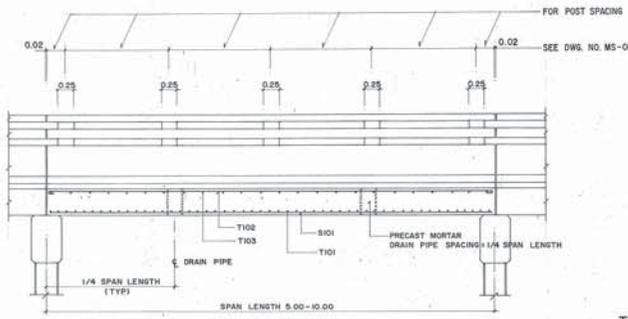


PART 2

LIST OF STANDARD DRAWINGS FOR STRUCTURAL WORK

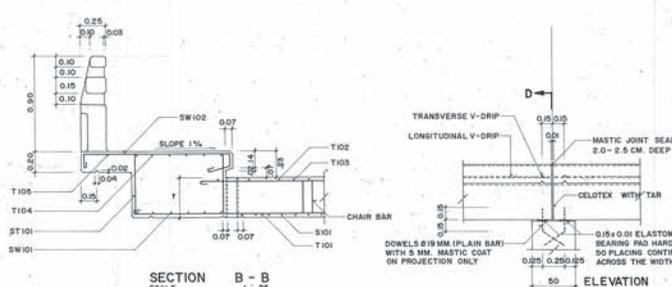
SHEET NO.	TITLE	DRAWING NO.		SHEET NO.	TITLE	DRAWING NO.	
		Original	Revised			Original	Revised
114	RC SLAB BRIDGE, BRIDGE REINF. PLAN, SECTIONS AND DETAILS	3AD5 - 106 - 14/1A	ST - 01	163	POST-TENSIONED BOX GIRDER 20.00 M. SPAN PRESTRESSED CABLE ARRANGEMENT	5BD20 - 5/2	-
115	7.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/4	ST - 02	164	POST-TENSIONED BOX GIRDER 20.00 M. SPAN PLANS, SECTIONS AND DETAILS	5BD20 - 5/3	-
116	7.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/4a	ST - 03	165	PRE-TENSIONED BOX GIRDER 20.00 M. SPAN PLANS, SECTION AND DETAILS SECTIONS AND DETAIL	5BD20 - 5/4	-
117	7.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/5	ST - 04	166	0° - 60° SKEW PC. BOX GIRDER BRIDGE PILE FOOTING PIERS, PILING PLANS	5BD20 - 10 - 614/1	-
118	8.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/6	ST - 05	167	0° - 60° SKEW PC. BOX GIRDER BRIDGE PILE FOOTING PIER DETAILS	5BD20 - 10 - 614/2	-
119	8.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/6a	ST - 06	168	0° - 60° SKEW PC. BOX GIRDER BRIDGE PIER REINFORCING AND SKIRTING DETAILS	5BD20 - 10 - 614/3	-
120	8.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/7	ST - 07	169	0° - 60° SKEW PC. BOX GIRDER BRIDGE SPREAD AND PILE FOOTING PIER DETAILS	5BD20 - 10 - 614/4	-
121	9.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/7a	ST - 08	170	0° - 60° SKEW PC. BOX GIRDER BRIDGE PILE REINFORCING AND SKIRTING DETAILS	5BD20 - 10 - 614/5	-
122	9.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/7b	ST - 09	171	0° - 30° SKEW PC. GIRDER BRIDGE GIRDER ARRANGEMENT AND DETAILS	3BD5 - 106 - 14/1a	PT - 01
123	9.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/7b	ST - 10	172	PRESTRESSED CONCRETE GIRDER Ø 3/8" - 7" WIRE STRAND ARRANGEMENT	3AD5 - 106 - 14/1b	PT - 02
124	10.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/7b	ST - 11	173	0° - 30° SKEW PC. PLANK GIRDER, BRIDGE GIRDER ARRANGEMENT AND DETAILS	3APD5 - 106 - 14/1d	PT - 04
125	10.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/19a	ST - 12	174	PRESTRESSED CONCRETE GIRDER DRAPED TENDON ARRANGEMENT	APC - 1	PT - 05
126	10.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/20	ST - 13	175	6.00 - 10.00 M. SPAN MULTI - BEAM BRIDGE	APC - 2	PT - 06
127	10.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/21	ST - 14	176	6.00 - 10.00 M. SPAN MULTI - BEAM BRIDGE PRESTRESSED CONCRETE GIRDER	3/14	-
128	11.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/21a	ST - 15	177	0.35 x 0.35 M. RC. PILE REINFORCEMENT DETAILS	AP - 3	-
129	11.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/22	ST - 16	178	BRIDGE APPROACH SLAB AND POROUS BACKFILL MATERIALS	52/22	-
130	12.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/8	ST - 17	179	BEARING UNIT AT BRIDGE END ON SOFT CLAY	52/23	-
131	12.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/8a	ST - 18	180	BEARING UNIT AT BRIDGE END ON SOFT CLAY, RIGID PAVEMENT	3AD5 - 106 - 14/26	MS - 01
132	12.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/9	ST - 19	181	RAILING POST AND RAILING DETAILS	3R/1	MS - 02
133	13.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/23	ST - 20	182	0.40 x 0.40 M. RC. PILE, PILE CAPACITY AND REINFORCEMENT DETAILS	3P/1	MS - 03
134	13.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/23a	ST - 21	183	0.40 x 0.40 M. PC. PILE, PILE CAPACITY AND REINFORCEMENT DETAILS	3P/1	MS - 04
135	13.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/24	ST - 22	184	CONCRETE SLOPE PROTECTION	AP - 2	MS - 11
136	14.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/10	ST - 23	185	ABUTMENT PROTECTOR FOR EMBANKMENT < 6.00 M. PLAN, ELEVATION AND SECTIONS	-	BC - 01
137	14.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/10a	ST - 24	186	REGID FRAME RC. BOX CULVERT; PLAN, ELEVATIONS AND SECTIONS	-	BC - 02
138	14.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/11	ST - 25	187	REGID FRAME RC. BOX CULVERT; TABLE OF REINFORCEMENT	-	BC - 03
139	0° - 30° SKEW RC. SLAB BRIDGE, BRIDGE REINF. PLAN, SECTIONS AND DETAILS	3BD5 - 106 - 14/1A	ST - 26	188	RC. SIMPLE SPAN BOX CULVERT; PLAN ELEVATIONS AND SECTIONS	-	BC - 02
140	0° - 30° SKEW RC. SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3BD5 - 106 - 14/2	ST - 27	189	RC. HEADWALL FOR BOX CULVERT; DIMENSION, REINF. AND DETAILS	-	BC - 04
141	0° - 30° SKEW RC. SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3BD5 - 106 - 14/2a	ST - 28	190	PRECAST BOX CULVERT DEPTH OF FILL < 0.60 M. PLAN, ELEVATION AND SECTIONS	7PB/1	BC - 05
142	0° - 30° SKEW RC. SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3BD5 - 106 - 14/3	ST - 29	191	PRECAST BOX CULVERT DEPTH OF FILL < 0.60 M. REINFORCEMENT AND DETAILS	7PB/2	BC - 06
143	0° - 30° SKEW RC. SLAB BRIDGE WALL BRACING PIER DETAILS	3BD5 - 106 - 14/4	ST - 30	192	PRECAST BOX CULVERT DEPTH OF FILL > 0.60 M. PLAN, ELEVATION AND SECTIONS	7PB/3	BC - 07
144	0° - 30° SKEW RC. SLAB BRIDGE WALL BRACING PILE BENT DETAILS	3BD5 - 106 - 14/5	ST - 31	193	PRECAST BOX CULVERT DEPTH OF FILL > 0.60 M. REINFORCEMENT AND DETAILS	7PB/4	BC - 08
145	0° - 30° SKEW RC. SLAB BRIDGE WALL BRACING PIER ON BED ROCK DETAILS	3BD5 - 106 - 14/6	ST - 32	194	RIGID FRAME RC. BOX CULVERT; PLAN, ELEVATION AND SECTION	7B/7	BC - 01A
146	0° - 30° SKEW RC. SLAB BRIDGE SPREAD FOOTING PIER ON BED ROCK DETAILS	3BD5 - 106 - 14/7	ST - 33	195	RIGID FRAME RC. BOX CULVERT; TABLE OF REINFORCEMENT	7B/7a	BC - 02A
147	6.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/2	ST - 34	196	RC. SIMPLE SPAN BOX CULVERT; PLAN, ELEVATION AND SECTION	7B/8	BC - 03A
148	6.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/2a	ST - 35	197	RC. HEADWALL FOR BOX CULVERT; DIMENSION, REINF. AND DETAILS	7B/9	BC - 04A
149	6.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/3	ST - 36	198	CANTILEVER RETAINING WALL 6.00 M. MAX. HIGH DETAILS AND SPECIFICATIONS	ABT267 - 17/8	-
150	13.50 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/27	-	199	ABT267 - 17/9	-	-
151	13.50 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/27a	-	200	PEDESTRIAN BRIDGE OUTSIDE PIER FOR SPAN ≤ 16.00 M. (TYPE I)	PS - 01	-
152	13.50 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/28	-	201	PEDESTRIAN BRIDGE OUTSIDE PIER FOR SPAN ≤ 16.00 M. (TYPE II)	PS - 02	-
153	17.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING PIER DETAILS	3AD5 - 106 - 14/29	-	202	PEDESTRIAN BRIDGE OUTSIDE PIER FOR SPAN 16.01 - 21.00 M. (TYPE I)	PS - 03	-
154	17.00 M. ROADWAY WIDTH SLAB BRIDGE SPREAD FOOTING ABUTMENT DETAILS	3AD5 - 106 - 14/29a	-	203	PEDESTRIAN BRIDGE OUTSIDE PIER FOR SPAN 16.01 - 21.00 M. (TYPE II)	PS - 04	-
155	17.00 M. ROADWAY WIDTH SLAB BRIDGE PILE BENT AND ABUTMENT DETAILS	3AD5 - 106 - 14/30	-	204	PEDESTRIAN BRIDGE OUTSIDE PIER FOR SPAN 21.01 - 25.00 M. (TYPE I)	PS - 05	-
156	12.00 - 24.00 M. SPAN MULTI - BEAM BRIDGE PLAN, SECTIONS AND REINFORCEMENT DETAILS	APB - 1	-	205	PEDESTRIAN BRIDGE OUTSIDE PIER FOR SPAN 21.01 - 25.00 M. (TYPE II)	PS - 06	-
157	12.00 - 24.00 M. SPAN MULTI - BEAM BRIDGE PRESTRESSED CONCRETE GIRDER	APB - 2	-	206	PEDESTRIAN BRIDGE INSIDE PIER FOR SPAN ≤ 16.00 M.	PS - 07	-
158	12.00 - 24.00 M. SPAN MULTI - BEAM BRIDGE PILE BENT AND ABUTMENT DETAILS	APB - 4	-	207	PEDESTRIAN BRIDGE INSIDE PIER FOR SPAN 16.01 - 21.00 M.	PS - 08	-
159	14.00 - 24.00 M. SPAN MULTI - BEAM BRIDGE 12.00 M. ROADWAY & CURB	APB - 7	-	208	PEDESTRIAN BRIDGE INSIDE PIER FOR SPAN 21.01 - 25.00 M.	PS - 09	-
160	PILE BENT AND SPREAD FOOTING WITH WALL BRACING, MAXIMUM HEIGHT 12.00 M.	APB - 8	-	209	PEDESTRIAN BRIDGE STAIR DETAILS TYPE I	PS - 10	-
	PRESTRESSED MULTI - BEAM CONCRETE BRIDGE FOR 8.00, 10.00, 12.00 AND 15.00 M.	APB - 7	-	210	PEDESTRIAN BRIDGE STAIR DETAILS TYPE II	PS - 11	-
	ROADWAY WIDTH 18.00 - 24.00 M. SPAN PILE FOOTING SHAPE AND REINFORCEMENT.	-	-	211	PRESTRESSED BRIDGE CONSTRUCTION SPECIFICATION AND MISCELLANEOUS DETAILS	PS - 12	-
161	PILE BENT AND SPREAD FOOTING WITH WALL BRACING, MAXIMUM HEIGHT 12.00 M.	APB - 9	-	212	PRESTRESSED CONCRETE GIRDER FOR SPAN 21.01 - 25.00 M. (PC 8801)	PS - 13	-
	PRESTRESSED MULTI - BEAM CONCRETE BRIDGE FOR 8.00, 10.00, 12.00 AND 15.00 M.	-	-	213	PRESTRESSED CONCRETE GIRDER FOR SPAN 16.01 - 21.00 M. (PC 8801)	PS - 14	-
	ROADWAY WIDTH 18.00 - 24.00 M. SPAN TABLE OF REINFORCEMENT AND CONSTRUCTION DETAILS	-	-	214	REINFORCED CONCRETE GIRDER FOR SPAN 14.00 M. (PC 8803)	PS - 15	-
162	0° - 60° SKEW PC. BOX GIRDER BRIDGE 20.00 M. SPAN BRIDGE DECK PLAN, SECTIONS AND DETAILS	5BD20S - 0° - 507/1A	-	215	REINFORCED CONCRETE GIRDER FOR SPAN ≤ 15.00 M. (RC 920/1)	PS - 16	-



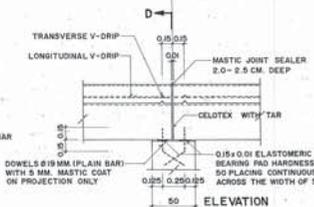
SECTION A - A
SCALE 1 : 40



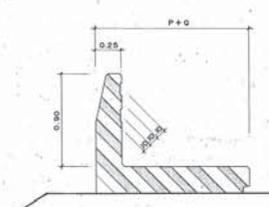
TYPICAL WATER DRIP DETAIL



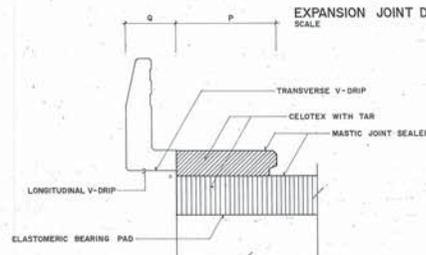
SECTION B - B
SCALE 1 : 25



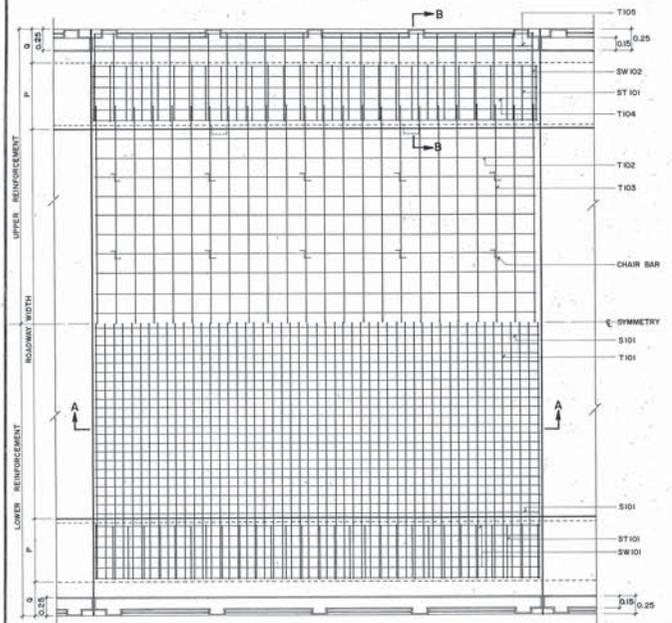
EXPANSION JOINT DETAILS
SCALE 1 : 25



PAINTING AT BRIDGE END
SCALE 1 : 25



SECTION D - D
SCALE 1 : 25



REINFORCEMENT PLAN
SCALE 1 : 40

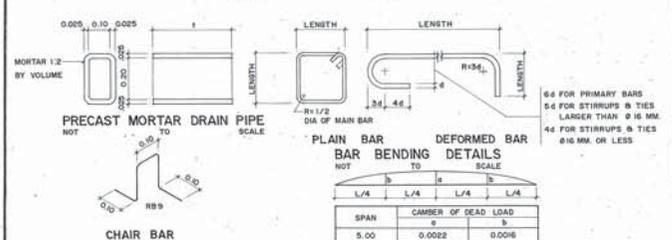


TABLE OF SLAB THICKNESS

SPAN	5.00	6.00	7.00	8.00	9.00	10.00
SLAB THICKNESS, I	0.32	0.36	0.39	0.43	0.47	0.53

TABLE OF CHAMBER OF DEAD LOAD

SPAN	5.00	6.00	7.00	8.00	9.00	10.00
CHAMBER OF DEAD LOAD	0.0022	0.0022	0.0022	0.0022	0.0022	0.0022

TABLE OF SLAB REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		#	NO. L	#	NO. L								
VARIES	S101	8	0.08	4.95	8	0.08	4.95	8	0.08	4.95	8	0.08	4.95
VARIES	ST101	3	0.25	42	-	3	0.25	50	-	3	0.25	58	-
VARIES	SW102	4	0.20	51	-	4	0.20	63	-	4	0.20	72	-
VARIES	T101	4	0.15	34	-	4	0.15	41	-	4	0.14	51	-
VARIES	T102	3	0.30	-	5.10	3	0.30	-	6.10	3	0.30	-	7.10
VARIES	T103	3	0.30	17	-	3	0.30	21	-	3	0.30	27	-

#3 = ϕ 3/8" OR 9 MM. #4 = ϕ 1/2" OR 12 MM. #5 = ϕ 1" OR 25 MM.

TABLE OF SIDEWALK AND EDGE BEAM REINFORCEMENT

WIDTH OF SIDE WALK	P	Q	R	BAR MARK	BAR BENDING DIAGRAMS	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.							
						#	NO. L	#	NO. L														
0.50	0.50	-	0.50	SW 101	VARIES	8	6	4.95	8	6	5.95	8	6	6.95	8	8	7.95	8	10	8.95	8	12	9.95
0.50	0.50	-	0.50	T 105	VARIES	4	6	4.95	4	6	5.95	4	6	6.95	4	6	7.95	4	10	8.95	4	12	9.95
1.00	0.50	0.50	0.50	SW 101	VARIES	8	6	4.95	8	6	5.95	8	6	6.95	8	8	7.95	8	10	8.95	8	12	9.95
1.00	0.50	0.50	0.50	T 105	VARIES	4	6	4.95	4	6	5.95	4	6	6.95	4	6	7.95	4	10	8.95	4	12	9.95
1.50	1.00	0.50	1.00	SW 101	VARIES	8	6	4.95	8	6	5.95	8	6	6.95	8	8	7.95	8	10	8.95	8	12	9.95
1.50	1.00	0.50	1.00	T 105	VARIES	4	6	4.95	4	6	5.95	4	6	6.95	4	6	7.95	4	10	8.95	4	12	9.95

#4 = ϕ 1/2" OR 12 MM. #5 = ϕ 1" OR 25 MM.

- NOTES:
- DESIGN STRESSES:
 - CONCRETE: $f_c = 70$ KSC.
 - STEEL: $f_s = 1,400$ KSC. FOR DEFORMED BARS
 $f_s = 1,200$ KSC. FOR PLAIN ROUND BARS.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 kg/m^3 AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 30 N/cm^2 FOR A $15 \times 15 \times 15 \text{ CM}$ CUBE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN FOR CUBIC METER IS AS FOLLOWS:
 - PORTLAND CEMENT: 350 KG
 - SAND: 0.43 m^3
 - CRUSHED ROCK OR GRAVEL: 0.86 m^3
 - CONCRETE SLUMP: MAX. 10 CM.
 - CLEAR CONCRETE COVER FOR TOP REINFORCEMENT IN SLAB BRIDGE SHALL BE 3.5 CM. ELSEWHERE OF SLAB BRIDGE AND SIDEWALK POSTS AND RAILINGS SHALL BE 2.5 CM.
 - ALL CONCRETE EXPOSED CORNERS SHALL HAVE A 2 CM CHAMFER UNLESS OTHERWISE INDICATED.
 - REBARS $\times 4$ OR LARGER SHALL BE TIS 24 GRADE S10 DEFORMED BARS. OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BAR.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TIS 5 SHALL BE USED AND WITH THE EXCEPTION OF COLUMNS AND BRACING, ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
 - PAINTING SHALL BE PROVIDED ON ALL SURFACES AT BRIDGE ENDS WHICH ARE EXPOSED TO TRAFFIC. WHITE AND BLACK COLOURS SHALL BE PAINTED ALTERNATELY, WHITE COLOUR SHALL BE LIGHT REFLECTED TYPE.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - BAR MARK S 101 MAY BE TAKEN OUT ONE BAR ON EACH SIDE OF THE BRIDGE WHEREVER THEY PASS THROUGH DRAIN PIPES. IF THE LOCATION OF THESE BARS ARE NEAR V-DRIP SUCH THAT CONCRETE COVER IS NOT ADEQUATE, THEY SHALL BE PLACED ON TOP OF ST 101, OTHER BARS WHICH PASS THROUGH DRAIN PIPES SHALL BE BENT ALONG THE PIPES.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3425-106/10/A.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 R.C. SLAB BRIDGE

BRIDGE REINF. PLAN SECTIONS AND DETAILS

DESIGNED: DOH & CONSULTANTS CHECKED: *[Signature]* DATE: JULY 1994

SUBMITTED: *[Signature]* SCALE: AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION)

APPROVED: *[Signature]* DWG. NO. ST-01
 (DIRECTOR GENERAL)

SHEET NO. 114

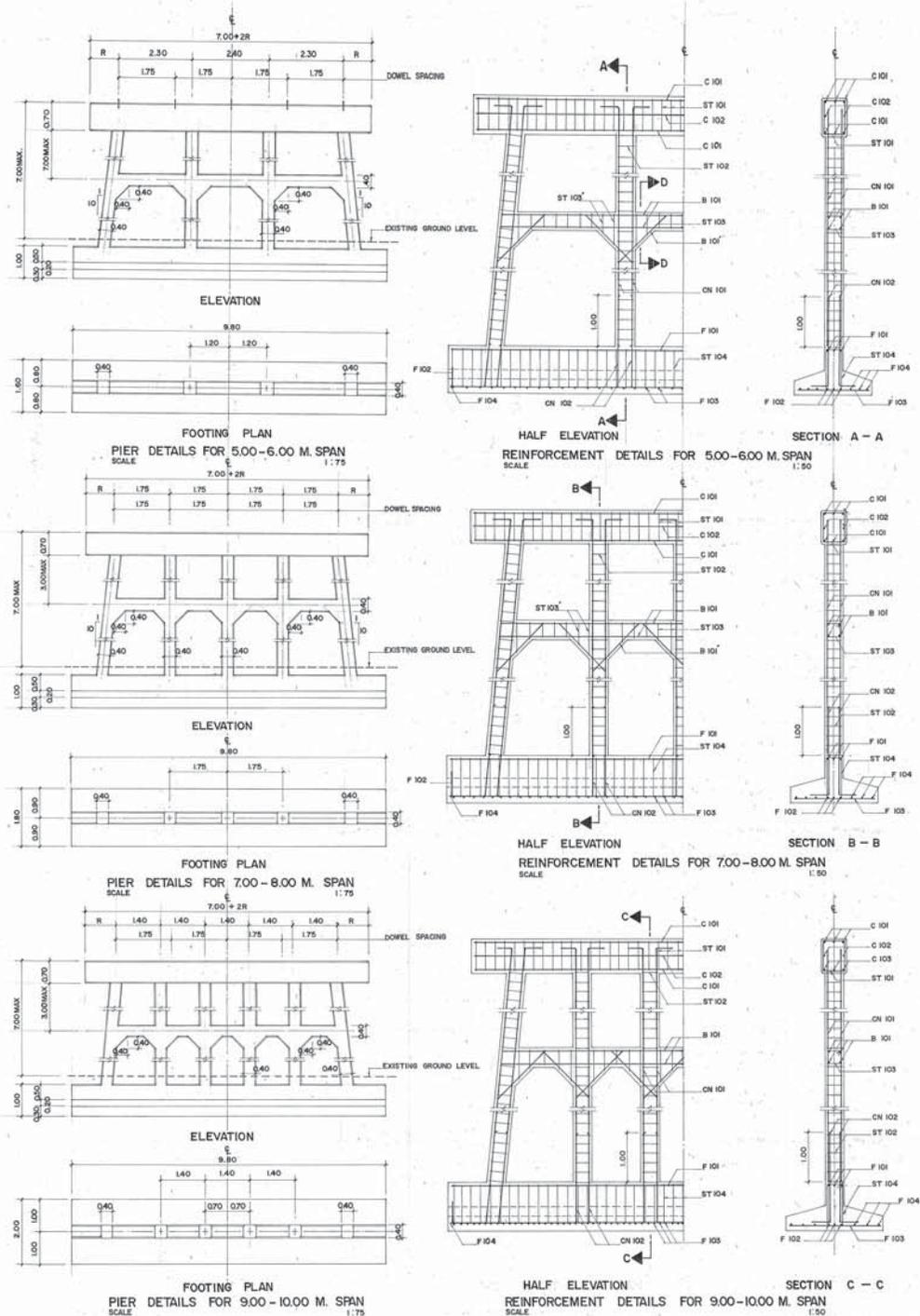
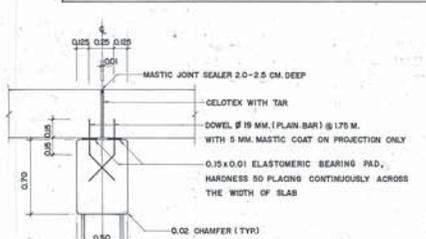


TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00M.		SPAN 6.00M.		SPAN 7.00M.		SPAN 8.00M.		SPAN 9.00M.		SPAN 10.00 M.	
		#	Q	#	Q	#	Q	#	Q	#	Q	#	Q
VARIES	C 101	8	6	8	6	8	6	8	6	8	6	8	6
VARIES	C 102	4	2	4	2	4	2	4	2	4	2	4	2
VARIES	CN 101	8	16	8	16	8	20	8	20	8	24	8	24
VARIES	CN 102	8	16	8	16	8	20	8	20	8	24	8	24
VARIES	ST 101	3	20	3	20	3	20	3	20	3	20	3	20
VARIES	ST 102	3	20	3	20	3	20	3	20	3	20	3	20
VARIES	ST 103	3	25	3	25	3	25	3	25	3	25	3	25
VARIES	ST 104	3	25	3	25	3	25	3	25	3	25	3	25
VARIES	B 101	8	8	8	8	8	8	8	8	8	8	8	8
VARIES	B 102	6	24	6	24	6	32	6	32	6	40	6	40
VARIES	F 101	8	3	8	3	8	3	8	3	8	3	8	3
VARIES	F 102	8	3	8	3	8	3	8	3	8	3	8	3
VARIES	F 103	4	25	4	25	4	25	4	25	4	25	4	25
VARIES	F 104	4	6	4	6	4	6	4	6	4	6	4	6

= 3 x 3/8" OR 9 MM, #4 = 1/2" OR 12 MM, #6 = 3/4" OR 20 MM, #8 = 1" OR 25 MM, NO = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR.



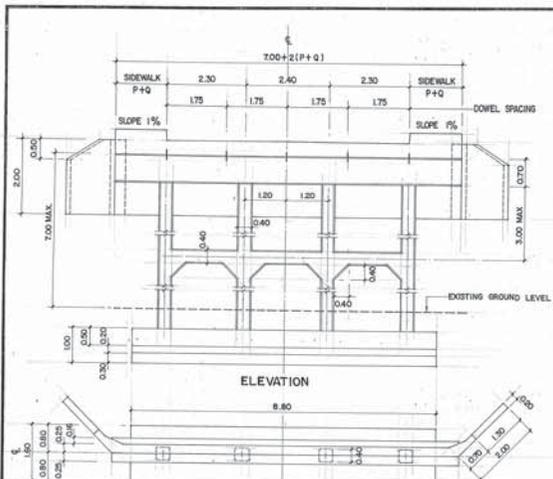
- NOTES:**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM. THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM. WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:1.5:1 BY VOLUME.
 - SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEED 3.0 M., A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M., AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEED 3.0 M., ADDITIONAL BRACING SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM, WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 Kg/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 Kg/CM² FOR A 28 DAYS CURE. CEMENT SHALL BE TIS TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	Kg
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.95	M ³
CONCRETE SLUMP MIX	10	CM.
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE 80 30 DEFORMED BARS OTHERS SHALL BE TIS 20 GRADE 80 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATION OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETER OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATION OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING CANAL BED TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIER HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TYPICAL PIER HEIGHT OF 12.0 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPED FROM DDH DWG. NO. 3AD5-106-14/23.

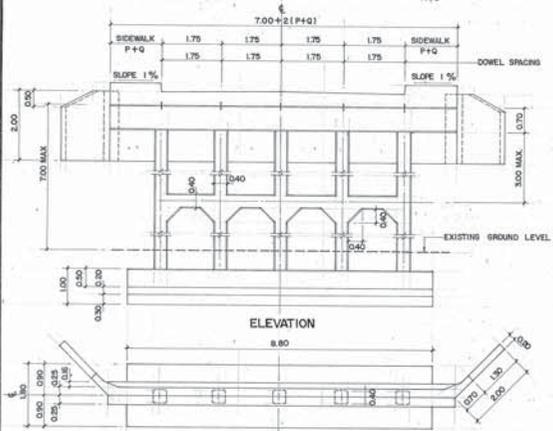
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 7.00 M. ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING PIER DETAILS

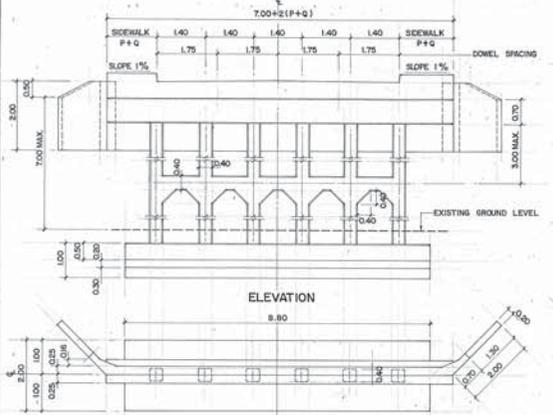
DESIGNED: DDH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i> <small>(DIRECTOR OF LOCATION & DESIGN DIVISION)</small>		SCALE: AS SHOWN
APPROVED: <i>[Signature]</i> <small>MVPA (DIRECTOR GENERAL)</small>		DWG. NO. ST-02 SHEET NO. 115



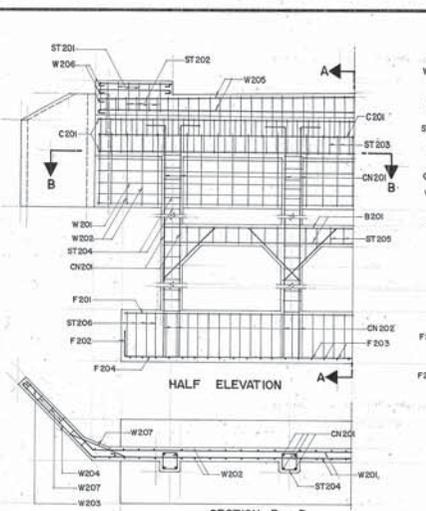
FOOTING PLAN
ABUTMENT DETAILS FOR 5.00-6.00 M SPAN
SCALE 1:75



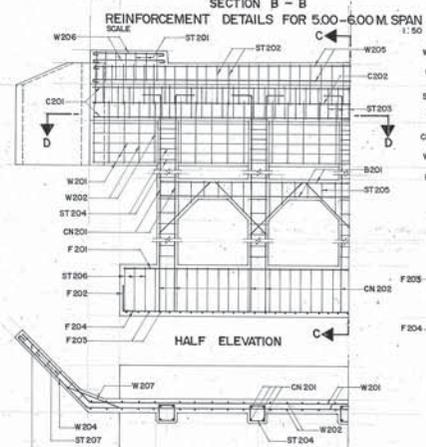
FOOTING PLAN
ABUTMENT DETAILS FOR 7.00-8.00 M SPAN
SCALE 1:75



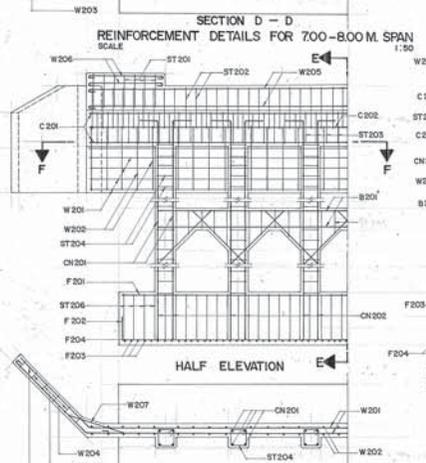
FOOTING PLAN
ABUTMENT DETAILS FOR 9.00-10.00 M SPAN
SCALE 1:75



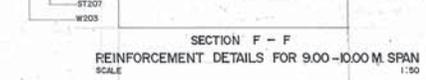
SECTION A - A
SCALE 1:50



SECTION B - B
REINFORCEMENT DETAILS FOR 5.00-6.00 M SPAN
SCALE 1:50



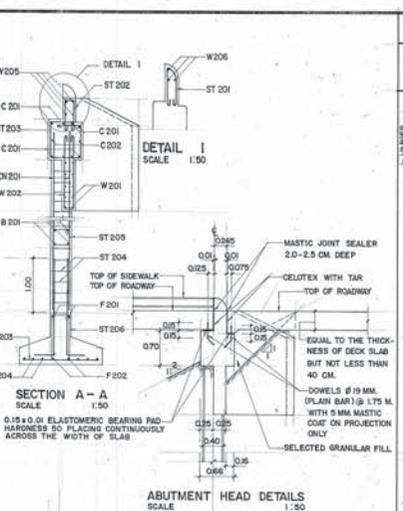
SECTION C - C
SCALE 1:50



SECTION D - D
REINFORCEMENT DETAILS FOR 7.00-8.00 M SPAN
SCALE 1:50



SECTION E - E
SCALE 1:50



DETAIL 1
SCALE 1:50

DETAIL 2
SCALE 1:50

DETAIL 3
SCALE 1:50

DETAIL 4
SCALE 1:50

DETAIL 5
SCALE 1:50

DETAIL 6
SCALE 1:50

DETAIL 7
SCALE 1:50

DETAIL 8
SCALE 1:50

DETAIL 9
SCALE 1:50

DETAIL 10
SCALE 1:50

DETAIL 11
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DETAIL 12
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DETAIL 13
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DETAIL 14
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DETAIL 15
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DETAIL 18
SCALE 1:50

DETAIL 19
SCALE 1:50

DETAIL 20
SCALE 1:50

DETAIL 21
SCALE 1:50

DETAIL 22
SCALE 1:50

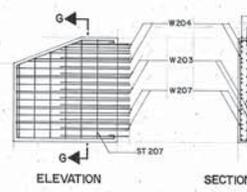
TABLE OF REINFORCEMENT																		
BAR MARK	SPAN 5.00 M.			SPAN 6.00 M.			SPAN 7.00 M.			SPAN 8.00 M.			SPAN 9.00 M.			SPAN 10.00 M.		
	#	NO.	L.	#	NO.	L.	#	NO.	L.	#	NO.	L.	#	NO.	L.	#	NO.	L.
C201	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2
ST201	2	1.215	2	1.295	2	1.355	2	1.435	2	1.515	2	1.595	2	1.675	2	1.755	2	1.835
ST202	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20
ST203	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20
ST204	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20
ST205	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20
ST206	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20	3	2.20
ST207	2	3.0	2	3.0	2	3.0	2	3.0	2	3.0	2	3.0	2	3.0	2	3.0	2	3.0
B201	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
B201'	6	24	1.55	6	24	1.55	6	24	1.55	6	24	1.55	6	24	1.55	6	24	1.55
CN201	8	16	9.25	8	16	9.25	8	16	9.25	8	16	9.25	8	16	9.25	8	16	9.25
CN202	8	16	2.31	8	16	2.31	8	16	2.31	8	16	2.31	8	16	2.31	8	16	2.31
F201	8	2	8.70	8	2	8.70	8	2	8.70	8	2	8.70	8	2	8.70	8	2	8.70
F202	8	2	9.90	8	2	9.90	8	2	9.90	8	2	9.90	8	2	9.90	8	2	9.90
F203	4	25	35	4	25	35	4	25	35	4	25	35	4	25	35	4	25	35
F204	4	6	8.70	4	6	8.70	4	6	8.70	4	6	8.70	4	6	8.70	4	6	8.70
W201	4	20	10	4	20	10	4	20	10	4	20	10	4	20	10	4	20	10
W202	8	30	2.70	8	30	2.70	8	30	2.70	8	30	2.70	8	30	2.70	8	30	2.70
W203	4	15	24	4	15	24	4	15	24	4	15	24	4	15	24	4	15	24
W204	2	30	12	2	30	12	2	30	12	2	30	12	2	30	12	2	30	12
W205	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
W206	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6
W207	4	15	26	4	15	26	4	15	26	4	15	26	4	15	26	4	15	26
W208	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435
W209	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535

2 = 1/4" OR 6 MM, # 3 = 3/8" OR 9 MM, # 4 = 1/2" OR 12 MM, # 6 = 1" OR 25 MM, NO = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR

NOTES:

- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT IT'S CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 VOLUME.
- SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
- HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, ABUTMENT WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 KG/CM² FOR A 15:15:10 MIX CURE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOW:

PORTLAND CEMENT	350	KG.
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP MAX.	10	CM
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE 50-30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
- THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.0 M.
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- THIS DRAWING IS ADAPTED FROM DDH. DWS. NO. 3.045-106-14/4.



WINGWALL REINFORCEMENT DETAILS
SCALE 1:50



PLAIN BAR
SCALE 1:50



DEFORMED BAR
BAR BENDING DETAILS
NOT TO SCALE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
7.00 M. ROADWAY WIDTH SLAB BRIDGE
SPREAD FOOTING ABUTMENT DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE JULY 1994
SUBMITTED: <i>[Signature]</i>	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED: <i>[Signature]</i>	(DIRECTOR GENERAL)	DWG. NO. ST-03
		SHEET NO. 116

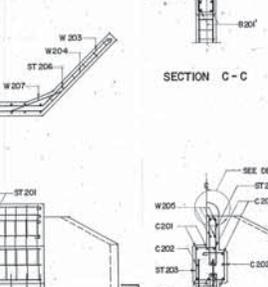
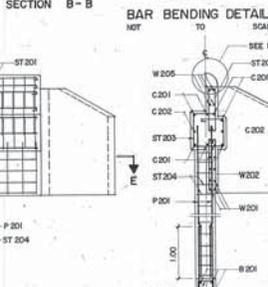
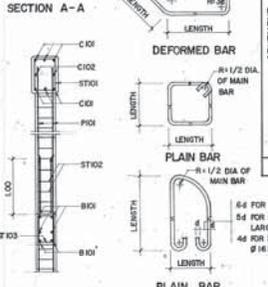
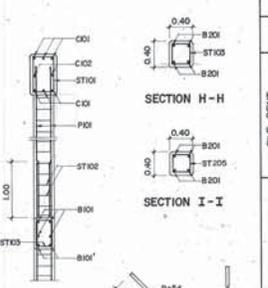
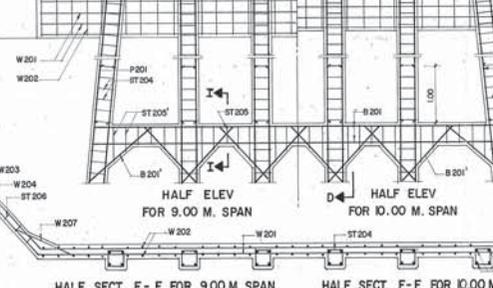
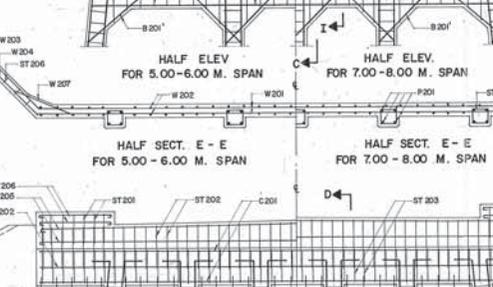
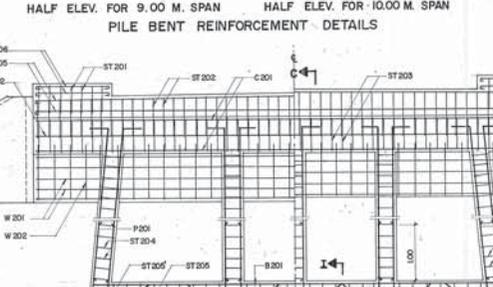
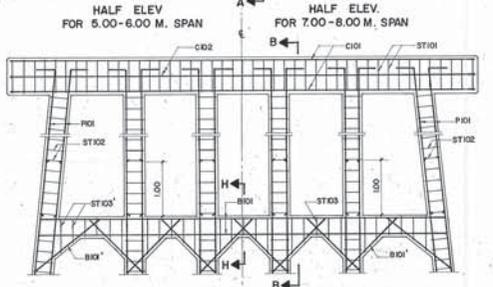
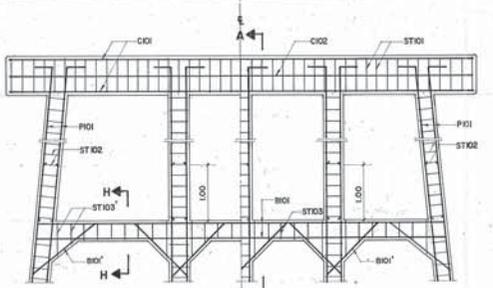
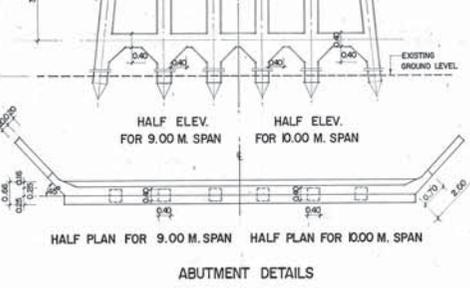
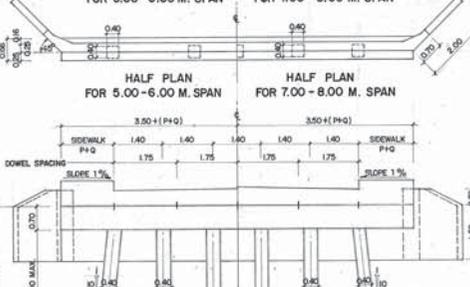
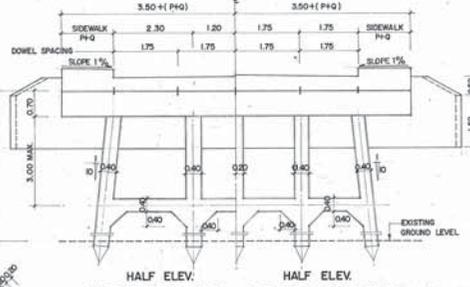
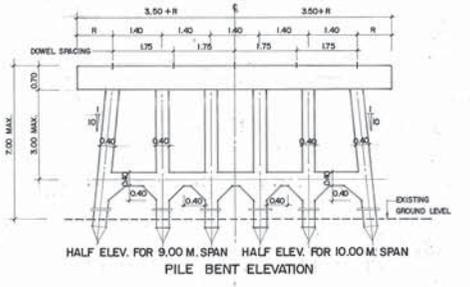
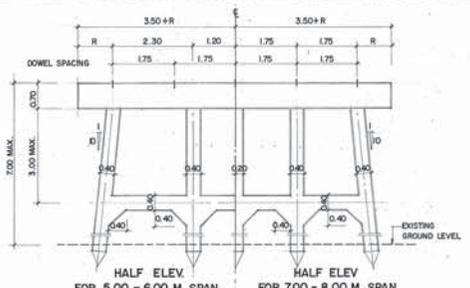
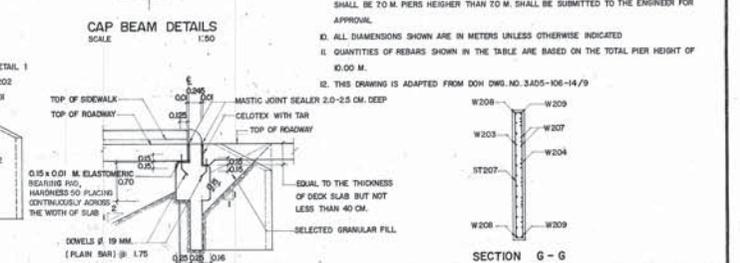
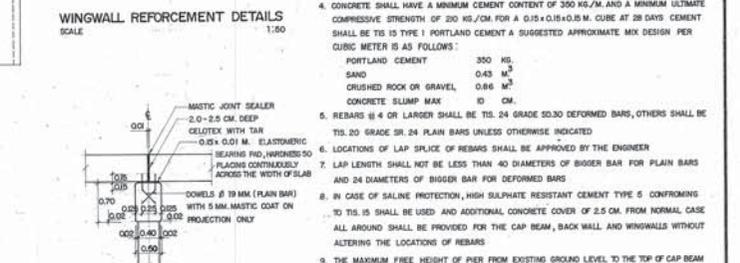


TABLE OF REINFORCEMENT													
BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		#	Ø	#	Ø	#	Ø	#	Ø	#	Ø	#	Ø
VARIES	C101	8	Ø 16	8	Ø 16								
VARIES	C102	4	Ø 16	4	Ø 16								
VARIES	ST101	3	Ø 20	2,35	Ø 20								
VARIES	ST102	3	Ø 20	56	Ø 16	1,35	Ø 20	56	Ø 16	1,35	Ø 20	56	Ø 16
VARIES	ST103	3	Ø 25	15	Ø 16	3	Ø 25	15	Ø 16	3	Ø 25	15	Ø 16
VARIES	ST103'	3	Ø 25	12	Ø 16	3	Ø 25	12	Ø 16	3	Ø 25	12	Ø 16
VARIES	B101	8	Ø 16	4	Ø 16								
VARIES	B101'	8	Ø 16	4	Ø 16								
VARIES	P101	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16
VARIES	P101'	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16
VARIES	C202	4	Ø 16	2	Ø 16								
VARIES	ST201	2	Ø 30	1,25	Ø 20	1,25	Ø 20						
VARIES	ST202	3	Ø 30	1,745	Ø 20	1,795	Ø 20	1,745	Ø 20	1,795	Ø 20	1,745	Ø 20
VARIES	ST203	3	Ø 30	2	Ø 20	2	Ø 20						
VARIES	ST204	3	Ø 20	56	Ø 16	1,35	Ø 20	56	Ø 16	1,35	Ø 20	56	Ø 16
VARIES	ST205	3	Ø 25	15	Ø 16	3	Ø 25	15	Ø 16	3	Ø 25	15	Ø 16
VARIES	ST205'	3	Ø 25	12	Ø 16	3	Ø 25	12	Ø 16	3	Ø 25	12	Ø 16
VARIES	ST206	2	Ø 30	12	Ø 20	12	Ø 20						
VARIES	B201	8	Ø 16	4	Ø 16								
VARIES	B201'	8	Ø 16	4	Ø 16								
VARIES	P201	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16
VARIES	P201'	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16	8	Ø 16	3,75	Ø 16
VARIES	W201	4	Ø 20	10	Ø 16	4	Ø 20	10	Ø 16	4	Ø 20	10	Ø 16
VARIES	W202	2	Ø 30	270	Ø 20	2,60	Ø 20	2,60	Ø 20	2,90	Ø 20	2,40	Ø 20
VARIES	W203	4	Ø 15	24	Ø 16	4	Ø 15	24	Ø 16	4	Ø 15	24	Ø 16
VARIES	W204	2	Ø 30	12	Ø 20	12	Ø 20						
VARIES	W205	2	Ø 16	2	Ø 16								
VARIES	W206	2	Ø 16	2	Ø 16								
VARIES	W207	4	Ø 15	26	Ø 16	4	Ø 15	26	Ø 16	4	Ø 15	26	Ø 16
VARIES	W208	4	Ø 16	2	Ø 16								
VARIES	W209	2	Ø 16	2	Ø 16								

NOTE:

- EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 90 TONS FOR PILE DETAILS SEE DWG. NO. MS-02, MS-03
- HORIZONTAL CROSS BRACING BETWEEN COLLUMS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - a) IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M., A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M., AND
 - b) IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M., ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 200 KG/CM² FOR A 0.15x0.15x0.15 M. CUBE AT 28 DAYS CEMENT SHALL BE TYPE I PORTLAND CEMENT A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

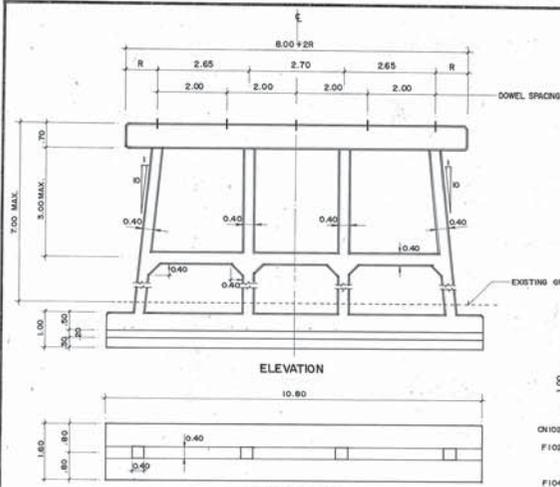
PORTLAND CEMENT	350 KG
SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.94 M ³
CONCRETE SLUMP	MAX 10 CM
- REBARs (Ø 4 OR LARGER) SHALL BE TIS 24 GRADE S0.30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED
- LOCATIONS OF LAP SPICE OF REBARs SHALL BE APPROVED BY THE ENGINEER
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARs
- THE MAXIMUM FRIE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
- QUANTITIES OF REBARs SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00 M.
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3405-106-14/9



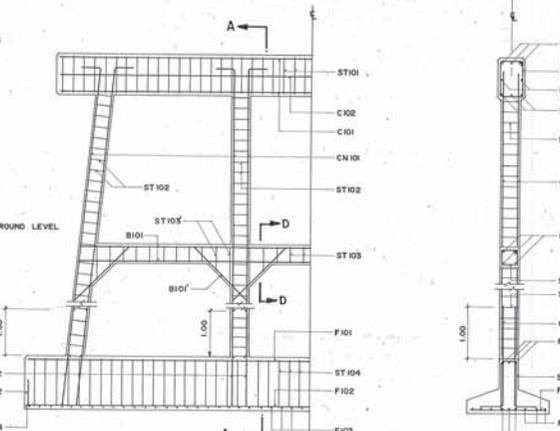
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 7.00M. ROADWAY WIDTH SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

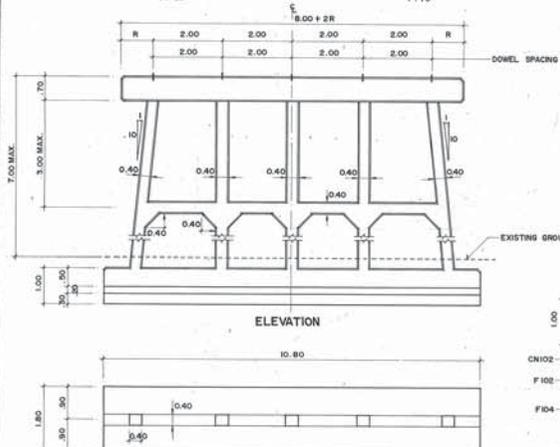
DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE JULY 1994
SUBMITTED:	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED: <i>[Signature]</i> DIRECTOR GENERAL		DWG. NO. ST-04 SHEET NO. 117



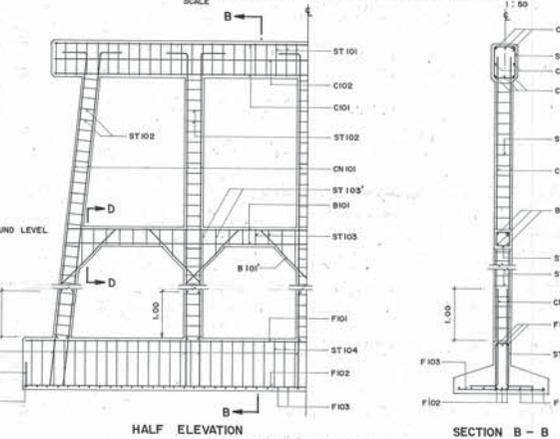
FOOTING PLAN
PIER DETAILS FOR 5.00-6.00M SPAN
SCALE 1:75



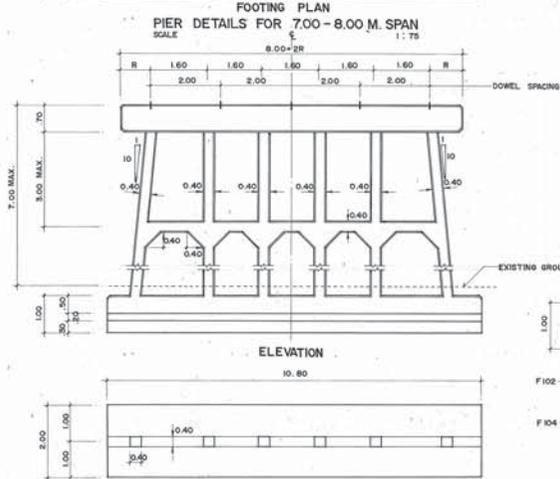
HALF ELEVATION
REINFORCEMENT DETAILS FOR 5.00-6.00M SPAN
SCALE 1:50



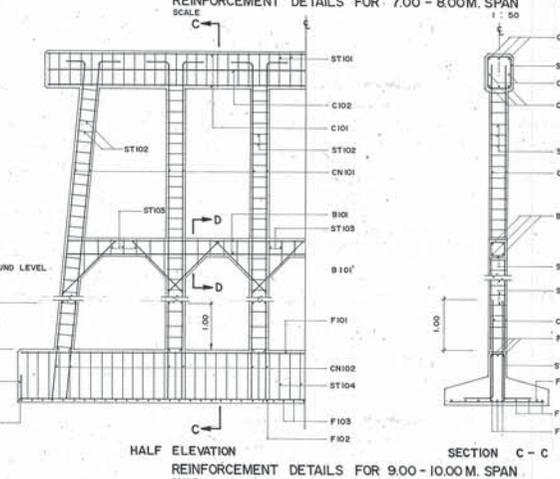
FOOTING PLAN
PIER DETAILS FOR 7.00-8.00M SPAN
SCALE 1:75



HALF ELEVATION
REINFORCEMENT DETAILS FOR 7.00-8.00M SPAN
SCALE 1:50



FOOTING PLAN
PIER DETAILS FOR 9.00-10.00M SPAN
SCALE 1:75

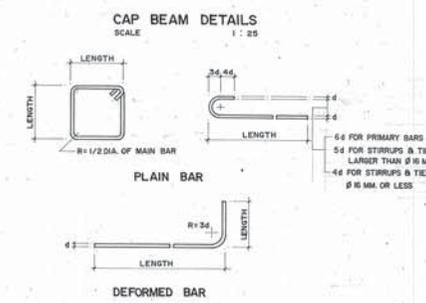
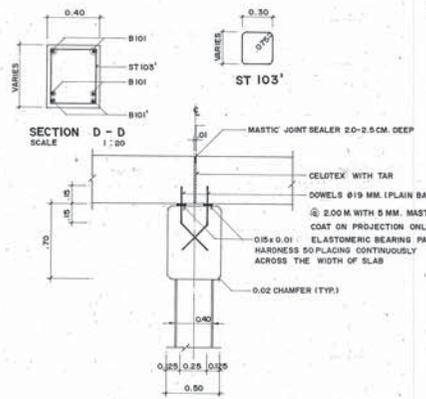


HALF ELEVATION
REINFORCEMENT DETAILS FOR 9.00-10.00M SPAN
SCALE 1:50

TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	NO.	BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
			#	NO.	#	NO.	#	NO.	#	NO.	#	NO.	#	NO.
VARIES (1)	1	C101	8	6	8	6	8	6	8	6	8	6	8	6
VARIES (2)	2	C102	4	2	4	2	4	2	4	2	4	2	4	2
VARIES (3)	3	CN101	8	16	11.25	8	16	11.25	8	16	11.25	8	16	11.25
VARIES (4)	4	CN102	8	16	2.31	8	16	2.31	8	16	2.31	8	16	2.31
VARIES (5)	5	ST101	3	20	2.35	3	20	2.35	3	20	2.35	3	20	2.35
VARIES (6)	6	ST102	3	20	192	1.35	3	20	192	1.35	3	20	192	1.35
VARIES (7)	7	ST103	3	25	42	1.35	3	25	42	1.35	3	25	42	1.35
VARIES (8)	8	ST104	3	25	24	1.35	3	25	24	1.35	3	25	24	1.35
VARIES (9)	9	ST103'	3	20	54	2.55	3	20	54	2.55	3	20	54	2.55
VARIES (10)	10	B101	8	8	8	8	8	8	8	8	8	8	8	8
VARIES (11)	11	B101'	8	24	1.55	8	24	1.55	8	24	1.55	8	24	1.55
VARIES (12)	12	F101	6	3	10.70	8	3	10.70	8	3	10.70	8	3	10.70
VARIES (13)	13	F102	8	3	11.90	8	3	11.90	8	3	11.90	8	3	11.90
VARIES (14)	14	F103	4	25	43	1.50	4	25	43	1.50	4	25	43	1.50
VARIES (15)	15	F104	4	6	10.70	4	6	10.70	4	6	10.70	4	6	10.70

= TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR



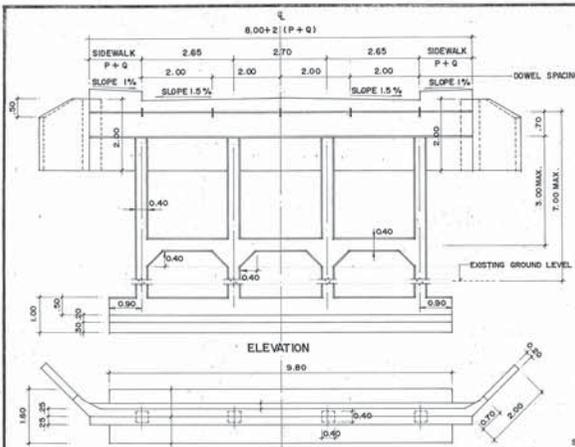
- NOTES:
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/MT².
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M.
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM, EXCEPT THE CAP BEAM AT WHICH CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.0 M.
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE SD 30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATION OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIERS FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 300 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 15 x 25 x 15 M CUBE AT 28 DAYS. CEMENT SHALL BE TIS IS TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	KG
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP MAX.	10	CM
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3AD5-106-14/6.

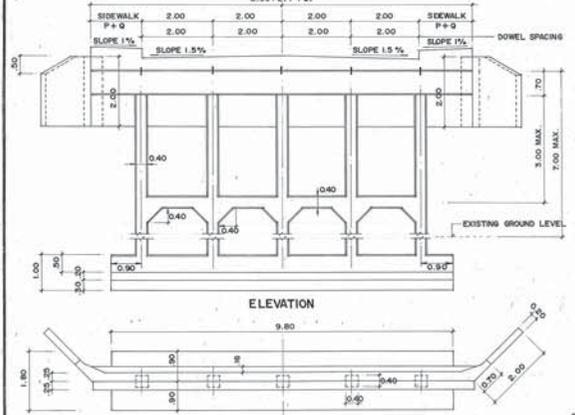
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 8.00M. ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING PIER DETAILS

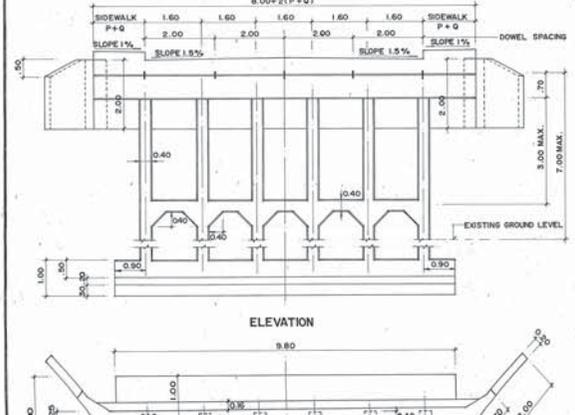
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 SUBMITTED: *[Signature]* SCALE: AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 APPROVED: *[Signature]* DWG. NO. ST-05
 (DIRECTOR GENERAL) SHEET NO. 1/8



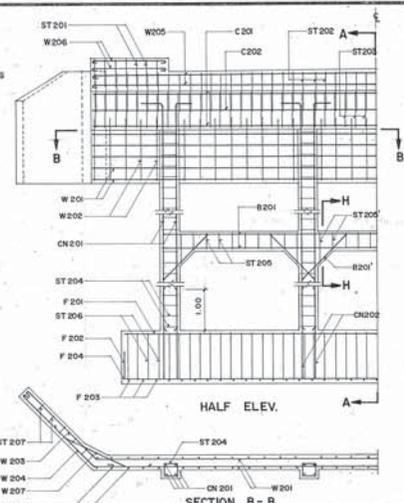
PLAN DETAILS FOR 5.00 - 6.00 M. SPAN
SCALE 1:75



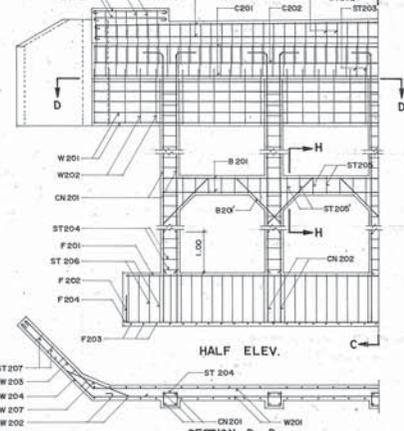
PLAN DETAILS FOR 7.00 - 8.00 M. SPAN
SCALE 1:75



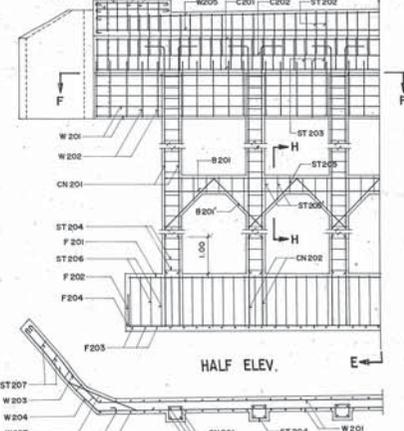
PLAN DETAILS FOR 9.00 - 10.00 M. SPAN
SCALE 1:75



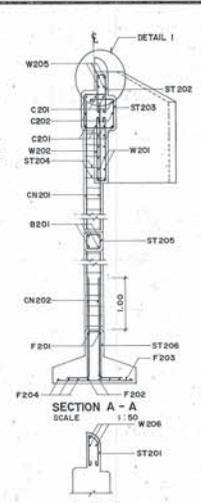
REINFORCEMENT DETAILS FOR 5.00 - 6.00 M. SPAN
SCALE 1:50



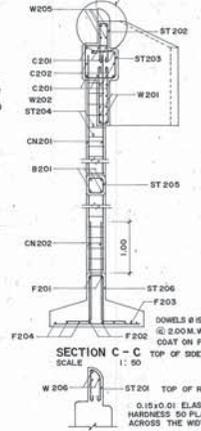
REINFORCEMENT DETAILS FOR 7.00 - 8.00 M. SPAN
SCALE 1:50



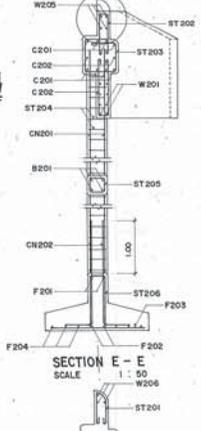
REINFORCEMENT DETAILS FOR 9.00 - 10.00 M. SPAN
SCALE 1:50



SECTION A - A SCALE 1:50



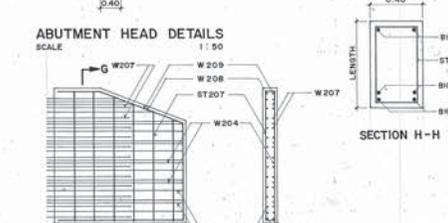
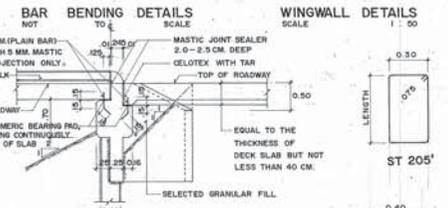
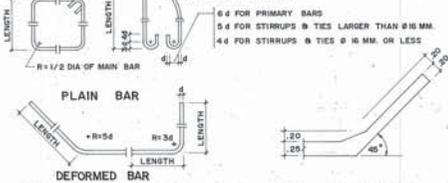
SECTION C - C SCALE 1:50



SECTION E - E SCALE 1:50

BAR MARK	SPAN 5.00 M.				SPAN 6.00 M.				SPAN 7.00 M.				SPAN 8.00 M.				SPAN 9.00 M.				SPAN 10.00 M.								
	#	Ø	NO.	L	#	Ø	NO.	L																					
C201	8	Ø	8	-	8	Ø	8	-	8	Ø	8	-	8	Ø	8	-	8	Ø	8	-	8	Ø	8	-	8				
C202	4	Ø	2	-	4	Ø	2	-	4	Ø	2	-	4	Ø	2	-	4	Ø	2	-	4	Ø	2	-	4				
ST201	2	20	-	1.215	2	20	-	1.295	2	20	-	1.355	2	20	-	1.435	2	20	-	1.515	2	20	-	1.535	2	20	-	1.535	
ST202	3	20	-	1.745	3	20	-	1.795	3	20	-	1.845	3	20	-	1.895	3	20	-	1.945	3	20	-	1.995	3	20	-	1.995	
ST203	3	20	-	3	20	-	3	20	-	3	20	-	3	20	-	3	20	-	3	20	-	3	20	-	3	20	-	3	20
ST204	3	20	156	1.35	3	20	156	1.35	3	20	156	1.35	3	20	156	1.35	3	20	156	1.35	3	20	156	1.35	3	20	156	1.35	
ST205	3	25	36	1.35	3	25	36	1.35	3	25	36	1.35	3	25	36	1.35	3	25	36	1.35	3	25	36	1.35	3	25	36	1.35	
ST206	3	25	24	-	3	25	24	-	3	25	24	-	3	25	24	-	3	25	24	-	3	25	24	-	3	25	24	-	3
ST207	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2
B201	8	Ø	8	3.30	8	Ø	8	3.30	8	Ø	8	3.30																	
B201'	6	Ø	24	1.55	6	Ø	24	1.55	6	Ø	24	1.55																	
CN201	8	Ø	16	9.25	8	Ø	16	9.25	8	Ø	16	9.25																	
CN202	8	Ø	16	2.31	8	Ø	16	2.31	8	Ø	16	2.31																	
F201	8	Ø	2	9.70	8	Ø	2	9.70	8	Ø	2	9.70																	
F202	8	Ø	2	10.90	8	Ø	2	10.90	8	Ø	2	10.90																	
F203	4	25	39	1.50	4	25	39	1.50	4	25	39	1.50	4	25	39	1.50	4	25	39	1.50	4	25	39	1.50	4	25	39	1.50	
F204	4	Ø	6	9.70	4	Ø	6	9.70	4	Ø	6	9.70																	
W201	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	4
W202	2	Ø	2	2.75	2	Ø	2	2.60	2	Ø	2	2.60	2	Ø	2	2.30	2	Ø	2	2.30	2	Ø	2	2.30	2	Ø	2	2.30	
W203	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4
W204	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2
W205	2	Ø	2	4	2	Ø	2	4	2	Ø	2	4	2	Ø	2	4	2	Ø	2	4	2	Ø	2	4	2	Ø	2	4	
W206	2	Ø	2	6	2	Ø	2	6	2	Ø	2	6	2	Ø	2	6	2	Ø	2	6	2	Ø	2	6	2	Ø	2	6	
W207	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	
W208	4	Ø	2	5.435	4	Ø	2	5.435	4	Ø	2	5.435																	
W209	2	Ø	2	5.535	2	Ø	2	5.535	2	Ø	2	5.535																	

NOTES:
1. THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
2. SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 50 TON/MT².
3. HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
a) IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
b) IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACINGS TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
4. CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS AT WHICH CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
5. QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 3.00 M.
6. REBARS # 4 OR LARGER SHALL BE TIE 24 GRADE S205 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE S24 PLAIN BARS UNLESS OTHERWISE INDICATED.
7. LOCATION OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
8. LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
9. IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS.6 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
10. THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
11. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 N/CM² FOR A 15x15x15 M CURE AT 28 DAYS. CEMENT SHALL BE TIS 5 TYPE 1 PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:
PORTLAND CEMENT 350 KG
SAND 0.45 M³
CRUSHED ROCK OR GRVEL 0.86 M³
CONCRETE SLUMP MAX. 10 CM.
12. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
13. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3425-106-14/8.



KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
8.00 M. ROADWAY WIDTH SLAB BRIDGE
SPREAD FOOTING ABUTMENT DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i>	SCALE AS SHOWN	
(DIRECTOR OF LOCATION & DESIGN DIVISION)		DWG. NO. ST-06
APPROVED: <i>[Signature]</i>	SHEET NO. 119	
(DIRECTOR GENERAL)		

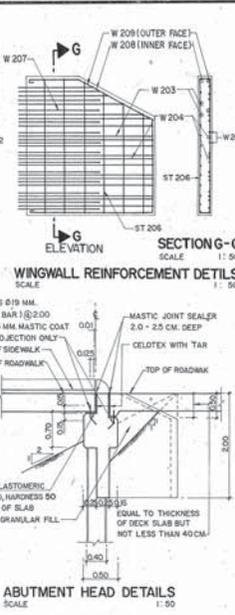
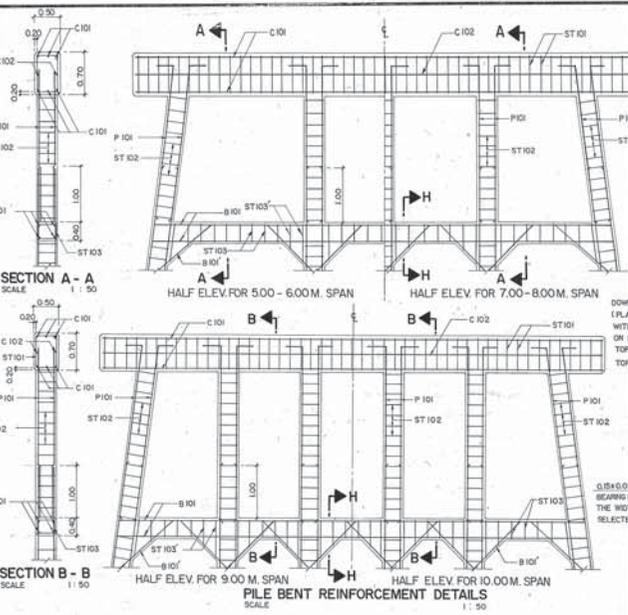
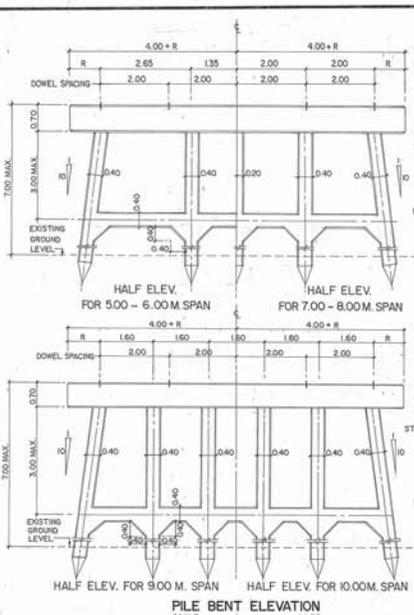
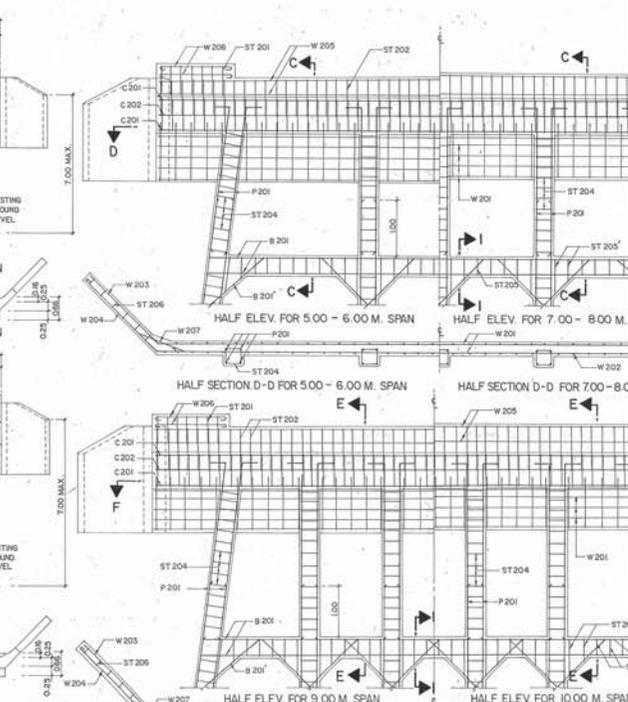
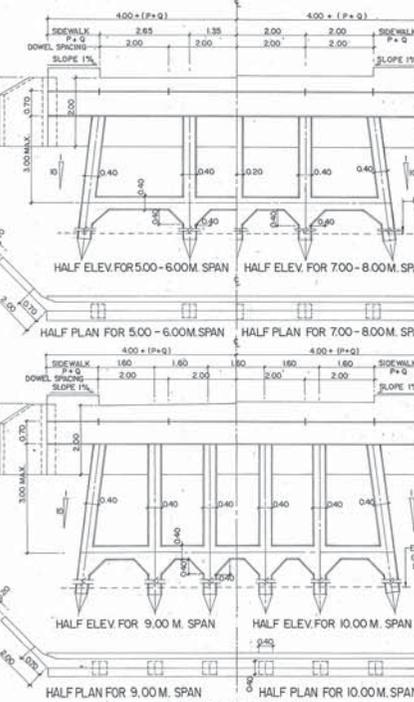


TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	MARK	SPAN 5.00 M.			SPAN 6.00 M.			SPAN 7.00 M.			SPAN 8.00 M.			SPAN 9.00 M.			SPAN 10.00 M.				
		#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L		
VARIES	C 101	8	-	6	-	8	-	6	-	8	-	6	-	8	-	6	-	8	-	6	
VARIES	C 102	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	
VARIES	ST 101	3	Ø20	235	3	Ø20	235	3	Ø20	235	3	Ø20	235	3	Ø20	235	3	Ø20	235	3	Ø20
	ST 102	3	Ø20	56	3	Ø20	56	3	Ø20	70	3	Ø20	70	3	Ø20	84	3	Ø20	84	3	Ø20
VARIES	ST 103	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-
	ST 105	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-
VARIES	B 101	8	-	4	-	8	-	4	-	8	-	4	-	8	-	4	-	8	-	4	-
	B 102	8	-	4	-	8	-	4	-	8	-	4	-	8	-	4	-	8	-	4	-
VARIES	P 101	8	-	12	1.55	8	-	12	1.55	8	-	12	1.55	8	-	12	1.55	8	-	12	1.55
	P 102	8	-	16	3.75	8	-	16	3.75	8	-	16	3.75	8	-	16	3.75	8	-	16	3.75
VARIES	C 201	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-
	C 202	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-
VARIES	ST 201	2	Ø20	-	1.25	2	Ø20	-	1.25	2	Ø20	-	1.25	2	Ø20	-	1.25	2	Ø20	-	1.25
	ST 202	3	Ø20	-	1.75	3	Ø20	-	1.75	3	Ø20	-	1.75	3	Ø20	-	1.75	3	Ø20	-	1.75
VARIES	ST 203	3	Ø20	-	3	Ø20	-	3	Ø20	-	3	Ø20	-	3	Ø20	-	3	Ø20	-	3	Ø20
	ST 204	3	Ø20	56	3	Ø20	56	3	Ø20	70	3	Ø20	70	3	Ø20	84	3	Ø20	84	3	Ø20
VARIES	ST 205	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-	3	Ø25	12	-
	ST 206	2	Ø30	12	-	2	Ø30	12	-	2	Ø30	12	-	2	Ø30	12	-	2	Ø30	12	-
VARIES	B 201	8	-	4	-	8	-	4	-	8	-	4	-	8	-	4	-	8	-	4	-
	B 202	8	-	12	1.55	8	-	12	1.55	8	-	12	1.55	8	-	12	1.55	8	-	12	1.55
VARIES	P 201	8	-	16	3.75	8	-	16	3.75	8	-	16	3.75	8	-	16	3.75	8	-	16	3.75
	P 202	4	Ø20	10	-	4	Ø20	10	-	4	Ø20	10	-	4	Ø20	10	-	4	Ø20	10	-
VARIES	W 201	2	Ø30	-	2.70	2	Ø30	-	2.60	2	Ø30	-	2.50	2	Ø30	-	2.40	2	Ø30	-	2.30
	W 202	4	Ø15	24	-	4	Ø15	24	-	4	Ø15	24	-	4	Ø15	24	-	4	Ø15	24	-
VARIES	W 203	2	Ø30	12	-	2	Ø30	12	-	2	Ø30	12	-	2	Ø30	12	-	2	Ø30	12	-
	W 205	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-
VARIES	W 204	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-
	W 206	4	Ø15	26	2.15	4	Ø15	26	2.15	4	Ø15	26	2.15	4	Ø15	26	2.15	4	Ø15	26	2.15
VARIES	W 207	4	-	2	5.435	4	-	2	5.435	4	-	2	5.435	4	-	2	5.435	4	-	2	5.435
	W 208	2	-	2	5.535	2	-	2	5.535	2	-	2	5.535	2	-	2	5.535	2	-	2	5.535

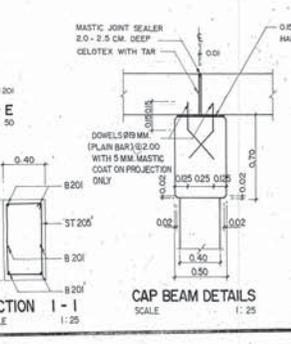
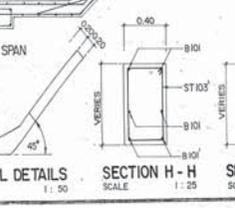
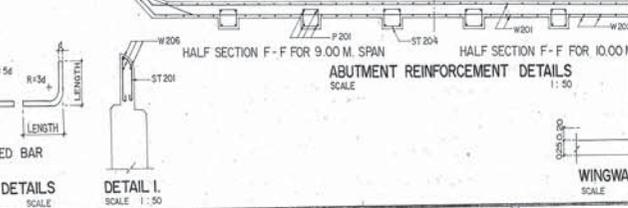
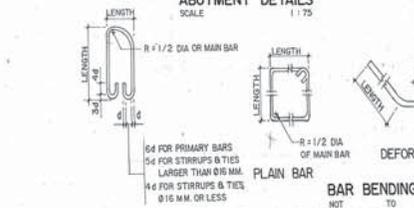
Ø = 2" Ø14" OR 6 MM. # 3 = Ø3" Ø9 MM. # 4 = Ø1/2" Ø12 MM. # 6 = Ø3/4" Ø20 MM. # 8 = Ø1" Ø25 MM. N_T = TOTAL AMOUNT OF BARS, L_T = TOTAL LENGTH OF EACH BAR.



NOTES:

- EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 50 TONS FOR PILE DETAIL. SEE DRAWING NO. MS-02, MS-03.
- HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M., A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M. AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE GROUND LEVEL EXCEEDS 3.0 M., ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15 X 0.15 X 0.15 M. CUBE AT 28 DAYS. CONCRETE SHALL BE TIS IS TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

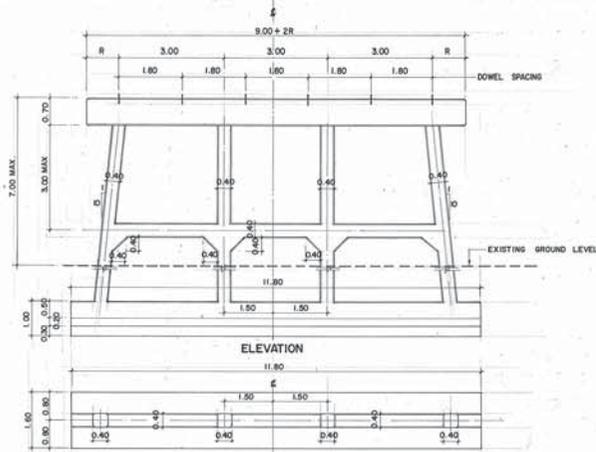
PURTLAND CEMENT	350 KG
SAND	0.45 M ³
CRUSHED ROCK OR GRAVEL	0.86 M ³
CONCRETE SLUMP MAX	10 CM
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE 50 SO DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
- THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00 M.
- THIS DRAWING IS ADAPTED FROM DCH DWG. NO. 3AP5-105-14/7



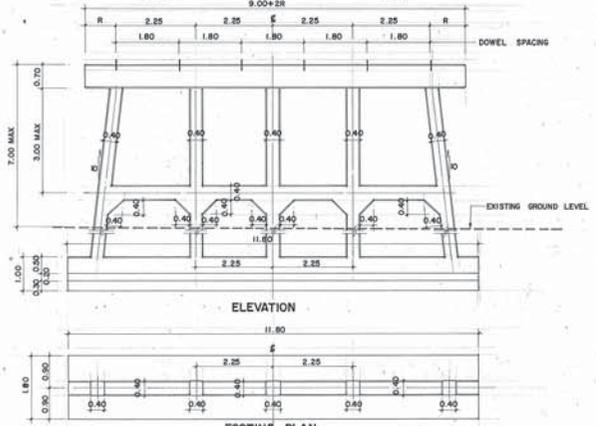
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
8.00 M. ROADWAY WIDTH SLAB BRIDGE
PILE BENT AND ABUTMENT DETAILS

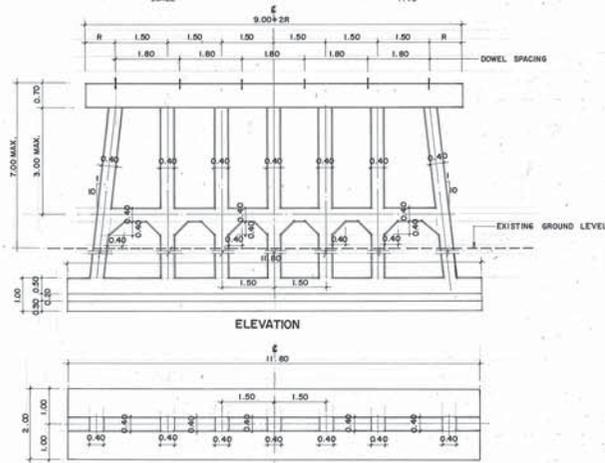
DESIGNED: DOH CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE JULY 1994
SUBMITTED:	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED:	<i>[Signature]</i> FOU, DIRECTOR GENERAL	DWG. NO. ST-07
		SHEET NO. 120



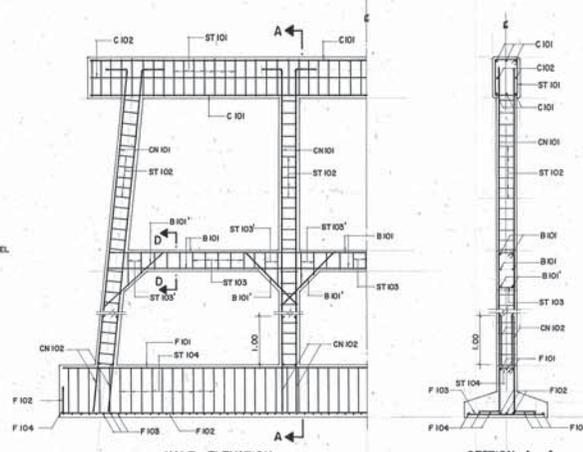
FOOTING PLAN
PIER DETAILS FOR 5.00-6.00 M. SPAN
SCALE 1:75



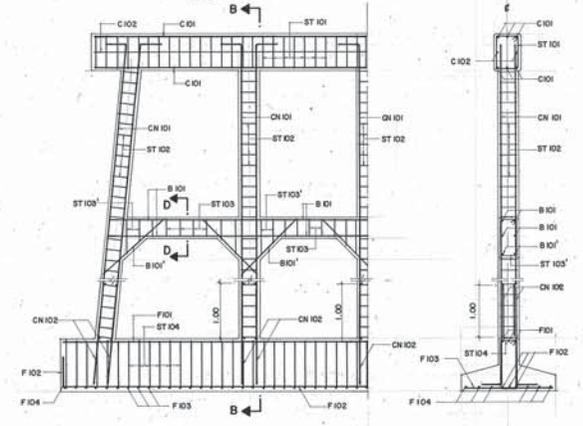
FOOTING PLAN
PIER DETAILS FOR 7.00-8.00 M. SPAN
SCALE 1:75



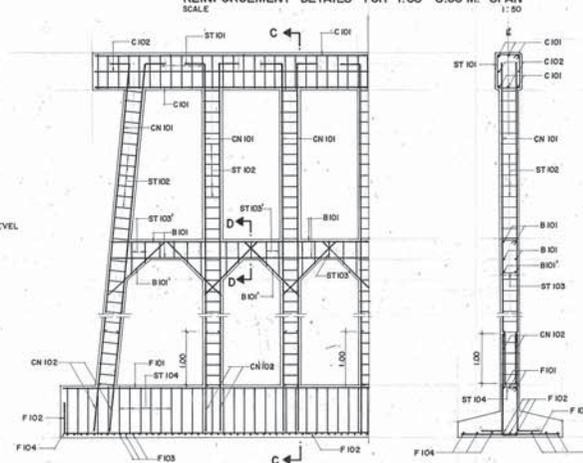
FOOTING PLAN
PIER DETAILS FOR 9.00-10.00 M. SPAN
SCALE 1:75



HALF ELEVATION
REINFORCEMENT DETAILS FOR 5.00-6.00 M. SPAN
SCALE 1:50



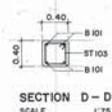
HALF ELEVATION
REINFORCEMENT DETAILS FOR 7.00-8.00 M. SPAN
SCALE 1:50



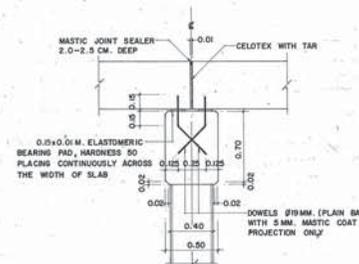
HALF ELEVATION
REINFORCEMENT DETAILS FOR 9.00-10.00 M. SPAN
SCALE 1:50

		TABLE OF REINFORCEMENT																							
BAR BEDDING DIAGRAMS	BAR MARK	SPAN 5.00 M.			SPAN 6.00 M.			SPAN 7.00 M.			SPAN 8.00 M.			SPAN 9.00 M.			SPAN 10.00 M.								
		#	@	NO. L	#	@	NO. L	#	@	NO. L	#	@	NO. L	#	@	NO. L	#	@	NO. L						
	C101	8	-	6	8	-	6	8	-	6	8	-	6	8	-	6	8	-	6	8	-	6			
	C102	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2			
	CN101	8	-	16	11.25	8	-	16	11.25	8	-	20	11.25	8	-	20	11.25	8	-	28	11.25	8	-	28	11.25
	CN102	8	-	16	2.31	8	-	16	2.31	8	-	20	2.31	8	-	20	2.31	8	-	28	2.31	8	-	28	2.31
	ST101	3	0.20	-	2.35	3	0.20	-	2.35	3	0.20	-	2.35	3	0.20	-	2.35	3	0.20	-	2.35	3	0.20	-	2.35
	ST102	3	0.20	192	1.35	3	0.20	192	1.35	3	0.20	240	1.35	3	0.20	240	1.35	3	0.20	336	1.35	3	0.20	336	1.35
	ST103	3	0.25	48	1.35	3	0.25	48	1.35	3	0.25	42	1.35	3	0.25	42	1.25	3	0.25	36	1.35	3	0.25	36	1.35
	ST103'	3	-	24	-	3	-	24	-	3	-	32	-	3	-	32	-	3	-	48	-	3	-	48	-
	ST104	3	0.20	59	2.55	3	0.20	59	2.55	3	0.20	59	2.55	3	0.20	59	2.55	3	0.20	59	2.55	3	0.20	59	2.55
	B101	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-
	B101'	6	-	24	1.55	6	-	24	1.55	6	-	32	1.55	6	-	32	1.55	6	-	48	1.55	6	-	48	1.55
	F101	8	-	3	11.70	8	-	3	11.70	8	-	3	11.70	8	-	3	11.70	8	-	3	11.70	8	-	3	11.70
	F102	8	-	3	12.90	8	-	3	12.90	8	-	3	12.90	8	-	3	12.90	8	-	3	12.90	8	-	3	12.90
	F103	4	0.25	47	1.50	4	0.25	47	1.50	4	0.25	59	1.70	4	0.25	59	1.70	4	0.25	94	1.90	4	0.25	94	1.90
	F104	4	-	6	11.70	4	-	6	11.70	4	-	6	11.70	4	-	6	11.70	4	-	6	11.70	4	-	6	11.70

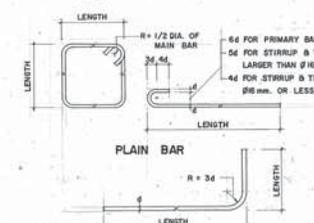
3 = 3/8" OR 9 MM, # 4 = 1/2" OR 12 MM, # 6 = 3/4" OR 19 MM, # 8 = 1" OR 25 MM, NO. = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR



SECTION D - D
SCALE 1:75



CAP BEAM DETAIL
SCALE 1:25



PLAIN BAR
DEFORMED BAR
BAR BONDING DETAILS
NOT TO SCALE

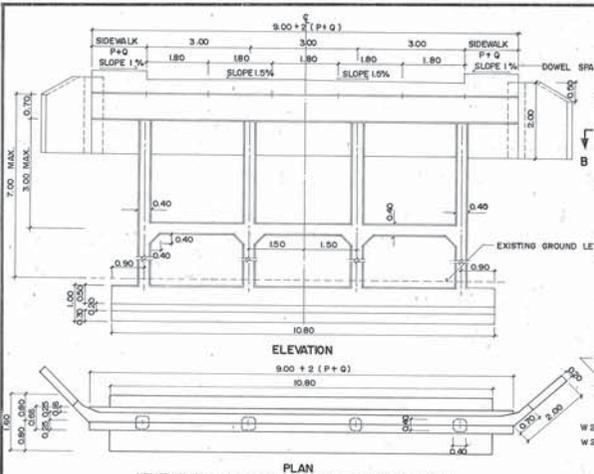
- NOTES**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.50 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:5 BY VOLUME.
 - SOL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACINGS BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.00 M. A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.00 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACINGS TO THE EXISTING GROUND LEVEL EXCEEDS 3.00 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.00 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15x0.15x0.15 m. CURE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE 1 PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWING:

PORTLAND CEMENT	350 KG
CRUSHED ROCK OR GRAVEL	0.86 M ³
SAND	0.43 M ³
CONCRETE SLUM MAX.	10 CM
 - REBAR # 4 OR LARGER SHALL BE TIS 24 GRADE 50 30 DEFORMED BARS, OTHER SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING CANAL BED TO THE TOP OF CAP BEAM SHALL BE 7.00 M. PIER HIGHER THAN 7.00 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.00 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO.

