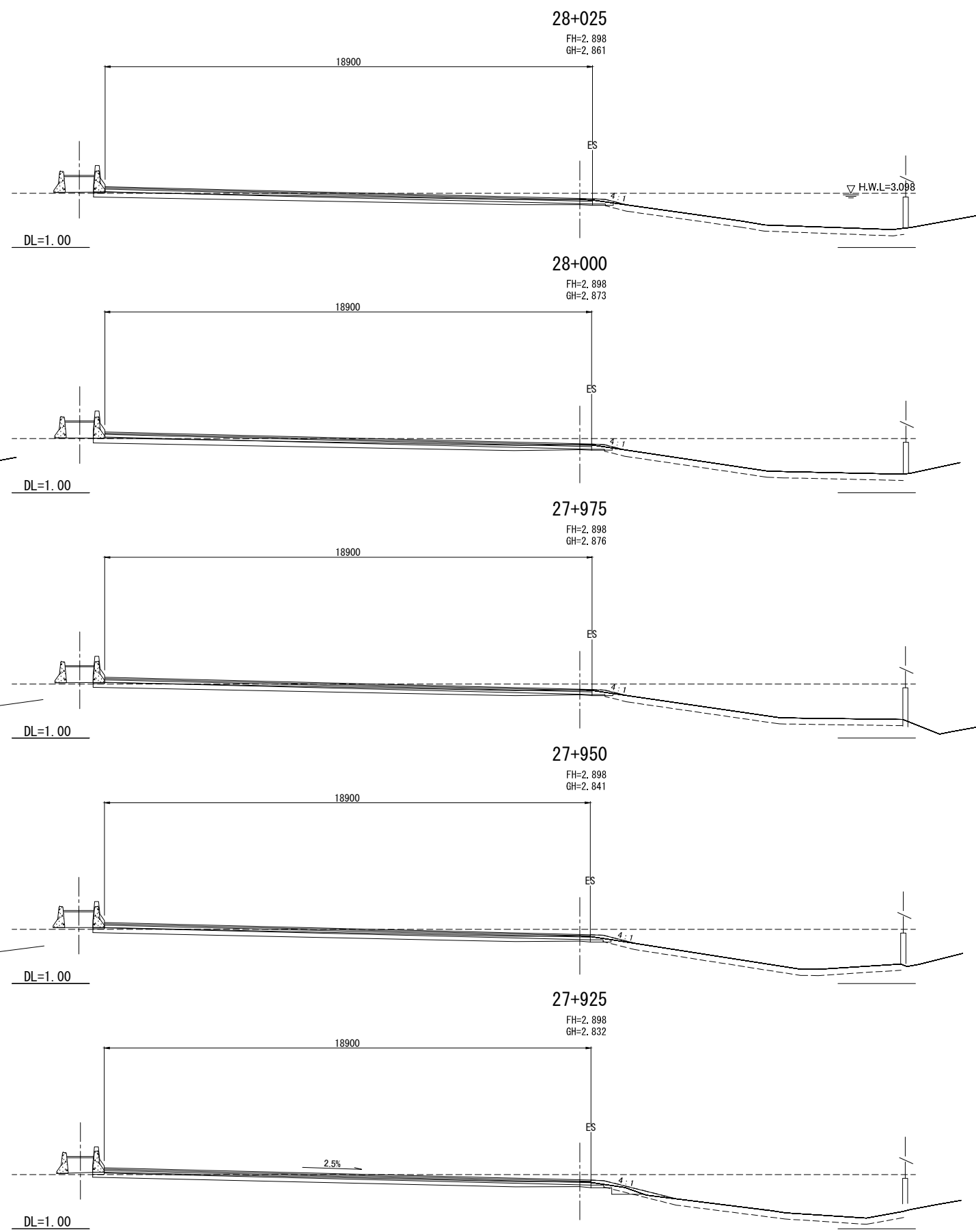
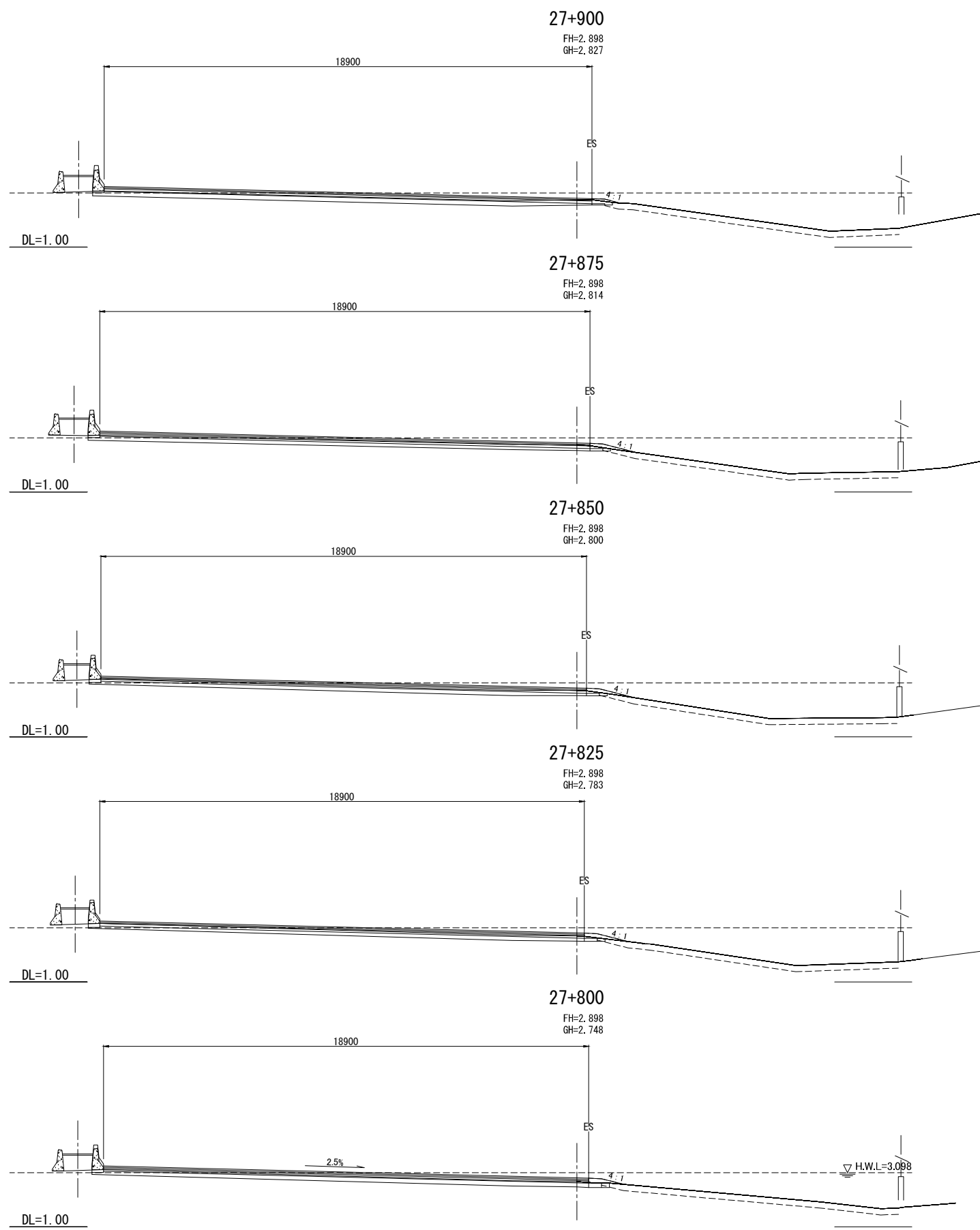


REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9 CROSS SECTIONS (64 / 70)	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation 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 1:100
														DWG. NO. MW-115	SHEET NO. 120

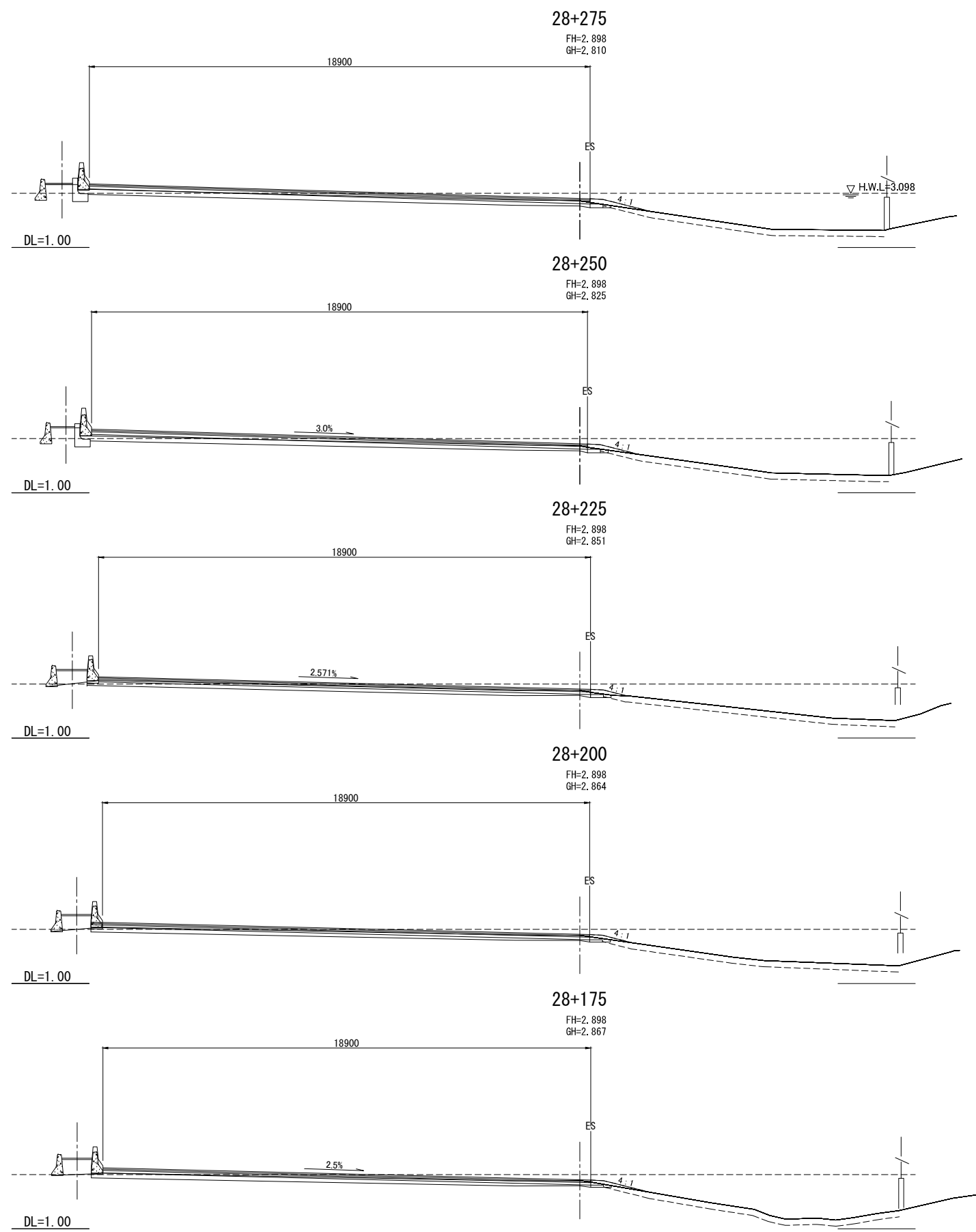
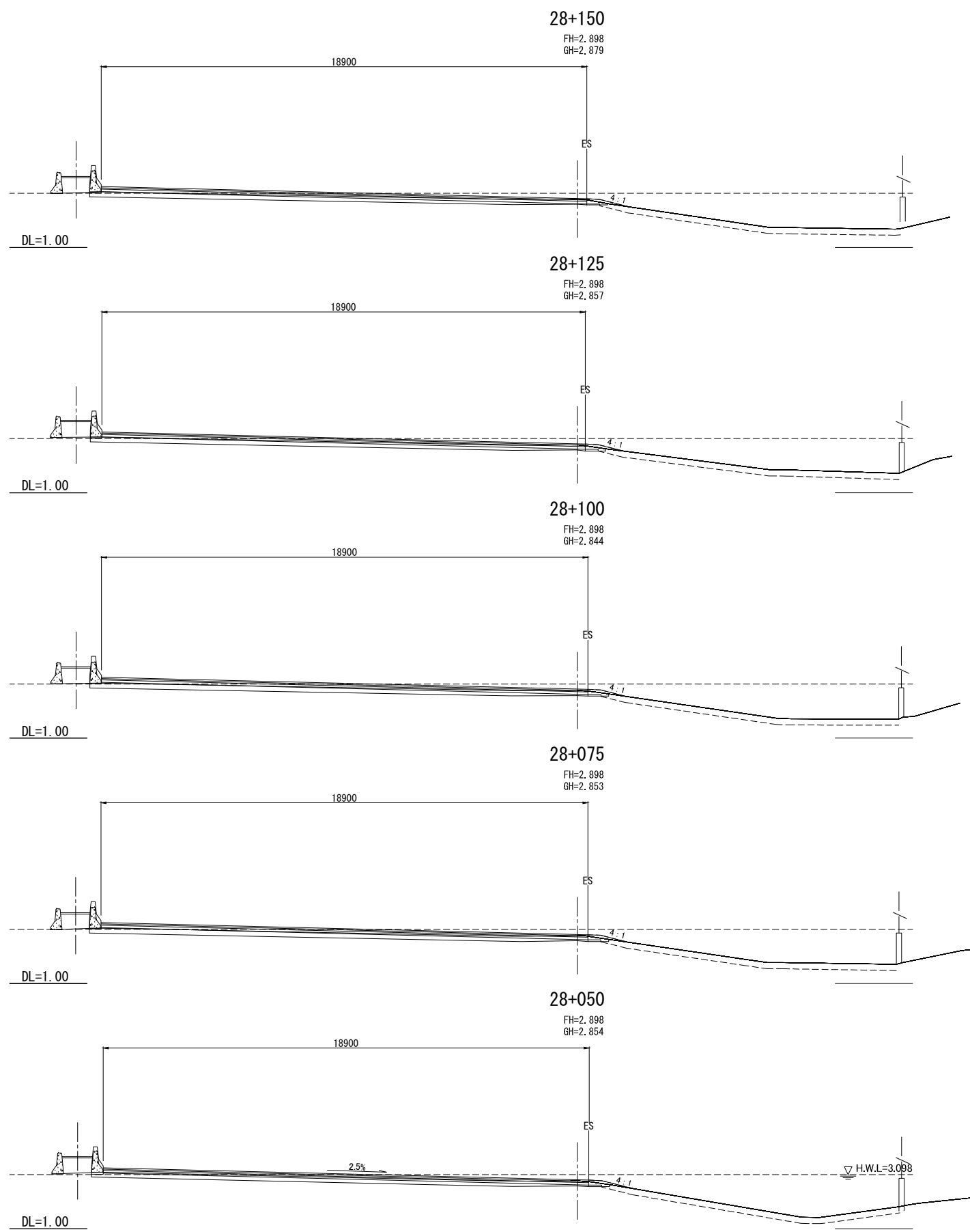
CTI ENGINEERING INTERNATIONAL CO., LTD.
 ORIENTAL CONSULTANTS CO., LTD.
 NIPPON KOEI CO., LTD.
 CTI ENGINEERING CO., LTD.



REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9 CROSS SECTIONS (65 / 70)	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 1:100
														DWG. NO. MW-116	SHEET NO. 121



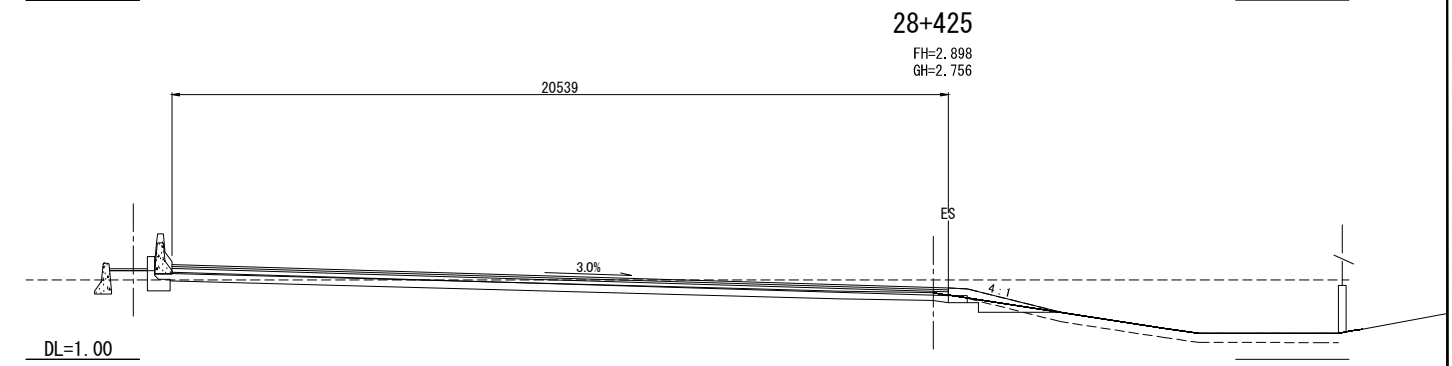
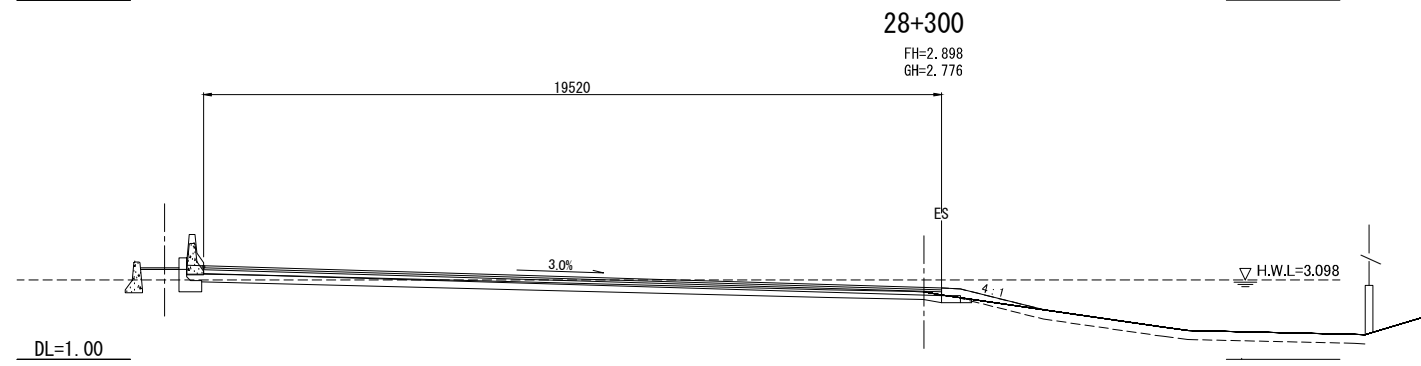
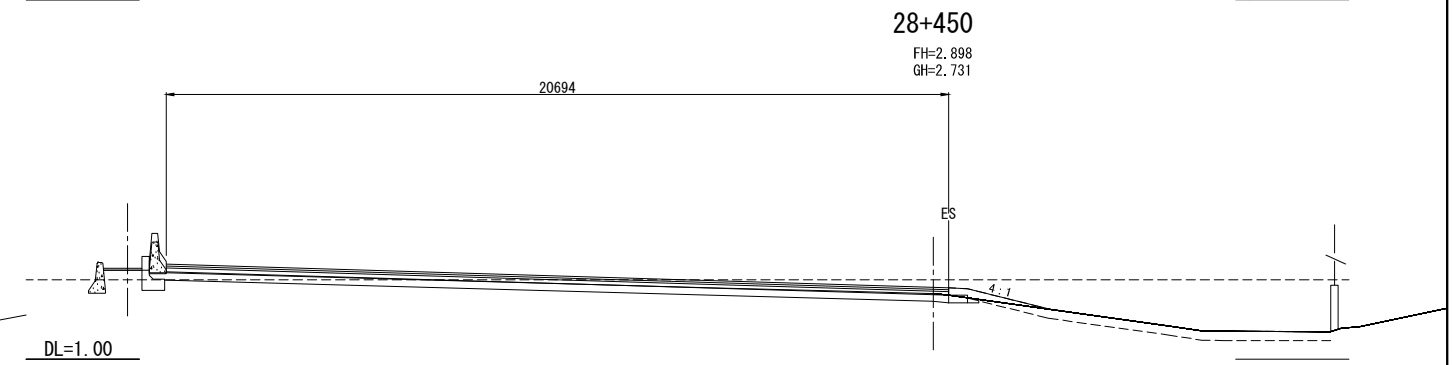
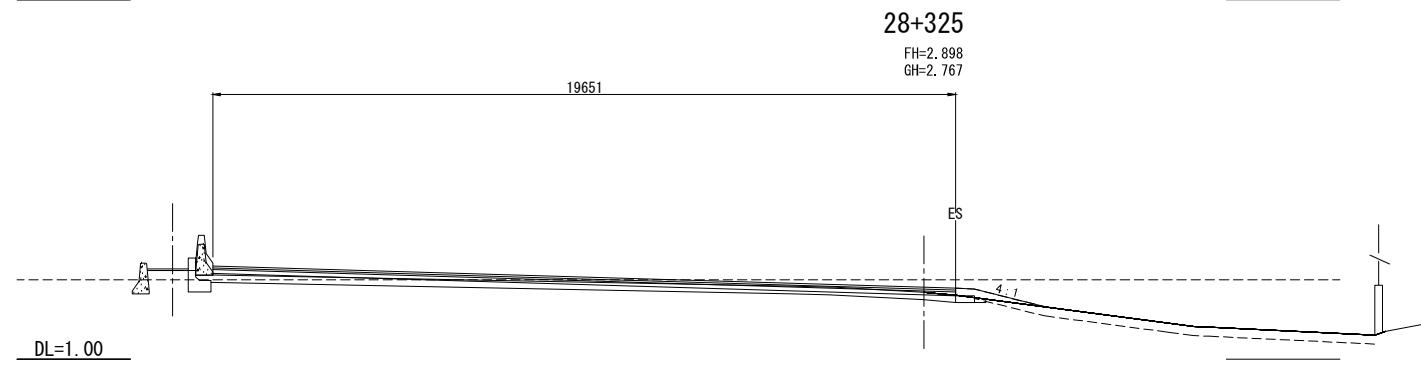
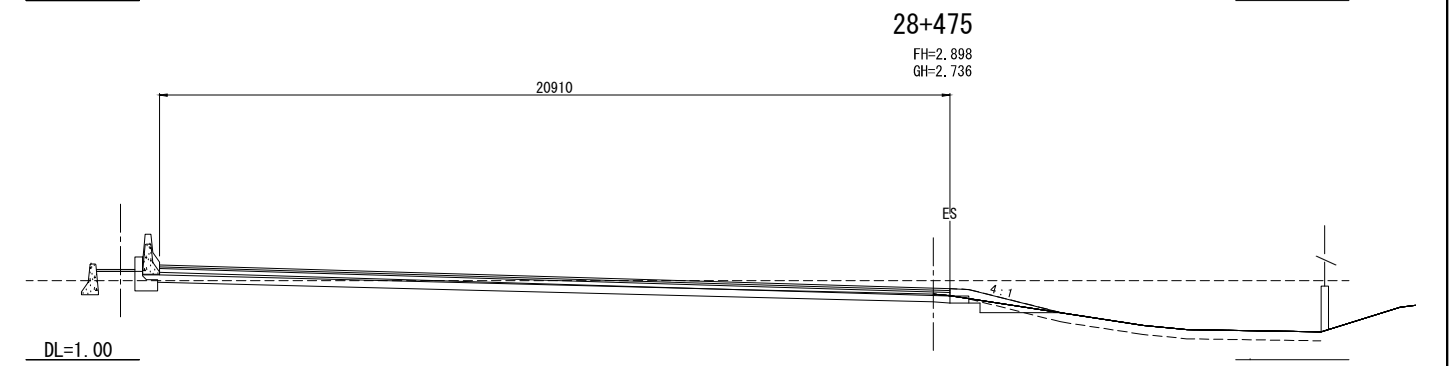
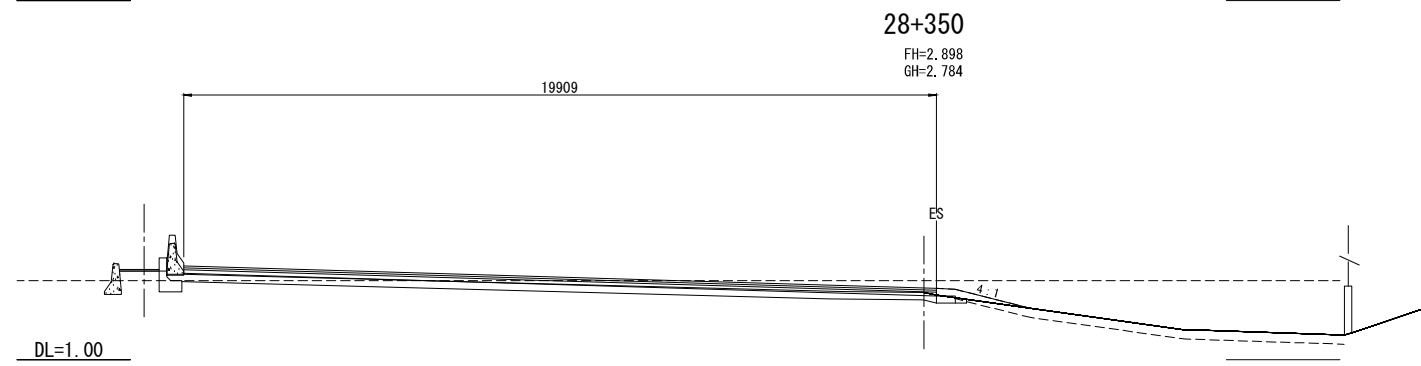
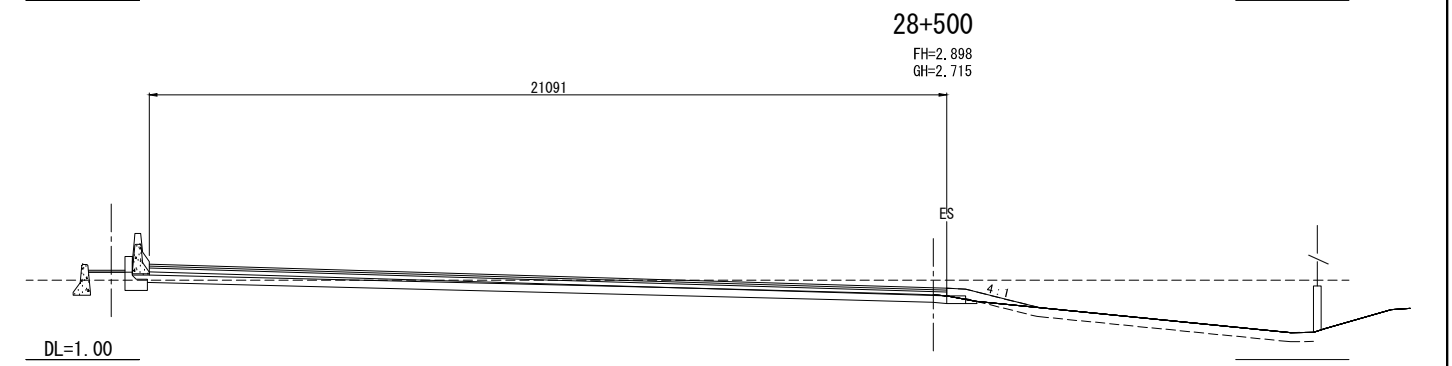
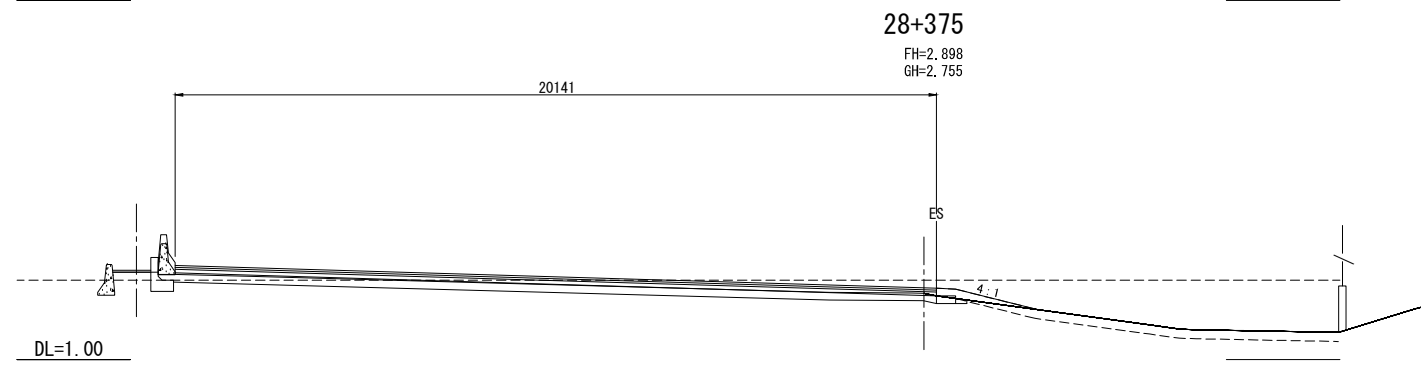
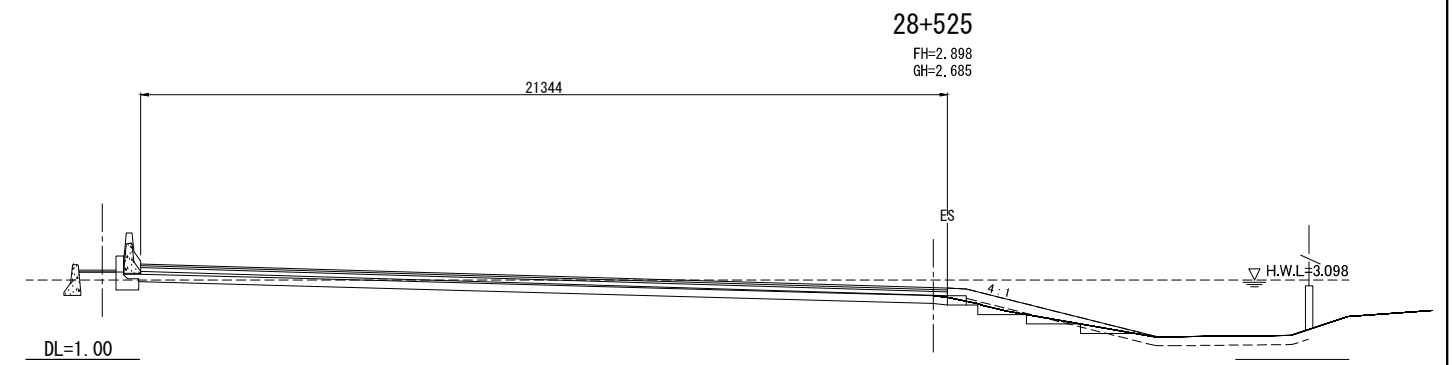
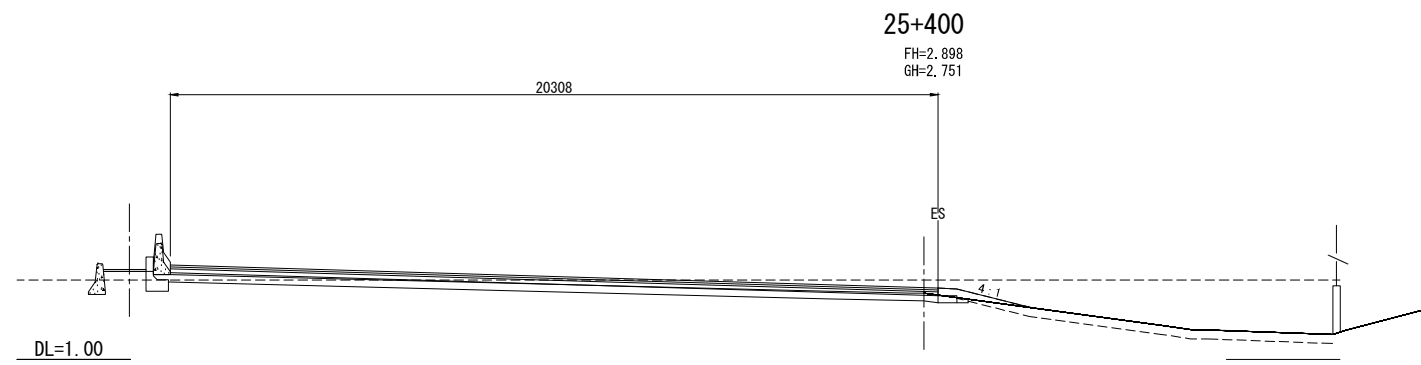
CTI ENGINEERING INTERNATIONAL CO., LTD.
ORIENTAL CONSULTANTS CO., LTD.
NIPPON KOEI CO., LTD.
CTI ENGINEERING CO., LTD.



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 1:100
														DWG. NO. MW-117	SHEET NO. 122

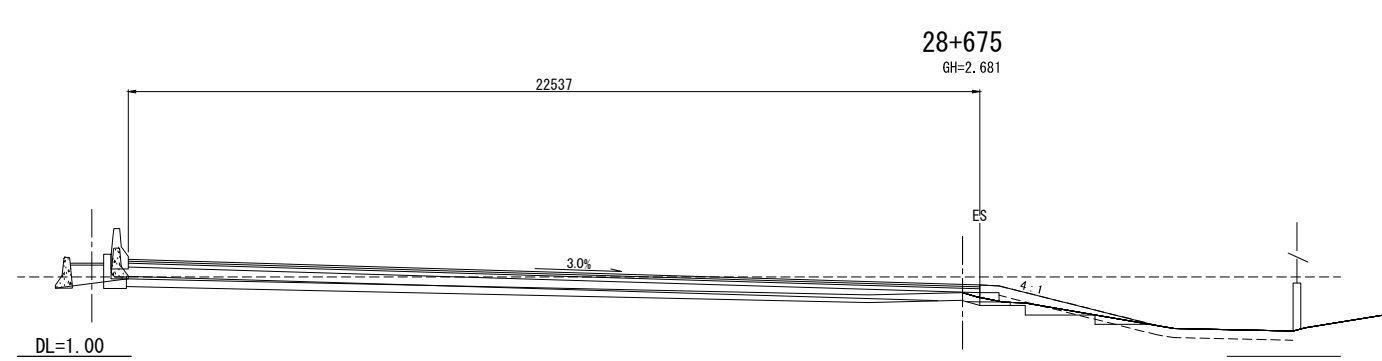
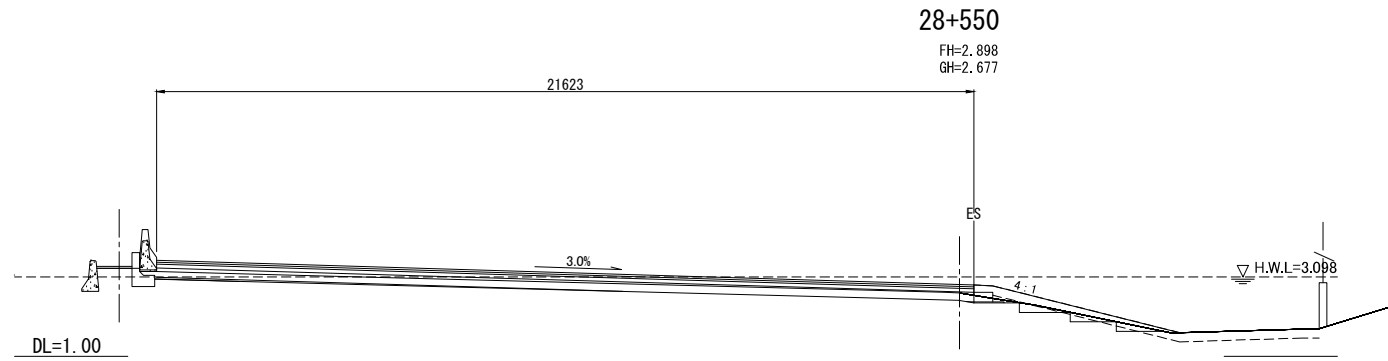
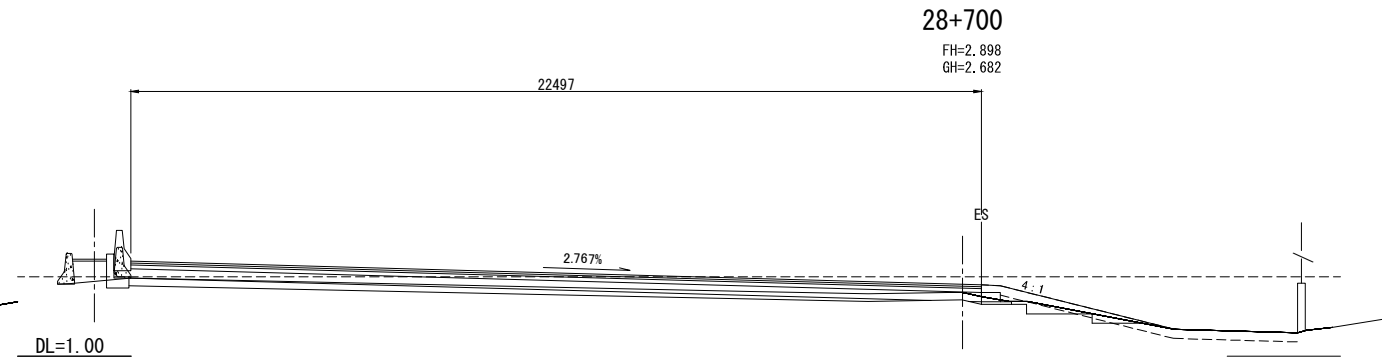
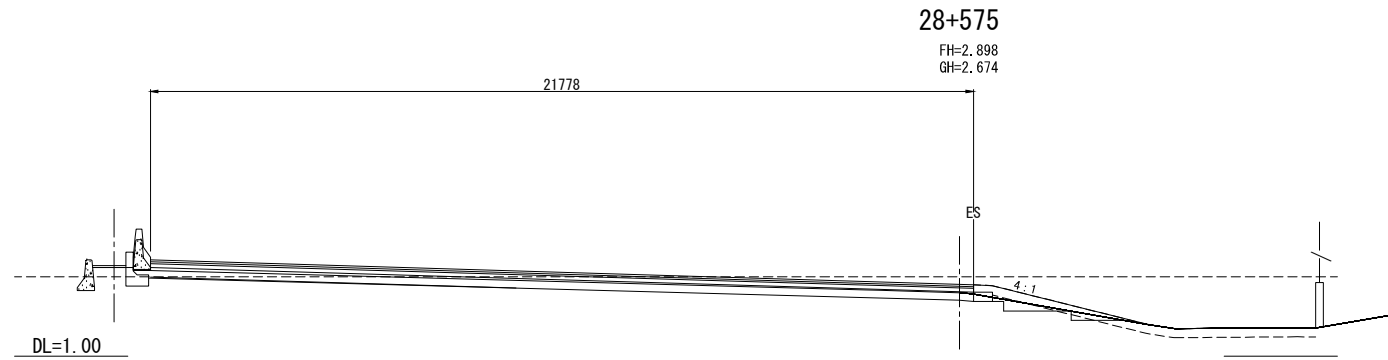
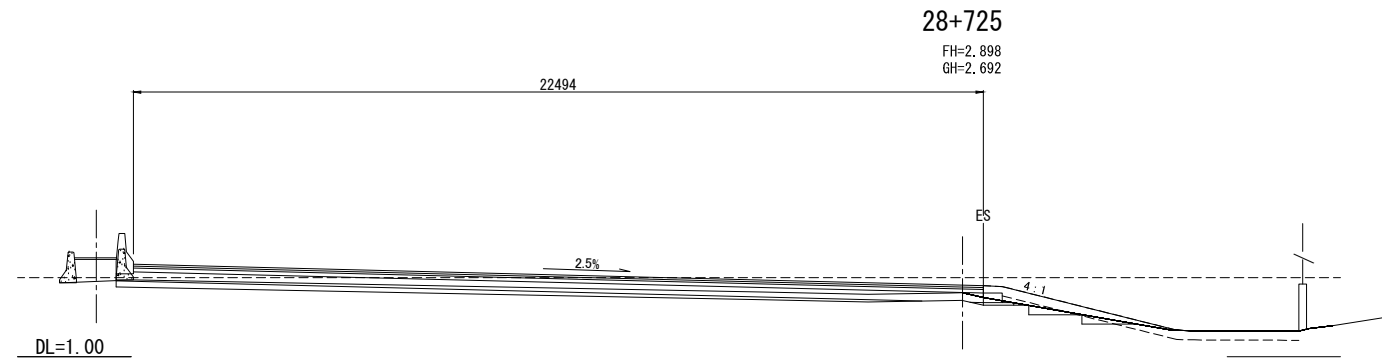
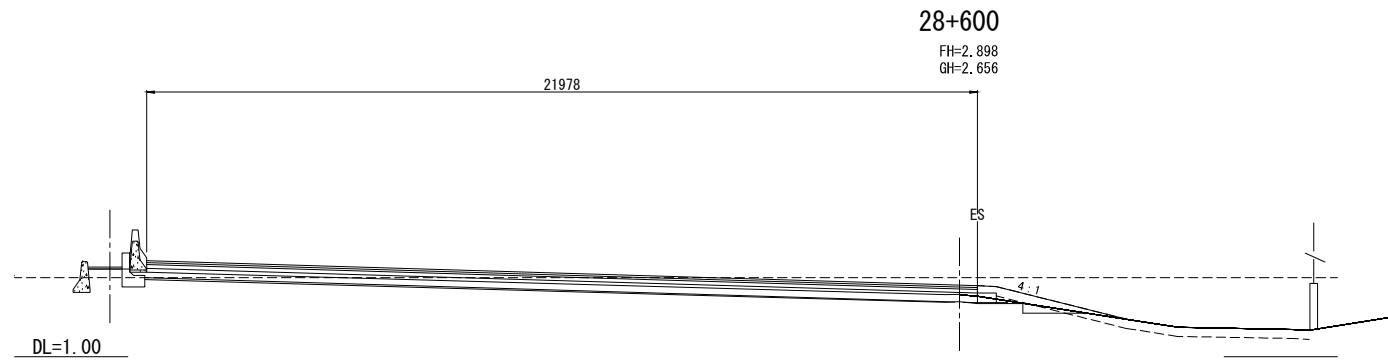
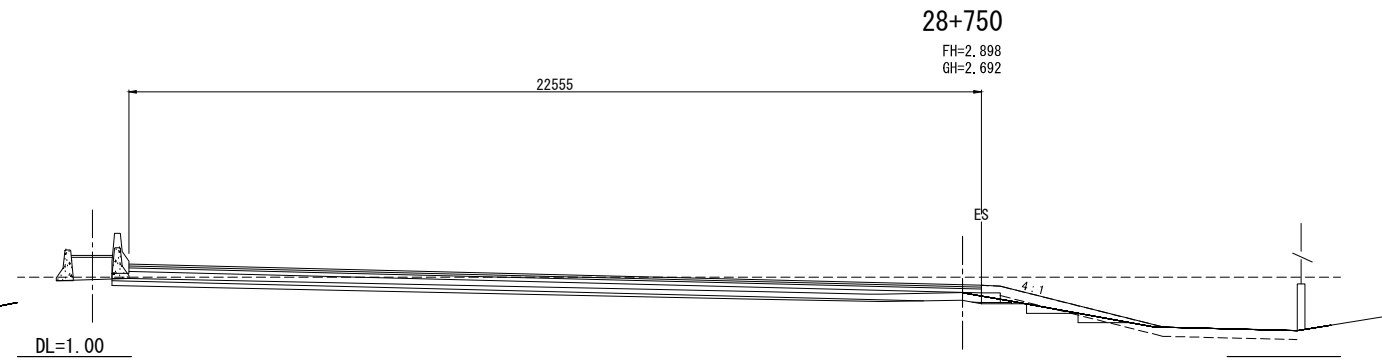
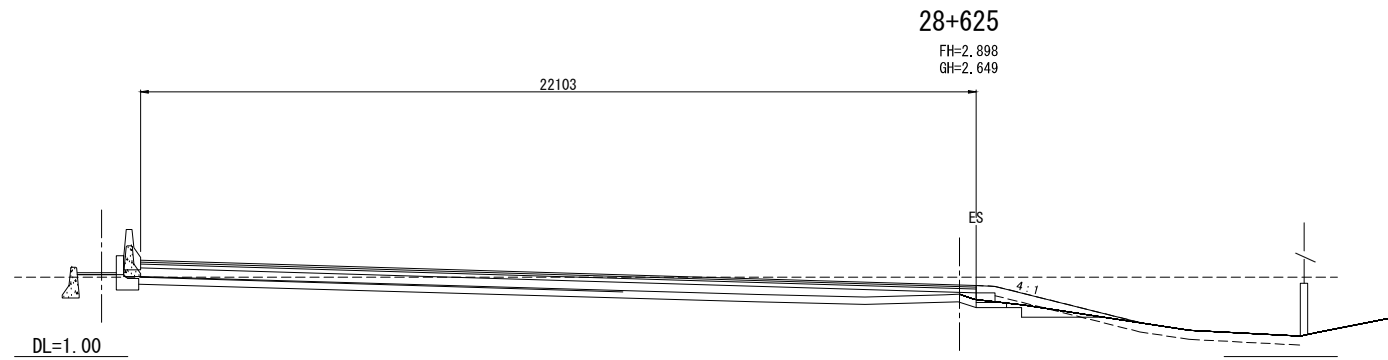
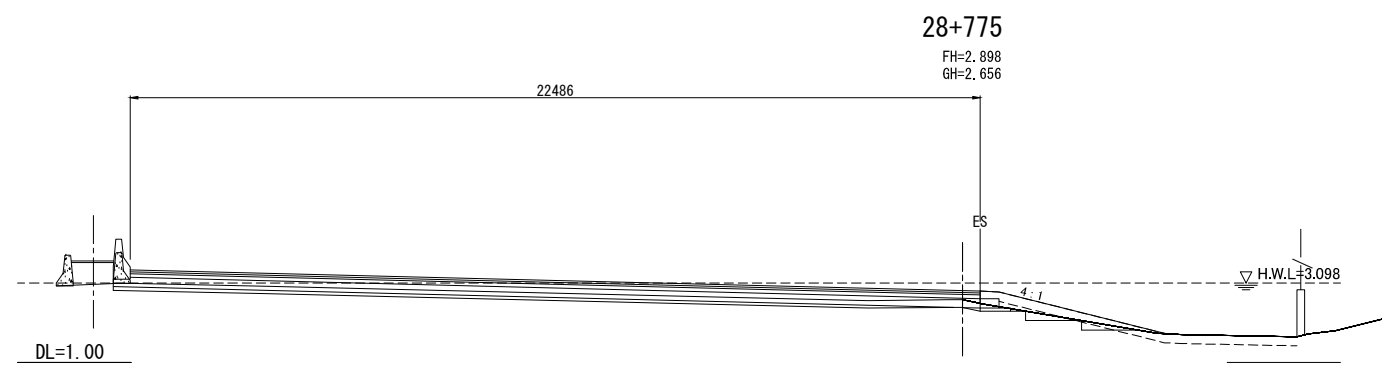
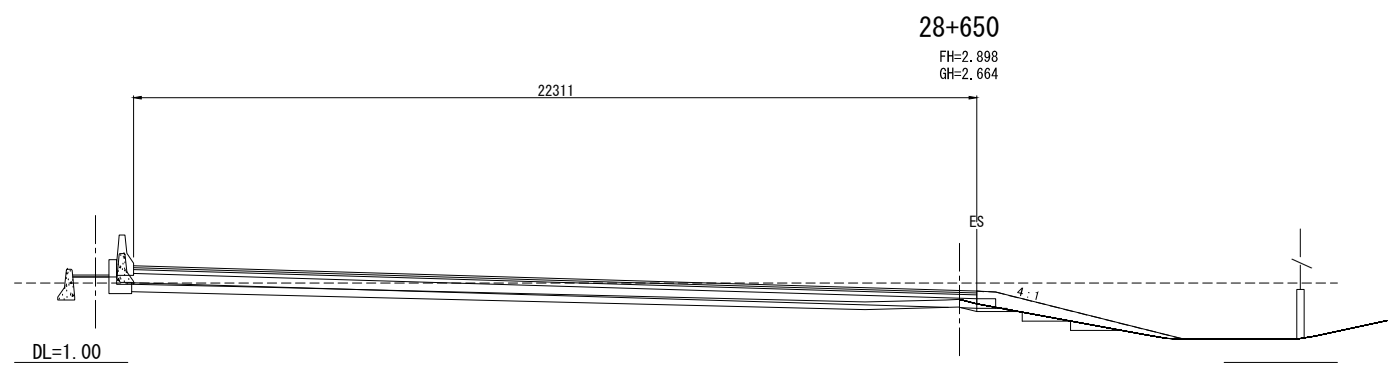


CTI ENGINEERING INTERNATIONAL CO., LTD.
 ORIENTAL CONSULTANTS CO., LTD.
 NIPPON KOEI CO., LTD.
 CTI ENGINEERING CO., LTD.

