

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

MINISTRY OF SURFACE TRANSPORT
GOVERNMENT OF INDIA

THE FEASIBILITY STUDY
ON
NATIONAL HIGHWAY BYPASSES
IN
INDIA

FINAL REPORT

VOLUME II : DRAWINGS : PART A - BAREILLY BYPASS
PART B - GWALIOR BYPASS

AUGUST 1998

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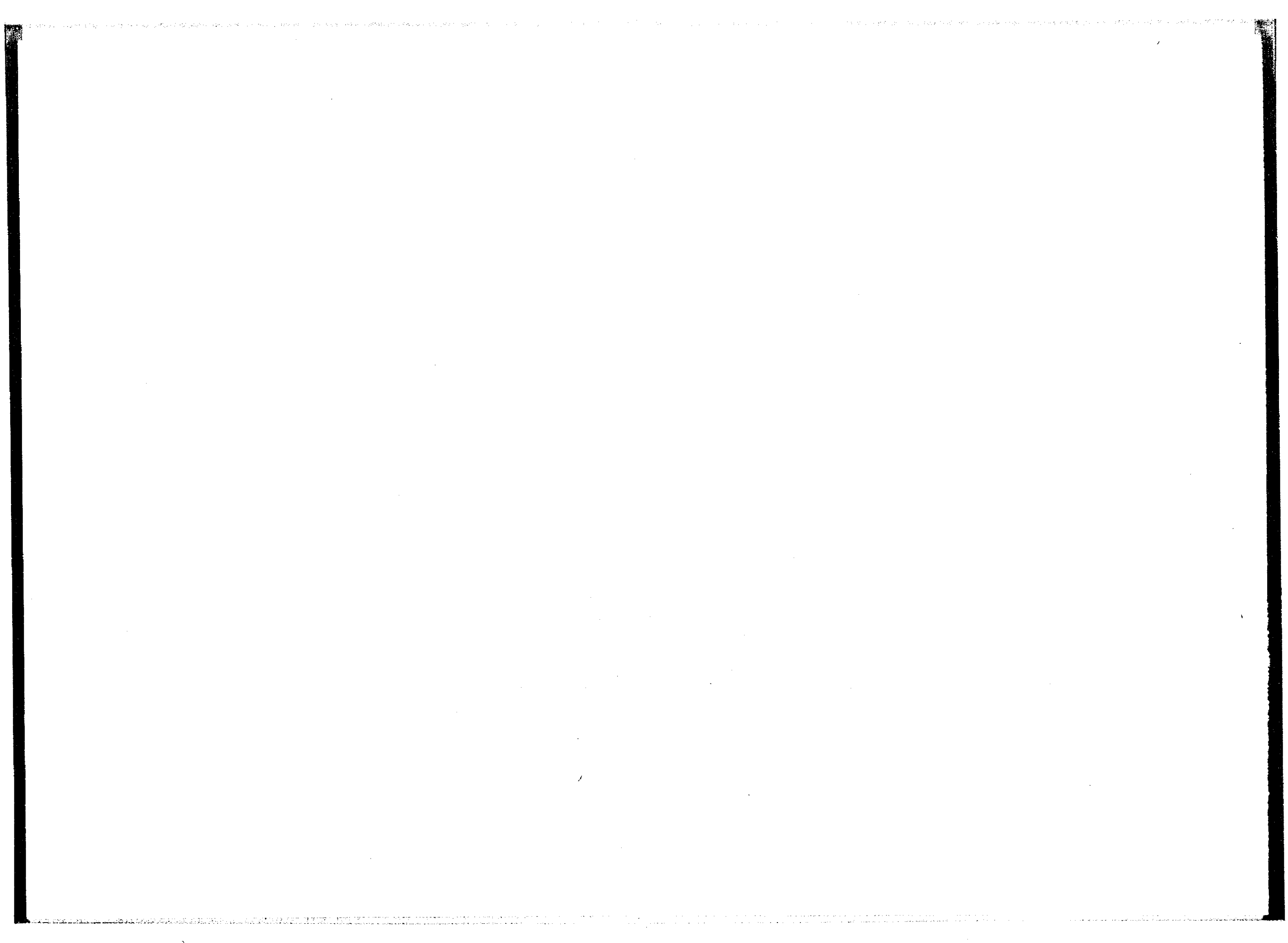
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NIPPON KOEI CO., LTD.
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

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GOVERNMENT OF INDIA**

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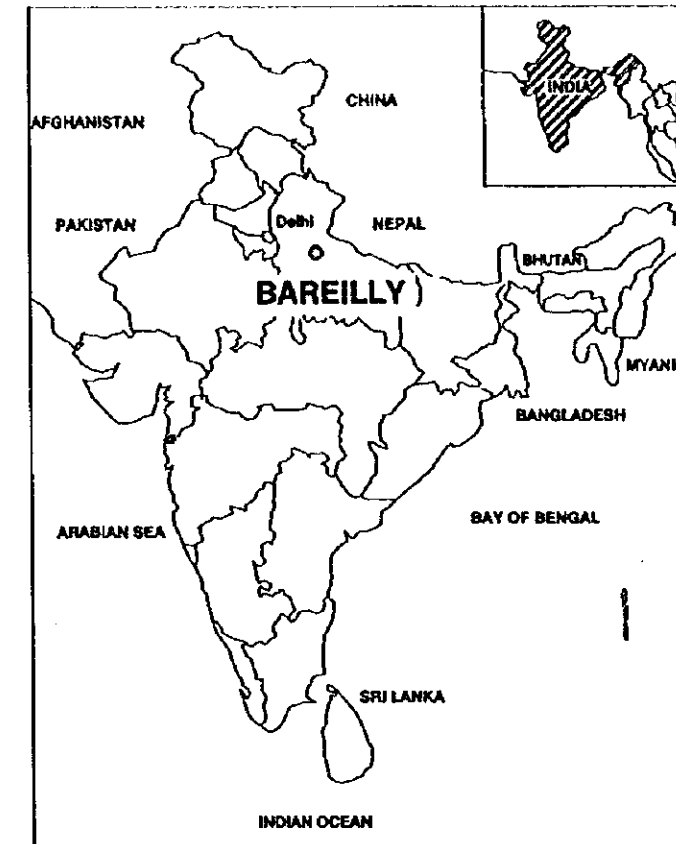
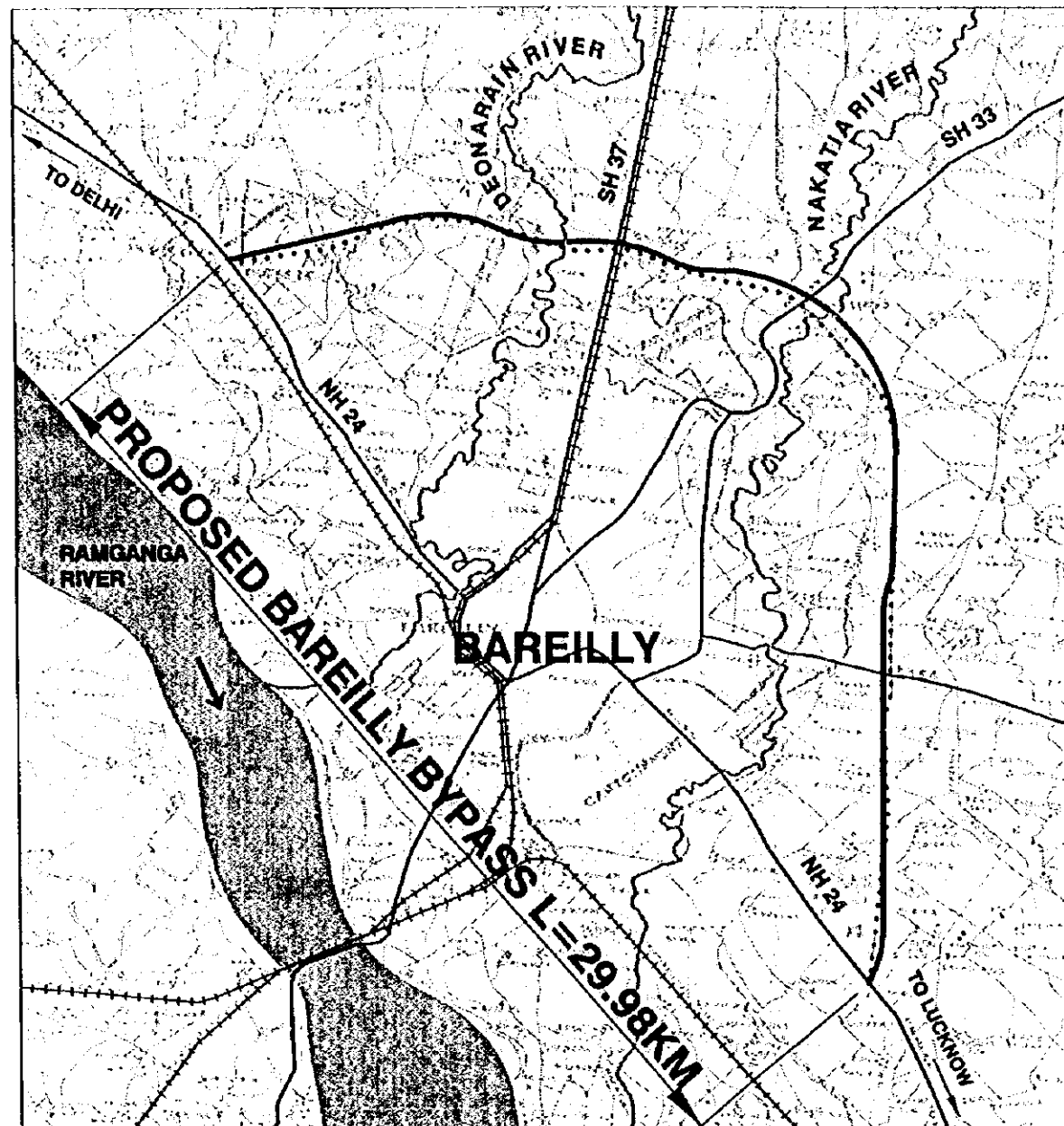
AUGUST - 1998

**Nippon Koei Co., Ltd.
Yachiyo Engineering Co., Ltd.**

DRAWING SCHEDULE

SHEET No.	TITLE OF DRAWING	SHEET No.	TITLE OF DRAWING
COVER			
A.	GENERAL	D.	SCHEDULE OF RIGHT-OF-WAY
A-1	DRAWING SCHEDULE	D-1	SCHEDULE OF RIGHT-OF-WAY (B.P. - 0+250)
A-2	LOCATION MAP	D-2	SCHEDULE OF RIGHT-OF-WAY (STA. 0+250 - 8+400)
B.	HIGHWAY DESIGN FOR BAREILLY BYPASS	D-3	SCHEDULE OF RIGHT-OF-WAY (STA. 8+400 - 8+830)
B-1	TYPICAL CROSS SECTION	D-4	SCHEDULE OF RIGHT-OF-WAY (STA. 8+830 - 13+000)
B-2 (1/5)	DESIGN ELEMENTS OF HORIZONTAL ALIGNMENT	D-5	SCHEDULE OF RIGHT-OF-WAY (STA.13+000 - 13+600)
B-2 (2/5)	DESIGN ELEMENTS OF BEGINNING INTERSECTION (NH-24,DELHI SIDE)	D-6	SCHEDULE OF RIGHT-OF-WAY (STA.13+600 - 22+000)
B-2 (3/5)	DESIGN ELEMENTS OF INTERCHANGE SH-37	D-7	SCHEDULE OF RIGHT-OF-WAY (STA.22+000 - 29+750)
B-2 (4/5)	DESIGN ELEMENTS OF INTERCHANGE SH-33	D-8	SCHEDULE OF RIGHT-OF-WAY (STA.29+750 - E.P.)
B-2 (5/5)	DESIGN ELEMENTS OF ENDING INTERSECTION (NH-24,LUCKNOW SIDE)		
B-3 (1/18-18/18)	PLAN AND PROFILE		
B-4 (1/4)	GENERAL LAYOUT OF BEGINNING INTERSECTION (NH-24,DELHI SIDE)		
B-4 (2/4)	GENERAL LAYOUT OF INTERCHANGE SH-37		
B-4 (3/4)	GENERAL LAYOUT OF INTERCHANGE SH-33		
B-4 (4/4)	GENERAL LAYOUT OF ENDING INTERSECTION (NH-24,LUCKNOW SIDE)		
C.	STRUCTURAL DESIGN FOR BAREILLY BYPASS		
C-1	OVER BRIDGES FOR INTERCHANGE	(STA. 8+700, 13+300)	
C-2	ROAD AND RAILWAY OVER BRIDGE	(STA. 9+090)	
C-3	ROAD OVER BRIDGE FOR STATE HIGHWAY	(STA.13+610)	
C-4	ROAD OVER BRIDGE FOR MAJOR DISTRICT ROAD	(STA.22+900)	
C-5	BRIDGE OVER DEONARAIN RIVER	(STA. 7+900)	
C-6	BRIDGE OVER NAKATIA RIVER	(STA.14+270)	
C-7	BRIDGE OVER MAJOR CANAL		
C-8	TYPICAL CULVERT-BOX FOR ROADS		
C-9	TYPICAL CULVERT-BOX FOR WATER CHANNELS		