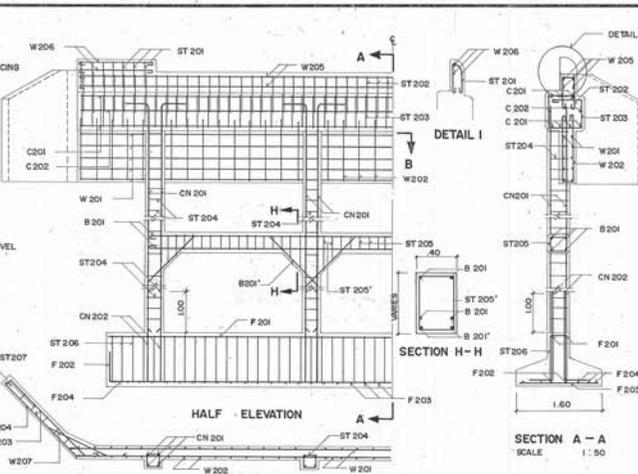
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS
STANDARD DRAWING

9.00 M. ROADWAY WIDTH SLAB BRIDGE
SPREAD FOOTING PIER DETAILS

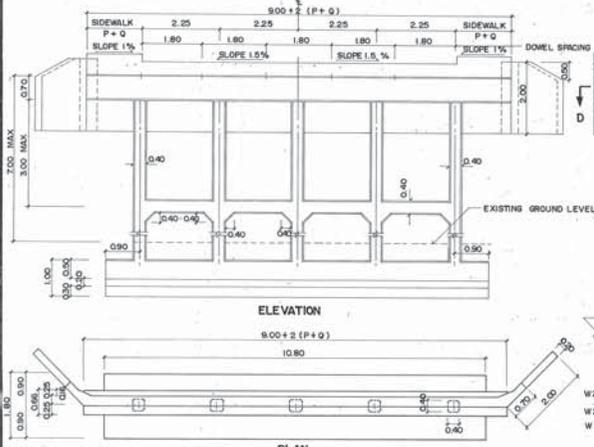
DESIGNED: DOH & CONSULTANTS	CHECKED: <i>Kajal</i>	DATE: JULY 1994
SUBMITTED: <i>P. Buranaporn</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN	
APPROVED: <i>Sakda</i> (FOR DIRECTOR GENERAL)	DWG. NO. ST-08	
		SHEET NO. 121



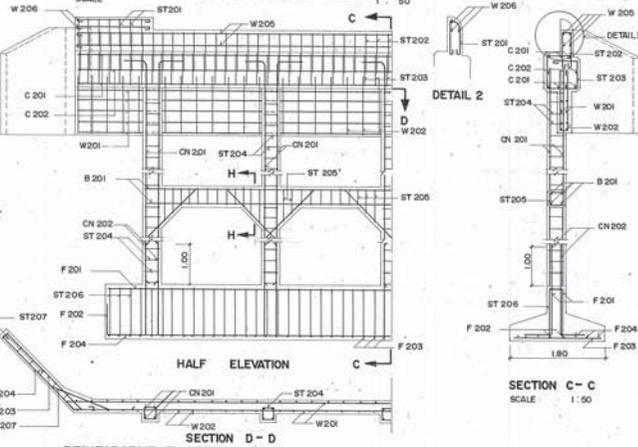
PLAN
ABUTMENT DETAILS FOR 5.00-6.00 M. SPAN
SCALE 1:75



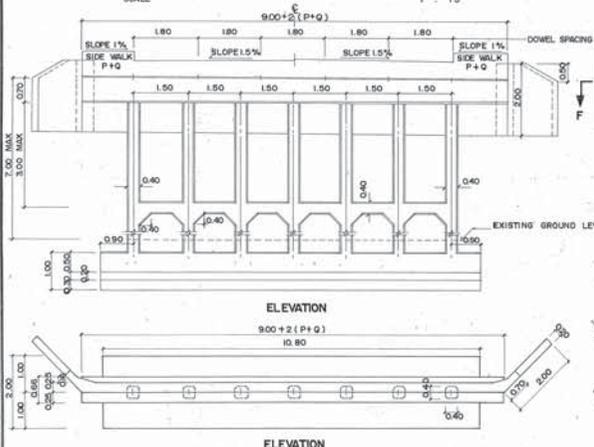
REINFORCEMENT DETAILS FOR 5.00-6.00 M. SPAN
SCALE 1:50



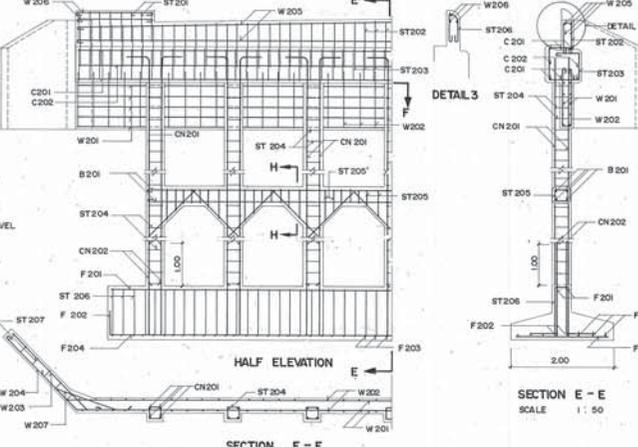
PLAN
ABUTMENT DETAILS FOR 7.00 - 8.00 M. SPAN
SCALE 1:75



REINFORCEMENT DETAILS FOR 7.00 - 8.00 M. SPAN
SCALE 1:50



PLAN
ABUTMENT DETAILS FOR 9.00 - 10.00 M. SPAN
SCALE 1:75

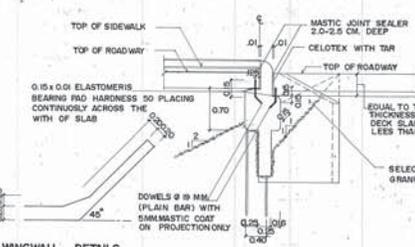


REINFORCEMENT DETAILS FOR 9.00 - 10.00 M. SPAN
SCALE 1:50

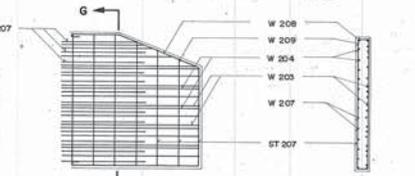
TABLE OF REINFORCEMENT

MARK	II	SPAN 5.00 M.				SPAN 6.00 M.				SPAN 7.00 M.				SPAN 8.00 M.				SPAN 9.00 M.				SPAN 10.00 M.			
		NO.	L	II	NO.	L	II	NO.	L	II	NO.	L	II	NO.	L	II	NO.	L	II	NO.	L	II	NO.	L	
C 201	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C 202	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4
ST 201	2	20	-	1,215	2	20	-	1,295	2	20	-	1,355	2	20	-	1,435	2	20	-	1,515	2	20	-	1,635	
ST 202	3	20	-	1,745	3	20	-	1,795	3	20	-	1,845	3	20	-	1,895	3	20	-	1,945	3	20	-	1,995	
ST 203	3	20	-	-	3	20	-	-	3	20	-	-	3	20	-	-	3	20	-	-	3	20	-	-	
ST 204	3	20	195	1,35	3	20	195	1,35	3	20	195	1,35	3	20	195	1,35	3	20	273	1,35	3	20	273	1,35	
ST 205	3	25	44	1,35	3	25	44	1,35	3	25	32	1,35	3	25	32	1,35	3	25	12	1,35	3	25	12	1,35	
ST 206	3	-	24	-	3	-	24	-	3	-	24	-	3	-	24	-	3	-	48	-	3	-	48	-	
ST 207	3	20	54	2,55	3	20	54	2,55	3	20	54	2,55	3	20	54	2,55	3	20	54	2,55	3	20	54	2,55	
B 201	2	30	12	-	3	30	12	-	3	30	12	-	3	30	12	-	3	30	12	-	3	30	12	-	
B 202	8	-	8	9,30	8	-	8	9,30	8	-	8	9,30	8	-	8	9,30	8	-	8	9,30	8	-	8	9,30	
B 203	6	-	20	1,55	6	-	24	1,55	6	-	32	1,55	6	-	32	1,55	6	-	48	1,55	6	-	48	1,55	
B 204	8	-	16	9,25	8	-	16	9,25	8	-	20	9,25	8	-	20	9,25	8	-	28	9,25	8	-	28	9,25	
CN 201	8	-	16	2,31	8	-	16	2,31	8	-	20	2,31	8	-	20	2,31	8	-	28	2,31	8	-	28	2,31	
CN 202	8	-	2	10,70	8	-	2	10,70	8	-	2	10,70	8	-	2	10,70	8	-	2	10,70	8	-	2	10,70	
F 201	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	
F 202	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	8	-	2	11,90	
F 203	4	25	43	1,5	4	25	43	1,5	4	25	43	1,5	4	25	43	1,5	4	25	43	1,5	4	25	43	1,5	
F 204	4	-	6	10,70	4	-	6	10,70	4	-	6	10,70	4	-	6	10,70	4	-	6	10,70	4	-	6	10,70	
W 201	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	4	20	10	-	
W 202	2	30	-	2,75	2	30	-	2,60	2	30	-	2,60	2	30	-	2,50	2	30	-	2,40	2	30	-	2,30	
W 203	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	
W 204	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	2	30	12	-	
W 205	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	
W 206	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	
W 207	4	15	26	2,15	4	15	26	2,15	4	15	26	2,15	4	15	26	2,15	4	15	26	2,15	4	15	26	2,15	
W 208	4	-	2	5,435	4	-	2	5,435	4	-	2	5,435	4	-	2	5,435	4	-	2	5,435	4	-	2	5,435	
W 209	2	-	2	5,535	2	-	2	5,535	2	-	2	5,535	2	-	2	5,535	2	-	2	5,535	2	-	2	5,535	

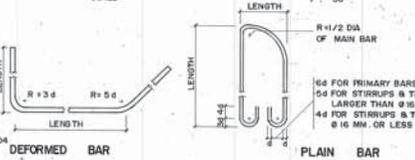
NO. = TOTAL AMOUNT OF BARS
L = TOTAL LENGTH OF EACH BAR



WINGWALL DETAILS
SCALE 1:50



ABUTMENT HEAD DETAILS
SCALE 1:50



ELEVATION
WINGWALL REINFORCEMENT DETAILS
SCALE 1:50



DEFORMED BAR
BENDING TO
DETAILS
SCALE

- NOTES
- THE BOTTOM OF FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10CM THICKNESS OF LEAN CONCRETE SHALL BE FURRED AT LEAST 10 CM. WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0M.
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 15x15x15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE I PORTLAND CEMENT A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG	CRUSHED ROCK OR GRAVEL	0.85 m ³
SAND	0.45 m ³	CONCRETE SLUMP	MAX. 10 CM.
 - REBAR # 4 OR LARGER SHALL BE TIS 24 GRADE 50 30 DEFORMED BARS. OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBAR SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATION OF REBAR.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. IF THE PIER HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBAR SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.0 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3405-106-16/17.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 9.00M. ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING ABUTMENT DETAILS

DESIGNED: DOH & CONSULTANTS
 SUBMITTED: P. Bunnong (DIRECTOR OF LOCATION & DESIGN DIVISION)
 APPROVED: (DIRECTOR GENERAL)

CHECKED: [Signature]
 DATE JULY 1994
 SCALE AS SHOWN
 DWG. NO. ST-09
 SHEET NO. 122

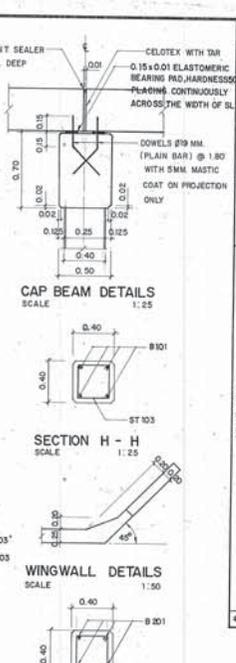
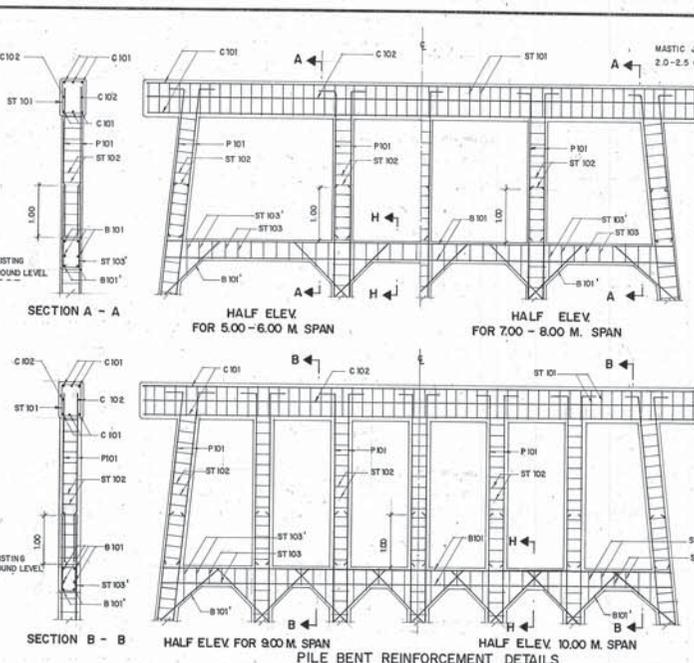
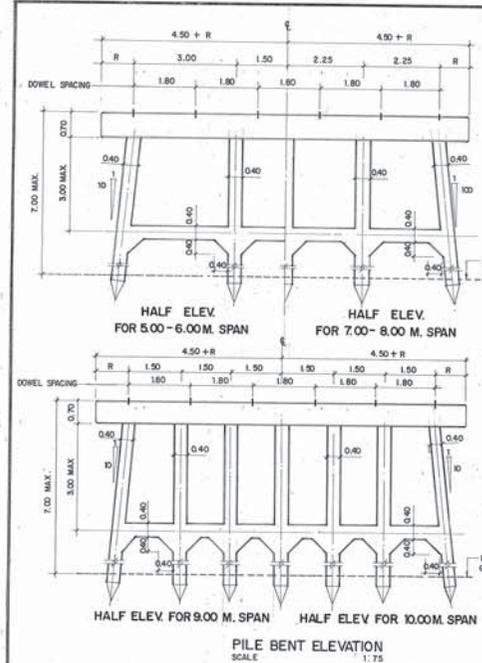
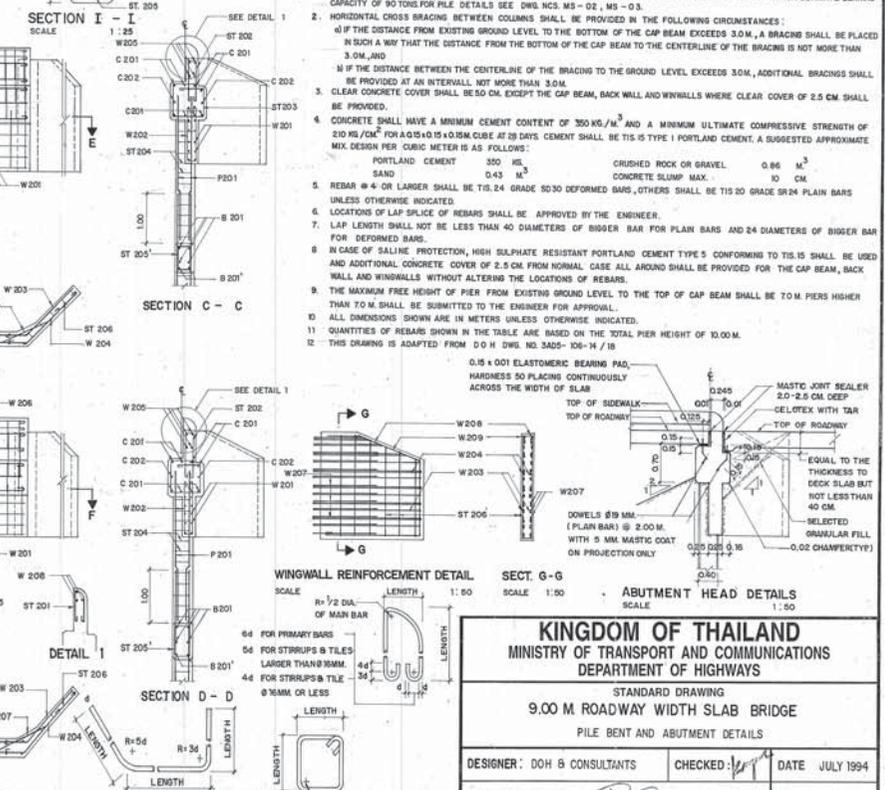
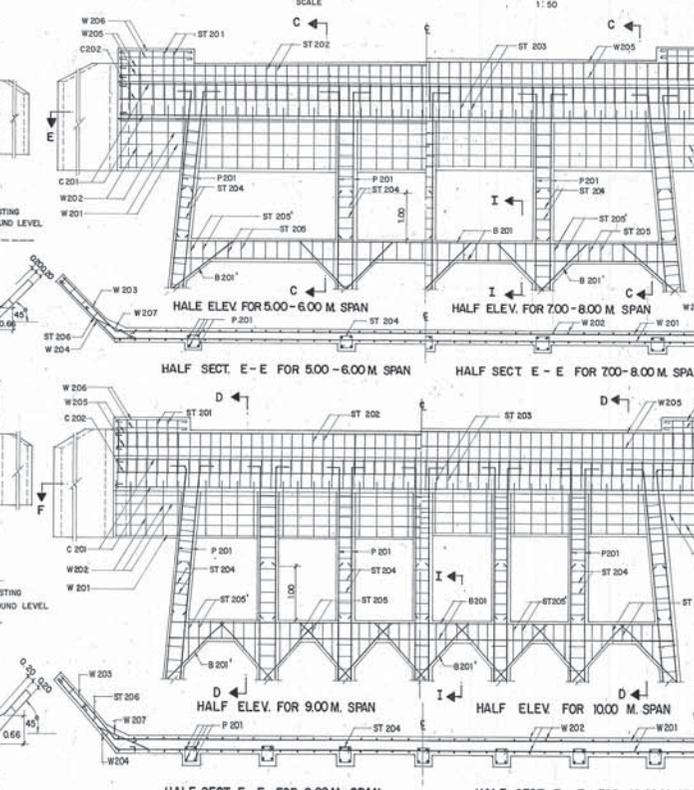
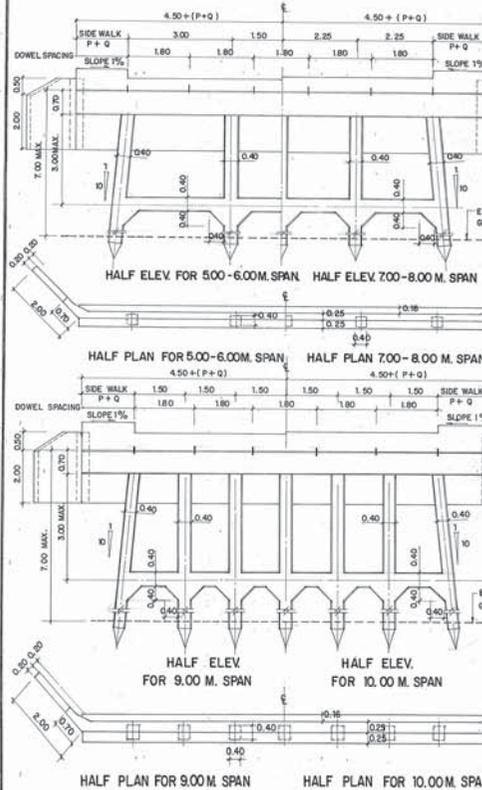


TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00 M			SPAN 6.00 M			SPAN 7.00 M			SPAN 8.00 M			SPAN 9.00 M			SPAN 10.00 M		
		#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L
VARIES	C101	8	6	-	8	6	-	8	6	-	8	6	-	8	6	-	8	6	-
VARIES	C102	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-
VARIES	ST101	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-
VARIES	ST102	3	0.20	56	1.35	3	0.20	56	1.35	3	0.20	70	1.35	3	0.20	98	1.35	3	0.20
VARIES	ST103	3	0.25	24	1.35	3	0.25	24	1.35	3	0.25	18	1.35	3	0.25	8	1.35	3	0.25
VARIES	ST103'	3	0.25	12	-	3	0.25	12	-	3	0.25	16	-	3	0.25	24	-	3	0.25
VARIES	B101	8	4	-	8	4	-	8	4	-	8	4	-	8	4	-	8	4	-
VARIES	B101'	8	12	1.55	6	12	1.55	6	12	1.55	6	12	1.55	6	12	1.55	6	12	1.55
VARIES	P101	8	16	3.75	8	16	3.75	8	16	3.75	8	16	3.75	8	16	3.75	8	16	3.75
VARIES	C201	8	8	-	8	8	-	8	8	-	8	8	-	8	8	-	8	8	-
VARIES	C202	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-
VARIES	ST201	2	0.20	-	2	0.20	-	2	0.20	-	2	0.20	-	2	0.20	-	2	0.20	-
VARIES	ST202	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-
VARIES	ST203	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-
VARIES	ST204	3	0.20	56	1.35	3	0.20	56	1.35	3	0.20	70	1.35	3	0.20	98	1.35	3	0.20
VARIES	ST205	3	0.25	24	1.35	3	0.25	24	1.35	3	0.25	18	1.35	3	0.25	8	1.35	3	0.25
VARIES	ST205'	3	0.25	12	-	3	0.25	12	-	3	0.25	16	-	3	0.25	24	-	3	0.25
VARIES	ST206	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30
VARIES	B201	8	4	-	8	4	-	8	4	-	8	4	-	8	4	-	8	4	-
VARIES	B201'	6	12	1.55	6	12	1.55	6	12	1.55	6	12	1.55	6	12	1.55	6	12	1.55
VARIES	P201	8	16	3.75	8	16	3.75	8	16	3.75	8	16	3.75	8	16	3.75	8	16	3.75
VARIES	W201	4	0.20	10	-	4	0.20	10	-	4	0.20	10	-	4	0.20	10	-	4	0.20
VARIES	W202	2	0.30	-	2	0.30	-	2	0.30	-	2	0.30	-	2	0.30	-	2	0.30	-
VARIES	W203	4	0.15	24	-	4	0.15	24	-	4	0.15	24	-	4	0.15	24	-	4	0.15
VARIES	W204	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30
VARIES	W205	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-
VARIES	W206	2	6	-	2	6	-	2	6	-	2	6	-	2	6	-	2	6	-
VARIES	W207	4	0.15	28	2.15	4	0.15	28	2.15	4	0.15	26	2.15	4	0.15	26	2.15	4	0.15
VARIES	W208	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435
VARIES	W209	2	2	5.533	2	2	5.533	2	2	5.533	2	2	5.533	2	2	5.533	2	2	5.533

NOTES:
 1. EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 90 TONS FOR PILE DETAILS SEE DWG NOS. MS-02, MS-03.
 2. HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 a) IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0M, AND
 b) IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE GROUND LEVEL EXCEEDS 3.0M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0M.
 3. CLEAR CONCRETE COVER SHALL BE 50.0 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 4. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 300 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15x0.15x0.15M CUBE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:
 PORTLAND CEMENT 350 KG, CRUSHED ROCK OR GRAVEL 0.86 M³, CONCRETE SLUMP MAX. 10 CM, SAND 0.43 M³.
 5. REBAR #4 OR LARGER SHALL BE TIS 24 GRADE S30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE S24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 6. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 7. LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 8. IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
 9. THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0M. PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 10. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 11. QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00M.
 12. THIS DRAWING IS ADAPTED FROM D O H DWG. NO. 3405-106-H/18



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 9.00 M ROADWAY WIDTH SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

DESIGNER: DOH & CONSULTANTS
 CHECKED: P. B. [Signature]
 DATE: JULY 1994

SUBMITTED: [Signature]
 (DIRECTOR OF LOCATION & DESIGN DIVISION)

APPROVED: [Signature]
 (DIRECTOR GENERAL)

SCALE AS SHOWN
 DWG. NO. ST-10
 SHEET NO. 123

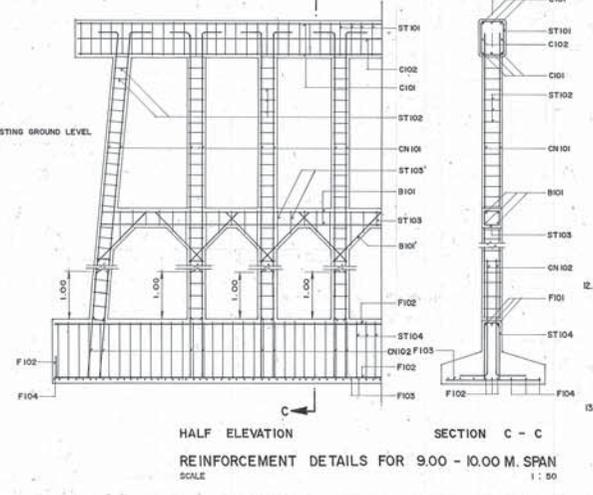
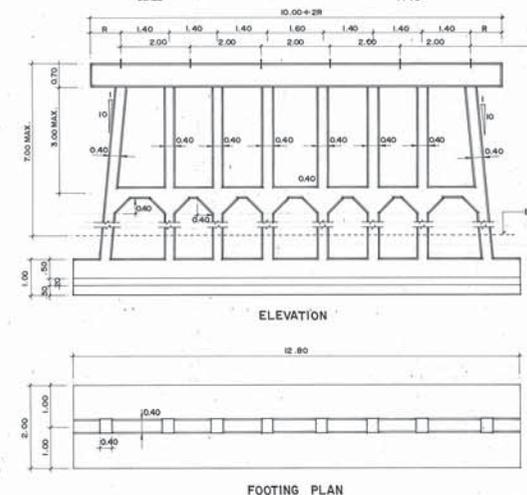
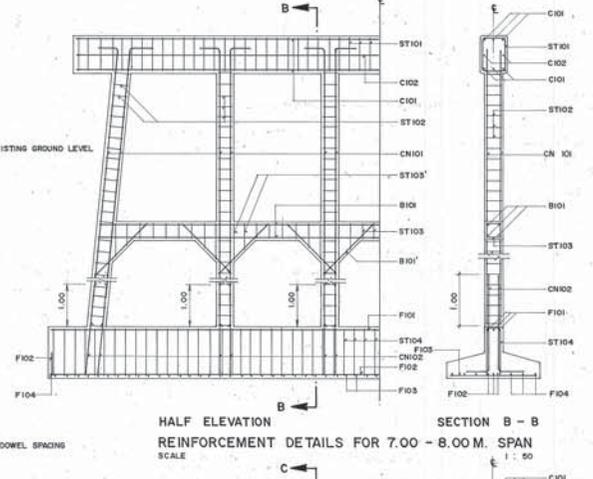
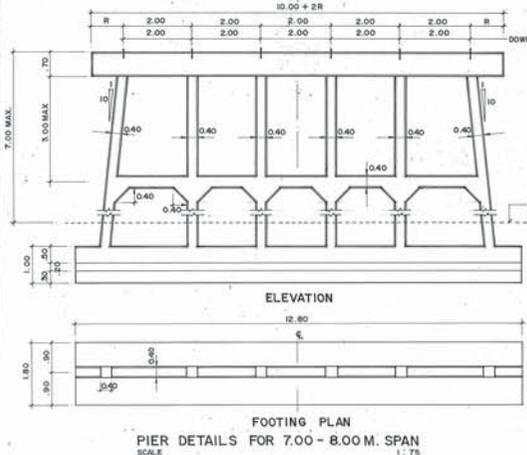
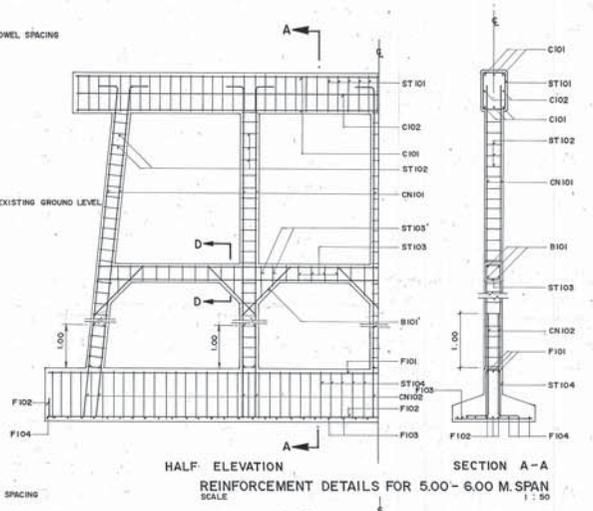
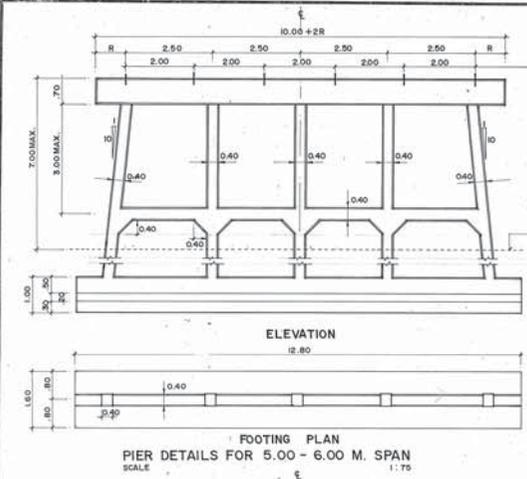
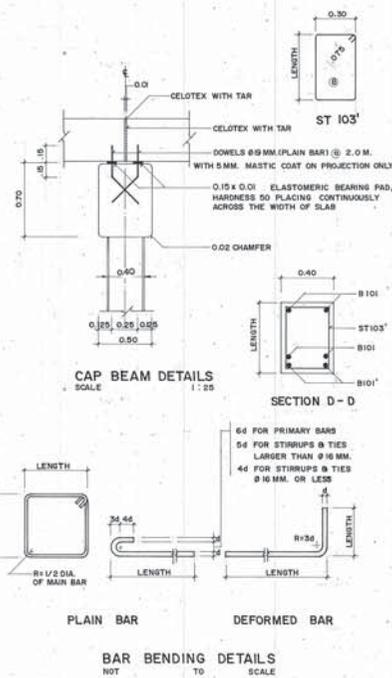


		TABLE OF REINFORCEMENT																								
		SPAN 5.00 M.			SPAN 6.00 M.			SPAN 7.00 M.			SPAN 8.00 M.			SPAN 9.00 M.			SPAN 10.00 M.									
BAR BENDING DIAGRAMS	NO.	BAR MARK	#	Ø	NO.	L	#	Ø	NO.	L	#	Ø	NO.	L	#	Ø	NO.	L	#	Ø	NO.	L				
	1	C101	8	-	6	-	8	-	6	-	8	-	6	-	8	-	6	-	8	-	6	-	8	-		
	2	C102	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-		
	3	CN101	8	-	20	11.25	8	-	20	11.25	8	-	24	11.25	8	-	24	11.25	8	-	32	11.25	8	-	32	11.25
	4	CN102	8	-	20	2.31	8	-	20	2.31	8	-	24	2.31	8	-	24	2.31	8	-	32	2.31	8	-	32	2.31
	5	ST101	3	Ø20	59	2.35	3	Ø20	59	2.35	3	Ø20	59	2.35	3	Ø20	59	2.35	3	Ø20	59	2.35	3	Ø20	59	2.35
	6	ST102	3	Ø20	240	1.35	3	Ø20	240	1.35	3	Ø20	288	1.35	3	Ø20	384	1.35	3	Ø20	384	1.35	3	Ø20	384	1.35
	7	ST103	3	Ø25	60	1.35	3	Ø25	60	1.35	3	Ø25	48	1.35	3	Ø25	36	1.35	3	Ø25	36	1.35	3	Ø25	36	1.35
	8	ST105	3	Ø25	24	-	3	Ø25	24	-	3	Ø25	32	-	3	Ø25	40	-	3	Ø25	40	-	3	Ø25	40	-
	9	ST104	3	Ø20	64	2.55	3	Ø20	64	2.55	3	Ø20	64	2.55	3	Ø20	64	2.55	3	Ø20	64	2.55	3	Ø20	64	2.55
	10	B101	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-
	11	B101'	6	-	24	1.55	6	-	24	1.55	6	-	32	1.55	6	-	40	1.55	6	-	40	1.55	6	-	40	1.55
	12	F101	8	-	3	12.70	8	-	3	12.70	8	-	3	12.70	8	-	3	12.70	8	-	3	12.70	8	-	3	12.70
	13	F102	8	-	3	13.90	8	-	3	13.90	8	-	3	13.90	8	-	3	13.90	8	-	3	13.90	8	-	3	13.90
	14	F103	4	Ø25	51	1.50	4	Ø25	51	1.50	4	Ø20	64	1.70	4	Ø20	64	1.70	4	Ø25	102	1.50	4	Ø25	102	1.50
	15	F104	4	-	6	12.70	4	-	6	12.70	4	-	6	12.70	4	-	6	12.70	4	-	6	12.70	4	-	6	12.70

3 = Ø 3/8" OR 9 MM., # 4 = Ø 1/2" OR 12 MM., # 6 = Ø 3/4" OR 20 MM., # 8 = 1" OR 25 MM., NO. = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR



- NOTES:**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT IT'S CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10CM. THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM. WIDER THAN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME
 - SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M²
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED BY THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M., A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M., AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL 3.0 M. ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM AT WHICH CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
 - ALL DIMENSION SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
 - REBARS #4 OR LARGER SHALL BE TIS 24 GRADE S20 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATION OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATION OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.0 M.

12. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 Kg/m³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 Kg/cm² FOR A 15x15x15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE 1 PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 Kg
SAND	0.45 M ³
CRUSHED ROCK OR GRAVEL 0.85 M ³	
CONCRETE SLUMP MIX.	10 CM

13. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3.AD 5-106-14/19.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
10.00 M. ROADWAY WIDTH SLAB BRIDGE
SPREAD FOOTING PIER DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i>	SCALE: AS SHOWN	
APPROVED: <i>[Signature]</i>		DWG. NO. ST - 11
P.E.C. (DIRECTOR GENERAL)		SHEET NO. 12-4

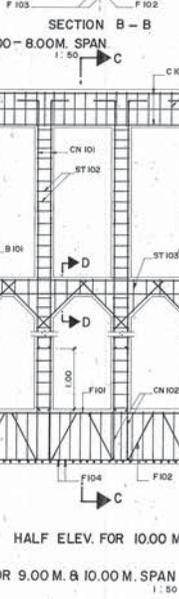
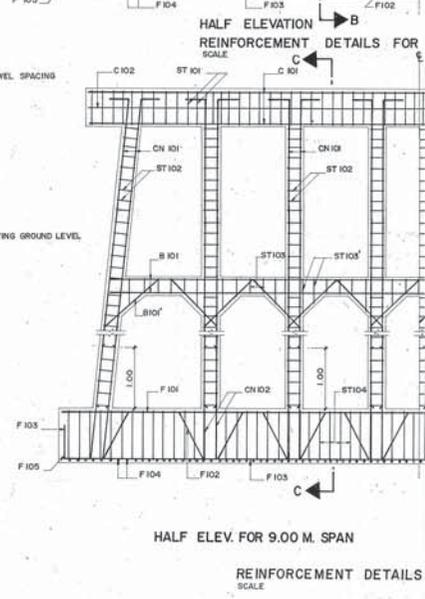
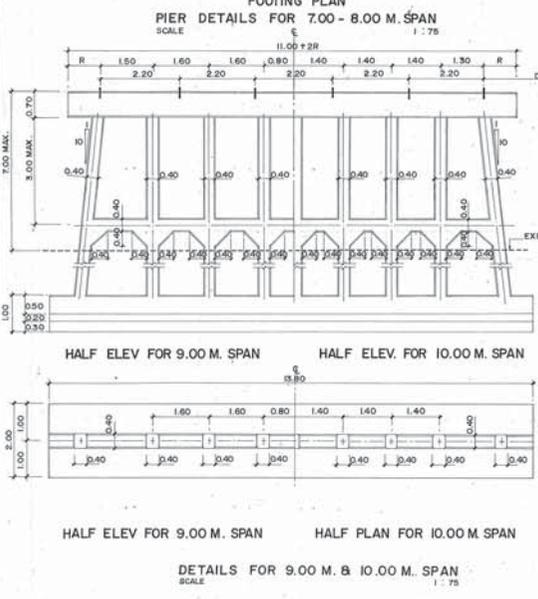
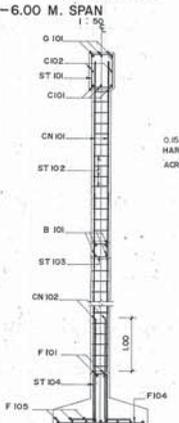
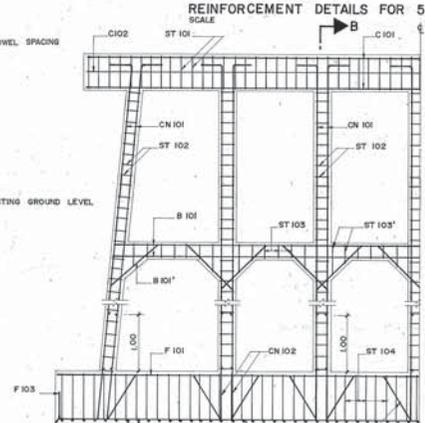
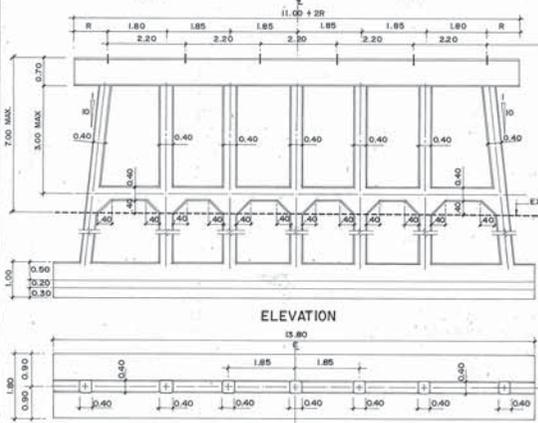
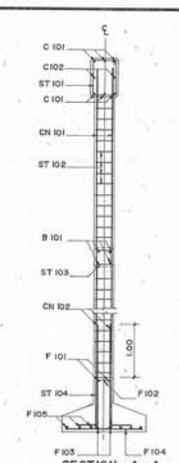
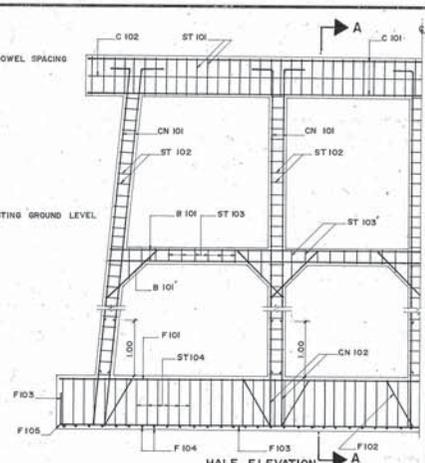
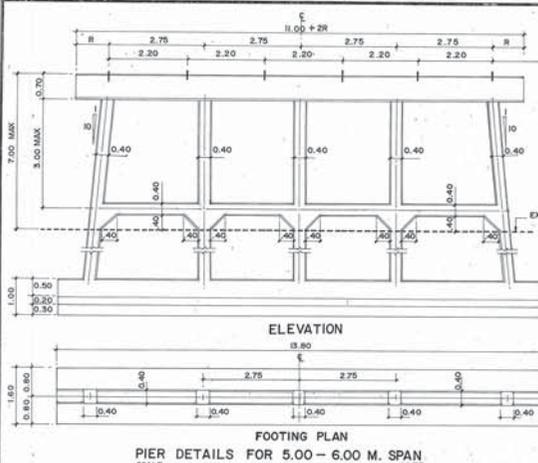
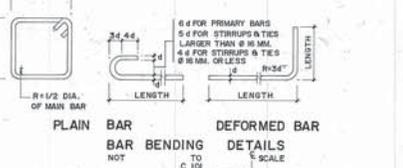
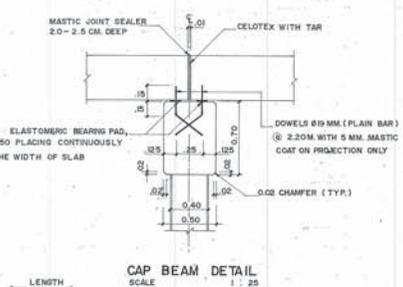


TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		#	NO. L	#	NO. L								
VARIES	C101	8	—	8	—	8	—	8	—	8	—	8	—
VARIES	C102	4	—	4	—	4	—	4	—	4	—	4	—
VARIES	CN101	8	—	20	11.25	8	—	20	11.25	8	—	20	11.25
VARIES	CN102	8	—	20	2.31	8	—	20	2.31	8	—	20	2.31
VARIES	ST101	3	0.20	64	2.35	3	0.20	64	2.35	3	0.20	64	2.35
VARIES	ST102	3	0.20	240	1.35	3	0.20	240	1.35	3	0.20	240	1.35
VARIES	ST103	3	0.25	58	1.35	3	0.25	58	1.35	3	0.25	58	1.35
VARIES	ST103*	3	0.25	32	—	3	0.25	32	—	3	0.25	32	—
VARIES	ST104	3	0.20	69	2.55	3	0.20	69	2.55	3	0.20	69	2.55
VARIES	B101	8	—	8	—	8	—	8	—	8	—	8	—
VARIES	B101*	6	—	32	1.55	6	—	32	1.55	6	—	32	1.55
VARIES	F101	8	—	2	13.70	8	—	2	13.70	8	—	2	13.70
VARIES	F102	8	—	1	—	8	—	1	—	8	—	1	—
VARIES	F103	8	—	2	14.90	8	—	2	14.90	8	—	2	14.90
VARIES	F104	4	0.25	55	1.50	4	0.25	55	1.50	4	0.25	55	1.50
VARIES	F105	4	—	6	13.70	4	—	6	13.70	4	—	6	13.70

11 3/8" Ø 3/8" Ø 9 MM, 11 4/8" Ø 1/2" Ø 12 MM, 11 6/8" Ø 3/4" Ø 20 MM, 11 8/8" Ø 1" Ø 25 MM, NO. = TOTAL AMOUNT OF BAR, L = TOTAL LENGTH OF EACH BAR.



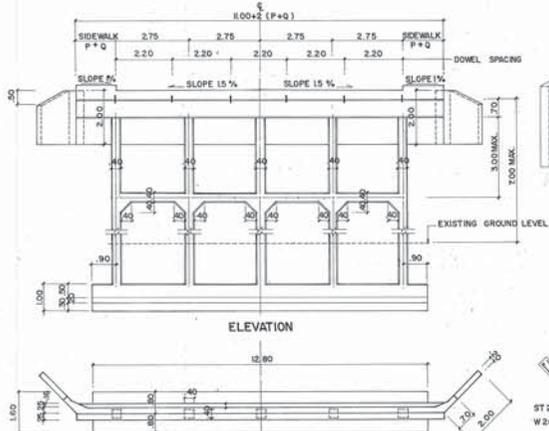
- NOTES :**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM. WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1 : 3 : 6 BY VOLUME.
 - SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, AT WHICH A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 15x15x15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	Kg.
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP MAX.	10	CM.
 - REBARS 11 4 OR LARGER SHALL BE TIS 24 GRADE S30 DEFORMED BARS OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.00 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3A25-106-14/21.

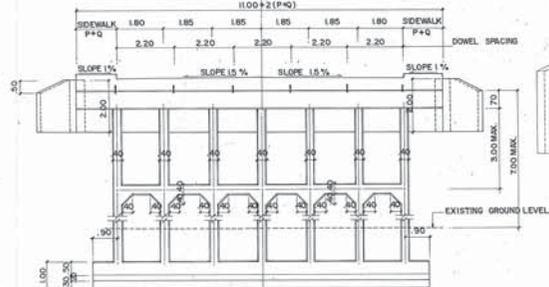
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
11.00 M. ROADWAY WIDTH SLAB BRIDGE
SPREAD FOOTING PIER DETAILS

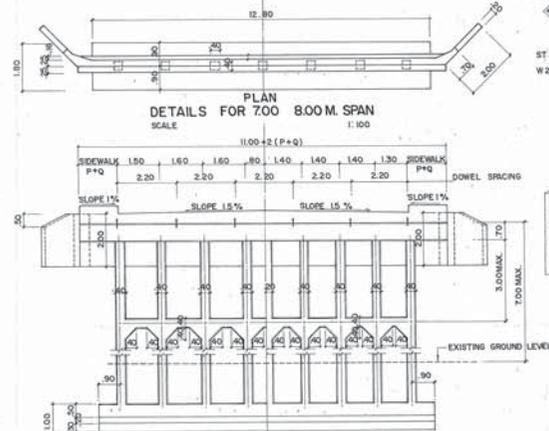
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SUBMITTED :	<i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> (DIRECTOR GENERAL)	DWG. NO. ST-14
		SHEET NO. 127



PLAN DETAILS FOR 500-600M SPAN
SCALE 1:100

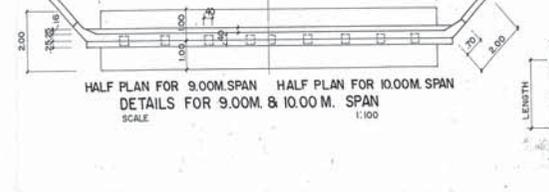


ELEVATION



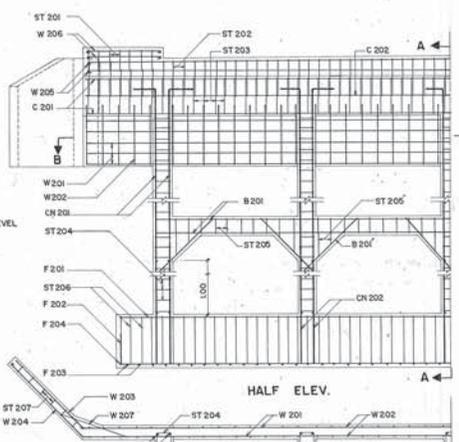
HALF PLAN FOR 9.00M SPAN
SCALE 1:100

HALF PLAN FOR 10.00M SPAN
SCALE 1:100

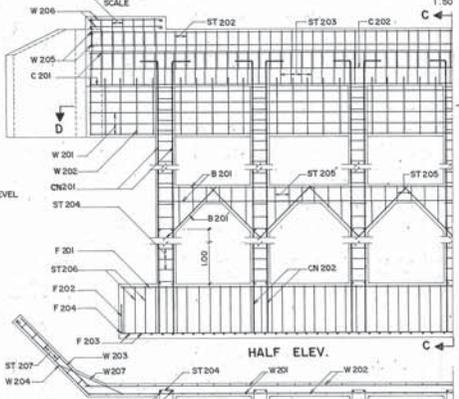


HALF PLAN FOR 9.00M SPAN
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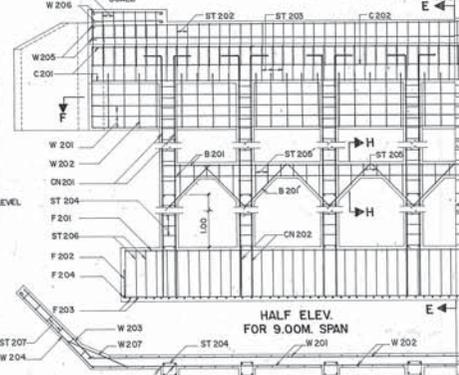
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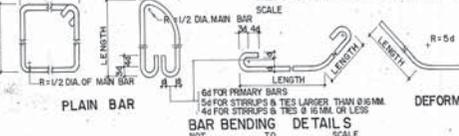
REINFORCEMENT DETAILS FOR 5.00-6.00M SPAN
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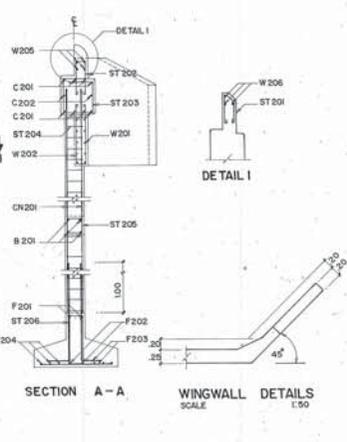
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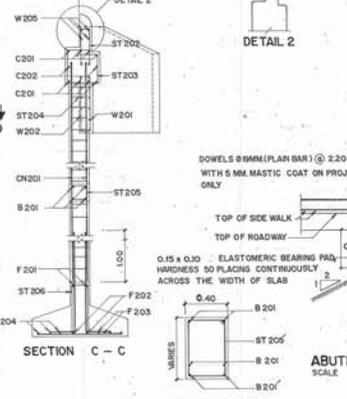
REINFORCEMENT DETAILS FOR 9.00M & 10.00M SPAN
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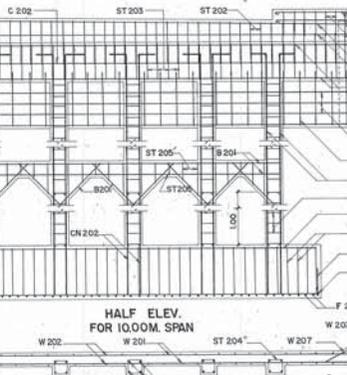
PLAIN BAR
BAR BENDING DETAILS
SCALE 1:50



SECTION A-A
SCALE 1:50



SECTION C-C
SCALE 1:50



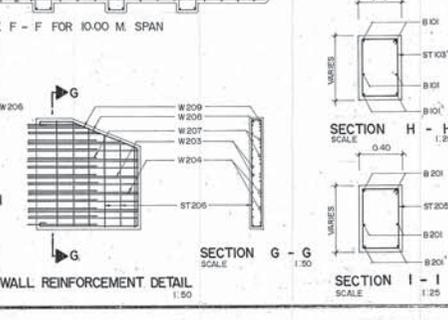
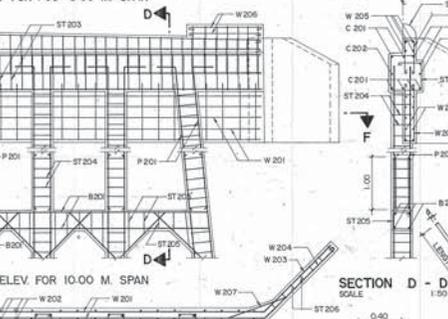
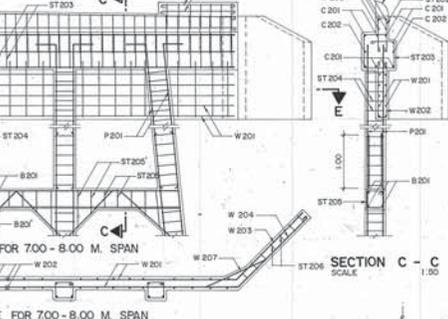
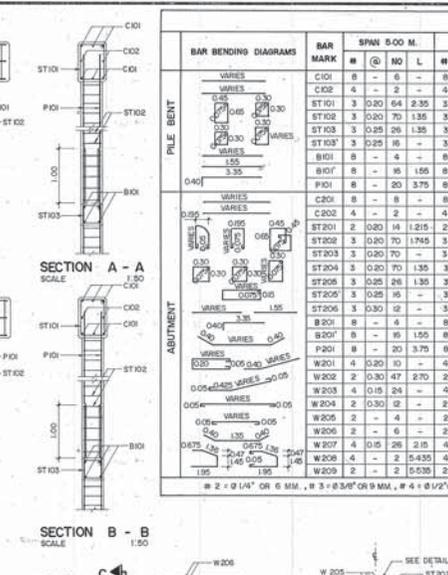
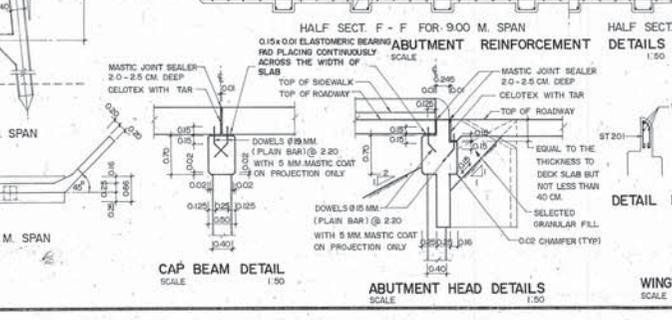
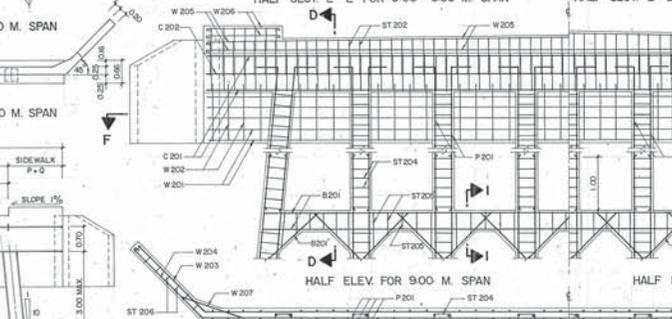
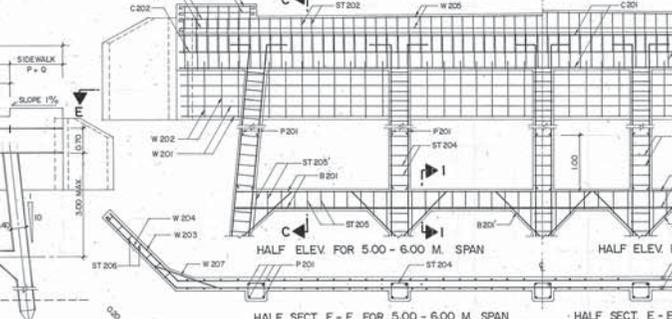
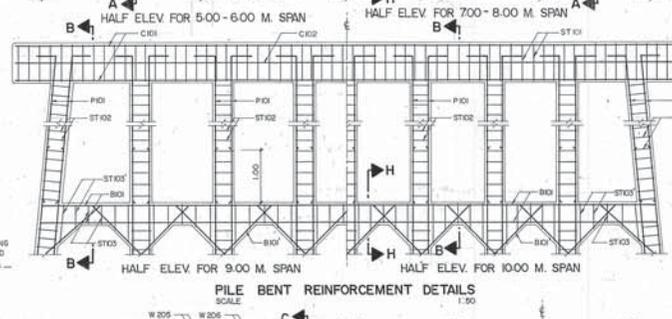
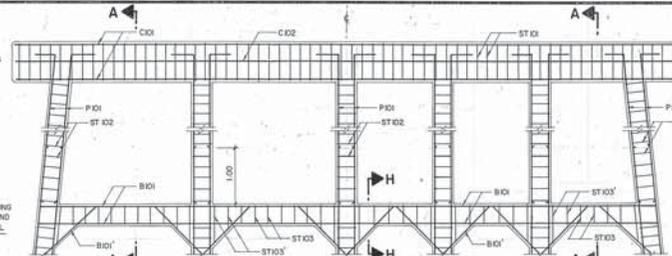
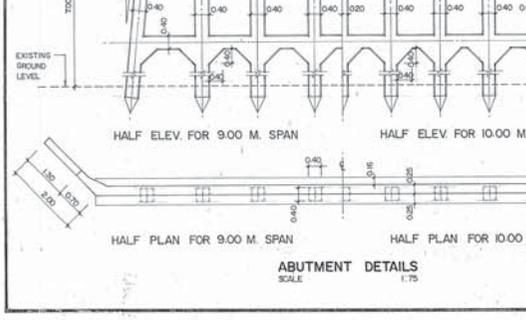
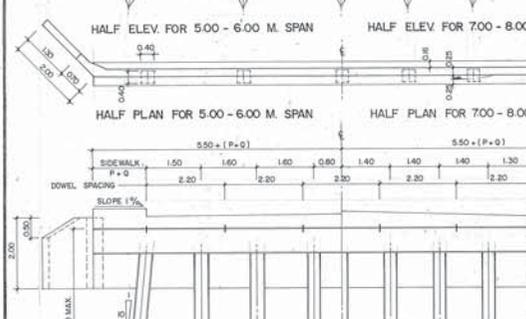
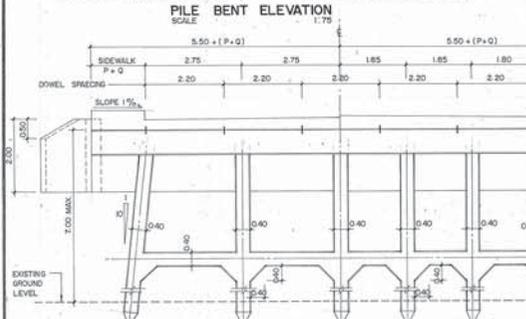
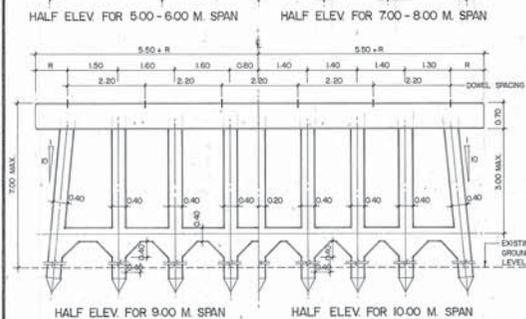
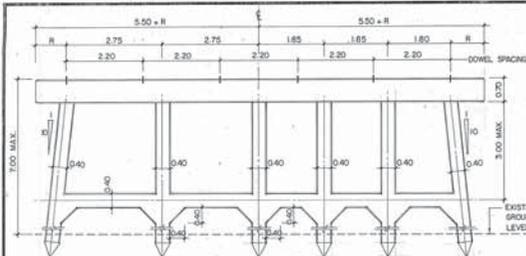
SECTION E-E
SCALE 1:50



ELEVATION
WINGWALL REINFORCEMENT DETAILS
SCALE 1:50

BAR BENDING DIAGRAM		TABLE OF REINFORCEMENT											
BAR MARK	NO.	SPAN 5.00 M	SPAN 6.00 M	SPAN 7.00 M	SPAN 8.00 M	SPAN 9.00 M	SPAN 10.00 M	L		L		L	
II	III	II	III	II	III	II	III	II	III	II	III	II	III
C201	8	8	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4	2	4
ST201	2	0.20	14	1.215	2	0.20	14	1.215	2	0.20	14	1.215	2
ST202	3	0.20	14	1.215	3	0.20	14	1.215	3	0.20	14	1.215	3
ST203	3	0.20	14	1.215	3	0.20	14	1.215	3	0.20	14	1.215	3
ST204	3	0.20	14	1.215	3	0.20	14	1.215	3	0.20	14	1.215	3
ST205	3	0.25	48	1.35	3	0.25	48	1.35	3	0.25	48	1.35	3
ST206	3	0.25	32	3	0.25	32	3	0.25	32	3	0.25	32	3
ST207	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30	12	2
B201	8	8	8	8	8	8	8	8	8	8	8	8	8
B202	6	32	155	6	32	155	6	32	155	6	32	155	6
CN201	8	20	9.25	8	20	9.25	8	20	9.25	8	20	9.25	8
CN202	8	20	2.31	8	20	2.31	8	20	2.31	8	20	2.31	8
F201	8	2	12.70	8	2	12.70	8	2	12.70	8	2	12.70	8
F202	8	2	13.90	8	2	13.90	8	2	13.90	8	2	13.90	8
F203	4	0.25	51	1.50	4	0.25	51	1.50	4	0.25	51	1.50	4
F204	4	6	12.70	4	6	12.70	4	6	12.70	4	6	12.70	4
W201	4	0.20	10	4	0.20	10	4	0.20	10	4	0.20	10	4
W202	2	0.30	46	2.70	2	0.30	46	2.70	2	0.30	46	2.70	2
W203	4	0.15	24	4	0.15	24	4	0.15	24	4	0.15	24	4
W204	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30	12	2
W205	2	4	2	4	2	4	2	4	2	4	2	4	2
W206	2	6	2	6	2	6	2	6	2	6	2	6	2
W207	4	0.15	26	2.15	4	0.15	26	2.15	4	0.15	26	2.15	4
W208	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4
W209	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535	2

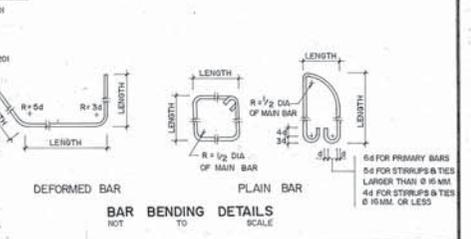
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BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
	#	NO	#	NO	#	NO	#	NO	#	NO	#	NO
VARIES												
C101	8	6	8	6	8	6	8	6	8	6	8	6
C102	4	2	4	2	4	2	4	2	4	2	4	2
ST101	3	020	64	235	3	020	64	235	3	020	64	235
ST102	3	020	70	135	3	020	70	135	3	020	98	135
ST103	3	025	16	135	3	025	16	135	3	025	14	135
ST103'	3	025	16	135	3	025	16	135	3	025	24	135
B101	8	4	8	4	8	4	8	4	8	4	8	4
B101'	8	4	8	4	8	4	8	4	8	4	8	4
B107	8	16	155	8	16	155	8	16	155	8	16	155
P101	8	20	375	8	20	375	8	20	375	8	20	375
C201	8	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4	2
ST201	2	020	14	1215	2	020	14	1295	2	020	14	1435
ST202	3	020	70	1745	3	020	70	1795	3	020	70	1895
ST203	3	020	70	135	3	020	70	135	3	020	70	135
ST204	3	020	70	135	3	020	70	135	3	020	98	135
ST205	3	025	16	135	3	025	16	135	3	025	14	135
ST206	3	025	16	135	3	025	16	135	3	025	24	135
B201	8	4	8	4	8	4	8	4	8	4	8	4
B201'	8	16	155	8	16	155	8	16	155	8	16	155
P201	8	20	375	8	20	375	8	20	375	8	20	375
W201	4	020	10	4	020	10	4	020	10	4	020	10
W202	2	030	47	260	2	030	47	260	2	030	47	260
W203	4	015	24	4	015	24	4	015	24	4	015	24
W204	2	030	12	2	030	12	2	030	12	2	030	12
W205	2	4	2	4	2	4	2	4	2	4	2	4
W206	2	6	2	6	2	6	2	6	2	6	2	6
W207	4	015	26	215	4	015	26	215	4	015	26	215
W208	4	2	5435	4	2	5435	4	2	5435	4	2	5435
W209	8	2	5330	8	2	5330	8	2	5330	8	2	5330

- NOTES:
- EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 90 TONS FOR PILE DETAILS SEE DWG NO MS-02, MS-03.
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING CANAL BED TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE CANAL BED EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 50 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 300 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 KG/CM² FOR A 0.15:0.85:0.15 Mixture AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. CONCRETE SHALL BE APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG
SAND	0.45 M ³
CRUSHED ROCK OR GRAVEL	0.85 M ³
CONCRETE SLUMP	MAX. 10 CM
 - REBAR # 4 OR LARGER SHALL BE TIS 24 GRADE 50.30 REFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT CEMENT TYPE 5 CONFORMING TO TIS 5 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING CANAL BED TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00 M.
 - THIS DRAWING IS ADAPTED FROM DOH DWG NO 3405-106-14/22.

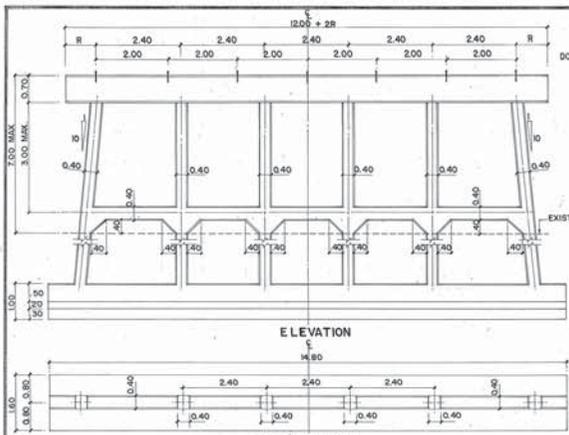


KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

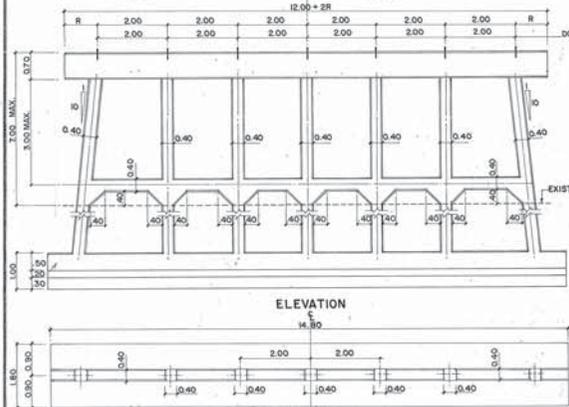
STANDARD DRAWING
 II.00 M ROADWAY WIDTH SLAB BRIDGE

DESIGNED: DOH & CONSULTANTS
 CHECKED: *[Signature]*
 APPROVED: *[Signature]*
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 (DIRECTOR GENERAL)

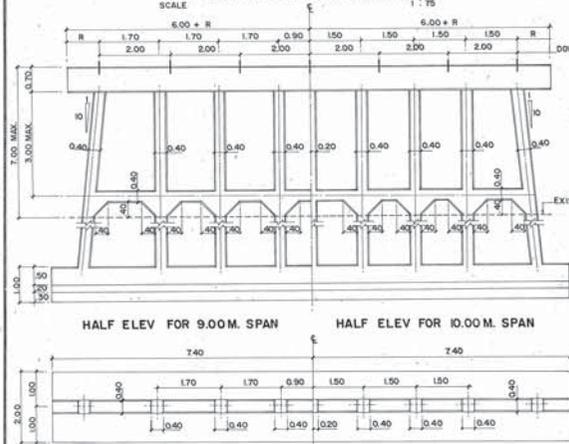
DATE: JULY 1994
 SCALE: AS SHOWN
 DWG. NO. ST-16
 SHEET NO. 129



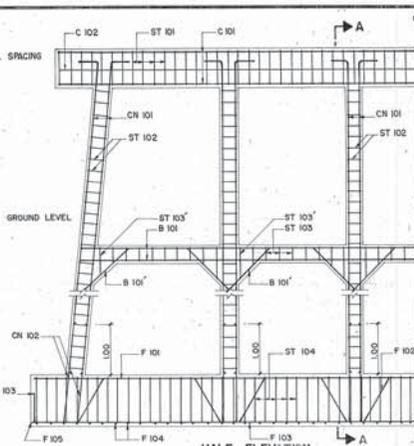
PIER DETAILS FOR 5.00- 6.00 M. SPAN
SCALE



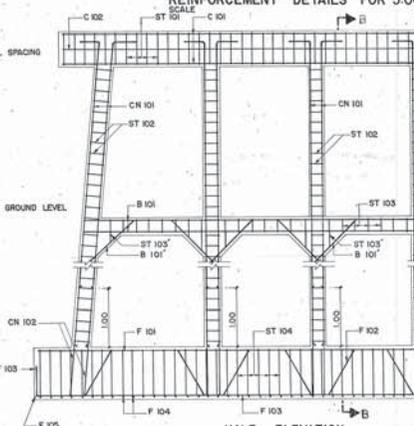
PIER DETAILS FOR 7.00- 8.00 M. SPAN
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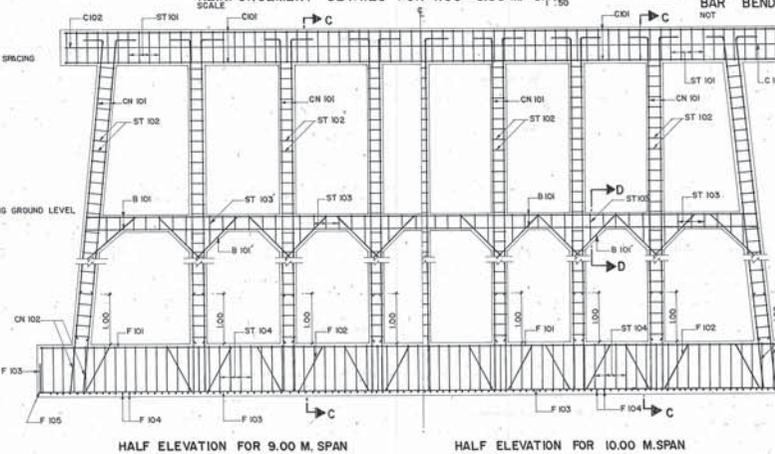
PIER DETAILS FOR 9.00 M. & 10.00 M. SPAN
SCALE



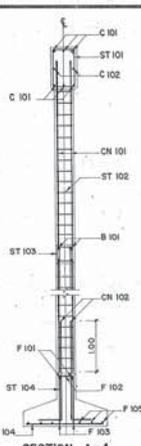
HALF ELEVATION REINFORCEMENT DETAILS FOR 5.00- 6.00 M. SPAN
SCALE



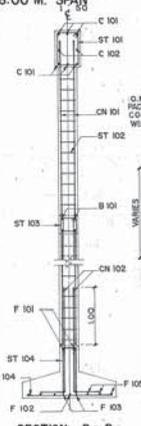
HALF ELEVATION REINFORCEMENT DETAILS FOR 7.00- 8.00 M. SPAN
SCALE



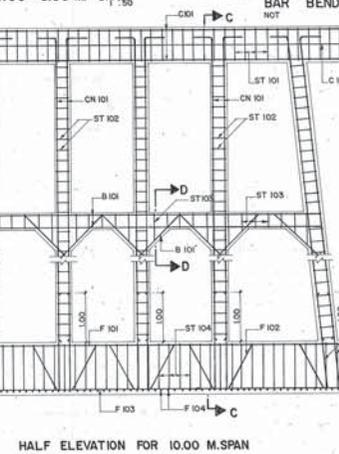
REINFORCEMENT DETAILS FOR 9.00 M. & 10.00 M. SPAN
SCALE



SECTION A-A



SECTION B-B



SECTION C-C

BAR BENDING DIAGRAMS		TABLE OF REINFORCEMENT																			
BAR MARK	II	④	NO.	L	II	④	NO.	L	II	④	NO.	L	II	④	NO.	L	II	④	NO.	L	
C 101	8	-	6	-	8	-	6	-	8	-	6	-	8	-	6	-	8	-	6	-	8
C 102	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4
CN 101	8	-	24	11.25	8	-	24	11.25	8	-	24	11.25	8	-	24	11.25	8	-	24	11.25	8
CN 102	8	-	24	2.31	8	-	24	2.31	8	-	24	2.31	8	-	24	2.31	8	-	24	2.31	8
ST 101	3	0.20	69	2.35	3	0.20	69	2.35	3	0.20	69	2.35	3	0.20	69	2.35	3	0.20	69	2.35	3
ST 102	3	0.20	288	1.35	3	0.20	288	1.35	3	0.20	336	1.35	3	0.20	336	1.35	3	0.20	336	1.35	3
ST 103	3	0.25	56	1.35	3	0.25	56	1.35	3	0.25	46	1.35	3	0.25	46	1.35	3	0.25	38	1.35	3
ST 104	3	0.25	40	-	3	0.25	40	-	3	0.25	48	-	3	0.25	48	-	3	0.25	56	-	3
ST 105	3	0.20	74	2.55	3	0.20	74	2.55	3	0.20	74	2.55	3	0.20	74	2.55	3	0.20	74	2.55	3
B 101	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
B 102	8	-	40	1.55	6	-	48	1.55	6	-	48	1.55	6	-	56	1.55	6	-	64	1.55	6
F 101	8	-	2	14.70	8	-	2	14.70	8	-	2	14.70	8	-	2	14.70	8	-	2	14.70	8
F 102	8	-	1	-	8	-	1	-	8	-	1	-	8	-	1	-	8	-	1	-	8
F 103	8	-	2	15.90	8	-	2	15.90	8	-	2	15.90	8	-	2	15.90	8	-	2	15.90	8
F 104	4	0.25	59	1.50	4	0.25	59	1.50	4	0.20	74	1.70	4	0.20	74	1.70	4	0.25	118	1.90	4
F 105	4	-	6	14.70	4	-	6	14.70	4	-	6	14.70	4	-	6	14.70	4	-	6	14.70	4



CAP BEAM DETAILS
SCALE



PLAIN BAR BAR BENDING DETAILS
SCALE



DEFORMED BAR BAR BENDING DETAILS
SCALE

- NOTES:
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTINGS HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACING SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0M, ADDITIONAL BRACING SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, AT WHICH CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 Kg/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 Kg/CM² FOR A 10x10x10 CM CUBE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	Kg
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP MAX.	10	CM
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE SD 30 DEFORMED BARS OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETER OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AN ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0M PIERS HIGHER THAN 7.0M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.0 M.
 - ALL DIMENSION SHOW ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWS. NO. 3AD5-106-14/B.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 12.00 ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING PIER DETAILS

DESIGNED : DOH. & CONSULTANTS	CHECKED : [Signature]	DATE JULY 1994
SUBMITTED : [Signature]	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED : [Signature]	(DIRECTOR GENERAL)	DWG. NO. ST.-17
		SHEET NO. 130

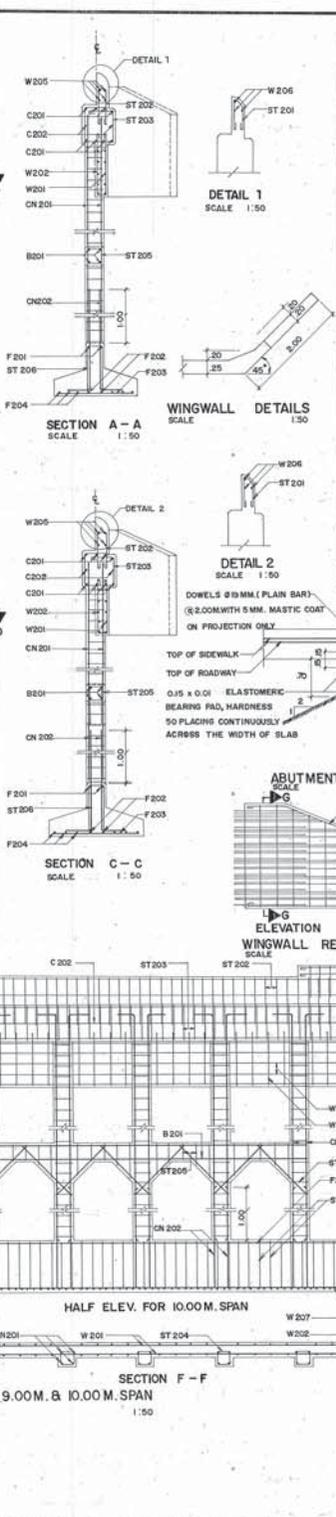
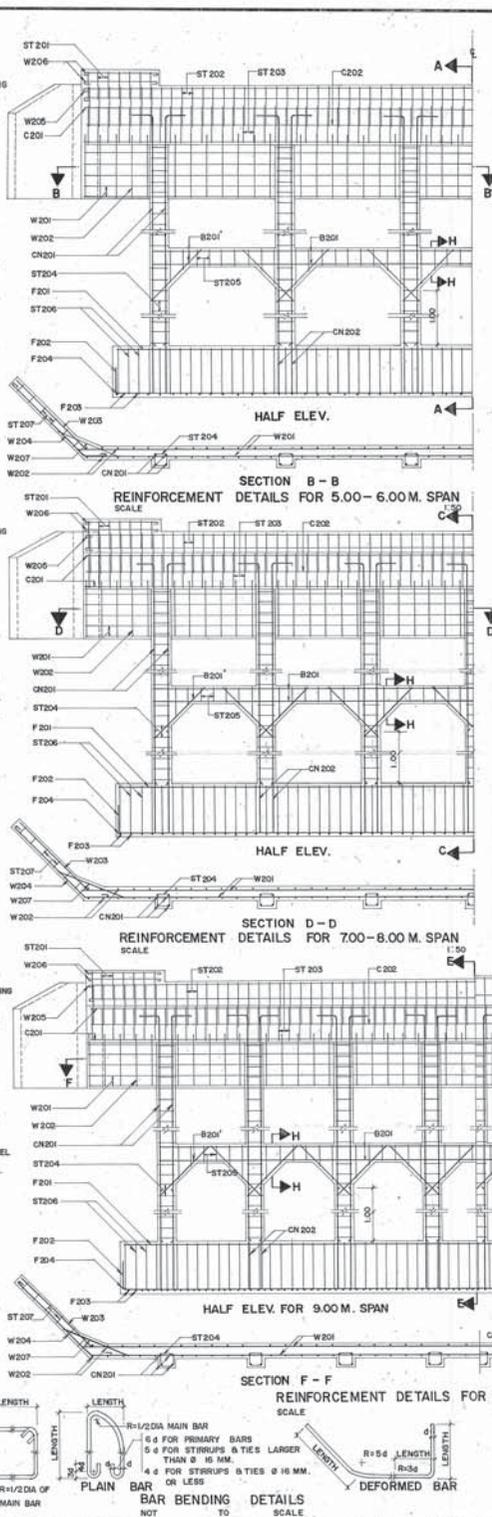
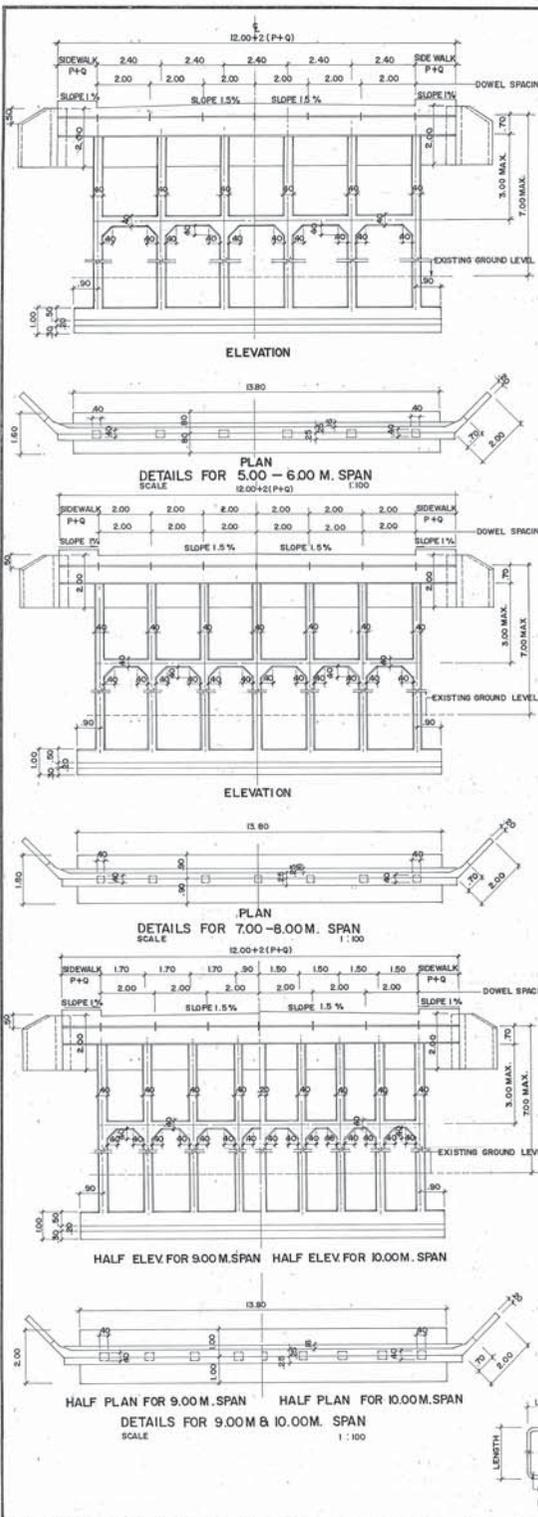


TABLE OF REINFORCEMENT

BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
	#	NO. L	#	NO. L								
C201	8	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4	2
ST201	2	20	14	2	20	14	2	20	14	2	20	14
ST202	3	20	75	3	20	75	3	20	75	3	20	75
ST203	3	20	75	3	20	75	3	20	75	3	20	75
ST204	3	20	234	135	3	20	234	135	3	20	234	135
ST205	3	25	50	135	3	25	50	135	3	25	50	135
ST206	3	25	40	3	25	40	3	25	40	3	25	40
ST207	2	30	12	2	30	12	2	30	12	2	30	12
B201	8	12	30	8	12	30	8	12	30	8	12	30
B201'	6	40	155	6	40	155	6	40	155	6	40	155
CN201	8	24	925	8	24	925	8	24	925	8	24	925
CN202	8	24	231	8	24	231	8	24	231	8	24	231
F201	8	2	1370	8	2	1370	8	2	1370	8	2	1370
F202	8	2	1490	8	2	1490	8	2	1490	8	2	1490
F203	4	25	55	150	4	25	55	150	4	25	55	150
F204	4	6	1370	4	6	1370	4	6	1370	4	6	1370
W201	4	20	10	4	20	10	4	20	10	4	20	10
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W203	4	15	24	4	15	24	4	15	24	4	15	24
W204	2	30	12	2	30	12	2	30	12	2	30	12
W205	2	4	105	2	4	105	2	4	105	2	4	105
W206	2	6	155	2	6	155	2	6	155	2	6	155
W207	4	15	26	215	4	15	26	215	4	15	26	215
W208	4	2	5435	4	2	5435	4	2	5435	4	2	5435
W209	2	2	5535	2	2	5535	2	2	5535	2	2	5535

BAR BENDING DIAGRAMS

NOTES:

- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE FOOTING HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND, COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
- SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
- HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS AT WHICH A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 kg/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 kg /CM² FOR A 15 x 15 x 15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	kg
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP MAX.	10	CM
- REBARS # 4 OR LARGER SHALL BE TYPE 24 GRADE S030 DEFORMED BARS OTHERS SHALL BE TYPE 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPES CONFORMING TO IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
- THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 20 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.0 M.
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- THIS DRAWING IS ADAPTED FROM DCM DWG. NO. 3426-106-147/8.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

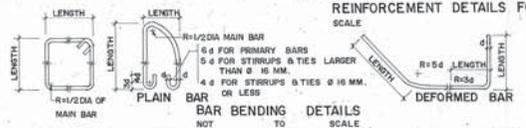
STANDARD DRAWING
 12.00 M. ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTINGS ABUTMENT DETAILS

