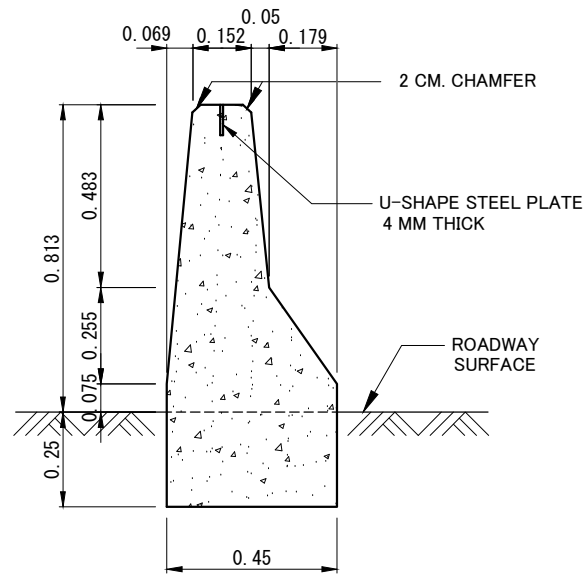


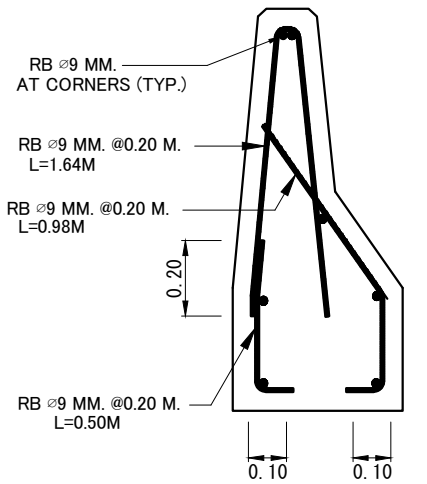
6. MEDIAN WORK

6-1 CONCRETE BARRIER

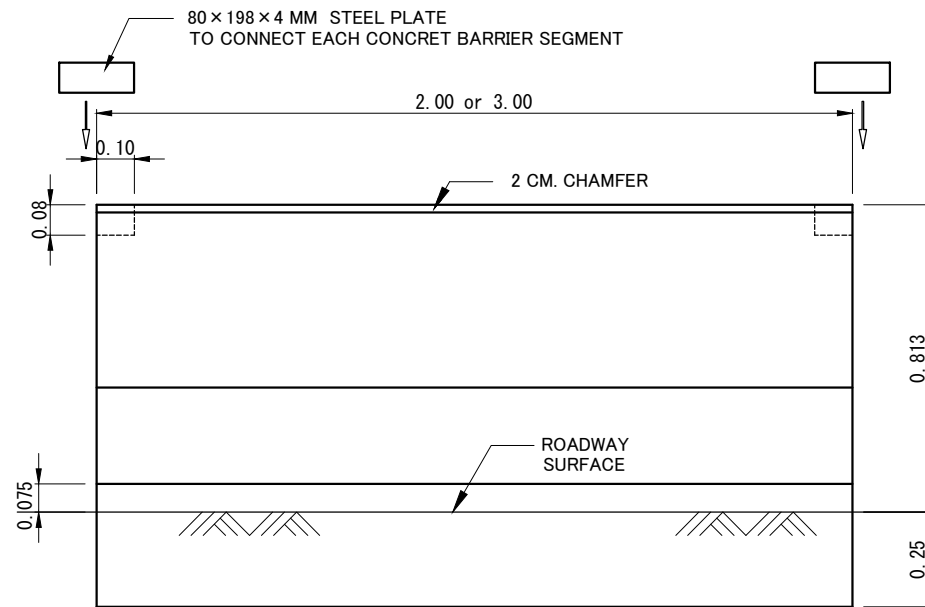


FRONT ELEVATION

CONCRETE BARRIER (Type1-a)
SCALE 1:10



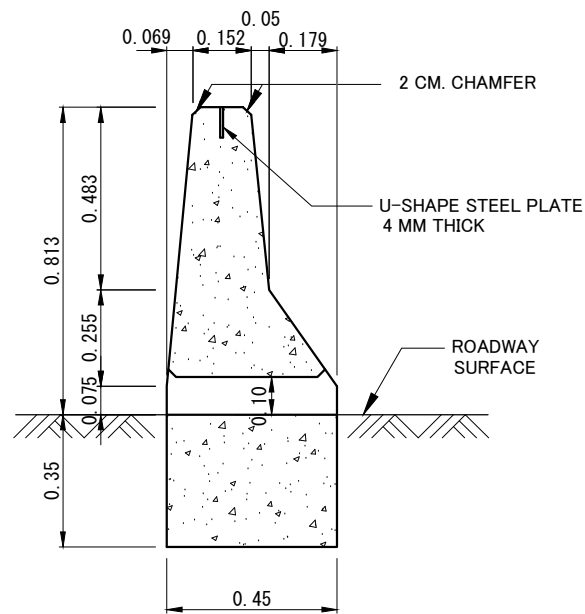
REINFORCEMENT DETAIL



SIDE ELEVATION

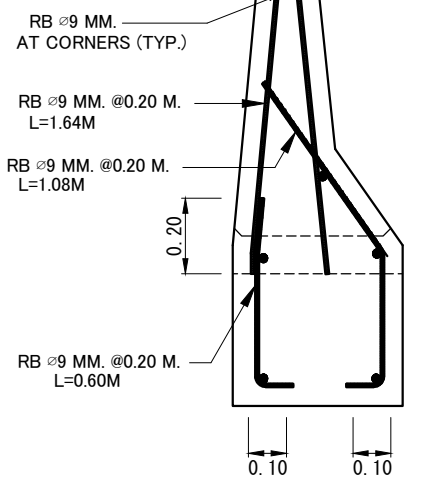
SCHEDULED LIST OF CONCRETE BARRIER (Type1-a)

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	

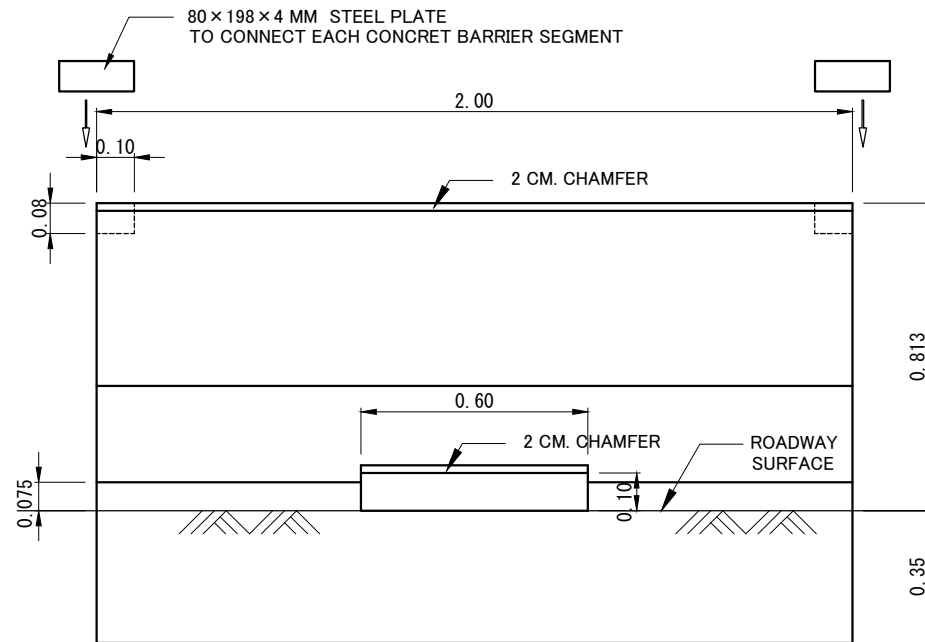


FRONT ELEVATION

CONCRETE BARRIER (Type1-b)
SCALE 1:10



REINFORCEMENT DETAIL



SIDE ELEVATION

SCHEDULED LIST OF CONCRETE BARRIER (Type1-b)

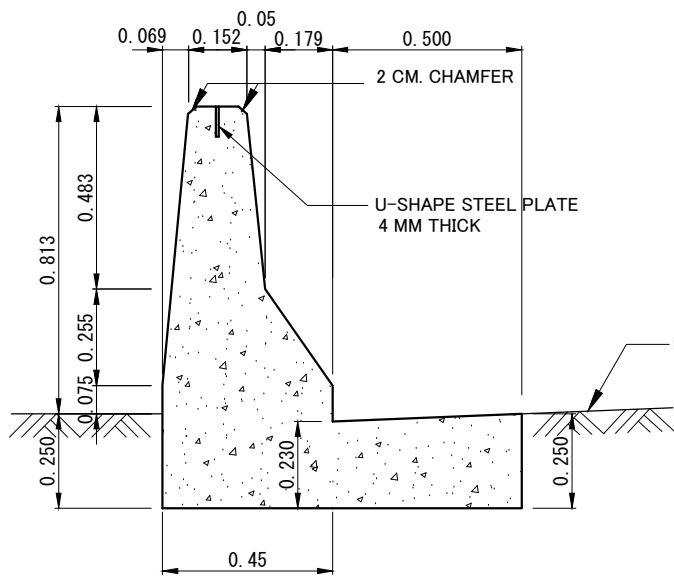
STA	DISTANCE (m)	REMARKS
1) STA 25+000.0 ~ STA 25+320.9	320.9	
2) STA 25+333.2 ~ STA 25+550.0	216.8	
3) STA 24+834.5 ~ STA 25+208.0	373.5	

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 :

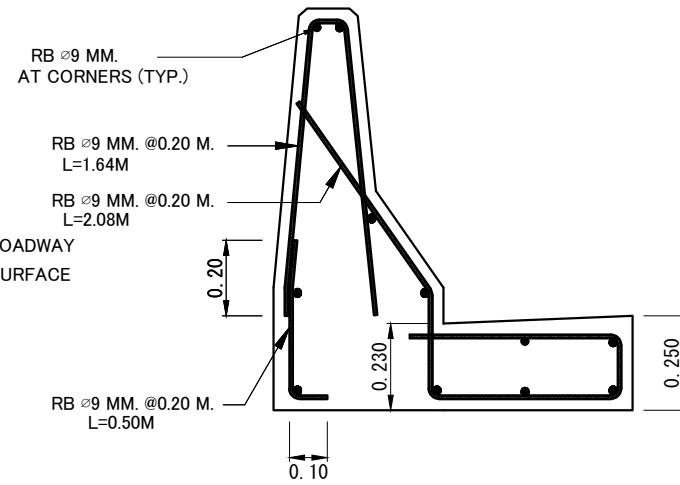
PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.86 M ³
CONCRETE SLUMP	10 CM.
- CLEAR CONCRETE COVER SHALL BE 5 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
- REINFORCEMENT AND OTHER DETAILS OF APPROACH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

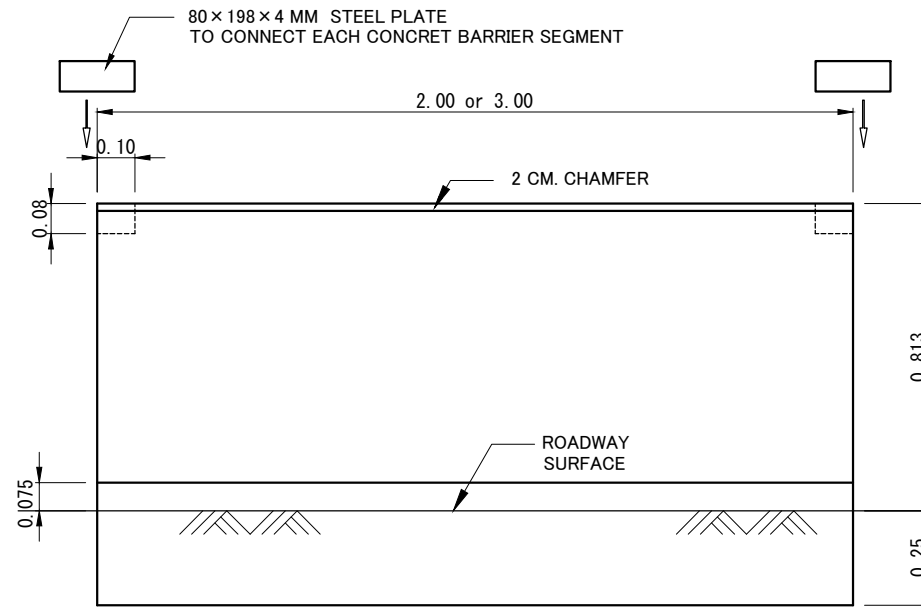


FRONT ELEVATION

CONCRETE BARRIER (Type1-c)
SCALE 1:10



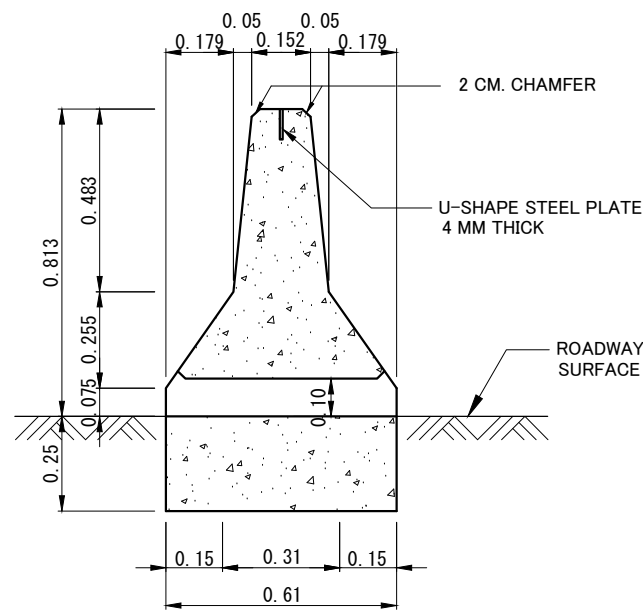
REINFORCEMENT DETAIL



SIDE ELEVATION

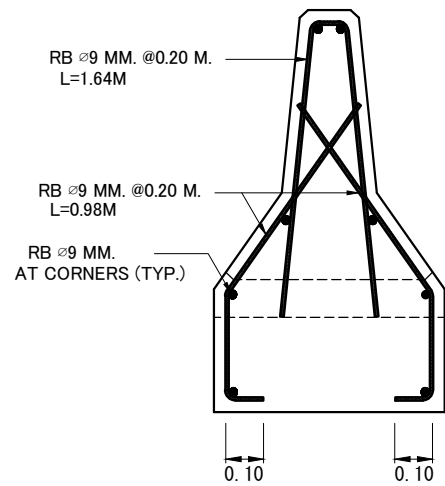
SCHEDULED LIST OF CONCRETE BARRIER (Type1-c)