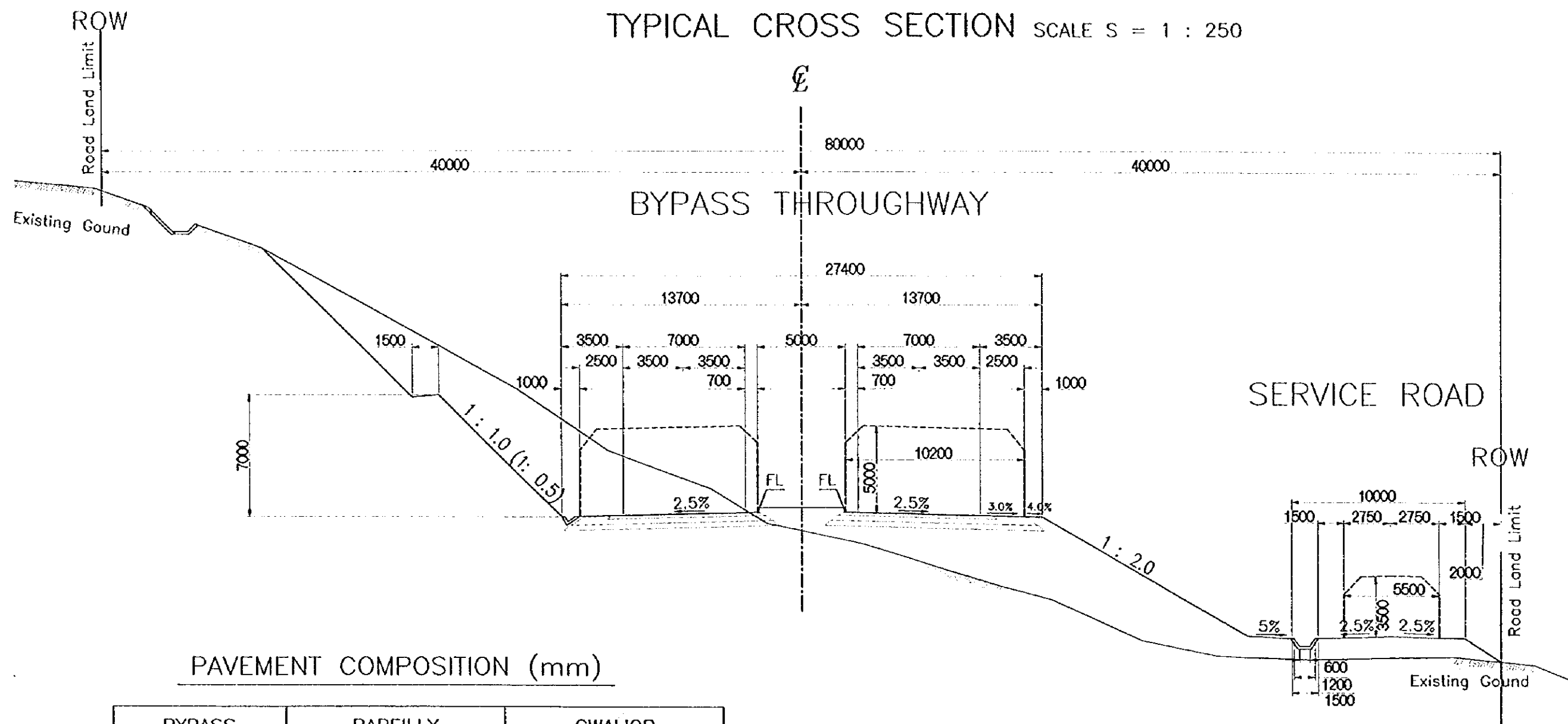
LOCATION MAP OF BAREILLY BYPASS



LEGEND

- PROPOSED BY JICA STUDY TEAM
- PROPOSED BY STATE PWD
- NH24/SH33/SH37 NATIONAL/STATE HIGHWAY
- OTHER ROAD
- +++++ RAILWAY
- ~~~~~ RIVER

TYPICAL CROSS SECTION SCALE S = 1 : 250

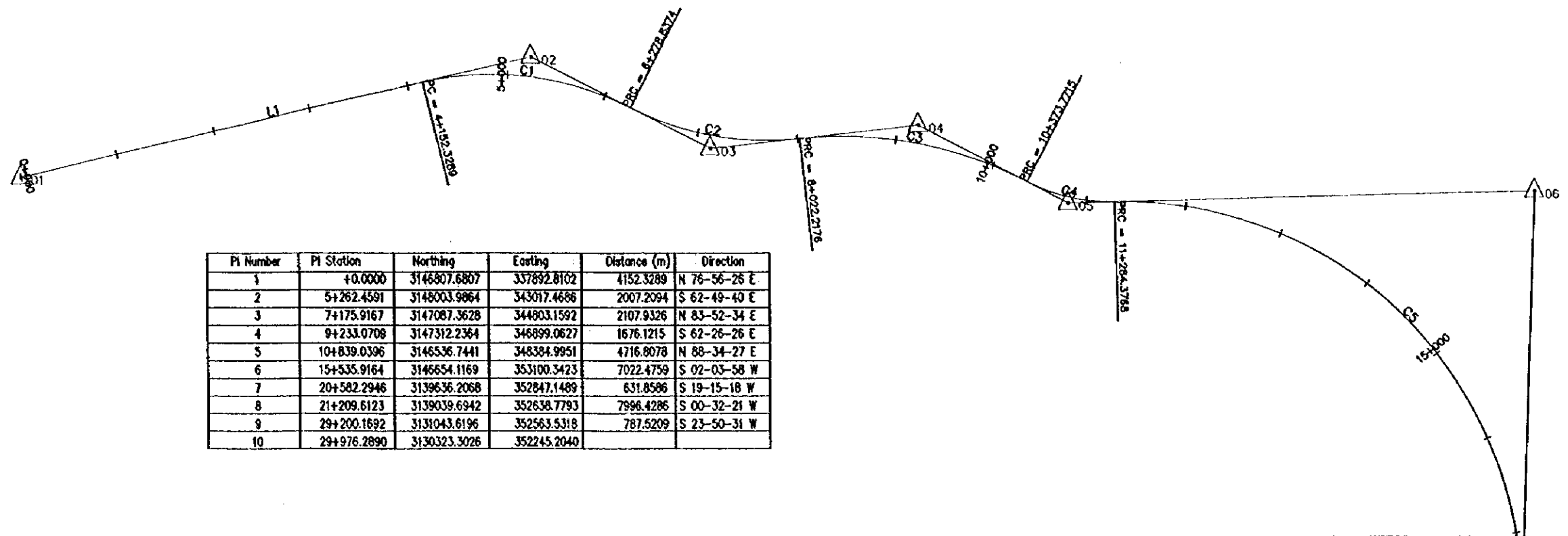


PAVEMENT COMPOSITION (mm)

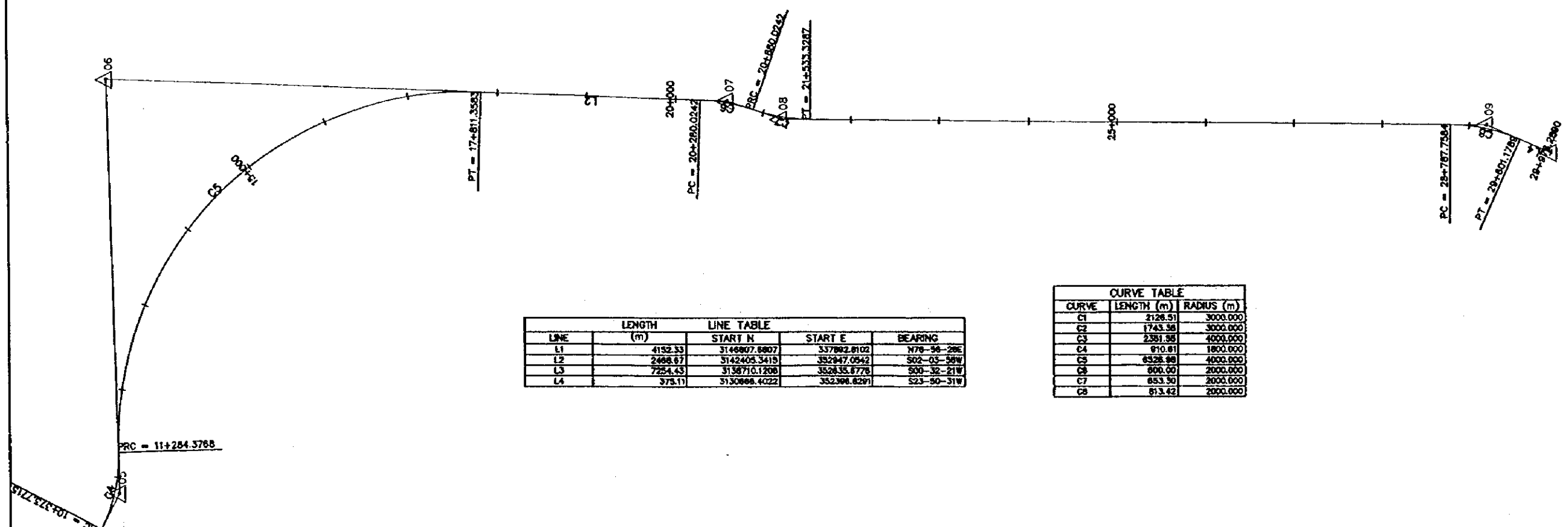
BYPASS	BAREILLY	GWALIOR
AC	40	40
DBM	160	160
WMM	300	300
GSB	300	300
TOTAL	800	800

NOTE:

1) Cut slope is 1:0.5 in rock section in Gwalior Bypass

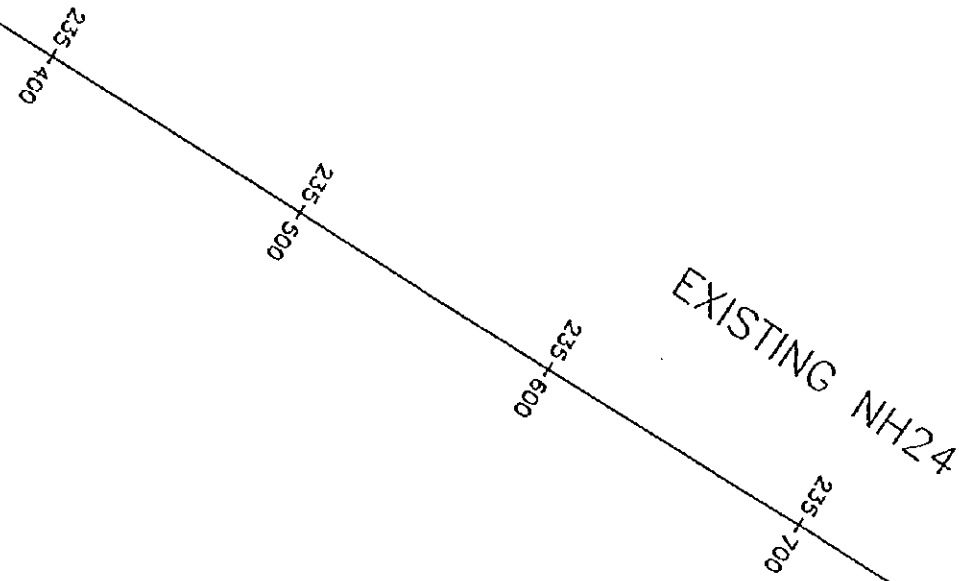


PI Number	PI Station	Northing	Easting	Distance (m)	Direction
1	+0.0000	3146807.6807	337892.8102	4152.3289	N 76-56-26 E
2	5+262.4591	3148003.9864	343017.4686	2007.2094	S 62-49-40 E
3	7+175.9167	3147087.3628	344803.1592	2107.9326	N 83-52-34 E
4	9+233.0708	3147312.2364	346899.0627	1676.1215	S 62-26-26 E
5	10+839.0396	3146536.7441	348384.9951	4716.8078	N 88-34-27 E
6	15+535.9164	3146654.1169	353100.3423	7022.4759	S 02-03-58 W
7	20+582.2946	3139636.2068	352847.1489	631.8596	S 19-15-18 W
8	21+209.6123	3139039.6942	352638.7793	7996.4286	S 00-32-21 W
9	29+200.1692	3131043.6196	352563.5318	787.5209	S 23-50-31 W
10	29+976.2890	3130323.3026	352245.2040		



LINE	LENGTH (m)	START N	START E	BEARING
L1	4152.33	3146807.6807	337892.8102	N76-56-26E
L2	2488.67	3142405.3415	352947.0942	S02-03-58W
L3	7254.43	3138710.1208	352435.8778	S00-32-21W
L4	373.11	3130888.4022	352398.8291	S23-50-31W

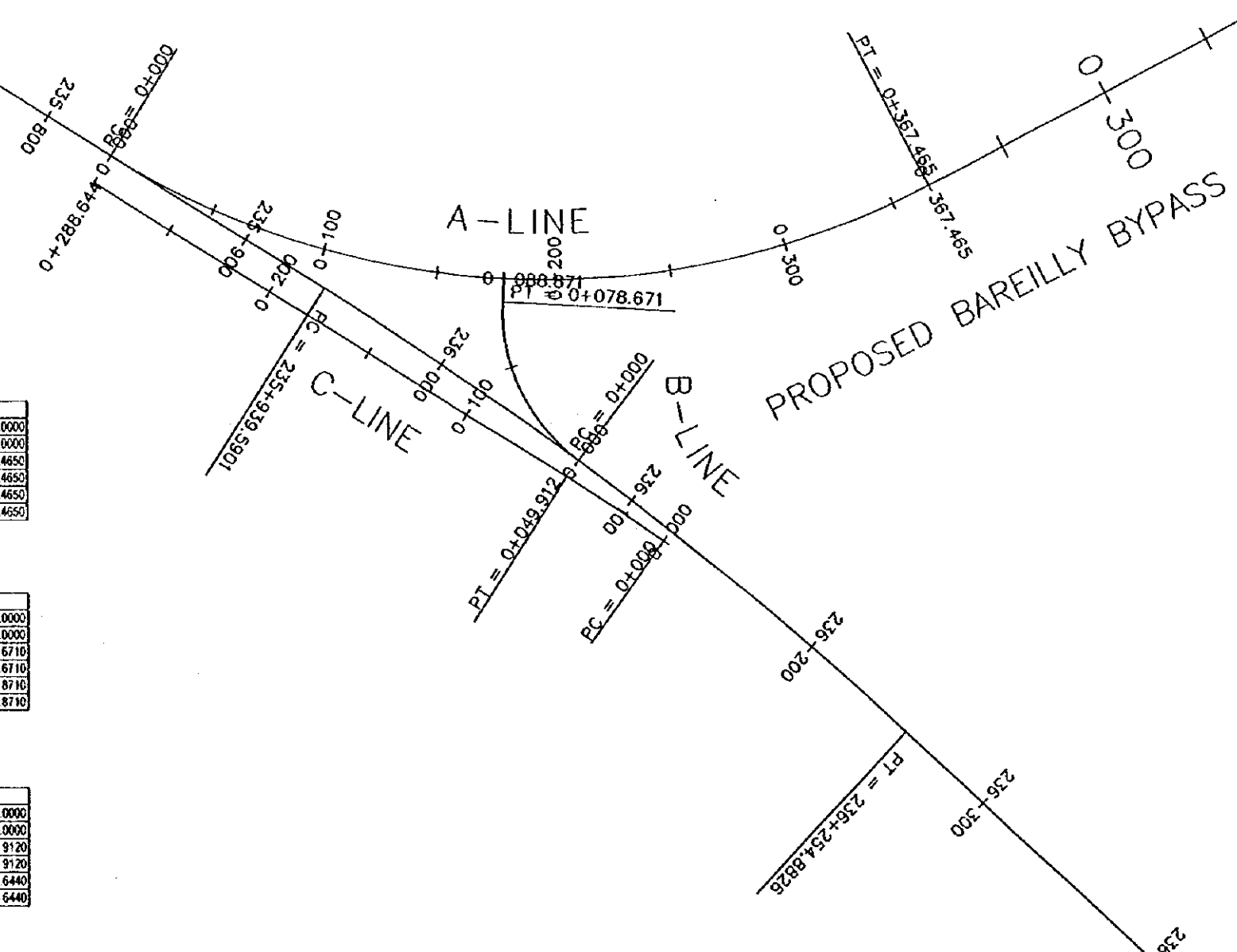
CURVE	LENGTH (m)	RADIUS (m)
C1	2128.91	3000.000
C2	1743.96	3000.000
C3	2381.96	4000.000
C4	910.81	1800.000
C5	6328.98	4000.000
C6	800.00	2000.000
C7	853.90	2000.000
C8	813.42	2000.000



ALIGNMENT OF NH24 AT BEGINNING INTERSECTION

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length (m)	Acc. Distance
BP	235+000		235+000	3147568.132	337199.2728		S42-54-16E		+0000
IP-1	238+097.890			3146764.086	337948.561		S32-16-41E		+0000
		BP	235+000	3147568.132	337199.2728	Tangent	S42-54-16E	939.5900	+939.5900
		PC-1	235+939.590	3146879.892	337199.2728	R=1700.000	RIGHT	315.2920	1+254.8820
EP	237+000			3145000.446	338428.9048				236+254.8820
		PT-1	236+254.883	3145530.418	338070.9908	Tangent	S32-16-41E	745.1180	2-000.0000
		EP	237+000	3146000.446	338428.9048				237+000.0000

Note: 1. General layout of intersection is shown in Sheet No. B-4(1/4)
 2. Alignment of the existing NH24 was assumed based on the topo-survey.



ALIGNMENT OF A-LINE

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length (m)	Acc. Distance
