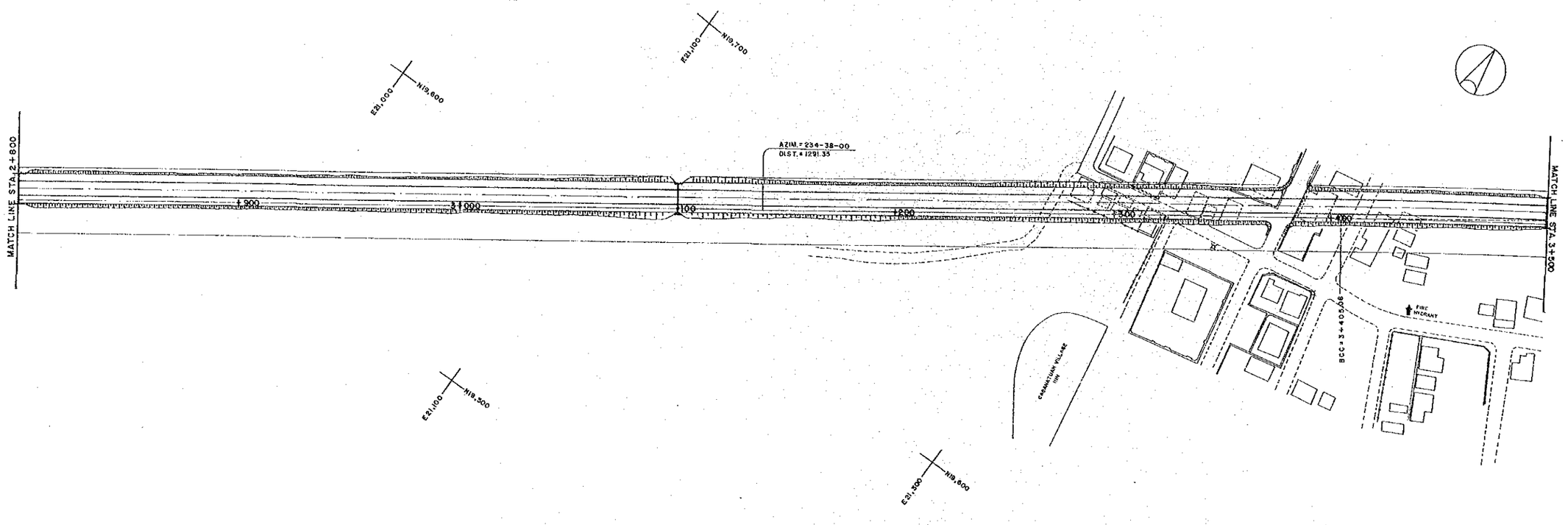




STATION	2+100	2+200	2+300	2+400	2+500	2+600	2+700	2+800
FINISHED GRADE	27.48	27.64	27.79	27.94	28.08	28.24	28.38	28.54	28.64	28.54	28.38	28.24	28.14	28.28	28.48
ORIGINAL GROUND	26.29	27.10	27.25	27.25	27.33	26.82	26.63	26.74	26.85	27.00	27.20	27.30	27.39	27.48	27.93
HOR. CURVATURE	R=1200														+763.67
VERT. CURVATURE					+470 R=10,000 LVC=60m +530							+670 LVC=60 m. R=8,571 +730			

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 2+800 – STA. 3+500	15/43



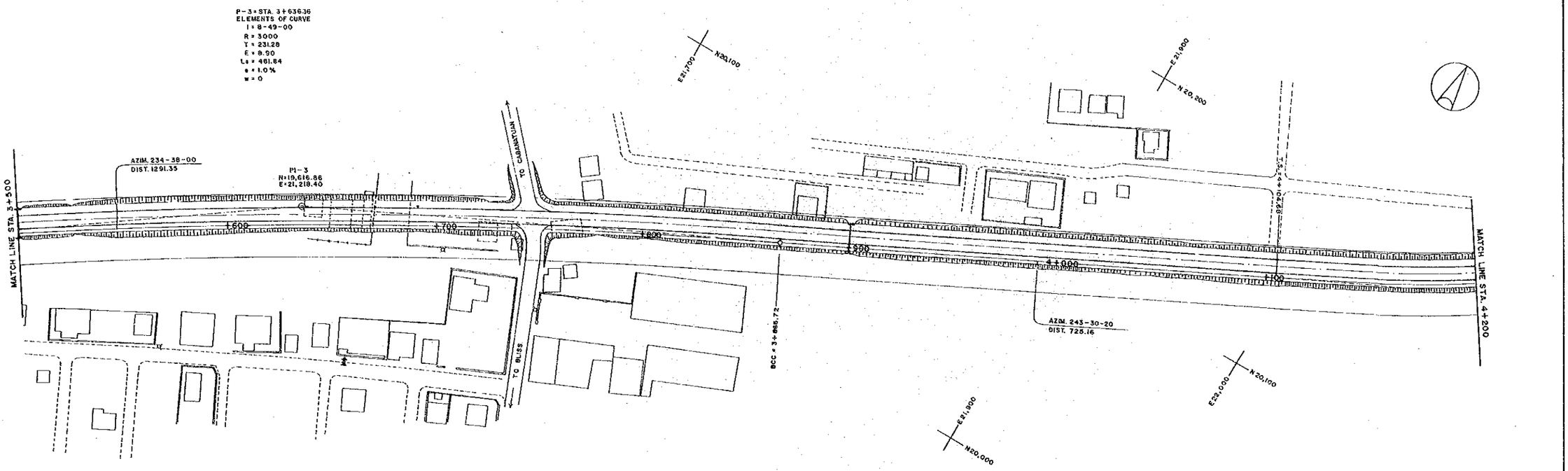
ELEVATION

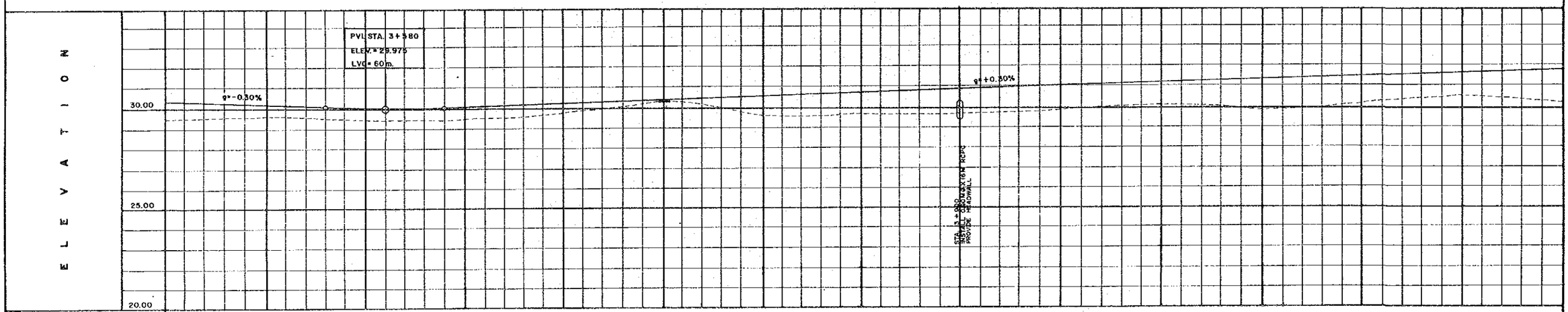
30.00
25.00
20.00

STATION	2+800	2+900	3+000	3+100	3+200	3+300	3+400	3+500
FINISHED GRADE	28.49	28.68	28.85	29.03	29.26	29.49	29.65	29.66	30.08	30.28	30.48	30.66	30.60	30.46	30.30
ORIGINAL GROUND	27.932	28.070	28.187	28.330	28.497	28.691	28.843	28.852	28.883	29.094	29.834	29.921	29.143	29.555	29.501
HOR. CURVATURE													+405.08 R=3000		
VERT. CURVATURE												+330 R=8,571 LVC=60m.		+390	

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 3+500 - STA. 4+200	16/43

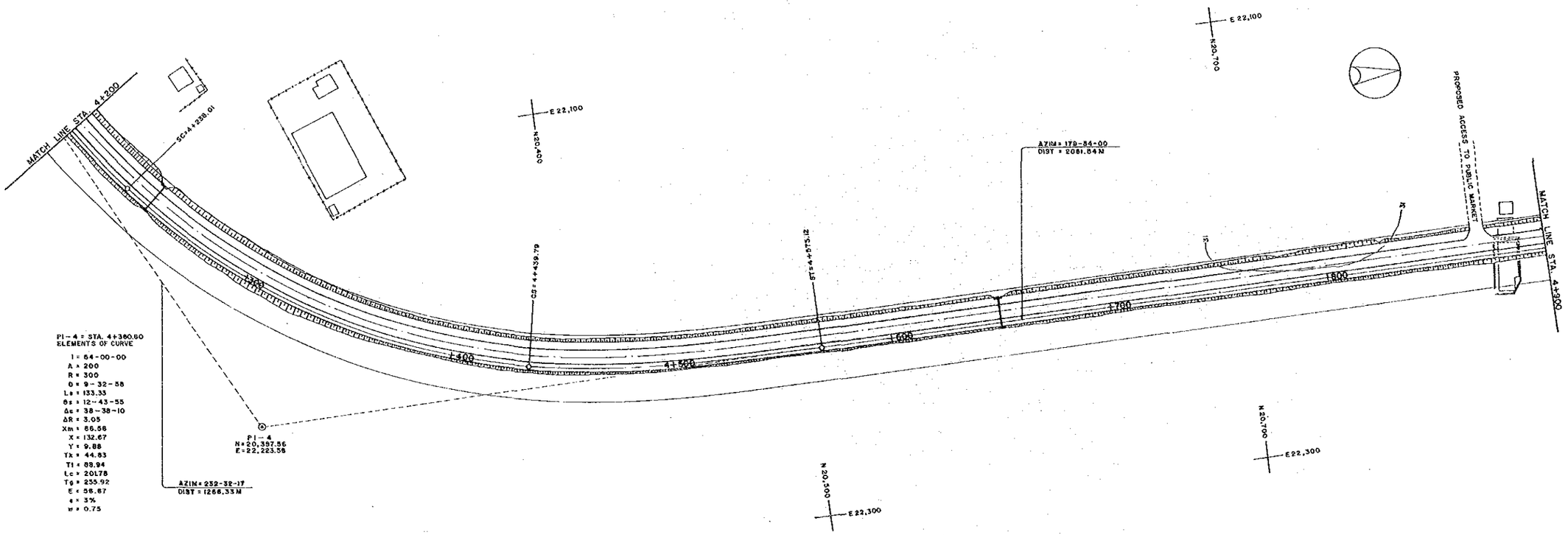


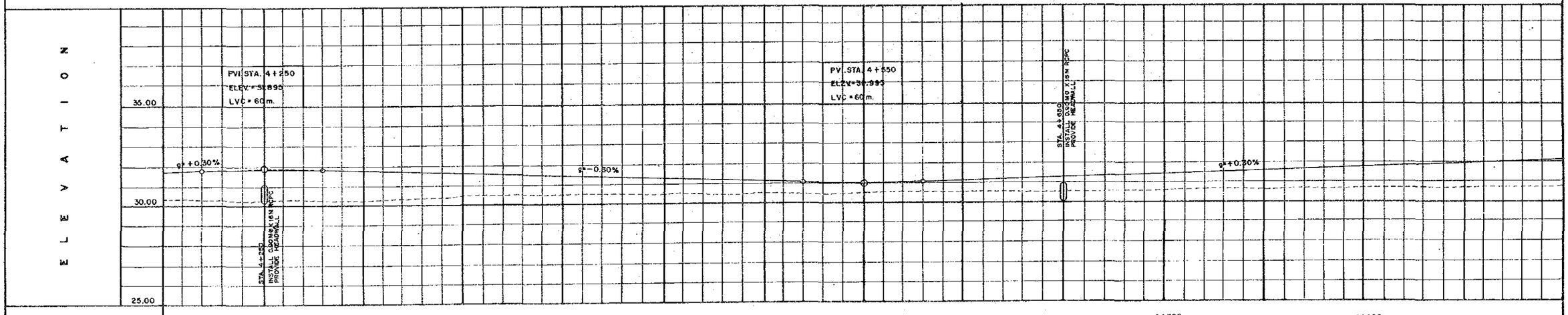


STATION	3+500	3+600	3+700	3+800	3+900	4+000	4+100	4+200
FINISHED GRADE	30.30	30.16	30.02	30.10	30.24	30.40	30.54	30.70	30.84	31.00	31.14	31.60	31.44	31.60	31.74
ORIGINAL GROUND	29.30	28.66	29.45	29.48	29.78	30.35	28.66	29.69	29.70	29.88	30.13	29.90	30.20	30.61	30.31
HOR. CURVATURE	R = 3000						+866.72								
VERT. CURVATURE	+590 LVC = 60m. R=10,000 +640														