DESIGNED : DOH. & CONSULTANTS CHECKED : [Signature] DATE JULY 1994

SUBMITTED : [Signature] SCALE AS SHOWN

APPROVED : [Signature] DWG. NO. ST-18

[Signature] (DIRECTOR GENERAL) SHEET NO. 131



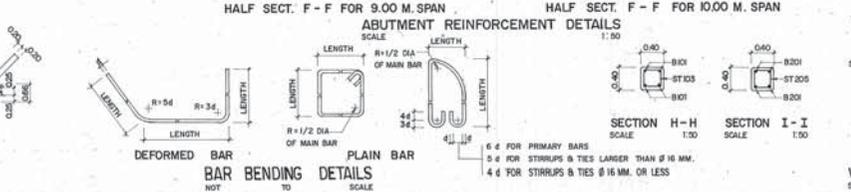
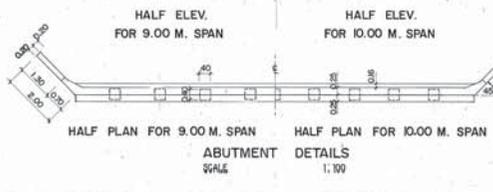
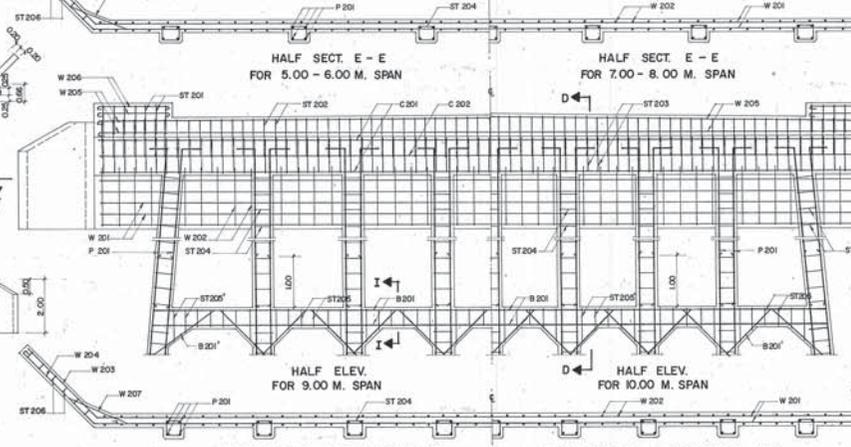
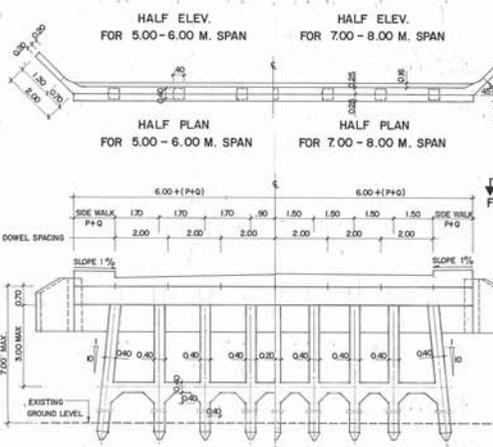
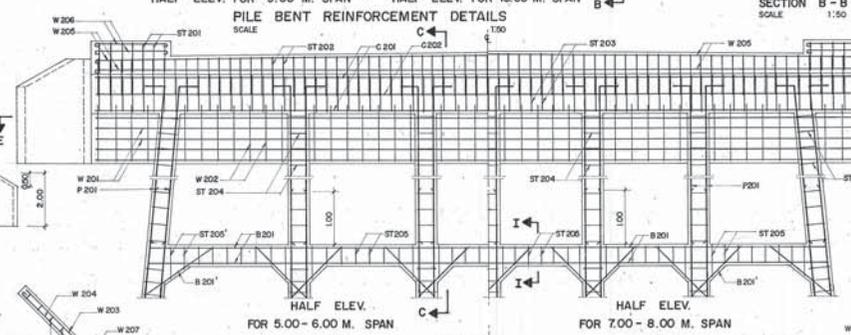
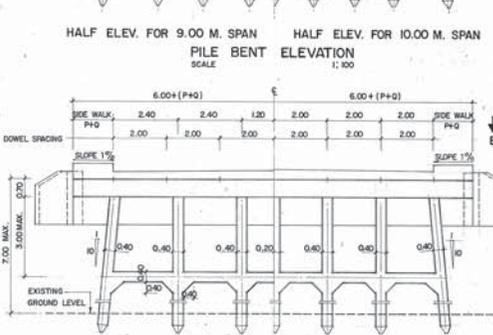
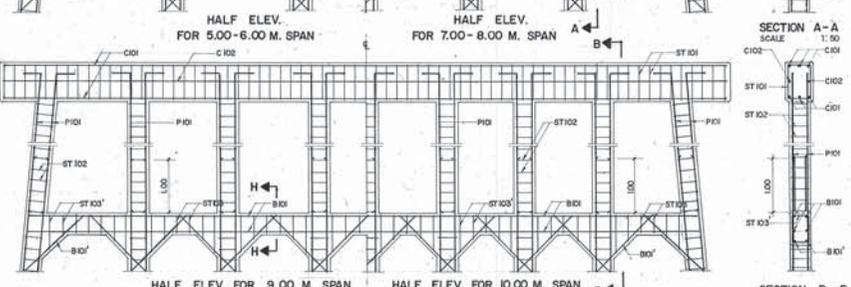
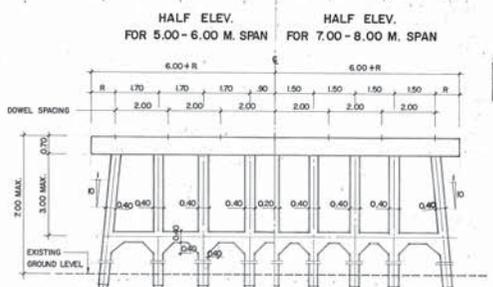
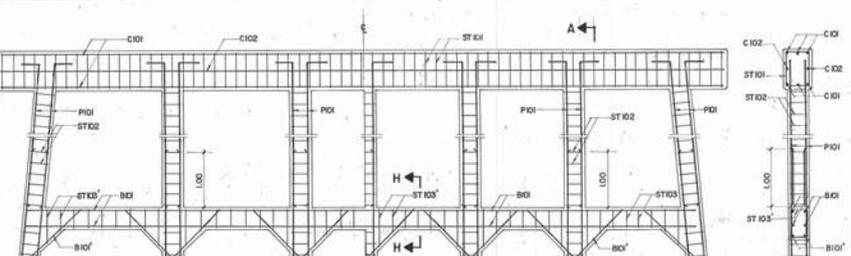
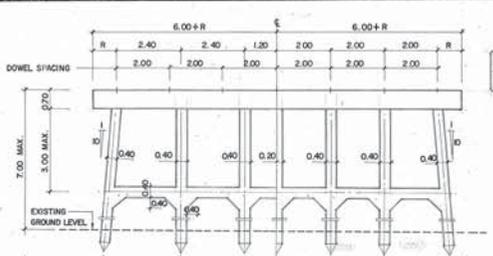
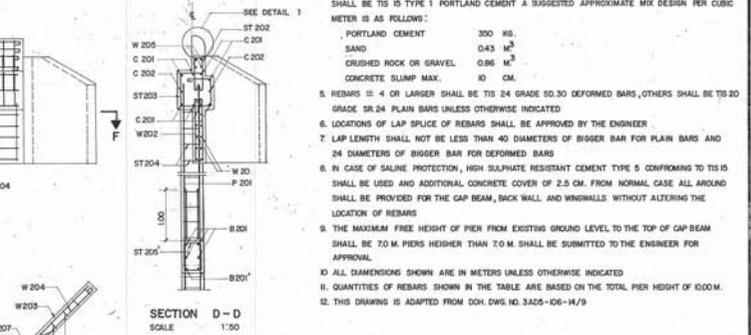
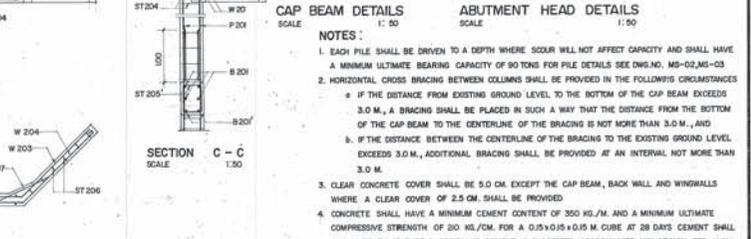
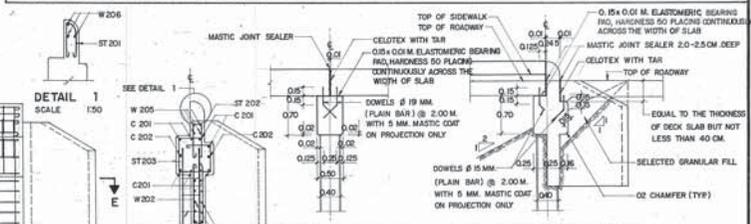


		TABLE OF REINFORCEMENT																		
		SPAN 5.00 M			SPAN 6.00 M			SPAN 7.00 M			SPAN 8.00 M			SPAN 9.00 M			SPAN 10.00 M			
		#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	
PILE BENT	VARIES																			
	C101	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	
	C102	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	
	ST101	3	0.30	2.35	3	0.30	2.35	3	0.30	2.35	3	0.30	2.35	3	0.30	2.35	3	0.30	2.35	
	ST102	3	0.30	84	1.35	3	0.30	84	1.35	3	0.30	98	1.35	3	0.30	98	1.35	3	0.30	135
	ST103	3	0.30	31	1.35	3	0.30	31	1.35	3	0.30	31	1.35	3	0.30	31	1.35	3	0.30	135
	ST104	3	0.30	16	3	0.30	16	3	0.30	24	3	0.30	24	3	0.30	28	3	0.30	28	3
	B101	8	4	8	4	8	4	8	4	8	4	8	4	8	4	8	4	8	4	1.35
	B101'	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	32
	P101	8	24	3.75	8	24	3.75	8	24	3.75	8	24	3.75	8	24	3.75	8	24	3.75	36
ABUTMENT	VARIES																			
	C201	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8	6	8
	C202	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4
	ST201	2	0.30	1.875	2	0.30	1.875	2	0.30	1.875	2	0.30	1.875	2	0.30	1.875	2	0.30	1.875	1.665
	ST202	3	0.30	1.745	3	0.30	1.745	3	0.30	1.845	3	0.30	1.845	3	0.30	1.945	3	0.30	1.945	1.995
	ST203	3	0.30	1	3	0.30	1	3	0.30	1	3	0.30	1	3	0.30	1	3	0.30	1	3
	ST204	3	0.30	84	1.35	3	0.30	84	1.35	3	0.30	98	1.35	3	0.30	112	1.35	3	0.30	135
	ST205	3	0.30	12	3	0.30	12	3	0.30	12	3	0.30	12	3	0.30	12	3	0.30	12	3
	B201	8	4	8	4	8	4	8	4	8	4	8	4	8	4	8	4	8	4	1.35
	B201'	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	6	15.5	32
P201	8	24	3.75	8	24	3.75	8	24	3.75	8	24	3.75	8	24	3.75	8	24	3.75	36	
WINGWALL	VARIES																			
	W201	4	0.20	10	4	0.20	10	4	0.20	10	4	0.20	10	4	0.20	10	4	0.20	10	2.40
	W202	2	0.30	2.70	2	0.30	2.70	2	0.30	2.70	2	0.30	2.70	2	0.30	2.70	2	0.30	2.70	2.40
	W203	4	0.15	24	4	0.15	24	4	0.15	24	4	0.15	24	4	0.15	24	4	0.15	24	2.40
	W204	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30	12	2.40
	W205	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2	4	2
	W206	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2	6	2
	W207	4	0.15	26	2.15	4	0.15	26	2.15	4	0.15	26	2.15	4	0.15	26	2.15	4	0.15	26
	W208	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4	2	5.435	4
	W209	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535	2	2	5.535	2



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

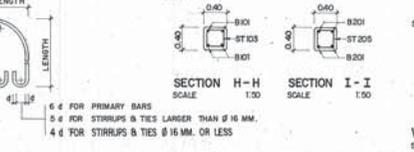
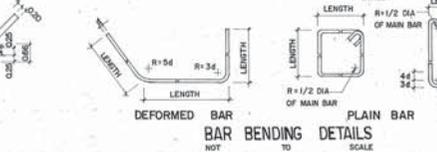
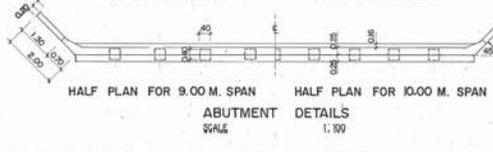
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 12.00 M. ROADWAY WIDTH SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

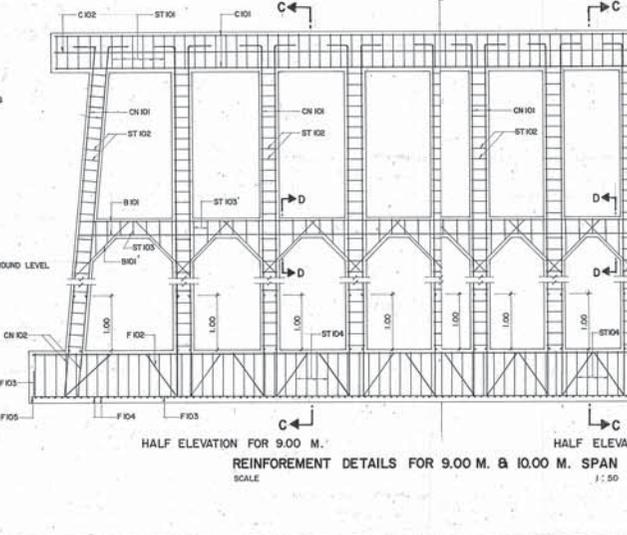
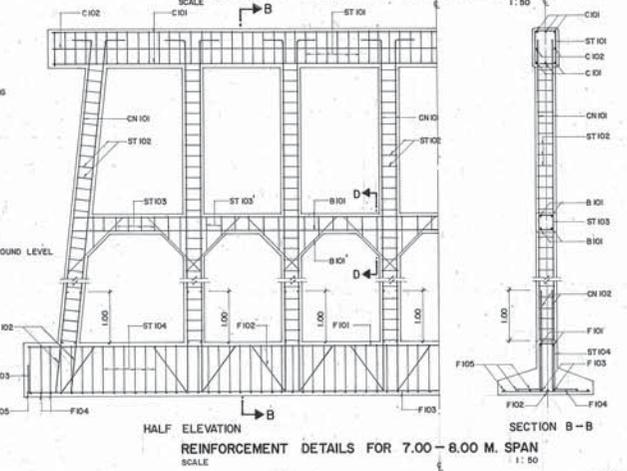
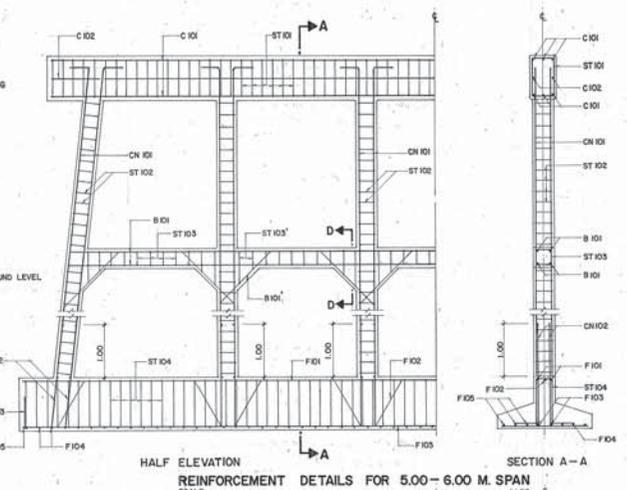
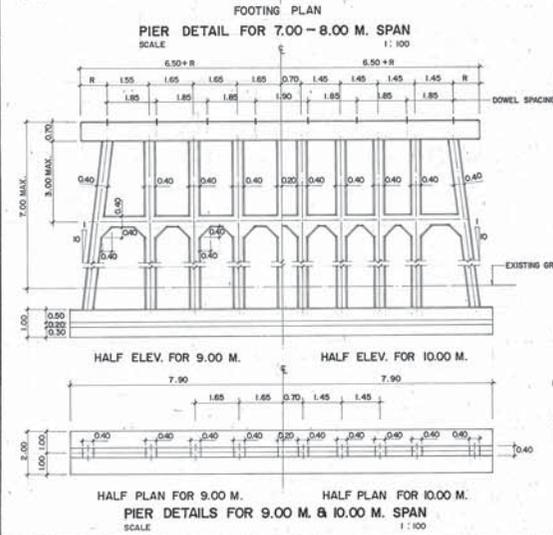
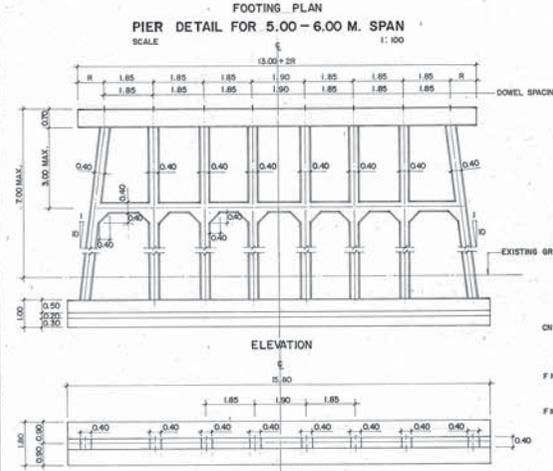
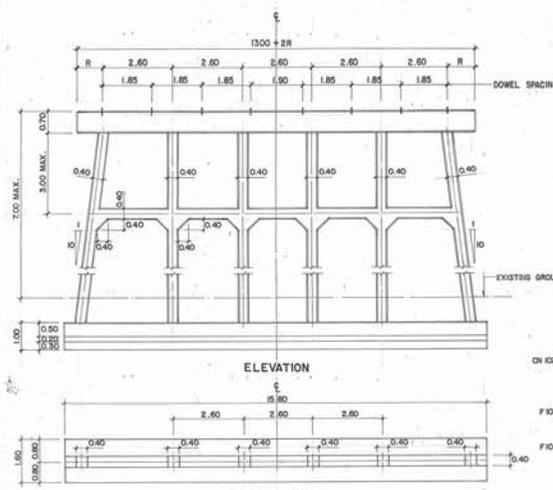
DESIGNED : DOH & CONSULTANTS
 CHECKED : [Signature]
 DATE : JULY 1994

SUBMITTED : [Signature]
 (DIRECTOR OF LOCATION & DESIGN DIVISION)

APPROVED : [Signature]
 (P/PL (DIRECTOR GENERAL))

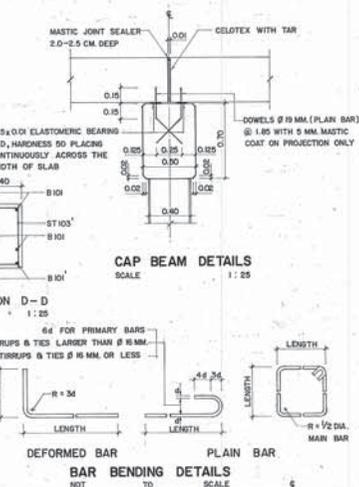
SCALE AS SHOWN
 DWG. NO. ST-19
 SHEET NO. 132





BAR BENDING DIAGRAM	MARK	SPAN 5.00 M.				SPAN 6.00 M.				SPAN 7.00 M.				SPAN 8.00 M.				SPAN 9.00 M.				SPAN 10.00 M.						
		#	Ø	NO.	L	#	Ø	NO.	L																			
C101	8	—	6	—	8	—	6	—	8	—	6	—	8	—	6	—	8	—	6	—	8	—	6	—	8	—	6	—
C102	4	—	2	—	4	—	2	—	4	—	2	—	4	—	2	—	4	—	2	—	4	—	2	—	4	—	2	—
CH101	8	—	24	11.25	8	—	24	11.25	8	—	32	11.25	8	—	32	11.25	8	—	36	11.25	8	—	40	11.25	8	—	40	11.25
CH102	8	—	24	2.31	8	—	24	2.31	8	—	32	2.31	8	—	32	2.31	8	—	36	2.31	8	—	40	2.31	8	—	40	2.31
ST101	3	0.20	74	2.35	3	0.20	74	2.35	3	0.20	74	2.35	3	0.20	74	2.35	3	0.20	74	2.35	3	0.20	74	2.35	3	0.20	74	2.35
ST102	3	0.20	288	1.35	3	0.20	288	1.35	3	0.20	384	1.35	3	0.20	384	1.35	3	0.20	432	1.35	3	0.20	480	1.35	3	0.20	480	1.35
ST103	3	0.25	78	1.35	3	0.25	78	1.35	3	0.25	96	1.35	3	0.25	96	1.35	3	0.25	108	1.35	3	0.25	120	1.35	3	0.25	120	1.35
ST103'	3	—	24	—	3	—	24	—	3	—	32	—	3	—	32	—	3	—	36	—	3	—	40	—	3	—	40	—
ST104	3	0.20	79	2.55	3	0.20	79	2.55	3	0.20	79	2.55	3	0.20	79	2.55	3	0.20	79	2.55	3	0.20	79	2.55	3	0.20	79	2.55
B101	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—	8	—
B101'	8	—	24	1.55	8	—	24	1.55	8	—	32	1.55	8	—	32	1.55	8	—	36	1.55	8	—	40	1.55	8	—	40	1.55
F101	8	—	2	15.70	8	—	2	15.70	8	—	2	15.70	8	—	2	15.70	8	—	2	15.70	8	—	2	15.70	8	—	2	15.70
F102	8	—	1	—	8	—	1	—	8	—	1	—	8	—	1	—	8	—	1	—	8	—	1	—	8	—	1	—
F103	8	—	2	16.90	8	—	2	16.90	8	—	2	16.90	8	—	2	16.90	8	—	2	16.90	8	—	2	16.90	8	—	2	16.90
F104	4	0.25	63	1.50	4	0.25	63	1.50	4	0.25	79	1.70	4	0.25	79	1.70	4	0.25	105	1.90	4	0.25	120	1.90	4	0.25	120	1.90
F105	4	—	6	15.70	4	—	6	15.70	4	—	6	15.70	4	—	6	15.70	4	—	6	15.70	4	—	6	15.70	4	—	6	15.70

Ø 3 = ϕ 3/8" OR 9 MM., Ø 4 = ϕ 1/2" OR 12 MM., Ø 6 = ϕ 3/4" OR 20 MM., Ø 8 = ϕ 1" OR 25 MM., NO. 1 = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR



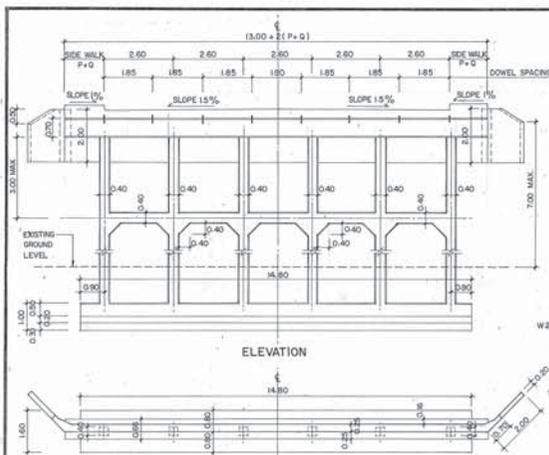
- NOTES :
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACINGS BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES :
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEED 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEED 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 Kg/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 Kg/CM² FOR A 15:15:15 M. CURE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS :

PORTLAND CEMENT	350	Kg.
SAND	0.45	m ³
CRUSHED ROCK OR GRAVEL	0.85	m ³
CONCRETE SLUMP MIX.	10	CM.
 - REBARS Ø 4 OR LARGER SHALL BE TIS 24 GRADE SD30 DEFORMED BARS OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING CANAL BED TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.0 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3425-105-H/23.

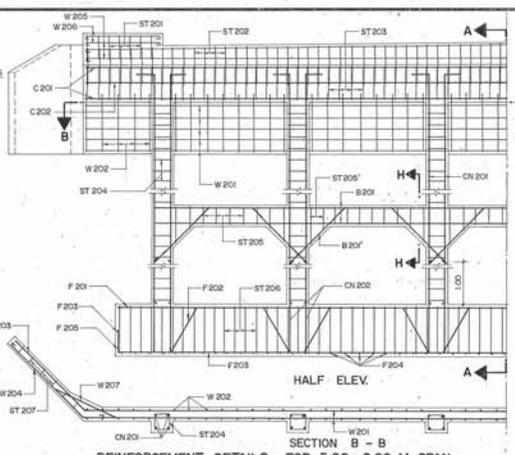
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 13.00 ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING PIER DETAILS

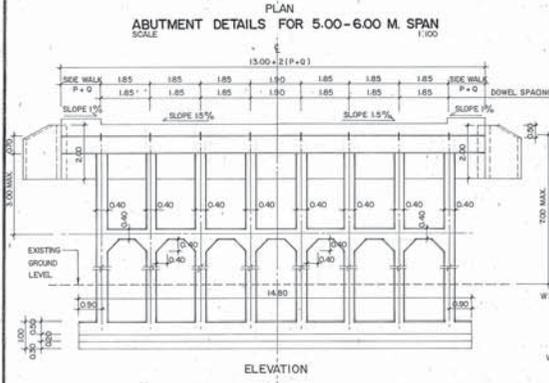
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE : JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE : AS SHOWN
APPROVED :	<i>[Signature]</i> FOR DIRECTOR GENERAL	DWG. NO. ST-20
		SHEET NO. 133



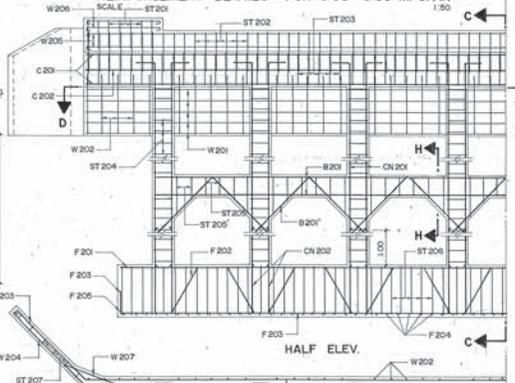
PLAN ABUTMENT DETAILS FOR 5.00-6.00 M SPAN
SCALE 1:100



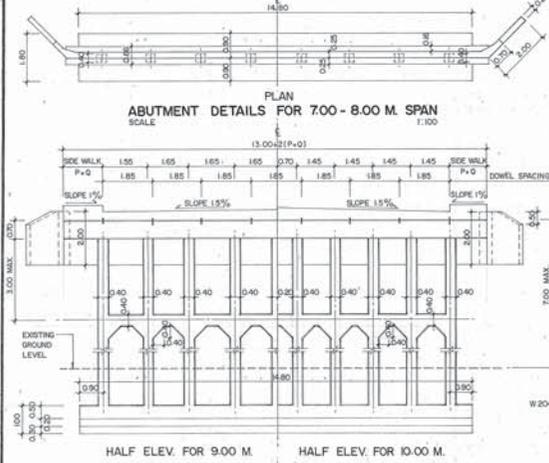
REINFORCEMENT DETAILS FOR 5.00-6.00 M SPAN
SCALE 1:50



PLAN ABUTMENT DETAILS FOR 7.00-8.00 M SPAN
SCALE 1:100

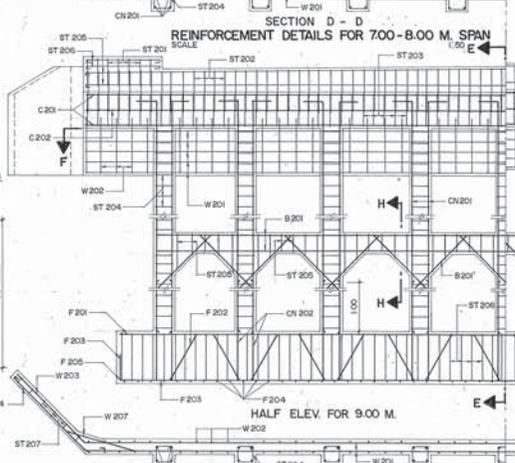


REINFORCEMENT DETAILS FOR 7.00-8.00 M SPAN
SCALE 1:50

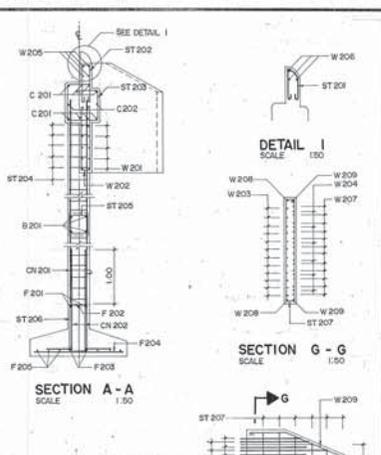


HALF PLAN FOR 9.00 M. HALF PLAN FOR 10.00 M.

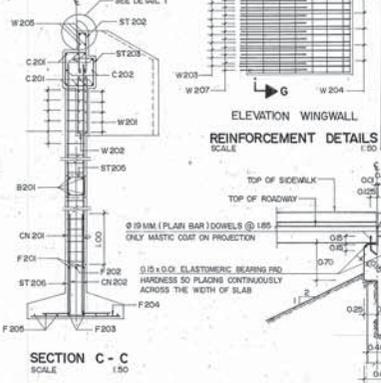
ABUTMENT DETAILS FOR 9.00 M. & 10.00 M. SPAN
SCALE 1:100



REINFORCEMENT DETAILS FOR 9.00 M. & 10.00 M. SPAN
SCALE 1:50

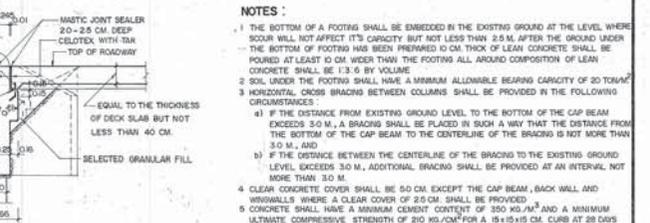


SECTION A-A SCALE 1:50

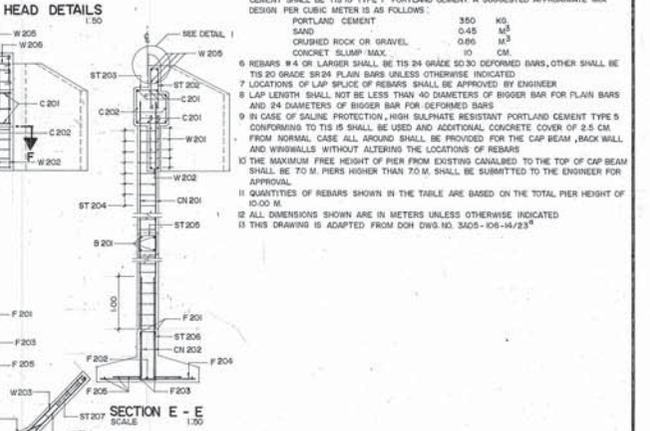


SECTION C-C SCALE 1:50

TABLE OF REINFORCEMENT		SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M					
BAR MARK	#	@	NO	L	#	@	NO	L	#	@	NO	L	#	@	NO	L	
C201	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
C202	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4
ST201	2	0.20	14	1.25	2	0.20	14	1.25	2	0.20	14	1.25	2	0.20	14	1.25	2
ST202	3	0.20	80	1.76	3	0.20	80	1.76	3	0.20	80	1.76	3	0.20	80	1.76	3
ST203	3	0.20	80	-	3	0.20	80	-	3	0.20	80	-	3	0.20	80	-	3
ST204	3	0.20	234	1.35	3	0.20	234	1.35	3	0.20	234	1.35	3	0.20	234	1.35	3
ST205	3	0.25	50	1.85	3	0.25	50	1.85	3	0.25	50	1.85	3	0.25	50	1.85	3
ST206	3	-	40	-	3	-	40	-	3	-	40	-	3	-	40	-	3
ST207	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2
ST208	3	0.20	74	2.55	3	0.20	74	2.55	3	0.20	74	2.55	3	0.20	74	2.55	3
ST209	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2
ST210	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST211	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4
ST212	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST213	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST214	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST215	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST216	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST217	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST218	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST219	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST220	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST221	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST222	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST223	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST224	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST225	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST226	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST227	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST228	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST229	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
ST230	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8



ABUTMENT HEAD DETAILS
SCALE 1:50



SECTION E-E SCALE 1:30

- NOTES:**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.0 M AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED TO THE THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WITHIN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 30 TON/M².
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACING SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR COVER COVER SHALL BE 50 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS (WHERE A CLEAR COVER OF 25 CM SHALL BE PROVIDED).
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 15x15x15 CM. CURB AT 28 DAYS CEMENT SHALL BE TYPE I PORTLAND CEMENT A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	KG
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.85	M ³
CONCRETE SLUMP	MAX.	10
	CM	
 - REBARS #4 OR LARGER SHALL BE TIS 24 GRADE 50 30 DEFORMED BARS, OTHER SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF REBAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 6 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIERS FROM EXISTING CANALIZED TO THE TOP OF CAP BEAM SHALL BE 70 M. PIERS HIGHER THAN 70 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DCH DWG. NO. 3405-106-14/23.

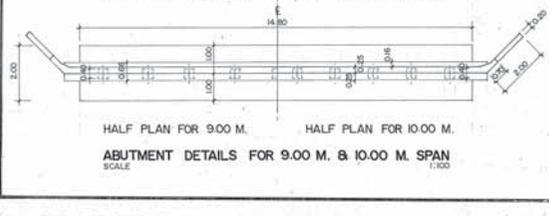
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
13.00 M. ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING ABUTMENT DETAILS

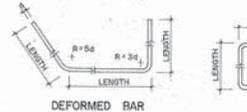
DESIGNED: DOH & CONSULTANTS
 SUBMITTED: *P. Bannan*
 APPROVED: *P. Bannan*

CHECKED: *V. Jit*
 DATE: JULY 1994

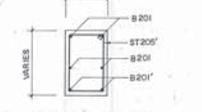
SCALE AS SHOWN
 DWG. NO. ST-21
 SHEET NO. 134



WINGWALL DETAILS
SCALE 1:50

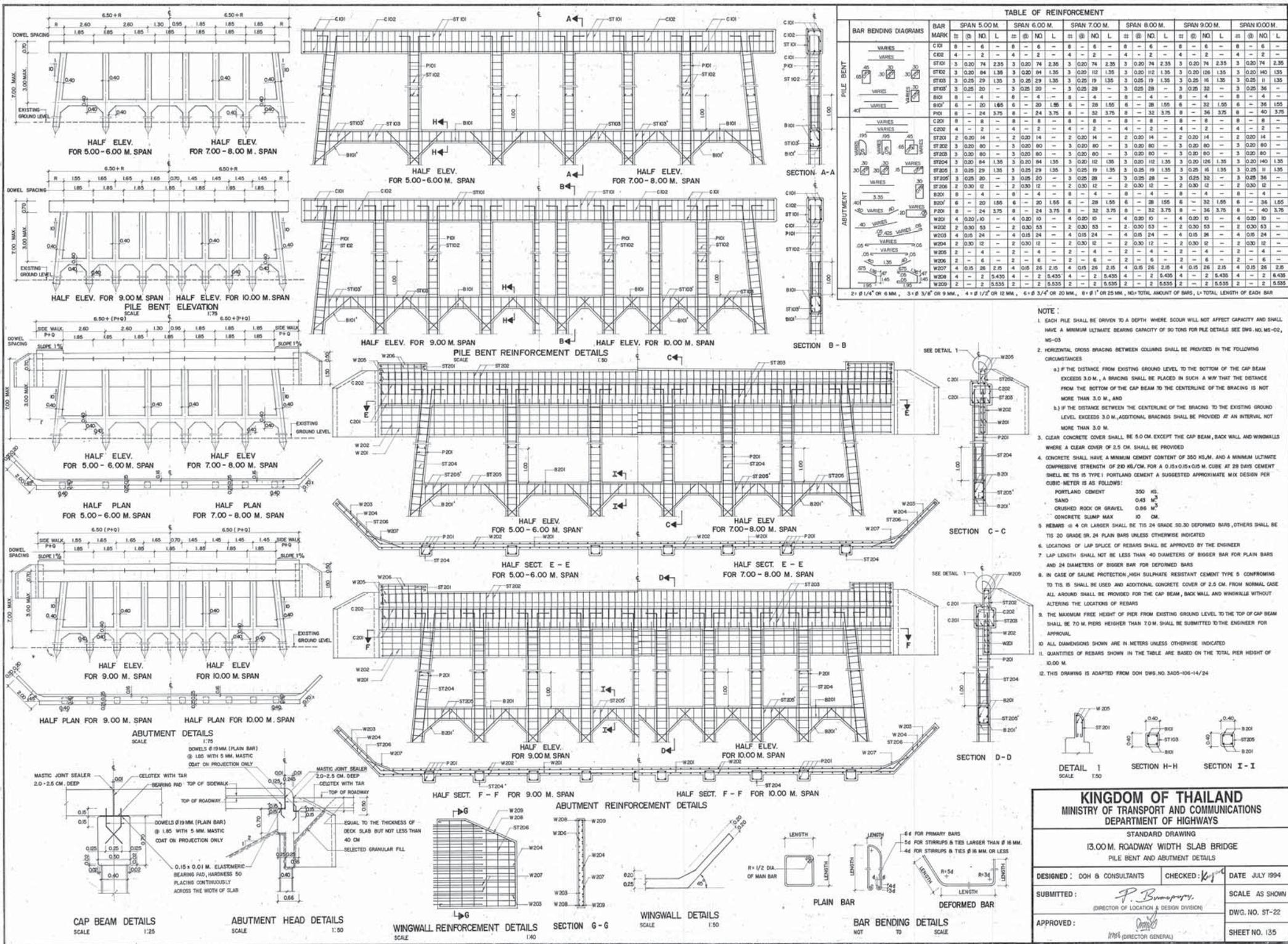


BAR BENDING DETAILS
NOT TO SCALE



SECTION H-H
SCALE 1:25

#4 FOR PRIMARY BARS
 #6 FOR STRUTS & TIES
 LARGER THAN #15 MM.
 #4 FOR STRUTS & TIES
 #16 MM. OR LESS



BAR MARK	SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M	
	#	Ø	NO	L	#	Ø	NO	L	#	Ø	NO	L
C101	8	6	8	6	8	6	8	6	8	6	8	6
C102	4	2	4	2	4	2	4	2	4	2	4	2
ST101	3	0.20	74	2.35	3	0.20	74	2.35	3	0.20	74	2.35
ST102	3	0.20	84	1.35	3	0.20	84	1.35	3	0.20	84	1.35
ST103	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST104	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST105	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST106	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST107	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST108	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST109	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST110	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST111	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST112	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST113	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST114	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST115	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST116	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST117	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST118	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST119	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST120	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST121	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST122	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST123	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST124	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST125	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST126	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST127	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST128	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST129	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST130	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST131	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST132	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST133	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST134	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST135	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST136	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST137	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST138	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST139	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST140	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST141	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST142	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST143	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST144	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST145	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST146	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST147	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST148	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST149	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35
ST150	3	0.25	29	1.35	3	0.25	29	1.35	3	0.25	29	1.35

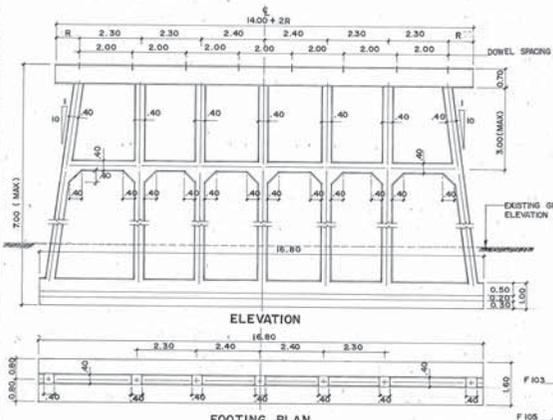
- NOTE:
- EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 90 TONS PER PILE DETAILS SEE DWG. NO. MS-02, MS-03
 - HORIZONTAL CROSS BRACINGS BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A MANNER THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 N/MM² FOR A 0.15:0.15:0.15 M. CURE AT 28 DAYS CEMENT SHELL BE TIS IS TYPE I PORTLAND CEMENT A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG
SAND	0.45 M ³
CRUSHED ROCK OR GRAVEL	0.86 M ³
CONCRETE SLUMP MAX	25 CM
 - REBARS 4 OR LARGER SHALL BE TIS 24 GRADE 50.30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE 50.24 PLAIN BARS UNLESS OTHERWISE INDICATED
 - LOCATIONS OF LAP SPICES OF REBARS SHALL BE APPROVED BY THE ENGINEER
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT CEMENT TYPE B CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00 M
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3A05-105-14/24

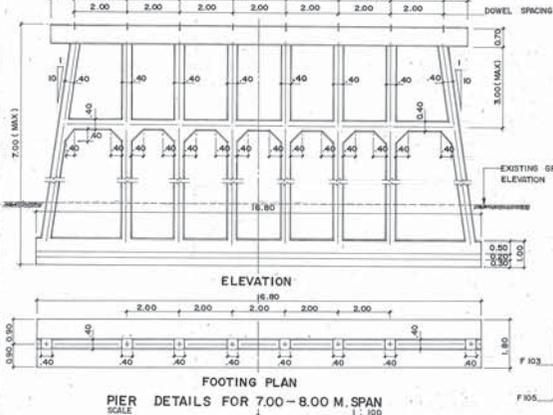
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 13.00 M. ROADWAY WIDTH SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

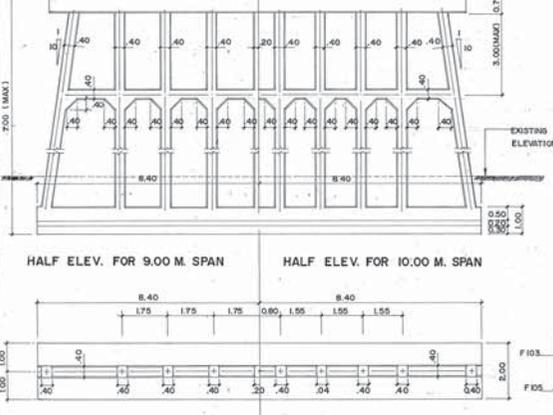
DESIGNED: DOH & CONSULTANTS	CHECKED: <i>K. J.</i>	DATE JULY 1994
SUBMITTED: <i>P. B.</i>	SCALE AS SHOWN	DWG. NO. ST-22
APPROVED: <i>P.</i>	MMH (DIRECTOR GENERAL)	SHEET NO. 135



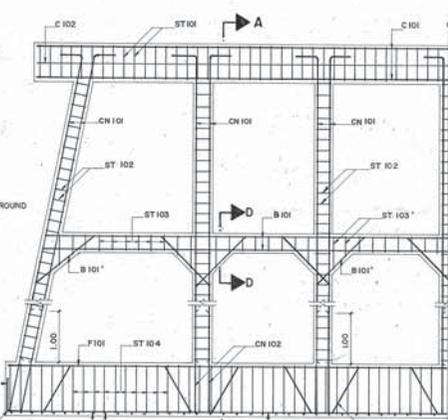
PIER DETAILS FOR 5.00 - 6.00 M. SPAN
SCALE 1:100



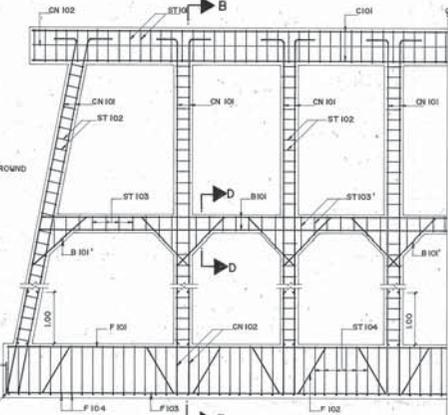
PIER DETAILS FOR 7.00 - 8.00 M. SPAN
SCALE 1:100



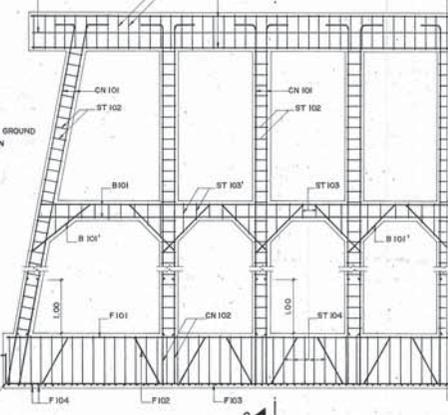
PIER DETAILS FOR 9.00 M. & 10.00 M. SPAN
SCALE 1:100



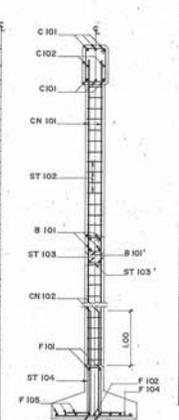
HALF ELEVATION REINFORCEMENT DETAILS FOR 5.00-6.00 M. SPAN
SCALE 1:50



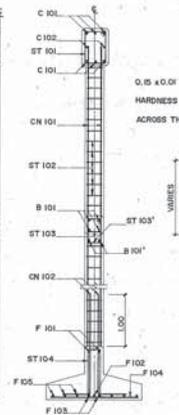
HALF ELEVATION REINFORCEMENT DETAILS FOR 7.00 - 8.00 M.
SCALE 1:50



HALF ELEVATION FOR 9.00 M. SPAN
SCALE 1:50



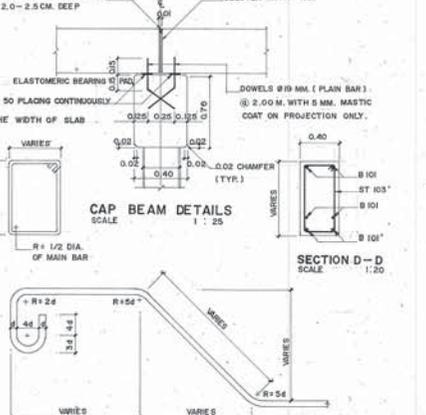
SECTION A - A



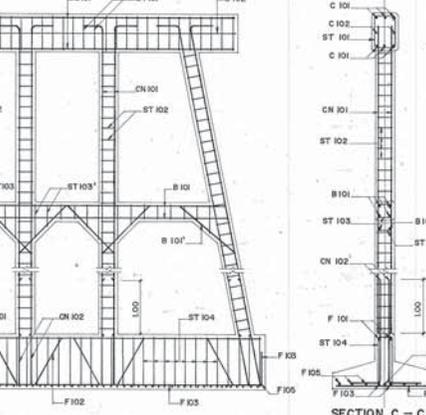
SECTION B - B

TABLE OF REINFORCEMENT		SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.			
BAR MARK	NO.	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L		
C 101	8	6	15.75	8	6	15.75	8	6	15.75	8	6	15.75	8	6	15.75
C 102	4	2	15.75	4	2	15.75	4	2	15.75	4	2	15.75	4	2	15.75
CN 101	8	28	11.25	8	28	11.25	8	32	11.25	8	36	11.25	8	40	11.25
CN 102	8	28	2.31	8	28	2.31	8	32	2.31	8	36	2.31	8	40	2.31
ST 101	3	0.20	79	3	0.20	79	3	0.20	79	3	0.20	79	3	0.20	79
ST 102	3	0.20	336	3	0.20	336	3	0.20	384	3	0.20	432	3	0.20	480
ST 103	3	0.25	62	3	0.25	62	3	0.25	52	3	0.25	42	3	0.25	28
ST 103'	3	3	48	3	3	48	3	3	56	3	3	64	3	3	72
ST 104	3	0.20	84	3	0.20	84	3	0.20	84	3	0.20	84	3	0.20	84
B 101	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
B 101'	6	48	1.55	6	48	1.55	6	56	1.55	6	64	1.55	6	72	1.55
F 101	8	2	16.75	8	2	16.75	8	2	16.75	8	2	16.75	8	2	16.75
F 102	8	1	8	8	1	8	8	1	8	8	1	8	8	1	8
F 103	8	2	17.95	8	2	17.95	8	2	17.95	8	2	17.95	8	2	17.95
F 104	4	0.25	67	4	0.25	67	4	0.20	84	4	0.25	134	4	0.25	134
F 105	4	6	16.75	4	6	16.75	4	6	16.75	4	6	16.75	4	6	16.75

REINFORCEMENT BAR BENDING DIAGRAMS



CAP BEAM DETAILS SCALE 1:25



SECTION D - D SCALE 1:20

NOTES:

- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SODUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
- SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
- HORIZONTAL CROSS BRACING BETWEEN COLLUMING SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACINGS TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, AT WHICH A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 Kg/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 Kg/CM² FOR A 15 X 15 X 15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	Kg
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP MAX.	10	CM.
- REBAR# 4 OR LARGER SHALL BE T1524 GRADE S030 DEFORMED BARS OTHERS SHALL BE T1520 GRADE SR24 PLAN BARS UNLESS OTHERWISE INFORMED.
- LOCATIONS OF LAP SPLICE OF REBAR SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO T15 IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBAR.
- THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- QUANTITIES OF REBAR SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.0 M.
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3AD5-106-14/10

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 14.00 M. ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING PIER DETAILS

DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> 1975 (DIRECTOR GENERAL)	DWG. NO. ST-23
		SHEET NO. 136

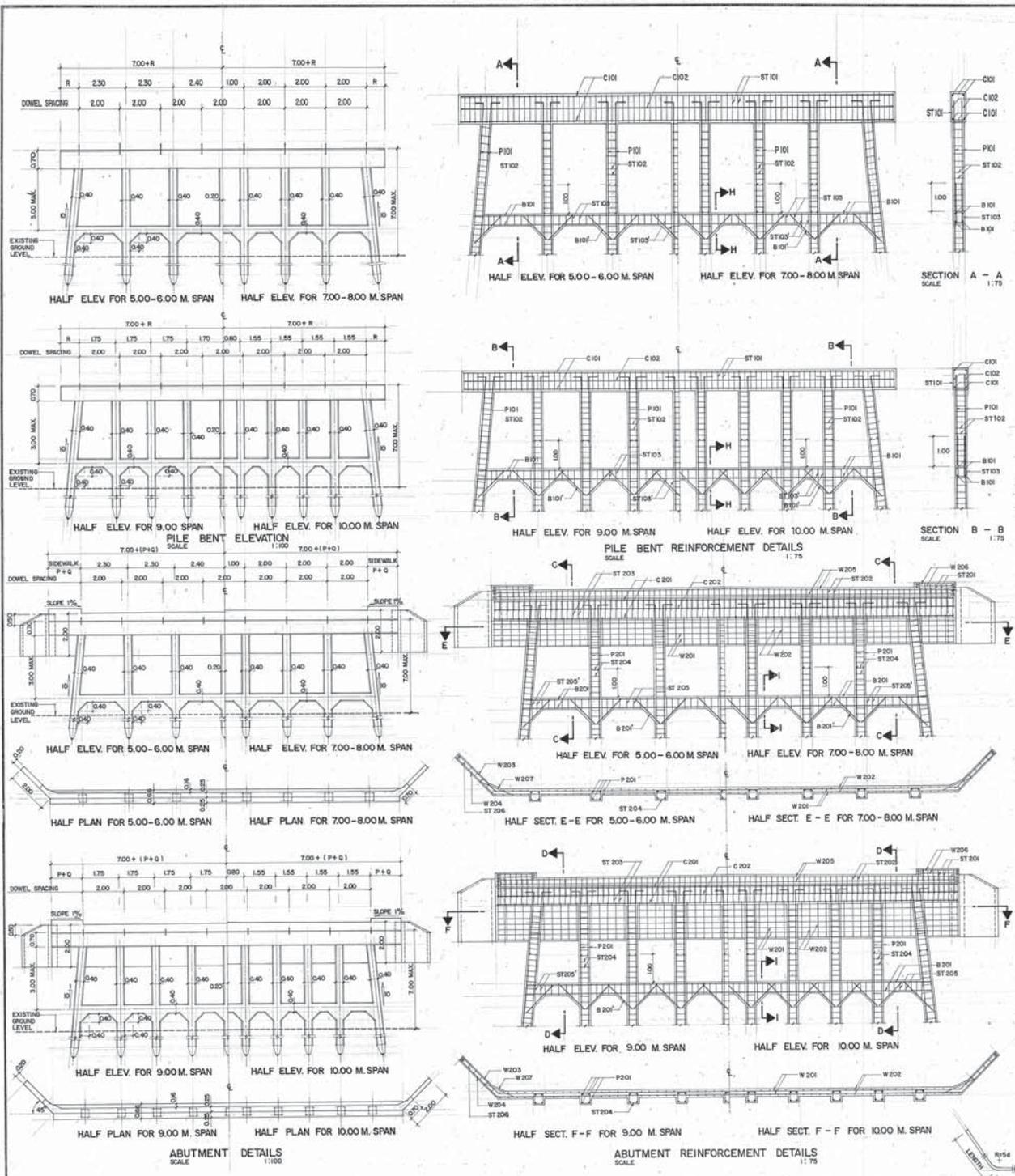
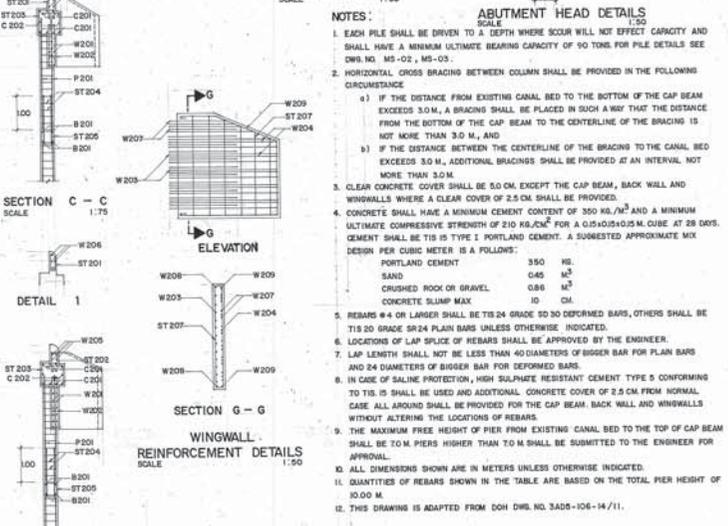
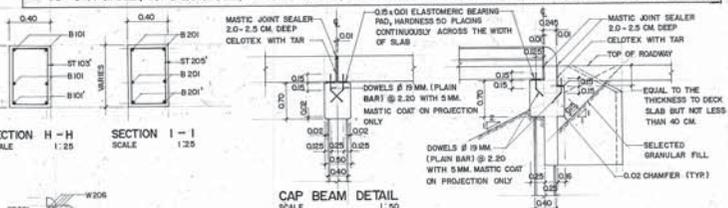


TABLE OF REINFORCEMENT

BAR MARK	SPAN 5.00 M.			SPAN 6.00 M.			SPAN 7.00 M.			SPAN 8.00 M.			SPAN 9.00 M.			SPAN 10.00 M.		
	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L
C101	8	Ø 16	2.30	8	Ø 16	2.30												
C102	4	Ø 16	2.30	4	Ø 16	2.30												
ST101	3	Ø 20	6.4	3	Ø 20	6.4												
ST102	3	Ø 20	1.35	3	Ø 20	1.35												
ST103	3	Ø 25	2.6	3	Ø 25	2.6												
ST103'	3	Ø 25	1.6	3	Ø 25	1.6												
B101	8	Ø 16	1.95	8	Ø 16	1.95												
P101	8	Ø 20	3.75	8	Ø 20	3.75												
C201	2	Ø 16	2.4	2	Ø 16	2.4												
C202	4	Ø 16	2.4	4	Ø 16	2.4												
ST201	2	Ø 20	14	2	Ø 20	14												
ST202	3	Ø 20	7.0	3	Ø 20	7.0												
ST203	3	Ø 20	7.0	3	Ø 20	7.0												
ST204	3	Ø 20	1.35	3	Ø 20	1.35												
ST205	3	Ø 25	2.6	3	Ø 25	2.6												
ST205'	3	Ø 25	1.6	3	Ø 25	1.6												
ST206	3	Ø 30	12	3	Ø 30	12												
B201	8	Ø 16	1.95	8	Ø 16	1.95												
P201	8	Ø 20	3.75	8	Ø 20	3.75												
W201	4	Ø 20	10	4	Ø 20	10												
W202	2	Ø 30	47	2	Ø 30	47												
W203	4	Ø 15	24	4	Ø 15	24												
W204	2	Ø 30	12	2	Ø 30	12												
W205	2	Ø 16	2.4	2	Ø 16	2.4												
W206	2	Ø 16	2.4	2	Ø 16	2.4												
W207	4	Ø 15	26	4	Ø 15	26												
W208	4	Ø 15	26	4	Ø 15	26												
W209	2	Ø 16	2.4	2	Ø 16	2.4												

Ø 2 = Ø 1/4" OR 6 MM., Ø 3 = 3/8" OR 9 MM., Ø 4 = Ø 1/2" OR 12 MM., Ø 8 = Ø 1" OR 25 MM., NO. X TOTAL AMOUNT OF BARS, L TOTAL LENGTH OF EACH BAR



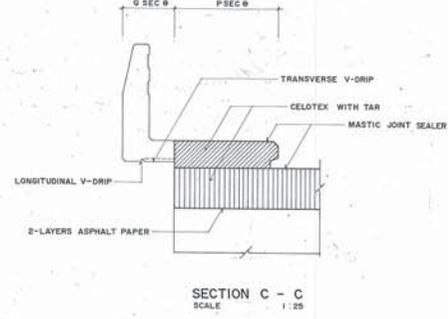
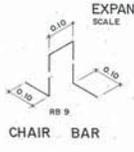
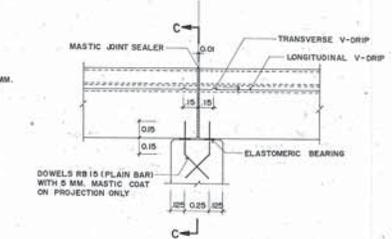
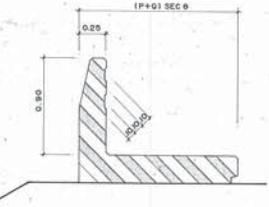
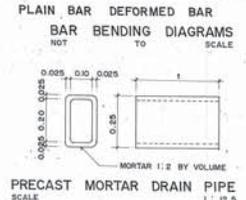
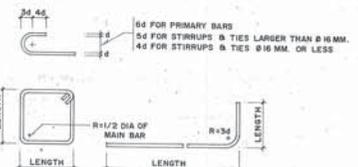
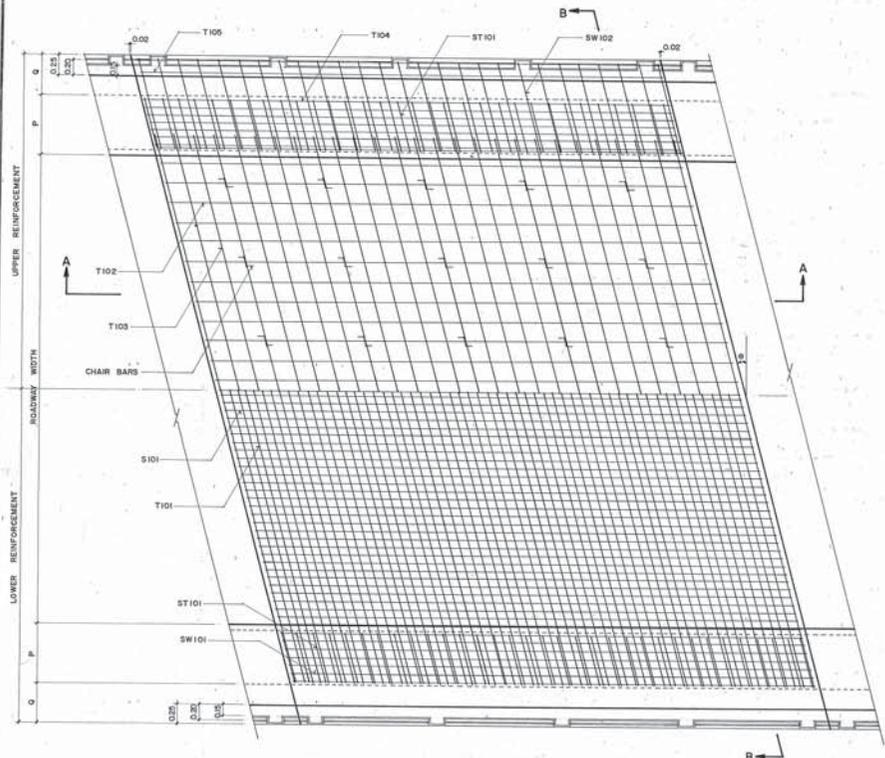
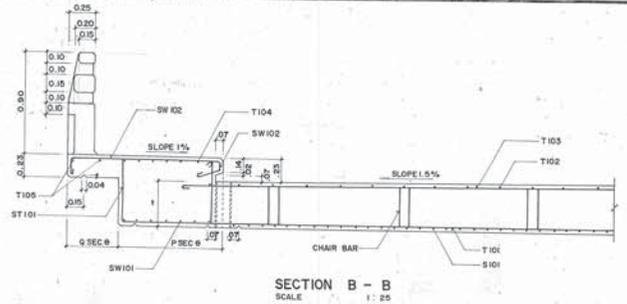
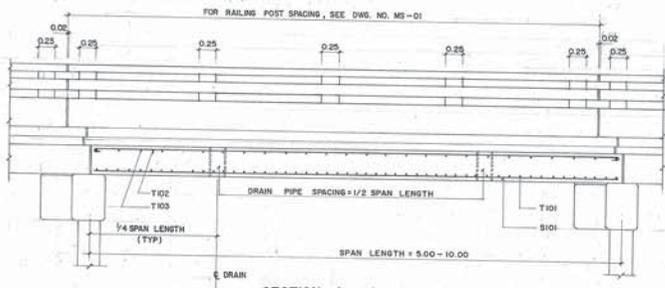
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 14.00 M. ROADWAY WIDTH SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

DESIGNED: DOH & CONSULTANTS CHECKED: [Signature] DATE: JULY 1994

SUBMITTED: [Signature] (DIRECTOR OF LOCATION & DESIGN DIVISION) SCALE AS SHOWN DWG. NO. ST-25

APPROVED: [Signature] (GENERAL DIRECTOR GENERAL) SHEET NO. 139



- NOTES:**
- DESIGN STRESSES:
 - a) CONCRETE, $f_c = 70$ KSC.
 - b) STEEL, $f_s = 1,400$ KSC (DEFORMED BARS)
 - $f_s = 1,200$ KSC (PLAIN ROUND BARS)
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 15 x 15 x 15 CM. CURB AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:
 - PORTLAND CEMENT 350 KG.
 - SAND 0.43 M³.
 - CRUSHED ROCK OR GRAVEL 0.86 M³.
 - CONCRETE SLUMP MAX. 10 CM.
 - CLEAR CONCRETE COVER FOR TOP REINFORCEMENT IN SLAB BRIDGE SHALL BE 3.5 CM. ELSEWHERE OF SLAB BRIDGE AND SIDEWALK POSTS AND RAILINGS SHALL BE 2.5 CM.
 - ALL CONCRETE EXPOSED CORNERS SHALL HAVE A 2 CM. CHAMFER UNLESS OTHERWISE INDICATED.
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S030 DEFORMED BARS, OTHERS SHALL BE TIS20 GRADE S124 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TIS IS SHALL BE USED AND, WITH THE EXCEPTION OF COLUMNS AND BRACING, ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
 - PAINTING SHALL BE PROVIDED ON ALL SURFACES AT BRIDGE ENDS WHICH ARE EXPOSED TO TRAFFIC. WHITE AND BLACK COLOURS SHALL BE PAINTED ALTERNATELY; WHITE COLOUR SHALL BE LIGHT REFLECTED TYPE.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - BAR MARK S101 MAY BE TAKEN OUT ONE BAR ON EACH SIDE OF THE BRIDGE WHEREVER THEY PASS THROUGH DRAIN PIPES. IF THE LOCATIONS OF THESE BARS ARE NEAR V-DRIP SUCH THAT CONCRETE COVER IS NOT ADEQUATE, THEY SHALL BE PLACED ON TOP OF ST101. OTHER BARS WHICH PASS THROUGH DRAIN PIPES SHALL BE BENT ALONG THE PIPES.
 - THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
 - THIS DRAWING IS ADAPTED FROM DCH DWG. NO. 3805-106-H/1A.

TABLE OF SLAB THICKNESS

SPAN	5.00	6.00	7.00	8.00	9.00	10.00
SLAB THICKNESS, t	0.32	0.36	0.39	0.43	0.47	0.53

TABLE OF SEC Ø

Ø DEGREE	0	5	10	15	20	25	30
SEC Ø	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547

TABLE OF SLAB REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00M.			SPAN 6.00M.			SPAN 7.00M.			SPAN 8.00M.			SPAN 9.00M.			SPAN 10.00M.			REMARK	
		#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L	#	Ø	L		
VARIES	ST101	8	Ø 16	4.95	8	Ø 15	5.95	8	Ø 13	6.95	8	Ø 12	7.95	8	Ø 10	8.95	8	Ø 9	9.95	NO. TOTAL AMOUNT OF BARS	
VARIES	ST101	3	Ø 25	42	-	3	Ø 25	50	-	3	Ø 25	58	-	3	Ø 25	66	-	3	Ø 25	74	L = TOTAL LENGTH OF EACH BAR
VARIES	SW102	4	Ø 20	51	-	4	Ø 20	63	-	4	Ø 20	72	-	4	Ø 20	81	-	4	Ø 20	93	-
VARIES	T101	4	Ø 15	34	-	4	Ø 15	41	-	4	Ø 14	31	-	4	Ø 14	38	-	4	Ø 13	29	-
VARIES	T102	3	Ø 30	5.10	3	Ø 30	6.10	3	Ø 30	7.10	3	Ø 30	8.10	3	Ø 30	9.10	3	Ø 30	10.10	-	
VARIES	T103	3	Ø 30	17	-	3	Ø 30	21	-	3	Ø 30	24	-	3	Ø 30	27	-	3	Ø 30	31	-

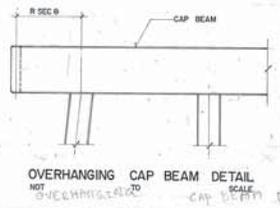
* 3 = 3/8" Ø 9 MM., * 4 = 1/2" Ø 12 MM., * 8 = 1" Ø 25 MM.

TABLE OF SIDEWALK AND EDGE BEAM REINFORCEMENT

WIDTH OF SIDEWALK	P	Q	R	BAR MARK	BAR BENDING DIAGRAMS	SPAN 5.00 M.					SPAN 7.00 M.					SPAN 9.00 M.					SPAN 10.00 M.					REMARK
						#	Ø	No.	L	#	Ø	No.	L	#	Ø	No.	L	#	Ø	No.	L	#	Ø	No.	L	
0.50	0.50	-	0.50	SW101	VARIES	8	Ø 6	4.95	8	Ø 6	5.95	8	Ø 6	6.95	8	Ø 6	7.95	8	Ø 6	8.95	8	Ø 6	9.95	NO. TOTAL AMOUNT OF BARS		
0.50	0.50	-	0.50	T104	VARIES	4	Ø 6	4.95	4	Ø 6	5.95	4	Ø 6	6.95	4	Ø 6	7.95	4	Ø 6	8.95	4	Ø 6	9.95	L = TOTAL LENGTH OF EACH BAR		
1.00	0.50	0.50	0.50	SW101	VARIES	8	Ø 6	4.95	8	Ø 6	5.95	8	Ø 6	6.95	8	Ø 6	7.95	8	Ø 6	8.95	8	Ø 6	9.95	* 4 = 1/2" Ø 12 MM.		
1.00	0.50	0.50	0.50	T104	VARIES	4	Ø 6	4.95	4	Ø 6	5.95	4	Ø 6	6.95	4	Ø 6	7.95	4	Ø 6	8.95	4	Ø 6	9.95	* 8 = 1" Ø 25 MM.		
1.50	1.00	0.50	1.00	SW101	VARIES	8	Ø 8	4.95	8	Ø 8	5.95	8	Ø 8	6.95	8	Ø 8	7.95	8	Ø 8	8.95	8	Ø 8	9.95			
1.50	1.00	0.50	1.00	T104	VARIES	4	Ø 8	4.95	4	Ø 8	5.95	4	Ø 8	6.95	4	Ø 8	7.95	4	Ø 8	8.95	4	Ø 8	9.95			
1.50	1.00	0.50	1.00	T105	VARIES	4	Ø 6	4.95	4	Ø 6	5.95	4	Ø 6	6.95	4	Ø 6	7.95	4	Ø 6	8.95	4	Ø 6	9.95			

TABLE OF DEAD LOAD CAMBER

SPAN	CAMBER	
	L/4	Ø
5.00	0.0022	0.0016
6.00	0.0034	0.0025
7.00	0.0054	0.0040
8.00	0.0076	0.0054
9.00	0.0103	0.0074
10.00	0.0122	0.0088



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

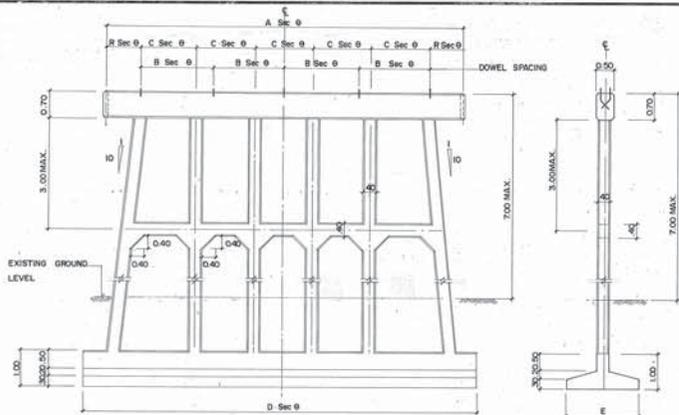
STANDARD DRAWING
 0° - 30° SKEW RC SLAB BRIDGE
 BRIDGE REINF., PLAN, SECTIONS AND DETAILS

DESIGNED: DOH & CONSULTANTS CHECKED: [Signature] DATE: JULY 1994

SUBMITTED: [Signature] SCALE: AS SHOWN

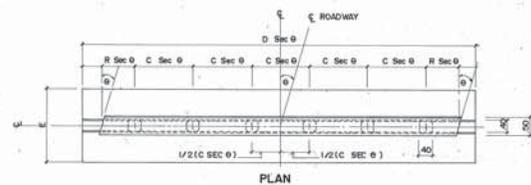
APPROVED: [Signature] (DIRECTOR OF LOCATION & DESIGN DIVISION) DWG. NO. ST-26

[Signature] (DIRECTOR GENERAL) SHEET NO. 159

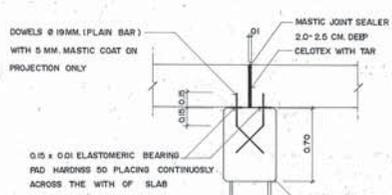


TRANSVERSE ELEVATION

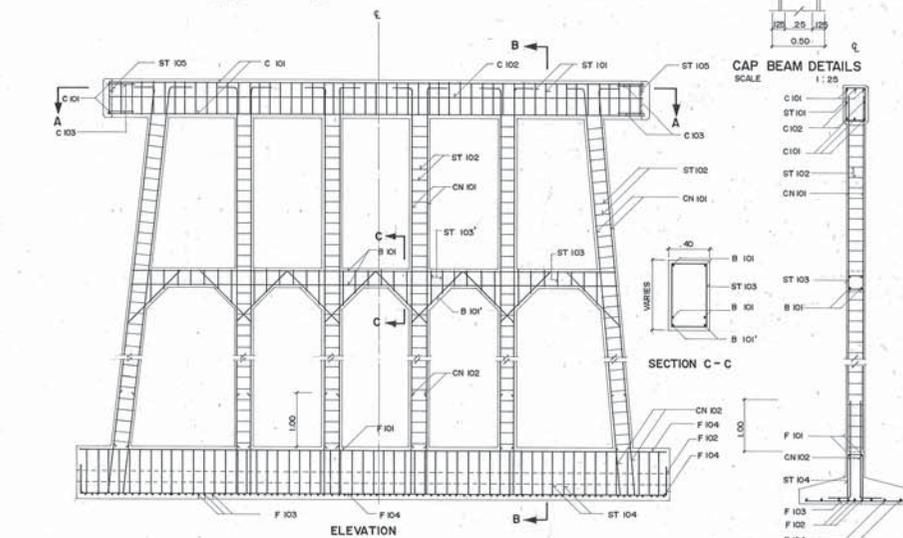
LONGITUDINAL ELEVATION



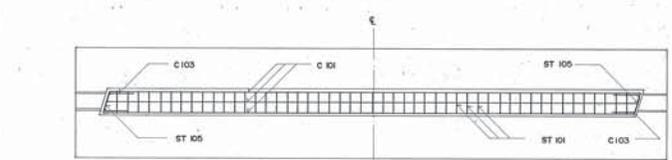
PLAN PIER DETAILS SCALE 1:75



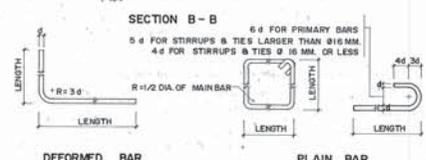
CAP BEAM DETAILS SCALE 1:25



SECTION C-C



SECTION A-A REINFORCEMENT DETAILS SCALE 1:50



DEFORMED BAR BAR BENDING DETAILS NOT TO SCALE

Ø, DEGREE	0	5	10	15	20	25	30
SEC Ø	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547

ROADWAY WIDTH M.	LENGTH OF CAP BEAM A Sec Ø M.	DOVEL SPACING		SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		B Sec Ø	C Sec Ø	COL. SPG. C Sec Ø M.	NO. OF COLUMN	COL. SPG. C Sec Ø M.	NO. OF COLUMN	COL. SPG. C Sec Ø M.	NO. OF COLUMN	COL. SPG. C Sec Ø M.	NO. OF COLUMN	COL. SPG. C Sec Ø M.	NO. OF COLUMN	COL. SPG. C Sec Ø M.	NO. OF COLUMN
6.00	(6.0 + 2R)	2.00	2.00	2.00	4	2.00	4	1.50	5	1.50	5	1.20	6	1.20	6
7.00	(7.0 + 2R)	1.75	2.30	2.30	4	2.30	4	1.75	5	1.75	5	1.40	6	1.40	6
8.00	(8.0 + 2R)	2.00	2.65	2.65	4	2.65	4	2.00	5	2.00	5	1.60	6	1.60	6
9.00	(9.0 + 2R)	1.80	3.00	3.00	4	3.00	4	2.25	5	2.25	5	1.80	6	1.80	6
10.00	(10.0 + 2R)	2.00	2.50	2.50	5	2.50	5	2.00	6	2.00	6	1.40	8	1.40	8
11.00	(11.0 + 2R)	2.20	2.75	2.75	5	2.75	5	1.80	7	1.80	7	1.50	8	1.50	8
12.00	(12.0 + 2R)	2.00	2.40	2.40	6	2.40	6	2.00	7	2.00	7	1.70	8	1.70	8
13.00	(13.0 + 2R)	1.85	2.80	2.80	6	2.80	6	1.85	8	1.85	8	1.55	9	1.55	9
14.00	(14.0 + 2R)	2.00	2.30	2.30	7	2.30	7	2.00	8	2.00	8	1.75	9	1.75	9

BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		#	Ø	#	Ø	#	Ø	#	Ø	#	Ø	#	Ø
VARIES	C 101	8	Ø 16	8	Ø 16								
VARIES	C 102	4	Ø 16	4	Ø 16								
VARIES	C 103	4	Ø 16	4	Ø 16								
VARIES	CN 101	8	Ø 16	11.25	Ø 16								
VARIES	CN 102	8	Ø 16	2.31	Ø 16								
VARIES	ST 101	3	Ø 16	2.35	Ø 16								
VARIES	ST 102	3	Ø 16	1.35	Ø 16								
VARIES	ST 103	3	Ø 16	1.35	Ø 16								
VARIES	ST 104	3	Ø 16	2.55	Ø 16								
VARIES	ST 105	3	Ø 16	1.95	Ø 16								
VARIES	B 101	8	Ø 16	8	Ø 16								
VARIES	B 102	6	Ø 16	1.55	Ø 16								
VARIES	F 101	8	Ø 16	8	Ø 16								
VARIES	F 102	8	Ø 16	8	Ø 16								
VARIES	F 103	4	Ø 16	1.55	Ø 16	1.55	Ø 16	1.75	Ø 16	1.75	Ø 16	1.95	Ø 16
VARIES	F 104	6	Ø 16	4	Ø 16								

ROADWAY WIDTH M.	LENGTH OF FOOTING D Sec Ø, M.	WIDTH OF FOOTING, E		
		SPAN 5.00 - 6.00 M.	SPAN 7.00 - 8.00 M.	SPAN 9.00 - 10.00 M.
6.00	8.80	1.60	1.80	2.00
7.00	9.80	1.60	1.80	2.00
8.00	10.80	1.60	1.80	2.00
9.00	11.80	1.60	1.80	2.00
10.00	12.80	1.60	1.80	2.00
11.00	13.80	1.60	1.80	2.00
12.00	14.80	1.60	1.80	2.00
13.00	15.80	1.60	1.80	2.00
14.00	16.80	1.60	1.80	2.00

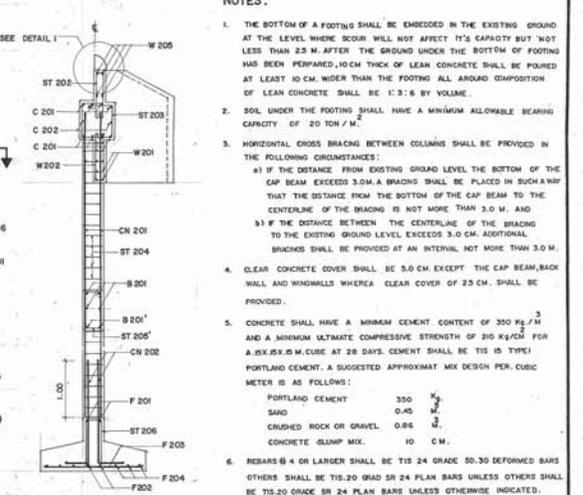
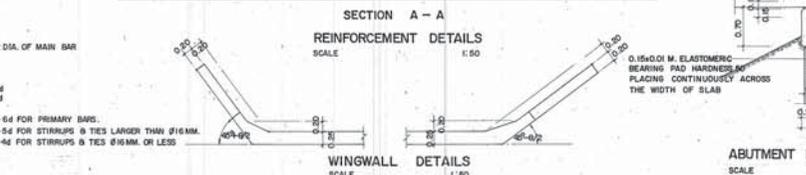
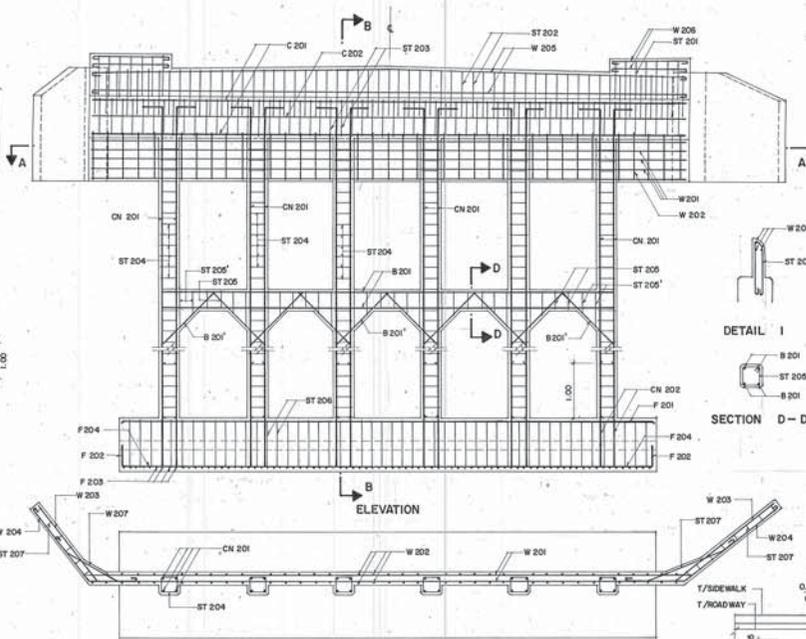
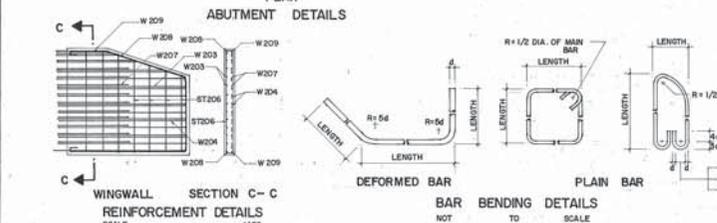
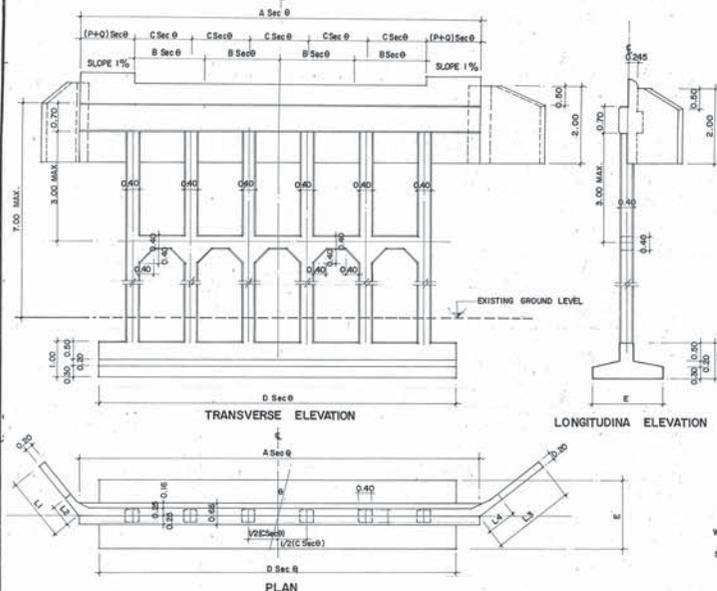
- NOTES**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED. 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON/M².
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M. AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM, EXCEPT THE CAP BEAM BACK WALL AND GIRD WALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 Kg/m³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 Kg/Cm² FOR A 15x15x15 M CUBE AT 28 DAYS. CEMENT SHALL BE TIS IS TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 Kg
SAND	0.45 m ³
CRUSHED ROCK OR GRAVEL	0.85 m ³
CONCRETE SLUMP	10 Cm
 - REBARS 14 OR LARGER SHALL BE TIS 24 GRADE 60 30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS. THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING CANAL BED TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE SKEW ANGLE (Ø) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.0 M.
 - ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING MAY BE USED IN COMBINATION WITH ONE OF THE FOLLOWING DRAWINGS BELOW, WHICHEVER IS APPLICABLE. DWG. NOS. ST-02, ST-05, ST-08
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3805-106-14/2.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 Ø° - 30° SKEW R.C. SLAB BRIDGE
 SPREAD FOOTING PIER DETAILS

DESIGNED BY: DOH & CONSULTANTS	CHECKED BY: [Signature]	DATE: JULY 1994
SUBMITTED BY: [Signature]	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED BY: [Signature]	(DIRECTOR GENERAL)	DWG. NO. ST-27
		SHEET NO. 140



- NOTES:**
- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 25 CM. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
 - SOL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON / M².
 - HORIZONTAL CROSS BRACING BETWEEN COLLARS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M ABRAZOS SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M. AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 CM. ADDITIONAL BRUCKS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, BACK WALL AND WINDOW WALLS WHEREA CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE A MINIM CEMENT CONTENT OF 350 KG / M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 KG/CM² FOR A 28 DAYS CURE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE) PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350	KG
SAND	0.45	M ³
CRUSHED ROCK OR GRAVEL	0.85	M ³
CONCRETE SLUMP MIX.	10	CM.
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE 50.30 DEFORMED BARS OTHERS SHALL BE TIS 20 GRAD SR 24 PLAN BARS UNLESS OTHERWISE SHALL BE TIS 20 GRADE SR 24 PLAN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OR REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 6 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING CANAL BED TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIERS HIGHER THAN 7.0 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREE BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 10.00 M.
 - ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED.
 - THIS DRAWING MAY BE USED IN COMINATION WITH ONE OF THE FOLLOWING DRAWINGS BELOW WHICHEVER IS APPLICABLE:
DWS. NOS. ST-03, ST-06, ST-09, ST-12, ST-15, ST-18, ST-21, ST-24.
 - THIS DRAWING IS ADAPTED FROM DOH DWS. NO.3805-106-14/24.

TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	SPAN 3.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		#	NO.	#	NO.	#	NO.	#	NO.	#	NO.
VARIES	C 201	8	8	8	8	8	8	8	8	8	8
	C 202	4	2	4	2	4	2	4	2	4	2
VARIES	ST 201	2	20	2	20	2	20	2	20	2	20
	ST 202	3	20	3	20	3	20	3	20	3	20
VARIES	ST 203	3	20	3	20	3	20	3	20	3	20
	ST 204	3	20	3	20	3	20	3	20	3	20
VARIES	ST 205	3	25	3	25	3	25	3	25	3	25
	ST 206	3	20	3	20	3	20	3	20	3	20
VARIES	ST 207	2	30	2	30	2	30	2	30	2	30
	B 201	8	8	8	8	8	8	8	8	8	8
VARIES	B 201'	6	8	6	8	6	8	6	8	6	8
	CH 201	8	8	8	8	8	8	8	8	8	8
VARIES	CH 202	8	8	8	8	8	8	8	8	8	8
	F 201	2	2	2	2	2	2	2	2	2	2
VARIES	F 202	8	2	8	2	8	2	8	2	8	2
	F 203	4	25	4	25	4	25	4	25	4	25
VARIES	F 204	4	6	4	6	4	6	4	6	4	6
	W 201	4	20	4	20	4	20	4	20	4	20
VARIES	W 202	2	30	2	30	2	30	2	30	2	30
	W 203	4	15	4	15	4	15	4	15	4	15
VARIES	W 204	2	30	2	30	2	30	2	30	2	30
	W 205	2	4	2	4	2	4	2	4	2	4
VARIES	W 206	2	6	2	6	2	6	2	6	2	6
	W 207	4	15	4	15	4	15	4	15	4	15
VARIES	W 208	4	2	4	2	4	2	4	2	4	2
	W 209	2	2	2	2	2	2	2	2	2	2

2 = 0.1" OR 6 MM., # 3 = 0.375" OR 9 MM., # 4 = 0.5" OR 12 MM., # 6 = 0.75" OR 19 MM. NO. = TOTAL AMOUNT OF BARS L = TOTAL LENGTH OF EACH BARS

TABLE OF ABUTMENT DIMENSIONS

ROADWAY WIDTH M.	LENGTH OF ABUTMENT HEAD A Sec θ	DOWEL SPACING B Sec θ	SPAN 3.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
			COL. SPG. OF	NO. COL.	COL. SPG. OF	NO. COL.						
6.00	{ 6.0 ± 2(P/4) } Sec θ	200 Sec θ	200 Sec θ	4	200 Sec θ	4	150 Sec θ	5	150 Sec θ	5	120 Sec θ	6
7.00	{ 7.0 ± 2(P/4) } Sec θ	175 Sec θ	230 Sec θ	4	230 Sec θ	4	175 Sec θ	5	175 Sec θ	5	140 Sec θ	6
8.00	{ 8.0 ± 2(P/4) } Sec θ	200 Sec θ	240 Sec θ	4	240 Sec θ	4	200 Sec θ	5	200 Sec θ	5	160 Sec θ	6
9.00	{ 9.0 ± 2(P/4) } Sec θ	180 Sec θ	300 Sec θ	4	300 Sec θ	4	225 Sec θ	5	225 Sec θ	5	150 Sec θ	7
10.00	{ 10.0 ± 2(P/4) } Sec θ	200 Sec θ	250 Sec θ	5	250 Sec θ	5	200 Sec θ	6	200 Sec θ	6	140 Sec θ	8
11.00	{ 11.0 ± 2(P/4) } Sec θ	220 Sec θ	275 Sec θ	5	275 Sec θ	5	180 Sec θ	7	180 Sec θ	7	130 Sec θ	8
12.00	{ 12.0 ± 2(P/4) } Sec θ	200 Sec θ	240 Sec θ	6	240 Sec θ	6	200 Sec θ	7	200 Sec θ	7	170 Sec θ	9
13.00	{ 13.0 ± 2(P/4) } Sec θ	185 Sec θ	260 Sec θ	6	260 Sec θ	6	185 Sec θ	8	185 Sec θ	8	140 Sec θ	10
14.00	{ 14.0 ± 2(P/4) } Sec θ	200 Sec θ	230 Sec θ	7	230 Sec θ	7	200 Sec θ	8	200 Sec θ	8	155 Sec θ	10

LENGTH OF WINGWALL

L1 = 1.64 Sec (45° ± θ/2) L3 = 1.64 Sec (45° ± θ/2)
 L2 = 0.50 Sec (45° ± θ/2) L4 = 0.50 Sec (45° ± θ/2)

TABLE OF Sec θ OR Sec (45° ± θ/2)

θ OR 45° ± θ/2	0	5	10	15	20	25	30	35	40	45	50	55	60
Sec θ OR Sec 45° ± θ/2	1.0000	1.0008	1.0016	1.0024	1.0032	1.0040	1.0048	1.0056	1.0064	1.0072	1.0080	1.0088	1.0096

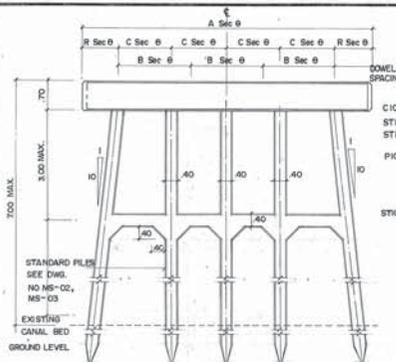
TABLE OF FOOTING DIMENSIONS

ROADWAY WIDTH M.	LENGTH OF FOOTING D Sec θ	WIDTH OF FOOTING, E		
		SPAN 3.00 - 6.00 M.	SPAN 7.00 - 9.00 M.	SPAN 9.00 - 10.00 M.
6.00	7.80 Sec θ	1.60	1.80	2.00
7.00	8.80 Sec θ	1.60	1.80	2.00
8.00	9.80 Sec θ	1.60	1.80	2.00
9.00	10.80 Sec θ	1.60	1.80	2.00
10.00	11.80 Sec θ	1.60	1.80	2.00
10.00	12.80 Sec θ	1.60	1.80	2.00
11.00	13.80 Sec θ	1.60	1.80	2.00
13.00	14.80 Sec θ	1.60	1.80	2.00
14.00	15.80 Sec θ	1.60	1.80	2.00

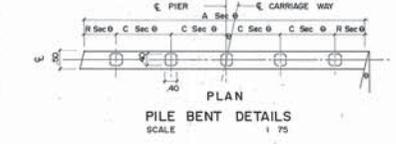
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 0°-30° SKEW RC. SLAB BRIDGE
 SPREAD FOOTING ABUTMENT DETAILS

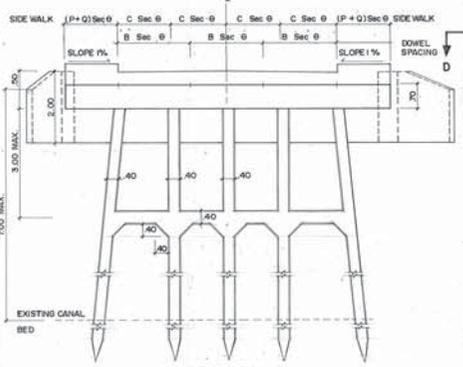
DESIGNED: DOH & CONSULTANTS CHECKED: *[Signature]* DATE JULY 1994
 SUBMITTED: *[Signature]* SCALE AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 APPROVED: *[Signature]* DWG. NO. ST-28
 (GENERAL) SHEET NO. 1/1



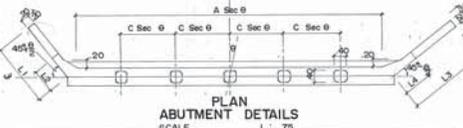
SECTION A-A
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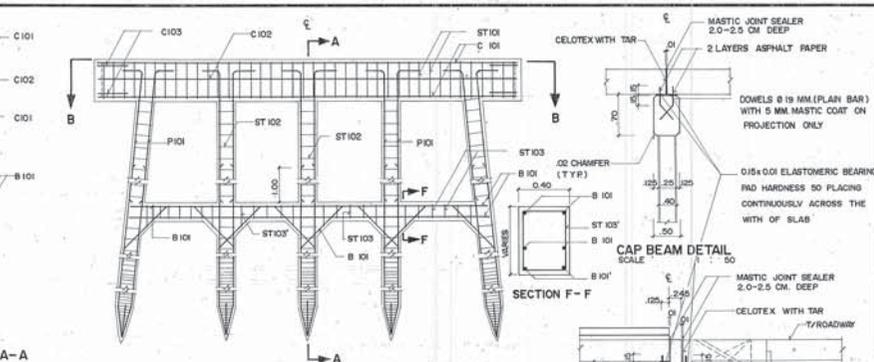
PILE BENT DETAILS
SCALE 1:75



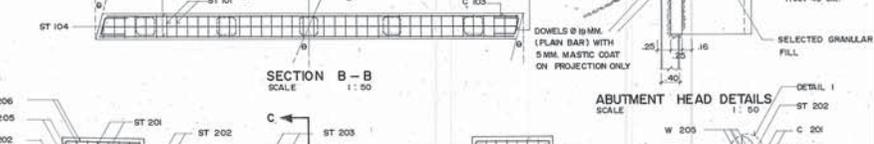
ELEVATION



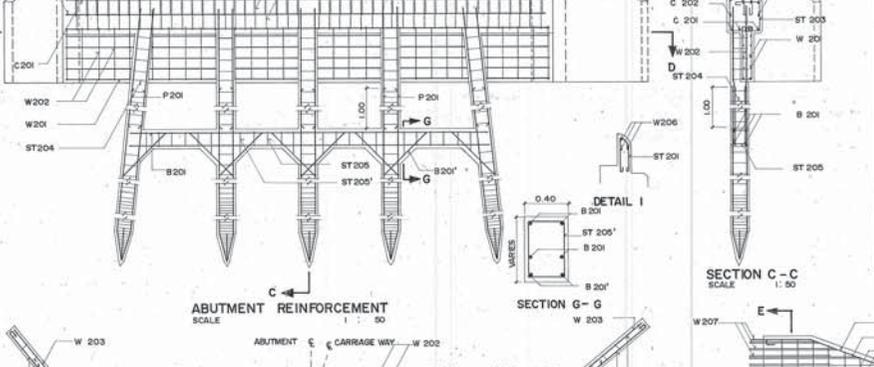
PLAN ABUTMENT DETAILS
SCALE 1:75



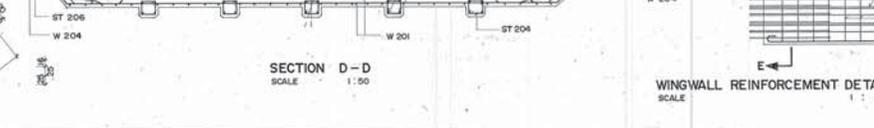
PILE BENT REINFORCEMENT
SCALE 1:50



ABUTMENT REINFORCEMENT
SCALE 1:50



ABUTMENT REINFORCEMENT
SCALE 1:50



SECTION D-D
SCALE 1:50

TABLE OF REINFORCEMENT

BAR MARK	SPAN 5.00 M				SPAN 6.00 M				SPAN 7.00 M				SPAN 8.00 M				SPAN 9.00 M				SPAN 10.00 M			
	II	III	IV	V	II	III	IV	V	II	III	IV	V	II	III	IV	V	II	III	IV	V	II	III	IV	V
C 101	8	6	6	6	8	6	6	6	8	6	6	6	8	6	6	6	8	6	6	6	8	6	6	6
C 102	4	2	4	4	4	2	4	4	4	2	4	4	4	2	4	4	4	2	4	4	4	2	4	4
ST 101	3	2.0	2.35	3	2.0	2.35	3	2.0	2.35	3	2.0	2.35	3	2.0	2.35	3	2.0	2.35	3	2.0	2.35	3	2.0	2.35
ST 102	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35
ST 103	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35
ST 103'	3	2.5	-	3	2.5	-	3	2.5	-	3	2.5	-	3	2.5	-	3	2.5	-	3	2.5	-	3	2.5	-
ST 104	3	2	2.55	3	2	2.55	3	2	2.55	3	2	2.55	3	2	2.55	3	2	2.55	3	2	2.55	3	2	2.55
B 101	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
B 101'	6	-	1.60	6	-	1.60	6	-	1.60	6	-	1.60	6	-	1.60	6	-	1.60	6	-	1.60	6	-	1.60
P 101	6	-	3.75	6	-	3.75	6	-	3.75	6	-	3.75	6	-	3.75	6	-	3.75	6	-	3.75	6	-	3.75
C 201	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
C 202	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-
ST 201	2	2.0	1.215	2	2.0	1.295	2	2.0	1.305	2	2.0	1.435	2	2.0	1.515	2	2.0	1.635	2	2.0	1.635	2	2.0	1.635
ST 202	3	2.0	1.745	3	2.0	1.795	3	2.0	1.845	3	2.0	1.895	3	2.0	1.945	3	2.0	1.995	3	2.0	2.045	3	2.0	2.095
ST 203	3	2.0	-	3	2.0	-	3	2.0	-	3	2.0	-	3	2.0	-	3	2.0	-	3	2.0	-	3	2.0	-
ST 204	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35	3	2.0	1.35
ST 205	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35	3	2.5	1.35
ST 206	2	3.0	-	2	3.0	-	2	3.0	-	2	3.0	-	2	3.0	-	2	3.0	-	2	3.0	-	2	3.0	-
B 201	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
B 201'	6	-	1.55	6	-	1.55	6	-	1.55	6	-	1.55	6	-	1.55	6	-	1.55	6	-	1.55	6	-	1.55
P 201	8	-	3.75	8	-	3.75	8	-	3.75	8	-	3.75	8	-	3.75	8	-	3.75	8	-	3.75	8	-	3.75
W 201	4	2	10	-	4	2	10	-	4	2	10	-	4	2	10	-	4	2	10	-	4	2	10	-
W 202	2	3.0	2.70	2	3.0	2.60	2	3.0	2.60	2	3.0	2.50	2	3.0	2.40	2	3.0	2.30	2	3.0	2.20	2	3.0	2.10
W 203	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-	4	15	24	-
W 204	2	3.0	12	-	2	3.0	12	-	2	3.0	12	-	2	3.0	12	-	2	3.0	12	-	2	3.0	12	-
W 205	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-	2	4	-
W 206	2	8	-	2	8	-	2	8	-	2	8	-	2	8	-	2	8	-	2	8	-	2	8	-
W 207	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15	4	15	26	2.15
W 208	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-	4	2	-
W 209	2	2	-	2	2	-	2	2	-	2	2	-	2	2	-	2	2	-	2	2	-	2	2	-

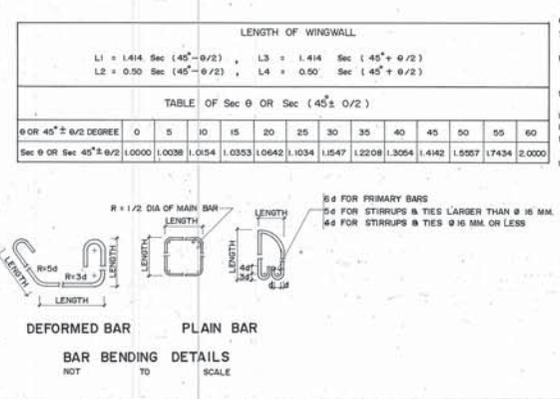
II 2=844" OR 6 MM, III 3=831" OR 9 MM, IV 4=818" OR 12 MM, V 5=804" OR 20 MM. NO. = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BARS

- NOTES:
- EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 90 TONS. FOR PILE DETAILS SEE DWG. NO. MS-02, MS-03.
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL, NOT MORE THAN 3.0 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM, EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 15 x 15 x 15 CM. CUBE AT 28 DAYS. CEMENT SHALL BE TYPE I PORTLAND CEMENT A SUCCESSFUL APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG	CRUSHED ROCK GRAVEL	0.86 m ³
SAND	0.43 m ³	CONCRETE SLUMP MAX	10 CM
 - REBARS # 4 OR LARGER SHALL BE TIS-24 GRADE 50-30 DEFORMED BAR, OTHERS SHALL BE TIS-20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETER OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED. ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M. PIENS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - THE SKEW ANGLE IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND ALINE PERPENDICULAR TO THE ROADWAY. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING MAY BE USED IN COMBINATION WITH ONE OF THE FOLLOWING DRAWINGS BELOW WHICHEVER IS APPLICABLE: DWG. NOS. ST-07, ST-08, ST-09.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3805-106-14/3.

TABLE OF PIER AND ABUTMENT DIMENSIONS

ROADWAY WIDTH M	LENGTH OF PILE BENT A Sec θ M	LENGTH OF ABUTMENT HEAD B Sec θ M	DOWEL SPACING C Sec θ M	SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M	
				COL. SPG. C Sec θ	NO. OF COLUMN	COL. SPG. C Sec θ	NO. OF COLUMN	COL. SPG. C Sec θ	NO. OF COLUMN	COL. SPG. C Sec θ	NO. OF COLUMN	COL. SPG. C Sec θ	NO. OF COLUMN	COL. SPG. C Sec θ	NO. OF COLUMN
6.00	(6.0 + 2R) Sec θ	(6.0 + 2(P+Q)) Sec θ	2.00 Sec θ	2.00 Sec θ	4	2.00 Sec θ	4	1.50 Sec θ	5	1.50 Sec θ	5	1.20 Sec θ	6	1.20 Sec θ	6
7.00	(7.0 + 2R) Sec θ	(7.0 + 2(P+Q)) Sec θ	1.75 Sec θ	2.30 Sec θ & 2.40 Sec θ	4	1.75 Sec θ	4	1.75 Sec θ	5	1.75 Sec θ	5	1.40 Sec θ	6	1.40 Sec θ	6
8.00	(8.0 + 2R) Sec θ	(8.0 + 2(P+Q)) Sec θ	2.00 Sec θ	2.65 Sec θ & 2.70 Sec θ	4	2.00 Sec θ	4	2.00 Sec θ	5	2.00 Sec θ	5	1.60 Sec θ	6	1.60 Sec θ	6
9.00	(9.0 + 2R) Sec θ	(9.0 + 2(P+Q)) Sec θ	1.80 Sec θ	3.00 Sec θ	4	2.25 Sec θ	4	2.25 Sec θ	5	2.25 Sec θ	5	1.50 Sec θ	7	1.50 Sec θ	7
10.00	(10.0 + 2R) Sec θ	(10.0 + 2(P+Q)) Sec θ	2.00 Sec θ	2.50 Sec θ	5	2.50 Sec θ	5	2.00 Sec θ	6	2.00 Sec θ	6	1.40 Sec θ	8	1.40 Sec θ	8
11.00	(11.0 + 2R) Sec θ	(11.0 + 2(P+Q)) Sec θ	2.20 Sec θ	2.75 Sec θ	5	2.75 Sec θ	5	1.80 Sec θ & 1.85 Sec θ	7	1.80 Sec θ & 1.85 Sec θ	7	1.50 Sec θ & 1.60 Sec θ	8	1.30 Sec θ & 1.40 Sec θ	9
12.00	(12.0 + 2R) Sec θ	(12.0 + 2(P+Q)) Sec θ	2.00 Sec θ	2.40 Sec θ	6	2.40 Sec θ	6	2.00 Sec θ	7	2.00 Sec θ	7	1.70 Sec θ & 1.80 Sec θ	8	1.50 Sec θ & 1.60 Sec θ	9
13.00	(13.0 + 2R) Sec θ	(13.0 + 2(P+Q)) Sec θ	1.85 Sec θ & 1.90 Sec θ	2.60 Sec θ	6	2.60 Sec θ	6	1.85 Sec θ & 1.90 Sec θ	8	1.85 Sec θ & 1.90 Sec θ	8	1.55 Sec θ & 1.60 Sec θ	9	1.40 Sec θ & 1.50 Sec θ	10
14.00	(14.0 + 2R) Sec θ	(14.0 + 2(P+Q)) Sec θ	2.00 Sec θ	2.30 Sec θ & 2.40 Sec θ	7	2.30 Sec θ & 2.40 Sec θ	7	2.00 Sec θ	8	2.00 Sec θ	8	1.75 Sec θ & 1.80 Sec θ	9	1.60 Sec θ & 1.70 Sec θ	10



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 Ø-30° SKEW R.C. SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

DESIGNED: DOH & CONSULTANTS CHECKED: [Signature] DATE: JULY 1994

SUBMITTED: [Signature] SCALE AS SHOWN

APPROVED: [Signature] DWG. NO. ST-29

[Signature] DIRECTOR GENERAL SHEET NO. 142

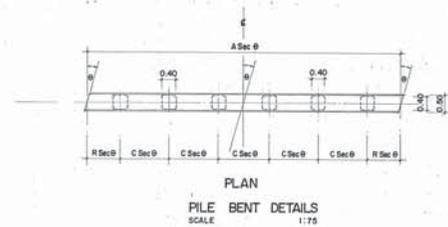
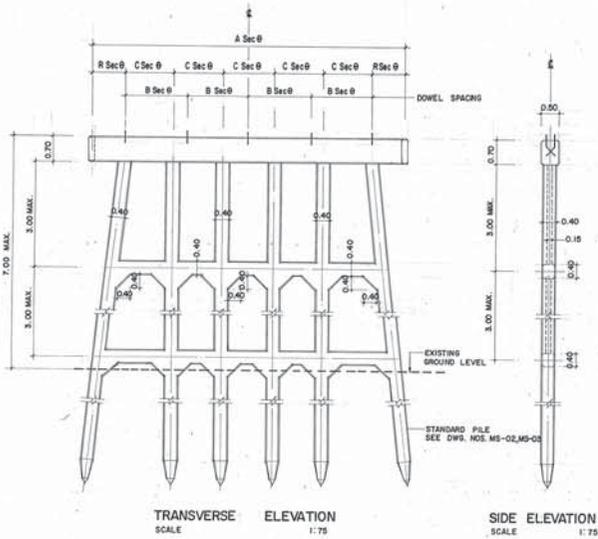


TABLE OF REINFORCEMENT													
BAR BENDING DIAGRAMS	BAR MARK	SPAN 8.00 M.				SPAN 9.00 M.				SPAN 10.00 M.			
		#	Ø	NO.	L	#	Ø	NO.	L	#	Ø	NO.	L
	C101	8	—	6	—	8	—	6	—	8	—	6	—
	C102	4	—	2	—	4	—	2	—	4	—	2	—
	C103	4	—	4	—	4	—	4	—	4	—	4	—
	ST101	3	Ø30	—	2.35	3	Ø30	—	2.35	3	Ø30	—	2.35
	ST102	3	Ø20	—	1.35	3	Ø20	—	1.35	3	Ø20	—	1.35
	ST103	3	Ø25	—	1.35	3	Ø25	—	1.35	3	Ø25	—	1.35
	ST103'	3	Ø25	—	—	3	Ø25	—	—	3	Ø25	—	—
	ST104	3	—	2	1.95	3	—	2	1.95	3	—	2	1.95
	B101	8	—	8	—	8	—	8	—	8	—	8	—
	B101'	6	—	—	1.55	6	—	—	1.55	6	—	—	1.55
	P101	8	—	—	3.75	8	—	—	3.75	8	—	—	3.75
	P102	8	—	—	—	8	—	—	—	8	—	—	—
	VW1	4	Ø25	—	6.975	4	Ø25	—	6.975	4	Ø25	—	6.975
	VW2	4	—	2	5.675	4	—	2	5.675	4	—	2	5.675
	HW	4	Ø25	—	—	4	Ø25	—	—	4	Ø25	—	—

3 = Ø3/8" OR 9 MM, # 4 = Ø1/2" OR 12 MM, # 6 = Ø3/4" OR 20 MM, # 8 = Ø1" OR 25 MM.
 NO. = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR.

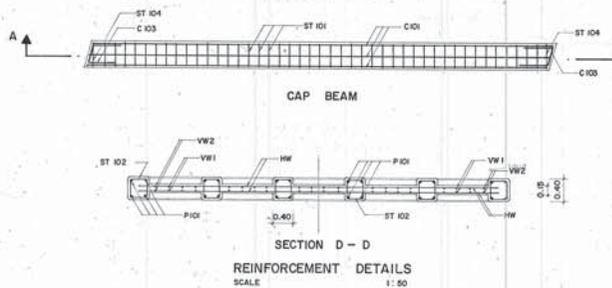
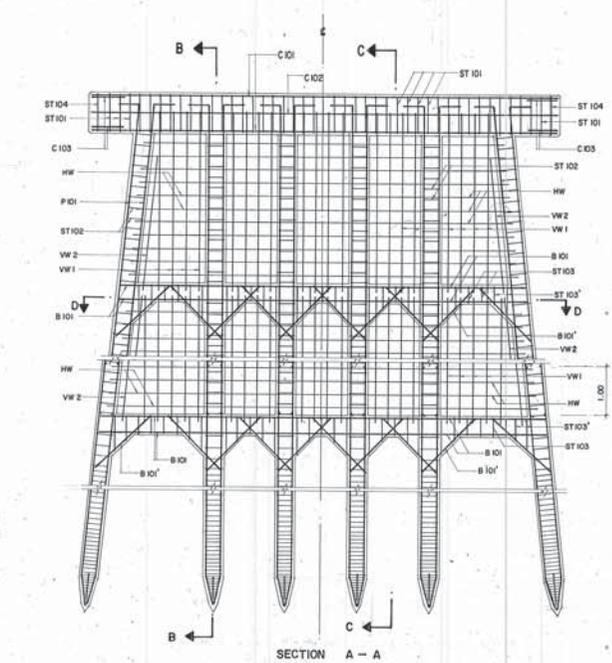
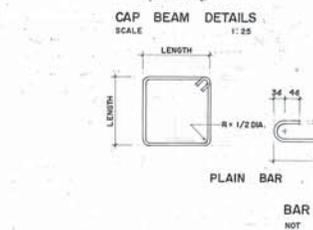
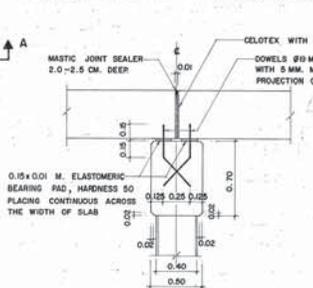
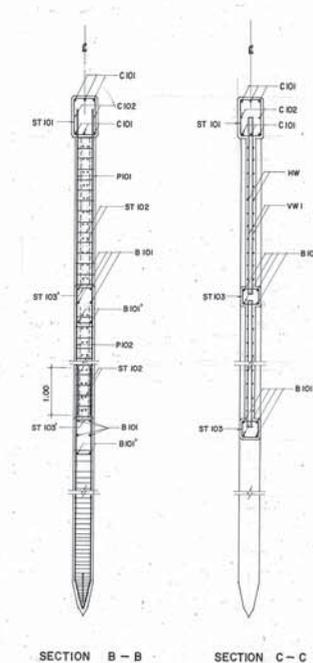


TABLE OF SEC Ø							
Ø DEGREE	0	5	10	15	20	25	30
Sec Ø	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547

TABLE OF PILE BENT DETAILS									
CARRIAGE WAY	LENGTH OF CAP BEAM A Sec Ø, M.	DOWELS SPACING B Sec Ø, M.	SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.		NO. OF COLUMN
			COL. SPG. C Sec Ø, M.	NO. OF COLUMN	COL. SPG. C Sec Ø, M.	NO. OF COLUMN	COL. SPG. C Sec Ø, M.	NO. OF COLUMN	
6.00	(6.0+2R) Sec Ø	2.00 Sec Ø	1.50 Sec Ø	5	1.20 Sec Ø	6	1.20 Sec Ø	6	6
7.00	(7.0+2R) Sec Ø	1.75 Sec Ø	1.75 Sec Ø	5	1.40 Sec Ø	6	1.40 Sec Ø	6	6
8.00	(8.0+2R) Sec Ø	2.00 Sec Ø	2.00 Sec Ø	5	1.60 Sec Ø	6	1.60 Sec Ø	6	6
9.00	(9.0+2R) Sec Ø	1.90 Sec Ø	2.25 Sec Ø	5	1.50 Sec Ø	7	1.50 Sec Ø	7	7
10.00	(10.0+2R) Sec Ø	2.00 Sec Ø	2.00 Sec Ø	6	1.40 Sec Ø	8	1.40 Sec Ø	8	8
11.00	(11.0+2R) Sec Ø	2.20 Sec Ø	1.80 Sec Ø 1.80 Sec Ø	7	1.50 Sec Ø 1.60 Sec Ø	8	1.30 Sec Ø 1.40 Sec Ø	9	9
12.00	(12.0+2R) Sec Ø	2.00 Sec Ø	2.00 Sec Ø	7	1.70 Sec Ø 1.80 Sec Ø	8	1.50 Sec Ø	9	9
13.00	(13.0+2R) Sec Ø	1.85 Sec Ø 1.90 Sec Ø	1.85 Sec Ø 1.90 Sec Ø	8	1.50 Sec Ø 1.60 Sec Ø	9	1.40 Sec Ø 1.45 Sec Ø	10	10
14.00	(14.0+2R) Sec Ø	2.00 Sec Ø	2.00 Sec Ø	8	1.75 Sec Ø	9	1.55 Sec Ø 1.60 Sec Ø	10	10



NOTES

- EACH PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE BEARING CAPACITY OF 90 TONS FOR PILE DETAILS SEE DWG. NOS. MS-02, MS-03.
- HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.00M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.00 M., AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL 3.00M. ADDITIONAL BRACING SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.00 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM AND DIAPHRAGMS WHERE A CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15x0.15x0.05 M. CUBE AT 28 DAYS. CEMENT SHALL BE TIS IS TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

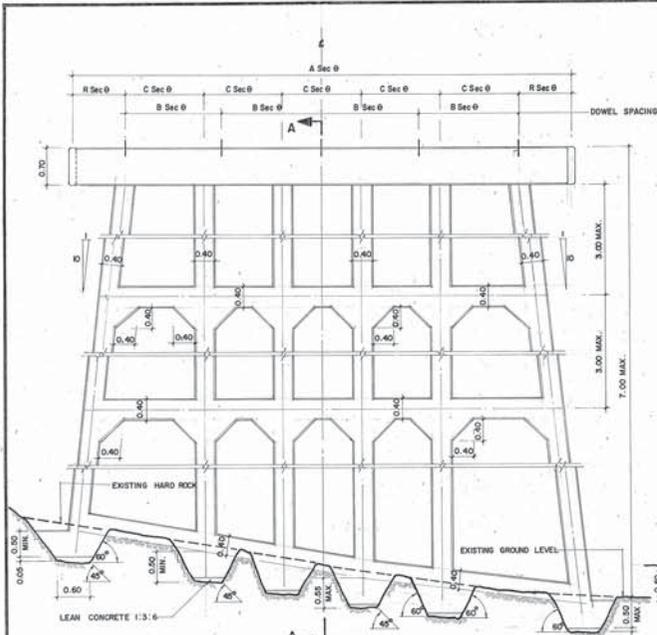
PORTLAND CEMENT	350 KG.
SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.86 M ³
CONCRETE SLUMP MAX.	10 CM.
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S0 S0 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATION OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETER OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM AND DIAPHRAGMS WITHOUT ALTERING THE LOCATIONS OF REBARS.
- THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.00 M. PIERS HIGHER THAN 7.00 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- THE SKEW ANGLE (Ø) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
- QUANTITIES AND LENGTH OF REBARS SHOWN ARE BASED ON THE CONDITION THAT THE DISTANCE BETWEEN THE BOTTOM OF CAP BEAM TO THE CENTERLINE OF THE TOP CROSS BRACING IS 3.00 M.
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.
- THIS DRAWING MAY BE USED IN COMBINATION WITH ONE OF THE FOLLOWING DRAWING BELOW WHICHEVER IS APPLICABLE:

DWG. NOS. ST-04, ST-07, ST-10
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3.80-106-14/2

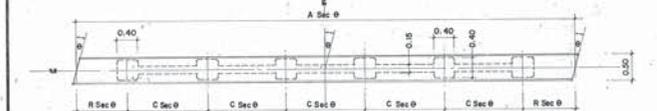
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 0°-30° SKEW RC. SLAB BRIDGE
 WALL BRACING PILE BENT DETAILS

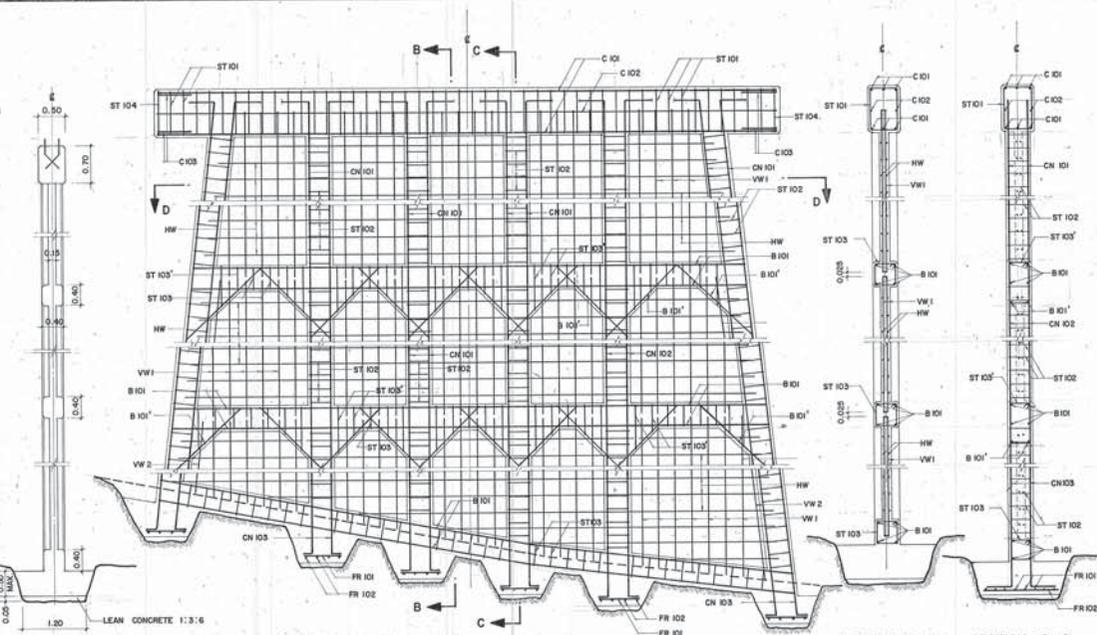
DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)		SCALE: 1:25, 1:50, 1:75
APPROVED: <i>[Signature]</i> P.O. (DIRECTOR GENERAL)		DWG. NO. ST-31
		SHEET NO. 144



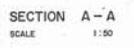
PIER ELEVATION
SCALE 1:50



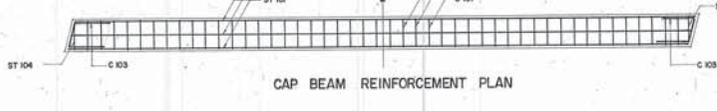
CAP BEAM PLAN



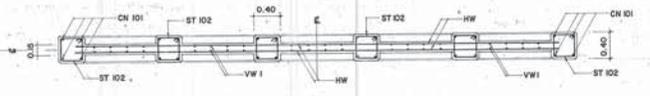
PIER REINFORCEMENT DETAILS
SCALE 1:40



SECTION A-A
SCALE 1:50



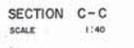
CAP BEAM REINFORCEMENT PLAN



SECTION D-D
SCALE 1:40



SECTION B-B
SCALE 1:40



SECTION C-C
SCALE 1:40

- NOTES :
- THIS STANDARD DRAWING IS APPLICABLE FOR FOUNDATIONS ON BED ROCK WHICH HAS A MINIMUM ALLOWABLE BEARING CAPACITY OF 80 TON/M².
 - THE BOTTOM OF THE LOWER FOOTING SHALL BE ABOVE 45° LINE FROM THE BOTTOM EDGES OF ADJACENT UPPER FOOTINGS.
 - THE EMBEDDED DEPTH OF EACH FOOTING MEASURED AT THE CENTERLINE OF EACH COLUMN FROM EXISTING HARD BED ROCK TO THE BOTTOM OF EXCAVATION SHALL NOT BE LESS THAN 0.55 M. AND SHALL BE UNDER THE APPROVAL OF THE ENGINEER.
 - HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.00 M., A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.00 M.
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.00 M., ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.00 M.
 - THE BOTTOM CROSS BRACING SHALL BE LAID ON BED ROCK UNDER THE APPROVAL OF THE ENGINEER.
 - CLEAR CONCRETE COVER SHALL BE 5 CM. EXCEPT THE CAP BEAM AND DIAPHRAGMS WHERE A CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
 - LEAN CONCRETE OF APPROXIMATELY 5 CM. EXCEPT THE CAP BEAM AND DIAPHRAGMS WHERE A CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
 - CONCRETE SHALL HAVE MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15x0.15x0.15 m. CUBE AT 28 DAYS CEMENT SHALL BE TS TYPE I PORTLAND CEMENT A SUGGESTED APPROXIMATE MIX DESIGN PER CUBE METER IS AS FOLLOWING :

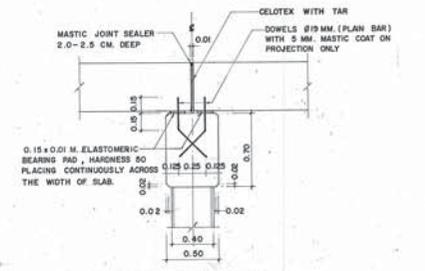
PORTLAND CEMENT	350 KG.	SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.86 M ³	CONCRETE SLUM	MAX. 10 CM.
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S30 DEFORMED BARS. OTHERS SHALL BE TIS 20 GRADE SR 24 PLAN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 1 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM AND DIAPHRAGMS WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 700 M. PIER HIGHER THAN 700 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
 - ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED.
 - THIS DRAWING MAY BE USED IN COMBINATION WITH ONE OF THE FOLLOWING DRAWING BELOW WHICHEVER IS APPLICABLE :
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 380-106-14/6

TABLE OF REINFORCEMENT													
BAR BENDING DIAGRAMS	BAR MARK	SPAN 8.00 M.				SPAN 9.00 M.				SPAN 10.00 M.			
		#	@	NO.	L	#	@	NO.	L	#	@	NO.	L
	C101	6	—	6	—	6	—	6	—	6	—	6	—
	C102	4	—	2	—	4	—	2	—	4	—	2	—
	C103	4	—	4	—	4	—	4	—	4	—	4	—
	CN101	8	—	—	—	8	—	—	—	8	—	—	—
	CN102	8	—	—	—	8	—	—	—	8	—	—	—
	CN103	8	—	—	—	8	—	—	—	8	—	—	—
	ST101	3	0.30	—	2.35	3	0.20	—	2.30	3	0.20	—	2.30
	ST102	3	0.20	—	1.35	3	0.20	—	1.35	3	0.20	—	1.35
	ST103	3	0.25	—	1.35	3	0.25	—	1.35	3	0.25	—	1.35
	ST104	3	0.25	—	3	0.25	—	—	3	0.25	—	—	
	B101	8	—	—	—	8	—	—	—	8	—	—	—
	B102	6	—	—	1.55	6	—	—	1.55	6	—	—	1.55
	FR101	8	0.15	—	0.55	8	0.15	—	0.55	8	0.15	—	0.55
	FR102	8	0.15	—	1.15	8	0.15	—	1.15	8	0.15	—	1.15
	VW1	4	0.25	—	—	4	0.25	—	—	4	0.25	—	—
	VW2	4	—	—	4	—	—	—	4	—	—	—	—
	HW	4	0.25	—	—	4	0.25	—	—	4	0.25	—	—

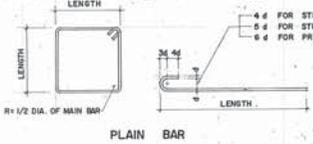
3 = # 3/8" OR 9 MM., # 4 = # 1/2" OR 12 MM., # 6 = # 3/4" OR 20 MM., # 8 = # 1" OR 25 MM.
 NO. = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR

TABLE OF Sec θ							
θ, DEGREE	0	5	10	15	20	25	30
Sec θ	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547

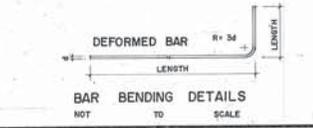
TABLE OF PIER DETAILS								
ROADWAY WIDTH, M.	LENGTH OF CAP BEAM A Sec θ, M.	DOWEL SPACING B Sec θ, M.	SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
			COL. SPG. C Sec θ, M.	NO. OF COL.	COL. SPG. C Sec θ, M.	NO. OF COL.	COL. SPG. C Sec θ, M.	NO. OF COL.
6.00	{6.0 + 2R} Sec θ	2.00 Sec θ	1.50 Sec θ	5	1.20 Sec θ	6	1.20 Sec θ	6
7.00	{7.0 + 2R} Sec θ	1.75 Sec θ	1.75 Sec θ	5	1.40 Sec θ	6	1.40 Sec θ	6
8.00	{8.0 + 2R} Sec θ	2.00 Sec θ	2.00 Sec θ	6	1.60 Sec θ	6	1.60 Sec θ	6
9.00	{9.0 + 2R} Sec θ	1.80 Sec θ	2.25 Sec θ	5	1.50 Sec θ	7	1.50 Sec θ	7
10.00	{10.0 + 2R} Sec θ	2.00 Sec θ	2.00 Sec θ	6	1.40 Sec θ	8	1.40 Sec θ	8
11.00	{11.0 + 2R} Sec θ	2.20 Sec θ	1.80 Sec θ	7	1.50 Sec θ	8	1.30 Sec θ	9
12.00	{12.0 + 2R} Sec θ	2.00 Sec θ	1.85 Sec θ	7	1.60 Sec θ	8	1.40 Sec θ	9
13.00	{13.0 + 2R} Sec θ	1.85 Sec θ	1.85 Sec θ	8	1.55 Sec θ	9	1.40 Sec θ	10
14.00	{14.0 + 2R} Sec θ	2.00 Sec θ	2.00 Sec θ	8	1.75 Sec θ	9	1.55 Sec θ	10



CAP BEAM DETAILS
SCALE 1:25



PLAIN BAR

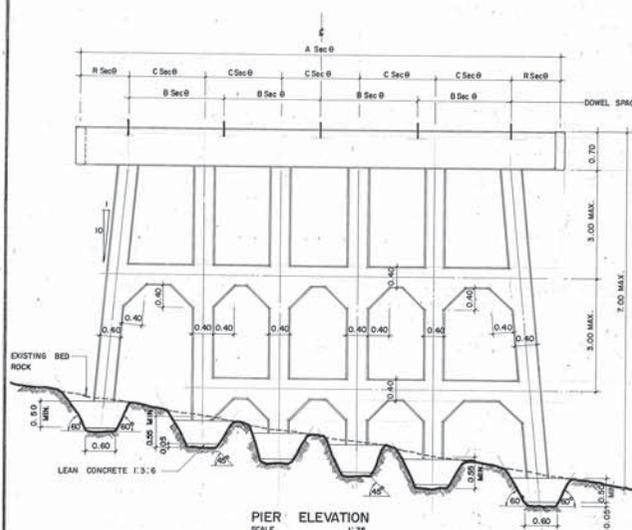


DEFORMED BAR
NOT TO SCALE

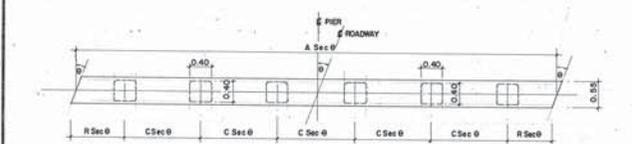
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 0°-30° SKEW RC. SLAB BRIDGE
 WALL BRACING PIER ON BED ROCK DETAILS

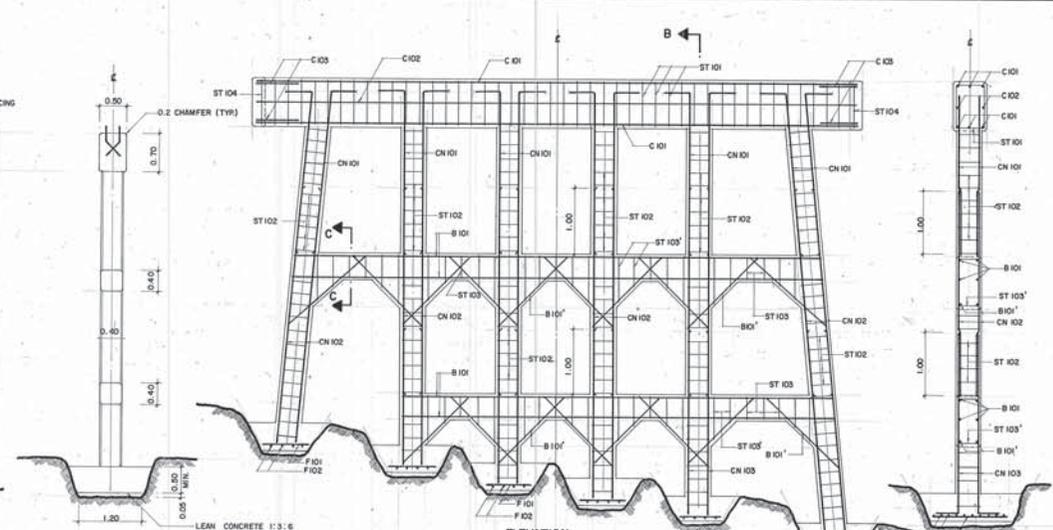
DESIGNED: DOH & CONSULTANTS	CHECKED: <i>Ky</i>	DATE: JULY 1994
SUBMITTED: <i>P. Burong</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN	
APPROVED: <i>S. S.</i> (FOR DIRECTOR GENERAL)	DWG. NO. ST-32	
		SHEET NO. 145



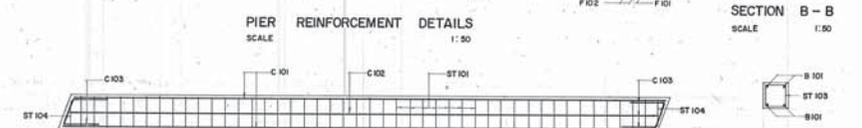
PIER ELEVATION
SCALE 1:75



CAP BEAM PLAN
SCALE 1:50



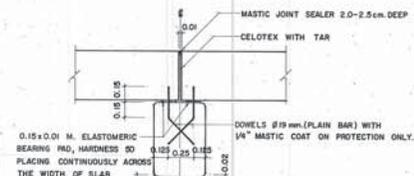
PIER REINFORCEMENT DETAILS
SCALE 1:50



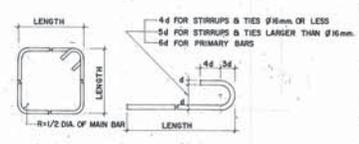
CAP BEAM REINFORCEMENT PLAN
SCALE 1:50

θ, DEGREE	0	5	10	15	20	25	30
Sec 0	1.0000	1.0038	1.0154	1.0353	1.0642	1.1034	1.1547

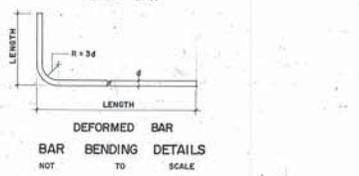
BAR BENDING DIAGRAMS	BAR MARK	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.	
		#	NO. L	#	NO. L								
VARIES	C101	8	6	8	6	8	6	8	6	8	6	8	6
VARIES	C102	4	2	4	2	4	2	4	2	4	2	4	2
VARIES	C103	4	4	4	4	4	4	4	4	4	4	4	4
VARIES	CN101	8	8	8	8	8	8	8	8	8	8	8	8
VARIES	CN102	8	8	8	8	8	8	8	8	8	8	8	8
VARIES	CN103	9	9	9	9	9	9	9	9	9	9	9	9
VARIES	BT101	3	0.20	2.35	3	0.20	2.35	3	0.20	2.35	3	0.20	2.35
VARIES	BT102	3	0.20	1.35	3	0.20	1.35	3	0.20	1.35	3	0.20	1.35
VARIES	ST103	3	0.25	1.35	3	0.25	1.35	3	0.25	1.35	3	0.25	1.35
VARIES	ST103'	3	0.25	1.35	3	0.25	1.35	3	0.25	1.35	3	0.25	1.35
VARIES	ST104	3	2	2.55	3	2	2.55	3	2	2.55	3	2	2.55
VARIES	B101	8	8	8	8	8	8	8	8	8	8	8	8
VARIES	B101'	6	1.55	6	1.55	6	1.55	6	1.55	6	1.55	6	1.55
VARIES	F101	8	0.15	0.55	8	0.15	0.55	8	0.15	0.55	8	0.15	0.55
VARIES	F102	8	0.15	1.15	8	0.15	1.15	8	0.15	1.15	8	0.15	1.15



CAP BEAM DETAILS
SCALE 1:25



PLAIN BAR



DEFORMED BAR
BAR BENDING DETAILS
NOT TO SCALE

ROADWAY WIDTH	LENGTH OF CAP BEAM	DOWEL SPACING	SPAN 5.00 M.	SPAN 6.00 M.	SPAN 7.00 M.	SPAN 8.00 M.	SPAN 9.00 M.	SPAN 10.00 M.
M.	A Sec 0, M.	B Sec 0, M.	COL. SPC. NO. OF C Sec 0, M. COLUMN	COL. SPC. NO. OF C Sec 0, M. COLUMN	COL. SPC. NO. OF C Sec 0, M. COLUMN	COL. SPC. NO. OF C Sec 0, M. COLUMN	COL. SPC. NO. OF C Sec 0, M. COLUMN	COL. SPC. NO. OF C Sec 0, M. COLUMN
6.00	6.00+2R1 Sec 0	2.00 Sec 0	2.00 Sec 0 4	2.00 Sec 0 4	1.50 Sec 0 5	1.50 Sec 0 5	1.20 Sec 0 6	1.20 Sec 0 6
7.00	(7.00+2R1) Sec 0	1.75 Sec 0	2.30 Sec 0 4 2.40 Sec 0 4	2.30 Sec 0 4 2.40 Sec 0 4	1.75 Sec 0 5	1.75 Sec 0 5	1.40 Sec 0 6	1.40 Sec 0 6
8.00	(8.00+2R1) Sec 0	2.00 Sec 0	2.65 Sec 0 4 2.70 Sec 0 4	2.65 Sec 0 4 2.70 Sec 0 4	2.00 Sec 0 5	2.00 Sec 0 5	1.60 Sec 0 6	1.60 Sec 0 6
9.00	(9.00+2R1) Sec 0	1.80 Sec 0	3.00 Sec 0 4	3.00 Sec 0 4	2.25 Sec 0 5	2.25 Sec 0 5	1.50 Sec 0 7	1.50 Sec 0 7
10.00	(10.00+2R1) Sec 0	2.00 Sec 0	2.50 Sec 0 5	2.50 Sec 0 5	2.00 Sec 0 6	2.00 Sec 0 6	1.40 Sec 0 8	1.40 Sec 0 8
11.00	(11.00+2R1) Sec 0	2.20 Sec 0	2.75 Sec 0 5	2.75 Sec 0 5	1.80 Sec 0 7	1.80 Sec 0 7	1.50 Sec 0 8	1.50 Sec 0 8
12.00	(12.00+2R1) Sec 0	2.00 Sec 0	2.40 Sec 0 6	2.40 Sec 0 6	2.00 Sec 0 7	2.00 Sec 0 7	1.70 Sec 0 8	1.70 Sec 0 8
13.00	(13.00+2R1) Sec 0	1.85 Sec 0 1.90 Sec 0	2.60 Sec 0 6	2.60 Sec 0 6	1.85 Sec 0 8	1.85 Sec 0 8	1.40 Sec 0 9	1.40 Sec 0 9
14.00	(14.00+2R1) Sec 0	2.00 Sec 0	2.30 Sec 0 7 2.40 Sec 0 7	2.30 Sec 0 7 2.40 Sec 0 7	2.00 Sec 0 8	2.00 Sec 0 8	1.55 Sec 0 9	1.55 Sec 0 9

- NOTES:
- THIS STANDARD DRAWING IS APPLICABLE FOR FOUNDATIONS ON BED ROCK WHICH HAS A MINIMUM ALLOWABLE BEARING CAPACITY OF 80 TON/M².
 - THE BOTTOM OF THE LOWER FOOTINGS SHALL BE ABOVE 45° LINE FROM THE BOTTOM EDGES OF ADJACENT UPPER FOOTINGS.
 - THE EMBEDDED DEPTH OF EACH FOOTING MEASURED AT THE CENTERLINE OF EACH COLUMN FROM EXISTING HARD BED ROCK TO THE BOTTOM OF EXCAVATION SHALL NOT BE LESS THAN 0.55 M. AND SHALL BE UNDER THE APPROVAL OF THE ENGINEER.
 - HORIZONTAL CROSS BRACING BETWEEN COLUMN SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.00 M., A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.00 M. AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEED 3.00 M. ADDITIONAL BRACING SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.00 M.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE CAP BEAM AT WHICH CLEAR COVER OF 2.5 CM. SHALL BE PROVIDED.
 - LEAN CONCRETE OF APPROXIMATELY 5.0 CM THICK SHALL BE PLACED UNDER THE BOTTOM OF ALL FOOTINGS. COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 IF VOLUME.
 - CONCRETE SHALL HAVE MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15:0.15:0.15 M. CUBE AT 28 DAYS CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBE METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG.
CRUSHED ROCK OR GRAVEL	0.86 M ³
SAND	0.43 M ³
CONCRETE SLUM MAX.	10 CM.
 - REBAR #4 OR LARGER SHALL BE TIS 24 GRADE SD30 DEFORMED BARS, OTHER SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATION OF LAP SPACING OF REBARS SHALL BE APPROVAL BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETER OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANCE PORTLAND CEMENT TYPE 5 CONFORMING TO TIS.15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM. FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITH OUT ALTERING THE LOCATION OF REBARS.
 - THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.00 M. PIER HIGHER THAN 7.00 M. SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 - THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREES BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY.
 - ALL DIMENSIONS SHOWN ARE IN METER UNLESS OTHERWISE INDICATED.
 - THIS DRAWING MAY BE USED IN COMBINATION WITH ONE OF THE FOLLOWING DRAWINGS BELOW WHICHEVER IS APPLICABLE: DWG. NOS. ST-02, ST-05, ST-08
 - THIS DRAWING IS ADAPTED FROM DDH. DWG. NO. 308-08-14/7

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

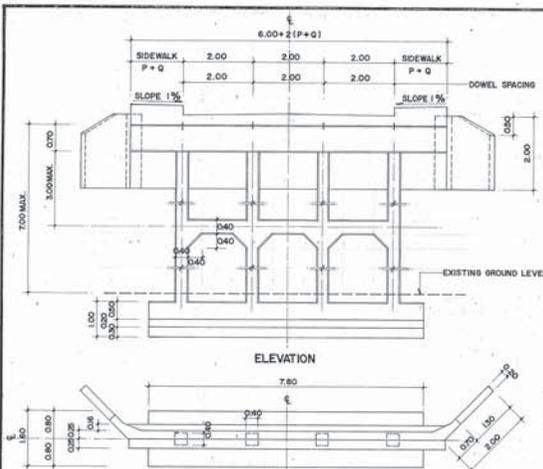
STANDARD DRAWING
 0°-30° SKEW RC. SLAB BRIDGE
 SPREAD FOOTING PIER ON BED ROCK DETAILS

DESIGNED: DDH 9 CONSULTANTS [checked] DATE: JULY, 1994

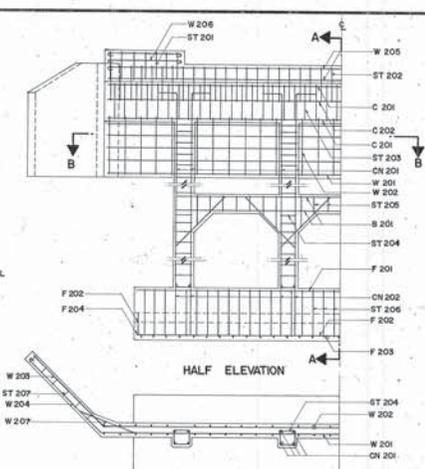
SUBMITTED: [Signature] SCALE: 1:25, 1:50
 (DIRECTOR OF LOCATION & DESIGN DIVISION)

APPROVED: [Signature] DWG. NO.: ST-33
 (DIRECTOR GENERAL)

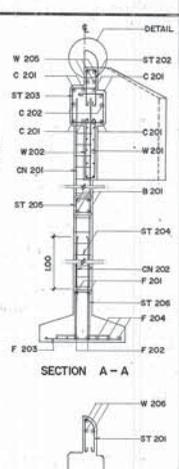
SHEET NO. 146



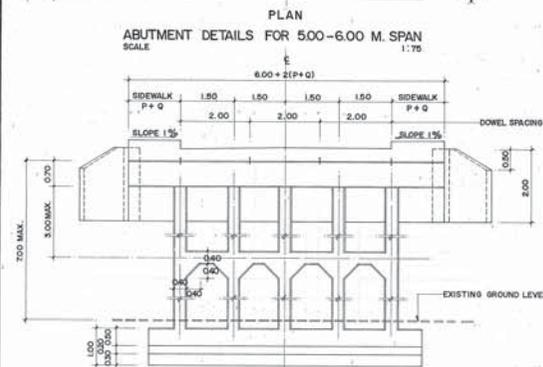
ABUTMENT DETAILS FOR 5.00-6.00 M.SPAN
SCALE 1:75



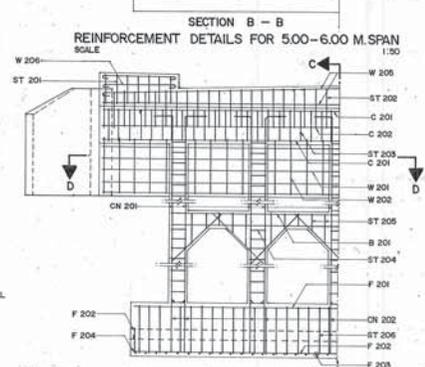
REINFORCEMENT DETAILS FOR 5.00-6.00 M.SPAN
SCALE 1:50



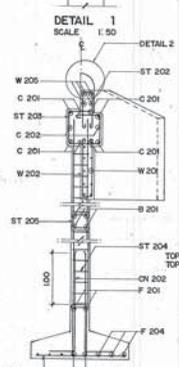
SECTION A - A



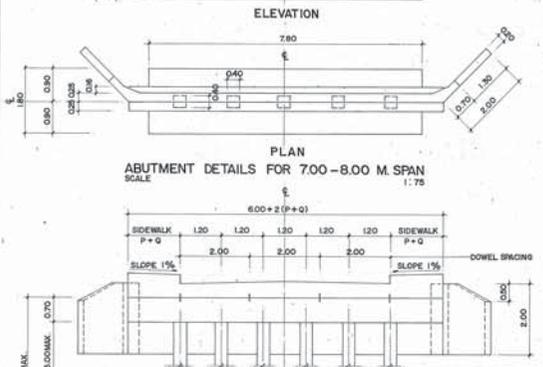
ABUTMENT DETAILS FOR 7.00-8.00 M.SPAN
SCALE 1:75



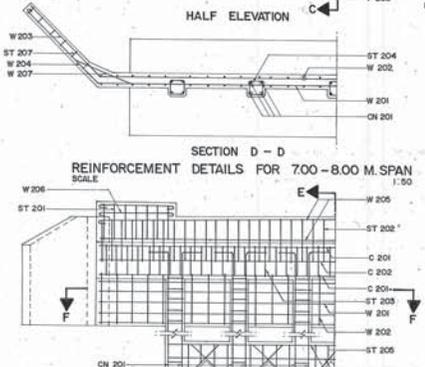
REINFORCEMENT DETAILS FOR 7.00-8.00 M.SPAN
SCALE 1:50



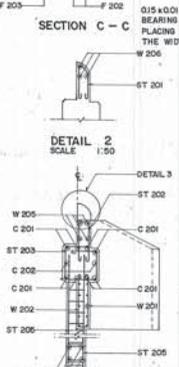
SECTION B - B



ABUTMENT DETAILS FOR 9.00-10.00 M.SPAN
SCALE 1:75



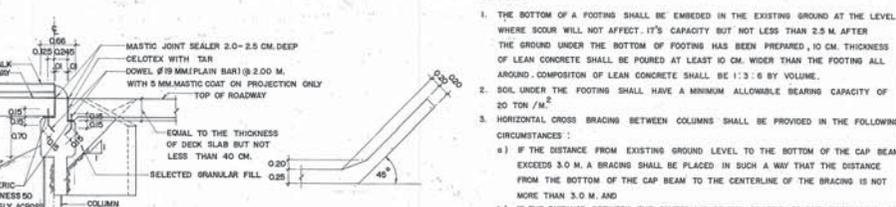
REINFORCEMENT DETAILS FOR 9.00-10.00 M.SPAN
SCALE 1:50



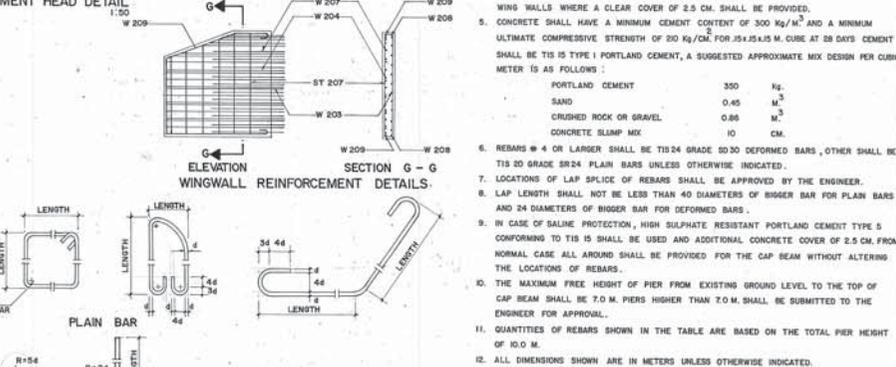
SECTION C - C

BAR BENDING DIAGRAMS		TABLE OF REINFORCEMENT																							
		SPAN 5.00M				SPAN 6.00M				SPAN 7.00M				SPAN 8.00M				SPAN 9.00M				SPAN 10.00M			
BAR MARK	#	(#)	NO	L	#	(#)	NO	L	#	(#)	NO	L	#	(#)	NO	L	#	(#)	NO	L	#	(#)	NO	L	
C 201	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8
C 202	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	4	-	
ST 201	2	0.20	-	1215	2	0.20	-	1295	2	0.20	-	1395	2	0.20	-	1435	2	0.20	-	1515	2	0.20	-	1635	
ST 202	3	0.20	-	1745	3	0.20	-	1795	3	0.20	-	1845	3	0.20	-	1895	3	0.20	-	1945	3	0.20	-	1995	
ST 203	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3	0.20	-	3
ST 204	3	0.20	156	135	3	0.20	156	135	3	0.20	156	135	3	0.20	156	135	3	0.20	156	135	3	0.20	156	135	
ST 205	3	0.25	18	135	3	0.25	18	135	3	0.25	18	135	3	0.25	18	135	3	0.25	18	135	3	0.25	18	135	
ST 206	3	0.25	24	24	3	0.25	24	24	3	0.25	24	24	3	0.25	24	24	3	0.25	24	24	3	0.25	24	24	
ST 207	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	
B 201	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	8	-	
B 202	6	-	24	155	6	-	24	155	6	-	24	155	6	-	24	155	6	-	24	155	6	-	24	155	
CN 201	8	-	16	925	8	-	16	925	8	-	20	925	8	-	20	925	8	-	24	925	8	-	24	925	
CN 202	8	-	16	231	8	-	16	231	8	-	20	231	8	-	20	231	8	-	24	231	8	-	24	231	
F 201	8	-	2	770	8	-	2	770	8	-	2	770	8	-	2	770	8	-	2	770	8	-	2	770	
F 202	8	-	2	890	8	-	2	890	8	-	2	890	8	-	2	890	8	-	2	890	8	-	2	890	
F 203	4	0.25	31	155	4	0.25	31	155	4	0.25	31	155	4	0.25	31	155	4	0.25	31	155	4	0.25	31	155	
F 204	4	-	6	770	4	-	6	770	4	-	6	770	4	-	6	770	4	-	6	770	4	-	6	770	
W 201	4	0.20	10	-	4	0.20	10	-	4	0.20	10	-	4	0.20	10	-	4	0.20	10	-	4	0.20	10	-	
W 202	2	0.30	-	270	2	0.30	-	260	2	0.30	-	260	2	0.30	-	250	2	0.30	-	240	2	0.30	-	230	
W 203	4	0.15	24	-	4	0.15	24	-	4	0.15	24	-	4	0.15	24	-	4	0.15	24	-	4	0.15	24	-	
W 204	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	2	0.30	12	-	
W 205	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	2	-	4	-	
W 206	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	2	-	6	-	
W 207	4	0.15	26	215	4	0.15	26	215	4	0.15	26	215	4	0.15	26	215	4	0.15	26	215	4	0.15	26	215	
W 208	4	-	2	5435	4	-	2	5435	4	-	2	5435	4	-	2	5435	4	-	2	5435	4	-	2	5435	
W 209	2	-	2	5535	2	-	2	5535	2	-	2	5535	2	-	2	5535	2	-	2	5535	2	-	2	5535	

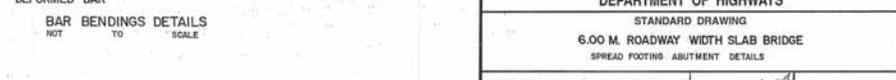
Notes: 1. THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SOOR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND THE FOOTING OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.



WINGWALL DETAIL SCALE 1:50
ABUTMENT HEAD DETAIL SCALE 1:50



SECTION G - G
ELEVATION WINGWALL REINFORCEMENT DETAILS

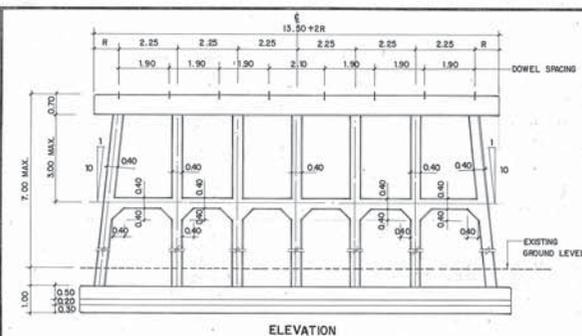


BAR BENDING DETAILS NOT TO SCALE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
6.00 M ROADWAY WIDTH SLAB BRIDGE
 SPREAD FOOTING ABUTMENT DETAILS

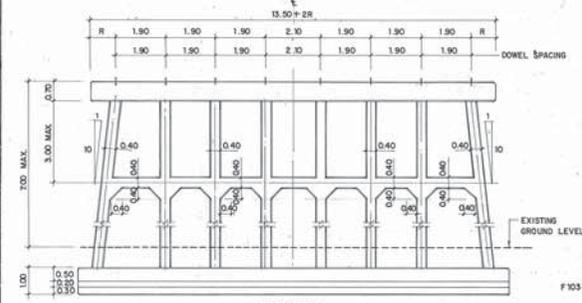
DESIGNED: DOH & CONSULTANTS CHECKED: [Signature] DATE: JULY 1994
 SUBMITTED: [Signature] (DIRECTOR OF LOCATION & DESIGN DIVISION) SCALE: AS SHOWN
 APPROVED: [Signature] (MPSA (DIRECTOR GENERAL)) DWG. NO. ST-35
 SHEET NO. 148



ELEVATION



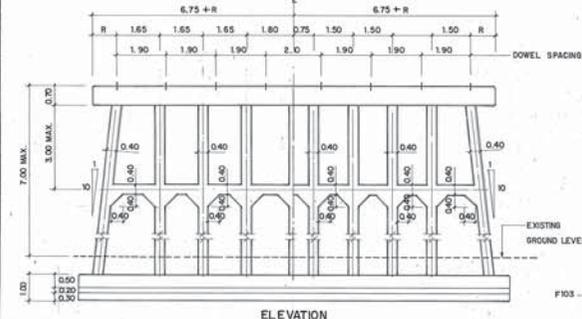
FOOTING PLAN
PIER DETAILS FOR 5.00 - 6.00 M. SPAN
SCALE 1:100



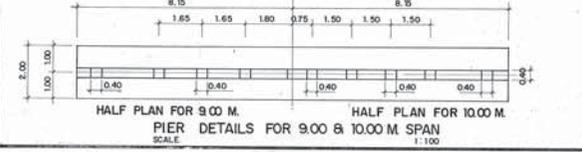
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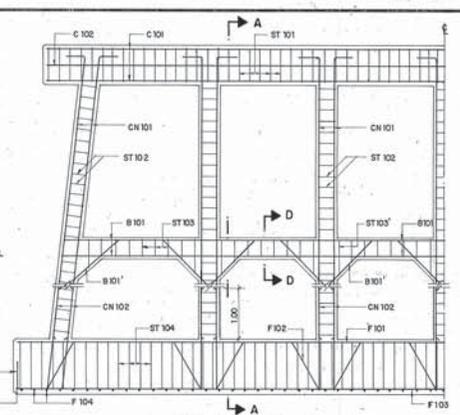
FOOTING PLAN
PIER DETAILS FOR 7.00 - 8.00 M SPAN
SCALE 1:100



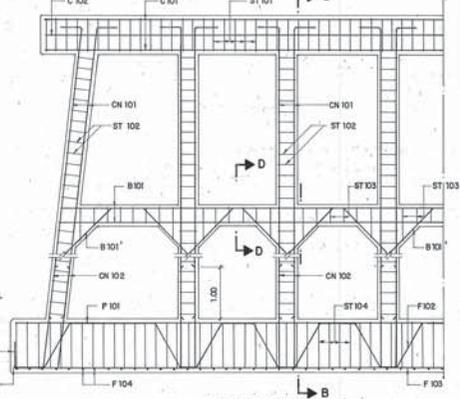
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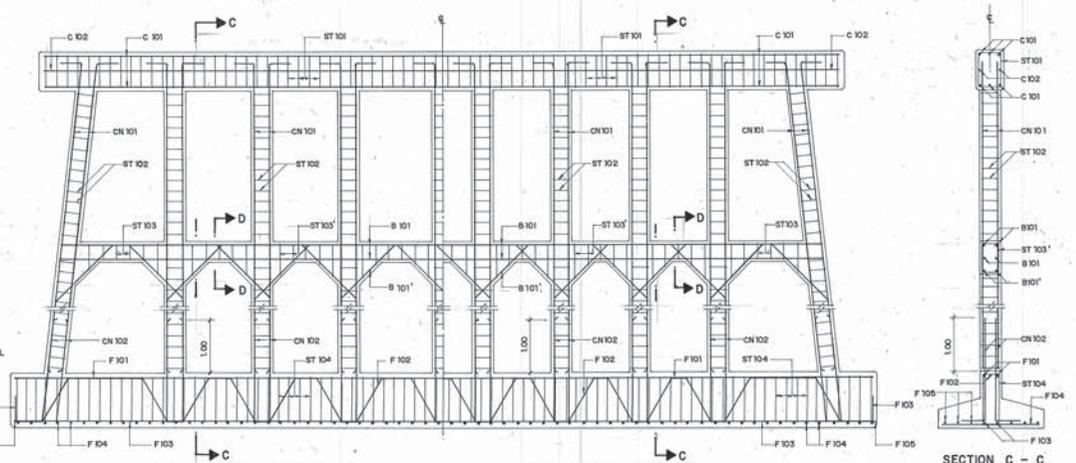
HALF PLAN FOR 9.00 M. HALF PLAN FOR 10.00 M.
PIER DETAILS FOR 9.00 & 10.00 M SPAN
SCALE 1:100



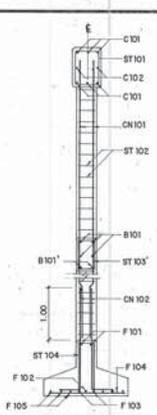
HALF ELEVATION
REINFORCEMENT DETAILS FOR 5.00 - 6.00 M SPAN
SCALE 1:50



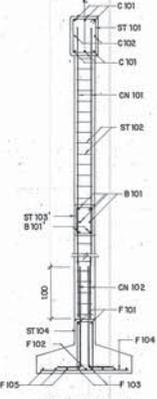
HALF ELEVATION
REINFORCEMENT DETAILS FOR 7.00 - 8.00 M SPAN
SCALE 1:50



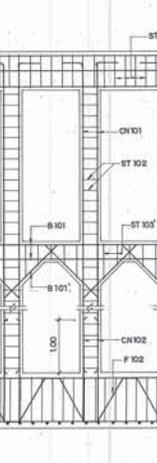
HALF ELEVATION FOR 9.00 M. HALF ELEVATION FOR 10.00 M.
REINFORCEMENT DETAILS FOR 9.00 & 10.00 M SPAN
SCALE 1:50



SECTION A - A



SECTION B - B



SECTION C - C

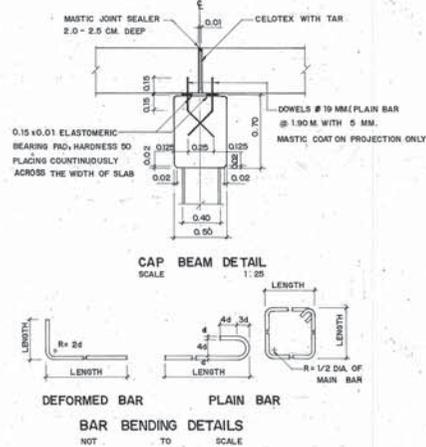
BAR BENDING DIAGRAMS	TABLE OF REINFORCEMENT												
	SPAN 5.00 M.		SPAN 6.00 M.		SPAN 7.00 M.		SPAN 8.00 M.		SPAN 9.00 M.		SPAN 10.00 M.		
MARK	#	Ø	NO.	L	#	Ø	NO.	L	#	Ø	NO.	L	
VARIES	C 101	8	-	6	-	8	-	6	-	8	-	6	-
VARIES	C 102	4	-	2	-	4	-	2	-	4	-	2	-
10.65	CN 101	8	-	28	11.25	8	-	28	11.25	8	-	28	11.25
191	CN 102	8	-	28	2.31	8	-	28	2.31	8	-	28	2.31
0.40	ST 101	3	0.20	95	2.35	3	0.20	77	2.35	3	0.20	77	2.35
0.65	ST 102	3	0.20	432	1.35	3	0.20	480	1.35	3	0.20	528	1.35
0.30	ST 103	3	0.25	84	1.35	3	0.25	84	1.35	3	0.25	84	1.35
0.30	ST 103'	3	-	48	3	-	48	3	-	3	-	64	3
VARIES	ST 104	3	0.20	99	2.55	3	0.20	82	2.55	3	0.20	79	2.55
1.55	B 101	8	-	8	-	8	-	8	-	8	-	8	-
6.20	B 101'	8	-	48	1.55	8	-	48	1.55	8	-	64	1.55
0.40	F 101	8	-	2	16.20	8	-	2	16.20	8	-	2	16.20
0.40	F 102	8	-	1	8	-	1	8	-	8	-	1	8
0.40	F 103	8	-	2	17.40	8	-	2	17.40	8	-	2	17.40
0.40	F 104	4	0.25	79	-	4	0.25	79	-	4	0.25	158	-
0.40	F 105	4	-	6	16.20	4	-	6	16.20	4	-	6	16.20

3 = 3/8" OR 9 MM, # 4 = 1/2" OR 12 MM, # 6 = 3/4" OR 20 MM, # 8 = 1" OR 25 MM, NO. = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR

NOTES:

- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTING HAS BEEN PREPARED, 10 CM THICK OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
- SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 20 TON / M².
- HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCE:
 - a) IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEED 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - b) IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEED 3.0 M ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM, EXCEPT THE CAP BEAM AND WING WALLS WHERE A CLEAR COVER OF 5 CM SHALL BE PROVIDED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG / M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG / CM² FOR A 0.15 x 0.15 x 0.15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE 1 PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG	CRUSHED ROCK OR GRAVEL	0.86 M ³
SAND	0.43 M ³	CONCRETE SLUMP	MAX. 10 CM
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S24 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATION OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANCE PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
- THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0 M, PIERS HIGHER THAN 7.0 M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
- QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.0 M.
- ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.



CAP BEAM DETAIL
SCALE 1:25



DEFORMED BAR PLAIN BAR
BAR BENDING DETAILS
NOT TO SCALE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
13.50 M. ROADWAY WIDTH SLAB BRIDGE
SPREAD FOOTING PIER DETAILS

DESIGNER: DOH & CONSULTANTS	CHECKED: [Signature]	DATE JULY 1994
SUBMITTED: [Signature]	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED: [Signature]	1114 (DIRECTOR GENERAL)	DWG. NO. 3AD5-106-14/27
		SHEET NO. 150

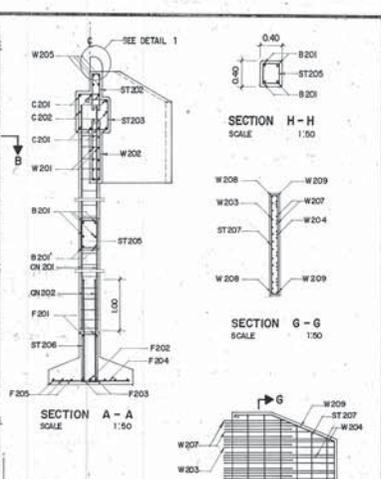
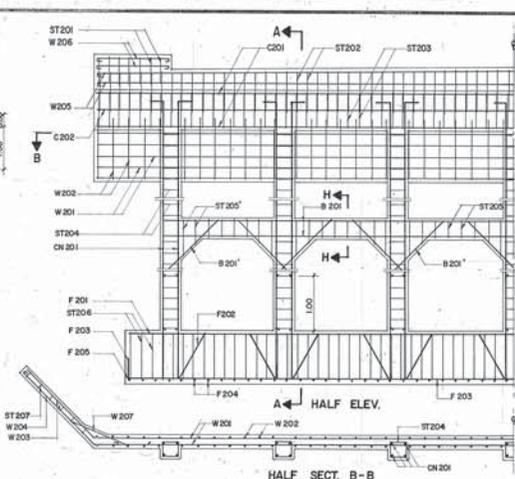
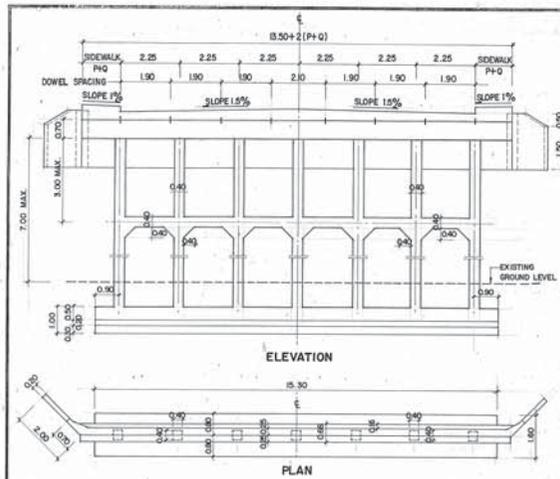
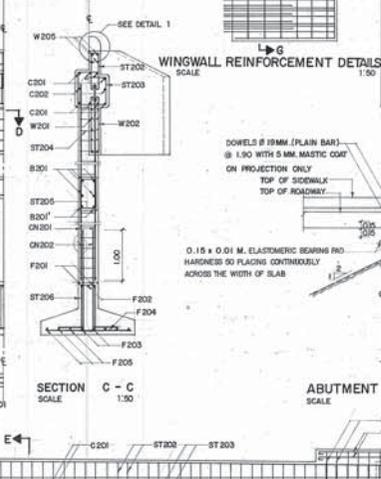
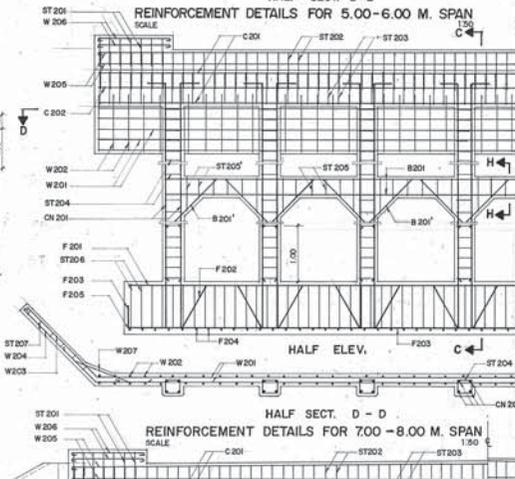
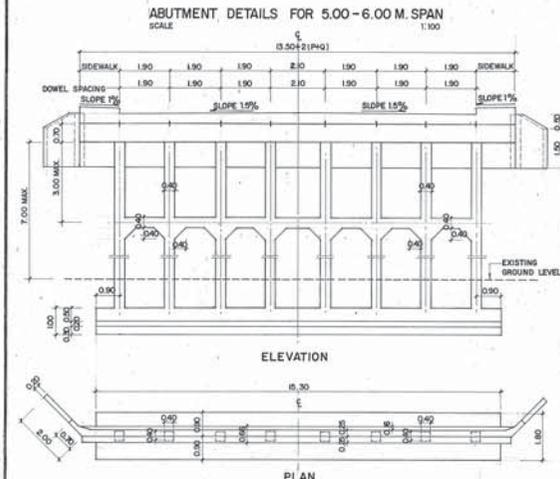


TABLE OF REINFORCEMENT

BAR MARK	SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M	
	#	NO. L	#	NO. L								
C201	8	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4	2
ST201	2	2	2	2	2	2	2	2	2	2	2	2
ST202	3	2	3	2	3	2	3	2	3	2	3	2
ST203	3	2	3	2	3	2	3	2	3	2	3	2
ST204	3	2	3	2	3	2	3	2	3	2	3	2
ST205	3	2	3	2	3	2	3	2	3	2	3	2
ST206	3	2	3	2	3	2	3	2	3	2	3	2
ST207	2	2	2	2	2	2	2	2	2	2	2	2
ST208	2	2	2	2	2	2	2	2	2	2	2	2
ST209	2	2	2	2	2	2	2	2	2	2	2	2
ST210	2	2	2	2	2	2	2	2	2	2	2	2
ST211	2	2	2	2	2	2	2	2	2	2	2	2
ST212	2	2	2	2	2	2	2	2	2	2	2	2
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ST215	2	2	2	2	2	2	2	2	2	2	2	2
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ST297	2	2	2	2	2	2	2	2	2	2	2	2
ST298	2	2	2	2	2	2	2	2	2	2	2	2
ST299	2	2	2	2	2	2	2	2	2	2	2	2
ST300	2	2	2	2	2	2	2	2	2	2	2	2



NOTES:

- THE BOTTOM OF A FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SOIL WILL NOT AFFECT ITS CAPACITY BUT NOT LESS THAN 2.5 M. AFTER THE GROUND UNDER THE BOTTOM OF FOOTINGS HAS BEEN PREPARED, 10 CM THICKNESS OF LEAN CONCRETE SHALL BE POURED AT LEAST 10 CM WIDER THAN THE FOOTING ALL AROUND COMPOSITION OF LEAN CONCRETE SHALL BE 1:3:6 BY VOLUME.
- SOIL UNDER THE FOOTING SHALL HAVE A MINIMUM ALLOWABLE BEARING CAPACITY OF 30 TON/M².
- HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 - IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0 M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 - IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE EXISTING GROUND LEVEL EXCEEDS 3.0 M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
- CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, BACK WALL AND WINGWALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
- CONCRETE SHALL HAVE ALUMINUM CEMENT CONTENT OF 300 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15+0.15+0.15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TS 15 TYPE I PORTLAND CEMENT A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:

PORTLAND CEMENT	350 KG
SAND	0.43 M ³
CRUSHED ROCK OR GRAVEL	0.88 M ³
CONCRETE SLUMP	MAX 10 CM
- REBARS ≥ 4 CM LARGER SHALL BE TS 24 GRADE SD 30 DEFORMED BARS, OTHERS SHALL BE TS 20. GRADE SR 34 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 2

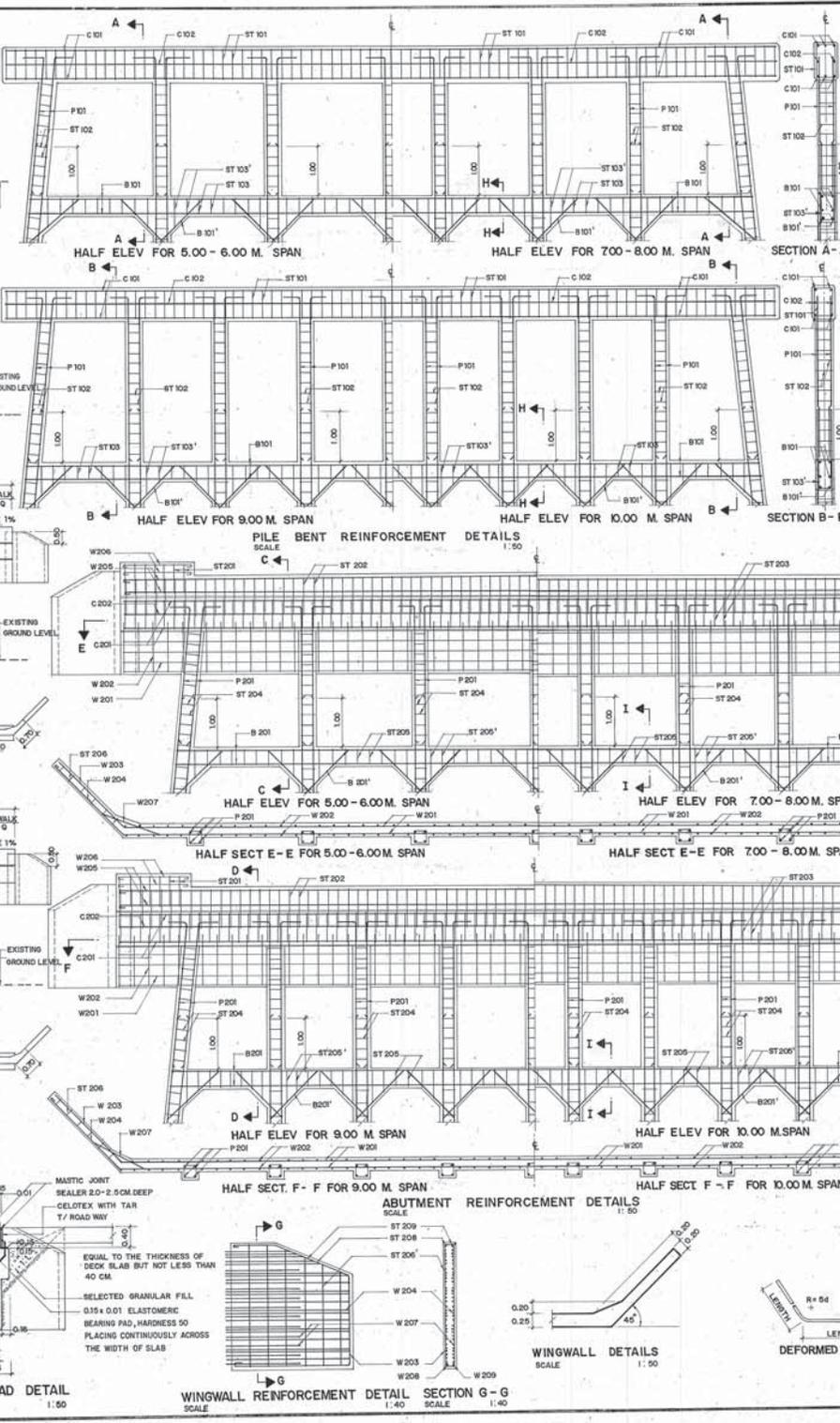
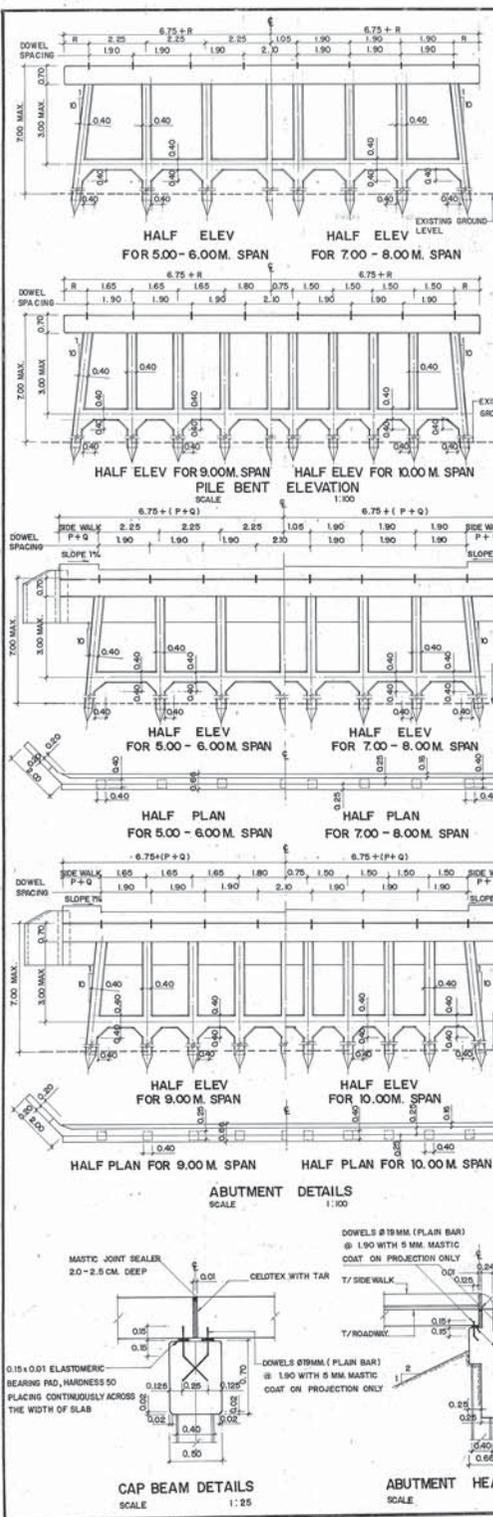


TABLE OF REINFORCEMENT		SPAN, 6.00 M.		SPAN, 7.00 M.		SPAN, 8.00 M.		SPAN, 9.00 M.		SPAN, 10.00 M.	
BAR MARK	NO. L	NO. L	NO. L								
C101	8	6	8	6	8	6	8	6	8	6	8
C102	4	2	4	2	4	2	4	2	4	2	4
ST101	3	0.20	9.4	2.35	3	0.20	9.4	2.35	3	0.20	9.4
ST102	3	0.20	126	1.35	3	0.20	126	1.35	3	0.20	126
ST103	3	0.25	24	1.35	3	0.25	24	1.35	3	0.25	24
ST103'	3	0.25	24	1.35	3	0.25	24	1.35	3	0.25	24
B101	8	4	8	4	8	4	8	4	8	4	8
B101'	6	24	1.55	6	24	1.55	6	24	1.55	6	24
P101	8	36	3.75	8	36	3.75	8	36	3.75	8	36
C201	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4
ST201	2	0.20	14	2	0.20	14	2	0.20	14	2	0.20
ST202	3	0.20	100	3	0.20	100	3	0.20	100	3	0.20
ST203	3	0.20	100	3	0.20	100	3	0.20	100	3	0.20
ST204	3	0.20	100	3	0.20	100	3	0.20	100	3	0.20
ST205	3	0.25	24	3	0.25	24	3	0.25	24	3	0.25
ST205'	3	0.25	24	3	0.25	24	3	0.25	24	3	0.25
ST206	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30
ST206'	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30
B201	8	4	8	4	8	4	8	4	8	4	8
B201'	6	24	1.55	6	24	1.55	6	24	1.55	6	24
P201	8	36	3.75	8	36	3.75	8	36	3.75	8	36
W201	4	0.20	10	4	0.20	10	4	0.20	10	4	0.20
W202	2	0.30	55	2	0.30	55	2	0.30	55	2	0.30
W203	4	0.15	24	4	0.15	24	4	0.15	24	4	0.15
W204	2	0.30	12	2	0.30	12	2	0.30	12	2	0.30
W205	2	4	2	2	4	2	2	4	2	2	4
W206	2	6	2	2	6	2	2	6	2	2	6
W207	4	0.15	26	2	0.15	26	2	0.15	26	2	0.15
W208	4	2	5.435	4	2	5.435	4	2	5.435	4	2
W209	2	2	5.935	2	2	5.935	2	2	5.935	2	2

NOTES:
 1. PILE SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY AND SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 90 TONS OR PILE DETAILS SEE DWG NO. MS-02, MS-03
 2. HORIZONTAL CROSS BRACING BETWEEN COLUMNS SHALL BE PROVIDED IN THE FOLLOWING CIRCUMSTANCES:
 a) IF THE DISTANCE FROM EXISTING GROUND LEVEL TO THE BOTTOM OF THE CAP BEAM EXCEEDS 3.0M, A BRACING SHALL BE PLACED IN SUCH A WAY THAT THE DISTANCE FROM THE BOTTOM OF THE CAP BEAM TO THE CENTERLINE OF THE BRACING IS NOT MORE THAN 3.0 M, AND
 b) IF THE DISTANCE BETWEEN THE CENTERLINE OF THE BRACING TO THE GROUND LEVEL EXCEEDS 3.0M, ADDITIONAL BRACINGS SHALL BE PROVIDED AT AN INTERVAL NOT MORE THAN 3.0 M.
 3. CLEAR CONCRETE COVER SHALL BE 5.0 CM EXCEPT THE CAP BEAM, BACK AND WING WALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 4. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT 300 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR A 0.15% W/0.5% MOISTURE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS:
 PORTLAND CEMENT 350 KG, CRUSHED ROCK OR GRAVEL 0.86 M³, SAND 0.43 M³, CONCRETE SLUMP MAX. 10 CM.
 5. REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 6. LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 7. LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 8. IN CASE OF SALINE PROTECTION, HIGH SULPHATE CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM, BACK WALL AND WINGWALLS WITHOUT ALTERING THE LOCATIONS OF REBARS.
 9. THE MAXIMUM FREE HEIGHT OF PIER FROM EXISTING GROUND LEVEL TO THE TOP OF CAP BEAM SHALL BE 7.0M PIERS HIGHER THAN 7.0M SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
 10. ALL DIMENSIONS SHOWN ARE IN METERS UNLESS OTHERWISE INDICATED.

