社会開発調査部報告書

No. 52

LAO PEOPLE'S DEMOCRATIC REPUBLIC

FEASIBILITY STUDY
ON
THA NGON BRIDGE CONSTRUCTION PROJECT

FINAL REPORT
DRAWINGS

FEBRUARY 1991

JAPAN INTERNATIONAL COOPERATION AGENCY

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LAO PEOPLE'S DEMOCRATIC REPUBLIC

FEASIBILITY STUDY
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THA NGON BRIDGE CONSTRUCTION PROJECT

FINAL REPORT
DRAWINGS

FEBRUARY 1991

JAPAN INTERNATIONAL COOPERATION AGENCY

国際協力事業団
22289

LIST OF DRAWINGS

NO.	TITLE	DRAWING NO.
1	LOCATION MAP	L T G – 1
	BRIDGE	
2	GENERAL VIEW (1/2)	L T B – 1
3	GENERAL VIEW (2/2)	L T B – 2
4	DETAIL OF MAIN GIRDER	L T B – 3
5	DETAIL OF DECK SLAB	L T B – 4
6	DETAIL OF SIDEWALK, HANDRAIL, DRAIN PIPE AND EXPANSION JOINT	L T B – 5
7	TEMPORARY BRIDGE	L T B – 6
	APPROACH ROAD	
8	PLAN	L T R – 1
9	PROFILE	L T R – 2
10	TYPICAL CROSS SECTION (1/2)	L T R – 3
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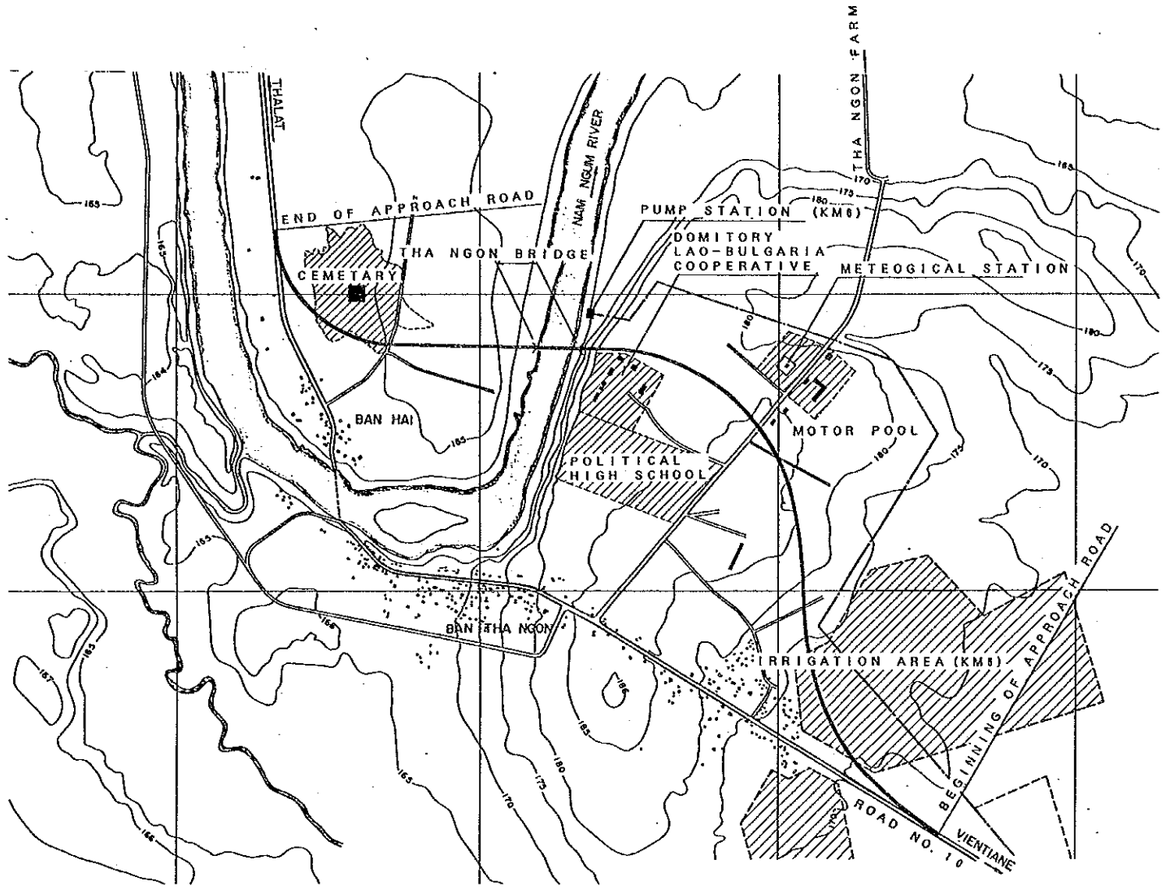
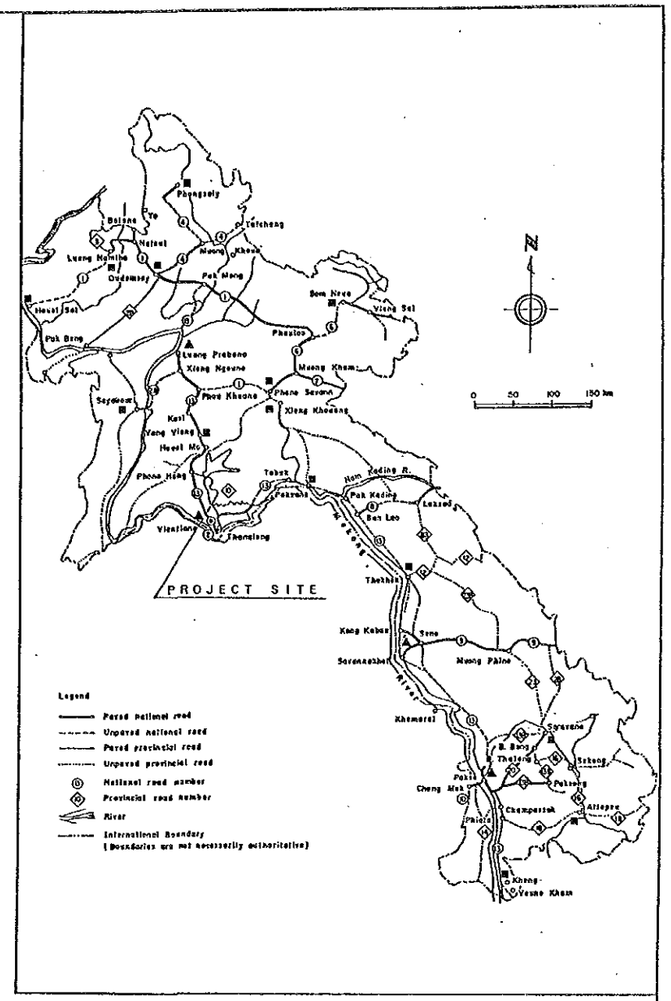
12	CROSS SECTION (1/4)	L T R – 5
13	CROSS SECTION (2/4)	L T R – 6
14	CROSS SECTION (3/4)	L T R – 7
15	CROSS SECTION (4/4)	L T R – 8
16	GENERAL ARRANGEMENT OF PIPE CULVERTS	L T R – 9
17	GENERAL ARRANGEMENT OF TEH INTERSECTION AT THA NGON SIDE	L T R – 10
18	GENERAL ARRANGEMENT OF THE INTERSECTION AT BAN HAI SIDE	L T R – 11



SCALE 1:10000

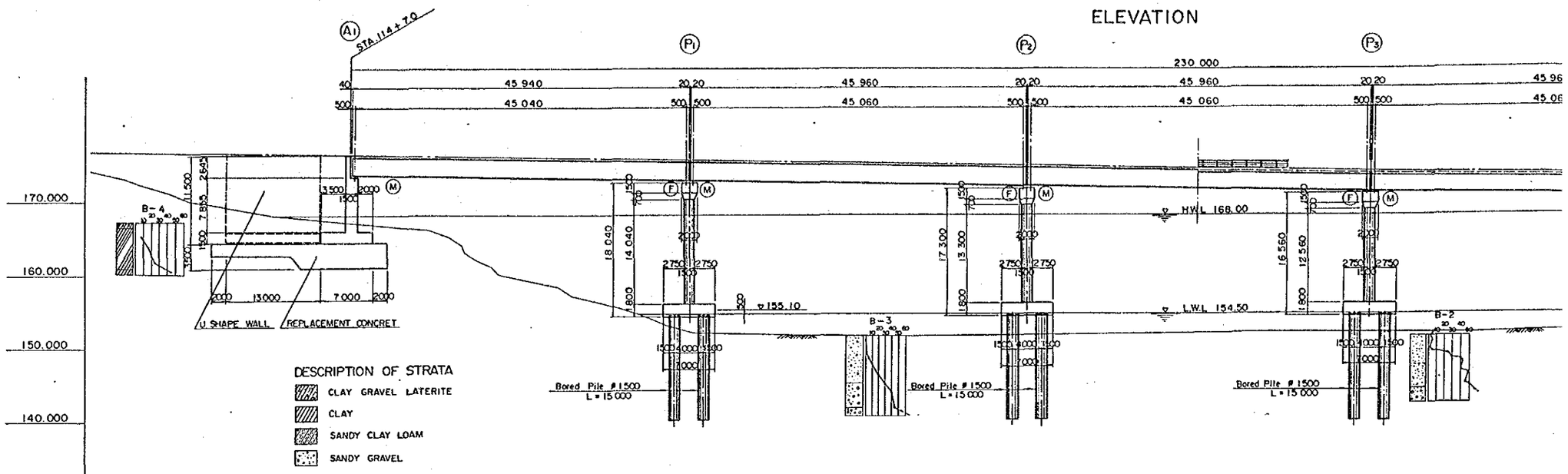


LEGEND

- PROPOSED BRIDGE
- PROPOSED APPROACH ROAD
- ROAD NO. 10
- EXISTING ROAD
- FERRY CROSSING
- CANAL (KM8)
- CONTROL POINT (AREA) FOR ROUTE SELECT

THA NGON BRIDGE CONSTRUCTION PROJECT	
LOCATION MAP	
SCALE 1:10,000	
DATE FEBRUARY, 1991	DRAWING NO. LTG-1
JAPAN INTERNATIONAL COOPERATION AGENCY	

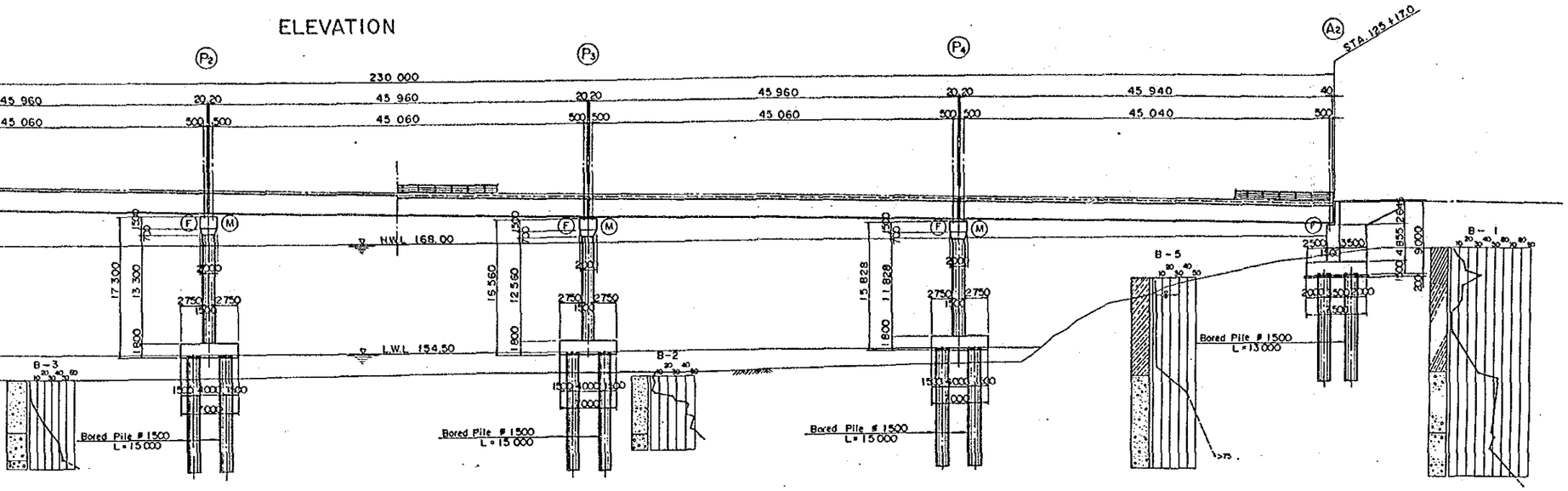
ELEVATION

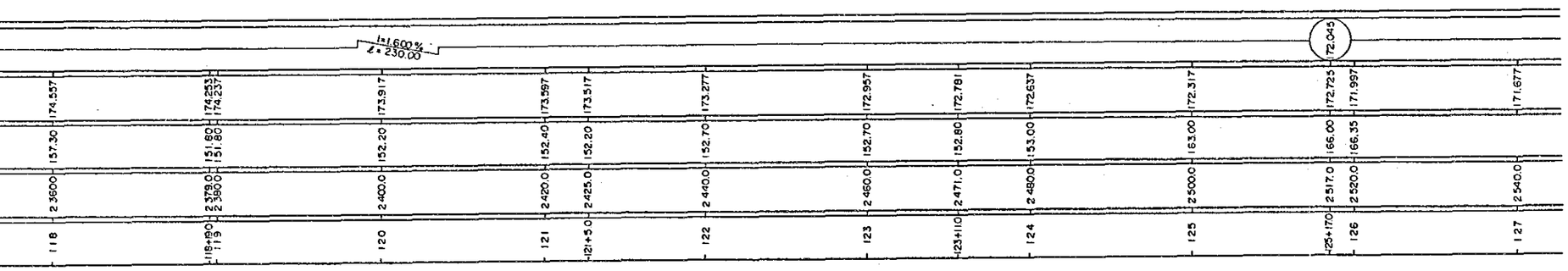


M.S.L = 130.000

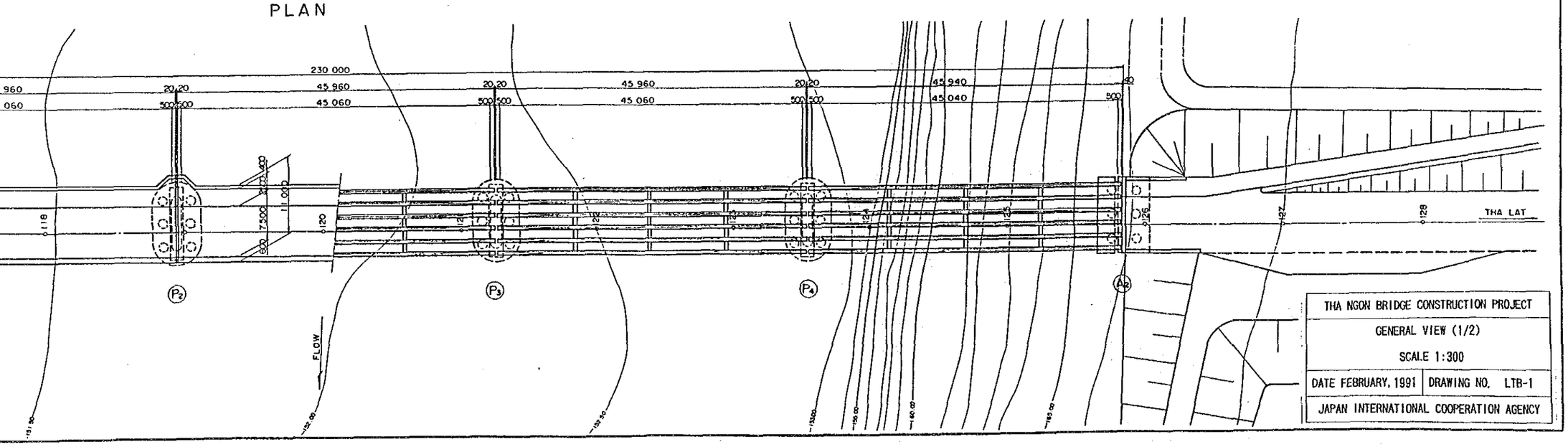
| | | |

ELEVATION



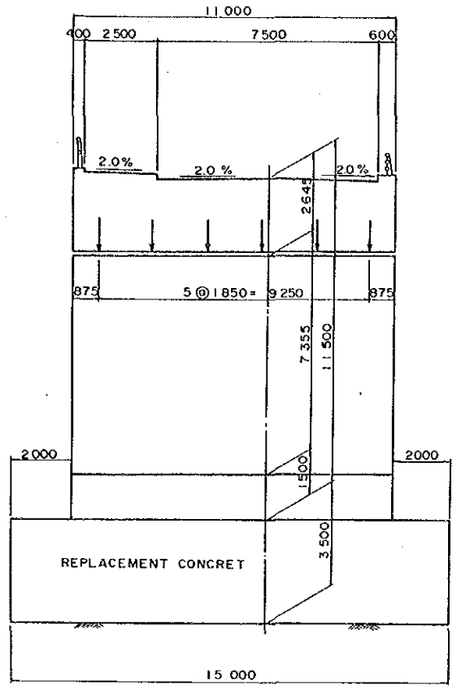


PLAN

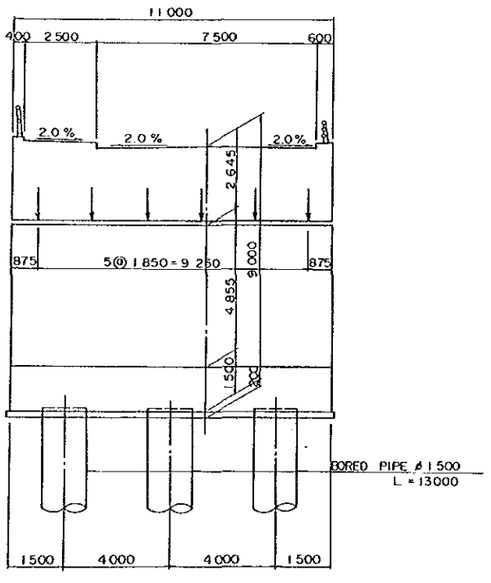


THA NGON BRIDGE CONSTRUCTION PROJECT	
GENERAL VIEW (1/2)	
SCALE 1:300	
DATE FEBRUARY, 1991	DRAWING NO. LTB-1
JAPAN INTERNATIONAL COOPERATION AGENCY	