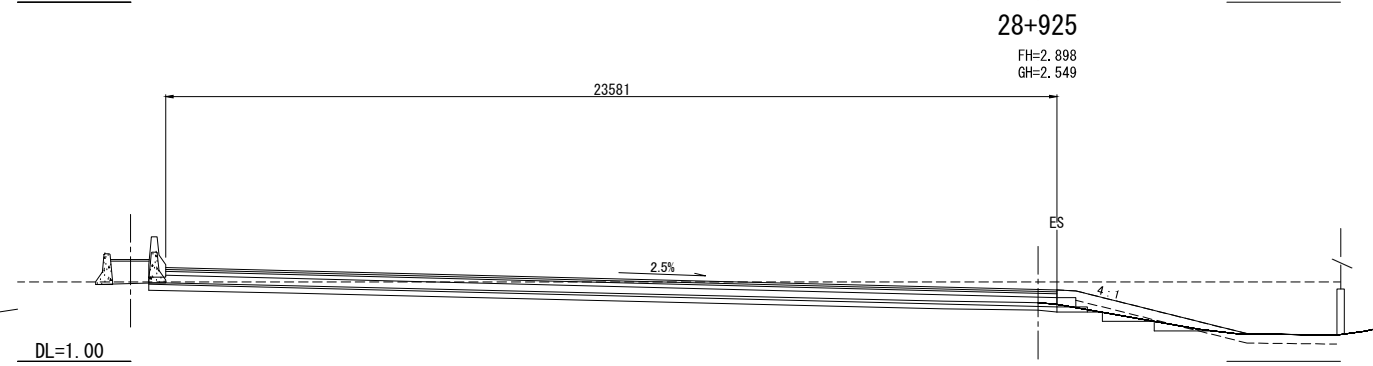
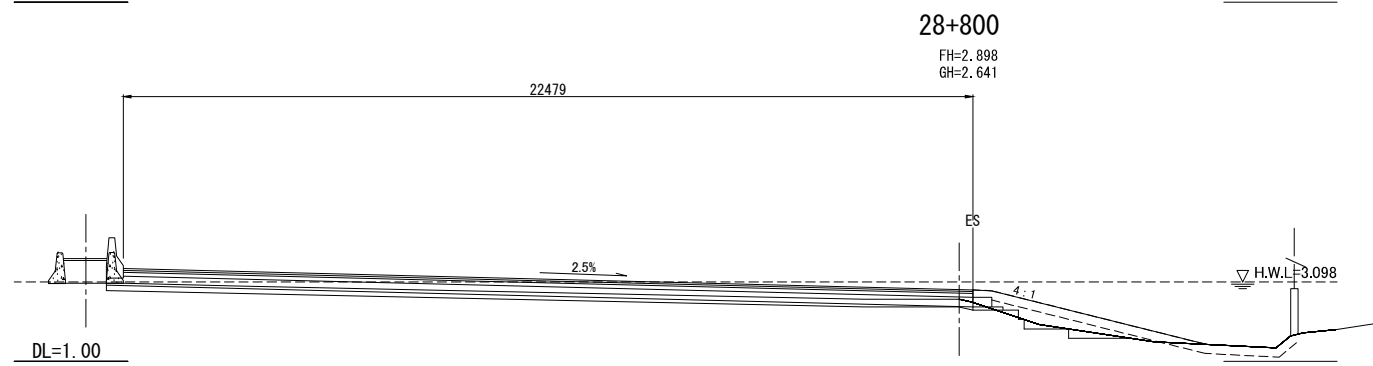
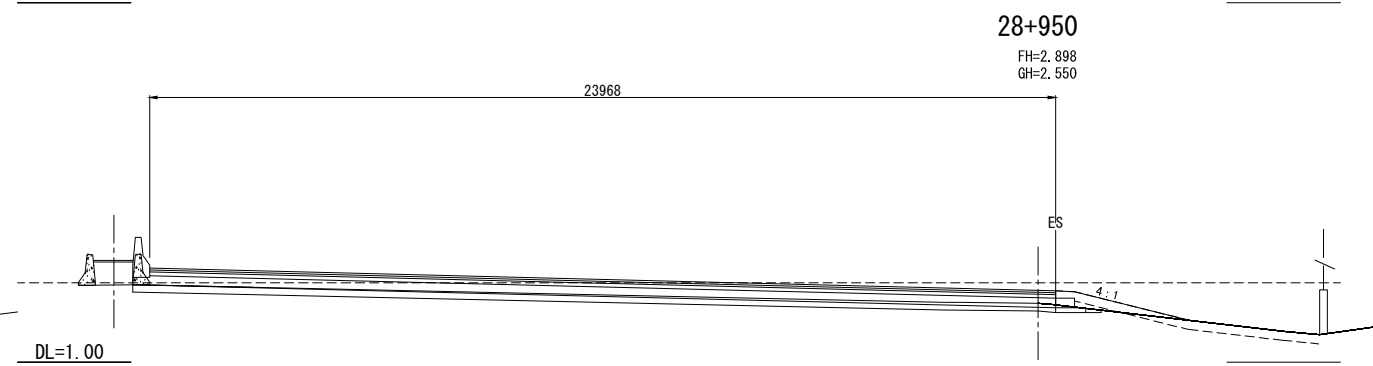
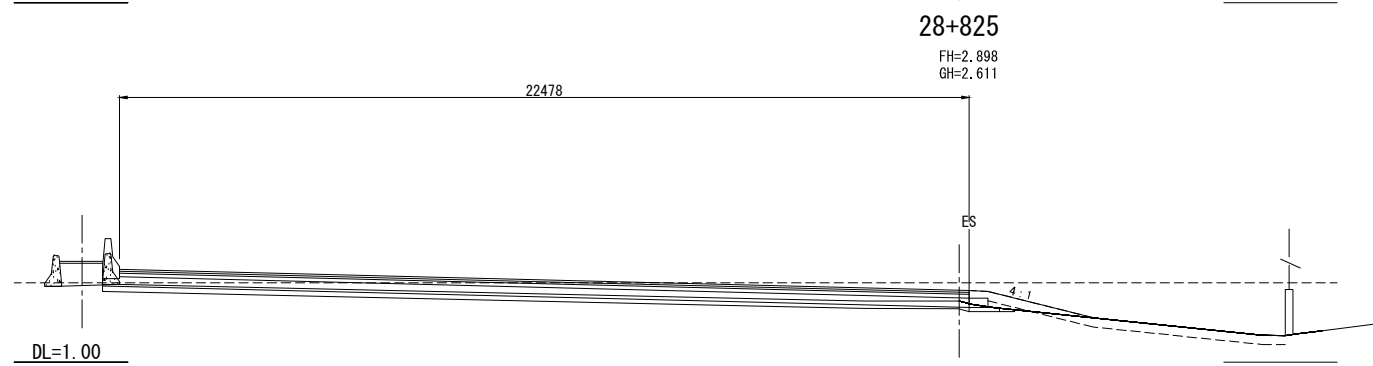
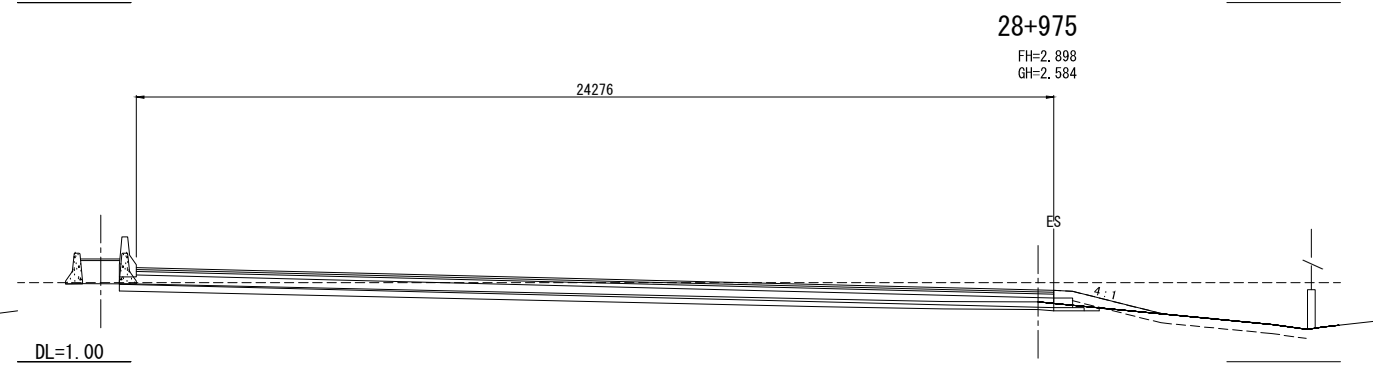
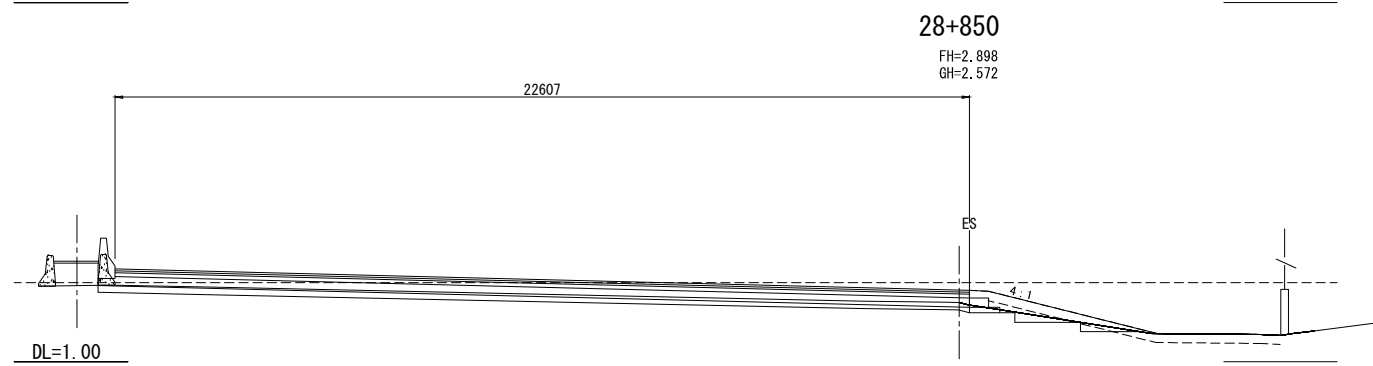
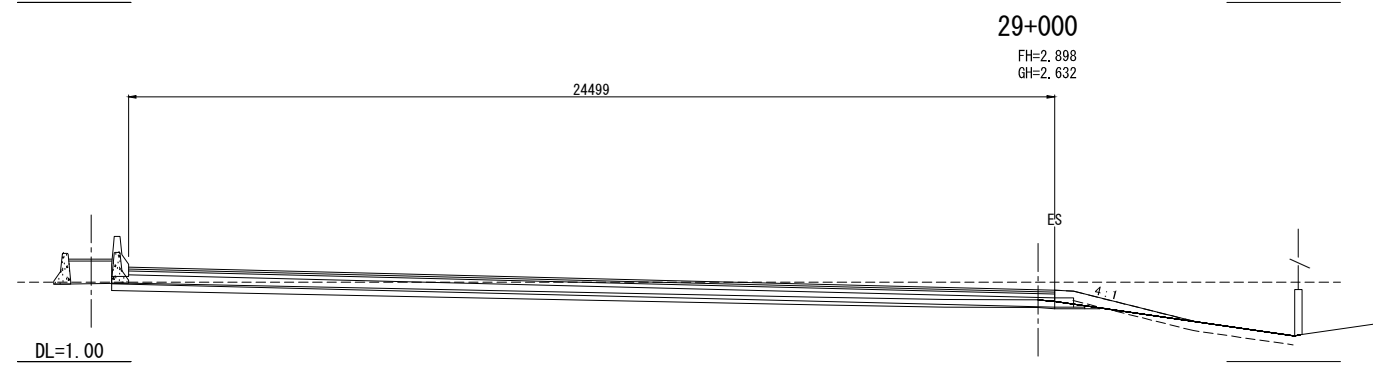
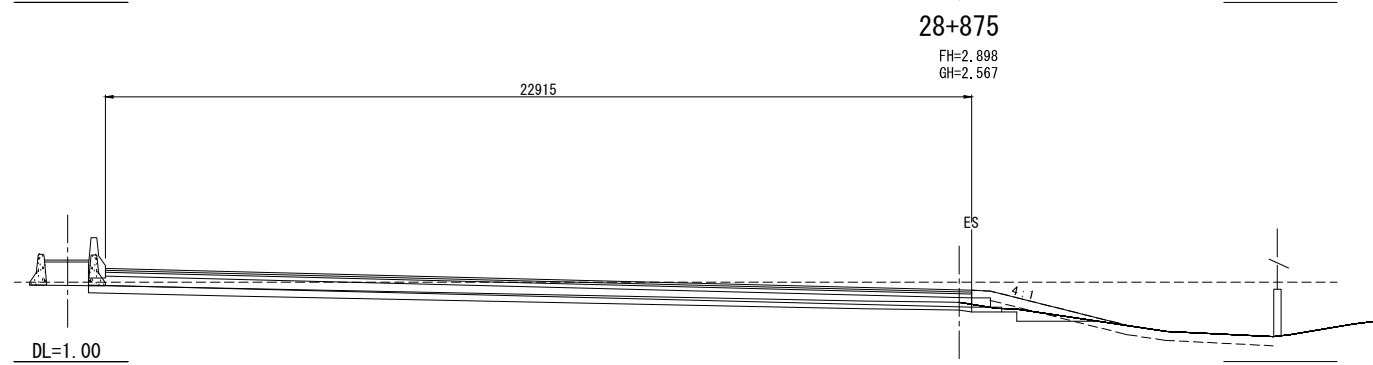
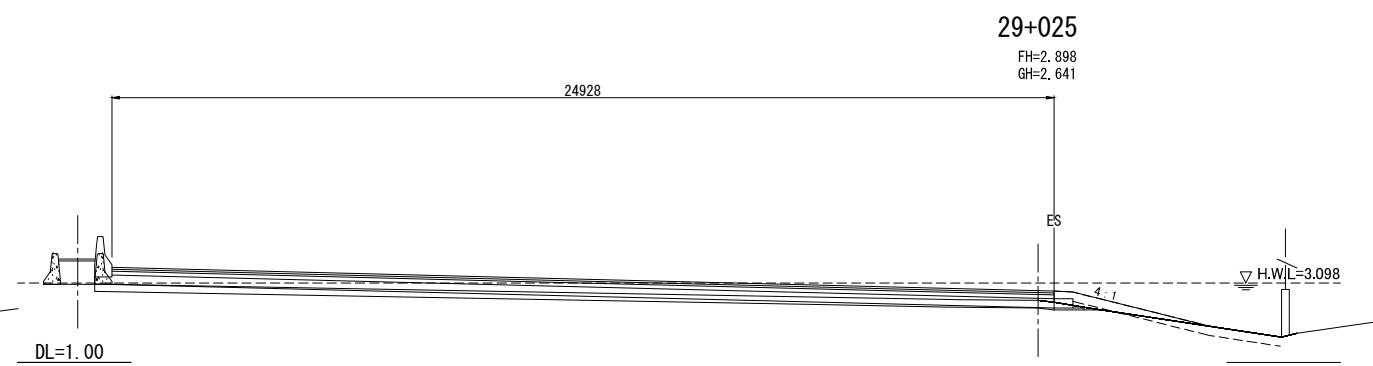
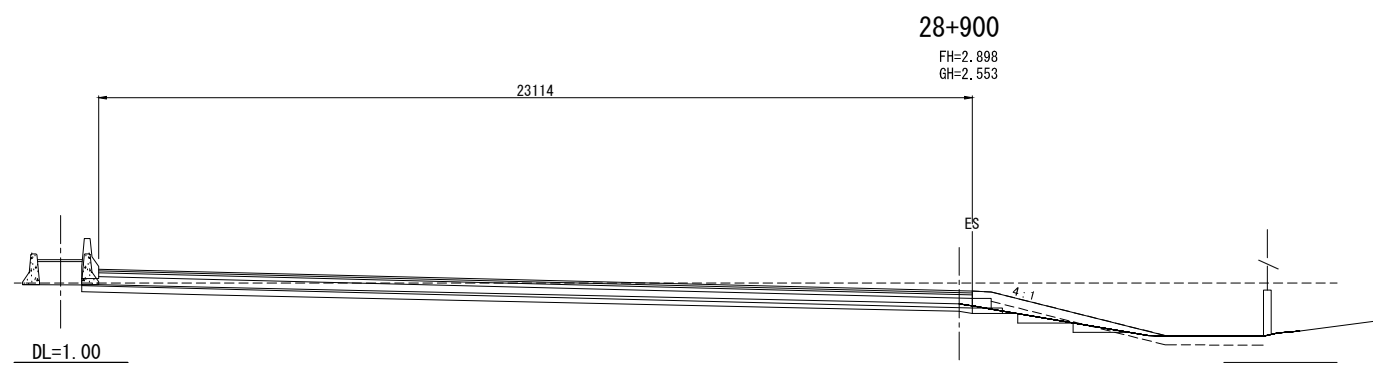


REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the 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 1:100
									CROSS SECTIONS (67 / 70)					DWG. NO. MW-118	SHEET NO. 123

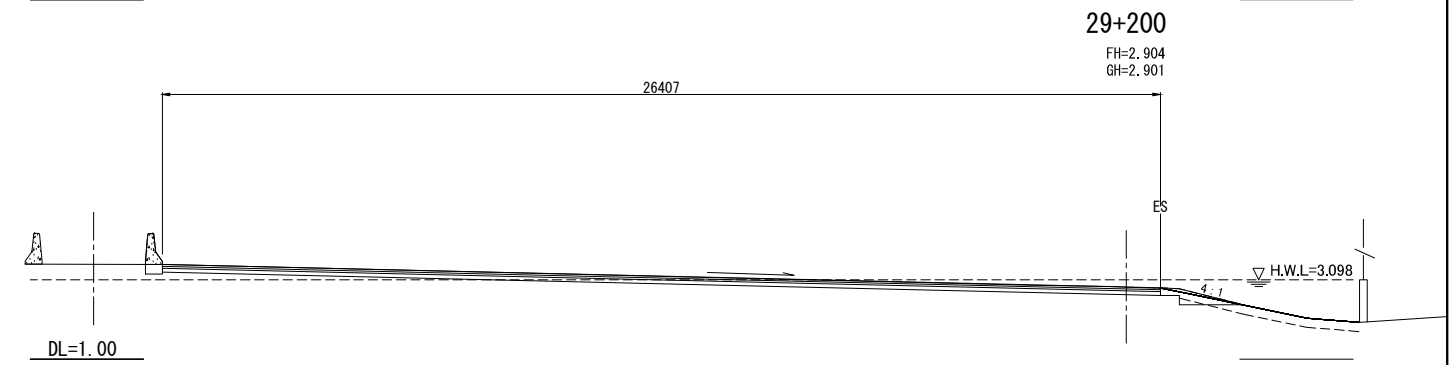
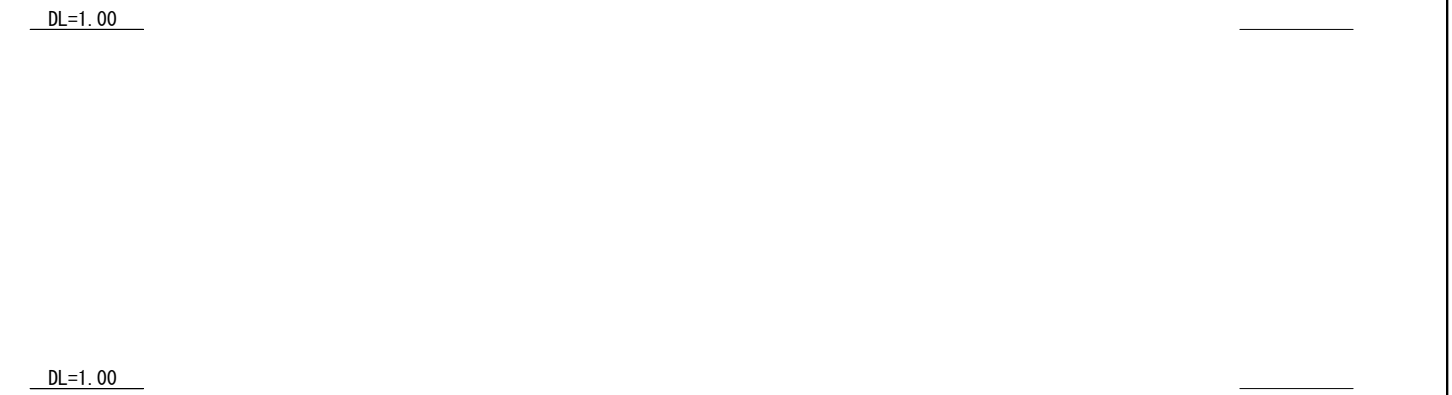
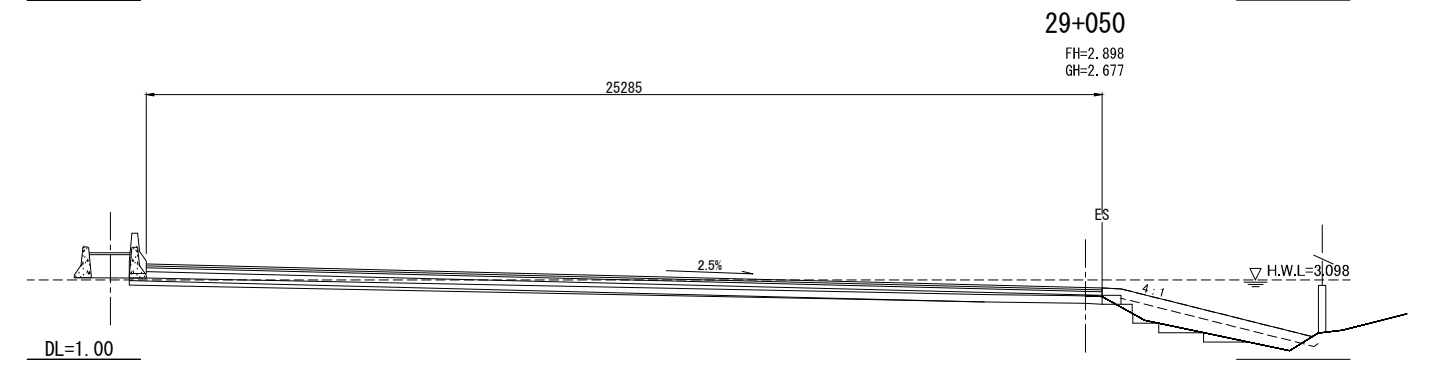
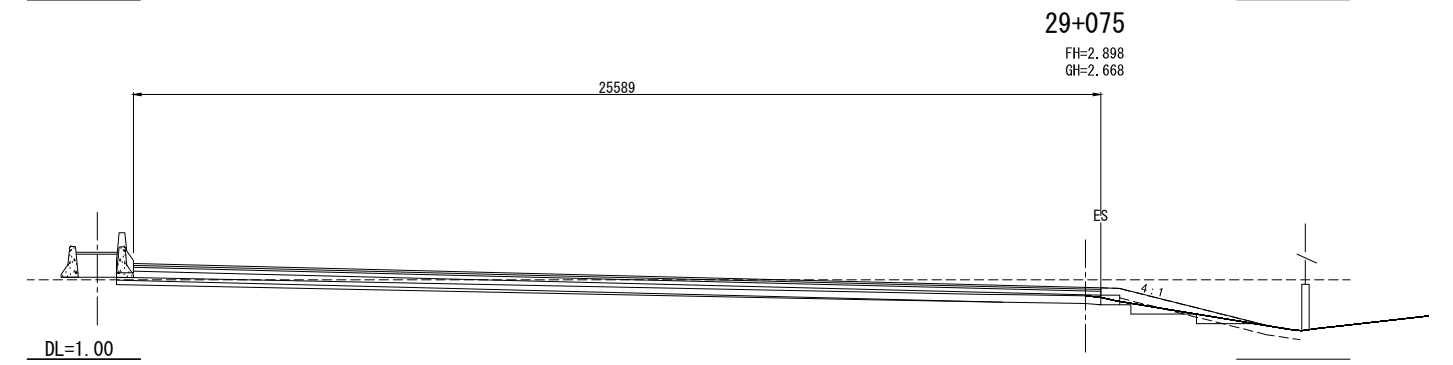
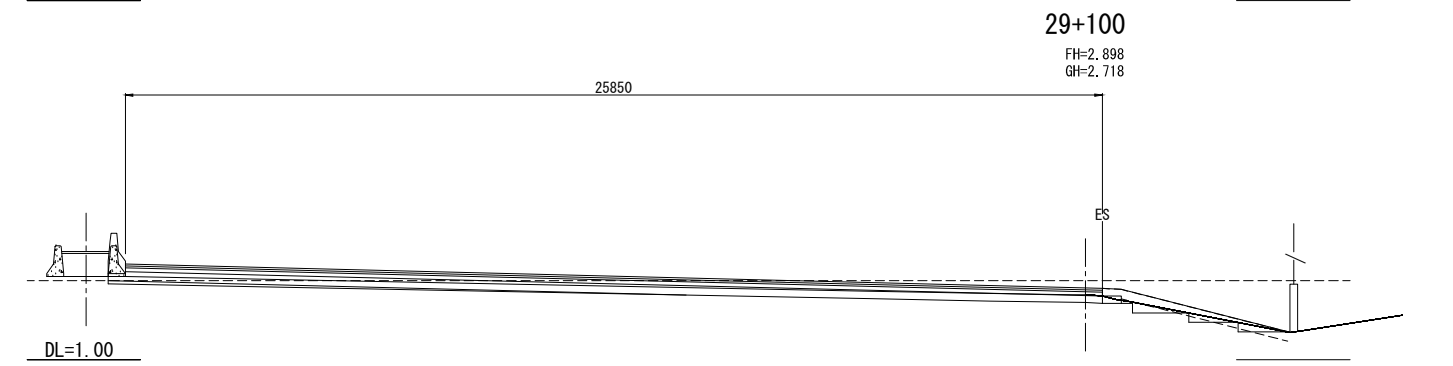
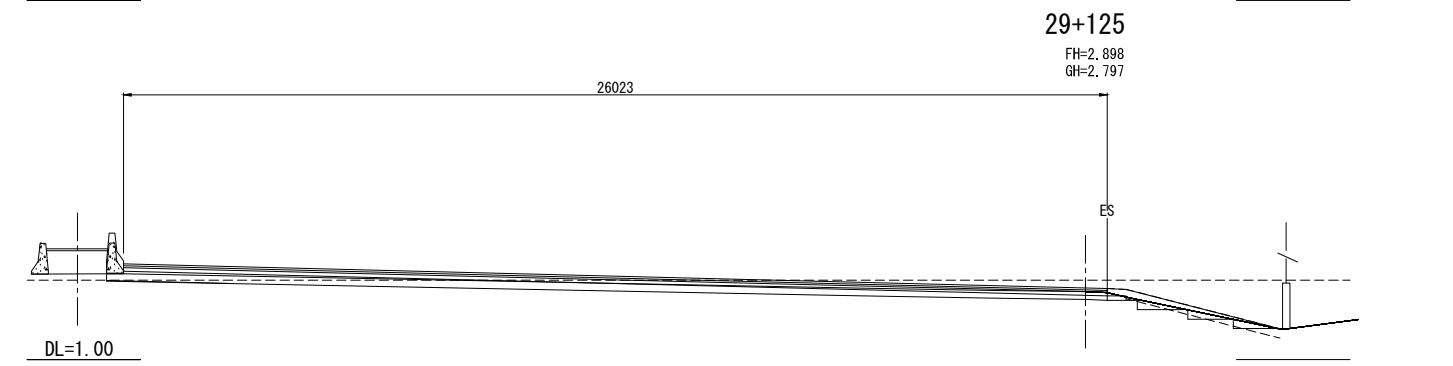
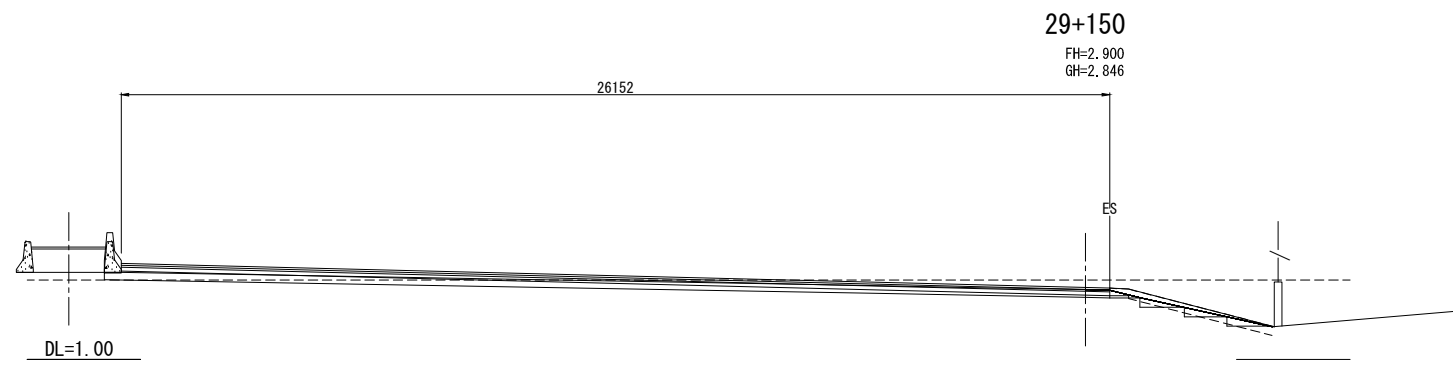
CTI ENGINEERING INTERNATIONAL CO., LTD.
 ORIENTAL CONSULTANTS CO., LTD.
 NIPPON KOEI CO., LTD.
 CTI ENGINEERING CO., LTD.



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 1:100
														DWG. NO. MW-119	SHEET NO. 124



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 1:100
														DWG. NO. MW-120	SHEET NO. 125



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 1:100
														DWG. NO. MW-121	SHEET NO. 126

3. TOLL GATE

DESIGN STANDARD

- STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, AASHTO-1996
- BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE , ACI 318-99
- DOH STANDARD DRAWINGS.

DESIGN LOAD

- LIVE LOAD WALKWAY = 400 KG/M²
- LIVE LOAD OF ROOF = 50 KG/M²

GENERAL

- THE LAYOUT AND LOCATIONS OF GUTTERS, STAIRS, HANDRAILS, DRAIN HOLES, DOWEL SLEEVES AND LIGHTING POLES SHOWN THIS DRAWING ARE ONLY FOR INFORMATION. THE CONTRACTOR HAS TO VERIFY THE CORRECT LOCATIONS, DIMENSIONS AND DETAILS OF ABOVE MENTIONED ELEMENTS TO MEET THE OWNERS REQUIREMENT OR AS SPECIFIED IN THE GENERAL LAYOUT DRAWING.

CONCRETE

DESCRIPTION	CLASS OF CONCRETE	MIN. CEMENT (Kg./M. ³)	MIN. STRENGTH AT 28 DAY** (Kg./CM. ²)
PRESTRESSED CONCRETE STRUCTURES	SPECIAL A	400	420*
ORDINARY REINFORCED CONCRETE	A (1 1/2)	330	300
CONCRETE BORED PILE	A (1 1/2)	330	300
LEAN CONCRETE	C	-	180

* REQUIRED 15 CM. CUBE COMPRESSIVE STRENGTH FOR PRESTRESSED CONCRETE STRUCTURAL AT JACKING FORCE STATE SHALL BE AT LEAST 330 Kg/CM.²

** SPECIFIED FOR 15 CM. CUBE COMPRESSIVE STRENGTH

REINFORCING STEEL

1. DEFORM BARS (DB) SHALL CONFORM TO TIS 24 GRADE SD40.
2. ROUND BARS (RB) SHALL CONFORM TO TIS 20 GRADE SR24.

CUTTING

- BARS SHALL BE SHEARED, FLAME CUTTING SHALL NOT BE PERMITTED UNLESS APPROVED BY THE ENGINEER.

DEVELOPMENT LENGTH

- UNLESS OTHERWISE SPECIFIED, THE DEVELOPMENT LENGTH FOR VARIOUS CASES SHALL BE COMPUTED ACCORDING TO ARTICLE 8.24 TO 8.31 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGE 1996

SPLICING

1. SPLICES, OTHER THAN THOSE SHOWN ON THE DRAWING. MAY BE MADE ONLY WITH THE APPROVAL OF THE ENGINEER
2. SPLICES IN ADJACENT BARS SHALL BE STAGGERED AT LEAST 60 CM. ALL LAP SPLICE LENGTH OF DEFORMED BARS SHALL BE COMPUTED ACCORDING TO ARTICLE 8.32 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES 1996 EDITION. PLAIN ROUND BARS SHALL HAVE A MINIMUM LAP LENGTH OF 60 BAR DIAMETERS WITH HOOKED END.
3. WELDED SPLICES OR OTHER MECHANICAL CONNECTIONS MAY USED IF AUTHORIZED BY THE ENGINEER. A FULL WELDED SPLICE OR A MECHANICAL CONNECTION SHALL DEVELOP IN TENSION OR COMPRESSION AS REQUIRED AT LEAST 125 PERCENT OF THE SPECIFIED YIELD STRENGTH OF THE BAR

BENDING

- BARS SHALL BE COLD BENT AROUND A PIN WITH THE FOLLOWING MINIMUM DIAMETER (D) IN RELATION TO THE DIAMETER OF THE BAR (d):

FOR MAIN REINFORCING BAR

D = 6d FOR RB6, RB9 , DB12 , DB16 , DB20 , DB25

D = 8d FOR DB28 , DB32

FOR STIRRUP AND TIE

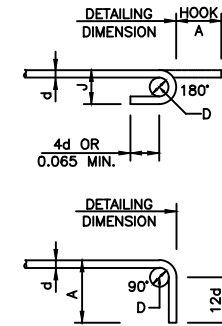
D = 4d FOR DB16 OR SMALLER

D = 6d FOR DB20 , DB25

HOOKS

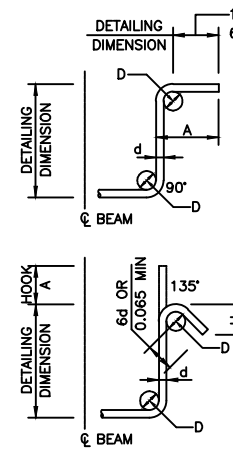
- ALL HOOKS, IF NOT SHOWN ON THE DRAWING, SHALL COMPLY WITH ACI STANDARD HOOK AS SET FORTH FOLLOW :

MAIN REINFORCING BAR HOOK DIMENSIONS (IN METER)



BAR SIZE	180° HOOK		90°HOOK
	A	J	A
RB6	0.11	0.06	0.10
RB9	0.13	0.08	0.15
DB12	0.15	0.10	0.20
DB16	0.20	0.13	0.25
DB20	0.24	0.15	0.30
DB25	0.30	0.20	0.40
DB28	0.40	0.28	0.50
DB32	0.45	0.32	0.55

STIRRUP AND TIE HOOK DIMENSIONS (IN METER)



BAR SIZE	135° HOOK		90°HOOK
	A	H APPROX	A
RB6	0.065	0.05	0.065
RB9	0.09	0.06	0.09
DB12	0.12	0.08	0.12
DB16	0.16	0.10	0.16
DB20	0.20	0.15	0.32
DB25	0.25	0.18	0.40

SPACING

1. CLEAR HORIZONTAL DISTANCE BETWEEN BARS OR PAIR OF BARS SHALL BE AT LEAST 1.5 BAR DIAMETER OR 40 MM.
2. CLEAR VERTICAL DISTANCE BETWEEN INDIVIDUAL BARS SHALL BE AT LEAST 25 MM.
3. CLEAR VERTICAL DISTANCE BETWEEN PAIR OF BARS SHALL BE AT LEAST 40 MM.
4. CLEAR HORIZONTAL AND VERTICAL DISTANCE BETWEEN TENDONS SHALL BE AT LEAST 50 MM.
5. CLEAR HORIZONTAL AND VERTICAL DISTANCE BETWEEN STRANDS SHALL BE AS SHOWN ON THE DRAWINGS.

CONCRETE COVER

UNLESS NOTED ON THE DRAWINGS THE FOLLOWING MINIMUM CONCRETE COVER (FROM FACE OF CONCRETE TO FACE OF BAR) SHALL BE PROVIDED:

- BOTTOM OF ALL PILE CAPS. 7.5 CM.
- SIDE AND TOP OF PILE CAPS. 5 CM.
- SIDE AND TOP OF ALL COLUMNS, PIERS, ABUTMENTS AND WALLS. 4 CM.
- ALL FACES OF BOX CULVERTS AND CHANNEL TRANSITIONS. 4 CM.
- TOP OF ALL DECK SLABS. 4 CM.
- BOTTOM OF ALL DECK SLABS. 2.5 CM.
- ALL FACES OF BARRIERS, CURBS AND PARAPETS. 3 CM.
- TOP OF STAIRS AND STAIR SLABS. 3.5 CM.
- SIDE AND BOTTOM OF STAIRS AND STAIR SLABS. 2.5 CM.
- ALL FACES OF BEAMS, GIRDERS AND DIAPHRAGMS. 4 CM.

CHAMFERING

- ALL EXPOSED CONCRETE CORNERS SHALL BE 2.0 CM. CHAMFER UNLESS OTHERWISE NOTED.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL SHAPES AND PLATES, UNLESS SPECIFIED ON THE DRAWINGS, SHALL BE OF STRUCTURAL STEEL GRADE CONFORMING TO THE REQUIREMENTS STATED IN THE SPECIFICATIONS, WITH A MINIMUM YIELD STRENGTH OF 2400 KG/CM.²
2. ALL STRUCTURAL STEEL PREFABRICATED WORKS INCLUDING THEIR FASTENERS SHALL BE GALVANIZED AS MENTIONED IN THE SPECIFICATIONS. THE WEIGHT OF ZINC COATING SHALL NOT BE LESS THAN 1,100 GRAMS/M.²
3. ALL ANCHOR BOLTS SHALL BE GALVANIZED ONLY AT THE EXPOSED PORTIONS.
4. ALL WELDING SYMBOLS ARE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS).
5. SIZE, INCREMENT LENGTH AND PITCH OF WELD SHOWN ARE IN MILLIMETERS.

MISCELLANEOUS

FOOTING

- TOP OF SPREAD FOOTING SHALL BE AT LEAST 1.00 M. BELOWER THAN THE ORIGINAL GROUND LEVEL.
- ALLOWABLE BEARING CAPACITY OF SOIL UNDER TOLL ISLAND AND COLUMN BASE SHALL NOT BE LESS THAN 5 TONNE/M.²

DRAWINGS

THIS DRAWINGS REFERED TO DOH'S STANDARD DRAWINGS.