BP	0+000			3146958.684	337765.7007		S42-54-16E		+0000
IP-1	0+202.704			3146958.684	337765.7007		N75-56-26E		+0000
		PC-1	0+000	3146958.684	337765.7007	R=350.000	LEFT	367.4650	+367.4650
EP	0+367.465			3146856.009	338101.1579				+367.4650
		PT-1	0+367.465	3146856.009	338101.1579	Tangent	N75-56-26E	0.0000	+367.4650
		EP	0+367.465	3146856.009	338101.1579				+367.4650

ALIGNMENT OF B-LINE

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length (m)	Acc. Distance
BP	0+000			3146779.8418	337924.9285		N38-27-25W		+0000
IP-1	0+042.845			3146813.3927	337898.2821		N17-53-12E		+0000
		PC-1	0+000	3146779.8418	337924.9285	R=90.000	RIGHT	78.6710	+78.6710
EP	0+088.871			3146863.8738	337914.5742				+78.6710
		PT-1	0+078.671	3146854.1668	337911.4414	Tangent	N17-53-12E	10.2000	+88.8710
		EP	0+088.871	3146863.8738	337914.5742				+88.8710

ALIGNMENT OF C-LINE

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length (m)	Acc. Distance
BP	0+000			3146737.0938	337951.2389		N40-02-10W		+0000
IP-1	0+024.961			3146756.2053	337935.1820		N42-54-16W		+0000
		PC-1	0+000	3146737.0938	337951.2389	R=996.970	LEFT	49.9120	+49.9120
EP	0+028.644			3146809.3578	337755.6656				+49.9120
		PT-1	0+049.912	3146774.4892	337918.1889	Tangent	N42-54-16W	238.7320	+288.6440
		EP	0+028.644	3146809.3578	337755.6656				+288.6440

Note: 1. General layout of intersection is shown in Sheet No. B-4(2/4)

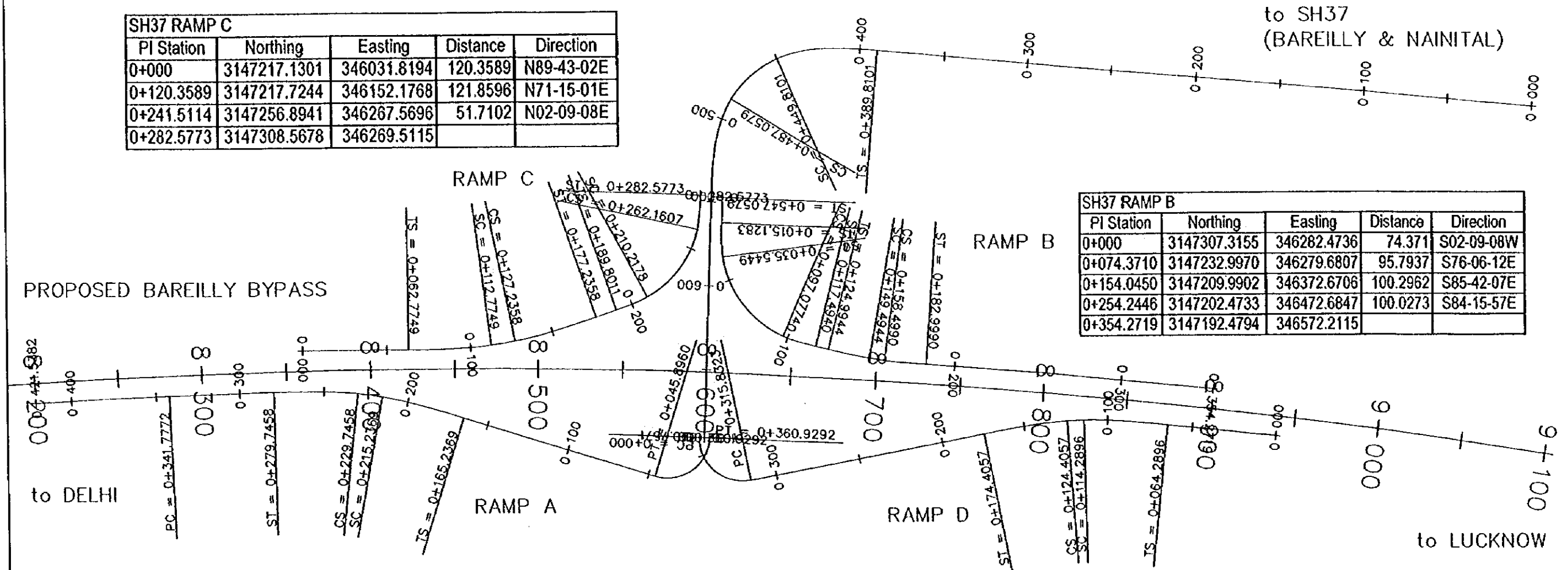
SH37 APPROACH RAMP				
PI Station	Northing	Easting	Distance	Direction
0+000	3147360.4917	346762.9473	389.8101	N84-58-59W
0+389.8101	3147394.5808	346374.6306	95.4342	N84-58-59W
0+485.2443	3147402.9265	346279.5621	239.1334	S02-09-08W
0+690.7571	3147163.9618	346270.5818		

SH37 RAMP C				
PI Station	Northing	Easting	Distance	Direction
0+000	3147217.1301	346031.8194	120.3589	N89-43-02E
0+120.3589	3147217.7244	346152.1768	121.8596	N71-15-01E
0+241.5114	3147256.8941	346267.5696	51.7102	N02-09-08E
0+282.5773	3147308.5678	346269.5115		

SH37 RAMP B				
PI Station	Northing	Easting	Distance	Direction
0+000	3147307.3155	346282.4736	74.371	S02-09-08W
0+074.3710	3147232.9970	346279.6807	95.7937	S76-06-12E
0+154.0450	3147209.9902	346372.6706	100.2962	S85-42-07E
0+254.2446	3147202.4733	346472.6847	100.0273	S84-15-57E
0+354.2719	3147192.4794	346572.2115		

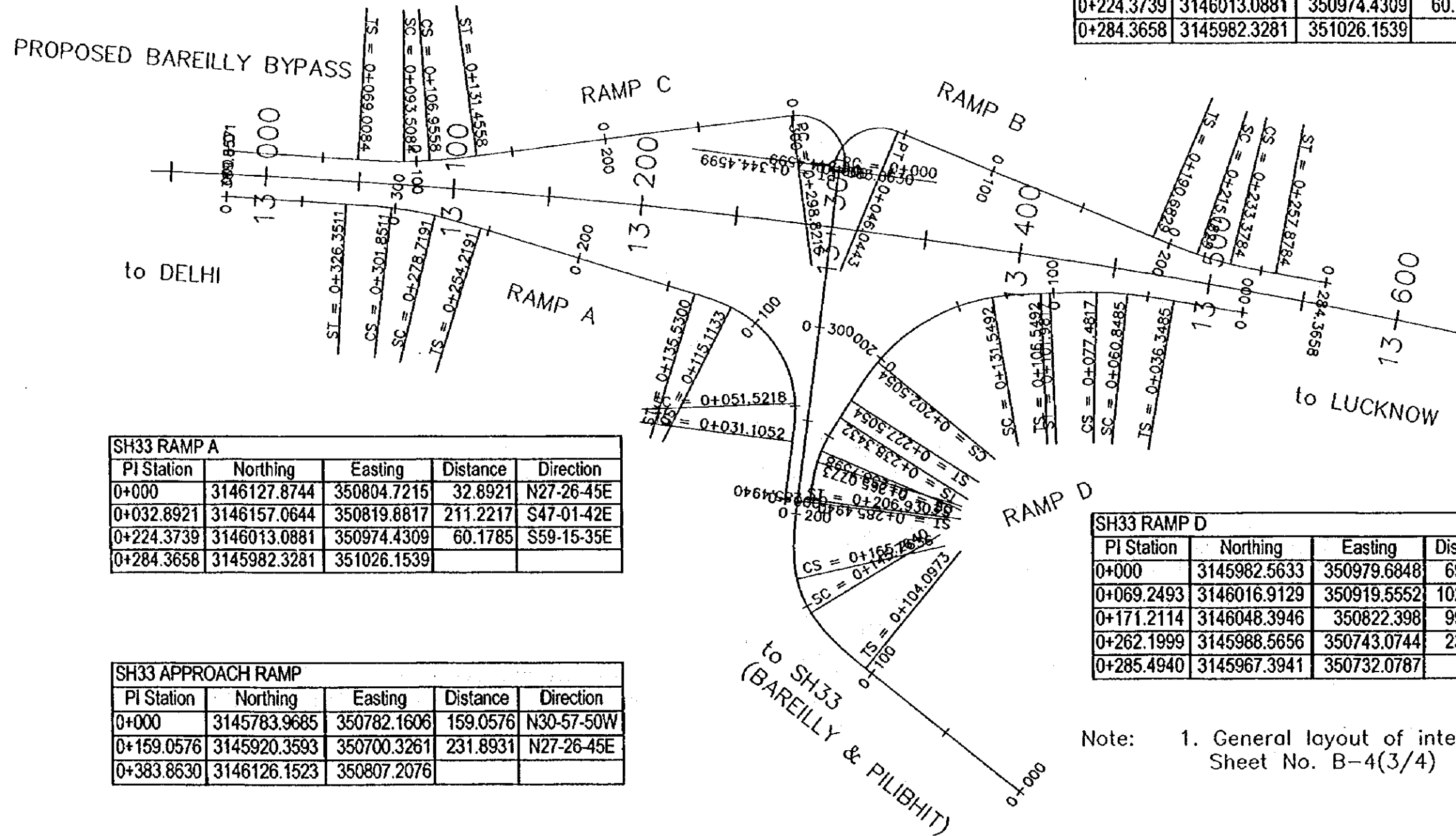
SH37 RAMP A				
PI Station	Northing	Easting	Distance	Direction
0+000	3147163.8233	346273.5787	32.6903	S02-09-08W
0+032.6903	3147131.1560	346272.3511	209.6399	N72-39-43W
