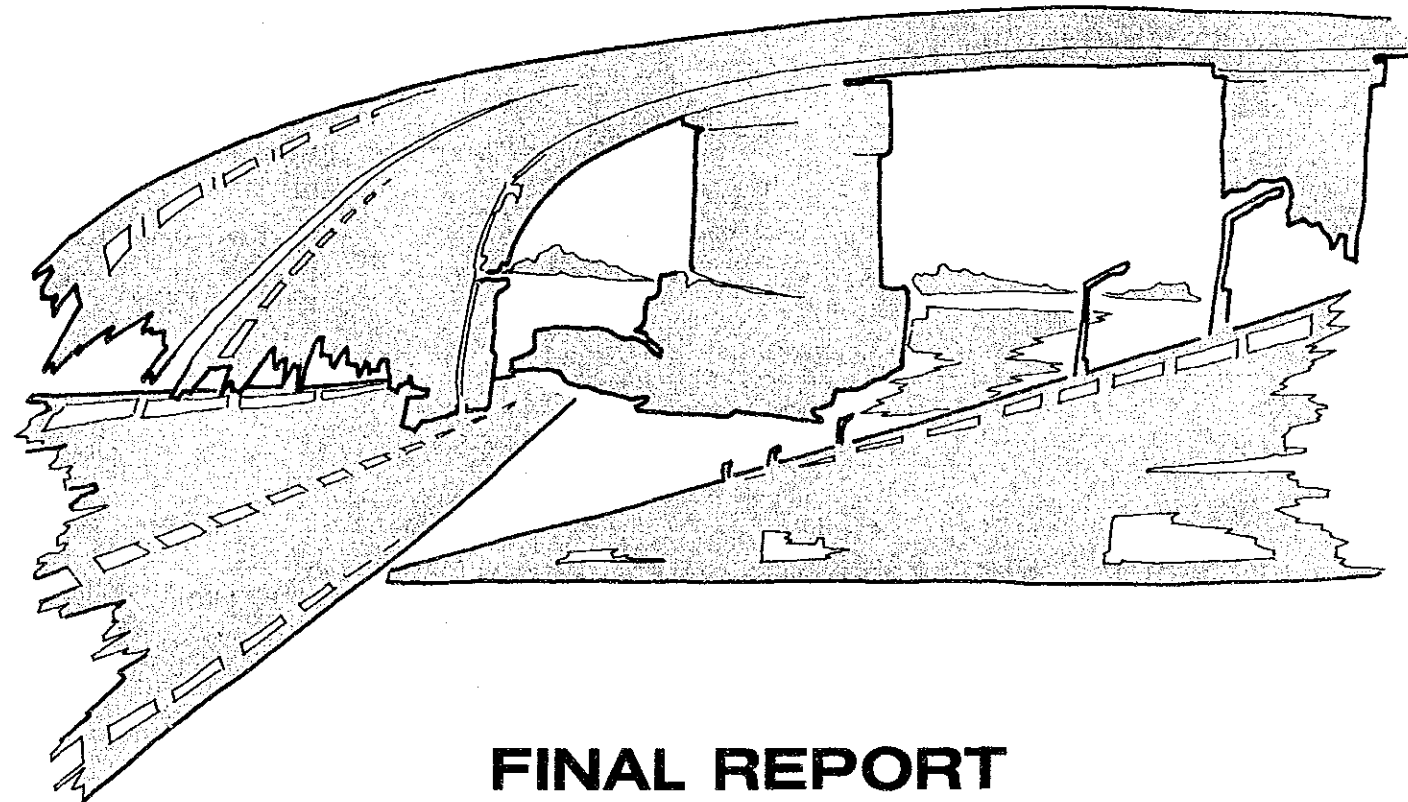




GOVERNMENT OF MALAYSIA
MALAYSIAN HIGHWAY AUTHORITY



STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS



FINAL REPORT

DRAWINGS

DECEMBER 1989

 JAPAN INTERNATIONAL COOPERATION AGENCY

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STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS

FINAL REPORT

DRAWINGS

DECEMBER 1989

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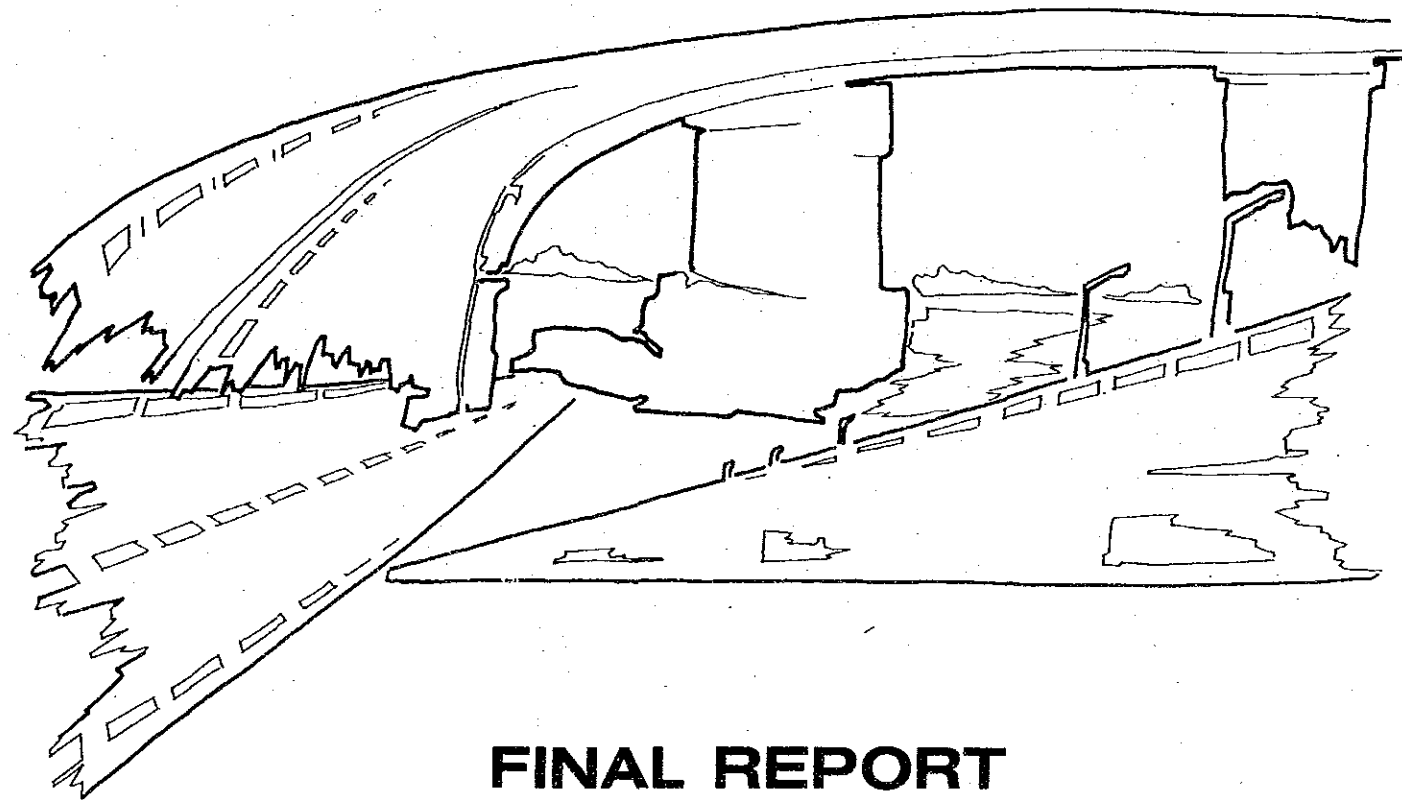
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**GOVERNMENT OF MALAYSIA
MALAYSIAN HIGHWAY AUTHORITY**

**STUDY ON TRAFFIC CONTROL AND
MANAGEMENT SYSTEM OF MALAYSIAN
EXPRESSWAYS AND TOLL HIGHWAYS**



FINAL REPORT

DRAWINGS

DECEMBER 1989

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団
〒100-8302 東京都千代田区千代田1-1-1

〒100-8302 東京都千代田区千代田1-1-1
国際協力事業団
〒100-8302 東京都千代田区千代田1-1-1



国際協力事業団

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2. Proposed Traffic Control and Management System Plan: Senai-Johor Bharu Highway
3. Proposed Traffic Control and Management System Plan: New Klang Valley Expressway
4. Proposed Traffic Control and Management System Plan: Federal Highway
5. Proposed Traffic Control and Management System Plan: Penang Bridge
6. Proposed Traffic Control and Management System Plan: Karak Highway

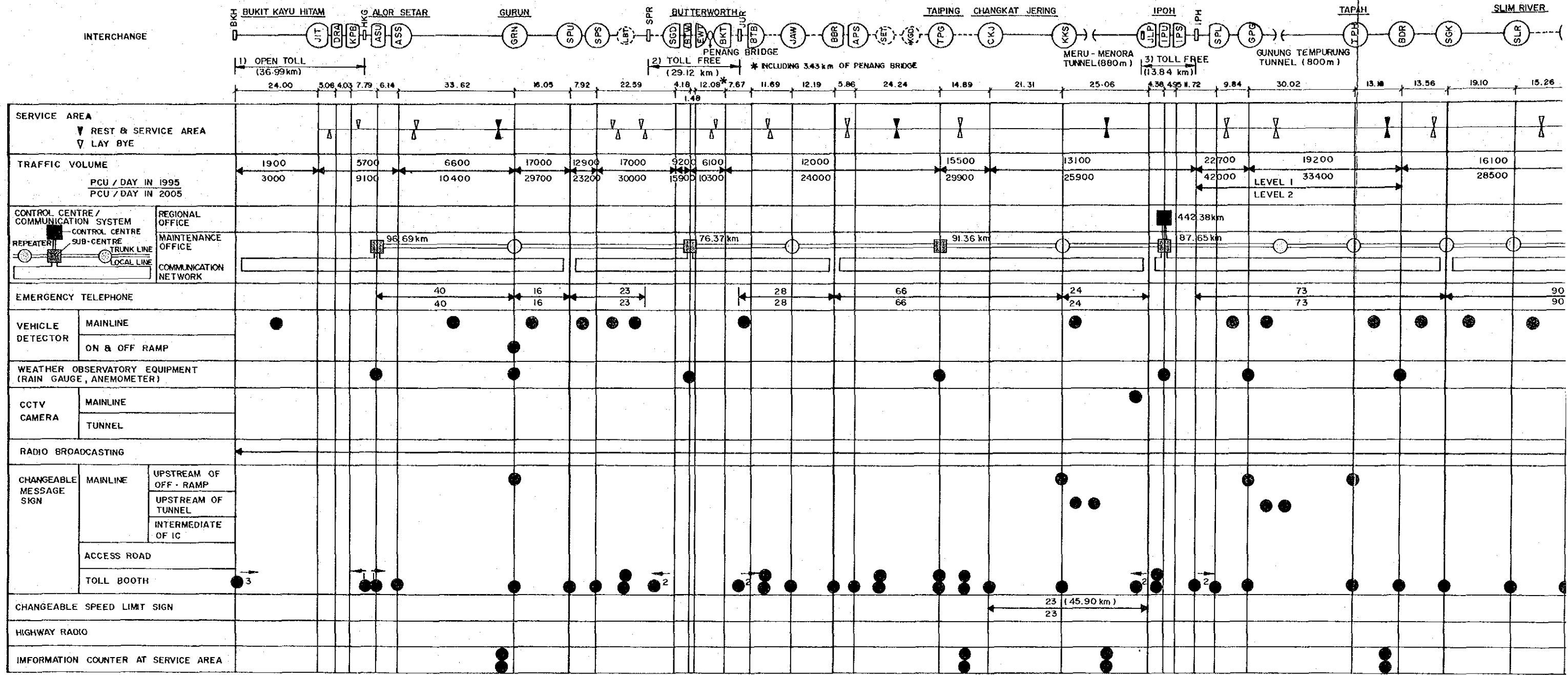
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5. Proposed Field Equipment Location on North-South Expressway (5/26)
6. Proposed Field Equipment Location on North-South Expressway (6/26)
7. Proposed Field Equipment Location on North-South Expressway (7/26)
8. Proposed Field Equipment Location on North-South Expressway (8/26)
9. Proposed Field Equipment Location on North-South Expressway (9/26)
10. Proposed Field Equipment Location on North-South Expressway (10/26)
11. Proposed Field Equipment Location on North-South Expressway (11/26)
12. Proposed Field Equipment Location on North-South Expressway (12/26)
13. Proposed Field Equipment Location on North-South Expressway (13/26)
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16. Proposed Field Equipment Location on North-South Expressway (16/26)
17. Proposed Field Equipment Location on North-South Expressway (17/26)
18. Proposed Field Equipment Location on North-South Expressway (18/26)
19. Proposed Field Equipment Location on North-South Expressway (19/26)
20. Proposed Field Equipment Location on North-South Expressway (20/26)
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22. Proposed Field Equipment Location on North-South Expressway (22/26)
23. Proposed Field Equipment Location on North-South Expressway (23/26)
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30. Communication Cable Installation Plan (7/12)
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39. Structure and Setting of Cable in Handhole
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42. Handhole

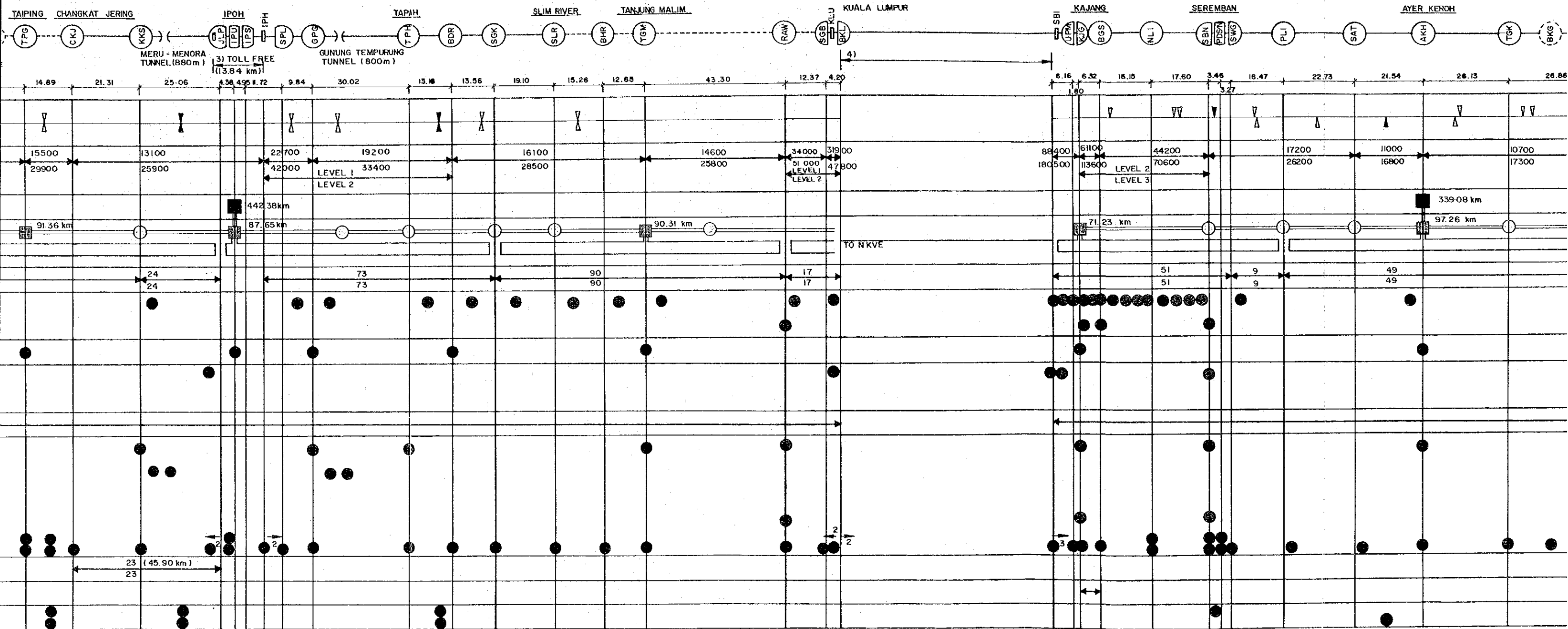
**A. PROPOSED TRAFFIC CONTROL
AND MANAGEMENT SYSTEM PLAN**



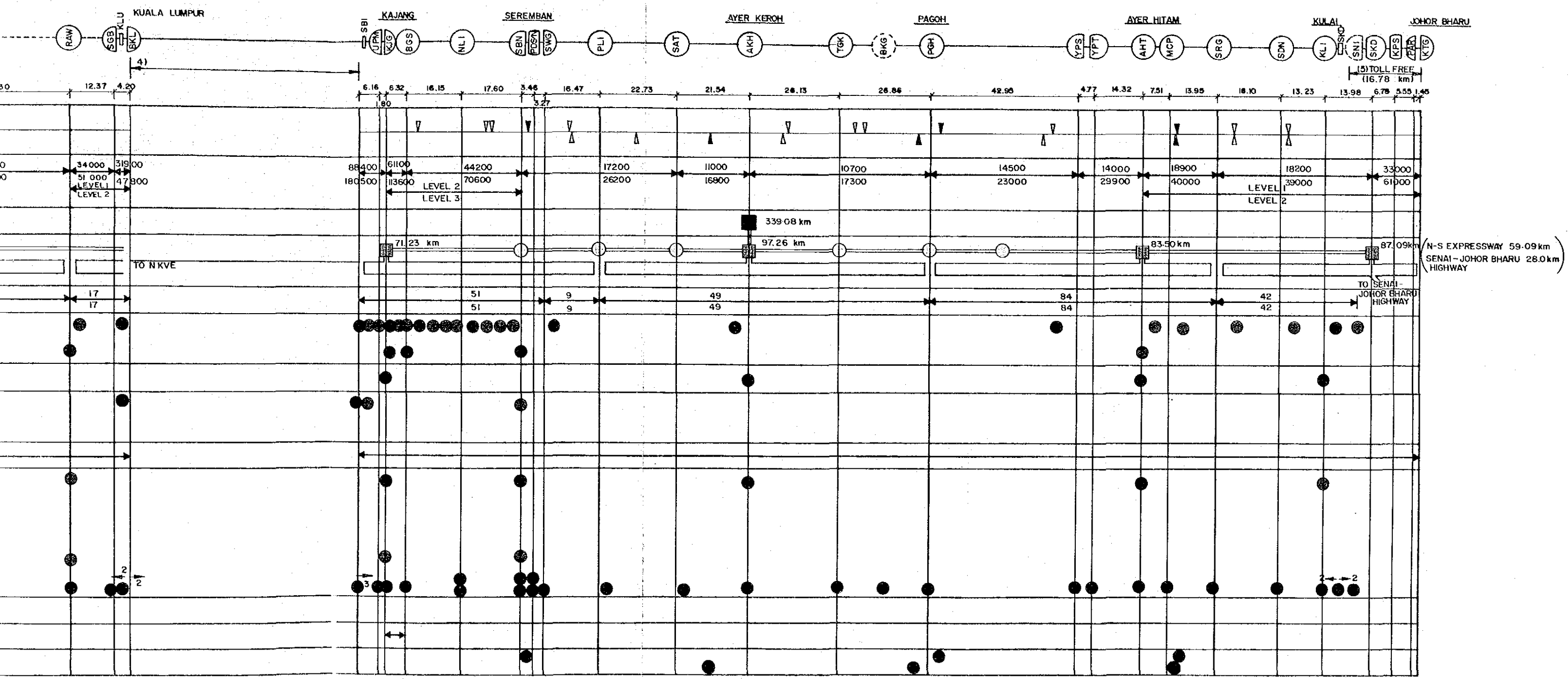
COLOR LEGEND

- STAGE 1
- STAGE 2
- STAGE 3

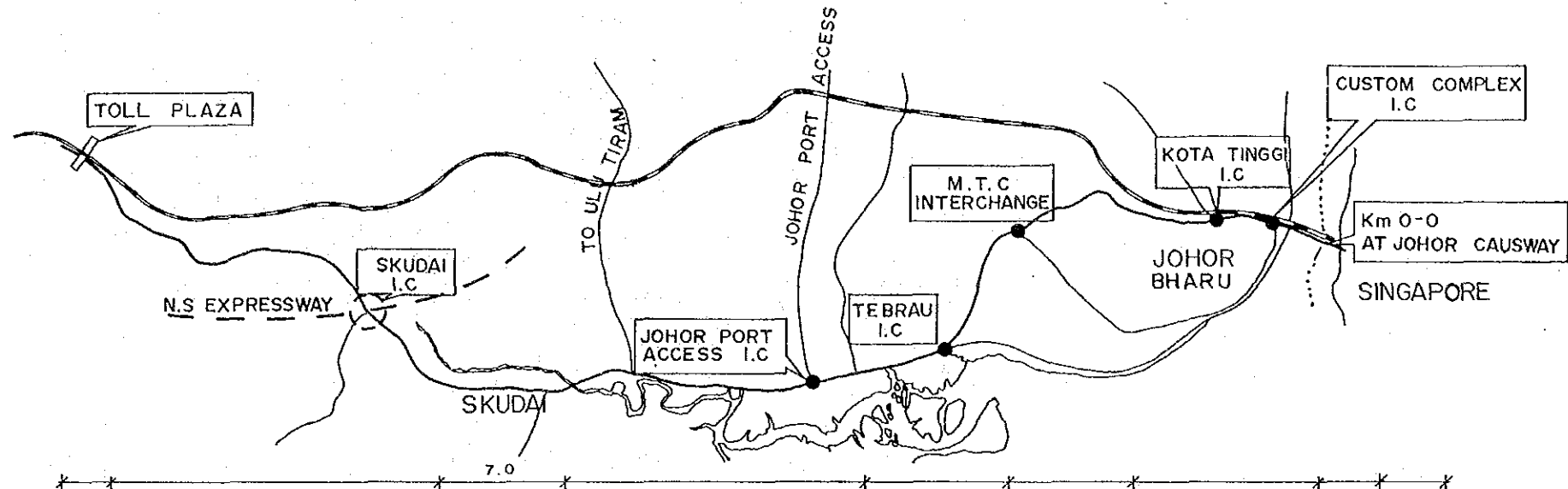
Proposed Traffic Control and Management System Installation Plan for North-South Expressway - 775 km



System Installation Plan for North-South Expressway - 775 km



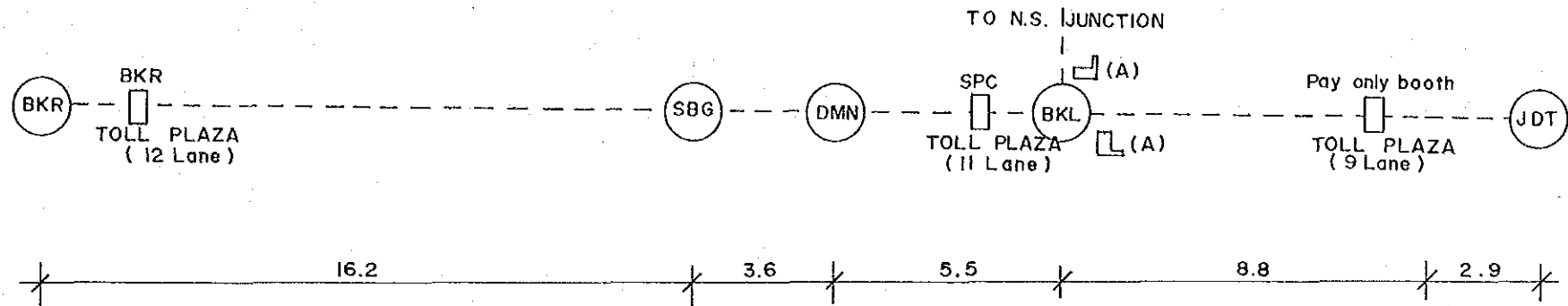
Proposed Traffic Control and Management System Installation Plan for Senai-Johor Bharu Highway - 28.0 km