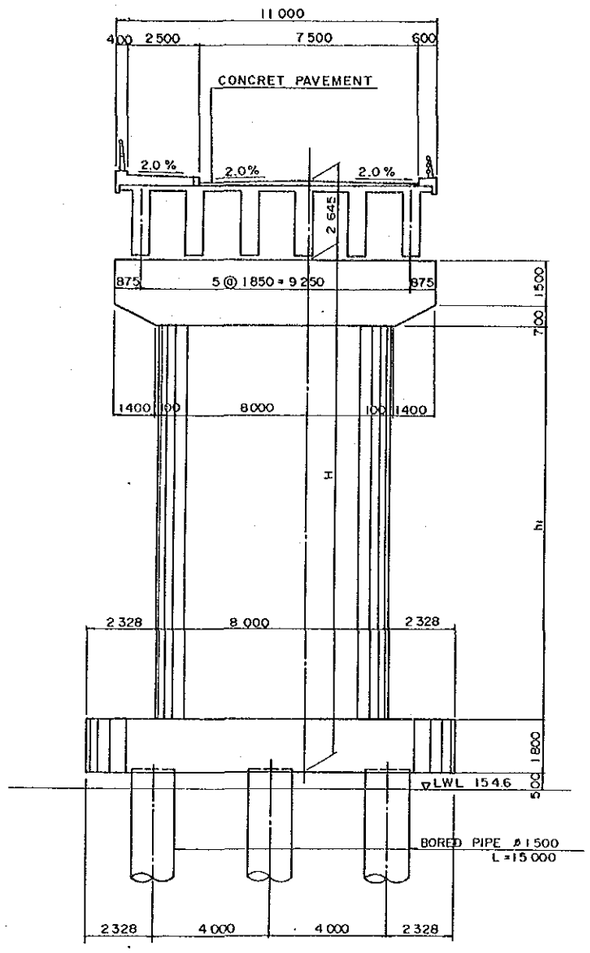
A1 ABUTMENT SCALE 1:100



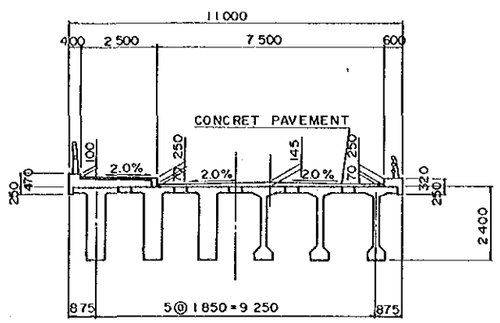
A2 ABUTMENT SCALE 1:100



PIERS SCALE 1:100



SECTION SCALE 1:100



DIMENSION OF PIERS

	H	h1
P1	18 040	14 040
P2	17 300	13 300
P3	16 560	12 560
P4	15 828	11 828

DESIGN STANDARD AND CRITERIA

DIMENSIONS	TYPE	5-SPAN PRESTRESSED CONCRETE T-GIRDER BRIDGE
	LENGTH	230 M
	SPAN	45 060 M
	WIDTH	OVERALL WIDTH : 11.0 M
		CARRIAGEWAY : 7.5 M
		SIDEWALK : 2.5 M
DESIGN ROAD	LIVE LOAD	DECKS: T-20(JAPANESE STANDARD)
		GIRDER: L-20(")
	SEISMIC ROAD	0.05 G
MAIN GIRDER	CONSTRUCTION	GIRDER ERECTION METHOD
	CONCRETE	σck = 350 kg/cm²
	PRESTRESSING STEEL	SWPR7A ; SWPR19
	REINFORCING BAR	SD 30 (JIS G 3112)
SUBSTRUCTURE	CONCRETE	σck = 240 kg/cm²
	REINFORCING BAR	SD 30 (JIS G 3112)
FOUNDATION	BORED PILE	Pa = 354 T/PILE
	SPREAD FOUNDATION	qa = 40 T/M²

THA NGON BRIDGE CONSTRUCTION PROJECT

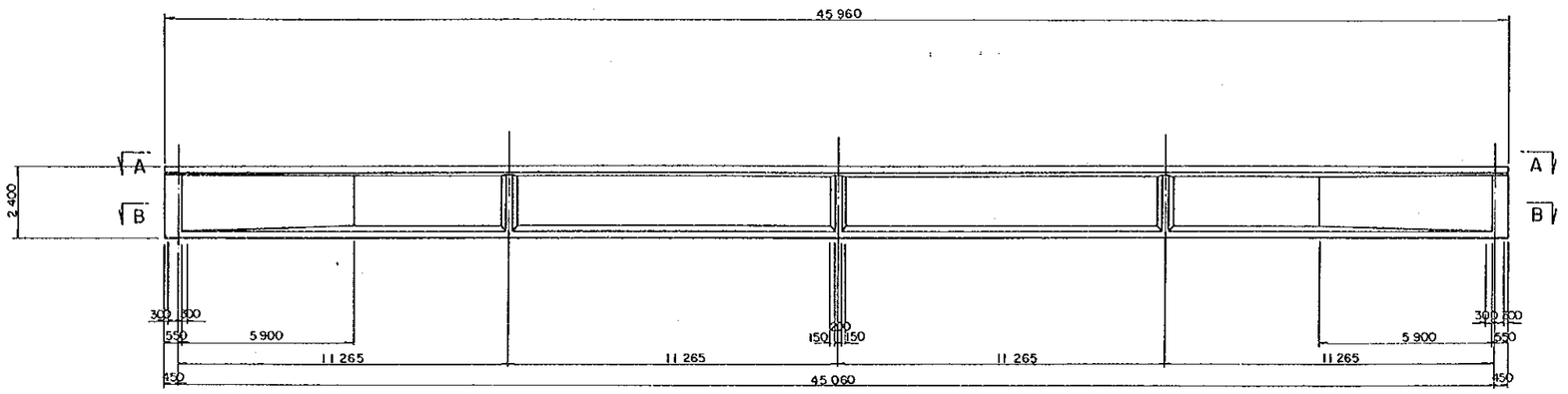
GENERAL VIEW (2/2)

SCALE 1:100

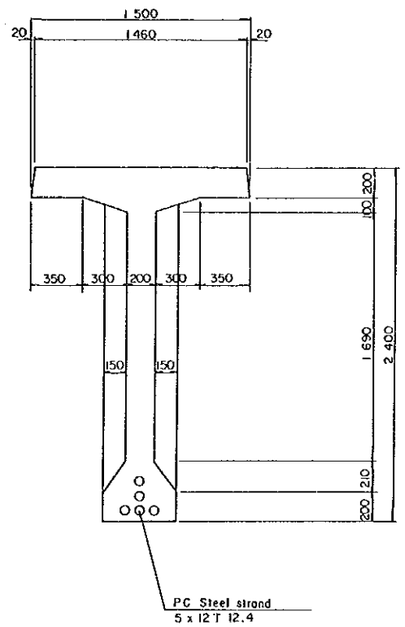
DATE FEBRUARY, 1991 | DRAWING NO. LTB-2

JAPAN INTERNATIONAL COOPERATION AGENCY

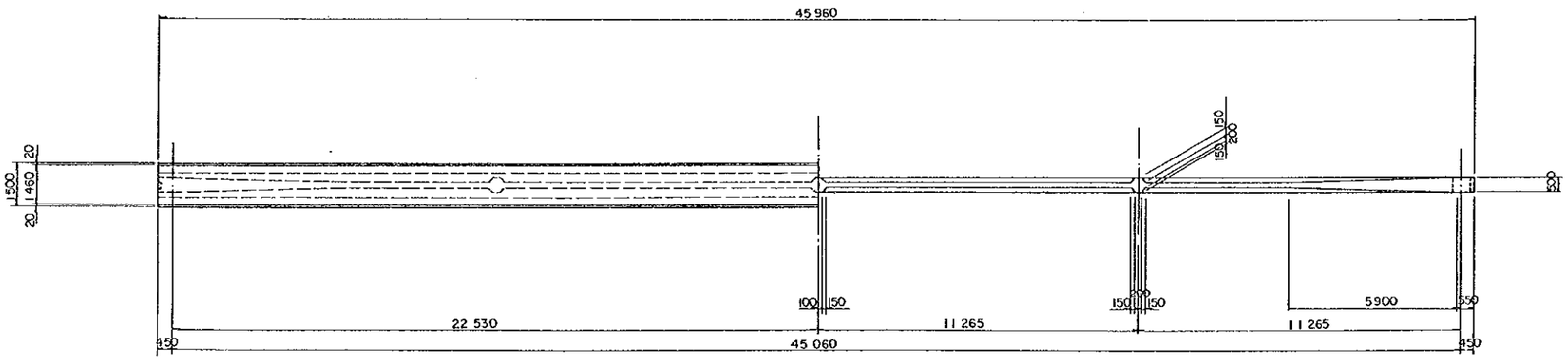
TYPICAL MAIN GIRDER ELEVATION SCALE 1:100



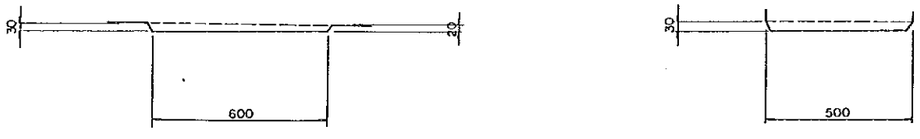
MAIN GIRDER SECTION SCALE 1:20



TOP VIEW SCALE 1:100

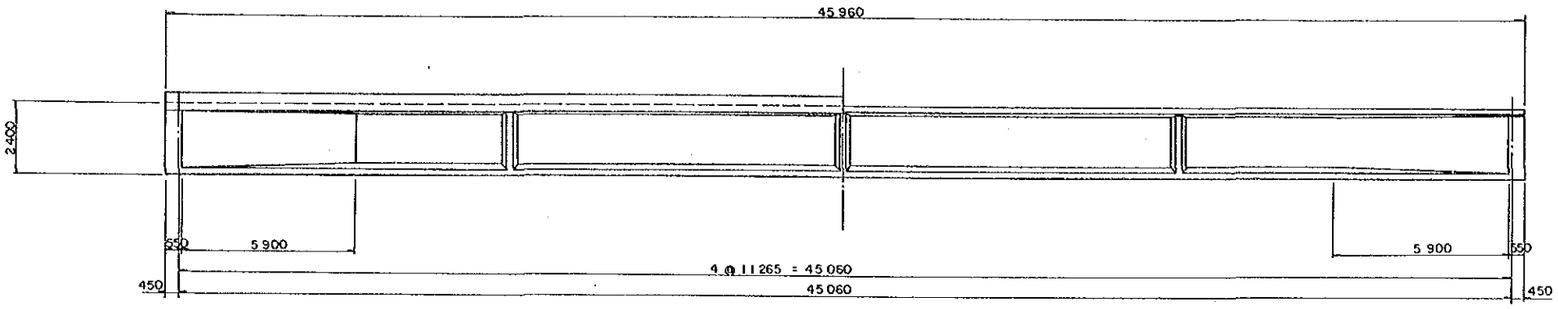


RARE SCALE 1:10

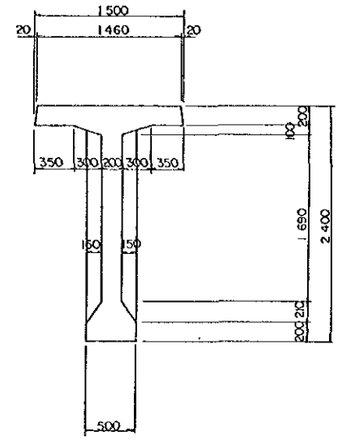


THA NGON BRIDGE CONSTRUCTION PROJECT	
DETAIL OF MAIN GIRDER SCALE 1:100, 1:20, 1:10	
DATE FEBRUARY, 1991	DRAWING NO. LTB-3
JAPAN INTERNATIONAL COOPERATION AGENCY	

