KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWINGS

FOR

I-GIRDER BRIDGE

BORED PILE

BRIDGE WIDENING

HANDICAPPED PEDESTRIAN OVERPASS AND UNDERPASS

2015

THAI VERSION

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LIST OF DRAWING

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204	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : UNDERGROUND FLOOR PLAN	UH-203
205	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : GROUND FLOOR PLAN	UH-204
206	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : ROOF PLAN	UH-205
207	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : PILE FOOTING DETAILS (SECTION A)	UH-206
208	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : PILE FOOTING DETAILS (SECTION B AND C)	UH-207
209	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : SPREAD FOOTING DETAILS (SECTION A)	UH-208
210	HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2 : SPREAD FOOTING DETAILS (SECTION B AND C)	UH-209
211	HANDICAPPED PEDESTRIAN UNDERPASS : LIGHTING	UH-210
212	HANDICAPPED PEDESTRIAN UNDERPASS TYPE-1 : UNDERGROUND PLAN - RAINWATER DRAINAGE SYSTEM	SNU-101
213	HANDICAPPED PEDESTRIAN UNDERPASS TYPE-2 : UNDERGROUND PLAN - RAINWATER DRAINAGE SYSTEM	SNU-102
214	HANDICAPPED PEDESTRIAN UNDERPASS TYPE-1 : VENTILATION SYSTEM	MEU-101
215	HANDICAPPED PEDESTRIAN UNDERPASS TYPE-2 : VENTILATION SYSTEM	MEU-102
216	HANDICAPPED PEDESTRIAN UNDERPASS : VENTILATION SYSTEM AT ROAD MEDIANS	MEU-103

1. DESIGN STANDARD AND CODES OF PRACTICE

AASHTO : AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6th EDITION, 2012

: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, AASHTO GUIDE SPECIFICATIONS FOR LRFD SEISMIC BRIDGE DESIGN, 2nd EDITION, 2011

USING THE FOLLOWING CODES WHEN THE AASHTO LRFD (2012) SPECIFICATIONS IS NOT SPECIFIED.

ACI : AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318M-11, 2011

BSI : BRITISH STANDARDS INSTITUTION, BS 5400

PCI : PRECAST AND PRESTRESSED CONCRETE INSTITUTE, PCI DESIGN HANDBOOK: PRECAST AND PRESTRESSED CONCRETE, 6th EDITION, 2010

2. MATERIAL SPECIFICATIONS

2.1 CONCRETE

2.1.1 CLASSIFICATIONS OF CONCRETE AND THE MINIMUM CEMENT CONTENTS SHALL BE AS FOLLOWS, UNLESS OTHERWISE SPECIFIED IN THE DRAWING.

CLASS	COMPRESSIVE CUBE STRENGTH AT 28 DAYS*(MPa)	MINIMUM CEMENT CONTENT (KG/M^3)
A	51-60	500
B	46-50	450
C	41-45	400
D	30-40	350
E	<30	300

2.1.2 THE COMPRESSIVE STRENGTH (f_{cu}) OF CONCRETE CUBES (15x15x15 CM.) SHALL BE AS FOLLOWS :

STRUCTURAL TYPES	STRUCTURAL ELEMENTS	COMPRESSIVE CUBE STRENGTH* AT 28 DAYS (MPa)	MINIMUM CEMENT CONTENT (KG/M^2)
SUPERSTRUCTURE	POST-TENSIONED I-GIRDER	45	400
	PRECAST I-GIRDER/BOX BEAM	50	450
	PRECAST PLANK GIRDER	50	450
	DECK SLAB FOR I-GIRDER/DIAPHRAGM	35	350
	CONCRETE TOPPING/SHEAR KEY	40	350
	SLAB TYPE BRIDGE/BARRIER/SIDEWALK	35	350
SUBSTRUCTURE	PIER AND CAP BEAM	35	350
	FOOTING	35	350
	ABUTMENT/WINGWALL	35	350
	BORED PILE (DRY PROCESS)	30	350
	BORED PILE (WET PROCESS)	35	350
	R.C. DRIVEN PILE	35	350
	PRECAST DRIVEN PILE	45	400
	PRECAST SPUN PILE	60	500
OTHERS	RETAINING WALL	35	350
	R.C. BOX CULVERT	30	350
	PRECAST BOX CULVERT	40	350
	OTHERS, NOT SPECIFY ABOVE	35	300
NON-STRUCTURE	LEAN CONCRETE (1:3:6 BY VOLUME)		

THE MIX DESIGN FOR ALL CLASSES OF CONCRETE, EXCEPT LEAN CONCRETE, SHALL BE SUBMITTED FOR APPROVAL

FOR THE CONCRETE COMPRESSIVE CUBE STRENGTH OVER THAN 35 MPa, THE NOMINAL AGGREGATE SIZE SHALL BE LIMITED TO 20 MM.

* FOR SPECIFICATION OF CONCRETE COMPRESSIVE STRENGTH, TEST RESULTS OF STANDARD CONCRETE 15x15x15 CENTIMETER CUBE AGED AT 28 DAYS ARE USED AS CRITERION. IN CASE THE COMPRESSIVE STRENGTHS OBTAINED FROM THE TESTING AT AGE EARLIER THAN 28 DAYS ARE NOT LESS THAN THE COMPRESSIVE STRENGTH AS SPECIFIED, THE CONCRETE SHALL BE ACCEPTED AS HAVING SPECIFIED COMPRESSIVE STRENGTH AT AGE OF 28 DAYS.

2.1.3 WHEN THE CONCRETE STRUCTURE IS EXPOSED TO HIGH LEVELS OF CHLORIDE ION (CL^-) OR USING NEAR SALTWATER, THE MAXIMUM WATER CEMENT RATIO (W/C RATIO) OF 0.40 AND THE SPECIAL CEMENT SUCH AS POZZOLAN PORTLAND CEMENT ARE RECOMMENDED. THE MINIMUM CUBE STRENGTH (f_{cu}) OF 40 MPa. (408 KG/CM^2) IS RECOMMENDED. THE SHORT-TERM (6 HOURS) RAPID CHLORIDE PERMEABILITY TEST (RCPT) SHALL BE SUBMITTED FOR APPROVAL, THE MAXIMUM RAPID CHLORIDE PERMEABILITY IS 1,500 COULOMBS (ASTM C1202).

2.1.4 WHEN THE CONCRETE STRUCTURE IS EXPOSED TO HIGH LEVELS OF SULPHATE ION (SO_4^{2-}) OR USING NEAR WASTEWATER, THE MAXIMUM WATER CEMENT RATIO (W/C RATIO) OF 0.45 AND HIGH SULPHATE RESISTANCE PORTLAND CEMENT CONFORMING TIS 15 SHALL BE USED. THE MINIMUM CUBE STRENGTH (f_{cu}) OF 40 MPa. (408 KG/CM^2) IS RECOMMENDED.

2.1.5 THE USE OF AGGREGATE FROM SOURCES THAT ARE KNOWN TO BE EXCESSIVELY ALKALI-SILICA REACTIVE (ASR) SHALL BE PROHIBITED.

2.1.6 CONCRETE COVER

UNLESS NOTED ON THE DRAWINGS, THE FOLLOWING MINIMUM CONCRETE COVER (FROM FACE OF CONCRETE TO FACE OF REBAR) SHALL BE PROVIDED AS INDICATED BELOW.

CAST-IN-PLACE CONCRETE PILE	75 MM.
PRECAST AND R.C. PILES	50 MM.**
FOOTING	75 MM.
PIER	50 MM.**
TOP REBARS IN DECK SLAB	40 MM.
BARRIER AND OTHERS	30 MM.

** IF PIERS OR PILES ARE IN SALTWATER, THE COVERING MUST BE75 MM.

2.1.7 ALL EXPOSED CONCRETE CORNERS SHALL HAVE A 20 MM. CHAMFER UNLESS OTHERWISE INDICATED

2.2 REBAR REINFORCEMENT

2.2.1 MILD STEEL ROUND BARS GRADE SR24 ACCORDING TO TIS 20 DENOTED BY "RB" SHALL BE USED FOR REBARS WITH DIAMETER 6 AND 9 MM., UNLESS OTHERWISE INDICATED.

2.2.2 HIGH YIELD DEFORMED BARS GRADE SD40 ACCORDING TO TIS 24 DENOTED BY "DB" SHALL BE USED FOR REBARS WITH DIAMETER 12, 16, 20, 25 AND 28 MM., UNLESS OTHERWISE INDICATED.

2.2.4 UNLESS NOTED ON THE DRAWINGS, THE FOLLOWING MINIMUM CLEAR DISTANCE BETWEEN PARALLEL BARS SHALL BE PROVIDED AS INDICATED BELOW.

REBAR SIZE	THE MINIMUM CLEAR DISTANCE
RB9, DB12, DB16, DB20 AND DB25	35 MM. IN A LAYER
DB28	40 MM. IN A LAYER
ANY REBARS TWO OR MORE LAYERS	25 MM. BETWEEN LAYERS

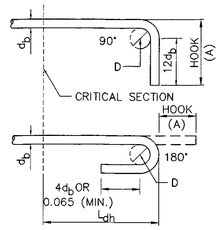
2.2.5 THE RESISTANCE OF FULL-MECHANICAL CONNECTION SHALL NOT BE LESS THAN 125 PERCENT OF THE SPECIFIED YIELD STRENGTH OF THE REBAR IN TENSION OR COMPRESSION, AS REQUIRED.

2.2.6 ALL HOOKS, IF NOT BE SHOWN ON THE DRAWING, SHALL COMPLY WITH AASHTO LRFD (2012) STANDARD HOOKS.

2.2.7 STANDARD HOOK DETAILS AND DEVELOPMENT LENGTH OF STANDARD HOOKS AS FOLLOWS :

2.2.7.1 STANDARD HOOK DIMENSIONS OF MAIN REINFORCING

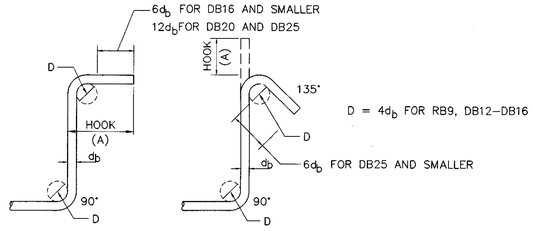
REBAR DIAMETER (d_b)	HOOK (A)		DIAMETER OF REBAR BENT (D)
	90° HOOK	180° HOOK	
RB9	0.15	0.12	0.06
DB12	0.20	0.15	0.08
DB16	0.25	0.18	0.10
DB20	0.30	0.20	0.12
DB25	0.40	0.25	0.15
DB28	0.45	0.30	0.23



D = $6d_b$ FOR RB9, DB12-DB25
D = $8d_b$ FOR DB28

2.2.7.2 STANDARD HOOK DIMENSIONS OF STIRRUP AND TIE

REBAR DIAMETER (d_b)	HOOK (A)		DIAMETER OF REBAR BENT (D)
	90° HOOK	135° HOOK	
RB9	0.10	0.10	0.04
DB12	0.15	0.12	0.05
DB16	0.15	0.15	0.07

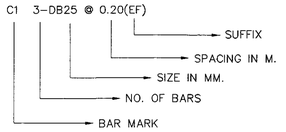


D = $4d_b$ FOR RB9, DB12-DB16

2.2.7.3 DEVELOPMENT LENGTH (L_{dh}) OF STANDARDS HOOKS
THE DEVELOPMENT LENGTH IS MEASURED FROM THE CRITICAL SECTION TO THE OUTSIDE END (OR EDGE) OF THE HOOK.

REBAR DIAMETER (d_b)	DEVELOPMENT LENGTH (L_{dh})		
	f_{cu}= 30 MPa	f_{cu}= 35 MPa	f_{cu}= 40 MPa
RB9	0.18	0.12	0.16
DB12	0.24	0.22	0.21
DB16	0.32	0.30	0.28
DB20	0.40	0.37	0.34
DB25	0.50	0.46	0.43
DB28	0.56	0.52	0.48

2.2.7.4 NOTATION OF BAR REINFORCEMENT



SUFFIX :
T = TOP
B = BOTTOM
EF = EACH FACE
FF = FAR FACE
NF = NEAR FACE
IF = INSIDE FACE
OF = OUTSIDE FACE
# = EACH WAY

2.2.8 LAP LENGTH OF SPLICING IS NOT APPLIED IN CRITICAL REGIONS OF DUCTILE OR SEISMIC-CRITICAL MEMBERS.
THE REQUIRED LENGTHS OF SPLICES IN REINFORCING STEEL ARE AS FOLLOWS :

REBAR DIAMETER (d_b)	LAP LENGTH (f_{cu} = 30 MPa)			LAP LENGTH (f_{cu} = 35 MPa)			LAP LENGTH (f_{cu} = 40 MPa)		
	COMP.	TENSION**		COMP.	TENSION**		COMP.	TENSION**	
		TOP BAR*	OTHER		TOP BAR*	OTHER		TOP BAR*	OTHER
DB12	0.40	0.55	0.40	0.40	0.55	0.40	0.40	0.55	0.40
DB16	0.50	0.70	0.50	0.50	0.70	0.50	0.50	0.70	0.50
DB20	0.60	0.90	0.65	0.60	0.90	0.65	0.60	0.90	0.65
DB25	0.75	1.40	1.00	0.75	1.30	0.95	0.75	1.20	0.90
DB28	0.85	1.75	1.25	0.85	1.65	1.15	0.85	1.50	1.10

* MINIMUM 0.30 M CONCRETE CAST BELOW

** THE MAXIMUM PERCENTAGE OF REINFORCEMENT SPLICED AT THE SAME SECTION SHALL BE 50

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THE GENERAL NOTES ARE RECOMMENDED UNLESS OTHERWISE SPECIFIED IN THE DRAWING
3. THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY

REV.1	REVISION 1/2017		JUN 2017
REV.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

STRUCTURAL NOTES

GENERAL NOTES - I

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** GN-001
		SHEET NO. 200/R1

3. HIGHWAY DESIGN LOADINGS

LIVE LOAD : HL-93 ; BASIC WIND SPEED : 120 KM/HR

4. BEARING AND EXPANSION JOINT

BEARINGS AND EXPANSION JOINTS SHALL BE DESIGNED AND MANUFACTURED ACCORDING TO AASHTO LRFD (2012) REQUIREMENTS OF LOADS, TRANSLATIONS AND ROTATIONS

5. DRAWING SYMBOLS AND NOTATION

- SECTION IN EXISTING GROUND
- SECTION THROUGH REINFORCED CONCRETE (W OR W/O REINFORCEMENT INDICATED)
- SECTION IN CAST-IN-PLACE
- SECTION IN CONCRETE PRECAST
- SECTION THROUGH ASPHALTIC CONCRETE SURFACE
- SECTION THROUGH SAND
- SECTION IN GRAVEL
- PLAN VIEW AND ELEVATION OF CUT AND FILL SLOPES
- 1:2 SLOPE 1:2 = 1 (VERTICAL LINE) TO 2 (HORIZONTAL LINE)
- ℄ CENTER LINE
- ⊠ SQUARE PILE
- ⫽ REINFORCEMENT IN BOTH WAYS
- Ø DIAMETER
- REBAR AS SEEN ON CROSS SECTION OR PLAN
- REBAR BENT PERPENDICULAR TO OR FROM READER
- LAP SPLICE OF REBAR
- BREAK ON REBAR
- WATER LEVEL
- TO INDICATE END OF DEFORMED BARS WITHOUT HOOK

EXAMPLE : ——⌒—— MEANS ————

- BAR BENT AWAY FROM THE READER
- LIMIT OF AREA COVERED BY REBARS
- X — X SECTION STRUCTURE
- STRUCTURAL TYPES
- XX-000 DRAWING NUMBERS
  - SERIES NUMBER
  - STRUCTURAL SUBTYPES

STRUCTURAL STEEL SECTION:
- L ANGLE
- C CHANNEL
- I I - BEAM

ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
C/C	CENTER OF CENTER
CG.	CENTROID
C.G.S	CENTROID OF STEEL
CIS.	CAST-IN-SITU
@	REBAR OR STIRRUP SPACING
℄	CENTERLINE
CM	CENTIMETER
CM^2	SQUARE CENTIMETER
DIA.	DIAMETER
D.O.H.	DEPARTMENT OF HIGHWAYS
DWG.	DRAWING
H	CLEAR COLUMN HEIGHT
H.W.L.	HIGH WATER LEVEL
kN	KILONEWTON
KG/CM^2	KILOGRAM PER SQUARE CENTIMETER
L.W.L.	LOW WATER LEVEL
M	METER
M^2	SQUARE METER
M^3	CUBIC METER
MM	MILLIMETER
MAX.	MAXIMUM
MIN.	MINIMUM
M.S.L.	MEAN SEA LEVEL
PC.	PRESTRESSED CONCRETE
R.C.	REINFORCED CONCRETE
S1	ROAD NORMAL CROWN OR CROSS SLOPE (%)
TIS	THAI INDUSTRIAL STANDARD

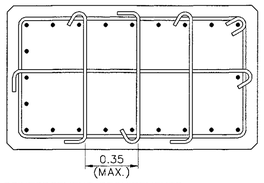
6. SEISMIC RESISTANCE DETAILS

6.1 SEISMIC PERFORMANCE LEVEL IN THAILAND ACCORDING TO AREA UNDER MINISTERIAL REGULATION B.E. 2550

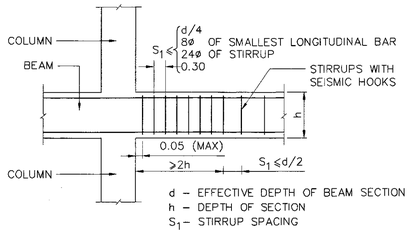
SEISMIC LEVELS	SEISMIC AREAS
LEVEL 1A	PROVINCES IN NORTHEAST AND EASTERN REGIONS
LEVEL 1B	ALL PROVINCES, EXCEPT SEISMIC AREAS IN LEVEL 1A AND LEVEL 2
LEVEL 2	KANCHANABURI, CHIANG RAI, CHIANG MAI, TAK, NAN, PHAYAO, PHRAE, LAMPANG, LAMPHUN AND MAE HONG SON

6.2 STEEL REINFORCEMENT DETAILS FOR RESIST EARTHQUAKE (LEVEL 1B AND LEVEL 2)

6.2.1 SEISMIC STIRRUP AND TIE HOOKS SHALL CONSIST OF A 135-DEGREE BEND, PLUS AN EXTENSION THE LARGER OF $6d_b$ OR 75 MM. THE SEISMIC HOOKS SHALL BE USED FOR STIRRUP AND TIE IN REGIONS OF EXPECTED PLASTIC HINGES. SUCH HOOKS AND THEIR REQUIRED LOCATIONS SHALL BE DETAILED IN THE DRAWINGS.



6.2.2 TRANSVERSE REINFORCEMENT REQUIREMENTS

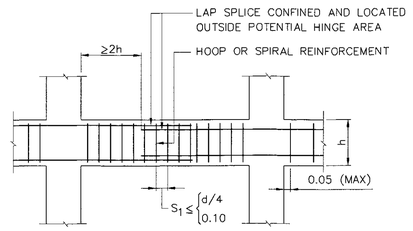


TYPICAL TRANSVERSE REINFORCEMENT DETAIL FOR FLEXURAL MEMBERS

NOTE : LAP SPLICES SHOULD NOT BE USED WITHIN A DISTANCE OF TWICE THE BEAM DEPTH (2h) FROM THE FACE OF COLUMN.

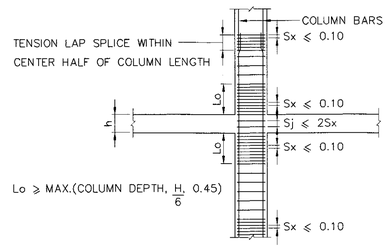
6.2.3 SPLICE REQUIREMENTS

6.2.3.1 LAP SPLICES OF CAP BEAM (BEAM) ARE PERMITTED ONLY IF HOOP OR SPIRAL REINFORCEMENT IS PROVIDED OVER THE LAP LENGTH



LAP SPLICE REQUIREMENTS

6.2.3.2 LAP SPLICE OF REINFORCING BAR AT THE COLUMN ENDS IS NOT PERMITTED, AND POSITION OF MAIN REINFORCING BAR SPLICING OF COLUMN SHALL LOCATED AT THE MIDDLE.

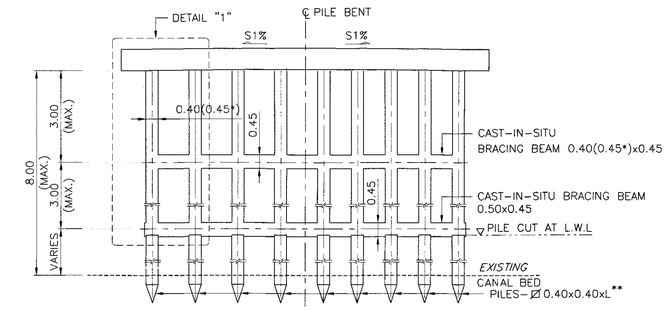


TYPICAL SPLICE LOCATION FOR COLUMNS

6.2.3.3 MINIMUM DEVELOPMENT AND SPLICE LENGTHS OF REBARS SHALL BE APPROVAL BY THE ENGINEER.

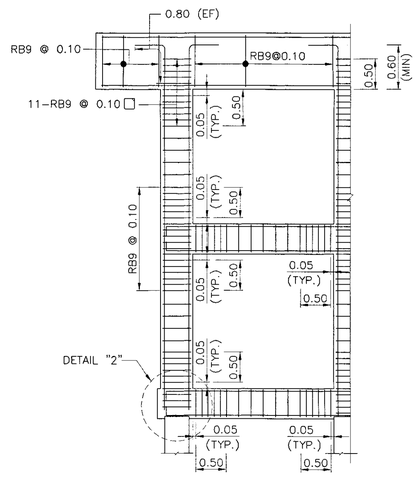
6.2.4 STEEL REINFORCEMENT DETAILS OF PILE BENT AND PIERS FOR RESIST EARTHQUAKE (LEVEL 1B AND LEVEL 2)

6.2.4.1 PILE BENT DETAIL

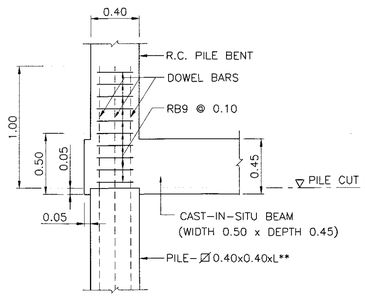


PILE BENT DETAIL
SCALE 1 : 75

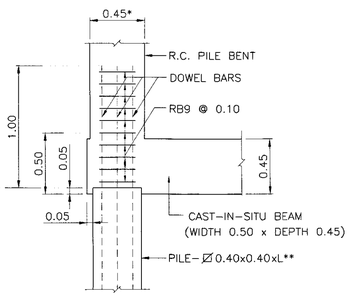
NOTE : * USING 0.45 WHEN PILE BENT AND BEAM ARE IN SALTWATER
** PILE LENGTH SHALL BE DETERMINED FOR EACH PILE



DETAIL "1"
SCALE 1 : 50



DETAIL "2" (REGULAR)
SCALE 1 : 25



DETAIL "2" (CL^- AND SO_4^{2-} PROTECTION)
SCALE 1 : 25

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
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3. THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY

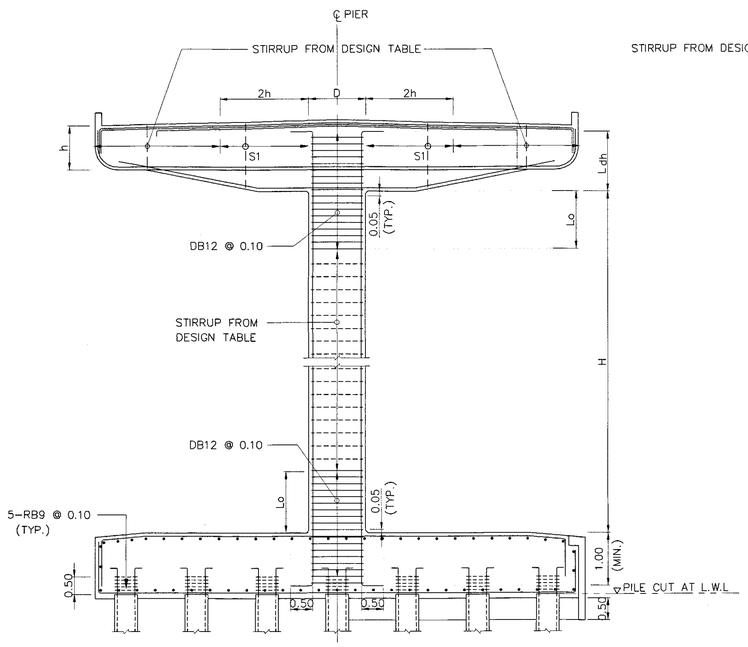
REV.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2017		JUN 2017

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

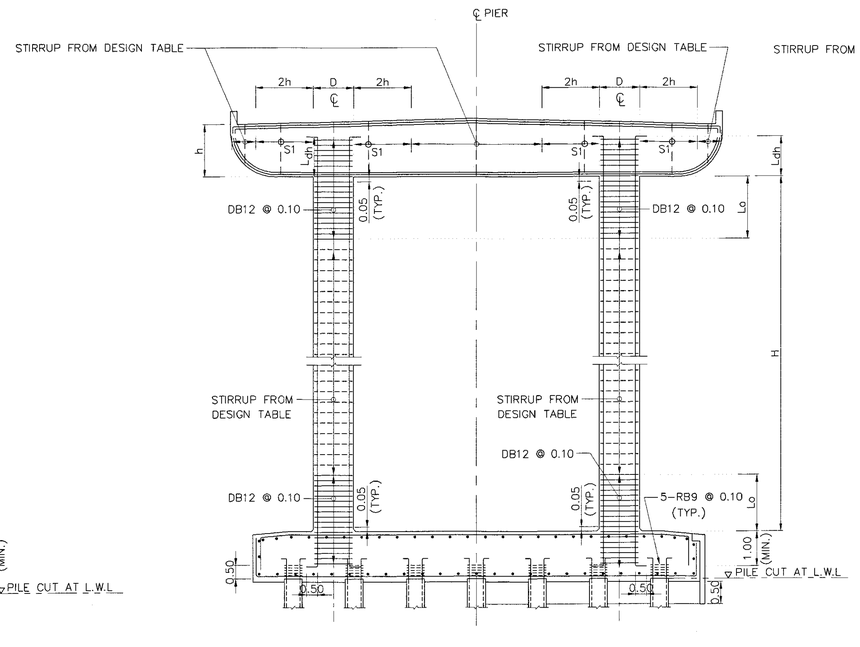
STANDARD DRAWING
STRUCTURAL NOTES
GENERAL NOTES – II

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** GN-002
		SHEET NO. 2

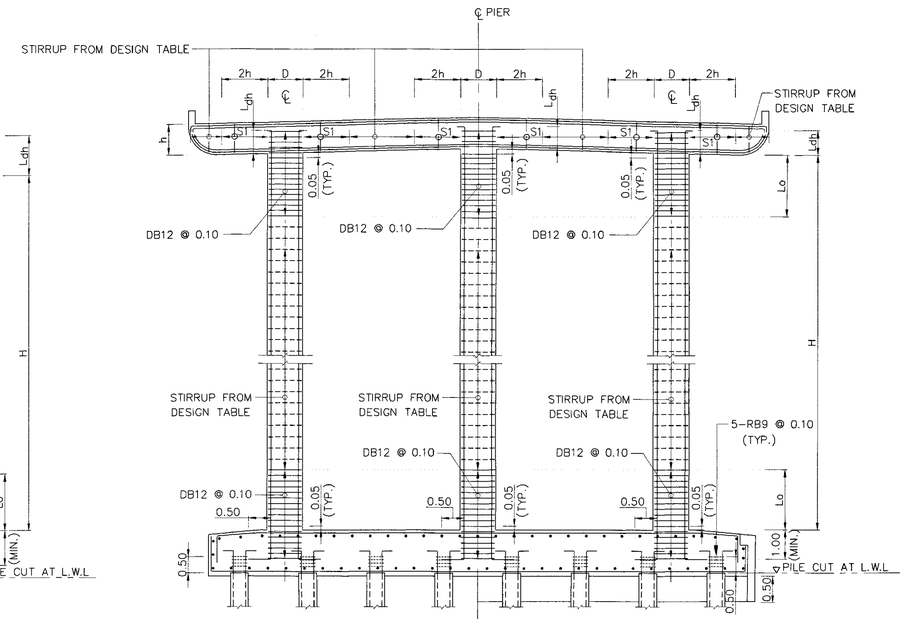
6.2.4.2 PIER DETAIL



SINGLE PIER DETAIL
NOT TO SCALE



DOUBLE PIER DETAIL
NOT TO SCALE



MULTI-PIER DETAIL
NOT TO SCALE

WHEN THE SPACINGS OF STIRRUPS (S1) ARE FOLLOWING
S1 = MINIMUM SPACING BETWEEN DESIGN TABLE AND,
S1 = 0.175 M., WHEN h = 0.70 M.
= 0.185 M., WHEN h = 0.75 M.
= 0.200 M., WHEN 0.80 ≤ h ≤ 1.90 M.

6.2.5 CONJUNCTION REGIONS (TEE JOINTS) ARE NECESSARY TO IMPROVE CONFINEMENT AS FOLLOWS :

6.2.5.1 THE ANCHORAGE LENGTHS FOR COLUMN-CAP BEAM CONNECTIONS ARE EQUAL TO TWICE THE DEPTH OF THE BEAM (2h)

6.2.5.2 COLUMNS ARE CONFINED AT THE END LENGTH (Lo)

MAX. PIER HEIGHT (H)	6.00	7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00	19.00	20.00
END REGION LENGTH (Lo)	1.00	1.20	1.35	1.50	1.70	1.85	2.00	2.20	2.35	2.50	2.70	2.85	3.00	3.20	3.35

6.2.5.3 L_{dh} SHALL BE EXTENED INTO CAP BEAM FOR AT LEAST 1.00 M.

7. FOUNDATION DETAILS

7.1 PILE FOUNDATION

7.1.1 PILES SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY AND HAVE A MINIMUM EMBEDED LENGTH OF 3.00 M.

7.1.2 IN CASE OF PARTLY-EMBEDDED VERTICAL DRIVEN PILE, THE LENGTH BETWEEN BOTTOM FOUNDATION ELEVATION AND GROUND ELEVATION (FREE STANDING HEIGHT) SHALL BE INDICATED AND APPROVED BY ENGINEER

7.1.3 FREE STANDING HEIGHT OF PILE SHALL NOT EXCEED 3.00 M. FOR OTHER SUITABLE FREE STANDING HEIGHT SHALL BE DESIGNED.

7.2 SPREAD FOUNDATION

7.2.1 TOP ELEVATION OF SPREAD FOUNDATION SHALL BE LOCATED LOWER THAN GROUND ELEVATION AT LEAST 1.00 M. (LOCATED ON STIFF SOIL LAYER) AND AT LEAST 2.50 M. DEEP FROM THE CANAL WHERE SCOUR WILL NOT AFFECT. THE ALLOWABLE SOIL BEARING CAPACITY UNDER THE SPREAD FOUNDATION SHALL BE MORE THAN 20 TONS PER SQ.M.(0.20 MPa)

7.2.2 SPREAD FOOTINGS FOUNDATIONS ARE NOT RECOMMENDED WHERE LIQUEFIABLE SOILS (SILKY CLAY) OCCUR UNLESS THE MAXIMUM DEPTH OF LIQUEFACTION OR SOIL IMPROVEMENT TECHNIQUES ARE USED TO MITIGATE THE EFFECTS OF LIQUEFACTION (AASHTO LRFD 2012, ARTICLE 10.5.4.2)

7.2.3 10 CM. THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM. WIDER THAN THE FOOTING ALL AROUND.

7.3 SEISMIC REQUIREMENTS OF PILES SHALL COMPLY WITH THE REQUIREMENTS SPECIFIED IN ARTICLE 5.13.4.6 AASHTO LRFD (2012)

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THE GENERAL NOTES ARE RECOMMENDED UNLESS OTHERWISE SPECIFIED IN THE DRAWING
3. THE SKEW ANGLE (Θ) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY

REV.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2017		JUN 2017

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

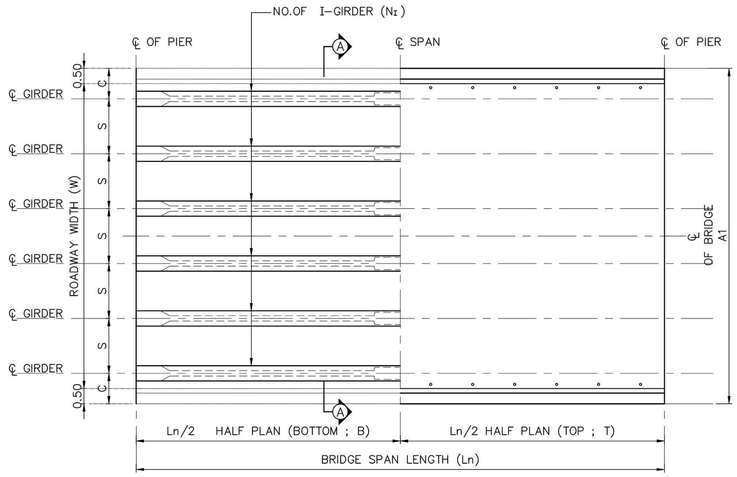
STANDARD DRAWING
STRUCTURAL NOTES
GENERAL NOTES – III

DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

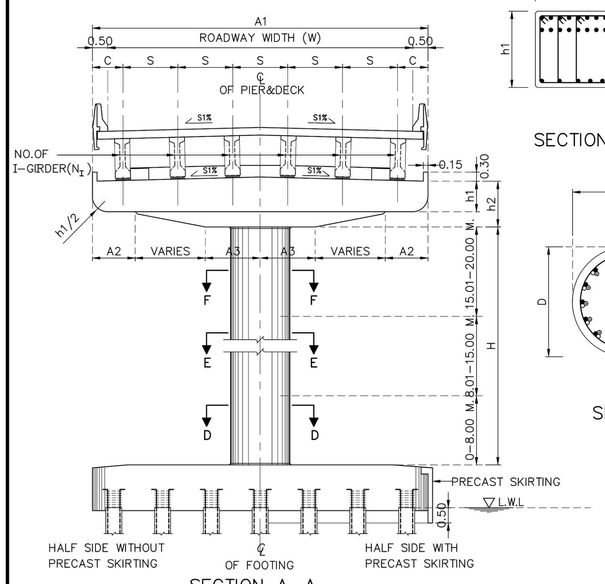
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** GN-003

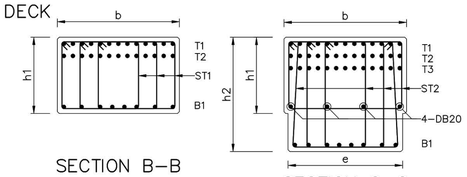
SHEET NO. 3



PLAN OF BRIDGE DECK

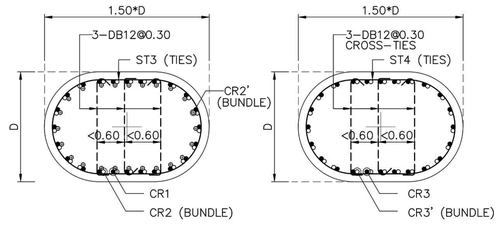


SECTION A-A



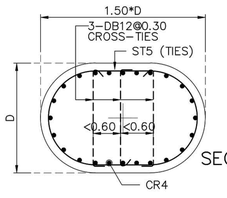
SECTION B-B

SECTION C-C



SECTION D-D

SECTION E-E



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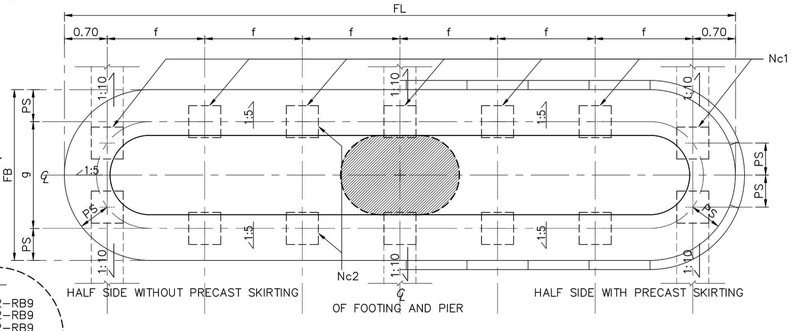
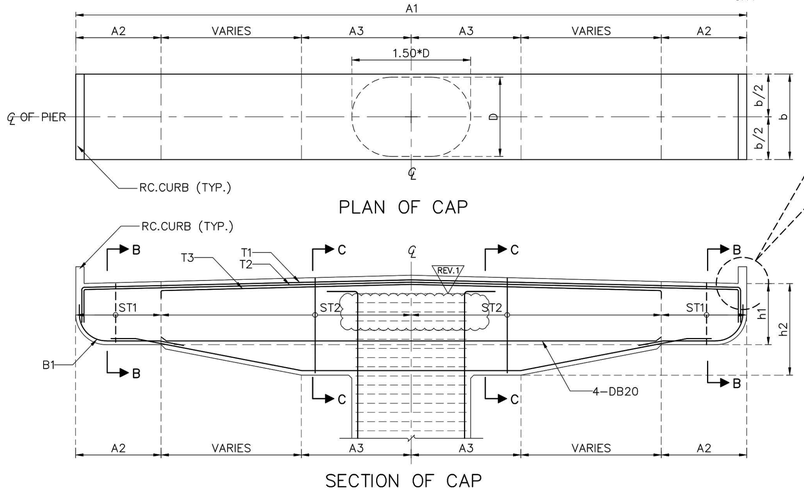
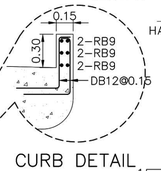


PLAN OF FOOTING

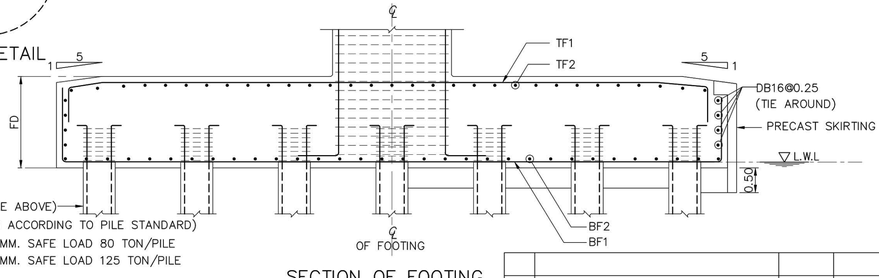


PLAN OF CAP

SECTION OF CAP



CURB DETAIL



PILE (FROM TABLE ABOVE)
(OTHERS DETAILS ACCORDING TO PILE STANDARD)
PILE ⌀525x525 MM. SAFE LOAD 80 TON/PILE
PILE ⌀650x650 MM. SAFE LOAD 125 TON/PILE

SECTION OF FOOTING

1.SPAN LENGTH 25.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

Ln (M.)	W (M.)	NO.OF I-GIRDER (NI)	DIMENSION (M.)								C		REBAR COLUMN								
			A1	A2	A3	b	e	S	h1	h2	STRAIGHT	CURVED	Dx1.5D(M.)	CR1	CR2	CR2'	ST3	CR3	CR3'	ST4	CR4	ST5
25.00 M. SEISMIC LEVEL 1	12.00	7	13.00	1.60	2.20	1.60	1.50	1.83	1.00	1.50	1.00	1.00-1.50	1.40x2.10	44-DB28	44-DB28	–	DB12@0.15	44-DB28	16-DB28	DB12@0.15	44-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	1.80	1.65	2.00	1.20	1.90	1.00	1.00-1.50	1.50x2.25	54-DB28	42-DB28	–	DB12@0.15	54-DB28	18-DB28	DB12@0.15	54-DB28	DB12@0.30
25.00 M. SEISMIC LEVEL 2	12.00	7	13.00	1.60	2.20	1.60	1.55	1.83	1.00	1.50	1.00	1.00-1.50	1.50x2.25	52-DB28	52-DB28	52-DB28	DB12@0.15	52-DB28	30-DB28	DB12@0.15	52-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	1.80	1.70	2.00	1.20	1.90	1.00	1.00-1.50	1.60x2.40	60-DB28	60-DB28	60-DB28	DB12@0.15	60-DB28	32-DB28	DB12@0.15	60-DB28	DB12@0.30

Ln (M.)	W (M.)	REBAR CAPBEAM						PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING SKEW 0°-15°					FOOTING SKEW 16°-45°					BOTTOM REBAR		TOP REBAR	
		T1	T2	T3	B1	ST1(STIRRUPS)	ST2(STIRRUPS)					FL	FB	FD	f	g	FL	FB	FD	f	g	BF1	BF2	TF1	TF2
25.00 M. SEISMIC LEVEL 1	12.00	22-DB28	22-DB28	22-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	⌀ 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75	DB32@0.10 **	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	24-DB28	24-DB28	24-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	⌀ 650x650	9	2	18	17.00	3.55	2.50	1.95	2.25	17.00	4.05	2.50	1.95	2.75	DB32@0.08 **	DB25@0.11	DB20@0.13	DB20@0.13
25.00 M. SEISMIC LEVEL 2	12.00	22-DB28	22-DB28	22-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	⌀ 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75	DB32@0.08 **	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	24-DB28	24-DB28	24-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	⌀ 650x650	9	2	18	17.00	3.55	2.50	1.95	2.25	17.00	4.05	2.50	1.95	2.75	DB32@0.09 ***	DB25@0.11	DB20@0.13	DB20@0.13

REMARK ; ** = 2 LAYERS
*** = 3 LAYERS

2.SPAN LENGTH 30.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

Ln (M.)	W (M.)	NO.OF I-GIRDER (NI)	DIMENSION (M.)								C		REBAR COLUMN								
			A1	A2	A3	b	e	S	h1	h2	STRAIGHT	CURVED	Dx1.5D(M.)	CR1	CR2	CR2'	ST3	CR3	CR3'	ST4	CR4	ST5
30.00 M. SEISMIC LEVEL 1	12.00	7	13.00	1.60	2.20	1.80	1.60	1.83	1.00	1.70	1.00	1.00-1.50	1.40x2.10	52-DB28	52-DB28	–	DB12@0.15	52-DB28	16-DB28	DB12@0.15	52-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	2.00	1.75	2.00	1.20	1.90	1.00	1.00-1.50	1.50x2.25	56-DB28	56-DB28	–	DB12@0.15	56-DB28	18-DB28	DB12@0.15	56-DB28	DB12@0.30
30.00 M. SEISMIC LEVEL 2	12.00	7	13.00	1.60	2.20	1.80	1.70	1.83	1.00	1.70	1.00	1.00-1.50	1.60x2.40	56-DB28	56-DB28	56-DB28	DB12@0.15	56-DB28	32-DB28	DB12@0.15	56-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	2.00	1.85	2.00	1.20	1.90	1.00	1.00-1.50	1.70x2.55	66-DB28	66-DB28	66-DB28	DB12@0.15	66-DB28	34-DB28	DB12@0.15	66-DB28	DB12@0.30

Ln (M.)	W (M.)	REBAR CAPBEAM						PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING SKEW 0°-15°					FOOTING SKEW 16°-45°				
		T1	T2	T3	B1	ST1(STIRRUPS)	ST2(STIRRUPS)					FL	FB	FD	f	g	FL	FB	FD	f	g
30.00 M. SEISMIC LEVEL 1	12.00	20-DB28	20-DB28	20-DB28	10-DB20	3-DB12@0.10	4-DB12@0.10	⌀ 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75
	15.00	27-DB28	27-DB28	27-DB28	12-DB20	3-DB12@0.10	4-DB12@0.10	⌀ 650x650	10	2	20	19.00	3.75	2.90	1.96	2.45	19.00	4.25	2.90	1.96	2.95
30.00 M. SEISMIC LEVEL 2	12.00	20-DB28	20-DB28	20-DB28	10-DB20	3-DB12@0.10	4-DB12@0.10	⌀ 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75
	15.00	27-DB28	27-DB28	27-DB28	12-DB20	3-DB12@0.10	4-DB12@0.10	⌀ 650x650	10	2	20	19.00	3.75	2.90	1.96	2.45	19.00	4.25	2.90	1.96	2.95

Ln (M.)	W (M.)	BOTTOM REBAR		TOP REBAR	
		BF1	BF2	TF1	TF2
30.00 M. SEISMIC LEVEL 1	12.00	DB32@0.09 **	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	DB32@0.12***	DB25@0.11	DB20@0.12	DB20@0.12
30.00 M. SEISMIC LEVEL 2	12.00	DB32@0.09***	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	DB32@0.09***	DB25@0.11	DB20@0.12	DB20@0.12

REMARK ; ** = 2 LAYERS
*** = 3 LAYERS

ADJUST LENGTH FOR SKEW BRIDGE

VALUE OF SECO IN CASE OF SKEW BRIDGE (SKEW, θ)					
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642
SKEW ANGLE, θ (DEGREE)	25	30	35	40	45
SEC θ	1.1034	1.1547	1.2208	1.3054	1.4142

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISE AS CLOUD		DEC 2017

KINGDOM OF THAILAND

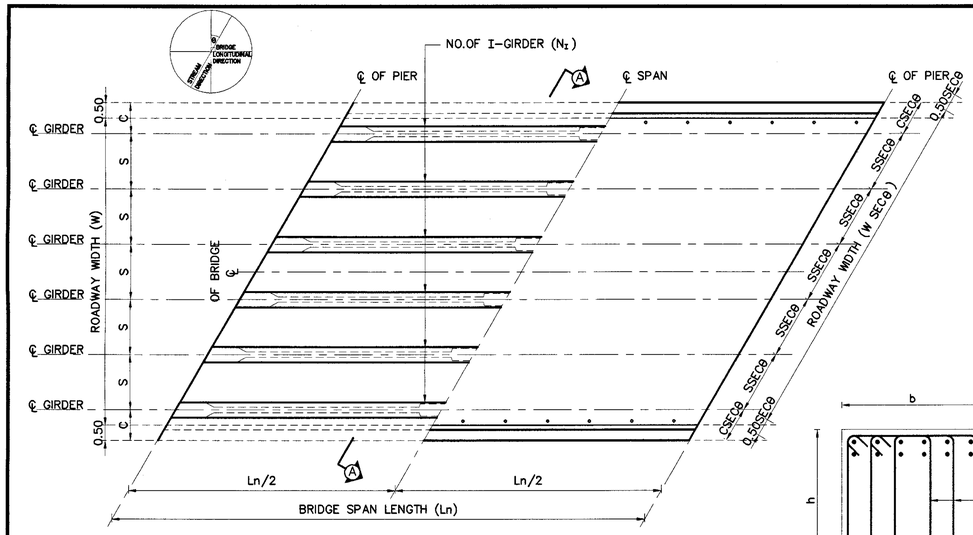
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

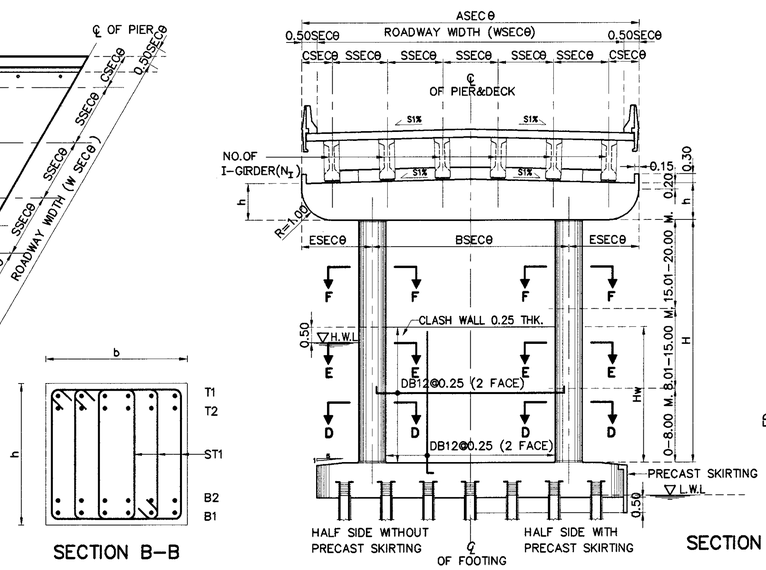
SINGLE COLUMN PIER WITHOUT SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M.
HEIGHT NOT OVER 20.00 M.

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
APPROVED : (FOR DIRECTOR GENERAL)
DATE : OCT 2015
SCALE : AS SHOWN
DWG NO. PC-301
SHEET NO. 4

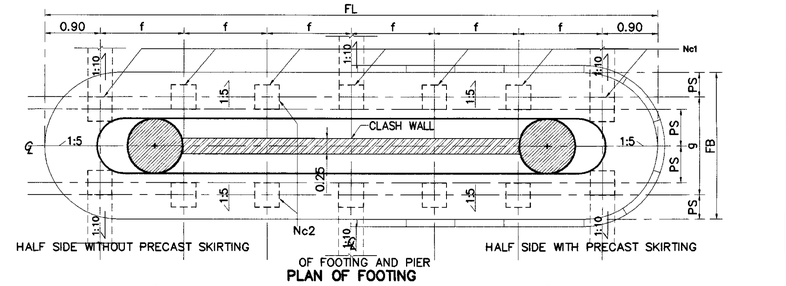
D:\std dwg 2015\PC-301(REV01)



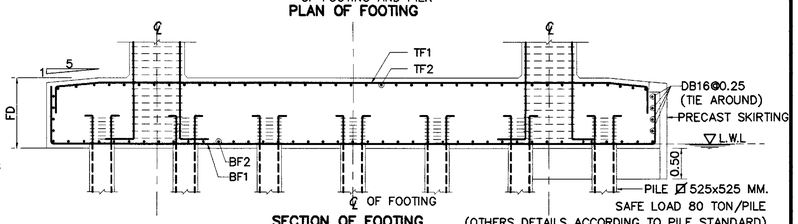
PLAN OF BRIDGE DECK



SECTION A–A



PLAN OF FOOTING



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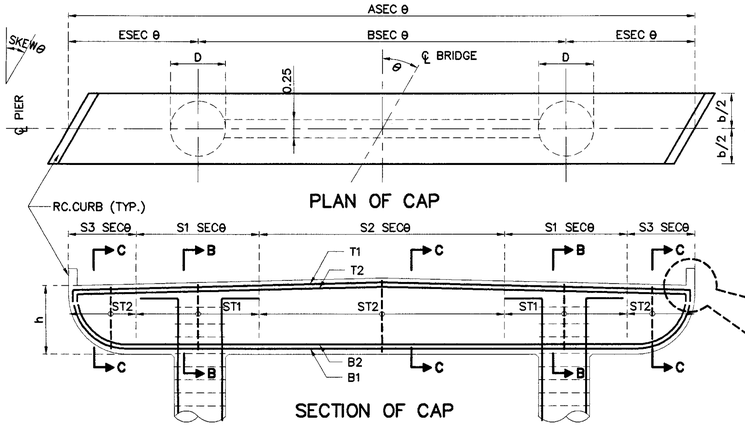
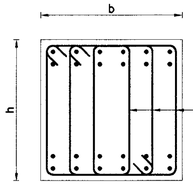


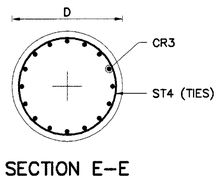
PLAN OF CAP

SECTION OF CAP

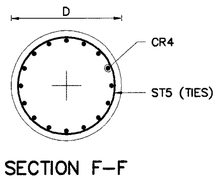
SECTION B–B



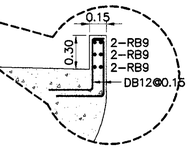
SECTION C–C



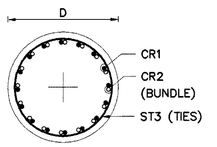
SECTION E–E



SECTION F–F



CURB DETAIL



SECTION D–D

ADJUST LENGTH FOR SKEW BRIDGE

VALUE OF SECθ IN CASE OF SKEW BRIDGE (SKEW, θ)										
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20	25	30	35	40	45
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142

1.SPAN LENGTH 25.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

1.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I–GIRDER (N_T)	DIMENSION (M.)							C		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	STRAIGHT	CURVED	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
25.00 M. SEISMIC LEVEL 1	12.00	7	13.00	7.30	2.85	1.83	3.70	3.60	1.00	1.00	1.00–1.50	1.30	30–DB28	30–DB28	DB12@0.15	30–DB28	DB12@0.30	24–DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	1.00–1.50	1.30	30–DB28	30–DB28	DB12@0.15	30–DB28	DB12@0.30	24–DB28	DB12@0.30
25.00 M. SEISMIC LEVEL 2	12.00	7	13.00	7.30	2.85	1.83	3.70	3.60	1.00	1.00	1.00–1.50	1.40	42–DB28	42–DB28	DB12@0.15	42–DB28	DB12@0.30	26–DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	1.00–1.50	1.50	44–DB28	44–DB28	DB12@0.15	44–DB28	DB12@0.30	30–DB28	DB12@0.30

1.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b (M.)	h (M.)	SKEW 0–30 DEGREE						SKEW 31–45 DEGREE					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
25.00 M. SEISMIC LEVEL 1	12.00	1.60	1.40	19–DB25	–	19–DB25	–	4–DB12@0.15	3–DB12@0.20	13–DB25	13–DB25	13–DB25	13–DB25	4–DB12@0.15	3–DB12@0.20
	15.00	1.60	1.40	14–DB25	14–DB25	14–DB25	14–DB25	4–DB12@0.125	3–DB12@0.20	18–DB25	18–DB25	18–DB25	18–DB25	4–DB12@0.125	3–DB12@0.20
25.00 M. SEISMIC LEVEL 2	12.00	1.60	1.40	19–DB25	–	19–DB25	–	4–DB12@0.15	3–DB12@0.20	14–DB25	14–DB25	14–DB25	14–DB25	4–DB12@0.15	3–DB12@0.20
	15.00	1.70	1.40	14–DB25	14–DB25	14–DB25	14–DB25	4–DB12@0.125	3–DB12@0.20	19–DB25	19–DB25	19–DB25	19–DB25	4–DB12@0.125	3–DB12@0.20

1.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
25.00 M. SEISMIC LEVEL 1	12.00	Ø 525x525	8	2	16	13.00	3.00	1.75	1.60	1.95	DB25@0.10	DB25@0.15	DB25@0.10	DB20@0.175
	15.00	Ø 525x525	9	2	18	16.00	3.00	2.00	1.78	1.95	DB28@0.09	DB25@0.125	DB28@0.09	DB20@0.175
25.00 M. SEISMIC LEVEL 2	12.00	Ø 525x525	8	2	16	13.00	3.00	1.75	1.60	1.95	DB25@0.09	DB25@0.15	DB25@0.09	DB20@0.175
	15.00	Ø 525x525	9	2	18	16.00	3.00	2.00	1.78	1.95	DB28@0.14 **	DB25@0.125	DB28@0.14 **	DB20@0.175

REMARK ; ** = 2 LAYERS

2.SPAN LENGTH 30.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

2.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I–GIRDER (N_T)	DIMENSION (M.)							C		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	STRAIGHT	CURVED	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
30.00 M. SEISMIC LEVEL 1	12.00	7	13.00	7.30	2.85	1.83	3.70	3.60	1.00	1.00	1.00–1.50	1.30	30–DB28	30–DB28	DB12@0.15	30–DB28	DB12@0.30	24–DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	1.00–1.50	1.40	30–DB28	30–DB28	DB12@0.15	30–DB28	DB12@0.30	26–DB28	DB12@0.30
30.00 M. SEISMIC LEVEL 2	12.00	7	13.00	7.30	2.85	1.83	3.70	3.60	1.00	1.00	1.00–1.50	1.50	42–DB28	42–DB28	DB12@0.15	42–DB28	DB12@0.30	30–DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	1.00–1.50	1.50	48–DB28	48–DB28	DB12@0.15	48–DB28	DB12@0.30	30–DB28	DB12@0.30

2.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b (M.)	h (M.)	SKEW 0–30 DEGREE						SKEW 31–45 DEGREE					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
30.00 M. SEISMIC LEVEL 1	12.00	1.60	1.40	10–DB25	10–DB25	10–DB25	10–DB25	4–DB12@0.125	3–DB12@0.20	14–DB25	14–DB25	14–DB25	14–DB25	4–DB12@0.125	3–DB12@0.20
	15.00	1.60	1.40	15–DB25	15–DB25	15–DB25	15–DB25	4–DB12@0.10	3–DB12@0.20	19–DB25	19–DB25	19–DB25	19–DB25	4–DB12@0.10	3–DB12@0.20
30.00 M. SEISMIC LEVEL 2	12.00	1.70	1.40	10–DB25	10–DB25	10–DB25	10–DB25	4–DB12@0.125	3–DB12@0.20	14–DB25	14–DB25	14–DB25	14–DB25	4–DB12@0.125	3–DB12@0.20
	15.00	1.70	1.40	15–DB25	15–DB25	15–DB25	15–DB25	4–DB12@0.10	3–DB12@0.20	19–DB25	19–DB25	19–DB25	19–DB25	4–DB12@0.10	3–DB12@0.20

2.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
30.00 M. SEISMIC LEVEL 1	12.00	Ø 525x525	9	2	18	14.00	3.00	1.75	1.53	1.95	DB28@0.13	DB25@0.15	DB28@0.13	DB20@0.175
	15.00	Ø 525x525	10	2	20	16.00	3.00	2.00	1.58	1.95	DB28@0.16 **	DB25@0.125	DB28@0.16 **	DB20@0.15
30.00 M. SEISMIC LEVEL 2	12.00	Ø 525x525	9	2	18	14.00	3.00	1.75	1.53	1.95	DB28@0.12	DB25@0.15	DB28@0.12	DB20@0.175
	15.00	Ø 525x525	10	2	20	16.00	3.00	2.00	1.58	1.95	DB28@0.13 **	DB25@0.125	DB28@0.13 **	DB20@0.15

REMARK ; ** = 2 LAYERS

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

TWO COLUMNS PIER WITHOUT SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M. HEIGHT NOT OVER 20.00 M.

REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. PC–302 | SHEET NO. 5

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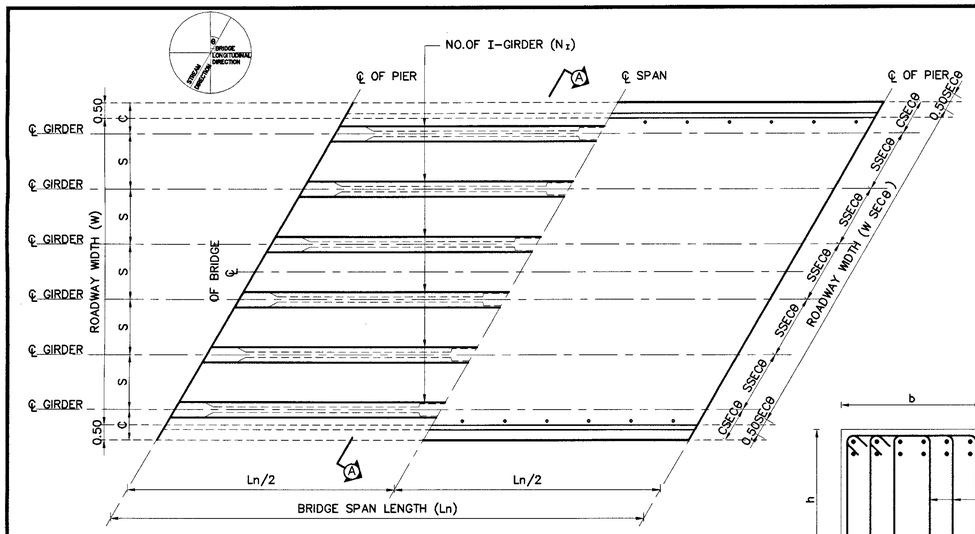
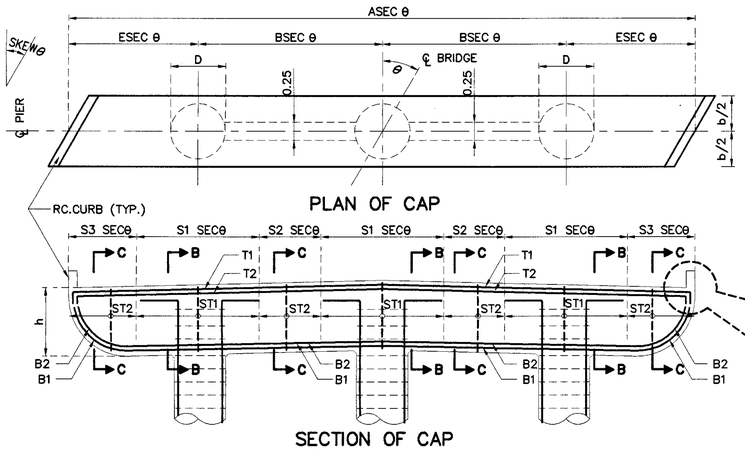
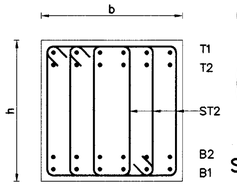




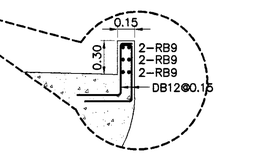
PLAN OF CAP

SECTION OF CAP

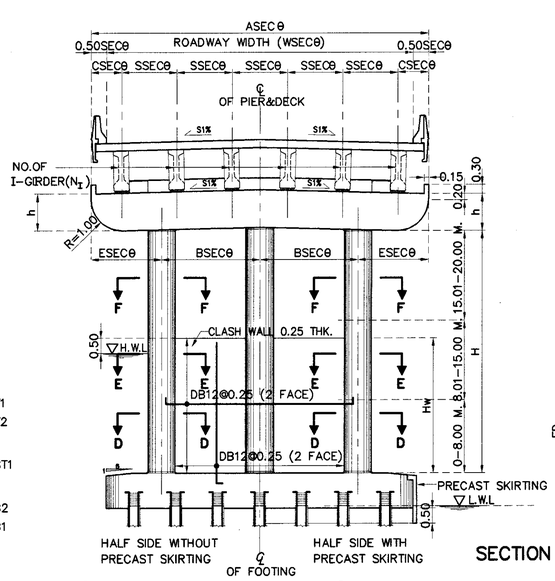
SECTION B–B



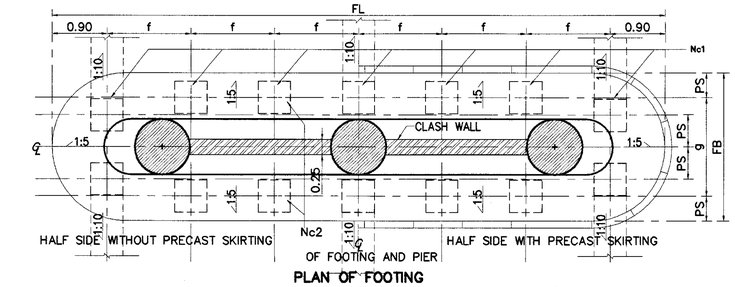
SECTION C–C



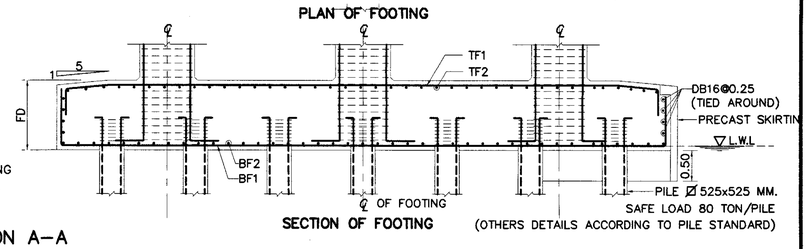
CURB DETAIL



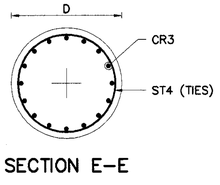
SECTION A–A



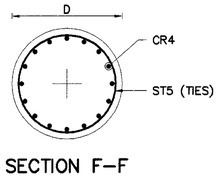
PLAN OF FOOTING



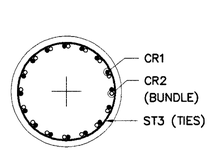
SECTION OF FOOTING



SECTION E–E



SECTION F–F



SECTION D–D

ADJUST LENGTH FOR SKEW BRIDGE

VALUE OF SEC θ IN CASE OF SKEW BRIDGE (SKEW, θ)									
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20	25	30	35	40	45
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142

1.SPAN LENGTH 25.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

1.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I-GIRDER (N_I)	DIMENSION (M.)							C		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	STRAIGHT	CURVED	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
25.00 M. SEISMIC LEVEL 1	12.00	7	13.00	4.70	1.80	1.83	3.60	1.10	–	1.00	1.00–1.50	1.20	26–DB25	26–DB25	DB12@0.15	26–DB25	DB12@0.30	26–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	1.00–1.50	1.40	33–DB25	33–DB25	DB12@0.15	33–DB25	DB12@0.30	33–DB25	DB12@0.30
25.00 M. SEISMIC LEVEL 2	12.00	7	13.00	4.70	1.80	1.83	3.60	1.10	–	1.00	1.00–1.50	1.20	40–DB25	40–DB25	DB12@0.15	40–DB25	DB12@0.30	40–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	1.00–1.50	1.40	33–DB25	33–DB25	DB12@0.15	33–DB25	DB12@0.30	33–DB25	DB12@0.30

1.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b	h	SKEW 0–30						SKEW 31–45					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
25.00 M. SEISMIC LEVEL 1	12.00	1.40	1.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20
	15.00	1.60	1.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20
25.00 M. SEISMIC LEVEL 2	12.00	1.40	1.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20
	15.00	1.60	1.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20

1.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
25.00 M. SEISMIC LEVEL 1	12.00	Ø 525x525	9	2	18	14.00	3.05	1.50	1.53	2.00	DB25@0.15	DB25@0.175	DB20@0.20	DB20@0.20
	15.00	Ø 525x525	10	2	20	16.00	3.05	1.75	1.58	2.00	DB25@0.13	DB25@0.15	DB20@0.13	DB20@0.20
25.00 M. SEISMIC LEVEL 2	12.00	Ø 525x525	9	2	18	14.00	3.05	1.50	1.53	2.00	DB25@0.14	DB25@0.175	DB20@0.175	DB20@0.20
	15.00	Ø 525x525	10	2	20	16.00	3.05	1.75	1.58	2.00	DB25@0.13	DB25@0.15	DB20@0.10	DB20@0.20

2.SPAN LENGTH 30.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

2.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I-GIRDER (N_I)	DIMENSION (M.)							C		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	STRAIGHT	CURVED	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
30.00 M. SEISMIC LEVEL 1	12.00	7	13.00	4.70	1.80	1.83	3.60	1.10	–	1.00	1.00–1.50	1.20	29–DB25	29–DB25	DB12@0.15	29–DB25	DB12@0.30	29–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	1.00–1.50	1.40	34–DB25	34–DB25	DB12@0.15	34–DB25	DB12@0.30	34–DB25	DB12@0.30
30.00 M. SEISMIC LEVEL 2	12.00	7	13.00	4.70	1.80	1.83	3.60	1.10	–	1.00	1.00–1.50	1.20	38–DB28	38–DB28	DB12@0.15	38–DB28	DB12@0.30	38–DB28	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	1.00–1.50	1.40	44–DB25	44–DB25	DB12@0.15	44–DB25	DB12@0.30	44–DB25	DB12@0.30

2.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b	h	SKEW 0–30						SKEW 31–45					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
30.00 M. SEISMIC LEVEL 1	12.00	1.40	1.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20
	15.00	1.60	1.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20
30.00 M. SEISMIC LEVEL 2	12.00	1.40	1.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20
	15.00	1.60	1.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20

2.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
30.00 M. SEISMIC LEVEL 1	12.00	Ø 525x525	9	2	18	14.00	3.45	1.50	1.53	2.40	DB25@0.15	DB25@0.175	DB20@0.20	DB20@0.20
	15.00	Ø 525x525	10	2	20	16.00	3.45	1.75	1.58	2.40	DB25@0.13	DB25@0.15	DB20@0.13	DB20@0.20
30.00 M. SEISMIC LEVEL 2	12.00	Ø 525x525	9	2	18	14.00	3.45	1.50	1.53	2.40	DB25@0.15	DB25@0.175	DB20@0.20	DB20@0.20
	15.00	Ø 525x525	10	2	20	16.00	3.45	1.75	1.58	2.40	DB25@0.13	DB25@0.15	DB20@0.11	DB20@0.20

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

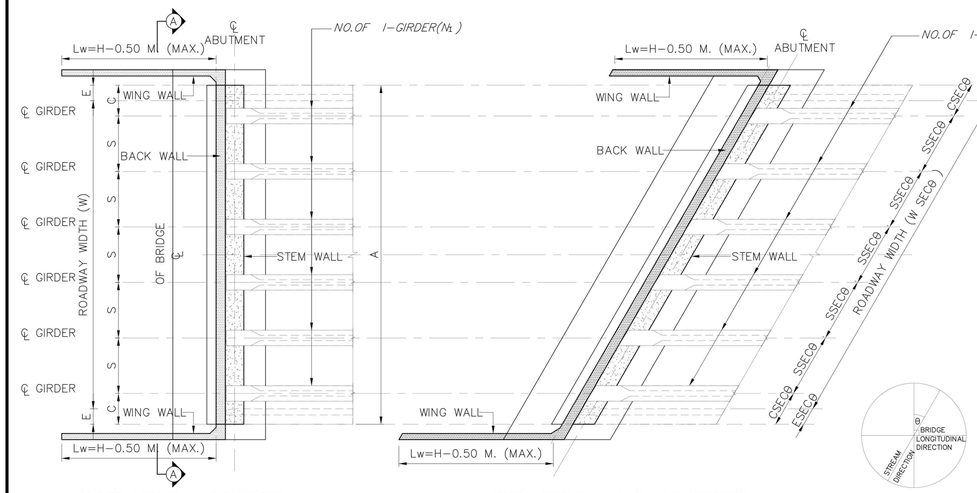
THREE COLUMNS PIER WITHOUT SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M. HEIGHT NOT OVER 20.00 M.

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. PC-303 | SHEET NO. 6

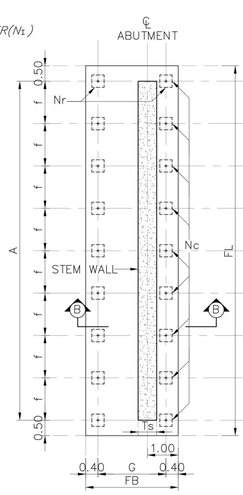
D:\std dwg 2015\PC-303(REV00)



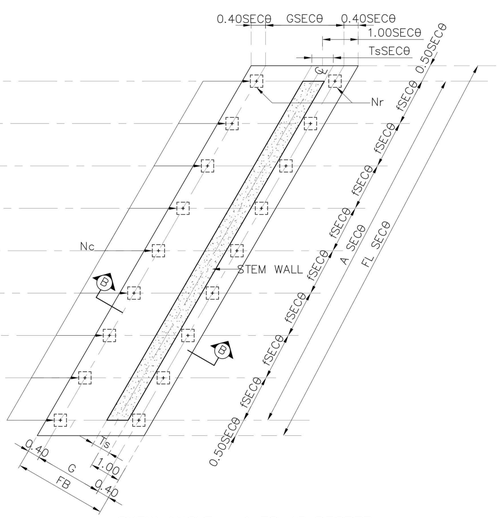
SKEW ANGLE = 0 DEGREE

SKEW ANGLE = 0 to 45 DEGREE

PLAN OF ABUTMENT

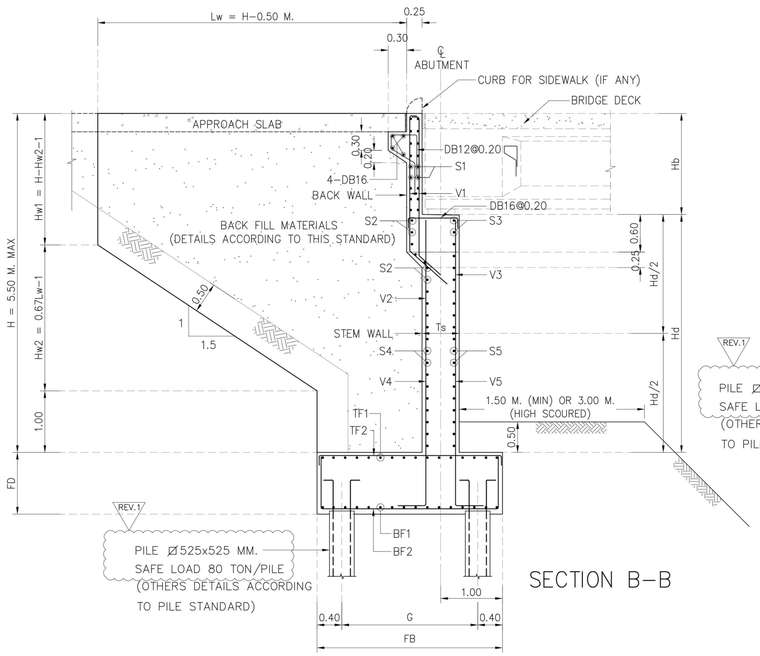


SKEW ANGLE = 0 DEGREE

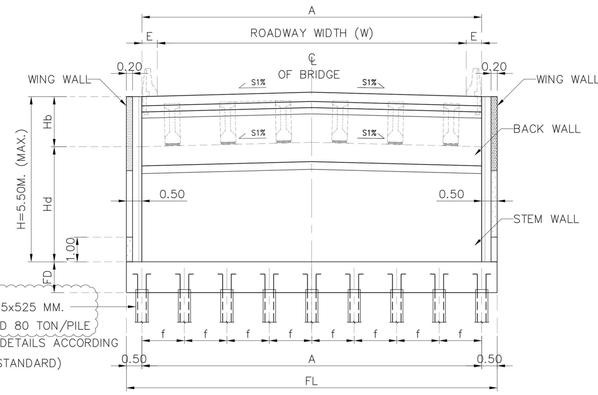


SKEW ANGLE = 1 TO 45 DEGREE

PLAN OF FOOTING



SECTION B−B



SECTION A−A

1.SPAN LENGTH 25.00 M. AND 30.00 M.

1.1 DIMENSION OF ABUTMENT

Ln (M.)	W (M.)	NO.OF I−GIRDER (N_T)	H(M.) (MAX)	DIMENSION (M.)						C	
				A	E	S	Hb	Hd	Ts	STRAIGHT	CURVED
25.00 M.	12.00	7	5.50	13.00	0.50	1.833	1.68 *	3.82	0.60	1.00	1.00−1.50
	15.00	8	5.50	16.00	0.50	2.00	1.68 *	3.82	0.60	1.00	1.00−1.50
30.00 M.	12.00	7	5.50	13.00	0.50	1.833	1.68 *	3.82	0.60	1.00	1.00−1.50
	15.00	8	5.50	16.00	0.50	2.00	1.68 *	3.82	0.60	1.00	1.00−1.50

REMARK ; * = DEPENDS ON DEPTH OF GIRDER

1.2 REBAR IN ABUTMENT

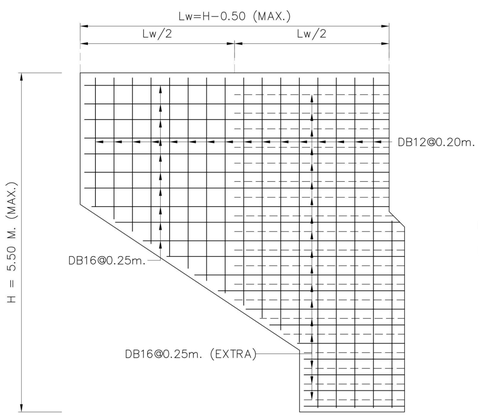
Ln (M.)	W (M.)	SKEW 0−45 DEGREE									
		V1	V2	V3	V4	V5	S1	S2	S3	S4	S5
25.00 M.	12.00,15.00	DB12@0.20	DB20@0.20	DB16@0.20	DB20@0.10	DB16@0.20	RB9@0.15	DB16@0.20	DB16@0.20	DB16@0.20	DB16@0.20
30.00 M.	12.00,15.00	DB12@0.20	DB20@0.20	DB16@0.20	DB20@0.10	DB16@0.20	RB9@0.15	DB16@0.20	DB16@0.20	DB16@0.20	DB16@0.20

1.3 FOUNDATION & PILE

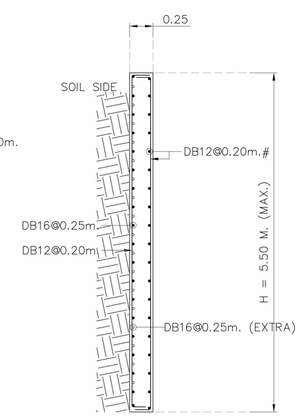
Ln (M.)	W (M.)	PILE SIZING (MM.)	Nc	Nr	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	G	BF1	BF2	TF1	TF2
25.00 M.	12.00	Ø 525x525	7	2	14	14.00	3.00	1.00	2.20	2.20	DB20@0.17	DB25@0.25	DB20@0.30	DB20@0.30
	15.00	Ø 525x525	9	2	18	17.00	3.00	1.00	2.03	2.20	DB20@0.17	DB25@0.25	DB20@0.30	DB20@0.30
30.00 M.	12.00	Ø 525x525	8	2	16	14.00	3.00	1.00	1.89	2.20	DB20@0.17	DB25@0.25	DB20@0.30	DB20@0.30
	15.00	Ø 525x525	10	2	20	17.00	3.00	1.00	1.80	2.20	DB20@0.17	DB25@0.25	DB20@0.30	DB20@0.30

1.4 ADJUST LENGTH FOR SKEW BRIDGE

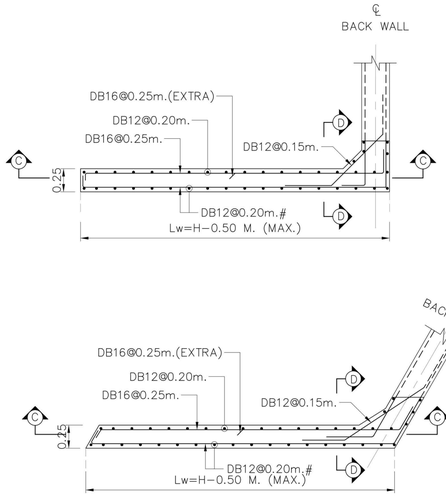
VALUE OF SECθ IN CASE OF SKEW BRIDGE (SKEW, θ)										
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20	25	30	35	40	45
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142



SECTION C−C



SECTION D−D



REV.	REVISION	SIGNATURE	DATE
REV.1	REVISE AS CLOUD		DEC 2017

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

ABUTMENT WITHOUT SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M.

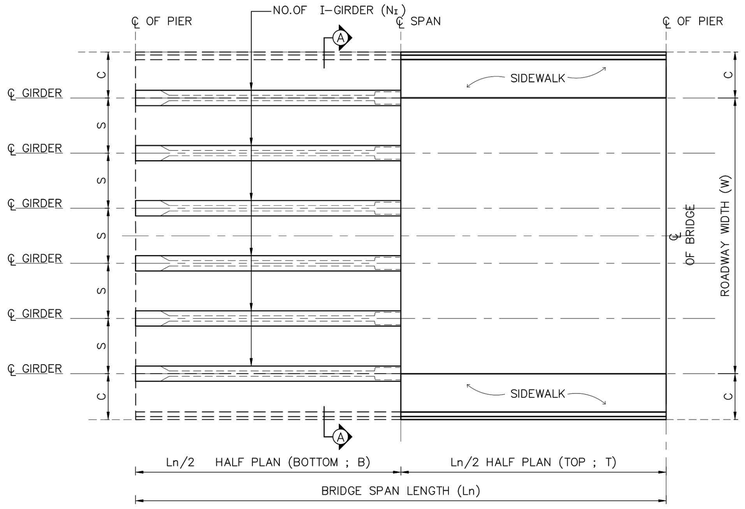
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

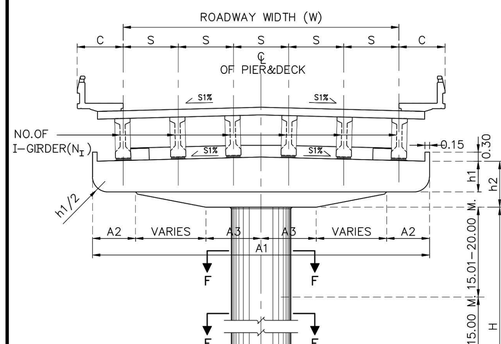
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** PC−304

SHEET NO. 7

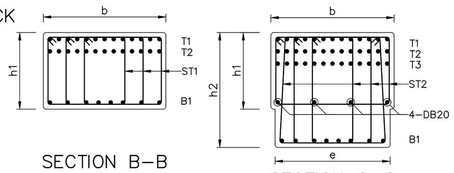
D:\std dwg 2015\PC−304(REV01)



PLAN OF BRIDGE DECK

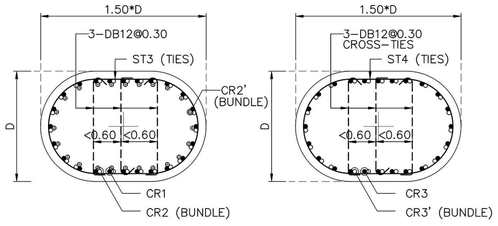


SECTION A-A



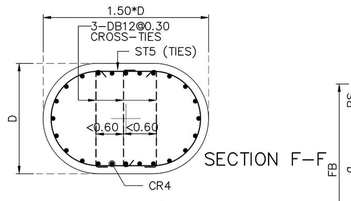
SECTION B-B

SECTION C-C

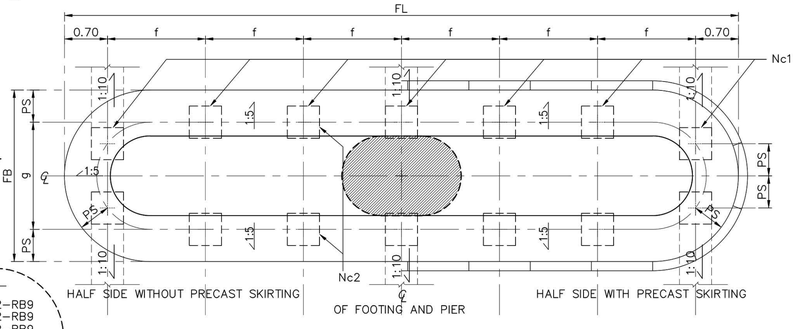


SECTION D-D

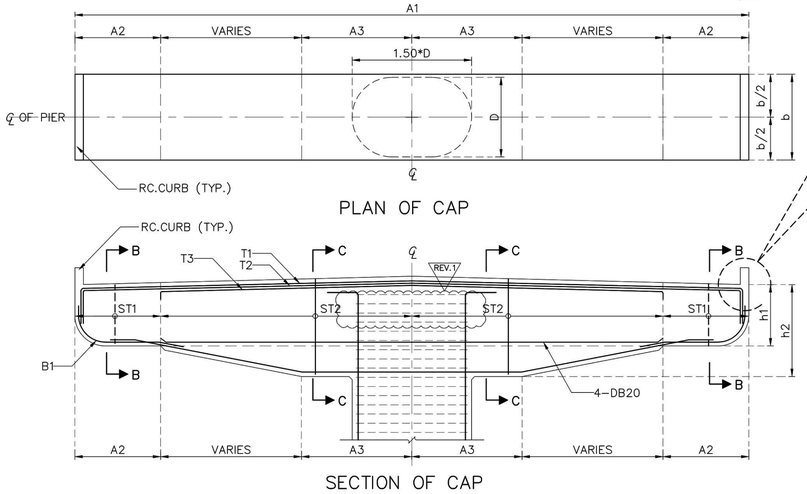
SECTION E-E



SECTION F-F

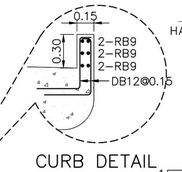


PLAN OF FOOTING

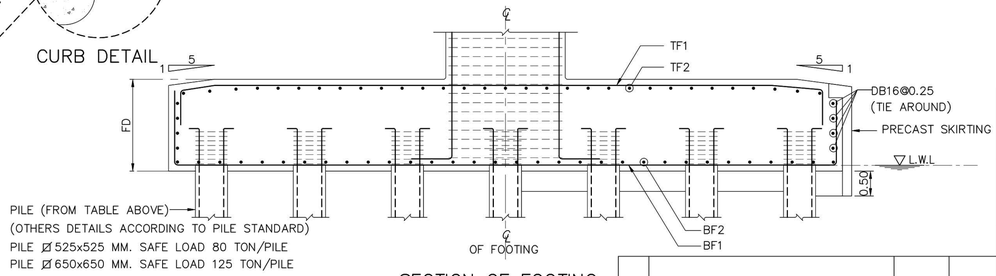


PLAN OF CAP

SECTION OF CAP



CURB DETAIL



PILE (FROM TABLE ABOVE)
(OTHERS DETAILS ACCORDING TO PILE STANDARD)
PILE Ø 525x525 MM. SAFE LOAD 80 TON/PILE
PILE Ø 650x650 MM. SAFE LOAD 125 TON/PILE

SECTION OF FOOTING

1.SPAN LENGTH 25.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

Ln (M.)	W (M.)	NO.OF I-GIRDER (N_I)	DIMENSION (M.)								C (SIDE WALK WIDTH)		REBAR COLUMN								
			A1	A2	A3	b	e	S	h1	h2	SW=1.00 M.	SW=1.50 M.	Dx1.5D(M.)	CR1	CR2	CR2'	ST3	CR3	CR3'	ST4	CR4	ST5
25.00 M. SEISMIC LEVEL 1	12.00	7	14.00	1.60	2.20	1.60	1.50	2.00	1.00	1.50	1.00	1.50	1.40x2.10	46-DB28	46-DB28	–	DB12@0.15	46-DB28	18-DB28	DB12@0.15	46-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	1.80	1.65	2.00	1.20	1.90	1.00	–	1.50x2.25	54-DB28	42-DB28	–	DB12@0.15	54-DB28	18-DB28	DB12@0.15	54-DB28	DB12@0.30
25.00 M. SEISMIC LEVEL 2	12.00	7	14.00	1.60	2.20	1.60	1.55	2.00	1.00	1.50	1.00	1.50	1.50x2.25	52-DB28	52-DB28	52-DB28	DB12@0.15	52-DB28	30-DB28	DB12@0.15	52-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	1.80	1.70	2.00	1.20	1.90	1.00	–	1.60x2.40	60-DB28	60-DB28	60-DB28	DB12@0.15	60-DB28	32-DB28	DB12@0.15	60-DB28	DB12@0.30

Ln (M.)	W (M.)	REBAR CAPBEAM						PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING SKEW 0°-15°					FOOTING SKEW 16°-45°					BOTTOM REBAR		TOP REBAR	
		T1	T2	T3	B1	ST1(STIRRUPS)	ST2(STIRRUPS)					FL	FB	FD	f	g	FL	FB	FD	f	g	BF1	BF2	TF1	TF2
25.00 M. SEISMIC LEVEL 1	12.00	22-DB28	22-DB28	22-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	Ø 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75	DB32@0.10 **	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	24-DB28	24-DB28	24-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	Ø 650x650	9	2	18	17.00	3.55	2.50	1.95	2.25	17.00	4.05	2.50	1.95	2.75	DB32@0.08 **	DB25@0.11	DB20@0.13	DB20@0.13
25.00 M. SEISMIC LEVEL 2	12.00	22-DB28	22-DB28	22-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	Ø 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75	DB32@0.08 **	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	24-DB28	24-DB28	24-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	Ø 650x650	9	2	18	17.00	3.55	2.50	1.95	2.25	17.00	4.05	2.50	1.95	2.75	DB32@0.09 ***	DB25@0.11	DB20@0.13	DB20@0.13

REMARK ; ** = 2 LAYERS
*** = 3 LAYERS

2.SPAN LENGTH 30.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

Ln (M.)	W (M.)	NO.OF I-GIRDER (N_I)	DIMENSION (M.)								C (SIDE WALK WIDTH)		REBAR COLUMN								
			A1	A2	A3	b	e	S	h1	h2	SW=1.00 M.	SW=1.50 M.	Dx1.5D(M.)	CR1	CR2	CR2'	ST3	CR3	CR3'	ST4	CR4	ST5
30.00 M. SEISMIC LEVEL 1	12.00	7	14.00	1.60	2.20	1.80	1.60	2.00	1.00	1.70	1.00	1.50	1.40x2.10	52-DB28	52-DB28	–	DB12@0.15	52-DB28	16-DB28	DB12@0.15	52-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	2.00	1.75	2.00	1.20	1.90	1.00	–	1.50x2.25	56-DB28	56-DB28	–	DB12@0.15	56-DB28	18-DB28	DB12@0.15	56-DB28	DB12@0.30
30.00 M. SEISMIC LEVEL 2	12.00	7	14.00	1.60	2.20	1.80	1.70	2.00	1.00	1.70	1.00	1.50	1.60x2.40	56-DB28	56-DB28	56-DB28	DB12@0.15	56-DB28	32-DB28	DB12@0.15	56-DB28	DB12@0.30
	15.00	8	16.00	2.00	2.70	2.00	1.85	2.00	1.20	1.90	1.00	–	1.70x2.55	66-DB28	66-DB28	66-DB28	DB12@0.15	66-DB28	34-DB28	DB12@0.15	66-DB28	DB12@0.30

REV.1

Ln (M.)	W (M.)	REBAR CAPBEAM						PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING SKEW 0°-15°					FOOTING SKEW 16°-45°				
		T1	T2	T3	B1	ST1(STIRRUPS)	ST2(STIRRUPS)					FL	FB	FD	f	g	FL	FB	FD	f	g
30.00 M. SEISMIC LEVEL 1	12.00	22-DB28	22-DB28	22-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	Ø 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75
	15.00	27-DB28	27-DB28	27-DB28	12-DB20	4-DB12@0.10	5-DB12@0.10	Ø 650x650	10	2	20	19.00	3.75	2.90	1.96	2.45	19.00	4.25	2.90	1.96	2.95
30.00 M. SEISMIC LEVEL 2	12.00	22-DB28	22-DB28	22-DB28	12-DB20	4-DB12@0.15	5-DB12@0.10	Ø 650x650	8	2	16	15.00	3.55	2.25	1.94	2.25	15.00	4.05	2.25	1.94	2.75
	15.00	27-DB28	27-DB28	27-DB28	12-DB20	4-DB12@0.10	5-DB12@0.10	Ø 650x650	10	2	20	19.00	3.75	2.90	1.96	2.45	19.00	4.25	2.90	1.96	2.95

Ln (M.)	W (M.)	BOTTOM REBAR		TOP REBAR	
		BF1	BF2	TF1	TF2
30.00 M. SEISMIC LEVEL 1	12.00	DB32@0.09 **	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	DB32@0.12***	DB25@0.11	DB20@0.12	DB20@0.12
30.00 M. SEISMIC LEVEL 2	12.00	DB32@0.09***	DB25@0.12	DB20@0.14	DB20@0.14
	15.00	DB32@0.09***	DB25@0.11	DB20@0.12	DB20@0.12

REMARK ; ** = 2 LAYERS
*** = 3 LAYERS

ADJUST LENGTH FOR SKEW BRIDGE

VALUE OF SECθ IN CASE OF SKEW BRIDGE (SKEW, θ)					
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642
SKEW ANGLE, θ (DEGREE)	25	30	35	40	45
SEC θ	1.1034	1.1547	1.2208	1.3054	1.4142

REV.	REVISION	SIGNATURE	DATE
REV.1	REVISE AS CLOUD		DEC 2017

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

SINGLE COLUMN PIER WITH SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M.
HEIGHT NOT OVER 20.00 M.

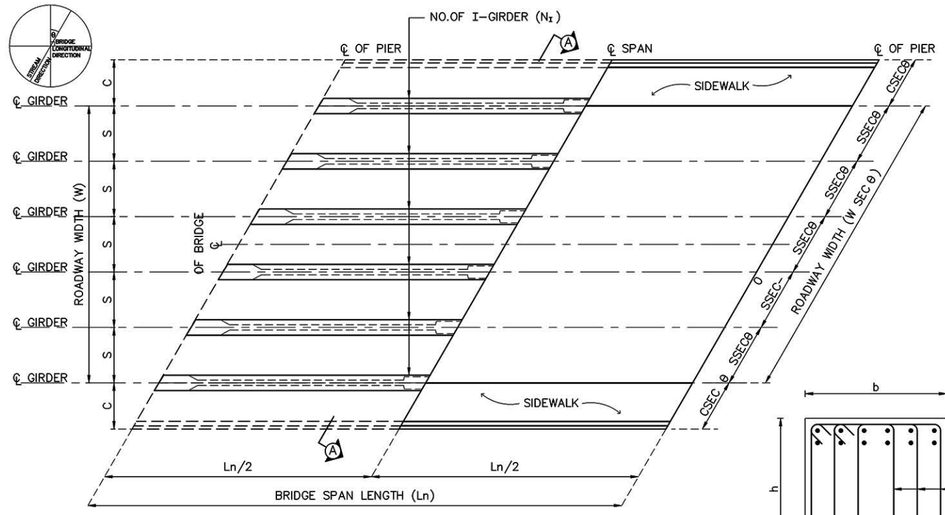
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

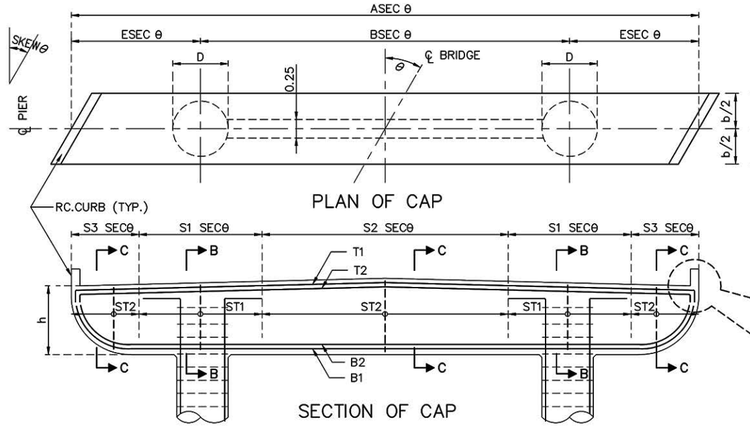
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** PC-305

SHEET NO. 8

D:\std dwg 2015\PC-305(REV01)

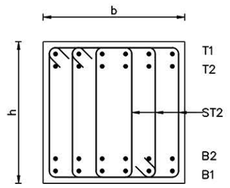


PLAN OF BRIDGE DECK

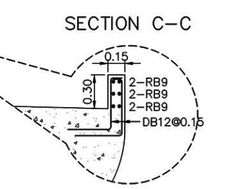


PLAN OF CAP

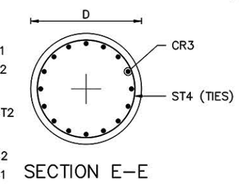
SECTION B–B



SECTION C–C



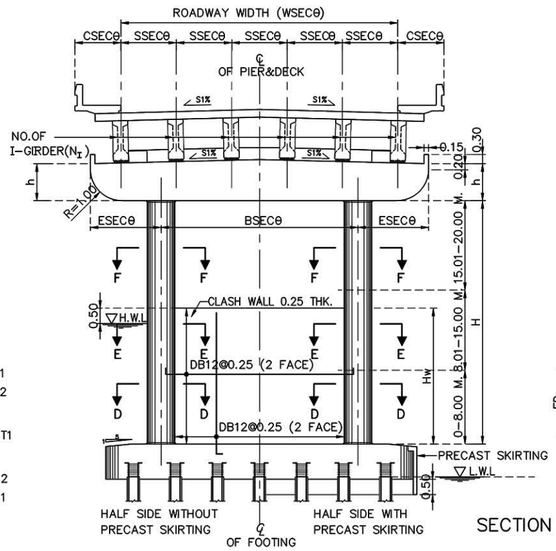
CURB DETAIL



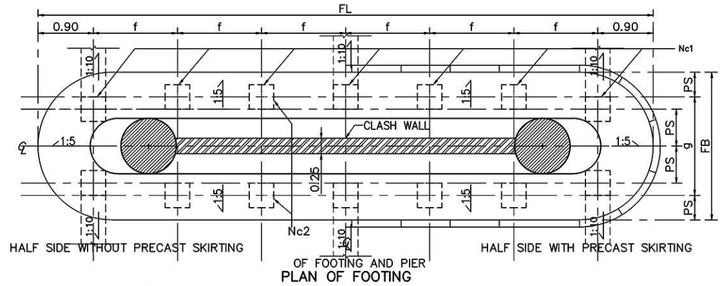
SECTION E–E

SECTION D–D

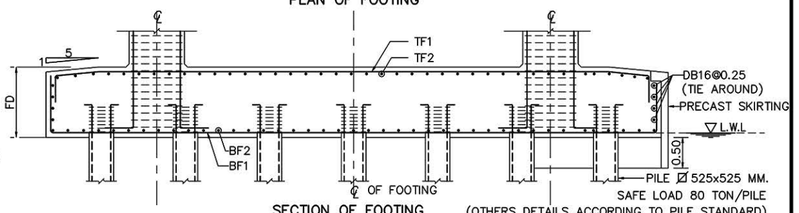
SECTION F–F



SECTION A–A



PLAN OF FOOTING



SECTION OF FOOTING

ADJUST LENGTH FOR SKEW BRIDGE

VALUE OF SECθ IN CASE OF SKEW BRIDGE (SKEW, θ)										
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20	25	30	35	40	45
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142

1.SPAN LENGTH 25.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

1.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I-GIRDER (N_T)	DIMENSION (M.)							C (SIDE WALK WIDTH)		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	SW=1.00 M.	SW=1.50 M.	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
25.00 M. SEISMIC LEVEL 1	12.00	7	14.00	7.30	2.85	2.00	3.70	4.60	1.00	1.00	1.50	1.30	30-DB28	30-DB28	DB12@0.15	30-DB28	DB12@0.30	24-DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	–	1.30	30-DB28	30-DB28	DB12@0.15	30-DB28	DB12@0.30	24-DB28	DB12@0.30
25.00 M. SEISMIC LEVEL 2	12.00	7	14.00	7.30	2.85	2.00	3.70	4.60	1.00	1.00	1.50	1.40	42-DB28	42-DB28	DB12@0.15	42-DB28	DB12@0.30	26-DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	–	1.50	44-DB28	44-DB28	DB12@0.15	44-DB28	DB12@0.30	30-DB28	DB12@0.30

1.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b (M.)	h (M.)	SKEW 0–30 DEGREE						SKEW 31–45 DEGREE					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
25.00 M. SEISMIC LEVEL 1	12.00	1.60	1.40	12-DB25	12-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20	13-DB25	13-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20
	15.00	1.60	1.40	14-DB25	14-DB25	14-DB25	14-DB25	5-DB12@0.125	3-DB12@0.20	18-DB25	18-DB25	18-DB25	18-DB25	5-DB12@0.125	3-DB12@0.20
25.00 M. SEISMIC LEVEL 2	12.00	1.60	1.40	12-DB25	12-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20	13-DB25	13-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20
	15.00	1.70	1.40	14-DB25	14-DB25	14-DB25	14-DB25	5-DB12@0.125	3-DB12@0.20	19-DB25	19-DB25	19-DB25	19-DB25	5-DB12@0.125	3-DB12@0.20

1.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
25.00 M. SEISMIC LEVEL 1	12.00	Ø 525x525	9	2	18	14.00	3.25	1.75	1.53	2.20	DB25@0.10	DB25@0.15	DB25@0.10	DB20@0.175
	15.00	Ø 525x525	9	2	18	16.00	3.00	2.00	1.75	1.95	DB28@0.09	DB25@0.125	DB28@0.09	DB20@0.175
25.00 M. SEISMIC LEVEL 2	12.00	Ø 525x525	9	2	18	14.00	3.25	1.75	1.53	2.20	DB25@0.09	DB25@0.15	DB25@0.09	DB20@0.175
	15.00	Ø 525x525	9	2	18	16.00	3.00	2.00	1.75	1.95	DB28@0.14 **	DB25@0.125	DB28@0.14 **	DB20@0.175

REV.1 BF1 REV.1 TF1

REMARK ; ** = 2 LAYERS

2.SPAN LENGTH 30.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

2.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I-GIRDER (N_T)	DIMENSION (M.)							C (SIDE WALK WIDTH)		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	SW=1.00 M.	SW=1.50 M.	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
30.00 M. SEISMIC LEVEL 1	12.00	7	14.00	7.30	2.85	2.00	3.70	4.60	1.00	1.00	1.50	1.30	30-DB28	30-DB28	DB12@0.15	30-DB28	DB12@0.30	24-DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	–	1.40	30-DB28	30-DB28	DB12@0.15	30-DB28	DB12@0.30	26-DB28	DB12@0.30
30.00 M. SEISMIC LEVEL 2	12.00	7	14.00	7.30	2.85	2.00	3.70	4.60	1.00	1.00	1.50	1.50	44-DB28	44-DB28	DB12@0.15	44-DB28	DB12@0.30	30-DB28	DB12@0.30
	15.00	8	16.00	9.40	3.30	2.00	3.40	6.00	1.60	1.00	–	1.50	48-DB28	48-DB28	DB12@0.15	48-DB28	DB12@0.30	30-DB28	DB12@0.30

2.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b (M.)	h (M.)	SKEW 0–30 DEGREE						SKEW 31–45 DEGREE					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
30.00 M. SEISMIC LEVEL 1	12.00	1.60	1.40	12-DB25	12-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20	13-DB25	13-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20
	15.00	1.60	1.40	15-DB25	15-DB25	15-DB25	15-DB25	5-DB12@0.10	3-DB12@0.20	19-DB25	19-DB25	19-DB25	19-DB25	5-DB12@0.10	3-DB12@0.20
30.00 M. SEISMIC LEVEL 2	12.00	1.70	1.40	12-DB25	12-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20	14-DB25	14-DB25	14-DB25	14-DB25	5-DB12@0.15	3-DB12@0.20
	15.00	1.70	1.40	15-DB25	15-DB25	15-DB25	15-DB25	5-DB12@0.10	3-DB12@0.20	19-DB25	19-DB25	19-DB25	19-DB25	5-DB12@0.10	3-DB12@0.20

2.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
30.00 M. SEISMIC LEVEL 1	12.00	Ø 525x525	9	2	18	14.00	3.25	1.75	1.53	2.20	DB28@0.15 **	DB25@0.15	DB28@0.13	DB20@0.175
	15.00	Ø 525x525	10	2	20	16.00	3.00	2.00	1.58	1.95	DB28@0.16 **	DB25@0.125	DB28@0.16 **	DB20@0.15
30.00 M. SEISMIC LEVEL 2	12.00	Ø 525x525	9	2	18	14.00	3.25	1.75	1.53	2.20	DB28@0.12 **	DB25@0.15	DB28@0.12	DB20@0.175
	15.00	Ø 525x525	10	2	20	16.00	3.00	2.00	1.58	1.95	DB28@0.13 **	DB25@0.125	DB28@0.13 **	DB20@0.15

REMARK ; ** = 2 LAYERS

REV.1	REVISE AS CLOUD		DEC 2017
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

TWO COLUMNS PIER WITH SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M. HEIGHT NOT OVER 20.00 M.

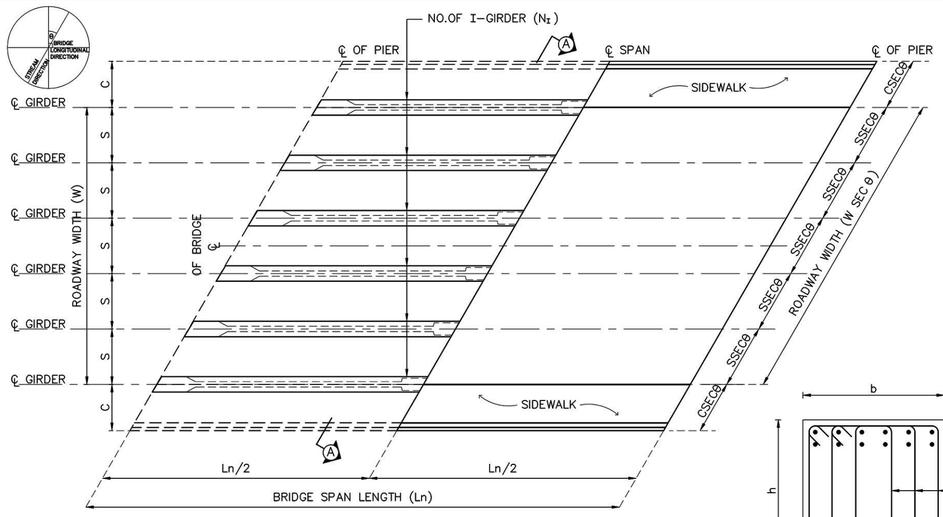
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

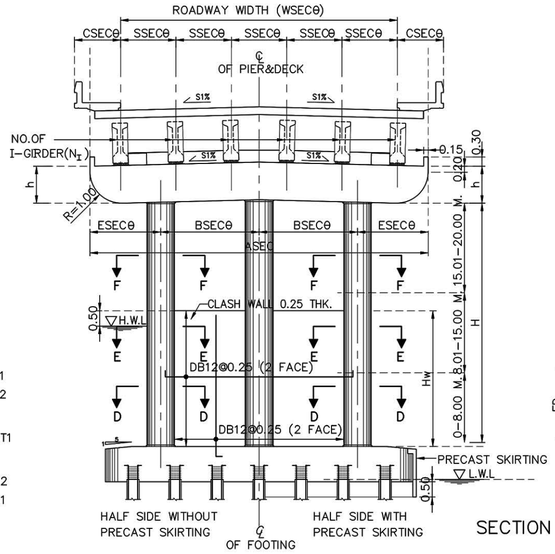
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** PC-306

SHEET NO. 9

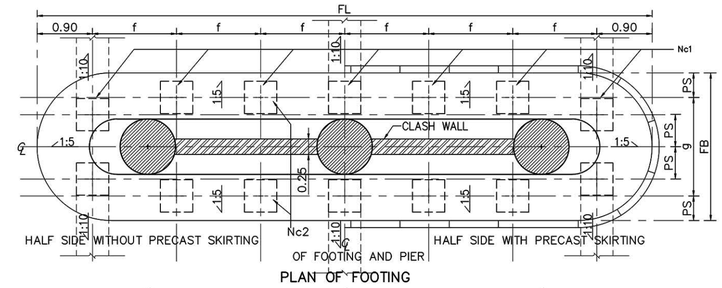
D:\std dwg 2015\PC-306(REV01)



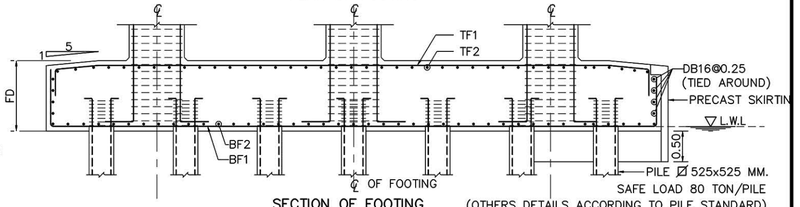
SECTION B–B



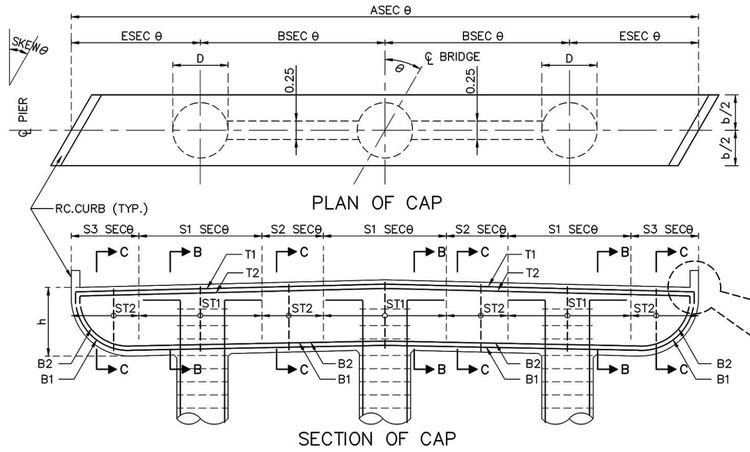
SECTION A–A



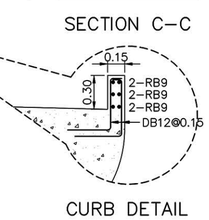
PLAN OF FOOTING



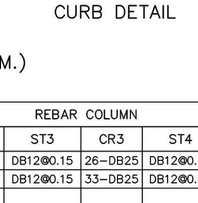
SECTION OF FOOTING



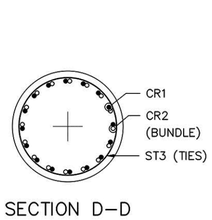
PLAN OF CAP



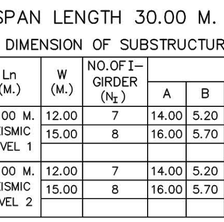
SECTION C–C



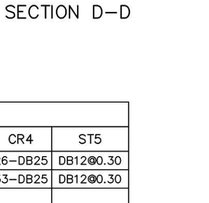
CURB DETAIL



SECTION E–E



SECTION F–F



SECTION D–D

SECTION OF CAP

ADJUST LENGTH FOR SKEW BRIDGE

VALUE OF SECθ IN CASE OF SKEW BRIDGE (SKEW, θ)										
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20	25	30	35	40	45
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142

1.SPAN LENGTH 25.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

1.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I–GIRDER (N_I)	DIMENSION (M.)							C (SIDE WALK WIDTH)		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	SW=1.00 M.	SW=1.50 M.	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
25.00 M. SEISMIC LEVEL 1	12.00	7	14.00	5.20	1.80	2.00	3.60	1.60	–	1.00	1.50	1.20	26–DB25	26–DB25	DB12@0.15	26–DB25	DB12@0.30	26–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	–	1.40	33–DB25	33–DB25	DB12@0.15	33–DB25	DB12@0.30	33–DB25	DB12@0.30
25.00 M. SEISMIC LEVEL 2	12.00	7	14.00	5.20	1.80	2.00	3.60	1.60	–	1.00	1.50	1.20	40–DB25	40–DB25	DB12@0.15	40–DB25	DB12@0.30	40–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	–	1.40	43–DB25	43–DB25	DB12@0.15	43–DB25	DB12@0.30	43–DB25	DB12@0.30

REV.1

1.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b	h	SKEW 0–30						SKEW 31–45					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
25.00 M. SEISMIC LEVEL 1	12.00	1.40	1.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20
	15.00	1.60	1.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20
25.00 M. SEISMIC LEVEL 2	12.00	1.40	1.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20	12–DB25	–	12–DB25	–	5–DB12@0.175	4–DB12@0.20
	15.00	1.60	1.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20	16–DB25	–	16–DB25	–	5–DB12@0.15	4–DB12@0.20

1.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	REV.1 BF1	BF2	TF1	TF2
25.00 M. SEISMIC LEVEL 1	12.00	⌀ 525x525	9	2	18	15.00	3.05	1.50	1.65	2.00	DB25@0.15	DB25@0.175	DB20@0.20	DB20@0.20
	15.00	⌀ 525x525	10	2	20	16.00	3.05	1.75	1.58	2.00	DB25@0.14	DB25@0.15	DB20@0.13	DB20@0.20
25.00 M. SEISMIC LEVEL 2	12.00	⌀ 525x525	9	2	18	15.00	3.05	1.50	1.65	2.00	DB25@0.14	DB25@0.175	DB20@0.175	DB20@0.20
	15.00	⌀ 525x525	10	2	20	16.00	3.05	1.75	1.58	2.00	DB25@0.125	DB25@0.15	DB20@0.10	DB20@0.20

2.SPAN LENGTH 30.00 M. HEIGHT NOT OVER 20.00 M. (0.00 M. ⩽ H ⩽ 20.00 M.)

2.1 DIMENSION OF SUBSTRUCTURE & REBAR OF COLUMN

Ln (M.)	W (M.)	NO.OF I–GIRDER (N_I)	DIMENSION (M.)							C (SIDE WALK WIDTH)		REBAR COLUMN							
			A	B	E	S	S1	S2	S3	SW=1.00 M.	SW=1.50 M.	D (M.)	CR1	CR2	ST3	CR3	ST4	CR4	ST5
30.00 M. SEISMIC LEVEL 1	12.00	7	14.00	5.20	1.80	2.00	3.60	1.60	–	1.00	1.50	1.20	29–DB25	29–DB25	DB12@0.15	29–DB25	DB12@0.30	29–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	–	1.40	34–DB25	34–DB25	DB12@0.15	34–DB25	DB12@0.30	34–DB25	DB12@0.30
30.00 M. SEISMIC LEVEL 2	12.00	7	14.00	5.20	1.80	2.00	3.60	1.60	–	1.00	1.50	1.20	44–DB25	44–DB25	DB12@0.15	44–DB25	DB12@0.30	44–DB25	DB12@0.30
	15.00	8	16.00	5.70	2.30	2.00	2.60	3.10	1.00	1.00	–	1.40	44–DB25	44–DB25	DB12@0.15	44–DB25	DB12@0.30	44–DB25	DB12@0.30

2.2 REBAR OF CAP BEAM

Ln (M.)	W (M.)	b	h	SKEW 0–30						SKEW 31–45					
				T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)	T1	T2	B1	B2	ST1(STIRRUPS)	ST2(STIRRUPS)
30.00 M. SEISMIC LEVEL 1	12.00	1.40	1.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20
	15.00	1.60	1.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20
30.00 M. SEISMIC LEVEL 2	12.00	1.40	1.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20	14–DB25	–	14–DB25	–	5–DB12@0.15	4–DB12@0.20
	15.00	1.60	1.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20	17–DB25	–	17–DB25	–	5–DB12@0.15	4–DB12@0.20

2.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING, PS (MM.)	Nc1	Nc2	NO.OF PILE	FOOTING DIMENSION (M.)					REV.1 BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	g	BF1	BF2	TF1	TF2
30.00 M. SEISMIC LEVEL 1	12.00	⌀ 525x525	9	2	18	15.00	3.45	1.50	1.65	2.40	DB25@0.175	DB25@0.175	DB20@0.20	DB20@0.20
	15.00	⌀ 525x525	10	2	20	16.00	3.45	1.75	1.58	2.40	DB25@0.15	DB25@0.15	DB20@0.13	DB20@0.20
30.00 M. SEISMIC LEVEL 2	12.00	⌀ 525x525	9	2	18	15.00	3.45	1.50	1.65	2.40	DB25@0.15	DB25@0.175	DB20@0.20	DB20@0.20
	15.00	⌀ 525x525	10	2	20	16.00	3.45	1.75	1.58	2.40	DB25@0.13	DB25@0.15	DB20@0.11	DB20@0.20

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

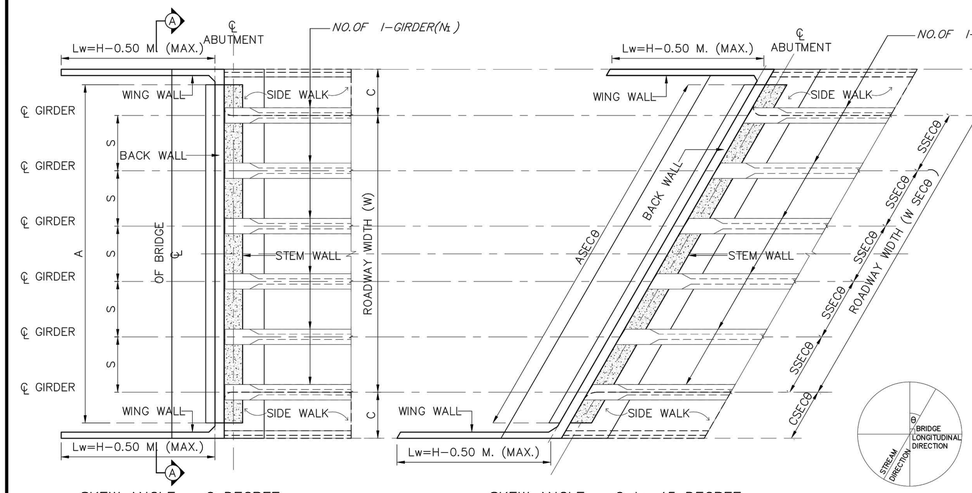
STANDARD DRAWING

THREE COLUMNS PIER WITH SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M.
HEIGHT NOT OVER 20.00 M.

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN		**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			**SCALE :** AS SHOWN
			DWG NO. PC–307
APPROVED : (FOR DIRECTOR GENERAL)			**SHEET NO.** 10

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISE AS CLOUD		DEC 2017

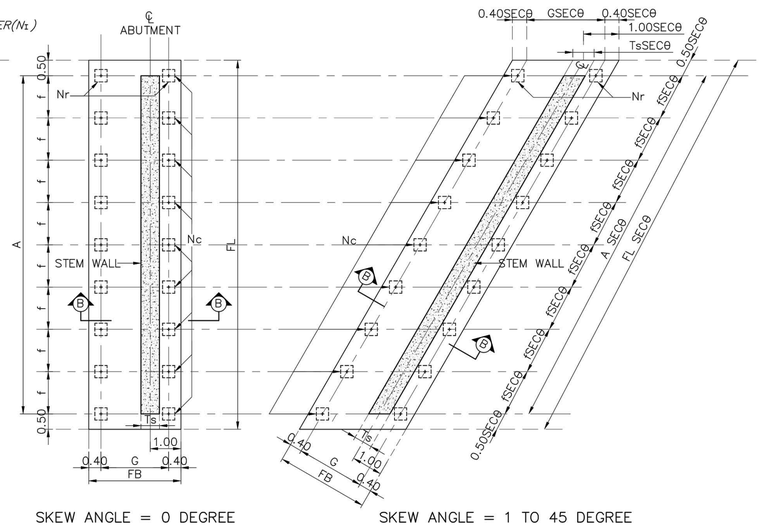
D:\std dwg 2015\PC-307(REV01)



SKEW ANGLE = 0 DEGREE

SKEW ANGLE = 0 to 45 DEGREE

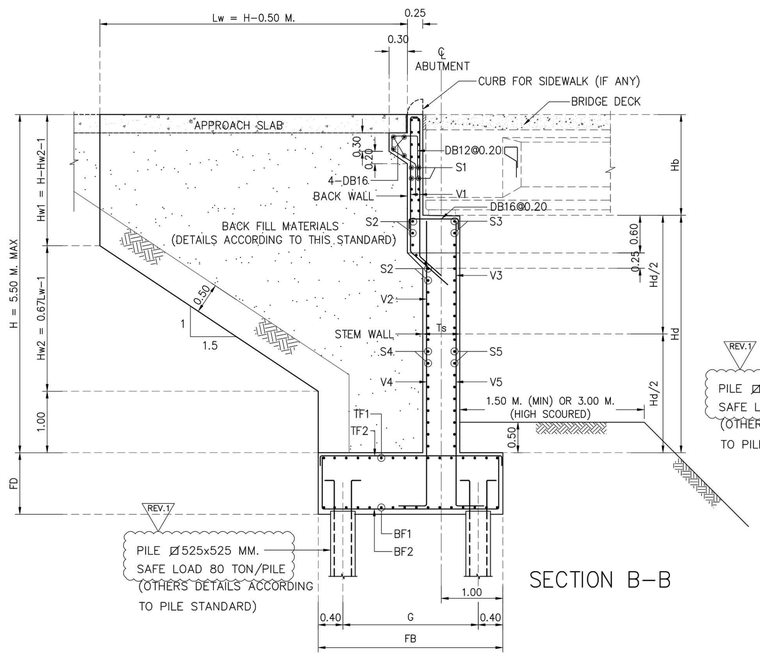
PLAN OF ABUTMENT



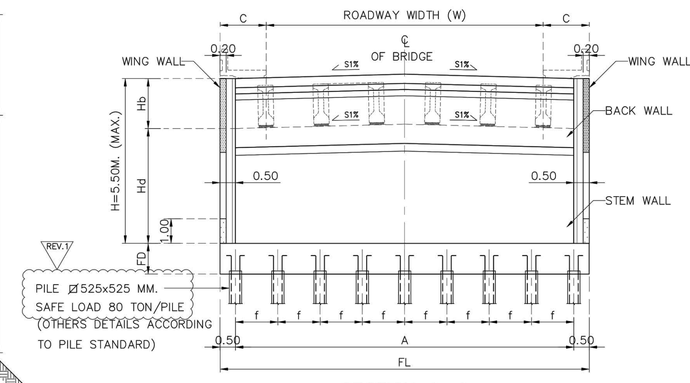
SKEW ANGLE = 0 DEGREE

SKEW ANGLE = 1 TO 45 DEGREE

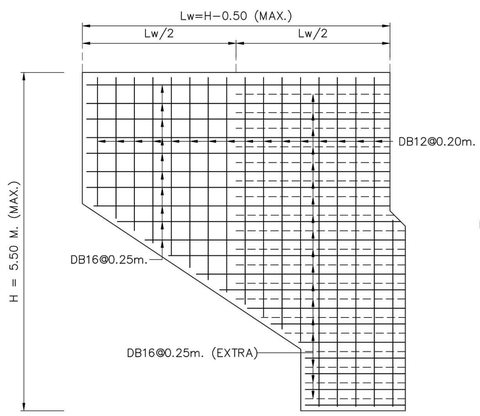
PLAN OF FOOTING



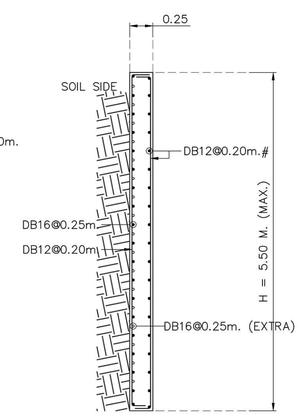
SECTION B−B



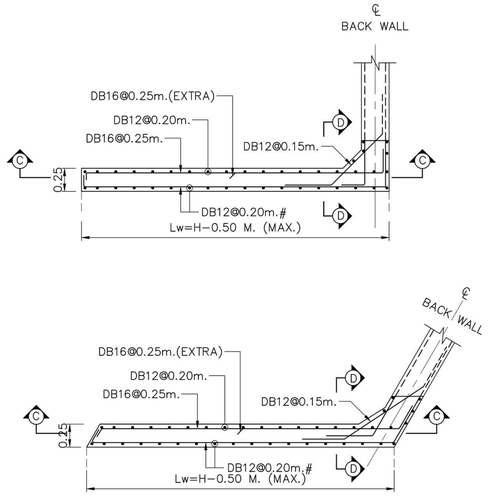
SECTION A−A



SECTION C−C



SECTION D−D



1.SPAN LENGTH 25.00 M. AND 30.00 M.

1.1 DIMENSION OF ABUTMENT

Ln (M.)	W (M.)	NO.OF I−GIRDER (N₂)	H(M.) (MAX)	DIMENSION (M.)					C (SIDE WALK WIDTH)	
				A	S	Hb	Hd	Ts	SW=1.00 M.	SW=1.50 M.
25.00 M.	12.00	7	5.50	14.00	2.00	1.68 *	3.82	0.60	1.00	1.50
	15.00	8	5.50	16.00	2.00	1.68 *	3.82	0.60	1.00	–
30.00 M.	12.00	7	5.50	14.00	2.00	1.68 *	3.82	0.60	1.00	1.50
	15.00	8	5.50	16.00	2.00	1.68 *	3.82	0.60	1.00	–

REMARK ; * = DEPENDS ON DEPTH OF GIRDER

1.2 REBAR IN ABUTMENT

Ln (M.)	W (M.)	SKEW 0−45 DEGREE								
		V1	V2	V3	V4	V5	S1	S2	S3	S4	S5
25.00 M.	12.00,15.00	DB12@0.20	DB20@0.20	DB16@0.20	DB20@0.10	DB16@0.20	RB9@0.15	DB16@0.20	DB16@0.20	DB16@0.20	DB16@0.20
30.00 M.	12.00,15.00	DB12@0.20	DB20@0.20	DB16@0.20	DB20@0.10	DB16@0.20	RB9@0.15	DB16@0.20	DB16@0.20	DB16@0.20	DB16@0.20

1.3 FOUNDATION & PILE

Ln (M.)	W (M.)	PILE SIZING (MM.)	Nc	Nr	NO.OF PILE	FOOTING DIMENSION (M.)					BOTTOM REBAR		TOP REBAR	
						FL	FB	FD	f	G	BF1	BF2	TF1	TF2
25.00 M.	12.00	Ø 525x525	8	2	16	15.00	3.00	1.00	2.03	2.20	DB20@0.15	DB25@0.25	DB20@0.30	DB20@0.30
	15.00	Ø 525x525	9	2	18	17.00	3.00	1.00	2.03	2.20	DB20@0.17	DB25@0.25	DB20@0.30	DB20@0.30
30.00 M.	12.00	Ø 525x525	9	2	18	15.00	3.00	1.00	1.78	2.20	DB20@0.15	DB25@0.25	DB20@0.30	DB20@0.30
	15.00	Ø 525x525	10	2	20	17.00	3.00	1.00	1.80	2.20	DB20@0.17	DB25@0.25	DB20@0.30	DB20@0.30

1.4 ADJUST LENGHT FOR SKEW BRIDGE

VALUE OF SECθ IN CASE OF SKEW BRIDGE (SKEW, θ)										
SKEW ANGLE, θ (DEGREE)	0	5	10	15	20	25	30	35	40	45
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISE AS CLOUD		DEC 2017

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

ABUTMENT WITH SIDEWALK : SPAN LENGTH 25.00 M. AND 30.00 M.

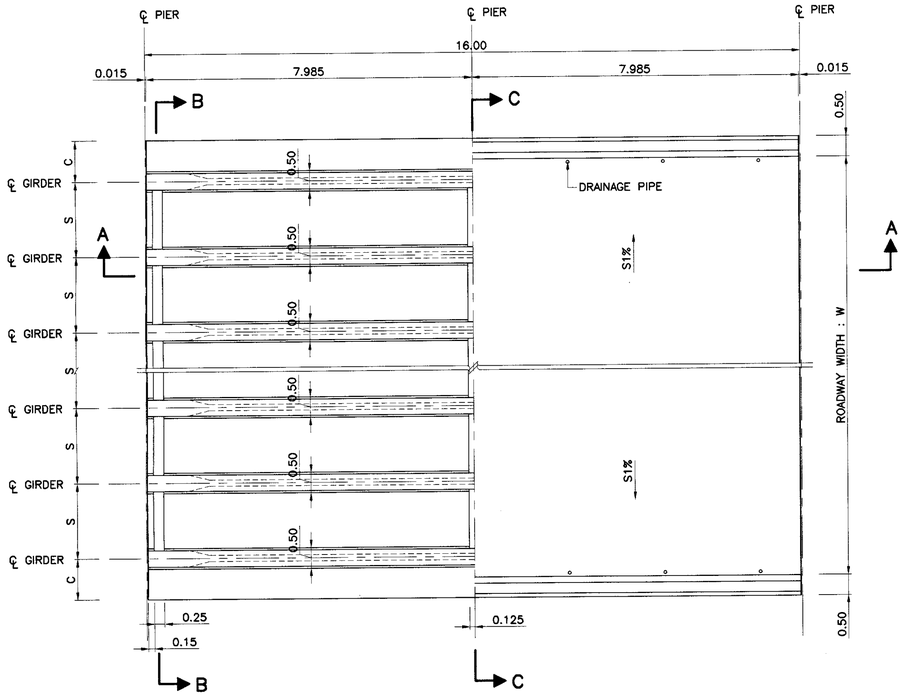
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** PC−308

SHEET NO. 11

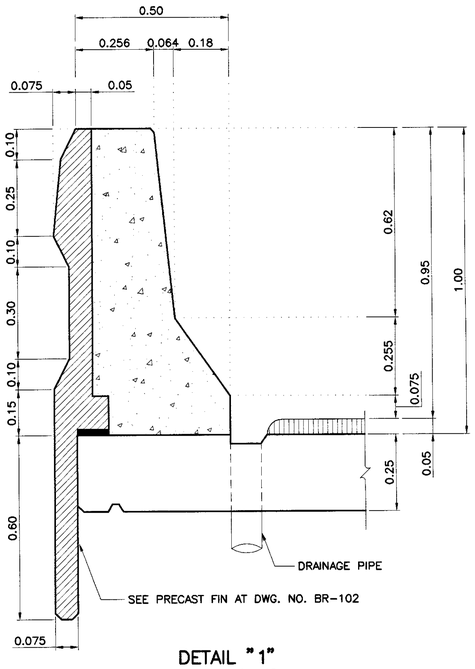
D:\std dwg 2015\PC−308(REV01)



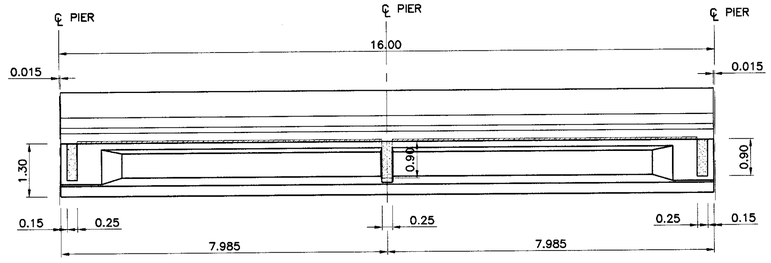
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 16.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



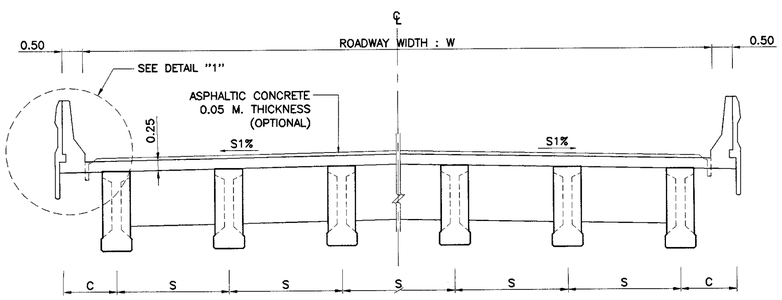
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

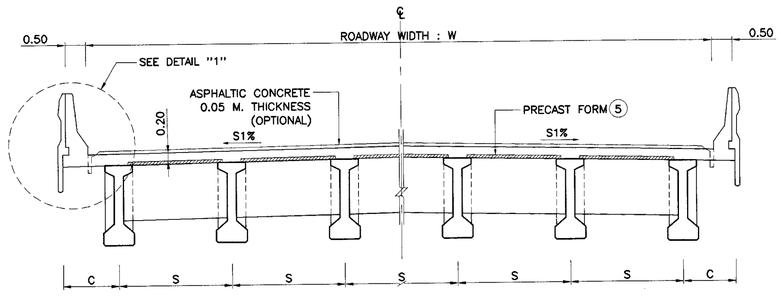
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	5 @ 1.86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX.)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-16F/02 TO NP1-16F/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

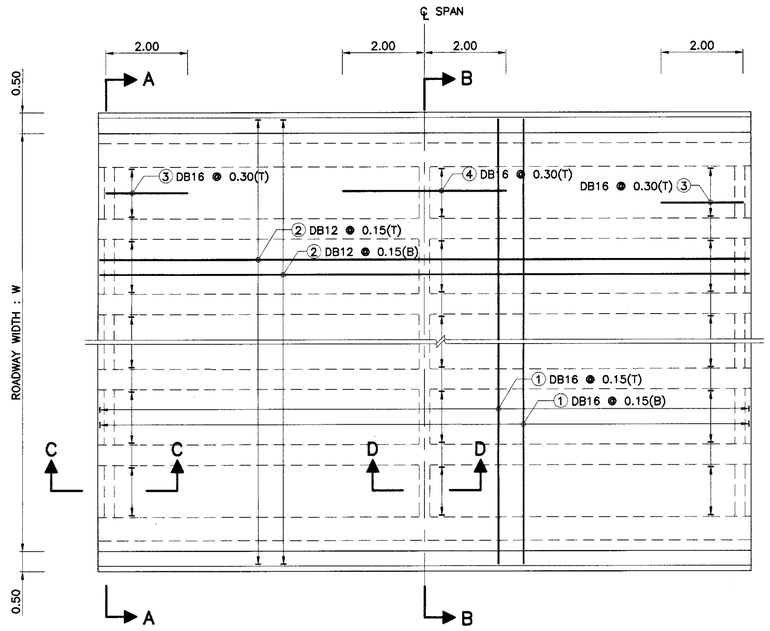
STANDARD DRAWING

I-GIRDER 16.00 M. (FULL JOINT) BRIDGE DECK DIMENSION

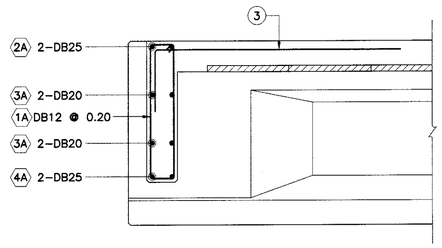
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED :	(DIRECTOR OF LOCATION & DESIGN BUREAU)	SCALE : AS SHOWN
APPROVED :	(FOR DIRECTOR GENERAL)	DWG NO.NP1-16F/01
		SHEET NO. 12

REF.	REVISION	SIGNATURE	DATE

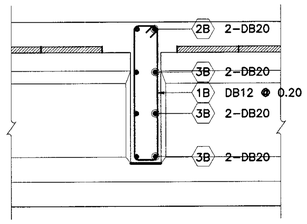
D:\std dwg 2015\NP1-16F-01(REV00)



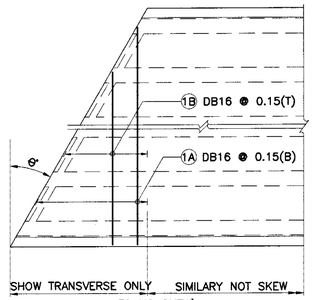
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

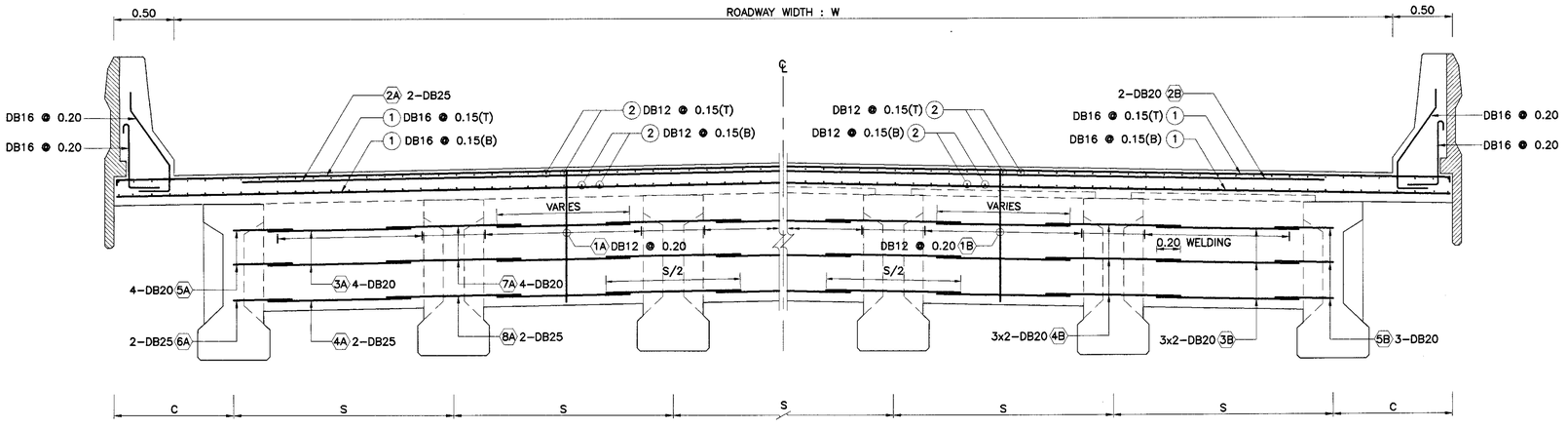
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19, 1.09, 1A
2A	DB25	W+1.00–2C, 2A
3A	DB20	S/2+0.40, 3A
4A	DB25	S/2+0.40, 4A
5A	DB20	S/4+0.10, 0.19, 5A
6A	DB25	S/4+0.10, 6A
7A	DB20	S/2
8A	DB25	7A , 8A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–2C, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/2, 4B
5B	DB20	S/4+0.10, 0.19, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70, 1
2	DB12	15.91, 2
3	DB16	2.00, 3, 0.50
4	DB16	4.00, 4



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO.NP1–16F/01 AND NP1–16F/03 TO NP1–16F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

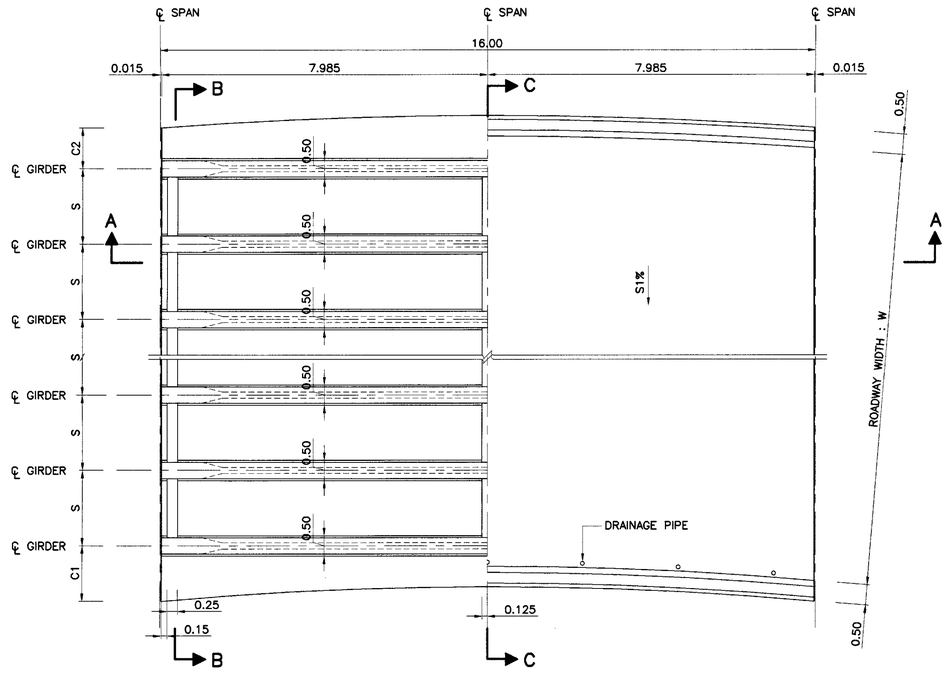
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 16.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1–16F/02
		SHEET NO. 13

D:\std dwg 2015\NP1–16F–02(REV00)

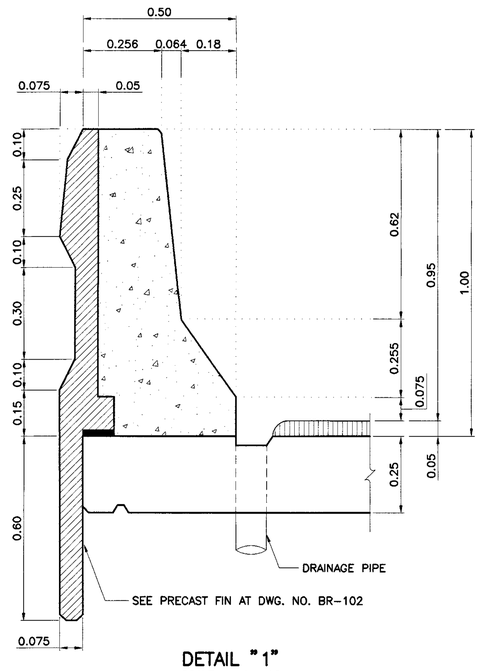


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

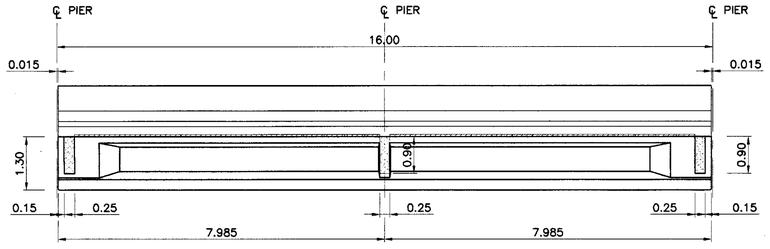
DECK PLAN FOR GIRDER SPAN LENGTH 16.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

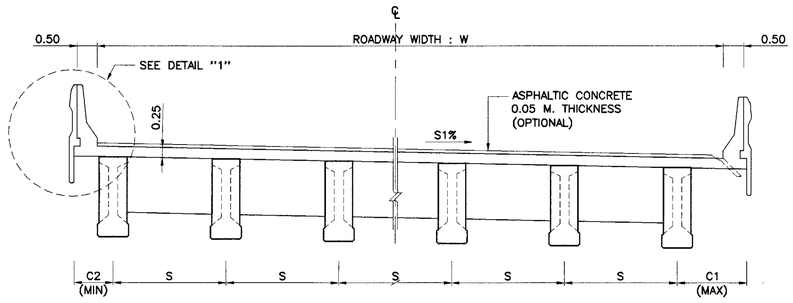
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

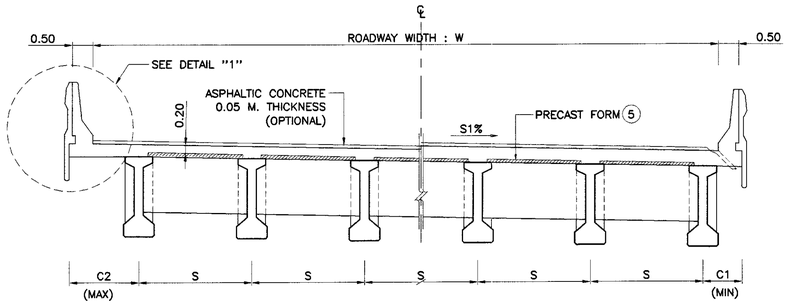
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-16F/01, NP1-16F/02, NP1-16F/04 TO NP1-16F/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS. 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

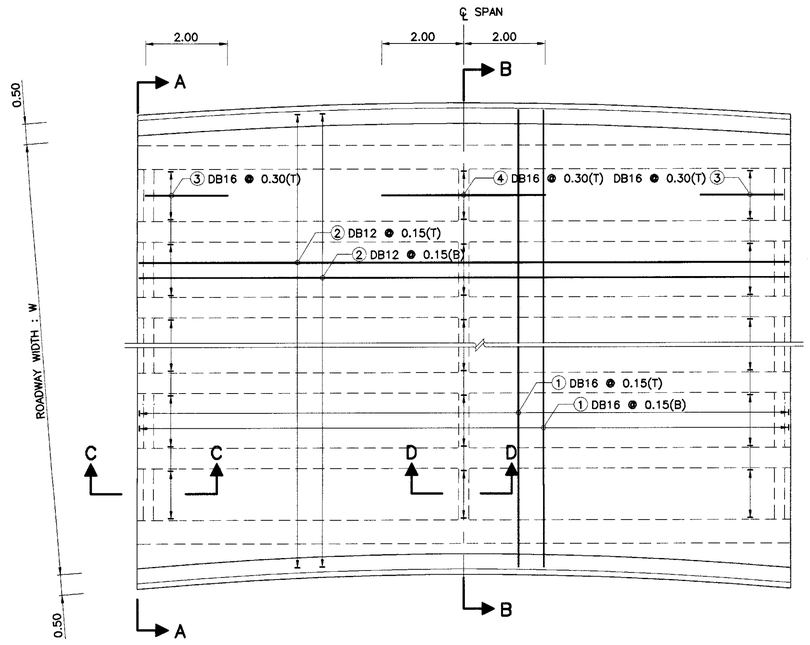
STANDARD DRAWING

I-GIRDER 16.00 M. (FULL JOINT)

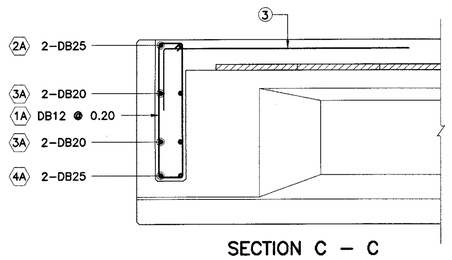
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1-16F/03
		SHEET NO. 14

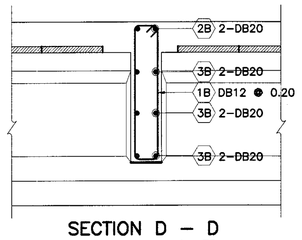
D:\std dwg 2015\NP1-16F-03(REV00)



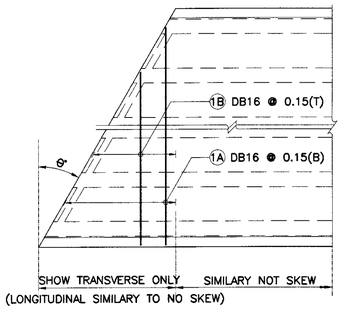
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

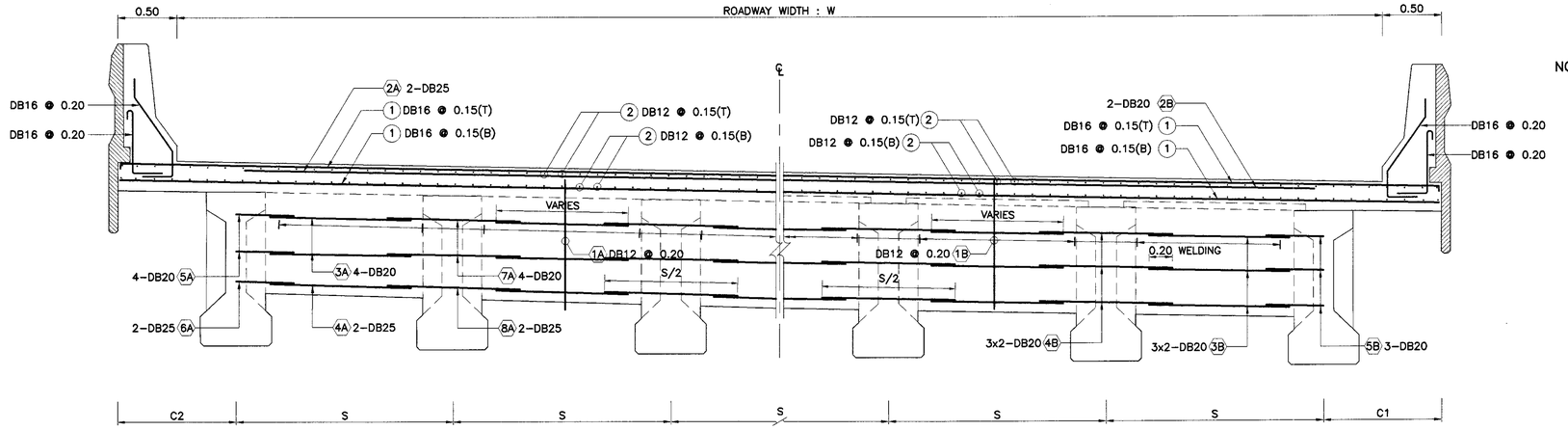
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19, 1.09, 1A
2A	DB25	W+1.00–C1–C2, 2A
3A	DB20	S/2+0.40, 3A
4A	DB25	S/2+0.40, 4A
5A	DB20	S/4+0.10, 0.19, 5A
6A	DB25	S/4+0.10, 6A
7A	DB20	S/2, 7A, 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–C1–C2, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/2, 4B
5B	DB20	S/4+0.10, 0.19, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70, 1
2	DB12	15.91, 2
3	DB16	2.00, 3, 0.50
4	DB16	4.00, 4



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO.NP1–16F/01 TO NP1–16F AND NP1–16F/05, NP1–16F/06

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

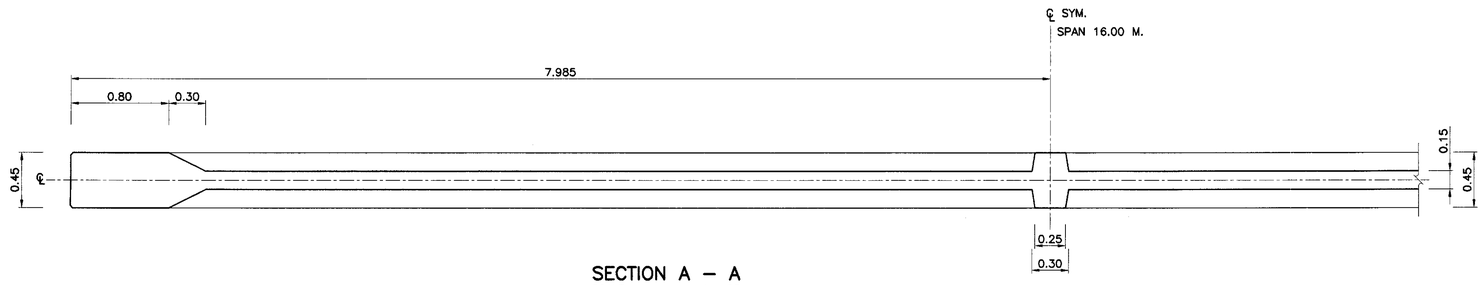
STANDARD DRAWING

I–GIRDER 16.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

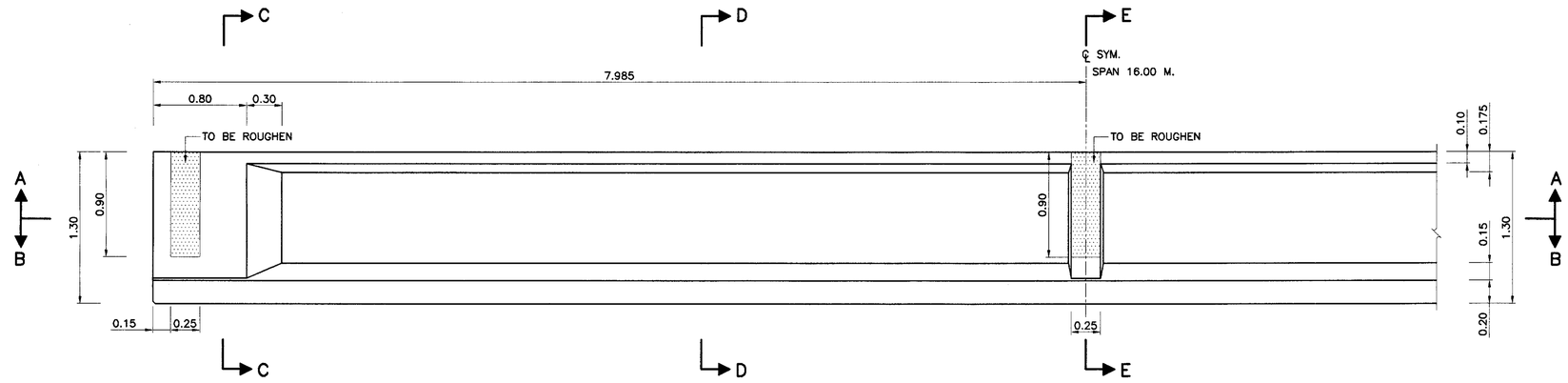
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO.NP1–16F/04
			SHEET NO. 15

REF.	REVISION	SIGNATURE	DATE

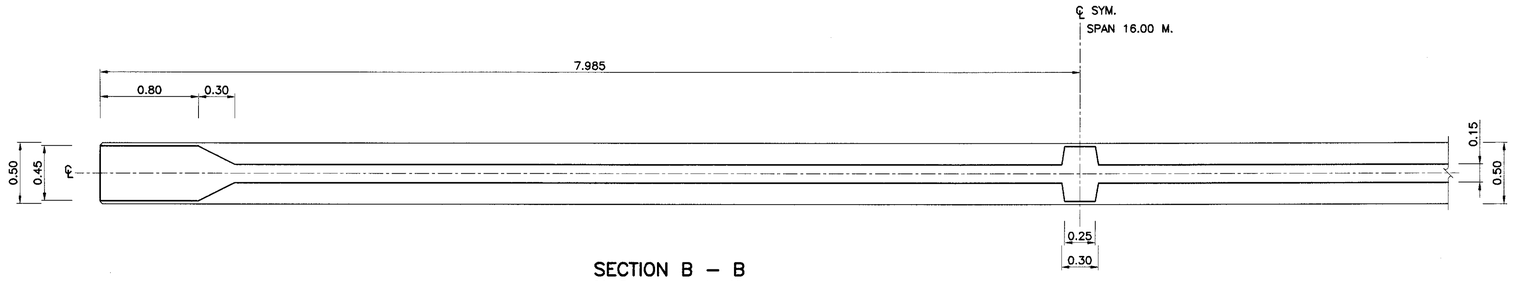
D:\std dwg 2015\NP1–16F–04(REV00)



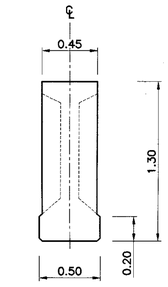
SECTION A – A
SCALE 1 : 25



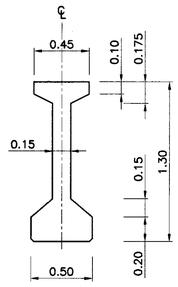
ELEVATION OF GIRDER SPAN LENGTH 16.00 M.
SCALE 1 : 25



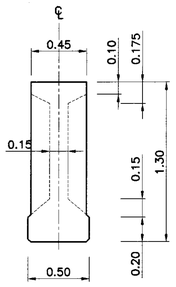
SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. CONCRETE FOR PRECAST I-GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-16F/01 TO NP1-16F/04 AND NP1-16F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

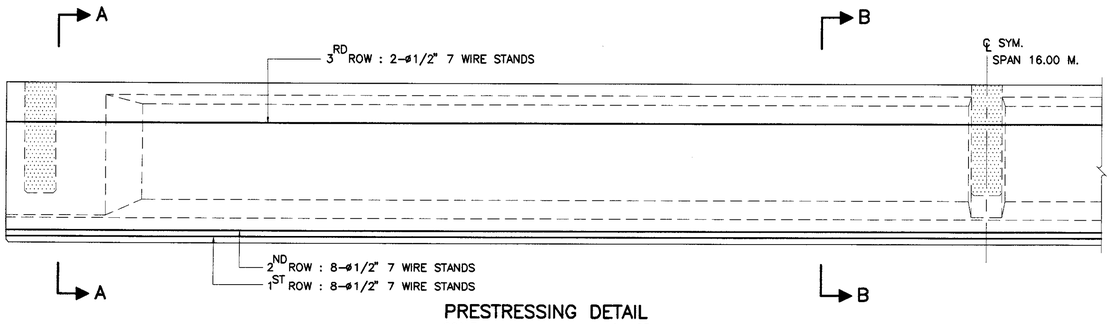
STANDARD DRAWING

I-GIRDER 16.00 M. (FULL JOINT)

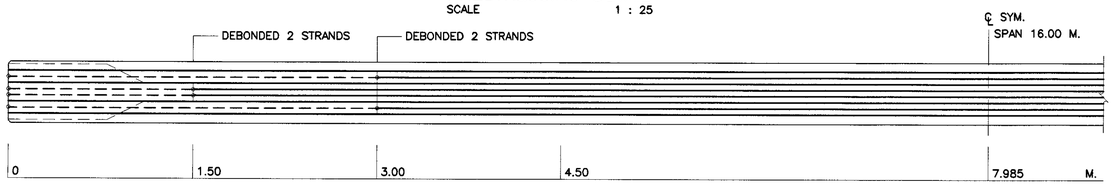
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1-16F/05
		SHEET NO. 16

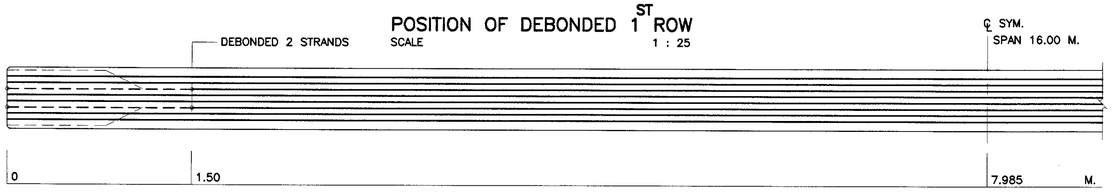
D:\std dwg 2015\NP1-16F-05(REV00)



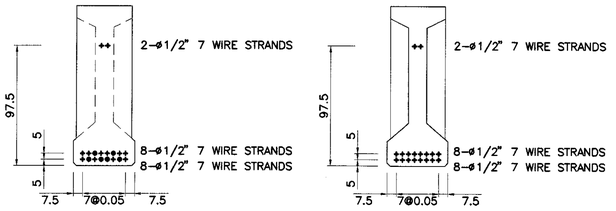
PRESTRESSING DETAIL
SCALE 1 : 25



POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25



POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25

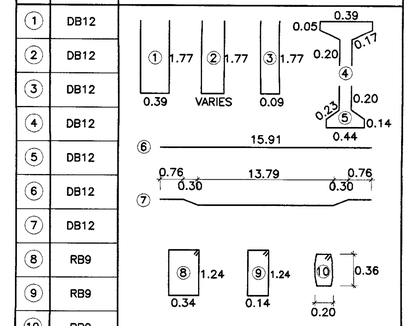


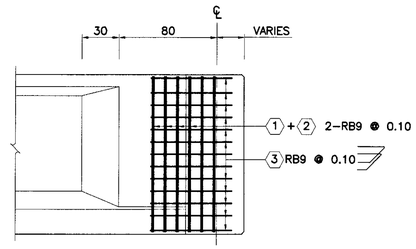
SECTION A – A
SCALE 1 : 25

SECTION B – B
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
①	DB12	
②	DB12	
③	DB12	
④	DB12	
⑤	DB12	
⑥	DB12	
⑦	DB12	
⑧	RB9	
⑨	RB9	
⑩	RB9	

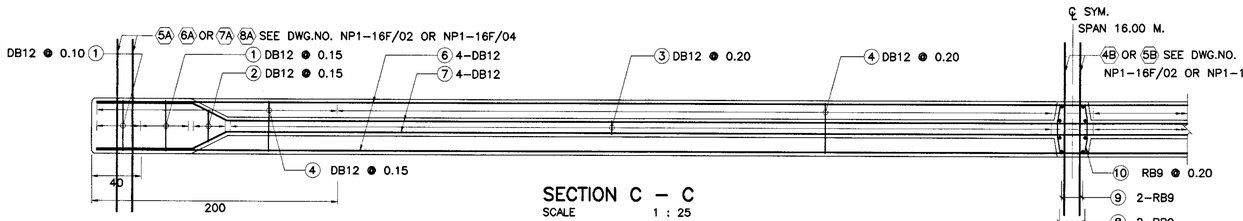




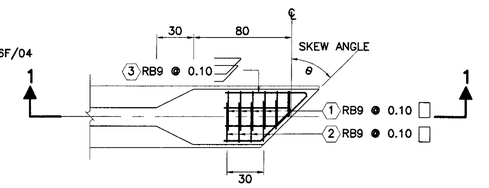
SECTION 1 – 1
SCALE 1 : 25

NOTE :

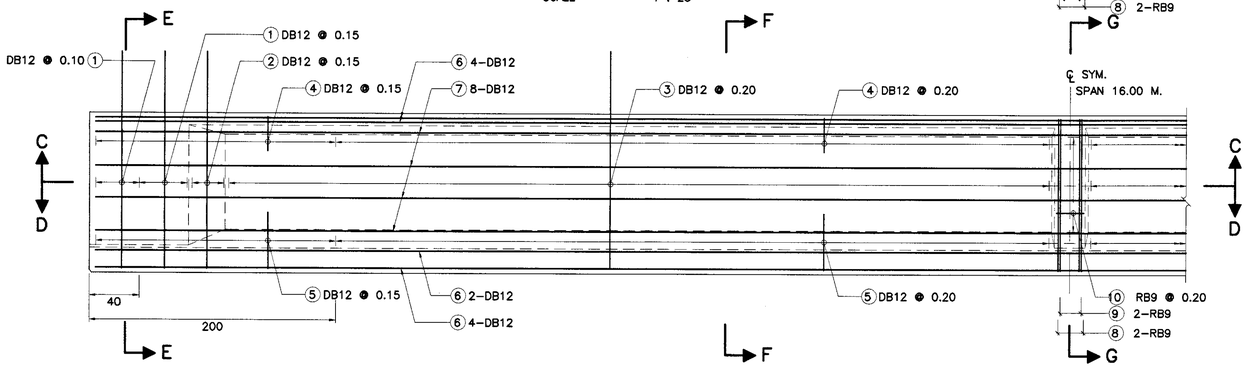
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ ---- DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-16F/01 TO NP1-16F/05



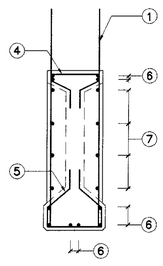
SECTION C – C
SCALE 1 : 25



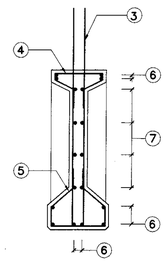
EXTRA REINFORCEMENT AT THE END (SKEW GIRDER)
SCALE 1 : 25



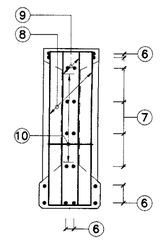
ELEVATION OF REINFORCEMENT
SCALE 1 : 25



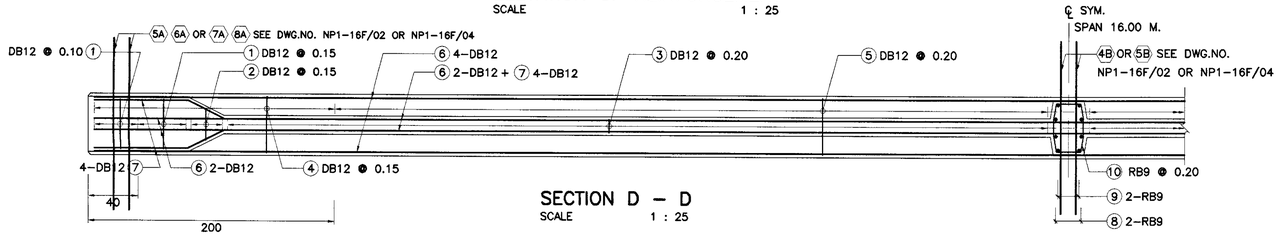
SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

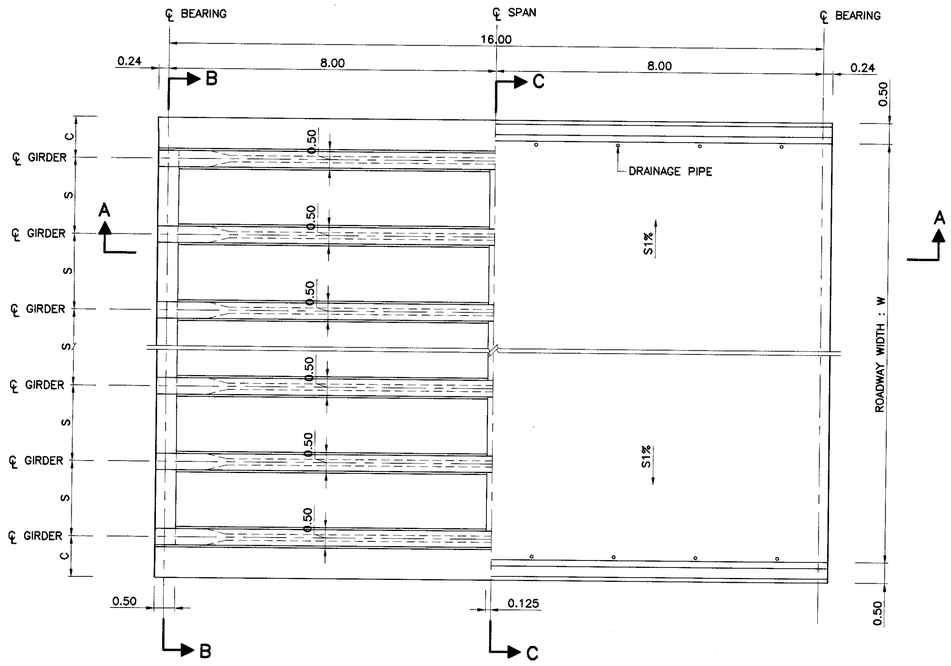
I-GIRDER 16.00 M. (FULL JOINT)

GIRDER PRESTRESSING & REINFORCEMENT

REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
APPROVED : (FOR DIRECTOR GENERAL)
DATE : OCT 2015
SCALE : AS SHOWN
DWG NO. NP1-16F/06
SHEET NO. 17

D:\std dwg 2015\NP1-16F-06(REV00)

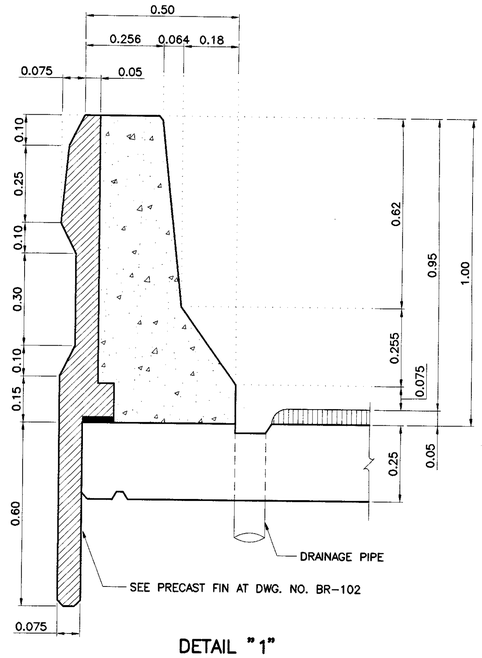


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

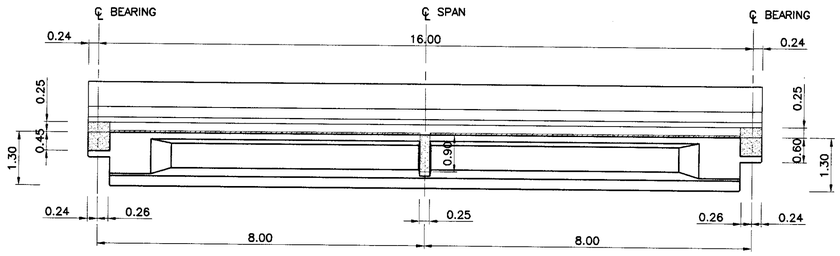
DECK PLAN FOR GIRDER SPAN LENGTH 16.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

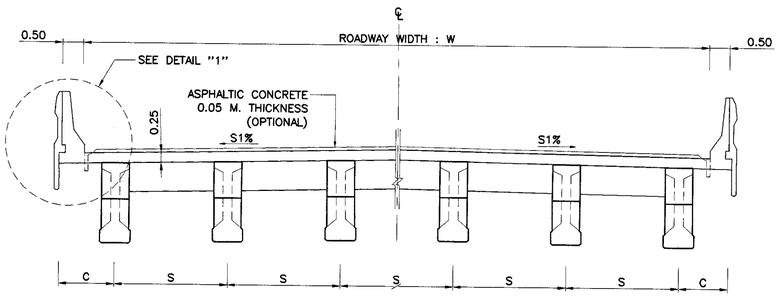
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	5 @ 1.86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX.)	1.00

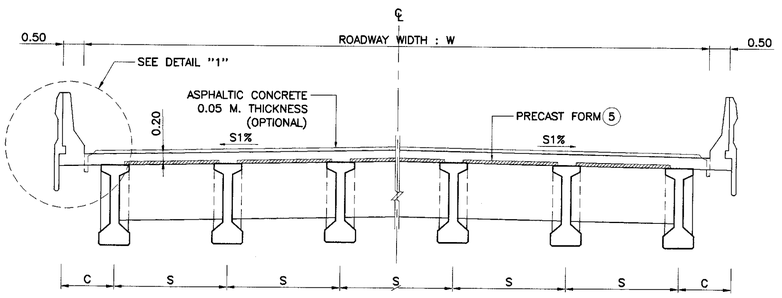
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-16H/02 TO NP1-16H/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS. 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

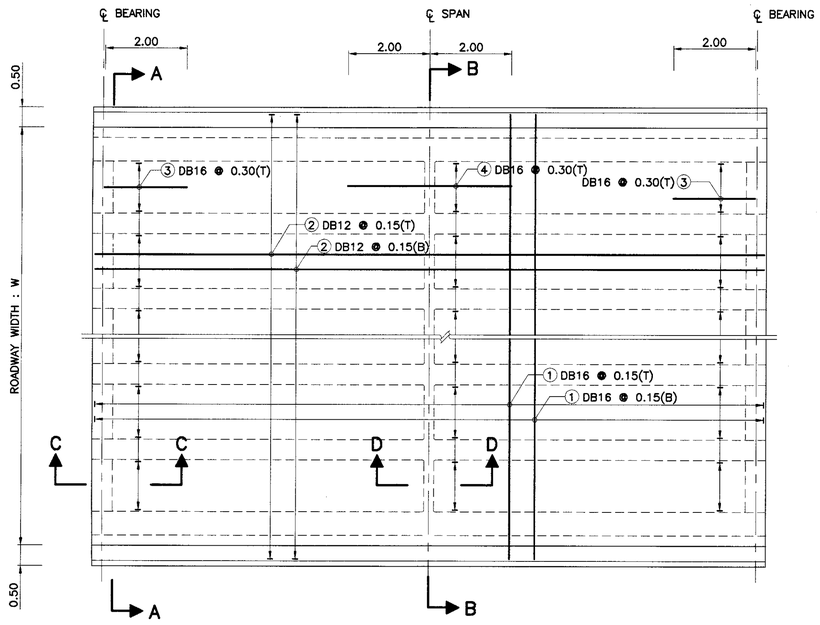
STANDARD DRAWING

I-GIRDER 16.00 M. (HALF JOINT)

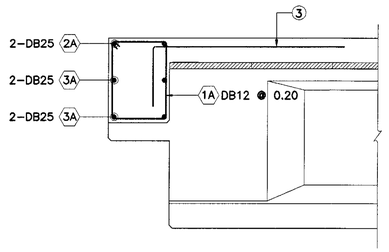
BRIDGE DECK DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1-16H/01
		SHEET NO. 18

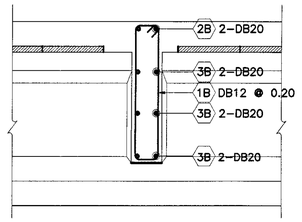
D:\std dwg 2015\NP1-16H-01(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

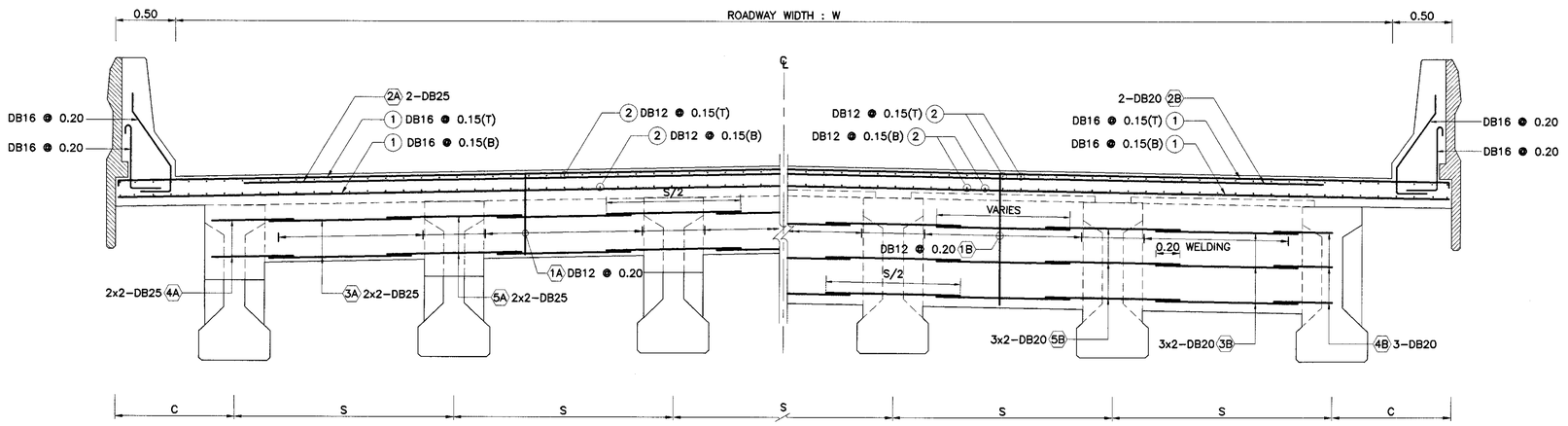
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44 / 0.54 / 1A — W+1.00–2C (2A)
2A	DB25	
3A	DB25	S/2+0.40 (3A)
4A	DB25	S/4+0.10 / 4A — S/2 (5A)
5A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.09 / 1B — W+1.00–2C (2B)
2B	DB20	
3B	DB20	S/2+0.40 (3B)
4B	DB20	S/4+0.10 / 0.19 / 4B — S/2 (5B)
5B	DB20	

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70 ①
②	DB12	16.40 ②
③	DB16	2.00 / ③ / 0.50 — 4.00 / ④
④	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–16H/01 AND NP1–16H/03 TO NP1–16H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

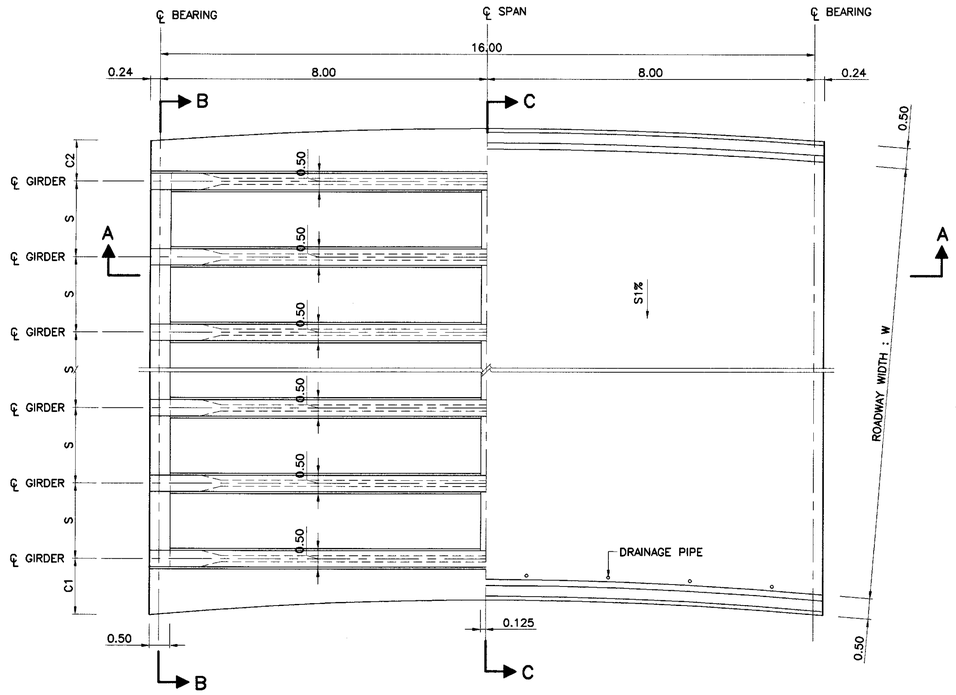
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 16.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1–16H/02
		SHEET NO. 19

D:\std dwg 2015\NP1-16H-02(REV00)



HALF PLAN (BOTTOM ; B)

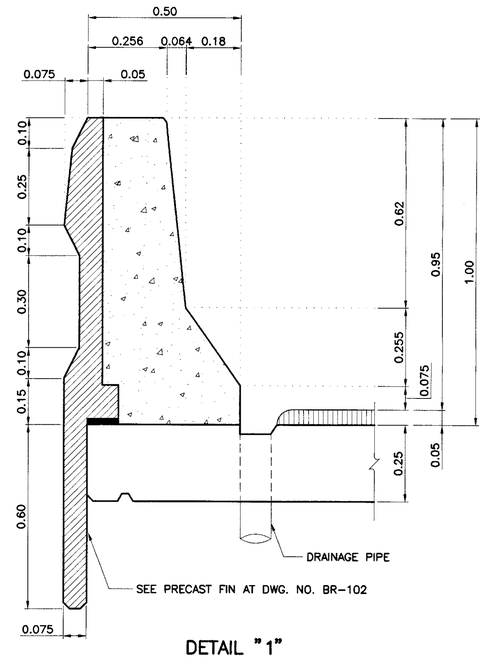
HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 16.00 M.

SCALE 1 : 75

SECTION A – A

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-16H/01 , NP1-16H/02 AND NP1-16/04 TO NP1-16H/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.

(5) PRECAST FORM SHALL BE AS FOLLOWS:

5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2

5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)

5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.

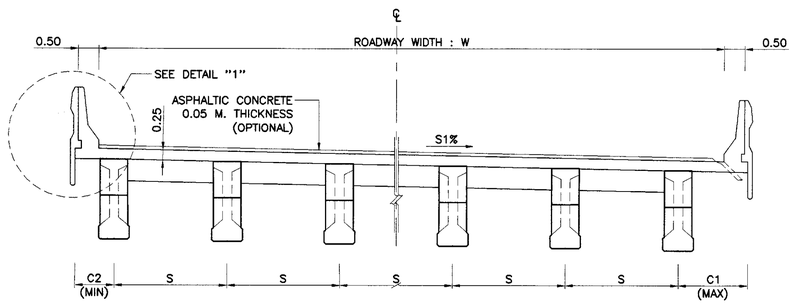
5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN

5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.

5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.

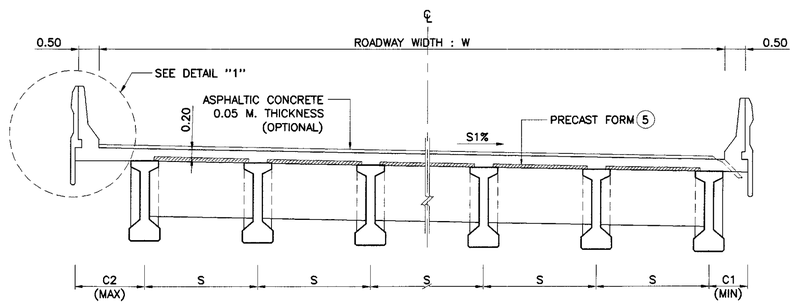
5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.