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

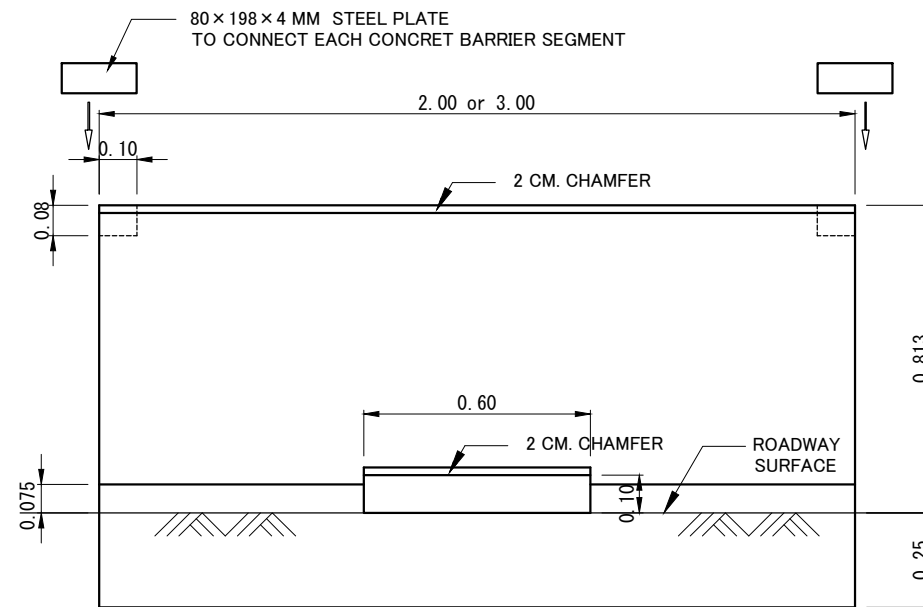


FRONT ELEVATION

CONCRETE BARRIER (Type2-a)
SCALE 1:10



REINFORCEMENT DETAIL



SIDE ELEVATION

SCHEDULED LIST OF CONCRETE BARRIER (Type2-a)

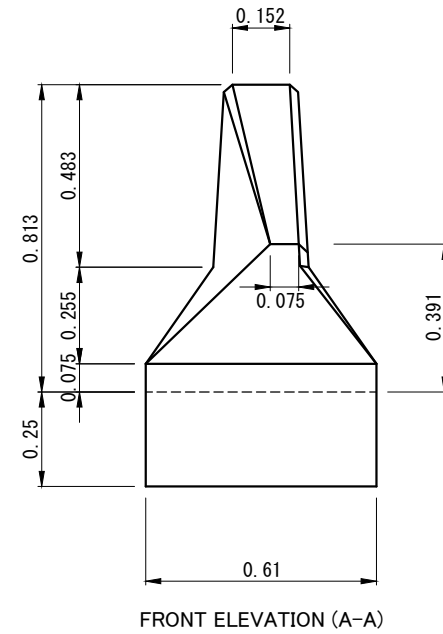
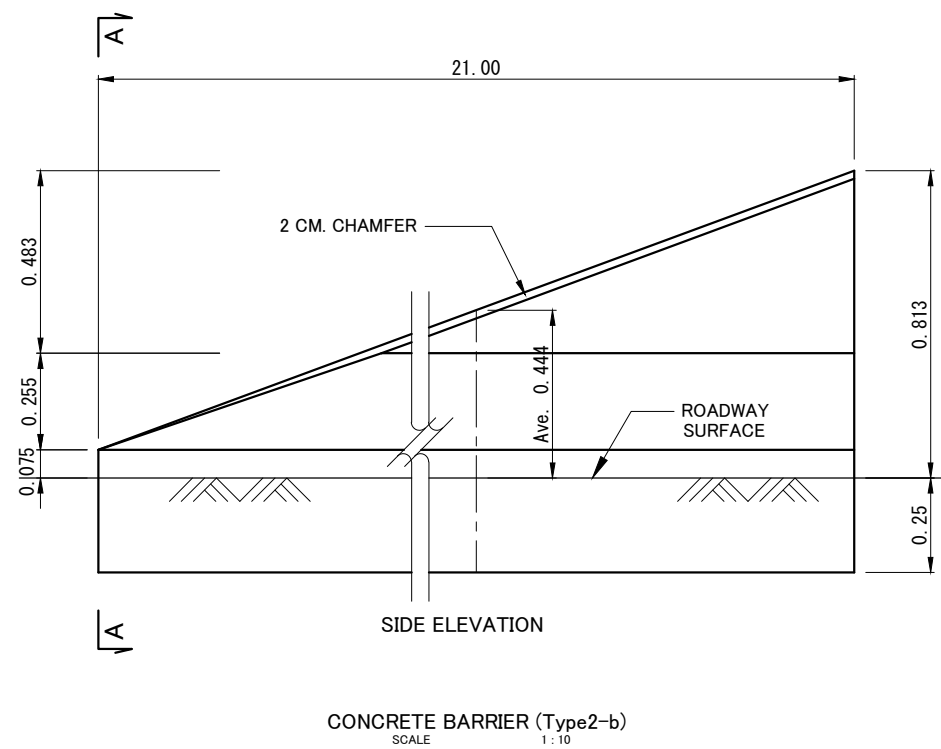
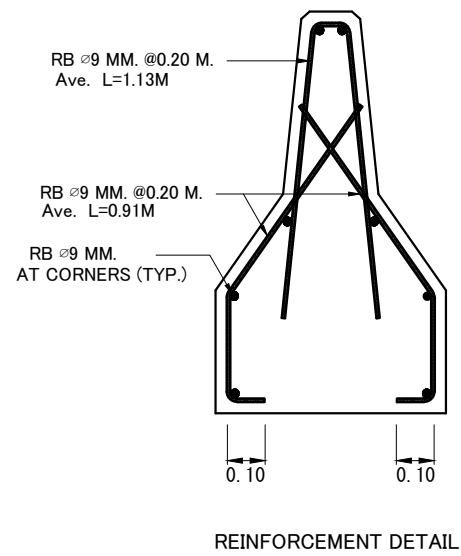
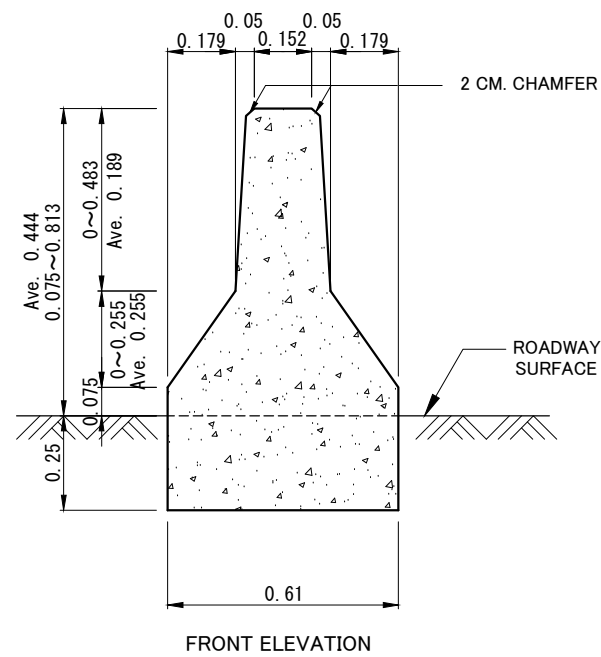
STA	DISTANCE (m)	REMARKS
1) STA 25+130.6 ~ STA 25+320.9	190.3	
2) STA 25+333.2 ~ STA 25+384.4	51.2	

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.

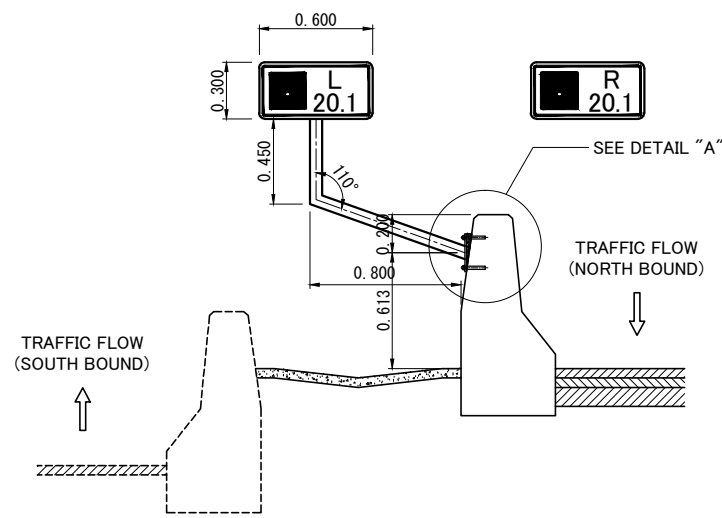
SCHEDULED LIST OF CONCRETE BARRIER (Type2-b)

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**

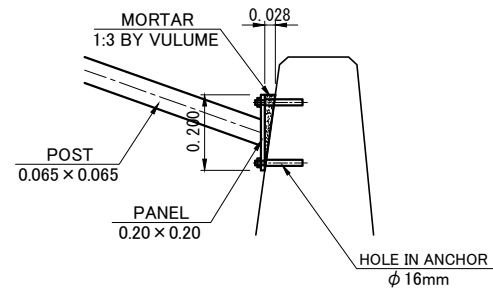
**6-3 DETAILS OF SIGN POST AT
MEDIAN**



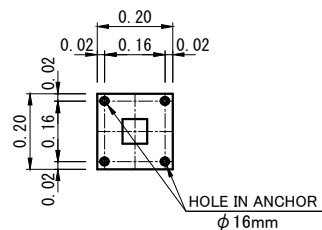
100-M. DISTANCE POST

SCHEDULED LIST OF 100-M. DISTANCE POST

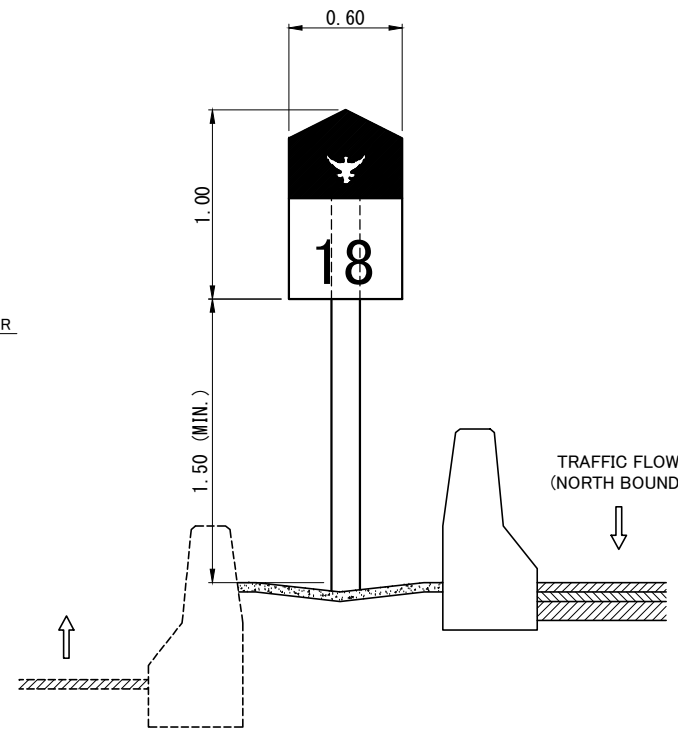
STA	DISTANCE (m)	Nos.	REMARKS
1) STA 10+600.0 ~ STA 11+125.0	525.0	5	
2) STA 11+550.0 ~ STA 20+580.0	9,030.0	90	
3) STA 23+690.0 ~ STA 29+200.0	5,510.0	56	