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 4+200 - STA. 4+900	17/43

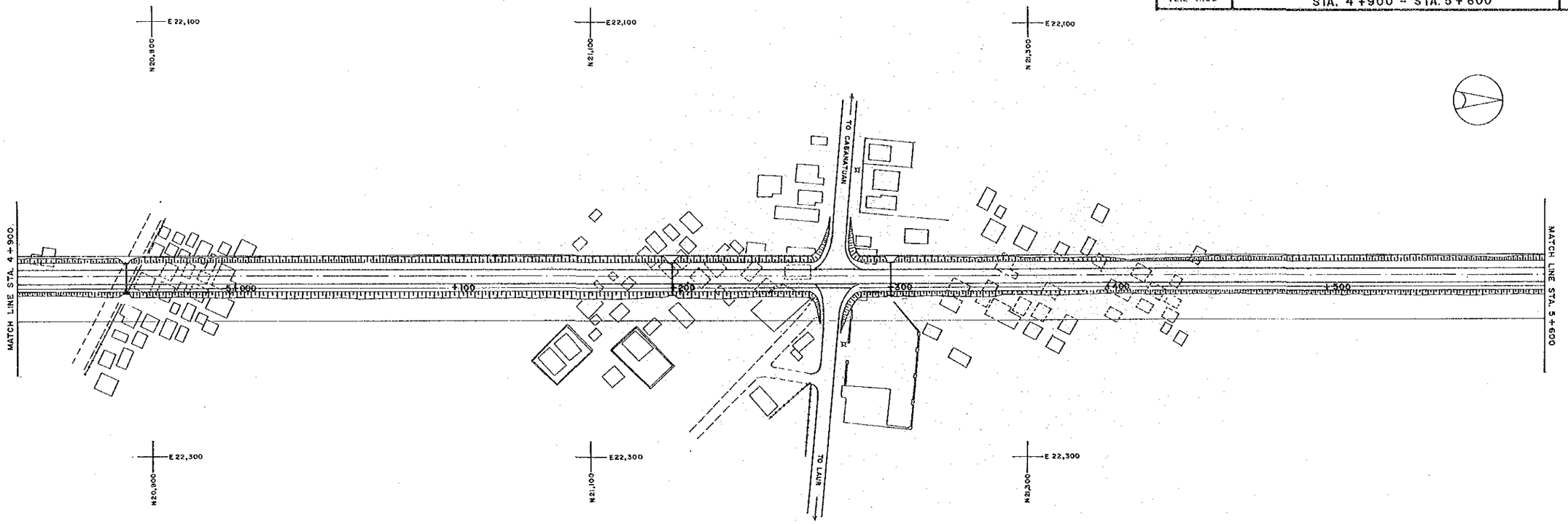


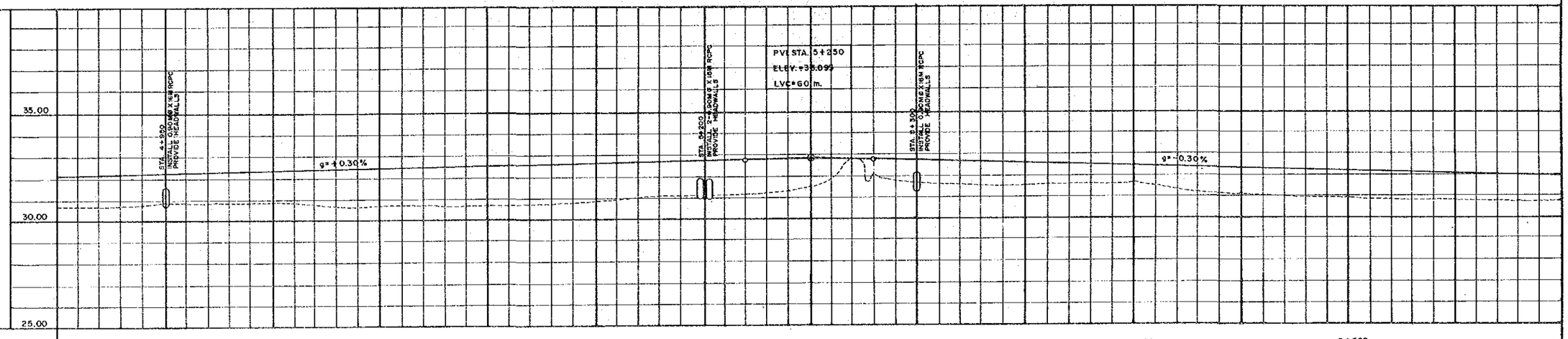


STATION	4+200	4+300	4+400	4+500	4+600	4+700	4+800	4+900
FINISHED GRADE	31.74	31.85	31.74	31.59	31.44	31.29	31.14	31.04	31.14	31.29	31.44	31.59	31.74	31.89	32.04
ORIGINAL GROUND	30.31	30.23	30.18	30.49	30.50	30.47	30.48	30.50	30.57	30.50	30.60	30.62	30.72	30.69	30.75
HOR. CURVATURE						R=300									+573.12
VERT. CURVATURE	+220	R=10,00 LVC=60m.	+280					+520	LVC=60m. R=10,000	+580					

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 4+900 – STA. 5+600	18/43

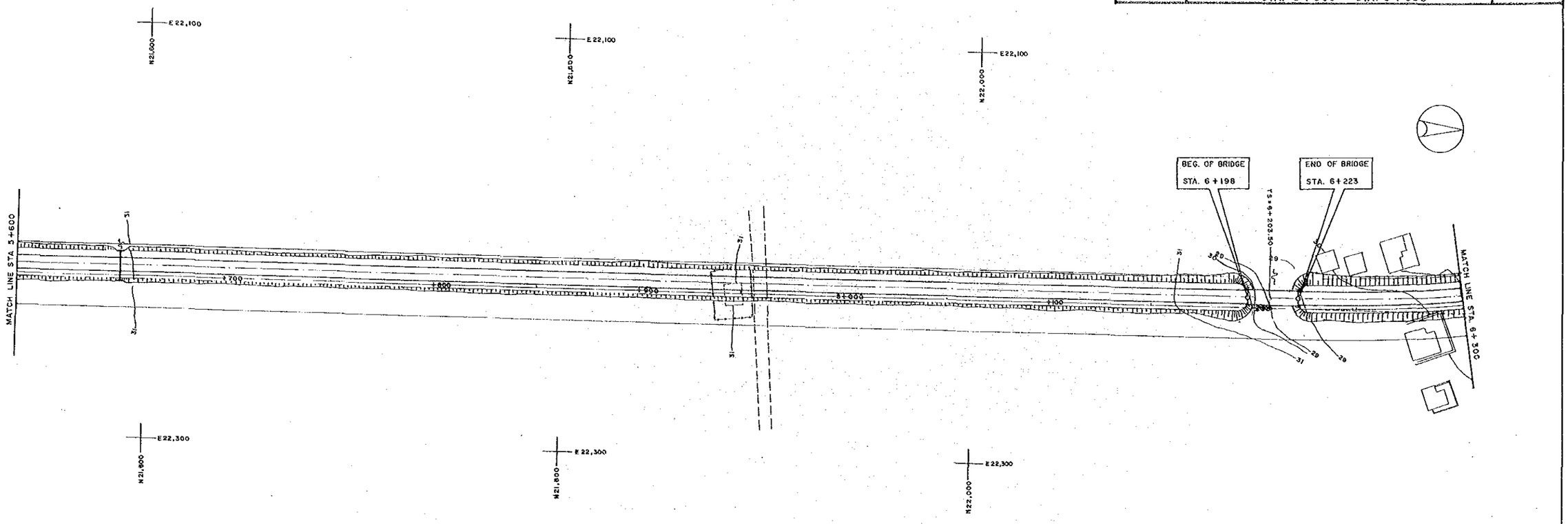


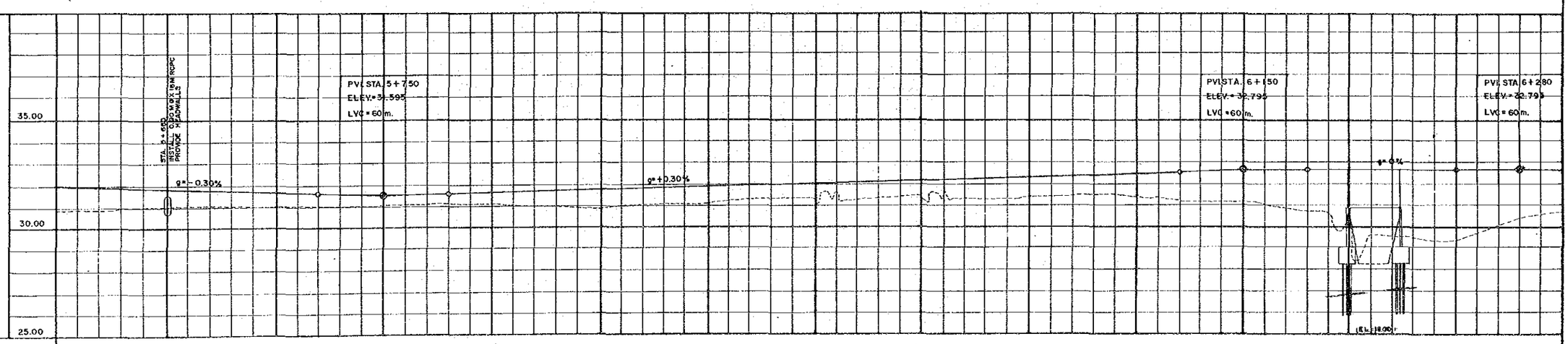


STATION	4+900	5+000	5+100	5+200	5+300	5+400	5+500	5+600
FINISHED GRADE	32.04	32.19	32.34	32.49	32.64	32.79	32.94	33.05	32.94	32.80	32.64	32.50	32.34	32.20	32.04
ORIGINAL GROUND	30.75	30.96	30.85	30.74	30.73	30.91	31.18	31.45	31.72	31.54	31.70	31.07	30.94	30.87	30.88
HOR. CURVATURE	NC														
VERT. CURVATURE	+220 LVC = 60 m. R = 10,000 +280														

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 5+600 - STA. 6+300	19/43

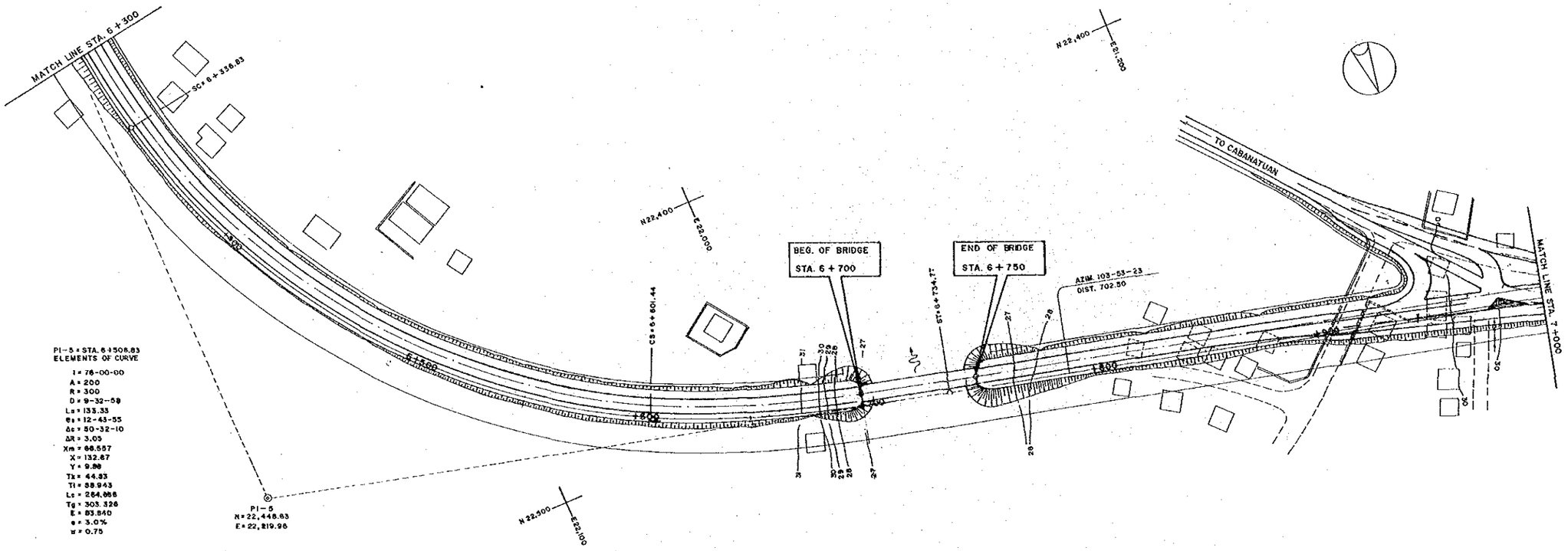


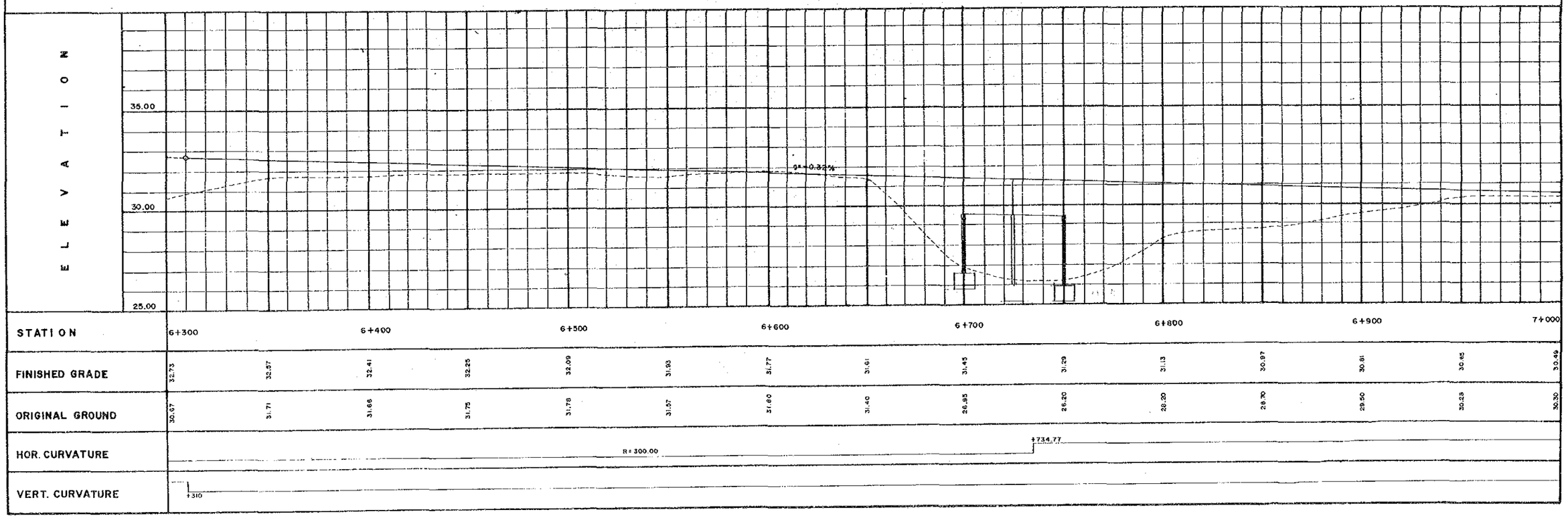


STATION	5+600	5+700	5+800	5+900	6+000	6+100	6+200	6+300
FINISHED GRADE	32.04	31.90 31.74 31.84 31.74 31.90 32.04 32.20 32.34 32.50 32.64 32.70 32.80 32.80 32.73						
ORIGINAL GROUND	30.88	31.03 31.06 31.06 31.10 30.90 31.15 31.36 31.38 31.42 31.48 31.18 30.32 29.31 30.87						
HOR. CURVATURE	NC						+203.50 R = 300	
VERT. CURVATURE	+720 L.VC = 60m. R=10,000 +780					+120 R= 20,000 L.VC = 60m. +180	+250 R = 18,750 L.VC = 60m.	