5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

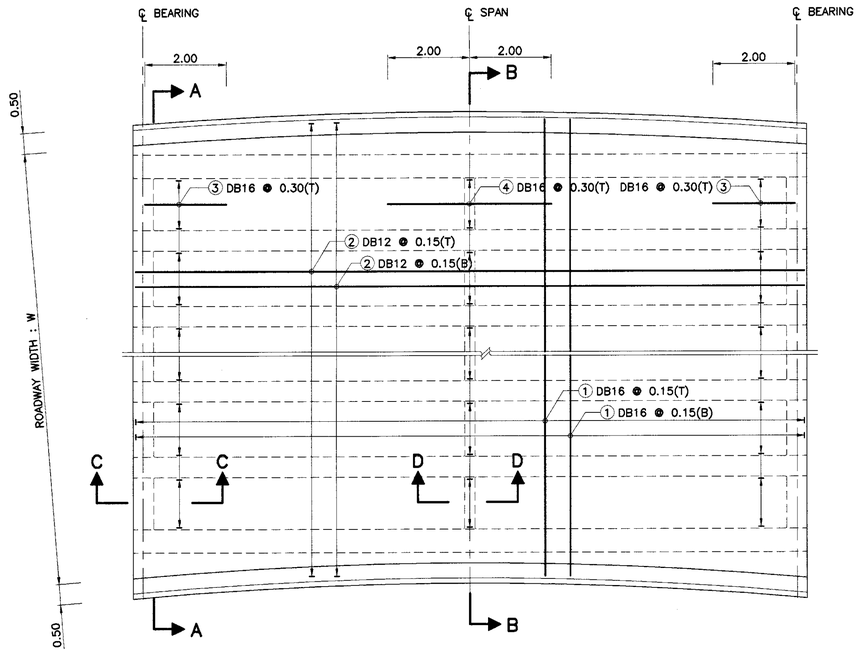
STANDARD DRAWING

I-GIRDER 16.00 M. (HALF JOINT)

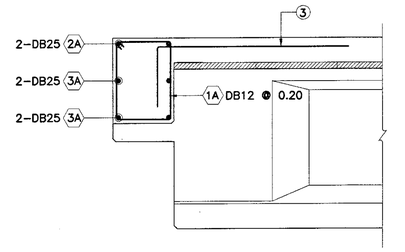
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1-16H/03
		SHEET NO. 20

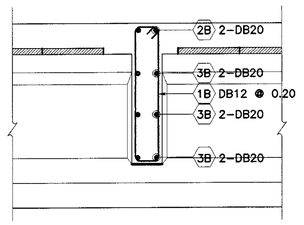
D:\std dwg 2015\NP1-16H-03(REV00)



PLAN OF REINFORCEMENT SLAB AND RAILING
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

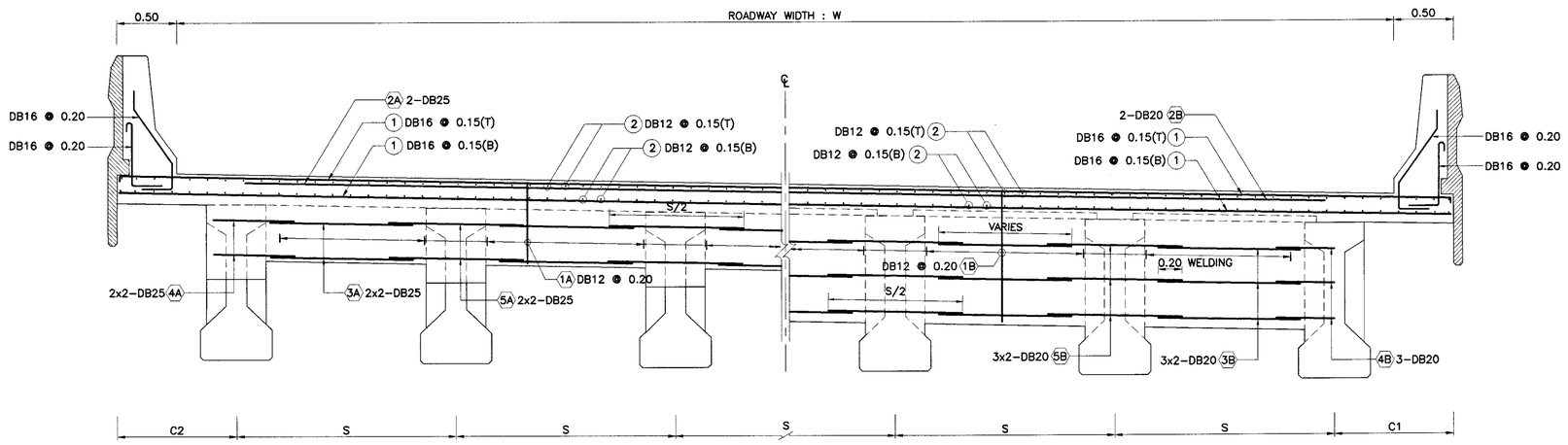
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.54, 1A
2A	DB25	W+1.00–C1–C2, 2A
3A	DB25	S/2+0.40, 3A
4A	DB25	S/4+0.10, 4A
5A	DB25	S/2, 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–C1–C2, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/4+0.10, 0.19, 4B
5B	DB20	S/2, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70, ①
②	DB12	16.40, ②
③	DB16	2.00, 0.50, ③
④	DB16	4.00, ④



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDEDY IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–16H/01 TO NP1–16H/03 AND NP1–16H/05, NP1–16H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 16.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

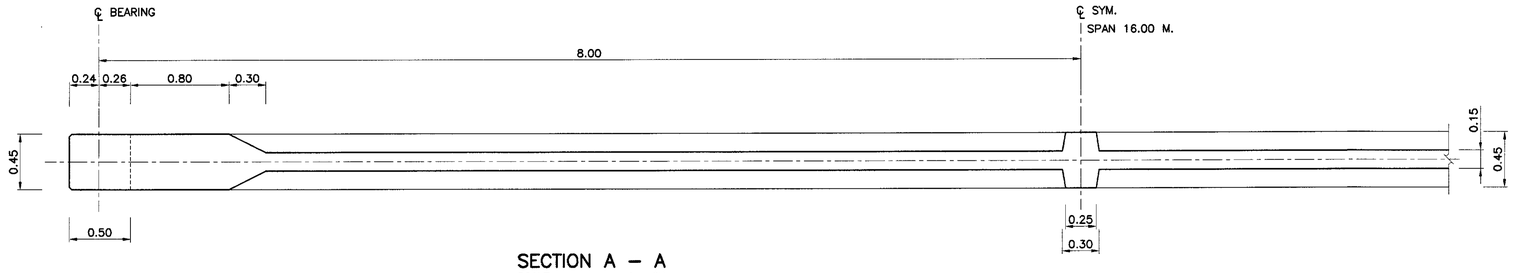
DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

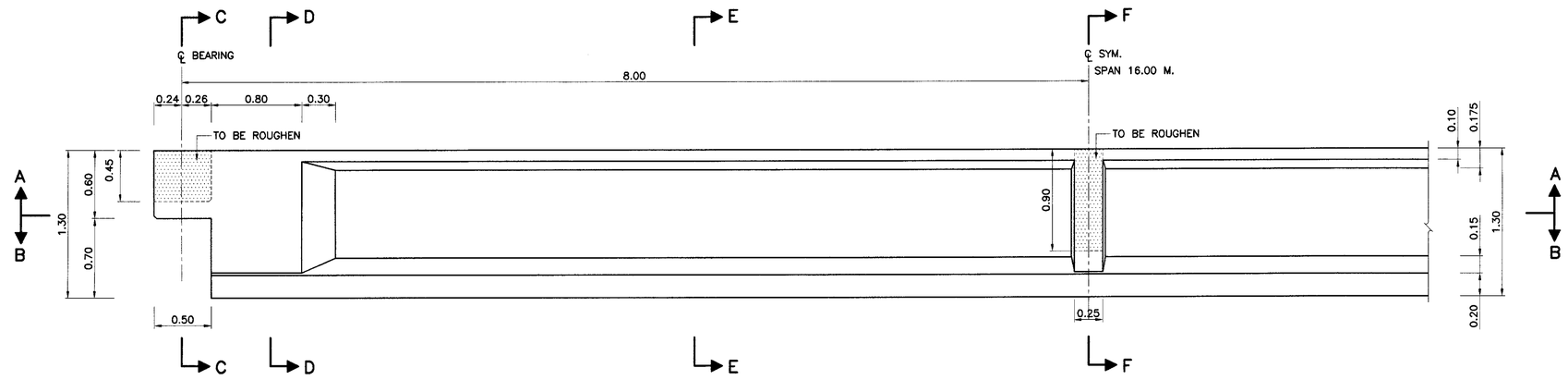
APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. NP1–16H/04

SHEET NO. 21

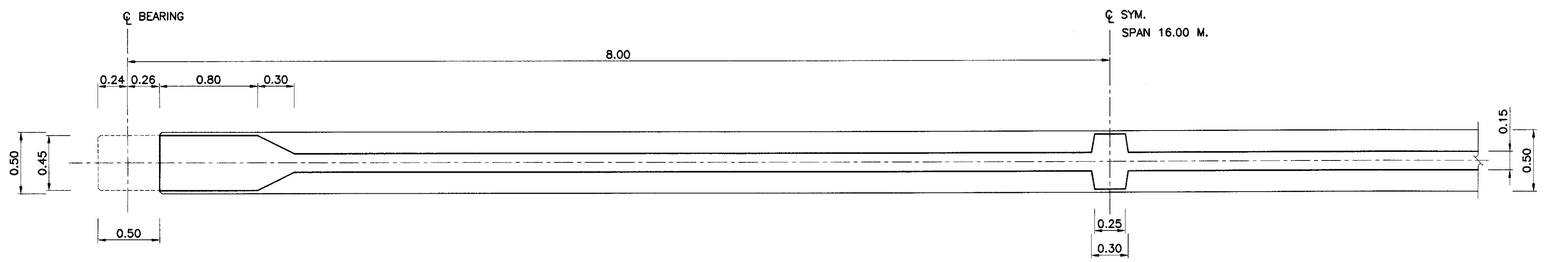
D:\std dwg 2015\NP1-16H-04(REV00)



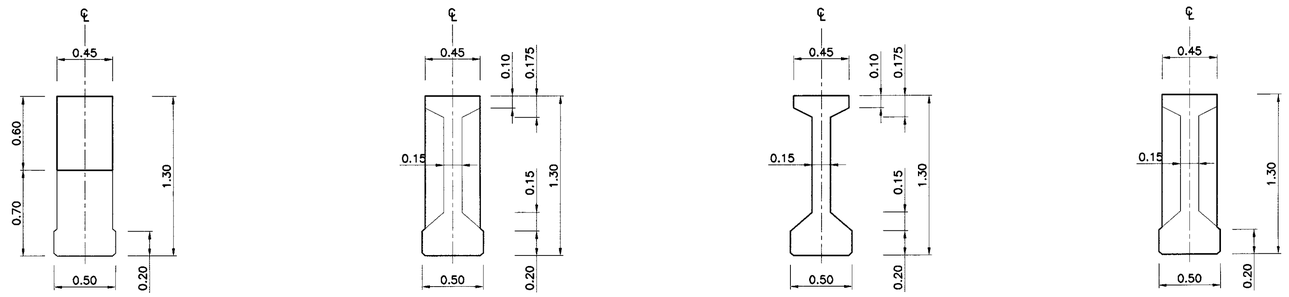
SECTION A – A
SCALE 1 : 25



ELEVATION OF GIRDER SPAN LENGTH 16.00 M.
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

SECTION F – F
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. CONCRETE FOR PRECAST I-GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-16H/01 TO NP1-16H/04 AND NP1-16H/06

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

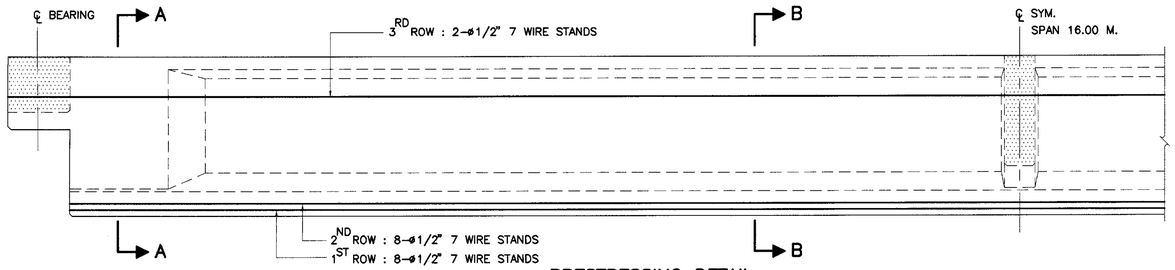
STANDARD DRAWING

I-GIRDER 16.00 M. (HALF JOINT)
GIRDER DIMENSION

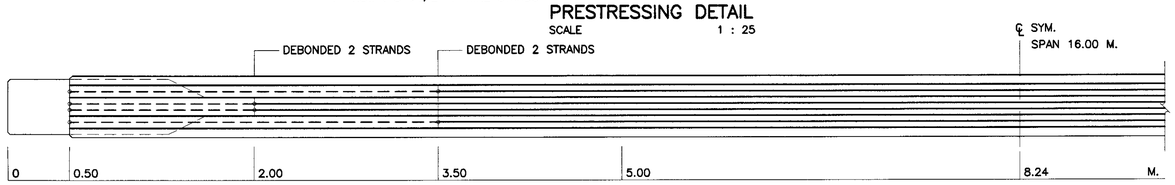
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. NP1-16H/05
SHEET NO. 22

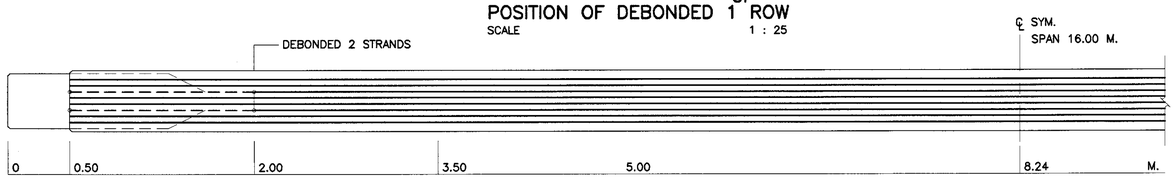
D:\std dwg 2015\NP1-16H-05(REV00)



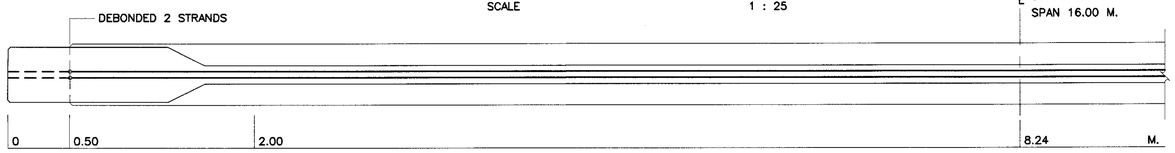
PRESTRESSING DETAIL
SCALE 1 : 25



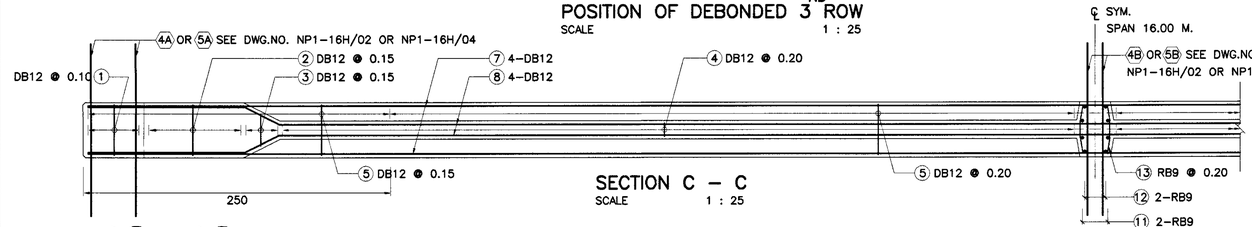
POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25



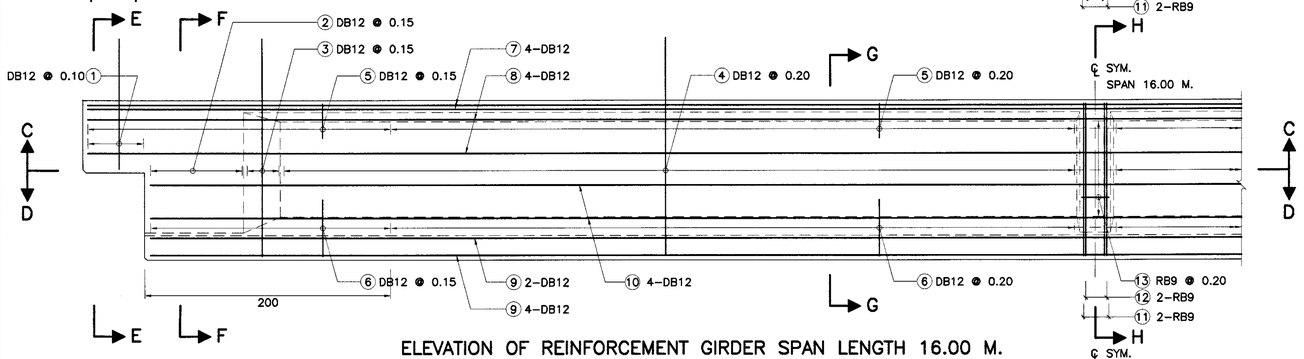
POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25



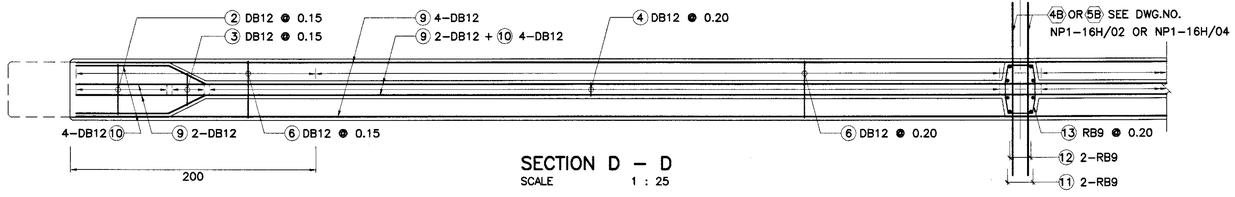
POSITION OF DEBONDED 3RD ROW
SCALE 1 : 25



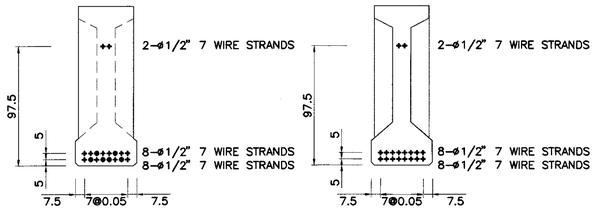
SECTION C – C
SCALE 1 : 25



ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 16.00 M.
SCALE 1 : 25

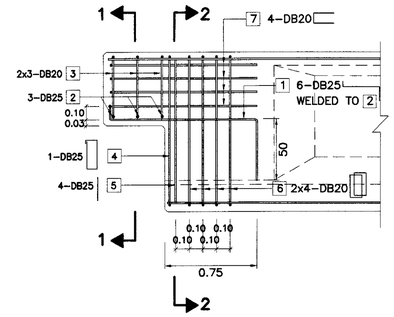


SECTION D – D
SCALE 1 : 25

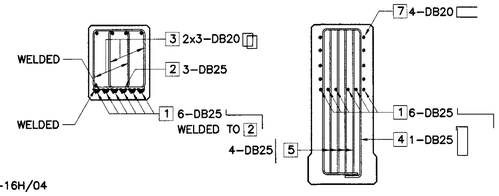


SECTION A – A
SCALE 1 : 25

SECTION B – B
SCALE 1 : 25



DAPPED END REINFORCEMENT
SCALE 1 : 25

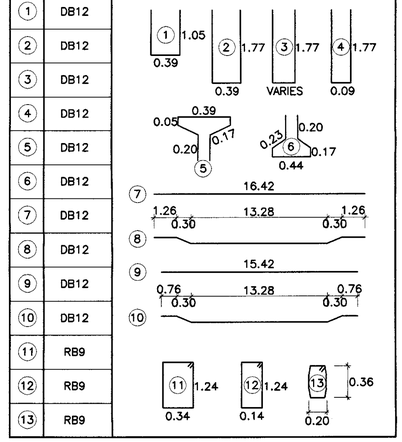


SECTION 1 – 1
SCALE 1 : 25

SECTION 2 – 2
SCALE 1 : 25

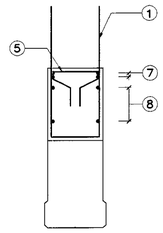
TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

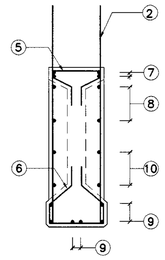


NOTE :

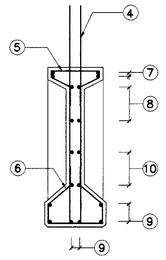
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ ---- DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-16H/01 TO NP1-16H/05



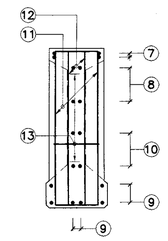
SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



SECTION H – H
SCALE 1 : 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

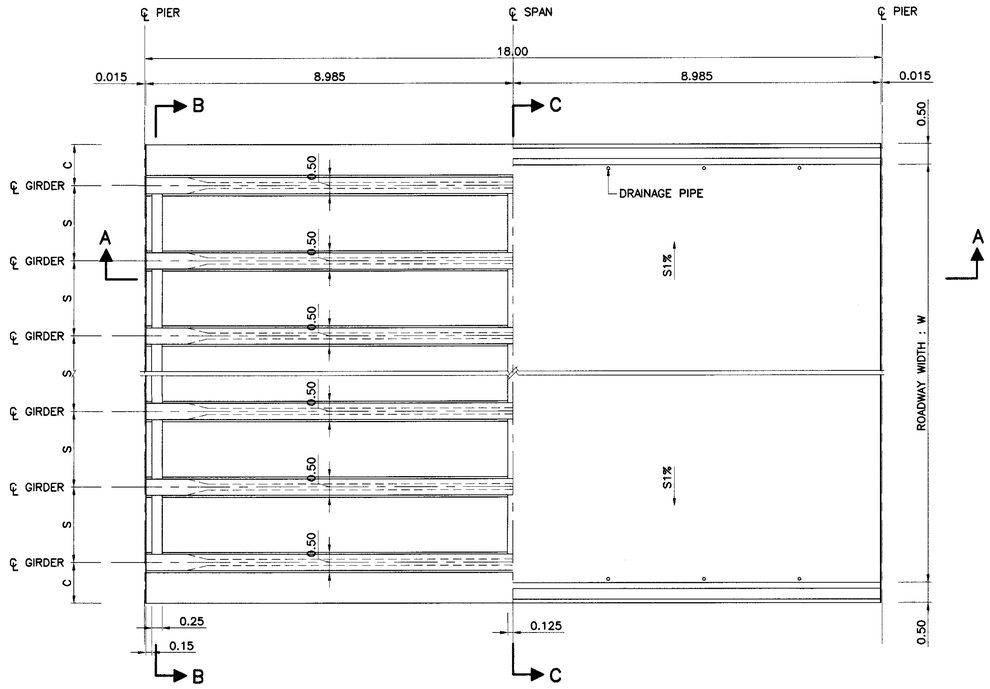
I-GIRDER 16.00 M. (HALF JOINT)

GIRDER PRESTRESSING & REINFORCEMENT

REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO.NP1-16H/06
SHEET NO. 23

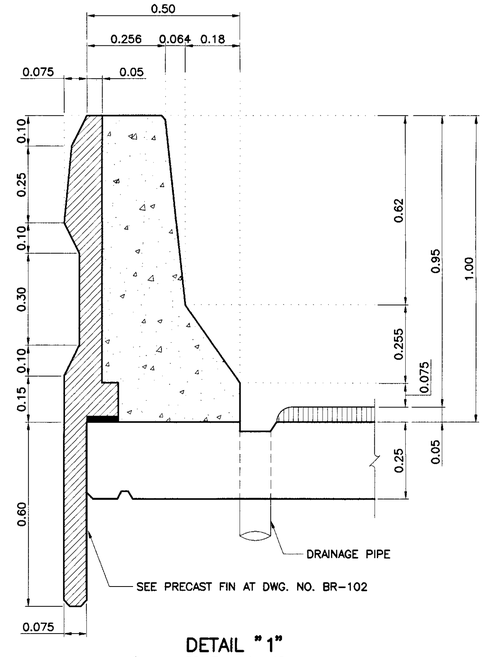
D:\std dwg 2015\NP1-16H-06(REV00)



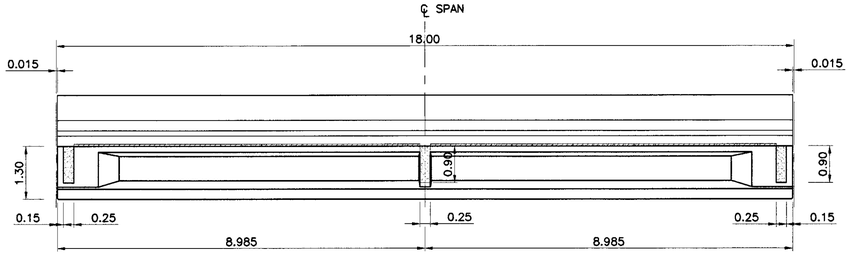
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 18.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



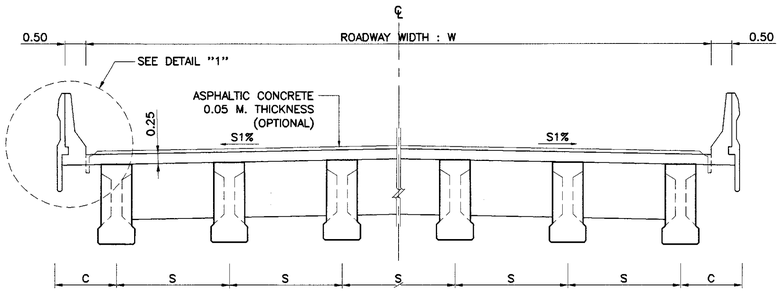
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

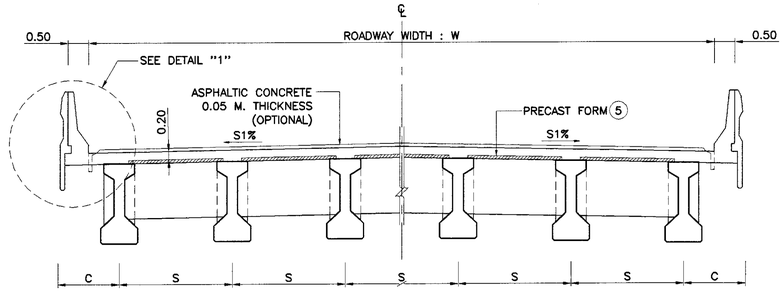
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	1 @ 1.92 6 @ 1.93	1.00
VARIES	n	2.00 (MAX.)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-18F/02 TO NP1-18F/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

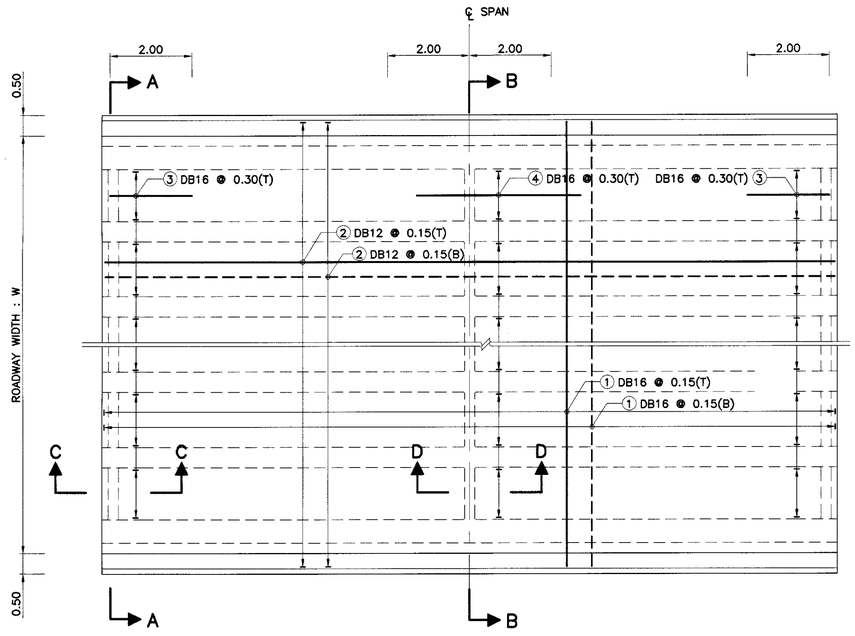
STANDARD DRAWING

I-GIRDER 18.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION

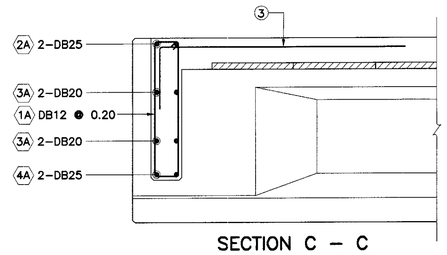
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO.NP1-18F/01
SHEET NO. 24

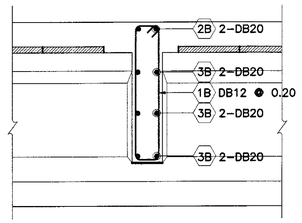
D:\std dwg 2015\NP-G18F_01(REV00)



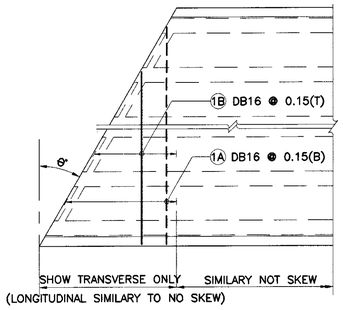
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

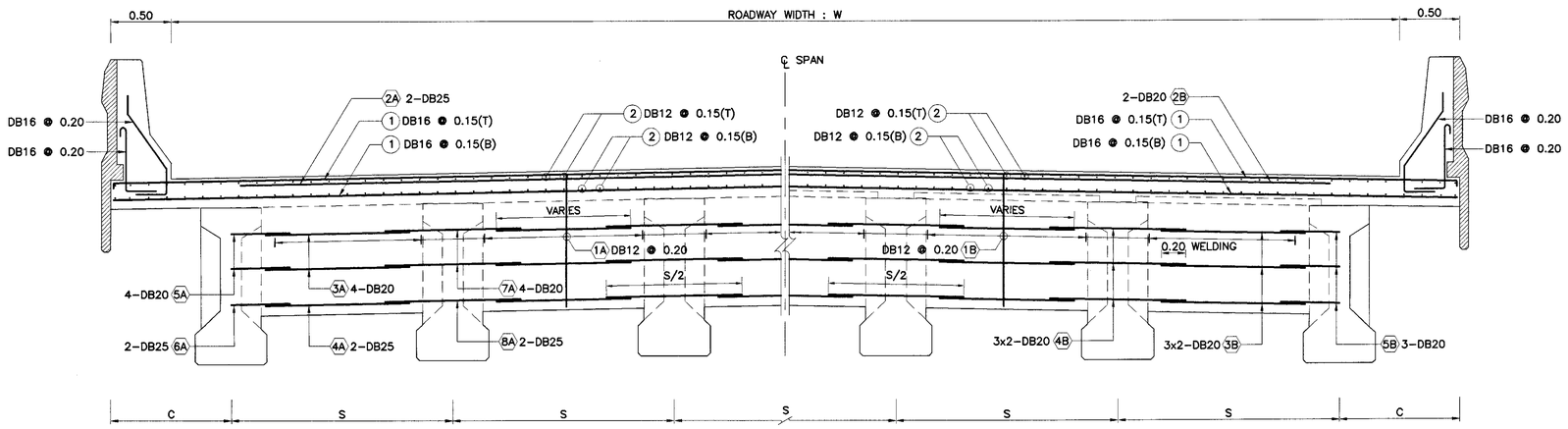
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19, 1.09, 1A
2A	DB25	W+1.00–2C, 2A
3A	DB20	S/2+0.40, 3A
4A	DB25	S/2+0.40, 4A
5A	DB20	S/4+0.10, 0.19, 5A
6A	DB25	S/4+0.10, 6A
7A	DB20	S/2, 7A, 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–2C, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/2, 4B
5B	DB20	S/4+0.10, 0.19, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70, ①
②	DB12	17.91, ②
③	DB16	2.00, 0.50, 4.00, ③, ④
④	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–18F/01 AND NP1–18F/03 TO NP1–18F/06 , NP1–18F/06

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

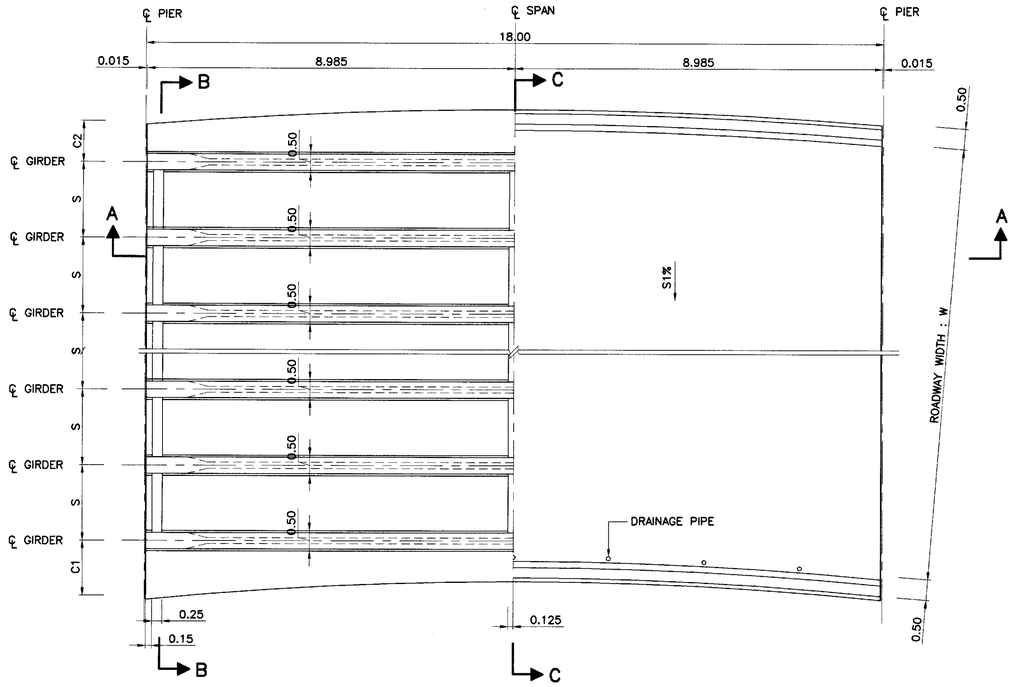
STANDARD DRAWING

I–GIRDER 18.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–18F/02
		SHEET NO. 25

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\NP-G18F-02(REV00)

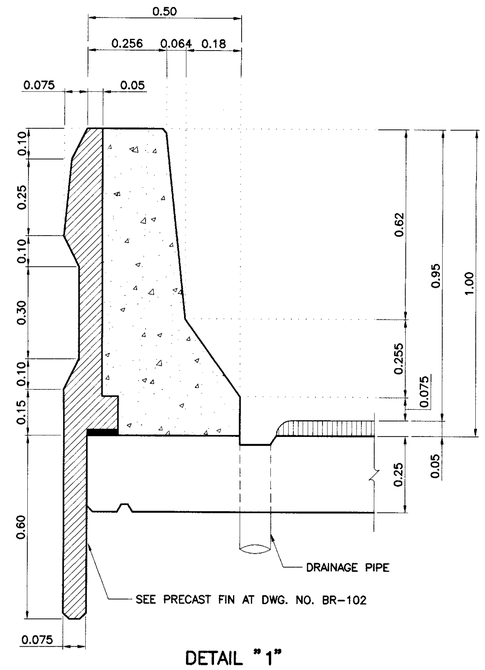


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

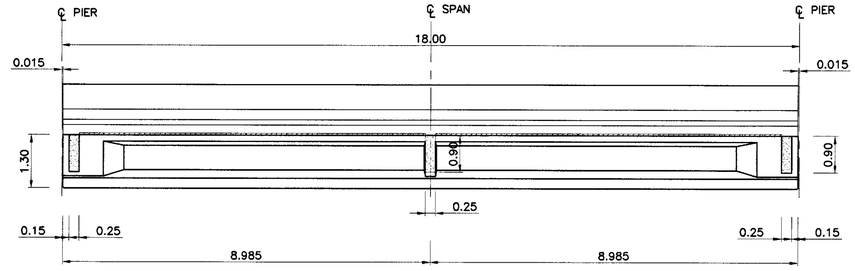
DECK PLAN FOR GIRDER SPAN LENGTH 18.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

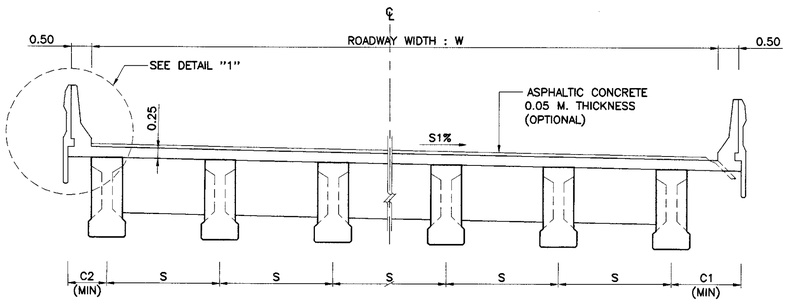
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

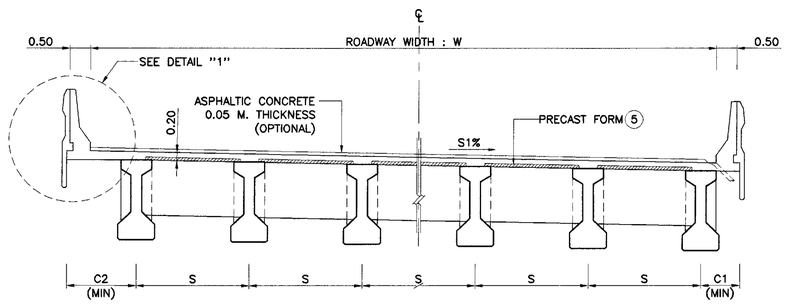
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-18F/01 , NP1-18F/02 AND NP1-18F/04 TO NP1-18/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

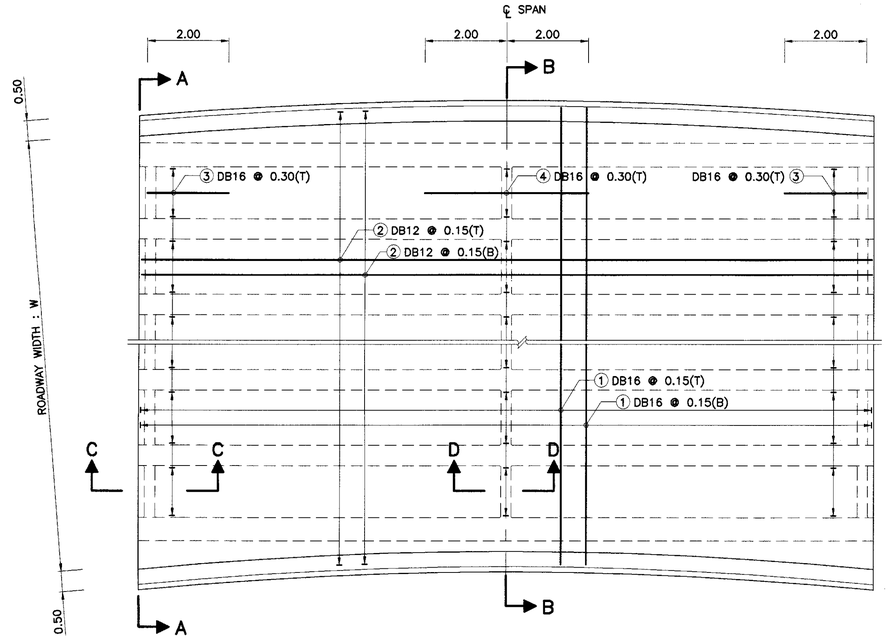
I-GIRDER 18.00 M. (FULL JOINT)

BRIDGE DECK DIMENSION (FOR CURVE)

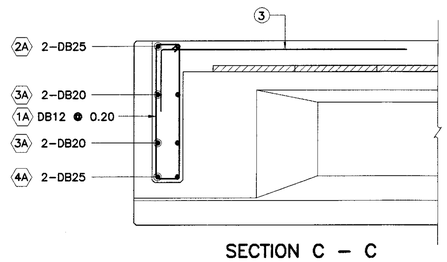
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. NP1-18F/03
			SHEET NO. 26

REF.	REVISION	SIGNATURE	DATE

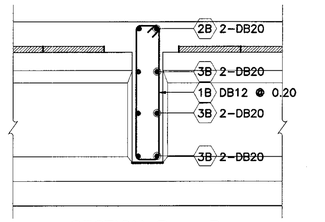
D:\std dwg 2015\NP-018F-03(REV00)



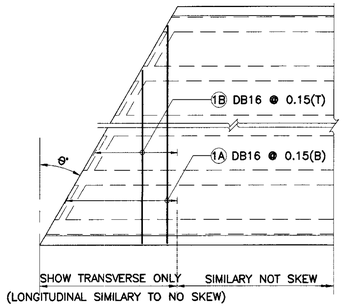
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

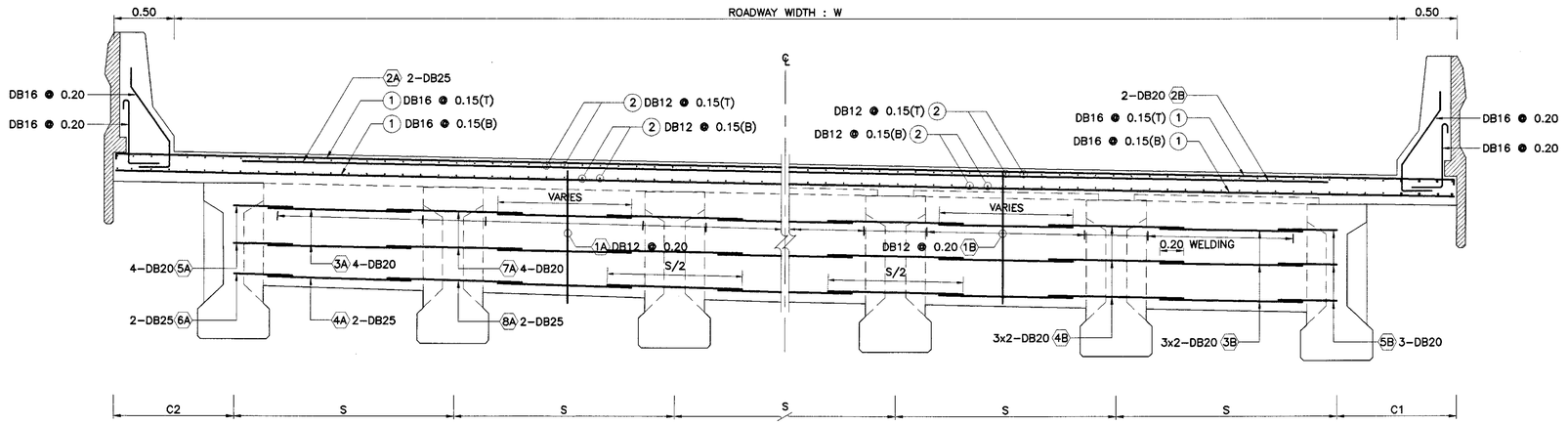
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19, 1.09, 1A
2A	DB25	W+1.00–C1–C2
3A	DB20	S/2+0.40
4A	DB25	S/2+0.40
5A	DB20	S/4+0.10, 0.19
6A	DB25	S/4+0.10
7A	DB20	S/2
8A	DB25	7A, 8A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–C1–C2
3B	DB20	S/2+0.40
4B	DB20	S/2
5B	DB20	S/4+0.10, 0.19

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70
2	DB12	15.91
3	DB16	2.00, 0.50
4	DB16	4.00



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–18F/01 TO NP1–18F/03 AND NP1–18F/05 , NP1–18F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

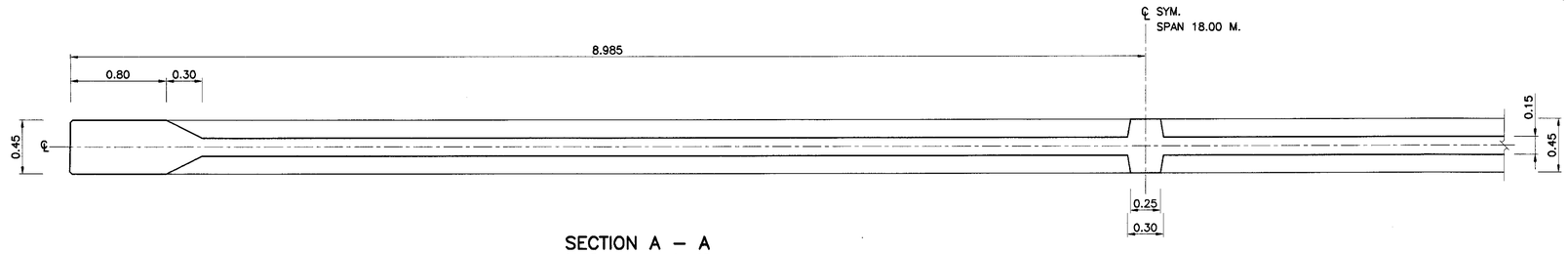
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

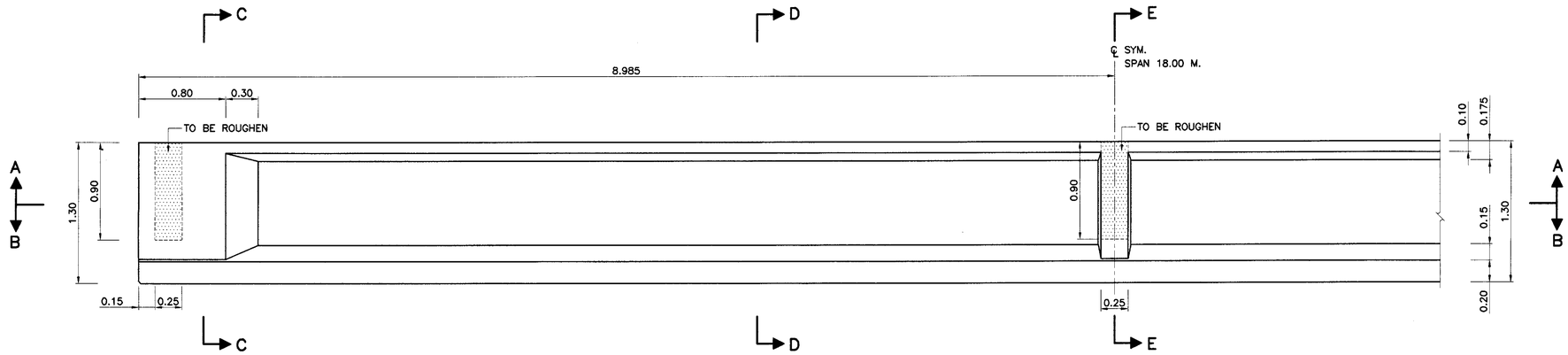
I–GIRDER 18.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–18F/04
		SHEET NO. 27

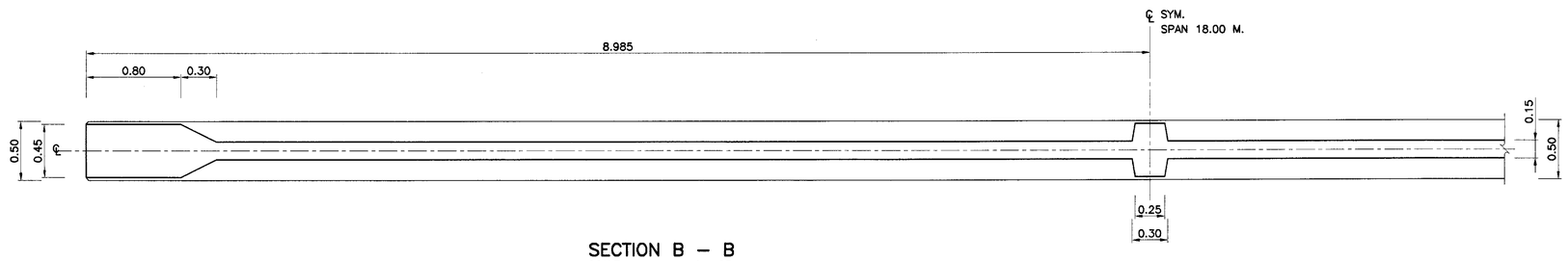
D:\std dwg 2015\NP-G18F-04(REV00)



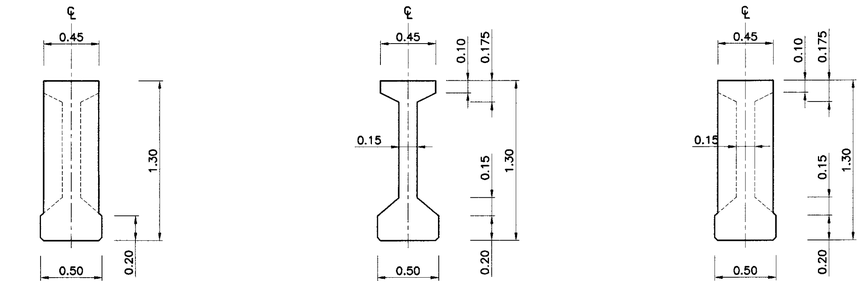
SECTION A – A
SCALE 1 : 25



ELEVATION OF GIRDER SPAN LENGTH 18.00 M.
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR PRECAST I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1–18F/01 TO NP1–18F/04 AND NP1–18F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

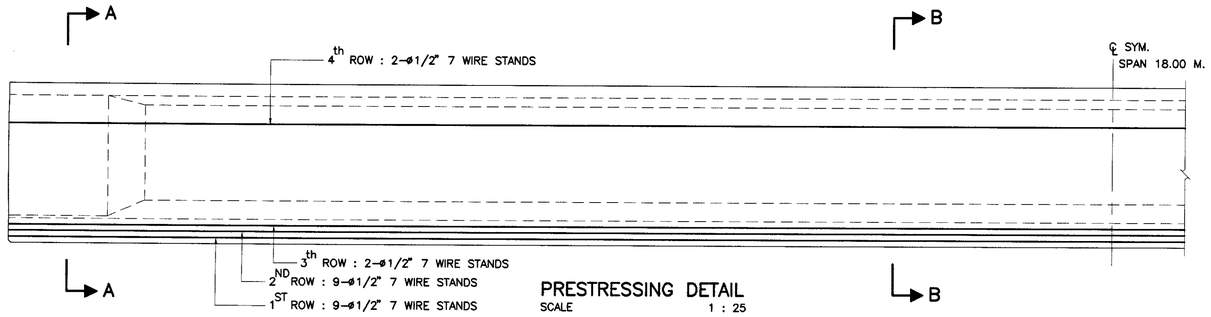
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

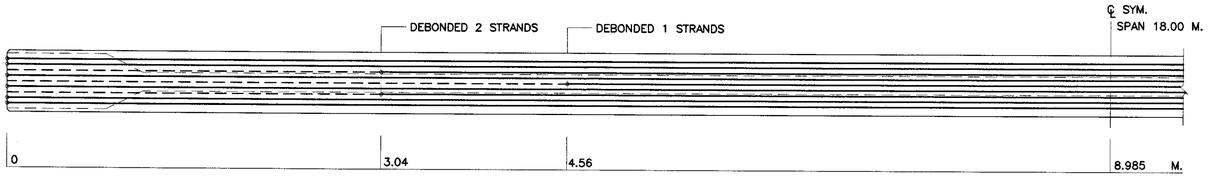
I–GIRDER 18.00 M. (FULL JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–18F/05
		SHEET NO. 28

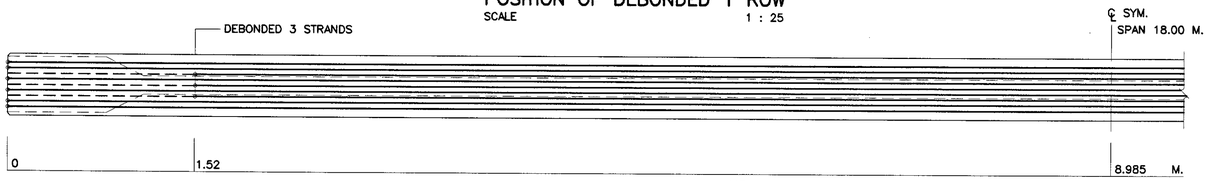
D:\std dwg 2015\NP-018F-05(REV00)



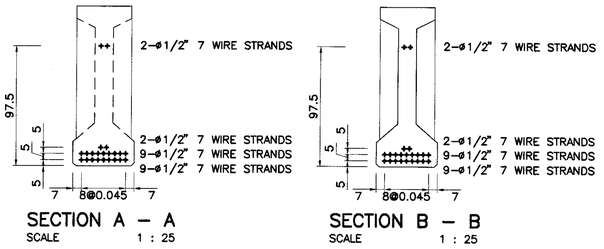
PRESTRESSING DETAIL
SCALE 1 : 25



POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25

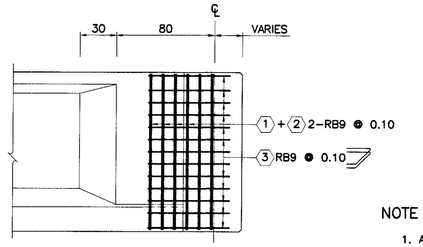


POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25

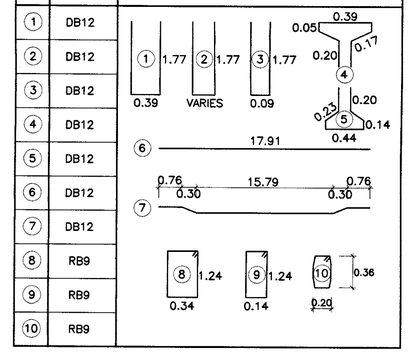
SECTION B – B
SCALE 1 : 25



SECTION 1 – 1
SCALE 1 : 25

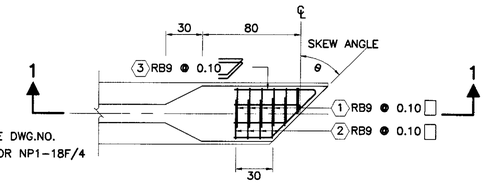
TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	RB9	
9	RB9	
10	RB9	

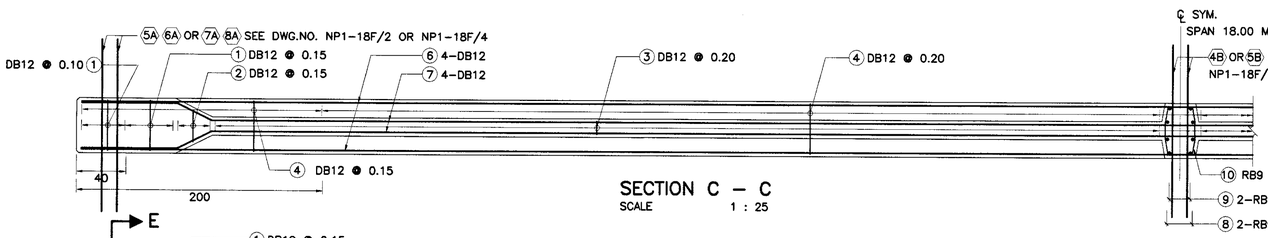


NOTE :

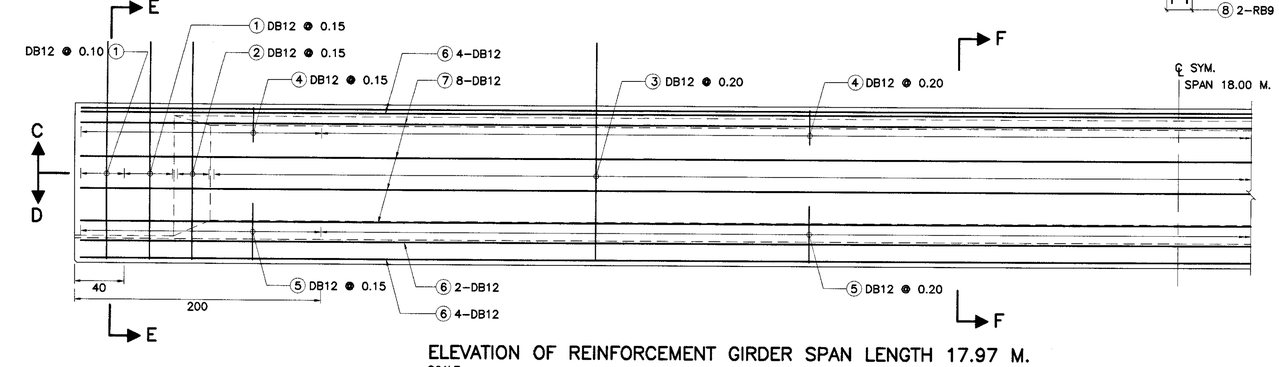
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ - - - - DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-18F/01 TO NP1-18F/05



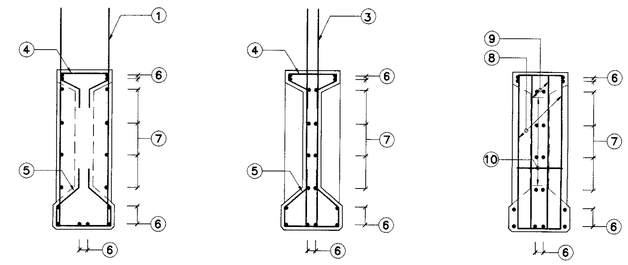
EXTRA REINFORCEMENT AT THE END (SKEW GIRDER)
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25



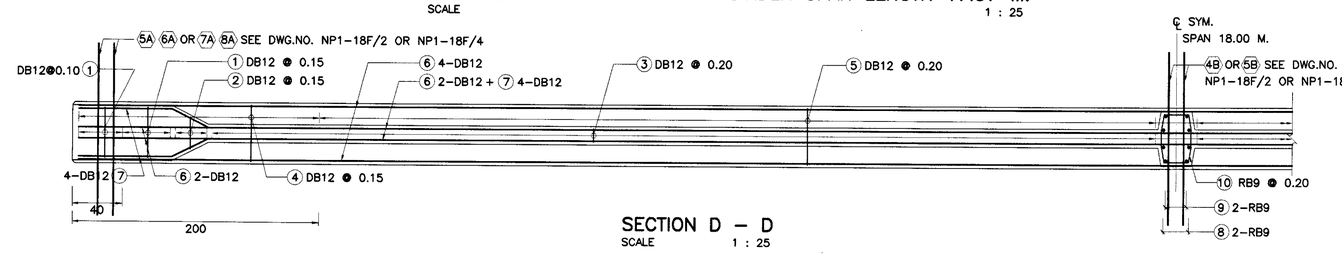
ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 17.97 M.
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25

SECTION F – F
SCALE 1 : 25

SECTION G – G
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

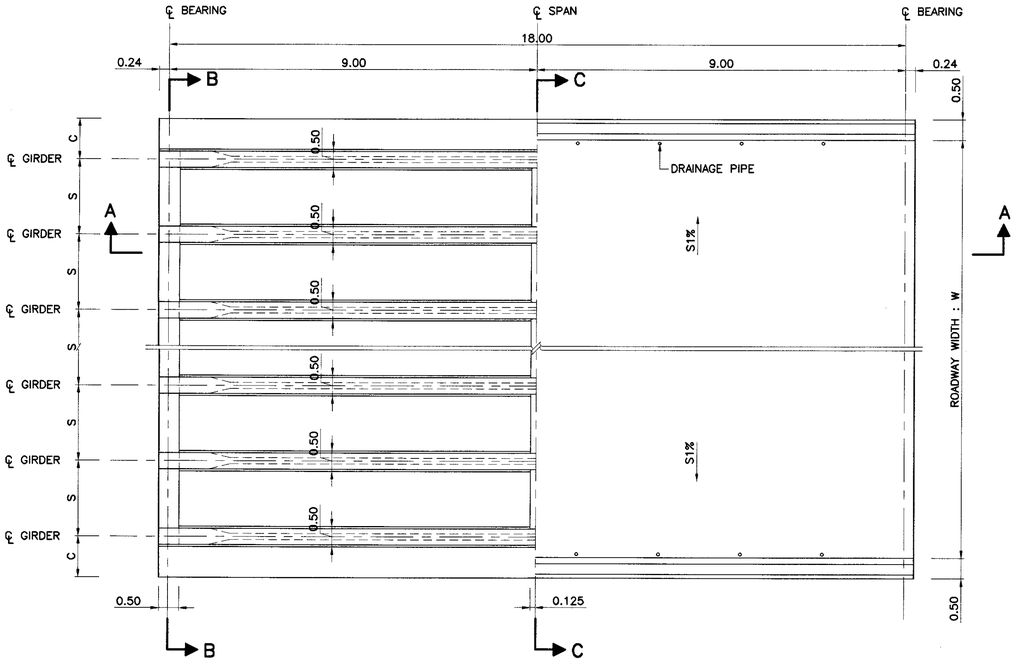
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 18.00 M. (FULL JOINT)
GIRDER PRESTRESSING & REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1-18F/06
		SHEET NO. 29

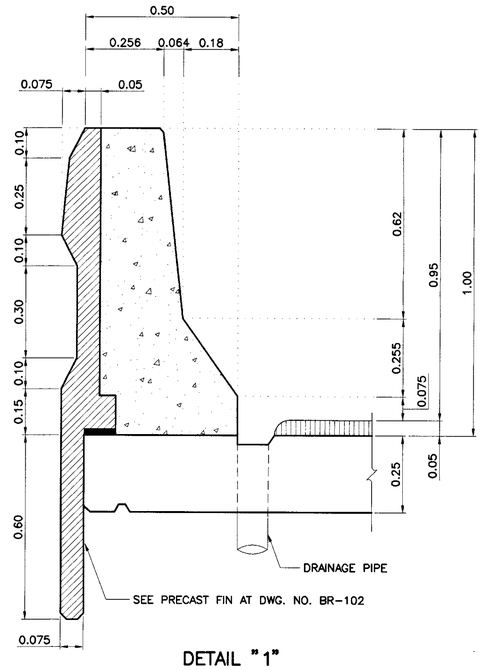
D:\std dwg 2015\NP-018F-06(REV00)



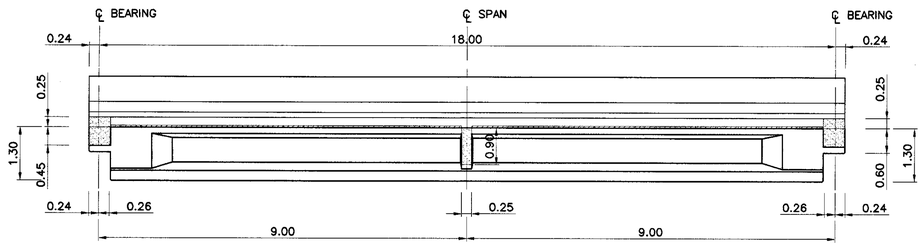
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 18.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



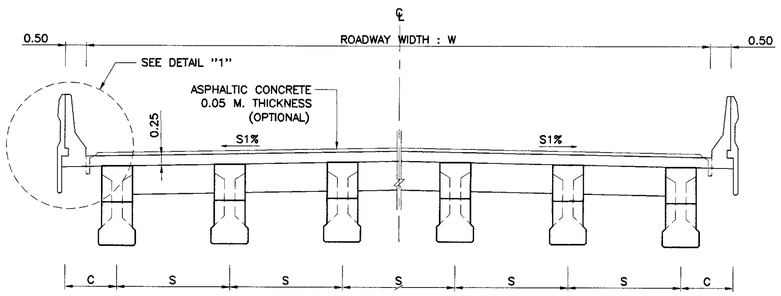
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

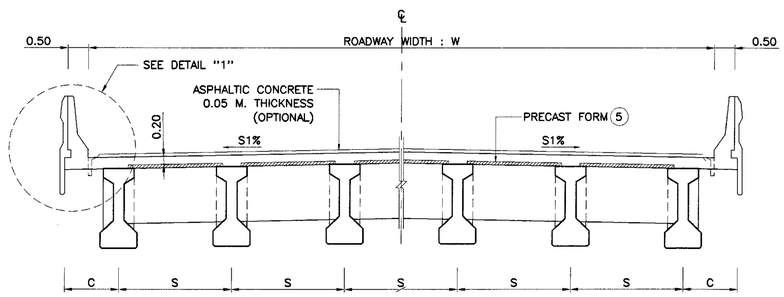
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	1 @ 1.92 6 @ 1.93	1.00
VARIES	n	2.00 (MAX.)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-18H/02 TO NP1-18H/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

KINGDOM OF THAILAND

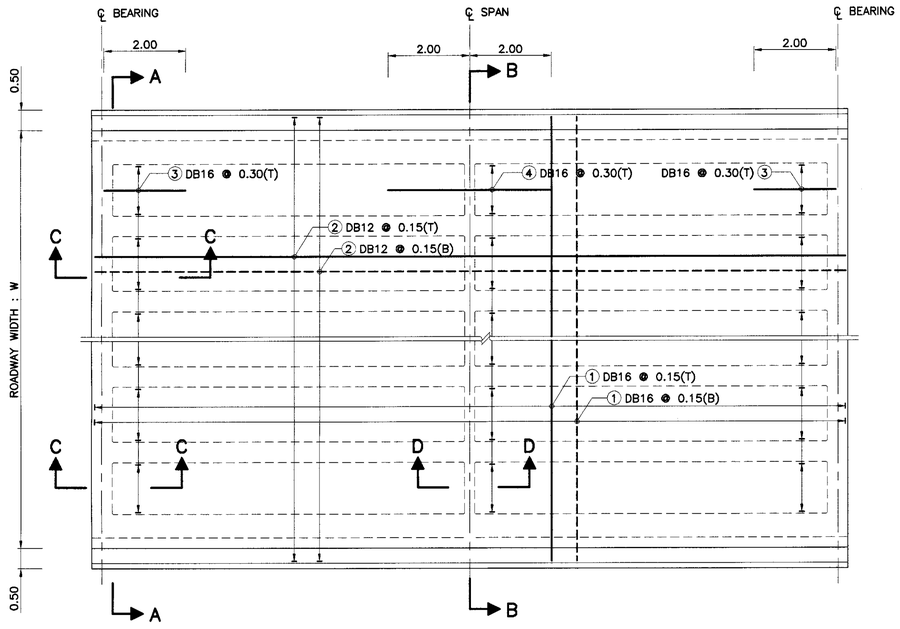
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 18.00 M. (HALF JOINT)
BRIDGE DECK DIMENSION

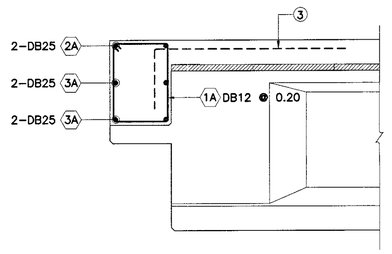
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. NP1-18H/01
SHEET NO. 30

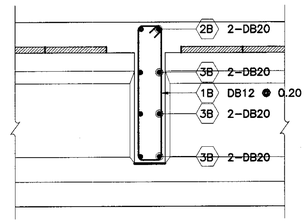
D:\std dwg 2015\NP-018H-01(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

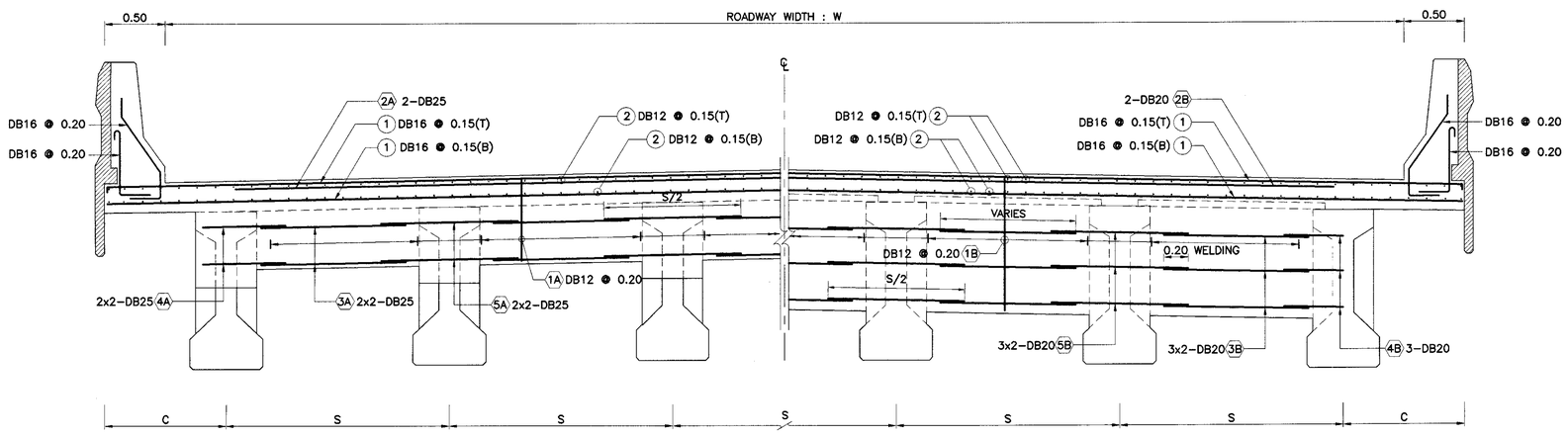
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44 / 0.54 / 1A
2A	DB25	W+1.00–2C / 2A
3A	DB25	S/2+0.40 / 3A
4A	DB25	S/4+0.10 / 4A
5A	DB25	S/2 / 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.09 / 1B
2B	DB20	W+1.00–2C / 2B
3B	DB20	S/2+0.40 / 3B
4B	DB20	S/4+0.10 / 0.19 / 4B
5B	DB20	S/2 / 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70 / 1
2	DB12	17.91 / 2
3	DB16	2.00 / 0.50 / 4.00 / 3 4
4	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B, AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–18H/01 AND NP1–18H/03 TO NP1–18H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

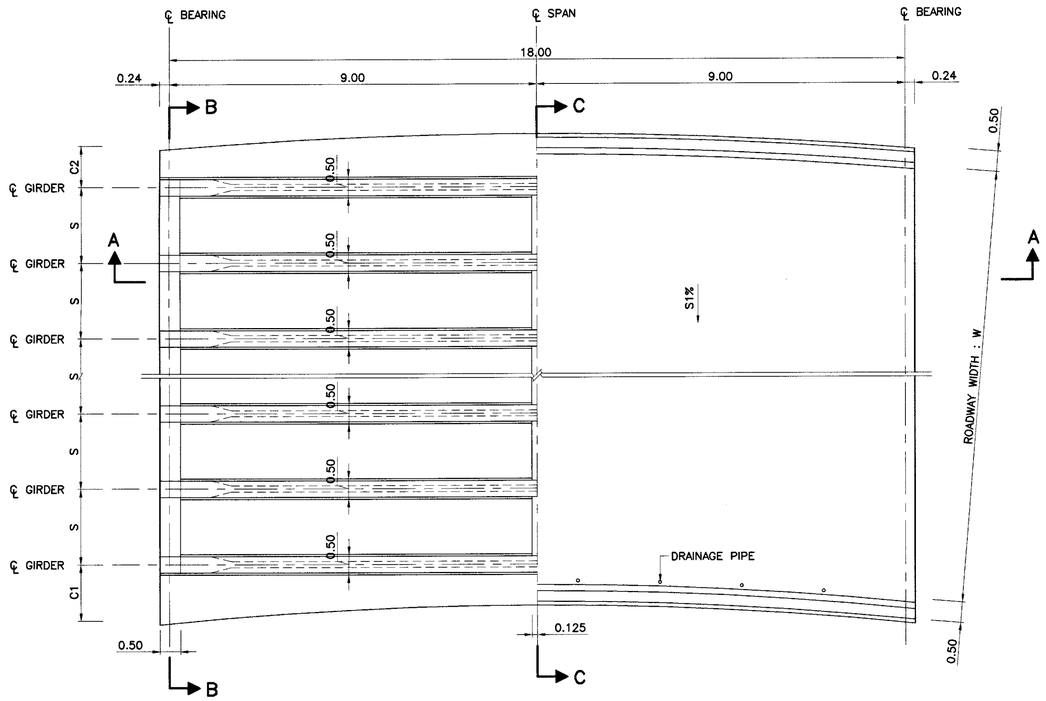
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 18.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–18H/02
		SHEET NO. 31

D:\std dwg 2015\NP-018H-02(EV00)

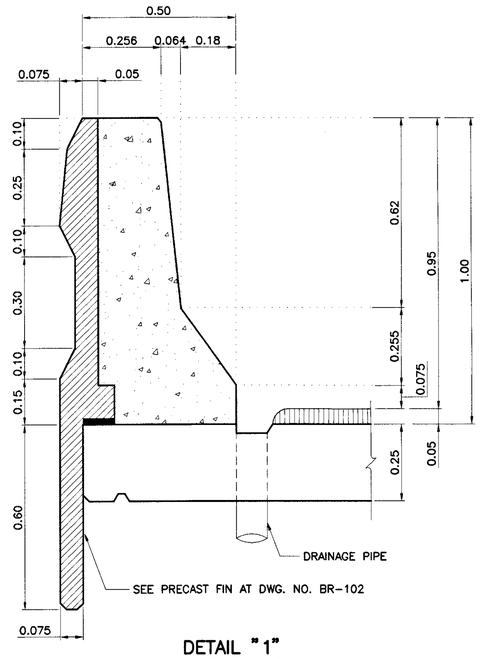


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

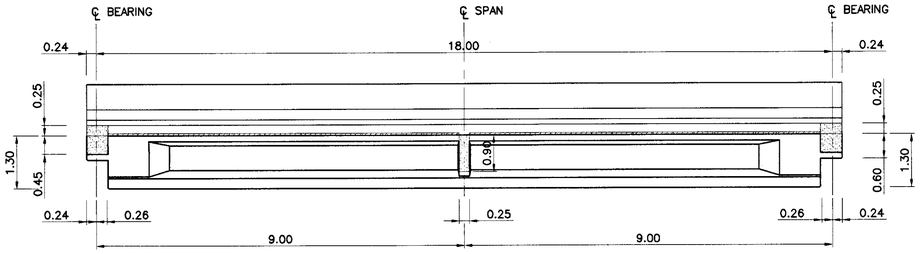
DECK PLAN FOR GIRDER SPAN LENGTH 18.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

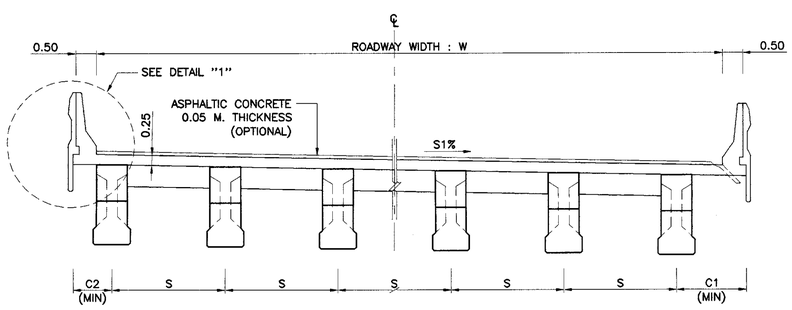
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

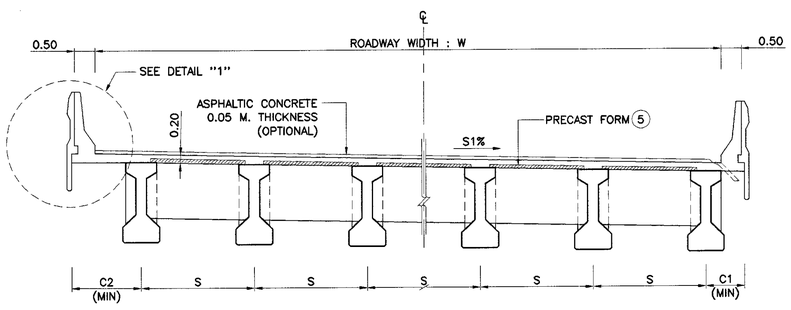
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-18H/01 , NP1-18H/02 AND NP1-18H/04 TO NP1-18H/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

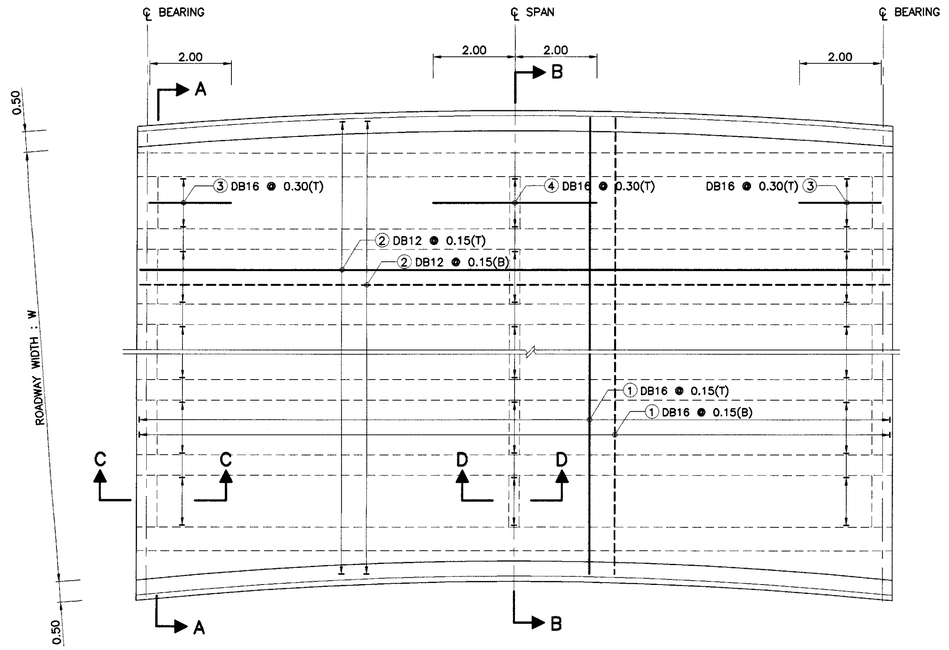
I-GIRDER 18.00 M. (HALF JOINT)

BRIDGE DECK DIMENSION (FOR CURVE)

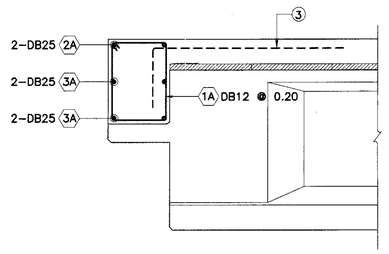
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. NP1-18H/03
			SHEET NO. 32

REF.	REVISION	SIGNATURE	DATE

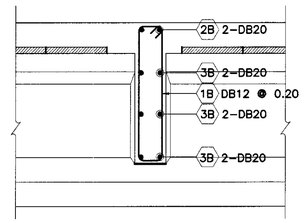
D:\std dwg 2015\NP-018H-03(REV00)



PLAN OF REINFORCEMENT SLAB AND RAILING
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

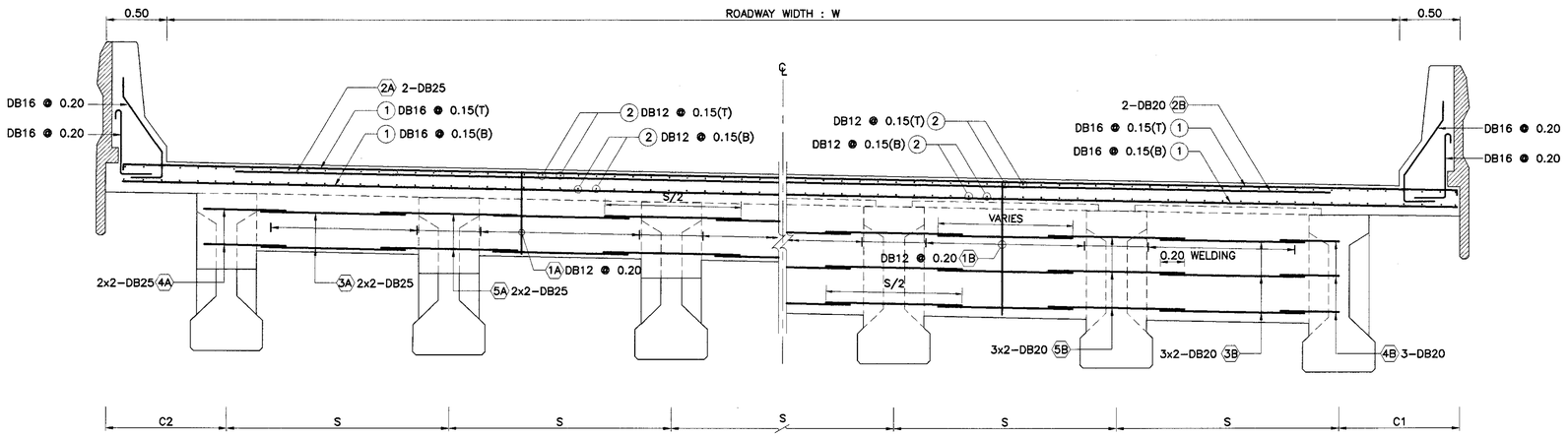
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.54, 1A, S/4+0.10, 4A; W+1.00–C1–C2 (2A); S/2+0.40 (3A); S/2 (5A)
2A	DB25	
3A	DB25	
4A	DB25	
5A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B, S/4+0.10, 0.19, 4B; W+1.00–C1–C2 (2B); S/2+0.40 (3B); S/2 (5B)
2B	DB20	
3B	DB20	
4B	DB20	
5B	DB20	

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70
2	DB12	15.91
3	DB16	2.00, 0.50, 4.00
4	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–18H/01 TO NP1–18H/03 AND NP1–18H/05, NP1–18H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

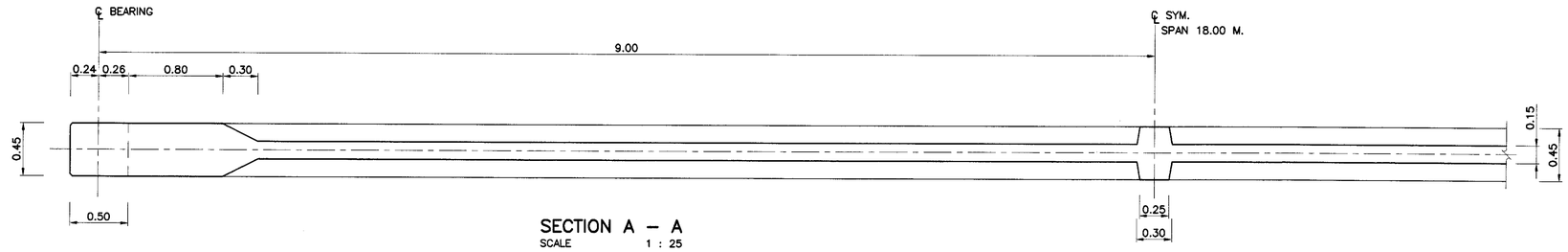
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

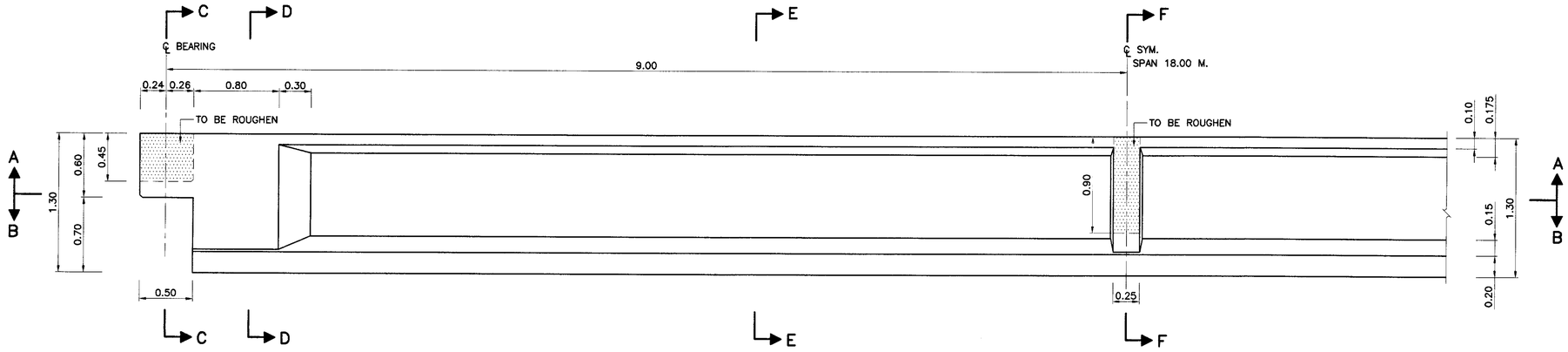
I–GIRDER 18.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–18H/04
		SHEET NO. 33

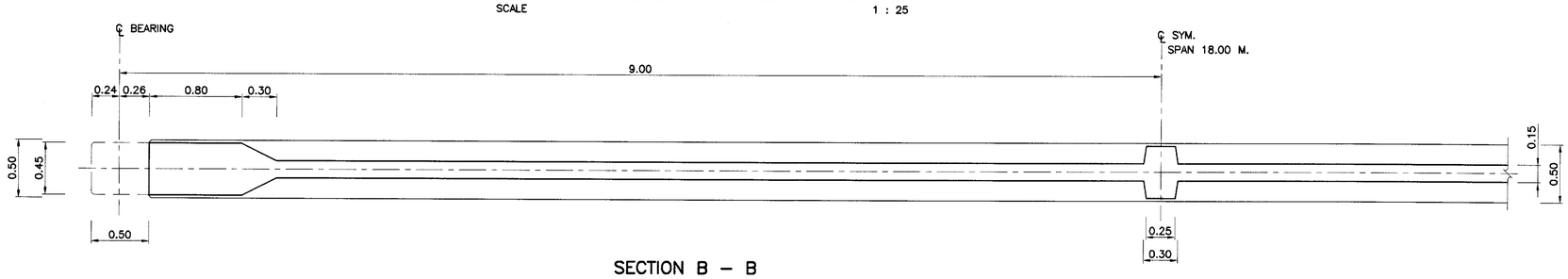
D:\std dwg 2015\NP-(18H-04(REV20)



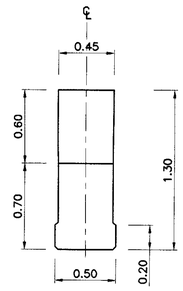
SECTION A – A
SCALE 1 : 25



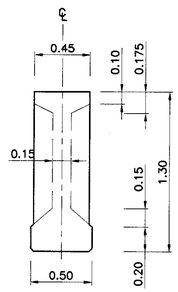
ELEVATION OF GIRDER SPAN LENGTH 18.00 M.
SCALE 1 : 25



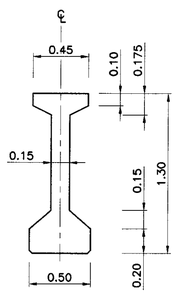
SECTION B – B
SCALE 1 : 25



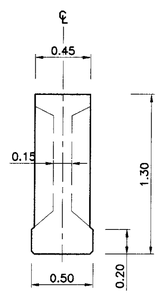
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. CONCRETE FOR PRECAST I-GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-18H/01 TO NP1-18H/04 AND NP1-18H/06

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

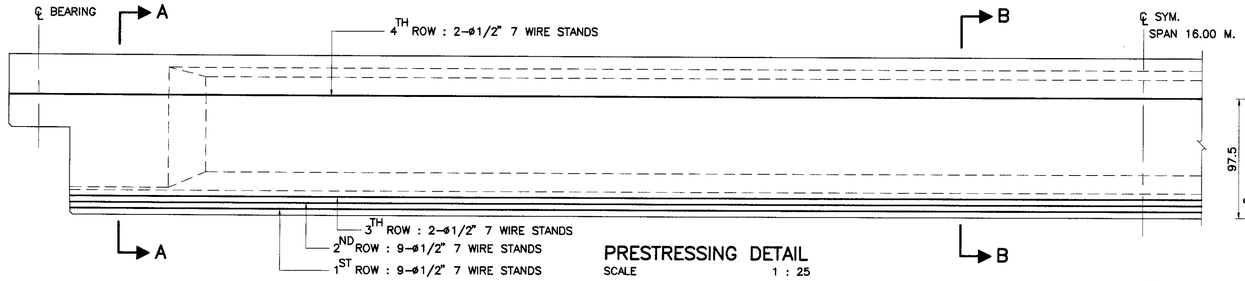
I-GIRDER 18.00 M. (HALF JOINT)

GIRDER DIMENSION

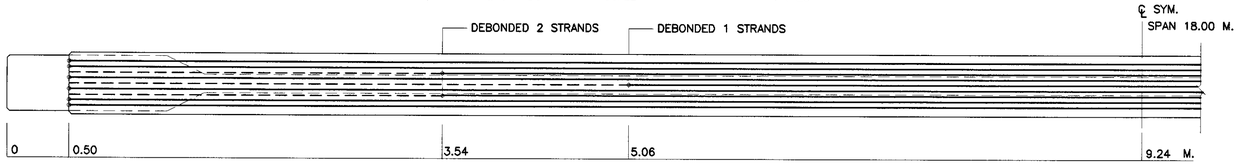
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. NP1-18H/05
			SHEET NO. 34

REF.	REVISION	SIGNATURE	DATE

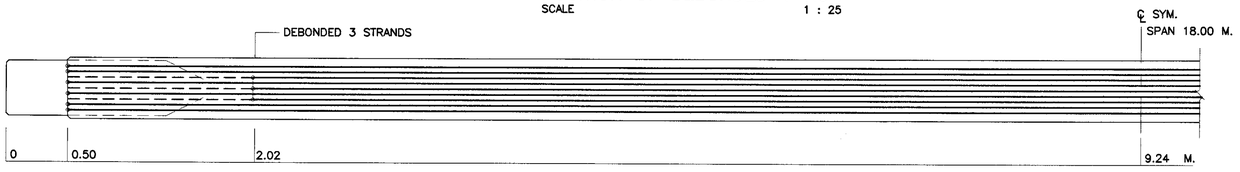
D:\std dwg 2015\NP-G18H-05(REV00)



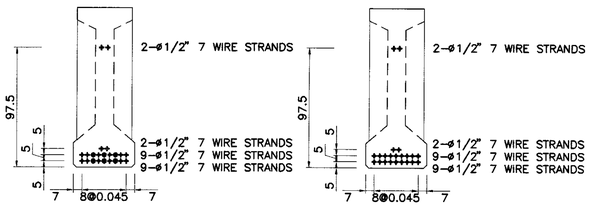
PRESTRESSING DETAIL
SCALE 1 : 25



POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25

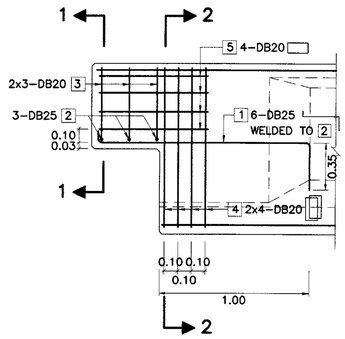


POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25

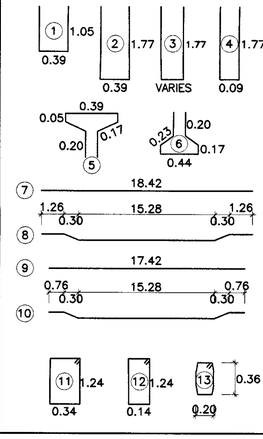
SECTION B – B
SCALE 1 : 25



DAPPED END REINFORCEMENT
SCALE 1 : 25

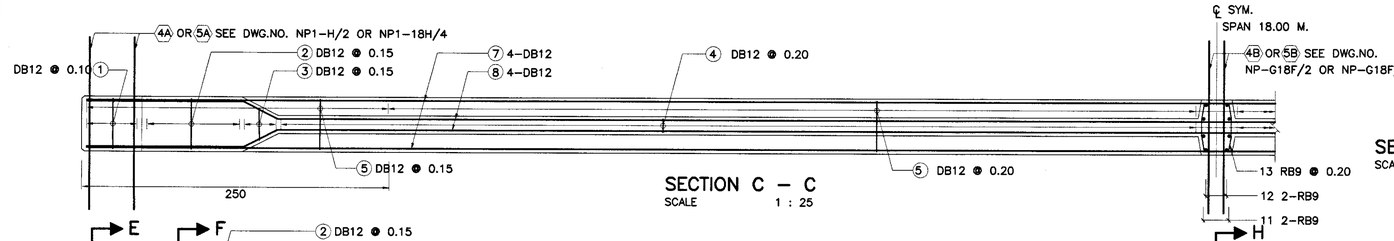
TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

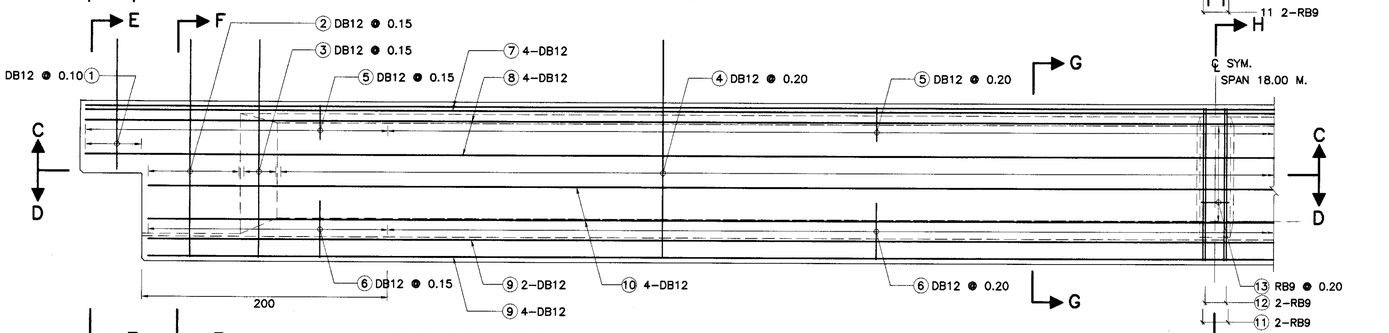


NOTE :

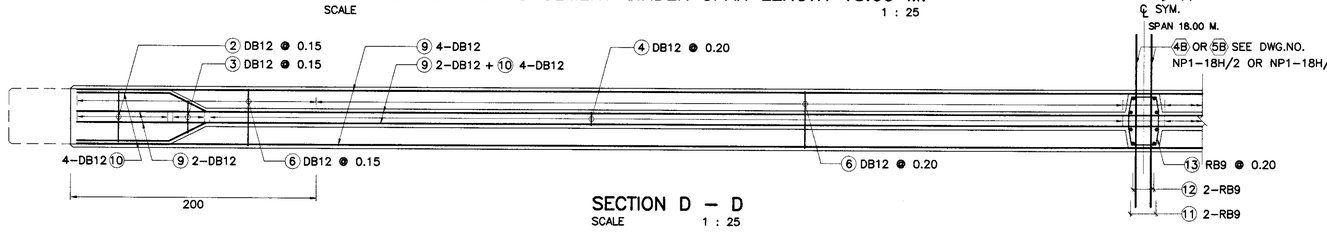
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTRESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ ---- DEBOND PRESTRESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-18H/01 TO NP1-18H/05



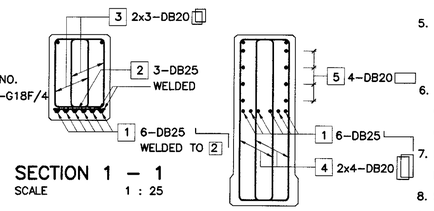
SECTION C – C
SCALE 1 : 25



ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 18.00 M.
SCALE 1 : 25

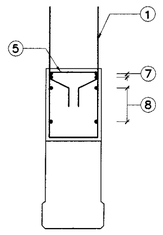


SECTION D – D
SCALE 1 : 25

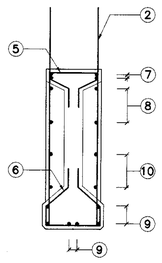


SECTION 1 – 1
SCALE 1 : 25

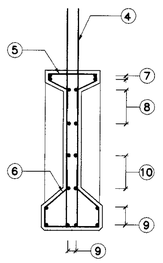
SECTION 2 – 2
SCALE 1 : 25



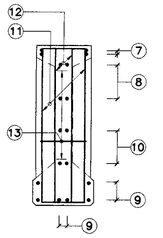
SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



SECTION H – H
SCALE 1 : 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 18.00 M. (HALF JOINT)

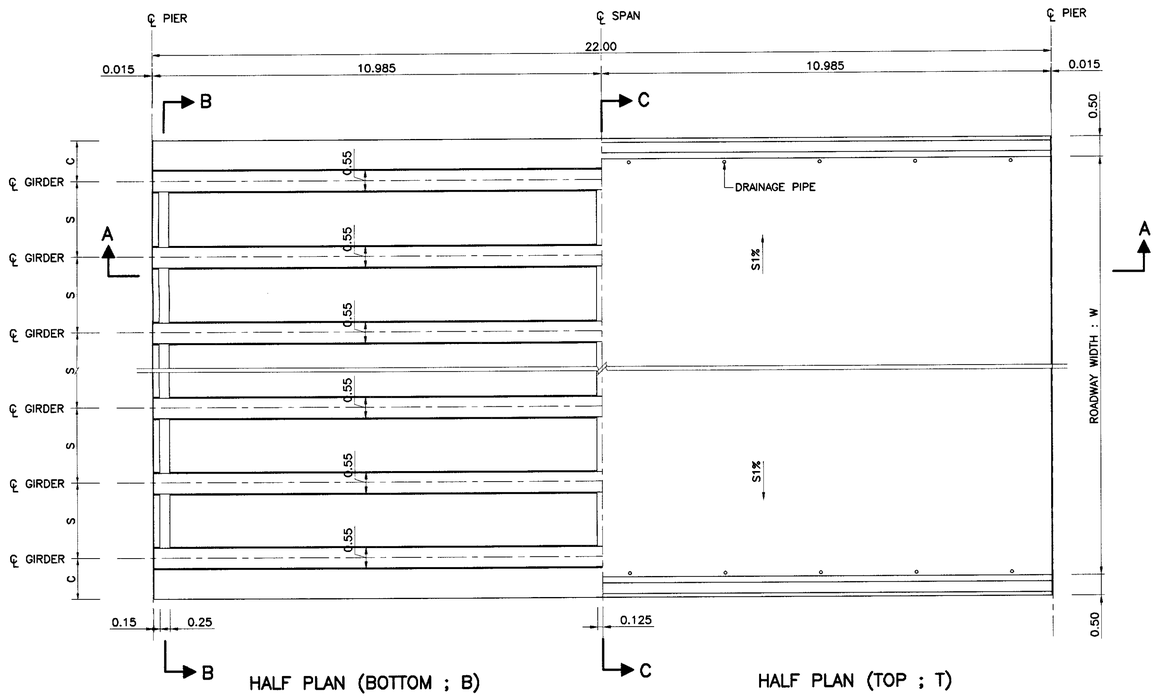
GIRDER PRESTRESSING & REINFORCEMENT

REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
APPROVED : (FOR DIRECTOR GENERAL)

DATE : OCT 2015
SCALE : AS SHOWN
DWG NO. NP1-18H/06
SHEET NO. 35

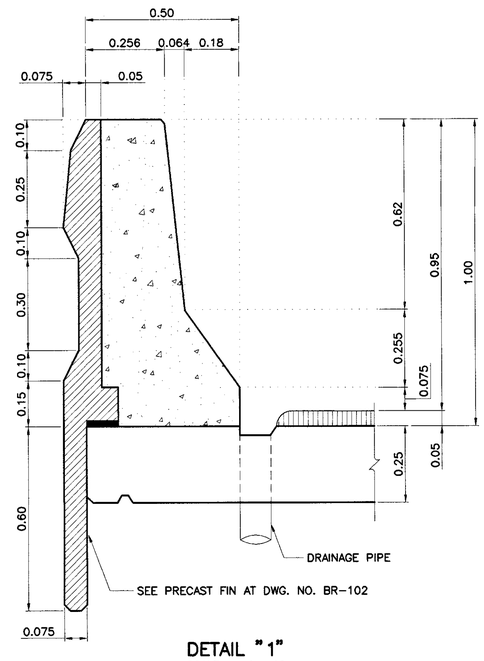
D:\std dwg 2015\NP-G18H-06(REV00)



HALF PLAN (BOTTOM ; B) HALF PLAN (TOP ; T)

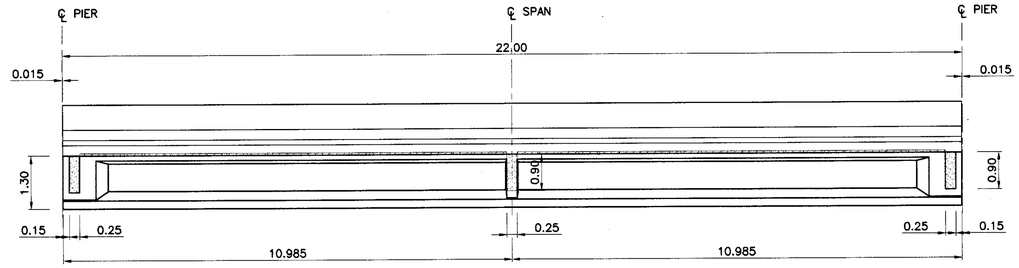
DECK PLAN FOR GIRDER SPAN LENGTH 22.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

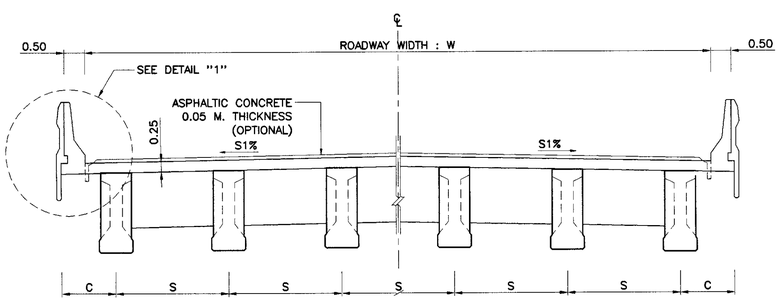
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	5 @ 1.86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX.)	1.00

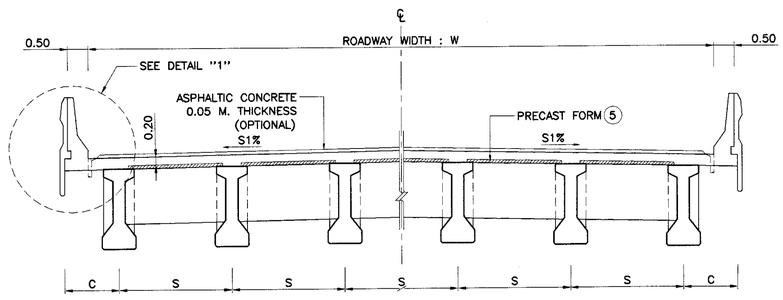
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-22F/02 TO NP1-22F/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

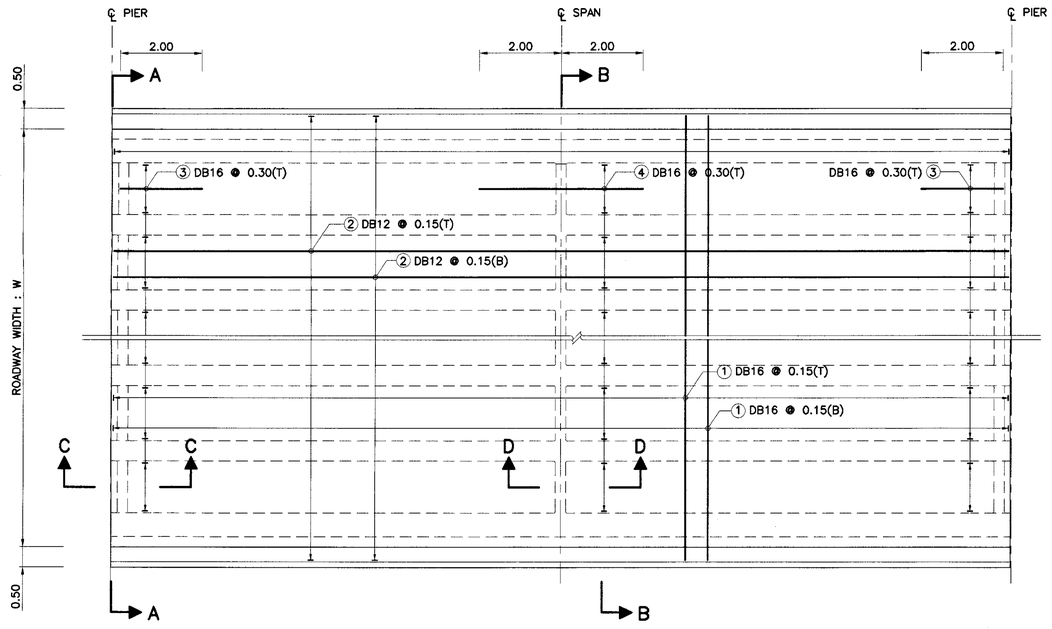
STANDARD DRAWING

I-GIRDER 22.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION

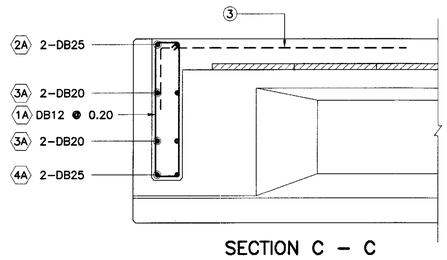
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1-22F/01
		SHEET NO. 36

REF.	REVISION	SIGNATURE	DATE

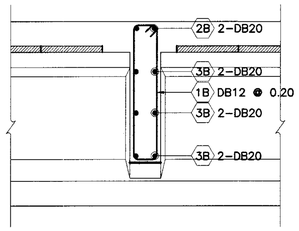
D:\std dwg 2015\NP1-22F-01(REV00)



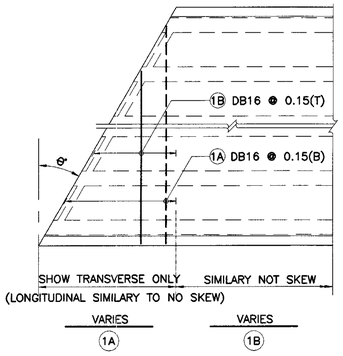
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

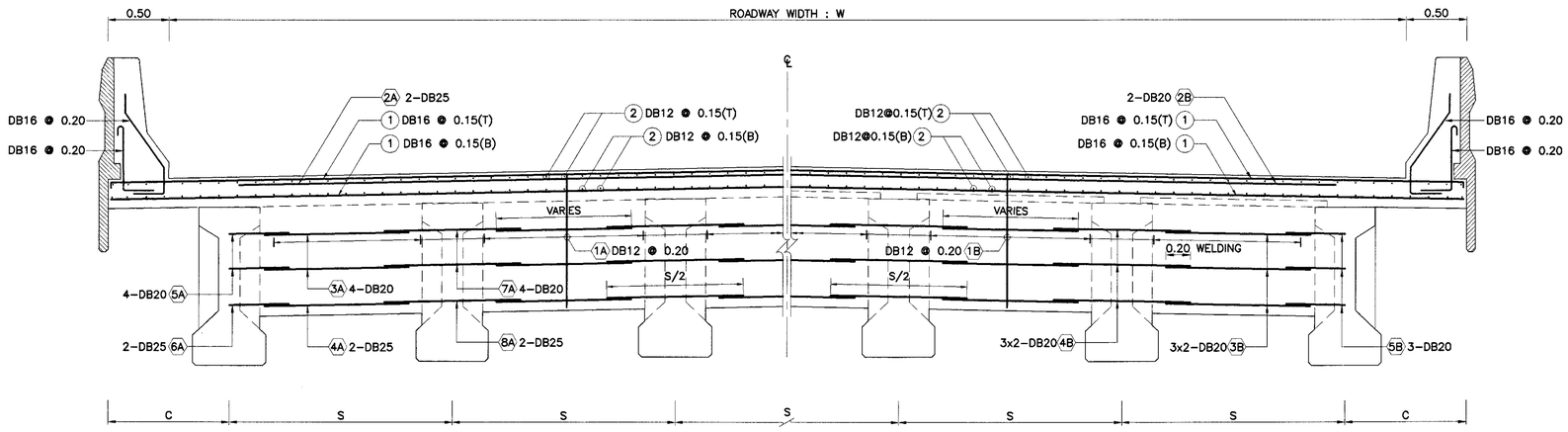
NO	BAR SIZE	SHAPE
1A	DB12	0.19, 1.09, 1A
2A	DB25	W+1.00–2C, 2A
3A	DB20	S/2+0.40, 3A
4A	DB25	S/2+0.40, 4A
5A	DB20	S/4+0.10, 0.19, 5A
6A	DB25	S/4+0.10, 6A
7A	DB20	S/2, 7A, 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–2C, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/2, 4B
5B	DB20	S/4+0.10, 0.19, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70, 1
2	DB12	21.88, 2
3	DB16	2.00, 3, 0.50, 4.00, 4
4	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–22F/01 AND NP1–22F/03 TO NP1–22F/06

REF.	REVISION	SIGNATURE	DATE

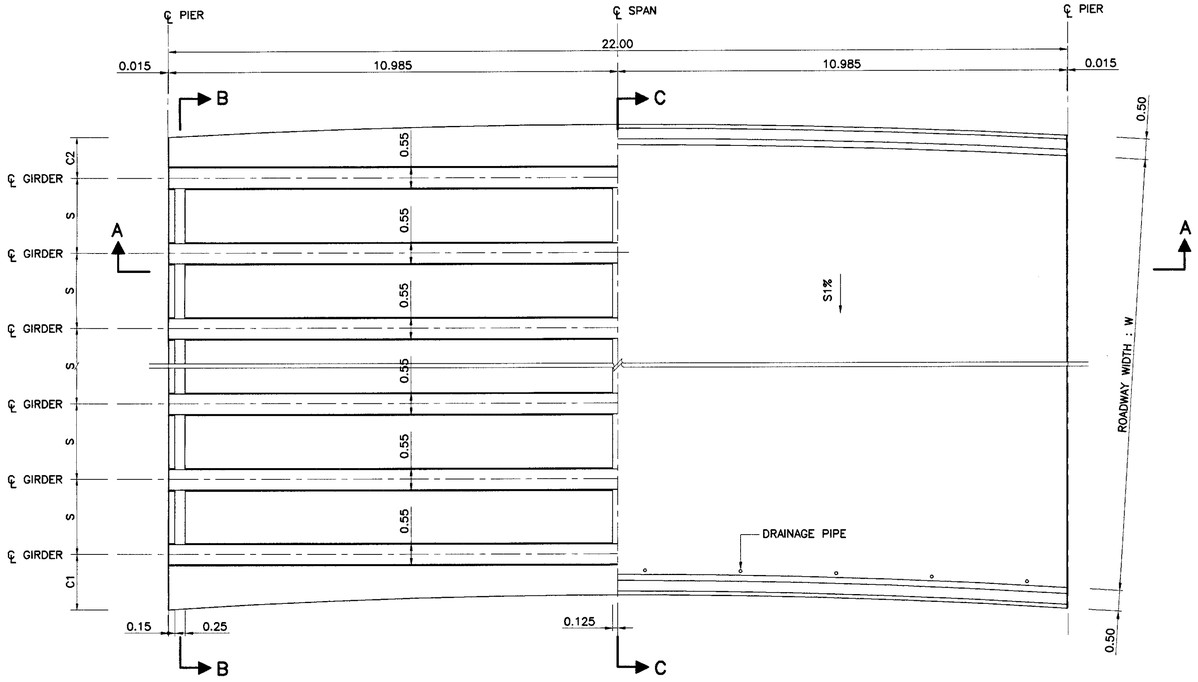
KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 22.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

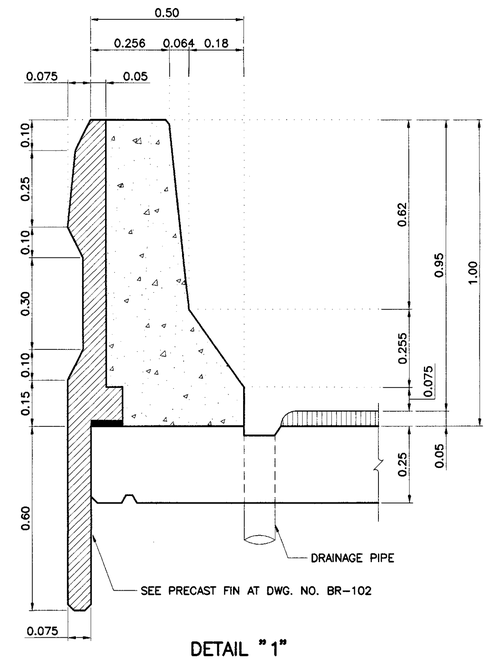
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–22F/02
		SHEET NO. 37

D:\std dwg 2015\NP1-22F-02(REV00)

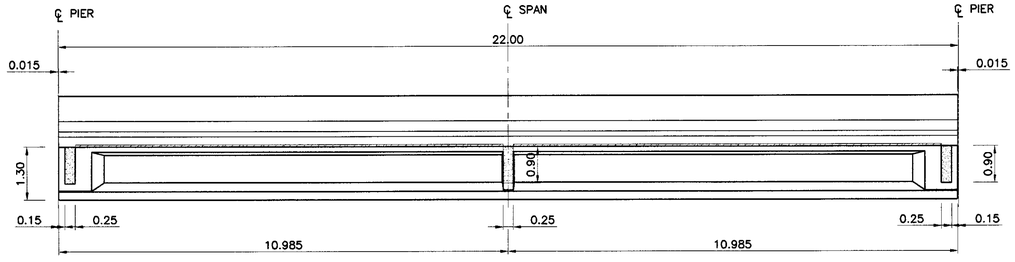


HALF PLAN (BOTTOM ; B) HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 22.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



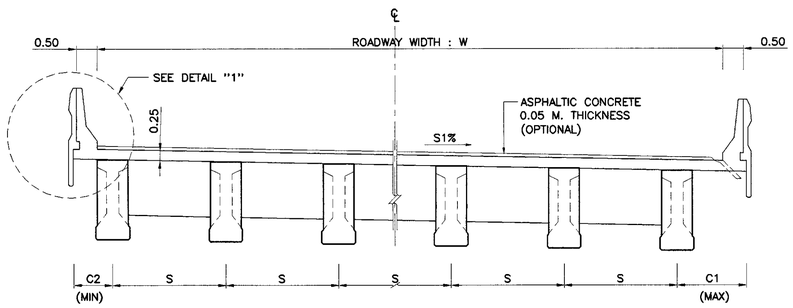
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

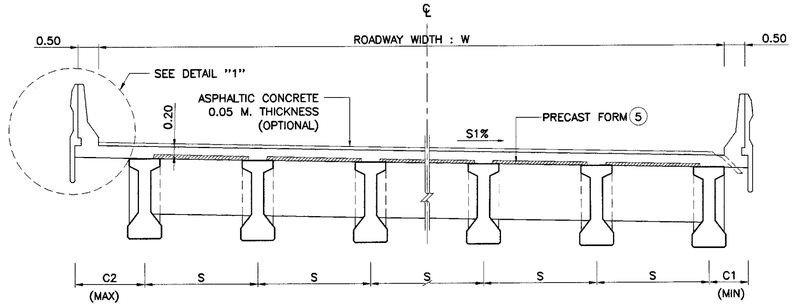
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-22F/01, NP1-22F/02 AND NP1-22F/04 TO NP1-22F/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS. 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

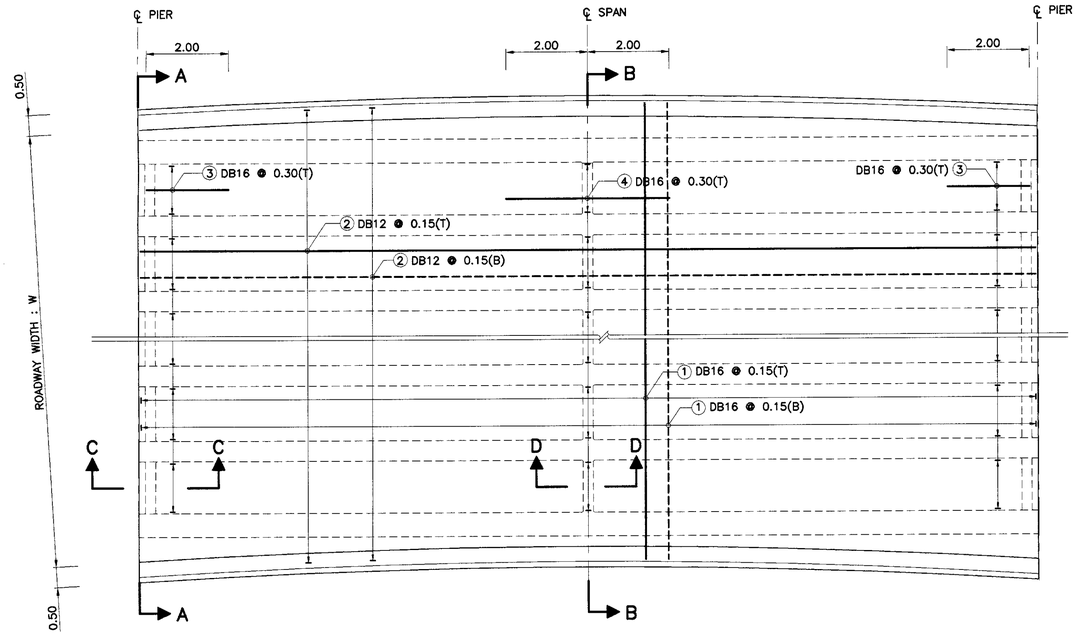
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

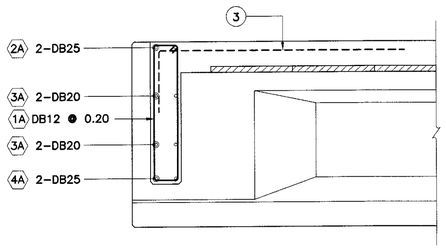
I-GIRDER 22.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1-22F/03
		SHEET NO. 38

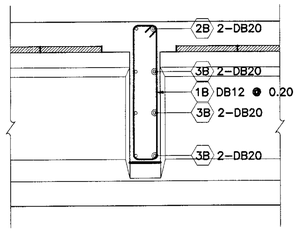
D:\std dwg 2015\NP1-22F-03(REV00)



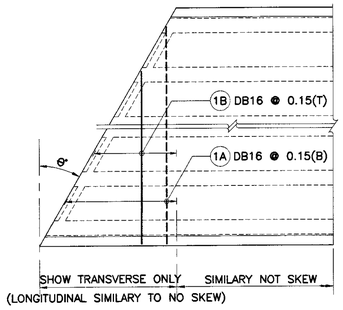
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



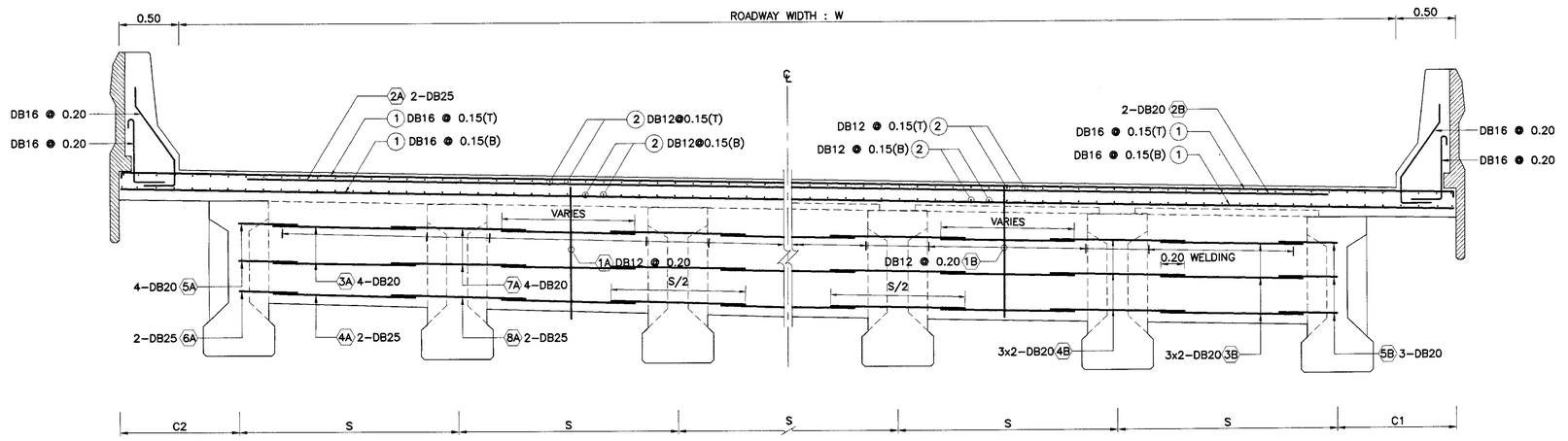
SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1A	DB12	0.19, 1.09, 1A
2A	DB25	W+1.00–C1–C2 — 2A
3A	DB20	S/2+0.40 — 3A
4A	DB25	S/2+0.40 — 4A
5A	DB20	S/4+0.10, 0.19, 5A
6A	DB25	S/4+0.10 — 6A
7A	DB20	S/2
8A	DB25	7A, 8A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00–C1–C2 — 2B
3B	DB20	S/2+0.40 — 3B
4B	DB20	S/2 — 4B
5B	DB20	S/4+0.10, 0.19, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70 — 1
2	DB12	21.88 — 2
3	DB16	2.00, 3, 0.50
4	DB16	4.00, 4

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–22F/01 TO NP1–22F/03 AND NP1–22F/05, NP1–22F/06

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

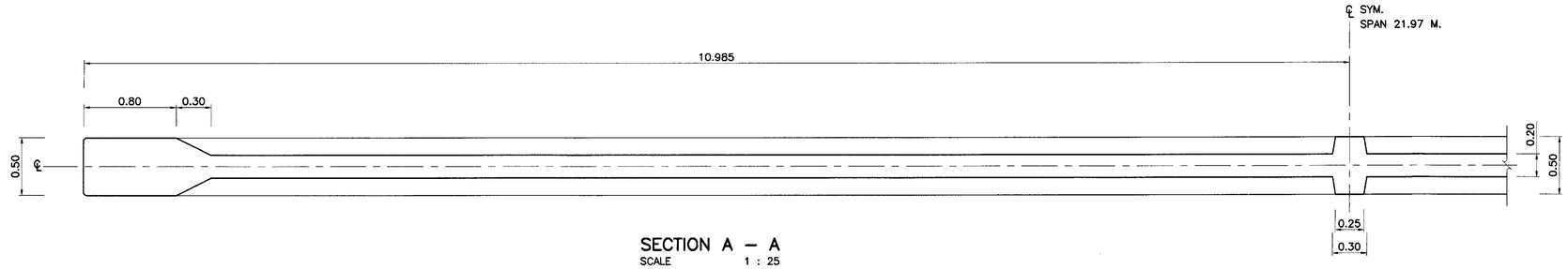
STANDARD DRAWING

I–GIRDER 22.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

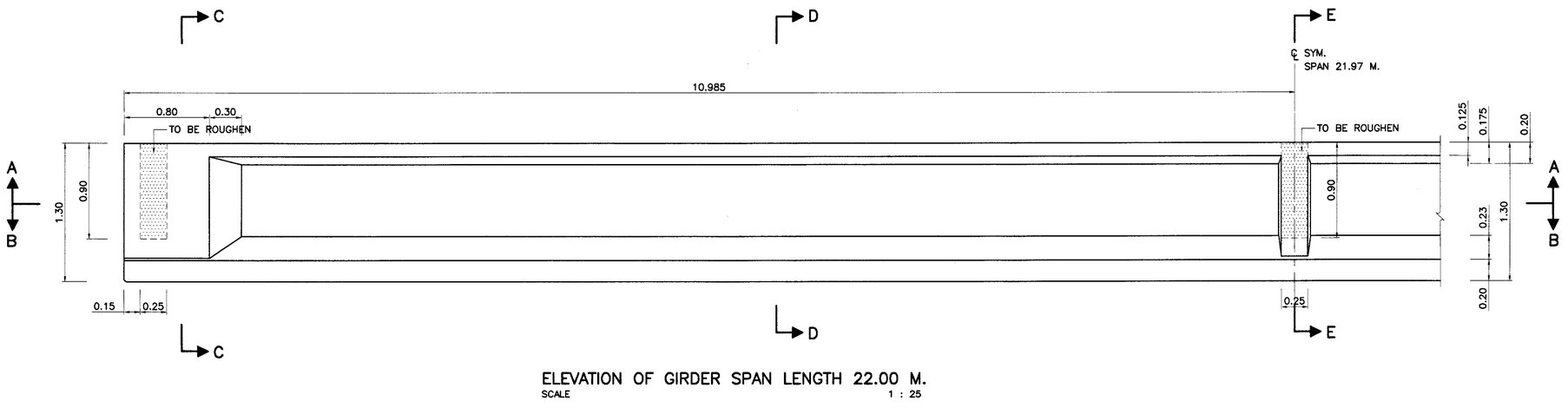
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–22F/04
		SHEET NO. 39

REF.	REVISION	SIGNATURE	DATE

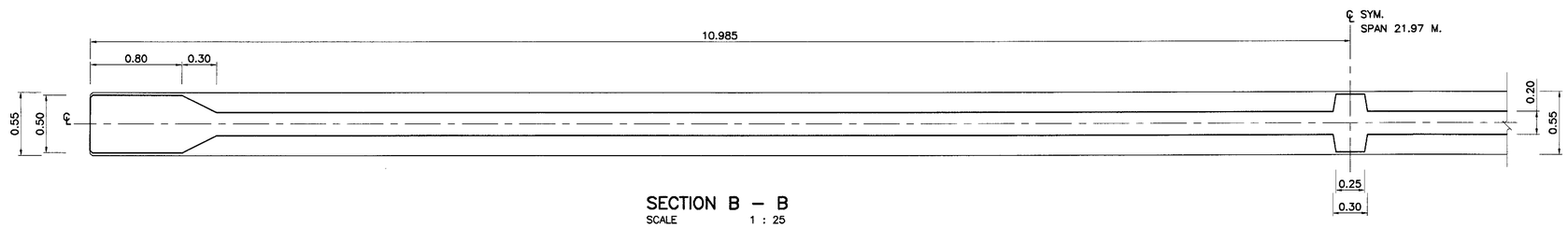
D:\std dwg 2015\NP1-22F-04(REV00)



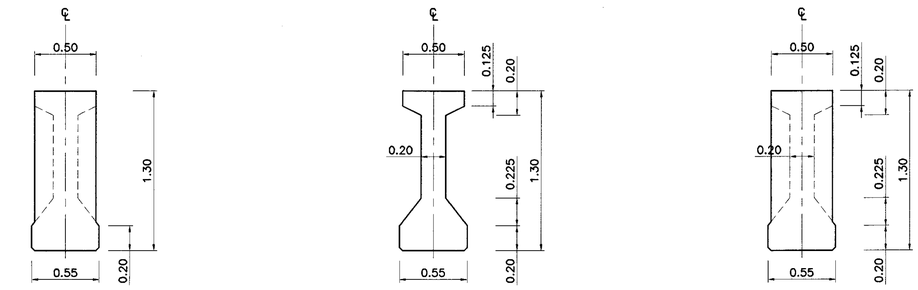
SECTION A – A
SCALE 1 : 25



ELEVATION OF GIRDER SPAN LENGTH 22.00 M.
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR PRECAST I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1–22F/01 TO NP1–22F/04 AND NP1–22F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

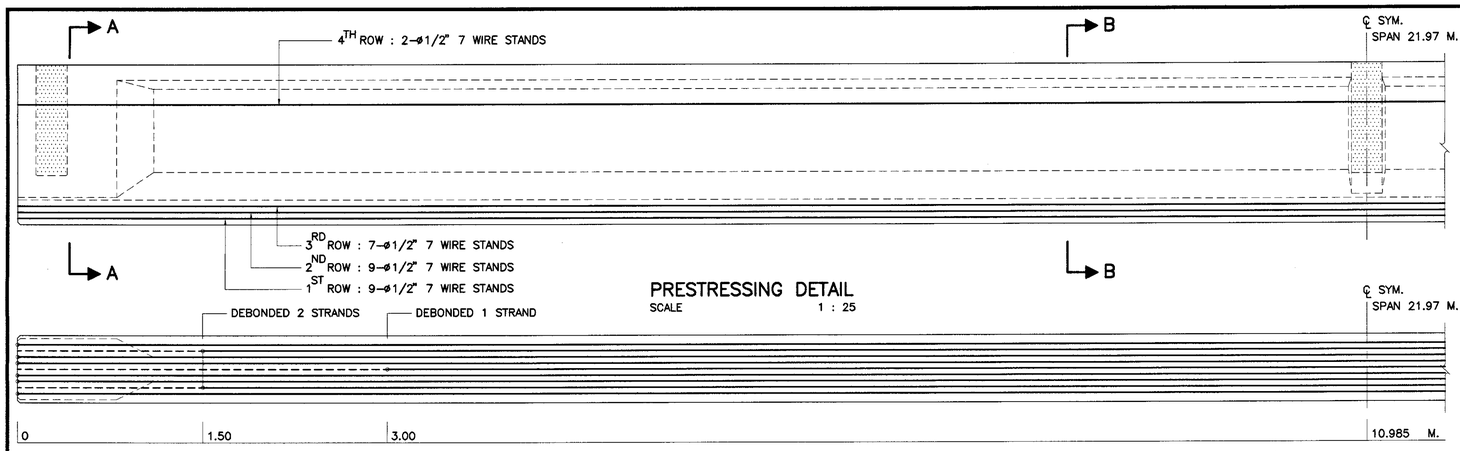
STANDARD DRAWING

I–GIRDER 22.00 M. (FULL JOINT)

GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1–22F/05
		SHEET NO. 40

D:\std dwg 2015\NP1-22F-05(REV00)

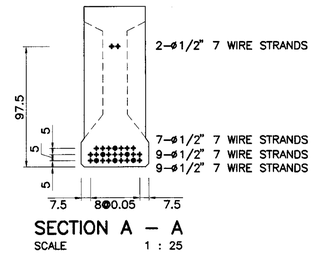


PRESTRESSING DETAIL
SCALE 1 : 25

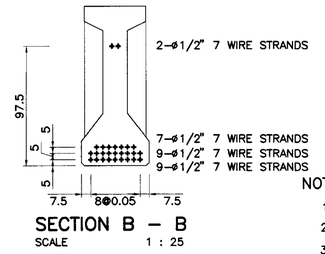
POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25

POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25

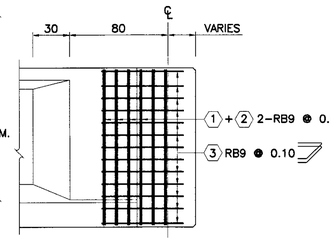
POSITION OF DEBONDED 3RD ROW
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25



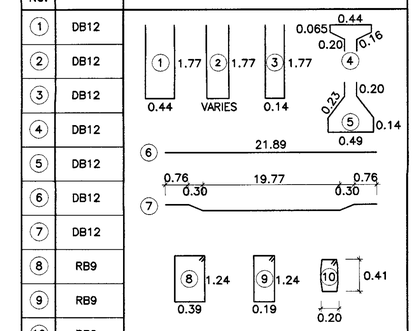
SECTION B – B
SCALE 1 : 25



SECTION 1 – 1
SCALE 1 : 25

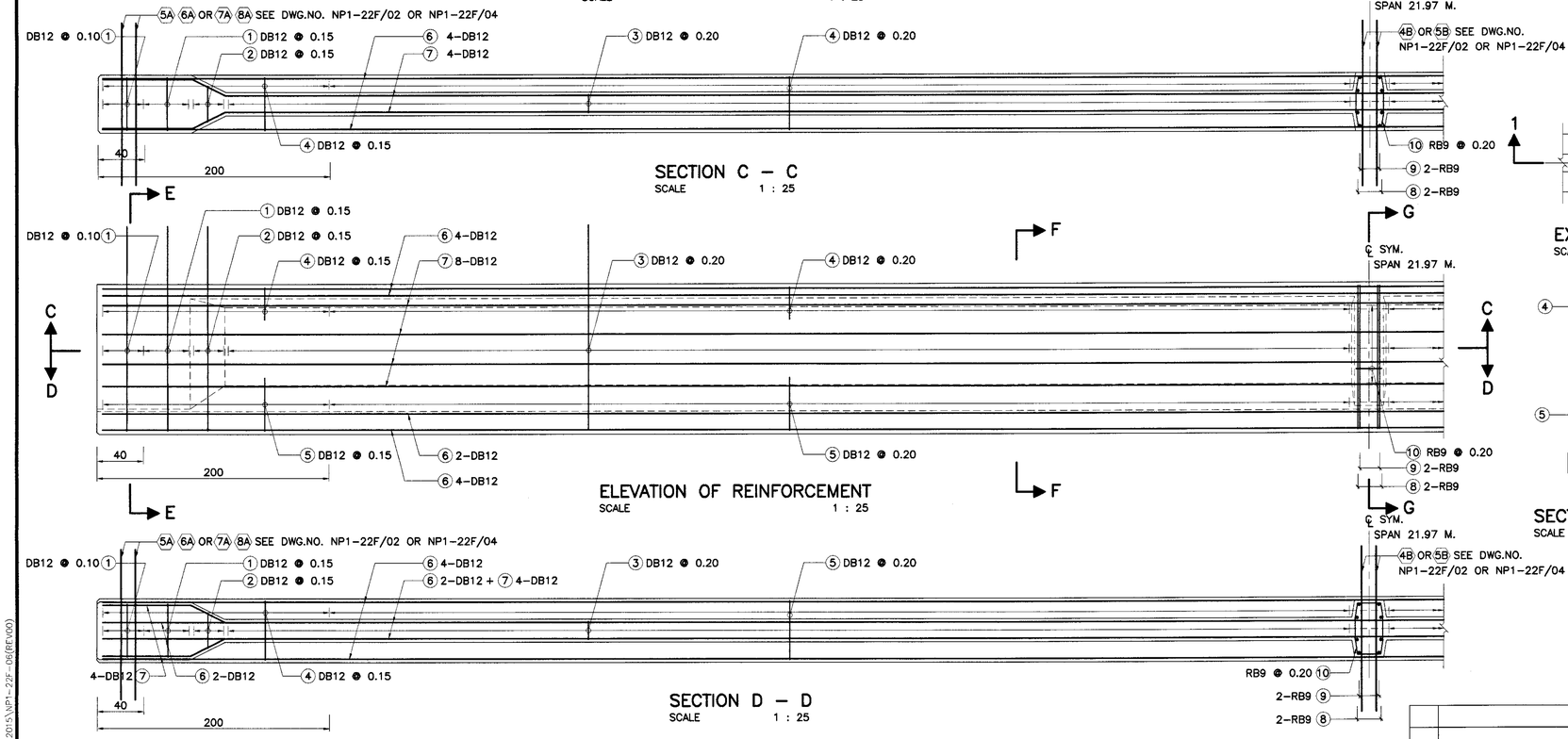
TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	RB9	
9	RB9	
10	RB9	



NOTE :

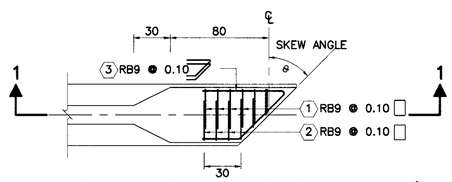
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ ------ DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-22F/01 TO NP1-22F/05



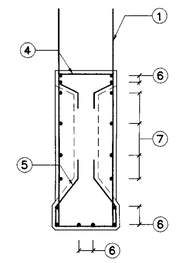
SECTION C – C
SCALE 1 : 25

ELEVATION OF REINFORCEMENT
SCALE 1 : 25

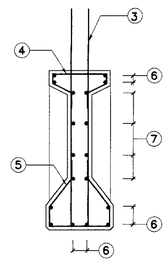
SECTION D – D
SCALE 1 : 25



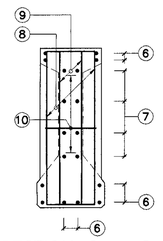
EXTRA REINFORCEMENT AT THE END (SKEW GIRDER)
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

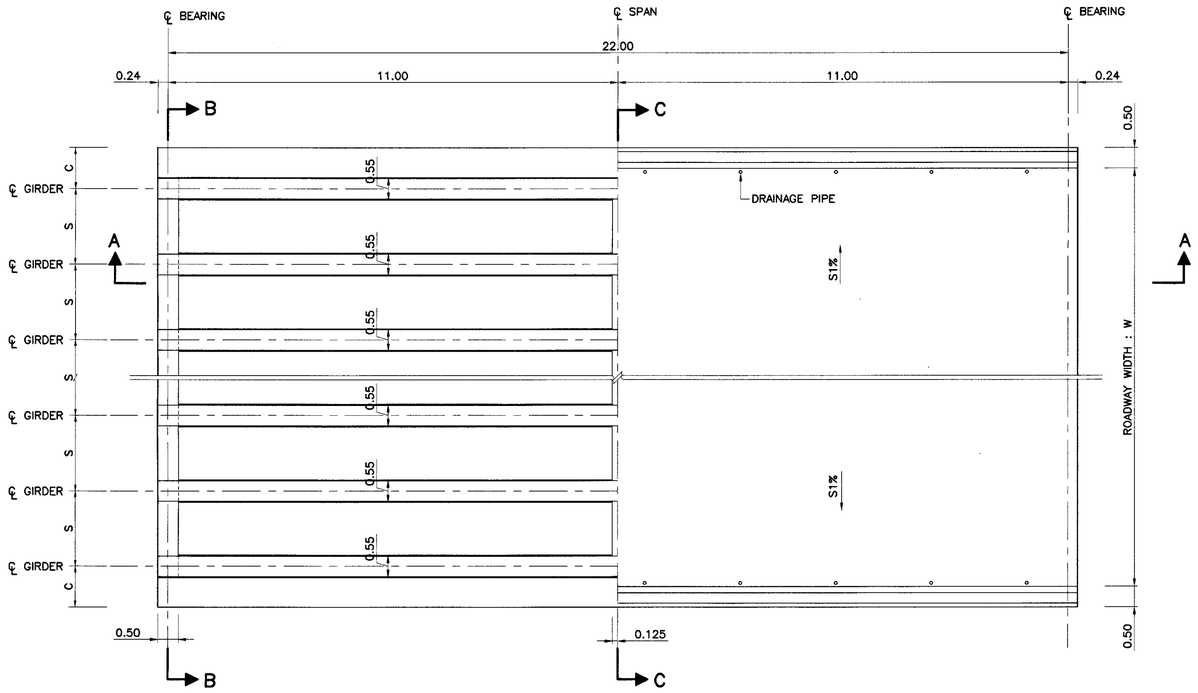
I-GIRDER 22.00 M. (FULL JOINT)

GIRDER PRESTRESSING & REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1-22F/06
		SHEET NO. 41

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\NP1-22F-06(REV00)

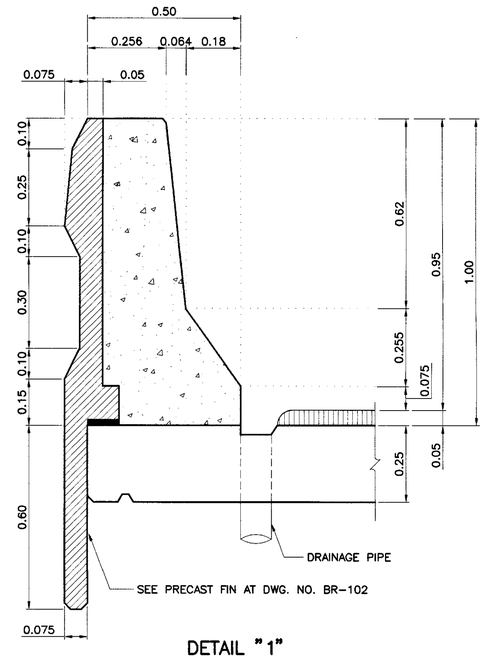


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

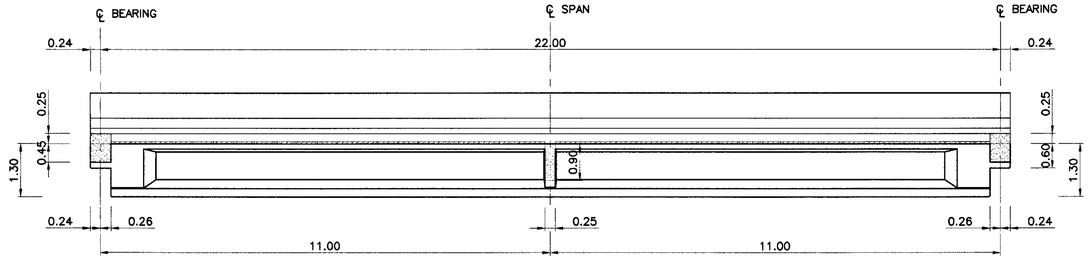
DECK PLAN FOR GIRDER SPAN LENGTH 22.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	5 @ 1.86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX.)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-22H/02 TO NP1-22H/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.

(5) PRECAST FORM SHALL BE AS FOLLOWS:

5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2

5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)

5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.

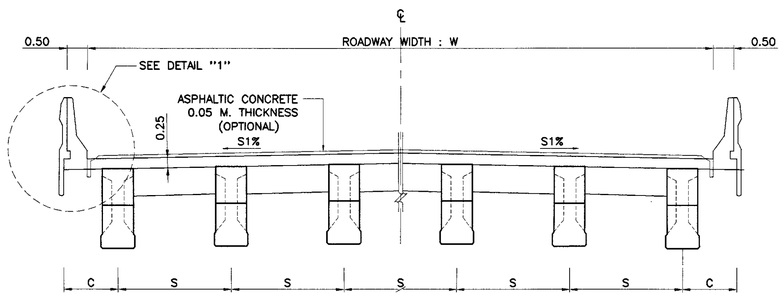
5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN

5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS95.

5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.

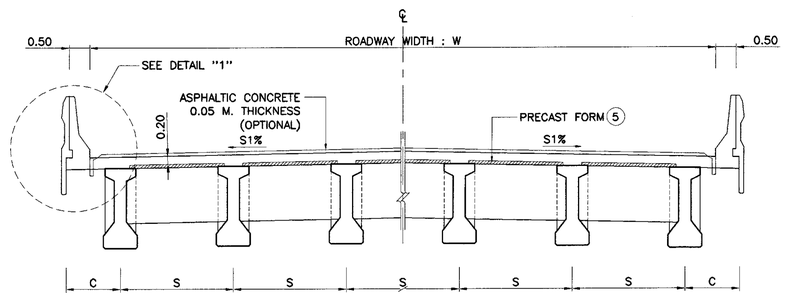
5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.

5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

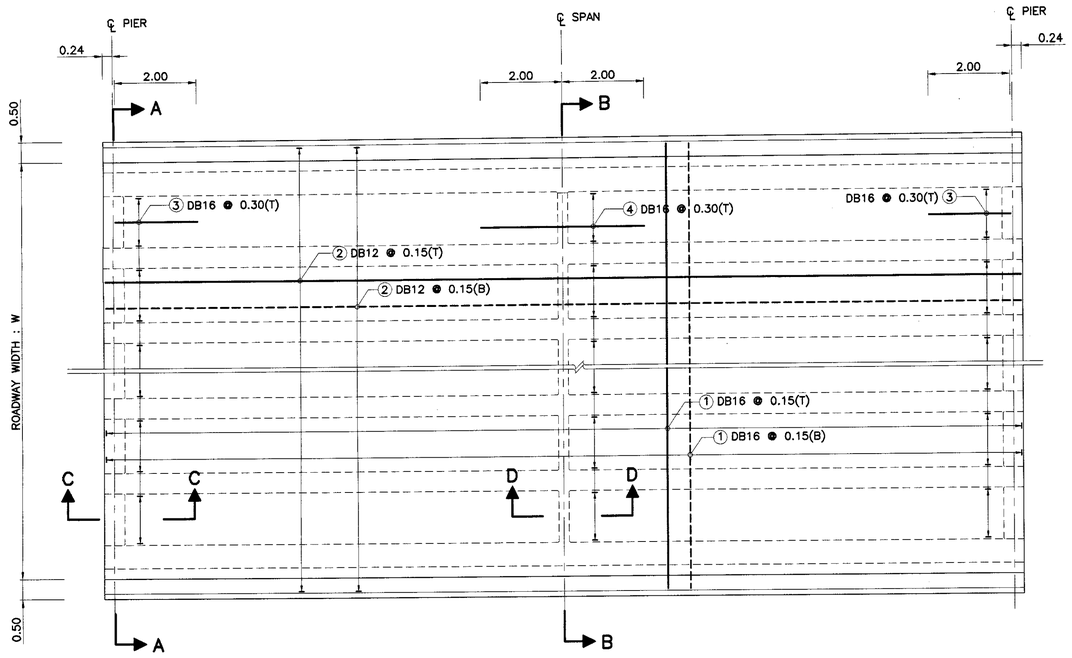
STANDARD DRAWING

I-GIRDER 22.00 M. (HALF JOINT)

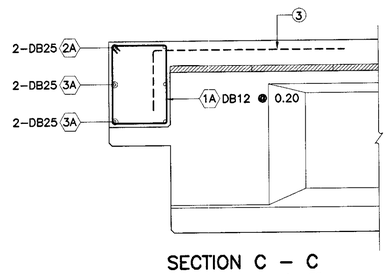
BRIDGE DECK DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1-22H/01
		SHEET NO. 42

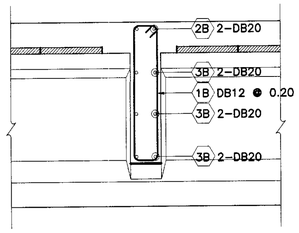
D:\std dwg 2015\NP1-22H-01(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

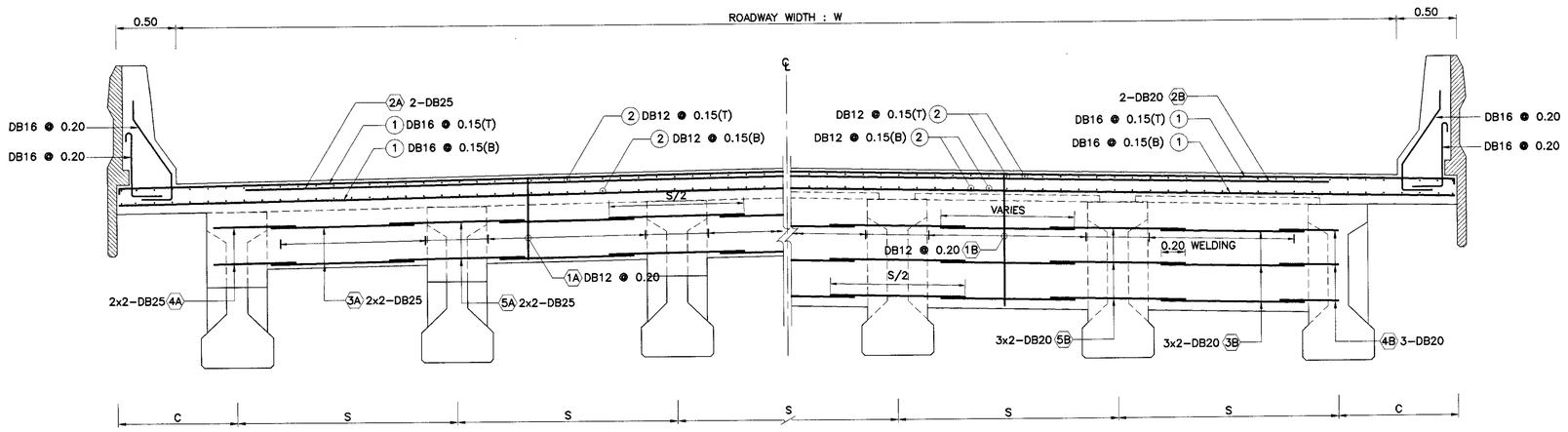
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44 / 0.54 / 1A
2A	DB25	W+1.00–2C / 2A
3A	DB25	S/2+0.40 / 3A
4A	DB25	S/4+0.10 / 4A
5A	DB25	S/2 / 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.09 / 1B
2B	DB20	W+1.00–2C / 2B
3B	DB20	S/2+0.40 / 3B
4B	DB20	S/4+0.10 / 0.19 / 4B
5B	DB20	S/2 / 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70 ①
②	DB12	22.40 ②
③	DB16	2.00 / 0.50 / 4.00 ③ ④
④	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–22H/01 AND NP1–22H/03 TO NP1–22H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

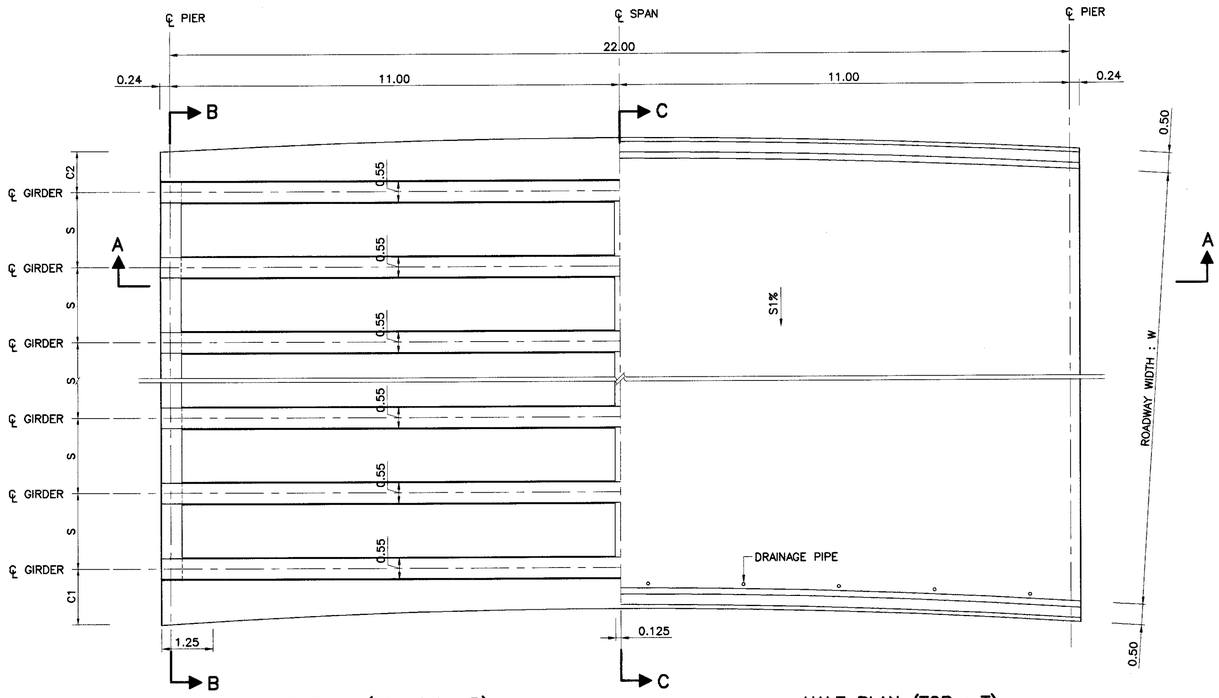
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 22.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–22H/02
		SHEET NO. 43

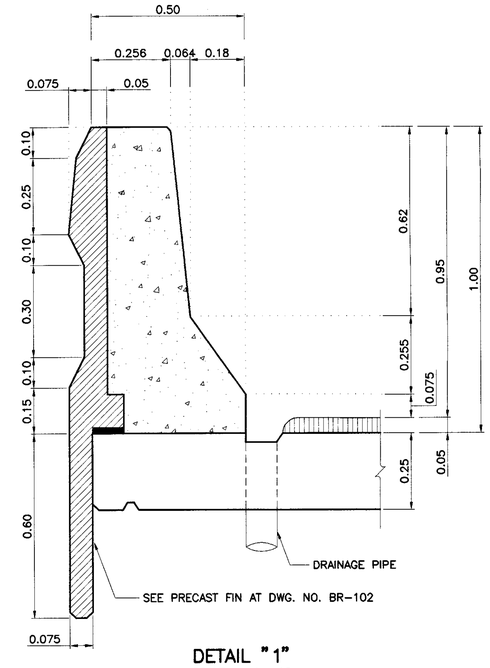
D:\std dwg 2015\NP1-22H-02(REV00)



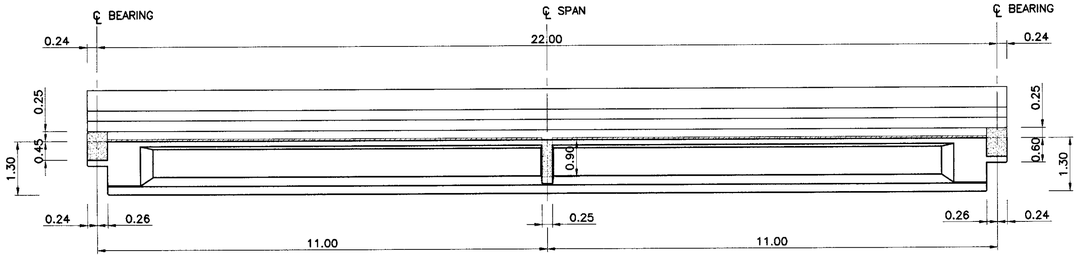
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 22.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-22H/01 , NP1-22H/02 AND NP1-22H/04 TO NP1-22H/06
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.

(5) PRECAST FORM SHALL BE AS FOLLOWS:

5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2

5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)

5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.

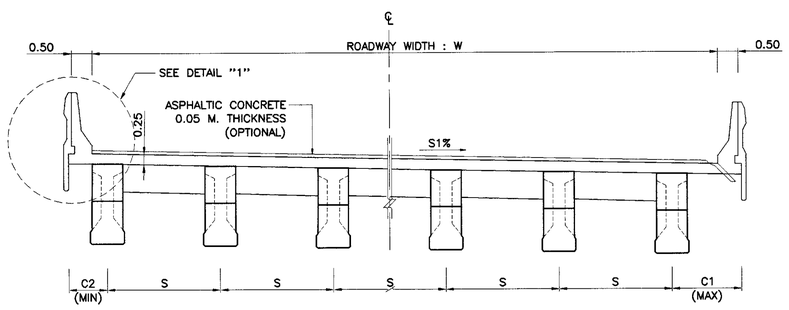
5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN

5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.

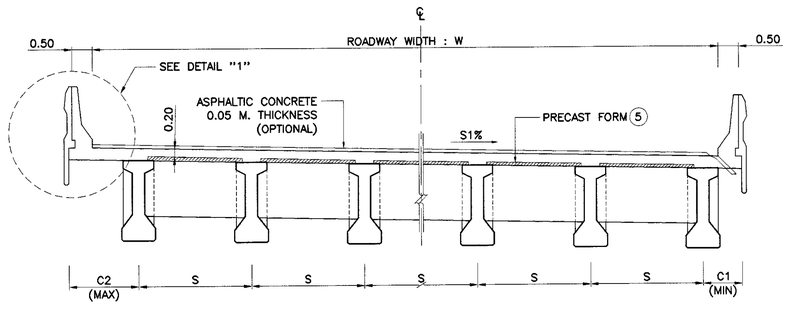
5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.

5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.

5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

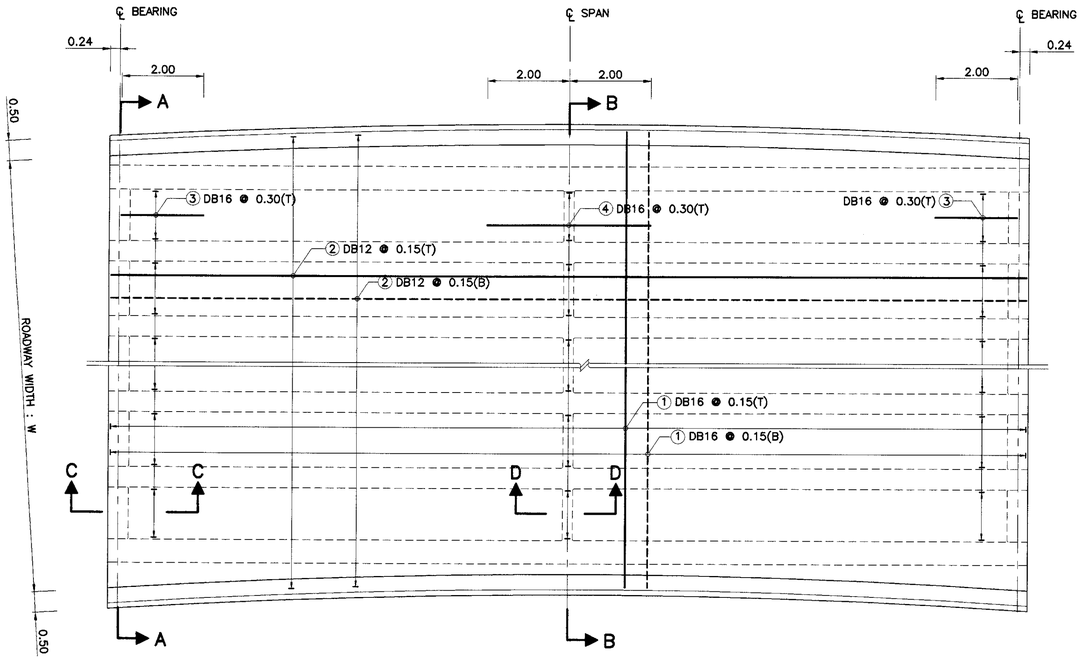
STANDARD DRAWING

I-GIRDER 22.00 M. (HALF JOINT)
BRIDGE DECK DIMENSION (FOR CURVE)

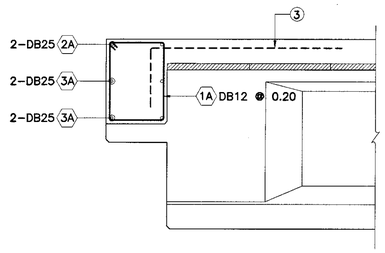
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED :	(DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED :	(FOR DIRECTOR GENERAL)		DWG NO.NP1-22H/03
			SHEET NO. 44

REF.	REVISION	SIGNATURE	DATE

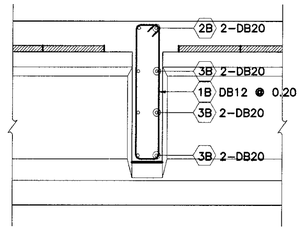
D:\std dwg 2015\NP1-22H-03(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

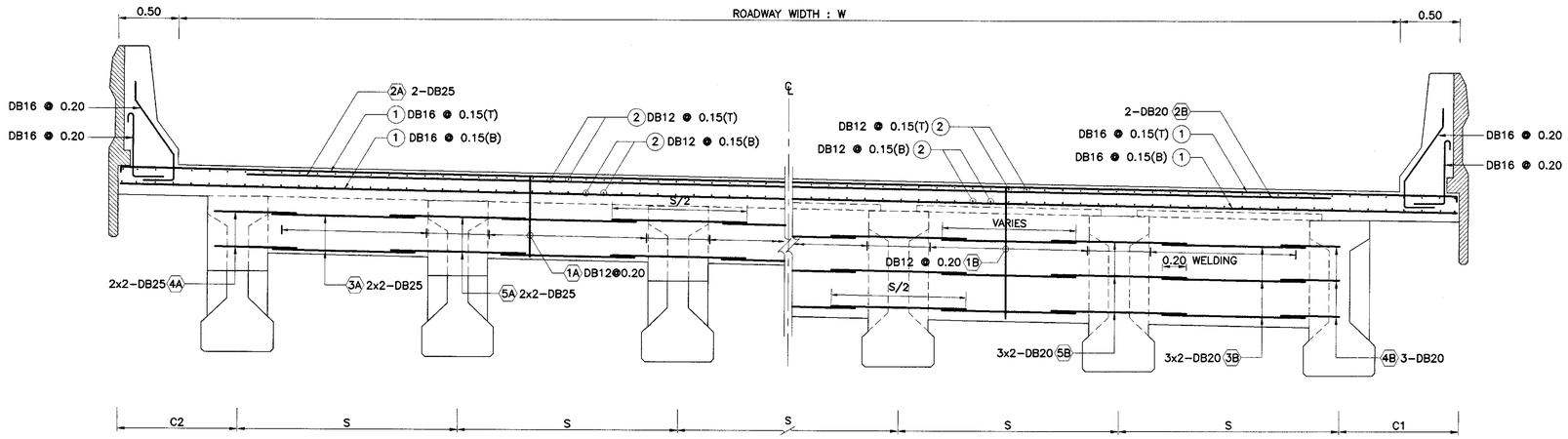
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44 / 0.54 / 1A
2A	DB25	W+1.00–C1–C2 / 2A
3A	DB25	S/2+0.40 / 3A
4A	DB25	S/4+0.10 / 4A
5A	DB25	S/2 / 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.09 / 1B
2B	DB20	W+1.00–C1–C2 / 2B
3B	DB20	S/2+0.40 / 3B
4B	DB20	S/4+0.10 / 0.19 / 4B
5B	DB20	S/2 / 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70 / ①
②	DB12	22.40 / ②
③	DB16	2.00 / 0.50 / ③
④	DB16	4.00 / ④



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–22H/01 TO NO. NP1–22H/03 AND NP1–22H/05 , NO. NP1–22H/06

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

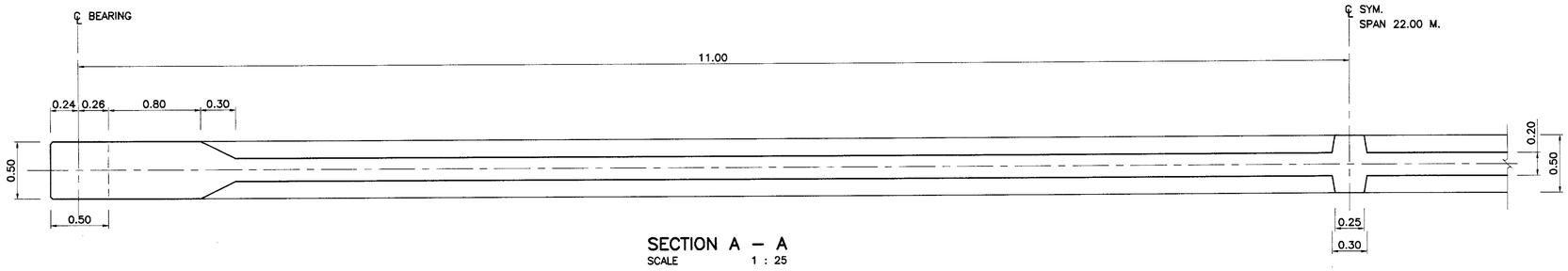
STANDARD DRAWING

I–GIRDER 22.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

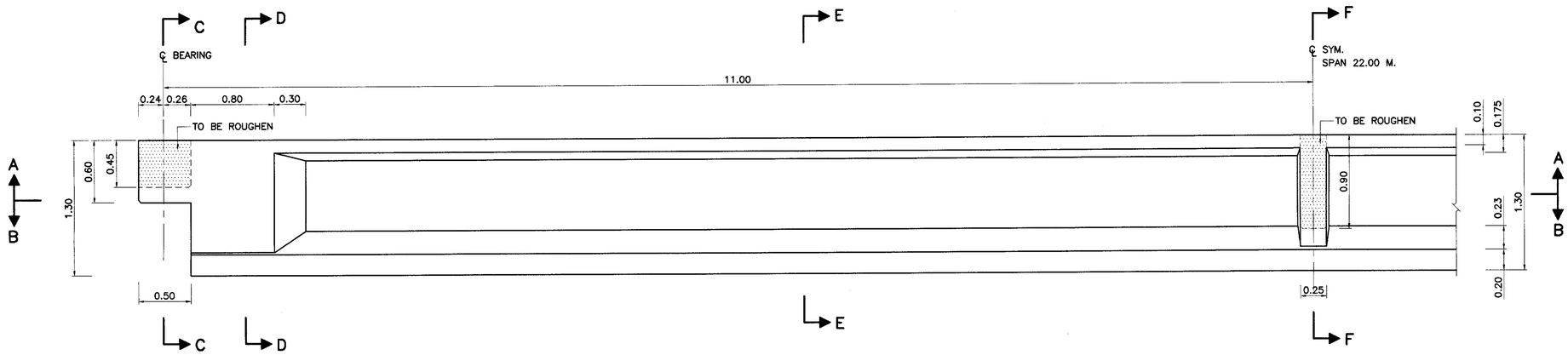
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
DWG NO. NP1–22H/04
APPROVED : (FOR DIRECTOR GENERAL)
SHEET NO. 45

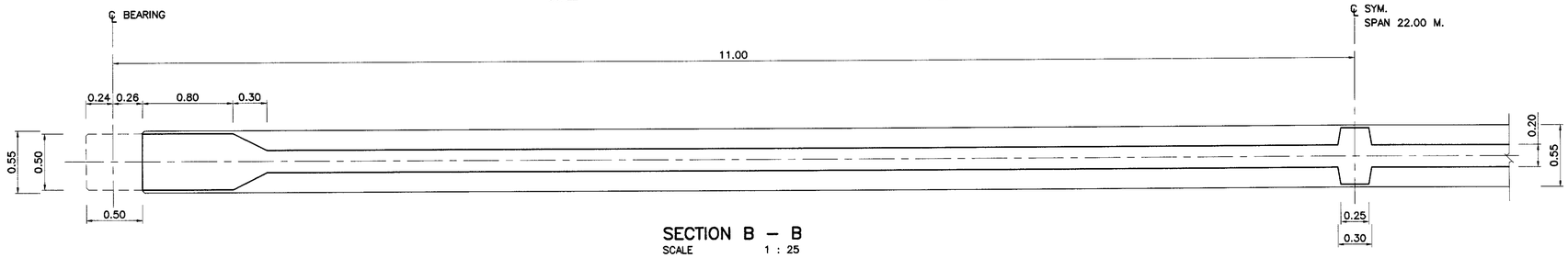
D:\std dwg 2015\NP1-22H-04(REV00)



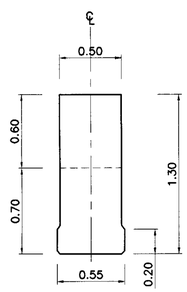
SECTION A – A
SCALE 1 : 25



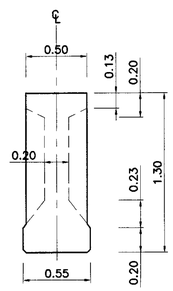
ELEVATION OF GIRDER SPAN LENGTH 22.00 M.
SCALE 1 : 25



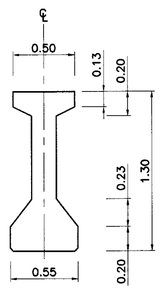
SECTION B – B
SCALE 1 : 25



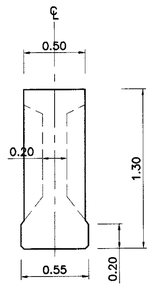
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR PRECAST I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1–22H/01 TO NP1–22H/04 AND NP1–22H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 22.00 M. (HALF JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–22H/05
		SHEET NO. 46

D:\std dwg 2015\NP1-22H-05(REV00)

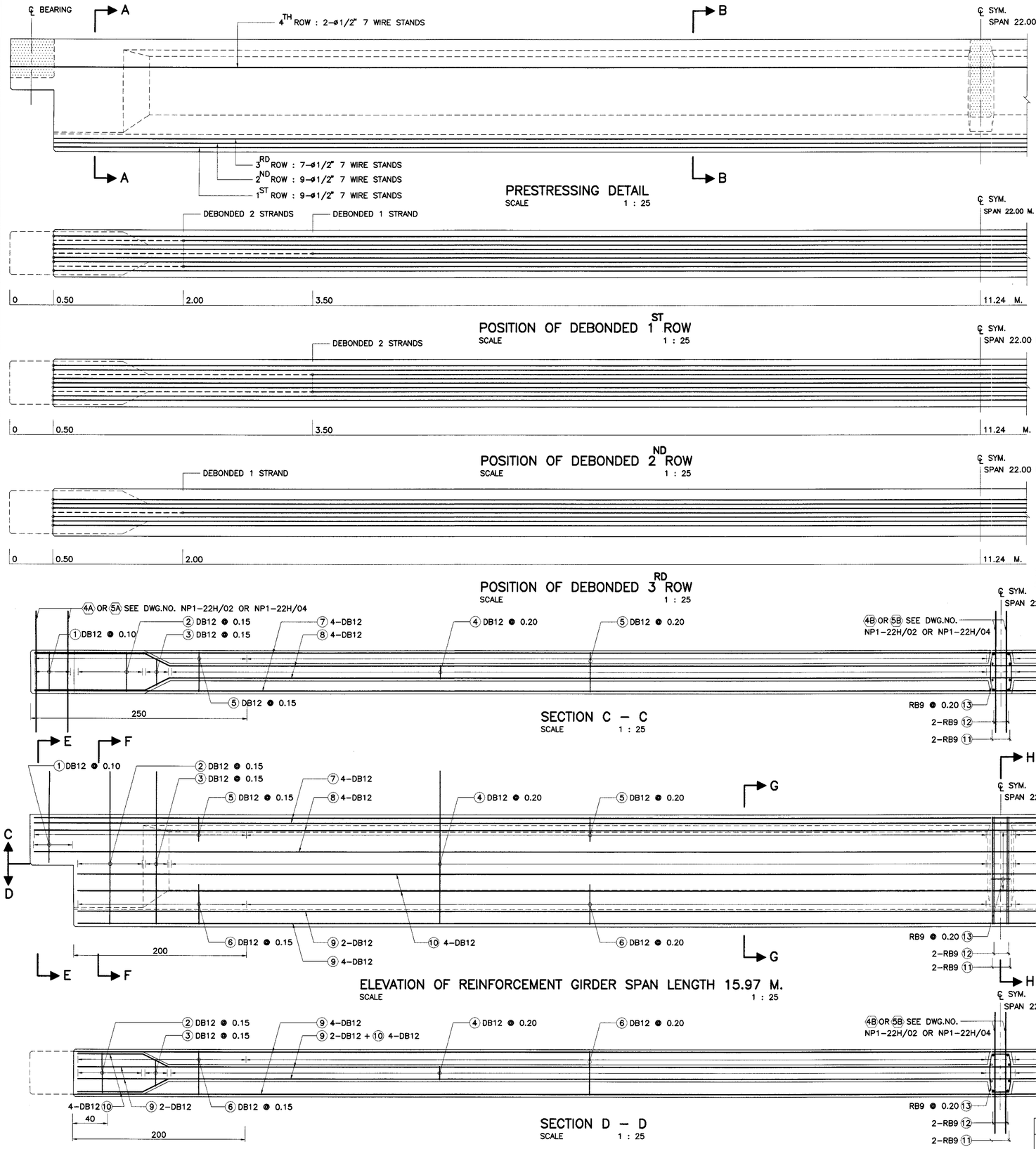


TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS 420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ ------ DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1-22H/01 TO NP1-22H/05

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

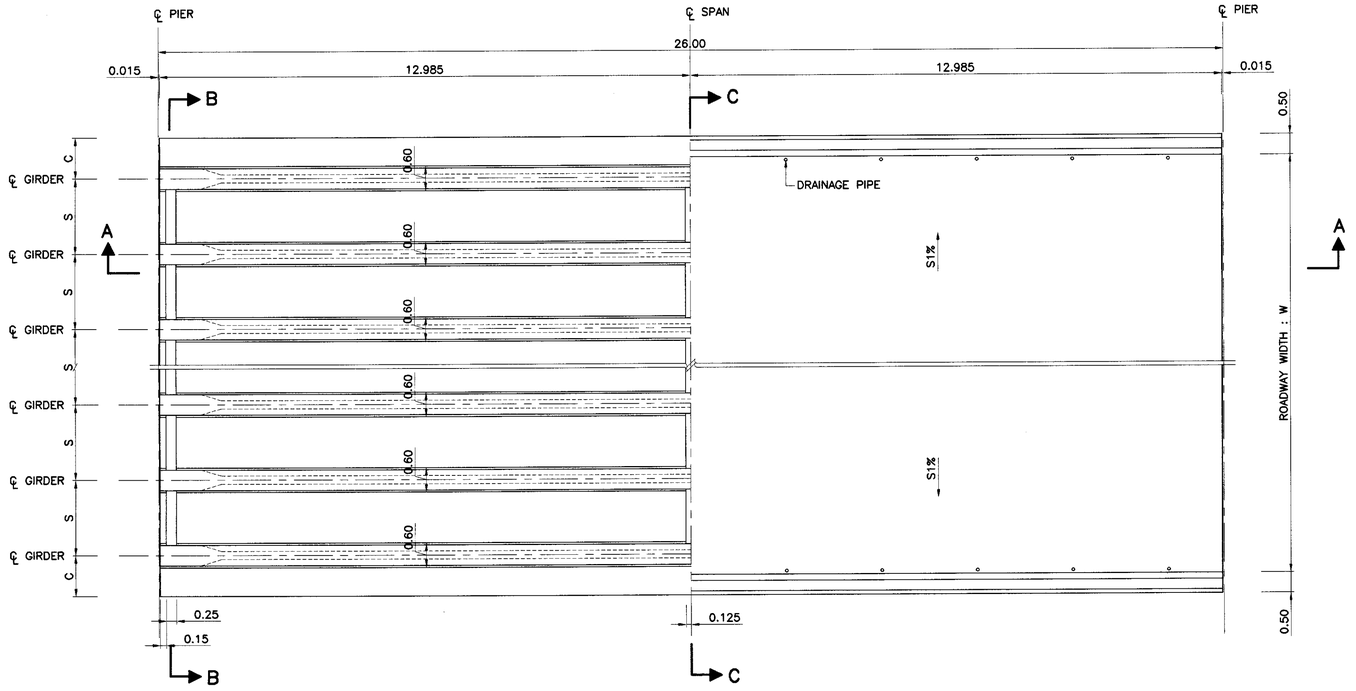
STANDARD DRAWING

I-GIRDER 22.00 M. (HALF JOINT)

GIRDER PRESTRESSING & REINFORCEMENT

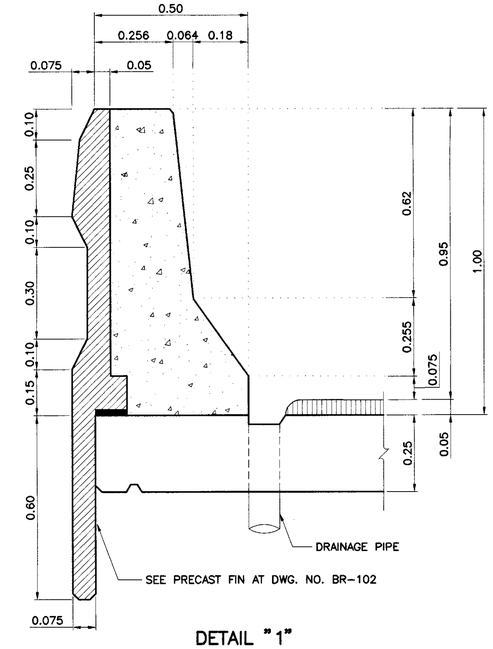
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1-22H/06
		SHEET NO. 47

D:\std dwg 2015\NP1-22H-06(REV00)

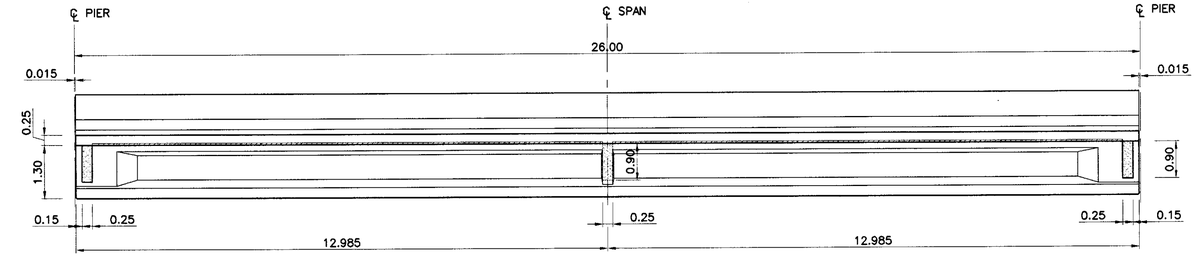


HALF PLAN (BOTTOM ; B) HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



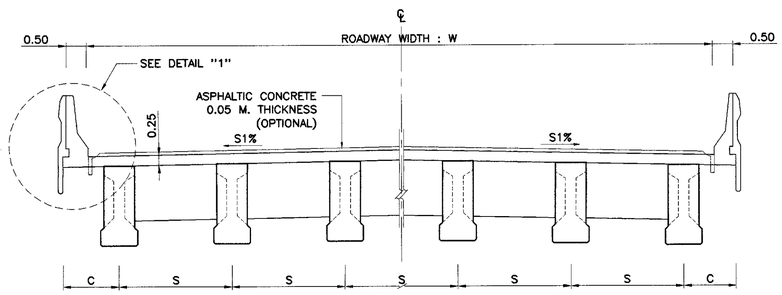
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

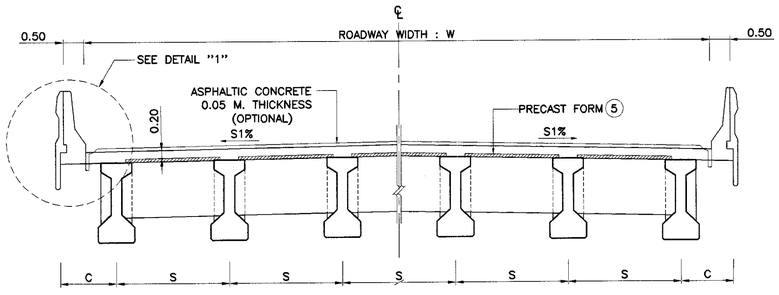
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	5 @ 1.60	1.00
10.00	6	6 @ 1.50	1.00
11.00	7	2 @ 1.66 4 @ 1.67	1.00
12.00	8	6 @ 1.57 1 @ 1.58	1.00
15.00	10	5 @ 1.56 4 @ 1.55	1.00
VARIES	n	2.00 (MAX.)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-26F/02 TO NP1-26F/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

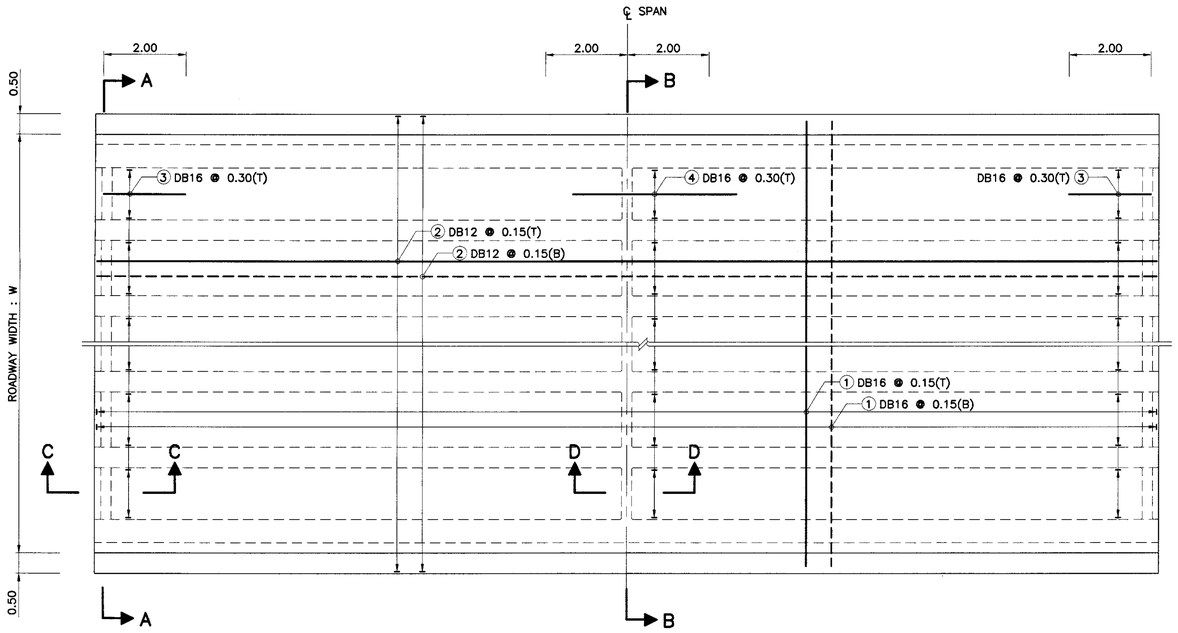
STANDARD DRAWING

I-GIRDER 26.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION

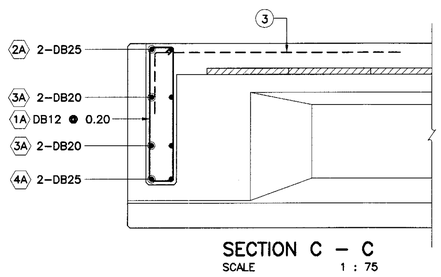
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. NP1-26F/01
SHEET NO. 48

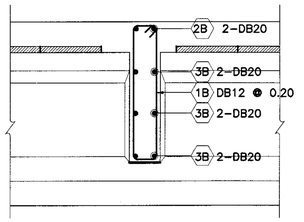
D:\std dwg 2015\NP1-26F-01(REV00)



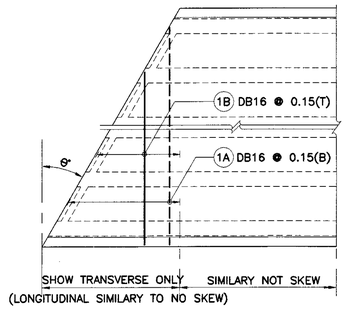
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

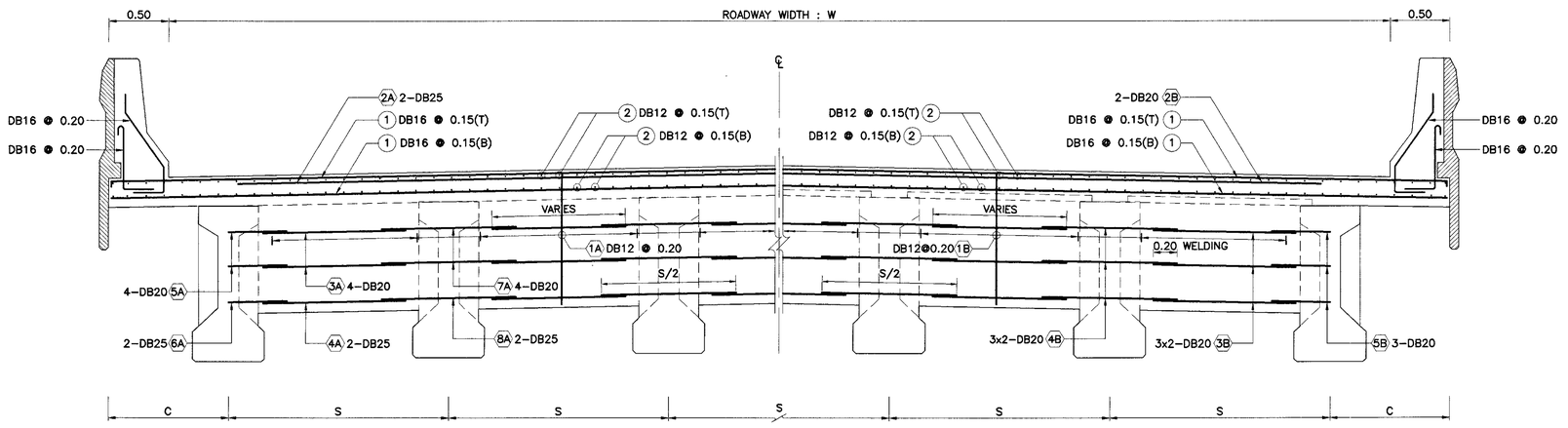
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19 / 1.09 / 1A
2A	DB25	W+1.00–2C — 2A
3A	DB20	S/2+0.40 — 3A
4A	DB25	S/2+0.40 — 4A
5A	DB20	S/4+0.10 — 0.19 — 5A
6A	DB25	S/4+0.10 — 6A
7A	DB20	S/2 — 7A, 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.09 / 1B
2B	DB20	W+1.00–2C — 2B
3B	DB20	S/2+0.40 — 3B
4B	DB20	S/2 — 4B
5B	DB20	S/4+0.10 — 0.19 — 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70 — 1
2	DB12	25.91 — 2
3	DB16	2.00 — 3 — 0.50
4	DB16	4.00 — 4



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO.I NP1–26F/01 AND NP1–26F/03 TO NP1–26F/07

REF.	REVISION	SIGNATURE	DATE

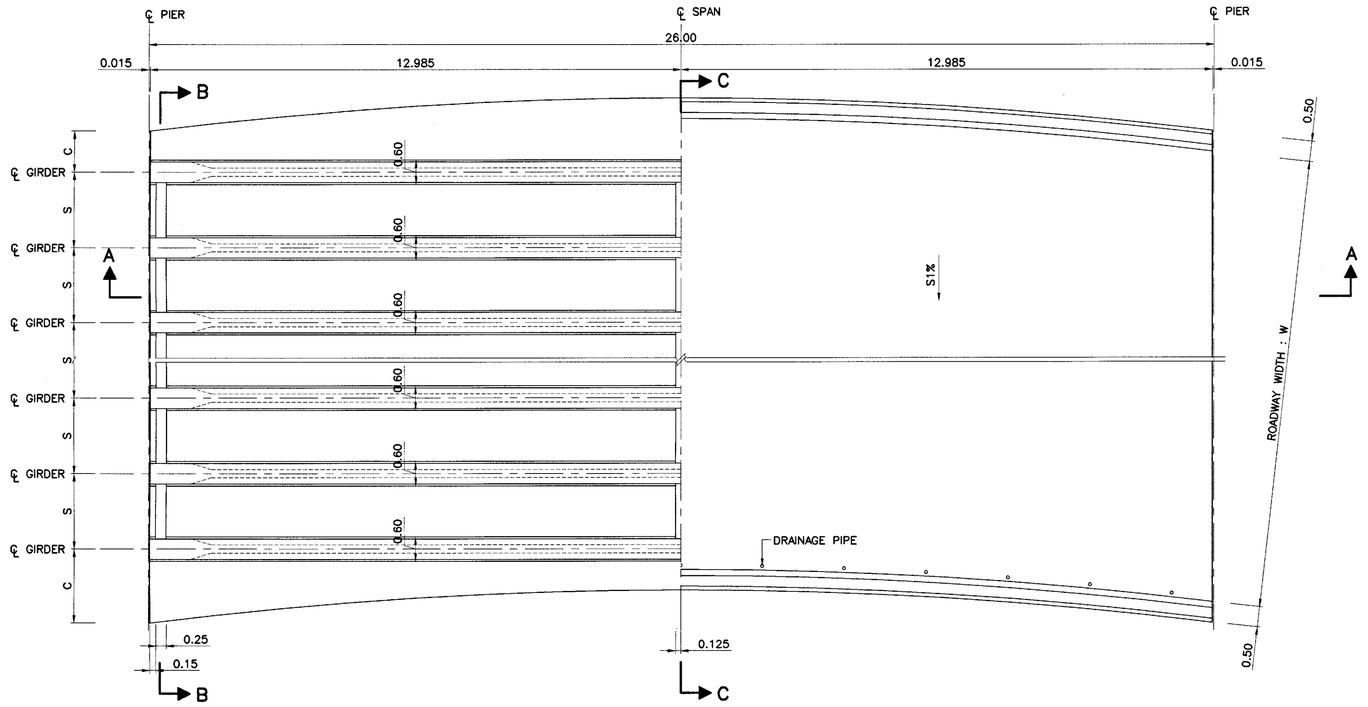
KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 26.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–26F/02
		SHEET NO. 49

D:\std dwg 2015\NP1-26F-02(REV00)

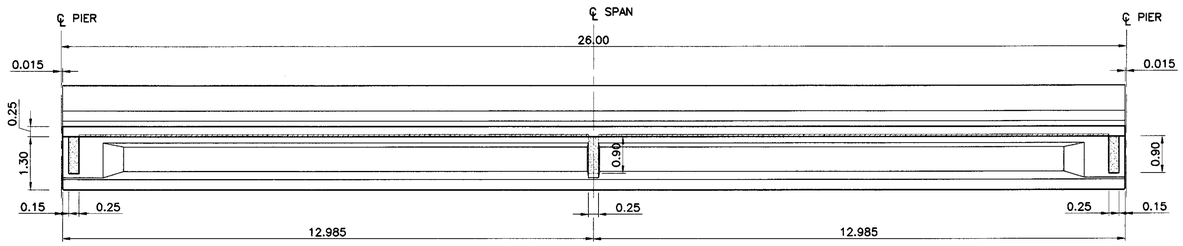


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

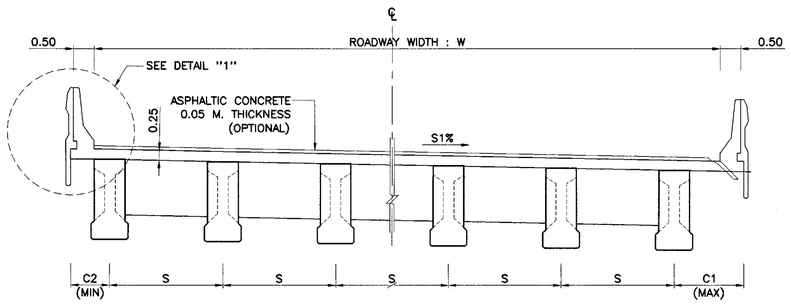
DECK PLAN FOR GIRDER SPAN LENGTH 26.00 M.