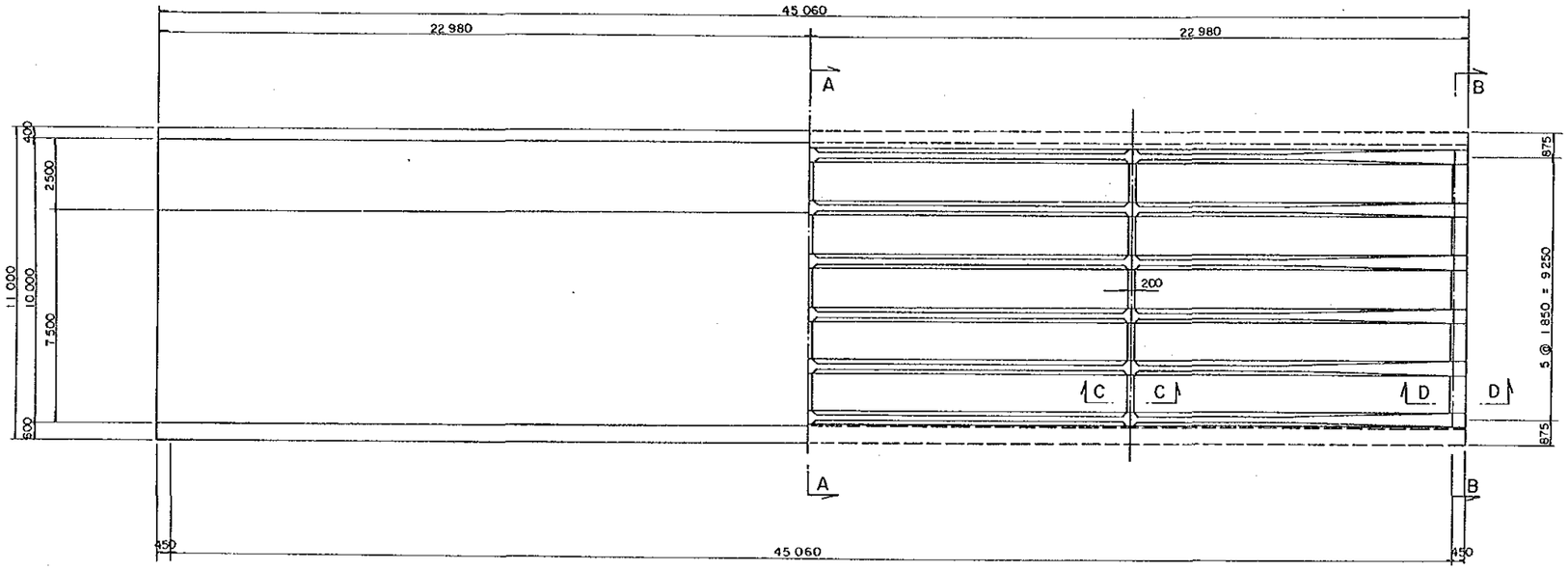
TYPICAL SECTION SCALE 1:100



MAIN GIRDER SECTION SCALE 1:30

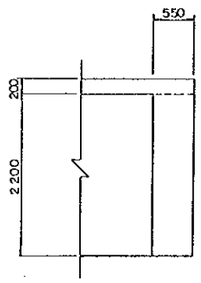


TYPICAL DECK ARRANGEMENT SCALE 1:100

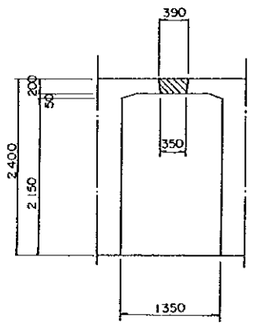


CROSS BEAM SCALE 1:40

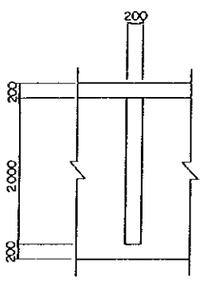
D — D



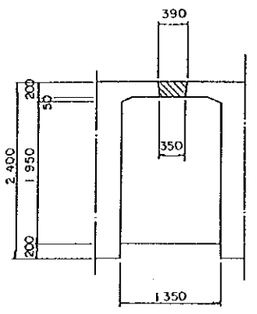
B — B



C — C

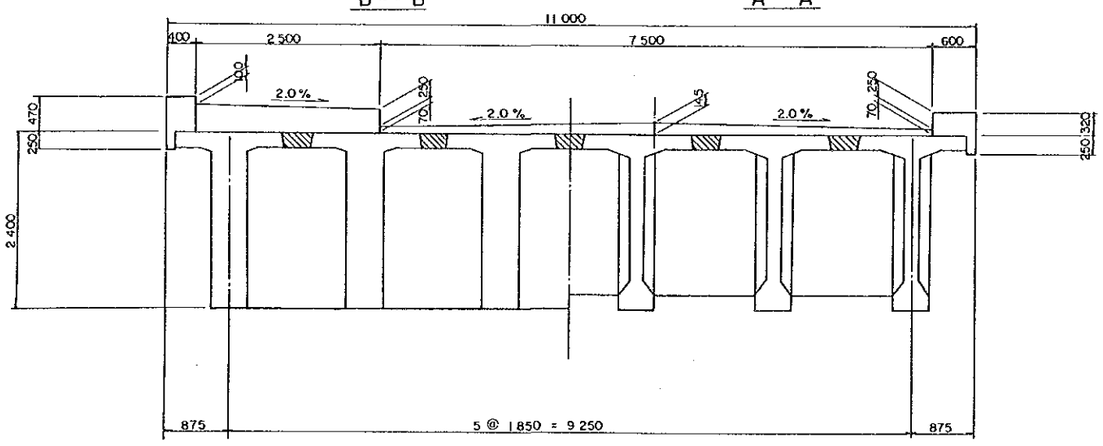


A — A



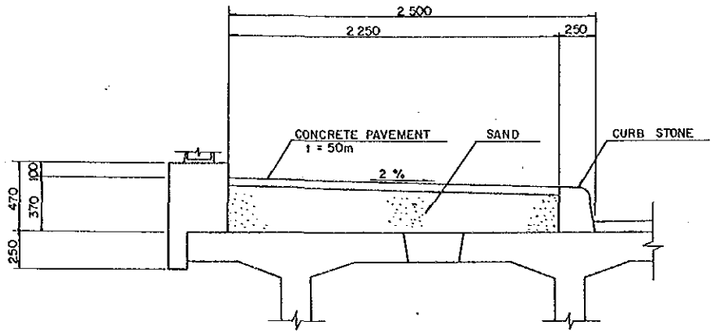
TYPICAL SECTION SCALE 1:40

B — B A — A

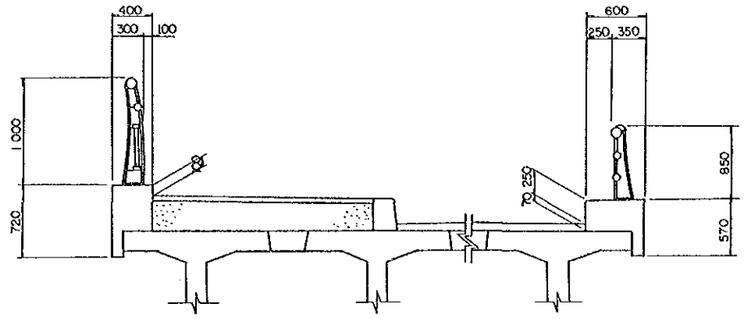


THA NGON BRIDGE CONSTRUCTION PROJECT	
DETAIL OF DECK SLAB	
SCALE 1:100, 1:40, 1:30	
DATE FEBRUARY, 1991	DRAWING NO. LTB-4
JAPAN INTERNATIONAL COOPERATION AGENCY	

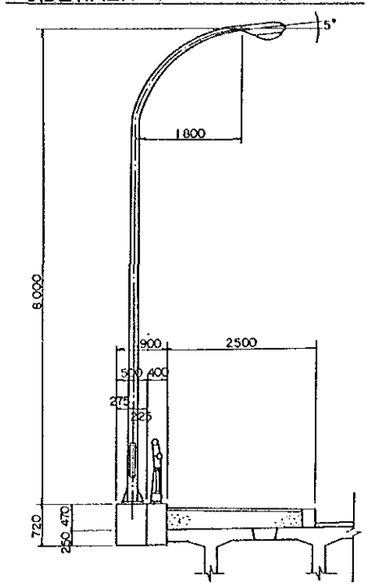
TYPICAL SIDEWALK SECTION SCALE 1:30



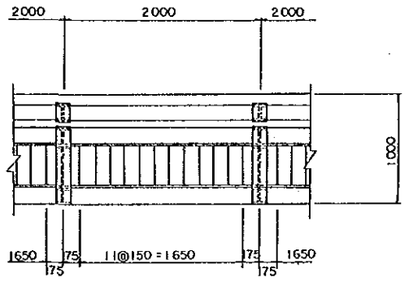
HANDRAIL SCALE 1:30



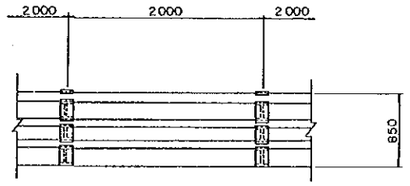
SIDEWALK ON PIER SCALE 1:50



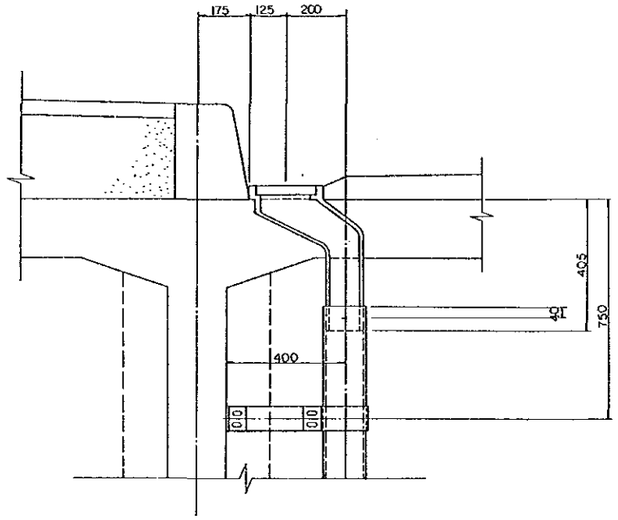
SIDEWALK SIDE SCALE 1:30



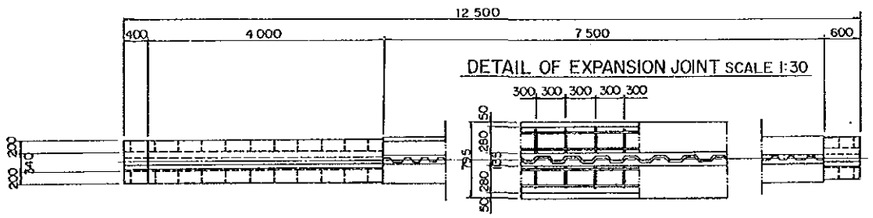
CARRIAGEWAY SIDE SCALE 1:30



DRAIN PIPE SCALE 1:10

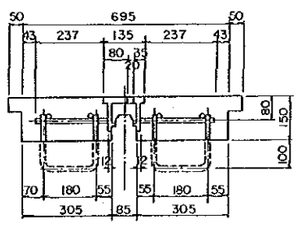


EXPANSION JOINT SCALE 1:50

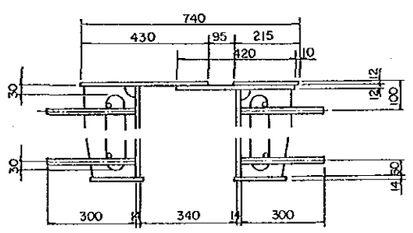


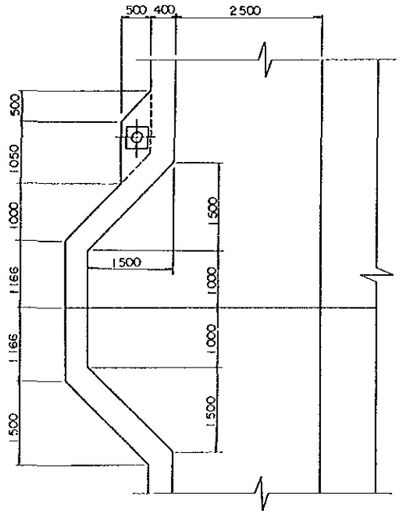
DETAIL OF EXPANSION JOINT SCALE 1:30

CARRIAGEWAY SECTION SCALE 1:10



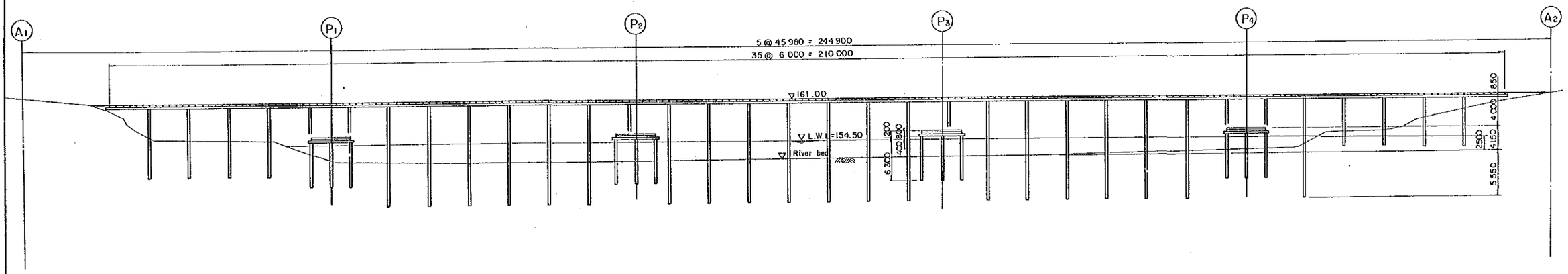
SIDEWALK SECTION SCALE 1: 0



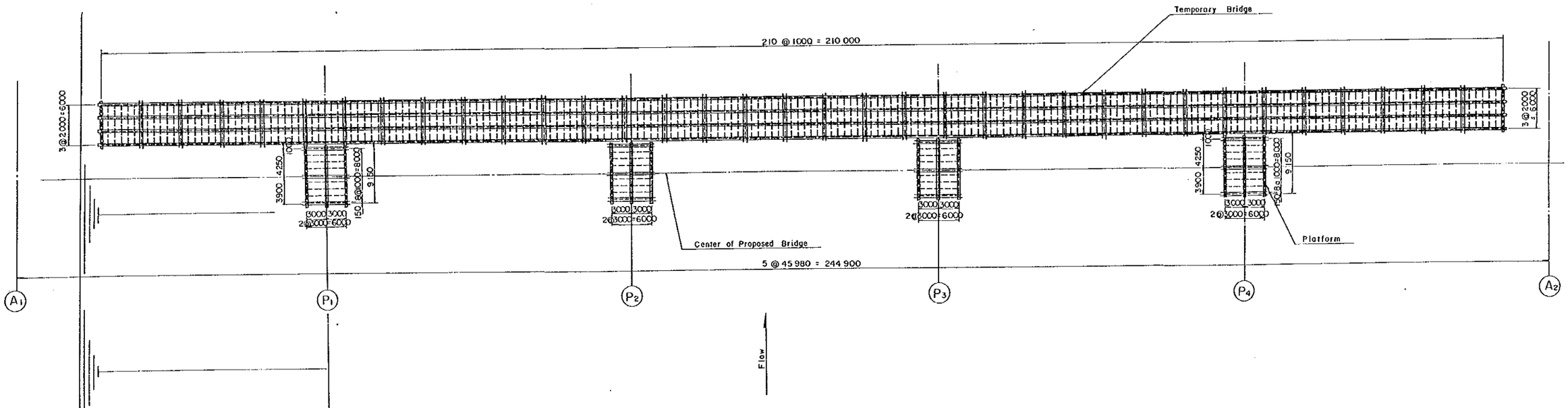


THA NGON BRIDGE CONSTRUCTION PROJECT	
DETAIL OF SIDEWALK, HANDRAIL, DRAIN PIPE AND EXPANSION JOINT SCALE 1:100, 1:50, 1:30 1:10	
DATE FEBRUARY, 1991	DRAWING NO. LTB-5
JAPAN INTERNATIONAL COOPERATION AGENCY	