SERVICE AREA									
TRAFFIC VOLUME									
PCU/DAY IN 1995					25200	Level I			
PCU/DAY IN 2005					40700	Level I			
Control Centre/ Communication System	Regional Office								
	Maintenance Office								
Communication System		To N-S Expressway							
Emergency Telephone									
Vehicle Detector	Mainline								
	On and Off - ramp								
Weather Observatory Equipment (Rain gauge, anemometer)									
CCTV Camera	Mainline								
	Tunnel								
Radio Broadcasting									
Changeable Message Sign	Mainline	Upstream of Off-ramp							
		Upstream of Tunnel							
		Intermediate of IC							
	Access Road								
Toll Booth (Type C)		● 2							● 3
Changeable Speed Limit Sign									
Highway Radio									
Information Counter at The Service Area									

COLOR LEGEND ● STAGE 1
 ● STAGE 2
 ⊗ STAGE 3

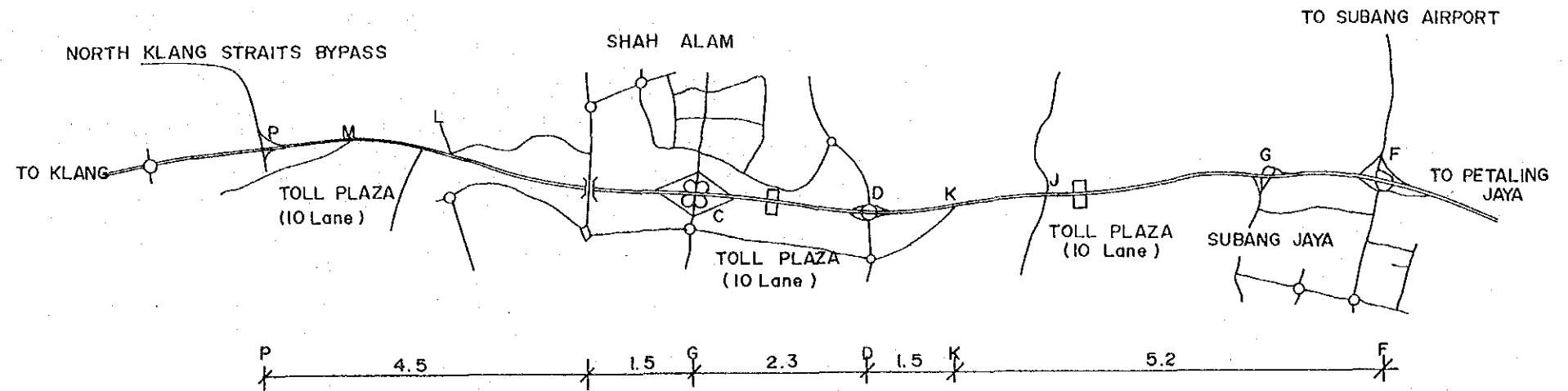
Proposed Traffic Control and Management System Installation Plan for New Klang Valley Expressway - 37.0 km



SERVICE AREA						
TRAFFIC VOLUME PCU/DAY IN 1995 PCU/DAY IN 2005			43 000 72 600	Level 2 Level 3	78 000 120 000	Level 3 Level 3
Control Centre/ Communication System Repeater Control Centre Sub centre Trunk Line Local Line	Regional Office					
	Maintenance Office Communication Network	To Federal Highway			To N-S Expressway	
Emergency Telephone			35 35			
Vehicle Detector	Mainline					
	On and Off - ramp	3		2	2	2
Weather Observatory Equipment (Rain gauge, anemometer)						
CCTV Camera	Mainline					
	Tunnel					
Radio Broadcasting						
Changeable Message Sign	Mainline (Type A)	Upstream of Off-ramp		2	3	
		Upstream of Tunnel				
		Intermediate of IC				
	Access Road (Type B)	3	2			3
	Toll Booth (Type C)	3	3	3	2	
Changeable Speed Limit Sign						
Highway Radio						
Information Counter at The Service Area						

COLOR LEGEND ● STAGE 1
● STAGE 2
● STAGE 3

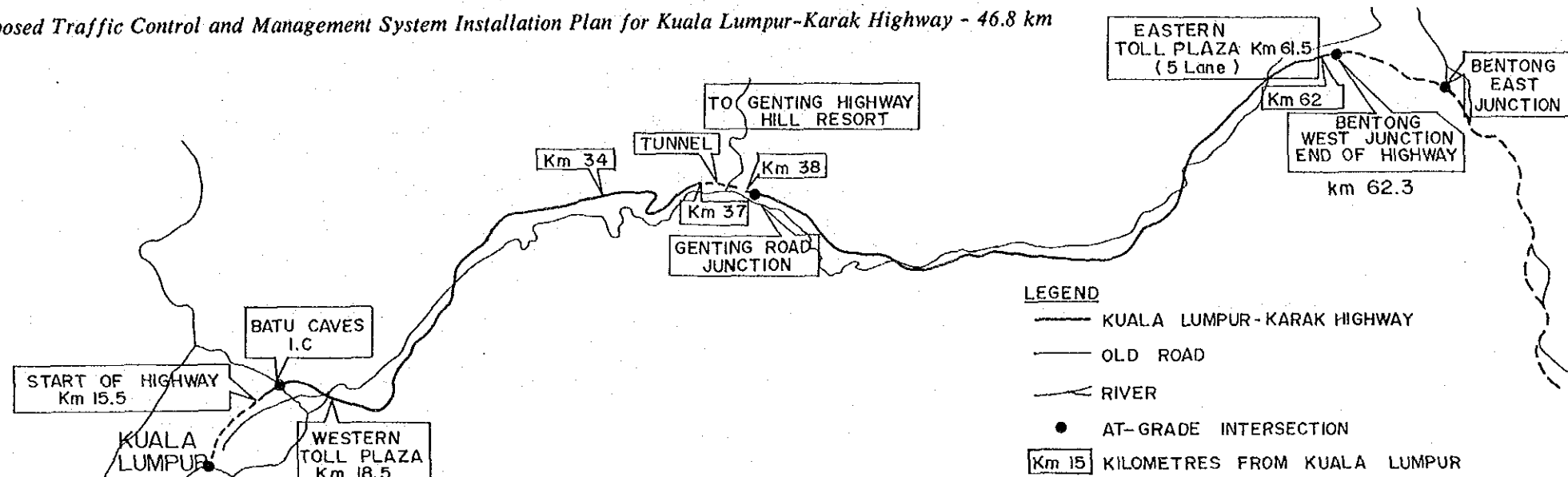
Proposed Traffic Control and Management System Installation Plan for Federal Highway 2 - 15.0 km



SERVICE AREA									
TRAFFIC VOLUME PCU/DAY IN 1995 PCU/DAY IN 2005				46 000 Level 1 70 600 Level 2				143 000 Level 1 190 000 Level 2	
Control Centre Communication System Repeater Control Centre Sub centre Trunk Line Local LVM		Regional Office Maintenance Office Communication Network		To New Klang Valley Expressway					
Emergency Telephone									
Vehicle Detector	Mainline			●	●			●	●
	On and Off - ramp								
Weather Observatory Equipment (Rain gauge, anemometer)									
CCTV Camera	Mainline								●
	Tunnel								
Radio Broadcasting									
Changeable Message Sign	Mainline (Type A)	Upstream of Off-ramp							
		Upstream of Tunnel							
		Intermediate of IC							
	Access Road (Type B)								
	Toll Booth (Type C)			● 3 3				● 3 3	
Changeable Speed Limit Sign									
Highway Radio									
Information Counter at The Service Area									

COLOR LEGEND ● STAGE 1
● STAGE 2
● STAGE 3

Proposed Traffic Control and Management System Installation Plan for Kuala Lumpur-Karak Highway - 46.8 km












SERVICE AREA		15.5	18.0	37.0	38.0	61.5	62.3
TRAFFIC VOLUME							
PCU/DAY IN 1995				22 800		Level 3	
PCU/DAY IN 2005				36 300		Level 3	
Control Centre/Communication System							
Regional Office							
Maintenance Office							
Communication Network						46.8 km	
Emergency Telephone				21	4	24	
Vehicle Defector	Mainline		●	●	●	●	
	On and Off-ramp						
Weather Observatory Equipment (Rain gauge, anemometer)						●	
CCTV Camera	Mainline		●	●	●		
	Tunnel				(X)(X)		
Radio Broadcasting							
Changeable Message Sign	Mainline (Type A)	Upstream of Off-ramp					
		Upstream of Tunnel			●	●	
		Intermediate of IC					
	Access Road (Type B)						
	Toll Booth (Type C)		●			●	
Changeable Speed Limit Sign							
Highway Radio							
Information Counter at The Service Area							





COLOR LEGEND ● STAGE 1
 ● STAGE 2
 ⊙ STAGE 3

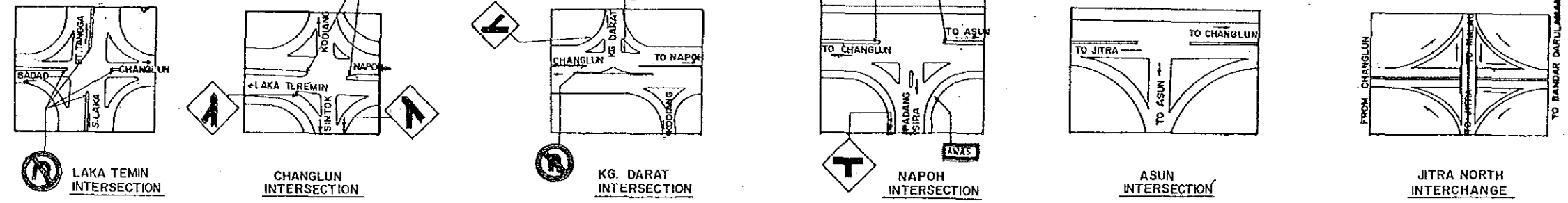
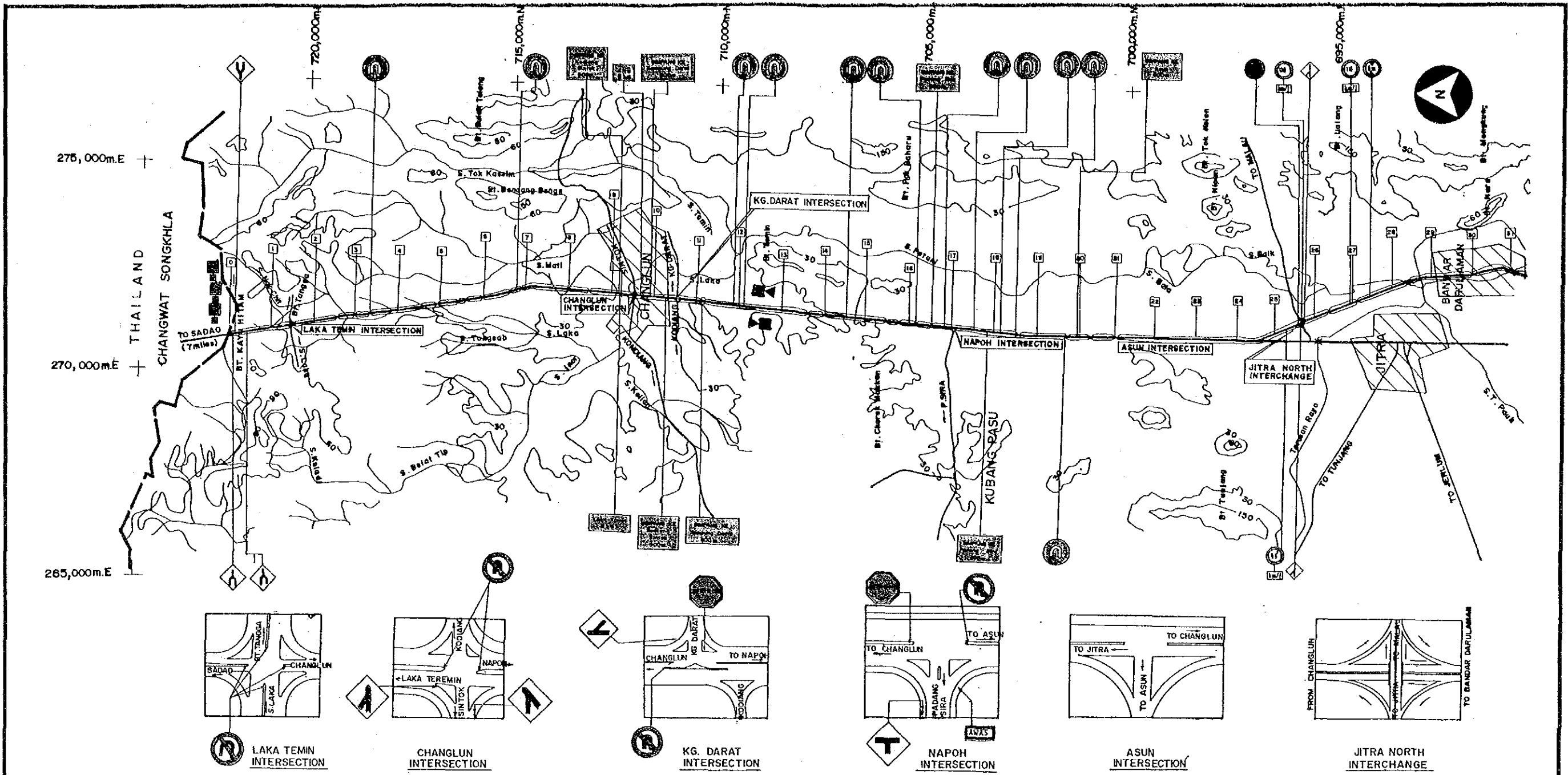
B. PROPOSED FIELD EQUIPMENT LOCATION MAP

LEGEND :

- | | |
|--|---|
|  EMERGENCY TELEPHONE |  CHANGEABLE MESSAGE SIGN
(Main Line) |
|  VEHICLE DETECTOR |  CHANGEABLE MESSAGE SIGN
(Toll Booth) |
|  INFORMATION COUNTER AT
SERVICE AREA |  CHANGEABLE SPEED LIMIT SIGN |
|  WEATHER OBSERVATORY
EQUIPMENT |  HIGHWAY RADIO |
|  CCTV CAMERA | |

STAGE :

- | |
|--|
|  STAGE 1 : IMMEDIATE |
|  STAGE 2 : 1990 - 1995 |
|  STAGE 3 : 1996 - 2005 |
|  EXISTING |



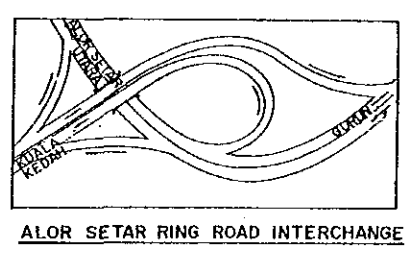
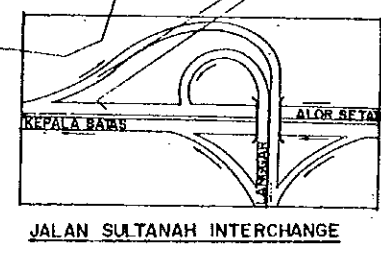
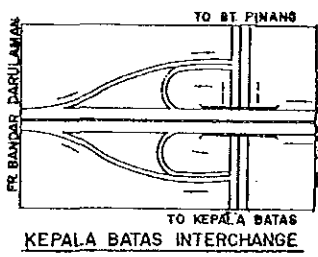
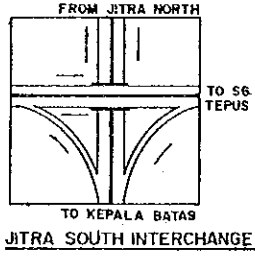
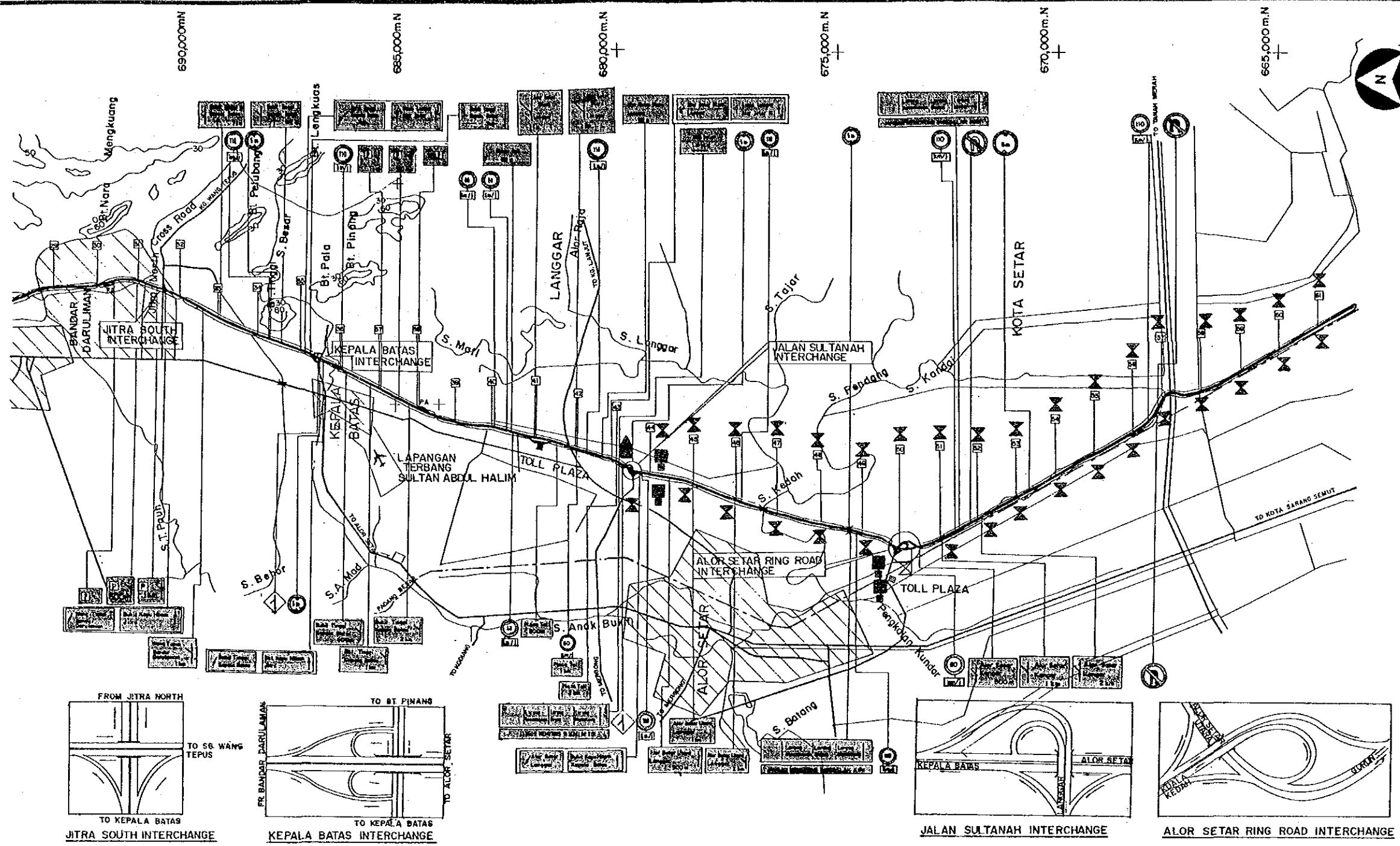
HORIZONTAL ALIGNMENT (M)																														
VERTICAL ALIGNMENT (M)																														
EMBANKMENT (+M) / CUT (-M)	0.15	0.10	-1.85	1.10	0.80	0.30	1.10	1.45	0.10	0.10	1.25	-0.10	0.10	0.10	0.15	2.10	0.10	0.80	0.45	0.10	-2.00	-1.34	-0.30	0.65	0.25	1.37	1.16	-7.00	2.10	1.42
FINISHED LEVEL (M)	89.00	89.07	82.70	40.02	38.64	36.05	34.24	33.15	30.14	32.45	23.25	24.06	25.55	22.09	27.00	33.68	29.42	19.33	18.54	19.52	16.51	19.98	13.55	19.55	23.40	20.87	20.51	16.73	9.73	10.17
KM POST	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (1/26)

SCALE:

 500 1000 2000 metres
 DRAWING NO: B1
 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY

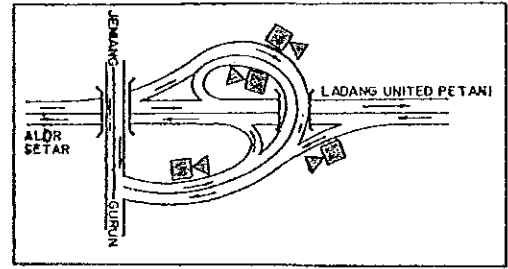
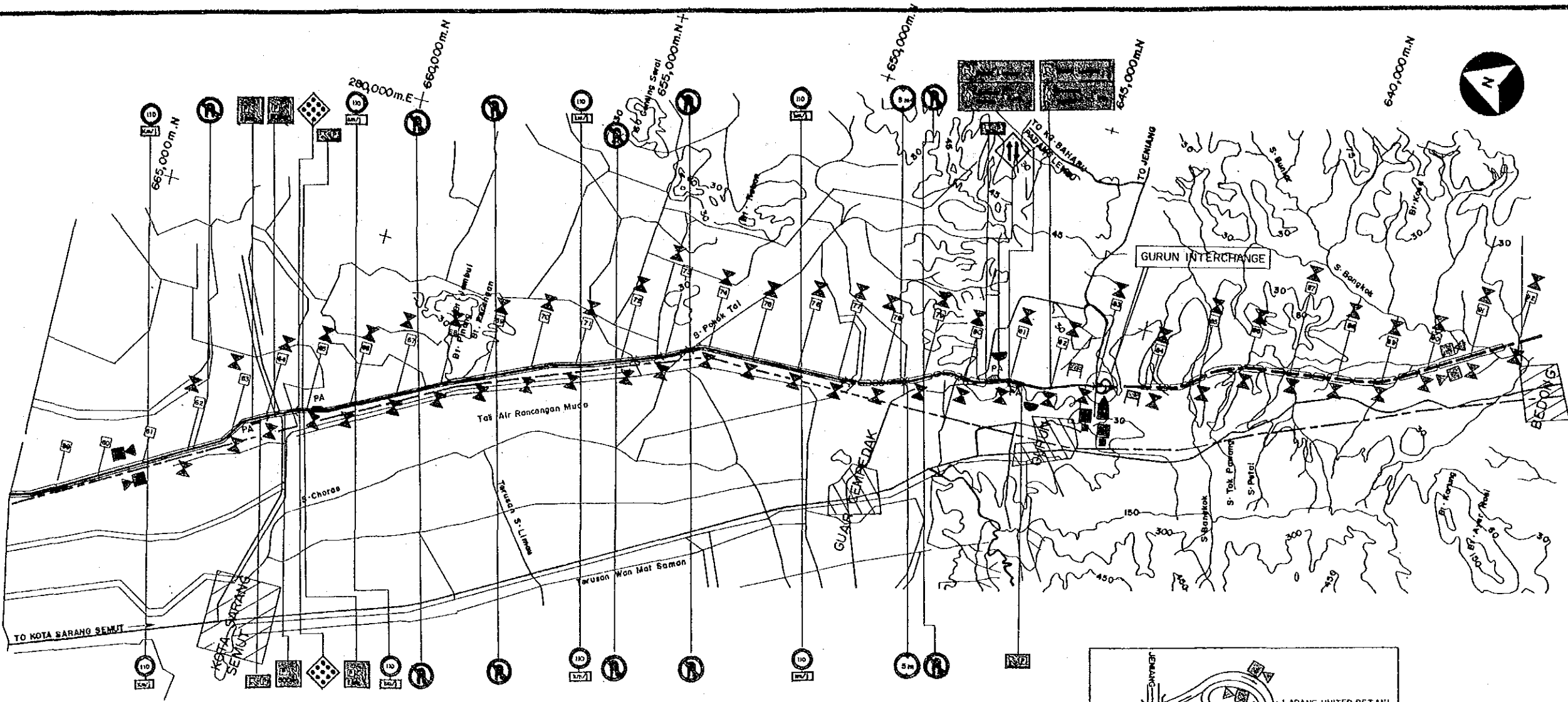