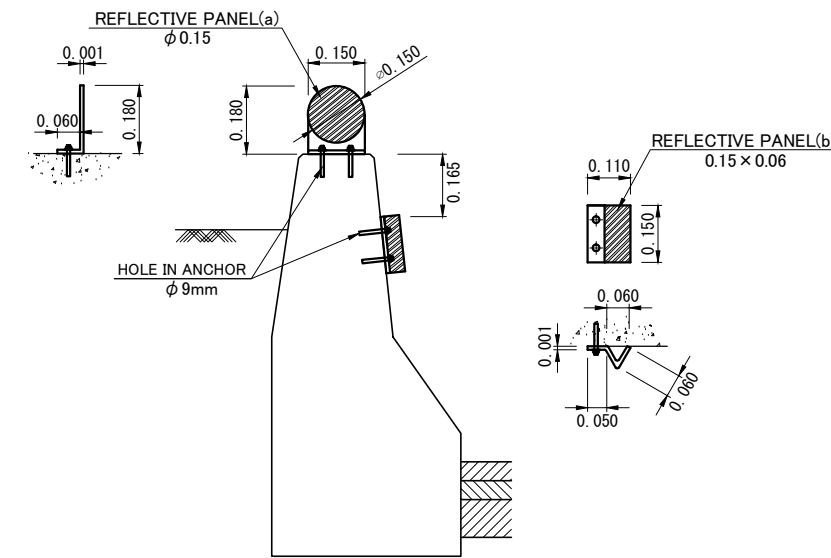
DETAIL "A"
SCALE 1:10



PANEL
SCALE 1:10



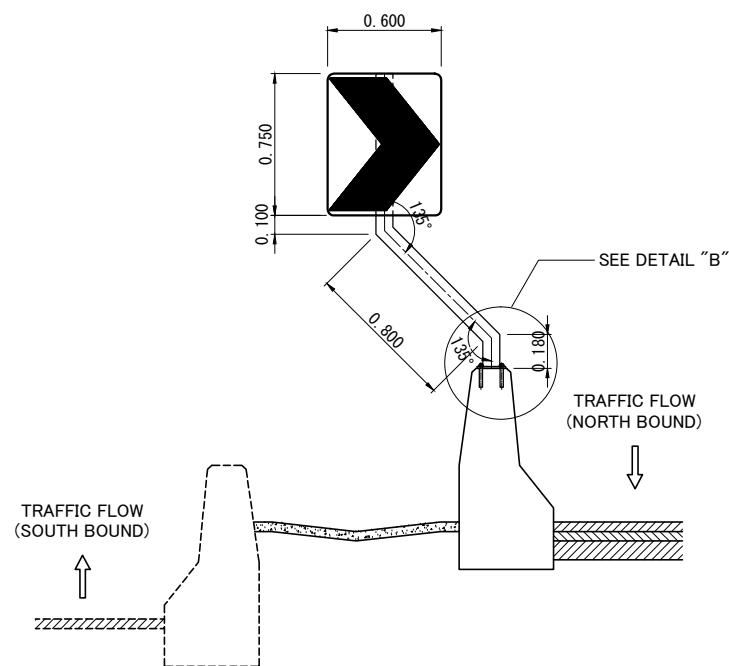
K.M. POST SIGN (MEDIAN)



LIGHT REFLECTOR (ctc 20m)
SCALE 1:10

SCHEDULED LIST OF LIGHT REFLECTOR

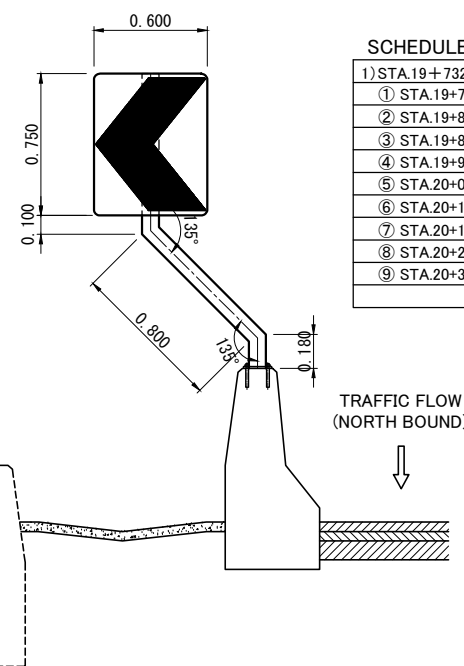
STA	DISTANCE (m)	Nos.	REMARKS
1) STA 10+600.0 ~ STA 11+125.0	525.0	26	
2) STA 11+550.0 ~ STA 20+580.0	9,030.0	451	
3) STA 23+690.0 ~ STA 29+200.0	5,510.0	275	



LEFT BEND

SCHEDULED LIST OF LEFT BEND

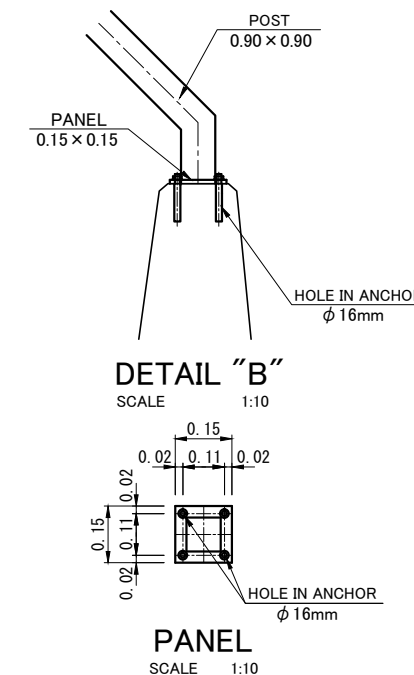
1) STA.12+773 ~ STA.13+239	3) STA.23+912 ~ STA.24+390
① STA.12+790	① STA.23+900
② STA.12+860	② STA.23+975
③ STA.12+940	③ STA.24+050
④ STA.13+010	④ STA.24+125
⑤ STA.13+090	⑤ STA.24+200
⑥ STA.13+160	⑥ STA.24+275
⑦ STA.13+230	⑦ STA.24+350
	⑧ STA.24+425
2) STA.16+809 ~ STA.17+090	4) STA.28+227 ~ STA.28+666
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

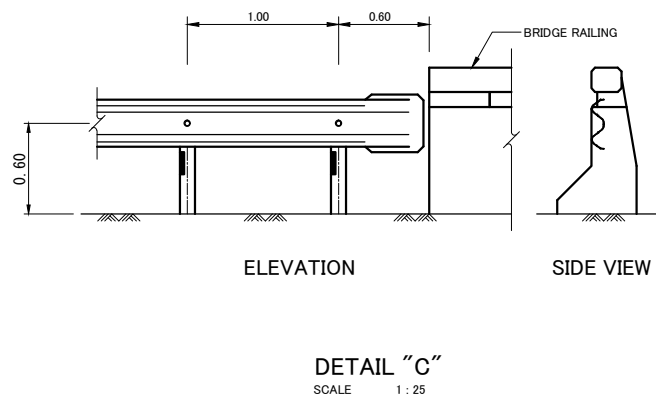
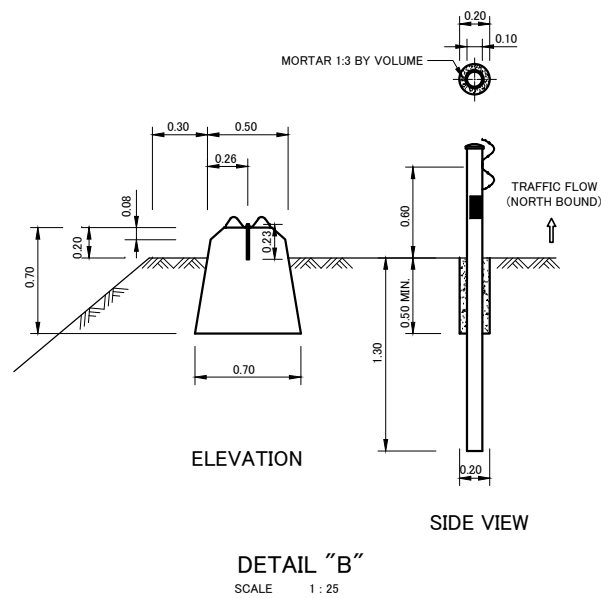
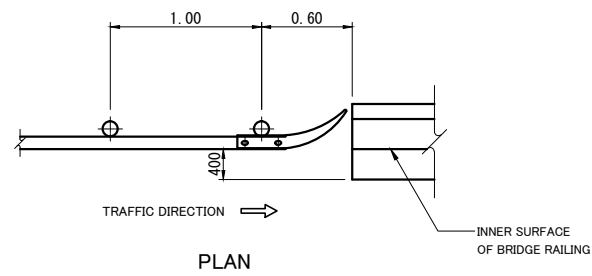
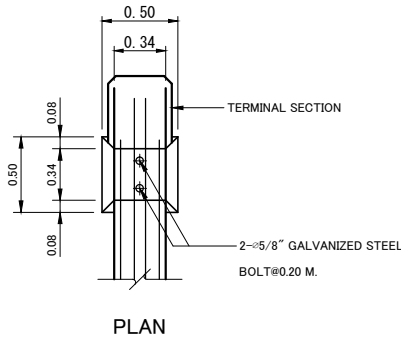
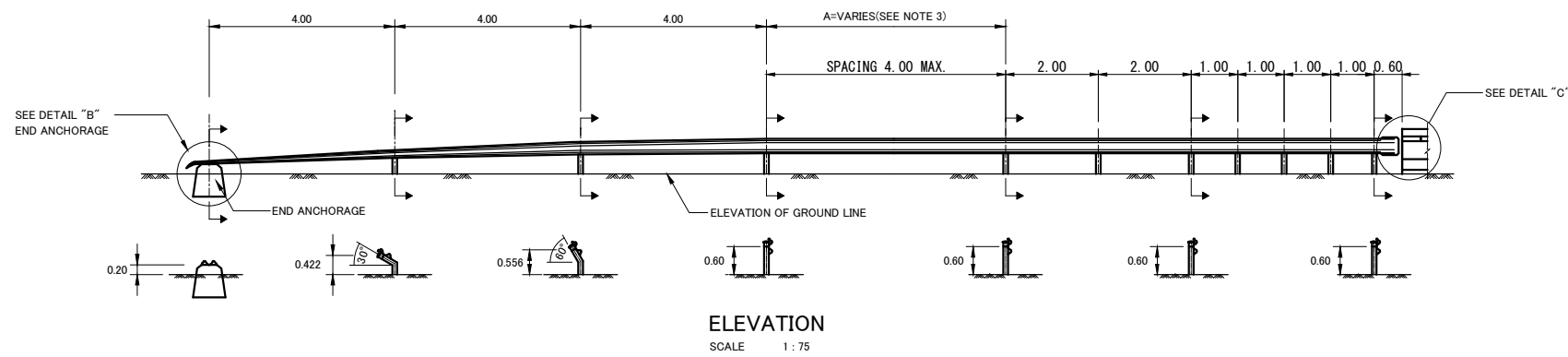
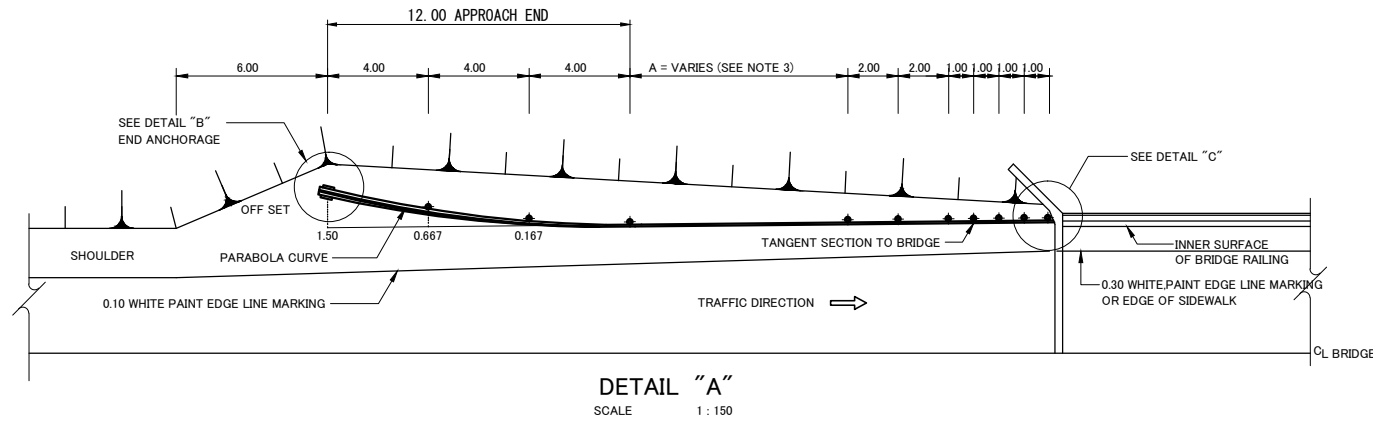
NOTES :