SECTION H-H SCALE 1:25
SECTION I-I SCALE 1:25
DETAIL 1 SCALE 1:50
WINGWALL DETAILS SCALE 1:50
DEFORMED BAR
PLAIN BAR
BAR BENDING DETAILS SCALE

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS
 STANDARD DRAWING
13.50 M. ROADWAY WIDTH SLAB BRIDGE
 PILE BENT AND ABUTMENT DETAILS

DESIGNER: DOH & CONSULTANTS	CHECKED: [Signature]	DATE: JULY 1994
SUBMITTED: [Signature]	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED: [Signature]	(DIRECTOR GENERAL)	DWG. NO. SACS-106-H/28
		SHEET NO. 15/2

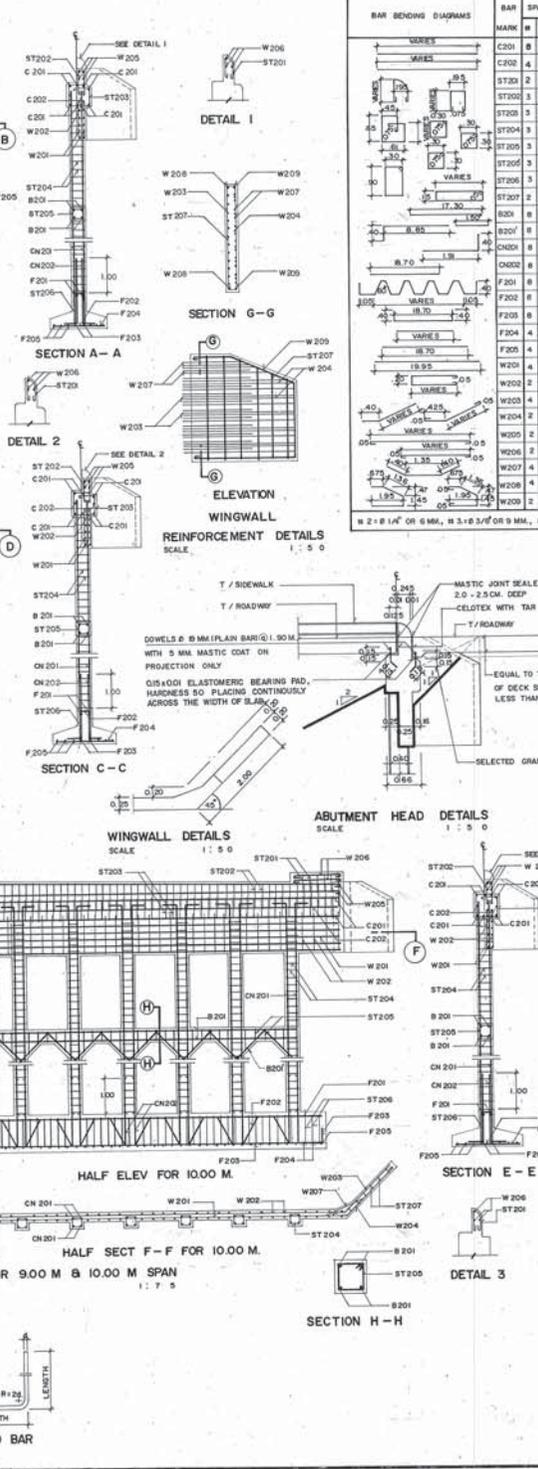
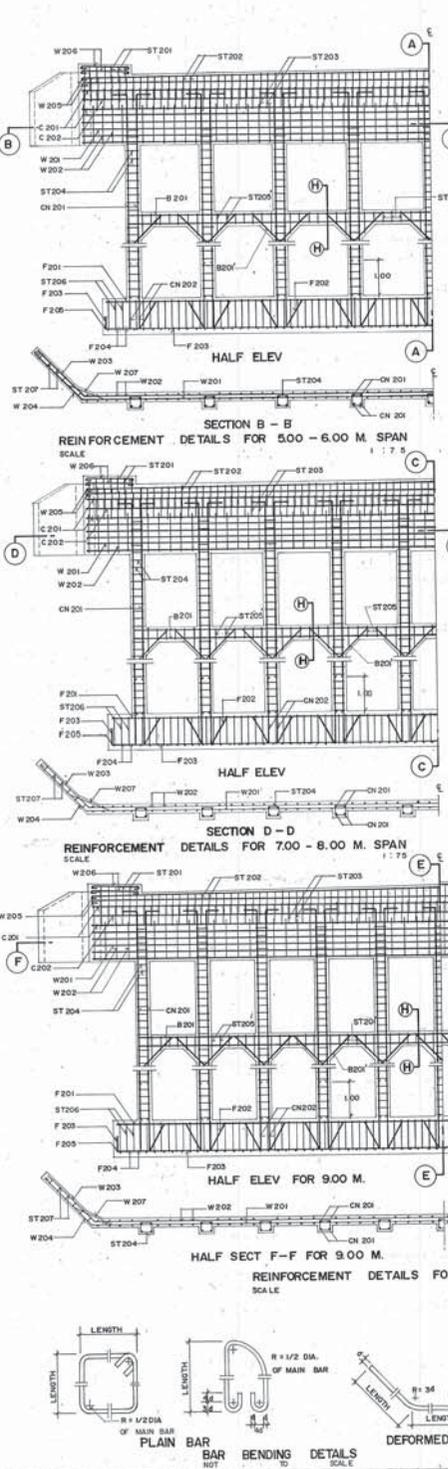
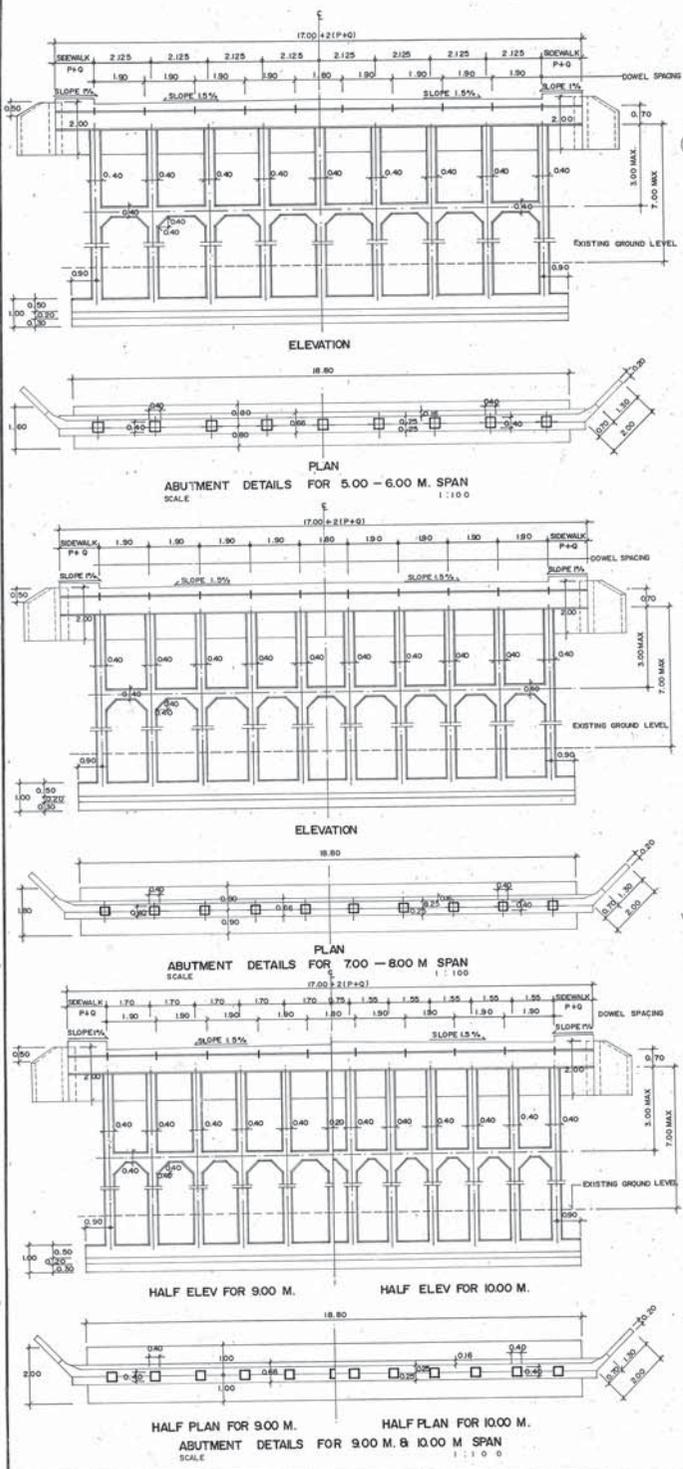


TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M	
	MARK	NO. L	MARK	NO. L								
C201	8	8	8	8	8	8	8	8	8	8	8	8
C202	4	2	4	2	4	2	4	2	4	2	4	2
ST301	2	14	2	14	2	14	2	14	2	14	2	14
ST302	3	20	3	20	3	20	3	20	3	20	3	20
ST303	3	20	3	20	3	20	3	20	3	20	3	20
ST304	3	20	3	20	3	20	3	20	3	20	3	20
ST305	3	25	3	25	3	25	3	25	3	25	3	25
ST306	3	25	3	25	3	25	3	25	3	25	3	25
ST307	2	30	2	30	2	30	2	30	2	30	2	30
ST308	2	30	2	30	2	30	2	30	2	30	2	30
ST309	2	30	2	30	2	30	2	30	2	30	2	30
ST310	2	30	2	30	2	30	2	30	2	30	2	30
ST311	2	30	2	30	2	30	2	30	2	30	2	30
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ST313	2	30	2	30	2	30	2	30	2	30	2	30
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ST315	2	30	2	30	2	30	2	30	2	30	2	30
ST316	2	30	2	30	2	30	2	30	2	30	2	30
ST317	2	30	2	30	2	30	2	30	2	30	2	30
ST318	2	30	2	30	2	30	2	30	2	30	2	30
ST319	2	30	2	30	2	30	2	30	2	30	2	30
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ST321	2	30	2	30	2	30	2	30	2	30	2	30
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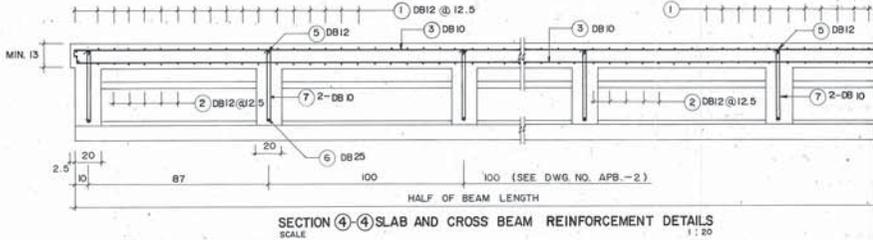
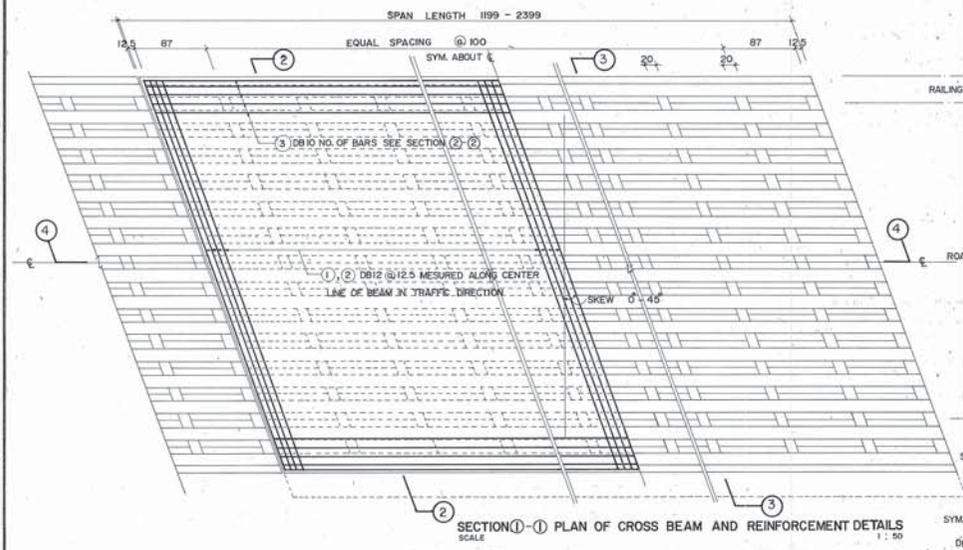
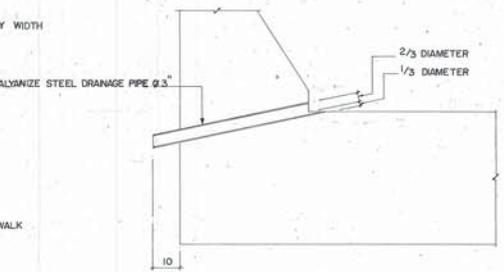
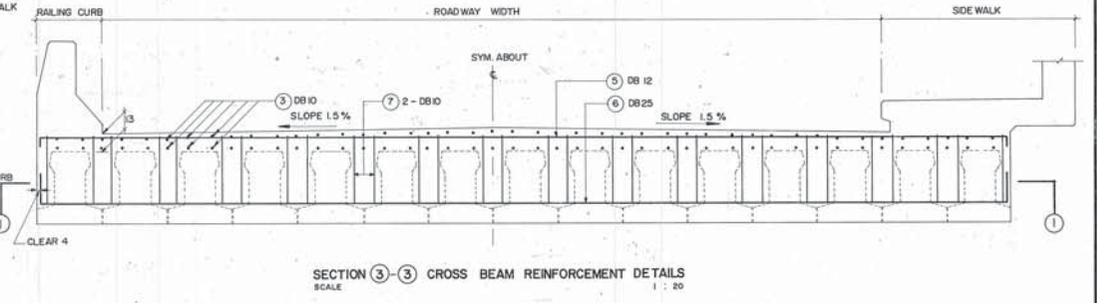
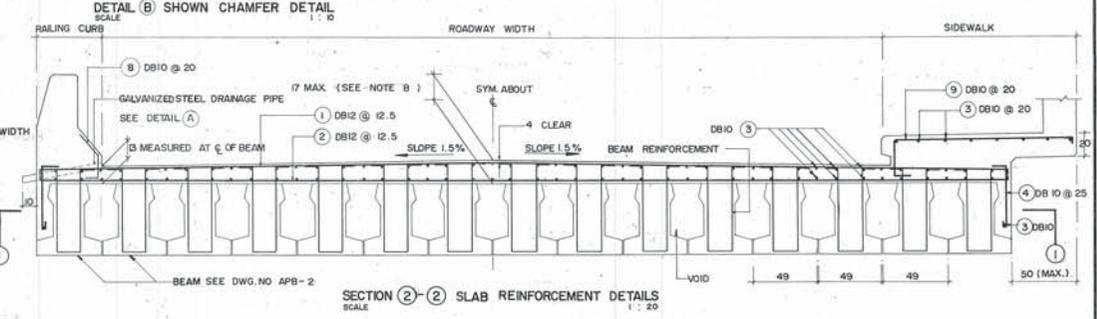
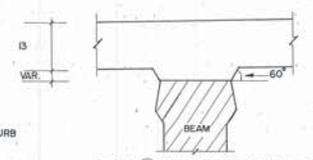
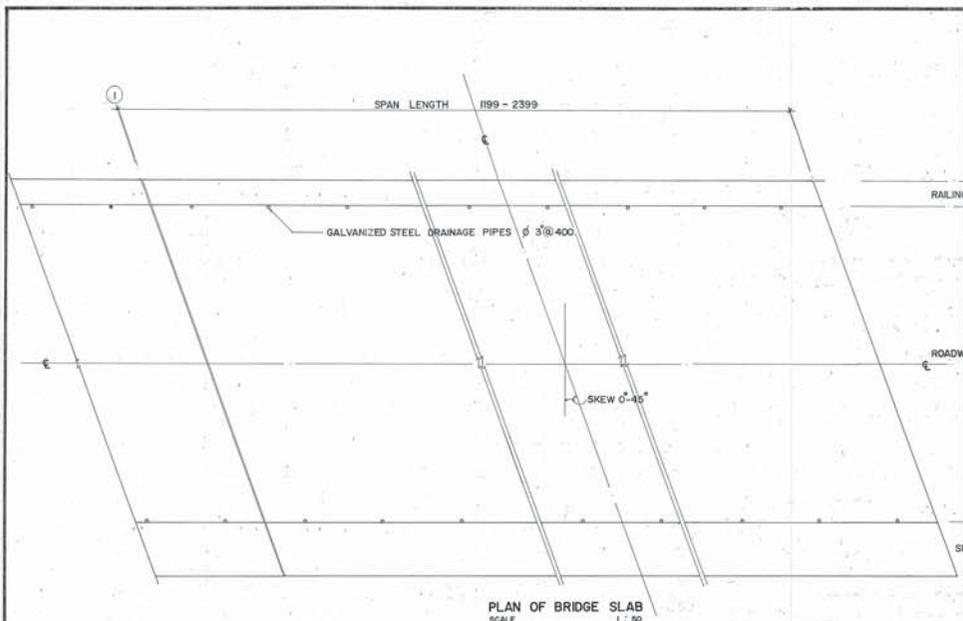


TABLE OF REINFORCEMENT

BAR MARK	NUMBER	BARS BENDING	BAR MARK	NUMBER	BARS BENDING
①	DB 12	5' 15"	⑧	DB10	30
②	DB 12	5' 5"	⑨	DB10	30
③	DB 10	5' 15"			
④	DB 10	50			
⑤	DB 12	10' 50"			
⑥	DB 25	5' 5"			
⑦	DB 10	5' 5"			

NOTES :

- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- ALL CONCRETE EXPOSED CORNERS SHALL HAVE 1 CM CHAMFER UNLESS OTHERWISE INDICATED.
- REBARS ϕ 12 MM. OR LARGER SHALL BE TIS 24 GRADE SD 30 DEFORMED BARS OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- CONCRETE IN SLAB AND CROSS BEAM SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 N/MM² FOR A 0.15 x 0.15 x 0.15 M. CUBE AT 28 DAYS. WITH MAXIMUM CONCRETE SLUMP 8 CM.
- CLEAR CONCRETE COVER SHALL BE 30 CM. UNLESS OTHERWISE INDICATED
- THE THICKNESS OF SLAB SHALL NOT BE GREATER THAN 17 CM. IN CASE OF HIGHER ELEVATION OF SLAB IS REQUIRED, THE SLAB SHALL BE RAISED UP AS SHOWN IN DETAILS B.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
12.00-24.00M.SPAN MULTI-BEAM BRIDGE PLAN,
SECTIONS AND REINFORCEMENT DETAILS.

DESIGNED : DOH. & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED : <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN	
APPROVED : <i>[Signature]</i> DIRECTOR GENERAL	DWG. NO. APB-1	
	SHEET NO. 156	

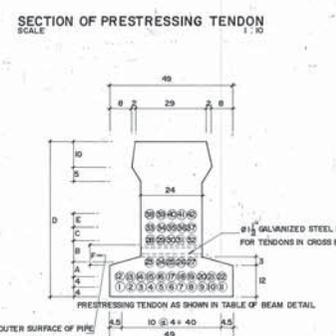
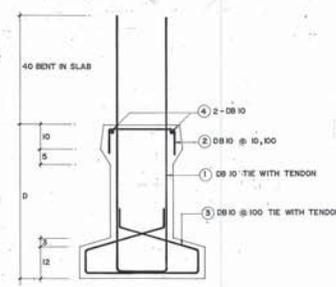
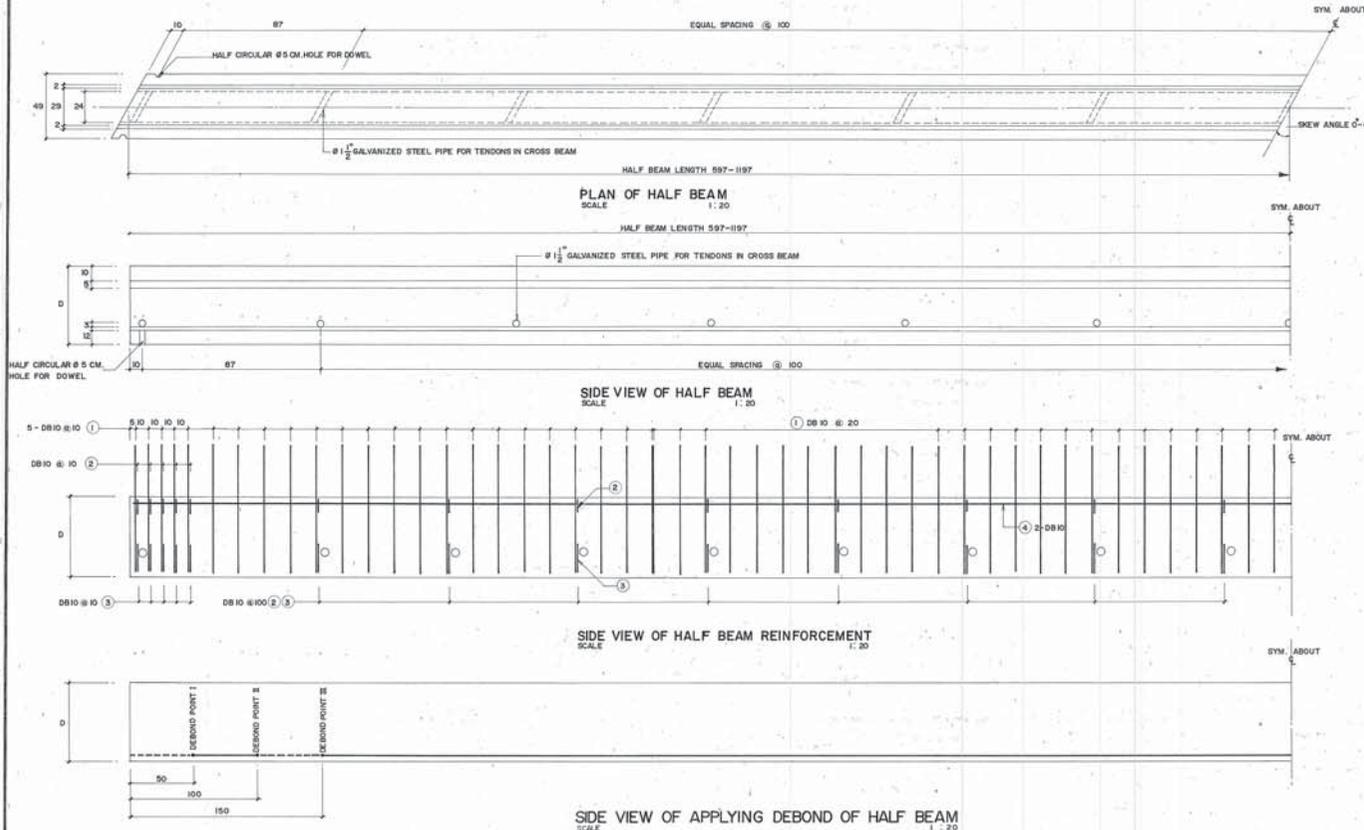
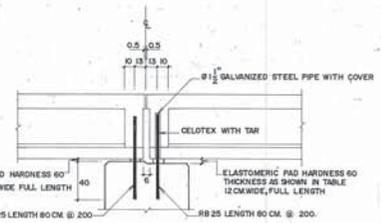


TABLE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR BENDING DIAGRAMS
①	DB 10	
②	DB 10	
③	DB 10	
④	DB 10	



- NOTES:
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - ALL EXPOSED CORNERS SHALL HAVE 1 CM. CHAMFERS UNLESS OTHERWISE INDICATED.
 - REBAR ≥ 4 OR LARGER SHALL BE T15 24 GRADE SD30 DEFORMED BARS, OTHERS SHALL BE T15 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - CONCRETE SHALL HAVE THE 28-DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH, BASED ON $15 \times 15 \times 15$ CM. CUBE SAMPLES, OF 40 N/mm^2 AND MAXIMUM SLUMP OF 8 CM.
 - PRESTRESSING OF STRAIGHT TENDON SHALL BE AS FOLLOWS:
 - $\phi 7$ mm. STRESS-RELIEVED WIRE SHALL HAVE AN MAXIMUM TENSION (BREAKING STRENGTH) OF 64 KN/TENDON.
 - $\phi 2/8$ " SEVEN-WIRE STRAND SHALL HAVE AN MAXIMUM TENSION OF 108 KN/TENDON.
 - APPLY FORCE TO A TENDON AT TRANSFER UNTIL THE MAXIMUM TENSION IS EQUAL TO THE CORRESPONDING FORCE SPECIFIED IN THE TABLE OF DETAIL OF BEAM.
 - DEBONDING MEANS THAT APPLY THE PLASTIC TUBE TO THE PRESTRESSING TENDON FOR PROTECT THE THEODONS FORM CONCRETE THE POINT OF APPLYING PLASTIC TUBE UP TO THE POINT AS SHOWN IN TABLE THROUGH THE END BEAM.
 - CLEAR CONCRETE COVER SHALL BE 2.5 CM OR AS SHOWN IN THE FIGURES.
 - IN CASE OF SKEW CASTING FOR SKEWED BRIDGE, THE TENDONS SHALL ALSO BE SKEWED.
 - IN DETERMINING THE LEVEL OF THE ABUTMENT HEAD, IT MUST SUBTRACT BY THE BEAM CHAMFERS.
 - ELASTOMERIC PAD SHALL BE FOLLOWED BY THE LATEST STANDARD OF AASHTO.

TABLE OF BEAM DETAIL

SPAN No.	BEAM LENGTH cm.	D cm.	PRESTRESSING TENDON 7 mm WIRES						PRESTRESSING TENDON 3/8" STRANDS						BEARING THICKNESS cm.				
			NO.	A	B	C	E	F	TENSION FORCE AT TRANSFER KN./TENDON	DEBONDING NO.-FIRST POINT	NO.	A	B	C		E	F	TENSION FORCE AT TRANSFER KN./TENDON	DEBONDING NO.-FIRST POINT
12	1194	44		19.25	-	-	-	7	47.1		2	9.9	-	-	-	8	77.5		2.0
14	1394	49		4	29	-	-	7	47.2		2	22	-	-	-	7	77.5		2.0
16	1594	54		4	24	-	-	7	47.5		2	26	-	-	-	7	77.1		2.5
18	1794	59		-	-	-	-	-	-		2	43	-	-	-	7	77.5		2.5
20	1994	68		-	-	-	-	-	-		2	50	-	-	-	7	77.5		3.0
22	2194	73		-	-	-	-	-	-		2	20	16	-	-	7	77.5		3.0
24	2394	80		-	-	-	-	-	-		2	12	12	10.5	-	7	77.5		3.0

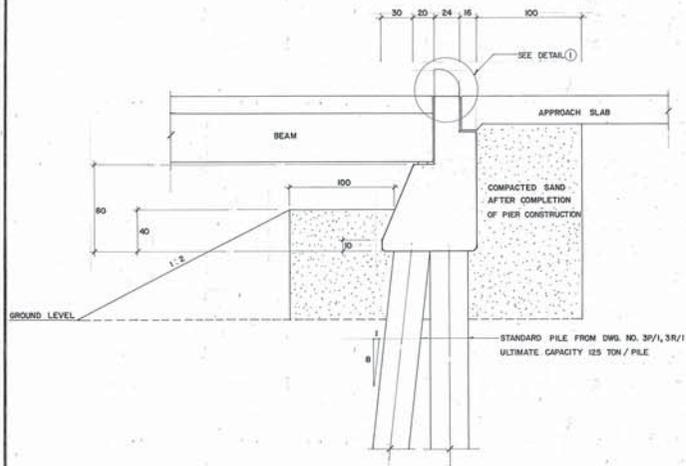
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 12.00-24.00M.SPAN MULTI-BEAM TYPE
 PRESTRESSED CONCRETE GIRDER

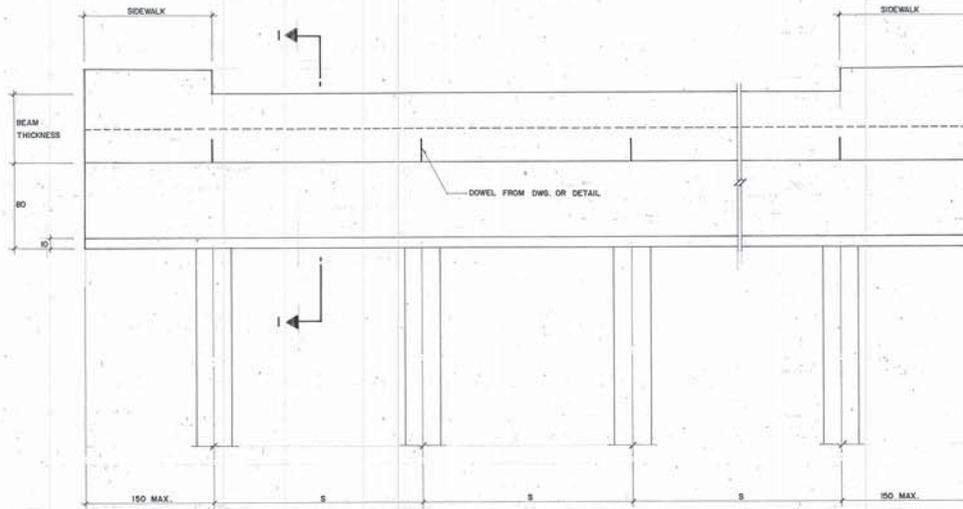
DESIGNED : DOH, & CONSULTANTS
 CHECKED : *Kapong*
 DATE JULY 1994

SUBMITTED : *P. Bunnag*
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 SCALE AS SHOWN

APPROVED : *MHA*
 (DIRECTOR GENERAL)
 DWG. NO. APB-2
 SHEET NO. 157

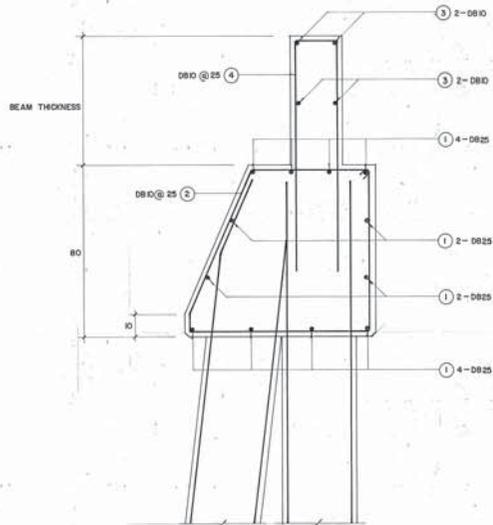


SECTION I - I ABUTMENT DETAIL
SCALE 1:25

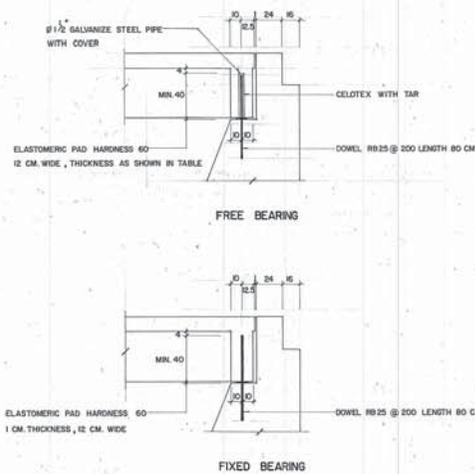


NOTES :

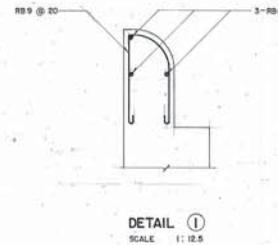
1. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. ALL EXPOSED CORNERS SHALL HAVE 1 CM. CHAMFERS UNLESS OTHERWISE INDICATED.
3. REBAR ≥ 4 OR LARGER SHALL BE TIS 24 GRADE S030 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
4. CONCRETE SHALL HAVE THE 28-DAY MINIMUM ULTIMATE COMPRESSIVE STRENGTH, BASED ON 15x15x15 CM. CUBE SAMPLES, OF 20 N./mm^2 AND MAXIMUM SLUMP OF 8 CM.
5. CLEAR CONCRETE COVER SHALL BE 3 CM. AND 5 CM. FOR HIGH SULPHATE RESISTANT.



SECTION I - I REINFORCEMENT DETAIL
SCALE 1:12.5



ABUTMENT HEAD DETAIL
SCALE 1:50



DETAIL 1
SCALE 1:12.5

SPACING OF PILE DETAIL

1. FOR PRESTRESS CONCRETE BRIDGE OF MULTI-BEAM 12.00-24.00 M. SPAN LENGTH.

TABLE OF PIER LOCATION AND BEARING PAD THICKNESS

SPAN LENGTH (M.)	S (CM.)	BEARING THICKNESS (CM.)
12.00	240	2
14.00	220	2
16.00	200	2.5
18.00	180	2.5
20.00	160	3
22.00	140	3
24.00	120	3

2. FOR GENERAL BRIDGE

S = AS SHOWN IN PLAN AND PROFILE OR NOTES OF BRIDGE.

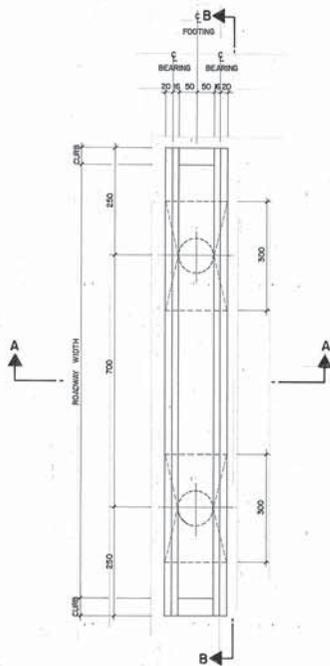
TABLE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR BENDING DIAGRAM
1	DB 25	
2	DB 10	
3	DB 10	
4	DB 10	

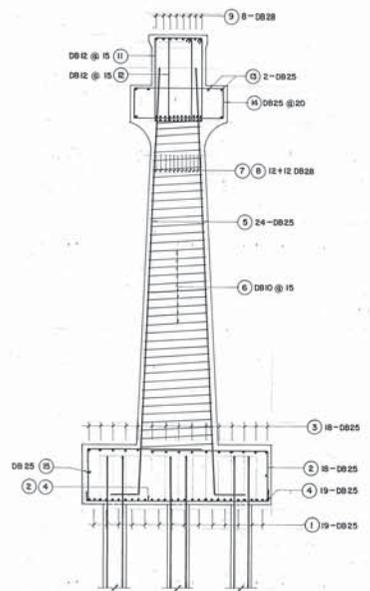
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 12.00-24.00 M. SPAN MULTI-BEAM TYPE
 PILE BENT AND ABUTMENT DETAILS FOR ANY ROADWAY WIDTH

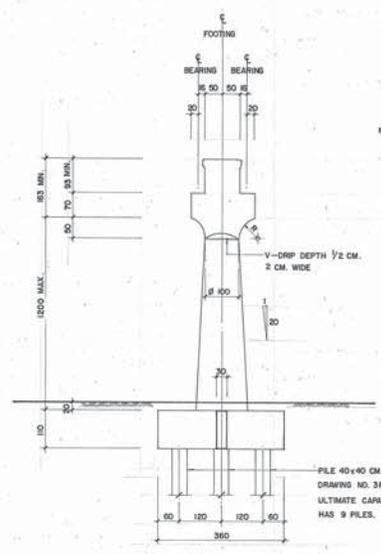
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE : JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> DIRECTOR GENERAL	DWG. NO. APB-4
		SHEET NO. 15/8



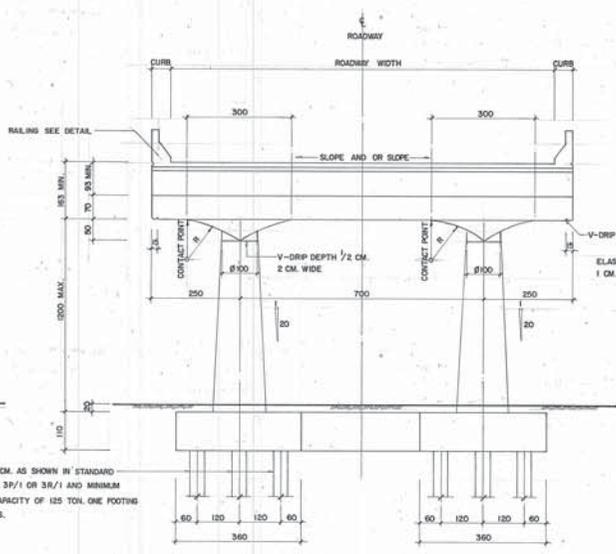
PLAN
SCALE 1:75



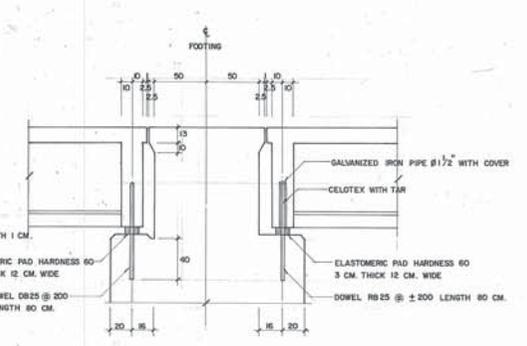
SECTION A - A FOOTING REINFORCEMENT
SCALE 1:50



SECTION A - A
SCALE 1:75



SECTION B - B
SCALE 1:75



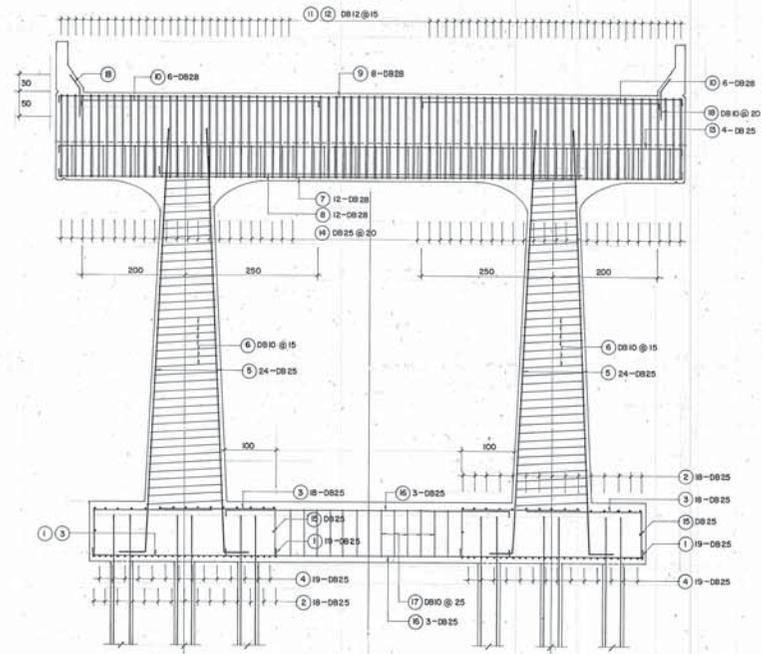
FIXED BEARING FREE BEARING
CONSTRUCTION JOINT
SCALE 1:25

TABLE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR BENDING DIAGRAMS
1	D8 25	10 L (1) (4) (7) (8) 10
2	D8 25	
3	D8 25	100 (2) (3)
4	D8 25	
5	D8 25	10 (9) (5) (5) 10
6	D8 10	
7	D8 28	50 (6)
8	D8 28	
9	D8 28	10 (10) (10)
10	D8 28	
11	D8 12	SPRAL (11) (12)
12	D8 12	
13	D8 25	10 (13) (14)
14	D8 25	
15	D8 25	10 (15)
16	D8 25	
17	D8 10	10 (17)
18	D8 10	

NOTES:

- ALL DIMENSIONS GIVEN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- ALL EXPOSED CORNER SHALL HAVE 1 CM. CHAMFERS UNLESS OTHERWISE INDICATED.
- REBARS SHALL CONFORM TO THE STANDARD TIS. 24 CLASS S030 FOR THE DEFORMED BARS.
- CONCRETE SHALL HAVE PROPERTIES AS FOLLOW.
 1. THE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 20 N/mm² FOR .15x.15x.15 M. CUBE AT 28 DAYS.
 2. SLUMP LESS THAN 8 CM.
- CLEAR CONCRETE COVER SHOULD BE 3 CM. UNLESS OTHERWISE INDICATED.
- BEFORE CASTING SLAB ON ANY FOOTING, IT SHOULD BE LAD DOWN THE NEXT BEAM OF OTHERS SPAN.
- ELASTOMERIC PAD SHALL CONFORM TO THE LATEST STANDARD OF AASHTO.



SECTION B - B FOOTING REINFORCEMENT
SCALE 1:50

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

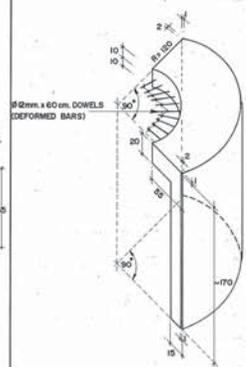
STANDARD DRAWING
 14.00 - 24.00 M. SPAN MULTI-BEAM TYPE
 12.00 M. ROADWAY B CURB

DESIGNED : DON & CONSULTANTS	CHECKED : <i>kye</i>	DATE JULY 1994
SUBMITTED :	<i>P. Burong</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>Selva</i> FOR (DIRECTOR GENERAL)	DWG. NO. APB-7 SHEET NO. 159

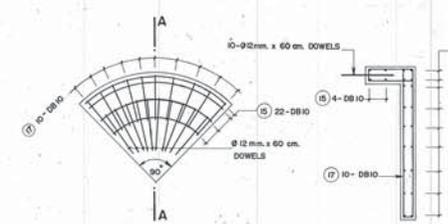
BAR MARK	NO.	BAR BENDING DIAGRAMS (CM.)
1	DB10	
2	DB10	
3	DB25	
4	DB25	
5	DB10	
6	DB10	
7	DB16	
8	DB16	
9	DB10	
10	DB10	
11	DB10	
12	DB16	
13	DB10	
14	DB10	
15	DB10	
16	DB10	
17	DB10	
18	DB10	
19	DB25	
20	DB25	
21	DB16	
22	DB16	
23	DB10	
24	DB10	

TABLE OF SIZE, LOCATION, NUMBER OF PILES OF FOOTING

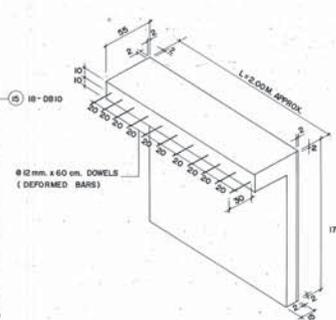
ROADWAY WIDTH	d	d ₁	d ₇	d ₂	PILE FOOTING														SPREAD FOOTING	
					NUMBER OF PILES									PILE HEAD SPACING C-C					HALF LENGTH OF FOOTING D ₅ CM.	WIDTH OF FOOTING D ₆ CM.
					P ₁	P ₂	P ₃	P ₄	P ₅	P ₆	P ₇	P ₈	P ₉	d ₃	d ₄					
8.00	1,040	306	20	154	4	4	4	4	4	-	-	-	2	22	110	85	470 + 175	320		
10.00	1,260	285	30	-	4	4	4	4	4	-	-	-	2	26	110	85	590 + 175	320		
12.00	1,480	272	40	-	4	4	4	4	4	4	-	-	2	30	130	85	690 + 175	320		
14.00	1,700	264	50	130	4	4	4	4	4	4	4	-	2	34	110	95	800 + 175	320		
15.00	1,800	260	50	140	4	4	4	4	4	4	4	4	2	34	117	90	850 + 175	320		



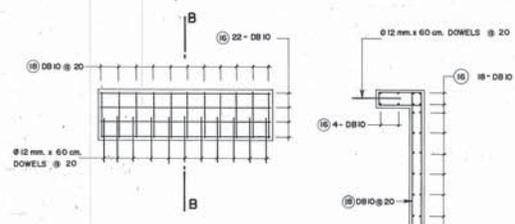
PRECAST SKIRTING 'A' DETAILS
SCALE 1:30



PRECAST SKIRTING 'A' REINFORCEMENT
SCALE 1:30



PRECAST SKIRTING 'B' DETAILS (SKEWED BRIDGE)
SCALE 1:30



PRECAST SKIRTING 'B' REINFORCEMENT
SCALE 1:30

NOTES :

- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG./M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG./CM² FOR A 0.15x0.15x0.15 CUBE AT 28 DAYS. CEMENT SHALL BE TIS 15 TYPE I PORTLAND CEMENT. AN APPROXIMATE MIX DESIGN PER CUBE METER IS AS FOLLOWS :

PORTLAND CEMENT	350	KG.
SAND	0.43	M ³
CRUSH ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP, MAX.	10	CM.
- REBAR # 4 OR LARGER SHALL BE TIS 24 GRADE SD 30 DEFORMED BARS, OTHER SHALL BE TIS 20 GRADE SR 24 PLAIN BAR UNLESS OTHERWISE INDICATED.
- CLEAR CONCRETE COVER SHALL BE 3 CM. FOR PORTLAND CEMENT TYPE I AND 5 CM. FOR HIGH SULPHATE RESISTANT FOR PORTLAND CEMENT TYPE 5 WITHOUT ALTERING THE SIZE OF REBARS.
- ALL EXPOSED CORNERS SHALL HAVE 2 CM. CHAMFERS UNLESS OTHERWISE INDICATED.
- COLUMN JOINT SPACING 340 M. MAXIMUM.
- ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
- MINIMUM SAFE BEARING CAPACITY OF SOIL UNDER SPREAD FOOTING PIERS SHALL BE 20 TON/M² THE BOTTOM OF FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
- FOR PILE FOOTING PIERS, EACH PILE SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 110 TONS AND SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
- REBARS FOR PILE FOOTING PIERS ARE BAR MARK NOS 1-18, REBARS FOR SPREAD FOOTING PIERS ARE BAR MARK NOS 7-15 AND BAR MARK NOS 19-24.
- FOR ELASTOMERIC PAD, CONTRACTOR SHALL SUBMIT A CERTIFICATE FROM THE MANUFACTURER SHOWING THAT THEY WILL PERFORM IN ACCORDANCE WITH THE SPECIFICATION.

REMARKS :

- 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 IN ORDER TO LOCATE PILE NOS P6-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.
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 12.00 M. FOR PILE FOOTING PIERS THESE QUANTITIES DO NOT INCLUDE REBARS IN THE PILES.
- FOR SPREAD FOOTING PIERS, THE MAXIMUM HEIGHT FROM THE BOTTOM OF FOOTING TO THE TOP OF CAP BEAM SHALL BE 15.00 M.
- LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR IN CASE OF PLAIN BAR AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- LENGTH AND AMOUNT OF REINFORCEMENT SHOWN IN THE TABLE MAY VARY ACCORDING TO PIER SHAPE BUT SPACING SHALL BE AS SHOWN ON THE DWGS.
- THE PRECAST SKIRTING "A" SHALL BE OBTAINED BY DIVIDING THE SEMICIRCULAR END OF A PIER INTO TWO EQUAL SECTORS OF 90°. THE PRECAST SKIRTING "B" SHALL BE OBTAINED BY DIVIDING THE STRAIGHT PORTION INTO EQUAL LENGTHS. THESE LENGTH SHALL BE AS LONG AS POSSIBLE BUT NOT MORE THAN 2.00 M.

KINGDOM OF THAILAND MINISTRY OF TRANSPORT AND COMMUNICATIONS DEPARTMENT OF HIGHWAYS			
STANDARD DRAWING PILE BENT AND SPREAD FOOTING WITH WALL BRACING, MAXIMUM HEIGHT 12.00 M. PRESTRESSED MULTI-BEAM CONCRETE BRIDGE FOR 8.00, 10.00, 12.00 AND 15.00 M. ROADWAY WIDTH 18.00-24.00 M. SPAN			
TABLE OF REINFORCEMENT AND CONSTRUCTION DETAILS			
DESIGNED : DOH & CONSULTANTS	CHECKED <i>Apud</i>	DATE	JULY 1994
SUBMITTED :	<i>P. Bungay</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE	AS SHOWN
APPROVED :	<i>Schee</i> FOR DIRECTOR GENERAL	DWG. NO.	JPB-9
		SHEET NO.	161

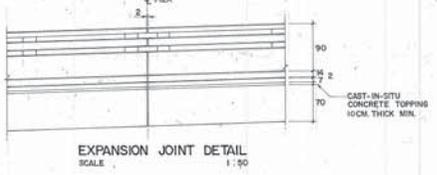
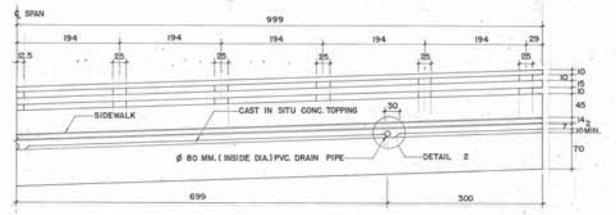
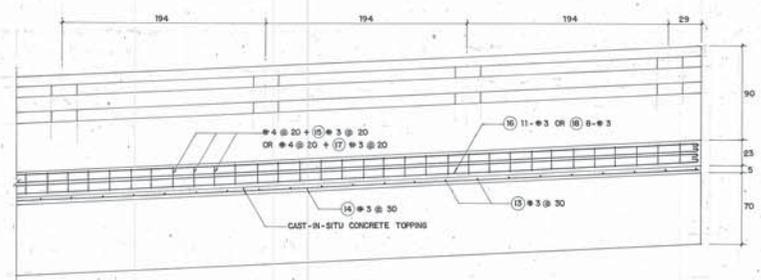
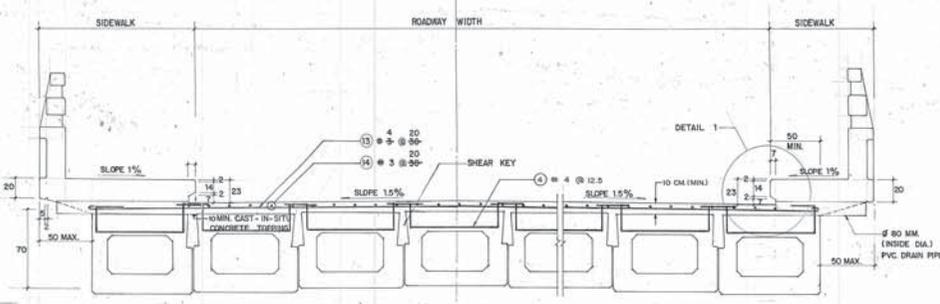
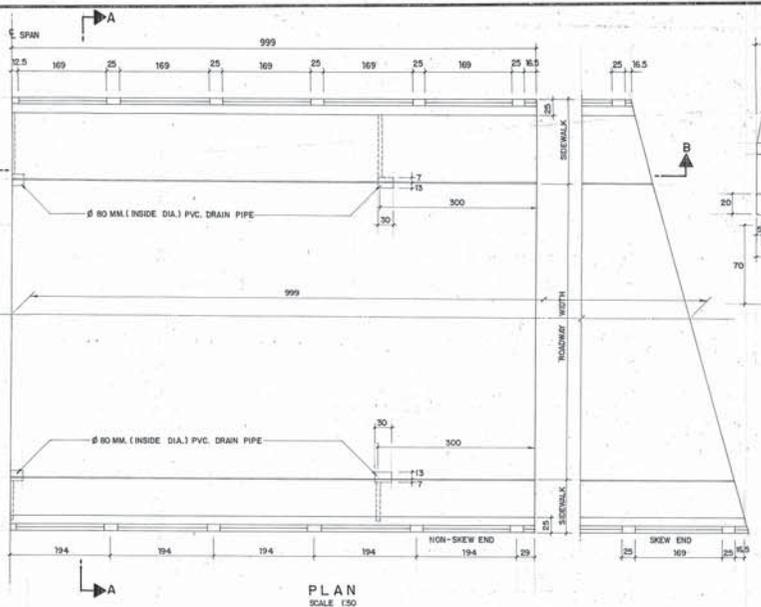


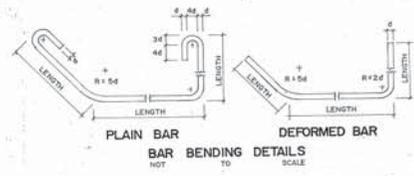
TABLE OF REINFORCEMENT

BAR BENDING DIAGRAMS	BAR MARK	#	NO	L	
TOP SLAB	VARIES	VARIES	13	4	100
	985	75	14	3	-
	36	36	15	3	101
	985	75	16	3	11
	36	36	17	3	67
	985	75	18	3	8
150 CM SIDEWALK	985	75	15	3	101
	36	36	16	3	11
100 CM SIDEWALK	985	75	17	3	67
	36	36	18	3	8

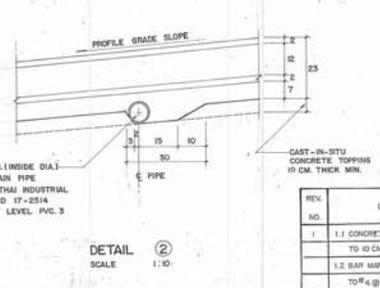
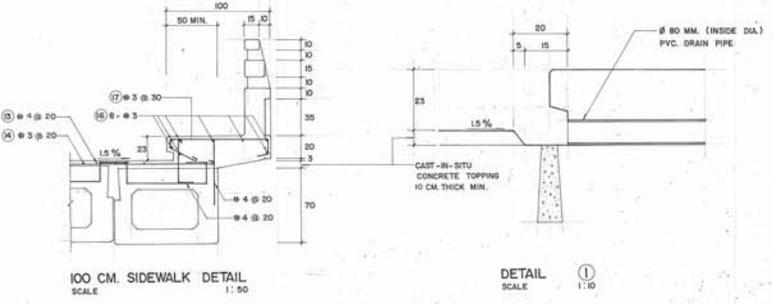
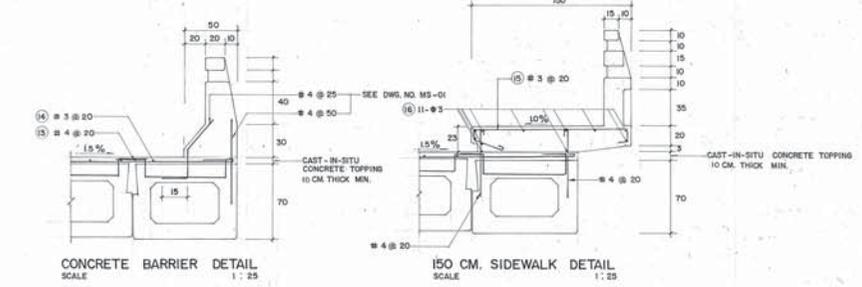
QUANTITIES SHOWN FOR 1 SIDE ONLY

NOTES:
1. REINFORCEMENTS SHOWN ARE FOR ONE SPAN ONLY
2. # 3 @ 3/8" OR 9 MM. NO. * OF BARS

TOTAL AMOUNT L * OF EACH BAR



- NOTES:
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE SD30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - SURFACE OF PRECAST GIRDERS IN CONTACT WITH CAST-IN-SITU CONCRETE SHALL BE ROUGHENED AND CLEANED BEFORE CONCRETING. THE SURFACES SHALL BE SOAKED FOR AT LEAST 2 HOURS. THEN CEMENT SLURRY OR MORTAR WITH CEMENT TO SAND RATIO OF 1:1 BY WEIGHT SHALL BE APPLIED BEFORE CONCRETING.
 - CAST-IN-SITU CONCRETE FOR BRIDGE TOPPING AND SHEAR KEY BETWEEN BOX GIRDERS SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 340 KG/CM² FOR 0.5x0.15x0.15 M. CUBE AT 28 DAYS.
 - CAST-IN-SITU CONCRETE FOR SIDEWALK, CURB AND RAILING SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
 - NUMBER OF BOX GIRDERS FOR EACH SPAN DEPENDS ON THE WIDTH OF ROADWAY, SIDEWALK AND GIRDER ARRANGEMENT. THE BOX GIRDERS SHALL BE ARRANGED IN SUCH A WAY THAT,
 - IF SIDEWALK WIDTH IS NOT MORE THAN 50 CM, THE OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL BE LINED UP WITH THE OUTSIDE EDGE OF THE SIDEWALK.
 - IF SIDEWALK WIDTH IS MORE THAN 50 CM THE OVERHANGING PART OF SIDEWALK FROM OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL NOT EXCEED 50 CM AND A MINIMUM OF 90 CM OF THE SIDEWALK SHALL BE ON TOP OF THIS BOX GIRDER.
 - THE OUTSIDE EDGES OF THE EXTERIOR GIRDERS SHALL BE IN LINE THROUGHOUT THE BRIDGE LENGTH REGARDLESS THE TYPES AND THE SPAN LENGTH OF THE GIRDERS.
 - CAST-IN-SITU CONCRETE FOR BRIDGE TOPPING AND SHEAR KEY BETWEEN BOX GIRDERS SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 340 KG/CM² FOR 0.5x0.15x0.15 M. CUBE AT 28 DAYS.
 - CAST-IN-SITU CONCRETE FOR SIDEWALK, CURB AND RAILING SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
 - NUMBER OF BOX GIRDERS FOR EACH SPAN DEPENDS ON THE WIDTH OF ROADWAY, SIDEWALK AND GIRDER ARRANGEMENT. THE BOX GIRDERS SHALL BE ARRANGED IN SUCH A WAY THAT,
 - IF SIDEWALK WIDTH IS NOT MORE THAN 50 CM, THE OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL BE LINED UP WITH THE OUTSIDE EDGE OF THE SIDEWALK.
 - IF SIDEWALK WIDTH IS MORE THAN 50 CM THE OVERHANGING PART OF SIDEWALK FROM OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL NOT EXCEED 50 CM AND A MINIMUM OF 90 CM OF THE SIDEWALK SHALL BE ON TOP OF THIS BOX GIRDER.
 - THE OUTSIDE EDGES OF THE EXTERIOR GIRDERS SHALL BE IN LINE THROUGHOUT THE BRIDGE LENGTH REGARDLESS THE TYPES AND THE SPAN LENGTH OF THE GIRDERS.
 - CAST-IN-SITU CONCRETE FOR BRIDGE TOPPING AND SHEAR KEY BETWEEN BOX GIRDERS SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 340 KG/CM² FOR 0.5x0.15x0.15 M. CUBE AT 28 DAYS.
 - CAST-IN-SITU CONCRETE FOR SIDEWALK, CURB AND RAILING SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
 - NUMBER OF BOX GIRDERS FOR EACH SPAN DEPENDS ON THE WIDTH OF ROADWAY, SIDEWALK AND GIRDER ARRANGEMENT. THE BOX GIRDERS SHALL BE ARRANGED IN SUCH A WAY THAT,
 - IF SIDEWALK WIDTH IS NOT MORE THAN 50 CM, THE OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL BE LINED UP WITH THE OUTSIDE EDGE OF THE SIDEWALK.
 - IF SIDEWALK WIDTH IS MORE THAN 50 CM THE OVERHANGING PART OF SIDEWALK FROM OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL NOT EXCEED 50 CM AND A MINIMUM OF 90 CM OF THE SIDEWALK SHALL BE ON TOP OF THIS BOX GIRDER.
 - THE OUTSIDE EDGES OF THE EXTERIOR GIRDERS SHALL BE IN LINE THROUGHOUT THE BRIDGE LENGTH REGARDLESS THE TYPES AND THE SPAN LENGTH OF THE GIRDERS.
 - CAST-IN-SITU CONCRETE FOR BRIDGE TOPPING AND SHEAR KEY BETWEEN BOX GIRDERS SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 340 KG/CM² FOR 0.5x0.15x0.15 M. CUBE AT 28 DAYS.
 - CAST-IN-SITU CONCRETE FOR SIDEWALK, CURB AND RAILING SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
 - NUMBER OF BOX GIRDERS FOR EACH SPAN DEPENDS ON THE WIDTH OF ROADWAY, SIDEWALK AND GIRDER ARRANGEMENT. THE BOX GIRDERS SHALL BE ARRANGED IN SUCH A WAY THAT,
 - IF SIDEWALK WIDTH IS NOT MORE THAN 50 CM, THE OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL BE LINED UP WITH THE OUTSIDE EDGE OF THE SIDEWALK.
 - IF SIDEWALK WIDTH IS MORE THAN 50 CM THE OVERHANGING PART OF SIDEWALK FROM OUTSIDE EDGE OF THE EXTERIOR GIRDER SHALL NOT EXCEED 50 CM AND A MINIMUM OF 90 CM OF THE SIDEWALK SHALL BE ON TOP OF THIS BOX GIRDER.
 - THE OUTSIDE EDGES OF THE EXTERIOR GIRDERS SHALL BE IN LINE THROUGHOUT THE BRIDGE LENGTH REGARDLESS THE TYPES AND THE SPAN LENGTH OF THE GIRDERS.



REV. NO.	DESCRIPTION	CHECKED		SUBMITTED		APPROVED	
		SGN	DATE	SGN	DATE	SGN	DATE
1	1.1 CONCRETE TOPPING THK. TO BE REVISED TO 10 CM MIN.						
	1.2 BAR MARK NO. 13, 14 TO BE REVISED TO # 4 @ 30 AND # 3 @ 30 RESPECTIVELY						
	1.3 SHAPE OF BAR MARK NO. 4 ON DWG. NO. 580205/2 TO BE REVISED						

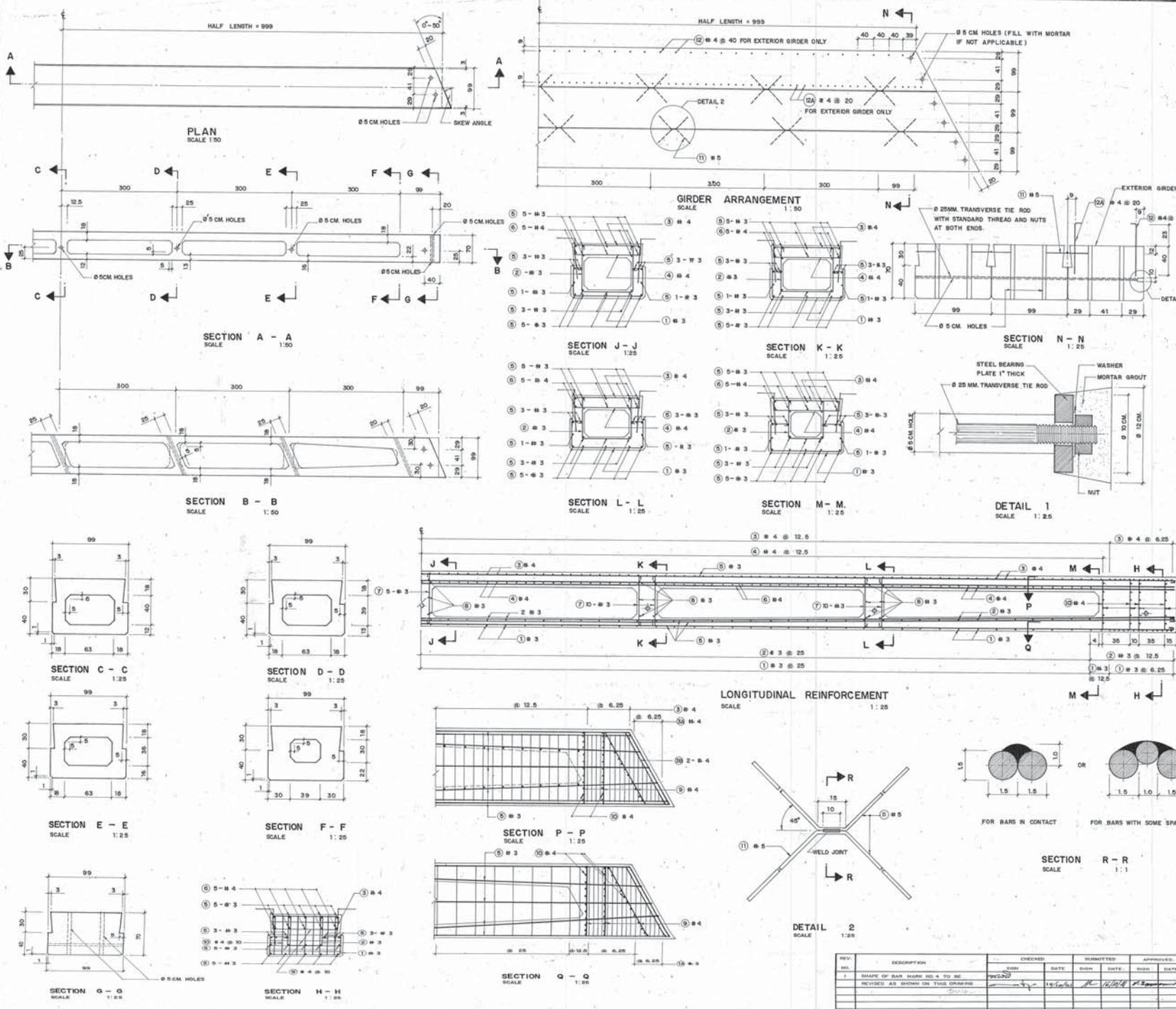
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
0'-50' SKEW PC. BOX GIRDER BRIDGE
20.00M SPAN
BRIDGE DECK PLAN, SECTION AND DETAILS

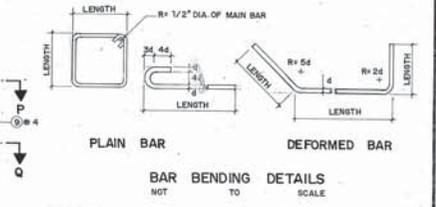
DESIGNED: DOH & CONSULTANTS
SUBMITTED: P. Bunnong
APPROVED: P. Bunnong

CHECKED: [Signature]
DATE: JULY 1994

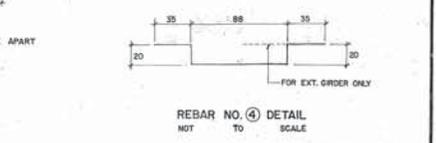
SCALE AS SHOWN
DWG. NO. 580205-0'-50'1A
SHEET NO. 162



BAR BENDING DIAGRAMS		BAR MARK	#	NO.	LENGTH CM.	TOTAL LENGTH CM.
①		1	3	116 ±	210 ±	22,020 ±
②		2	3	88 ±	175 ±	16,380 ±
③		3	4	187 ±	189	35,343 ±
④		4	4	159 ±	198 ±	13,992 ±
⑤		5	3	21	2,114	44,400
⑥		6	4	5	2,093	10,465
⑦		7	3	50	80	4,000
⑧		8	3	30	110	3,300
⑨		9	4	50 ±	95 ±	4,750 ±
⑩		10	4	70 ±	65 ±	4,550 ±
⑪		11	5	14	135	1,890 ±
⑫		12	4	46 ±	75	3,675 ±
⑬		13	4	99 ±	75	7,425 ±
TOTAL LENGTH M.			3	4	5	
			900.00	753.37	18.90	
# 3 = Ø 3/8" OR 9 MM # 4 = Ø 1/2" OR 12 MM # 5 = Ø 5/8" OR 16 MM		NO = TOTAL AMOUNT OF BARS		L = TOTAL LENGTH OF EACH BAR		



- NOTES:
- REBARS #4 OR LARGER SHALL BE TIS 24 GRADE S5030 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE S24 PLAIN BARS UNLESS OTHERWISE INDICATED
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 POST-TENSIONED BOX GIRDER
 30.00M SPAN
 PLAN, SECTION AND REINFORCEMENT DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: [Signature]	DATE: JULY 1994
SUBMITTED: [Signature]	DATE: 16/5/94	SCALE: AS SHOWN
APPROVED: [Signature]	DATE: []	EDWD. NO. 5.01.00.5.C.2.
		SHEET NO. 103

REV.	DESCRIPTION	CHECKED	SUBMITTED	APPROVED	
NO.	DATE	NO.	DATE	NO.	DATE
1	NAME OF BAR MARKING TO BE REVISED AS SHOWN ON THIS DRAWING	[Signature]	[Signature]	[Signature]	

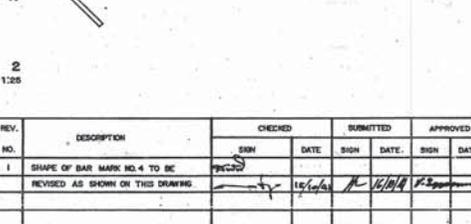
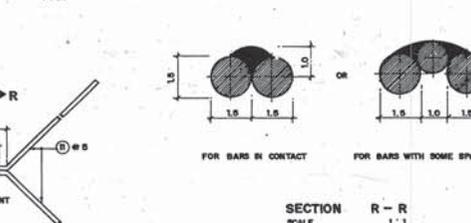
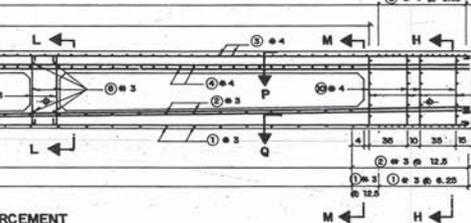
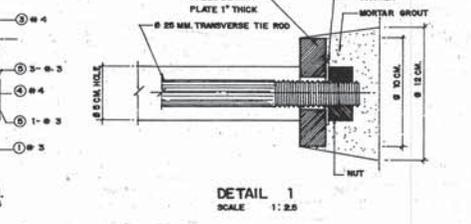
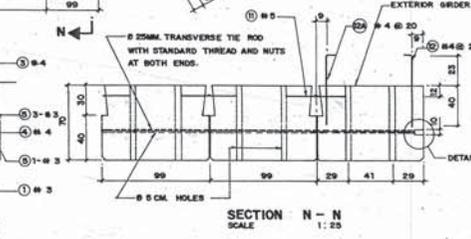
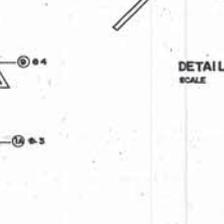
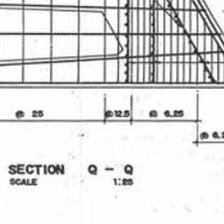
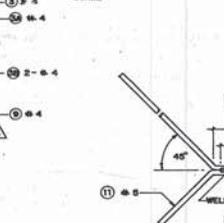
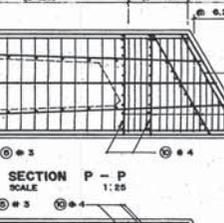
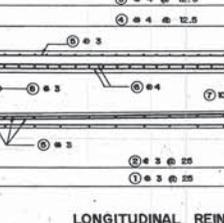
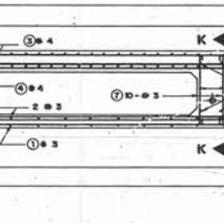
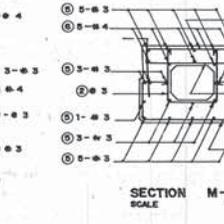
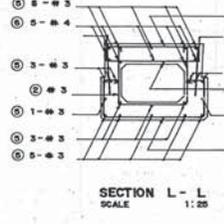
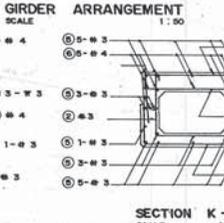
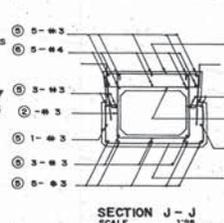
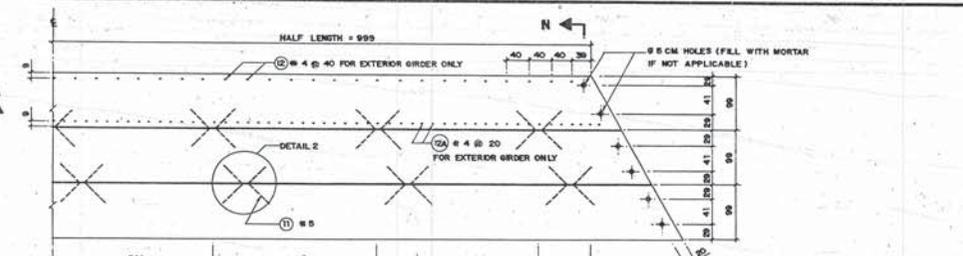
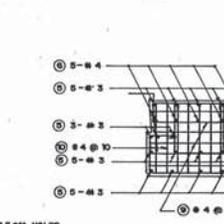
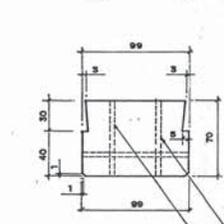
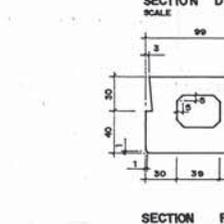
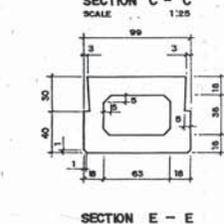
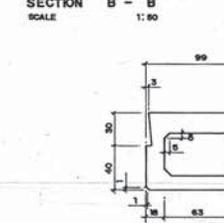
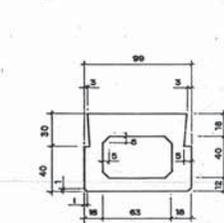
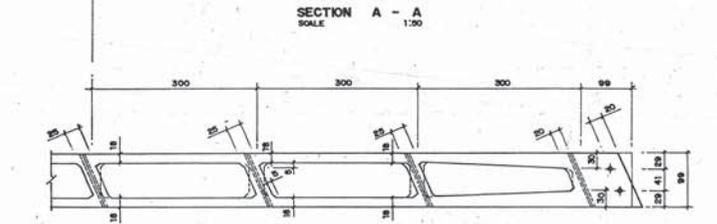
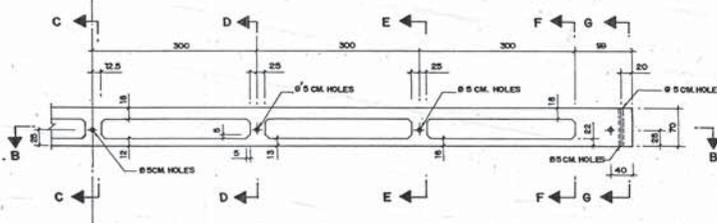
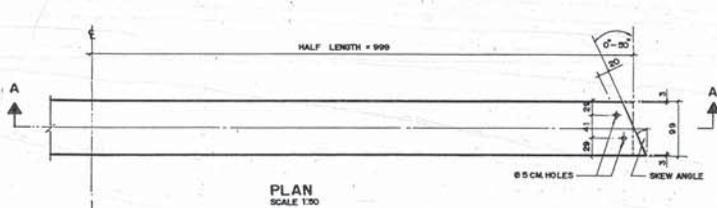
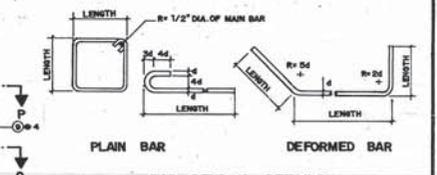
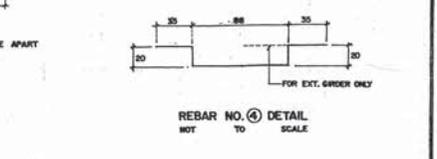


TABLE OF REINFORCEMENT					
BAR BENDING DIAGRAMS	BAR MARK	NO.	LENGTH CM.	TOTAL LENGTH CM.	
35	1	3	116 ± 210 ±	22,020 ±	
48-58	2	3	88 ± 170 ±	18,360 ±	
58-68	3	4	187 ± 180	35,343 ±	
75-85	4	4	159 ± 150	13,962 ±	
85-95	5	3	21	2,174	44,400
95-105	6	4	50 ± 95 ±	4,750 ±	
105-115	7	3	50 ± 80	4,000	
115-125	8	3	30 ± 110	3,300	
125-135	9	4	50 ± 65 ±	4,850 ±	
135-145	10	5	14 ± 135	1,890 ±	
145-155	11	4	40 ± 75	3,670 ±	
155-165	12	4	90 ± 78	7,428 ±	
TOTAL LENGTH M.		3	4	5	
		900.00	753.37	18.90	
# 3 = # 3/8" OR 9.5 MM. # 4 = # 1/2" OR 12.5 MM. # 5 = # 5/8" OR 15.9 MM.		NO = TOTAL AMOUNT OF BARS L = TOTAL LENGTH OF EACH BAR			



- NOTES:
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S030 DEFORMED BARS, OTHERS SHALL BE TIS 30 GRADE S124 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

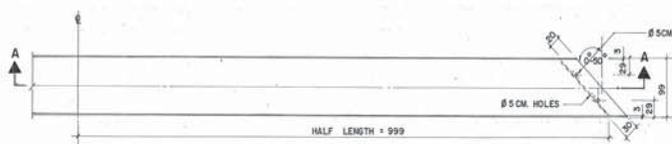


KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

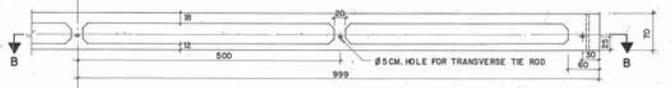
STANDARD DRAWING
 POST-TENSIONED BOX GIRDER
 20.00M SPAN
 PLAN, SECTION AND REINFORCEMENT DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: [Signature]	DATE: JULY 1994
SUBMITTED: [Signature]	APPROVED: [Signature]	DWS. NO. 5.117.10.5/2
APPROVED: [Signature]		SHEET NO. 163

REV. NO.	DESCRIPTION	CHECKED		SUBMITTED		APPROVED	
		SIGN	DATE	SIGN	DATE	SIGN	DATE
1	SHAPE OF BAR MARK NO. 4 TO BE REVISED AS SHOWN ON THIS DRAWING	[Signature]	15/10/94	[Signature]	14/10/94	[Signature]	



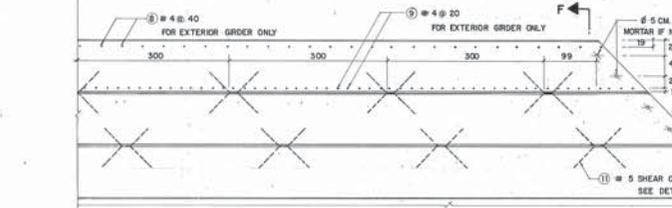
PLAN



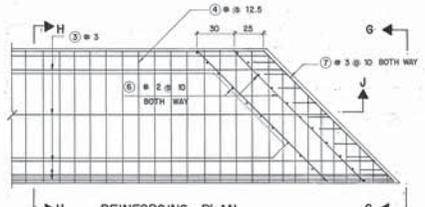
SECTION A - A



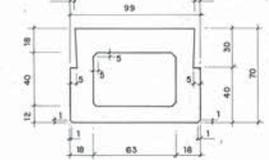
SECTION B - B



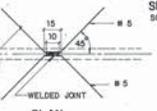
BOX GIRDER ARRANGEMENT



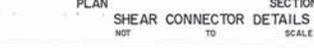
REINFORCING PLAN



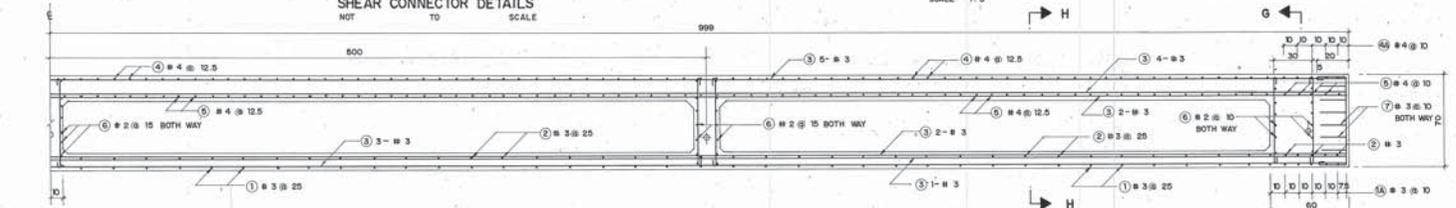
SECTION C - C



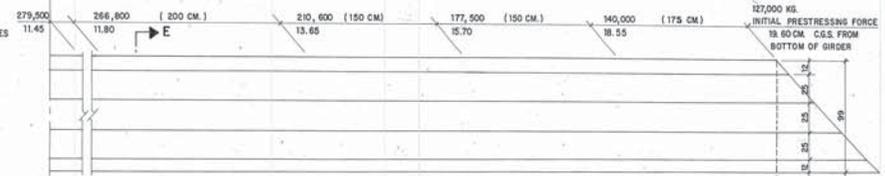
SECTION D - D



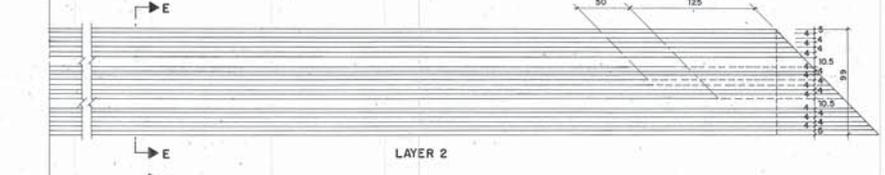
SHEAR CONNECTOR DETAILS



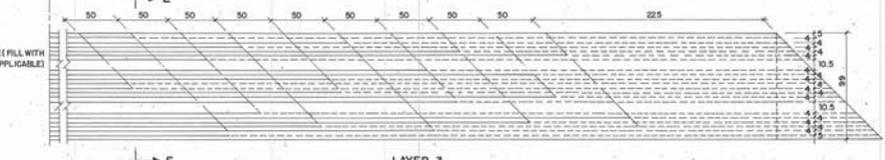
SECTION J - J



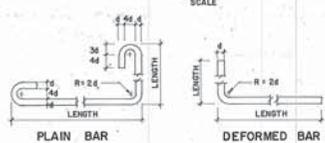
LAYER 1



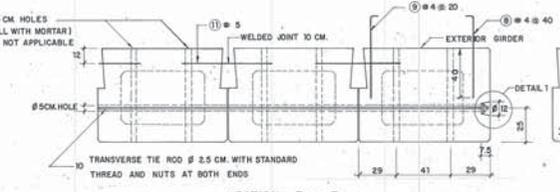
LAYER 2



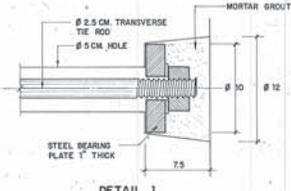
LAYER 3 PRESTRESSING TENDON PLANS



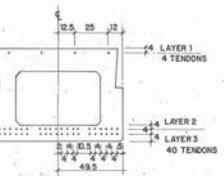
BAR BENDING DIAGRAMS



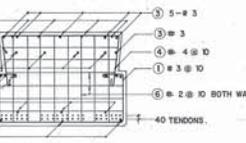
SECTION F - F



DETAIL 1



SECTION E - E



SECTION G - G

TABLE OF REINFORCEMENT FOR ONE GIRDER					
BAR BENDING DIAGRAMS (DIMENSION IN CM.)	BAR MARK	NO.	L	TOTAL LENGTH	TOTAL REINFORCEMENT
(1) SEE SECTION J-J	1	3	87	210	183.00
(2) SEE SECTION J-J	2	3	77	200	154.00
(3) SEE SECTION J-J	3	3	23	2063	475.00
(4) SEE SECTION J-J	4	4	160	189	302.40
(5) SEE SECTION J-J	5	4	152	87	132.24
(6) SEE SECTION J-J	6	2	150	95.5	142.50
(7) SEE SECTION J-J	7	3	30	145.5	43.02
(8) SEE SECTION J-J	8	4	51	75	38.25
(9) SEE SECTION J-J	9	4	101	75	75.75
(10) SEE SECTION J-J	10	8	5	VARIES	VARIES
(11) SEE SECTION J-J	11	5	VARIES	135	VARIES

* 2 = 8/16" OR 6 MM * 5 = 5/16" OR 15 MM
 * 3 = 3/8" OR 9 MM * 8 = 8/16" OR 25 MM
 * 4 = 1/2" OR 12 MM * 11 = TOTAL AMOUNT OF BARS
 L = TOTAL LENGTH OF EACH BAR.