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. TG-01	SHEET NO. 127

PAINTING METAL STRUCTURES

1 MATERIAL

a) SHOP COAT (PRIME COAT)

THE SHOP OR PRIME COAT OF PAINT FOR METAL SHALL BE A RED LEAD PAINT AND SHALL CONFORM TO THE SPECIFICATION FOR RED LEAD READY-MIXED PAINT M72. RED LEAD PIGMENT IN THE DRY FORM OR AS A PASTE IN OIL SHALL CONFORM TO ASTM D83. THE 97% GRADE SHALL BE SPECIFIED FOR DRY PIGMENT.

b) FIRST FIELD COAT

WHEN THE FINISHED COAT OF PAINT IS SPECIFIED TO BE ALUMINIUM, BLACK OR GRAPHITE PAINT, OR COLORED GREEN BROWN OR DARK GRAY. THE FIRST FIELD COAT SHALL BE A RED LEAD PAINT AS SPECIFIED FOR THE SHOP COAT, TINTED LIGHT BROWN AS REQUIRED, WITH LAMP BLACK IN THE AMOUNT NOT EXCEED 1/4 POUND PER GALLON OF LINSEED OIL.

WHEN THE FINISHED COAT IS TO BE WHITE OR GRAY, A FIRST FIELD COAT CONFORMING TO THE SPECIFICATION FOR WHITE AND TINTED READY-MIXED PAINT (LEAD AND ZINC BASE), AASHTO M70 MAY BE USED IN LIEU OF RED LEAD PAINT. THE PAINT SHALL BE TINTED AS DIRECTED BY DOH.

c) SECOND FIELD COAT (FINISH COAT)

THE PAINT TO BE USED FOR THE SECOND FIELD COAT SHALL BE AS REQUIRED BY THE SPECIAL PROVISIONS OR AS NOTED ON THE PLANS. IT SHALL CONFORM TO ONE OF THE FOLLOWING AASHTO SPECIFICATIONS:

- (1) FOLIAGE GREEN BRIDGE PAINT, M67
- (2) BLACK BRIDGE PAINT, M68
- (3) ALUMINUM PAINT (PASTE-MIXING VEHICLE), M69
- (4) WHITE AND TINTED READY-MIXED PAINT (LEAD AND ZINC BASE), M70
- (5) RED LEAD (DRY AND PASTE IN OIL) AND PAINT MADE THEREFROM, M70
- (6) RED LEAD READY-MIXED PAINT, M72

IF RED LEAD IS USED FOR THE SECOND FIELD COAT IT SHALL BE TINTED WITH LAMP BLACK AS DIRECTED BY THE ENGINEER.

2 NUMBER OF COATS AND COLOR

ALL STEEL SHALL BE PAINTED ONE SHOP OR PRIME COAT, AND WITH NOT LESS THAN TWO FIELD COATS AS SPECIFIED ABOVE. THE COLOR SHALL BE AS SPECIFIED OR DETERMINED BY THE ENGINEER. THE COATS SHALL BE SUFFICIENTLY DIFFERENT IN COLOR TO PERMIT DETECTION OF INCOMPLETE APPLICATION.

3 MIXING OF PAINT

PAINT SHALL BE FACTORY MIXED. ALL PAINT SHALL ALSO BE FIELD MIXED BEFORE APPLYING IN ORDER TO KEEP THE PIGMENTS IN UNIFORM SUSPENSIONS.

4 WEATHER CONDITIONS

PAINT SHALL NOT BE APPLIED WHEN THE AIR TEMPERATURE IS BELOW 40°F OR WHEN THE AIR IS MISTY, OR WHEN, IN THE OPINION OF THE ENGINEER, CONDITIONS ARE OTHERWISE UNSATISFACTORY FOR THE WORK. IF SHALL NOT BE APPLIED UPON DAMP OR FROSTED SURFACES.

5 APPLICATION

PAINTING SHALL BE DONE IN A NEAT AND WORKMANLIKE MANNER. PAINT MAY BE APPLIED WITH HAND BRUSHES OR BY SPRAYING EXCEPT THAT ALUMINIUM PAINT PREFERABLY SHALL BE APPLIED BY SPRAYING. BY EITHER METHOD THE COATING OF PAINT APPLIED SHALL BE SMOOTHLY AND UNIFORMLY SPREAD SO THAT NO EXCESS PAINT WILL COLLECT AT ANY POINT. IF WORKDONE BY SPRAYING IS NOT SATISFACTORY TO THE ENGINEER, HAND BRUSHING WILL BE REQUIRED.

WELDING

1 WELDING OF STEEL STRUCTURES SHALL BE IN GENERAL ACCORDANCE WITH THE SPECIFICATIONS FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY AWS D1.1.

2 WELDING SHALL BE CARRIED OUT WITH ELECTRODES OF MANUAL SHIELDED METAL-ARC WELDING (SMAW). SUCH ELECTRODES SHALL CONFORM TO THE LOW-HYDROGEN CLASSIFICATION REQUIREMENTS OF THE LATEST EDITION OF THE AMERICAN WELDING SOCIETY'S FILLER METAL SPECIFICATION AWS A5.1 OR AWS A5.5 AND BE CAPABLE OF PRODUCING WELD METAL HAVING AN IMPACT STRENGTH OF AT LEAST 20 FT-LBS AT 0 °F.

3 ELECTRODES CONFORMING TO AWS A5.1 SHALL BE PURCHASED IN HERMETICALLY SEALED CONTAINERS OR SHALL BE DRIED FOR AT LEAST TWO HOURS BETWEEN 450-500 °F BEFORE THEY ARE USED. ELECTRODES CONFORMING TO AWS A5.5 SHALL BE PURCHASED IN HERMETICALLY SEALED CONTAINERS OR SHALL BE DRIED ONE HOUR ± 15 MINUTES AT A TEMPERATURE OF 800 °F ± 25 °F BEFORE BEING USED.

4 INSPECTION OF WELDS IN SPECTION OF WELDS IN ALL STRUCTURAL STEELS MAY BEGIN IMMEDIATELY AFTER THEY ARE COMPLETED. IN ADDITION TO INSPECTION AS REQUIRED BY AWS D1.1 ALL WELDS SHALL BE VISUALLY EXAMINED. PROCEDURES TECHNIQUE AND STANDARDS OF ACCEPTANCE SHALL BE IN ACCORDANCE WITH AWS D.1.

5 STUD WELDING

a) THE AREAS TO WHICH STUDS ARE TO BE WELDED SHALL BE FREE OF SCALE, RUST, MOISTURE, OR OTHER INJURIOUS MATERIAL TO THE EXTENT NECESSARY TO OBTAIN SATISFACTORY WELDS.

b) FOR FILLET WELDS, THE STUD BASE SHALL BE PREPARED SO THAT THE BASE OF THE STUD FITS AGAINST THE BASE METAL. THE STUD BASE SHALL NOT BE PAINTED, GALVANIZED, OR CADMIUM-PLATED PRIOR TO WELDING.

6 MINIMUM SIZE OF FILLET WELDS ARE AS FOLLOWS :

MATERIAL THICKNESS OF THICKER PART JOINED, t (MM.)	MINIMUM SIZE OF FILLET WELD, a (MM.)	MAXIMUM SIZE OF FILLET WELD, a (MM.)
t ≤ 6	3	6
6 < t ≤ 13	5	t-2
13 < t ≤ 19	6	t-2
19 < t	8	t-2

7 MINIMUM THICKNESS OF GROOVE WELDS ARE AS FOLLOWS :

MATERIAL THICKNESS OF THICKER PART JOINED, t (MM.)	EFFECTIVE MINIMUM THICKNESS, (MM.)
t ≤ 6	3
6 < t ≤ 13	5
13 < t ≤ 19	6
19 < t < 38	8
38 < t < 57	10
57 < t < 150	13
150 < t	16






8 WELDING TO CONNECT MAJOR STRUCTURAL PARTS SHALL BE FILLET WELD TO THE FULL LENGTH OF COVER PLATE AND FULL DEPTH GUTT JOINT GROOVE WELD.

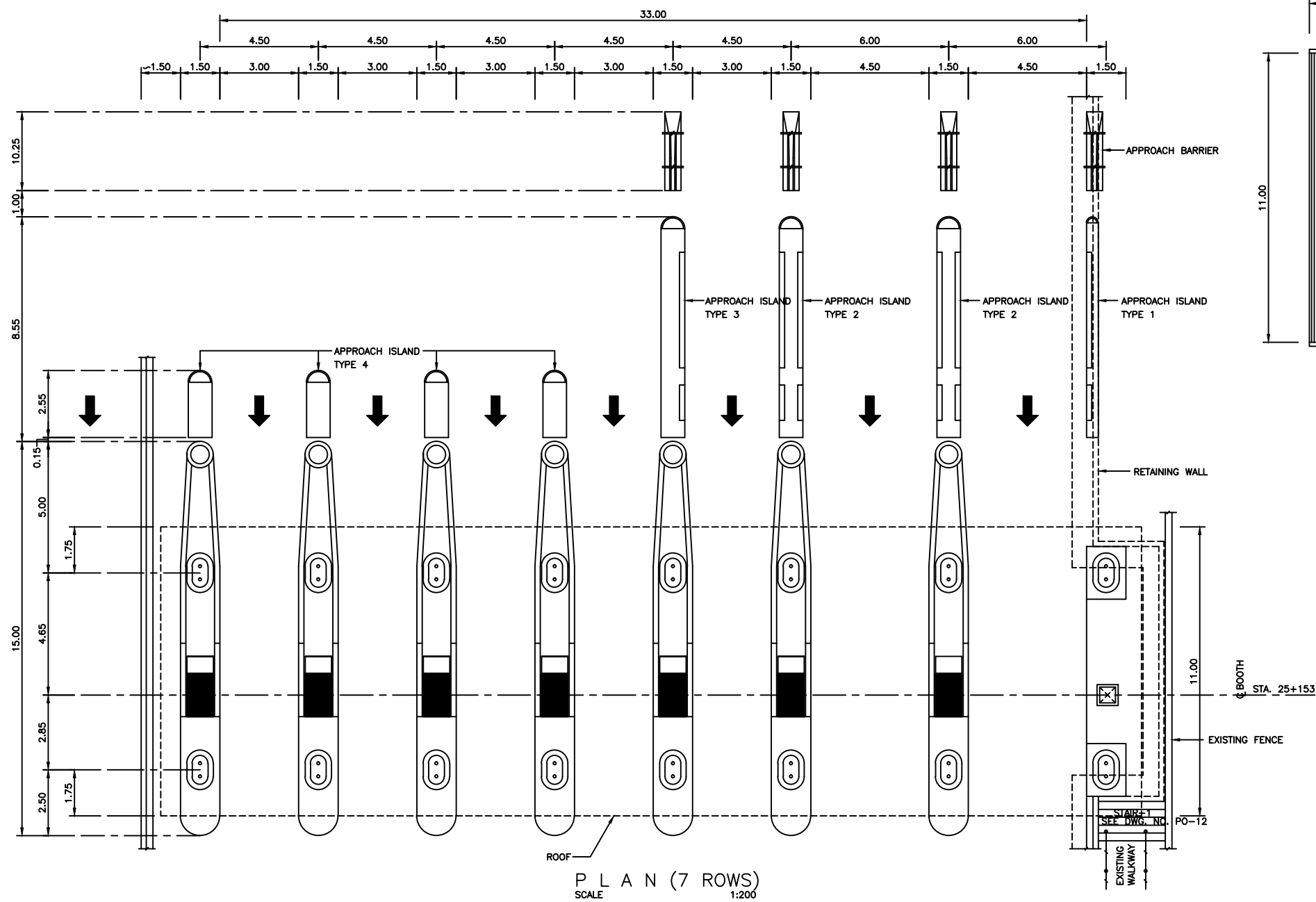
9 GROOVE WELD SHALL BE SINGLE V-SHAPE, FOR METAL THICKNESS LESS THAN AND EQUAL TO 6 MM. THICKER PART SHALL BE DOUBLE V-SHAPE.

10 SEAL WELD SHALL BE REQUIRED IN ORDER TO COMBINE THE FUNCTIONS OF SEALING AND STRENGTH.

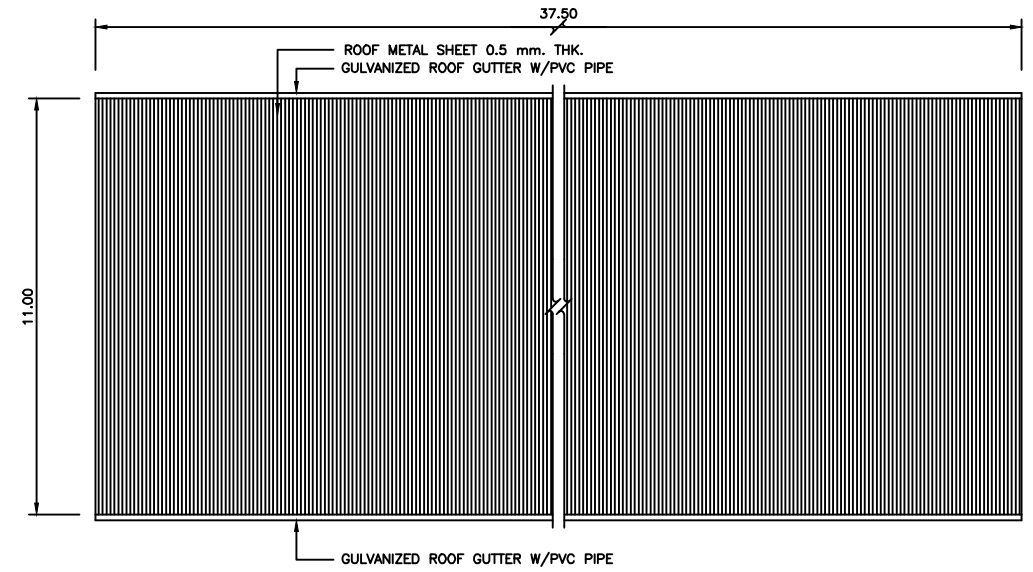
OTHER REQUIREMENTS

IN CASE OF NOT SPECIFIED IN THIS NOTE. AASHTO'S STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES SHALL BE APPLIED.

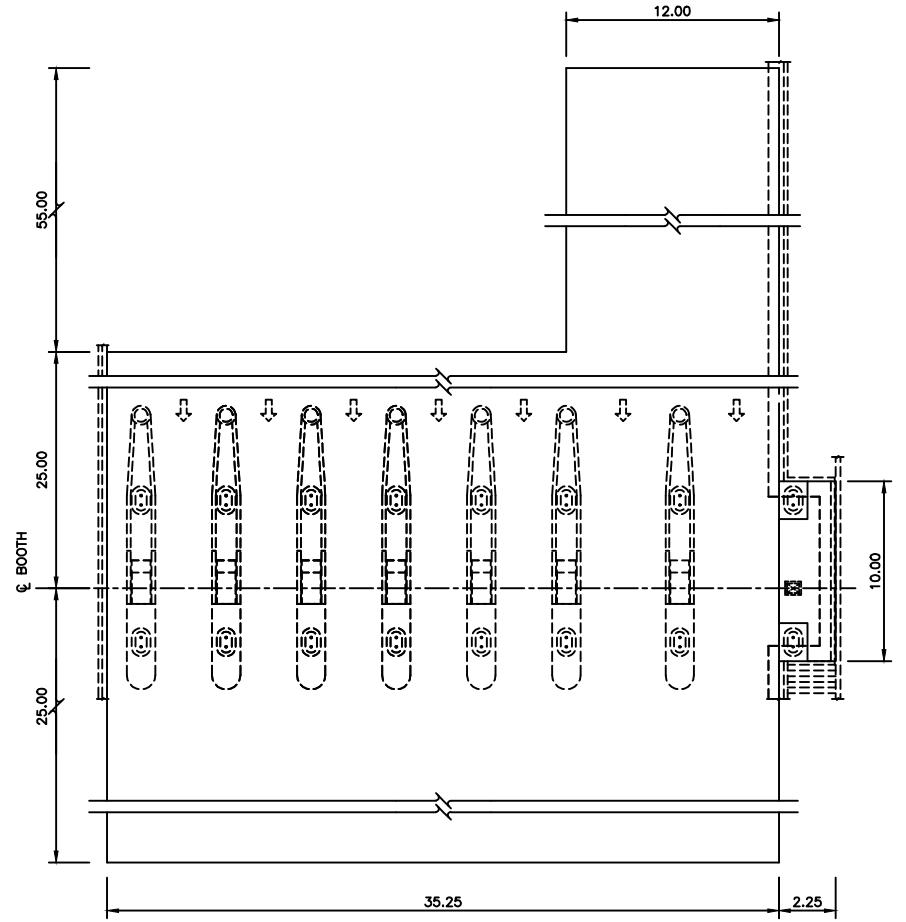
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	 KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	 CTI ENGINEERING INTERNATIONAL CO., LTD.  ORIENTAL CONSULTANTS CO., LTD.  NIPPON KOEI CO., LTD.  CTI ENGINEERING CO., LTD.	DESIGNED BY	CHECKED BY	DATE :	SCALE :
									TOLL GATE	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	-
												DWG. NO.	TG-02	SHEET NO.	128	



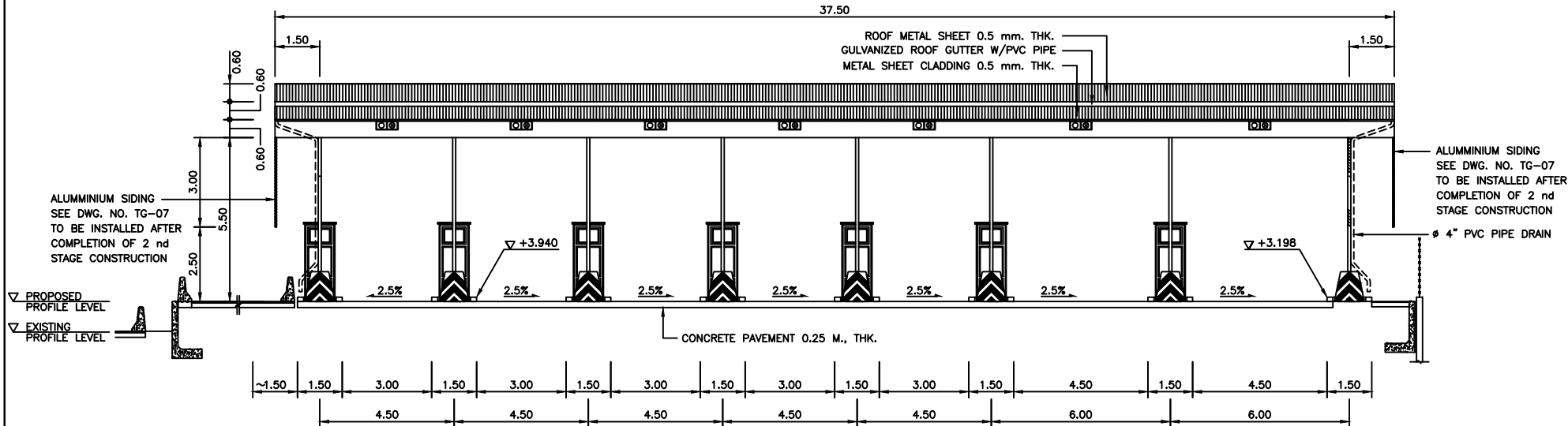
P L A N (7 R O W S)
SCALE 1:200



ROOF PLAN (7 R O W S)
SCALE 1:200

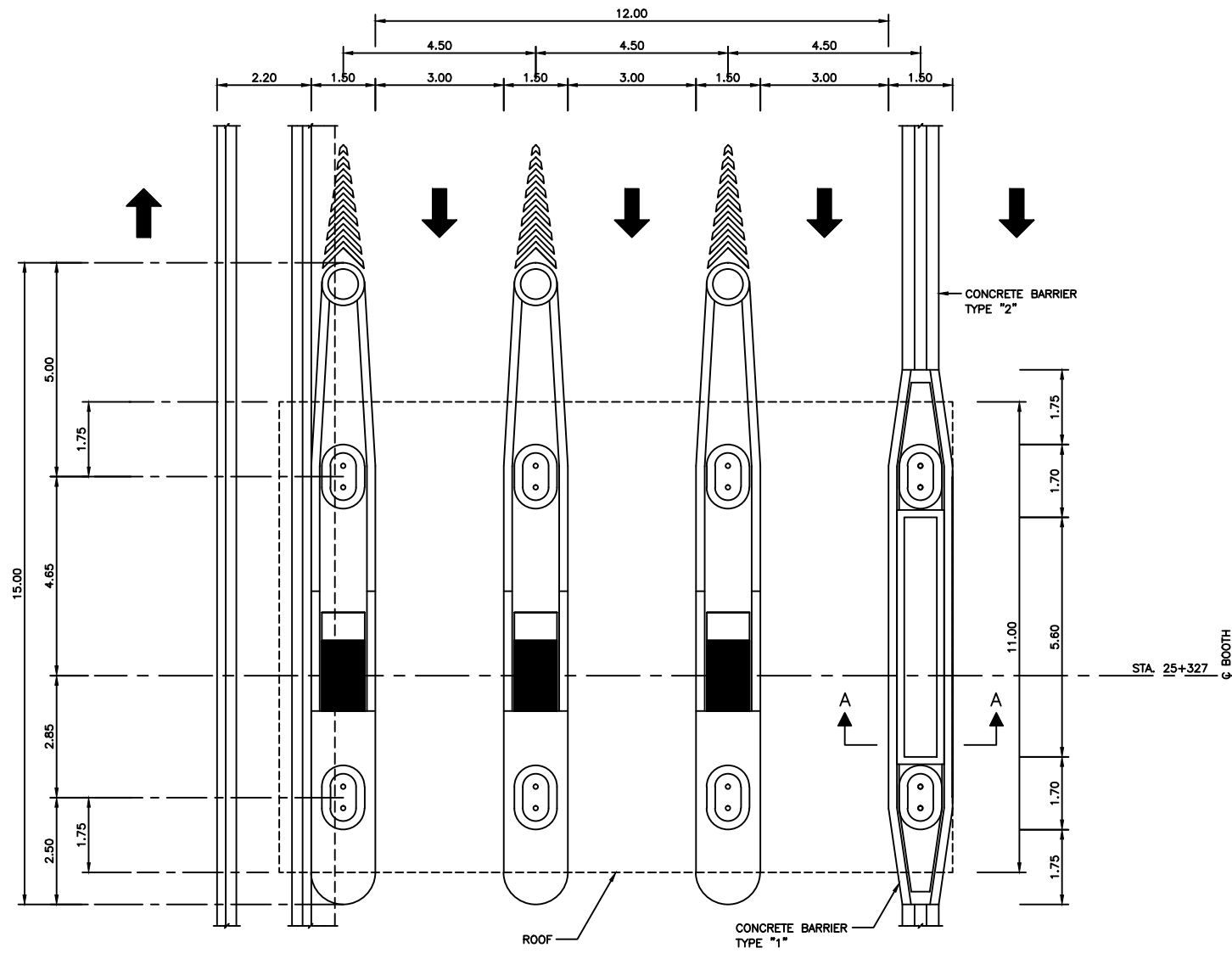


PAVEMENT LAYOUT (7 R O W S)
SCALE 1:400

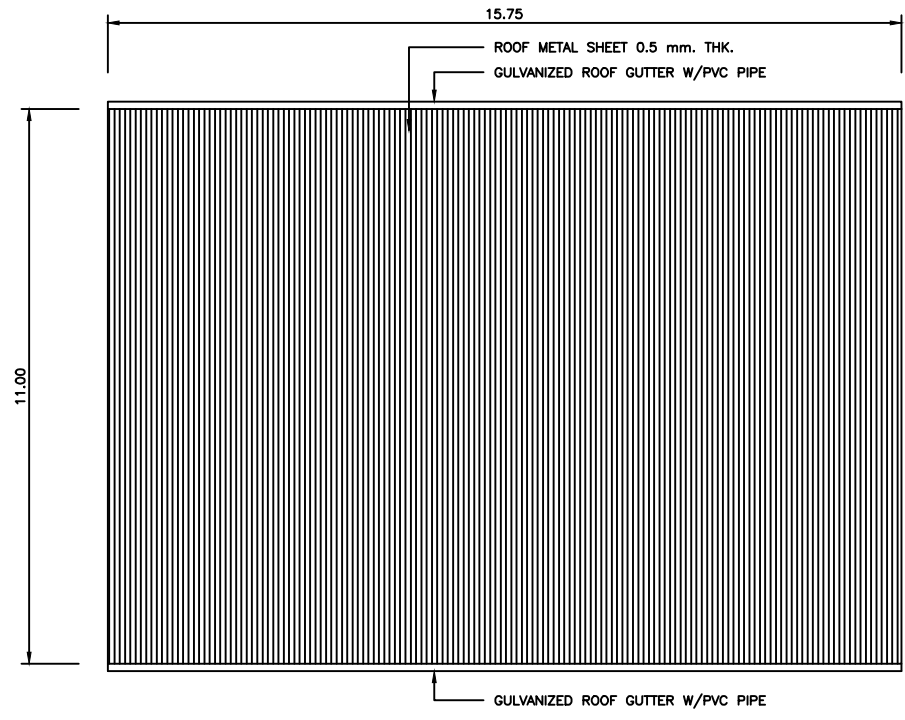


E L E V A T I O N (7 R O W S)
SCALE 1:200

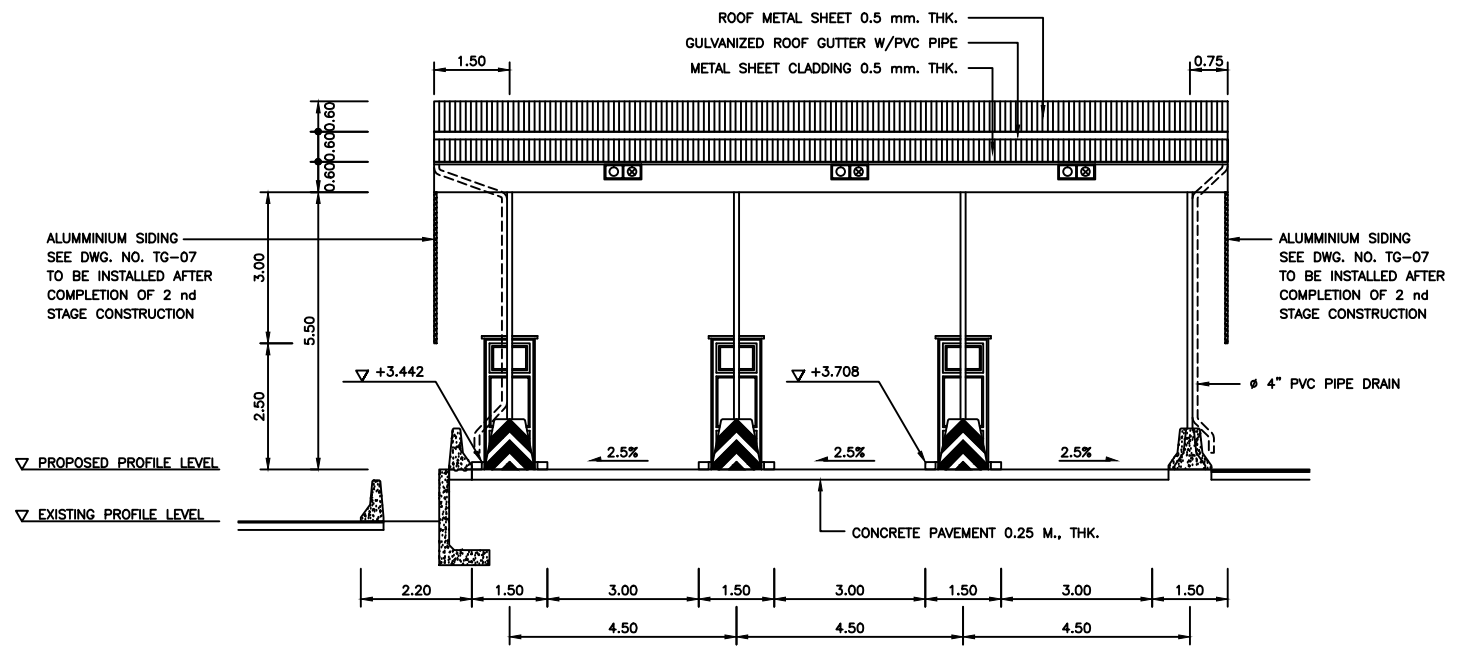
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9 TOLL GATE	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory 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
															DWG. NO. TG-03	SHEET NO. 129



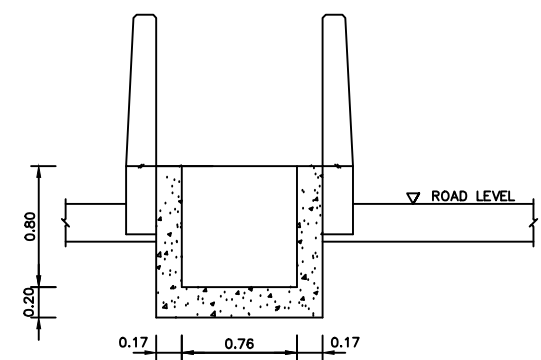
PLAN (3 ROWS)
SCALE 1:150



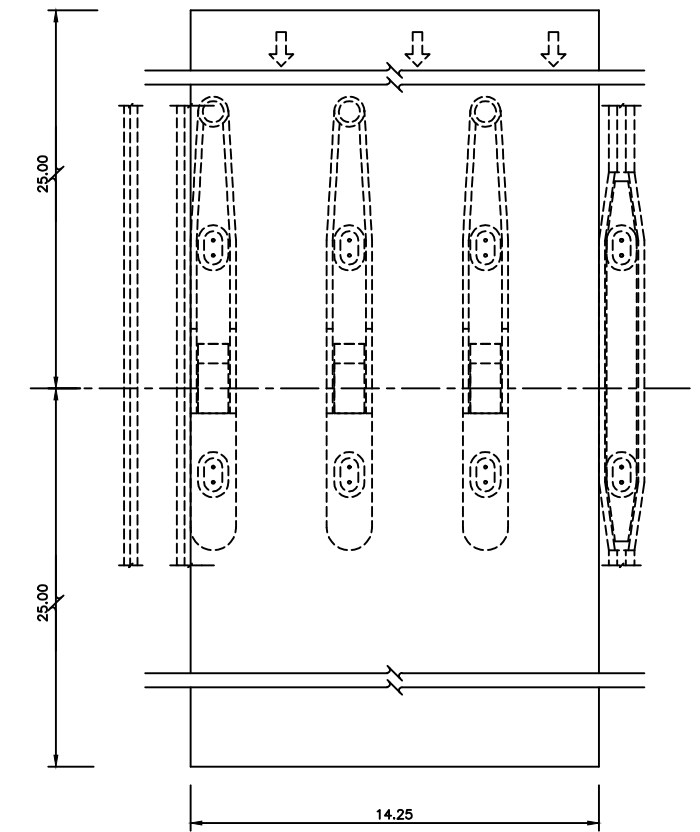
ROOF PLAN (3 ROWS)
SCALE 1:150



ELEVATION (3 ROWS)
SCALE 1:150



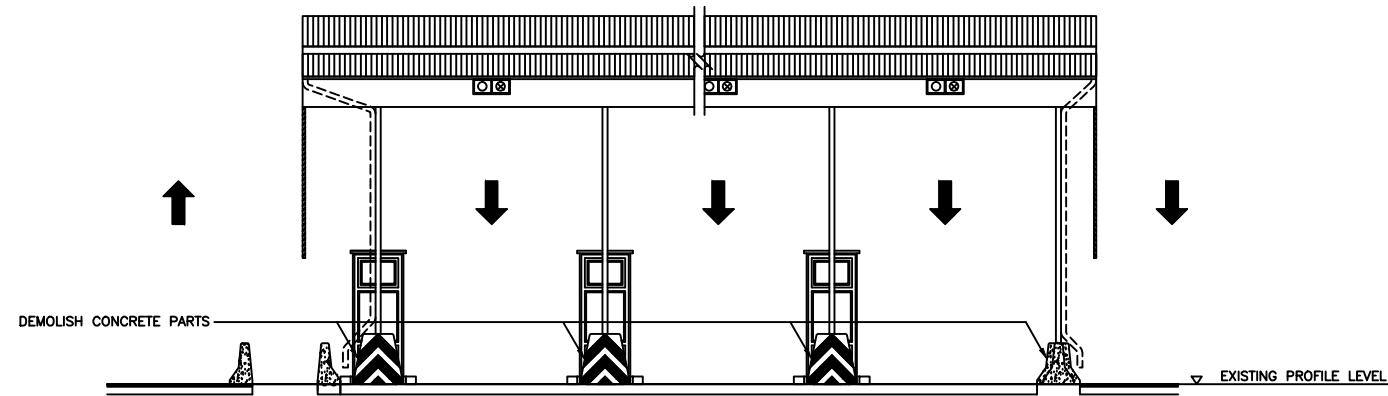
SECTION A-A
SCALE 1:50



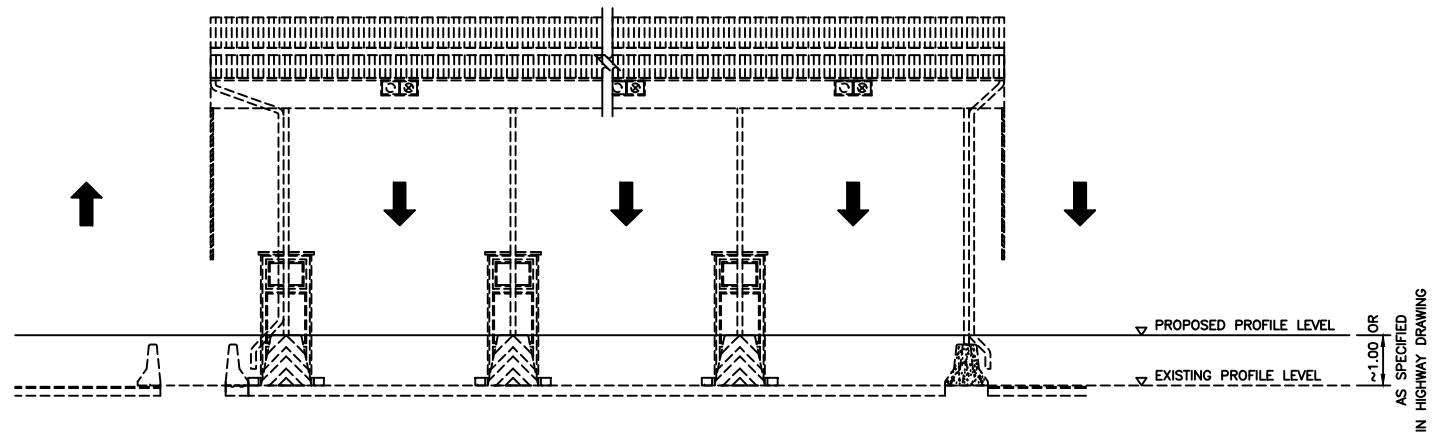
PAVEMENT LAYOUT (3 ROWS)
SCALE 1:250

REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH 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
									TOLL GATE	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.	TG-04	SHEET NO.	130	

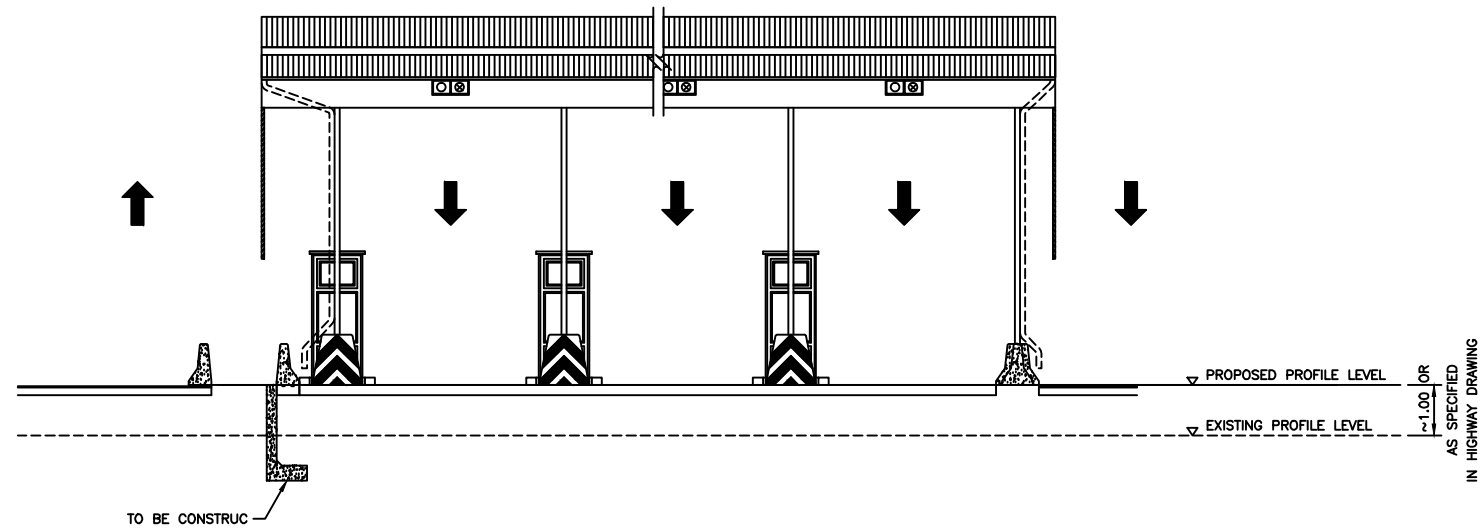
1. EXISTING TOLL GATE TO BE REMOVED.



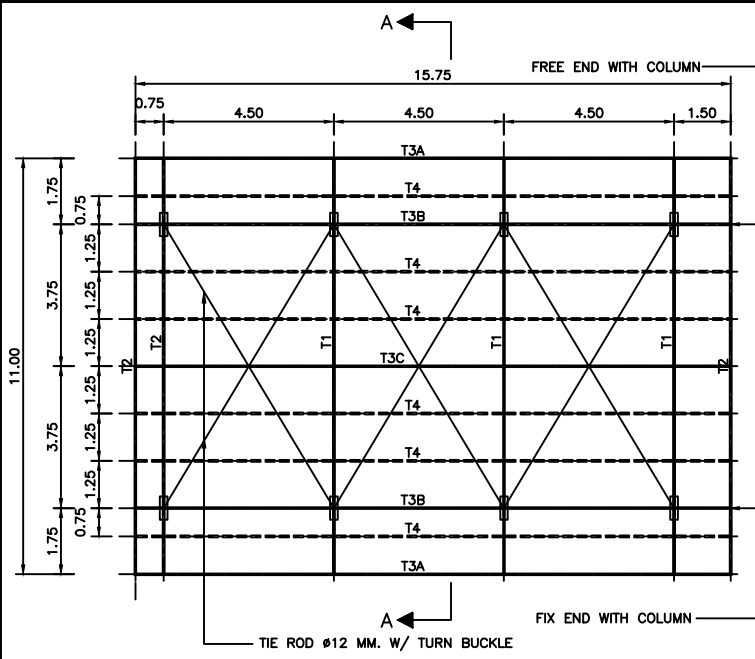
2. FILL AND COMPACT ROADWAY TO NEW ELEVATION AFTER REMOVED ALL EXISTING TOLL GATE.



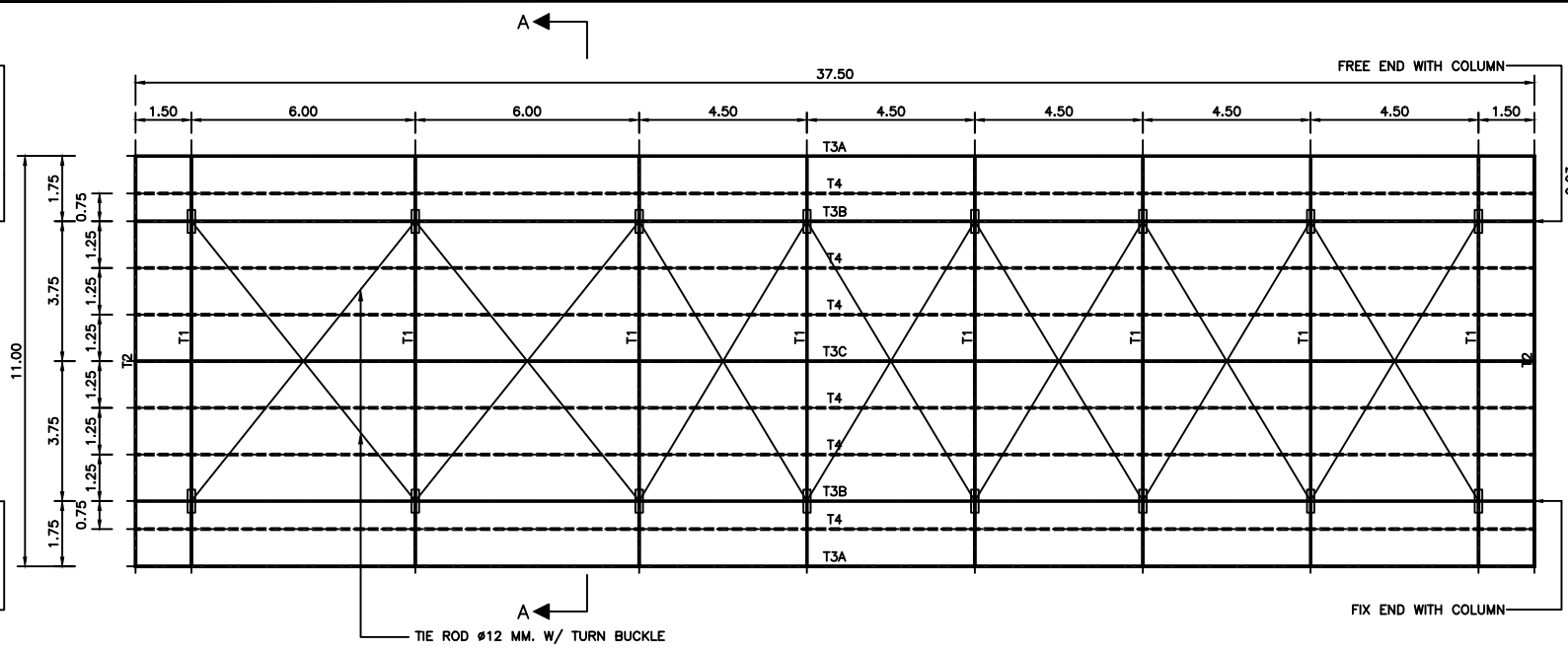
3. CONSTRUCT NEW TOLL GATE BY USING THE FOLLOWING DRAWINGS.