HORIZONTAL ALIGNMENT (M)	A=337.5 R=1500 A=324.0 R=1500 A=324.0 R=6000 R=3500 R=4000 A=345.0 R=1700 A=342.0 R=1300 A=342.0 R=700 A=313.0 R=700 A=335.4 R=1500 A=335.4 R=1500 A=318.2 R=750 A=318.2 R=900 A=318.2
VERTICAL ALIGNMENT (M)	30.080 30.010 30.730 31.310 31.810 32.430 33.130 34.080 34.730 35.200 35.900 36.800 37.880 38.900 39.770 40.620 41.440 42.130 42.700 43.160 43.520 43.800 44.000 44.130 44.200 44.230 44.260 44.280 44.300 44.310 44.320 44.330 44.340 44.350 44.360 44.370 44.380 44.390 44.400 44.410 44.420 44.430 44.440 44.450 44.460 44.470 44.480 44.490 44.500 44.510 44.520 44.530 44.540 44.550 44.560 44.570 44.580 44.590 44.600 44.610 44.620 44.630 44.640 44.650 44.660 44.670 44.680 44.690 44.700 44.710 44.720 44.730 44.740 44.750 44.760 44.770 44.780 44.790 44.800 44.810 44.820 44.830 44.840 44.850 44.860 44.870 44.880 44.890 44.900 44.910 44.920 44.930 44.940 44.950 44.960 44.970 44.980 44.990 45.000 45.010 45.020 45.030 45.040 45.050 45.060 45.070 45.080 45.090 45.100 45.110 45.120 45.130 45.140 45.150 45.160 45.170 45.180 45.190 45.200 45.210 45.220 45.230 45.240 45.250 45.260 45.270 45.280 45.290 45.300 45.310 45.320 45.330 45.340 45.350 45.360 45.370 45.380 45.390 45.400 45.410 45.420 45.430 45.440 45.450 45.460 45.470 45.480 45.490 45.500 45.510 45.520 45.530 45.540 45.550 45.560 45.570 45.580 45.590 45.600
EMBANKMENT (+M) / CUT (-M)	4.32 -1.24 -3.24 8.06 -0.24 2.07 2.03 2.88 2.84 2.00 1.25 2.24 1.25 3.53 1.78 1.78 5.20 2.81 1.82 1.2 1.8 5.80 2.80 1.60 1.70 1.80 1.80 1.80 4.00 0.80 4.70 1.80
FINISHED LEVEL (M)	12.17 12.51 12.20 12.86 7.29 8.59 7.63 8.38 8.04 5.80 5.40 5.58 5.08 7.46 4.03 3.88 7.42 3.71 3.02 2.8 3.90 7.3 4.80 3.90 3.90 3.90 3.90 6.10 6.42 6.90 4.10
KM POST	29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (2/26)

SCALE: 1:1000
 0 500 1000 2000 metres
 DRAWING NO: B2
 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



GURUN INTERCHANGE

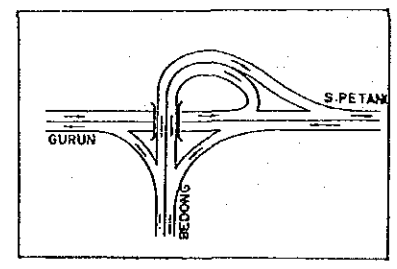
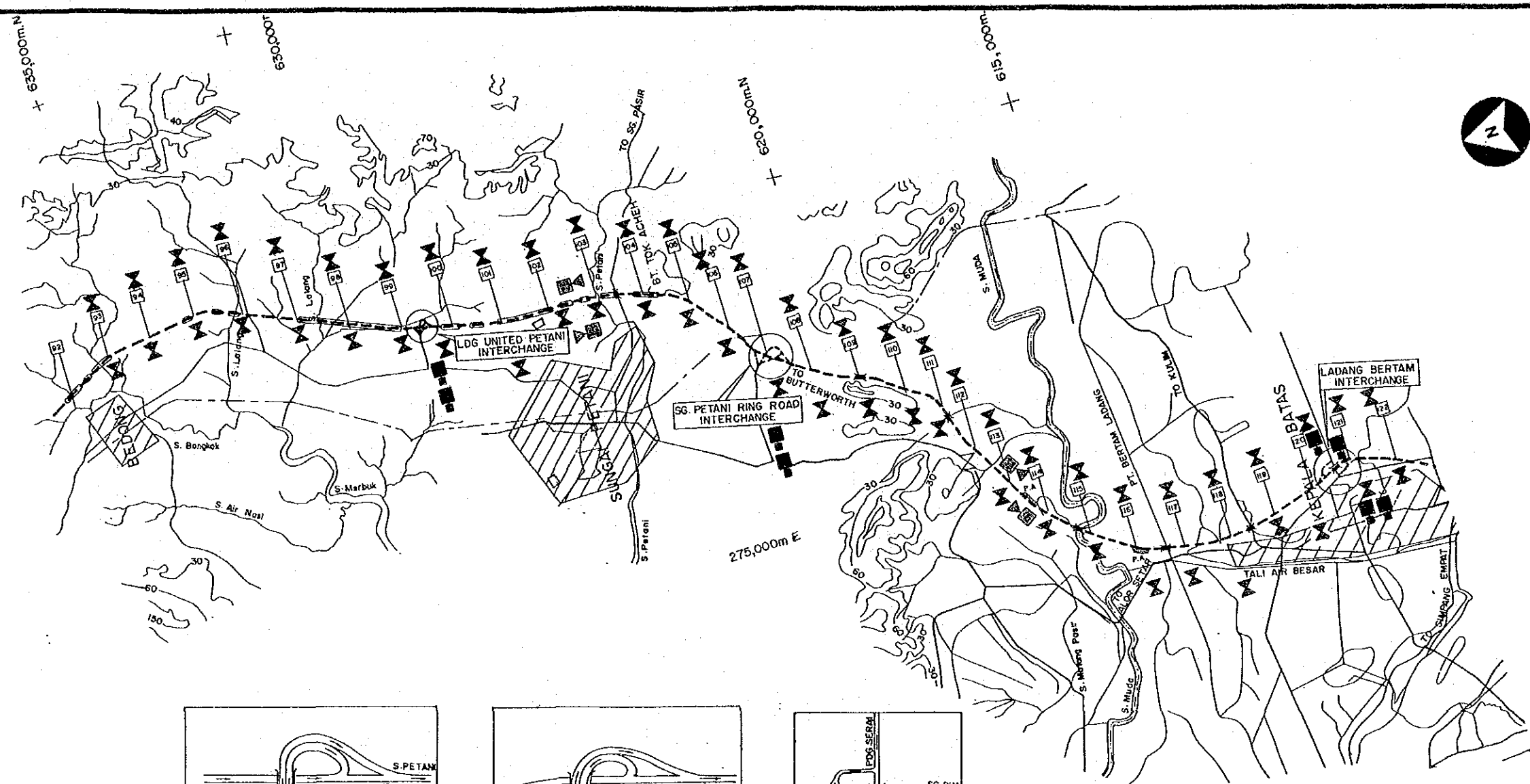
HORIZONTAL ALIGNMENT (M)	A=374.17 R=2000		A=374.17 R=3000		R=8000		R=900		-318.23 A=1.23		A=307.41 R=700		A=418.33 R=2000		A=418.33 R=2000		A=374.0 R=2000		A=374.0 R=3000											
VERTICAL ALIGNMENT (M)																														
EMBANKMENT (+M)/CUT (-)	1.70	2.10	1.90	1.90	4.20	1.73	2.70	2.90		1.90	2.40	2.48	27.0	1.90	1.90	1.90	2.90	8.90	33.60	-4.75		0.90	7.74	8.90	3.78	4.31	4.90	1.85	2.78	
FINISHED LEVEL (M)	4.2	4.05	4.20	4.20	7.00	4.38	5.30	4.80		4.80	5.30	5.93	3.50	5.75	5.70	5.70	8.80	18.40	22.00	11.25		40.40	35.74	30.66	21.56	20.45	14.52	10.99	13.30	
KM POST	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	83	84	85	86	87	88	89	90	91

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (3/26)

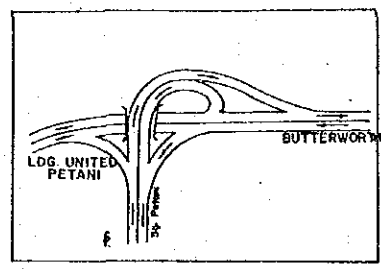
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 DRAWING NO: B3
 DATE: DEC 1989

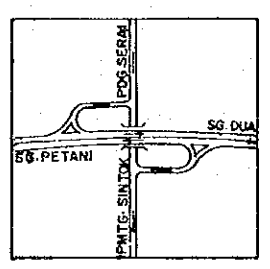
STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



LADANG UNITED PETANI INTERCHANGE



SG. PETANI RING ROAD INTERCHANGE



LADANG BERTAM INTERCHANGE

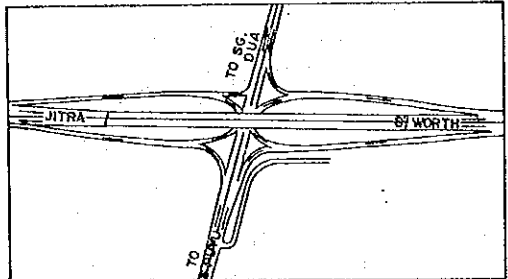
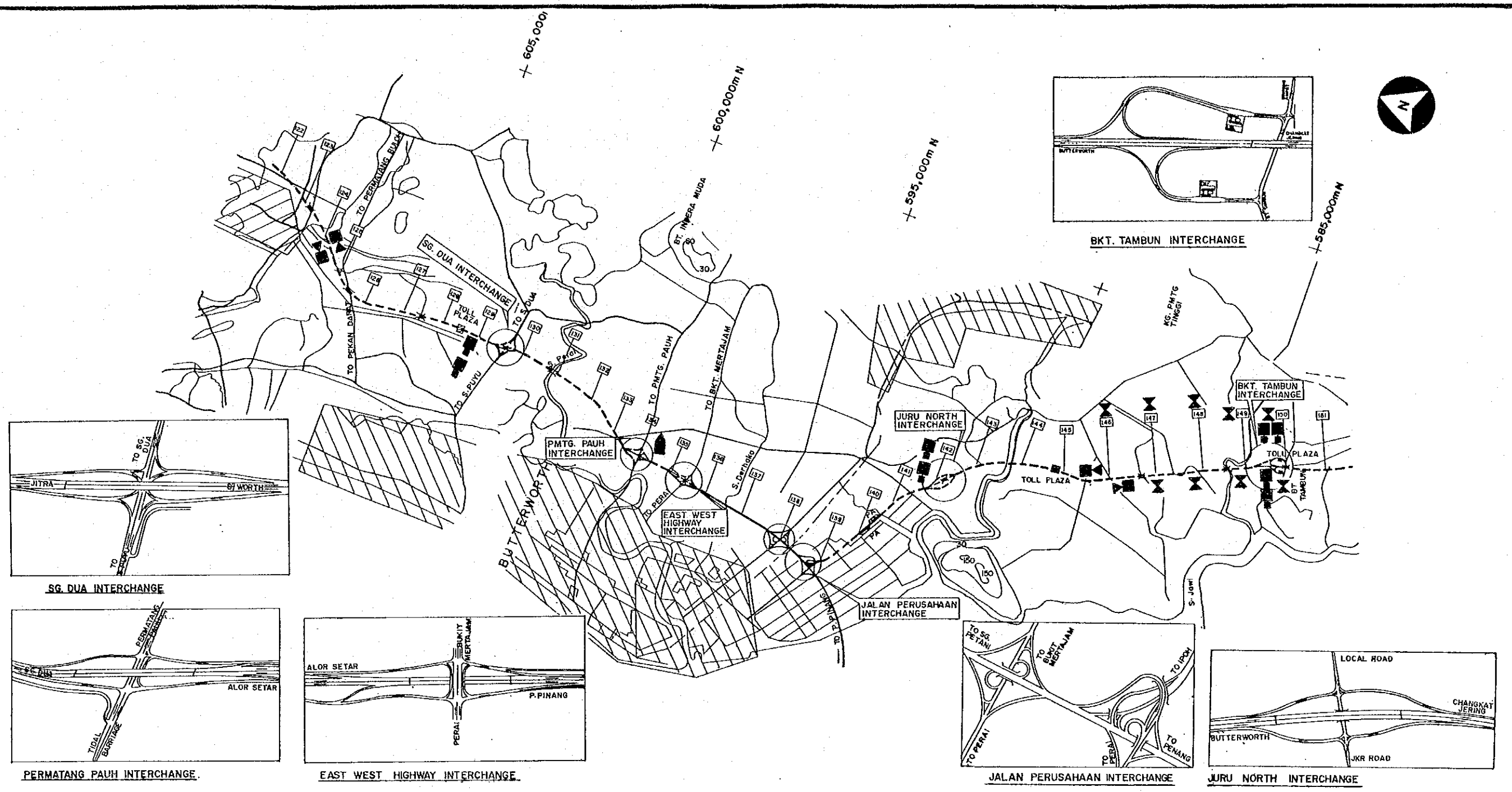
HORIZONTAL ALIGNMENT (M)																															
VERTICAL ALIGNMENT (M)																															
EMBANKMENT (+M)/CUT (-M)	<p>2.75 2.32 -1.20 -1.25 -3.30 -3.00 -0.75 0.30 1.10 2.70 1.25 3.60 -2.65 3.10 1.80 1.0 1.0 4.10</p>																														
FINISHED LEVEL (M)	<p>12.50 7.44 6.31 12.02 12.73 8.42 4.30 4.52 3.35 13.78 20.30 22.59 7.3 6.90 20.35 18.35 .66 10.58</p>																														
KM POST	91	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

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (4/26)

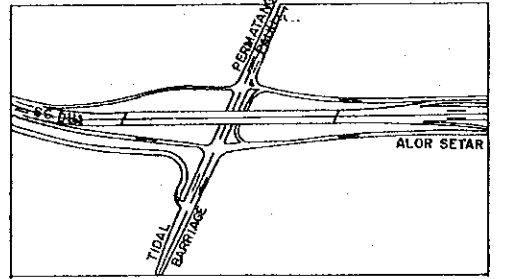
SCALE:

 DRAWING NO: B4
 DATE: DEC 1989

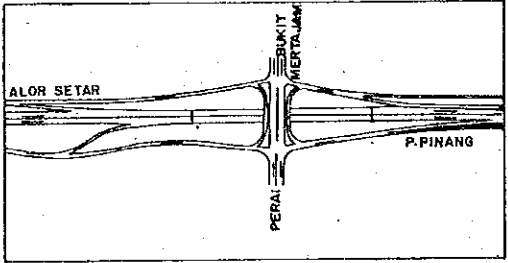
STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



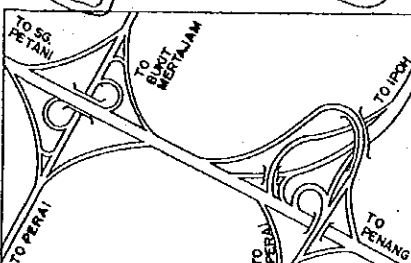
SG. DUA INTERCHANGE



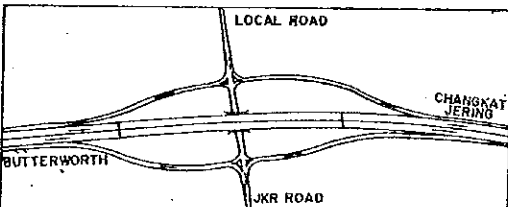
PERMATANG PAUH INTERCHANGE



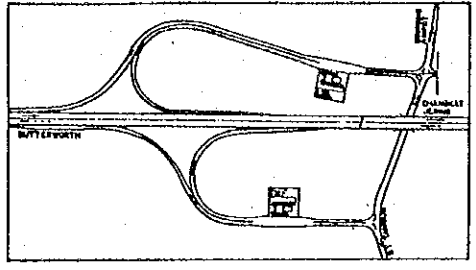
EAST WEST HIGHWAY INTERCHANGE



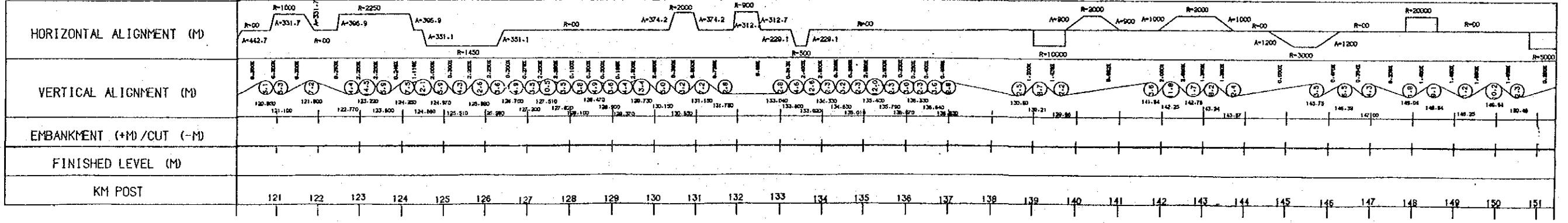
JALAN PERUSAHAAN INTERCHANGE



JURU NORTH INTERCHANGE



BKT. TAMBUN INTERCHANGE



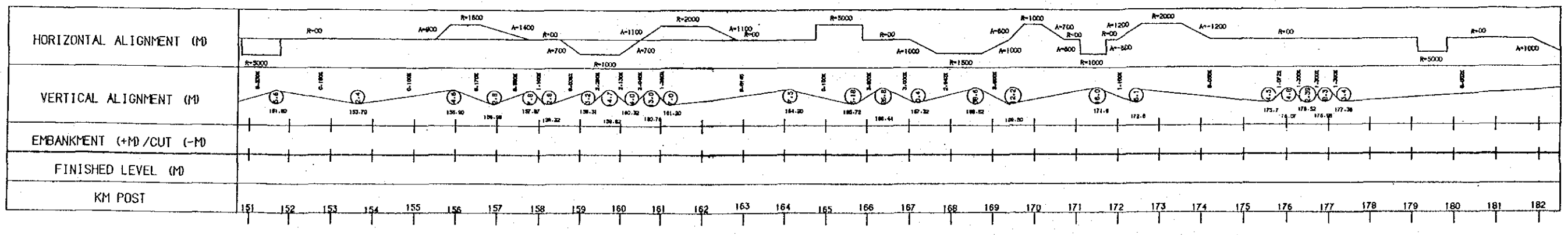
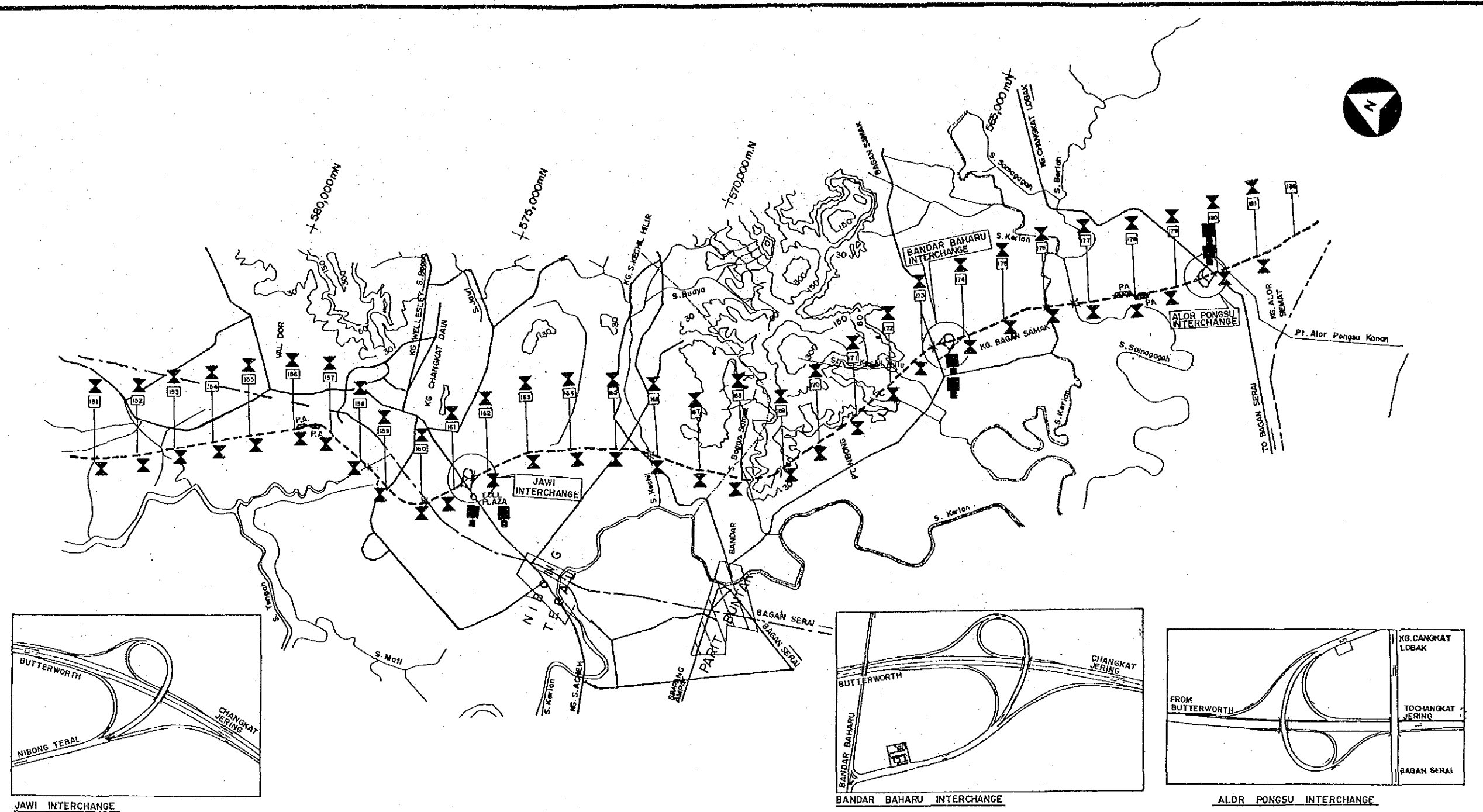
PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (5/26)

SCALE:

 500 1000 2000
 metres

DRAWING NO: B5
 DATE: DEC 1989

**STUDY ON TRAFFIC CONTROL AND
 MANAGEMENT SYSTEM OF MALAYSIAN
 EXPRESSWAYS AND TOLL HIGHWAYS**
 JAPAN INTERNATIONAL COOPERATION AGENCY