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINES HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 6+300 – STA. 7+000	20/43

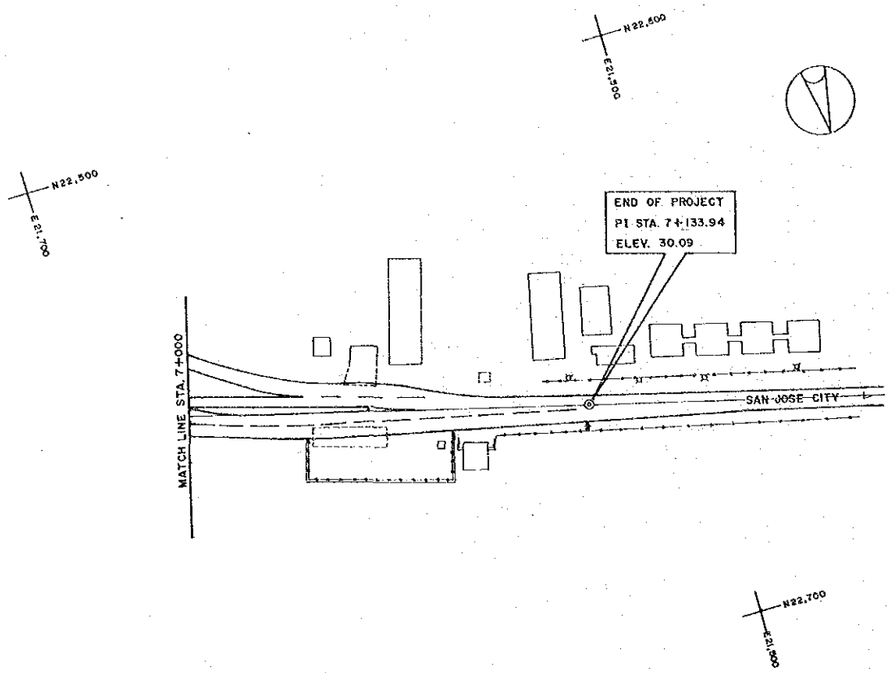


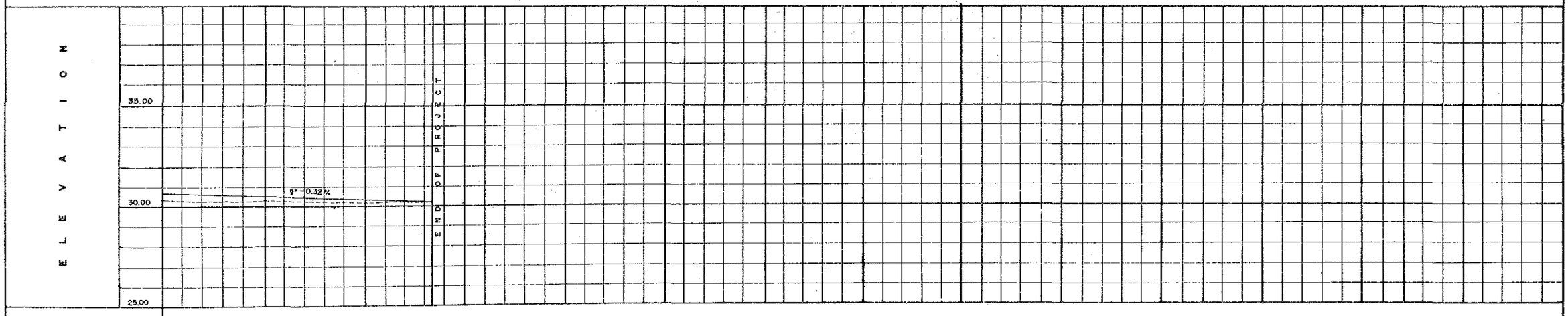


STATION	6+300	6+400	6+500	6+600	6+700	6+800	6+900	7+000
FINISHED GRADE	32.73	32.57	32.41	32.25	32.09	31.93	31.77	31.61	31.45	31.29	31.13	30.97	30.81	30.65	30.49
ORIGINAL GROUND	30.67	31.71	31.66	31.75	31.78	31.57	31.60	31.40	26.95	26.20	28.20	28.70	29.50	30.28	30.30
HOR. CURVATURE					R = 300.00					+734.77					
VERT. CURVATURE		+310													

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	CABANATUAN CITY ALTERNATIVE ROUTE	DRAWING NO.
HOR. 1:1000 VER. 1:100	**PLAN & PROFILE** STA. 7 + 000 – STA. 7 + 133.94	21/43





STATION	7+000		7+100	7+133.94
FINISHED GRADE	30.49	30.33	30.17	30.09
ORIGINAL GROUND	30.30	30.32	30.15	30.09
HOR. CURVATURE				
VERT. CURVATURE				

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE		DRAWING NO.
1:500	**PLARIDEL INTERSECTION** KM. 41+700	22/43

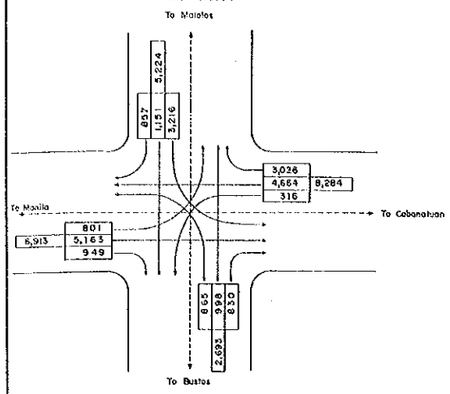
TO MALOLOS

TO MANILA

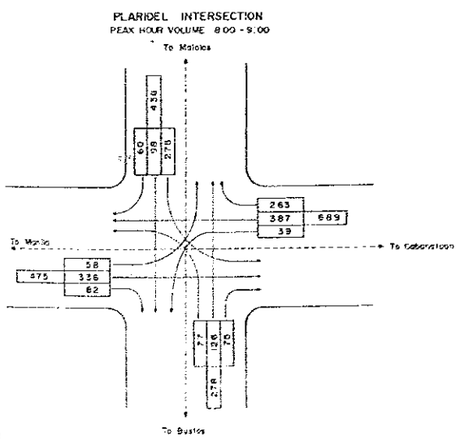
TO CABANATUAN

TO BUSTOS

PLARIDEL INTERSECTION
18-HOUR VOLUME



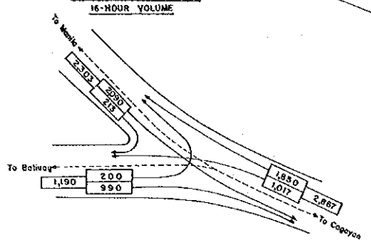
PLARIDEL INTERSECTION
PEAK HOUR VOLUME 8:00 - 9:00



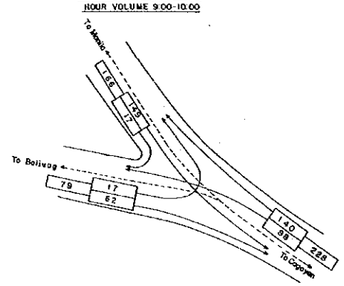
FEAS
THE PAN
SCALE:
1:500

TO MANILA

BALIUAG INTERSECTION
16-HOUR VOLUME



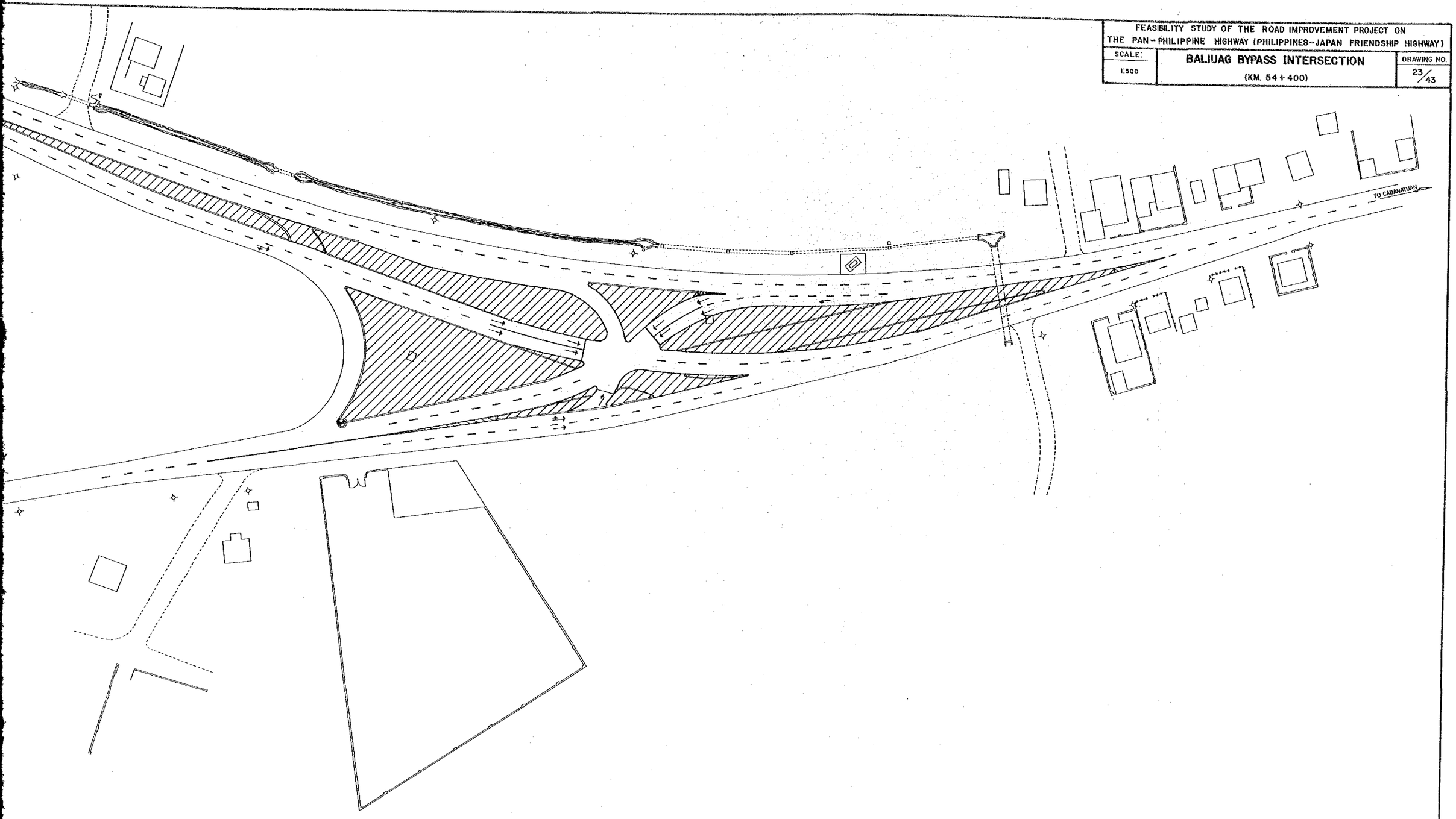
BALIUAG INTERSECTION
HOUR VOLUME 9:00-10:00



TO BALIUAG

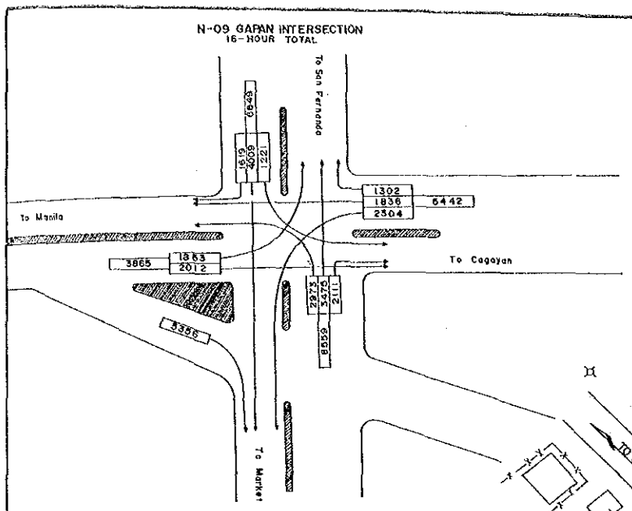
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