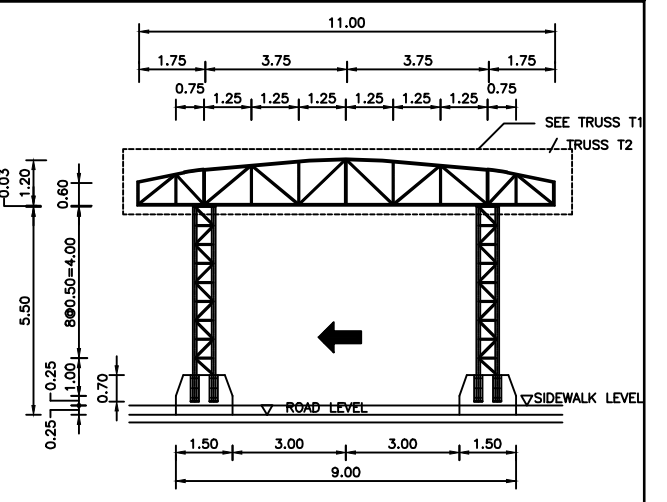
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9 TOLL GATE	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project 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
															DWG. NO. TG-05	SHEET NO. 131



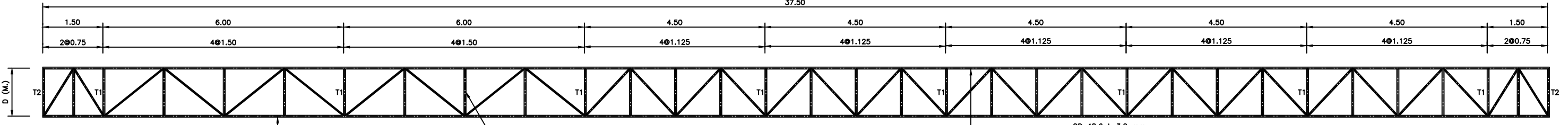
ROOF PLAN (3 ROWS)
SCALE 1:100



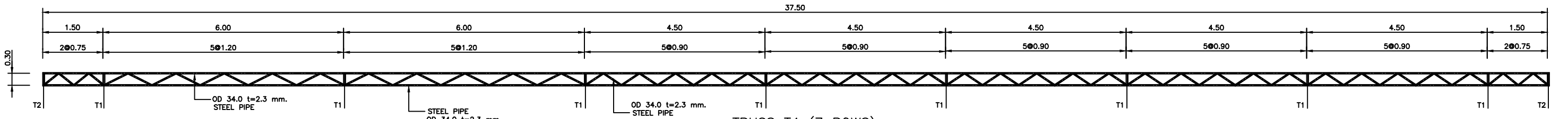
ROOF PLAN (7 ROWS)
SCALE 1:100



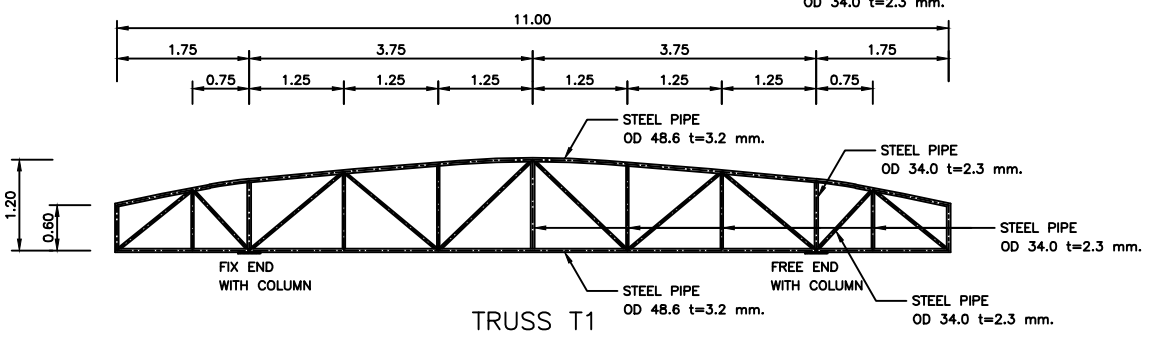
SECTION A-A
SCALE 1:100



TRUSS T3 A,B,C (7 ROWS)
SCALE 1:50

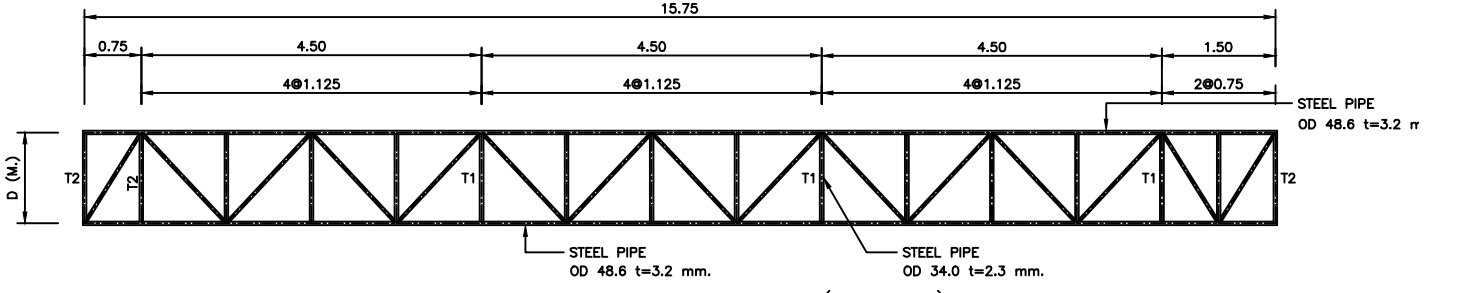


TRUSS T4 (7 ROWS)
SCALE 1:50

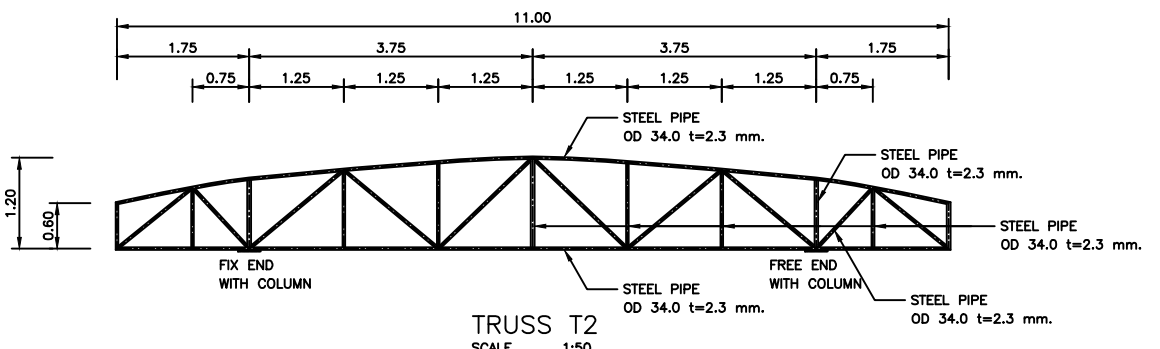


TRUSS T1
SCALE 1:50

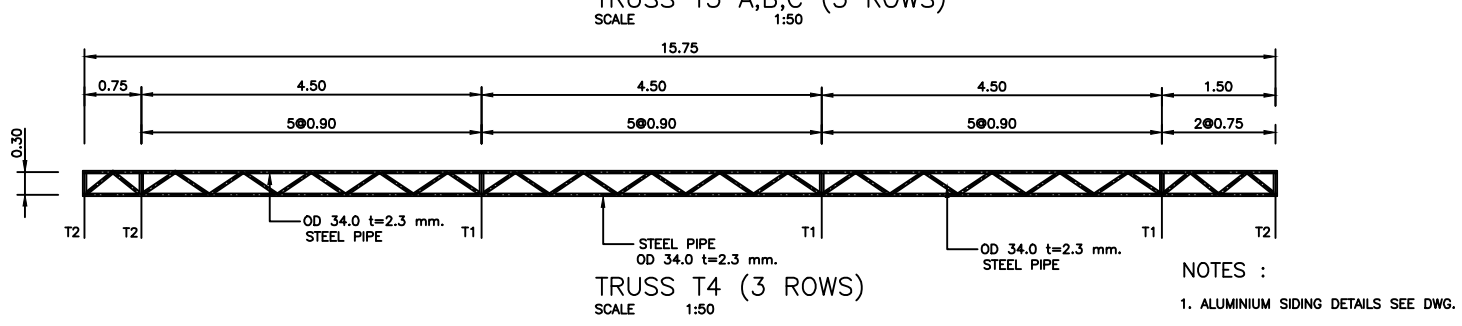
TRUSS	D (M.)
T3A	0.60
T3B	0.922
T3C	1.20



TRUSS T3 A,B,C (3 ROWS)
SCALE 1:50



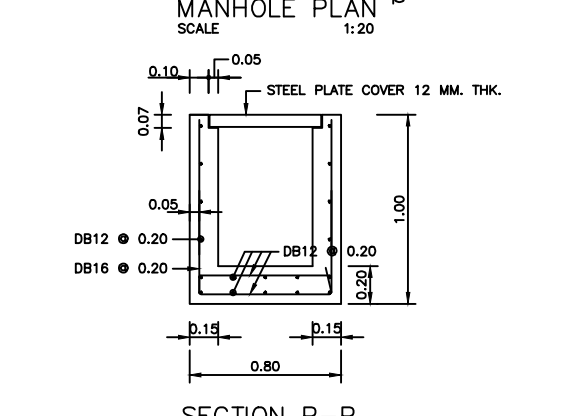
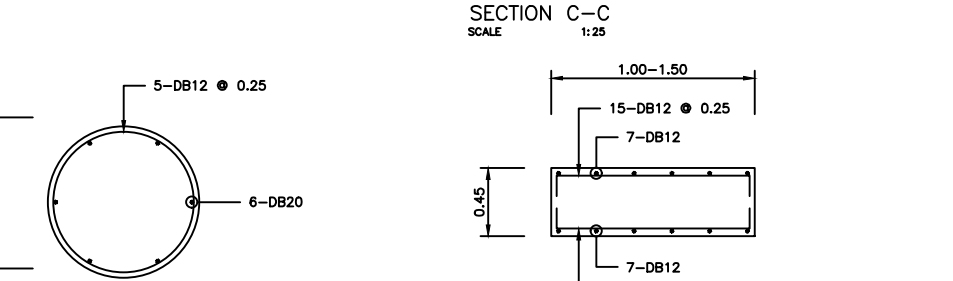
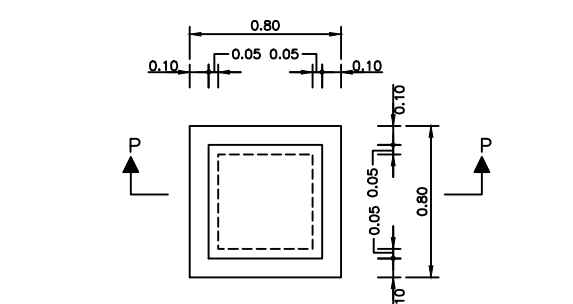
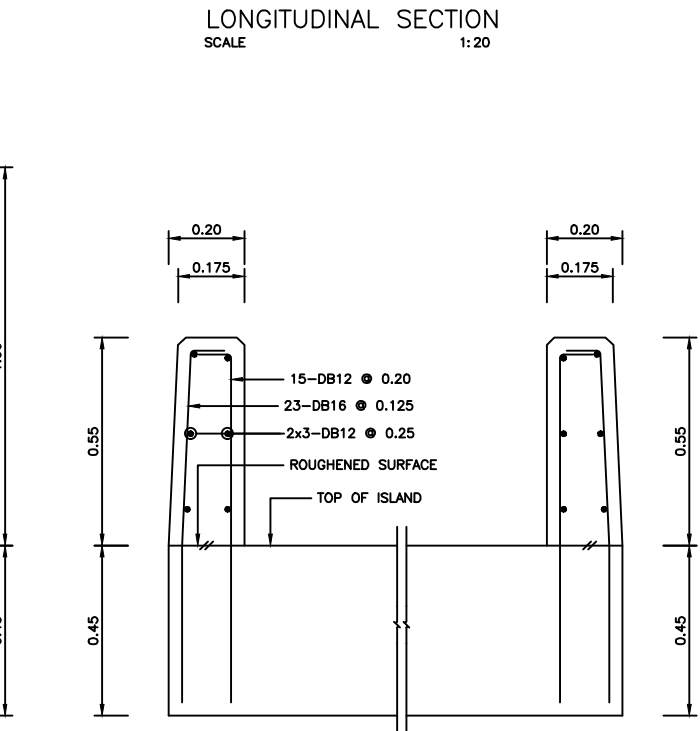
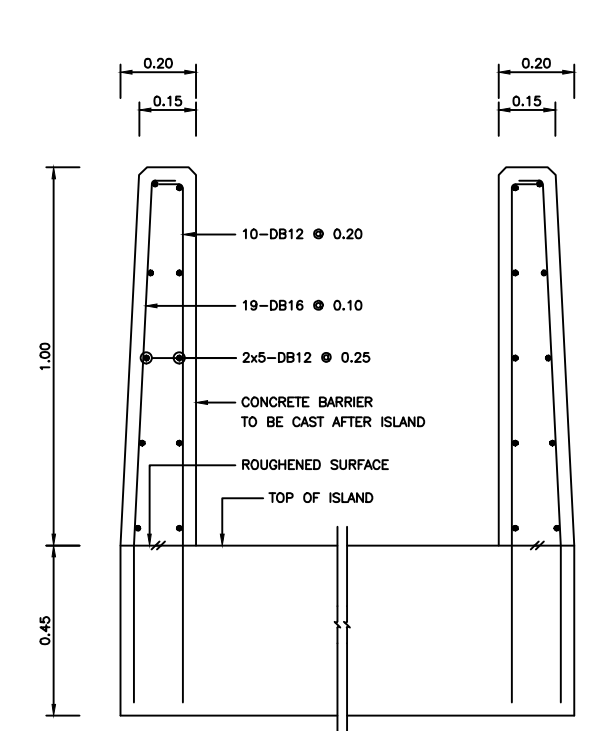
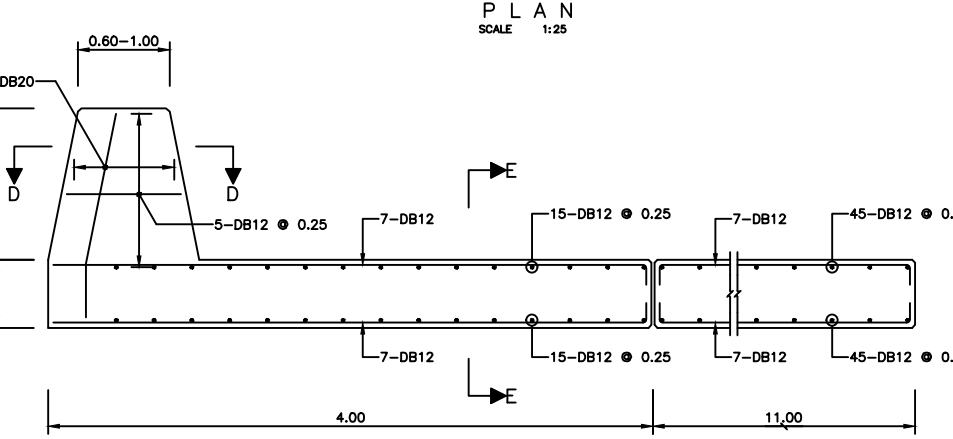
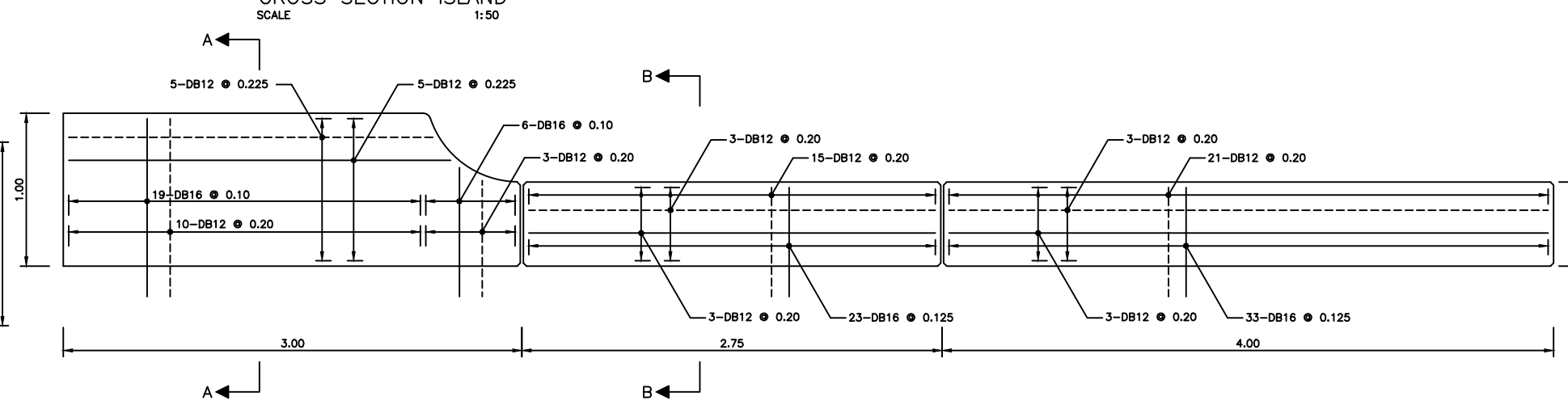
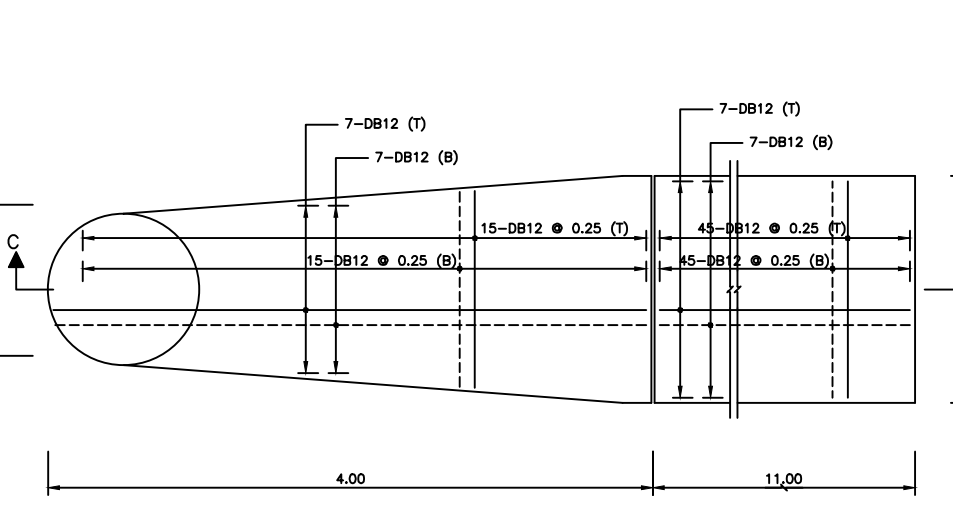
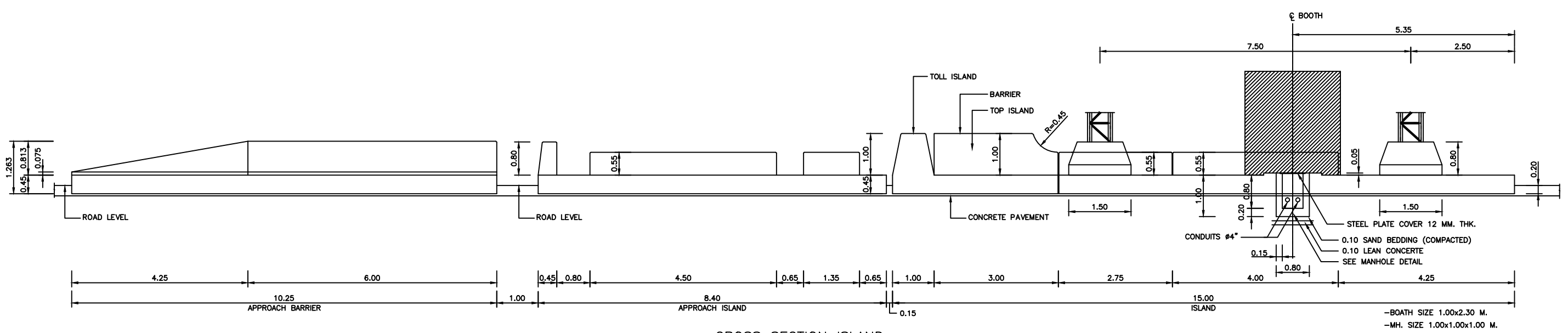
TRUSS T2
SCALE 1:50



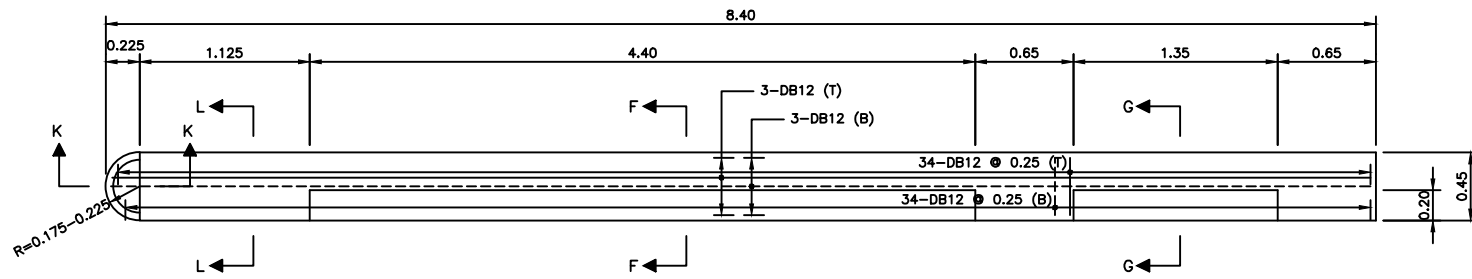
TRUSS T4 (3 ROWS)
SCALE 1:50

NOTES :
1. ALUMINIUM SIDING DETAILS SEE DWG. TG-07

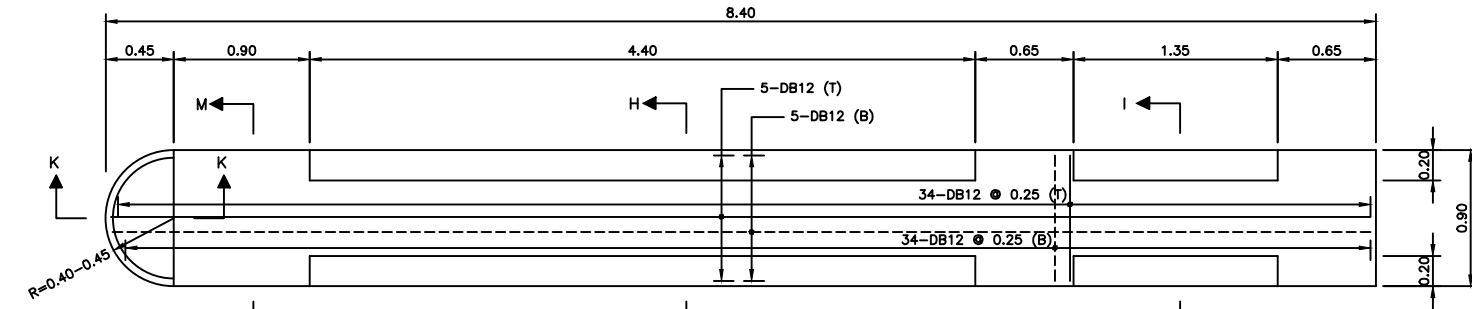
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	DESIGNED BY	CHECKED BY	DATE :	SCALE :
		CHECKED	DATE	CHECKED	DATE									AUGUST 2012	AS SHOWN
														DWG. NO.	SHEET NO.
												SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	TG-06	132



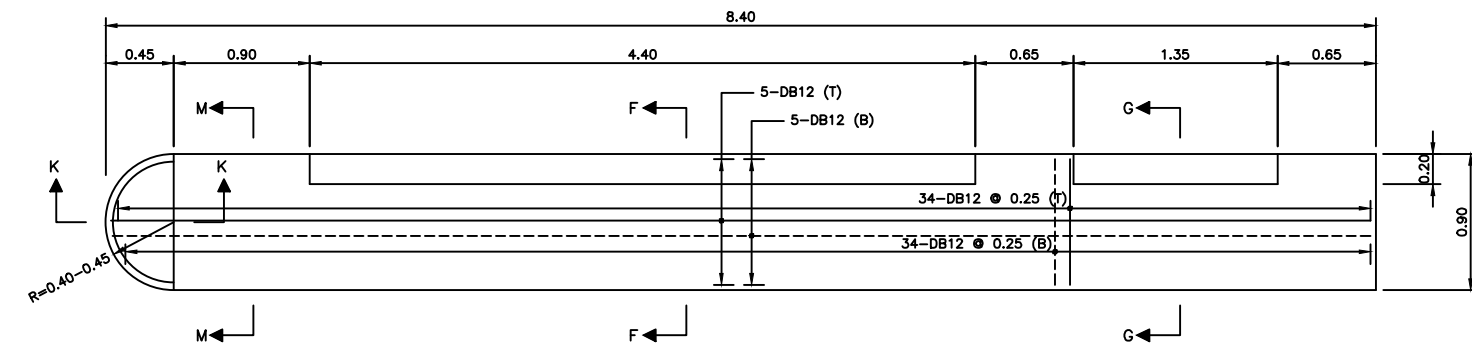
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	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
									TOLL GATE						DWG. NO. TG-08	SHEET NO. 134



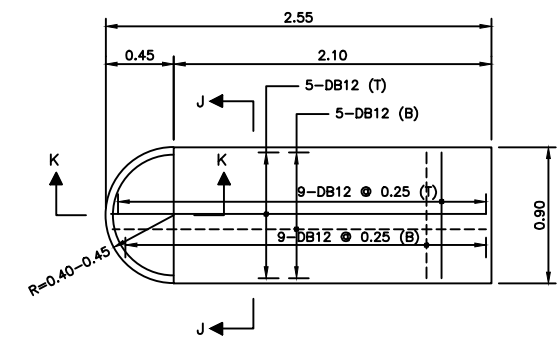
APPROACH ISLAND TYPE 1 PLAN
SCALE 1:25



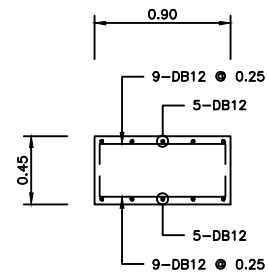
APPROACH ISLAND TYPE 2 PLAN
SCALE 1:25



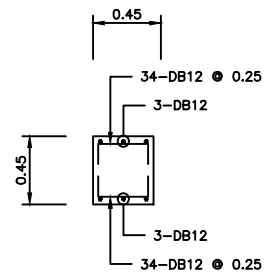
APPROACH ISLAND TYPE 3 PLAN
SCALE 1:25



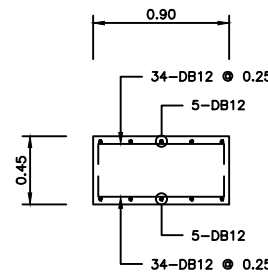
APPROACH ISLAND TYPE 4 PLAN
SCALE 1:25



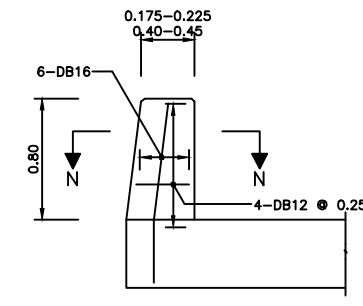
SECTION J-J
SCALE 1:25



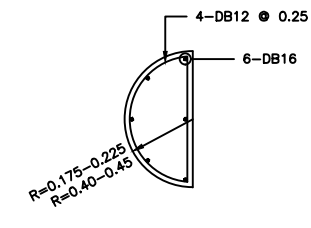
SECTION L-L
SCALE 1:25



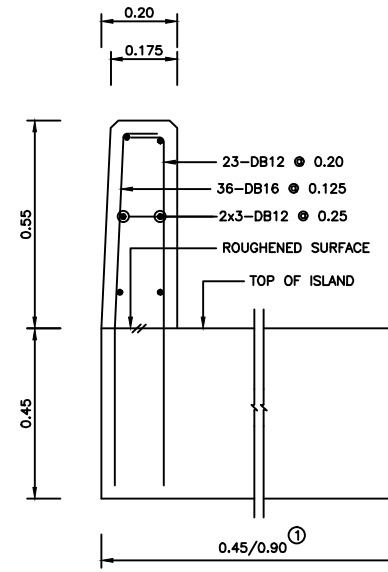
SECTION M-M
SCALE 1:25



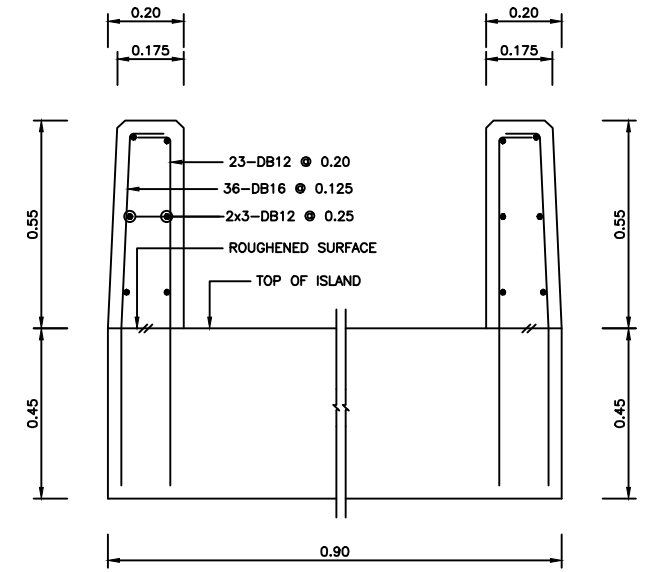
SECTION K-K
SCALE 1:20



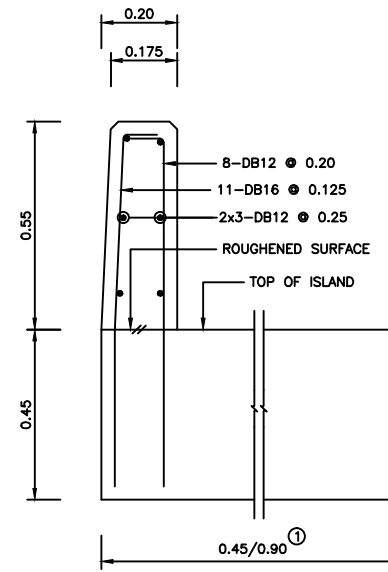
SECTION N-N
SCALE 1:20



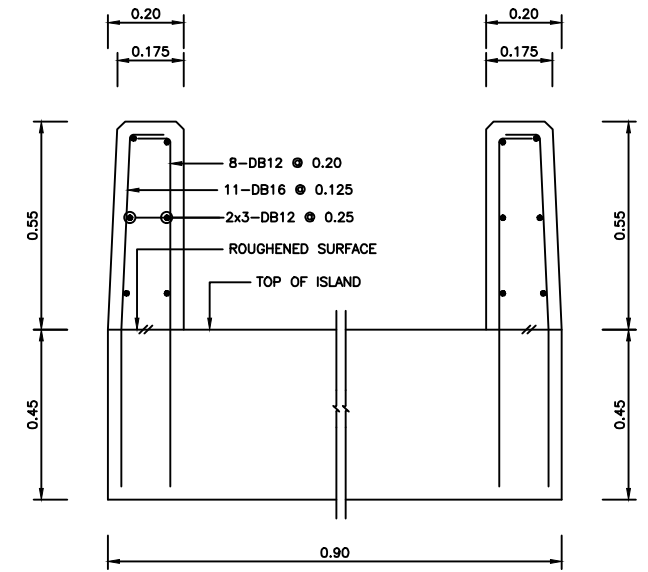
SECTION F-F
SCALE 1:10



SECTION H-H
SCALE 1:10



SECTION G-G
SCALE 1:10

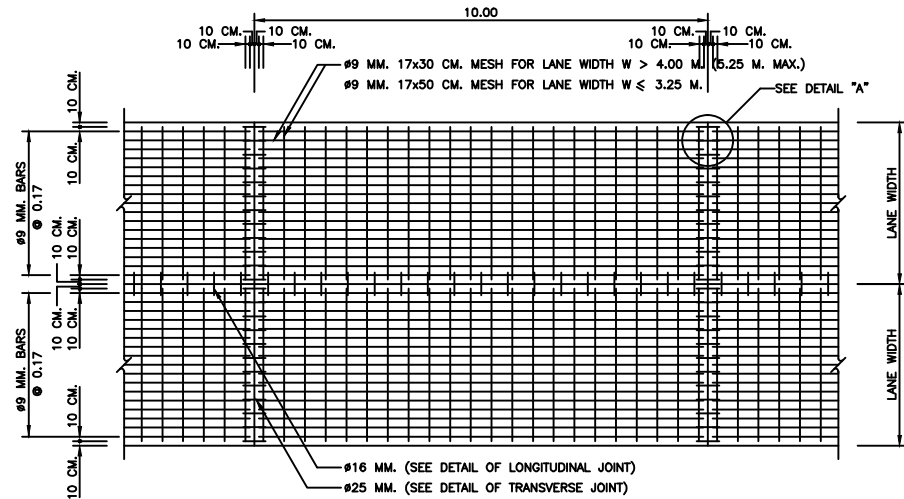


SECTION I-I
SCALE 1:10

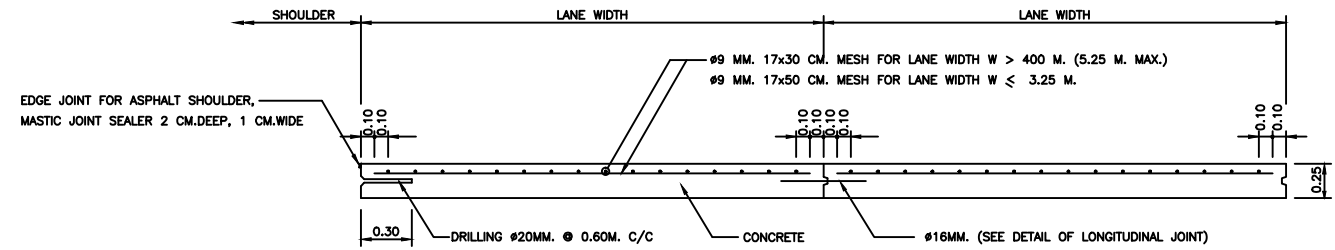
NOTE

① APPROACH ISLAND TYPE 1/APPROACH ISLAND TYPE 4.

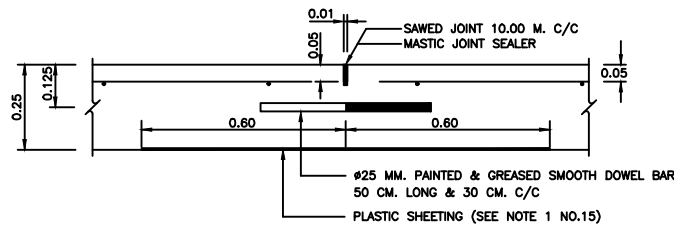
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	<p>KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS</p>	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	<p>CTI ENGINEERING INTERNATIONAL CO., LTD. ORIENTAL CONSULTANTS CO., LTD. NIPPON KOEI CO., LTD. CTI ENGINEERING CO., LTD.</p>	DESIGNED BY	CHECKED BY	DATE	SCALE
									TOLL GATE	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.	TG-09	SHEET NO.	135



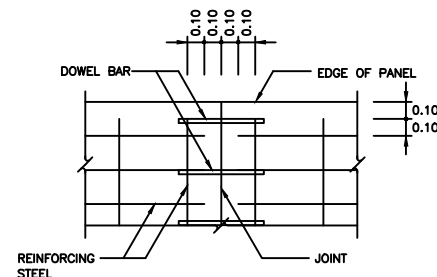
PLAN OF REINFORCED CONCRETE PAVEMENT
SCALE 1:75



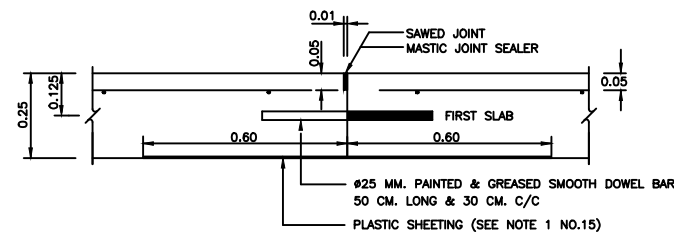
REINFORCEMENT DETAIL OF CONCRETE PAVEMENT CROSS-SECTION
SCALE 1:25



DETAIL OF CONTRACTION JOINT (J-4, J-5)

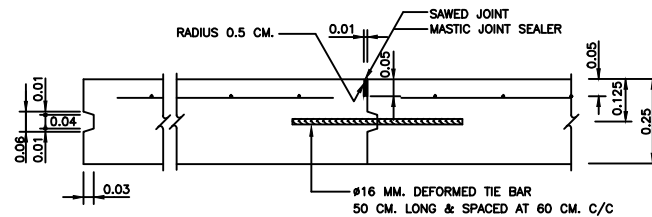


DETAIL " A "
SCALE 1:20

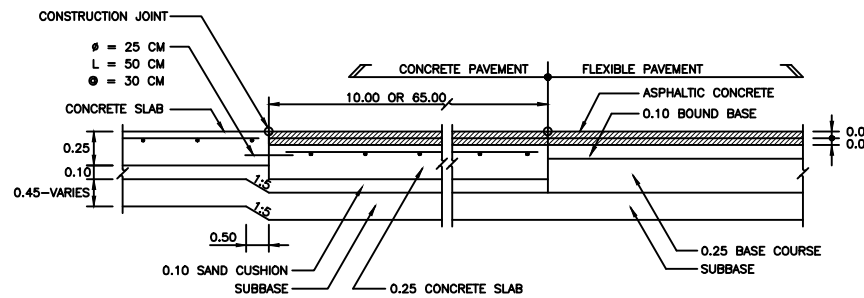


DETAIL OF CONSTRUCTION JOINT (J-2)

DETAIL OF TRANSVERSE JOINTS
SCALE 1:10



DETAIL OF LONGITUDINAL JOINT (J-1, J-3)
SCALE 1:10



DETAIL OF JOINT BETWEEN CONCRETE PAVEMENT & FLEXIBLE PAVEMENT
SCALE

NOTES 1 :

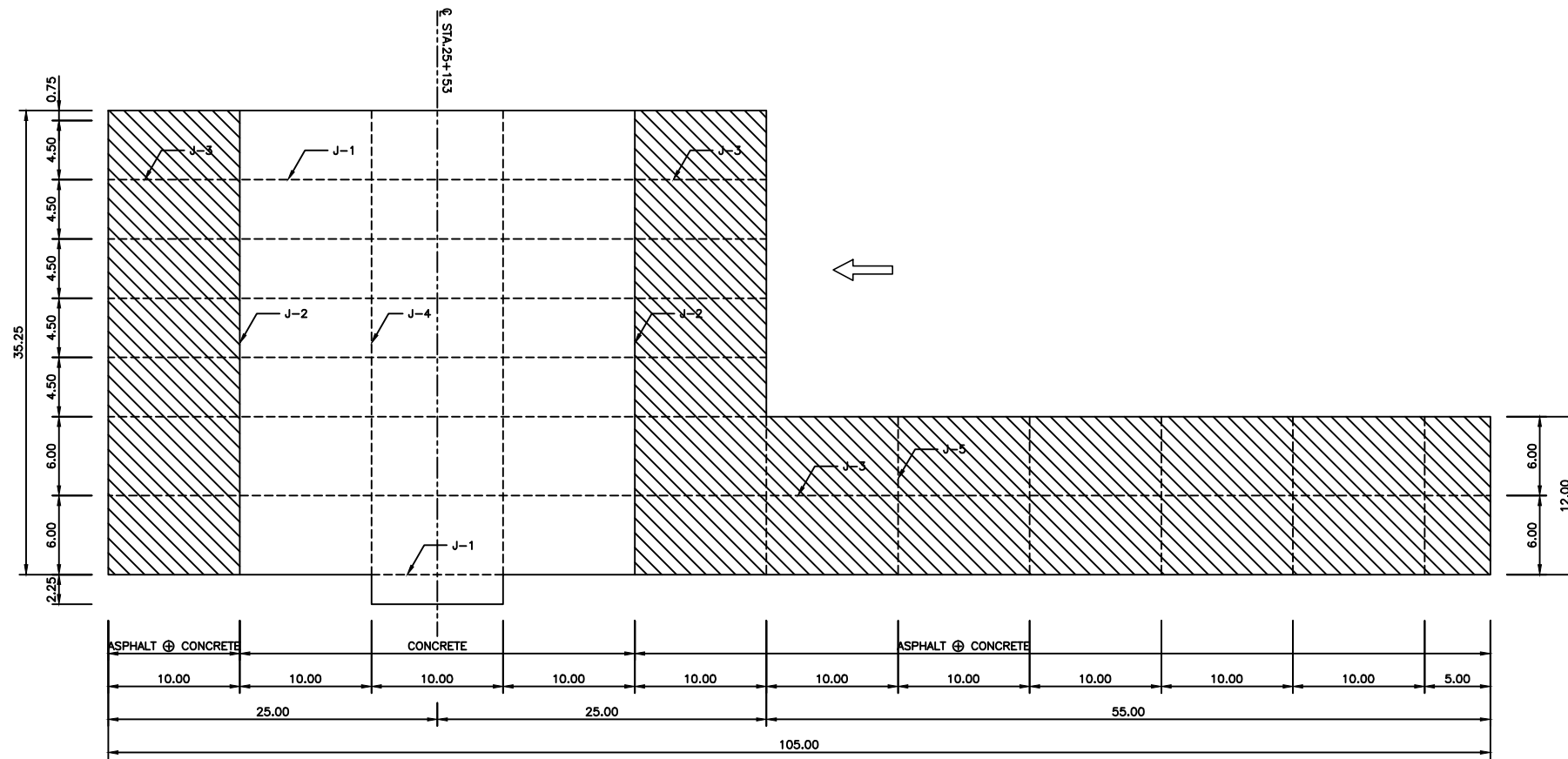
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- EXPANSION JOINT SHALL BE CONSTRUCTED AT THE INTERVAL OF 350 METERS. IF THE LAST INTERVAL IS LESS THAN 350 METERS, THE INTERVALS SHALL BE AVERAGED BUT BETWEEN 300 AND 350 METERS.
- EXPANSION JOINT SHALL BE PROVIDED AT THE OUTER EDGE OF BOTH SIDES OF THE BOX CULVERT CROSSING.
- MASTIC JOINT SEALER SHALL BE OF THE HOT POURED ELASTIC TYPE CONFORMING TO TIS. 479.
- JOINT FILLER SHALL CONFORM TO THE AASHTO M. 213-74 OR ASTM. D1751-73 SPECIFICATION.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 325 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	7	CM. (MAX.)
- REINFORCING STEEL SHALL CONFORM TIS.20 GRADE SR 24 FOR ROUND BARS AND TIS. 24 GRADE SD 30 FOR DEFORMED BAR.
- WELDED WIRE CAN BE USED IN PLACE OF BAR MESH. (SEE NOTE ②)
- CONCRETE PAVEMENT SHALL BE REQUIRED FOR CONCRETE POURING. IN CASE OF NECESSARY POURING CONCRETE BY MAN-POWER, CONCRETE SHALL BE POURED ONLY GAP SPACE NOT MORE THAN 30.00 METERS LONG.
- ALL JOINTS EXCEPT EXPANSION JOINT SHALL BE MADE BY SLOT CUTTING MACHINE ONLY. FOAM SHEET, PLYWOOD, TIMBER OR MATERIAL OF THE SAME TYPE SHALL NOT BE ALLOWED.
- TRAFFIC SHALL BE ALLOWED ONLY IF THE ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE CUBE CONFORMS TO THE REQUIREMENT IN NOTE NO.6
- ROAD CONSTRUCTION MATERIAL NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD OF THE DEPARTMENT OF HIGHWAYS.
- PREPARATION OF JOINT FOR MASTIC JOINT SEALER.
 - THE JOINT SHALL BE CLEANED WITH A BLOWER TO GET RID OF ALL KINDS OF DIRT THE JOINT SHALL BE COMPLETELY DRY.
 - PRIMER SHALL BE APPLIED TO THE JOINT WITH A BRUSH OR SPRAYER THE JOINT SHALL BE LET DRY BEFORE THE POURING OF MASTIC JOINT SEALER WHICH HAS BEEN BOILED AND DISSOLVED BY MEANS OF HEAT CONDUCTIVITY TO THE SPECIFIED TEMPERATURE.
 - JOINTS SHALL BE CUT AND MASTIC JOINT SEALER SHALL BE DROPPED AS SOON AS POSSIBLE.
 - MASTIC JOINT SEALER SHALL BE DROPPED WITH JOINT SEALANT APPLYING MACHINE.
- THE THICKNESS OF FLEXIBLE PAVEMENT CORRESPONDED TO THE FIGURE CONFORMING TO TYPICAL CROSS-SECTION.
- PLASTIC SHEET USED IN CONSTRUCTION SHALL HAVE THE FOLLOWING REQUIREMENTS :
 - THICKNESS OF 0.07 MM. WITH A TOLERANCE OF NOT MORE THAN 7% SHALL BE REQUIRED.
 - WIDTH SHALL NOT BE LESS THAN 1.20 M.
 - IT SHALL BE COLOURLESS, TRANSPARENT AND WATERPROOF, FREE FROM POROUS AREA, TURN AREA AND BLISTERING AREA WHICH ARE VISIBLE BY NAKED EYE. EDGE SHALL BE STRAIGHT.
 - CONTINUOUS LENGTH SHALL BE REQUIREMENT TO THE WIDTH OF TRAFFIC LANES. CONNECTION ALLOWED AT LONGITUDINAL JOINTS WITH NOT LESS THAN 20 CM. OVERLAPPING SHALL BE REQUIRED.
- CONCRETE PAVEMENT CONSTRUCTION CONTROL SHALL CONFORM TO THE STANDARD DH-S 409/2530 REGARDING "REGULATIONS OF CONSTRUCTION CONTROL OF PORTLAND CEMENT CONCRETE PAVEMENT."