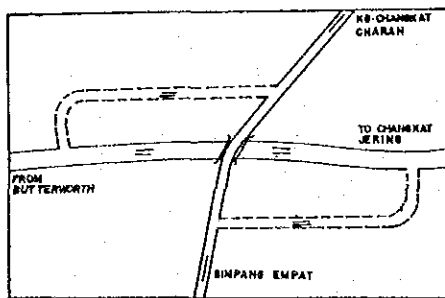
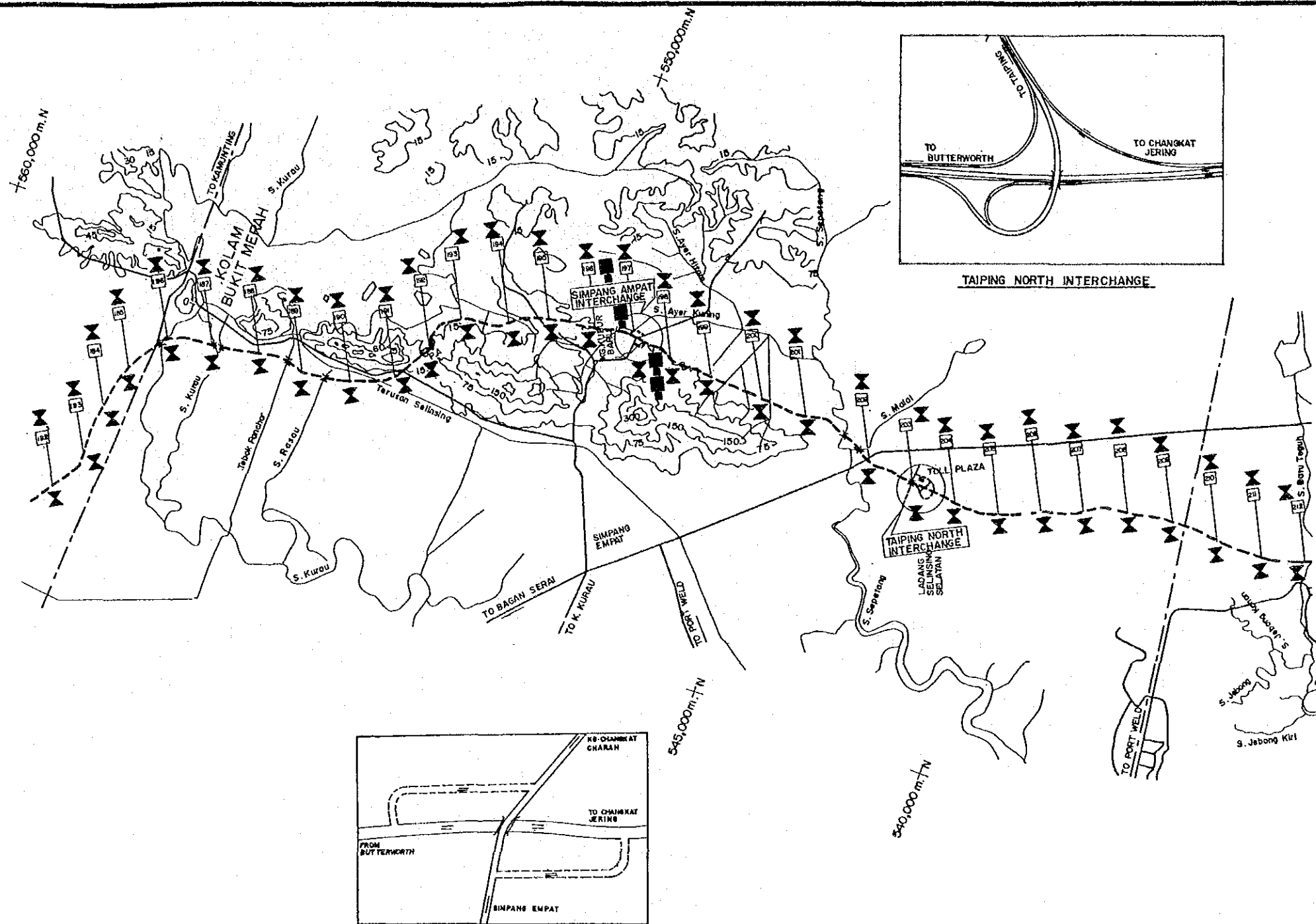


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (6/26)

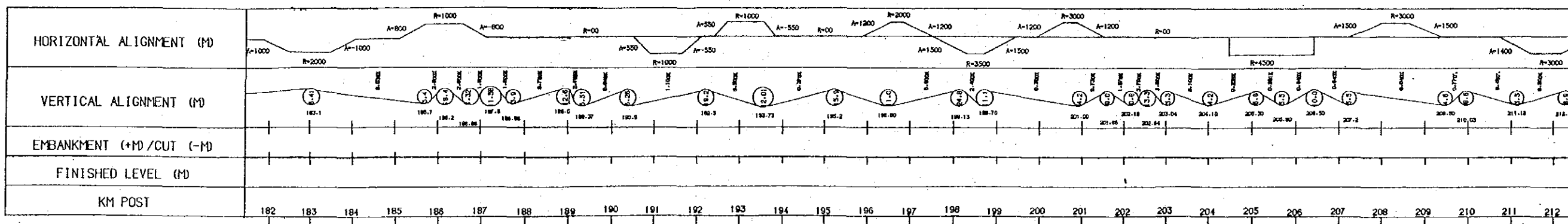
SCALE: 1:1000
 0 500 1000 2000 METRES

DRAWING NO: B6
 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



SIMPANG EMPAT INTERCHANGE

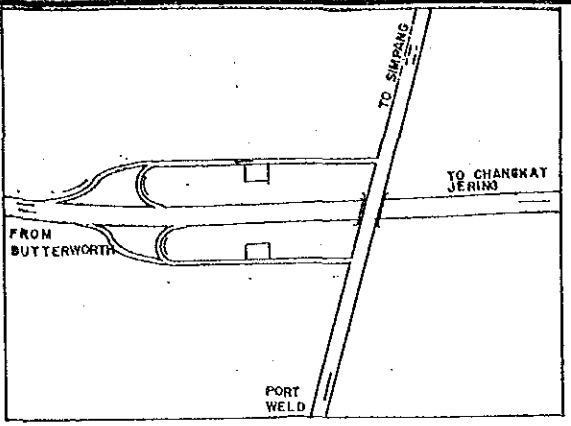


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (7/26)

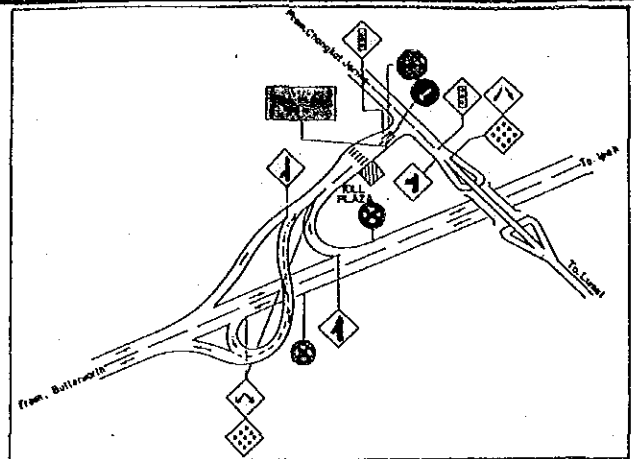
SCALE:

 DRAWING NO: B7
 DATE: DEC 1989

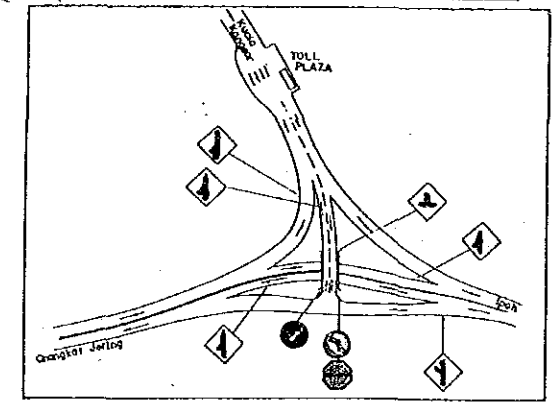
**STUDY ON TRAFFIC CONTROL AND
 MANAGEMENT SYSTEM OF MALAYSIAN
 EXPRESSWAYS AND TOLL HIGHWAYS**
 JAPAN INTERNATIONAL COOPERATION AGENCY



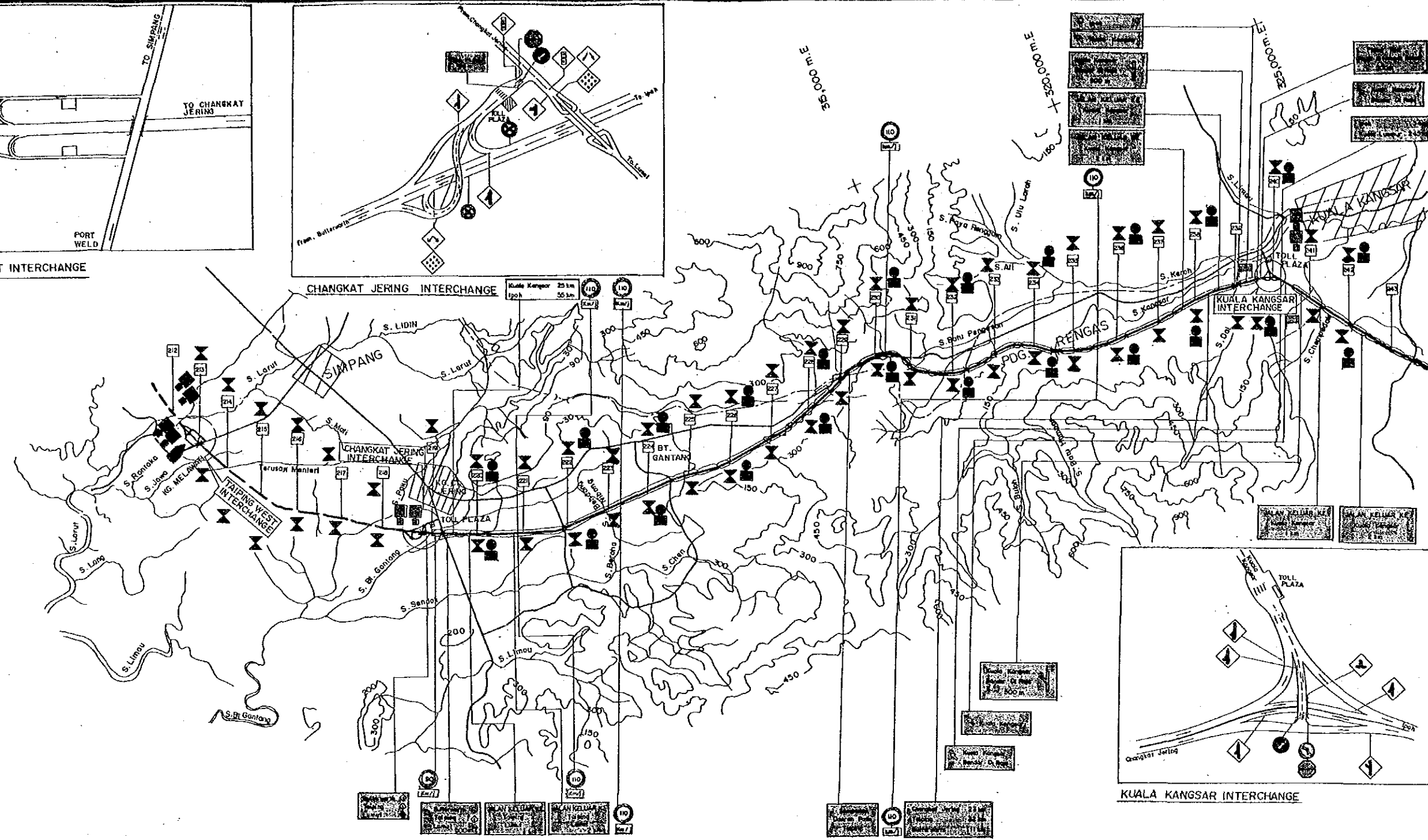
TAIPING WEST INTERCHANGE



CHANGKAT JERING INTERCHANGE



KUALA KANGSAR INTERCHANGE



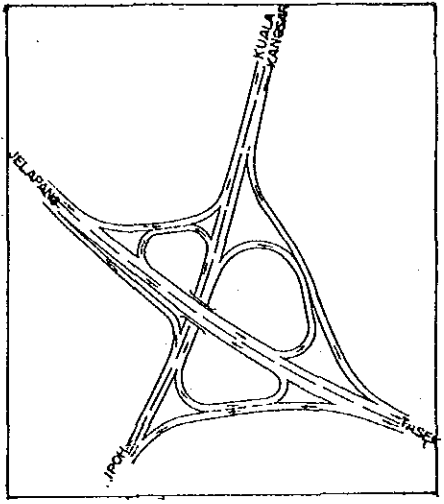
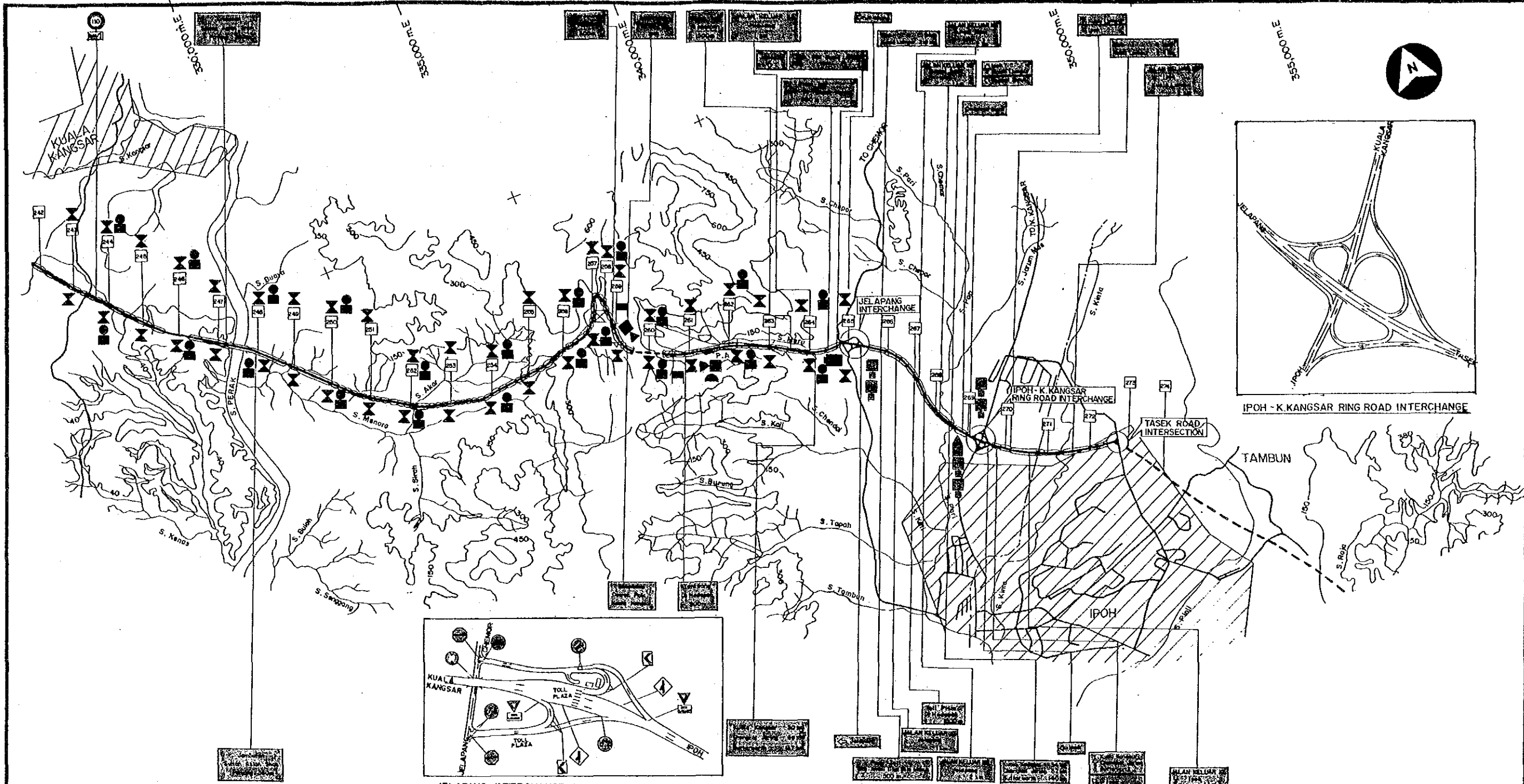
HORIZONTAL ALIGNMENT (M)																						
VERTICAL ALIGNMENT (M)																						
EMBANKMENT (+M)/CUT (-M)	1.80, 2.44, 2.74, 2.44, 2.44, 1.83, 6.20, 1.82, -1.72, -3.05, 1.22, -3.66, 6.10, 2.80, 3.66, 1.52, 4.27, -9.45, -2.03, 6.40, -1.92, 7.08, -1.8, 1.83																					
FINISHED LEVEL (M)	12.61, 14.60, 17.42, 20.12, 23.76, 28.05, 38.63, 44.21, 66.85, 80.72, 129.88, 101.60, 93.90, 85.98, 79.89, 70.52, 68.00, 66.78, 59.36, 55.71, 59.14, 56.60, 53.40, 64.20																					
KM POST	212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242																					

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (8/26)

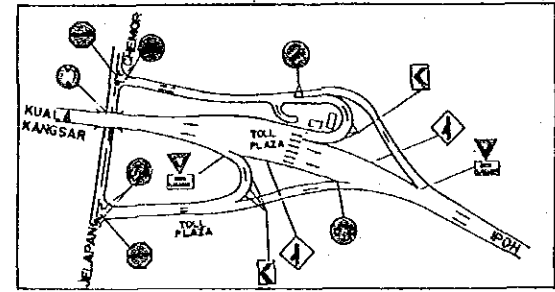
SCALE: 1:1000

 DRAWING NO: B8
 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



IPOH - K. KANGSAR RING ROAD INTERCHANGE



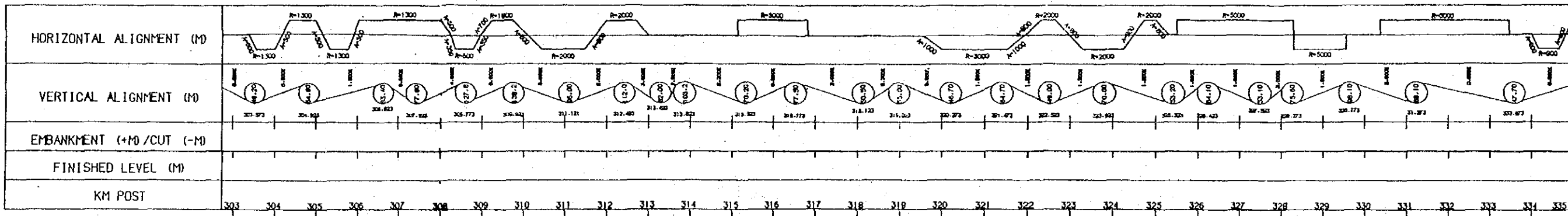
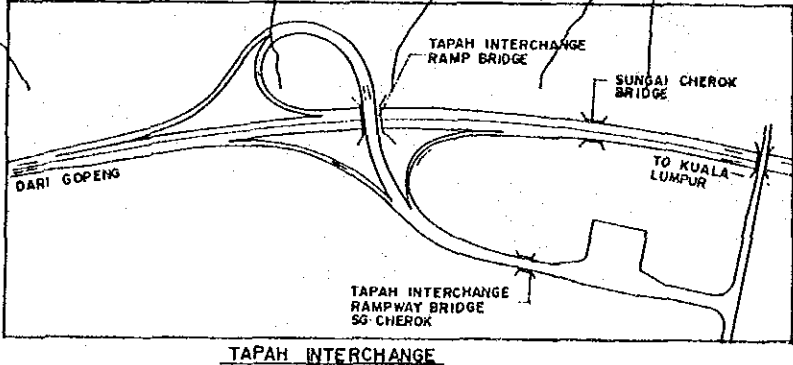
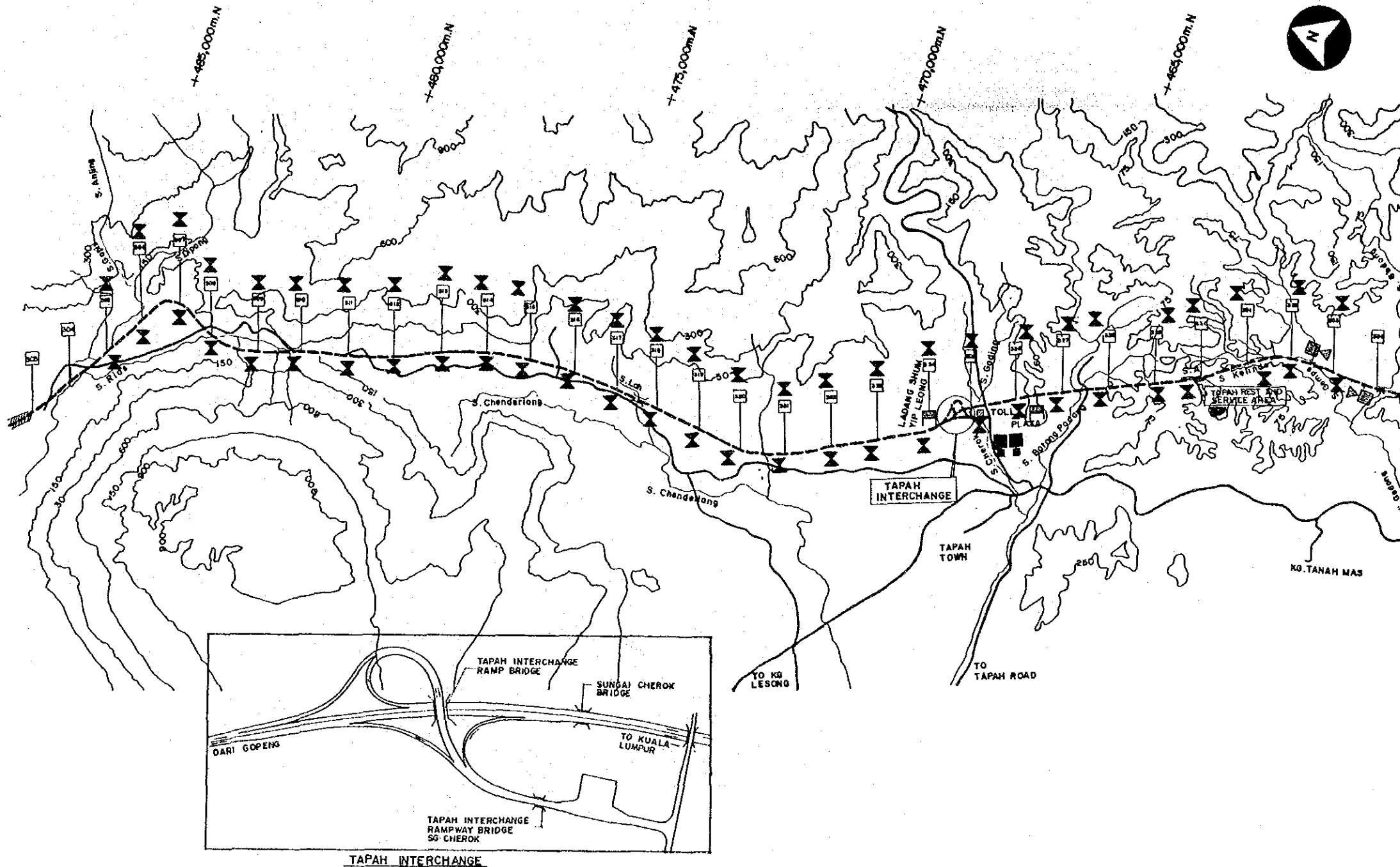
JELAPANG INTERCHANGE