0+222.8456	3147193.6306	346072.2366	57.6087	S88-51-28W
0+279.7458	3147192.4821	346014.6394	62.0315	S88-01-44W
0+341.7772	3147190.3485	345952.6446	39.8818	S87-34-07W
0+381.6590	3147188.6565	345912.7987	39.8818	S86-25-21W
0+421.5382	3147186.1680	345872.9946		

SH37 RAMP D				
PI Station	Northing	Easting	Distance	Direction
0+000	3147164.3202	346609.4359	119.6419	N83-58-49W
0+119.6419	3147176.8670	346490.4537	228.4085	S78-47-51W
0+347.4620	3147132.4929	346266.3971	31.6297	N02-09-08E
0+360.9292	3147164.1003	346267.5849		



SH33 RAMP C				
PI Station	Northing	Easting	Distance	Direction
0+000	3146246.5738	350508.4514	100.2996	S66-16-43E
0+100.2996	3146206.2241	350600.2768	231.0005	S77-08-59E
0+331.1651	3146154.8483	350825.4917	32.3435	S27-26-45W
0+344.4599	3146126.1451	350810.5843		

SH33 RAMP B				
PI Station	Northing	Easting	Distance	Direction
0+000	3146127.8744	350804.7215	32.8921	N27-26-45E
0+032.8921	3146157.0644	350819.8817	211.2217	S47-01-42E
0+224.3739	3146013.0881	350974.4309	60.1785	S59-15-35E
0+284.3658	3145982.3281	351026.1539		

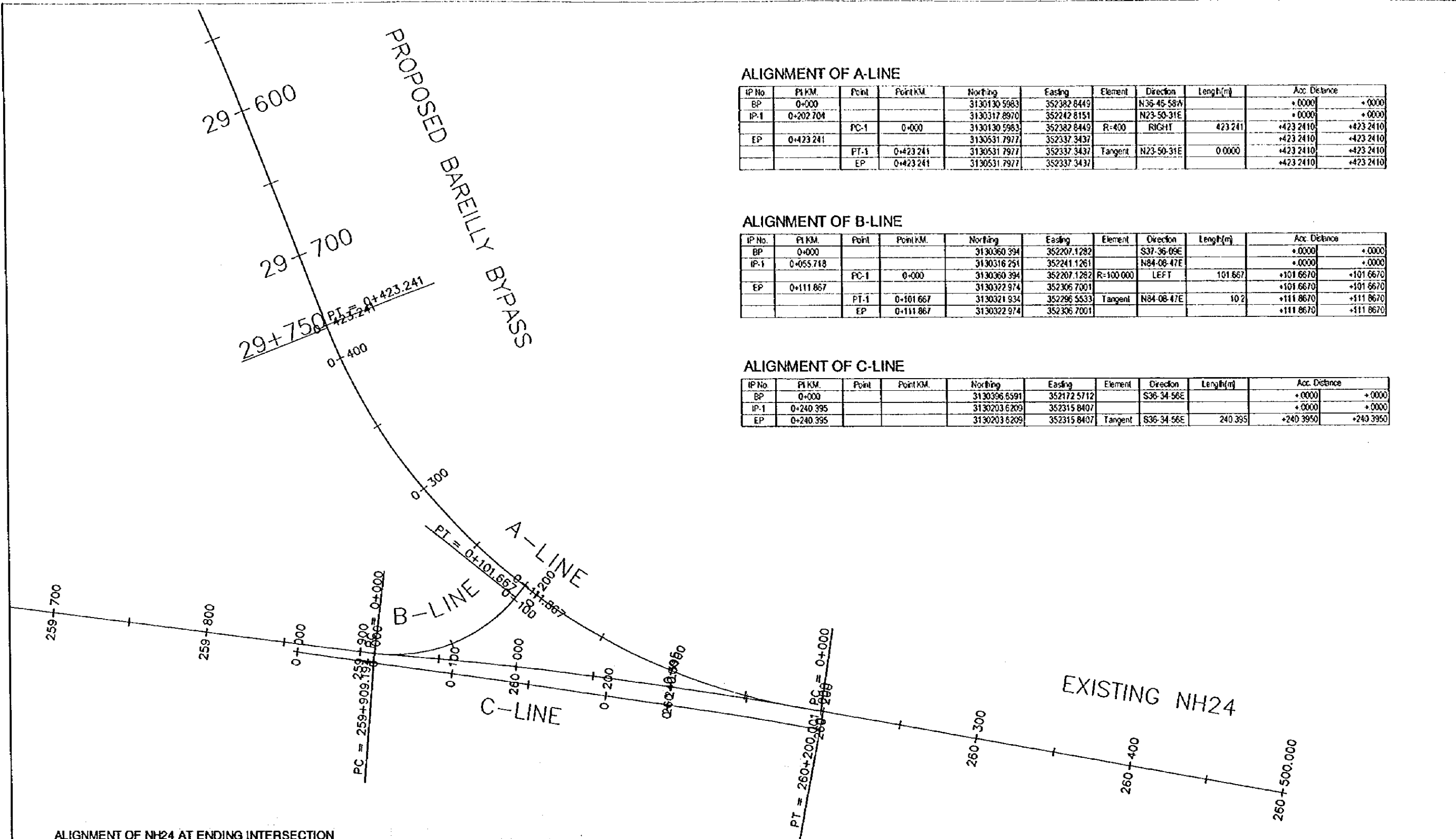


SH33 RAMP A				
PI Station	Northing	Easting	Distance	Direction
0+000	3146127.8744	350804.7215	32.8921	N27-26-45E
0+032.8921	3146157.0644	350819.8817	211.2217	S47-01-42E
0+224.3739	3146013.0881	350974.4309	60.1785	S59-15-35E
0+284.3658	3145982.3281	351026.1539		

SH33 RAMP D				
PI Station	Northing	Easting	Distance	Direction
0+000	3145982.5633	350979.6848	69.2493	N60-15-45W
0+069.2493	3146016.9129	350919.5552	102.1305	N72-02-46W
0+171.2114	3146048.3946	350822.398	99.3566	S52-58-30W
0+262.1999	3145988.5656	350743.0744	23.8567	S27-26-45W
0+285.4940	3145967.3941	350732.0787		

SH33 APPROACH RAMP				
PI Station	Northing	Easting	Distance	Direction
0+000	3145783.9685	350782.1606	159.0576	N30-57-50W
0+159.0576	3145920.3593	350700.3261	231.8931	N27-26-45E
0+383.8630	3146126.1523	350807.2076		

Note: 1. General layout of intersection is shown in Sheet No. B-4(3/4)



ALIGNMENT OF A-LINE

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length(m)	Acc. Distance
BP	0+000			3130130.5983	352382.8449		N36-45-58W		+0000
IP-1	0+202.704			3130317.8970	352242.8151		N23-50-31E		+0000
		PC-1	0+000	3130130.5983	352382.8449	R=400	RIGHT	423.241	+423.2410
EP	0+423.241			3130531.7977	352337.3437				+423.2410
		PT-1	0+423.241	3130531.7977	352337.3437	Tangent	N23-50-31E	0.0000	+423.2410
		EP	0+423.241	3130531.7977	352337.3437				+423.2410

ALIGNMENT OF B-LINE

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length(m)	Acc. Distance
