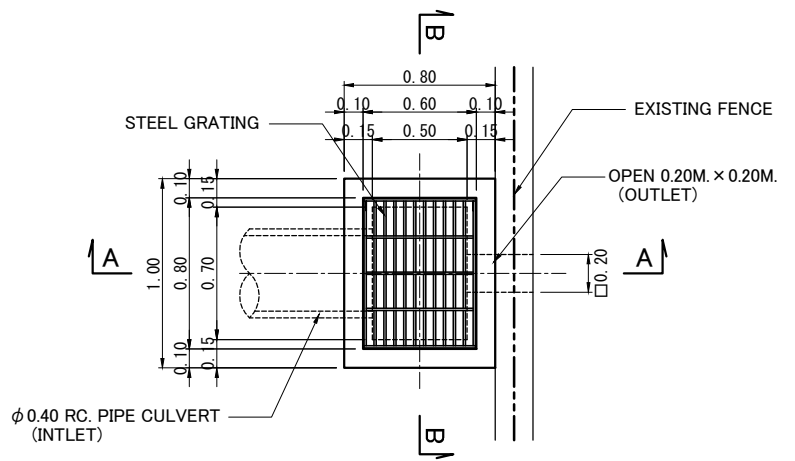
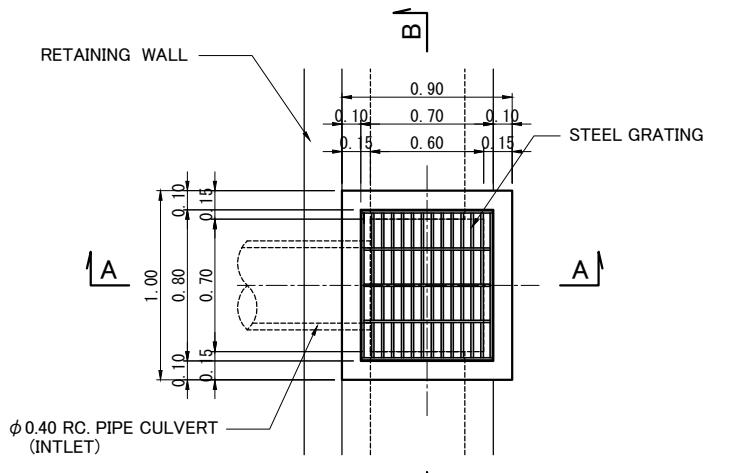


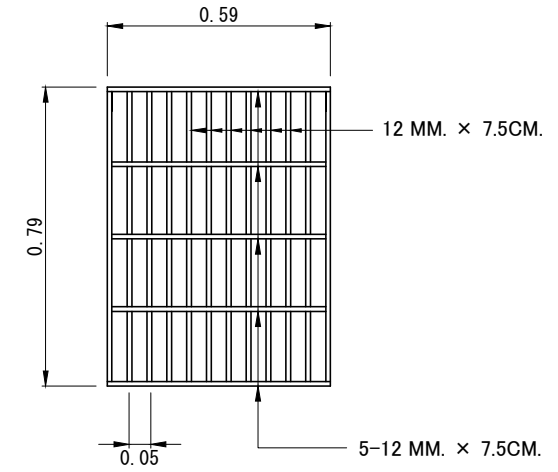
**5-4 DETAILS OF OUTLET CATCH
BASIN AT SHOULDER**



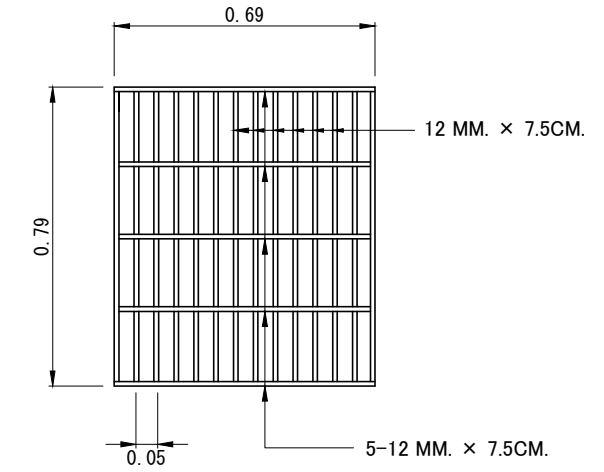
PLAN



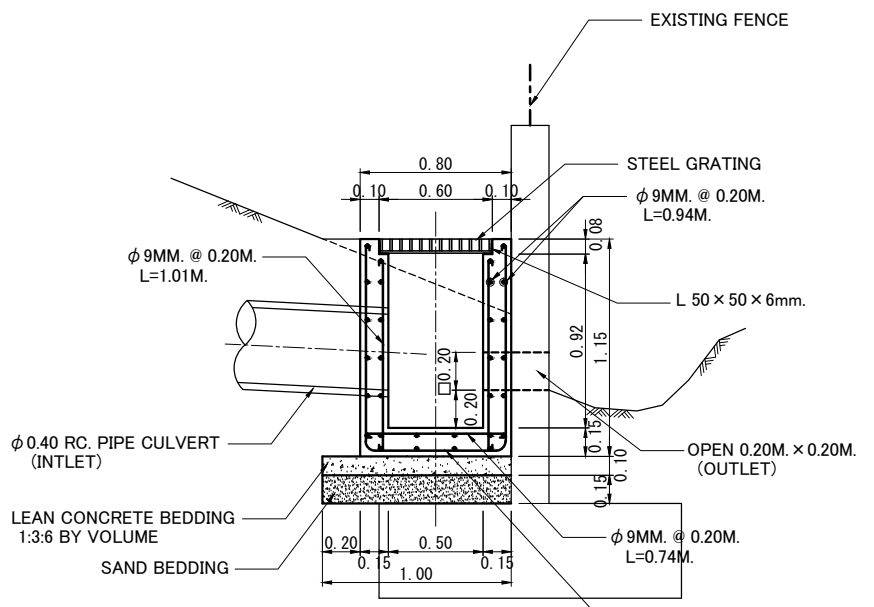
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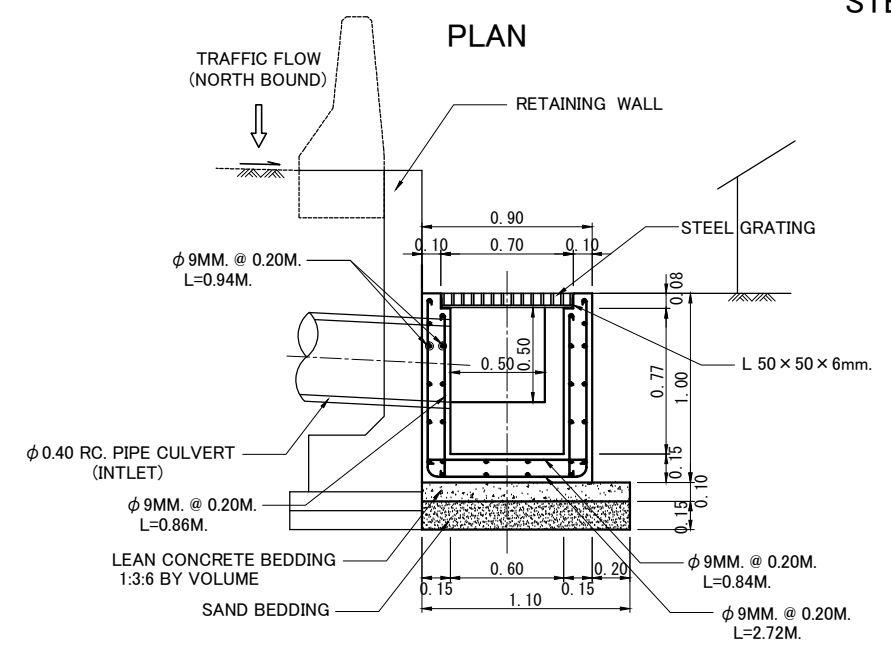
STEEL GRATING COVER (TYPE 1)
SCALE 1:10



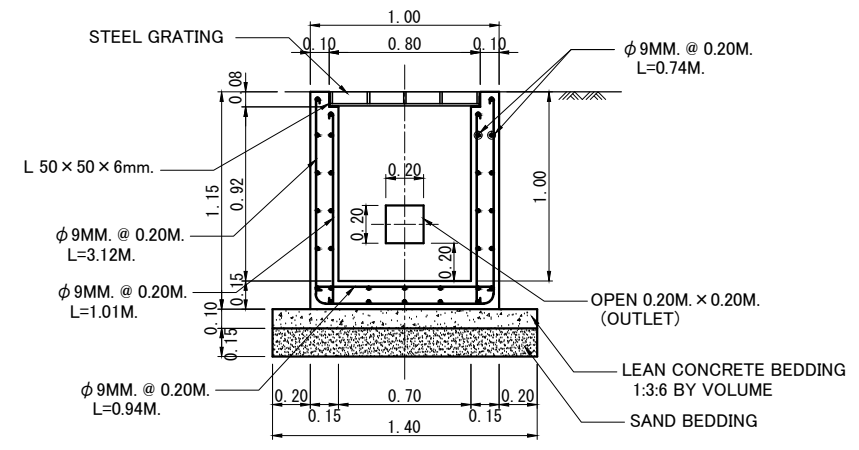
STEEL GRATING COVER (TYPE 2)
SCALE 1:10



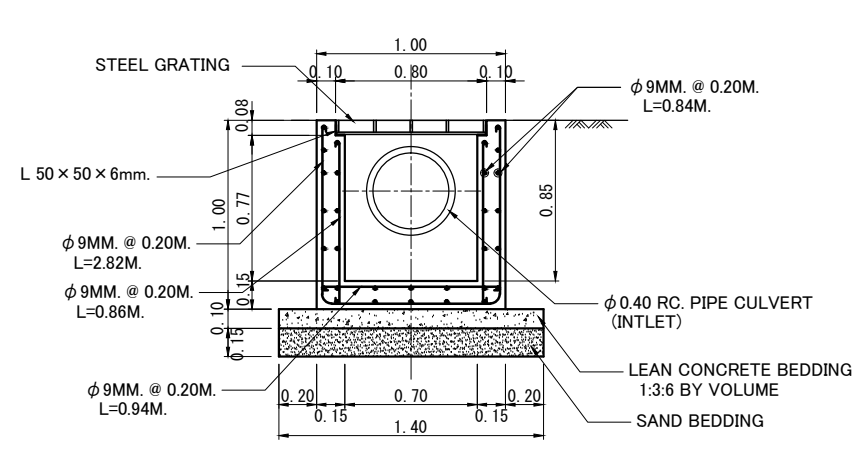
SECTION A-A



SECTION A-A



SECTION B-B



SECTION B-B

CATCH BASIN (Type1)
SCALE 1:20

CATCH BASIN (Type2)
SCALE 1:20

DETAILS OF OUTLET CATCH BASIN AT SHOULDER
SCALE 1:20

SCHEDULED LIST OF CATCH BASIN (Type1)

STA	No.	REMARKS
1) STA 20+382.5	1	
2) STA 24+430.0	1	
3) STA 24+512.0	1	
4) STA 24+594.0	1	
5) STA 24+650.0	1	
6) STA 24+690.0	1	
7) STA 24+750.0	1	
8) STA 24+815.0	1	

SCHEDULED LIST OF CATCH BASIN (Type2)

STA	No.	REMARKS
1) STA 24+667.0	1	
2) STA 24+920.0	1	
3) STA 24+975.0	1	

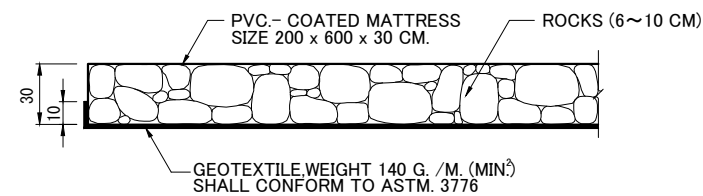
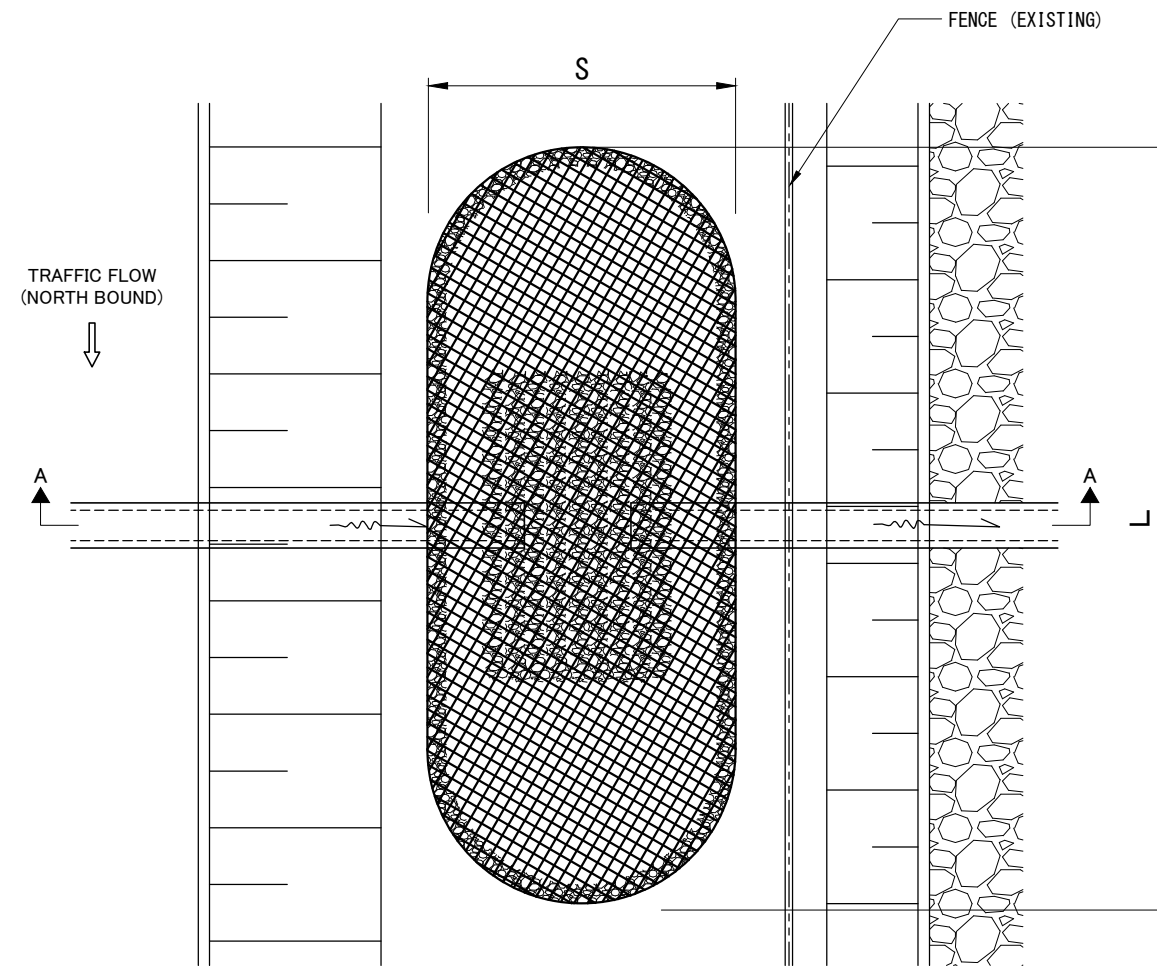
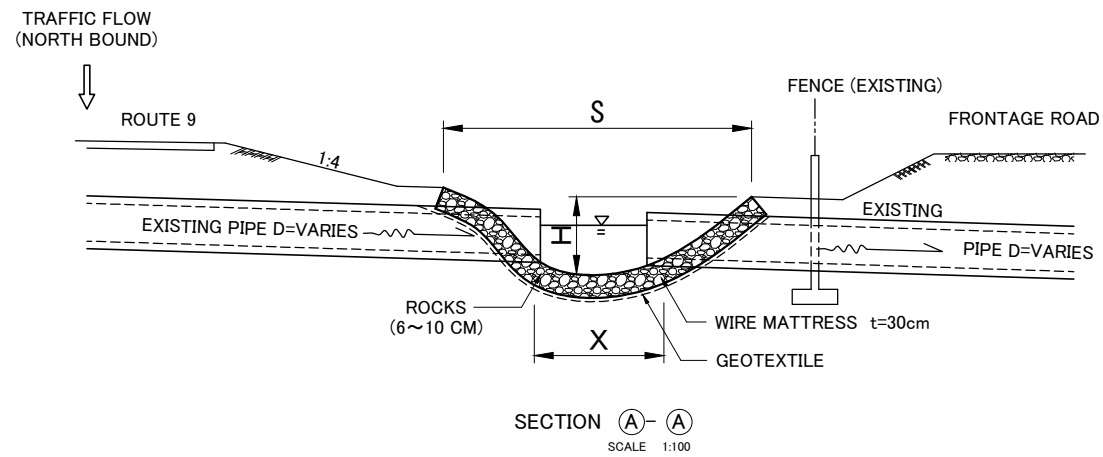
NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- THE SHADED AREAS REPRESENT PORTIONS TO BE DEMOLISHED.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOW :

PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M.
CRUSHED ROCK OR GRAVEL	0.86 M.
CONCRETE SLUMP	10 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
- STRUCTURAL STEEL SHALL CONFORM TO TIS.116 GRADE FE 30.
- DETAILS OF R.C.PIPE CULVERT SHALL CONFORM TO THE STANDARD OF DOH OF THAILAND.

REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	DESIGNED BY	CHECKED BY	DATE	SCALE
								DETAILS OF OUTLET CATCH BASIN AT SHOULDER	The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	1:10 / 1:20
													DR-5	SHEET NO. 155

**5-5 DETAILS OF INLET / OUTLET
PROTECTION**



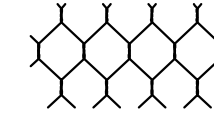
DETAILS OF DRAINAGE INLET/OUTLET PROTECTION
SCALE 1:100

WIRE MATTRESS

PVC-COATED RENO MATTRESS: OR GALVANIZED WIRES THAT IS COATED WITH PVC. DETAILS ARE AS FOLLOWS:

1. NETTING

THE GALVANIZED WIRES COATED WITH PVC. ARE MADE INTO 6 x 8 CM.(+10%) HEXAGONAL NETTING JOINED TOGETHER BY TWISTING THE WIRES ROUND EACH OTHER TWICE AS SHOWN IN THE PICTURE.



2. WIRES

THE WIRE MUST BE ABLE TO RESIST THE TENSION OF 28.5-51 KG./MM.² (ACCORDING TO BS 1052/1980 STANDARD)
THE DIAMETER OF WIRE FOR FRAME IS AT LEAST 2.7 MM.
THE DIAMETER OF WIRE FOR NETTING IS AT LEAST 2.0 MM.
THE DIAMETER OF WIRE FOR BOX WRAPPING IS AT LEAST 2.0 MM.
AND THE WIRE IS LONG ENOUGH TO BE USED IN INSTALLATION (ABOUT 5% OF RENO MATTRESS' WEIGHT).

3. GALVANIZING

THE WIRES MUST BE GALVANIZED ACCORDING TO BS 443/1982 STANDARD.

4. DEVIATION

THE DEVIATION OF THE WIRE'S DIAMETER SHALL BE LESS THAN ± 2.5%

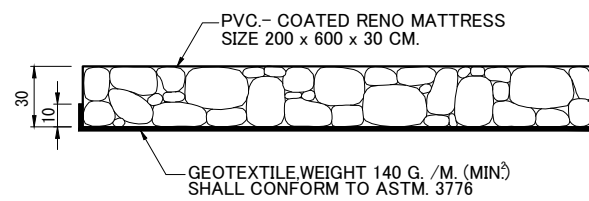
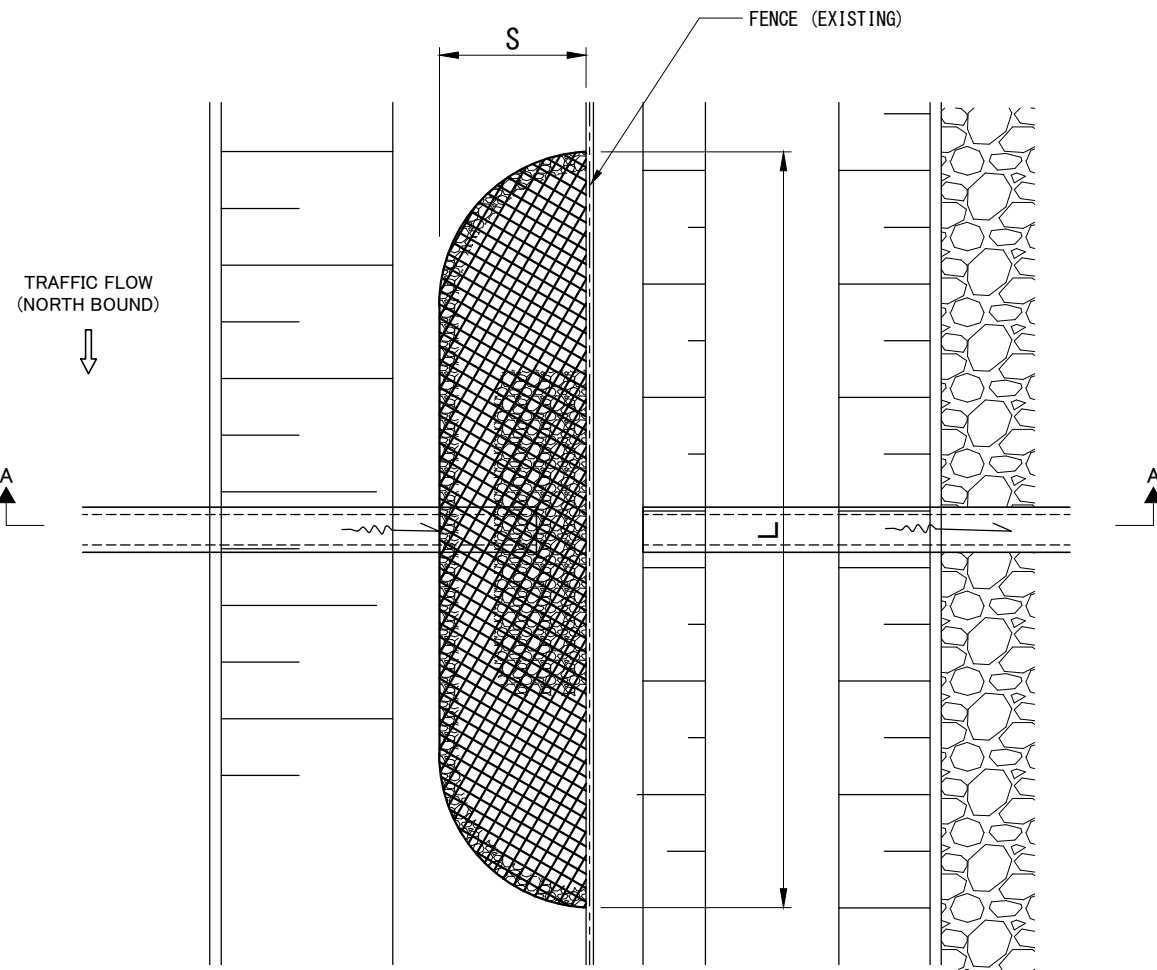
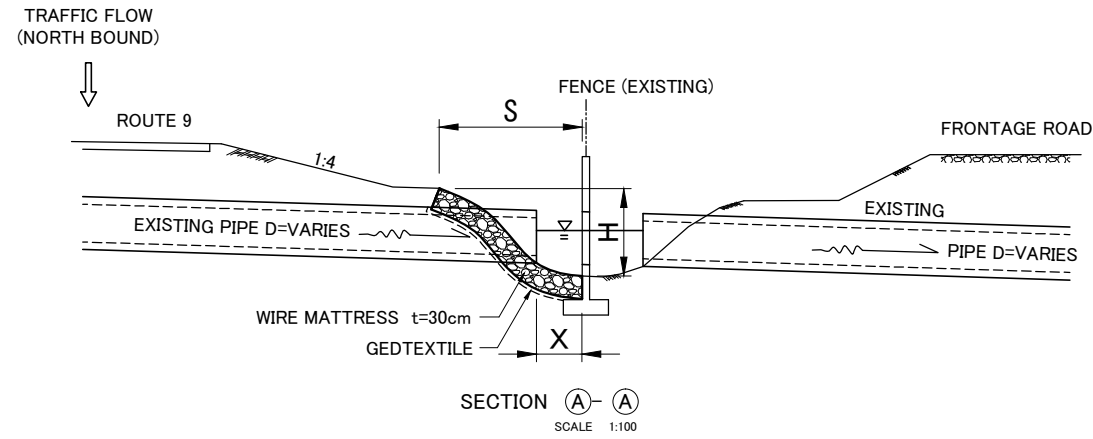
5. ROCKS

THE ROCKS USED FOR THIS WORK MUST BE HARD ENOUGH AND NOT CRUMBLE WHEN WET AND ENDURE REGARDLESS OF THE CLIMATE.THEY ARE GRANITE. SIZE OF THE ROCKS SHOULD BE 6-10 CM. OR ±(5%-7%).