HORIZONTAL ALIGNMENT (M)	R=2505.3 R=2298.8 R=1822.3 R=1636.6 R=915.0 R=3081.0 R=782.0 R=180.0 R=1828 R=213 R=808 R=407.0 R=219.0 R=60 R=57 R=457 R=27 R=256 R=488 R=213 R=145 R=122.0 R=182.0 R=122.0
VERTICAL ALIGNMENT (M)	Vertical curve symbols and labels along the alignment.
EMBANKMENT (+M)/CUT (-M)	1.33 -1.4 -0.62 6.05 0.8-30 -9.80 -7.76 -10.2 -6.02 -10.0 -2.82 -6.40 1.00 -23.20 7.03 11.90 14.06 3.50 18.90 5.13 -19.20 -10.40 -16.70 0.90 6.61 -4.27 -1.66 6.42 4.88 7.71
FINISHED LEVEL (M)	64.20 62.20 51.60 49.80 48.81-40 47.20 42.21 67.10 61.80 77.20 82.20 75.00 101.80 143.60 192.00 245.60 275.50 303.80 307.10 287.00 306.60 186.00 106.60 76.80 87.40 66.50 65.3 69.70 66.72 51.18 65.61
KM POST	232 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (9/26)

SCALE:
1000 0 2000
500 1000 metres
DRAWING NO: B9
DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
JAPAN INTERNATIONAL COOPERATION AGENCY

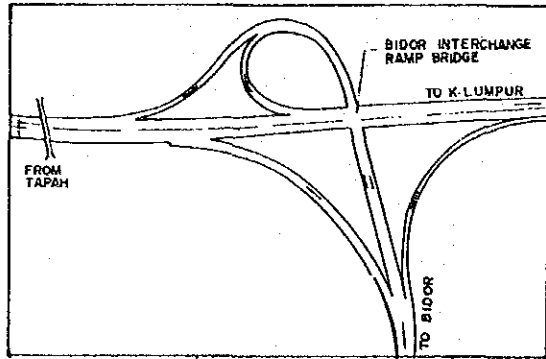
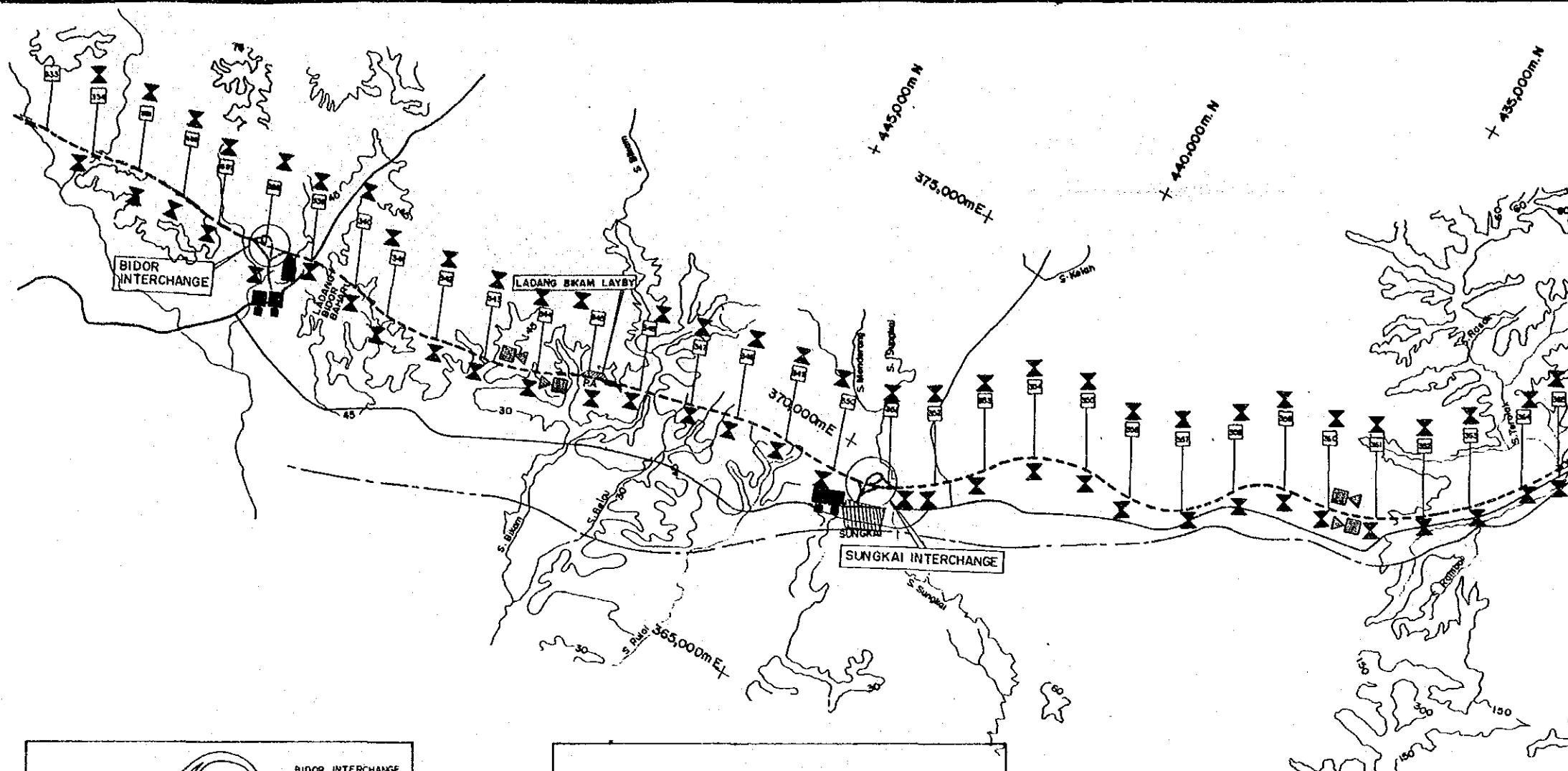


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (11/26)

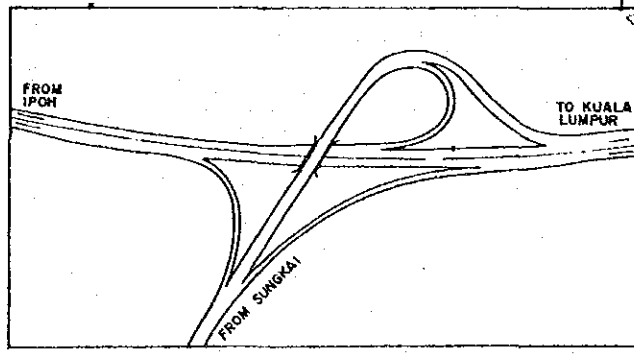
SCALE:

 DRAWING NO: B11
 DATE: DEC 1989

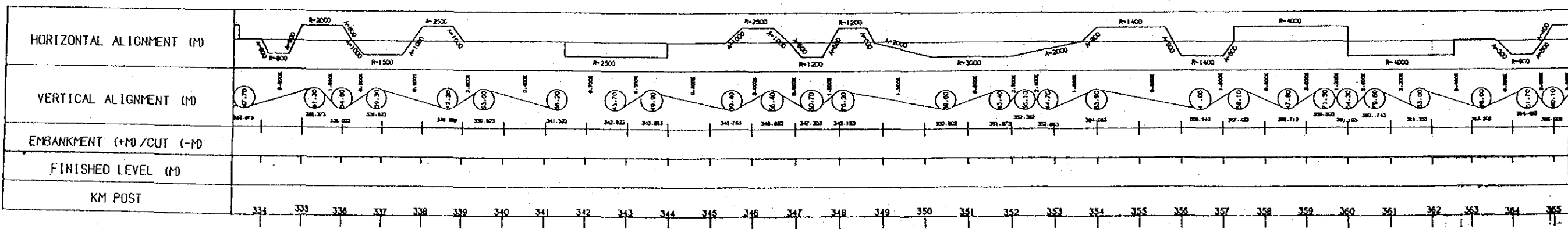
STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



BIDOR INTERCHANGE



SUNGKAI INTERCHANGE

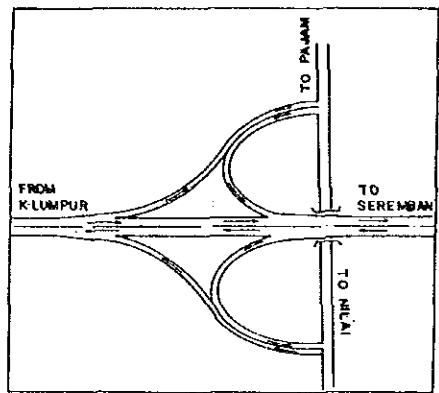
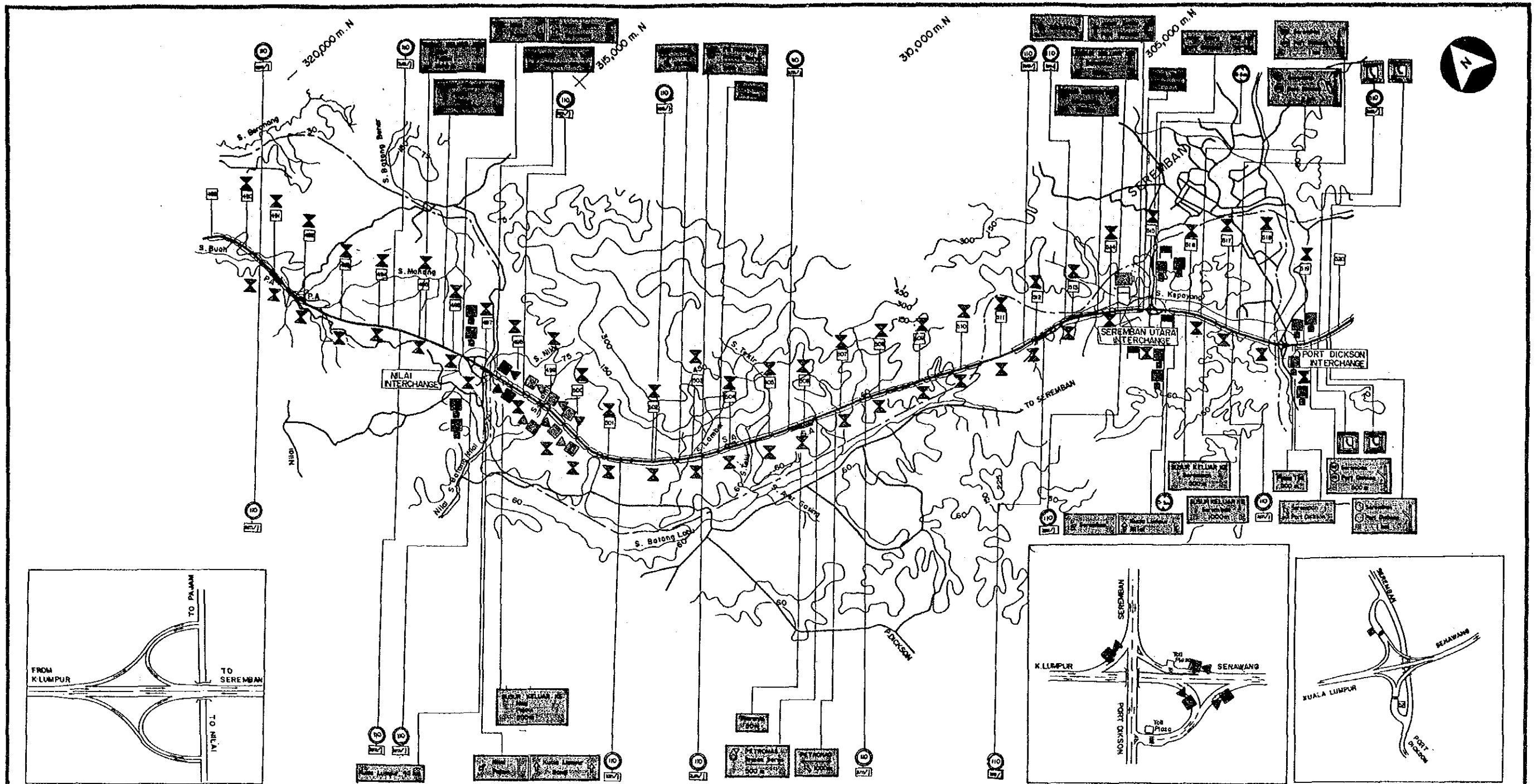


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (12/26)

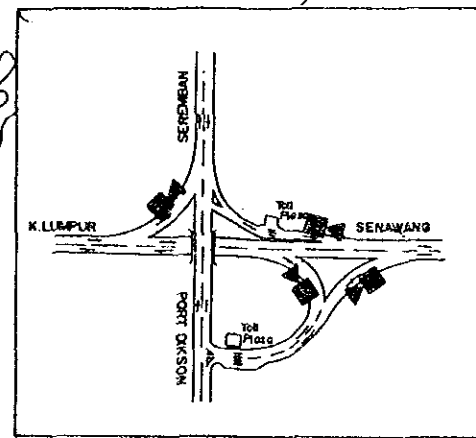
SCALE:

 DRAWING NO: B12 DATE: DEC 1989

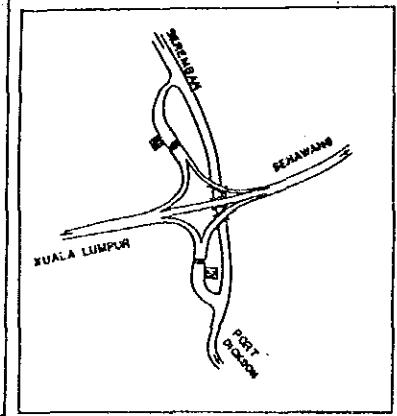
STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



NILAI INTERCHANGE



SEREMBAN UTARA INTERCHANGE



PORT DICKSON INTERCHANGE

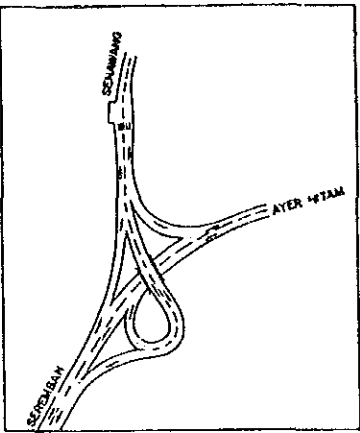
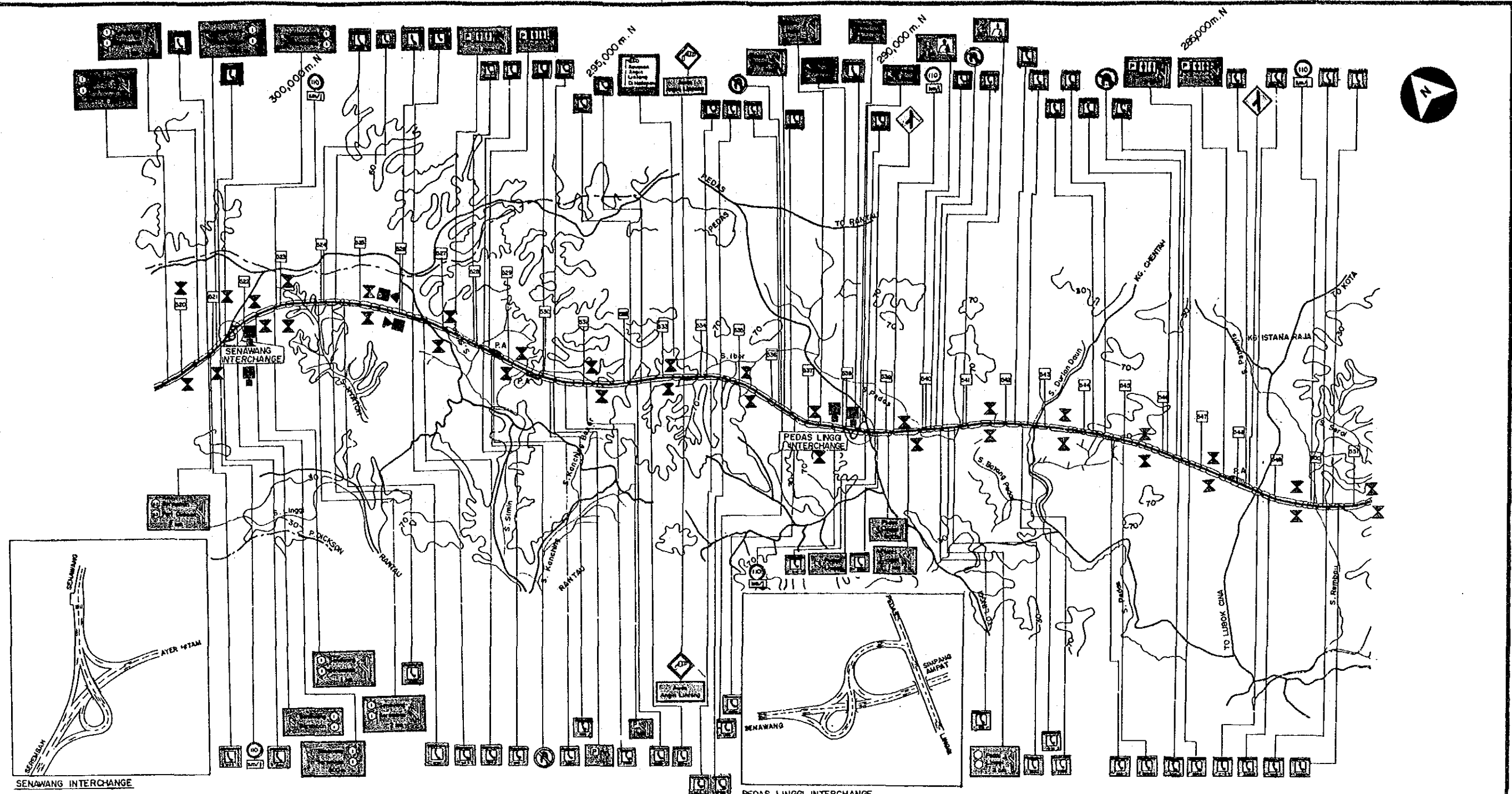
HORIZONTAL ALIGNMENT (M)	R=1200 A=120 V=17%	R=1200 A=272 V=17%	A=302 R=814	A=302 R=4850	A=300 R=1200 A=300 R=50	A=600 R=2100	A=600 R=400	A=350 E=2000 A=350 R=1500	A=180 R=1800 A=300 R=1000	A=180 R=1500 A=180 R=1500	B=210 R=3500	B=120 R=800	R=4000									
VERTICAL ALIGNMENT (M)	0.20% 0.42% 0.14%	1.00% 1.10% 1.10% 1.00% 0.40% 1.25%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%	1.20%									
EMBANKMENT (+M)/CUT (-M)	-7.30 -3.428	+1.33 -0.182	+6.70 +1.186	+8.08 +6.400	+8.86 +8.32	+78.04 +88.50	+36.43 +39.370	-49.31 -4.92	+8.84 +8.302	-1.482 -13.128	+88.270 +46.931	+6.881 +6.961	-3.382 -3.382	-0.04 -0.304	+4.724 -4.879	-0.791 -5.956	-46.816 -4.871	16.08 6.63	-7.23 7.4	31.9 -2.7	-3.0 -3.0	9.0 -11.2
FINISHED LEVEL (M)	40.841 30.454	38.098	50.70 49.33	438.35 469.15	485.89 587.27	472.44 561.02	498.687 60.635	50.598 63.282	68.444 74.478	45.58 37.23	34.17 31.80	28.02 26.46	33.02 53.92	77.08								
KM POST	490 491	492	493 494	495 496	497 498	499 500	501 502	503 504	505 506	507 508	509 510	512 513	514 515	516 517	518 519	520						

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (17/26)

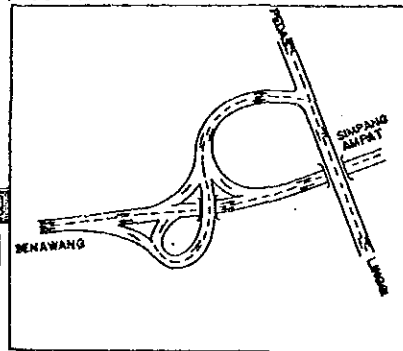
SCALE:
1000 0 2000
500 1000 meters

DRAWING NO: B17
DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
JAPAN INTERNATIONAL COOPERATION AGENCY



SENAWANG INTERCHANGE



PEDAS LINGGI INTERCHANGE

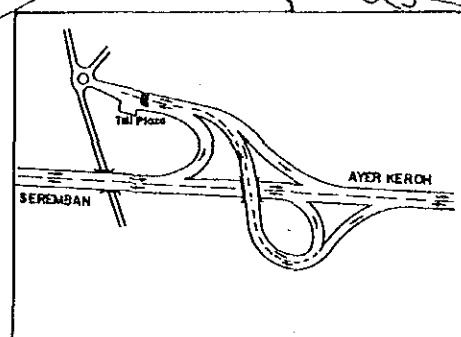
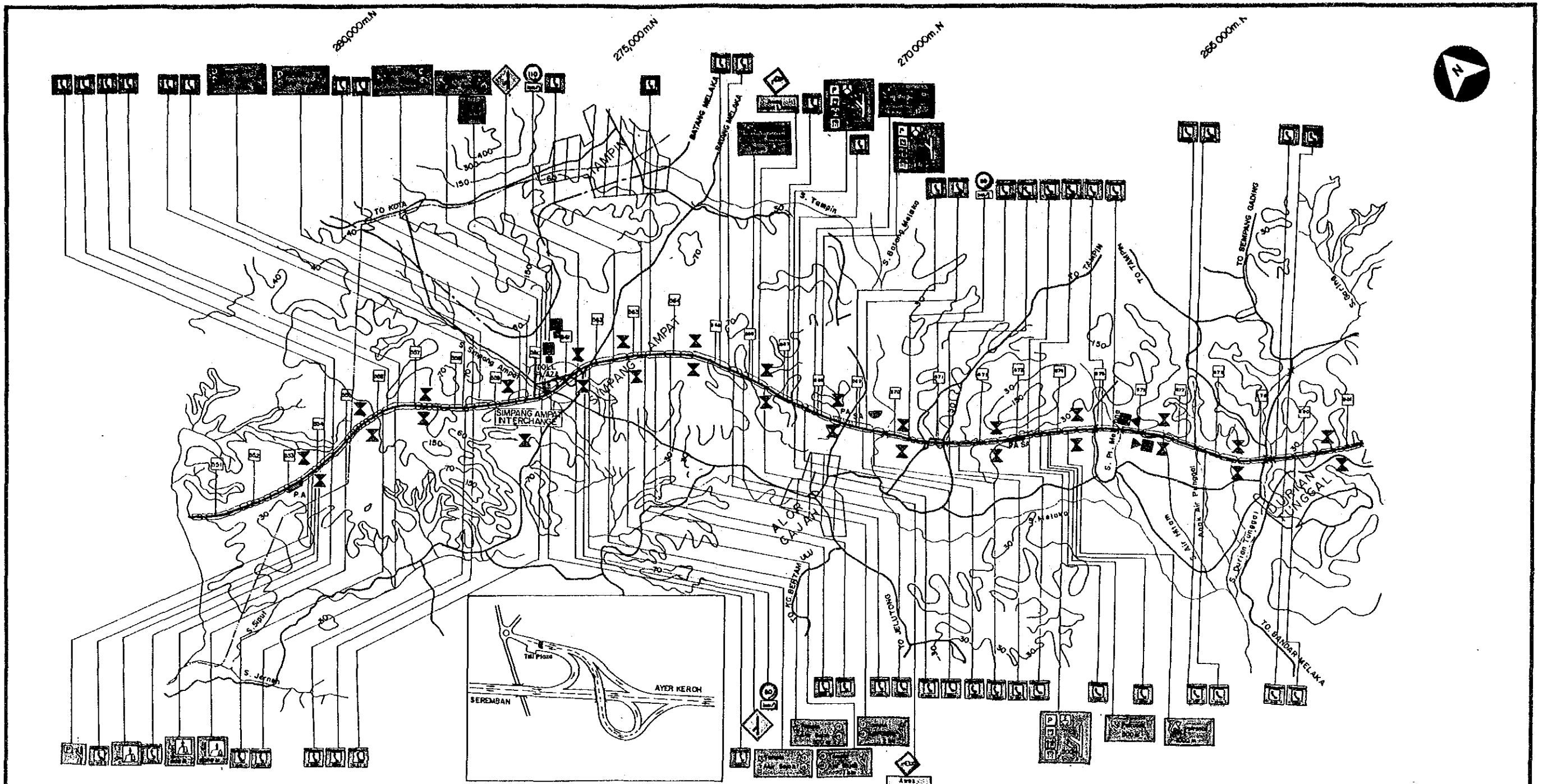
HORIZONTAL ALIGNMENT (M)																															
VERTICAL ALIGNMENT (M)																															
EMBANKMENT (+M)/CUT (-M)	-11.7	-4.4	18.0	8.2	18.8	-17.0	12.0	8.8	-7.0	-9.8	-12.2	-12.0	12.0	4.8	7.2	6.4	-3.8	-2.4	3.0	-3.4	18	-2.2	-1.8	-0.4	-15.2	6.8	3.2	7.2	-1.8	2.0	1.0
FINISHED LEVEL (M)	77.09	73.29	73.87	70.96	68.82	68.21	69.30	63.83	49.79	52.68	71.32	62.82	73.31	77.50	77.83	38.87	15.24	44.78	62.21	50.22	37.11	38.83	31.26	32.89	54.63	48.23	63.81	35.00	35.00	31.86	18.31
KM POST	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (18/26)