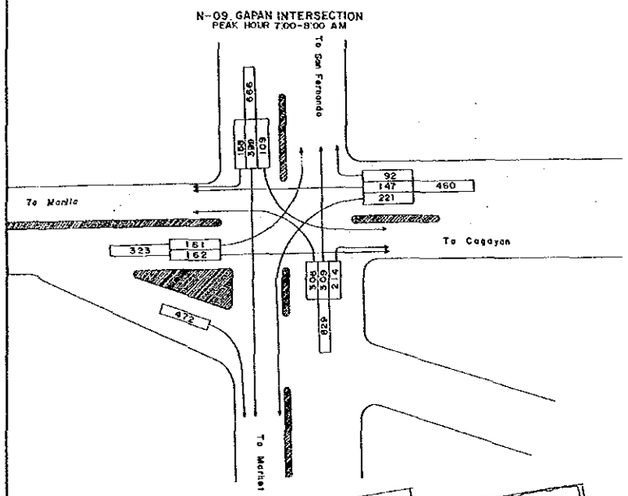
SCALE:	BALIUAG BYPASS INTERSECTION (KM. 54+400)	DRAWING NO.
1:500		23/43



FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	GAPAN INTERSECTION (KM. 93+900)	DRAWING NO.
1:500		24/43

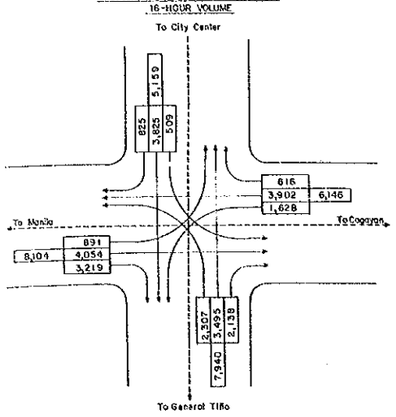




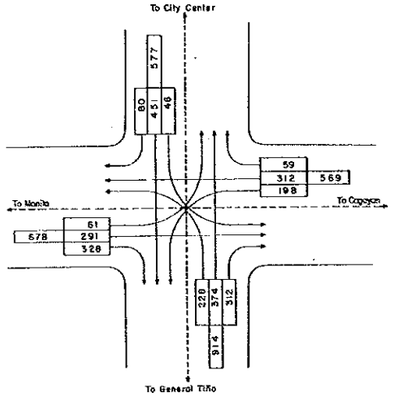
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

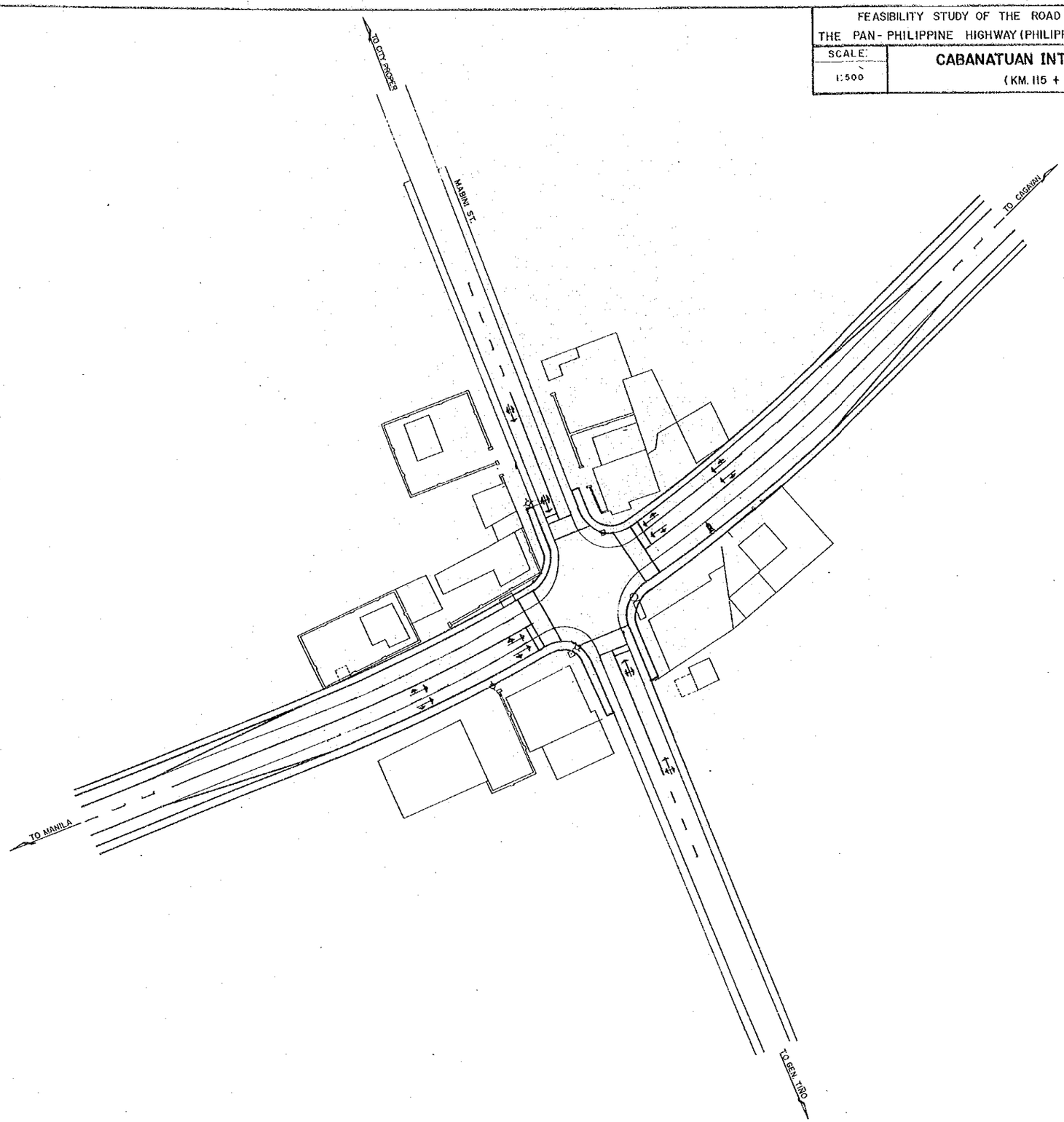
SCALE:	CABANATUAN INTERSECTION II (KM. 115 + 700)	DRAWING NO.
1:500		25/43

CABANATUAN II INTERSECTION
16-HOUR VOLUME



CABANATUAN II INTERSECTION
PEAK HOUR VOLUME 7:00-8:00





FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY(PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE	CABANATUAN INTERSECTION IV (KM. 116 + 600)	DRAWING NO.
1:500		26/43

TO CITY CENTER

TO CITY CENTER

DEL PILAR ST.

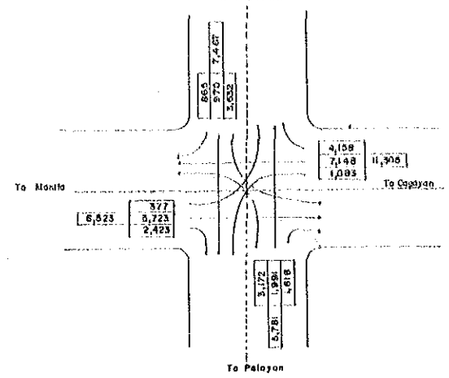
TO MANILA

TO CAGAYAN

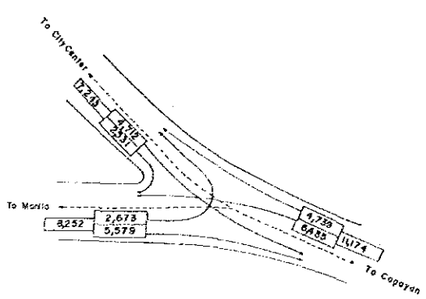
TO PALAYAN

TO PALAYAN

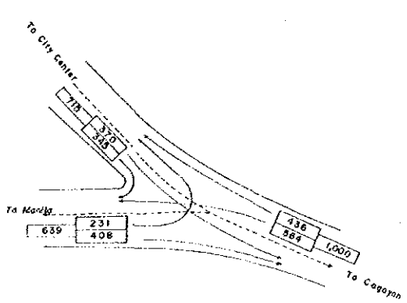
CABANATUAN IV INTERSECTION
16-HOUR VOLUME



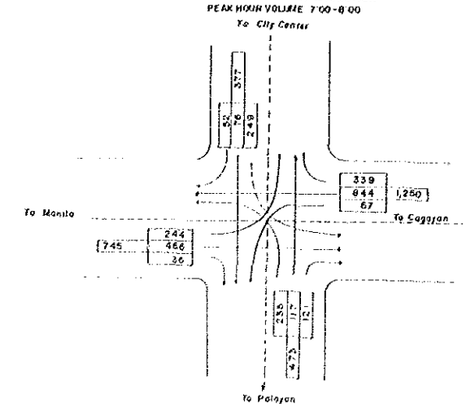
CABANATUAN III INTERSECTION
16-HOUR VOLUME



CABANATUAN III INTERSECTION
HOUR VOLUME 7:00-8:00



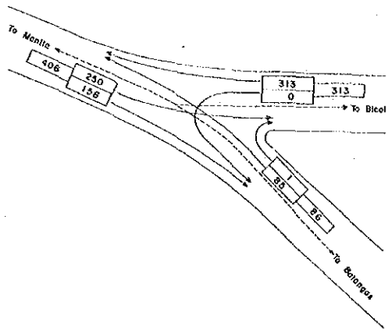
CABANATUAN IV INTERSECTION
PEAK HOUR VOLUME 7:00-8:00



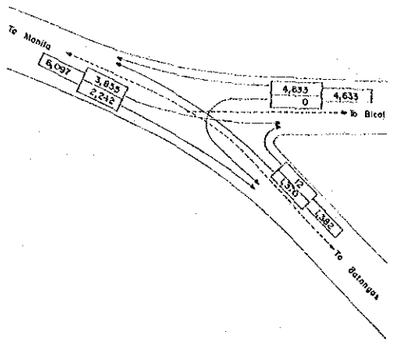
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	STO TOMAS INTERSECTION I. (KM. 60)	DRAWING NO.
1:500		27/43

STO. TOMAS I INTERSECTION
PEAK HOUR VOLUME 15:00 16:00



STO. TOMAS I INTERSECTION
24-HOUR VOLUME



FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON
THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	STO TOMAS INTERSECTION II (KM. 61)	DRAWING NO.
1:500		28/43

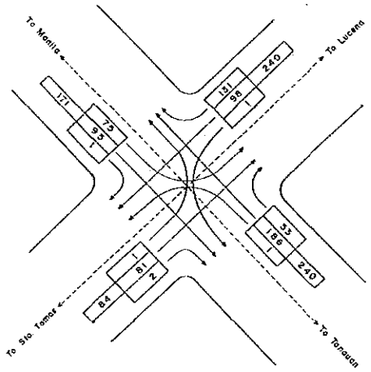
TO MANILA

TO LUCENA

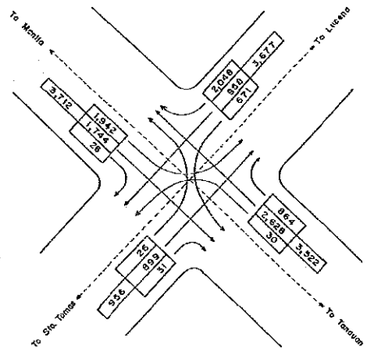
TO STO. TOMAS

TO TANAUAN

STO. TOMAS (II) INTERSECTION
PEAK HOUR VOLUME 7:00-8:00

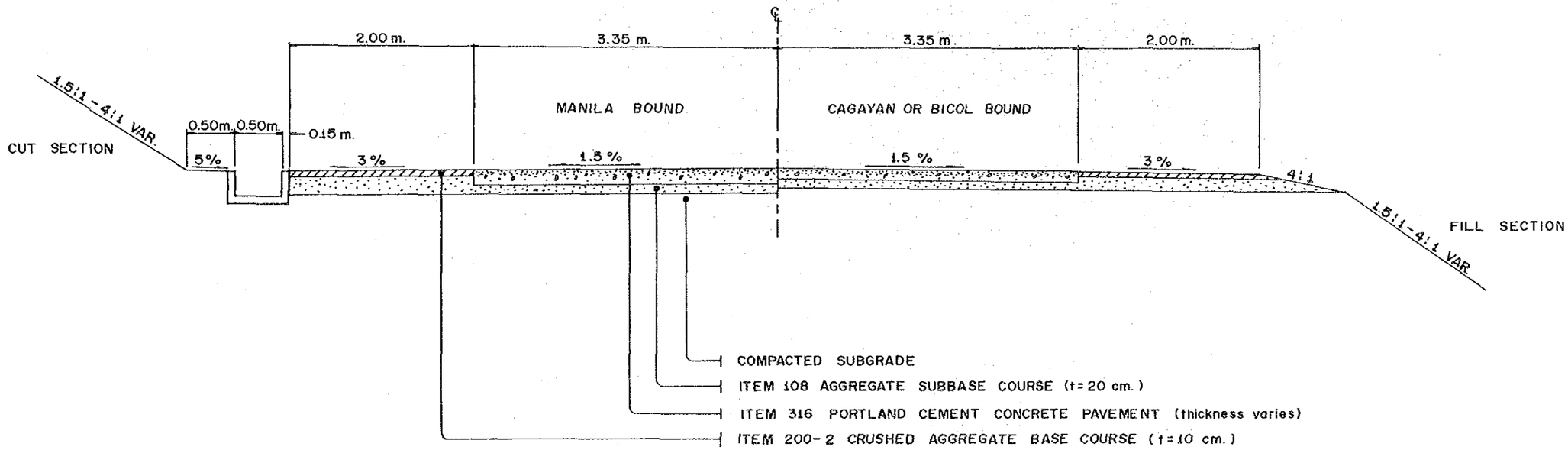


STO. TOMAS (II) INTERSECTION
24-HOUR VOLUME



FEASIBILITY STUDY ON THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)		
SCALE:	TYPICAL CROSS SECTION PCC RECONSTRUCTION (2 LANE)	DRAWING 29/43