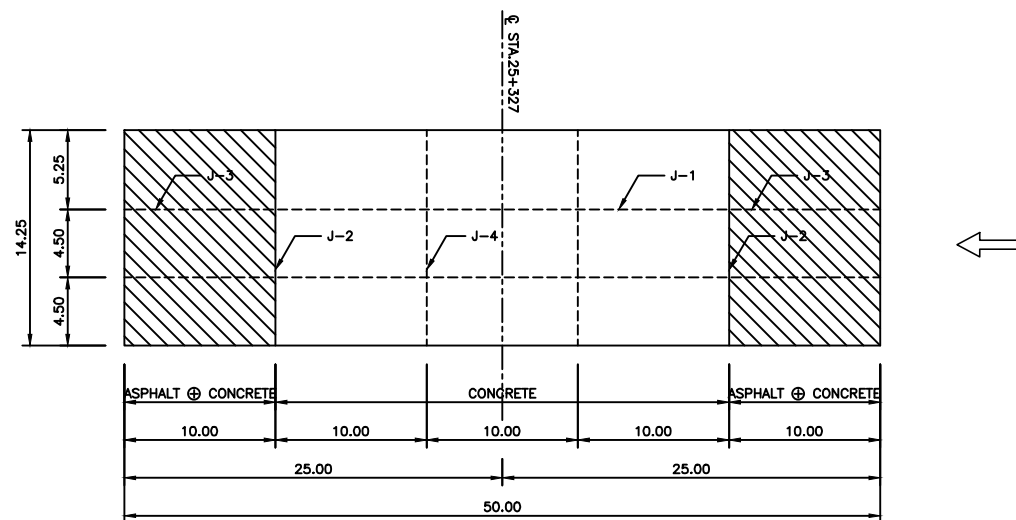
NOTES 2 :

- BAR MESH 9 MM. AS SHOWN IN THIS DRAWING SHALL BE REPLACED BY WELDED STEEL WIRE WITH PROPERTIES CONFORMING TO STANDARD SPECIFICATION FOR WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT, AASHTO DESIGNATION M 55 - 75 (ASTM. DESIGNATION A 185 - 73). BEFORE USING WELDED STEEL WIRE FABRIC, THE SAMPLES SHALL BE SENT TO MATERIAL AND RESEARCH DIVISION DOH. FOR APPROVING.
- MINIMUM SIZE OF WIRE TO BE USED SHALL NOT BE LESS THAN STANDARD WIRE AASHTO DESIGNATION M 32 - 78 (ASTM DESIGNATION A 82 - 76) SIZE NUMBER W. 12 AT NOMINAL DIAMETER OF 3.15 MM. AND NOMINAL AREA OF 0.007 CM². WIRE TO BE USED SHALL HAVE YIELD STRENGTH OF NOT LESS THAN 65,000 LB/INCH² (PSI).
- LAP SPLICES OF BAR MESH SHALL NOT BE LESS THAN 40 TIMES OF WIRE DIAMETER AND NOT LESS THAN SPACING OF CROSS WIRE + 5 CM.
- QUANTITY OF STEEL WIRE FABRIC CALCULATED FROM NOMINAL AREA AND SPACING IN EACH DIRECTION SHALL CONFORM TO THE FOLLOWING REQUIREMENT :
 - LONGITUDINAL STEEL (STEEL BETWEEN TRANSVERSE JOINT) SHALL HAVE THE MINIMUM AREA OF 1.511 CM²/M.
 - TRANSVERSE STEEL :
 - MINIMUM OF 0.453 CM²/M. SHALL REQUIRED IF SPACE BETWEEN LONGITUDINAL JOINT OR FREE EDGE IS MEASURED AT 3.00 M.
 - MINIMUM OF 0.491 CM²/M. SHALL REQUIRED IF SPACE BETWEEN LONGITUDINAL JOINT OR FREE EDGE IS MEASURED AT 3.25 M.
 - MINIMUM OF 0.529 CM²/M. SHALL REQUIRED IF SPACE BETWEEN LONGITUDINAL JOINT OR FREE EDGE IS MEASURED AT 3.50 M.
- QUANTITY OF WELDED STEEL WIRE FABRIC SPECIFIED REFERS TO QUANTITY OF WELDED STEEL WIRE FABRIC MEASURED AGAINST AVERAGE SPACE LENGTH OF 1 METER FROM THE TOTAL SPACE LENGTH BETWEEN JOINT OR FREE EDGE.
- WELDING POINTS SHALL BE ADEQUATELY STRONG AND SHALL NOT COME OFF DURING TRANSPORTATION OR PLACING. HOWEVER, THEY SHALL NOT BE SUBJECT TO REJECTION IF COMING OFF DURING CONSTRUCTION WITH WHATEVER REASON EXCEPT THAT DISCONNECTED POINTS EXCEED 1% OF ALL WELDING POINTS. IF ROLLED OVER, DISCONNECTED POINTS SHALL NOT EXCEED 1% OF ALL POINTS IN THE AREA OF 14 M². DISCONNECTED POINTS FOR ONE WELDED STEEL WIRE FABRIC SHALL NOT EXCEED HALF OF ALL ALLOWABLE DISCONNECTED WELDING POINTS.
- WELDED STEEL WIRE FABRIC SHEET SHALL BE SMOOTH NOT ROLL OR TWIST ALL DIRECTIONS, WHILE BEING PLACED DURING CONSTRUCTION.
- CLEAR CONCRETE COVER SPACE OF WELDED STEEL WIRE FABRIC SHALL CONFORM TO BAR MESH SPECIFICATION IN THIS DRAWING.

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 TOLL GATE 25 CM. CONCRETE PAVEMENT (1 / 2)	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 : AS SHOWN
														DWG. NO. TG-11	SHEET NO. 137



7-ROWS
SCALE 1:50

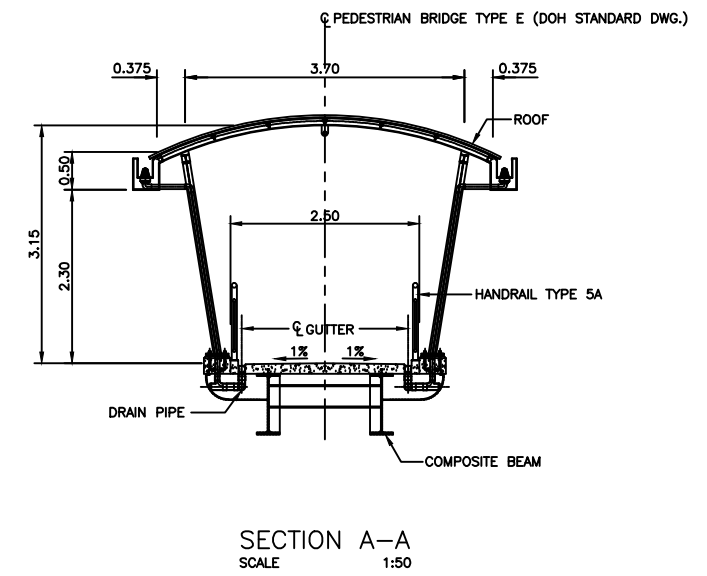
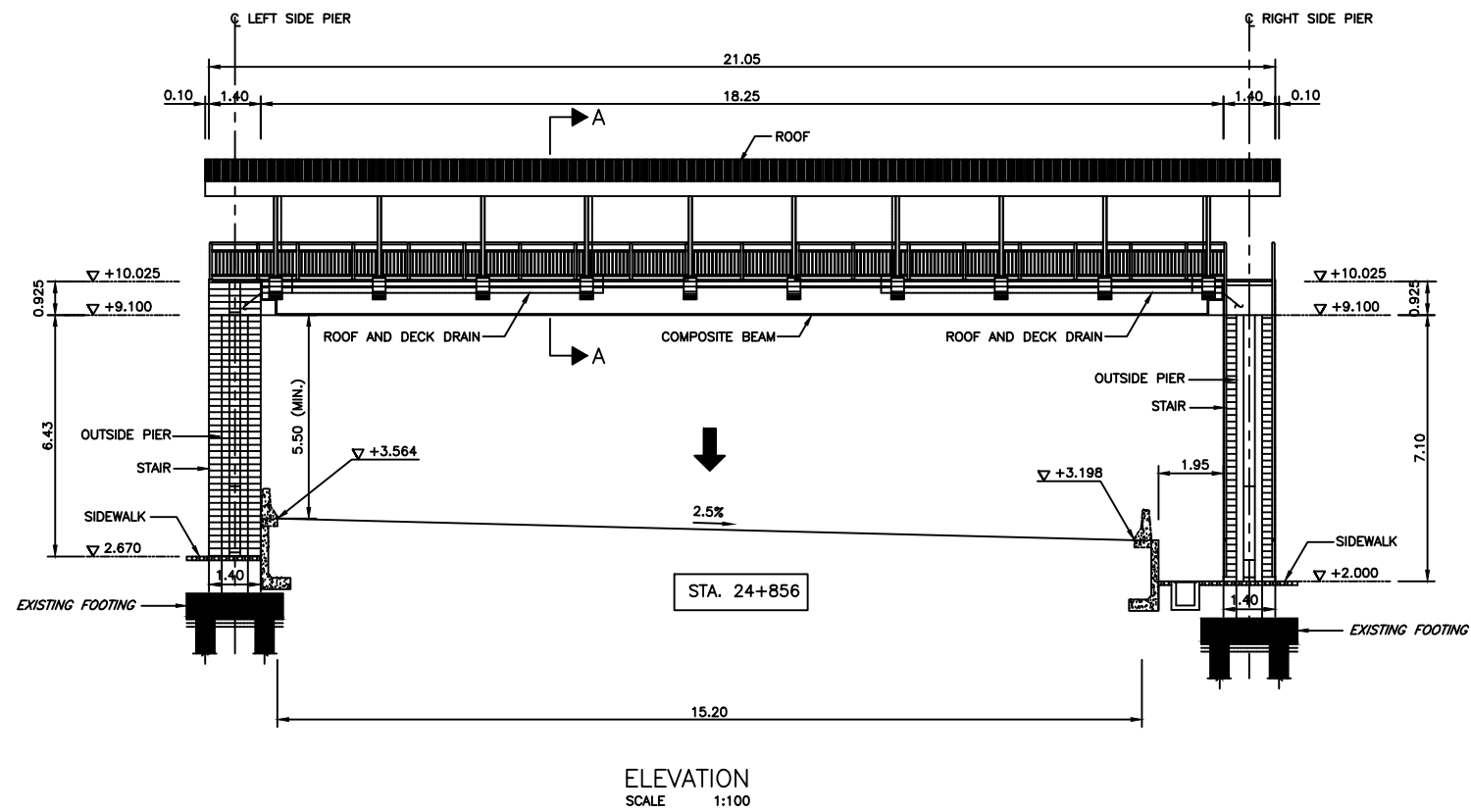


3-ROWS
SCALE 1:50

PAVEMENT AND JOINT LAYOUT PLAN

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								SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	1:50
									The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road			DWG. NO.	SHEET NO.		
									25 CM. CONCRETE PAVEMENT (2 / 2)				TG-12	138		

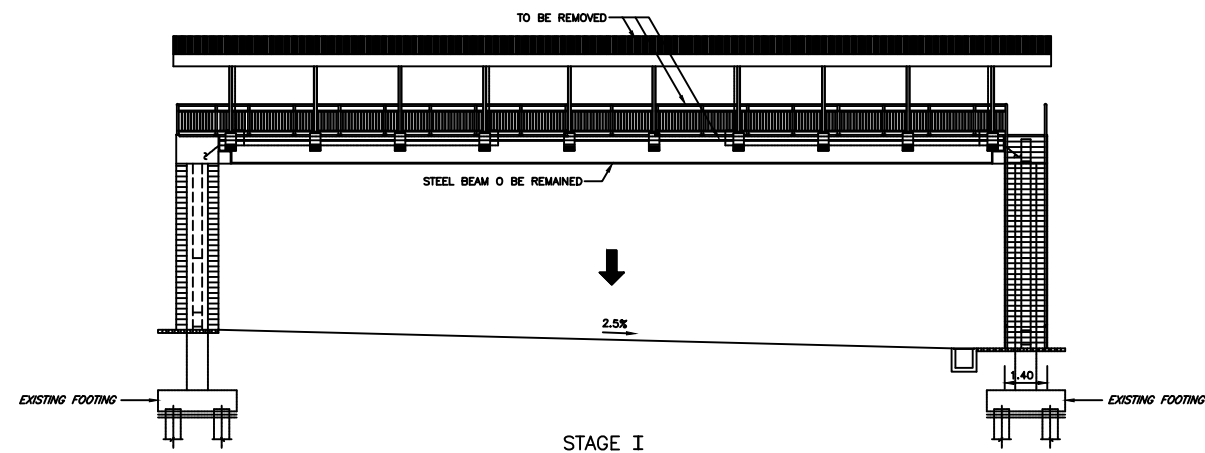
4. PEDESTRIAN OVERPASS FOR TOLL GATE ACCESS



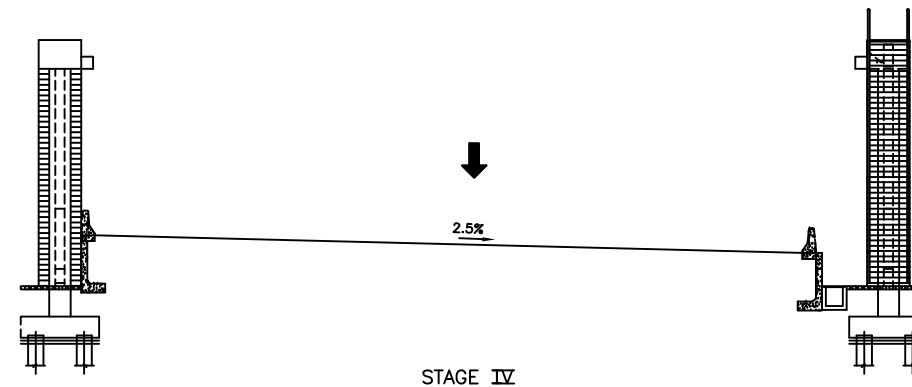
NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. STAIRS AND PIER ARE REINFORCED CONCRETE, WHEREAS THE BRIDGES THEMSELVES ARE COMPOSITE MEMBER OF STEEL GIRDER AND REINFORCED CONCRETE DECK.
3. FOR STRUCTURAL NOTES AND GENERAL LAYOUTS OF PEDESTRIAN SEE DWG. NO. TG-01 TO TG-02.
4. FOR COMPOSITE BEAM OF BRIDGE SEE DWG. NO. PO-03.
5. FOR PIER DETAILS SEE DWG. NO. PO-04.
6. FOR STAIR DETAILS SEE DWG. NO. PO-05 TO PO-06.
7. FOR ROOF FRAME STRUCTURE TYPE 5 DETAILS SEE DWG. NO. PO-07 TO PO-08.
8. FOR ROOF AND DECK DRAIN DETAILS SEE DWG. NO. PO-10 TO PO-11.
10. FOR RETAINING WALL DETAILS SEE DWG. NO. PO-12.

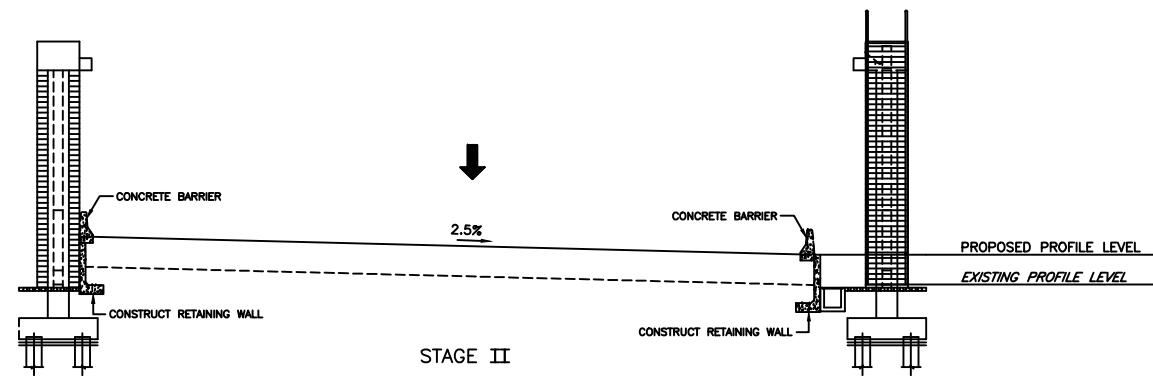
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the 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.
														PO-01	139



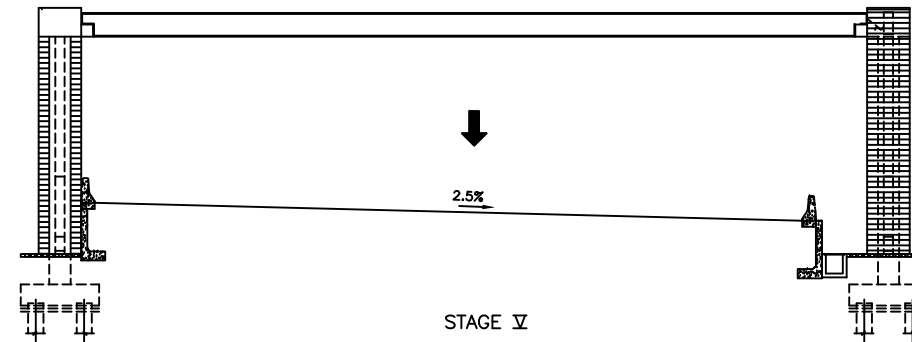
1. REMOVE STEEL ROOF ON DECK AND DECK SLAB.
2. REMOVE STEEL BEAM BY LIFT AND PLACE BESIDE THE PEDESTRAIN BRIDGE.



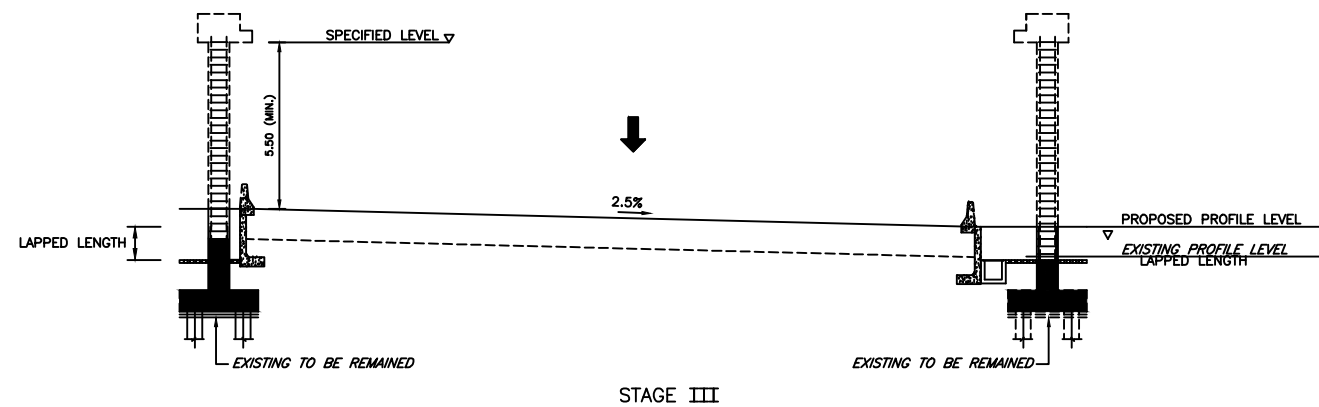
1. RECONSTRUCT RC. BEAM AND RC. STAIR.



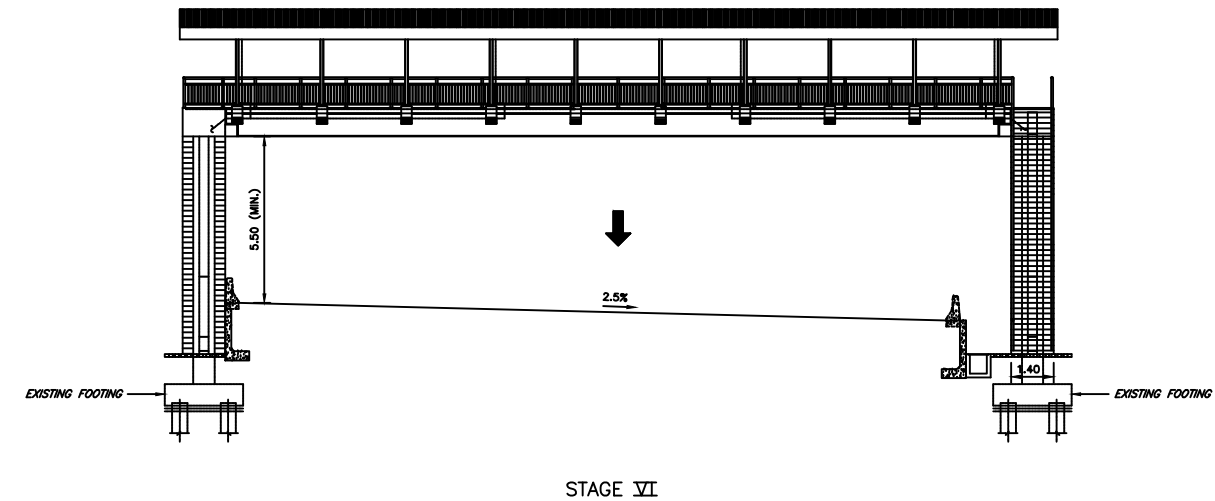
1. DEMOLISH STAIR AND BEAM.
2. DEMOLISH COLUMN AND PIER HEAD BY KEEPING THE REINFORCING STEEL OF COLUMN, AT SPECIFIED LEVEL.
3. FILL ROADWAY TO PROPOSED PROFILE LEVEL.
4. CONSTRUCT RETAINING WALL AND BARRIER.



1. PLACE EXISTING STEEL BEAM ON NEW PIER HEAD.

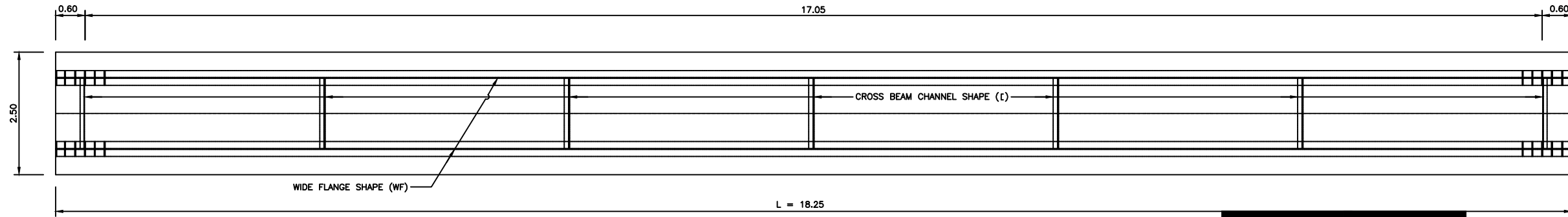


1. EXTEND RC. COLUMN W/PIER HEAD TO SPECIFIED LEVEL.

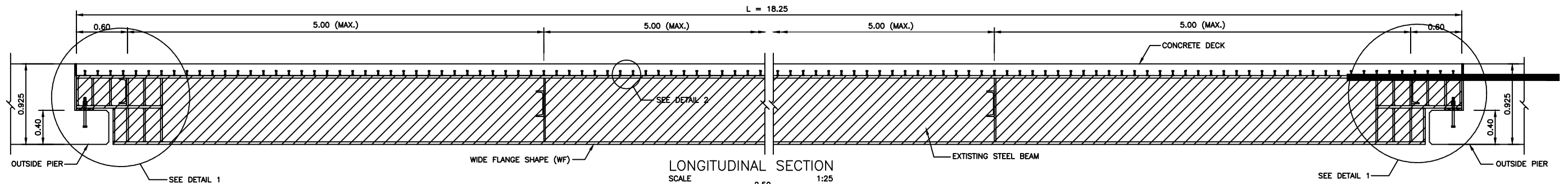


1. CONSTRUCT DECK SLAB ,STEEL ROOF AND RAILING FOR STAIR AND DECK OF NEW PEDESTRAIN BRIDGE.

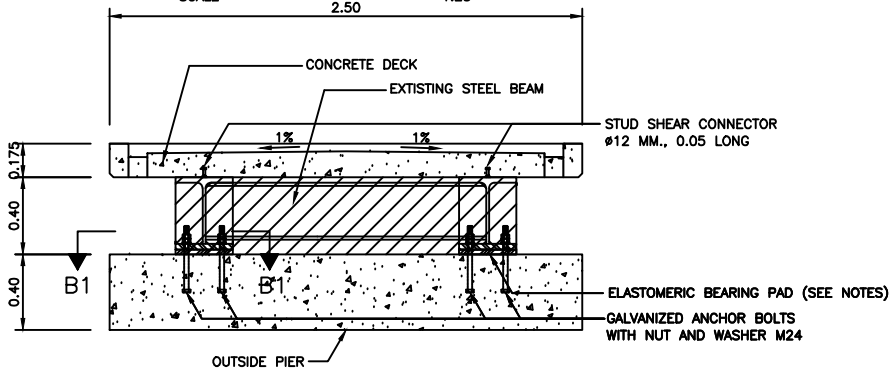
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the 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.
														PO-02	140



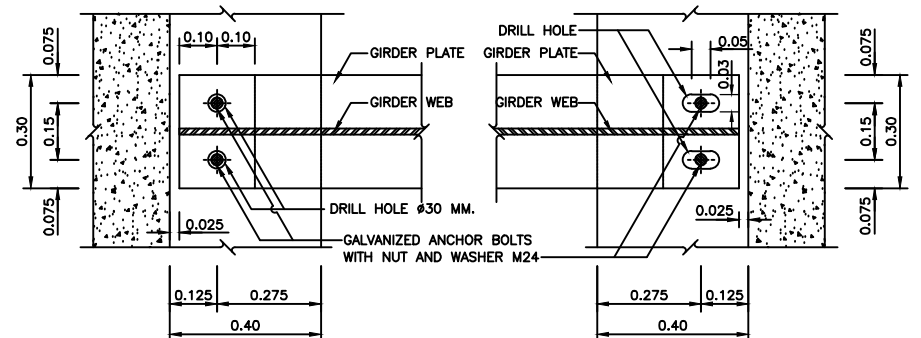
EXISTING COMPOSITE BEAM PLAN
SCALE 1:50



LONGITUDINAL SECTION
SCALE 1:25

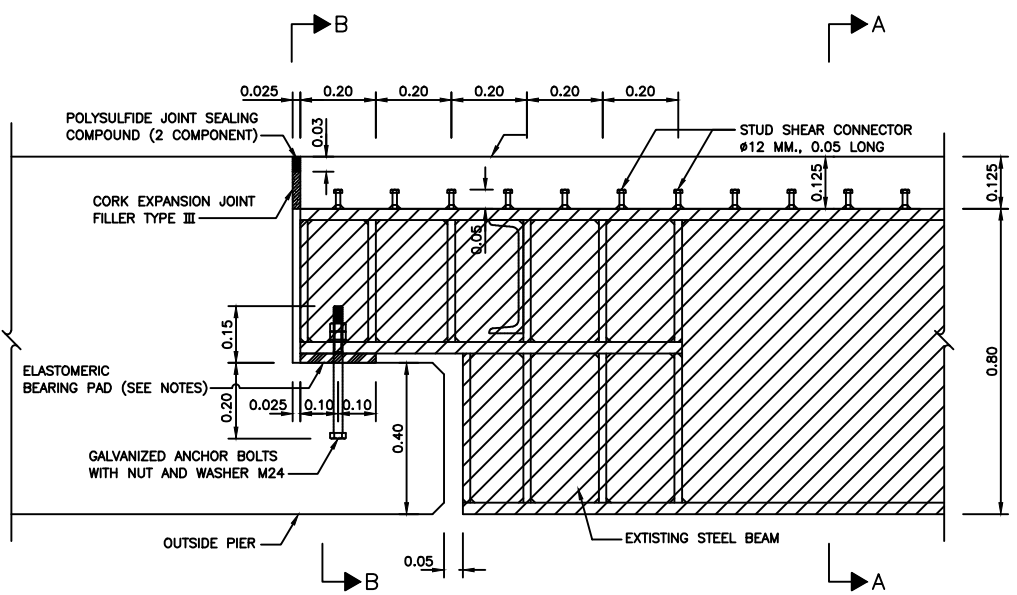


SECTION B-B
SCALE 1:20

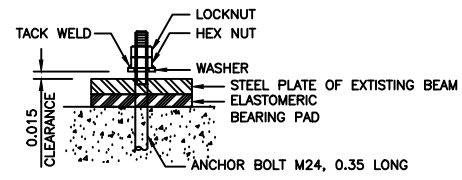


SECTION B1-B1 (ROTATION END BEARING)
SCALE 1:10

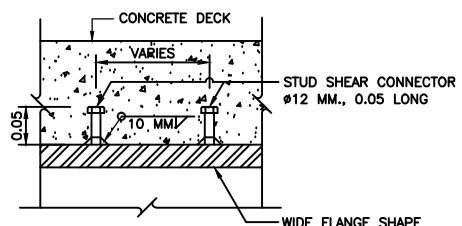
SECTION B1-B1 (ROLLER END BEARING)
SCALE 1:10



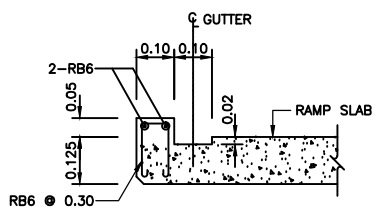
DETAIL 1 (END OF COMPOSITE BEAM)
SCALE 1:10



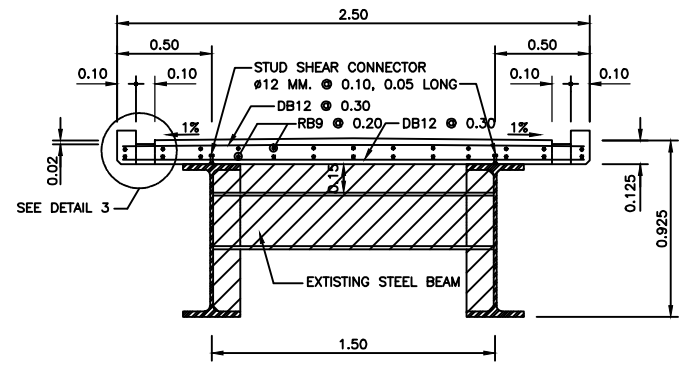
ANCHOR DETAIL
SCALE 1:7.5



DETAIL 2
SCALE 1:5



DETAIL 3
SCALE 1:10



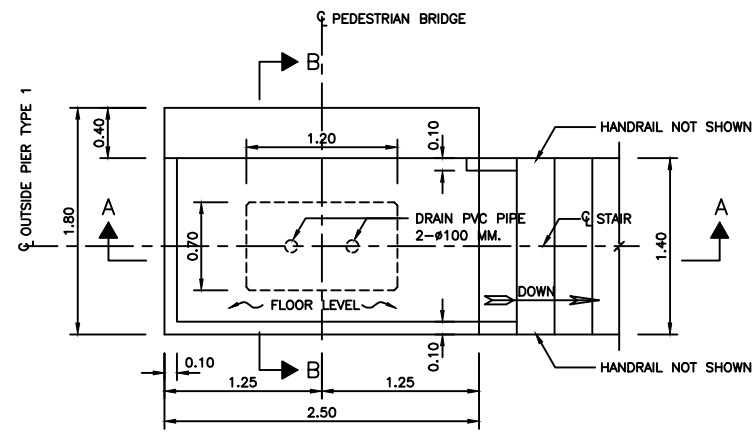
SECTION A-A
SCALE 1:20

- NOTES :
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - ANCHOR BOLTS, NUT AND WASHER SHALL CONFORM TO AASTHO M169, TIS 672 AND TIS 259, RESPECTIVELY.
 - BEARING
 - BEARING TO BE LAMINATED ELASTOMERIC BEARING CONFORMING TO LATEST AASTHO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES

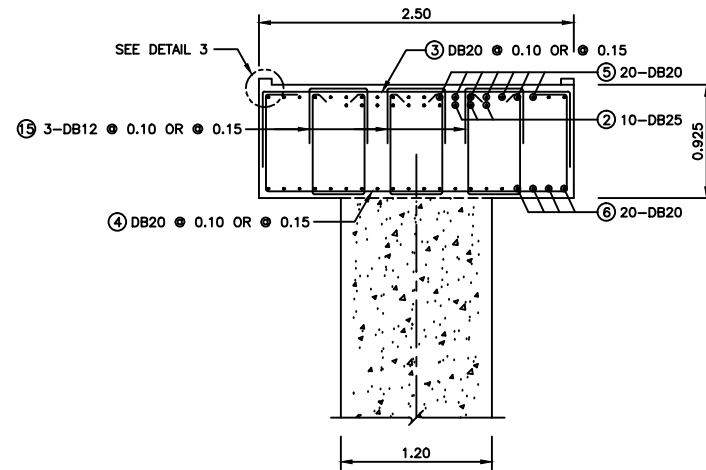
	GIRDER SPAN, L (MAX.) (M.)		
	21.00	-	-
MAX. VERT. LOAD (KN.)	126.8	-	-
MIN. VERT. LOAD (KN.)	75.3	-	-
HOR. LONG LOAD (FIXED)	8	-	-
HOR. MOVEMENT (FREE)			
- EXPANSION (mm)	6	-	-
- CONTRACTION (mm)	-	-	-
ROTATION (RAD.)	0.005	-	-

- CALCULATION AND INSTALLATION DETAIL OF BEARING TO SUBMITTED FOR APPROVAL BEFORE USE TO CONSTRUCTION.
- LEVELLING BEARING SUPPORT SHALL BE NON SHRINK MATERIAL COMPRESSIVE STRENGTH HIGHER THAN CONCRETE OF PIER.

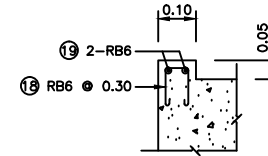
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	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
									TOLL GATE PEDESTRIAN BRIDGE						DWG. NO. PO-03	SHEET NO. 141



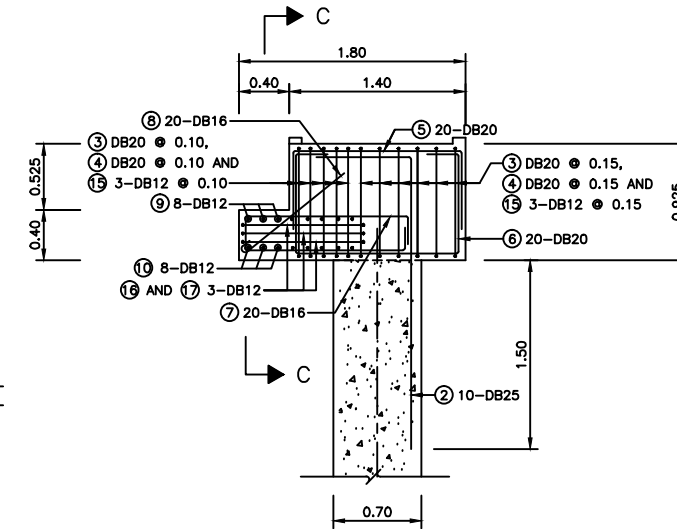
OUTSIDE PIER PLAN
SCALE 1:30



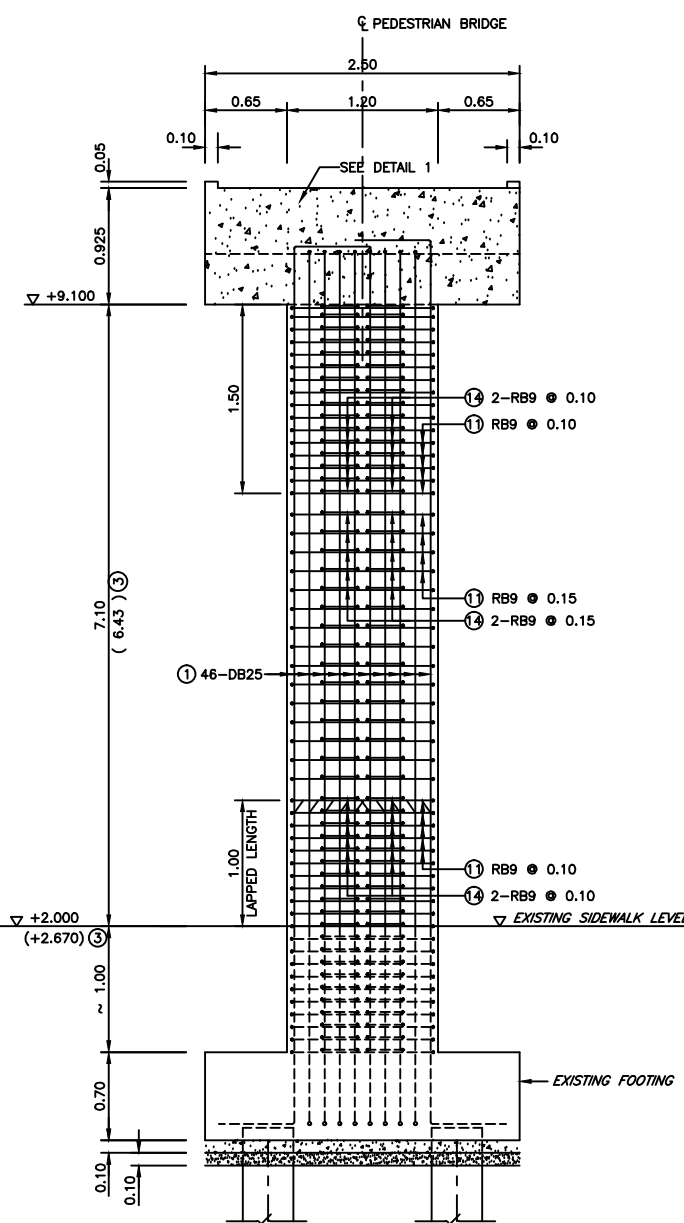
DETAIL 1
SCALE 1:30



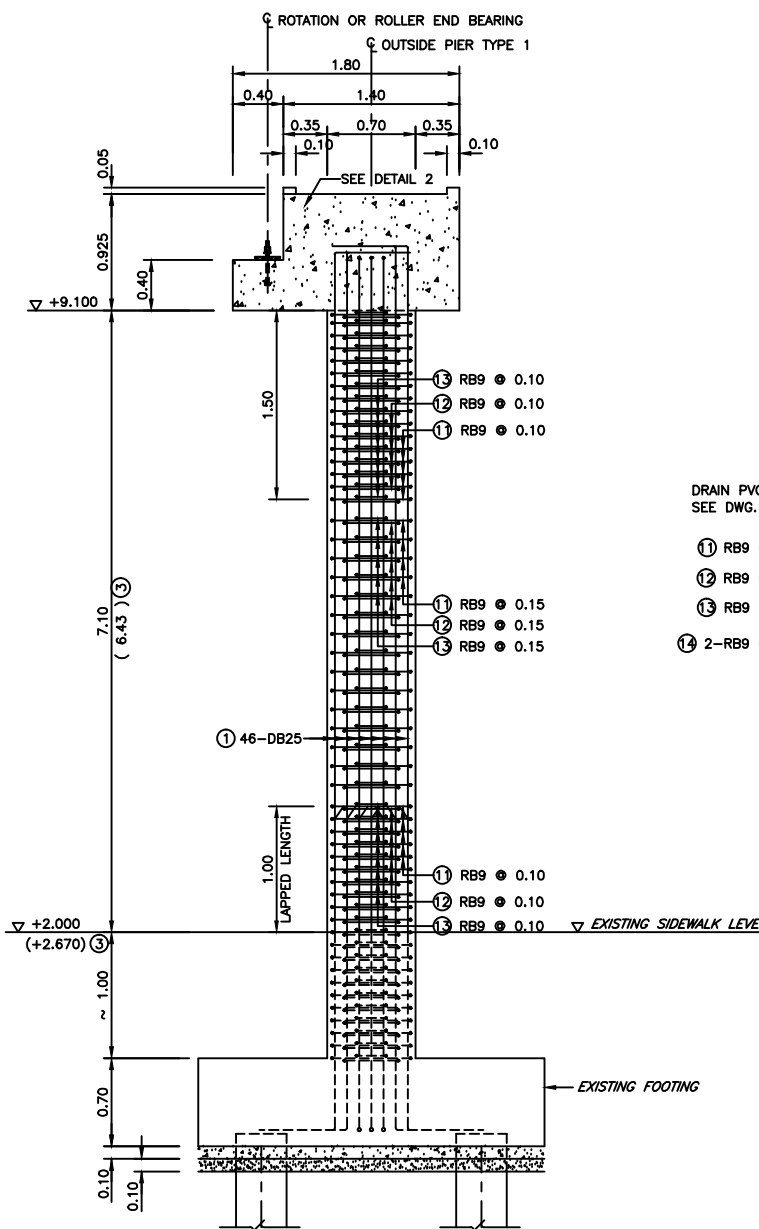
DETAIL 3
SCALE 1:10



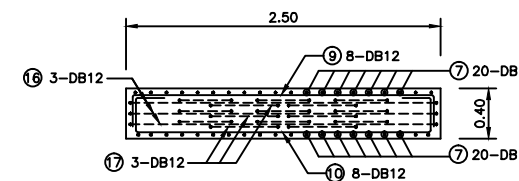
DETAIL 2
SCALE 1:30



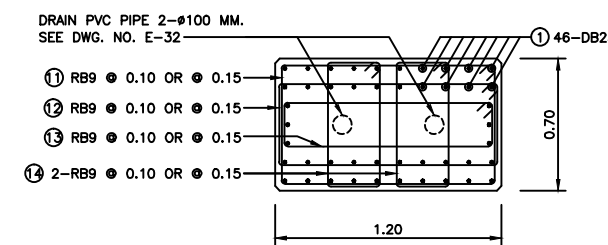
SECTION A-A
SCALE 1:30



SECTION B-B
SCALE 1:30



SECTION C-C
SCALE 1:30



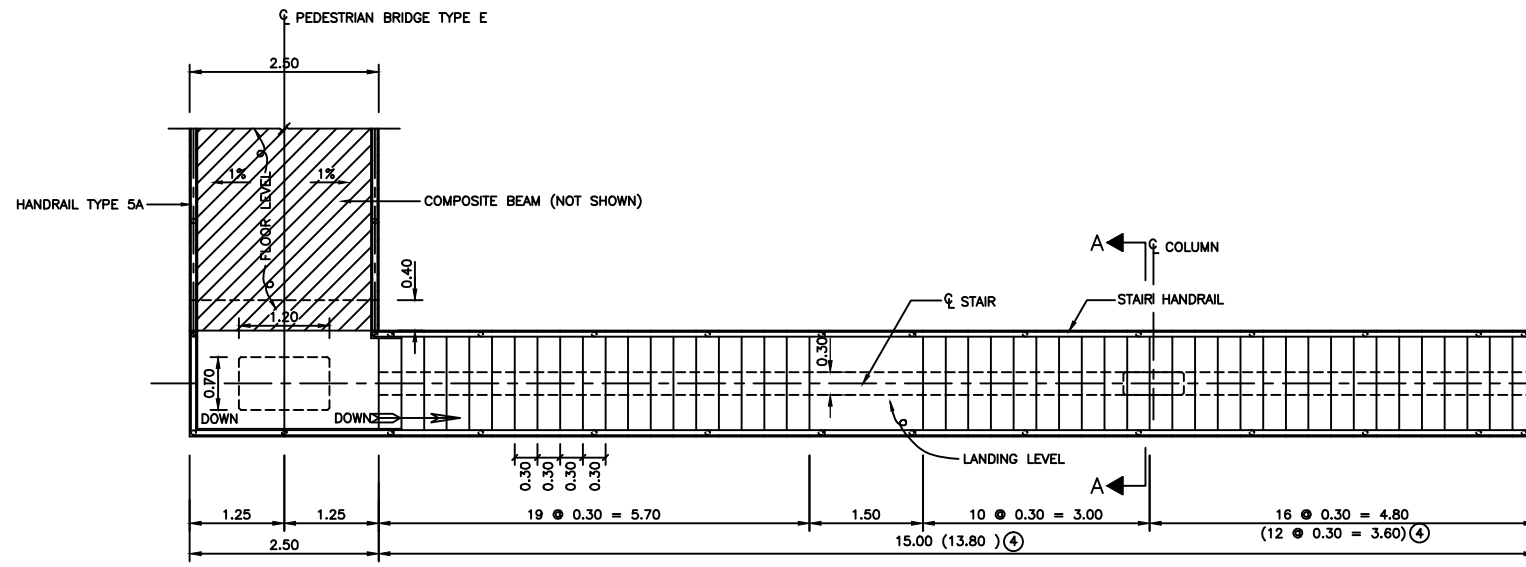
TYPICAL COLUMN
SCALE 1:20

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIAMETER (MM.)	BAR BENDING DIAGRAM
①	DB25	
②	DB25	
③	DB20	
④	DB20	
⑤	DB20	
⑥	DB20	
⑦	DB16	
⑧	DB16	
⑨	DB12	
⑩	DB12	
⑪	RB9	
⑫	RB9	
⑬	RB9	
⑭	RB9	
⑮	DB12	
⑯	DB12	
⑰	DB12	
⑱	RB6	
⑲	RB6	