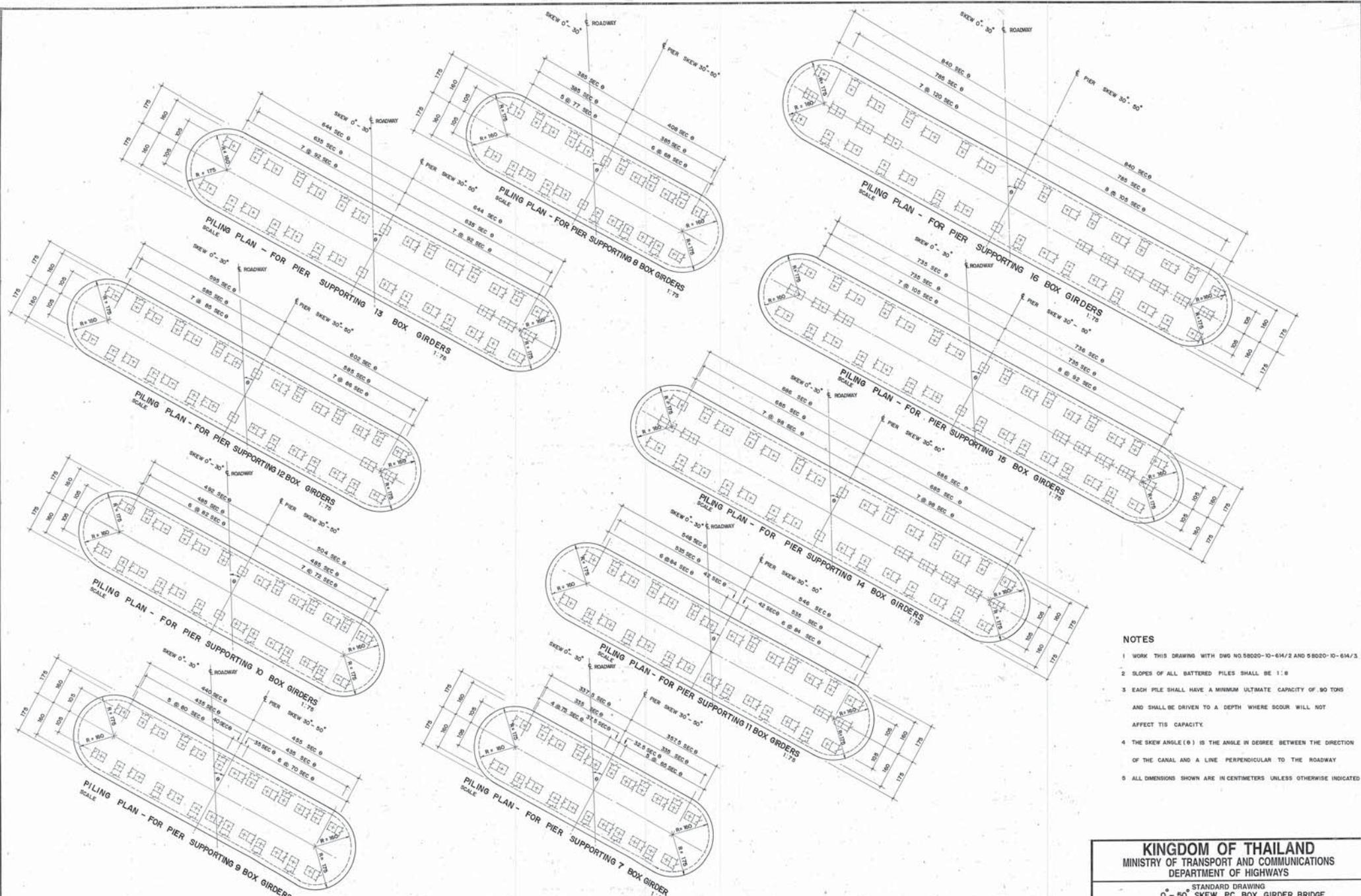
- NOTES:
- TOTAL PRESTRESSING TENDONS SHALL BE 44 TENDONS OF 8/16" OF 7 WIRE STRANDS WITH A MINIMUM ULTIMATE STRENGTH OF 17,600 KG/CM².
 - OTHER TYPES OF PRESTRESSING TENDONS MAY BE USED UNDER THE APPROVAL OF THE ENGINEER.
 - LOCATIONS OF BOND AND DEBOND OF TENDONS SHALL BE AS SHOWN ON THE DRAWING. DEBONDING SHALL BE DONE BY USING SUITABLE PLASTIC TUBES WRAPPED AROUND THE TENDONS.
 - EACH PRESTRESSING TENDON SHALL HAVE AN INITIAL STRESS OF 12,300 KG/CM² OR IT SHALL BE STRETCHED UNTIL AN ELONGATION OF 12.7 CM HAS REACHED.
 - TRANSVERSE TIE RODS SHALL BE STRUCTURAL GRADE WITH 2 LAYERS OF RUST PROOF PAINT SUCH AS RUST-O-LIUM OR EQUIVALENT QUALITY PAINT. THREADED ENDS SHALL BE STANDARD THREAD WITH NUTS AND BEARING WASHERS.
 - MIX DESIGN OF CONCRETE FOR PRESTRESSED BOX GIRDERS SHALL BE SUBMITTED FOR APPROVAL OF THE ENGINEER. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 360 KG/CM² FOR 0.15x0.15x0.15 M. CUBE AT 28 DAYS.
 - REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S20 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR 24 LAP BARS EXCEPT OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.

- CONSTRUCTION SEQUENCES
- CONCRETE THE BOX GIRDER AFTER A MINIMUM ULTIMATE STRENGTH OF 250 KG/CM² FOR 0.15x0.15x0.15 M. CUBE HAS REACHED THE PRE-TENSIONING TENDONS MAY BE RELEASED.
 - PLACE THE GIRDERS IN POSITIONS THEY SHALL BE LIFTED AT BOTH ENDS. MIDSPAN LIFTING IS PROHIBITED.
 - THE NEXT ADJACENT GIRDER SHALL BE PRESSED AGAINST THE FIRST ONE BY TIGHTENING THE NUTS AT THE ENDS OF THE TRANSVERSE TIE BARS WITH A TORQUE OF 2,000 KG/CM THEN SHEAR CONNECTORS TOGETHER.
 - CONCRETE ALL SHEAR KEYS WITH CONCRETE HAVING THE SAME PROPERTIES AS FOR THE SIDEWALK.
 - CONCRETE BRIDGE TOPPING, SIDEWALKS AND RAILINGS THEN COAT THE BRIDGE TOPPING WITH THE SPECIFIED WEARING SURFACE.
 - DUE TO THE PRESENT OF THE 1.5 CM UPWARD CAMBER OF GIRDER AT TRANSFER, THEREFORE IN CALCULATION OF THE ELEVATION OF THE TOP OF PIERS THIS QUANTITY SHALL BE TAKEN INTO ACCOUNT SO THAT THE FINAL FINISHED ELEVATION OF THE BRIDGE WILL BE IN ACCORDANCE WITH THE DESIGN DRAWINGS.
 - IF GIRDERS CAN NOT BE PLACED ACROSS THE FULL WIDTH OF THE BRIDGE DUE TO THE NEED OF PARTIAL OPENING OF TRAFFIC LANES THE FIRST GROUP OF GIRDERS MAY BE JOINED TOGETHER AS MENTIONED IN STEPS 3 AND 4. THE METHOD OF PRESSING THE LATTER GROUP OF GIRDERS TO THE FIRST GROUP SHALL BE DONE UNDER THE APPROVAL OF THE ENGINEER.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PRE-TENSIONED BOX GIRDER
 20.00M SPAN
 PLAN, SECTIONS AND DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED:	<i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN
APPROVED:	<i>[Signature]</i> (DIRECTOR GENERAL)	DWG. NO. 58020 S/4 SHEET NO. 165



- NOTES**
- 1 WORK THIS DRAWING WITH DWG NO.58020-10-614/2 AND 58020-10-614/3
 - 2 SLOPES OF ALL BATTERED PILES SHALL BE 1:8
 - 3 EACH PILE SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 90 TONS AND SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
 - 4 THE SKEW ANGLE (θ) IS THE ANGLE IN DEGREE BETWEEN THE DIRECTION OF THE CANAL AND A LINE PERPENDICULAR TO THE ROADWAY
 - 5 ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 0°-50° SKEW PC BOX GIRDER BRIDGE
 20.00M SPAN
 PILE FOOTING PIER, PILING PLANS

DESIGNED : DOH & CONSULTANTS CHECKED : *[Signature]* DATE JULY 1994

SUBMITTED : *[Signature]* SCALE AS SHOWN

APPROVED : *[Signature]* DWG. NO. 58020-10-614/1

SHEET NO. 166

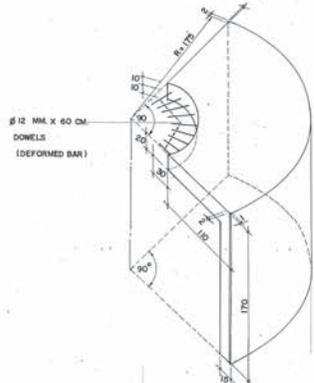
TABLE OF SEC θ

SEC	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

TABLE OF REINFORCEMENT

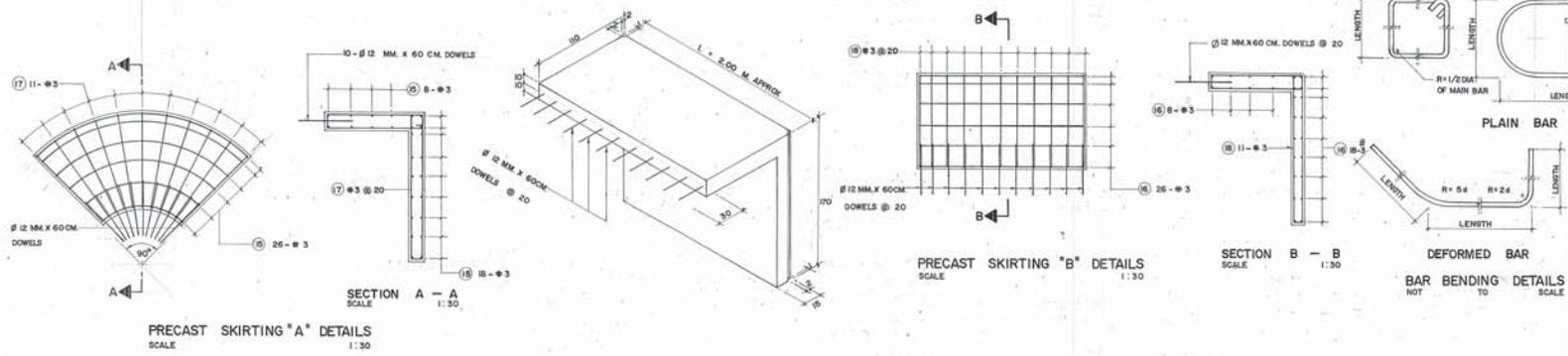
BAR BENDING DIAGRAMS CM.	BAR MARK	#	7-BOX GIRDER				8-BOX GIRDER				9-BOX GIRDER				10-BOX GIRDER				11-BOX GIRDER				12-BOX GIRDER				13-BOX GIRDER				14-BOX GIRDER				15-BOX GIRDER				16-BOX GIRDER			
			NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH	NO	D	L	TOTAL LENGTH				
	1	3	30	141	5,807	30	141	4,230	30	141	4,798	30	141	5,217	30	141	5,640	30	141	6,073	30	141	6,537	30	141	7,000	30	141	7,483	30	141	7,947	30	141	8,447							
	2	3	20	985	2,533	12,645	20	1,045	2,733	13,665	20	1,185	2,933	14,665	20	1,285	3,133	15,665	20	1,385	3,333	16,665	20	1,485	3,533	17,665	20	1,585	3,733	18,665	20	1,685	3,933	19,665	20	1,785	4,133	20,665				
	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	42,780	23	1,715	1,960	45,080	23	1,815	2,060	47,380				
	4	8	68	375	25,000	75	375	28,225	82	375	30,750	88	375	33,000	95	375	35,425	101	375	37,750	108	375	40,000	115	375	42,325	122	375	44,600	128	375	46,875	135	375	49,150	142	375	51,400				
	5	3	51	856	19,386	56	856	46,816	61	856	50,986	66	856	54,986	71	856	58,986	76	856	62,986	81	856	66,986	86	856	70,986	91	856	74,986	96	856	78,986	101	856	82,986	106	856	86,986				
	6	3	3	1,015	3,045	3	1,115	3,345	3	1,215	3,645	3	1,315	3,945	3	1,415	4,245	3	1,515	4,545	3	1,615	4,845	3	1,715	5,145	3	1,815	5,445	3	1,915	5,745	3	2,015	6,045							
	7	8	190	2,061	39,590	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	290	2,061	597,690							
	8	5	24	750	18,912	24	850	21,312	24	950	23,712	24	1,050	26,112	24	1,150	28,512	24	1,250	30,912	24	1,350	33,312	24	1,450	35,712	24	1,550	38,112	24	1,650	40,512	24	1,750	42,912							
	9	3	120	236	29,320	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	755	3,442	39,030	58	855	3,642	42,230	58	955	3,842	45,430	58	1,055	4,042	48,630	58	1,155	4,242	51,830	58	1,255	4,442	55,030	58	1,355	4,642	58,230	58	1,455	4,842	61,430								
	11	3	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376	116	236	27,376							
	12	5	8	765	840	6,720	8	865	940	7,220	8	965	1,040	8,320	8	1,065	1,140	9,220	8	1,165	1,240	10,120	8	1,265	1,340	11,020	8	1,365	1,440	11,920	8	1,465	1,540	12,820								
	13	3	26	356	13,028	43	356	15,308	48	356	17,088	53	356	18,868	58	356	20,648	63	356	22,428	68	356	24,208	73	356	25,988	78	356	27,768	83	356	29,548	88	356	31,308							
	14	3	104	804	4,020	104	804	4,320	104	804	4,620	104	804	4,920	104	804	5,220	104	804	5,520	104	804	5,820	104	804	6,120	104	804	6,420	104	804	6,720	104	804	7,020							
	15	3	208	185	38,480	208	204	42,432	260	204	46,300	260	204	50,300	312	204	54,300	312	204	58,300	364	204	62,300	364	204	66,300	416	204	70,300	416	204	74,300	468	204	78,300							
	16	3	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564	44	581	25,564							
	17	3	120	581	41,632	120	581	51,128	120	581	58,100	120	581	65,920	120	581	74,200	120	581	82,920	120	581	92,000	120	581	101,440	120	581	111,200	120	581	121,320										
				3 x 3/8" OR 9MM				4 x 1/2" OR 12MM				5 x 5/8" OR 16MM				6 x 1" OR 25MM				NO-TOTAL AMOUNT OF BARS				L = TOTAL LENGTH OF EACH BAR																		

- NOTES:
- WORK THIS DRAWING WITH DWG NO. 5B20-10-64/1 AND 5B20-10-64/2.
 - CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR .15 x .15 CUBE AT 28 DAYS AN APPROXIMATE MIX DESIG PER CUBIC METER IS SUGGESTED AS FOLLOWS:
 - PORTLAND CEMENT, M/H 350 KG.
 - SAND 0.43 M³
 - CRUSHED ROCK OR GRAVEL 0.86 M³
 - CONCRETE SLUMP, MAX 10 CM
 - CLEAR CONCRETE COVER SHALL BE 2.5 CM.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED AND ADDITIONAL CONCRETE COVER OF 2.5 CM FROM NORMAL CASE ALL AROUND SHALL BE PROVIDED FOR THE CAP BEAM WITHOUT ALTERING THE LOCATIONS OF REBARS.
 - REBARS #4 OR LARGER SHALL BE TIS-24 GRADE SD 30 DEFORMED BARS, OTHERS SHALL BE TIS-20 GRADE SR 24 PLAIN BARS, UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAB SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF NON-SKEW BRIDGE, BEARINGS UNDER 10.0 M. SPAN SLAB BRIDGE SHALL BE CONSTANTLY 22 CM. WIDE
 - 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.
 - QUANTITIES OF REBARS SHOWN IN THE TABLE ARE BASED ON THE TOTAL PIER HEIGHT OF 2.00 M.
 - LENGTH AND AMOUNT OF REBARS SHOWN IN THE TABLE MAY VARY ACCORDING TO PIER SHAPE BUT SPACING SHALL BE AS SHOWN ON THE DRAWINGS.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.



NUMBER OF BOX GIRDER	D1 CM	D2 CM	D3 CM	HALF LENGTH OF FOOTING CM	WIDTH OF FOOTING CM	NUMBER OF PILES				PILE HEAD SPACING C-C		W (CM)
						0°-30° SKEW	30°-60° SKEW	60°-90° SKEW	90°-120° SKEW	0°-30° SKEW	30°-60° SKEW	
7	770 SEC 0	216 SEC 0	109 SEC 0	335 SEC 0 + 175	350	20	24	75 SEC 0	65 SEC 0	335 SEC 0		
8	870 SEC 0	250 SEC 0	-	365 SEC 0 + 175	350	22	26	77 SEC 0	68 SEC 0	365 SEC 0		
9	970 SEC 0	283 SEC 0	142 SEC 0	435 SEC 0 + 175	350	24	28	80 SEC 0	70 SEC 0	435 SEC 0		
10	1,070 SEC 0	316 SEC 0	99 SEC 0	485 SEC 0 + 175	350	26	30	82 SEC 0	72 SEC 0	485 SEC 0		
11	1,170 SEC 0	349 SEC 0	-	530 SEC 0 + 175	350	28	32	84 SEC 0	74 SEC 0	535 SEC 0		
12	1,270 SEC 0	382 SEC 0	-	585 SEC 0 + 175	350	30	34	86 SEC 0	76 SEC 0	585 SEC 0		
13	1,370 SEC 0	415 SEC 0	-	635 SEC 0 + 175	350	32	36	88 SEC 0	78 SEC 0	635 SEC 0		
14	1,470 SEC 0	448 SEC 0	-	685 SEC 0 + 175	350	34	40	90 SEC 0	80 SEC 0	685 SEC 0		
15	1,570 SEC 0	480 SEC 0	-	735 SEC 0 + 175	350	36	44	92 SEC 0	82 SEC 0	735 SEC 0		
16	1,670 SEC 0	510 SEC 0	-	785 SEC 0 + 175	350	38	46	94 SEC 0	84 SEC 0	785 SEC 0		

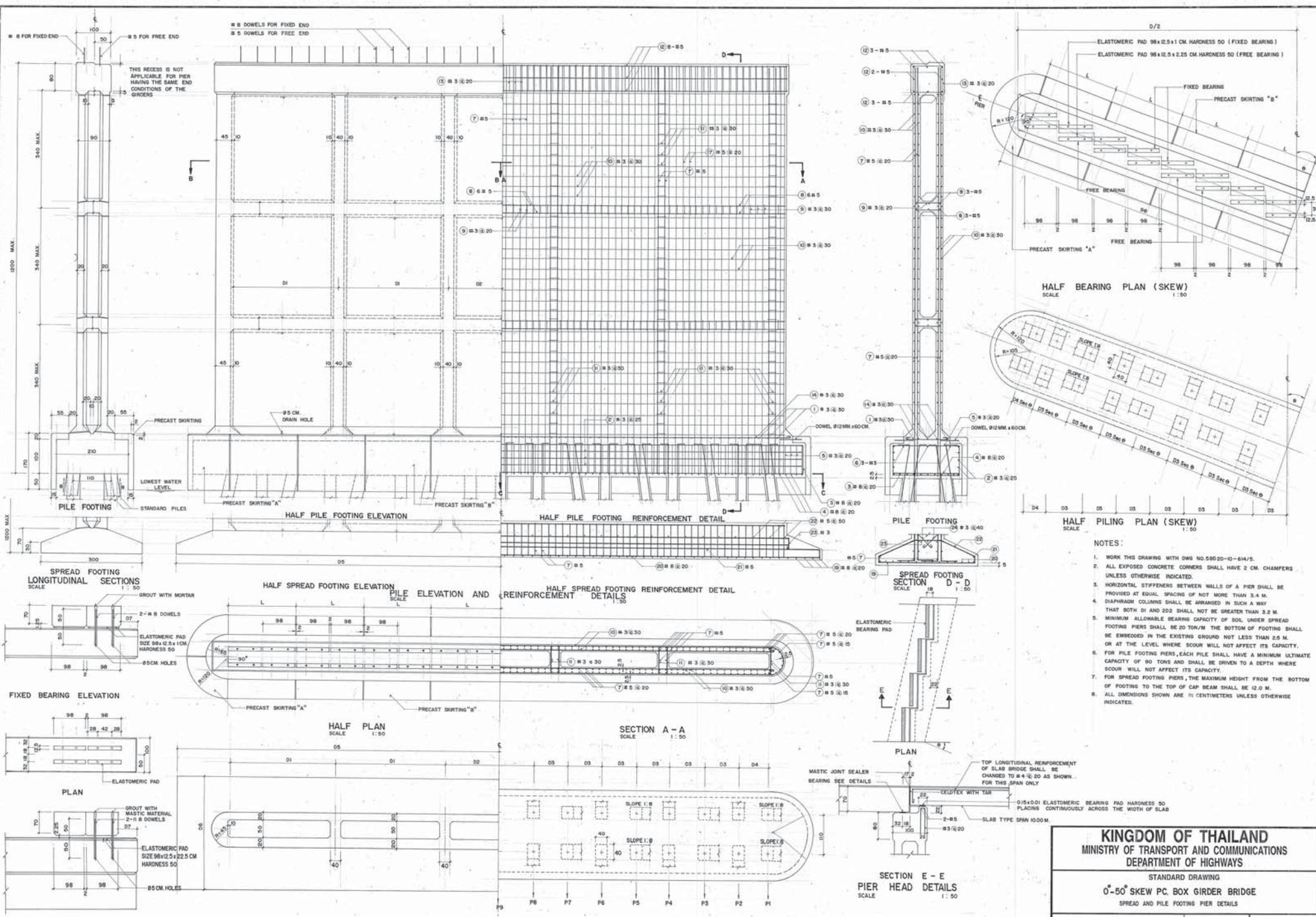
SEC 0	SKEW ANGLE (0)										
	0	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°
	1.0000	1.0098	1.0194	1.0333	1.0642	1.1034	1.1547	1.2208	1.3054	1.4142	1.5557



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 0°-50° SKEW PC BOX GIRDER BRIDGE
 20.00 M. SPAN
 PIER REINFORCING AND SKIRTING DETAILS

DESIGNED: DMH & CONSULTANTS CHECKED: [Signature] DATE: JULY 1994
 SUBMITTED: [Signature] (DIRECTOR OF LOCATION & DESIGN DIVISION) SCALE: AS SHOWN
 APPROVED: [Signature] (DIRECTOR GENERAL) DWG. NO. 5B20-10-64/3
 SHEET NO. 168

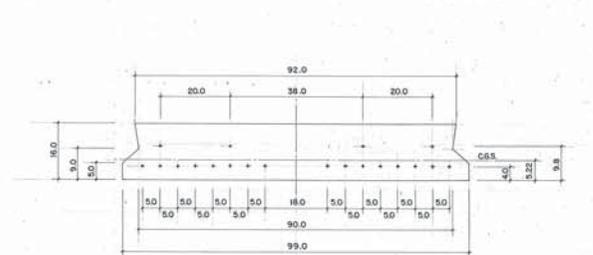


KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

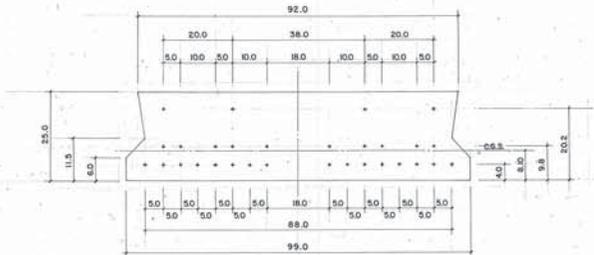
STANDARD DRAWING
0-50° SKEW PC. BOX GIRDER BRIDGE
 SPREAD AND PILE FOOTING PIER DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>Kaporn</i>	DATE JULY 1994
SUBMITTED:	<i>P. Bumpay</i>	SCALE AS SHOWN
APPROVED:	<i>Phan</i>	DWG. NO. 5 BD 20-10-614/4
	Phan (DIRECTOR GENERAL)	SHEET NO. 169

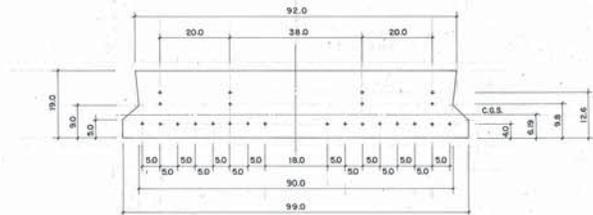
- NOTES:
- WORK THIS DRAWING WITH DWG NO. 5BD20-10-614/5.
 - ALL EXPOSED CONCRETE CORNERS SHALL HAVE 2 CM. CHAMFERS UNLESS OTHERWISE INDICATED.
 - HORIZONTAL STIFFENERS BETWEEN WALLS OF A PIER SHALL BE PROVIDED AT EQUAL SPACING OF NOT MORE THAN 3.4 M.
 - DIAPHRAGM COLLING SHALL BE ARRANGED IN SUCH A MANNER THAT BOTH DI AND 2D2 SHALL NOT BE GREATER THAN 3.2 M.
 - MINIMUM ALLOWABLE BEARING CAPACITY OF SOIL UNDER SPREAD FOOTING PIERS SHALL BE 20 TON/M² THE BOTTOM OF FOOTING SHALL BE EMBEDDED IN THE EXISTING GROUND NOT LESS THAN 2.0 M. OR AT THE LEVEL WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
 - FOR PILE FOOTING PIERS, EACH PILE SHALL HAVE A MINIMUM ULTIMATE CAPACITY OF 90 TONS AND SHALL BE DRIVEN TO A DEPTH WHERE SCOUR WILL NOT AFFECT ITS CAPACITY.
 - FOR SPREAD FOOTING PIERS, THE MAXIMUM HEIGHT FROM THE BOTTOM OF FOOTING TO THE TOP OF CAP BEAM SHALL BE 12.0 M.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.



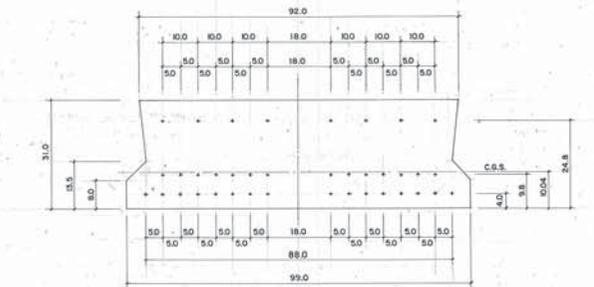
5.00 M. SPAN



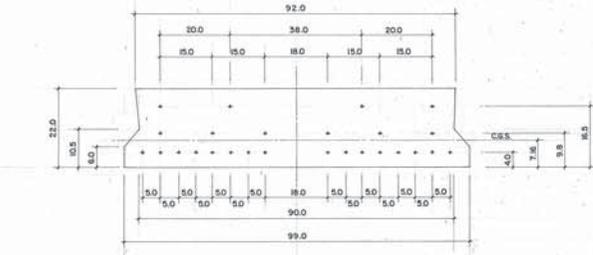
8.00 M. SPAN



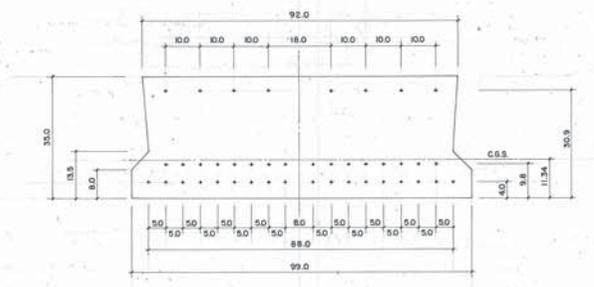
6.00 M. SPAN



9.00 M. SPAN



7.00 M. SPAN



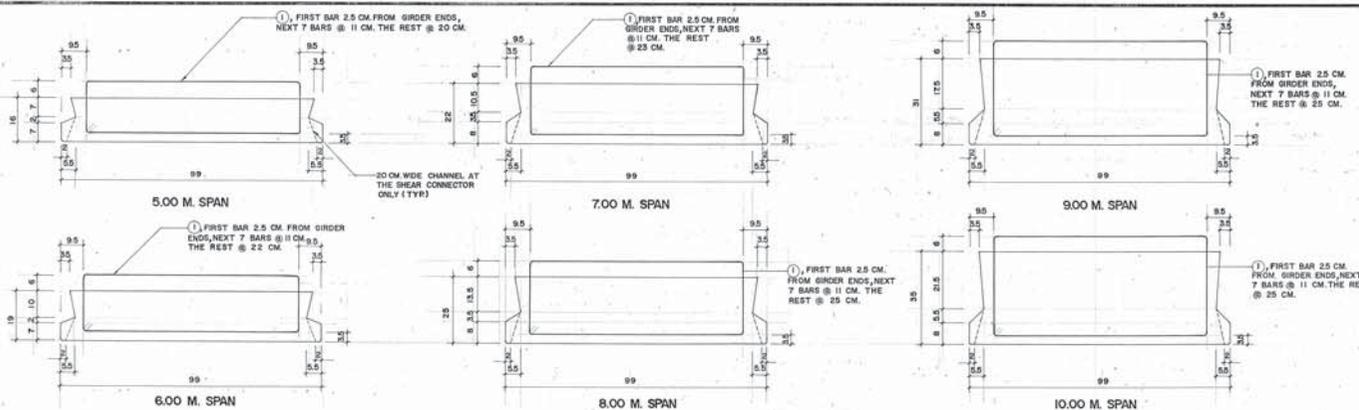
10.00 M. SPAN

TENDON ARRANGEMENTS
SCALE 1:7.5

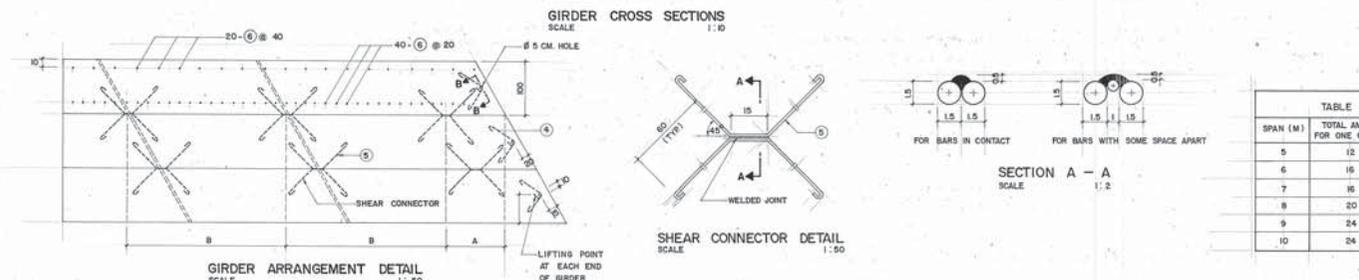
NOTES:

1. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH DWG. NO. PT-CI. IT SHOWS ALTERNATIVE ARRANGEMENTS OF THE PRESTRESSING TENDONS WHEN THE # 5/8" STRANDS ARE USED INSTEAD OF THE # 7 MM. WIRES AS SHOWN ON DWG. NO. PT-CI.
2. ALL PRESTRESSING TENDONS SHALL BE # 5/8" (9.53 MM) 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. ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
5. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3APD5-106-14/1b.

KINGDOM OF THAILAND			
MINISTRY OF TRANSPORT AND COMMUNICATIONS			
DEPARTMENT OF HIGHWAYS			
STANDARD DRAWING			
PRESTRESSED CONCRETE PLANK GIRDER			
# 5/8" WIRE STRAND ARRANGEMENTS			
DESIGNED :	DOH & CONSULTANTS	CHECKED :	DATE JULY 1994
SUBMITTED :	<i>P. B...</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE :	AS SHOWN
APPROVED :	<i>[Signature]</i> (DIRECTOR GENERAL)	DWG. NO. :	PT-02
			SHEET NO. 172



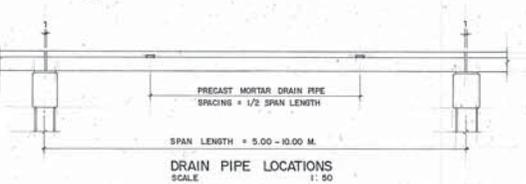
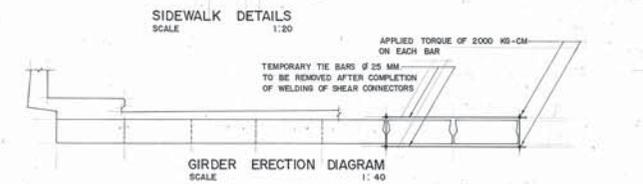
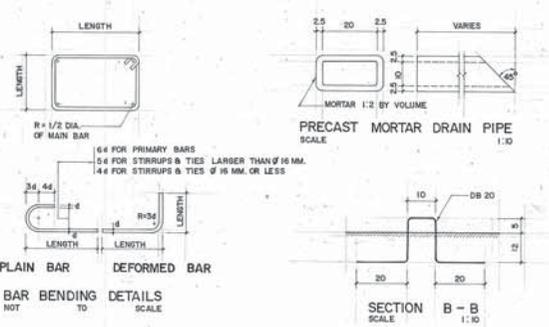
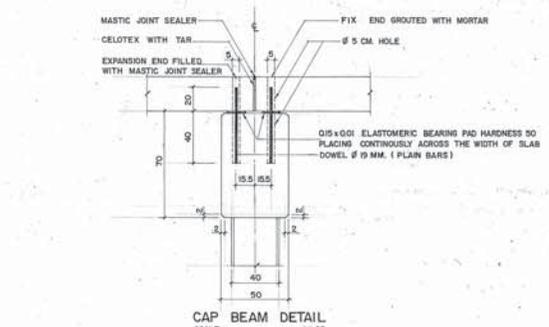
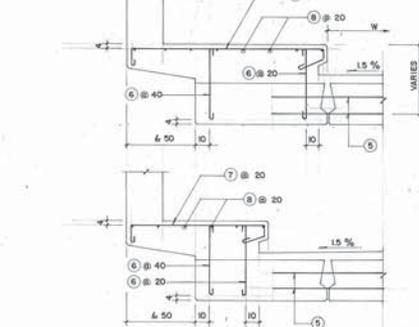
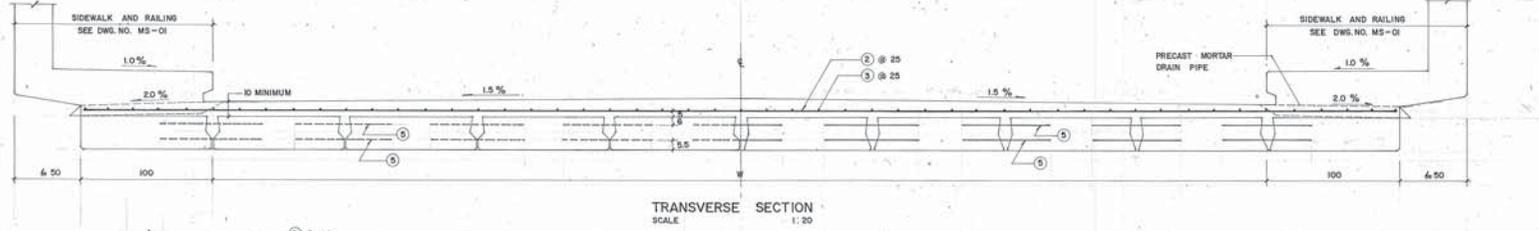
BAR BENDING DIAGRAMS	BAR MARK	BAR #	SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M	
			NO	TOTAL LENGTH CM	NO	TOTAL LENGTH CM								
	①	RB 2	32	211 6752	36	217 7812	38	223 6474	40	229 9160	40	241 9640	40	249 9960
	②	RB 3	20	100 2000	24	100 2400	28	100 2800	32	100 3200	36	100 3600	40	100 4000
	③	DB 3	4	500 2000	4	600 2400	4	700 2800	4	800 3200	4	900 3600	4	1000 4000
	④	DB 4	4	100 400	4	100 400	4	100 400	4	100 400	4	100 400	4	100 400
	⑤	DB 5	12	172.5 2070	16	172.5 2760	16	172.5 2760	20	172.5 3450	24	172.5 4130	24	172.5 4130



BAR BENDING DIAGRAMS	SIDE WALK WIDTH CM	BAR MARK	BAR #	SPAN 5.00 M		SPAN 6.00 M		SPAN 7.00 M		SPAN 8.00 M		SPAN 9.00 M		SPAN 10.00 M	
				NO	TOTAL LENGTH CM	NO	TOTAL LENGTH CM								
	40	⑥	DB 4	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 5520.5
			RB 3	25	90.0 2265.0	30	90.0 2700.0	35	90.0 3150.0	40	90.0 3600.0	45	90.0 4050.0	50	90.0 4500.0
			DB 4	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 5520.5
			DB 4	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 5520.5
			DB 5	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 3	5	500 2500	5	600 3000	5	700 3500	5	800 4000	5	900 4500	5	1000 5000
			DB 4	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 5520.5
			RB 3	25	200.0 5000	30	200.0 6000	35	200.0 7000	40	200.0 8000	45	200.0 9000	50	200.0 10000
			DB 4	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 5520.5
			DB 5	12	172.5 2070	16	172.5 2760	16	172.5 2760	20	172.5 3450	24	172.5 4130	24	172.5 4130

SPAN (M)	TOTAL AMOUNT FOR ONE GIRDER	A (CM)	B (CM)
5	12	70	179.50
6	16	70	193.00
7	16	70	186.36
8	20	70	164.75
9	24	50	159.80
10	24	50	178.00

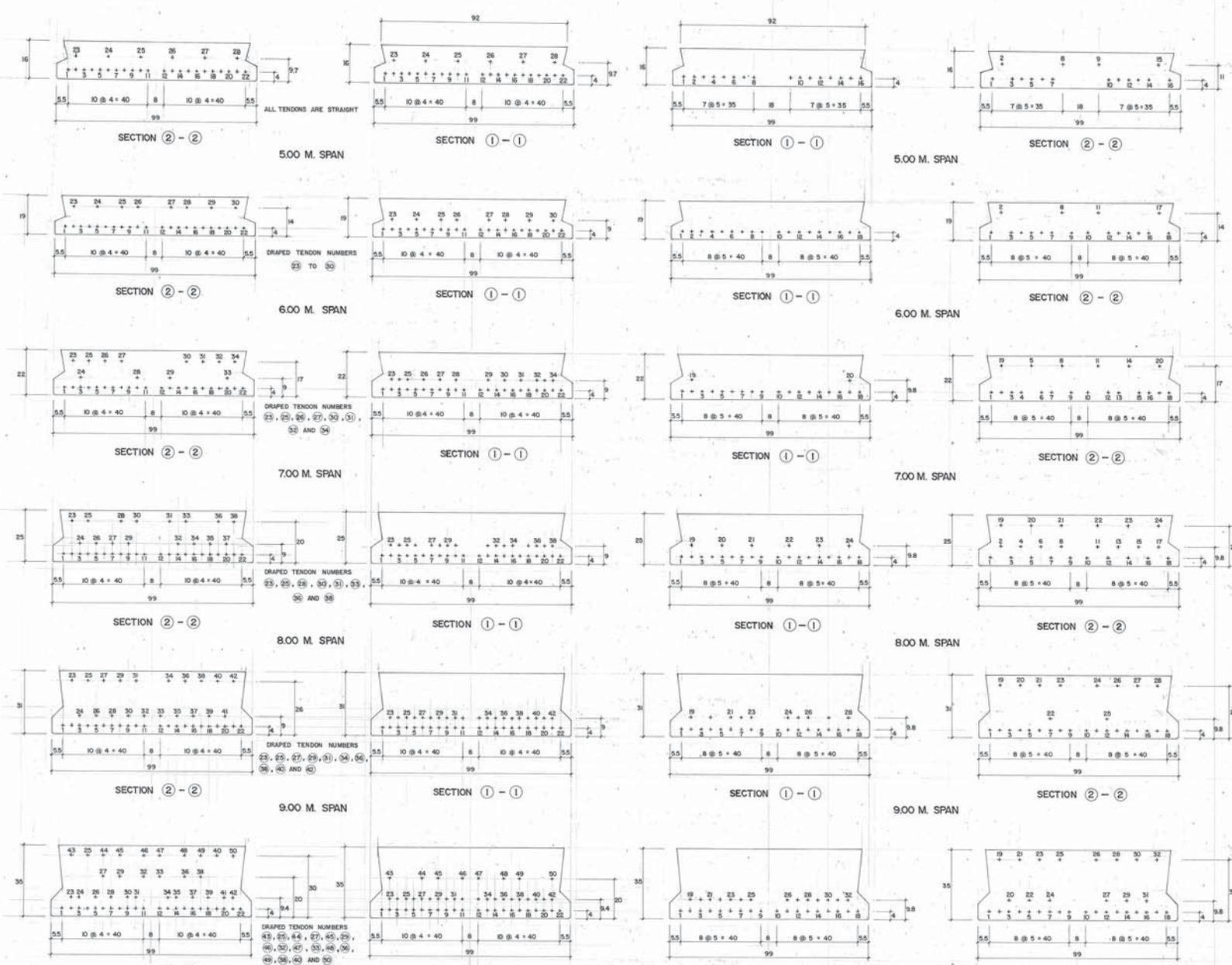
- NOTES:**
- WORK THIS DRAWING WITH DWG. NO. PT-04
 - CASTING LENGTH OF A GIRDER SHALL BE 1 CM. SHORTER THAN THE SPAN LENGTH.
 - UNLESS OTHERWISE APPROVED, CEMENT USED IN THE CONCRETE MIX SHALL BE PORTLAND CEMENT TYPE I CONFORMING TO TIS IS.
 - MIX DESIGN OF CONCRETE FOR PRESTRESSED GIRDERS, BRIDGE TOPPING, SIDEWALK AND RAILING SHALL BE SUBMITTED FOR THE APPROVAL OF THE ENGINEER. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH FOR A JS-V-15 M. CUBE AT 28 DAYS AS FOLLOWS :-
 A) FOR PRESTRESSED GIRDER 420 KG/CM²
 B) FOR BRIDGE TOPPING 300 KG/CM²
 C) FOR SIDEWALK AND RAILING 210 KG/CM²
 - PRESTRESSING TENDONS MAY BE RELEASED AFTER CONCRETE HAS ATTAINED A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 340 KG/CM² FOR THE STANDARD CUBE.
 - REBARS SMALLER THAN # 3 SHALL BE TIS 24 GRADE SR24 PLAIN ROUND BARS, OTHERS SHALL BE TIS 24 GRADE SD30 DEFORMED BARS UNLESS OTHERWISE INDICATED.
 - ALL MATERIALS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
 - GIRDERS SHALL BE LIFTED AT BOTH ENDS, MIDSPAN LIFTING IS PROHIBITED.
 - THIS TYPE OF GIRDERS MAY BE USES WITH PIERS FOR SLAB BRIDGE HAVING THE SAME SPAN LENGTH.
 - DOWELS FOR HOLDING GIRDERS TO PIERS SHALL BE PROVIDED AT EVERY ALTERNATE GIRDER.
 - TOP AND BOTTOM SHEAR CONNECTORS SHALL BE WELDED SIMULTANEOUSLY.
 - TIGHTENING OF THE NEXT ADJACENT GIRDER TO THE PREVIOUS ONE SHALL BE DONE IN SUCCESSION.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - IF PIERS FALL WITHIN THE TRANSITION OF HORIZONTAL CURVE, THE TOP OF CAP BEAM SHALL BE SUPERELEVATED IN ACCORDANCE WITH THE ROADWAY SUPERELEVATION 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.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3APD 5-106-14 / I.C.



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 0° - 30° SKEW PC GIRDER BRIDGE
 GIRDER ARRANGEMENT AND DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: [Signature]	DATE: JULY 1994
SUBMITTED: [Signature]	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN
APPROVED: [Signature]	(LPH DIRECTOR GENERAL)	DWG. NO. PT-03
		SHEET NO. 173

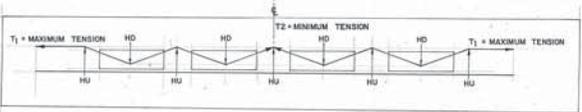


- NOTES:**
- WORK THIS DRAWING WITH DWG. NO. PT-03.
 - PRESTRESSING TENDONS SHALL BE AS FOLLOWS :-
 - Ø 7 MM STRESS-RELIEVED WIRE SHALL HAVE A MINIMUM ULTIMATE STRENGTH OF 16,500 KG/CM² AND CONFORM TO TIS 95 OR APPROVED EQUAL.
 - Ø 3/8" SEVEN-WIRE STRAND SHALL HAVE A MINIMUM ULTIMATE LOAD OF 9,078 KG. AND CONFORM TO TIS 430 OR APPROVED EQUAL.
 - PRESTRESSING OF STRAIGHT TENDON SHALL BE AS FOLLOWS :-
 - Ø 7 MM STRESS-RELIEVED WIRE SHALL HAVE AN INITIAL PRESTRESSING FORCE OF 4,320 KG/TENDON AFTER ANCHORING.
 - Ø 3/8" SEVEN-WIRE STRAND SHALL HAVE AN INITIAL PRESTRESSING FORCE OF 6,330 KG/TENDON AFTER ANCHORING.
 - PRESTRESSING OF DRAPED TENDON SHALL BE AS FOLLOWS :-
 - TWO METHODS OF PRESTRESSING MAY BE USED :
 FIRST METHOD : APPLY FORCE TO A HORIZONTAL TENDON AT LEVEL HD OR HU IN SUCH A WAY THAT WHEN HOLD-DOWN DEVICE (HD) AND HOLD-UP DEVICE (HU) ARE APPLIED TO HOLD THE TENDON IN POSITION THE PRESTRESSING FORCE IN THE TENDON AT MIDSPAN OF EACH GIRDER IS EQUAL TO THE CORRESPONDING FORCE SPECIFIED IN NOTE 3.
 SECOND METHOD : FIX THE HD AND HU DEVICE IN SUCH A WAY THAT WHEN APPLYING A FORCE TO THE DRAPED PRESTRESSING TENDON IT WILL BE IN THE DESIRED POSITION, JACK THE TENDON UNTIL THE MAXIMUM TENSION IS EQUAL TO THE CORRESPONDING FORCE SPECIFIED IN NOTE 3. THE MINIMUM TENSION IN THE TENDON SHALL BE AS FOLLOWS :-
 FOR Ø 7 MM STRESS-RELIEVED WIRE = 10,500 KG/CM²
 OR = 4,050 KG/TENDON
 FOR Ø 3/8" SEVEN-WIRE STRAND = 11,050 KG/CM²
 = 6,000 KG/TENDON
 - THE SURFACES OF HD AND HU DEVICES WHICH CONTACT THE TENDONS SHALL HAVE A SMOOTH CIRCULAR SHAPE HAVING A RADIUS NOT LESS THAN 5 CM.

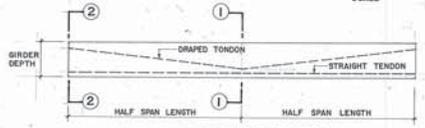
 THE NUMBERS OF HD AND HU DEVICE SHALL BE ARRANGED IN SUCH A WAY THAT THE LIMITS OF FORCES AS SPECIFIED IN THE ABOVE PARAGRAPH A CAN BE ACHIEVED.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3APD 5-106-14/14.

LOCATIONS OF Ø 7 MM. STRESS-RELIEVED WIRES
SCALE 1:10

LOCATIONS OF Ø 3/8" SEVEN-WIRE STRANDS
SCALE 1:10

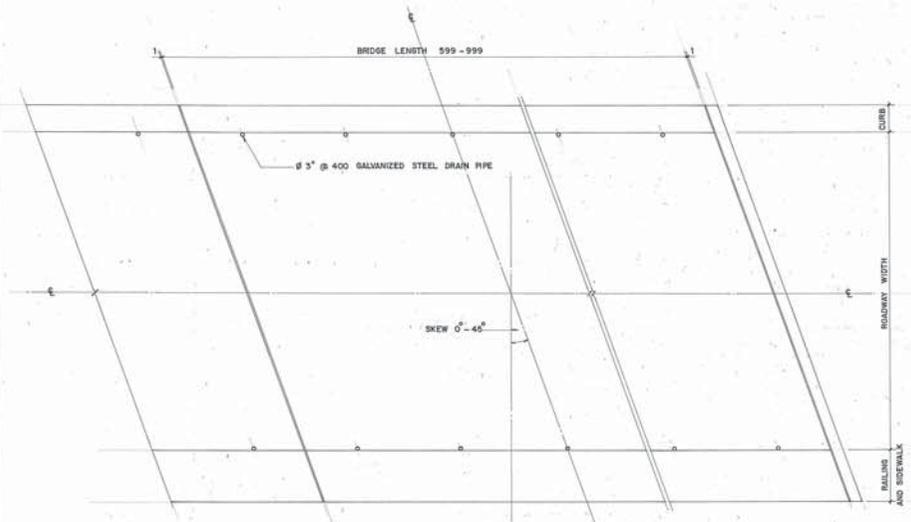


PRESTRESSING DIAGRAM

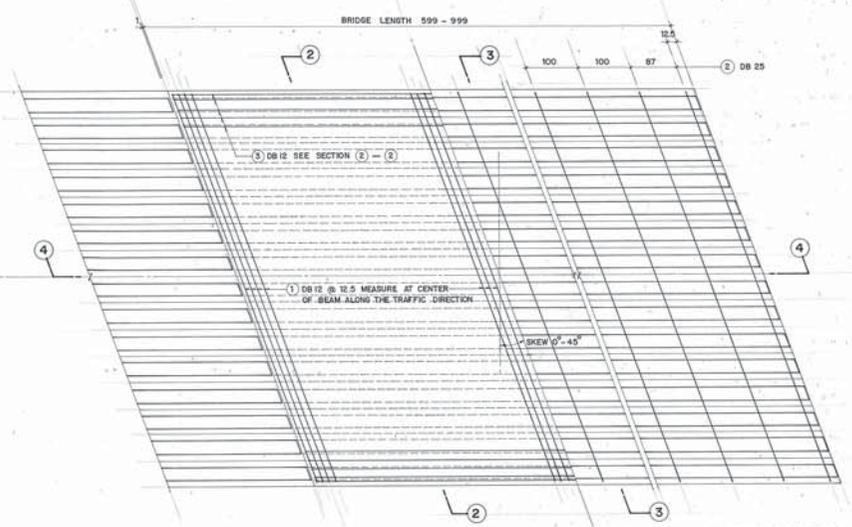


PROFILE OF TENDONS

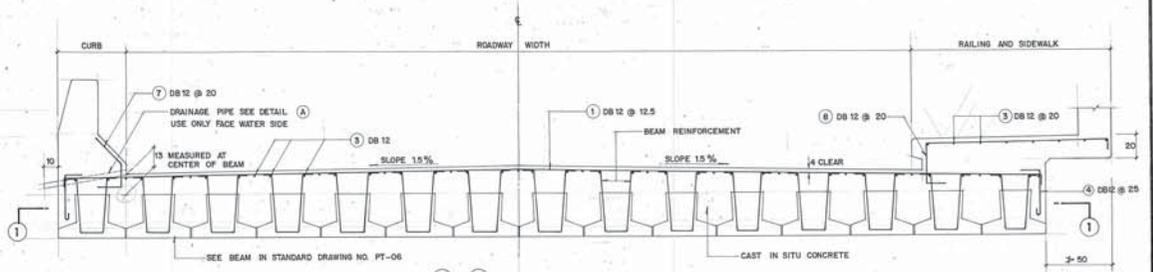
KINGDOM OF THAILAND		
MINISTRY OF TRANSPORT AND COMMUNICATIONS		
DEPARTMENT OF HIGHWAYS		
STANDARD DRAWING		
PRESTRESSED CONCRETE GIRDER		
DRAPED TENDON ARRANGEMENT		
DESIGNED : DOM & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> DIRECTOR GENERAL	DWG. NO. PT-04
		SHEET NO. 174



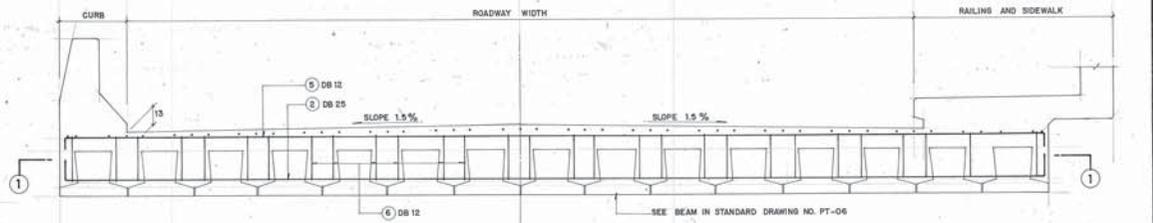
PLAN OF SLAB
SCALE 1:50



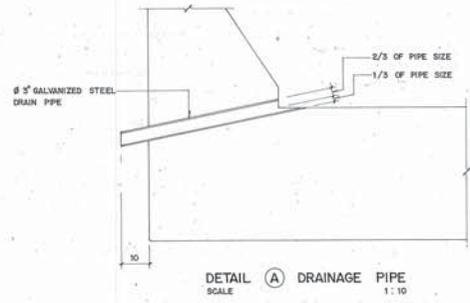
SECTION 1-1 PLAN OF BEAM
SCALE 1:50



SECTION 2-2 SLAB REINFORCEMENT
SCALE 1:20



SECTION 3-3 CROSS BEAM REINFORCEMENT
SCALE 1:20

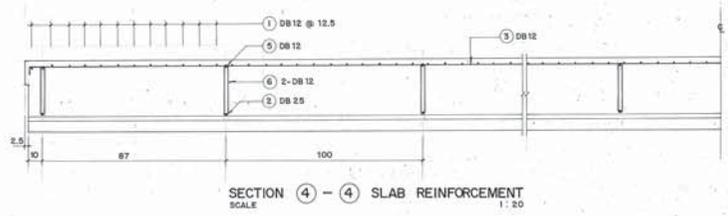


DETAIL A DRAINAGE PIPE
SCALE 1:10

- NOTES :**
1. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 2. ALL EXPOSED CORNERS SHALL HAVE A 1 CM. CHAMFER UNLESS OTHERWISE INDICATED.
 3. REBAR Ø 12 MM OR LARGER SHALL BE T15 24 GRADE S030 DEFORMED BARS OTHER SHALL BE T15 20 GRADE S#24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 4. CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 N/MM² FOR A 15 x 15 x 15 CM CUBE AT 28 DAYS. CEMENT SHALL BE T15 15 TYPE I PORTLAND CEMENT AND MAXIMUM SLUMP OF 8 CM.
 5. CLEAR CONCRETE COVER SHALL BE 5 CM UNLESS OTHERWISE INDICATED.
 6. THIS DRAWING IS ADAPTED FROM DOH DWS. NO. APC-1.

TABLE OF REINFORCEMENT

BAR MARK	BAR SIZE	BAR BENDING DIAGRAM
①	DB 12	
②	DB 25	
③	DB 12	
④	DB 12	
⑤	DB 12	
⑥	DB 12	
⑦	DB 12	
⑧	DB 12	

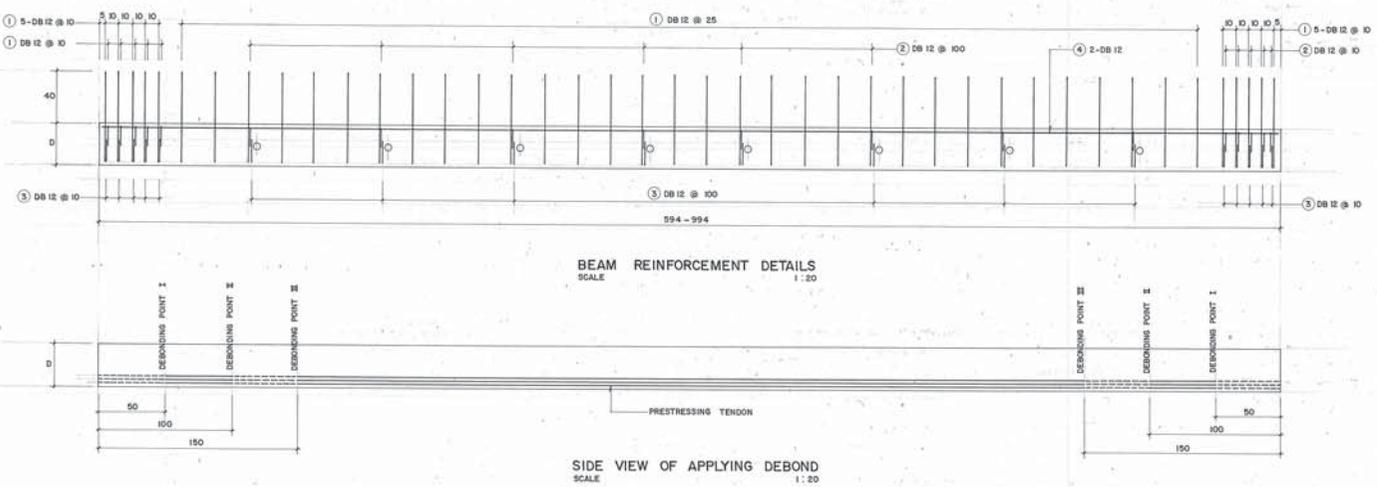
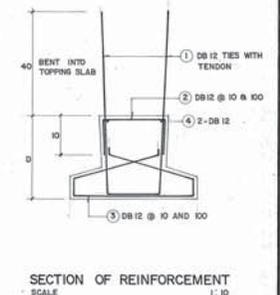
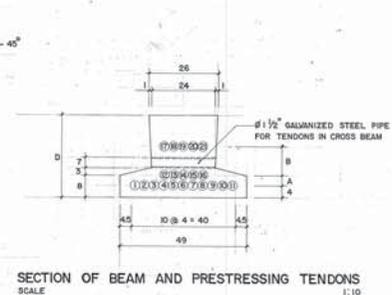
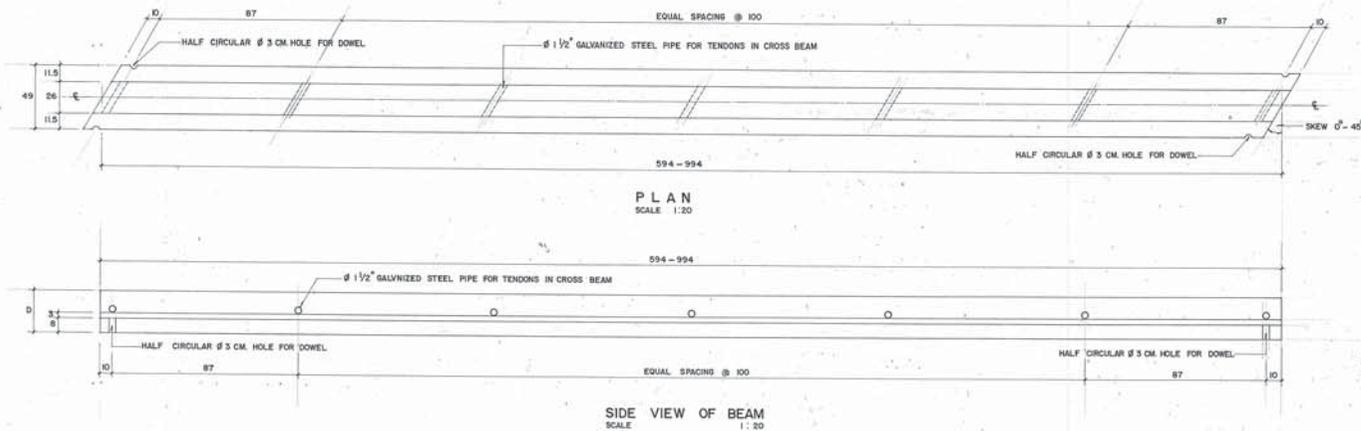


SECTION 4-4 SLAB REINFORCEMENT
SCALE 1:20

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS
 STANDARD DRAWING
 6.00-10.00 M. SPAN MULTI-BEAM TYPE

DESIGNED : DOH & CONSULTANTS CHECKED : *[Signature]* DATE JULY 1994
 SUBMITTED : *[Signature]* SCALE AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION) DWG. NO. PT-05
 APPROVED : *[Signature]*
 (DIRECTOR GENERAL)

SHEET NO. 175



- NOTES :**
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - ALL EXPOSED CORNERS SHALL HAVE A 1 CM CHAMFER UNLESS OTHERWISE INDICATED.
 - REBAR ϕ 12 MM OR LARGER SHALL BE TIS 24 GRADE S D 30 DEFORMED BARS, OTHER SHALL BE TIS 20 GRADE SR 24 PLAN BARS UNLESS OTHERWISE INDICATED.
 - CONCRETE SHALL HAVE THE 28-DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH, BASED ON $0.15 \times 0.15 \times 0.15$ CM. CUBE SAMPLES, OF 40 N/MM^2 AND MAXIMUM SLUMP OF 8 CM.
 - PRESTRESSING OF STRAIGHT TENDON SHALL BE AS FOLLOWS :
 - ϕ 7 MM. STRESS-RELIEVED WIRE SHALL HAVE A MAXIMUM TENSION (BREAKING STRENGTH) OF 64 KN/TENDON.
 - ϕ 3/8" SEVEN-WIRE STRAND SHALL HAVE A MAXIMUM TENSION (BREAKING STRENGTH) OF 106 KN/TENDON.
 - APPLY FORCE TO A TENDON AT TRANSFER UNTIL THE MAXIMUM TENSION AT TRANSFER IS EQUAL TO THE CORRESPONDING FORCE SPECIFIED IN THE TABLE OF DETAILS OF BEAMS.
 - DEBONDING OF A PRESTRESSING TENDON IS ACHIEVED BY ENVELOPING THE TENDON WITH A PLASTIC TUBE FROM THE DEBONDING POINTS AS SHOWN IN THE TABLE THROUGH THE END OF BEAM.
 - UNLESS OTHERWISE SHOWN, CLEAR CONCRETE COVER SHALL BE 2.5 CM.
 - IN CASE OF SKEW CASTING FOR SKEW BRIDGE, THE TENDON SHALL ALSO BE SKEW.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. APC-2.

TABLE OF DETAILS OF BEAMS

SPAN M.	BEAM LENGTH CM.	D cm.	PRESTRESSING TENDON 7 mm WIRES				PRESTRESSING TENDON 3/8" STRANDS				
			NO.	TENSION FORCE AT TRANSFER KN/TENDON	A	B	NO.	TENSION FORCE AT TRANSFER KN/TENDON	A	B	
6.0	594	19	 (14 TENDONS)	45.9	47	-	 (6 TENDONS)	77.5	8	-	 (3 TENDONS)
8.0	794	25	 (17 TENDONS)	47.0	4	9.25	 (10 TENDONS)	77.5	6.25	-	 (2 TENDONS)
10.0	994	35	 (20 TENDONS)	47.7	4	16	 (12 TENDONS)	77.5	15	-	 (2 TENDONS)

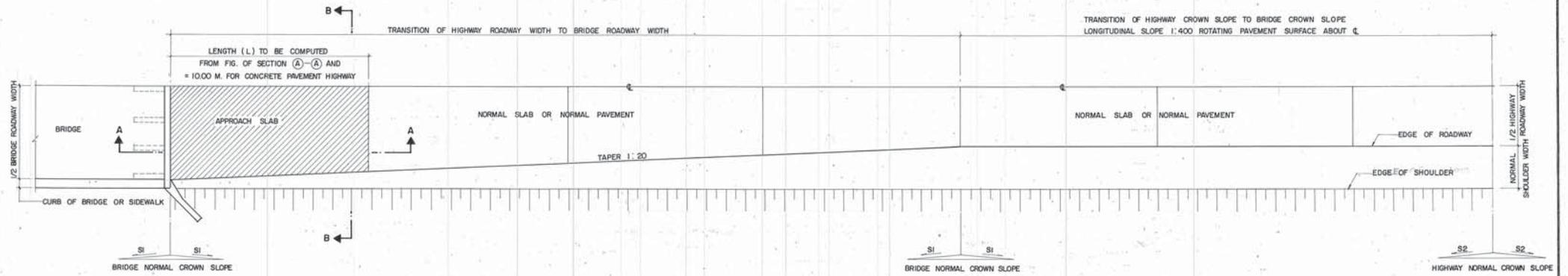
TABLE OF REINFORCEMENT

NO.	BAR SIZE	BAR BENDING DIAGRAM
1	DB 12	
2	DB 12	
3	DB 12	
4	DB 12	

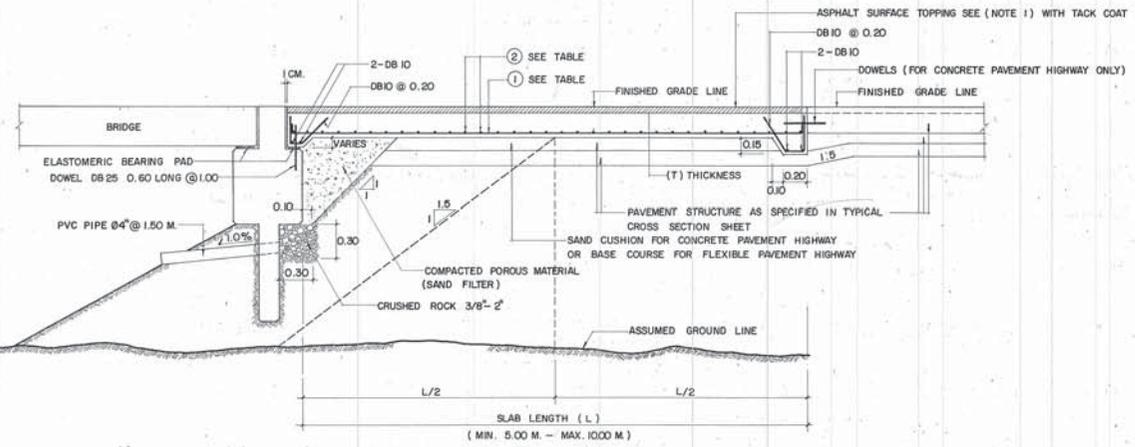
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 6.00 - 10.00 M SPAN MULTI-BEAM TYPE
 PRESTRESSED CONCRETE GIRDER

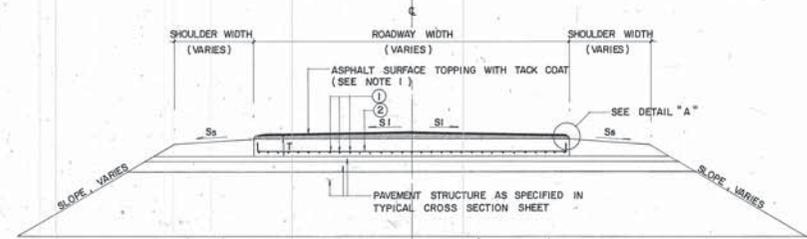
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> JPH (DIRECTOR GENERAL)	DWG. NO. PT-06 SHEET NO. 176



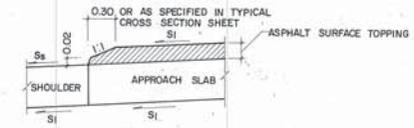
PLAN
NOT TO SCALE



SECTION A - A
SCALE 1:25



SECTION B - B
SCALE 1:50



DETAIL "A"
NOT TO SCALE

NOTES

- THE ASPHALT SURFACE FOR THE TOPPING ON THE APPROACH SLAB SHALL BE AS FOLLOW:
 - FOR CONCRETE PAVEMENT HIGHWAY ON SOFT FOUNDATION WITH ASPHALTIC CONCRETE TREATED SHOULDER THE 5cm HOT MIXED ASPHALTIC CONCRETE SHALL BE USED AS THE TOPPING.
 - FOR CONCRETE PAVEMENT HIGHWAY ON SOFT FOUNDATION WITH BITUMINOUS SURFACE TREATMENT TREATED SHOULDER OR NONTREATED SHOULDER EITHER 5cm COLD MIX ASPHALTIC CONCRETE OR 5cm HOT MIXED ASPHALTIC CONCRETE SHALL BE USED.
 - FOR CONCRETE PAVEMENT HIGHWAY ON NORMAL SOIL FOUNDATION NO ASPHALT SURFACE TOPPING REQUIRED AND THE APPROACH SLAB SHALL BE RAISED TO THE FINISHED GRADE LINE.
- FOR FLEXIBLE PAVEMENT HIGHWAY WITH ASPHALTIC CONCRETE SURFACE THE TOPPING SHALL BE THE SAME AS THE HIGHWAY ASPHALTIC CONCRETE SURFACE COURSE BUT SHOULD BE 5cm THICK (MINIMUM).
- FOR FLEXIBLE PAVEMENT HIGHWAY WITH BITUMINOUS SURFACE TREATMENT SURFACE EITHER 5mm COLD MIXED ASPHALTIC CONCRETE OR 5cm HOT MIXED ASPHALTIC CONCRETE SHALL BE USED.
- THE COLD MIXED AND THE HOT MIXED ASPHALTIC CONCRETE FOR THE TOPPING AS STATED IN NOTE 1 WILL BE CONFORMED TO THE SPECIAL PROVISIONS FOR ASPHALT TOPPING ON THE APPROACH SLAB STATED BY THE MATERIAL & RESEARCH DIVISION DEPARTMENT OF HIGHWAY.
- THE TACK COAT SHALL BE REFERRED TO STANDARD DH-S 403/2531
- THE CONSTITUENTS OF THE CONCRETE MIX PER CUBIC METER MUST BE AS FOLLOWS-PORTLAND CEMENT 300 kg, SAND 430 LITRES
- CRUSHED ROCK OR GRAVEL 860 LITRES, SLUMP OF THE CONCRETE MIX NOT BE HIGHER THAN 8cm WITH AN ULTIMATE COMPRESSIVE STRENGTH OF STANDARD CUBE 15x15x15 cm NOT LOWER THAN 20 N/mm² AT THE AGE OF 28 DAYS.
- REINFORCING STEEL MUST CONFORM TO THE STANDARD TIS.20-2527 FOR THE ROUND BAR AND TIS.24-2527 CLASS S030 FOR THE DEFORMED BAR.
- THE NORMAL CONCRETE CLEAR COVERING SHALL BE 3cm AND 5cm FOR SULPHATE RESISTANT
- THE COST OF THE APPROACH SLAB SHALL INCLUDE THE COST FOR THE ASPHALT TOPPING AND THE TACK COAT AS STATED IN THIS DRAWING (IF ANY)
- DIMENSIONS ARE IN METER UNLESS OTHERWISE INDICATED.

TABLE SHOW THE DETAILS OF THE APPROACH SLAB

SLAB LENGTH (L) M.	THICKNESS (T) CM.	REINFORCEMENT	
		①	②
5.00	20	DB20 @ 0.20	DB10 @ 0.20
6.00	22	DB20 @ 0.15	DB10 @ 0.15
7.00	24	DB20 @ 0.20	DB12 @ 0.20
8.00	26	DB20 @ 0.15	DB12 @ 0.15
9.00	28	DB25 @ 0.20	DB16 @ 0.20
10.00	30	DB25 @ 0.15	DB25 @ 0.15

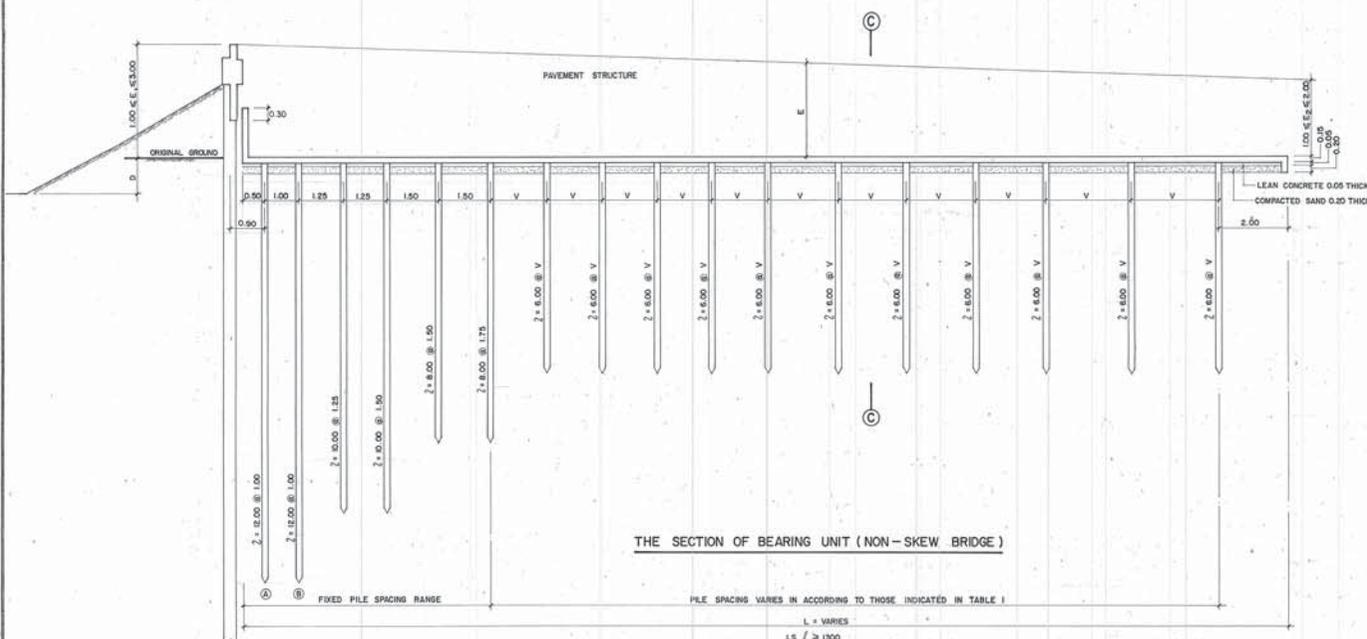
REMARK

FOR SKEW BRIDGE THE SLAB LENGTH (L) WILL BE THE SHORT SIDE OF THE APPROACH SLAB BUT THE THICKNESS AND THE REINFORCEMENT SHALL BE EQUIVALENT TO THOSE OF THE SLAB WITH THE SLAB LENGTH (L) EQUAL TO THE LONG SIDE OF THE APPROACH SLAB.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
**BRIDGE APPROACH SLAB AND
POROUS BACKFILL MATERIALS**

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN	
APPROVED: <i>[Signature]</i> (DIRECTOR GENERAL)	DWG. NO. AP-3	
		SHEET NO. 178



THE SECTION OF BEARING UNIT (NON-SKEW BRIDGE)

PILE SPACING VARIES IN ACCORDING TO THOSE INDICATED IN TABLE 1

$L = \text{VARIES}$

$LS \geq 1300$

$LS \geq 40$

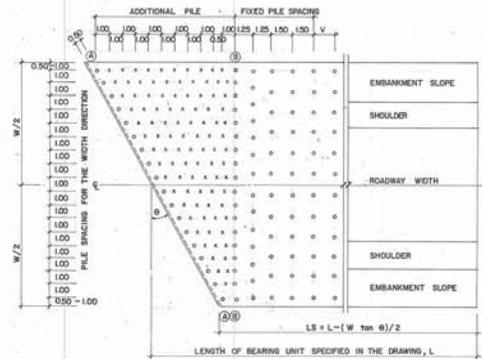
$LS \geq 2.5(\epsilon + D)$

OR $LS = \text{LENGTH TO BE SPECIFIED BY THE LOCATION AND DESIGN DIVISION}$

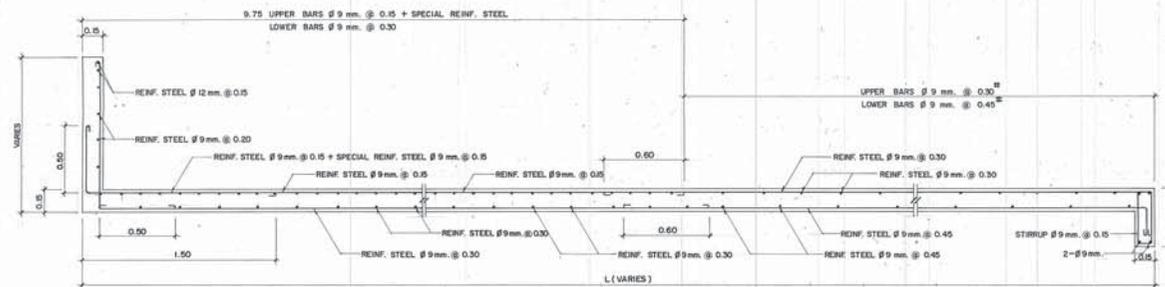
BEARING SLAB SHALL HAVE 2.00 M. EXTENSION AT THE SLAB FREE END.

NOTES :

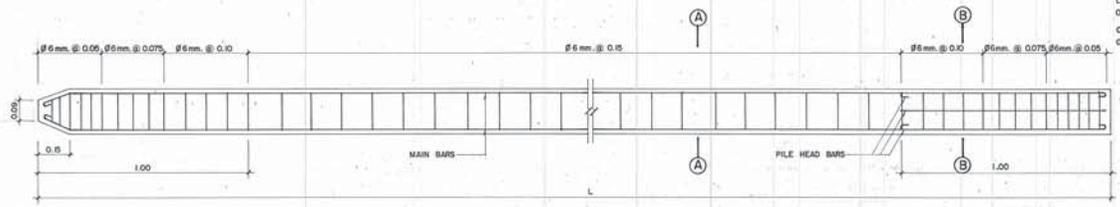
- CONCRETE MIX PER 1 CU.M SHALL APPROXIMATELY HAVE
PORTLAND CEMENT IN ACCORDANCE WITH ASTM STANDARD
C 150-63 TYPE 1 OR EQUIVALENT QUALITY, NOT LESS THAN 300 KG.
COARSE SAND 430 LITRE
CRUSHED ROCK OR GRAVEL 860 LITRE
WATER 195 LITRE
CONCRETE SLUMP NOT EXCEED 10 CM.
- ULTIMATE COMPRESSIVE STRENGTH OF THE STANDARD CUBE, $150 \times 150 \times 150$ CM. SHALL NOT BE LESS THAN 210 KG./CM².
- REINFORCEMENT STEEL, $\phi 6$ MM. AND $\phi 9$ MM. SHALL BE STRUCTURAL GRADE WHILE $\phi 12$ MM. AND ABOVE SHALL BE INTERMEDIATE GRADE DEFORMED BAR.
- ANY DETAILS NOT SPECIFIED IN THE DRAWING OR UNCLEARED OR NON-COMFORMED WHICH WOULD CRETE THE PROBLEM IN CONSTRUCTION, THE DECISION OF THE DOH'S LOCATION AND DESIGN DIVISION SHALL GOVERN.
- ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE INDICATED.
- DESIGN ASSUMPTION : SOIL CONDITION FOLLOWS THE GENERAL CHARACTERISTIC OF BANGKOK CLAY.
- PRESTRESSED CONCRETE PILE SHALL BE ALLOWED ONLY THOSE HAVING THE EFFECTIVE PERIMETER NOT LESS THAN THE VALUE STATED IN THE DRAWING WITH THE PRIOR APPROVAL OF THE DOH'S LOCATION AND DESIGN ON CASE BY CASE BASIS.
- IN CASE OF SKEW BRIDGE, THE LENGTH OF BEARING UNIT (L) SHALL BE MEASURED ALONG THE LINE AT THE MIDDLE OF THE WIDTH OF BEARING UNIT. THE LENGTH OF BEARING UNIT ON THE SHORT SIDE SHALL NOT BE LESS THAN (LS) AS SPECIFIED IN THE DRAWING.
- THIS DRAWING IS ADOPTED FROM THE DOH'S STANDARD DRAWING NO. S2/22.



PLAN INDICATING THE LOCATION OF ADDITIONAL PILE FOR THE CASE OF SKEW BRIDGE



THE REINFORCEMENT FOR BEARING SLAB 1:20



THE RC. PILE 1:12.5

TABLE 1 INDICATING THE DEPTH OF FILL AND PILE SPACING

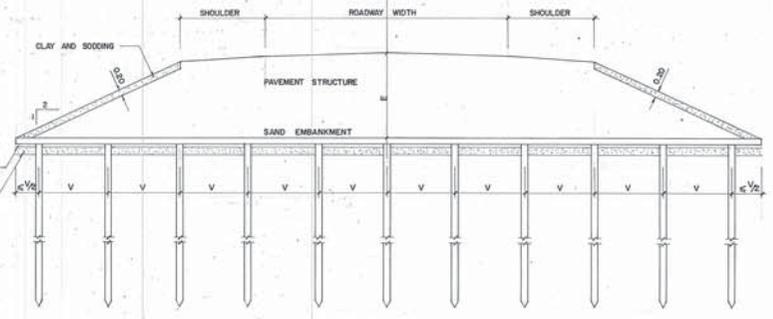
E (METER)	2.75 - 3.00	2.50 - 2.75	2.25 - 2.50	< 2.25
V (METER)	1.50	1.75	2.00	2.50

TABLE 2 INDICATING SIZE AND REINFORCEMENT FOR THE PILE

Ø	A	MAIN BARS	PILE HEAD BARS	LIFING POINTS (MEASURED FROM BOTH ENDS)
12.00	0.20	4- $\phi 16$ mm.	4- $\phi 12$ mm.	2.40
10.00	0.18	4- $\phi 12$ mm.	4- $\phi 12$ mm.	2.00
8.00	0.16	4- $\phi 9$ mm.	4- $\phi 9$ mm.	1.60
6.00	0.14	4- $\phi 9$ mm.	4- $\phi 9$ mm.	1.20

SECTION (A) - (A) 1:12.5

SECTION (B) - (B) 1:12.5



SECTION C - C 1:7.5

- IN CASE OF NON-SKEW BRIDGE
- ROW (A) AND (B) SHALL BE 1.00 METER APART
- IN CASE OF SKEW BRIDGE
- PILE SPACING (ADDITIONAL PART) ALONG THE LENGTH OF BEARING UNIT SHALL BE 1.00 METER BY MEASURING FROM ROW (A) TOWARD (B) FOR THE LAST PILE NEAR ROW (B), IF THE SPACING FROM ROW (B) IS LESS THAN 1.00 METER, THE SPACING OF THE LAST TWO PILES SHALL BE ADJUSTED TO HAVE THE SPACING NOT LESS THAN 0.50 METER BUT NOT EXCEED 1.00 METER.
 - X ADDITIONAL PILE, 12.00 M. LONG.
 - O PILES AS INDICATED IN THE DRAWING FOR NON-SKEW BRIDGE
 - Z FOR DEFORMED BAR, NOT NECESSARY TO HOOK.