TYPICAL CROSS SECTION
PCC RECONSTRUCTION (2 LANE)



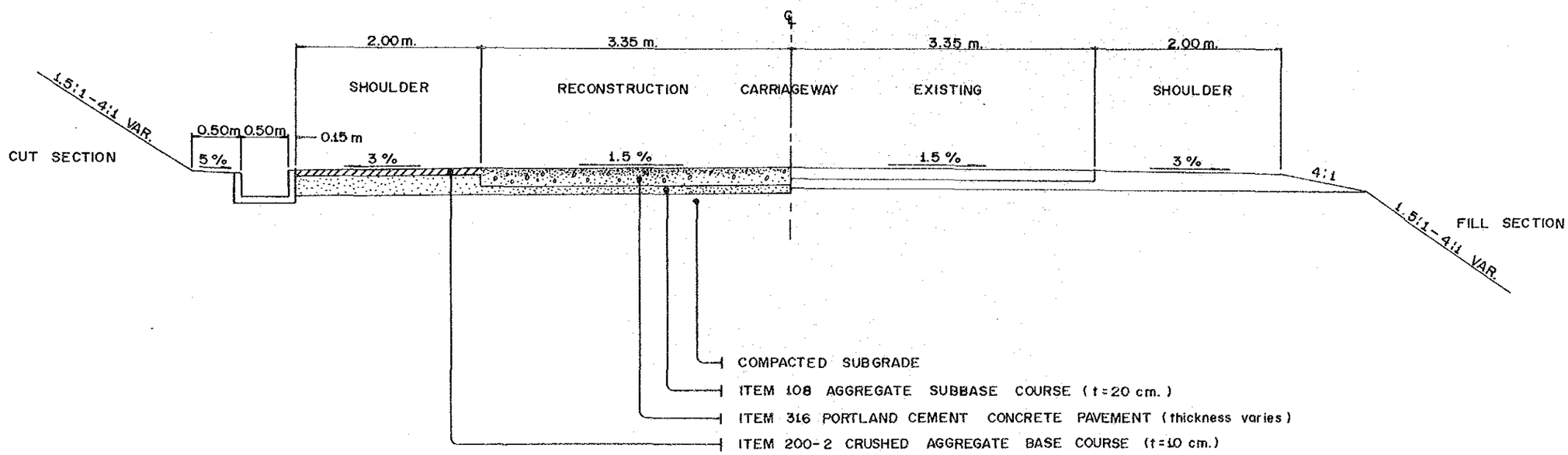
NOTE:

PCC Thickness, Manila Bound = varies from 30, 33 and 35cm.

PCC Thickness, Cagayan and Bicol bound = varies from 28, 30 and 33 cm.

FEASIBILITY STUDY ON THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY(PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)		
SCALE:	TYPICAL CROSS SECTION PCC RECONSTRUCTION (1 LANE)	DRAWING 30/43

TYPICAL CROSS SECTION
PCC RECONSTRUCTION (1 LANE)

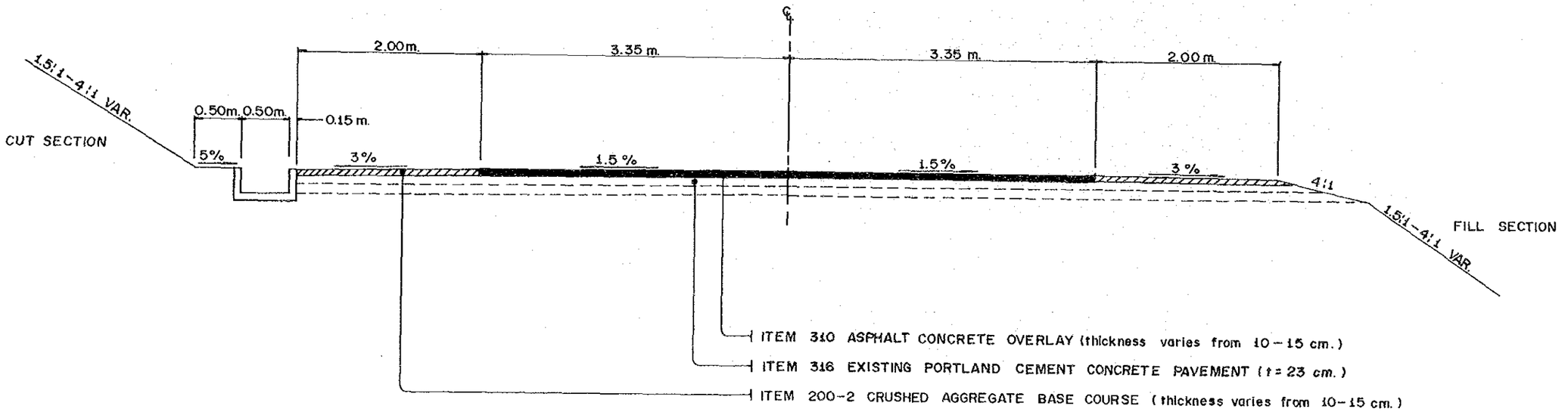


NOTE:

PCC Thickness varies from 28, 30, 33 and 35 cm

FEASIBILITY STUDY ON THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)		
SCALE:	TYPICAL CROSS SECTION ASPHALT CONCRETE OVERLAY ON RIGID EXISTING	DRAWING 31/43

TYPICAL CROSS SECTION
ASPHALT CONCRETE OVERLAY ON RIGID EXISTING



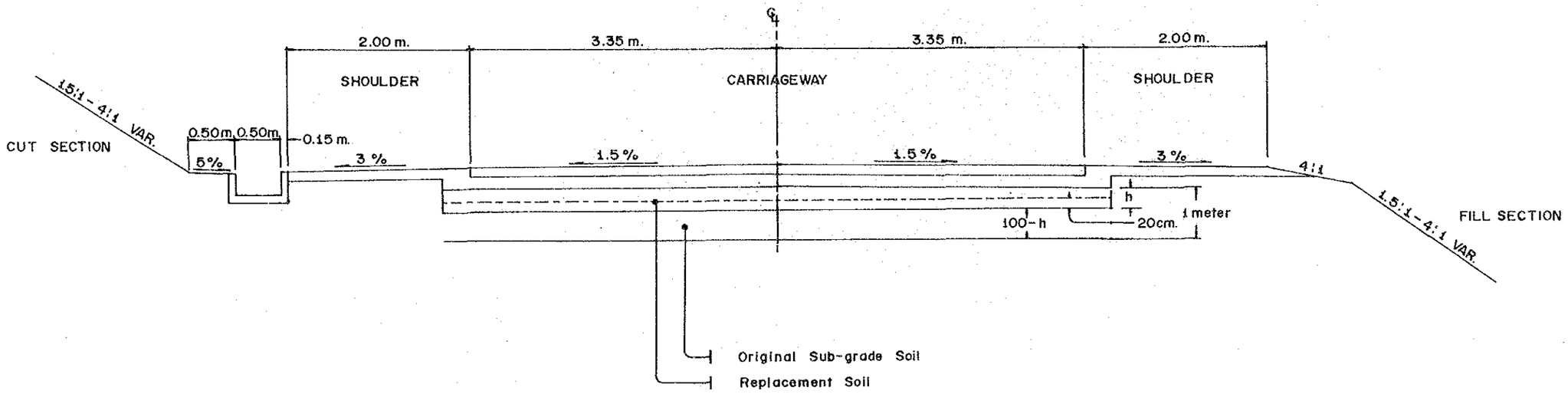
NOTE;

Asphalt concrete overlay varies from 10, 15 and 35 cm.

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)		
SCALE:	SUB-GRADE REPLACEMENT(LAYER METHOD)	DRAWING NO. 32/43

SUB-GRADE REPLACEMENT

(Layer Method)



NOTE:

Replacement of the subgrade soil is done , the total depth of the soil undergoing such treatment minus 20 cm is taken as the effective depth of subgrade soil improvement . For the bottom 20 cm of the improved soil, the CBR value is taken at the same value as that of the original soil . The maximum CBR value of an improved subgrade soil is limited to 20. For the calculation of the average CBR value, the following formula is applied.

$$CBR = \left\{ \frac{(h-20)\,CBR_1^{1/3} + (100-h+20)\,CBR_2^{1/3}}{100} \right\}^3$$

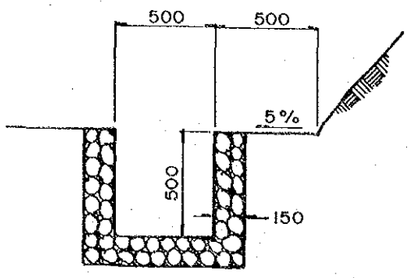
h : Thickness of Replacement Soil (cm.)
CBR_1: CBR of Replacement Soil
CBR_2: CBR of Original Sub-grade Soil

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

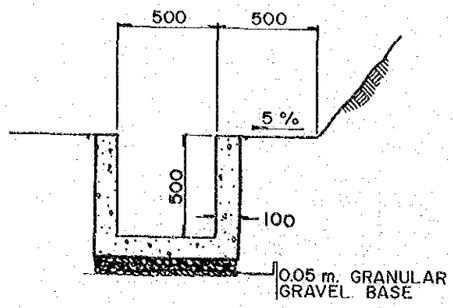
SCALE

DRAWING 33/43

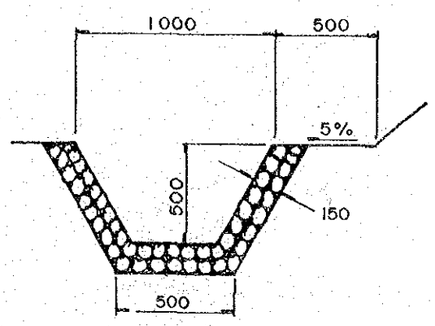
SIDE DITCHES



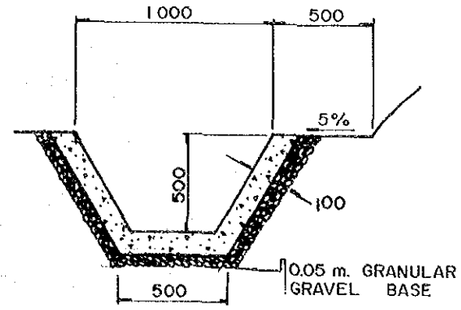
MSD - 1
(FOR MOUNTAINOUS AREA)



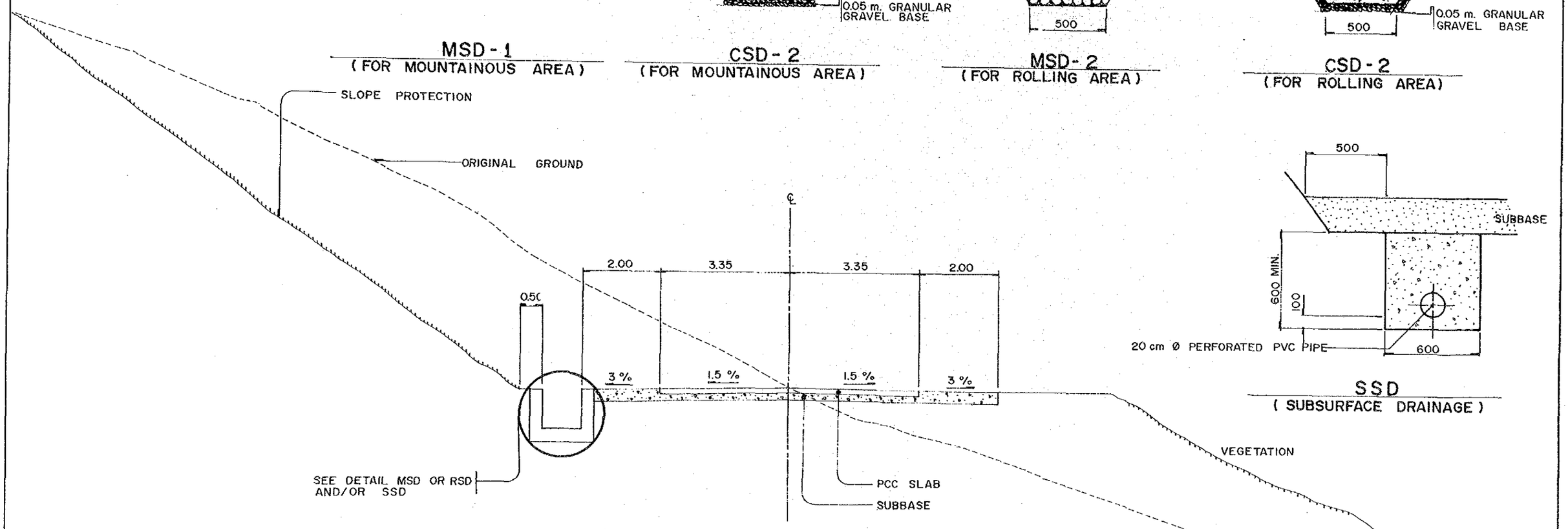
CSD - 2
(FOR MOUNTAINOUS AREA)



MSD - 2
(FOR ROLLING AREA)