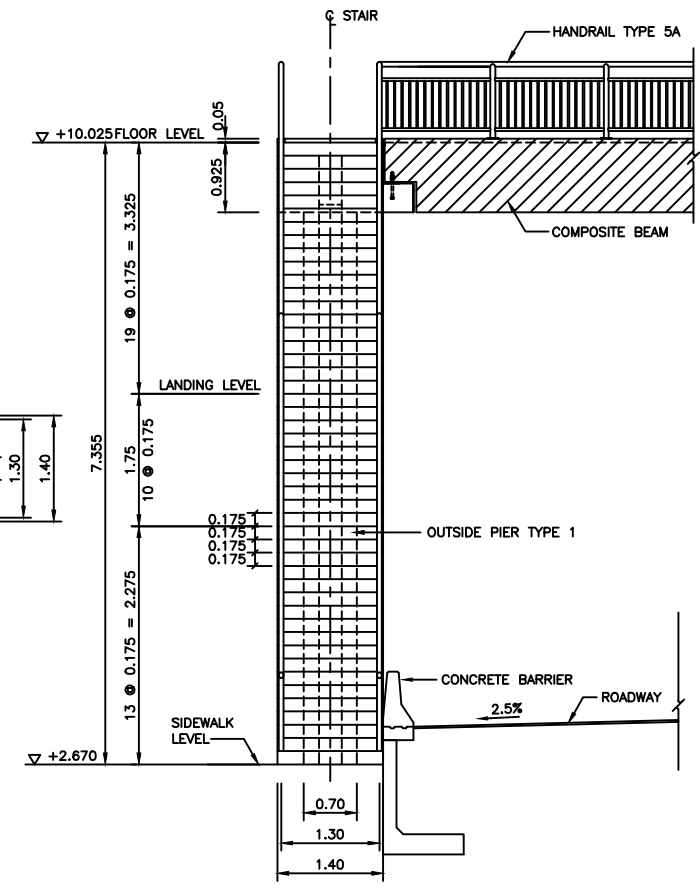
NOTES :

- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- DUE TO TENSION FORCE IN REINFORCEMENT OF COLUMN, IT REQUIRES 1.3 Ld FOR LAP SPLICE LENGTH WHERE Ld EQUALS TENSILE DEVELOPMENT LENGTH.
- RIGHT SIDE PIER / (LEFT SIDE PIER)

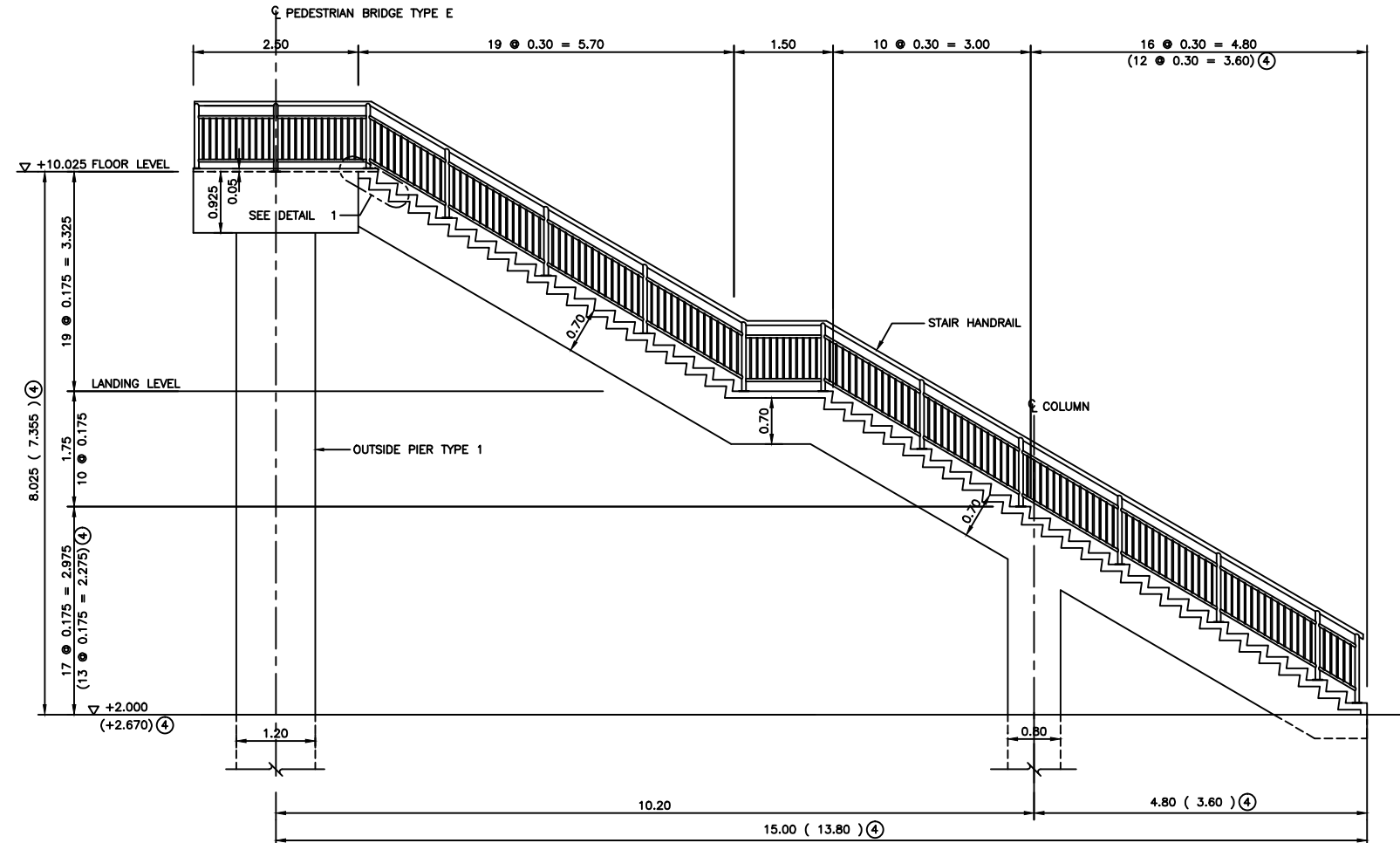
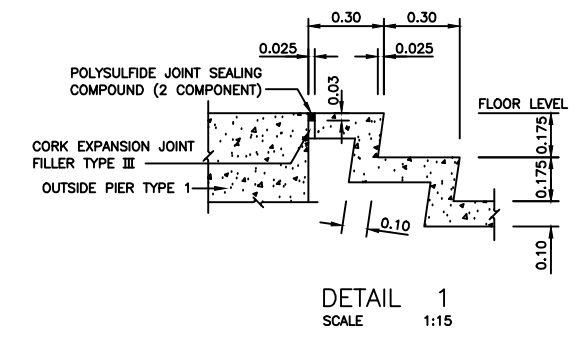
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	HIGHWAY ROUTE NO. 9	OWNER	PROJECT TITLE	DESIGNED BY	CHECKED BY	DATE	SCALE
								TOLL GATE PEDESTRIAN BRIDGE	The Inter-City Motorways Division Department of Highways Ministry of Transport	The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	SAGARA Hidetaka ROAD ENGINEER	WATANABE Ryohei CHIEF ENGINEER	AUGUST 2012	AS SHOWN
											DWG. NO.	PO-04	SHEET NO.	142



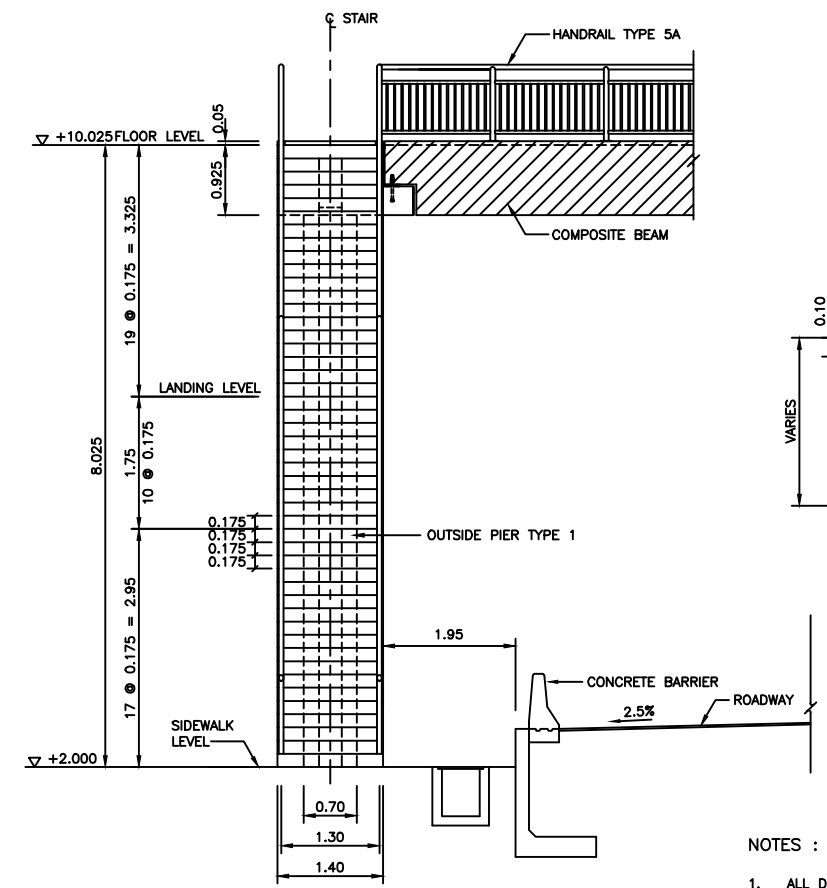
STAIR PLAN
SCALE 1:50



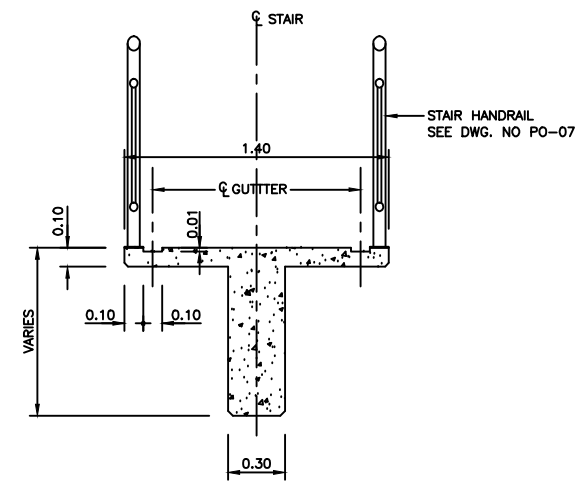
STAIR ELEVATION 2 (LEFT SIDE PIER)
SCALE 1:50



STAIR ELEVATION 1
SCALE 1:50



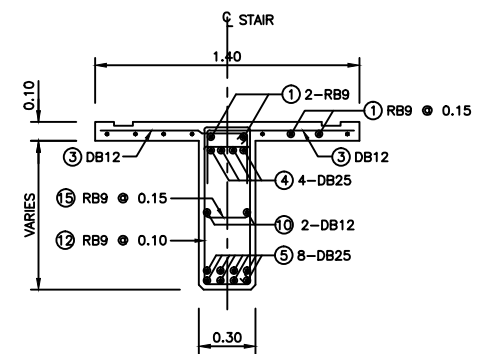
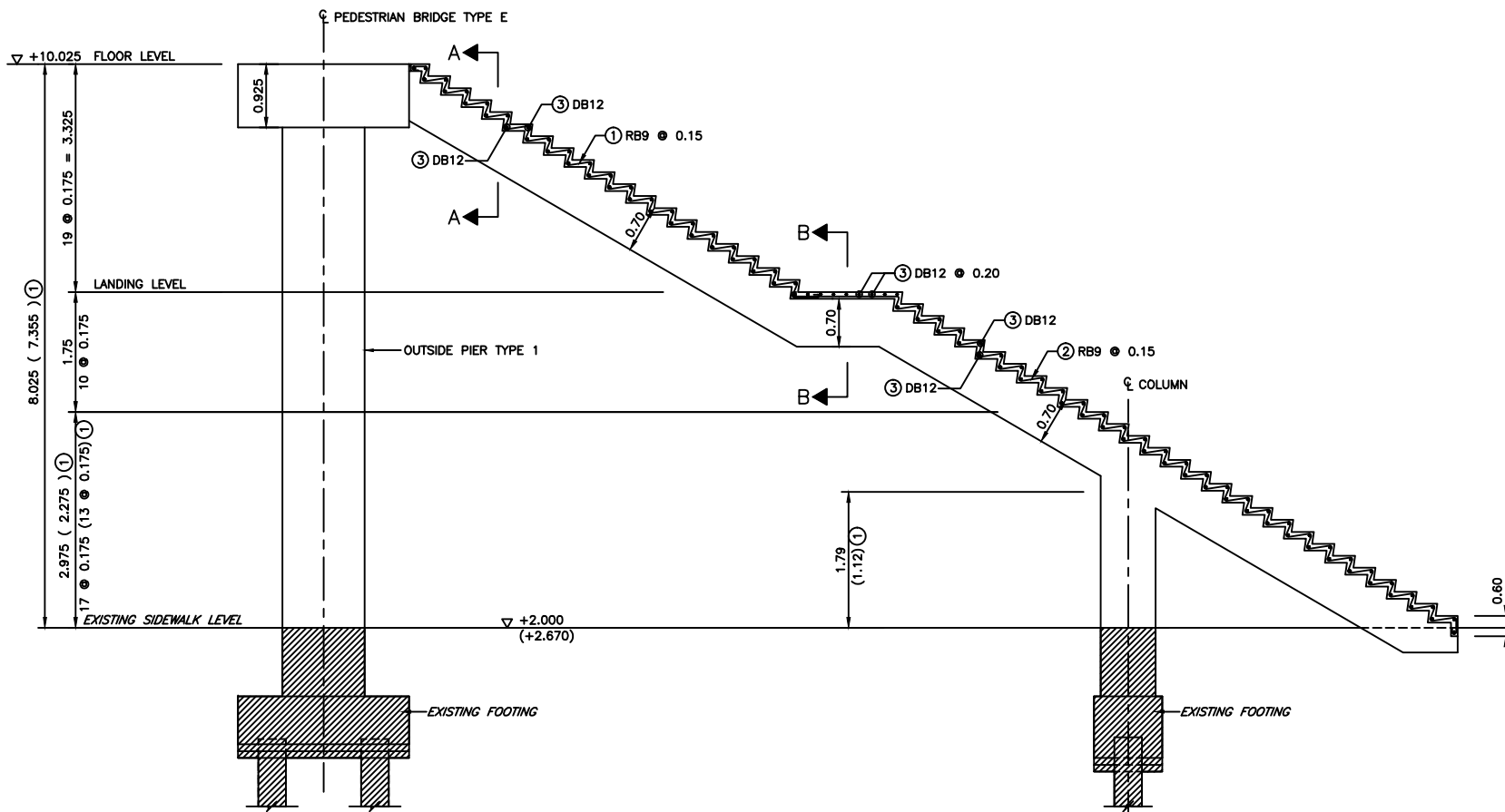
STAIR ELEVATION 2 (RIGHT SIDE PIER)
SCALE 1:50



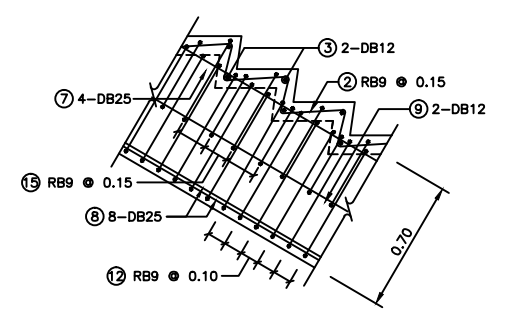
SECTION A-A
SCALE 1:20

- NOTES :
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 2. OUTSIDE PIERS SEE DWG. NO. PO-04.
 3. FOR STEEL ROOF OF STAIR AND WALKWAY SEE DWG. PO-06 TO PO-09.
 - ④ RIGHT SIDE PIER/(LEFT SIDE PIER)

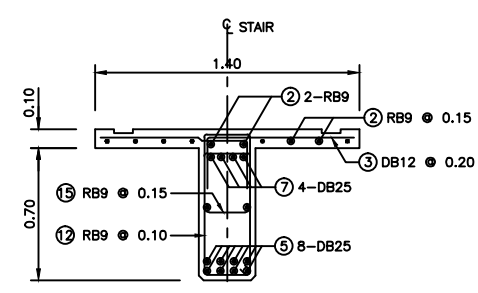
REV. NO.	DESCRIPTION	ENGINEER CHECKED	ENGINEER DATE	DOH CHECKED	DOH DATE	REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9 TOLL GATE PEDESTRIAN BRIDGE	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE 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 AS SHOWN
														DWG. NO. PO-05	SHEET NO. 143



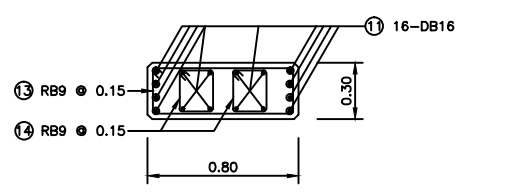
SECTION A-A
SCALE 1:20



DETAIL 1
SCALE 1:20

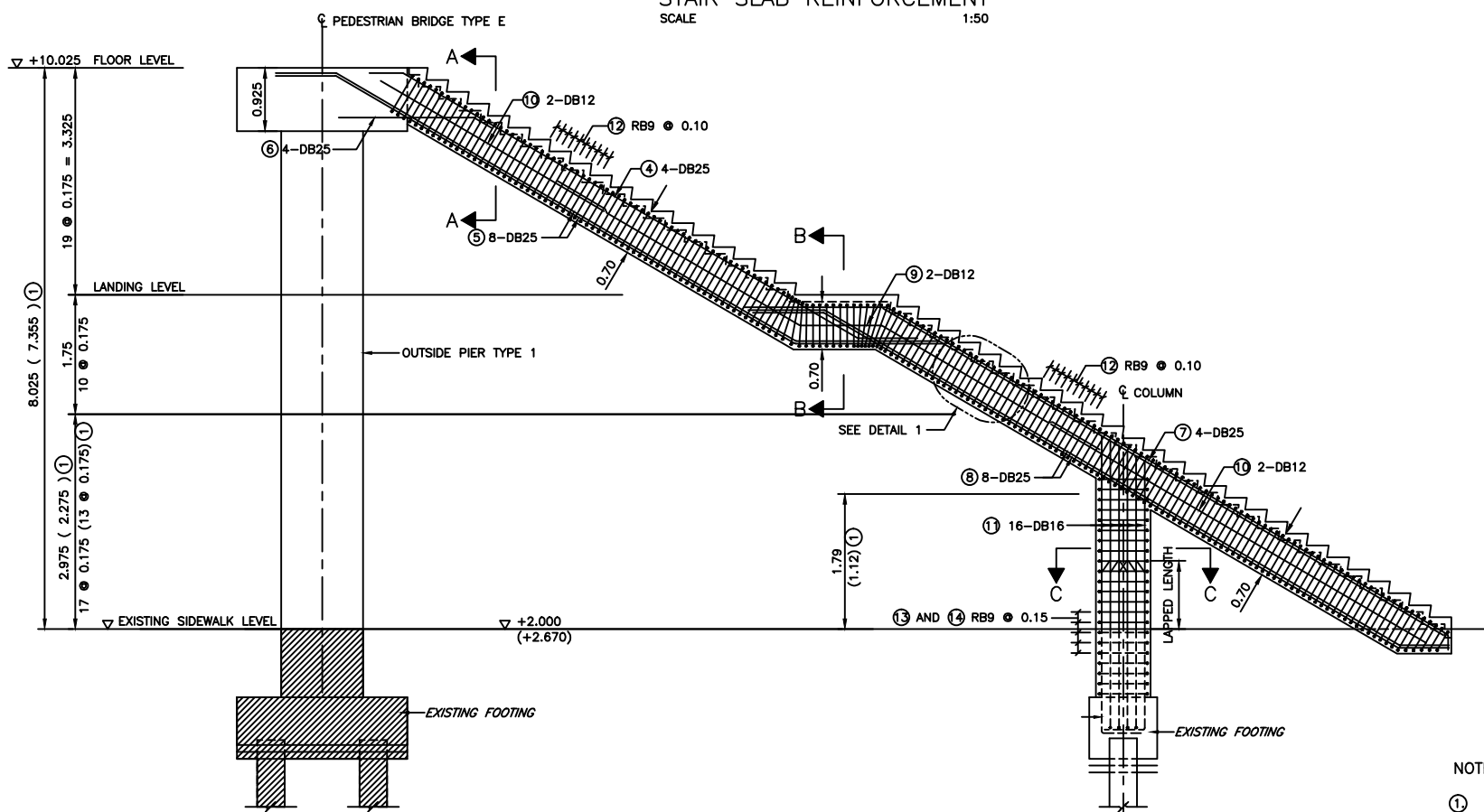


SECTION B-B
SCALE 1:20



SECTION C-C
SCALE 1:20

STAIR SLAB REINFORCEMENT
SCALE 1:50



STAIR BEAM REINFORCEMENT
SCALE 1:50

NOTES :
① RIGHT SIDE PIER/(LEFT SIDE PIER)

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIAMETER (MM.)	BAR BENDING DIAGRAM
①	RB9	
②	RB9	
③	DB12	
④	DB25	
⑤	DB25	
⑥	DB25	
⑦	DB25	
⑧	DB25	
⑨	DB12	
⑩	DB12	
⑪	DB16	
⑫	RB9	
⑬	RB9	
⑭	RB9	
⑮	RB9	

REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY
		CHECKED	DATE	CHECKED	DATE		

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

HIGHWAY ROUTE NO. 9
TOLL GATE
PEDESTRIAN BRIDGE

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

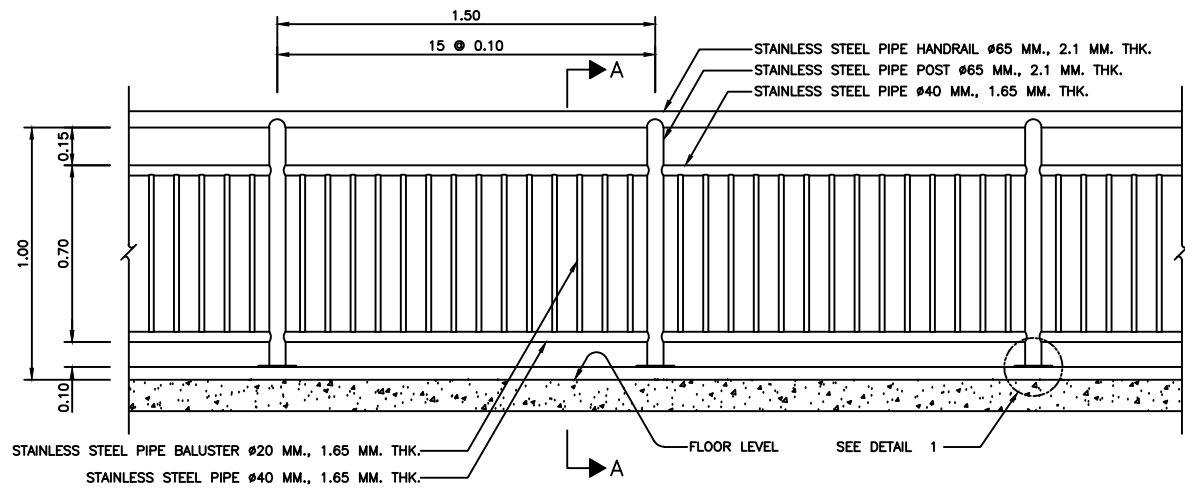
CHECKED BY
WATANABE Ryohei
CHIEF ENGINEER

DATE :
AUGUST 2012

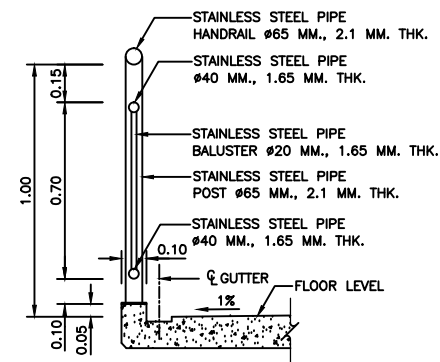
DWG. NO.
PO-06

SCALE :
AS SHOWN

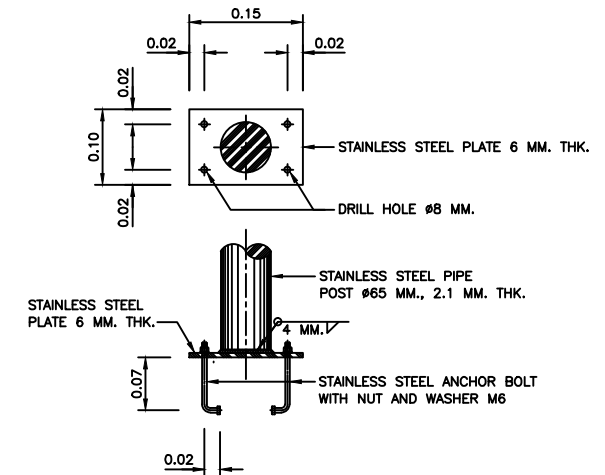
SHEET NO.
144



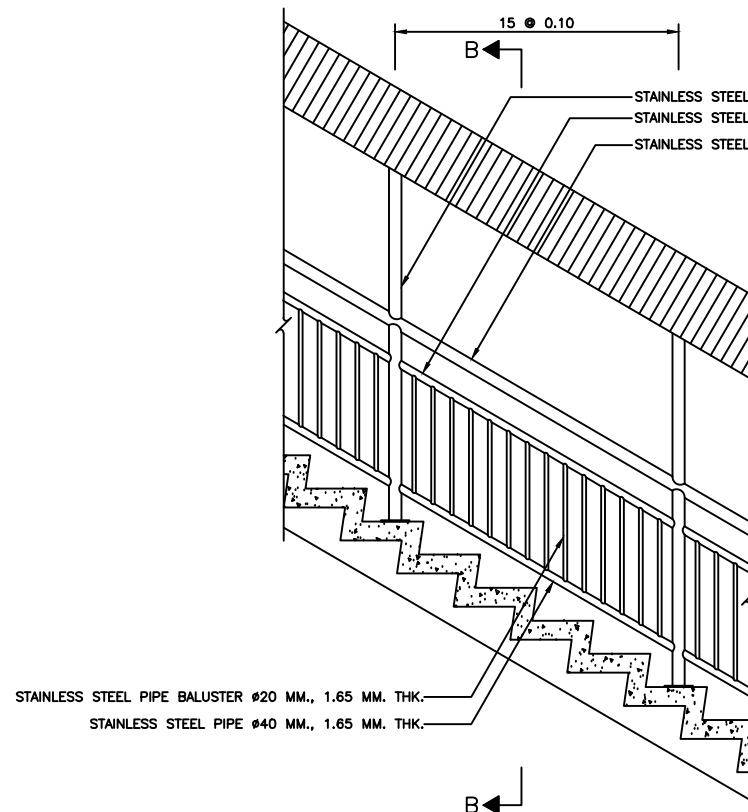
HANDRAIL TYPE 5A
SCALE 1:15



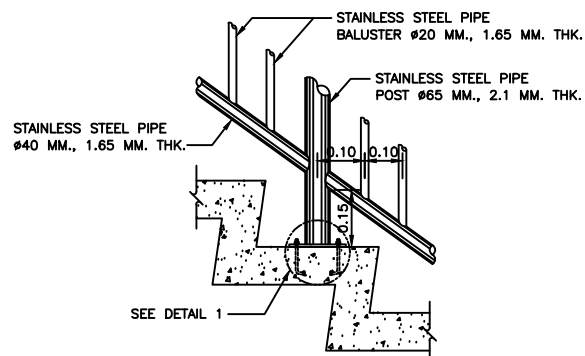
SECTION A-A
SCALE 1:15



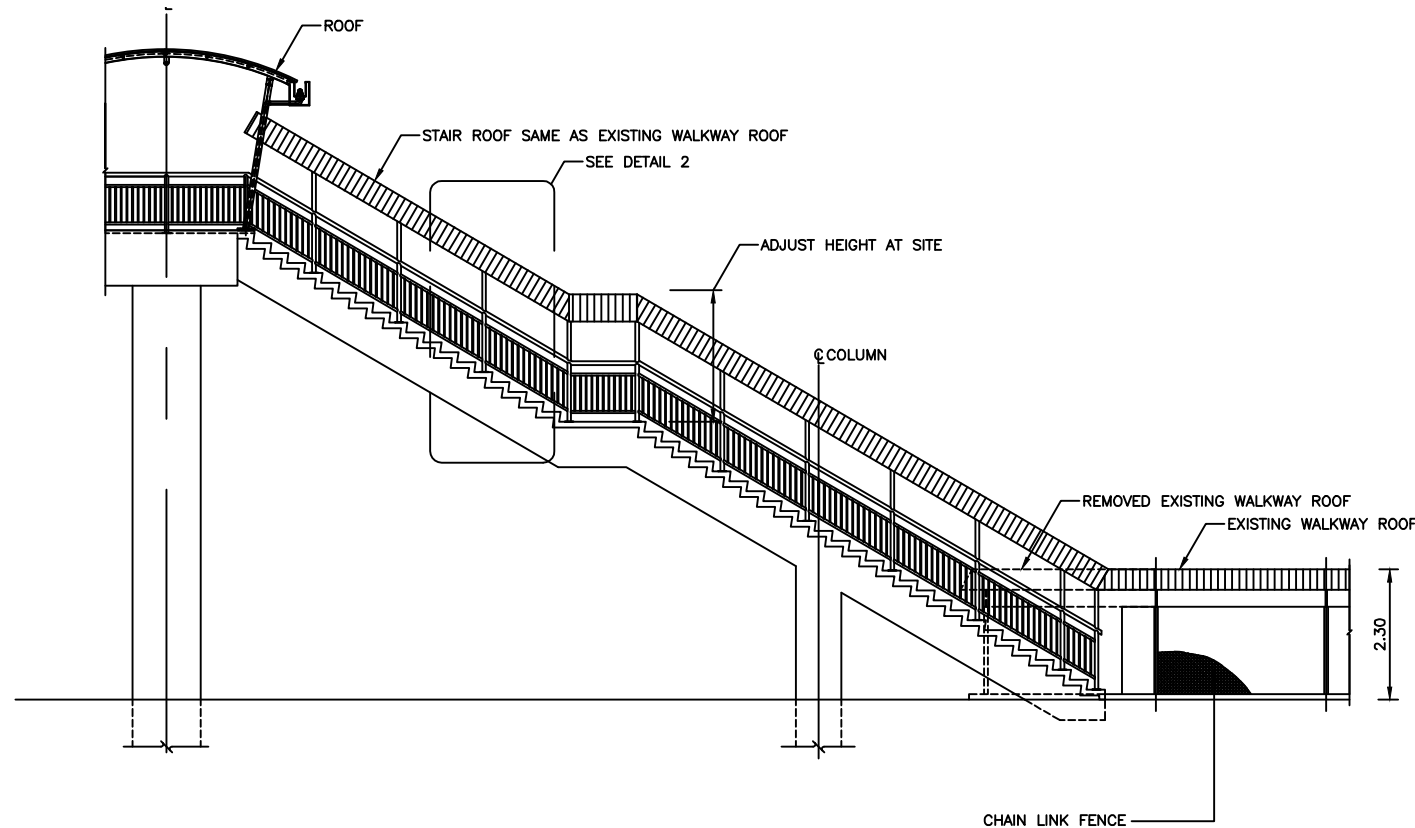
DETAIL 1
SCALE 1:5



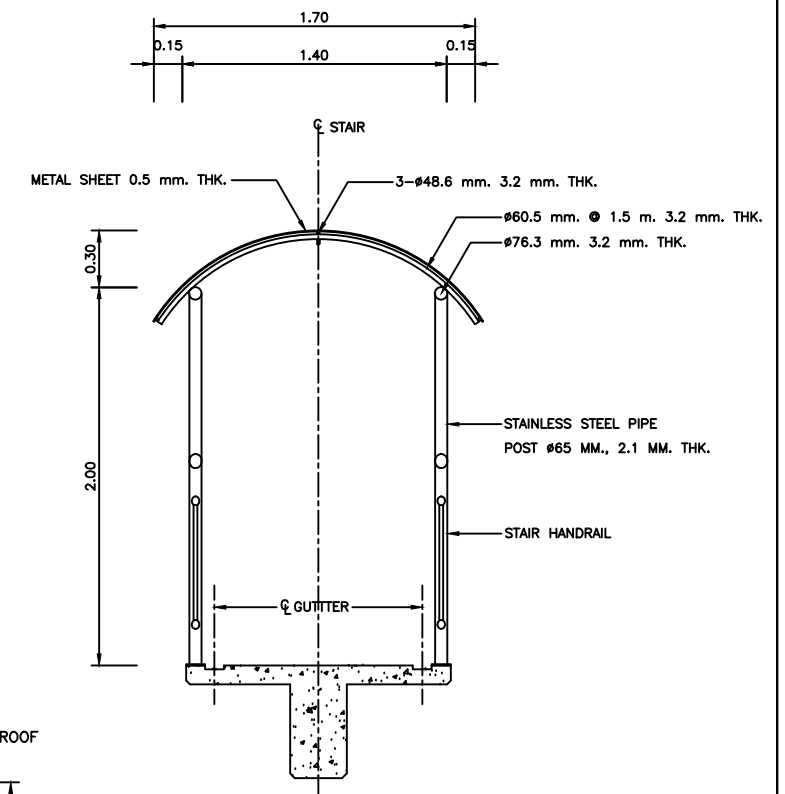
DETAIL 2
SCALE 1:20



STAIR HANDRAIL
SCALE 1:10



ELEVATION OF ROOF (STAIR)
SCALE 1:15

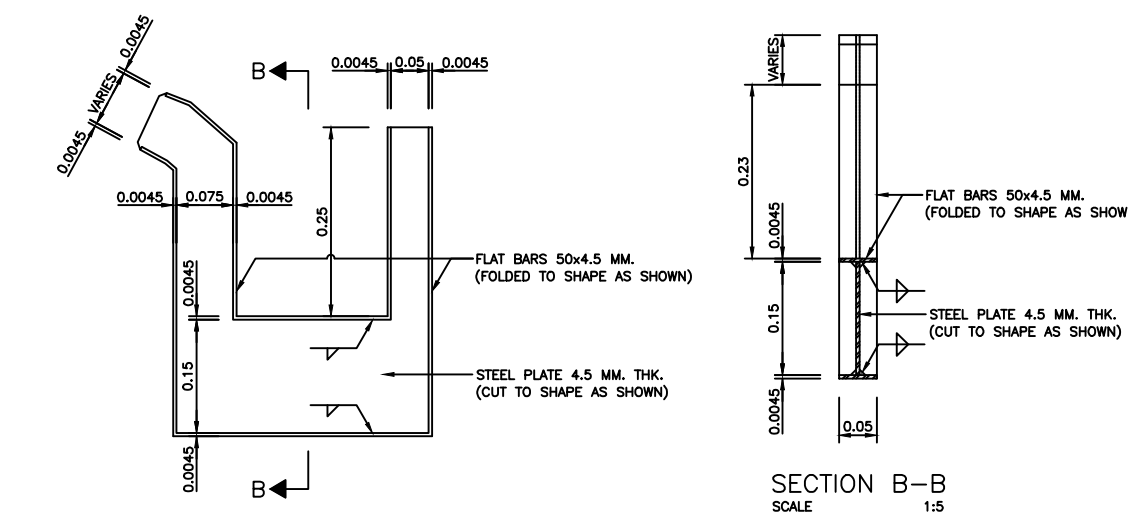
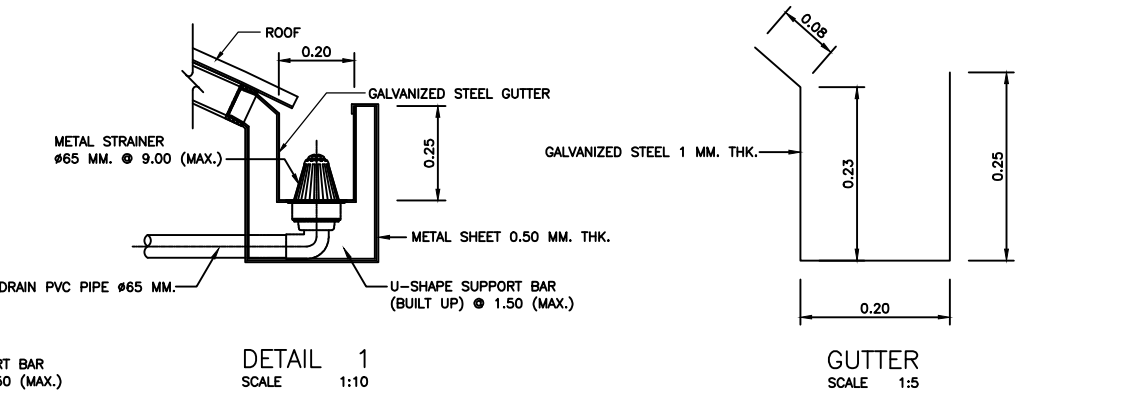
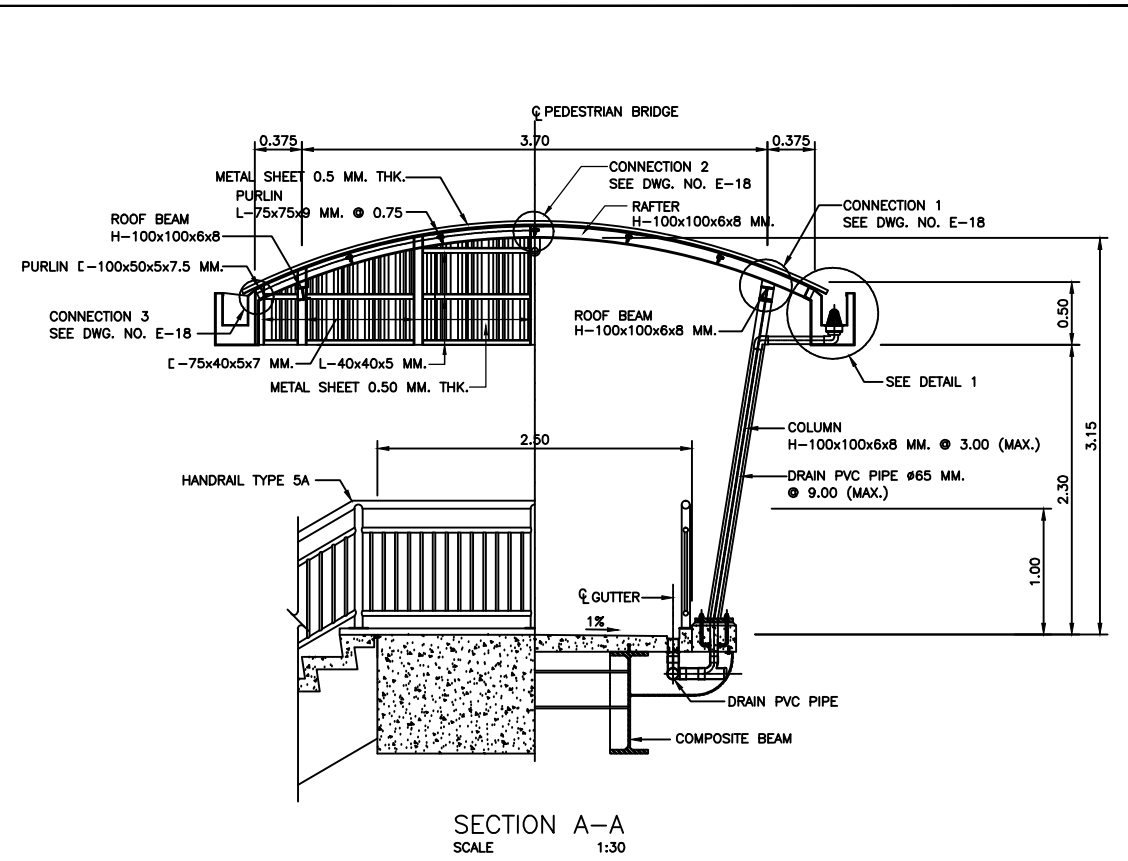
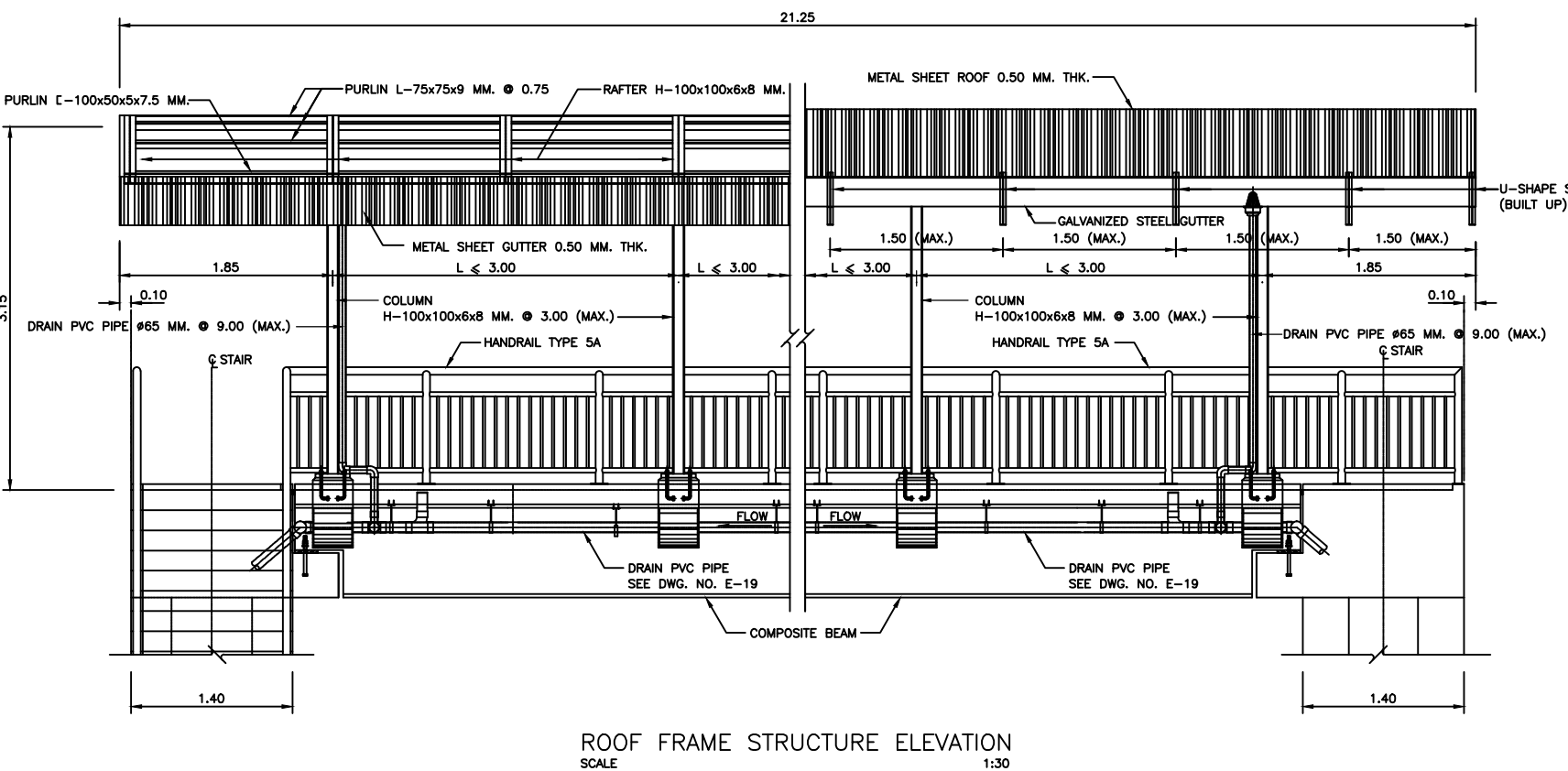
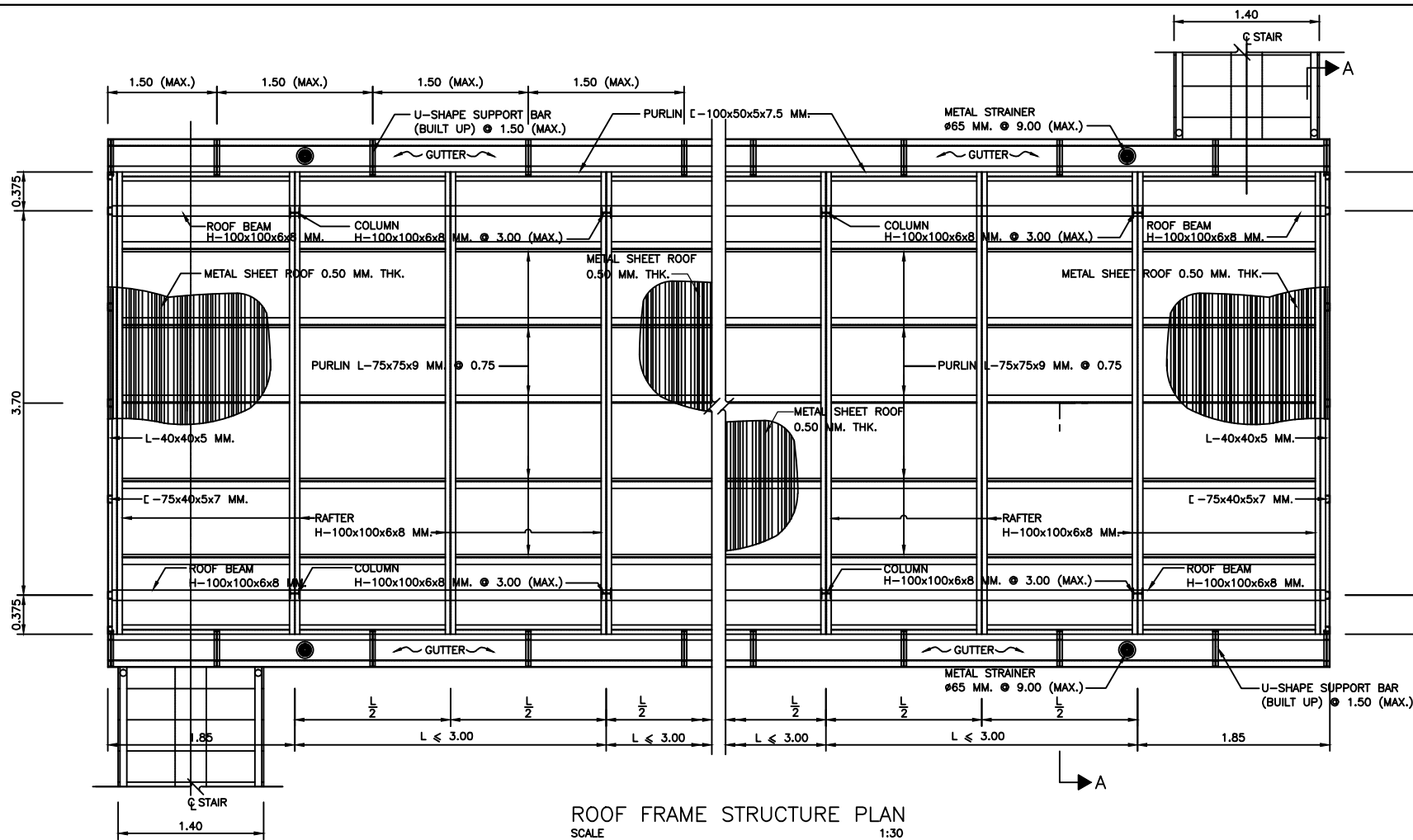