BP	0+000			3130360.394	352207.1282		S37-36-09E		+0000
IP-1	0+055.718			3130316.251	352241.1261		N84-08-47E		+0000
		PC-1	0+000	3130360.394	352207.1282	R=100.000	LEFT	101.667	+101.6670
EP	0+111.867			3130322.974	352306.7001				+101.6670
		PT-1	0+101.667	3130321.934	352296.5533	Tangent	N84-08-47E	10.2	+111.8670
		EP	0+111.867	3130322.974	352306.7001				+111.8670

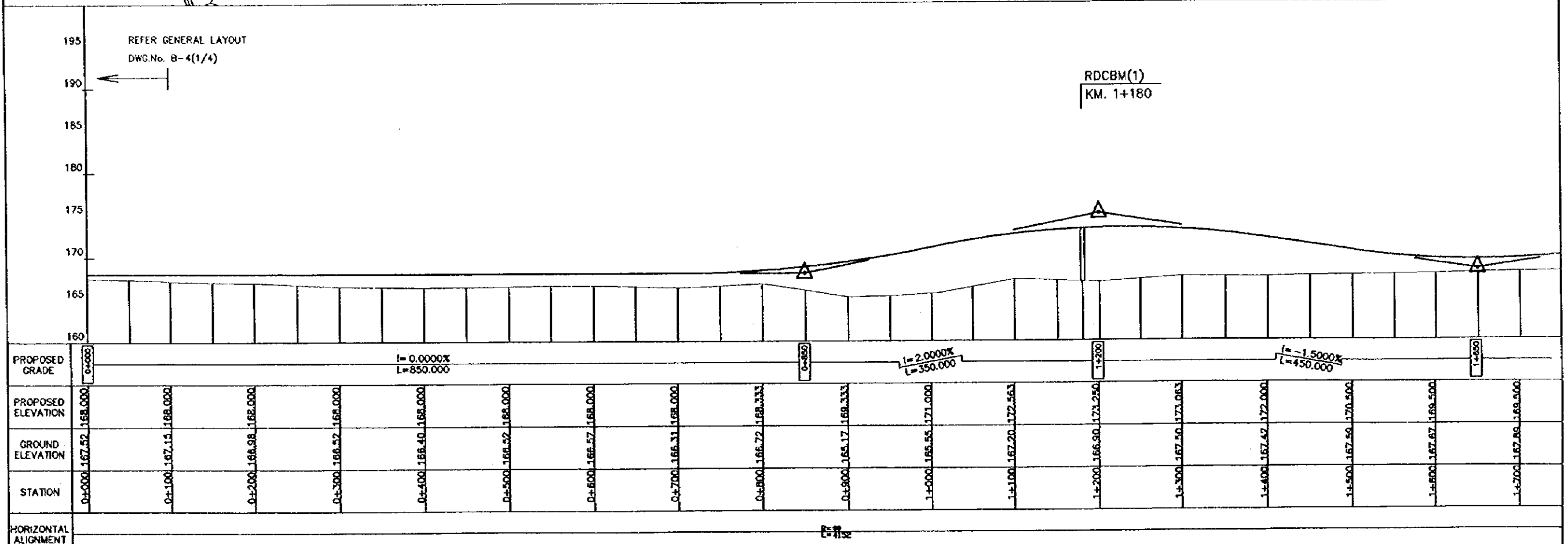
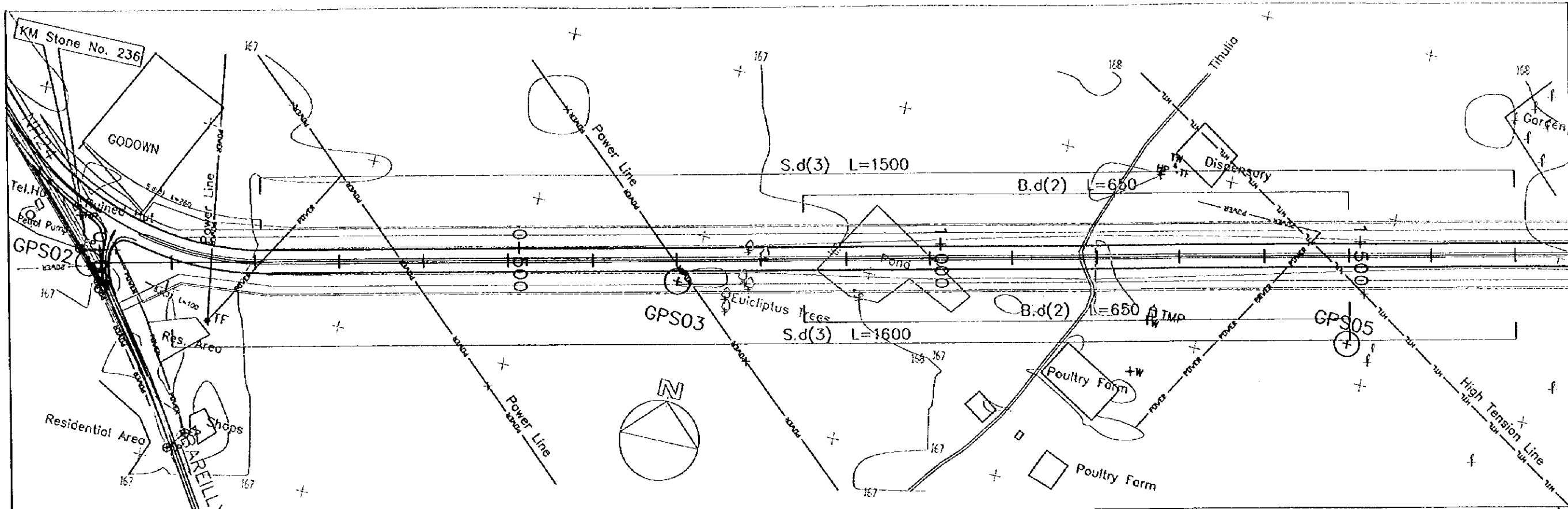
ALIGNMENT OF C-LINE

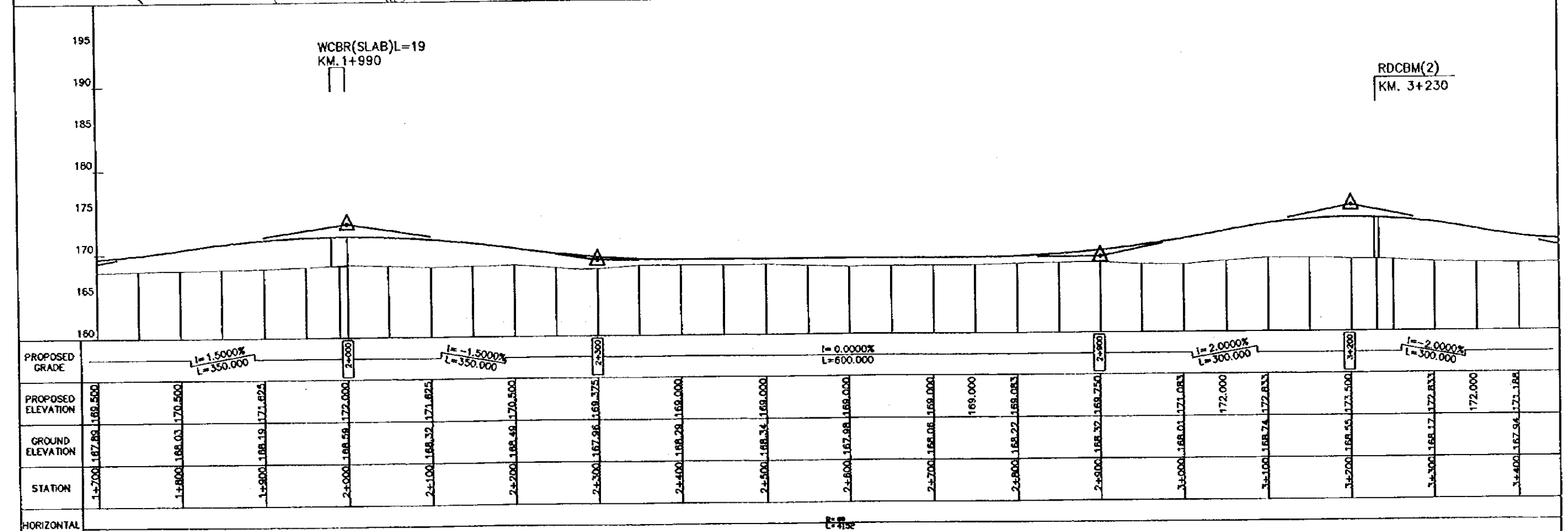
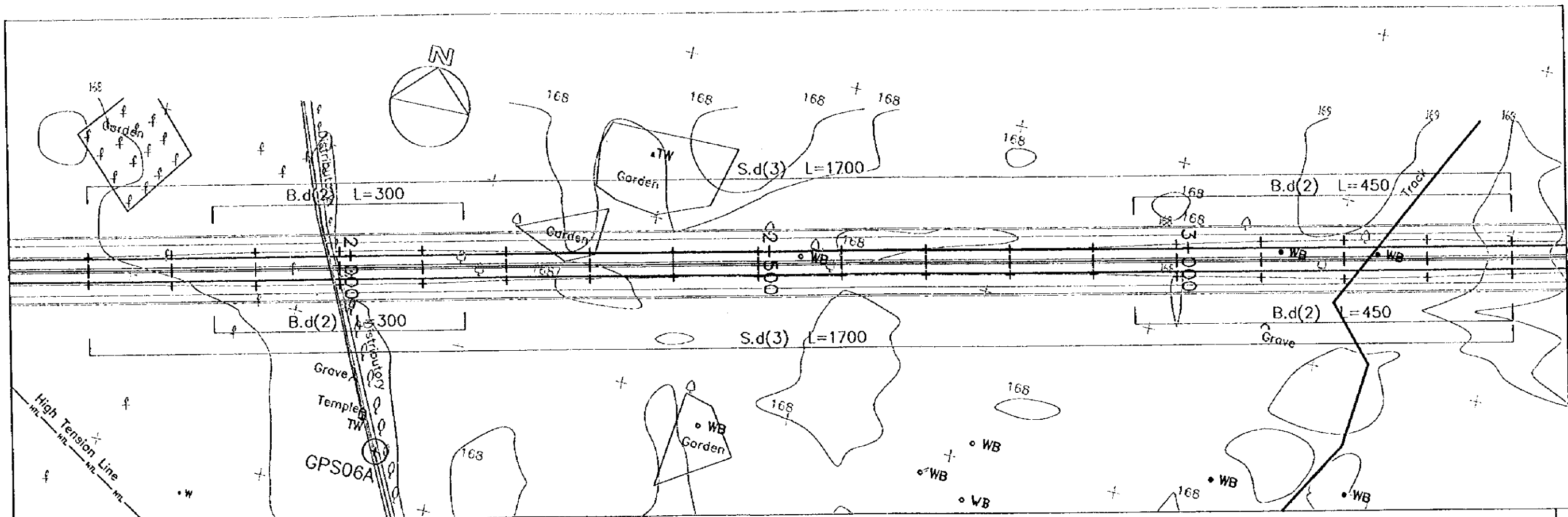
IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length(m)	Acc. Distance
BP	0+000			3130396.6591	352172.5712		S36-34-56E		+0000
IP-1	0+240.395			3130203.6209	352315.8407				+0000
EP	0+240.395			3130203.6209	352315.8407	Tangent	S36-34-56E	240.395	+240.3950

ALIGNMENT OF NH24 AT ENDING INTERSECTION

IP No	PI KM	Point	Point KM	Northing	Easting	Element	Direction	Length(m)	Acc. Distance
BP	259+000		259+000	3131080.7146	351552.3556		37-36-09		+0000
IP-1	259+909.154			3130360.3941	352207.1282		34-40-47		+0000
		BP	259+000	3131080.7146	351552.3556	Tangent	37-36-09	909.154	+909.1540
		PC-1	259+909.154	3130360.3941	352207.1282	R=3061.638	RIGHT	290.807	+1-290.8010
EP	260+500.000			3129882.7596	352954.3902				+1-290.8010
		PT-1	260+200.201	3130179.4623	352361.6942	Tangent	34-40-47	299.999	+1-600.8000
		EP	260+500.000	3129882.7596	352954.3902				+1-600.8000

Note: 1. General layout of intersection is shown in Sheet No. B-4(4/4)
 2. Alignment of the existing NH24 was assumed based on the topo-survey.



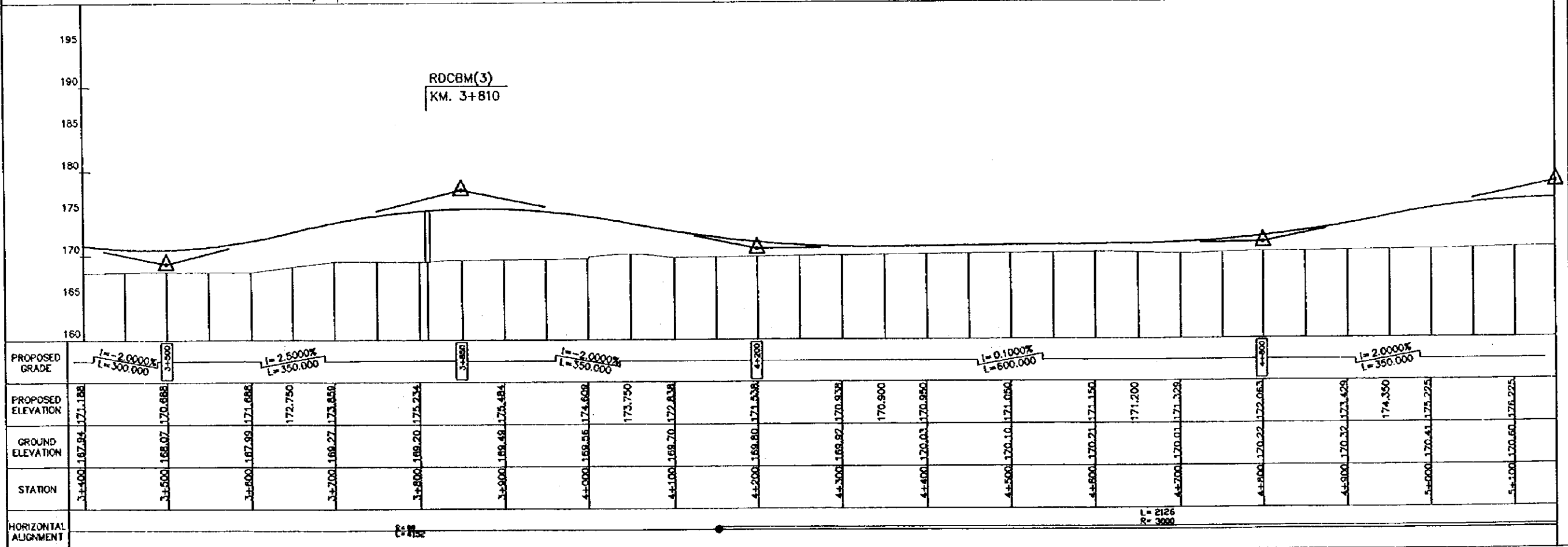
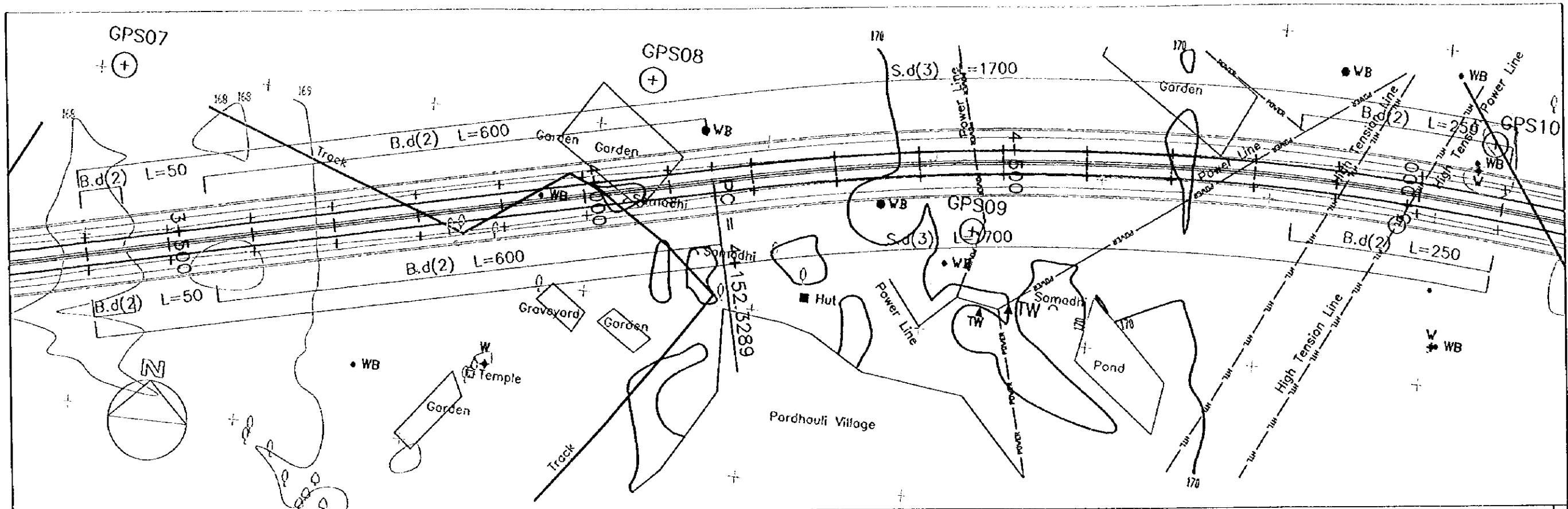


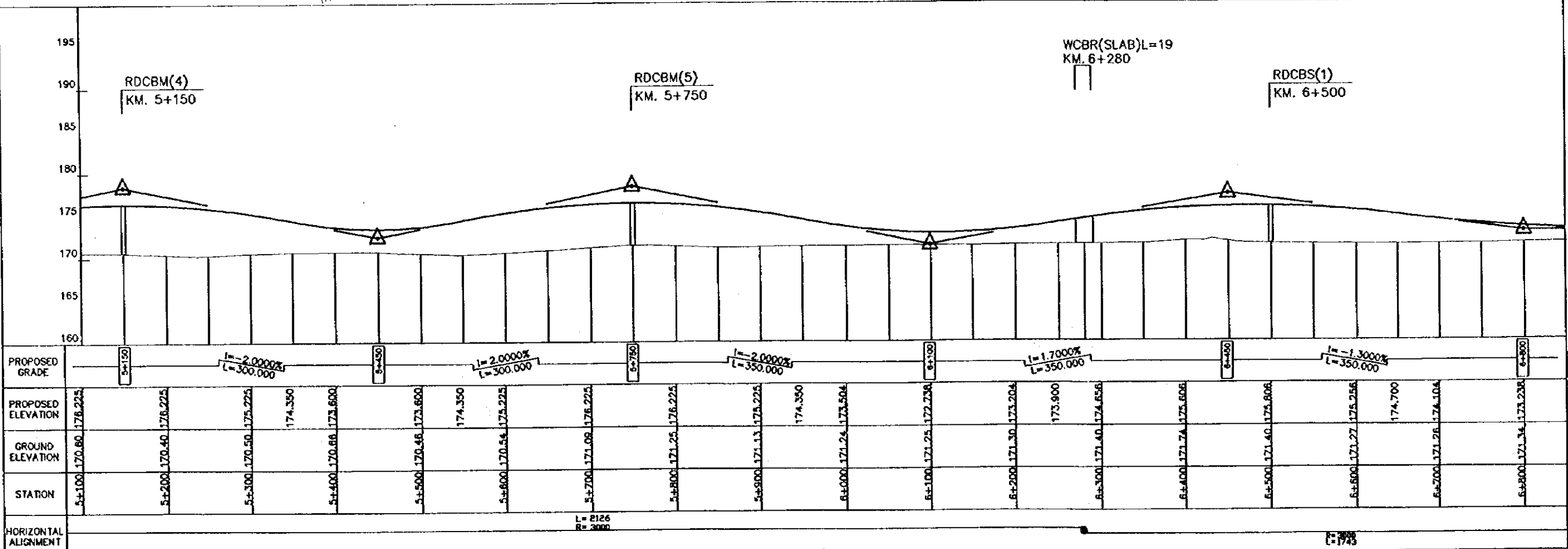
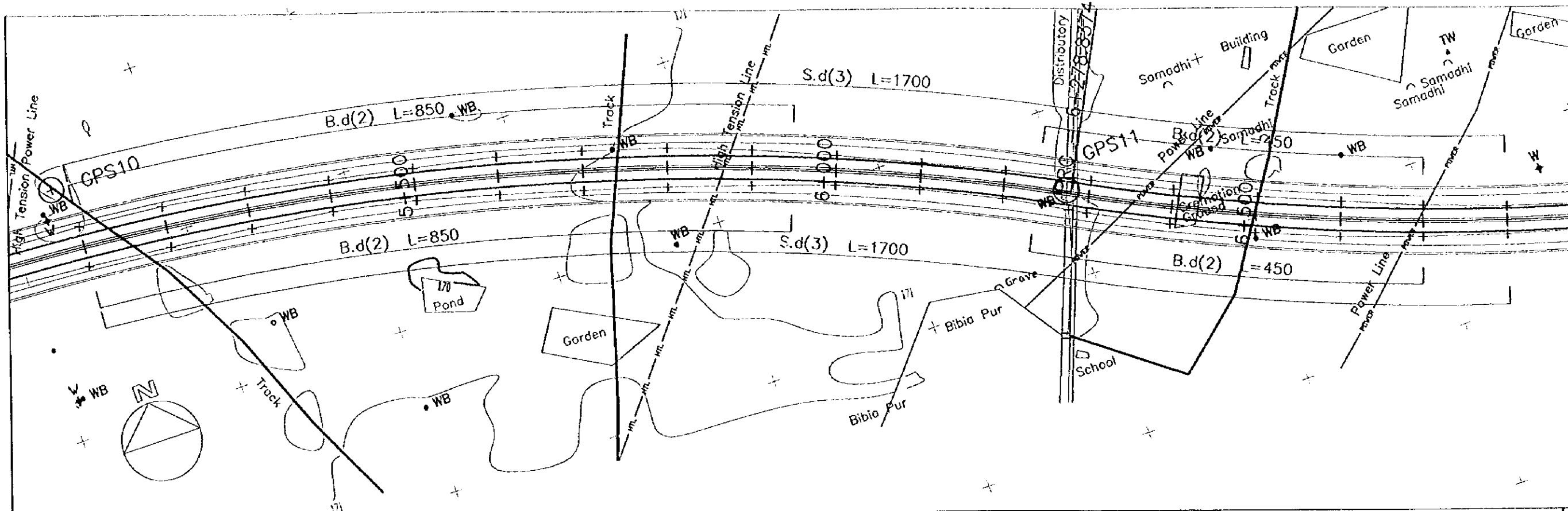
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

DWG TITLE : PLAN AND PROFILE (KM. 1+700 - 3+400)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

DWG NO. : B-3 (2/18)





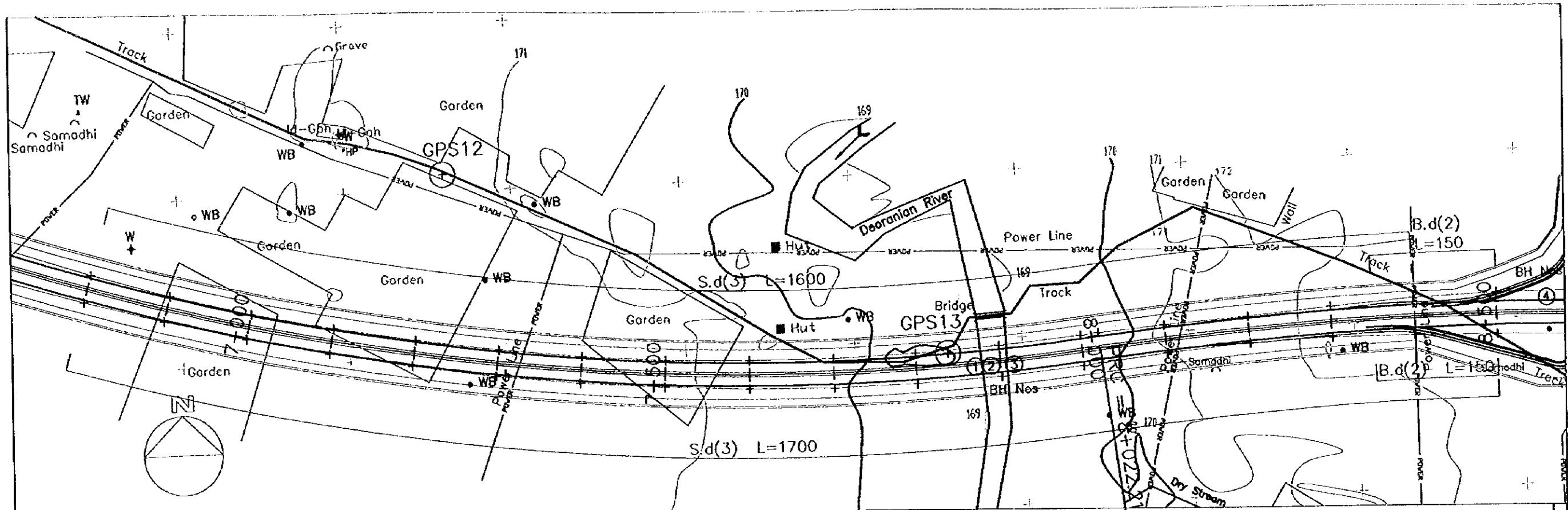
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DWG TITLE :

PLAN AND PROFILE (4/18, KM. 5+100 - 6+800)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

DWG NO. :
B-3 (4/18)



INTERCHANGE SH-37 SECTION
REFER DWG.No. B-4(2/4)

RDCBM(6)
8+450

WCBR(RC-T)L=50
KM. 7+900

195
190
185
180
175
170
165
160

PROPOSED GRADE	I = 0.0000% L = 1400.000															L = 2.1000% L = 250.000		
PROPOSED ELEVATION	6+800	6+900	7+000	7+100	7+200	7+300	7+400	7+500	7+600	7+700	7+800	7+900	8+000	8+100	8+200	8+300	8+400	8+500