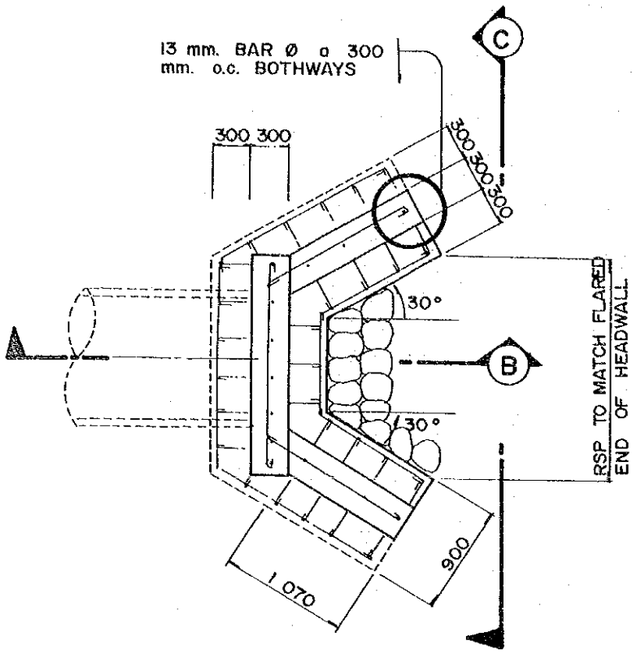
CSD - 2
(FOR ROLLING AREA)



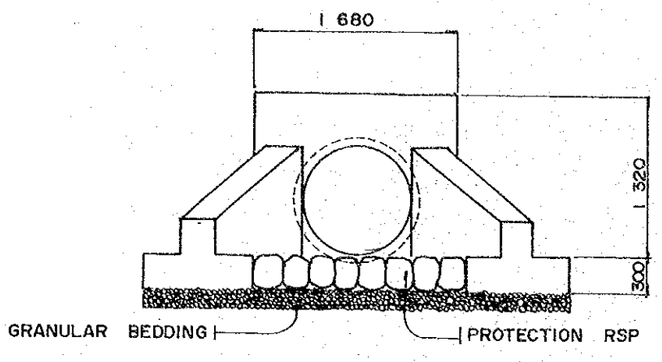
SSD
(SUBSURFACE DRAINAGE)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

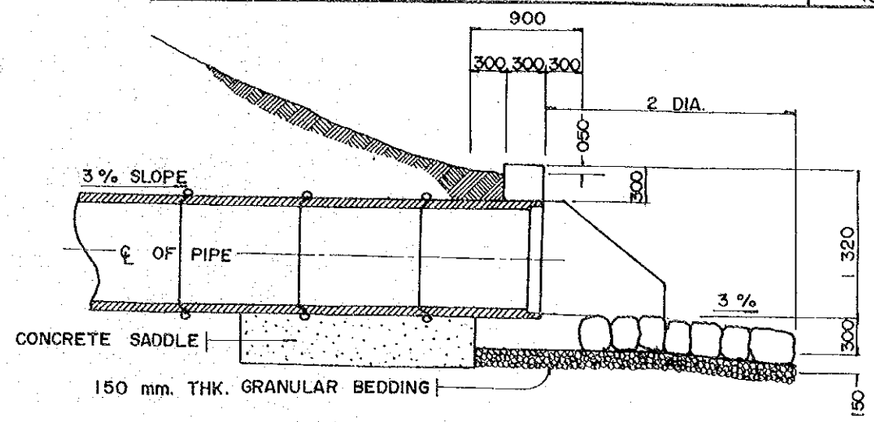
SCALE	CATCH BASIN AND FLARED HEADWALL WITH 0.910 M. Ø RCP PIPE	DRAWING 34/43



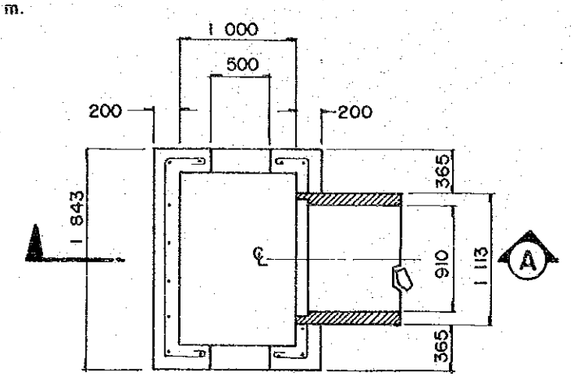
DETAIL OF FLARED HEADWALL
SCALE 1:50 m.



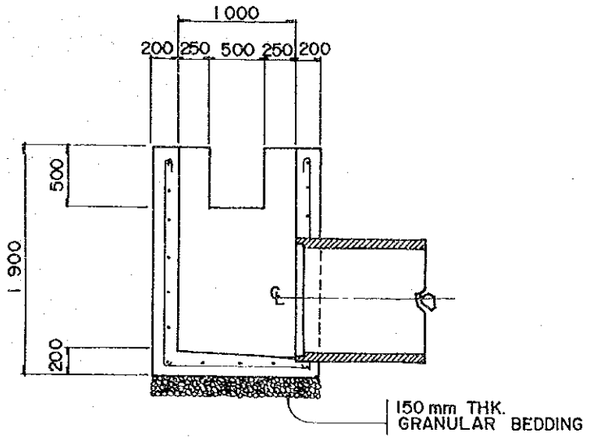
SECTION B
SCALE 1:50 m.



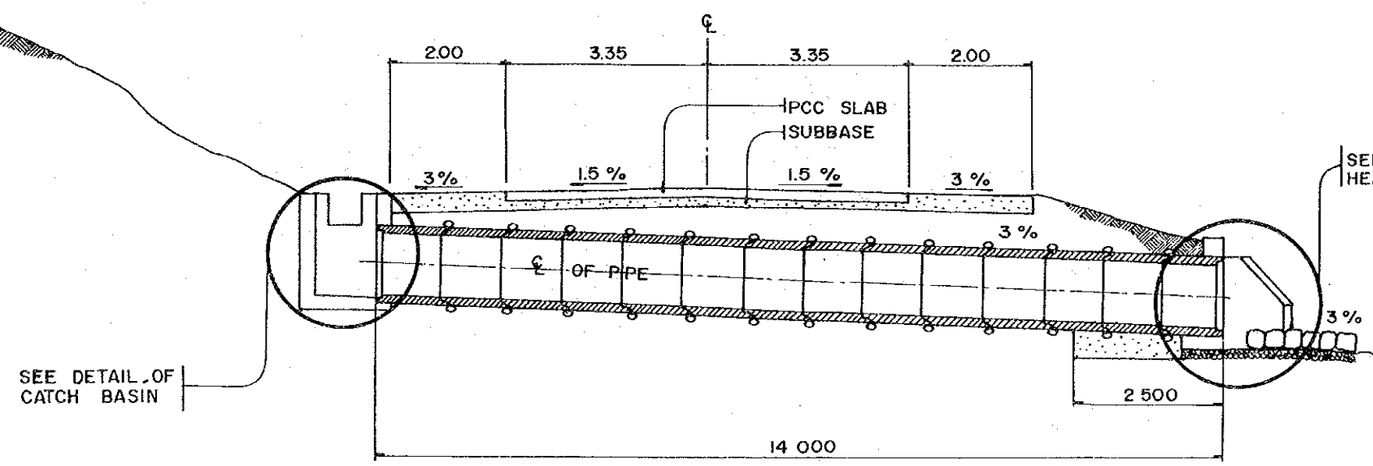
SECTION C
SCALE 1:50 m.



DETAIL OF CATCH BASIN
SCALE 1:50 m.



SECTION A
SCALE 1:50 m



CATCH BASIN AND FLARED HEADWALL WITH 0.910 M. Ø RCP PIPE
SCALE 1:100 m.

PROPOSED REHABILITATION WORKS

N-1; Sta. Rita - Gapan Section; Km. 39 - 85 ; (Feasibility Study Segment)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PROPOSED REHABILITATION WORKS SEGMENT N-1	DRAWING NO. 35/43

PROPOSED REHABILITATION WORKS

39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72

STAGE 1

Pavement

MANILA BOUND: Re PCC 35 | Re PCC 35 | Re PCC 35 | Re PCC 35 | Re PCC 35 | OL AC 15 | PCC Re 35

CAGAYAN BOUND: 25% | OL AC 15 | PCC Re. 35

IMPROVEMENT OF DRAINAGE: CSD-1 | MSD-1 | MSD-2

STAGE 2

Pavement

MANILA BOUND: Re PCC 35

CAGAYAN BOUND: 50% | 80% | 80%

Re PCC 33 | Re PCC 33 | Re PCC 33 | Re PCC 33 | Re PCC 33

IMPROVEMENT OF DRAINAGE: MSD-1

PROPOSED REHABILITATION WORKS

72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105

STAGE 1

Pavement

MANILA BOUND: Re PCC 35 | Re PCC 35

CAGAYAN BOUND: 50%

Re PCC 33 | Re PCC 33

IMPROVEMENT OF DRAINAGE: CSD-1 | MSD-2

STAGE 2

Pavement

MANILA BOUND: Re PCC 35

CAGAYAN BOUND: 50%

Re PCC 33 | Re PCC 33 | Re PCC 33

IMPROVEMENT OF DRAINAGE: MSD-2

LEGEND:

PCC Reconstruction | Asphalt Overlay | Drainage

PROPOSED REHABILITATION WORKS

N-2; Gapan - Cabanatuan Section; Km. 85 - 120 (Feasibility Study Segment)

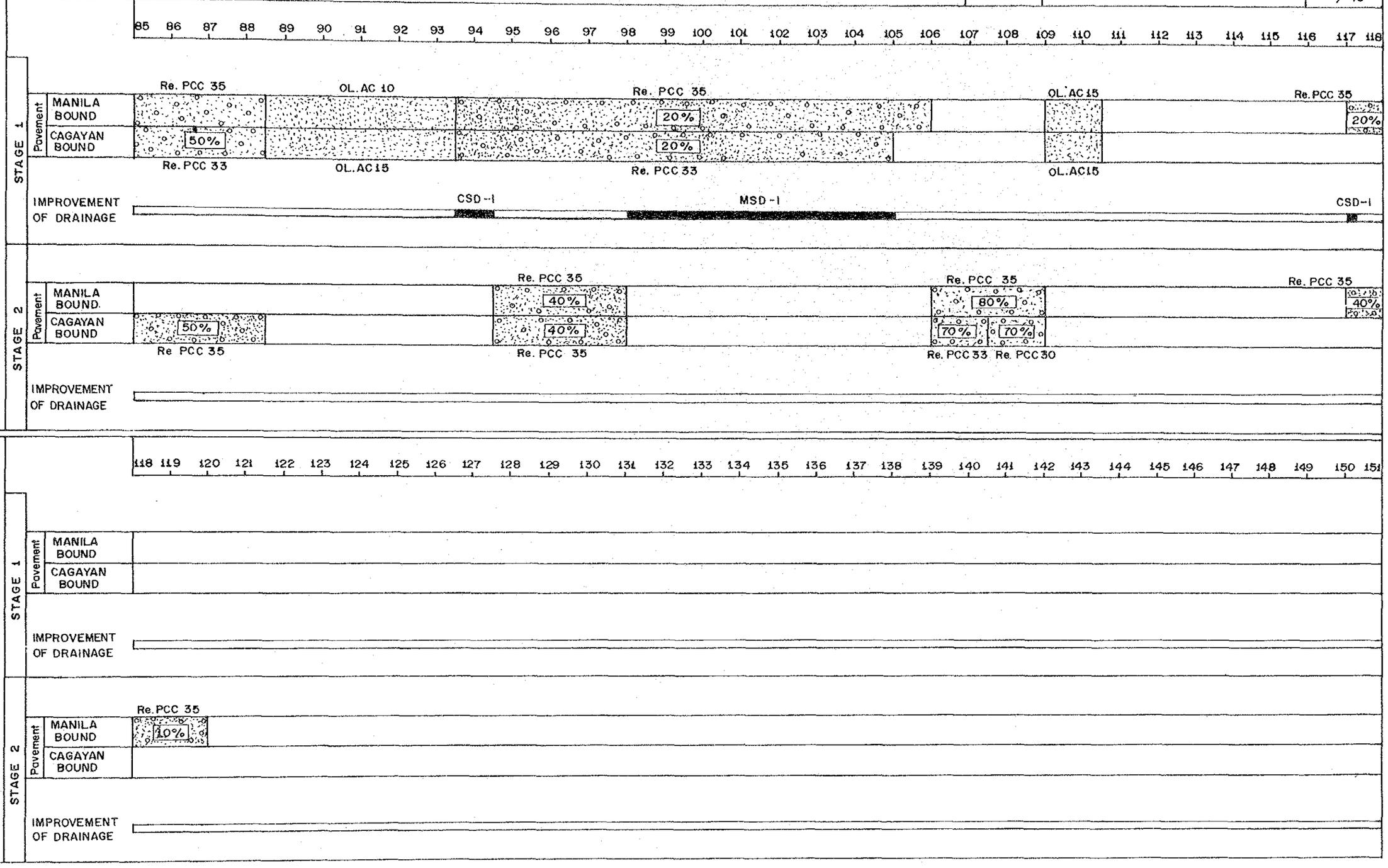
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:

PROPOSED REHABILITATION WORKS SEGMENT N-2

DRAWING NO. 36/43

PROPOSED REHABILITATION WORKS



LEGEND:

PCC Reconstruction

Asphalt Overlay

Drainage

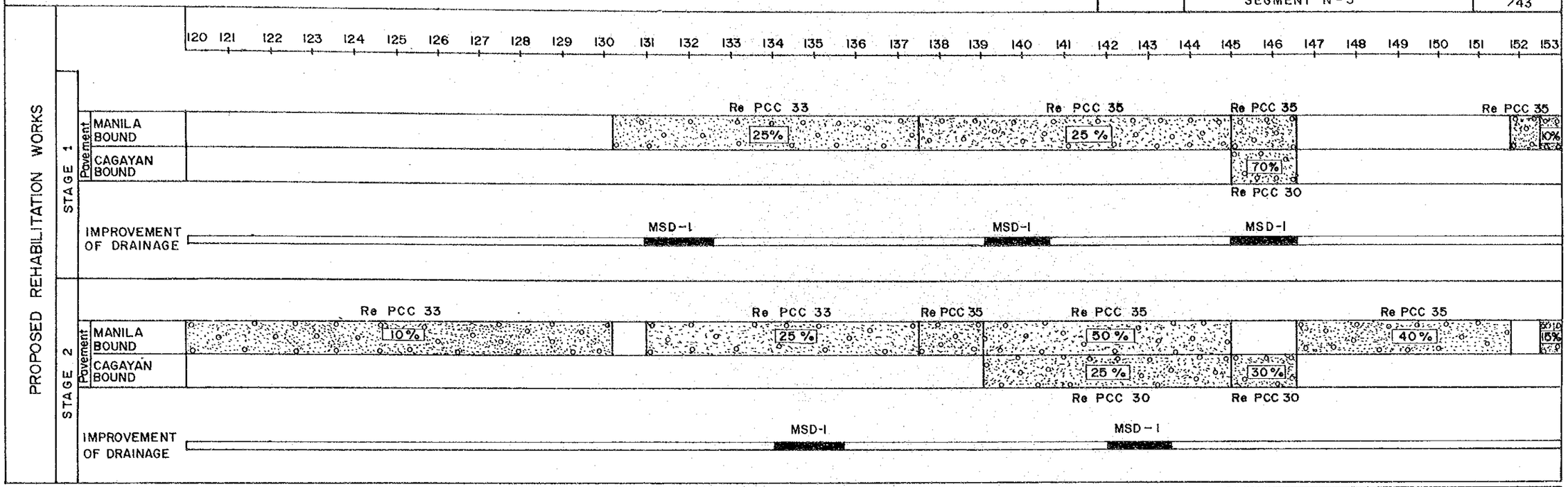
PROPOSED REHABILITATION WORKS

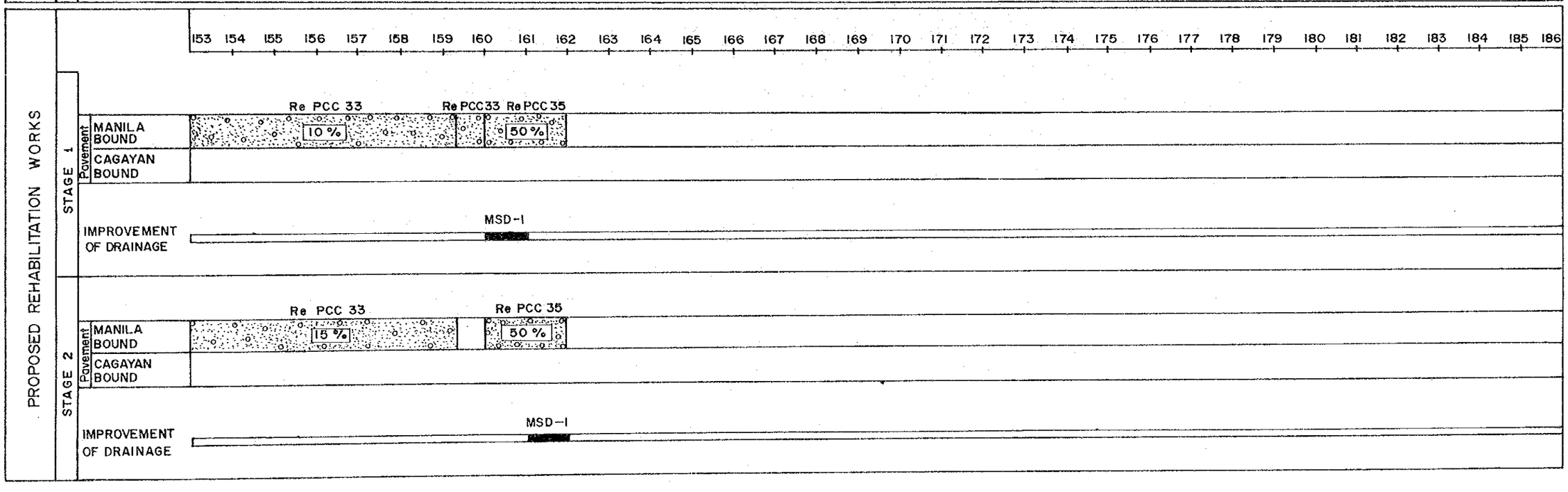
N-3; Cabanatuan - San Jose Section; Km. 120-162; (Feasibility Study Segment)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PROPOSED REHABILITATION WORKS SEGMENT N-3	DRAWING NO. 37/43

PROPOSED REHABILITATION WORKS





LEGEND:

PCC Reconstruction

Asphalt Overlay

Drainage

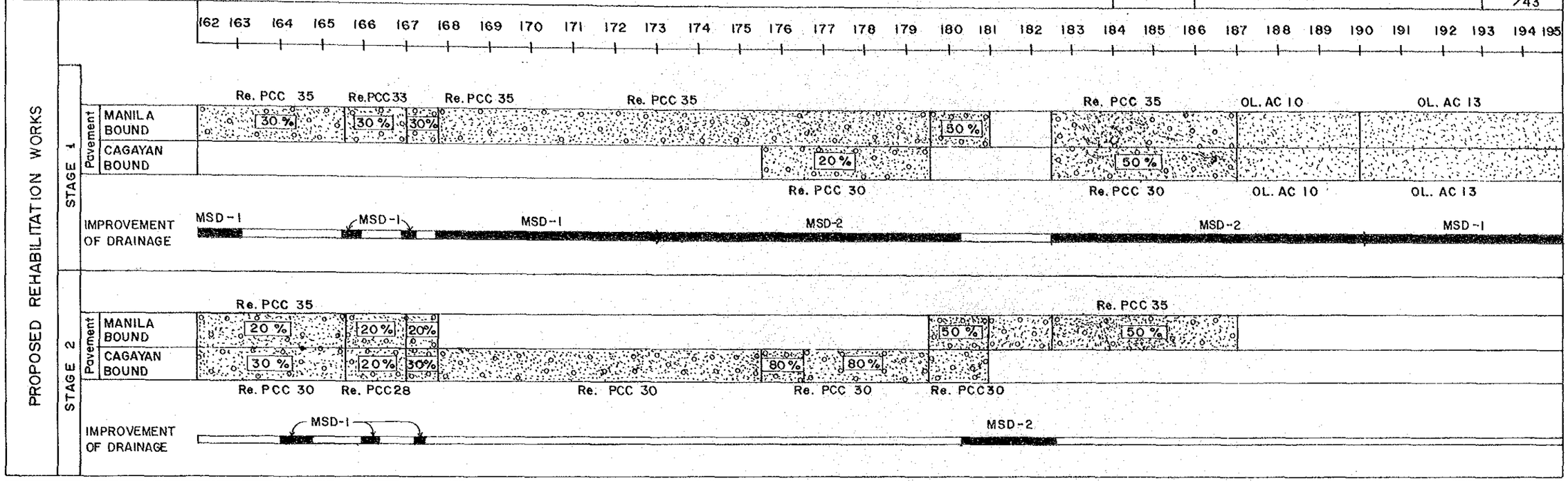
PROPOSED REHABILITATION WORKS

N-4; San Jose - Dalton Section; Km. 162-200 ; (Feasibility Study Segment)

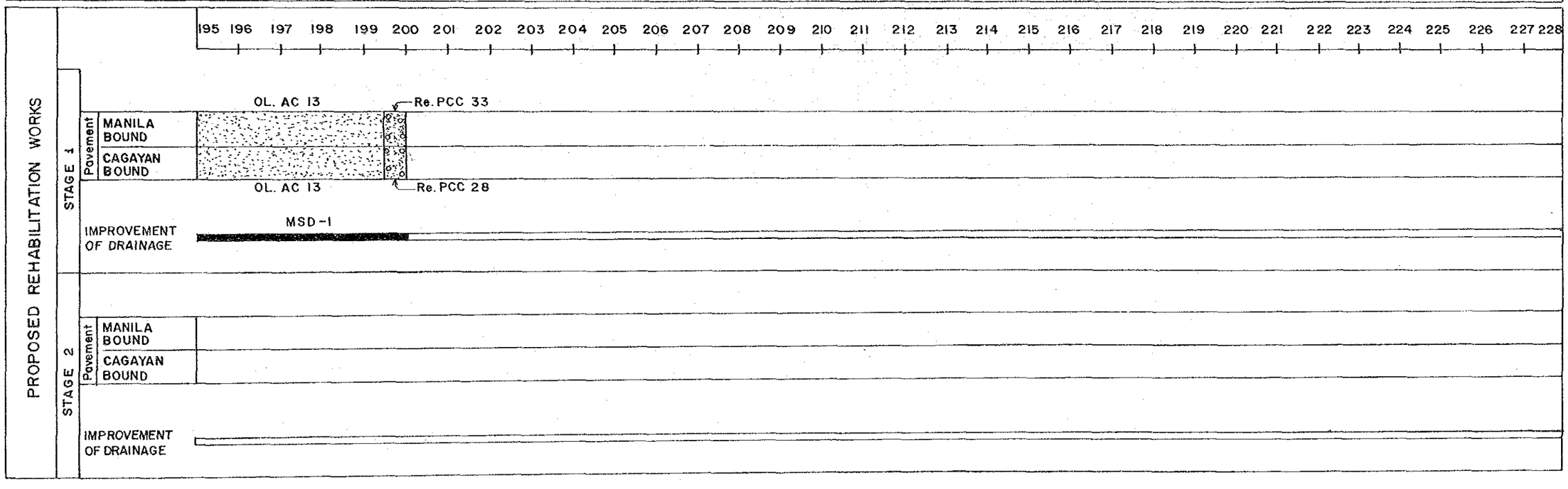
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PROPOSED REHABILITATION WORKS SEGMENT N - 4	DRAWING NO. 38/43

PROPOSED REHABILITATION WORKS



PROPOSED REHABILITATION WORKS



LEGEND:

PCC Reconstruction

Asphalt Overlay

Drainage

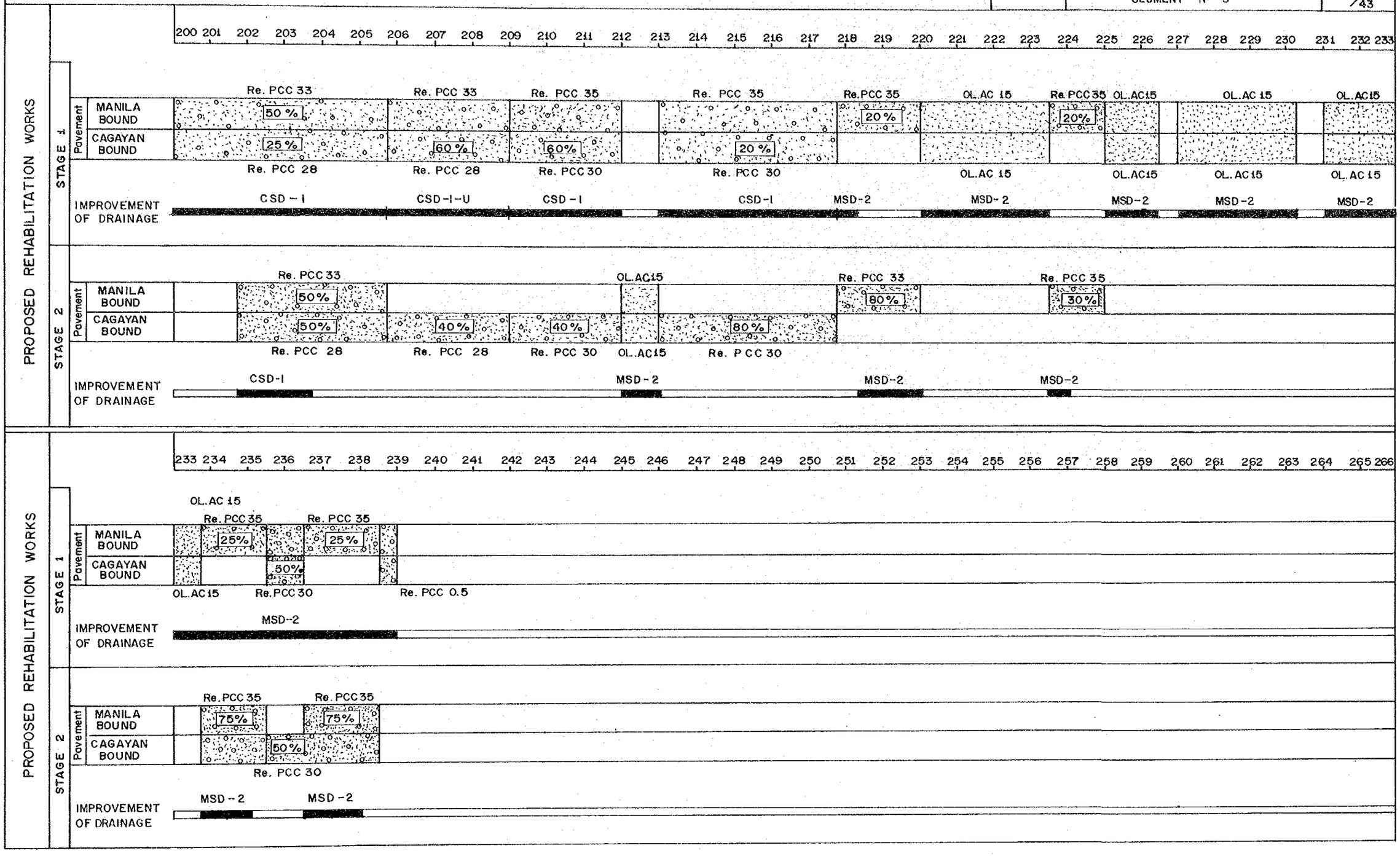
PROPOSED REHABILITATION WORKS

N-5; Dalton - Aritao Section; Km. 200 - 239; (Feasibility Study Segment)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PROPOSED REHABILITATION WORKS SEGMENT N - 5	DRAWING NO. 39/43