- 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 CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	DESIGNED BY	CHECKED BY	DATE	SCALE
								KINGDOM OF THAILAND	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 / 1:200
								MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS					DWG. NO.	SHEET NO.
								DETAILS OF SIGN POST AT MEDIAN					CB-5	162

7. SAFETY WORK

7-1 DETAILS OF GUARDRAIL



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

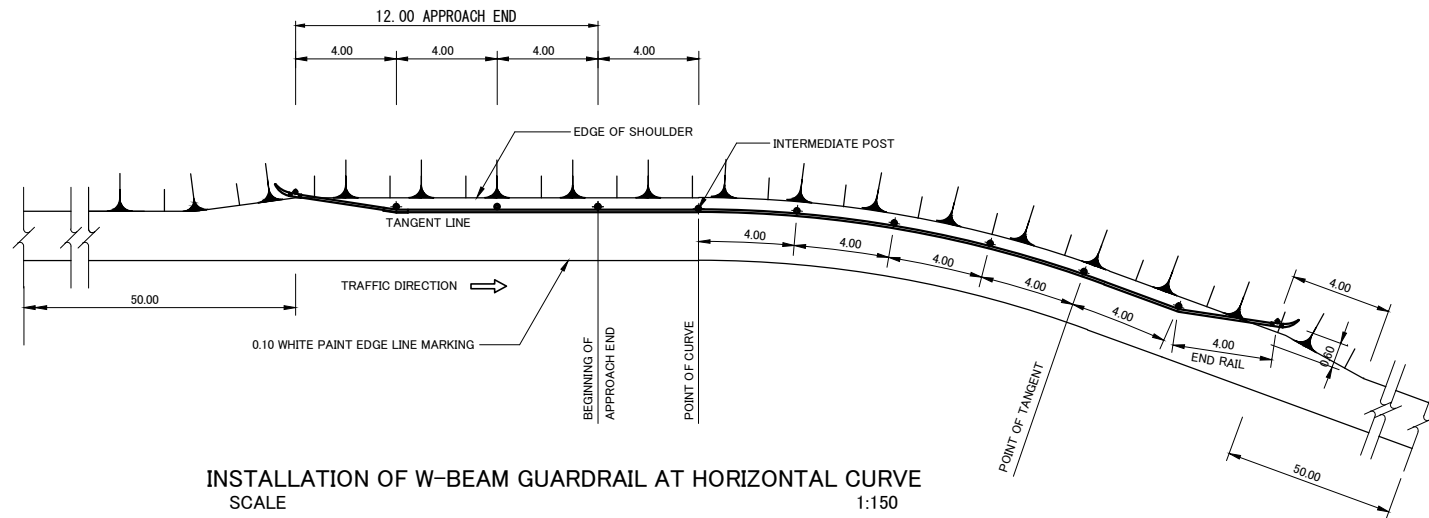
SCHEDULED LIST OF GUARDRAIL (Type1)

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

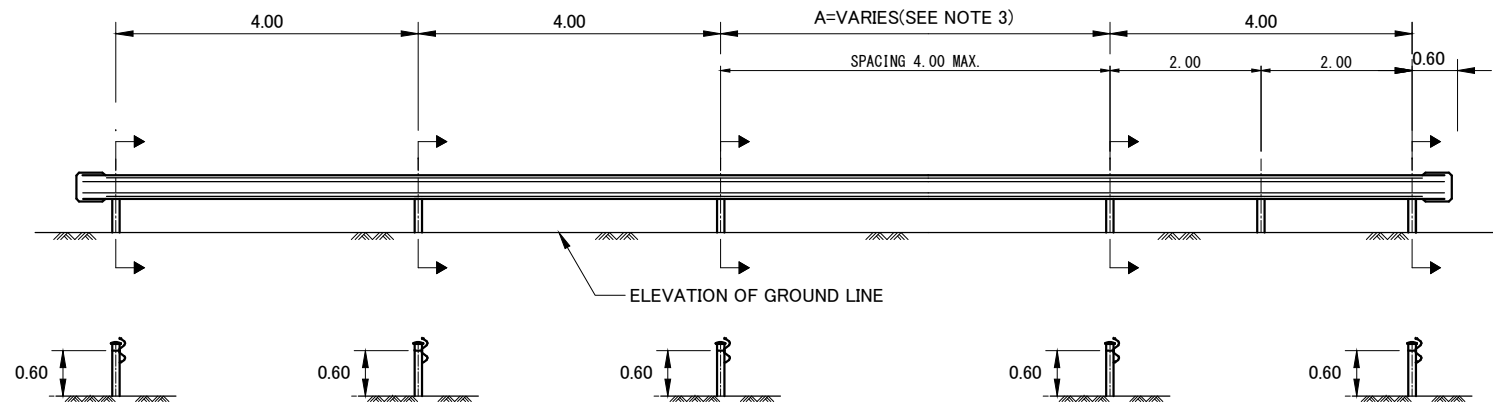
NOTES :

- 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.)

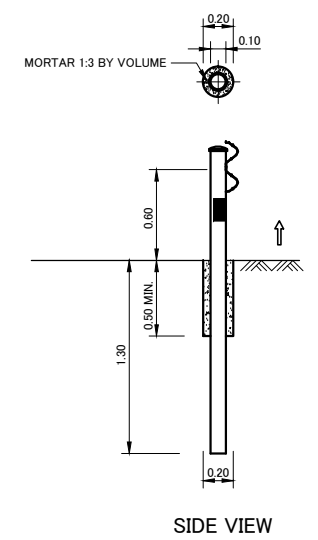
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the 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. SW-1	SHEET NO. 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)

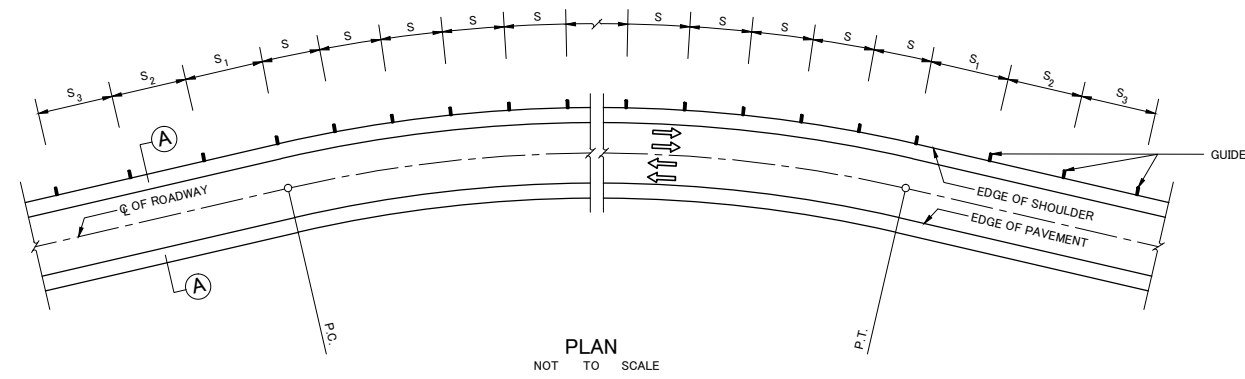
STA	DISTANCE(m)	REMARKS
1) STA.13+762.0~STA.13+890.0	129.0	FLYOVER PIER PROTECTION
2) STA.15+176.0~STA.15+227.0	53.0	DITTO
3) STA.24+810.0~STA.24+850.0	41.0	TOLLGATE CONTROL FACILITIES PROTECTION
4) STA.25+208.0~STA.25+345.0	137.0	DITTO
5) STA.27+804.0~STA.27+828.0	25.0	MOUNTING OVERHEAD SIGN PROTECTION

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. PAYMENT SHALL BE MEASURED BY LINEAR METERS OF RAIL INCLUDING TERMINAL SECTION CONCRETE ANCHOR AND SPLICE SECTION.
3. OBSTACLE MEANS PERMANENT STRUCTURE WHICH MAY BE DANGEROUS TO VEHICLES STRIKING SUCH AS, ELECTRIC POLE, BRIDGE PIER, ETC.
4. 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	

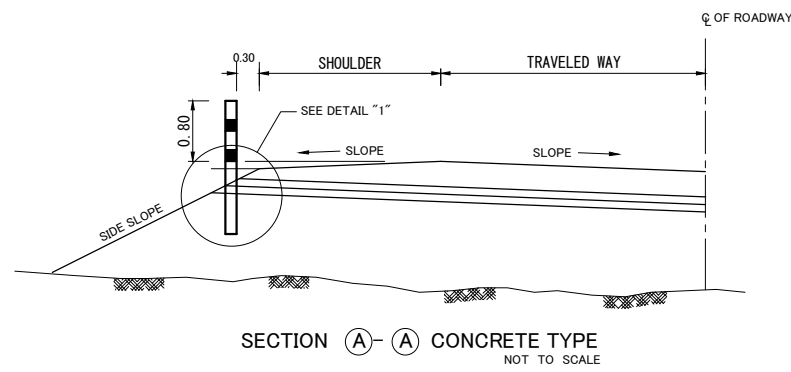
7-2 DETAILS OF GUIDE POST



PLAN
NOT TO SCALE

SCHEDULED LIST OF GUIDE POST

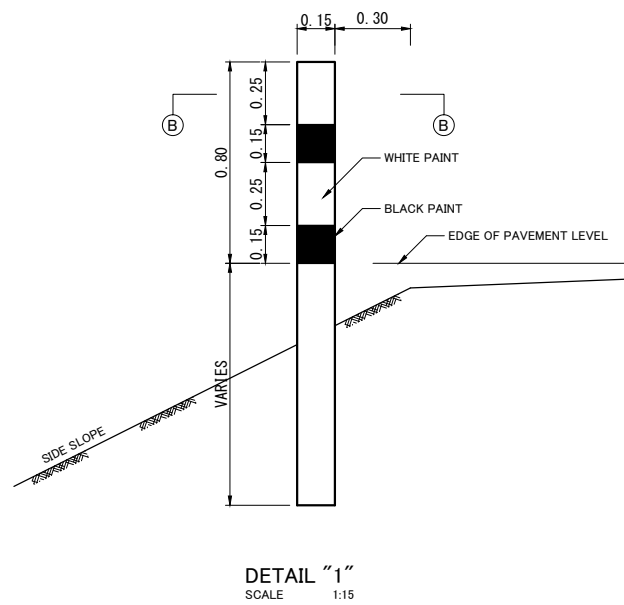
STA	DISTANCE(m)	REMARKS
1) STA.19+380.0~STA.20+640.0	1260.0	N=32



SECTION A-A CONCRETE TYPE
NOT TO SCALE

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



DETAIL "1"
SCALE 1:15

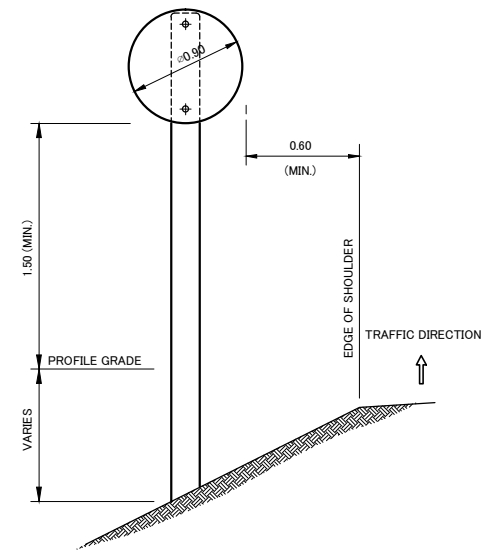
DETAILS OF GUIDEPOST (REFLECTORY)

NOTES:

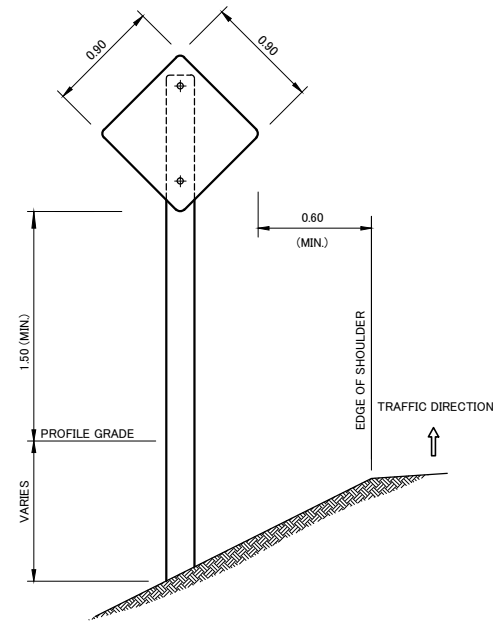
- DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- THE MATERIAL, LOCATION AND INSTALLING DETAILS SHALL CONFORM TO THE REQUIREMENTS OF DOH, THAILAND.
- THIS FACILITY IS DESIGNED TO BE RE-USED. SPECIAL ATTENTION SHALL BE PAID DURING REMOVAL.