GROUND ELEVATION	171.34	171.50	171.72	171.84	171.97	172.04	172.12	172.16	172.69	172.45	169.54	168.37	169.58	170.41	171.71	172.13	172.07	172.15
STATION	6+800	6+900	7+000	7+100	7+200	7+300	7+400	7+500	7+600	7+700	7+800	7+900	8+000	8+100	8+200	8+300	8+400	8+500
HORIZONTAL ALIGNMENT	R = 2352 R = 4000																	

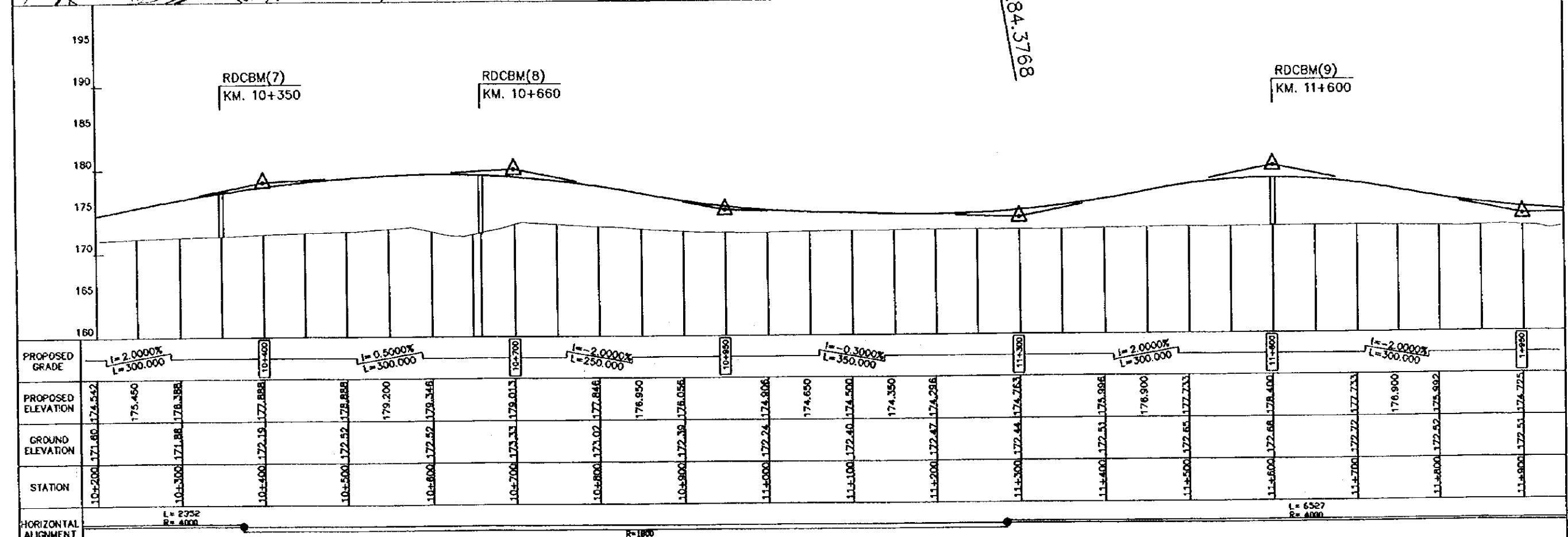
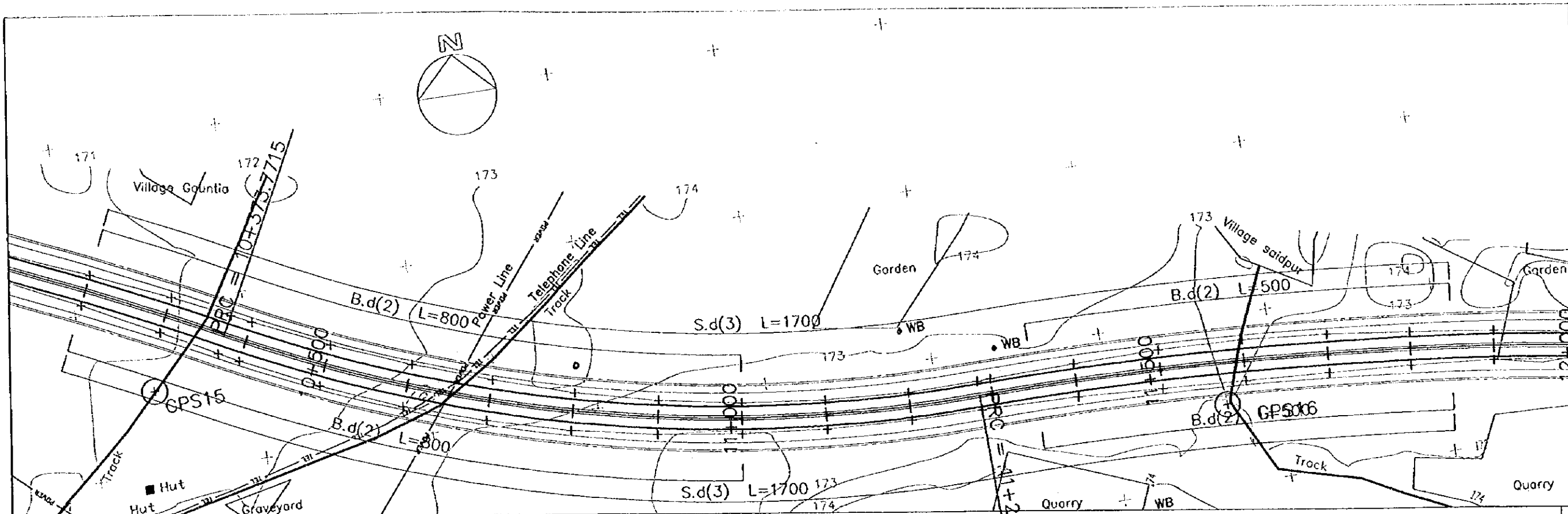
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

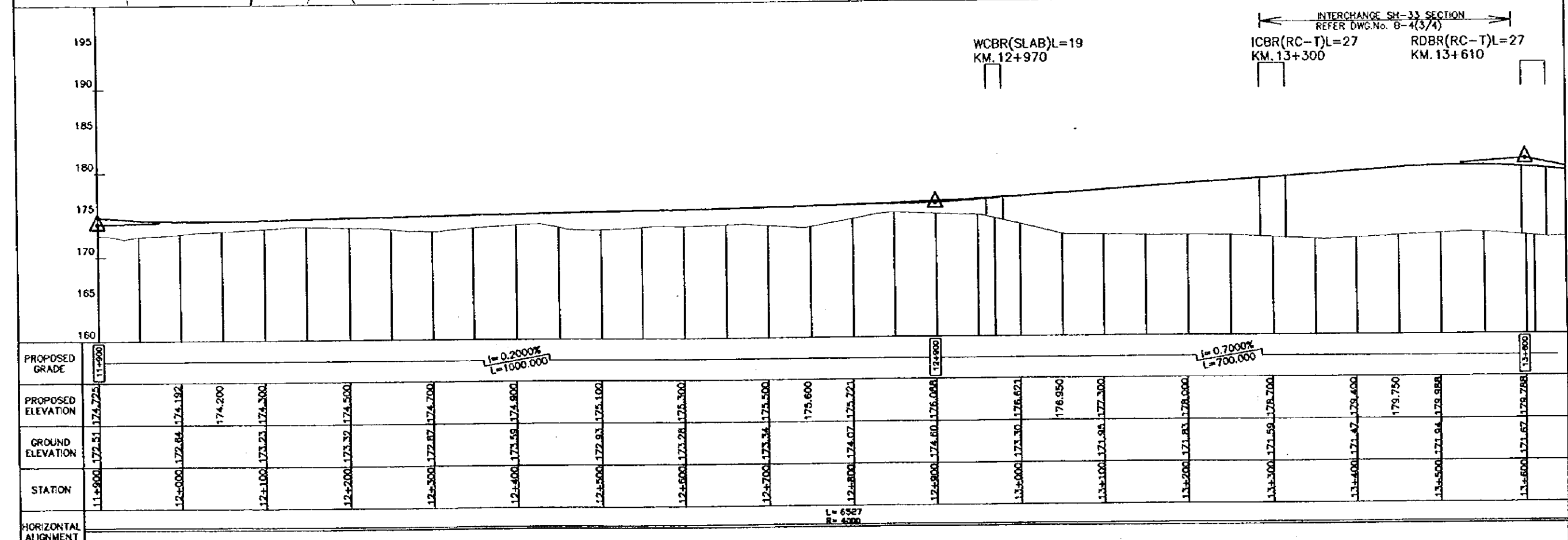
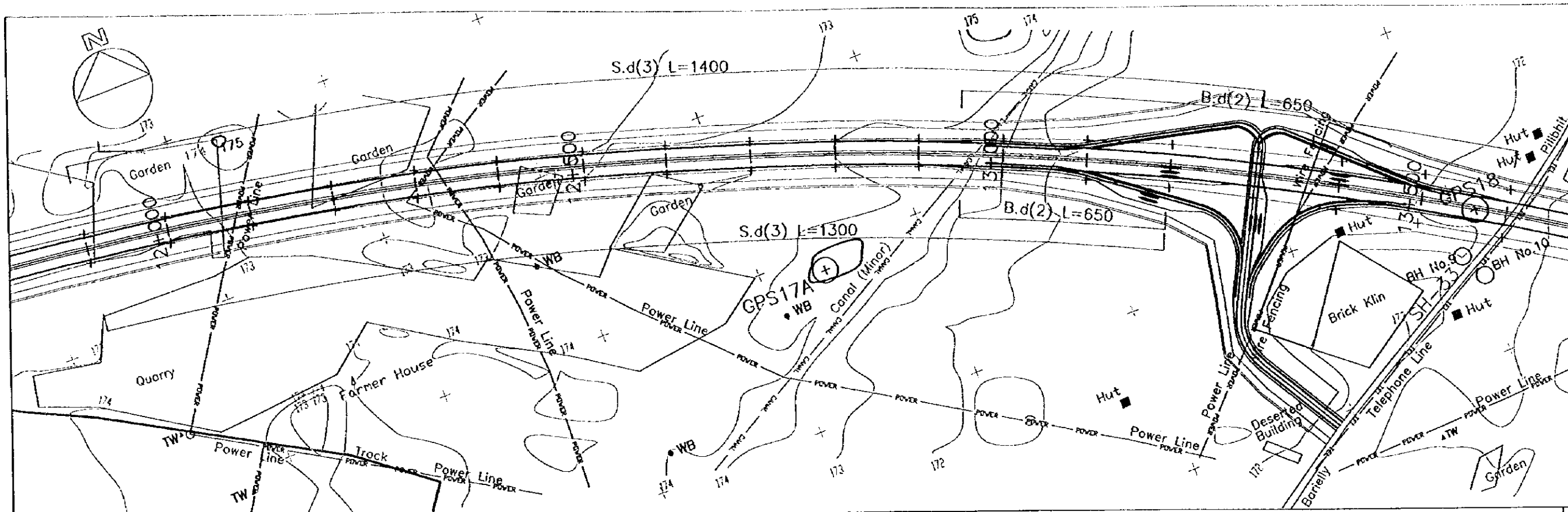
DWG TITLE :

PLAN AND PROFILE (KM. 6+800 - 8+500)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

DWG NO. :
B-3 (5/18)





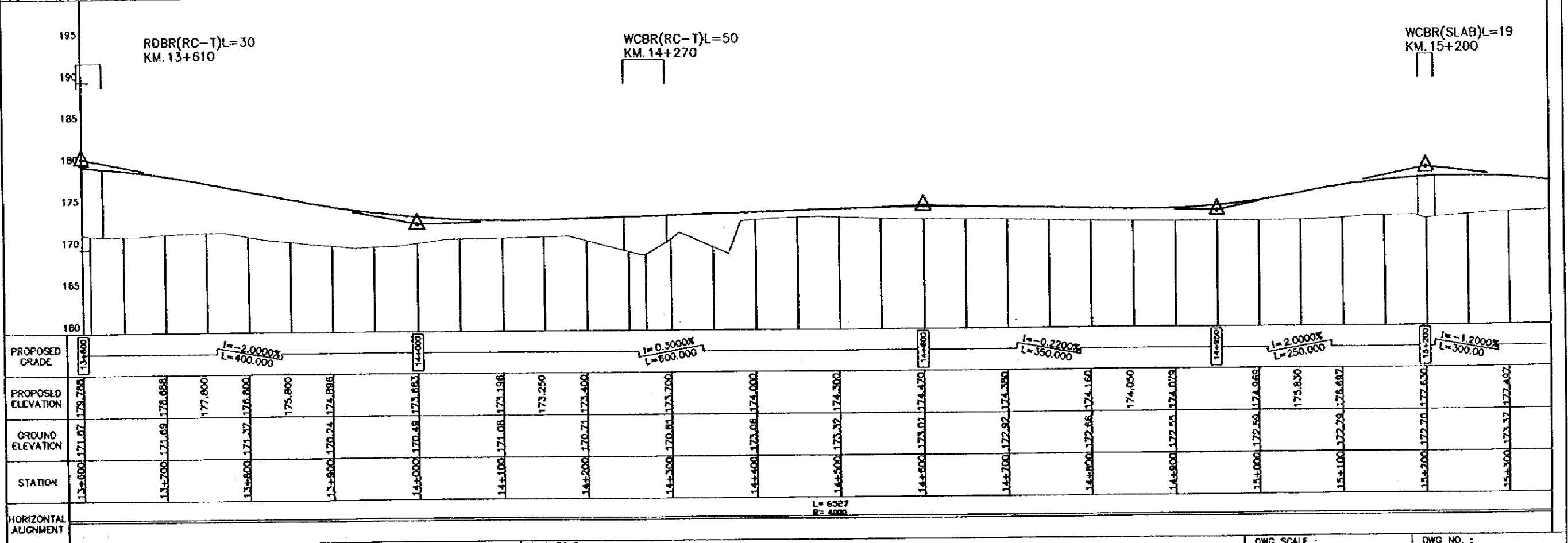
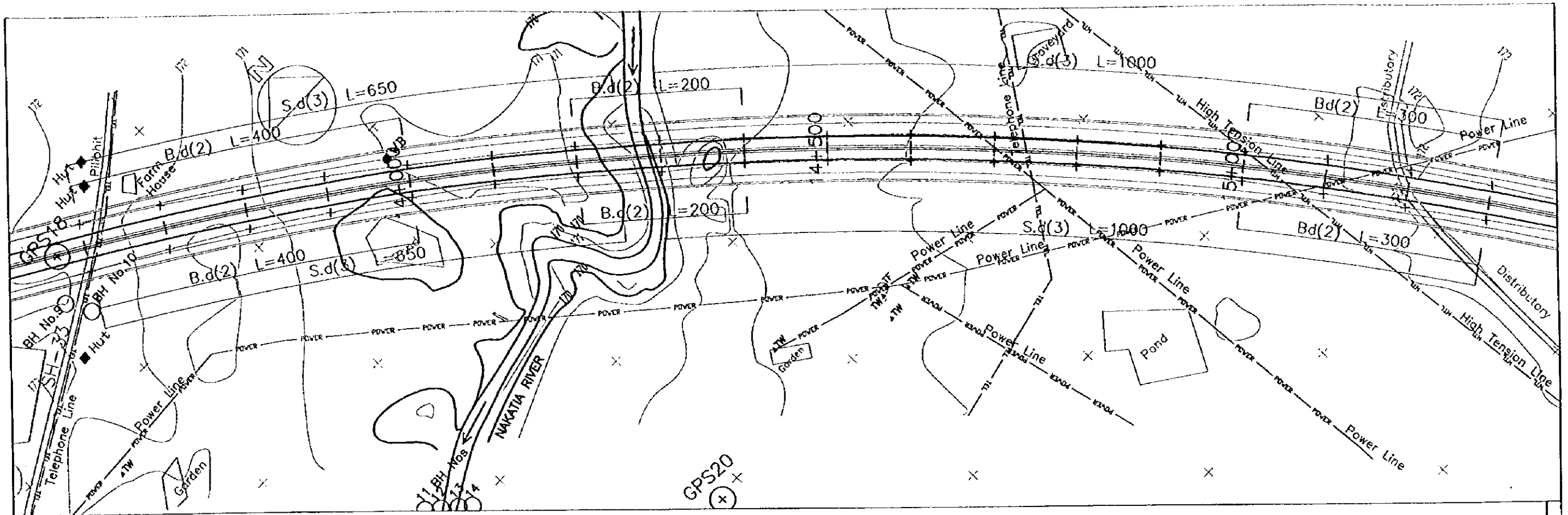
PROPOSED GRADE	11+900	12+000	12+100	12+200	12+300	12+400	12+500	12+600	12+700	12+800	12+900	13+000	13+100	13+200	13+300	13+400	13+500	13+600	
PROPOSED ELEVATION	174.725	174.192	174.200	174.300	174.500	174.700	174.900	175.100	175.300	175.500	175.600	175.621	176.950	177.300	178.000	178.700	179.400	179.750	179.958
GROUND ELEVATION	172.51	172.84	173.23	173.37	173.57	173.87	174.100	174.34	174.500	174.67	174.808	175.30	175.94	176.67	177.400	178.100	178.84	179.58	179.788
STATION	11+900	12+000	12+100	12+200	12+300	12+400	12+500	12+600	12+700	12+800	12+900	13+000	13+100	13+200	13+300	13+400	13+500	13+600	
HORIZONTAL ALIGNMENT	L = 6527 R = 458																		

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

DWG TITLE : PLAN AND PROFILE (STA 11+900 - 13+600)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

DWG NO. :
B-3 (8/18)

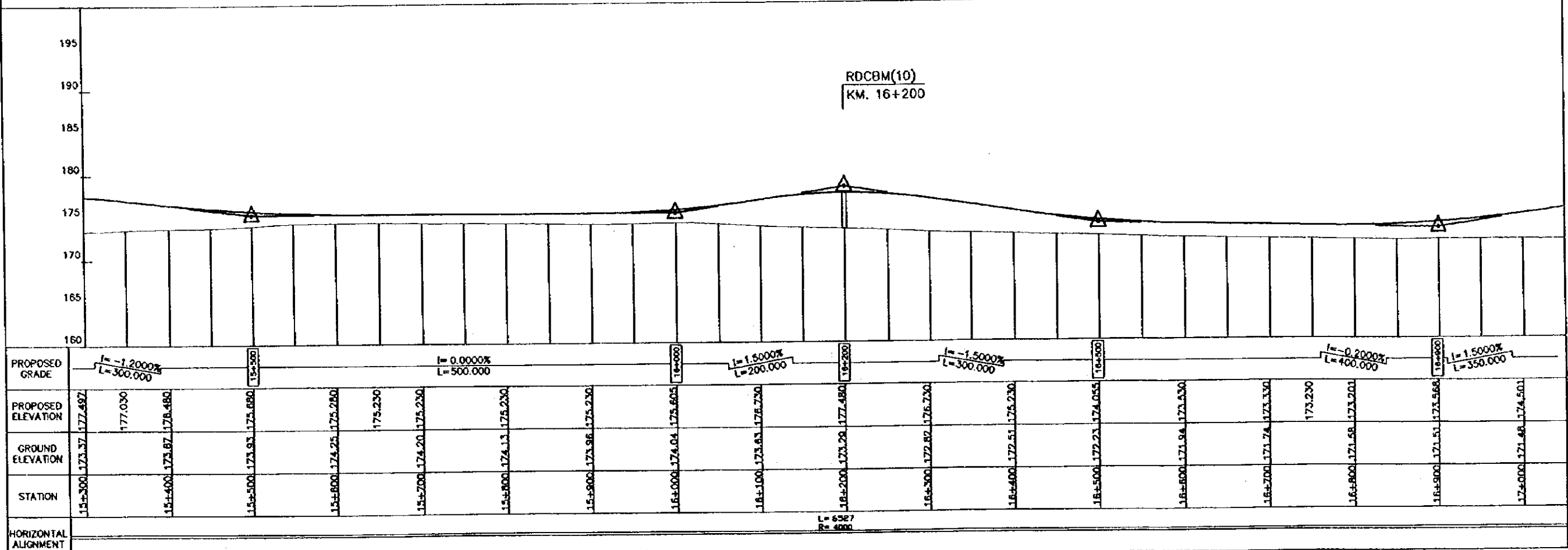
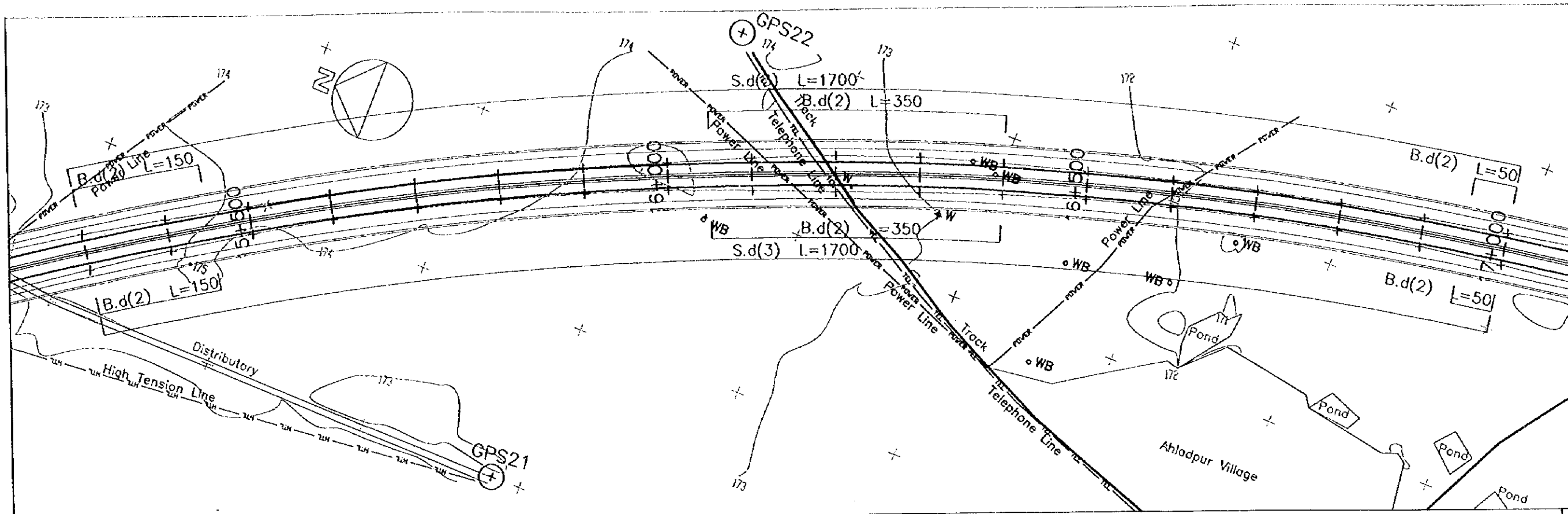


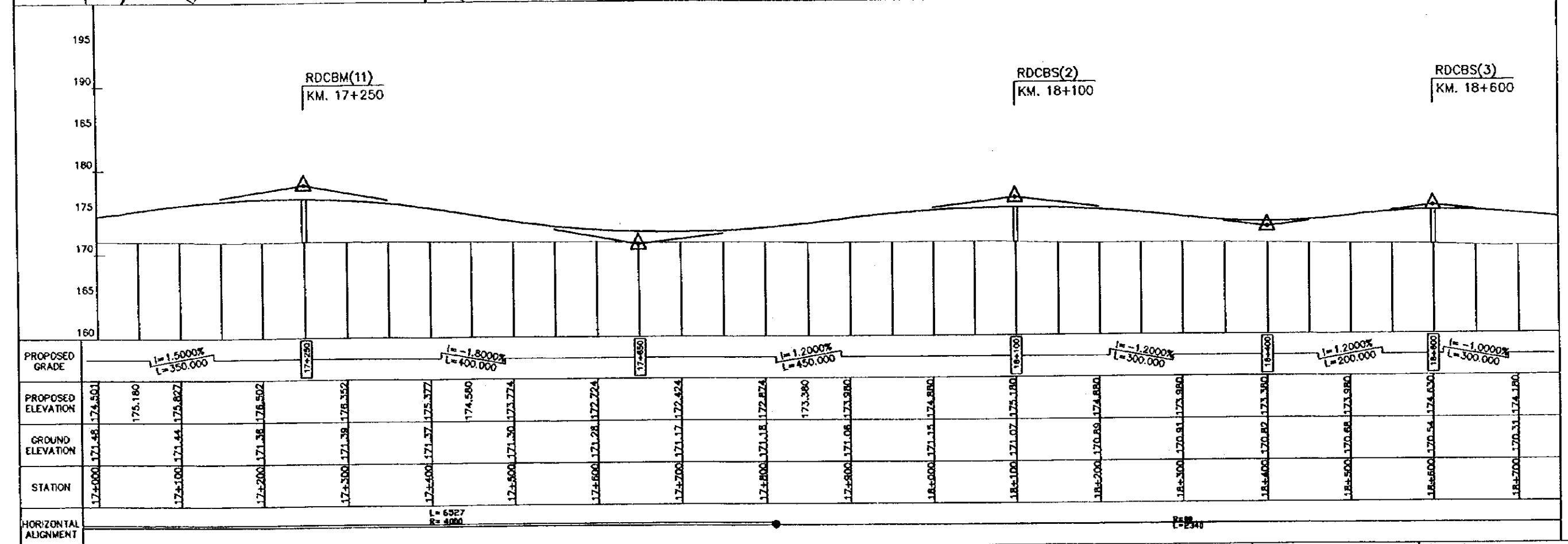
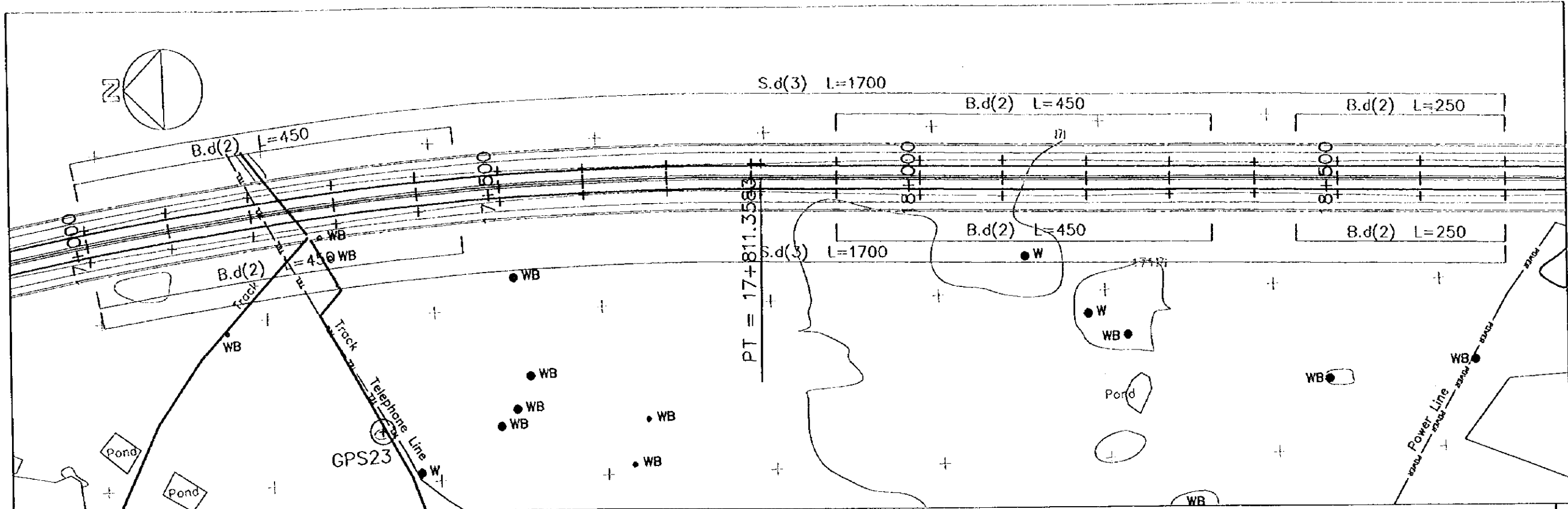
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
 THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

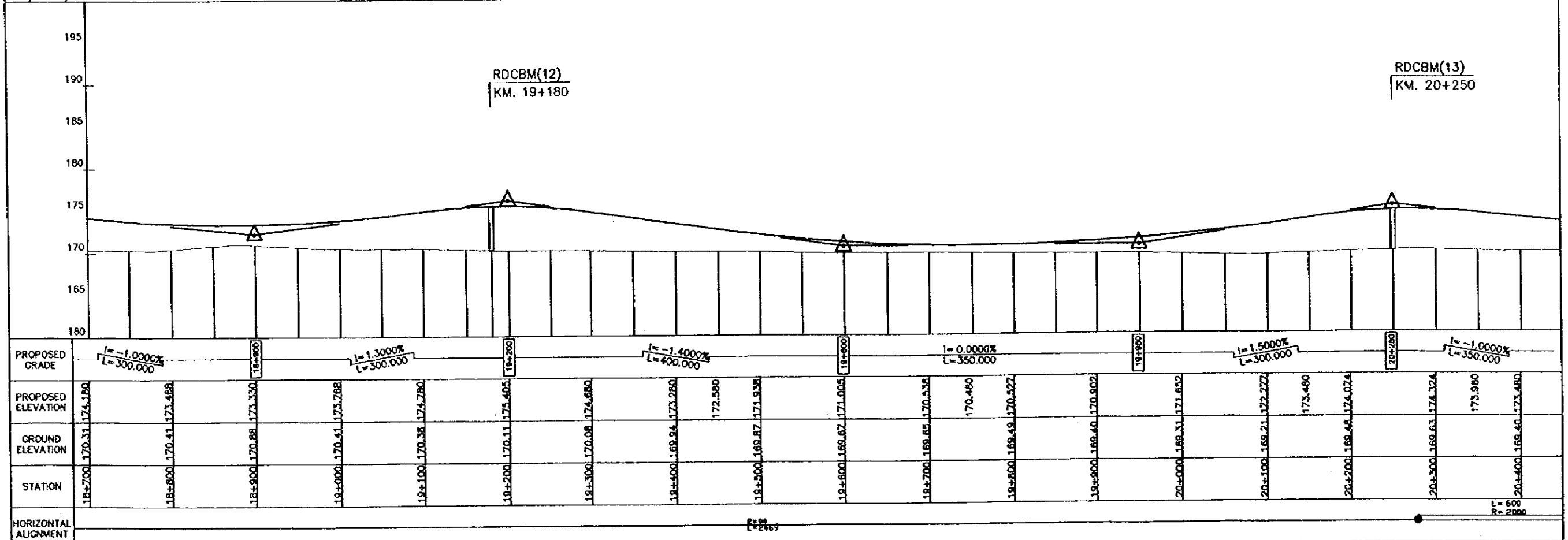
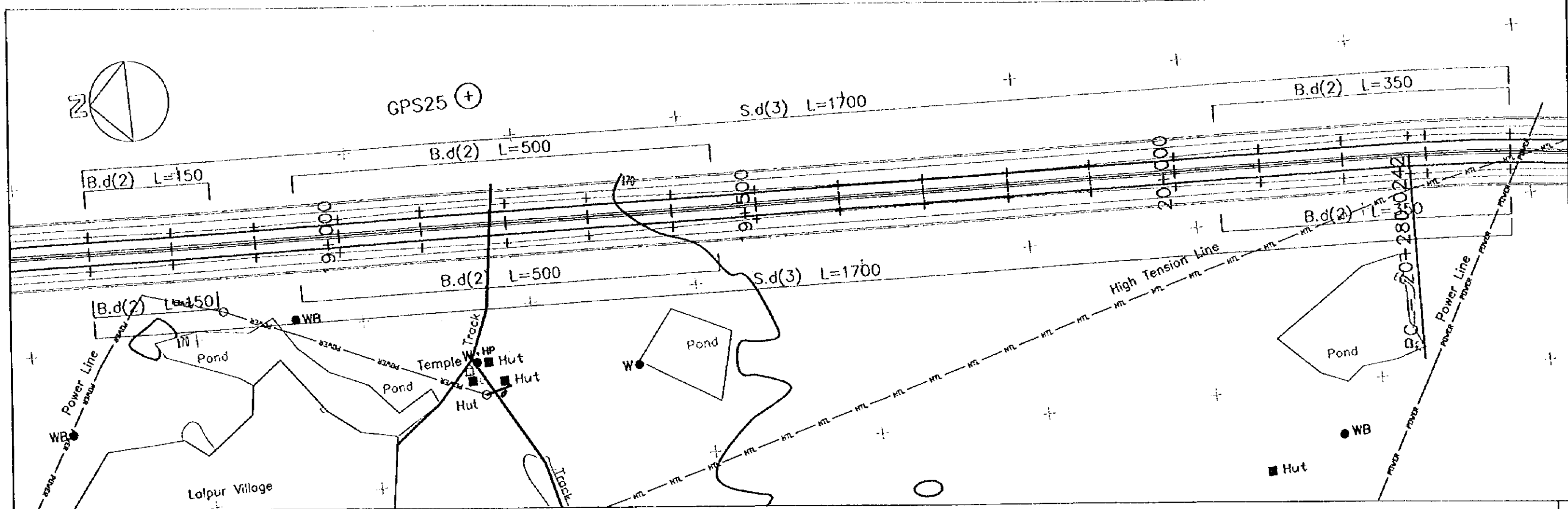
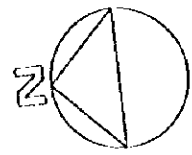
DWG TITLE : PLAN AND PROFILE (STA 13+600 - 15+500)

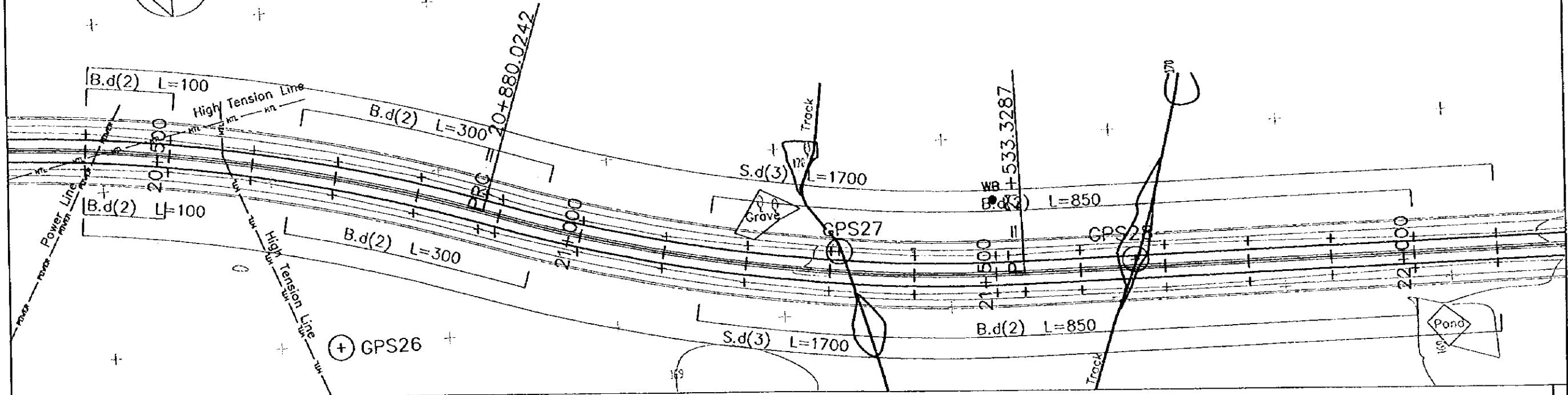
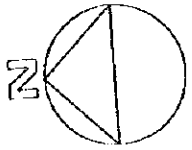
DWG SCALE :
 H = 1 : 5,000
 V = 1 : 500

DWG NO. : B-3 (9/18)







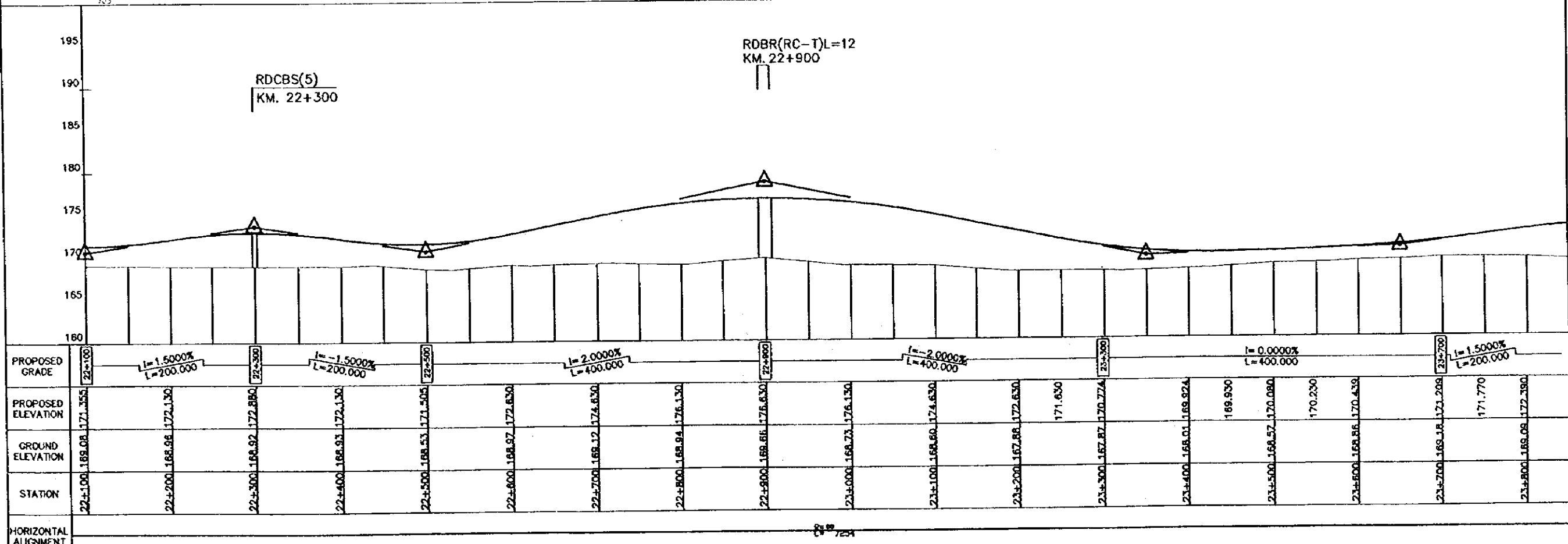
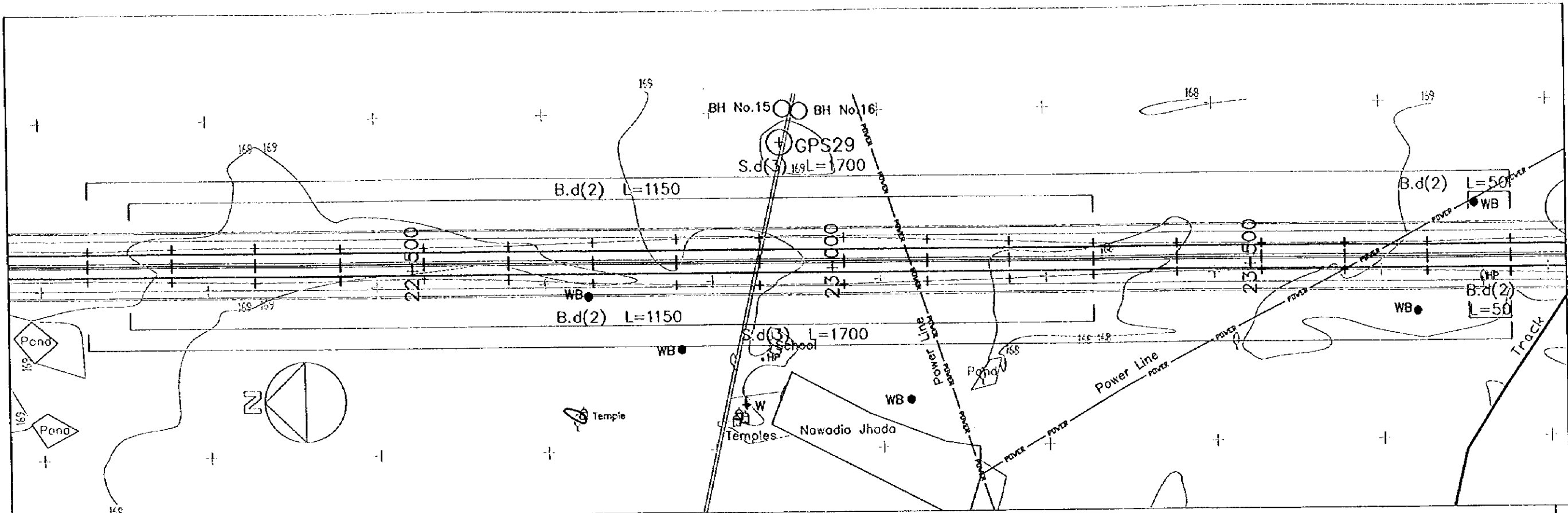


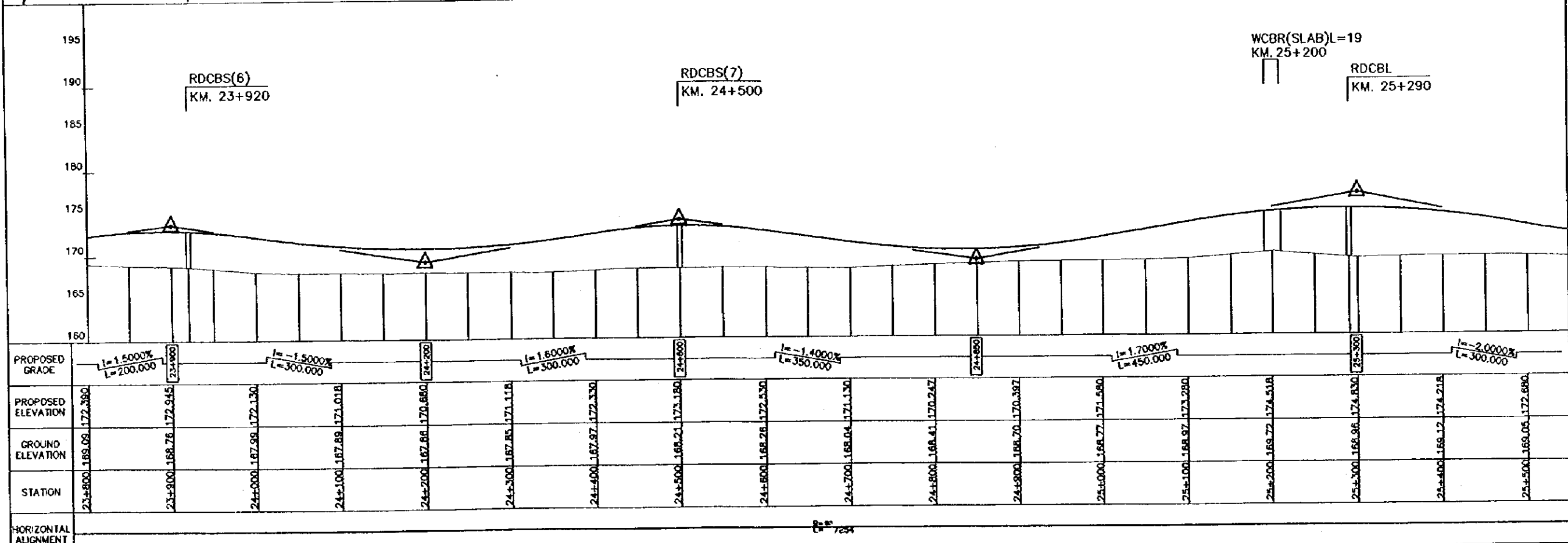
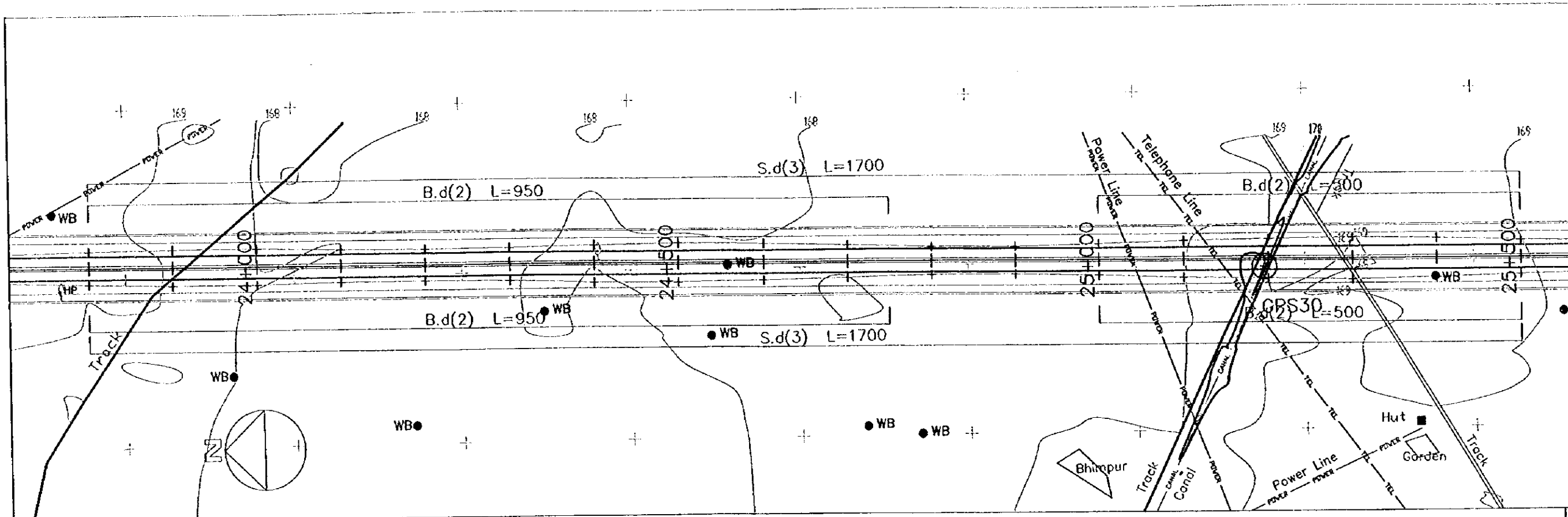
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

DWG TITLE : PLAN AND PROFILE (STA 20+400 - 22+100)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