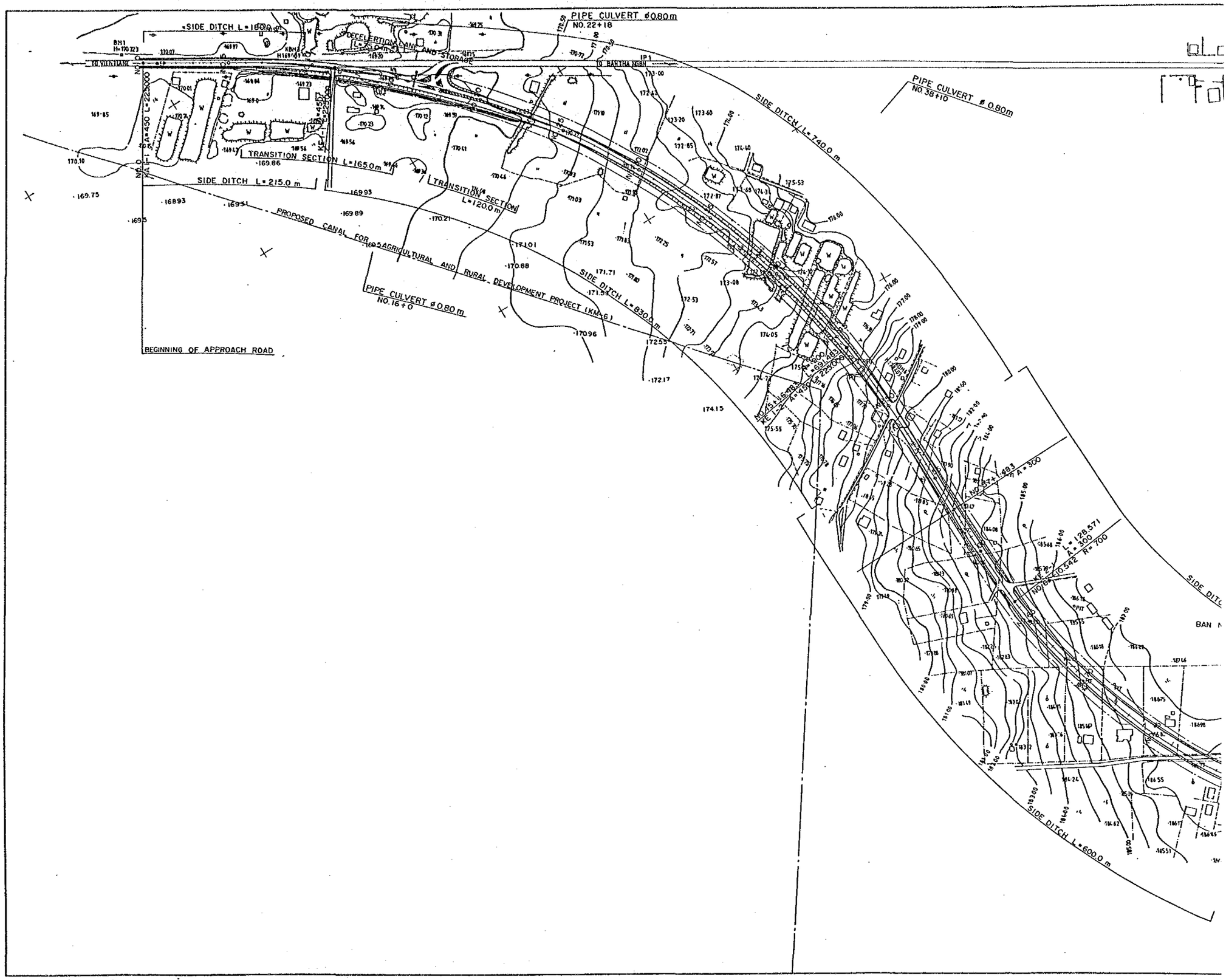
ELEVATION

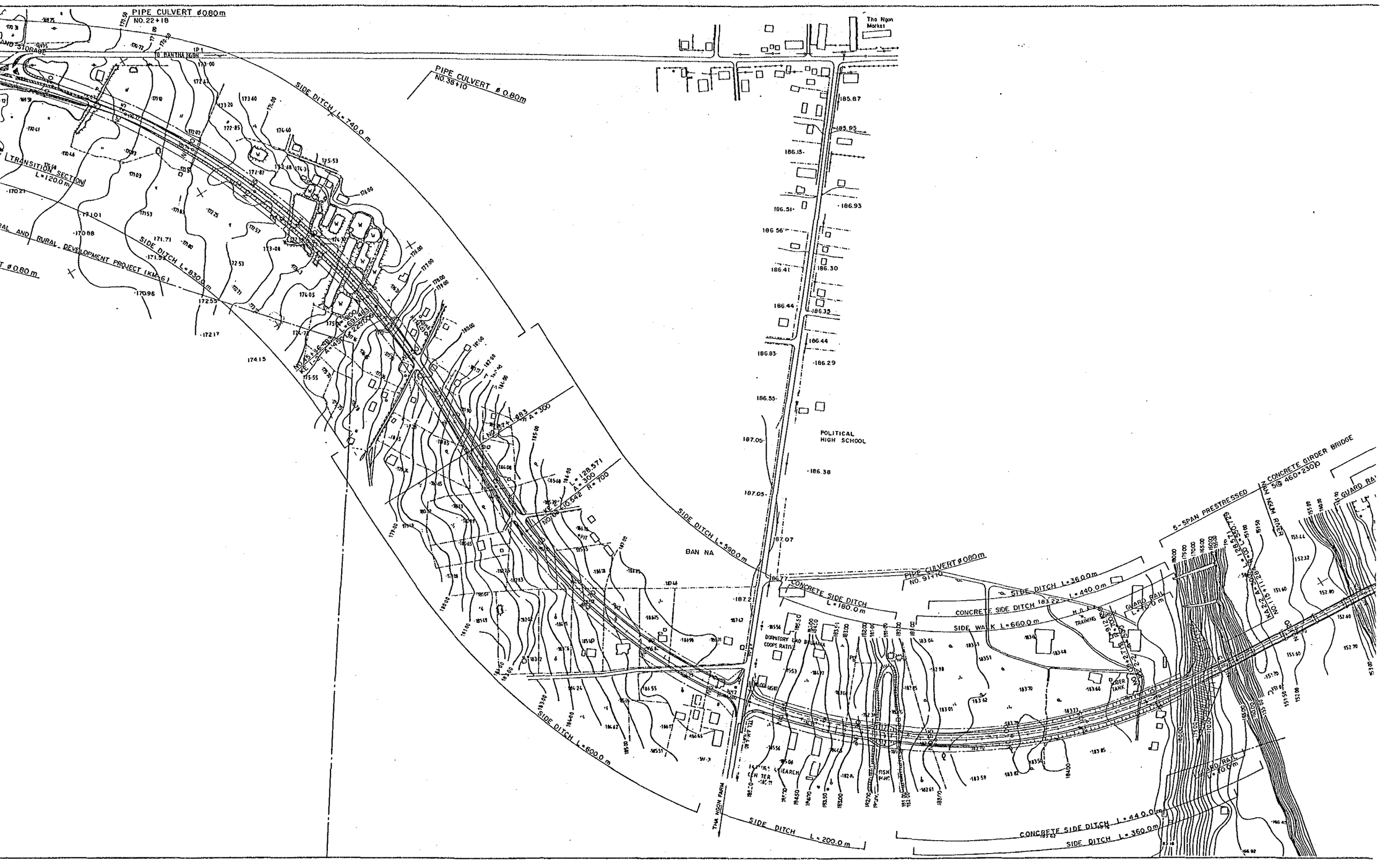


PLAN

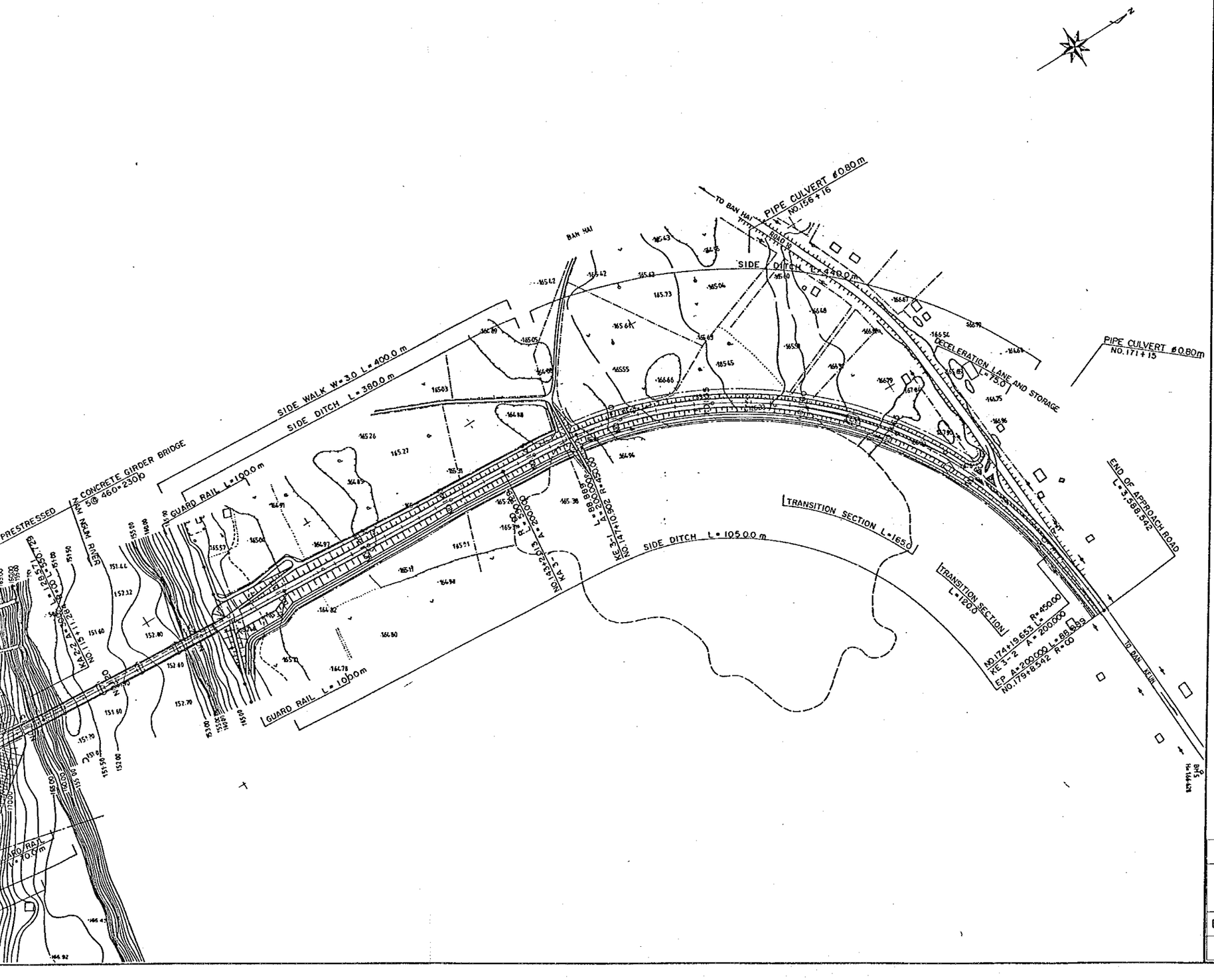


THA NGON BRIDGE CONSTRUCTION PROJECT	
TEMPORARY BRIDGE	
SCALE 1:300	
DATE FEBRUARY, 1991	DRAWING NO. LTB-6
JAPAN INTERNATIONAL COOPERATION AGENCY	


SIDE DITCH L=1600 m
DECELERATION LANE AND STORAGE
TO VIENTIANE
TO BANTHA NGEN
PIPE CULVERT ø0.80m
NO.22+18
PIPE CULVERT ø0.80m
NO.38+16
SIDE DITCH L=740.0 m
TRANSITION SECTION L=165.0m
SIDE DITCH L=215.0 m
TRANSITION SECTION L=120.0 m
PROPOSED CANAL FOR AGRICULTURAL AND RURAL DEVELOPMENT PROJECT (KM-6)
PIPE CULVERT ø0.80 m
NO.16+0
SIDE DITCH L=830.0 m
BEGINNING OF APPROACH ROAD
SIDE DITCH L=600.0 m


PIPE CULVERT ø0.80m
NO.22+18
PIPE CULVERT ø 0.80m
NO.38+10
SIDE DITCH L=740.0 m
TRANSITION SECTION
L=120.0 m
SIDE DITCH L=830.0 m
RURAL AND RURAL DEVELOPMENT PROJECT (KM-6)
Tho Ngon Market
POLITICAL HIGH SCHOOL
BAN NA
SIDE DITCH L=590.0 m
PIPE CULVERT ø0.80m
NO. 91+10
CONCRETE SIDE DITCH
L=180.0 m
SIDE DITCH L=360.0 m
CONCRETE SIDE DITCH
SIDE WALK L=660.0 m
5-SPAN PRESTRESSED
CONCRETE GIRDER BRIDGE
SIDE DITCH L=600.0 m
SIDE DITCH L=200.0 m
CONCRETE SIDE DITCH L=440.0 m
SIDE DITCH L=360.0 m
THA NGON FARM
DORMITORY LAO BULGANIA COOPERATIVE
WATER TANK
GUARD RAIL
NAM NGUM RIVER

Tho Ngon Market
POLITICAL HIGH SCHOOL
PIPE CULVERT ø0.80m NO.156+16
TO BAN HAI
BAN HAI
SIDE DITCH L=440.0m
DECELERATION LANE AND STORAGE L=75.0
PIPE CULVERT NO.171+15
END OF APPROACH L=3,588.542
SIDE WALK W=3.0 L=400.0m
SIDE DITCH L=380.0m
GUARD RAIL L=100.0m
5-SPAN PRESTRESSED CONCRETE GIRDER BRIDGE 5@ 460=2300
TRANSITION SECTION L=165.0
TRANSITION SECTION L=120.0
SIDE DITCH L=105.0m
GUARD RAIL L=100.0m
PIPE CULVERT ø0.80m NO.91+10
SIDE DITCH L=360.0m
CONCRETE SIDE DITCH L=180.0m
CONCRETE SIDE DITCH 183.22 L=440.0m
SIDE WALK L=660.0m
GUARD RAIL L=70.0m
CONCRETE SIDE DITCH L=440.0m
SIDE DITCH L=360.0m
DITCH L=200.0m



Note :

——·—— shows the limit of right of way

LEGEND

- CEMETARY
- TRAVERSE POINT
- BENCH MARK
- SPOT LEVEL
- INTERSECTION POINT
- CENTER PEG
- HOUSE
- SHED
- ROAD
- FOOT PATH
- FENCE
- CENTER LINE
- 5m
- 1m
- 0.5m
- CONTOUR LINE
- VEGE TATION AREA
- TRUCK FARM
- ORCHARD
- GRASS LAND
- FOREST
- CLUMBLING EARTH CLIFE
- DEPRESSION
- ELECTRIC POLE