SCALE 1 : 75



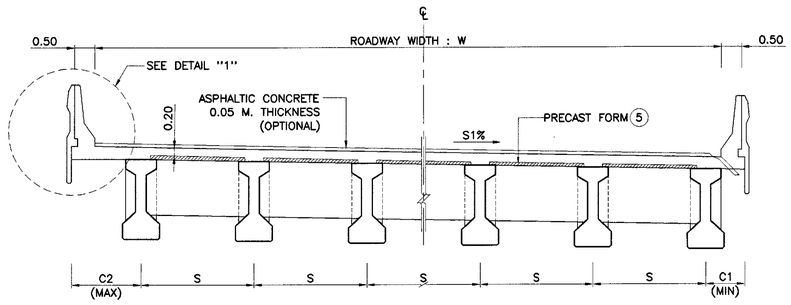
SECTION A – A

SCALE 1 : 75



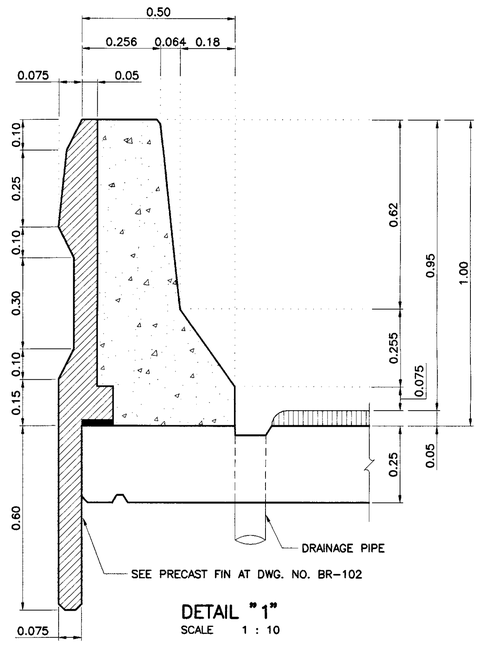
SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	6	1.70 (MAX.)	0.60	1.50	0.60	1.50
10.00	7	1.70 (MAX.)	0.60	1.50	0.60	1.50
11.00	7	1.70 (MAX.)	0.60	1.50	0.60	1.50
12.00	8	1.70 (MAX.)	0.60	1.50	0.60	1.50
15.00	10	1.70 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	1.70 (MAX.)	0.60	1.50	0.60	1.50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-26F/01 , NP1-26F/02 AND NP1-26F/04 TO NP1-26F/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

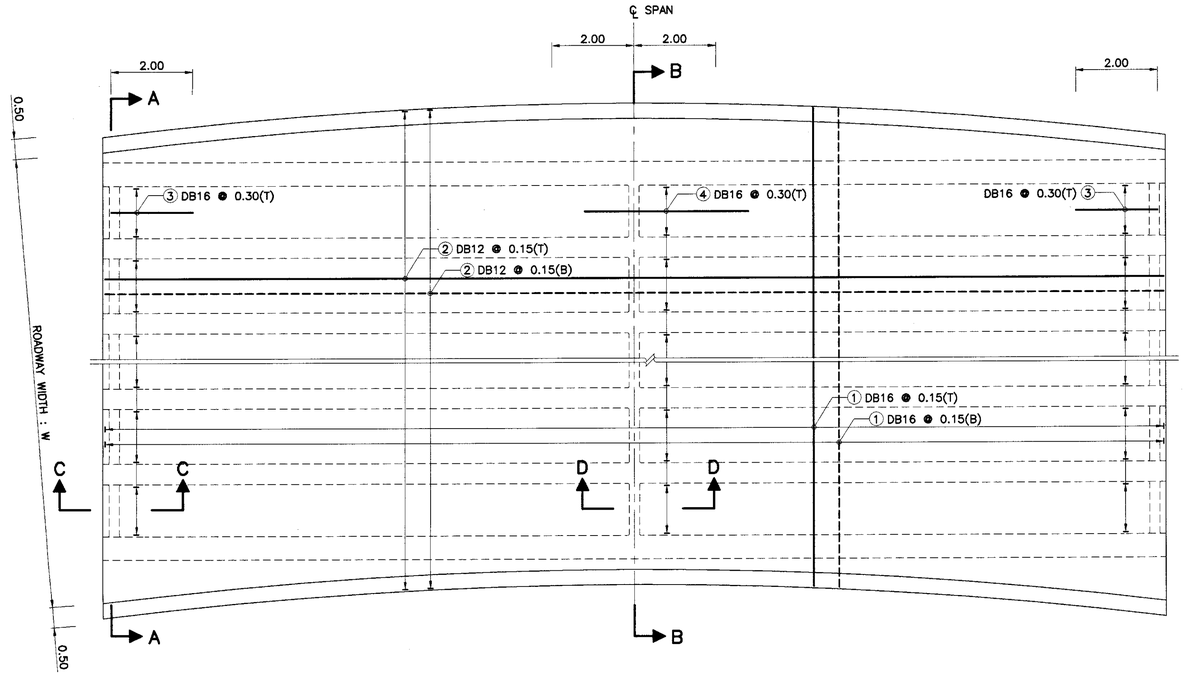
STANDARD DRAWING

I-GIRDER 26.00 M. (FULL JOINT)

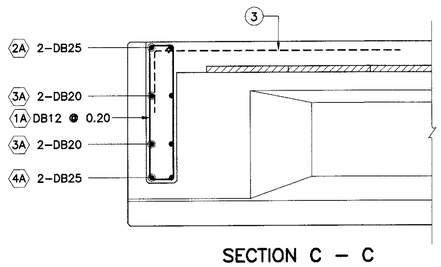
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1-26F/03
		SHEET NO. 50

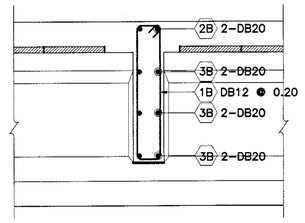
D:\std dwg 2015\NP1-26F-03(REV00)



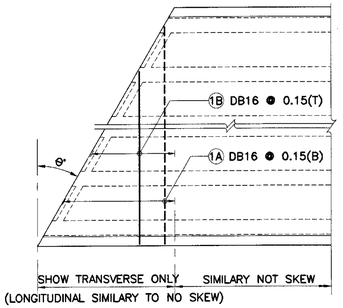
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75



SKEW REINFORCEMENT
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

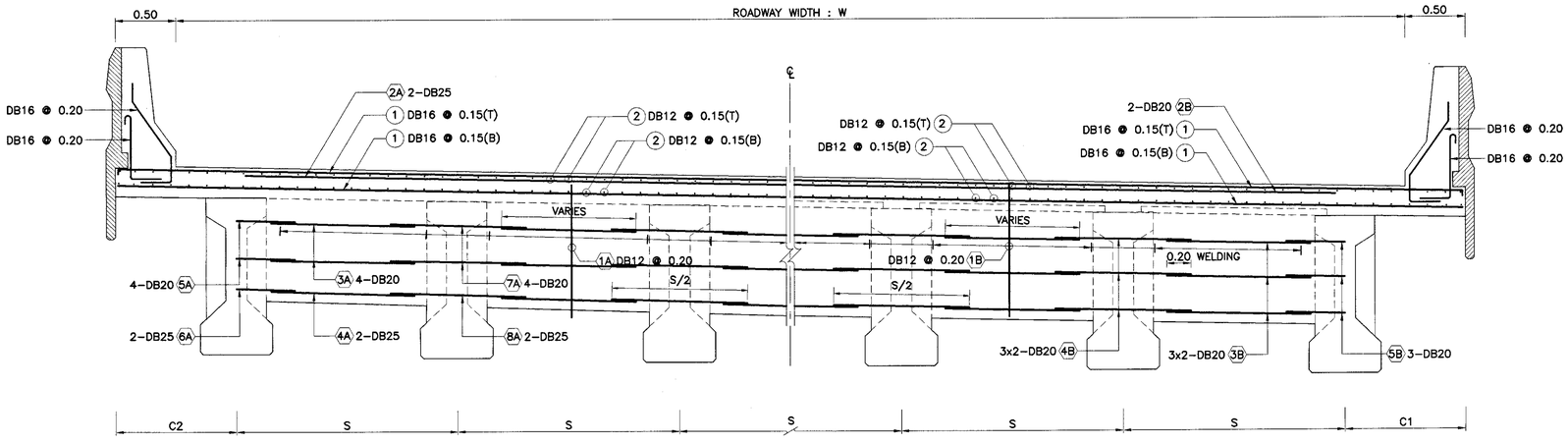
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19 / 1.09 / 1A
2A	DB25	W+1.00–C1–C2 — 2A
3A	DB20	S/2+0.40 — 3A
4A	DB25	S/2+0.40 — 4A
5A	DB20	S/4+0.10 — 0.19 — 5A
6A	DB25	S/4+0.10 — 6A
7A	DB20	S/2 — 7A, 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.09 / 1B
2B	DB20	W+1.00–C1–C2 — 2B
3B	DB20	S/2+0.40 — 3B
4B	DB20	S/4+0.10 — 0.19 — 5B
5B	DB20	S/2 — 4B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70 — 1
2	DB12	25.91 — 2
3	DB16	2.00 — 3 — 0.50
4	DB16	4.00 — 4



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–26F/01 TO NP1–26F/03 AND NP1–26F/05, NP1–26F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

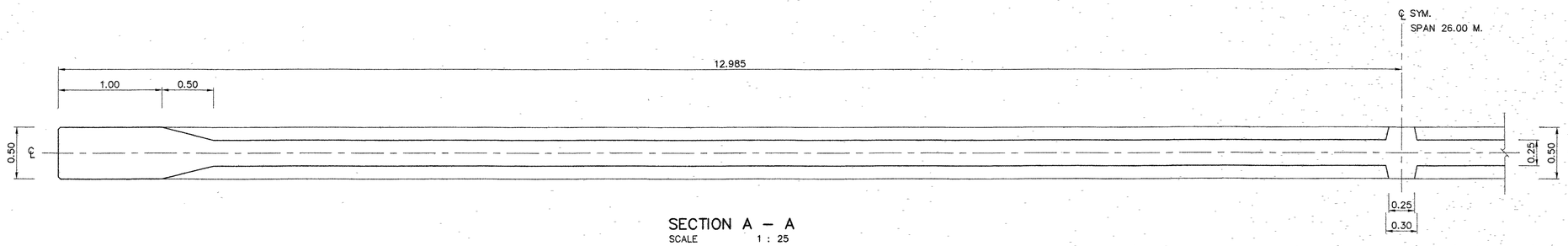
STANDARD DRAWING

I–GIRDER 26.00 M. (FULL JOINT)

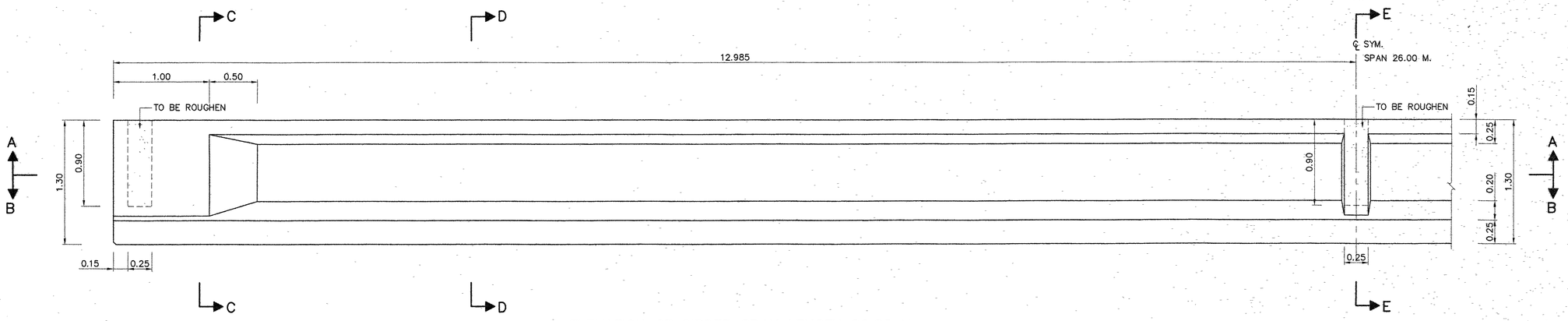
BRIDGE DECK REINFORCEMENT (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–26F/04
		SHEET NO. 51

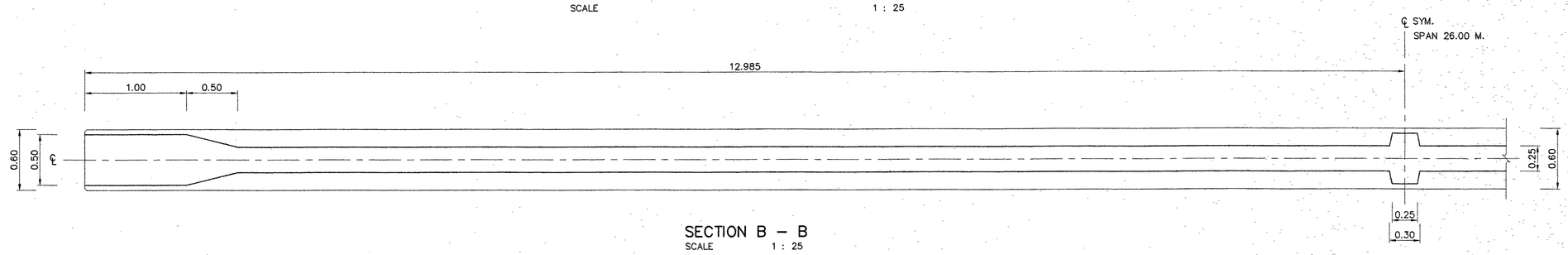
D:\std dwg 2015\NP1-26F-04(REV00)



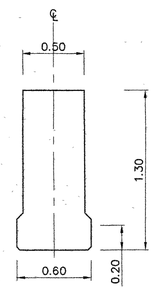
SECTION A – A
SCALE 1 : 25



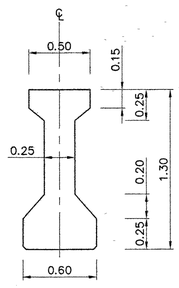
ELEVATION OF GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25



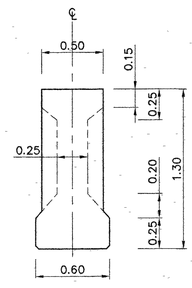
SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST TENSION I–GIRDER BEAM SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NP1–26F/01 TO NP1–26F/04 AND NP1–26F/06 , NP1–26F/07

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

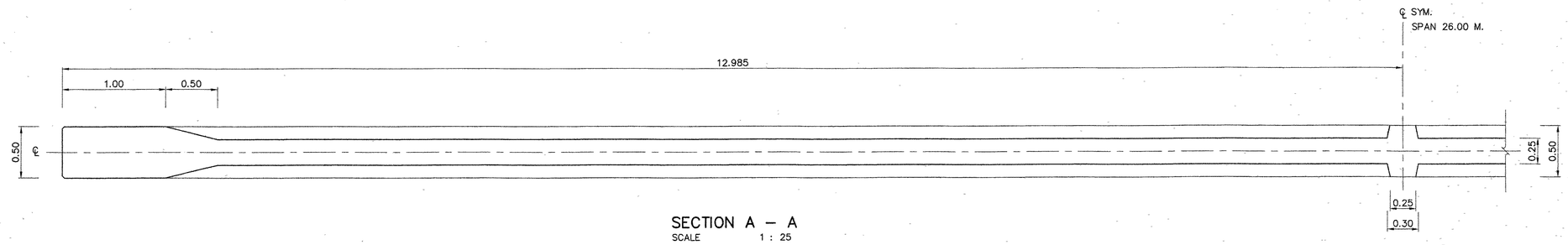
STANDARD DRAWING

I–GIRDER 26.00 M. (FULL JOINT)

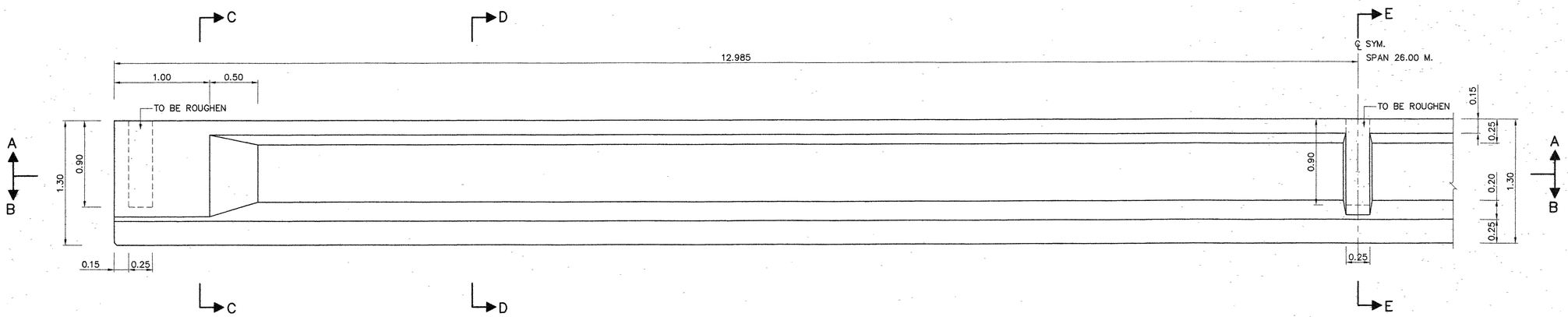
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP1–26F/05
		SHEET NO. 52/R1

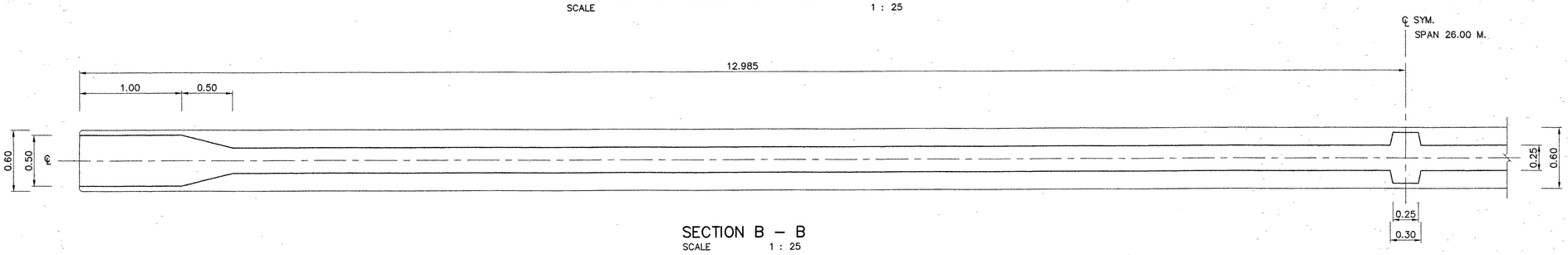
D:\std dwg 2015\NP1-26F-05(REV01)



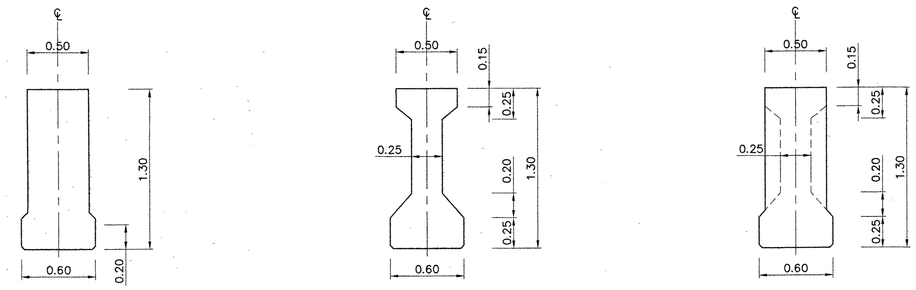
SECTION A – A
SCALE 1 : 25



ELEVATION OF GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

หมายเหตุ :

1. มิติที่ระบุไว้ในแบบทั้งหมดมีหน่วยเป็นเมตร เว้นแต่ระบุไว้เป็นอย่างอื่น
2. น้ำหนักบรรทุกจรที่ใช้ในการออกแบบ: HL–93.
3. คานคอนกรีตอัดแรง I–GIRDER ชนิดดึงเหล็กทีหลัง จะต้องมีกำลังอัดประลัยต่ำสุดเท่ากับ 45 เมกะปาสคาล (459 กก./ซม.^{2}) ของแท่งตัวอย่างคอนกรีตรูปทรงลูกบาศก์ที่อายุ 28 วัน
4. แบบแผ่นนี้ใช้ประกอบกับแบบเลขที่ NP1–26F/01 ถึง NP1–26F/04 และ NP1–26F/06 , NP1–26F/07

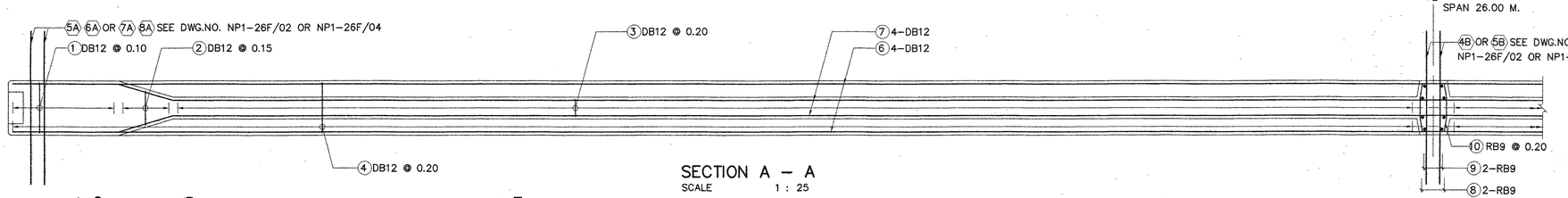
REV.1	REVISION 1/2018		FEB2018
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

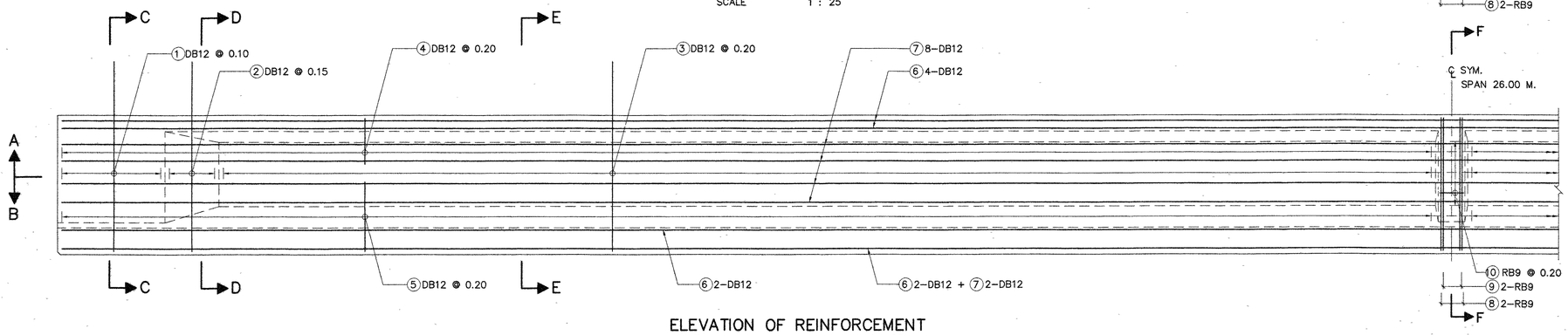
STANDARD DRAWING
I–GIRDER 26.00 M. (FULL JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–26F/05
		SHEET NO. 52/R1

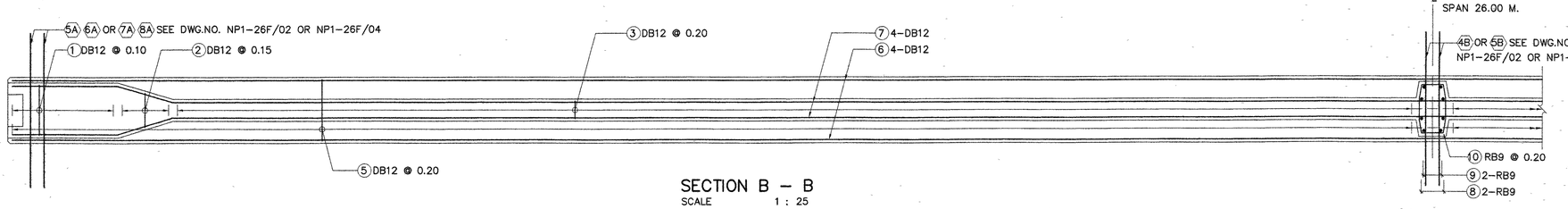
D:\std dwg 2015\NP1-26F-05(REV01)-Th



SECTION A – A
SCALE 1 : 25



ELEVATION OF REINFORCEMENT
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	RB9	
9	RB9	
10	RB9	

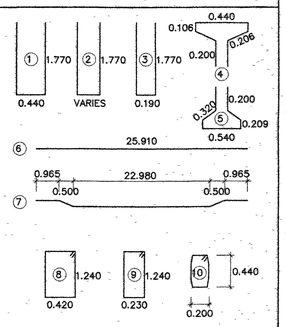
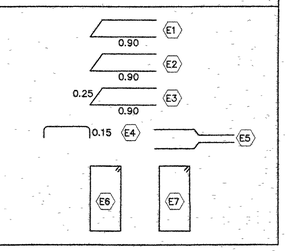
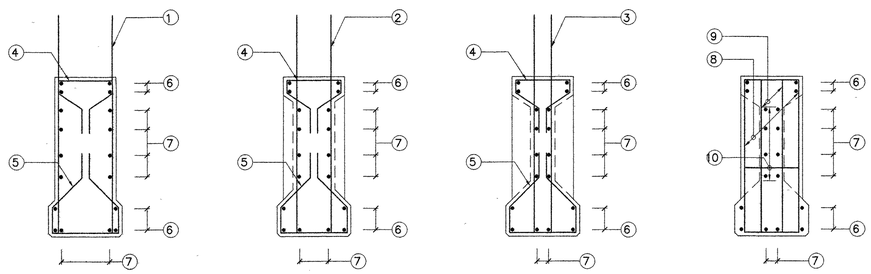


TABLE OF EXTRA REINFORCEMENT AT THE END

BAR NO.	SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	DB16	
E6	DB16	
E7	DB12	



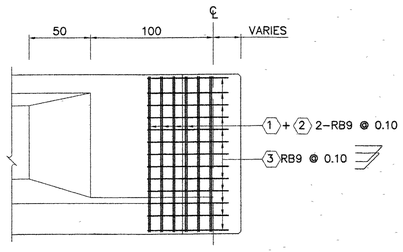


SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

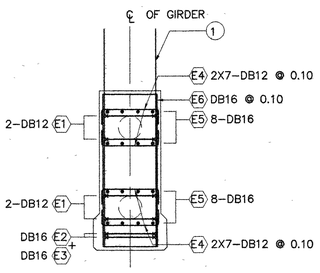
SECTION F – F
SCALE 1 : 25



SECTION 1 – 1
SCALE 1 : 25

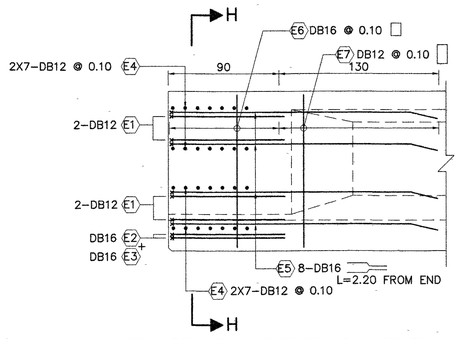
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST TENSION I–GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP1–26F/02 OR NP1–26F/04
5. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP1–26F/01 TO NP1–26F/05 AND NP1–26F/07

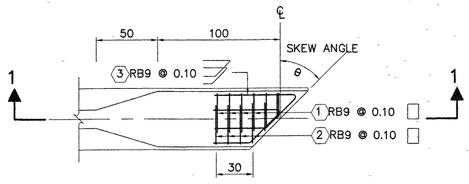


SECTION H – H
SCALE 1 : 25

EXTRA REINFORCEMENT AT THE END (FRONT VIEW)
SCALE 1 : 25



EXTRA REINFORCEMENT AT THE END (SIDE VIEW)
SCALE 1 : 25



EXTRA REINFORCEMENT AT THE END (FOR SKEW GIRDER)
SCALE 1 : 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

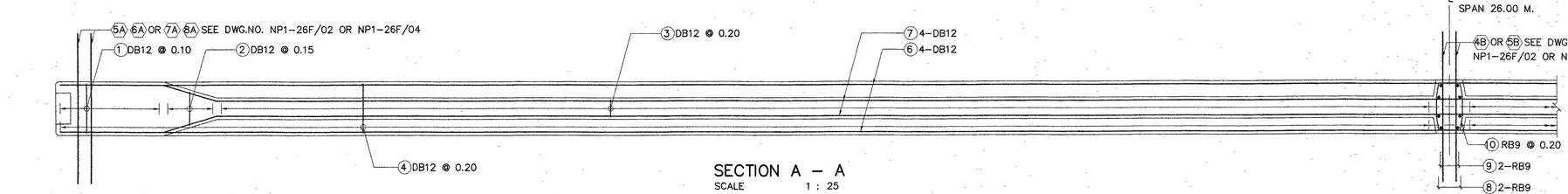
STANDARD DRAWING

I–GIRDER 26.00 M. (FULL JOINT)

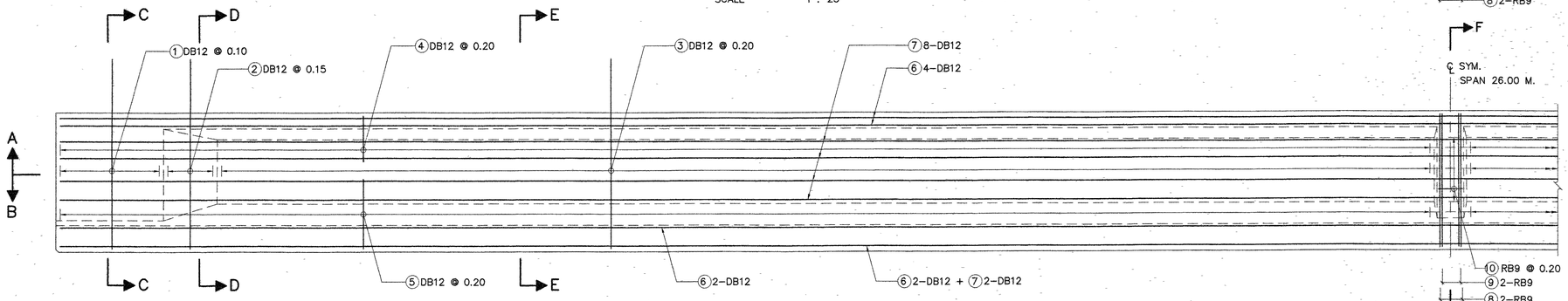
GIRDER REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
	SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
REV.1 REVISION 1/2018		FEB2018	DWG NO. NP1–26F/06
REF. REVISION	APPROVED : (FOR DIRECTOR GENERAL)	SIGNATURE DATE	SHEET NO. 53/R1

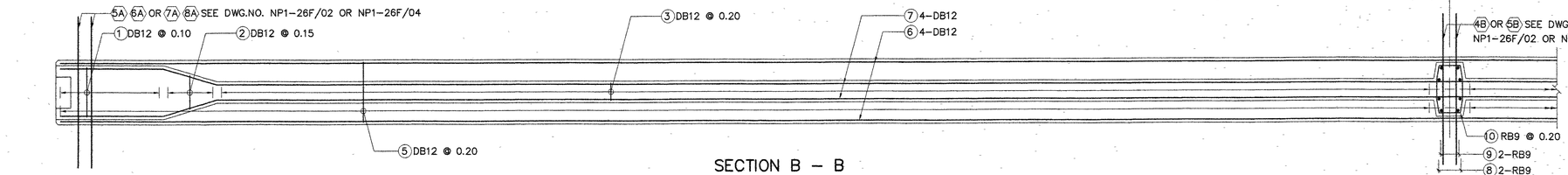
D:\std dwg 2015\NP1-26F-06(REV01)



SECTION A – A
SCALE 1 : 25



ELEVATION OF REINFORCEMENT
SCALE 1 : 25



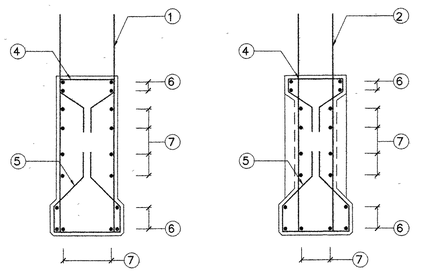
SECTION B – B
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	RB9	
9	RB9	
10	RB9	

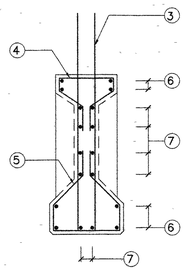
TABLE OF EXTRA REINFORCEMENT AT THE END

BAR NO.	SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	DB16	
E6	DB16	
E7	DB12	

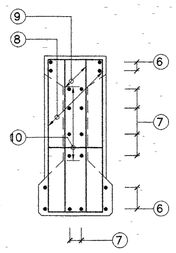


SECTION C – C
SCALE 1 : 25

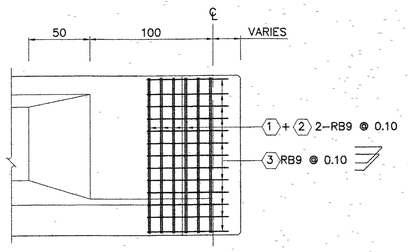
SECTION D – D
SCALE 1 : 25



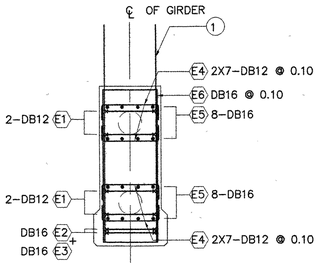
SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25

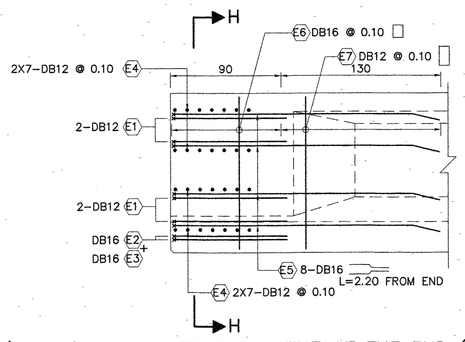


SECTION 1 – 1
SCALE 1 : 25

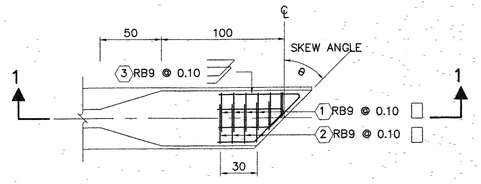


SECTION H – H
SCALE 1 : 25

EXTRA REINFORCEMENT AT THE END (FRONT VIEW)
SCALE 1 : 25



EXTRA REINFORCEMENT AT THE END (SIDE VIEW)
SCALE 1 : 25



EXTRA REINFORCEMENT AT THE END (FOR SKEW GIRDER)
SCALE 1 : 25

หมายเหตุ :

1. มิติที่ระบุไว้ในแบบทั้งหมดมีหน่วยเป็นเมตร เว้นแต่ระบุไว้เป็นอย่างอื่น
2. น้ำหนักบรรทุกจรที่ใช้ในการออกแบบ: HL–93.
3. คานคอนกรีตอัดแรง I–GIRDER ชนิดดึงเหล็กที่หลัง จะต้องมีกำลังอัดประลัยต่ำสุดเท่ากับ 45 เมกะปาสคาล (459 กก./ซม.²) ของแท่งตัวอย่างคอนกรีตรูปทรงลูกบาศก์ที่อายุ 28 วัน
4. การฝังเหล็กเสริมหมายเลข 5A, 6A, 5B สำหรับคานตัวนอก และเหล็กเสริมหมายเลข 7A, 8A, 4B สำหรับคานตัวใน ดังแสดงในแบบเลขที่ NP1–26F/02 หรือ NP1–26F/04
5. มุมเอียงของสะพาน ต้องไม่เกิน 45 องศา
6. แบบแผ่นนี้ใช้ประกอบกับแบบเลขที่ NP1–26F/01 ถึง NP1–26F/05 และ NP1–26F/07

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 26.00 M. (FULL JOINT)

GIRDER REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015	
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN	
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–26F/06	
		SHEET NO. 53/R1	

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

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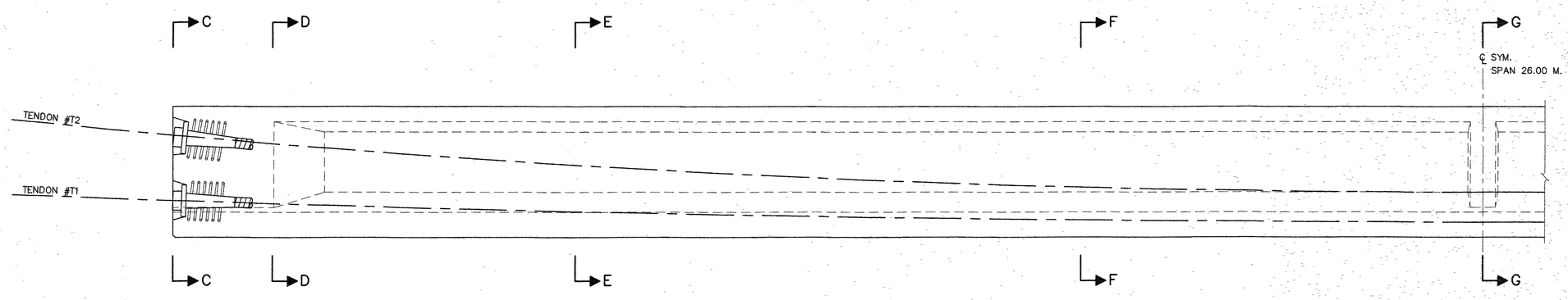
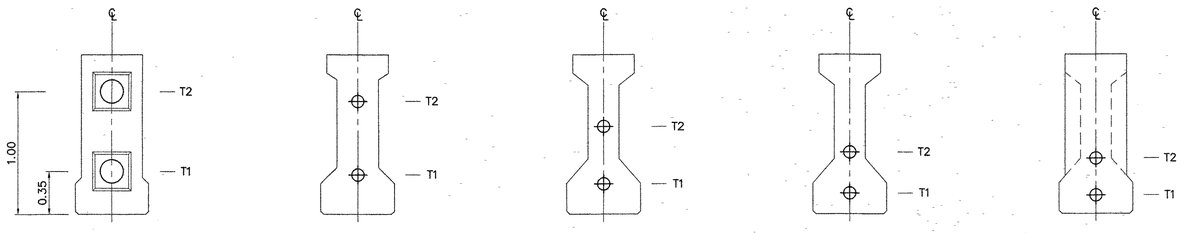


ELEVATION OF CABLE PROFILE GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25

VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER)

DISTANCE (M.)	12.985	12.000	11.000	10.000	9.000	8.000	7.000	6.000	5.000	4.000	3.000	2.000	1.000	0.000
TENDON #T2 (M.)	1.000	0.919	0.844	0.775	0.714	0.658	0.609	0.567	0.531	0.502	0.479	0.463	0.453	0.450
TENDON #T1 (M.)	0.350	0.320	0.293	0.268	0.246	0.226	0.208	0.193	0.180	0.169	0.161	0.155	0.151	0.150



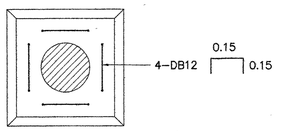
SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

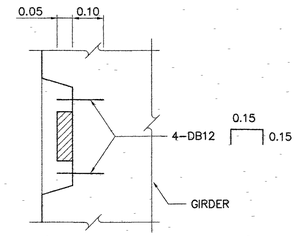
SECTION E – E
SCALE 1 : 25

SECTION F – F
SCALE 1 : 25

SECTION G – G
SCALE 1 : 25



ANCHORAGE PLATE



BLOCKOUT FOR ANCHORAGE PLATE

EXTRA REINFORCEMENT FOR ANCHORAGE PLATE
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST TENSION I–GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 15.2 MM. IN ACCORDANCE WITH TIS.420 GRADE 1860
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 250 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH. IN WHICH THE SEQUENCE OF JACKING SHALL BE TENDON 1 AND THEN TENDON 2. EACH TENDON IS STRESSED BOTH END.
   - 4.3 NUMBER OF PRESTRESSING STRANDS
     - T1 = 14 PRESTRESSING STRANDS
     - T2 = 14 PRESTRESSING STRANDS
5. DUCTS ARE GALVANIZED METAL SHEATHING GROUTED IMMEDIATELY AFTER STRESSING OPERATION.
6. JACKING FORCES ARE CALCULATED USING "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" AND ASSUMED DESIGN PARAMETERS AS FOLLOW :
   - FRICTION CURVATURE COEFFICIENT 0.20
   - FRICTION WOBBLE COEFFICIENT 0.0033 1/M.
   - A WEDGE SLIP 6 MM.
7. THE CONTRACTOR SHALL CARRY OUT TEST WITH THE TENDONS AND DUCTS PROPOSED FOR USING TO ESTABLISH THE FRICTION COEFFICIENTS AND SHALL ADJUST THE STRESSING FORCES FOR APPROVAL IF THE MEASURED COEFFICIENT IS DIFFERED SIGNIFICANTLY FROM THE ASSUME VALUE.
8. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 36 MPa. (367 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
9. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
10. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
11. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
12. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP1–26F/01 TO NP1–26F/06

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 26.00 M. (FULL JOINT)
POSTTENSIONED TENDON PROFILE

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP1–26F/07
		SHEET NO. 54/R1

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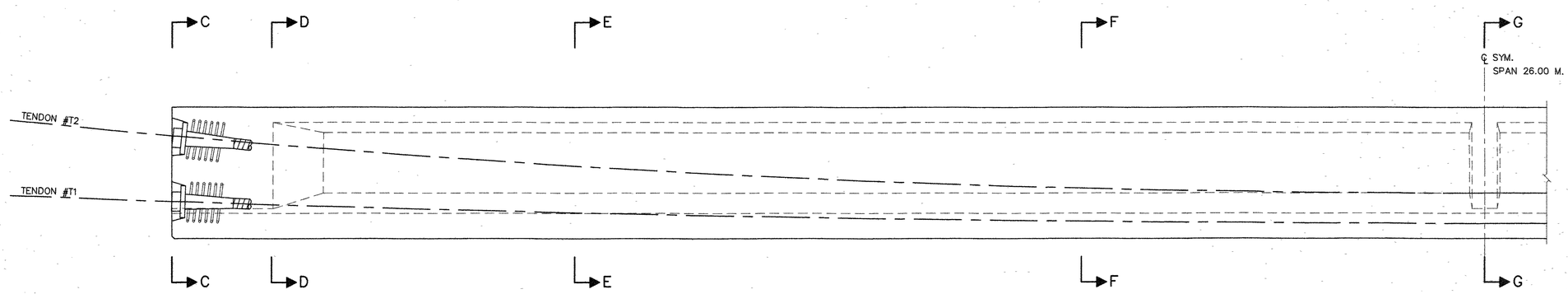
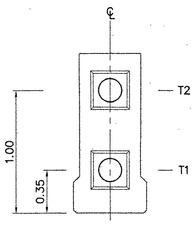


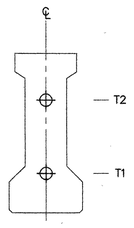
ELEVATION OF CABLE PROFILE GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25

VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER)

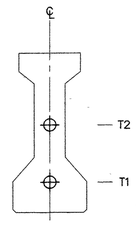
DISTANCE (M.)	12.985	12.000	11.000	10.000	9.000	8.000	7.000	6.000	5.000	4.000	3.000	2.000	1.000	0.000
TENDON #T2 (M.)	1.000	0.919	0.844	0.775	0.714	0.658	0.609	0.567	0.531	0.502	0.479	0.463	0.453	0.450
TENDON #T1 (M.)	0.350	0.320	0.293	0.268	0.246	0.226	0.208	0.193	0.180	0.169	0.161	0.155	0.151	0.150



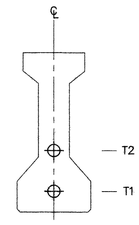
SECTION C – C
SCALE 1 : 25



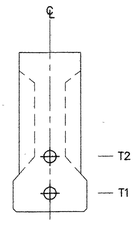
SECTION D – D
SCALE 1 : 25



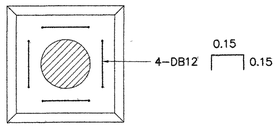
SECTION E – E
SCALE 1 : 25



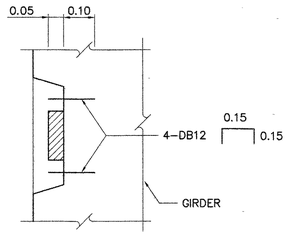
SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



ANCHORAGE PLATE



BLOCKOUT FOR ANCHORAGE PLATE

EXTRA REINFORCEMENT FOR ANCHORAGE PLATE
SCALE 1 : 25

หมายเหตุ :

1. มิติที่ระบุไว้ในแบบทั้งหมดมีหน่วยเป็นเมตร เว้นแต่ระบุไว้เป็นอย่างอื่น
2. น้ำหนักบรรทุกจรที่ใช้ในการออกแบบ: HL–93.
3. คานคอนกรีตอัดแรง I–GIRDER ชนิดดึงเหล็กทีหลัง จะต้องมีกำลังอัดประลัยต่ำสุดเท่ากับ 45 เมกะปาสคาล (459 กก./ซม.^{2}) ของแท่งตัวอย่างคอนกรีตรูปทรงลูกบาศก์ที่อายุ 28 วัน
4. การอัดแรง PRESTRESSING :
   4.1 ลวดอัดแรงดีเกลียวประเภทลายแรงดึงต่ำชนิด 7 เส้น
   (LOW RELAXATION SEVEN WIRE STRANDS) ขนาด ø 15.2 มม. ตาม มอก. 420
   4.2 แรงดึงระบุซึ่งเป็นค่าลักษณะเฉพาะที่ต่ำสุด เท่ากับ 250 กิโลนิวตันต่อเส้น
   4.3 แรงดึงเริ่มแรกขณะถ่ายแรงเท่ากับ 75% ของแรงดึงระบุ โดยดึงลวดที่ปลายทั้งสองข้าง
   T1 = 14 เส้น
   T2 = 14 เส้น
5. ชนิดของท่อร้อยลวดอัดแรงใช้ท่อโลหะเคลือบสังกะสี หลังจากดึงลวดอัดแรงเสร็จให้อัดน้ำปูนทันที
6. แรงดึงลวดคำนวณโดยใช้ตัวแปรตามวิธีการคำนวณของ AASHTO ดังนี้
   ค่าสัมประสิทธิ์แรงเสียดทานระหว่างลวดอัดแรงกับท่อ (FRICTION WOBBLE COEFFICIENT) = 0.0033 1/M.
   ค่าสัมประสิทธิ์แรงเสียดทานเนื่องจากความโค้ง (FRICTION CURVATURE COEFFICIENT) = 0.20
   ระยะเข้าที่ของสมอยึด (A WEDGE SLIP) = 6 MM.
7. ผู้รับจ้างต้องทดสอบคุณสมบัติของลวดอัดแรงและท่อ ให้เป็นไปตามที่ระบุในข้อ 6 หากมีความแตกต่างจากที่ระบุไว้ ผู้รับจ้างต้องคำนวณค่าแรงดึงลวดขณะถ่ายแรงใหม่ และส่งแบบรายละเอียดพร้อมรายการคำนวณดังกล่าวให้คณะกรรมการตรวจการจ้างพิจารณาก่อนดำเนินการ
8. ขณะถ่ายแรงของลวดอัดแรง (JACKING FORCE) ให้ทำได้เมื่อ กำลังอัดประลัยต่ำสุดของคอนกรีตรูปทรงลูกบาศก์ขนาด 15x15x15 ซม. จะต้องไม่น้อยกว่า 36 เมกะปาสคาล (367 กก./ซม.^{2})
9. วิธีการยก ให้ยก ณ จุดยกที่ปลายทั้งสองข้างของคานคอนกรีตอัดแรง และห้ามยกที่จุดกึ่งกลางของคาน
10. ระยะเรียงของคานคอนกรีตอัดแรง I–GIRDER ต้องไม่เกิน 2.00 ม.
11. มุมเฉียงของสะพาน ต้องไม่เกิน 45 องศา
12. แบบนี้ใช้ประกอบกับแบบเลขที่ NP1–26F/01 TO NP1–26F/06

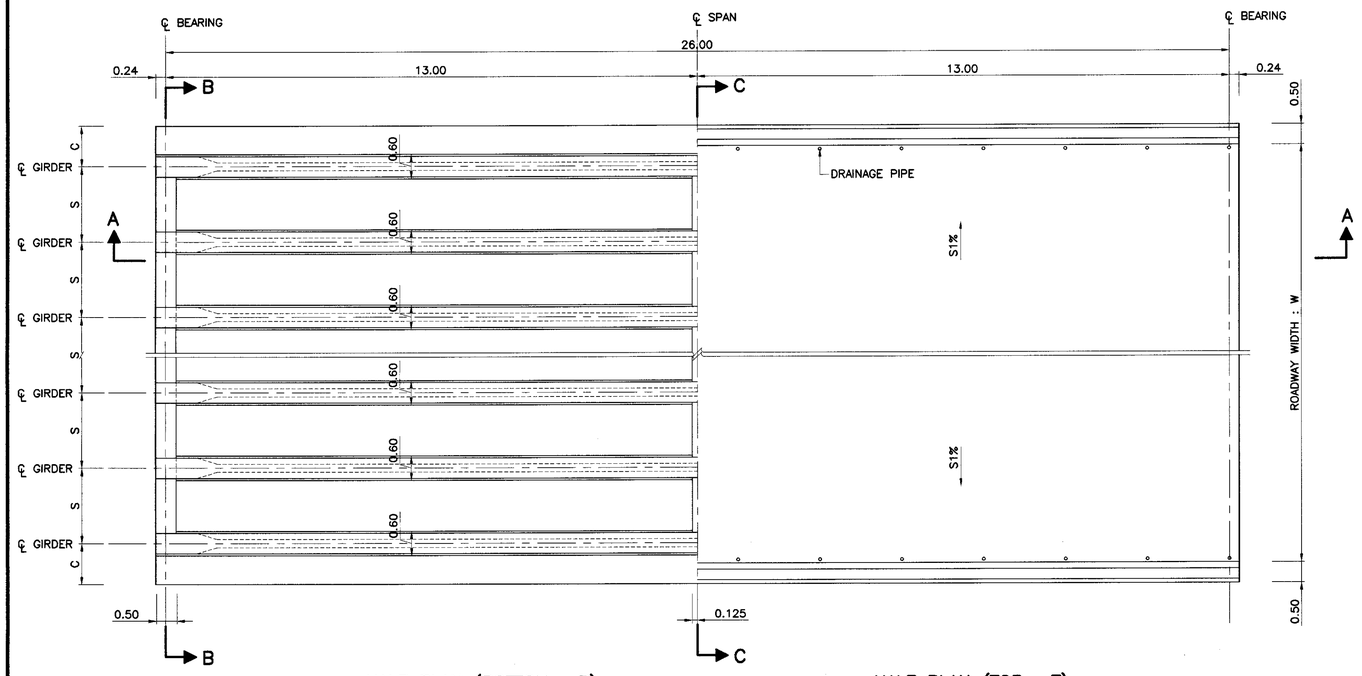
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 26.00 M. (FULL JOINT)
POSTTENSIONED TENDON PROFILE

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015	
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN	
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–26F/07	
		SHEET NO. 54/R1	

REV.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018
REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\NP1-26F-07(REV01) - TH

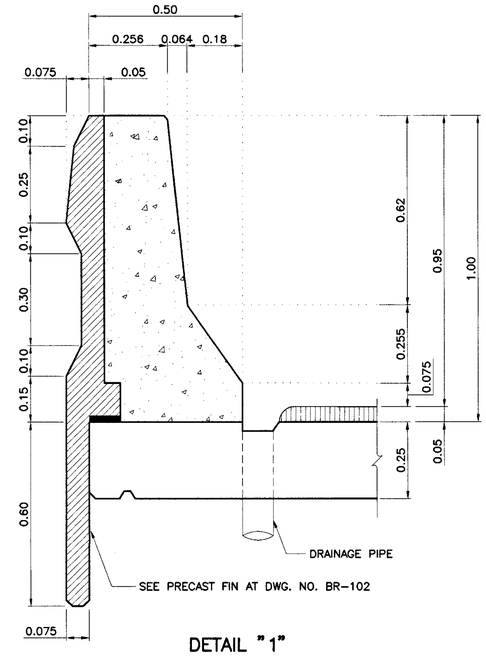


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

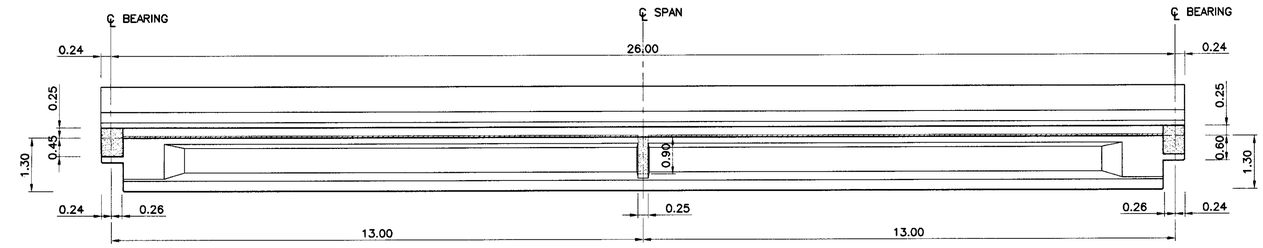
DECK PLAN FOR GIRDER SPAN LENGTH 16.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

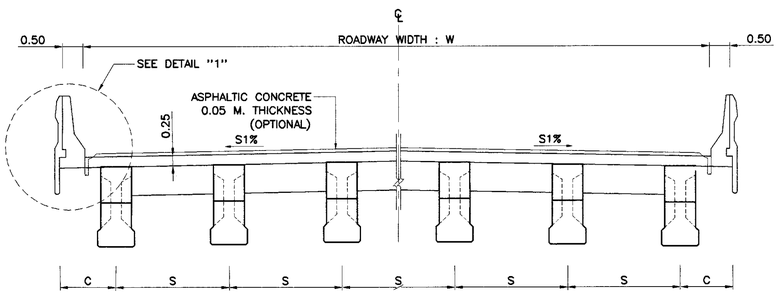
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	5 @ 1.60	1.00
10.00	6	6 @ 1.50	1.00
11.00	7	2 @ 1.66 4 @ 1.67	1.00
12.00	8	6 @ 1.57 1 @ 1.58	1.00
15.00	10	5 @ 1.56 4 @ 1.55	1.00
VARIES	n	2.00 (MAX.)	1.00

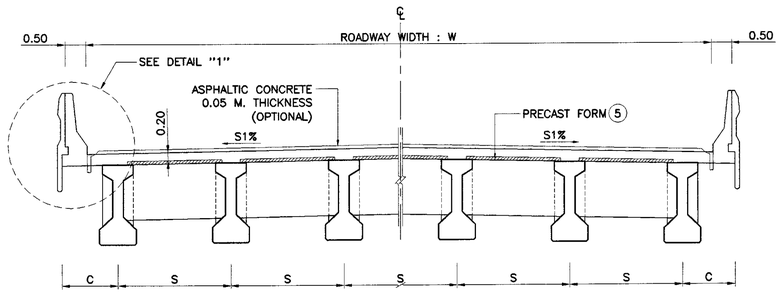
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-26H/02 TO NP1-26H/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 26.00 M. (HALF JOINT) BRIDGE DECK DIMENSION

REF.	REVISION	SIGNATURE	DATE

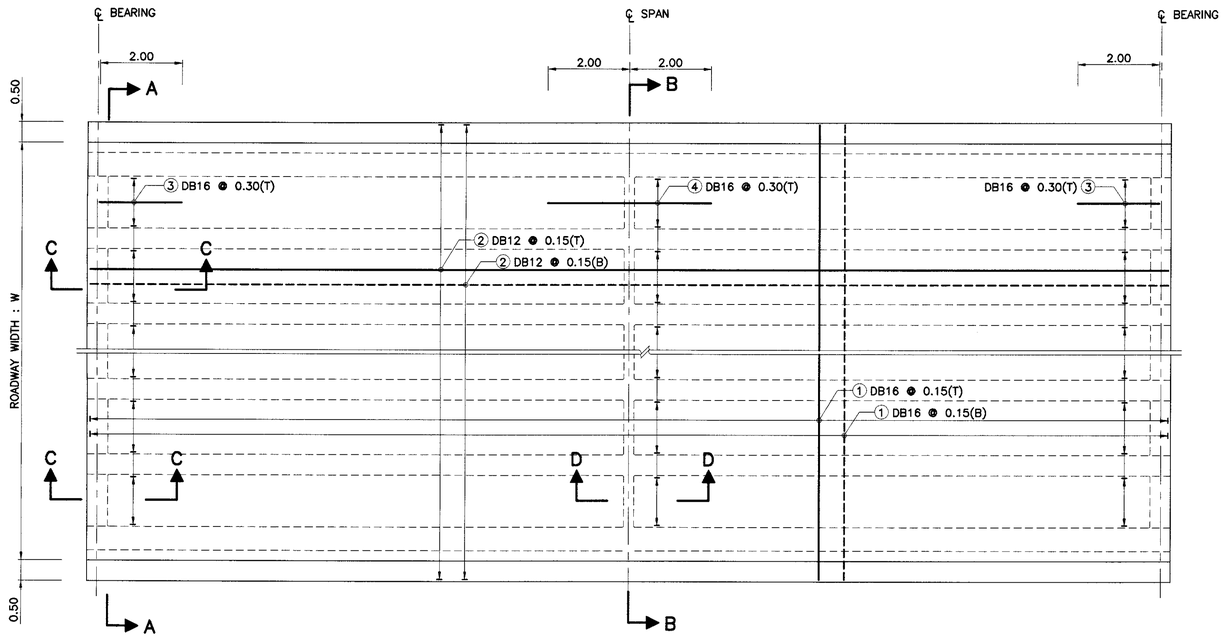
DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

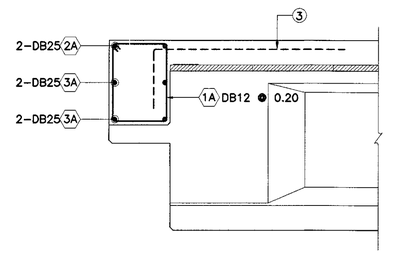
APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. NP1-26H/01

SHEET NO. 55

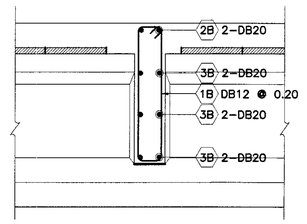
D:\std dwg 2015\NP1-26H-01(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

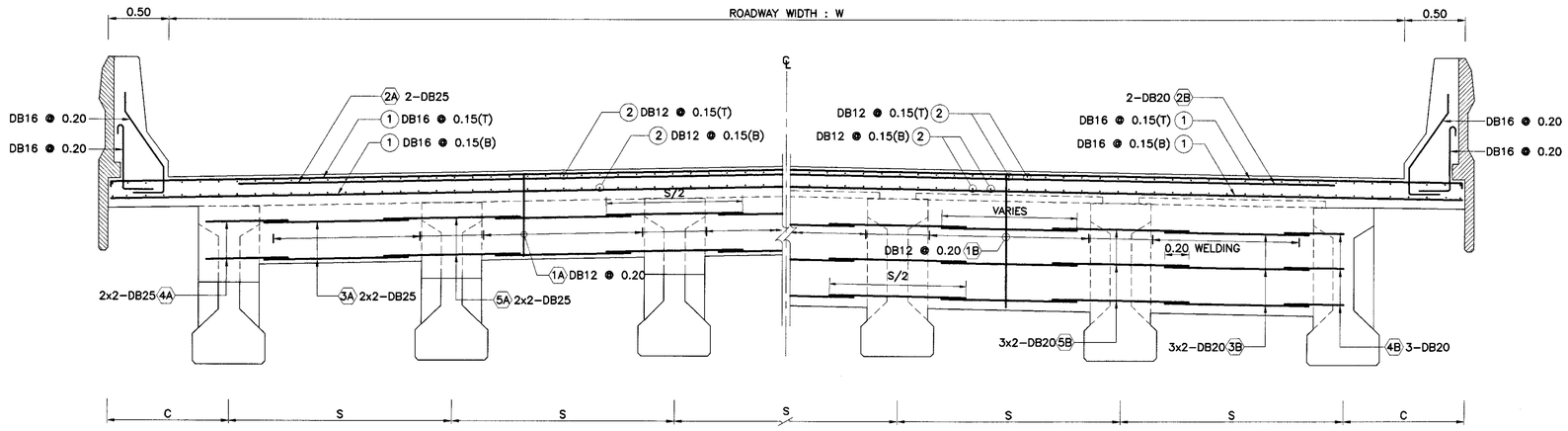
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.54, 1A, S/4+0.10, 4A; W+1.00–2C (2A); S/2+0.40 (3A); S/2 (5A)
2A	DB25	
3A	DB25	
4A	DB25	
5A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B, S/4+0.10, 0.19, 4B; W+1.00–2C (2B); S/2+0.40 (3B); S/2 (5B)
2B	DB20	
3B	DB20	
4B	DB20	
5B	DB20	

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70 ①
②	DB12	26.40 ②
③	DB16	2.00 ③, 0.50, 4.00 ④
④	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–26H/01 AND NP1–26H/03 TO NP1–26H/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 26.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT

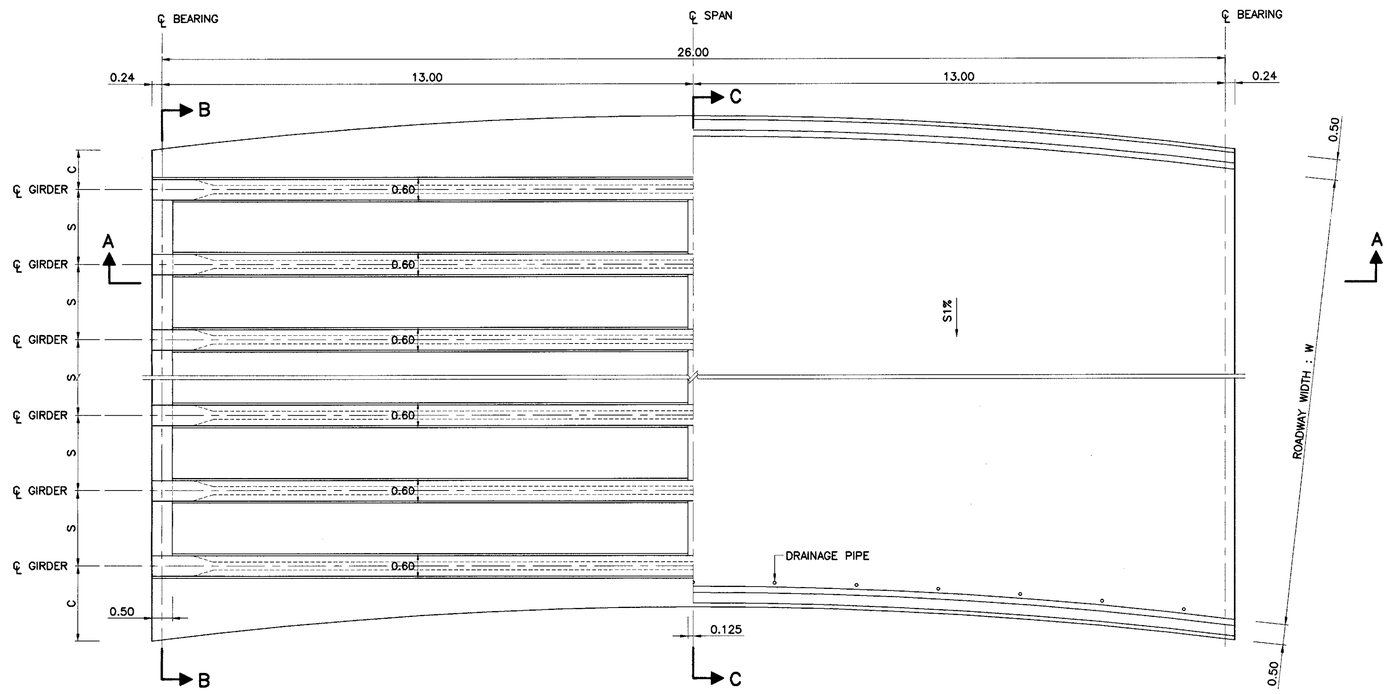
DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. NP1–26H/02

SHEET NO. 56

D:\std dwg 2015\NP1-26H-02(REV00)

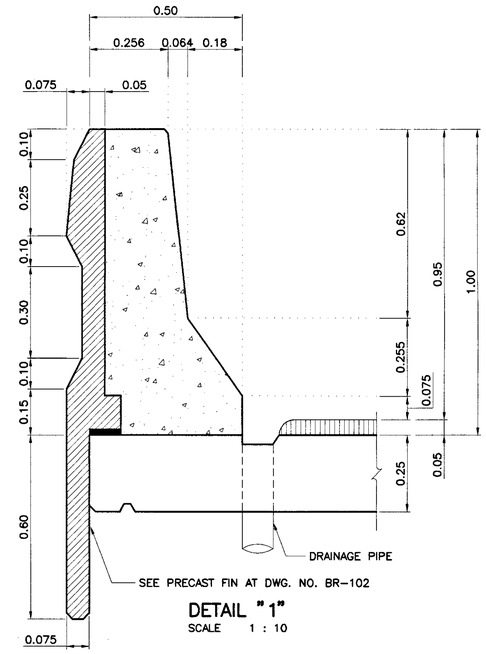


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 16.00 M.

SCALE 1 : 75



DETAIL "1"

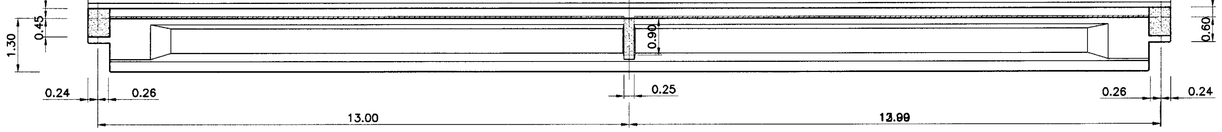
SCALE 1 : 10

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	1.70 (MAX.)	0.60	1.50	0.60	1.50
10.00	7	1.70 (MAX.)	0.60	1.50	0.60	1.50
11.00	7	1.70 (MAX.)	0.60	1.50	0.60	1.50
12.00	8	1.70 (MAX.)	0.60	1.50	0.60	1.50
15.00	10	1.70 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	1.70 (MAX.)	0.60	1.50	0.60	1.50

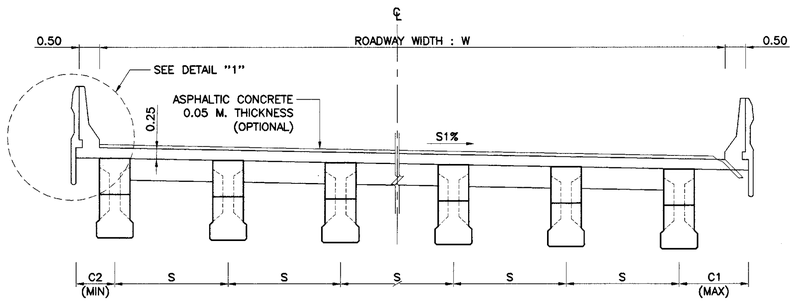
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP1-26H/01 , NP1-26H/02 AND NP1-26H/04 TO NP1-26H/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



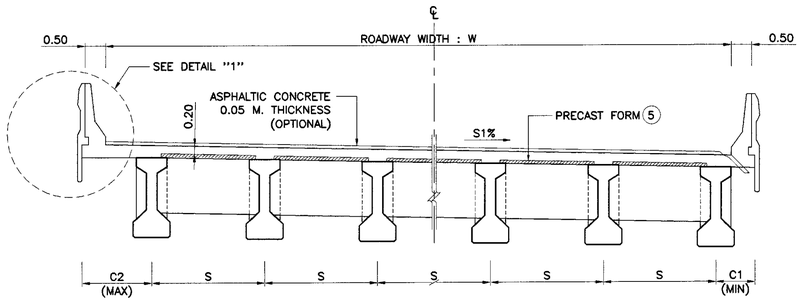
SECTION A – A

SCALE 1 : 75



SECTION B – B

SCALE 1 : 75



SECTION C – C

SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 26.00 M. (HALF JOINT)

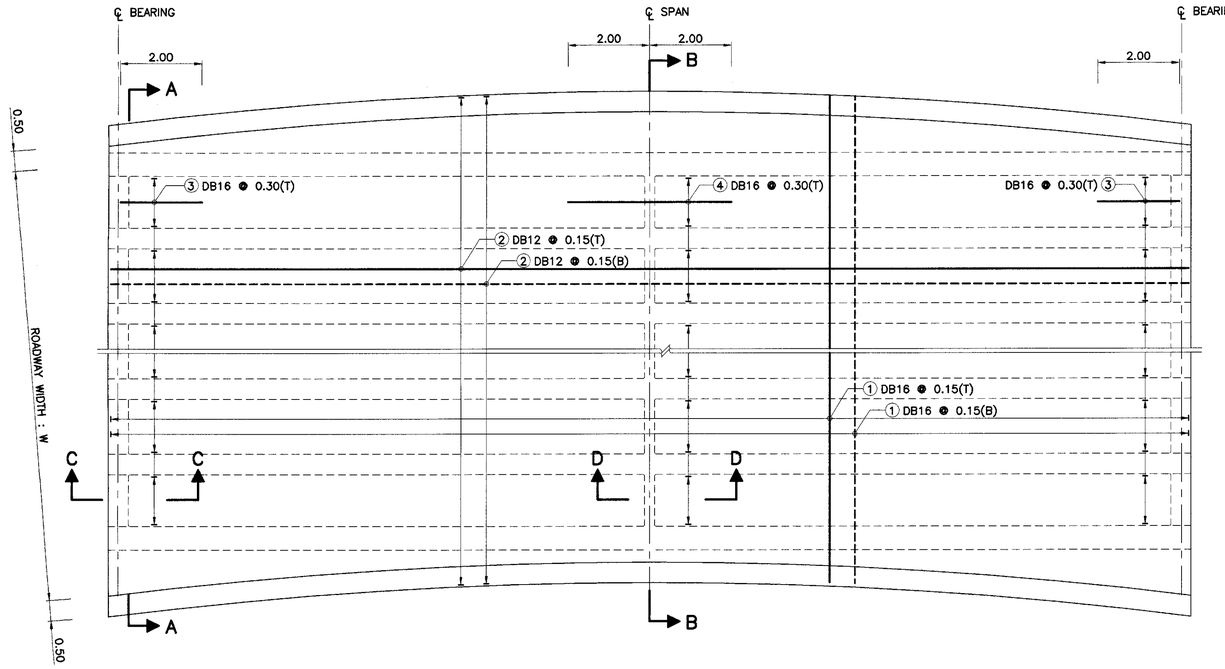
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

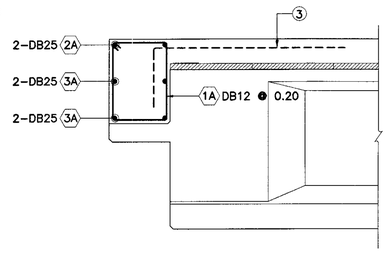
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO.NP1-26H/03 | SHEET NO. 57

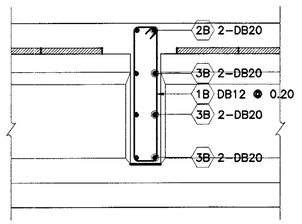
D:\std dwg 2015\NP1-26H-03(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75



SECTION D – D
SCALE 1 : 75

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

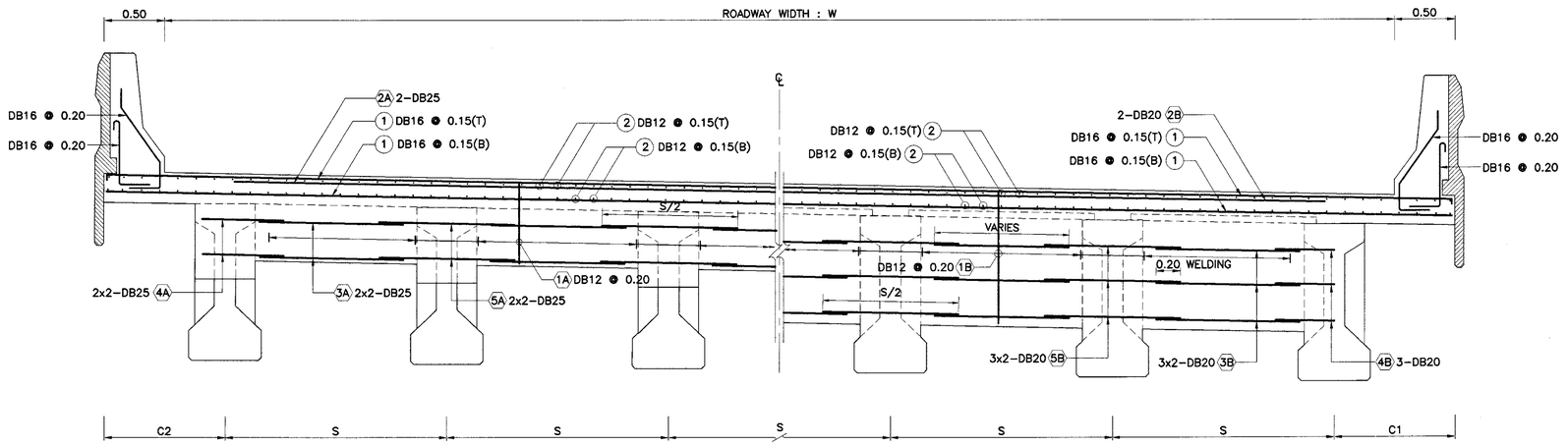
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.54, 1A
2A	DB25	W+1.00−2C, 2A
3A	DB25	S/2+0.40, 3A
4A	DB25	S/4+0.10, 4A
5A	DB25	S/2, 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

NO	BAR SIZE	SHAPE
1B	DB12	0.19, 1.09, 1B
2B	DB20	W+1.00−2C, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/4+0.10, 0.19, 4B
5B	DB20	S/2, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70, ①
②	DB12	26.40, ②
③	DB16	2.00, 0.50, 4.00, ③, ④
④	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP1–26H/01 TO NO. NP1–26H/03 AND NP1–26H/05 TO NO. NP1–26H/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

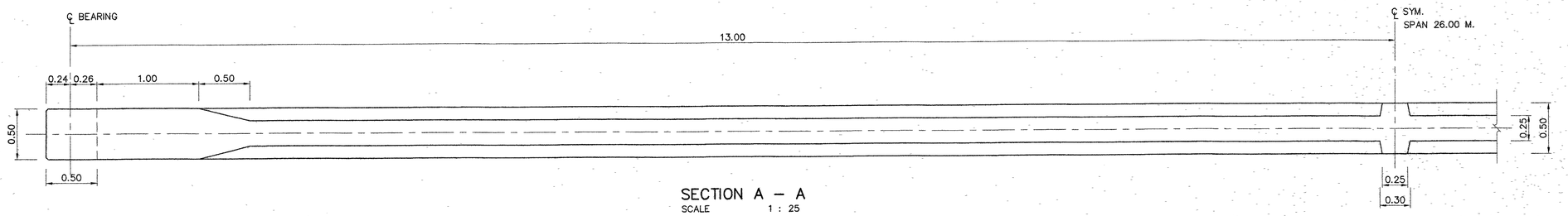
STANDARD DRAWING

I–GIRDER 26.00 M. (HALF JOINT)

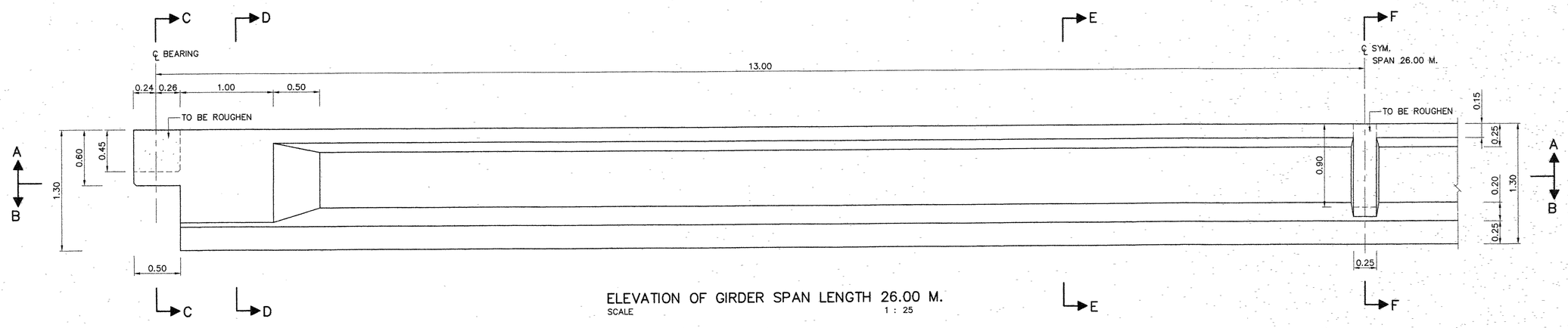
BRIDGE DECK REINFORCEMENT (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP1–26H/04
		SHEET NO. 58

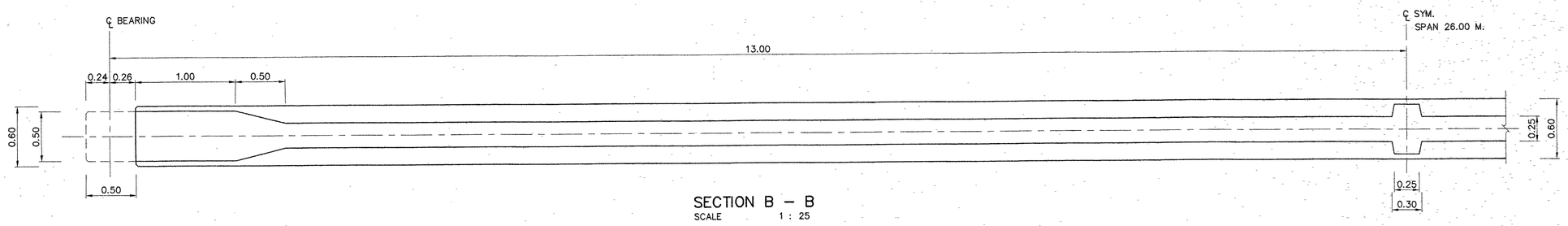
D:\std dwg 2015\NP1-26H-04(REV00)



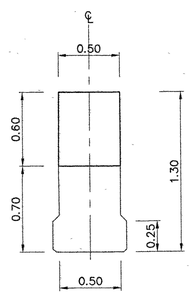
SECTION A – A
SCALE 1 : 25



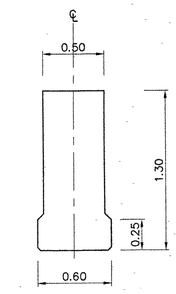
ELEVATION OF GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25



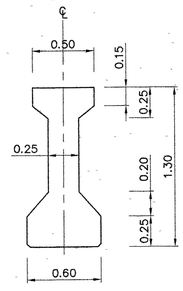
SECTION B – B
SCALE 1 : 25



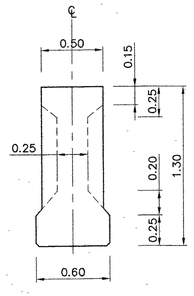
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25

หมายเหตุ :

1. มิติที่ระบุไว้ในแบบทั้งหมดมีหน่วยเป็นเมตร เว้นแต่ระบุไว้เป็นอย่างอื่น
2. น้ำหนักบรรทุกจรที่ใช้ในการออกแบบ: HL–93.
3. คานคอนกรีตอัดแรง I–GIRDER ชนิดดึงเหล็กทีหลัง จะต้องมีกำลังอัดประลัยต่ำสุดเท่ากับ 45 เมกะปาสคาล (459 กก./ซม.²) ของแท่งตัวอย่างคอนกรีตรูปทรงลูกบาศก์ที่อายุ 28 วัน
4. แบบแผ่นนี้ใช้ประกอบกับแบบเลขที่ NP1–26H/01 ถึง NP1–26H/04 และ NP1–26H/06 , NP1–26H/07

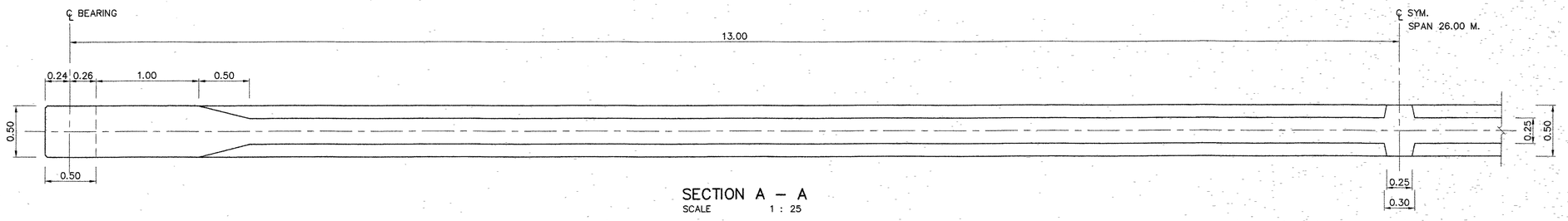
REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

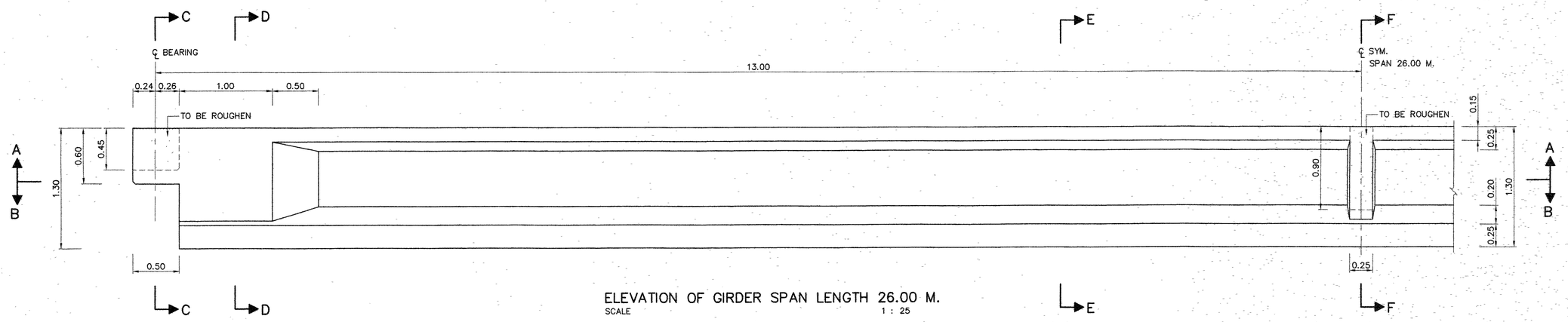
STANDARD DRAWING
I–GIRDER 26.00 M. (HALF JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1–26H/05
		SHEET NO. 59/R1

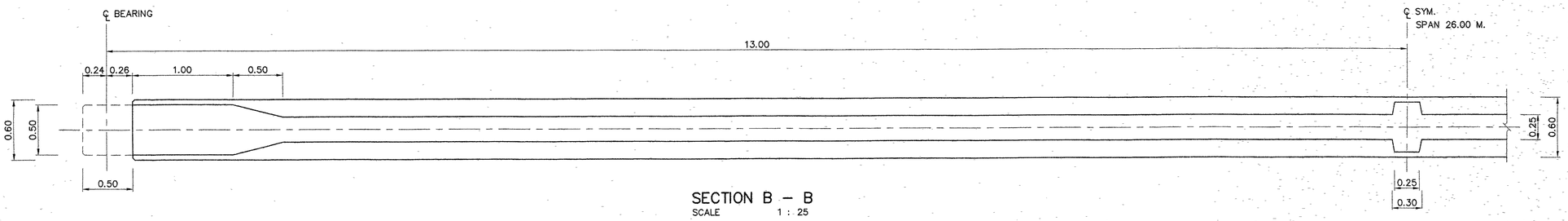
D:\std dwg 2015\NP1–26H–05(REV01) – TH



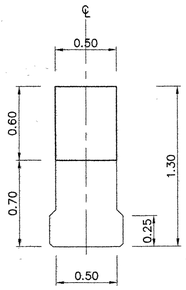
SECTION A – A
SCALE 1 : 25



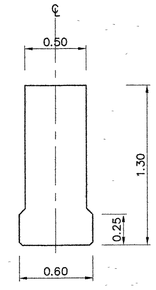
ELEVATION OF GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25



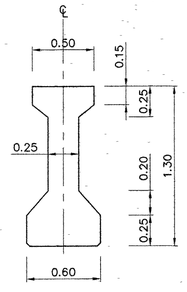
SECTION B – B
SCALE 1 : 25



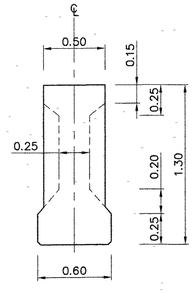
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST TENSION I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP1–26H/01 TO NP1–26H/04 AND NP1–26H/06 , NP1–26H/07

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

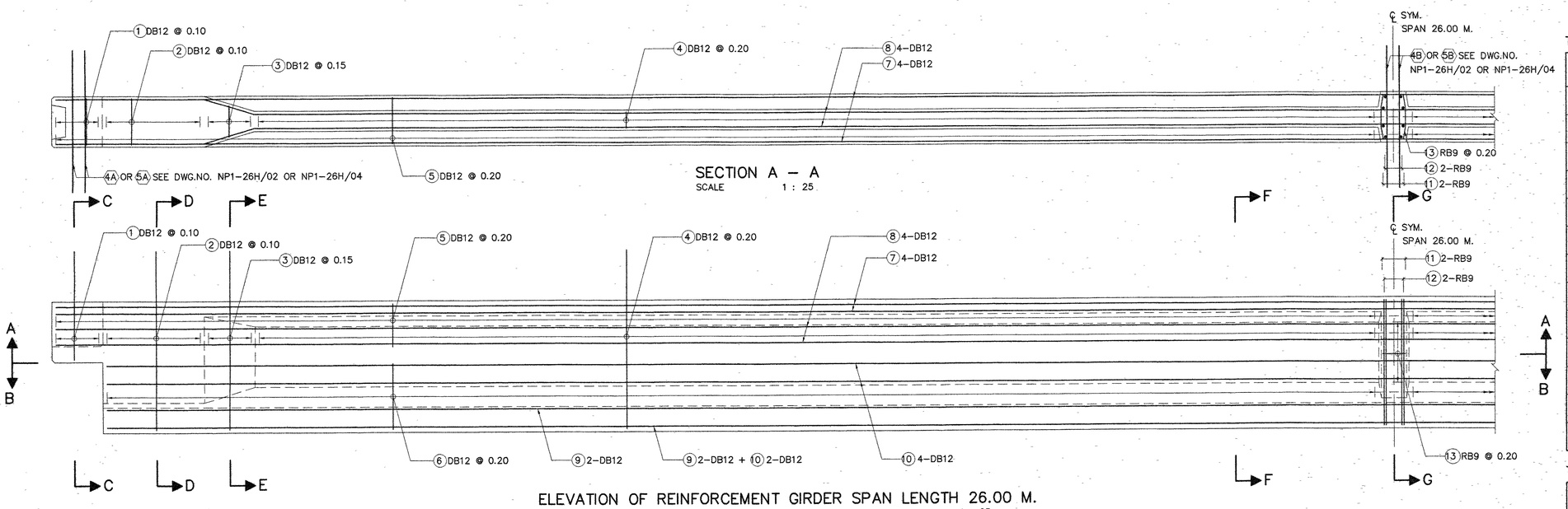
I–GIRDER 26.00 M. (HALF JOINT)

GIRDER DIMENSION

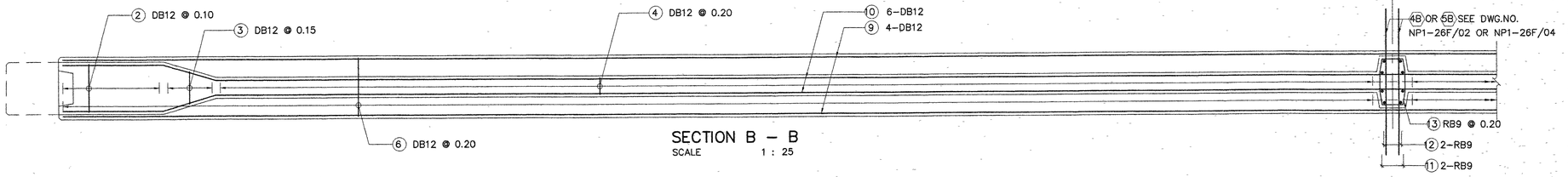
DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN		**DATE :** OCT 2015
	SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
	APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP1–26H/05
			SHEET NO. 59/R1

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

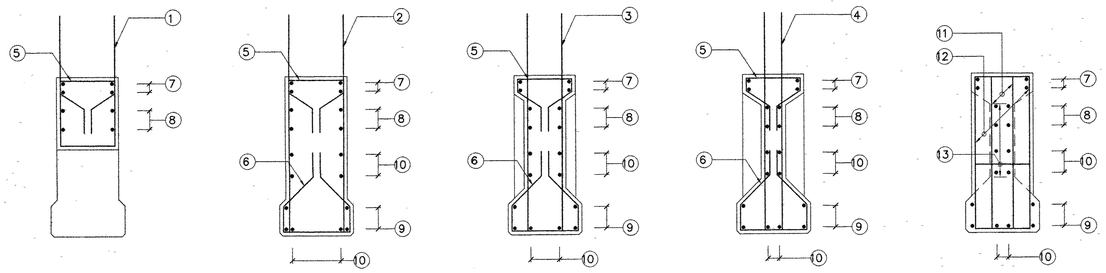
D:\std dwg 2015\NP1-26H-05(REV01)



ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



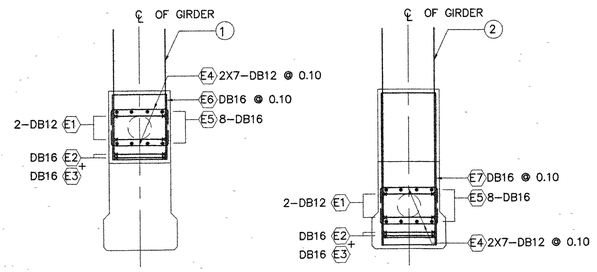
SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

SECTION F – F
SCALE 1 : 25

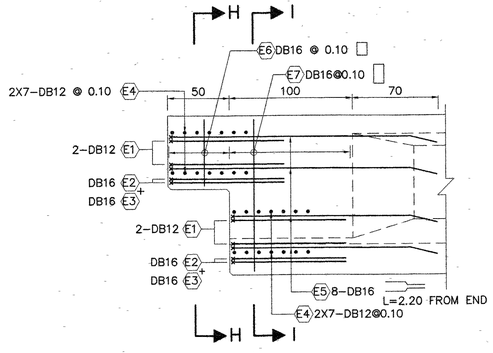
SECTION G – G
SCALE 1 : 25



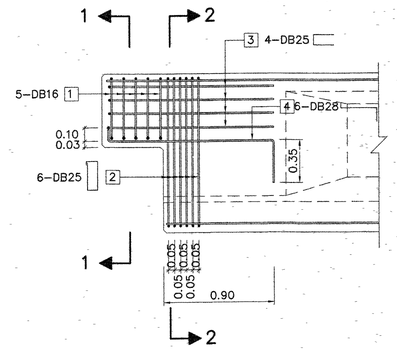
SECTION H – H
SCALE 1 : 25

SECTION I – I
SCALE 1 : 25

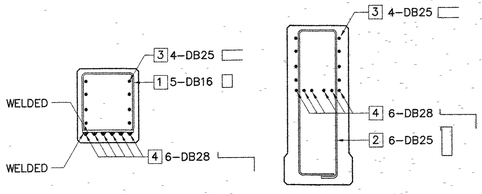
EXTRA REINFORCEMENT AT THE END (FRONT VIEW)
SCALE 1 : 25



EXTRA REINFORCEMENT AT THE END (SIDE VIEW)
SCALE 1 : 25



DAPPED END REINFORCEMENT
SCALE 1 : 25



SECTION 1 – 1
SCALE 1 : 25

SECTION 2 – 2
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

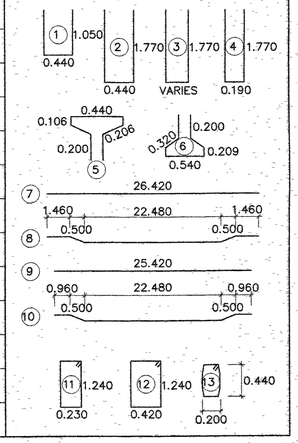


TABLE OF DAPPED END REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB16	
2	DB25	
3	DB25	
4	DB28	

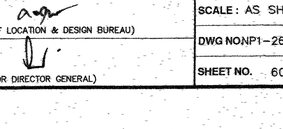
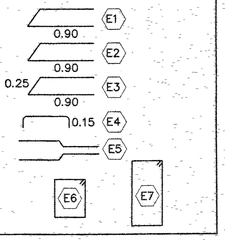


TABLE OF EXTRA REINFORCEMENT AT THE END

BAR NO.	SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	DB16	
E6	DB16	
E7	DB16	



หมายเหตุ :

1. มิติที่ระบุไว้ในแบบทั้งหมดมีหน่วยเป็นเมตร เว้นแต่ระบุไว้เป็นอย่างอื่น
2. น้ำหนักบรรทุกจรที่ใช้ในการออกแบบ: HL-93.
3. คานคอนกรีตอัดแรง I-GIRDER ชนิดดึงเหล็กที่หลัง จะต้องมีกำลังอัดประลัยต่ำสุดเท่ากับ 45 เมกะปาสคาล (459 กก./ซม.²) ของแท่งตัวอย่างคอนกรีตรูปทรงลูกบาศก์ที่อายุ 28 วัน
4. การผังเหล็กเสริมหมายเลข 5A, 6A, 5B สำหรับคานตัวนอก และเหล็กเสริมหมายเลข 7A, 8A, 4B สำหรับคานตัวใน ดังแสดงในแบบเลขที่ NP1-26H/02 หรือ NP1-26H/04
5. มุมเฉียงของสะพาน ต้องไม่เกิน 45 องศา
6. แบบแผ่นนี้ใช้ประกอบกับแบบเลขที่ NP1-26H/01 ถึง NP1-26H/05 และ NP1-26H/07

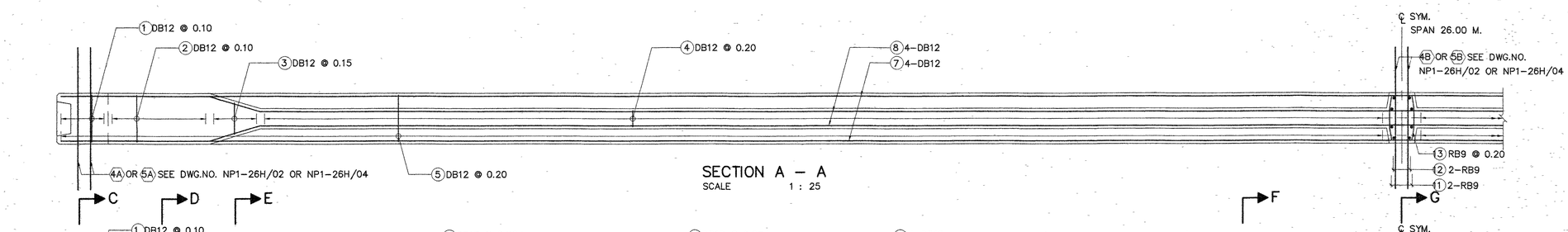
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 26.00 M. (HALF JOINT)
GIRDER REINFORCEMENT

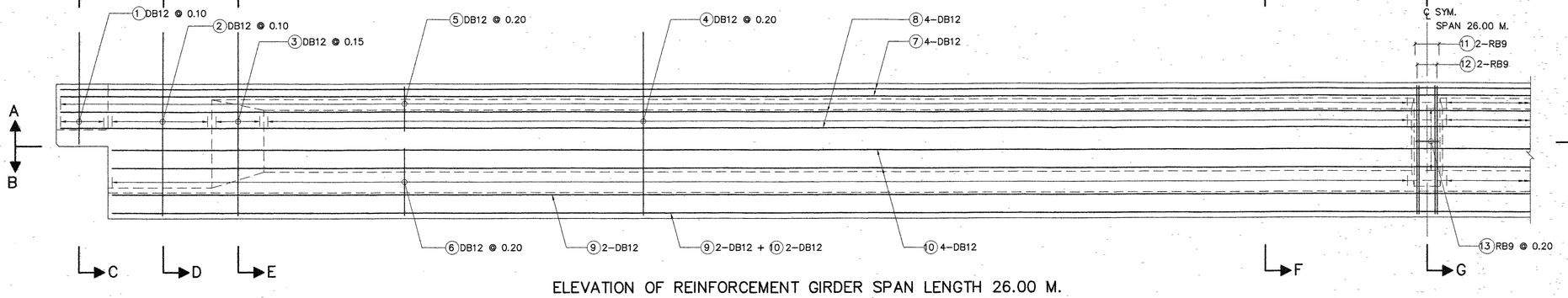
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. NP1-26H/06
			SHEET NO. 60/R1

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

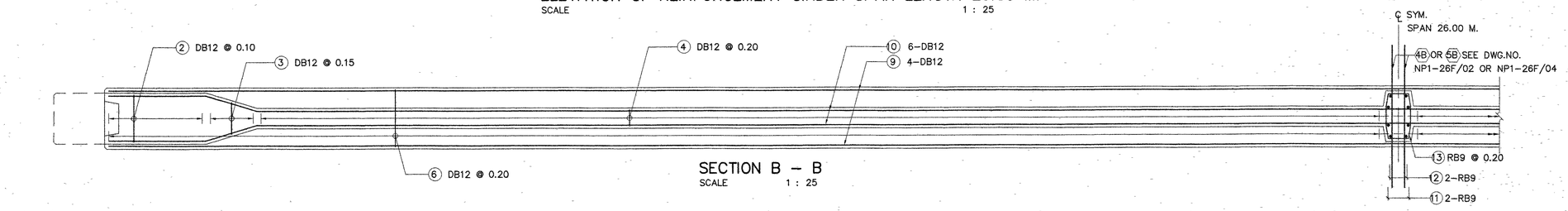
D:\std dwg 2015\NP1-26H-06(REV01) - TH



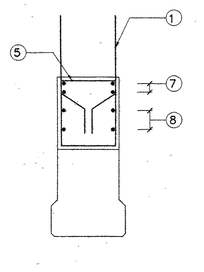
SECTION A – A
SCALE 1 : 25



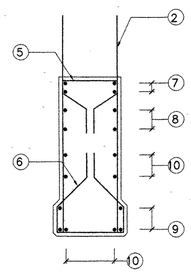
ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25



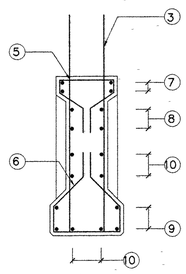
SECTION B – B
SCALE 1 : 25



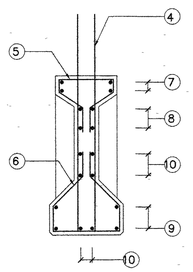
SECTION C – C
SCALE 1 : 25



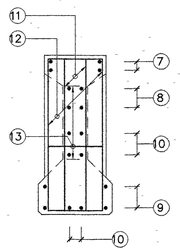
SECTION D – D
SCALE 1 : 25



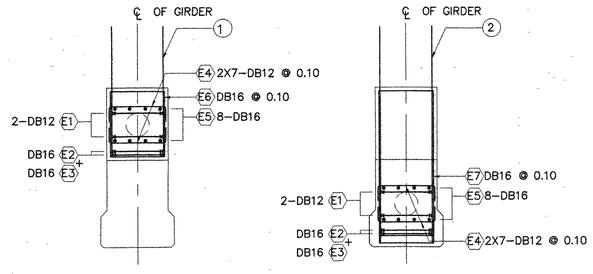
SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



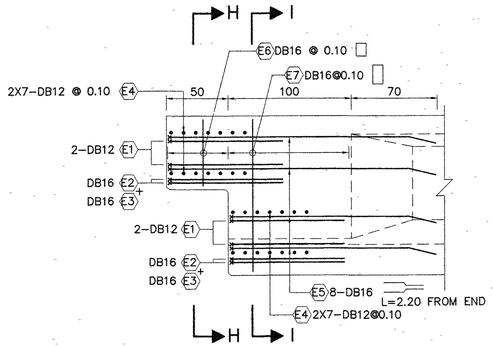
SECTION G – G
SCALE 1 : 25



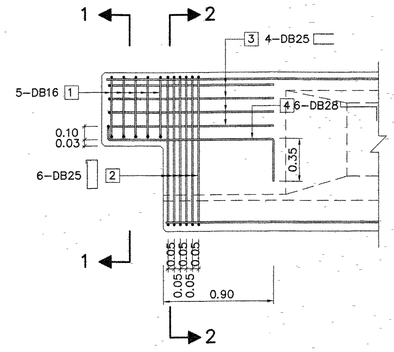
SECTION H – H
SCALE 1 : 25

SECTION I – I
SCALE 1 : 25

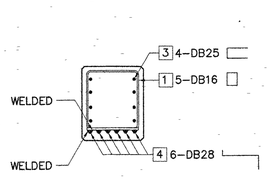
EXTRA REINFORCEMENT AT THE END (FRONT VIEW)
SCALE 1 : 25



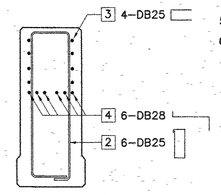
EXTRA REINFORCEMENT AT THE END (SIDE VIEW)
SCALE 1 : 25



DAPPED END REINFORCEMENT
SCALE 1 : 25



SECTION 1 – 1
SCALE 1 : 25



SECTION 2 – 2
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

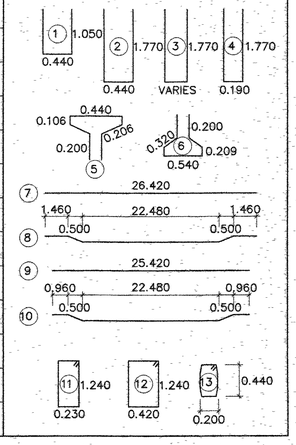


TABLE OF DAPPED END REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB16	
2	DB25	
3	DB25	
4	DB28	

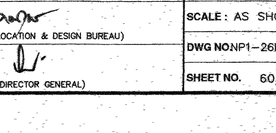
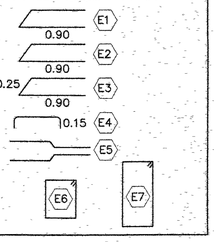


TABLE OF EXTRA REINFORCEMENT AT THE END

BAR NO.	SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	DB16	
E6	DB16	
E7	DB16	



NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR POST TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP1-26H/02 OR NP1-26H/04
5. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP1-26H/01 TO NP1-26H/05 AND NP1-26H/07

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 26.00 M. (HALF JOINT)

GIRDER REINFORCEMENT

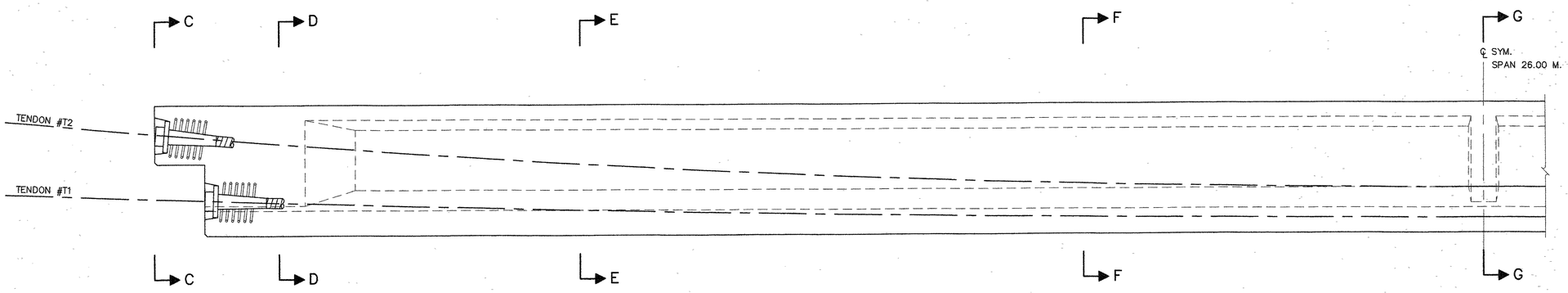
REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO.NP1-26H/06 | SHEET NO. 60/R1

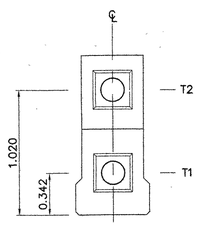
D:\std dwg 2015\NP1-26H-06(REV01)



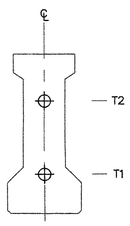
ELEVATION OF CABLE PROFILE GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25

VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER)

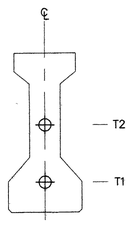
DISTANCE (M.)	13.240	12.740	12.000	11.000	10.000	9.000	8.000	7.000	6.000	5.000	4.000	3.000	2.000	1.000	0.000
TENDON #T2 (M.)	1.020	0.978	0.919	0.844	0.775	0.714	0.658	0.609	0.567	0.531	0.502	0.479	0.463	0.453	0.450
TENDON #T1 (M.)		0.342	0.320	0.293	0.268	0.246	0.226	0.208	0.193	0.180	0.169	0.161	0.155	0.151	0.150



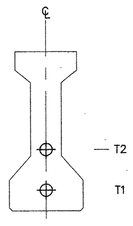
SECTION C – C
SCALE 1 : 25



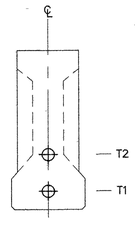
SECTION D – D
SCALE 1 : 25



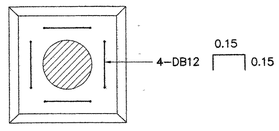
SECTION E – E
SCALE 1 : 25



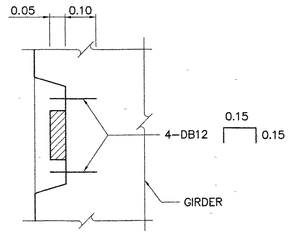
SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



ANCHORAGE PLATE



BLOCKOUT FOR ANCHORAGE PLATE

EXTRA REINFORCEMENT FOR ANCHORAGE PLATE
SCALE 1 : 25

หมายเหตุ :

1. มิติที่ระบุไว้ในแบบทั้งหมดมีหน่วยเป็นเมตร เว้นแต่ระบุไว้เป็นอย่างอื่น
2. น้ำหนักบรรทุกจรที่ใช้ในการออกแบบ: HL–93.
3. คานคอนกรีตอัดแรง I–GIRDER ชนิดดึงเหล็กที่หลัง จะต้องมีกำลังอัดประลัยต่ำสุดเท่ากับ 45 เมกะปาสคาล (459 กก./ซม.^{2}) ของแท่งตัวอย่างคอนกรีตรูปทรงลูกบาศก์ที่อายุ 28 วัน
4. การอัดแรง PRESTRESSING :
   4.1 ลวดอัดแรงดีเกลียวประเภทคลายแรงดึงต่ำชนิด 7 เส้น
   (LOW RELAXATION SEVEN WIRE STRANDS) ขนาด ø 15.2 มม. ตาม มอก. 420
   4.2 แรงดึงระบุซึ่งเป็นคุณลักษณะเฉพาะที่ต่ำสุด เท่ากับ 250 กิโลนิวตันต่อเส้น
   4.3 แรงดึงเริ่มแรกขณะถ่ายแรงเท่ากับ 75% ของแรงดึงระบุ โดยดึงลวดที่ปลายทั้งสองข้าง
   T1 = 14 เส้น
   T2 = 14 เส้น
5. ชนิดของท่อร้อยลวดอัดแรงใช้ท่อโลหะเคลือบสังกะสี หลังจากดึงลวดอัดแรงเสร็จให้อัดน้ำปูนทันที
6. แรงดึงลวดคำนวณโดยใช้ตัวแปรตามวิธีการคำนวณของ AASHTO ดังนี้
   ค่าสัมประสิทธิ์แรงเสียดทานระหว่างลวดอัดแรงกับท่อ (FRICTION WOBBLE COEFFICIENT) = 0.0033 1/M.
   ค่าสัมประสิทธิ์แรงเสียดทานเนื่องจากความโค้ง (FRICTION CURVATURE COEFFICIENT) = 0.20
   ระยะเข้าที่ของสมอยึด (A WEDGE SLIP) = 6 MM.
7. ผู้รับจ้างต้องทดสอบคุณสมบัติของลวดอัดแรงและท่อ ให้เป็นไปตามที่ระบุในข้อ 6 หากมีความแตกต่างจากที่ระบุไว้ ผู้รับจ้างต้องคำนวณค่าแรงดึงลวดขณะถ่ายแรงใหม่ และส่งแบบรายละเอียดพร้อมรายการคำนวณดังกล่าว ให้คณะกรรมการตรวจการจ้างพิจารณาก่อนดำเนินการ
8. ขณะถ่ายแรงของลวดอัดแรง (JACKING FORCE) ให้ทำได้เมื่อ กำลังอัดประลัยต่ำสุดของคอนกรีต รูปทรงลูกบาศก์ขนาด 15x15x15 ซม. จะต้องไม่น้อยกว่า 36 เมกะปาสคาล (367 กก./ซม.^{2})
9. วิธีการยก ให้ยก ณ จุดยกที่ปลายทั้งสองข้างของคานคอนกรีตอัดแรง และห้ามยกที่จุดกึ่งกลางของคาน
10. ระยะเรียงของคานคอนกรีตอัดแรง I–GIRDER ต้องไม่เกิน 2.00 ม.
11. มุมเฉียงของสะพาน ต้องไม่เกิน 45 องศา
12. แบบนี้ใช้ประกอบกับแบบเลขที่ NP1–26H/01 TO NP1–26H/06

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 26.00 M. (HALF JOINT)
POSTTENSIONED TENDON PROFILE

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO.NP1–26H/07
			SHEET NO. 61/R1

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

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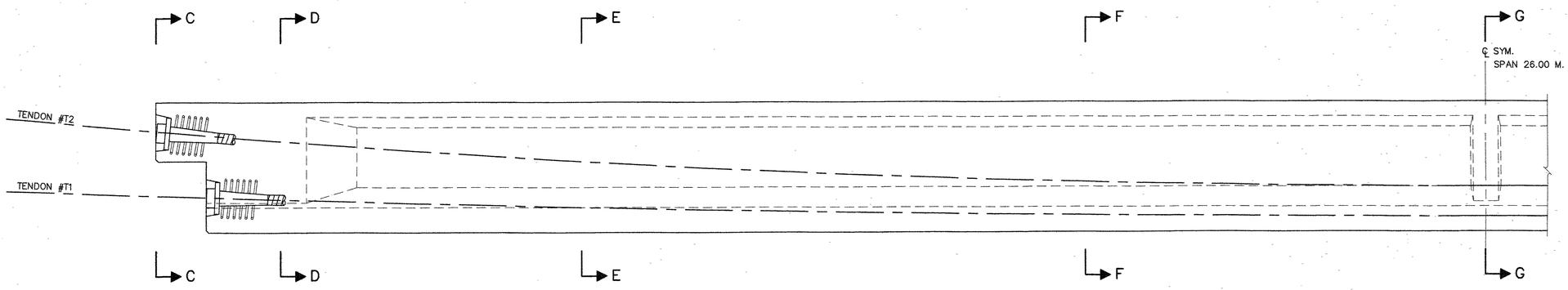

ELEVATION OF CABLE PROFILE GIRDER SPAN LENGTH 26.00 M.
SCALE 1 : 25

VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER)

DISTANCE (M.)	13.240	12.740	12.000	11.000	10.000	9.000	8.000	7.000	6.000	5.000	4.000	3.000	2.000	1.000	0.000
TENDON #T2 (M.)	1.020	0.978	0.919	0.844	0.775	0.714	0.658	0.609	0.567	0.531	0.502	0.479	0.463	0.453	0.450
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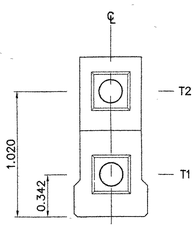
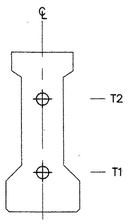
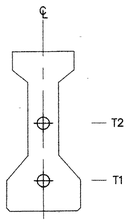


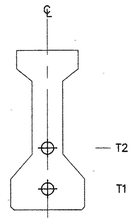
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
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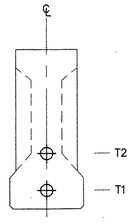
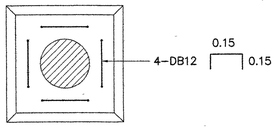
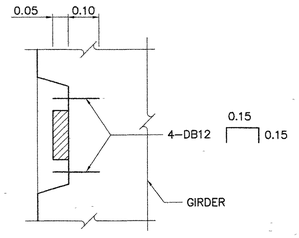


SECTION G – G
SCALE 1 : 25



ANCHORAGE PLATE



BLOCKOUT FOR ANCHORAGE PLATE

EXTRA REINFORCEMENT FOR ANCHORAGE PLATE
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST TENSION I–GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 15.2 MM. IN ACCORDANCE WITH TIS.420 GRADE 1860
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 250 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH. IN WHICH THE SEQUENCE OF JACKING SHALL BE TENDON 1 AND THEN TENDON 2. EACH TENDON IS STRESSED BOTH END.
   - 4.3 NUMBER OF PRESTRESSING STRANDS
     - T1 = 14 PRESTRESSING STRANDS
     - T2 = 14 PRESTRESSING STRANDS
5. DUCTS ARE GALVANIZED METAL SHEATHING GROUTED IMMEDIATELY AFTER STRESSING OPERATION.
6. JACKING FORCES ARE CALCULATED USING "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" AND ASSUMED DESIGN PARAMETERS AS FOLLOW :
   - FRICTION CURVATURE COEFFICIENT 0.20
   - FRICTION WOBBLE COEFFICIENT 0.0033 1/M.
   - A WEDGE SLIP 6 MM.
7. THE CONTRACTOR SHALL CARRY OUT TEST WITH THE TENDONS AND DUCTS PROPOSED FOR USING TO ESTABLISH THE FRICTION COEFFICIENTS AND SHALL ADJUST THE STRESSING FORCES FOR APPROVAL IF THE MEASURED COEFFICIENT IS DIFFERED SIGNIFICANTLY FROM THE ASSUME VALUE.
8. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 36 MPa. (367 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
9. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
10. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
11. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
12. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP1–26H/01 TO NP1–26H/06

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 26.00 M. (HALF JOINT)
POSTTENSIONED TENDON PROFILE

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP1–26H/07
		SHEET NO. 61/R1

REF.	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB2018

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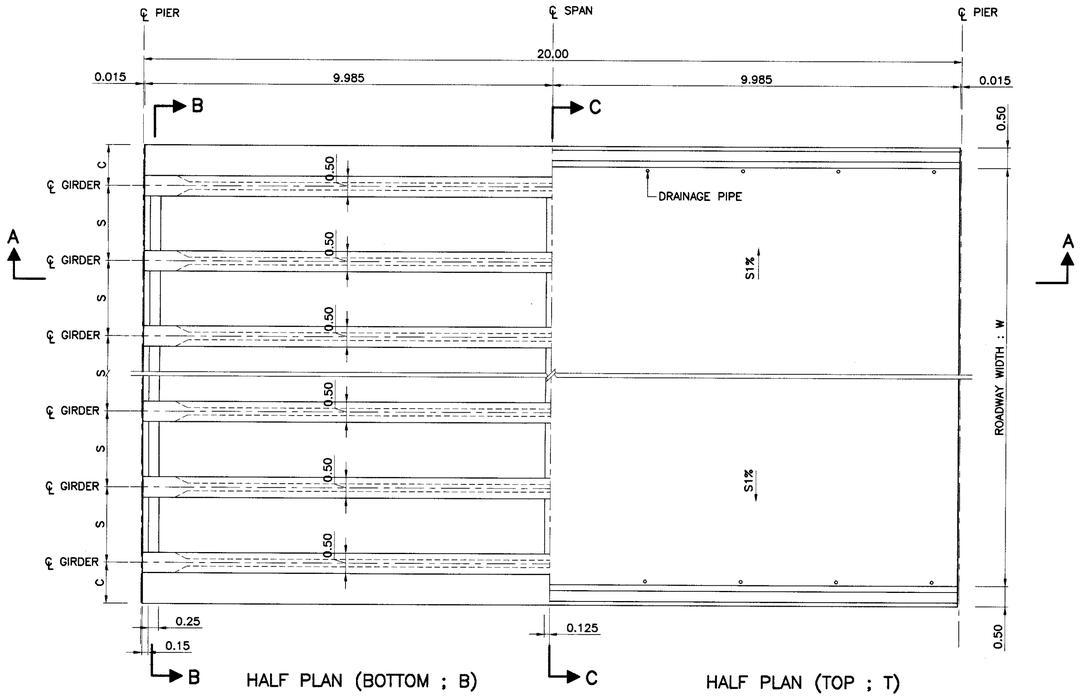
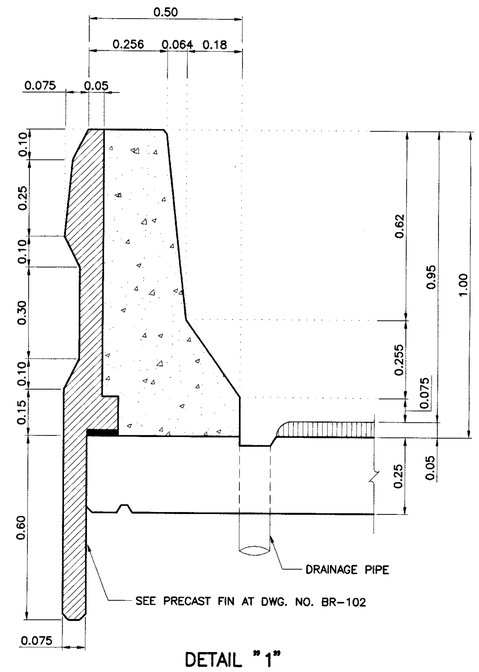
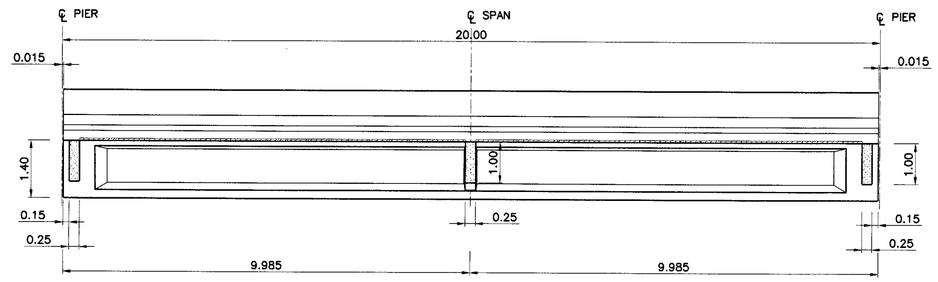


DECK PLAN FOR GIRDER SPAN LENGTH 20.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



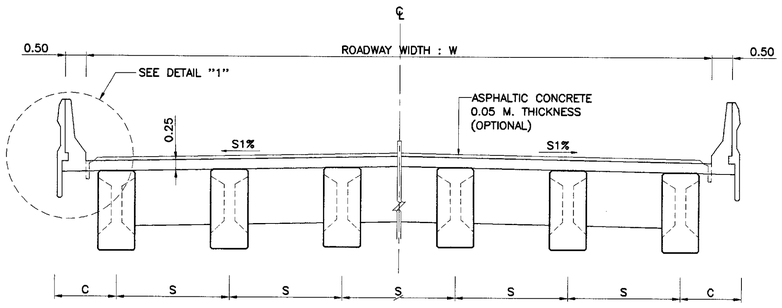
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

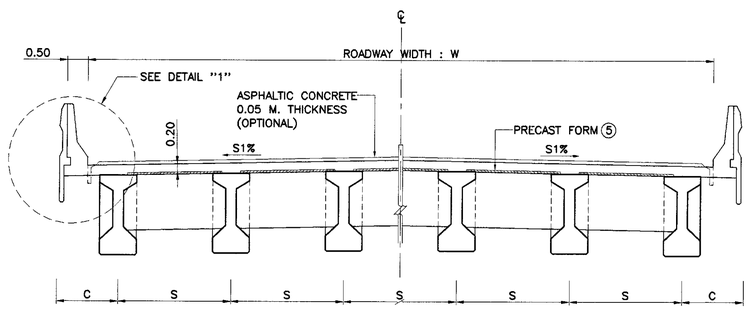
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	5 @ 1.86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX.)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2-20F/02 TO NP2-20F/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

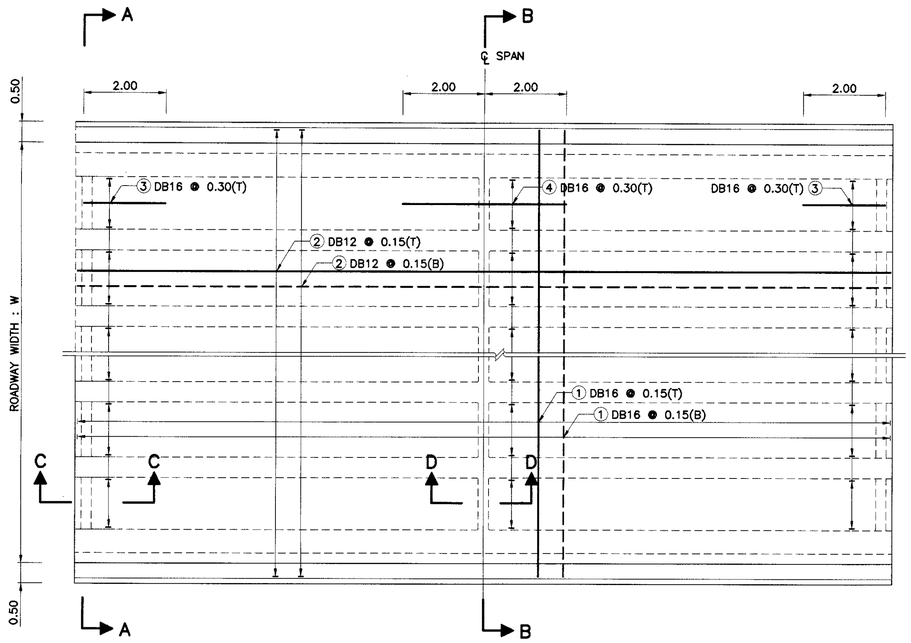
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

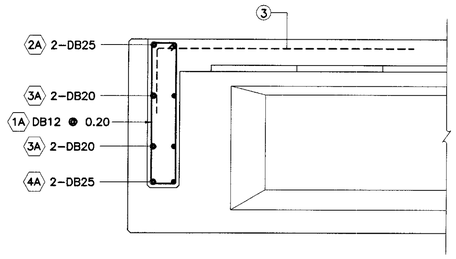
I-GIRDER 20.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP2-20F/01
		SHEET NO. 62

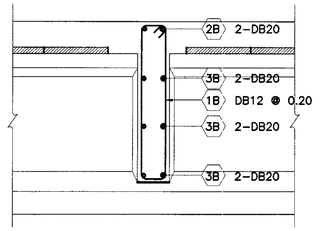
D:\std dwg 2015\NP2-20F-01(REV00)



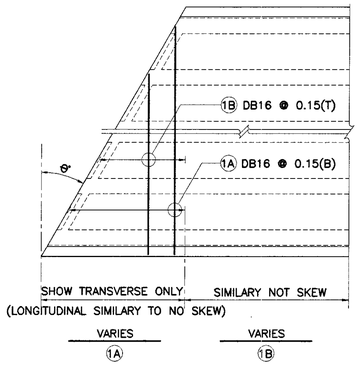
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



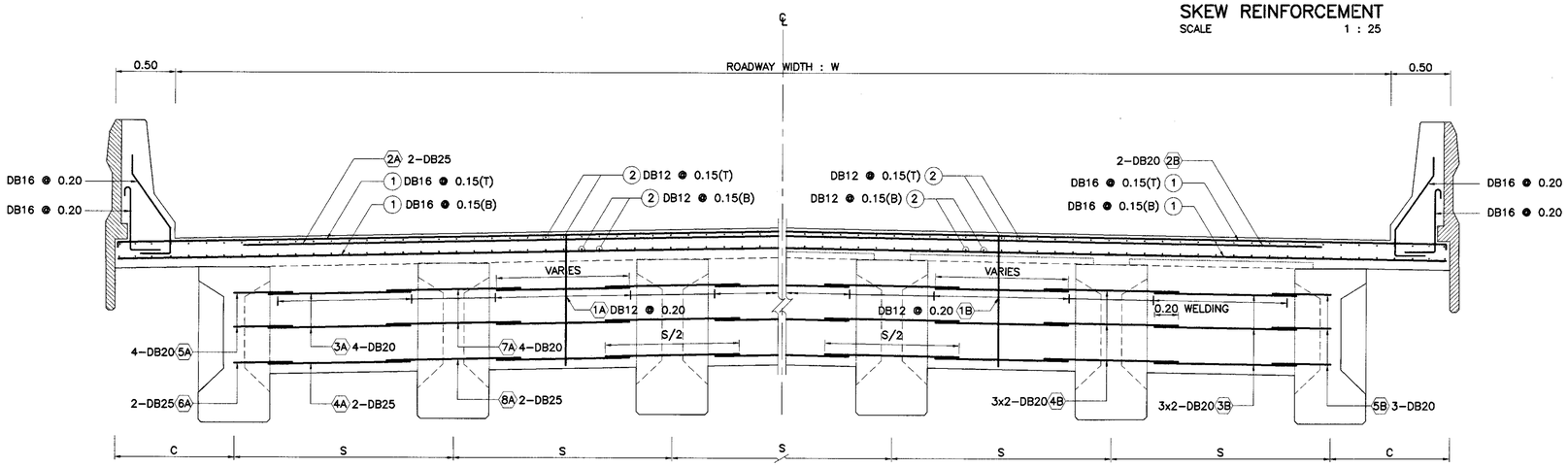
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SKEW REINFORCEMENT
SCALE 1 : 25



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19 / 1.19 / 1A
2A	DB25	W+1.00–2C — 2A
3A	DB20	S/2+0.40 — 3A
4A	DB25	S/2+0.40 — 4A
5A	DB20	S/4+0.10 — 5A
6A	DB25	0.19 / S/4+0.10 — 6A
7A	DB20	S/2 — 7A , 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.19 / 1B
2B	DB20	W+1.00–2C — 2B
3B	DB20	S/2+0.40 — 3B
4B	DB20	S/2 — 4B
5B	DB20	0.19 / S/4+0.10 — 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70 — ①
②	DB12	19.91 — ②
③	DB16	2.00 / 0.50 — ③
④	DB16	4.00 — ④

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2–20F/01 AND NP2–20F/03 TO NP2–20F/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

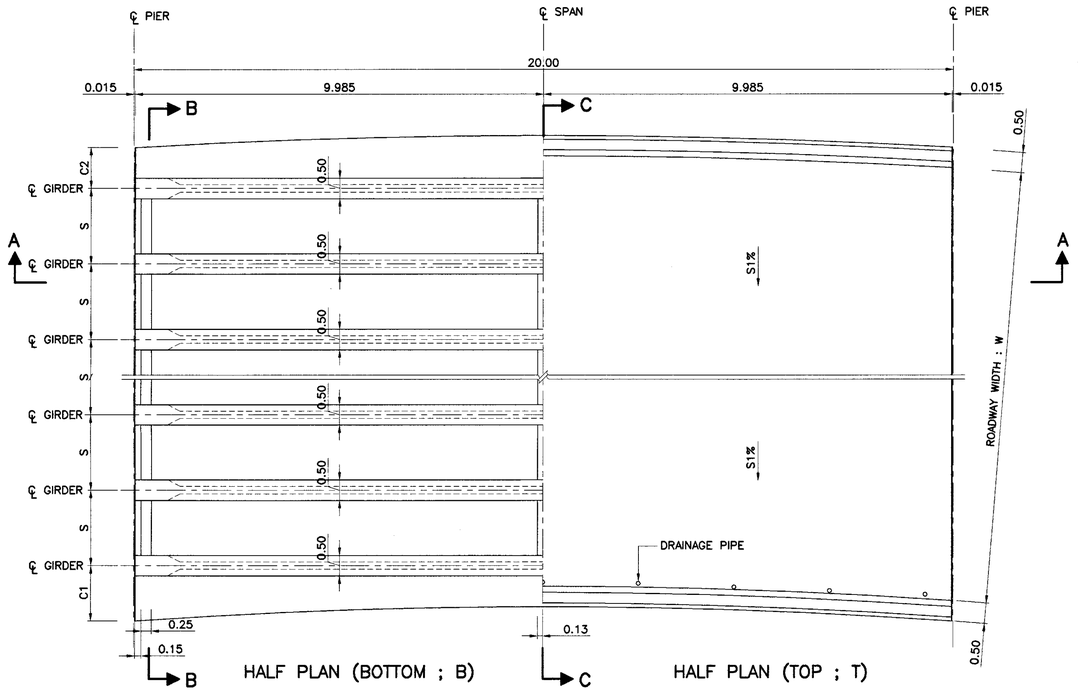
STANDARD DRAWING

I–GIRDER 20.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
APPROVED : (FOR DIRECTOR GENERAL)

DATE : OCT 2015
SCALE : AS SHOWN
DWG NO. NP2–20F/02
SHEET NO. 63

D:\std dwg 2015\NP2-20F-02(REV0)

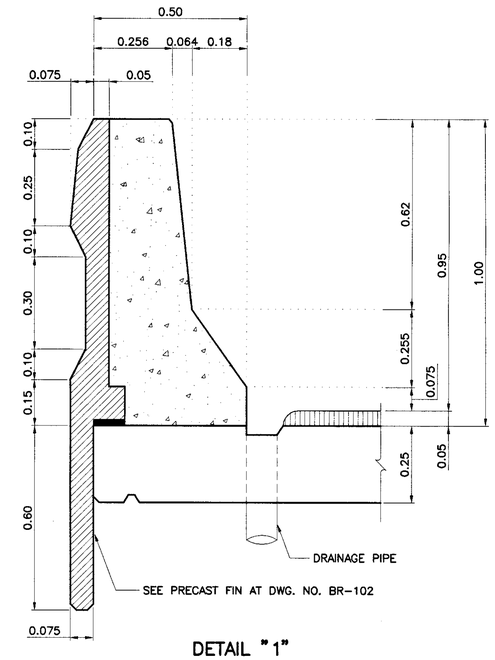


HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

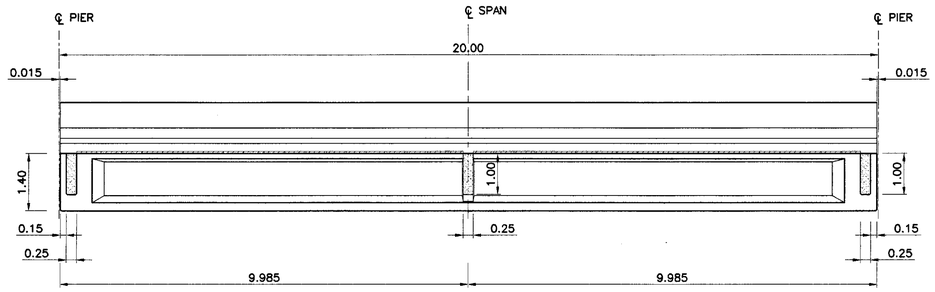
DECK PLAN FOR GIRDER SPAN LENGTH 20.00 M.

SCALE 1 : 75



DETAIL "1"

SCALE 1 : 10



SECTION A – A

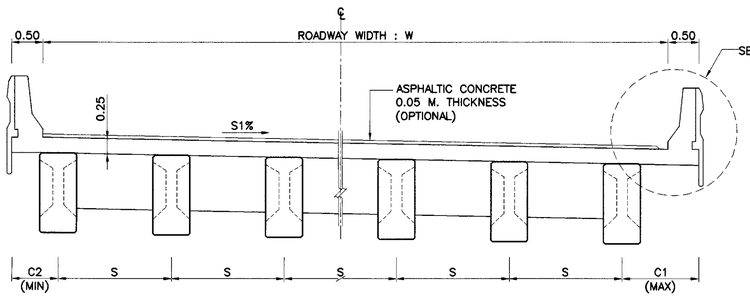
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50

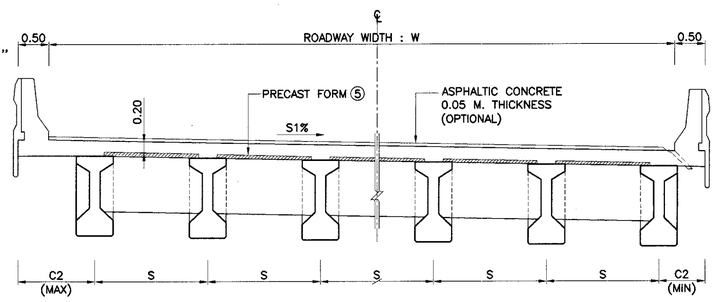
NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2-20F/01, NP2-20F/02 AND NP2-20F/04 TO NP2-20F/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2 (INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



SECTION B – B

SCALE 1 : 50



SECTION C – C

SCALE 1 : 50

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

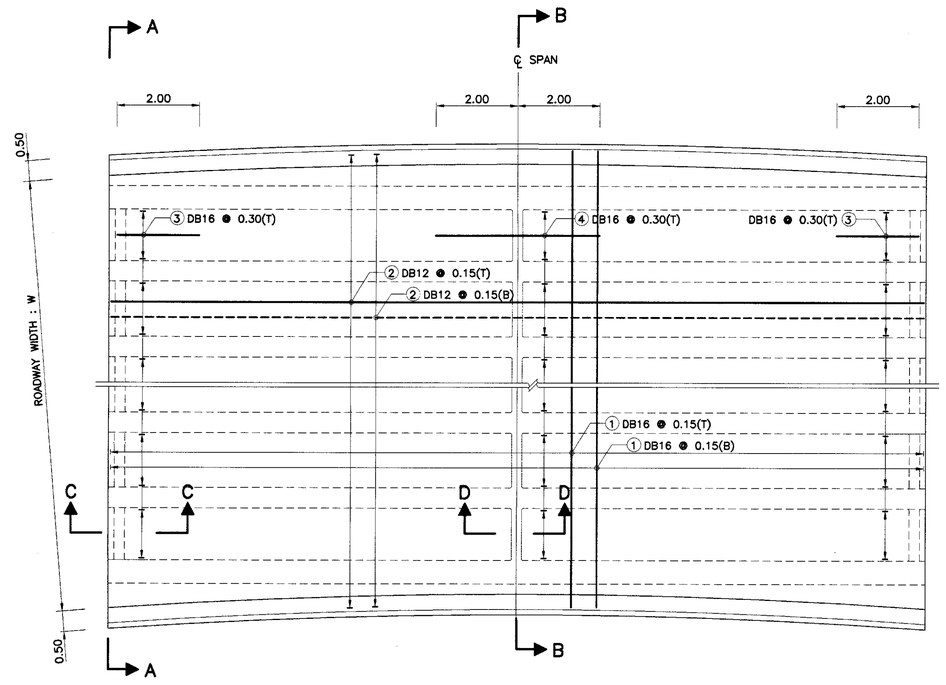
STANDARD DRAWING

I-GIRDER 20.00 M. (FULL JOINT)

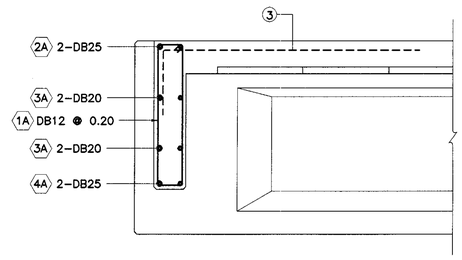
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP2-20F/03
		SHEET NO. 64

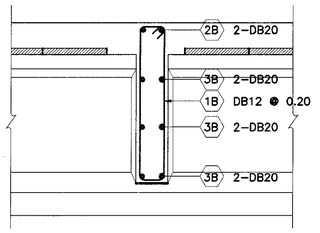
D:\std dwg 2015\NP2-20F-03(REV00)



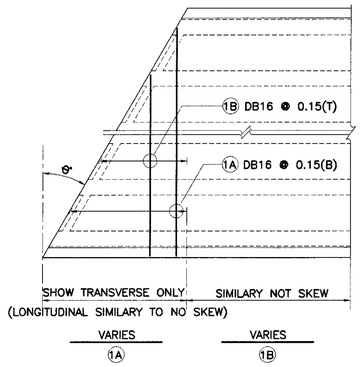
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SKEW REINFORCEMENT
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

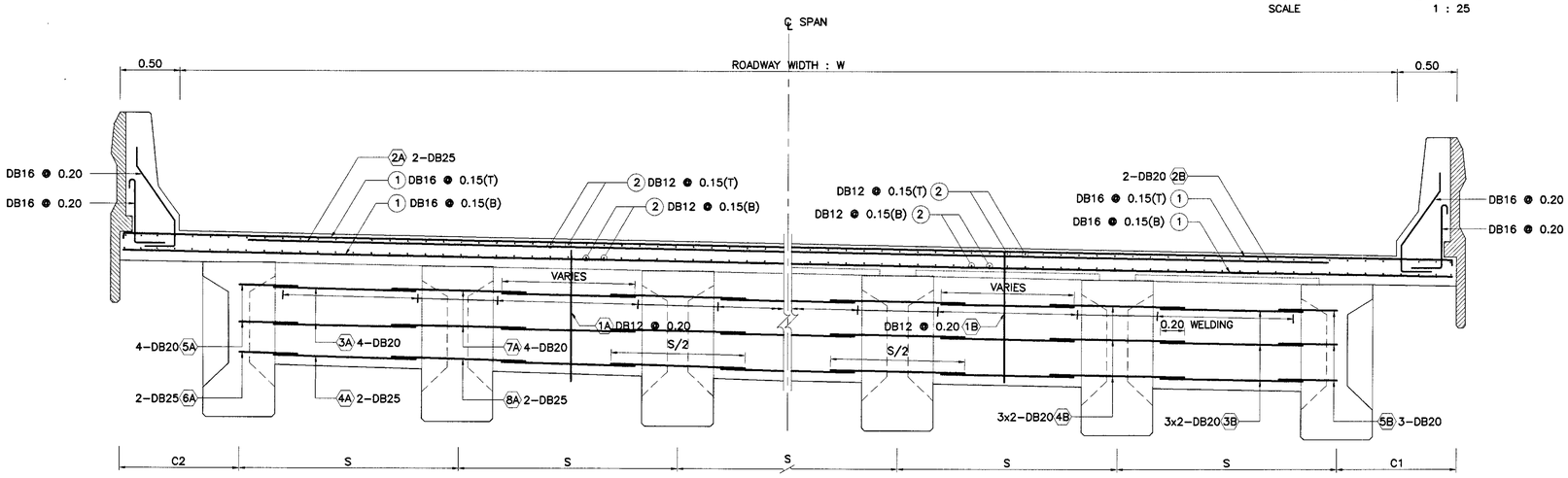
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19, 1.19, 1A
2A	DB25	W+1.00–2C, 2A
3A	DB20	S/2+0.40, 3A
4A	DB25	S/2+0.40, 4A
5A	DB20	S/4+0.10, 0.19, 5A
6A	DB25	S/4+0.10, 6A
7A	DB20	S/2, 7A , 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.19, 1B
2B	DB20	W+1.00–2C, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/4+0.10, 0.19, 5B
5B	DB20	S/2, 4B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70, 1
2	DB12	19.91, 2
3	DB16	2.00, 0.50, 3
4	DB16	4.00, 4



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2–20F/01 TO NP2–20F/03 AND NP2–20F/05 TO NP2–20F/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

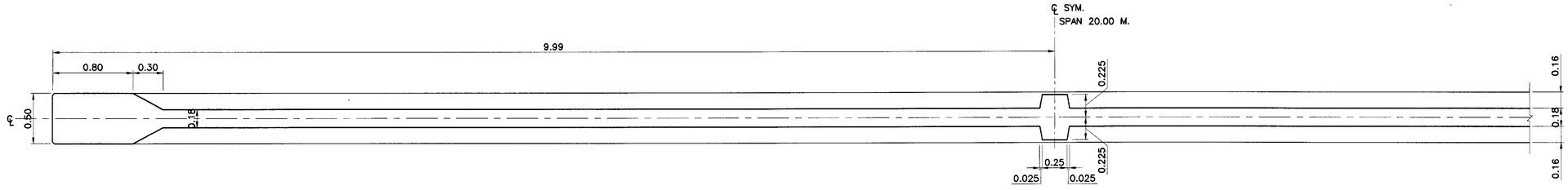
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

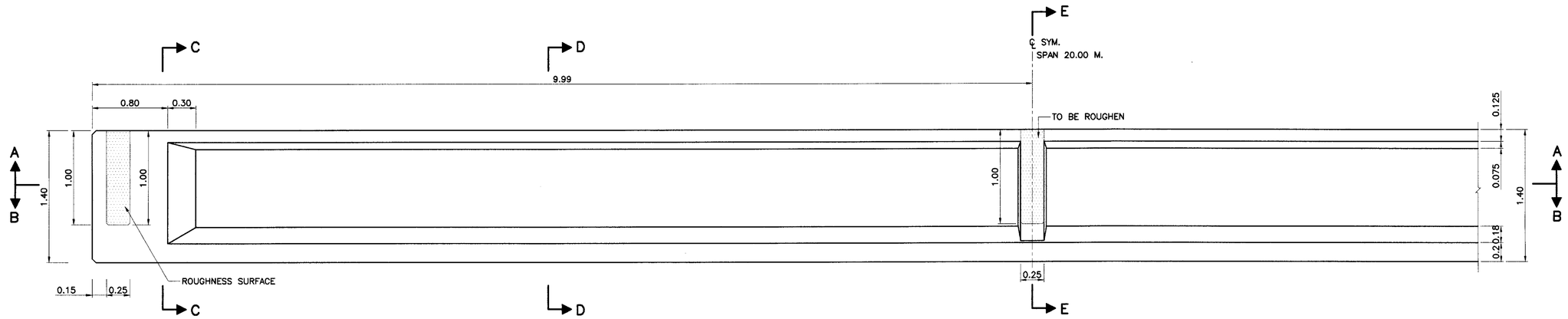
I–GIRDER 20.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP2–20F/04
		SHEET NO. 65

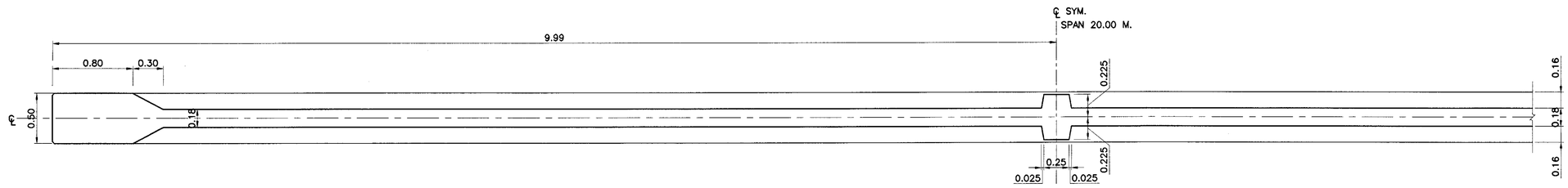
D:\std dwg 2015\NP2-20F-04(REV00)



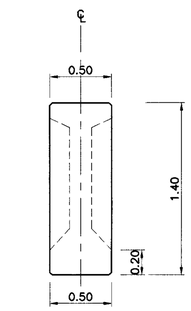
SECTION A – A
SCALE 1 : 25



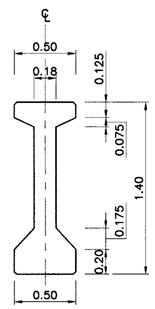
ELEVATION OF GIRDER SPAN LENGTH 20.00 M.
SCALE 1 : 25



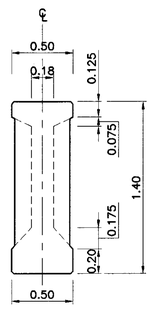
SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR PRECAST I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NP2–20F/01 TO NP2–20F/04 AND NP2–20F/06 TO NP2–20F/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

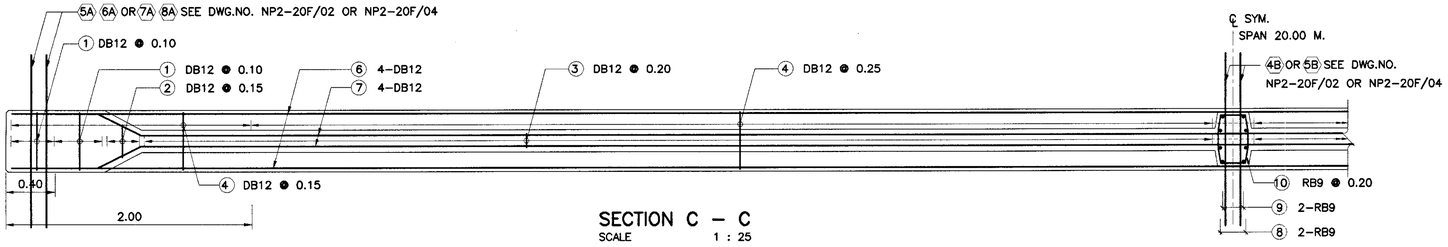
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

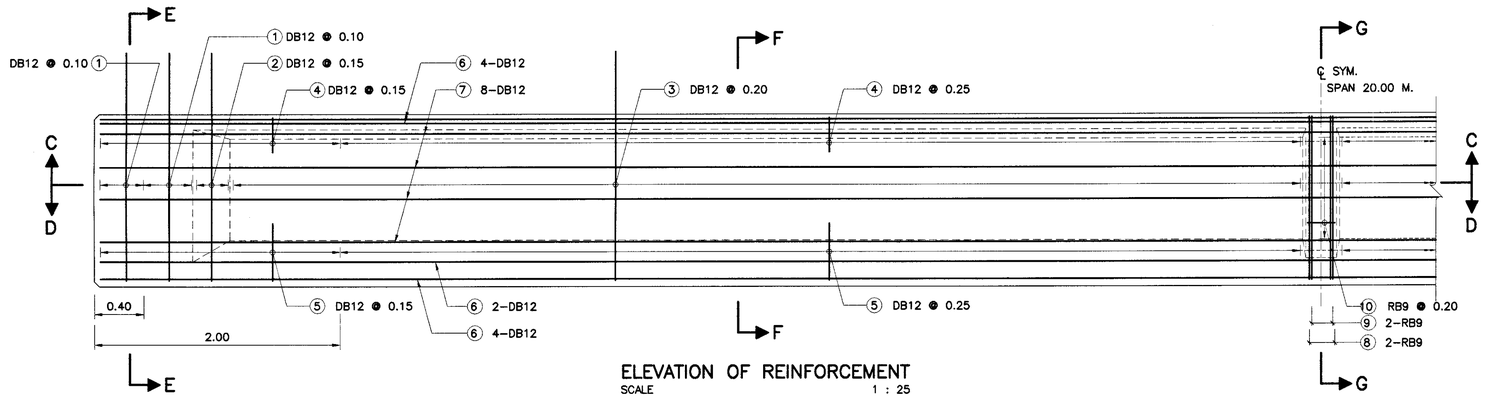
I–GIRDER 20.00 M. (FULL JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP2–20F/05
		SHEET NO. 66

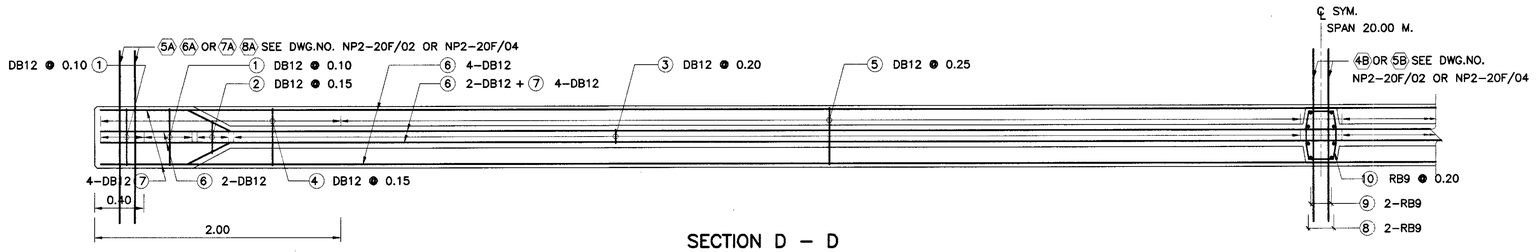
D:\std dwg 2015\NP2-20F-05(REV00)



SECTION C – C
SCALE 1 : 25



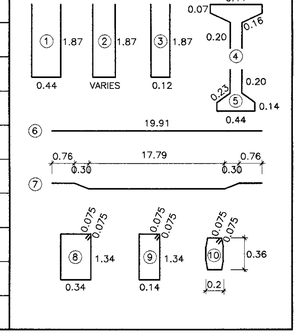
ELEVATION OF REINFORCEMENT
SCALE 1 : 25

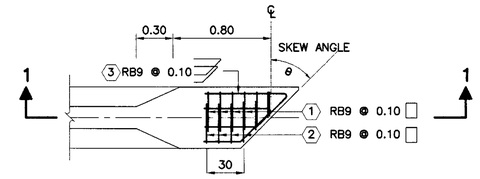


SECTION D – D
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	RB9	
9	RB9	
10	RB9	

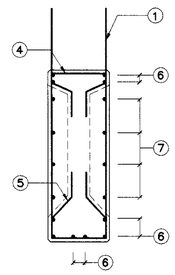




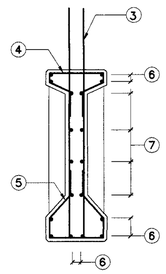
EXTRA REINFORCEMENT AT THE END (SKEW GIRDER)
SCALE 1 : 25

NOTE :

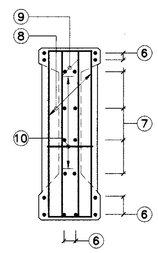
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP2-20F/02 OR NP2-20F/04
5. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2-20F/01 TO NP2-20F/05 AND NP2-20F/07



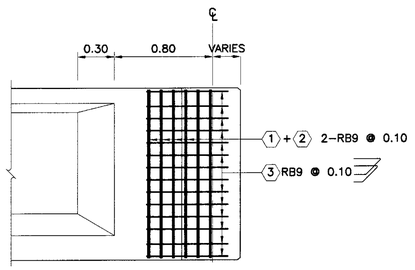
SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



SECTION 1 – 1
SCALE 1 : 25

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

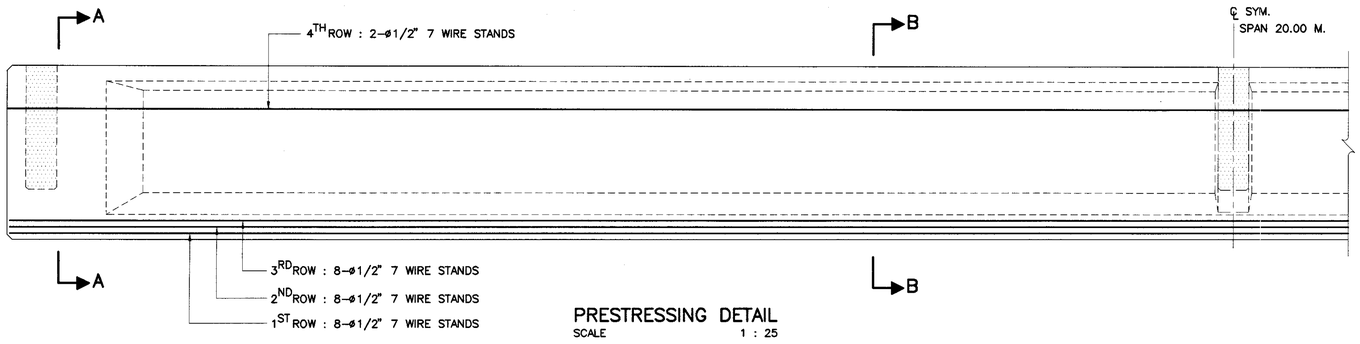
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

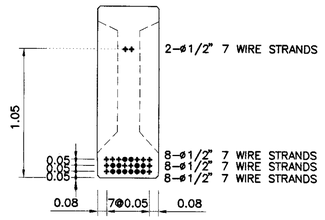
I-GIRDER 20.00 M. (FULL JOINT)
GIRDER REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP2-20F/06
		SHEET NO. 67

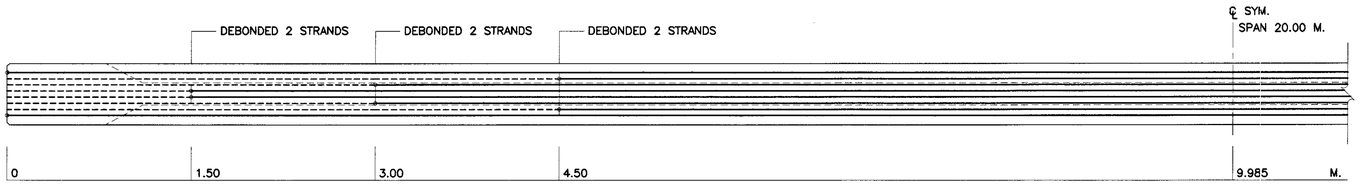
D:\std dwg 2015\NP2-20F-06(REV00)



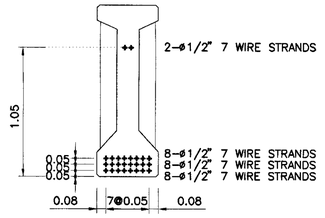
PRESTRESSING DETAIL
SCALE 1 : 25



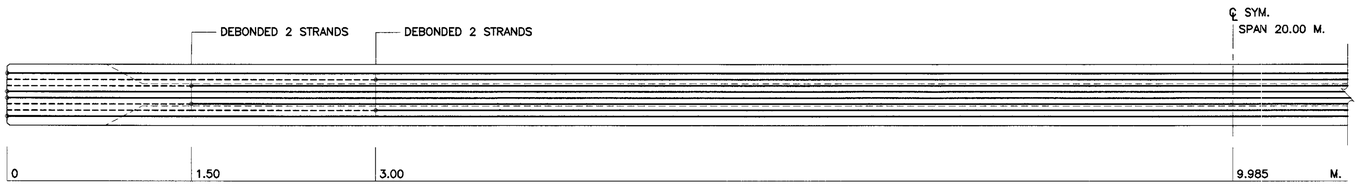
SECTION A – A
SCALE 1 : 25



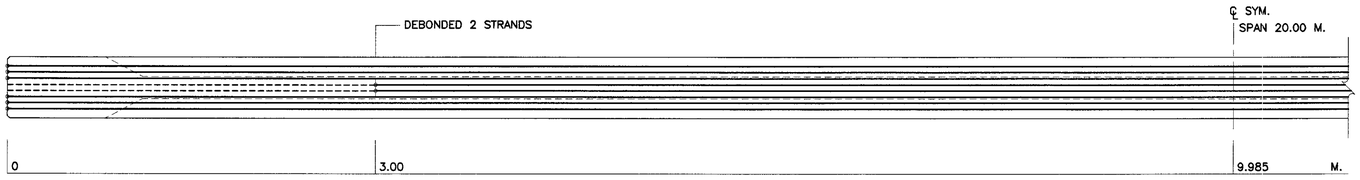
POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25



POSITION OF DEBONDED 3RD ROW
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - ⊕ ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ - - - - DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP2-20F/01 TO NP2-20F/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

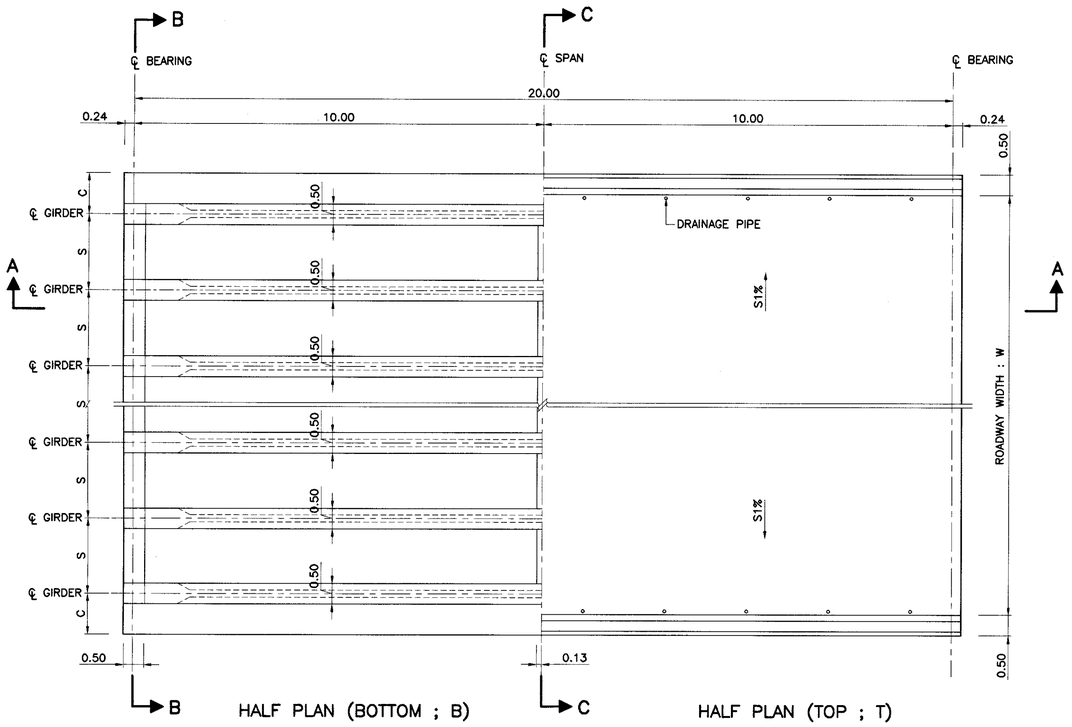
STANDARD DRAWING

I-GIRDER 20.00 M. (FULL JOINT)

GIRDER PRESTRESSING

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. NP2-20F/07
		SHEET NO. 68

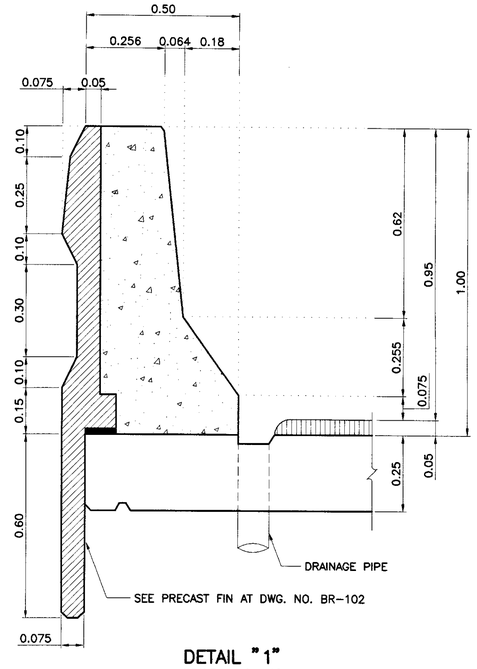
D:\std dwg 2015\NP2-20F-07(REV00)



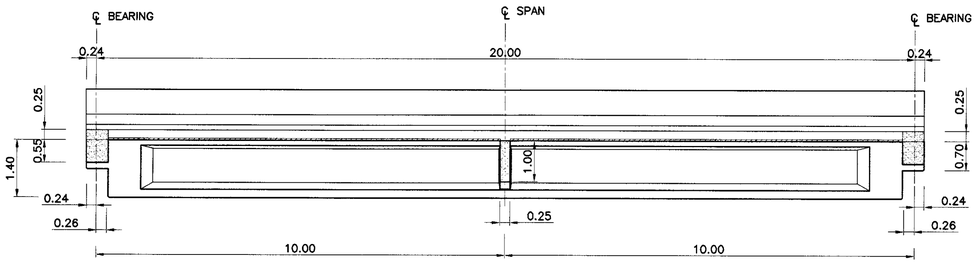
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

DECK PLAN FOR GIRDER SPAN LENGTH 20.00 M.
SCALE 1 : 75



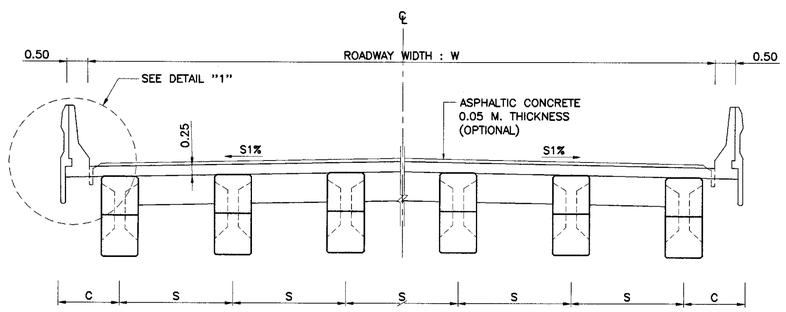
DETAIL "1"
SCALE 1 : 10



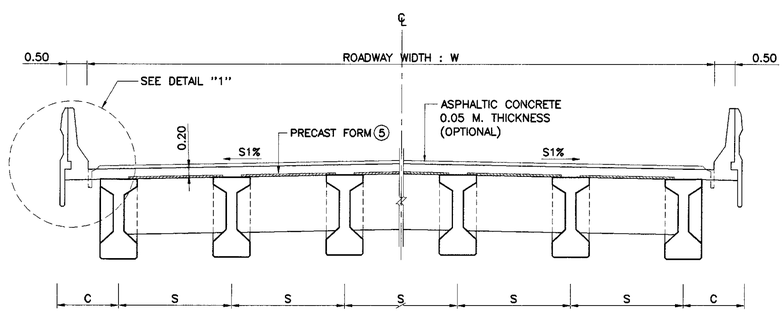
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	5 @ 1.86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX.)	1.00



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2-20F/02 TO NP2-20F/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
5. PRECAST FORM SHALL BE AS FOLLOWS:
   - 5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2 (INCLUDED THE WEIGHT OF PRECAST FORM)
   - 5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
   - 5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 20.00 M. (HALF JOINT)
BRIDGE DECK DIMENSION

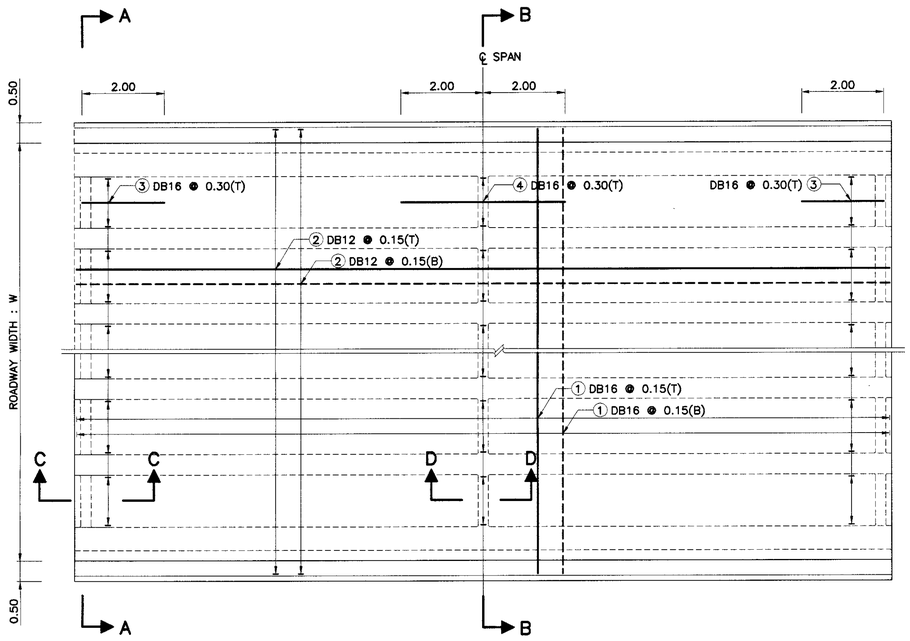
DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

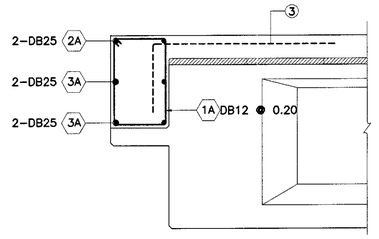
APPROVED : (FOR DIRECTOR GENERAL) | DWG NO.NP2-20H/01

SHEET NO. 69

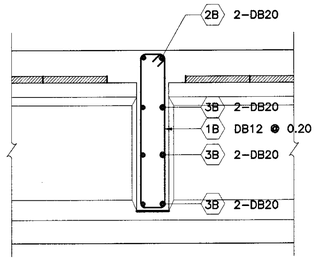
D:\std dwg 2015\NP2-20H-01(REV00)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

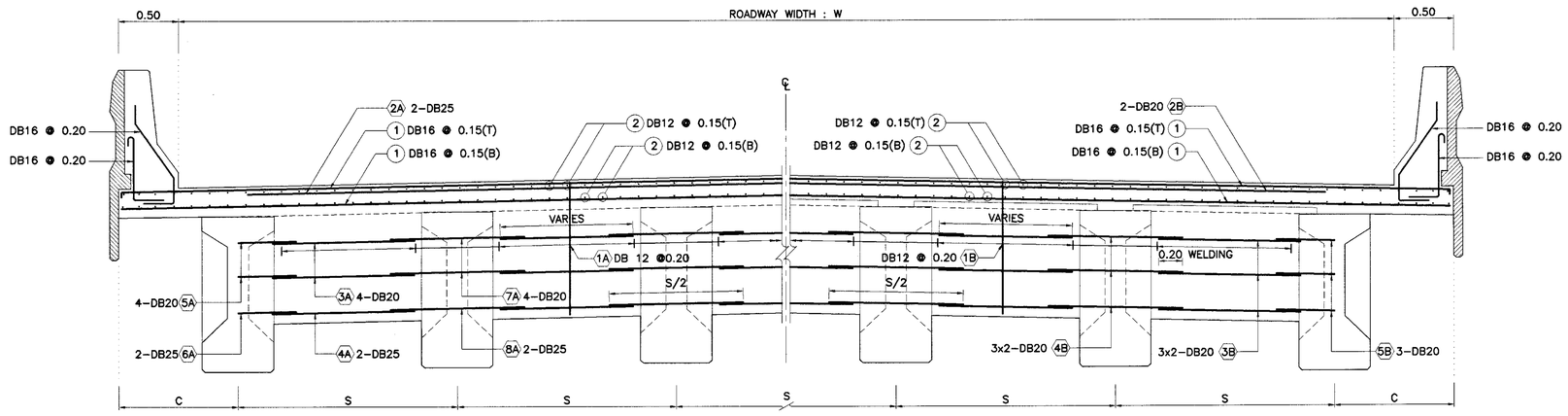
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.64
2A	DB25	W+1.00–2C
3A	DB25	S/2+0.40
4A	DB25	S/4+0.10
5A	DB25	S/2

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.19
2B	DB20	W+1.00–2C
3B	DB20	S/2+0.40
4B	DB20	S/4+0.10, 0.19
5B	DB20	S/2

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70
2	DB12	19.91
3	DB16	2.00, 0.50, 4.00
4	DB16	



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2–20H/01 AND NP2–20H/03 TO NP2–20H/07

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

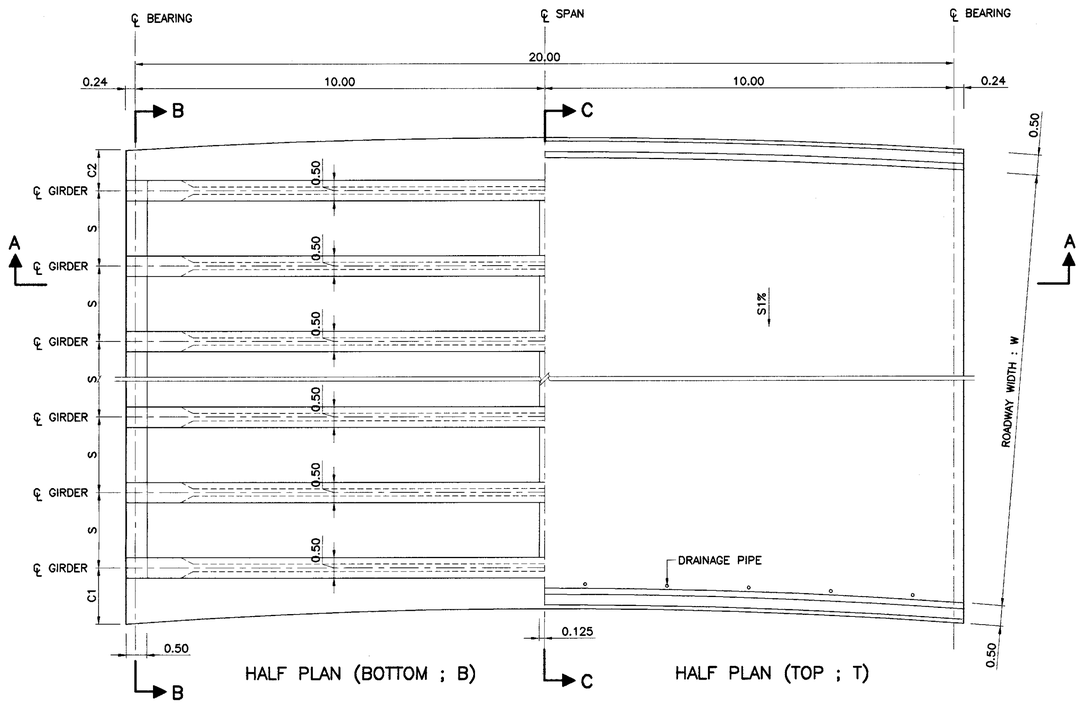
STANDARD DRAWING

I–GIRDER 20.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT

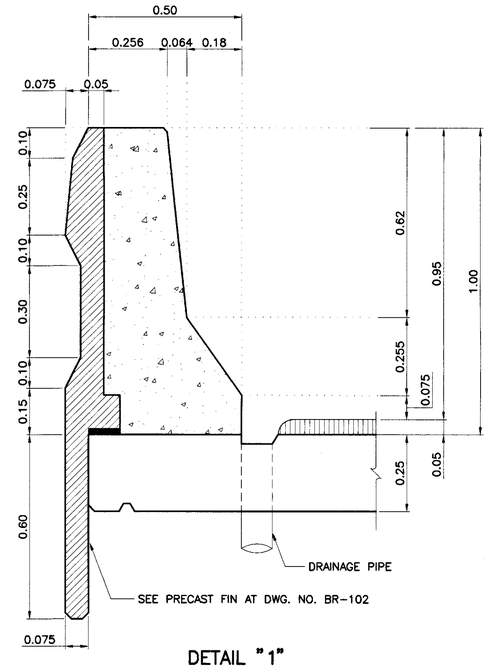
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
DWG NO. NP2–20H/02
APPROVED : (FOR DIRECTOR GENERAL)
SHEET NO. 70

D:\std dwg 2015\NP2–20H–02(REV00)



DECK PLAN FOR GIRDER SPAN LENGTH 20.00 M.
SCALE 1 : 75



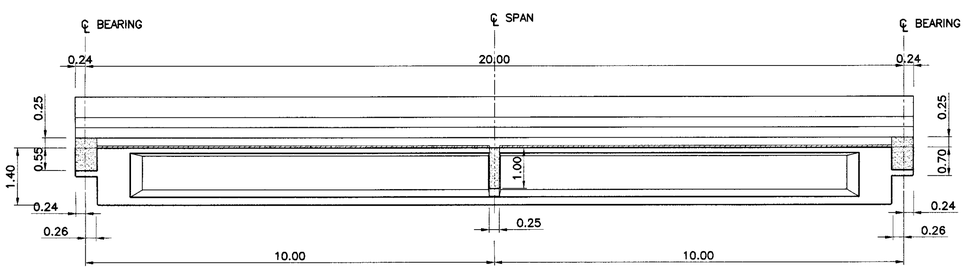
DETAIL "1"
SCALE 1 : 10

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2-20H/01, NP2-20H/02 AND NP2-20H/04 TO NP2-20H/07
4. CONCRETE FOR PC. SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.

(S) PRECAST FORM SHALL BE AS FOLLOWS:

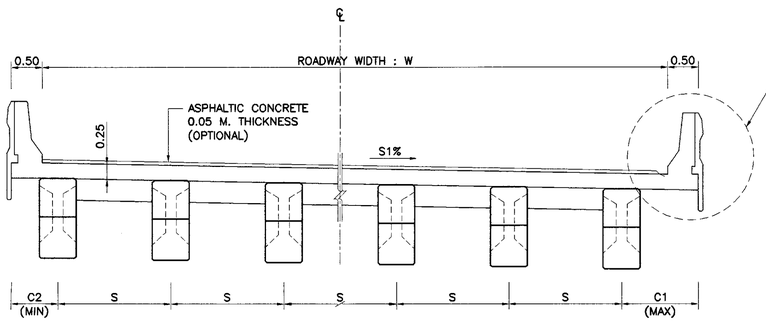
5.1 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
5.2 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2(INCLUDED THE WEIGHT OF PRECAST FORM)
5.3 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
5.4 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT:SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
5.5 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95.
5.6 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
5.7 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
5.8 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.