SCALE:

 DRAWING NO: B18 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



SIMPANG AMPAT INTERCHANGE

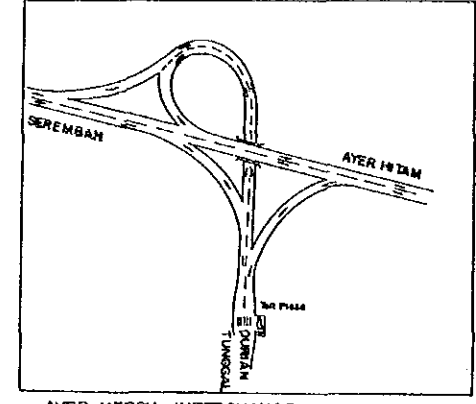
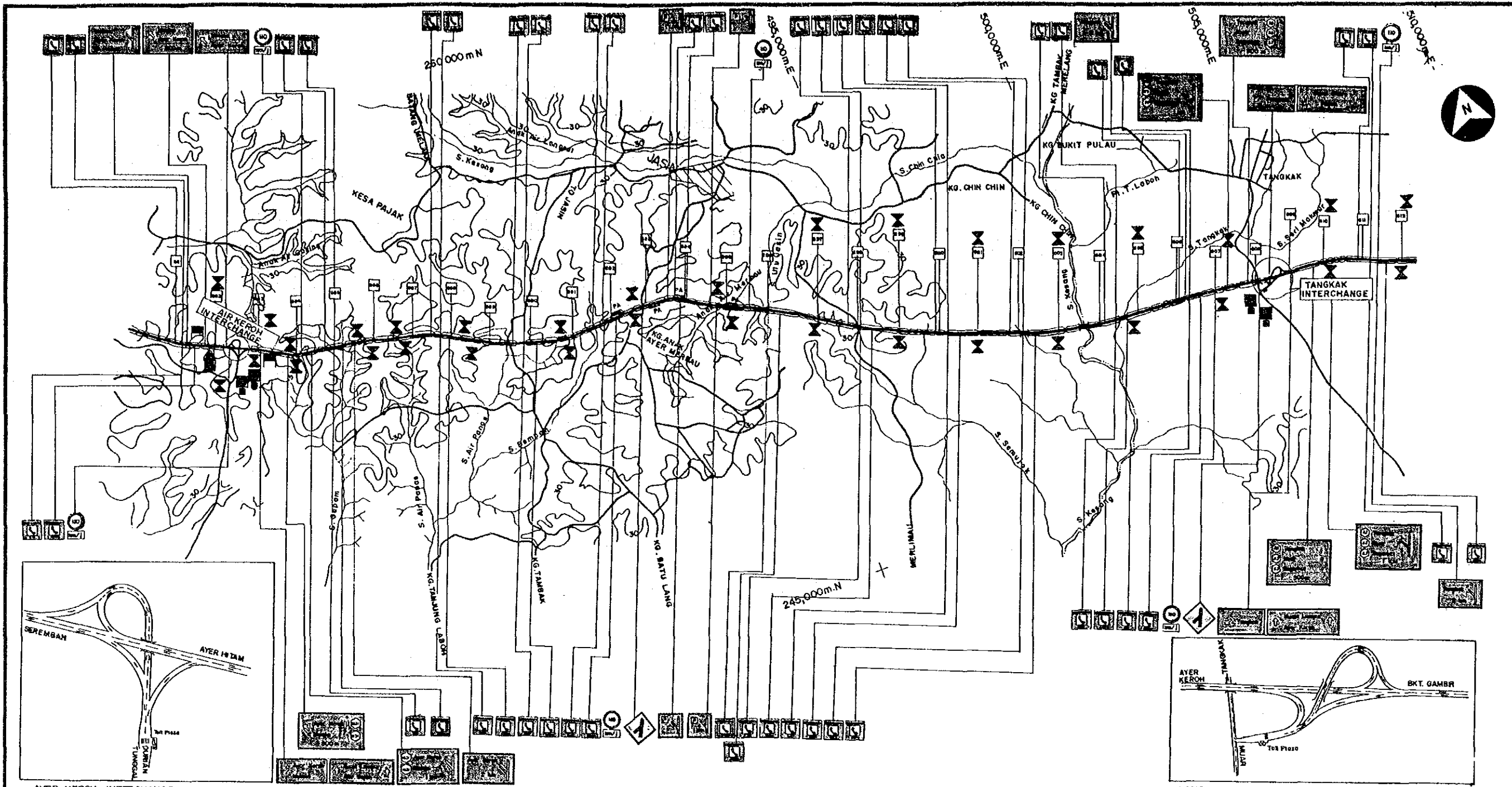
HORIZONTAL ALIGNMENT (M)	
VERTICAL ALIGNMENT (M)	
EMBANKMENT (+M)/CUT (-M)	1.0, -13.0, 8.0, 1.0, 8.4, 2.2, 0.8, -22.0, 1.8, -5.8, -1.8, 3.6, 3.8, 0.00, 7.4, 8.0, 12.0, 7.4, -5.0, -4.8, 0.0, -4.2, -3.4, -5.8, 2.4, -5.0, 8.0, 10.2, 8.0, -8.4, -18.0, -1.4
FINISHED LEVEL (M)	19.31, 73.92, 50.57, 44.31, 52.78, 46.73, 66.85, 86.77, 60.94, 46.25, 11.69, 50.92, 46.86, 37.00, 50.04, 42.23, 45.28, 36.51, 34.81, 27.66, 21.13, 24.70, 26.96, 41.17, 22.73, 20.94, 16.09, 25.31, 23.27, 16.64, 19.29, 34.42
KM POST	550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (19/26)

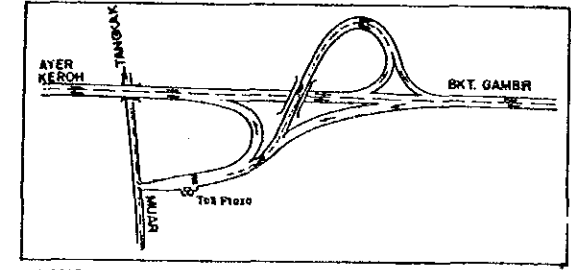
SCALE:

 DRAWING NO: B19 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY



AYER KEROH INTERCHANGE



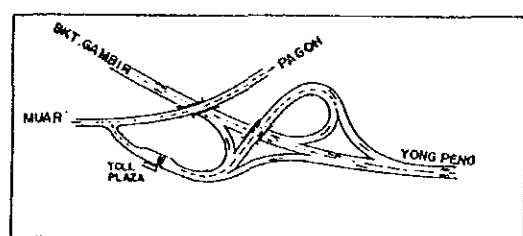
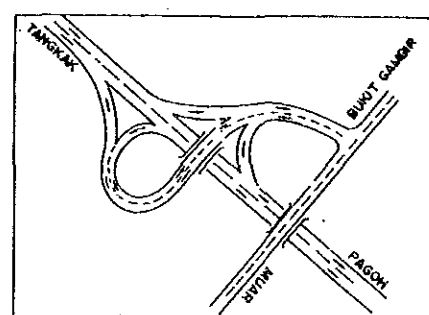
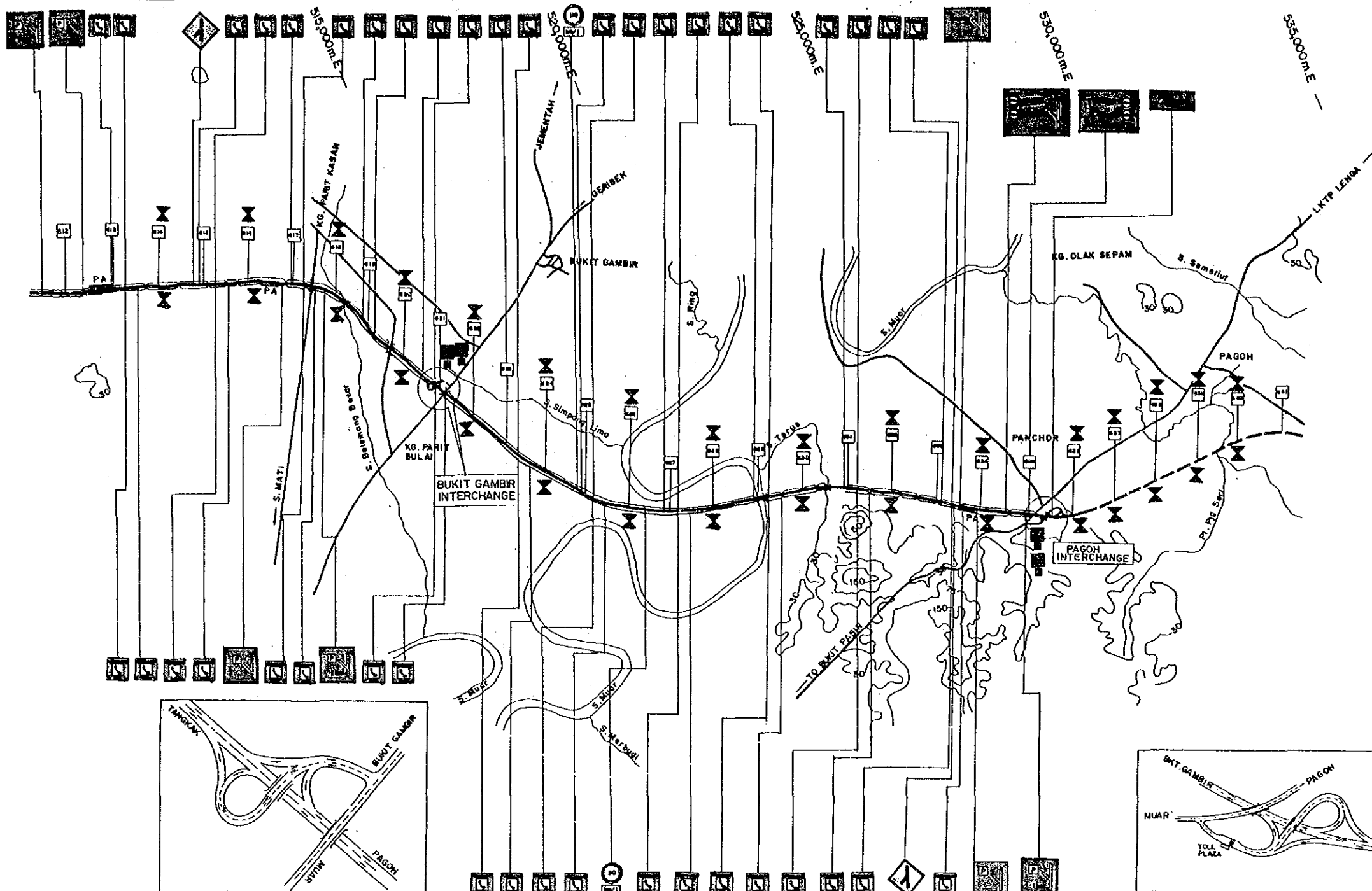
TANGKAK INTERCHANGE

HORIZONTAL ALIGNMENT (M)																																	
VERTICAL ALIGNMENT (M)																																	
EMBANKMENT (+M)/CUT (-M)	-1.5	12.3	-1.2	-0.3	8.5	3.0	2.0	1.8	-7.0	-8.3	-1.0	0.3	-7.0	1.8	2.2	1.1	8.0	-3.0	0.5	1.0	0.0	-2.0	-8.0	3.0	3.0	-3.0	0.5	2.0	0.0	-2.0	2.0	2.0	
FINISHED LEVEL (M)	34.42	47.17	37.4	45.1	32.8	32.0	48.0	40.6	34.9	18.8	36.7	32.3	34.7	32.0	24.9	34.9	44.1	34.9	25.2	28.8	22.0	14.2	7.37	7.42	8.37	17.1	10.3	22.7	8.34	9.66	9.49	13.2	
KM POST	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (20/26)

SCALE: 1:1000
 0 500 1000 2000 metres
 DRAWING NO: B20 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY

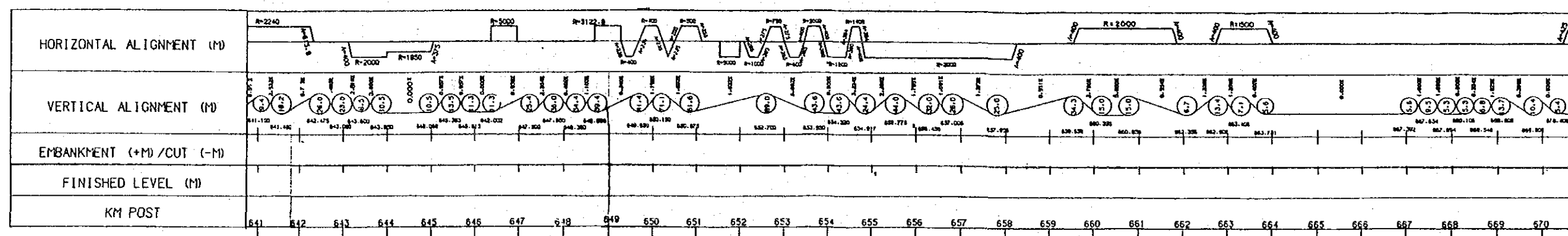
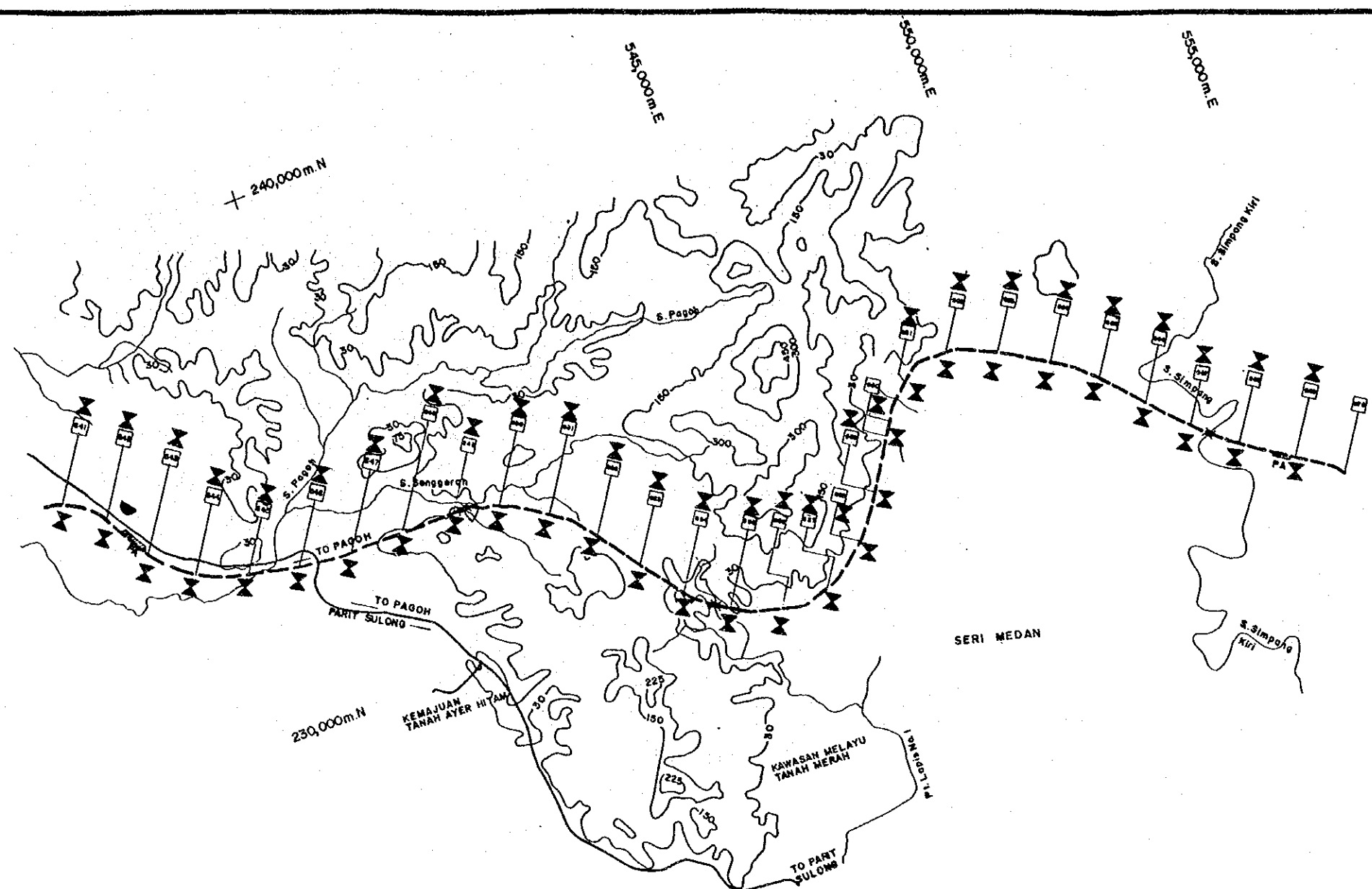


HORIZONTAL ALIGNMENT (M)																																														
VERTICAL ALIGNMENT (M)																																														
EMBANKMENT (+M) / CUT (-M)	5.0	3.0	-3.0	2.0	-3.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0	-1.0	2.0	1.0	-2.0	2.0	1.0	1.0	-2.0	1.0	2.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0							
FINISHED LEVEL (M)	12.2	15.1	12.4	10.2	13.4	6.83	6.34	5.80	5.34	5.1	5.25	6.24	4.32	4.20	4.20	4.20	4.20	6.20	23.2	13.8	16.0	16.1	22.8	26.3	13.0	7.31	6.11	6.20																		
KM POST	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641																

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (21/26)

SCALE: 1000 0 2000 500 1000 meters
 DRAWING NO: B21
 DATE: DEC 1989

STUDY ON TRAFFIC CONTROL AND MANAGEMENT SYSTEM OF MALAYSIAN EXPRESSWAYS AND TOLL HIGHWAYS
 JAPAN INTERNATIONAL COOPERATION AGENCY

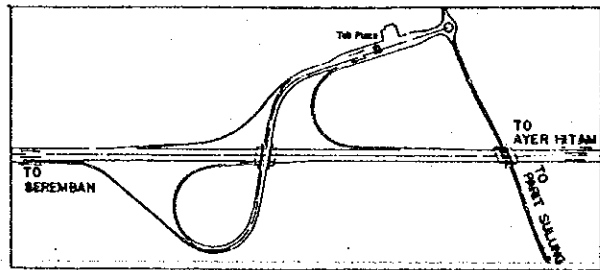
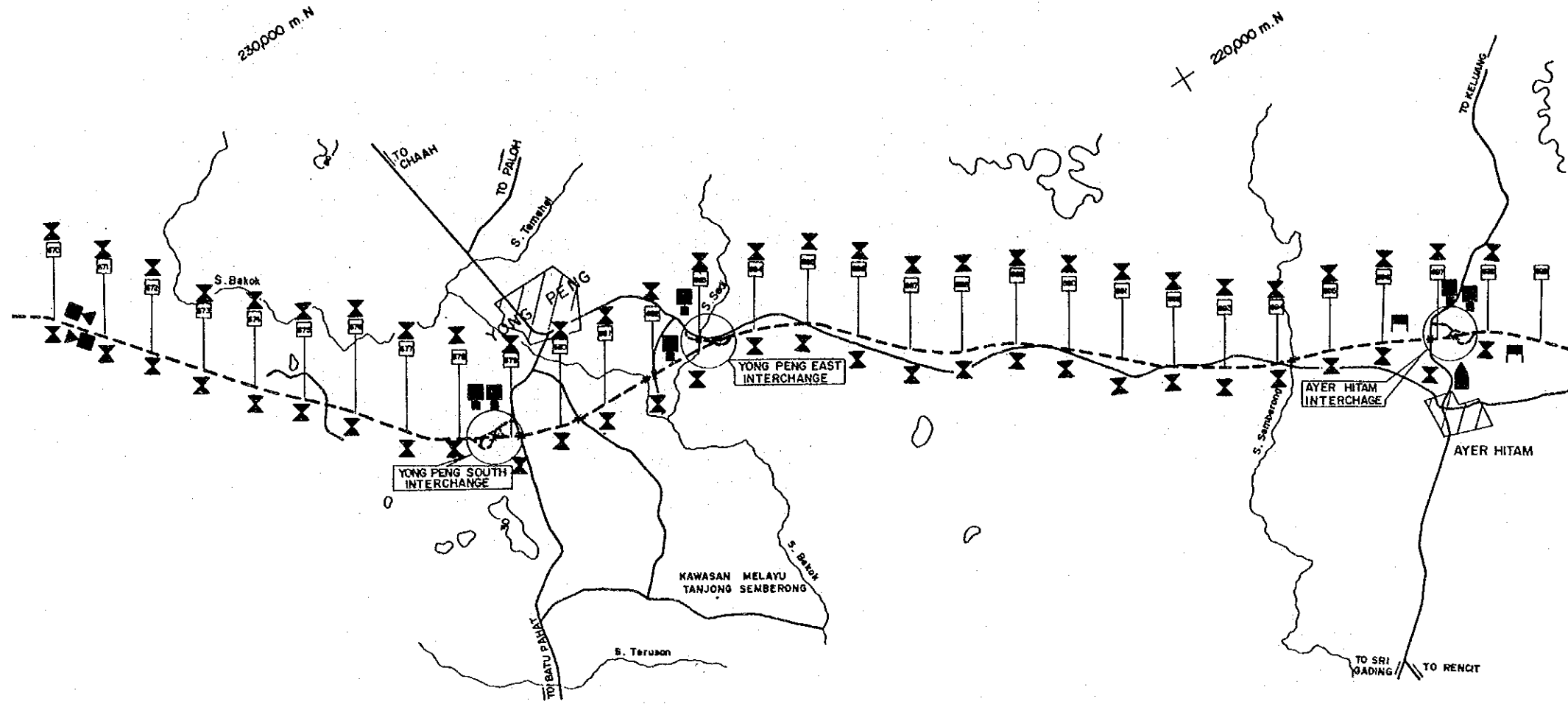