SCHEDULED LIST OF DRAINAGE INLET/OUTLET PROTECTION

NO.	STA	Height (H) (m)	Gap (X) (m)	Width (S) (m)	Length (L) (m)	REMARKS
1	STA 23+961	2.00	1.80	7.20	13.20	
2	STA 24+079	2.00	1.80	7.50	14.70	
3	STA 24+240	2.10	1.90	7.50	30.00	
4	STA 25+502	2.10	1.00	7.70	12.70	
5	STA 25+828	2.20	1.75	8.00	13.80	
6	STA 25+947	2.20	1.80	7.50	9.90	
7	STA 26+050	2.30	0.00	7.60	10.00	No Drainage on R9
8	STA 26+172	2.20	1.45	7.80	11.70	
9	STA 26+404	2.20	1.65	8.00	12.50	
10	STA 26+682	2.20	0.90	7.60	14.40	
11	STA 27+021	2.10	1.30	8.70	12.30	
12	STA 27+327	2.30	1.45	7.80	15.20	
13	STA 27+584	2.20	0.80	7.50	15.00	Concrete slope around pipe
14	STA 27+678	2.00	0.90	7.00	13.20	
15	STA 27+937	2.40	1.10	7.70	13.50	
16	STA 28+184	2.10	1.40	7.80	12.30	
17	STA 28+544	2.30	0.75	6.50	13.90	

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE:	SCALE:
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	1:100
														DWG. NO. DR-6	SHEET NO. 156



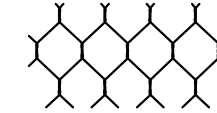
DETAILS OF DRAINAGE INLET/OUTLET PROTECTION
SCALE 1:100

RENO OR WIRE MATTRESS

PVC-COATED RENO MATTRESS: OR GALVANIZED WIRES THAT IS COATED WITH PVC. DETAILS ARE AS FOLLOWS:

1. NETTING

THE GALVANIZED WIRES COATED WITH PVC ARE MADE INTO 6 x 8 CM (+10%) HEXAGONAL NETTING JOINED TOGETHER BY TWISTING THE WIRES ROUND EACH OTHER TWICE AS SHOWN IN THE PICTURE.



2. WIRES

THE WIRE MUST BE ABLE TO RESIST THE TENSION OF 28.5-51 KG./MM.² (ACCORDING TO BS 1052/1980 STANDARD)
THE DIAMETER OF WIRE FOR FRAME IS AT LEAST 2.7 MM.
THE DIAMETER OF WIRE FOR NETTING IS AT LEAST 2.0 MM.
THE DIAMETER OF WIRE FOR BOX WRAPPING IS AT LEAST 2.0 MM.
AND THE WIRE IS LONG ENOUGH TO BE USED IN INSTALLATION (ABOUT 5% OF RENO MATTRESS' WEIGHT).

3. GALVANIZING

THE WIRES MUST BE GALVANIZED ACCORDING TO BS 443/1982 STANDARD.

4. DEVIATION

THE DEVIATION OF THE WIRE'S DIAMETER SHALL BE LESS THAN ± 2.5%

5. ROCKS

THE ROCKS USED FOR THIS WORK MUST BE HARD ENOUGH AND NOT CRUMBLE WHEN WET AND ENDURE REGARDLESS OF THE CLIMATE.
THE SIZE OF THE ROCKS SHOULD BE 6-10 CM. OR ±(5%-7%).

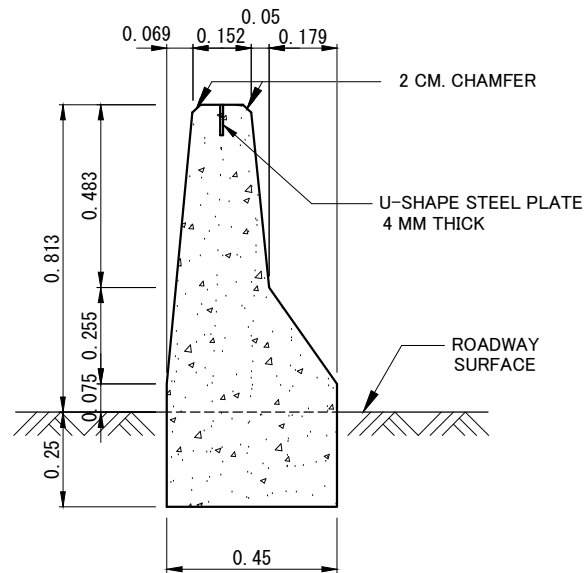
SCHEDULED LIST OF DRAINAGE INLET/OUTLET PROTECTION

NO.	STA	Height (H) (m)	Between (X) (m)	Width (S) (m)	Length (L) (m)	REMARKS
1	STA 12+651.0	2.10	0.50	2.50	15.00	fence is low
2	STA 12+810.8	2.10	0.50	2.50	15.00	fence is low
3	STA 15+616.2	2.00	0.80	4.50	12.00	
4	STA 15+736.1	2.00	2.40	3.90	9.00	
5	STA 19+878.4	2.10	2.20	3.50	8.00	
6	STA 20+103.2	2.10	2.00	3.30	8.00	
7	STA 20+319.6	2.10	0.00	3.00	7.40	
8	STA 20+581.7	2.10	1.50	3.50	6.40	

REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE : AUGUST 2012	SCALE : 1:100
							DETAILS OF INLET / OUTLET PROTECTION						DWG. NO. DR-7	SHEET NO. 157

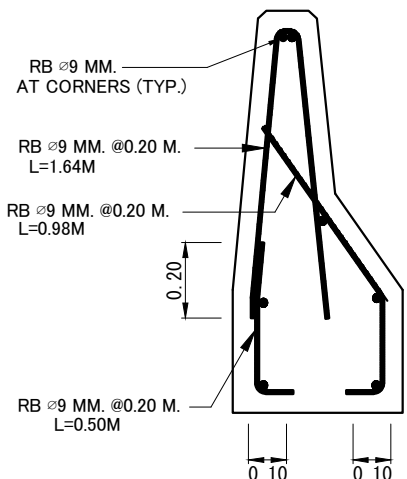
6. MEDIAN WORK

6-1 CONCRETE BARRIER

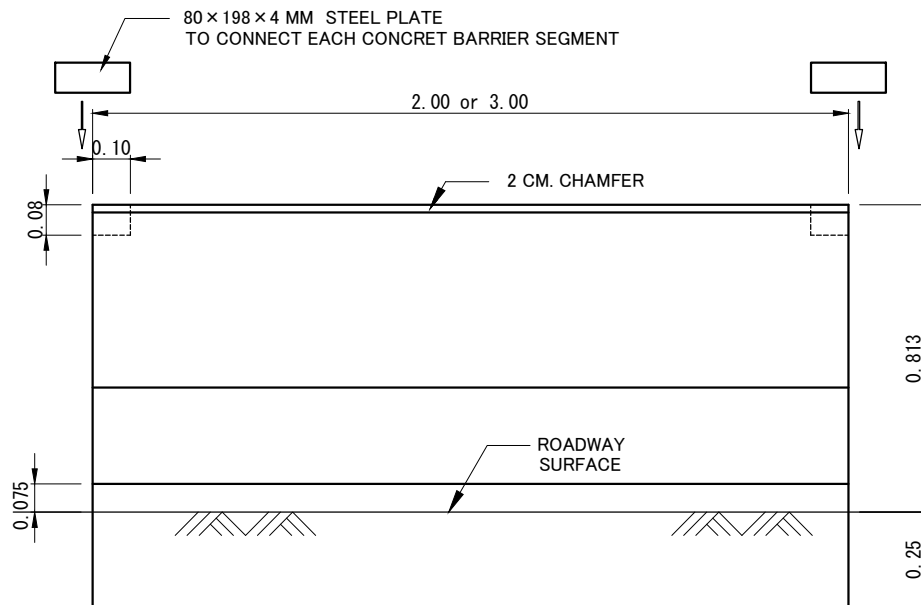


FRONT ELEVATION

CONCRETE BARRIER (Type1-a)
SCALE 1:10



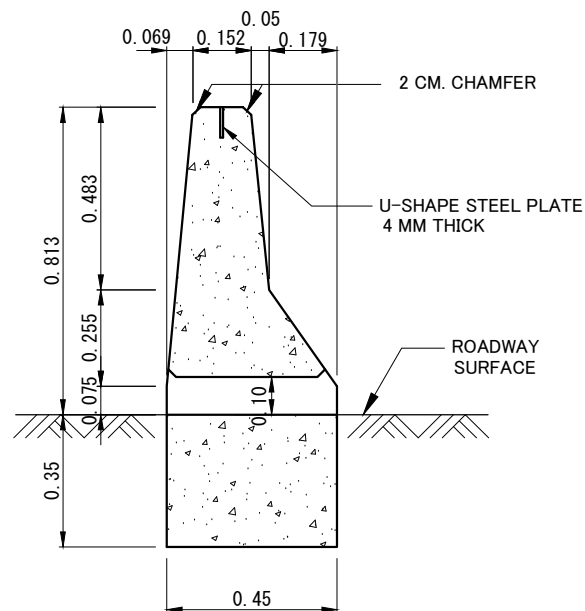
REINFORCEMENT DETAIL



SIDE ELEVATION

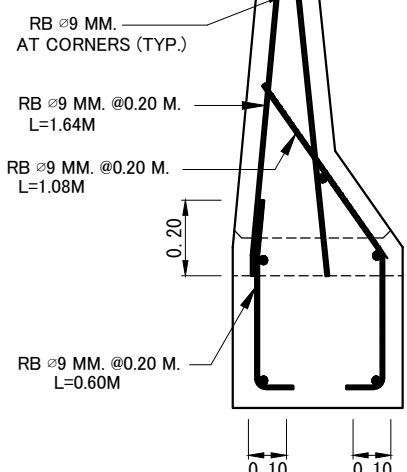
SCHEDULED LIST OF CONCRETE BARRIER (Type1-a)

STA	DISTANCE (m)	REMARKS
1) STA 10+600.0 ~ STA 11+124.0	524.0	
2) STA 11+558.0 ~ STA 15+175.0	3,617.0	
3) STA 15+175.0 ~ STA 19+666.0	4,491.0	
4) STA 20+363.0 ~ STA 20+580.0	197.0	
5) STA 23+690.0 ~ STA 25+000.0	1,310.0	
6) STA 25+550.0 ~ STA 25+639.5	89.5	
7) STA 25+675.0 ~ STA 29+200.0	3,525.0	

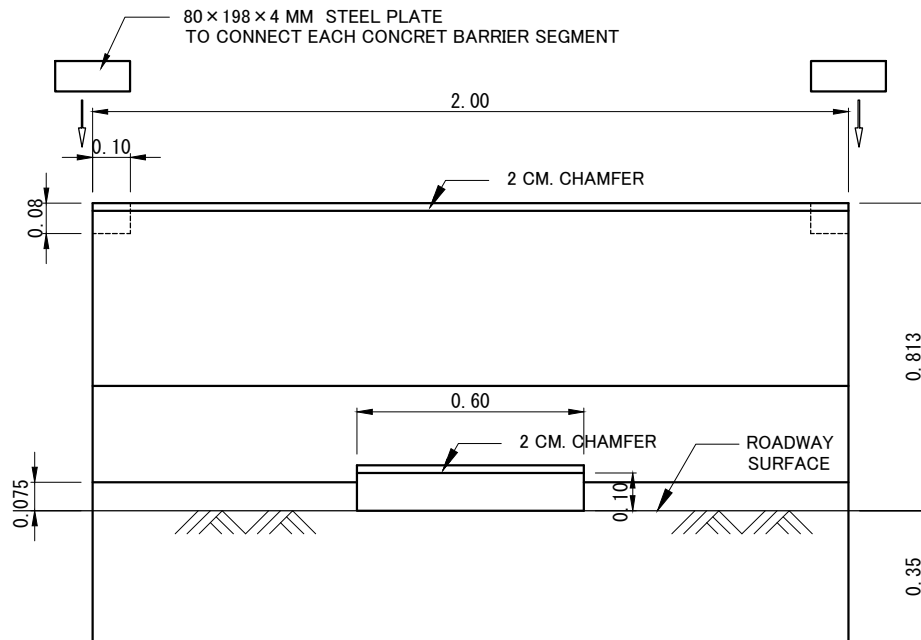


FRONT ELEVATION

CONCRETE BARRIER (Type1-b)
SCALE 1:10



REINFORCEMENT DETAIL



SIDE ELEVATION

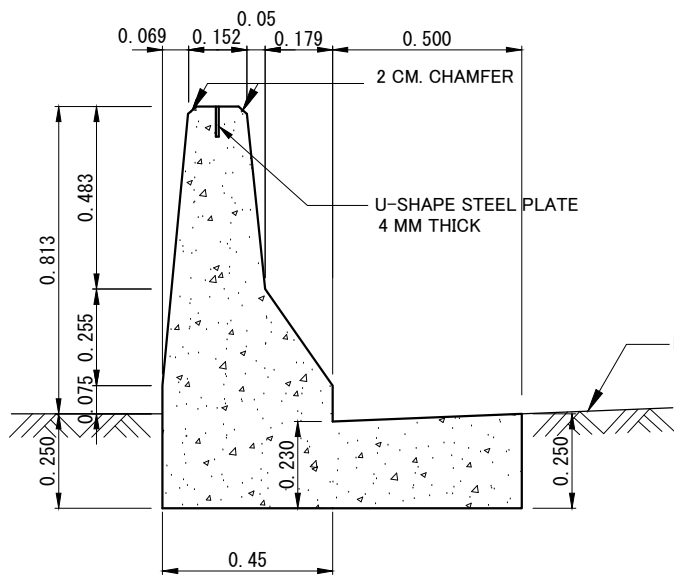
SCHEDULED LIST OF CONCRETE BARRIER (Type1-b)

STA	DISTANCE (m)	REMARKS
1) STA 25+000.0 ~ STA 25+320.9	320.9	
2) STA 25+333.2 ~ STA 25+550.0	216.8	
3) STA 24+834.5 ~ STA 25+206.0	373.5	

- NOTES :
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
 - CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOW :

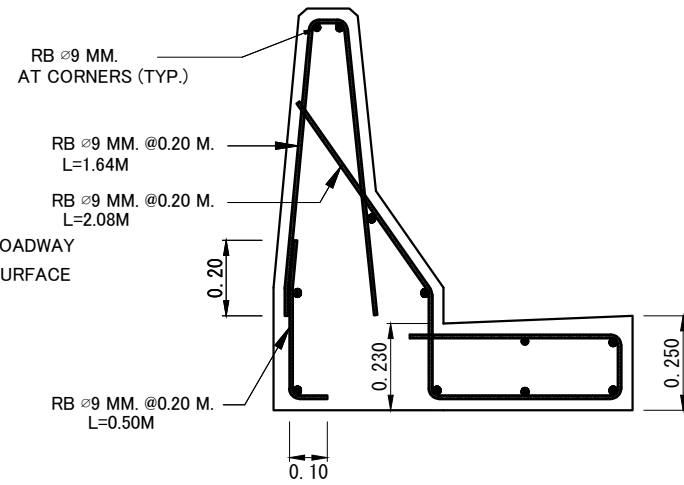
PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.86 M ³
CONCRETE SLUMP	10 CM.
 - CLEAR CONCRETE COVER SHALL BE 5 CM.
 - REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
 - REINFORCEMENT AND OTHER DETAILS OF APPROACH CONCRETE BARRIER SHALL BE THE SAME AS CONCRETE BARRIER.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	1:10
														DWG. NO.	SHEET NO.
														CB-1	158

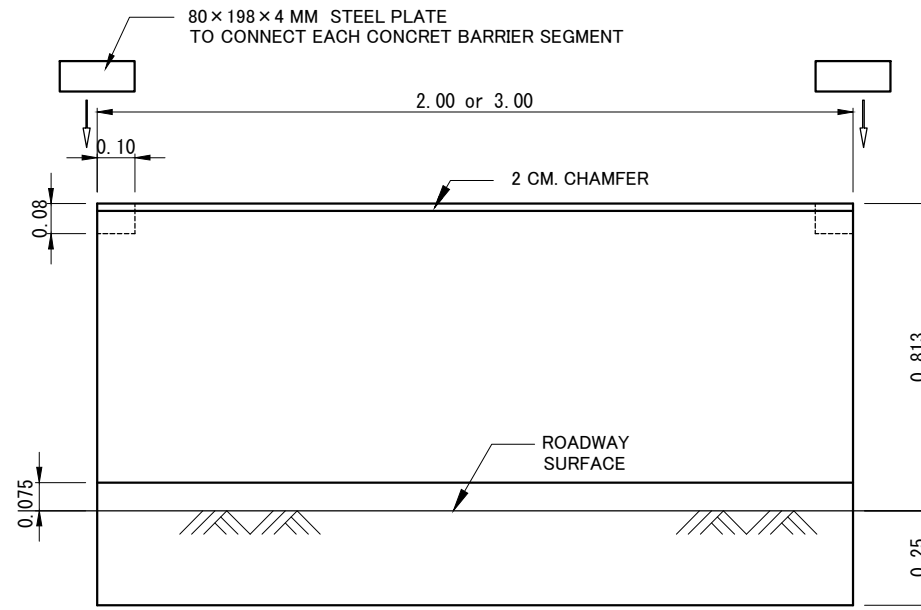


FRONT ELEVATION

CONCRETE BARRIER (Type1-c)
SCALE 1:10



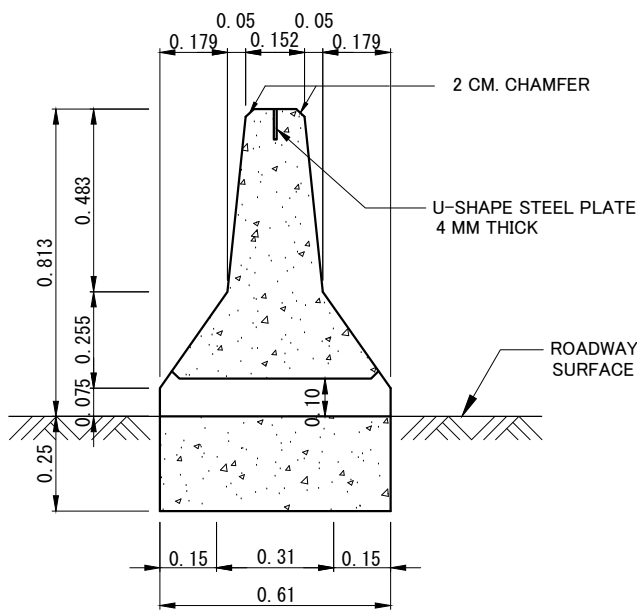
REINFORCEMENT DETAIL



SIDE ELEVATION

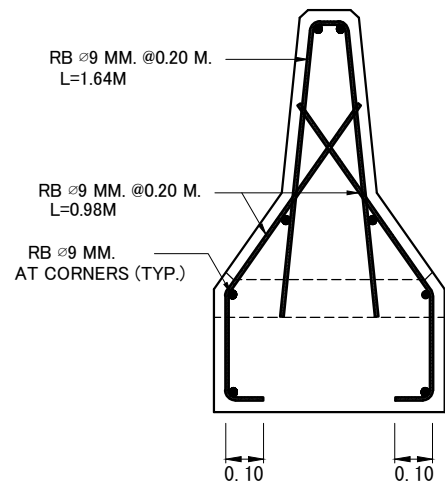
SCHEDULED LIST OF CONCRETE BARRIER (Type1-c)

STA	DISTANCE (m)	REMARKS
1) STA 19+666.0 ~ STA 20+383.0	717.0	

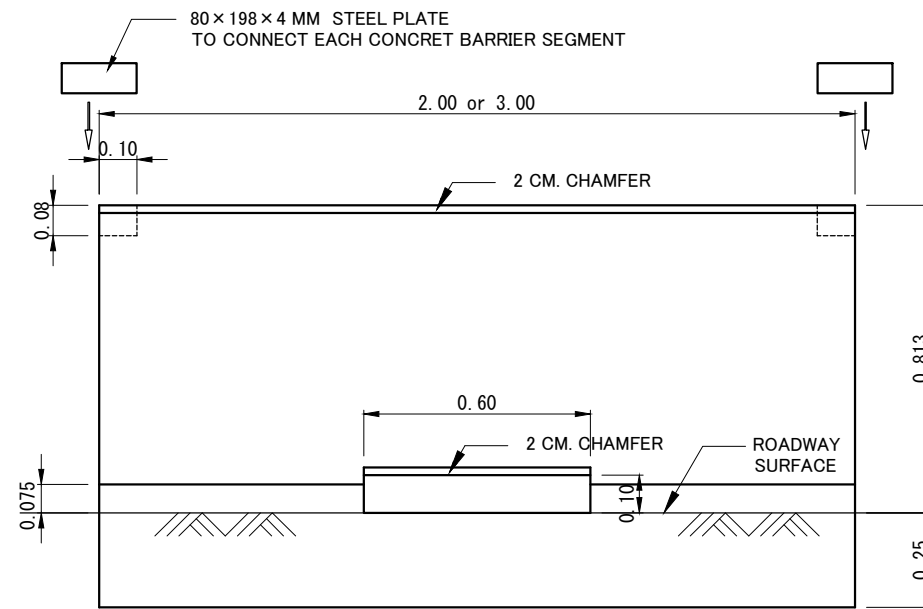


FRONT ELEVATION

CONCRETE BARRIER (Type2-a)
SCALE 1:10



REINFORCEMENT DETAIL



SIDE ELEVATION

SCHEDULED LIST OF CONCRETE BARRIER (Type2-a)