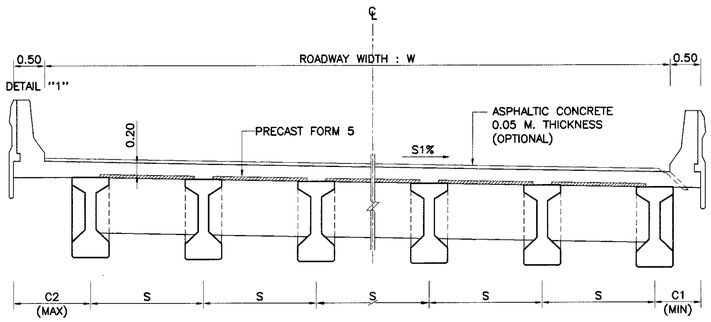
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER			
			C1 (M.)		C2 (M.)	
			MIN.	MAX.	MIN.	MAX.
9.00	5	2.00 (MAX.)	0.60	1.50	0.60	1.50
10.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
11.00	6	2.00 (MAX.)	0.60	1.50	0.60	1.50
12.00	7	2.00 (MAX.)	0.60	1.50	0.60	1.50
15.00	8	2.00 (MAX.)	0.60	1.50	0.60	1.50
VARIES	n	2.00 (MAX.)	0.60	1.50	0.60	1.50



SECTION B – B
SCALE 1 : 50



SECTION C – C
SCALE 1 : 50

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

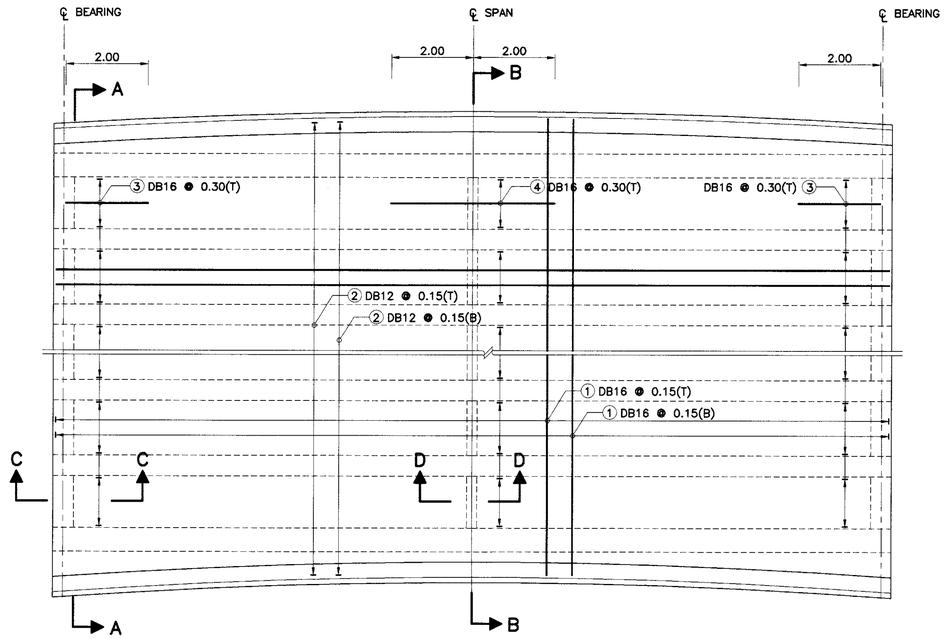
STANDARD DRAWING

I-GIRDER 20.00 M. (HALF JOINT)

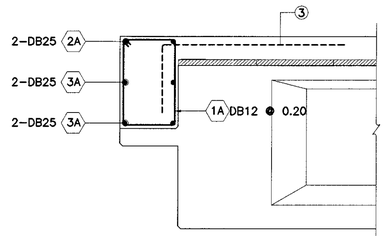
BRIDGE DECK DIMENSION (FOR CURVE)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP2-20H/03
		SHEET NO. 71

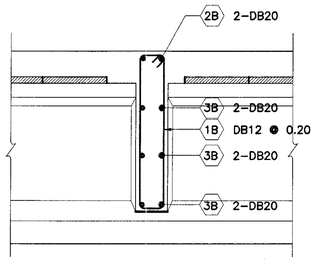
D:\std dwg 2015\NP2-20H-03(REV00)



PLAN OF REINFORCEMENT SLAB AND RAILING
SCALE 1 : 75



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

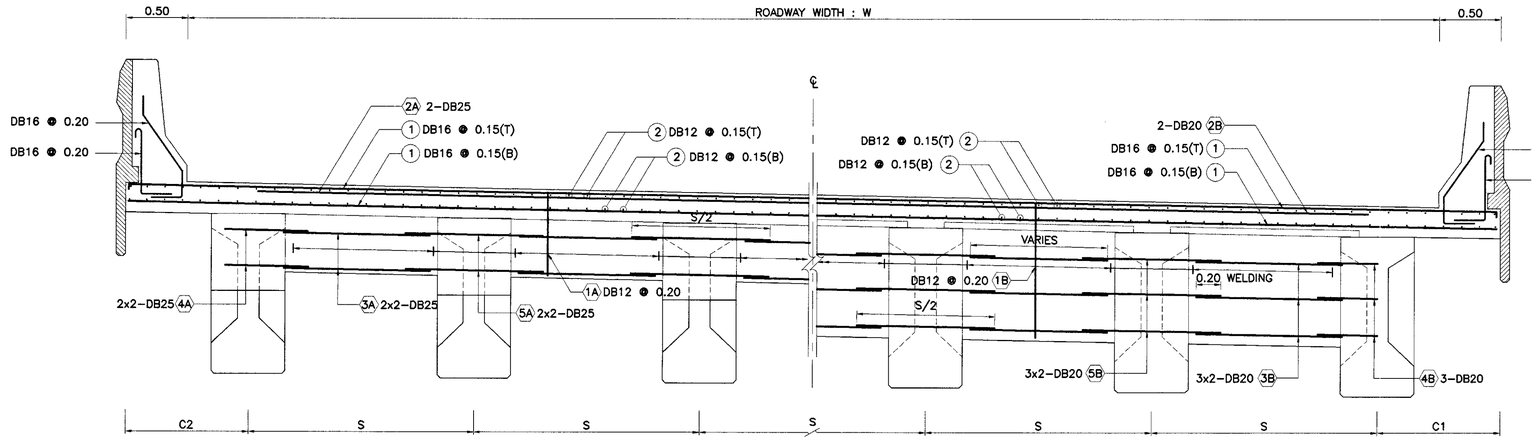
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.64, 1A
2A	DB25	W+1.00–2C, 2A
3A	DB25	S/2+0.40, 3A
4A	DB25	S/4+0.10, 4A
5A	DB25	S/2, 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.19, 1B
2B	DB20	W+1.00–2C, 2B
3B	DB20	S/2+0.40, 3B
4B	DB20	S/4+0.10, 0.19, 4B
5B	DB20	S/2, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70, 1
2	DB12	19.91, 2
3	DB16	2.00, 0.50, 3
4	DB16	4.00, 4



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2–20H/01 TO NP2–20H/03 AND NP2–20H/05 TO NP2–20H/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

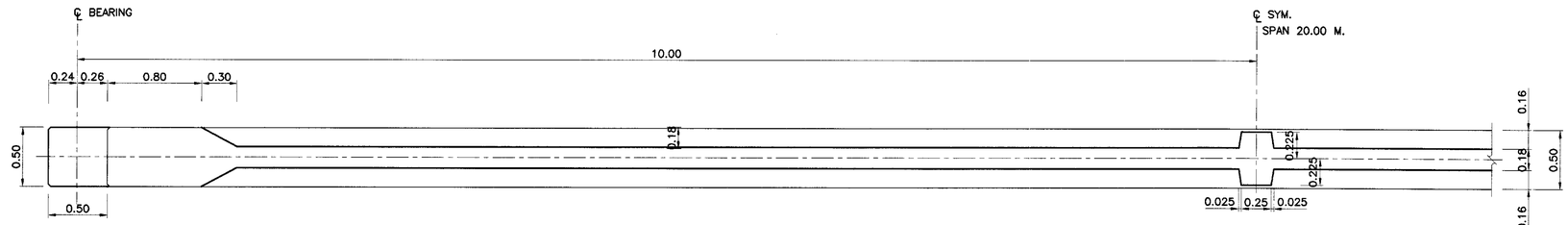
STANDARD DRAWING

I–GIRDER 20.00 M. (HALF JOINT)
BRIDGE DECK REINFORCEMENT (FOR CURVE)

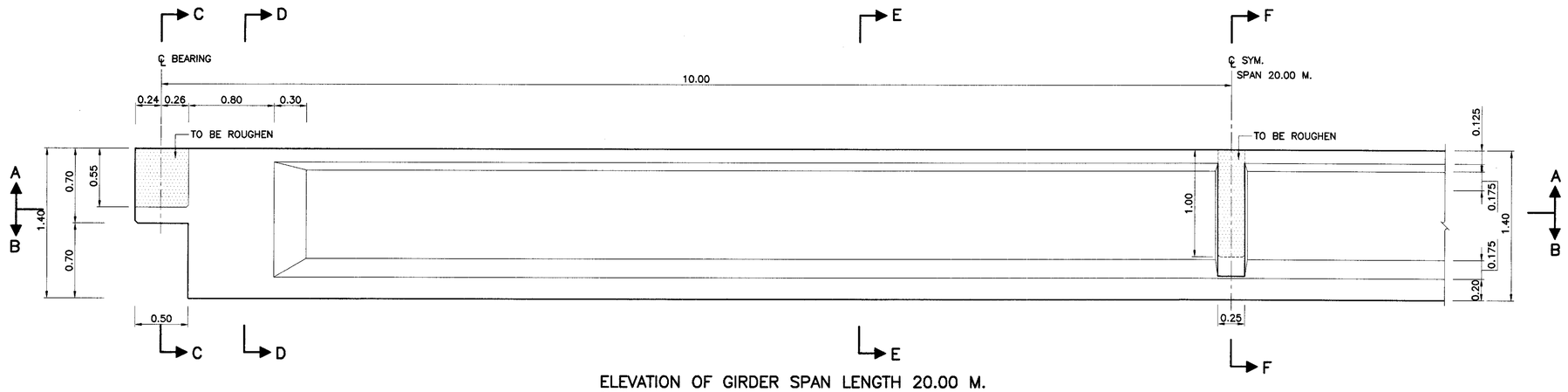
DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
APPROVED : (FOR DIRECTOR GENERAL)

DATE : OCT 2015
SCALE : AS SHOWN
DWG NO.NP2–20H/04
SHEET NO. 72

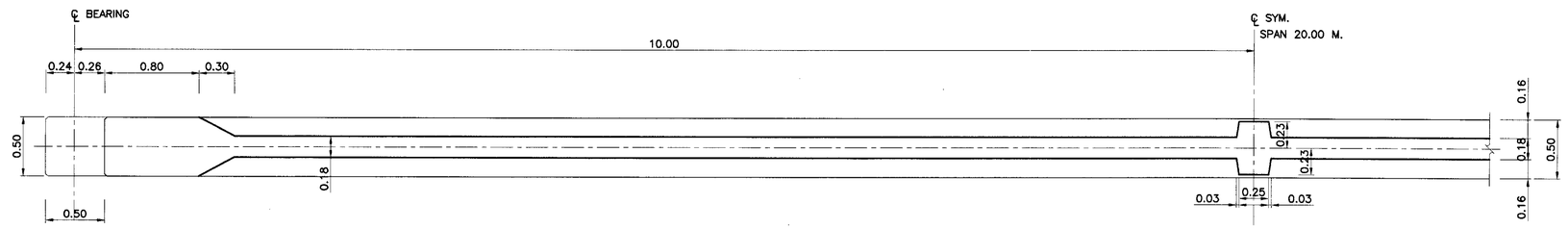
D:\std dwg 2015\NP2–20H–04(REV00)



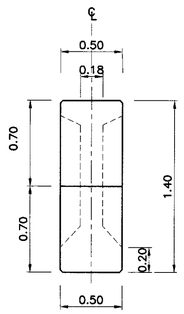
SECTION A – A
SCALE 1 : 25



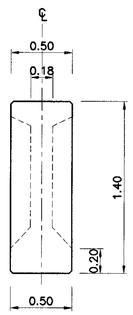
ELEVATION OF GIRDER SPAN LENGTH 20.00 M.
SCALE 1 : 25



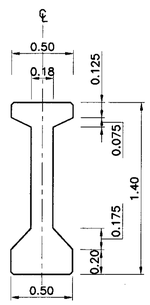
SECTION B – B
SCALE 1 : 25



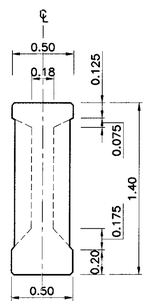
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR PRECAST I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NP2–20H/01 TO NP2–20H/04 AND NP2–20H/06 TO NP2–20H/07

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

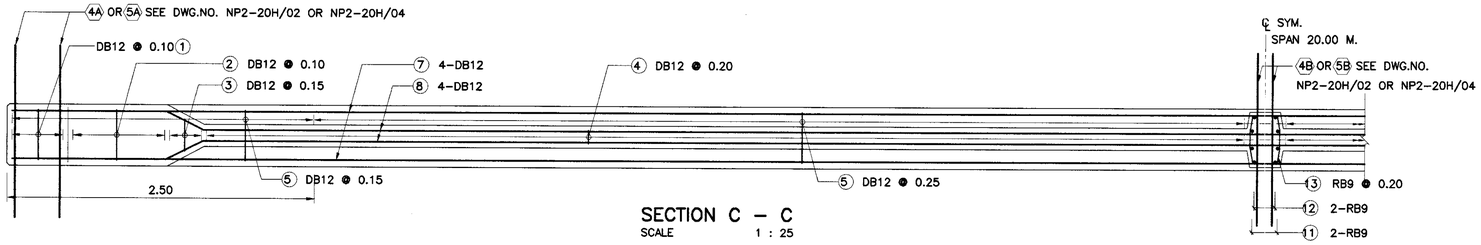
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

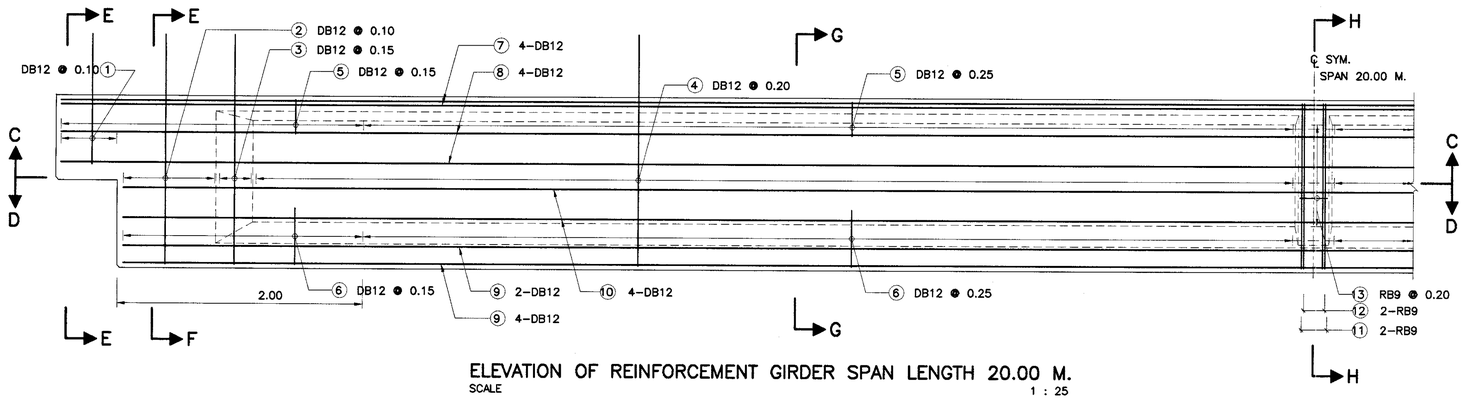
I–GIRDER 20.00 M. (HALF JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. NP2–20H/05
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 73

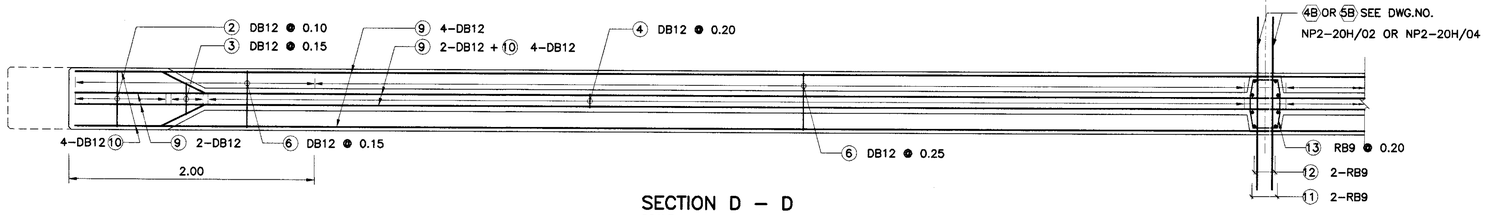
D:\std dwg 2015\NP2-20H-05(REV00)



SECTION C – C
SCALE 1 : 25



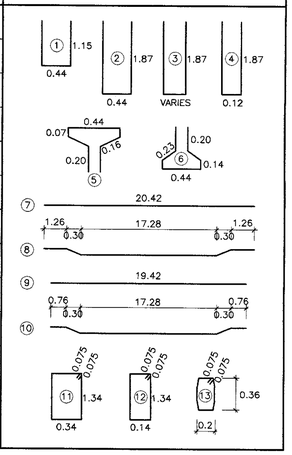
ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 20.00 M.
SCALE 1 : 25

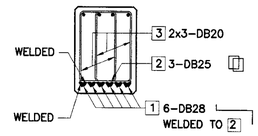


SECTION D – D
SCALE 1 : 25

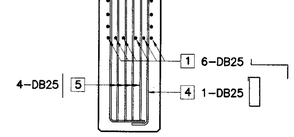
TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
(1)	DB12	
(2)	DB12	
(3)	DB12	
(4)	DB12	
(5)	DB12	
(6)	DB12	
(7)	DB12	
(8)	DB12	
(9)	DB12	
(10)	DB12	
(11)	RB9	
(12)	RB9	
(13)	RB9	





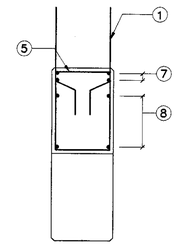
SECTION 1 – 1
SCALE 1 : 25



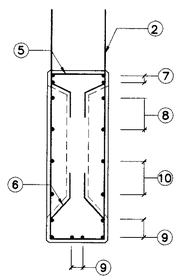
SECTION 2 – 2
SCALE 1 : 25

NOTE :

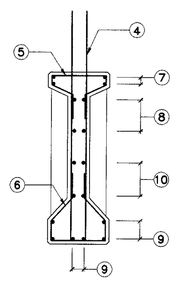
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP2-20H/02 OR NP2-20H/04
5. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2-20H/01 TO NP2-20H/05 AND NP2-20H/07



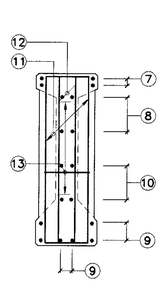
SECTION E – E
SCALE 1 : 25



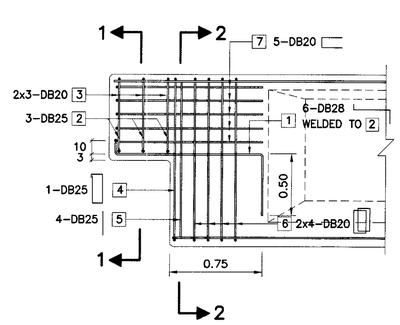
SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25



SECTION H – H
SCALE 1 : 25



DAPPED END REINFORCEMENT
SCALE 1 : 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

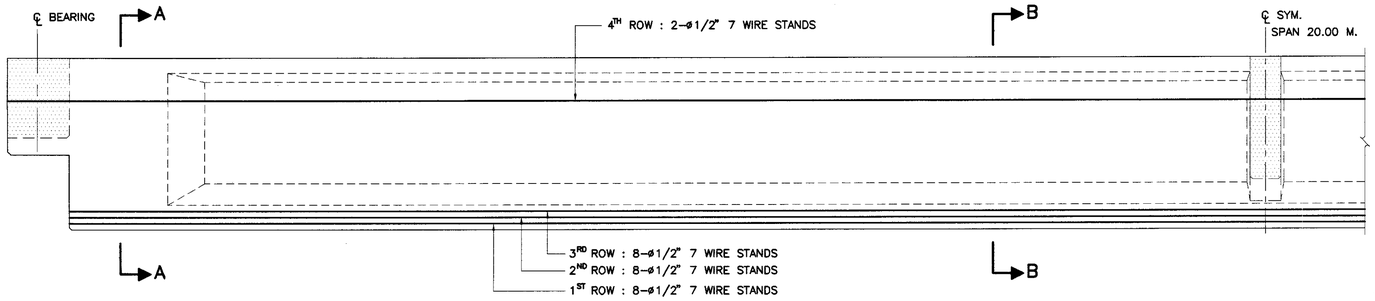
STANDARD DRAWING

I-GIRDER 20.00 M. (HALF JOINT)
GIRDER REINFORCEMENT

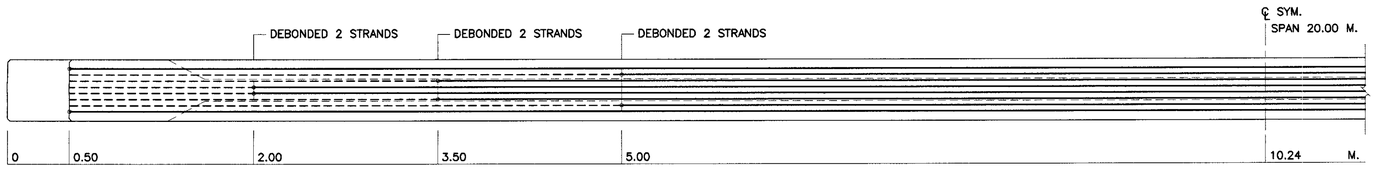
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP2-20H/06
		SHEET NO. 74

REF.	REVISION	SIGNATURE	DATE

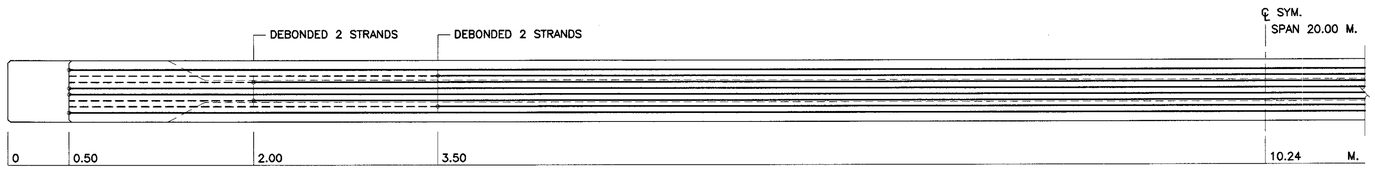
D:\std dwg 2015\NP2-20H-06(REVISED)



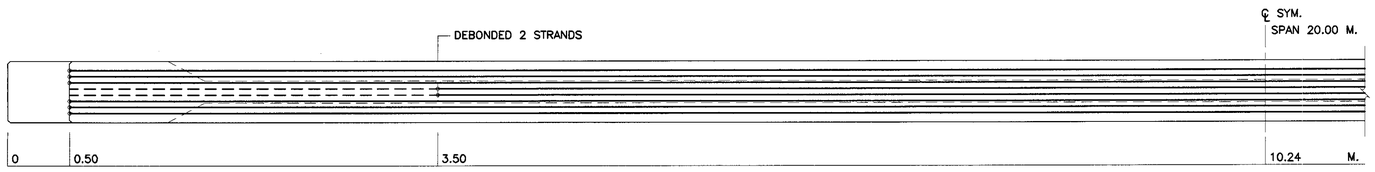
PRESTRESSING DETAIL
SCALE 1 : 25



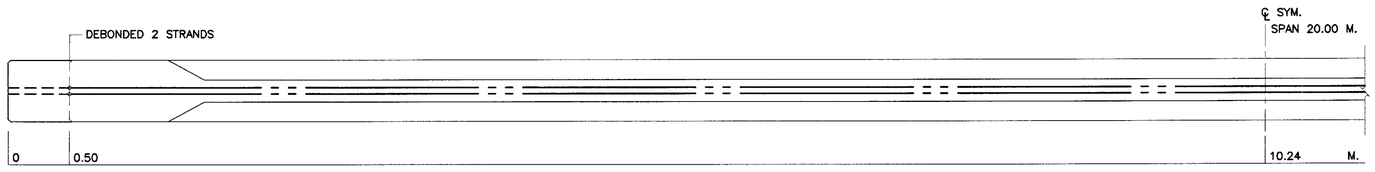
POSITION OF DEBONDED 1ST ROW
SCALE 1 : 25



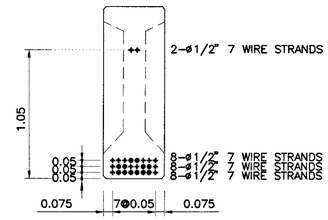
POSITION OF DEBONDED 2ND ROW
SCALE 1 : 25



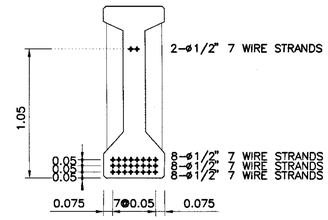
POSITION OF DEBONDED 3RD ROW
SCALE 1 : 25



POSITION OF DEBONDED 4TH ROW
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS.420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW:
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - ⊕ ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ - - - - DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP2-20H/01 OR NP2-20H/06

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

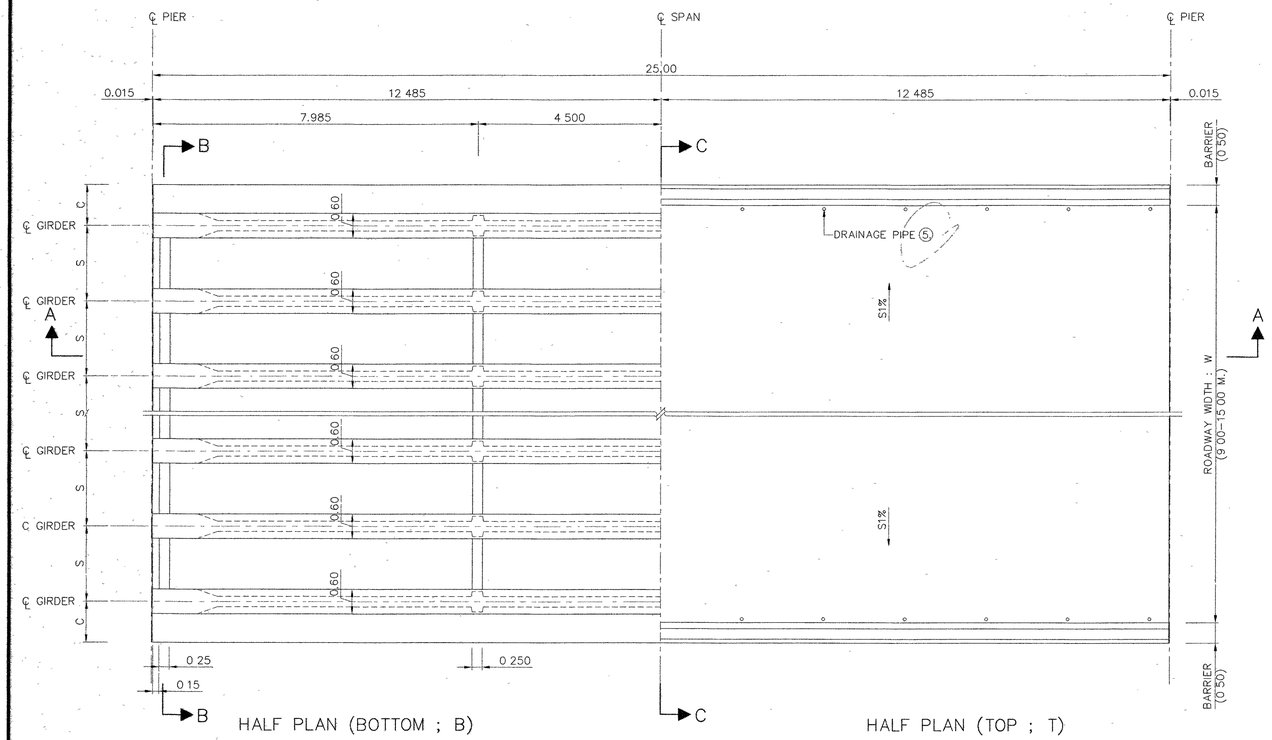
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 20.00 M. (HALF JOINT)
GIRDER PRESTRESSING

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO.NP2-20H/07
		SHEET NO. 75

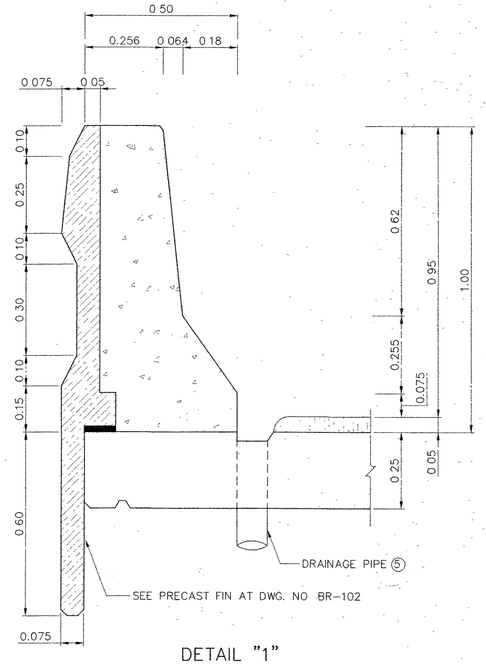
D:\std dwg 2015\NP2-20H-07(REV00)



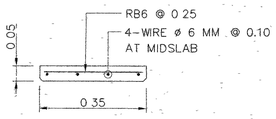
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

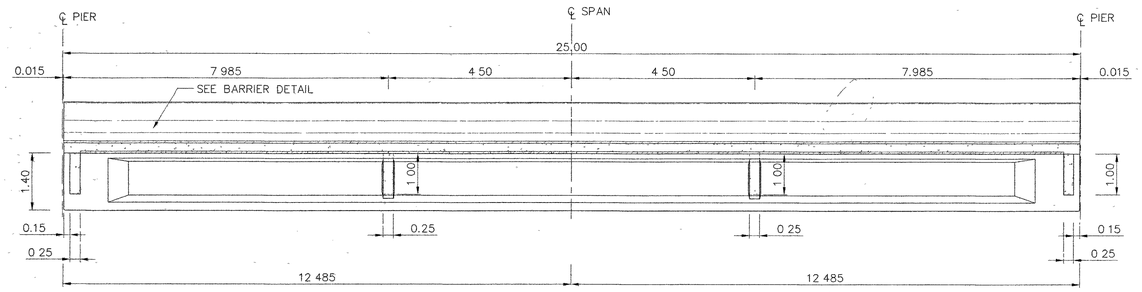
DECK PLAN FOR GIRDER SPAN LENGTH 25.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



PRECAST FORM DETAIL
SCALE 1 : 10



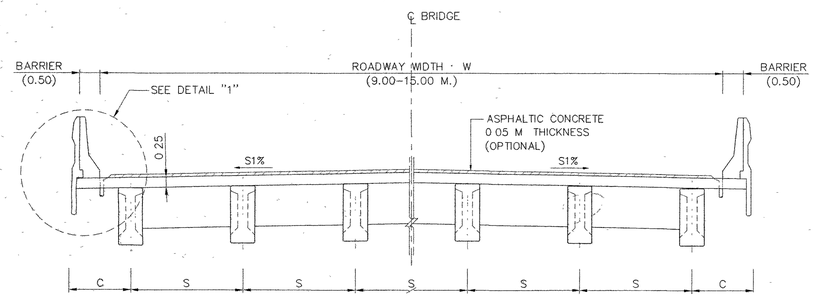
SECTION A – A
SCALE 1 . 75

TABLE OF W, S, C AND NO. OF GIRDER

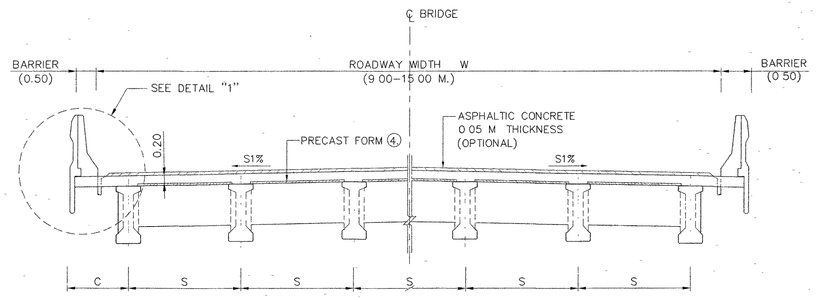
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9 00	5	4 @ 2 00	1 00
10 00	6	5 @ 1 80	1 00
11 00	6	5 @ 2.00	1.00
12 00	7	4 @ 1 83 2 @ 1.84	1 00
15 00	8	5 @ 1 86 2 @ 1.85	1.00
VARIES	n	2 00 (MAX.)	1 00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD · HL–93
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2–25F/02 TO NP2–25F/07
4. PRECAST FORM SHALL BE AS FOLLOWS:
   - 4.1 CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE
   - 4.2 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 4.3 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2 (INCLUDED THE WEIGHT OF PRECAST FORM)
   - 4.4 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M
   - 4.5 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 4.6 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95
   - 4.7 PRECAST FORM SHALL NOT BEND OR DEFLECT THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS
   - 4.8 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 4.9 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED
5. DRAINAGE PIPE SEE BRIDGE DRAINAGE SYSTEM



SECTION B – B
SCALE 1 · 75



SECTION C – C
SCALE 1 · 75

REV	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND

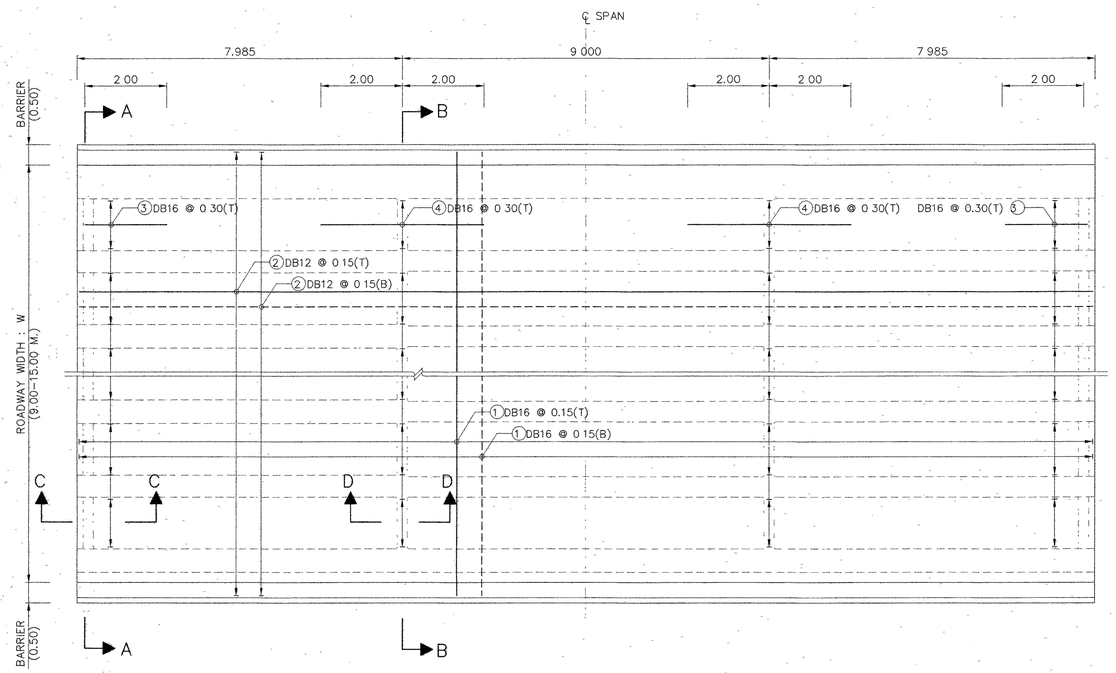
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

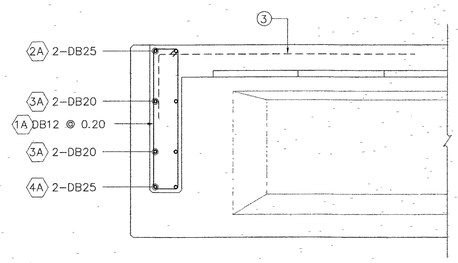
I–GIRDER 25.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2–25F/01
		SHEET NO. 76/R1

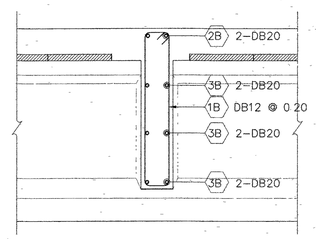
D:\std dwg 2015\NP-G25F-01(REV01)



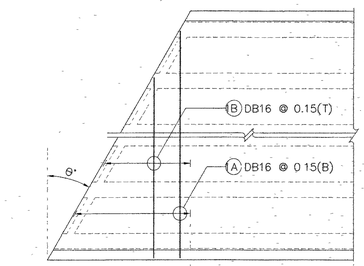
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 . 25



SECTION D – D
SCALE 1 . 25



SKEW REINFORCEMENT
SCALE 1 . 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

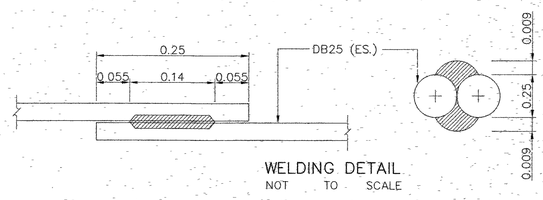
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19 / 1.19 / W+1.00–2C (2A) / S/2+0.40 (3A) / S/2+0.40 (4A)
2A	DB25	
3A	DB20	
4A	DB25	
5A	DB20	S/4+0.10 / 0.19 / S/4+0.10 (6A)
6A	DB25	
7A	DB20	S/2 (7A , 8A)
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.19 / W+1.00–2C (2B) / S/2+0.40 (3B) / S/4+0.10 / 0.19 / S/2 (4B)
2B	DB20	
3B	DB20	
4B	DB20	
5B	DB20	

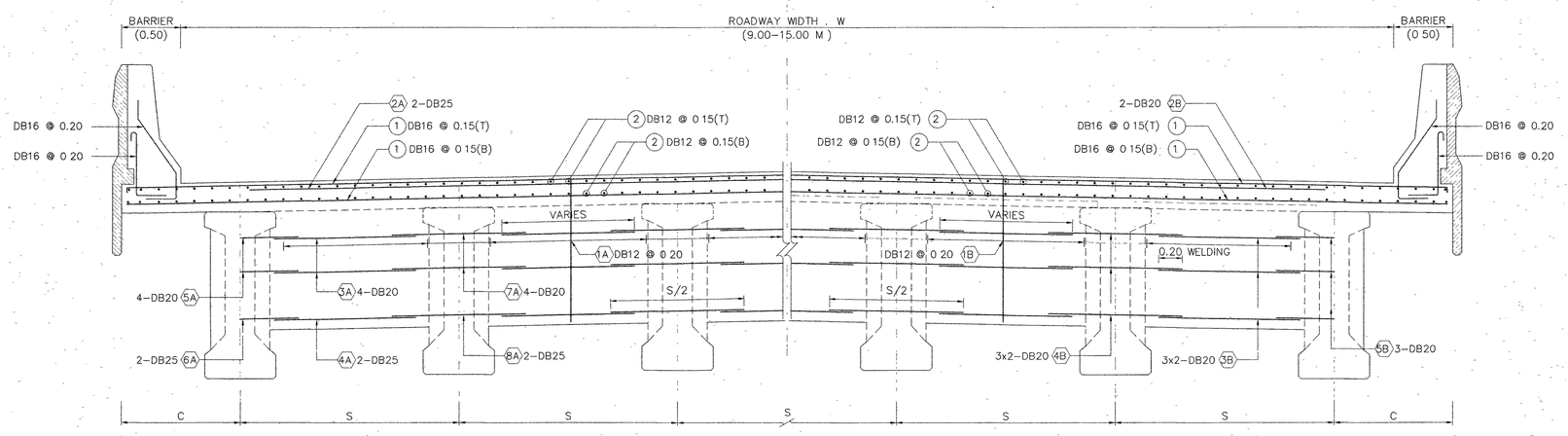
TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70
②	DB12	19.91
③	DB16	2.00 / 0.50
④	DB16	4.00



WELDING DETAIL
NOT TO SCALE

℄ BRIDGE



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS.24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2–25F/01 AND NP2–25F/03 TO NP2–25F/07

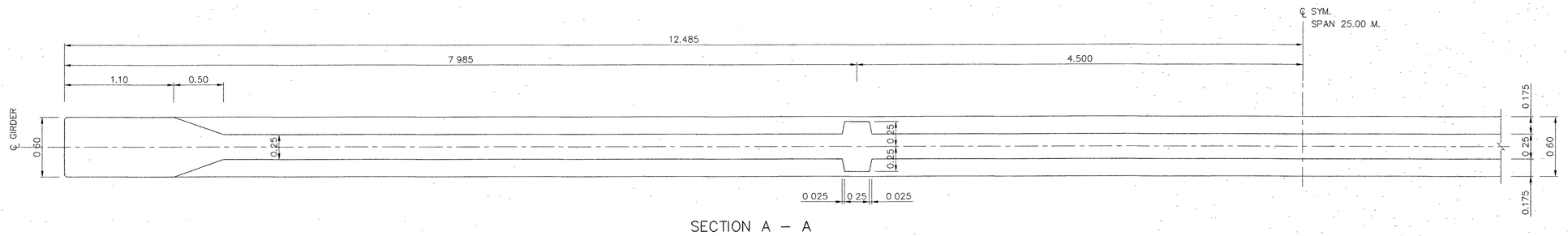
REV 1	REVISION 1/2018		FEB 2018
REV	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

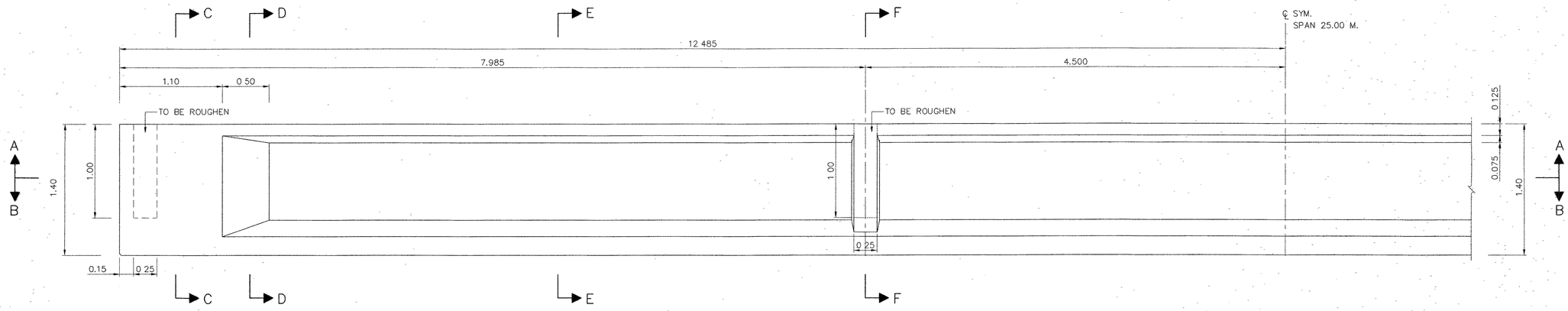
STANDARD DRAWING
I–GIRDER 25.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2–25F/02
		SHEET NO. 77/R1

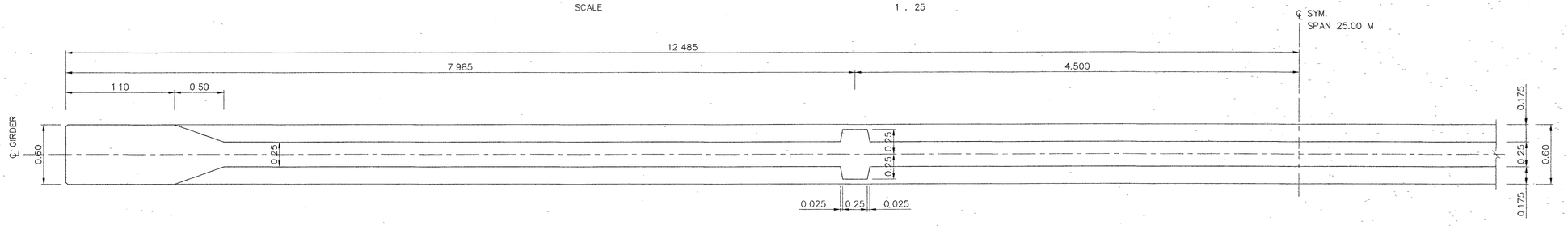
D:\std dwg 2015\NP-C25F-02(REV01)



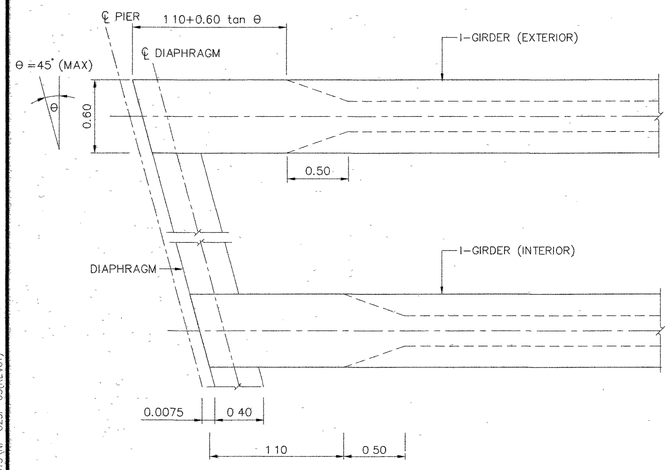
SECTION A – A
SCALE 1 . 25



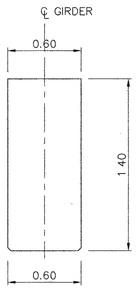
ELEVATION OF GIRDER SPAN LENGTH 25.00 M.
SCALE 1 . 25



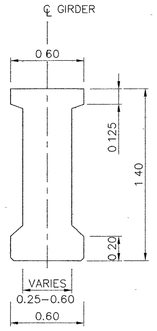
SECTION B – B
SCALE 1 25



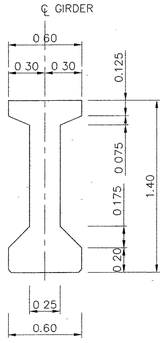
I-GIRDER PLAN
SCALE 1 · 25



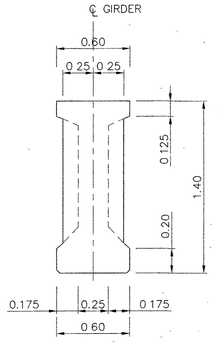
SECTION C – C
SCALE 1 . 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 · 25



SECTION F – F
SCALE 1 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD · HL–93.
3. CONCRETE FOR PRECAST I–GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO NP2–25F/01, NP2–25F/02 AND NP2–25F/04 TO NP2–25F/07

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 25.00 M. (FULL JOINT)
GIRDER DIMENSION

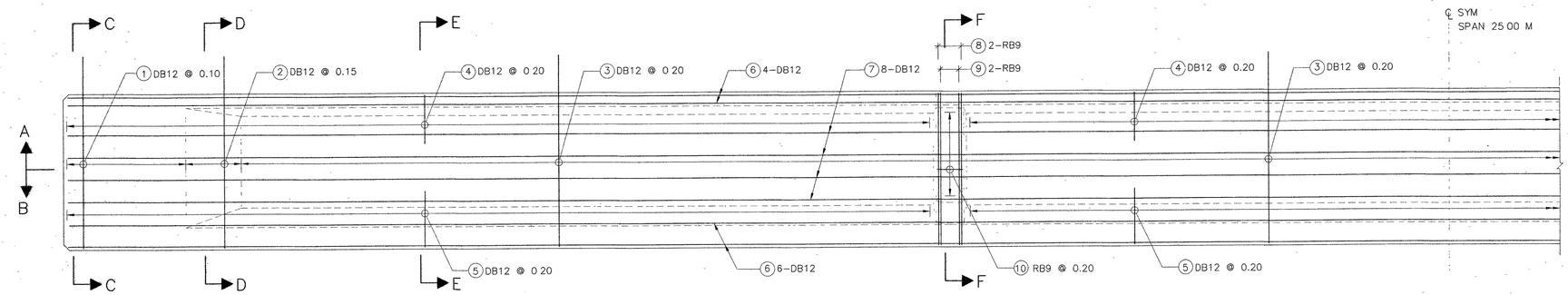
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

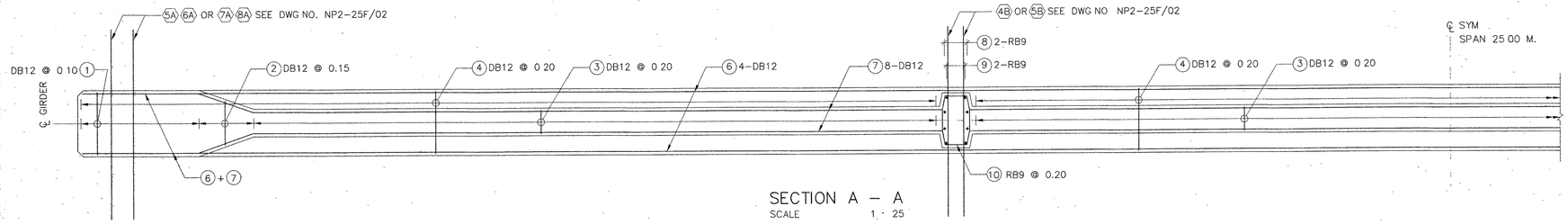
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** NP2–25F/03

SHEET NO. 78/R1

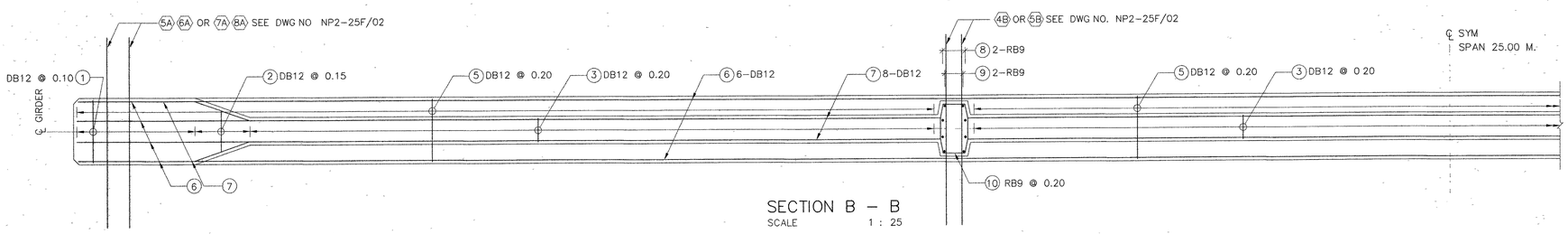
D:\std dwg 2015\NP-C25F-03(REV01)



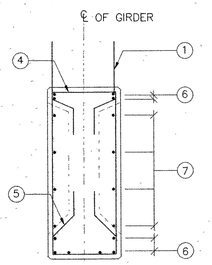
ELEVATION OF REINFORCEMENT
SCALE 1 . 25



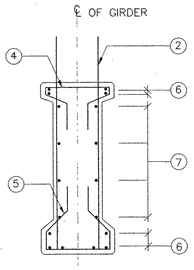
SECTION A – A
SCALE 1 · 25



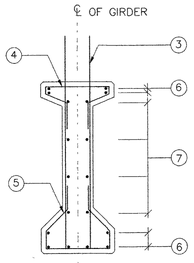
SECTION B – B
SCALE 1 : 25



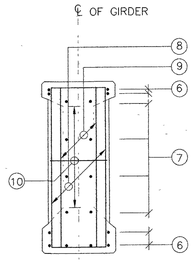
SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 25



SECTION E – E
SCALE 1 25



SECTION F – F
SCALE 1 · 25

TABLE OF GIRDER REINFORCEMENT

NO.	SIZE	SHAPE
①	DB12	
②	DB12	
③	DB12	
④	DB12	
⑤	DB12	
⑥	DB12	
⑦	DB12	
⑧	RB9	
⑨	RB9	
⑩	RB9	

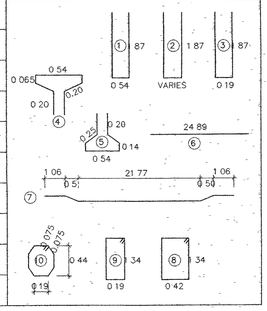


TABLE OF EXTRA REINFORCEMENT

NO.	BARS SIZE	SHAPE
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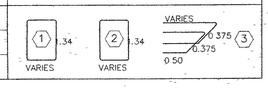
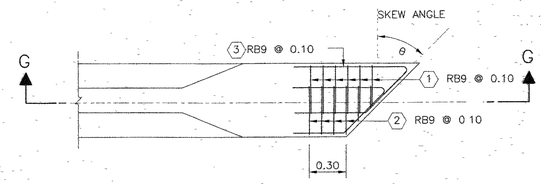
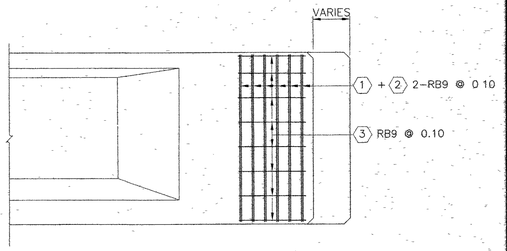
②	RB9	
③	RB9	





EXTRA REINFORCEMENT AT END (SKEW GIRDER)
SCALE 1 · 25



SECTION G – G
SCALE 1 25

NOTE :

1 ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2 DESIGN LIVE LOAD HL–93
3 MIX. DESIGN OF CONCRETE FOR PRESTRESSED I–GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM) FOR CUBE STRENGTH AT 28 DAYS
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP2–25F/02
5 SKEW ANGLE SHALL BE LESS THAN 45 DEGREE
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2–25F/01 TO NP2–25F/03 AND NP2–25F/05 TO NP2–25F/07

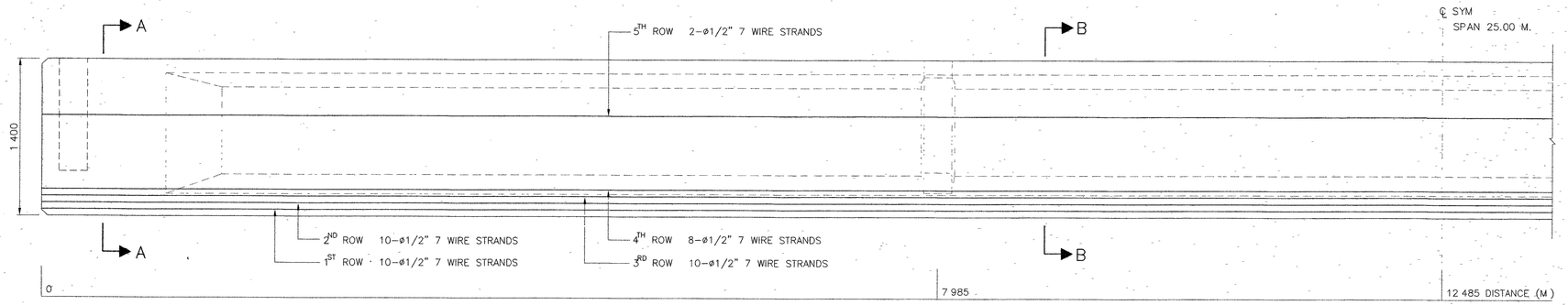
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 25.00 M. (FULL JOINT)
GIRDER REINFORCEMENT FOR PRE–TENSION

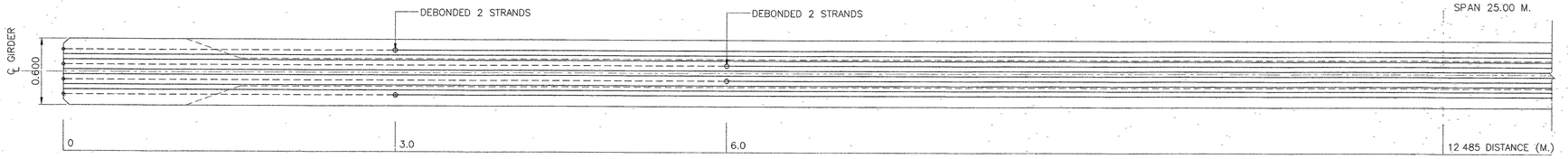
DESIGNED : D.O.H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN		**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			**DWG NO.** NP2–25F/04
			SHEET NO. 79/R1

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

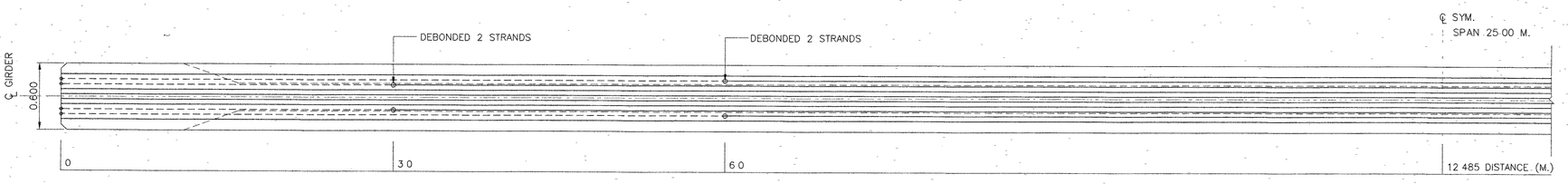
D:\std dwg 2015\NP-25F-04(REV01)



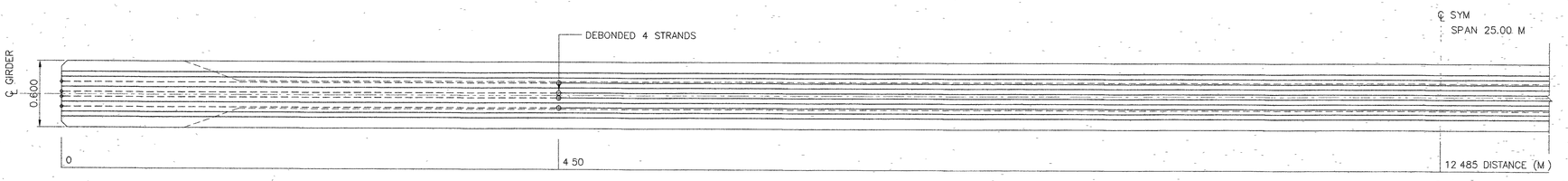
PRESTRESSING DETAILS
SCALE 1 : 25



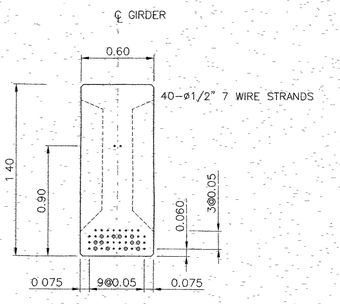
POSITION OF DEBONDED 1 ST ROW
SCALE 1 : 25



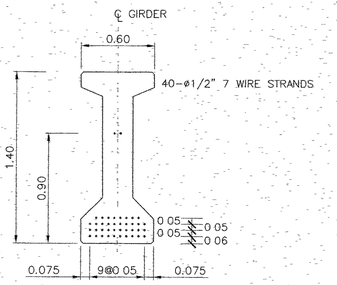
POSITION OF DEBONDED 2 ND ROW
SCALE 1 25



POSITION OF DEBONDED 3 RD ROW
SCALE 1 . 25



SECTION A – A
SCALE 1 . 25



SECTION B – B
SCALE 1 . 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
2. DESIGN LIVE LOAD . HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12.7 MM. IN ACCORDANCE WITH TIS 420
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH.
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW
   - 5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   - 5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M
9. SKEW ANGLE SHALL BE LESS THAN 45 DEGREE.
10. SYMBOLS OF PRESTRESSING STRANDS
    - + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
    - ⊕ ----- DEBOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO NP2-25F/01 TO NP2-25F/04 AND NP2-25F/06, NP2-25F/07

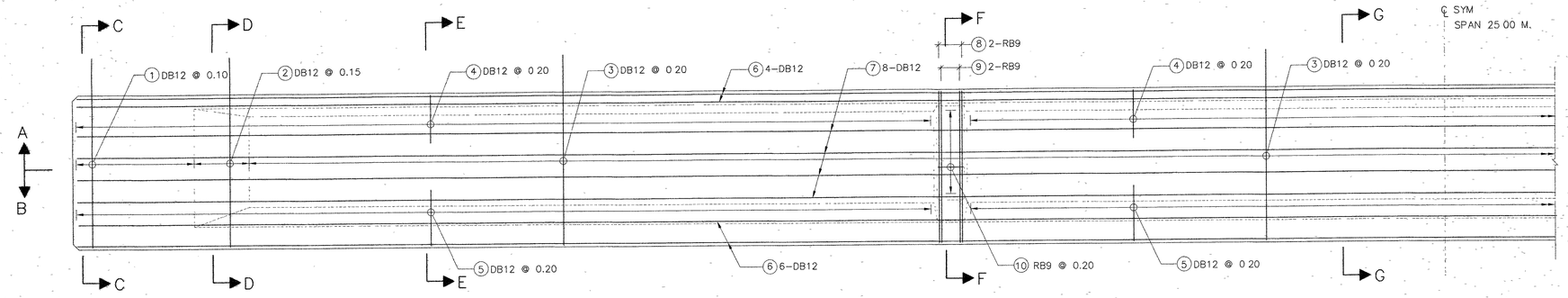
REV1	REVISION 1/2018		(FEB 2018)
REV	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 25.00 M. (FULL JOINT)
GIRDER PRE-TENSION DETAILS

DESIGNED : D.O.H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-25F/05
		SHEET NO. 80/R1

D:\std dwg 2015\NP-025F-05(REV01)



ELEVATION OF REINFORCEMENT
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

NO	SIZE	SHAPE
1.	DB12	
2.	DB12	
3.	DB12	
4.	DB12	
5.	DB12	
6.	DB12	
7.	DB12	
8.	RB9	
9.	RB9	
10.	RB9	

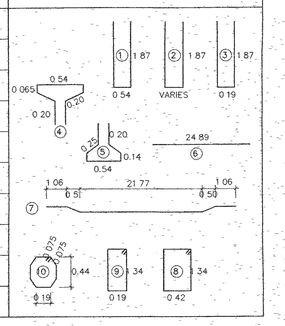
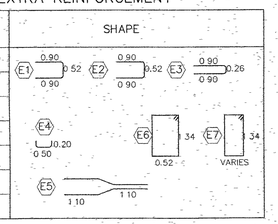
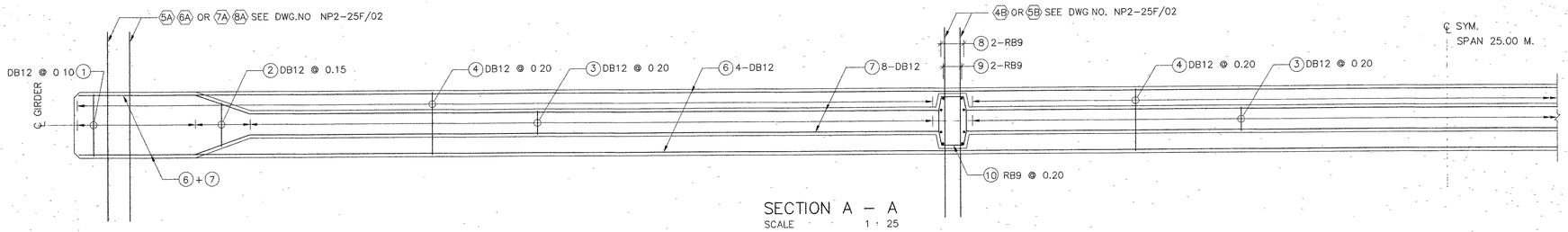


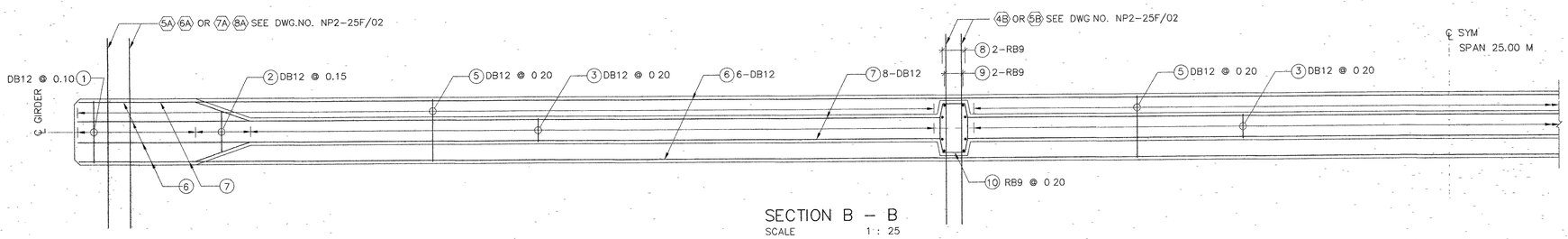
TABLE OF EXTRA REINFORCEMENT

NO.	BARS SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	RB9	
E6	DB12	
E7	DB12	

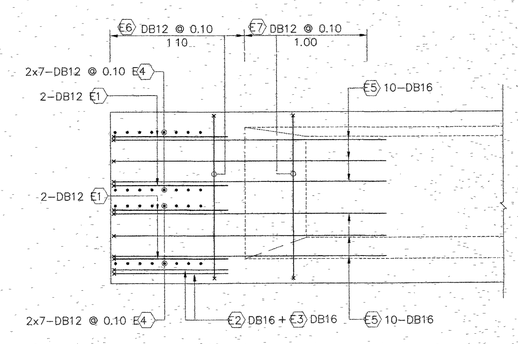




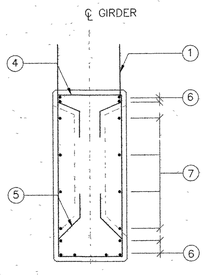
SECTION A – A
SCALE 1 : 25



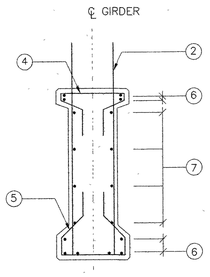
SECTION B – B
SCALE 1 : 25



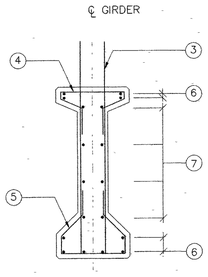
EXTRA REINFORCEMENT AT THE END SIDE VIEW
SCALE 1 : 25



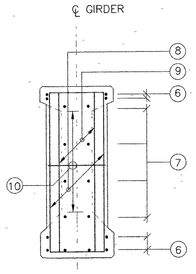
SECTION C – C
SCALE 1 : 25



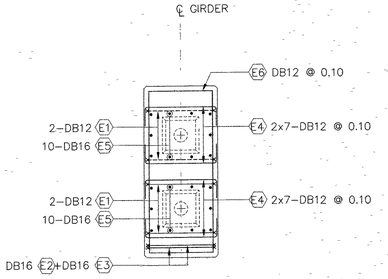
SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 25



SECTION F – F
SCALE 1 25



EXTRA REINFORCEMENT AT THE END FRONT VIEW
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX DESIGN OF CONCRETE FOR POST-TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP2-25F/02
5. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2-25F/01 TO NP2-25F/05 AND NP2-25F/07

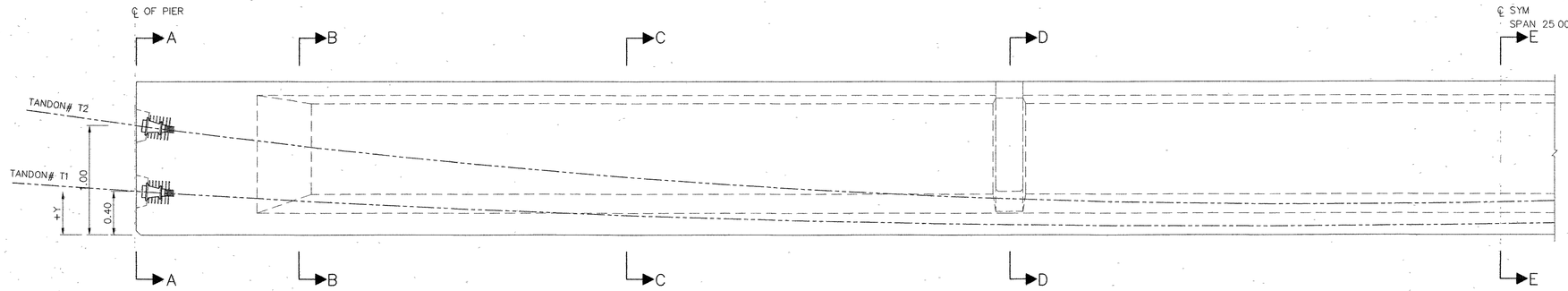
REV.1	REVISION 1/2018		FEB 2018
REV	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 25.00 M. (FULL JOINT)
GIRDER REINFORCEMENT FOR POST-TENSION

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-25F/06
		SHEET NO. 81/R1

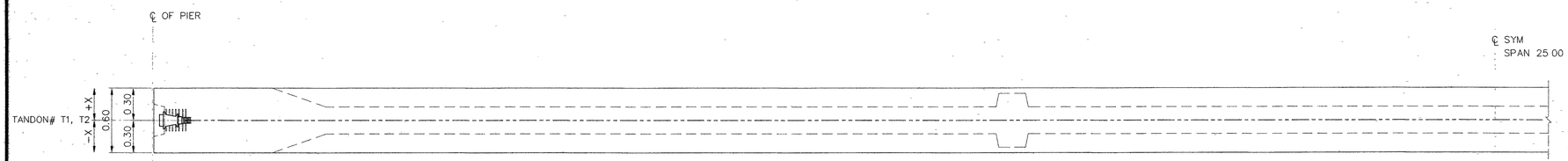
D:\std dwg 2015\NP-025F-06(REV01)



VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER : Y)

DISTANCE (M.)	12.485	12.00	11.00	10.00	9 00	8.00	7.00	6.00	5.00	4.00	3 00	2.00	1 00	0.00
TANDON# T2	1 000	0 947	0.843	0.749	0 664	0 587	0.520	0 462	0 412	0 372	0 340	0 318	0 304	0 300
TANDON# T1	0 400	0 377	0 333	0 292	0 256	0 223	0 194	0.169	0 148	0 131	0.117	0.108	0 102	0 100

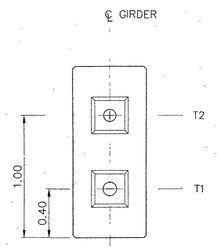
CABLE PROFILE (GIRDER 25.00 M.)
SCALE 1 25



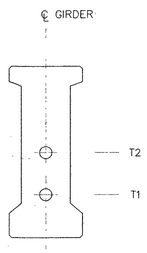
HORIZONTAL TENDON PROFILE DETAILS (MEASURED FROM CENTERLINE OF GIRDER : X)

DISTANCE (M.)	12 485	12.00	11 00	10 00	9.00	8 00	7 00	6 00	5 00	4 00	3 00	2 00	1 00	0.00
TANDON# T2	0.000	0.000	0 000	0 000	0 000	0 000	0 000	0.000	0 000	0 000	0 000	0.000	0.000	0.000
TANDON# T1	0 000	0.000	0 000	0.000	0.000	0 000	0 000	0.000	0 000	0.000	0.000	0 000	0 000	0.000

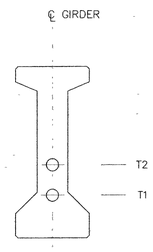
CABLE DIAGRAMATIC ARRANGMENT (GIRDER 25.00 M.)
SCALE 1 . 25



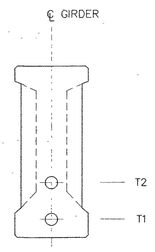
SECTION A – A
SCALE 1 : 25



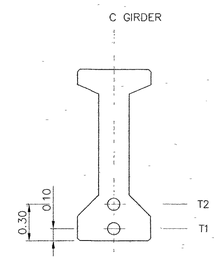
SECTION B – B
SCALE 1 25



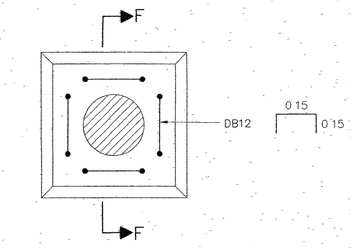
SECTION C – C
SCALE 1 . 25



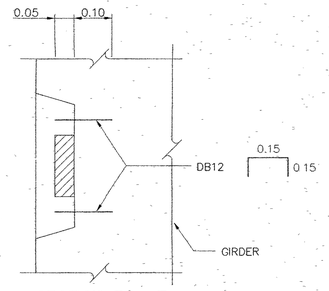
SECTION D – D
SCALE 1 . 25



SECTION E – E
SCALE 1 : 25



FRONT VIEW



SECTION F – F

EXTRA REINFORCEMENTS FOR RECESS
SCALE 1 : 10

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX DESIGN OF CONCRETE FOR POST-TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING
   - 4 1 LOW RELAXATION SEVEN WIRE STRANDS ø 15.2 MM. IN ACCORDANCE WITH TIS.420 GRADE 1860
   - 4 2 MIN CHARACTERISTIC STRENGTH OF STRAND 250 KN.
   - 4 3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH. IN WHICH THE SEQUENCE OF JACKING SHALL BE TENDON 1 AND THEN TENDON 2. EACH TENDON IS STRESSED BOTH END.
   - 4.3 NUMBER OF PRESTRESSING STRANDS
     T1 = 13 PRESTRESSING STRANDS
     T2 = 15 PRESTRESSING STRANDS
5. DUCTS ARE GALVANIZED METAL SHEATHING GROUTED IMMEDIATELY AFTER STRESSING OPERATION.
6. JACKING FORCES ARE CALCULATED USING "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" AND ASSUMED DESIGN PARAMETERS AS FOLLOW .
   - FRICTION CURVATURE COEFFICIENT 0.20
   - FRICTION WOBBLE COEFFICIENT 0.0033 1/M
   - A WEDGE SLIP 6 MM.
7. THE CONTRACTOR SHALL CARRY OUT TEST WITH THE TENDONS AND DUCTS PROPOSED FOR USING TO ESTABLISH THE FRICTION COEFFICIENTS AND SHALL ADJUST THE STRESSING FORCES FOR APPROVAL IF THE MEASURED COEFFICIENT IS DIFFERED SIGNIFICANTLY FROM THE ASSUME VALUE.
8. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM OF 36 MPa. (367 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
9. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER
10. SPACING OF GIRDERS SHALL BE LESS THAN 2 00 M.
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO NP2-25F/01 TO NP2-25F/06

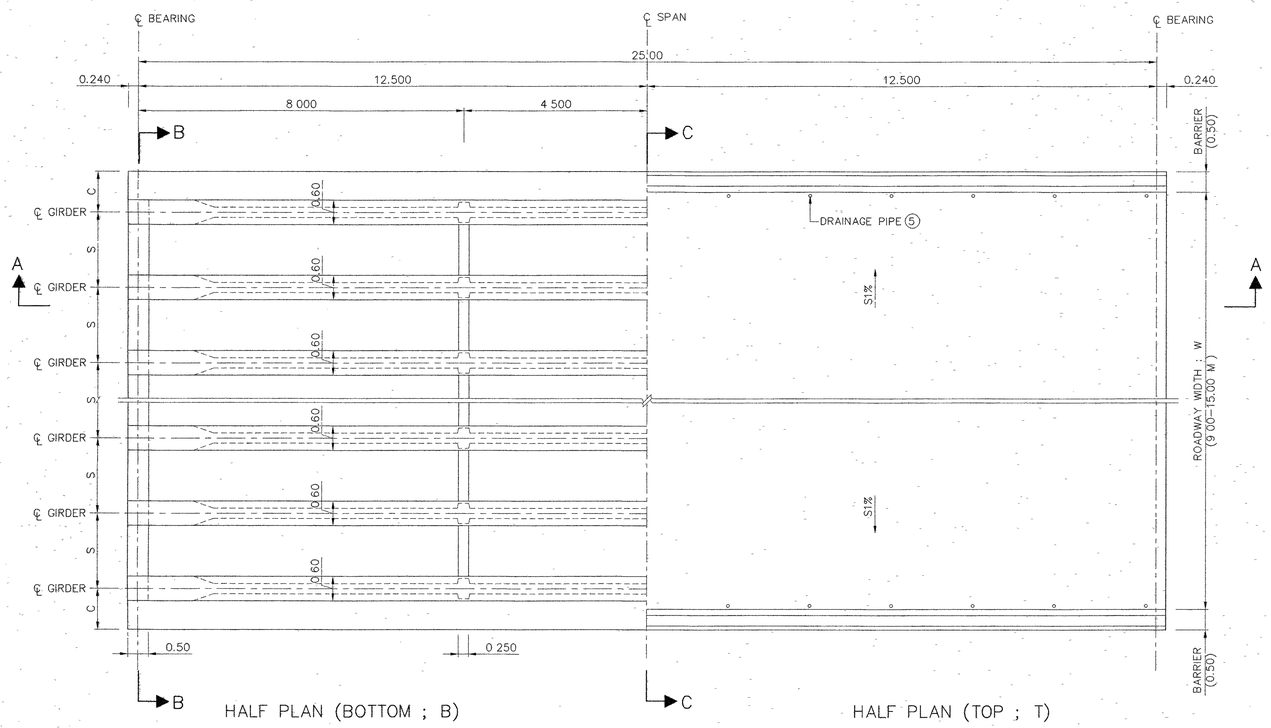
REV 1	REVISION 1/2018		FEB 2018
REV	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 25.00 M. (FULL JOINT)
GIRDER POST-TENSION DETAILS

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
		DWG NO. NP2-25F/07
APPROVED : (FOR DIRECTOR GENERAL)		**SHEET NO.** 82/R1

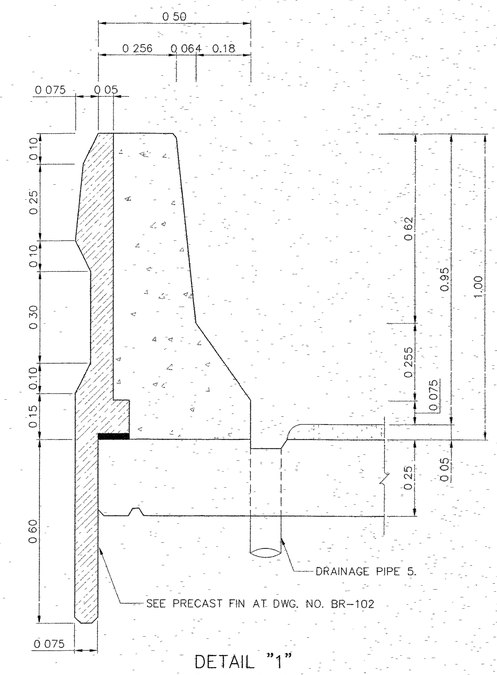
D:\std dwg 2015\NP-G25F-07(REV01)



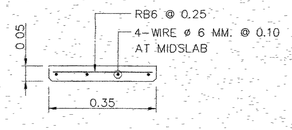
HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

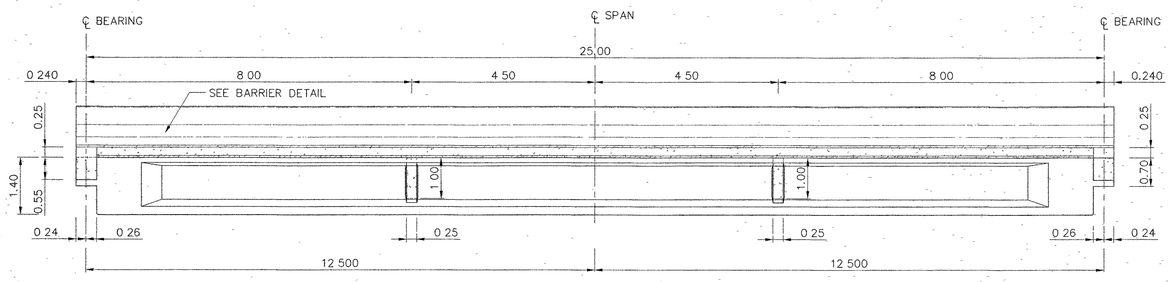
DECK PLAN FOR GIRDER SPAN LENGTH 25.00 M.
SCALE 1 : 75



DETAIL "1"
SCALE 1 : 10



PRECAST FORM DETAIL
SCALE 1 : 10



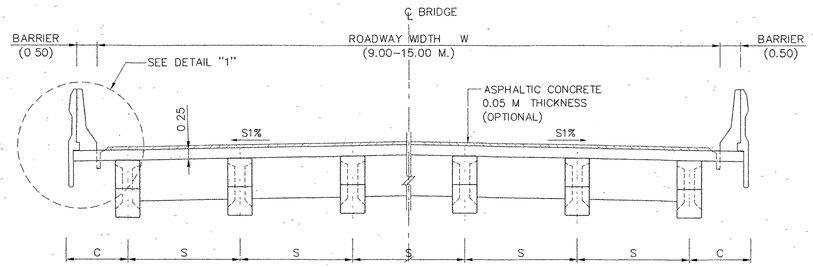
SECTION A – A
SCALE 1 : 75

TABLE OF W, S, C AND NO. OF GIRDER

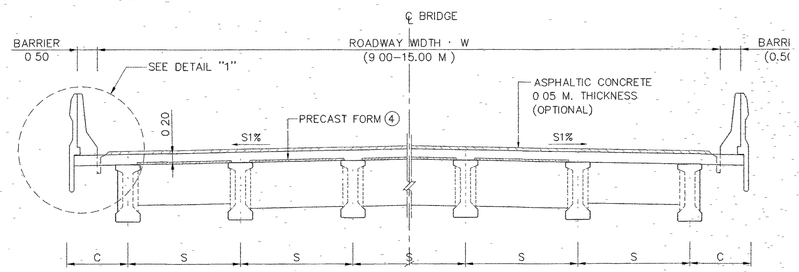
ROADWAY WIDTH W (M)	NO OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9 00	5	4 @ 2 00	1 00
10 00	6	5 @ 1 80	1 00
11 00	6	5 @ 2 00	1.00
12 00	7	4 @ 1.83 2 @ 1 84	1 00
15 00	8	5 @ 1 86 2 @ 1.85	1.00
VARIES	n	2.00 (MAX)	1.00

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2–25H/02 TO NP2–25H/07
4. PRECAST FORM SHALL BE AS FOLLOWS:
   - 4 1 CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE
   - 4.2 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 4.3 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2 (INCLUDED THE WEIGHT OF PRECAST FORM)
   - 4.4 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 4 5 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT SAND) OF 1.2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 4 6 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS 95.
   - 4 7 PRECAST FORM SHALL NOT BEND OR DEFLECT THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 4 8 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 4.9 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.
5. DRAINAGE PIPE SEE BRIDGE DRAINAGE SYSTEM



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 25.00 M. (HAFT JOINT)
BRIDGE DECK DIMENSION

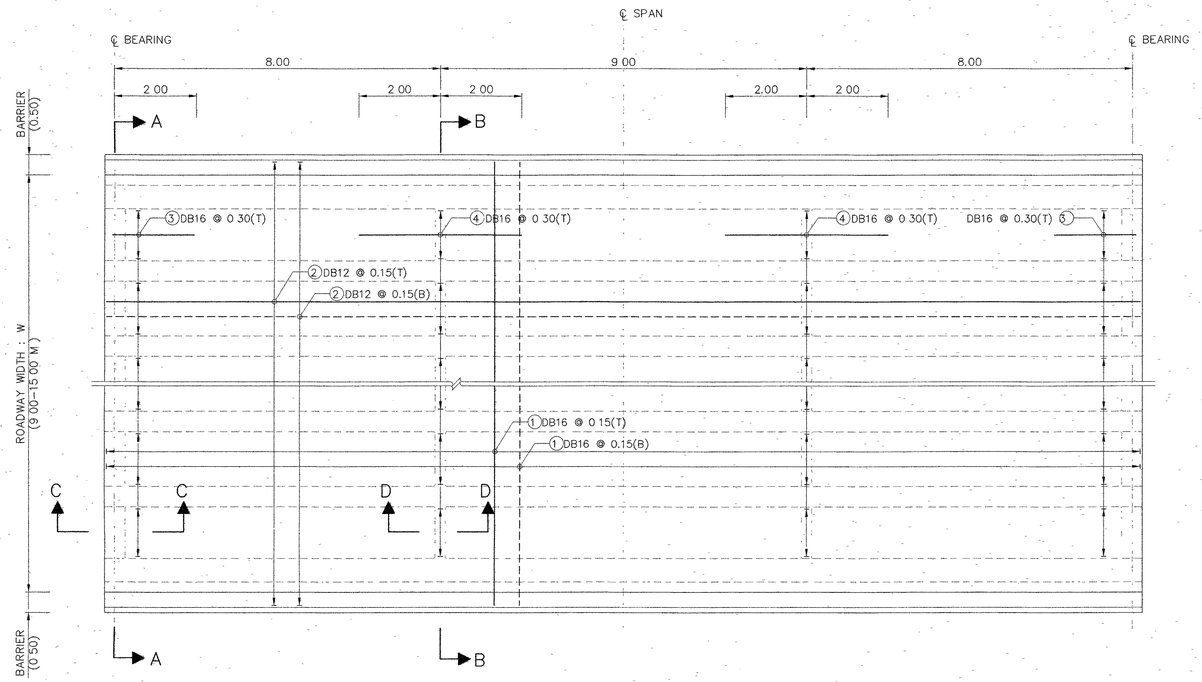
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

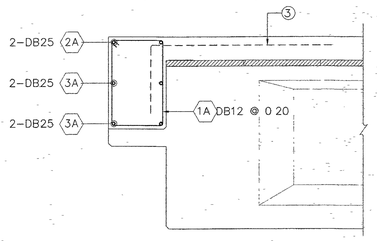
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** NP2–25H/01

SHEET NO. 83/R1

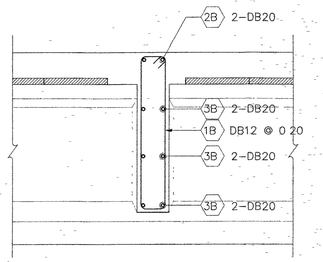
D:\std dwg 2015\NP-G25H-01(REV01)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

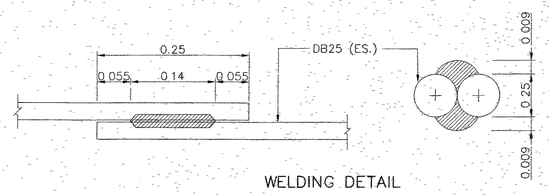
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.64
2A	DB25	W+1.00-2C
3A	DB25	S/2+0.40
4A	DB25	S/4+0.10
5A	DB25	S/2

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

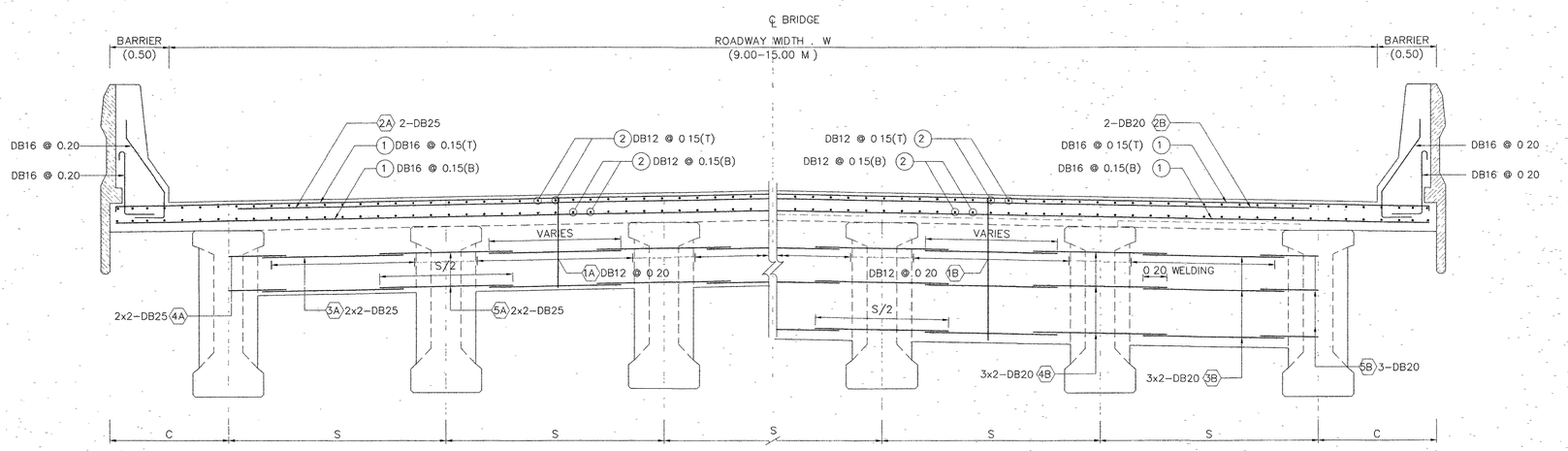
BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.19
2B	DB20	W+1.00-2C
3B	DB20	S/2+0.40
4B	DB20	S/4+0.10, 0.19
5B	DB20	S/2

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70
2	DB12	19.91
3	DB16	2.00, 0.50
4	DB16	4.00



WELDING DETAIL
NOT TO SCALE



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS 24 GRADE SD40 FOR DEFORMED BARS
5. THE REINFORCE BAR NO 4A, 5A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO NP2-25H/01 AND NP2-25H/03 TO NP2-25H/07

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018
REV	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I-GIRDER 25.00 M. (HAFT JOINT)
BRIDGE DECK REINFORCEMENT

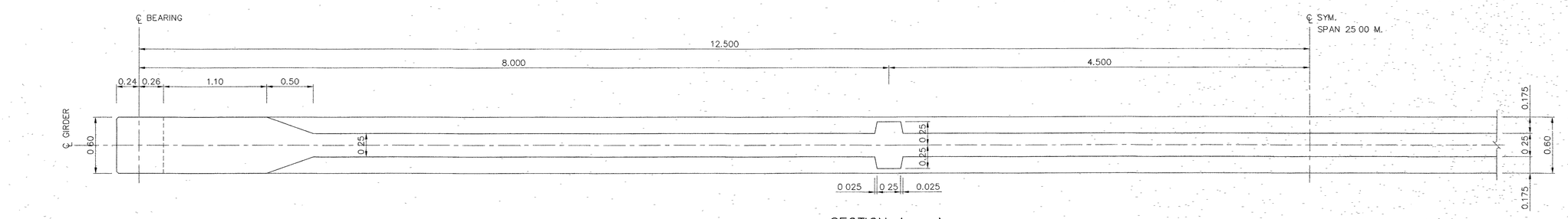
DESIGNED : D.O.H. & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN

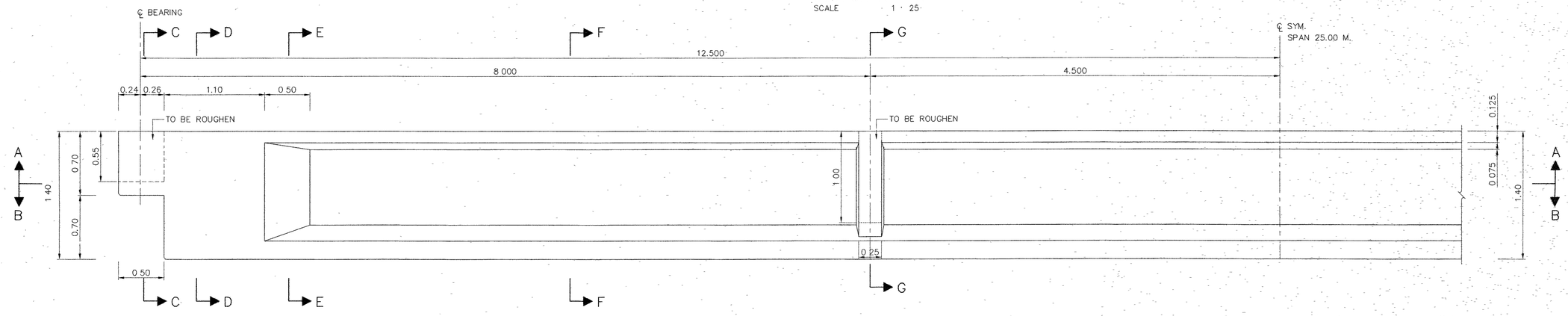
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** NP2-25H/02

SHEET NO. 84/R1

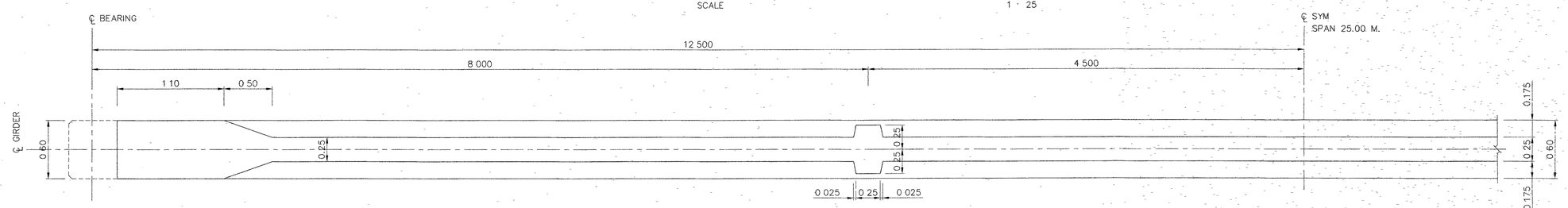
D:\std dwg 2015\NP-025H-02(RLV01)



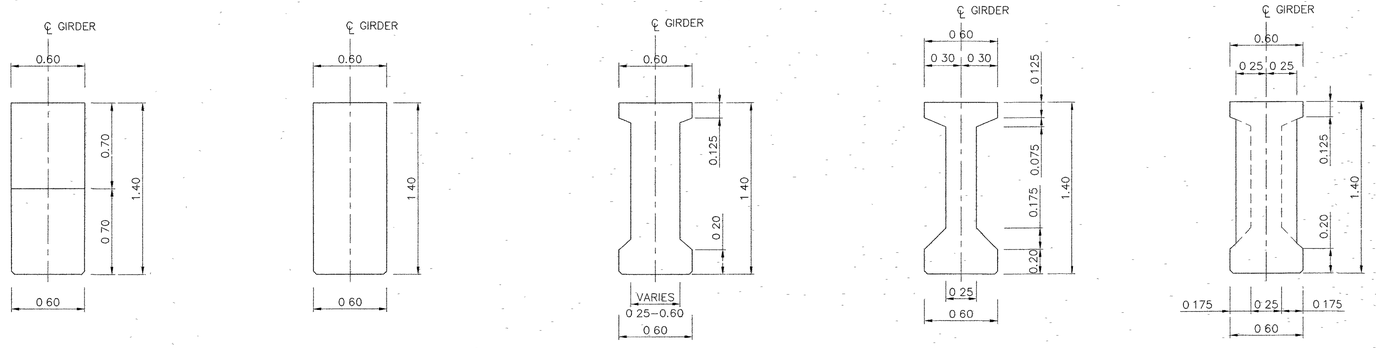
SECTION A – A
SCALE 1 : 25



ELEVATION OF GIRDER SPAN LENGTH 25.00 M.
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

SECTION D – D
SCALE 1 : 25

SECTION E – E
SCALE 1 : 25

SECTION F – F
SCALE 1 : 25

SECTION G – G
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. CONCRETE FOR PRESTRESSED I-GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO. NP2-25H/01, NP2-25H/02 AND NP2-25H/04 TO NP2-25H/07

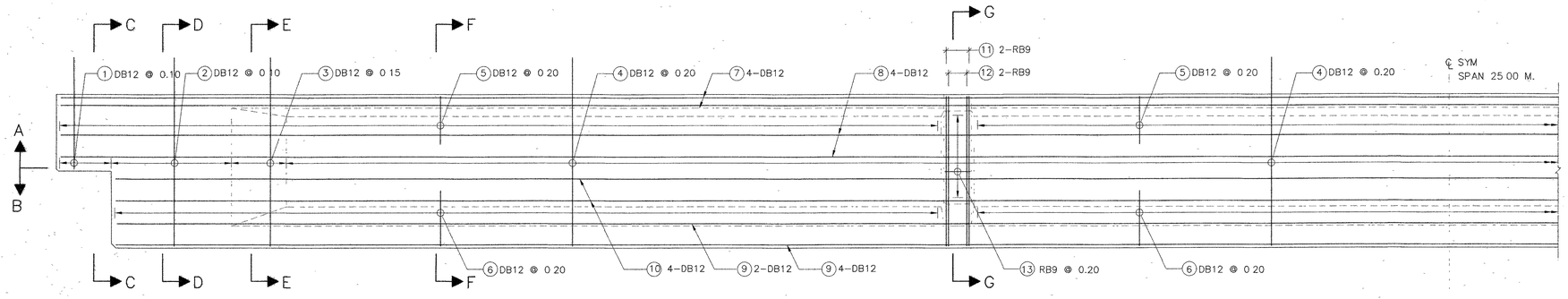
REV	REVISION	SIGNATURE	DATE
REV.1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

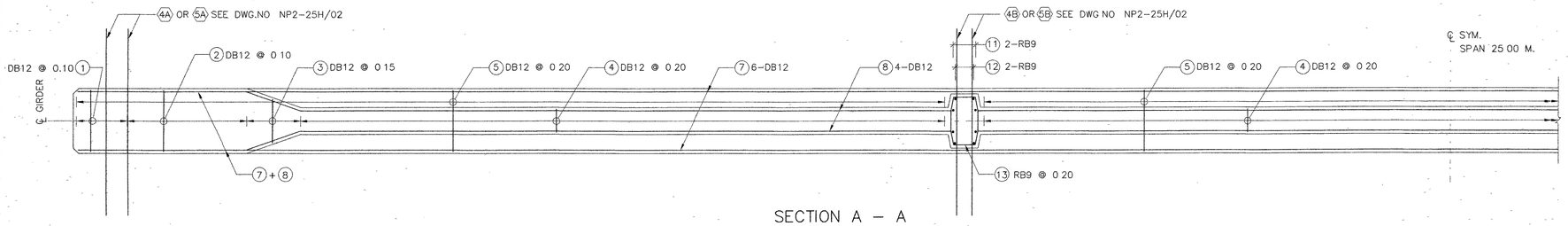
STANDARD DRAWING
I-GIRDER 25.00 M. (HAFT JOINT)
GIRDER DIMENSION

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-25H/03
		SHEET NO. 85/R1

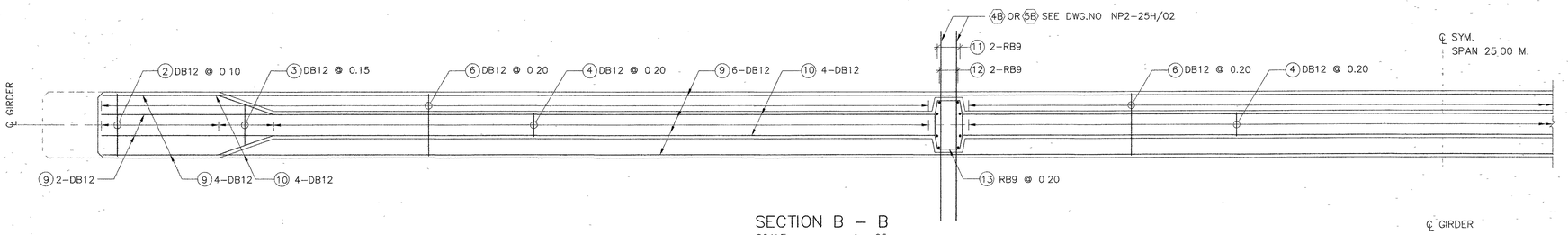
D:\std dwg 2015\NP-025H-03(REV01)



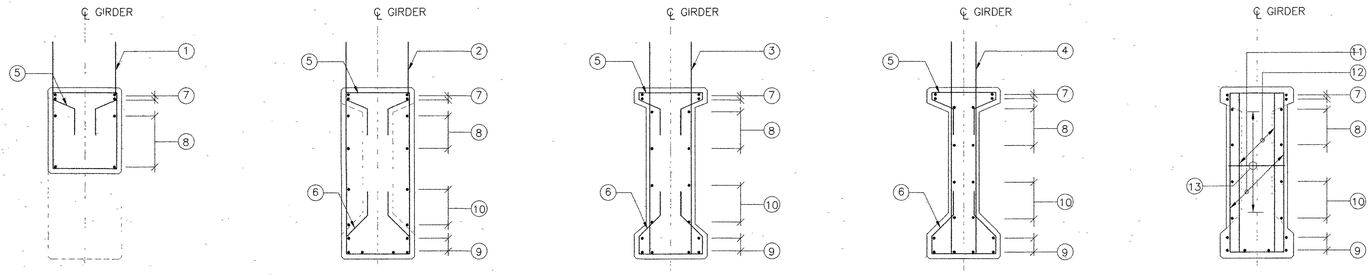
LONGITUDINAL REINFORCEMENT
SCALE 1 25



SECTION A – A
SCALE 1 · 25



SECTION B – B
SCALE 1 25



SECTION C – C
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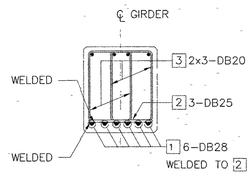
SECTION D – D
SCALE 1 . 25

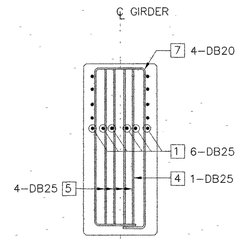
SECTION E – E
SCALE 1 : 25

SECTION F – F
SCALE 1 . 25

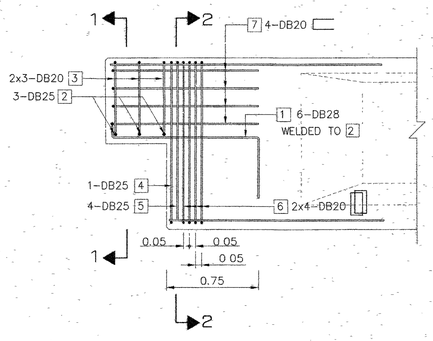
SECTION G – G
SCALE 1 25



SECTION 1 – 1
SCALE 1 : 25



SECTION 2 – 2
SCALE 1 : 25



DAPPED END REINFORCEMENT
SCALE 1 . 25

TABLE OF GIRDER REINFORCEMENT

BAR NO	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

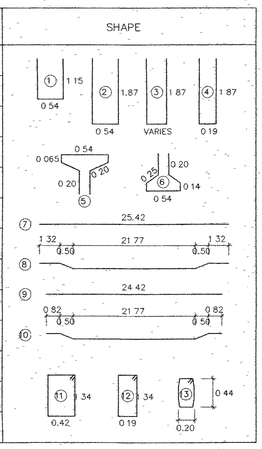


TABLE OF EXTRA REINFORCEMENT

NO.	BARS SIZE	SHAPE
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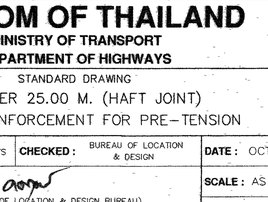
2	DB25	
3	DB20	
4	DB25	
5	DB25	
6	DB20	
7	DB20	



NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
2. DESIGN LIVE LOAD . HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP2-25F/02
5. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO.NP2-25H/01 TO NP2-25H/03 AND NP2-25H/05 TO NP2-25H/07

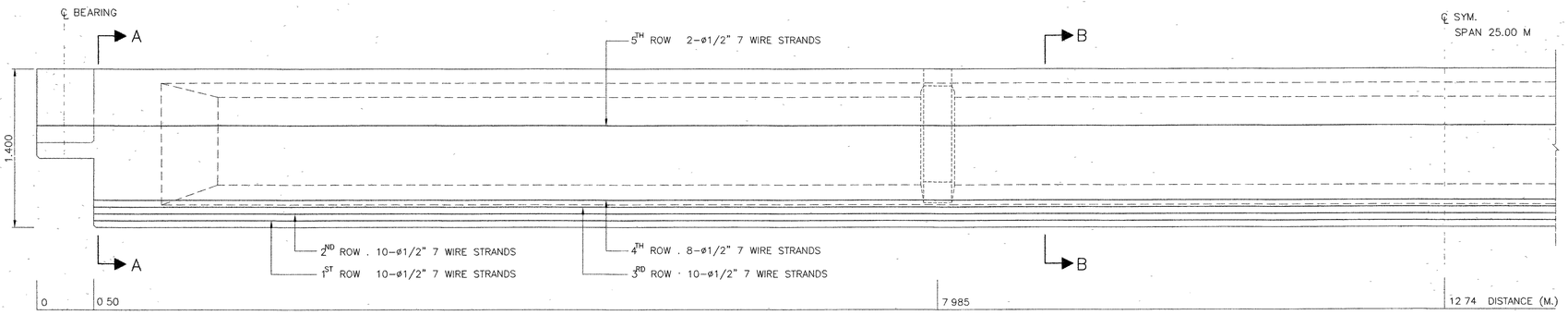
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 25.00 M. (HAFT JOINT)
GIRDER REINFORCEMENT FOR PRE-TENSION

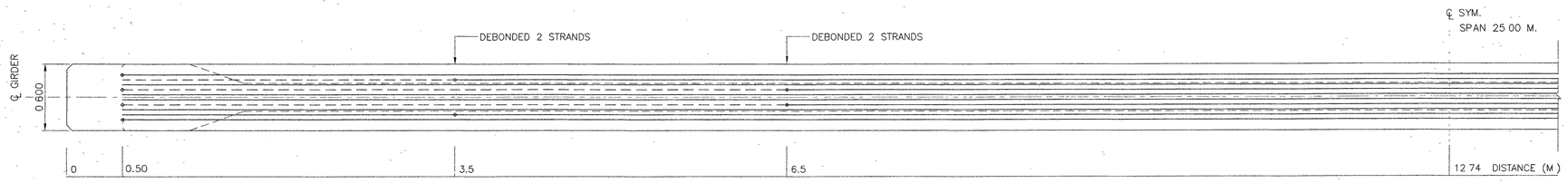
DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-25H/04
		SHEET NO. 86/R1

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

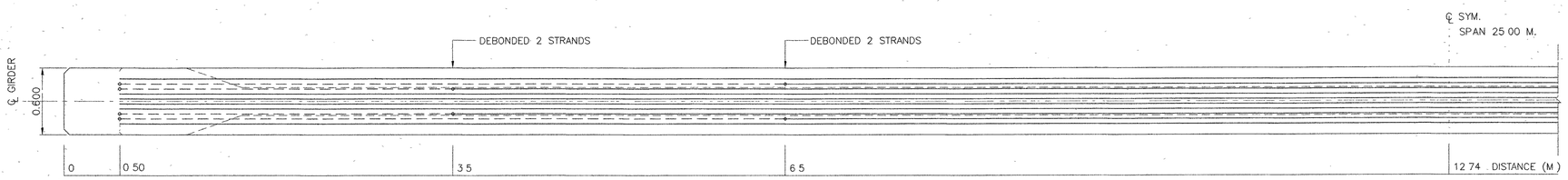
D:\std dwg 2015\NP-025H-04(REV01)



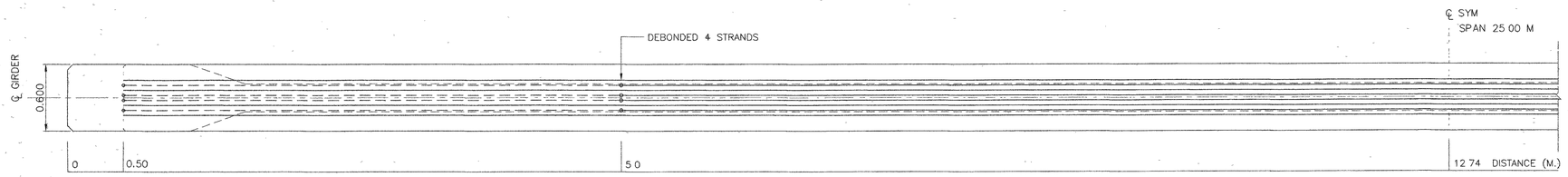
PRESTRESSING DETAILS
SCALE 1 25



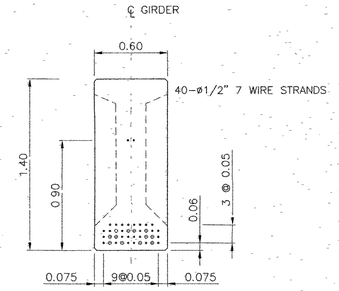
POSITION OF DEBONDED 1 ST ROW
SCALE 1 : 25



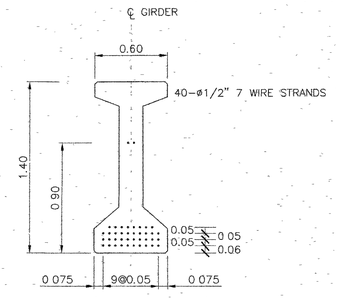
POSITION OF DEBONDED 2 ND ROW
SCALE 1 25



POSITION OF DEBONDED 3 RD ROW
SCALE 1 25



SECTION A – A
SCALE 1 25



SECTION B – B
SCALE 1 · 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
2 DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR PRESTRESSED I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa (510 KG/CM ^{2}) FOR CUBE STRENGTH AT 28 DAYS.
4 PRESTRESSING :
   4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 12 7 MM IN ACCORDANCE WITH TIS 420
   4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 180 KN.
   4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH
5. POSITION OF DEBONDED SHALL BE SPECIFIED IN THIS DRAWING AS FOLLOW.
   5.1 POINT OF DEBONDED MEANS STARTING POINT TO END OF GIRDER
   5.2 DEBONED MEANS PERFORMING FOR NO CONTACT BETWEEN STRAND AND CONCRETE.
6 AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 40 MPa. (410 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
7. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
8. SPACING OF GIRDERS SHALL BE LESS THAN 2 00 M.
9 SYMBOLS OF PRESTRESSING STRANDS
   + ——— BOND PRESTESSING STRANDS (ø12.7 MM-7 WIRE STRANDS)
   ⊕ ----- DEBOND PRESTESSING STRANDS (ø12 7 MM-7 WIRE STRANDS)
10. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO NP2-25H/01 TO NP2-25H/04 AND NP2-25H/06, NP2-25H/07

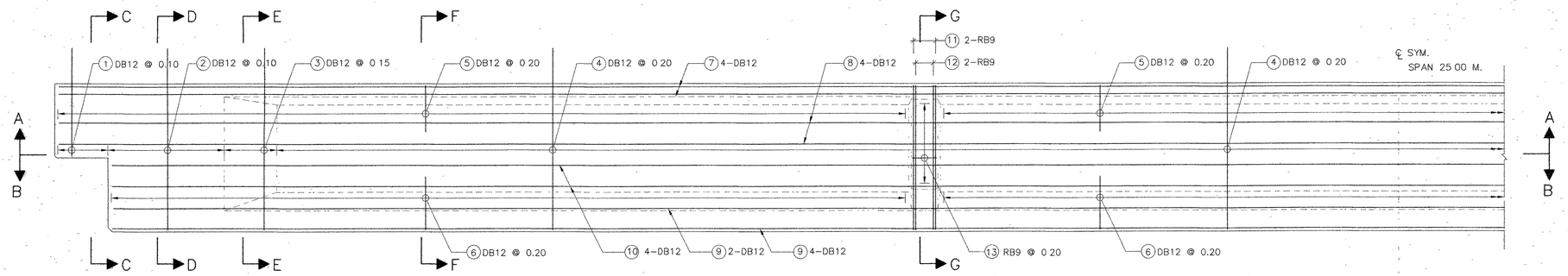
REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

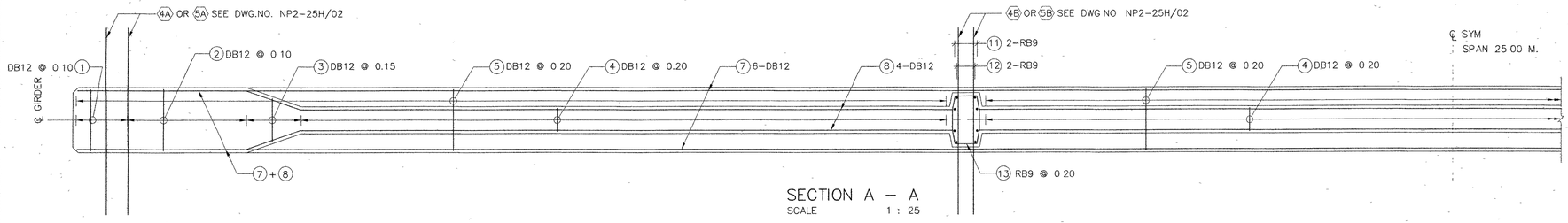
STANDARD DRAWING
I-GIRDER 25.00 M. (HAFT JOINT)
GIRDER PRE-TENSION DETAILS

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-25H/05
		SHEET NO. 87/R1

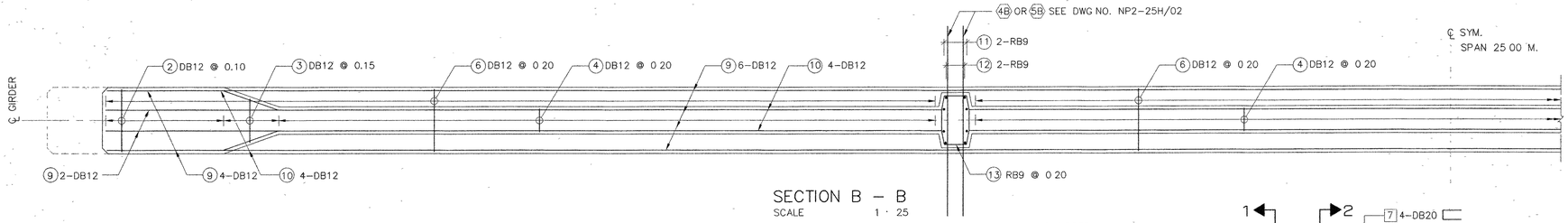
D:\std dwg 2015\NP-025H-05(REV01)



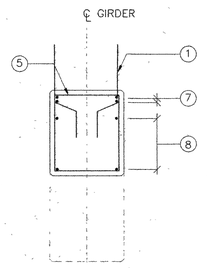
LONGITUDINAL REINFORCEMENT
SCALE 1 : 25



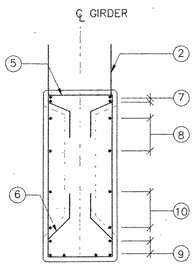
SECTION A – A
SCALE 1 : 25



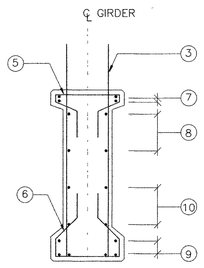
SECTION B – B
SCALE 1 : 25



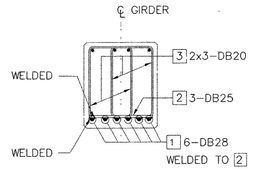
SECTION C – C
SCALE 1 : 25



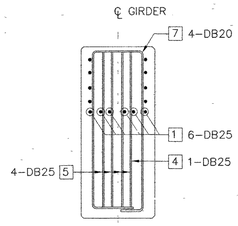
SECTION D – D
SCALE 1 : 25



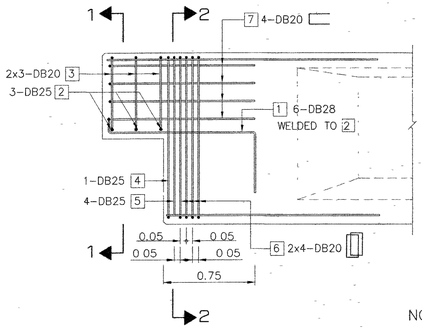
SECTION E – E
SCALE 1 : 25



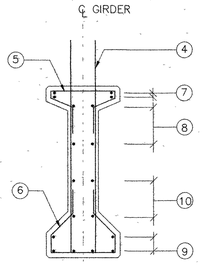
SECTION 1 – 1
SCALE 1 : 25



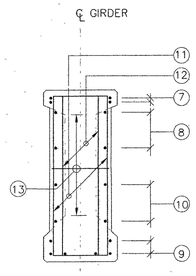
SECTION 2 – 2
SCALE 1 : 25



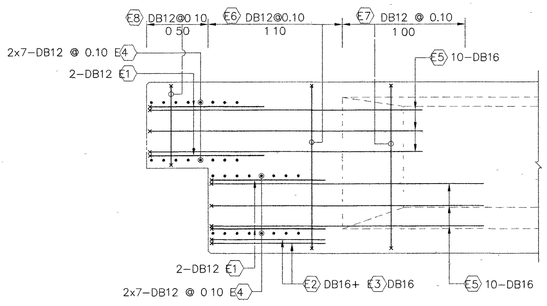
DAPPED END REINFORCEMENT
SCALE 1 . 25



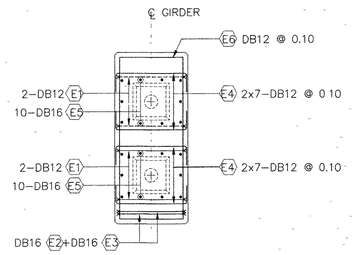
SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 25



EXTRA REINFORCEMENT AT THE END SIDE VIEW
SCALE 1 : 25



EXTRA REINFORCEMENT AT THE END FRONT VIEW
SCALE 1 : 25

TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB12	
2	DB12	
3	DB12	
4	DB12	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	

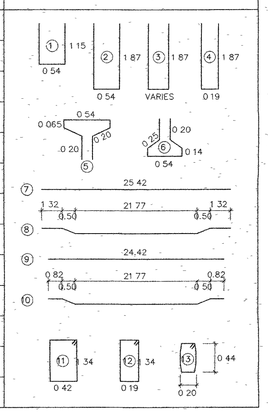


TABLE OF EXTRA REINFORCEMENT

NO.	BARS SIZE	SHAPE
1	DB25	
2	DB25	
3	DB20	
4	DB25	
5	DB25	
6	DB20	
7	DB20	

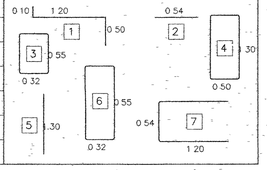
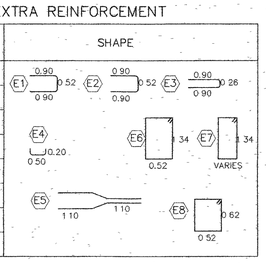


TABLE OF EXTRA REINFORCEMENT

NO.	BARS SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	RB9	
E6	DB12	
E7	DB12	
E8	DB12	



NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. MIX DESIGN OF CONCRETE FOR POST-TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM) FOR CUBE STRENGTH AT 28 DAYS
4. THE REINFORCE BAR NO 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO 7A, 8A, 4B FOR INSIDE GIRDER SEE DRAWING NO. NP2-25F/02
5. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO NP2-25H/01 TO NP2-25H/05 AND NP2-25H/07

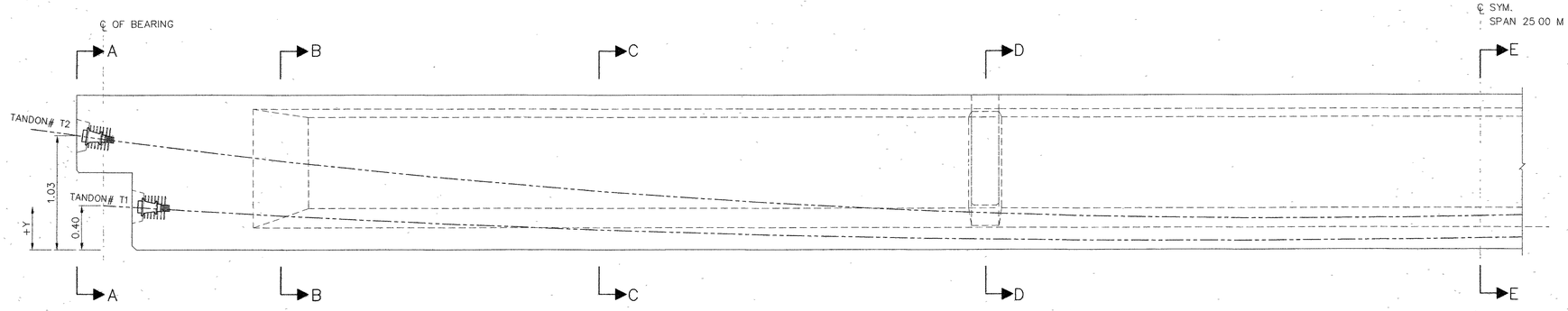
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 25.00 M. (HAFT JOINT)
GIRDER REINFORCEMENT FOR POST-TENSION

DESIGNED : D.O.H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015	
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN	
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-25H/06	
		SHEET NO. 88/R1	

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

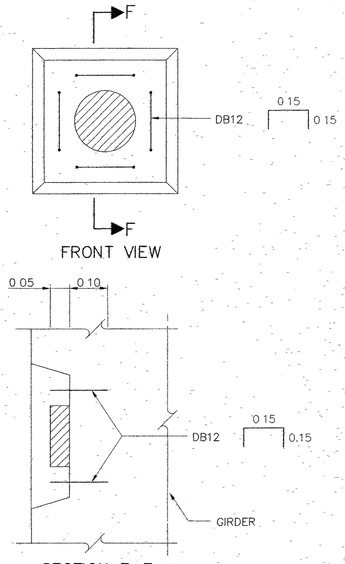
D:\std dwg 2015\NP-025H-06(REV01)



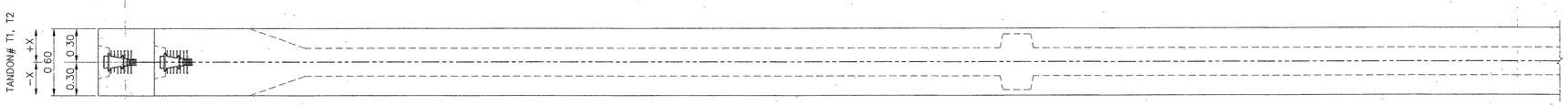
VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER : Y)

DISTANCE (M)	12.74	12.24	12 00	11 00	10 00	9.00	8.00	7 00	6.00	5 00	4.00	3 00	2 00	1.00	0 00
TANDON# T2	1 029	0.973	0 947	0 843	0 749	0 664	0.587	0.520	0 462	0 412	0.372	0.340	0 318	0 304	0 300
TANDON# T1	–	0 388	0 377	0 333	0.292	0 256	0 223	0.194	0 169	0 148	0 131	0 117	0.108	0 102	0 100

CABLE PROFILE (GIRDER 25.00 M.)
SCALE 1 : 25



EXTRA REINFORCEMENTS FOR RECESS
SCALE 1 . 10



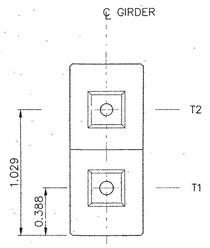
HORIZONTAL TENDON PROFILE DETAILS (MEASURED FROM CENTERLINE OF GIRDER : X)

DISTANCE (M)	12.74	12.24	12 00	11.00	10 00	9 00	8 00	7 00	6 00	5 00	4.00	3 00	2 00	1 00	0 00
TANDON# T2	0.000	0.000	0.000	0.000	0 000	0 000	0 000	0 000	0 000	0.000	0.000	0 000	0 000	0.000	0 000
TANDON# T1	0 000	0 000	0.000	0 000	0.000	0.000	0 000	0.000	0 000	0.000	0 000	0 000	0 000	0 000	0.000

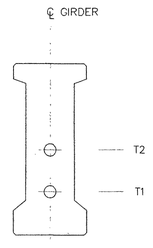
CABLE DIAGRAMATIC ARRANGMENT (GIRDER 25.00 M.)
SCALE 1 25

NOTE :

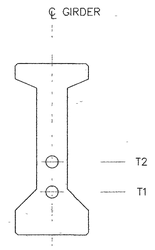
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST–TENSION I–GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING
   - 4 1 LOW RELAXATION SEVEN WIRE STRANDS ø 15.2 MM. IN ACCORDANCE WITH TIS.420 GRADE 1860
   - 4.2 MIN CHARACTERISTIC STRENGTH OF STRAND 250 KN.
   - 4 3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH IN WHICH THE SEQUENCE OF JACKING SHALL BE TENDON 1 AND THEN TENDON 2 EACH TENDON IS STRESSED BOTH END
   - 4 3 NUMBER OF PRESTRESSING STRANDS
     - T1 = 13 PRESTRESSING STRANDS
     - T2 = 15 PRESTRESSING STRANDS
5. DUCTS ARE GALVANIZED METAL SHEATHING GROUTED IMMEDIATELY AFTER STRESSING OPERATION.
6. JACKING FORCES ARE CALCULATED USING "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" AND ASSUMED DESIGN PARAMETERS AS FOLLOW :
   - FRICTION CURVATURE COEFFICIENT 0 20
   - FRICTION WOBBLE COEFFICIENT 0 0033 1/M
   - A WEDGE SLIP 6 MM.
7. THE CONTRACTOR SHALL CARRY OUT TEST WITH THE TENDONS AND DUCTS PROPOSED FOR USING TO ESTABLISH THE FRICTION COEFFICIENTS AND SHALL ADJUST THE STRESSING FORCES FOR APPROVAL IF THE MEASURED COEFFICIENT IS DIFFERED SIGNIFICANTLY FROM THE ASSUME VALUE
8. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 36 MPa. (367 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED.
9. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER. DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
10. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO NP2–25H/01 TO NP2–25H/06



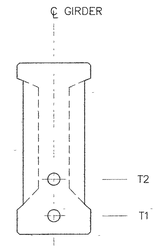
SECTION A – A
SCALE 1 : 25



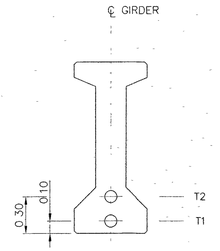
SECTION B – B
SCALE 1 . 25



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 . 25



SECTION E – E
SCALE 1 : 25

REV 1	REVISION 1/2018		FEB 2018
REV	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

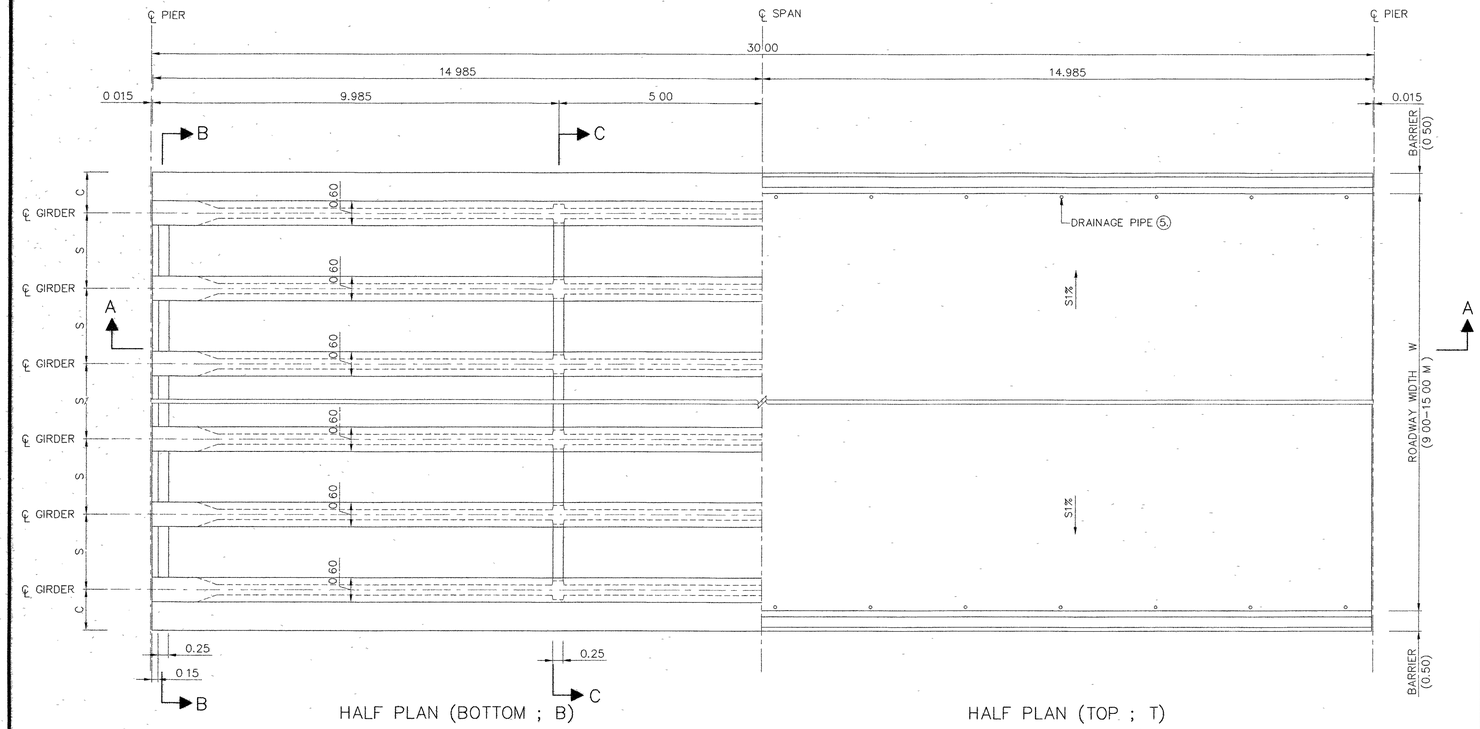
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

I–GIRDER 25.00 M. (HAFT JOINT)
GIRDER POST–TENSION DETAILS

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2–25H/07
		SHEET NO. 89/R1

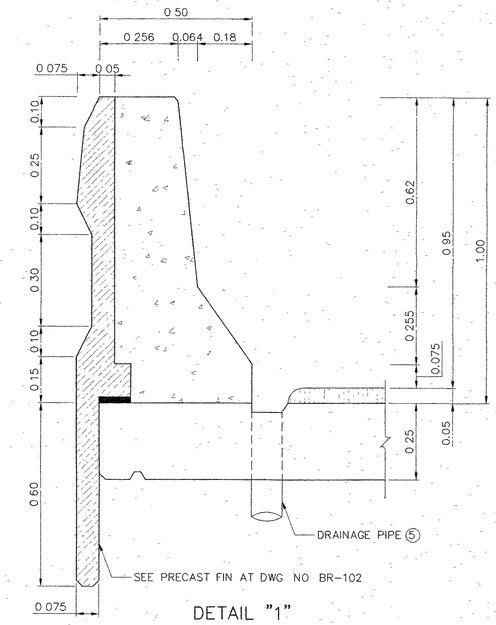
D:\std dwg 2015\NP–G25H–07(REV01)



HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

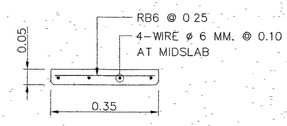
DECK PLAN FOR GIRDER SPAN LENGTH 30.00 M.
SCALE 1 : 75



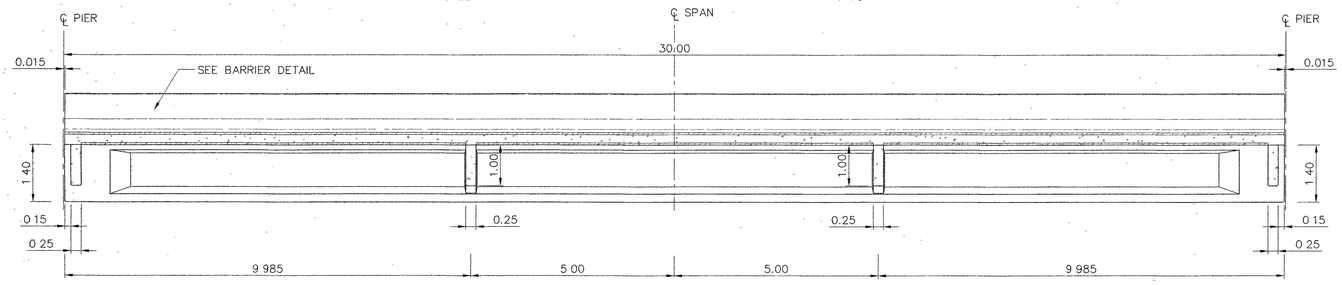
DETAIL "1"
SCALE 1 : 10

TABLE OF W, S, C AND NO. OF GIRDER

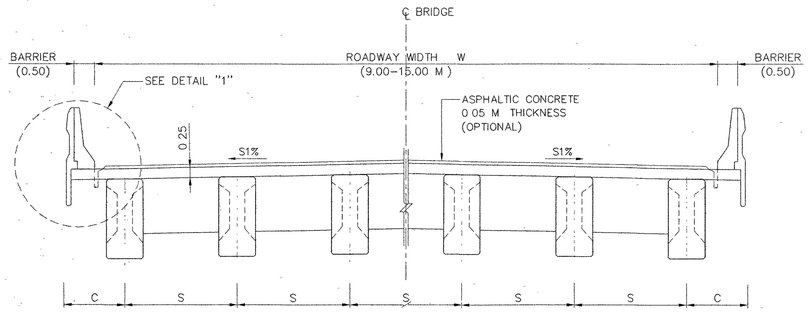
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	7 @ 2.00	1.00
VARIES	n	2.00 (MAX.)	1.00



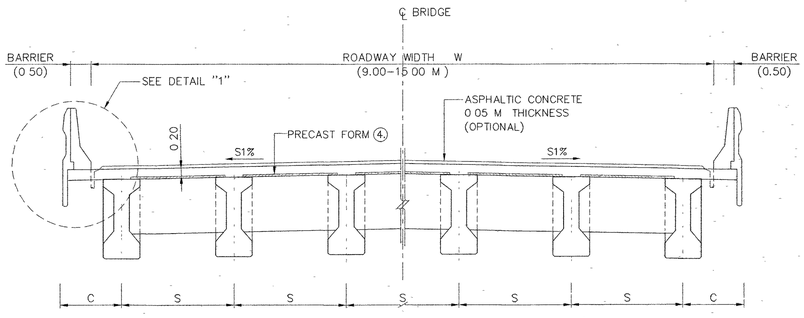
PRECAST FORM DETAIL
SCALE 1 : 10



SECTION A – A
SCALE 1 : 75



SECTION B – B
SCALE 1 : 75



SECTION C – C
SCALE 1 : 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2–30F/02 TO NP2–30F/05
4. PRECAST FORM SHALL BE AS FOLLOWS:
   - 4.1 CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
   - 4.2 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 4.3 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2 (INCLUDED THE WEIGHT OF PRECAST FORM)
   - 4.4 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M
   - 4.5 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT : SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 4.6 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS.95
   - 4.7 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 4.8 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 4.9 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.
5. DRAINAGE PIPE SEE BRIDGE DRAINAGE SYSTEM

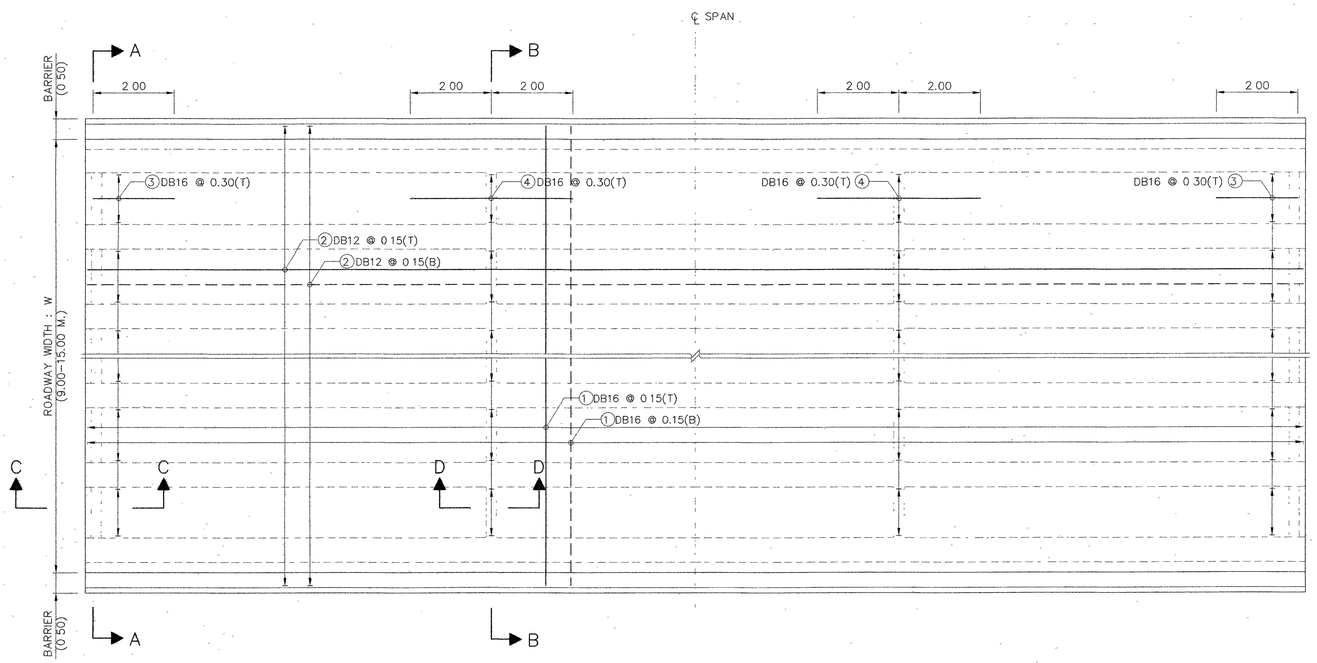
REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018
REF	REVISION		

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

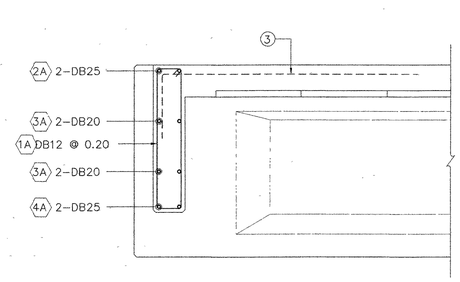
STANDARD DRAWING
I–GIRDER 30.00 M. (FULL JOINT)
BRIDGE DECK DIMENSION

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2–30F/01
		SHEET NO. 90/R1

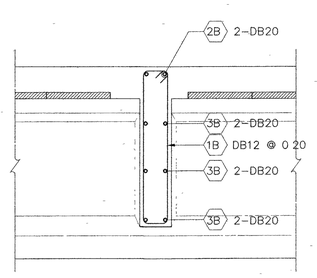
D:\std dwg 2015\NP2_30F-01(REV01)



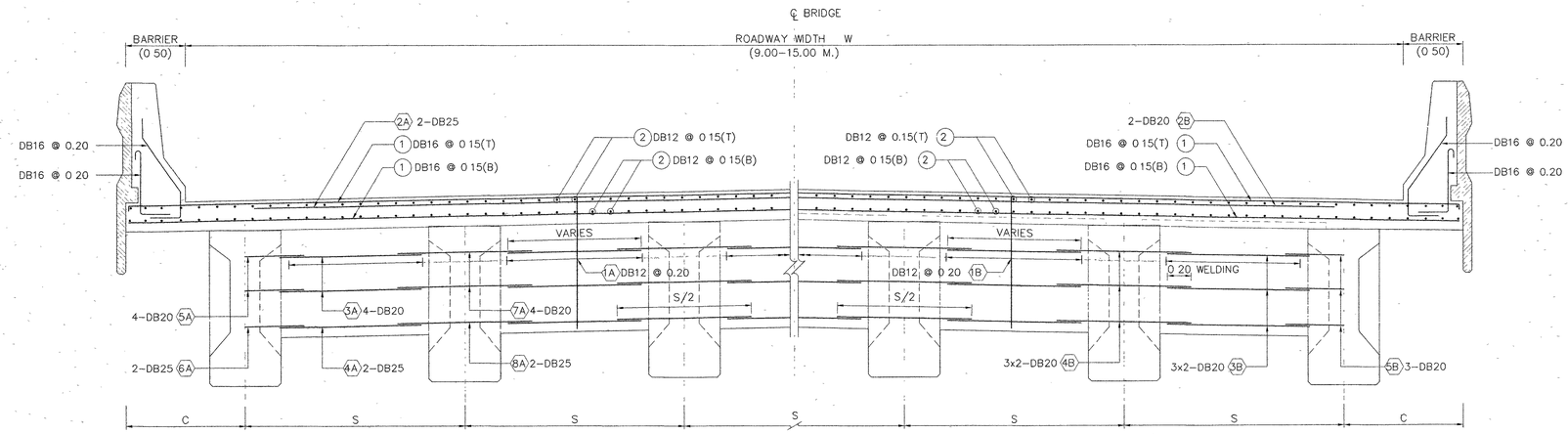
PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

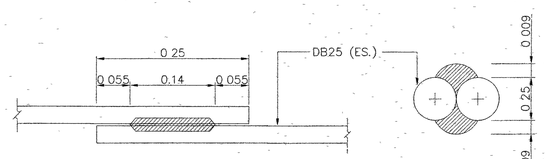
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.19 / 1.19 / 1A
2A	DB25	W+1.00–2C — 2A
3A	DB20	S/2+0.40 — 3A
4A	DB25	S/2+0.40 — 4A
5A	DB20	S/4+0.10 — 5A
6A	DB25	S/4+0.10 — 6A
7A	DB20	S/2 — 7A , 8A
8A	DB25	

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19 / 1.19 / 1B
2B	DB20	W+1.00–2C — 2B
3B	DB20	S/2+0.40 — 3B
4B	DB20	S/4+0.10 — 4B
5B	DB20	S/2 — 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
1	DB16	W+0.70 — 1
2	DB12	19.91 — 2
3	DB16	2.00 / 0.50 / 4.00 — 3 4
4	DB16	



WELDING DETAIL
NOT TO SCALE

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL–93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS 24 GRADE SD40 FOR DEFORMED BARS
5. THE REINFORCE BAR NO. 5A, 6A, 7A, 8A, 4B AND 5B SHALL BE EMBEDED IN GIRDER AT STAGE OF GIRDER CASTING.
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO NP2–30F/01 AND NP2–30F/03 TO NP2–30F/05

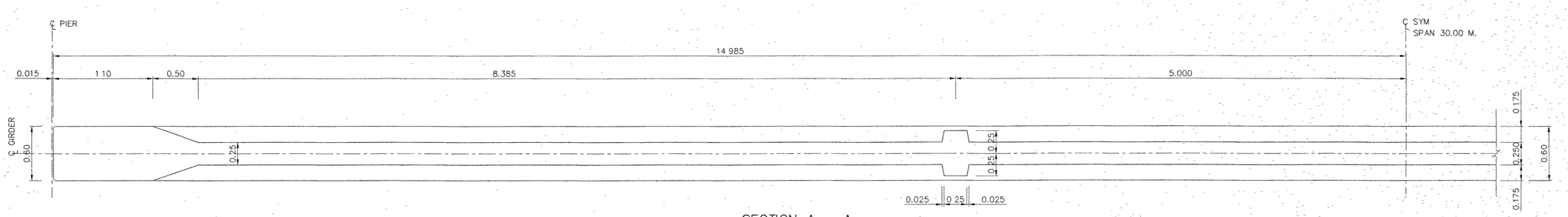
REF	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

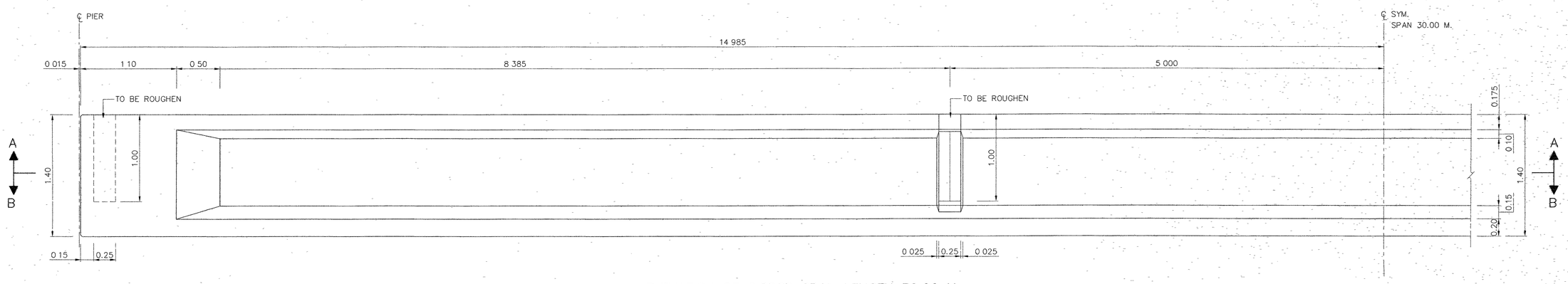
STANDARD DRAWING
I–GIRDER 30.00 M. (FULL JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D O H & CONSULTANTS **CHECKED :** BUREAU OF LOCATION & DESIGN **DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) **SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL) **DWG NO.** NP2–30F/02
SHEET NO. 91/R1

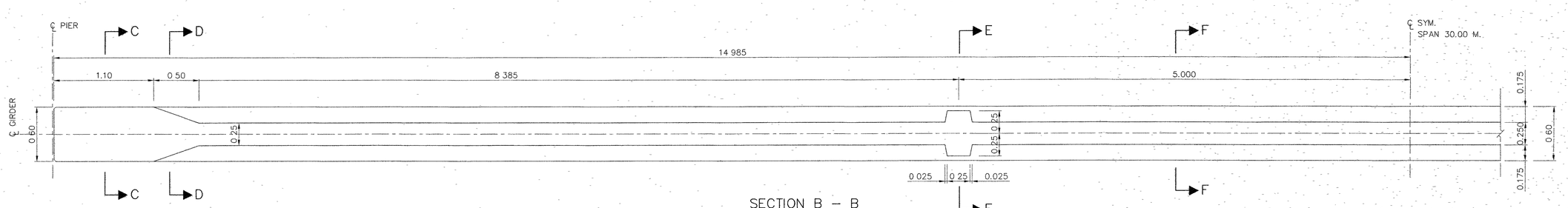
D:\std dwg 2015\NP2_30F-02(REV01)



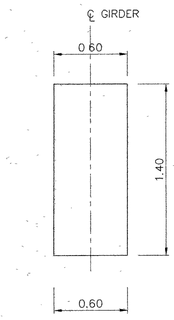
SECTION A – A
SCALE 1 : 25



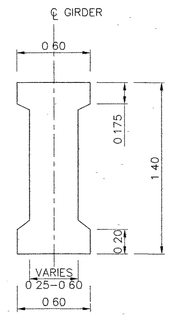
ELEVATION OF GIRDER SPAN LENGTH 30.00 M.
SCALE 1 25



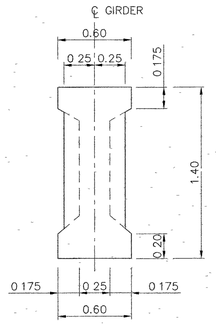
SECTION B – B
SCALE 1 : 25



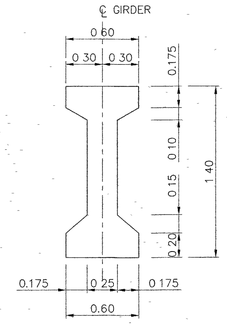
SECTION C – C
SCALE 1 · 25



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 · 25



SECTION F – F
SCALE 1 . 25

NOTE :

1 ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2 DESIGN LIVE LOAD : HL-93.
3 CONCRETE FOR POST-TENSION I-GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa (459 KG/CM^2) FOR 15x15x15 CM CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4 THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP2-30F/01, NP2-30F/02 AND NP2-30F/04 TO NP2-30F/05

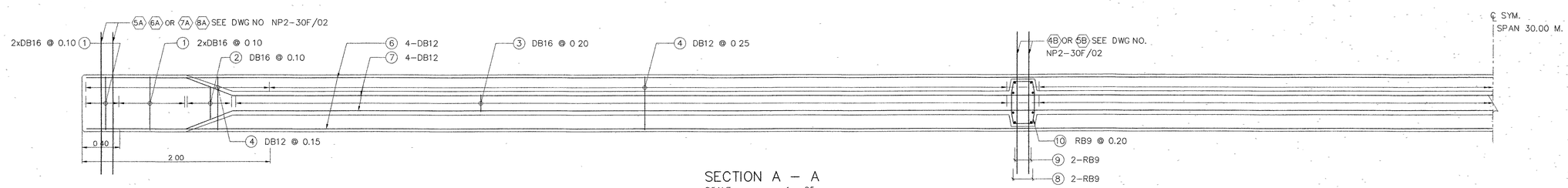
REV 1	REVISION 1/2018		FEB 2018
REF	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

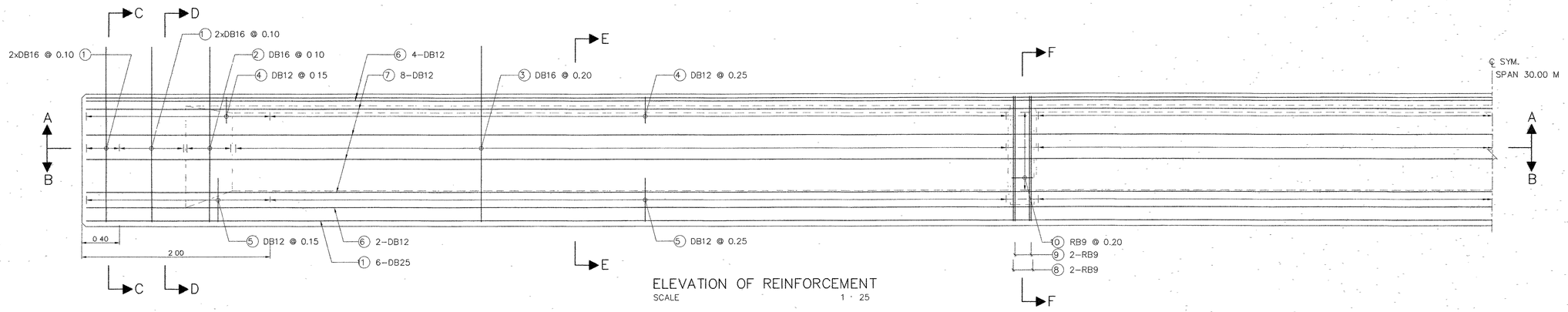
STANDARD DRAWING
I-GIRDER 30.00 M. (FULL JOINT)
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-30F/03
		SHEET NO. 92/R1

D:\std dwg 2015\NP2_30F-03(REV01)



SECTION A – A
SCALE 1 25



ELEVATION OF REINFORCEMENT
SCALE 1 · 25

SECTION B – B
SCALE 1 25

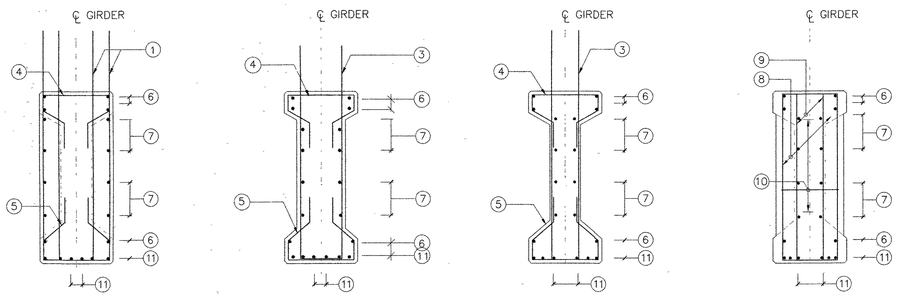


TABLE OF GIRDER REINFORCEMENT

BAR NO.	BAR SIZE	SHAPE
(1)	DB16	
(2)	DB16	
(3)	DB16	
(4)	DB12	
(5)	DB12	
(6)	DB12	
(7)	DB12	
(8)	RB9	
(9)	RB9	
(10)	RB9	
(11)	DB25	

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD HL-93.
3. MIX DESIGN OF CONCRETE FOR POST-TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. THE REINFORCE BAR NO. 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B REINFFOR INSIDE GIRDER SEE DRAWING NO. NP2-30F/02
5. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO NP2-30F/01 TO NP2-30F/03 AND NP2-30F/05

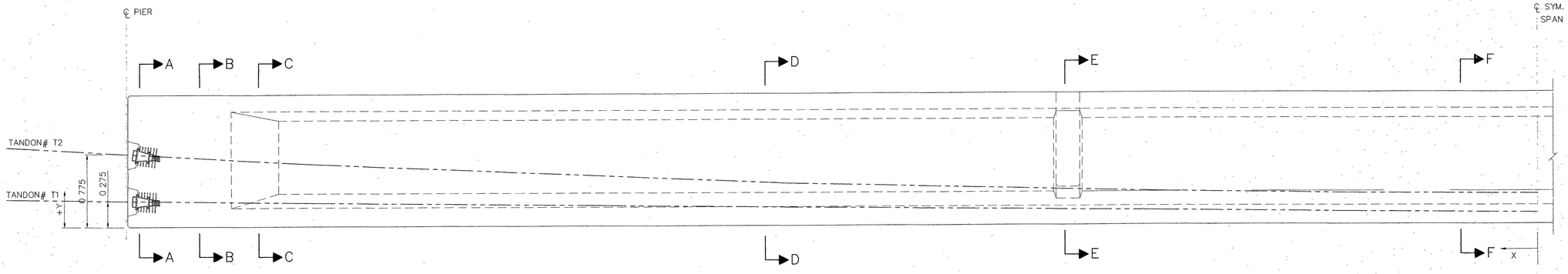
REF.	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 30.00 M. (FULL JOINT)
GIRDER REINFORCEMENT

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
		DWG NO. NP2-30F/04
APPROVED : (FOR DIRECTOR GENERAL)		**SHEET NO.** 93/R1

D:\std dwg 2015\NP2-30F-04(REV01)



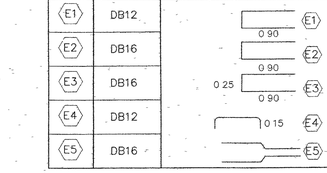
PRESTRESSING DETAIL (VERTICAL PROFILE)
SCALE 1 : 25

VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER : Y)

DISTANCE (X), M.	14.985	14 00	13 50	13 00	12.00	11.00	10.00	9.00	8.00	7.00	6 00	5 00	4 00	3.00	2.00	1 00	0.00
TENDON #T2 (M.)	0 775	0.717	0.689	0.662	0.612	0.565	0.523	0.484	0.450	0.419	0 393	0 371	0 352	0 338	0 328	0 322	0 320
TENDON #T1 (M.)	0.275	0.255	0.246	0.237	0.219	0.204	0.189	0.176	0.164	0 154	0 145	0 137	0 131	0.126	0.123	0 121	0.120

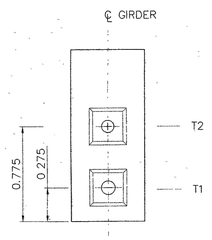
TABLE OF EXTRA REINFORCEMENT AT THE END

BAR NO.	SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	DB16	

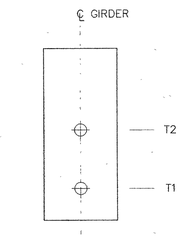


NOTE :

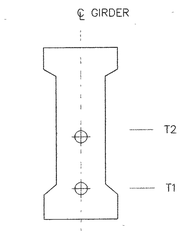
1 ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD · HL-93
3. MIX DESIGN OF CONCRETE FOR POST-TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING
   4 1 LOW RELAXATION SEVEN WIRE STRANDS ø 15.2 MM. IN ACCORDANCE WITH TIS.420 GRADE 1860
   4 2 MIN CHARACTERISTIC STRENGTH OF STRAND 250 KN.
   4 3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH IN WHICH THE SEQUENCE OF JACKING SHALL BE TENDON 1 AND THEN TENDON 2 EACH TENDON IS STRESSED BOTH END
   4 3 NUMBER OF PRESTRESSING STRANDS
      T1 = 17 PRESTRESSING STRANDS
      T2 = 17 PRESTRESSING STRANDS
5 DUCTS ARE GALVANIZED METAL SHEATHING GROUTED IMMEDIATELY AFTER STRESSING OPERATION.
6. JACKING FORCES ARE CALCULATED USING "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" AND ASSUMED DESIGN PARAMETERS AS FOLLOW :
   FRICTION CURVATURE COEFFICIENT 0.20
   FRICTION WOBBLE COEFFICIENT 0.0033 1/M.
   A WEDGE SLIP 6 MM.
7. THE CONTRACTOR SHALL CARRY OUT TEST WITH THE TENDONS AND DUCTS PROPOSED FOR USING TO ESTABLISH THE FRICTION COEFFICIENTS AND SHALL ADJUST THE STRESSING FORCES FOR APPROVAL IF THE MEASURED COEFFICIENT IS DIFFERED SIGNIFICANTLY FROM THE ASSUME VALUE.
8 AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 36 MPa. (367 KG/CM^2), THE JACKING FORCES SHALL BE APPLIED
9. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER DO NOT LIFT UP AT THE MIDDLE OF GIRDER
10 SPACING OF GIRDERS SHALL BE LESS THAN 2 00 M
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2-30H/01 TO NP2-30H/04



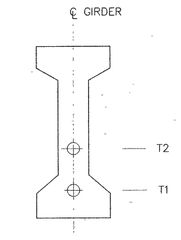
SECTION A – A
SCALE 1 . 25



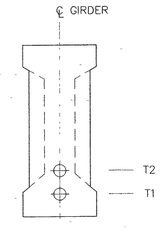
SECTION B – B
SCALE 1 . 25



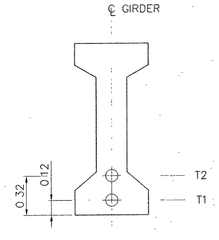
SECTION C – C
SCALE 1 . 25



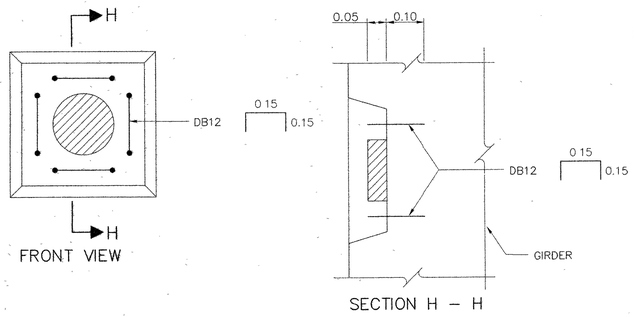
SECTION D – D
SCALE 1 . 25



SECTION E – E
SCALE 1 . 25

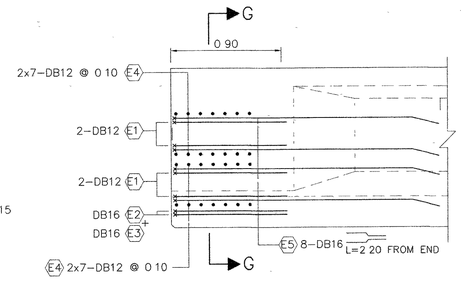


SECTION F – F
SCALE 1 . 25

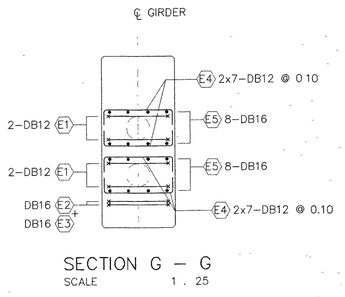


SECTION H – H

EXTRA REINFORCEMENTS FOR RECESS
SCALE 1 10



EXTRA REINFORCEMENT AT THE END (SIDE VIEW)
SCALE 1 : 25



SECTION G – G
SCALE 1 . 25

EXTRA REINFORCEMENT AT THE END FRONT VIEW)
SCALE 1 : 25

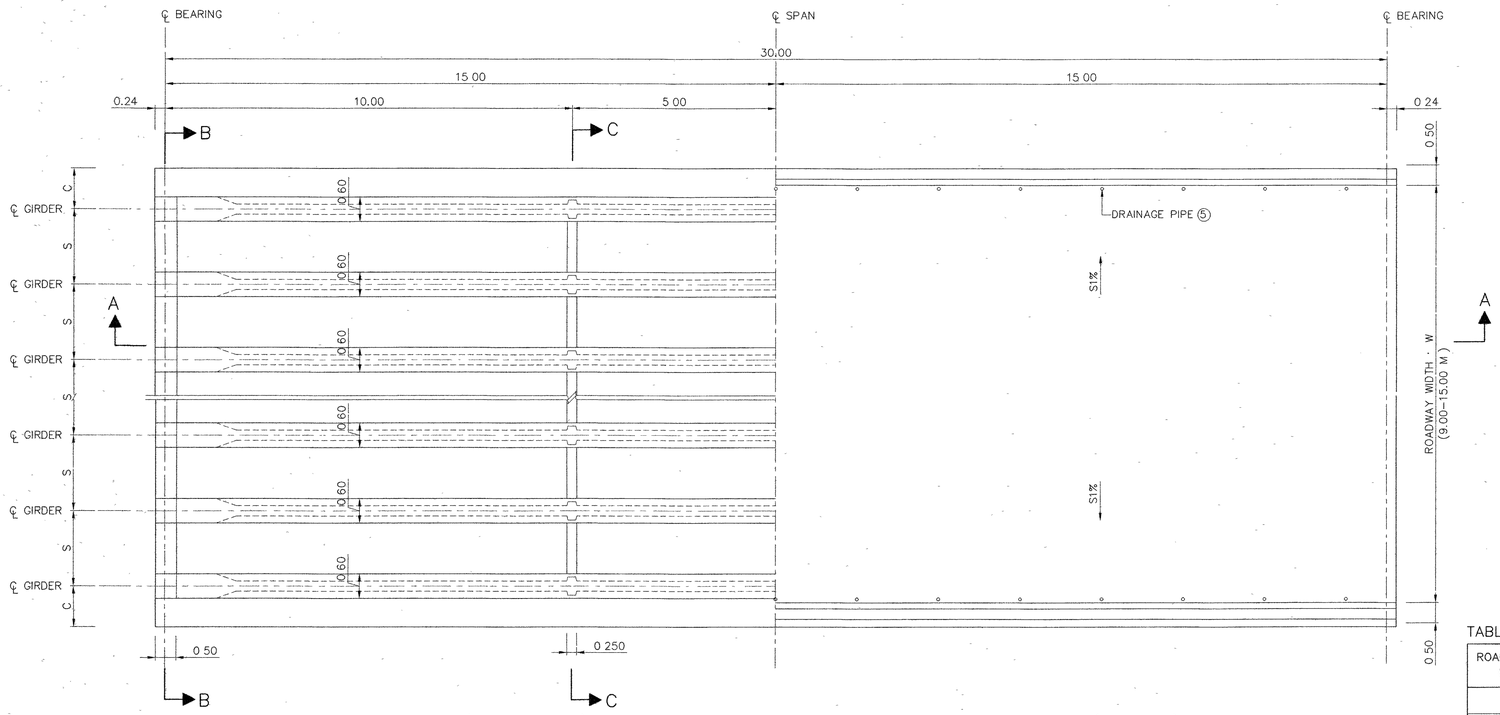
REV 1	REVISION 1/2018		FEB 2018
REF	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I-GIRDER 30.00 M. (FULL JOINT)
GIRDER PRESTRESSING

DESIGNED : D O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-30F/05
		SHEET NO. 94/R1

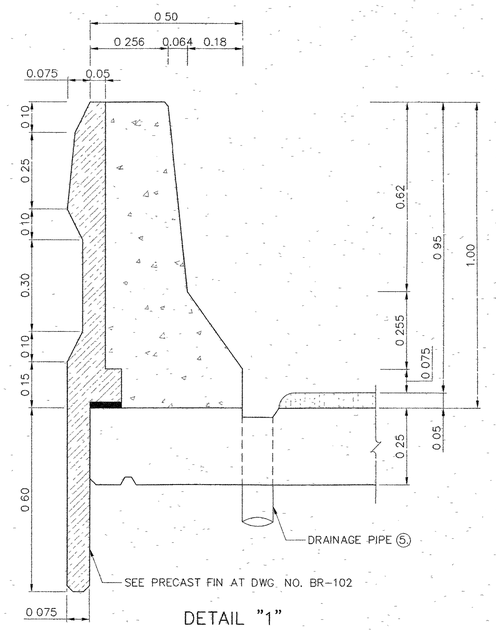
D:\std dwg 2015\NP2-30F-05(REV01)



HALF PLAN (BOTTOM ; B)

HALF PLAN (TOP ; T)

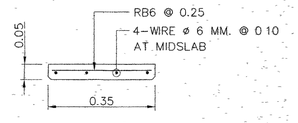
DECK PLAN FOR GIRDER SPAN LENGTH 30.00 M.
SCALE 1 . 75



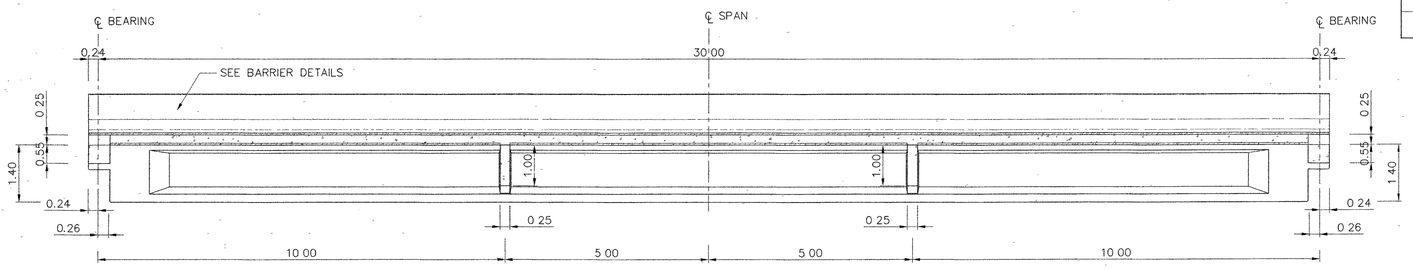
DETAIL "1"
SCALE 1 · 10

TABLE OF W, S, C AND NO. OF GIRDER

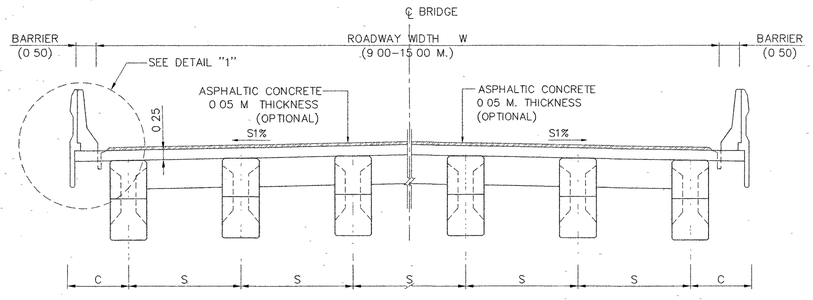
ROADWAY WIDTH W (M.)	NO. OF GIRDER	SPACING S (M.)	CANTILEVER C (M.)
9.00	5	4 @ 2.00	1.00
10.00	6	5 @ 1.80	1.00
11.00	6	5 @ 2.00	1.00
12.00	7	4 @ 1.83 2 @ 1.84	1.00
15.00	8	7 @ 2.00	1.00
VARIES	n	2.00 (MAX.)	1.00



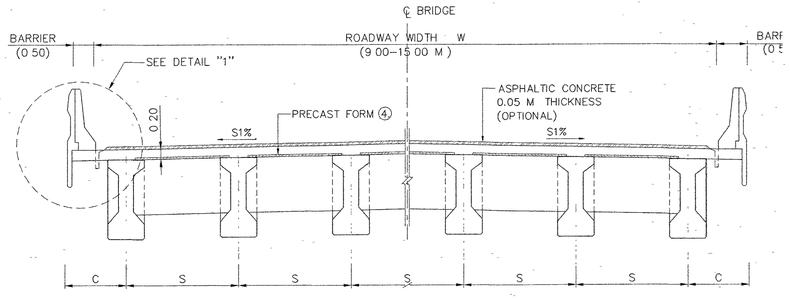
PRECAST FORM DETAIL
SCALE 1 : 10



SECTION A – A
SCALE 1 · 75



SECTION B – B
SCALE 1 · 75



SECTION C – C
SCALE 1 · 75

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO. NP2-30H/02 TO NP2-30H/05
4. PRECAST FORM SHALL BE AS FOLLOWS
   - 4.1 CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 50 MPa. (510 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
   - 4.2 THE WEIGHT OF PRECAST FORM SHALL BE LESS THAN 120 KG/M^2
   - 4.3 ALL PRECAST FORM SHALL CARRY THE TOTAL SAFE LOAD NOT LESS THAN 750 KG/M^2 (INCLUDED THE WEIGHT OF PRECAST FORM)
   - 4.4 THE WIDTH OF PRECAST FORM SHALL BE GREATER THAN 0.35 M.
   - 4.5 ENDS OF PRECAST FORM SHALL BE SEATED OVER THE SUPPORT NOT LESS THAN 7.5 CM. MOTAR WITH THE MIXED RATIO (CEMENT . SAND) OF 1:2 SHALL BE USED TO ADJUST THE ALIGNMENT OF THE PRECAST AND TO SMOOTHEN
   - 4.6 CONCRETE PROPERTIES SHALL BE CONFORMED TO THE SPECIFICATION OF PRESTRESSED CONCRETE GIRDERS AND ALL PRESTRESSING STRANDS SHALL BE CONFORMED TO TIS.420 OR TIS 95.
   - 4.7 PRECAST FORM SHALL NOT BEND OR DEFLECT. THE TOLERANCE OF ALL DIMENSIONS OF PRECAST FORM SHALL BE WITHIN THE ACCEPTABLE LIMITS.
   - 4.8 PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PREPARE THE SHOP DRAWINGS OF PRECAST FORM INCLUDING ALL CALCULATION AND SUPPORTED DOCUMENTS. THE DOCUMENTS SHALL BE CERTIFIED BY ENGINEERS AS THE REQUIREMENTS OF COUNCIL OF ENGINEERS AND SUBMITTED TO THE DESIGNERS FOR APPROVED.
   - 4.9 THE BOTTOM SURFACE OF PRECAST FORM SHALL BE SMOOTHENED.
5. DRAINAGE PIPE SEE BRIDGE DRAINAGE SYSTEM

REV	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018
REF	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

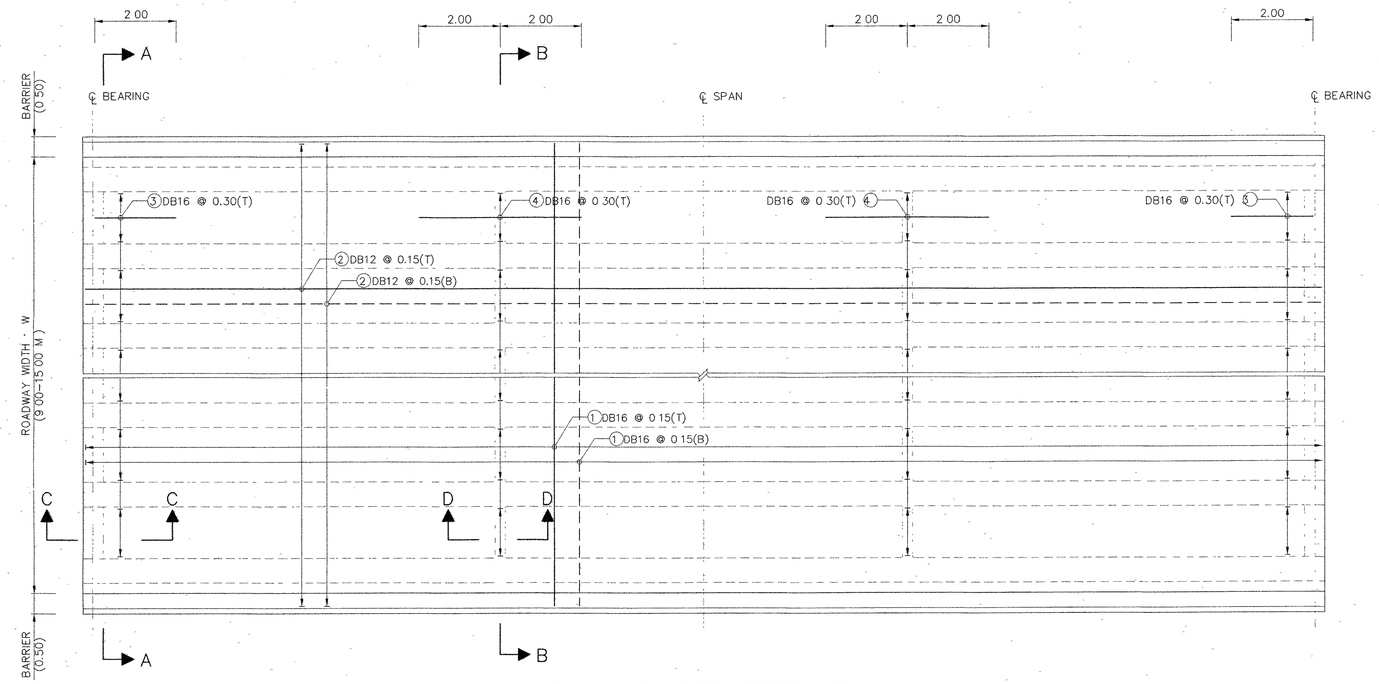
STANDARD DRAWING

I-GIRDER 30.00 M. (HAFT JOINT)

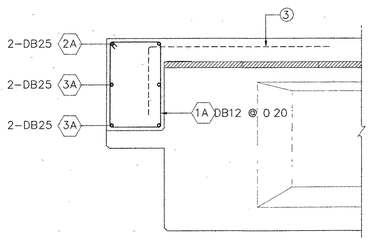
BRIDGE DECK DIMENSION

DESIGNED : D.O.H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-30H/01
		SHEET NO. 95/R1

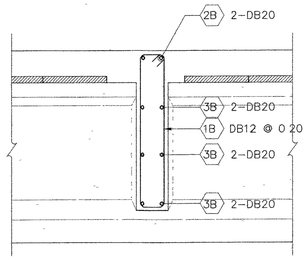
D:\std dwg 2015\NP2-30H-01(REV01)



PLAN OF SLAB REINFORCEMENT
SCALE 1 : 75



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25

TABLE OF REINFORCEMENT (EXTERIOR DIAPHRAGM)

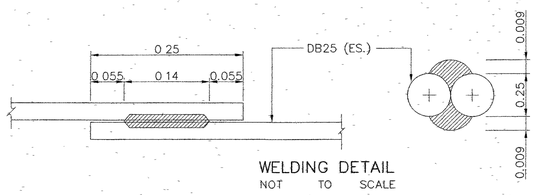
BAR NO.	BAR SIZE	SHAPE
1A	DB12	0.44, 0.64, 1A
2A	DB25	W+1.00-2C, 2A
3A	DB25	S/2+0.40, 3A
4A	DB25	S/4+0.10, 4A
5A	DB25	S/2, 5A

TABLE OF REINFORCEMENT (INTERIOR DIAPHRAGM)

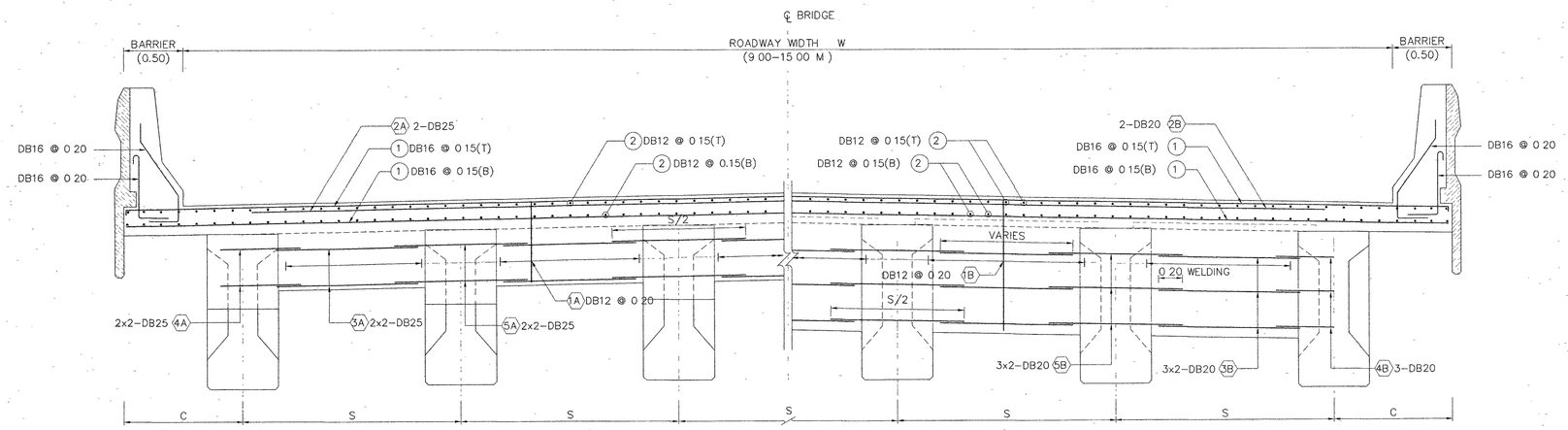
BAR NO.	BAR SIZE	SHAPE
1B	DB12	0.19, 1.19, 1B
2B	DB20	W+1.00-2C, 2B
3B	DB20	S/2+0.40, 5B
4B	DB20	S/4+0.10, 0.19, 4B
5B	DB20	S/2, 5B

TABLE OF REINFORCEMENT (SLAB)

BAR NO.	BAR SIZE	SHAPE
①	DB16	W+0.70, ①
②	DB12	19.91, ②
③	DB16	2.00, ③, 0.50
④	DB16	4.00, ④



WELDING DETAIL
NOT TO SCALE



HALF SECTION A – A

HALF SECTION B – B

CROSS SECTION OF REINFORCEMENT SLAB AND DIAPHRAGM
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. DESIGN LIVE LOAD : HL-93.
3. CONCRETE FOR DECK SLAB SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 15x15x15 CM CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS.15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. REINFORCING STEEL SHALL CONFORM TO TIS.20 GRADE SR24 FOR ROUND BARS AND TIS 24 GRADE SD40 FOR DEFORMED BARS.
5. THE REINFORCE BAR NO. 4A, 5A, 4B AND 5B SHALL BE EMBEDDED IN GIRDER AT STAGE OF GIRDER CASTING
6. THIS DRAWING IS USED IN CONJUNCTION WITH DWG NO NP2-30H/01 AND NP2-30H/03 TO NP2-30H/05

REF	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

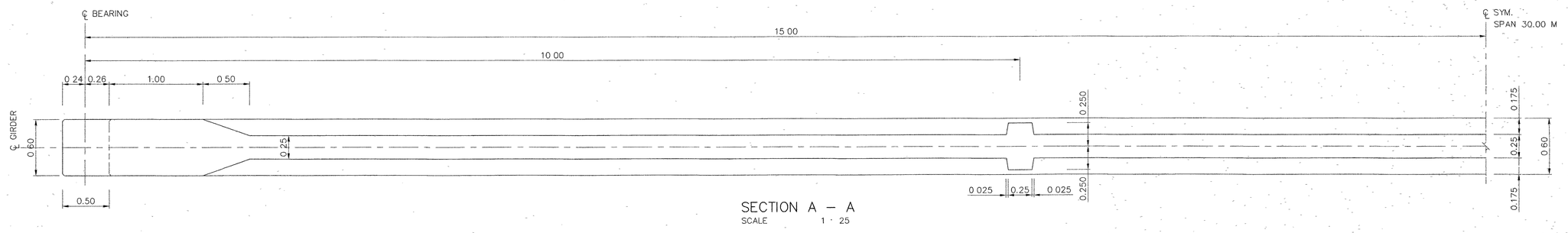
KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

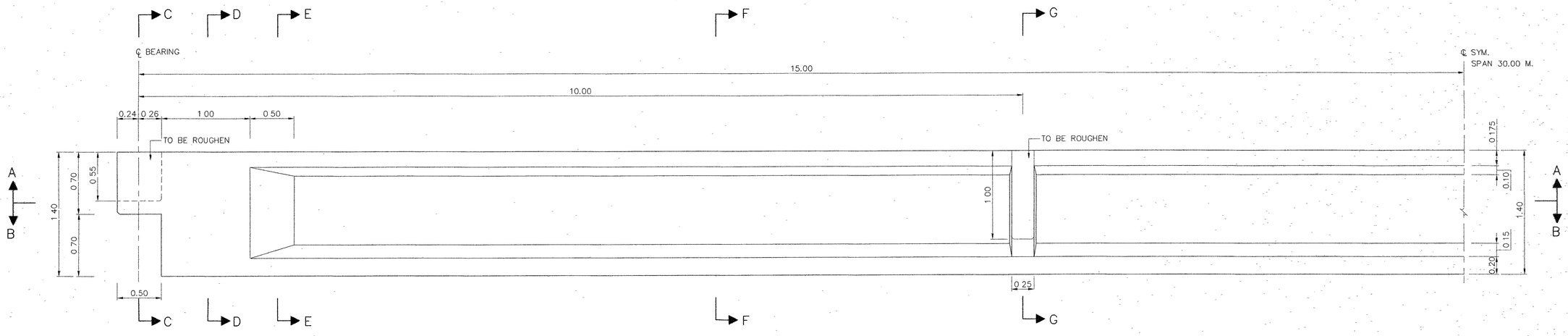
STANDARD DRAWING
I-GIRDER 30.00 M. (HAFT JOINT)
BRIDGE DECK REINFORCEMENT

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-30H/02
		SHEET NO. 96/R1

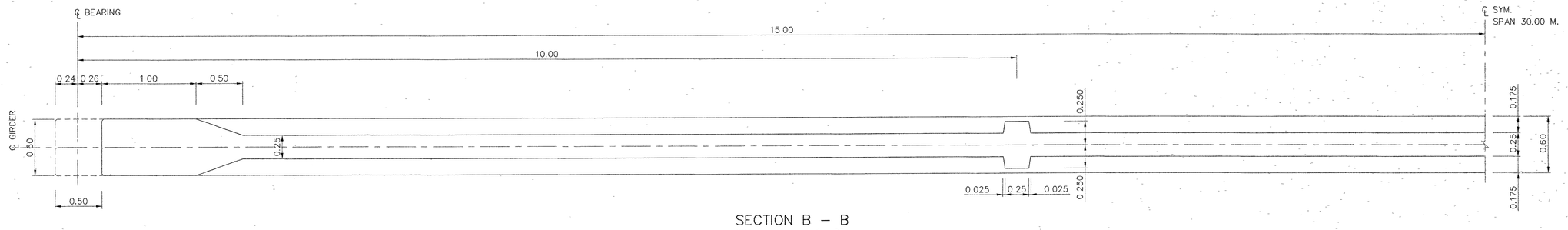
D:\std dwg 2015\NP2-30H-02(REV01)



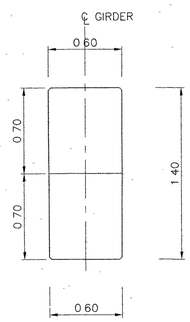
SECTION A – A
SCALE 1 : 25



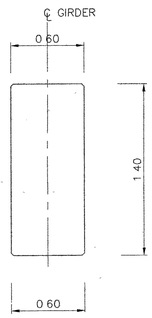
ELEVATION OF GIRDER SPAN LENGTH 30.00 M.
SCALE 1 : 25



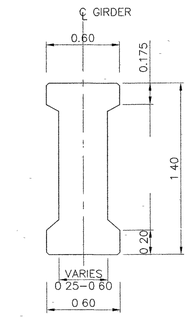
SECTION B – B
SCALE 1 : 25



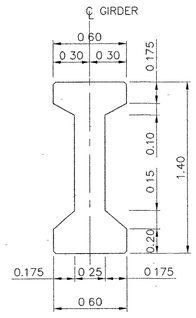
SECTION C – C
SCALE 1 : 25



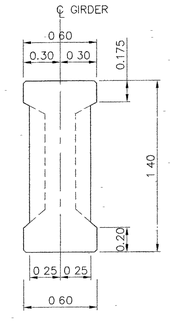
SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25



SECTION F – F
SCALE 1 : 25



SECTION G – G
SCALE 1 : 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
2. DESIGN LIVE LOAD : HL-93.
3. CONCRETE FOR POST-TENSION I-GIRDER SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa (459 KG/CM^2) FOR 15x15x15 CM. CUBE AT 28 DAYS, CEMENT SHALL CONFORM TO TIS 15 TYPE I PORTLAND CEMENT OR APPROVAL TYPE.
4. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. NP2-30H/01, NP2-30H/02 AND NP2-30H/04 TO NP2-30H/05

REF	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

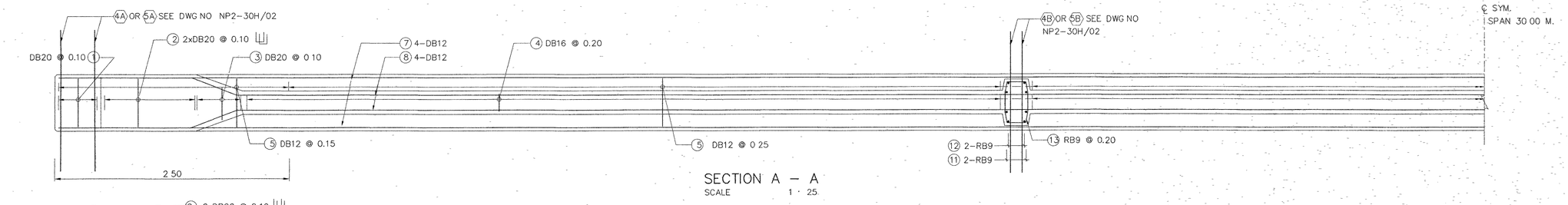
STANDARD DRAWING

I-GIRDER 30.00 M. (HAFT JOINT)

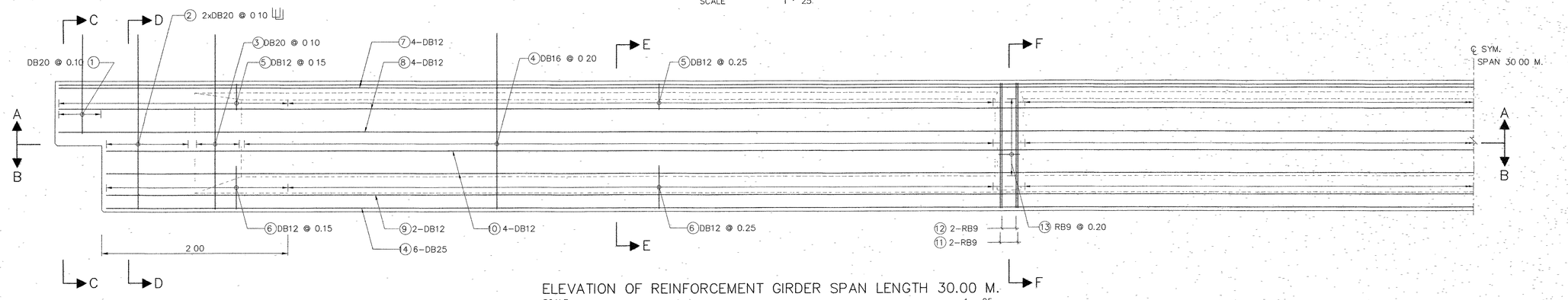
GIRDER DIMENSION

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2-30H/03
		SHEET NO. 97/R1

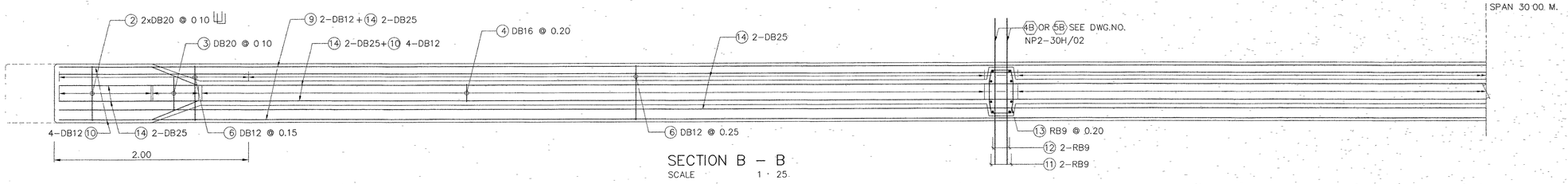
D:\std dwg 2015\NP2-30H-0(REV01)



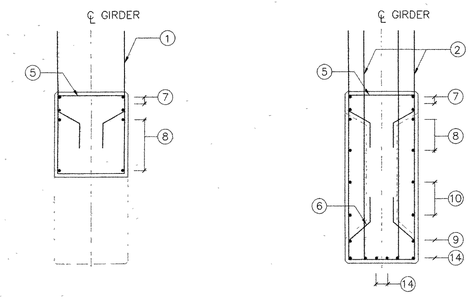
SECTION A – A
SCALE 1 · 25



ELEVATION OF REINFORCEMENT GIRDER SPAN LENGTH 30.00 M.
SCALE 1 . 25

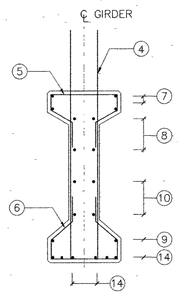


SECTION B – B
SCALE 1 · 25

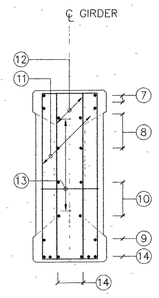


SECTION C – C
SCALE 1 · 25

SECTION D – D
SCALE 1 : 25



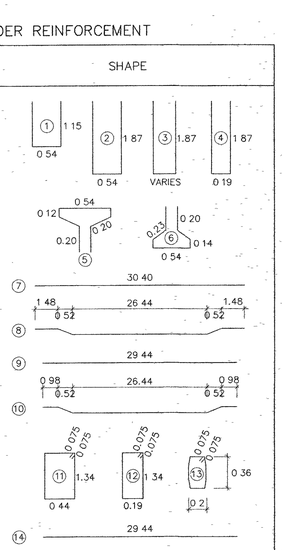
SECTION E – E
SCALE 1 25



SECTION F – F
SCALE 1 25

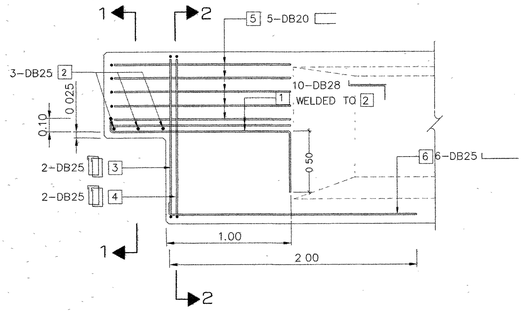
TABLE OF GIRDER REINFORCEMENT

BAR NO.	SIZE	SHAPE
1	DB20	
2	DB20	
3	DB20	
4	DB16	
5	DB12	
6	DB12	
7	DB12	
8	DB12	
9	DB12	
10	DB12	
11	RB9	
12	RB9	
13	RB9	
14	DB25	

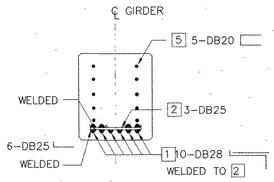


NOTE :

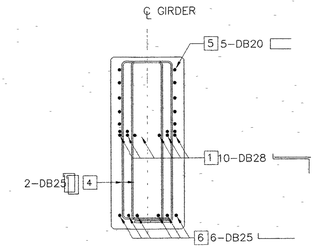
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
2. DESIGN LIVE LOAD : HL-93.
3. MIX. DESIGN OF CONCRETE FOR POST-TENSION I-GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS
4. THE REINFORCE BAR NO 5A, 6A, 5B FOR EDGE GIRDER AND REINFORCE BAR NO. 7A, 8A, 4B REINFFOR INSIDE GIRDER SEE DRAWING NO NP2-30H/02
5. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2-30H/01 TO NP2-30H/03 AND NP2-30H/05



DAPPED END REINFORCEMENT (EXTRA)
SCALE 1 . 25



SECTION 1 – 1
SCALE 1 · 25



SECTION 2 – 2
SCALE 1 · 25

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

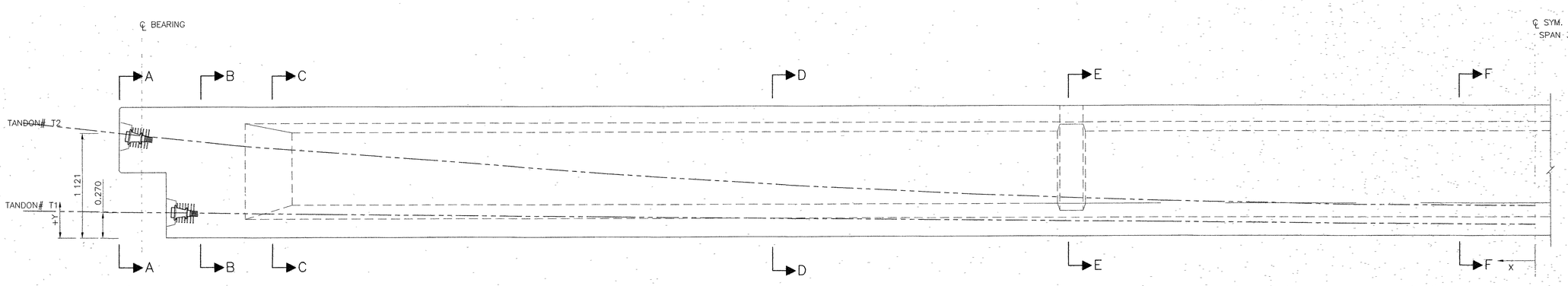
I-GIRDER 30.00 M. (HAFT JOINT)

GIRDER REINFORCEMENT

DESIGNED : D O H & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN		**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			**SCALE :** AS SHOWN
			DWG NO. NP2-30H/04
APPROVED : (FOR DIRECTOR GENERAL)			**SHEET NO.** 98/R1

REF	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

D:\std dwg 2015\NP2-30H-04(REV01)



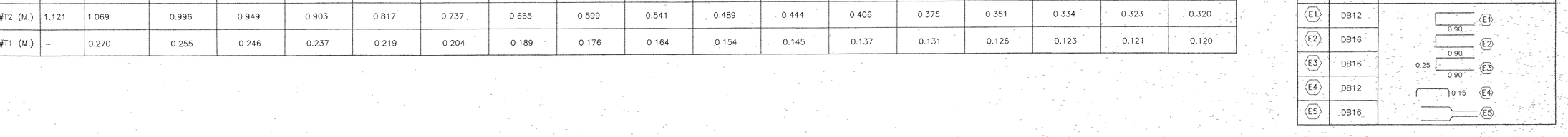
PRESTRESSING DETAIL (VERTICAL PROFILE)
SCALE 1 : 25

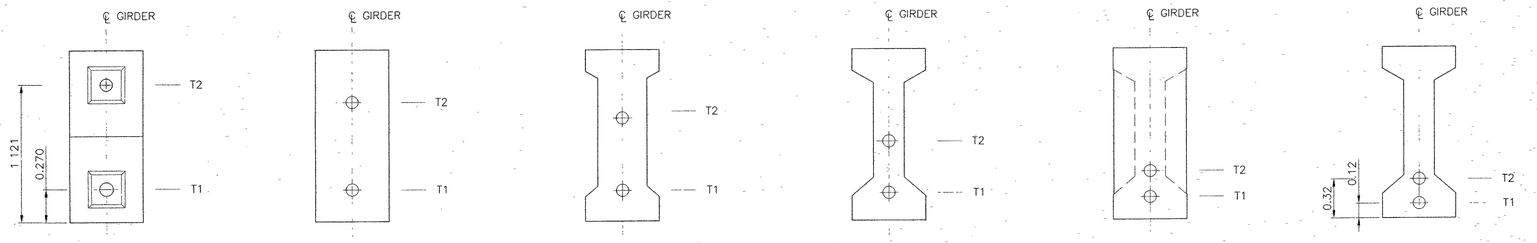
VERTICAL TENDON PROFILE DETAILS (MEASURED FROM BOTTOM OF GIRDER : Y)

DISTANCE (X), M	15.24	14.74	14.00	13.50	13 00	12.00	11.00	10 00	9.00	8.00	7.00	6 00	5.00	4 00	3.00	2 00	1 00	0 00
TENDON #T2 (M.)	1.121	1 069	0.996	0 949	0 903	0 817	0 737	0 665	0 599	0.541	0.489	0 444	0 406	0 375	0 351	0 334	0 323	0.320
TENDON #T1 (M.)	–	0.270	0 255	0 246	0.237	0 219	0 204	0 189	0 176	0 164	0 154	0.145	0.137	0.131	0.126	0.123	0.121	0.120

TABLE OF EXTRA REINFORCEMENT AT THE END

BAR NO.	SIZE	SHAPE
E1	DB12	
E2	DB16	
E3	DB16	
E4	DB12	
E5	DB16	





SECTION A – A
SCALE 1 . 25

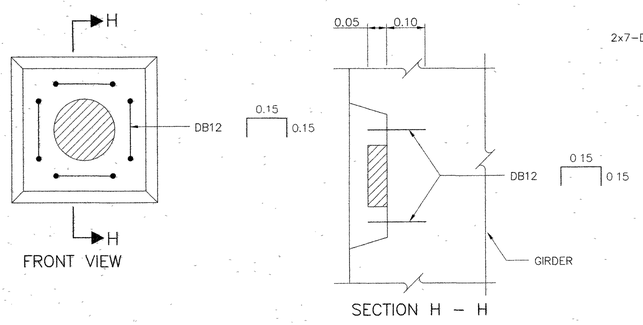
SECTION B – B
SCALE 1 . 25

SECTION C – C
SCALE 1 . 25

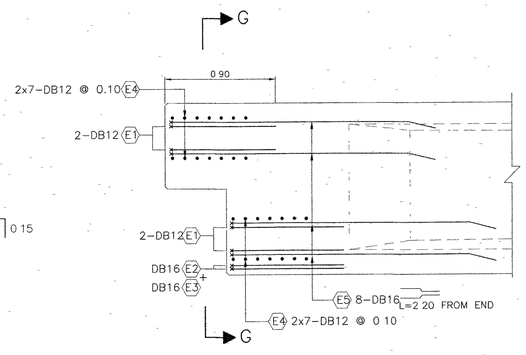
SECTION D – D
SCALE 1 . 25

SECTION E – E
SCALE 1 . 25

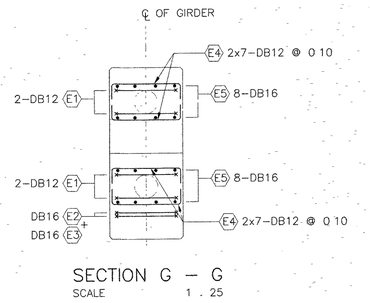
SECTION F – F
SCALE 1 . 25



EXTRA REINFORCEMENTS FOR RECESS
SCALE 1 10



EXTRA REINFORCEMENT AT THE END (SIDE VIEW)
SCALE 1 : 25



SECTION G – G
SCALE 1 . 25

EXTRA REINFORCEMENT AT THE END (FRONT VIEW)
SCALE 1 25

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
2. DESIGN LIVE LOAD HL–93.
3. MIX. DESIGN OF CONCRETE FOR POST–TENSION I–GIRDER BEAM HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 45 MPa. (459 KG/CM^2) FOR CUBE STRENGTH AT 28 DAYS.
4. PRESTRESSING :
   - 4.1 LOW RELAXATION SEVEN WIRE STRANDS ø 15 2 MM. IN ACCORDANCE WITH TIS 420 GRADE 1860
   - 4 2 MIN CHARACTERISTIC STRENGTH OF STRAND 250 KN.
   - 4.3 INITIAL PRESTRESS SHALL BE 75% OF CHARACTERISTIC STRENGTH IN WHICH THE SEQUENCE OF JACKING SHALL BE TENDON 1 AND THEN TENDON 2 EACH TENDON IS STRESSED BOTH END
   - 4 3 NUMBER OF PRESTRESSING STRANDS
     T1 = 17 PRESTRESSING STRANDS
     T2 = 17 PRESTRESSING STRANDS
5. DUCTS ARE GALVANIZED METAL SHEATHING GROUTED IMMEDIATELY AFTER STRESSING OPERATION.
6. JACKING FORCES ARE CALCULATED USING "AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS" AND ASSUMED DESIGN PARAMETERS AS FOLLOW :
   - FRICTION CURVATURE COEFFICIENT 0.20
   - FRICTION WOBBLE COEFFICIENT 0.0033 1/M
   - A WEDGE SLIP 6 MM
7. THE CONTRACTOR SHALL CARRY OUT TEST WITH THE TENDONS AND DUCTS PROPOSED FOR USING TO ESTABLISH THE FRICTION COEFFICIENTS AND SHALL ADJUST THE STRESSING FORCES FOR APPROVAL IF THE MEASURED COEFFICIENT IS DIFFERED SIGNIFICANTLY FROM THE ASSUME VALUE
8. AFTER THE COMPRESSIVE STRENGTH OF CONCRETE OF THE BRIDGE GIRDER GAINS THE MINIMUM COMPRESSIVE STRENGTH TESTED BY USING THE CONCRETE CUBE 15x15x15 CM. OF 36 MPa (367 KG/CM^2) THE JACKING FORCES SHALL BE APPLIED.
9. LIFTING METHOD SHALL BE LIFTING UP AT BOTH END OF GIRDER DO NOT LIFT UP AT THE MIDDLE OF GIRDER.
10. SPACING OF GIRDERS SHALL BE LESS THAN 2.00 M.
11. THIS DRAWING IS USED IN CONJUNCTION WITH DWG.NO.NP2–30H/01 TO NP2–30H/04

REF	REVISION	SIGNATURE	DATE
REV 1	REVISION 1/2018		FEB 2018

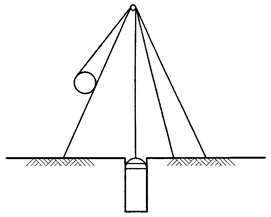
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
I–GIRDER 30.00 M. (HAFT JOINT)
GIRDER PRESTRESSING

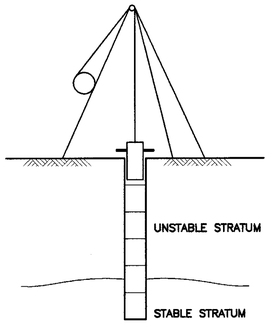
DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** NP2–30H/05
		SHEET NO. 99/R1

D:\std dwg 2015\NP2-30H-05(REV01)

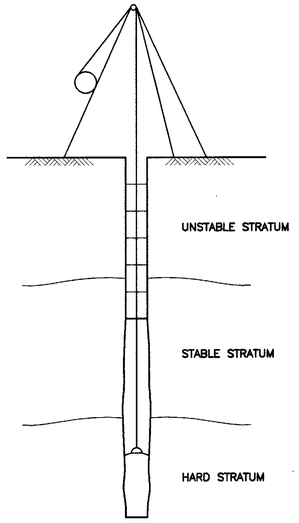
CONSTRUCTION SEQUENCES



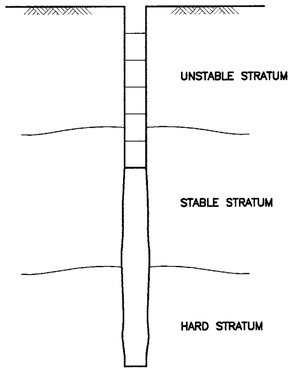
1. PRE–BORE



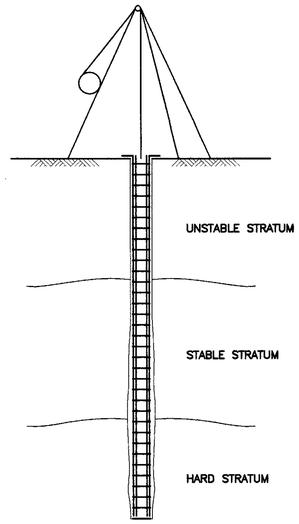
2. DRIVE TEMPORARY STEEL CASING INTO STABLE STRATUM



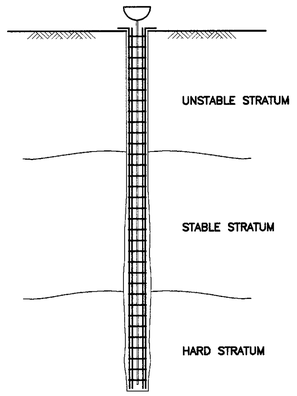
3. BORE INTO HARD STRATUM



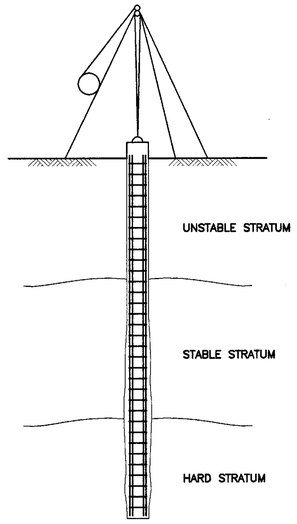
4. INSPECT THE HOLE



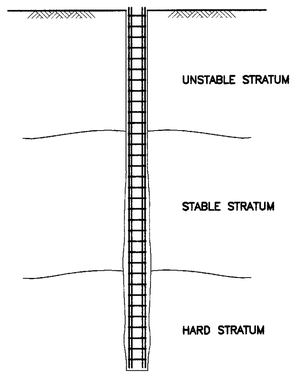
5. PLACE REINFORCEMENT



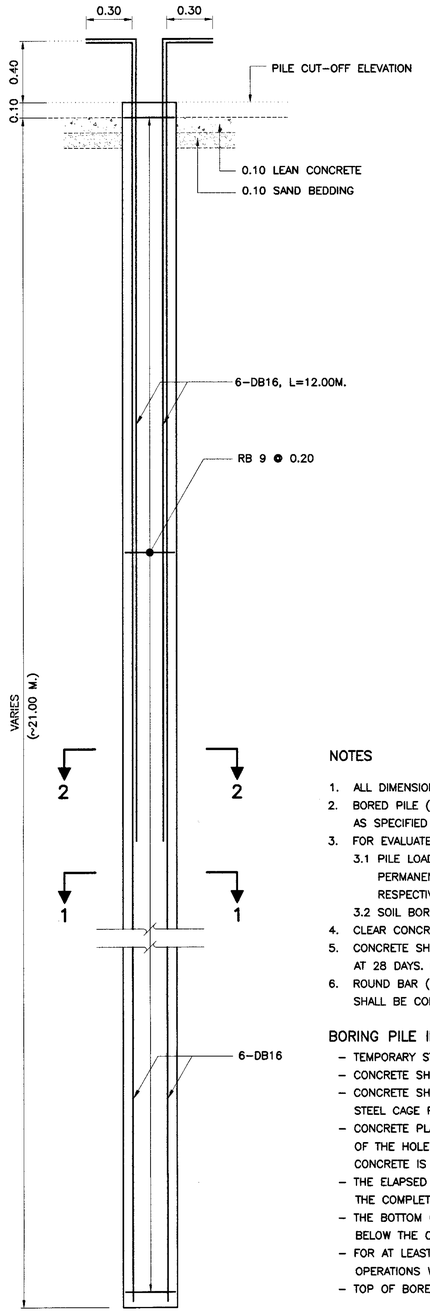
6. PLACE CONCRETE



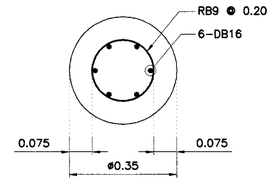
7. EXTRACT THE TEMPORARY STEEL CASING



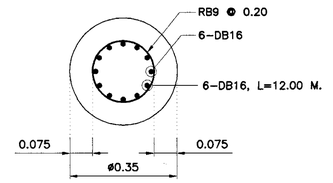
8. COMPLETED PILE



BORED PILE DETAIL
SCALE 1 : 10



SECTION 1 – 1
SCALE 1 : 10



SECTION 2 – 2
SCALE 1 : 10

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. BORED PILE (DRY PROCESS) SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY AS SPECIFIED IN FOOTING DETAILS.
3. FOR EVALUATE PILE CAPACITY SHALL BE USED 2 METHOD AS FOLLOWED :
   3.1 PILE LOAD TEST SHALL BE CONFORMED TO ASTM D1143. TOTAL SETTLEMENT AND PERMANENT SETTLEMENT SHALL NOT BE MORE THAN 25 MM. AND 6.5 MM., RESPECTIVELY. THE LOCATION OF TESTED PILE SHALL BE APPROVED BY THE ENGINEER.
   3.2 SOIL BORING TEST TO CALCULATE PILE CAPACITY HAVING SAFETY FACTOR TO 3.0.
4. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
5. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
6. ROUND BAR (RB) SHALL BE CONFORMED TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL BE CONFORMED TO TIS 24 GRADE SD 40.