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

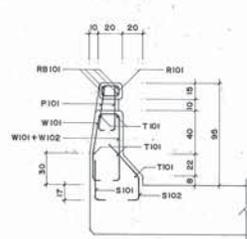
BEARING UNIT AT BRIDGE END ON SOFT CLAY

DESIGNED : DOH & CONSULTANTS CHECKED : *Kay* DATE JULY 1994

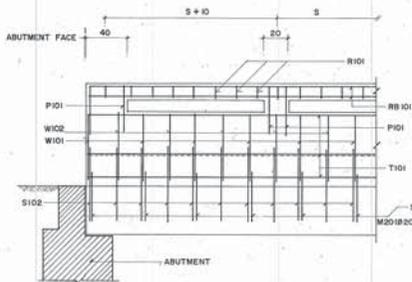
SUBMITTED : *P. Barry* SCALE AS SHOWN
(DIRECTOR OF LOCATION & DESIGN DIVISION)

APPROVED : *Subo* DWG. NO. S2/22
FOR (DIRECTOR GENERAL)

SHEET NO. 179

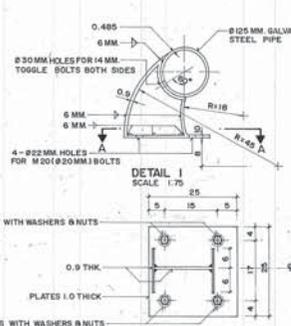


TRANSVERSE SECTION

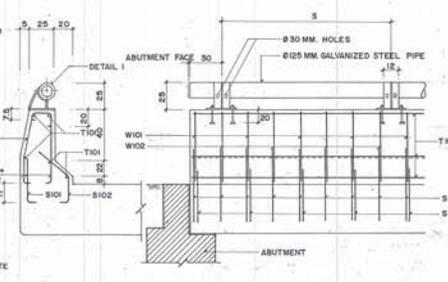


LONGITUDINAL SECTION

TYPE 1 TRAFFIC RAILING
SCALE 1:25

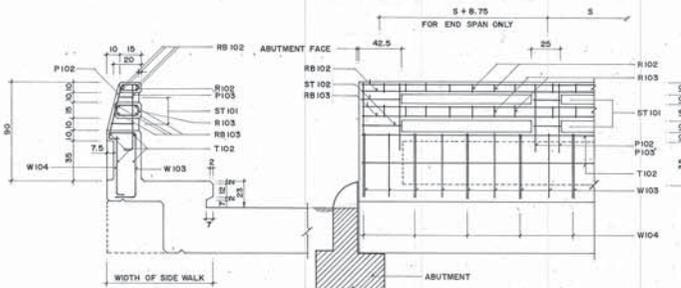


DETAIL 1
SCALE 1:7.5



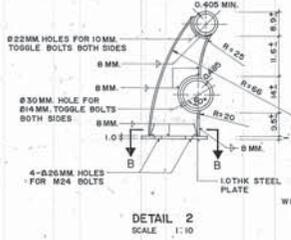
TRANSVERSE SECTION LONGITUDINAL SECTION

TYPE 2 TRAFFIC RAILING
SCALE 1:25

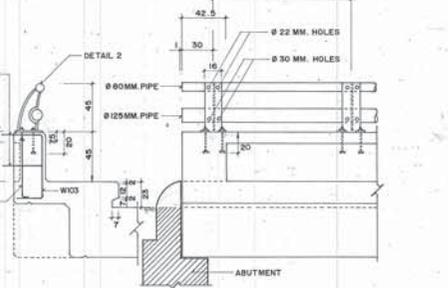


TRANSVERSE SECTION LONGITUDINAL SECTION

TYPE 3 COMBINATION RAILING
SCALE 1:25

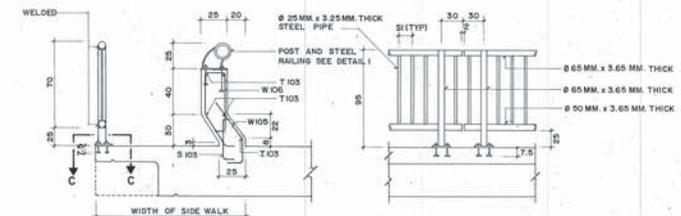


DETAIL 2
SCALE 1:10

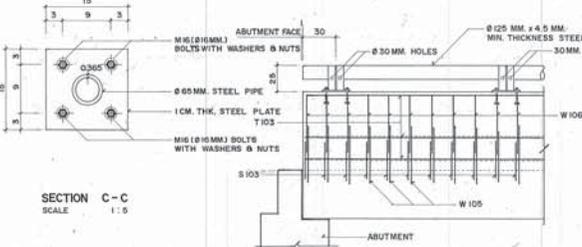


TRANSVERSE SECTION LONGITUDINAL SECTION

TYPE 4 COMBINATION RAILING
SCALE 1:25

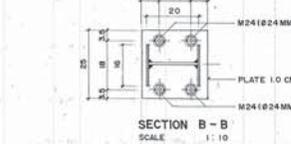


TRANSVERSE SECTION PEDESTRIAN RAILING EXPANSION JOINT
SCALE

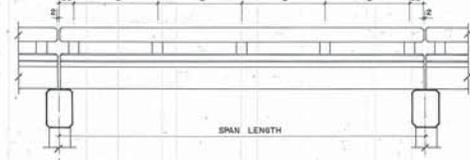


LONGITUDINAL SECTION

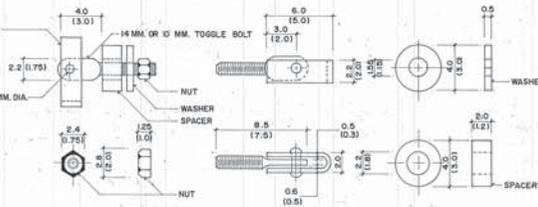
TYPE 5 TRAFFIC CURB AND PEDESTRIAN RAILING
SCALE 1:25



SECTION B-B
SCALE 1:10



TYPICAL RAILING POST SPACING
SCALE 1:50



14 MM x 10 MM TOGGLE BOLT AND TOGGLE
SCALE

TABLE OF RAILING REINFORCEMENT												
TYPE	TYPE OF RAILING	BAR BENDING DIAGRAMS			TYPE OF RAILING	BAR BENDING DIAGRAMS			TYPE OF RAILING	BAR BENDING DIAGRAMS		
		MARK	#	NO. L		MARK	#	NO. L		MARK	#	NO. L
1	TRAFFIC	48	17	4	COMBINATION	22	2	4	TRAFFIC AND PEDESTRIAN	74	10	3
		51	10	20		60	10	20		103	5	20
		52	10	20		60	10	20		103	5	20
		53	10	20		60	10	20		103	5	20
2	AND TRAFFIC	48	17	4	COMBINATION	22	2	4	TRAFFIC AND PEDESTRIAN	74	10	3
		51	10	20		60	10	20		103	5	20
		52	10	20		60	10	20		103	5	20
		53	10	20		60	10	20		103	5	20
3	COMBINATION	48	17	4	COMBINATION	22	2	4	TRAFFIC AND PEDESTRIAN	74	10	3
		51	10	20		60	10	20		103	5	20
		52	10	20		60	10	20		103	5	20
		53	10	20		60	10	20		103	5	20

TABLE OF RAILING POST SPACING											
SPACING, S (M)	5.00	6.00	7.00	8.00	9.00	10.00	15.00	20.00	25.00	29.97	
SPACING, S1 (M)	1.46	1.80	1.60	1.85	1.68	1.68	1.82	1.96	1.96		
SPACING, S2 (M)	0.1460	0.1500	0.1451	0.1540	0.1529	0.1568	0.1517	0.1509	0.1541		

- NOTES:**
- SCOPES OF APPLICATION OF RAILING ARE AS FOLLOWS -
 TYPE 1, FOR SHORT BRIDGES OR BRIDGES WITHOUT SIDE WALK IN GENERAL.
 TYPE 2, FOR BRIDGES WITHOUT SIDEWALK WHICH HAVE A TOTAL LENGTH OF MORE THAN 80.0M OR FOR BRIDGES IN URBAN AREA OR WHEN STEEL RAILINGS ARE REQUIRED FOR AESTHETIC PURPOSES IT SHALL BE SHOWN ON THE DRAWINGS BY THE ENGINEER.
 TYPE 3, FOR BRIDGES WITH 50 M SIDEWALKS OR WIDER IN GENERAL.
 TYPE 4, FOR BRIDGES WITH 50 M SIDEWALKS OR WIDER AND HAVING A TOTAL LENGTH OF MORE THAN 80.0M OR WHEN STEEL RAILINGS ARE REQUIRED FOR AESTHETIC PURPOSES IT SHALL BE SHOWN ON THE DRAWING BY THE ENGINEER.
 TYPE 5, FOR BRIDGES WITH HEAVY TRAFFIC AND DENSE PEDESTRIAN IN ORDER TO SEPARATE THE VEHICLES FROM PEDESTRIAN FOR THE SAKE OF SAFETY IT SHALL BE SHOWN ON THE DRAWINGS BY THE ENGINEER.
 - ANY SPECIAL RAILINGS, IF DIFFERENT FROM THE ABOVE-MENTIONED MAY BE USED UNDER THE APPROVAL OF THE ENGINEER.
 - DESIGN STRESSES:
 CONCRETE $f_c = 20 \text{ KG/CM}^2$
 REBAR $f_s = 1200 \text{ KG/CM}^2$ FOR PLAIN BARS.
 $f_s = 1400 \text{ KG/CM}^2$ FOR DEFORMED BARS.
 - CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM 28-DAYS COMPRESSIVE STRENGTH OF 210 KG/CM² CEMENT SHALL BE THIS IS TYPE 1 PORTLAND CEMENT UNLESS SALINE PROTECTION IS SPECIFIED WHEN TYPE 5 PORTLAND CEMENT SHALL BE USED INSTEAD.
 - REBAR # 4 OR LARGER SHALL BE TIS 24 GRADE S030 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - CLEAR CONCRETE COVER SHALL BE 2.5 CM.
 - ALL EXPOSED CORNERS SHALL HAVE 2 CM. CHAMFERS UNLESS OTHERWISE INDICATED.
 - RAILING POST SPACINGS FOR ALL TYPES OF RAILING ARE AS SHOWN IN THE TABLE ABOVE.
 IN SOME CASE, TRAFFIC RAILING TYPE 1 MAY BE SUBSTITUTED BY GUARD RAILS FASTENED ON CONCRETE RAILING POSTS IF APPROVED BY THE ENGINEER.
 - DIAMETERS OF GALVANIZED STEEL PIPES SHOWN ARE NOMINAL DIAMETERS.
 - ALL STRUCTURAL STEEL FOR RAILING POSTS, RAILINGS AND ALL ACCESSORIES SHALL BE GALVANIZED WITH MINIMUM OF 376 G/M² (1.25 OUNCE/FT²) THE FABRICATOR SHALL SUBMIT THE SAMPLES FOR TESTING AS FOLLOWS:

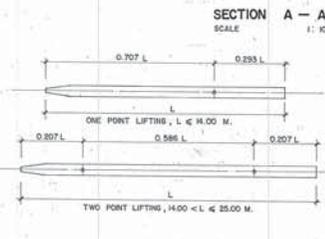
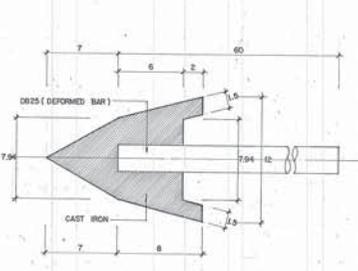
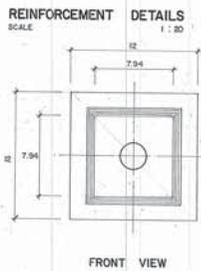
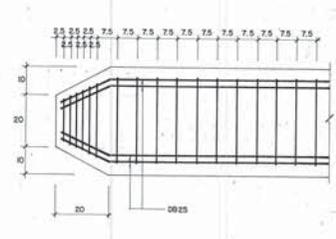
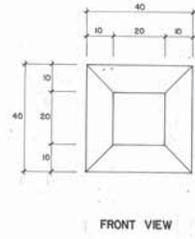
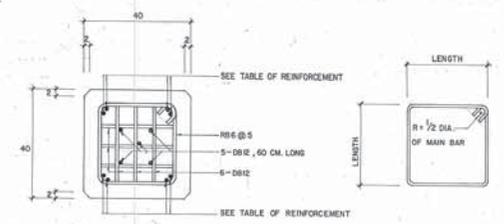
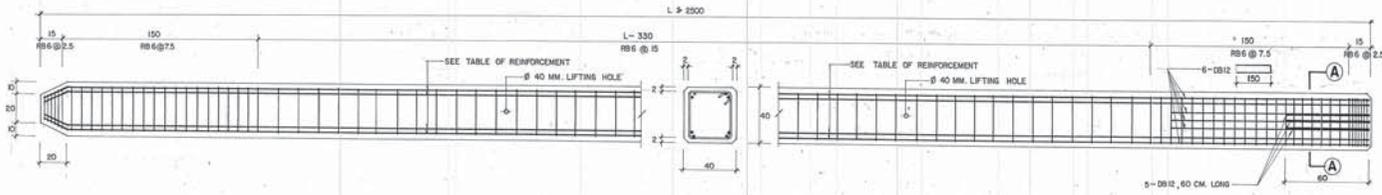
QUANTITY OF PRODUCT	NUMBER OF SAMPLES
LESS THAN 500	2
500 - 820	3
820 - 1,200	4
1,200 - 1,600	5
1,600 - 2,000	6
 - AT RAILING JOINT, A PIECE OF PIPE PROGRAM LONG HAVING AN OUTER DIAMETER SLIGHTLY SMALLER THAN THE INNER DIAMETER OF THE RAILING PIPES SHALL BE INSERTED AND FASTENED TO BOTH RAILING PIPES BY 2-#10MM SET SCREWS AT 0.5M FROM EACH SIDE OF THE JOINT.
 - EXPANSION JOINTS SHALL BE PROVIDED FOR STEEL PIPE RAILING AT THE INTERVAL NOT MORE THAN 15.0M. BOTH ENDS OF THE RAILING PIPES SHALL BE CLOSED BY WELDING TO THE PIPES A CIRCULAR PLATE HAVING THE SAME SIZE AND THICKNESS OF THE PIPE.
 - QUANTITIES OF REBAR SHOWN ARE FOR RAILING AND POSTS ONLY QUANTITIES OF REBAR IN SIDEWALKS AND CURBS ARE SHOWN ON SLAB BRIDGE DRAWINGS IN CONSTRUCTION OF BRIDGE DECK AND SIDEWALKS. SOWELS FOR RAILING POST SHALL BE PROVIDED IN ACCORDANCE WITH THIS DRAWING.
 - WELDED JOINTS OF PEDESTRIAN RAILING POSTS SHALL BE PAINTED BY 2 LAYERS OF ALUMINUM PAINT
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - PAINTING AT THE END FACES OF RAILING POSTS AND SIDEWALKS WHICH EXPOSED TO TRAFFIC (IF ANY) SHALL BE PROVIDED BY APPLYING ALTERNATE STRIPES OF BLACK AND WHITE COLOUR OF 10 CM. WIDE EACH AND 45 TO THE HORIZONTAL PLANE. WHITE PAINT SHALL BE LIGHT REFLECTED ONE DETAILS OF THE PAINTING ARE SHOWN ON DWG NO. ST-01 OR ST-26.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3A05-106-14/26.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

RAILING POST AND RAILING DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i>	(DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED: <i>[Signature]</i>	(DIRECTOR GENERAL)	DWG. NO. MS-01
		SHEET NO. 1B1



LENGTH OF PILE (L)	REINFORCEMENT
NOT MORE THAN 10 M.	4-#28 MM. OR 8-#20 MM.
MORE THAN 10.00 M., BUT NOT MORE THAN 25.00 M.	8-#25 MM.

PILE TIP TYPE A
SCALE 1:10

PILE TIP TYPE B
SCALE 1:2.5

PILE LIFTING LOCATIONS
SCALE

TABLE OF APPROXIMATE ULTIMATE CAPACITY (R) 40x40 CM. PILE IN TONS DRIVEN BY DROP HAMMER WITH FRICTION WINCH, HAMMER WEIGHT (W) OF 3.5, 4.0 AND 4.5 TONS, DROP HEIGHT (h) OF 100, 120 AND 150 CM. WITH APPROPRIATE CUSHION OF 5 CM. THICK ON THE TOP OF PILE HEAD, IN ACCORDANCE WITH AVERAGE PILE PENETRATION (S) FOR THE LAST FIVE BLOWS.

LENGTH OF PILE (L) M.	APPROX. WEIGHT OF PILE (P) TONS	3.5-TON DROP HAMMER (W) WITH FRICTION WINCH																		4.0-TON DROP HAMMER (W) WITH FRICTION WINCH																		4.5-TON DROP HAMMER (W) WITH FRICTION WINCH																	
		PENETRATION (S) - CM.																		PENETRATION (S) - CM.																		PENETRATION (S) - CM.																	
		1.5	1.0	0.7	0.5	0.4	0.3	0.2	0.1	0.05	1.5	1.0	0.7	0.5	0.4	0.3	0.2	0.1	0.05	1.5	1.0	0.7	0.5	0.4	0.3	0.2	0.1	0.05																											
		HAMMER DROP HEIGHT (H) - CM.																		HAMMER DROP HEIGHT (H) - CM.																		HAMMER DROP HEIGHT (H) - CM.																	
		100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150	100	120	150																		
6	2.304	85	99	120	108	128	148	127	146	171	143	162	188	152	172	198	162	182	209	173	193	230	184	204	232	190	210	238	199	219	256	200	220	248	212	232	260																		
7	2.688	80	94	115	102	118	141	121	138	162	136	154	179	145	163	189	154	173	199	163	183	209	175	195	221	181	200	227	194	214	240	198	218	244	202	222	250																		
8	3.072	75	89	108	97	113	134	115	132	154	130	147	171	139	156	180	147	165	190	157	175	200	168	186	211	173	192	217	190	210	235	192	212	237	194	214	240																		
9	3.456	73	85	103	93	107	128	110	126	148	124	141	163	132	149	172	141	158	181	150	168	191	160	178	202	162	181	206	192	212	237	194	214	239	196	216	241																		
10	3.840	69	81	98	89	103	122	105	120	141	119	135	157	127	143	165	135	151	174	144	161	184	154	171	194	159	178	199	194	214	239	196	216	241	198	218	243																		
11	4.224	66	78	94	85	99	117	101	116	136	114	129	150	122	137	159	130	146	167	138	155	177	148	164	186	153	169	192	196	216	241	198	218	243	199	219	244																		
12	4.608	64	75	90	82	95	113	97	111	131	110	124	145	117	132	153	125	140	161	133	149	170	143	158	180	147	163	185	198	218	243	199	219	244	200	220	245																		
13	4.992	61	72	87	79	91	109	94	107	126	106	120	140	113	127	147	120	135	155	129	144	164	136	151	173	142	158	178	200	220	245	201	221	246	202	222	247																		
14	5.376	59	69	84	76	88	105	90	103	121	102	116	135	109	123	142	116	131	150	124	139	159	133	148	168	138	154	172	202	222	247	202	222	247	203	223	248																		
15	5.760	57	67	81	73	85	101	87	100	117	99	112	130	105	119	137	112	126	145	120	134	153	129	143	162	133	147	167	203	223	248	203	223	248	204	224	249																		
16	6.144	55	65	79	71	82	98	84	97	114	96	108	126	102	115	133	109	122	141	116	130	149	125	138	157	129	143	162	204	224	249	204	224	249	205	225	250																		
17	6.528	53	63	76	69	80	95	82	94	110	93	105	122	99	112	129	106	119	136	113	126	144	121	134	152	125	139	157	205	225	250	205	225	250	206	226	251																		
18	6.912	52	61	73	67	77	92	79	91	107	90	102	119	96	108	125	102	115	132	110	123	140	117	130	148	122	135	152	206	226	251	206	226	251	207	227	252																		
19	7.296	50	59	71	65	75	89	77	88	104	87	99	115	93	105	122	100	112	129	107	119	136	114	127	144	118	131	148	207	227	252	207	227	252	208	228	253																		
20	7.680	49	57	69	63	73	87	75	86	101	85	96	112	91	102	118	97	109	125	104	116	132	111	123	140	115	127	144	208	228	253	208	228	253	209	229	254																		
21	8.064	47	55	67	61	71	85	73	84	98	83	94	109	88	100	115	94	106	122	101	113	129	108	120	137	112	124	140	209	229	254	209	229	254	210	230	255																		
22	8.448	46	54	66	60	69	82	71	81	96	81	91	106	86	97	112	92	103	119	98	110	126	105	117	133	109	121	137	210	230	255	210	230	255	211	231	256																		

NOTES :

- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG./M³ AND A MINIMUM 28-DAY 0.15 M.-CURE STRENGTH OF 300 KG./CM². CEMENT SHALL BE TYPE I PORTLAND CEMENT. A SUGGESTED APPROXIMATE MIX DESIGN PER CUBIC METER IS AS FOLLOWS.

PORTLAND CEMENT	350	KG.
SAND	0.43	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE, SLIMP, MAX.	10	CM.
- REBAR #12 MM. OR LARGER SHALL BE TIS 24 GRADE 5030 DEFORMED BAR, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SPECIFICATIONS SHALL BE USED, INSTEAD OF PORTLAND CEMENT TYPE I.
- CLEAR CONCRETE COVER SHALL BE 5 CM.
- WEIGHT OF DROP HAMMER SHALL NOT BE LESS THAN HALF THE WEIGHT OF THE PILE, NOT BE LESS THAN 3.5 TONS.
- FOLLOWER SHALL NOT BE USED UNLESS IT IS NECESSARY AND AN APPROVAL OF THE ENGINEER IS GIVEN IN SUCH CASES, ITEM 7 BELOW SHALL BE FOLLOWED.
- PILE LOAD TESTS MAY BE NEEDED UNDER THE JUDGMENT OF THE ENGINEER, TESTING PROCEDURE AND CRITERIA SHALL BE ACCORDANCE WITH THE DGH SPECIFICATIONS.
- SHOP DRAWING SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL FOR PILES LONGER THAN OR DIFFER FROM THOSE SHOWN ON THIS DRAWING.

- TYPE A OR TYPE B PILE TIPS SHALL BE USED UNDER THE APPROVAL OF THE ENGINEER.
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- ALL PILE ULTIMATE CAPACITIES SHOWN IN THIS DRAWING ARE DERIVED FROM HILEY'S FORMULA.

$$R = \frac{W \cdot H \cdot E}{S + C}$$
 WHERE R, W, H AND S ARE AS STATED IN THE TABLES.
 - W = EFFICIENCY FACTOR = $\frac{W + P}{W + P}$
 - P = WEIGHT OF THE PILE IN TONS.
 - E = COEFFICIENT OF PILE HEAD AND CUSHION.
 - S = 0.25 FOR CONCRETE PILE WITH JUTE MAT HEAD CUSHION.
 - E = EQUIPMENT LOSS FACTOR = 0.75
 - C = TEMPORARY COMPRESSION = $C_1 + C_2 + C_3$
 - C₁ = PILE SHORTENING FOR PILE LENGTH OF L(M) = $\frac{W \cdot L}{A \cdot E}$ CM.
 - C₂ = COMPRESSION IN PILE HEAD CUSHION = $0.018 \frac{W}{A}$ CM.
 - C₃ = COMPRESSION IN THE SOIL UNDERNEATH AND SURROUNDING THE PILE = 0.25 CM.
 - A = GROSS SECTIONAL AREA OF PILE IN CM²
 - E = MODULUS OF ELASTICITY OF CONCRETE 250,500 KG./CM²
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 3R/1

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

0.40 x 0.40 M. RC. PILE
 PILE CAPACITY AND REINFORCEMENT DETAILS

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN	
APPROVED: <i>[Signature]</i> P.C. (DIRECTOR GENERAL)	DWG. NO. MS-02	
SHEET NO. 182		

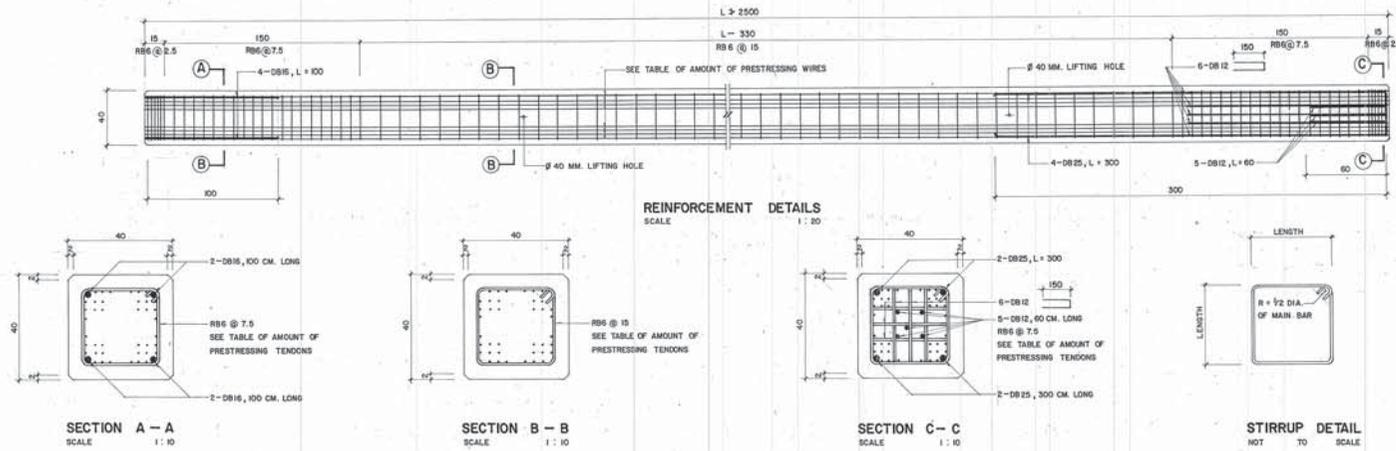


TABLE OF AMOUNT PRESTRESSING TENDONS

PRESTRESSING WIRES Ø 5 MM.	PRESTRESSING WIRES Ø 7 MM.	PRESTRESSING WIRES Ø 9.53 MM. (3/8")
40	24	16

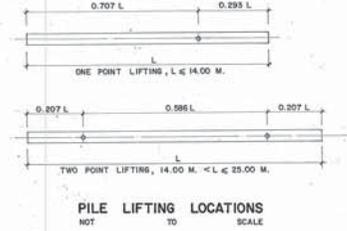
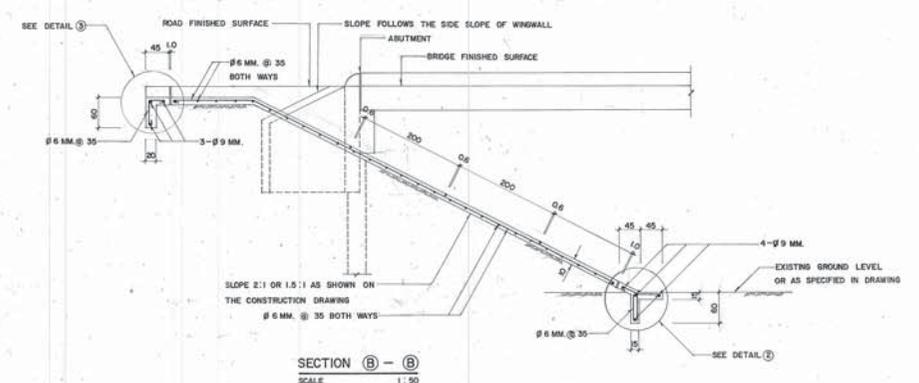
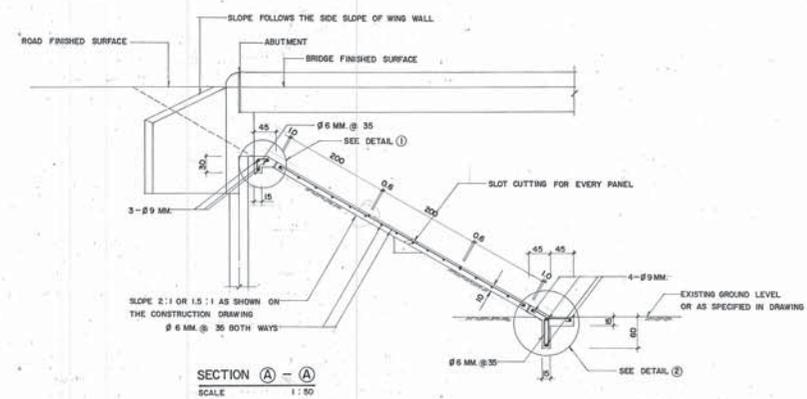
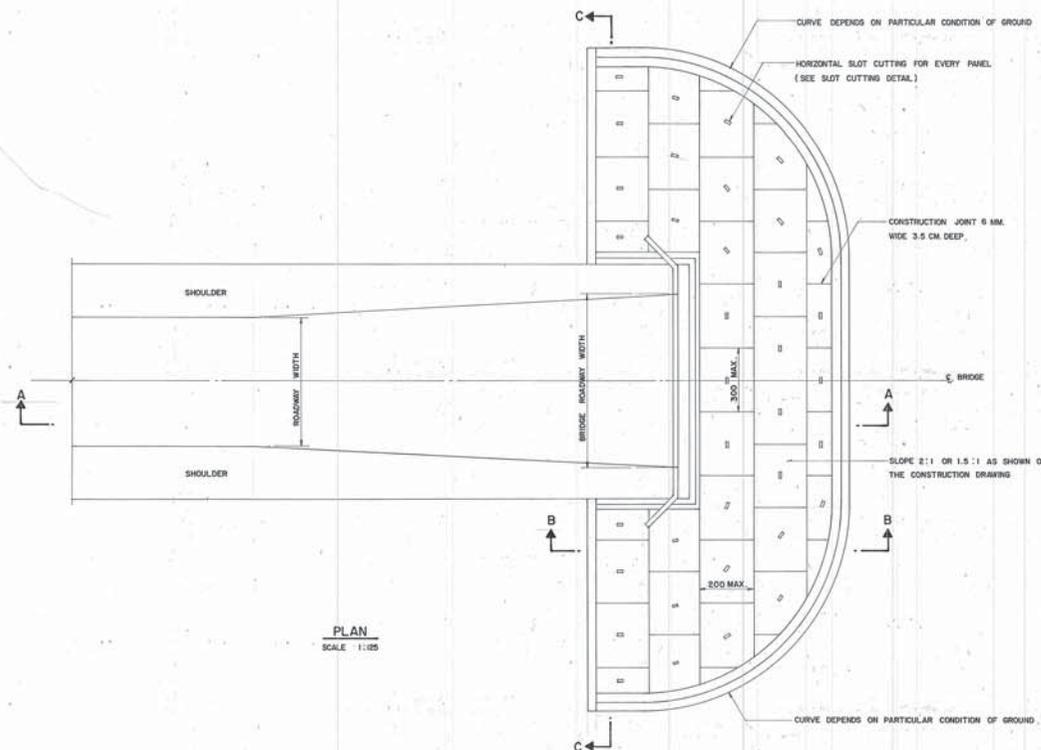
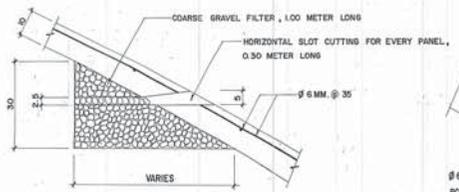
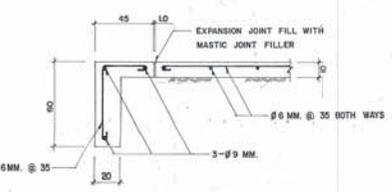
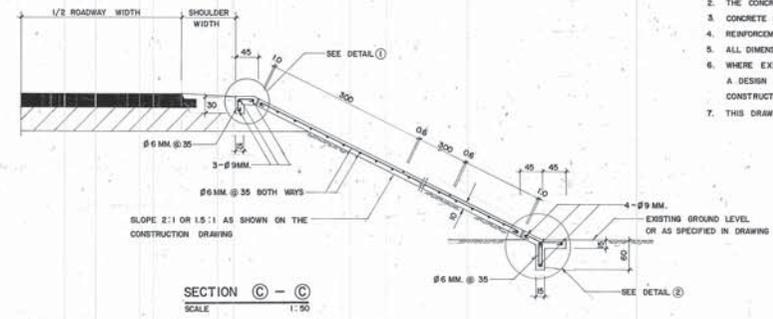
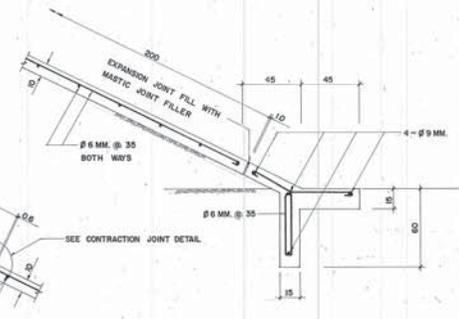
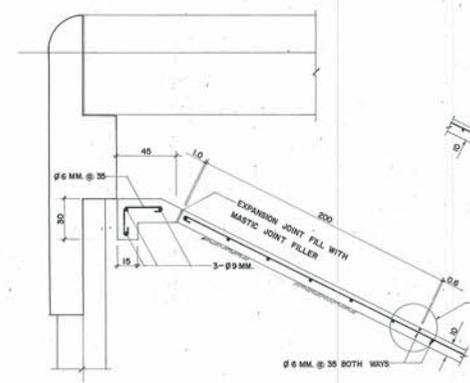


TABLE OF APPROXIMATE ULTIMATE CAPACITY (R) 40x40 CM. PILE IN TONS DRIVEN BY DROP HAMMER WITH FRICITION WINCH, HAMMER WEIGHT (W) OF 3.5, 4.0 AND 4.5 TONS, DROP HEIGHT (h) OF 100, 120 AND 150 CM. WITH APPROPRIATE CUSHION OF 5 CM. THICK ON THE TOP OF PILE HEAD, IN ACCORDANCE WITH AVERAGE PILE PENETRATION (S) FOR THE LAST FIVE BLOWS.

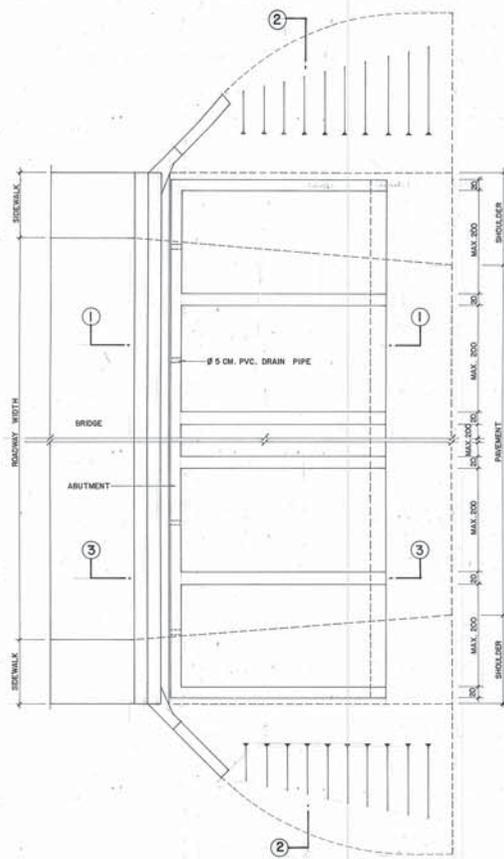
LENGTH OF PILE (L) M.	APPROX. WEIGHT OF PILE (P) TONS	3.5-TON DROP HAMMER (W) WITH FRICITION WINCH																		4.0-TON DROP HAMMER (W) WITH FRICITION WINCH																		4.5-TON DROP HAMMER (W) WITH FRICITION WINCH																																															
		PENETRATION (S) - CM.																		PENETRATION (S) - CM.																		PENETRATION (S) - CM.																																															
		HAMMER DROP HEIGHT (H) - CM.																		HAMMER DROP HEIGHT (H) - CM.																		HAMMER DROP HEIGHT (H) - CM.																																															
		1.5	1.0	0.7	0.5	0.4	0.3	0.2	0.1	0.05	1.5	1.0	0.7	0.5	0.4	0.3	0.2	0.1	0.05	1.5	1.0	0.7	0.5	0.4	0.3	0.2	0.1	0.05																																																									
6	2.304	85	99	120	108	125	148	127	146	171	143	162	188	152	172	198	162	182	209	173	193	220	184	204	232	190	210	238	99	115	139	125	143	170	145	166	193	162	183	212	171	193	222	182	203	233	192	214	244	204	226	256	200	231	262	113	131	157	140	161	190	162	184	215	180	203	234	190	213	244	200	223	255	211	235	267	223	247	279	229	253	285			
7	2.688	80	94	113	102	118	141	121	138	162	136	154	179	145	163	189	154	173	199	164	183	209	175	190	221	181	200	227	94	110	132	118	136	161	138	158	184	154	175	202	163	184	212	173	194	222	184	205	233	195	216	245	201	221	251	107	125	150	134	154	181	155	176	205	176	194	224	181	203	234	191	214	244	202	224	255	213	236	267	219	242	273			
8	3.072	76	89	108	97	113	134	115	132	154	130	147	171	138	156	180	147	165	190	147	165	190	157	175	200	168	186	211	173	192	217	82	96	115	104	119	141	121	138	162	136	153	178	144	162	187	153	171	196	162	180	206	172	191	216	177	196	221	94	110	132	118	136	161	138	158	184	154	175	202	163	184	212	173	194	222	184	205	233	195	216	245	201	221	251
9	3.456	73	85	103	93	107	128	110	126	148	124	141	163	132	149	172	141	158	181	150	168	191	160	178	202	166	184	208	79	92	111	100	115	136	117	133	156	131	146	171	136	156	179	147	164	188	156	174	198	166	184	208	171	189	213	88	102	122	110	126	149	127	145	169	141	159	184	149	167	193	157	176	201	168	189	211	180	201	223	181	200	226			
10	3.840	69	81	98	89	103	122	105	120	141	119	135	157	127	143	165	135	151	174	144	161	184	154	171	194	159	176	199	77	89	106	96	111	130	112	127	149	123	138	161	127	146	168	135	153	176	144	162	185	154	172	195	167	184	207	86	98	116	105	121	143	122	139	162	134	151	174	138	156	179	147	164	188	156	174	198	166	184	208	171	189	213			
11	4.224	66	78	94	85	99	117	100	116	136	114	129	150	122	137	159	130	146	167	138	155	177	148	164	186	153	169	192	73	85	103	92	107	126	108	124	145	121	137	159	129	145	167	137	153	175	145	162	184	154	171	194	159	176	199	80	92	110	100	115	134	113	128	150	126	142	165	133	150	173	141	159	182	150	168	191	160	177	201	165	182	206			
12	4.608	64	75	90	82	96	113	97	111	131	110	124	145	117	132	153	125	140	161	133	149	170	143	159	180	147	163	185	70	81	98	88	103	121	103	119	140	116	132	154	124	140	162	132	148	170	140	156	178	149	166	188	154	170	192	77	89	106	96	111	130	112	127	149	123	138	161	127	146	168	135	153	176	144	162	185	154	172	195	167	184	207			
13	4.992	61	72	87	79	91	109	94	107	126	106	120	140	113	127	147	120	135	155	123	144	164	138	153	173	142	158	178	68	79	96	86	100	118	101	116	135	114	128	149	120	136	156	128	143	164	136	152	173	145	160	182	149	165	186	74	87	104	94	109	127	109	124	145	121	137	159	129	145	167	137	153	175	145	162	184	154	171	194	159	176	199			
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16	6.144	55	65	78	71	82	98	84	97	114	96	108	126	102	115	133	109	122	141	116	130	149	125	138	157	129	143	162	62	73	87	81	94	111	95	109	127	107	123	141	111	126	144	112	138	155	124	139	158	132	147	166	131	147	166	66	77	93	84	96	114	98	112	131	110	125	144	111	126	145	116	130	149	125	138	157	129	143	162						
17	6.528	53	63	76	69	80	95	82	94	110	93	105	122	99	112	129	106	119	136	113	126	144	121	134	152	125	139	157	60	71	85	80	91	108	92	106	124	104	117	136	110	124	143	117	131	150	124	139	158	132	147	166	131	147	166	64	75	90	81	94	111	95	109	127	107	123	141	111	126	144	112	138	155	124	139	158	132	147	166	131	147	166			
18	6.912	52	61	73	67	77	92	79	91	107	90	102	119	96	108	125	102	115	132	110	123	140	117	130	148	118	131	148	58	68	82	76	86	102	87	100	117	98	111	129	104	117	135	111	124	142	118	131	150	125	139	158	129	143	162	60	71	85	80	91	108	92	106	124	104	117	136	110	124	143	117	131	150	124	139	158	132	147	166	131	147	166			
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21	8.064	47	56	67	61	71	85	73	84	98	83	94	109	88	100	115	94	106	122	101	113	129	108	120	137	112	124	140	52	61	74	69	78	91	81	93	109	92	104	120	99	111	127	100	112	128	106	118	134	151	167	186	54	63	76	71	80	94	84	96	113	94	106	122	101	114	132	108	121	135	153	128	142	161	135	150	168	131	147	166					
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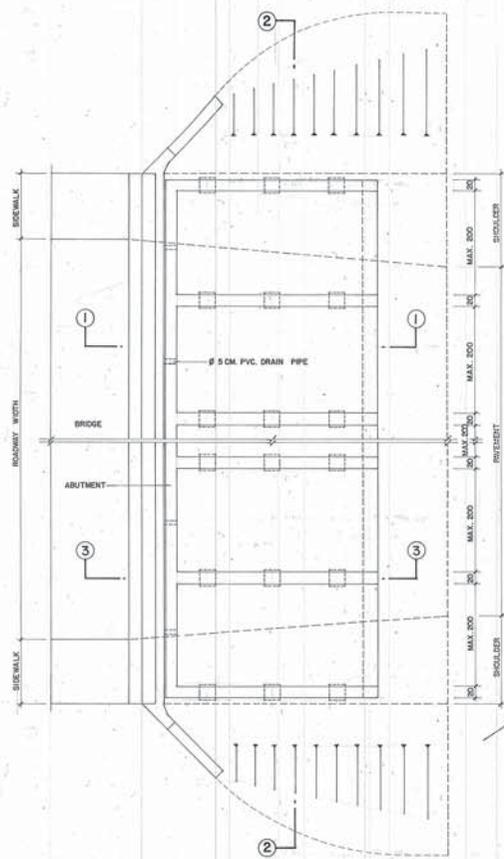
- NOTES :
1. BEFORE POURING THE CONCRETE SLAB, THE EXISTING SLOPE SHALL BE WELL PREPARED AND COMPACTED TO MEET THE SIDE SLOPES OF THE ROADBED.
 2. THE CONCRETE SLAB SHALL BE 10 CM THICK.
 3. THE CONCRETE SHALL BE CLASS "C".
 4. REINFORCEMENT SHALL CONFORM TO THE TIS 20 GRADE SR 24.
 5. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 6. WHERE EXISTING SOIL CONDITIONS ARE POOR OR WHERE ROADBED IS VERY HIGH, A DESIGN MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
 7. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 52/10-19.



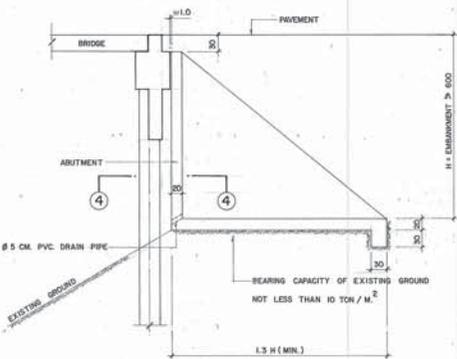
KINGDOM OF THAILAND MINISTRY OF TRANSPORT AND COMMUNICATIONS DEPARTMENT OF HIGHWAYS		
STANDARD DRAWING		
CONCRETE SLOPE PROTECTION		
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>Kajal</i>	DATE JULY 1994
SUBMITTED :	<i>P. Bumpay</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>S. S. S.</i> (DIRECTOR GENERAL)	DWG. NO. MS - 04
		SHEET NO. 184



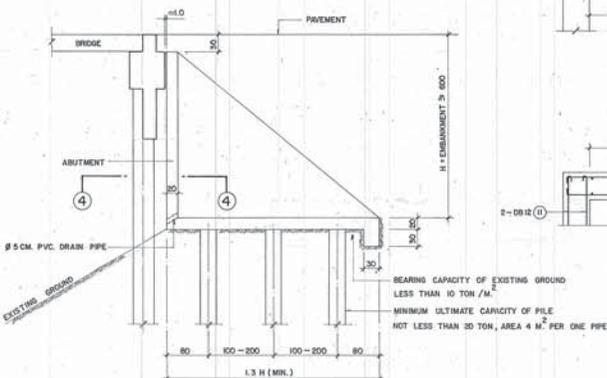
PLAN, ABUTMENT PROTECTOR TYPE A
SCALE 1:50



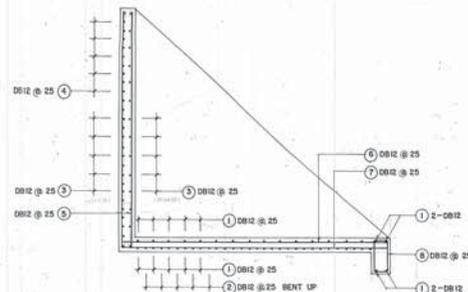
PLAN, ABUTMENT PROTECTOR TYPE B
SCALE 1:50



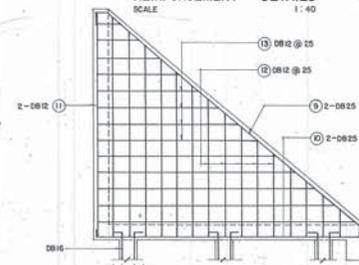
SECTION 1-1
SCALE 1:50



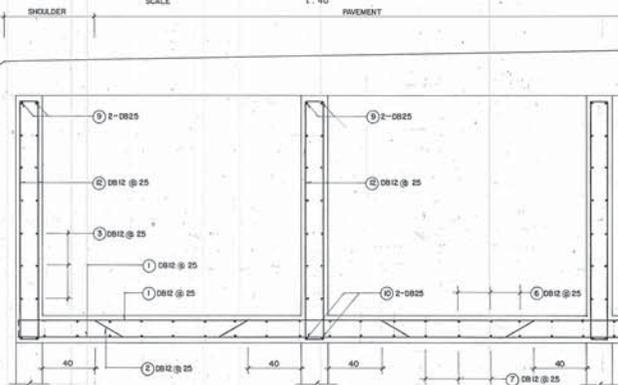
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SCALE 1:50



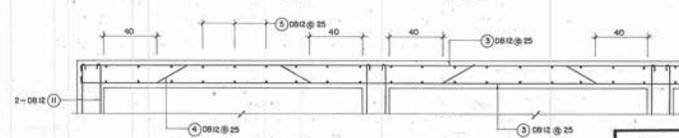
SECTION 1-1
REINFORCEMENT DETAILS
SCALE 1:40



SECTION 1-1
REINFORCEMENT DETAILS
SCALE 1:40



SECTION 2-2
REINFORCEMENT DETAILS
SCALE 1:20



SECTION 4-4
REINFORCEMENT DETAILS
SCALE 1:20

TABLE OF REINFORCEMENT

BAR MARK	BAR DIA. (MM.)	BAR BENDING DIAGRAMS
1	DB12	10
2	DB12	10
3	DB12	10
4	DB12	10
5	DB12	10
6	DB12	10
7	DB12	10
8	DB12	10
9	DB25	10
10	DB25	10
11	DB12	10
12	DB12	10
13	DB12	10

NOTES :

- DEPTH OF FILL SHALL NOT EXCEED 0.60 M.
- ALL EXPOSED CORNERS SHALL HAVE 1 CM. CHAMFER UNLESS OTHERWISE INDICATED.
- REBARS ϕ 12 MM. OR LARGER SHALL BE TIS 24 GRADE S030 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE SR24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- CONCRETE SHALL HAVE A MINIMUM CEMENT CONTENT OF 350 KG/M³ AND A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KG/CM² FOR .15 x .15 x .15 M. CUBE AT 28 DAYS. CEMENT SHALL BE TIS TYPE I PORTLAND CEMENT AND MAXIMUM SLUMP OF 10 CM.
- CLEAR CONCRETE COVER SHALL BE 5 CM.
- IF THE DISTANCE BETWEEN PILES IS LESS THAN 100 CM., ONE ROW OF PILES SHALL BE REDUCED. SIMILARLY, IF THE DISTANCE BETWEEN PILES IS MORE THAN 200 CM., ONE ADDITIONAL ROW OF PILES SHALL BE INTRODUCED.
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- DB IS THE DIAMETER OF BARS IN MILLIMETERS.
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. AP-2.

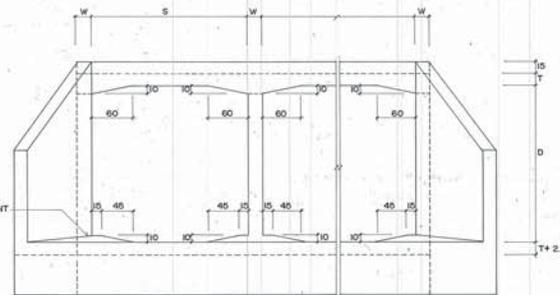
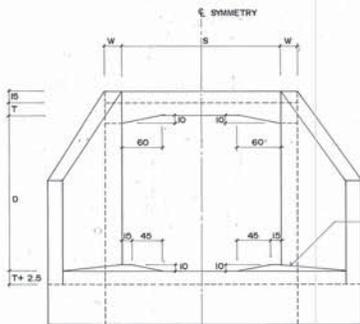
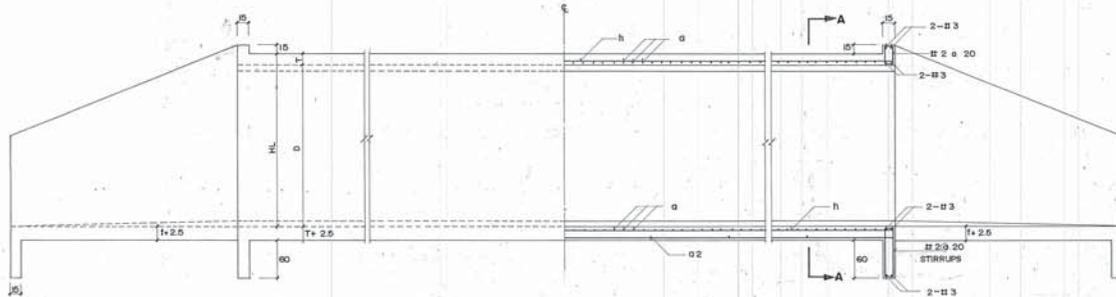
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING

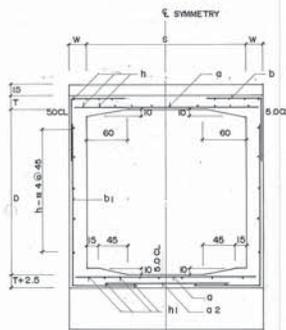
ABUTMENT PROTECTOR FOR EMBANKMENT \geq 6.00 M.

PLAN, ELEVATION AND SECTIONS

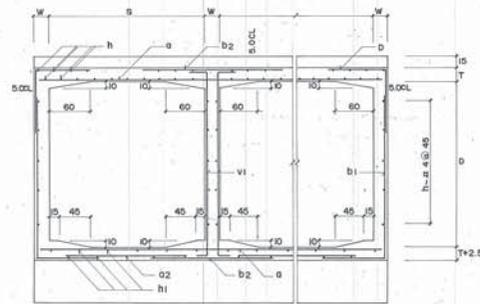
DESIGNED : DOH & CONSULTANTS	CHECKED <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> FOR DIRECTOR GENERAL	DWG. NO. MS-11
		SHEET NO. 185



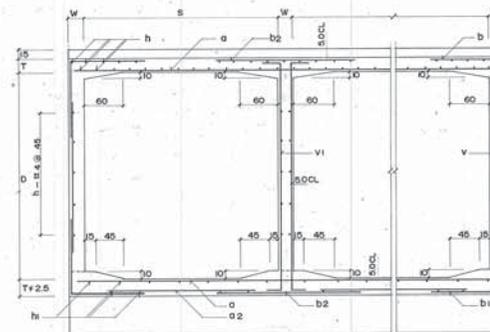
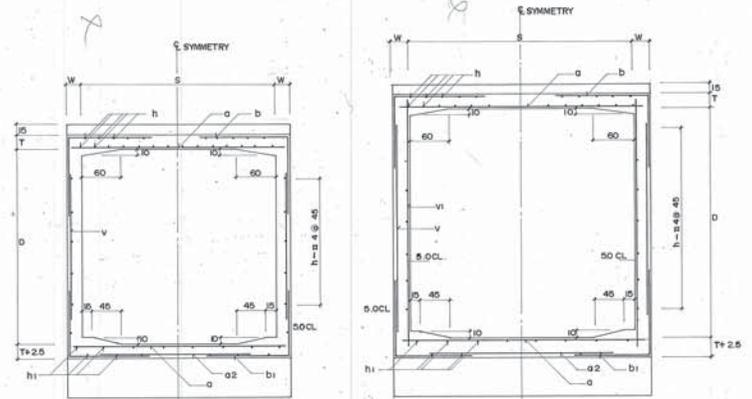
TRANSVERSE ELEVATION
SCALE 1:40



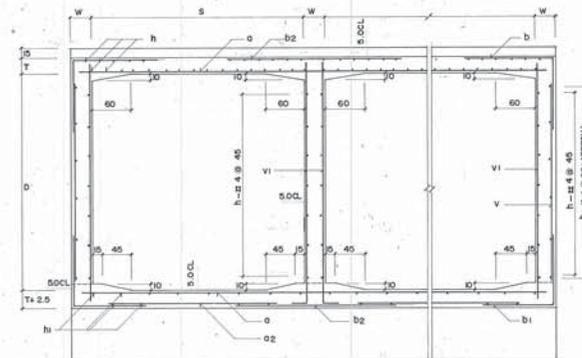
SECTION A - A
SCALE 1:40



MULTIPLE BOXES TYPE A
(FOR D ≤ 245 CM. AND W < 30 CM.)



MULTIPLE BOXES TYPE B
(FOR D > 245 CM. AND W < 30 CM.)



MULTIPLE BOXES TYPE C
(FOR D > 245 CM. AND W ≥ 30 CM.)

NOTES:

1. FOR GENERAL NOTES NOT MENTIONED IN THIS DRAWING SEE DWG. NO. BC-02
2. CLEAR CONCRETE COVER SHALL BE 80 CM EXCEPT THE BOTTOM OF BOTTOM SLABS OR WALL WHERE CLEAR COVER OF 7.5 CM SHALL BE PROVIDED
3. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
4. WORK THIS DRAWING WITH DWG. NOS. BC-02, BC-04
5. THIS DRAWING IS ADAPTED FROM DOH DRAWING NO. 78/7
6. THIS DRAWING SHALL BE USED FOR NEW CONSTRUCTION OF R.C. BOX CULVERT.

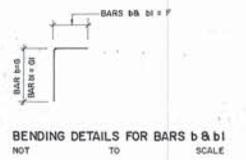
KINGDOM OF THAILAND			
MINISTRY OF TRANSPORT AND COMMUNICATIONS			
DEPARTMENT OF HIGHWAYS			
STANDARD DRAWING			
RIGID FRAME R.C. BOX CULVERT			
PLAN ELEVATIONS AND SECTIONS			
DESIGNED: DOH & CONSULTANT	CHECKED: <i>Kep</i>	DATE JULY 1994	
SUBMITTED: <i>P. Buranapong</i>	(DIRECTOR OF LOCATION & DESIGN DIVISION)		SCALE AS SHOWN
APPROVED: <i>[Signature]</i>	(DIRECTOR GENERAL)		DWG. NO. BC-01
			SHEET NO. 186

S	D	CLEAR SPAN	FILL HEIGHT	T	W	BAR MARK g		BAR MARK o2		BAR MARK db1		BAR MARK b		BAR MARK h		BAR MARK v		BAR MARK vi		BAR MARK b2			
						#	CM	#	CM	#	CM	#	CM	#	CM	#	CM	#	CM	#	CM	#	CM
0-30	24	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
3-60	24	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
61-150	20	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
151-225	20	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
226-300	21	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
301-375	22.5	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
376-450	24	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
451-600	27.5	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
601-750	31	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
751-900	35	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
901-1050	39	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
1051-1200	42	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
1201-1500	46	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195

S	D	CLEAR SPAN	FILL HEIGHT	T	W	BAR MARK g		BAR MARK o2		BAR MARK db1		BAR MARK b		BAR MARK h		BAR MARK v		BAR MARK vi		BAR MARK b2			
						#	CM	#	CM	#	CM	#	CM	#	CM	#	CM	#	CM	#	CM	#	CM
0-30	24	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
3-60	24	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
61-150	20	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
151-225	20	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
226-300	21	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
301-375	22.5	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
376-450	24	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
451-600	27.5	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
601-750	31	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
751-900	35	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
901-1050	39	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195
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1201-1500	46	25	5	14	170	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195	4	1120	195

NOTES :

- DESIGN PARAMETERS ARE
 - LIVE LOADS : HS 20-44
 - WORKING STEEL STRESSES :
 - PLAIN BARS, $f_s = 1200 \text{ KG/CM}^2$
 - DEFORMED BARS, $f_s = 1400 \text{ KG/CM}^2$
 - WORKING CONCRETE STRESS, $f_c = 60 \text{ KG/CM}^2$
- CONCRETE SHALL HAVE THE 28-DAY MINIMUM ULTIMATE COMPRESSIVE STRENGTH BASED ON IS 456 CM. GIVE SAMPLES OF 100 KG/CM^2 AND SHALL HAVE A MINIMUM CEMENT CONTENT OF 320 KG PER CUBIC METER OF CONCRETE. THE FOLLOWING IS THE SUGGESTED CONCRETE MIX PROPORTIONS PER CUBIC METER :
 - TYPE I PORTLAND CEMENT 320 KG
 - SAND 0.43 M³
 - CRUSHED ROCK OR GRAVEL 0.86 M³ WITH THE MAXIMUM SLUMP OF 10 CM.
- REBARS # 4 OR LARGER SHALL BE TIS 24 GRADE S30 DEFORMED BARS, OTHERS SHALL BE TIS 20 GRADE S24 PLAIN BARS UNLESS OTHERWISE INDICATED.
- LOCATIONS OF LAP SPICE OF REBARS SHALL BE APPROVED BY THE ENGINEER.
- LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 15 SHALL BE USED INSTEAD OF TYPE I PORTLAND CEMENT.
- WORK THIS DRAWING WITH DWG. NOS. BC-01 AND BC-04.
- ALL FIGURES IN COLUMN MARK $\frac{1}{2}$ ARE APPLICABLE FOR SINGLE BOXES. ALL FIGURES IN COLUMN MARK $\frac{3}{4}$ ARE APPLICABLE FOR MULTIPLE BOXES.
- THIS DRAWING IS ADAPTED FROM DC DWG. NO. TB/2/P
- THIS DRAWING SHALL BE USED FOR NEW CONSTRUCTION OF R.C. BOX CULVERT.



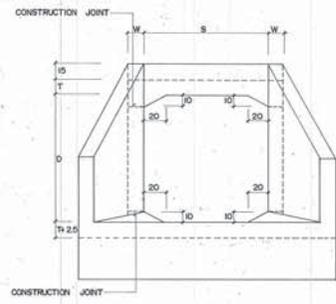
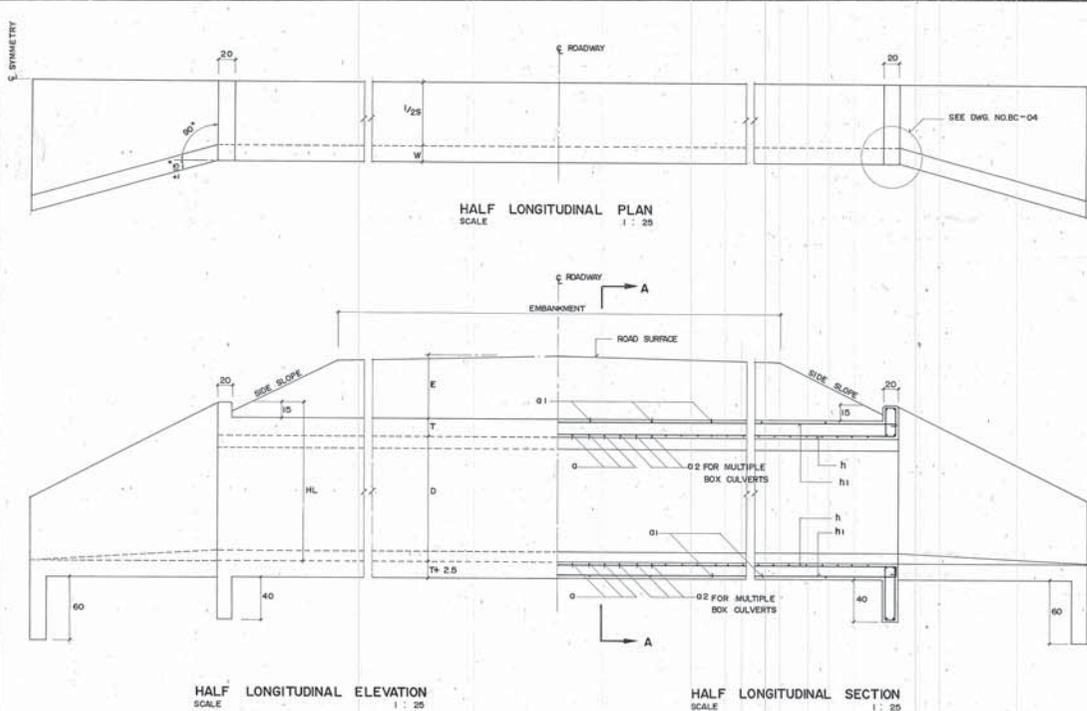
4 OR 1/2" GR12MM, # 5 OR 5/8" GR 16 MM, # 6 OR 3/4" GR 20MM, # 8 OR 1" GR 25MM, NO = TOTAL AMOUNT OF BARS, L = TOTAL LENGTH OF EACH BAR

KINGDOM OF THAILAND
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 DEPARTMENT OF HIGHWAYS

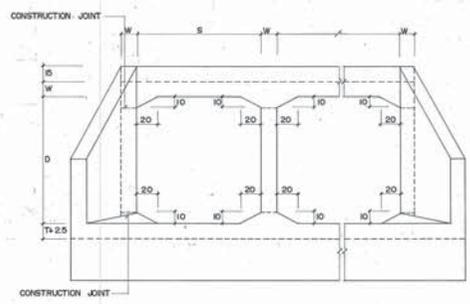
STANDARD DRAWING
 RIGID FRAME R.C. BOX CULVERT

TABLE OF REINFORCEMENT

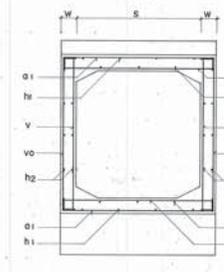
DESIGNED : DOH. & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> (DIRECTOR GENERAL)	DWG. NO. BC-02
		SHEET NO. 187



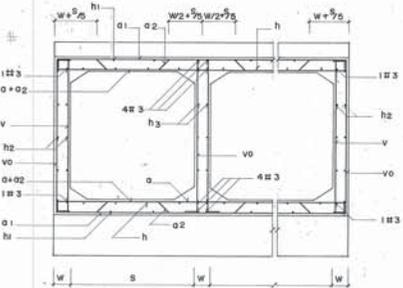
ELEVATION
SCALE 1:25



ELEVATION
SCALE 1:25



SECTION A-A
SCALE 1:25

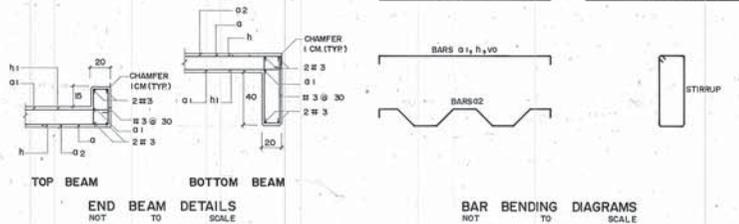


SECTION A A
SCALE 1:25

HALF LONGITUDINAL ELEVATION
SCALE 1:25

HALF LONGITUDINAL SECTION
SCALE 1:25

- NOTES :
- DESIGN PARAMETERS ARE
 - LIVE LOADING : HS 20-44
 - WORKING STEEL STRESSES :
 - PLAN BARS, $f_s = 1200 \text{ KG/CM}^2$
 - DEFORMED BARS, $f_s = 1400 \text{ KG/CM}^2$
 - WORKING CONCRETE STRESS, $f_c = 60 \text{ KG/CM}^2$
 - CONCRETE SHALL HAVE THE 28 DAYS MINIMUM COMPRESSIVE STRENGTH, BASED ON 15x15x15 CM. CUBE SAMPLES, OF 180 KG/CM³ AND SHALL HAVE A MINIMUM CEMENT CONTENT OF 320 KG PER CUBIC METER OF CONCRETE. THE FOLLOWING IS THE SUGGESTED CONCRETE MIX PROPORTIONS PER CUBIC METER :
 - TYPE I PORTLAND CEMENT 300 KG
 - SAND 0.45 M³
 - CRUSHED ROCK OR GRAVEL 0.86 M³
 - WITH THE MAXIMUM SLUMP OF 10 CM
 - REBARS II 4 OR LARGER SHALL BE TS 24 GRADE S20 DEFORMED BARS OTHERS SHALL BE TS 30 GRADE S24 PLAIN BARS UNLESS OTHERWISE INDICATED.
 - LOCATIONS OF LAP SPLICE OF REBARS SHALL BE APPROVED BY THE ENGINEER
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BARS AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BARS.
 - IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TS 15 SPECIFICATIONS SHALL BE USED INSTEAD OF TYPE I PORTLAND CEMENT.
 - CLEAR CONCRETE COVER SHALL BE 5.0 CM. EXCEPT THE BOTTOM OF BOTTOM SLABS AND OUTSIDE FACES OF THE EXTERIOR WALLS WHERE A CLEAR COVER OF 2.5 CM SHALL BE PROVIDED.
 - WORK THIS DRAWING WITH DWG. NO. BC-04.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 7B / 8.
 - THIS DRAWING SHALL BE USED FOR NEW CONSTRUCTION OF R.C. BOX CULVERT



END BEAM DETAILS
SCALE

BAR BENDING DIAGRAMS
SCALE

CLEAR SPAN	DEPTH OF FILL, E CM	T CM	SINGLE BOX CULVERT												MULTIPLE BOX CULVERT																			
			a				a1				h				h1				a				a1				h				h1			
			#	Q	L	#	Q	L	#	Q	L	#	Q	L	#	Q	L	#	Q	L	#	Q	L	#	Q	L	#	Q	L	#	Q	L		
60 CM	0-30	20	5	16	113	3	45	113	4	30	8	3	45	6	5	32	3	45	5	32	3	45	5	32	4	44	3	60	4	44	4	30	3	45
	31-60	20	4	22	113	3	60	113	4	30	8	3	45	6	4	44	3	60	4	44	4	30	3	45	4	44	3	60	4	44	4	30	3	45
	61-150	20	4	22	113	3	60	113	4	30	8	3	45	6	4	44	3	60	4	44	4	30	3	45	4	44	3	60	4	44	4	30	3	45
	151-225	20	4	22	113	3	60	113	4	30	8	3	45	6	4	44	3	60	4	44	4	30	3	45	4	44	3	60	4	44	4	30	3	45
90 CM	0-30	22.5	5	15	143	3	45	143	4	25	12	3	40	8	5	30	3	45	5	26	4	25	3	40	4	44	3	60	4	44	4	30	3	40
	31-60	20	4	15	143	3	60	143	4	40	8	3	40	8	4	30	3	60	4	30	4	40	3	40	4	44	3	60	4	44	4	30	3	40
	61-150	20	4	22	143	3	60	143	4	40	8	3	40	8	4	44	3	60	4	44	4	30	3	40	4	44	3	60	4	44	4	30	3	40
	151-225	20	4	22	143	3	60	143	4	40	8	3	40	8	4	44	3	60	4	44	4	30	3	40	4	44	3	60	4	44	4	30	3	40
120 CM	0-30	22.5	5	13	173	3	45	173	4	25	14	3	36	10	5	26	3	45	5	26	4	25	3	40	4	44	3	60	4	44	4	30	3	40
	31-60	20	5	16	173	3	60	173	4	30	12	3	36	10	5	32	3	60	5	32	4	30	3	40	4	44	3	60	4	44	4	30	3	40
	61-150	20	4	15	173	3	60	173	4	36	10	3	36	10	4	30	3	60	4	30	4	40	3	40	4	44	3	60	4	44	4	30	3	40
	151-225	20	4	15	173	3	60	173	4	36	10	3	36	10	4	30	3	60	4	30	4	40	3	40	4	44	3	60	4	44	4	30	3	40
150 CM	0-30	24	6	18	210	3	45	210	4	25	16	3	45	10	6	36	3	45	6	30	4	25	3	45	4	44	3	60	4	44	4	30	3	45
	31-60	22.5	6	22	210	3	60	210	4	30	14	3	45	10	6	44	3	60	6	44	4	30	3	45	4	44	3	60	4	44	4	30	3	45
	61-150	20	5	16	203	3	60	203	4	45	10	3	45	10	5	32	3	60	5	32	4	45	3	45	4	44	3	60	4	44	4	30	3	45
	151-225	22.5	5	16	203	3	60	203	4	45	10	3	45	10	5	32	3	60	5	32	4	45	3	45	4	44	3	60	4	44	4	30	3	45
180 CM	0-30	25	5	12	233	3	45	233	4	21	22	3	45	12	5	24	3	45	5	24	4	21	3	45	4	44	3	60	4	44	4	30	3	45
	31-60	24	5	14	233	3	60	233	4	30	16	3	45	12	5	28	3	60	5	28	4	30	3	45	4	44	3	60	4	44	4	30	3	45
	61-150	22.5	5	15	233	3	60	233	4	45	12	3	45	12	5	28	3	60	5	28	4	30	3	45	4	44	3	60	4	44	4	30	3	45
	151-225	22.5	5	14	233	3	60	233	4	45	12	3	45	12	5	28	3	60	5	28	4	30	3	45	4	44	3	60	4	44	4	30	3	45

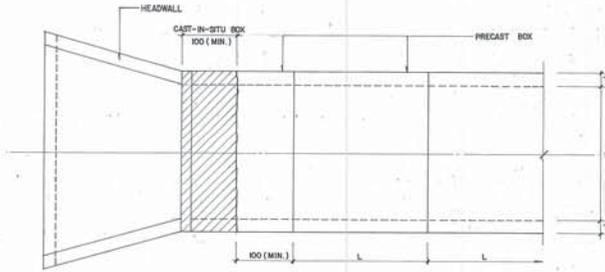
3 = 3/8" OR 9 MM. # 4 = 1/2" OR 12 MM. NO. = TOTAL AMOUNT OF BARS
5 = 5/8" OR 16 MM. # 6 = 3/4" OR 20 MM. L = TOTAL LENGTH OF EACH BAR

DEPTH D CM	SINGLE BOX CULVERT												MULTIPLE BOX CULVERTS					
	DEPTH OF FILL (E) 0-225 CM												DEPTH OF FILL (E) 0-225 CM					
	WIDTH W CM	REINFORCING BAR V		REINFORCING BAR V0		REINFORCING BAR h		EXTERIOR WALL REINFORCING BAR V		TOTAL AMOUNT OF #2 (# 3) EACH WALL		INTERIOR WALL REINFORCING BAR V0		TOTAL AMOUNT OF #3 (# 3) EACH WALL				
60	20	4	30	3	30	3	30	4	30	4	30	8	3	40	4			
90	20	4	30	3	30	3	30	4	30	12	3	40	6					
120	20	4	30	3	30	3	30	4	30	12	3	40	6					
150	22.5	4	30	3	30	3	30	4	30	16	3	40	8					
180	25	4	30	3	30	3	30	4	30	20	3	40	10					

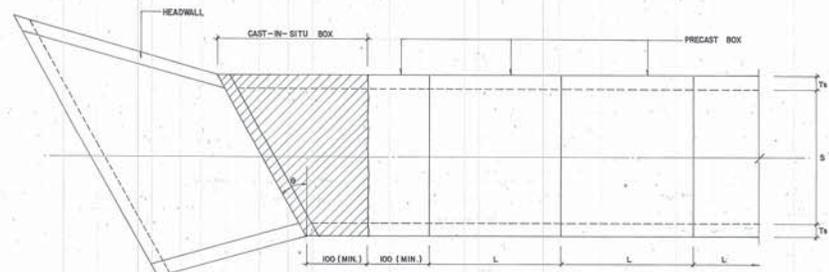
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 SIMPLE SPAN BOX CULVERT
 PLAN, ELEVATIONS, SECTIONS AND DETAILS

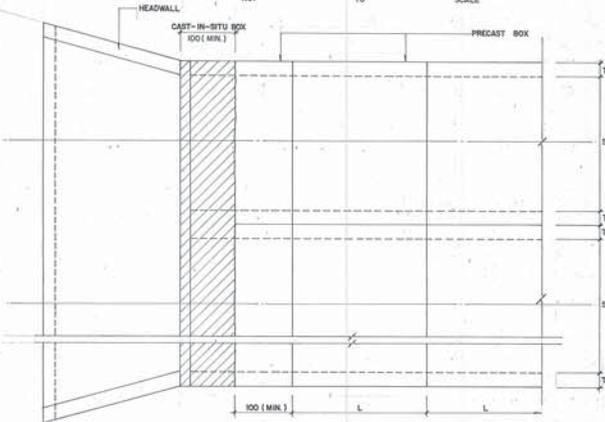
DESIGNED: DOH & CONSULTANT CHECKED: [Signature] DATE JULY 1994
 SUBMITTED: [Signature] SCALE AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 APPROVED: [Signature] DWG. NO. BC-03
 (THIA DIRECTOR GENERAL) SHEET NO. 188



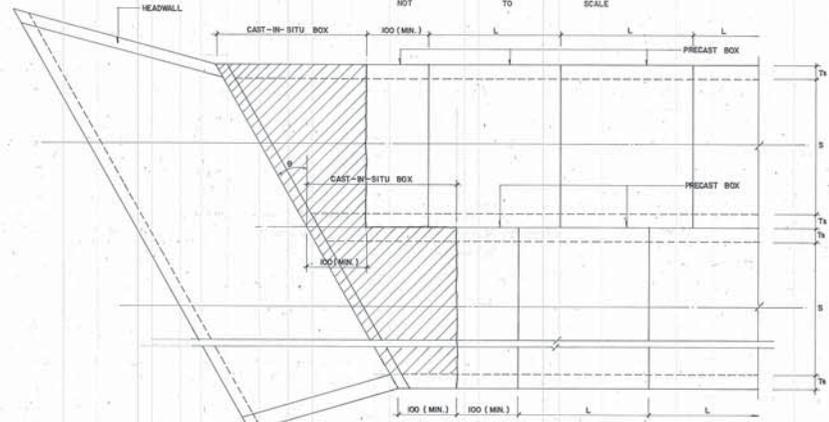
PLAN (SINGLE BOX , NON - SKEW)
NOT TO SCALE



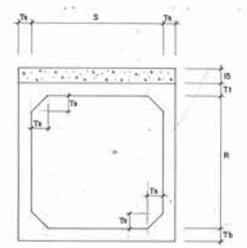
PLAN (SINGLE BOX , SKEW θ)
NOT TO SCALE



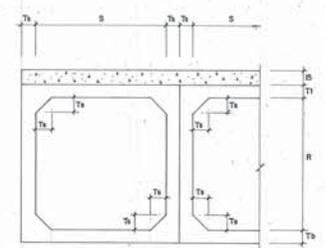
PLAN (MULTIPLE BOXES , NON - SKEW)
NOT TO SCALE



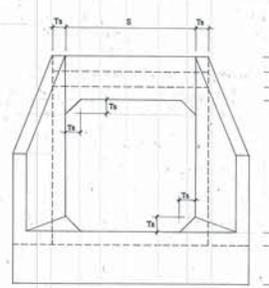
PLAN (MULTIPLE BOXES , SKEW θ)
NOT TO SCALE



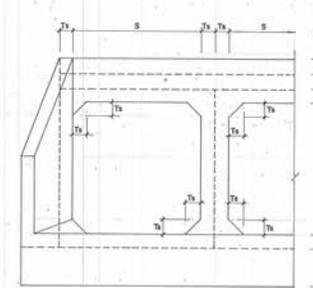
ELEVATION (SINGLE BOX , NON - SKEW)
NOT TO SCALE



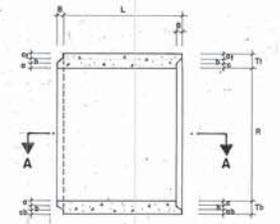
ELEVATION (MULTIPLE BOXES , NON - SKEW)
NOT TO SCALE



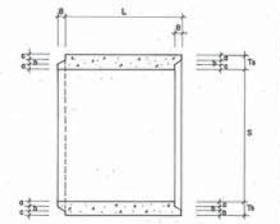
HEADWALL ELEVATION (SINGLE BOX)
NOT TO SCALE



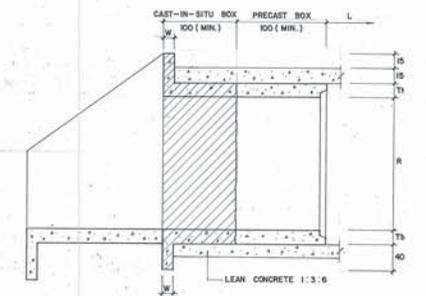
HEADWALL ELEVATION (MULTIPLE BOXES)
NOT TO SCALE



LONGITUDINAL SECTION OF PRECAST BOX
NOT TO SCALE



SECTION A - A
NOT TO SCALE



LONGITUDINAL SECTION OF HEADWALL
NOT TO SCALE

NOTES :

- DESIGN LOAD IS HS20-44.
- DEPTH OF FILL SHALL NOT EXCEED 0.60 M.
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- WORK THIS DRAWING WITH DWG. NO. BC-06.
- THE SKEW ANGLE (θ) SHALL NOT BE MORE THAN 45 DEGREE.
- W IS 15 CM. FOR NON-SKEW BOX AND IS 25 CM. FOR SKEW BOX.
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 7/PB/1.

TABLE OF DIMENSIONS

SIZE OF CULVERT	DIMENSIONS												
	S x R	R	S	T ₁	T ₂	T ₃	e	b	e	ef	eb	ef	L (MML)
120 x 120	120	120	12.5	19	15	4	4.5	4	10.5	6.5	10.5	6.5	290
150 x 120	150	150	15	20	17.5	5	4.5	5.5	10	7.5	10.5	8	290
150 x 150	150	150	15	20	17.5	5	4.5	5.5	10	7.5	10.5	8	250
180 x 150	150	180	17.5	20	17.5	6	4.5	7	8.5	6	9.5	7	250
180 x 180	180	180	17.5	20	17.5	6	4.5	7	8.5	6	9.5	7	250
210 x 180	180	210	20	20	20	7.5	4.5	8	7.5	7.5	8	8	200
210 x 210	210	210	20	20	20	7.5	4.5	8	7.5	7.5	8	8	200
240 x 210	210	240	20	20	20	7.5	4.5	8	7.5	7.5	8	8	200
240 x 240	240	240	20	20	20	7.5	4.5	8	7.5	7.5	8	8	200

TABLE OF REINFORCEMENT (SQ. CM. PER 1.0 M. LENGTH OF BOX)

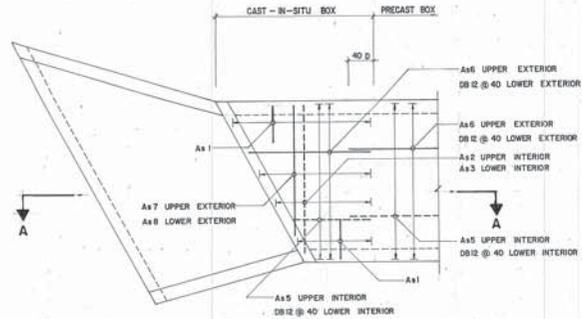
SIZE OF CULVERT	REINFORCEMENT BARS										END BEAM	
	Ax1	Ax2	Ax3	Ax4	Ax7	Ax8	Ax5	Ax6	Ax9	Ax10		
120 x 120	3.4	9.1	5.1	2.8	3.8	3.0	4.4	3.8	2-ØB12	2-ØB12		
150 x 120	4.0	9.3	5.1	3.0	4.0	3.6	4.4	4.0	2-ØB16	2-ØB12		
150 x 150	3.4	9.7	5.5	3.0	4.0	3.6	4.7	4.0	2-ØB16	2-ØB12		
180 x 150	4.9	10.2	5.5	3.6	4.0	3.6	4.4	4.0	2-ØB20	2-ØB16		
180 x 180	4.2	10.8	6.1	3.5	4.0	3.6	4.7	4.0	2-ØB20	2-ØB16		
210 x 180	5.7	10.8	6.1	4.0	4.2	4.0	4.2	4.0	2-ØB25	2-ØB20		
210 x 210	5.3	11.2	6.8	4.0	4.9	4.0	4.4	4.0	2-ØB25	2-ØB20		
240 x 210	6.4	12.3	7.4	4.0	5.7	4.7	4.7	4.0	2-ØB25	2-ØB25		
240 x 240	5.9	12.7	8.0	4.9	6.1	5.5	4.7	4.0	2-ØB25	2-ØB25		

STEEL AREA PER 1.0 M. WIDTH OF BOX

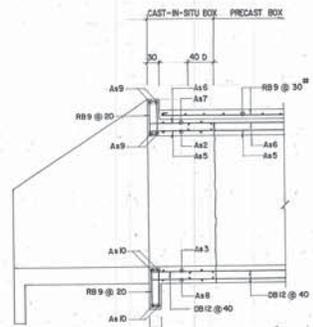
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PRECAST BOX CULVERT DEPTH OF FILL \geq 0.60 M.
 PLAN, ELEVATION AND SECTIONS

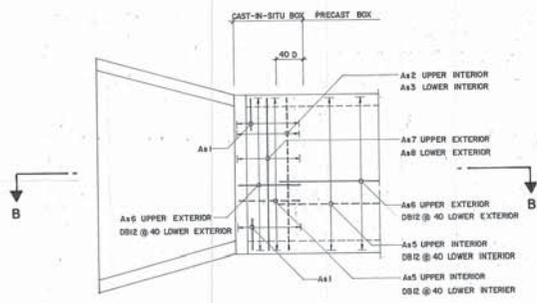
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> /s/ (DIRECTOR GENERAL)	DWG. NO. BC-05
		SHEET NO. 190



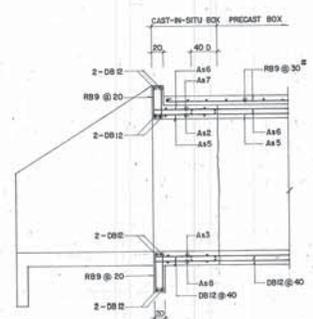
DETAILS FOR SKEW θ CAST-IN-SITU BOX
NOT TO SCALE



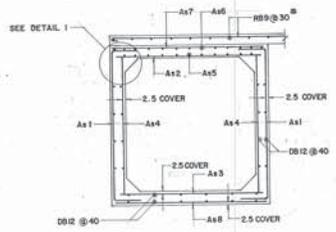
SECTION A - A
NOT TO SCALE



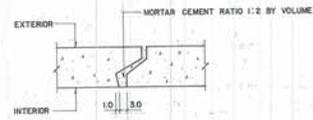
DETAILS FOR CAST-IN-SITU BOX
NOT TO SCALE



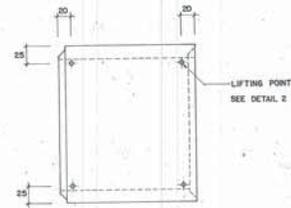
SECTION B - B
NOT TO SCALE



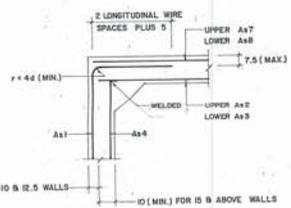
DETAILS FOR PRECAST BOX
NOT TO SCALE



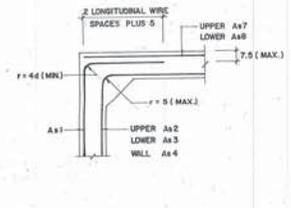
MASTIC JOINT SEALER
NOT TO SCALE



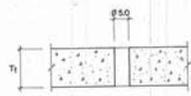
BOX LIFTING LOCATIONS
NOT TO SCALE



TYPE A
DETAIL 1
NOT TO SCALE



TYPE B

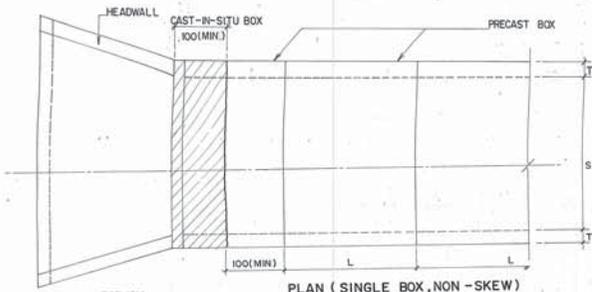


DETAIL 2
NOT TO SCALE

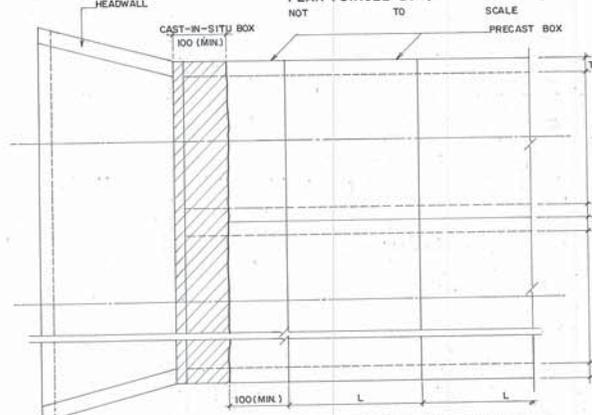
NOTES :

1. CONCRETE :
 - a.) FOR PRECAST BOX CULVERT SHALL HAVE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 44 MPa FOR .15 x .15 x .15 M. CURE AT 28 DAYS.
 - b.) FOR CAST-IN-SITU BOX CULVERT SHALL HAVE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa FOR .15 x .15 x .15 M. CURE AT 28 DAYS.
2. WELDED WIRE FABRIC FOR STEEL REINFORCEMENT SHALL HAVE A MINIMUM YIELD STRENGTH (F_y) OF 440 MPa.
3. CLEAR CONCRETE COVER SHALL BE 2.5 CM. EXCEPT THE BOTTOM SLABS OR WALLS AT WHICH CLEAR COVER OF 5 CM. SHALL BE PROVIDED.
4. DEPTH OF FILL SHALL NOT EXCEED 0.60 M.
5. PREPARATION FOR INSTALLATION OF PRECAST BOX CULVERT.
 - a.) POURING LEAN CONCRETE OF MIXING RATIO 1:3:6 BY WEIGHT AND THICKNESS NOT LESS THAN 12 CM.
 - b.) THE LEVEL OF LEAN CONCRETE MUST BE APPROXIMATELY 3 CM. LOWER THAN THE EXACT LEVEL.
 - c.) INSTALL PRECAST BOX CULVERT AFTER LEAN CONCRETE WAS HARDEN. BEFORE INSTALLING PRECAST BOX CULVERT, THERE MUST BE CEMENT MORTAR WITH MIXING RATIO 1:2 BY VOLUME ON THE SURFACE OF LEAN CONCRETE AND THE THICKNESS OF THESE MORTAR SHOULD BE THICK ENOUGH TO FILL THE VOID BETWEEN THE BOTTOM OF PRECAST BOX CULVERT AND TOP SURFACE OF LEAN CONCRETE.
6. REINFORCING STEEL WHICH HAS A DIFFERENT STRENGTH FROM THE ABOVE SPECIFICATIONS COULD BE USED UPON APPROVAL OF THE LOCATION AND DESIGN DIVISION.
7. FOR DETAILS OF HEADWALL SEE DRAWING NO. BC-04.
8. THE DIMENSIONS AS SHOWN IN TABLE OF DIMENSIONS ARE ONLY RECOMMENDED DIMENSIONS.
9. THE REINFORCEMENT FOR CAST-IN-SITU CONCRETE SECTION MUST BE THE SAME AS THE REINFORCEMENT IN PRECAST BOX CULVERT. FOR SKEW BOX THE REINFORCEMENT SHALL FOLLOW THIS DRAWING.
10. PROVIDE DB12 BARS AS LONGITUDINAL STEEL BARS AT THE INNER AND OUTER SIDE OF PRECAST BOX CULVERT WALL. (SPACING NOT MORE THAN 40 CM.)
11. IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS 5 SHALL BE USED INSTEAD OF TYPE 1 CEMENT.
12. WORK THIS DRAWING WITH DWG. NO. BC-05.
13. DB IS THE DIAMETER OF REINFORCING BAR IN MILLIMETERS.
14. ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
15. THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 7.PB/2.

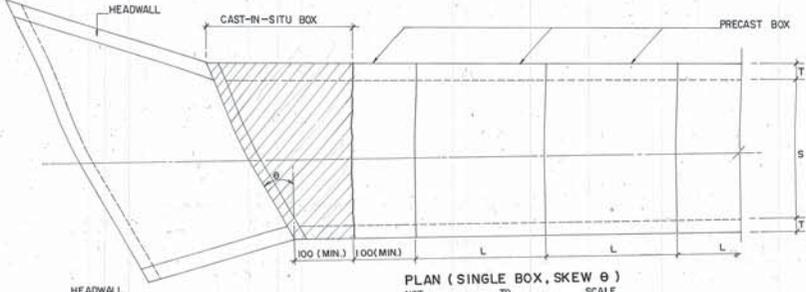
KINGDOM OF THAILAND MINISTRY OF TRANSPORT AND COMMUNICATIONS DEPARTMENT OF HIGHWAYS		
STANDARD DRAWING PRECAST BOX CULVERT DEPTH OF FILL 3-0.60 M. REINFORCEMENT AND DETAILS		
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED : <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)		SCALE AS SHOWN
APPROVED : <i>[Signature]</i> (1974) (DIRECTOR GENERAL)		DWG. NO. BC-06 SHEET NO. 191



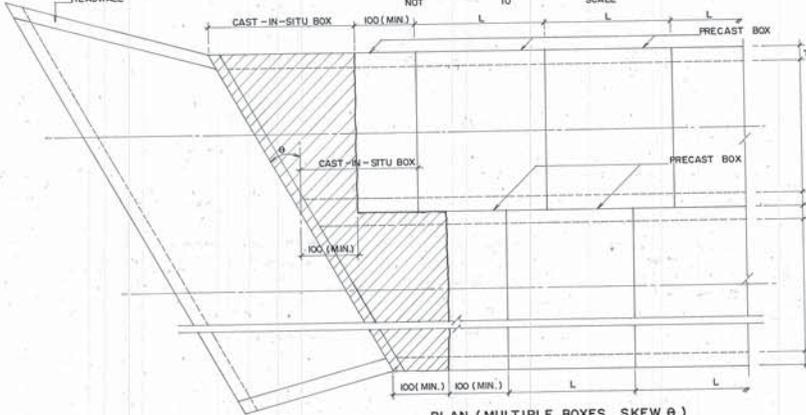
PLAN (SINGLE BOX, NON-SKEW)
NOT TO SCALE



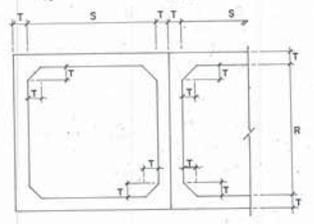
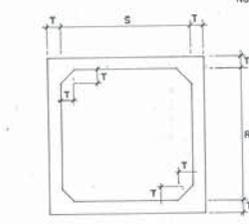
ELEVATION (SINGLE BOX, NON-SKEW)
NOT TO SCALE



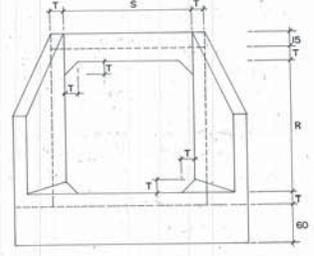
PLAN (SINGLE BOX, SKEW θ)
NOT TO SCALE



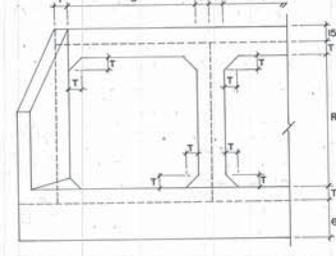
ELEVATION (SINGLE BOX, SKEW θ)
NOT TO SCALE



ELEVATION (MULTIPLE BOX, NON-SKEW)
NOT TO SCALE

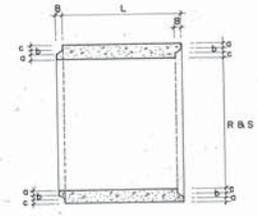


HEADWALL ELEVATION (SINGLE BOX)
NOT TO SCALE

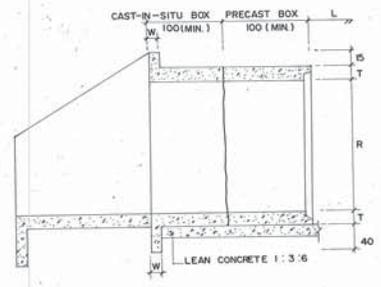


HEADWALL ELEVATION (MULTIPLE BOXES)
NOT TO SCALE

- NOTES:
- DESIGN LOAD IS HS 20-44.
 - DEPTH OF FILL EXCEEDS 0.60 M.
 - ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - WORK THIS DRAWING WITH DOH DWG. NO. BC-08.
 - THE SKEW ANGLE (θ) SHALL NOT BE MORE THAN 45 DEGREES.
 - W IS 20 CM. FOR NON-SKEW BOX AND 15 30 CM. FOR SKEW BOX.
 - THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 7 PB/3.