SCALE 1:2000

0 5 100 150 200

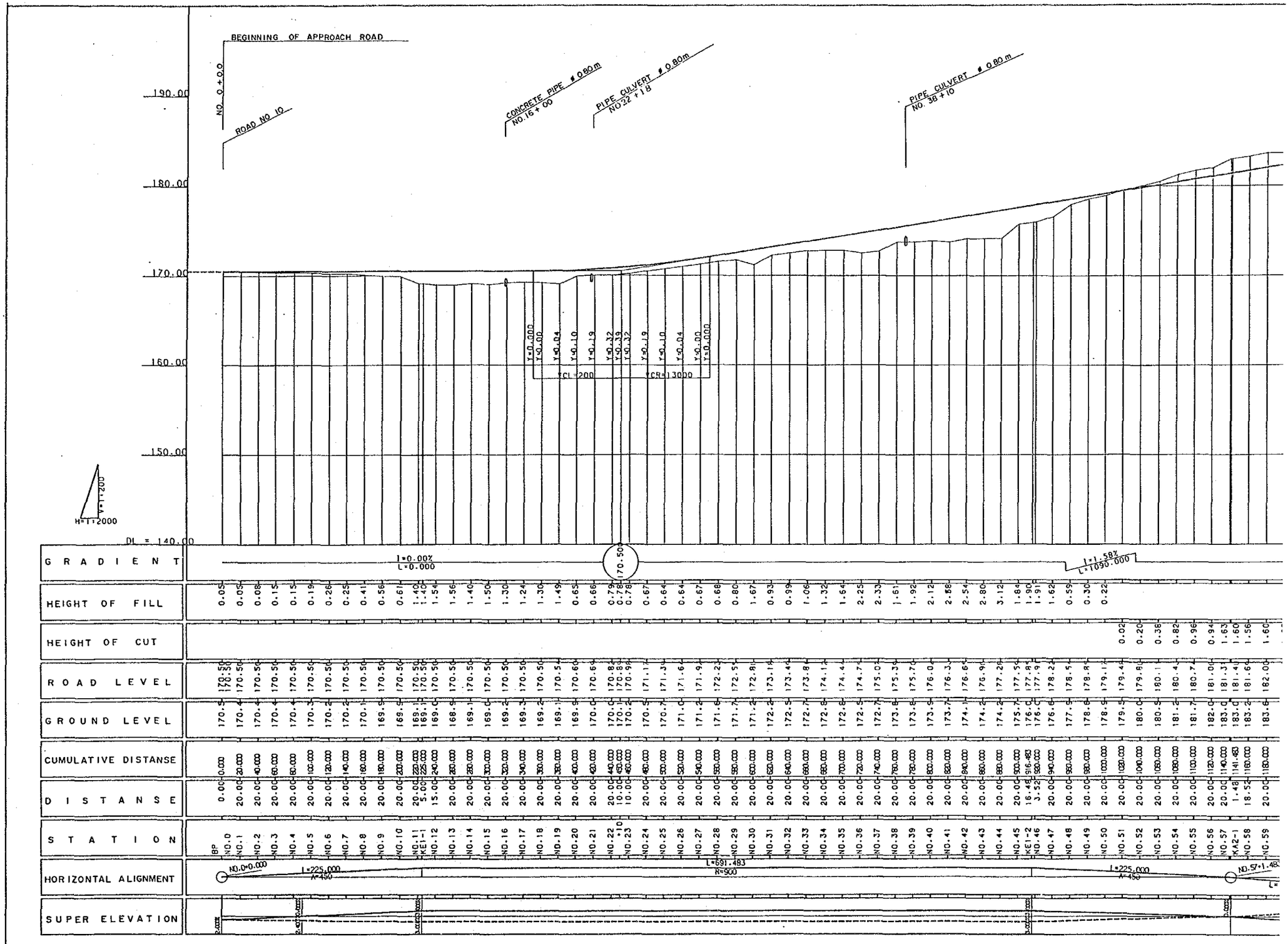
THA NGON BRIDGE CONSTRUCTION PROJECT

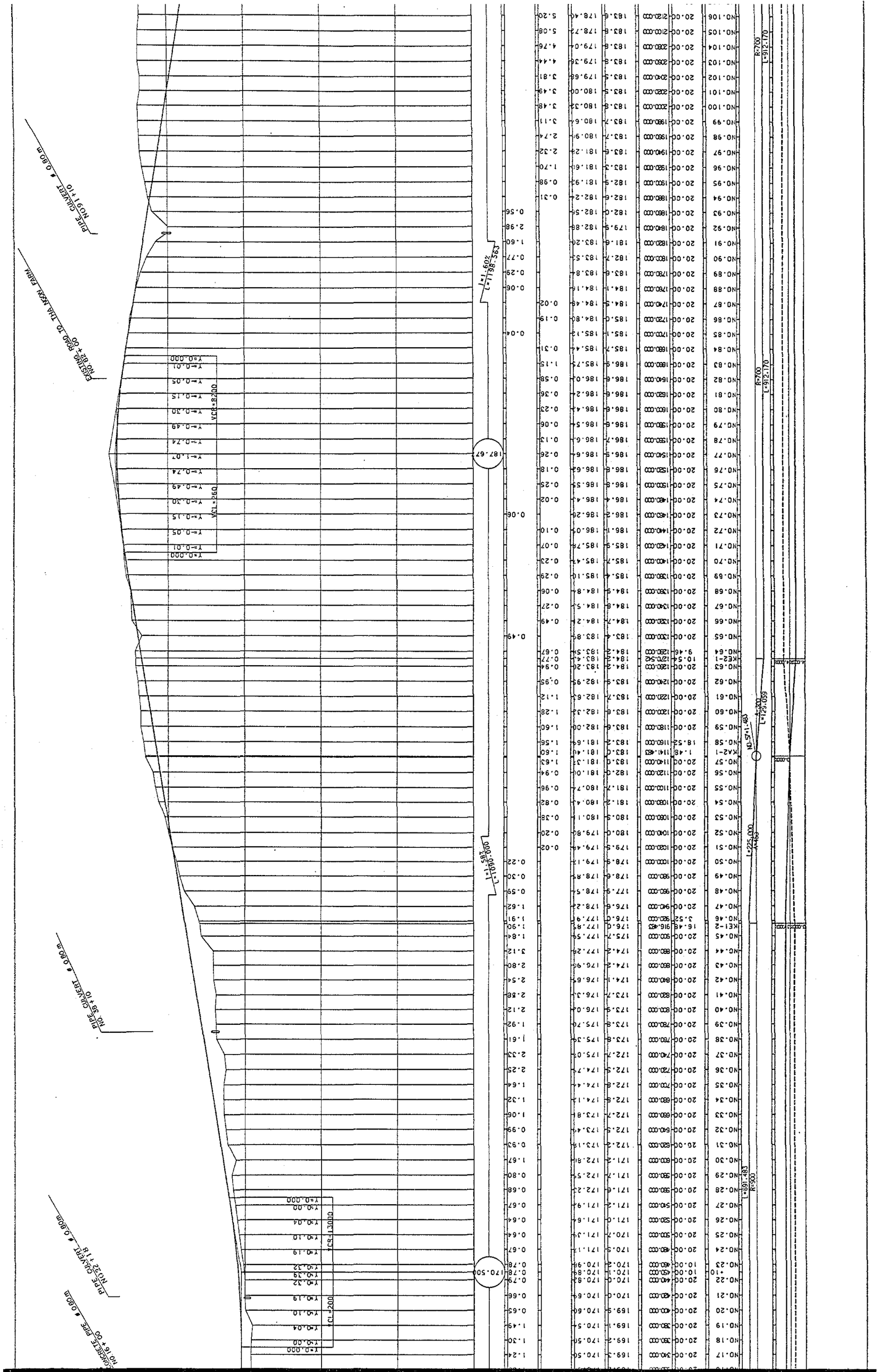
PLAN

SCALE 1:2,000

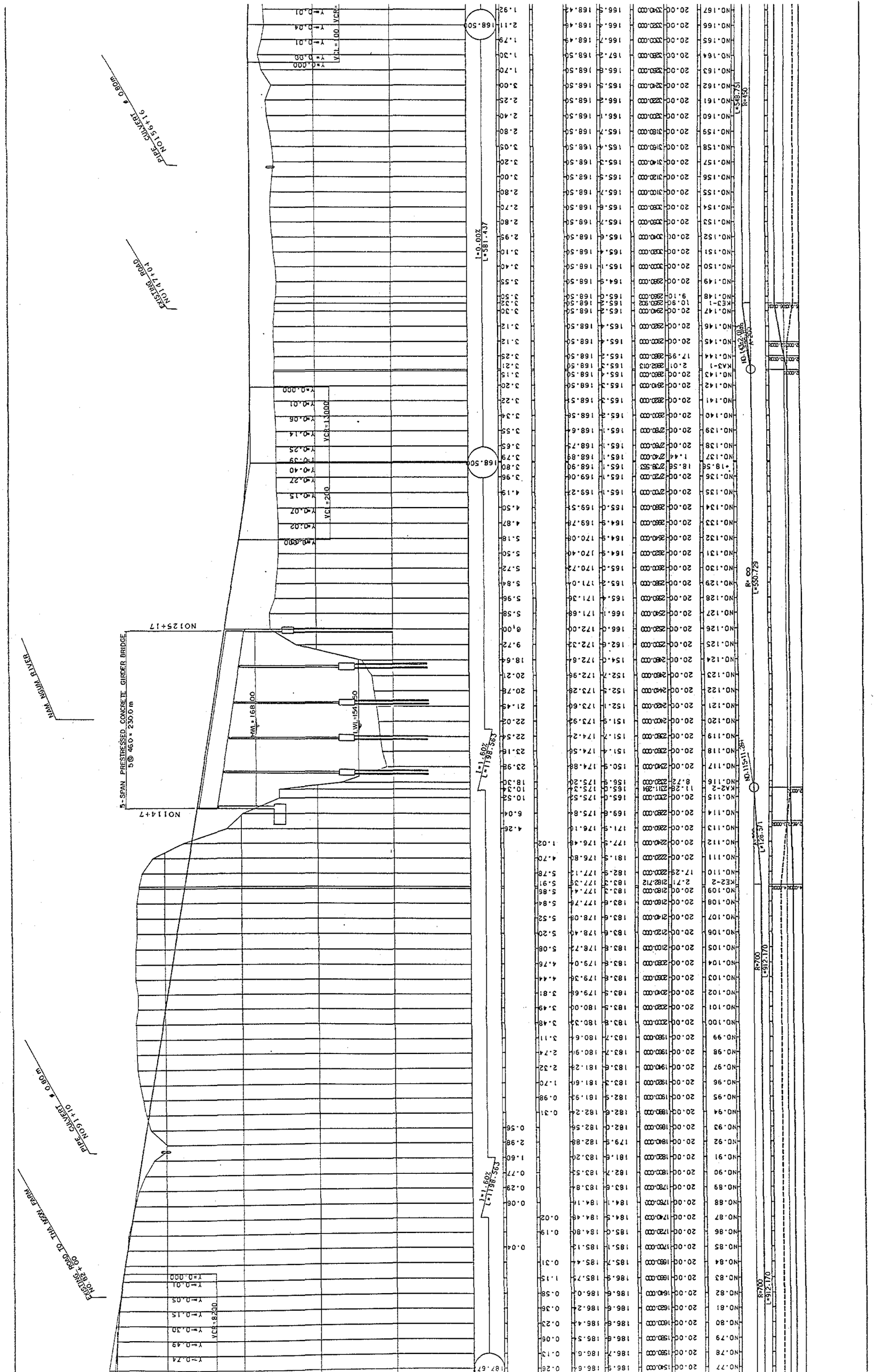
DATE FEBRUARY, 1991 | DRAWING NO. LTR-1

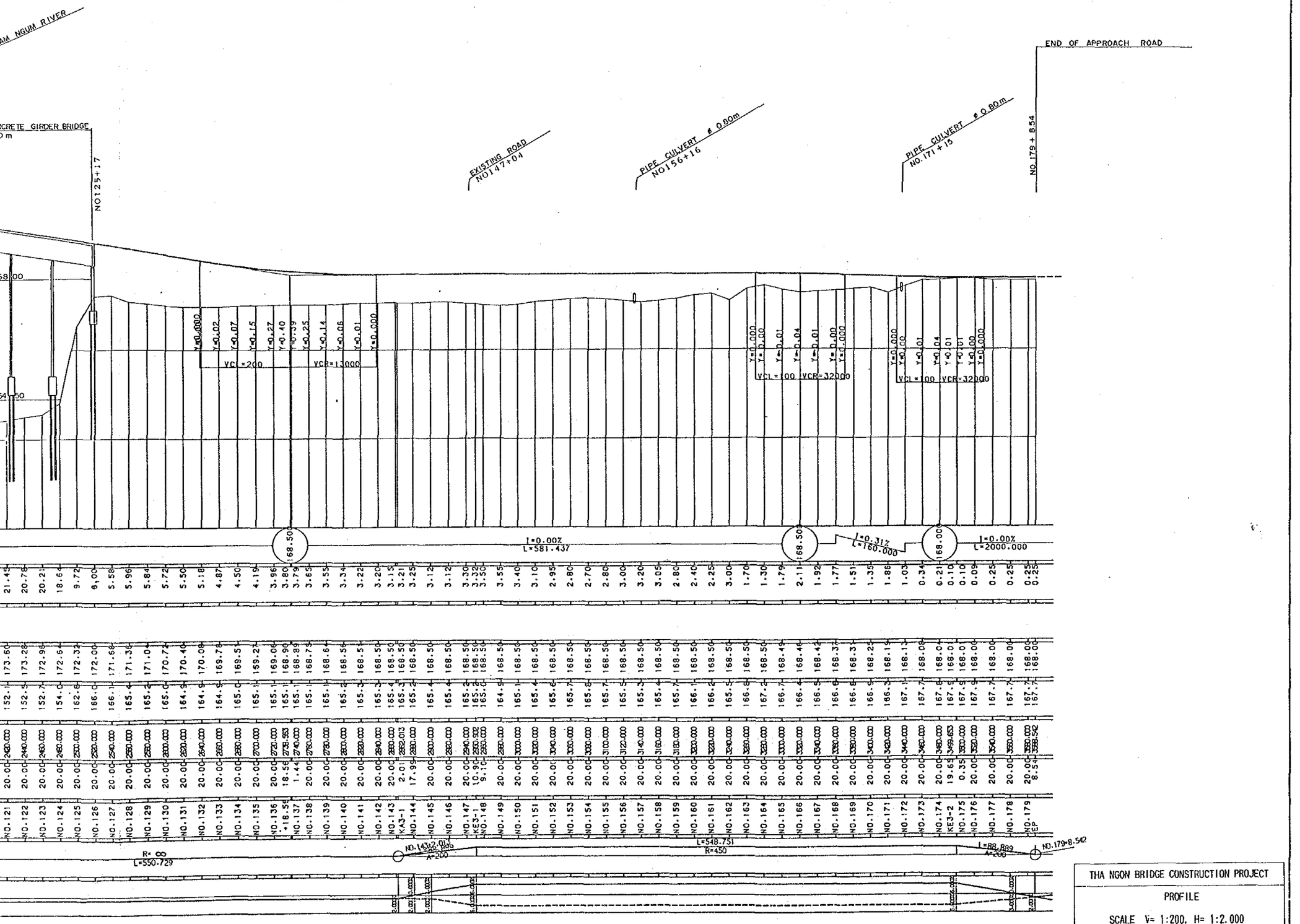
JAPAN INTERNATIONAL COOPERATION AGENCY


BEGINNING OF APPROACH ROAD
NO. 0+0.00
ROAD NO 10
CONCRETE PIPE ϕ 0.80m NO.16 + 00
PIPE CULVERT ϕ 0.80m NO.32 + 18
PIPE CULVERT ϕ 0.80m NO. 38 + 10
190.00
180.00
170.00
160.00
150.00
I=1:1.200
H=1:2000
DL = 140.00
*CL =200
*CR=13000
GRADIENT
I=0.00%
L=0.000
I=1.58%
L=1090.000
HEIGHT OF FILL
HEIGHT OF CUT
ROAD LEVEL
GROUND LEVEL
CUMULATIVE DISTANSE
DISTANSE
STATION
HORIZONTAL ALIGNMENT
SUPER ELEVATION
BP
NO.0
NO.1
NO.2
NO.3
NO.4
NO.5
NO.6
NO.7
NO.8
NO.9
NO.10
NO.11
KEI-1
NO.12
NO.13
NO.14
NO.15
NO.16
NO.17
NO.18
NO.19
NO.20
NO.21
NO.22
+10
NO.23
NO.24
NO.25
NO.26
NO.27
NO.28
NO.29
NO.30
NO.31
NO.32
NO.33
NO.34
NO.35
NO.36
NO.37
NO.38
NO.39
NO.40
NO.41
NO.42
NO.43
NO.44
NO.45
KEI-2
NO.46
NO.47
NO.48
NO.49
NO.50
NO.51
NO.52
NO.53
NO.54
NO.55
NO.56
NO.57
KA2-1
NO.58
NO.59
NO.0+0.000
I=225.000
R=450
L=691.483
R=500
I=225.000
R=450
NO.57+1.48



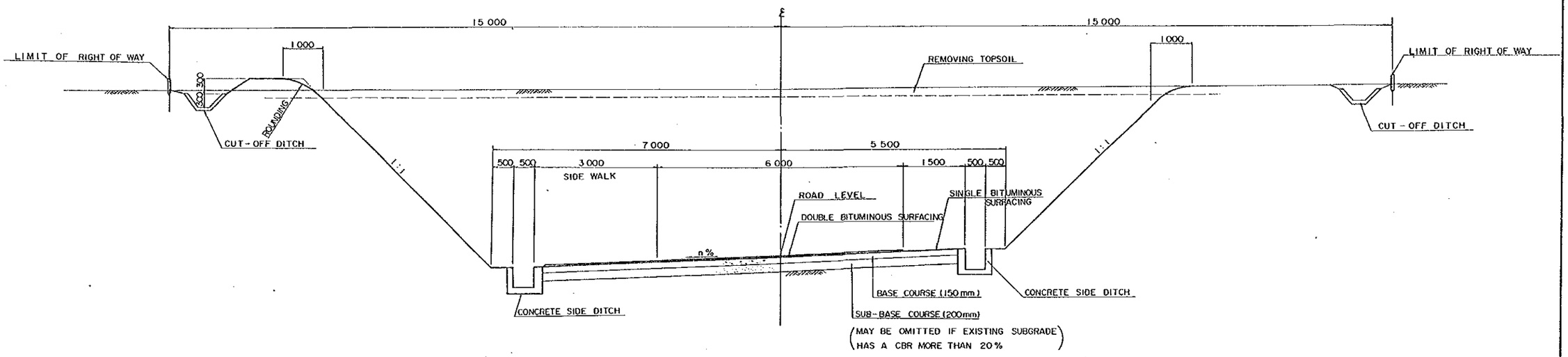
ND.106	20.00	2120.000	183.6	178.40	5.20				
ND.105	20.00	2100.000	183.8	178.72	5.08				
ND.104	20.00	2080.000	183.8	179.04	4.76				
ND.103	20.00	2060.000	183.8	179.36	4.44				
ND.102	20.00	2040.000	183.5	179.66	3.81				
ND.101	20.00	2020.000	183.5	180.00	3.49				
ND.100	20.00	2000.000	183.8	180.32	3.48				
ND.99	20.00	1980.000	183.7	180.61	3.11				
ND.98	20.00	1960.000	183.7	180.96	2.74				
ND.97	20.00	1940.000	183.6	181.28	2.32				
ND.96	20.00	1920.000	183.3	181.61	1.70				
ND.95	20.00	1900.000	182.9	181.93	0.98				
ND.94	20.00	1880.000	182.6	182.24	0.31				
ND.93	20.00	1860.000	182.0	182.56					0.56
ND.92	20.00	1840.000	179.9	182.88					2.98
ND.91	20.00	1820.000	181.6	183.20					1.60
ND.90	20.00	1800.000	182.7	183.53					0.77
ND.89	20.00	1780.000	183.6	183.84					0.29
ND.88	20.00	1760.000	184.1	184.16					0.06
ND.87	20.00	1740.000	184.5	184.48					0.02
ND.86	20.00	1720.000	185.0	184.80					0.19
ND.85	20.00	1700.000	185.1	185.12					0.04
ND.84	20.00	1680.000	185.7	185.44					0.31
ND.83	20.00	1660.000	186.9	185.75					1.15
ND.82	20.00	1640.000	186.6	186.04					0.58
ND.81	20.00	1620.000	186.6	186.24					0.36
ND.80	20.00	1600.000	186.6	186.44					0.23
ND.79	20.00	1580.000	186.6	186.54					0.06
ND.78	20.00	1560.000	186.7	186.67					0.13
ND.77	20.00	1540.000	186.9	186.64					0.26
ND.76	20.00	1520.000	186.8	186.62					0.18
ND.75	20.00	1500.000	186.8	186.55					0.25
ND.74	20.00	1480.000	186.4	186.43					0.02
ND.73	20.00	1460.000	186.2	186.26					0.06
ND.72	20.00	1440.000	186.1	186.07					0.10
ND.71	20.00	1420.000	185.9	185.78					0.07
ND.70	20.00	1400.000	185.7	185.47					0.23
ND.69	20.00	1380.000	185.4	185.10					0.29
ND.68	20.00	1360.000	184.9	184.84					0.06
ND.67	20.00	1340.000	184.8	184.57					0.27
ND.66	20.00	1320.000	184.7	184.21					0.49
ND.65	20.00	1300.000	183.4	183.86					0.49
ND.64	9.46	1280.000	184.2	183.54					0.67
KE2-1	10.54	1270.542	184.4	183.47					0.77
ND.63	20.00	1260.000	184.2	183.26					0.94
ND.62	20.00	1240.000	183.9	182.95					0.95
ND.61	20.00	1220.000	183.7	182.65					1.12
ND.60	20.00	1200.000	183.6	182.34					1.28
ND.59	20.00	1180.000	183.6	182.00					1.60
ND.58	18.52	1160.000	183.4	181.64					1.56
KA2-1	1.48	1141.483	183.0	181.40					1.60
ND.57	20.00	1140.000	183.0	181.37					1.63
ND.56	20.00	1120.000	182.0	181.00					0.94
ND.55	20.00	1100.000	181.7	180.74					0.96
ND.54	20.00	1080.000	181.2	180.40					0.82
ND.53	20.00	1060.000	180.9	180.11					0.38
ND.52	20.00	1040.000	180.0	179.80					0.20
ND.51	20.00	1020.000	179.9	179.44					0.02
ND.50	20.00	1000.000	178.9	179.12					0.22
ND.49	20.00	980.000	178.6	178.84					0.30
ND.48	20.00	960.000	177.9	178.54					0.59
ND.47	20.00	940.000	176.6	178.24					1.62
ND.46	3.52	920.000	176.0	177.94					1.91
KE1-2	16.48	916.483	176.0	177.90					1.90
ND.45	20.00	900.000	175.7	177.54					1.84
ND.44	20.00	880.000	174.2	177.28					3.12
ND.43	20.00	860.000	174.2	176.96					2.80
ND.42	20.00	840.000	174.1	176.65					2.54
ND.41	20.00	820.000	173.7	176.33					2.68
ND.40	20.00	800.000	173.9	176.04					2.12
ND.39	20.00	780.000	173.9	175.76					1.92
ND.38	20.00	760.000	173.8	175.39					1.61
ND.37	20.00	740.000	172.7	175.07					2.33
ND.36	20.00	720.000	172.5	174.79					2.25
ND.35	20.00	700.000	172.6	174.44					1.64
ND.34	20.00	680.000	172.6	174.13					1.32
ND.33	20.00	660.000	172.7	173.81					1.06
ND.32	20.00	640.000	172.5	173.44					0.99
ND.31	26.00	620.000	172.2	173.15					0.93
ND.30	20.00	600.000	171.2	172.81					1.67
ND.29	20.00	580.000	171.7	172.57					0.80
ND.28	20.00	560.000	171.6	172.22					0.68
ND.27	20.00	540.000	171.2	171.94					0.67
ND.26	20.00	520.000	171.0	171.64					0.64
ND.25	20.00	500.000	170.7	171.30					0.64
ND.24	20.00	480.000	170.9	171.17					0.67
ND.23	10.00	460.000	170.2	170.99					0.78
+10	10.00	450.000	170.1	170.84					0.78
ND.22	20.00	440.000	170.0	170.82					0.79
ND.21	20.00	420.000	170.0	170.66					0.66
ND.20	20.00	400.000	169.9	170.66					0.65
ND.19	20.00	380.000	169.1	170.54					1.49
ND.18	20.00	360.000	169.2	170.50					1.30
ND.17	20.00	340.000	169.3	170.50					1.24