BORING PILE INSTRUCTION

- TEMPORARY STEEL CASING SHALL BE PLACED IN VERTICAL LINE.
- CONCRETE SHALL BE PLACED THROUGH A TREMIE.
- CONCRETE SHALL BE PLACED AS SOON AS POSSIBLE AFTER REINFORCING STEEL CAGE PLACEMENT.
- CONCRETE PLACEMENT SHALL BE CONTINUOUS IN THE HOLE TO THE TOP ELEVATION OF THE HOLE AND CONTINUE AFTER THE HOLE IS FULL UNTIL GOOD QUALITY CONCRETE IS EVIDENT AT THE TOP OF THE HOLE.
- THE ELAPSED TIME FROM THE BEGINNING OF CONCRETE PLACEMENT IN THE HOLE TO THE COMPLETION OF PLACEMENT SHALL NOT EXCEED 2 HOURS.
- THE BOTTOM OF TEMPORARY STEEL CASING SHALL BE MAINTAINED AT LEAST 0.50 M. BELOW THE CONCRETE LEVEL.
- FOR AT LEAST 24 HOURS AFTER PILE CONCRETE HAS BEEN PLACED, NO CONSTRUCTION OPERATIONS WITHIN 3 M. FROM THE SHAFT SHALL BE CONDUCTED.
- TOP OF BORED PILE LEVEL SHALL BE AT LEAST 0.50 M. HIGHER THAN THE PILE CUT–OFF ELEVATION

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

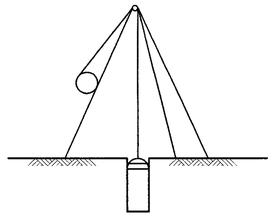
STANDARD DRAWING

0.35 M. BORED PILE (DRY PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

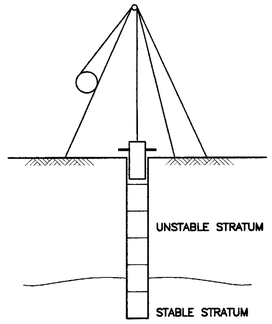
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–401
		SHEET NO. 100

D:\std dwg 2015\PL-401(REV00)

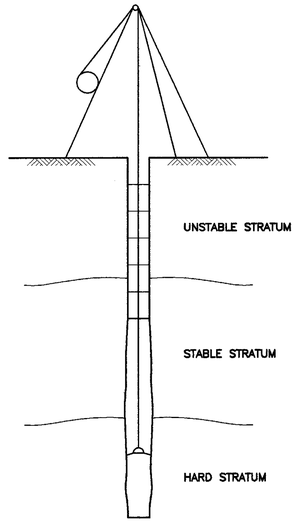
CONSTRUCTION SEQUENCES



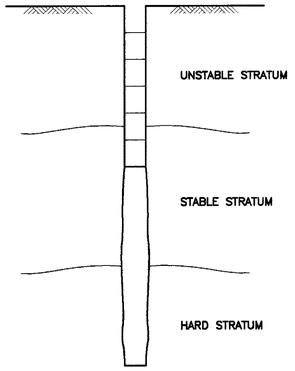
1. PRE–BORE



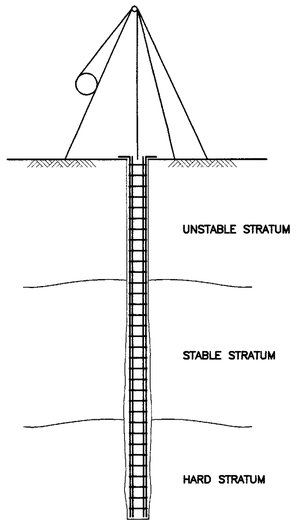
2. DRIVE TEMPORARY STEEL CASING INTO STABLE STRATUM



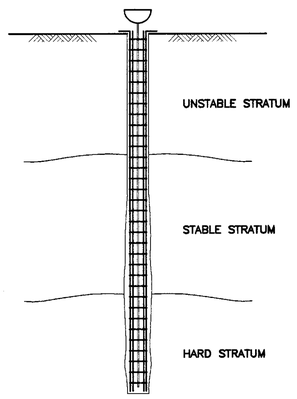
3. BORE INTO HARD STRATUM



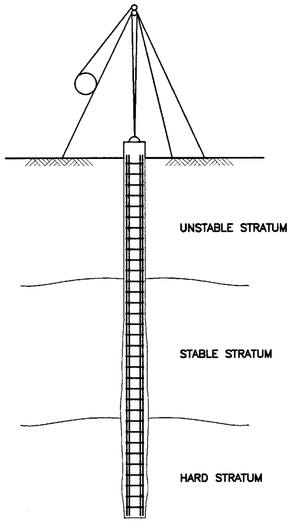
4. INSPECT THE HOLE



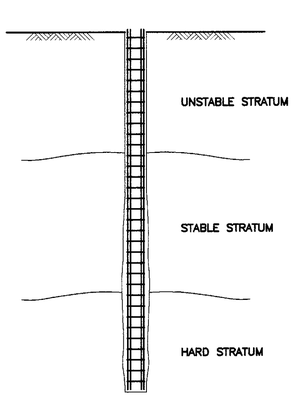
5. PLACE REINFORCEMENT



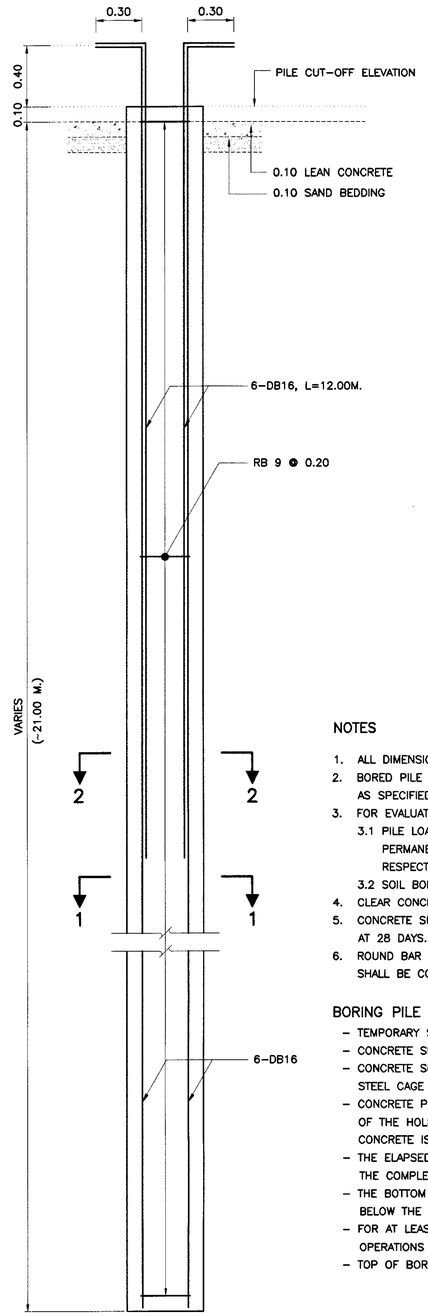
6. PLACE CONCRETE



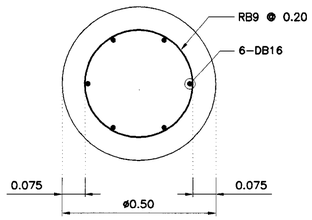
7. EXTRACT THE TEMPORARY STEEL CASING



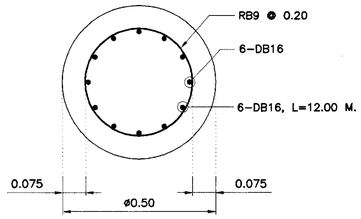
8. COMPLETED PILE



BORED PILE DETAIL
SCALE 1 : 20



SECTION 1 – 1
SCALE 1 : 10



SECTION 2 – 2
SCALE 1 : 10

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. BORED PILE (DRY PROCESS) SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY AS SPECIFIED IN FOOTING DETAILS.
3. FOR EVALUATE PILE CAPACITY SHALL BE USED 2 METHOD AS FOLLOWED :
   3.1 PILE LOAD TEST SHALL BE CONFORMED TO ASTM D1143. TOTAL SETTLEMENT AND PERMANENT SETTLEMENT SHALL NOT BE MORE THAN 25 MM. AND 6.5 MM., RESPECTIVELY. THE LOCATION OF TESTED PILE SHALL BE APPROVED BY THE ENGINEER.
   3.2 SOIL BORING TEST TO CALCULATE PILE CAPACITY HAVING SAFETY FACTOR TO 3.0.
4. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
5. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
6. ROUND BAR (RB) SHALL BE CONFORMED TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL BE CONFORMED TO TIS 24 GRADE SD 40.

BORING PILE INSTRUCTION

- TEMPORARY STEEL CASING SHALL BE PLACED IN VERTICAL LINE.
- CONCRETE SHALL BE PLACED THROUGH A TREMIE.
- CONCRETE SHALL BE PLACED AS SOON AS POSSIBLE AFTER REINFORCING STEEL CAGE PLACEMENT.
- CONCRETE PLACEMENT SHALL BE CONTINUOUS IN THE HOLE TO THE TOP ELEVATION OF THE HOLE AND CONTINUE AFTER THE HOLE IS FULL UNTIL GOOD QUALITY CONCRETE IS EVIDENT AT THE TOP OF THE HOLE.
- THE ELAPSED TIME FROM THE BEGINNING OF CONCRETE PLACEMENT IN THE HOLE TO THE COMPLETION OF PLACEMENT SHALL NOT EXCEED 2 HOURS.
- THE BOTTOM OF TEMPORARY STEEL CASING SHALL BE MAINTAINED AT LEAST 0.50 M. BELOW THE CONCRETE LEVEL.
- FOR AT LEAST 24 HOURS AFTER PILE CONCRETE HAS BEEN PLACED, NO CONSTRUCTION OPERATIONS WITHIN 3 M. FROM THE SHAFT SHALL BE CONDUCTED.
- TOP OF BORED PILE LEVEL SHALL BE AT LEAST 0.50 M. HIGHER THAN THE PILE CUT–OFF ELEVATION

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

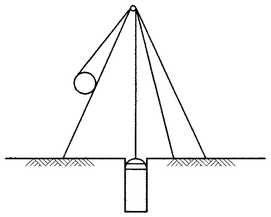
STANDARD DRAWING

0.50 M. BORED PILE (DRY PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

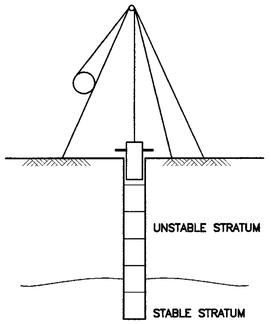
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–402
		SHEET NO. 101

D:\std dwg 2015\PL-402(REV00)

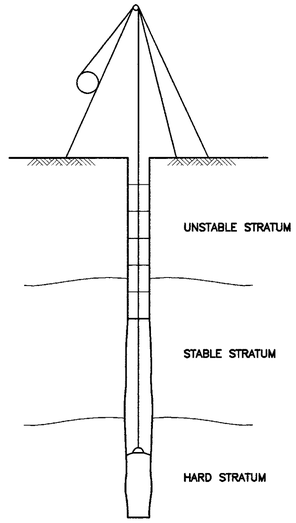
CONSTRUCTION SEQUENCES



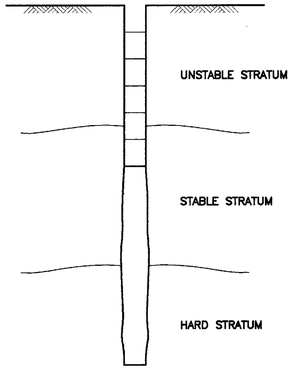
1. PRE–BORE



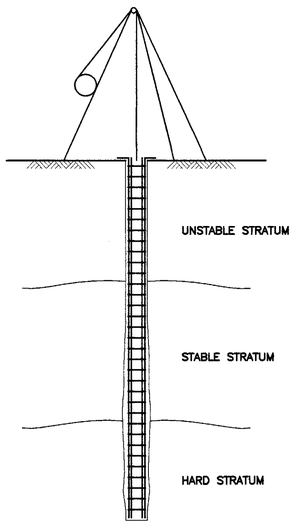
2. DRIVE TEMPORARY STEEL CASING INTO STABLE STRATUM



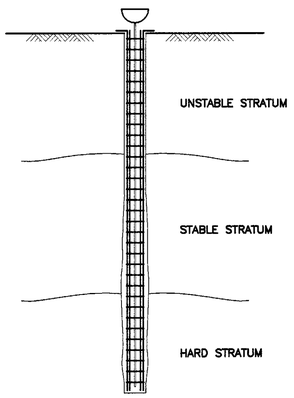
3. BORE INTO HARD STRATUM



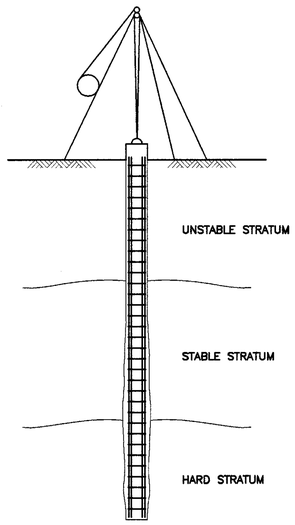
4. INSPECT THE HOLE



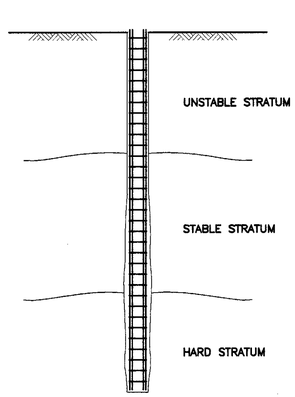
5. PLACE REINFORCEMENT



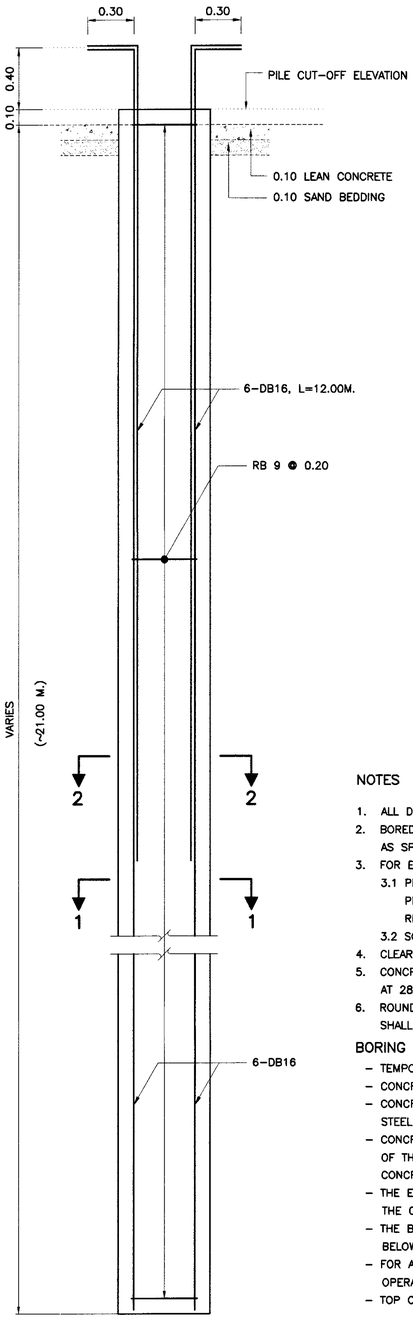
6. PLACE CONCRETE



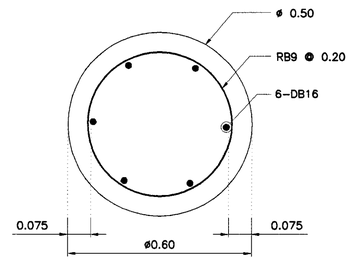
7. EXTRACT THE TEMPORARY STEEL CASING



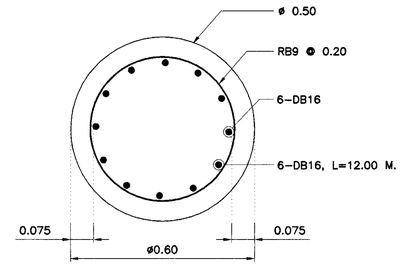
8. COMPLETED PILE



BORED PILE DETAIL
SCALE 1 : 20



SECTION 1 – 1
SCALE 1 : 10



SECTION 2 – 2
SCALE 1 : 10

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. BORED PILE (DRY PROCESS) SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY AS SPECIFIED IN FOOTING DETAILS.
3. FOR EVALUATE PILE CAPACITY SHALL BE USED 2 METHOD AS FOLLOWED :
   3.1 PILE LOAD TEST SHALL BE CONFORMED TO ASTM D1143. TOTAL SETTLEMENT AND PERMANENT SETTLEMENT SHALL NOT BE MORE THAN 25 MM. AND 6.5 MM., RESPECTIVELY. THE LOCATION OF TESTED PILE SHALL BE APPROVED BY THE ENGINEER.
   3.2 SOIL BORING TEST TO CALCULATE PILE CAPACITY HAVING SAFETY FACTOR TO 3.0.
4. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
5. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
6. ROUND BAR (RB) SHALL BE CONFORMED TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL BE CONFORMED TO TIS 24 GRADE SD 40.

BORING PILE INSTRUCTION

- TEMPORARY STEEL CASING SHALL BE PLACED IN VERTICAL LINE.
- CONCRETE SHALL BE PLACED THROUGH A TREMIE.
- CONCRETE SHALL BE PLACED AS SOON AS POSSIBLE AFTER REINFORCING STEEL CAGE PLACEMENT.
- CONCRETE PLACEMENT SHALL BE CONTINUOUS IN THE HOLE TO THE TOP ELEVATION OF THE HOLE AND CONTINUE AFTER THE HOLE IS FULL UNTIL GOOD QUALITY CONCRETE IS EVIDENT AT THE TOP OF THE HOLE.
- THE ELAPSED TIME FROM THE BEGINNING OF CONCRETE PLACEMENT IN THE HOLE TO THE COMPLETION OF PLACEMENT SHALL NOT EXCEED 2 HOURS.
- THE BOTTOM OF TEMPORARY STEEL CASING SHALL BE MAINTAINED AT LEAST 0.50 M. BELOW THE CONCRETE LEVEL.
- FOR AT LEAST 24 HOURS AFTER PILE CONCRETE HAS BEEN PLACED, NO CONSTRUCTION OPERATIONS WITHIN 3 M. FROM THE SHAFT SHALL BE CONDUCTED.
- TOP OF BORED PILE LEVEL SHALL BE AT LEAST 0.50 M. HIGHER THAN THE PILE CUT–OFF ELEVATION

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

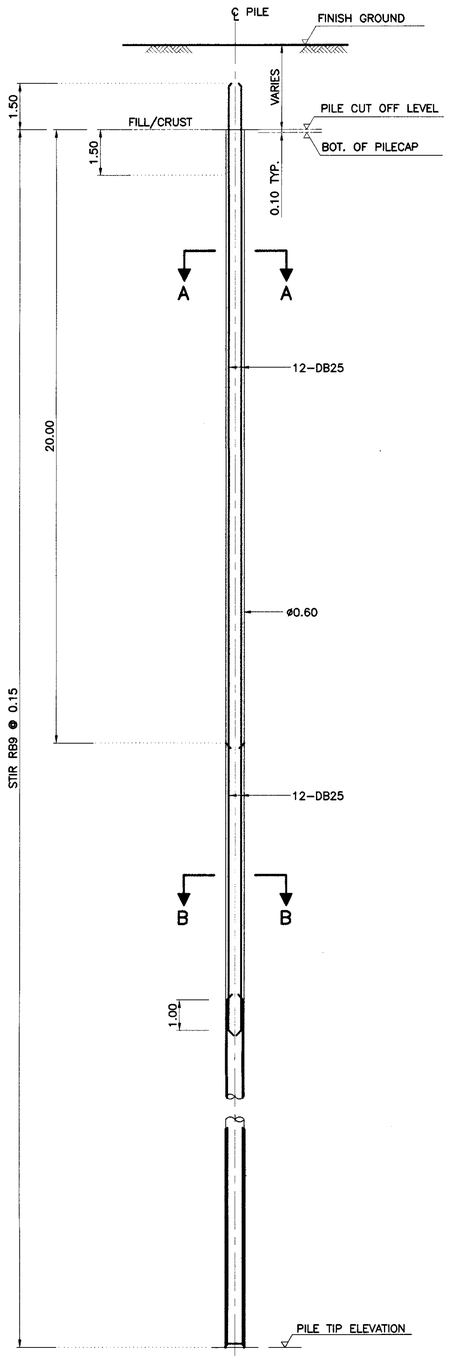
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

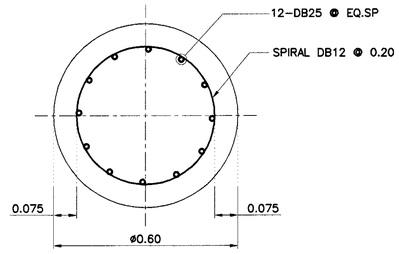
0.60 M. BORED PILE (DRY PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–403
		SHEET NO. 102

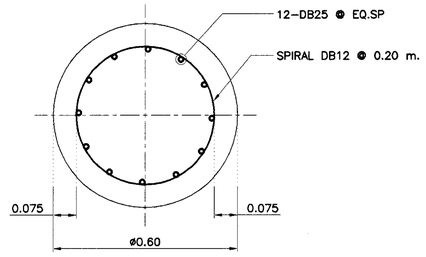
D:\std dwg 2015\PL-403(REV00)



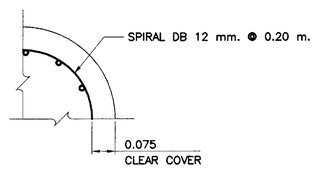
BORED PILE, ø0.60 M.
SCALE 1 : 100



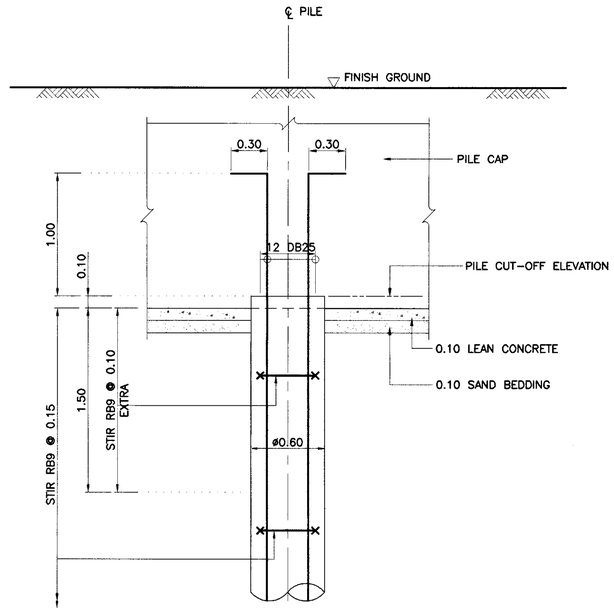
SECTION A – A
SCALE 1 : 10



SECTION B – B
SCALE 1 : 10



CLEAR COVER DETAIL
SCALE 1 : 10



PILE HEAD DETAIL
SCALE 1 : 25

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
3. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
4. ROUND BAR (RB) SHALL CONFORM TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL CONFORM TO TIS 24 GRADE SD 40.
5. REINFORCEMENT OF THE TEST PILES AND PILES USED AS TENSION PILES DURING TESTING SHALL EXTEND TO THE BOTTOM OF THE PILE.
6. PILE LOADS :

TYPE	DIAMETER (m)	DESIGN CAPACITY (kN)	ULTIMATE CAPACITY BY STATIC LOAD TEST (kN)
1	0.60	800	1,600

7. FINAL PILE TIP ELEVATION SHALL BE APPROVED BY ENGINEER.
8. STEEL COUPLING MAY USED FOR REINFORCEMENT SPLICING AS THE ENGINEER APPROVAL.
9. COMPACTION GROUTING
   – COMPACTING THE SOIL AT THE PILE TOE TO A PRESSURE OF NOT LESS THAN 6 MPa. (600 TON/M.^{2})
   – THE METHOD OF COMPACTION GROUTING SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
10. TEST PILE SHALL NOT BE USED FOR WORKING PILE AND AT LESS 1 PILE SHALL BE TEST TO 11,000 kN (1,122 TON) BY STATIC LOAD TEST METHOD.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

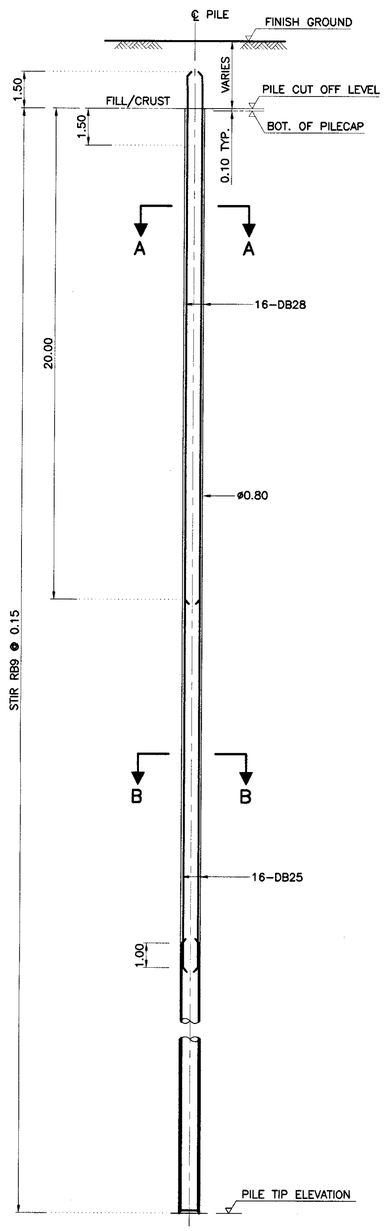
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

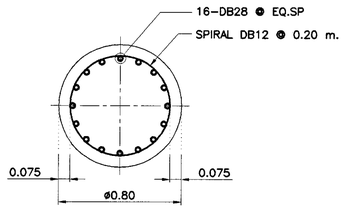
0.60 M. BORED PILE (WET PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–501
		SHEET NO. 103

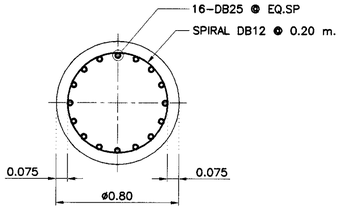
D:\std dwg 2015\PL_501(REV00)



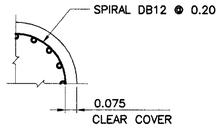
BORED PILE, ø0.80 M.
SCALE 1 : 125



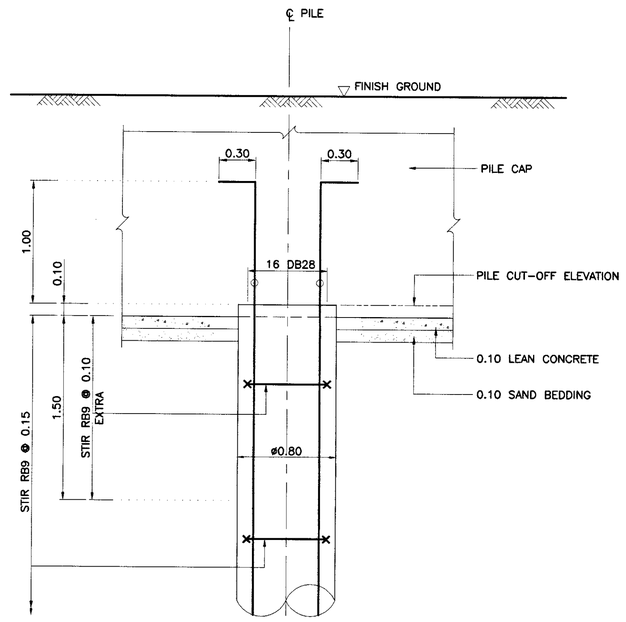
SECTION A – A
SCALE 1 : 20



SECTION B – B
SCALE 1 : 20



CLEAR COVER DETAIL
SCALE 1 : 20



PILE HEAD DETAIL
SCALE 1 : 25

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
3. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
4. ROUND BAR (RB) SHALL CONFORM TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL CONFORM TO TIS 24 GRADE SD 40.
5. REINFORCEMENT OF THE TEST PILES AND PILES USED AS TENSION PILES DURING TESTING SHALL EXTEND TO THE BOTTOM OF THE PILE.
6. PILE LOADS :

TYPE	DIAMETER (m)	DESIGN CAPACITY (kN)	ULTIMATE CAPACITY BY STATIC LOAD TEST (kN)
1	0.80	3,000	6,000

7. FINAL PILE TIP ELEVATION SHALL BE APPROVED BY ENGINEER.
8. STEEL COUPLING MAY USED FOR REINFORCEMENT SPLICING AS THE ENGINEER APPROVAL.
9. COMPACTION GROUTING
   - COMPACTING THE SOIL AT THE PILE TOE TO A PRESSURE OF NOT LESS THAN 6 MPa (600 TON/M.^{2})
   - THE METHOD OF COMPACTION GROUTING SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
10. TEST PILE SHALL NOT BE USED FOR WORKING PILE AND AT LESS 1 PILE SHALL BE TEST TO 11,000 kN (1,122 TON) BY STATIC LOAD TEST METHOD.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

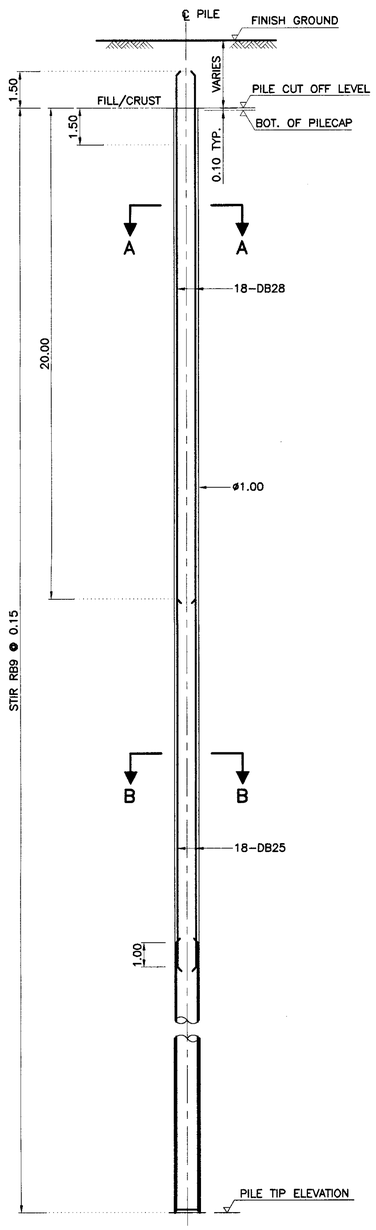
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

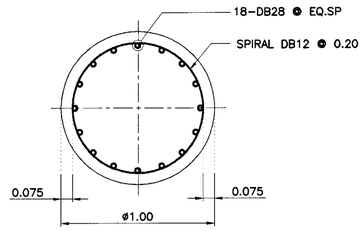
0.80 M. BORED PILE (WET PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–502
		SHEET NO. 104

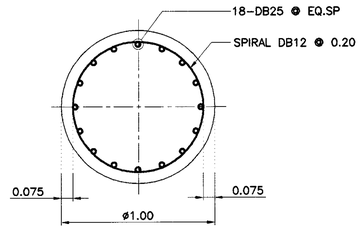
D:\std dwg 2015\PL-502(REV00)



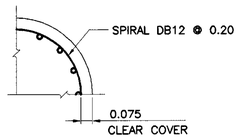
BORED PILE, ø1.00 M.
SCALE 1 : 125



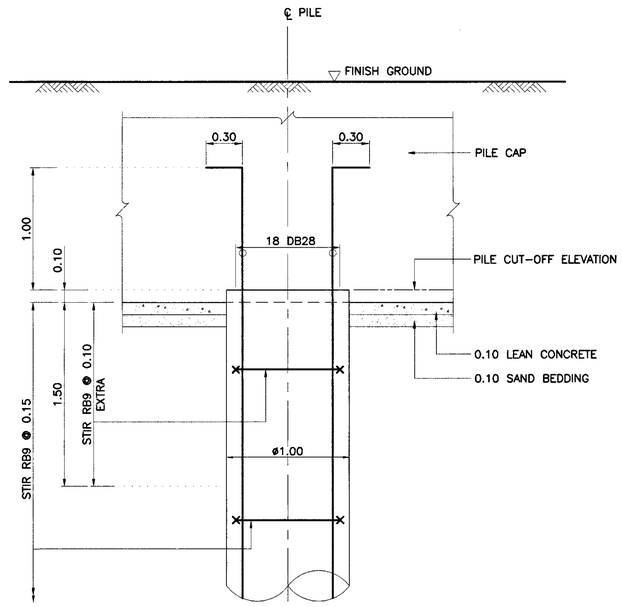
SECTION A – A
SCALE 1 : 20



SECTION B – B
SCALE 1 : 20



CLEAR COVER DETAIL
SCALE 1 : 20



PILE HEAD DETAIL
SCALE 1 : 25

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
3. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
4. ROUND BAR (RB) SHALL CONFORM TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL CONFORM TO TIS 24 GRADE SD 40.
5. REINFORCEMENT OF THE TEST PILES AND PILES USED AS TENSION PILES DURING TESTING SHALL EXTEND TO THE BOTTOM OF THE PILE.
6. PILE LOADS :

TYPE	DIAMETER (m)	DESIGN CAPACITY (kN)	ULTIMATE CAPACITY BY STATIC LOAD TEST (kN)
1	1.00	4,500	9,000

7. FINAL PILE TIP ELEVATION SHALL BE APPROVED BY ENGINEER.
8. STEEL COUPLING MAY USED FOR REINFORCEMENT SPLICING AS THE ENGINEER APPROVAL.
9. COMPACTION GROUTING
   - COMPACTING THE SOIL AT THE PILE TOE TO A PRESSURE OF NOT LESS THAN 6 MPa. (600 TON/M.^{2})
   - THE METHOD OF COMPACTION GROUTING SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
10. TEST PILE SHALL NOT BE USED FOR WORKING PILE AND AT LESS 1 PILE SHALL BE TEST TO 11,000 kN (1,122 TON) BY STATIC LOAD TEST METHOD.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

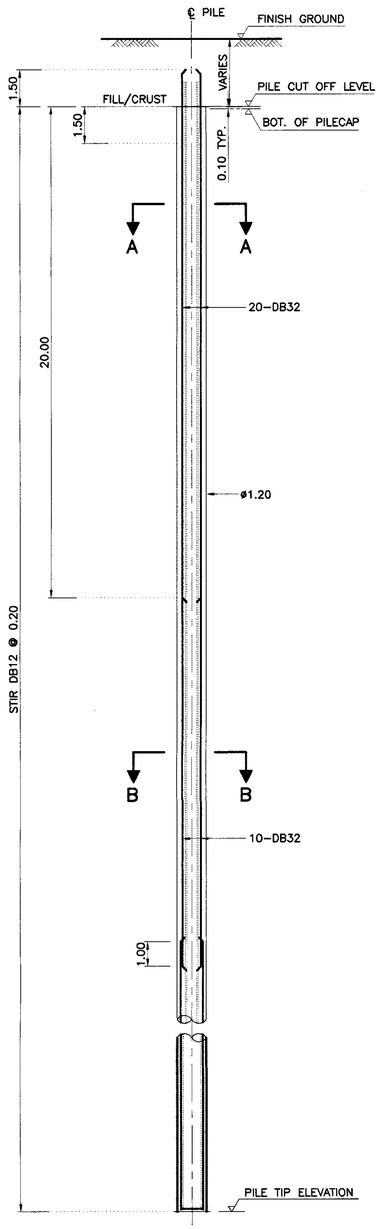
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

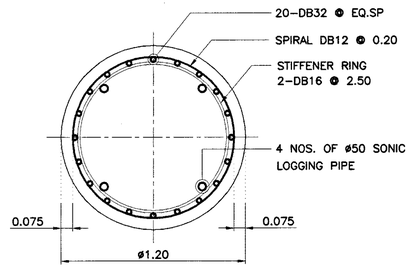
1.00 M. BORED PILE (WET PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–503
		SHEET NO. 105

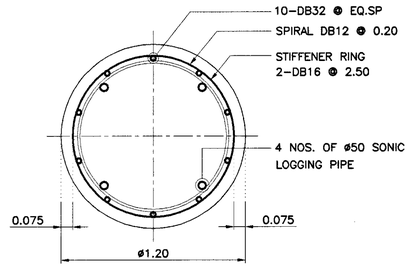
D:\std dwg 2015\PL-503(REV00)



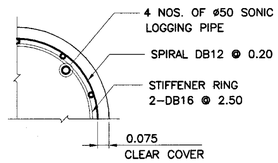
BORED PILE, ø1.20 M.
SCALE 1 : 125



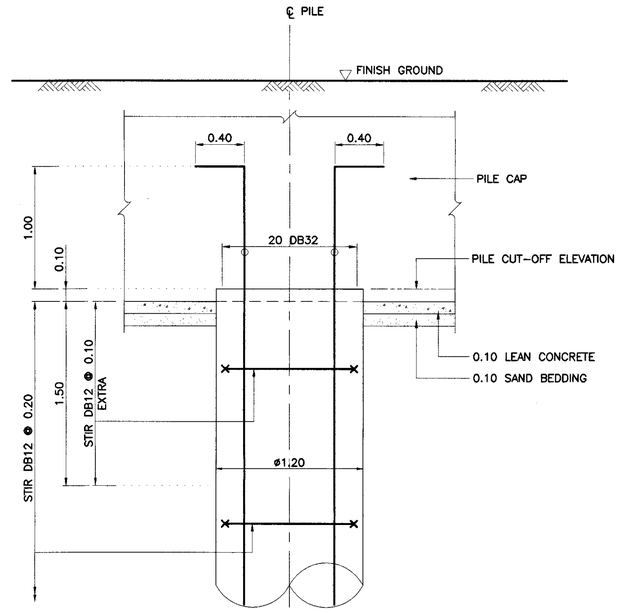
SECTION A – A
SCALE 1 : 20



SECTION B – B
SCALE 1 : 20



CLEAR COVER DETAIL
SCALE 1 : 20



PILE HEAD DETAIL
SCALE 1 : 25

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
3. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15–20 CM.
4. ROUND BAR (RB) SHALL CONFORM TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL CONFORM TO TIS 24 GRADE SD 40.
5. REINFORCEMENT OF THE TEST PILES AND PILES USED AS TENSION PILES DURING TESTING SHALL EXTEND TO THE BOTTOM OF THE PILE.
6. PILE LOADS :

TYPE	DIAMETER (m)	DESIGN CAPACITY (kN)	ULTIMATE CAPACITY BY STATIC LOAD TEST (kN)
1	1.20	5,500	11,000

7. FINAL PILE TIP ELEVATION SHALL BE APPROVED BY ENGINEER.
8. STEEL COUPLING MAY USED FOR REINFORCEMENT SPLICING AS THE ENGINEER APPROVAL.
9. AFTER BORED PILE COMPLETION, SONIC LOGGING SHALL BE PERFORMED ON 6 DIRECTIONS. IF THE QUALITY OF CONCRETE IS PERFECT, THE GROUTING SHALL BE PERFORMED TO REACH EITHER THE MAXIMUM PRESSURE OF 40 BAR OR USAGE OF MAXIMUM CEMENT GROUTING ABOUT 1,700 LITERS.
9. COMPACTION GROUTING
   - COMPACTING THE SOIL AT THE PILE TOE TO A PRESSURE OF NOT LESS THAN 6 MPa. (600 TON/M.)
   - THE METHOD OF COMPACTION GROUTING SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
10. TEST PILE SHALL NOT BE USED FOR WORKING PILE AND AT LESS 1 PILE SHALL BE TEST TO 11,000 kN (1,122 TON) BY STATIC LOAD TEST METHOD.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

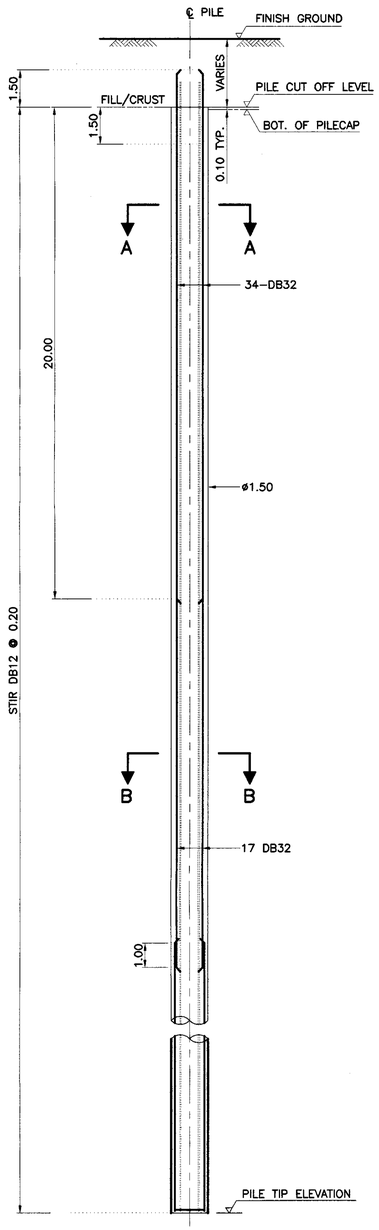
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

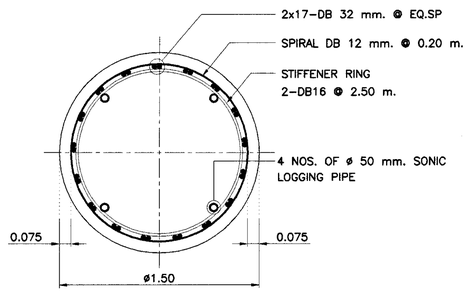
1.20 M. BORED PILE (WET PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL–504
		SHEET NO. 106

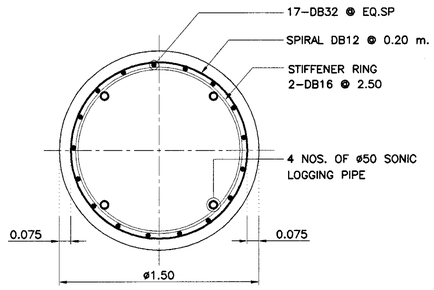
D:\std dwg 2015\PL-504(REV00)



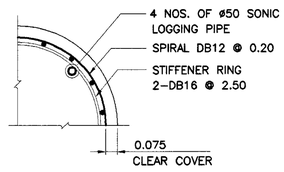
BORED PILE, ø 1.50 M.
SCALE 1 : 125



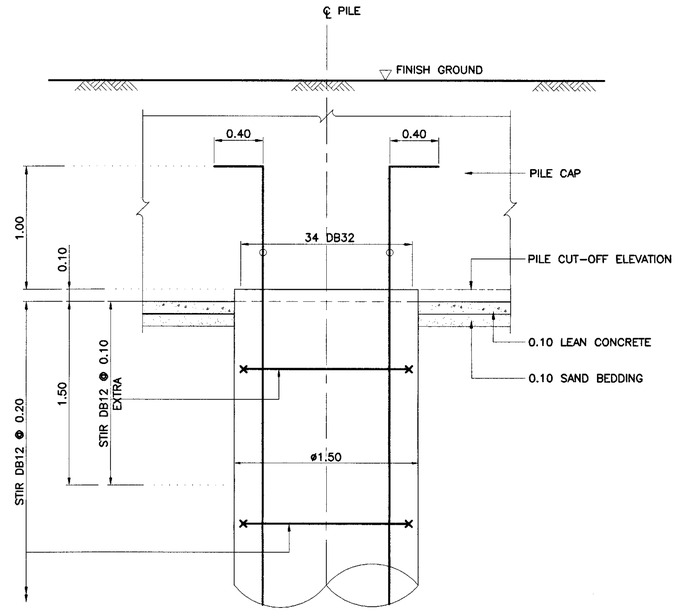
SECTION A – A
SCALE 1 : 20



SECTION B – B
SCALE 1 : 20



CLEAR COVER DETAIL
SCALE 1 : 20



PILE HEAD DETAIL
SCALE 1 : 25

NOTES

1. ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED
2. CLEAR CONCRETE COVERING SHALL BE 7.50 CM.
3. CONCRETE SHALL HAVE CUBE COMPRESSIVE STRENGTH OF 35 MPa. (357 KG/CM^2) AT 28 DAYS. CONCRETE SLUMP SHALL BE 15-20 CM.
4. ROUND BAR (RB) SHALL CONFORM TO TIS 20 GRADE SR24. DEFORMED BAR (DB) SHALL CONFORM TO TIS 24 GRADE SD 40.
5. REINFORCEMENT OF THE TEST PILES AND PILES USED AS TENSION PILES DURING TESTING SHALL EXTEND TO THE BOTTOM OF THE PILE.
6. PILE LOADS :

TYPE	DIAMETER (m)	DESIGN CAPACITY (kN)	ULTIMATE CAPACITY BY STATIC LOAD TEST (kN)
1	1.50	10,000	20,000

7. FINAL PILE TIP ELEVATION SHALL BE APPROVED BY ENGINEER.
8. STEEL COUPLING MAY USED FOR REINFORCEMENT SPLICING AS THE ENGINEER APPROVAL.
9. AFTER BORED PILE COMPLETION, SONIC LOGGING SHALL BE PERFORMED ON 6 DIRECTIONS. IF THE QUALITY OF CONCRETE IS PERFECT, THE GROUTING SHALL BE PERFORMED TO REACH EITHER THE MAXIMUM PRESSURE OF 40 BAR OR USAGE OF MAXIMUM CEMENT GROUTING ABOUT 1,700 LITERS.
10. COMPACTION GROUTING
    - COMPACTING THE SOIL AT THE PILE TOE TO A PRESSURE OF NOT LESS THAN 6 MPa. (600 TON/M.)
    - THE METHOD OF COMPACTION GROUTING SHALL BE PROPOSED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER.
11. TEST PILE SHALL NOT BE USED FOR WORKING PILE AND AT LESS 1 PILE SHALL BE TEST TO 20,000 kN (2,040 TON) BY STATIC LOAD TEST METHOD.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

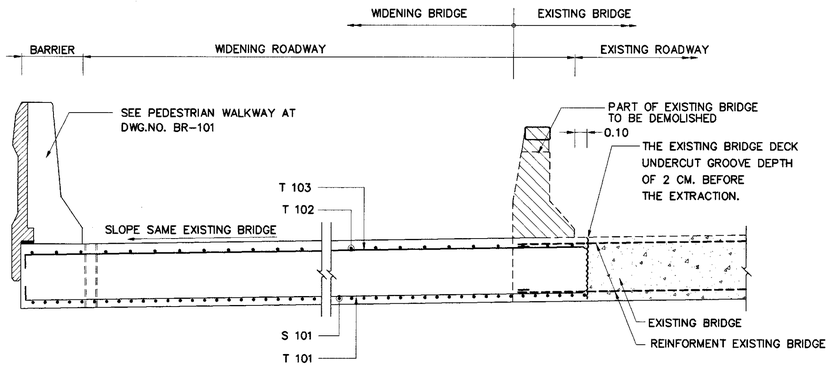
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

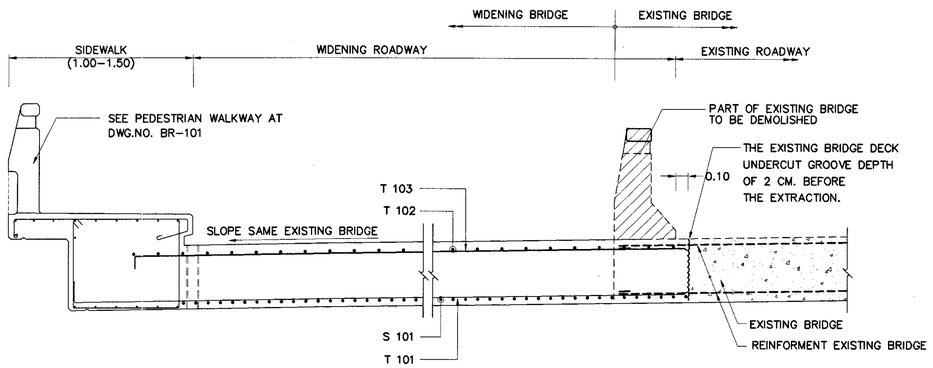
1.50 M. BORED PILE (WET PROCESS)
PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PL-505
		SHEET NO. 107

D:\std dwg 2015\PL-505(REV00)

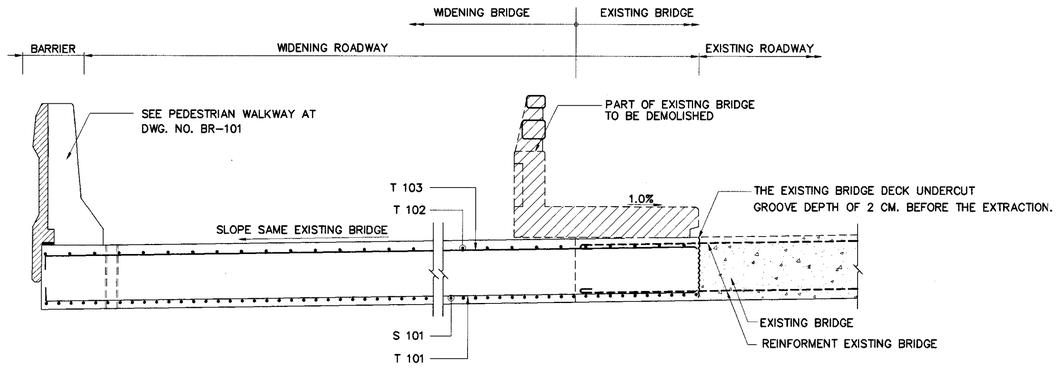


NEW BRIDGE WIDENING WITH EDGE

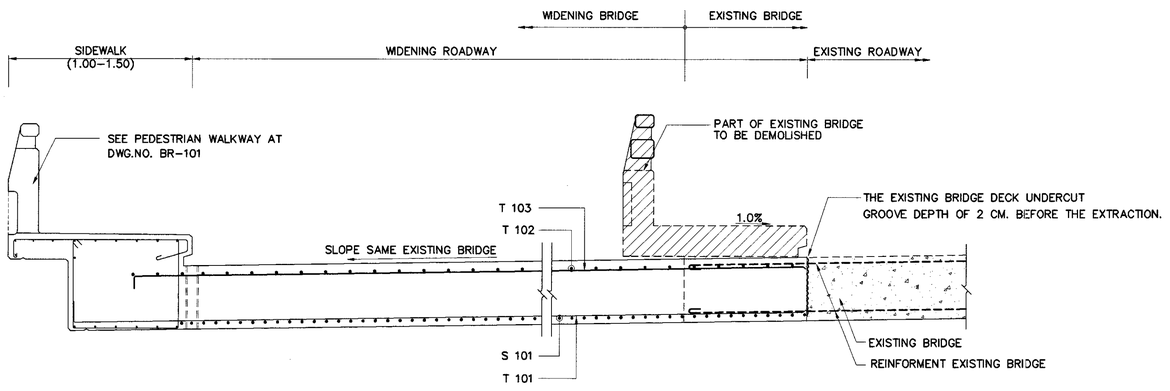


NEW BRIDGE WIDENING WITH SIDEWALK

CASE I : THE EXISTING BRIDGE WITH EDGE



NEW BRIDGE WIDENING WITH EDGE



NEW BRIDGE WIDENING WITH SIDEWALK

CASE II : THE EXISTING BRIDGE WITH SIDEWALK

WIDENING PART AS SLAB TYPE WITHOUT LONGITUDINAL JOINTS

SCALE 1 : 25

CONSTRUCTION SPECIFICATION

1. BRIDGE DECK AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER SB-101 TO SB-105
2. EDGE BEAM, BRIDGE RAILING, AND ALL PARTS OF CONCRETE TOPPING OF THE EXISTING BRIDGES SHALL BE REMOVED. THE CONCRETE DECK SHALL BE GROOVED AT LEAST 2 CM. DEEP ALONG THE SPECIFIC LINE PRIOR TO REMOVAL THE ITEMS. ALL EXISTING REINFORCEMENT IN CONCRETE DECK SHALL BE REMAINED.
3. ALL TOP AND BOTTOM TRANSVERSE REINFORCEMENT SHALL BE CONNECTED USING LAP SPICE TO WIDEN THE EXISTING BRIDGE AS SPECIFIED IN THE DRAWING.
4. ALL LONGITUDINAL AND OTHER REINFORCEMENT SHALL BE PLACED COMPLETELY AS STATED IN THE DRAWING PRIOR TO CASTING THE FRESH CONCRETE FOR THE WIDENING PART OF THE BRIDGE.
5. PRIOR TO POURING CONCRETE, ALL DUST AND OIL SHALL BE REMOVED AND CLEANED FOR ALL EXPOSED SURFACE OF THE CONNECTING MEMBERS. THE EPOXY RESIN AS PER ASTM C881 TYPE II GRADE I CLASS C SHALL BE APPLIED TO THE BONDING SURFACE OF THE CONNECTING CONCRETE MEMBERS.
6. THE LAP SPLICE LENGTH SHALL BE ADOPTED AS FOLLOWS:
   - 6.1 ROUND BAR (RB9) : THE LAP SPLICE LENGTH = 0.50 M.
   - 6.2 DEFORMED BAR (DB12): THE LAP SPLICE LENGTH = 0.55 M.
   - 6.3 DEFORMED BAR (DB16): THE LAP SPLICE LENGTH = 0.70 M.
   - 6.4 DEFORMED BAR (DB20): THE LAP SPLICE LENGTH = 0.90 M.
   - 6.5 DEFORMED BAR (DB25): THE LAP SPLICE LENGTH = 1.40 M.
   - 6.6 DEFORMED BAR (DB28): THE LAP SPLICE LENGTH = 1.75 M.
7. THE WELDED SPLICE OF REINFORCEMENT SHALL BE USED BASED ON AWS WHEN THE MECHANICAL LAP SPLICE LENGTH IS NOT SUFFICIENT.
8. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
9. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

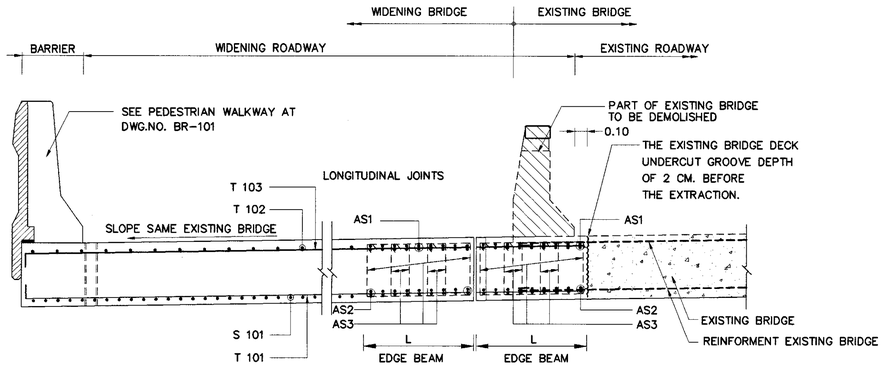
STANDARD DRAWING

EXISTING SLAB TYPE BRIDGE

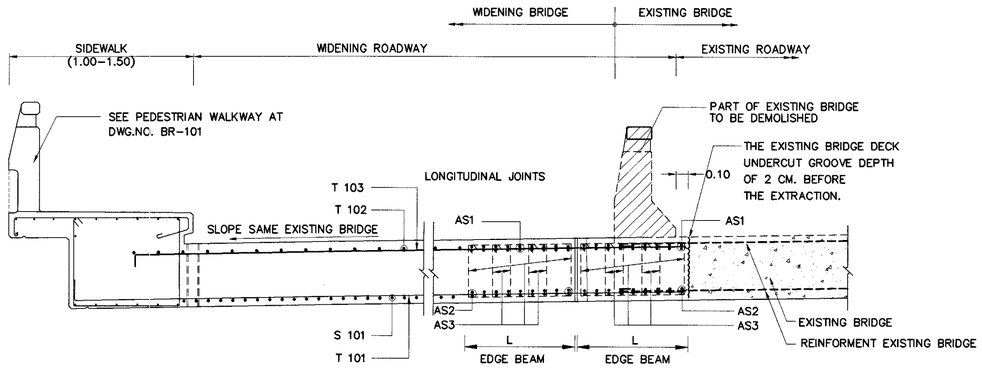
WIDENING BY SLAB TYPE WITHOUT LONGITUDINAL JOINTS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. WS-101
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 108

D:\std dwg 2015\WS-101(REV00)

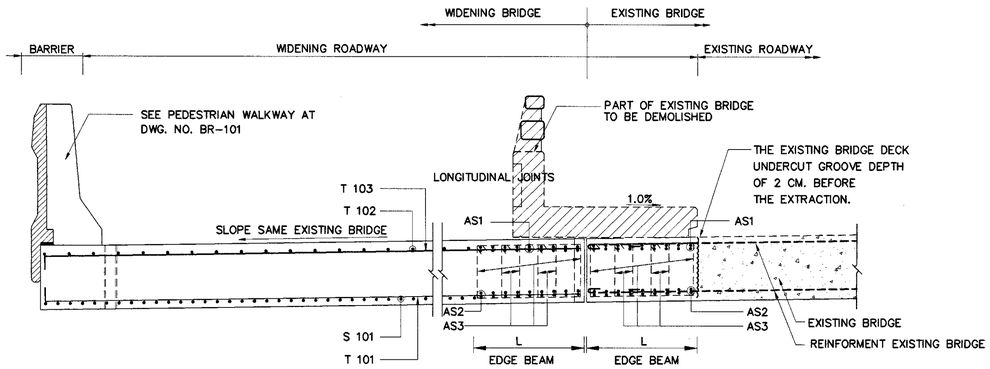


NEW BRIDGE WIDENING WITH EDGE

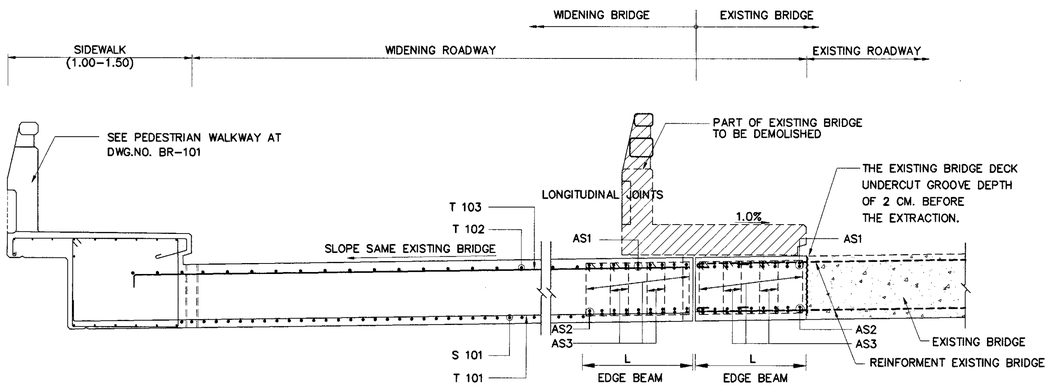


NEW BRIDGE WIDENING WITH SIDEWALK

CASE I : THE EXISTING BRIDGE WITH EDGE



NEW BRIDGE WIDENING WITH EDGE

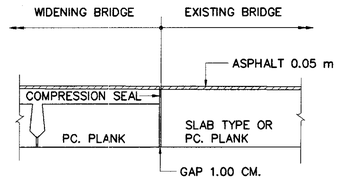


NEW BRIDGE WIDENING WITH SIDEWALK

CASE II : THE EXISTING BRIDGE WITH SIDEWALK

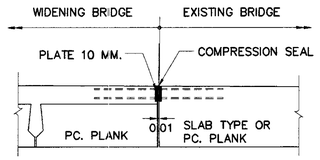
WIDENING PART AS SLAB TYPE WITH LONGITUDINAL JOINTS

SCALE 1 : 25



LONGITUDINAL JOINTS WITH ASPHALT 0.05

SCALE 1 : 25



LONGITUDINAL JOINTS WITHOUT ASPHALT 0.05

SCALE 1 : 25

TABLE 1

SPAN (M.)	EDGE BEAM L, (M.)	AS1	AS2	AS3
5.00	0.50	2x4 -DB25	2x4 -DB25	2-DB12@0.15
6.00	0.60	2x5 -DB25	2x5 -DB25	2-DB12@0.15
7.00	0.70	2x6 -DB25	2x6 -DB25	2-DB12@0.15
8.00	0.80	2x7 -DB25	2x7 -DB25	2-DB12@0.15
9.00	0.90	2x8 -DB25	2x8 -DB25	3-DB12@0.15
10.00	0.90	2x9 -DB25	2x9 -DB25	3-DB12@0.15

CONSTRUCTION SPECIFICATION

1. BRIDGE DECK AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER SB-101 TO SB-105
2. EDGE BEAM, BRIDGE RAILING, AND ALL PARTS OF CONCRETE TOPPING OF THE EXISTING BRIDGES SHALL BE REMOVED. THE CONCRETE DECK SHALL BE GROOVED AT LEAST 2 CM. DEEP ALONG THE SPECIFIC LINE PRIOR TO REMOVAL THE ITEMS. ALL EXISTING REINFORCEMENT IN CONCRETE DECK SHALL BE REMAINED.
3. ALL TOP AND BOTTOM TRANSVERSE REINFORCEMENT SHALL BE CONNECTED USING LAP SPICE TO WIDEN THE EXISTING BRIDGE AS SPECIFIED IN THE DRAWING.
4. ALL LONGITUDINAL AND OTHER REINFORCEMENT SHALL BE PLACED COMPLETELY AS STATED IN THE DRAWING PRIOR TO CASTING THE FRESH CONCRETE FOR THE WIDENING PART OF THE BRIDGE.
5. PRIOR TO POURING CONCRETE, ALL DUST AND OIL SHALL BE REMOVED AND CLEANED FOR ALL EXPOSED SURFACE OF THE CONNECTING MEMBERS. THE EPOXY RESIN AS PER ASTM C881 TYPE II GRADE I CLASS C SHALL BE APPLIED TO THE BONDING SURFACE OF THE CONNECTING CONCRETE MEMBERS.
6. THE LAP SPLICE LENGTH SHALL BE ADOPTED AS FOLLOWS:
   - 6.1 ROUND BAR (RB9) : THE LAP SPLICE LENGTH = 0.50 M.
   - 6.2 DEFORMED BAR (DB12): THE LAP SPLICE LENGTH = 0.55 M.
   - 6.3 DEFORMED BAR (DB16): THE LAP SPLICE LENGTH = 0.70 M.
   - 6.4 DEFORMED BAR (DB20): THE LAP SPLICE LENGTH = 0.90 M.
   - 6.5 DEFORMED BAR (DB25): THE LAP SPLICE LENGTH = 1.40 M.
   - 6.6 DEFORMED BAR (DB28): THE LAP SPLICE LENGTH = 1.75 M.
7. THE WELDED SPLICE OF REINFORCEMENT SHALL BE USED BASED ON AWS WHEN THE MECHANICAL LAP SPLICE LENGTH IS NOT SUFFICIENT.
8. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
9. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

EXISTING SLAB TYPE BRIDGE

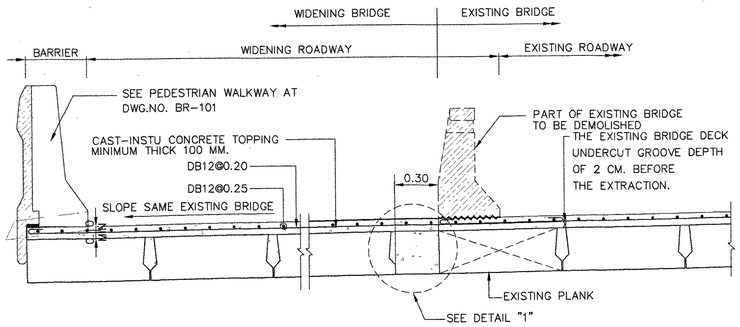
WIDENING BY SLAB TYPE WITH LONGITUDINAL JOINTS

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

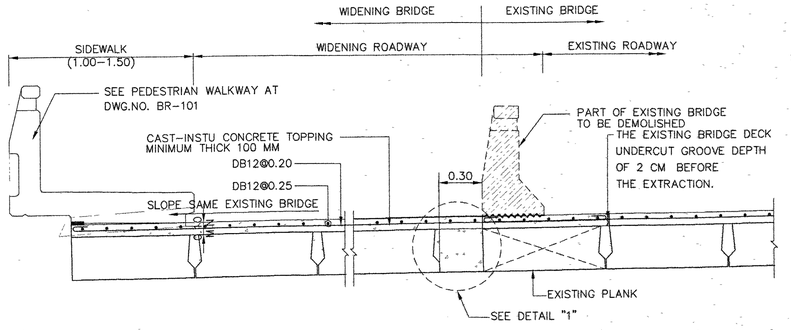
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. WS-102 | SHEET NO. 109

D:\std dwg 2015\WS-102(REV00)

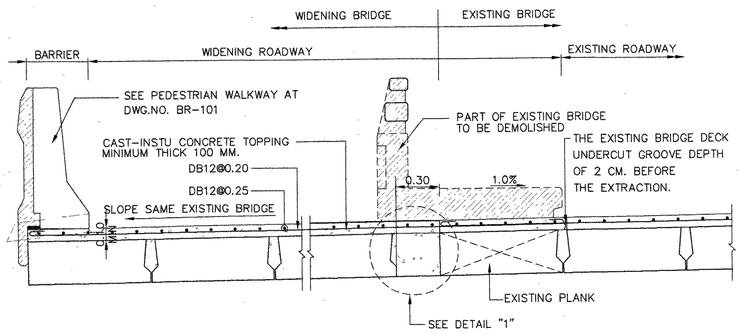


NEW BRIDGE WIDENING WITH EDGE

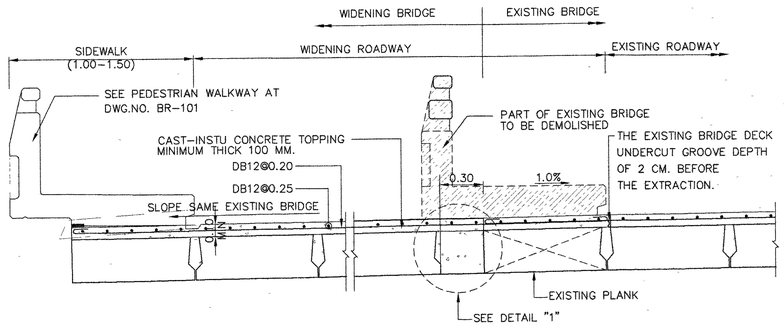


NEW BRIDGE WIDENING WITH SIDEWALK

CASE I : THE EXISTING BRIDGE WITH EDGE



NEW BRIDGE WIDENING WITH EDGE

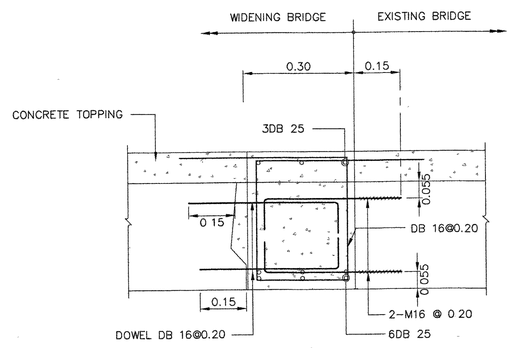


NEW BRIDGE WIDENING WITH SIDEWALK

CASE II : THE EXISTING BRIDGE WITH SIDEWALK

WIDENING PART AS PC. PLANK WITHOUT LONGITUDINAL JOINTS

SCALE 1 : 25



DETAIL "1"

SCALE 1 : 10

CONSTRUCTION SPECIFICATION

1. PC. PLANK GIRDER AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER WS-106 TO WS-107
2. EDGE BEAM, BRIDGE RAILING, AND ALL PARTS OF CONCRETE TOPPING OF THE EXISTING BRIDGES SHALL BE REMOVED. THE CONCRETE DECK SHALL BE GROOVED AT LEAST 2 CM. DEEP ALONG THE SPECIFIC LINE PRIOR TO REMOVAL THE ITEMS. ALL EXISTING REINFORCEMENT IN CONCRETE DECK SHALL BE REMAINED.
3. CONCRETE GROOVING SHALL BE CLEANED.
4. ALL PRECAST PLANK BEAMS SHALL BE INSTALLED CORRESPONDING TO THE SPECIFIC WIDENING WIDTH. SHEAR KEY ALONG THE ADJACENT PLANK BEAMS SHALL BE WELDED.
5. ALL NEW REINFORCEMENT IN CONCRETE DECK SHALL CONNECT TO THE EXISTING ONES USING THE LAP SPLICE LENGTH SPECIFIED IN THIS DRAWING
6. POURING AND CASTING THE CONCRETE TOPPING AND WALK WAY IN THE NEW BRIDGE WIDENING PARTS.
7. PRIOR TO POURING CONCRETE, ALL DUST AND OIL SHALL BE REMOVED AND CLEANED FOR ALL EXPOSED SURFACE OF THE CONNECTING MEMBERS. THE EPOXY RESIN AS PER ASTM C881 TYPE II GRADE I CLASS C SHALL BE APPLIED TO THE BONDING SURFACE OF THE CONNECTING CONCRETE MEMBERS.
8. THE LAP SPLICE LENGTH SHALL BE ADOPTED AS FOLLOWS:
   - 8.1 ROUND BAR (RB9) : THE LAP SPLICE LENGTH = 0.50 M.
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10. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
11. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

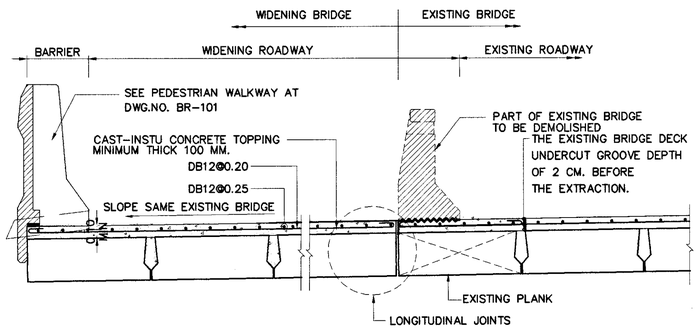
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

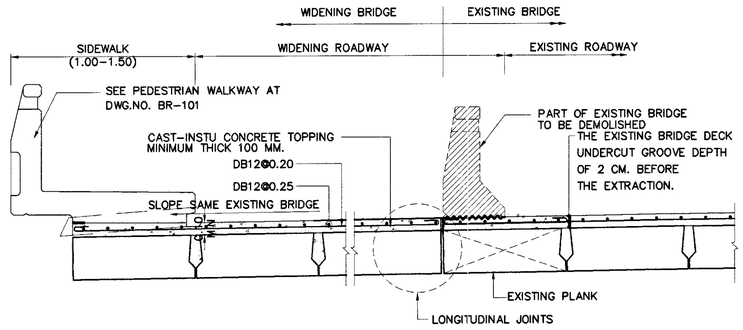
EXISTING PC. PLANK BRIDGE

WIDENING BY PLANK WITHOUT LONGITUDINAL JOINTS (REMOVED EDGE)

DESIGNED : D.O.H. & CONSULTANTS	**CHECKED :** BUREAU OF LOCATION & DESIGN	**DATE :** OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		**SCALE :** AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		**DWG NO.** WS-103
		SHEET NO. 110

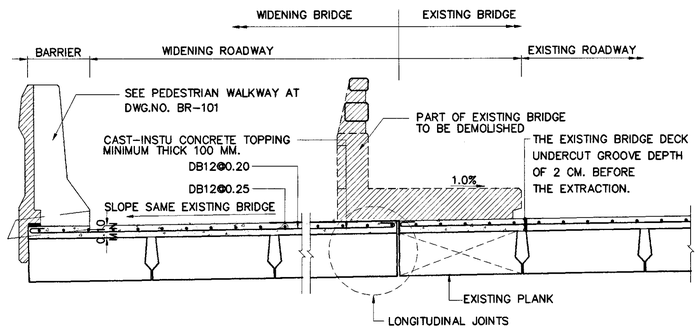


NEW BRIDGE WIDENING WITH EDGE

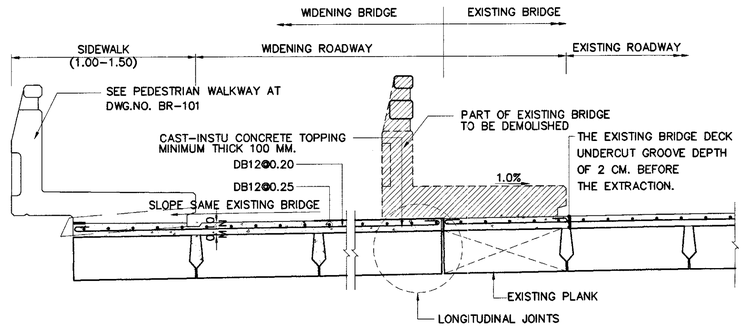


NEW BRIDGE WIDENING WITH SIDEWALK

CASE I : THE EXISTING BRIDGE WITH EDGE



NEW BRIDGE WIDENING WITH EDGE

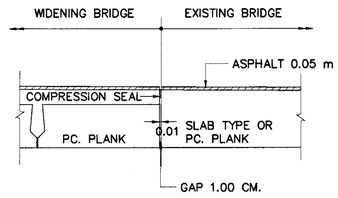


NEW BRIDGE WIDENING WITH SIDEWALK

CASE II : THE EXISTING BRIDGE WITH SIDEWALK

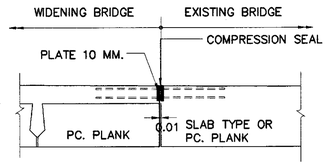
WIDENING PART AS PC. PLANK WITH LONGITUDINAL JOINTS

SCALE 1 : 25



LONGITUDINAL JOINTS WITH ASPHALT 0.05

SCALE 1 : 25



LONGITUDINAL JOINTS WITHOUT ASPHALT 0.05

SCALE 1 : 25

CONSTRUCTION SPECIFICATION

1. PC. PLANK GIRDER AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER WS-106 TO WS-107
2. EDGE BEAM, BRIDGE RAILING, AND ALL PARTS OF CONCRETE TOPPING OF THE EXISTING BRIDGES SHALL NOT BE REMOVED. THE CONCRETE DECK SHALL BE GROOVED AT LEAST 2 CM. DEEP ALONG THE SPECIFIC LINE PRIOR TO REMOVAL THE ITEMS. ALL EXISTING REINFORCEMENT IN CONCRETE DECK SHALL BE REMAINED.
3. CONCRETE GROOVING SHALL BE CLEANED.
4. ALL PRECAST PLANK BEAMS SHALL BE INSTALLED CORRESPONDING TO THE SPECIFIC WIDENING WIDTH. SHEAR KEY ALONG THE ADJACENT PLANK BEAMS SHALL BE WELDED.
5. ALL NEW REINFORCEMENT IN CONCRETE DECK SHALL CONNECT TO THE EXISTING ONES USING THE LAP SPLICE LENGTH SPECIFIED IN THIS DRAWING
6. POURING AND CASTING THE CONCRETE TOPPING AND WALK WAY IN THE NEW BRIDGE WIDENING PARTS.
7. PRIOR TO POURING CONCRETE, ALL DUST AND OIL SHALL BE REMOVED AND CLEANED FOR ALL EXPOSED SURFACE OF THE CONNECTING MEMBERS. THE EPOXY RESIN AS PER ASTM C881 TYPE II GRADE I CLASS C SHALL BE APPLIED TO THE BONDING SURFACE OF THE CONNECTING CONCRETE MEMBERS.
8. THE LAP SPLICE LENGTH SHALL BE ADOPTED AS FOLLOWS:
   - 8.1 ROUND BAR (RB9) : THE LAP SPLICE LENGTH = 0.50 M.
   - 8.2 DEFORMED BAR (DB12): THE LAP SPLICE LENGTH = 0.55 M.
   - 8.3 DEFORMED BAR (DB16): THE LAP SPLICE LENGTH = 0.70 M.
   - 8.4 DEFORMED BAR (DB20): THE LAP SPLICE LENGTH = 0.90 M.
   - 8.5 DEFORMED BAR (DB25): THE LAP SPLICE LENGTH = 1.40 M.
   - 8.6 DEFORMED BAR (DB28): THE LAP SPLICE LENGTH = 1.75 M.
9. THE WELDED SPLICE OF REINFORCEMENT SHALL BE USED BASED ON AWS WHEN THE MECHANICAL LAP SPLICE LENGTH IS NOT SUFFICIENT.
10. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
11. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

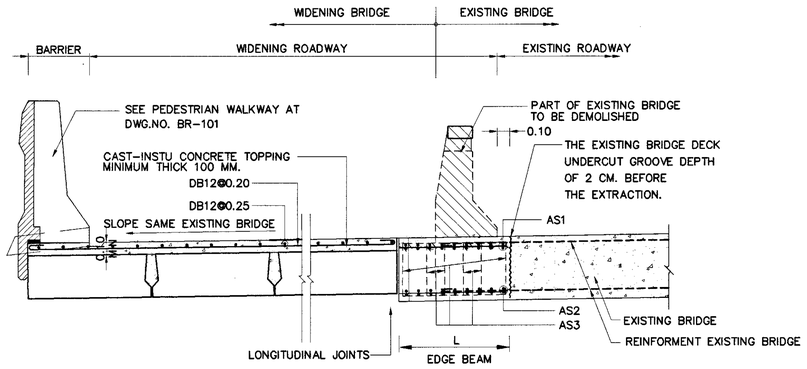
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

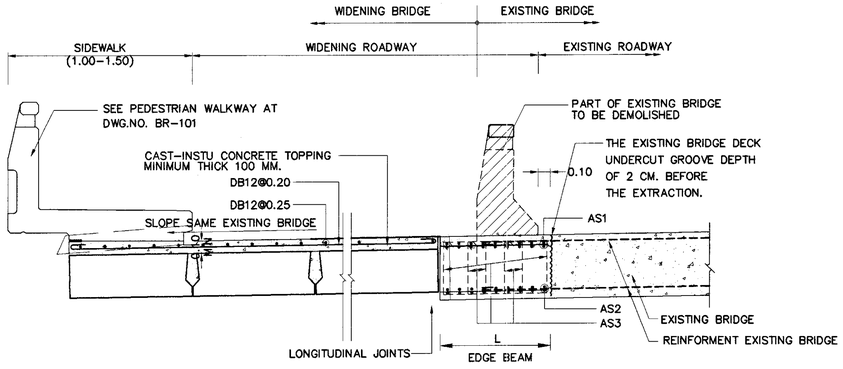
STANDARD DRAWING
EXISTING PC. PLANK BRIDGE
WIDENING BY PC. PLANK WITH LONGITUDINAL JOINTS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-104
		SHEET NO. 111

D:\std dwg 2015\WS-104(REV00)

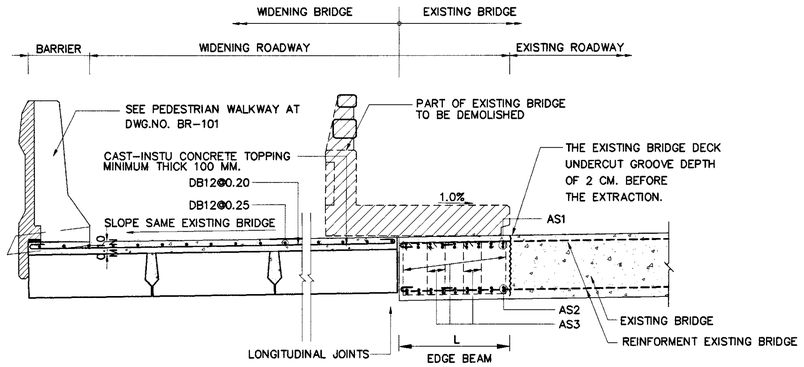


NEW BRIDGE WIDENING WITH EDGE

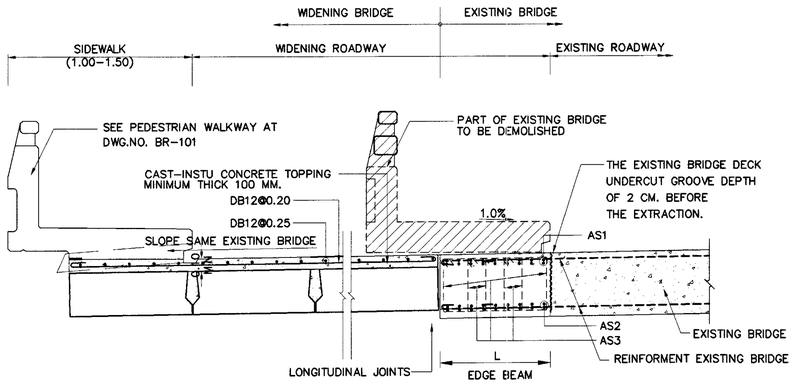


NEW BRIDGE WIDENING WITH SIDEWALK

CASE I : THE EXISTING BRIDGE WITH EDGE



NEW BRIDGE WIDENING WITH EDGE

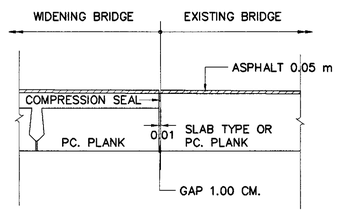


NEW BRIDGE WIDENING WITH SIDEWALK

CASE II : THE EXISTING BRIDGE WITH SIDEWALK

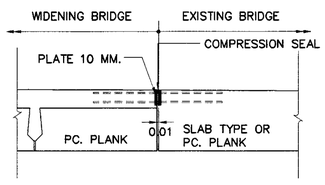
WIDENING PART AS PC. PLANK WITH LONGITUDINAL JOINTS

SCALE 1 : 25



LONGITUDINAL JOINTS WITH ASPHALT 0.05

SCALE 1 : 25



LONGITUDINAL JOINTS WITHOUT ASPHALT 0.05

SCALE 1 : 25

TABLE 1

SPAN (M.)	EDGE BEAM L (M.)	AS1	AS2	AS3
5.00	0.60	2x8 -DB25	2x8 -DB25	2-DB12@0.15
6.00	0.60	2x8 -DB25	2x8 -DB25	2-DB12@0.15
7.00	0.80	2x9 -DB25	2x9 -DB25	2-DB12@0.15
8.00	0.80	2x9 -DB25	2x9 -DB25	2-DB12@0.15
9.00	1.00	2x10-DB25	2x10-DB25	3-DB12@0.15
10.00	1.00	2x10-DB25	2x10-DB25	3-DB12@0.15

CONSTRUCTION SPECIFICATION

1. PC. PLANK GIRDER AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWNG SHALL CONFORM TO THE STANDARD DRAWING NUMBER WS-106 TO WS-107
2. EDGE BEAM, BRIDGE RAILING, AND ALL PARTS OF CONCRETE TOPPING OF THE EXISTING BRIDGES SHALL BE REMOVED. THE CONCRETE DECK SHALL BE GROOVED AT LEAST 2 CM. DEEP ALONG THE SPECIFIC LINE PRIOR TO REMOVAL THE ITEMS. ALL EXISTING REINFORCEMENT IN CONCRETE DECK SHALL BE REMAINED.
3. CONCRETE GROOVING SHALL BE CLEANED.
4. ALL PRECAST PLANK BEAMS SHALL BE INSTALLED CORRESPONDING TO THE SPECIFIC WIDENING WIDTH. SHEAR KEY ALONG THE ADJACENT PLANK BEAMS SHALL BE WELDED.
5. ALL NEW REINFORCEMENT IN CONCRETE DECK SHALL CONNECT TO THE EXISTING ONES USING THE LAP SPLICE LENGTH SPECIFIED IN THIS DRAWNG.
6. POURING AND CASTING THE CONCRETE TOPPING AND WALK WAY IN THE NEW BRIDGE WIDENING PARTS.
7. PRIOR TO POURING CONCRETE, ALL DUST AND OIL SHALL BE REMOVED AND CLEANED FOR ALL EXPOSED SURFACE OF THE CONNECTING MEMBERS. THE EPOXY RESIN AS PER ASTM C881 TYPE II GRADE I CLASS C SHALL BE APPLIED TO THE BONDING SURFACE OF THE CONNECTING CONCRETE MEMBERS.
8. THE LAP SPLICE LENGTH SHALL BE ADOPTED AS FOLLOWS:
   - 8.1 ROUND BAR (RB9) : THE LAP SPLICE LENGTH = 0.50 M.
   - 8.2 DEFORMED BAR (DB12): THE LAP SPLICE LENGTH = 0.55 M.
   - 8.3 DEFORMED BAR (DB16): THE LAP SPLICE LENGTH = 0.70 M.
   - 8.4 DEFORMED BAR (DB20): THE LAP SPLICE LENGTH = 0.90 M.
   - 8.5 DEFORMED BAR (DB25): THE LAP SPLICE LENGTH = 1.40 M.
   - 8.6 DEFORMED BAR (DB28): THE LAP SPLICE LENGTH = 1.75 M.
9. THE WELDED SPLICE OF REINFORCEMENT SHALL BE USED BASED ON AWS WHEN THE MECHANICAL LAP SPLICE LENGTH IS NOT SUFFICIENT.
10. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWNG, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
11. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

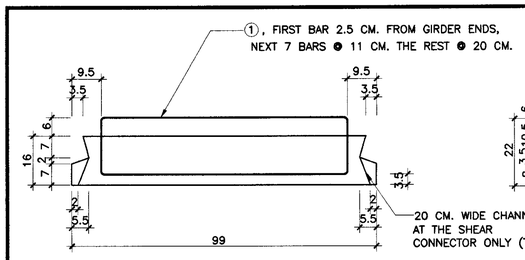
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

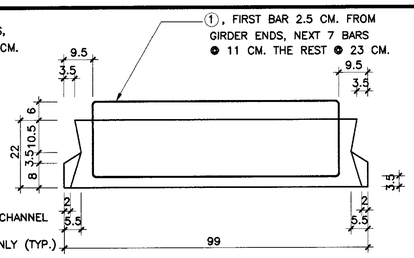
STANDARD DRAWING
EXISTING SLAB TYPE BRIDGE
WIDENING BY PC. PLANK WITH LONGITUDINAL JOINTS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-105
		SHEET NO. 112

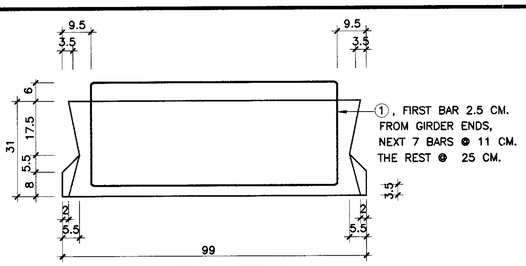
D:\std dwg 2015\WS-105(REV00)



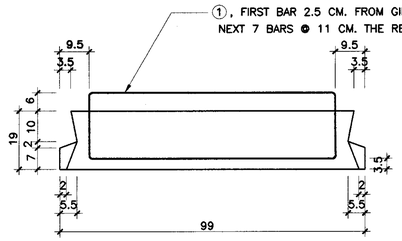
5.00 M. SPAN



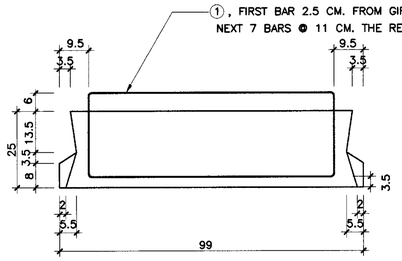
7.00 M. SPAN



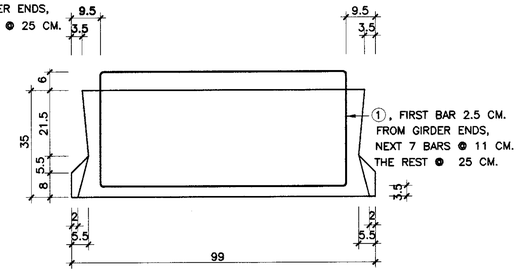
9.00 M. SPAN



6.00 M. SPAN

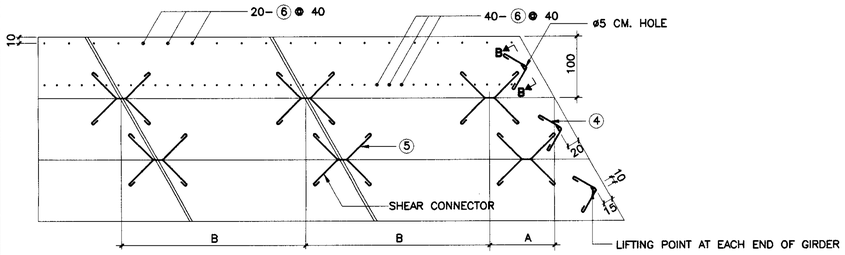


8.00 M. SPAN

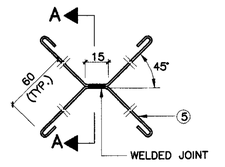


10.00 M. SPAN

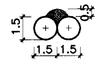
GIRDER CROSS SECTIONS
SCALE 1 : 10



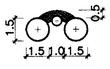
GIRDER ARRANGEMENT DETAIL
SCALE 1 : 50



SHEAR CONNECTOR DETAILS
SCALE 1 : 20



FOR BARS IN CONTACT



FOR BARS WITH SOME SPACE APART

SECTION A – A
SCALE 1 : 2

BAR BENDING DIAGRAMS	BAR MARK	#	SPAN 5.00 M. NO.	LENGTH CM.	TOTAL LENGTH CM.	SPAN 6.00 M. NO.	LENGTH CM.	TOTAL LENGTH CM.	SPAN 7.00 M. NO.	LENGTH CM.	TOTAL LENGTH CM.	SPAN 8.00 M. NO.	LENGTH CM.	TOTAL LENGTH CM.	SPAN 9.00 M. NO.	LENGTH CM.	TOTAL LENGTH CM.	SPAN 10.00 M. NO.	LENGTH CM.	TOTAL LENGTH CM.
	①	RB2	32	211	6752	36	217	7612	38	223	8474	40	229	9160	40	241	9640	40	249	9960
	②	RB4	20	100	2000	24	100	2400	28	100	2800	32	100	3200	36	100	3600	40	100	4000
	③	RB3	4	500	2000	4	600	2400	4	700	2800	4	800	3200	4	900	3600	4	1000	4000
	④	DB4	4	100	400	4	100	400	4	100	400	4	100	400	4	100	400	4	100	400
	⑤	DB5	12	172.5	2070	16	172.5	2760	16	172.5	2760	20	172.5	3450	24	172.5	4130	24	172.5	4130

RB = ROUND BARS
DB = DEFORMED BARS #2=ø1/4" OR ø6MM., #4=ø1/2 OR ø12MM., # 5=ø5/8" OR ø16MM.
NO=TOTAL AMOUNT OF BARS
L=TOTAL LENGTH OF EACH BAR

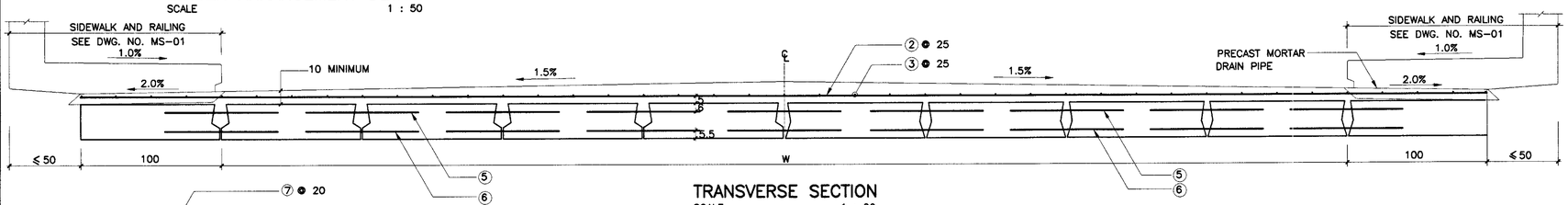
BAR BENDING DIAGRAMS	SIDE WALK WIDTH CM.	BAR MARK	#	SPAN 5.00 M. NO.	L CM.	TOTAL LENGTH CM.	SPAN 6.00 M. NO.	L CM.	TOTAL LENGTH CM.	SPAN 7.00 M. NO.	L CM.	TOTAL LENGTH CM.	SPAN 8.00 M. NO.	L CM.	TOTAL LENGTH CM.	SPAN 9.00 M. NO.	L CM.	TOTAL LENGTH CM.	SPAN 10.00 M. NO.	L CM.	TOTAL LENGTH CM.
	40	⑥	DB4	37	62.5	2312.5	45	65.5	2947.5	53	68.5	3630.5	60	71.5	4290.0	68	77.5	5270.0	75	81.5	6112.5
		⑦	RB3	25	90.6	2265.0	30	90.6	2718.0	35	90.6	3171.0	40	90.6	3624.0	45	90.6	4077.0	50	90.6	4530.0
		⑧	RB3	3	500	1500	3	600	1800	3	700	2100	3	800	2400	3	900	2700	3	1000	3000
	100	⑥	DB4	37	62.5	2312.5	45	65.5	2947.5	53	68.5	3630.5	60	71.5	4290	68	77.5	5270	75	81.5	6112.5
		⑦	RB3	25	150.6	3765	30	150.6	4518	35	150.6	5271	40	150.6	6024	45	150.6	6777	50	150.6	7530
		⑧	RB3	5	500	2500	5	600	3000	5	700	3500	5	800	4000	5	900	4500	5	1000	5000
	150	⑥	DB4	37	62.5	2312.5	45	65.5	2947.5	53	68.5	3630.5	60	71.5	4290	68	775	5270	75	81.5	6112.5
		⑦	RB3	25	200.6	5015	30	200.6	6018	35	200.6	7021	40	200.6	8024	45	200.6	9027	50	200.6	1003.0
		⑧	RB3	8	500	4000	8	600	4800	8	700	5600	8	800	6400	8	900	7200	8	1000	8000

RB = ROUND BARS # 3=ø3/8" OR ø9MM. # 4=ø1/2" OR ø12MM.
NO=TOTAL AMOUNT OF BARS
L=TOTAL LENGTH OF EACH BARS

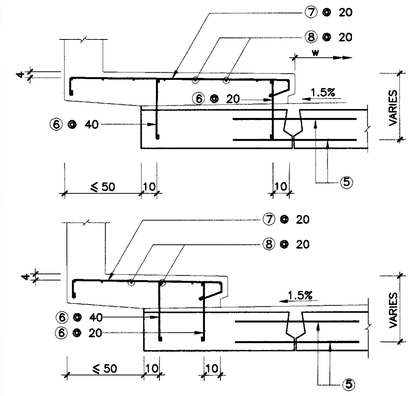
TABLE OF SHEAR CONNECTOR			
SPAN (M)	TOTAL AMOUNT FOR ONE GIRDER	A (CM)	B (CM)
5	12	70	179.50
6	16	70	153.00
7	16	70	186.36
8	20	70	164.75
9	24	50	159.80
10	24	50	178.00

NOTES :

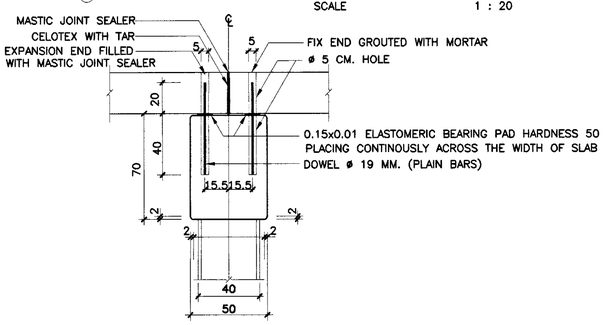
1. WORK THIS DRAWING WITH DWG. NO. WS-107.
2. CASTING LENGTH OF A GIRDER SHALL BE 1 CM. SHORTER THAN THE SPAN LENGTH.
3. UNLESS OTHERWISE APPROVED , CEMENT USED IN THE CONCRETE MIX SHALL BE PORTLAND CEMENT TYPE I CONFORMING TO TIS 15.
4. MIX DESIGN OF CONCRETE FOR PRESTRESSED GIRDERS, BRIDGE TOPPING, SIDEWALK AND RAILING SHALL BE SUBMITTED FOR THE APPROVAL OF THE ENGINEER. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M^3. AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH FOR A 0.15x0.15x0.15 M. CUBE AT 28 DAYS AS FOLLOWS:
   A) FOR PRESTRESSED GIRDER 510 KG/CM^2
   B) FOR BRIDGE TOPPING 408 KG/CM^2
   C) FOR SIDEWALK AND RAILING 357 KG/CM^2
5. PRESTRESSING TENDONS MAY BE RELEASED AFTER CONCRETE HAS ATTAINED A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 357 KG/CM^2. FOR THE STRANDARD CUBE.
6. REBARS SMALLER THAN 9 MM. SHALL BE TIS 20 GRADE SR 24 PLAIN ROUND BARS, OTHERS SHALL BE TIS 24 GRADE SD 40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
7. ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
8. GIRDER SHALL BE LIFTED AT BOTH ENDS, MIDSPAN LIFTING IS PROHIBITED.
9. THIS TYPE OF GIRDERS MAY BE USED WITH PIERS FOR SLAB BRIDGE HAVING THE SAME SPAN LENGTH.
10. DOWELS FOR HOLDING GIRDERS OVER PIERS SHALL BE PROVIDED AT EVERY ALTERNATE GIRDE
11. TOP AND BOTTOM SHEAR CONNECTOR SHALL BE WELDED SIMULTANEOUSLY.
12. TIGHTENING OF THE NEXT ADJACENT GIRDER THE PREVIOUS ONE SHALL BE DONE IN SUCCESSION.
13. IF PIERS FALL WITHIN THE TRANSITION OF HORIZONTAL CURVE, THE TOP OF CAP BEAM SHALL BE SUPERELEVATED IN ACCORDANCE WITH THE ROADWAY SUPERLEVATION SO THAT THE GIRDERS SHALL BE ON A SMOOTH PLANE. ELEVATION OF FINISHED SURFACE SHALL BE ATTAINED BY ADJUSTING THE CONCRETE TOPPING THIS SHALL BE DONE WITH THE APPROVAL OF THE ENGINEER.
14. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
15. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. PT-03
16. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWES INDICATED.



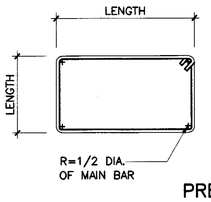
TRANSVERSE SECTION
SCALE 1 : 20

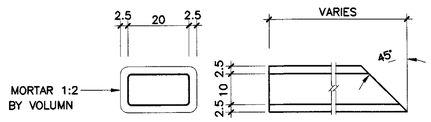


SIDEWALK DETAILS
SCALE 1 : 20

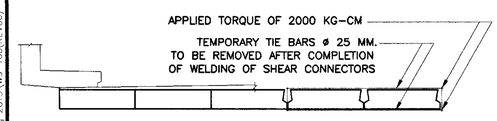


CAP BEAM DETAILS
SCALE 1 : 20

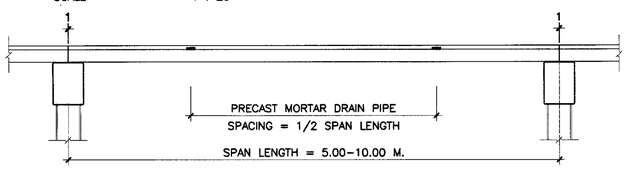




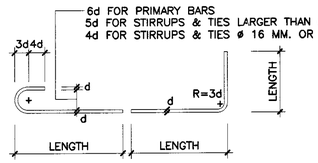
PRECAST MORTAR DRAIN PIPE
SCALE 1 : 20



GIRDER ERECTION DIAGRAM
SCALE 1 : 40

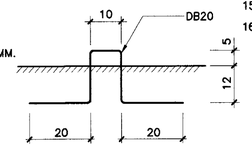


DRAIN PIPE LOCATIONS
SCALE 1 : 50



PLAIN BAR DEFORMED BAR

BAR BENDING DETAILS
NOT TO SCALE



SECTION B – B
SCALE 1 : 50
(SHOWN DETAIL OF LIFTING HOOK)

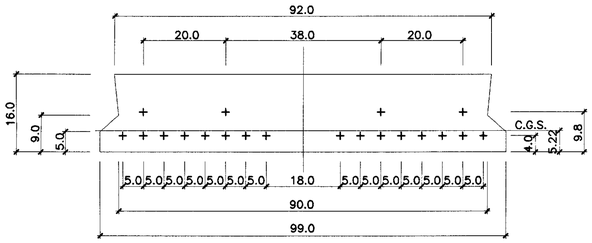
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

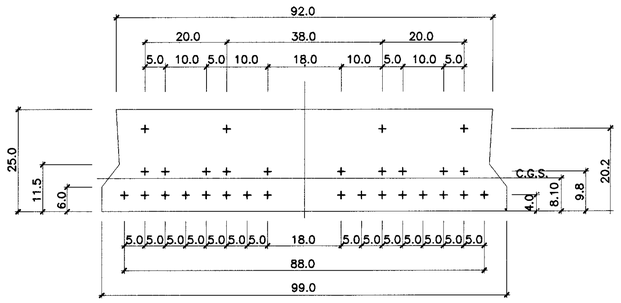
STANDARD DRAWING
0°–30° SKEW PC. BOX GIRDER BRIDGE
GIRDER ARRANGEMENT AND DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-106
		SHEET NO. 113

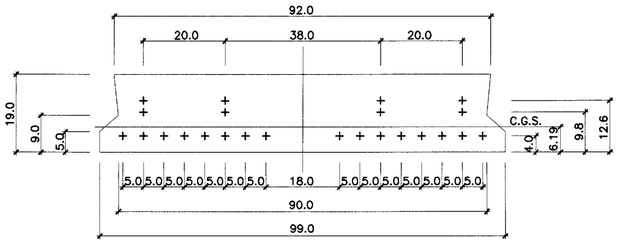
D:\std dwg 2015\WS-106(REV00)



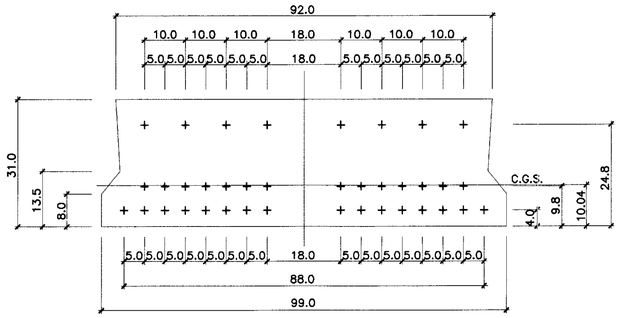
5.00 M. SPAN



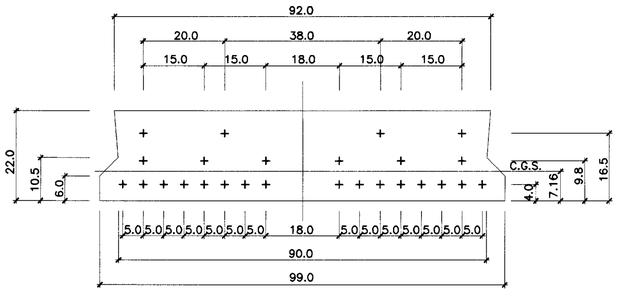
8.00 M. SPAN



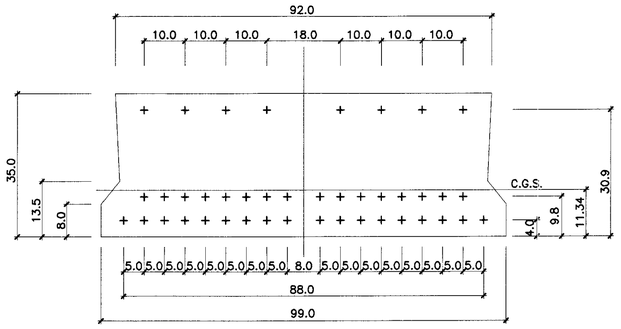
6.00 M. SPAN



9.00 M. SPAN



7.00 M. SPAN



10.00 M. SPAN

TENDON ARRANGMENTS
SCALE 1 : 7.5

NOTES :

1. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH DWG. NO. WS-106. IT SHOWS ALTERNATIVE ARRANGMENTS OF THE PRESTRESSING TENDONS WHEN THE ø 9.53 MM. (3/8") STRANDS ARE USED INSTEAD OF THE ø 7 MM. WIRES AS SHOWN ON DWG. NO. WS-106.
2. ALL PRESTRESSING TENDONS SHALL BE ø 9.53 MM. (3/8") STRESS-RELIEVED 7-WIRE STRANDS CONFORMING TO TIS. 420 GRADE 1,725 OR APPROVED EQUAL WITH THE MINIMUM ULTIMATE TENSILE LOAD OF 9,078 KG.
3. THE INITIAL PRESTRESSING FORCE PER TENDON AFTER ANCHORING SHALL BE 6,330 KG. WITH THE CORRESPONDING ELONGATION OF 0.615 CM. PER 1 METER OF TENDON LENGTH. AN ADDITIONAL ELONGATION OF 1.0 CM. SHALL BE PROVIDED TO ALLOW FOR TENDON SLIPPAGE AT ANCHORING.
4. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. PT-02
5. ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

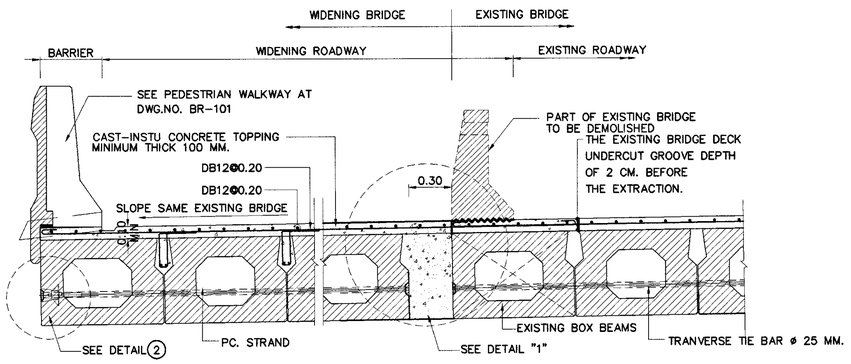
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

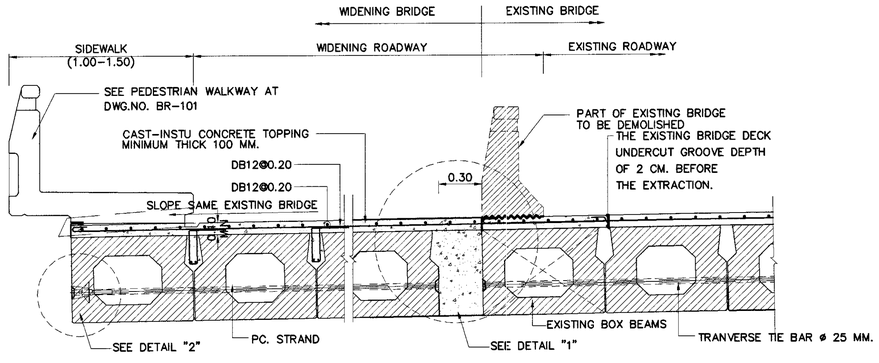
PRESTRESSED CONCRETE PLANK GIRDER
ø 9.53 MM. WIRE STRAND ARRANGEMENTS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-107
		SHEET NO. 114

D:\std dwg 2015\WS-107(REV00)

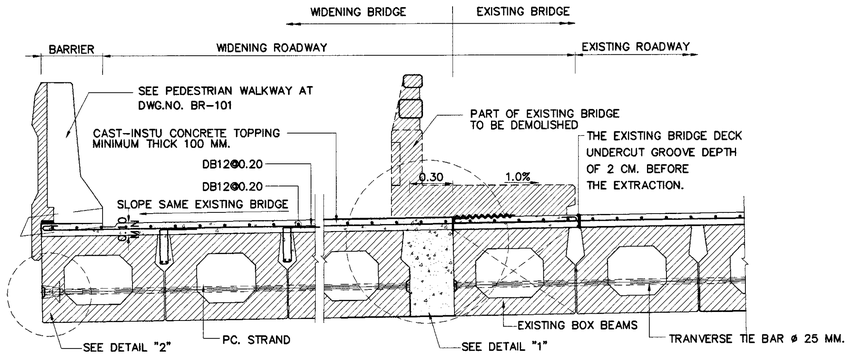


NEW BRIDGE WIDENING WITH EDGE

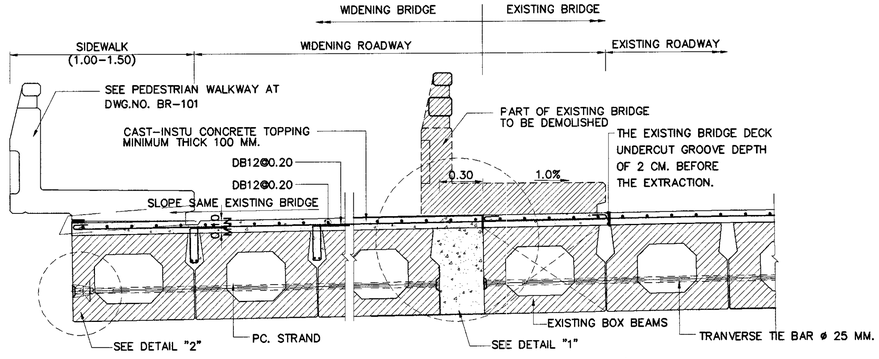


NEW BRIDGE WIDENING WITH SIDEWALK

CASE I : THE EXISTING BRIDGE WITH EDGE



NEW BRIDGE WIDENING WITH EDGE

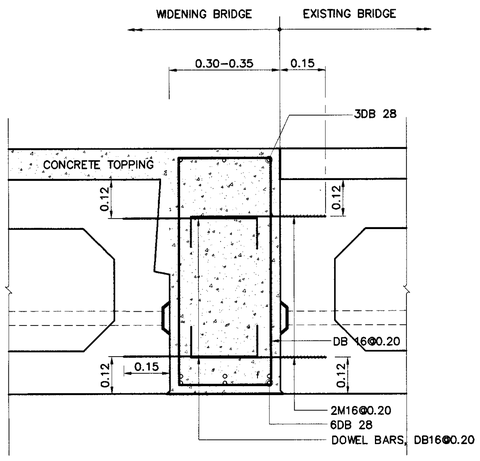


NEW BRIDGE WIDENING WITH SIDEWALK

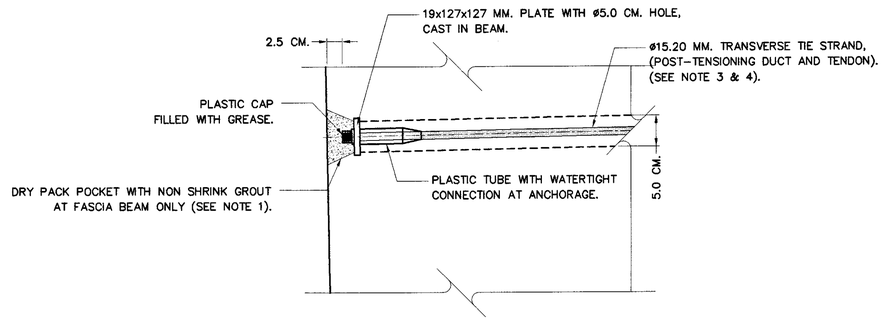
CASE II : THE EXISTING BRIDGE WITH SIDEWALK

WIDENING PART AS BOX BEAMS BRIDGE

SCALE 1 : 25



DETAIL "1"
SCALE 1 : 10



DETAIL "2"
SCALE 1 : 5

CONSTRUCTION SPECIFICATION

1. PC. BOX BEAM AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER BB-101 TO BB-103
2. EDGE BEAM, BRIDGE RAILING, AND ALL PARTS OF CONCRETE TOPPING OF THE EXISTING BRIDGES SHALL BE REMOVED. THE CONCRETE DECK SHALL BE GROOVED AT LEAST 2 CM. DEEP ALONG THE SPECIFIC LINE PRIOR TO REMOVAL THE ITEMS. ALL EXISTING REINFORCEMENT IN CONCRETE DECK SHALL BE REMAINED.
3. CONCRETE GROOVING SHALL BE CLEANED.
4. ALL PRECAST PLANK BEAMS SHALL BE INSTALLED CORRESPONDING TO THE SPECIFIC WIDENING WIDTH. SHEAR KEY ALONG THE ADJACENT PLANK BEAMS SHALL BE WELDED.
5. ALL NEW REINFORCEMENT IN CONCRETE DECK SHALL CONNECT TO THE EXISTING ONES USING THE LAP SPLICE LENGTH SPECIFIED IN THIS DRAWING.
6. POURING AND CASTING THE CONCRETE TOPPING AND WALK WAY IN THE NEW BRIDGE WIDENING PARTS.
7. PRIOR TO POURING CONCRETE, ALL DUST AND OIL SHALL BE REMOVED AND CLEANED FOR ALL EXPOSED SURFACE OF THE CONNECTING MEMBERS. THE EPOXY RESIN AS PER ASTM C881 TYPE II GRADE I CLASS C SHALL BE APPLIED TO THE BONDING SURFACE OF THE CONNECTING CONCRETE MEMBERS.
8. THE LAP SPLICE LENGTH SHALL BE ADOPTED AS FOLLOWS:
   - 8.1 ROUND BAR (RB9) : THE LAP SPLICE LENGTH = 0.50 M.
   - 8.2 DEFORMED BAR (DB12): THE LAP SPLICE LENGTH = 0.55 M.
   - 8.3 DEFORMED BAR (DB16): THE LAP SPLICE LENGTH = 0.70 M.
   - 8.4 DEFORMED BAR (DB20): THE LAP SPLICE LENGTH = 0.90 M.
   - 8.5 DEFORMED BAR (DB25): THE LAP SPLICE LENGTH = 1.40 M.
   - 8.6 DEFORMED BAR (DB28): THE LAP SPLICE LENGTH = 1.75 M.
9. THE WELDED SPLICE OF REINFORCEMENT SHALL BE USED BASED ON AWS WHEN THE MECHANICAL LAP SPLICE LENGTH IS NOT SUFFICIENT.
10. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
11. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

NOTES :

1. NON SHRINK GROUT FOR EXTERIOR POCKETS SHALL BE THE SAME COLOR AND TEXTURE AS THE BEAM CONCRETE.
2. OTHER ANCHORAGE SYSTEMS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. ALTERNATE ANCHORAGE SYSTEMS SHALL BE WATERTIGHT AND CORROSION PROOF.
3. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. NO. BB-102 AND BB-103
4. USE TRANSVERSE PC ø15.2 MM 7 WIRE STANDS RUSTPROOF AFTER CONCRETE TOPPING 3 DAYS SHALL BE JACKING FORCE AFTER LOSS IS 150 KN

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

EXISTING BOX BEAMS BRIDGE WIDENING BY BOX BEAMS

REF.	REVISION	SIGNATURE	DATE

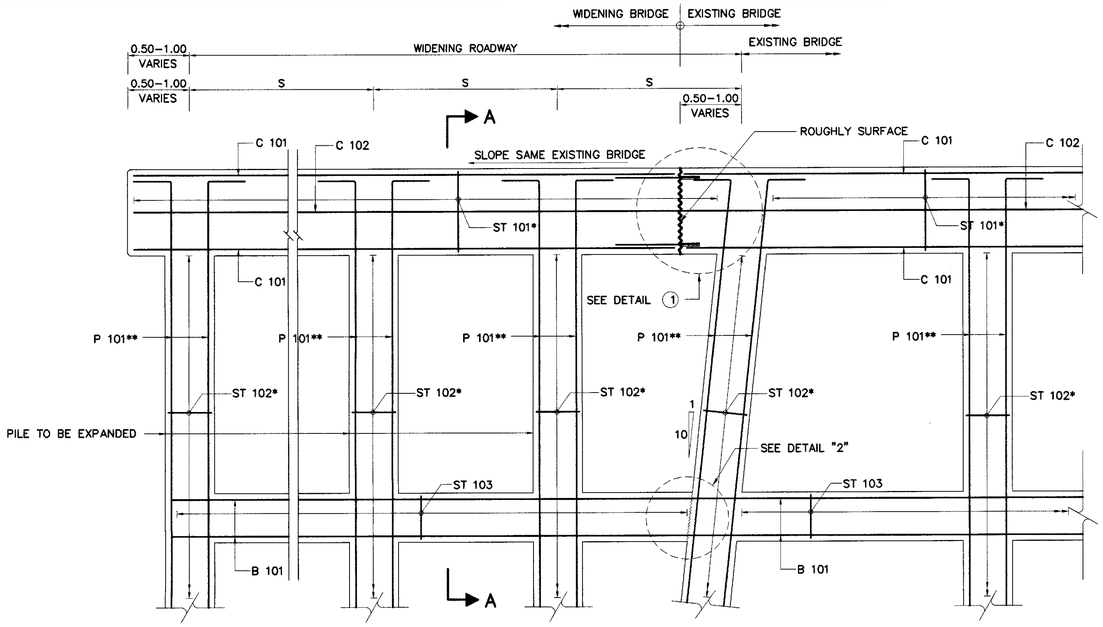
DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

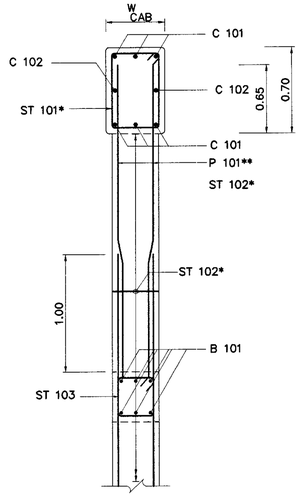
APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. WS-108

SHEET NO. 115

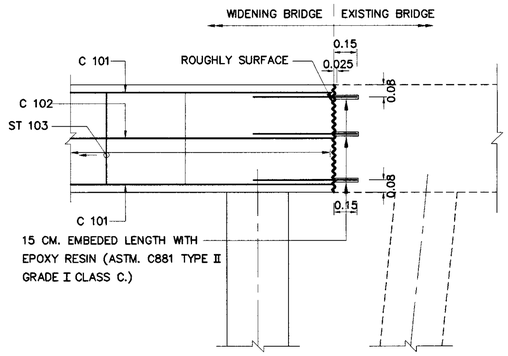
D:\std dwg 2015\WS-108(REV00)



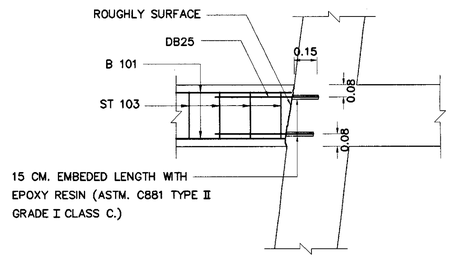
PILE BENT REINFORCEMENT DETAILS
SCALE 1 : 25



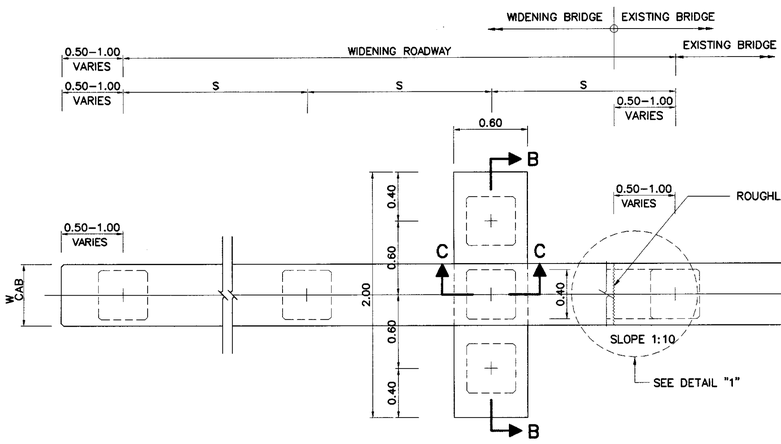
SECTION A – A
SCALE 1 : 25



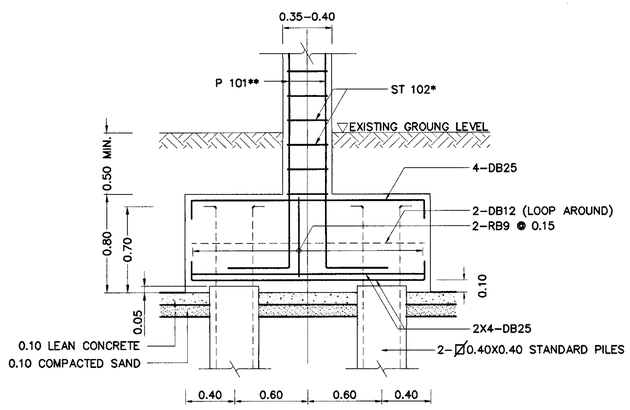
DETAIL "1"
SCALE 1 : 20



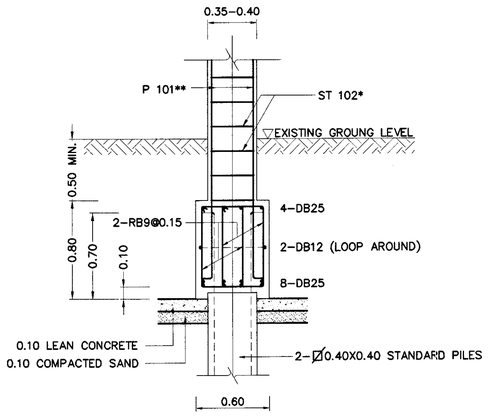
DETAIL "2"
SCALE 1 : 20



PILE BENT PLAN (TOP VIEW)
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

EXPANSION PARTS OF FOOTING
SCALE 1 : 25

NOTES :

1. PILE BENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB TOPPING AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. PIER DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003.
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

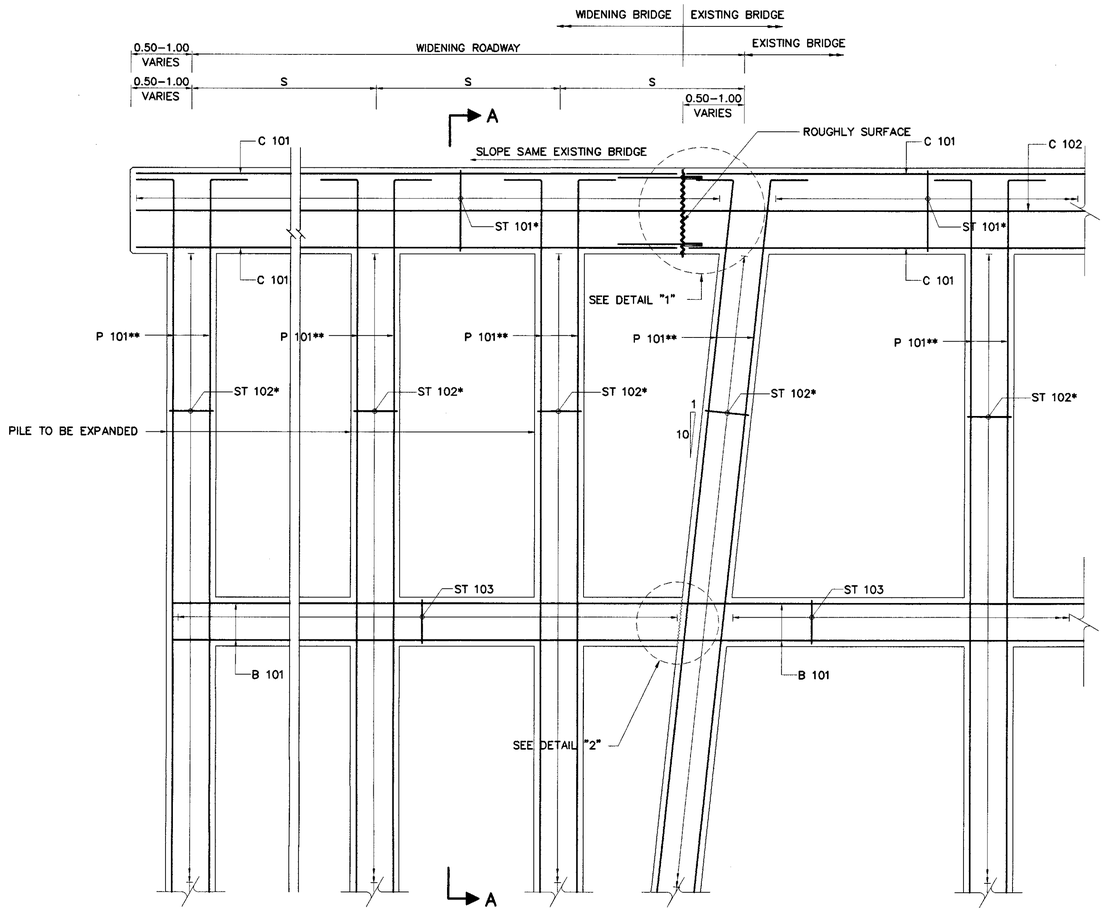
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
REINFORCEMENT DETAILS FOR EXISTING PILE BENT WITH BATTER PILES (THE NEW FOOTING UNDERNEATH THE RIVER BED)

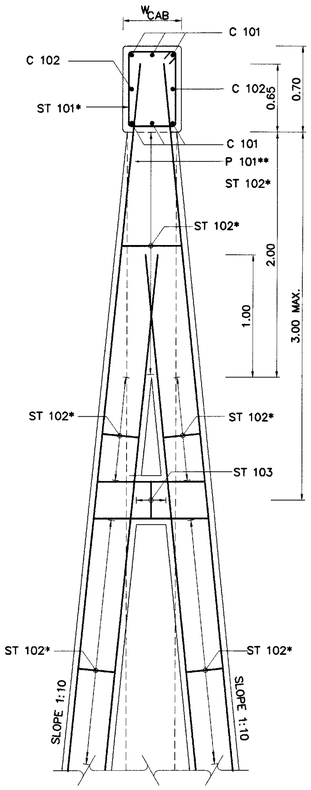
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. WS–201
			SHEET NO. 116

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\WS–201(REV00)



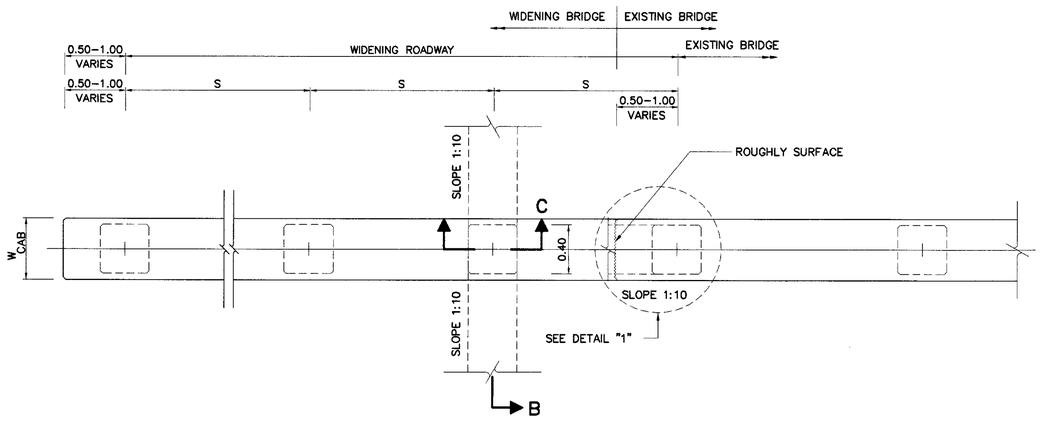
PILE BENT REINFORCEMENT DETAILS
SCALE 1 : 25



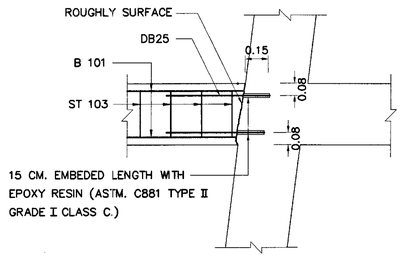
SECTION A – A
SCALE 1 : 25

NOTES :

1. PILE BENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. PIER DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.



PILE BENT PLAN (TOP VIEW)
SCALE 1 : 25



DETAIL "2"
SCALE 1 : 20

REF.	REVISION	SIGNATURE	DATE

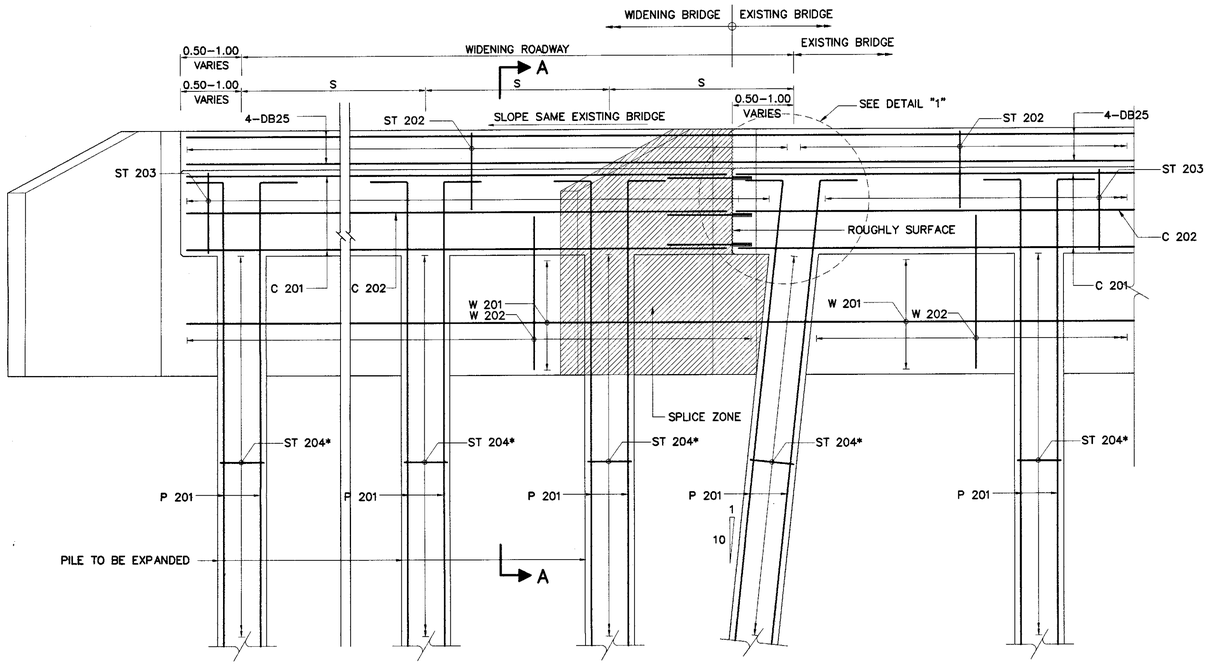
KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

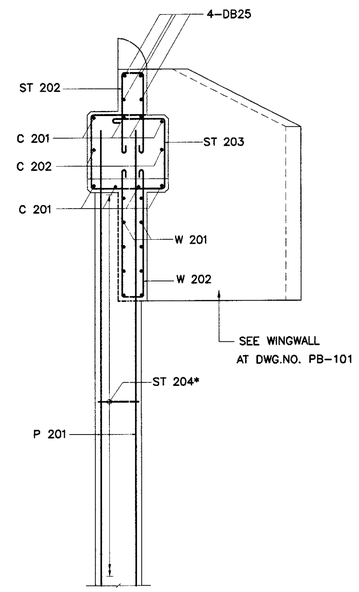
STANDARD DRAWING
REINFORCEMENT DETAILS FOR EXISTING PILE BENT WITH BATTER PILES
(THE NEW FOOTING ABOVE THE RIVER BED)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. WS–202
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 117

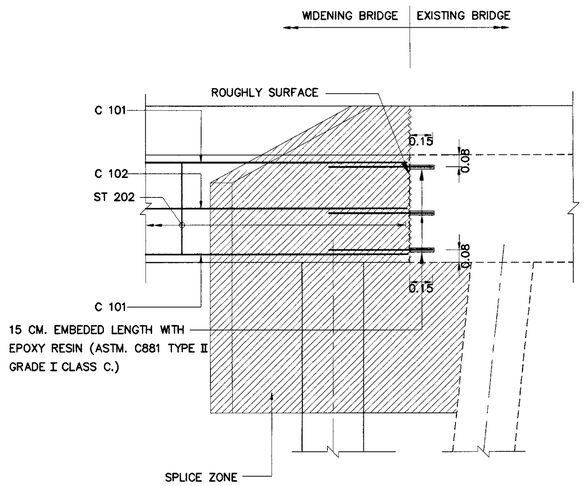
D:\std dwg 2015\WS-202(REV00)



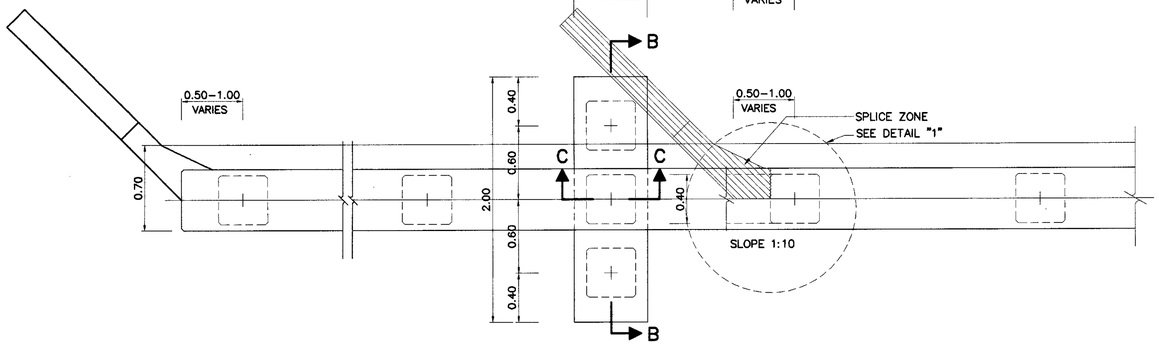
ABUTMENT REINFORCEMENT DETAILS
SCALE 1 : 25



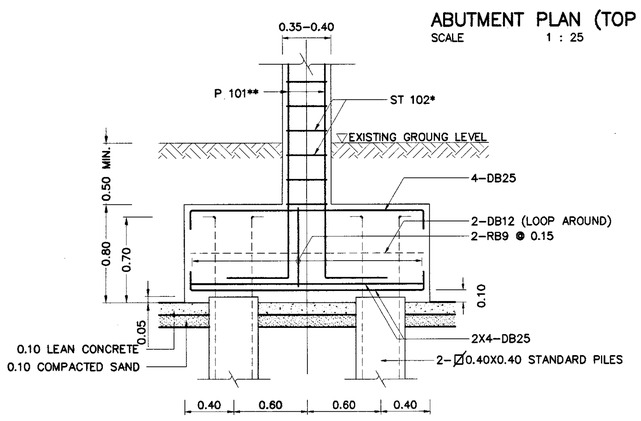
SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20

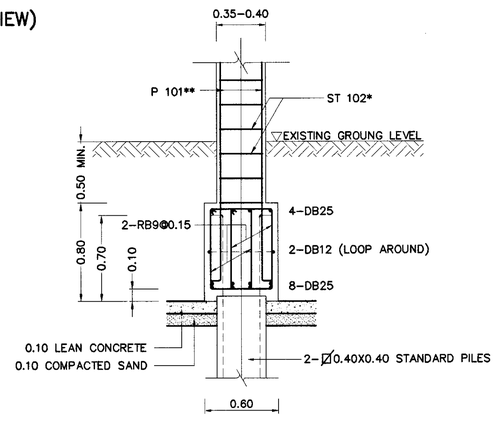


ABUTMENT PLAN (TOP VIEW)
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25

EXPANSION PARTS OF FOOTING
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

NOTES :

1. ABUTMENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. CAP BEAM AND WINGWALL OF ABUTMENT SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–101
3. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
4. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
5. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
6. CLEAN JOINTS WITHOUT DIRTY.
7. ABUTMENT DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
8. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
10. BEFORE POURING CONCRETE, CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
11. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
12. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
13. THE WELDED BARS ARE THE AWS. STANDARDS.
14. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
15. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

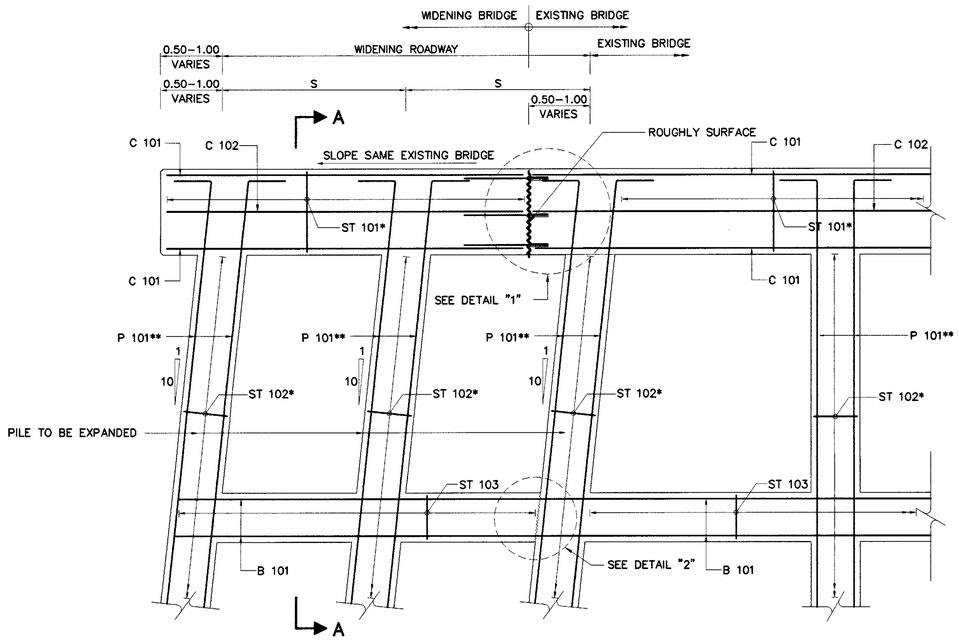
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

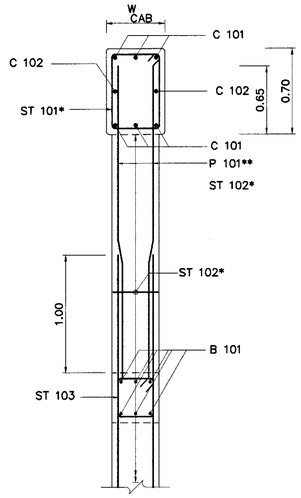
REINFORCEMENT DETAILS FOR EXISTING ABUTMENT OF PILE BENT WITH BATTER PILES

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–203
		SHEET NO. 118

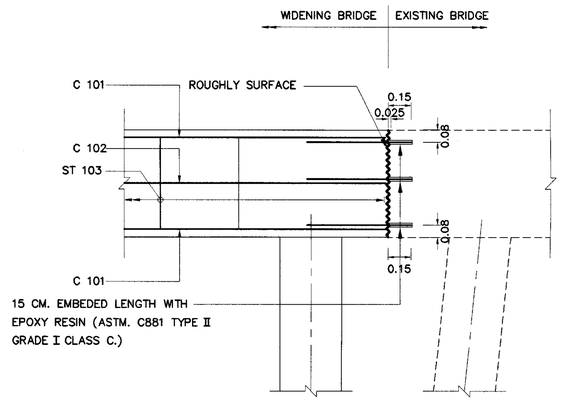
D:\std dwg 2015\WS-203(REV00)



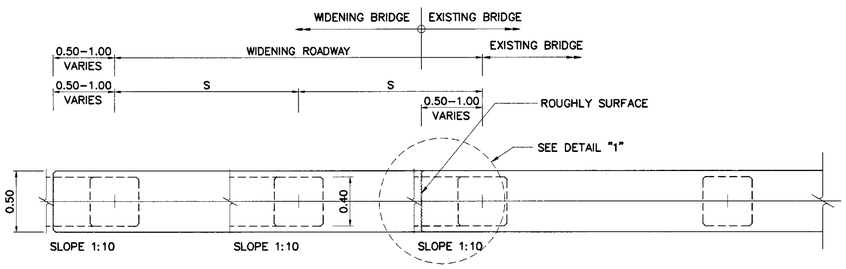
PILE BENT REINFORCEMENT DETAILS
SCALE 1 : 25



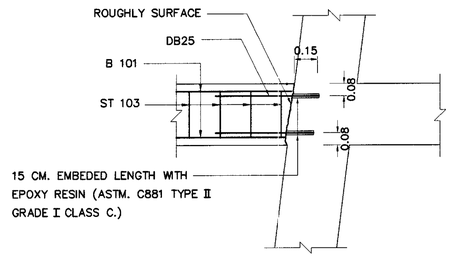
SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



PILE BENT PLAN (TOP VIEW)
SCALE 1 : 25



DETAIL "2"
SCALE 1 : 20

NOTES :

1. PILE BENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB TOPPING AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. PIER DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

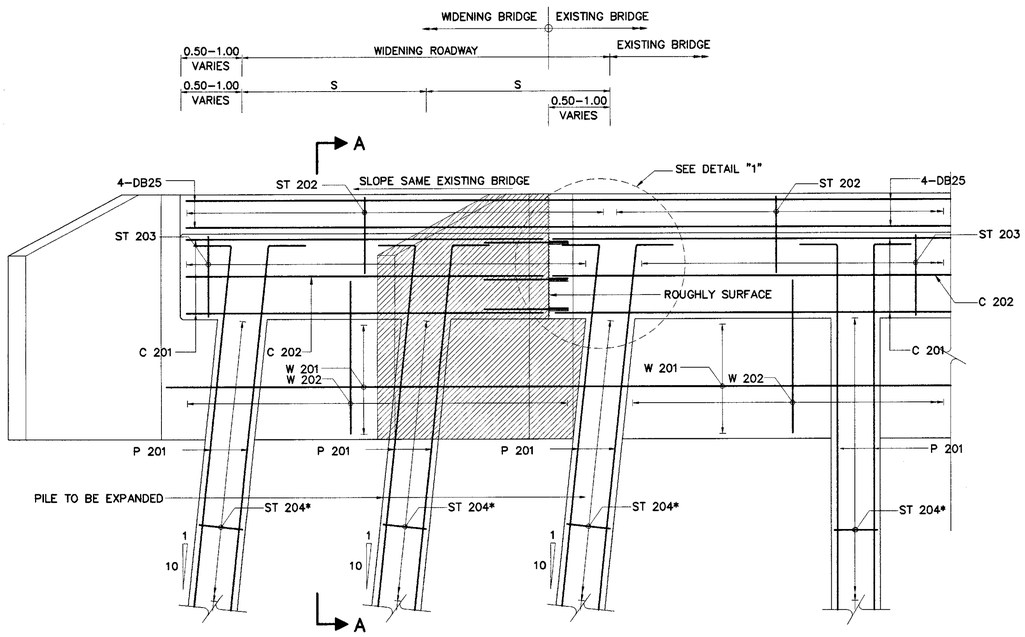
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

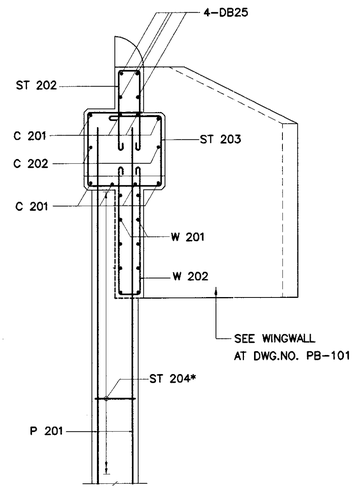
STANDARD DRAWING
REINFORCEMENT DETAILS FOR EXISTING PILE BENT WITH BATTER PILES
(THE NARROW WIDENING USING NEW PILES NOT MORE THAN 2)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–204
		SHEET NO. 119

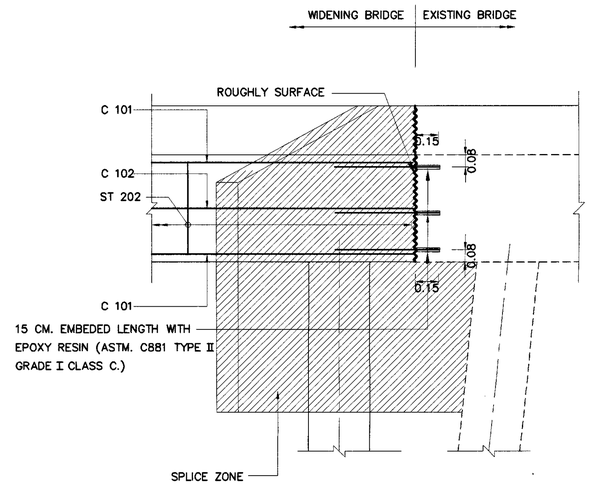
D:\std dwg 2015\WS-204(REV00)



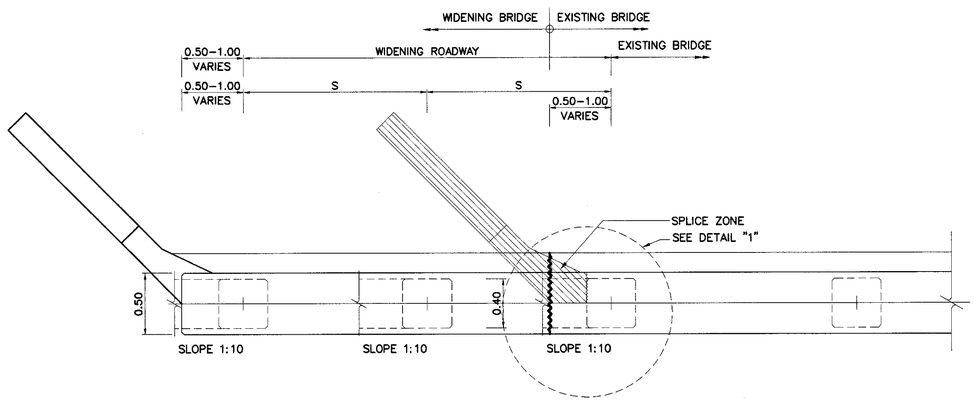
ABUTMENT REINFORCEMENT DETAILS
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



ABUTMENT PLAN (TOP VIEW)
SCALE 1 : 25

NOTES :

1. ABUTMENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. CAP BEAM AND WINGWALL OF ABUTMENT SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–101
3. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
4. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
5. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB TOPPING AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
6. CLEAN JOINTS WITHOUT DIRTY.
7. ABUTMENT DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
8. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
10. BEFORE POURING CONCRETE, CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
11. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
12. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
13. THE WELDED BARS ARE THE AWS. STANDARDS.
14. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
15. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

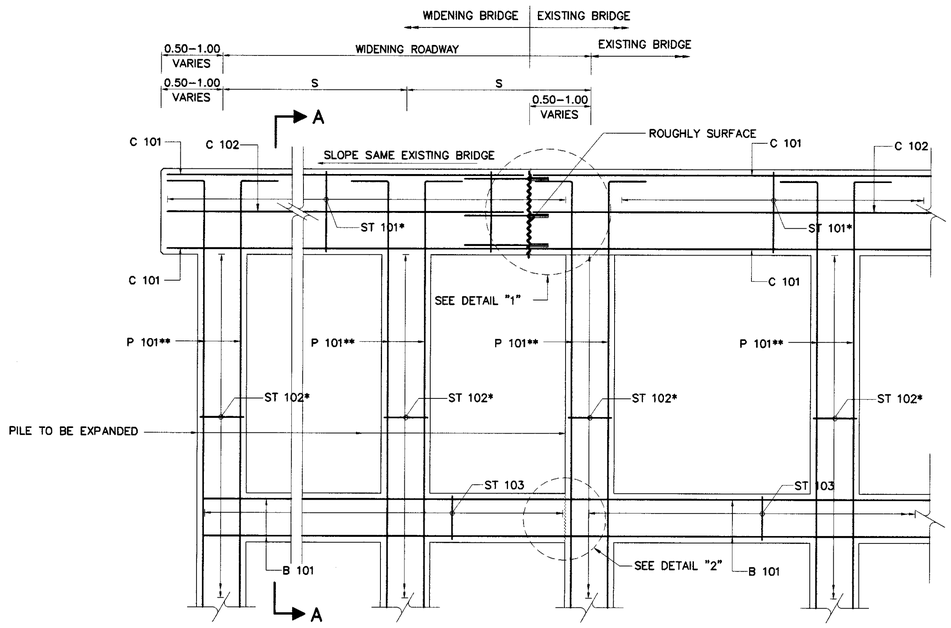
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

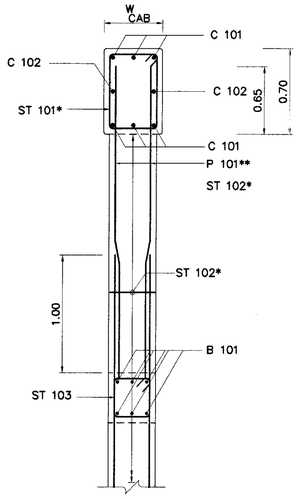
STANDARD DRAWING
REINFORCEMENT DETAILS FOR EXISTING ABUTMENT WITH BATTER PILES (THE NARROW WIDENING USING NEW PILES NOT MORE THAN 2)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–205
		SHEET NO. 120

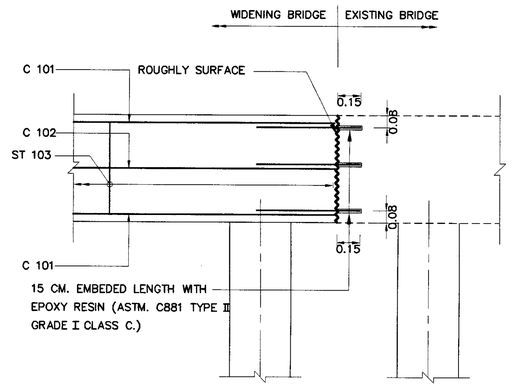
D:\std dwg 2015\WS-205(REV00)



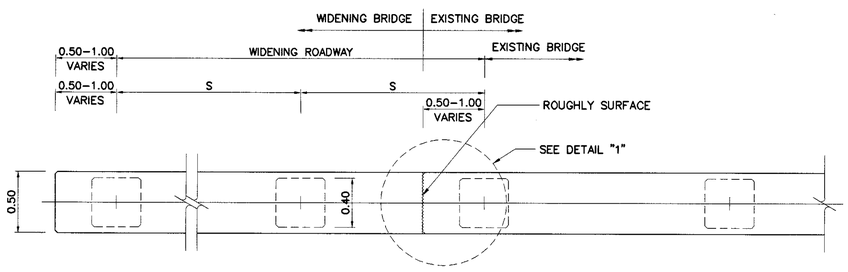
PILE BENT REINFORCEMENT DETAILS
SCALE 1 : 25



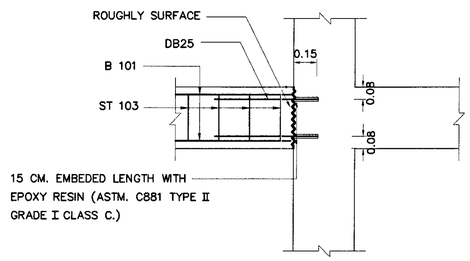
SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



PILE BENT PLAN (TOP VIEW)
SCALE 1 : 25



DETAIL "2"
SCALE 1 : 20

NOTES :

1. PILE BENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB TOPPING AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. PIER DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

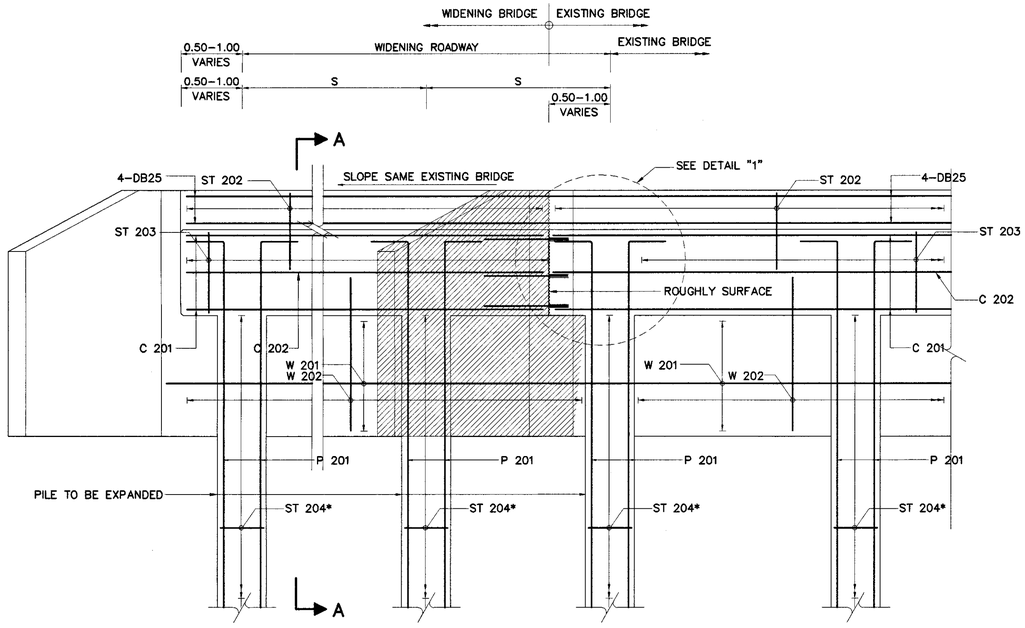
STANDARD DRAWING

REINFORCEMENT DETAILS FOR EXISTING PILE BENT WITHOUT BATTER PILES

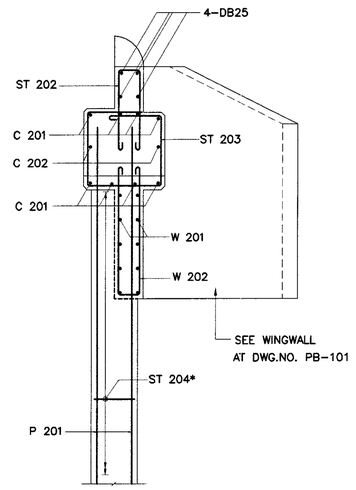
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–206
		SHEET NO. 121

REF.	REVISION	SIGNATURE	DATE

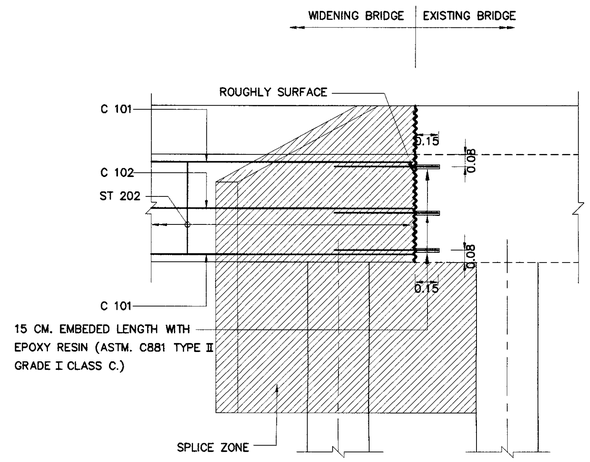
D:\std dwg 2015\WS-206(REV00)



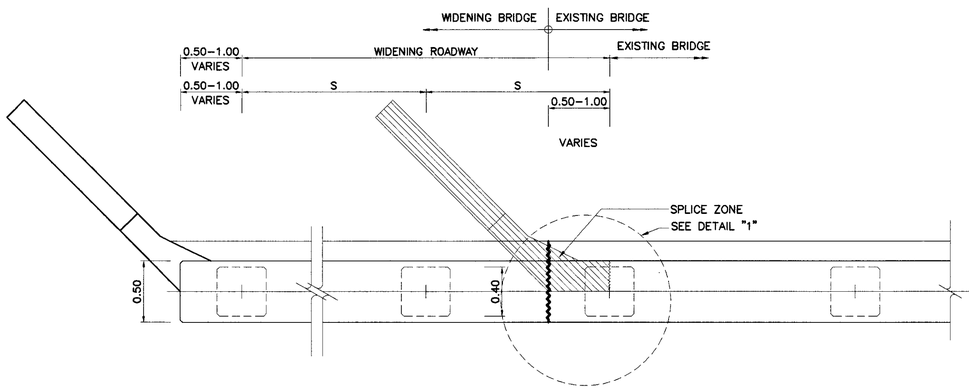
ABUTMENT REINFORCEMENT DETAILS
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



ABUTMENT PLAN (TOP VIEW)
SCALE 1 : 25

NOTES :

1. ABUTMENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–303
2. CAP BEAM AND WINGWALL OF ABUTMENT SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–101
3. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
4. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
5. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB TOPPING AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
6. CLEAN JOINTS WITHOUT DIRTY.
7. ABUTMENT DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–303
8. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
10. BEFORE POURING CONCRETE, CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
11. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
12. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–303
13. THE WELDED BARS ARE THE AWS. STANDARDS.
14. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
15. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

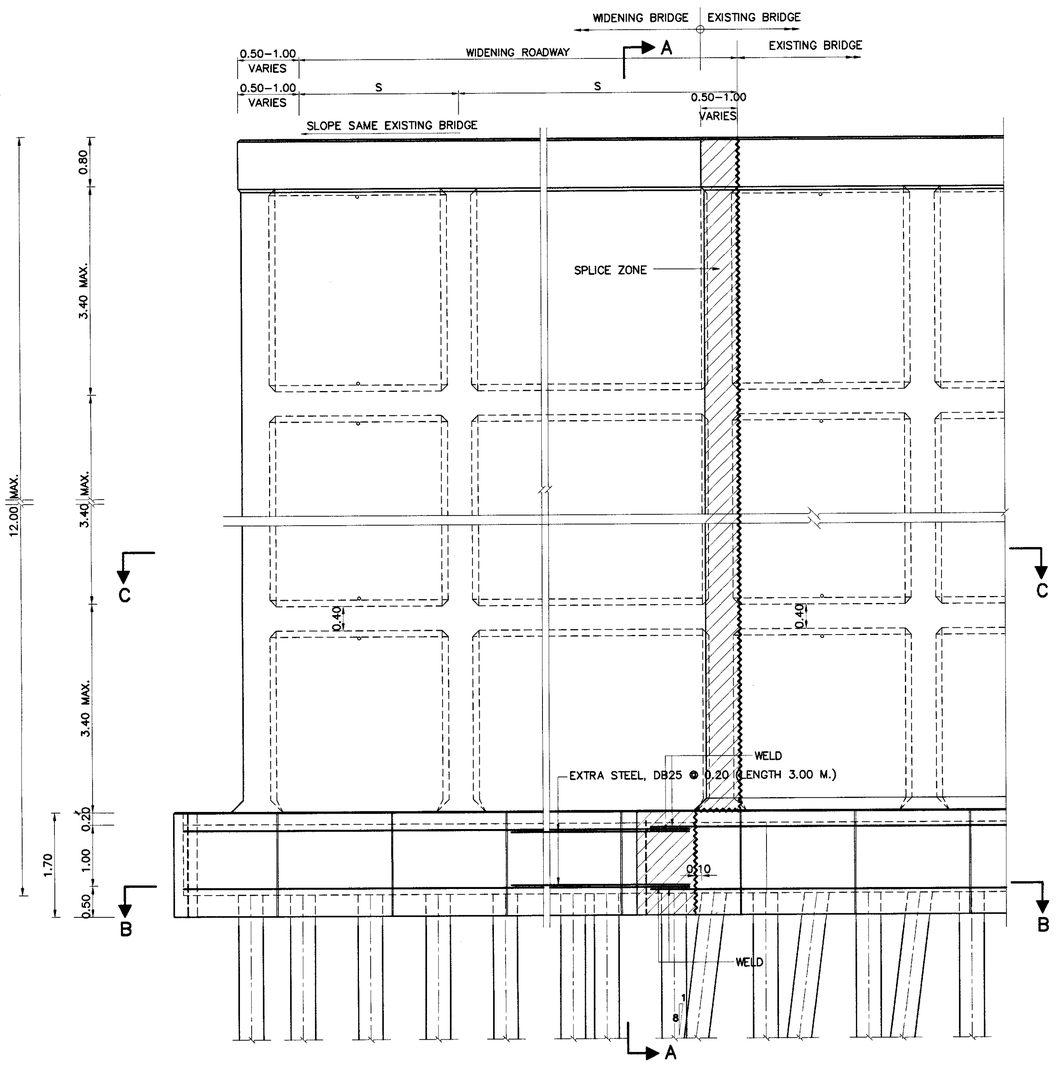
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

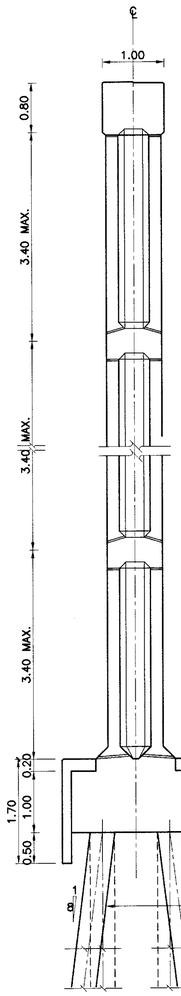
REINFORCEMENT DETAILS FOR EXISTING ABUTMENT WITHOUT BATTER PILES

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–207
		SHEET NO. 122

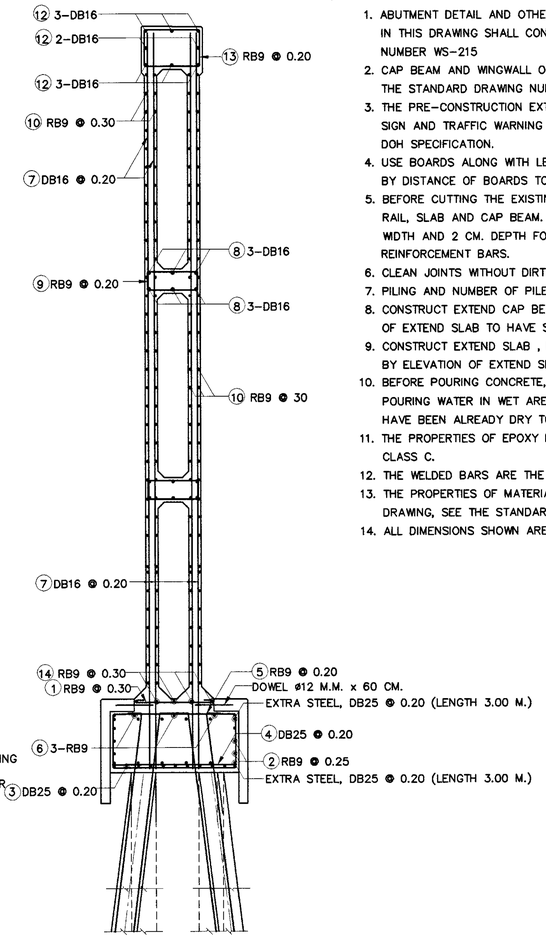
D:\std dwg 2015\WS-207(REV00)



ELEVATION
SCALE 1 : 50



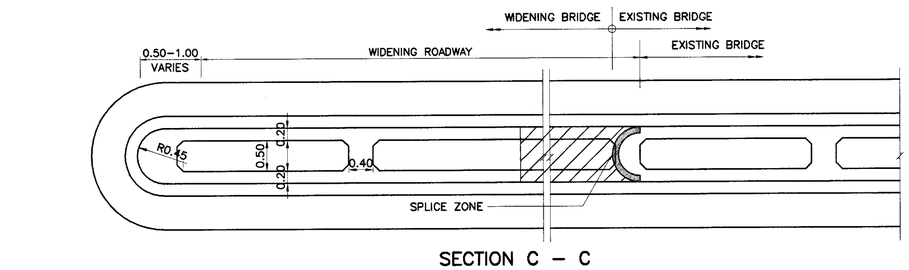
PILE FOOTING ELEVATION



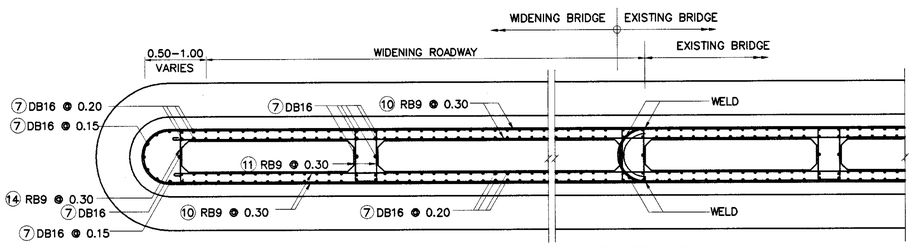
PILE FOOTING REINFORCEMENT

NOTES :

1. ABUTMENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER WS–215
2. CAP BEAM AND WINGWALL OF ABUTMENT SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–101
3. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
4. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
5. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
6. CLEAN JOINTS WITHOUT DIRTY.
7. PILING AND NUMBER OF PILES ARE STANDARD DRAWINGS NUMBER PB–303
8. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
10. BEFORE POURING CONCRETE, CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
11. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

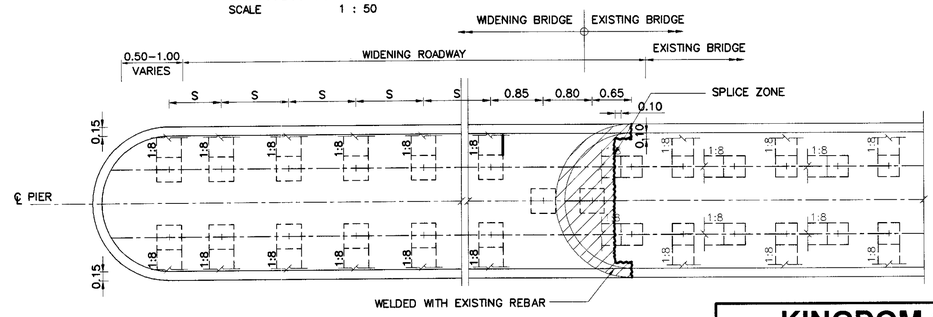


SECTION C – C
SCALE 1 : 50



SHEAR WALL REINFORCEMENT DETAILS
SCALE 1 : 50

SECTION A – A
SCALE 1 : 50



SECTION B – B
SCALE 1 : 50

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

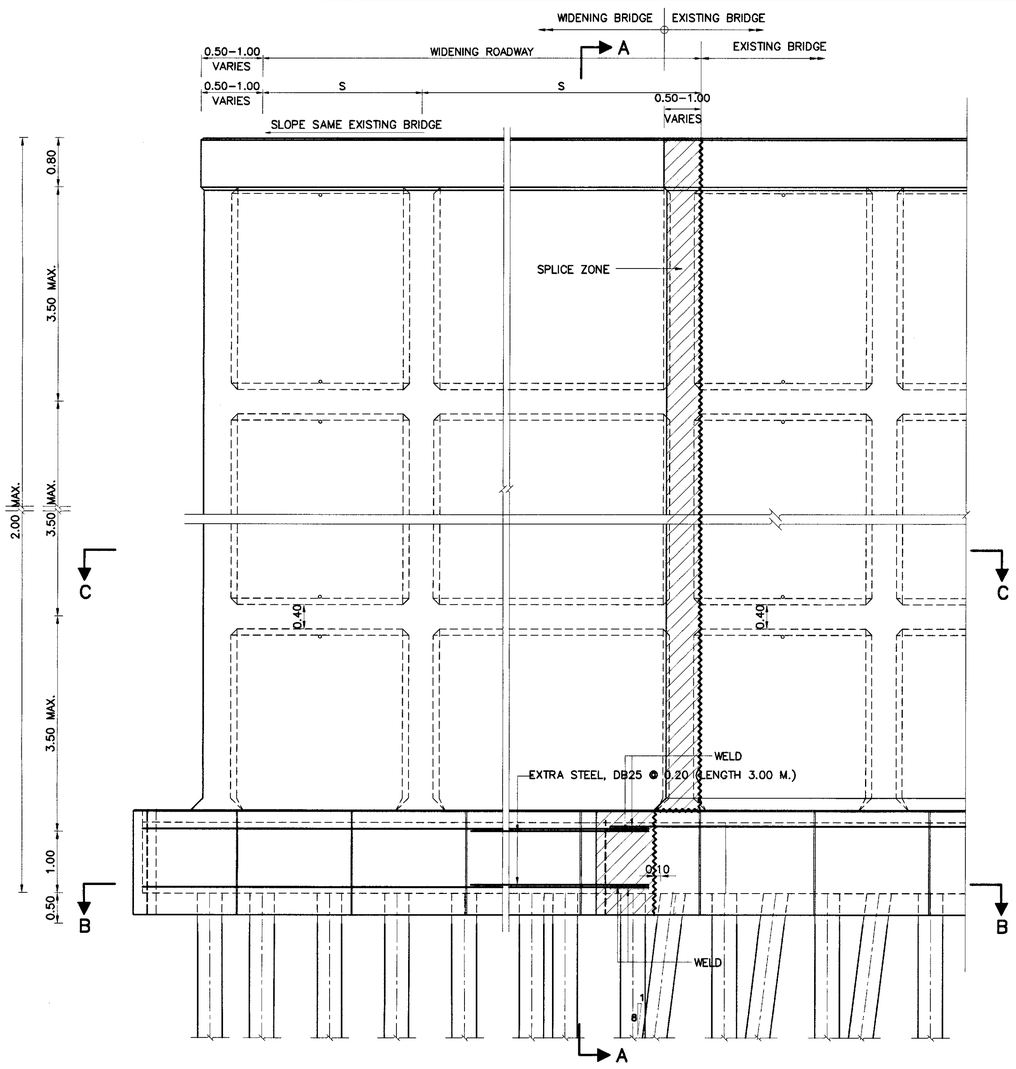
STANDARD DRAWING

REINFORCEMENT DETAILS FOR EXISTING WALL PIER
PILE GROUP FOOTING FOR PC. BOX BEAM, H_{MAX}= 12.00 M.

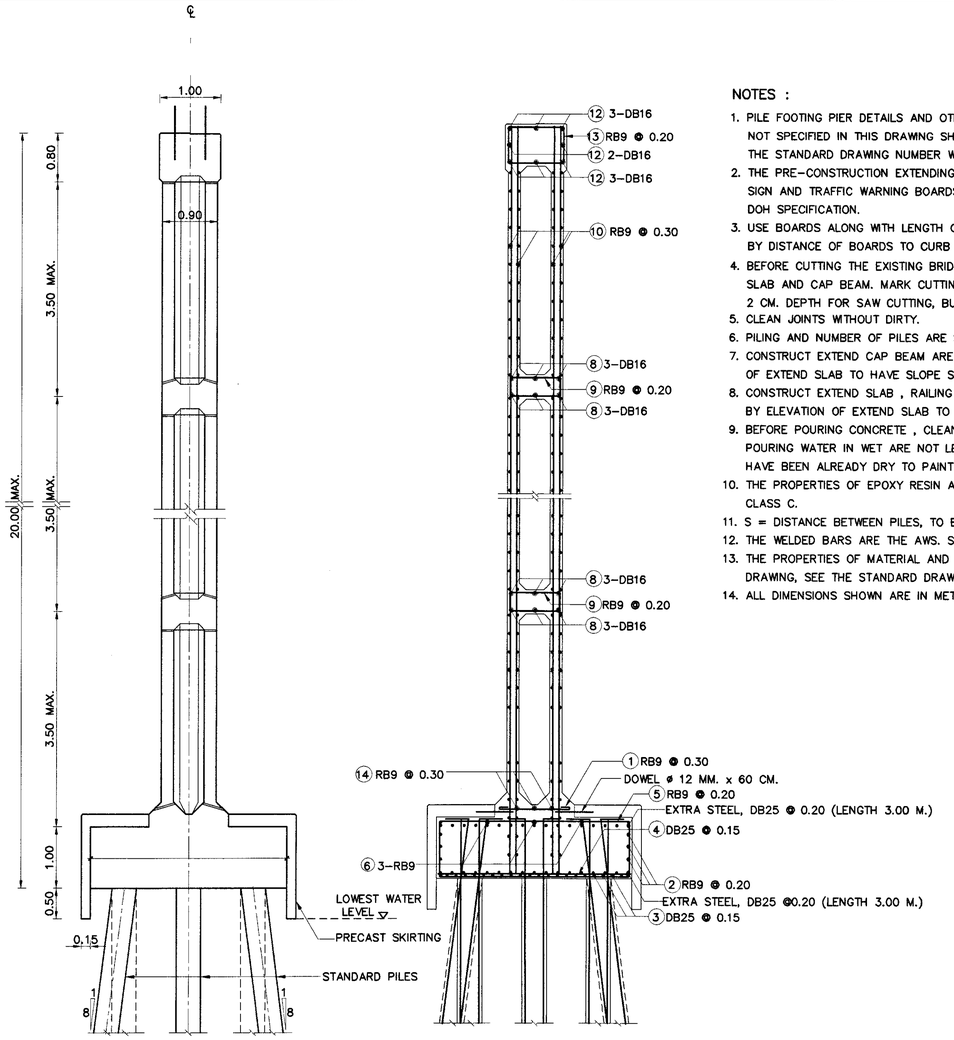
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. WS–208
			SHEET NO. 123

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\WS-208(REV00)



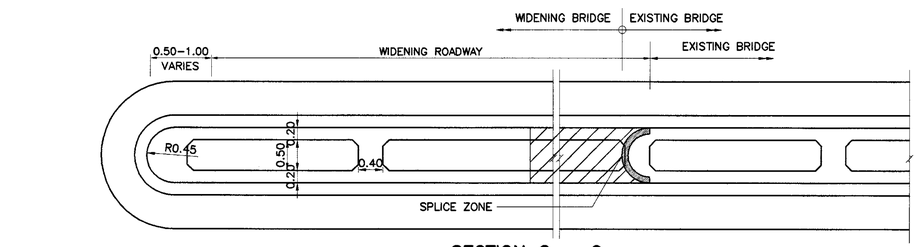
ELEVATION
SCALE 1 : 50



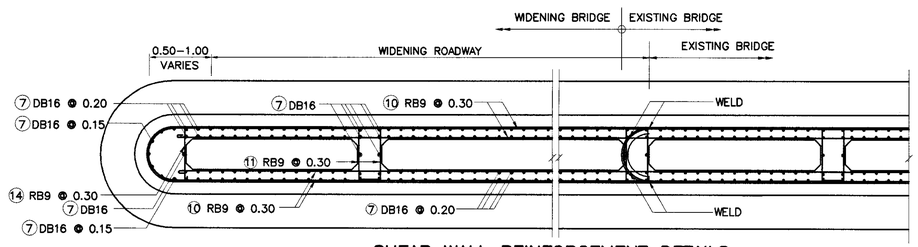
PILE FOOTING ELEVATION PILE FOOTING REINFORCEMENT

NOTES :

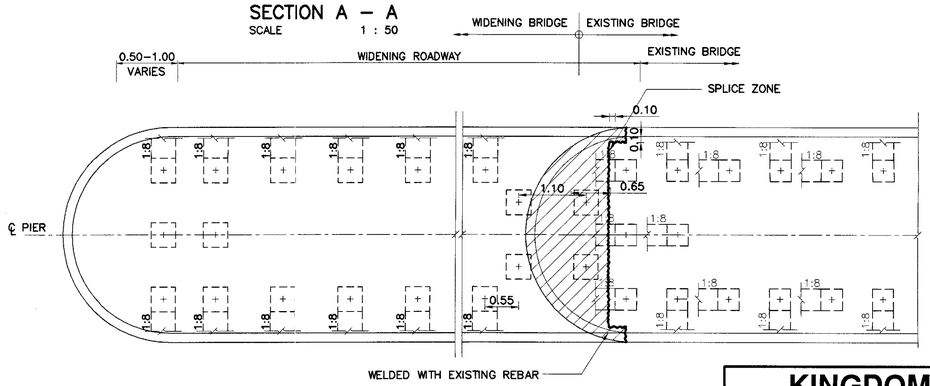
1. PILE FOOTING PIER DETAILS AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER WS–218
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. PILING AND NUMBER OF PILES ARE STANDARD DRAWINGS NUMBER WS–220
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER WS–220
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.