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

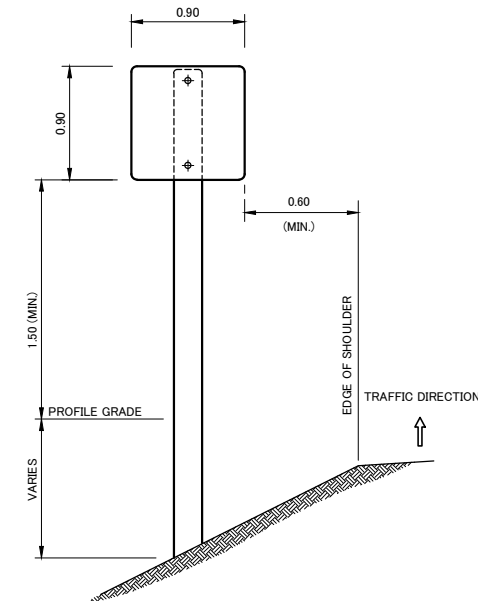
7-3 DETAILS OF SIGN POST



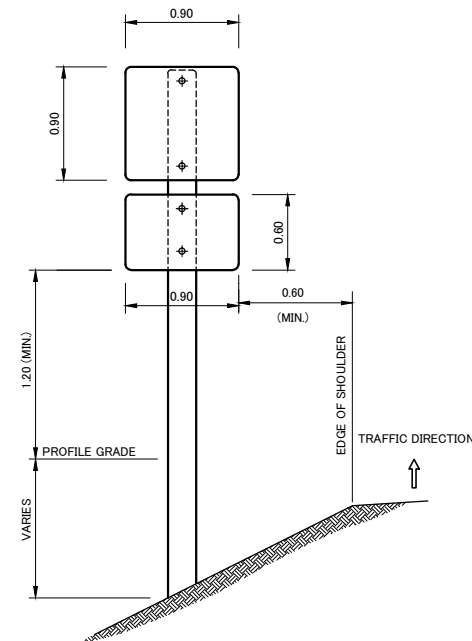
REGULATORY SIGN



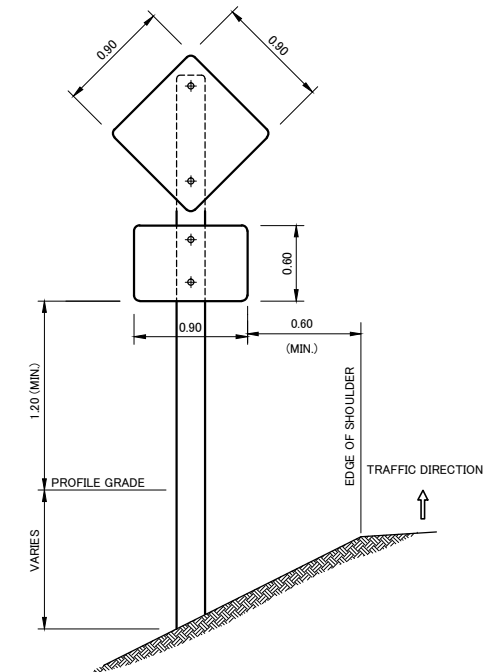
WARNING SIGN



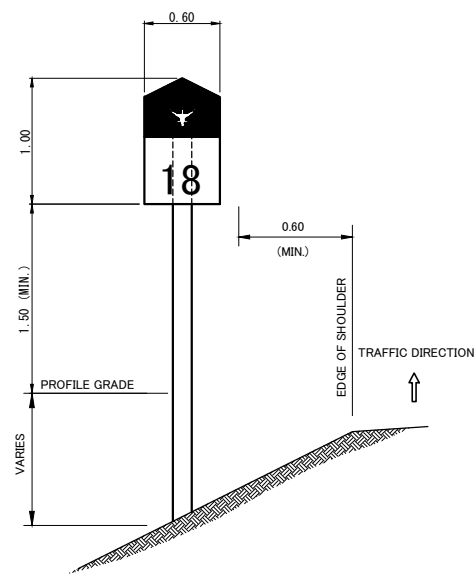
ROUTE MARKER



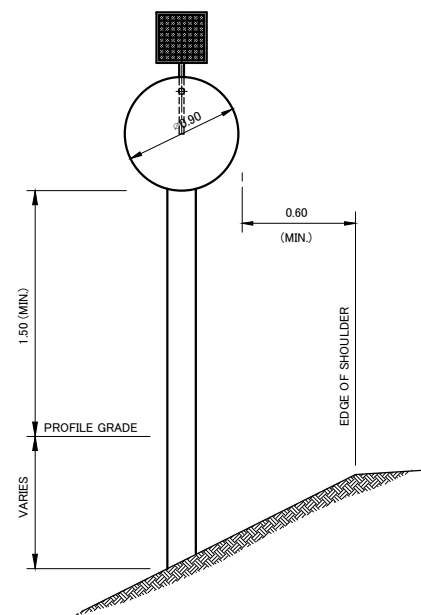
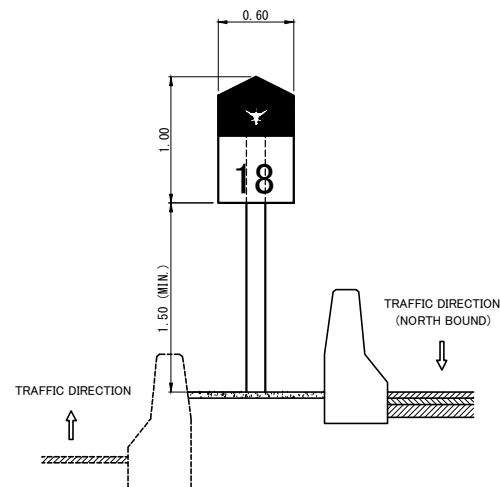
ROUTE TURN ASSEMBLIES TYPE I OR DIRECTIONAL ASSEMBLIES



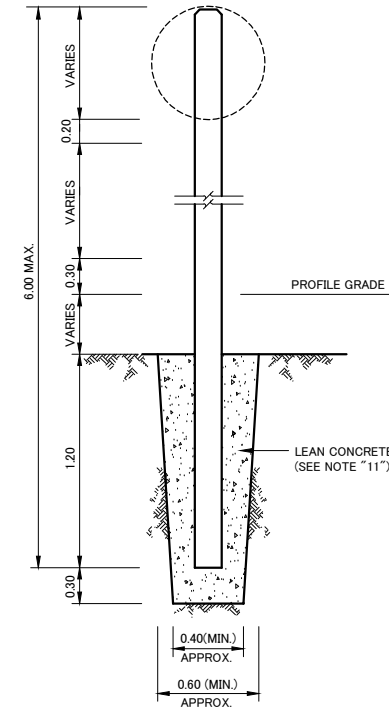
ROUTE TURN ASSEMBLIES TYPE I OR DIRECTIONAL ASSEMBLIES



Km POST SIGN



SOLAR POWER GENERATION (REGULATORY SIGN)



SIGN POST INSTALLATION DETAIL NOT TO SCALE

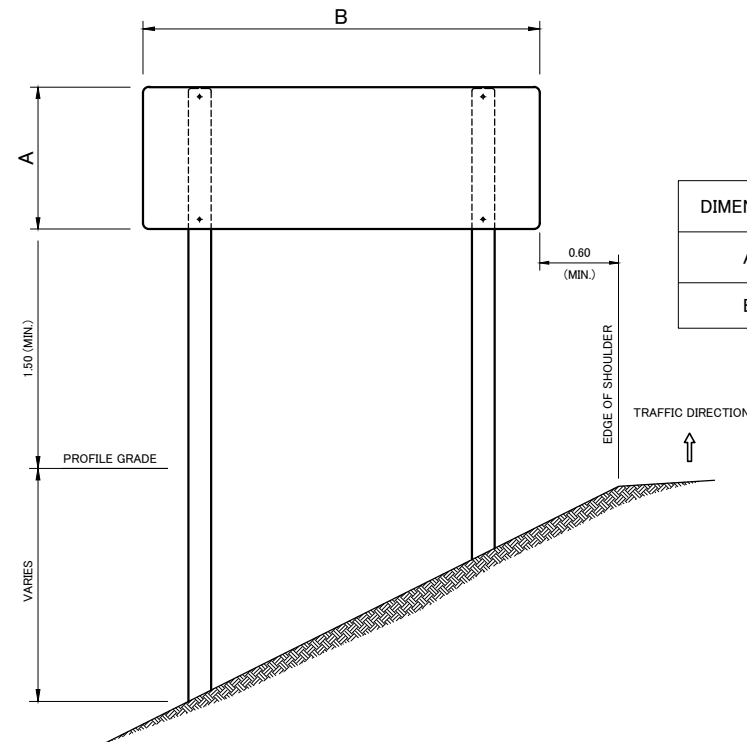
NOTES :

- 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.

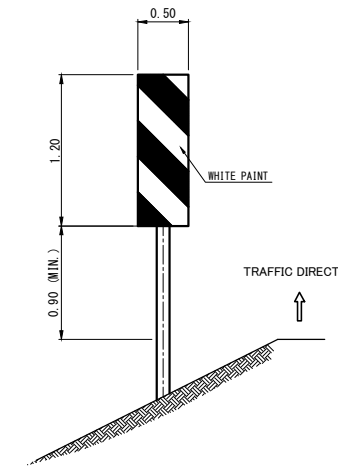
DETAILS OF SIGN POST

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	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 SIGN POST	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	1:30
												DWG. NO.	SW-4	SHEET NO.	166	

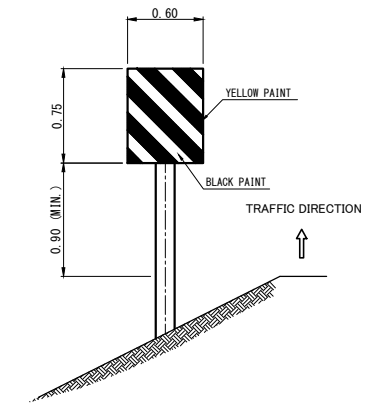


DIMENSION	①	②	③	④	⑤	⑥	⑦	⑧
A	0.50	0.80	0.80	0.90	1.30	1.50	2.40	3.20
B	1.40	2.00	2.40	2.10	2.50	1.50	3.50	2.80

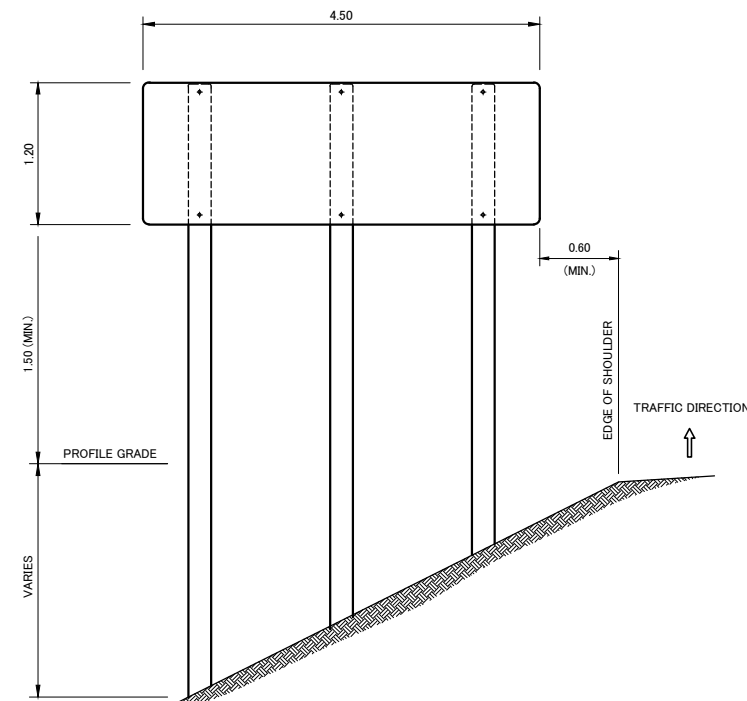
DESTINATION WITH ARROW SIGN
 DESTINATION AND DISTANCE SIGN
 TOWN AND DISTRICT BOUNDARY SIGN
 WITH THAI AND ENGLISH WORDS
 OR THAI WORDS ONLY