DWG NO. : B-3 (13/18)



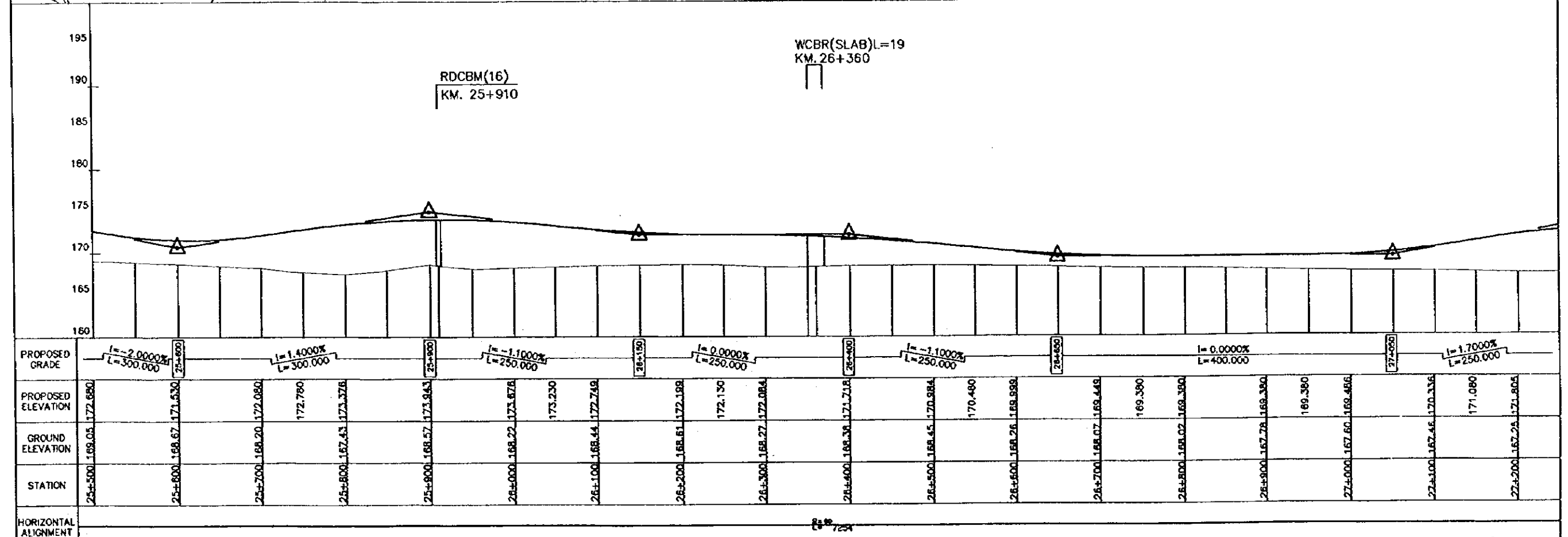
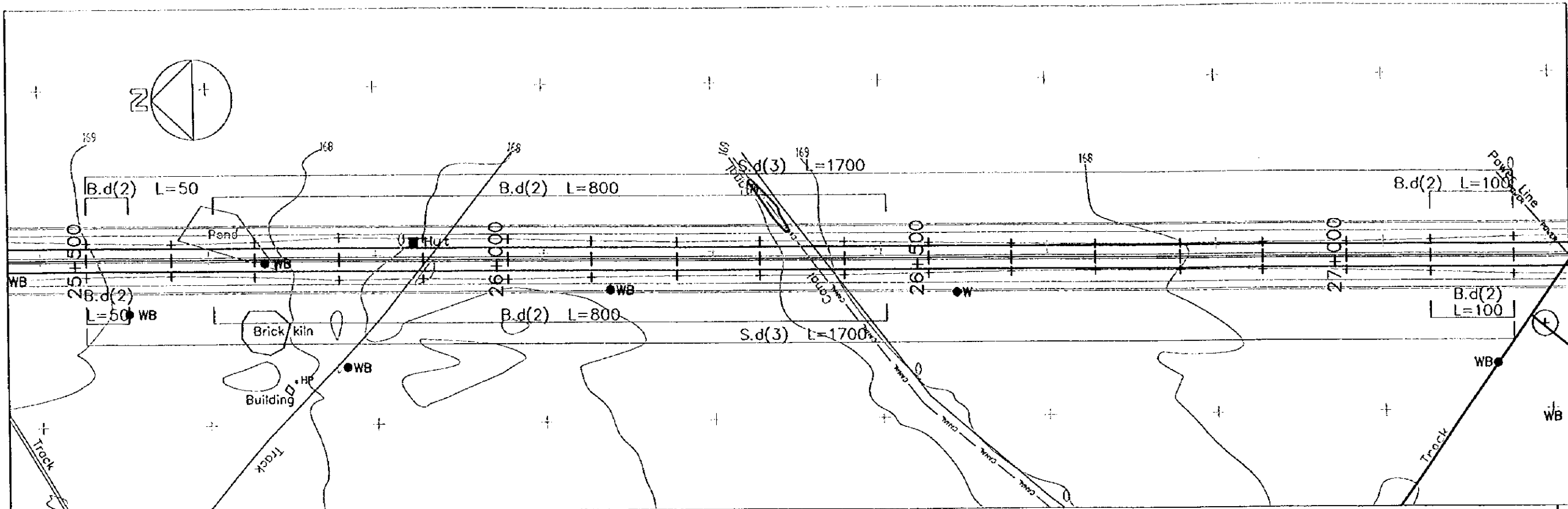


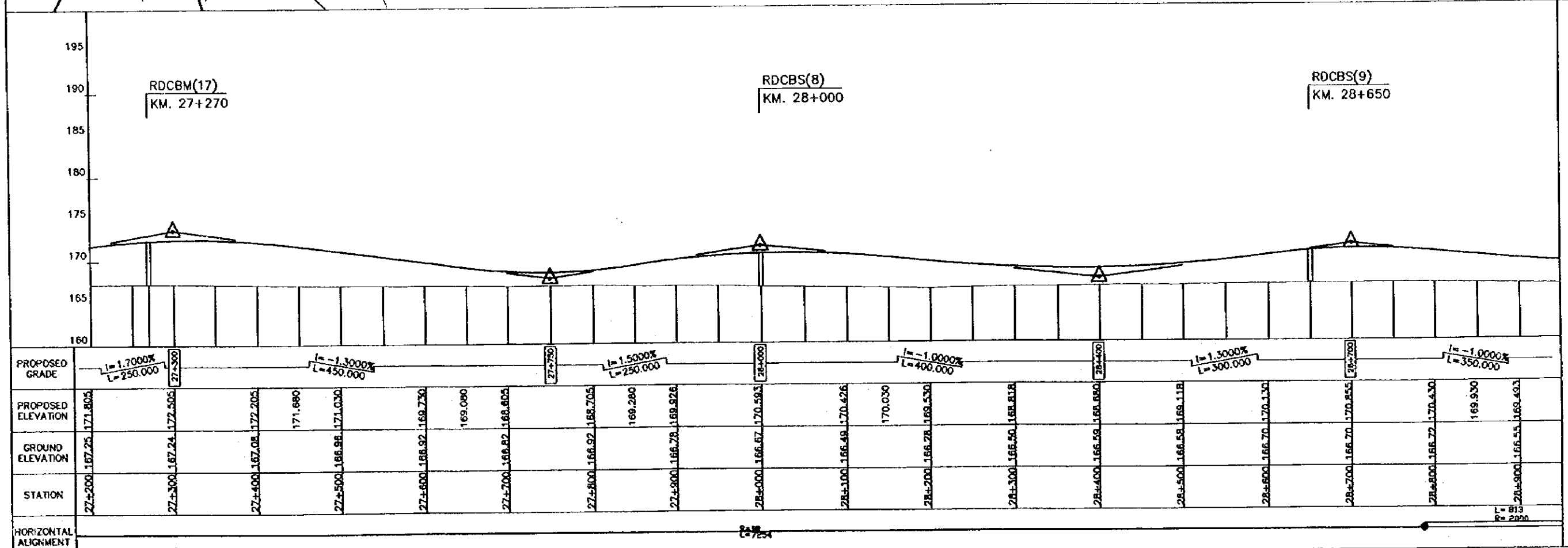
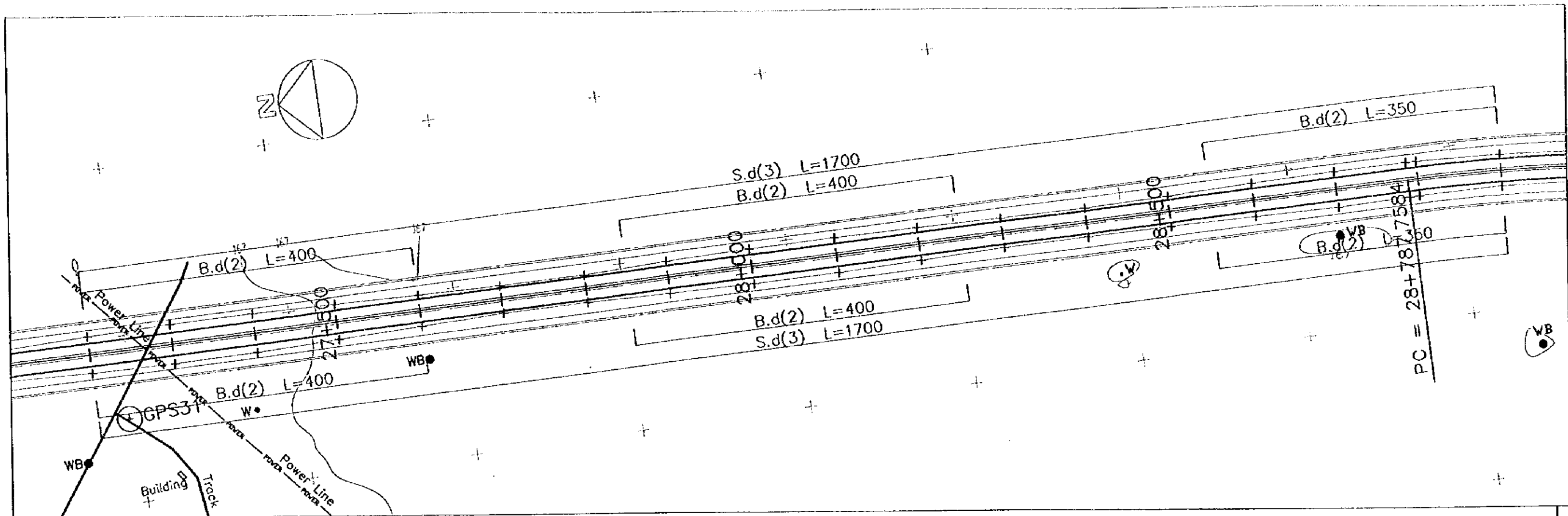
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
 THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

DWG TITLE : PLAN AND PROFILE (STA 23+800 - 25+500)

DWG SCALE :
 H = 1 : 5,000
 V = 1 : 500

DWG NO. : B-3 (15/18)



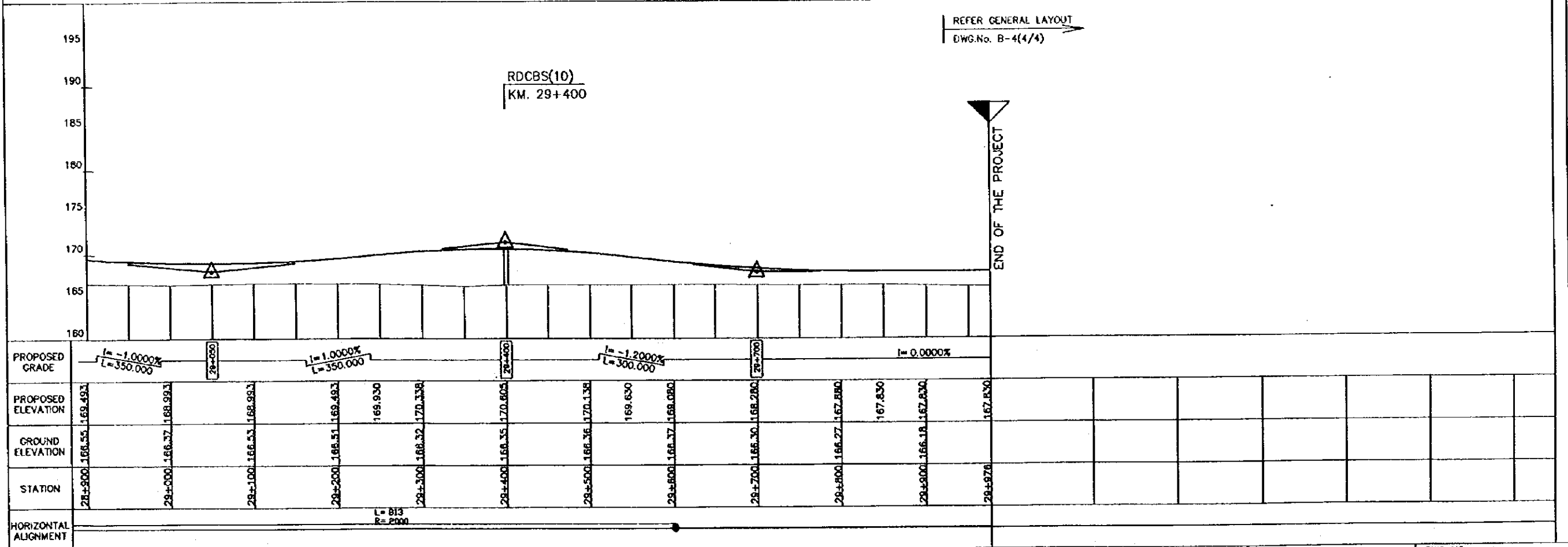
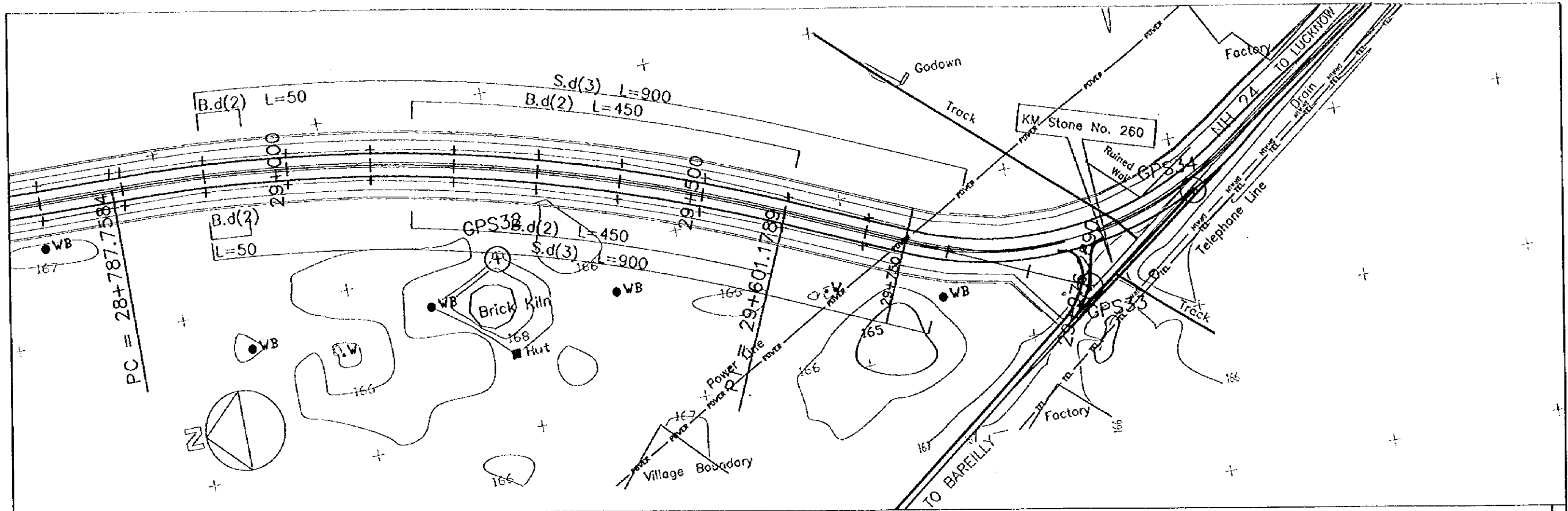


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

DWG TITLE : PLAN AND PROFILE (STA 27+200 - 28+900)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

DWG NO. : B-3 (17/18)

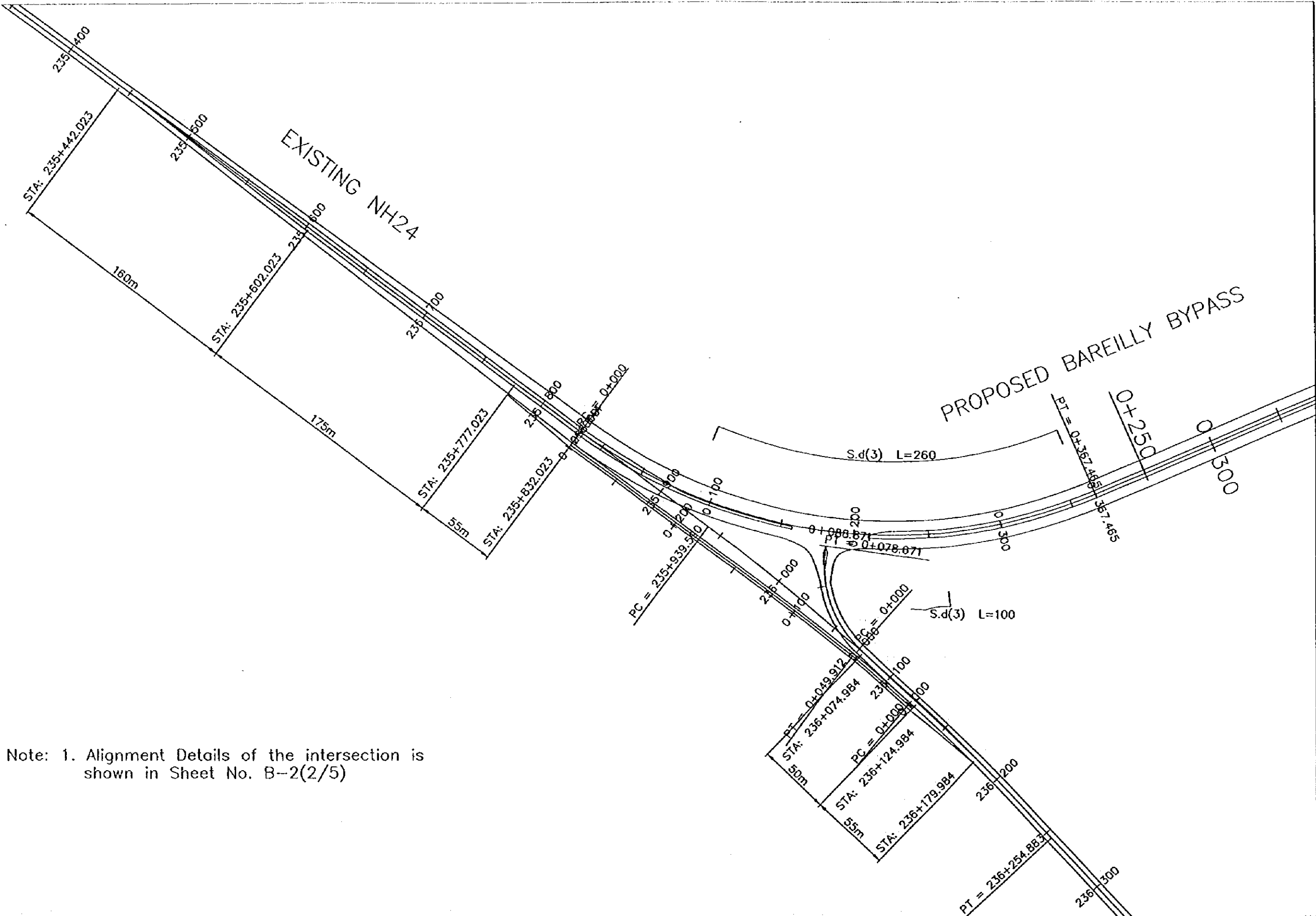


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
THE FEASIBILITY STUDY ON NATIONAL HIGHWAY BYPASSES IN INDIA

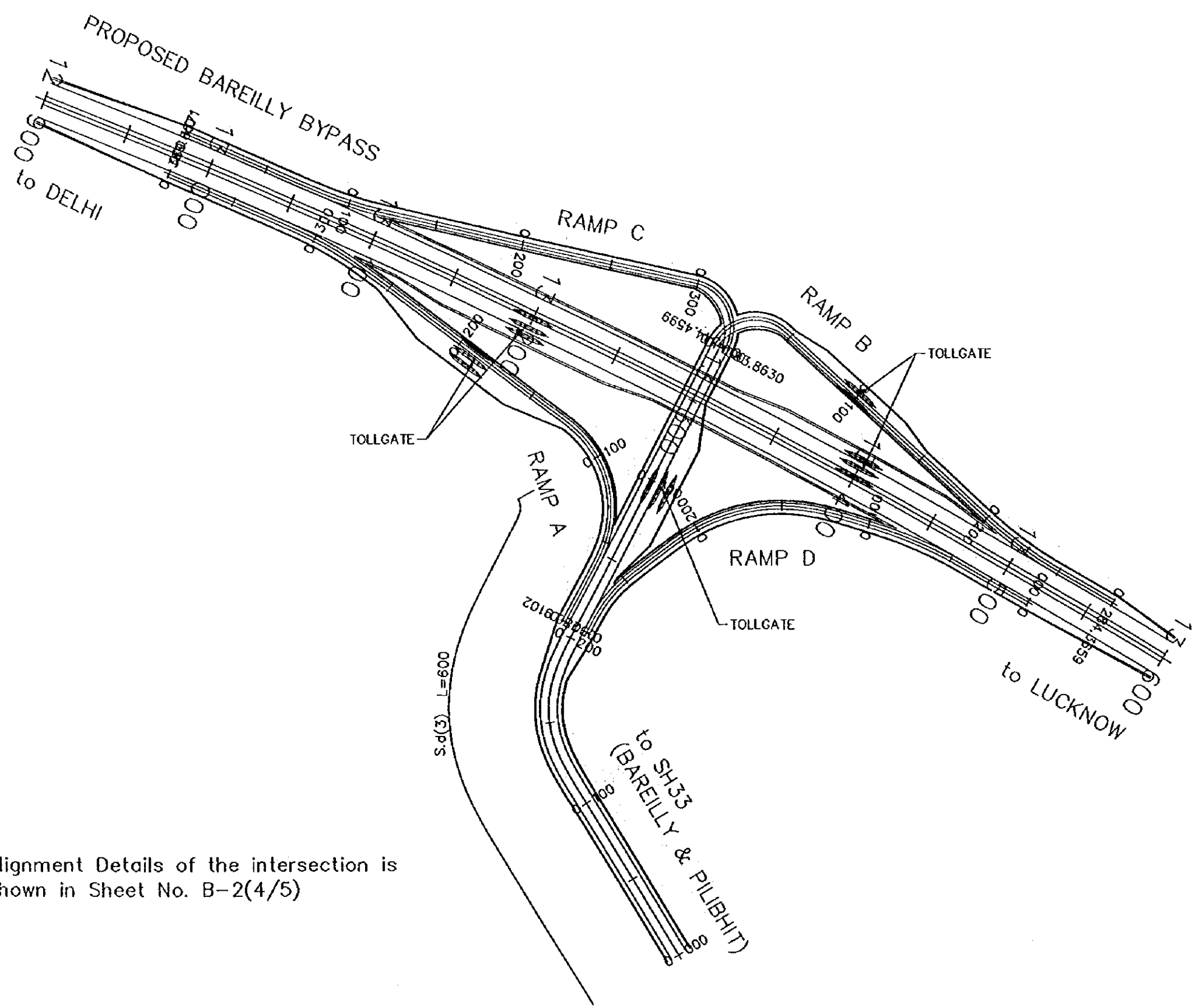
DWG TITLE : PLAN AND PROFILE (STA 28+900 - 29+976.289)

DWG SCALE :
H = 1 : 5,000
V = 1 : 500

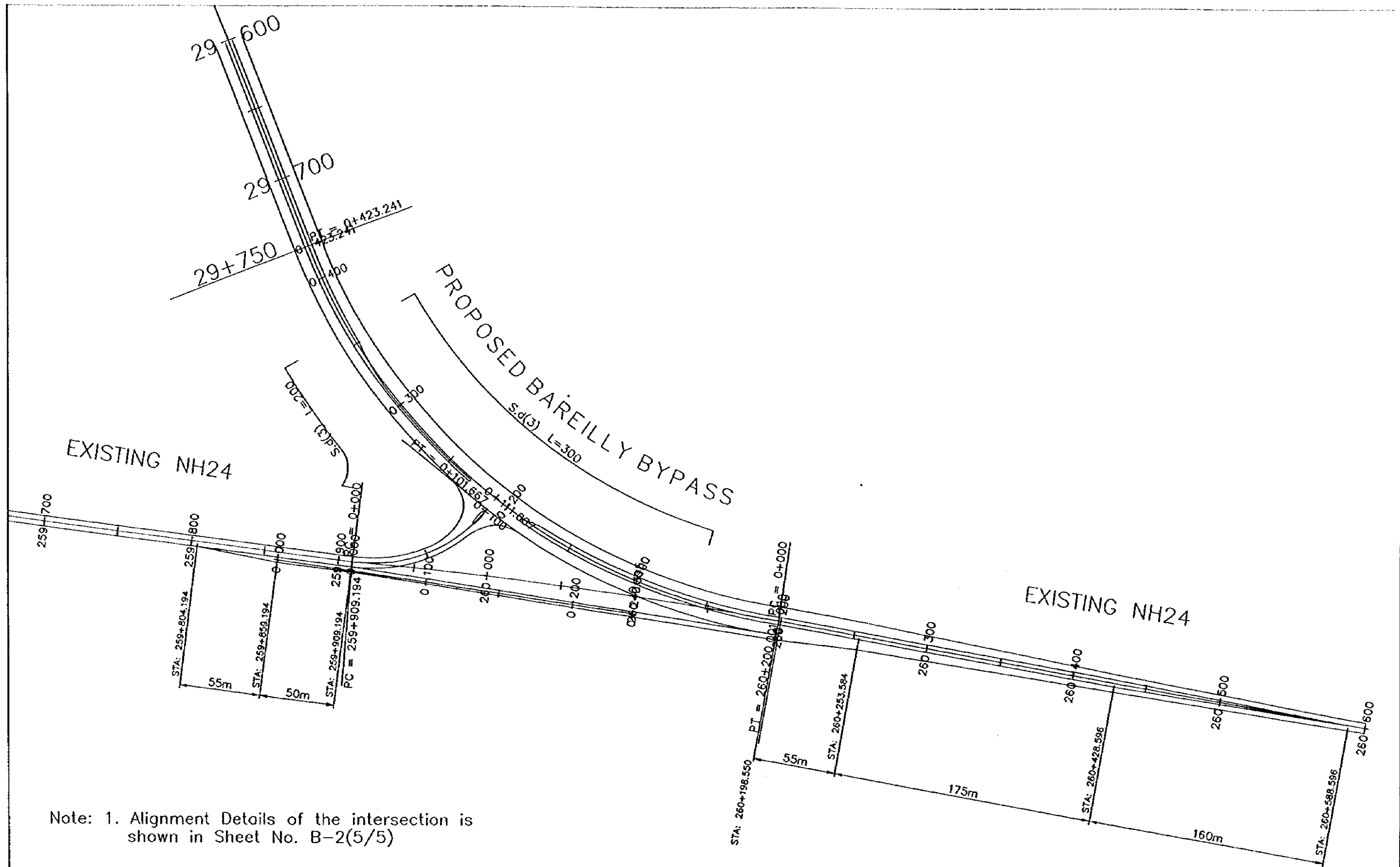
DWG NO. :
B-3 (18/18)



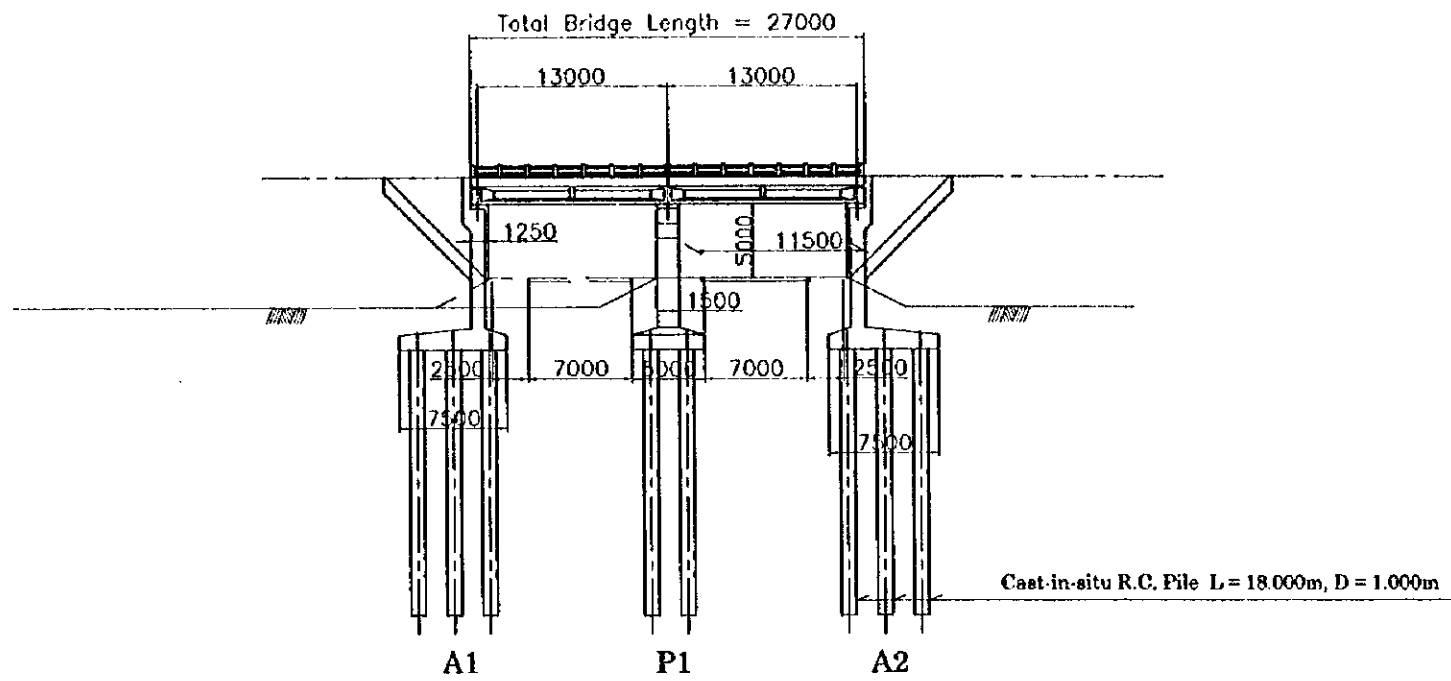
Note: 1. Alignment Details of the intersection is shown in Sheet No. B-2(2/5)



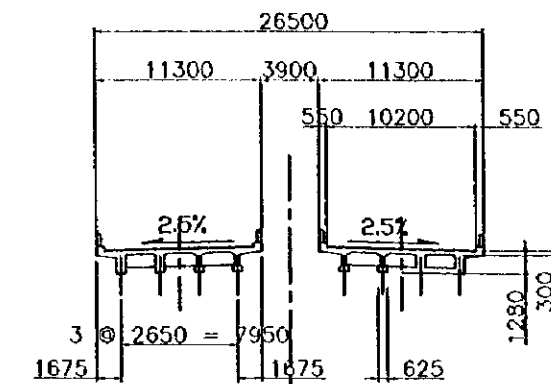
Note: 1. Alignment Details of the intersection is shown in Sheet No. B-2(4/5)



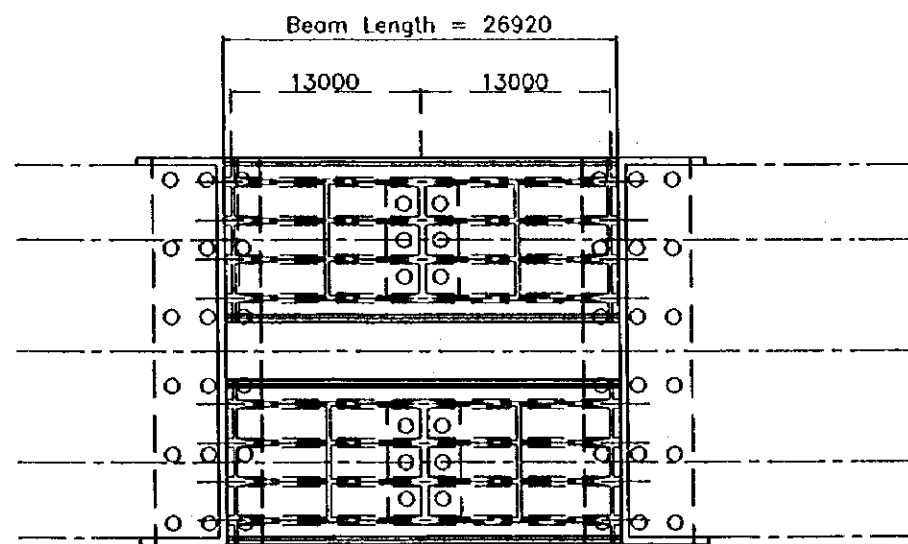
Note: 1. Alignment Details of the intersection is shown in Sheet No. B-2(5/5)



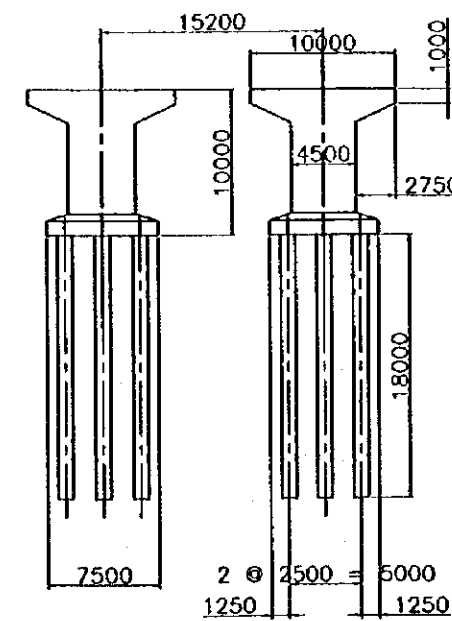
Side View Scale 1:500



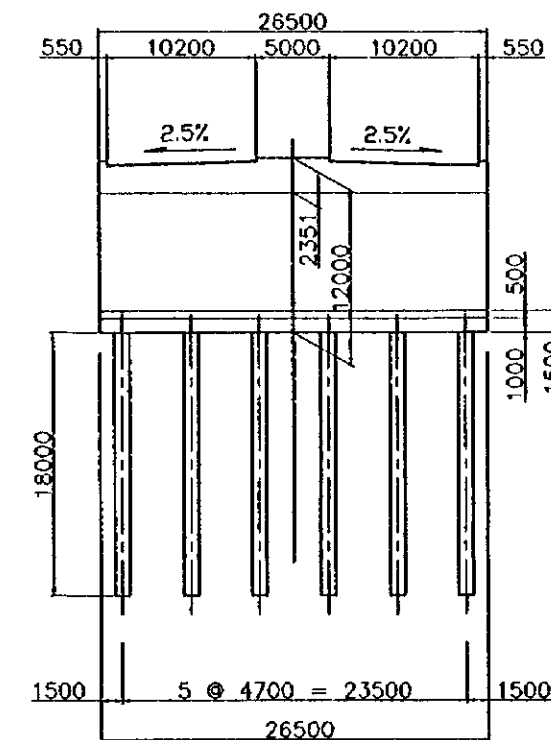
Superstructure Cross Section Scale 1:500
(RC T beam 2 @ 13.0 = 26.0m)



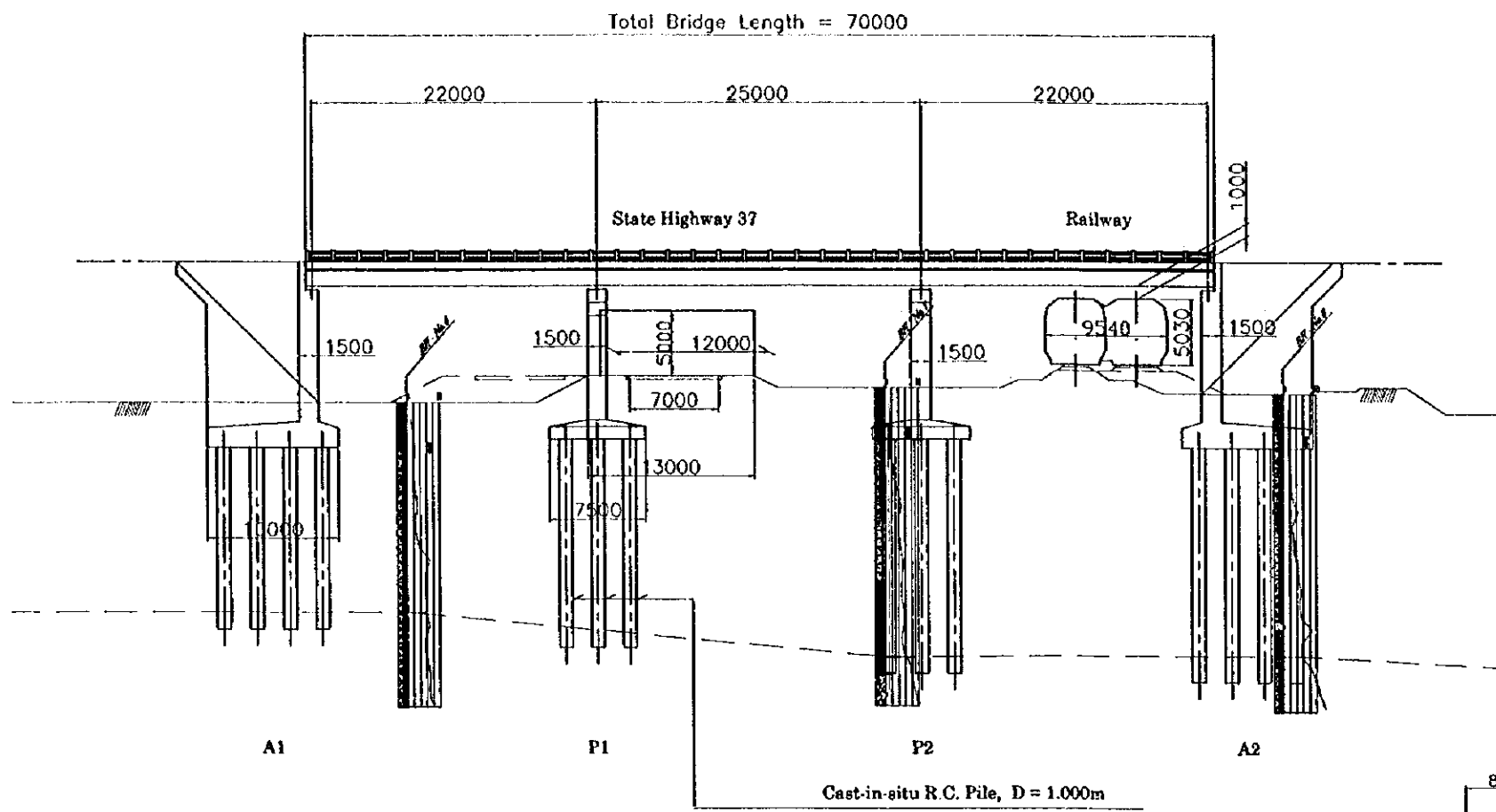
Plan Scale 1:500



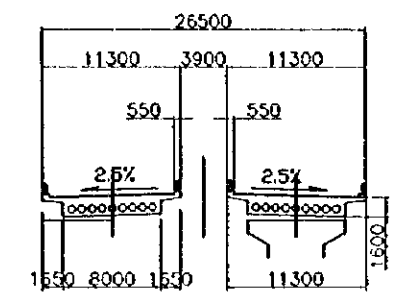
Pier Scale 1:500



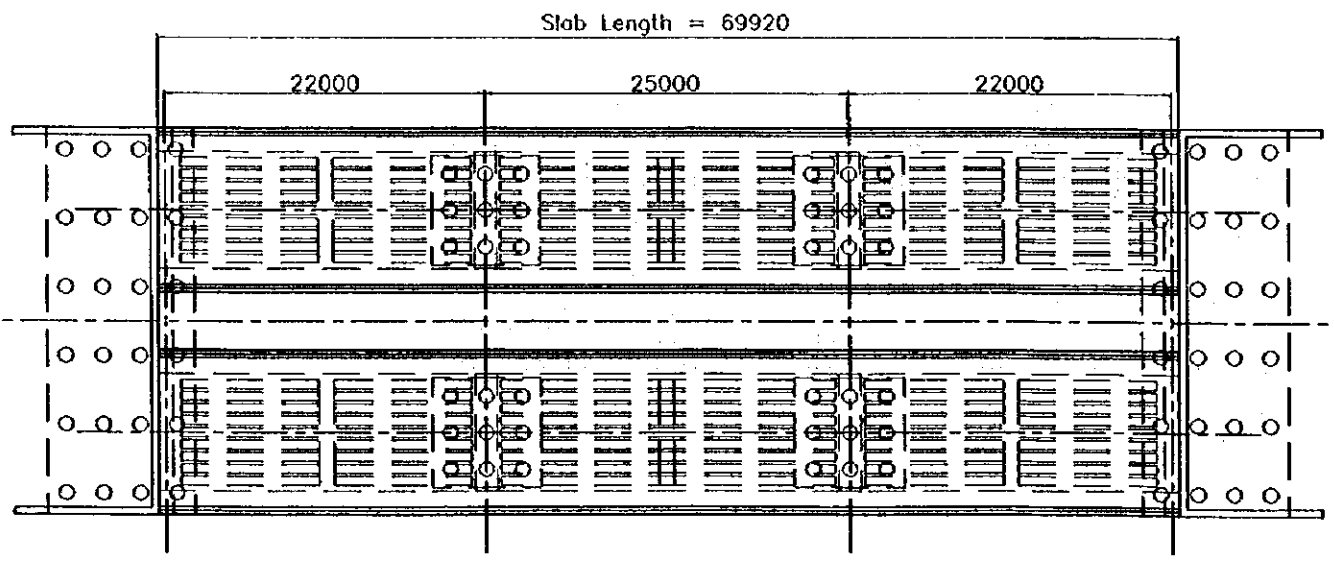
Abutment Scale 1:500



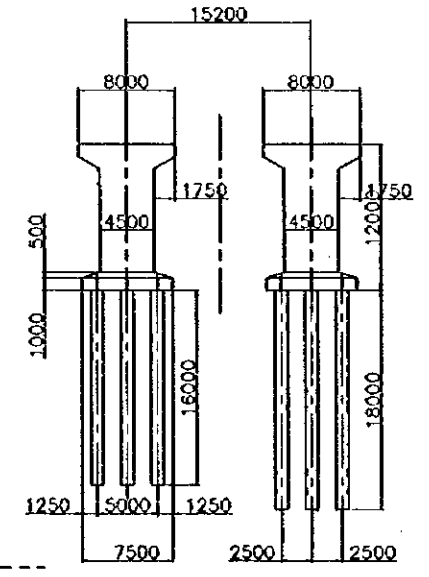
Side View Scale 1:600



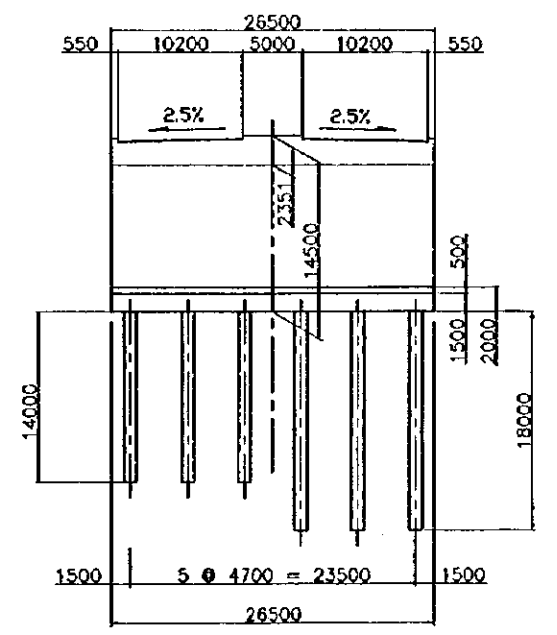
Superstructure Cross Section Scale 1:600
(PC Hollow Slab 22.0 + 25.0 + 22.0 = 69.0m)



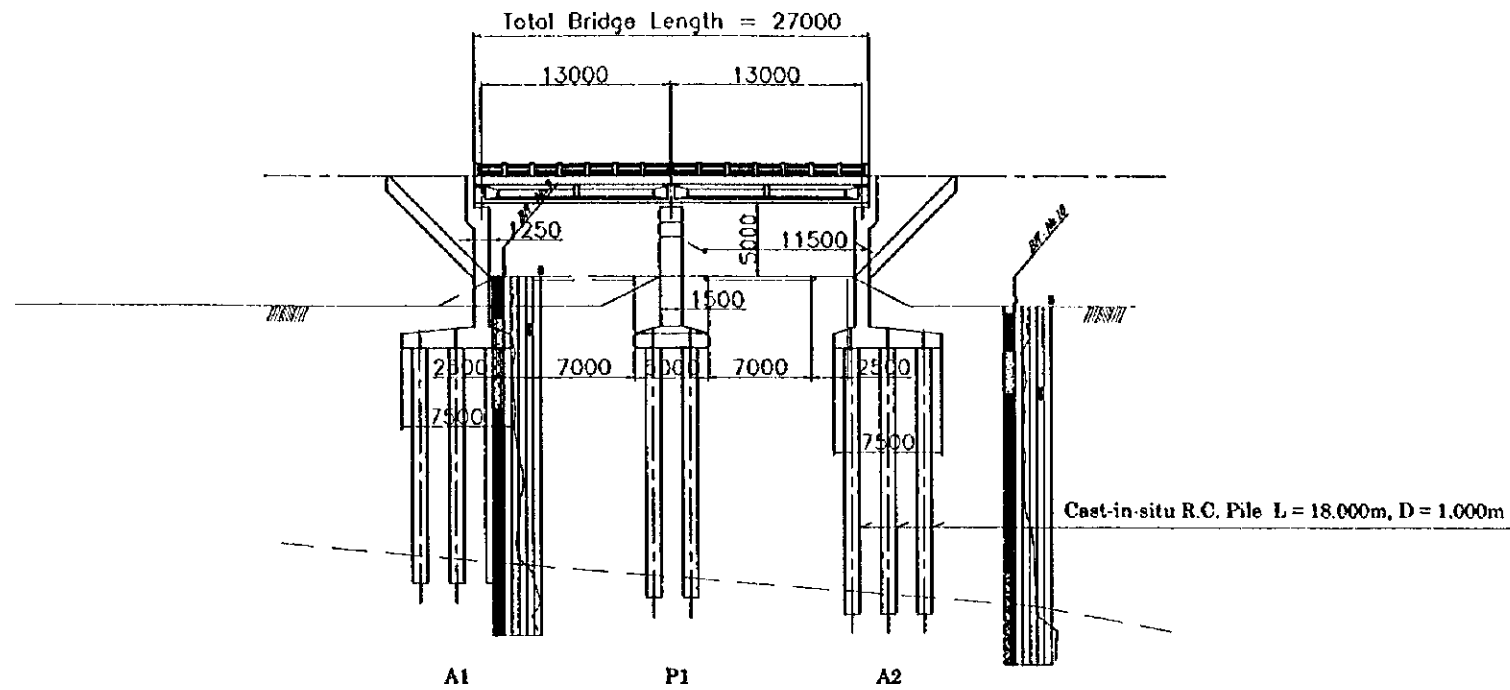
Plan Scale 1:500



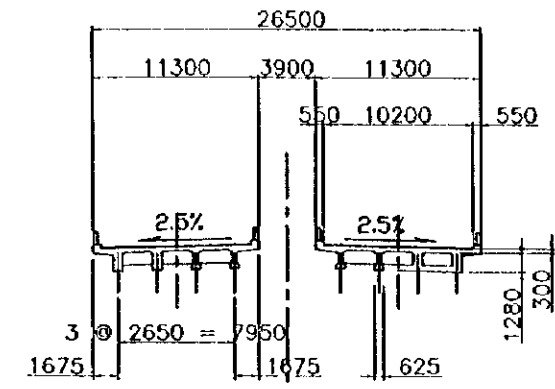
Pier Scale 1:600



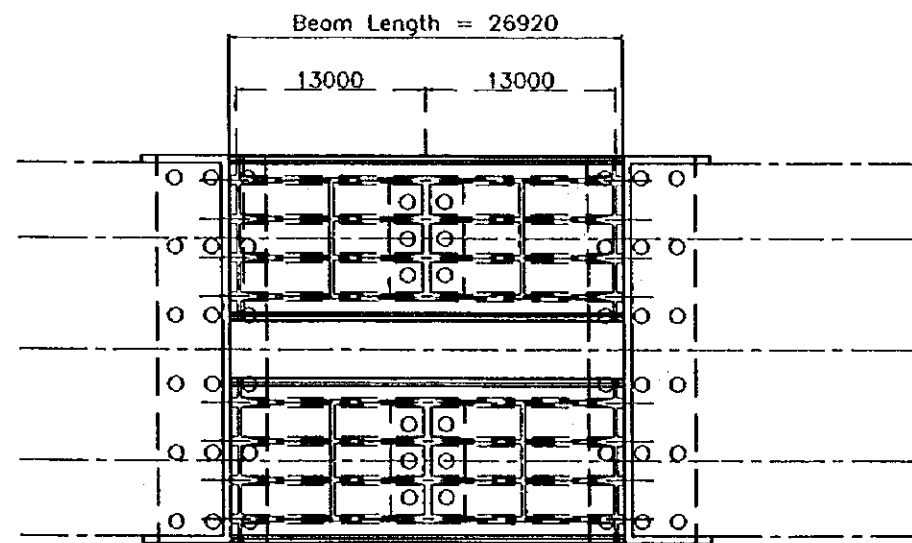
Abutment Scale 1:600



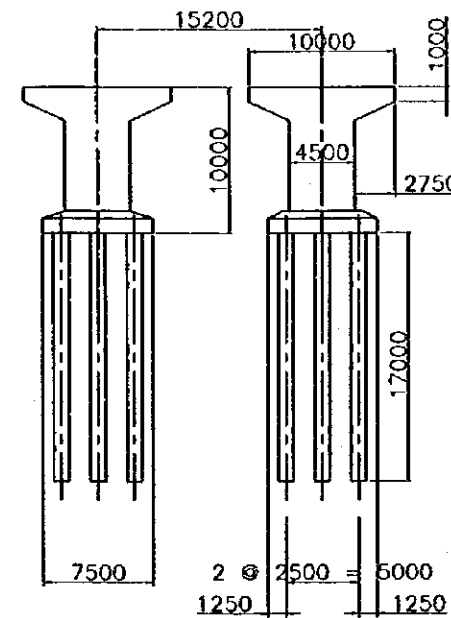
Side View Scale 1:500



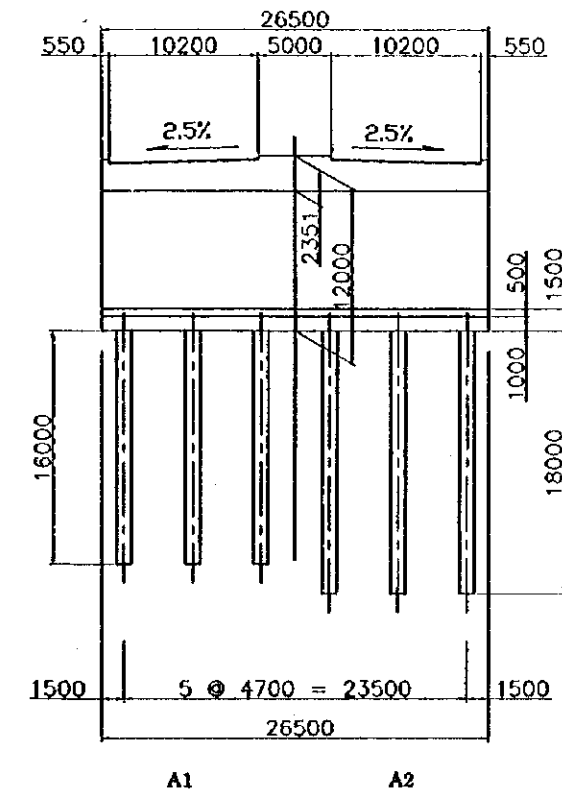
Superstructure Cross Section Scale 1:500
(R/C T beam 2 @ 13.0 = 26.0m)



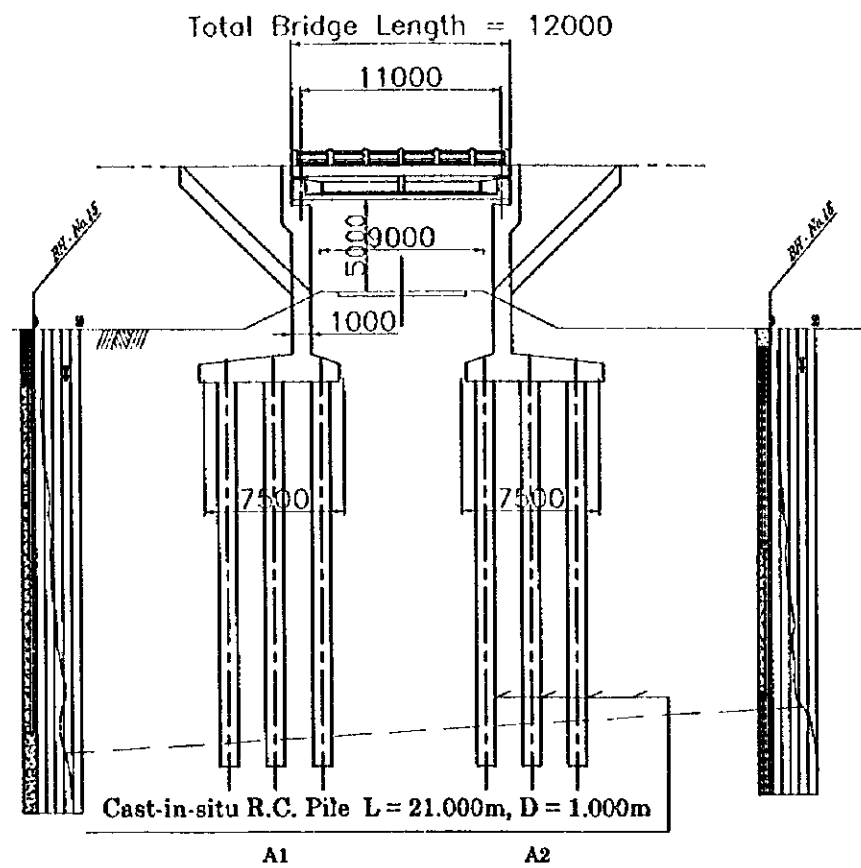
Plan Scale 1:500



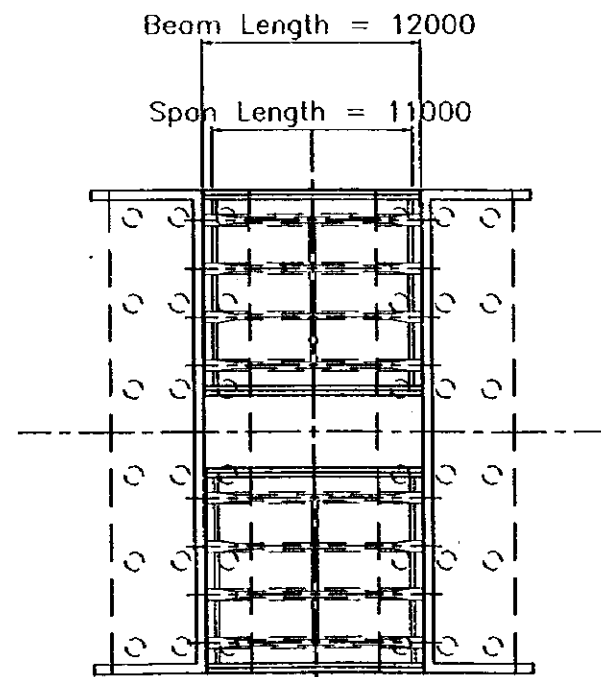
Pier Scale 1:500