SECTION C – C
SCALE 1 : 50



SHEAR WALL REINFORCEMENT DETAILS
SCALE 1 : 50



SECTION A – A
SCALE 1 : 50

SECTION B – B
SCALE 1 : 50

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

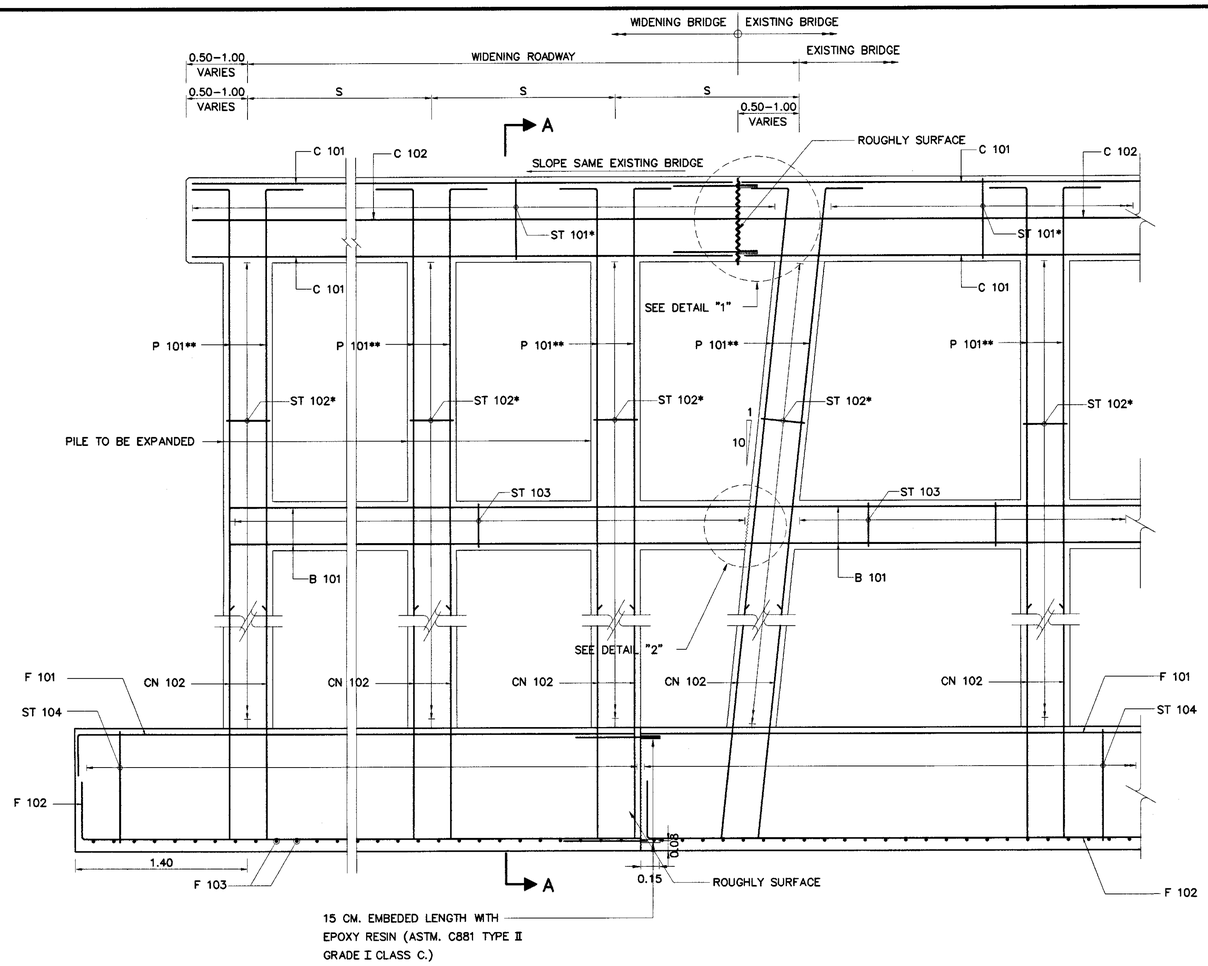
STANDARD DRAWING

REINFORCEMENT DETAILS FOR EXISTING WALL PIER
PILE GROUP FOOTING FOR PC. BOX BEAM, H_{MAX} = 20.00 M.

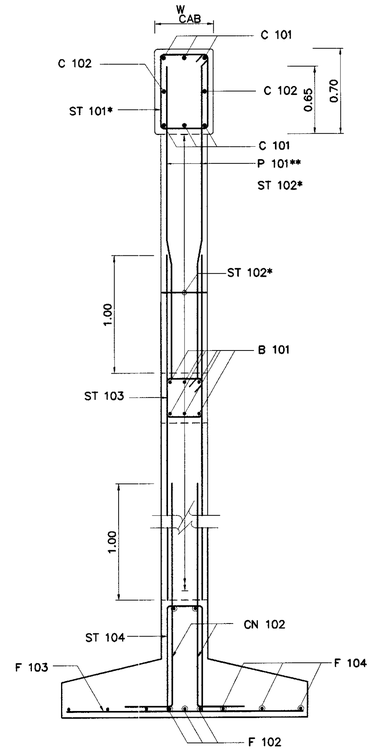
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. WS–209
			SHEET NO. 124

REF.	REVISION	SIGNATURE	DATE

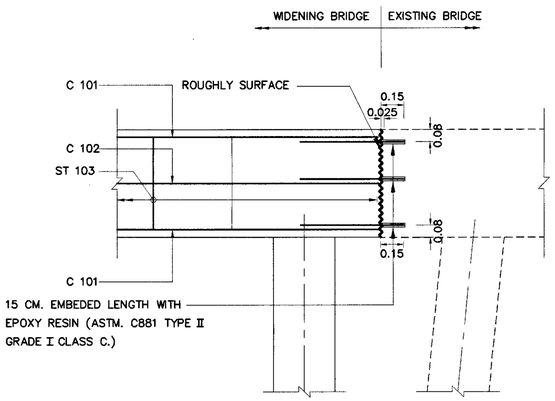
D:\std dwg 2015\WS-209(REV00)



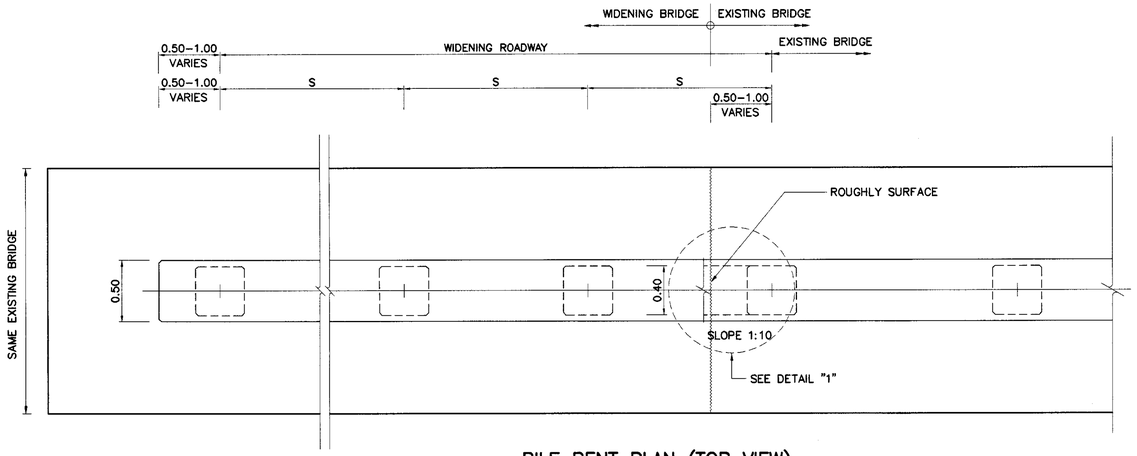
PILE BENT REINFORCEMENT DETAILS
SCALE 1 : 25



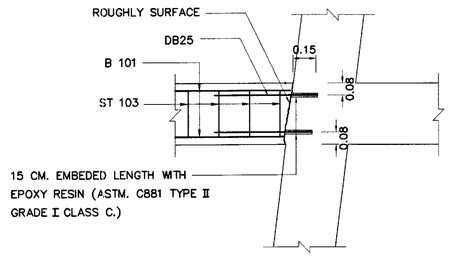
SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



PILE BENT PLAN (TOP VIEW)
SCALE 1 : 25



DETAIL "2"
SCALE 1 : 20

NOTES :

1. PILE BENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–304
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. SPREAD FOOTING PIER DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–304
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–304
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

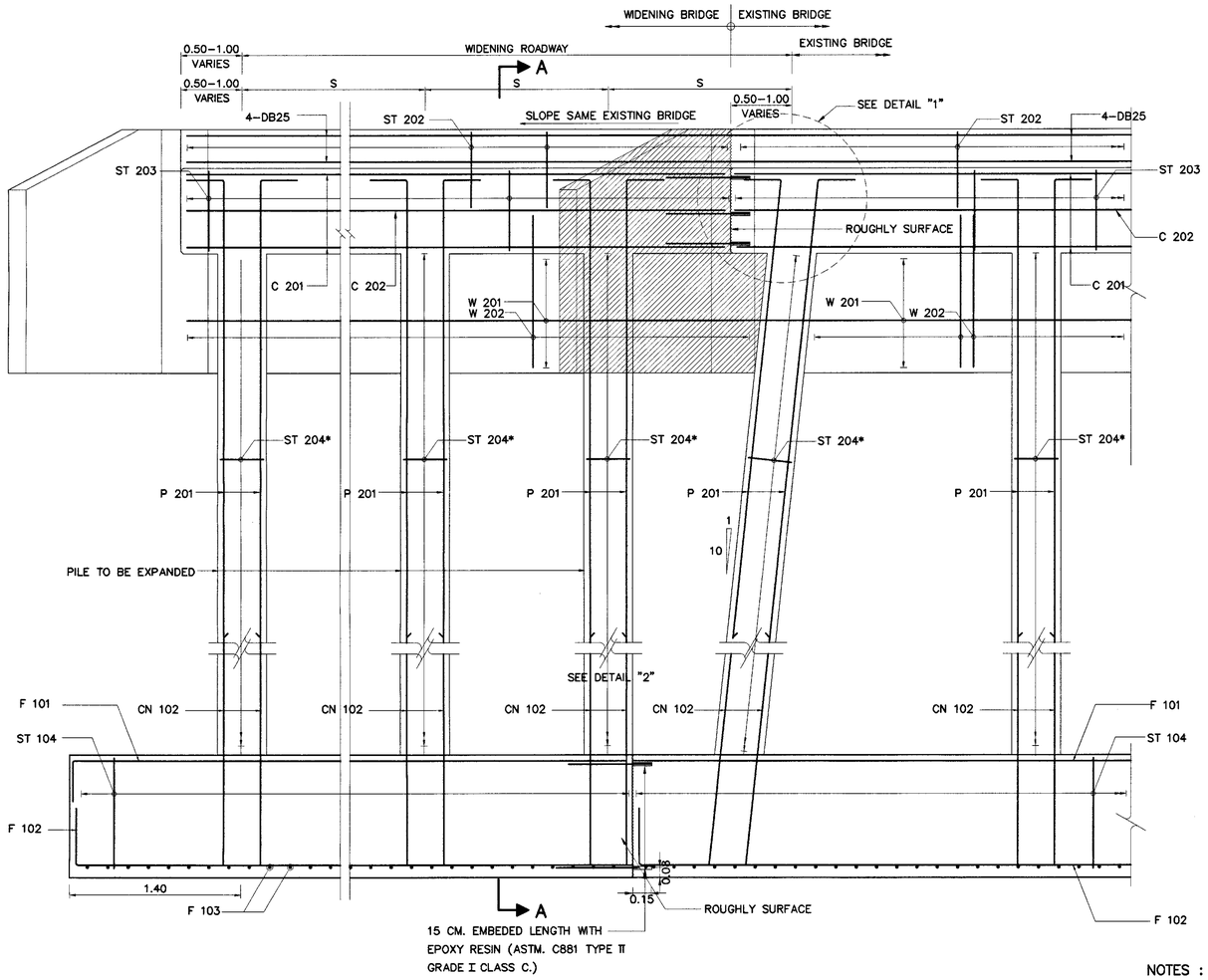
STANDARD DRAWING

REINFORCEMENT DETAILS FOR EXISTING PILE BENT WITH BATTER PILES

REF.	REVISION	SIGNATURE	DATE

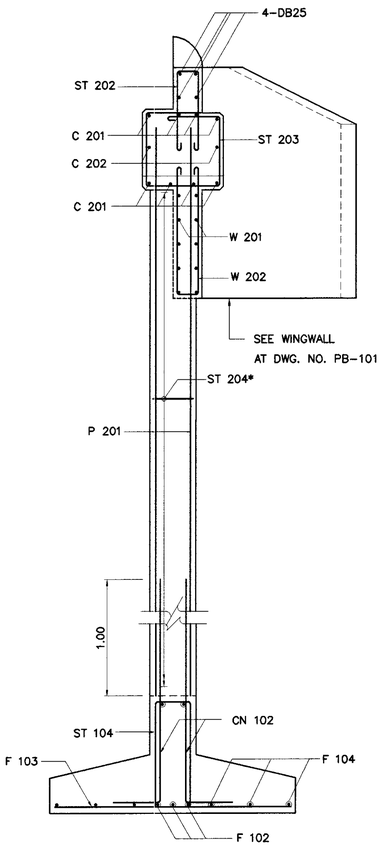
DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
DWG NO. WS–210
APPROVED : (FOR DIRECTOR GENERAL)
SHEET NO. 125

D:\std dwg 2015\WS-210(REV00)

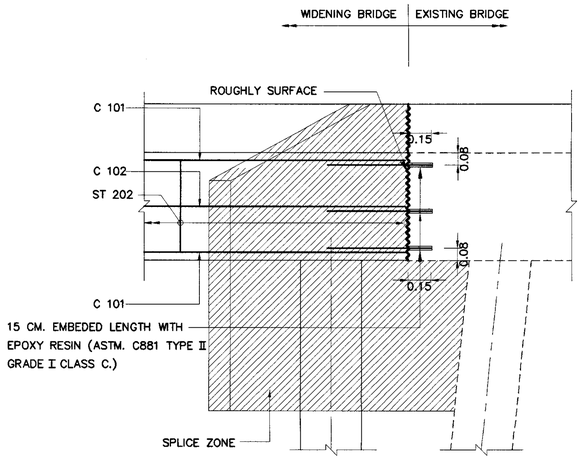


NOTES :

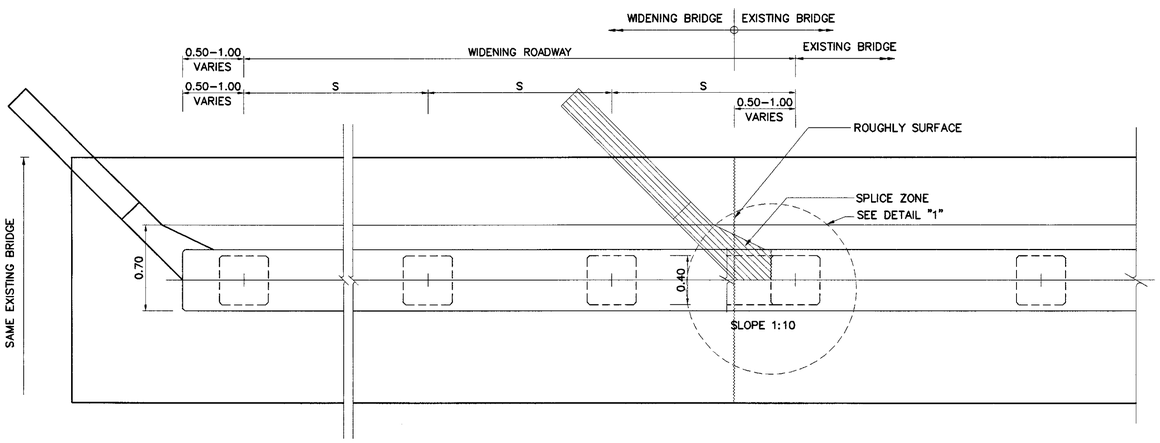
ABUTMENT REINFORCEMENT DETAILS
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



ABUTMENT PLAN (TOP VIEW)
SCALE 1 : 25

NOTES :

1. ABUTMENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB-302
2. CAP BEAM AND WINGWALL OF ABUTMENT SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB-101
2. THE PRE-CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB TOPPING AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. SPREAD FOOTING ABUTMENT DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB-302
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB-302
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

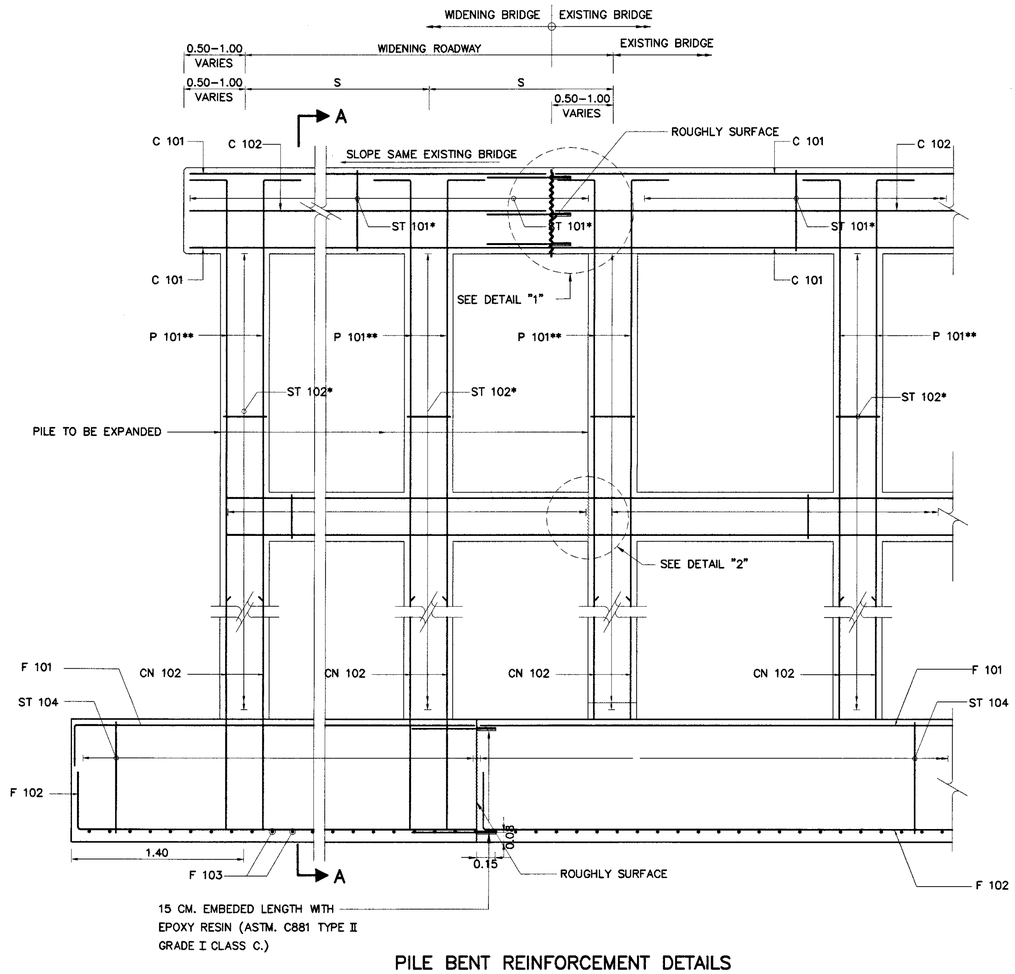
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

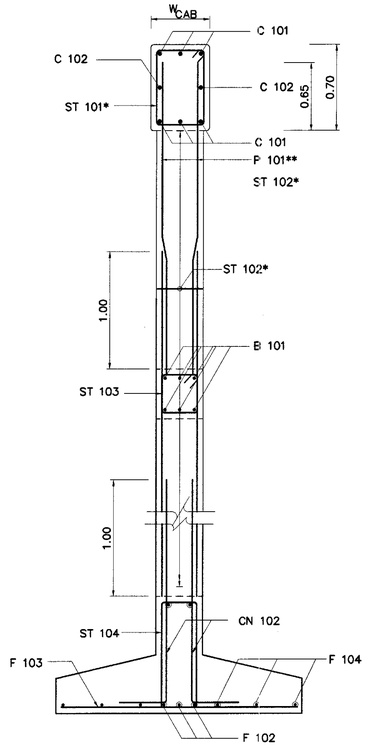
REINFORCEMENT DETAILS FOR EXISTING ABUTMENT WITH BATTER PILES

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-211
		SHEET NO. 126

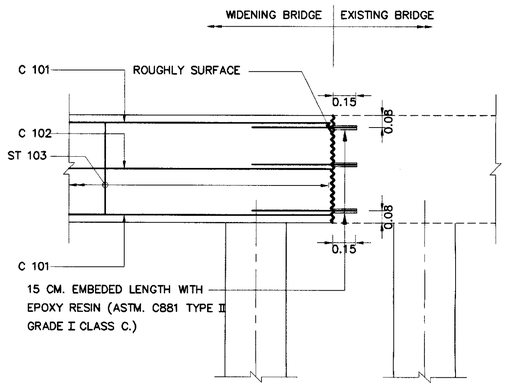
D:\std dwg 2015\WS-211(REV00)



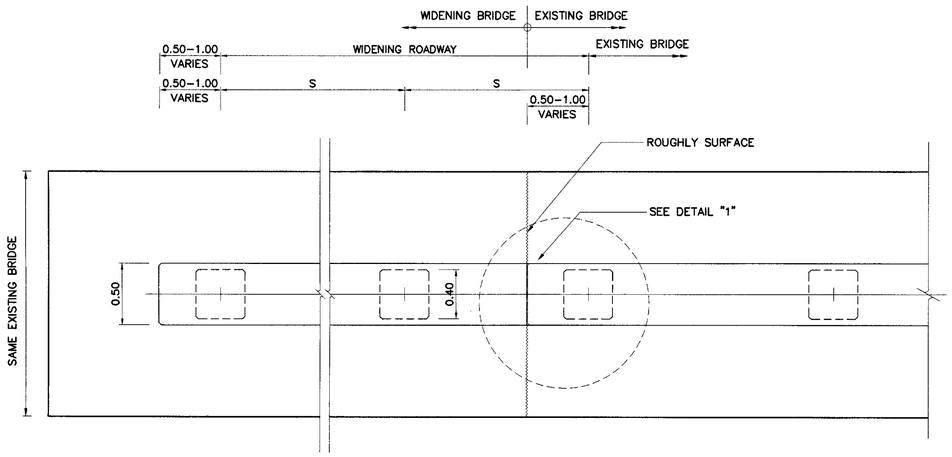
PILE BENT REINFORCEMENT DETAILS
SCALE 1 : 25



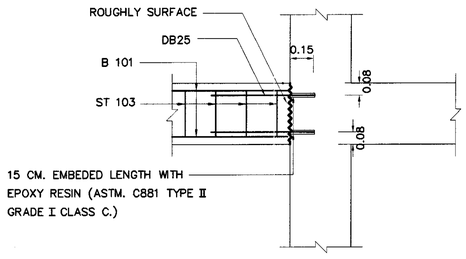
SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



PILE BENT PLAN (TOP VIEW)
SCALE 1 : 25



DETAIL "2"
SCALE 1 : 20

NOTES :

1. PILE BENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB–304
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. SPREAD FOOTING PIER DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB–304
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB–304
12. THE WELDED BARS ARE THE AWS. STANDARDS.
13. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
14. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

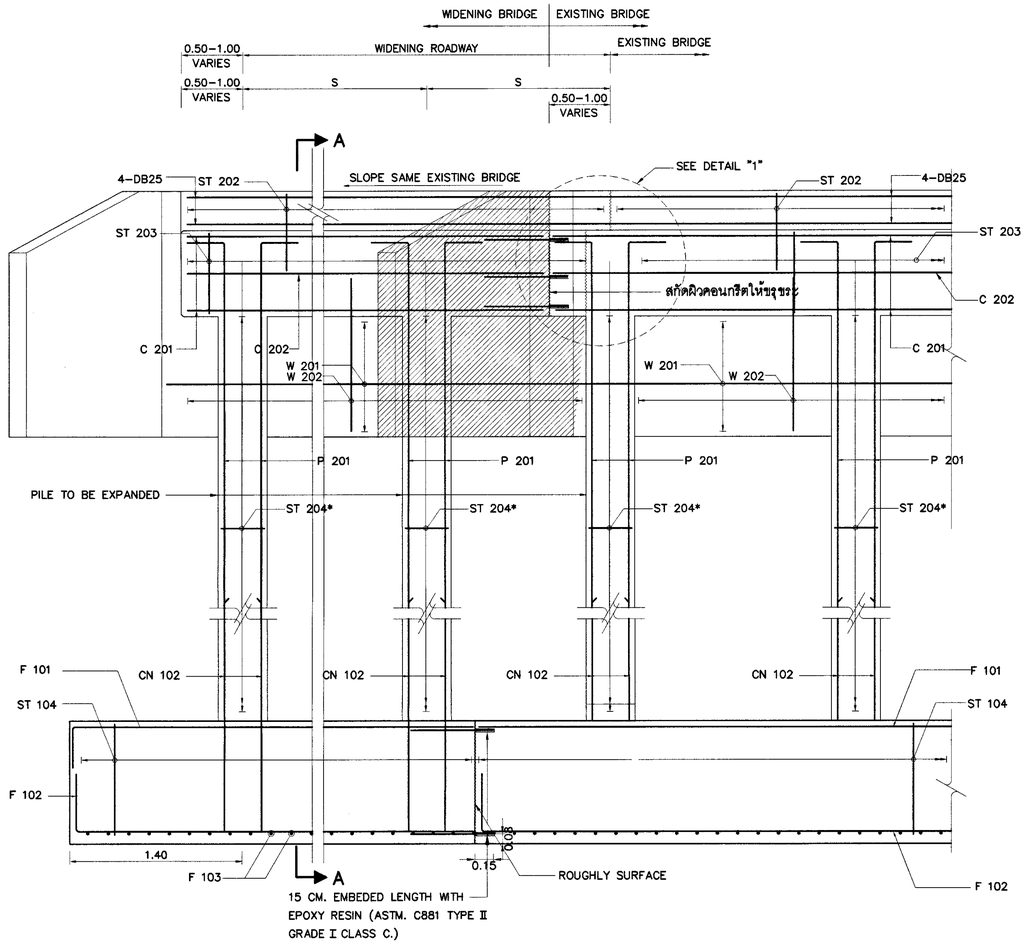
STANDARD DRAWING

REINFORCEMENT DETAILS FOR EXISTING PILE BENT WITHOUT BATTER PILES

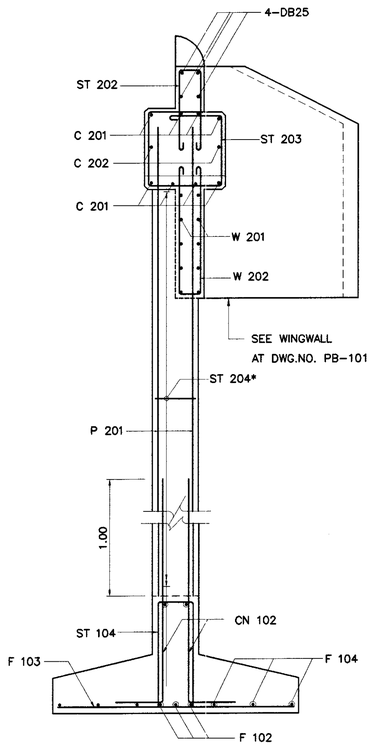
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. WS–212
			SHEET NO. 127

REF.	REVISION	SIGNATURE	DATE

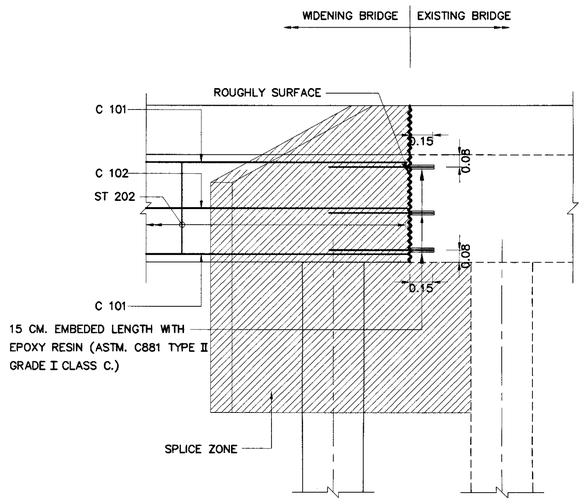
D:\std dwg 2015\WS-212(REV00)



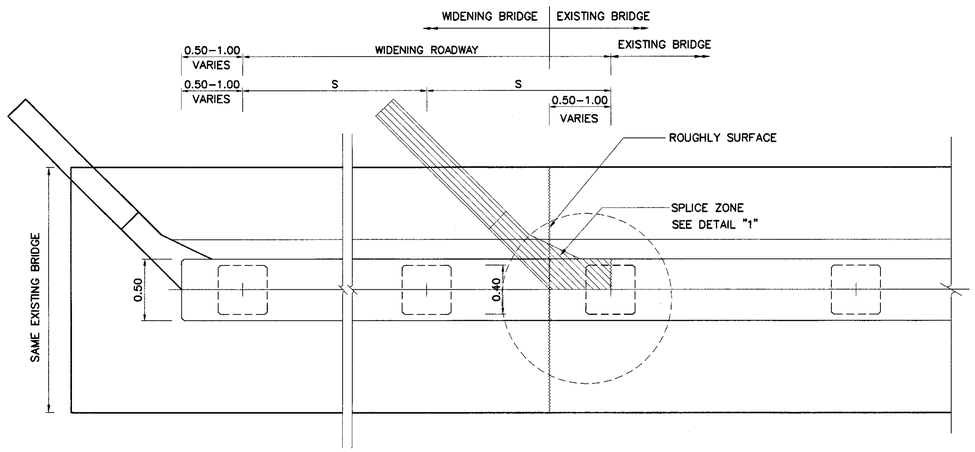
ABUTMENT REINFORCEMENT DETAILS
SCALE 1 : 25



SECTION A – A
SCALE 1 : 25



DETAIL "1"
SCALE 1 : 20



ABUTMENT PLAN (TOP VIEW)
SCALE 1 : 25

NOTES :

1. ABUTMENT DETAIL AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB-302
2. CAP BEAM AND WINGWALL OF ABUTMENT SHALL CONFORM TO THE STANDARD DRAWING NUMBER PB-101
3. THE PRE-CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
4. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
5. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
6. CLEAN JOINTS WITHOUT DIRTY.
7. SPREAD FOOTING ABUTMENT DETAIL AND NUMBER OF PILE BENT ARE SHOWN IN STANDARD DRAWINGS NUMBER PB-302
8. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
10. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
11. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
12. S = DISTANCE BETWEEN PILES, TO BE STANDARD DRAWINGS NUMBER PB-302
13. THE WELDED BARS ARE THE AWS. STANDARDS.
14. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
15. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

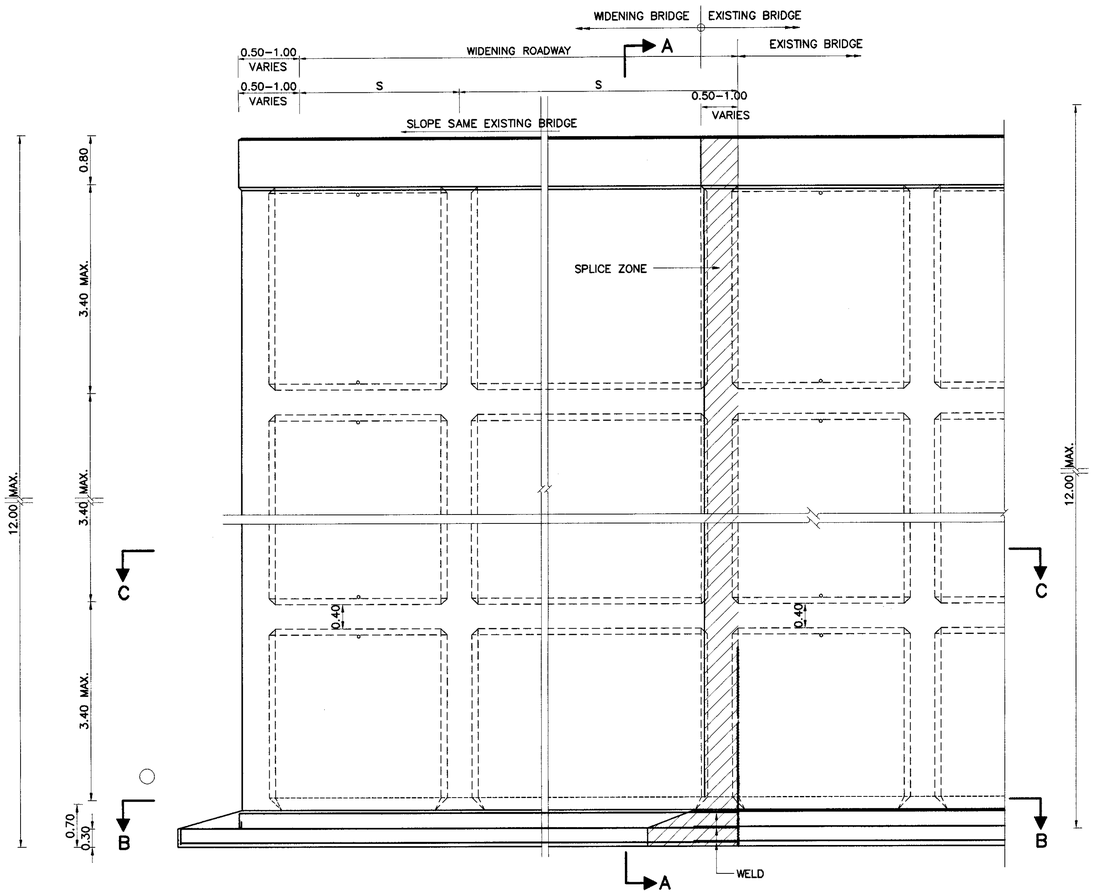
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

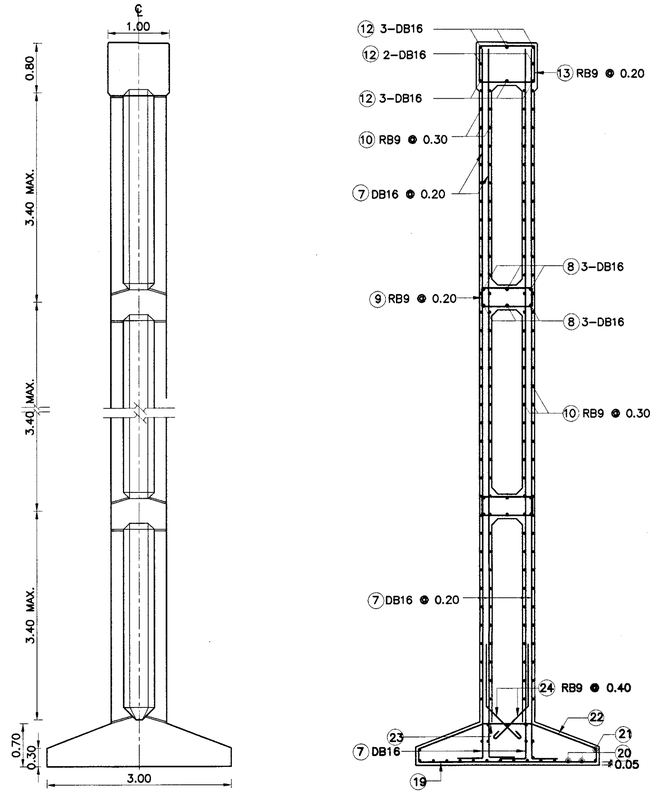
REINFORCEMENT DETAILS FOR EXISTING ABUTMENT WITHOUT BATTER PILES

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-213
		SHEET NO. 128

D:\std dwg 2015\WS-213(REV00)



ELEVATION
SCALE 1 : 50



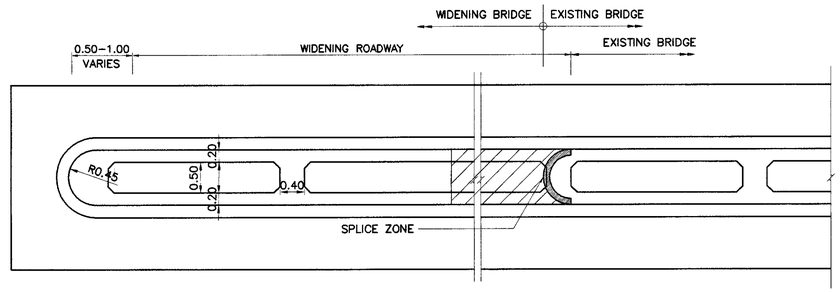
PILE FOOTING ELEVATION

PILE FOOTING REINFORCEMENT

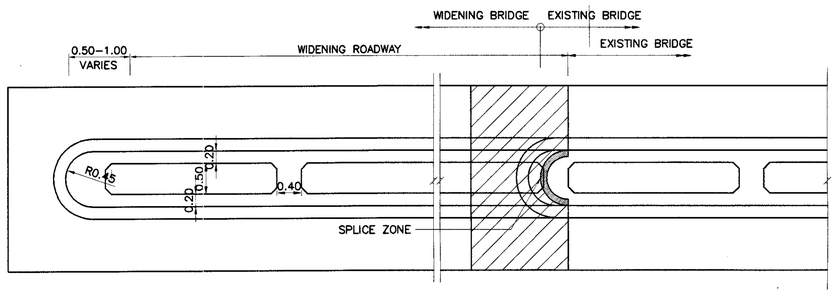
NOTES :

1. PILE FOOTING PIER DETAILS AND OTHER BRIDGE COMPONENTS NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD DRAWING NUMBER WS–215
2. THE PRE–CONSTRUCTION EXTENDING BRIDGE WIDTH SHALL HAVE SIGN AND TRAFFIC WARNING BOARDS BEFORE CONSTRUCTION BY DOH SPECIFICATION.
3. USE BOARDS ALONG WITH LENGTH OF BRIDGE THAT EXTEND WIDTH BY DISTANCE OF BOARDS TO CURB ABOUT 1.00 M.
4. BEFORE CUTTING THE EXISTING BRIDGE, DEMOLISH THE EXISTING CURB, RAIL, SLAB AND CAP BEAM. MARK CUTTING LINE ALONG SLAB, 1 CM. WIDTH AND 2 CM. DEPTH FOR SAW CUTTING, BUT HAVE TO AVOID THE REINFORCEMENT BARS.
5. CLEAN JOINTS WITHOUT DIRTY.
6. PILING AND NUMBER OF PILES ARE STANDARD DRAWINGS NUMBER WS–217
7. CONSTRUCT EXTEND CAP BEAM ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
8. CONSTRUCT EXTEND SLAB , RAILING CURB ARE THIS DRAWING BY ELEVATION OF EXTEND SLAB TO HAVE SLOPE SAME EXISTING SLAB
9. BEFORE POURING CONCRETE , CLEAN JOINT AND BARS WITHOUT DIRTY POURING WATER IN WET ARE NOT LESS THAN TWO HOURS WHILE JOINTS HAVE BEEN ALREADY DRY TO PAINT JOINTS WITH EPOXY RESIN.
10. THE PROPERTIES OF EPOXY RESIN ARE ASTM. C881 TYPE II GRADE I CLASS C.
11. THE WELDED BARS ARE THE AWS. STANDARDS.
12. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
13. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

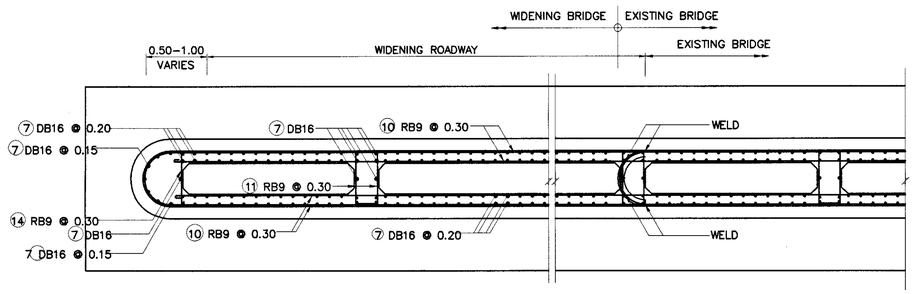
SECTION A–A
SCALE 1 : 50



SECTION C – C
SCALE 1 : 50



SECTION B – B
SCALE 1 : 50



SHEAR WALL REINFORCEMENT DETAILS
SCALE 1 : 50

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

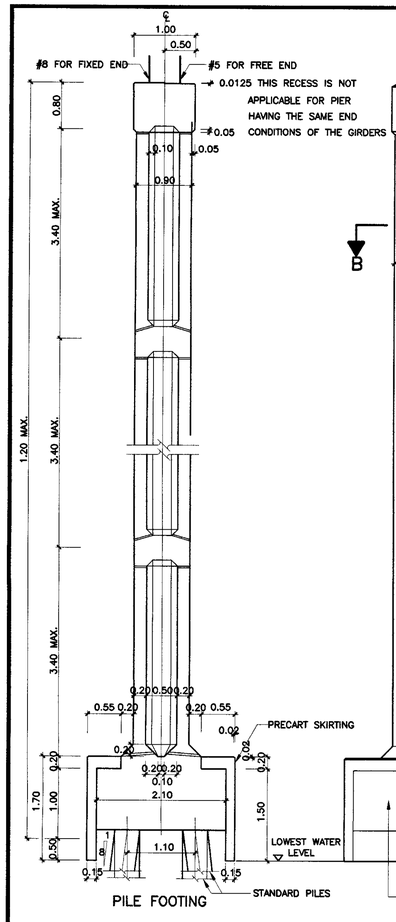
STANDARD DRAWING

REINFORCEMENT DETAILS FOR EXISTING WALL PIER
SPREAD FOOTING FOR PC. BOX BEAM, H_{MAX} = 12.00 M.

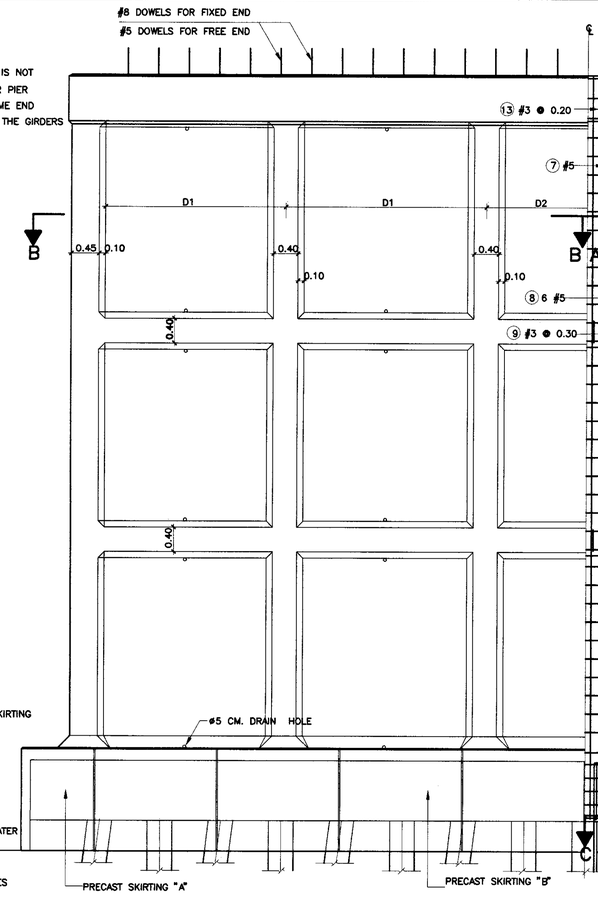
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. WS–214
			SHEET NO. 129

REF.	REVISION	SIGNATURE	DATE

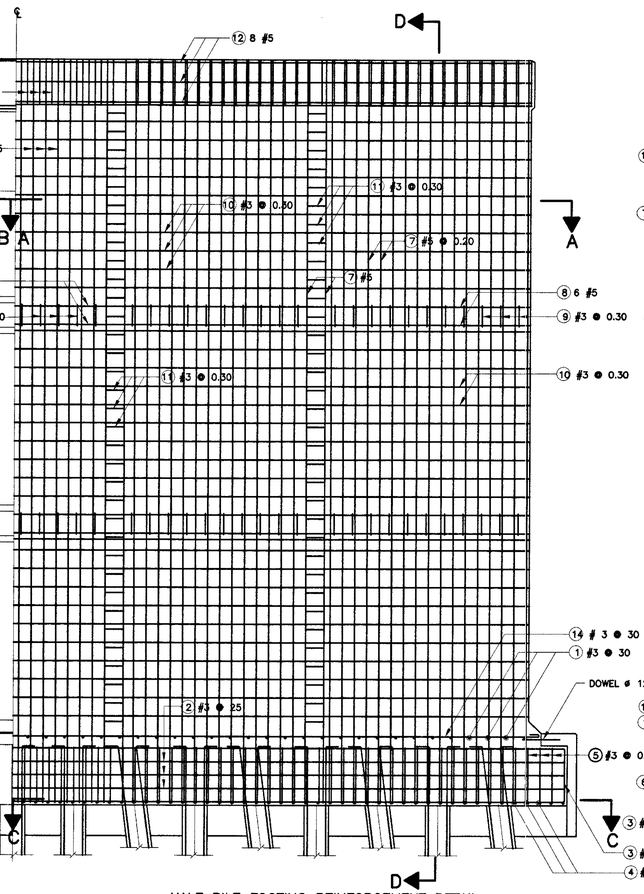
D:\std dwg 2015\WS–214(REV00)



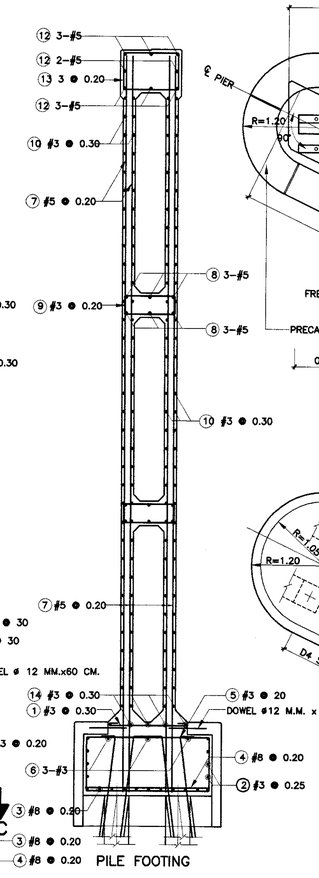
PILE FOOTING



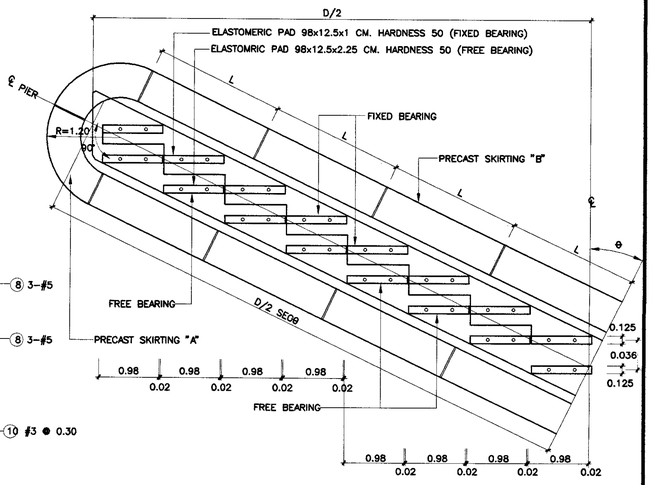
HALF PILE FOOTING ELEVATION



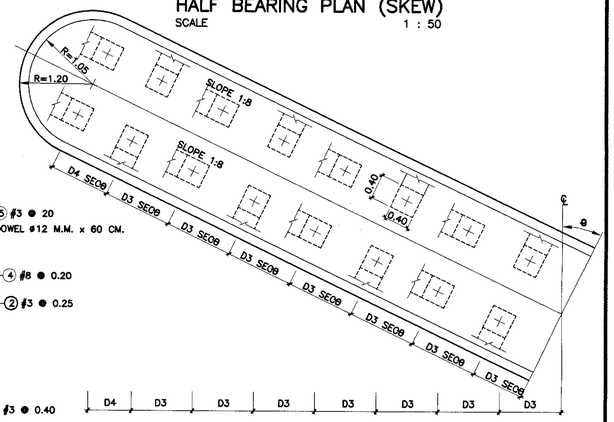
HALF PILE FOOTING REINFORCEMENT DETAIL



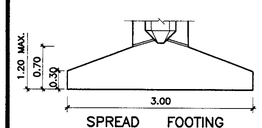
PILE FOOTING



HALF BEARING PLAN (SKEW)
SCALE 1 : 50

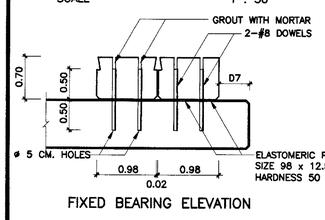


HALF PILING PLAN (SKEW)
SCALE 1 : 50

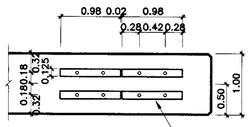


SPREAD FOOTING

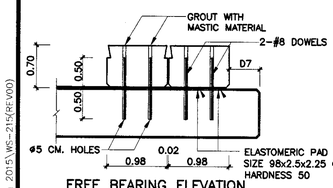
LOGITUDINAL SECTIONS
SCALE 1 : 50



FIXED BEARING ELEVATION

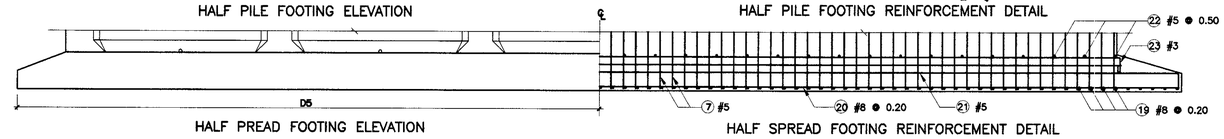


PLAN



FREE BEARING ELEVATION

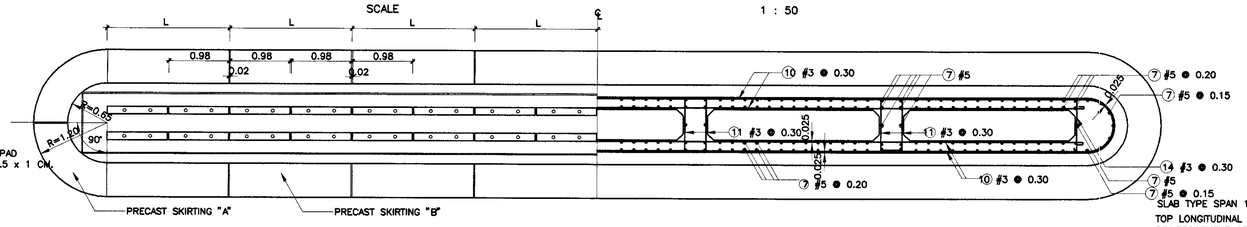
BEARING DETAILS
SCALE 1 : 50



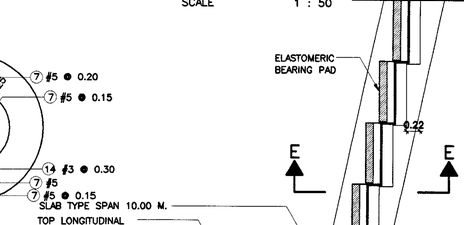
HALF PREAD FOOTING ELEVATION

HALF SPREAD FOOTING REINFORCEMENT DETAIL

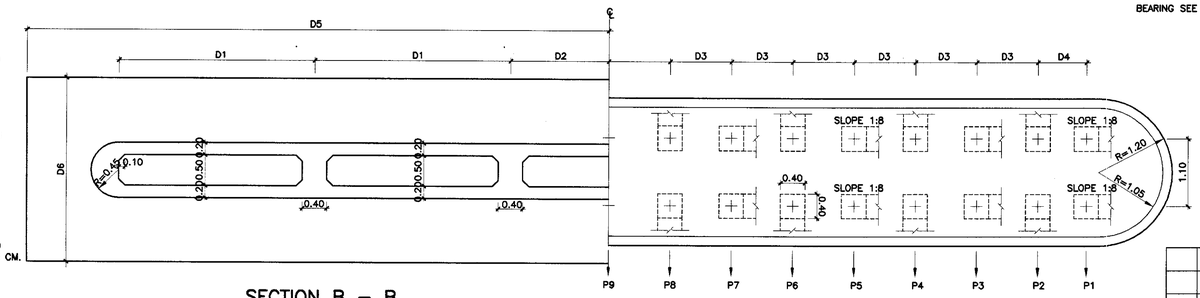
PILE ELEVATION AND REINFORCEMENT DETAILS
SCALE 1 : 50



HALF PLAN
SCALE 1 : 50

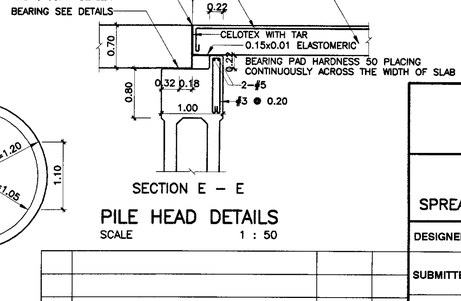


SECTION A – A
SCALE 1 : 50



SECTION B – B
SCALE 1 : 50

SECTION C – C
SCALE 1 : 50



SECTION E – E

PILE HEAD DETAILS
SCALE 1 : 50

PLAN

SECTION D – D
SCALE 1 : 50

NOTES :

1. WORK THIS DRAWING WITH DWG. NO.WS–216
2. ALL EXPOSED CONCRETE CORNERS SHALL HAVE 2 CM CHAMFERS UNLESS OTHERWISE INDICATED.
3. HORIZONTAL STIFFENERS BETWEEN WALLS OF A PIER SHALL BE PROVIDED AT EQUAL SPACING OF NOT MORE THAN 3.4 M.
4. DIAPHRAGM COLUMNS SHALL BE ARRANGED IN SUCH A WAY THAT BOTH D1 AND 2(D2) SHALL NOT BE GREATER THAN 3.2 M.
5. MINIMUM ALLOWABLE BEARING CAPACITY OF SOIL UNDER SPREAD FOOTING PIERS SHALL BE 20 TON/M^2 THE BOTTOM OF FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND NOT LESS THAN 2.5 M. OR AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
6. FOR PILE FOOTING PIERS, EACH PILE SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 125 TONS AND SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
7. FOR PILE DETAILS SEE DWG. NO. PL–101 OR PL–201
8. FOR SPREAD FOOTING PIERS, THE MAXIMUM HEIGHT FROM THE BOTTOM OF FOOTING TO THE TOP OF CAP BEAM SHALL BE 12.00 M.
9. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
10. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 58D20–10–614/4
11. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REMARKS : #3 = 9 MM., #5 = 16 MM., #6 = 20 MM., #8 = 25 MM.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

0°–50° SKEW PC. BOX GIRDER BRIDGE

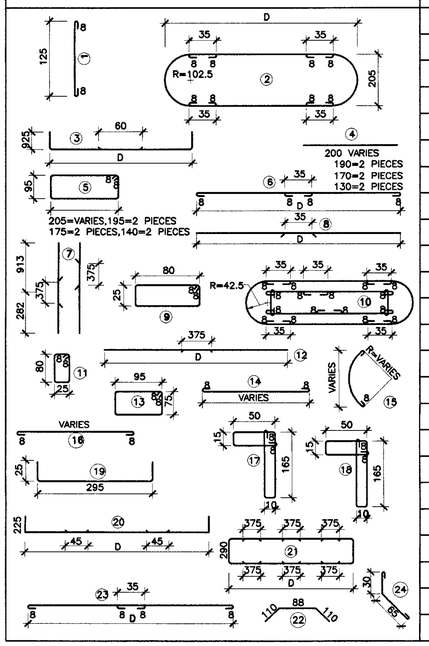
SPREAD AND PILE FOOTING PIER DETAILS, H_{MAX} = 12.00 M.

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–215
		SHEET NO. 130

D:\std dwg 2015\WS-215(REV00)

TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS
CM.



BAR MARK	#	7–BOX GIRDER				8–BOX GIRDER				9–BOX GIRDER				10–BOX GIRDER				11–BOX GIRDER				12–BOX GIRDER				13–BOX GIRDER				14–BOX GIRDER				15–BOX GIRDER				16–BOX GIRDER			
		NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH
1	3	●30	–	141	3,807	●30	–	141	4,230	●30	–	141	4,794	●30	–	141	5,217	●30	–	141	5,640	●30	–	141	6,073	●30	–	141	6,637	●30	–	141	7,060	●30	–	141	7,483	●30	–	141	8,047
2	3	●20	845	2,188	10,940	●20	945	2,388	11,940	●20	1,045	2,588	12,940	●20	1,145	2,788	13,940	●20	1,255	2,998	14,990	●20	1,365	3,218	16,090	●20	1,475	3,438	17,190	●20	1,585	3,658	18,290	●20	1,695	3,878	19,390	●20	1,805	4,098	20,490
3	8	11	845	1,090	11,990	11	945	1,190	13,090	11	1,045	1,290	14,190	11	1,145	1,390	15,290	11	1,255	1,500	16,500	11	1,365	1,610	17,710	11	1,475	1,720	18,920	11	1,585	1,830	20,130	11	1,695	1,940	21,340	11	1,805	2,050	22,550
4	8	44	–	200	8,800	49	–	200	9,800	54	–	200	10,800	59	–	200	11,800	64	–	200	12,800	69	–	200	13,800	74	–	200	14,800	79	–	200	15,800	84	–	200	16,800	89	–	200	17,800
5	3	44	–	611	26,884	49	–	611	29,939	54	–	611	32,994	59	–	611	36,094	64	–	611	39,104	69	–	611	42,159	74	–	611	45,214	79	–	611	48,269	84	–	611	55,324	89	–	611	58,379
6	3	3	845	904	2,712	3	945	1,004	3,012	3	1,045	1,104	3,135	3	1,145	1,204	3,612	3	1,255	1,314	3,942	3	1,365	1,424	4,272	3	1,475	1,534	4,602	3	1,585	1,644	4,932	3	1,695	1,754	5,262	3	1,805	1,864	5,592
7	5	148	–	1,232.5	182,410	172	–	1,232.5	211,990	196	–	1,232.5	241,570	220	–	1,232.5	271,150	244	–	1,232.5	300,730	268	–	1,232.5	330,310	292	–	1,232.5	359,850	316	–	1,232.5	389,470	340	–	1,232.5	419,050	364	–	1,232.5	448,630
8	5	12	845	882.5	10,590	12	945	982.5	11,790	12	1,054	1,082.5	12,990	12	1,145	1,182.5	14,190	12	1,255	1,292.5	15,510	12	1,365	1,402.5	16,830	12	1,475	1,512.5	18,150	12	1,585	1,622.5	19,470	12	1,695	1,732.5	20,790	12	1,805	1,842.5	22,110
9	3	58	–	226	13,108	68	–	226	15,368	78	–	226	17,268	86	–	226	19,889	98	–	226	22,148	108	–	226	24,408	118	–	226	26,668	128	–	226	28,928	138	–	226	31,188	148	–	226	33,448
10	3	37	825	3,394	125,578	37	925	3,794	141,000	37	1,025	4,194	154,900	37	1,125	4,594	170,000	37	1,235	4,994	184,998	37	1,345	5,394	199,800	37	1,455	5,794	214,000	37	1,565	6,194	239,000	37	1,675	6,594	244,800	37	1,785	6,994	258,988
11	3	96	–	226	21,696	96	–	226	21,696	96	–	226	21,696	96	–	226	21,696	128	–	226	28,476	128	–	226	28,476	128	–	226	28,476	160	–	226	36,160	160	–	226	36,160	160	–	226	36,160
12	5	8	735	772.5	6,180	8	835	872.5	6,980	8	935	972.5	7,780	8	1,035	1,072.5	8,580	8	1,145	1,182.5	9,460	8	1,255	1,292.5	10,340	8	1,365	1,402.5	11,220	8	1,475	1,512.5	12,100	8	1,585	1,622.5	12,980	8	1,695	1,732.5	13,860
13	3	40	–	356	14,240	45	–	356	16,020	50	–	356	17,800	55	–	356	19,580	60	–	356	21,360	65	–	356	23,140	70	–	356	24,920	75	–	356	26,700	80	–	356	28,480	85	–	356	30,260
14	3	●30	–	776	4,656	●30	–	876	5,256	●30	–	976	5,856	●30	–	1,076	6,456	●30	–	1,186	7,116	●30	–	1,296	7,776	●30	–	1,406	8,436	●30	–	1,516	9,096	●30	–	1,626	9,756	●30	–	1,736	10,416
15	3	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072	88	–	–	16,072
16	3	176	–	171	30,096	176	–	196	34,496	220	–	179	39,380	220	–	199	43,780	264	–	196	49,104	264	–	204	53,856	308	–	192	59,136	308	–	208	64,064	352	–	197	69,344	352	–	211	74,272
17	3	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840	40	–	471	18,840
18	3	●20	–	471	33,912	●20	–	471	38,622	●20	–	471	43,332	●20	–	471	48,984	●20	–	471	54,636	●20	–	471	60,288	●20	–	471	64,998	●20	–	471	71,592	●20	–	471	78,186	●20	–	471	82,896
19	8	40	–	345	13,800	44	–	345	15,180	48	–	345	16,560	52	–	345	17,940	56	–	345	19,320	60	–	345	20,700	64	–	345	22,080	68	–	345	23,460	72	–	345	24,840	76	–	345	26,220
20	6	16	930	1,065	17,040	16	1,030	1,165	18,640	16	1,130	1,265	20,240	16	1,230	1,365	21,840	16	1,340	1,475	23,600	16	1,450	1,585	25,360	16	1,560	1,695	27,120	16	1,670	1,805	28,880	16	1,780	1,915	30,640	16	1,890	2,025	32,400
21	5	1	930	2,680	2,680	1	1,030	2,880	2,880	1	1,130	3,080	3,080	1	1,1230	3,280	3,280	1	1,340	3,500	3,500	1	1,450	3,840	3,840	1	1,560	4,214	4,214	1	1,670	4,434	4,434	1	1,780	4,664	4,664	1	1,890	4,894	4,894
22	5	17	–	293	4,981	19	–	293	5,567	21	–	293	6,153	23	–	293	6,739	25	–	293	7,325	27	–	293	7,911	29	–	293	8,497	31	–	293	9,083	33	–	293	9,669	35	–	293	10,255
23	3	1	930	985	985	1	1,030	1,085	1,085	1	1,130	1,195	1,195	1	1,230	1,305	1,305	1	1,340	1,415	1,415	1	1,450	1,525	1,525	1	1,560	1,635	1,635	1	1,670	1,745	1,745	1	1,780	1,855	1,855	1	1,890	1,965	1,965
24	3	28	–	111	3,108	34	–	111	3,774	40	–	111	4,440	46	–	111	5,106	52	–	111	5,772	58	–	111	6,438	64	–	111	7,104	70	–	111	7,770	76	–	111	8,436	82	–	111	9,102

#3=ø3/8" OR 9 MM., #5=ø5/8" OR 16 MM., #6=ø3/4" OR 20 MM., #8=ø1" OR 25 MM. NO = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR.

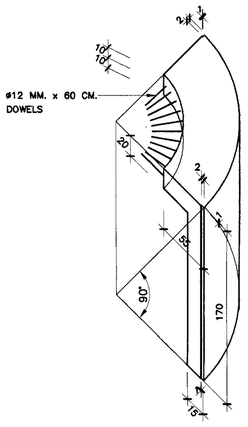
NUMBER OF BOX GIRDER	D CM.	D1 CM.	D7 CM.	D2 CM.	PILE FOOTING									SKEW 0°–30°	SKEW 30°–50°	PILE HEAD SPACING C–C 0°–30° SKEW		PILE HEAD SPACING C–C 30°–50° SKEW		SPREAD FOOTING	
					NUMBER OF PILES															HALF LENGTH OF FOOTING D_5 CM.	WIDTH OF FOOTING D_6 CM.
					P_1	P_2	P_3	P_4	P_5	P_6	P_7	P_8	P_9			D_3	D_4	D_3	D_4		
7	740 SEC θ	206 SEC θ	20 SEC θ	104 SEC θ	4	4	4	4	–	–	–	–	2	16	16	94 SEC θ	85 SEC θ	80 SEC θ	80 SEC θ	320 SEC θ + 150	300
8	840 SEC θ	240 SEC θ	20 SEC θ	–	4	4	4	4	–	–	–	–	2	16	18	110 SEC θ	95 SEC θ	98 SEC θ	76 SEC θ	370 SEC θ + 150	300
9	940 SEC θ	273 SEC θ	20 SEC θ	137 SEC θ	4	4	4	4	4	–	–	–	2	18	20	110 SEC θ	90 SEC θ	98 SEC θ	77 SEC θ	420 SEC θ + 150	300
10	1,040 SEC θ	306 SEC θ	20 SEC θ	154 SEC θ	4	4	4	4	4	–	–	–	2	20	22	110 SEC θ	85 SEC θ	98 SEC θ	78 SEC θ	470 SEC θ + 150	300
11	1,150 SEC θ	257.5 SEC θ	25 SEC θ	–	4	4	4	4	4	4	–	–	2	22	24	110 SEC θ	85 SEC θ	100 SEC θ	75 SEC θ	525 SEC θ + 150	300
12	1,260 SEC θ	285 SEC θ	30 SEC θ	–	4	4	4	4	4	4	–	–	2	24	26	110 SEC θ	85 SEC θ	100 SEC θ	80 SEC θ	580 SEC θ + 150	300
13	1,370 SEC θ	312.5 SEC θ	35 SEC θ	–	4	4	4	4	4	4	4	–	2	26	28	110 SEC θ	85 SEC θ	101 SEC θ	80 SEC θ	635 SEC θ + 150	300
14	1,480 SEC θ	272 SEC θ	40 SEC θ	–	4	4	4	4	4	4	4	–	2	28	30	110 SEC θ	85 SEC θ	102 SEC θ	78 SEC θ	690 SEC θ + 150	300
15	1,590 SEC θ	294 SEC θ	45 SEC θ	–	4	4	4	4	4	4	4	4	2	30	32	110 SEC θ	85 SEC θ	103 SEC θ	75 SEC θ	745 SEC θ + 150	300
16	1,700 SEC θ	316 SEC θ	50 SEC θ	–	4	4	4	4	4	4	4	4	2	32	34	110 SEC θ	85 SEC θ	103 SEC θ	79 SEC θ	800 SEC θ +150	300

TABLE OF SEC θ

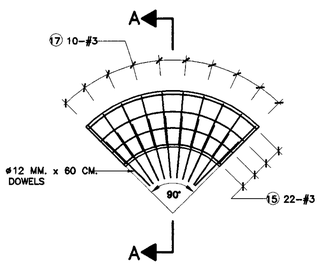
	SKEW ANGLE (θ)										
	0	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
SEC θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142	1.5557

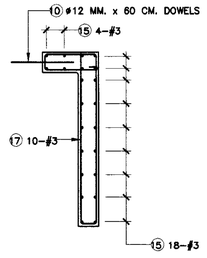
NOTES :

1. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 357 KM./CM.^{2} FOR 0.15x0.15x0.15 CUBE AT 28 DAYS.
2. CLEAR CONCRETE COVER SHALL BE 2.5 CM.
3. REBARS #4 OR LARGER SHALL BE TIS. 24 GRADE SD.40 DEFORMMED BARS , OTHERS SHALL BE TIS 20 GRADE SR.24 PLAIN BARS , UNLESS OTHERWISE INDICATED.
4. LOCATIONS OF LAB SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
5. LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIMETERS OF BIGGER BAR FOR DEFORMED BARS.
6. ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER. FOR ELASTOMERIC PADS, CONTRACTOR SHALL SUBMIT A CERTIFICATE FROM THE MANUFACTURER SHOWING THAT THEY WILL PERFORM IN ACCORDANCE WITH SPECIFICATIONS.
7. PILES SHALL BE LOCATED BY STARTING FROM PILE NO. P9 AT THE CENTERLINE OF THE PIER AND THE PILE SPACINGS D3 AND D4 SHALL BE MEASURED FROM THIS PILE ORDER TO LOCATE PILE NOS P8–P1 RESPECTIVELY. IF THERE IS NO PILE NO P9 AT THE CENTERLINE OF THE PIER, THE FIRST PILE SPACING D3 ADJACENT TO THE CENTERLINE OF THE PIER SHALL BE SUBSTITUTED BY D3/2.
8. FOR PIERS WITH SKEW ANGLES OF 0°–30°, ALL PILES UNDER MARK ( ) SHALL BE OMITTED AND PILES UNDER MARK (•) SHALL BE ADDED ON WHEREVER THOSE MARKS APPEAR.
9. FOR PIERS WITH SKEW ANGLES OF 30°–50°,ALL PILES UNDER MARK (•–•) SHALL BE OMITTED.
10. FOR PILE FOOTING PIERS, EACH PILE SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 125 TONS AND SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
11. FOR PILE DETAILS SEE DWG. NO. PL–101 OR PL–201
12. IN CASE OF NON–SKEW BRIDGE, BEARING UNDER 10.00 M. SPAN SLAB BRIDGE SHALL BE CONSTANTLY 22 CM. WIDE.
13. LENGTH AND AMOUNT OF REINF. SHOWN IN THE TABLE MAY VARY ACCORDING TO PIER SHAPE BUT SPACING SHALL BE AS SHOWN ON THE DWG.
14. REBARS FOR PILE FOOTING PIER ARE BAR MARK NO. 1–18.
15. REBARS FOR SPREAD FOOTING PIER ARE BAR MARK NO. 7–13 AND BAR MARK NO. 19–24.
16. QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.00 M. AS SHOWN ON DWG. NO. WS–215 FOR PILE FOOTING PIERS. THESE QUANTITIES DO NOT INCLUDE REBARS IN THE PILES.
17. WORK THIS DRAWING WITH DWG. NO. WS–215
18. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
19. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 5BD20–10–614/5
20. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

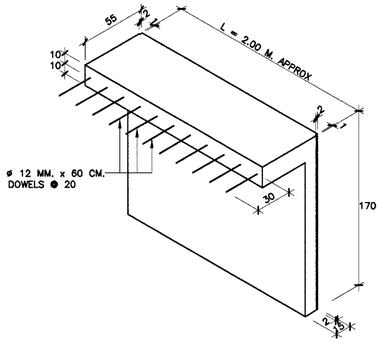


PRECAST SKIRTING "A" DETAILS
SCALE 1 : 30

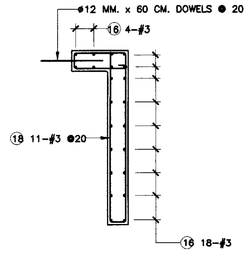




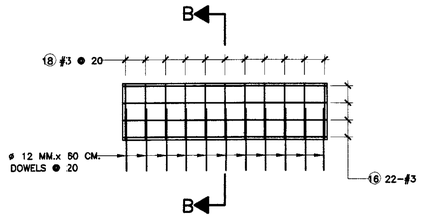
SECTION A – A
SCALE 1 : 30

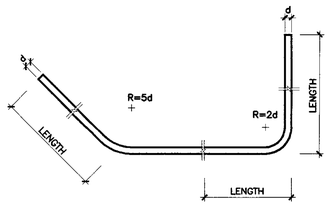


PRECAST SKIRTING "B" DETAILS
SCALE 1 : 30

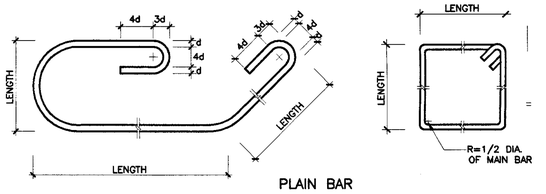


SECTION B – B
SCALE 1 : 30





DEFORMED BAR



PLAIN BAR

BAR BENDING DETAILS
NOT TO SCALE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

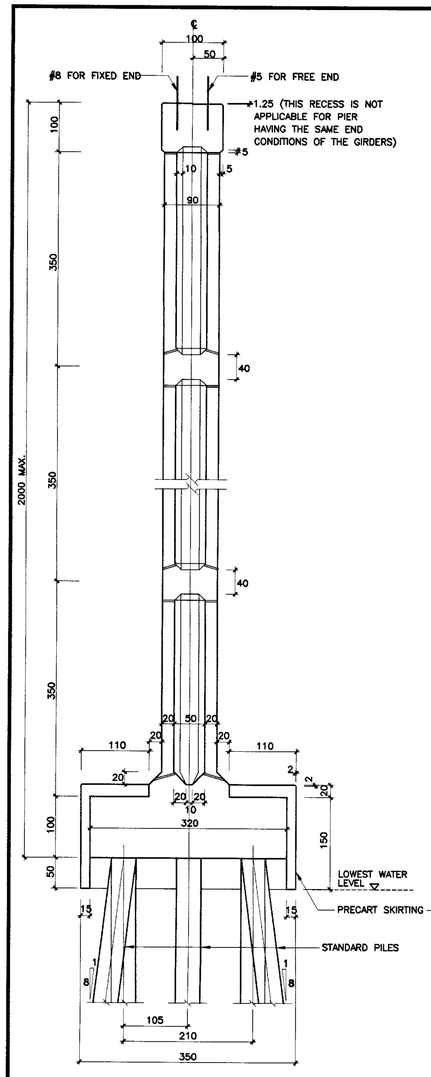
0°–50° SKEW PC. BOX GIRDER BRIDGE 20.00 M. SPAN

PIER REINFORCING AND SKIRTING DETAILS, H_{MAX} = 12.00 M.

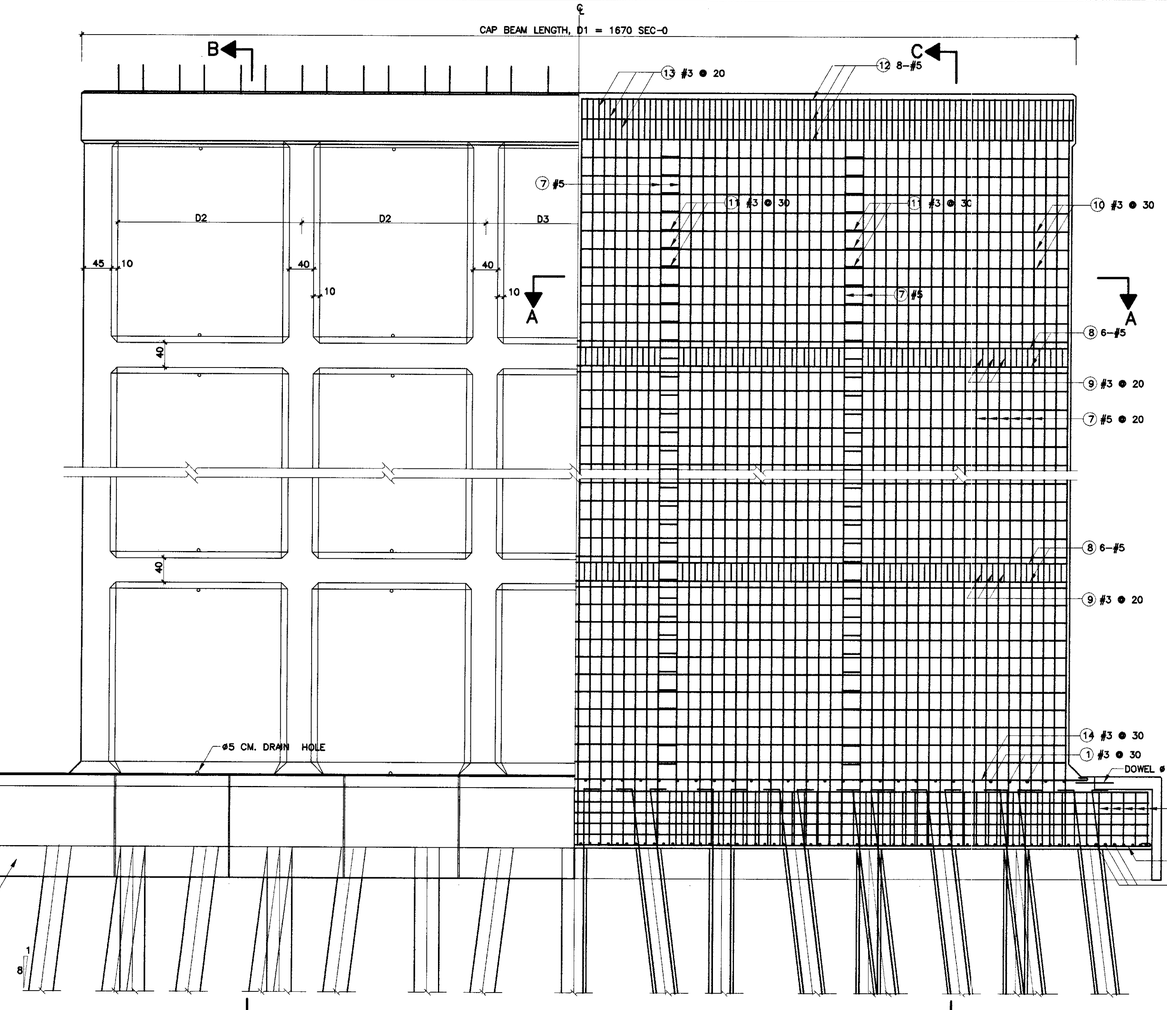
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. WS–216
SHEET NO. 131

D:\std dwg 2015\WS-216(REV00)



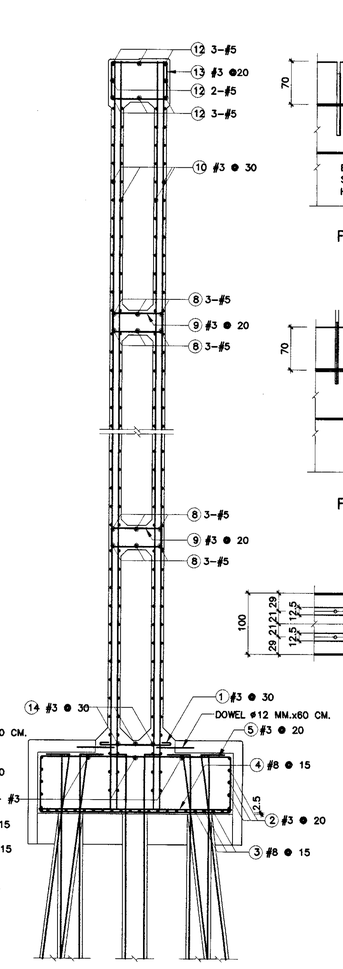
SECTION B – B
SCALE 1 : 50



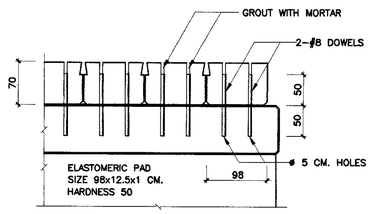
HALF PILE FOOTING ELEVATION

HALF PILE FOOTING REINFORCEMENT

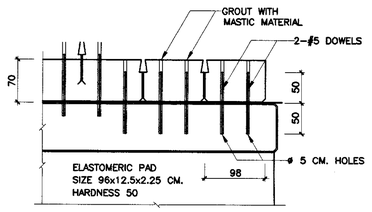
ELEVATION AND REINFORCEMENT DETAIL
SCALE 1 : 50



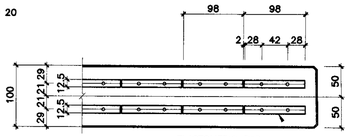
SECTION C – C
SCALE 1 : 50



FIXED BEARING ELEVATION

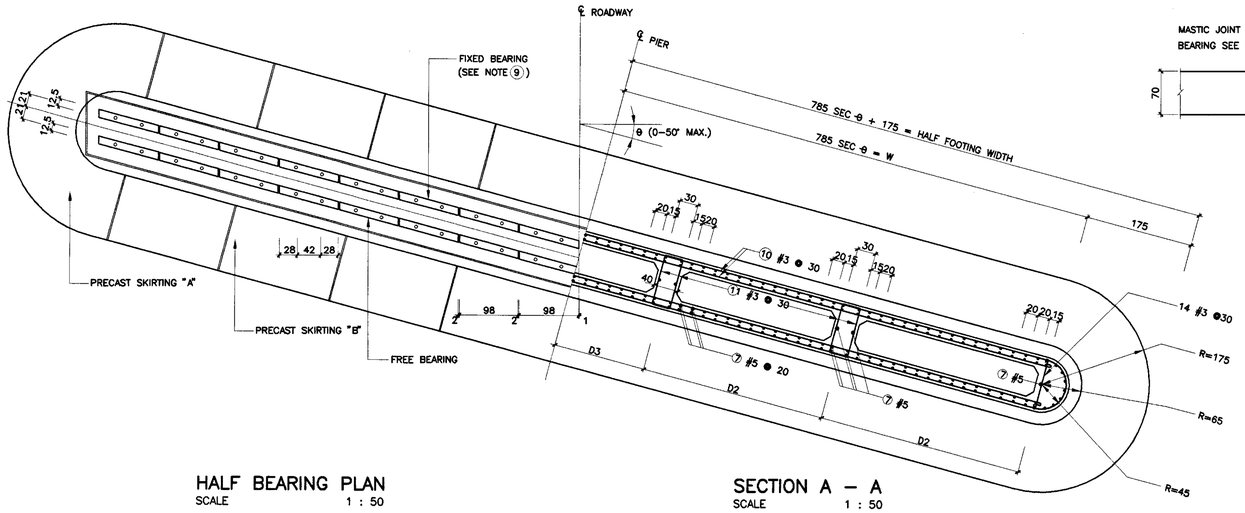


FREE BEARING ELEVATION



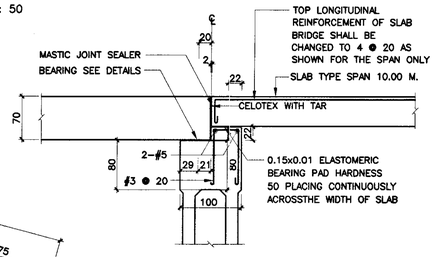
PLAN

BEARING DETAILS
SCALE 1 : 50

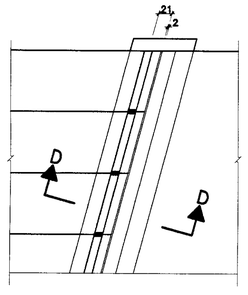


HALF BEARING PLAN
SCALE 1 : 50

SECTION A – A
SCALE 1 : 50



SECTION D – D
SCALE 1 : 50



PILE HEAD DETAILS
SCALE 1 : 50

NOTES :
1. WORK THIS DRAWING WITH DWG. NO. WS–218 AND WS–219.
2. FOR SKIRT DETAILS SEE DWG. NO. WS–219.
3. ALL EXPOSED CONCRETE CORNERS SHALL HAVE 2 CM CHAMFERS UNLESS OTHERWISE INDICATED.
4. HORIZONTAL STIFFENERS BETWEEN WALLS OF A PIER SHALL BE PROVIDED AT EQUAL SPACING OF NOT MORE THAN 3.50 M.
5. DIAPHRAGM COLUMNS SHALL BE ARRANGED IN SUCH A WAY THAT BOTH D_2 AND $2D_3$ SHALL NOT BE QREATER THAN 3.20 M.
6. FOR PILE DETAILS SEE DWG. NO. PL–101 OR PL–201
7. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
8. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 5BD20–10–614/2
9. PIER IS FOR SUPPORTING BOX GIRDERS
10. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

REMARKS : #3 = 9 MM., #5 = 16 MM., #6 = 20 MM., #8 = 25 MM.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

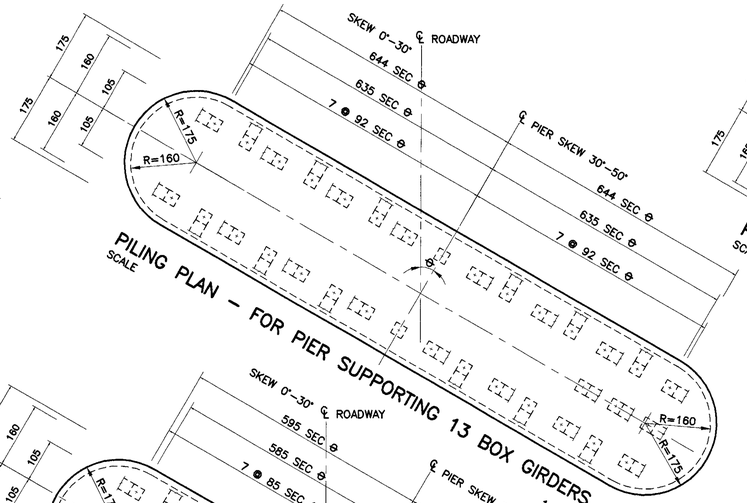
STANDARD DRAWING

0°–50° SKEW PC. BOX GIRDER BRIDGE 20.00 M. SPAN
PILE FOOTING PIER DETAILS, H_{MAX} = 20.00 M.

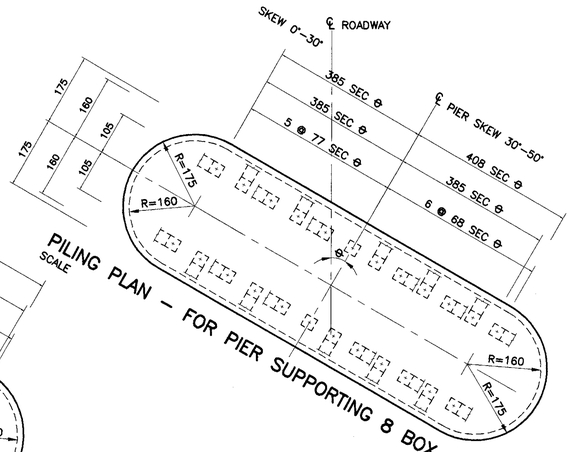
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS–217
		SHEET NO. 132

REF.	REVISION	SIGNATURE	DATE

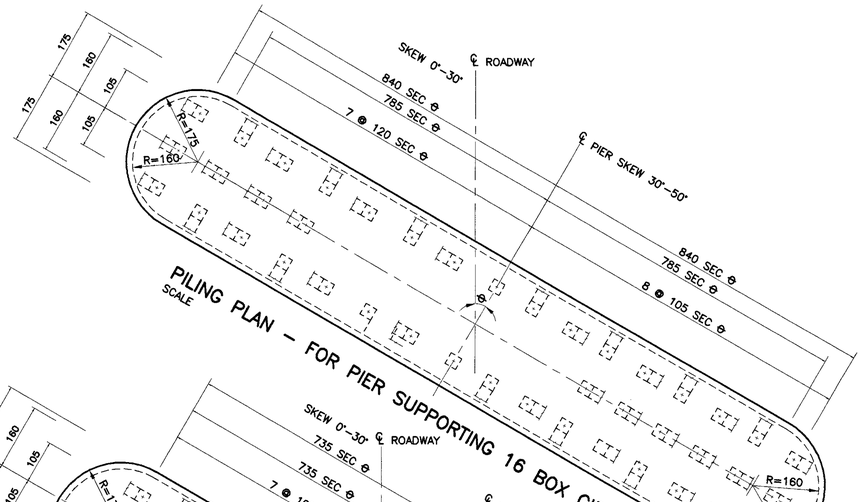
D:\std dwg 2015\WS-217(REV00)



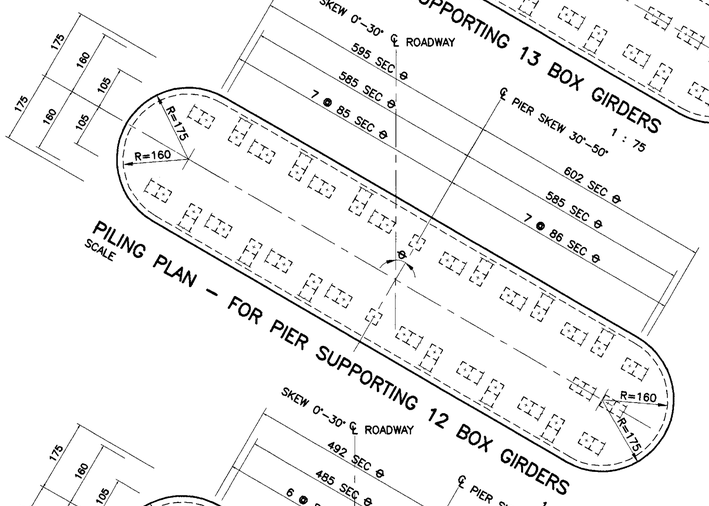
PILING PLAN - FOR PIER SUPPORTING 13 BOX GIRDERS
SCALE 1 : 75



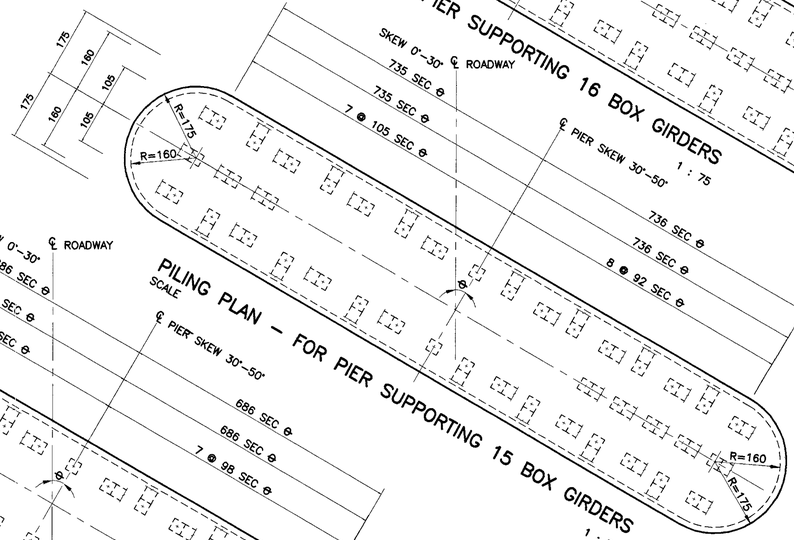
PILING PLAN - FOR PIER SUPPORTING 8 BOX GIRDERS
SCALE 1 : 75



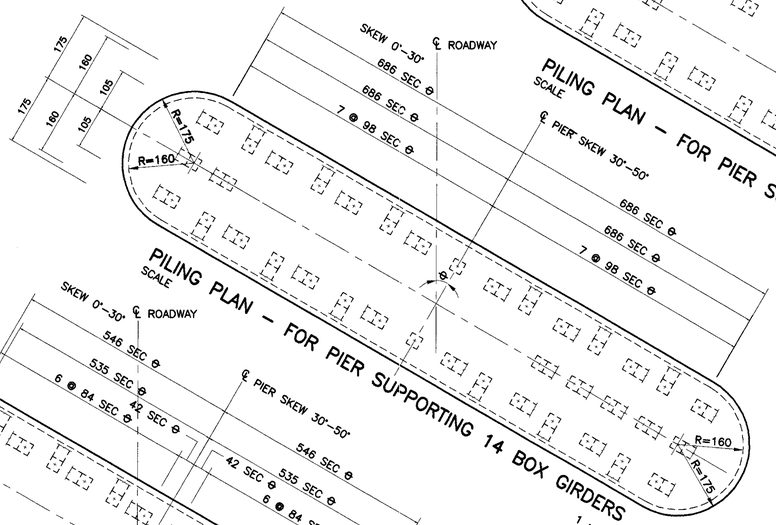
PILING PLAN - FOR PIER SUPPORTING 16 BOX GIRDERS
SCALE 1 : 75



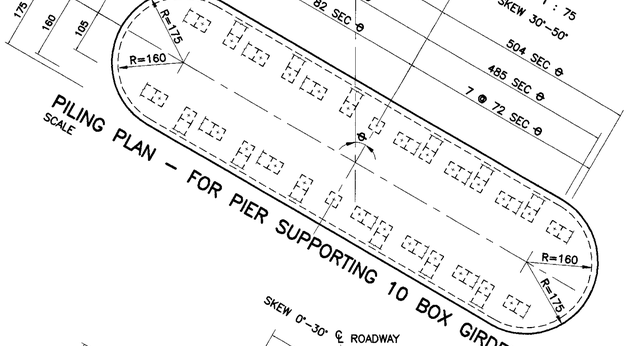
PILING PLAN - FOR PIER SUPPORTING 12 BOX GIRDERS
SCALE 1 : 75



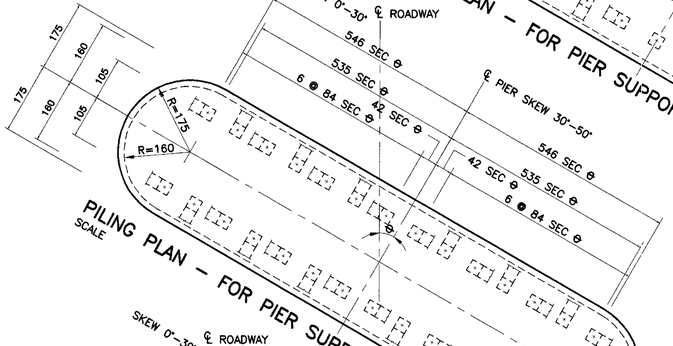
PILING PLAN - FOR PIER SUPPORTING 15 BOX GIRDERS
SCALE 1 : 75



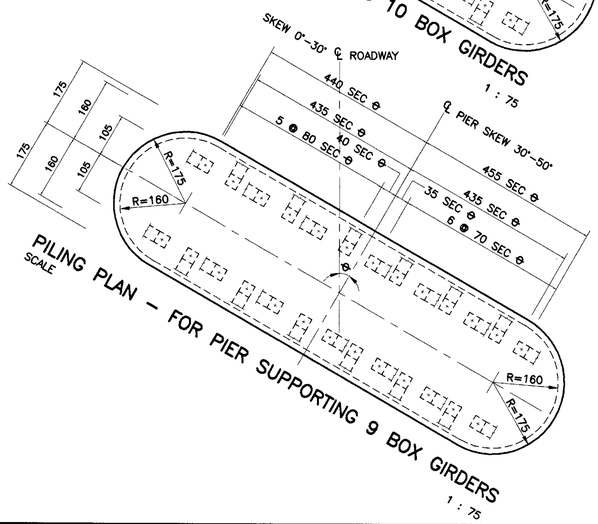
PILING PLAN - FOR PIER SUPPORTING 14 BOX GIRDERS
SCALE 1 : 75



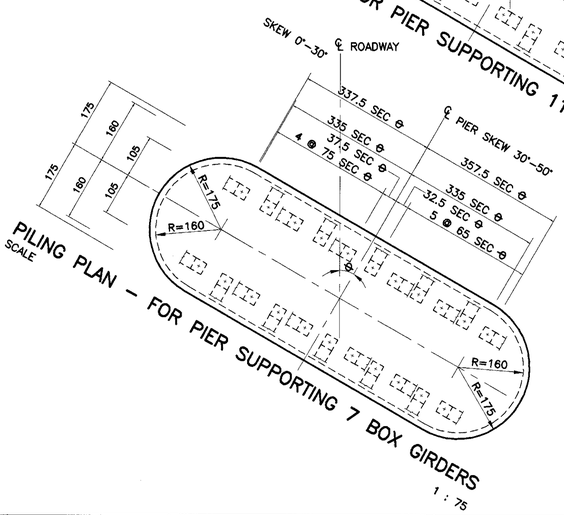
PILING PLAN - FOR PIER SUPPORTING 10 BOX GIRDERS
SCALE 1 : 75



PILING PLAN - FOR PIER SUPPORTING 11 BOX GIRDERS
SCALE 1 : 75



PILING PLAN - FOR PIER SUPPORTING 9 BOX GIRDERS
SCALE 1 : 75



PILING PLAN - FOR PIER SUPPORTING 7 BOX GIRDERS
SCALE 1 : 75

NOTES :

1. WORK THIS DRAWING WITH DWG. NO. WS-217 AND WS-219.
2. SLOPES OF ALL BATTERED PILES SHALL BE 1:8
3. EACH PILE SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 125 TONS AND SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT TIS CAPACITY.
4. THE SKEW ANGLE (ϴ) IS THE ANGLE DEGREE BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
5. FOR PILE DETAILS SEE DWG. NO. PL-101 OR PL-201
6. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN-001 TO GN-003
7. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 5BD 20-10-614/1
8. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

TABLE OF SEC ϴ

	SKEW ANGLE (ϴ)										
	0	5	10	15	20	25	30	35	40	45	50
SEC	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142	1.5557

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

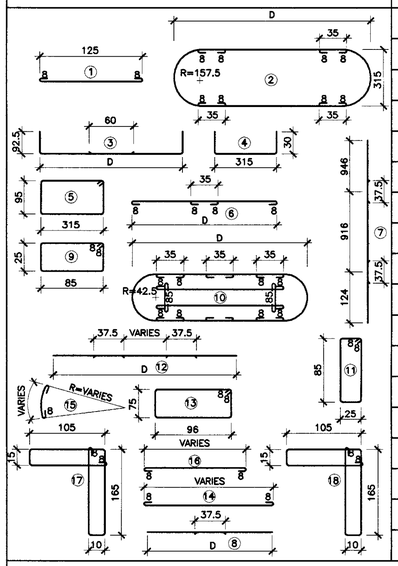
0°-50° SKEW PC. BOX GIRDER BRIDGE 20.00 M. SPAN
PILE FOOTING PIER, PILING PLANS, H_{MAX} = 20.00 M.

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. WS-218
		SHEET NO. 133

D:\std dwg 2015\WS-218(REV00)

TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS CM.

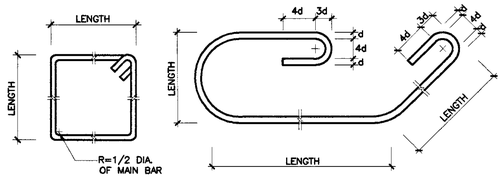


BAR MARK	#	7–BOX GIRDER NO	D	L	TOTAL LENGTH	8–BOX GIRDER NO	D	L	TOTAL LENGTH	9–BOX GIRDER NO	D	L	TOTAL LENGTH	10–BOX GIRDER NO	D	L	TOTAL LENGTH	11–BOX GIRDER NO	D	L	TOTAL LENGTH	12–BOX GIRDER NO	D	L	TOTAL LENGTH	13–BOX GIRDER NO	D	L	TOTAL LENGTH	14–BOX GIRDER NO	D	L	TOTAL LENGTH	15–BOX GIRDER NO	D	L	TOTAL LENGTH	16–BOX GIRDER NO	D	L	TOTAL LENGTH
1	3	●30	–	141	3,907	●30	–	141	4,230	●30	–	141	4,796	●30	–	141	5,217	●30	–	141	5,640	●30	–	141	6,073	●30	–	141	6,637	●30	–	141	7,060	●30	–	141	7,483	●30	–	141	8,047
2	3	●20	905	2,533	12,645	●20	1,086	2,733	13,665	●20	1,185	2,933	14,665	●20	1,285	3,133	15,665	●20	1,385	3,333	16,595	●20	1,495	3,533	17,665	●20	1,585	3,733	18,645	●20	1,685	3,933	19,665	●20	1,795	4,135	20,665	●20	1,885	4,333	21,665
3	8	23	1,015	1,260	28,980	23	1,115	1,360	31,280	23	1,215	1,460	33,580	23	1,315	1,560	35,880	23	1,415	1,660	38,180	23	1,515	1,760	40,480	23	1,615	1,860	42,790	23	1,715	1,960	45,080	23	1,815	2,080	47,360	23	1,915	2,160	49,680
4	8	68	–	375	25,500	75	–	375	28,125	82	–	375	30,750	68	–	375	33,000	95	–	375	35,625	101	–	375	37,875	106	–	375	40,500	115	–	375	43,125	122	–	375	45,750	128	–	375	48,000
5	3	51	–	836	42,636	56	–	836	46,816	61	–	836	50,996	66	–	836	55,176	71	–	836	59,356	76	–	836	63,536	81	–	836	67,716	86	–	836	71,896	91	–	836	76,076	96	–	836	80,256
6	3	3	1,015	–	3,045	3	1,115	–	3,348	3	1,215	–	3,645	3	1,315	–	3,946	3	1,415	–	4,248	3	1,515	–	4,546	3	1,615	–	4,846	3	1,715	–	5,146	3	1,815	–	5,446	3	1,915	–	5,746
7	5	190	–	2,061	391,590	200	–	2,061	412,200	210	–	2,061	432,810	220	–	2,061	453,420	230	–	2,061	474,030	240	–	2,061	494,640	250	–	2,061	515,250	260	–	2,061	535,860	270	–	2,061	556,470	280	–	2,061	577,080
8	5	24	750	–	18,912	24	850	–	21,312	24	950	–	23,712	24	1,080	–	26,112	24	1,150	–	28,512	24	1,250	–	30,912	24	1,380	–	33,312	24	1,450	–	35,712	24	1,550	–	38,112	24	1,650	–	40,512
9	3	120	–	236	28,320	140	–	236	33,040	160	–	236	37,760	180	–	236	42,480	200	–	236	47,200	220	–	236	51,920	240	–	236	56,640	260	–	236	61,360	280	–	236	66,080	300	–	236	70,800
10	3	58	735	3,442	199,636	58	855	3,842	222,836	58	955	4,242	246,036	58	1,055	4,642	269,236	58	1,155	5,042	292,436	58	1,255	5,442	315,636	58	1,386	5,842	338,836	53	1,455	6,242	362,056	58	1,555	6,642	385,236	56	1,688	7,042	408,436
11	3	116	–	236	27,376	116	–	236	27,376	116	–	236	27,376	116	–	236	27,376	174	–	236	41,064	174	–	236	41,064	174	–	236	41,064	232	–	236	54,752	232	–	236	54,752	232	–	236	54,752
12	5	8	765	840	6,720	8	865	940	7,520	8	965	1,040	8,320	8	1,065	1,140	9,120	8	1,165	1,240	9,920	8	1,265	1,340	10,720	8	1,365	1,440	11,520	8	1,465	1,540	12,320	8	1,565	1,640	13,120	8	1,665	1,740	13,920
13	3	38	–	356	13,528	43	–	356	15,308	48	–	356	17,088	53	–	356	18,868	56	–	356	20,646	63	–	356	22,428	68	–	356	24,208	73	–	356	25,988	78	–	356	27,768	83	–	356	29,548
14	3	●20	–	804	4,020	●20	–	904	4,520	●20	–	1,004	5,020	●20	–	1,104	5,520	●20	–	1,204	6,020	●20	–	1,304	6,520	●20	–	1,404	7,020	●20	–	1,504	7,520	●20	–	1,604	8,020	●20	–	1,704	8,520
15	3	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348	104	–	–	26,348
16	3	208	–	185	38,480	208	–	204	42,432	260	–	185	48,100	260	–	205	53,300	312	–	191	59,592	312	–	206	64,272	364	–	193	70,252	364	–	207	75,348	416	–	195	81,120	416	–	208	66,528
17	3	44	–	581	25,564	44	–	581	25,564	44	–	581	25,564	44	–	581	25,364	44	–	581	25,564	44	–	581	25,564	44	–	581	25,564	44	–	581	25,564	44	–	581	25,564	44	–	581	25,564
18	3	●20	–	581	41,832	●20	–	581	51,128	●20	–	581	58,100	●20	–	581	63,910	●20	–	581	69,720	●20	–	581	76,692	●20	–	581	81,340	●20	–	581	89,474	●20	–	581	92,960	●20	–	581	102,256

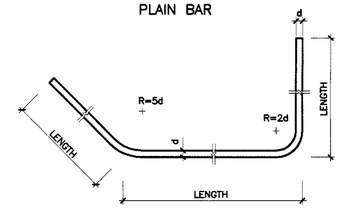
#3 = ø3/8" OR 9 MM. #4 = ø1/2" OR 12 MM. #5 = ø5 5/8" OR 16 MM. #6 = ø1" OR 25 MM. NO = TOTAL AMOUNT OF BARS L= TOTAL LENGTH OF EACH BAR

TABLE OF SEC θ

	SKEW ANGLE (θ) 0	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
SEC θ	1.0000	1.0058	1.0154	1.0353	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142	1.5557

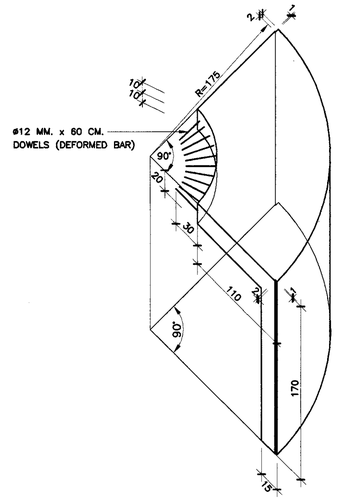


PLAIN BAR



DEFORMED BAR

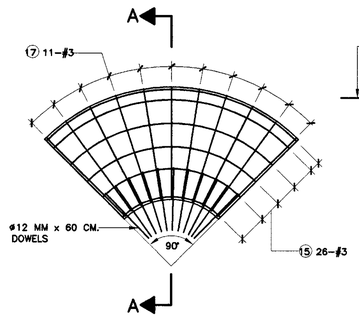
BAR BENDING DETAILS
NOT TO SCALE



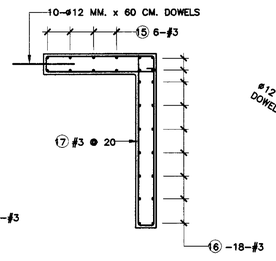
PILE FOOTING

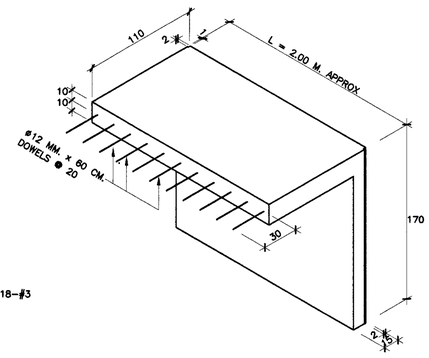
NUMBER OF BOX GIRDER	D1 CM.	D2 CM.	D3 CM.	HALF LENGTH OF FOOTING CM.	WIDTH OF FOOTING CM.	NUMBER OF PILES 0°–30° SKEW	NUMBER OF PILES 30°–50° SKEW	PILE HEAD SPACING C–C 0°–30° SKEW	PILE HEAD SPACING C–C 30°–50° SKEW	W (CM.)
7	770 SEC θ	216 SEC θ	109 SEC θ	335 SEC θ + 175	350	20	24	75 SEC θ	85 SEC θ	335 SEC θ
8	870 SEC θ	250 SEC θ	–	385 SEC θ + 175	350	22	26	77 SEC θ	68 SEC θ	385 SEC θ
9	970 SEC θ	283 SEC θ	142 SEC θ	435 SEC θ + 175	350	24	28	80 SEC θ	70 SEC θ	435 SEC θ
10	1,070 SEC θ	316 SEC θ	169 SEC θ	485 SEC θ + 175	350	26	30	82 SEC θ	72 SEC θ	485 SEC θ
11	1,170 SEC θ	262.5 SEC θ	–	535 SEC θ + 175	350	28	32	84 SEC θ	84 SEC θ	535 SEC θ
12	1,270 SEC θ	287.5 SEC θ	–	585 SEC θ + 175	350	30	34	85 SEC θ	86 SEC θ	585 SEC θ
13	1,370 SEC θ	312.5 SEC θ	–	635 SEC θ + 175	350	32	36	92 SEC θ	92 SEC θ	635 SEC θ
14	1,470 SEC θ	270 SEC θ	–	685 SEC θ + 175	350	34	40	98 SEC θ	98 SEC θ	685 SEC θ
15	1,570 SEC θ	290 SEC θ	–	735 SEC θ + 175	350	36	44	105 SEC θ	92 SEC θ	735 SEC θ
16	1,670 SEC θ	310 SEC θ	–	785 SEC θ + 175	350	38	46	120 SEC θ	105 SEC θ	785 SEC θ

NOTES:
1. WORK THIS DRAWING WITH DWG. NO. WS–217 AND WS–218
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 357 KG./CM.^{2} FOR 0.15x0.15x0.15 CUBE AT 28 DAYS.
3. CLEAR CONCRETE COVER SHALL BE 2.5 CM.
4. REBARS DB12 OR LARGER SHALL BE TIS24 GRADE SD40 DEFORMED BARS, OTHERS SHALL BE TIS20 GRADE SR24 PLAIN BARS, UNLESS OTHERWISE INDICATED.
5. LOCATIONS OF LAB SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
6. LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
7. IN CASE OF NON–SKEW BRIDGE, BEARINGS UNDER 10.00 M. SPAN SLAB BRIDGE SHALL BE CONSTANTLY 22 CM. WIDE
8. ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER. FOR ELASTOMERIC PADS, CONTRACTOR SHALL SUBMIT A CERTIFICATE FROM THE MANUFACTURER SHOWING THAT THEY WILL PERFORM IN ACCORDANCE WITH THE SPECIFICATIONS.
9. QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 20.00 M.
10. LENGHT AND AMOUNT OF REBARS SHOWN IN THE TABLE MAY VARY ACCORDING TO PIER SHAPE BUT SPACING SHALL BE AS SHOWN ON THE DRAWINGS.
11. THE PROPERTIES OF MATERIAL AND ORTHER DETAILS ARE NOT SHOWN IN THIS DRAWING, SEE THE STANDARD DRAWINGS NUMBER GN–001 TO GN–003
12. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 5BD20–10–614/3
13. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

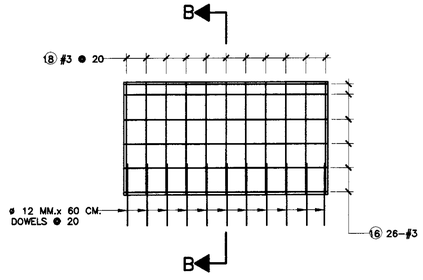


SECTION A – A
SCALE 1 : 30

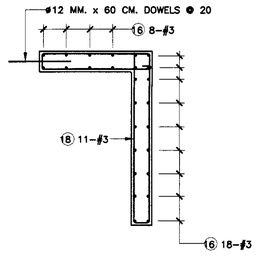




PRECAST SKIRTING "A" DETAILS
SCALE 1 : 30



PRECAST SKIRTING "B" DETAILS
SCALE 1 : 30



SECTION B – B
SCALE 1 : 30

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

0°–50° SKEW PC. BOX GIRDER BRIDGE 20.00 M. SPAN
PIER REINFORCING AND SKIRTING DETAILS, H_{MAX}= 20.00 M.

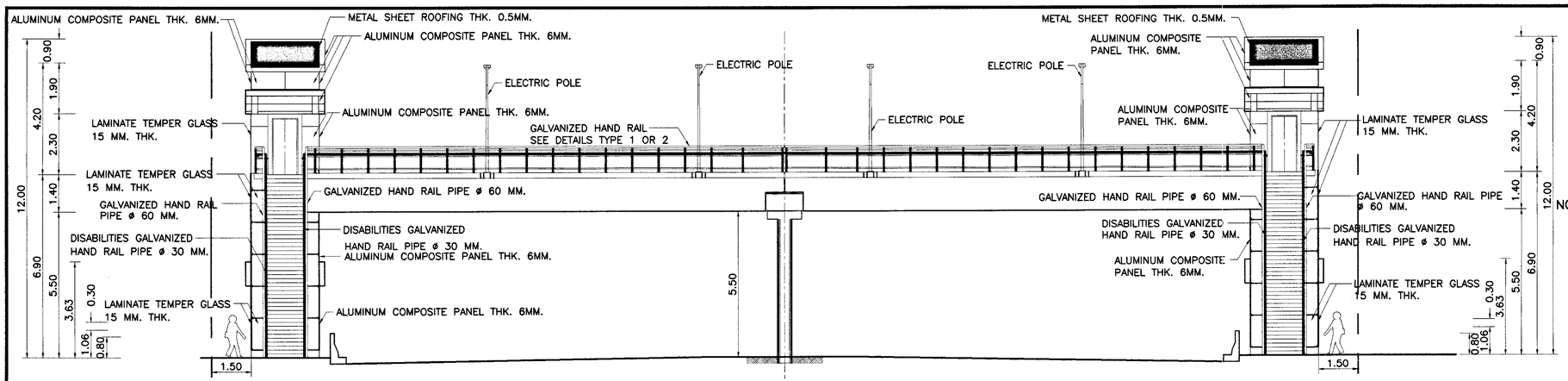
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

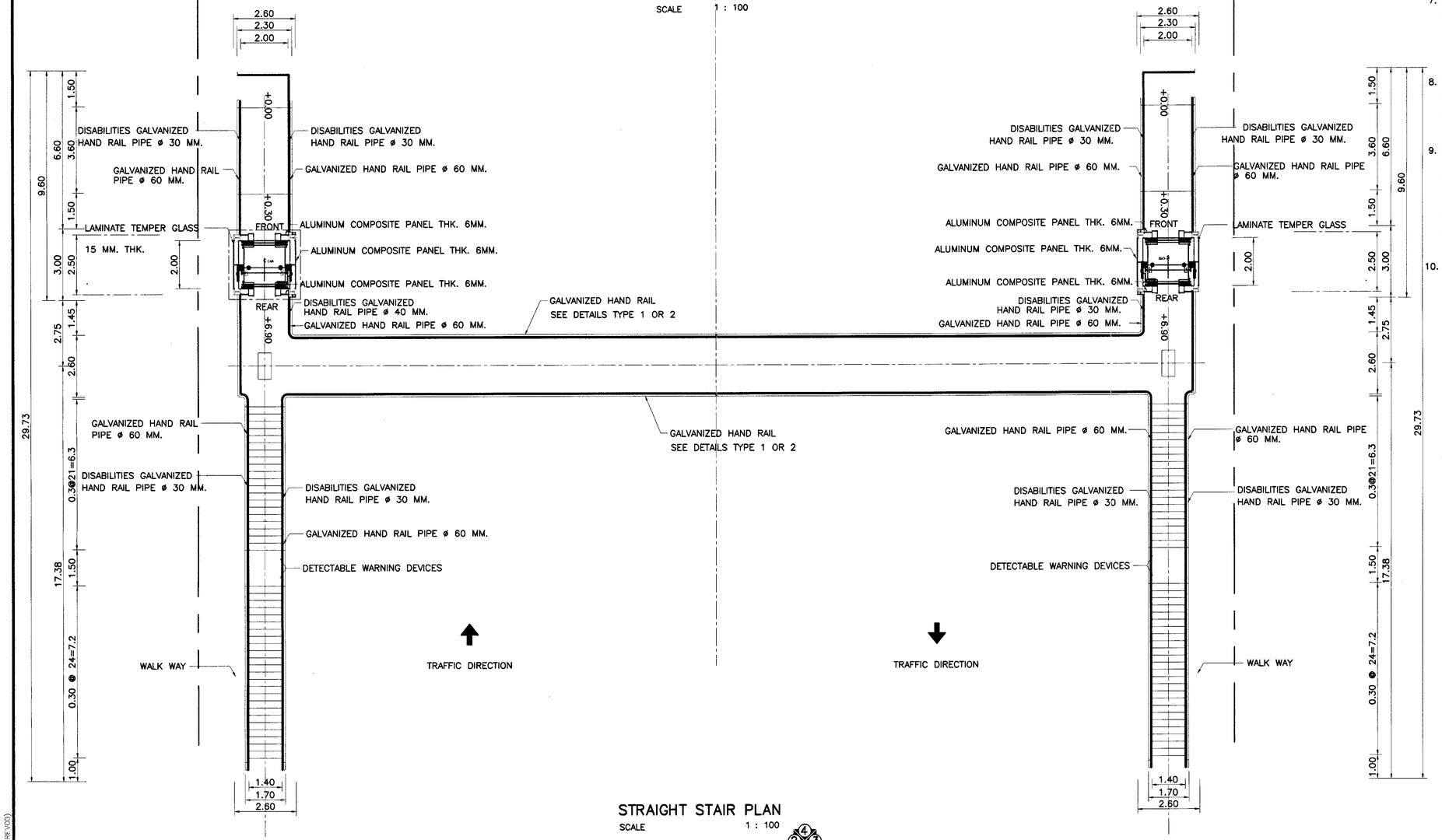
APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. WS–219 | SHEET NO. 134

D:\std dwg 2015\WS-219(REV00)



ELEVATION 1

SCALE 1 : 100



STRAIGHT STAIR PLAN

SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. WALL IS FINISHED BY ALUMINUM COMPOSITE PANEL
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY. ELEVATOR SHALL BE MACHINE ROOM LESS TYPE. AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M. AND WALKWAY SHOULD BE CLEAR BETWEEN WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. WALK WAY, SLOPE AND STAIR WIDTH MUST BE AT LEAST 1.50 M. CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE. WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH. INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE. (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS, WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR. LANDING MUST BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 - 0.90 M. WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT. AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M. IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM. SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED WALL TEXTURE SHALL BE SMOOTH.
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

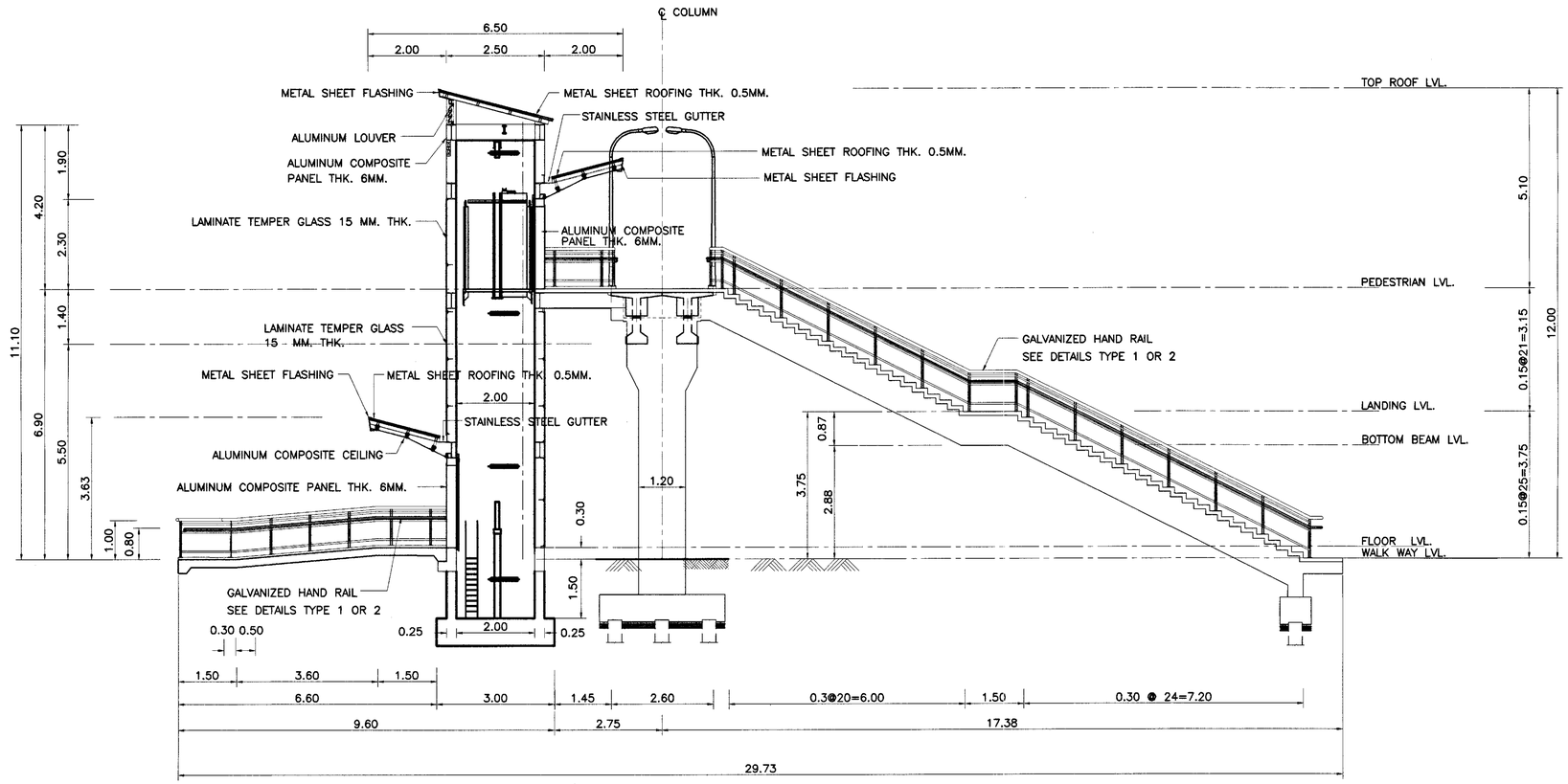
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL TYPE 1
ELEVATION 1 AND PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. APH-101
		SHEET NO. 135

D:\std dwg 2015\APH-101(REV00)



STRAIGHT STAIR SECTION

SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. WALL IS FINISHED BY ALUMINUM COMPOSITE PANEL
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY. ELEVATOR SHALL BE MACHINE ROOM LESS TYPE. AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M. AND WALKWAY SHOULD BE CLEAR BETWEEN WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. WALK WAY, SLOPE AND STAIR WIDTH MUST BE AT LEAST 1.50 M. CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE. WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH. INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE. (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS, WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR. LANDING MUST BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M. WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT. AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M. IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM. SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED WALL TEXTURE SHALL BE SMOOTH.
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

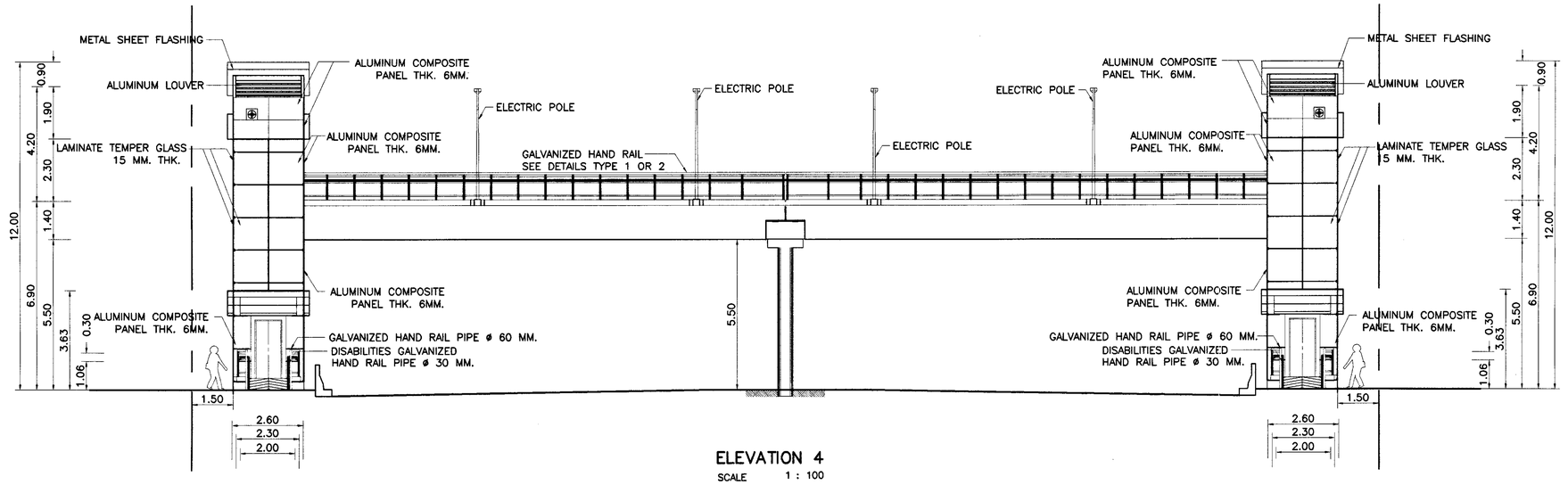
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL TYPE 1
SECTION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. APH-102
		SHEET NO. 136

D:\std dwg 2015\APH-102(6EV00)

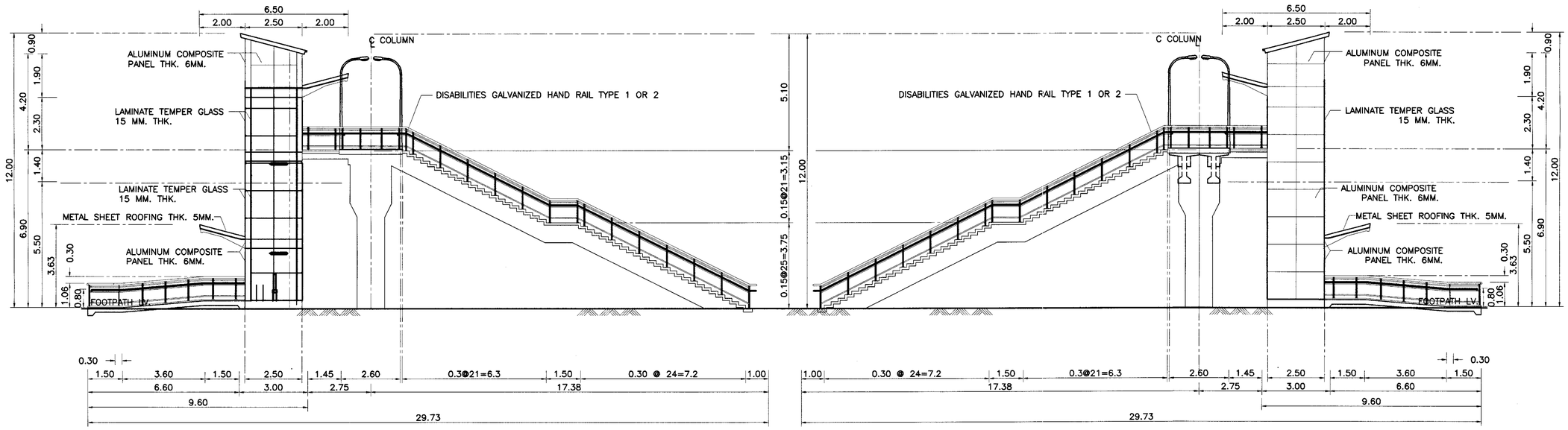


ELEVATION 4

SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. WALL IS FINISHED BY ALUMINUM COMPOSITE PANEL
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY. ELEVATOR SHALL BE MACHINE ROOM LESS TYPE. AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M. AND WALKWAY SHOULD BE CLEAR BETWEEN WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. WALK WAY, SLOPE AND STAIR WIDTH MUST BE AT LEAST 1.50 M. CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE. WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH. INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE. (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS, WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR. LANDING MUST BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M. WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT. AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M. IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM. SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED WALL TEXTURE SHALL BE SMOOTH.
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101



WALK-WAY SIDE ELEVATION

SCALE 1 : 100

TRAFFIC SIDE ELEVATION

SCALE 1 : 100

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

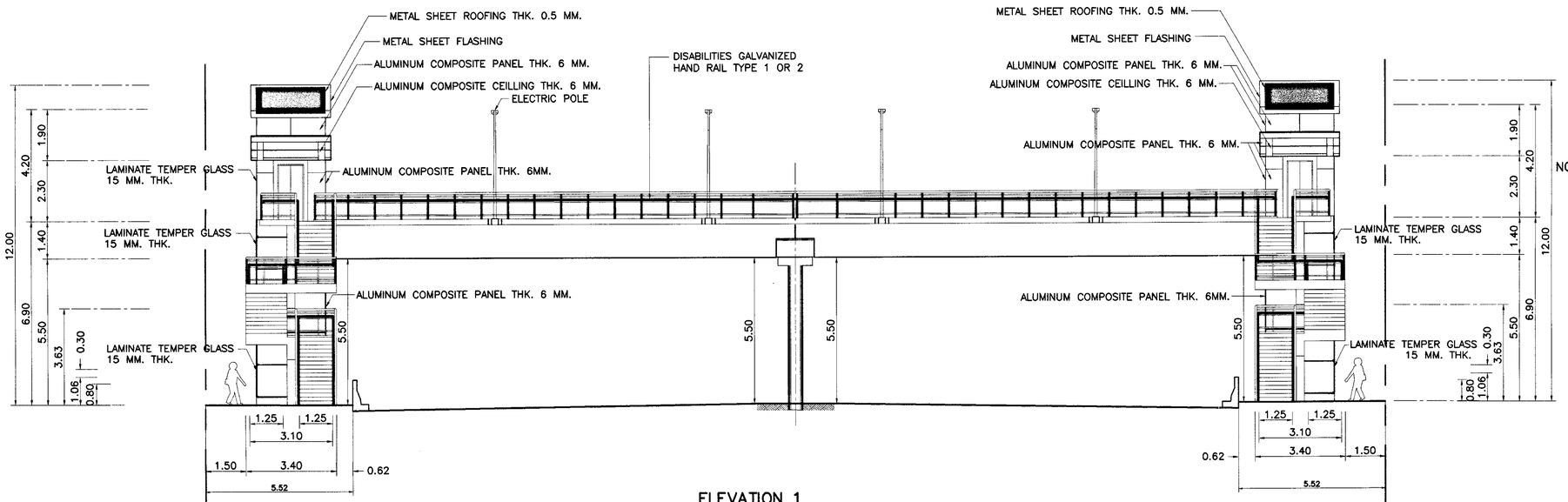
HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL TYPE 1

ELEVATION 4 AND SIDE VIEWS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. APH-103
			SHEET NO. 137

REF.	REVISION	SIGNATURE	DATE

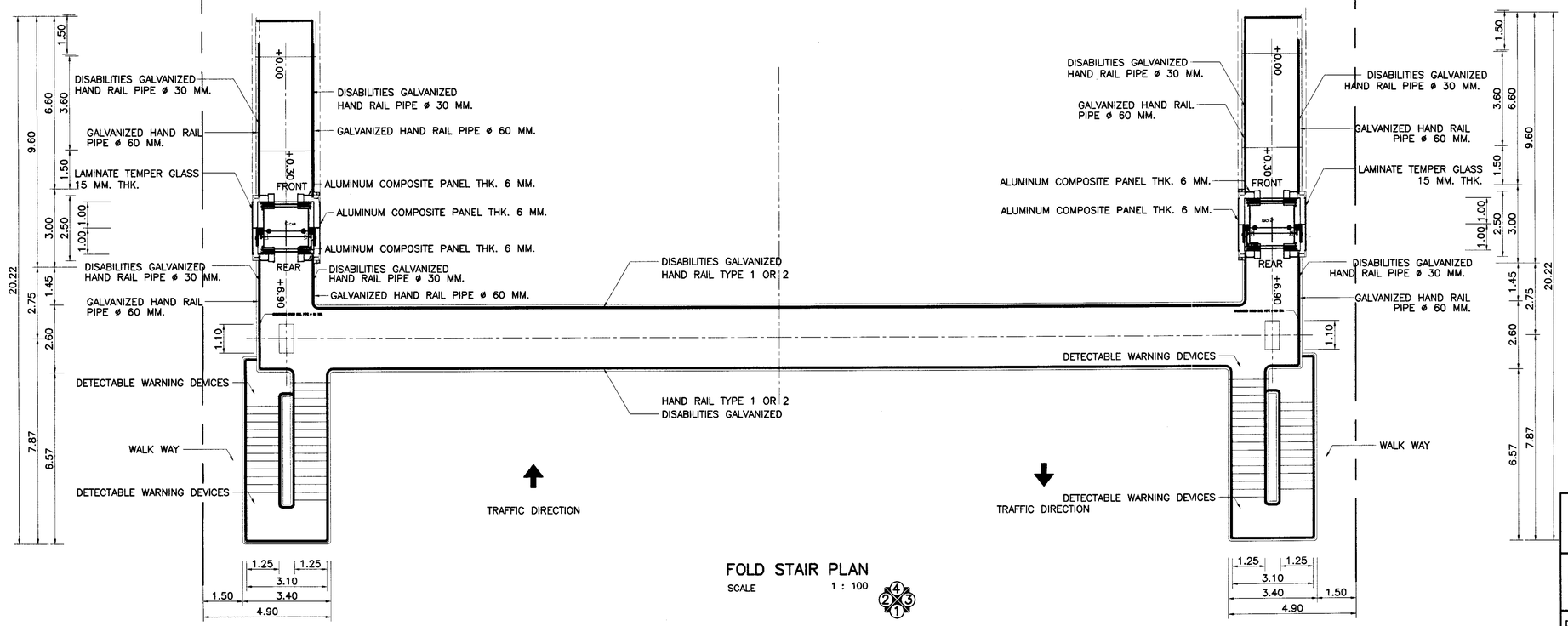
D:\std dwg 2015\APH-103(REV00)



ELEVATION 1
SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. WALL IS FINISHED BY ALUMINUM COMPOSITE PANEL
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY. ELEVATOR SHALL BE MACHINE ROOM LESS TYPE. AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M. AND WALKWAY SHOULD BE CLEAR BETWEEN WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. WALK WAY, SLOPE AND STAIR WIDTH MUST BE AT LEAST 1.50 M. CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE. WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH. INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE. (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS, WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR. LANDING MUST BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M. WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT. AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M. IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM. SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED WALL TEXTURE SHALL BE SMOOTH.
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101



FOLD STAIR PLAN
SCALE 1 : 100

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

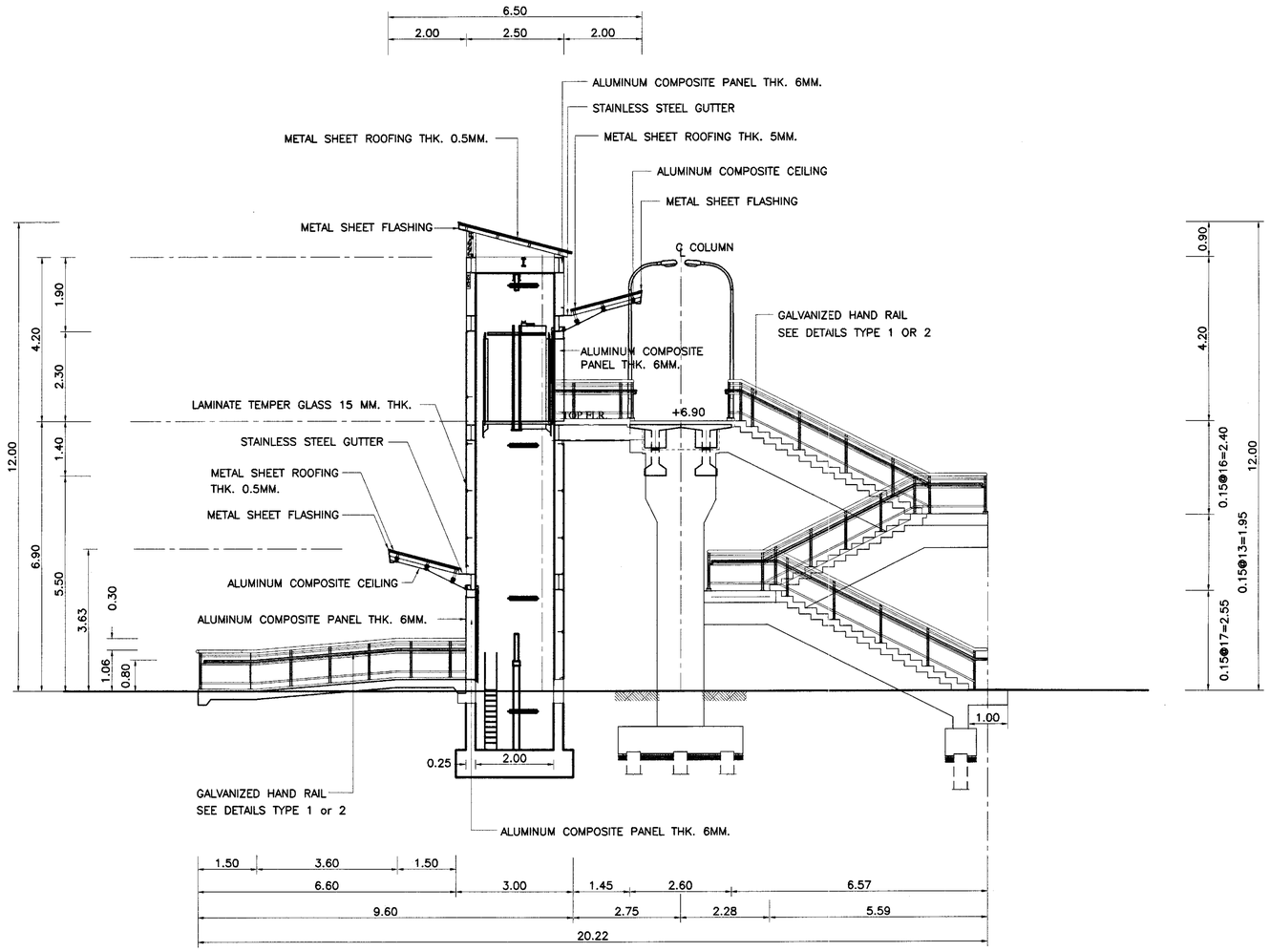
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL TYPE 2
ELEVATION 1 AND PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED :	(DIRECTOR OF LOCATION & DESIGN BUREAU)	SCALE : AS SHOWN
APPROVED :	(FOR DIRECTOR GENERAL)	DWG NO. APH-104
		SHEET NO. 138

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\APH-104(REV00)



FOLD STAIR SECTION

SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. WALL IS FINISHED BY ALUMINUM COMPOSITE PANEL
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY. ELEVATOR SHALL BE MACHINE ROOM LESS TYPE. AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M. AND WALKWAY SHOULD BE CLEAR BETWEEN WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. WALK WAY, SLOPE AND STAIR WIDTH MUST BE AT LEAST 1.50 M. CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE. WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH. INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE. (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS, WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR. LANDING MUST BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M. WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT. AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M. IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM. SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED WALL TEXTURE SHALL BE SMOOTH.
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

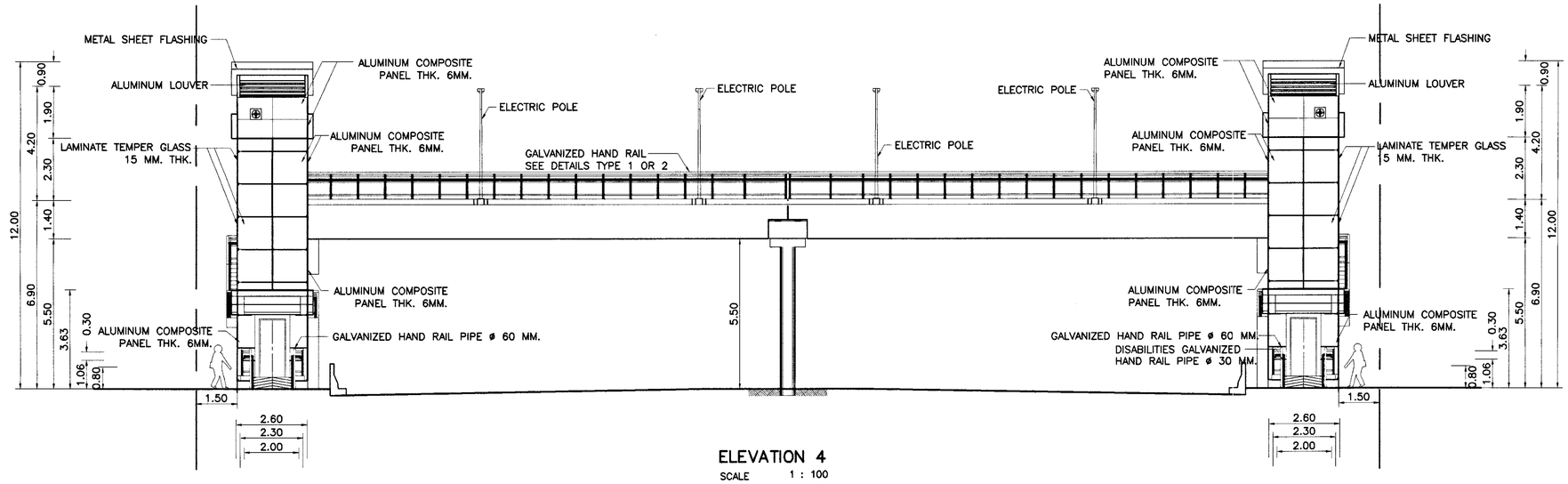
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL TYPE 2
SECTION

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. APH-105
		SHEET NO. 139

D:\std dwg 2015\APH-105(REV00)

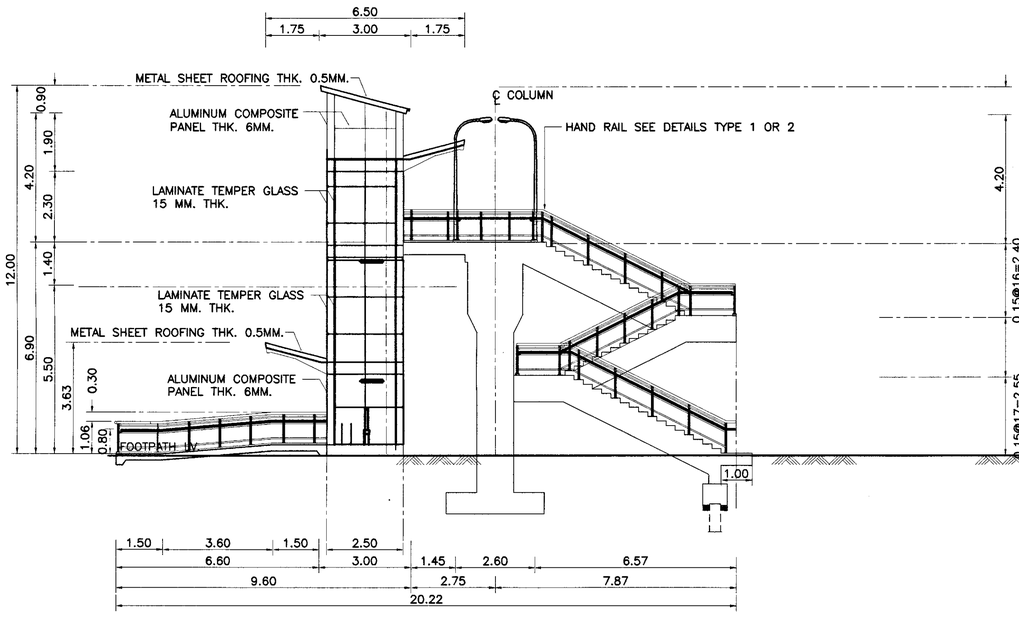


ELEVATION 4

SCALE 1 : 100

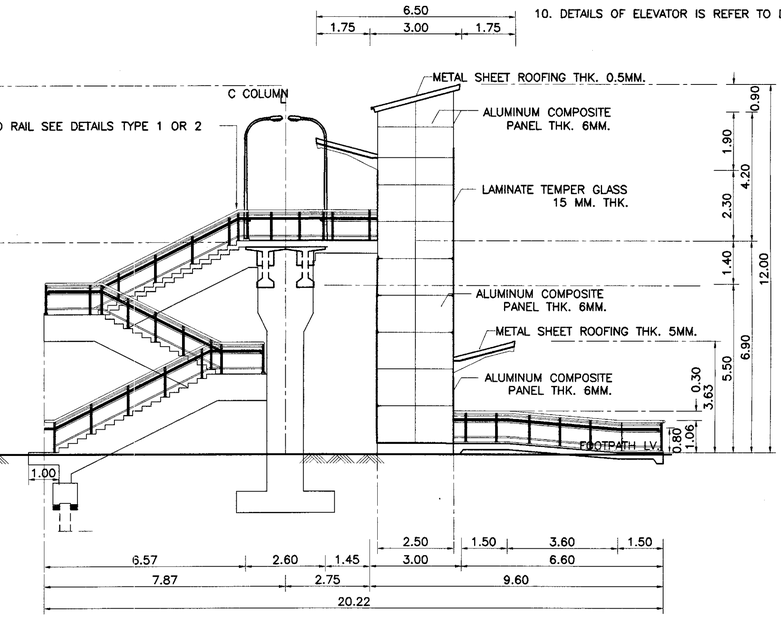
NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. WALL IS FINISHED BY ALUMINUM COMPOSITE PANEL
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY. ELEVATOR SHALL BE MACHINE ROOM LESS TYPE. AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M. AND WALKWAY SHOULD BE CLEAR BETWEEN WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. WALK WAY, SLOPE AND STAIR WIDTH MUST BE AT LEAST 1.50 M. CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE. WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH. INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE. (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS, WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR. LANDING MUST BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M. WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT. AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M. IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM. SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED WALL TEXTURE SHALL BE SMOOTH.
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101



WALK-WAY SIDE ELEVATION

SCALE 1 : 100



TRAFFIC SIDE ELEVATION

SCALE 1 : 100

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

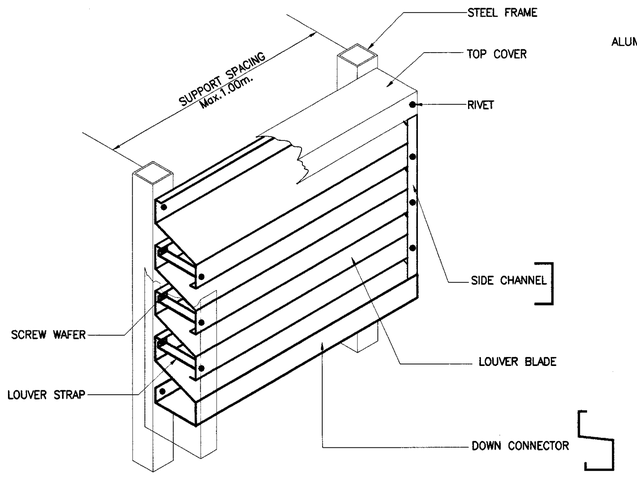
STANDARD DRAWING

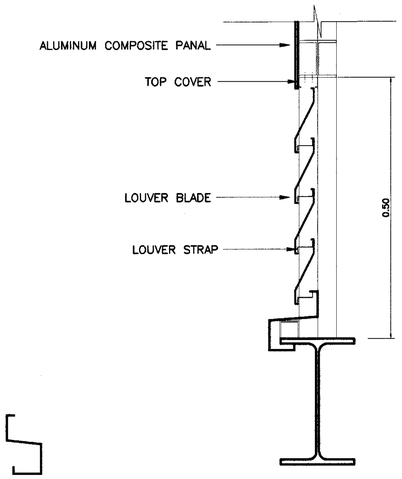
HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL TYPE 2

ELEVATION 4 AND SIDE VIEWS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. APH-106
		SHEET NO. 140

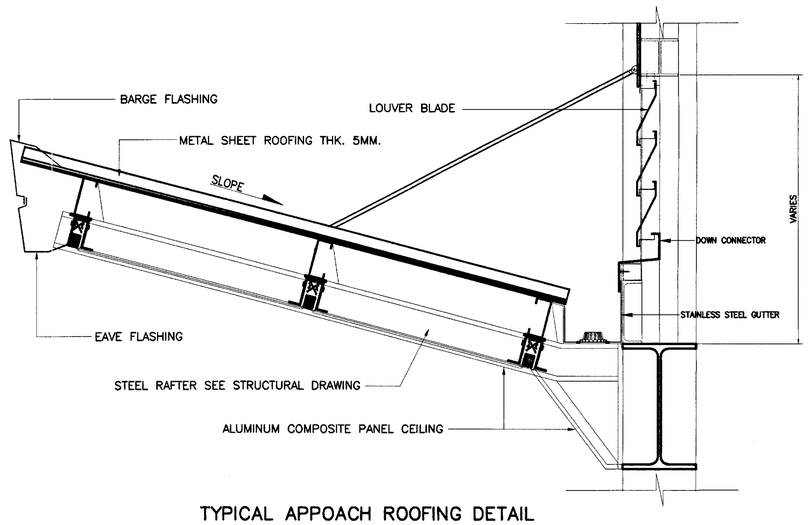
D:\std dwg 2015\APH-106(REV00)





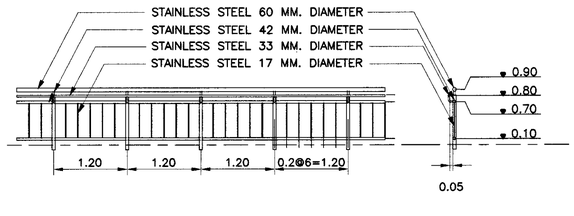
TYPICAL LOUVER DETAIL

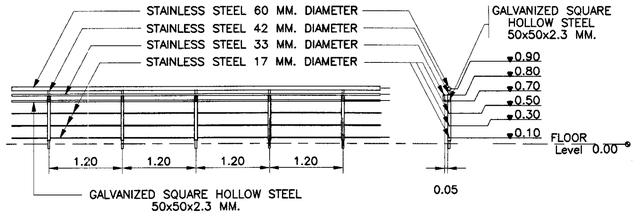
SCALE NOT TO SCALE

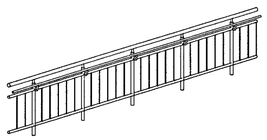


TYPICAL APPOACH ROOFING DETAIL

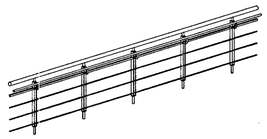
SCALE 1:100







BALUSTRADE TYPE 1



BALUSTRADE TYPE 2

TYPICAL BALUSTRADE DETAILS

SCALE 1:50

TYPICAL LIFT SHAFT ROOFING DETAIL

SCALE 1:100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. HOT ROLLED STRUCTURAL STEEL SECTIONS SHALL CONFORM TO TIS. 1227 GRADE SM 400.
3. HOLLOW STRUCTURAL STEEL SECTIONS SHALL CONFORM TO TIS. 107 GRADE HS 41.
4. METAL SHEET ROOFING SHALL CONFORM TO TIS. 1128 AND COLORED IN GREEN.
5. ANTI-CORROSIVE PRIMER PAINT SHALL CONFORM TO TIS.2387
6. STAINLESS STEEL BALUSTRADE PIPE SHALL CONFORM TO TIS 1006
   STAINLESS STEEL COLUMN SHALL BE 60 AND 40 MM. DIAMETER AND MINIMUM 2.77 MM. THK
   STAINLESS STEEL HANDRAIL SHALL BE 60 AND 33 MM. DIAMETER AND 1.65 MM. THK
7. STAINLESS SIEVE SHALL CONFORM TO TIS. 1378
8. LOUVER SHALL CONFORM TO TIS. 2223
9. TEMPERED GLASS SHALL CONFORM TO TIS. 965
10. LAMINATED GLASS SHALL CONFORM TO TIS. 1222
11. ALUMINUM COMPOSITE PANEL SHALL CONFORM TO TIS. 2314
12. STEEL ROLLING SHUTTER SHALL CONFORM TO TIS. 593
13. TEMPERED GLASS INSTALLATION SEE DWG. AUH-107 FOR DETAIL

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS ARCHITECTURAL ACCESSORY DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. APH-107
		SHEET NO. 141

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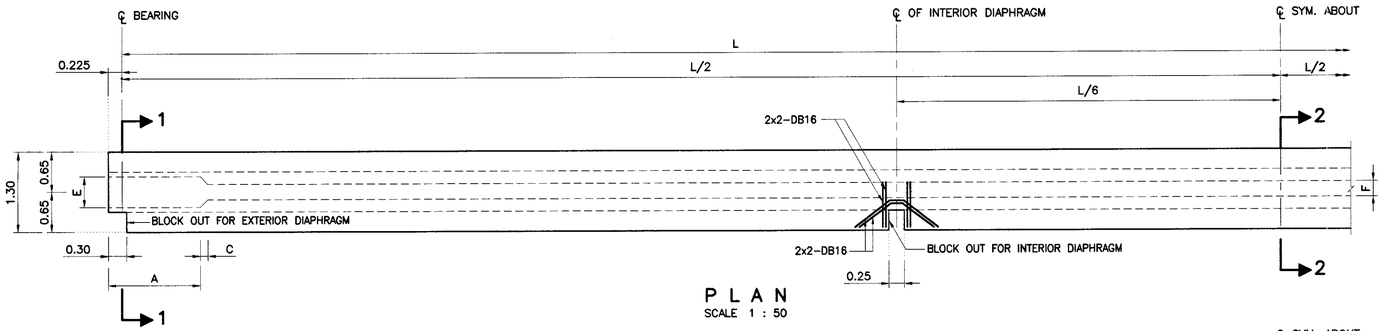
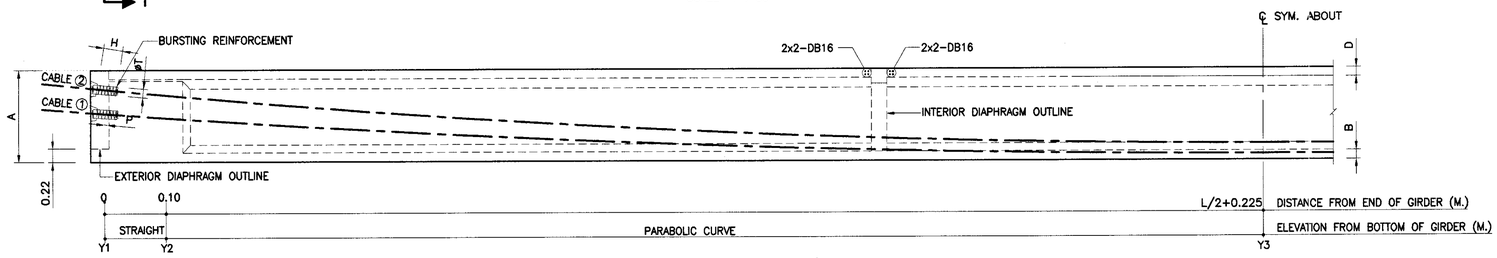
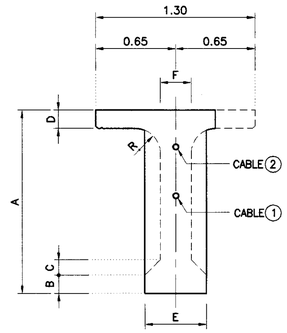


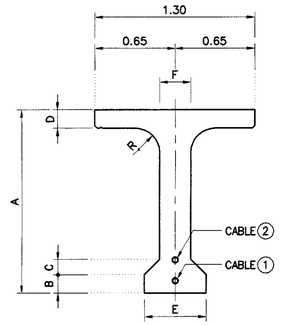
PLAN
SCALE 1 : 50



CABLE PROFILE
SCALE 1 : 50



SECTION 1 – 1
SCALE 1 : 50



SECTION 2 – 2
SCALE 1 : 50

BURSTING REINFORCEMENT

NO. OF STRANDS IN CABLE	DIAMETER OF REINFORCEMENT (MM.)	H (CM.)	øI (CM.)	PITCH, P (CM.)
13–19	DB16	33.00	35.00	5.50
8–12	DB16	28.50	27.00	5.50
4–7	DB12	21.00	20.00	5.00

NOTE :

1. GENERAL
   - 1.1 ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE
   - 2.1 HAVING A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15x15x15 CM. STANDARD CUBE TEST AT 28 DAYS NOT LESS THAN 45 MPa.
   - 2.2 HAVING A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15x15x15 CM. STANDARD CUBE AT TRANSFER STRESS OF NOT LESS THAN 0.8 OF CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS.
   - 2.3 ALL EXPOSED CORNERS SHALL BE CHAMFERED OF 10x10 MM.
3. REINFORCEMENT
   - 3.1 DEFORM BARS (DB) SHALL CONFORM TO TIS 24 GRADE SD40.
   - 3.2 ROUND BARS (RB) SHALL CONFORM TO TIS 20 GRADE SD24.
   - 3.3 CONCRETE COVER TO THE REINFORCEMENT TO BE 30 MM.
4. PRESTRESSING
   - 4.1 THE PRESTRESSING SYSTEM SHALL BE POST TENSION MULTI STRAND SYSTEM MEETING THE REQUIREMENTS OF THE LATEST AASHTO STANDARD SPECIFICATIONS. THE PRESTRESSING SYSTEM SHALL BE VSL, DYWIDAG, FREYSSINET, CCL, OR OTHER EQUIVALENT.
   - 4.2 PRESTRESSING STEEL SHALL BE ø12.7 MM. LOW RELAXATION SEVEN WIRE STRANDS CONFORMING TO TIS 420–1991 GRADE 1860 HAVING A BREAKING STRENGTH OF 184 KN/STRAND.
   - 4.3 REINFORCEMENT AT ANCHORAGE FOR POST TENSION SYSTEM SHALL BE MODIFIED TO MEET THE REQUIREMENT AND RECOMMENDATION OF THE SPECIFICATIONS AND THE ANCHORAGE MANUFACTURER TO BE USED.
   - 4.4 JACKING FORCE OF EACH CABLE SHALL BE 75% OF ULTIMATE STRENGTH OF PRESTRESSING STEEL EXCLUSIVE OF LOSSED DUE TO FRICTION IN THE JACK, ANCHORAGE AND ANCHORAGE SET

4 ø12.7 MM.	ULTIMATE TENSION	=	735	KN.
	JACKING FORCE	=	551	KN.
7 ø12.7 MM.	ULTIMATE TENSION	=	1,286	KN.
	JACKING FORCE	=	965	KN.
9 ø12.7 MM.	ULTIMATE TENSION	=	1,653	KN.
	JACKING FORCE	=	1,241	KN.
12 ø12.7 MM.	ULTIMATE TENSION	=	2,205	KN.
	JACKING FORCE	=	1,654	KN.
19 ø12.7 MM.	ULTIMATE TENSION	=	3,490	KN.
	JACKING FORCE	=	2,618	KN.

PRESTRESSING LOSSED ARE BASED ON THE FOLLOWING ASSUMPTIONS

COEFFICIENT OF FRICTION, μ	=	0.30
WOBBLE FRICTION COEFFICIENT, K	=	0.0066/M.
ANCHORAGE SEATING LOSS	=	0.25 INCH

   - 4.5 DUCT SHALL BE GROUTED WITH CEMENT SLURRY APPLY EXPOXY RESIN IMMEDIATELY AFTER THE STRESSING OF ALL TENDONS HAD BEEN COMPLETED AND APPROVED BY THE ENGINEER. THE GROUTING METHODOLOGY SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE ANCHORAGE MENUFACTURER UPON APPROVAL OF THE ENGINEER. AFTER GROUTING MATERIAL GAINED STRENGTH AS REQUIRIED, THE RECESSES FOR ANCHORAGE AT ENDS OF GIRDER SHALL BE FILLED IN WITH CONCRETE OF NON–SHRINK MATERIAL HAVING THE SAME STRENGTH AS THE GIRDER.
5. BEARING
   - 5.1 BEARING SHALL BE LAMINATED ELASTOMERIC BEARING CONFORMING TO THE LATEST AASHTO STANDARD SPACIFICATIONS FOR HIGHWAY BRIDGE AND AS SPECIFIED IN THIS DRAWING THE BEARING SHALL BE DESIGNED TO ACCOMMODATE THE LOADS AND DEFORMATIONS AS SPECIFIED IN THE TABLE BELOW.

DESCRIPTION	GIRDER TYPE						
	1	2	3	4	5	6	7
MAX. VERT. LOAD (KN.)	480	450	380	350	280	260	220
MIN. VERT. LOAD (KN.)	270	250	200	180	130	120	100
HOR. LONG LOAD (FIXED) (KN.)	23	22	18	17	13	11	10
HOR. MOVEMENT (FREE)							
– EXPANSION (MM.)	6	6	6	5	5	4	4
– CONTRACTION (MM.)	14	13	12	11	10	9	9
RODATION (RAD.)	0.006	0.005	0.006	0.006	0.006	0.005	0.006

   - 5.2 NON–SHRINK MATERIALS FOR LEVELING BEARING PLINTH OR BEARING SUPPORT SHALL BE USED IF ANY ADJUSTMENT TO THE BRIDGE BEARING SEATS ARE REQUIRED FOR BEARING BE PLACED HORIZONTALLY.

GIRDER & CABLE SCHEDULE

GIRDER TYPE	SPAN, L (M.)	DIMENSION (MM.)							CABLE NO.	NO. OF STRANDS IN CABLE	CABLE PROFILE (MM.)			TENSIONING SEQUENCE
		A	B	C	D	E	F	R			Y1	Y2	Y3	
1	35.26–37.75	1500	150	125	150	500	250	200	1	19	800	728	100	2
									2	19	1200	1104	270	1
2	32.76–35.25	1500	150	125	150	500	250	200	1	19	800	723	100	2
									2	12	1200	1097	270	1
3	30.26–32.75	1300	150	115	150	450	220	200	1	19	700	629	100	2
									2	9	1100	1002	270	1
4	27.76–30.25	1300	150	115	150	450	220	200	1	12	700	623	100	2
									2	12	1100	994	270	1
5	25.26–27.75	1100	120	100	120	400	200	150	1	12	500	444	100	2
									2	9	800	725	260	1
6	22.76–25.25	1100	120	100	120	400	200	150	1	12	500	439	100	2
									2	4	800	716	250	1
7	20.26–22.75	1000	120	60	120	300	180	150	1	7	400	350	100	2
									2	7	700	624	250	1

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

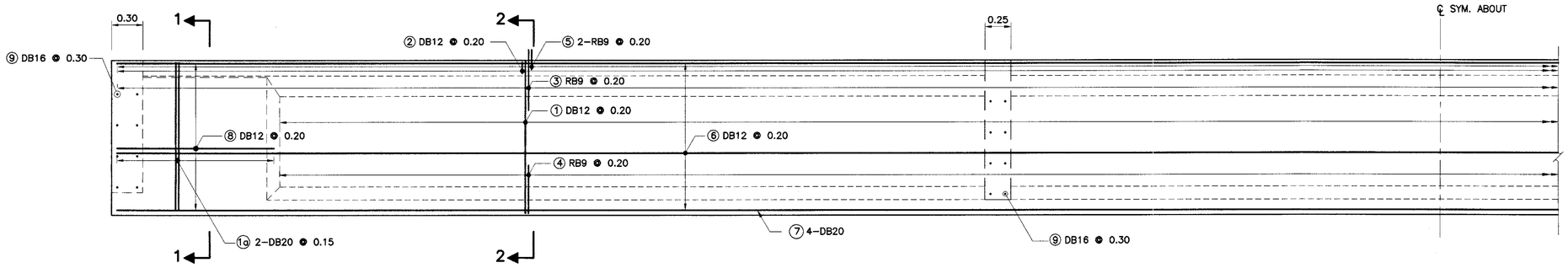
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
POST–TENSIONED CONCRETE GIRDER TYPE 1–7 DETAILS (1/2)

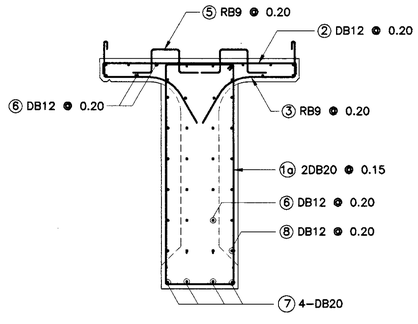
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. PH–001
SHEET NO. 142

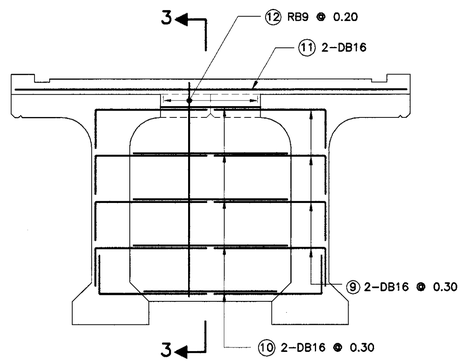
D:\std dwg 2015\PH-001(REV00)



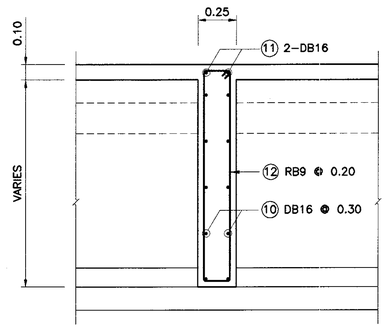
REINFORCEMENT DETAIL
SCALE 1 : 25



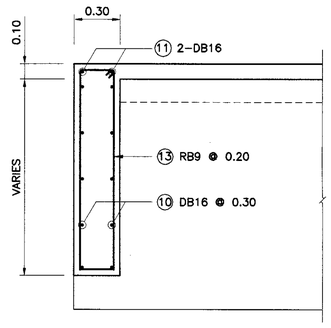
SECTION 1 – 1
SCALE 1 : 25



INTERIOR DIAPHRAGM REINFORCEMENT
SCALE 1 : 25



SECTION 3 – 3
SCALE 1 : 25



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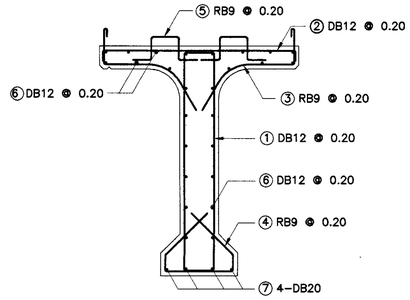
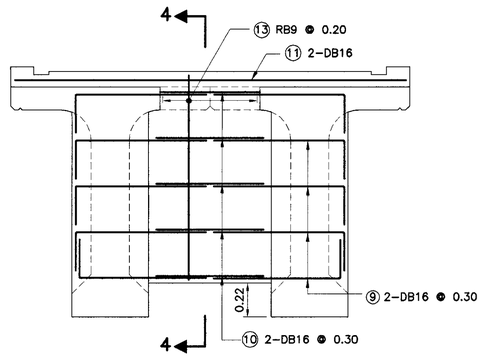
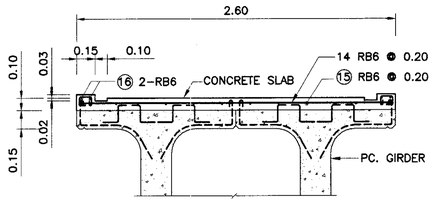
SCALE 1 : 25



SECTION 2 – 2
SCALE 1 : 25



EXTERIOR DIAPHRAGM REINFORCEMENT
SCALE 1 : 25



SLAB REINFORCEMENT
SCALE 1 : 25

TABLE OF REINFORCEMENT

BAR MARK	BAR DIAMETER (MM.)	BAR BENDING DIAGRAM (MM.)
①	DB12	120
①a	DB20	200
②	DB12	1240
③	RB9	90, 90
④	RB9	
⑤	RB9	180, 120, 120
⑥	DB12	VARIES
⑦	DB20	VARIES
⑧	DB12	VARIES
⑨	DB16	250, VARIES
⑩	DB16	VARIES
⑪	DB16	2500
⑫	RB9	90, VARIES, 190
⑬	RB9	90, VARIES, 240
⑭	RB6	2540, 60, 60
⑮	RB6	VARIES, 60, 60
⑯	RB6	90, 70

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SLAB AND DIAPHRAGM SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15x15x15 CM. STANDARD CUBE TEST AT 28 DAYS NOT LESS THAN 40 MPa.

REF.	REVISION	SIGNATURE	DATE

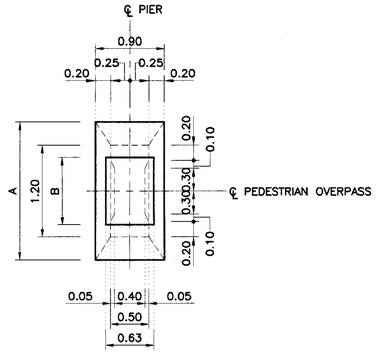
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

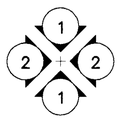
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
POST–TENSIONED CONCRETE GIRDER TYPE 1–7 DETAILS (2/2)

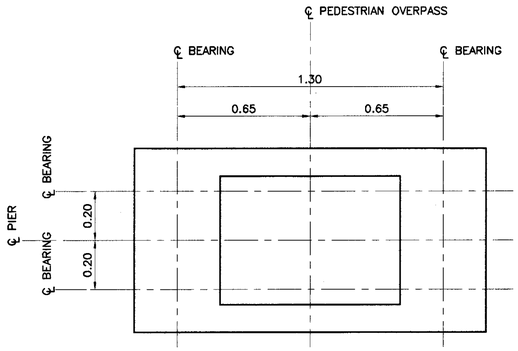
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–002
		SHEET NO. 143

D:\std dwg 2015\PH-002(REV00)

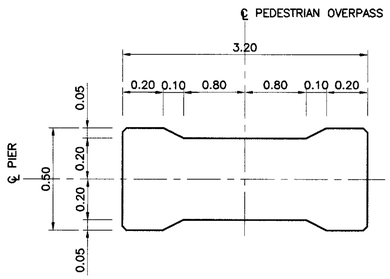


PLAN
SCALE 1 : 40

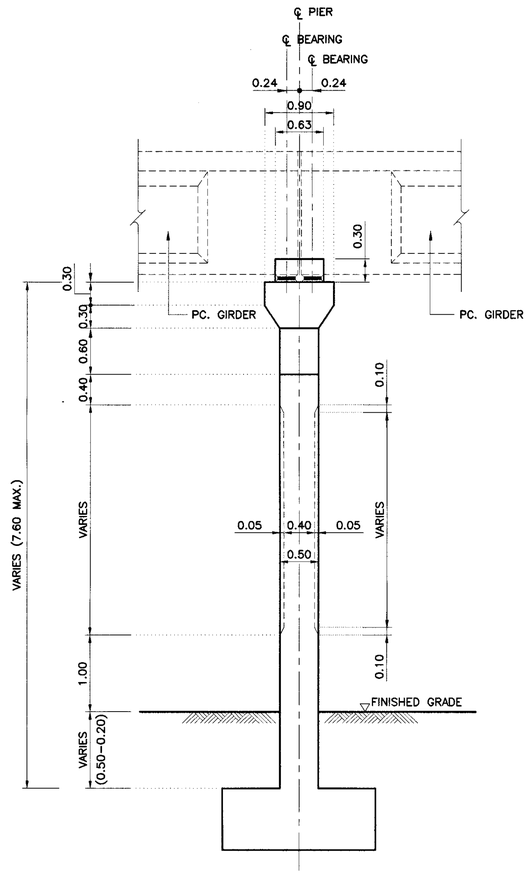




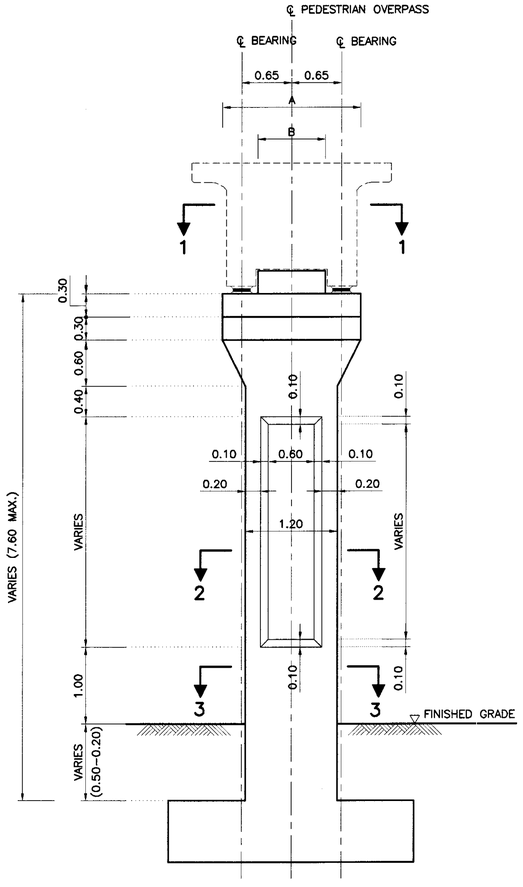
SECTION 1 – 1
SCALE 1 : 15



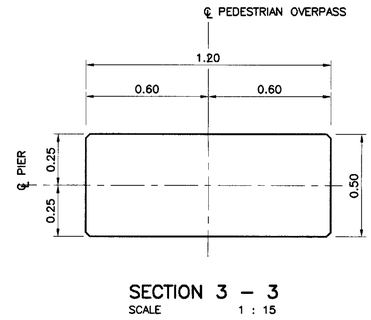
SECTION 2 – 2
SCALE 1 : 15



ELEVATION 1
SCALE 1 : 40



ELEVATION 2
SCALE 1 : 40



SECTION 3 – 3
SCALE 1 : 15

PIER TYPE	A	B	REMARK
1	1.90	0.78	FOR GIRDER TYPE 1,2
2	1.85	0.83	FOR GIRDER TYPE 3,4
3	1.80	0.88	FOR GIRDER TYPE 5,6
4	1.70	0.98	FOR GIRDER TYPE 7

NOTES :

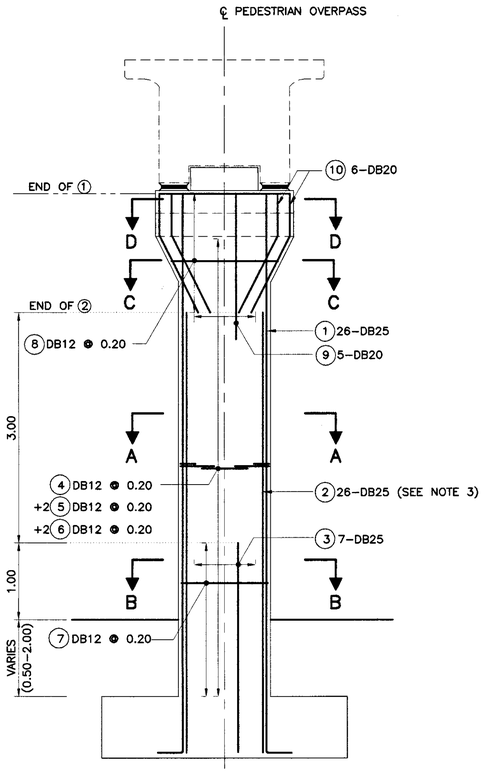
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PILE FOOTING DETAILS SEE DWG. NO. PH–007.
3. FOR SPREAD FOOTING DETAILS SEE DWG. NO. PH–008.

REF.	REVISION	SIGNATURE	DATE

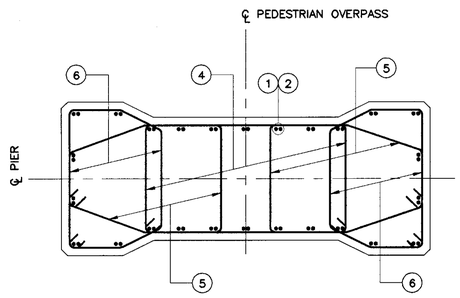
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS
STANDARD DRAWING
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
INSIDE PIER TYPE 1–4 DETAILS (1/2)

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. PH–003
SHEET NO. 144

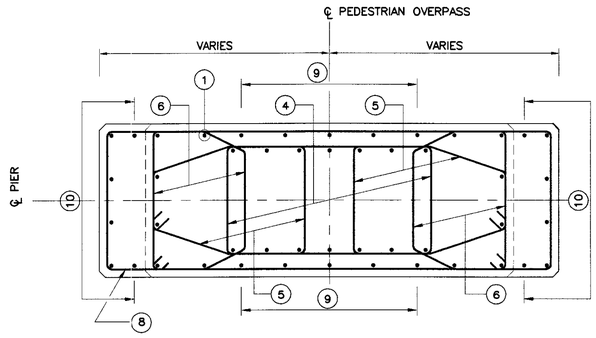
D:\std dwg 2015\PH-003(REV00)



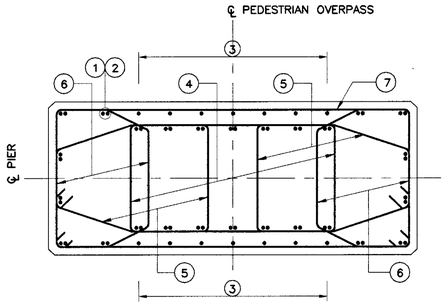
ELEVATION
SCALE 1 : 40



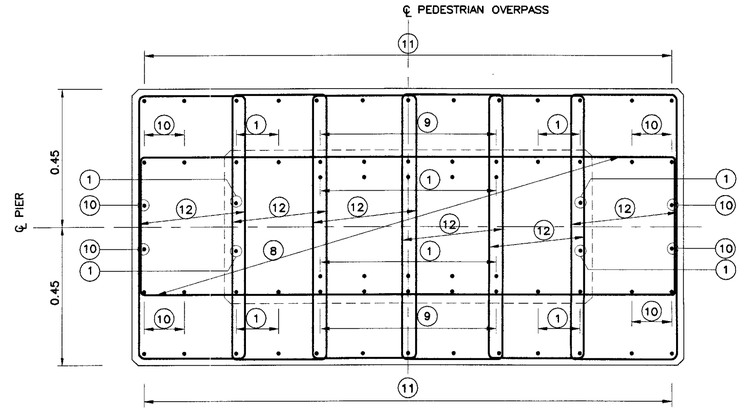
SECTION A – A
SCALE 1 : 10



SECTION C – C
SCALE 1 : 10



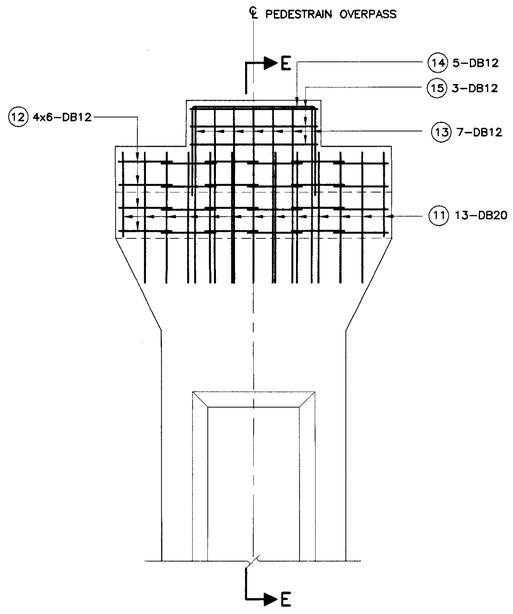
SECTION B – B
SCALE 1 : 10



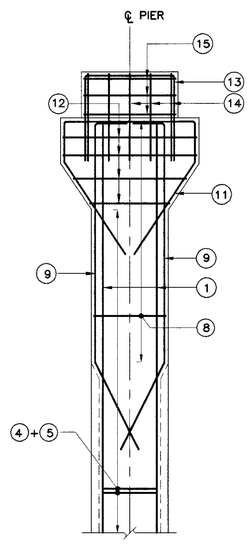
SECTION D – D
SCALE 1 : 10

BAR BENDING SCHEDULE

BAR MARK	BAR SIZE (MM.)	BAR BENDING (MM.)
①	DB25	VARIES, 400
②	DB25	VARIES, 400
③	DB25	VARIES, 400
④	DB12	650, 120, 340
⑤	DB12	160, 110, 440, 20, 340
⑥	DB12	220, 270, 170, 120, 340
⑦	DB12	1140, 120, 440
⑧	DB12	VARIES, 120, 440, (1140–1840)
⑨	DB20	250, 1540, 700
⑩	DB20	600, 540, 1050
⑪	DB20	810, 240, 240, 600, 600
⑫	DB12	VARIES, 120, VARIES
⑬	DB12	540, 600, 600
⑭	DB12	VARIES, 600, 600
⑮	DB12	590, 120, VARIES



CORBEL DETAIL
SCALE 1 : 20



SECTION E – E
SCALE 1 : 20

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE PIER SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15x15x15 CM. STANDARD CUBE TEST AT 28 DAYS NOT LESS THAN 40 MPa.
3. BAR MARK ② IS ADDTIONAL REBAR FOR PIER TYPE 1 AND PIER TYPE 2 ONLY.