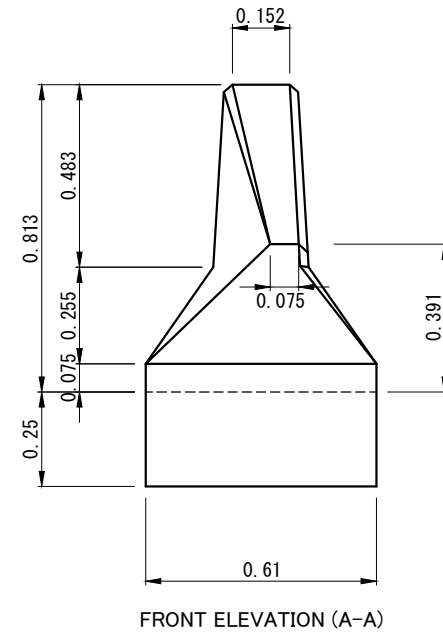
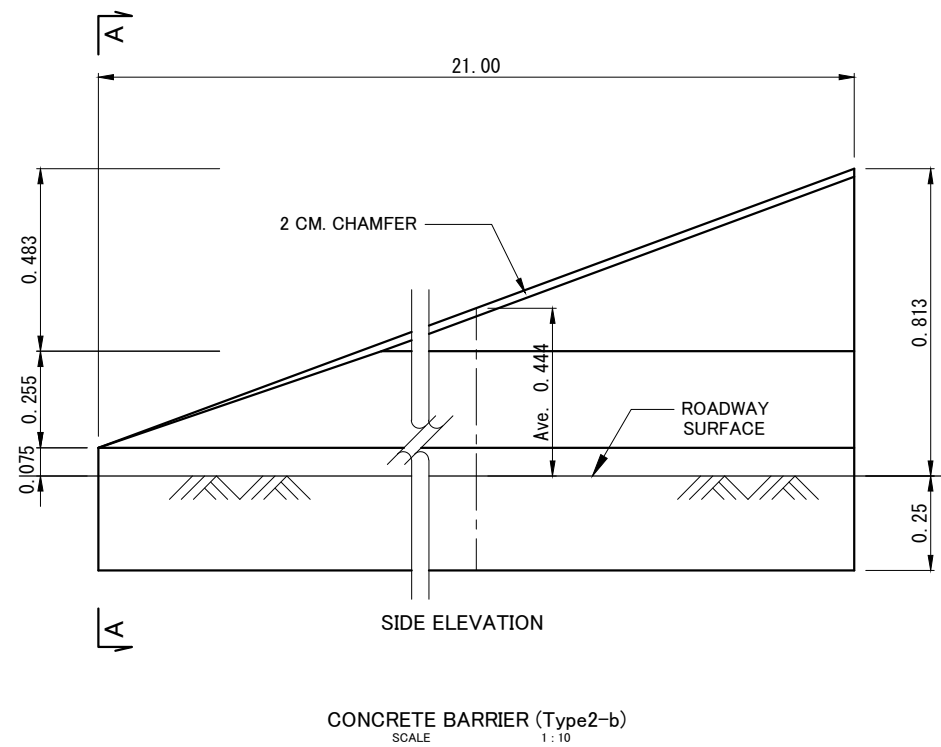
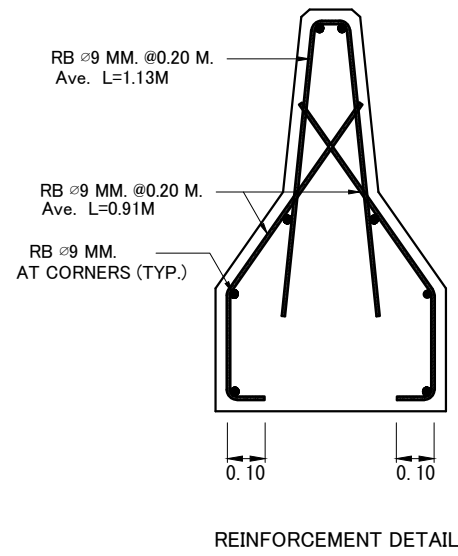
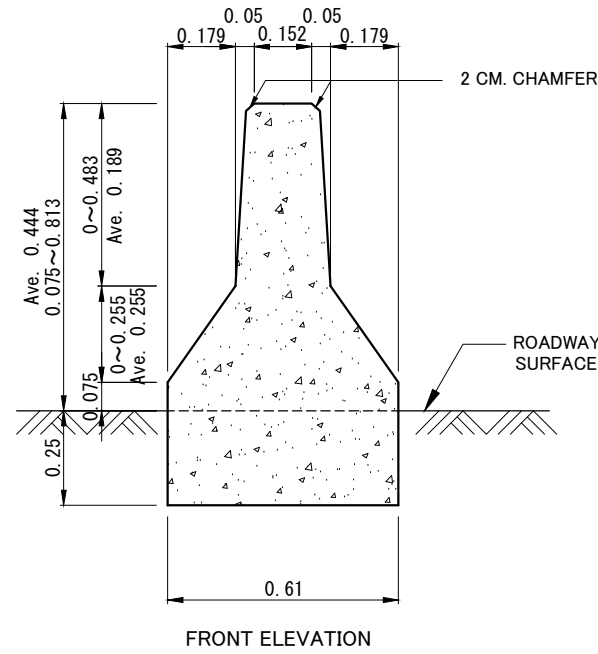
STA	DISTANCE (m)	REMARKS
1) STA 25+130.6 ~ STA 25+320.9	190.3	
2) STA 25+333.2 ~ STA 25+384.4	51.2	

NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOW :

PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M. ³
CRUSHED ROCK OR GRAVEL	0.86 M. ³
CONCRETE SLUMP	10 CM.
- CLEAR CONCRETE COVER SHALL BE 5 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
- REINFORCEMENT AND OTHER DETAILS OF APPROACH CONCRETE BARRIER SHALL BE THE SAME AS CONCRETE BARRIER.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	1:10
														DWG. NO.	SHEET NO.
														CB-2	159



- NOTES :
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
 - CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOW :

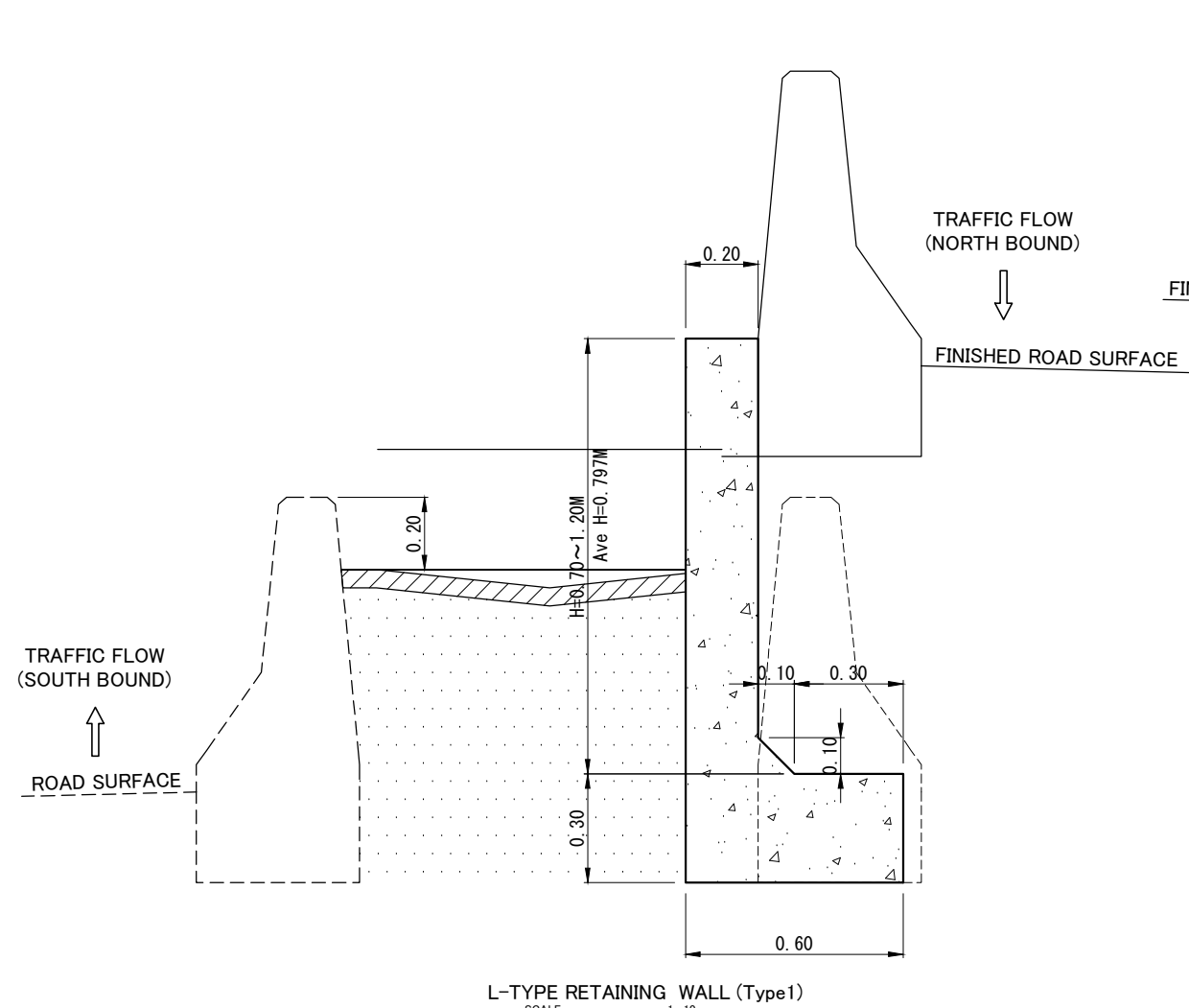
PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.88 M ³
CONCRETE SLUMP	10 CM.
 - CLEAR CONCRETE COVER SHALL BE 5 CM.
 - REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
 - REINFORCEMENT AND OTHER DETAILS OF APPROACH CONCRETE BARRIER SHALL BE THE SAME AS CONCRETE BARRIER.

SCHEDULED LIST OF CONCRETE BARRIER (Type2-b)

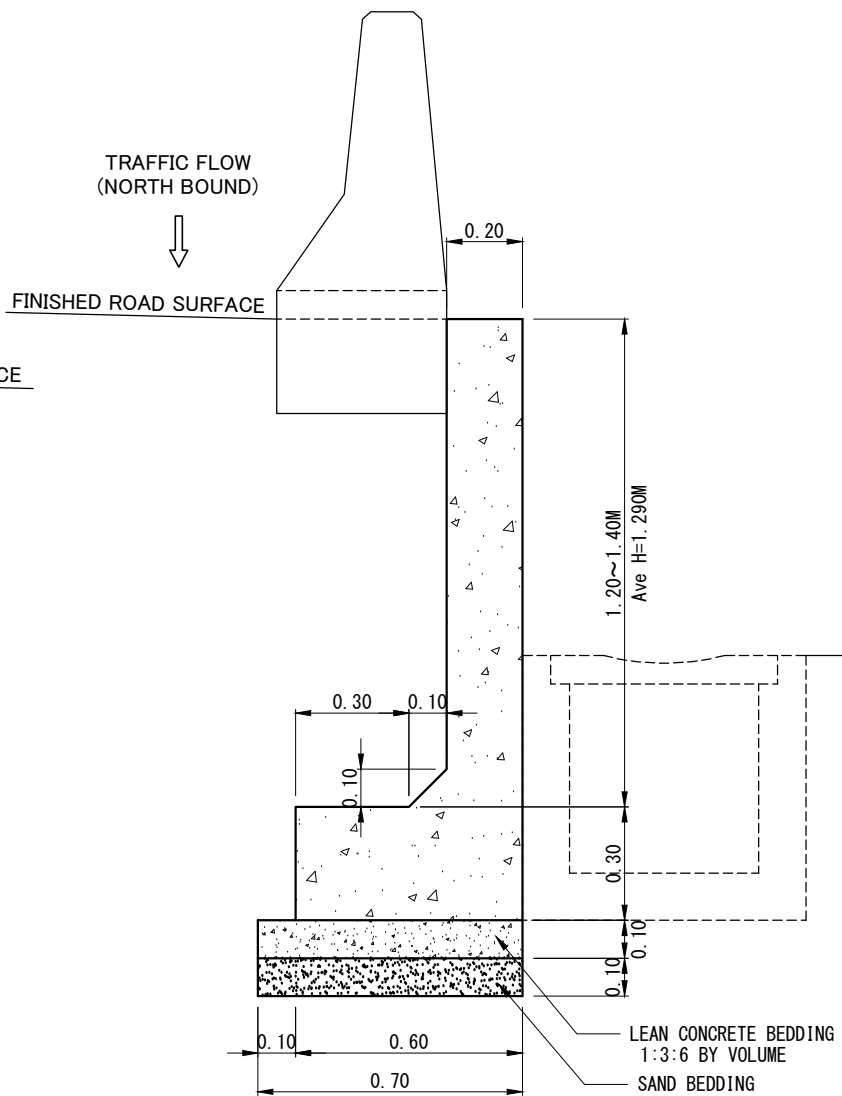
STA	DISTANCE (m)	Nos.	REMARKS
1) STA 25+384.4 ~ STA 25+405.4	21.0	1	

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE										AUGUST 2012	1:10
															DWG. NO.	SHEET NO.
															CB-3	160

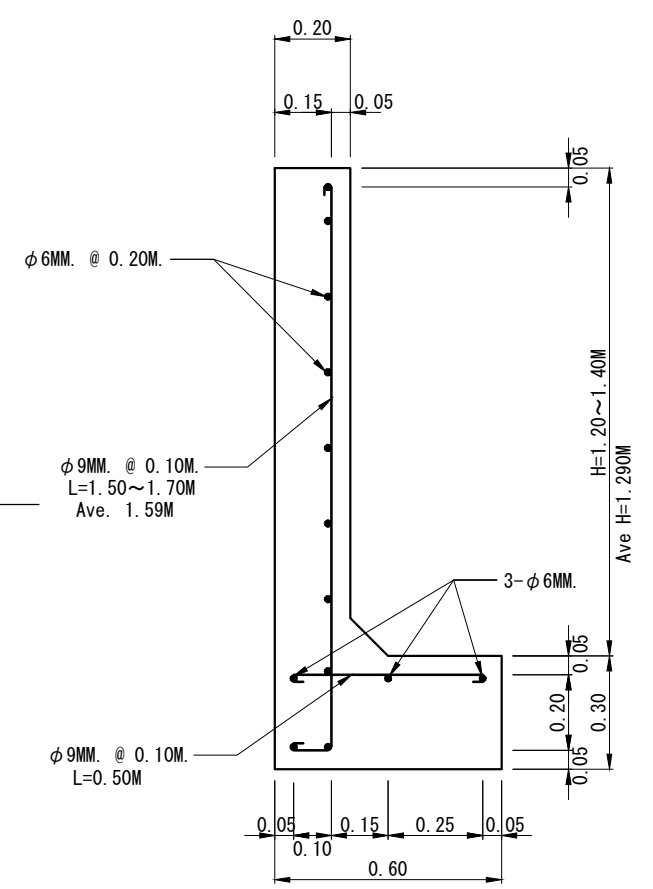
**6-2 L-TYPE PRECAST CONCRETE
WALL**



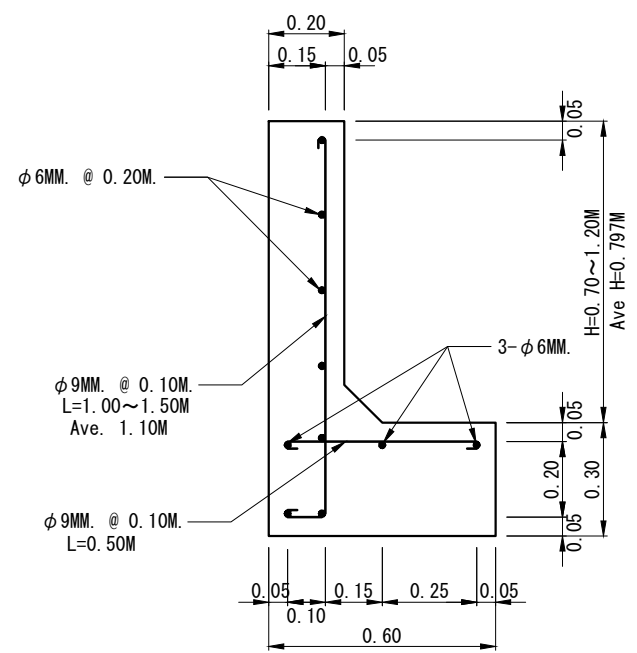
L-TYPE RETAINING WALL (Type1)
SCALE 1:10



L-TYPE RETAINING WALL (Type2)
SCALE 1:10



REINFORCEMENT DETAIL (Type2)
SCALE 1:10



REINFORCEMENT DETAIL (Type1)
SCALE 1:10

SCHEDULED LIST OF RETAINING WALL

No.	STA	TYPE	H	DISTANCE(m)	REMARKS
1	STA 11+592.0 ~ STA 11+619.5	Type1	H=0.60M	27.5	
2	STA 15+568.0 ~ STA 15+777.0			209.0	
3	STA 16+822.5 ~ STA 17+131.0			308.5	
4	STA 25+000.0 ~ STA 25+050.0			50.0	
5	STA 25+500.0 ~ STA 25+550.0			50.0	
6	STA 28+243.5 ~ STA 28+720.0			476.5	
7	STA 11+724.0 ~ STA 11+767.0			43.0	
8	STA 19+211.5 ~ STA 19+268.0			56.5	
9	STA 25+050.0 ~ STA 25+075.0			25.0	
10	STA 25+325.0 ~ STA 25+350.0			25.0	
11	STA 25+425.0 ~ STA 25+500.0			75.0	
12	STA 25+550.0 ~ STA 25+639.5		89.5		
13	STA 12+311.5 ~ STA 13+310.5		999.0		
14	STA 25+075.0 ~ STA 25+100.0		25.0		
15	STA 25+300.0 ~ STA 25+325.0		25.0		
16	STA 25+350.0 ~ STA 25+425.0		75.0		
17	STA 23+862.0 ~ STA 24+375.0		513.0		
18	STA 25+100.0 ~ STA 25+300.0		200.0		
19	STA 24+375.0 ~ STA 24+850.0		H=1.00M	275.0	
20	STA 24+775.0 ~ STA 25+000.0		H=1.10M	225.0	
21	STA 24+650.0 ~ STA 24+775.0		H=1.20M	125.0	
22	STA 24+975.0 ~ STA 25+208.0		H=1.20M	233.0	
23	STA 24+834.5 ~ STA 24+975.0	Type2	H=1.40M	140.5	

L-TYPE PRECAST CONCRETE WALL
SCALE 1:10

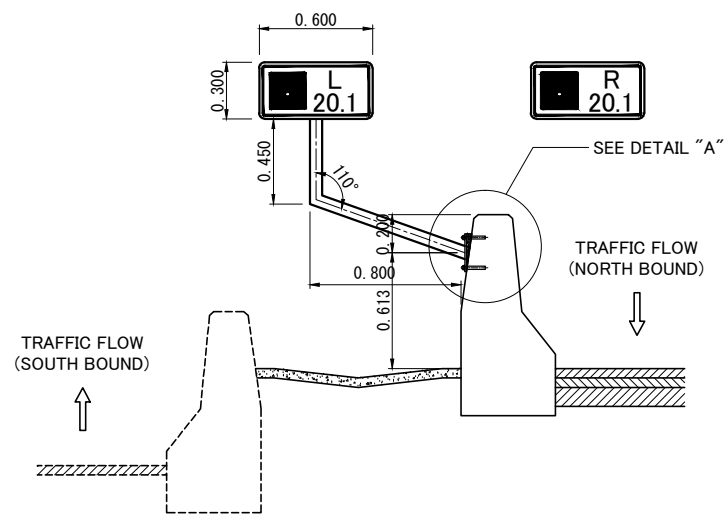
NOTES:

- ALL DIMENSION ARE IN METERS UNLESS OTHERWISE INDICATED.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15 x 15 x 15 CM. CUBE. AT 28 DAY. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS :

PORTLAND CEMENT TYPE 1	350	KG. (MIN.)
SAND	0.43	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE	10	CM. (MAX)
- CLEAR CONCRETE COVER SHALL BE 2.5 CM. (MIN.)
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR 24.

REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE : AUGUST 2012	SCALE : 1:10
									L-TYPE PRECAST CONCRETE WALL					DWG. NO. CB-4	SHEET NO. 161

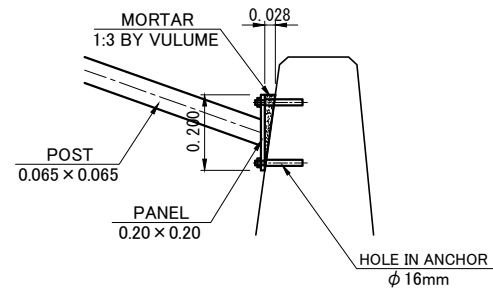
**6-3 DETAILS OF SIGN POST AT
MEDIAN**



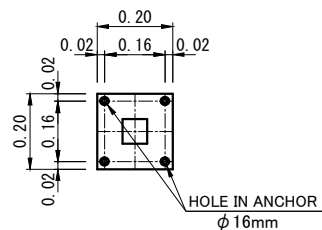
100-M. DISTANCE POST

SCHEDULED LIST OF 100-M. DISTANCE POST

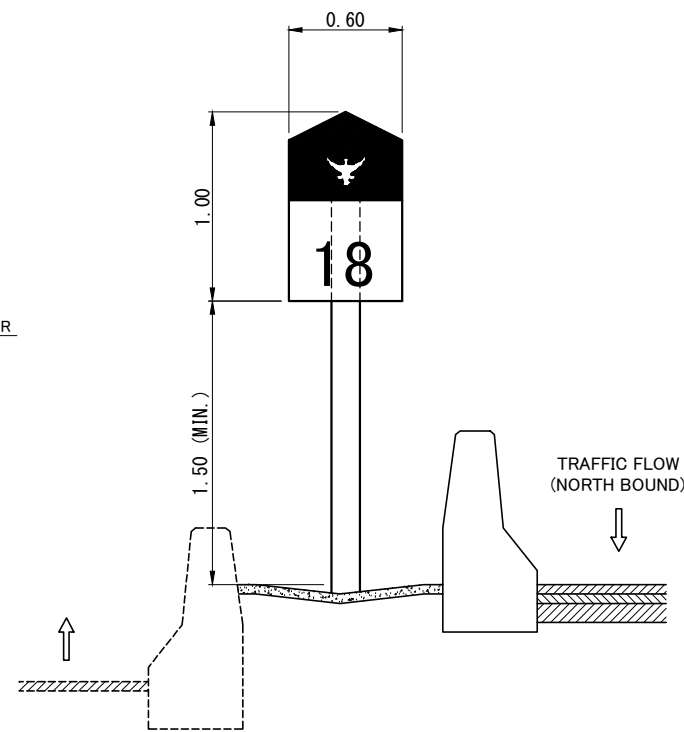
STA	DISTANCE (m)	Nos.	REMARKS
1) STA 10+600.0 ~ STA 11+125.0	525.0	5	
2) STA 11+550.0 ~ STA 20+580.0	9,030.0	90	
3) STA 23+690.0 ~ STA 29+200.0	5,510.0	56	



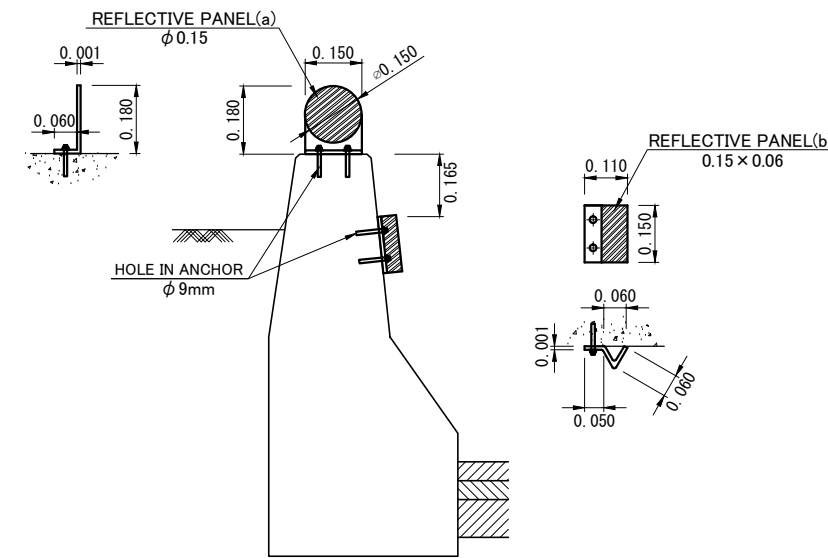
DETAIL "A"
SCALE 1:10



PANEL
SCALE 1:10



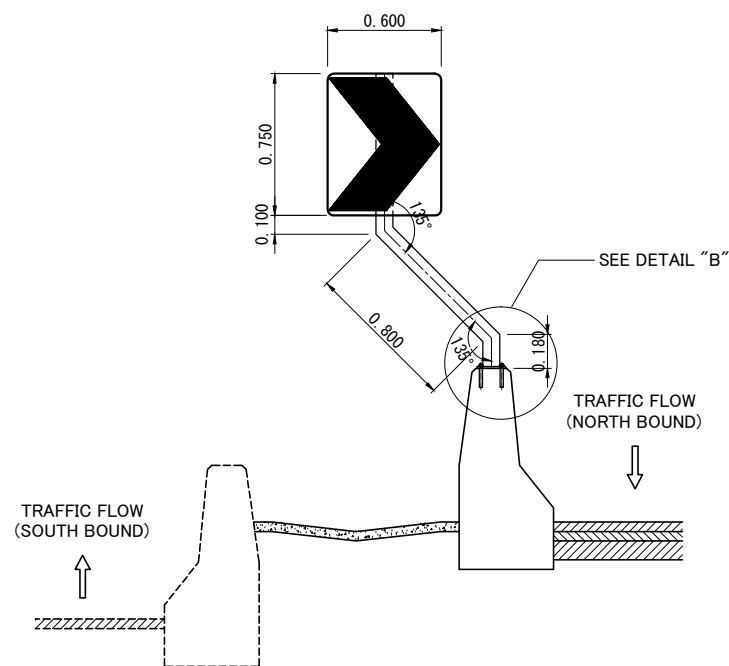
K.M. POST SIGN (MEDIAN)



LIGHT REFLECTOR (ctc 20m)
SCALE 1:10

SCHEDULED LIST OF LIGHT REFLECTOR

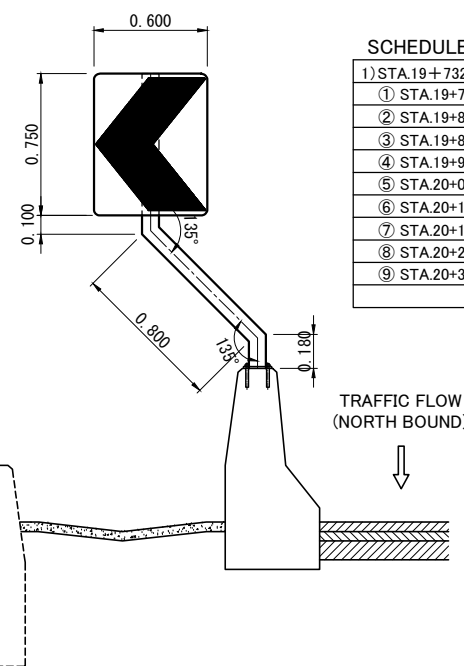
STA	DISTANCE (m)	Nos.	REMARKS
1) STA 10+600.0 ~ STA 11+125.0	525.0	26	
2) STA 11+550.0 ~ STA 20+580.0	9,030.0	451	
3) STA 23+690.0 ~ STA 29+200.0	5,510.0	275	



LEFT BEND

SCHEDULED LIST OF LEFT BEND

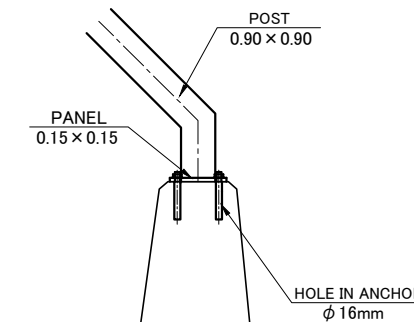
1) STA.12+773 ~ STA.13+239	① STA.23+900
② STA.12+860	② STA.23+975
③ STA.12+940	③ STA.24+050
④ STA.13+010	④ STA.24+125
⑤ STA.13+090	⑤ STA.24+200
⑥ STA.13+160	⑥ STA.24+275
⑦ STA.13+230	⑦ STA.24+350
	⑧ STA.24+425
2) STA.16+809 ~ STA.17+090	4) STA.28+227 ~ STA.28+666
① STA.16+790	① STA.28+220
② STA.16+850	② STA.28+295
③ STA.16+920	③ STA.28+370
④ STA.17+005	④ STA.28+445
⑤ STA.17+080	⑤ STA.28+520
	⑥ STA.28+595
	⑦ STA.24+670
	⑧ STA.28+745



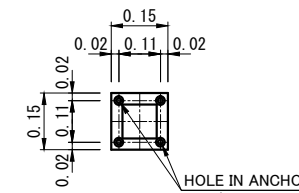
RIGHT BEND

SCHEDULED LIST OF RIGHT BEND

1) STA.19+732 ~ STA.20+316
① STA.19+720
② STA.19+810
③ STA.19+890
④ STA.19+960
⑤ STA.20+030
⑥ STA.20+110
⑦ STA.20+180
⑧ STA.20+260
⑨ STA.20+340



DETAIL "B"
SCALE 1:10



PANEL
SCALE 1:10

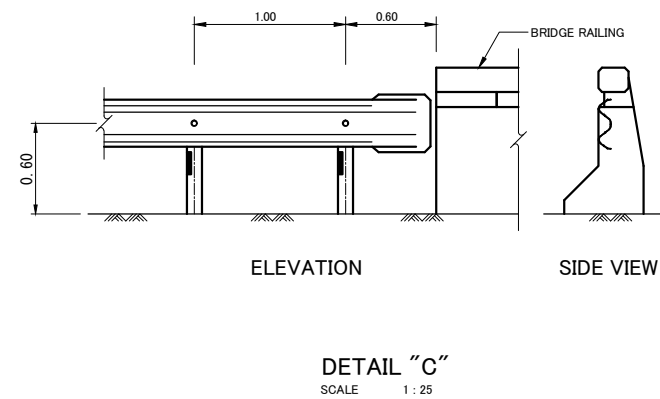
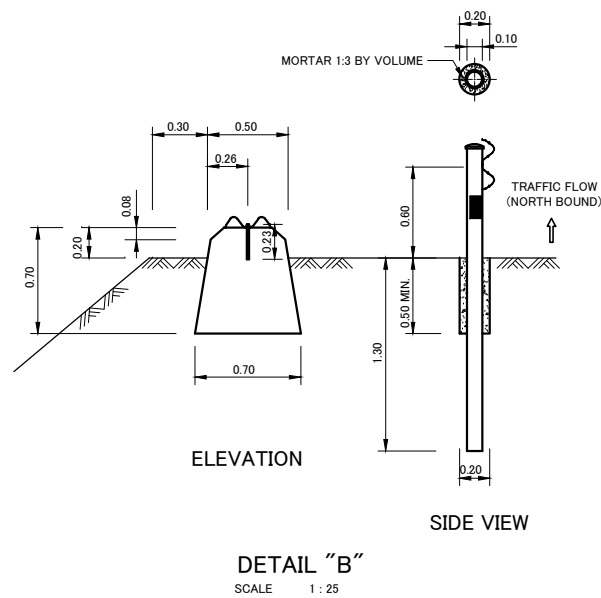
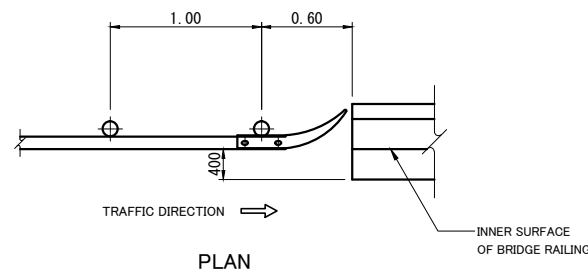
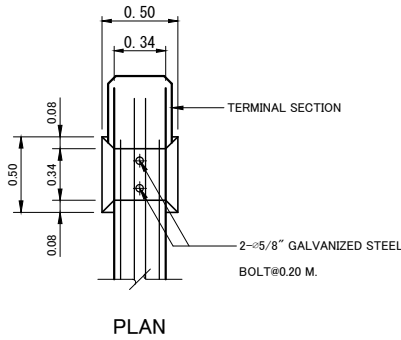
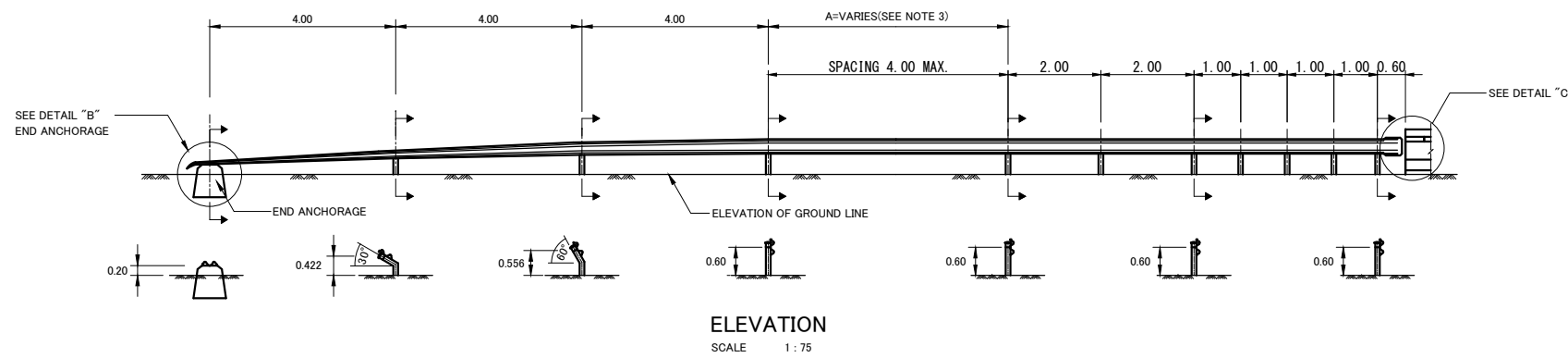
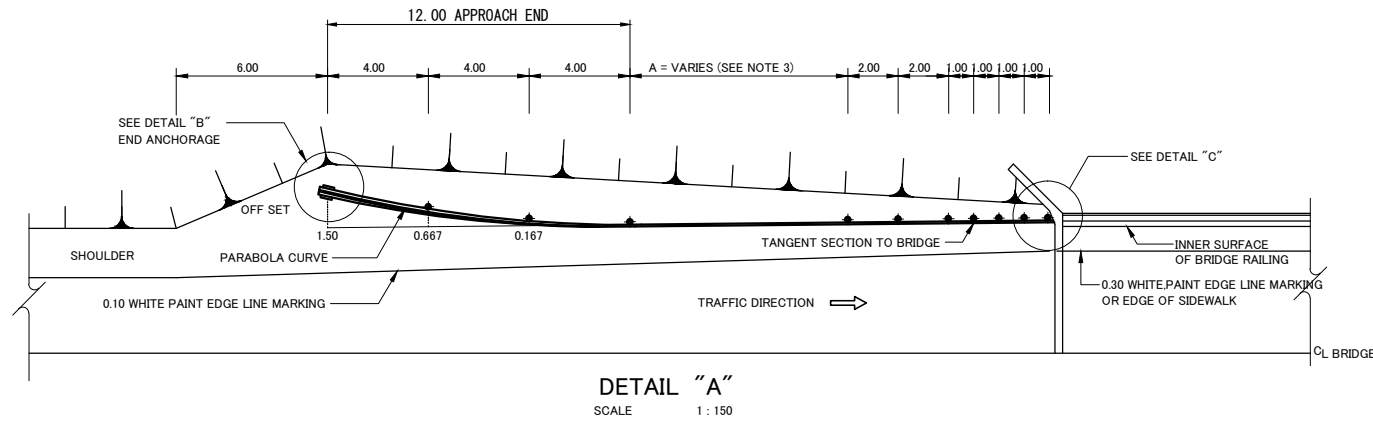
NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- THE POSTS, PANELS, SIGNS INCLUDING PLATES AND ANCHOR SHALL CONFORM TO THE REQUIREMENTS OF DOH, THAILAND.
- THESE FACILITIES HAVE BEEN DESIGNED BASED ON THE INVENTORY RESULTS OF THE EXISTING FACILITIES, REPLACEMENT SHALL CONFORM TO THE EXISTING MEASUREMENTS.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	1:10 / 1:200
														DWG. NO.	SHEET NO.
														CB-5	162

7. SAFETY WORK

7-1 DETAILS OF GUARDRAIL



DETAILS OF GUARDRAIL (TYPE-1)
SCALE 1 : VARIES

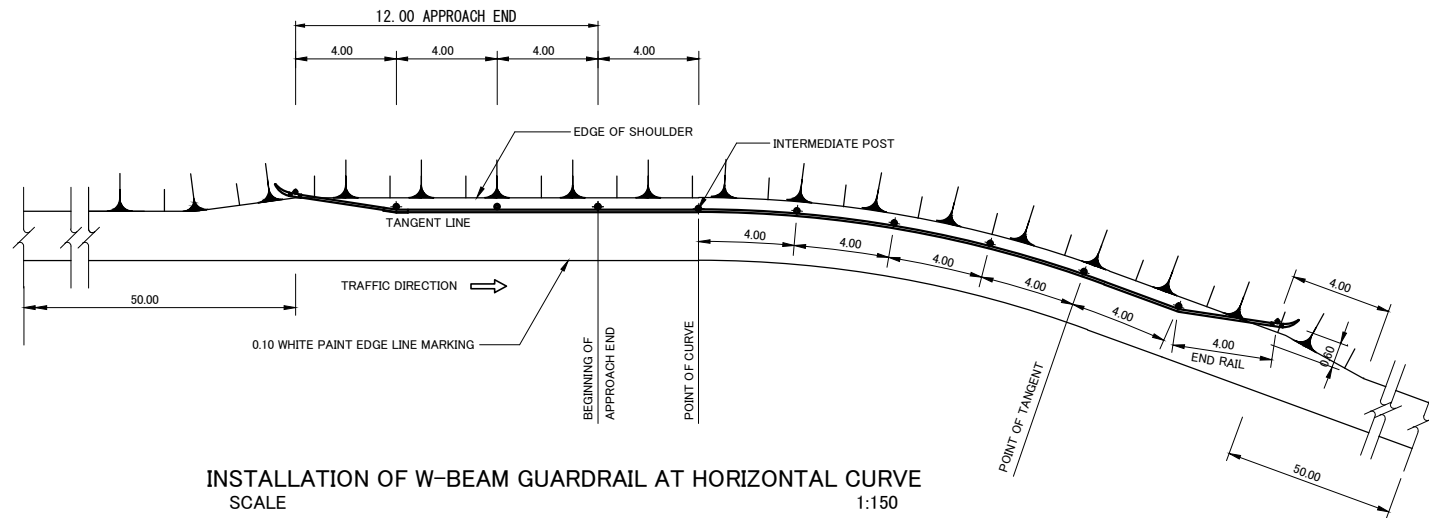
SCHEDULED LIST OF GUARDRAIL (Type1)

STA	DISTANCE(m)	REMARKS
1) STA.11+554~STA.11+602	49	BRIDGE APPROACH
2) STA.13+400~STA.13+452	53	PROTECTION BOX CULVERT
3) STA.15+800~STA.15+856	57	MOUNTING OVERHEADSKN PROTECTION
4) STA.16+320~STA.16+368	49	DITTO
5) STA.16+816~STA.16+860	45	DITTO
6) STA.18+000~STA.18+052	53	DITTO
7) STA.19+670~STA.20+380	749	RIGHT CURVE

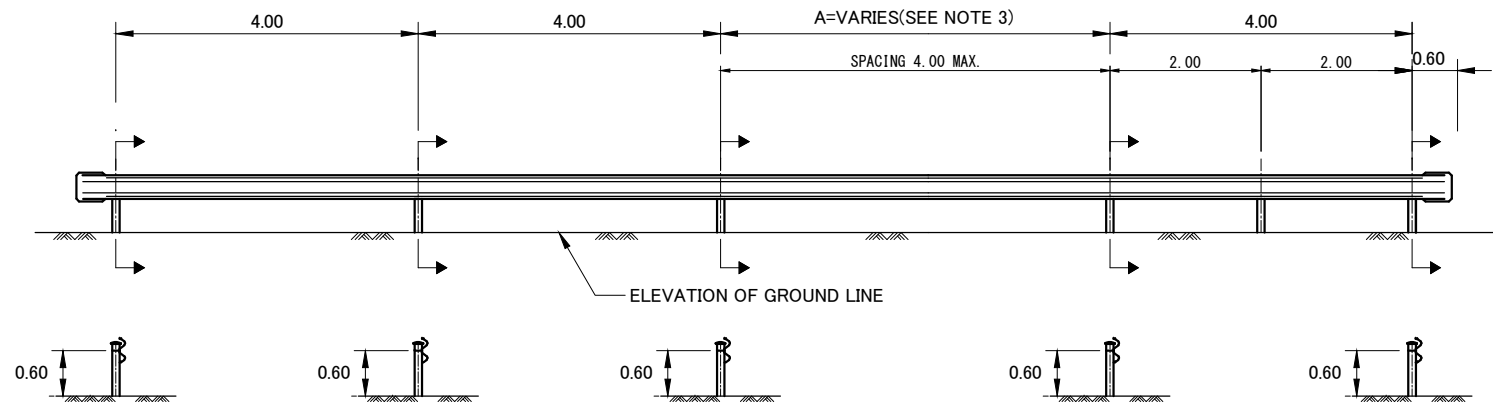
NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- THE DETAIL REQUIREMENTS SHALL CONFORM TO THE DOH, THAILAND STANDARDS OR TO THE EXISTING ONES.
- THE PORTION OF GUARDRAIL INDICATED BY "A" SHALL NOT APPLY IF EMBANKMENT HEIGHT IS LESS THAN 4.00 M. (SIDE SLOPE 1.5 : 1 MAX.)

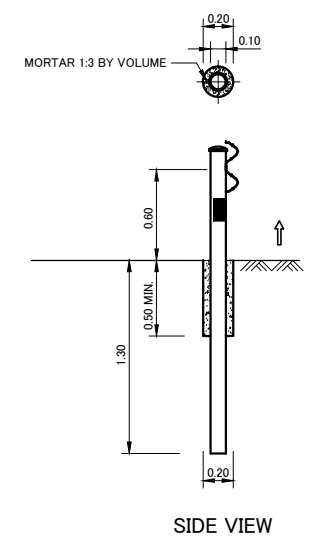
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	AS SHOWN
														DWG. NO.	SHEET NO.
														SW-1	163



INSTALLATION OF W-BEAM GUARDRAIL AT HORIZONTAL CURVE
SCALE 1:150



ELEVATION
SCALE 1:50



SIDE VIEW

DETAILS OF GUARDRAIL (TYPE-2)
SCALE 1:50

SCHEDULED LIST OF GUARDRAIL (Type2)

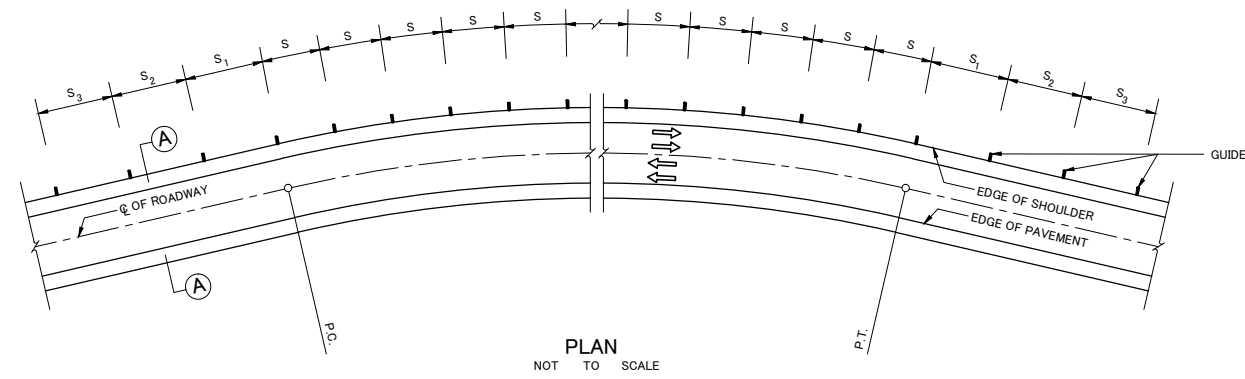
STA	DISTANCE(m)	REMARKS
1) STA.13+762.0~STA.13+890.0	129.0	FLYOVER PIER PROTECTION
2) STA.15+176.0~STA.15+227.0	53.0	DITTO
3) STA.24+810.0~STA.24+850.0	41.0	TOLLGATE CONTROL FACILITIES PROTECTION
4) STA.25+208.0~STA.25+345.0	137.0	DITTO
5) STA.27+804.0~STA.27+828.0	25.0	MOUNTING OVERHEAD SIGN PROTECTION

NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- PAYMENT SHALL BE MEASURED BY LINEAR METERS OF RAIL INCLUDING TERMINAL SECTION CONCRETE ANCHOR AND SPLICE SECTION.
- OBSTACLE MEANS PERMANENT STRUCTURE WHICH MAY BE DANGEROUS TO VEHICLES STRIKING SUCH AS, ELECTRIC POLE, BRIDGE PIER, ETC.
- THE PORTION OF GUARDRAIL INDICATED BY "A" SHALL NOT APPLY IF EMBANKMENT HEIGHT IS LESS THAN 4.00 M. (SIDE SLOPE 1.5 : 1 MAX.)