PIER GUIDE
NO156+16
0.60m
EXISTING ROAD
NO147+04
NO125+17
5-SPAN PRESTRESSED CONCRETE GIRDER BRIDGE
5@ 46.0 = 230.0 m
NO114+7
HWL=168.00
LWL=154.50
MWH NGHM BELT
PIPE CULVERT
NO91+10
0.60m
EXISTING ROAD TO TUA MAYA CABIN
NO.82+00
I=0.00%
L=581.437
I=1.60%
L=198.563
I=1.60%
L=198.563
168.50
168.50
VCR=100
VCR=1000
VCR=200
VCR=8200
R=∞
L=550.729
R=350
L=548.751
R=350
ID.143+2.00m
R=350
L=126.371
R=∞
L=191.710
R=∞
L=191.710
R=∞
L=191.710

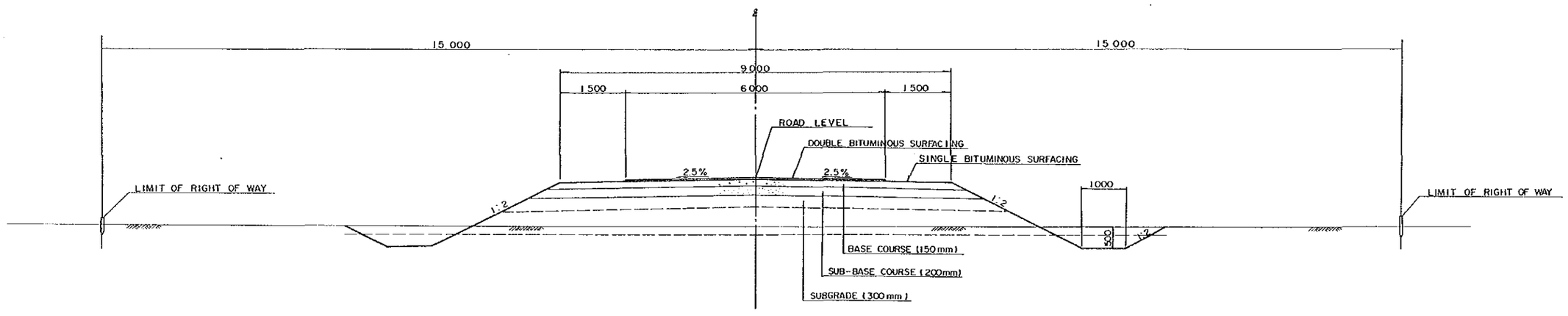


THA NGON BRIDGE CONSTRUCTION PROJECT	
PROFILE	
SCALE V= 1:200, H= 1:2.000	
DATE FEBRUARY. 1991	DRAWING NO. LTR-2
JAPAN INTERNATIONAL COOPERATION AGENCY	

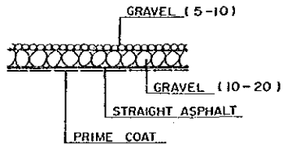
SECTION 93+00-112+00



SECTION 0+00 - 80+00

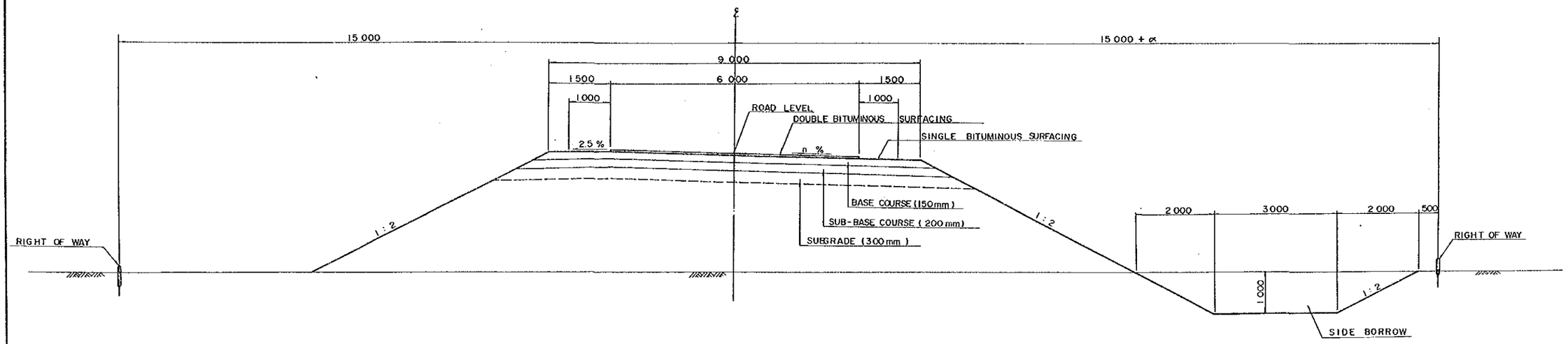


DOUBLE BITUMINOUS SUREACING

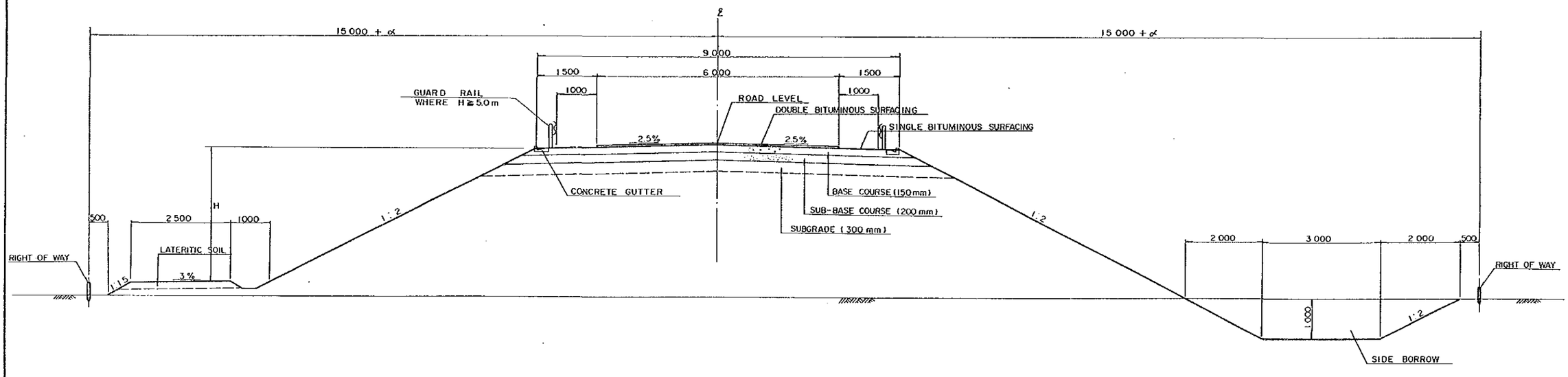


THA NGON BRIDGE CONSTRUCTION PROJECT	
TYPICAL CROSS SECTION (1/2)	
SCALE 1:50	
DATE FEBRUARY, 1991	DRAWING NO. LTR-3
JAPAN INTERNATIONAL COOPERATION AGENCY	

SECTION 148+00 - 169+00

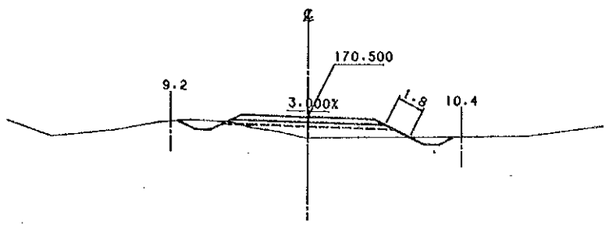


SECTION 127+00 - 146+00



THA NGON BRIDGE CONSTRUCTION PROJECT	
TYPICAL CROSS SECTION (2/2)	
SCALE 1:50	
DATE FEBRUARY, 1991	DRAWING NO. LTR-4
JAPAN INTERNATIONAL COOPERATION AGENCY	

NO. 11+ 5
GH=169.10
PH=170.500



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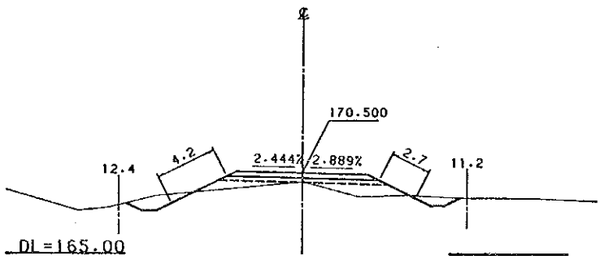
PH=170.500



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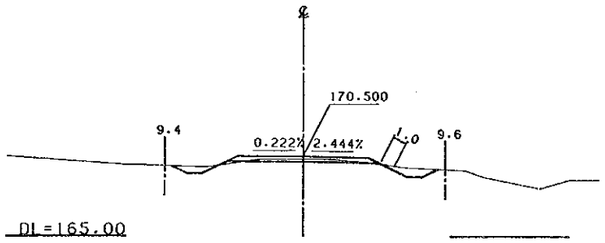

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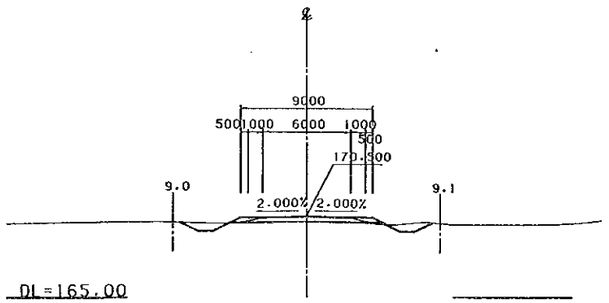

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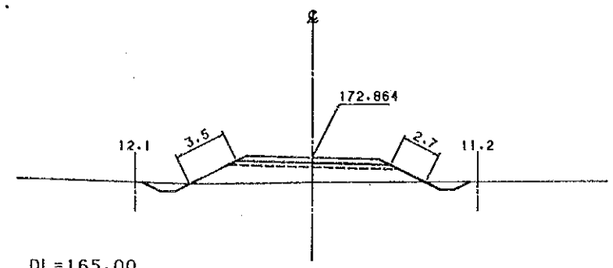
PH=172.864



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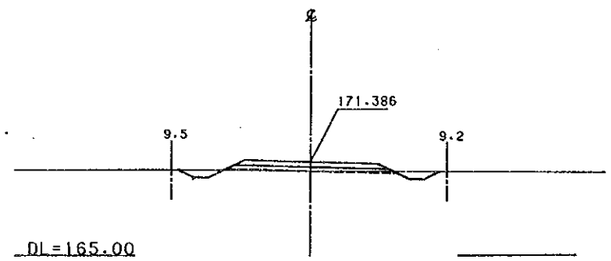
PH=171.386



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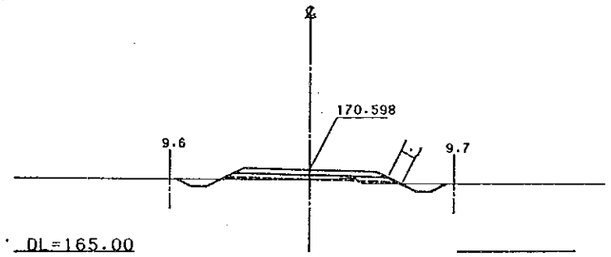
PH=170.598



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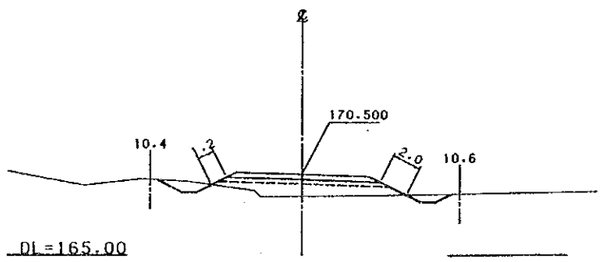
PH=170.500



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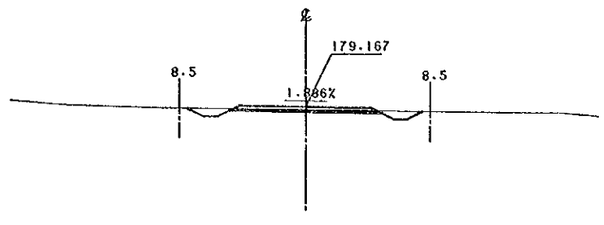

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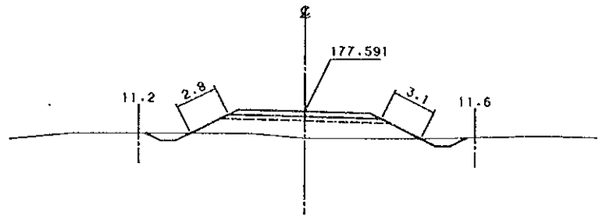

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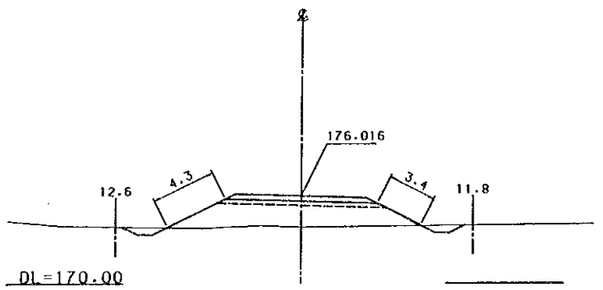
PH=176.016



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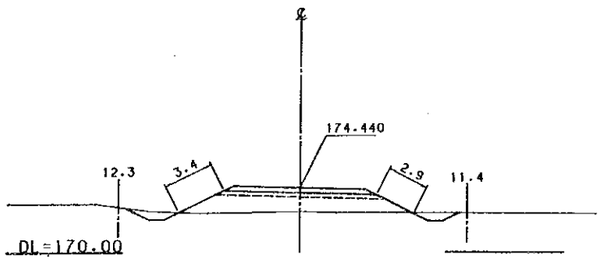

DL=170.00

THA NGON BRIDGE CONSTRUCTION PROJECT	
CROSS SECTION (1/4)	
SCALE 1:200	
DATE FEBRUARY, 1991	DRAWING NO. LTR-5
JAPAN INTERNATIONAL COOPERATION AGENCY	