REF.	REVISION	SIGNATURE	DATE

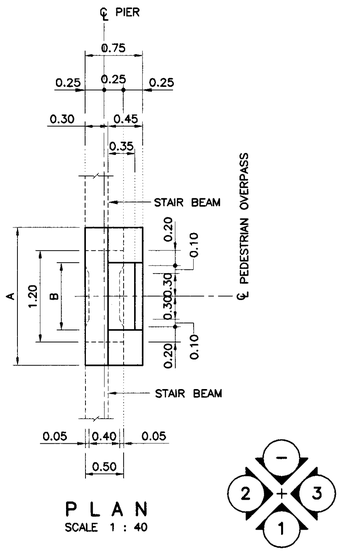
KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS
STANDARD DRAWING

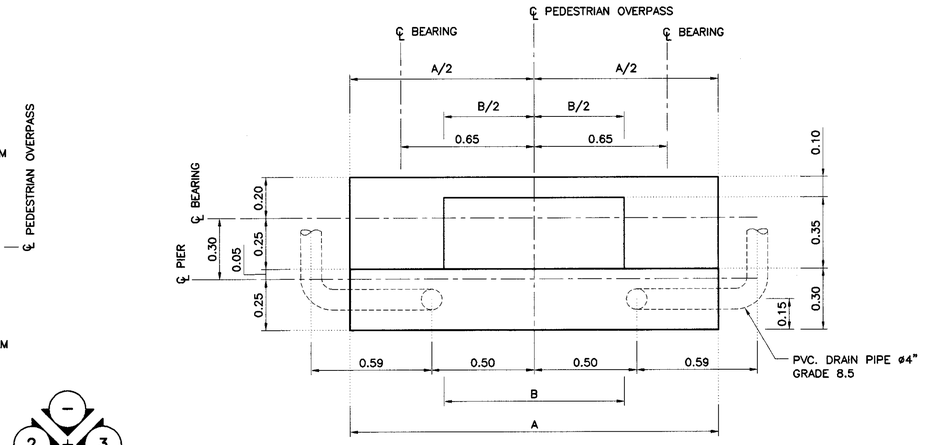
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
INSIDE PIER TYPE 1–4 DETAILS (2/2)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–004
		SHEET NO. 145

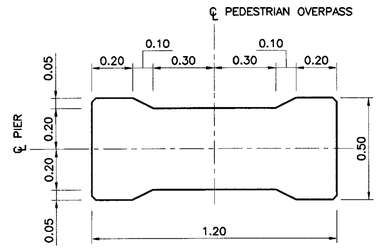
D:\std dwg 2015\PH-004(REV00)



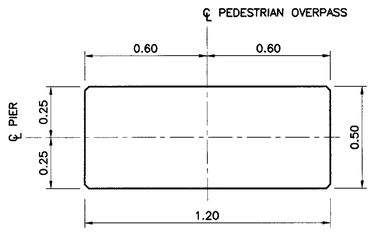
PLAN
SCALE 1 : 40



SECTION 1 – 1
SCALE 1 : 15



SECTION 2 – 2
SCALE 1 : 15



SECTION 3 – 3
SCALE 1 : 15

ELEVATION 1
SCALE 1 : 40

ELEVATION 2
SCALE 1 : 40

ELEVATION 3
SCALE 1 : 40

PIER TYPE	A	B	C	REMARK
1	1.90	0.78	1.70	FOR GIRDER TYPE 1,2
2	1.85	0.83	1.50	FOR GIRDER TYPE 3,4
3	1.80	0.88	1.30	FOR GIRDER TYPE 5,6
4	1.70	0.98	1.20	FOR GIRDER TYPE 7

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR STAIR BEAM AND STAIR DETAILS SEE DWG. NO. PH–109 TO 110 AND PH–209 TO 210.
3. FOR PILE FOOTING DETAILS SEE DWG. NO. PH–007.
4. FOR SPREAD FOOTING DETAILS SEE DWG. NO. PH–008.
5. MINIMUM SLOPE FOR DRAIN PIPE = 1:50.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

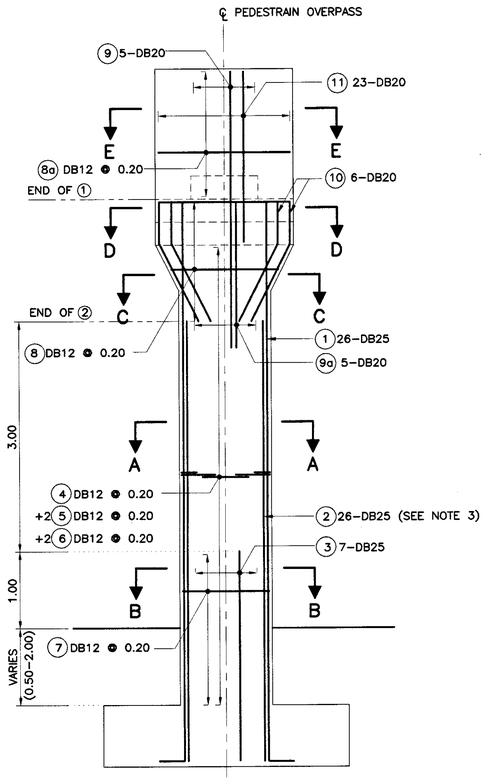
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

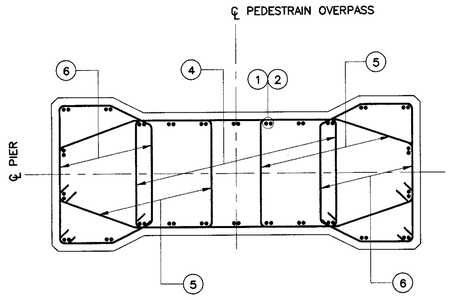
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
OUTSIDE PIER TYPE 1–4 DETAILS (1/2)

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. PH–005
SHEET NO. 146

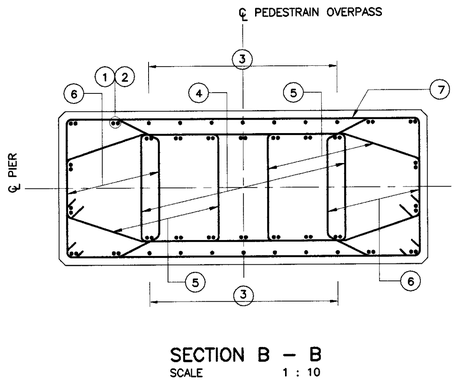
D:\std dwg 2015\PH-005(REV00)



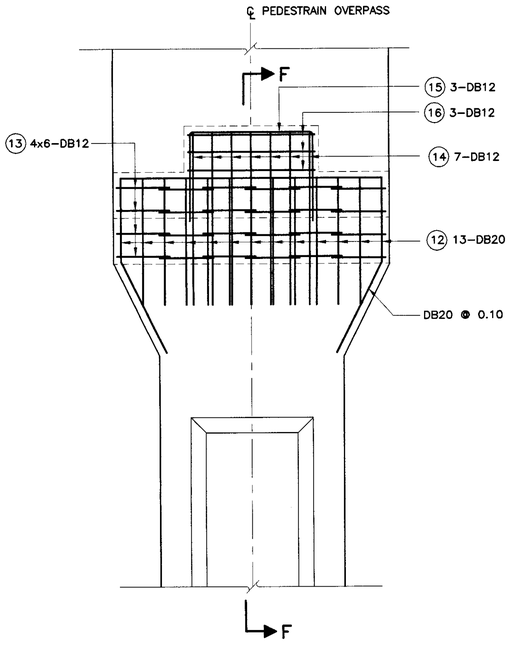
ELEVATION
SCALE 1 : 40



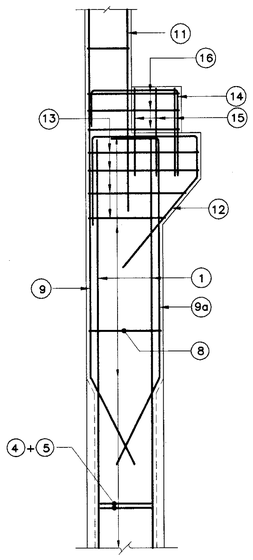
SECTION A – A
SCALE 1 : 10



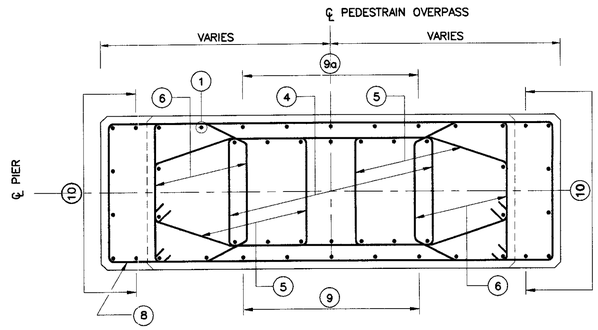
SECTION B – B
SCALE 1 : 10



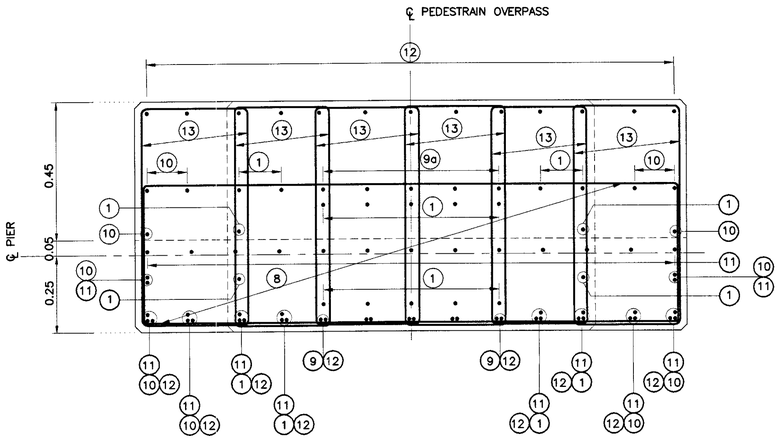
CORBEL DETAIL
SCALE 1 : 20



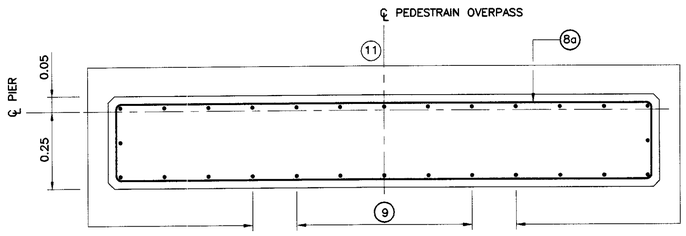
SECTION F – F
SCALE 1 : 20



SECTION C – C
SCALE 1 : 10



SECTION D – D
SCALE 1 : 10



SECTION E – E
SCALE 1 : 10

BAR BENDING SCHEDULE

BAR MARK	BAR SIZE (MM.)	BAR BENDING (MM.)
1	DB25	VARIES, 400
2	DB25	VARIES, 400
3	DB25	VARIES, 400
4	DB12	650, 120, 340
5	DB12	160, 110, 440, 120, 340
6	DB12	220, 270, 170, 120, 340
7	DB12	114, 120, 440
8	DB12	VARIES, 120, 440, (114–184)
8a	DB12	VARIES, 120, 240
9	DB20	VARIES, 250, 700
9a	DB20	154, 250, 700
10	DB20	60, 54, 105
11	DB20	250, VARIES
12	DB20	660, 600, 240, 600
13	DB12	VARIES, 120, VARIES
14	DB12	560, 100, 600
15	DB12	VARIES, 600, 600
16	DB12	590, 120, VARIES

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE PIER SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15x15x15 CM. STANDARD CUBE TEST AT 28 DAYS NOT LESS THAN 40 MPa.
3. BAR MARK (2) IS ADDTIONAL REBAR FOR PIER TYPE 1 AND PIER TYPE 2 ONLY.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

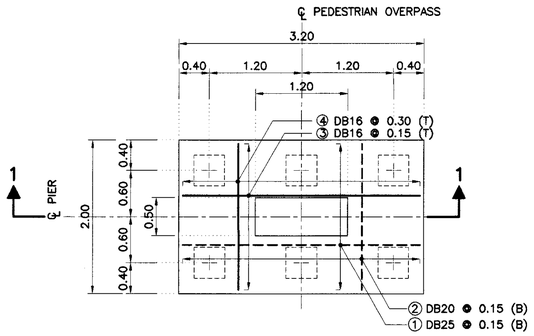
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

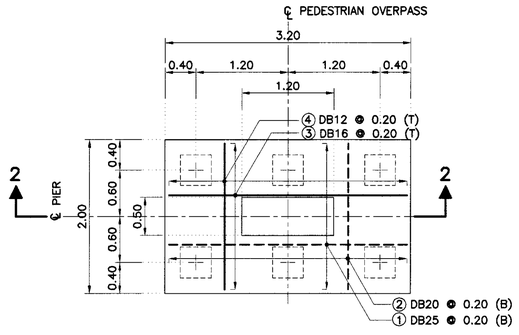
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
OUTSIDE PIER TYPE 1–4 DETAILS (2/2)

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
DWG NO. PH–006
APPROVED : (FOR DIRECTOR GENERAL)
SHEET NO. 147

D:\std dwg 2015\PH-006(REV00)



FOOTING TYPE 1
SCALE 1 : 40



FOOTING TYPE 2
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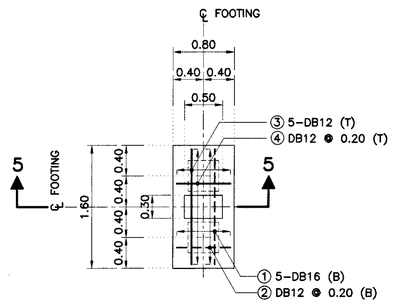
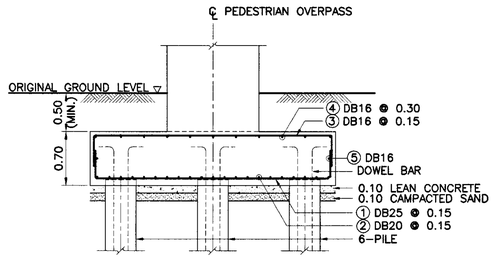
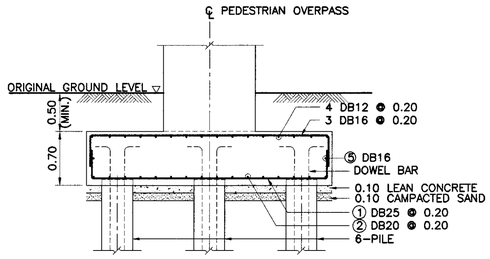


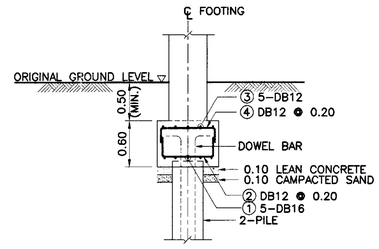
FOOTING TYPE 5
SCALE 1 : 40



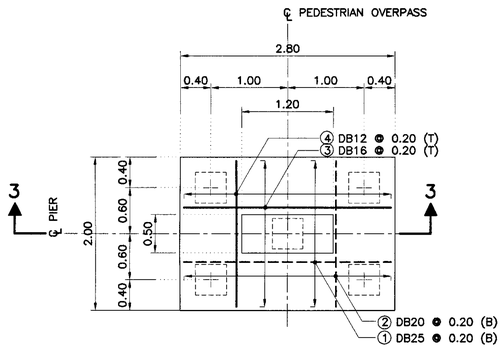
SECTION 1– 1
SCALE 1 : 40



SECTION 2 – 2
SCALE 1 : 40



SECTION 5 – 5
SCALE 1 : 40



FOOTING TYPE 3
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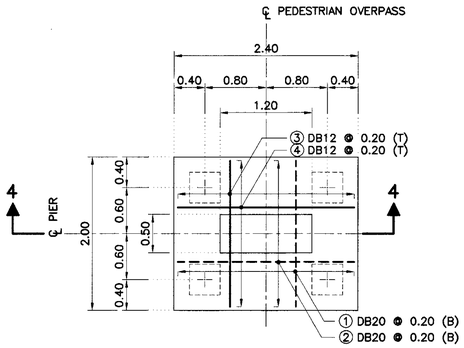

FOOTING TYPE 4
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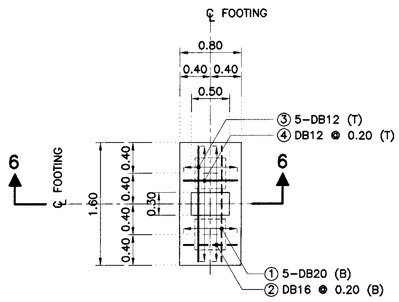

FOOTING TYPE 6
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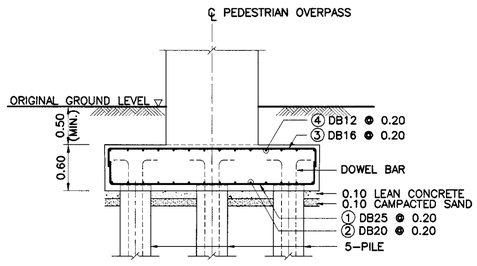
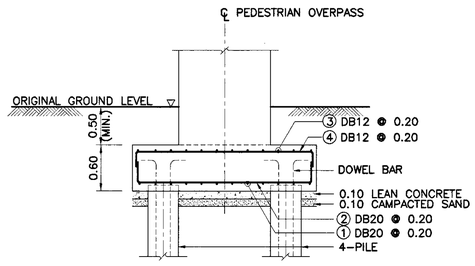
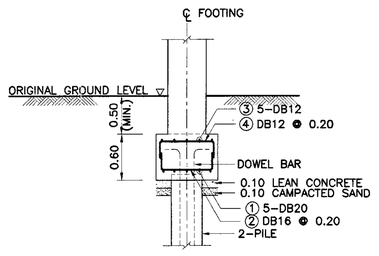


SECTION 3– 3
SCALE 1 : 40



SECTION 4 – 4
SCALE 1 : 40



SECTION 6 – 6
SCALE 1 : 40

FOOTING TYPE	BAR MARK	BAR DIAMETER (MM.)	BAR BENDING DIAGRAM (MM.)
FOOTING TYPE 1	①	DB25	500 _ 3100 _ 500
	②	DB20	500 _ 1900 _ 500
	③	DB16	3100 / 500 _ 500
	④	DB16	1900 / 500 _ 500
	⑤	DB16	3050 / _ 1200
FOOTING TYPE 2	①	DB25	500 _ 3100 _ 500
	②	DB20	500 _ 1900 _ 500
	③	DB16	3100 / 500 _ 500
	④	DB12	1900 / 500 _ 500
	⑤	DB16	3050 / _ 1200
FOOTING TYPE 3	①	DB25	400 _ 2700 _ 400
	②	DB20	400 _ 1900 _ 400
	③	DB16	2700 / 400 _ 400
	④	DB12	1900 / 400 _ 400
FOOTING TYPE 4	①	DB20	400 _ 1900 _ 400
	②	DB20	400 _ 2300 _ 400
	③	DB12	1900 / 400 _ 400
	④	DB12	2300 / 400 _ 400
FOOTING TYPE 5	①	DB16	400 _ 1500 _ 400
	②	DB12	400 _ 700 _ 400
	③	DB12	1500 / 400 _ 400
	④	DB12	700 / 400 _ 400
FOOTING TYPE 6	①	DB20	400 _ 1500 _ 400
	②	DB16	400 _ 700 _ 400
	③	DB12	1500 / 400 _ 400
	④	DB12	700 / 400 _ 400

NOTES :
1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15x15x15 CM. STANDARD CUBE TEST AT 28 DAYS NOT LESS THAN 40 MPa.
3. FOR PILE DETAILS SEE DOH STANDARD DRAWING NO. PL-001 AND PL-101 EACH PILE SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY NOT LESS THAN 125 TONNE (FACTOR OF SAFETY 2.5)

REF.	REVISION	SIGNATURE	DATE

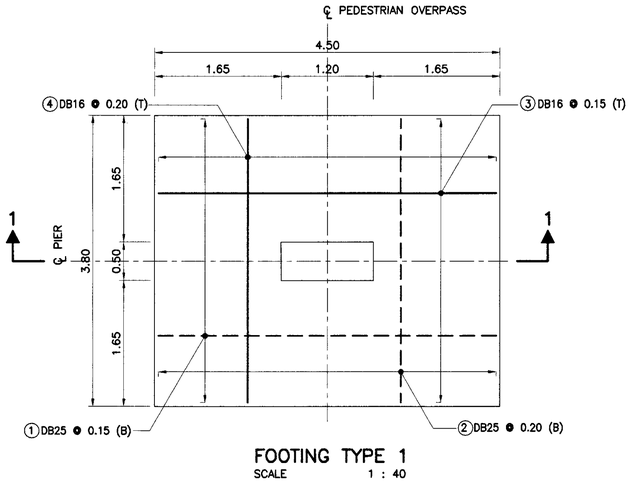
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

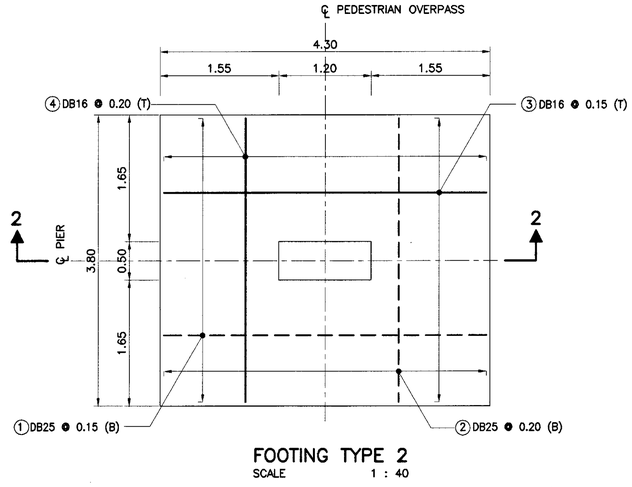
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
PILE FOOTING TYPE 1–4 DETAILS

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. PH-007
SHEET NO. 148

D:\std dwg 2015\PH-007(REV00)



FOOTING TYPE 1
SCALE 1 : 40



FOOTING TYPE 2
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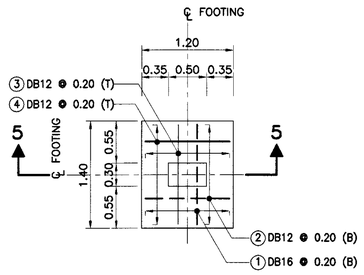

FOOTING TYPE 5
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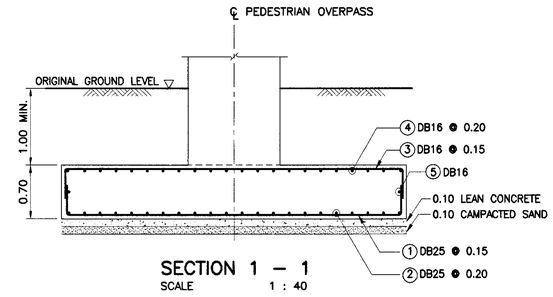
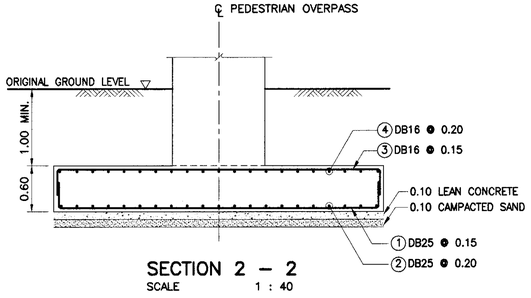


SECTION 1 – 1
SCALE 1 : 40



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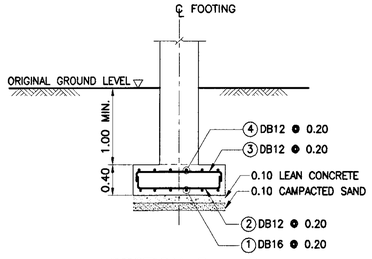
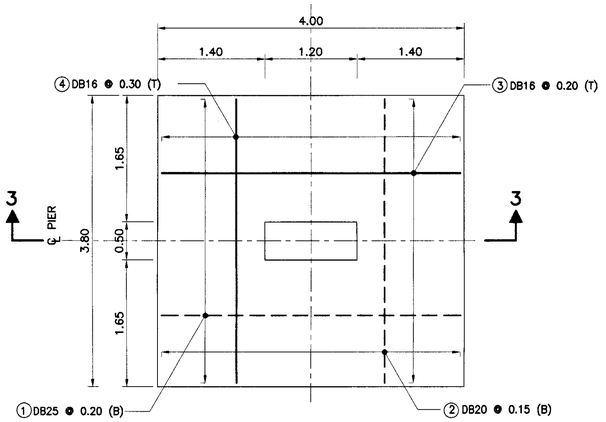


SECTION 5 – 5
SCALE 1 : 40



FOOTING TYPE 3
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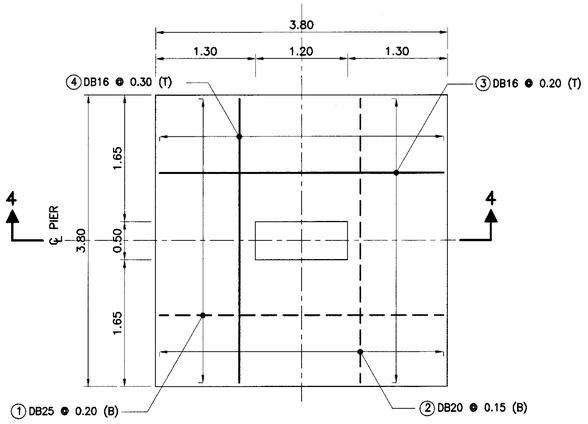

FOOTING TYPE 4
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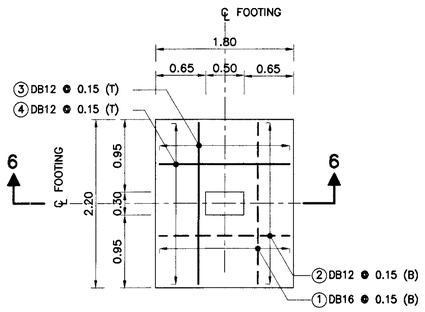
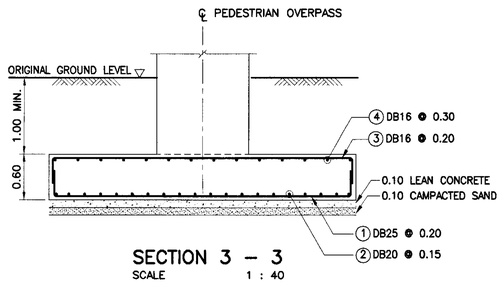
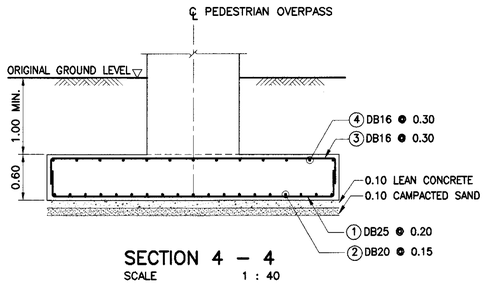


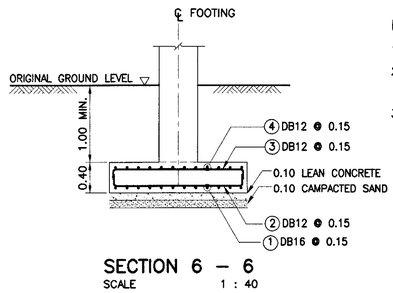
FOOTING TYPE 6
SCALE 1 : 40



SECTION 3 – 3
SCALE 1 : 40



SECTION 4 – 4
SCALE 1 : 40



SECTION 6 – 6
SCALE 1 : 40

FOOTING TYPE	BAR MARK	BAR DIAMETER (MM.)	BAR BENDING DIAGRAM (MM.)
FOOTING TYPE 1	①	DB25	500 | 4400 | 500
	②	DB25	500 | 3700 | 500
	③	DB16	500 | 4400 | 500
	④	DB16	500 | 3700 | 500
	⑤	DB16	2100 | 4400 | 2100
FOOTING TYPE 2	①	DB25	400 | 4200 | 400
	②	DB25	400 | 3700 | 400
	③	DB16	400 | 4200 | 400
	④	DB16	400 | 3700 | 400
FOOTING TYPE 3	①	DB25	400 | 3900 | 400
	②	DB20	400 | 3700 | 400
	③	DB16	400 | 3900 | 400
	④	DB16	400 | 3700 | 400
FOOTING TYPE 4	①	DB25	400 | 3700 | 400
	②	DB20	400 | 3700 | 400
	③	DB16	400 | 3700 | 400
	④	DB16	400 | 3700 | 400
FOOTING TYPE 5	①	DB16	250 | 1300 | 250
	②	DB12	250 | 1100 | 250
	③	DB12	250 | 1300 | 250
	④	DB12	250 | 1100 | 250
FOOTING TYPE 6	①	DB16	250 | 2100 | 250
	②	DB12	250 | 1700 | 250
	③	DB12	250 | 2100 | 250
	④	DB12	250 | 1700 | 250

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 15X15X15 CM. STANDARD CUBE TEST AT 28 DAYS NOT LESS THAN 40 MPa.
3. SOIL UNDER THE SPREAD FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TONNE/M^2

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

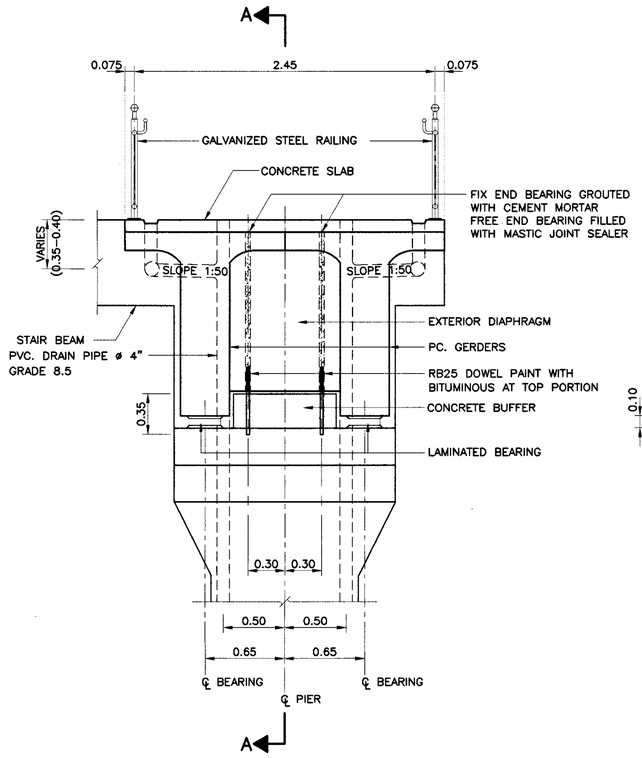
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
SPREAD FOOTING TYPE 1–4 DETAILS

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

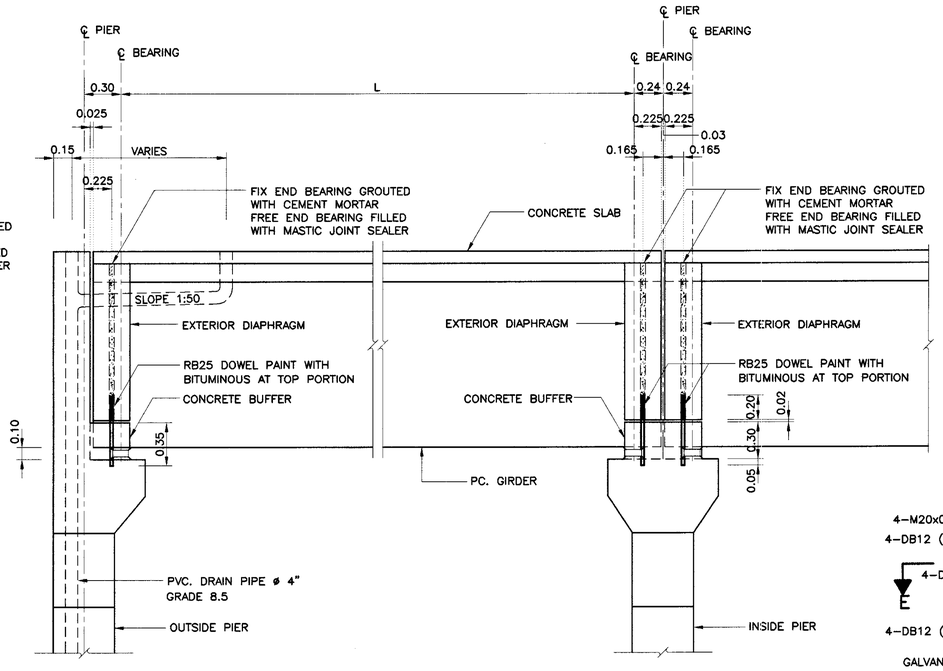
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. PH-008 | SHEET NO. 149

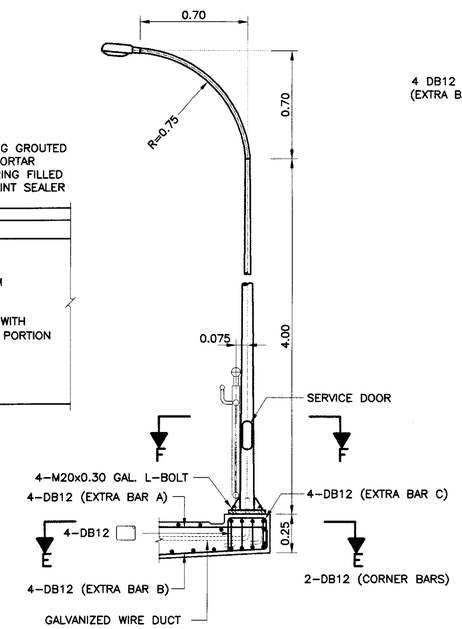
D:\std dwg 2015\PH-008(REV00)



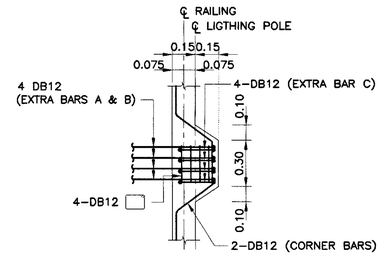
PIER HEAD DETAIL
SCALE 1:25



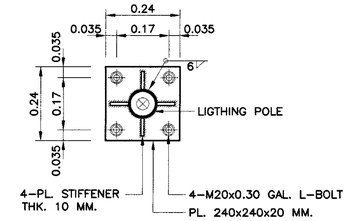
SECTION A – A
SCALE 1:25



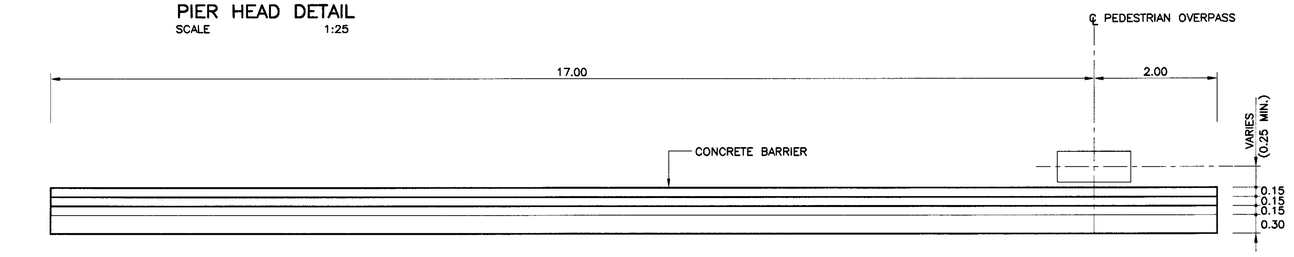
LIGHTING POLE DETAILS
SCALE 1:20



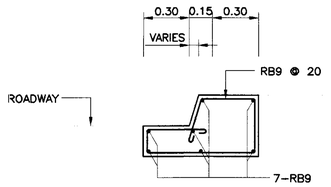
SECTION E – E
SCALE 1:20



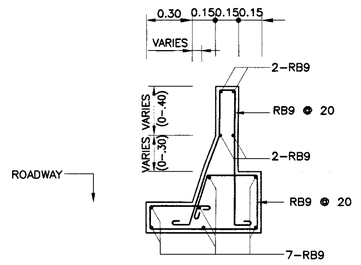
SECTION F – F
SCALE 1:10



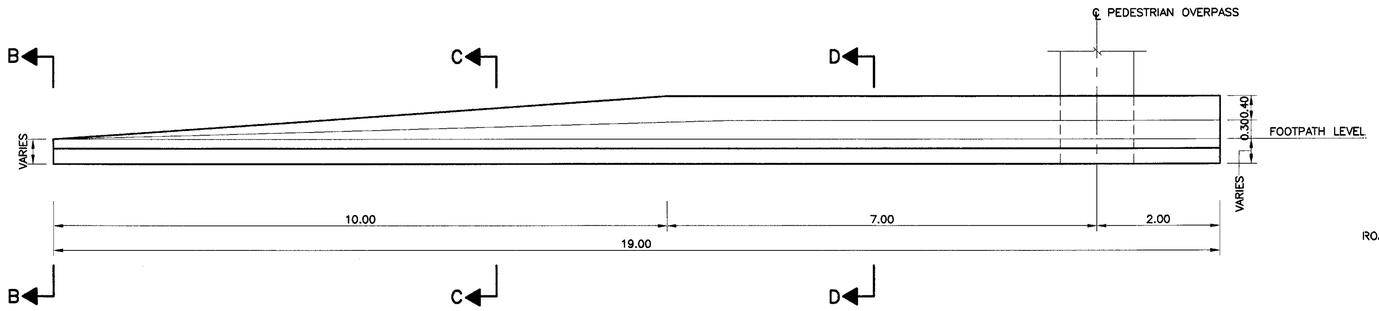
PLAN



SECTION B – B
SCALE 1:20

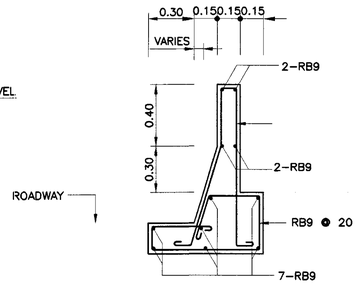


SECTION C – C
SCALE 1:20



PROFILE

CONCRETE BARRIER
SCALE 1:50



SECTION D – D
SCALE 1:20

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. CONCRETE FOR BARRIERS SHALL HAS A MINIMUM 15x15x15 CM. CUBE COMRESSIVE STRENGTH OF 35 MPa. AT 28 DAYS.
3. STAIRS, PIER AND WALL SHALL NOT BE RENDERING.
4. DETAIL OF CONCRETE BARRIER SHALL CONFORM TO THIS DRAWING OR DOH.
5. ALL ANCHOR BOLTS AND NUTS SHALL BE GALVANIZED TYPE.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

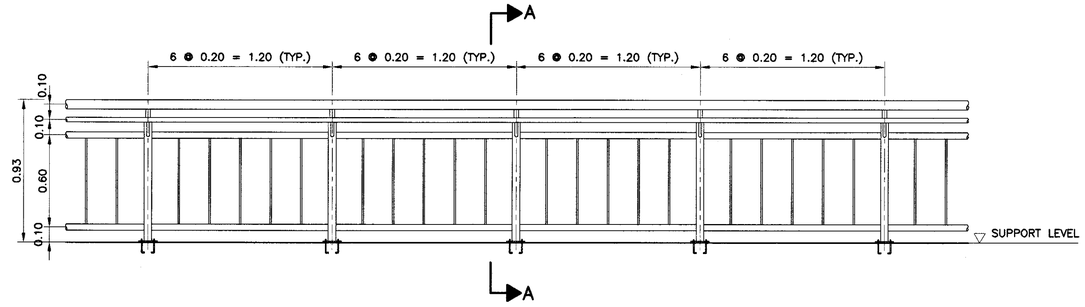
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

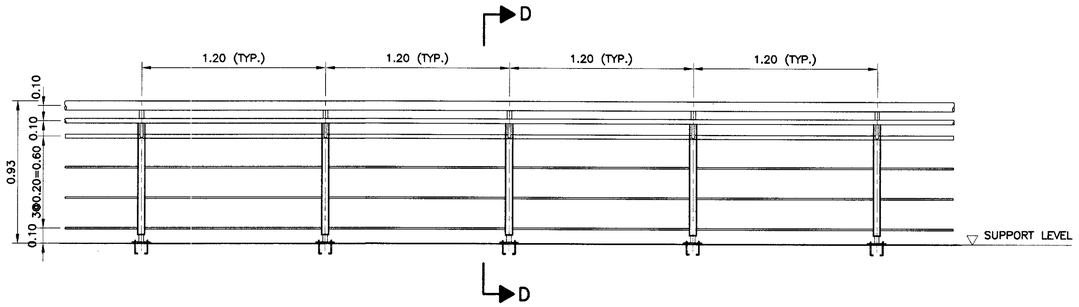
HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
PIER HEAD, CONCRETE BARRIER & LIGHTING POLE DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–009
		SHEET NO. 150

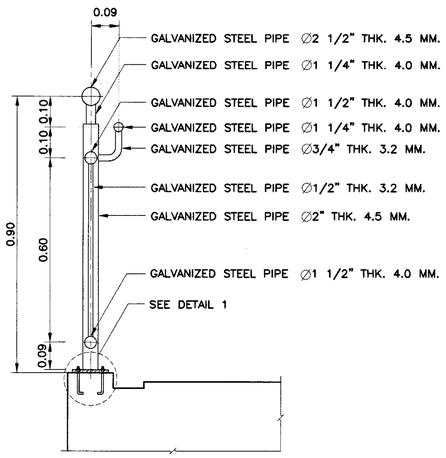
D:\std\2015\PH-009(06)A0.dwg Plot 20



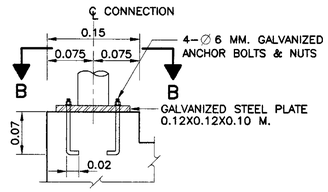
RAILING TYPE 1 DETAILS
SCALE 1:20



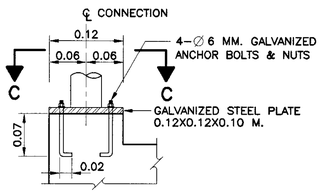
RAILING TYPE 2 DETAILS
SCALE 1:20



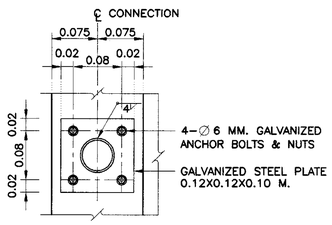
SECTION A – A
SCALE 1:10



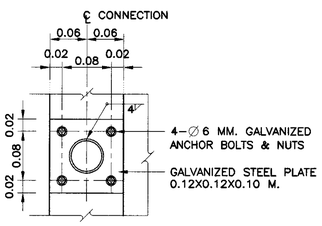
DETAIL 1 (ON PC. GIRDER)
SCALE 1:5



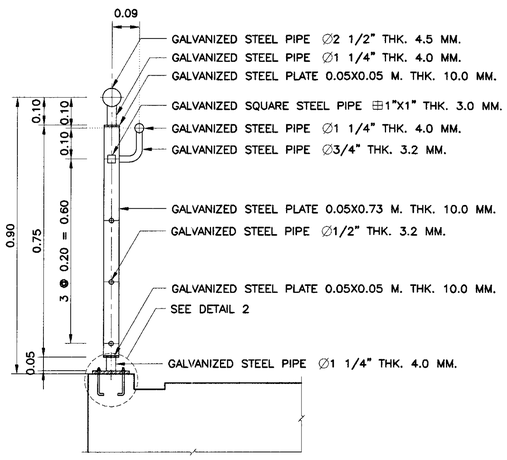
DETAIL 1 (ON STAIR AND RAMP)
SCALE 1:5



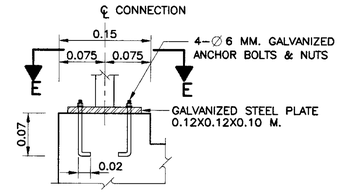
SECTION B – B
SCALE 1:5



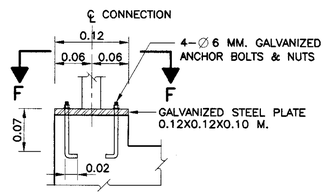
SECTION C – C
SCALE 1:5



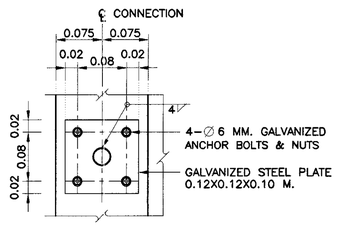
SECTION D – D
SCALE 1:10



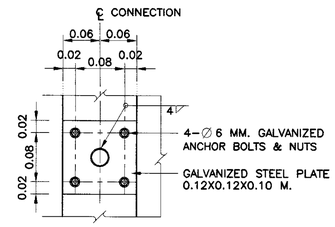
DETAIL 2 (ON PC. GIRDER)
SCALE 1:5



DETAIL 2 (ON STAIR AND RAMP)
SCALE 1:5



SECTION E – E
SCALE 1:5



SECTION F – F
SCALE 1:5

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. ALL ANCHOR BOLTS AND NUTS SHALL BE GALVANIZED TYPE.

REF.	REVISION	SIGNATURE	DATE

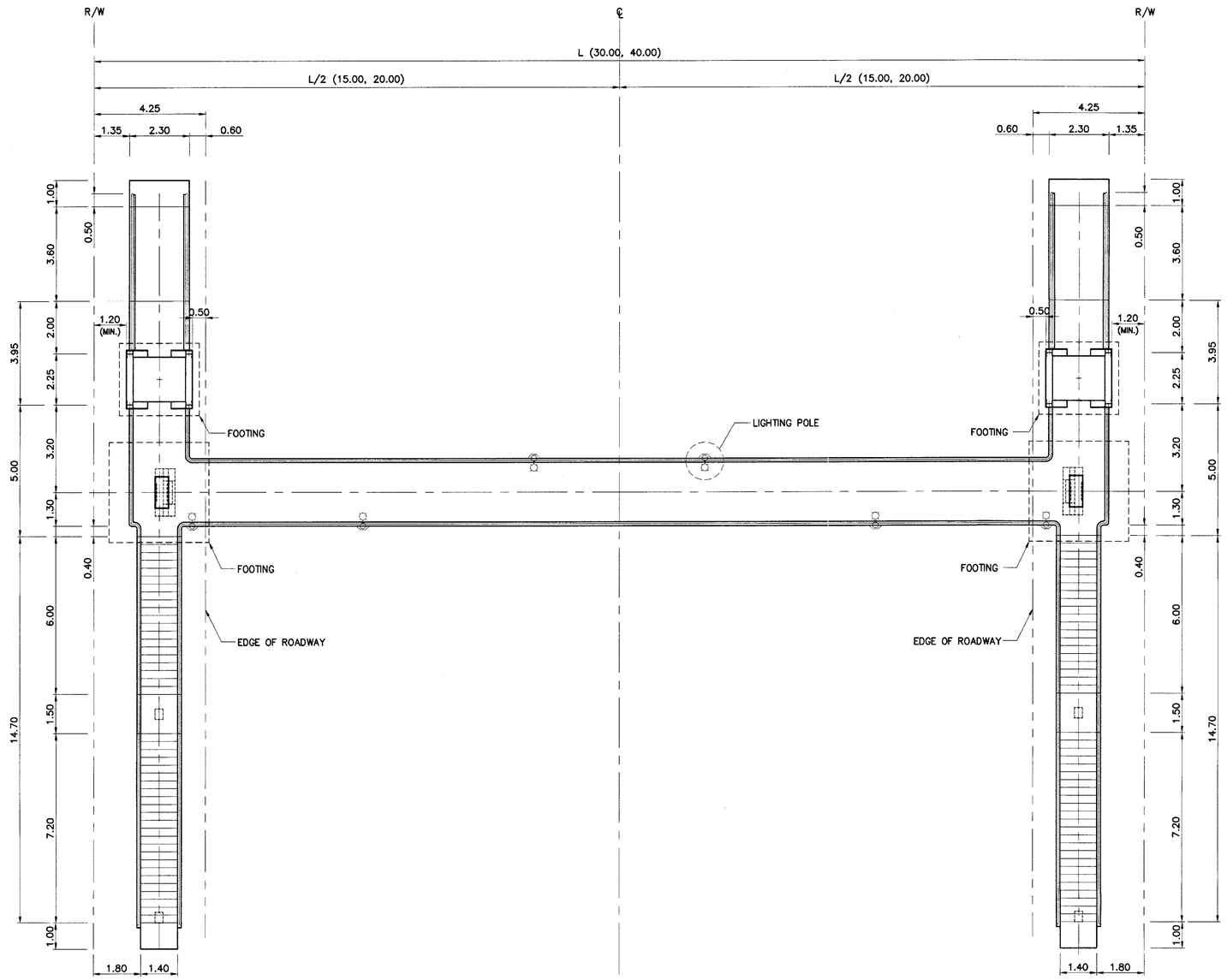
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)
RAILING TYPE 1 AND TYPE 2 DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. PH–010
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 151

D:\std dwg 2015\PH-010(REV00)



PLAN 30.00, 40.00 M. R.O.W.
SCALE 1 : 100

TABLE OF LIGHTING POLE

R.O.W. (m.)	NO. OF LIGHTING POLES	LIGHTING POLE ARRANGEMENT
30.00	4	
40.00	6	

REF.	REVISION	SIGNATURE	DATE

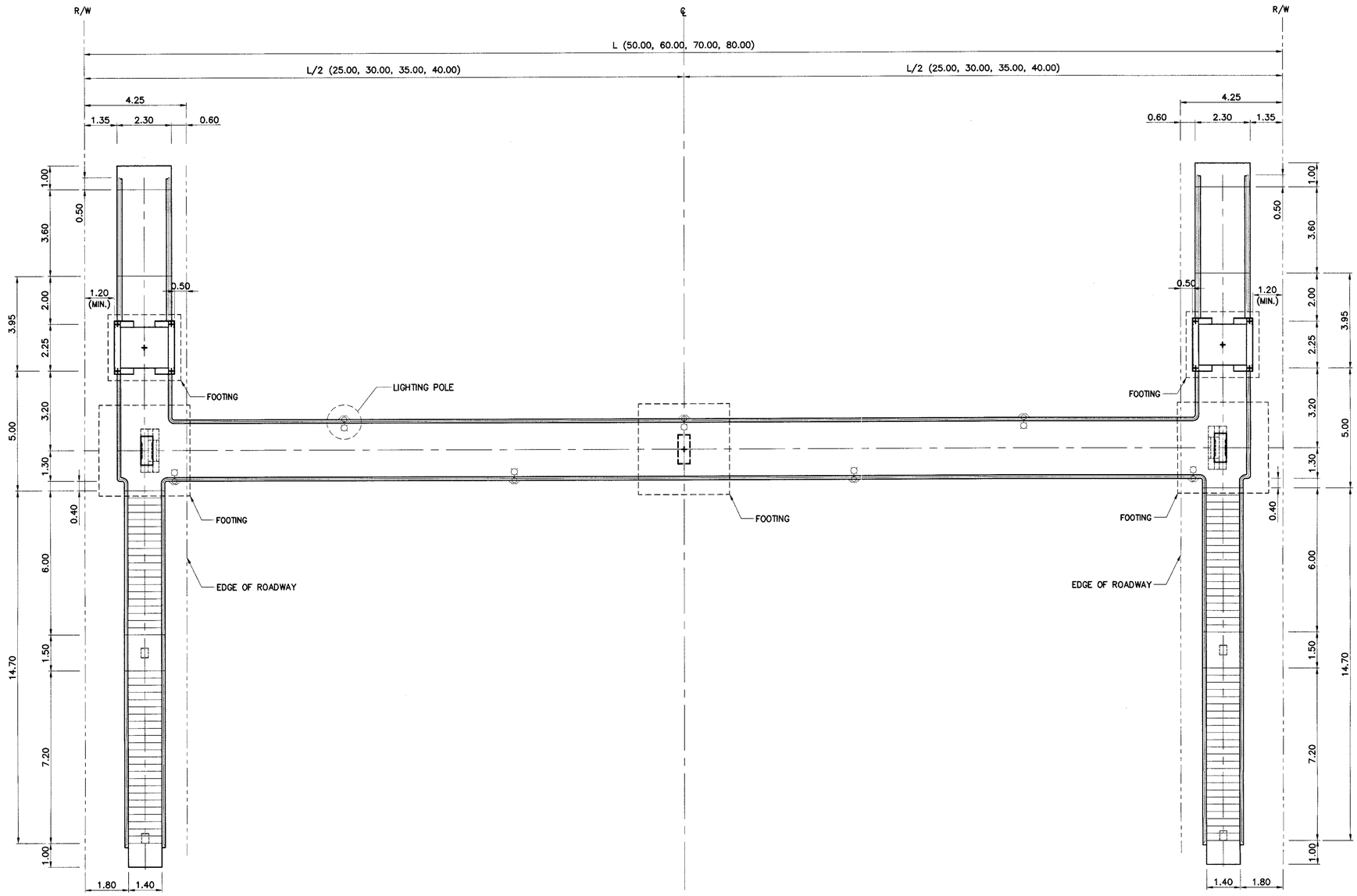
KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
PLAN (R.O.W. 30.00, 40.00 M.)

DESIGNED: D.O.H. & CONSULTANTS
CHECKED: BUREAU OF LOCATION & DESIGN
DATE: OCT 2015
SUBMITTED: (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE: AS SHOWN
DWG NO. PH-101
APPROVED: (FOR DIRECTOR GENERAL)
SHEET NO. 152

D:\std dwg 2015\PH-101(REV00)



PLAN 50.00, 60.00, 70.00, 80.00 M. R.O.W.
SCALE 1 : 100

TABLE OF LIGHTING POLE

R.O.W. (m.)	NO. OF LIGHTING POLES	LIGHTING POLE ARRANGEMENT
50.00	7	
60.00	8	
70.00	9	
80.00	10	

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

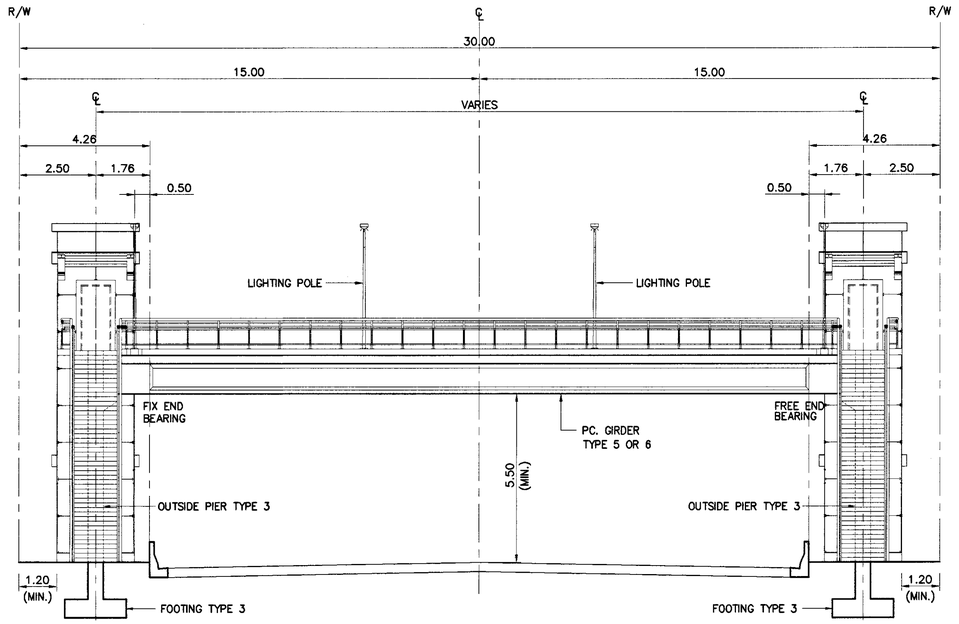
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
PLAN (R.O.W. 50.00, 60.00, 70.00, 80.00 M.)

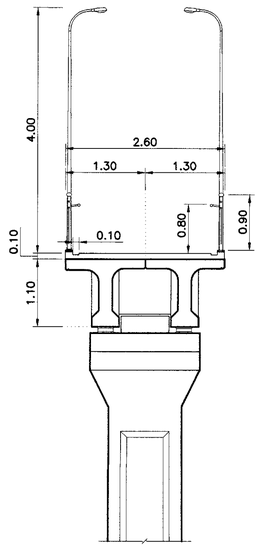
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. PH-102
			SHEET NO. 153

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\PH-102(REV00)



ELEVATION 30.00 R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-109 TO PH-112.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

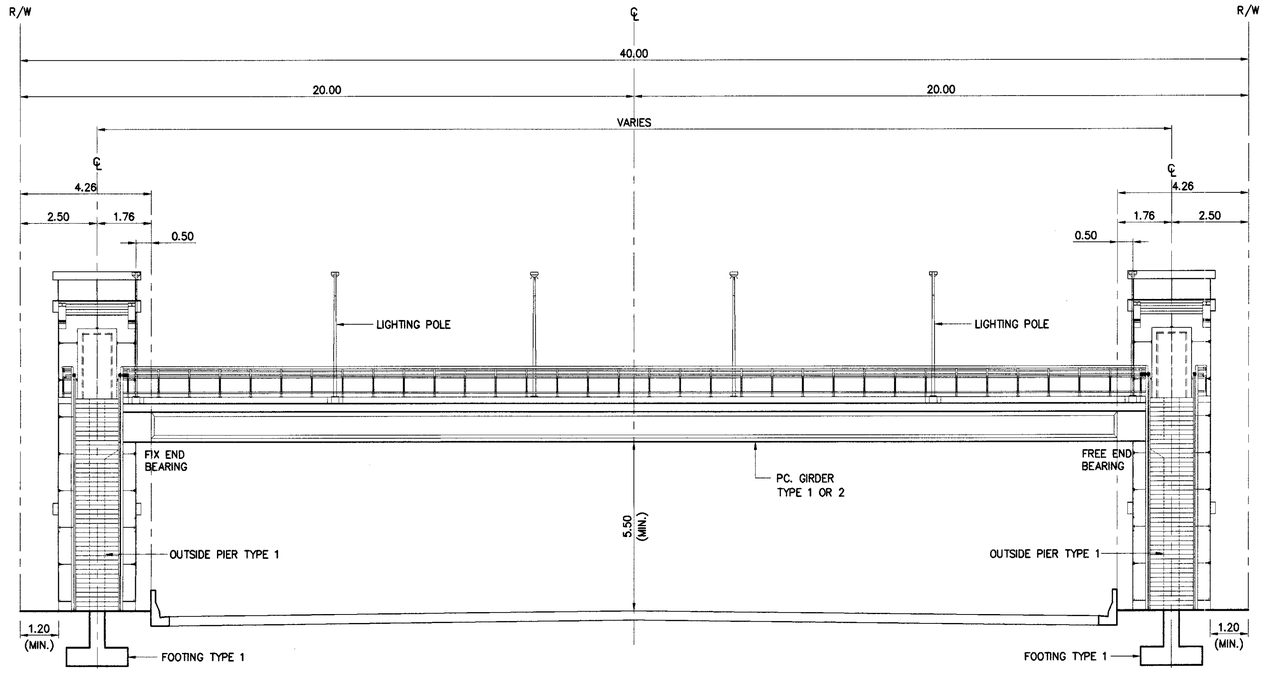
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

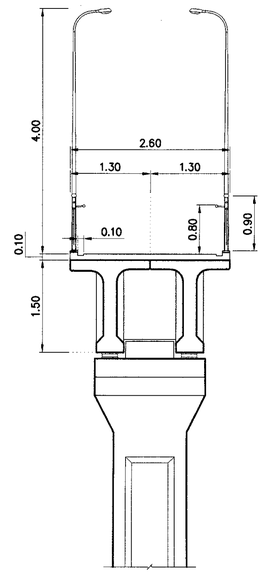
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
ELEVATION (R.O.W. 30.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-103
		SHEET NO. 154

D:\std dwg 2015\PH-103(REV00)



ELEVATION 40.00 R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-109 TO PH-112.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

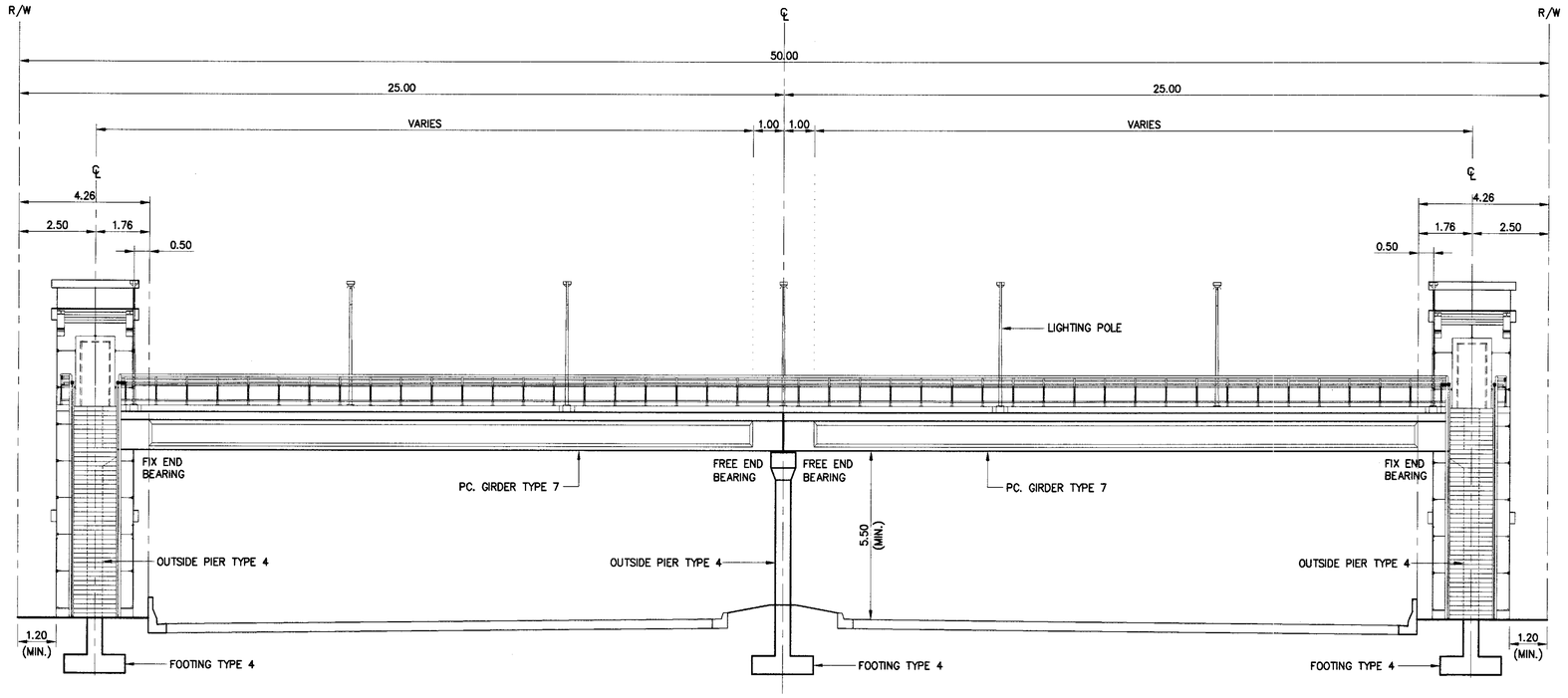
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

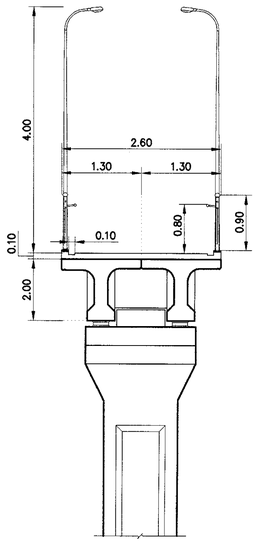
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
ELEVATION (R.O.W. 40.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-104
		SHEET NO. 155

D:\std dwg 2015\PH-104(REV00)



ELEVATION 50.00 R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-109 TO PH-112.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

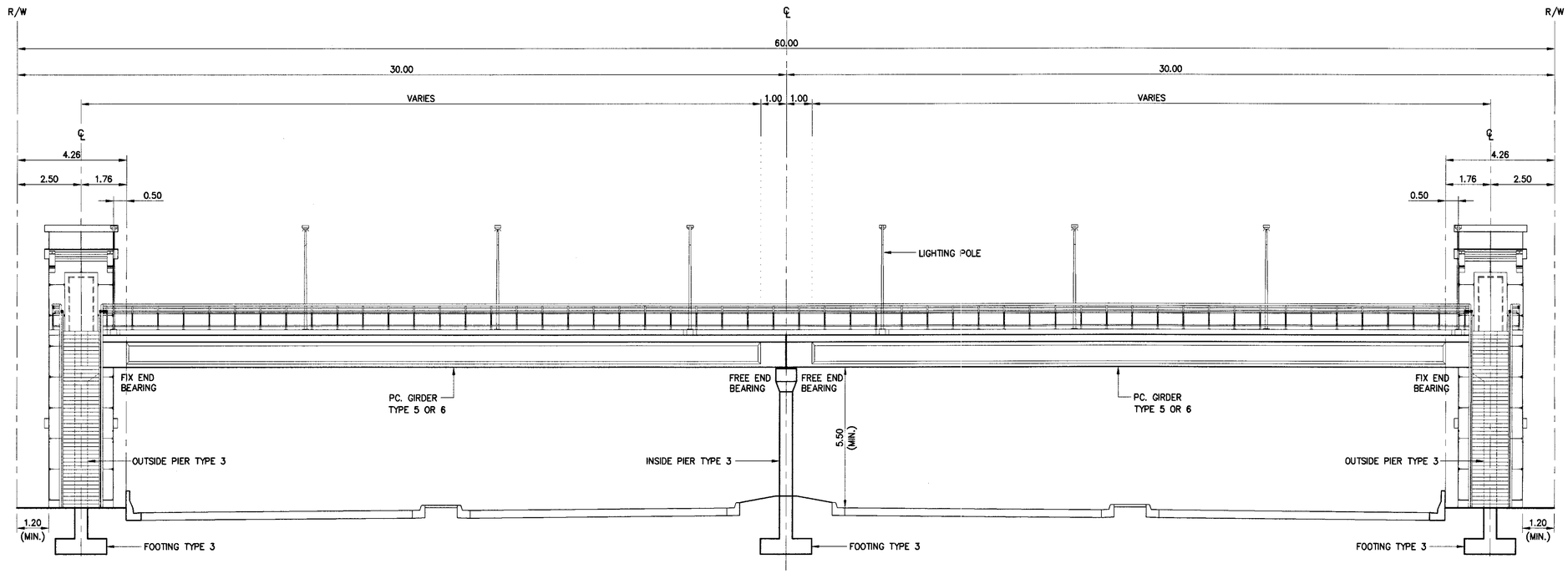
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

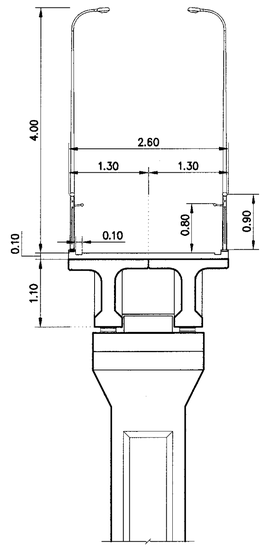
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
ELEVATION (R.O.W. 50.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-105
		SHEET NO. 156

D:\std dwg 2015\PH-105(REV00)



ELEVATION 60.00 R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-109 TO PH-112.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

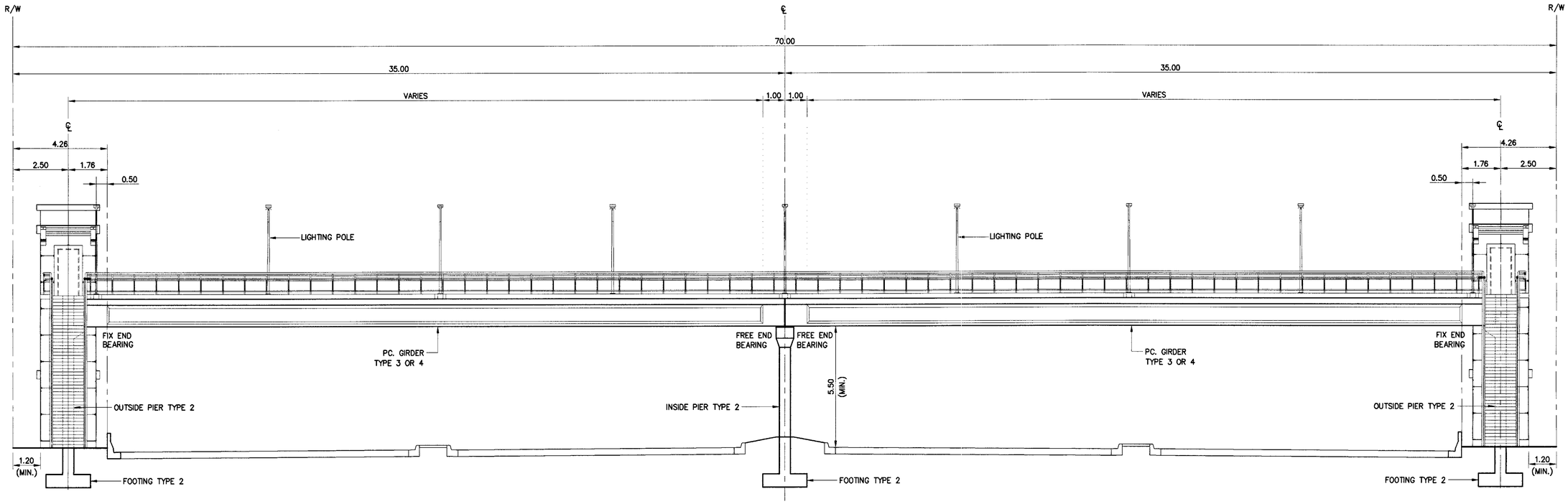
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

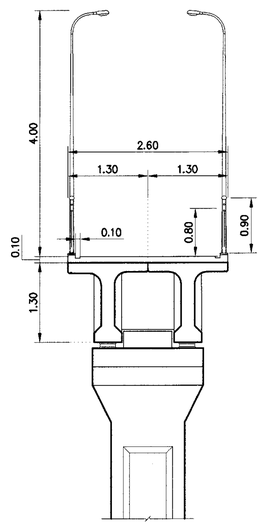
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
ELEVATION (R.O.W. 60.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-106
		SHEET NO. 157

D:\std dwg 2015\PH-106(REV00)



ELEVATION 70.00 R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-109 TO PH-112.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

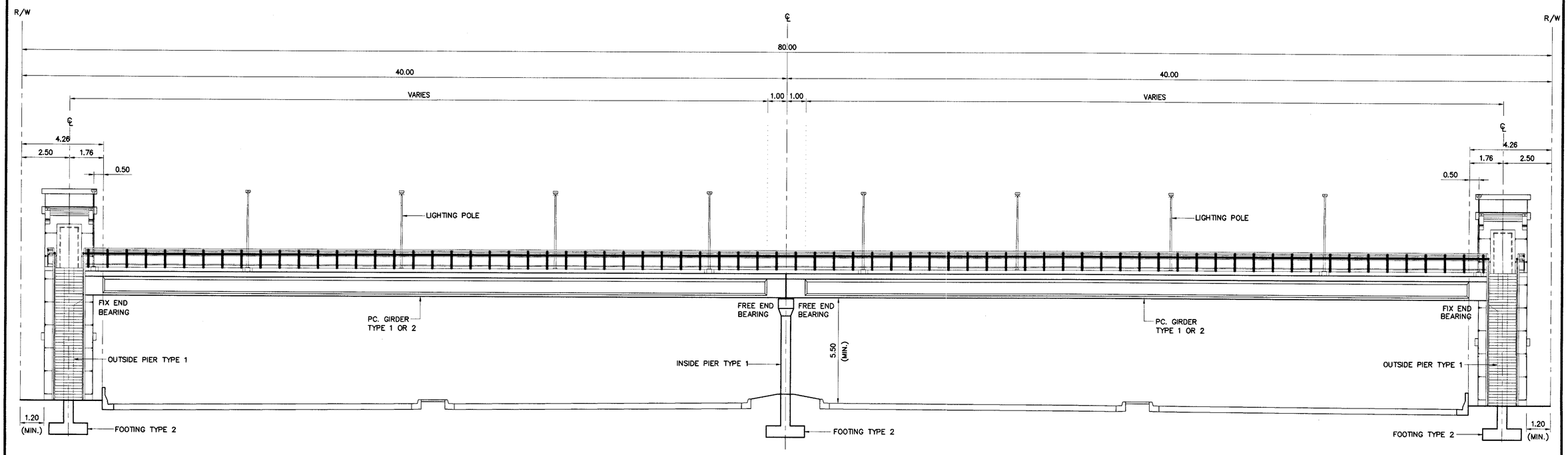
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

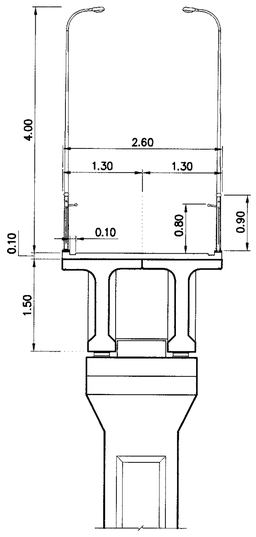
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
ELEVATION (R.O.W. 70.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-107
		SHEET NO. 158

D:\std dwg 2015\PH-107(REV00)



ELEVATION 80.00 R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-109 TO PH-112.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

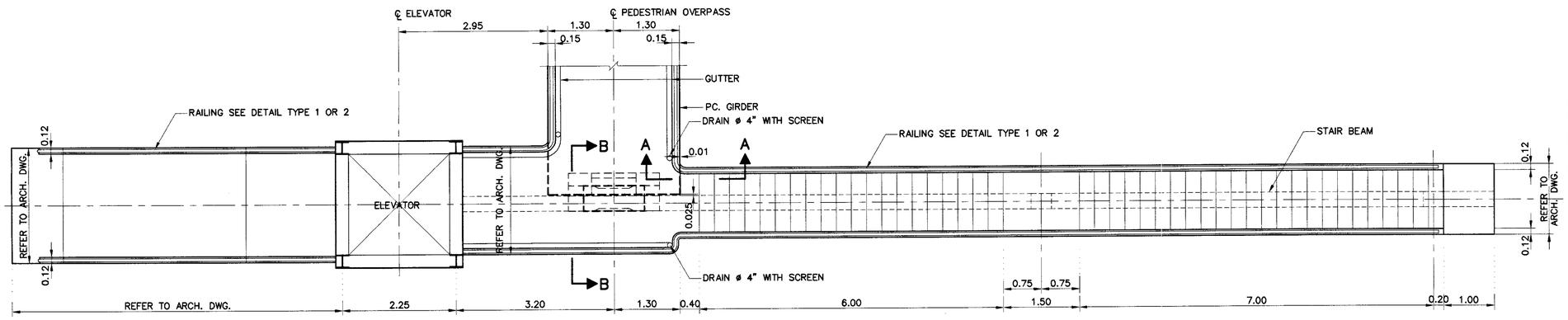
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

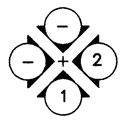
STANDARD DRAWING

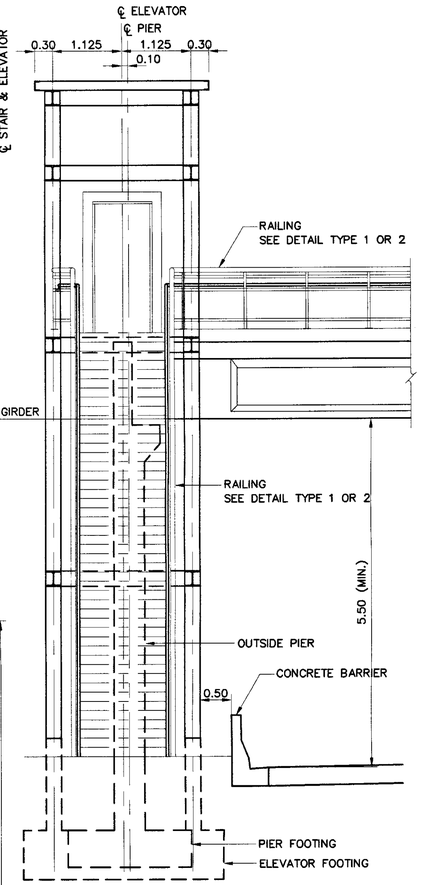
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
ELEVATION (R.O.W. 80.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-108
		SHEET NO. 159

D:\std dwg 2015\PH-108(REV00)

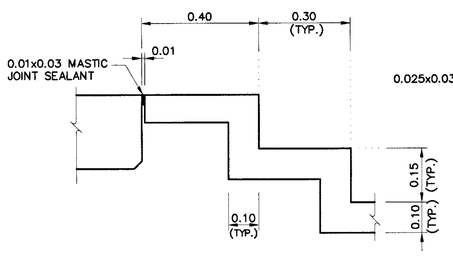




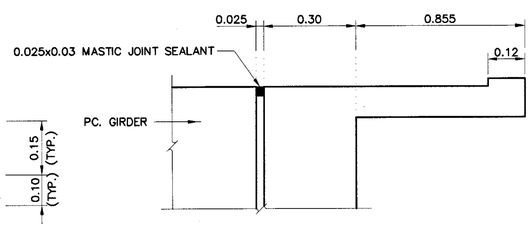


ELEVATION 2
SCALE 1:50

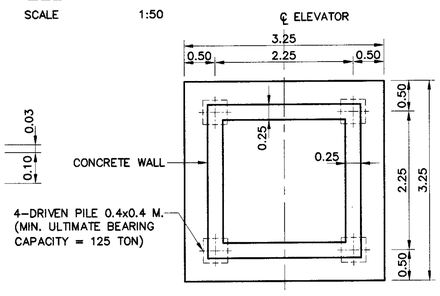
ELEVATION 1
SCALE 1:50



SECTION A–A
SCALE 1:10



SECTION B–B
SCALE 1:10



SECTION C–C
SCALE 1:50

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR RAILING DETAILS, SEE DWG. NO. PH–010.
3. FOR PILE DETAILS OF ELEVATOR FOOTING, SEE DOH STANDARD DRAWING NO. PL–001 AND PL–101.
4. FOR CONCRETE BARRIER DETAILS, SEE DWG. NO. PH–009.

REF.	REVISION	SIGNATURE	DATE

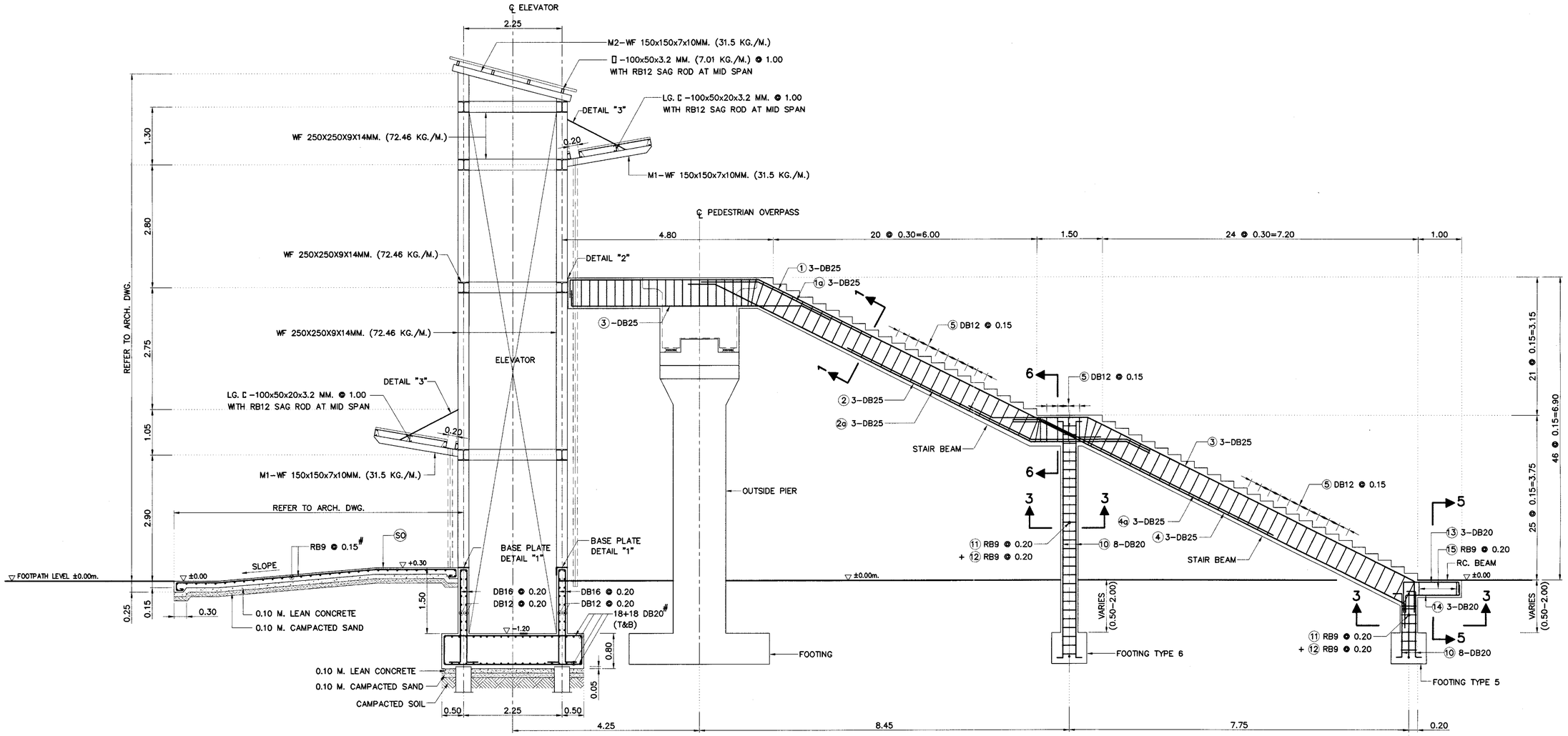
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

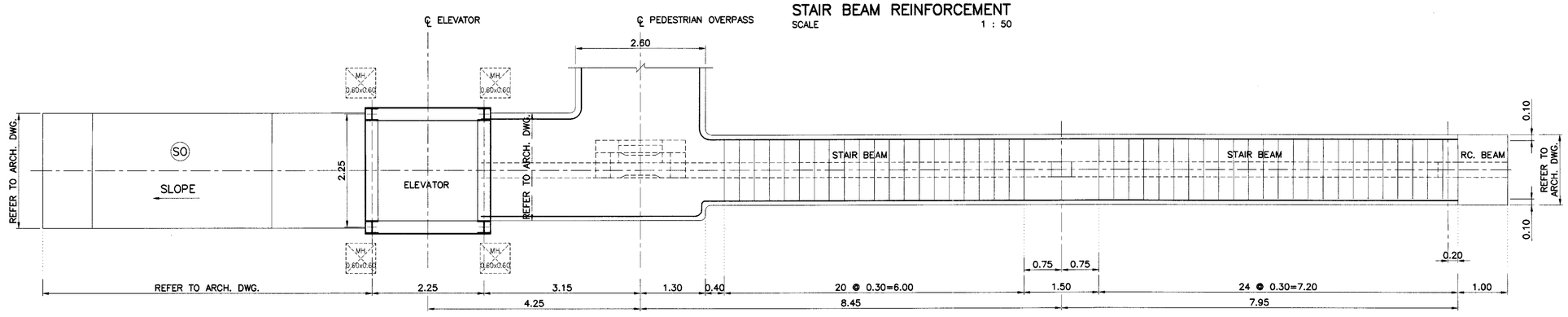
HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
STAIR AND ELEVATOR DETAILS (1/4)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–109
		SHEET NO. 160

D:\std. dwg 2015\PH-109(REV00)



STAIR BEAM REINFORCEMENT
SCALE 1 : 50



GROUND FLOOR PLAN
SCALE 1 : 50

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

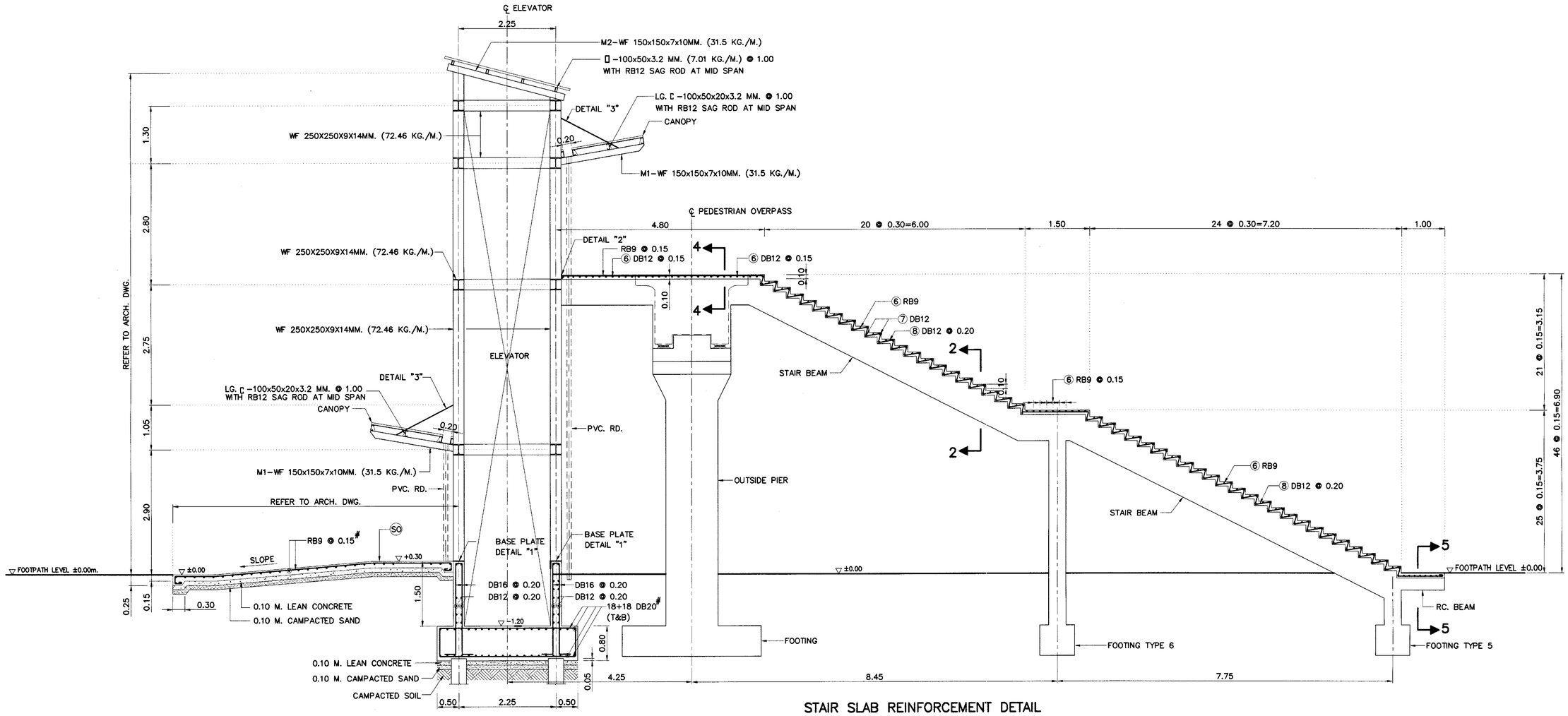
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
STAIR AND ELEVATOR DETAILS (2/4)

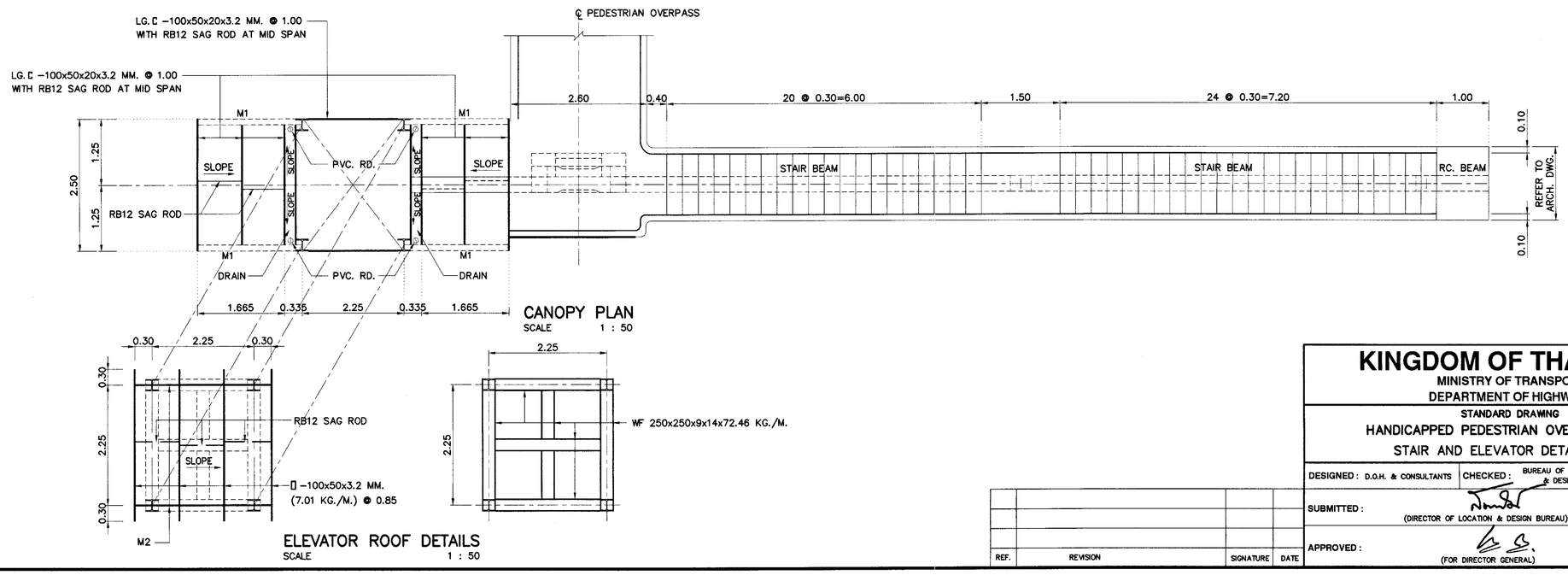
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–110
		SHEET NO. 161

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\PH-110(REV00)



STAIR SLAB REINFORCEMENT DETAIL
SCALE 1 : 50



CANOPY PLAN
SCALE 1 : 50

ELEVATOR ROOF DETAILS
SCALE 1 : 50

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

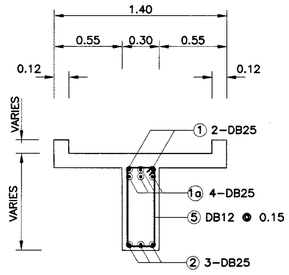
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
STAIR AND ELEVATOR DETAILS (3/4)

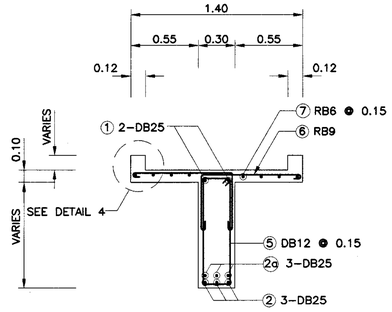
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–111
		SHEET NO. 162

REF.	REVISION	SIGNATURE	DATE

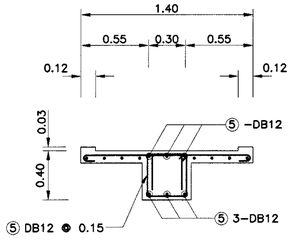
D:\std dwg 2015\PH-111(REV00)



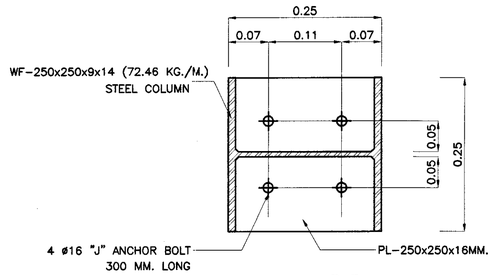
SECTION 1-1
SCALE 1:25



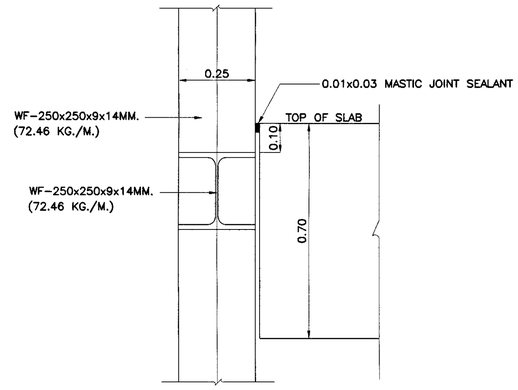
SECTION 2-2
SCALE 1:25



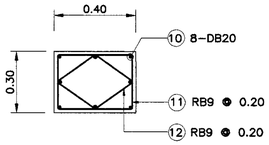
SECTION 5-5
SCALE 1:25



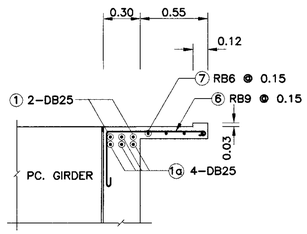
DETAIL "1"
SCALE 1 : 5



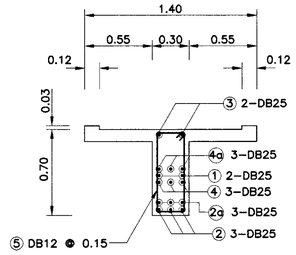
DETAIL "2"
SCALE 1 : 10



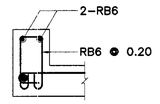
SECTION 3-3
SCALE 1:25



SECTION 4-4
SCALE 1:25

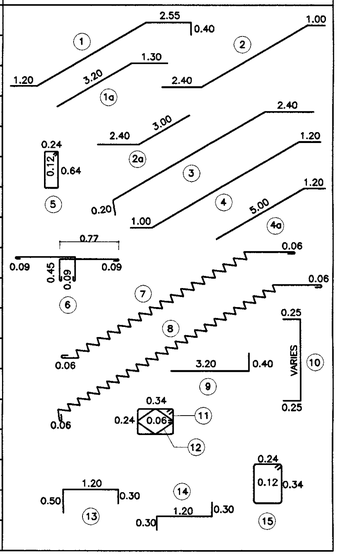


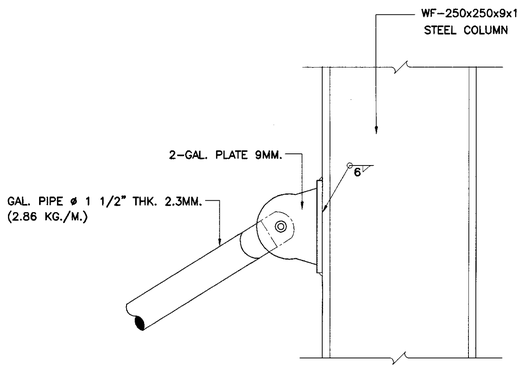
SECTION 6-6
SCALE 1:25

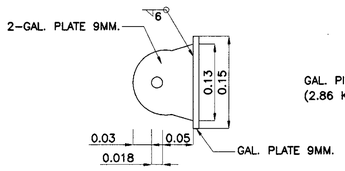


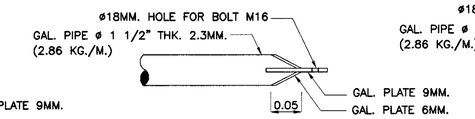
DETAIL 4
SCALE 1:10

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA.(MM.)	BAR BENDING DIAGRAM
①	DB 25	
1a	DB 25	
②	DB 25	
2a	DB 25	
③	DB 25	
④	DB 25	
4a	DB 25	
⑤	DB 12	
⑥	RB 9, DB 12	
⑦	RB 6	
⑧	RB 6	
⑨	DB 25	
⑩	DB 20	
⑪	RB 9	
⑫	RB 9	
⑬	DB 20	
⑭	DB 20	
⑮	RB 9	









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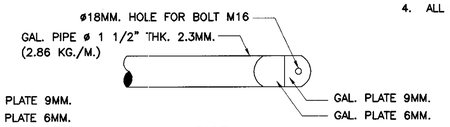


SIDE

DETAIL "3"
SCALE 1 : 5

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE STAIR AND PIER SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE CYLINDRICAL COMPRESSIVE STRENGTH OF 35 MPa., BASED ON 15.0x15.0x15.0cm. STANDARD CUBE AT 20 DAYS.
3. ALL WELDING THK. ARE 0.75xPLATE THK. BUT NOT LESS THAN 3 MM.
4. ALL BOLTS AND NUTS SHALL BE GALVANIZED TYPE

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

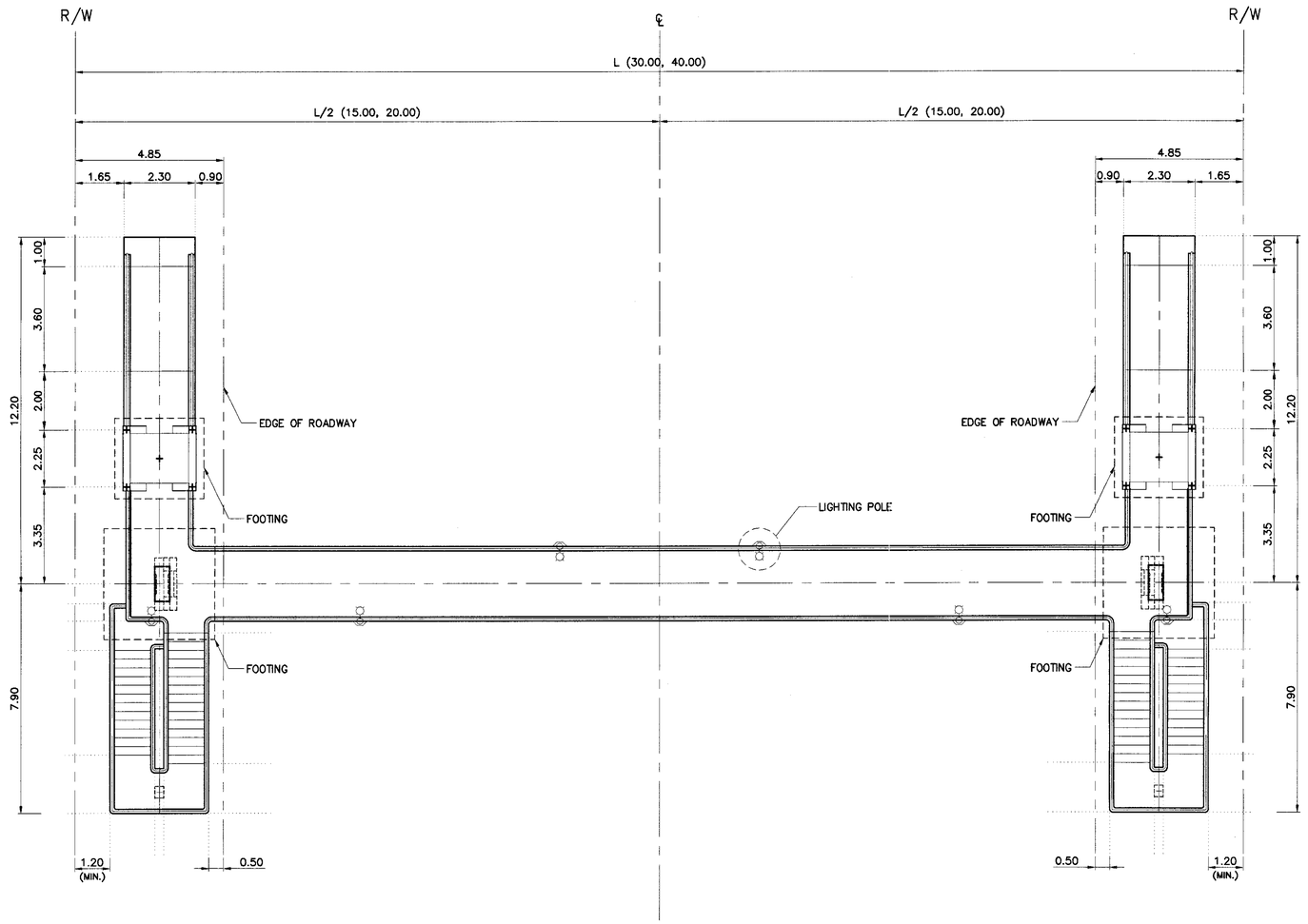
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 1
STAIR AND ELEVATOR DETAILS (4/4)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-112
		SHEET NO. 163

D:\std dwg 2015\PH-112(REV00)



PLAN 30.00, 40.00 M. R.O.W.
SCALE 1 : 100

TABLE OF LIGHTING POLE

R.O.W. (m.)	NO. OF LIGHTING POLES	LIGHTING POLE ARRANGEMENT
30.00	4	
40.00	6	

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

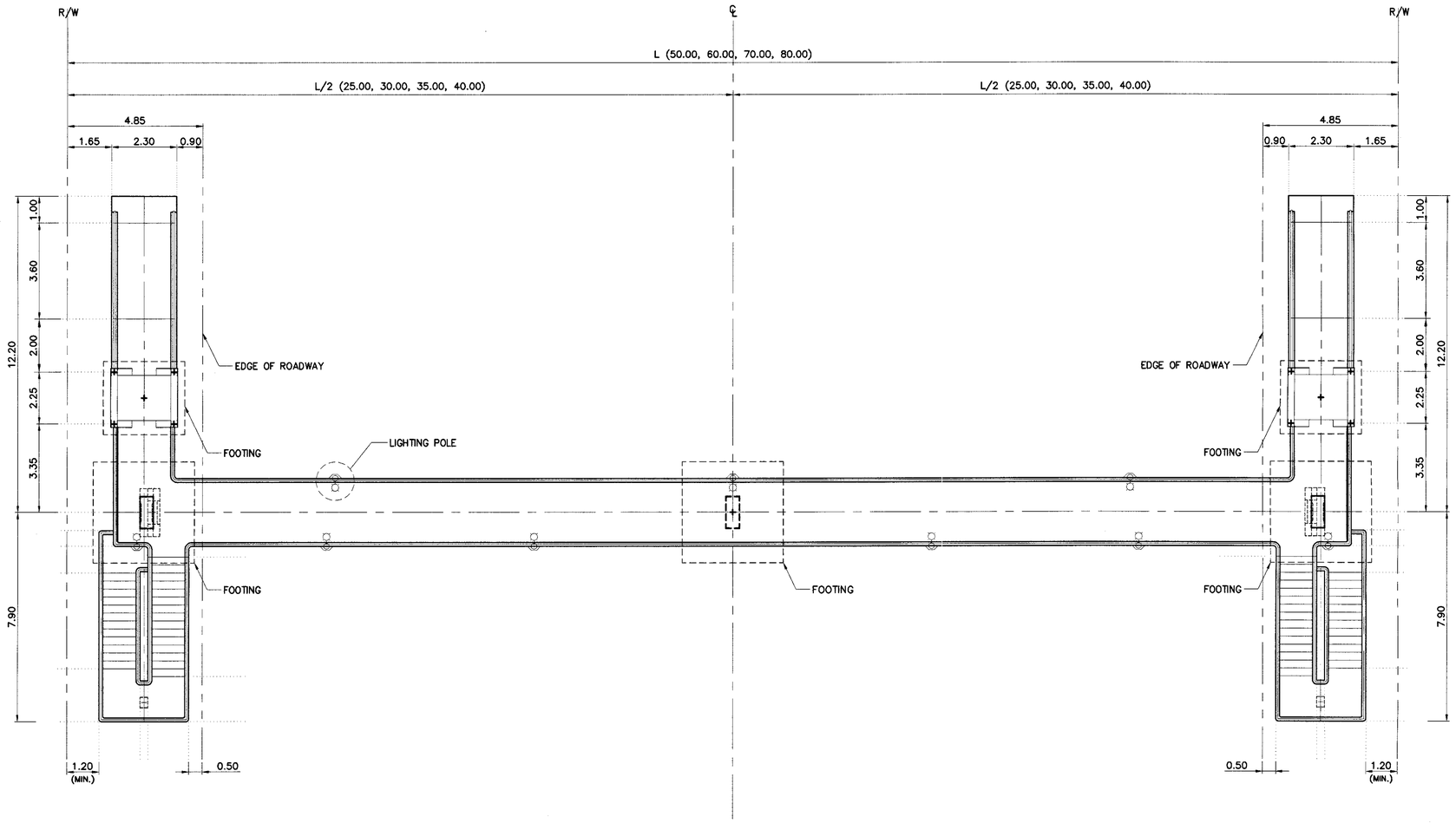
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2

PLAN (R.O.W. 30.00, 40.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-201
		SHEET NO. 164

D:\std dwg 2015\PH-201(REV00)



PLAN 50.00, 60.00, 70.00, 80.00 M. R.O.W.
SCALE 1 : 100

TABLE OF LIGHTING POLE

R.O.W. (m.)	NO. OF LIGHTING POLES	LIGHTING POLE ARRANGEMENT
50.00	7	
60.00	8	
70.00	9	
80.00	10	

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

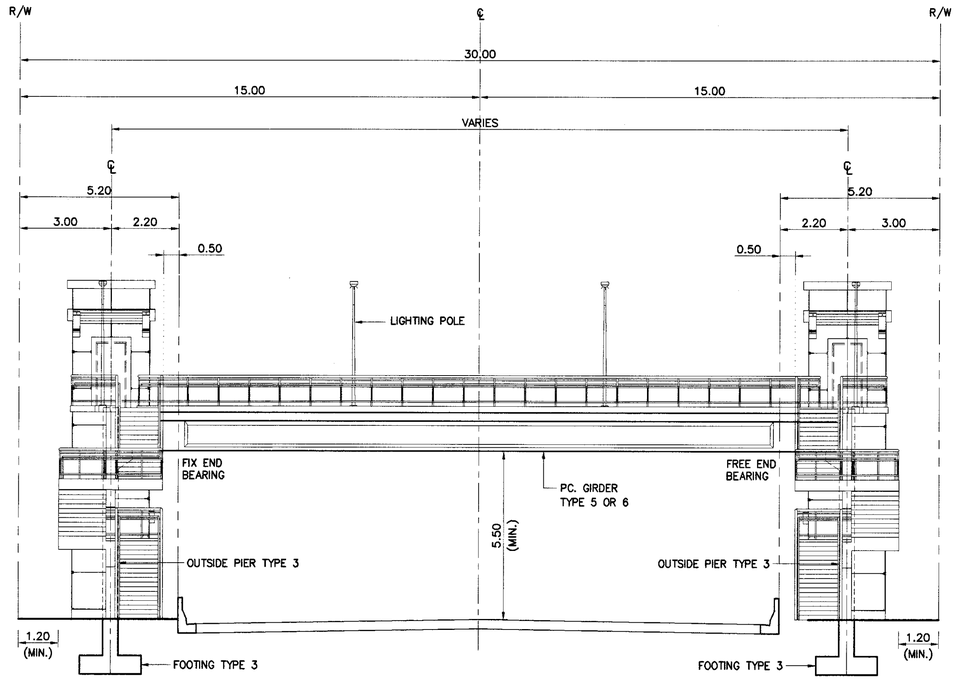
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

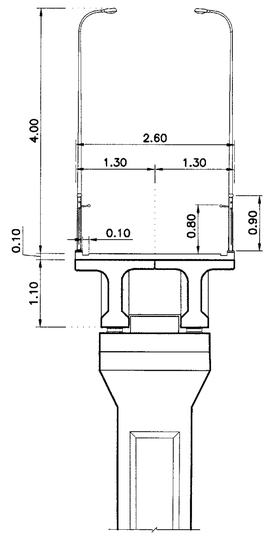
HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
PLAN (R.O.W. 50.00, 60.00, 70.00, 80.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-202
		SHEET NO. 165

D:\std dwg 2015\PH-202(REV00)



ELEVATION 30.00 M. R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-209 TO PH-212.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

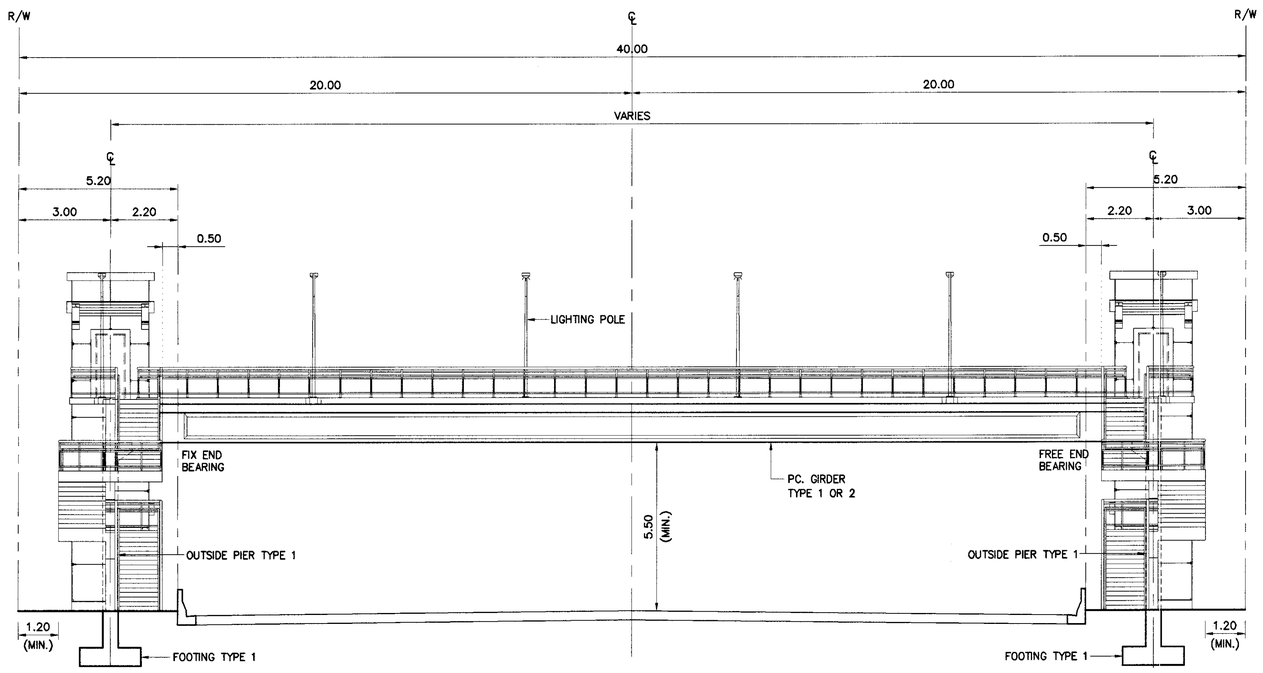
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

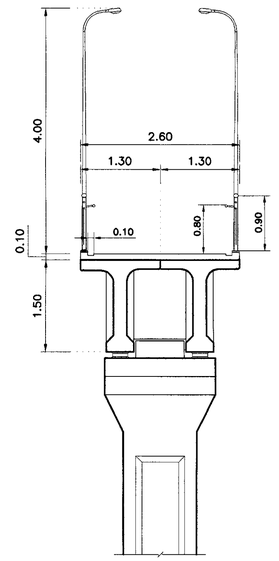
HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
ELEVATION (R.O.W. 30.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-203
		SHEET NO. 166

D:\std dwg 2015\PH-203(REV00)



ELEVATION 40.00 M. R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-209 TO PH-212.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

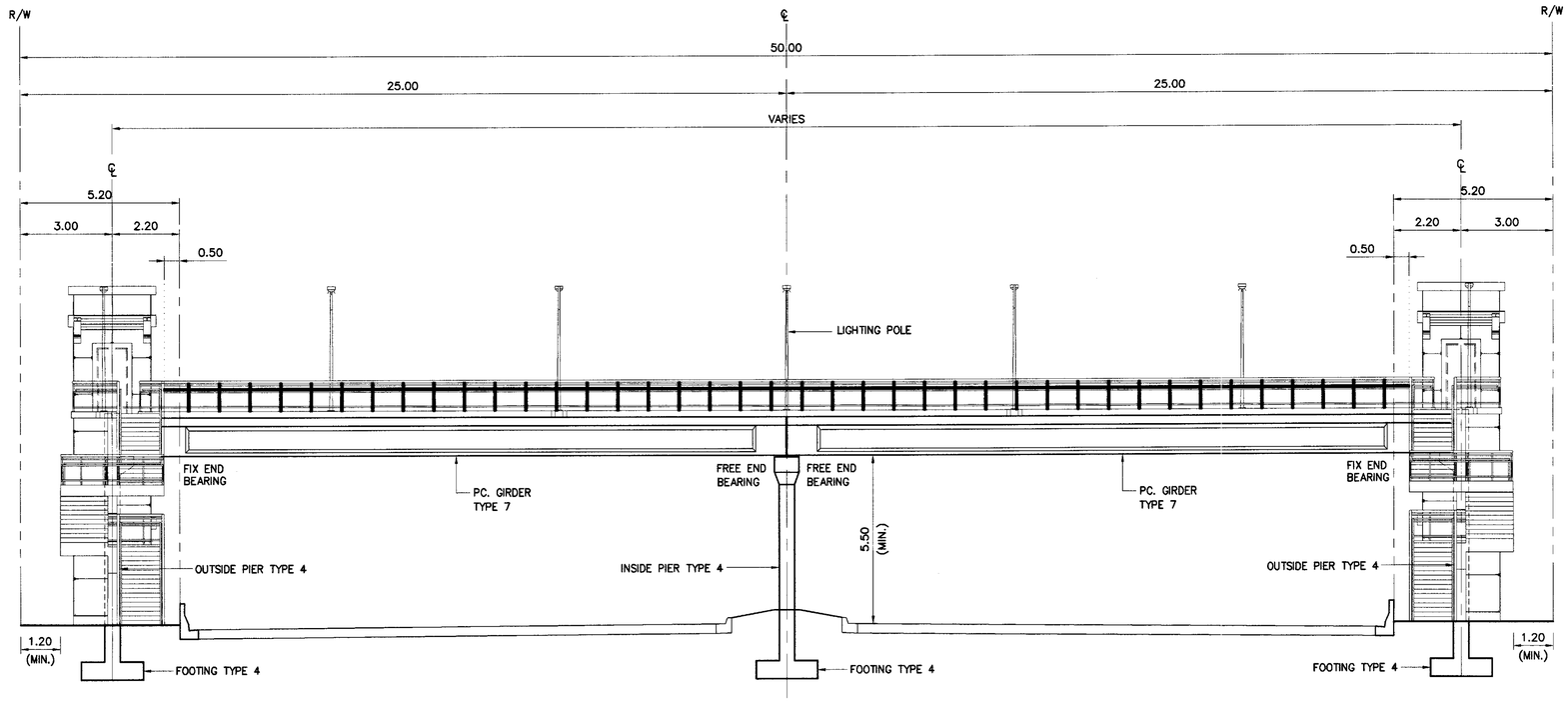
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

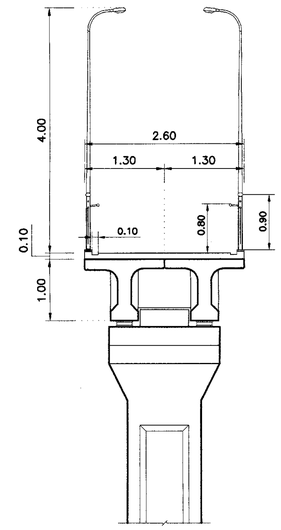
HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
ELEVATION (R.O.W. 40.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-204
		SHEET NO. 167

D:\std dwg 2015\PH-204(REV00)



ELEVATION 50.00 M. R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-209 TO PH-212.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

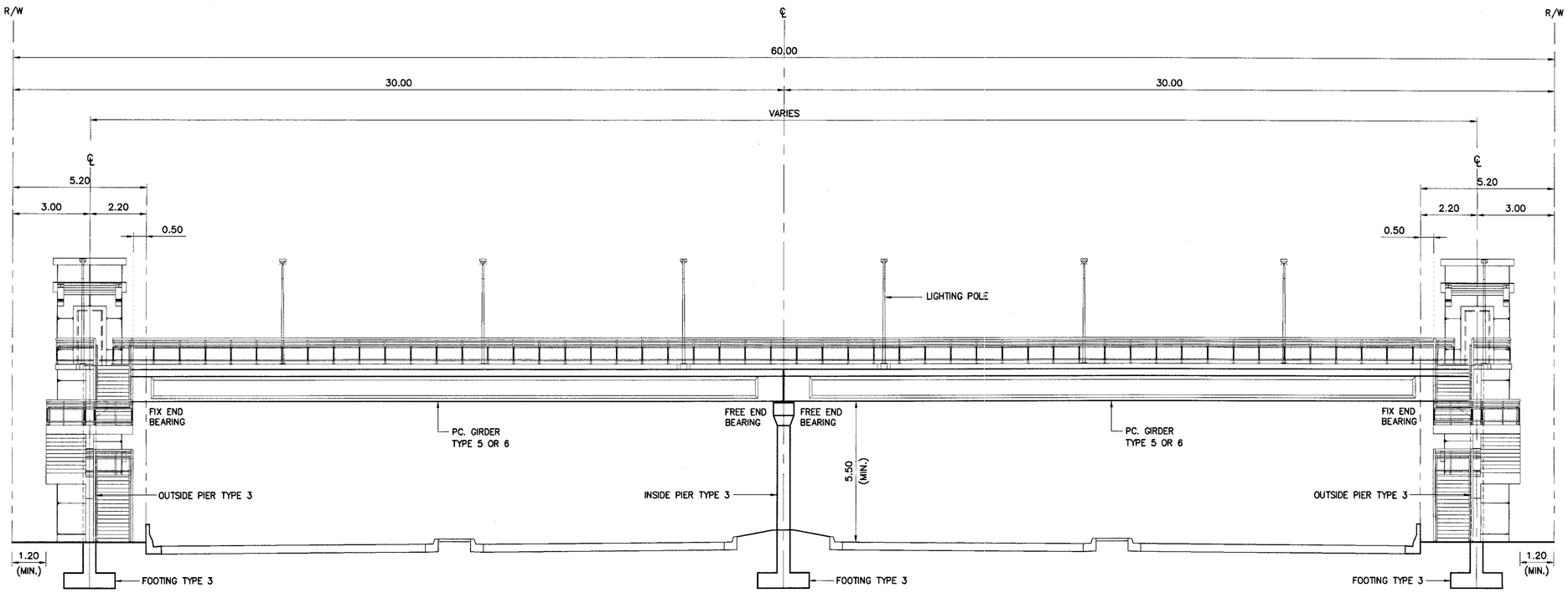
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2

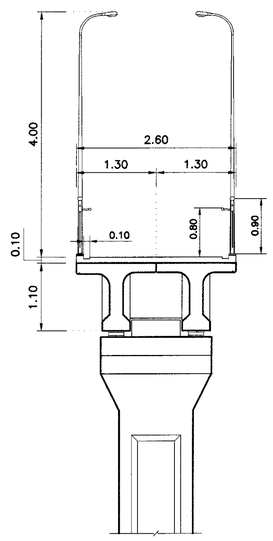
ELEVATION (R.O.W. 50.00 M.)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-205
		SHEET NO. 168

D:\std dwg 2015\PH-205(REV00)



ELEVATION 60.00 M. R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-209 TO PH-212.

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

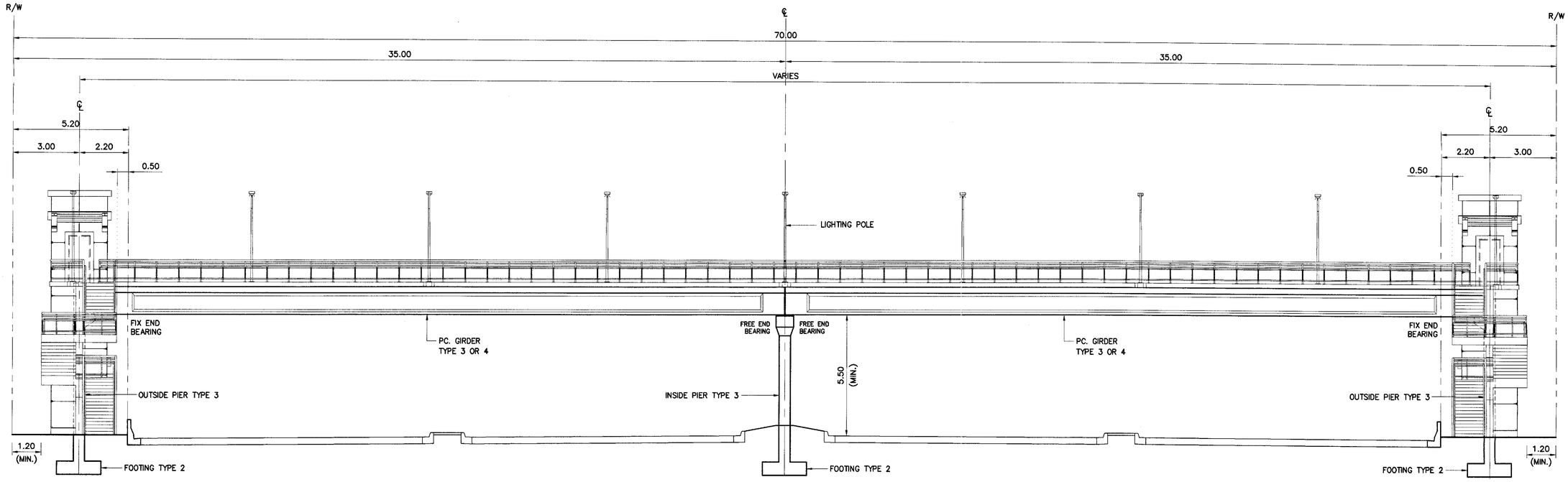
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
ELEVATION (R.O.W. 60.00 M.)

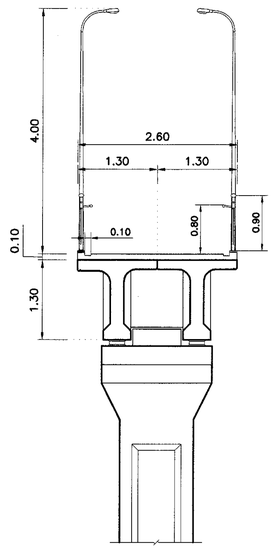
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-206
		SHEET NO. 169

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\PH-206(REV00)



ELEVATION 70.00 M. R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-209 TO PH-212.

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

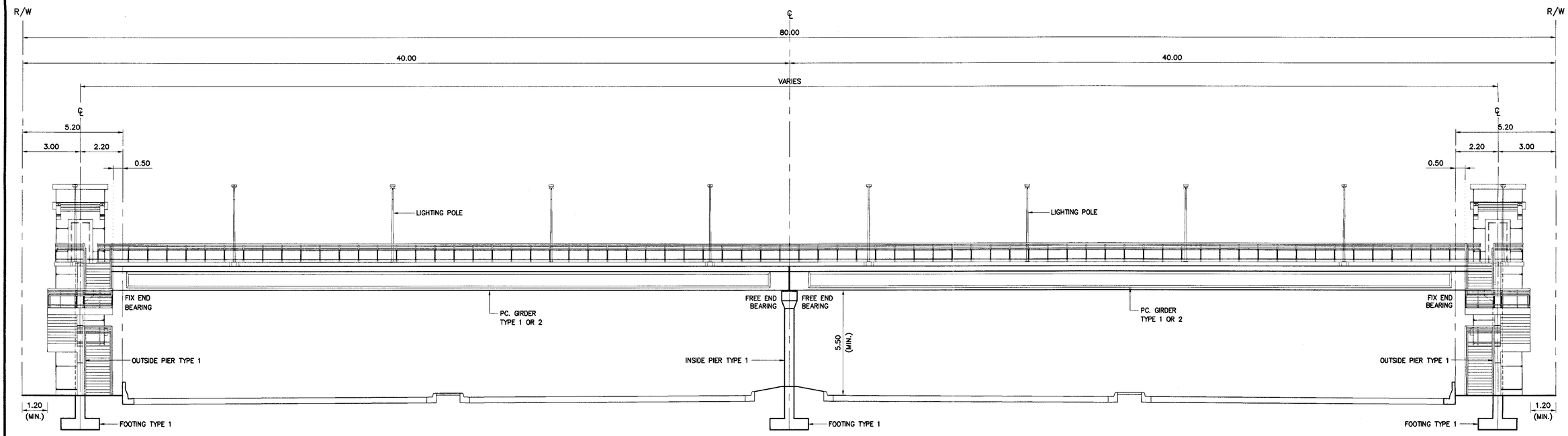
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
ELEVATION (R.O.W. 70.00 M.)

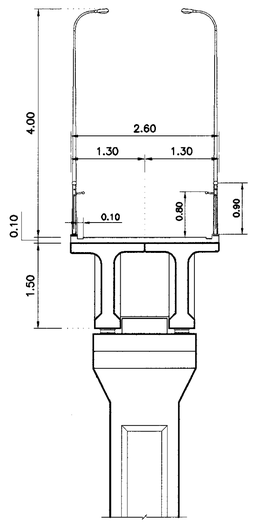
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. PH-207
			SHEET NO. 170

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\PH-207(REV00)



ELEVATION 80.00 M. R.O.W.
SCALE 1 : 100



TYPICAL CROSS SECTION
SCALE 1 : 50

NOTE :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR PC. GIRDER SEE DWG. NO. PH-001 AND PH-002.
3. FOR INSIDE PIER SEE DWG. NO. PH-003 AND PH-004.
4. FOR OUTSIDE PIER SEE DWG. NO. PH-005 AND PH-006.
5. FOR LIGHTING POLE SUPPORT SEE DWG. NO. PH-009.
6. FOR PILE FOOTING SEE DWG. NO. PH-007.
7. FOR SPREAD FOOTING SEE DWG. NO. PH-008.
8. FOR FIX END BEARING AND FREE END BEARING SEE DWG. NO. PH-009.
9. FOR STAIR AND ELEVATOR SEE DWG. NO. PH-209 TO PH-212.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

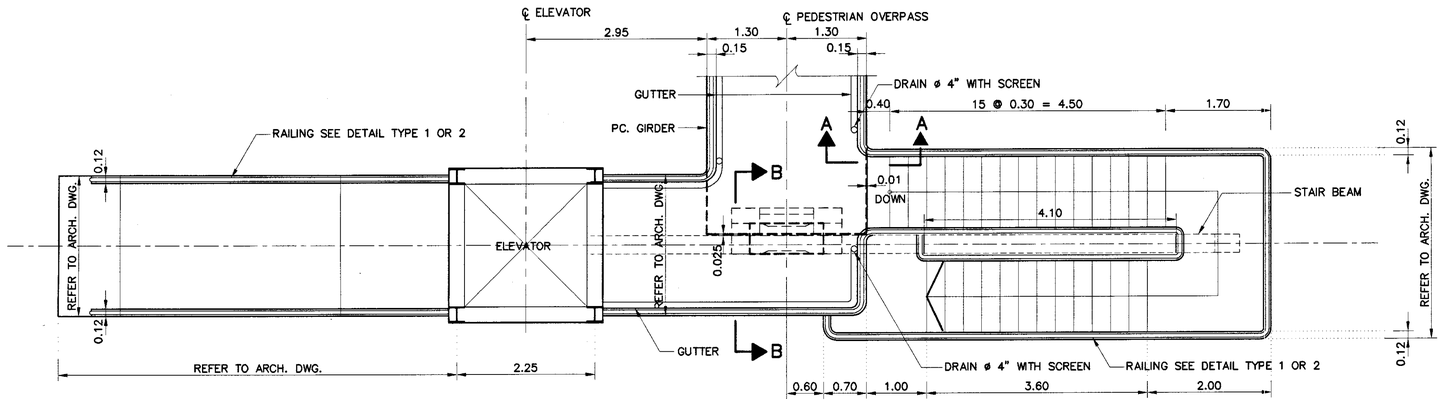
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
ELEVATION (R.O.W. 80.00 M.)

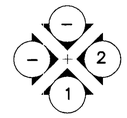
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-208
		SHEET NO. 171

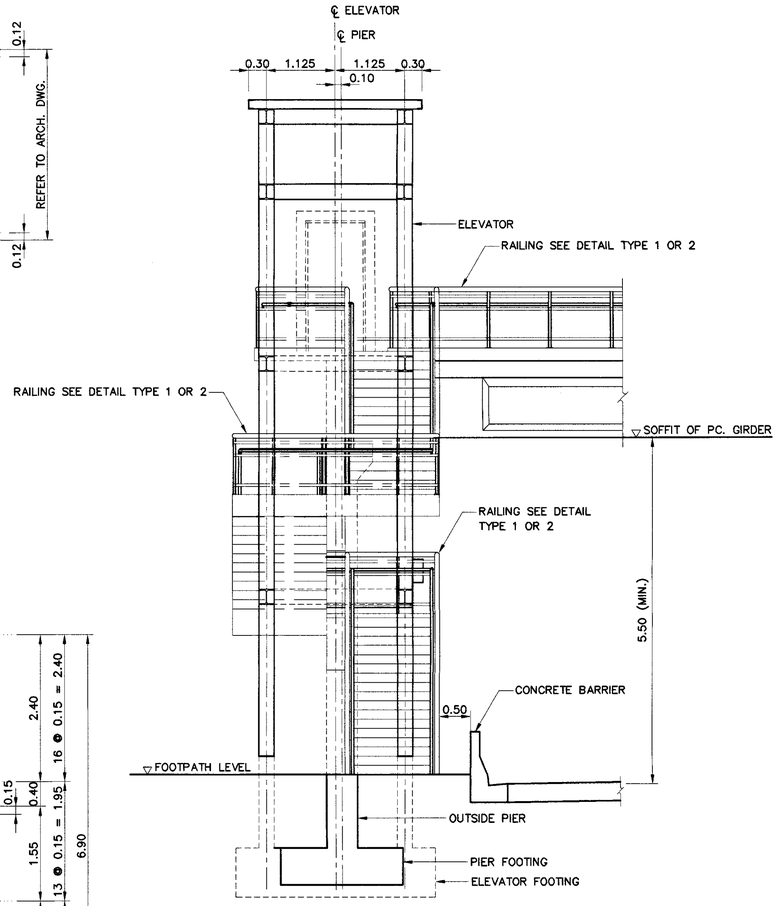
D:\std dwg 2015\PH-208(REV00)



PLAN

SCALE 1:50



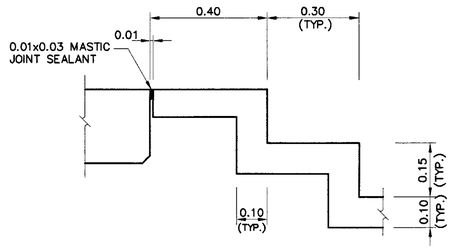


ELEVATION 2

SCALE 1:50

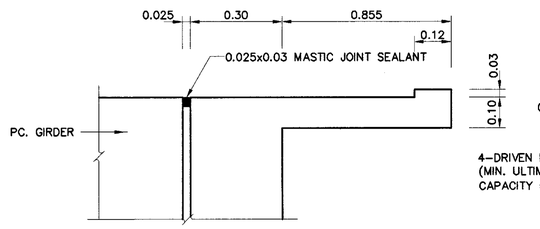
ELEVATION 1

SCALE 1:50



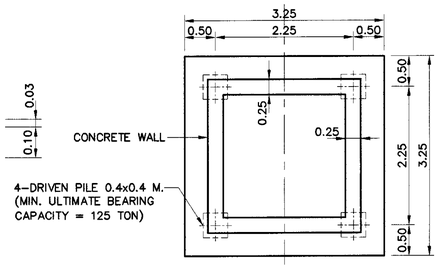
SECTION A–A

SCALE 1:10



SECTION B–B

SCALE 1:10



SECTION C–C

SCALE 1:50

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. FOR RAILING DETAILS, SEE DWG. NO. PH-010.
3. FOR PILE DETAILS OF ELEVATOR FOOTING, SEE DOH STANDARD DRAWING NO. PL-001 AND PL-101.
4. FOR CONCRETE BARRIER DETAILS, SEE DWG. NO. PH-009.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

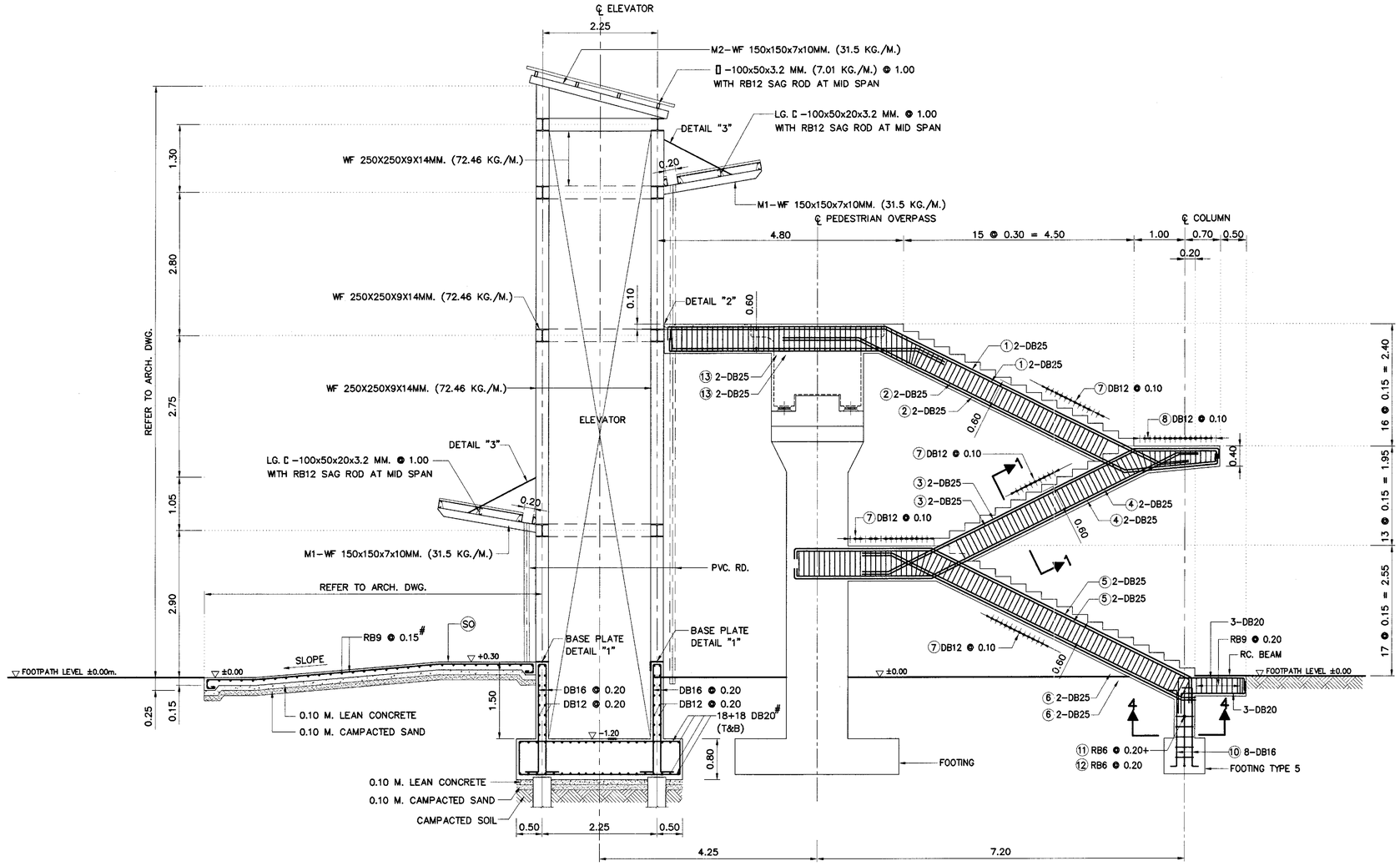
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
STAIR AND ELEVATOR DETAILS (1/4)

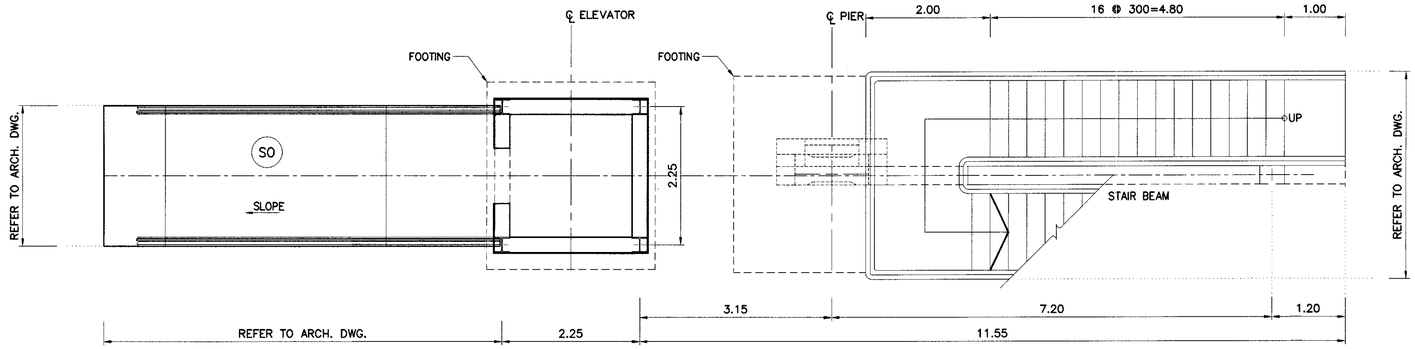
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-209
		SHEET NO. 172

D:\std dwg 2015\PH-209(REV00)



STAIR BEAM REINFORCEMENT

SCALE 1 : 50



GROUND FLOOR PLAN

SCALE 1 : 50

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

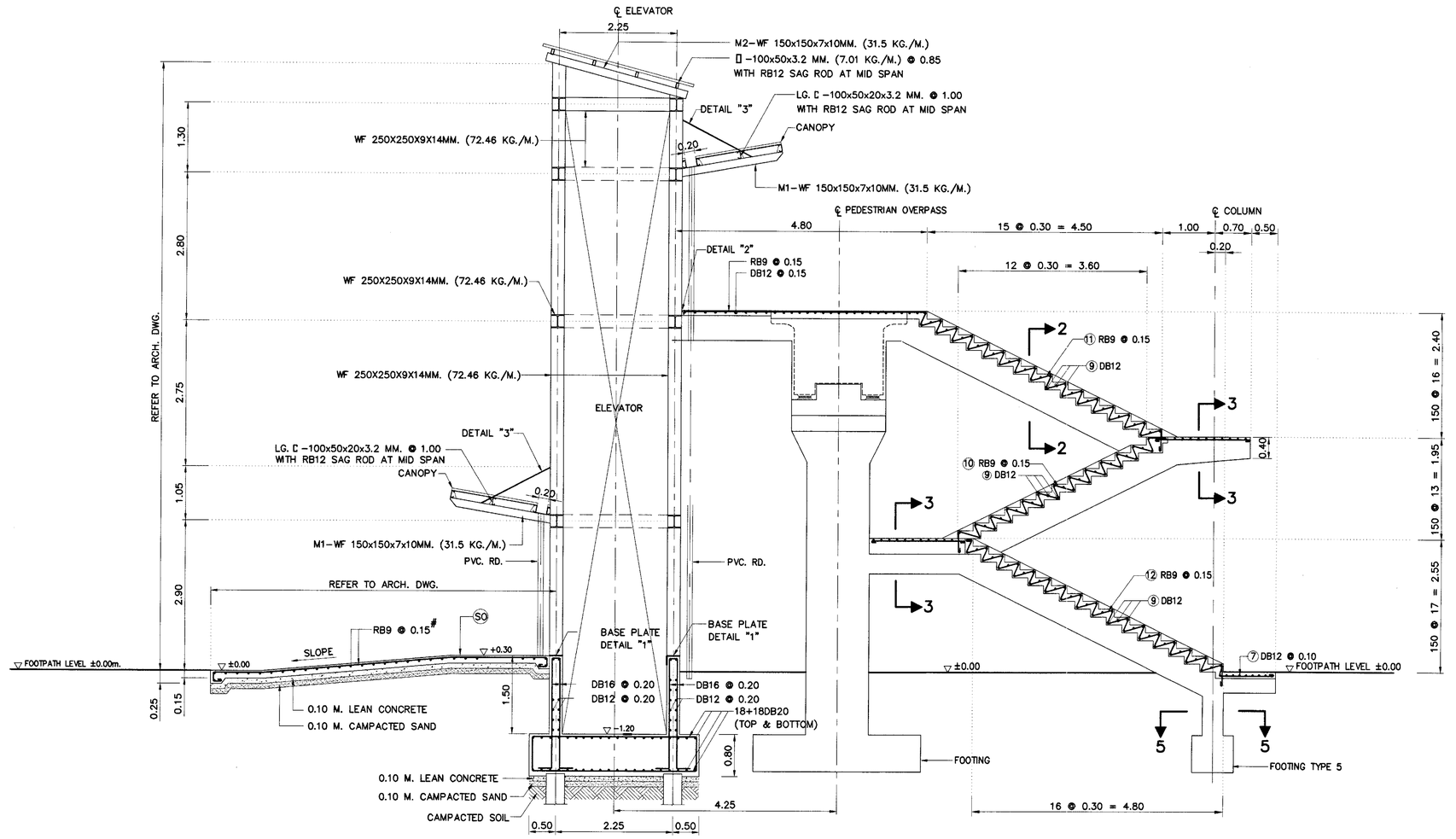
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2

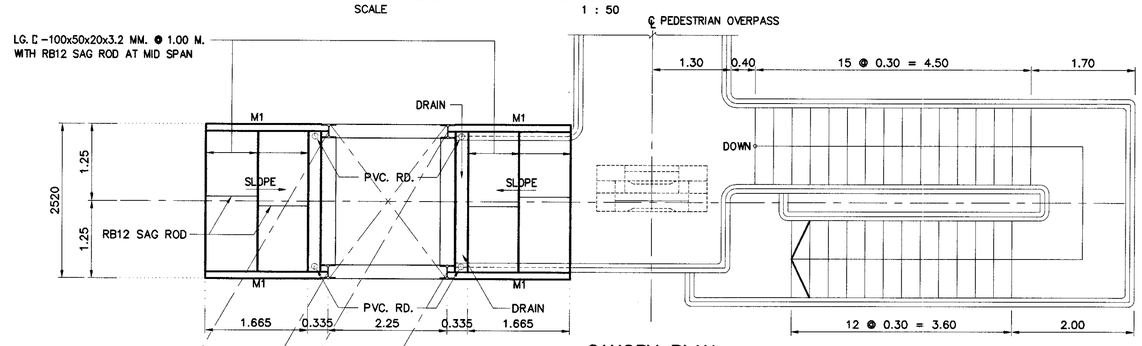
STAIR AND ELEVATOR DETAILS (2/4)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–210
		SHEET NO. 173

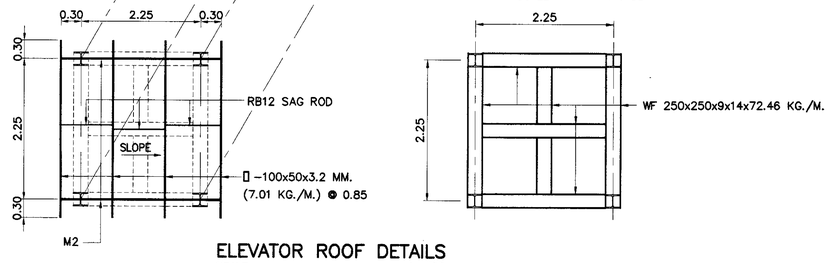
D:\std dwg 2015\PH-210(REV00)



STAIR SLAB REINFORCEMENT
SCALE 1 : 50



CANOPY PLAN
SCALE 1 : 50



ELEVATOR ROOF DETAILS
SCALE 1 : 50

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

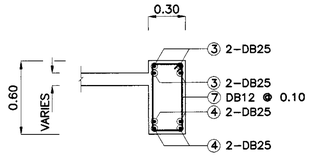
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
STAIR AND ELEVATOR DETAILS (3/4)

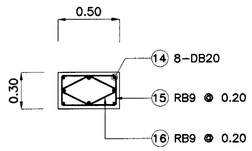
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH–211
		SHEET NO. 174

REF.	REVISION	SIGNATURE	DATE

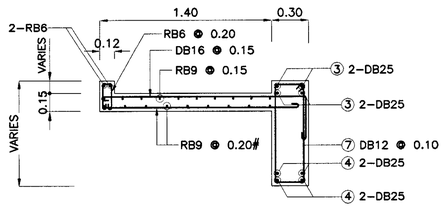
D:\std dwg 2015\PH-211(REV00)



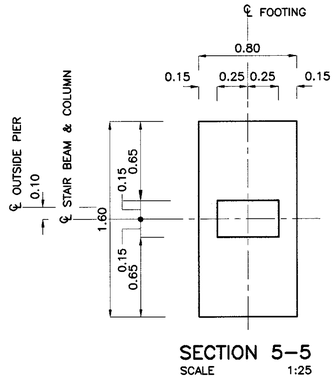
SECTION 1-1
SCALE 1:25



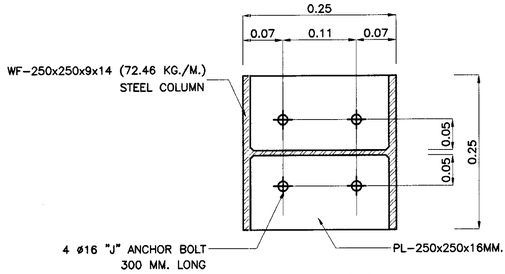
SECTION 4-4
SCALE 1:25



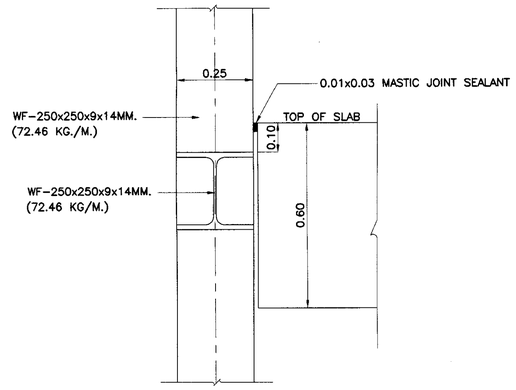
SECTION 2-2
SCALE 1:25



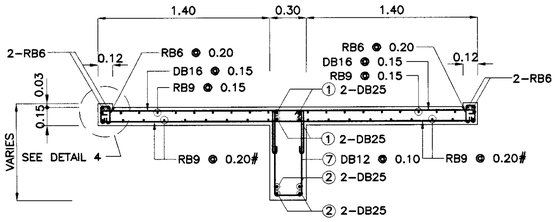
SECTION 5-5
SCALE 1:25



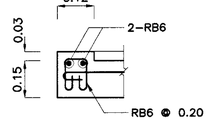
DETAIL "1"
SCALE 1 : 5



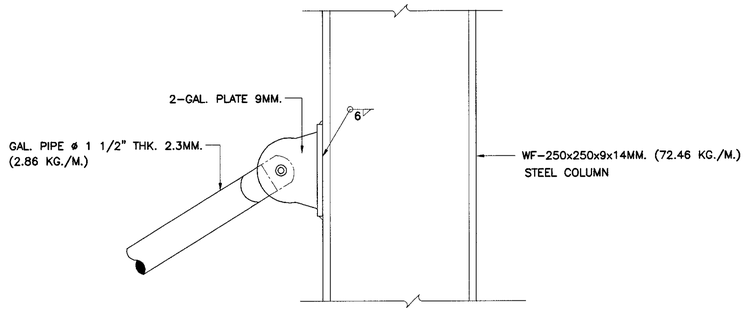
DETAIL "2"
SCALE 1 : 10

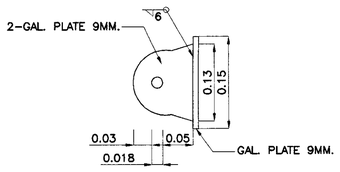


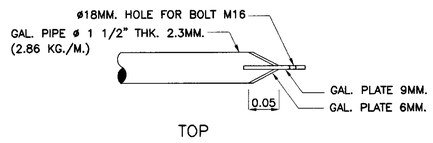
SECTION 3-3
SCALE 1:25



DETAIL 4
SCALE 1:10







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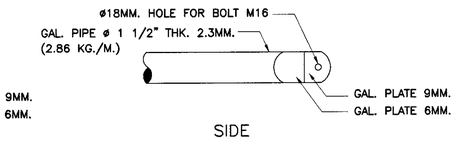
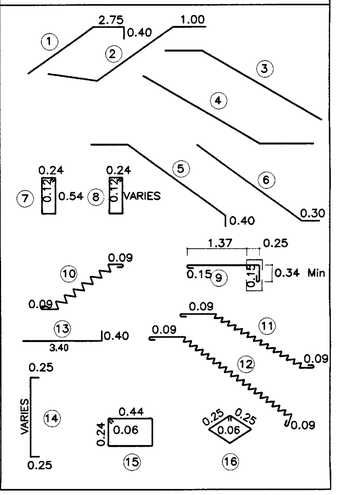


SIDE

DETAIL "3"
SCALE 1 : 5

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA.(MM.)	BAR BENDING DIAGRAM
①	DB 25	
②	DB 25	
③	DB 25	
④	DB 25	
⑤	DB 25	
⑥	DB 25	
⑦	DB 12	
⑧	DB 12	
⑨	DB 12	
⑩	RB 9	
⑪	RB 9	
⑫	RB 9	
⑬	DB 25	
⑭	DB 20	
⑮	RB 9	
⑯	RB 9	



NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE STAIR AND PIER SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE CYLINDRICAL COMPRESSIVE STRENGTH OF 35 MPa., BASED ON 15.0x15.0x15.0cm. STANDARD CUBE AT 20 DAYS.
3. ALL WELDING THK. ARE 0.75xPLATE THK. BUT NOT LESS THAN 3 MM.
4. ALL BOLTS AND NUTS SHALL BE GALVANIZED TYPE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

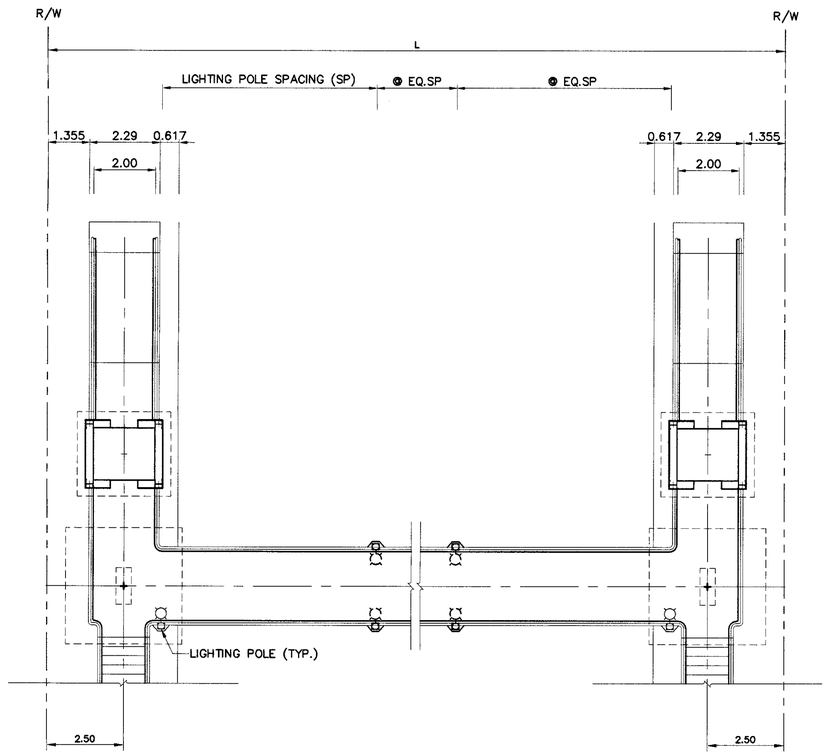
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS TYPE 2
STAIR AND ELEVATOR DETAILS (4/4)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. PH-212
			SHEET NO. 175

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\PH-212(REV00)

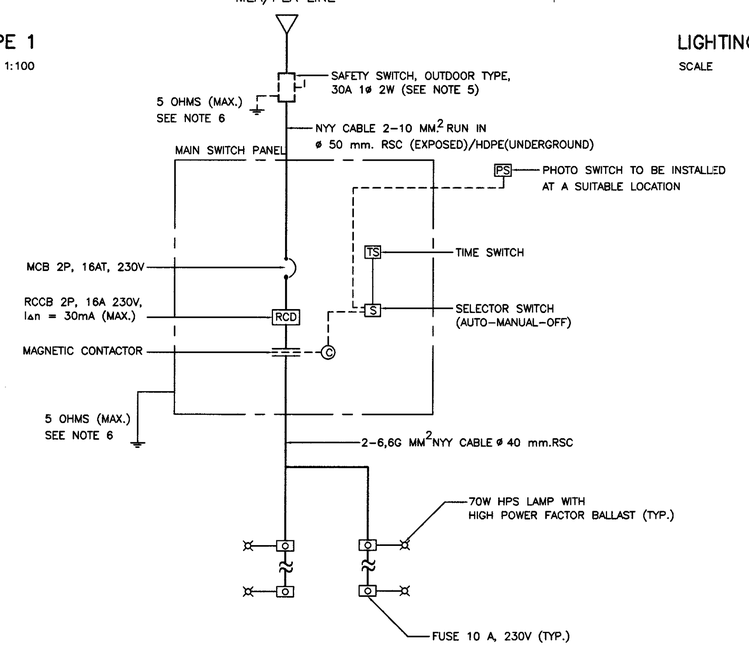


LIGHTING PLAN OF PEDESTRIAN BRIDGE TYPE 1

SCALE 1:100

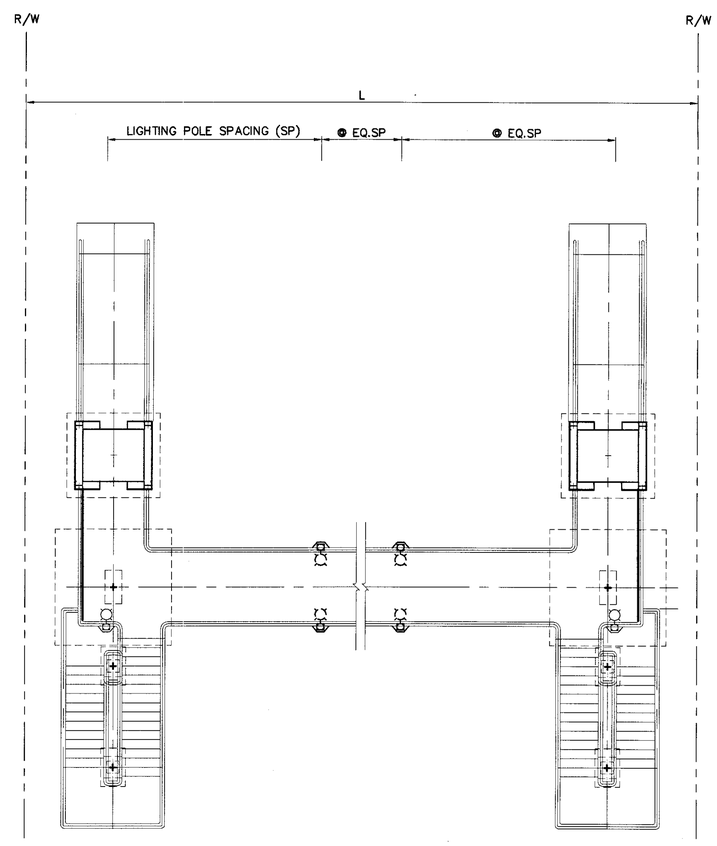
TABLE

L (m.)	NUMBER OF LIGHT	LIGHTING POLE ARRANGEMENT
30	4	
40	6	
50	7	
60	8	
70	9	
80	10	



SINGLE LINE DIAGRAM

NOT TO SCALE



LIGHTING PLAN OF PEDESTRIAN BRIDGE TYPE 2

SCALE 1:100

NOTES :

1. ALL DIMENSION SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THE LAMP SHALL BE HIGH PRESSURE SODIUM LAMP, 70 WATT WITH HIGH POWER FACTOR BALLAST.
3. THE MINIMUM HORIZONTAL ILLUMINATION LEVEL (Eh,min.) SHALL NOT BE LESS THAN 50 LUX. THE UNIFORMITY RATIO (Eh,min/Eh,ave) SHALL NOT BE LESS THAN 0.3 ALSO.
4. ALL STAINLESS STEEL RAILINGS AND METALLIC PARTS SHALL BE CONTINUOUS GROUNDED TO THE GROUND ROD(S) AT THE BOTH SIDE OF BRIDGE.
5. FOR THE MAIN SWITCH PANEL INSTALLED AT THE MEA/PEA METERING POLE OR SERVED IN THE MEA/PEA UNDERGROUND SERVICE AREA, THE SAFETY SWITCH IS NOT INSTALLED.
6. FOR THE AREA DIFFICULTLY TO MAINTENANCE WITH APPROVAL OF MEA/PEA, THE RESISTANCE BETWEEN GROUND AND GROUND ROD ALLOWED BE MORE THAN 5 OHMES BUT NOT EXCEED TO 25 OHMS.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

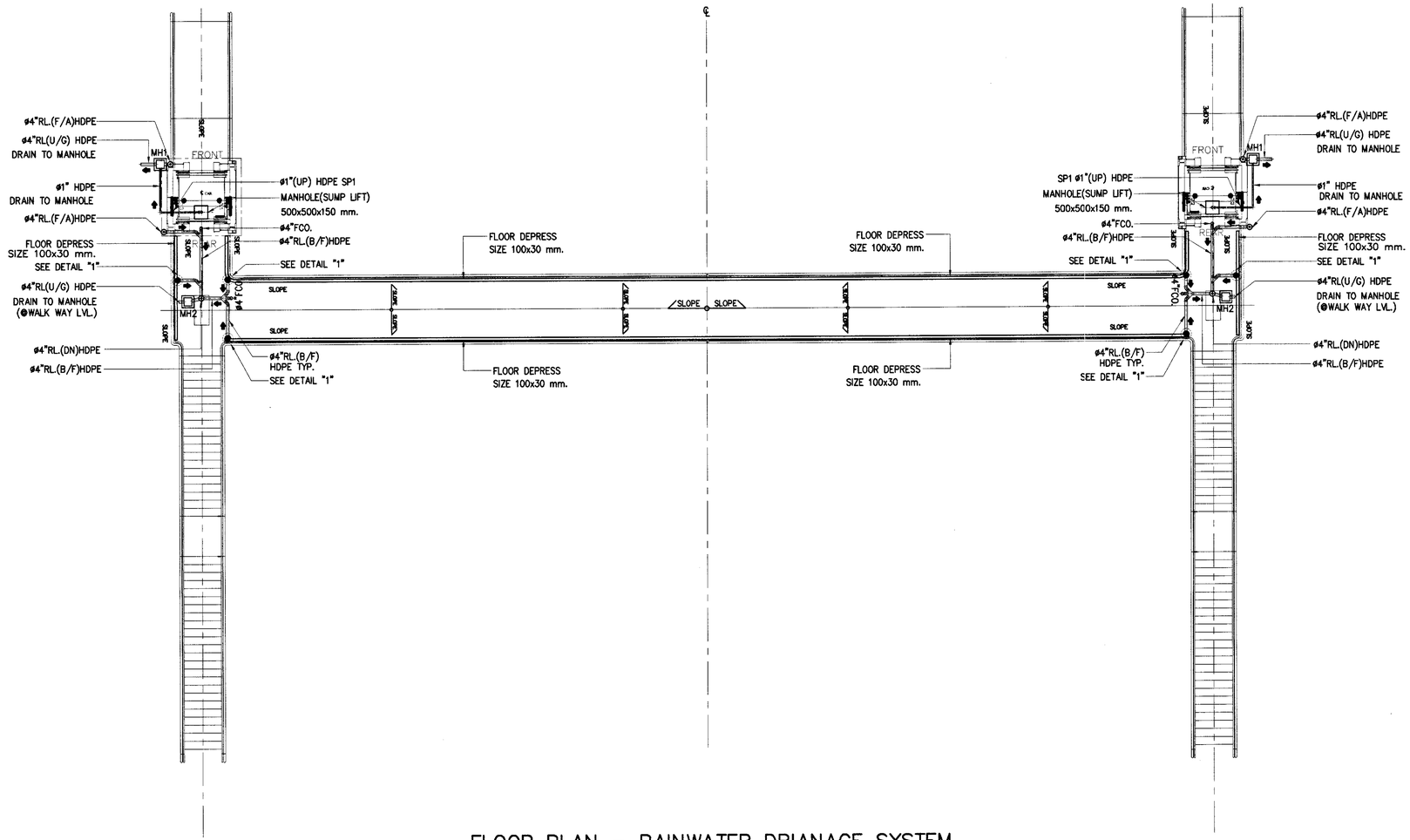
STANDARD DRAWING

HANDICAPPED PEDESTRIAN OVERPASS (TYPICAL)

LIGHTING SYSTEM

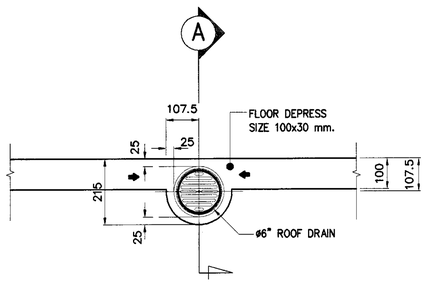
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. PH-213
		SHEET NO. 176

D:\std dwg 2015\PH-213(REV00)

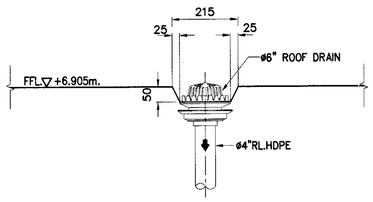


FLOOR PLAN – RAINWATER DRIANAGE SYSTEM

SCALE 1:100



PLAN



SECTION A

DETAIL "1"

NOT TO SCALE

NOTE:

1. SUBMERSIBLE PUMP(SP1,SP2) ARE CONTROL BY FLOAT LEVEL SWITCH
   CAPACITY 75 LITER PER SECOND AT 6.5 M.THD
   DRIVING MOTOR 120 W., 220–240 V./1P/50 Hz.
2. MANHOLE (MH1–MH4) SIZE 0.30x0.30 m.
3. RAINWATER PIPE AND PIPE FOR PUMP ARE HDPE PN10.

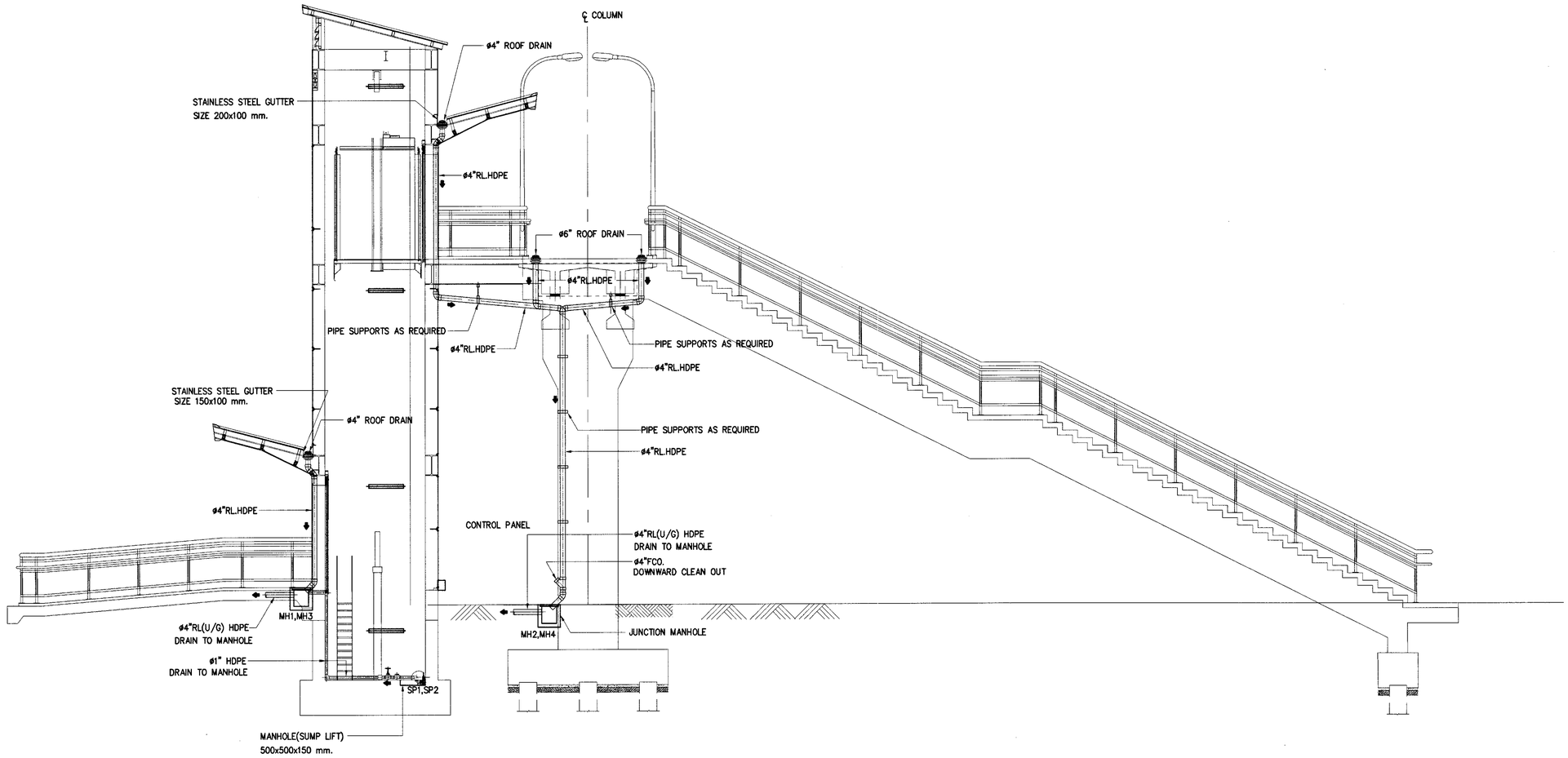
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
PEDESTRIAN OVERPASS TYPE–1
FLOOR PLAN – RAINWATER DRIANAGE SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. SNO–101
		SHEET NO. 177

D:\std dwg 2015\SNO-101(REV00)



SECTION – RAINWATER DRAINAGE SYSTEM

SCALE 1:50

NOTE:

1. SUBMERSIBLE PUMP (SP1,SP2) ARE CONTROL BY FLOAT LEVEL SWITCH
   CAPACITY 75 LITER PER SECOND AT 6.5 M.THD
   DRIVING MOTOR 120 W., 220–240 V./1P/50 Hz.
2. MANHOLE (MH1–MH4) SIZE 0.30x0.30 m.
3. RAINWATER PIPE AND PIPE FOR PUMP ARE HDPE PN10.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

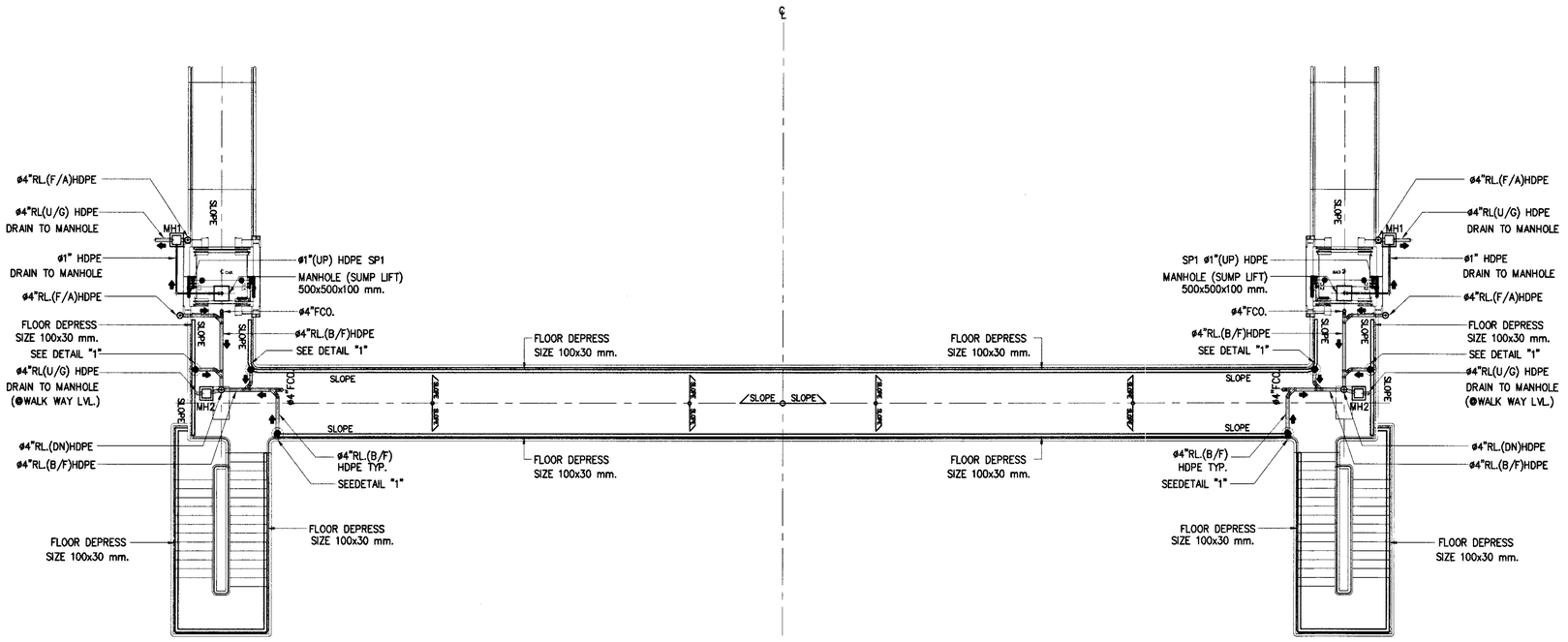
STANDARD DRAWING

PEDESTRIAN OVERPASS TYPE–1

SECTION – RAINWATER DRIANAGE SYSTEM

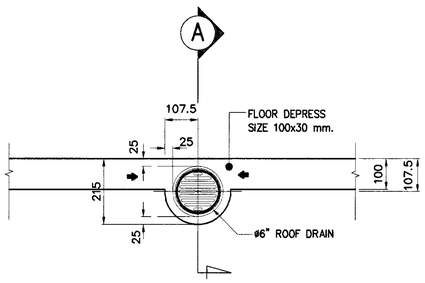
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. SNO–102
		SHEET NO. 178

D:\std dwg 2015\SNO-102(REV00)

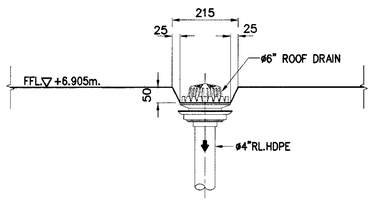


FLOOR PLAN – RAINWATER DRAINAGE SYSTEM

SCALE 1:100



PLAN



SECTION A

DETAIL "1"

NOT TO SCALE

NOTE:

1. SUBMERSIBLE PUMP (SP1,SP2) ARE CONTROL BY FLOAT LEVEL SWITCH CAPACITY 75 LITER PER SECOND AT 6.5 M.THD DRIVING MOTOR 120 W., 220–240 V./1P/50 Hz.
2. MANHOLE (MH1–MH4) SIZE 0.30x0.30 m.
3. RAINWATER PIPE AND PIPE FOR PUMP ARE HDPE PN10.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

PEDESTRIAN OVERPASS TYPE–2

FLOOR PLAN – RAINWATER DRAINAGE SYSTEM

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SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. SNO–103
		SHEET NO. 179

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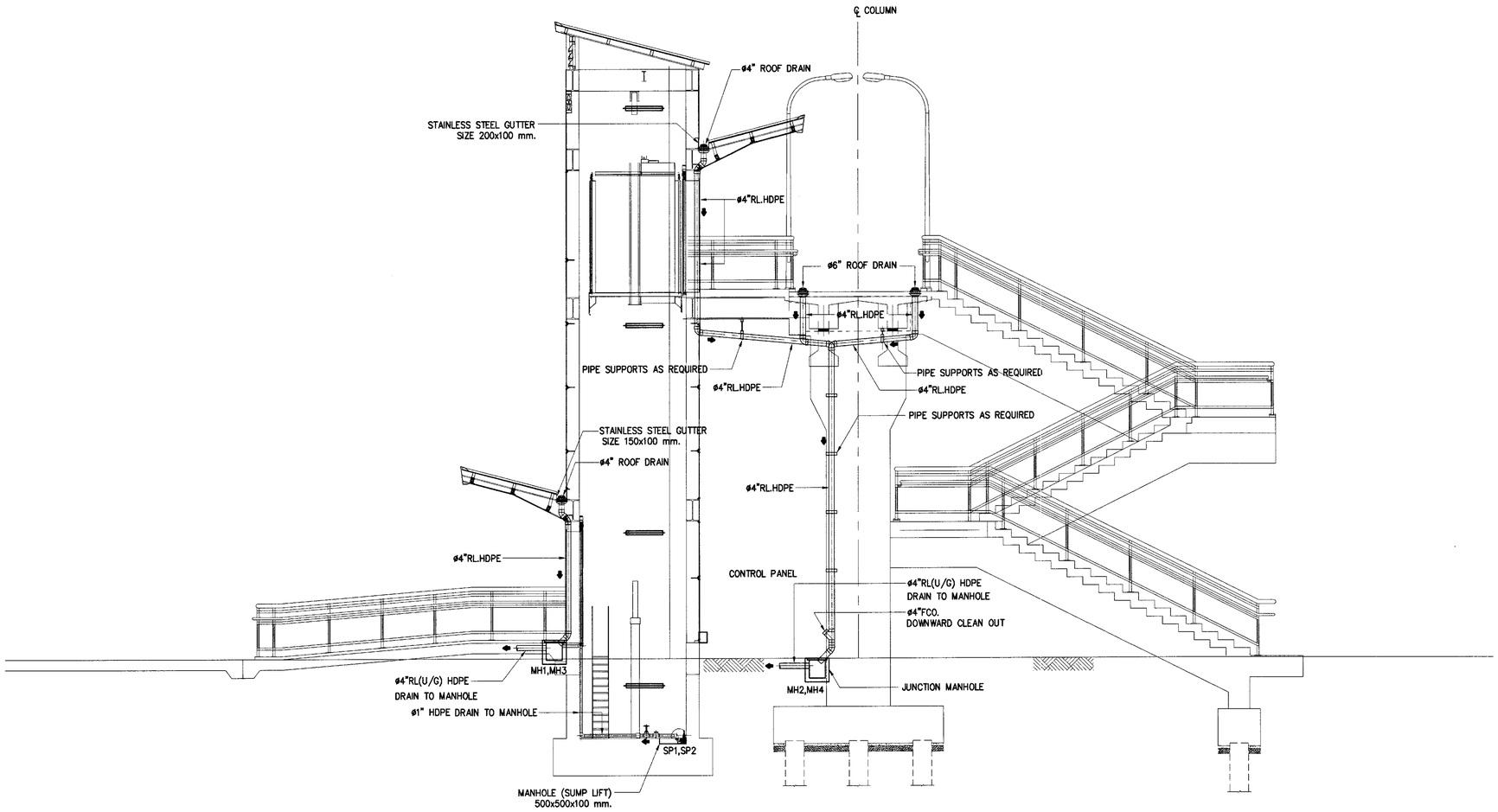


SECTION – RAINWATER DRAINAGE SYSTEM

SCALE 1:50

NOTE:

1. SUBMERSIBLE PUMP (SP1,SP2) ARE CONTROL BY FLOAT LEVEL SWITCH CAPACITY 75 LITER PER SECOND AT 6.5 M.THD DRIVING MOTOR 120 W., 220–240 V./1P/50 Hz.
2. MANHOLE (MH1–MH4) SIZE 0.30x0.30 m.
3. RAINWATER PIPE AND PIPE FOR PUMP ARE HDPE PN10.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

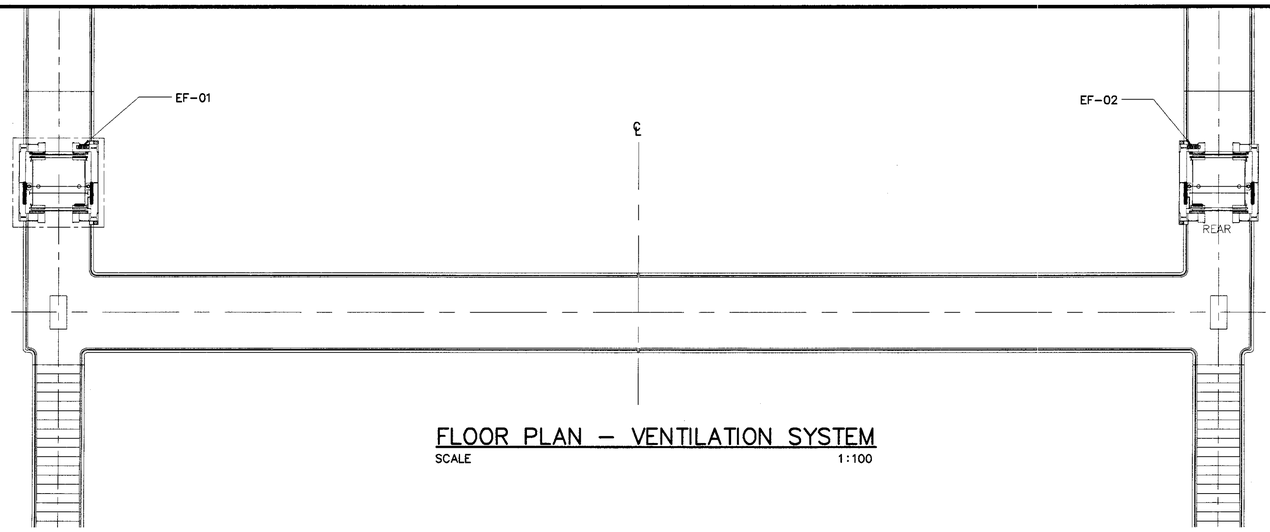
STANDARD DRAWING

PEDESTRIAN OVERPASS TYPE-2

SECTION – RAINWATER DRAINAGE SYSTEM

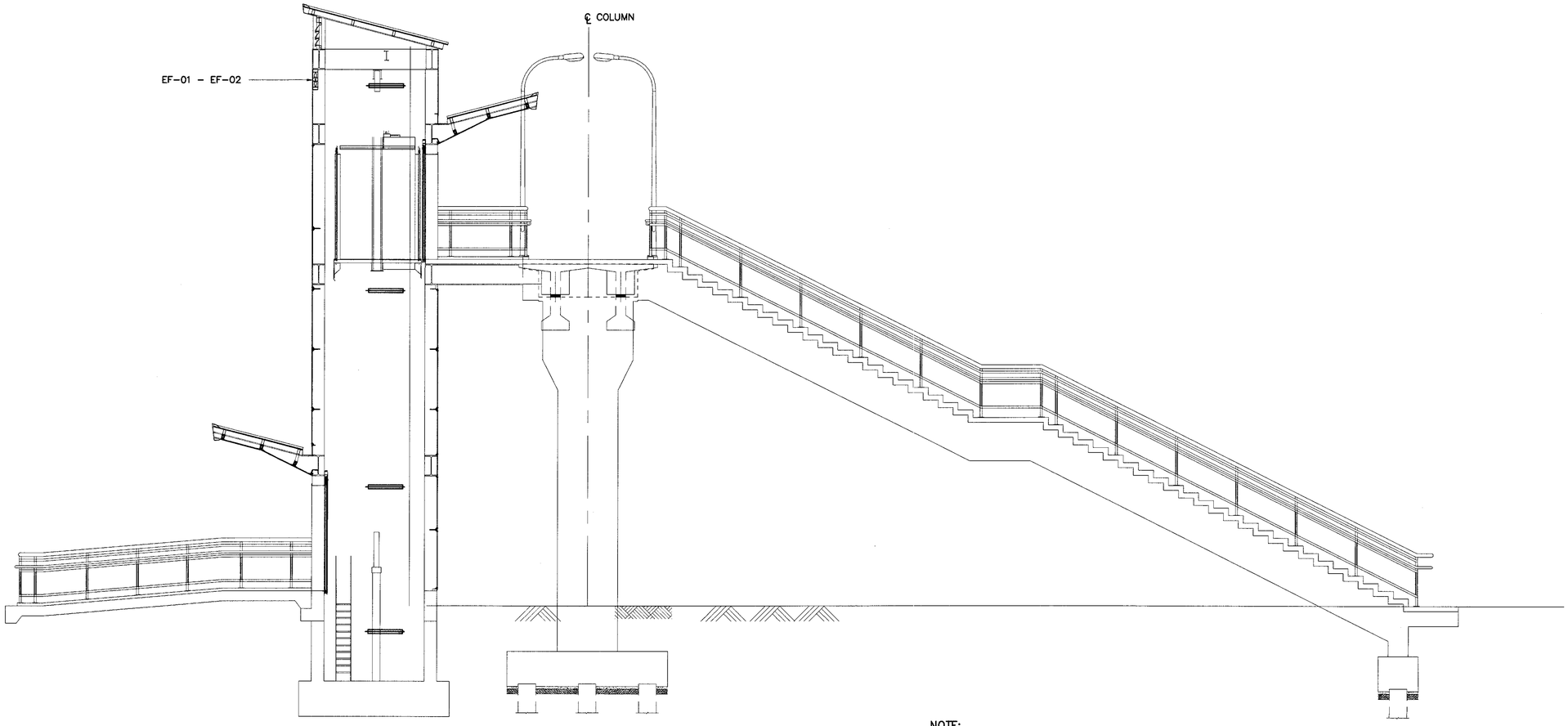
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. SNO-104
		SHEET NO. 180

D:\std dwg 2015\SNO-104(REV00)



FLOOR PLAN – VENTILATION SYSTEM

SCALE 1:100



SECTION – VENTILATION SYSTEM

SCALE 1:50

NOTE:

1. EXHAUST FANS (EF-01,EF-02) ARE CAPACITY 750 CFM., DRIVING MOTOR 0.5 km.,220V./1P/50 Hz.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

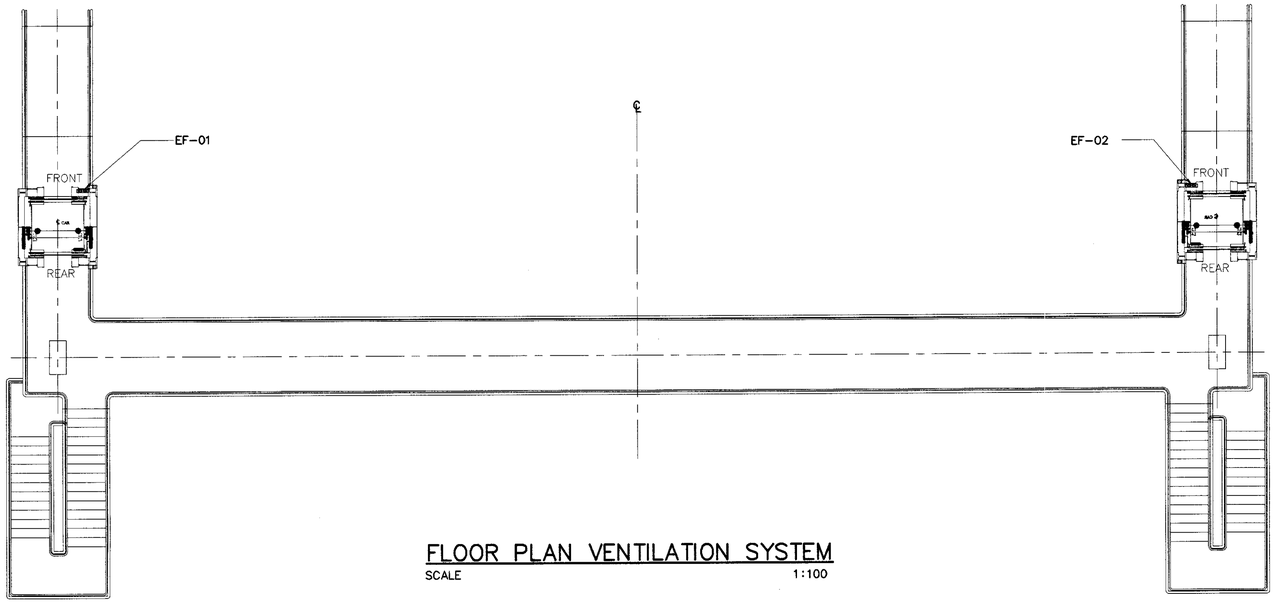
STANDARD DRAWING

PEDESTRIAN OVERPASS TYPE-1

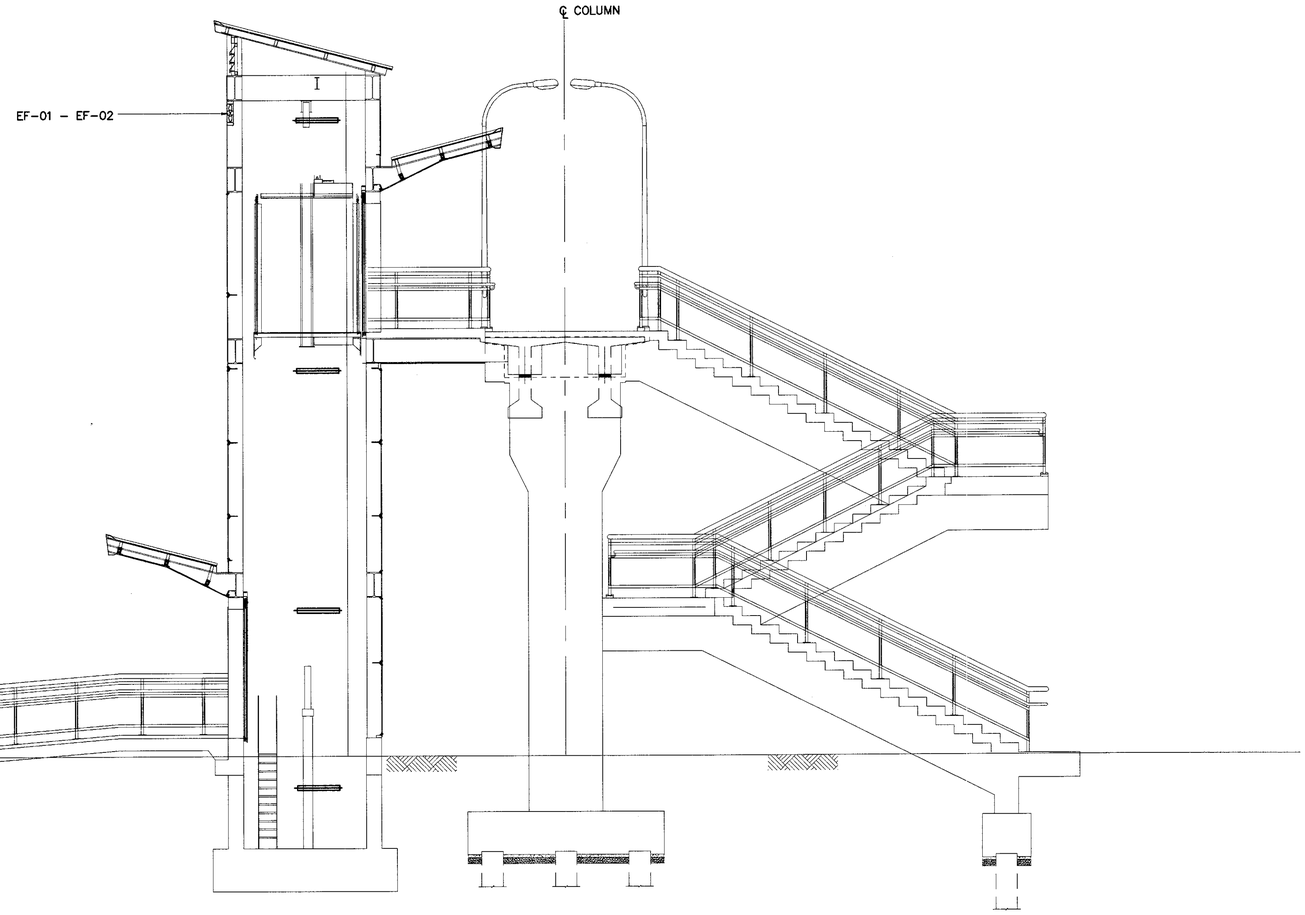
VENTILATION SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. MEO-101
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 181

D:\std dwg 2015\MEO-101(REV00)



FLOOR PLAN VENTILATION SYSTEM
SCALE 1:100



SECTION VENTILATION SYSTEM
SCALE 1:50

NOTE:
1. EXHAUST FANS (EF-01,EF-02) ARE CAPACITY 750 CFM., DRIVING MOTOR 0.5 km.,220V./1P/50 Hz.

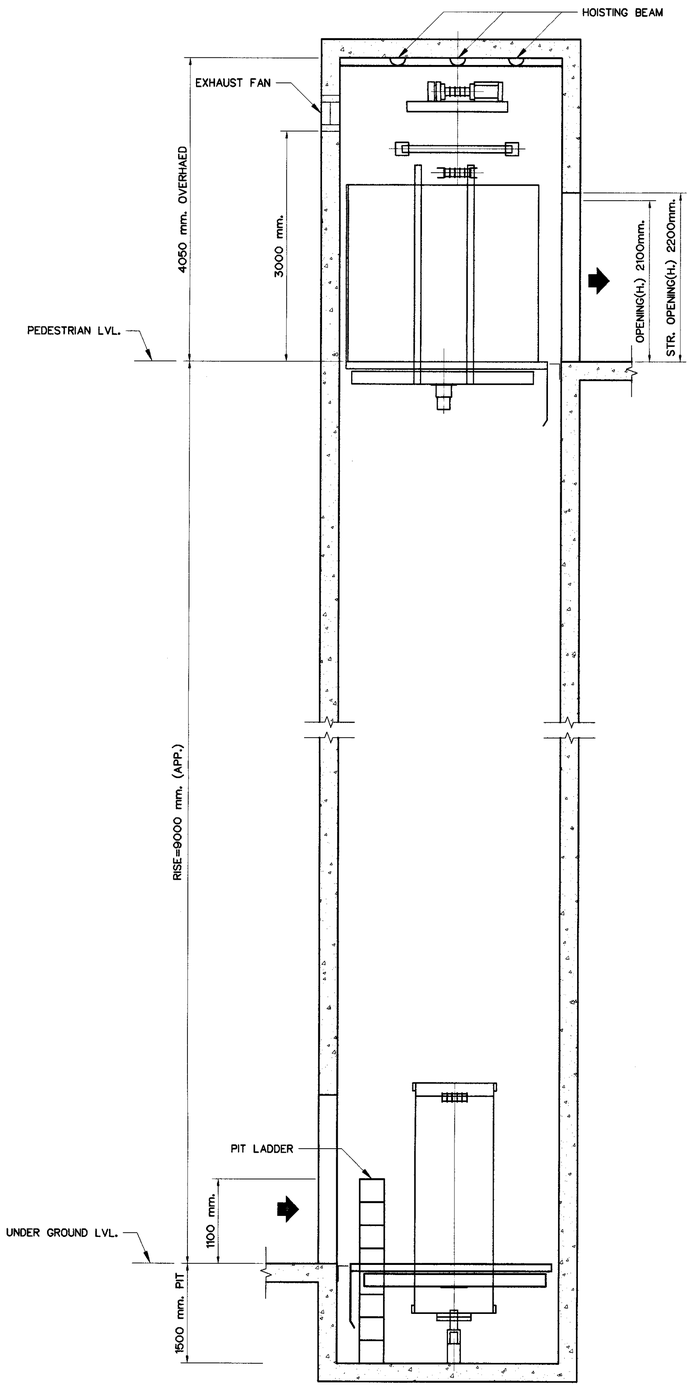
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

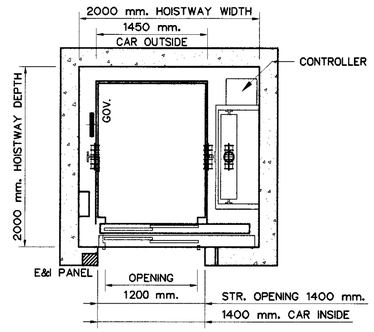
STANDARD DRAWING
PEDESTRIAN OVERPASS TYPE-2
VENTILATION SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. MEO-102
		SHEET NO. 182

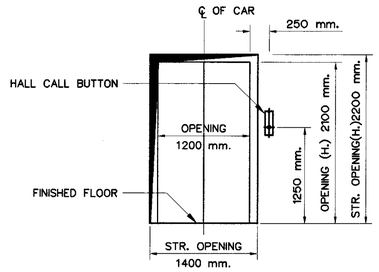
D:\std. dwg 2015\MEO-102(REV00)



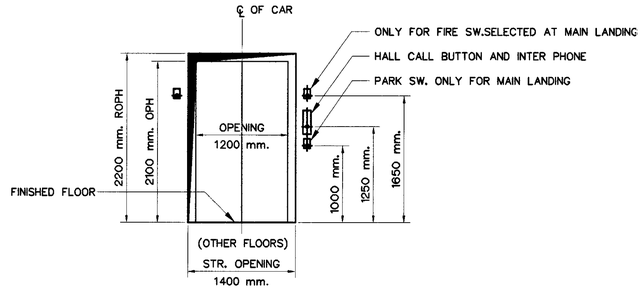
ELEVATION



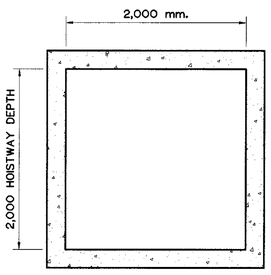
HOISTWAY PLAN



AT TOP LEVEL



FRONT VIEW



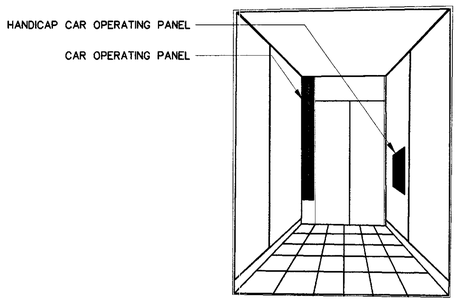
REACTIONS IN PIT

TECHNICAL DATA

USE	PASSENGER/FREIGHT
DUTY LOAD	> 700 Kg.
SPEED	1.0m/s
CONTROL	VVVF
MOTOR POWER	–
RATED CURRENT	–
MAXIMAL CURRENT	< 50 A
POWER SUPPLY	380V 3P/5W 50HZ
LIGHTING SUPPLY	220V 50HZ

ELEVATOR SCHEDULES

TYPE OF LIFT (PL) (PL)	Q'TY	CAPACITY (Kgs)	SPEED (mps)	CAR SIZE (mm)	DOOR WIDTH (mm)	TRAVEL DISTANCE (mm)	MOTOR APPROx.(kw)	V/P/Hz	REMARK
PASSENGER/FREIGHT	2	> 700	1	BY MANUFACTURER	1,200x2,100	–	–	380/3/50	MACHINE ROOMLESS



CAR OPERATING PANEL POSITION

NOT TO SCALE

NOTE:

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.