PROPOSED REHABILITATION WORKS



LEGEND:

PCC Reconstruction

Asphalt Overlay

Drainage

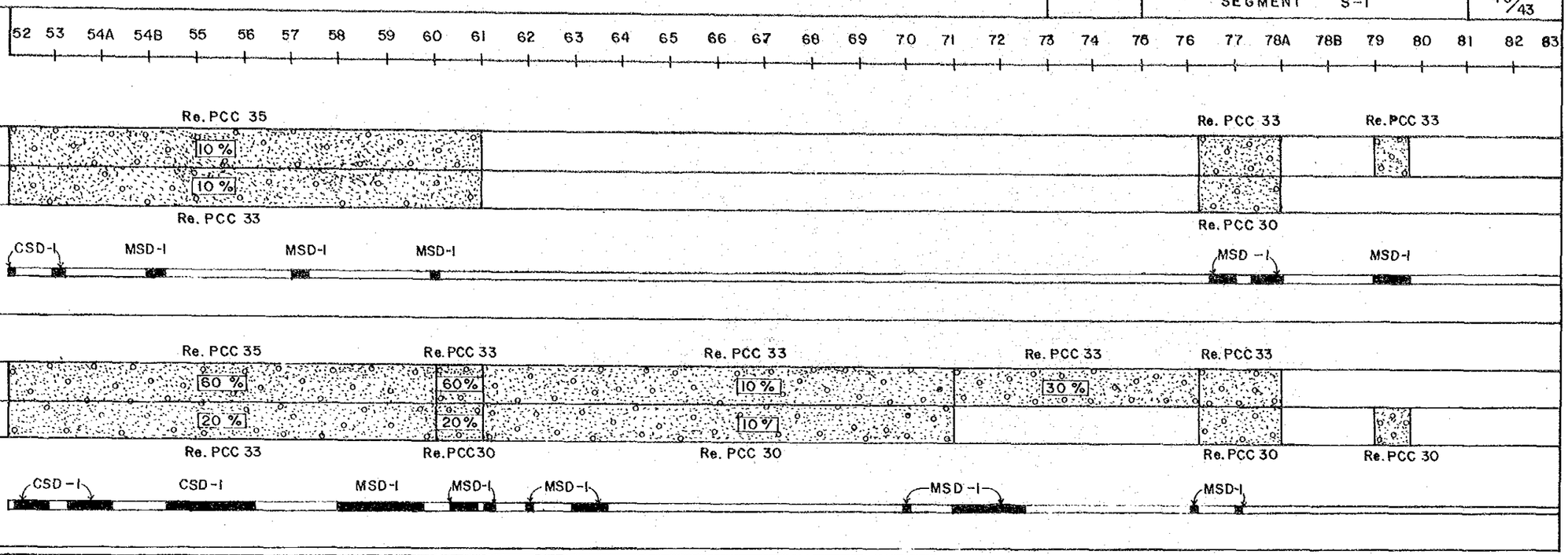
PROPOSED REHABILITATION WORKS

S-1 ; Calamba – Tiaong Section; Km 52 – 98 (Feasibility Study Segment)

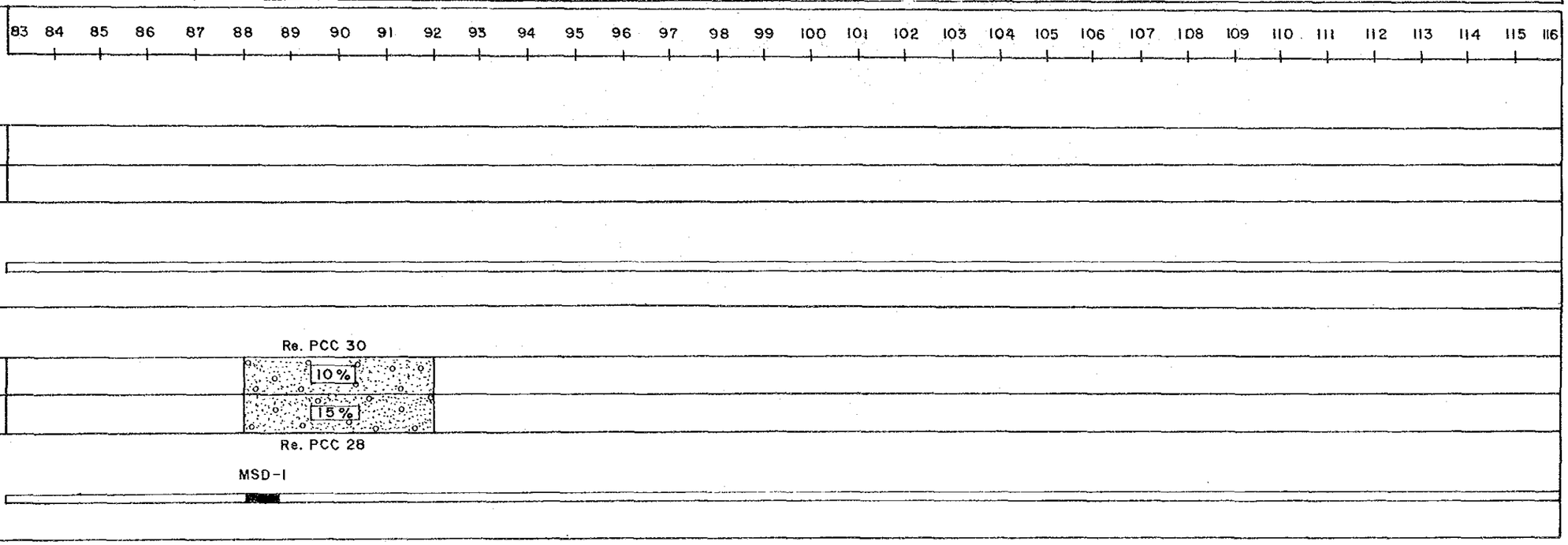
FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE :	PROPOSED REHABILITATION WORKS SEGMENT S-1	DRAWING NO. 40/43

PROPOSED REHABILITATION WORKS



PROPOSED REHABILITATION WORKS



LEGEND :

PCC Reconstruction

Asphalt Overlay

Drainage

PROPOSED REHABILITATION WORKS

S-2; Tiaong - Bagbilao Section; Km 92-146 (Feasibility Study Segment)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:

PROPOSED REHABILITATION WORKS SEGMENT S-2

DRAWING NO. 41/43

PROPOSED REHABILITATION WORKS

92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125

STAGE 1

MANILA BOUND: Re. PCC 30 50% (105) — Re. PCC30 50% (122)

BICOL BOUND: 25% (105) Re. PCC 28

IMPROVEMENT OF DRAINAGE: MSD-2 (105) — MSD-2 (122)

STAGE 2

MANILA BOUND: Re. PCC 30 10% (92–105) — Re. PCC 30 40% (105–122) — Re. PCC 30 50% (122)

BICOL BOUND: 15% (92–105) Re. PCC 28 — 50% (105–122) Re. PCC 28 — 50% (122)

IMPROVEMENT OF DRAINAGE: MSD-2 (92) — MSD-2 (96) — MSD-2 (101) — MSD-2 (105) — MSD-2 (111) — MSD-2 (122)

125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158

STAGE 1

MANILA BOUND: OLAC.13 OLAC.10 (136–138) — Re. PCC 30 (141–142) — Re. PCC 30 (145–146)

BICOL BOUND: OLAC.13 OLAC.10 (136–138) — Re. PCC 28 (141–142) — Re. PCC 28 (145–146)

IMPROVEMENT OF DRAINAGE: MSD-1 (136–138) — MSD-1 (141–142) — MSD-1 (145–146)

STAGE 2

MANILA BOUND

BICOL BOUND

IMPROVEMENT OF DRAINAGE

LEGEND:

PCC Reconstruction — Asphalt Overlay — Drainage

PROPOSED REHABILITATION WORKS

S-3; Pagbilao - Plaridel Section, Km 146 - 188 E Feasibility Study Segment)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE	PROPOSED REHABILITATION WORKS SEGMENT S - 3	DRAWING NO.
		42/43

PROPOSED REHABILITATION WORKS

146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179

STAGE 1

Pavement

MANILA BOUND: Re PCC 30 | Re PCC 30 10% | Re PCC 30

BICOL BOUND: Re PCC 28 | Re PCC 28 30% | Re PCC 28

IMPROVEMENT OF DRAINAGE: CSD - I - J | CSD-I-J | MSD - I

STAGE 2

Pavement

MANILA BOUND: Re PCC 30 60%

BICOL BOUND: 40% Re PCC 28

IMPROVEMENT OF DRAINAGE: CSD-I-U | CSD-I-U

PROPOSED REHABILITATION WORKS

179 180 181 182 183 184 185 186 187 188A 188B 188C 188D 188E 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208

STAGE 1

Pavement

MANILA BOUND: Re PCC30 | Re PCC 30 5% | 50% | 50%

BICOL BOUND: 5% | 50% | 50% | 50%

Re PCC 28 | Re PCC 28

IMPROVEMENT OF DRAINAGE: MSD-I | MSD-I-U | MSD-U | MSD-U

STAGE 2

Pavement

MANILA BOUND: Re PCC 30 20% | Re PCC 30 40% | Re PCC 30 50%

BICOL BOUND: 30%

Re PCC 28

IMPROVEMENT OF DRAINAGE: MSD-I | MSD-I-U | MSD -2 | MSD-2

LEGEND:

PCC Reconstruction

Asphalt Overlay

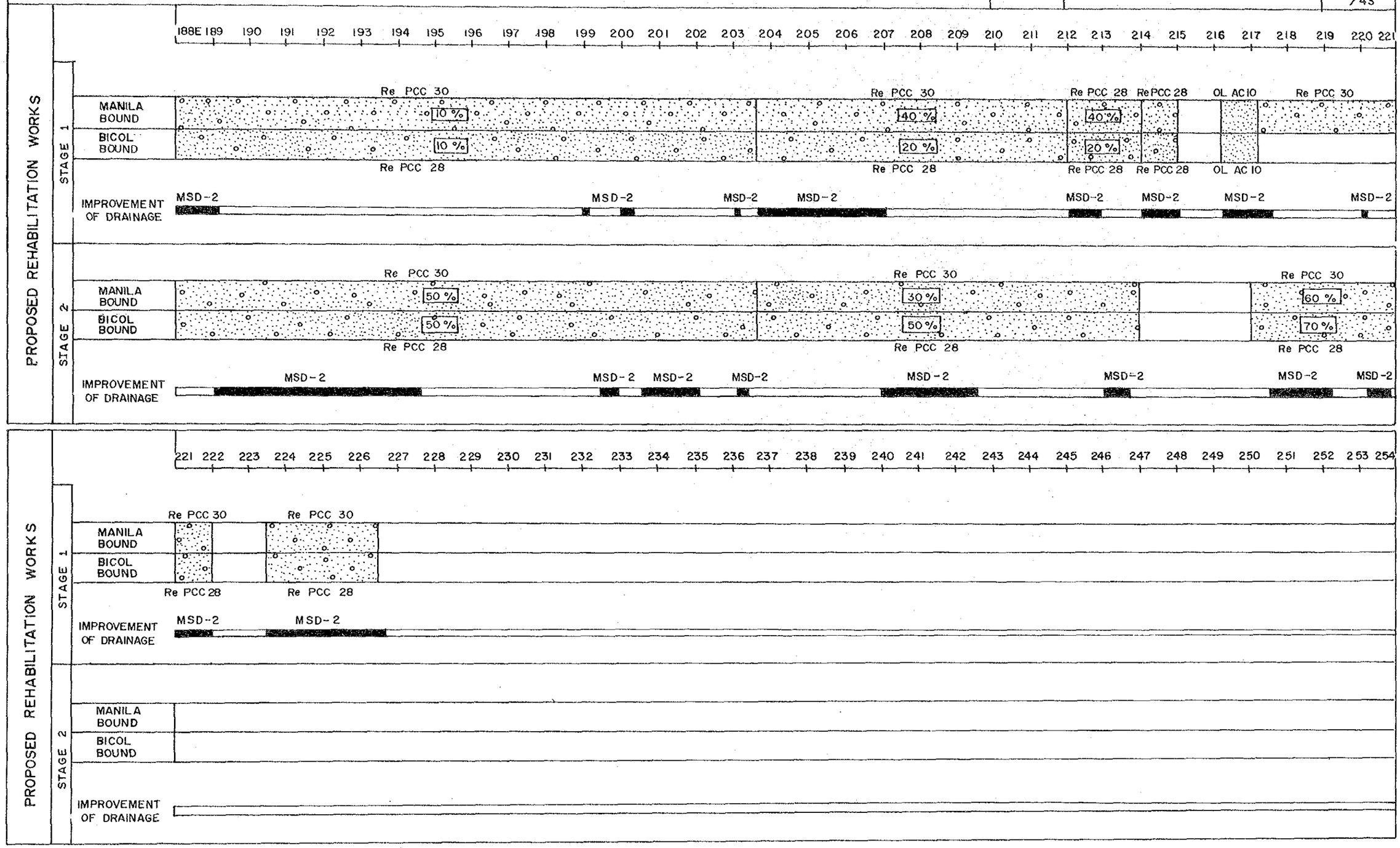
Drainage

PROPOSED REHABILITATION WORKS

S-4 ; Gumaca - Calauag Section ; Km 188E - 226.50 (Feasibility Study Segment)

FEASIBILITY STUDY OF THE ROAD IMPROVEMENT PROJECT ON THE PAN-PHILIPPINE HIGHWAY (PHILIPPINES-JAPAN FRIENDSHIP HIGHWAY)

SCALE:	PROPOSED REHABILITATION WORKS SEGMENT S - 4	DRAWING NO. 43/43



LEGEND:

PCC Reconstruction

Asphalt Overlay

Drainage