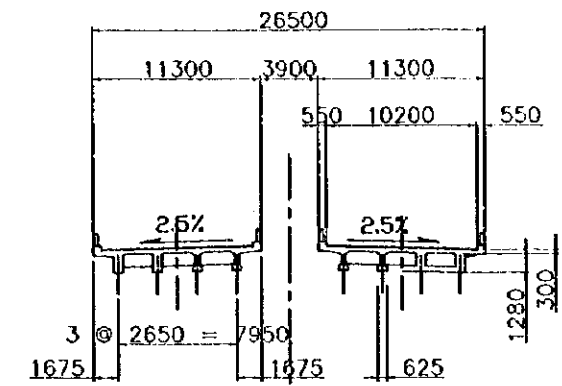
Abutment Scale 1:500



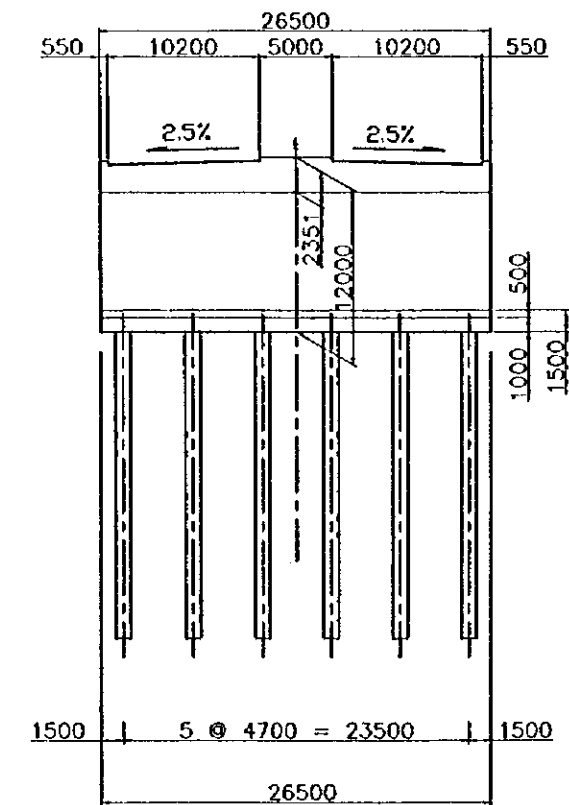
Side View Scale 1:400



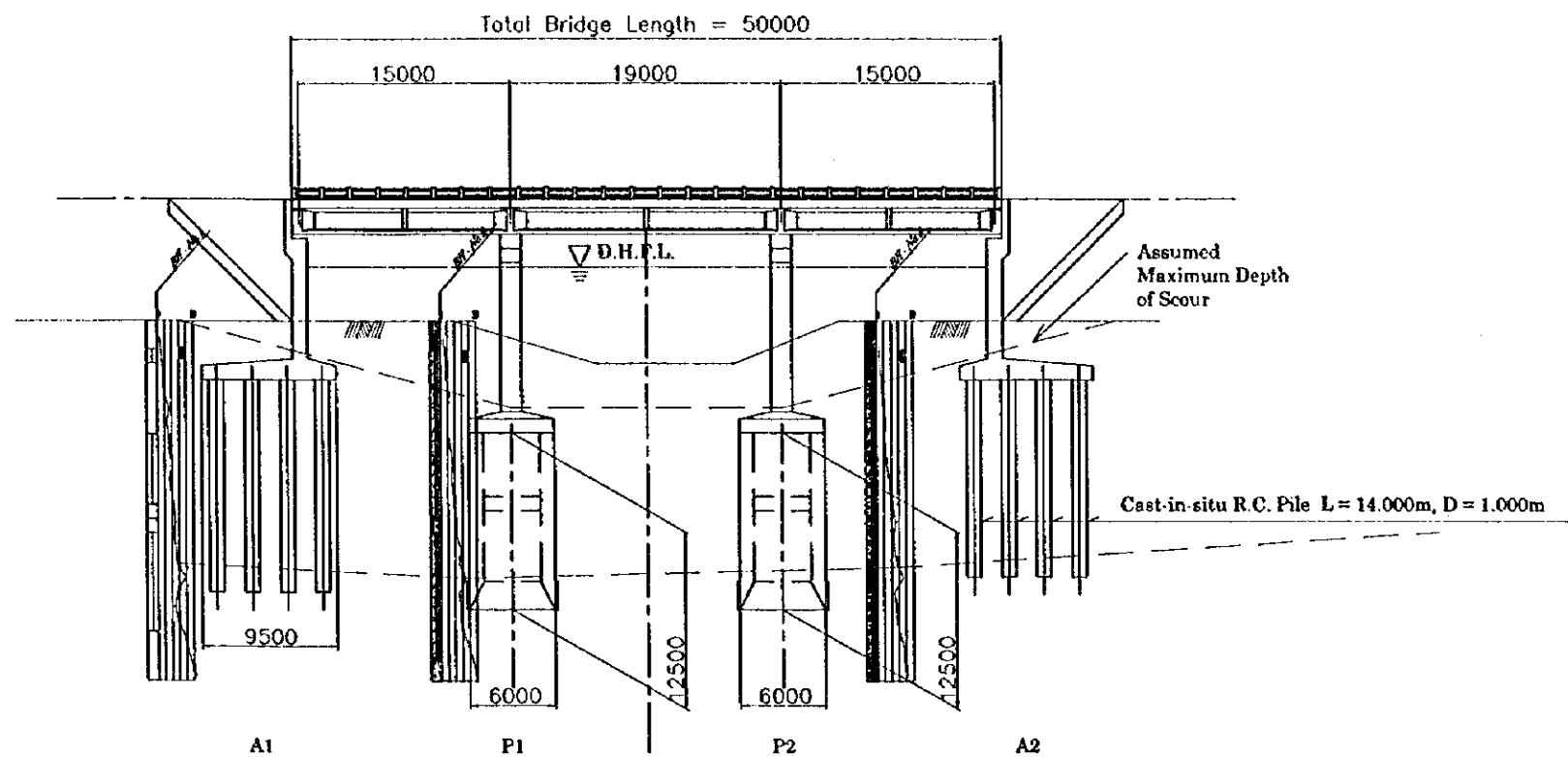
Plan Scale 1:400



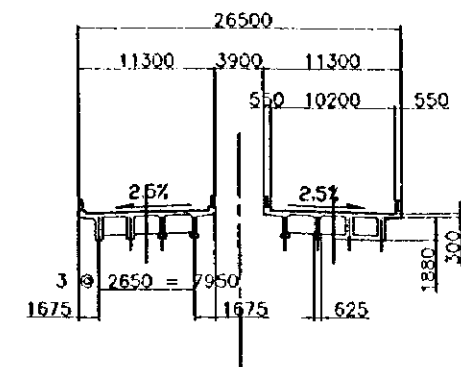
Superstructure Cross Section Scale 1:500
(R.C.T. beam 1 @ 11.0 = 11.0m)



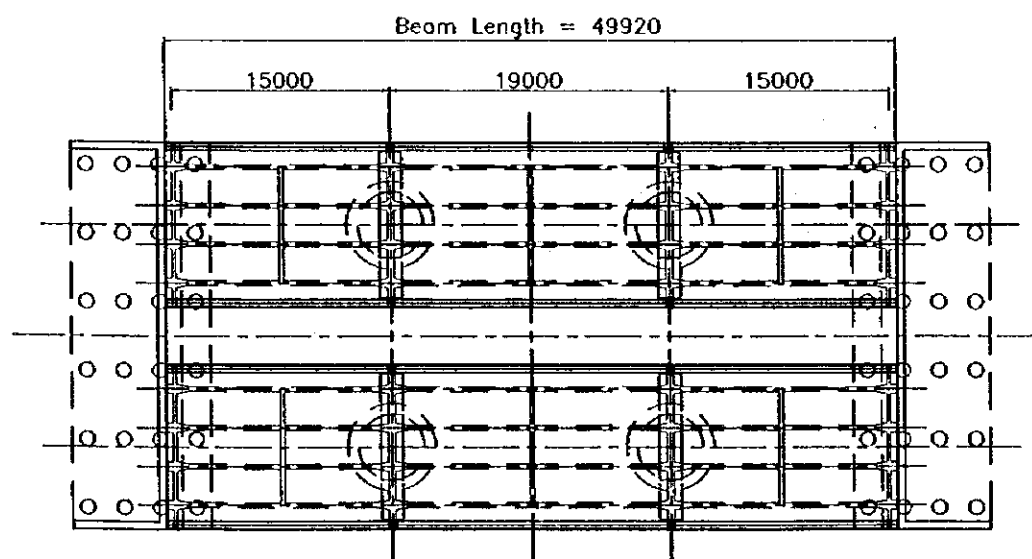
Abutment Scale 1:500



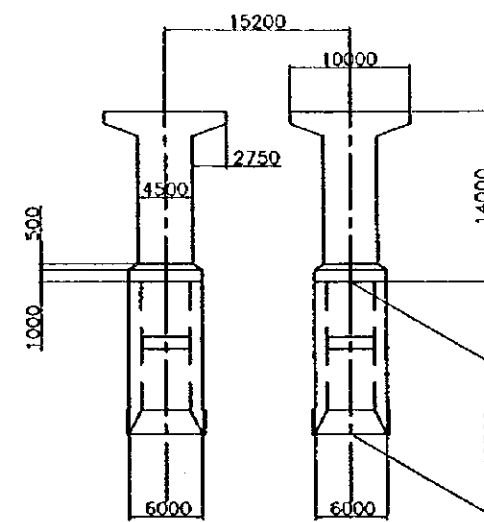
Side View Scale 1:600



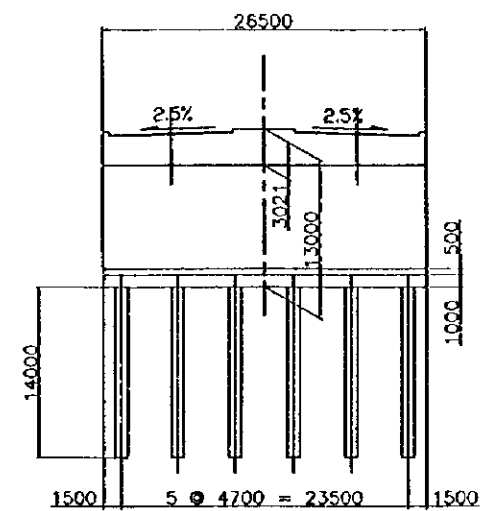
Superstructure Cross Section Scale 1:600
(RC T beam 15.0 + 19.0 + 15.0 = 49.0m)



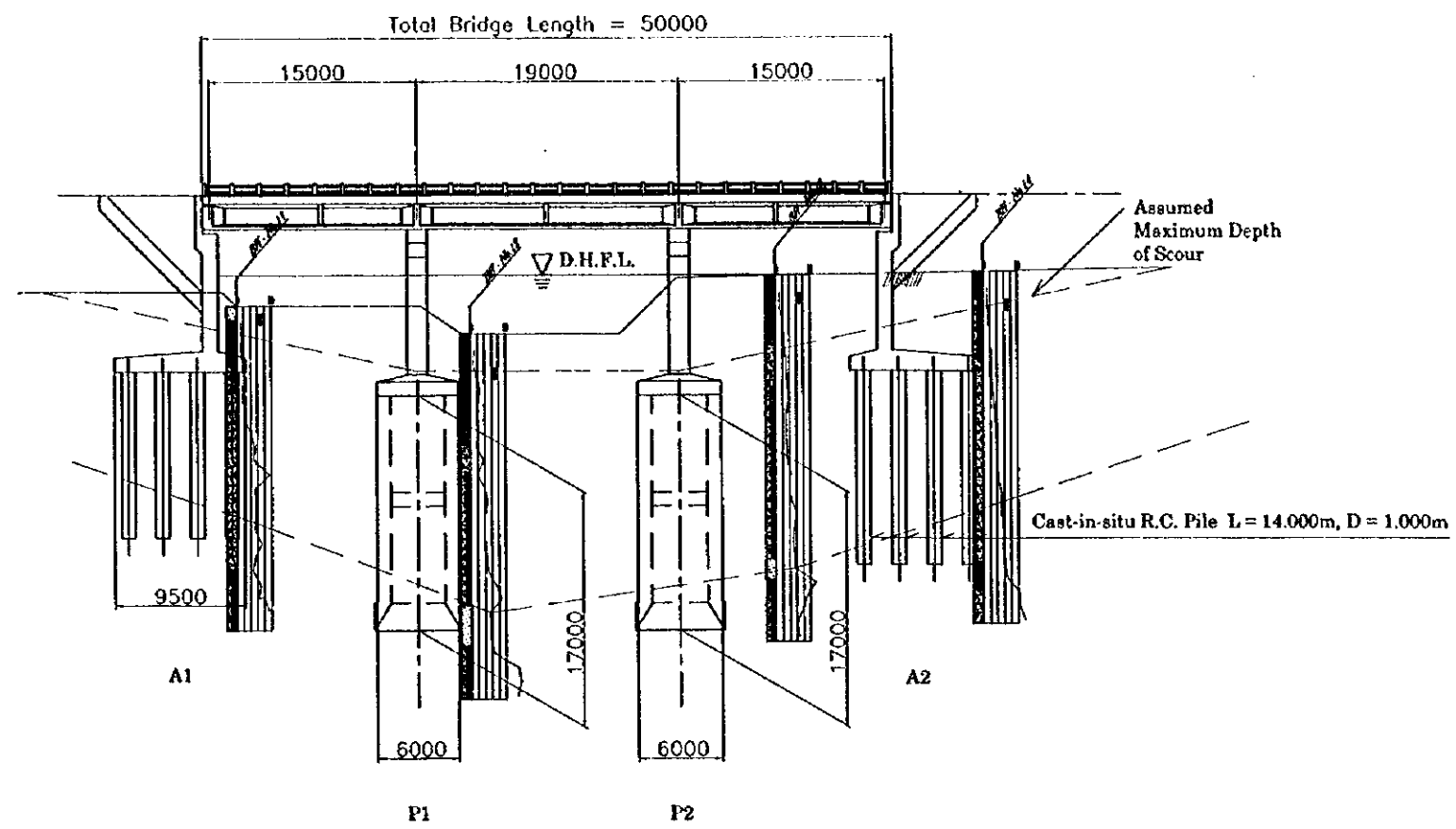
Plan Scale 1:600



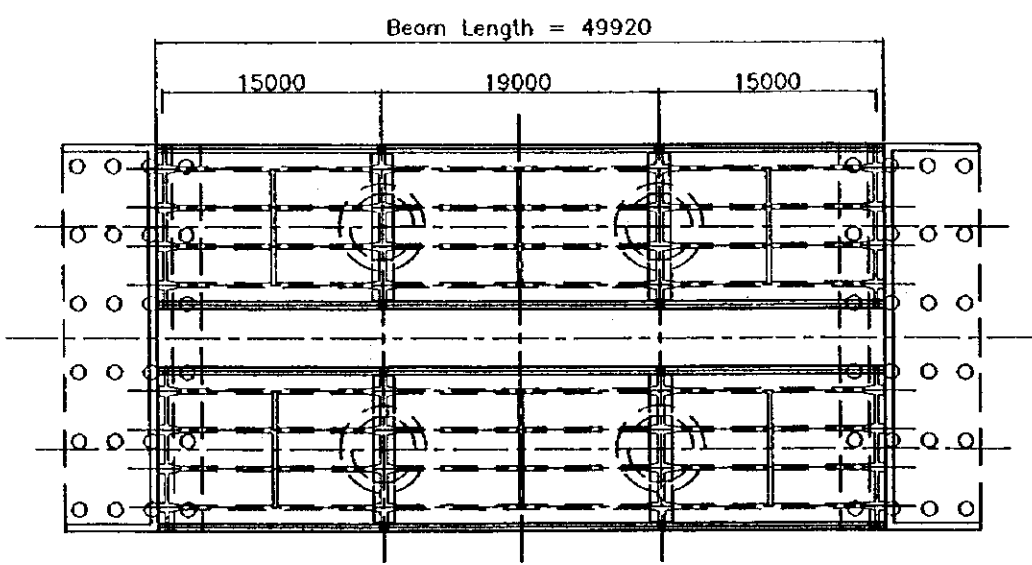
Pier Scale 1:600



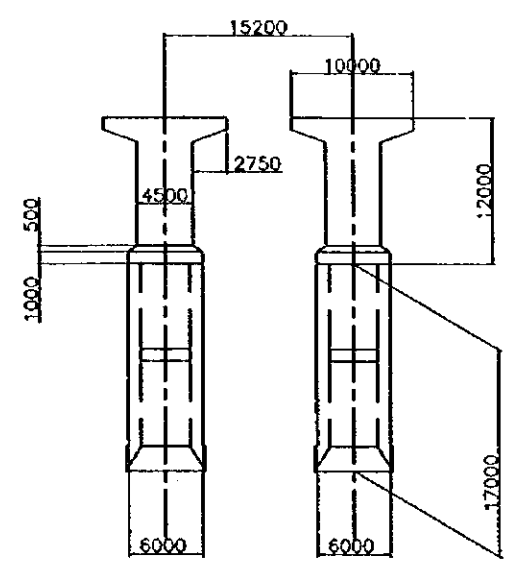
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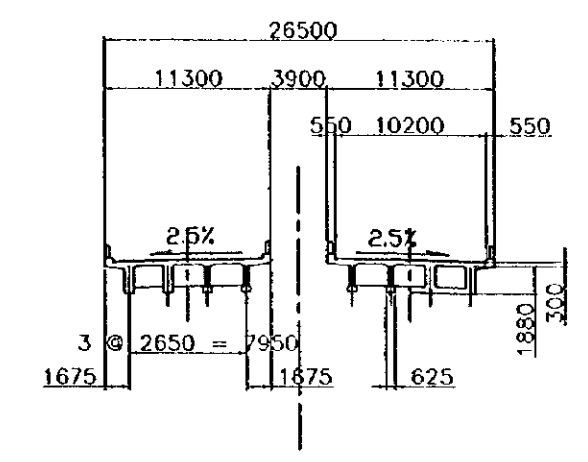
Side View Scale 1:500



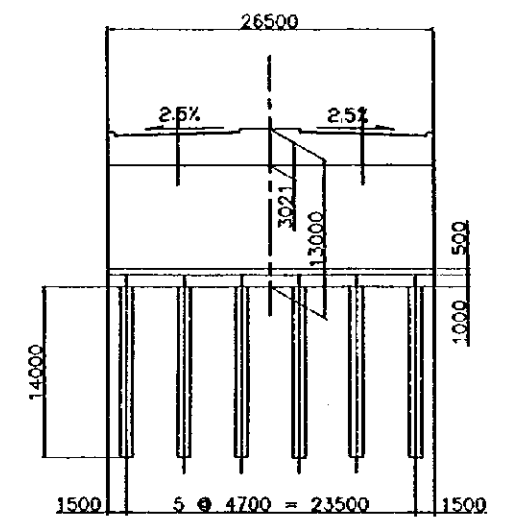
Plan Scale 1:500



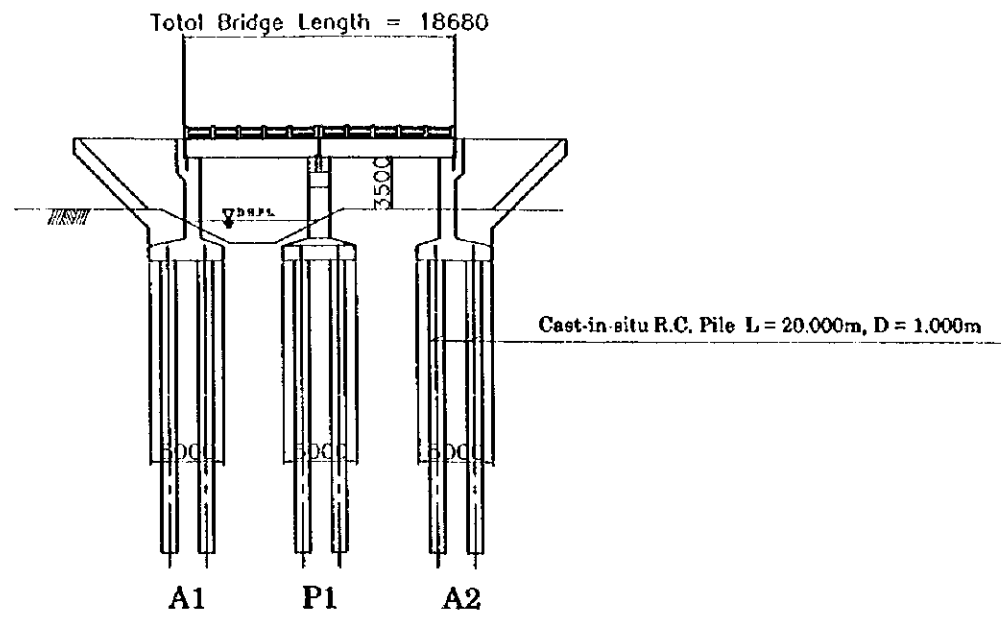
Pier Scale 1:500



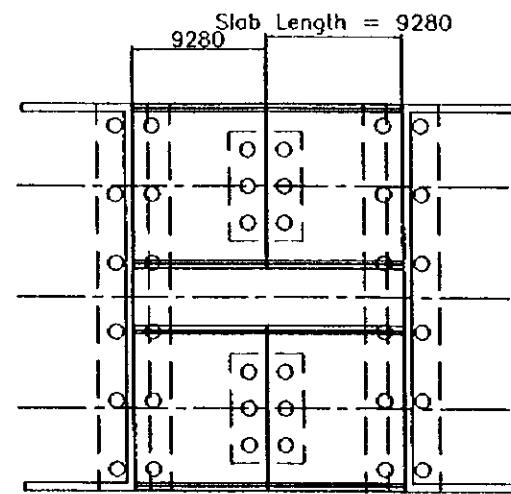
Superstructure Cross Section Scale 1:600
(RC T beam, 15.0 + 19.0 + 15.0 = 49.0m)



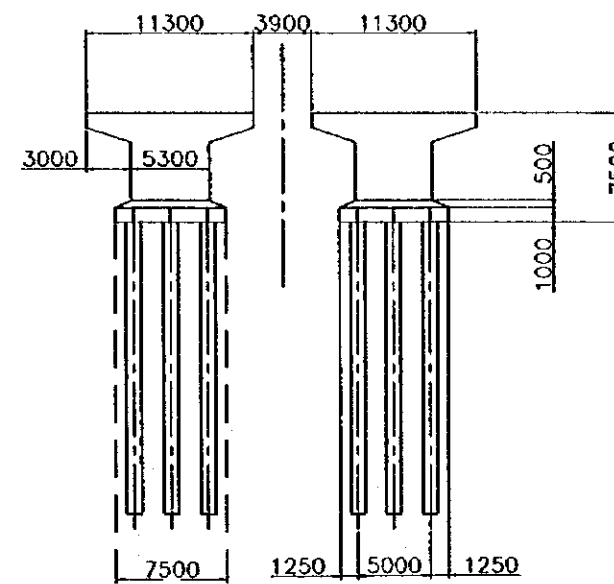
Abutment Scale 1:500



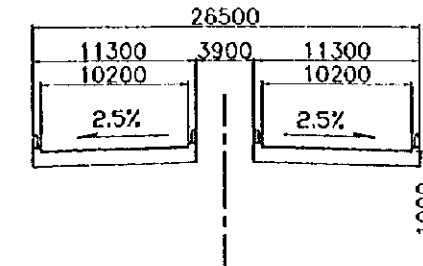
Side View Scale 1:500



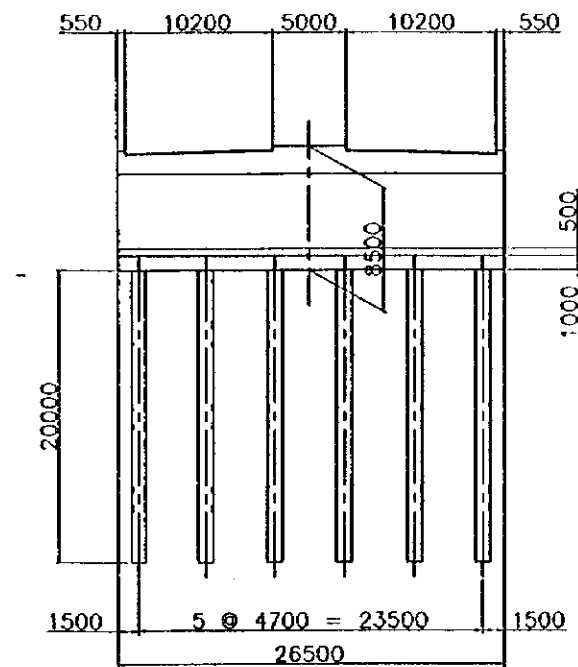
Plan Scale 1:500



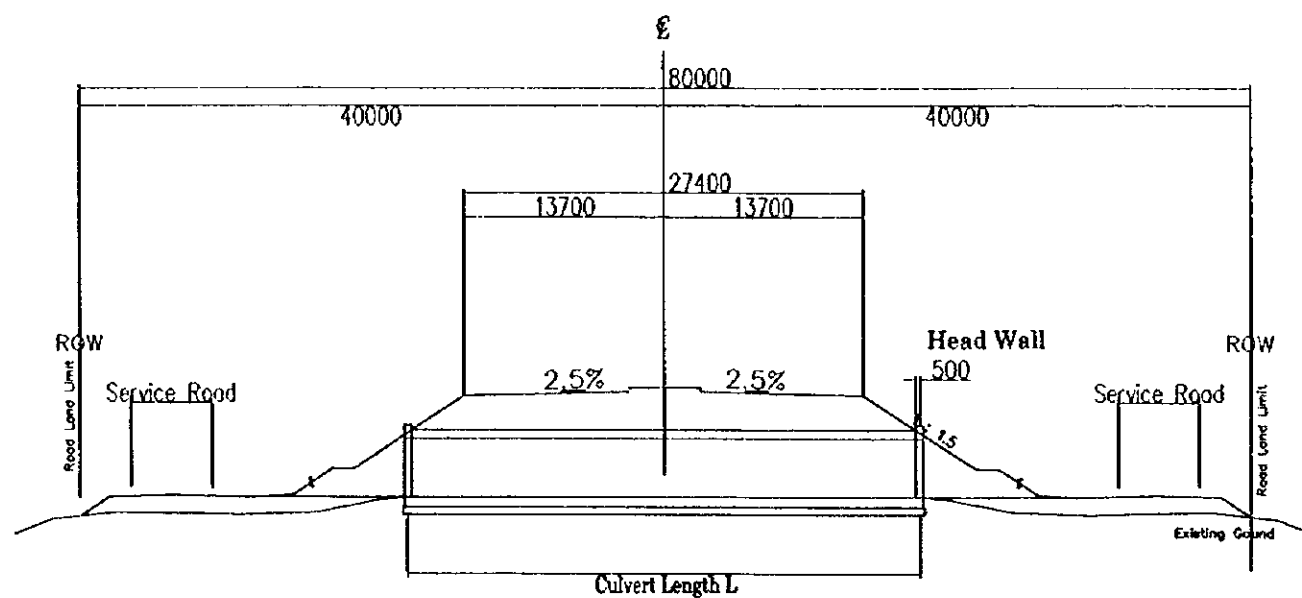
Pier Scale 1:500



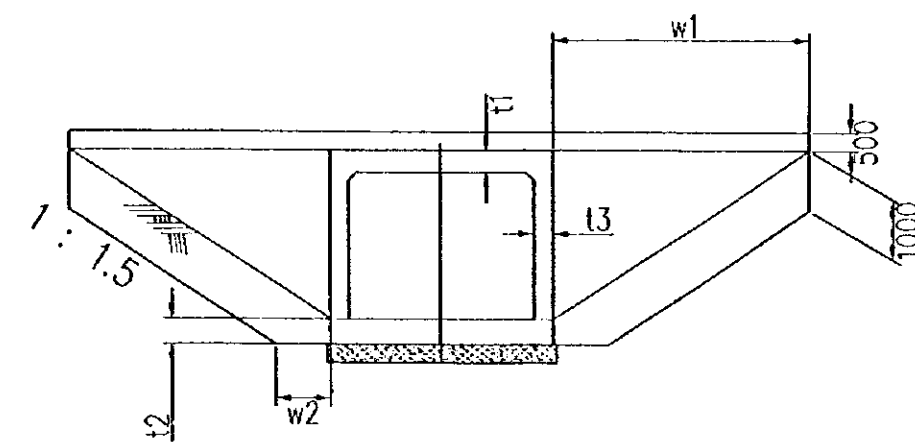
Superstructure Cross Section Scale 1:500
(RC Slab 2 @ 9.0 = 18.0m)



Abutment Scale 1:500



Typical Side View Scale 1:500



Typical Cross Section * Scale refer to Table below.

Table. Type and Size of Culvert - Box (RDCB)

Type of Culvert	Inner Dimension W x H	t1	t2	t3	w1	w2	Length of Culvert L
RDCBL	5,000 x 4,000	600	700	500	7,000	1,000	33,400
RDCBM	4,000 x 3,500	500	600	500	6,000	1,000	33,400
RDCBS	2,500 x 2,500	400	500	400	5,000	2,000	33,400

(Unit: mm)

* L is in the case that coverage height above upper slab is 2.0m

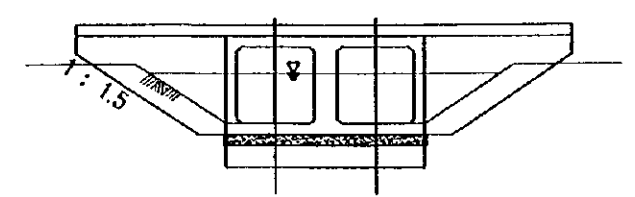
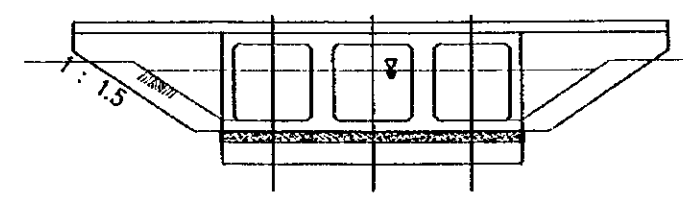
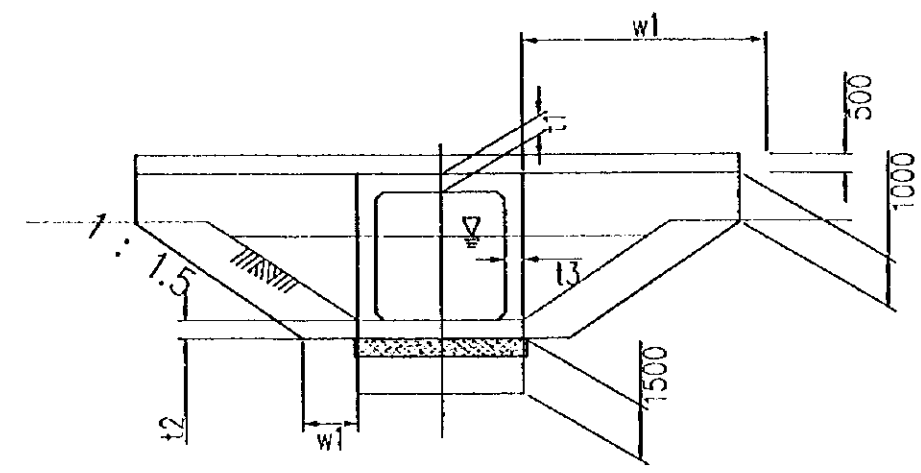
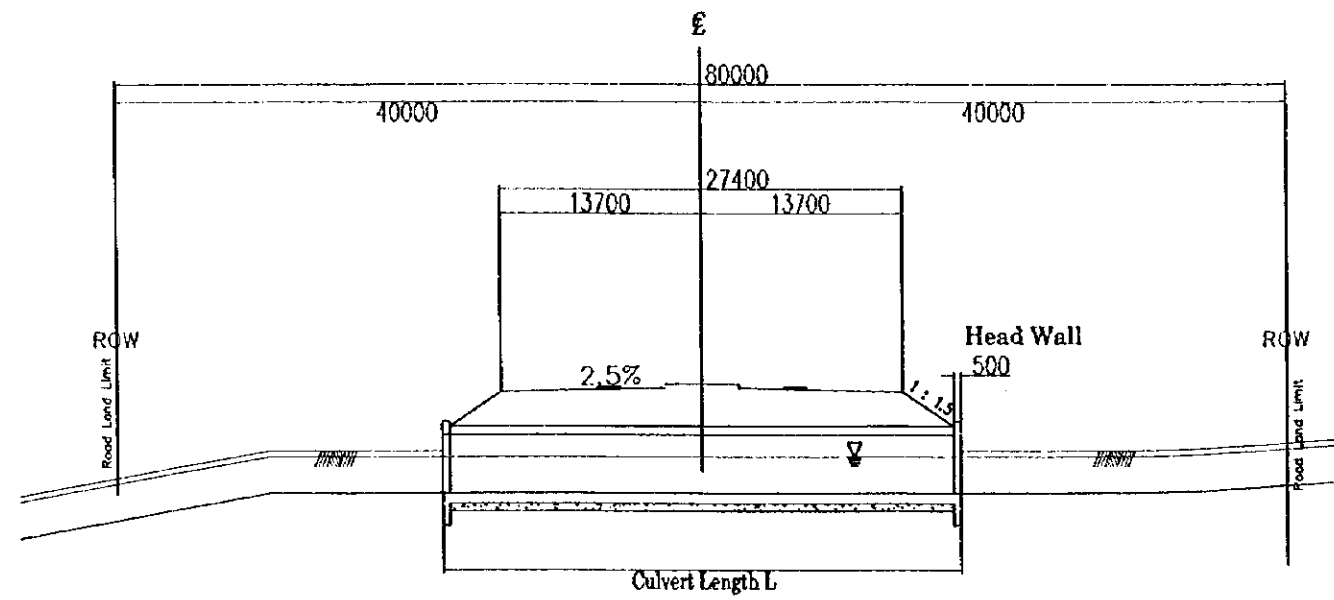


Table. Type and Size of Culvert - Box (WCCB)

(Unit: mm)

Type of Culvert	Inner Dimension W x H	t1	t2	t3	w1	w2	Length of Culvert L
WCCBL	3,500 x 3,500	500	600	500	6,000	1,000	33,400
WCCBM	2,500 x 2,500	400	500	400	5,000	2,000	33,400
WCCBS	1,500 x 1,500	300	400	300	3,000	2,000	33,400

* Number of Internal Cell was defined with Maximum Design Discharge
 * Length is in case that coverage height above upper slab is 2.0m.