PASSENGER ELEVATOR

NOT TO SCALE

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

PEDESTRIAN OVERPASS AND UNDERPASS

ELEVATOR

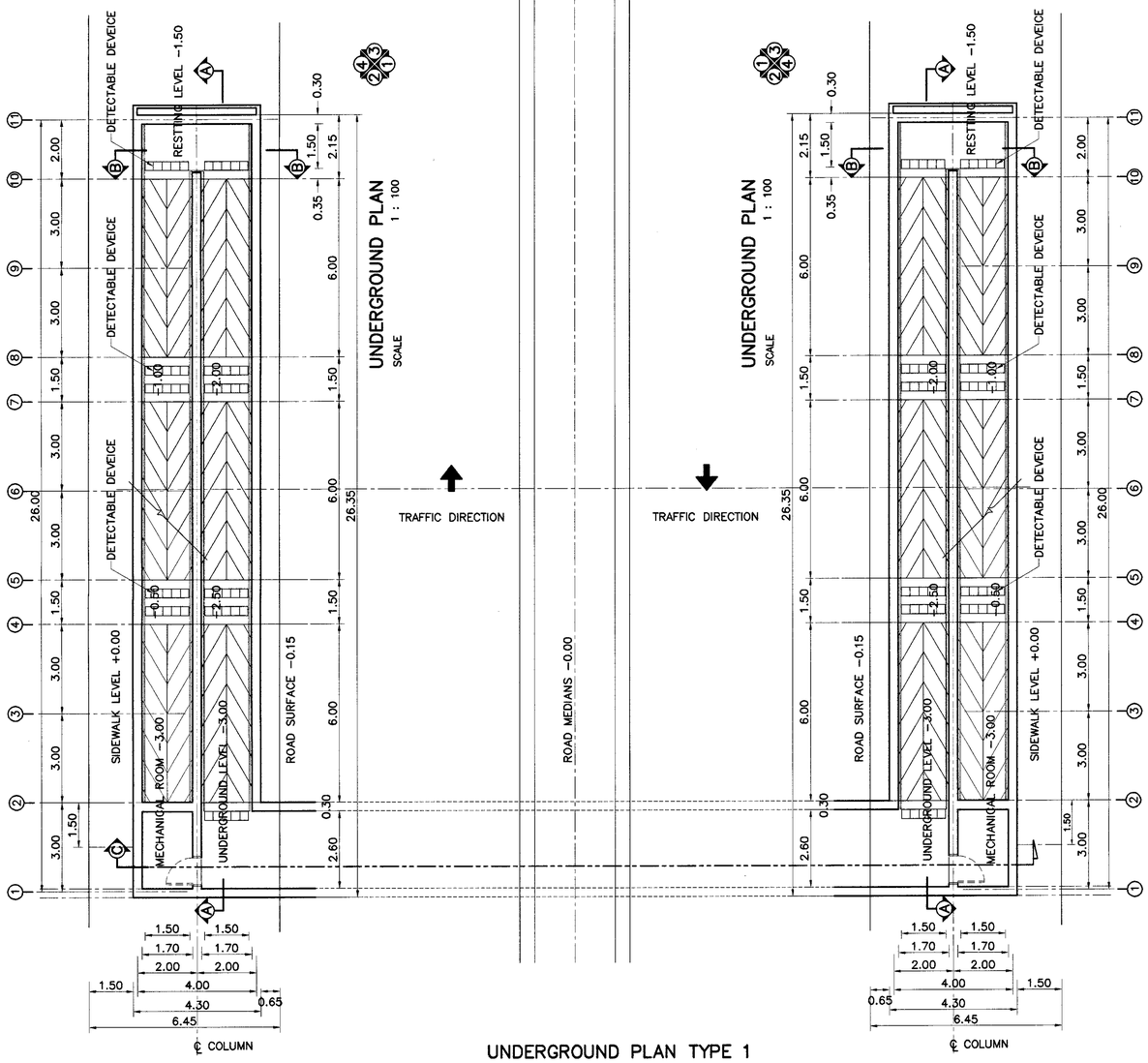
DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

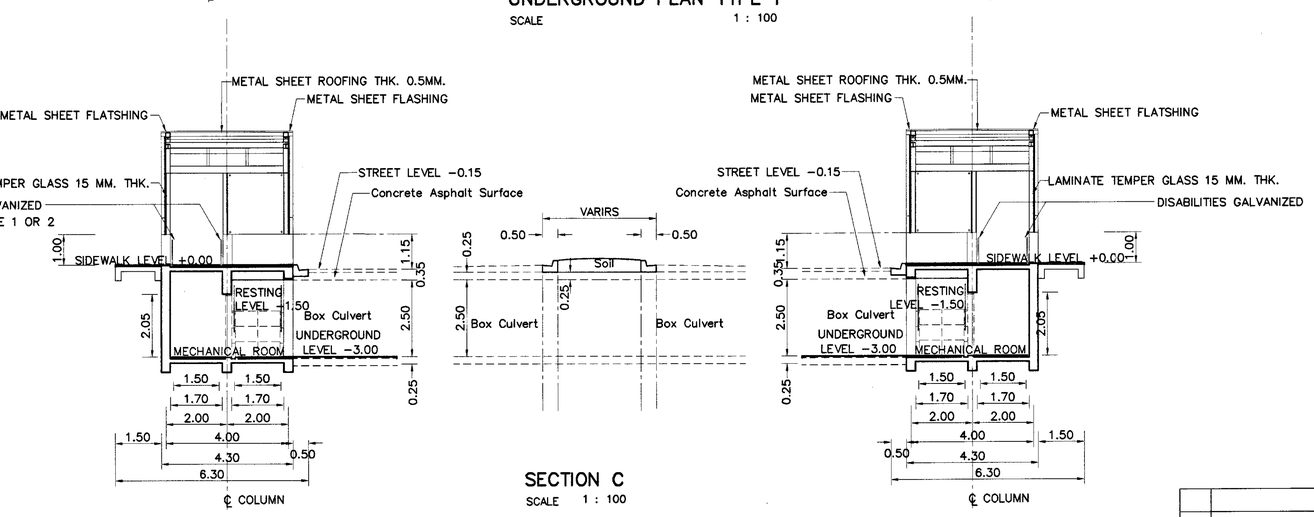
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. ELO-101

SHEET NO. 183

D:\std dwg 2015\ELO-101(REV00)





NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE WALL IS FINISHED BY GRANITE TILE OR ADVISED BY ENGINEER
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY.
   ELEVATOR SHALL BE MACHINE ROOM LESS TYPE.
   AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M.
   AND WALKWAY SHOULD BE KEPT CLEAR BETWEEN LIFT SHAFT WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT
   AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. SLOPE AND STAIR MUST BE AT LEAST 1.50 M. WIDTH CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE
   WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY
   ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH.
   INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE.
   (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS,
   WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR
   LANDING SHALL BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M.
   WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT.
   AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M.
   IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM.
   SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED
   WALL TEXTURE SHALL BE SMOOTH

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

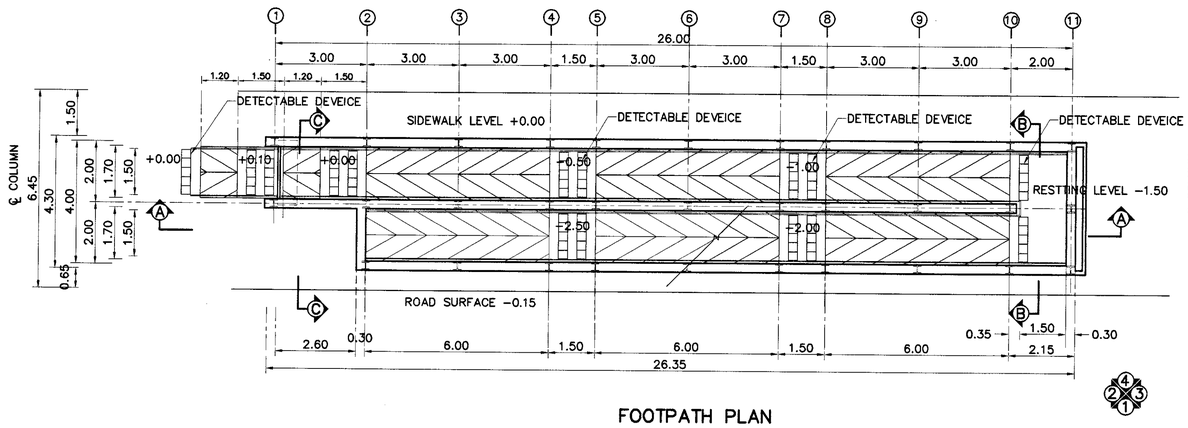
STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL TYPE 1
UNDERGROUND PLAN AND SECTION C

REF.	REVISION	SIGNATURE	DATE

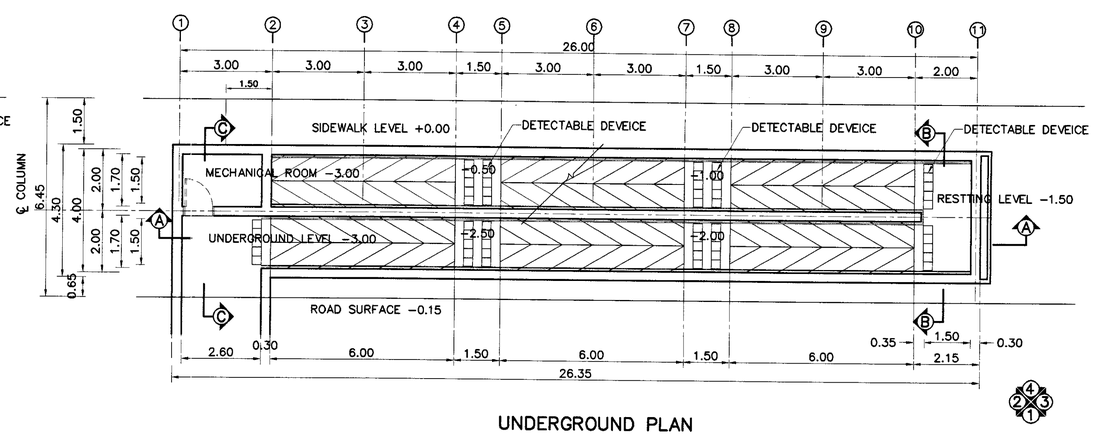
DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)
DWG NO. AUH-101
SHEET NO. 184

D:\std dwg 2015\AUH-101(REV00)



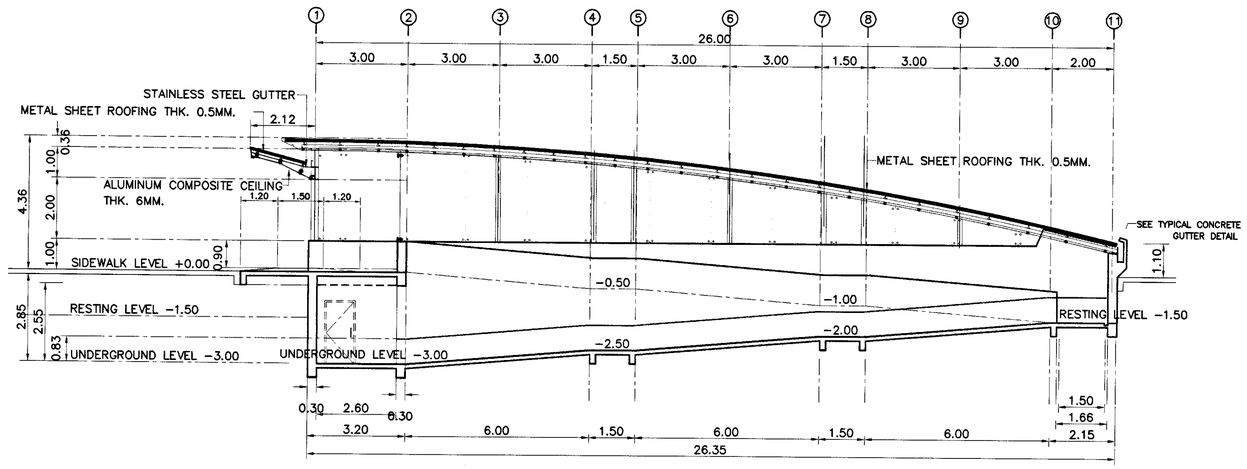
FOOTPATH PLAN

SCALE 1 : 100



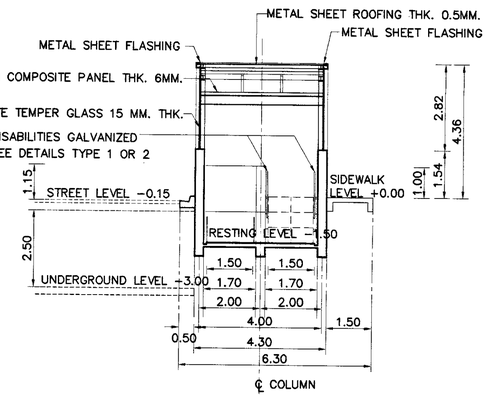
UNDERGROUND PLAN

SCALE 1 : 100



SECTION A − A

SCALE 1 : 100



SECTION B − B

SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE WALL IS FINISHED BY GRANITE TILE OR ADVISED BY ENGINEER
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY.
   ELEVATOR SHALL BE MACHINE ROOM LESS TYPE.
   AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M.
   AND WALKWAY SHOULD BE KEPT CLEAR BETWEEN LIFT SHAFT WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT
   AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. SLOPE AND STAIR MUST BE AT LEAST 1.50 M. WIDTH CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON−SLIP TEXTURE
   WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY
   ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH.
   INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE.
   (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG−NO. EN−401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS,
   WHICH IS NON−SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR
   LANDING SHALL BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 − 0.90 M.
   WITH 30−40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT.
   AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M.
   IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM.
   SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED
   WALL TEXTURE SHALL BE SMOOTH

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

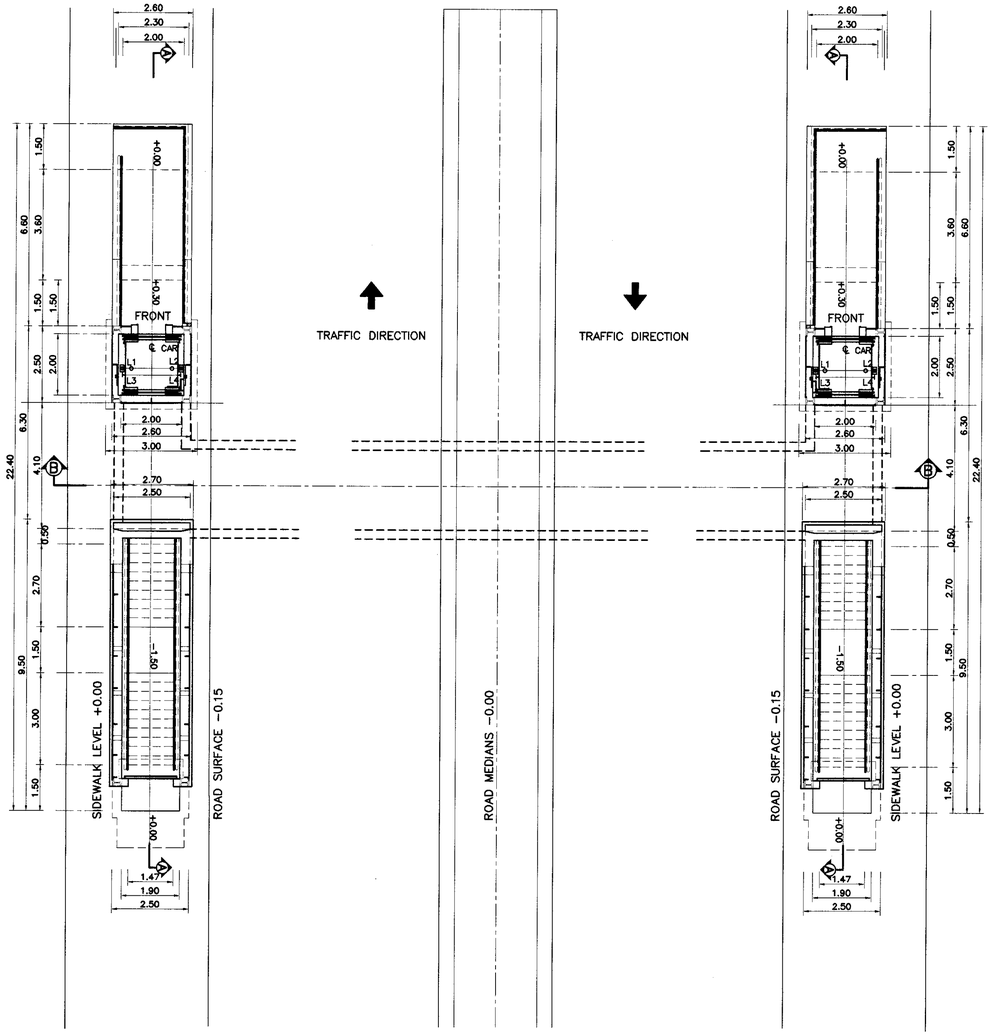
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL TYPE 1
PLANS AND SECTIONS

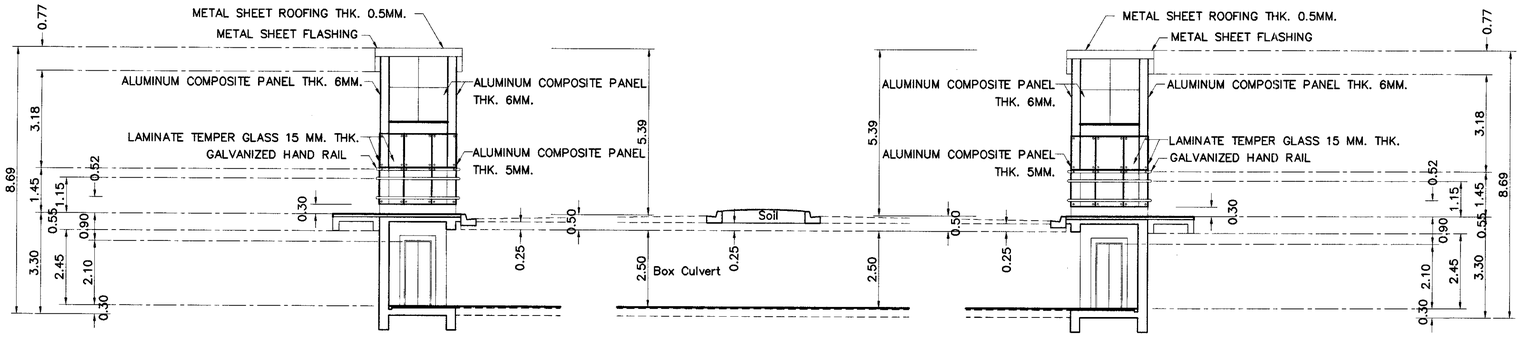
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. AUH−102
		SHEET NO. 185

D:\std dwg 2015\AUH-107(REV00)



FOOTPATH PLAN

SCALE 1 : 100



SECTION B – B

SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE WALL IS FINISHED BY GRANITE TILE OR ADVISED BY ENGINEER
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY.
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   AND WALKWAY SHOULD BE KEPT CLEAR BETWEEN LIFT SHAFT WALL AND R.O.W. AT LEAST 1.50 M.
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   AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. SLOPE AND STAIR MUST BE AT LEAST 1.50 M. WIDTH CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE
   WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY
   ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH.
   INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE.
   (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS,
   WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR
   LANDING SHALL BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M.
   WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT.
   AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M.
   IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM.
   SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED
   WALL TEXTURE SHALL BE SMOOTH
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

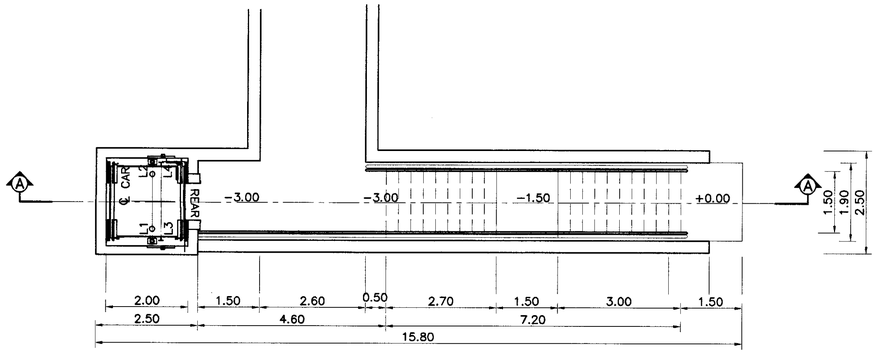
STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL TYPE 2

FOOTPATH PLAN AND SECTION B

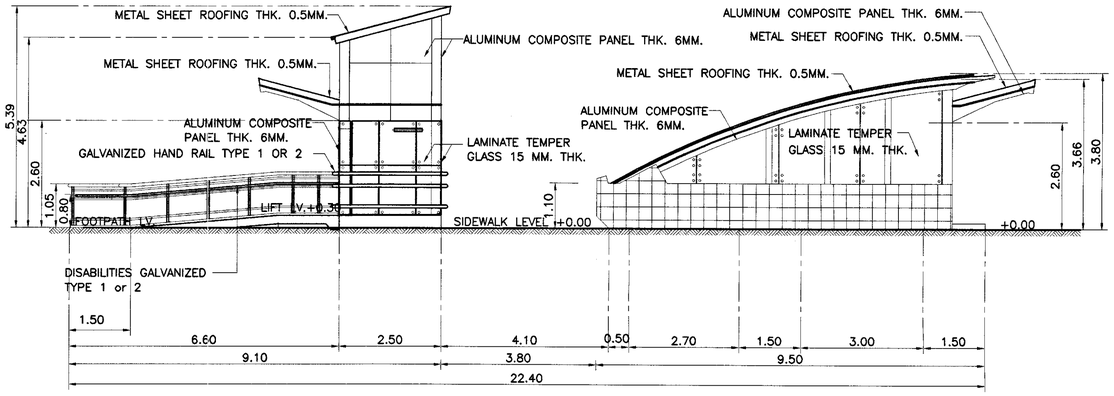
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. AUH-104
		SHEET NO. 187

D:\std dwg 2015\AUH-104(REV00)



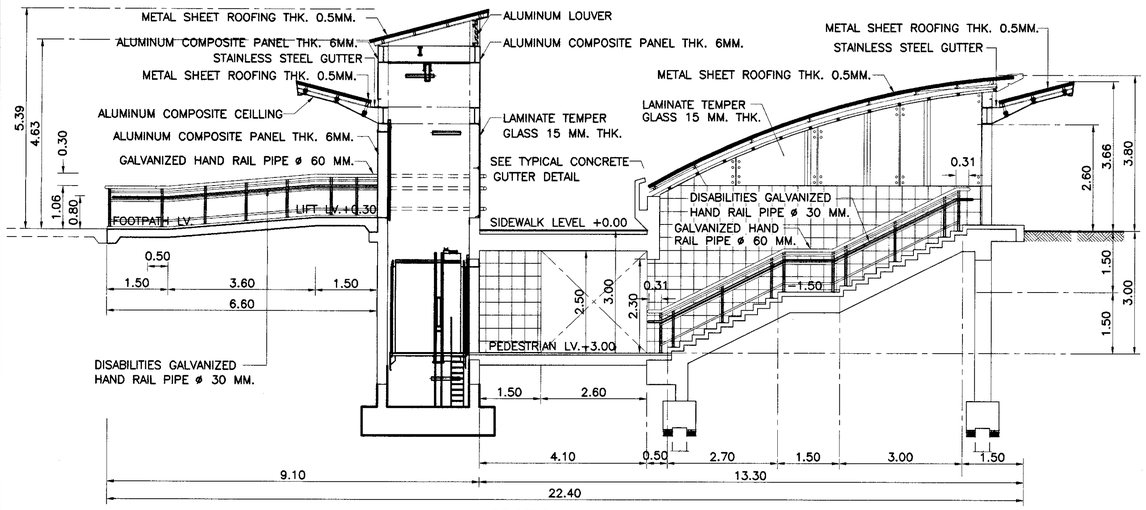
UNDERGROUND PLAN

SCALE 1 : 75



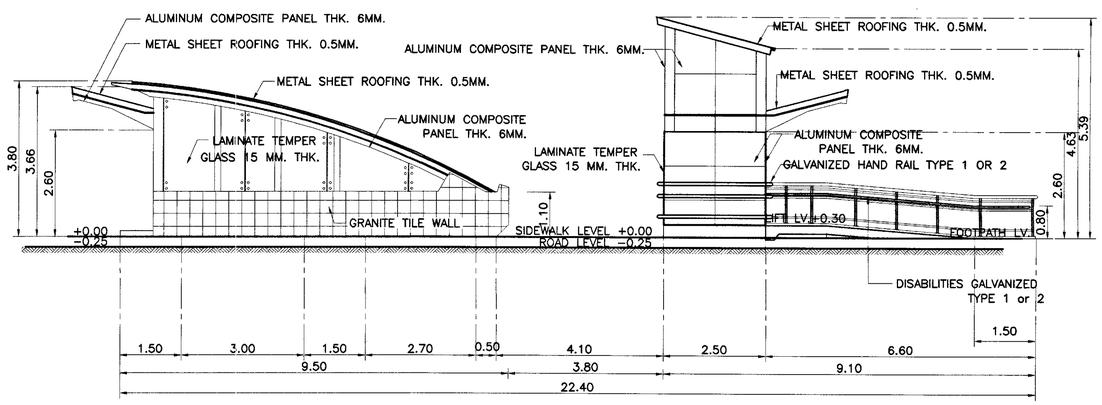
ELEVATION 1 ①

SCALE 1 : 75



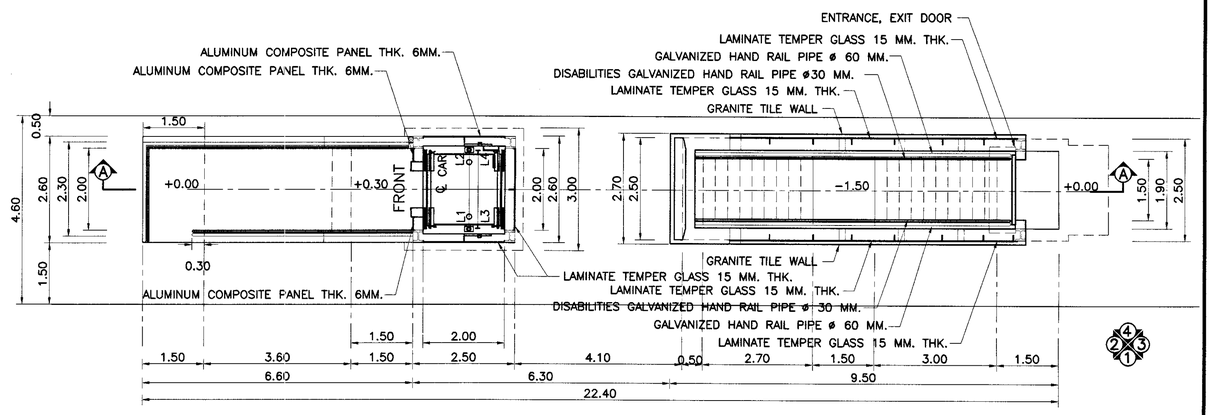
SECTION A – A

SCALE 1 : 75



ELEVATION 4 ②

SCALE 1 : 75



FOOTPATH PLAN

SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE WALL IS FINISHED BY GRANITE TILE OR ADVISED BY ENGINEER
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY.
   ELEVATOR SHALL BE MACHINE ROOM LESS TYPE.
   AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M.
   AND WALKWAY SHOULD BE KEPT CLEAR BETWEEN LIFT SHAFT WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT
   AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. SLOPE AND STAIR MUST BE AT LEAST 1.50 M. WIDTH CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON–SLIP TEXTURE
   WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY
   ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH.
   INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE.
   (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG–NO. EN–401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS,
   WHICH IS NON–SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR
   LANDING SHALL BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M.
   WITH 30–40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT.
   AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M.
   IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM.
   SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED
   WALL TEXTURE SHALL BE SMOOTH
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO–101

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

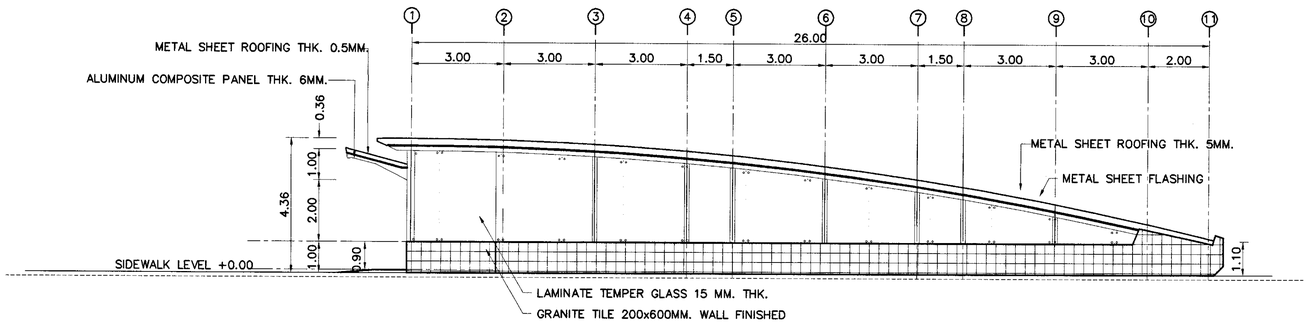
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL TYPE 2
PLAN, ELEVATIONS AND SECTION A

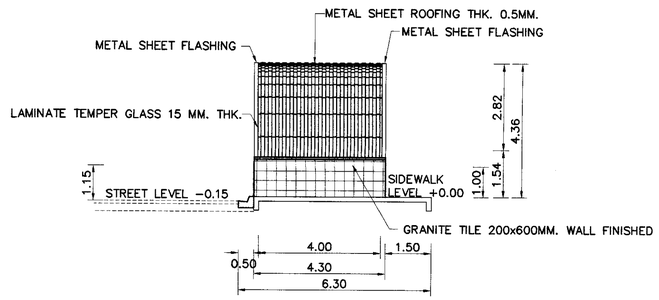
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. AUH–105
		SHEET NO. 188

D:\std dwg 2015\AUH-105(REV00)



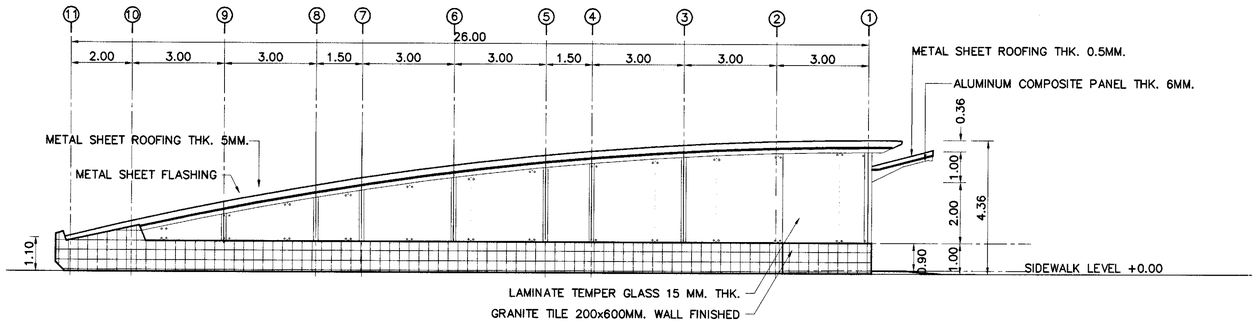
ELEVATION 1

SCALE 1 : 100



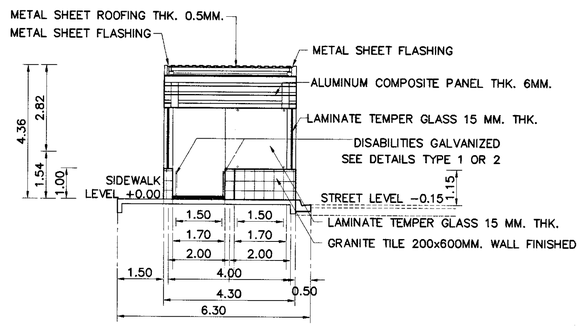
ELEVATION 2

SCALE 1 : 100



ELEVATION 4

SCALE 1 : 100



ELEVATION 3

SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE WALL IS FINISHED BY GRANITE TILE OR ADVISED BY ENGINEER
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY.
   ELEVATOR SHALL BE MACHINE ROOM LESS TYPE.
   AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M.
   AND WALKWAY SHOULD BE KEPT CLEAR BETWEEN LIFT SHAFT WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT
   AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. SLOPE AND STAIR MUST BE AT LEAST 1.50 M. WIDTH CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON−SLIP TEXTURE
   WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY
   ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH.
   INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE.
   (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG−NO. EN−401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS,
   WHICH IS NON−SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR
   LANDING SHALL BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 − 0.90 M.
   WITH 30−40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT.
   AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M.
   IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM.
   SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED
   WALL TEXTURE SHALL BE SMOOTH

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

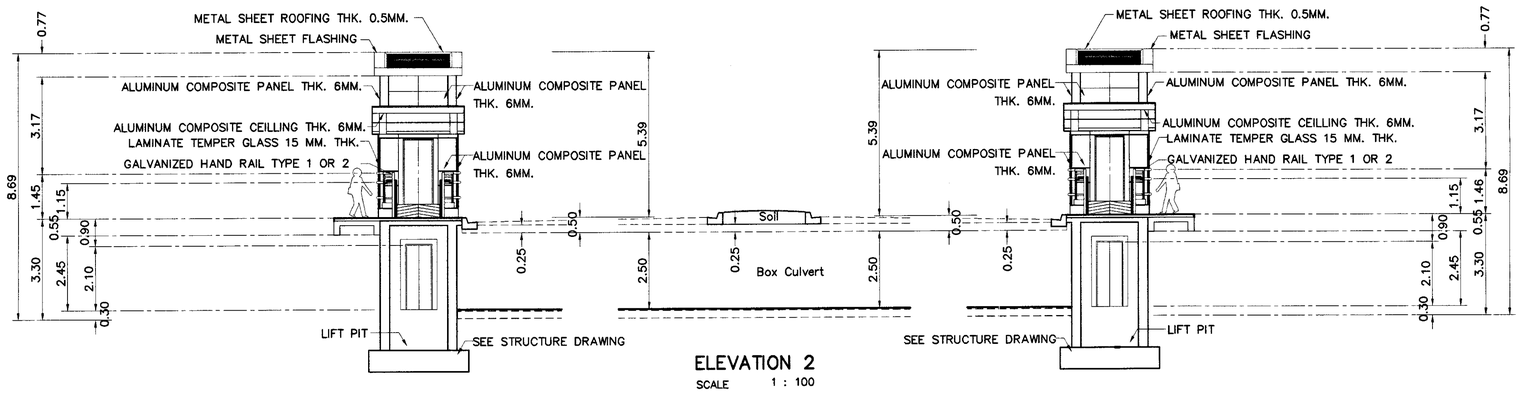
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

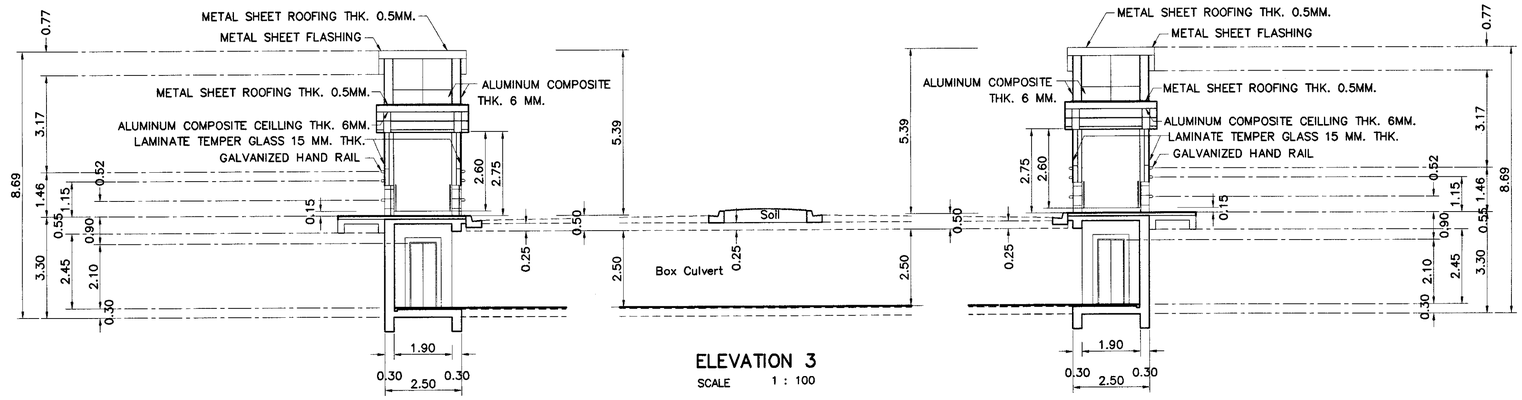
HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL TYPE 1
ELEVATION 1 TO 4

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. AUH−103
		SHEET NO. 186

D:\std dwg 2015\AUH-103(REV00)



ELEVATION 2
SCALE 1 : 100



ELEVATION 3
SCALE 1 : 100

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE WALL IS FINISHED BY GRANITE TILE OR ADVISED BY ENGINEER
3. LIFT SHAFT SHALL BE CLEARLY SEEN THROUGH THE LIFT CAR FROM WALKWAY.
   ELEVATOR SHALL BE MACHINE ROOM LESS TYPE.
   AND MEET ALL UNIVERSAL DESIGN STANDARD CODE OF PRACTICE.
4. WALL AT ROAD SIDE SHOULD BE SET BACK FROM CURB OR CURB AND GUTTER AT LEAST 0.50 M.
   AND WALKWAY SHOULD BE KEPT CLEAR BETWEEN LIFT SHAFT WALL AND R.O.W. AT LEAST 1.50 M.
5. HANDICAP RAMP SLOPE MUST BE 1:12 FLAT SURFACE WITHOUT JOINT
   AND PROVIDE FLAT AREA 1.50 M. EVERY 6.00 M. (6.00 M. MAXIMUM LONG SLOPE)
6. SLOPE AND STAIR MUST BE AT LEAST 1.50 M. WIDTH CLEAR WAY
7. FLOOR MUST BE PROVIDED CLEAR AND NON-SLIP TEXTURE
   WARNING DETECTABLE DEVICES MUST BE INSTALLED IN SINGLE LINE ACROSS WALKWAY
   ON FLAT FLOOR AS WIDE AS WALKWAY WIDTH.
   INSTALLATION SHALL PROVIDE 0.30 M. SPACING FROM STEP OR SLOPE.
   (DETECTABLE DEVICE SEE STANDARD DRAWING HIGHWAY DESIGN DWG-NO. EN-401)
8. STAIR MUST PROVIDE 0.15 M. MAXIMUM RISERS AND 0.30 M. MINIMUM TREADS,
   WHICH IS NON-SLIP TEXTURE. STAIR NOSING COLOR MUST BE DIFFERENT FROM STEP COLOR
   LANDING SHALL BE FLAT AREA 1.50 x 1.50 M. AND INSTALL EVERY 3.50 M. MAXIMUM HIGH
9. HANDICAP HAND RAILS MUST HAVE 2 LEVELS WHICH SHALL BE HIGH 0.80 – 0.90 M.
   WITH 30-40 MM. DIAMETERS WITH SMOOTH SURFACE THAT CAN BE HELD TIGHT.
   AT THE END OF SLOPE OR STEP, HANDRAIL MUST BE STRETCH OUT 0.30 M.
   IT MUST BE INSTALLED ON BOTH SIDES. WALL MOUNT HAND RAIL SHALL BE PROVIDED 50 MM.
   SPACING FROM WALL AND MINIMUM 120 MM. HIGH FROM SCREWED
   WALL TEXTURE SHALL BE SMOOTH
10. DETAILS OF ELEVATOR IS REFER TO DWG. ELO-101

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

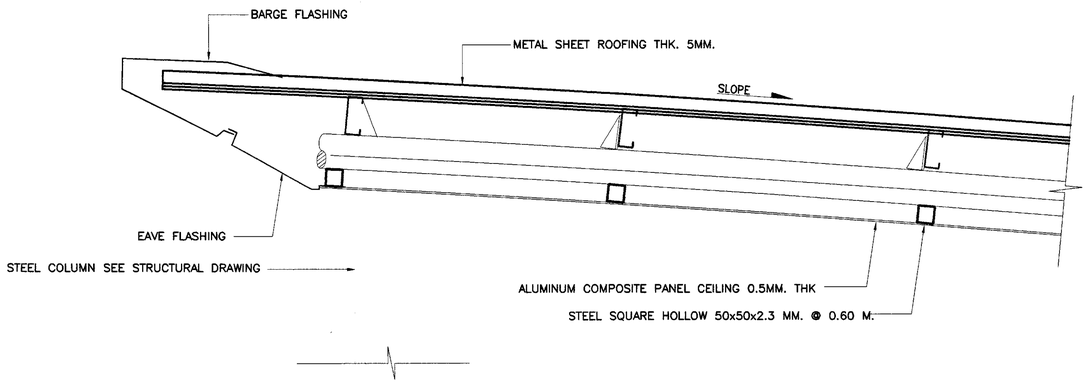
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

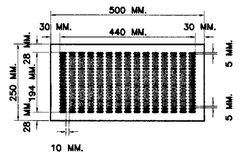
HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL TYPE 2
ELEVATION 2 AND 3

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. AUH-106
		SHEET NO. 189

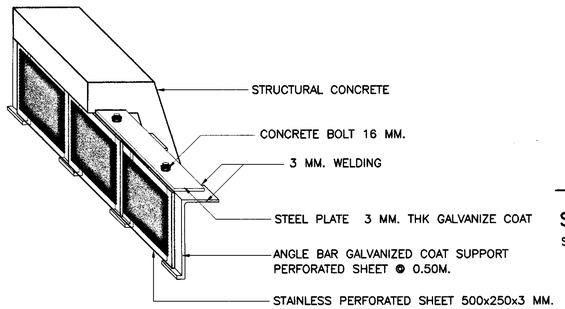
D:\std dwg 2015\AUH-106(REV00)



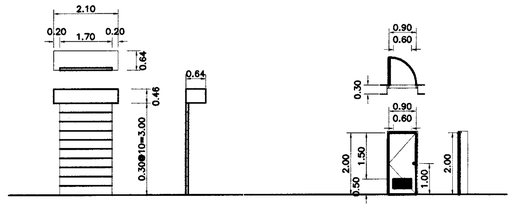
TYPICAL ROOFING UNDER GROUND WALK WAY
SCALE 1:100



PERFORATED DETAIL
SCALE 1: 10



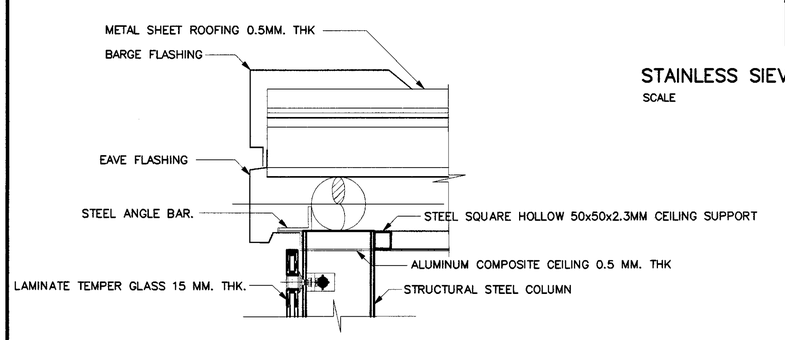
STAINLESS SIEVE INSTALLATION DETAIL
SCALE NOT TO SCALE

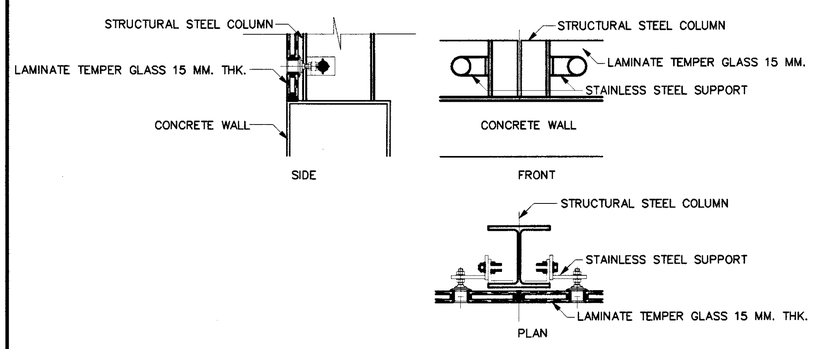


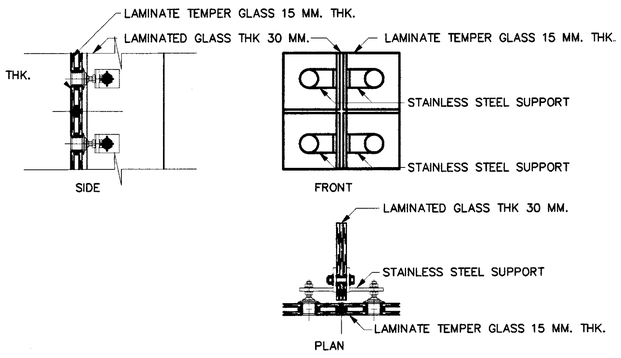
STEEL ROLLING SHUTTER
SCALE 1:100

SERVICE DOOR
SCALE 1:100

CONCRETE GUTTER DETAIL
SCALE 1:100







LAMINATE TEMPERED GLASS INSTALLATION DETAIL
SCALE NOT TO SCALE

NOTES :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. HOT ROLLED STRUCTURAL STEEL SECTIONS SHALL CONFORM TO TIS. 1227 GRADE SM 400.
3. HOLLOW STRUCTURAL STEEL SECTIONS SHALL CONFORM TO TIS. 107 GRADE HS 41.
4. METAL SHEET ROOFING SHALL CONFORM TO TIS. 1128 AND COLORED IN GREEN.
5. ANTI-CORROSIVE PRIMER PAINT SHALL CONFORM TO TIS.2387
6. STAINLESS STEEL BALUSTRADE PIPE SHALL CONFORM TO TIS 1006
   STAINLESS STEEL COLUMN SHALL BE 60 AND 40 MM. DIAMETER AND MINIMUM 2.77 MM. THK
   STAINLESS STEEL HANDRAIL SHALL BE 60 AND 33 MM. DIAMETER AND 1.65 MM. THK
7. STAINLESS SIEVE SHALL CONFORM TO TIS. 1378
8. LOUVER SHALL CONFORM TO TIS. 2223
9. TEMPERED GLASS SHALL CONFORM TO TIS. 965
10. LAMINATED GLASS SHALL CONFORM TO TIS. 1222
11. ALUMINUM COMPOSITE PANEL SHALL CONFORM TO TIS. 2314
12. STEEL ROLLING SHUTTER SHALL CONFORM TO TIS. 593
13. TYPICAL ROOFING AND APPROACH SEE DWG. APH-107 FOR DETAILS

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS ARCHITECTURAL ACCESSORY DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. AUH-107
		SHEET NO. 190

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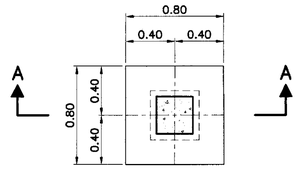
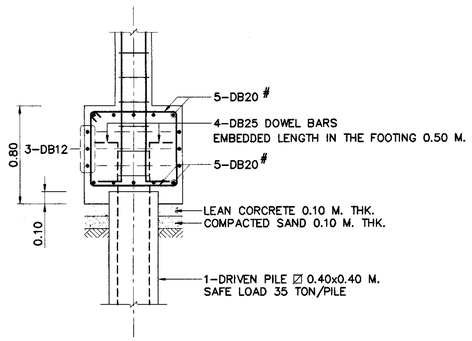
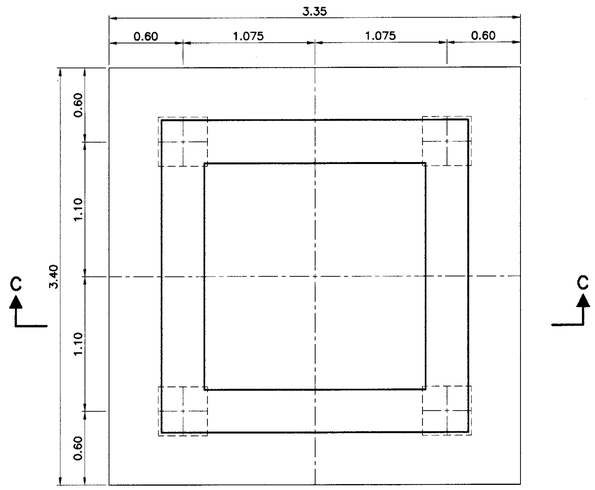


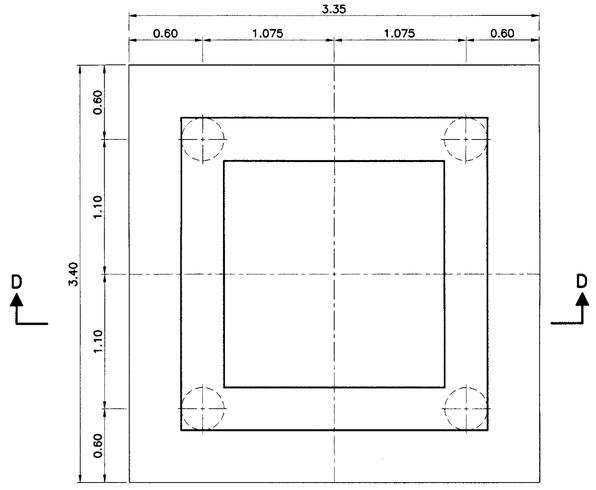
PLAN F1 (DRIVEN PILE)
SCALE 1 : 25



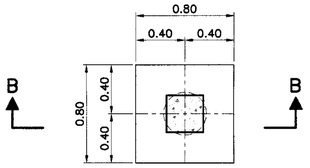
SECTION A – A
SCALE 1 : 25



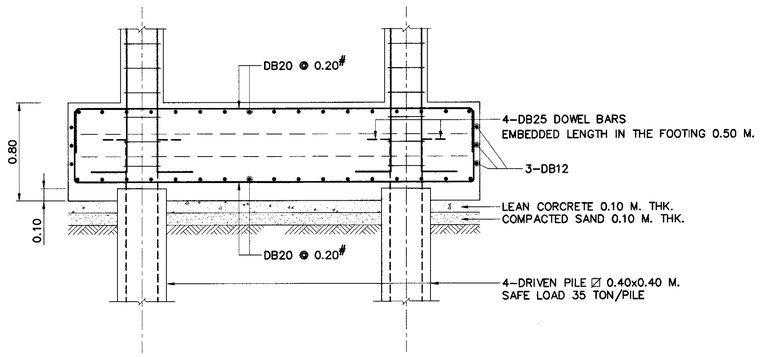
PLAN (DRIVEN PILE)
SCALE 1 : 25



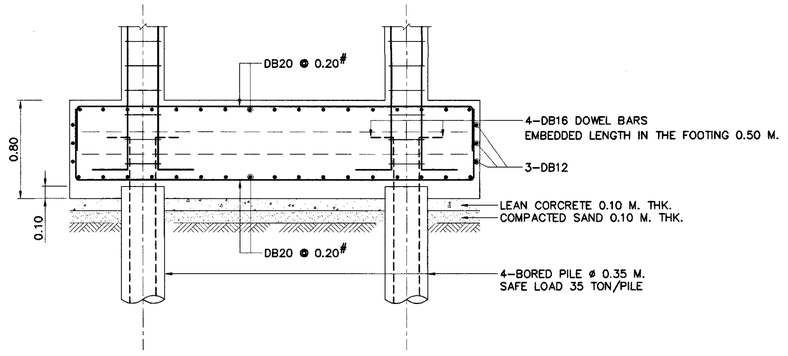
PLAN F4 (BORED PILE)
SCALE 1 : 25



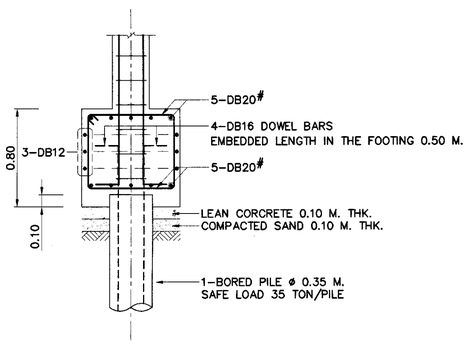
PLAN F1 (BORED PILE)
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25



SECTION D – D
SCALE 1 : 25



SECTION B – B
SCALE 1 : 25

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.075 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH–101 AND UH–201

TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.
CD3	WF 250x250x9x14x72.4 KG/M.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPICAL FOOTING DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH–001
		SHEET NO. 191

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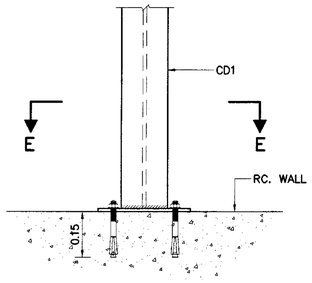
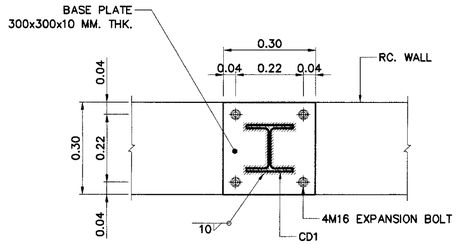
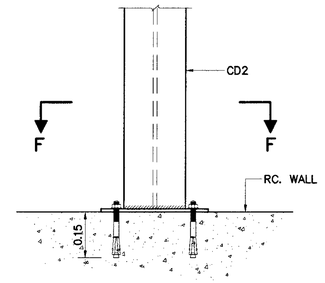


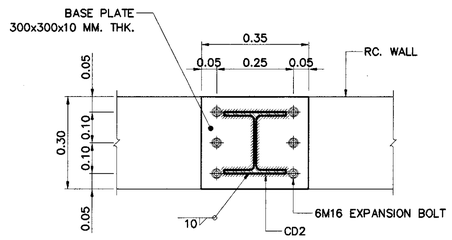
DETAIL "1" (CD1)
SCALE 1 : 10



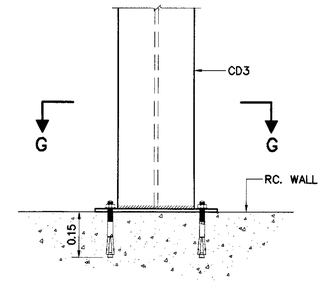
SECTION E – E
SCALE 1 : 10



DETAIL "2" (CD2)
SCALE 1 : 10



SECTION F – F
SCALE 1 : 10



DETAIL "3" (CD3)
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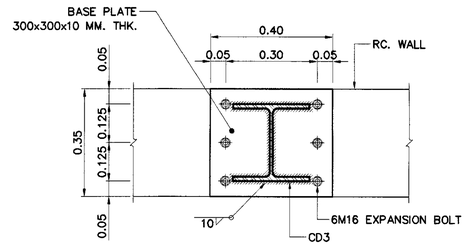
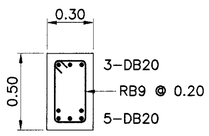


SECTION G – G
SCALE 1 : 10

TABLE OF COLUMN

GROUND FLOOR ⇑ FOUNDATION	0.30 × 0.30 8–DB20 MAIN 2–RB9 @ 0.20	0.30 × 0.30 8–DB20 MAIN 2–RB9 @ 0.20	0.35 × 0.35 8–DB20 MAIN 2–RB9 @ 0.20
LEVELS / COLUMN NO.	C0	C1	C2



B1
SCALE 1 : 20

TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.
CD3	WF 250x250x9x14x72.4 KG/M.

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. STRUCTURAL STEEL SHALL CONFORM TO TIS 1227 GRADE SM400.
5. ANCHOR BOLTS SHALL CONFORM TO ASTM–A307.
6. WELD AND WELDING ELECTRODE (TYPE E70) SHALL CONFORM TO AWS STANDARDS.
7. ALL STEEL AND BOLT ASSEMBLY SHALL BE GALVANIZED

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPICAL COLUMN AND BEAM DETAILS

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH–002
		SHEET NO. 192

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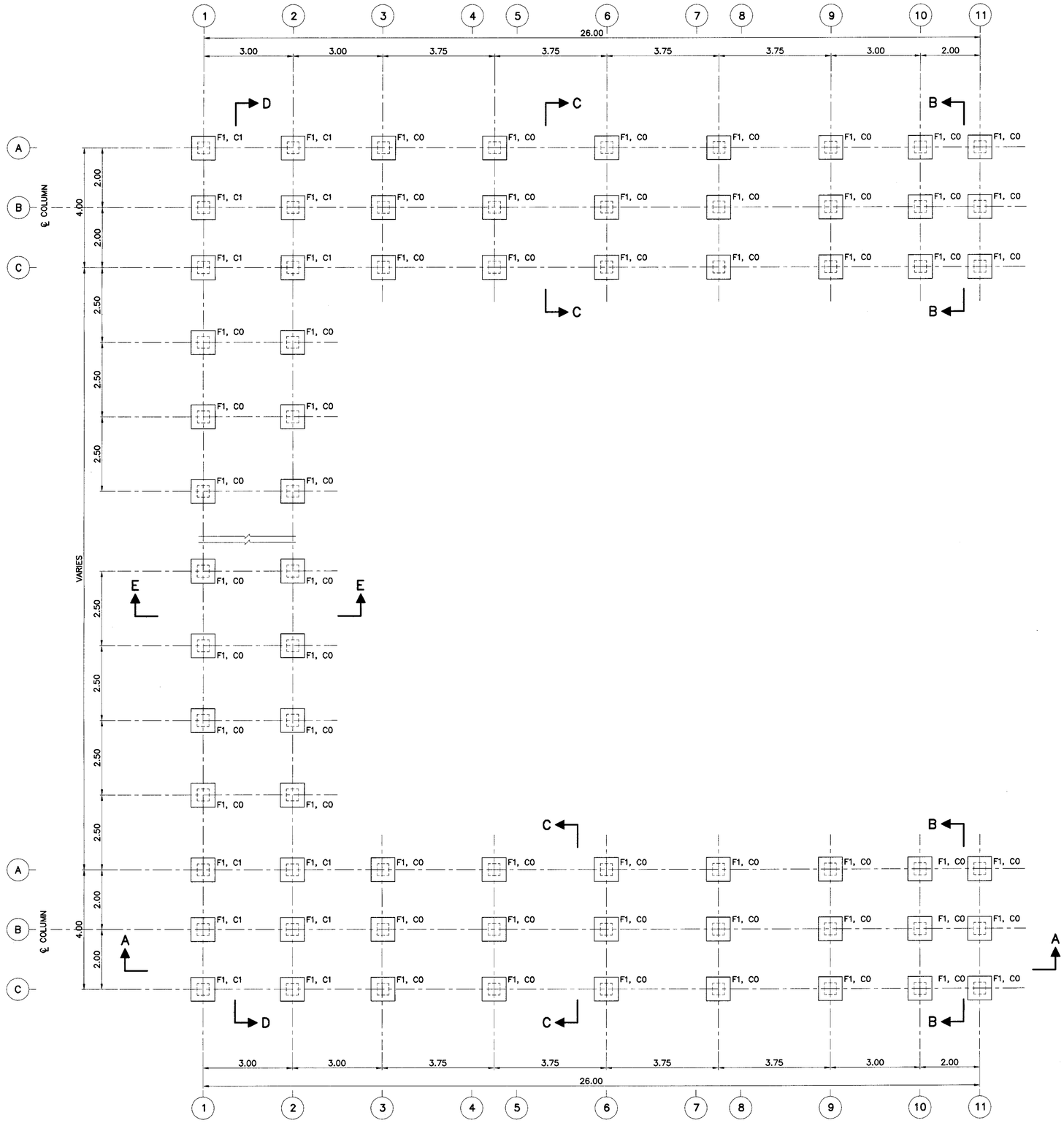

PILE FOOTING PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1

PILE FOOTING PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-101
		SHEET NO. 193

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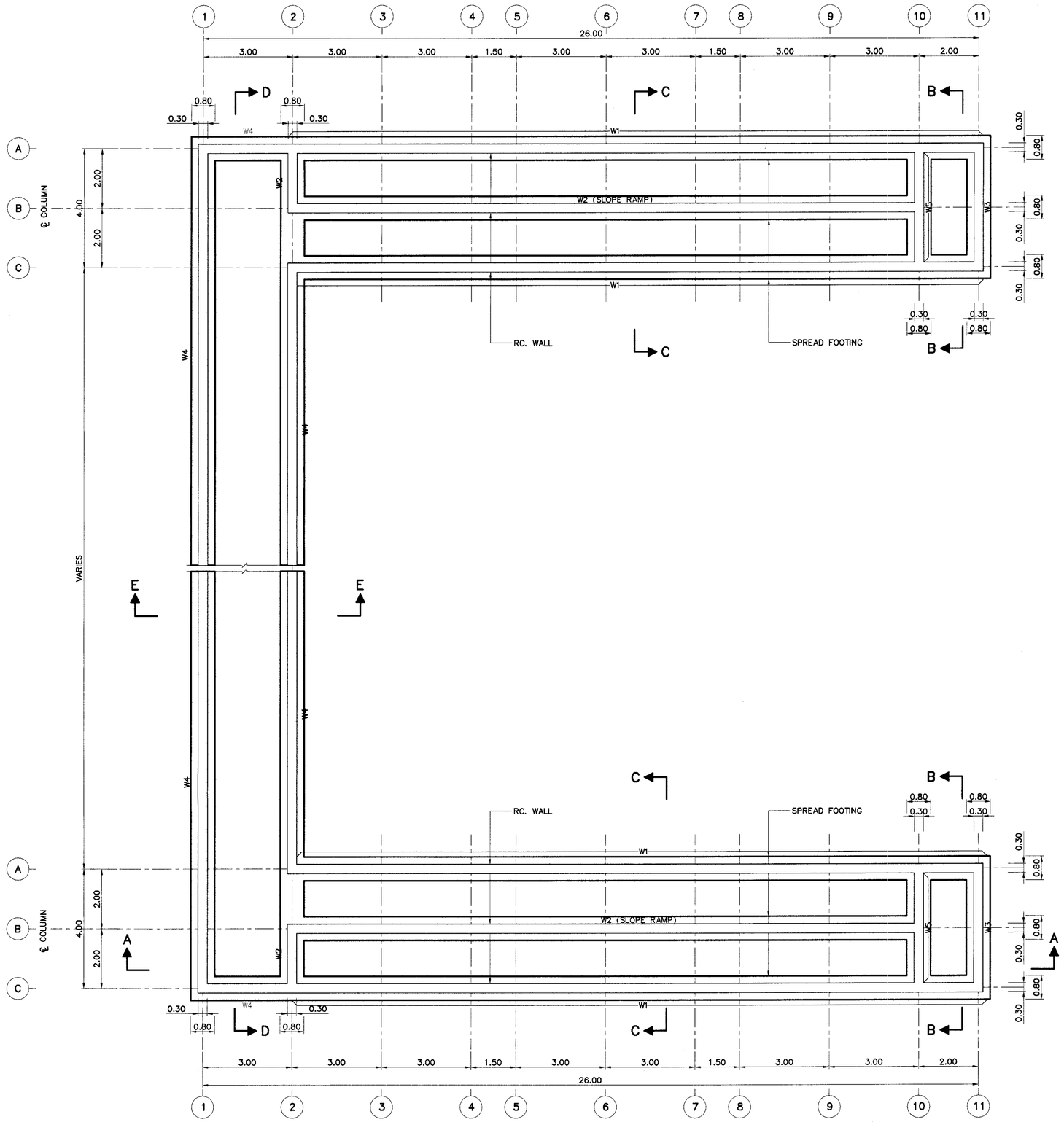

SPREAD FOOTING PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. EACH SPREAD FOOTING SHALL BE LOCATED BELOW TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE BEARING CAPACITY OF 0.10 MPa (10 TON/M^2)

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
SPREAD FOOTING PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-102
		SHEET NO. 194

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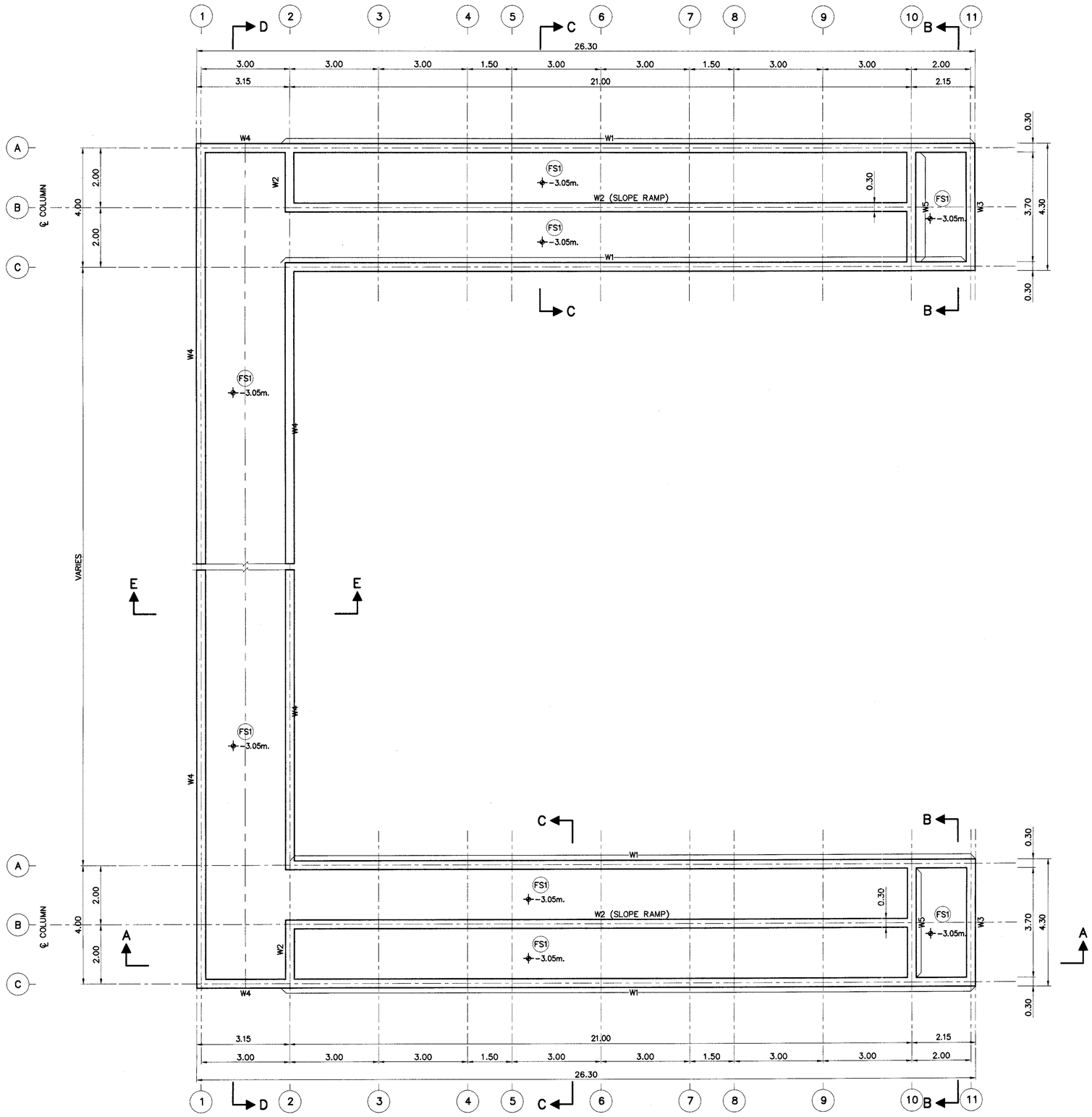

UNDERGROUND FLOOR PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
UNDERGROUND FLOOR PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-103
		SHEET NO. 195

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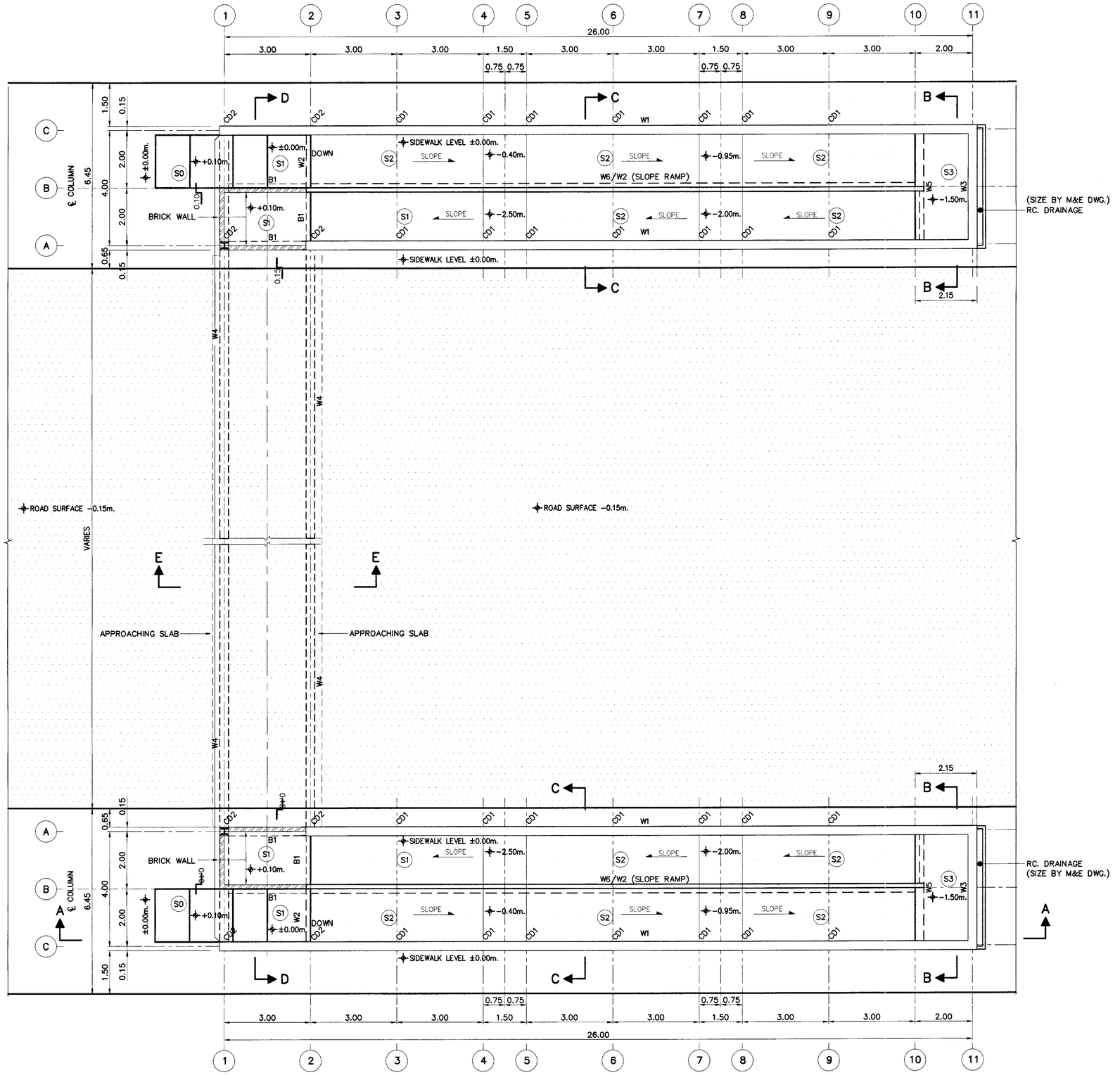


GROUND FLOOR PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
GROUND FLOOR PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. UH-104
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 196

D:\std dwg 2015\UH-104(REV00)

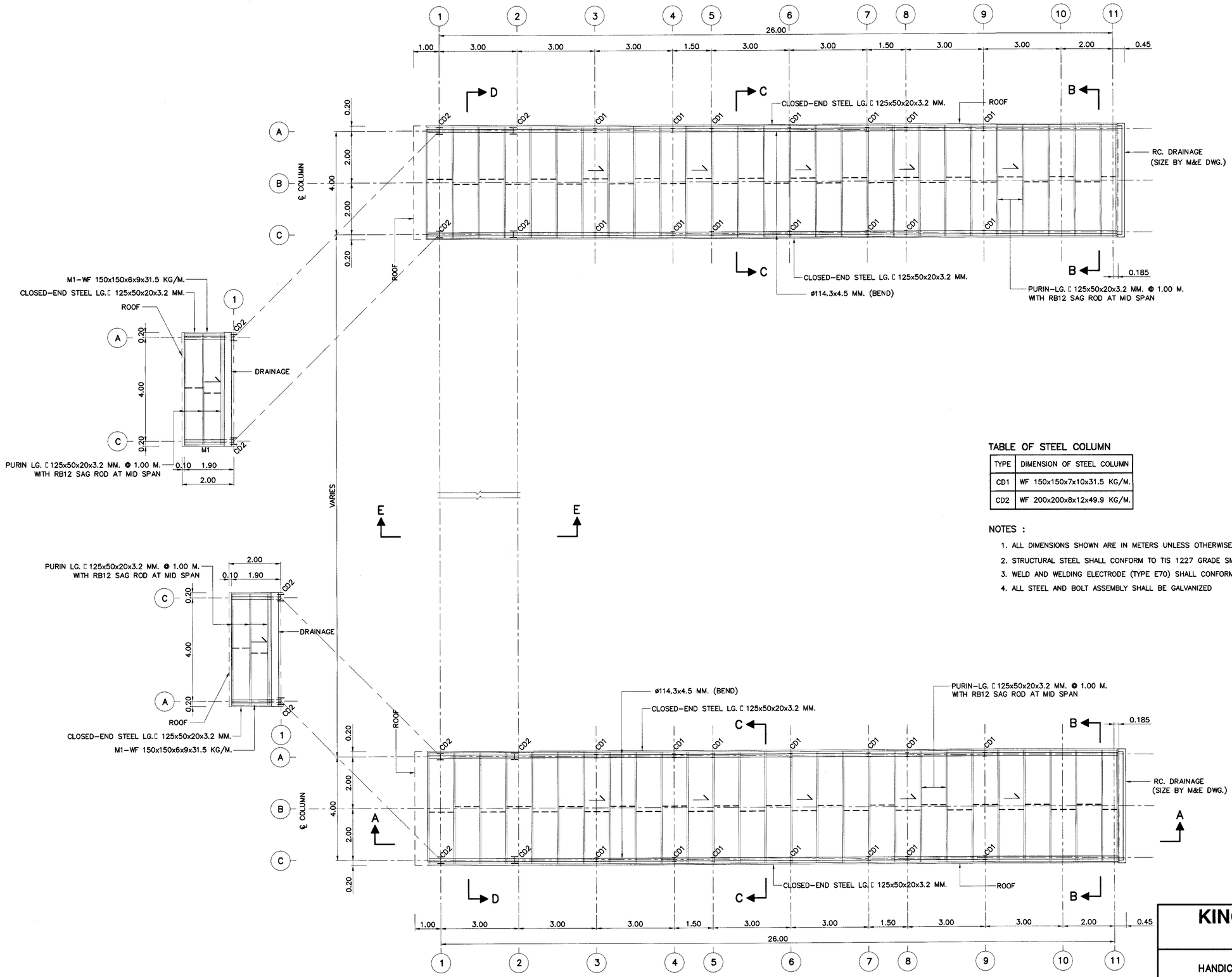


TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. STRUCTURAL STEEL SHALL CONFORM TO TIS 1227 GRADE SM400.
3. WELD AND WELDING ELECTRODE (TYPE E70) SHALL CONFORM TO AWS STANDARDS.
4. ALL STEEL AND BOLT ASSEMBLY SHALL BE GALVANIZED

ROOF PLAN
SCALE 1 : 75

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

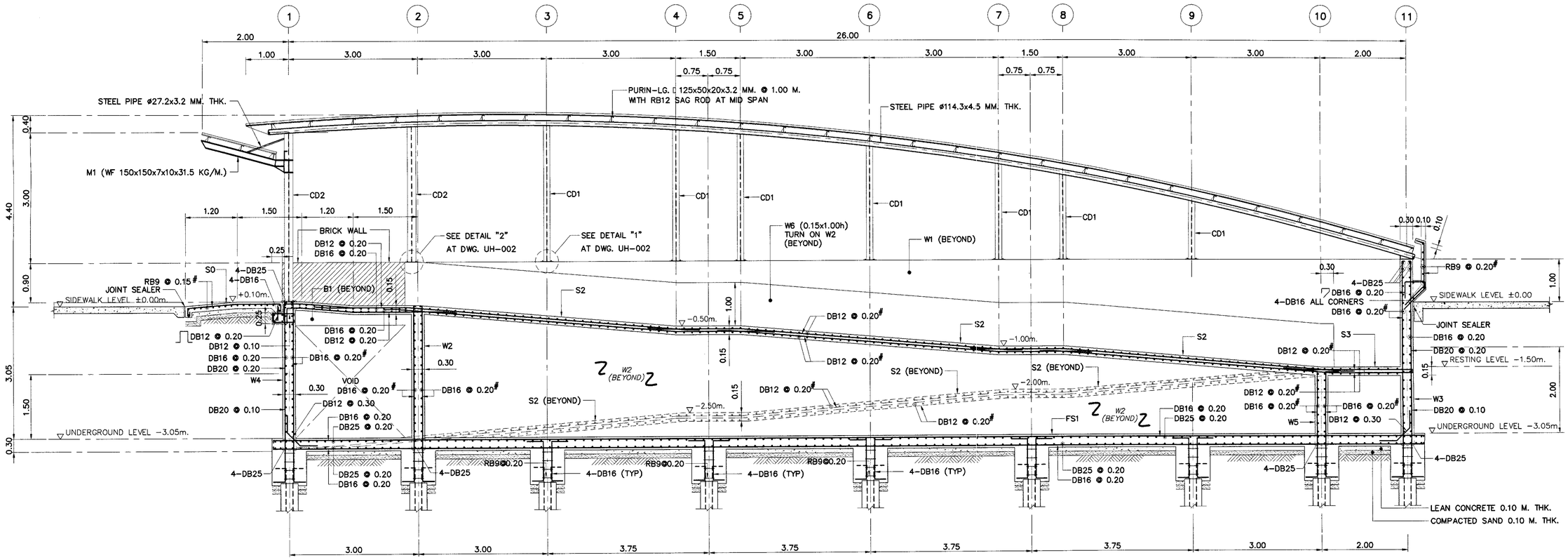
STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
ROOF PLAN

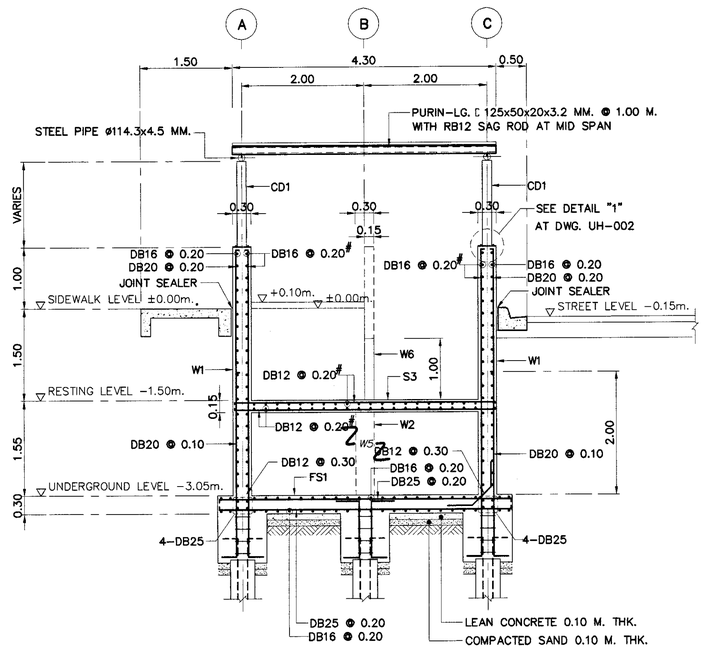
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-105
		SHEET NO. 197

REF.	REVISION	SIGNATURE	DATE

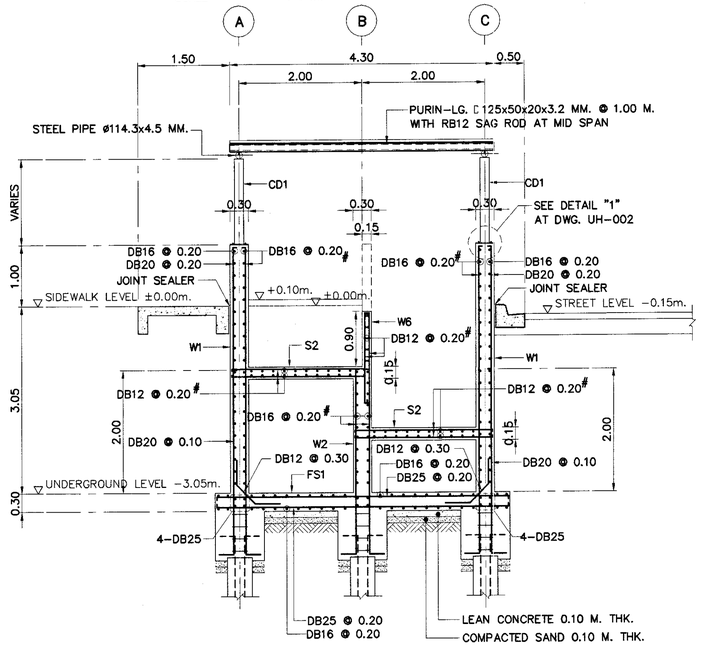
D:\std dwg 2015\UH_105(REV00)



SECTION A – A
SCALE 1 : 50



SECTION B – B
SCALE 1 : 50



SECTION C – C
SCALE 1 : 50

TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH-001 AND UH-101.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
PILE FOOTING DETAILS (SECTION A, B AND C)

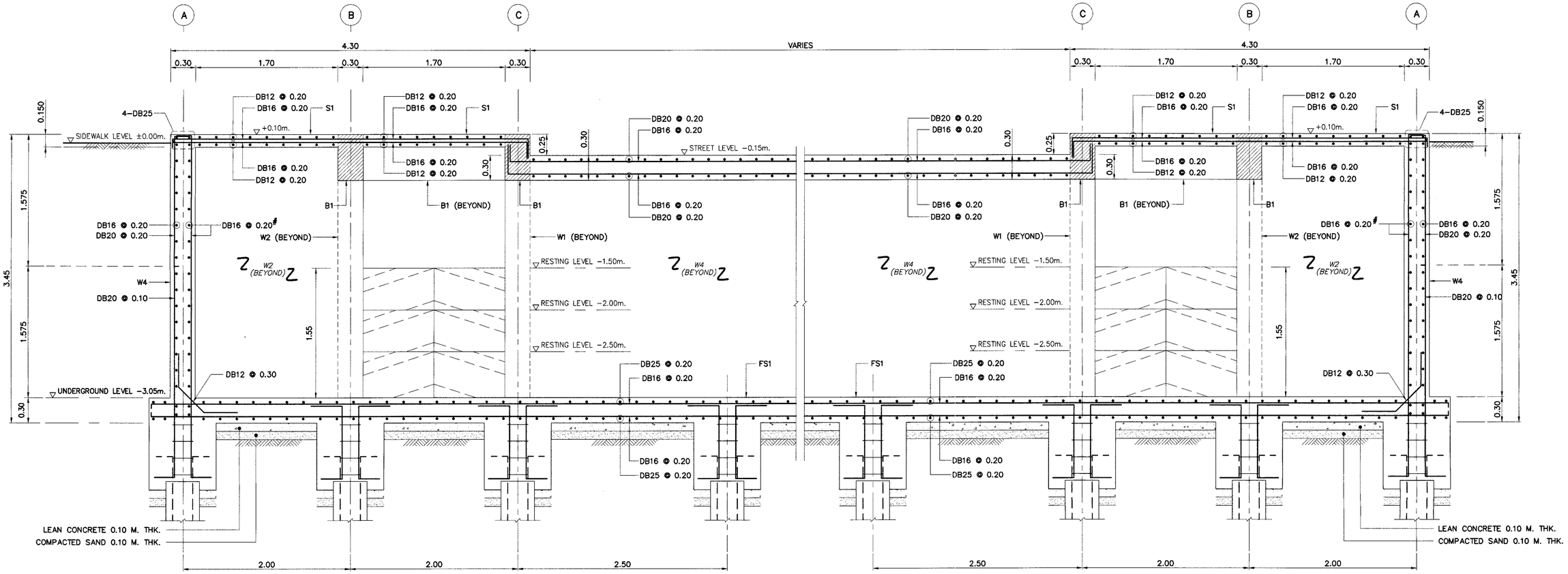
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS | CHECKED : BUREAU OF LOCATION & DESIGN | DATE : OCT 2015

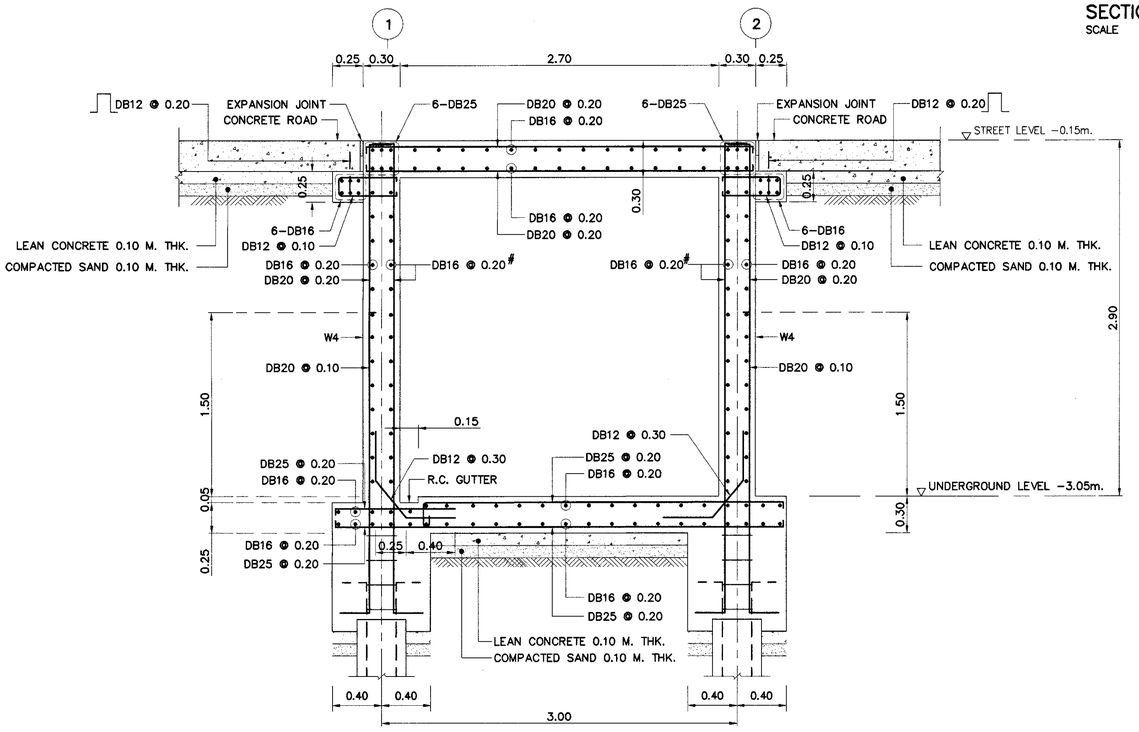
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU) | SCALE : AS SHOWN

APPROVED : (FOR DIRECTOR GENERAL) | DWG NO. UH-106 | SHEET NO. 198

D:\std dwg 2015\UH_106(REV00)



SECTION D – D
SCALE 1 : 25



SECTION E – E
SCALE 1 : 25

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.075 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH–001 AND UH–101

REF.	REVISION	SIGNATURE	DATE

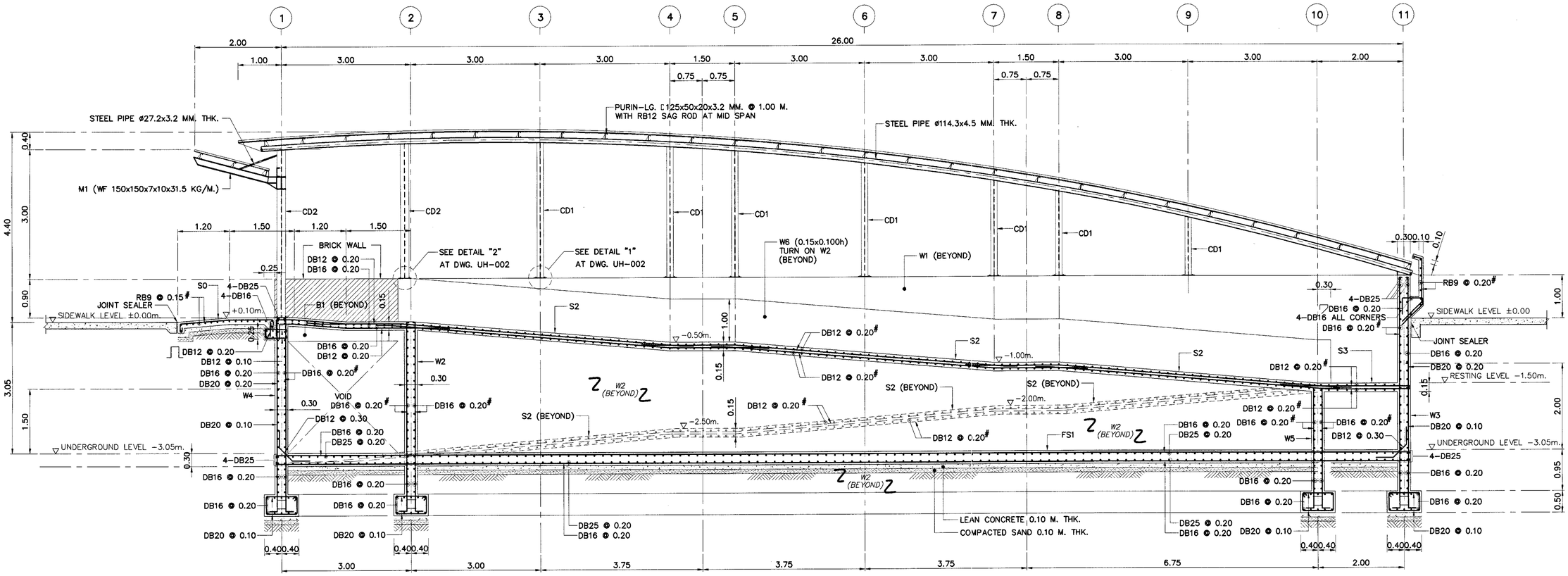
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

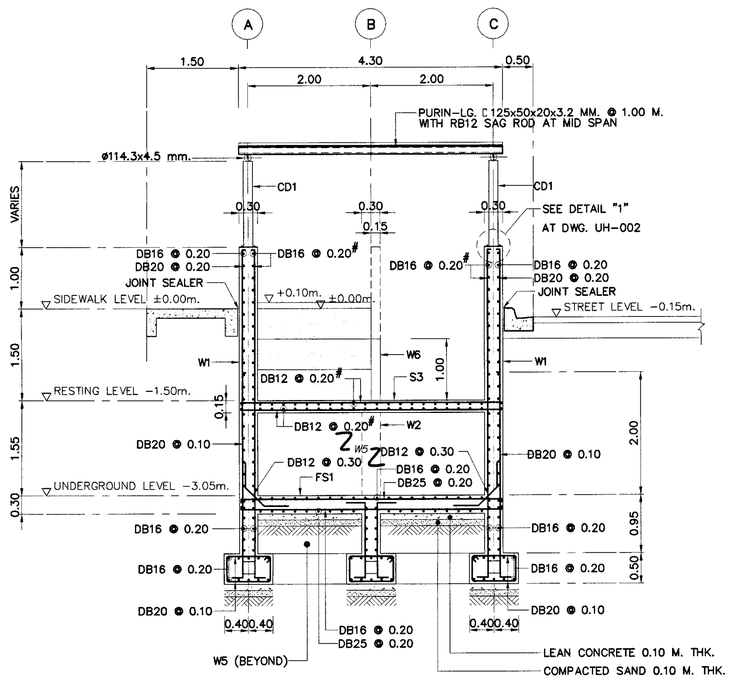
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
PILE FOOTING DETAILS (SECTION D AND E)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH–107
		SHEET NO. 199

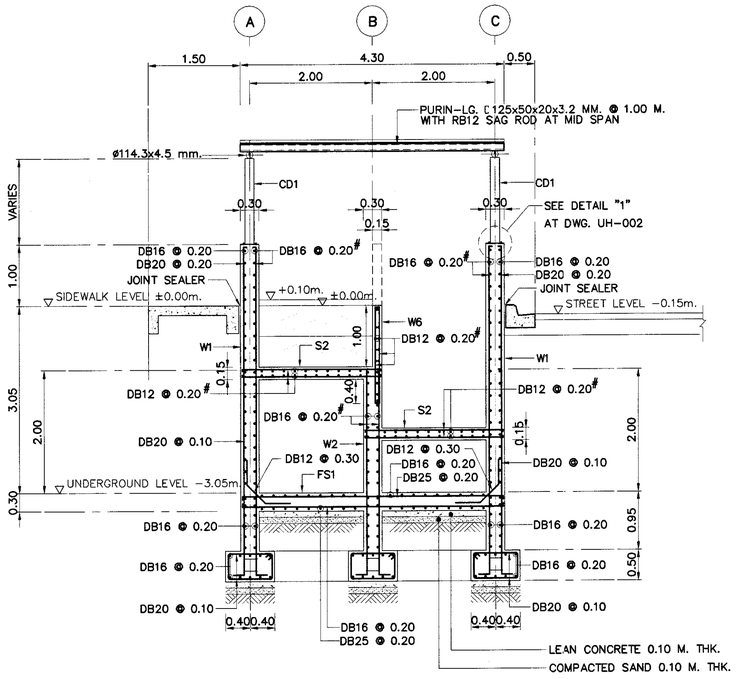
D:\std dwg 2015\UH_107(REV00)



SECTION A – A
SCALE 1 : 50



SECTION B – B
SCALE 1 : 50



SECTION C – C
SCALE 1 : 50

TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH SPREAD FOOTING SHALL BE LOCATED BELOW TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE BEARING CAPACITY OF 0.10 MPa (10 TON/M^2)
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH-102

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

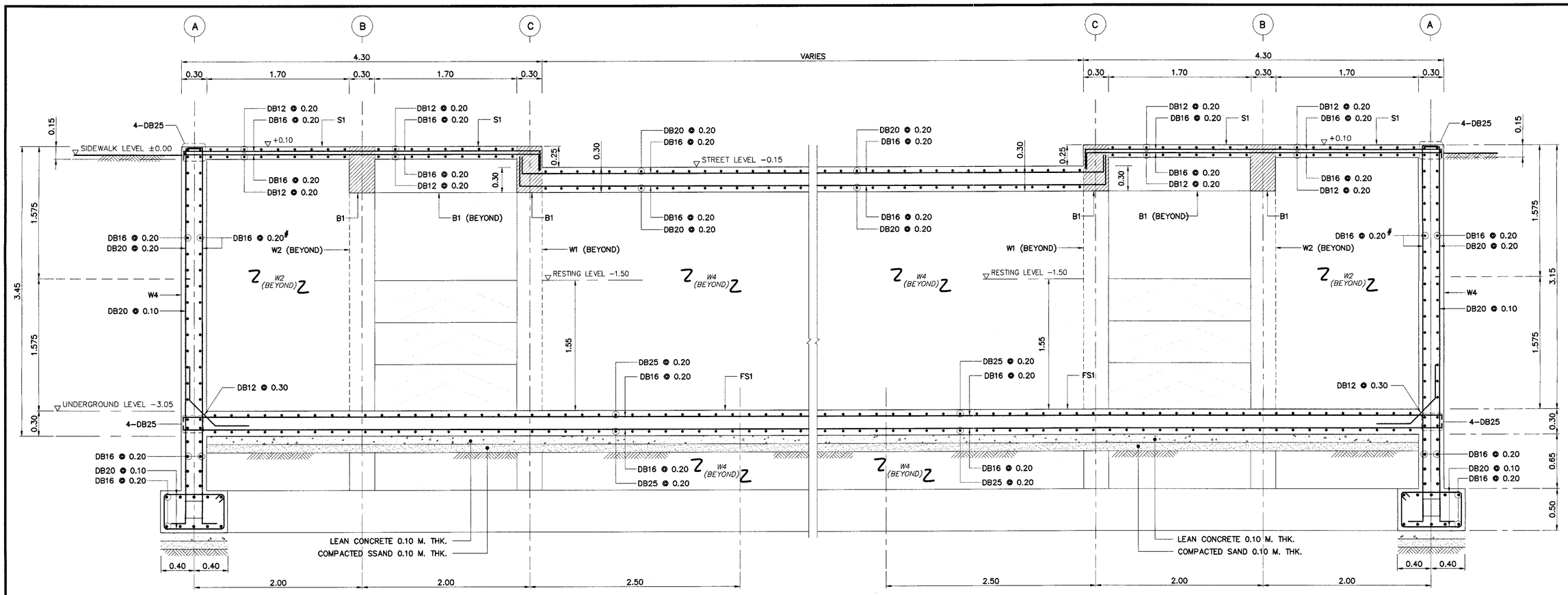
STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
SPREAD FOOTING DETAILS (SECTION A, B AND C)

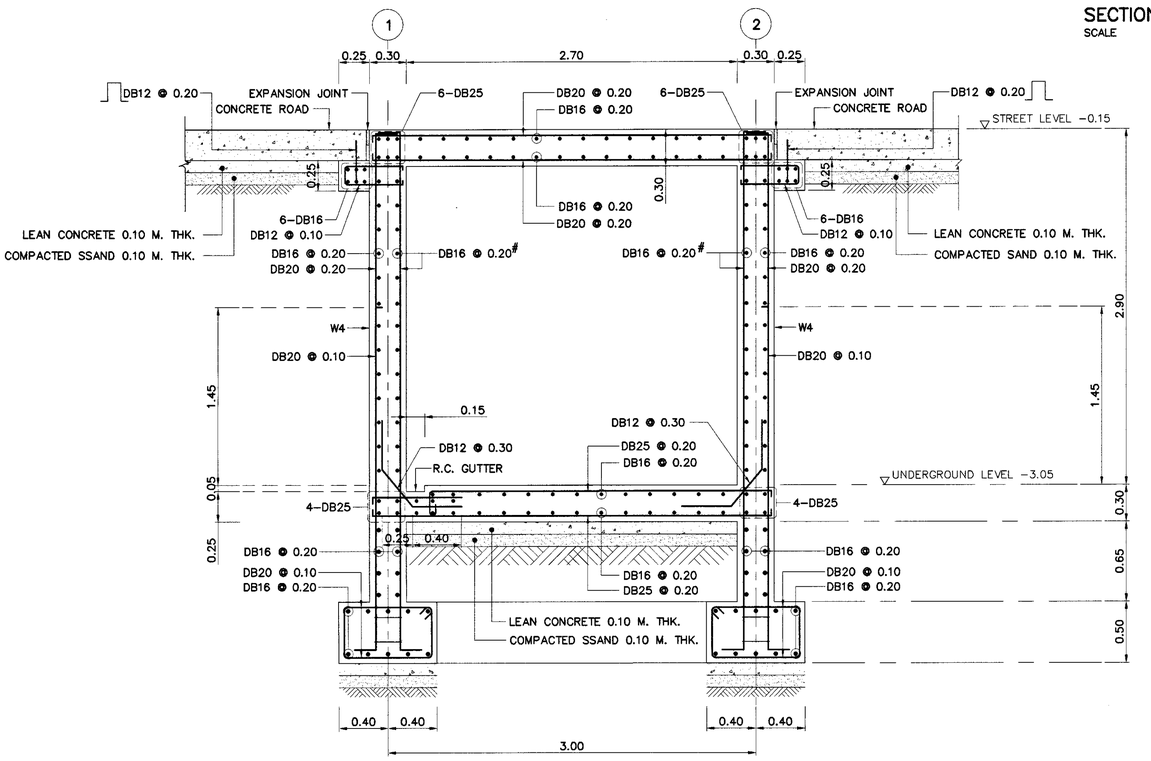
REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
SCALE : AS SHOWN
DWG NO. UH-108
APPROVED : (FOR DIRECTOR GENERAL)
SHEET NO. 200

D:\std dwg 2015\UH-108(REV00)



SECTION D − D
SCALE 1 : 25



SECTION E − E
SCALE 1 : 25

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH SPREAD FOOTING SHALL BE LOCATED BELOW TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE BEARING CAPACITY OF 0.10 MPa (10 TON/M^2)
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH−102

REF.	REVISION	SIGNATURE	DATE

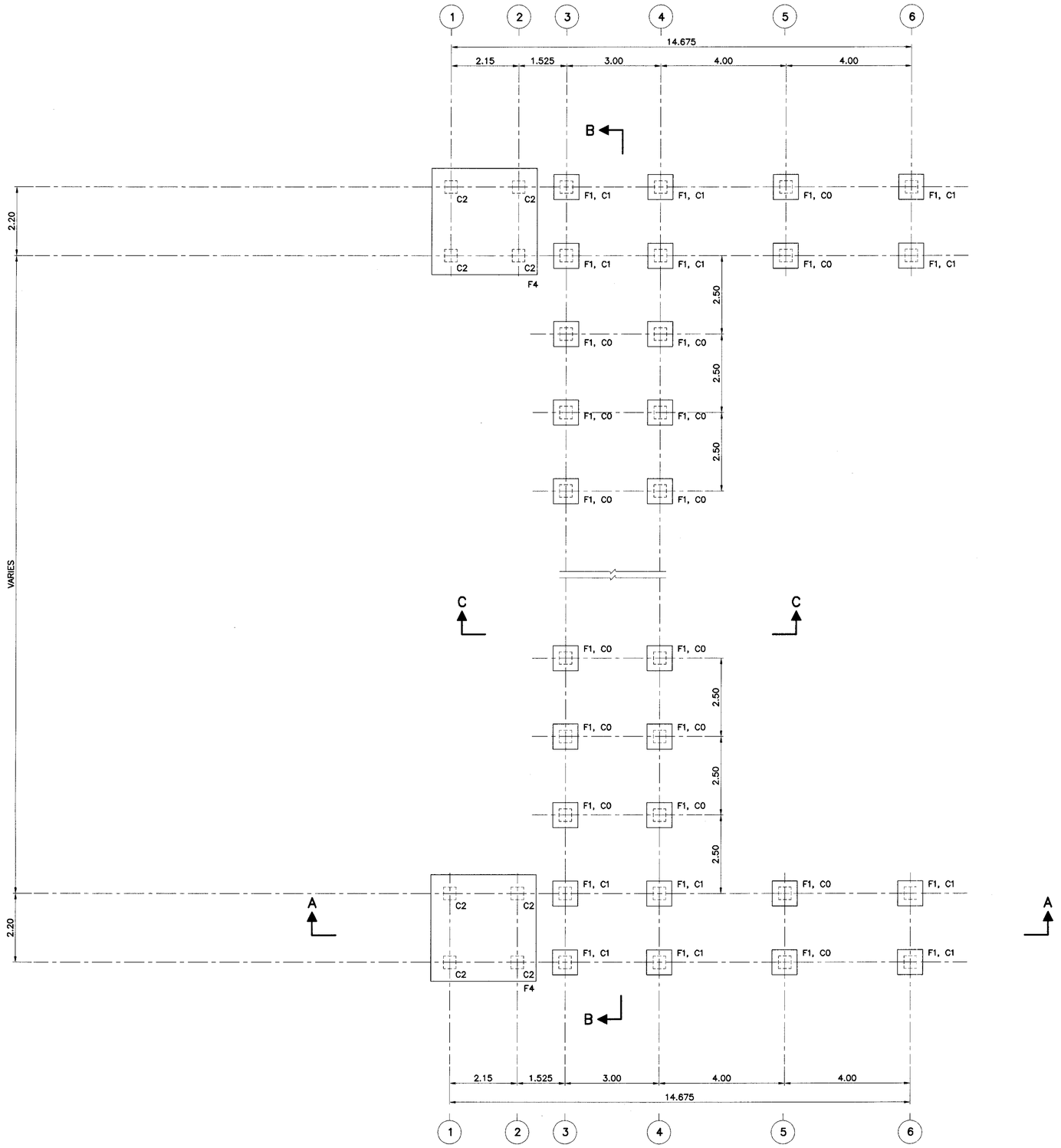
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1
SPREAD FOOTING DETAILS (SECTION D AND E)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH−109
		SHEET NO. 201

D:\std dwg 2015\UH_109(REV00)



PILE FOOTING PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED

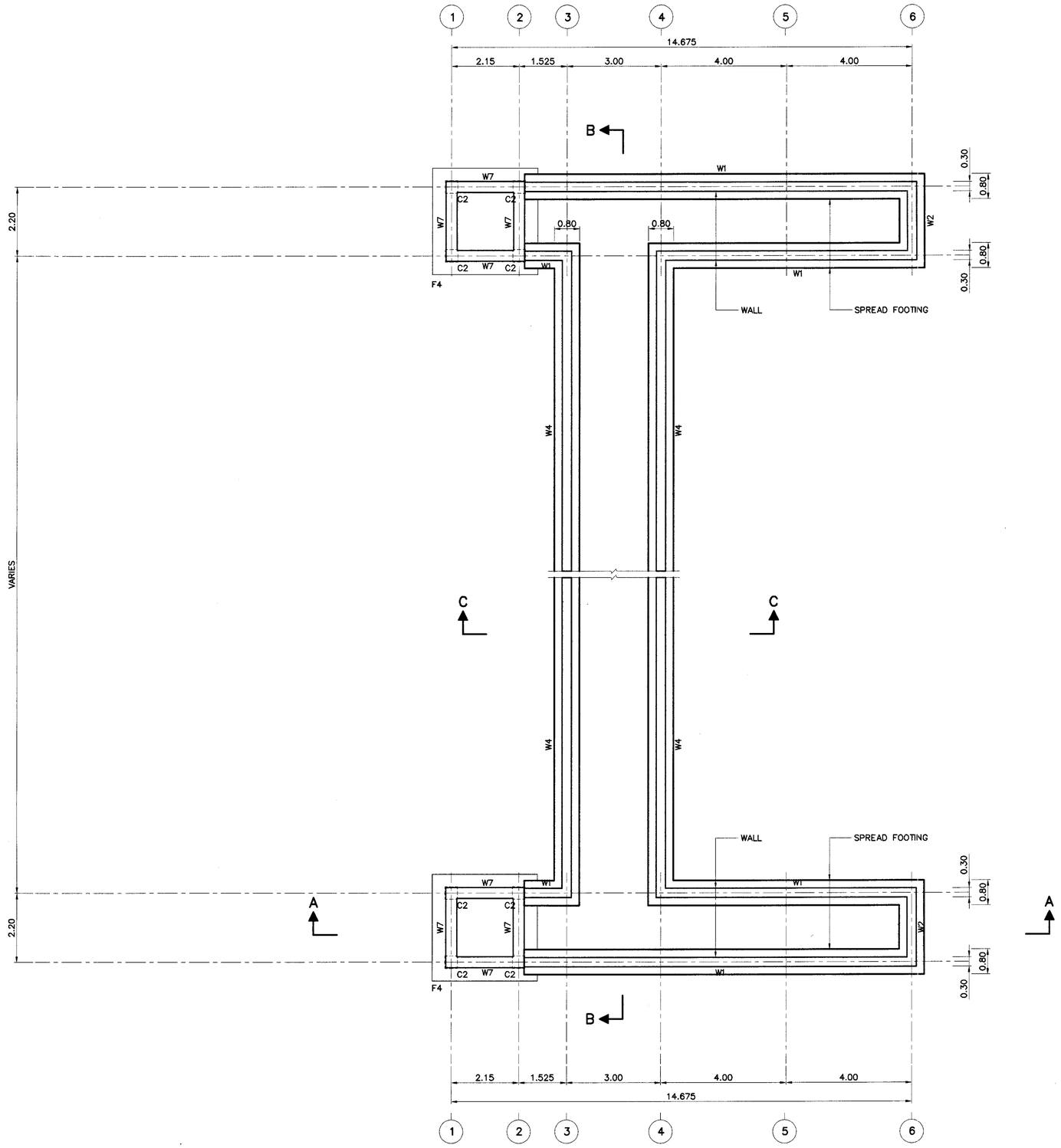
REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
PILE FOOTING PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-201
		SHEET NO. 202

D:\std dwg 2015\UH_201(REV00)



SPREAD FOOTING PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. EACH SPREAD FOOTING SHALL BE LOCATED BELOW TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE BEARING CAPACITY OF 0.10 MPa (10 TON/M^2)

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

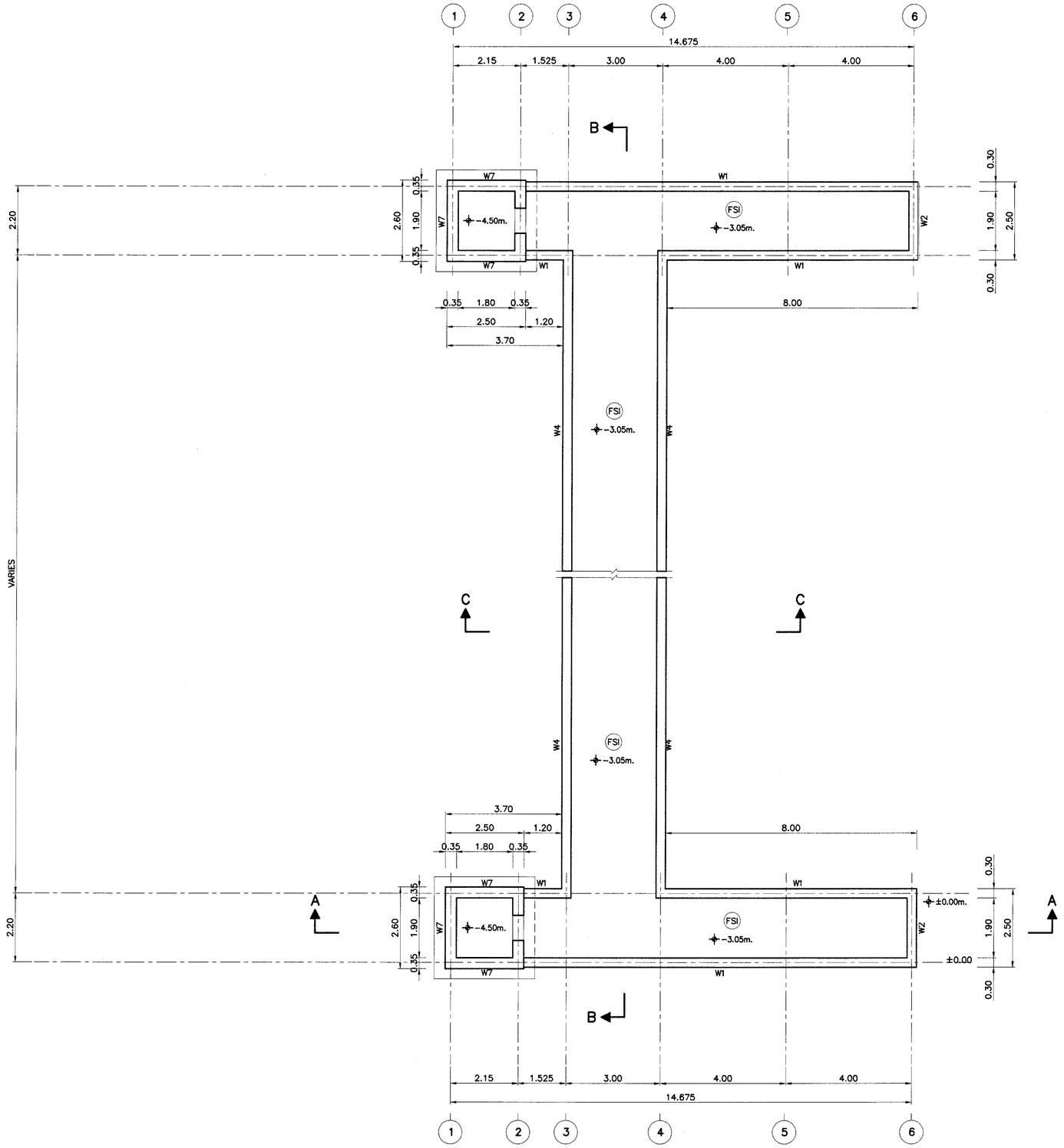
STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
SPREAD FOOTING PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-202
		SHEET NO. 203

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\UH_202(REV00)



UNDERGOUND FLOOR PLAN

SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

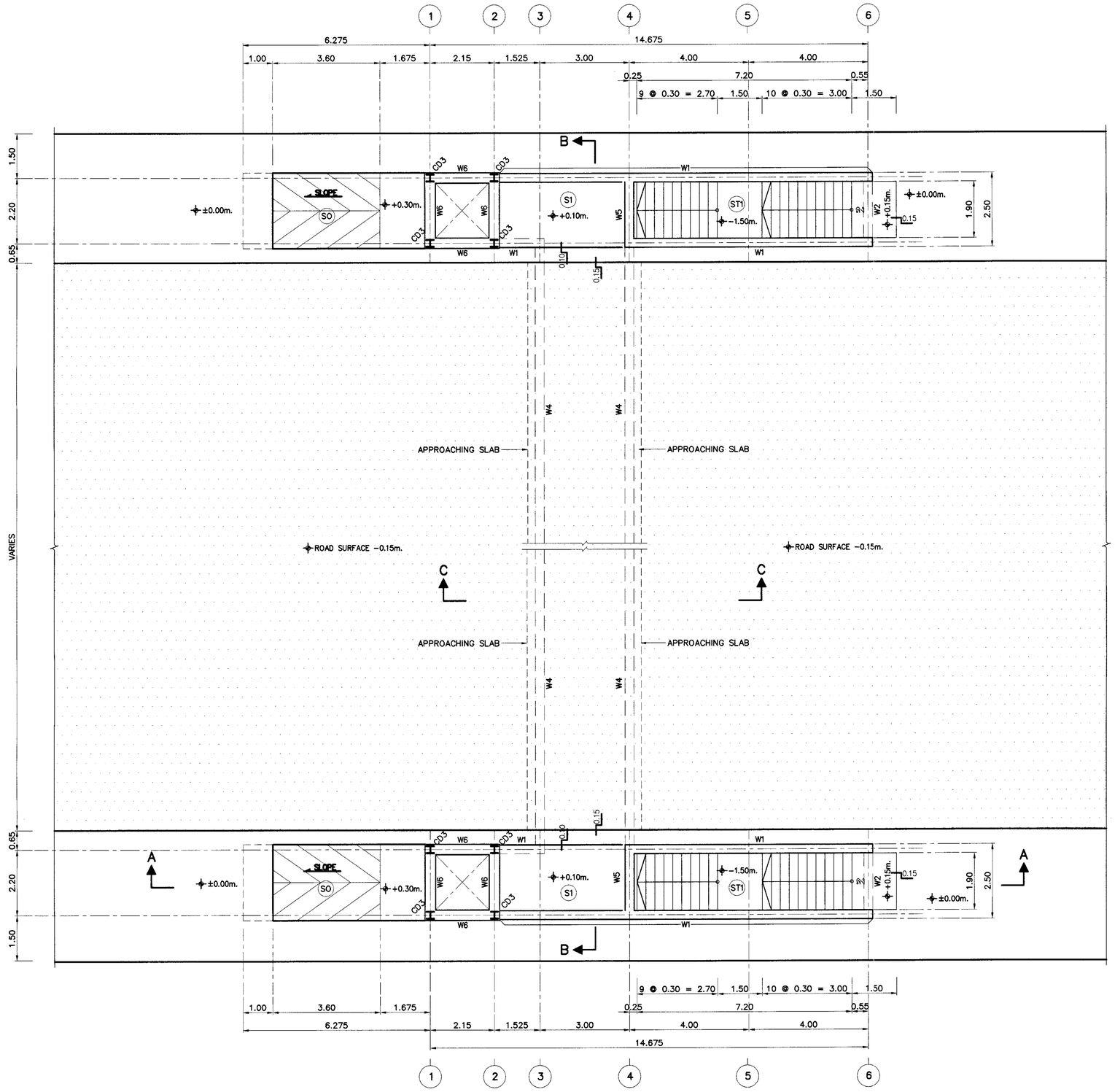
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2

UNDERGROUND FLOOR PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-203
		SHEET NO. 204

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\UH_203(REV00)



GROUND FLOOR PLAN
SCALE 1 : 75

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
GROUND FLOOR PLAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN		DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)			SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)			DWG NO. UH-204
			SHEET NO. 205

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\UH_204(REV00)

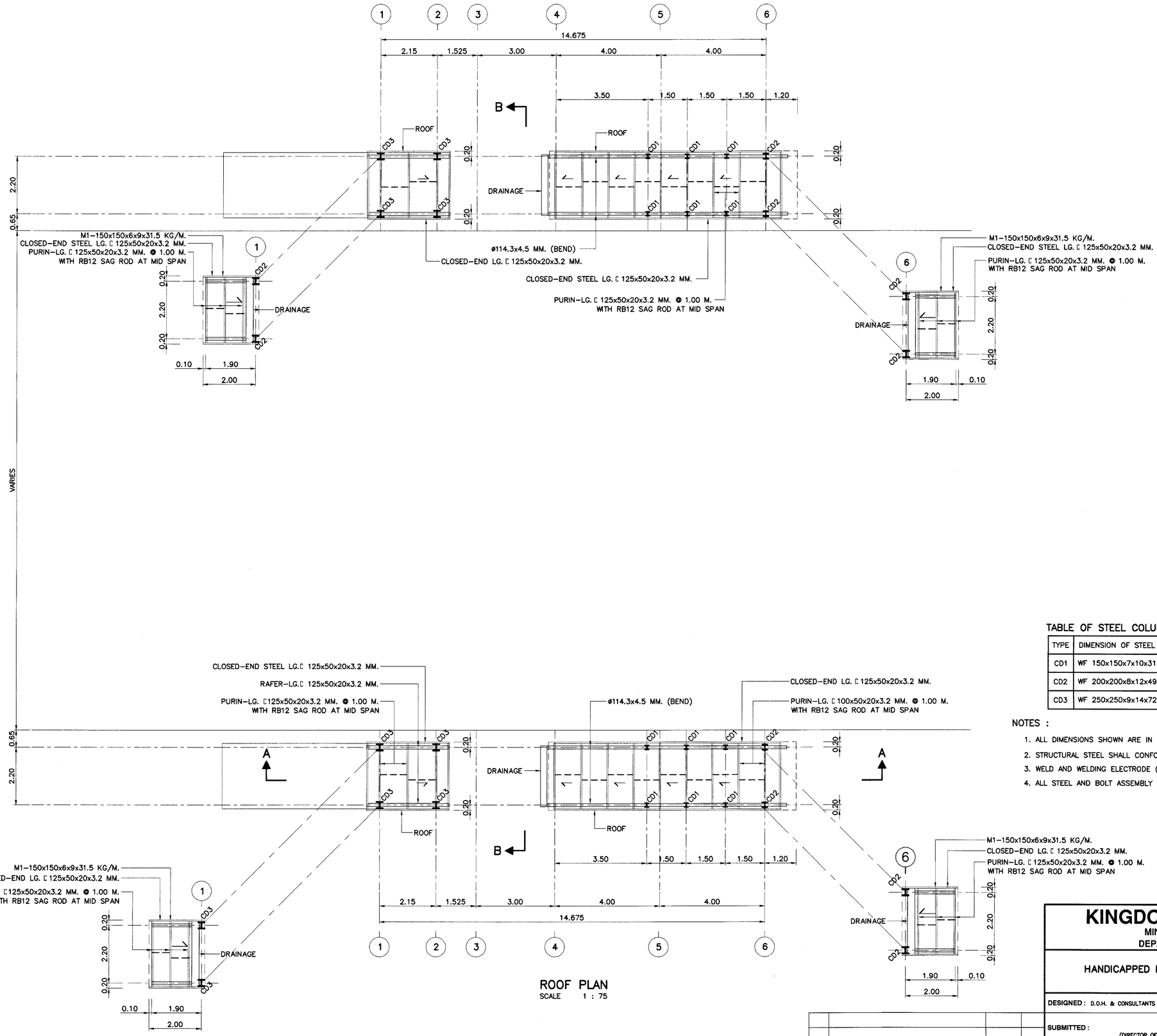


TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.
CD3	WF 250x250x9x14x72.4 KG/M.

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. STRUCTURAL STEEL SHALL CONFORM TO TIS 1227 GRADE SM400.
3. WELD AND WELDING ELECTRODE (TYPE E70) SHALL CONFORM TO AWS STANDARDS.
4. ALL STEEL AND BOLT ASSEMBLY SHALL BE GALVANIZED

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

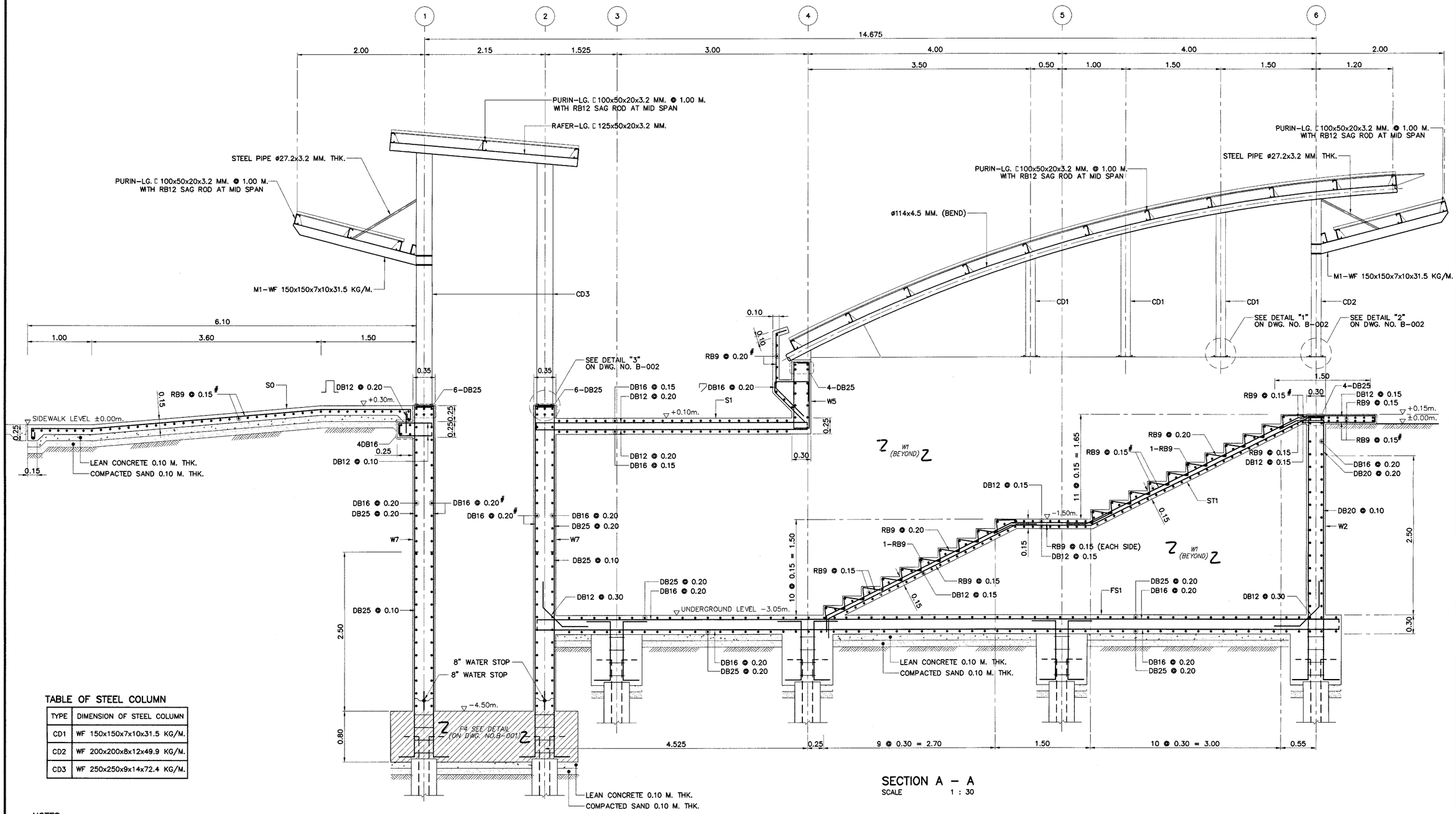
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
ROOF PLAN

REF.	REVISION	SIGNATURE	DATE

DESIGNED : D.O.H. & CONSULTANTS
CHECKED : BUREAU OF LOCATION & DESIGN
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)
APPROVED : (FOR DIRECTOR GENERAL)

DATE : OCT 2015
SCALE : AS SHOWN
DWG NO. UH–205
SHEET NO. 206

D:\std dwg 2015\UH_205(REV00)



SECTION A – A
SCALE 1 : 30

TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.
CD3	WF 250x250x9x14x72.4 KG/M.

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH–201

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

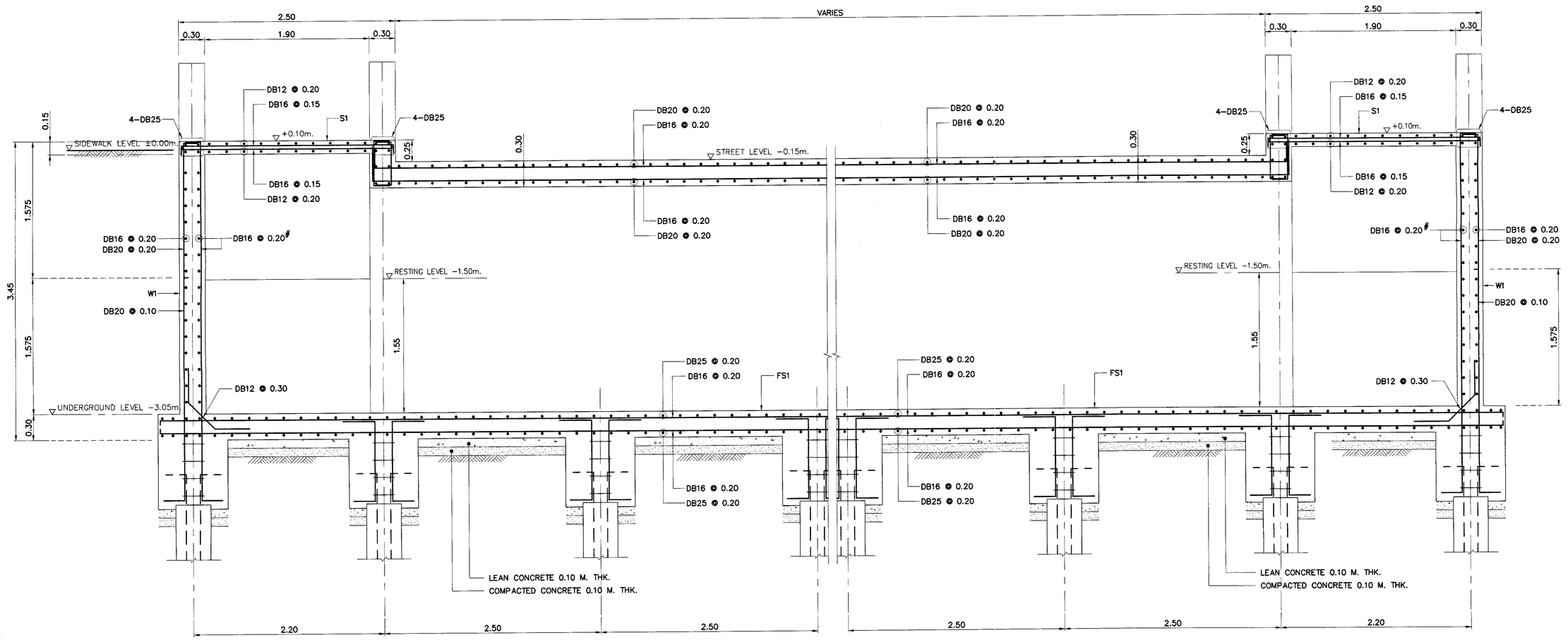
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

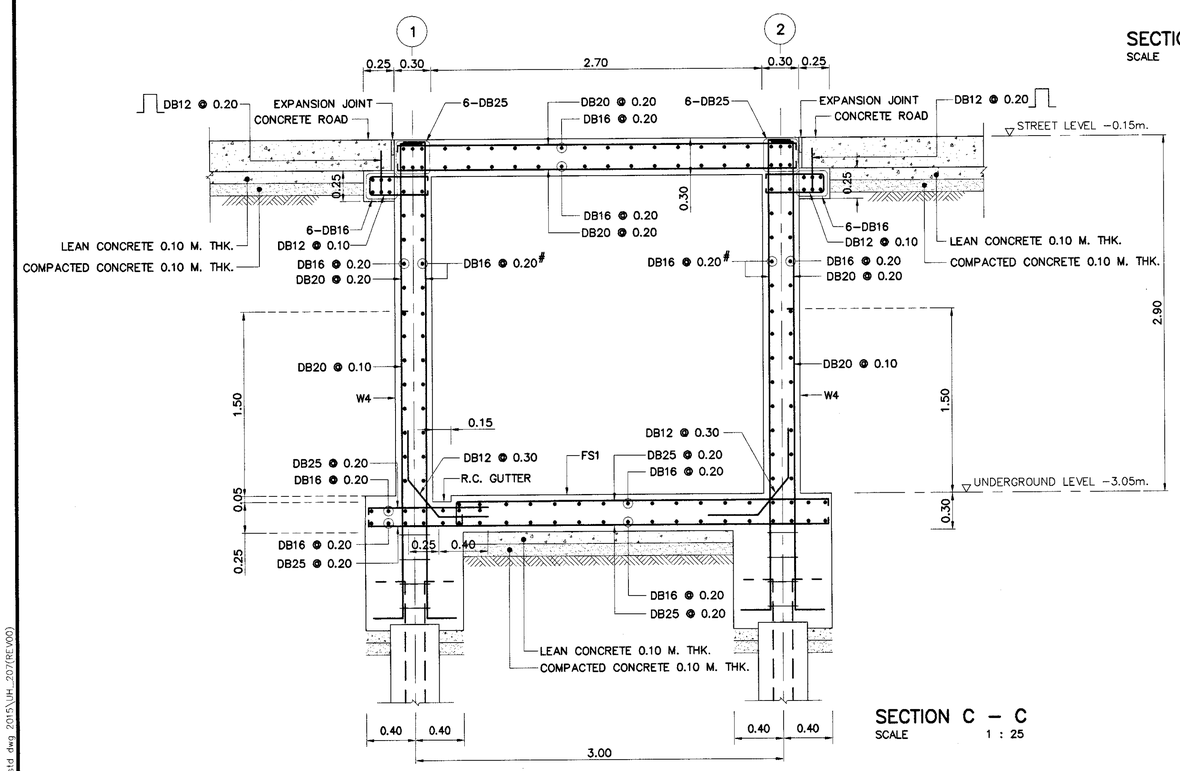
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
PILE FOOTING DETAILS (SECTION A)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH–206
		SHEET NO. 207

D:\std dwg 2015\UH_206(REV00)



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE CAPACITY OF 0.35 MN (35 TON) FOR EACH PILE AND A MINIMUM 3.50 M. EMBEDED LENGTH UNDER A DEPTH ARE REQUIRED
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH-001 AND UH-201

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
PILE FOOTING DETAILS (SECTION B AND C)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-207
		SHEET NO. 208

REF.	REVISION	SIGNATURE	DATE

D:\std dwg 2015\UH-207(REV00)

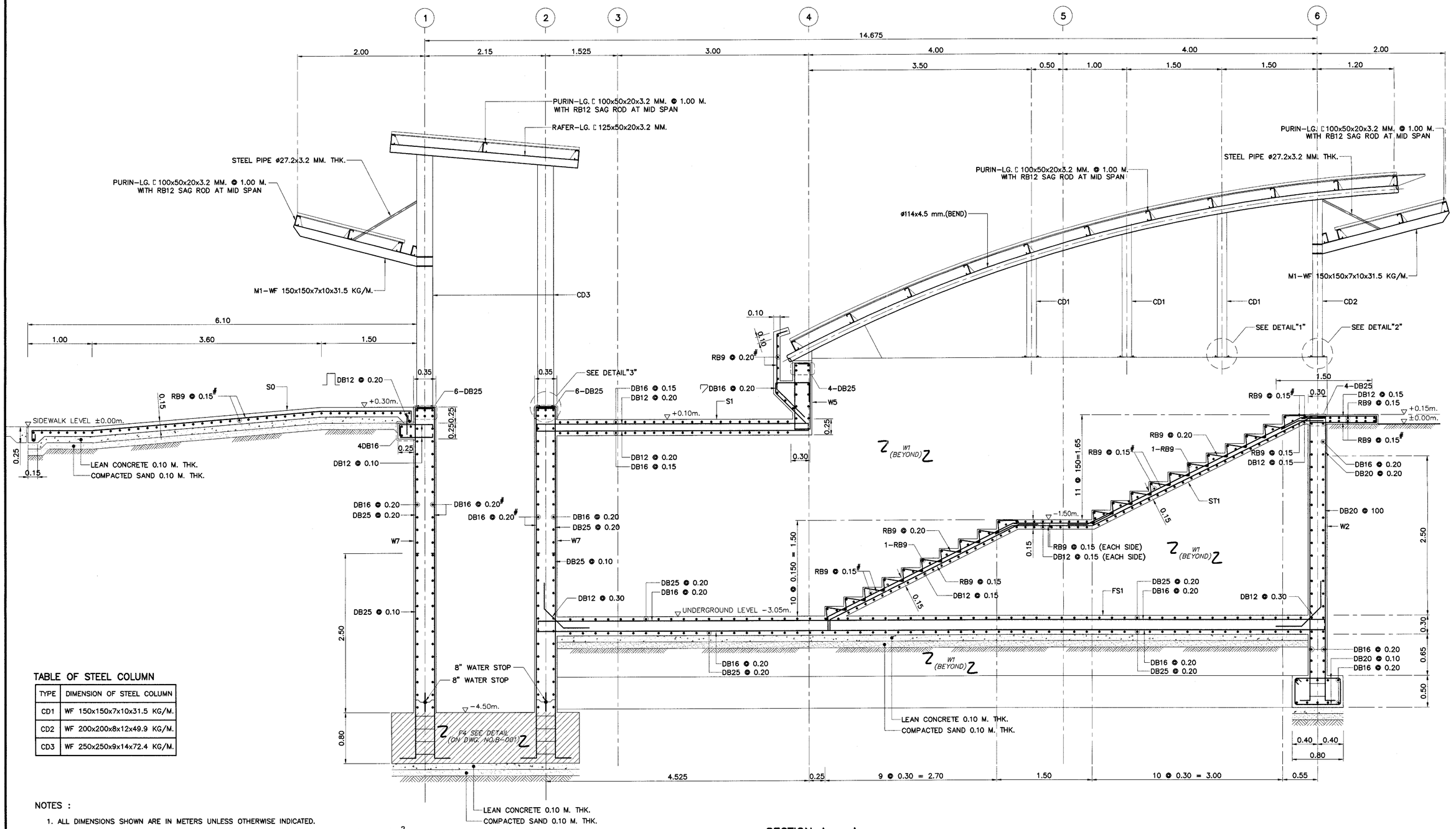


TABLE OF STEEL COLUMN

TYPE	DIMENSION OF STEEL COLUMN
CD1	WF 150x150x7x10x31.5 KG/M.
CD2	WF 200x200x8x12x49.9 KG/M.
CD3	WF 250x250x9x14x72.4 KG/M.

SECTION A – A
SCALE 1 : 30

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH SPREAD FOOTING SHALL BE LOCATED BELOW TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE BEARING CAPACITY OF 0.10 MPa (10 TON/M^2)
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH–202

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

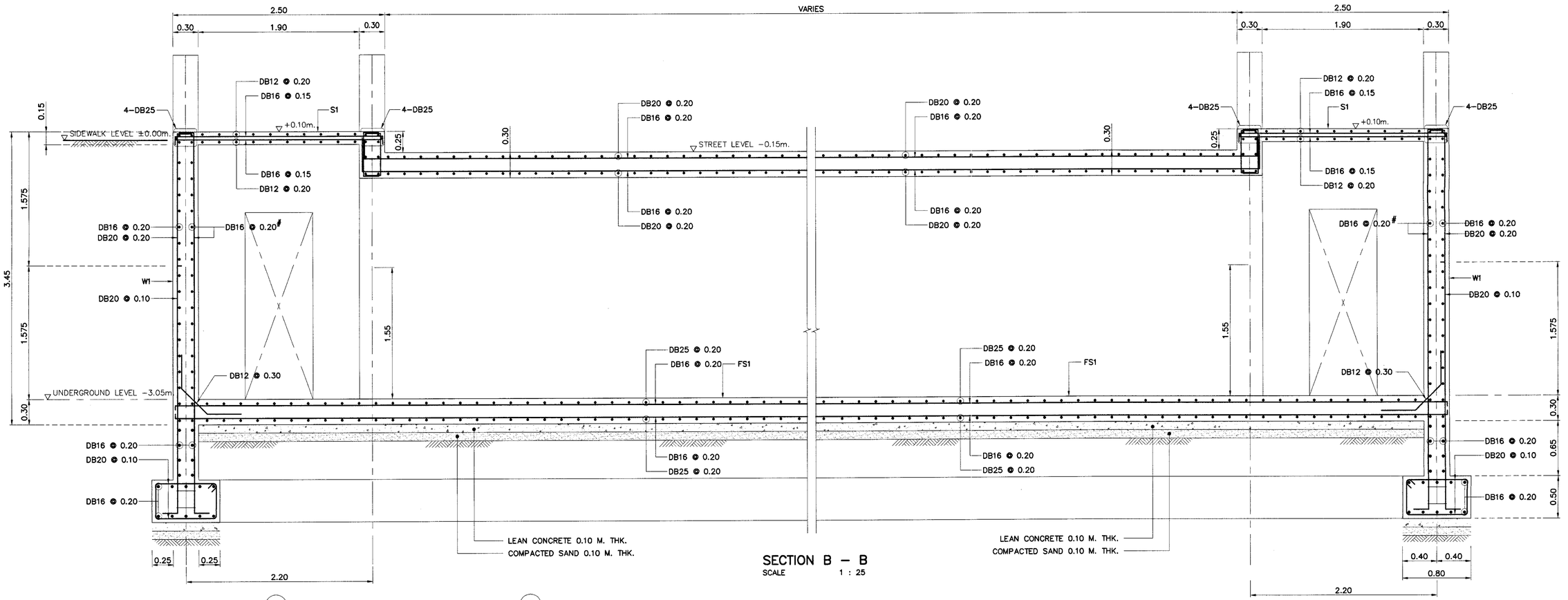
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

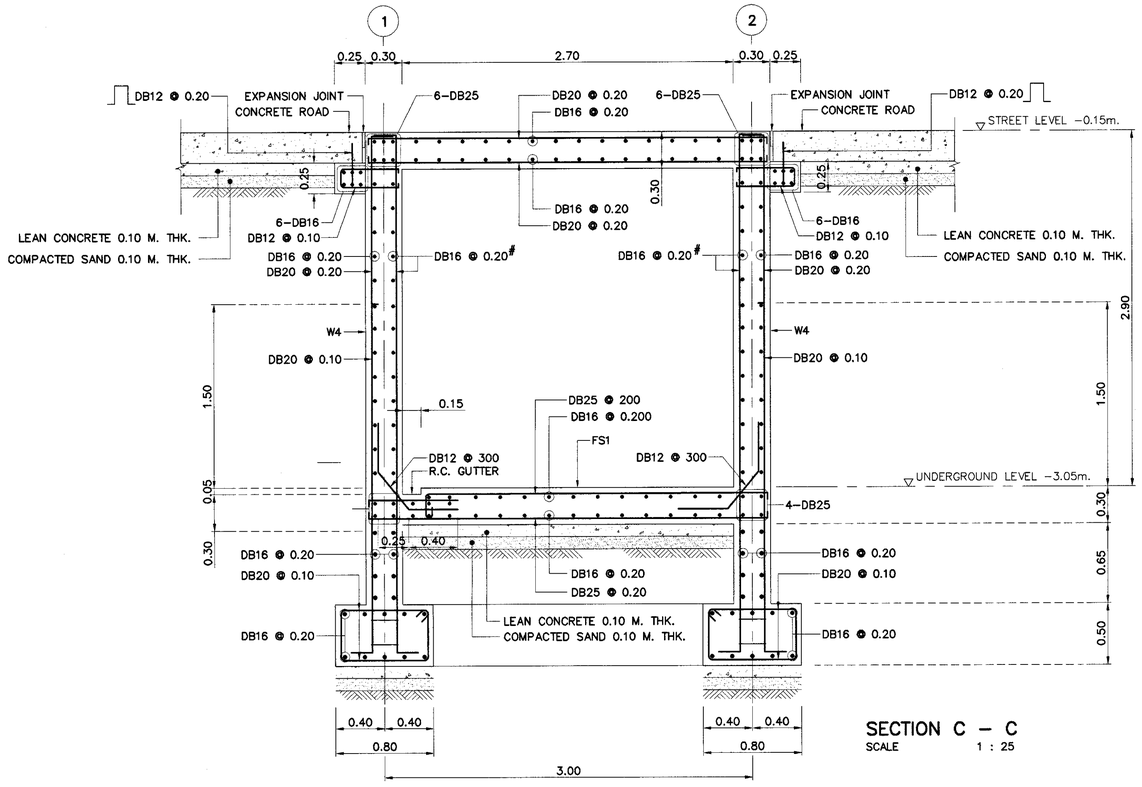
HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
SPREAD FOOTING DETAILS (SECTION A)

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH–208
		SHEET NO. 209

D:\std dwg 2015\UH_208(REV00)



SECTION B – B
SCALE 1 : 25



SECTION C – C
SCALE 1 : 25

NOTES :

1. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa (357 KG/CM^2) FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
3. REBARS SMALLER THAN RB9 MM. SHALL BE TIS.20 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS.24 GRADE SD40 DEFORMED BARS UNLESS OTHERWISE INDICATED.
4. EACH SPREAD FOOTING SHALL BE LOCATED BELOW TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY, THE MINIMUM ALLOWABLE BEARING CAPACITY OF 0.10 MPa (10 TON/M^2)
5. CLEAR CONCRETE COVER SHALL BE 0.05 M. EXCEPT THE BOTTOM OF SLABS OR WALL WHERE CLEAR COVER OF 0.10 M. SHALL BE PROVIDED.
6. THE RESISTANCE OF WELDED REBAR IS AT LEAST 125 PERCENT OF THE YIELD STRENGTH OF REBARS
7. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. THIS DRAWING IS USED IN CONJUNCTION WITH DWG. UH–202

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

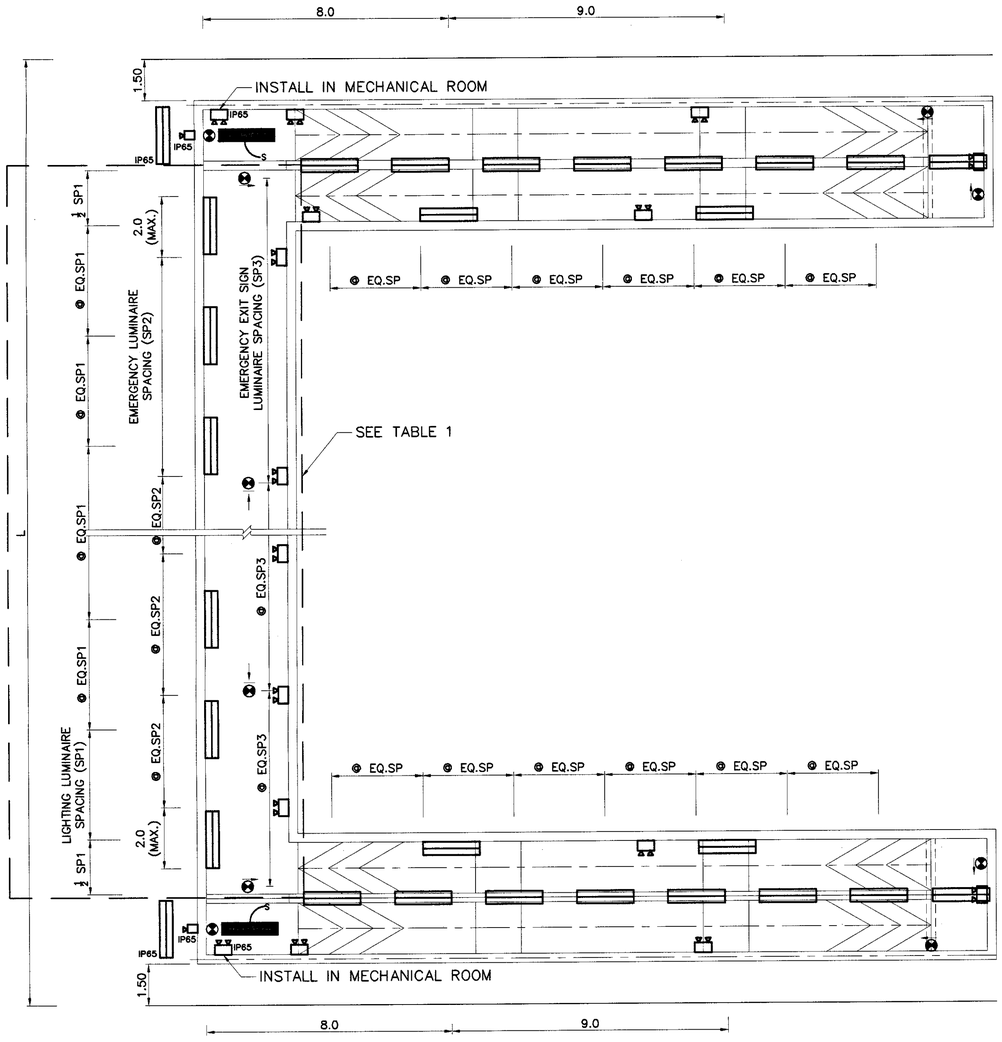
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2
SPREAD FOOTING DETAILS (SECTION B AND C)

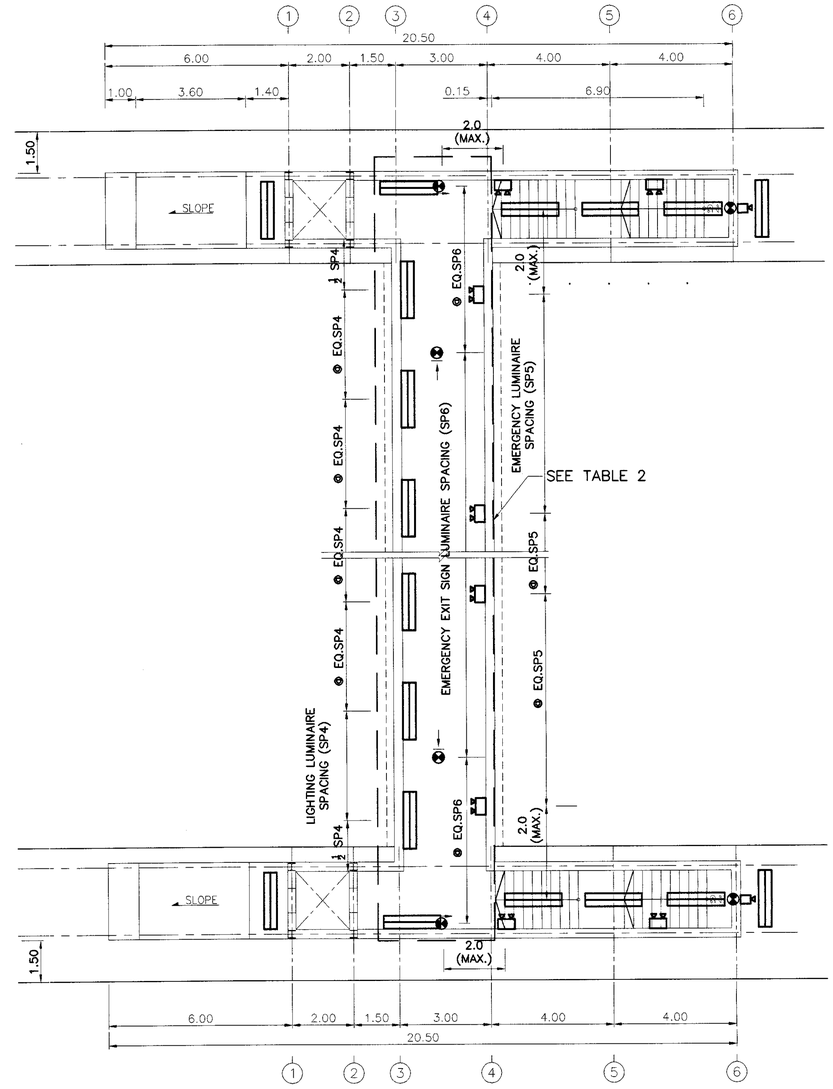
DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH–209
		SHEET NO. 210

D:\std dwg 2015\UH_209(REV00)



LIGHTING PLAN FOR HANDICAPPED PEDESTRIAN UNDERPASS TYPE 1

SCALE 1:100



LIGHTING PLAN FOR HANDICAPPED PEDESTRIAN UNDERPASS TYPE 2

SCALE 1:100

LEGEND :

- WEATHER PROOF LIGHTING LUMINAIRE, IP54, MADE OF METALLIC HOUSING, ANTI-CORROSION PROOF WITH COVER, FITTED WITH ANODIZED ALUMINUM SHEET REFLECTOR, 2-36WATT FLUORESCENT LAMPS.
- IP65 DITTO BUT IP65.
- WEATHER PROOF LIGHTING LUMINAIRE, IP65, MADE OF POLYCARBONATE HOUSING WITH COVER, COMPLETED WITH STAINLESS STEEL CLIPS, 2-36WATT FLUORESCENT LAMPS, ON-OFF BY A SWITCH, INSTALL IN MECHANICAL ROOM.
- EMERGENCY LUMINAIRE, HOUSING MADE OF METAL, ANTI-CORROSION PROOF, 2 LAMPS.
- IP65, IP65 EMERGENCY LUMINAIRE, HOUSING MADE OF METAL, ANTI-CORROSION PROOF, IP65, 1 AND 2 LAMP(S) RESPECTIVELY.
- EMERGENCY EXIT SIGN LUMINAIRE, HOUSING MADE OF METAL, ANTI-CORROSION PROOF

REFERENCE STANDARD :

1. EMERGENCY LUMINAIRE : EIT STANDARD 2004-15
2. EMERGENCY EXIT SIGN LUMINAIRE : TIS 2430, EIT STANDARD 2004-15

NOTE :

1. ALL DIMENSION SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
2. THE MINIMUM AVERAGE MAINTAINED ILLUMINANCE SHOULD BE 100 LUX.

TABLE 1

L (m.)	RECOMMENDED NUMBER OF LUMINAIRE (SETS)		
	LIGHTING*	EMERGENCY	EMERGENCY EXIT SIGN
30 – LESS THAN 34	6	3	4
34 – LESS THAN 39	7	3	4
39 – LESS THAN 43	8	4	4
43 – LESS THAN 47	9	4	4
47 – LESS THAN 53	10	4	4
53 – LESS THAN 57	11	4	4
57 – LESS THAN 60	12	5	4
60 – LESS THAN 65	13	5	4
65 – LESS THAN 70	14	5	4
70 – LESS THAN 75	15	6	6
75 – 80	16	6	6

REMARK* : SEE NOTE 2

TABLE 2

L (m.)	RECOMMENDED NUMBER OF LUMINAIRE (SETS)		
	LIGHTING*	EMERGENCY	EMERGENCY EXIT SIGN
30 – LESS THAN 34	8	3	4
34 – LESS THAN 39	9	4	4
39 – LESS THAN 43	10	4	4
43 – LESS THAN 47	11	4	4
47 – LESS THAN 53	12	4	4
53 – LESS THAN 57	13	5	4
57 – LESS THAN 60	14	5	4
60 – LESS THAN 65	15	5	4
65 – LESS THAN 70	16	6	4
70 – LESS THAN 75	17	6	6
75 – 80	18	6	6

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS

LIGHTING

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. UH-210
		SHEET NO. 211

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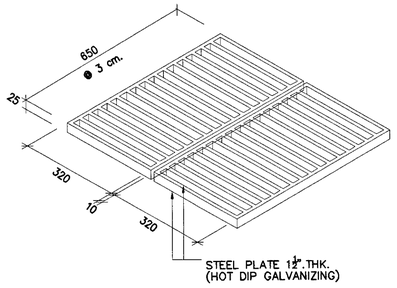
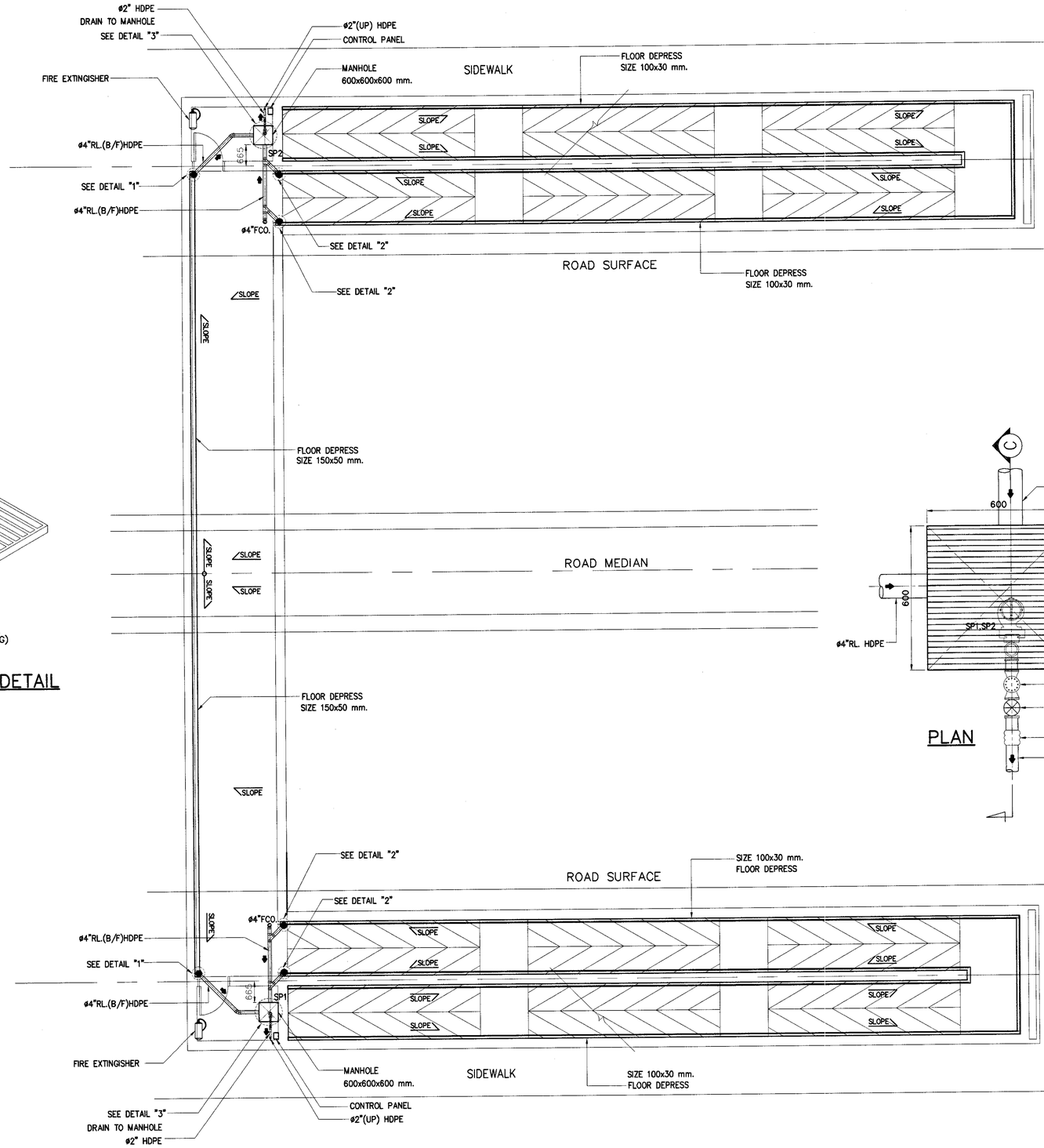
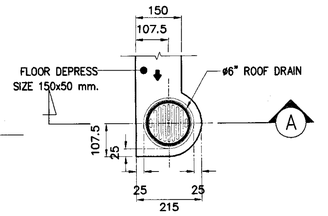


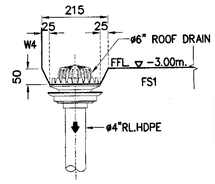
COVER-STEEL GRATING DETAIL
NOT TO SCALE



UNDERGROUND PLAN-RAINWATER DRAINAGE SYSTEM
SCALE 1:75

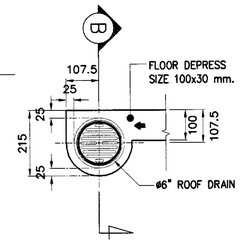


PLAN

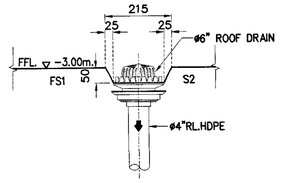


SECTION A

DETAIL "1"
NOT TO SCALE



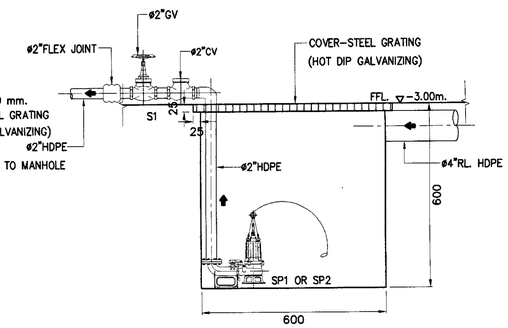
PLAN



SECTION B

DETAIL "2"
NOT TO SCALE

PLAN



DETAIL "3"
NOT TO SCALE

SECTION C

NOTE:

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. SUBMERSIBLE PUMP (SP1,SP2) ARE CONTROL BY FLOAT LEVEL SWITCH CAPACITY 300 LITER PER SECOND AT 10 M.THD, DRIVING MOTOR 400 W., 220-240 V./1P/50 Hz.
3. ABC DRYCHEMICAL FIRE EXTINGISHER 4.5 Kg. ARE INSTALLAED 1.50 METER HEIGHT.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE-1
UNDERGROUND PLAN-RAINWATER DRAINAGE SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. SNU-101
		SHEET NO. 212

REF.	REVISION	SIGNATURE	DATE

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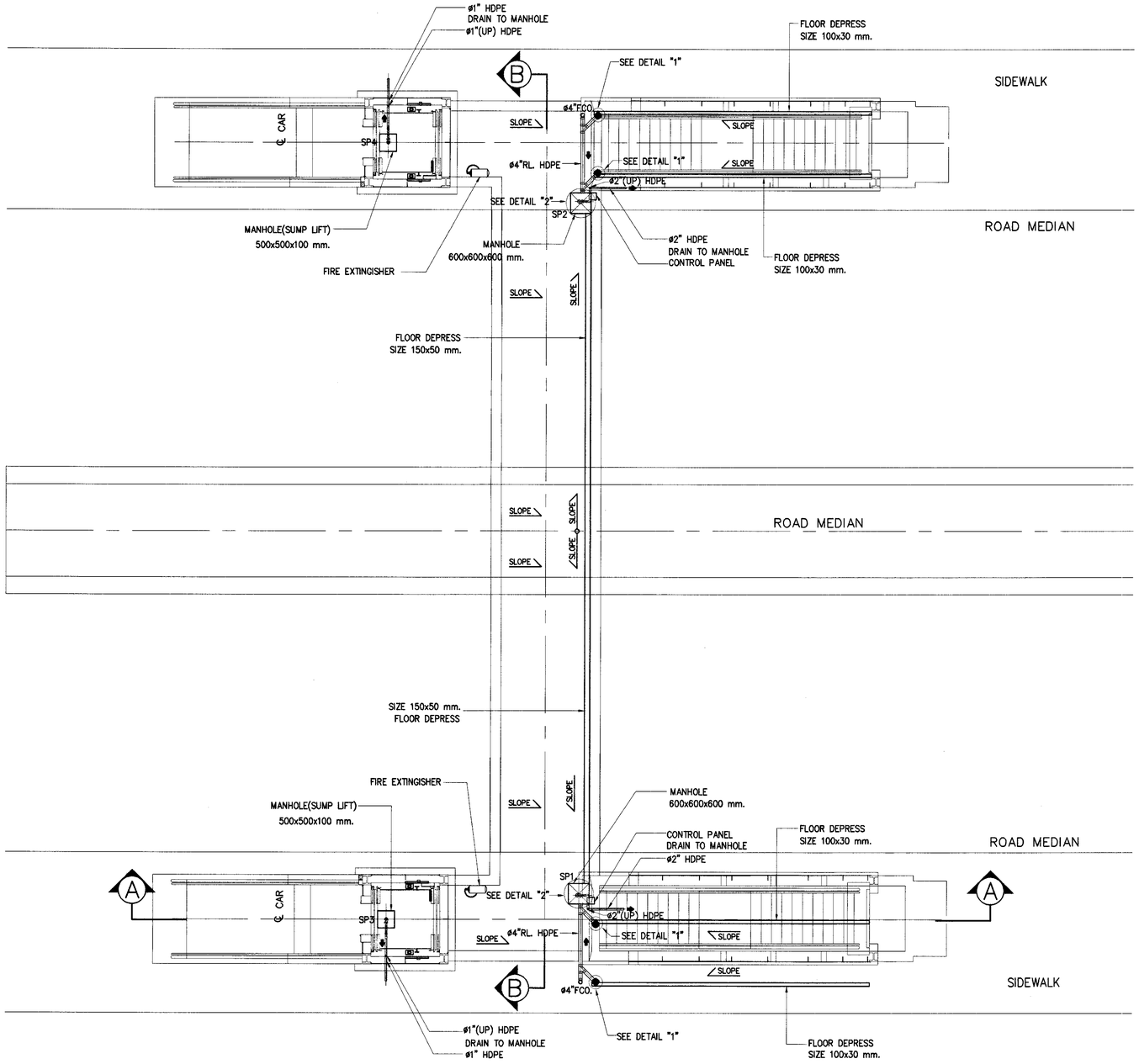
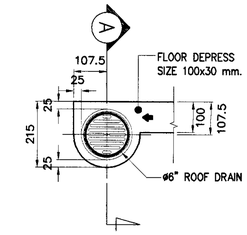
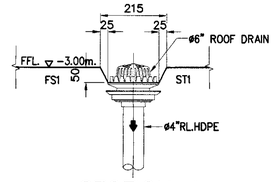


UNDERGROUND PLAN–RAINWATER DRAINAGE SYSTEM

SCALE 1:75

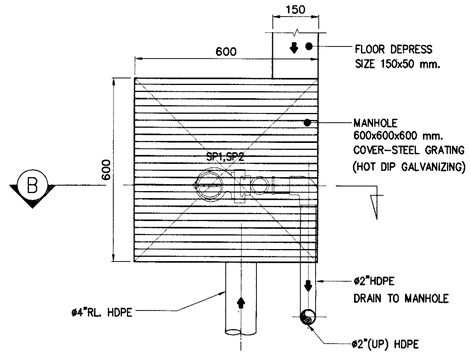


PLAN

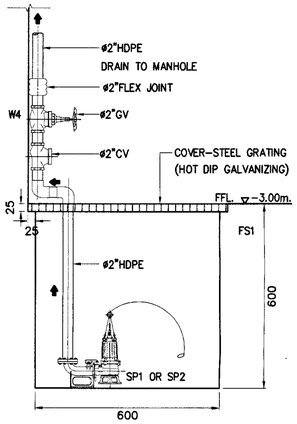


SECTION A

DETAIL "1"
NOT TO SCALE

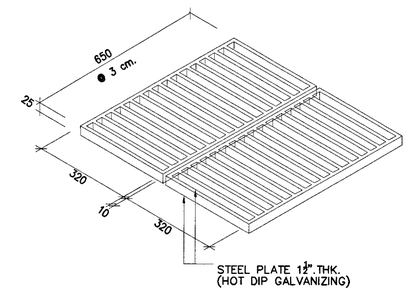


PLAN



SECTION B

DETAIL "2"
NOT TO SCALE



COVER–STEEL GRATING DETAIL

NOT TO SCALE

NOTE:

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. SUBMERSIBLE PUMP(SP1,SP2) ARE CONTROL BY FLOAT LEVEL SWITCH
   CAPACITY 300 LITER PER SECOND AT 10 M.THD,
   DRIVING MOTOR 400 W., 220–240 V./1P/50 Hz.
3. SUBMERSIBLE PUMP (SP3,SP4) ARE CONTROL BY FLOAT LEVEL SWITCH
   CAPACITY 70 LITER PER SECOND AT 6.5 M.THD,
   DRIVING MOTOR 120 W., 220–240 V./1P/50 Hz.
4. ABC DRYCHEMICAL FIRE EXTINGISHER 4.5 Kg. ARE
   INSTALLAED 1.50 METER HEIGHT.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE–2
UNDERGROUND PLAN–RAINWATER DRAINAGE SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
		DWG NO. SNU–102
APPROVED : (FOR DIRECTOR GENERAL)		SHEET NO. 213

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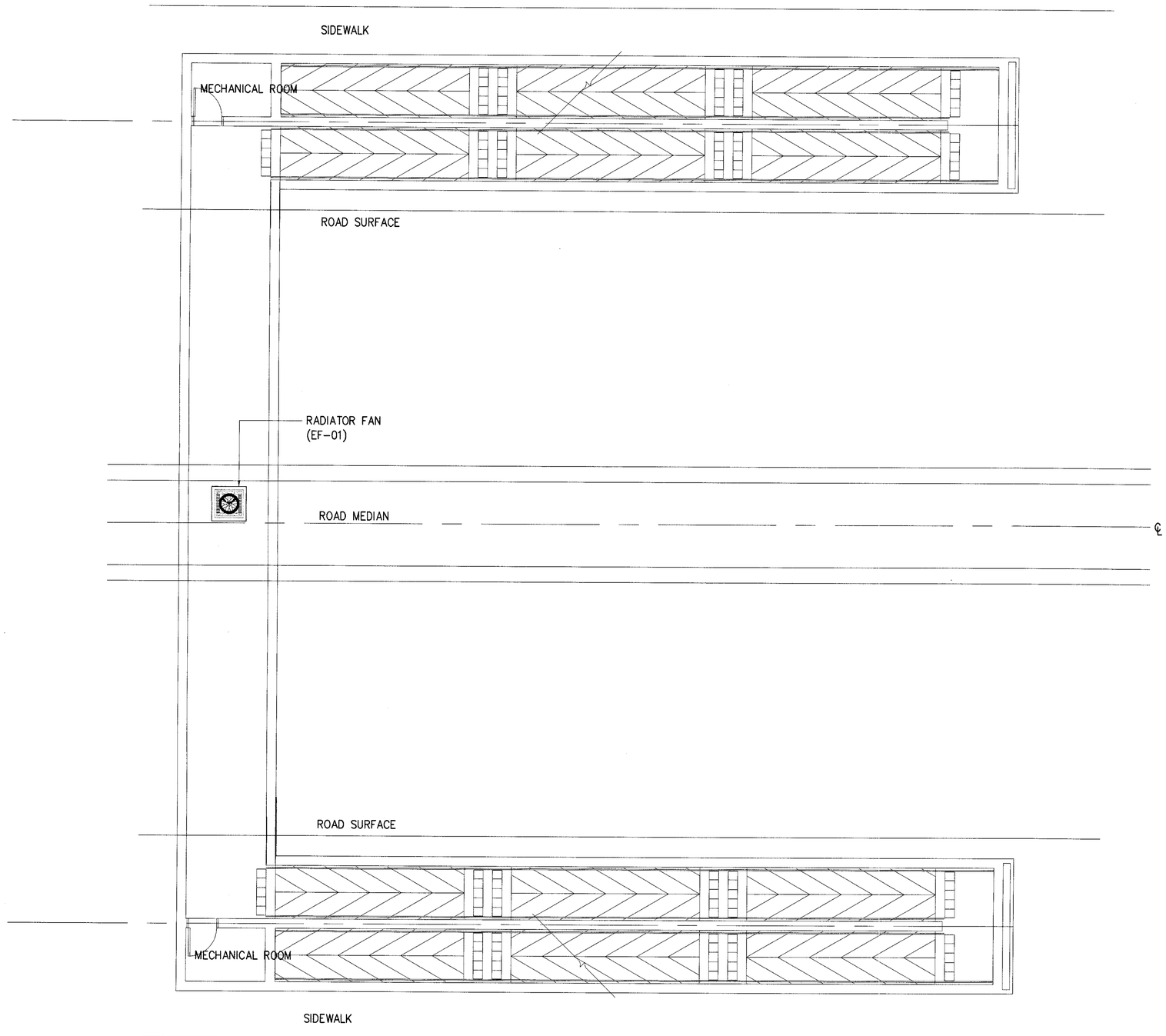

PLAN OF VENTILATION SYSTEM

SCALE 1:75

NOTE :

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. RADIATOR FAN (EF-01) ARE ,AXIAL FLOW AS FOLLOWING
   - FOR UNDERPASS SIZE 50-60 m.(LONG) SHALL BE CAPACITY 1,017 CFM., DRIVING MOTOR 1 Kw. ,220v./1P/50 Hz.
   - FOR UNDERPASS SIZE 70-80 m.(LONG) SHALL BE CAPACITY 1,356 CFM., DRIVING MOTOR 1.5 Kw. ,220v./1P/50 Hz.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE-1

VENTILATION SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. MEU-101
		SHEET NO. 214

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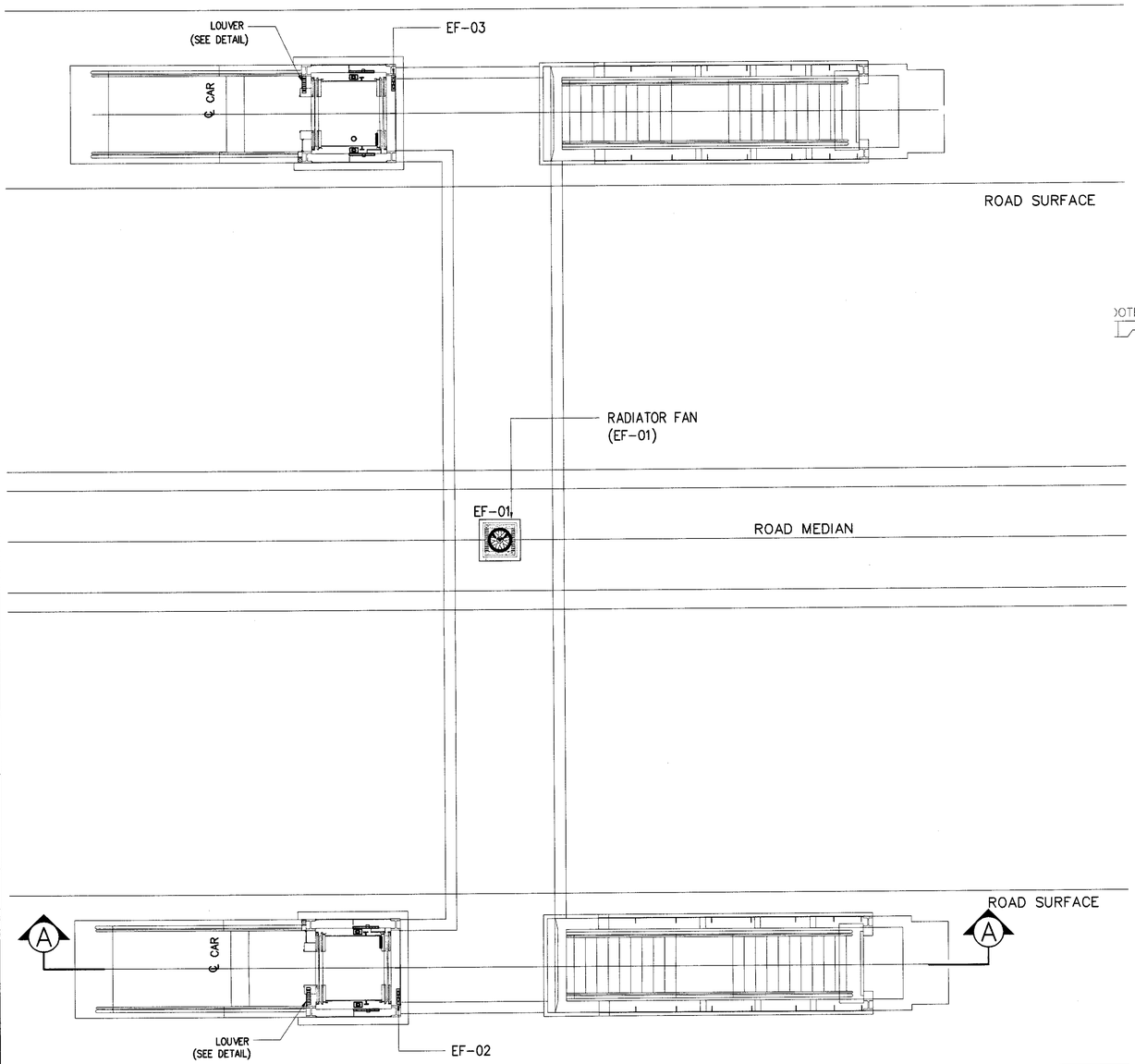
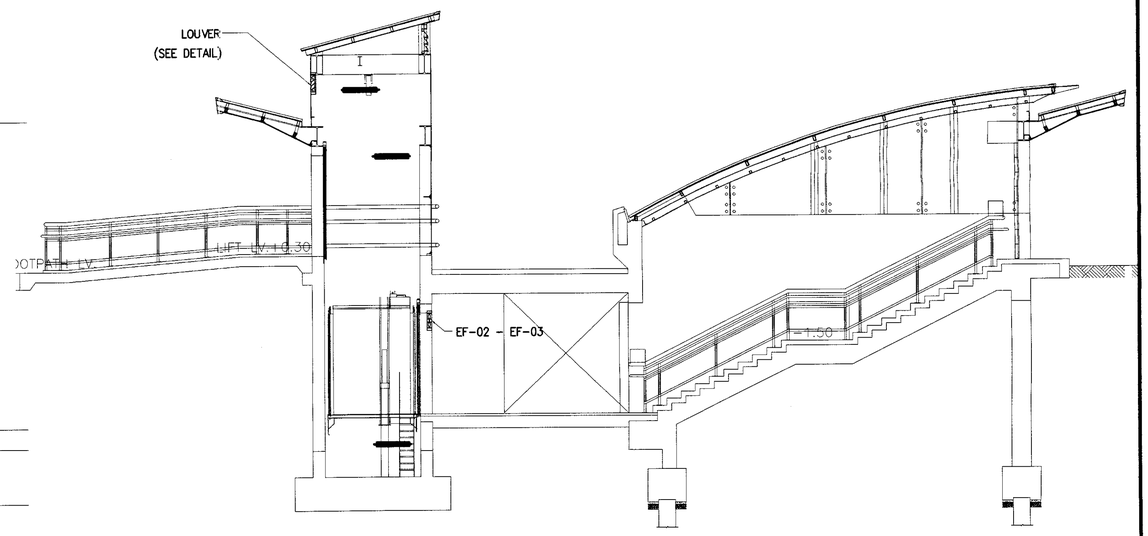


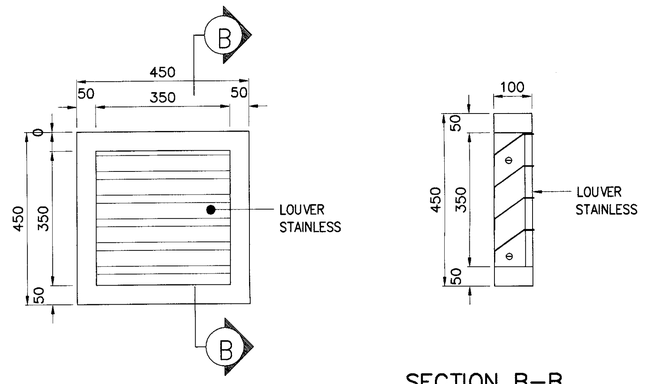
PLAN OF VENTILATION SYSTEM

SCALE 1:75



SECTION A – A

SCALE 1 : 75



PLAN SECTION B–B

LOUVER DETAIL

NOT TO SCALE

NOTE :

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.
2. RADIATOR FAN (EF-01) ARE ,AXIAL FLOW AS FOLLOWING
   - FOR UNDERPASS SIZE 50-60 m.(LONG) SHALL BE CAPACITY 1,017 CFM., DRIVING MOTOR 1 Kw. ,220v./1P/50 Hz.
   - FOR UNDERPASS SIZE 70-80 m.(LONG) SHALL BE CAPACITY 1,356 CFM., DRIVING MOTOR 1.5 Kw. ,220v./1P/50 Hz.
3. EXHAUST FANS (EF-02,EF-03) ARE AXIAL FLOW SHALL BE CAPACITY 750 CFM., DRIVING MOTOR 0.5 Km., 220v./1P/50Hz.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND

MINISTRY OF TRANSPORT

DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS TYPE-2

VENTILATION SYSTEM

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
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APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. MEU-102
		SHEET NO. 215

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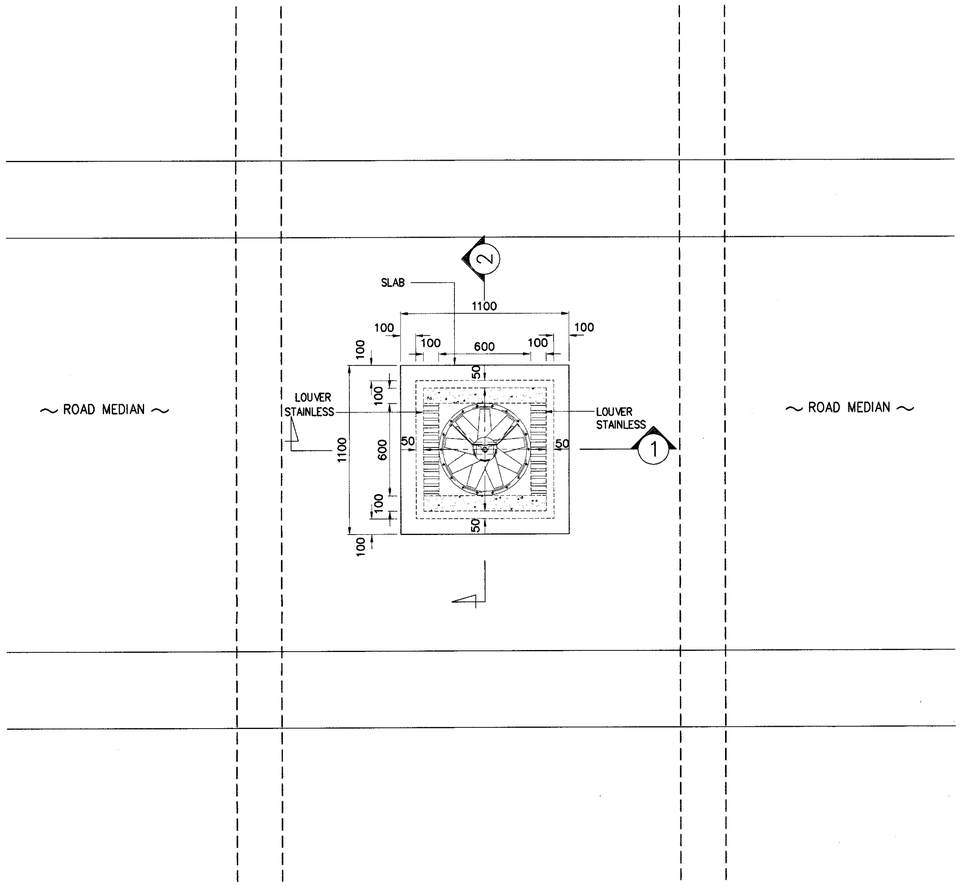


PLAN OF UNDERPASS VENTILATION SYSTEM AT ROAD MEDIAN

SCALE 1:20

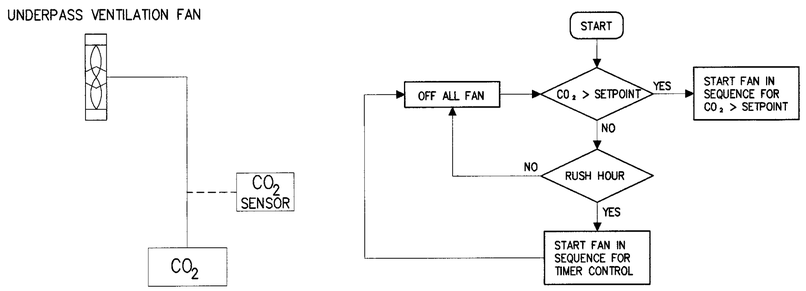
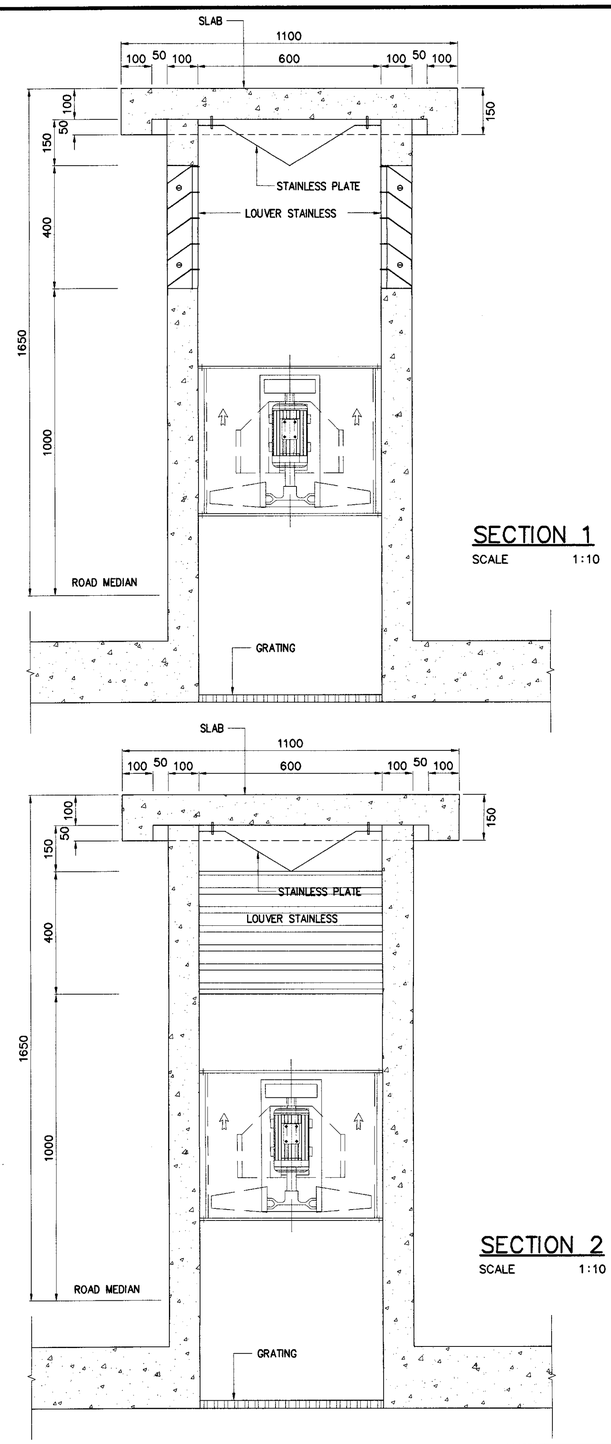


DIAGRAM – UNDERPASS VENTILATION STSTEM



SECTION 1

SCALE 1:10

SECTION 2

SCALE 1:10

NOTE:

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE INDICATED.

REF.	REVISION	SIGNATURE	DATE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT
DEPARTMENT OF HIGHWAYS
STANDARD DRAWING

HANDICAPPED PEDESTRIAN UNDERPASS VENTILATION SYSTEM AT ROAD MEDIAN

DESIGNED : D.O.H. & CONSULTANTS	CHECKED : BUREAU OF LOCATION & DESIGN	DATE : OCT 2015
SUBMITTED : (DIRECTOR OF LOCATION & DESIGN BUREAU)		SCALE : AS SHOWN
APPROVED : (FOR DIRECTOR GENERAL)		DWG NO. MEU-103
		SHEET NO. 216

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