SECTION B-B
SCALE 1:20

NOTES :

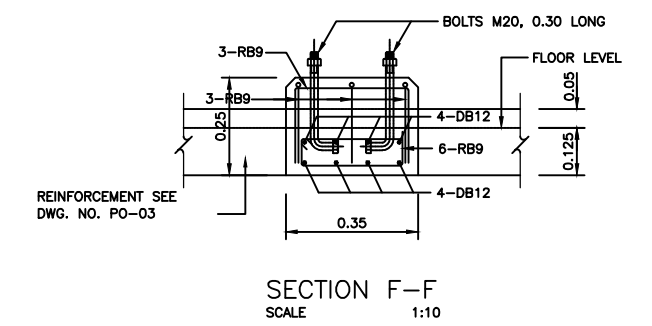
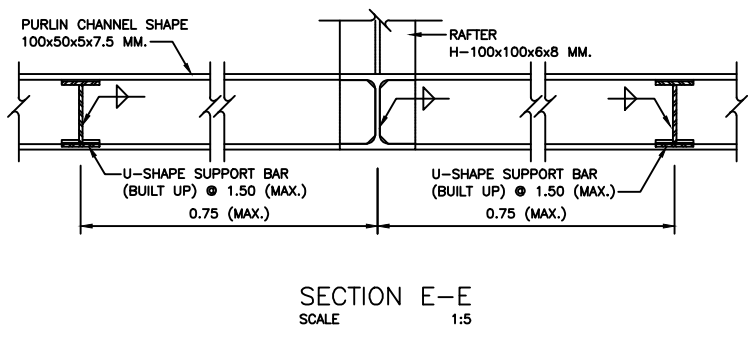
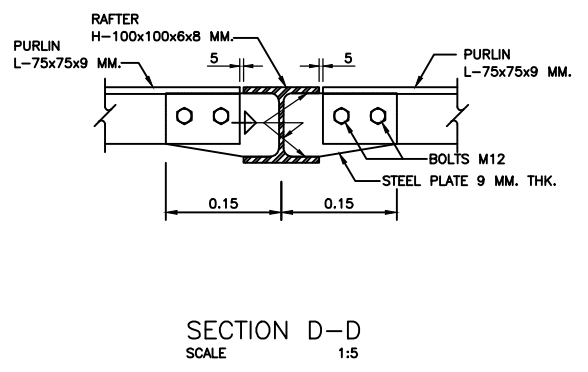
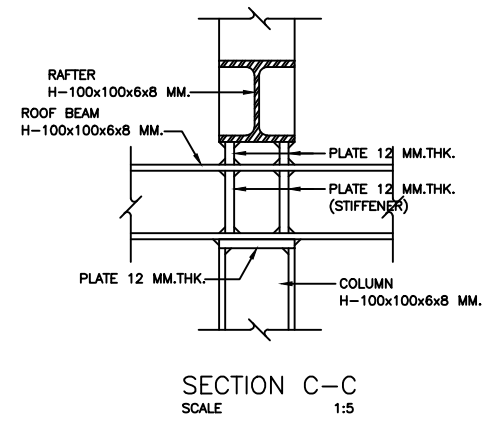
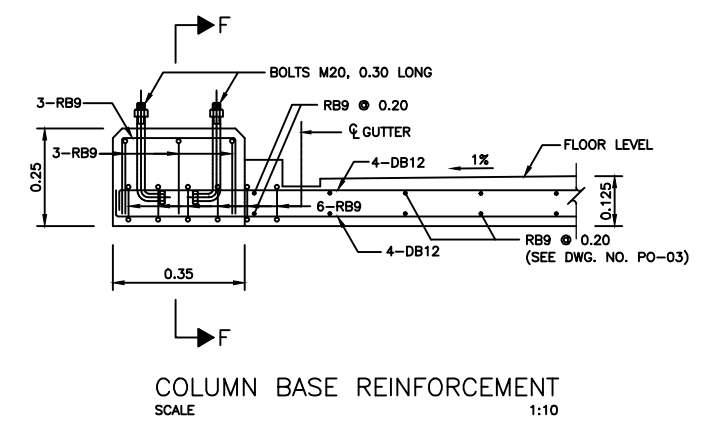
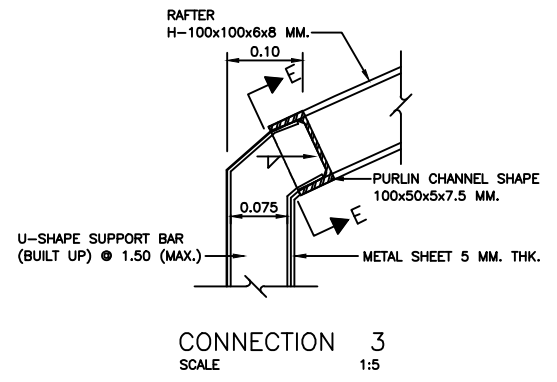
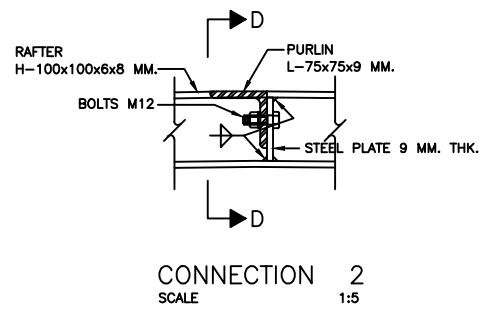
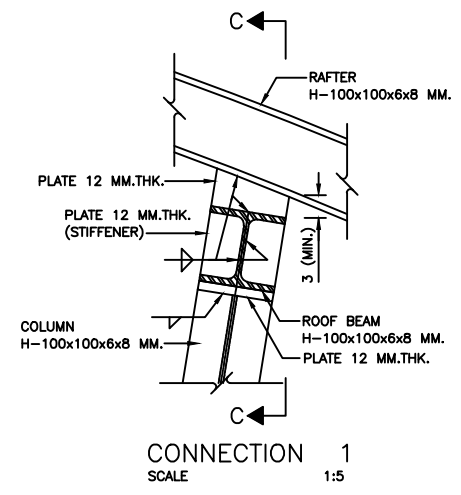
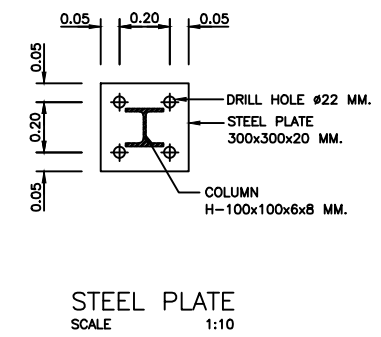
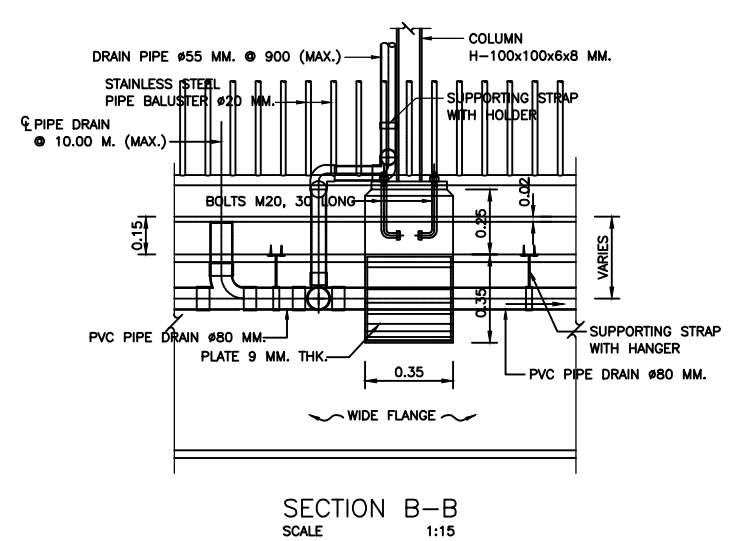
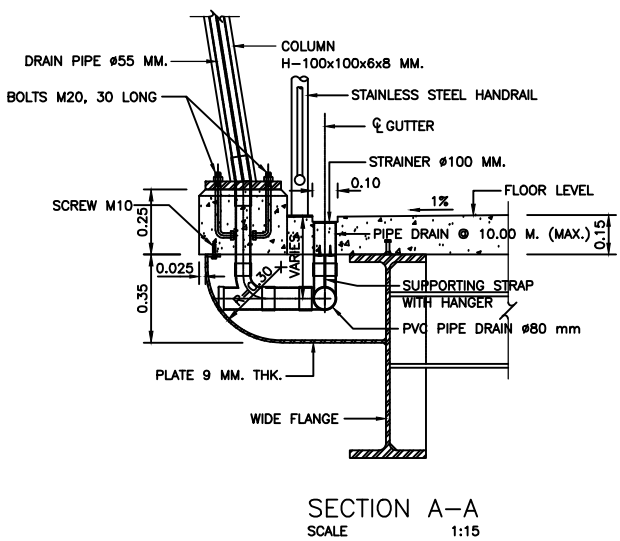
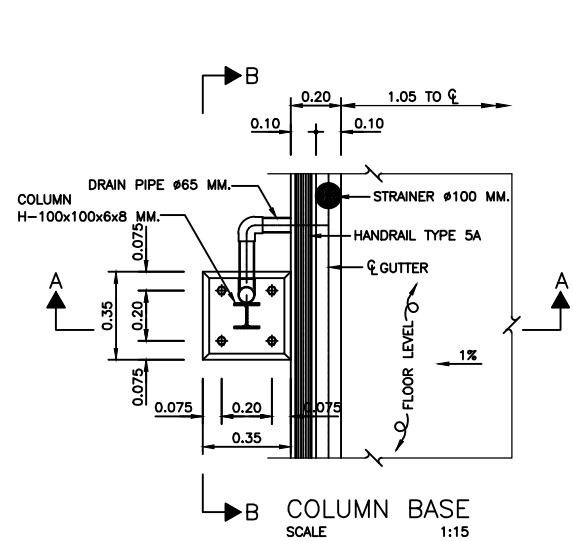
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- STAINLESS STEEL PIPE SHALL CONFORM TO TIS 1006 GRADE 304
- BLACK STEEL PIPE SHALL CONFORM TO TIS 276 CLASS 2
- MATERIAL OF RAILING SHALL BE AS DIRECTED BY THE DESIGNER AND SPECIFIED IN LIST OF WORK REQUIRED.

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.
														PO-07	145



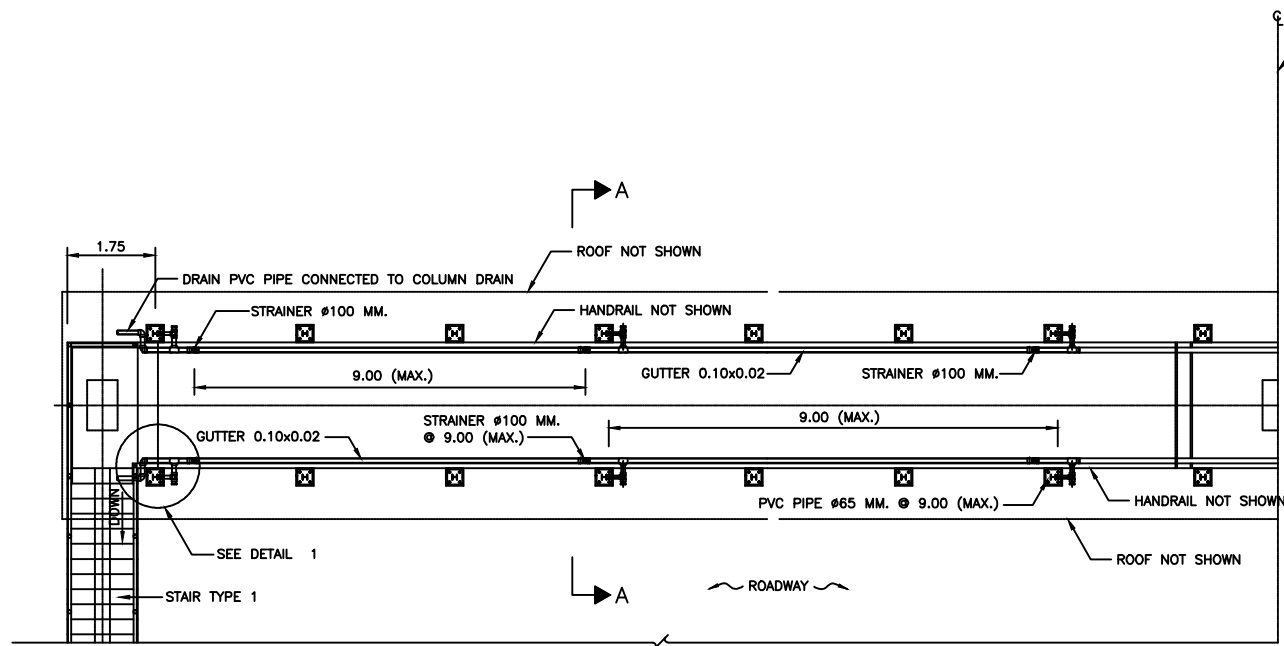
- NOTES :**
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - WELDING SEE DWG. NO. G-02
 - METAL STRAINER (ROOF DRAINS) SHALL CONFORM TO TIS 1052

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 TOLL GATE PEDESTRIAN BRIDGE	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 AS SHOWN
														DWG. NO. PO-08	SHEET NO. 146



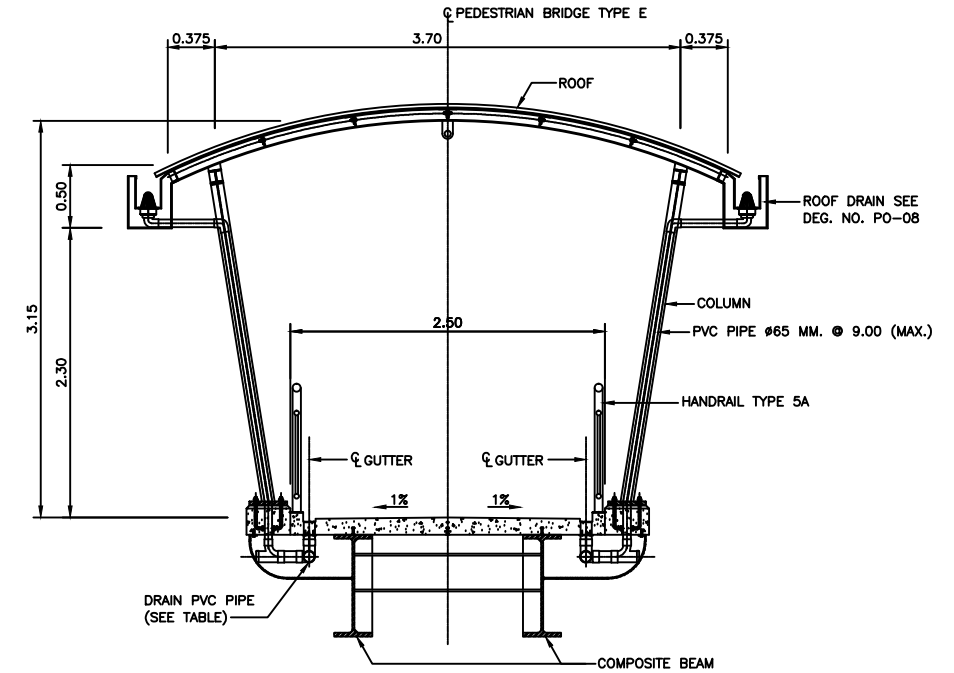
- NOTES :**
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - WELDING SEE DWG. NO. TG-02
 - METAL SHEET
 - 3.1.1 METAL SHEET SHALL BE HIGH TENSILE STEEL SHEET HOT DIP ZINC-ALUMINIUM ALLOY COATING (AL%=50-55%) AND PVDF (20-25 MICRONS THICK) PAINT COATING
 - 3.1.2 THE TOTAL METAL SHEET THICKNESS SHALL NOT BE LESS THAN 0.53 MM.
 - 3.2 FINISH COATING
ALL ALUMINIUM-ZINC ALLOY COATED METAL SHEET SHALL HAVE A CONVERSION AND A PRIMER (NOT LESS THAN 5 MICRONS THICK) COATING BEFORE RECEIVING THE FINISH COATING FOR ROOFING SHALL RECEIVE ALUMINIUM AND ZINC ALLOY COATING OF NOT LESS THAN 150 G/M²
 - 3.3 METAL SHEET PROFILE SHALL HAVE SPACING OF CREST NOT MORE THAN 130 MM. AND HIGH OF CREST NOT LESS THAN 23 MM. OR CORRUGATED PROFILE
 - METAL SHEET FIXING SYSTEM MUST BE HEX DRILL POINT SCREW WITH EPDM SEAL FASTENER GUAGE 12
 - METAL SHEET SDREW FIXING SPACING SHALL BE EVERY INTERNAL ALTERNATE CREST.

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 The Preparatory Survey on the Rehabilitation Project of PEDESTRIAN BRIDGE	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
															DWG. NO. PO-09	SHEET NO. 147

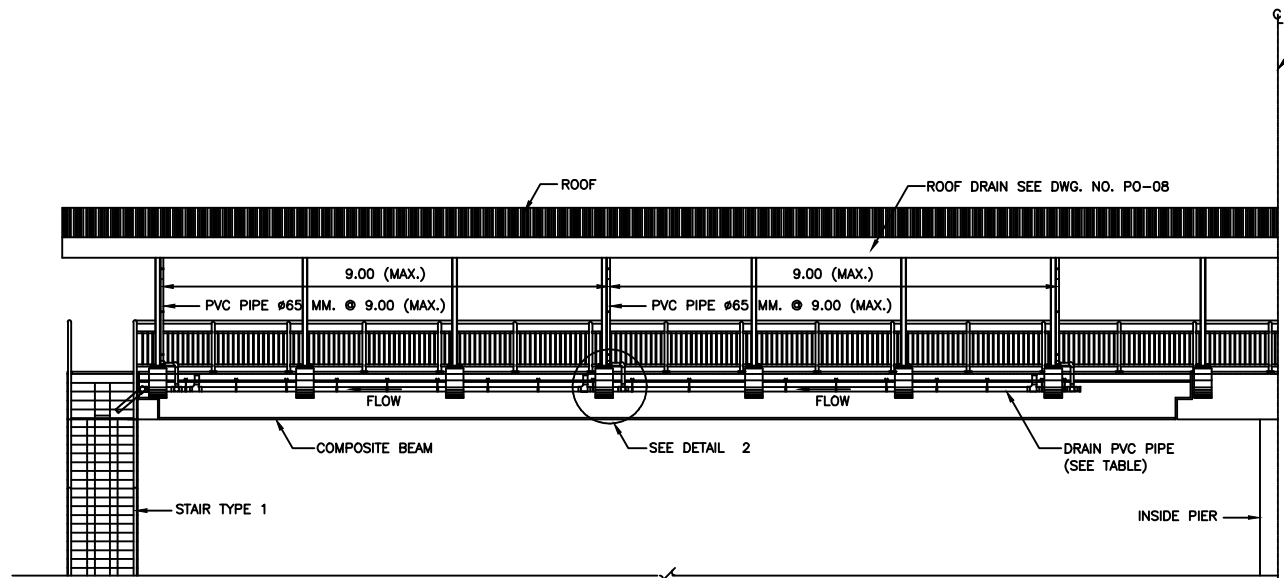


ROOF AND DECK DRAIN PLAN
SCALE 1:75

SYMMETRICAL ABOUT CENTER LINE

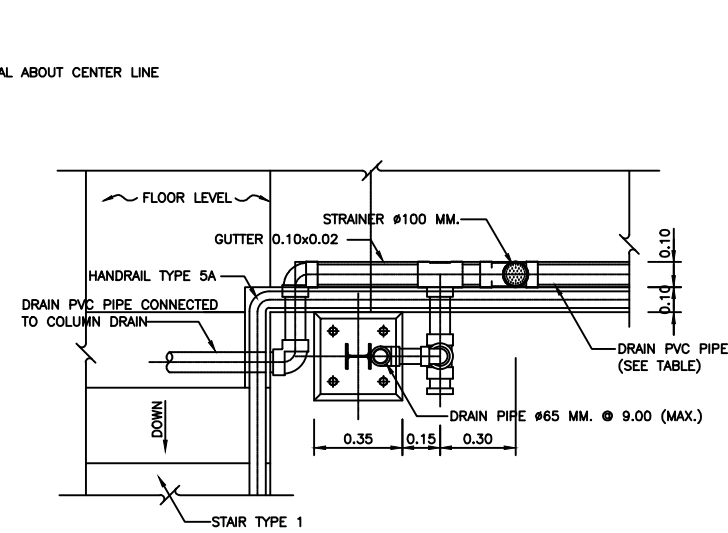


SECTION A-A
SCALE 1:30

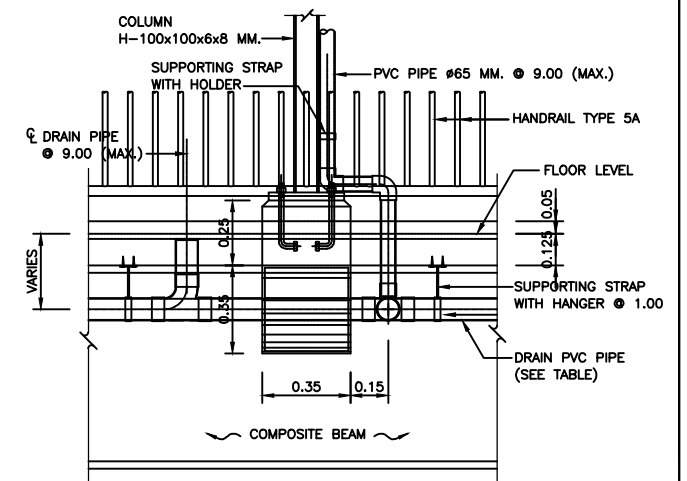


ROOF AND DECK DRAIN ELEVATION
SCALE 1:75

SYMMETRICAL ABOUT CENTER LINE



DETAIL 1
SCALE 1:15



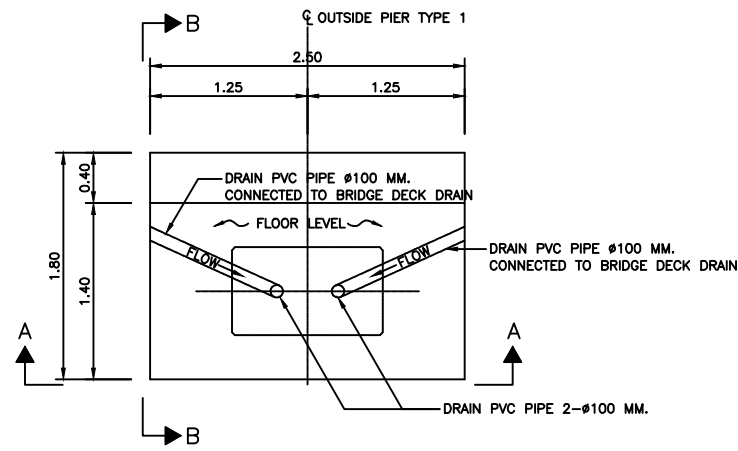
DETAIL 2
SCALE 1:15

DRAIN PVC PIPE	
PEDESTRIAN BRIDGE LENGTH (M.)	DIAMETER OF PIPE (MM.)
30-40	ø80
50-80	ø100

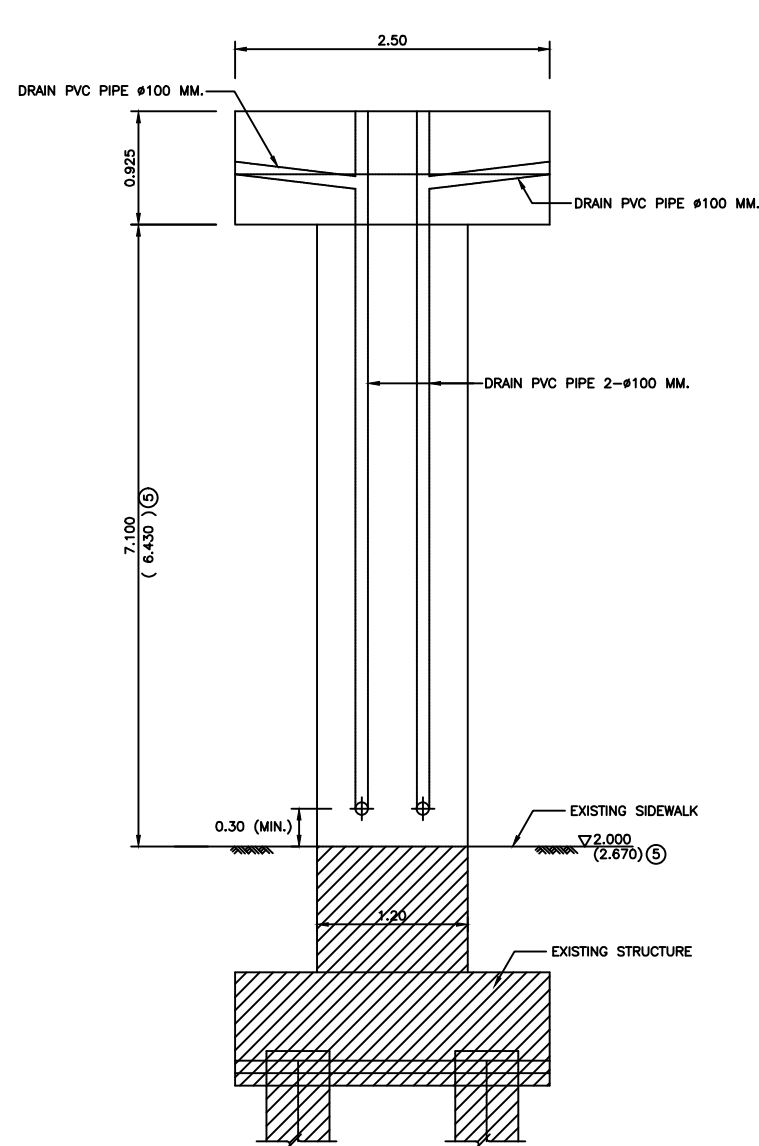
NOTES :

- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- UNPLASTICIZED POLYVINYL CHLORIDE PIPES SHALL CONFORM TO TIS 17 CLASS 8.5 AND EXPOSED SURFACE SHALL BE PAINTED WITH OIL PAINT COFORMING TO TIS 327, ITS COLOUR SIMILAR TO CONCRETE SURFACE.
- THE DETAILS ABOVE ARE TENTATIVE LAYOUT OF WHICH THE CONTRACTOR SHALL SUBMITTED SHOP DRAWING TO THE ENGINEER FOR APPROVAL.

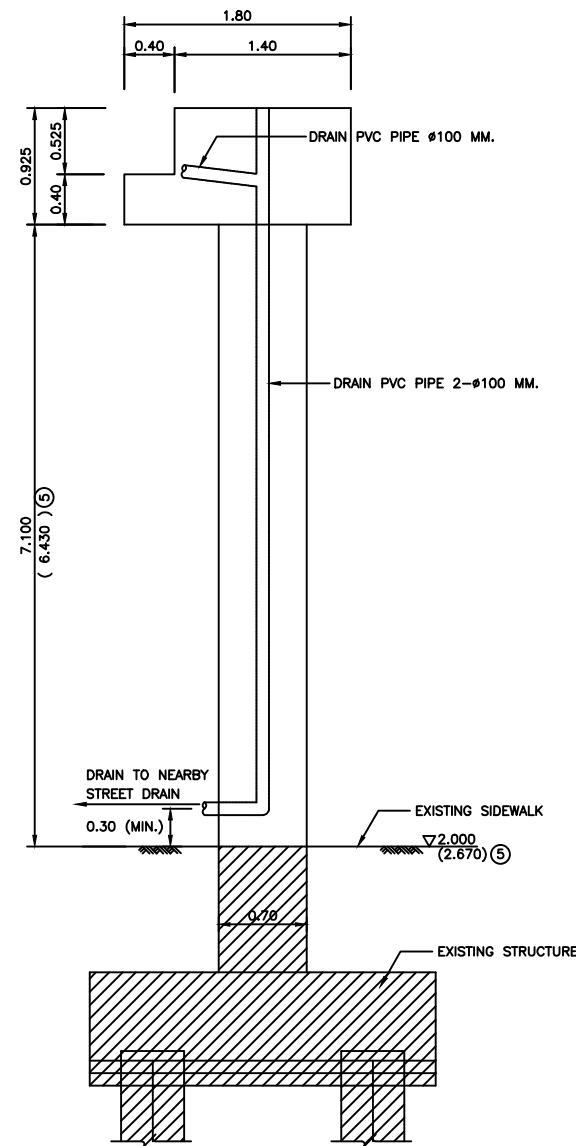
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the Outer Bangkok Ring Road	DESIGNED BY SAGARA Hidetaka ROAD ENGINEER	CHECKED BY WATANABE Ryohei CHIEF ENGINEER	DATE AUGUST 2012	SCALE AS SHOWN
		CHECKED	DATE	CHECKED	DATE										
									TOLL GATE PEDESTRIAN BRIDGE					DWG. NO. PO-10	SHEET NO. 148



PLAN



SECTION A-A



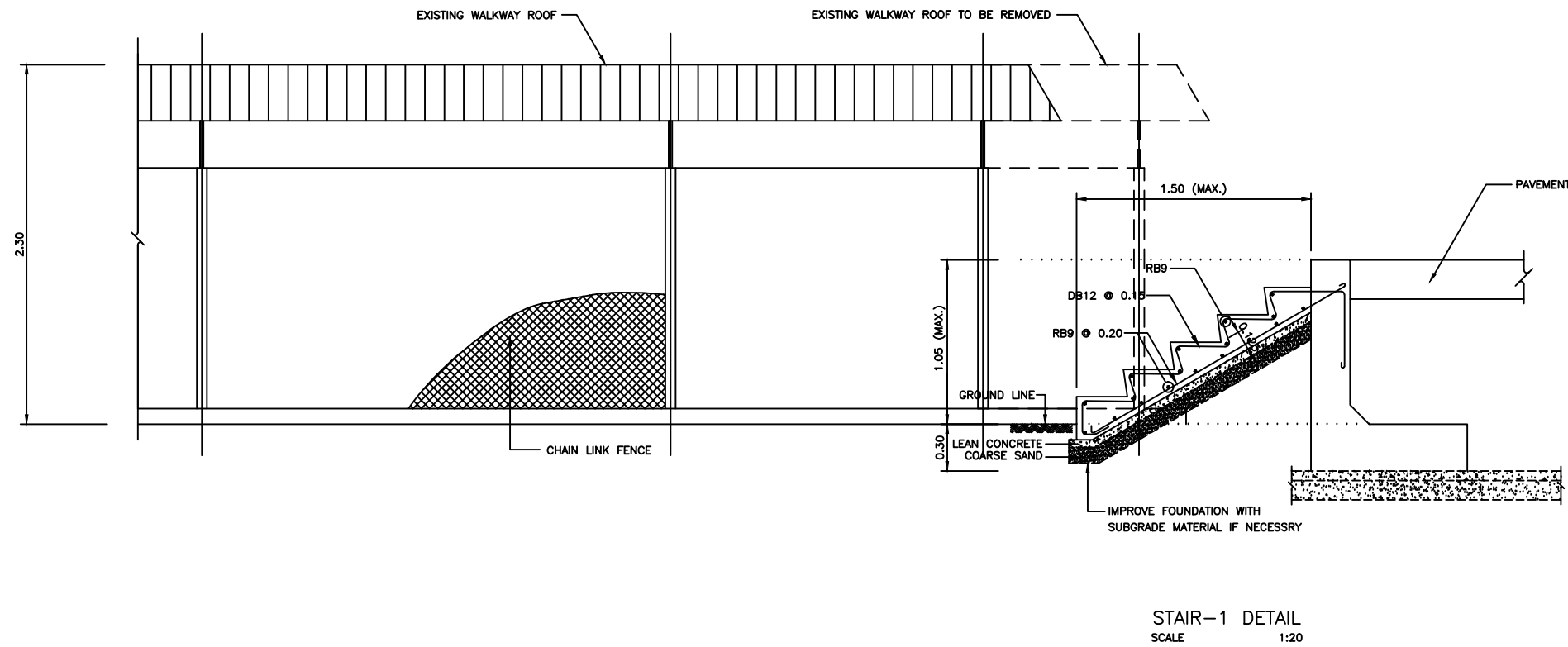
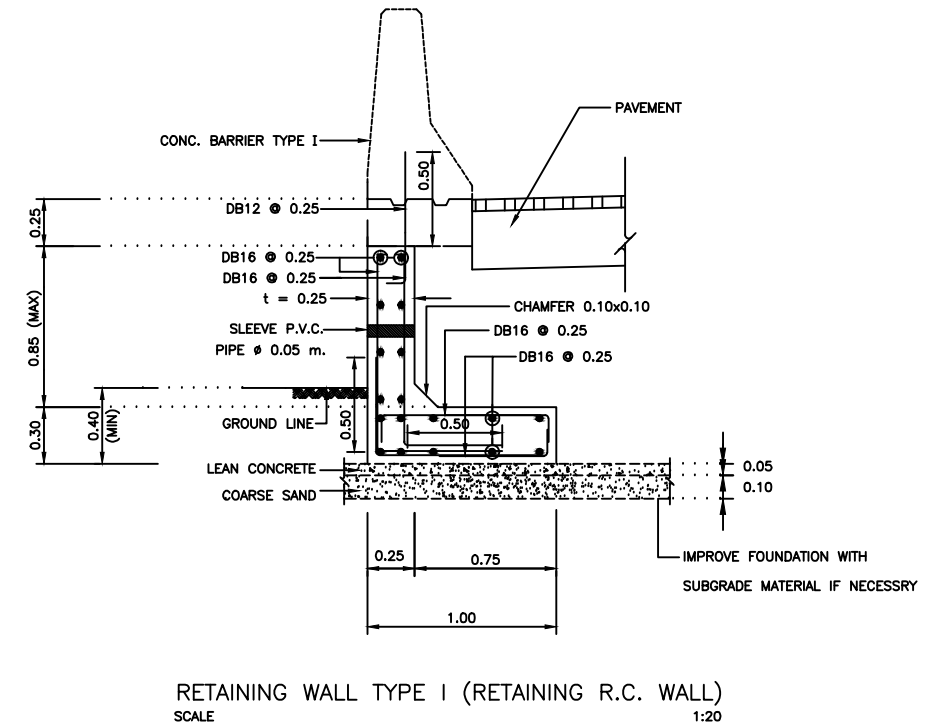
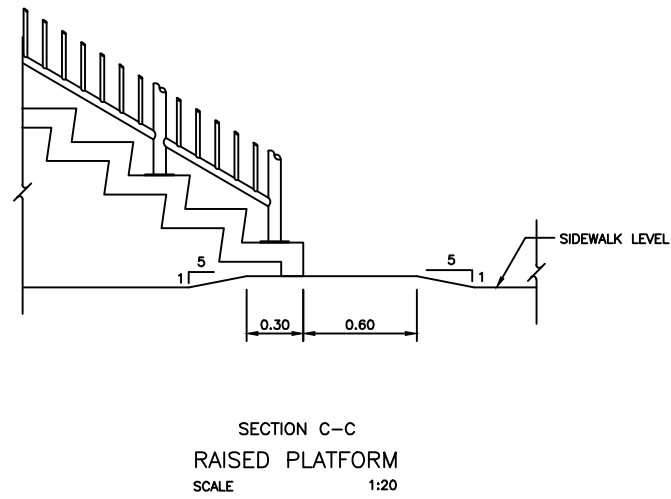
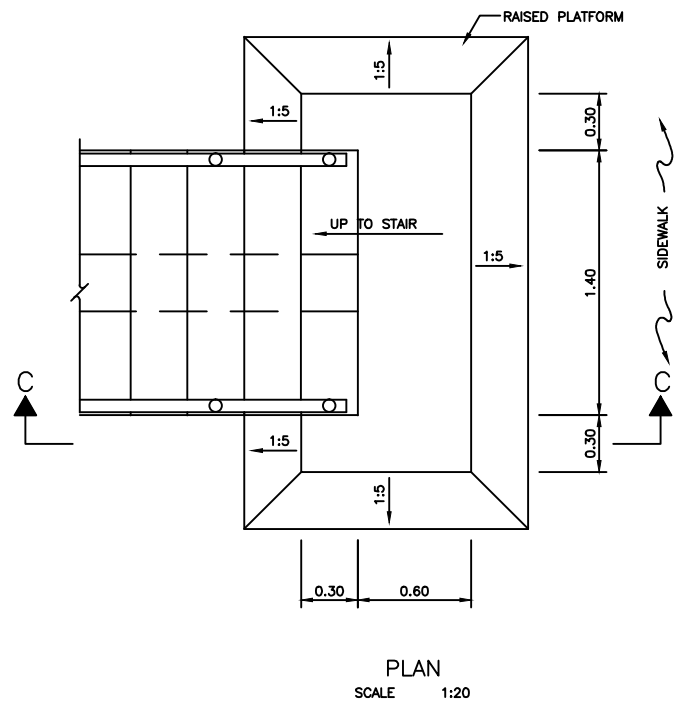
SECTION B-B

COLUMN DRAIN PIPE FOR OUTSIDE PIER TYPE 1
SCALE 1:30

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 2. ROOF AND DECK DRAIN DETAILS SEE DWG. NO. PO-10.
 3. UNPLASTICIZED POLYVINYL CHLORIDE PIPES SHALL CONFORM TO TIS 17 CLASS 13.5
 4. THE DETAILS ABOVE ARE TENTATIVE LAYOUT OF WHICH THE CONTRACTOR SHALL SUBMITTED SHOP DRAWING TO THE ENGINEER FOR APPROVAL.
- ⑤ RIGH SIDE PIER/(LEFT SIDE PIER)

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>TOLL GATE PEDESTRIAN BRIDGE</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>
											DWG. NO.	SHEET NO.		
											PO-11	149		

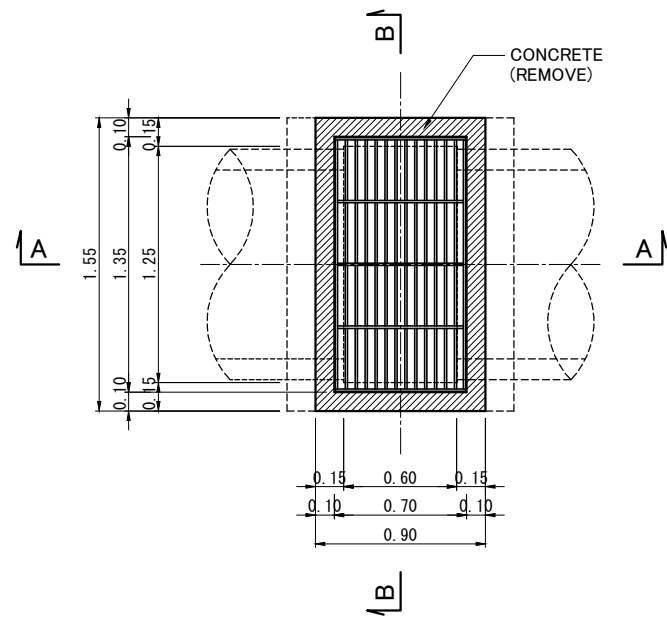


- NOTES :
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
 2. STAINLESS STEEL PIPE SHALL CONFORM TO TIS 1006
 3. MATERIAL OF RAILING SHALL BE AS DIRECTED BY THE DESIGNER AND SPECIFIED IN LIST OF WORK REQUIRED