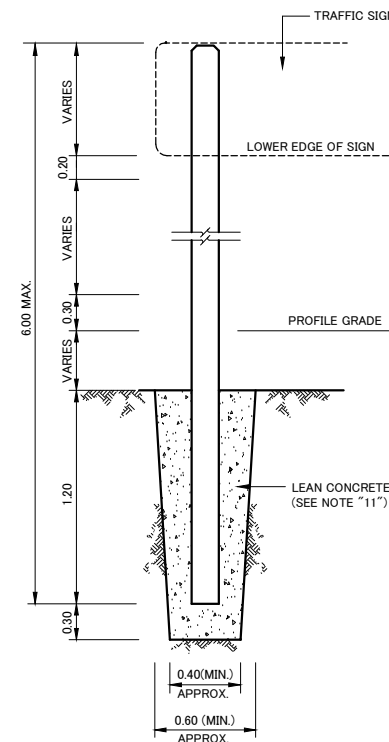
VERTICAL PANEL



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

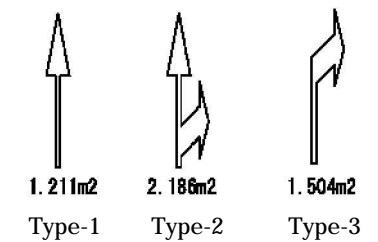
PORTLAND CEMENT TYPE 1	350	KG.(MIN.)
SAND	0.43	M. ³
CRUSHED ROCK OR GRAVEL	0.86	M. ³
CONCRETE SLUMP	10	CM.(MAX.)
- LEAN CONCRETE FOR SIGN POST BASE SHALL HAVE A PROPORTION OF CEMENT : SAND : AGGREGATE 1:3:6 BY VOLUME AND A CONCRETE SLUMP OF 10 CM.(MAX.)
- CLEAR CONCRETE COVER SHALL BE 2.5 CM.
- REINFORCING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

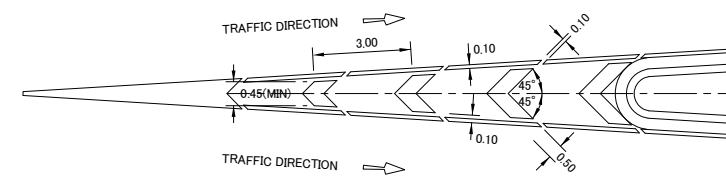
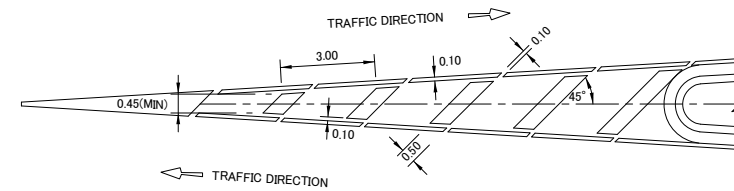
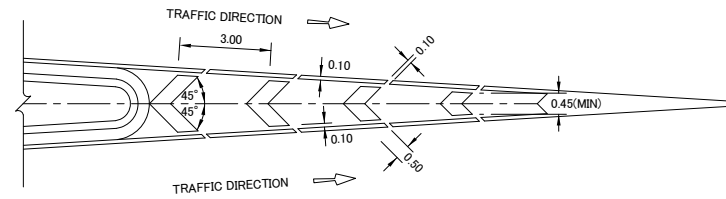
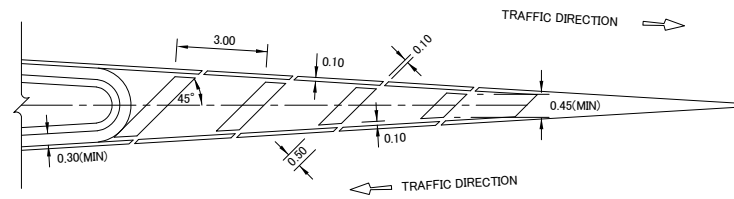
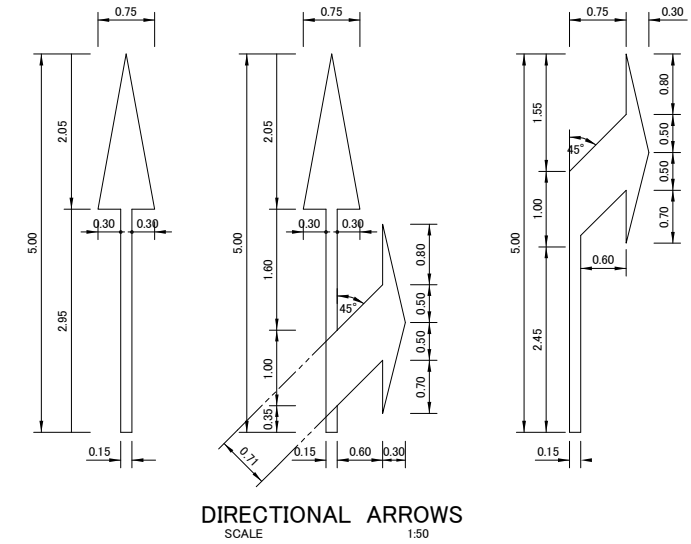
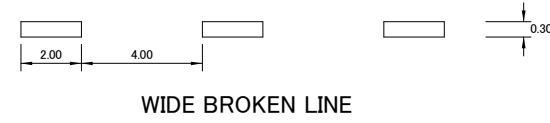
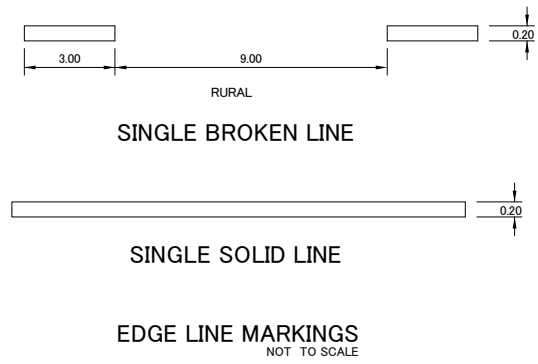
**7-4 DETAILS OF SIGNAGE &
AVEMENT MARKING**

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 %			



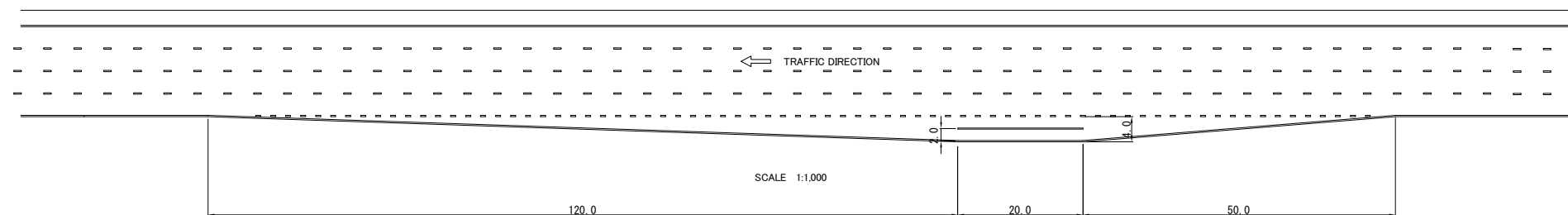
REV. NO.	DESCRIPTION	ENGINEER CHECKED DATE	DOH CHECKED DATE	REV. NO.	APPROVED BY	<p>KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS</p>	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	<p>CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING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



SCHEDULED LIST OF EMERGENCY PARKING BAY

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

EMERGENCY PARKING BAY



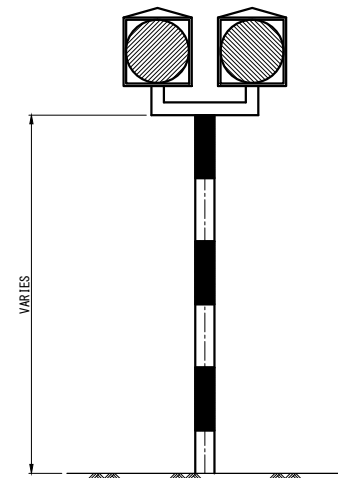
DETAILS OF SIGNAGE AND PAVEMENT MARKINGS

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	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

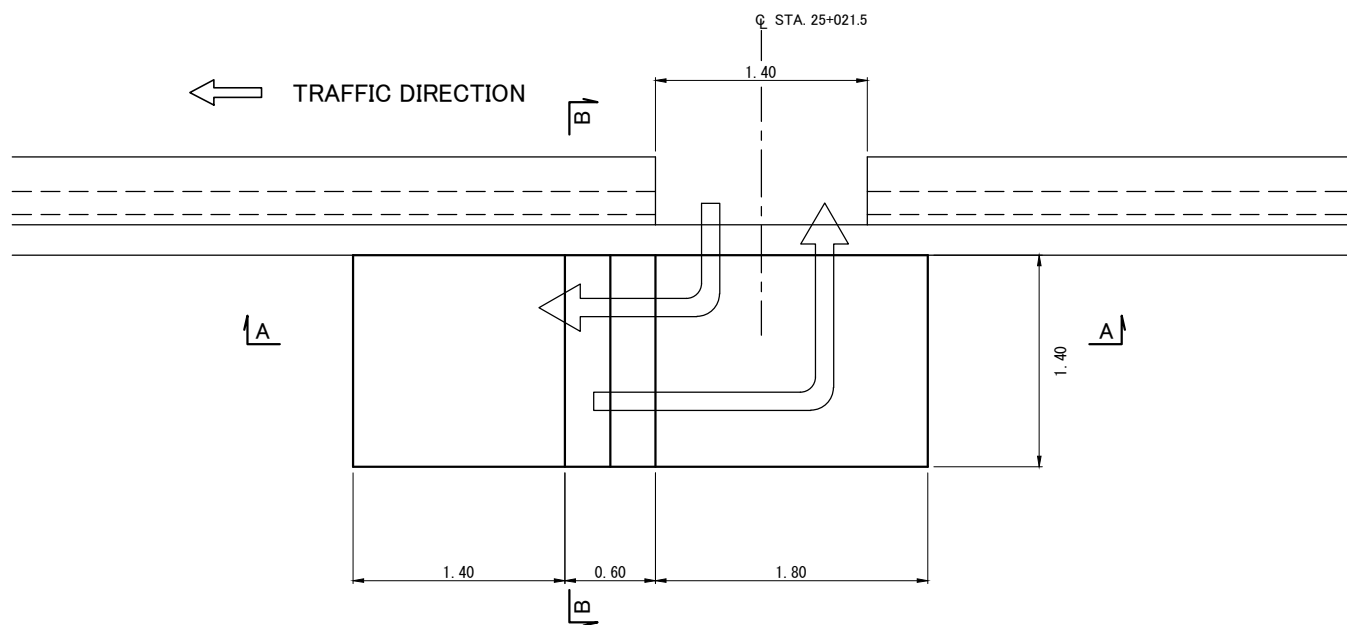
STA	Nos.	REMARKS
1) STA.11+600.0	1	
2) STA.25+380.0	1	
3) STA.25+380.0	1	
4) STA.25+380.0	2	
5) STA.25+380.0	2	

NOTES :

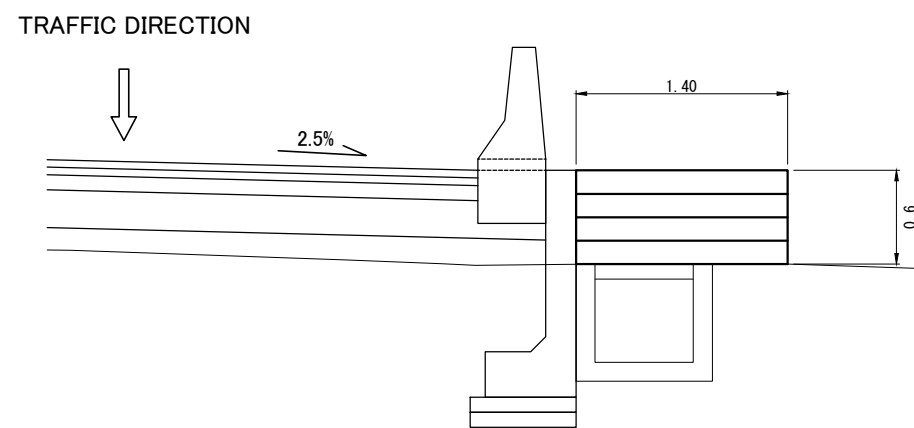
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THESE FACILITIES ARE DESIGNED TO BE RE-USED SPECIAL ATTENTION SHALL BE PAID DURING REMOVAL.