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (22/26)

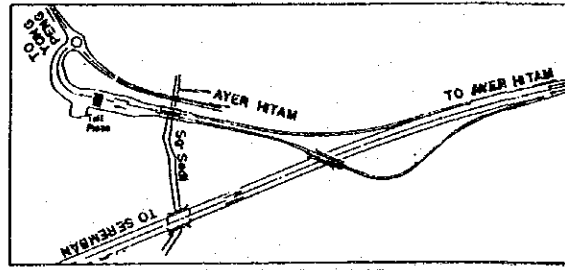
SCALE:

 500 1000 meters
 DRAWING NO: B22
 DATE: DEC 1989

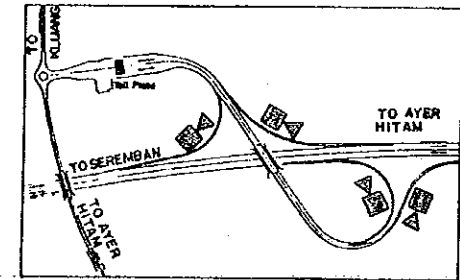
**STUDY ON TRAFFIC CONTROL AND
 MANAGEMENT SYSTEM OF MALAYSIAN
 EXPRESSWAYS AND TOLL HIGHWAYS**
 JAPAN INTERNATIONAL COOPERATION AGENCY



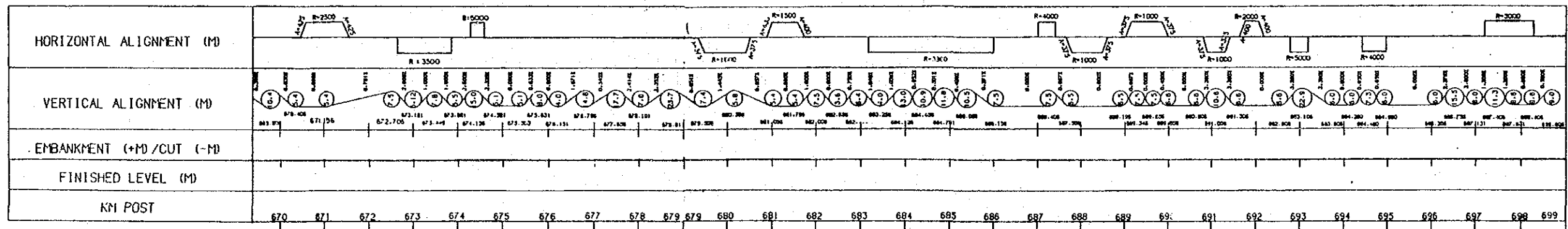
YONG PENG SOUTH INTERCHANGE



YONG PENG EAST INTERCHANGE



AYER HITAM INTERCHANGE

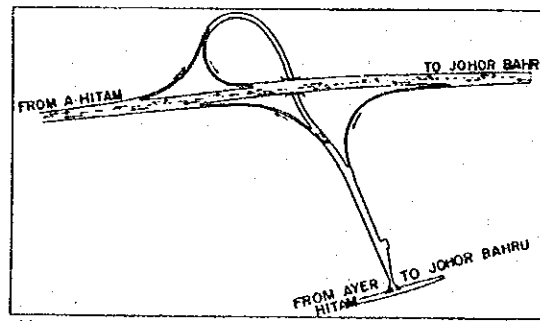
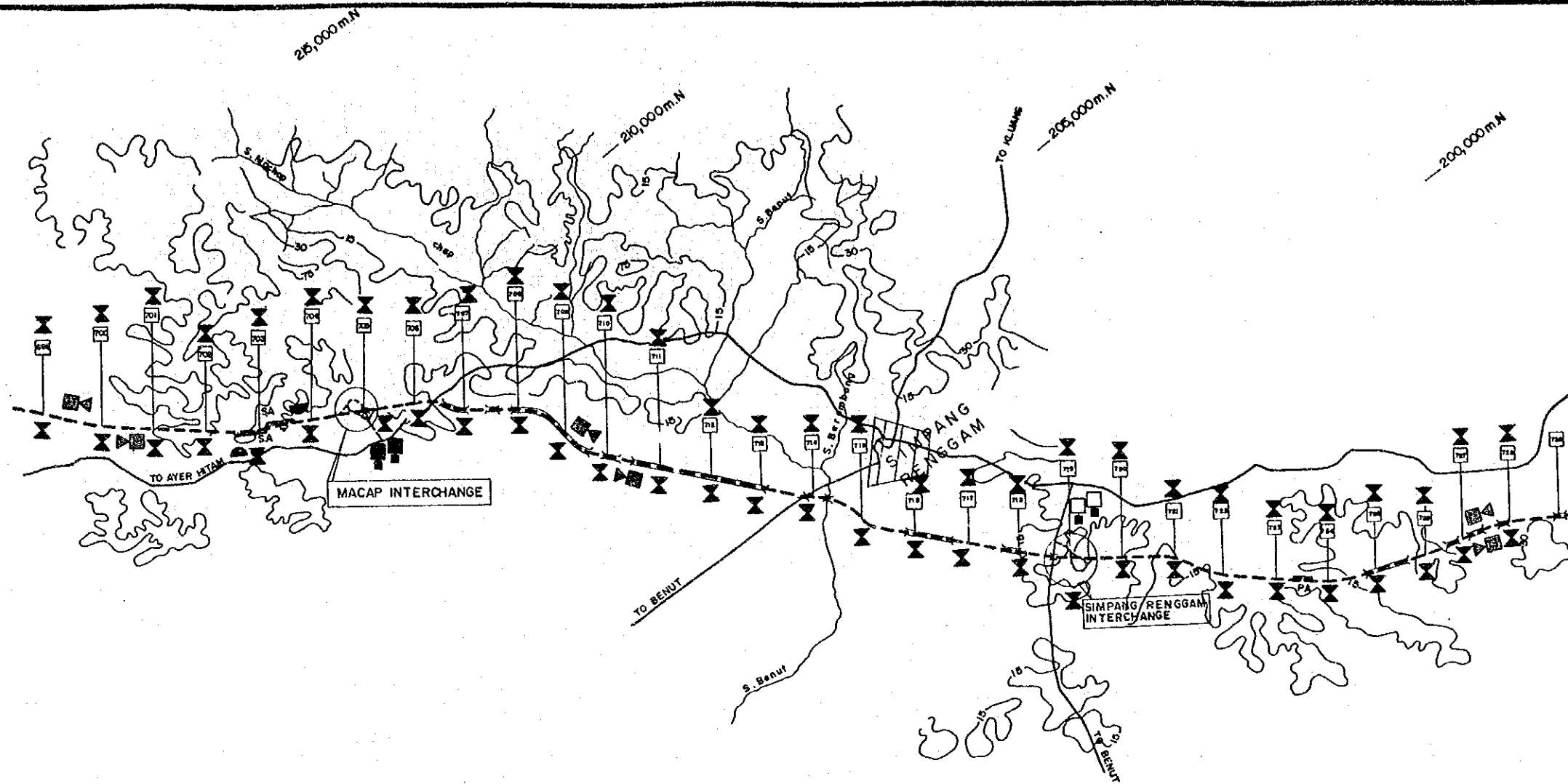


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (23/26)

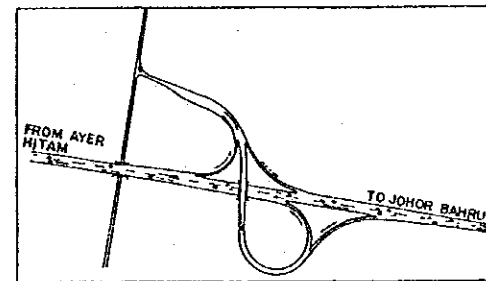
SCALE:

 500 1000 2000 metres
 DRAWING NO: B23
 DATE: DEC 1989

**STUDY ON TRAFFIC CONTROL AND
 MANAGEMENT SYSTEM OF MALAYSIAN
 EXPRESSWAYS AND TOLL HIGHWAYS**
 JAPAN INTERNATIONAL COOPERATION AGENCY



MACAP INTERCHANGE



SIMPANG/RENGGAM INTERCHANGE

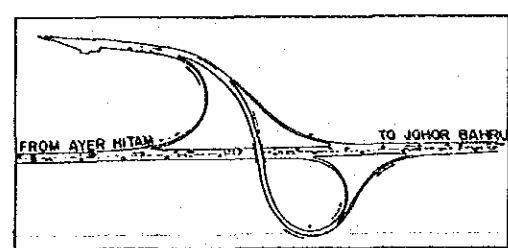
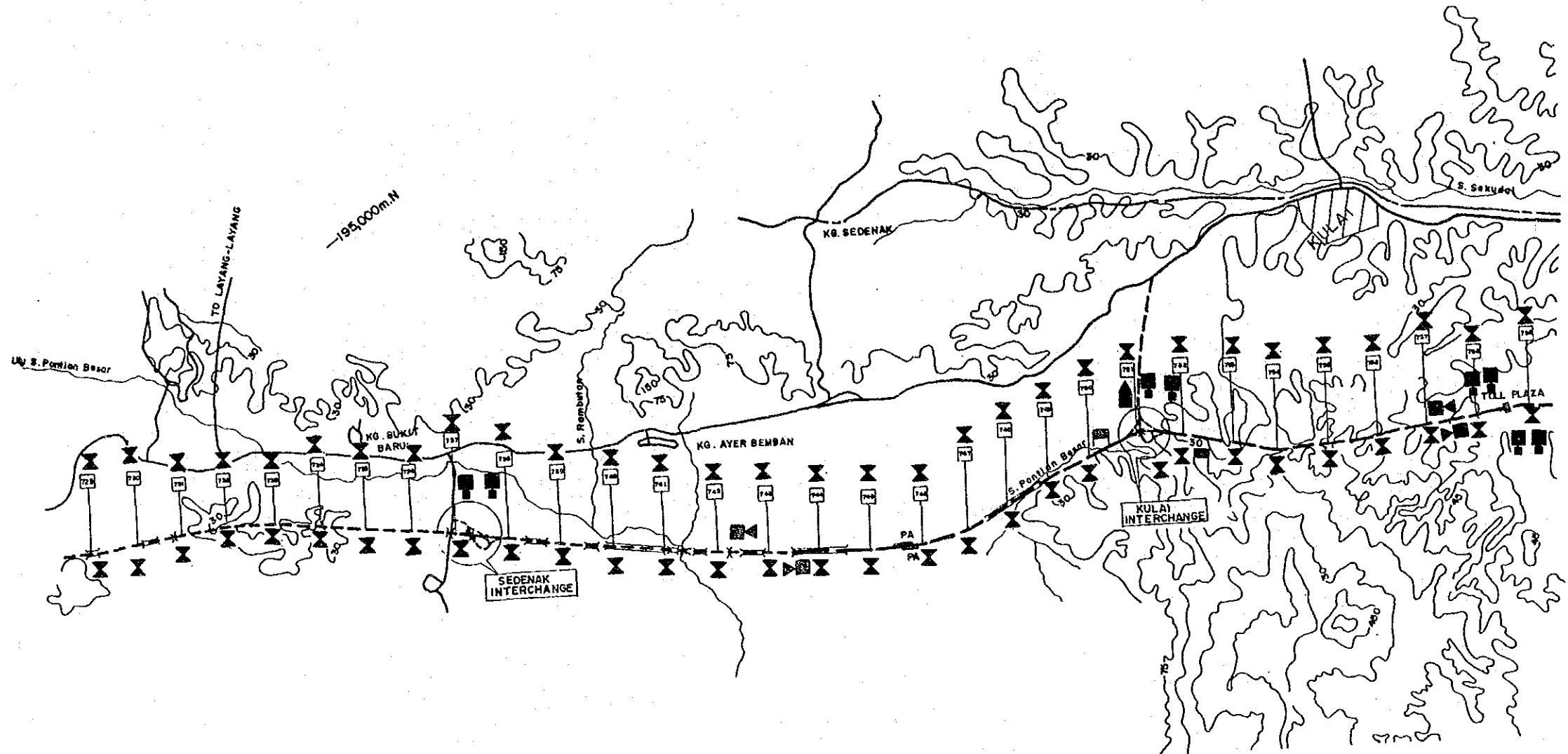
HORIZONTAL ALIGNMENT (M)	
VERTICAL ALIGNMENT (M)	
EMBANKMENT (+M)/CUT (-M)	
FINISHED LEVEL (M)	
KM POST	700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (24/26)

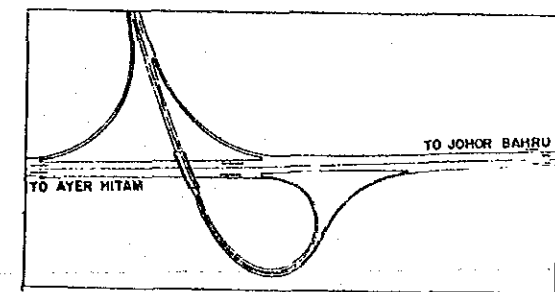
SCALE:

 DRAWING NO: B24 DATE: DEC 1989

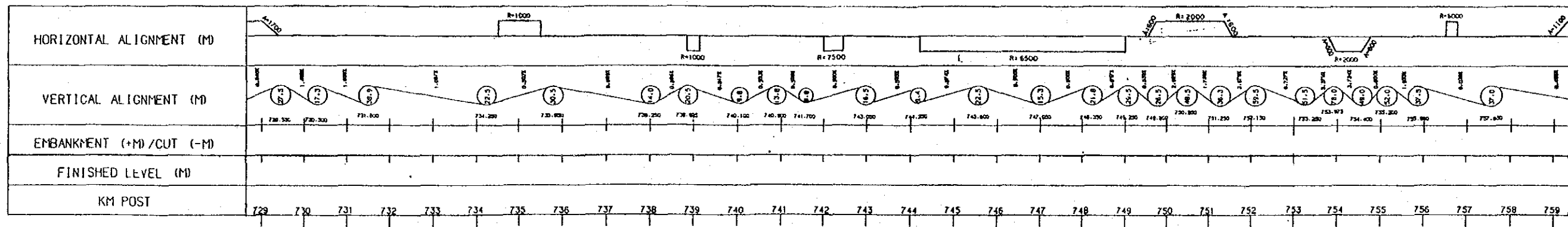
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SEDENAK INTERCHANGE



KULAI INTERCHANGE

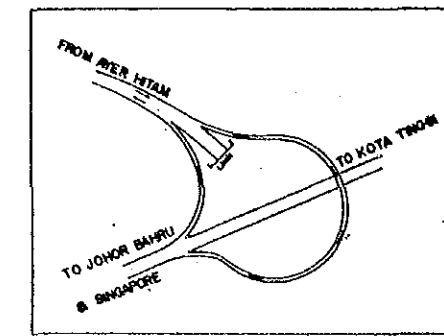
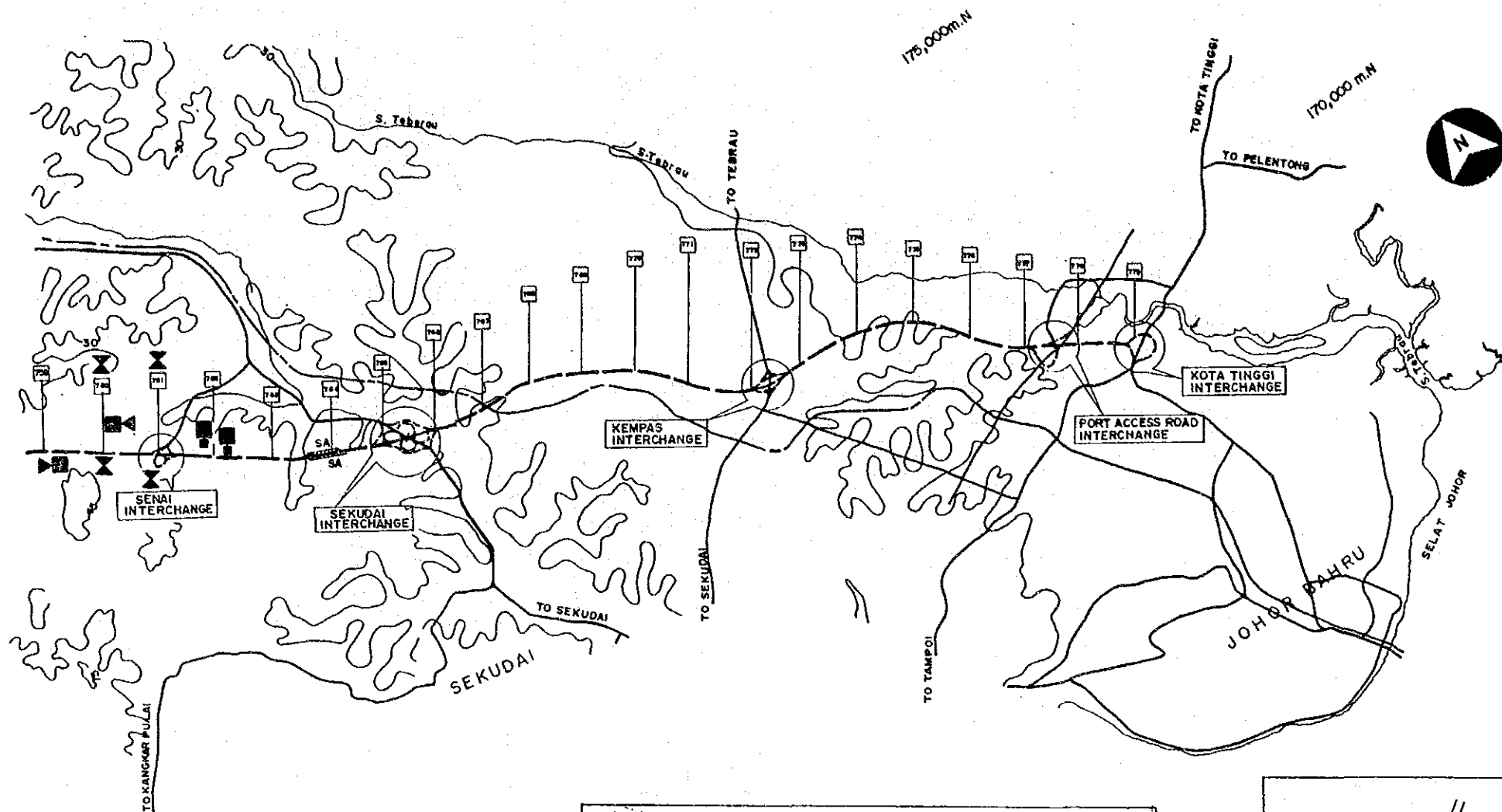


PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (25/26)

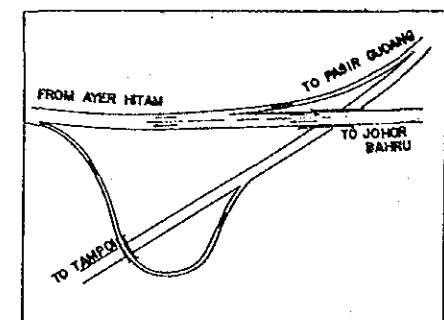
SCALE:

 DRAWING NO: B25
 DATE: DEC 1989

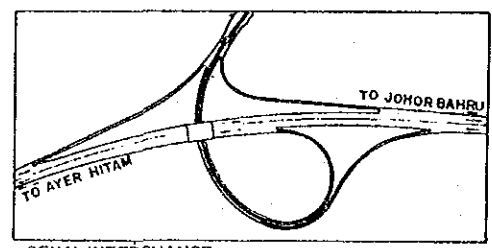
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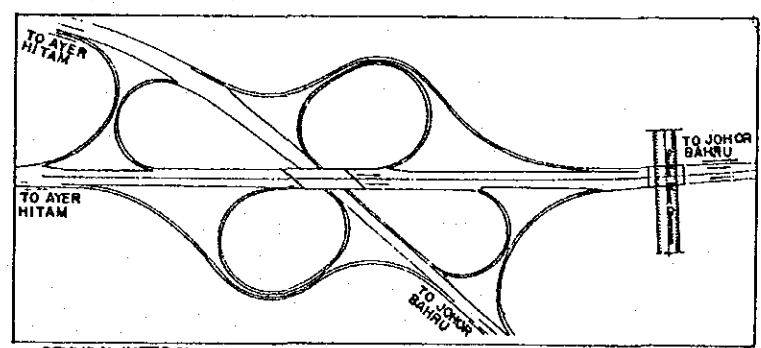
KOTA TINGGI INTERCHANGE