NO. 63+10.542
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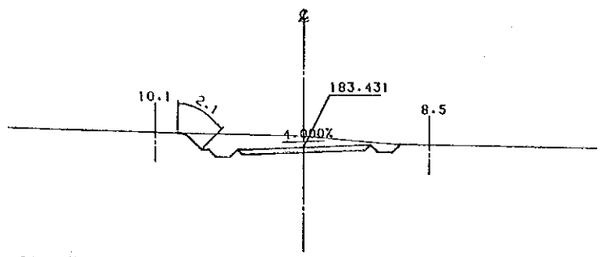
PH=183.431



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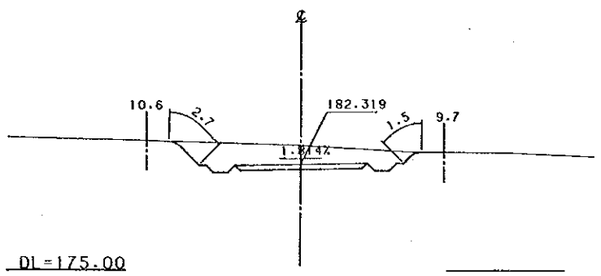
PH=182.319



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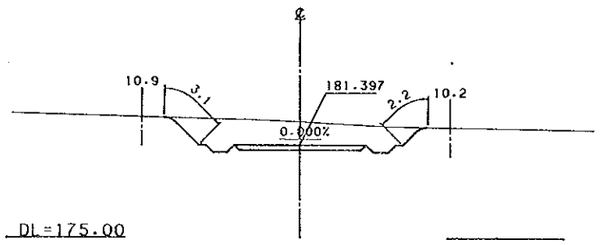
NO. 57+ 1.483
GH=183.00
PH=181.397



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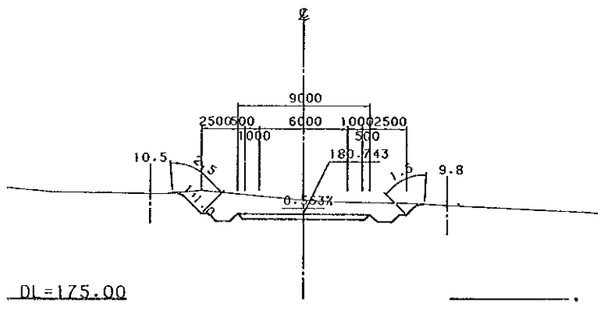
PH=180.743



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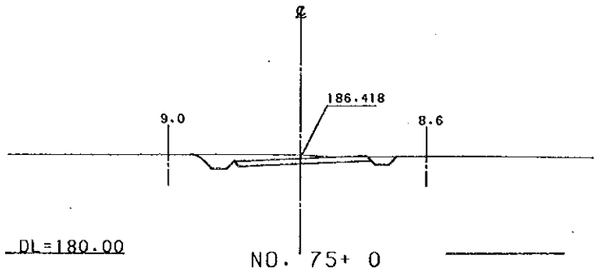
PH=186.418



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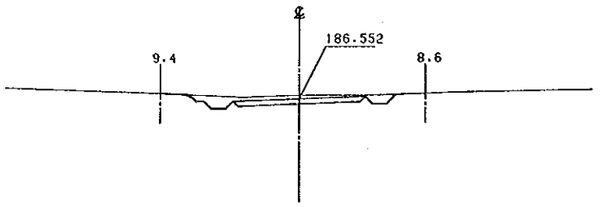

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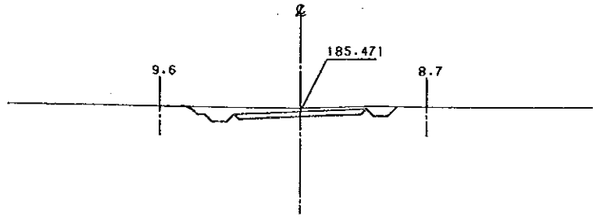
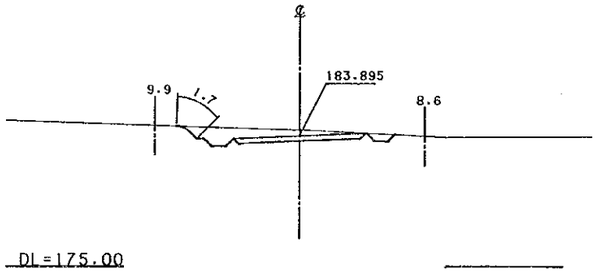
NO. 70+ 0
GH=185.70
PH=185.471



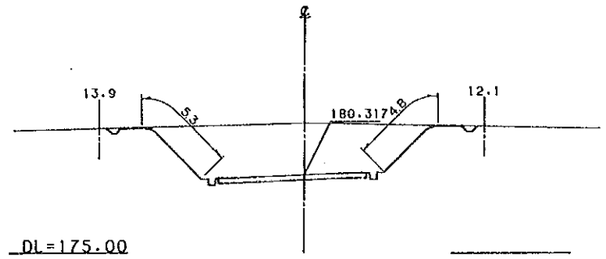
DL=175.00

NO. 65+ 0
GH=184.30
PH=183.895



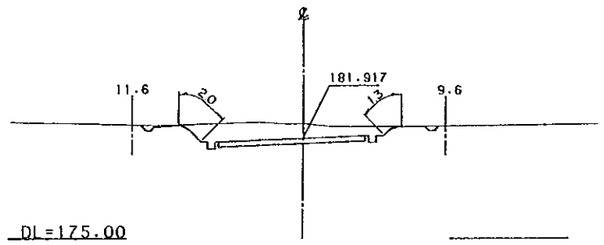
DL=175.00

NO. 100+ 0
GH=183.80
PH=180.317



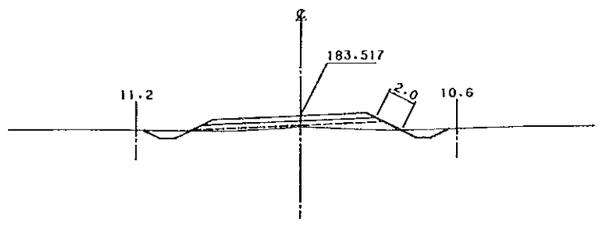
DL=175.00

NO. 95+ 0
GH=182.90
PH=181.917



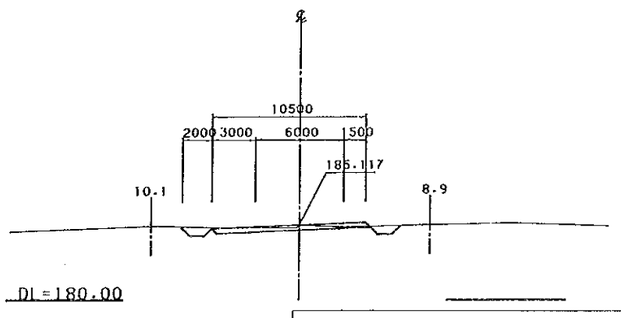
DL=175.00

NO. 90+ 0
GH=182.75
PH=183.517



DL=175.00

NO. 85+ 0
GH=185.08
PH=185.117

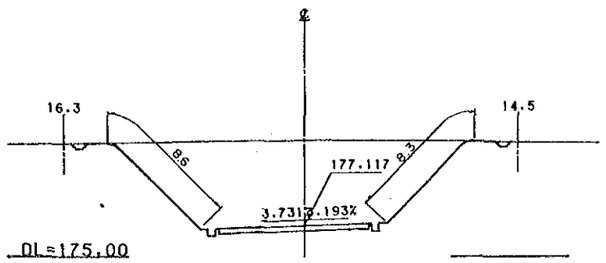


DL=180.00

THA NGON BRIDGE CONSTRUCTION PROJECT	
CROSS SECTION (2/4)	
SCALE 1:200	
DATE FEBRUARY, 1991	DRAWING NO. LTR-6
JAPAN INTERNATIONAL COOPERATION AGENCY	

NO. 110+ 0

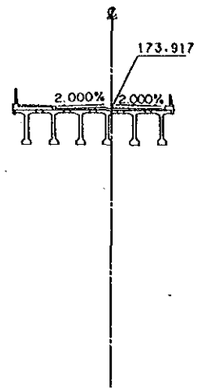
GH=182.90
PH=177.117



DL=175.00

NO. 120+ 0

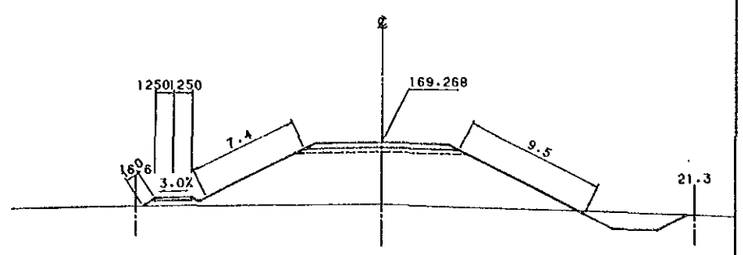
GH=151.90
PH=173.917



DL=155.00

NO. 135+ 0

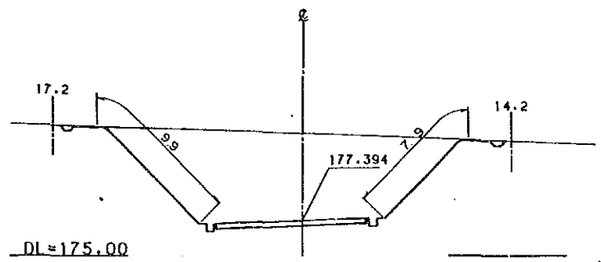
GH=165.07
PH=169.268



DL=160.00

NO. 109+ 2.712

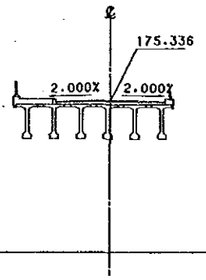
GH=183.30
PH=177.394



DL=175.00

NO. 115+11.284

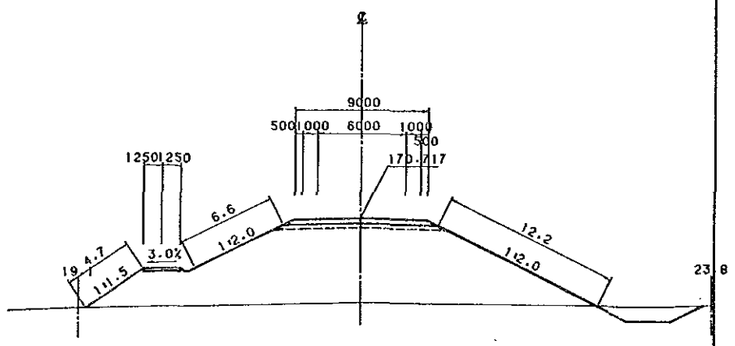
GH=165.00
PH=175.336



DL=160.00

NO. 130+ 0

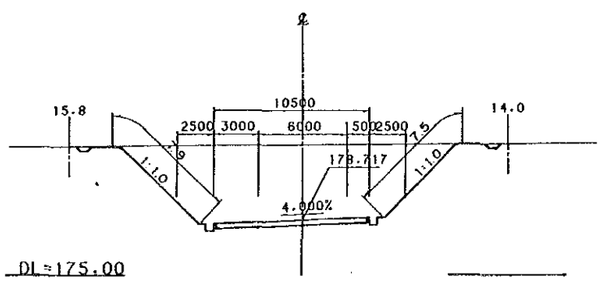
GH=165.00
PH=170.717



DL=160.00

NO. 105+ 0

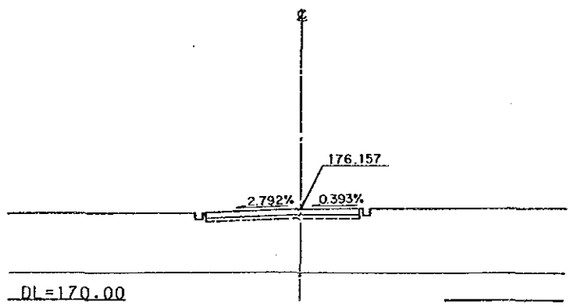
GH=163.80
PH=178.717



DL=175.00

NO. 113+ 0

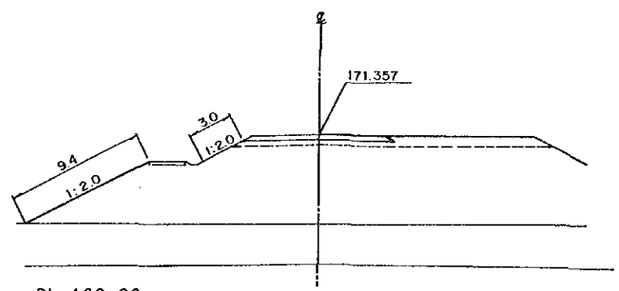
GH=171.90
PH=176.157



DL=170.00

NO. 128+ 0

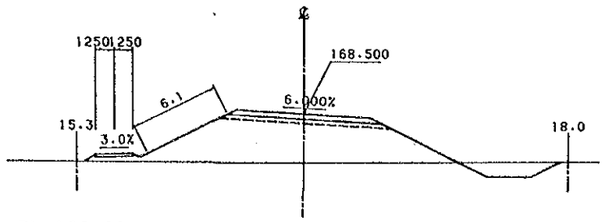
GH=165.40
PH=171.357



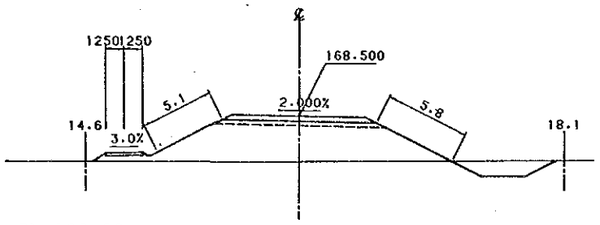
DL=160.00

THA NGON BRIDGE CONSTRUCTION PROJECT	
CROSS SECTION (3/4)	
SCALE 1:200	
DATE FEBRUARY, 1991	DRAWING NO. LTR-7
JAPAN INTERNATIONAL COOPERATION AGENCY	