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

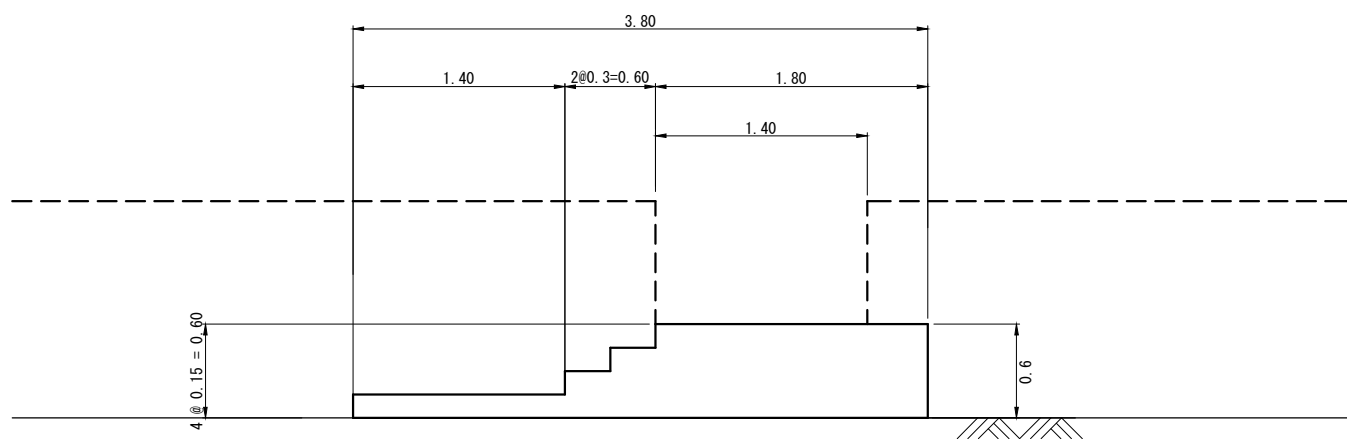
7-6 STAIRWAY WORK



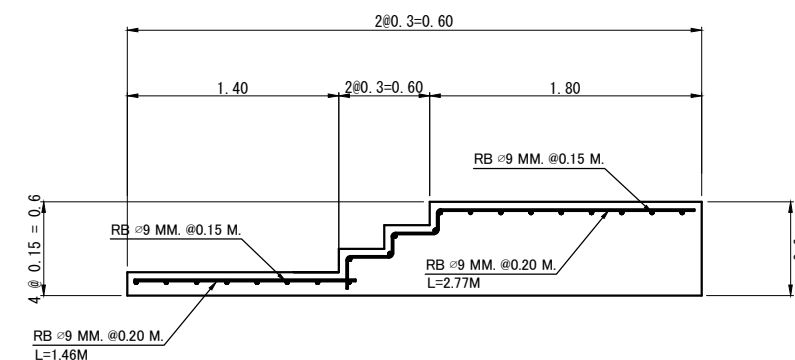
TOP VIEW



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	<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	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

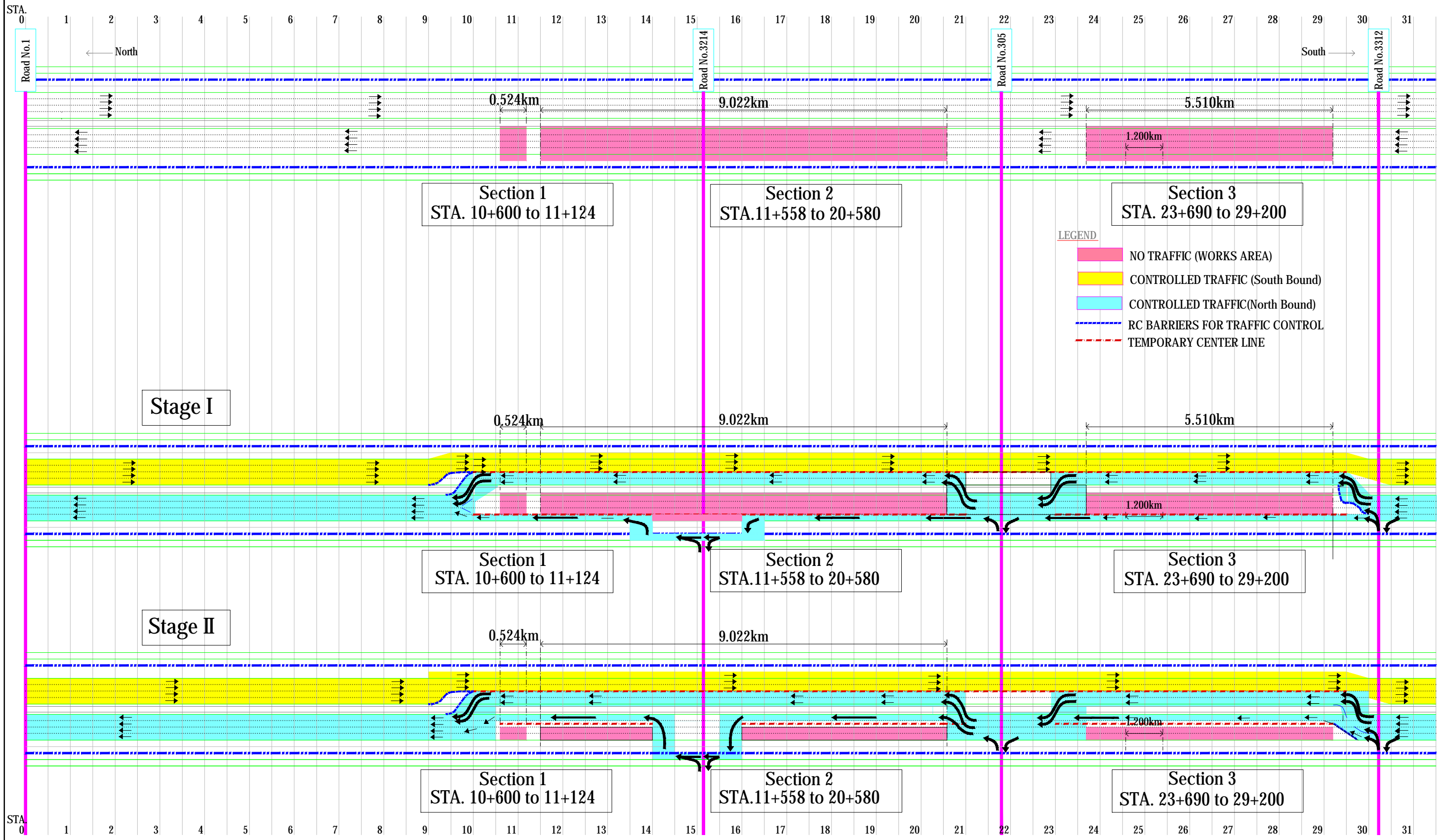
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MEDIAN CROSSOVER (AROUND STA.10+500)	1	TS2-2	190
SIGNBOARD-2	1	TS2-3	191
RELOCATED ENTRANCE&EXIT(NORTH BOUND)	1	TS2-4	192
RELOCATED EXIT(SOUTH BOUND)	1	TS2-5	193
RELOCATED ENTRANCE(SOUTH BOUND)	1	TS2-6	194
MEDIAN CROSSOVER (AROUND STA.20+700)	1	TS2-7	195
RELOCATED ENTRANCE(NORTH BOUND)	1	TS2-8	196
SIGNBOARD-3	1	TS2-9	197
RELOCATED EXIT(NORTH BOUND)	1	TS2-10	198
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

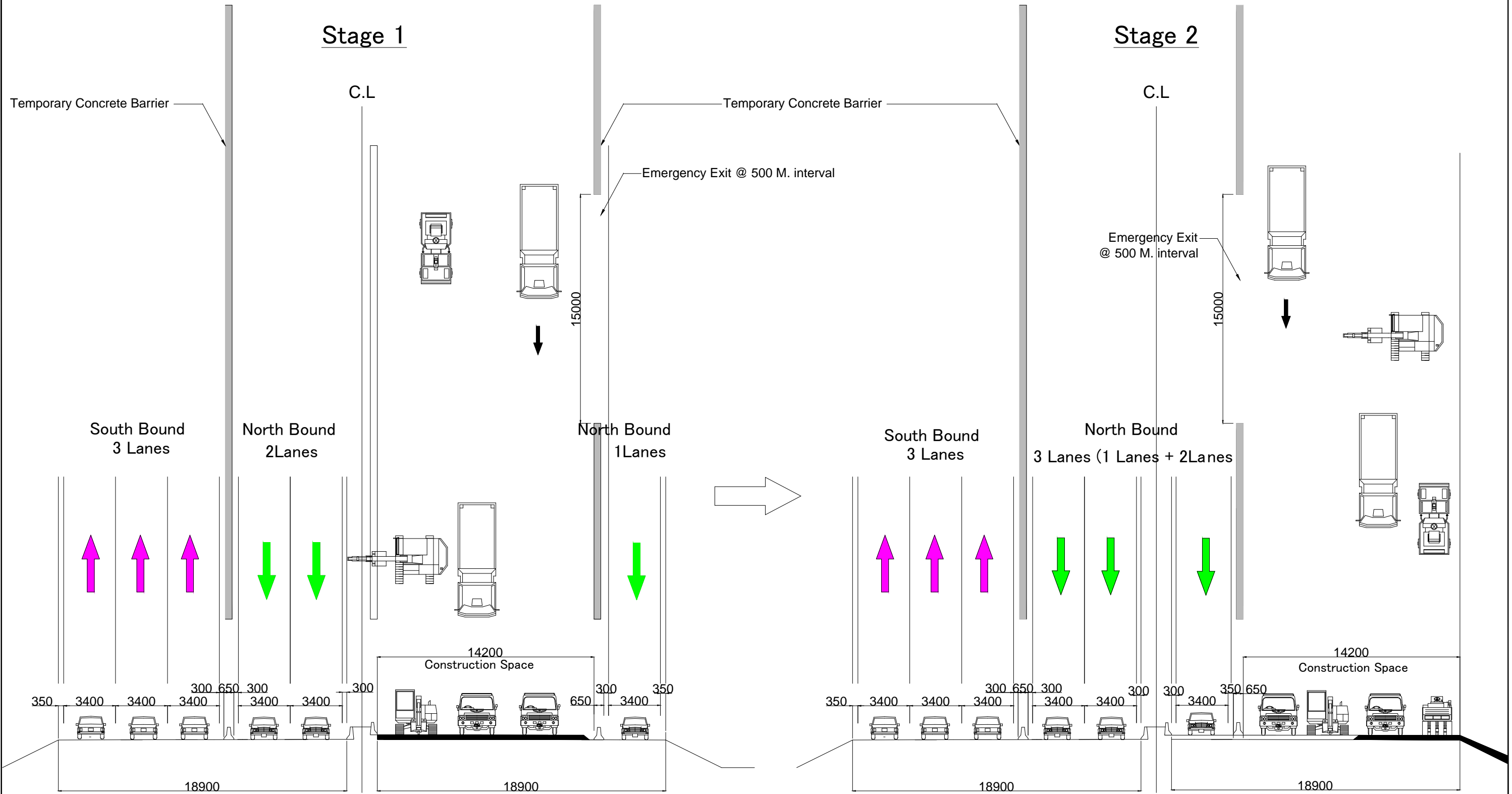
1. GENERAL TRAFFIC CONTROL

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										AUGUST 2012	AS SHOWN
									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	DWG. NO.	SHEET NO.	
														TC-1	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	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	AS SHOWN
									TYPICAL CROSS SECTION						DWG. NO. TC-2	SHEET NO. 174

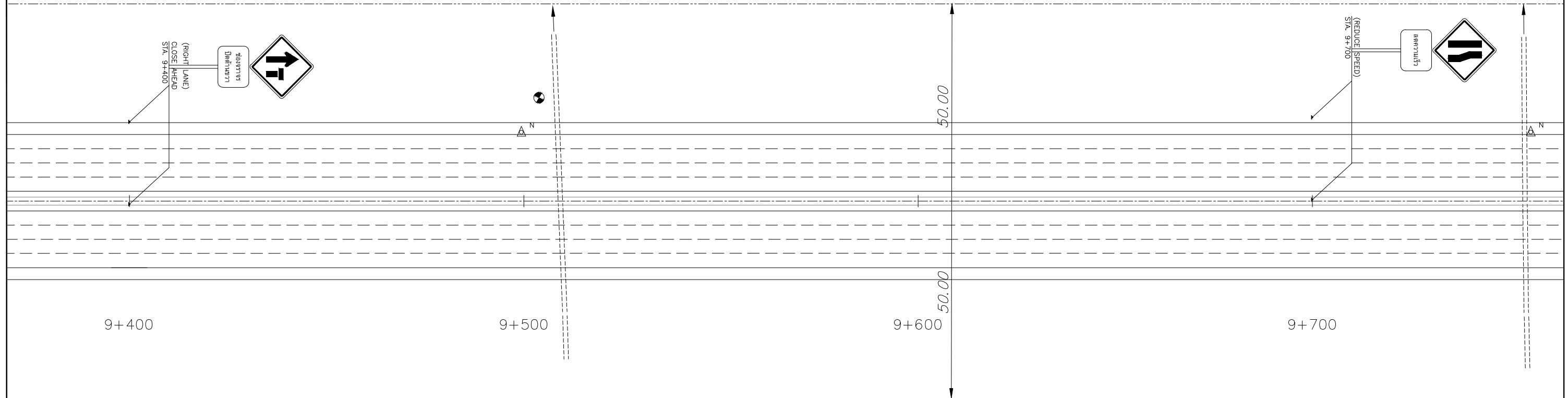
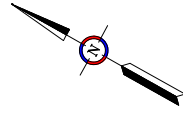
2. TRANSITION SECTION