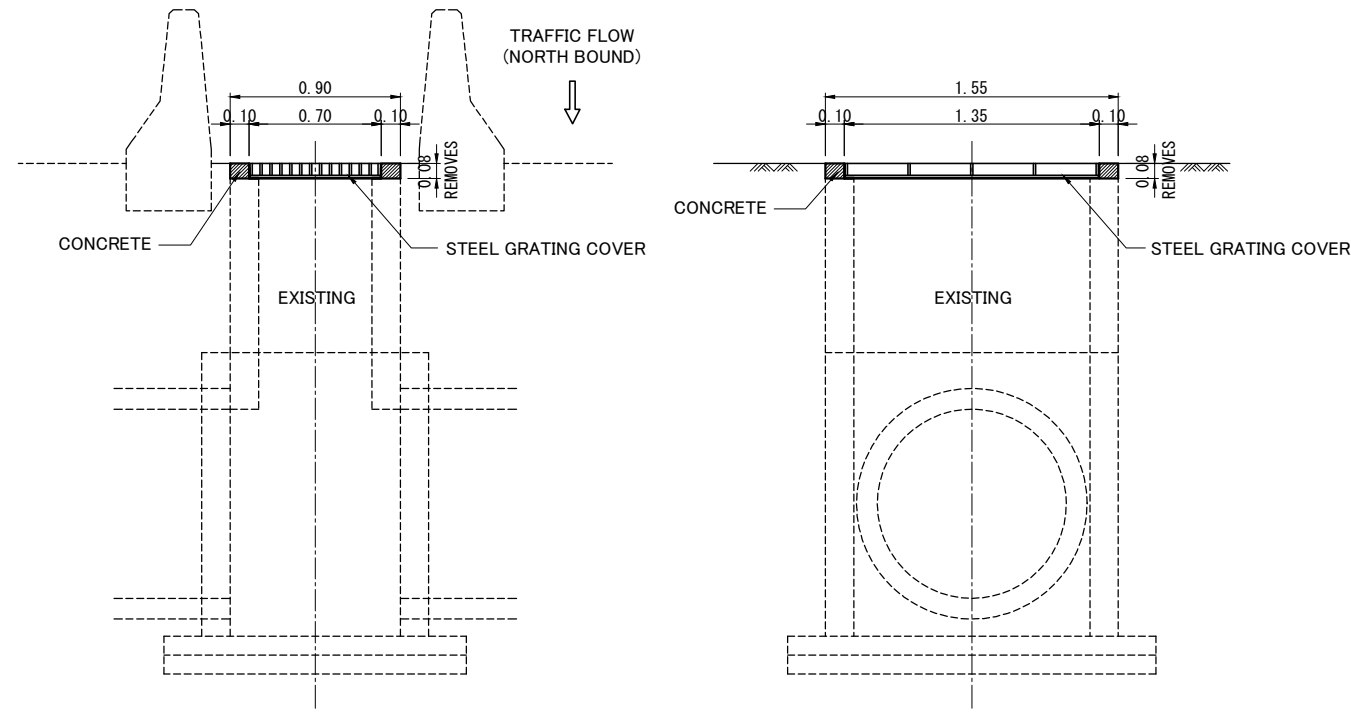
REV. NO.	DESCRIPTION	ENGINEER		DOH		REV. NO.	APPROVED BY	KINGDOM OF THAILAND MINISTRY OF TRANSPORT DEPARTMENT OF HIGHWAYS	HIGHWAY ROUTE NO. 9	OWNER The Inter-City Motorways Division Department of Highways Ministry of Transport	PROJECT TITLE The Preparatory Survey on the Rehabilitation Project of the 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.
														PO-12	150

5. DRAINAGE WORK

**5-1 HEIGHT ADJUSTMENT OF
EXISTING CATCH BASIN AT
MEDIAN**



PLAN



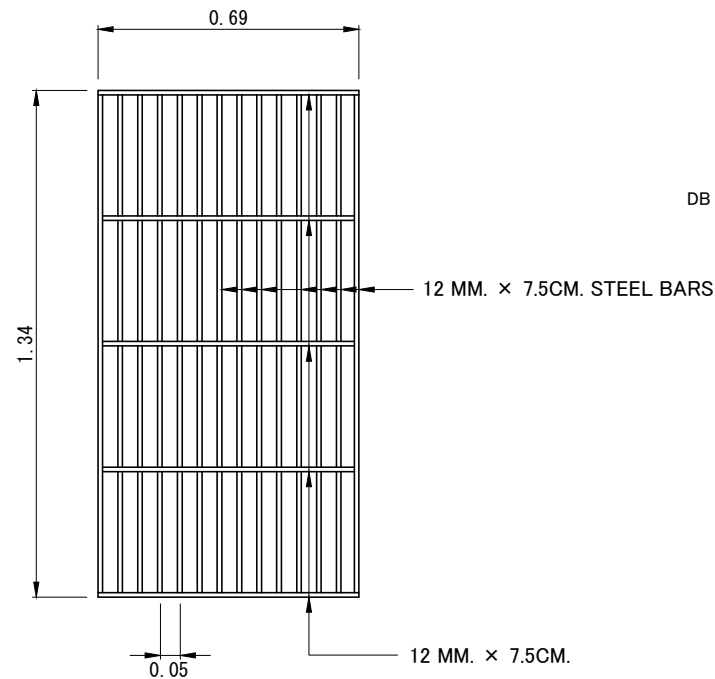
SECTION A-A

SECTION B-B

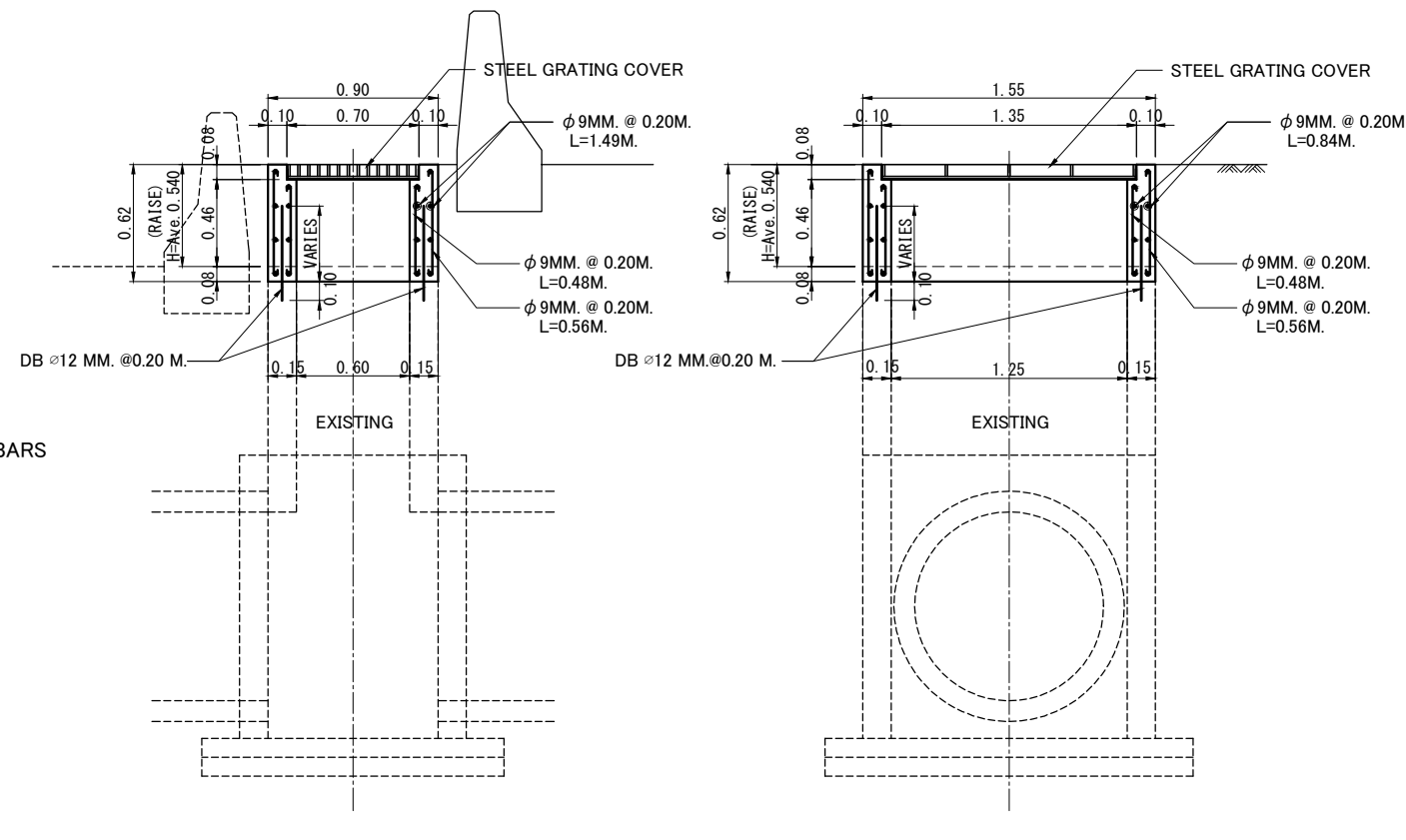
REMOVAL WORK
SCALE 1:20

SCHEDULED LIST OF HEIGHT ADJUSTMENT OF EXISTING CATCH BASIN (MEDIAN)

NO.	STA	H (m)	NO.	STA	H (m)	NO.	STA	H (m)	
1	STA 10+613.9	0.630	31	STA 15+193.3	0.590	61	STA 24+230.6	0.000	
2	STA 10+615.9	0.630	32	STA 15+331.7	0.580	62	STA 25+820.9	0.600	
3	STA 10+890.0	0.570	33	STA 15+480.4	0.550	63	STA 25+940.5	0.600	
4	STA 11+629.8	0.570	34	STA 15+605.5	0.580	64	STA 26+165.0	0.600	
5	STA 11+745.3	0.610	35	STA 15+726.3	0.520	65	STA 26+261.0	0.590	
6	STA 11+832.8	0.600	36	STA 15+958.4	0.550	66	STA 26+397.8	0.580	
7	STA 12+087.3	0.610	37	STA 16+205.3	0.610	67	STA 26+675.6	0.600	
8	STA 12+239.8	0.610	38	STA 16+320.0	0.610	68	STA 27+014.5	0.590	
9	STA 12+371.2	0.600	39	STA 16+461.9	0.600	69	STA 27+320.1	0.590	
10	STA 12+373.5	0.600	40	STA 16+609.5	0.490	70	STA 27+577.6	0.600	
11	STA 12+470.7	0.460	41	STA 16+707.7	0.560	71	STA 27+670.9	0.570	
12	STA 12+649.0	0.350	42	STA 16+863.4	0.250	72	STA 27+930.0	0.590	
13	STA 12+809.0	0.100	43	STA 17+026.2	0.600	73	STA 28+169.1	0.520	
14	STA 13+024.0	0.610	44	STA 17+340.5	0.600	74	STA 28+533.9	0.070	
15	STA 13+398.8	0.460	45	STA 17+460.3	0.610	75	STA 28+815.3	0.570	
16	STA 13+402.4	0.460	46	STA 17+609.8	0.550	76	STA 29+049.2	0.620	
17	STA 13+619.9	0.630	47	STA 17+791.9	0.600				
18	STA 13+781.2	0.620	48	STA 17+868.9	0.630				
19	STA 14+022.6	0.610	49	STA 18+083.2	0.610				
20	STA 14+136.9	0.530	50	STA 18+439.8	0.620				
21	STA 14+296.5	0.560	51	STA 18+713.0	0.610				
22	STA 14+416.6	0.560	52	STA 18+863.8	0.610				
23	STA 14+538.2	0.620	53	STA 19+046.0	0.610				
24	STA 14+662.4	0.590	54	STA 19+281.0	0.630				
25	STA 14+718.6	0.570	55	STA 19+487.8	0.610				
26	STA 14+830.8	0.580	56	STA 19+674.6	0.540				
27	STA 14+942.7	0.610	57	STA 20+579.9	0.560				
28	STA 15+022.9	0.550	58	STA 23+762.6	0.560				
29	STA 15+189.0	0.590	59	STA 23+946.5	0.040				
30	STA 15+191.2	0.590	60	STA 24+073.0	0.000				
								Total H=40.510m	
								Ave. H=0.540m	



DETAIL OF STEEL GRATING COVER
SCALE 1:10



SECTION A-A

SECTION B-B

HEIGHT ADJUSTMENT OF EXISTING CATCH BASIN (MEDIAN)
SCALE 1:20

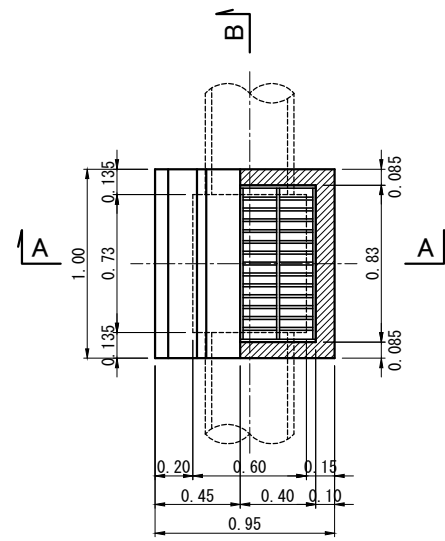
NOTES :

- 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 :

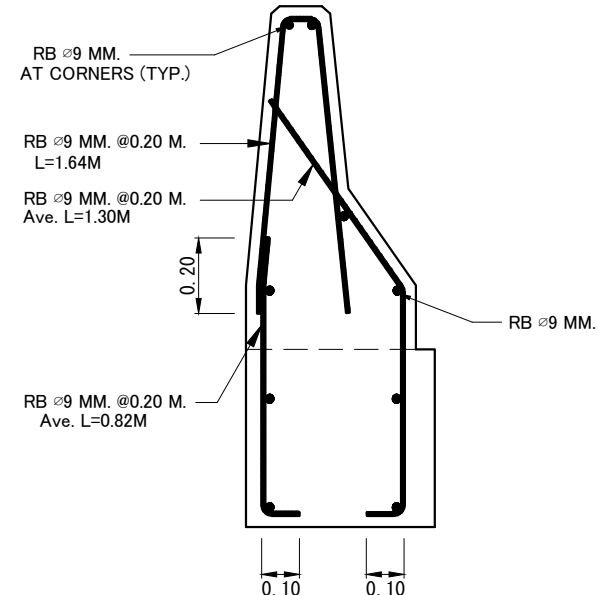
PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M.
CRUSHED ROCK OR GRAVEL	0.86 M.
CONCRETE SLUMP	10 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
- STRUCTURAL STEEL SHALL CONFORM TO TIS.116 GRADE FE 30.

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 HEIGHT ADJUSTMENT OF EXISTING CATCH BASIN AT MEDIAN	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 : 1:10 / 1:20
									DWG. NO. DR-1	SHEET NO. 151						

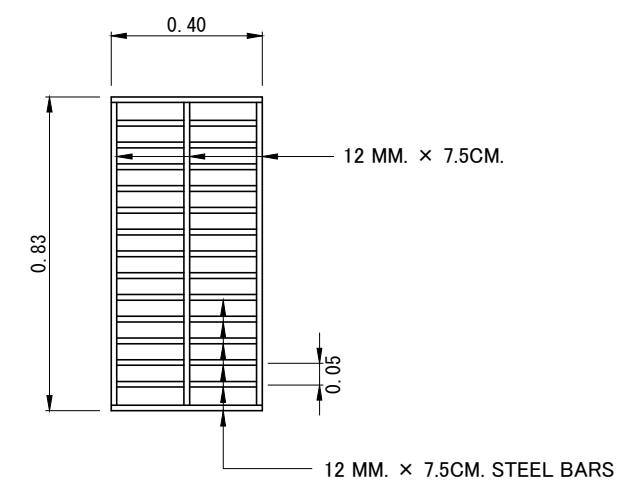
**5-2 HEIGHT ADJUSTMENT OF
EXISTING CATCH BASIN AT
SHOULDER**



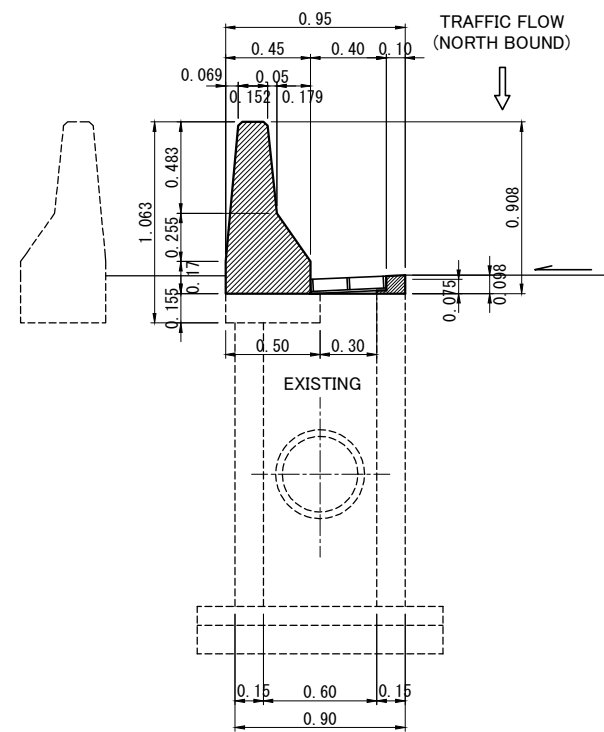
PLAN



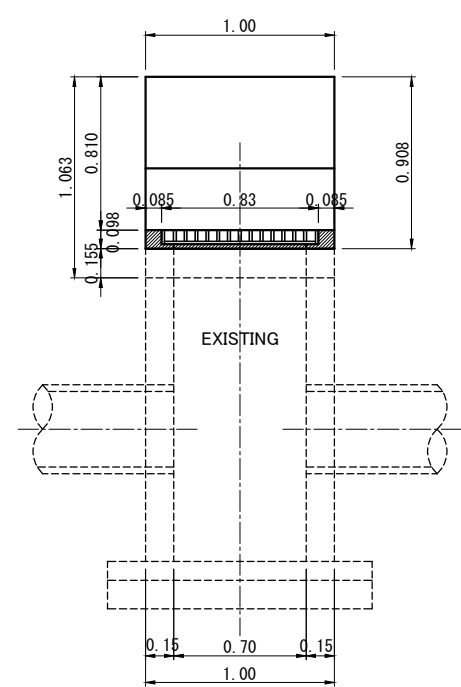
REINFORCEMENT DETAIL
SCALE 1:10



DETAIL OF STEEL GRATING COVER
SCALE 1:10

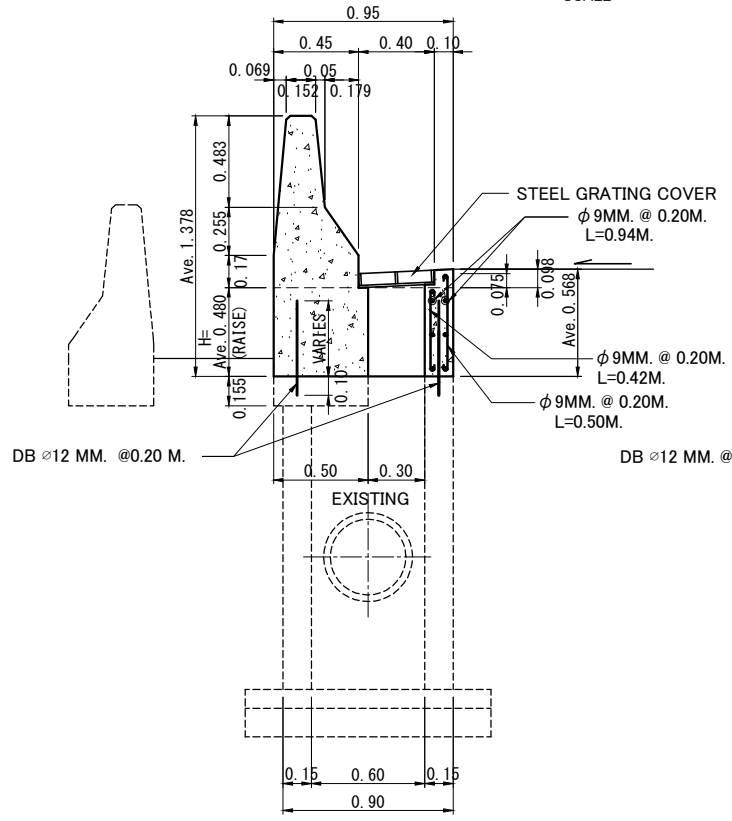


SECTION A-A

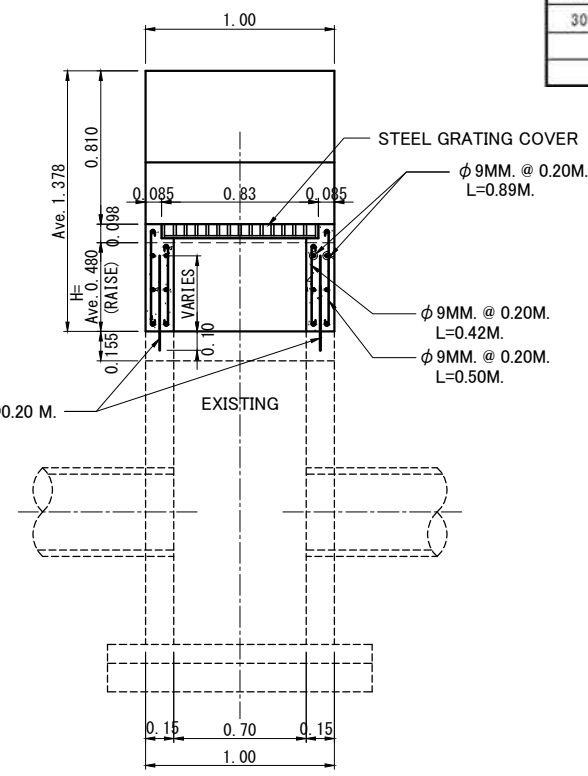


SECTION B-B

REMOVAL WORK
SCALE 1:20



SECTION A-A



SECTION B-B

HEIGHT ADJUSTMENT OF EXISTING CATCH BASIN (SHOULDER)
SCALE 1:20

SCHEDULED LIST OF HEIGHT ADJUSTMENT OF EXISTING CATCH BASIN (SHOULDER)

NO.	STA	H(m)	NO.	STA	H(m)	NO.	STA	H(m)	
1	STA 19+718.4	0.442	31	STA 19+967.5	0.572	61	STA 20+160.6	0.412	
2	STA 19+729.3	0.442	32	STA 19+973.2	0.562	62	STA 20+169.9	0.382	
3	STA 19+738.1	0.442	33	STA 19+979.1	0.562	63	STA 20+178.9	0.352	
4	STA 19+747.9	0.442	34	STA 19+984.8	0.562	64	STA 20+187.9	0.352	
5	STA 19+756.6	0.442	35	STA 19+995.0	0.562	65	STA 20+196.8	0.342	
6	STA 19+765.6	0.442	36	STA 20+000.6	0.562	66	STA 20+205.8	0.342	
7	STA 19+774.4	0.442	37	STA 20+006.5	0.562	67	STA 20+215.0	0.332	
8	STA 19+783.2	0.442	38	STA 20+012.3	0.552	68	STA 20+223.9	0.322	
9	STA 19+792.2	0.432	39	STA 20+018.4	0.552	69	STA 20+232.6	0.312	
10	STA 19+801.1	0.432	40	STA 20+024.2	0.542	70	STA 20+242.2	0.302	
11	STA 19+810.1	0.452	41	STA 20+030.1	0.542	71	STA 20+251.1	0.282	
12	STA 19+818.2	0.462	42	STA 20+036.0	0.542	72	STA 20+259.8	0.282	
13	STA 19+827.1	0.482	43	STA 20+042.5	0.542	73	STA 20+268.9	0.272	
14	STA 19+836.0	0.512	44	STA 20+048.0	0.542	74	STA 20+277.7	0.272	
15	STA 19+845.2	0.532	45	STA 20+054.5	0.542	75	STA 20+286.7	0.252	
16	STA 19+854.3	0.552	46	STA 20+060.7	0.542	76	STA 20+295.9	0.232	
17	STA 19+875.0	0.592	47	STA 20+067.0	0.532	77	STA 20+305.0	0.212	
18	STA 19+884.2	0.592	48	STA 20+072.8	0.532				
19	STA 19+896.0	0.612	49	STA 20+078.5	0.532				
20	STA 19+902.9	0.612	50	STA 20+088.7	0.522				
21	STA 19+908.6	0.602	51	STA 20+095.6	0.512				
22	STA 19+914.6	0.632	52	STA 20+101.5	0.512				
23	STA 19+920.3	0.642	53	STA 20+107.0	0.502				
24	STA 19+926.1	0.632	54	STA 20+113.2	0.492				
25	STA 19+931.9	0.622	55	STA 20+118.9	0.492				
26	STA 19+938.4	0.612	56	STA 20+124.6	0.482				
27	STA 19+944.1	0.592	57	STA 20+130.5	0.462				
28	STA 19+950.0	0.582	58	STA 20+136.1	0.462				
29	STA 19+955.6	0.572	59	STA 20+142.5	0.452				
30	STA 19+961.7	0.572	60	STA 20+151.6	0.422				
								Total H=	36.864 m
								Ave. H=	0.48 m

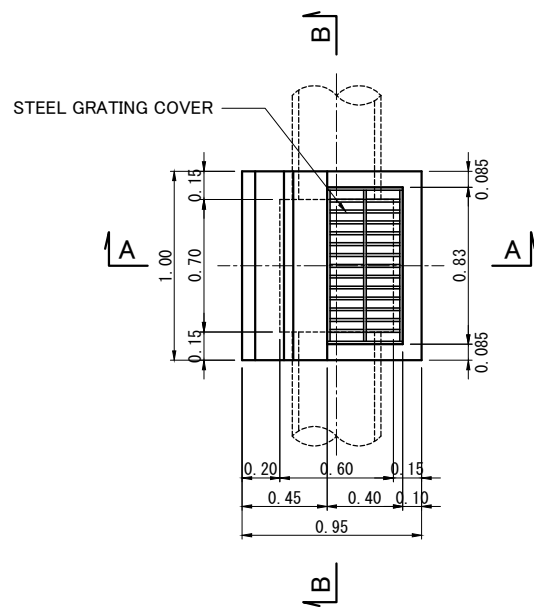
NOTES :

- 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 :

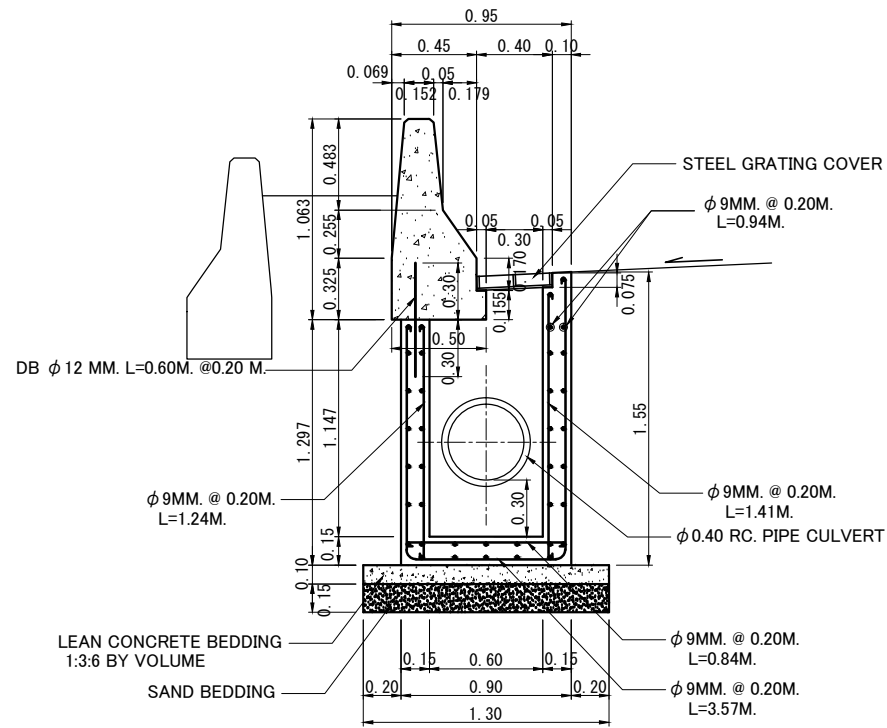
PORTLAND CEMENT TYPE 1	350 KG. (MIN.)
SAND	0.43 M.
CRUSHED ROCK OR GRAVEL	0.86 M.
CONCRETE SLUMP	10 CM.
- REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD30 FOR DEFORMED BARS.
- STRUCTURAL STEEL SHALL CONFORM TO TIS.116 GRADE FE 30.

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
									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 DWG. NO. DR-2	1:10 / 1:20 SHEET NO. 152	

**5-3 DETAILS OF INLET CATCH BASIN
AT MEDIAN & PIPE CULVERT**



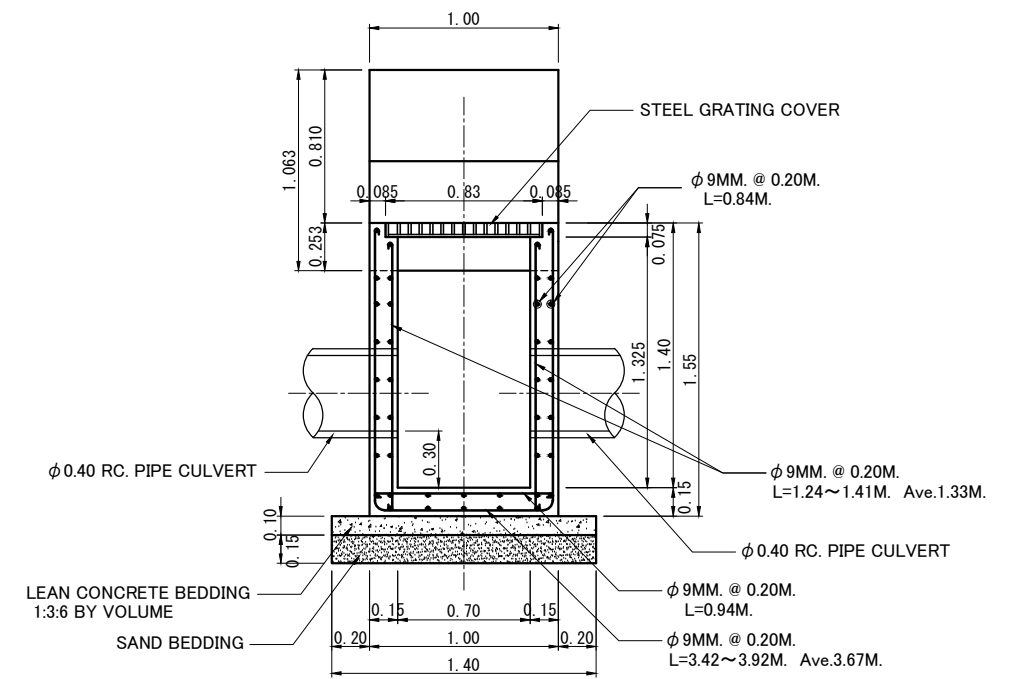
PLAN



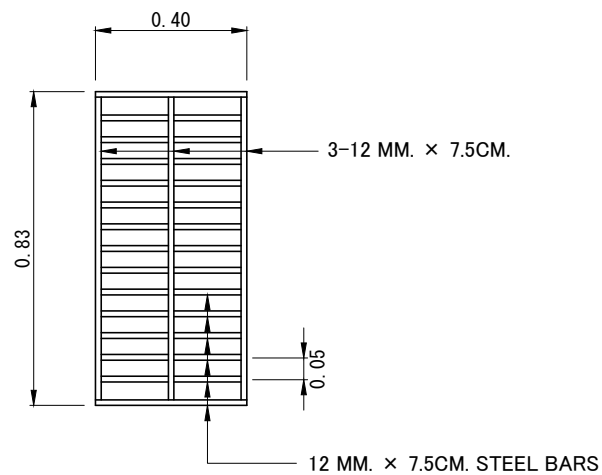
SECTION A-A

CATCH BASIN (SHOULDER)

SCALE 1:20

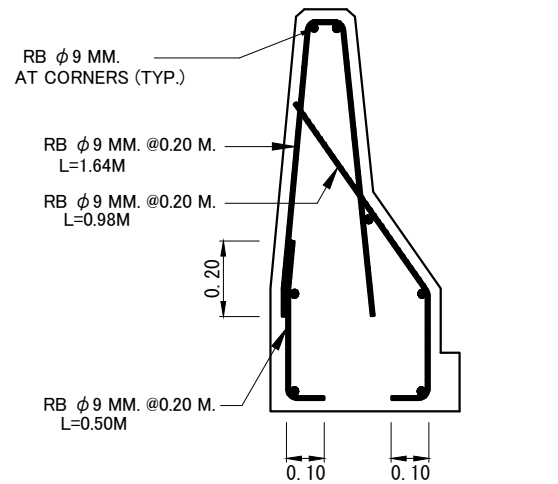


SECTION B-B



STEEL GRATING COVER

SCALE 1:10



REINFORCEMENT DETAIL

SCALE 1:10

SCHEDULED LIST OF CATCH BASIN (SHOULDER)

STA	Nos.	REMARKS
1) STA 19+666.5	1	
2) STA 19+674.6	1	
3) STA 19+678.4	1	
4) STA 19+698.4	1	
5) STA 19+708.4	1	
6) STA 19+765.6	1	
7) STA 20+313.2	1	
8) STA 20+322.5	1	
9) STA 20+327.5	1	
10) STA 20+342.5	1	
11) STA 20+352.5	1	
12) STA 20+362.5	1	
13) STA 20+372.5	1	
14) STA 20+382.5	1	

NOTES :

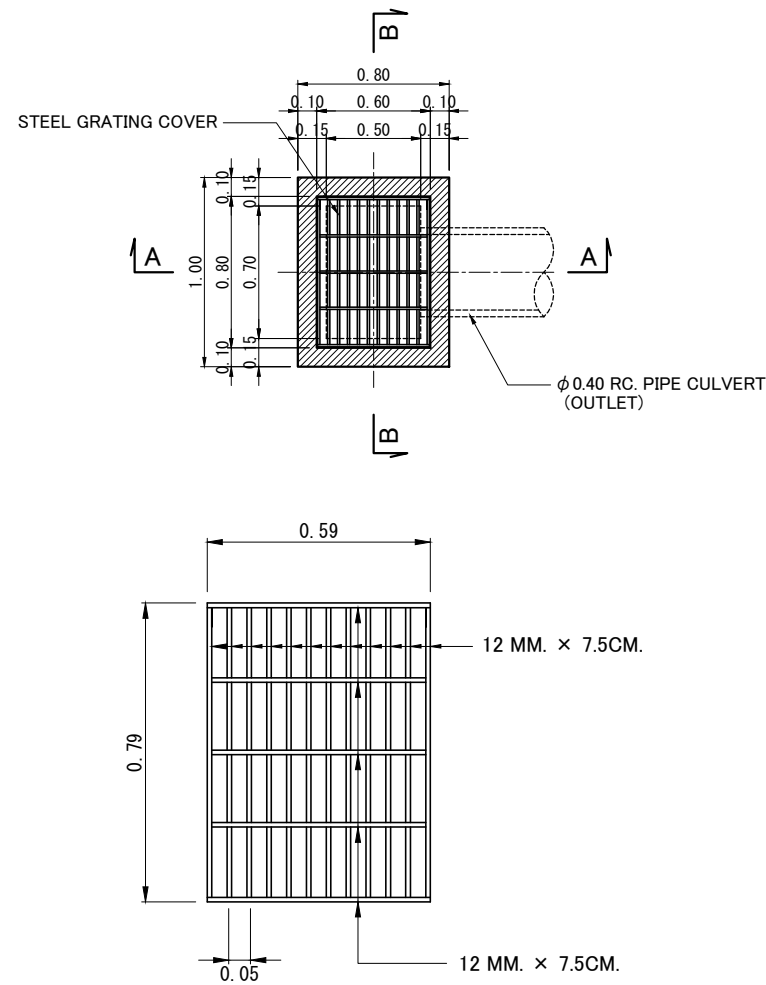
- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- THE SHADED AREAS REPRESENT PORTIONS TO BE DEMOLISHED.
- CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS :

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.

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 / 1:20
														DWG. NO.	SHEET NO.
														DR-3	153

SCHEDULED LIST OF CATCH BASIN (MEDIAN)

STA	Nbs.	REMARKS
1) STA 24+430.0	1	
2) STA 24+512.0	1	
3) STA 24+594.0	1	
4) STA 24+650.0	1	
5) STA 24+690.0	1	
6) STA 24+750.0	1	
7) STA 24+815.0	1	
8) STA 24+867.0	1	
9) STA 24+920.0	1	
10) STA 24+975.0	1	



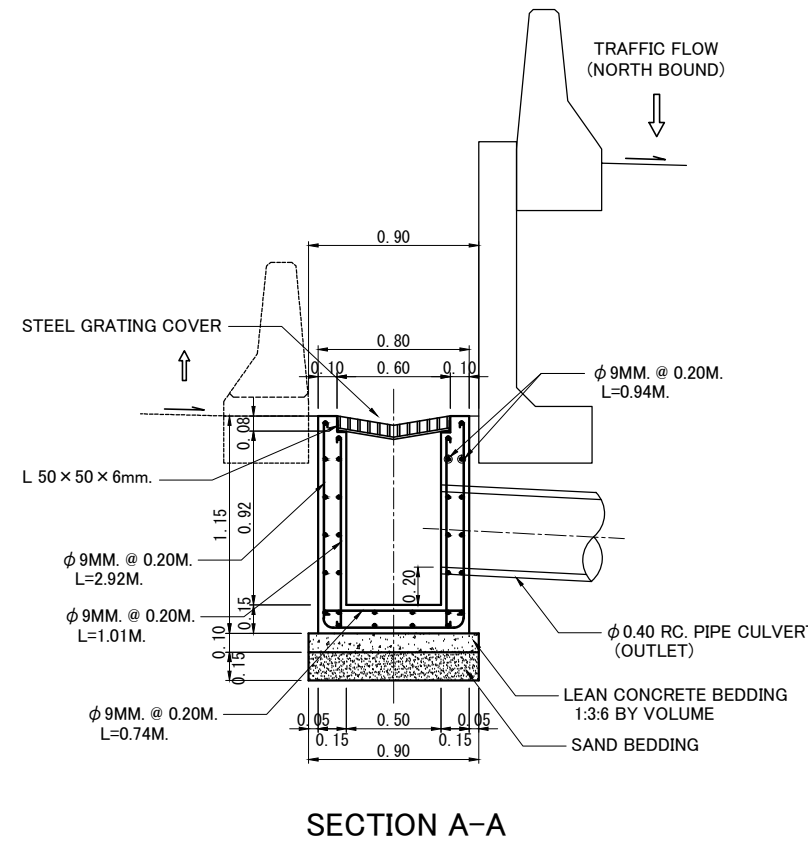
DETAIL OF STEEL GRATING COVER
SCALE 1:10

SCHEDULED LIST OF ϕ 0.40 RC. PIPE CULVERT FOR CROSSING

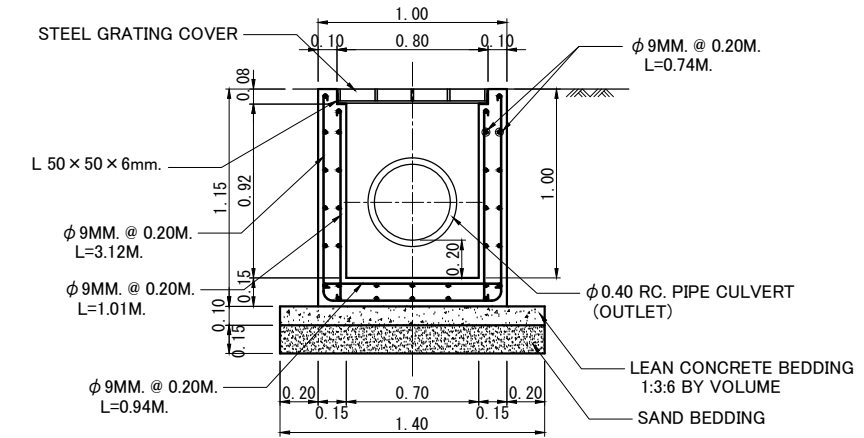
STA	DISTANCE (m)	REMARKS
1) STA 19+674.6	1.0	
2) STA 20+382.5	30.0	
3) STA 24+430.0	29.0	
4) STA 24+512.0	24.0	
5) STA 24+594.0	20.0	
6) STA 24+650.0	20.0	
7) STA 24+690.0	20.0	
8) STA 24+750.0	20.0	
9) STA 24+815.0	20.0	
10) STA 24+867.0	17.0	
11) STA 24+920.0	17.0	
12) STA 24+975.0	19.0	

SCHEDULED LIST OF ϕ 0.40 RC. PIPE CULVERT FOR LONGITUDINAL

STA	DISTANCE (m)	REMARKS
1) STA.19+667.0 - STA.19+718.3	51.3	
2) STA.20+313.7 - STA.20+382.0	68.3	

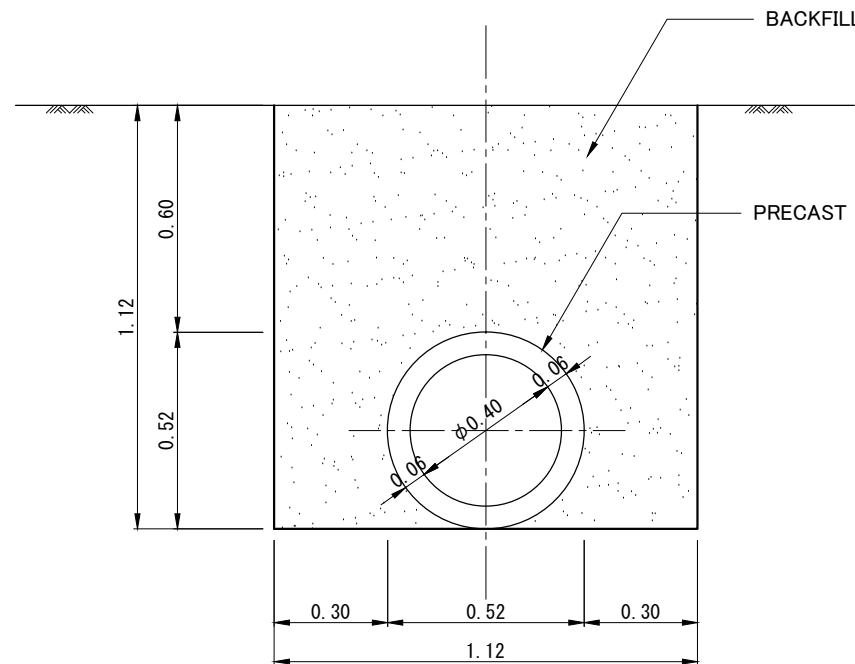


SECTION A-A



SECTION B-B

CATCH BASIN (MEDIAN)
SCALE 1:20



RC. PIPE CULVERT
(ORDINARY BEDDING)
SCALE 1:10

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.

DETAILS OF INLET CATCH BASIN AT MEDIAN AND PIPE CULVERT
SCALE VARIES

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 / 1:20
														DWG. NO. DR-4	SHEET NO. 154