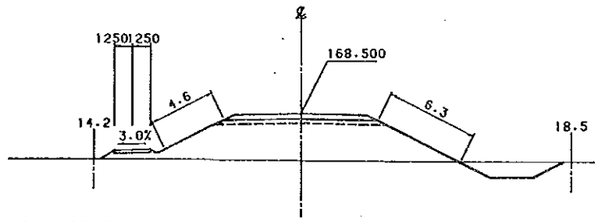
NO. 147+10.902
GH=165.18
PH=168.500



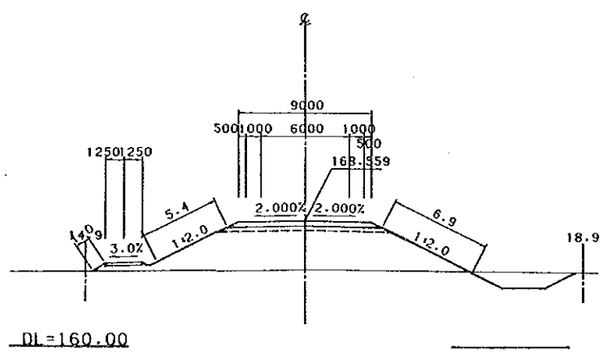
NO. 145+ 0
GH=165.38
PH=168.500



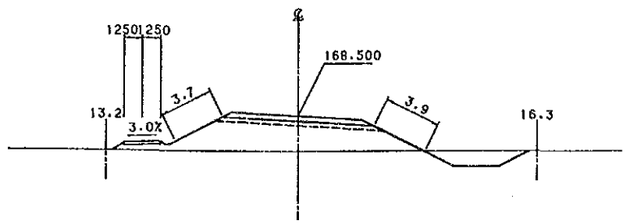
NO. 143+ 2.013
GH=165.29
PH=168.500



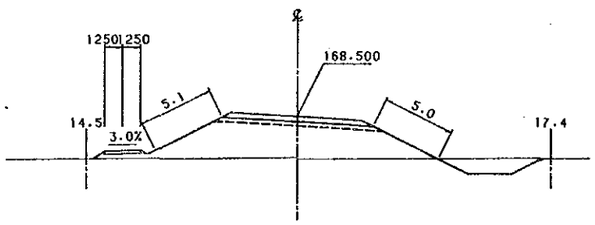
NO. 140+ 0
GH=165.22
PH=168.559



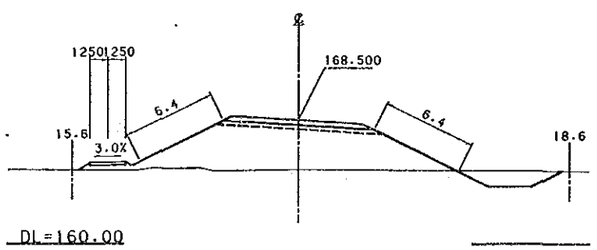
NO. 160+ 0
GH=166.10
PH=168.500



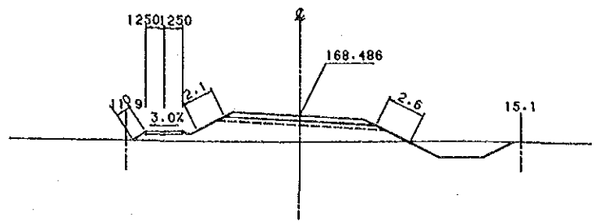
NO. 155+ 0
GH=165.70
PH=168.500



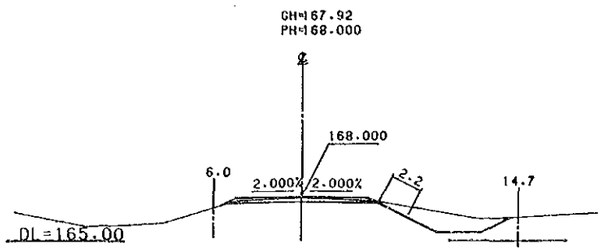
NO. 150+ 0
GH=165.10
PH=168.500



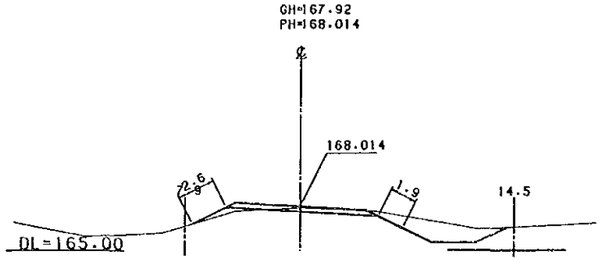
NO. 165+ 0
GH=166.70
PH=168.486



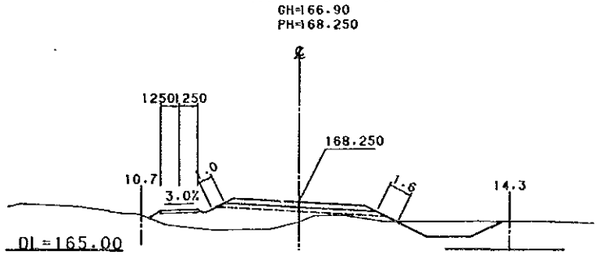
NO. 179+ 8.542
GH=167.92
PH=168.000



NO. 174+19.653
GH=167.92
PH=168.014

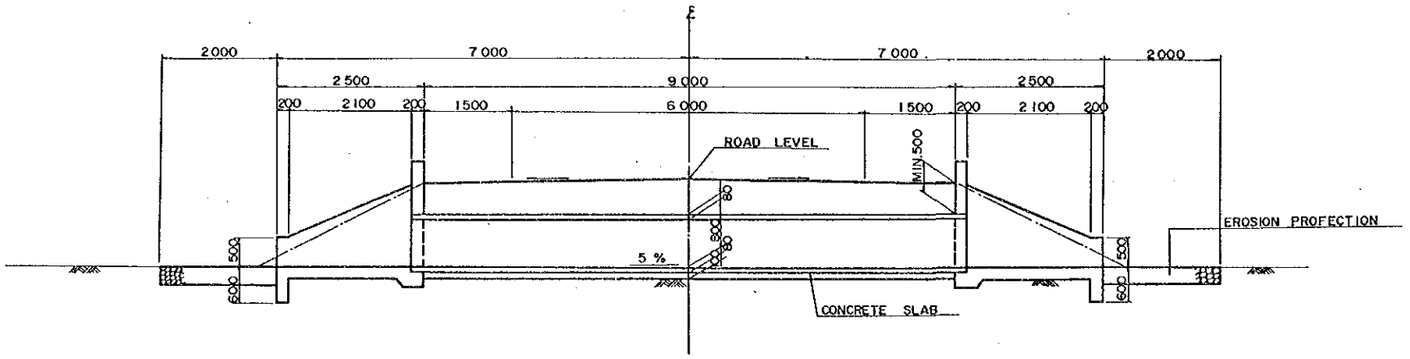


NO. 170+ 0
GH=166.90
PH=168.250

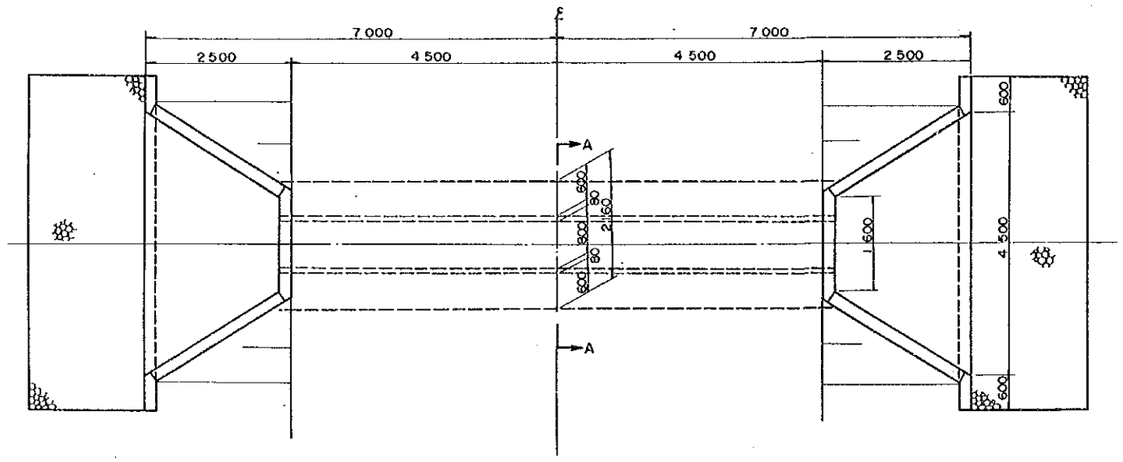


THA NGON BRIDGE CONSTRUCTION PROJECT	
CROSS SECTION (4/4)	
SCALE 1:200	
DATE FEBRUARY, 1991	DRAWING NO. LTR-8
JAPAN INTERNATIONAL COOPERATION AGENCY	

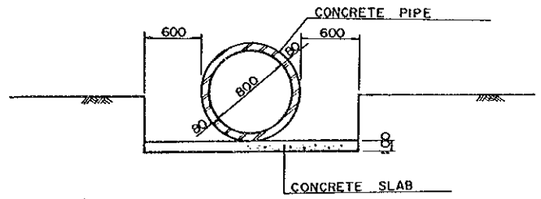
ELEVATION
SCALE 1:50



PLAN
SCALE 1:50

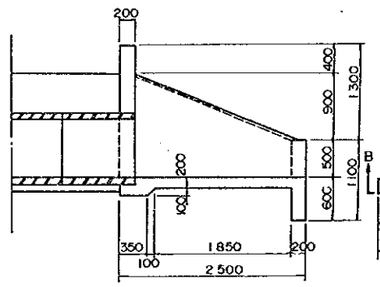


SECTION A-A
SCALE 1:30

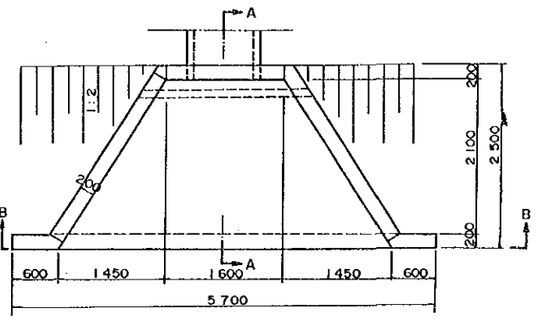


INLET AND OUTLET
SCALE 1:40

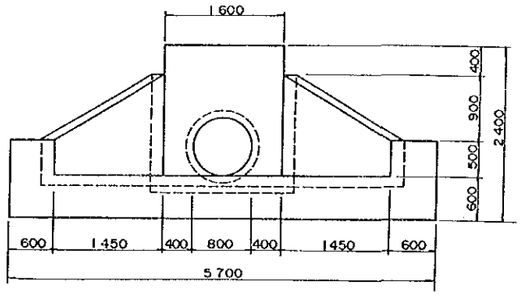
SECTION A-A



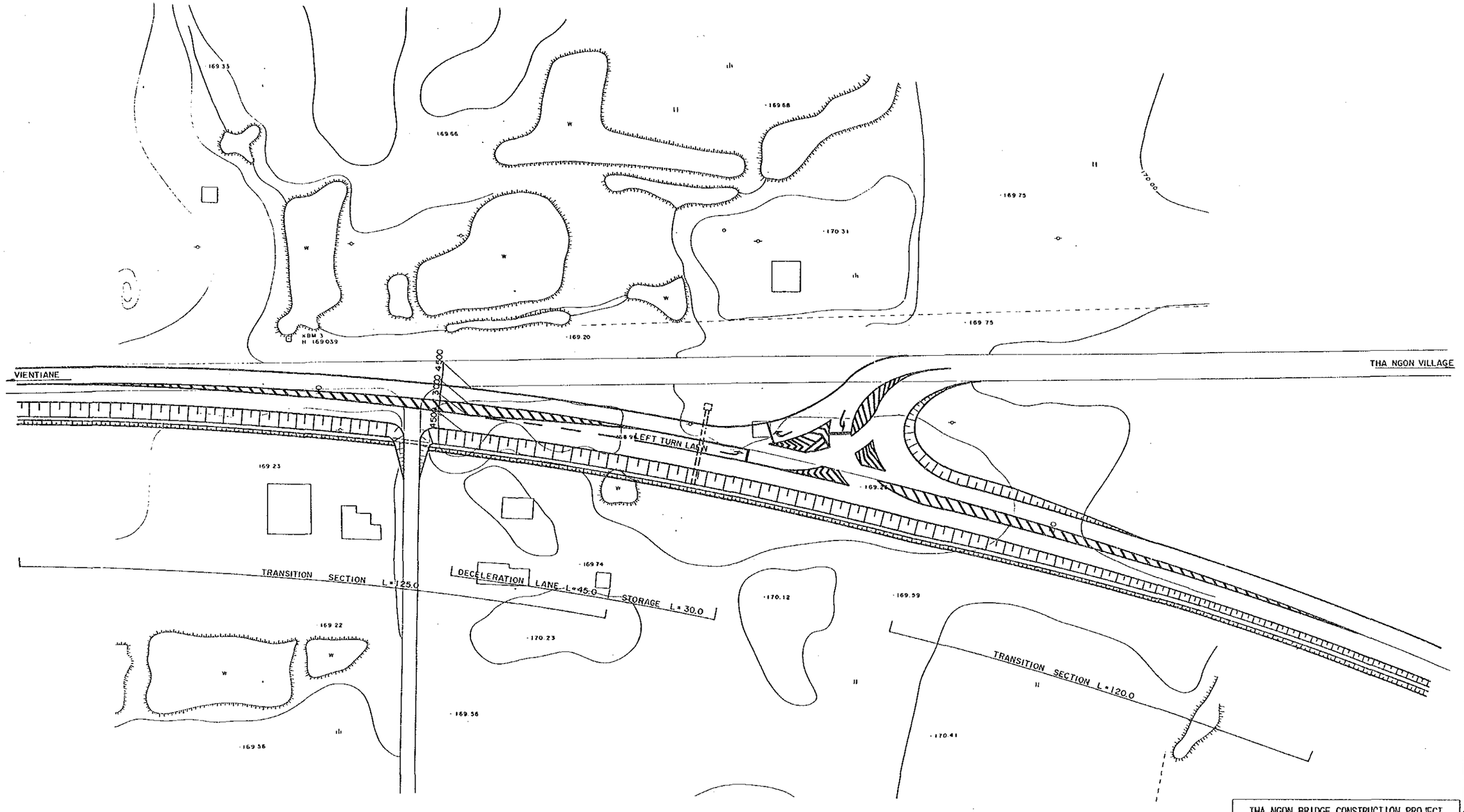
PLAN



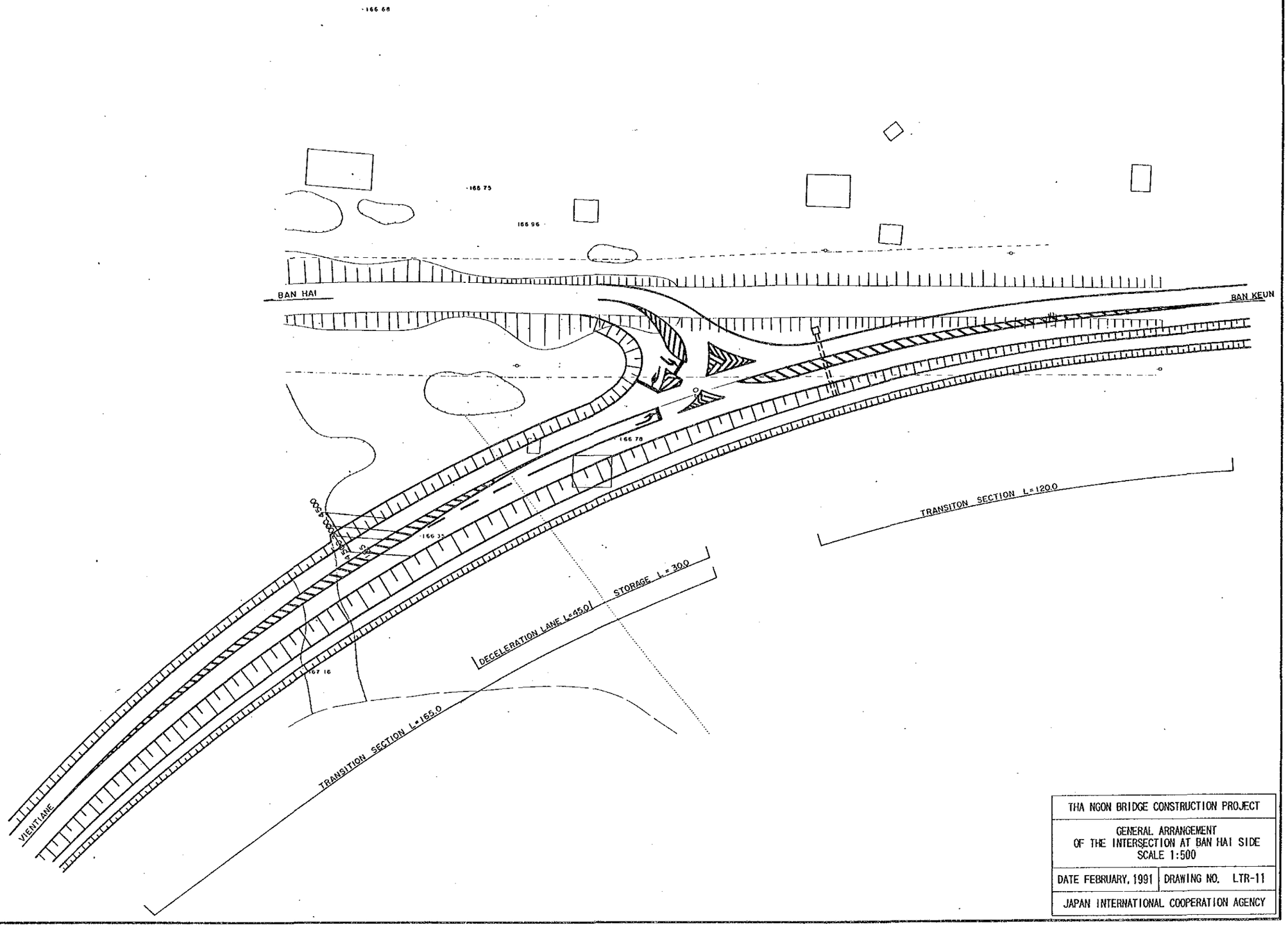
SECTION B-B



THA NGON BRIDGE CONSTRUCTION PROJECT	
GENERAL ARRANGEMENT OF PIPE CULVERTS	
SCALE 1:50, 1:40, 1:30	
DATE FEBRUARY, 1991	DRAWING NO. LTR-9
JAPAN INTERNATIONAL COOPERATION AGENCY	



THA NGON BRIDGE CONSTRUCTION PROJECT	
GENERAL ARRANGEMENT OF THE INTERSECTION AT THA NGON SIDE SCALE 1:500	
DATE FEBRUARY, 1991	DRAWING NO. LTR-10
JAPAN INTERNATIONAL COOPERATION AGENCY	



THA NGON BRIDGE CONSTRUCTION PROJECT	
GENERAL ARRANGEMENT OF THE INTERSECTION AT BAN HAI SIDE SCALE 1:500	
DATE FEBRUARY, 1991	DRAWING NO. LTR-11
JAPAN INTERNATIONAL COOPERATION AGENCY	

JICA