(STAGE 1)

Signboard-1

South Bound

Around STA. 9+600 Stage1&2

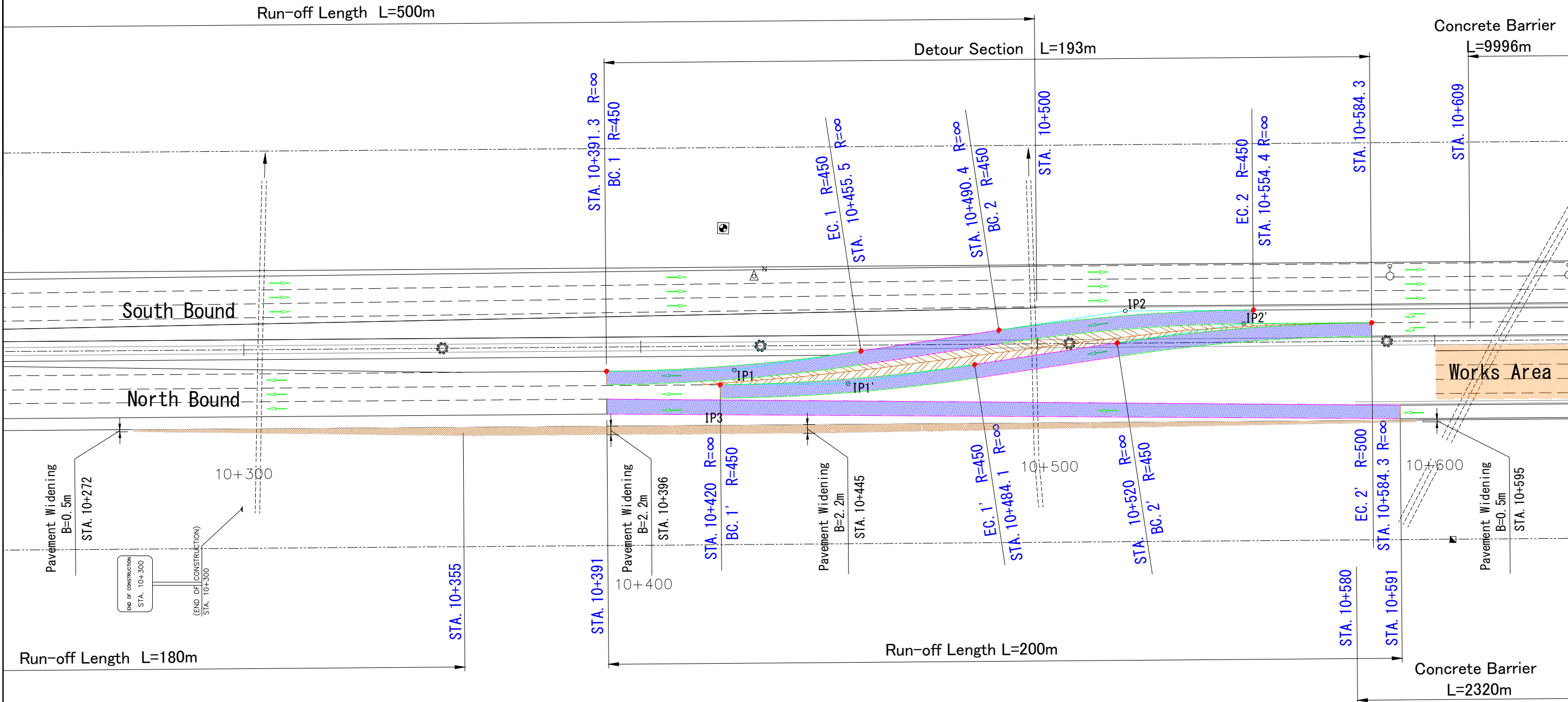
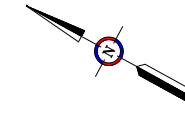


REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the 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 :

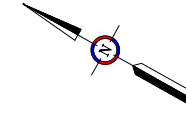
1. Set 40km/h as maximum speed limit for transition road.
2. Set 60km/h as maximum speed limit for standard road.
3. Install traffic control signs in accordance with the Road Work Guide published by DoH.

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

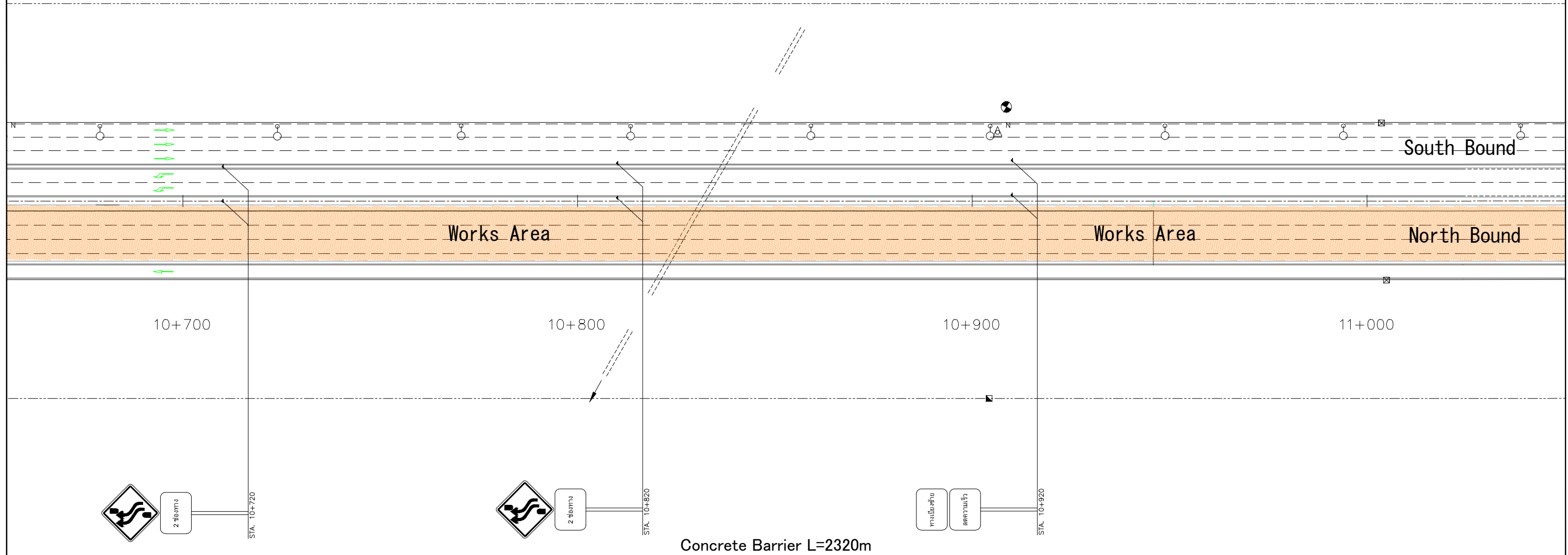
IP No.	STA.	Curve Length	IA	Radius
		(m)	(dd-mm-ss)	(m)
IP 1'	10+452.184	64.358	8-11-39.350	450
IP 2'	10+551.943	64.358	8-11-39.350	450

SignBoard-2

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



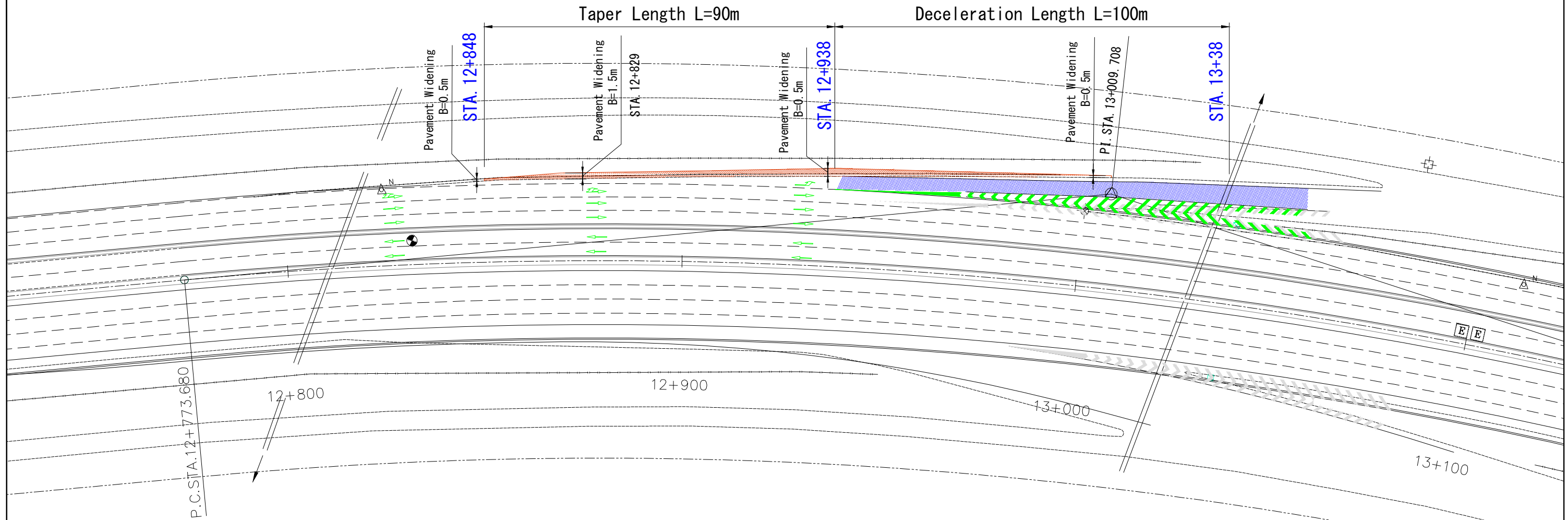
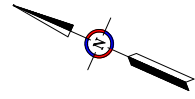
Concrete Barrier L=9996m



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. TS1-3	SHEET NO. 177

Relocated Exit

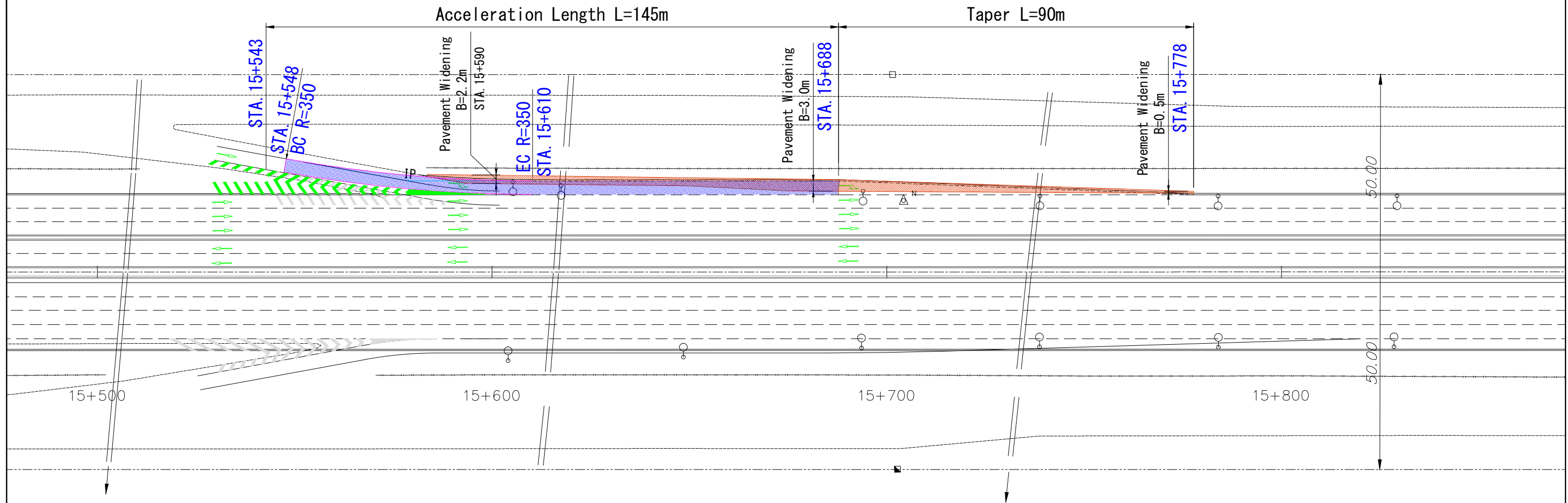
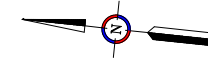
South Bound
Around STA. 12+900 Stage1&2



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				RELOCATED ENTRANCE(SOUTH BOUND)	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			