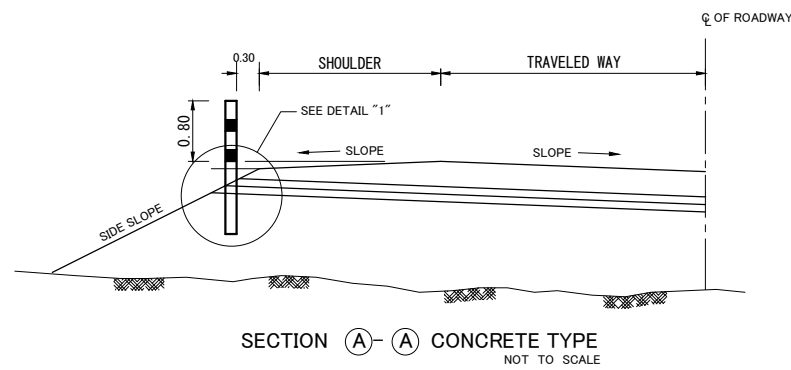
REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE : AUGUST 2012	SCALE : AS SHOWN
							DETAILS OF GUARDRAIL						DWG. NO. SW-2	SHEET NO. 164

7-2 DETAILS OF GUIDE POST



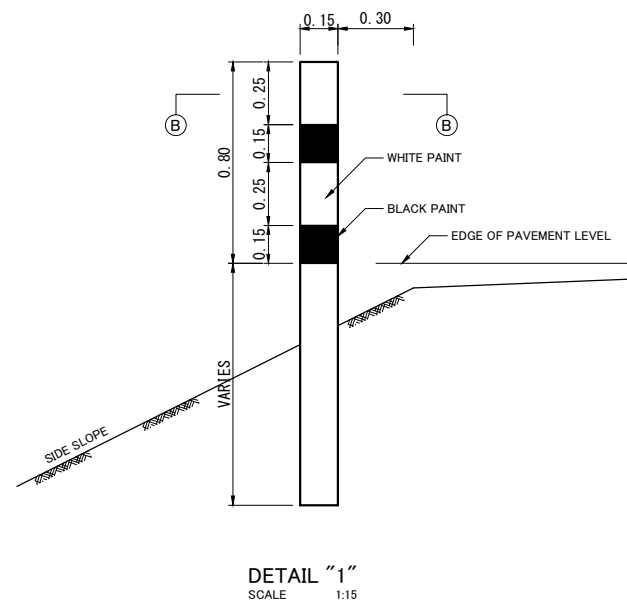
SCHEDULED LIST OF GUIDE POST

STA	DISTANCE(m)	REMARKS
1) STA.19+380.0~STA.20+640.0	1260.0	N=32



VALUES FOR SPACING OF GUIDE POST

RADIUS OF CURVE (METER)	SPACING OF GUIDE POST (METER)			
	S	S ₁	S ₂	S ₃
15-74	4	7	12	24
75-99	6	11	18	36
100-149	7	13	21	42
150-199	8	14	24	48
200-299	9	16	27	54
300-499	10	18	30	60
500-999	15	27	45	60
1000-1500	21	38	60	60



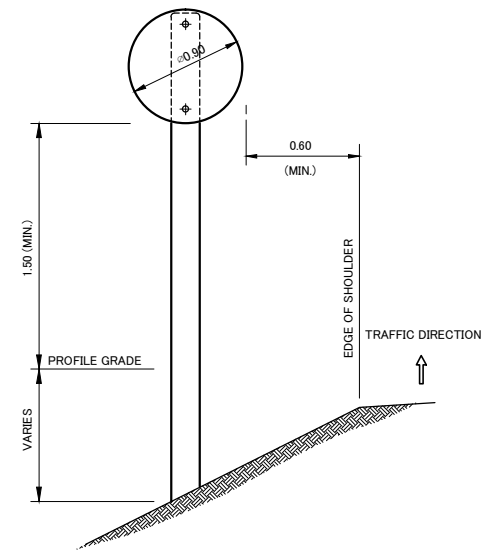
DETAILS OF GUIDEPOST (REFLECTORY)

NOTES:

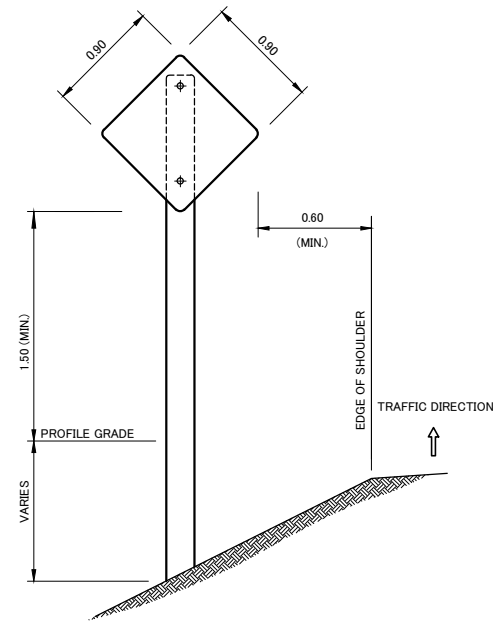
- DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- THE MATERIAL, LOCATION AND INSTALLING DETAILS SHALL CONFORM TO THE REQUIREMENTS OF DOH, THAILAND.
- THIS FACILITY IS DESIGNED TO BE RE-USED. SPECIAL ATTENTION SHALL BE PAID DURING REMOVAL.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE	SCALE
		CHECKED	DATE	CHECKED	DATE								SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	-
															DWG. NO. SW-3	SHEET NO. 165

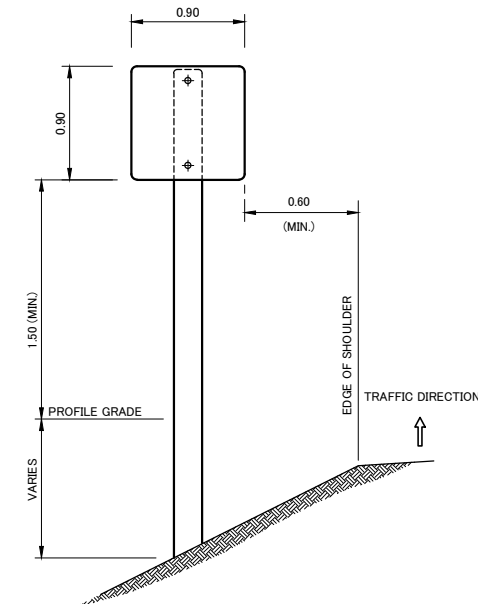
7-3 DETAILS OF SIGN POST



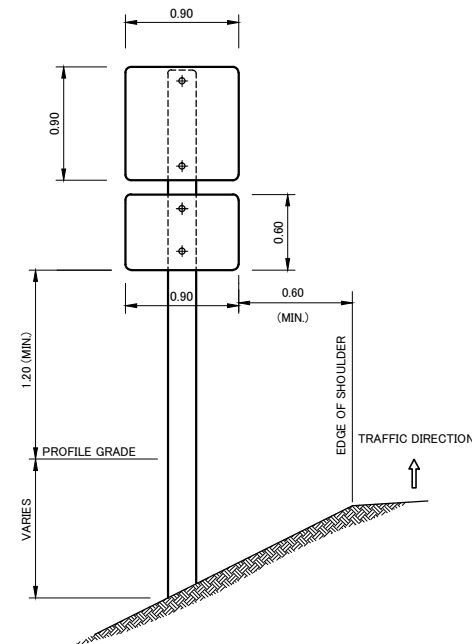
REGULATORY SIGN



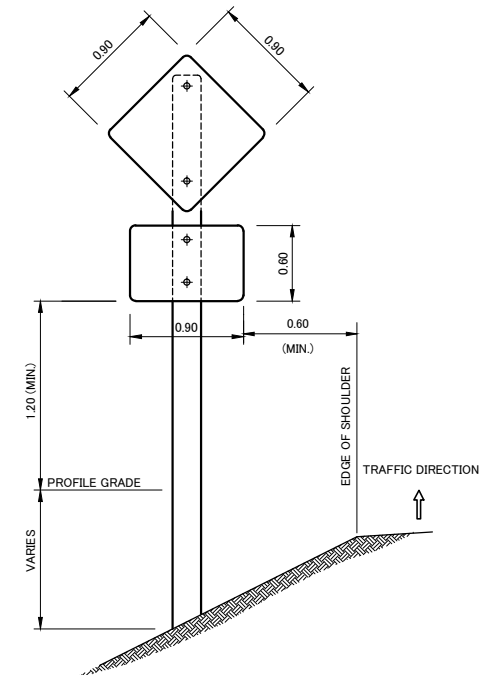
WARNING SIGN



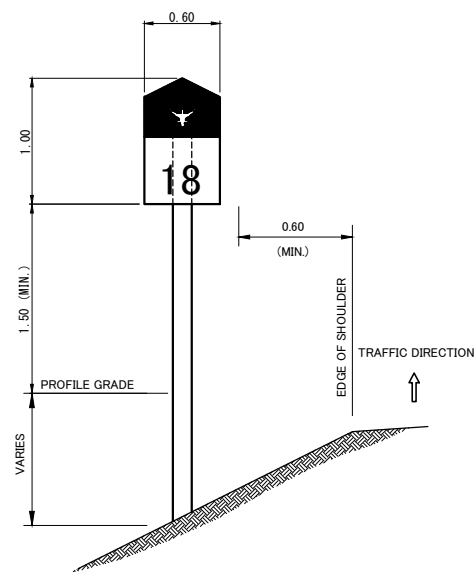
ROUTE MARKER



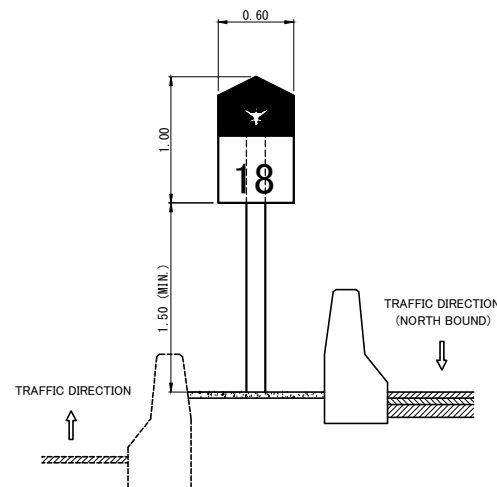
ROUTE TURN ASSEMBLIES TYPE I
OR DIRECTIONAL ASSEMBLIES



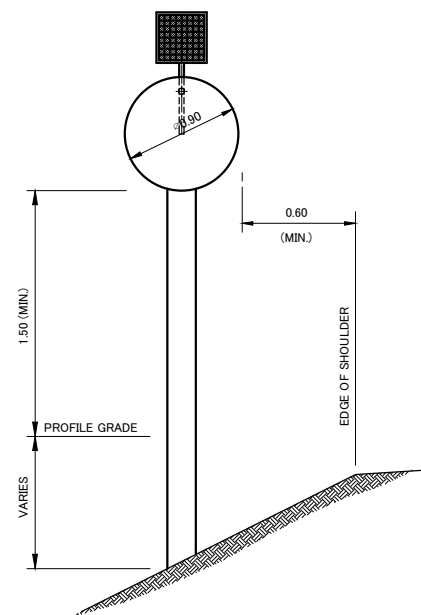
ROUTE TURN ASSEMBLIES TYPE I
OR DIRECTIONAL ASSEMBLIES



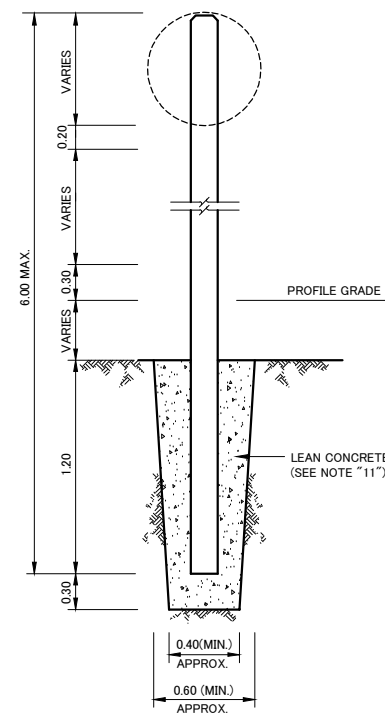
Km POST SIGN



SOLAR POWER GENERATION
(REGULATORY SIGN)



DETAILS OF SIGN POST



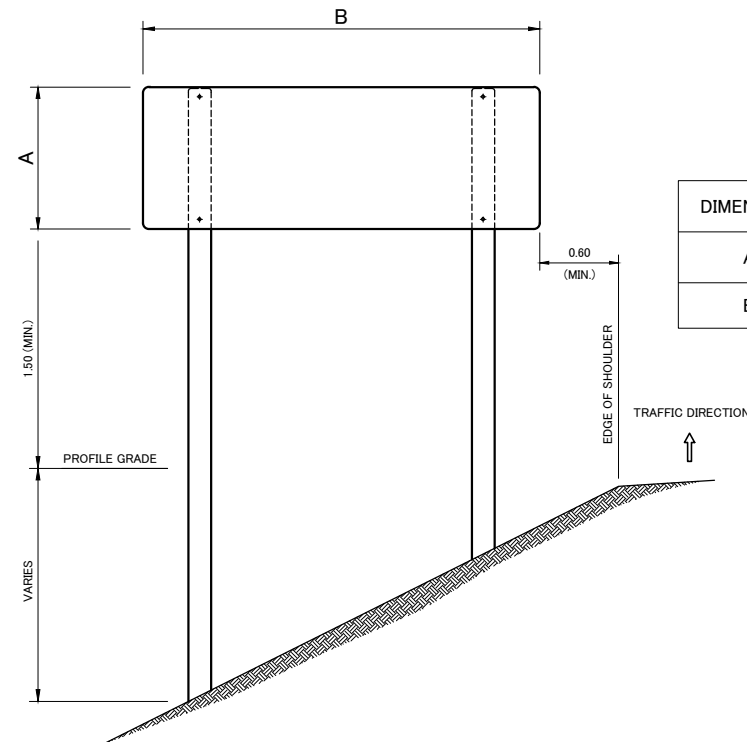
SIGN POST INSTALLATION DETAIL
NOT TO SCALE

NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- SIGN PLATE SHALL BE MADE OF 2 MM. THICK ALUMINIUM ALLOY.
- ALUMINIUM ALLOY SIGN PLATE SHALL CONFORM TO TIS. 331
- UNLESS OTHERWISE INDICATED, SIGN AND THEIR SUPPORTS SHALL BE OF THE SIZES, COLORS AND TYPES PRESCRIBED BY, AND SITE IN ACCORDANCE WITH THE RECOMMENDATIONS OF, THE DEPARTMENT'S TRAFFIC CONTROL DEVICE MANUAL, PAST 1 ISSUED B.E. 2531
- REFLECTIVE SHEETING SHALL CONFORM TO TIS.606 TYPE 1
- SIGN FRAME SHALL BE MADE OF 50x25x1.8 MM. STEEL RECTANGULAR TUBING FRAME WELDED AND SMOOTHED IN PRIMING PAINT FOR FRAME SHALL BE RUST PREVENTIVE PAINT (RED LEAD BASED PRIMER FOR IRON AND STEEL SURFACED, TYPE 3) WHICH CONFORMS TO TIS.389; THE SUCCEEDING COATING SHALL BE PAINTED WITH BLACK METAL PAINT.
- LENGTH OF SIGN POSTS AND POSITIONS OF HOLES STATED IN THE DRAWING ARE FOR THE MIN. SIZE ONLY THESE LENGTHS AND POSITION OF HOLES SHALL BE ADJUSTED DEPENDING ON SITE CONDITIONS.
- PORTION OF CONCRETE POST FROM GROUND LINE TO THE ELEVATION OF 20 CM. ABOVE FINISHED ROADWAY PROFILE SHALL BE PAINTED IN BLACK AND ALL OTHER PART SHALL BE PAINTED IN WHITE.
- BACK OF SIGN, CLOSE TO EDGE OF PAVEMENT SIDE, SHALL BE STAMPED WITH DEPTH NOT LESS THAN 0.5 MM.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSG. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS

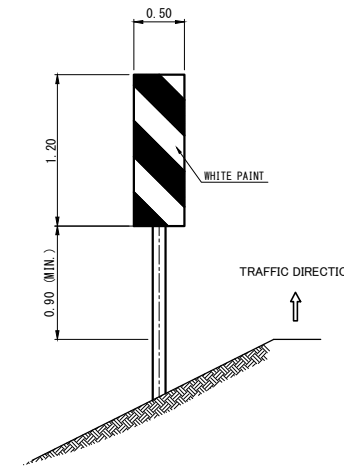
PORTLAND CEMENT TYPE 1	350	KG.(MIN.)
SAND	0.43	M. ³
CRUSHED ROCK OR GRAVEL	0.86	M. ³
CONCRETE SLUMP	10	CM.(MAX.)
- LEAN CONCRETE FOR SIGN POST BASE SHALL HAVE A PROPORTION OF CEMENT : SAND : AGGREGATE 1:3:6 BY VOLUME AND A CONCRETE SLUMP OF 10 CM.(MAX.)
- CLEAR CONCRETE COVER SHALL BE 2.5 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR 24.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE										AUGUST 2012	1:30
									DETAILS OF SIGN POST						DWG. NO. SW-4	SHEET NO. 166

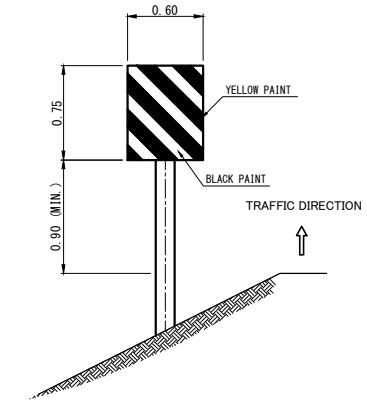


DIMENSION	①	②	③	④	⑤	⑥	⑦	⑧
A	0.50	0.80	0.80	0.90	1.30	1.50	2.40	3.20
B	1.40	2.00	2.40	2.10	2.50	1.50	3.50	2.80

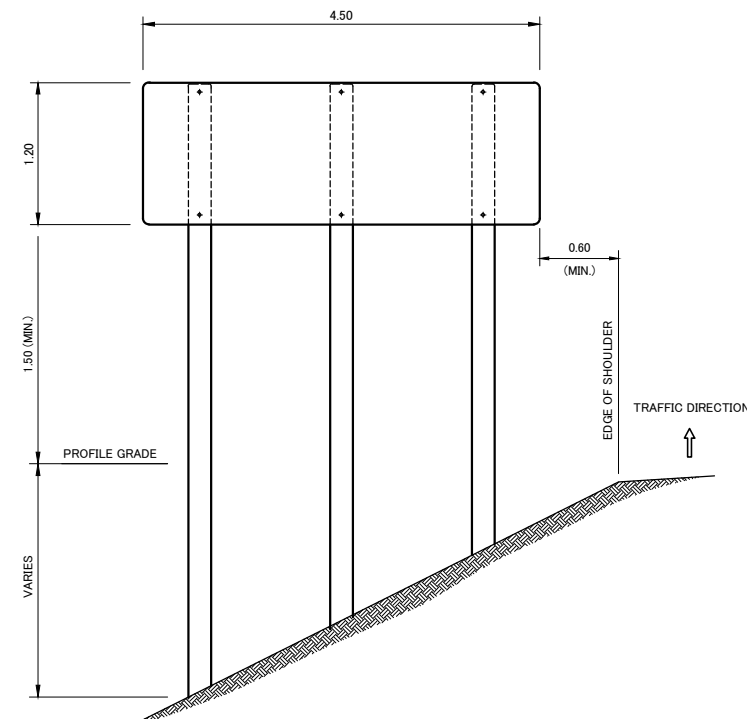
DESTINATION WITH ARROW SIGN
 DESTINATION AND DISTANCE SIGN
 TOWN AND DISTRICT BOUNDARY SIGN
 WITH THAI AND ENGLISH WORDS
 OR THAI WORDS ONLY



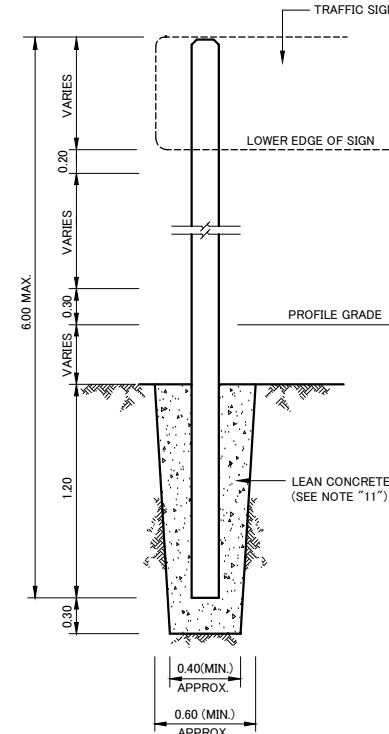
VERTICAL PANEL



BARREL



DESTINATION WITH ARROW SIGN
 DESTINATION AND DISTANCE SIGN
 TOWN AND DISTRICT BOUNDARY SIGN
 WITH THAI AND ENGLISH WORDS
 OR THAI WORDS ONLY



SIGN POST INSTALLATION DETAIL
 NOT TO SCALE

DETAILS OF SIGN POST

NOTES :



- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- SIGN PLATE SHALL BE MADE OF 2 MM. THICK ALUMINIUM ALLOY.
- ALUMINIUM ALLOY SIGN PLATE SHALL CONFORM TO TIS. 331
- UNLESS OTHERWISE INDICATED, SIGN AND THEIR SUPPORTS SHALL BE OF THE SIZES, COLORS AND TYPES PRESCRIBED BY, AND SITE IN ACCORDANCE WITH THE RECOMMENDATIONS OF, THE DEPARTMENT'S TRAFFIC CONTROL DEVICE MANUAL, PAST 1 ISSUED B.E. 2531
- REFLECTIVE SHEETING SHALL CONFORM TO TIS.606 TYPE 1 (EFFICIENT OF RETRO-REFLECTION LEVEL 1)
- SIGN FRAME SHALL BE MADE OF 50x25x1.6 MM. STEEL RECTANGULAR TUBING FRAME WELDED AND SMOOTHED IN PRIMING PAINT FOR FRAME SHALL BE RUST PREVENTIVE PAINT (RED LEAD BASED PRIMER FOR IRON AND STEEL SURFACED, TYPE 3) WHICH CONFORMS TO TIS.389; THE SUCCEEDING COATING SHALL BE PAINTED WITH BLACK METAL PAINT.
- LENGTH OF SIGN POSTS AND POSITIONS OF HOLES STATED IN THE DRAWING ARE FOR THE MIN. SIZE ONLY THESE LENGTHS AND POSITION OF HOLES SHALL BE ADJUSTED DEPENDING ON SITE CONDITIONS.
- PORTION OF CONCRETE POST FROM GROUND LINE TO THE ELEVATION OF 20 CM. ABOVE FINISHED ROADWAY PROFILE SHALL BE PAINTED IN BLACK AND ALL OTHER PART SHALL BE PAINTED IN WHITE.
- BACK OF SIGN, CLOSE TO EDGE OF PAVEMENT SIDE, SHALL BE STAMPED WITH DEPTH NOT LESS THAN 0.5 MM.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS

PORTLAND CEMENT TYPE 1	350	KG.(MIN.)
SAND	0.43	M. ³
CRUSHED ROCK OR GRAVEL	0.86	M. ³
CONCRETE SLUMP	10	CM.(MAX.)
- LEAN CONCRETE FOR SIGN POST BASE SHALL HAVE A PROPORTION OF CEMENT : SAND : AGGREGATE 1:3:6 BY VOLUME AND A CONCRETE SLUMP OF 10 CM.(MAX.)
- CLEAR CONCRETE COVER SHALL BE 2.5 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR 24.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	-
														DWG. NO. SW-5	SHEET NO. 167

SCHEDULED LIST OF ROAD SIGNS

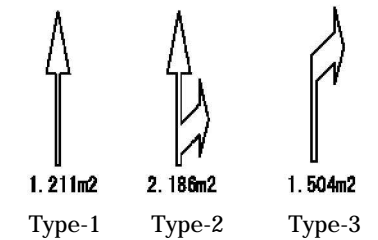
NO.	STA	TYPE	POST		SIGN BOARD																			REMARKS
			12cmx12cm	φ6cm	REGULATORY SIGN		WARNING SIGN			ROUTE MARKER				REGULATORY SIGN(LARGE)		ROUTE MARKER (LARGE)								
					1.00x0.60	φ0.90	0.60x1.50	0.75x0.60	0.75x0.90	0.90x0.90	1.20x0.60	0.60x0.90	0.90x0.90	1.30x2.50	3.20x2.60	0.50x1.40	0.60x2.00	0.80x2.40	0.80x2.10	1.50x1.50	2.40x3.50	1.20x4.50		
1	STA 10+700	ROUTE MARKER	1									1	1											
2	STA 11+000	Km POST	2		2																			SHOULDER+MEDIAN
3	STA 11+020	ROUTE MARKER	1									1												
4	STA 11+350	ROUTE MARKER	2													1								
5	STA 11+600	WARNING SIGN	1					1																
6	STA 12+000	Km POST	2		2																		SHOULDER+MEDIAN	
7	STA 12+380	WARNING SIGN	1						1	1														
8	STA 13+000	Km POST	2		2																		SHOULDER+MEDIAN	
9	STA 13+100	WARNING SIGN	1						1	1														
10	STA 13+200	WARNING SIGN	1						1	1														
11	STA 13+340	WARNING SIGN	1							1														
12	STA 14+000	Km POST	2		2																		SHOULDER+MEDIAN	
13	STA 14+380	REGULATORY SIGN	1				1						1											
14	STA 14+500	ROUTE MARKER	2																			1		
15	STA 15+000	Km POST	2		2																		SHOULDER+MEDIAN	
16	STA 15+040	ROUTE MARKER	2																	1				
17	STA 15+200	REGULATORY SIGN	1				1	1																
18	STA 15+300	ROUTE MARKER	1											1										
19	STA 15+540	WARNING SIGN	1							1														
20	STA 15+900	WARNING SIGN		1							1													
21	STA 15+950	ROUTE MARKER	2																					
22	STA 16+000	Km POST	2		2															1			SHOULDER+MEDIAN	
23	STA 16+005	WARNING SIGN		1							1													
24	STA 16+180	ROUTE MARKER	2																		1			
25	STA 16+270	ROUTE MARKER	1										1											
26	STA 17+000	Km POST	2		2																		SHOULDER+MEDIAN	
27	STA 18+000	Km POST	2		2																		SHOULDER+MEDIAN	
28	STA 18+700	REGULATORY SIGN	1				1							1										
29	STA 19+000	ROUTE MARKER	2																					
30	STA 19+000	Km POST	2		2																	1	SHOULDER+MEDIAN	
31	STA 19+100	REGULATORY SIGN	2												1									
32	STA 19+500	ROUTE MARKER	2																		1			
33	STA 19+830	ROUTE MARKER	2																					
34	STA 19+700	ROUTE MARKER	1										1											
35	STA 19+970	ROUTE MARKER	2																			1		
36	STA 20+000	Km POST	2		2																		SHOULDER+MEDIAN	
37	STA 20+130	ROUTE MARKER	2																					
38	STA 20+250	ROUTE MARKER	2																				1	
39	STA 20+300	REGULATORY SIGN	1				1																	
40	STA 23+690	ROUTE MARKER	2																					
41	STA 23+760	WARNING SIGN	1														1							
42	STA 23+760	ROUTE MARKER	2																					
43	STA 23+820	ROUTE MARKER	2																					
44	STA 23+870	ROUTE MARKER	2																					
45	STA 23+930	ROUTE MARKER	1																					
46	STA 24+000	Km POST	2		2																			SHOULDER+MEDIAN
47	STA 24+050	ROUTE MARKER	2																					
48	STA 24+100	ROUTE MARKER	1											1										
49	STA 24+200	ROUTE MARKER	2																					
50	STA 24+380	WARNING SIGN	1																		1			
51	STA 24+450	REGULATORY SIGN	1				1																	SOLAR POWER GENERATION
52	STA 24+480	ROUTE MARKER	2																			1		
53	STA 24+550	REGULATORY SIGN	1				1																	SOLAR POWER GENERATION
54	STA 24+780	REGULATORY SIGN	1				1																	SOLAR POWER GENERATION
55	STA 25+000	Km POST	2		2																			SHOULDER+MEDIAN
56	STA 25+360	ROUTE MARKER	2																					
57	STA 25+397	ROUTE MARKER	2																					
58	STA 25+450	REGULATORY SIGN	1				1																	SOLAR POWER GENERATION
59	STA 25+485	REGULATORY SIGN	1				1																	SOLAR POWER GENERATION
60	STA 25+470	ROUTE MARKER	2																				1	
61	STA 25+930	REGULATORY SIGN	1				1																	
62	STA 25+960	REGULATORY SIGN	1				1																	
63	STA 25+985	REGULATORY SIGN	1				1																	
64	STA 25+997	REGULATORY SIGN	1				1																	
65	STA 25+740	ROUTE MARKER	2																					
66	STA 25+850	ROUTE MARKER	2																					
67	STA 26+000	Km POST	2		2																			SHOULDER+MEDIAN
68	STA 26+250	ROUTE MARKER	2																					
69	STA 26+840	ROUTE MARKER	2																					
70	STA 26+843	REGULATORY SIGN	2										1											
71	STA 26+840	ROUTE MARKER	2																					
72	STA 27+000	Km POST	2		2																			SHOULDER+MEDIAN
73	STA 27+900	ROUTE MARKER	3																					
74	STA 28+000	Km POST	2		2																		1	SHOULDER+MEDIAN
75	STA 28+500	ROUTE MARKER	2																					
76	STA 28+550	REGULATORY SIGN	2											1										
77	STA 28+660	ROUTE MARKER	2																					
78	STA 28+900	WARNING SIGN	1																					
79	STA 29+000	Km POST	2		2																			SHOULDER+MEDIAN
80	STA 29+100	REGULATORY SIGN	1				1																	

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	 KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	 CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE:	SCALE:
		CHECKED	DATE	CHECKED	DATE										AUGUST 2012	-
												SAGARA Hidetaka	WATANABE Ryohei	DWG. NO.	SHEET NO.	
												ROAD ENGINEER	CHIEF ENGINEER	SW-6	168	

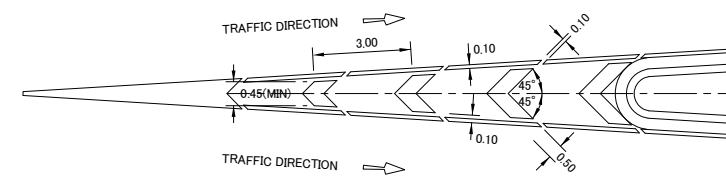
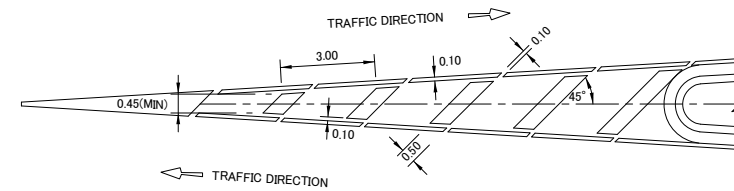
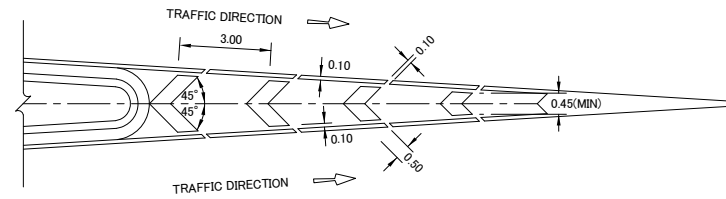
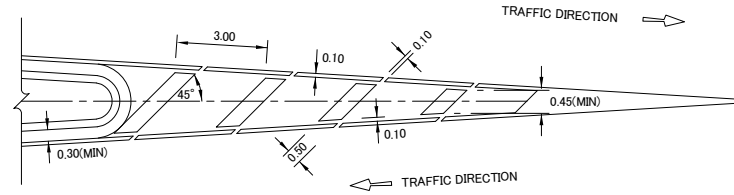
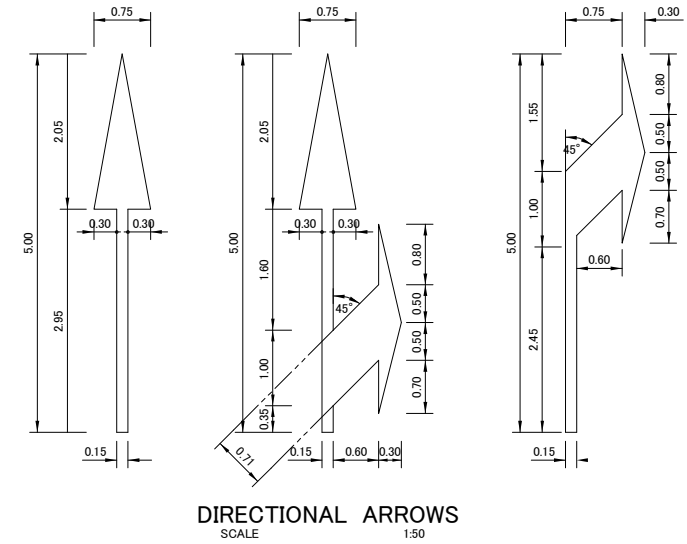
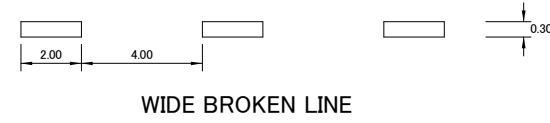
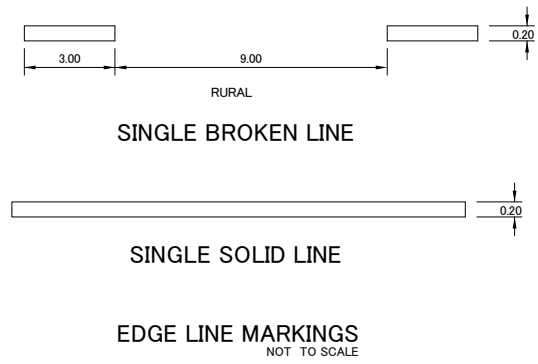
**7-4 DETAILS OF SIGNAGE &
AVEMENT MARKING**

SCHEDULED LIST OF SIGNAGE & PAVEMENT MARKING

STA.				Single Solid Line (Yellow) at Outer Edge W=0.20M.	Single Solid Line (White) Inside W=0.20M.	Single Broken Line W=0.20M.	Wide Broke Lne W=0.30M.	Cross and Chevron Hatching Marking W=0.50M. (Sq.M.)	Type-1 L=5.0M.	Type-2 L=5.0M.	Type-3 L=5.0M.
STA. 10	6.0	STA. 110	124.0	524.0 M. ³ %	524.0 M. ³ %	524.0 M. ³ "					
STA. 11	558.0	STA. 150	175.0	3617.0 M. ³ %	3617.0 M. ³ %	3617.0 M. ³ "			1.211 Sq.M./Each ³ %		1.504 Sq.M./Each ³ %
STA. 12	625.0	STA. 120	950.0				325.0 M. ³ %				
STA. 12	950.0	STA. 130	14.5		64.5 M. ³ %						
STA. 12	950.0	STA. 130	150.0		20 ³ %						
STA. 13	23.3	STA. 130	61.2		79.1 M. ³ %			12.7			
STA. 13	14.5	STA. 130	150.0			135.5 M. ³ %					
STA. 12	9.0	STA. 130	150.0				25 ³ %				
STA. 12	950.0	STA. 130	40.6					34.1			
STA. 14	794.3	STA. 140	990.5				196.2 M. ³ %				
STA. 15	175.0	STA. 200	580.0	5405.0 M. ³ %	5405.0 M. ³ %	5405.0 M. ³ "			1.211 Sq.M./Each ³ %	2.186 Sq.M./Each ³ %	1.504 Sq.M./Each ³ %
STA. 15	589.1	STA. 150	807.6				218.5 M. ³ %				
STA. 15	425.0	STA. 150	589.1		164.1 M. ³ %						
STA. 15	440.4	STA. 150	589.1		148.7 M. ³ %						
STA. 15	440.4	STA. 150	525.0		84.6 M. ³ %						
STA. 15	425.0	STA. 150	525.0		10 ³ %						
STA. 15	457.0	STA. 150	493.0					16.3			
STA. 15	527.0	STA. 150	575.0					30.9			
STA. 19	8.0	STA. 200	439.6				639.6 M. ³ %				
STA. 20	343.8	STA. 200	580.0			236.2 M. ³ %					
STA. 20	439.6	STA. 200	580.0		140.4 M. ³ %						
STA. 20	439.6	STA. 200	580.0					70.0			
STA. 23	690.0	STA. 290	2.0	5499.4 M. ³ %	551 ³ %					2.186 Sq.M./Each ³ %	1.504 Sq.M./Each ³ %
STA. 23	690.0	STA. 250	102.0			1412.0 M. ³ "					
STA. 25	213.1	STA. 290	2.0			3986.9 M. ³ "					
STA. 23	690.0	STA. 230	8.0				11 ³ %				
STA. 23	690.0	STA. 240	365.0			675.0 M. ³ %					
STA. 25	3.0	STA. 250	102.0			278.6 M. ³ %					
STA. 25	110.5	STA. 250	2.0		827.0 M. ³ %						
STA. 25	307.4	STA. 250	355.7		200.9 M. ³ %						
STA. 25	110.5	STA. 250	453.0		683.9 M. ³ %						
STA. 25	110.5	STA. 250	129.8					2.6			
STA. 25	195.4	STA. 250	307.4			252.0 M. ³ %					
STA. 25	365.8	STA. 250	588.0			410.8 M. ³ %					
STA. 25	406.0	STA. 250	436.9					8.8			
STA. 26	711.2	STA. 260	891.8		2 ³ %		180.6 M. ³ %				
STA. 28	370.4	STA. 290	2.0				829.6 M. ³ %				
STA. 28	908.4	STA. 290	2.0				291.6 M. ³ %				



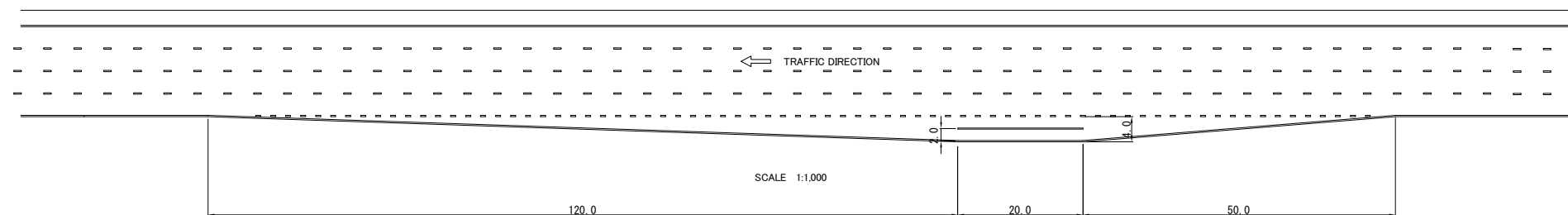
REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE	SCALE
							DETAILS OF SIGNAGE & PAVEMENT MARKING	The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road		SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	AS SHOWN
												DWG. NO. SW-7	SHEET NO. 169	



SCHEDULED LIST OF EMERGENCY PARKING BAY

STA	REMARKS
1) STA.14+950	APPROXIMATE
2) STA.26+825	APPROXIMATE

EMERGENCY PARKING BAY

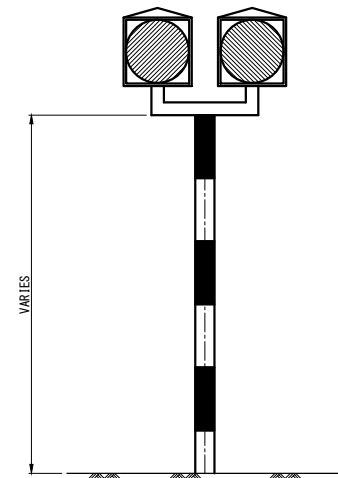


DETAILS OF SIGNAGE AND PAVEMENT MARKINGS

- NOTES :
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING SHALL BE REFERENCED TO DWG. NO. RS-602
ALL PAVEMENT MARKINGS SHALL CONFORM TO THE REQUIREMENTS OF DOH, THAILAND OR THE EXISTING ONES.
 - EMERGENCY PARKING BAY LOCATION IS TENTATIVE AND SHOULD BE SAME AS THE EXISTING ONE.
 - ROAD STUDS ON THE EDGE LINE MARKINGS AT INTERCHANGE ARE DESIGNED TO BE RE-USED. SPECIAL ATTENTION SHALL BE PAID DURING REMOVAL.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE										AUGUST 2012	AS SHOWN
															DWG. NO.	SHEET NO.
															SW-8	170

7-5 DETAILS OF REUSING ACILITIES



SIGNAL
SCALE 1:30

SCHEDULED LIST OF SIGNAL

STA	Nos.	REMARKS
1) STA.15+540.0	1	
2) STA.25+380.0	1	



OPTICAL FIBER BOARD
SCALE 1:10

SCHEDULED LIST OF OPTICAL FIBER BOARD

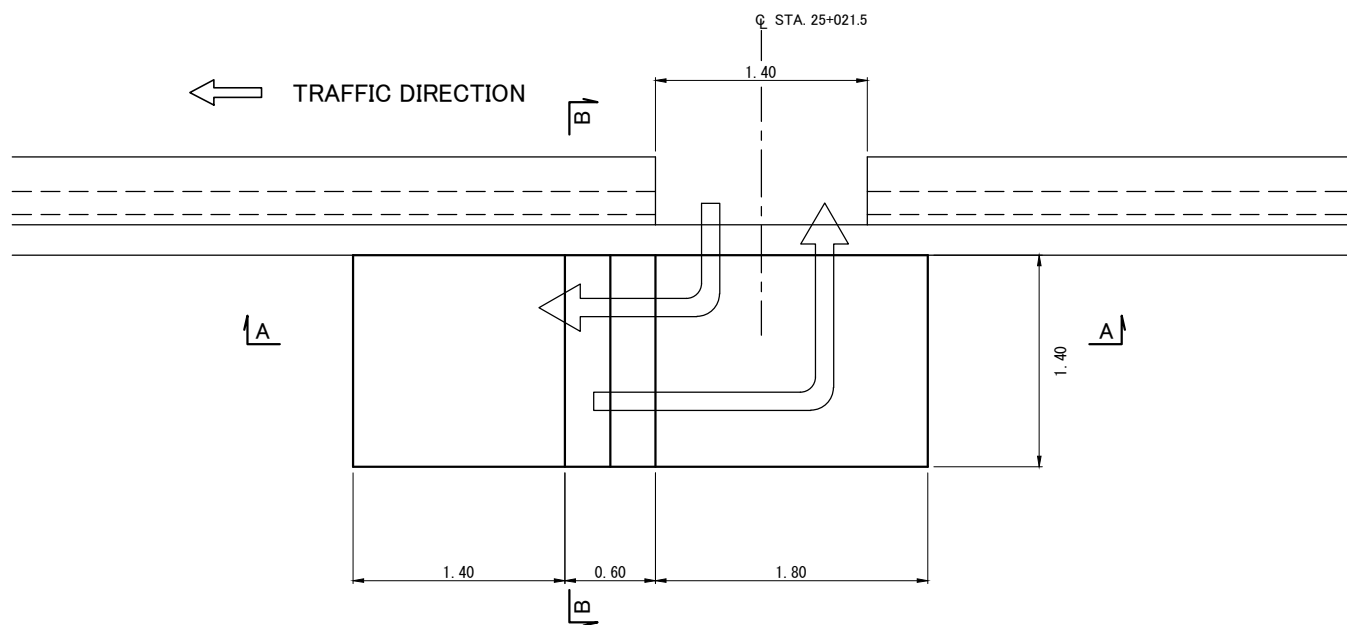
STA	Nos.	REMARKS
1) STA.11+600.0	1	
2) STA.25+380.0	1	
3) STA.25+380.0	1	
4) STA.25+380.0	2	
5) STA.25+380.0	2	

NOTES :

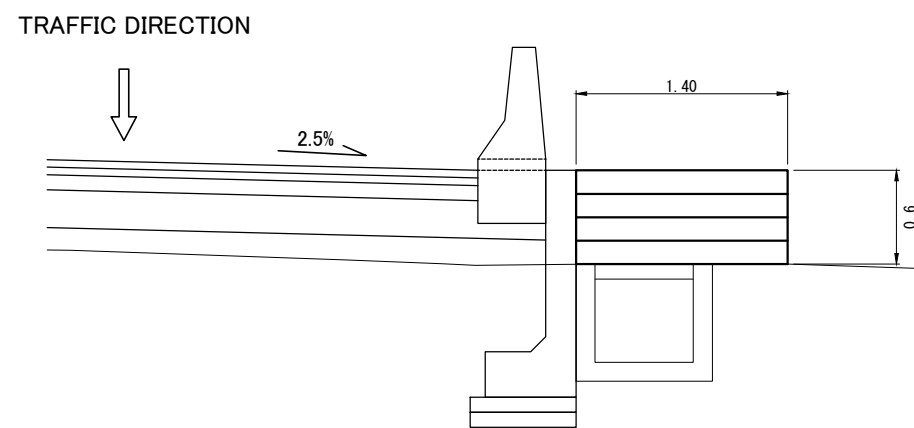
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THESE FACILITIES ARE DESIGNED TO BE RE-USED SPECIAL ATTENTION SHALL BE PAID DURING REMOVAL.