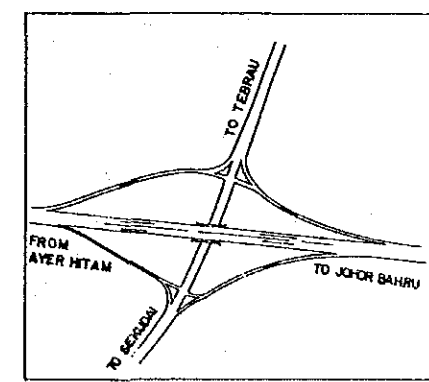
PORT ACCESS ROAD INTERCHANGE



SENAI INTERCHANGE



SEKUDAI INTERCHANGE



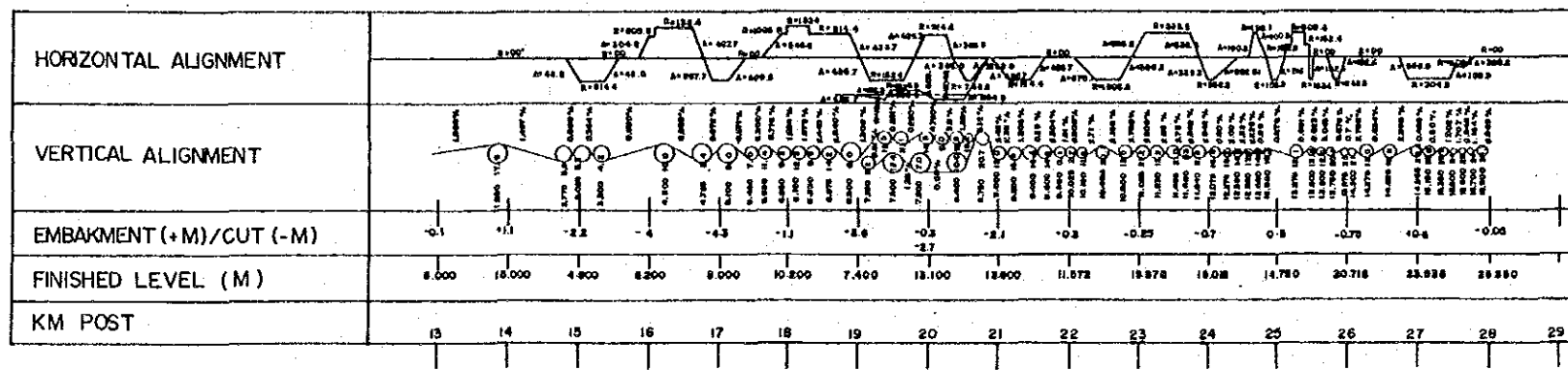
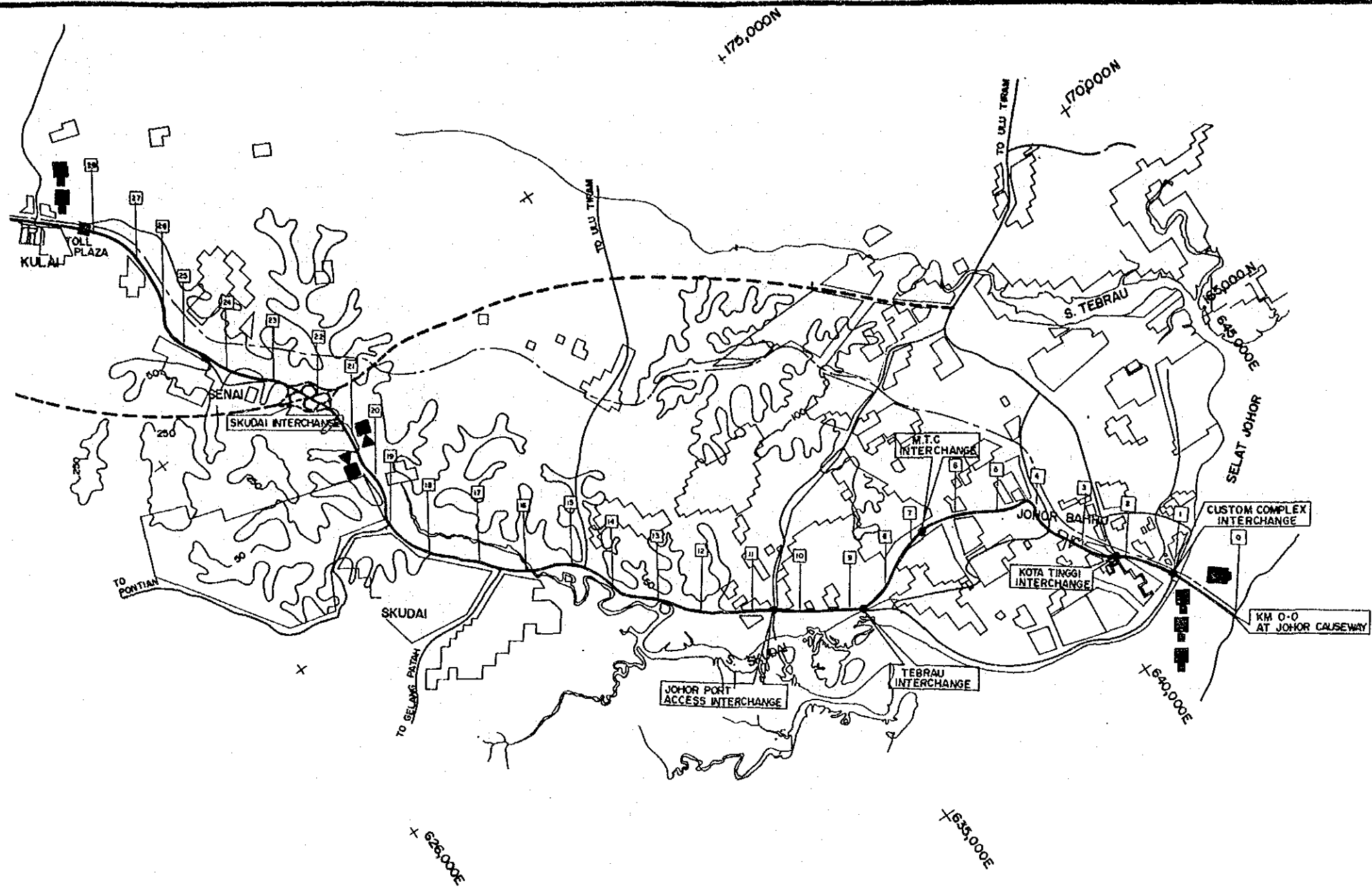
KEMPAS INTERCHANGE

HORIZONTAL ALIGNMENT (M)	
VERTICAL ALIGNMENT (M)	
EMBANKMENT (+M) / CUT (-M)	
FINISHED LEVEL (M)	
KM POST	759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780

PROPOSED FIELD EQUIPMENT LOCATION ON NORTH-SOUTH EXPRESSWAY (26/26)

SCALE: 1:1000
 0 500 1000 2000 meters
 DRAWING NO: B26
 DATE: DEC 1989

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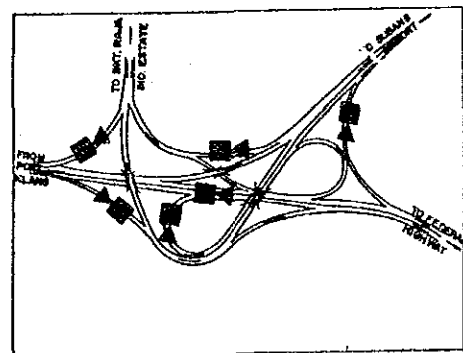
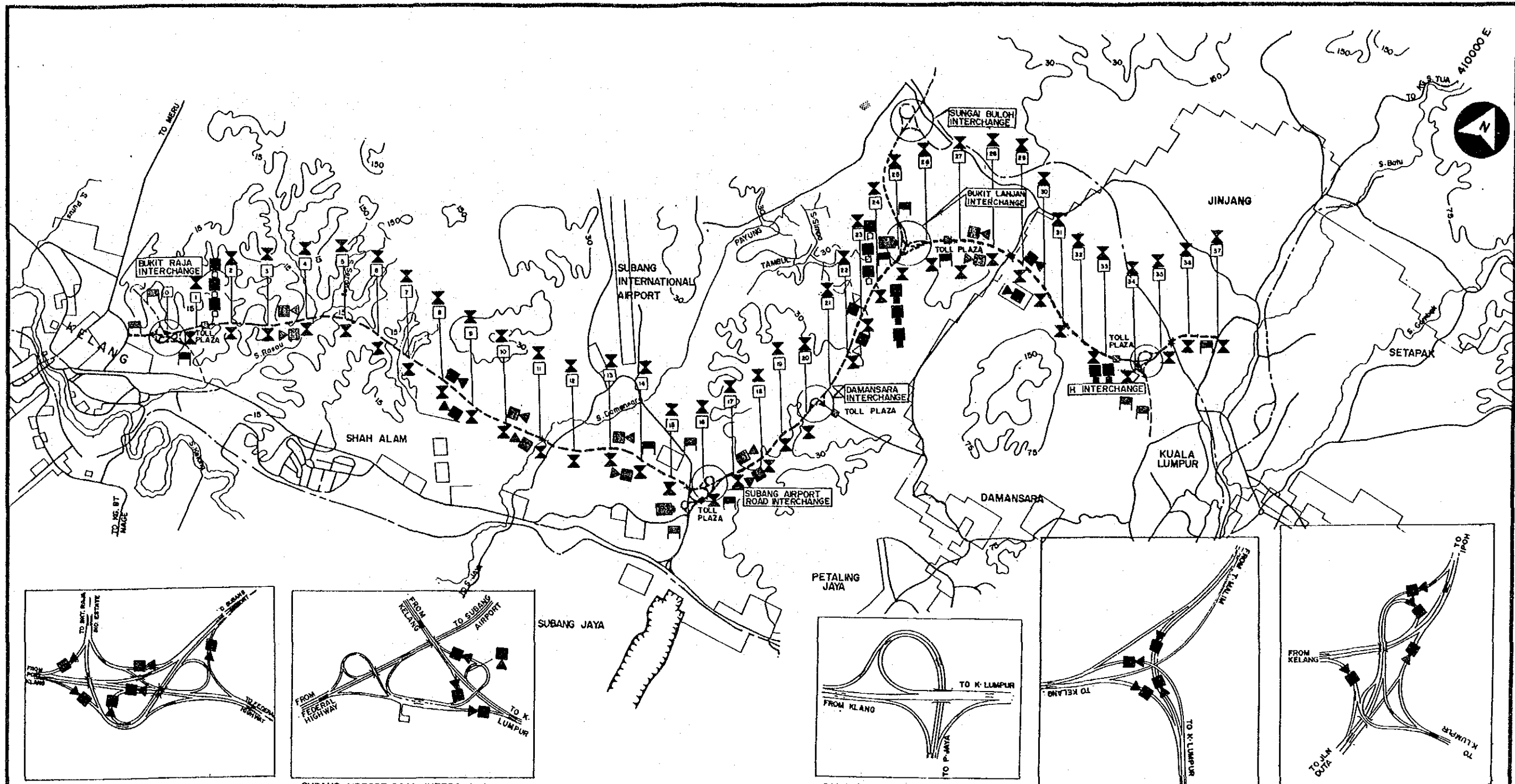


PROPOSED FIELD EQUIPMENT LOCATION ON SENAI-JOHOR BHARU HIGHWAY

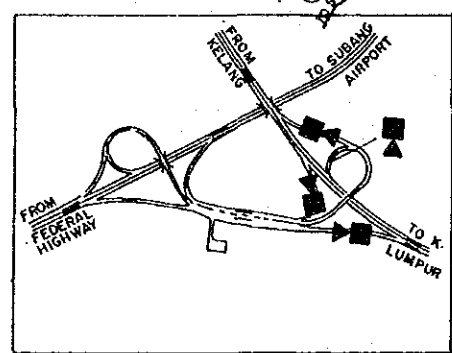
SCALE:
1000 0 2000
500 1000 metres

DRAWING NO: B27
DATE: DEC 1989

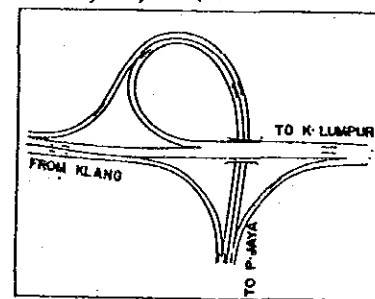
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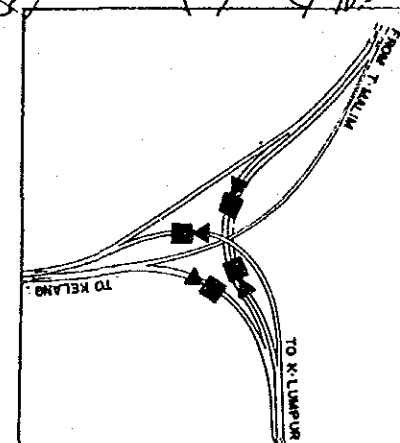
BUKIT RAJA INTERCHANGE



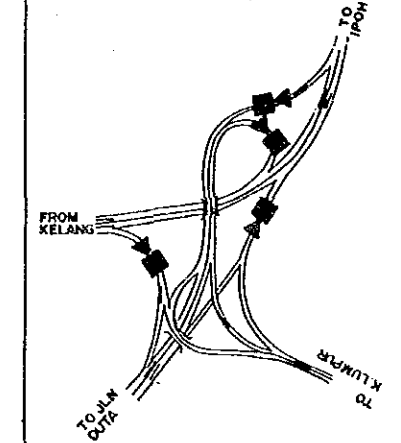
SUBANG AIRPORT ROAD INTERCHANGE



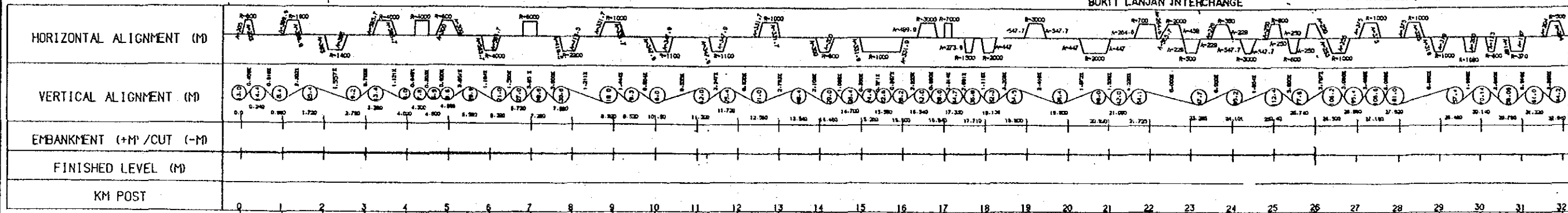
DAMANSARA INTERCHANGE



BUKIT LANJAN INTERCHANGE



H INTERCHANGE

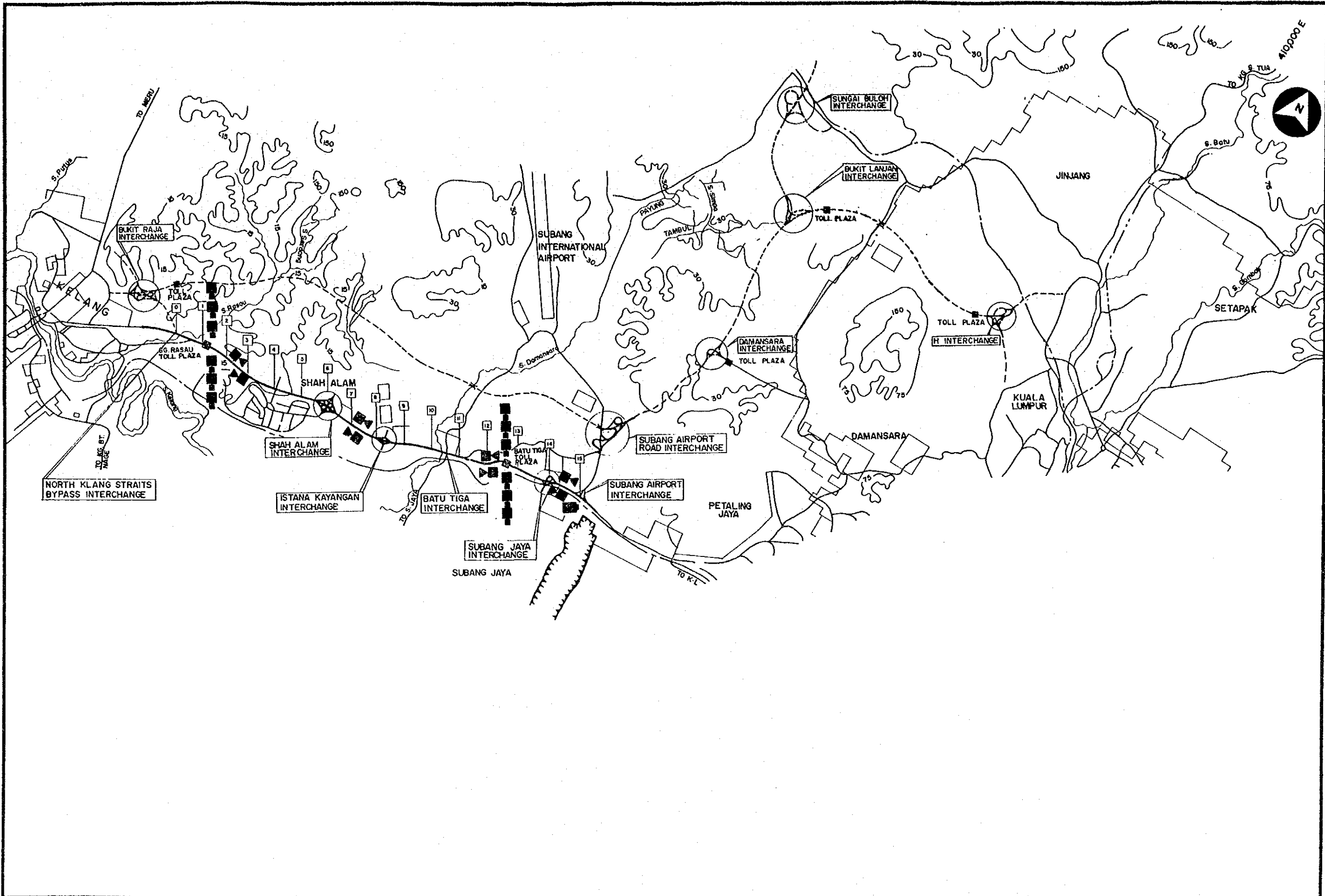


PROPOSED FIELD EQUIPMENT LOCATION ON NEW KLANG VALLEY EXPRESSWAY

SCALE:

 500 1000 2000 metres
 DRAWING NO: B28 DATE: DEC 1989

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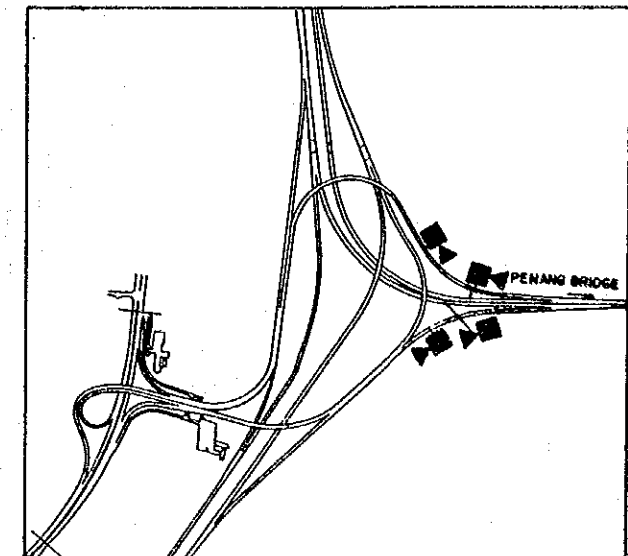
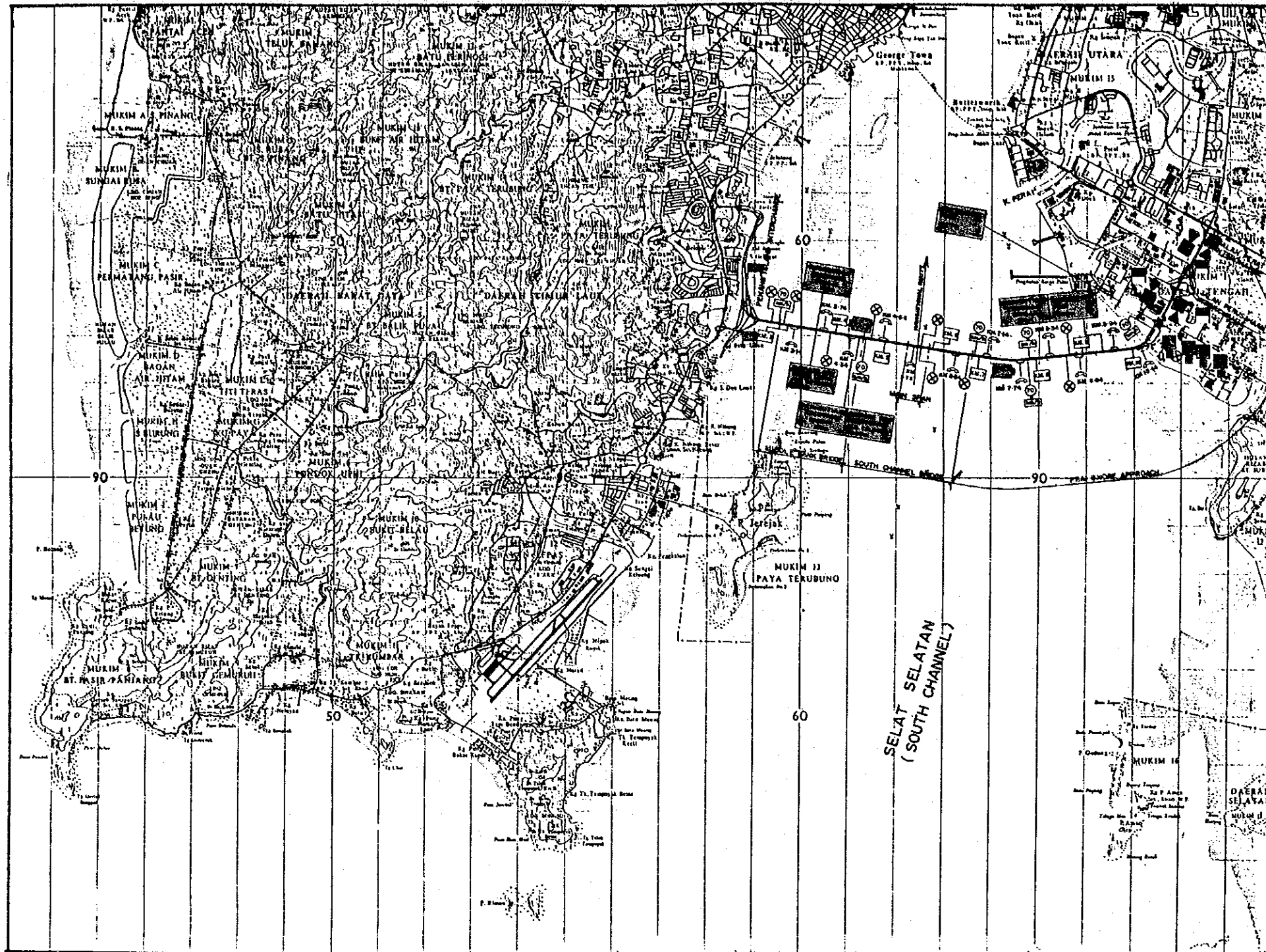
PROPOSED FIELD EQUIPMENT LOCATION ON FEDERAL HIGHWAY

SCALE:
 1000 0 2000
 500 1000 metres

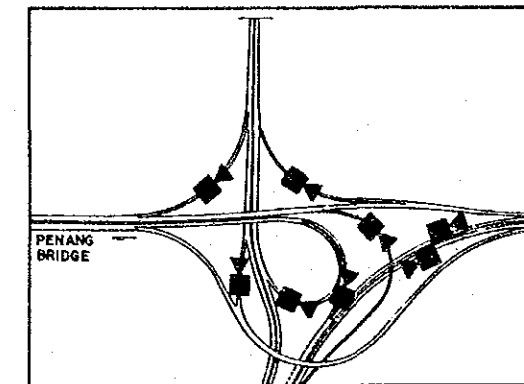
DRAWING NO: B29 DATE: DEC 1989

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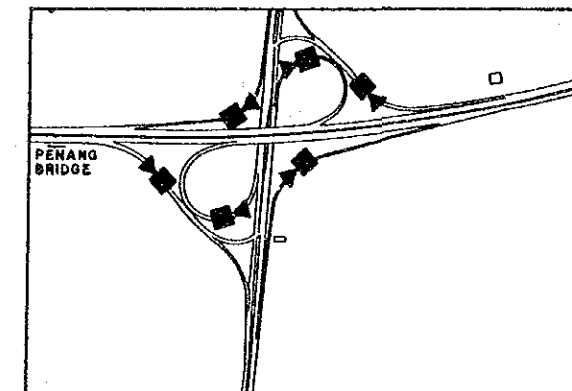
JAPAN INTERNATIONAL COOPERATION AGENCY



PENANG ISLAND INTERCHANGE



JALAN PERUSAHAAN INTERCHANGE



JALAN PERAI INTERCHANGE

ROUTE MAP OF PENANG BRIDGE

HORIZONTAL ALIGNMENT	0+00	0+20	0+40	0+60	0+80	1+00	1+20	1+40	1+60	1+80	2+00
VERTICAL ALIGNMENT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EMBANKMENT (M)/CUT (M)	NOT APPLICABLE										
FINISHED LEVEL (M)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
KM. POST	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0



PROPOSED FIELD EQUIPMENT LOCATION ON PENANG BRIDGE

SCALE:

 500 1000 2000 metres
 DRAWING NO: B30
 DATE: DEC 1989

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