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	1:10 / 1:30
														DWG. NO. SW-9	SHEET NO. 171

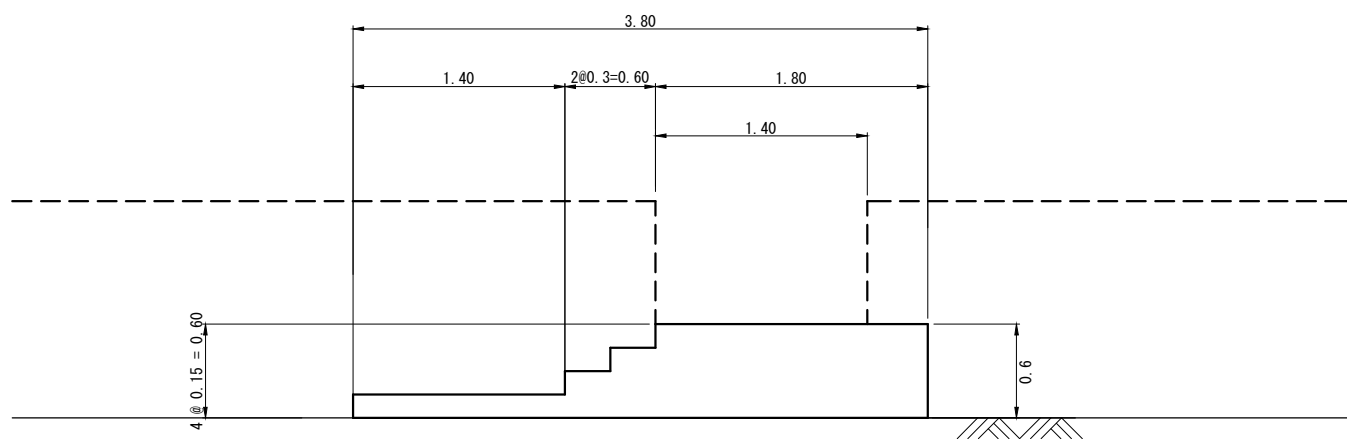
7-6 STAIRWAY WORK



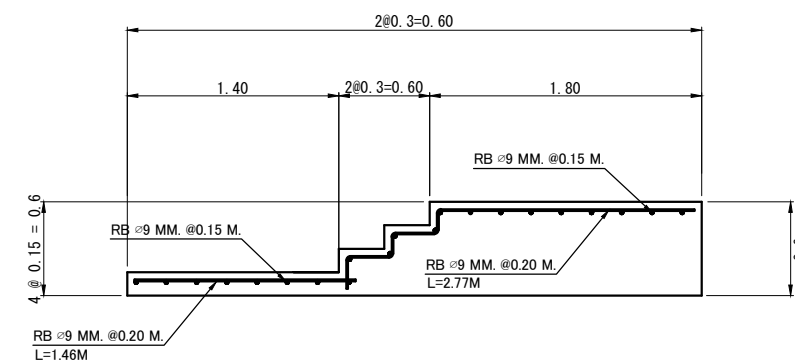
TOP VIEW



FRONT ELEVATION (B-B)



FRONT ELEVATION (A-A)



REINFORCEMENT DETAIL

SCHEDULED LIST OF STAIRWAY WORK

STA	REMARKS
1) STA.25+21.5	

STAIRWAY WORK
SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 180 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS.

REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE : AUGUST 2012	SCALE : 1:100
							STAIRWAY WORK						DWG. NO. SW-10	SHEET NO. 172

8. TRAFFIC MANAGEMENT DURING CONSTRUCTION

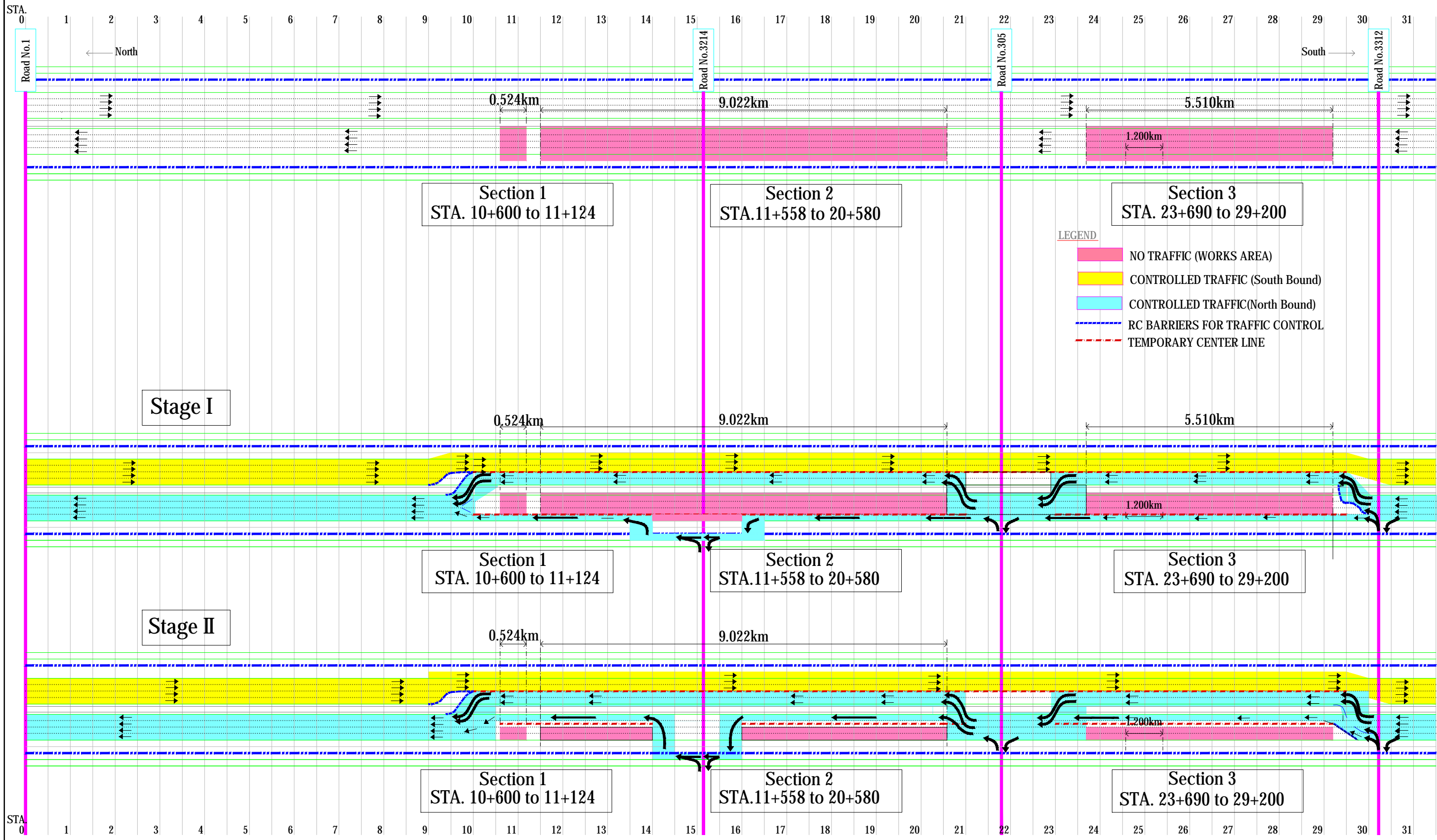
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MEDIAN CROSSOVER (AROUND STA.23+500)	1	TS2-11	199

SIGNBOARD-4	1	TS2-12	200
MEDIAN CROSSOVER (AROUND STA.29+300)	1	TS2-13	201
RELOCATED ENTRANCE(NORTH BOUND)	1	TS2-14	202
SIGNBOARD-5	1	TS2-15	203
4. TOLL GATE TRAFFIC CONTROL			
STAGE 1	4	TT- 1 - TT- 4	207
STAGE 2	4	TT- 5 - TT- 8	211
5. TEMPORARY CONCRETE BARRIER	1	TC- 1	212

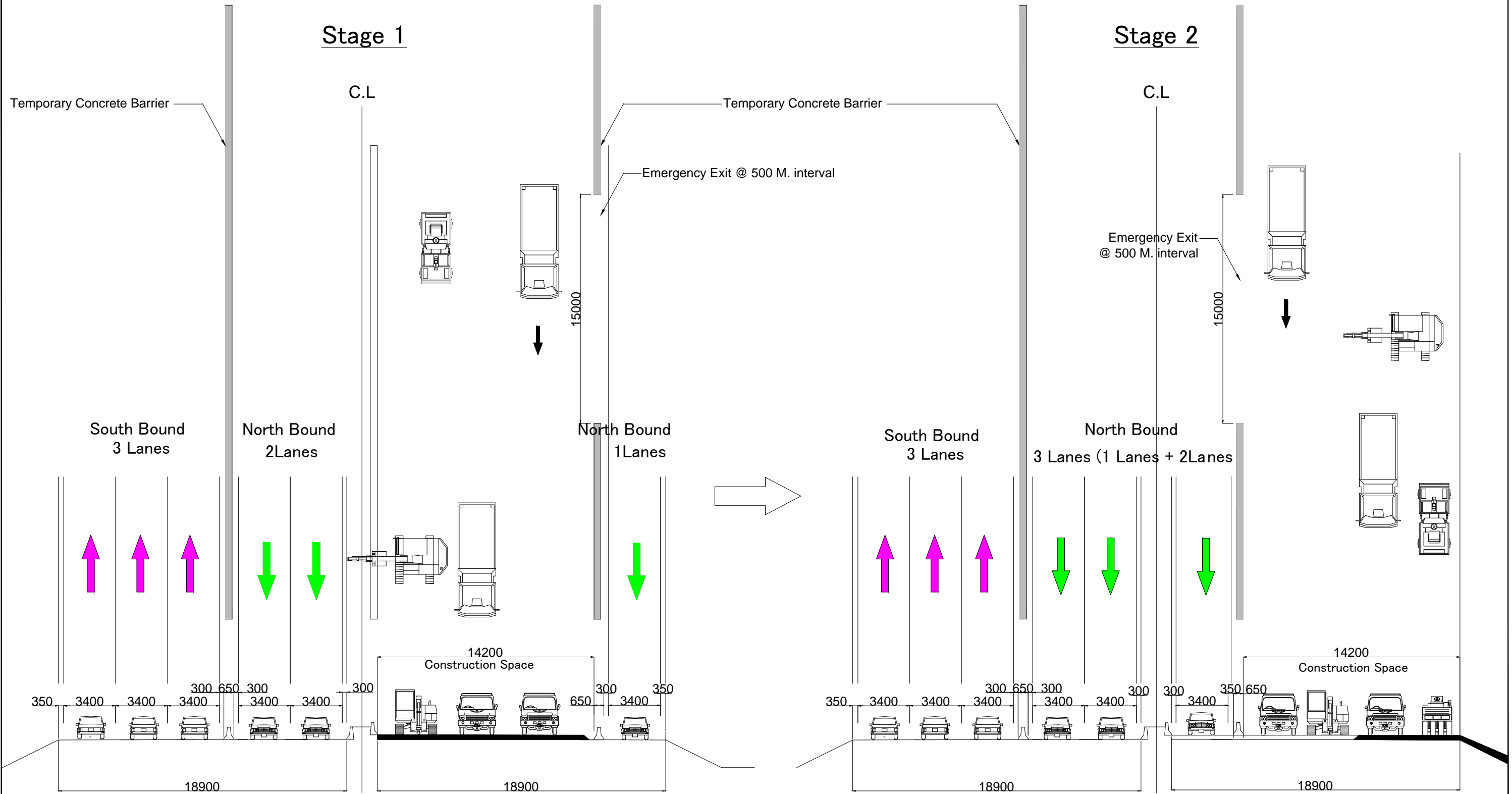
1. GENERAL TRAFFIC CONTROL

Preliminary Traffic Control Plan by Working Stages



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE	SCALE
		CHECKED	DATE	CHECKED	DATE				BASIC PLAN	The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road		SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohhei CHIEF ENGINEER	AUGUST 2012	AS SHOWN
														TC-1	SHEET NO. 173	

TYPICAL CROSS SECTION



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	AS SHOWN
														DWG. NO. TC-2	SHEET NO. 174

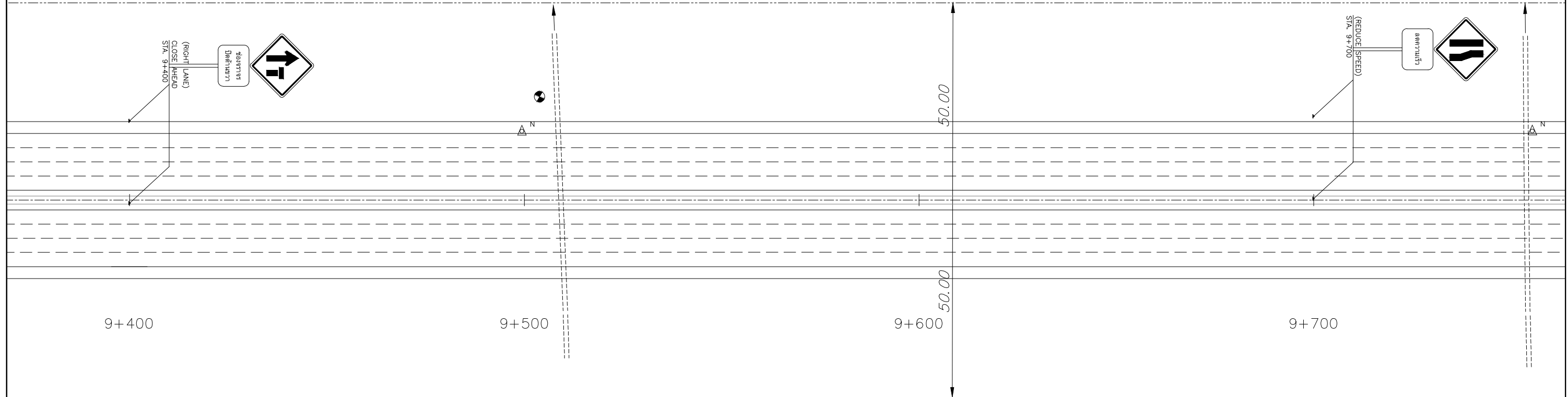
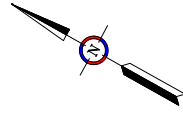
2. TRANSITION SECTION

(STAGE 1)

Signboard-1

South Bound

Around STA. 9+600 Stage1&2

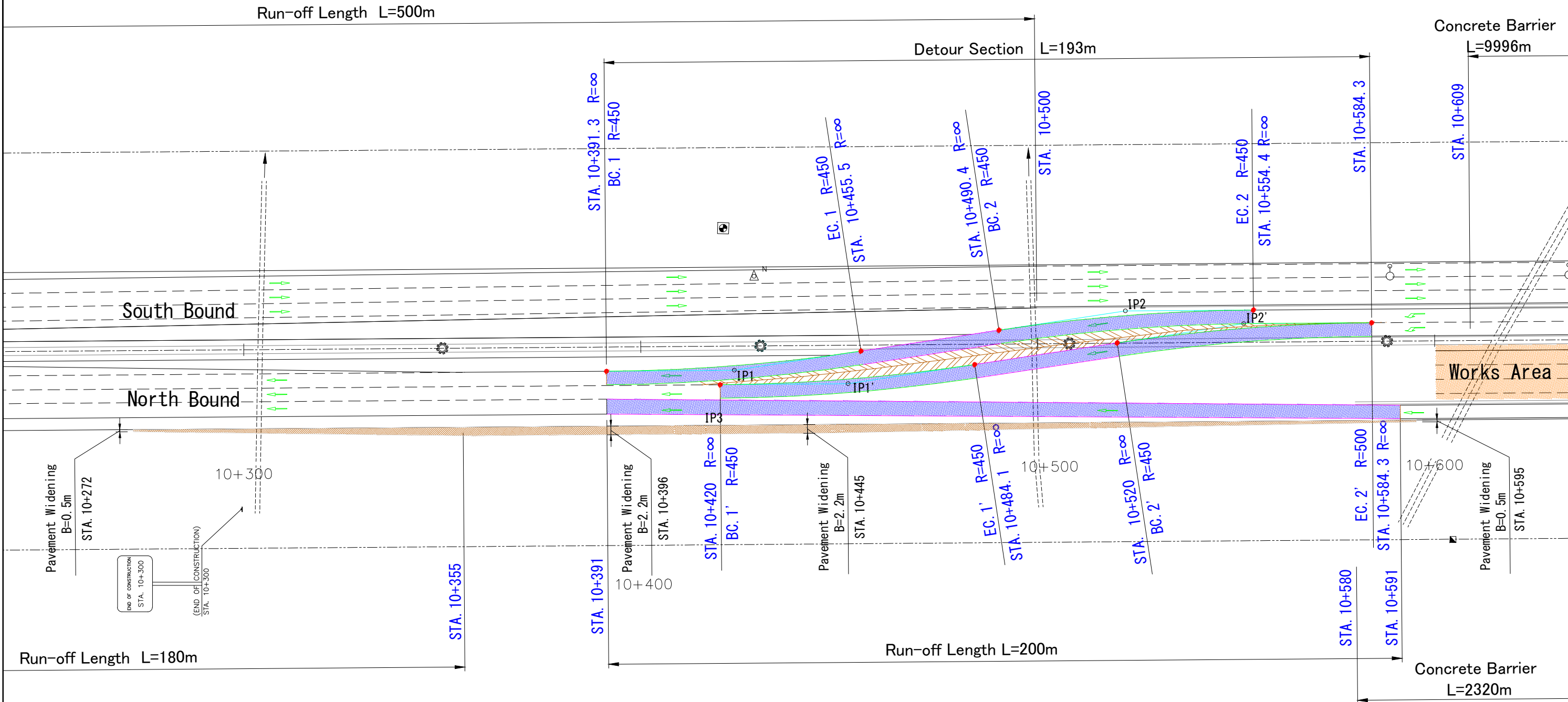
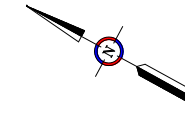


REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	SCALE 1:500
														DWG. NO. TS1-1	SHEET NO. 175

Median Crossover

South Bound To North Bound

Around STA. 10+500 Stage1



Note :

1. Set 40km/h as maximum speed limit for transition road.
2. Set 60km/h as maximum speed limit for standard road.
3. Install traffic control signs in accordance with the Road Work Guide published by DoH.

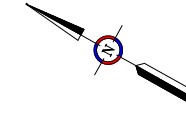
IP No.	STA.	Curve Length	IA	Radius
		(m)	(dd-mm-ss)	(m)
IP 1	10+423.567	64.358	8-11-39.350	450
IP 2	10+522.179	64.358	8-11-39.350	450

IP No.	STA.	Curve Length	IA	Radius
		(m)	(dd-mm-ss)	(m)
IP 1'	10+452.184	64.358	8-11-39.350	450
IP 2'	10+551.943	64.358	8-11-39.350	450

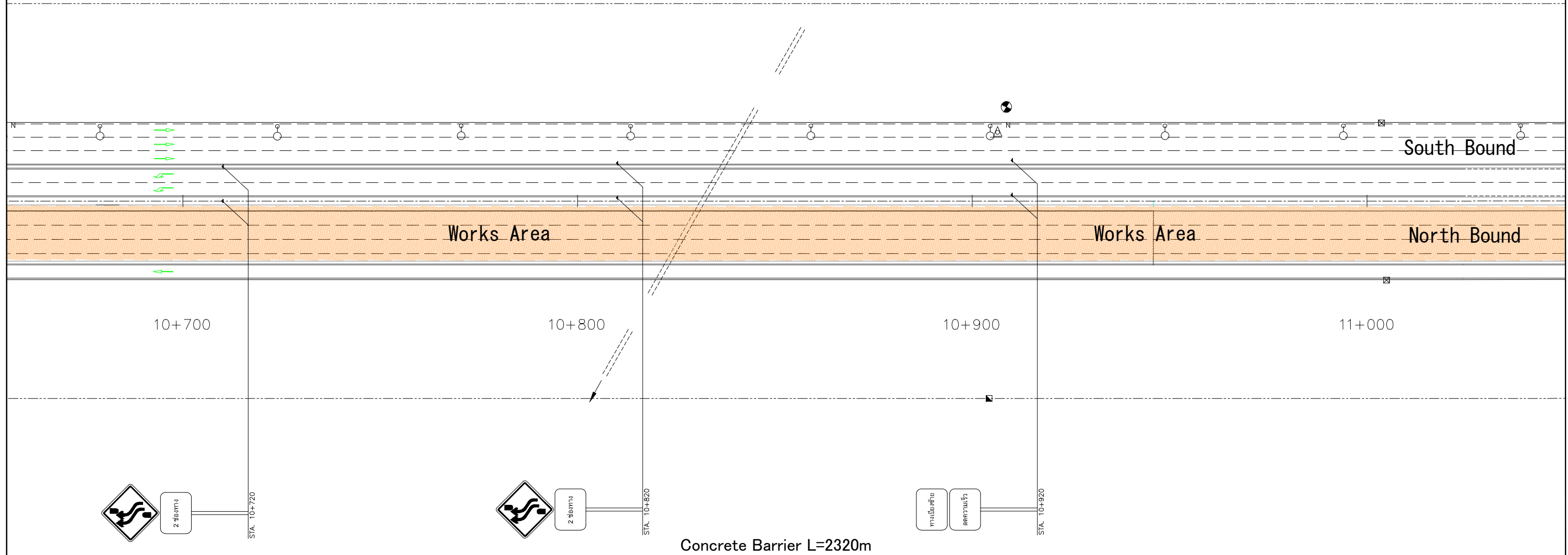
REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY	<p>KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS</p>	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road		DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE AUGUST 2012	SCALE SCALE 1:500
							MEDIAN CROSSOVER (AROUND STA.10+500)							DWG. NO. TS1-2

SignBoard-2

South Bound To North Bound
Around STA. 10+800 Stage1



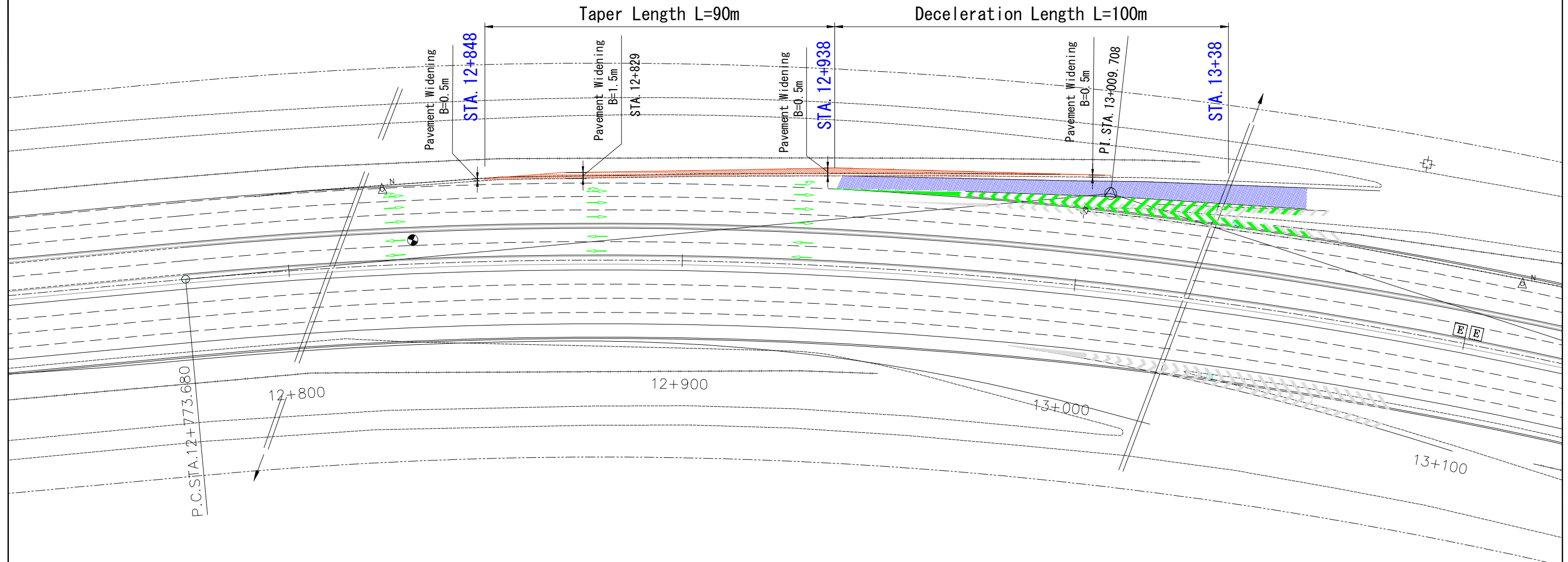
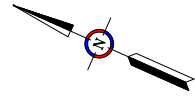
Concrete Barrier L=9996m



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	SCALE 1:500
														DWG. NO.	SHEET NO.
														TS1-3	177

Relocated Exit

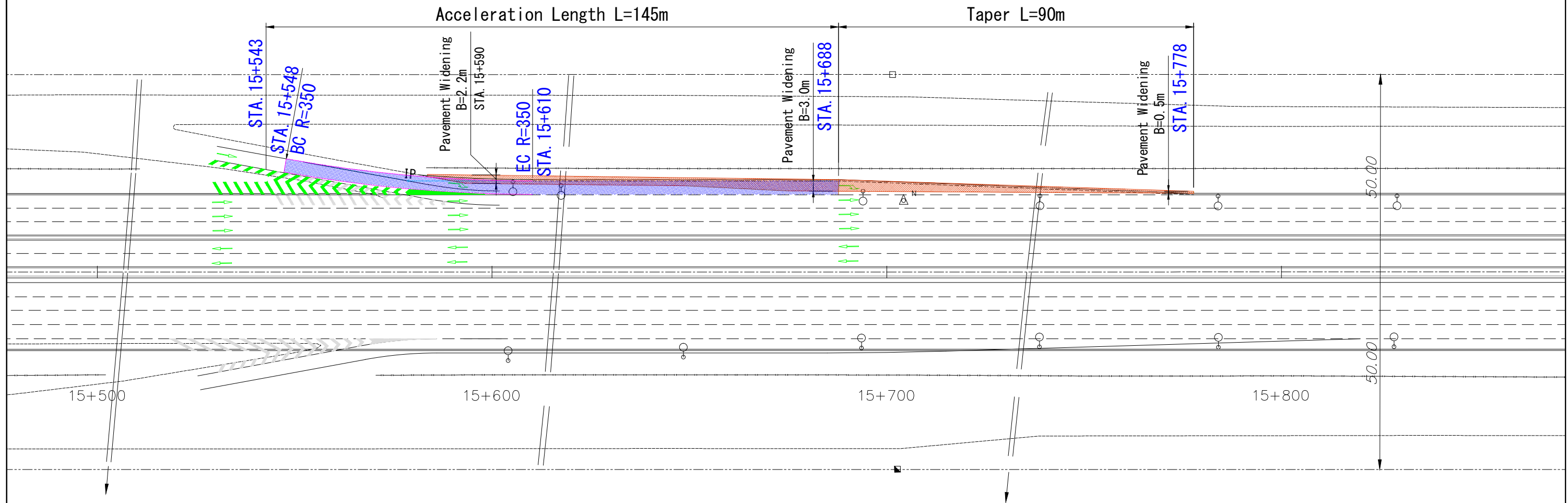
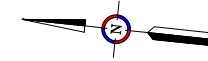
South Bound
Around STA. 12+900 Stage1&2



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	SCALE 1:500
														DWG. NO. TS1-4	SHEET NO. 178

Relocated Entrance

South Bound
Around STA. 15+600 Stage1&2



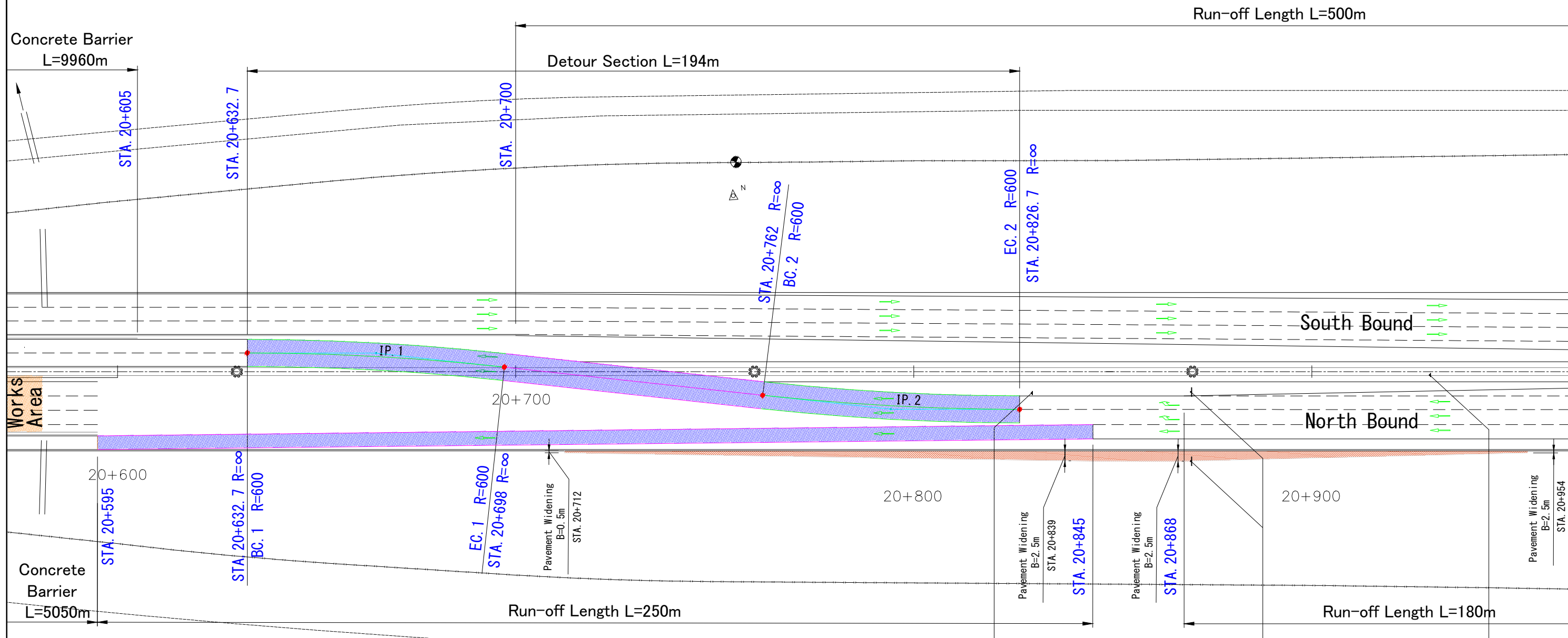
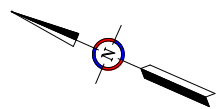
IP No.	STA.	Curve Length	IA	Radius
		(m)	(dd-mm-ss)	(m)
IP	15+578.822	62.758	10-16-25.100	350

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE:	SCALE:
		CHECKED	DATE	CHECKED	DATE				The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	SAGARA Hidetaka ROAD ENGINEER		WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	SCALE 1:500	
												DWG. NO.	SHEET NO.			
												TS1-5	179			

Median Crossover

North Bound To South Bound

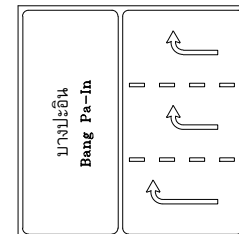
Around STA.20+700 Stage1



IP No.	STA.	Curve Length		IA (dd-mm-ss)	Radius (m)
		(m)	(m)		
IP 1	20+664.987	64.680		6-10-35.400	600
IP 2	20+794.233	64.680		6-10-35.400	600

Note :

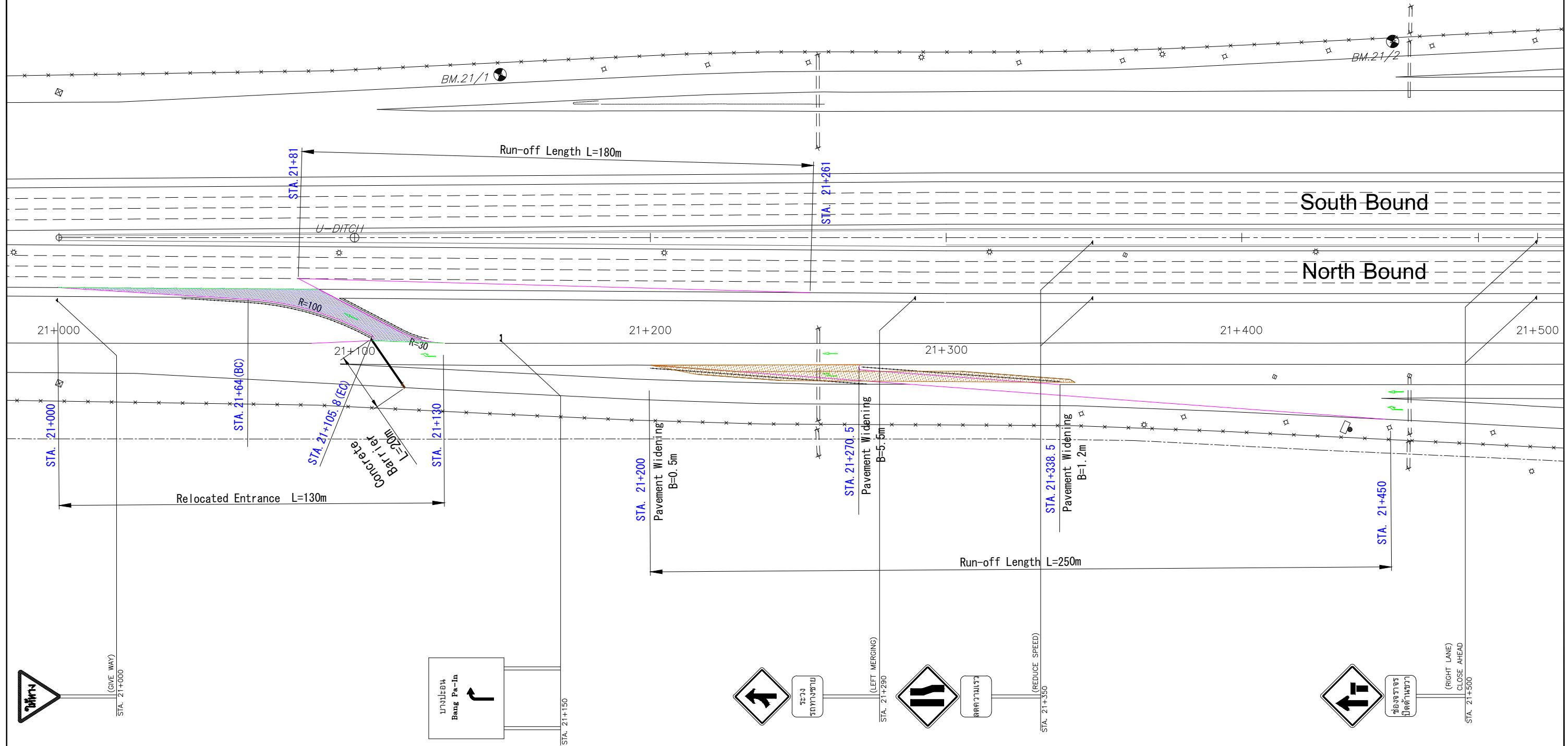
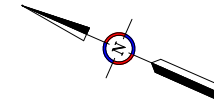
1. Set 40km/h as maximum speed limit for transition road.
2. Set 60km/h as maximum speed limit for standard road.
3. Install traffic control signs in accordance with the Road Work Guide published by DoH.



REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY		HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE		DESIGNED BY	CHECKED BY	DATE	SCALE
							KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	MEDIAN CROSSOVER (AROUND STA.20+700)	The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012 TS1-6	SCALE 1:500 SHEET NO. 180

Relocated Entrance

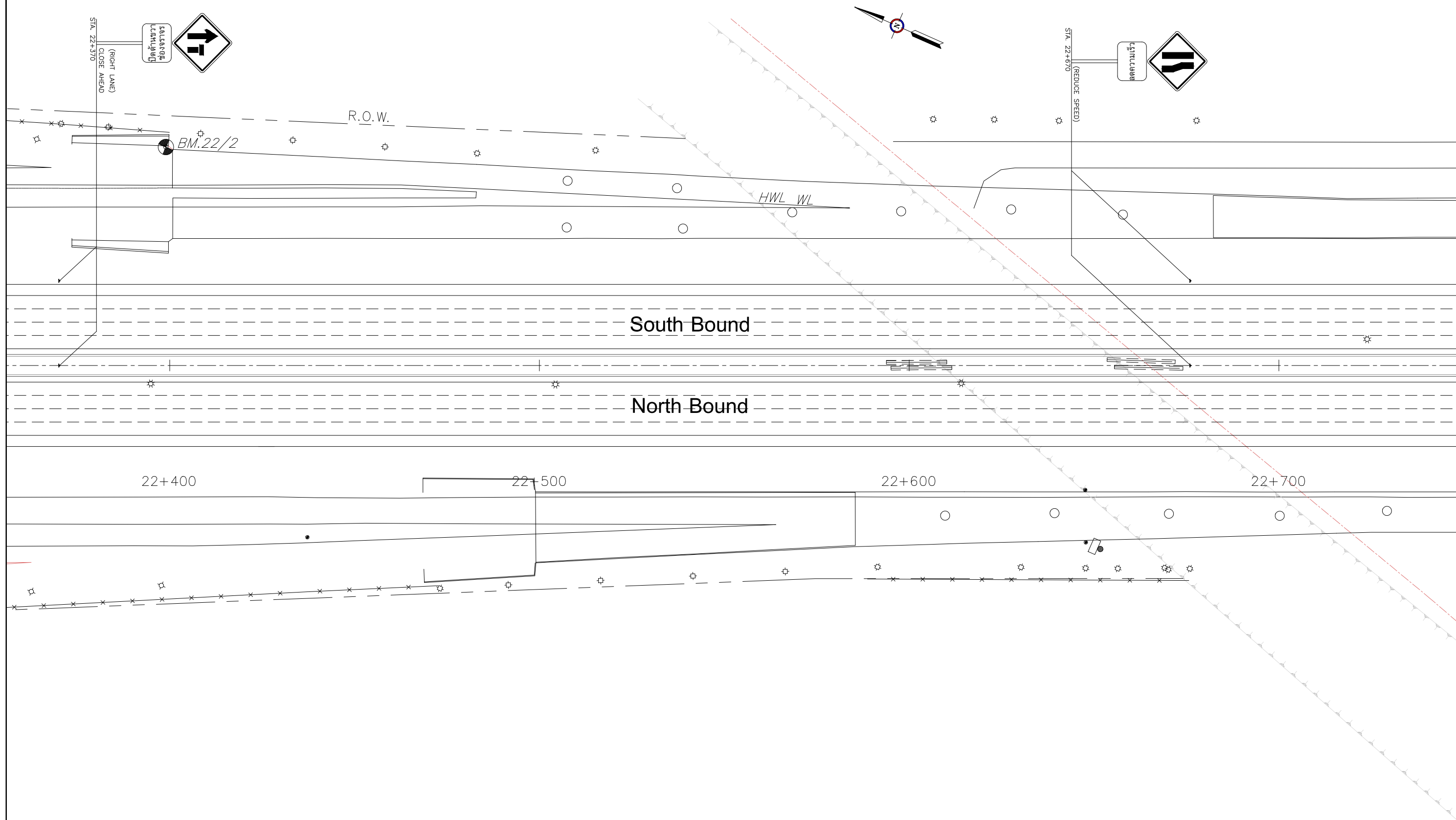
North Bound
Around STA.21+200 Stage1&2



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE:	SCALE:
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	SCALE 1:750
														DWG. NO. TS1-7	SHEET NO. 181

Signboard-3

South Bound
Around STA. 22+500 Stage1&2

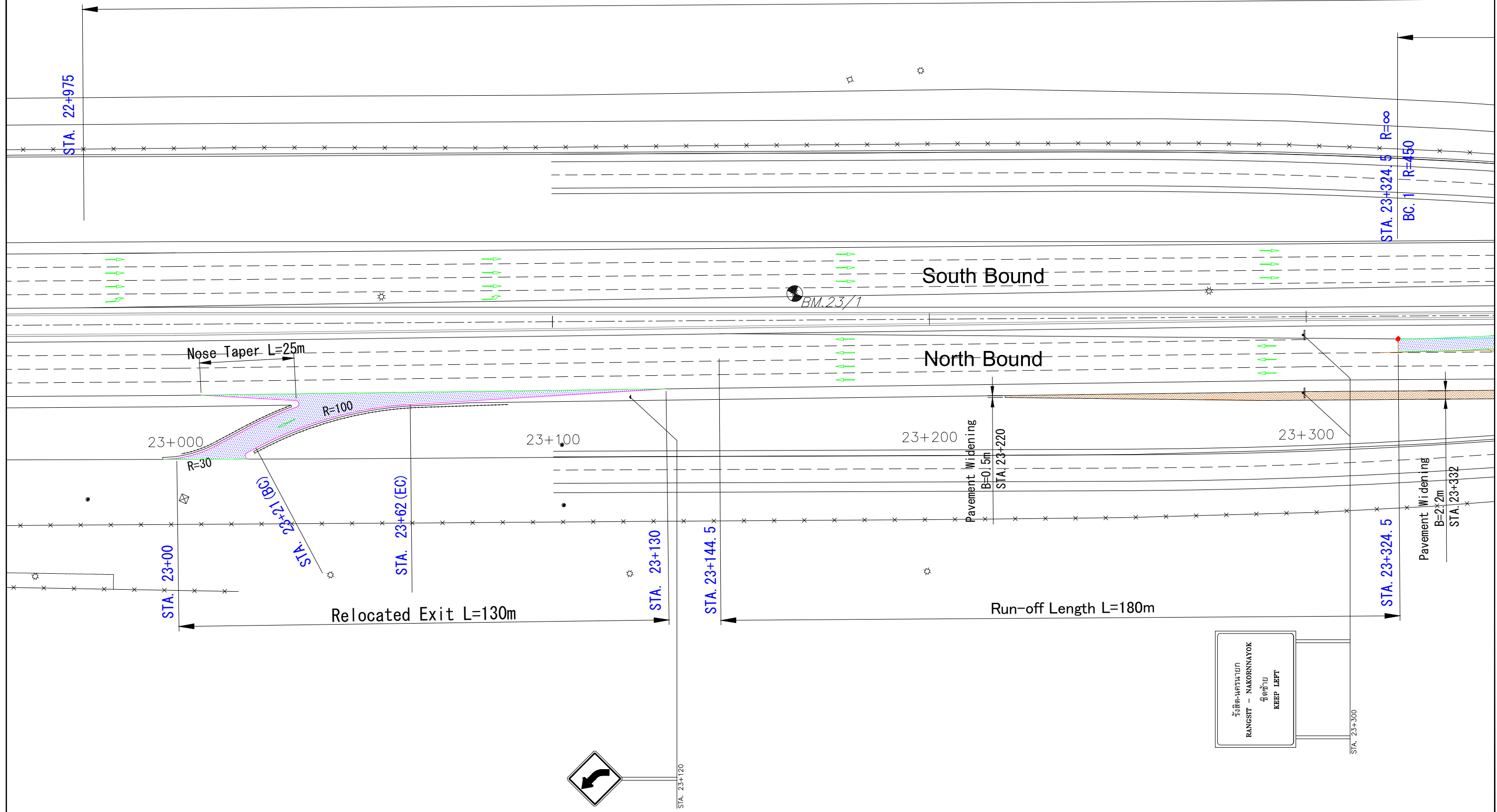


REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE:	SCALE:
		CHECKED	DATE	CHECKED	DATE				SIGNBOARD-3	The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road		SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	SCALE 1:500
														DWG. NO.	SHEET NO.	
														TS1-8	182	

Relocated Exit

North Bound
Around STA. 23+100 Stage1&2

Run-off Length L=500m



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	SCALE 1:500
														DWG. NO. TS1-9	SHEET NO. 183