LONGITUDINAL SECTION OF PRECAST BOX
NOT TO SCALE



LONGITUDINAL SECTION OF HEADWALL
NOT TO SCALE

TABLE OF DIMENSIONS

SIZE OF CULVERT	DIMENSIONS							
	S x R	R	S	T	a	b	c	L
120 x 120	120	120	12.5	4	4.5	4	250	
150 x 120	120	150	15	5	4.5	5.5	250	
150 x 150	150	150	15	5	4.5	5.5	250	
180 x 150	150	180	17.5	6	4.5	7	250	
180 x 180	180	180	17.5	6	4.5	7	250	
210 x 180	180	210	20	7.5	4.5	8	200	
210 x 210	210	210	20	7.5	4.5	8	200	
240 x 210	210	240	20	7.5	4.5	8	200	
240 x 240	240	240	20	7.5	4.5	8	200	

TABLE OF REINFORCEMENT (SQ. CM. PER 1.0 M. LENGTH OF BOX)

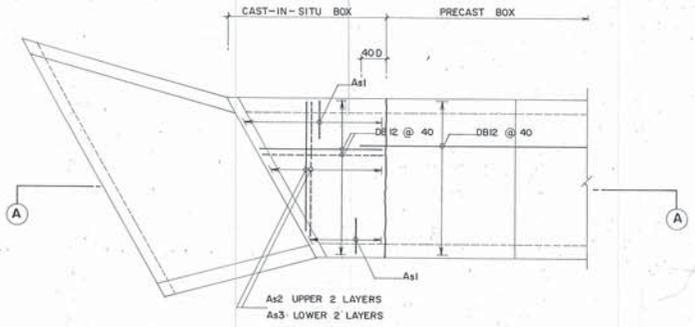
DEPTH OF FILL (M.)	CULVERT 120 x 120				CULVERT 150 x 120				CULVERT 150 x 150				CULVERT 180 x 150				CULVERT 180 x 180				CULVERT 210 x 180				CULVERT 210 x 210				CULVERT 240 x 210				CULVERT 240 x 240												
	M	As1	As2	As3	As4	M	As1	As2	As3	As4	M	As1	As2	As3	As4	M	As1	As2	As3	As4	M	As1	As2	As3	As4	M	As1	As2	As3	As4	M	As1	As2	As3	As4										
0.6	86	3.8	6.4	5.9	2.5	71	4.9	6.8	5.7	3.0	104	4.2	7.4	6.1	3.0	84	5.1	7.6	6.1	3.6	120	4.7	8.3	6.6	3.6	97	5.1	8.3	6.6	4.0	140	4.7	8.9	7.0	4.0	104	5.9	10.4	8.0	4.0	155	5.5	10.8	8.5	4.0
0.9	61	2.5	3.8	3.8	2.5	58	3.2	4.2	4.4	3.0	74	3.0	4.7	4.9	3.0	69	3.6	5.1	4.9	3.6	84	3.6	5.5	5.3	3.6	79	4.0	5.7	5.5	4.0	97	4.0	6.1	5.7	4.0	89	4.7	7.4	6.8	4.0	104	4.2	7.8	7.2	4.0
1.2	53	2.5	3.0	3.2	2.5	56	3.0	3.4	3.6	3.0	64	3.0	3.8	4.0	3.0	64	3.6	4.2	4.4	3.6	74	3.6	4.7	4.9	3.6	74	4.0	5.1	5.3	4.0	84	4.0	5.3	5.7	4.0	81	4.2	6.6	6.6	4.0	91	4.0	6.8	7.0	4.0
1.5	51	2.5	2.8	3.0	2.5	56	3.0	3.4	3.6	3.0	61	3.0	3.6	3.8	3.0	64	3.6	4.2	4.4	3.6	69	3.6	4.4	4.7	3.6	71	4.0	4.9	5.3	4.0	84	4.0	5.3	5.7	4.0	76	4.4	6.6	7.2	4.0	81	4.2	7.0	7.6	4.0
1.8	48	2.5	3.0	3.0	2.5	56	3.0	3.4	3.6	3.0	56	3.0	3.6	3.8	3.0	64	3.6	4.2	4.4	3.6	66	3.6	4.4	4.7	3.6	69	4.0	5.1	5.3	4.0	84	4.0	5.3	5.7	4.0	74	4.7	7.2	7.6	4.0	79	4.4	7.4	8.0	4.0
2.4	46	2.5	3.2	3.2	2.5	51	3.0	3.6	3.8	3.0	56	3.0	3.8	4.0	3.0	58	3.6	4.4	4.7	3.6	64	3.6	4.7	5.1	3.6	66	4.0	5.5	5.7	4.0	71	4.0	5.7	6.1	4.0	74	4.7	7.2	7.6	4.0	79	4.4	7.4	8.0	4.0
3.0	46	2.5	3.4	3.6	2.5	51	3.0	4.2	4.4	3.0	53	3.0	4.4	4.7	3.0	58	3.6	5.1	5.3	3.6	61	3.6	5.3	5.7	3.6	66	4.0	6.1	6.4	4.0	69	4.0	6.4	6.8	4.0	71	5.3	8.0	8.9	4.0	76	4.9	8.5	9.1	4.0
3.7	46	2.5	4.0	4.0	2.5	51	3.0	4.7	4.9	3.0	53	3.0	4.9	5.1	3.0	58	3.6	5.7	6.1	3.6	61	3.6	5.9	6.4	3.6	66	4.2	7.0	7.2	4.0	69	4.0	7.2	7.6	4.0	74	5.9	9.1	9.7	4.0	74	5.5	9.3	10.2	4.0
4.3	46	2.5	4.4	4.4	2.5	51	3.4	5.3	5.5	3.0	53	3.0	5.5	5.7	3.0	58	4.0	6.6	6.8	3.6	61	3.6	6.8	7.0	3.6	64	4.7	7.6	8.0	4.0	69	4.4	7.8	8.3	4.0										
4.9	46	2.5	4.9	5.1	2.5	48	3.8	5.9	6.1	3.0	53	3.4	6.1	6.4	3.0	56	4.4	7.2	7.4	3.6	61	4.0	7.4	7.8	3.6	64	5.3	8.5	8.9	4.0	69	4.9	8.7	9.1	4.0										
5.5	43	3.0	5.3	5.5	2.5	48	4.2	6.6	6.6	3.0	51	3.6	6.8	7.0	3.0	56	4.9	7.8	8.3	3.6	58	4.4	8.0	8.5	3.6	64	5.7	9.3	9.7	4.0															

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

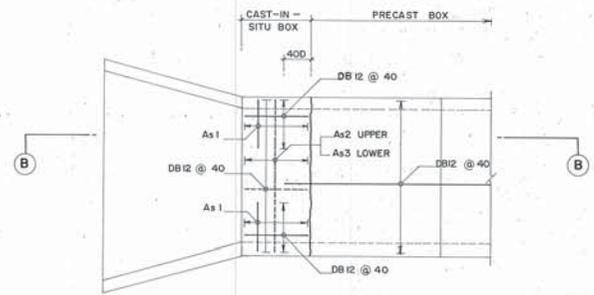
STANDARD DRAWING
 PRECAST BOX CULVERT DEPTH OF FILL > 0.60 M.

PLAN, ELEVATION AND SECTIONS

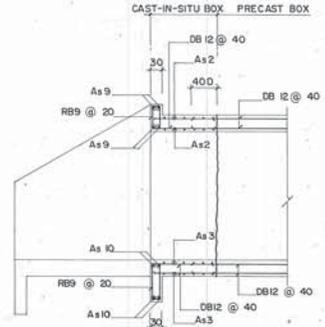
DESIGNED : DOH. & CONSULTANTS.	CHECKED <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> FOR DIRECTOR GENERAL	DWG. NO. BC-07
		SHEET NO. 192



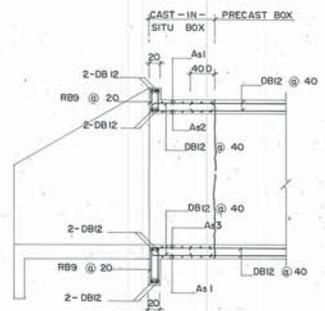
DETAILS FOR SKEW @ CAST-IN-SITU BOX
NOT TO SCALE



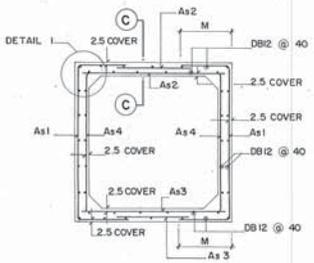
DETAILS FOR CAST-IN-SITU BOX
NOT TO SCALE



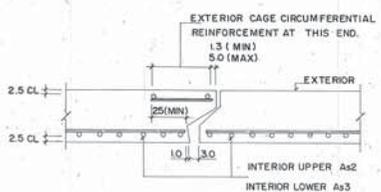
SECTION A-A
NOT TO SCALE



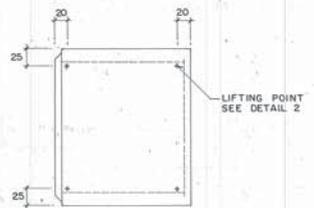
SECTION B-B
NOT TO SCALE



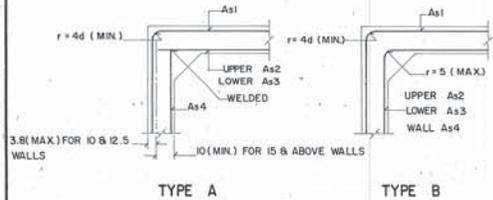
DETAILS FOR PRECAST BOX
NOT TO SCALE



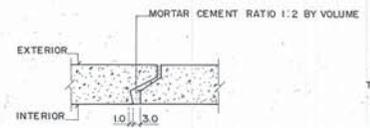
SECTION C-C
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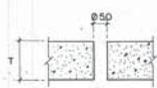
BOX LIFTING LOCATIONS
NOT TO SCALE



DETAIL I
NOT TO SCALE



MASTIC JOINT SEALER DETAIL
NOT TO SCALE



DETAIL 2
NOT TO SCALE

TABLE OF REINFORCEMENT
END BEAM FOR SKEW BOX

SIZE OF CULVERT S x R	END BEAM	
	As 9	As 10
120 x 120	2-DB12	2-DB12
150 x 120	2-DB16	2-DB12
150 x 150	2-DB16	2-DB12
180 x 150	2-DB20	2-DB16
180 x 180	2-DB20	2-DB16
210 x 180	2-DB25	2-DB20
210 x 210	2-DB25	2-DB20
240 x 210	2-DB25	2-DB25
240 x 240	2-DB25	2-DB25

NOTES:

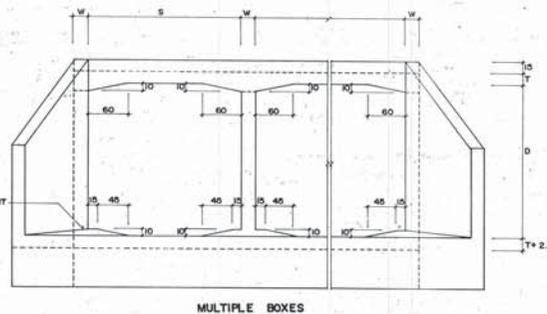
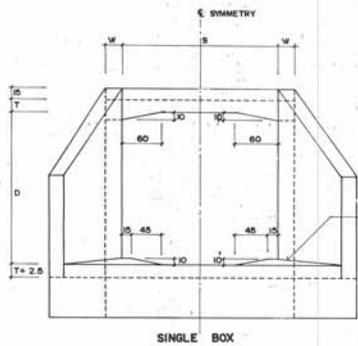
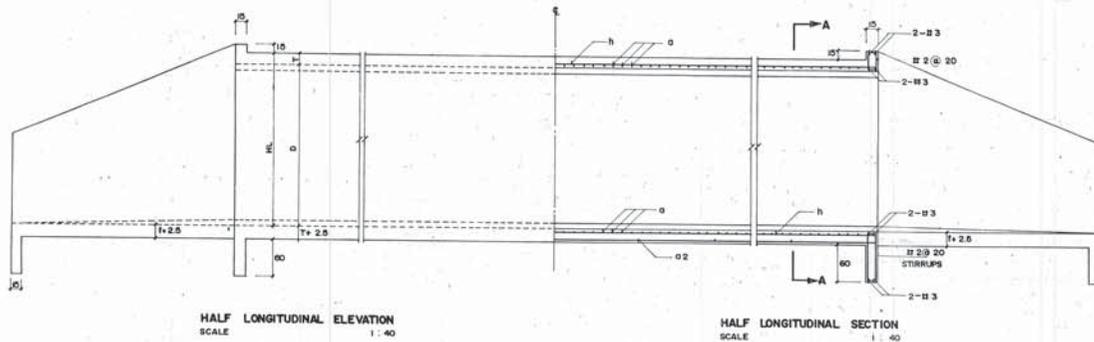
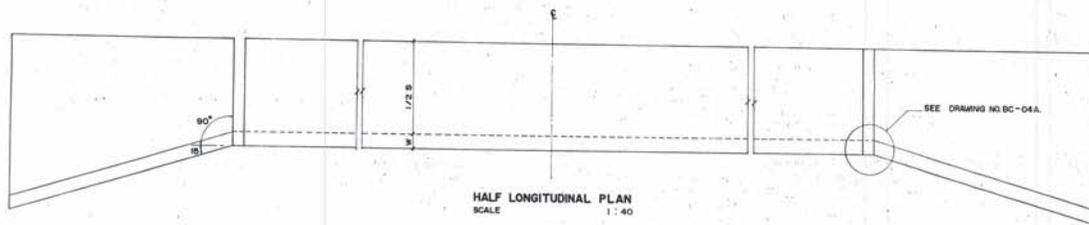
- CONCRETE:
 - FOR PRECAST BOX CULVERT SHALL HAVE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 44 MPa FOR .15 X .15 X .15 M.CUBE AT 28 DAYS.
 - FOR CAST-IN-SITU BOX CULVERT SHALL HAVE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 35 MPa FOR .15 X .15 X .15 M.CUBE AT 28 DAYS.
- WELDED WIRE FABRIC FOR STEEL REINFORCEMENT SHALL HAVE MINIMUM YIELD STRENGTH (F_{sy}) OF 440 MPa.
- CLEAR CONCRETE COVER SHALL BE 2.5 CM. EXCEPT THE BOTTOM SLABS OR WALLS AT WHICH CLEAR COVER OF 5 CM. SHALL BE PROVIDED.
- DEPTH OF FILL EXCEEDS 0.60 M.
- PREPARATION FOR INSTALLATION OF PRECAST BOX CULVERT.
 - POURING LEAN CONCRETE OF MIXING RATIO 1:3:6 BY WEIGHT AND THICKNESS NOT LESS THAN 12 CM.
 - THE LEVEL OF LEAN CONCRETE MUST BE APPROXIMATELY 3 CM. LOWER THAN THE EXACT LEVEL.
 - INSTALL PRECAST BOX CULVERT AFTER LEAN CONCRETE WAS HARDEN. BEFORE INSTALLING PRECAST BOX CULVERT, THERE MUST BE CEMENT MORTAR WITH MIXING RATIO 1:2 BY VOLUME ON THE SURFACE OF LEAN CONCRETE AND THE THICKNESS OF THESE MORTAR SHOULD BE THICK ENOUGH TO FILL THE VOID BETWEEN THE BOTTOM OF PRECAST BOX CULVERT AND TOP SURFACE OF LEAN CONCRETE.
- REINFORCING STEEL WHICH HAS A DIFFERENT STRENGTH FROM THE ABOVE SPECIFICATIONS COULD BE USED UPON APPROVAL OF THE LOCATION AND DESIGN DIVISION.
- FOR DETAILS OF HEADWALL SEE DRAWING NO. BC-04.
- THE DIMENSIONS AS SHOWN IN TABLE OF DIMENSIONS ARE ONLY RECOMMENDED DIMENSION.
- THE REINFORCEMENT FOR CAST-IN-SITU CONCRETE SECTION MUST BE SAME AS THE REINFORCEMENT IN PRECAST BOX CULVERT. FOR SKEW BOX THE REINFORCEMENT SHALL FOLLOW THIS DRAWING.
- PROVIDE DB12 BARS AS LONGITUDINAL STEEL BARS AT THE INNER AND OTHER SIDE OF PRECAST BOX CULVERT WALL (SPACING NOT MORE THAN 40 CM.).
- IN CASE OF SALINE PROTECTION, HIGH SULPHATE RESISTANT PORTLAND CEMENT TYPE 5 CONFORMING TO TIS IS SHALL BE USED INSTEAD OF TYPE 1 CEMENT.
- WORK THIS DRAWING WITH DWS. NO. BC-07.
- DB IS THE DIAMETER OF REINFORCEMENT STEEL IN MILLIMETERS.
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- THIS DRAWING IS ADAPTED FROM DOH DWG. NO. 7 PB/4.

KINGDOM OF THAILAND
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 DEPARTMENT OF HIGHWAYS

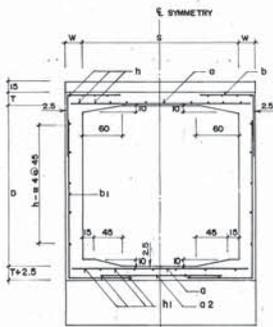
STANDARD DRAWING
 PRECAST BOX CULVERT DEPTH OF FILL > 0.60 M.

REINFORCEMENT AND DETAILS

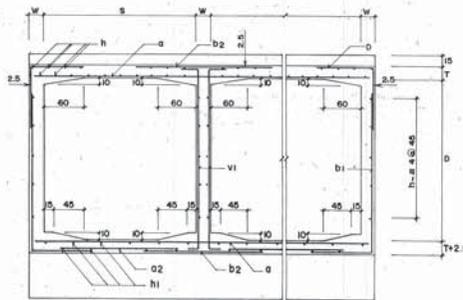
DESIGNED: DOH. & CONSULTANTS.	CHECKED: <i>Nguyen</i>	DATE JULY 1994
SUBMITTED:	<i>P. Bunyavech</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED:	<i>Abhe</i> FOR DIRECTOR GENERAL	DWG. NO. BC-08
		SHEET NO. 193



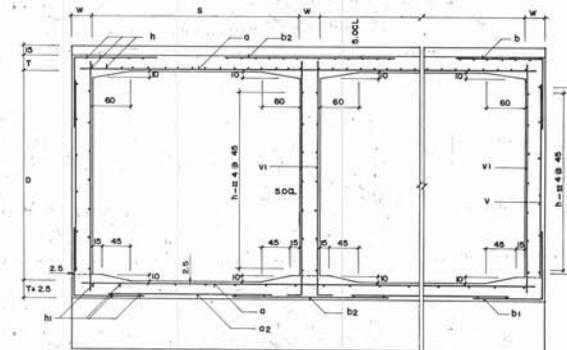
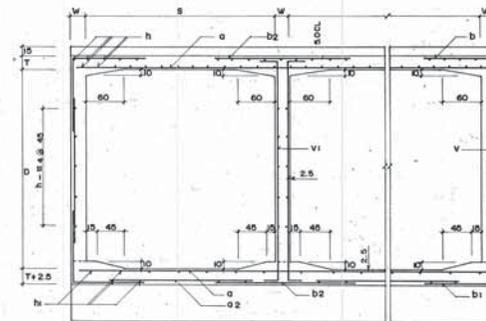
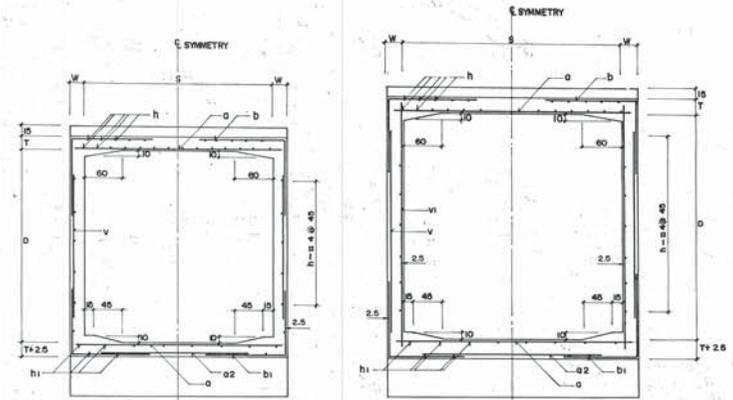
TRANSVERSE ELEVATION
SCALE 1:40



SINGLE BOX TYPE A
(FOR D ≤ 240 CM. AND W < 25 CM.)



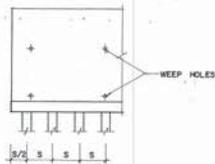
MULTIPLE BOXES TYPE A
(FOR D ≤ 240 CM. AND W < 25 CM.)



NOTES:

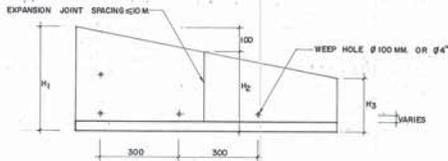
- FOR GENERAL NOTES NOT MENTIONED IN THIS DRAWING SEE DMS NO. BC-02
- CLEAR CONCRETE COVER SHALL BE 2.5 CM. EXCEPT THE BOTTOM OF BOTTOM SLABS OR WALL WHERE CLEAR COVER OF 5 CM. SHALL BE PROVIDED
- ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
- WORK THIS DRAWING WITH DMS NO. BC-02A, BC-02A
- THIS DRAWING IS ADAPTED FROM DOH DRAWING NO. 78/77
- THIS DRAWING SHALL BE USED FOR EXTENSION OF EXISTING R.C. BOX CULVERTS WHICH HAVE CONCRETE COVERING 2.5 CM. ONLY

KINGDOM OF THAILAND MINISTRY OF TRANSPORT AND COMMUNICATIONS DEPARTMENT OF HIGHWAYS			
STANDARD DRAWING RIGID FRAME R.C. BOX CULVERT PLAN ELEVATIONS AND SECTIONS			
DESIGNED: DOH & CONSULTANT	CHECKED: <i>[Signature]</i>	DATE: JULY 1994	
SUBMITTED:	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN	
APPROVED:	<i>[Signature]</i> DIRECTOR GENERAL	DWG. NO. BC-01A SHEET NO. 194	



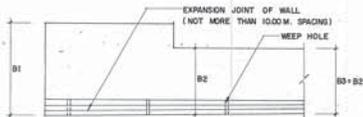
SIDE VIEW OF WALL SHOWING THE POSITION OF PILE ALONG THE LENGTH OF WALL
SCALE 1:100

NOTE: S = 2.50 M. FOR HEIGHT (H) ≤ 1.10 M.
OTHERWISE S = 1.00 M.



SIDE VIEW OF WALL IN CASE OF HEIGHT OF WALL VARIES ALONG THE LENGTH OF WALL
SCALE 1:100

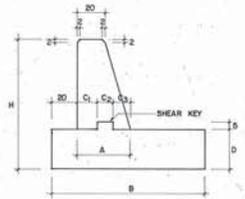
NOTE: THE WIDTH OF BASE B1, B2 & B3 VARIES ALONG THE HEIGHT H1, H2 & H3 OF WALL



PLAN OF BASE OF PILE FOOTING IN CASE OF HEIGHT OF WALL VARIES ALONG THE LENGTH OF WALL
SCALE 1:100

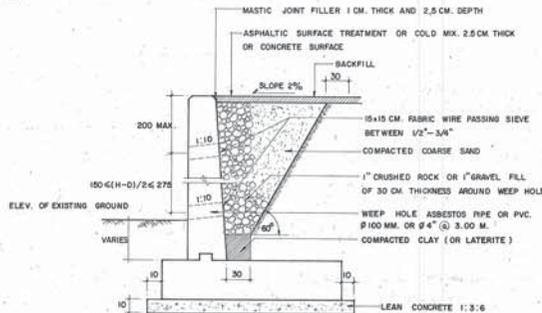


PLAN OF BASE OF SPREAD FOOTING IN CASE OF HEIGHT OF WALL VARIES ALONG THE LENGTH OF WALL
SCALE 1:100

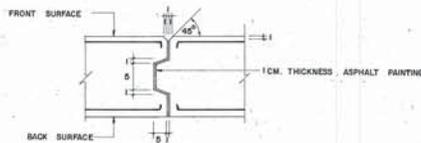


SECTION OF RETAINING WALL SHOWING DIMENSIONS AND THE POSITION OF SHEAR KEY
SCALE 1:100

NOTES: IN CASE OF HEIGHT, H, FALLS WITHIN THE RANGE OF THE HEIGHT GIVEN IN THE ABOVE TABLE, THE VALUES (D, A, C1, C2 AND C3) FOR THE HEIGHT H CAN BE CALCULATED BY VARYING THESE VALUES LINEARLY IN THE RANGE OF HEIGHT GIVEN. THE VALUE B SHALL BE CALCULATED IN THE SAME MANNER AS THE RETAINING WALL WITH MAT FOOTING. THE VALUE B IN THE ABOVE TABLE CAN BE APPLICABLE FOR THE RETAINING WALL WITH PILE FOOTING. FOR ANY OF H WHICH IS HIGHER THAN REQUIRED HEIGHT, e.g.; FOR H = 5.50 M. USE B = 6.00 M.



DETAIL OF BASE OF RETAINING WALL, WEEP HOLE AND EARTH BACKFILL



EXPANSION JOINT OF RETAINING WALL DETAIL

CONSTRUCTION SPECIFICATION

1. GENERAL NOTE FOR RETAINING WALL

1.1 CONCRETE SHALL HAVE MINIMUM ULTIMATE STRENGTH OF 210 KG/CM² FOR 15x15x15 CUBE AT 28 DAYS AND CONCRETE SLUMP TEST SHALL NOT EXCEED 10 CM.

AN APPROXIMATE MIX DESIGN OF CONCRETE PER CUBIC METER IS RECOMMENDED AS FOLLOW:-

PORTLAND CEMENT TYPE I (CONFORM TO TIS 15 PART I)	325 KGS.
SAND	430 LITRES
CRUSHED ROCK OR GRAVEL	860 LITRES
W/C RATIO	0.45-0.50 BY WEIGHT

1.2 AFTER THE FOUNDATION UNDERNEATH IS COMPACTED, THE LEAN CONCRETE SHALL BE PLACED FOR 10 CM. THICK AS THE BASE WITH 10 CM. AROUND WIDER THAN THE FOUNDATION. THE MIX DESIGN OF THE LEAN CONCRETE IS 1:3:6 BY VOLUME.

1.3 CONCRETE COVER SHALL BE 2.5 CM EXCEPT FOR THE FOUNDATION STRUCTURE THE CONCRETE COVER SHALL BE 5 CM. IN CASE OF MARINE CLAY, CONCRETE COVER FOR THE OTHER PART OF THE WALL AND THE FOUNDATION FACING THE MARINE SOIL SHALL BE ADDED 2.5 CM. FROM THE DIMENSIONS SHOWN IN THIS DRAWING.

1.4 EARTH BACKFILL SHALL BE SANDY SOIL OR GRAVEL SOIL OR ROCK OR OTHE SOIL IN THE CONSTRUCTION AREA HAVING THE SAME QUALITIES BY THE APPROVAL OF THE OWNER DMSION.

2. SPECIAL NOTES OF RETAINING WALL USING SPREAD FOOTING

2.1 THE ELEVATION OF THE FOUNDATION SHALL BE NOT LESS THAN 50 CM. FROM THE EXISTING GROUND LINE MEASURED FROM THE SURFACE OF THE LEAN CONCRETE IN NO. 1.2

2.2 EARTH BACKFILL SHALL BE SUPPORT THE ALLOWABLE LOAD NOT LESS THAN P Tons/m² AS TABLE FOLLOWS:-

HEIGHT OF WALL (m.)	8.0 < H ≤ 6.0	4.0 < H ≤ 8.0	3.0 < H < 4.0	2.0 < H < 3.0	H < 2.0
P, Tons/m ²	22.0	17.0	14.0	12.0	6.5

ALL THOSE CONSIDER WITH IN NOTES NO. 3

3. SPECIAL NOTE FOR RETAINING WALL WITH PILE FOUNDATION

3.1 THE ELEVATION OF THE FOUNDATION SHALL BE AT LEAST THE SAME LEVEL AS THE EXISTING GROUND MEASURED FROM THE SURFACE OF THE LEAN CONCRETE

3.2 VARIOUS SIZES OF RC. PILE GIVEN IN THIS DRAWING HAVE THE DETAIL AS FOLLOWS:-

3.2.1 RC. PILE SIZE 35x35 CM² SHALL BE DRIVEN UNTIL IT REACHES ALLOWABLE LOAD WHICH MUST NOT BE LESS THAN 35 TONS IF THE DEPTH OF THE DRIVEN PILE IS LESS THAN 10.00 M., PILE LOAD TEST MUST BE PERFORMED TO ENSURE THAT ALLOWABLE TENSILE STRENGTH IS NOT LESS THAN 15 TONS.

3.2.2 RC. PILE SIZE 20x20 CM² SHALL BE DRIVEN UNTIL IT REACHES ALLOWABLE LOAD WHICH MUST NOT BE 12 TONS IF THE DEPTH OF THE DRIVEN PILE IS LESS THAN 10.00 M., PILE LOAD TEST MUST BE PERFORMED TO ENSURE THAT ALLOWABLE TENSILE STRENGTH IS NOT LESS THAN 4 TONS

3.2.3 RC. PILE SIZE 18x18 CM² SHALL BE DRIVE UNTIL IT REACHES ALLOWABLE LOAD WHICH MUST NOT BE LESS THAN 2 TONS

3.2.4 TO TEST THE ALLOWABLE LOAD OF PILE, THE METHOD OF "STATIC PILE LOAD TEST" SHALL BE CONDUCTED AND THE CALCULATION OF ALLOWABLE LOAD CAN BE OBTAINED AS FOLLOW:-

A. IN CASE OF THE TESTED PILE CAN RESIST MORE THAN GIVEN ALLOWABLE LOAD FOR PILE SIZE IN 3.2.1, 3.2.2 AND 3.2.3, THE AVERAGE SETTLEMENT RATIO OF PILE (TOTAL SETTLEMENT OF PILE HEAD AT THAT TIME / LOADING SUBJECTED TO PILE HEAD AT THE SAME TIME.) SHALL NOT EXCEED 0.025 CM./PILE IN 24 HOURS THEN ALLOWABLE LOAD CAN BE OBTAINED AS A HALF OF SUBJECTED LOAD (FACTOR OF SAFETY = 2.0)

B. IN CASE OF SETTLEMENT RATIO EXCEEDING THE VALUE INDICATED IN A. OR INCREASING LOAD ON PILE HEAD UNTIL ITS FAILURE, ALLOWABLE LOAD IS OBTAINED BY DIVIDING THAT LOAD BY 2.5 (FACTOR OF SAFETY = 2.5) IN CASE OF STATIC PILE LOAD TEST CAN NOT BE PERFORMED, ALLOWABLE LOAD MIGHT BE COMPUTED BY PILE DRIVING FORMULAS SUCH AS HILEY FORMULA, JUNBO FORMULA OR DANISH FORMULA USING FACTOR OF SAFETY AT LEAST 3.0

3.2.5 CONCRETE FOR PILE SHALL HAVE ULTIMATE COMPRESSIVE STRENGTH AT LEAST 300 KG/CM² FOR 15x15x15 CUBE AT 28 DAYS AND CONCRETE SLUMP TEST CAN NOT EXCEED 8 CM.

AN APPROXIMATE MIX DESIGN OF CONCRETE PER CUBIC METER IS RECOMMENDED AS FOLLOW:-

PORTLAND CEMENT TYPE I (CONFORM TO TIS 15 PART I) MIN.	350 KGS.
SAND	430 LITRES
CRUSH ROCK OR GRAVEL	860 LITRES
W/C RATIO	0.40-0.45 BY WEIGHT

3.2.6 BEFORE CONSTRUCTION OF BASE OF RETAINING WALL, THE TOP OF PILE SHALL BE CHISELED AND BEND THE MAIN REINFORCING STEEL AS SHOWN IN THE DRAWING OR USE THE METHOD OF WELDING THE REINFORCING STEEL WITH THE SAME SIZE OF STEEL AS SHOWN IN THE DRAWING.

3.2.7 FOR PILE SIZE 35x35 CM., USING PILE TIP EITHER TYPE A OR B DEPENDS ON OWNER DIVISION.

4. REINFORCING STEEL NOTES:

4.1 ALL REINFORCING STEEL SHALL BE INTERMEDIATE GRADE DEFORMED BAR (CONFORM TO TIS 24, S030) EXCEPT FOR BAR DIAMETER IS LESS THAN Ø12mm WHICH MAY BE STRUCTURE GRADE. (CONFORM TO TIS 20, S124)

4.2 IN CASE OF SPLICING OF REINFORCEMENT SPLICING SHALL BE BY AROUND BUTT-WELDING WHICH THE STRENGTH OF WELDED JOINT IS NOT LESS THAN THE ULTIMATE TENSILE STRENGTH OR BY LAPPING BARS WHICH THE LAP LENGTH SHALL NOT BE LESS THAN 20 TIMES THE BAR DIAMETER FOR THE INTERMEDIATE GRADE REINFORCING STEEL (40 TIMES THE BAR DIAMETERS FOR STRUCTURAL GRADE REINFORCING STEEL) LOCATION OF THE LAPPED BARS BE SPACED APART UNDER CONSIDERATION OF THE INSPECTOR.

NOTES

- ALL DIMENSIONS ARE IN CENTIMETER UNLESS OTHERWISE INDICATED.
- ANY PROBLEMS DUE THE DESIGNATIONS SHALL BE CONSIDERED AND DECIDED BY THE LOCATION AND DESIGN DIVISION.
- RETAINING WALLS SHOWN IN THIS DRAWING SHALL BE USED FOR THE ROADWAY EMBANKMENT THAT IS PROPERTY DESIGNED.

KINGDOM OF THAILAND MINISTRY OF TRANSPORT AND COMMUNICATIONS DEPARTMENT OF HIGHWAYS			
STANDARD DRAWING CANTELEVER RETAINING WALL 6.00 M. MAX. HIGH DETAILS AND SPECIFICATIONS			
DESIGNED: DOM & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994	
SUBMITTED: <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE: AS SHOWN		DWG. NO. ABT 267-17/B
APPROVED: <i>[Signature]</i> FDC (DIRECTOR GENERAL)	SHEET NO. 198		

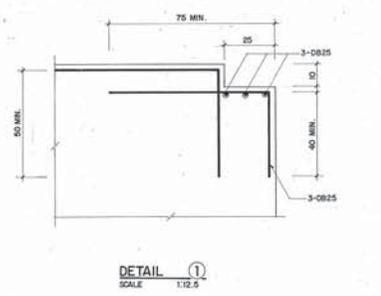
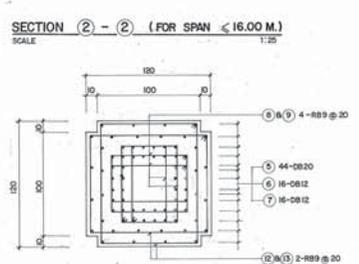
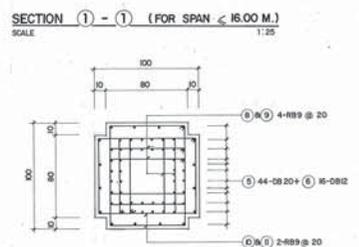
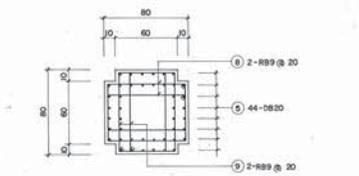
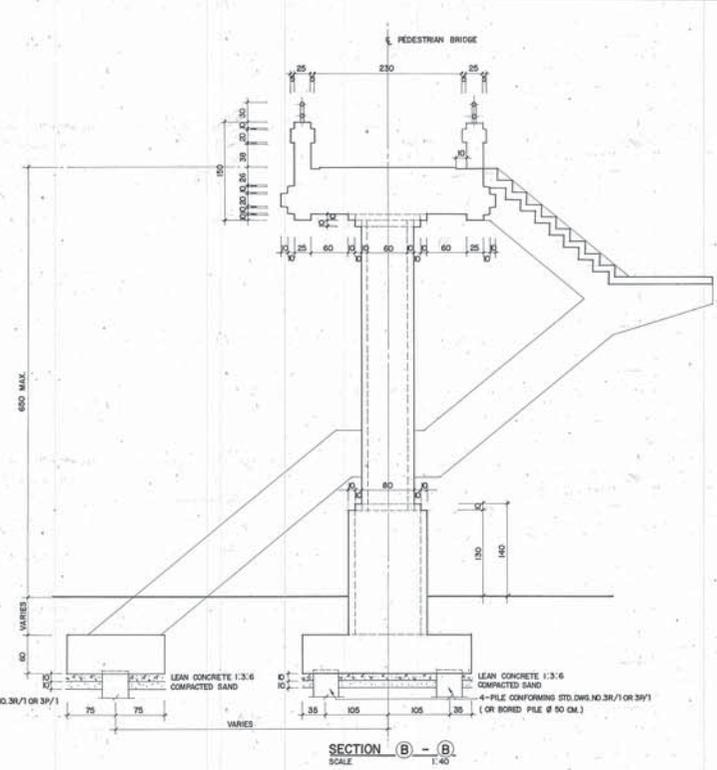
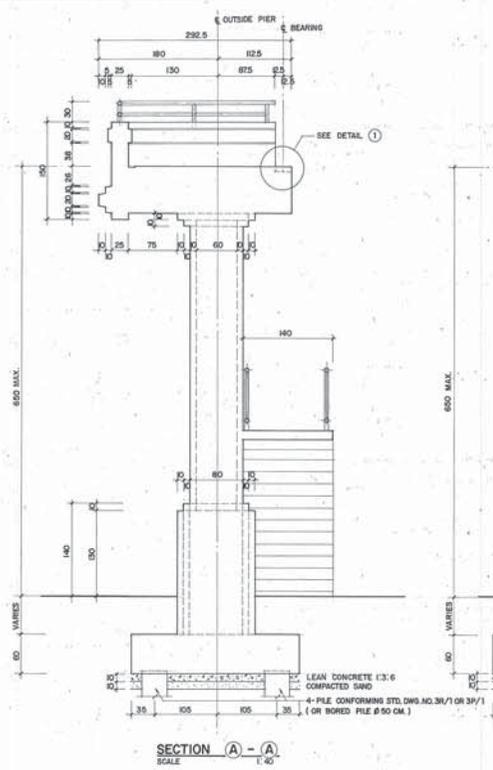
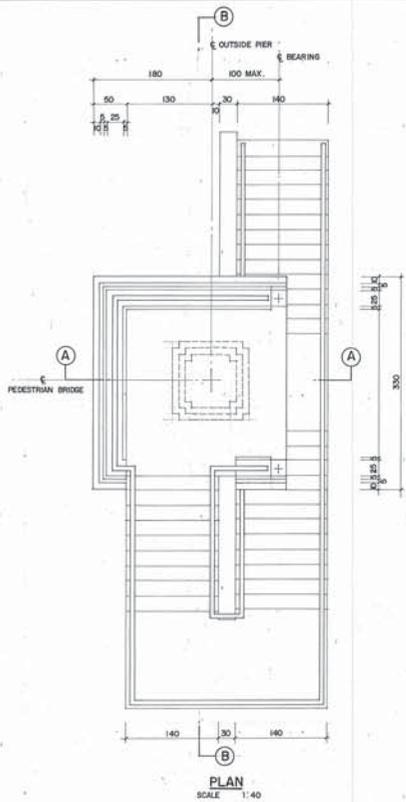
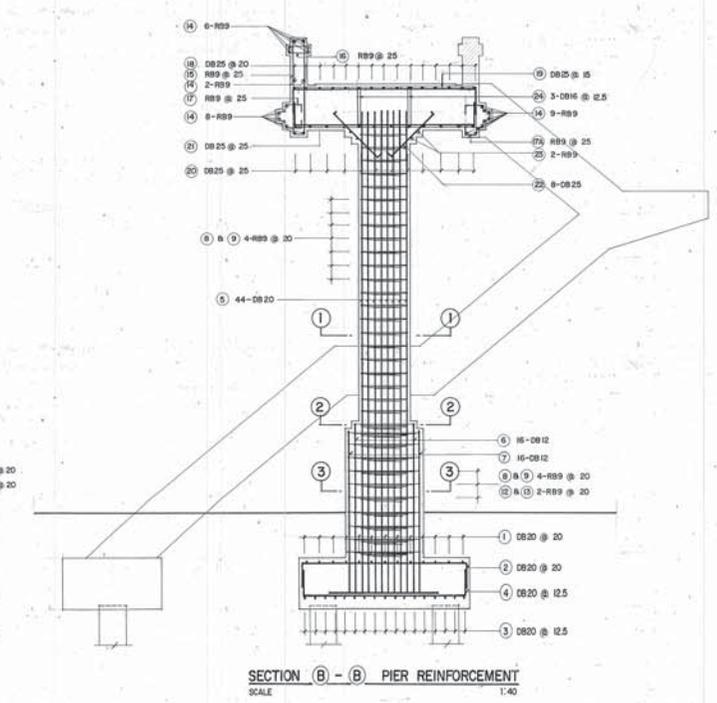
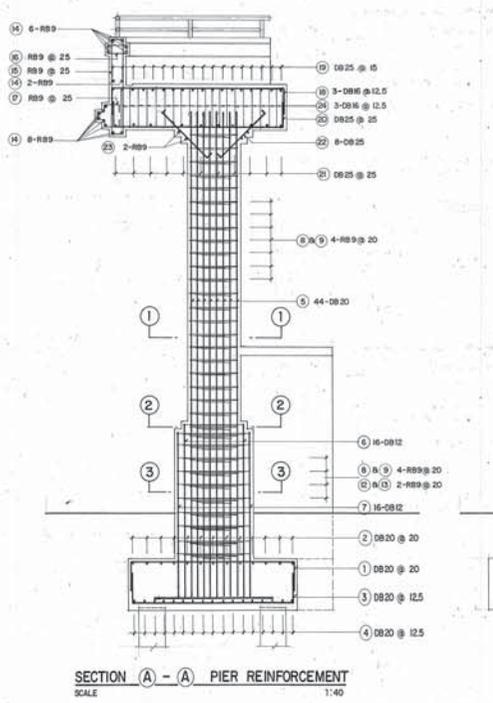


TABLE OF REINFORCEMENT		
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1 & 2	ØB20	
3 & 4	ØB20	
5	ØB20	
6	ØB12	
7	ØB12	
8	RB9	
9	RB9	
10	RB9	
11	RB9	
12	RB9	
13	RB9	
14	RB9	
15	RB9	
16	RB9	
17 & 17A	RB9	
18 & 19	ØB25	
20 & 21	ØB25	
22	ØB25	
23	RB9	
24	ØB16	



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE
 OUTSIDE PIER DETAILS FOR SPAN < 16.00 M. (TYPE II)

DESIGNED: DOH & CONSULTANTS CHECKED: *[Signature]* DATE JULY 1994

SUBMITTED: *[Signature]* SCALE AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION) DWG. NO. PS-02

APPROVED: *[Signature]* SHEET NO. 201
 (DIRECTOR GENERAL)

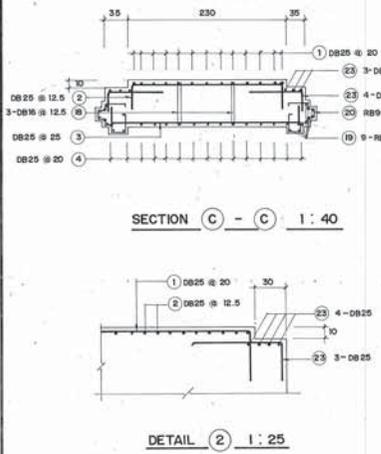
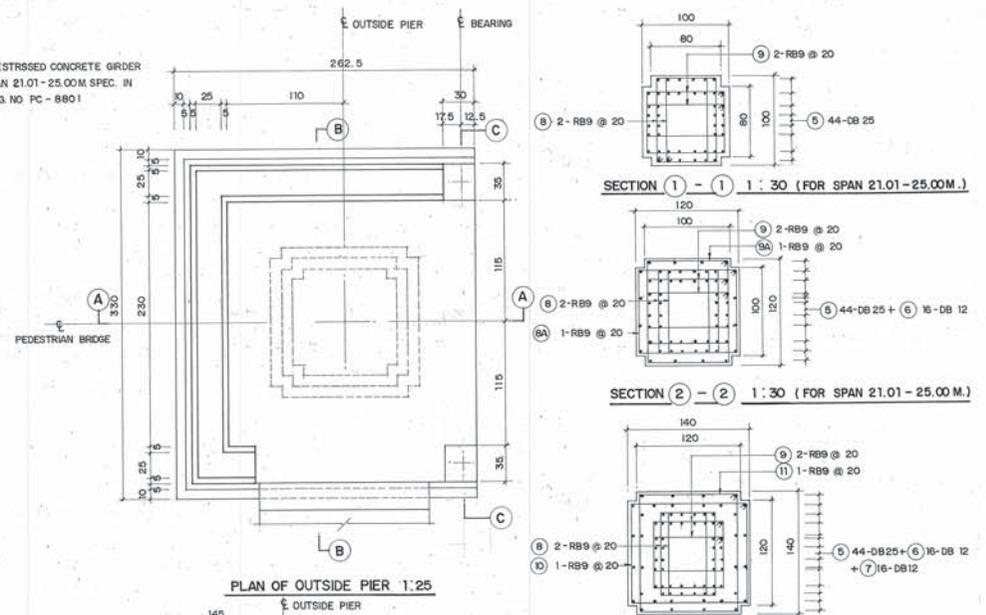
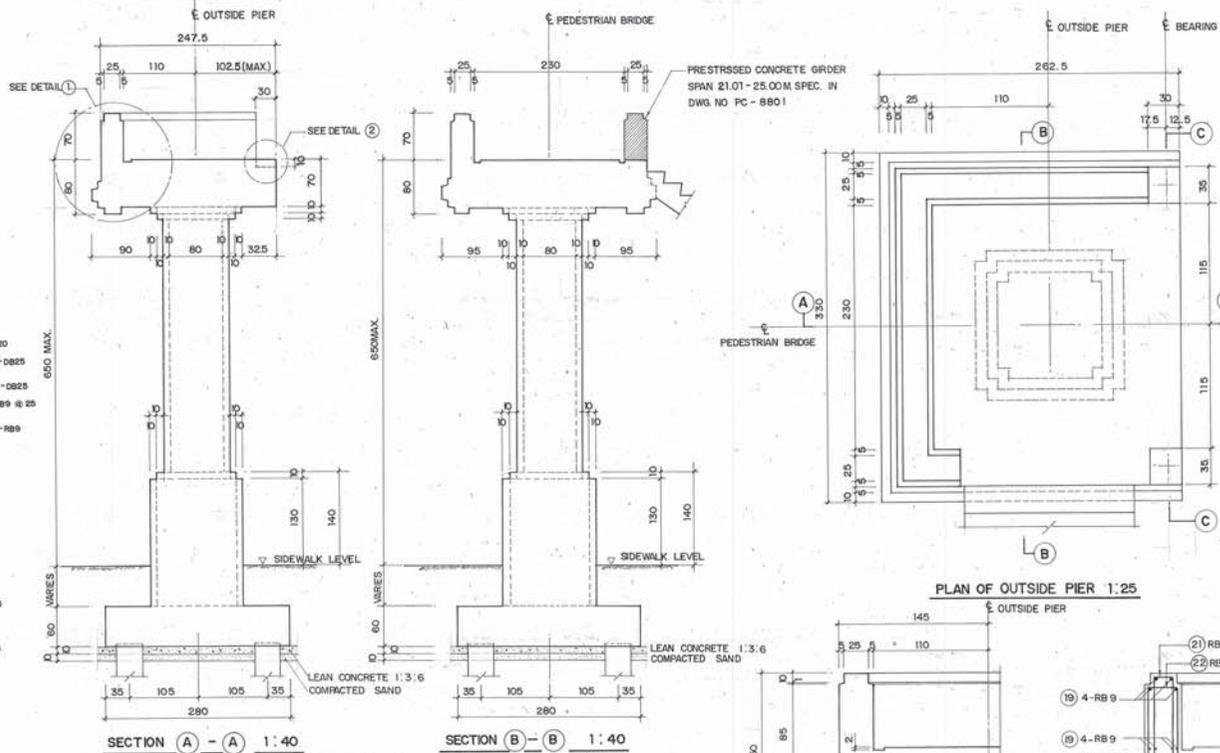
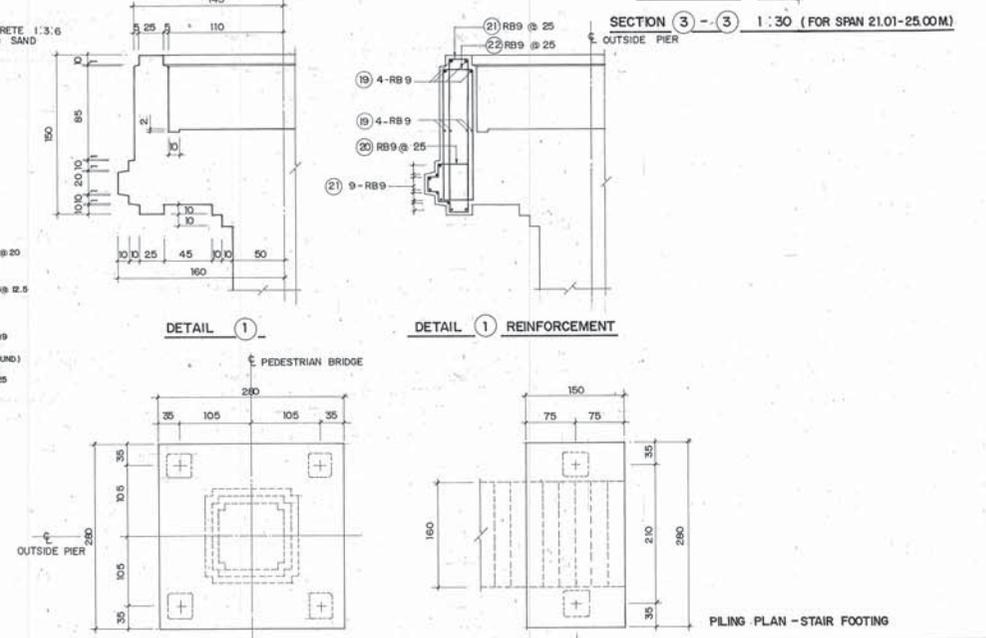
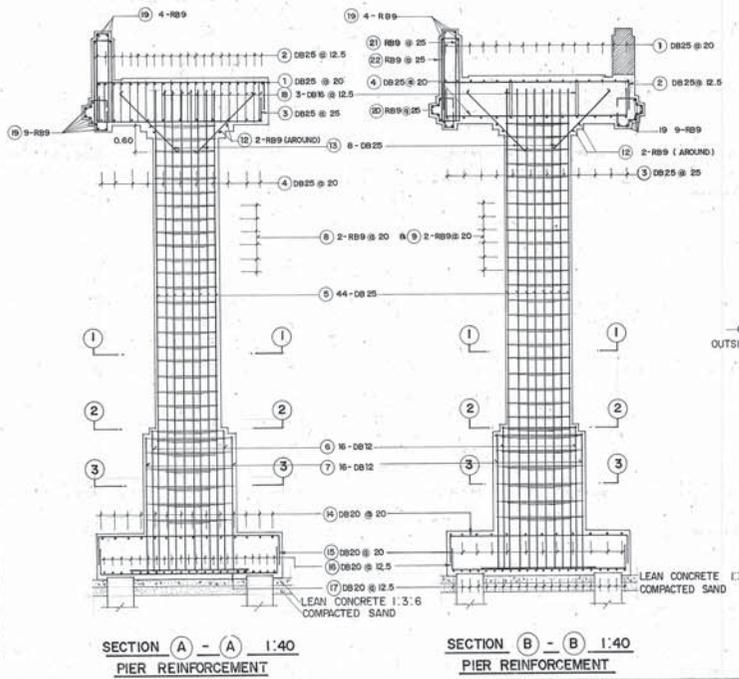


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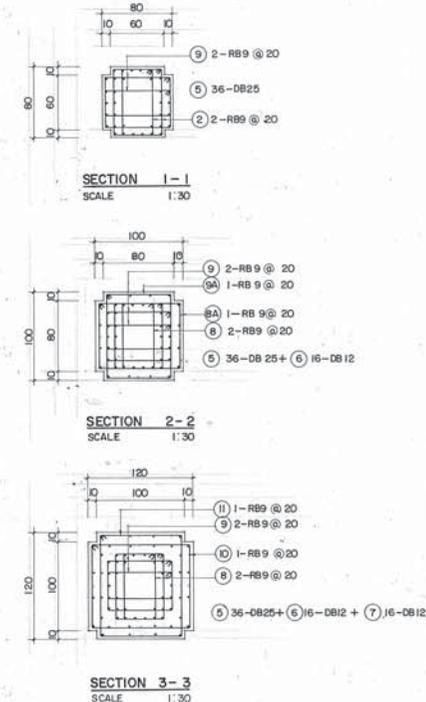
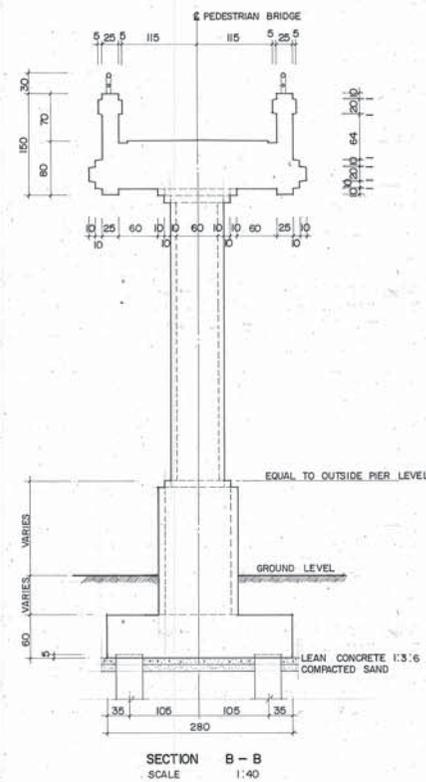
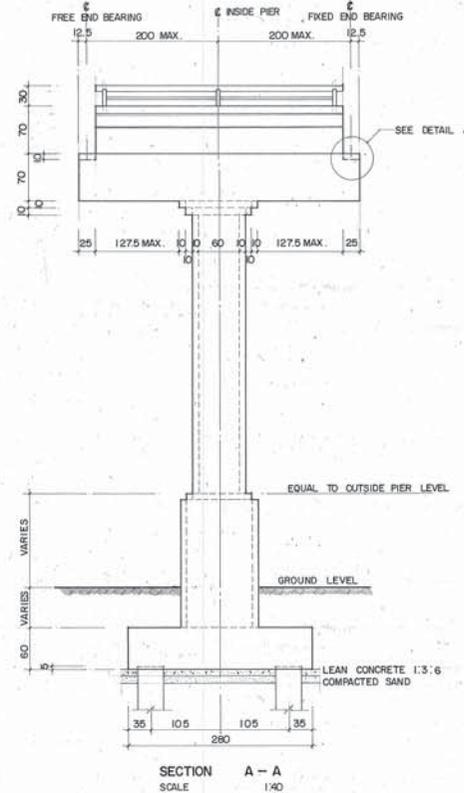
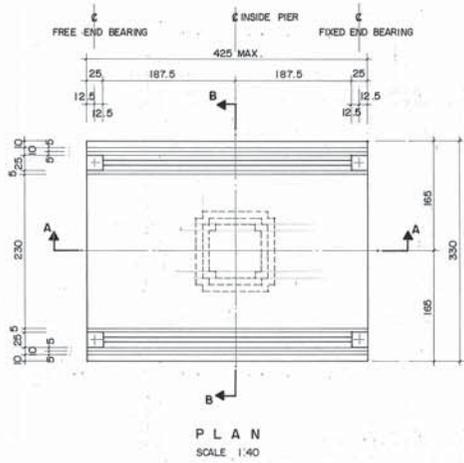
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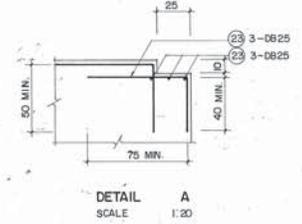
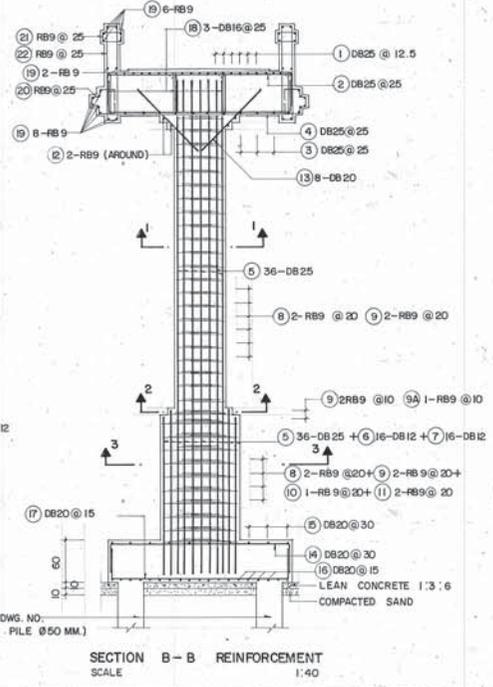
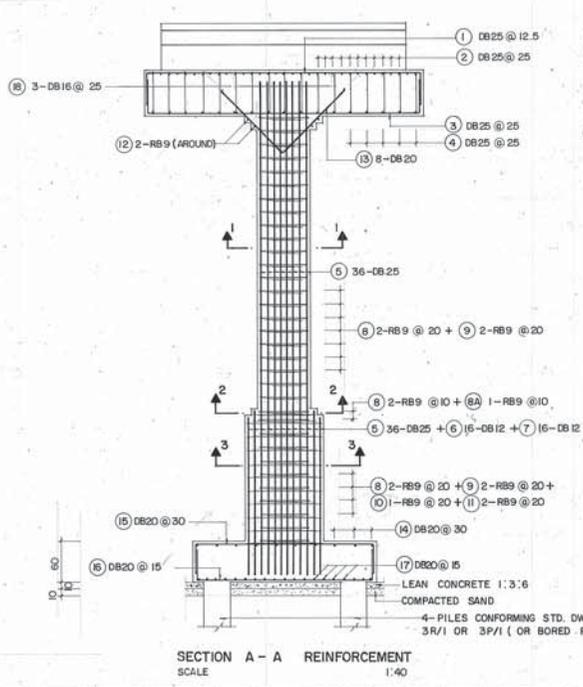
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE
 OUTSIDE PIER DETAILS FOR SPAN 21.01 - 25.00 M. (TYPE I)

DESIGNED : DOH & CONSULTANTS	CHECKED : <i>Kep</i>	DATE JULY 1994
SUBMITTED :	<i>P. Benjaporn</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>Silpa</i> (DIRECTOR GENERAL)	DWG. NO. PS-05
		SHEET NO. 204



BAR MARK	BAR DIA. (MM.)	BAR BENDING DIAGRAM
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5	DB 25	[Diagram]
6	DB 12	[Diagram]
7	DB 12	[Diagram]
8 & 8A	RB 9	[Diagram]
9 & 9A	RB 9	[Diagram]
10	RB 9	[Diagram]
11	RB 9	[Diagram]
12	RB 9	[Diagram]
13	DB 20	[Diagram]
14	DB 20	[Diagram]
15	DB 20	[Diagram]
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17	DB 20	[Diagram]
18	DB 16	[Diagram]
19	RB 9	[Diagram]
20	RB 9	[Diagram]
21	RB 9	[Diagram]
22	RB 9	[Diagram]
23	DB 25	[Diagram]



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE
 INSIDE PIER DETAILS FOR SPAN ≤ 16.00 M.

DESIGNED: DOH & CONSULTANTS CHECKED: [Signature] DATE JULY 1994
 SUBMITTED: [Signature] SCALE AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 APPROVED: [Signature] DWG. NO. PS-07
 (P&E DIRECTOR GENERAL) SHEET NO. 206

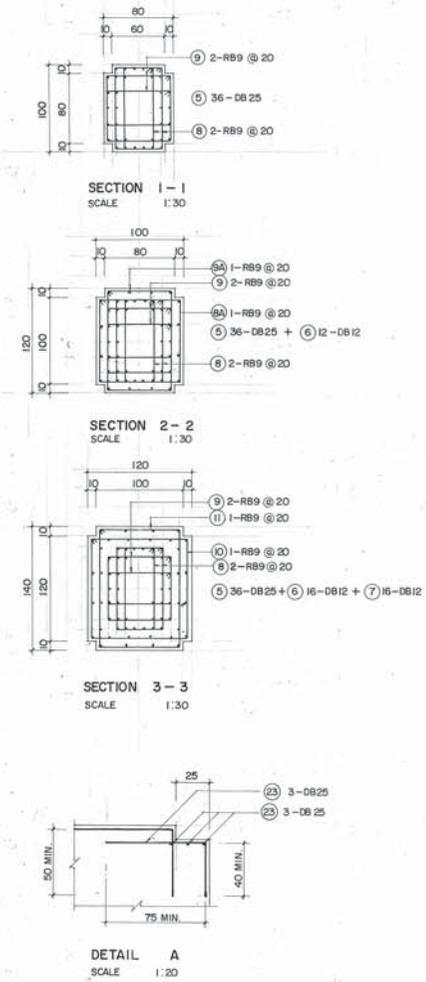
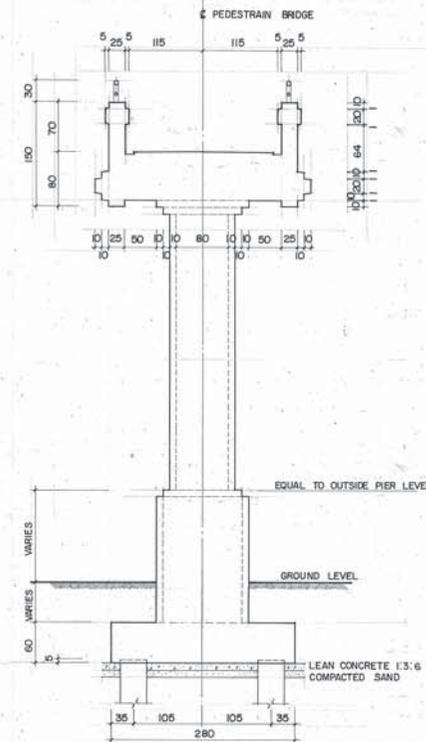
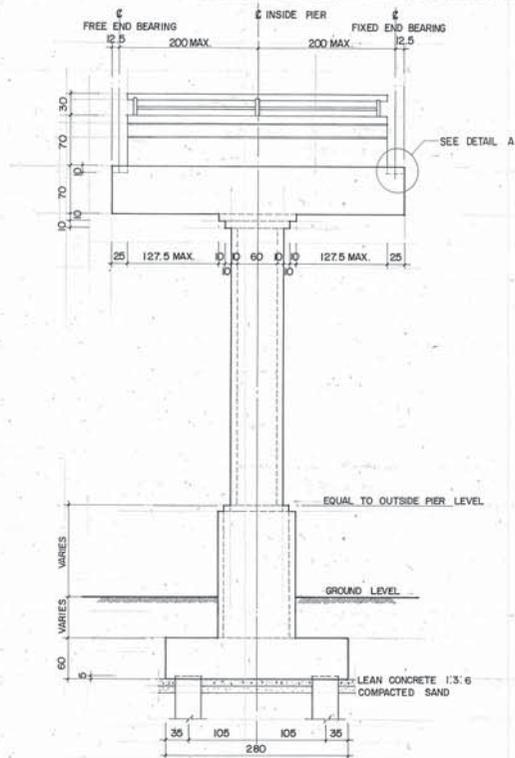
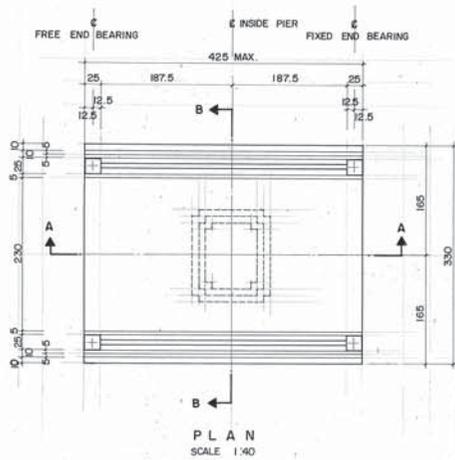
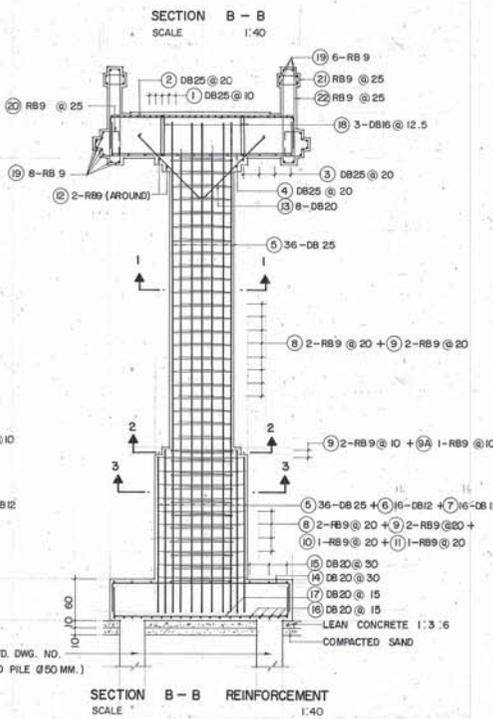
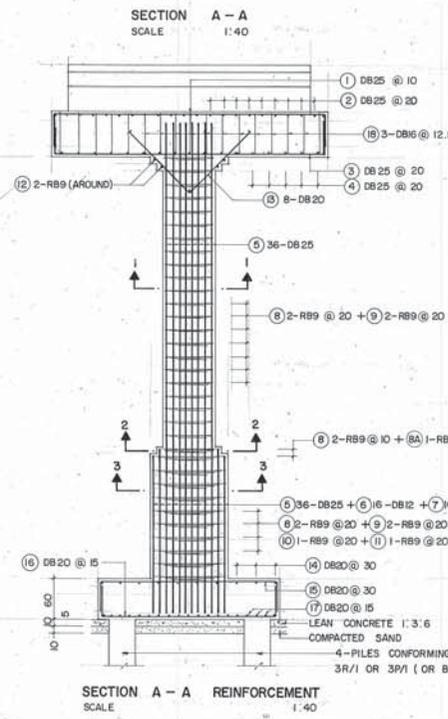


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3	DB 25	[Diagram]
4	DB 25	[Diagram]
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6	DB 12	[Diagram]
7	DB 12	[Diagram]
8 & 8A	RB 9	[Diagram]
9 & 9A	RB 9	[Diagram]
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19	RB 9	[Diagram]
20	RB 9	[Diagram]
21	RB 9	[Diagram]
22	RB 9	[Diagram]
23	DB 25	[Diagram]



KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE
 INSIDE PIER DETAILS FOR SPAN 16.01-21.00 M.

DESIGNED: DOH & CONSULTANTS CHECKED: [Signature] DATE: JULY 1994
 SUBMITTED: [Signature] SCALE: AS SHOWN
 (DIRECTOR OF LOCATION & DESIGN DIVISION)
 DWG. NO. PS-08
 APPROVED: [Signature] DIRECTOR GENERAL
 SHEET NO. 207

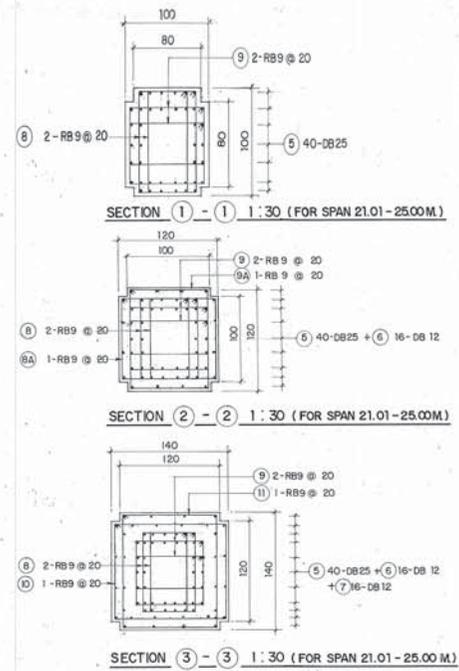
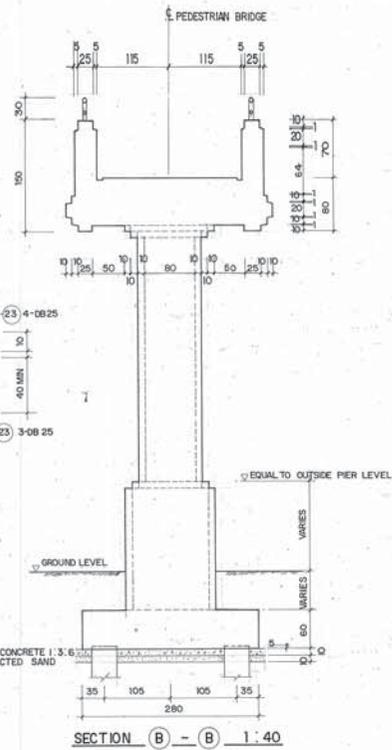
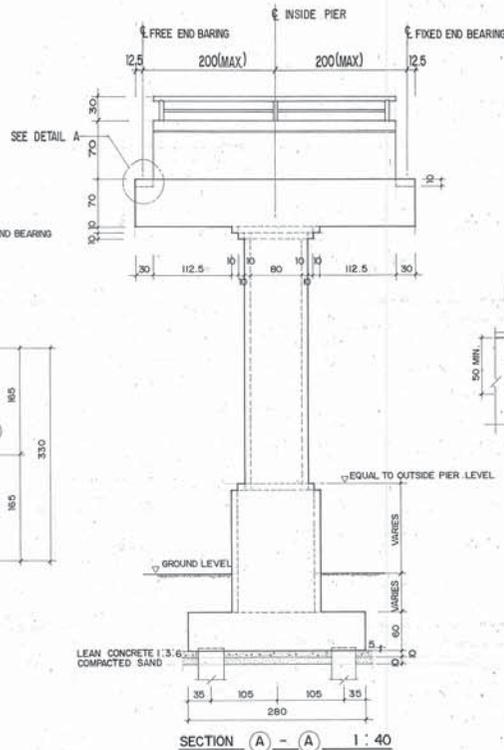
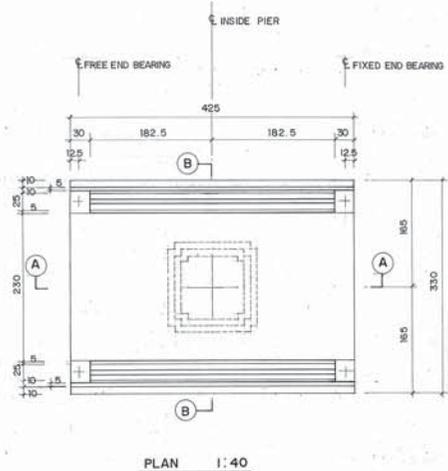
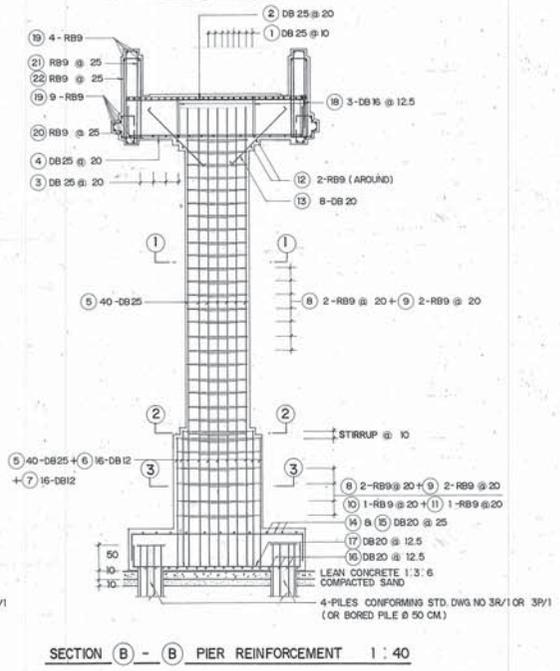
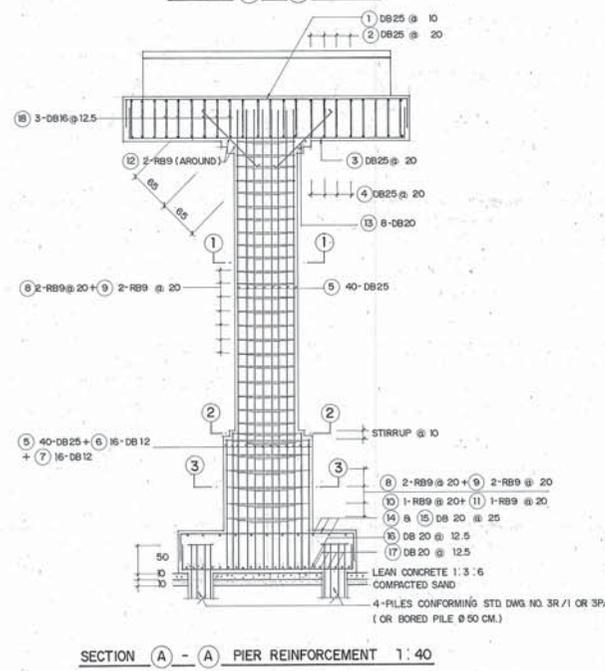


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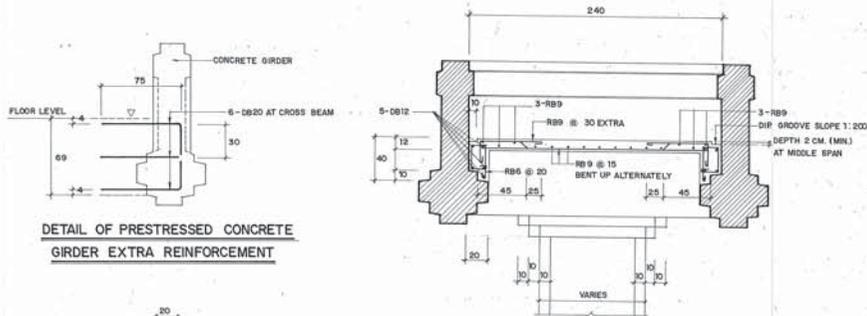
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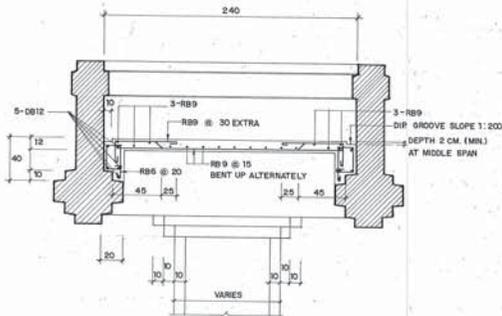
KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE
 INSIDE PIER DETAILS FOR SPAN 21.01 - 25.00M.

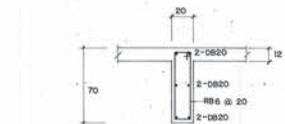
DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE : JULY 1994
SUBMITTED :	<i>[Signature]</i> DIRECTOR OF LOCATION & DESIGN DIVISION	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> DIRECTOR GENERAL	DWG. NO. PS-09
		SHEET NO. 208



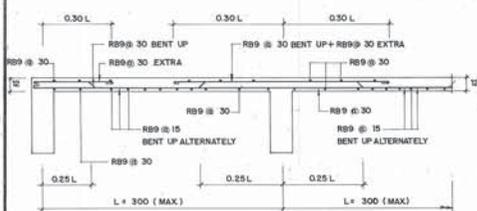
DETAIL OF PRESTRESSED CONCRETE GIRDER EXTRA REINFORCEMENT



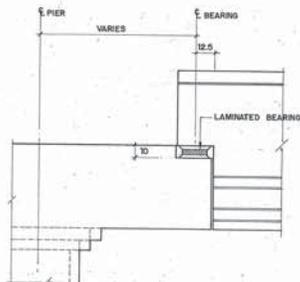
CROSS SECTION OF SLAB REINFORCEMENT 1:25



DETAIL OF CROSS BEAM REINFORCEMENT 1:25



DETAIL OF SLAB REINFORCEMENT 1:25

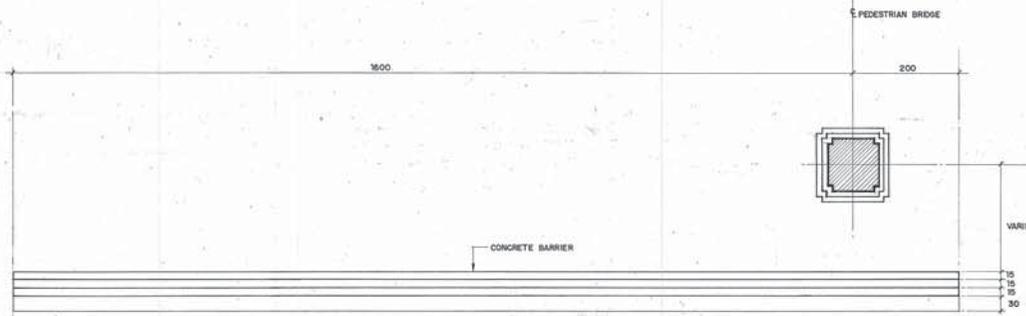


DETAIL OF BEARING

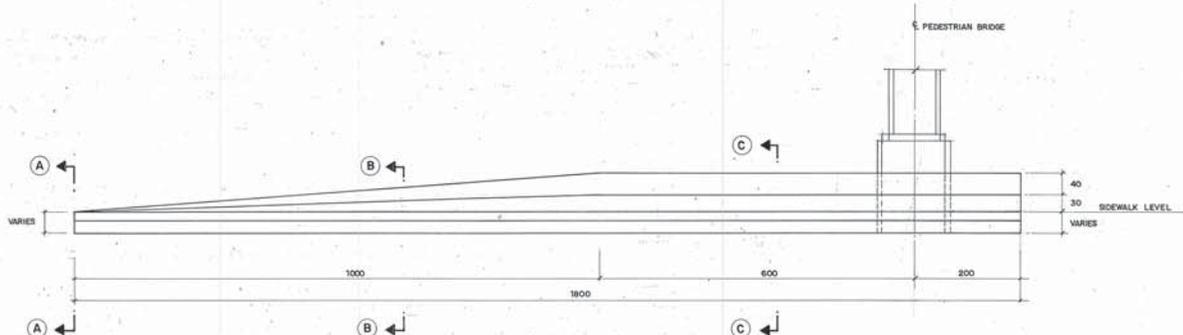
CONSTRUCTION SPECIFICATION

1. REINFORCING STEEL
 - 1.1 ROUND BAR (RB) SHALL CONFORM TIS 20 CLASS SR24
 - 1.2 DEFORMED BAR (DB) SHALL CONFORM TIS 24 CLASS SD30
2. CONCRETE
 - 2.1 A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR A 15x15x15 CM. CUBE AT 28 DAYS.
 - 2.2 CONCRETE SLUMP, MAX. 80 CM.
 - 2.3 CLEAR CONCRETE COVER SHALL BE 3.0 CM. UNLESS OTHERWISE INDICATED
4. PILES (SELECTED FROM 4.1 OR 4.2)
 - 4.1 R.C. PILE OR PRESTRESSED CONCRETE PILE 40 x 40 CM. SHALL CONFORM STD. DWG. NO. 3R/1 OR 3P/1 RESPECTIVELY HAVING ULTIMATE CAPACITY NOT LESS THAN 110 TONS FROM HILEY'S FORMULA OR 90 TONS FROM LOAD TEST.
 - 4.2 BORED PILE Ø 50 CM. HAVING ULTIMATE CAPACITY NOT LESS THAN 90 TONS FROM LOAD TEST.
5. BORED PILE
 - 5.1 BORED PILE Ø 50 CM. DEPTH NOT LESS THAN 21.00 M. OR TO SAND LAYER USING 10-DB16, LENGTH 20.00 M. (INCLUDED LAPPING) FOR MAIN REINFORCING STEEL, RB6 @ 15 MM FOR STIRRUPS AND PILE HEAD MUST BE EXTRA REINFORCED 10-DB20, LENGTH 5.00M. CONTRACTOR MUST TEST BORED PILE BY LOAD TEST AT 90 TONS. CONFORMING ASTM D1143 AND MUST HAVE TOTAL SETTLEMENT AND PERMANENT SETTLEMENT NOT OVER THAN 25 MM. AND 6.5 MM. RESPECTIVELY. ITEM OF COMPUTATION OR DETAILS SHALL BE UNDER LOCATION AND DESIGN DIVISION APPROVAL.
 - 5.2 CONCRETE SPECIFICATION FOR BORED PILE IS THE SAME AS ITEM 2.
 - 5.3 OPERATING METHOD OF BORED PILE
 - 5.3.1 CASING MUST IN VERTICAL LINE
 - 5.3.2 MUST POUR CONCRETE TO FINISHED BORE HOLE IMMEDIATELY BY CONE AND REMOVED CASING BY PRESSURED
 - 5.3.3 MUST BE NOT BORING SOIL LESS THAN 3.0 M. FROM THE PILE WHICH AGE NOT OVER 24 HRS.
 - 5.3.4 MUST HAVE 10-DB 20, 80 CM. LENGTH FOR EXTRA REINFORCING STEEL IN FOUNDATION.

- 5.3.5 TOP OF BORED PILE LEVEL MUST HIGER THAN REQUIRED LEVEL NOT LESS THAN 500 MM.
- 6 FOUNDATION LEVEL OF PEDESTRIAN BRIDGE MUST BE THE SAME LEVEL.
- 7 STAINLESS STEEL PIPE OF PEDESTRIAN BRIDGE SHALL BE APPROVED BY ENGINEER.
- 7.1 STAIRS
 - HAND RAIL (TOP - BOTTOM) Ø 2 1/2" THICKNESS 1.5 MM. (MIN) IS WELDED WITH BALUSTER (TOP - BOTTOM) AND POST.
 - POST Ø 2 1/2" THICKNESS 1.5 MM. (MIN) THE TOP AND BOTTOM IS WELDED WITH HAND RAIL AND STAINLESS STEEL PLATE 10 x 10 CM. THICKNESS 6 MM. FIXED IN STAIRS SLAB RESPECTIVELY.
 - BALUSTER Ø 1 1/2" THICKNESS 1.2 MM. (MIN) IS WELDED WITH HAND RAIL (TOP - BOTTOM)
- 7.2 PEDESTRIAN BRIDGE HAND RAIL.
 - HAND RAIL Ø 2 1/2" THICKNESS 1.5 MM. (MIN) IS WELDED WITH BALUSTER.
 - POST Ø 2 1/2" THICKNESS 1.5 MM. THE TOP AND BOTTOM IS WELDED WITH HAND RAIL AND STAINLESS STEEL PLATE 10 x 10 CM. THICKNESS 6 MM. FIXED IN PRESTRESSED CONCRETE GIRDER AND RC. WALL RESPECTIVELY.
 - BALUSTER Ø 1" THICKNESS 1.2 MM. (MIN) BOTHSIDE IS WELDED WITH POST.
- 8 WELDING SHALL CONFORM AISC SPECIFICATIONS.
- 9 STAIRS, PIER AND WALL SHALL BE NOT RENDERING.
- 10 DETAIL OF CONCRETE BARRIER SHALL CONFORM THIS DRAWING OR ENGINEER APPROVAL
- 11 ALL DIMENSIONS SHOWN ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED

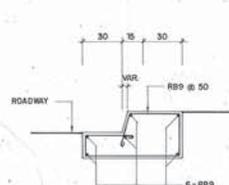


PLAN

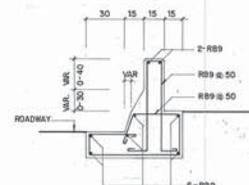


PROFILE

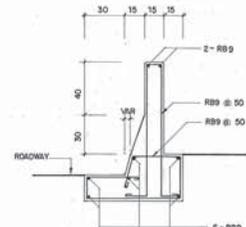
INSTALLATION CONCRETE BARRIER 1:50



SECTION A - A 1:20

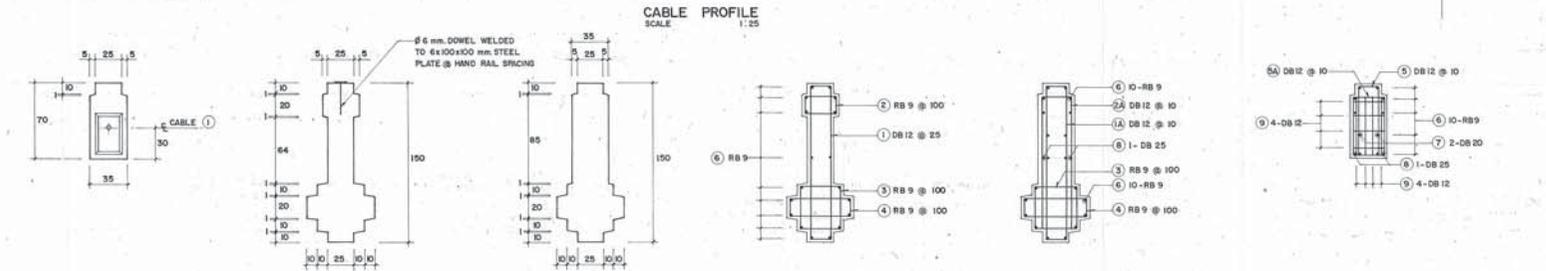
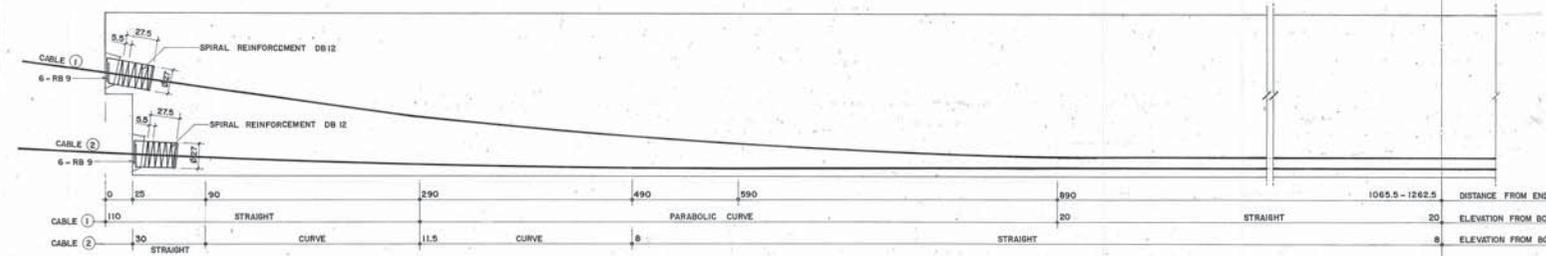
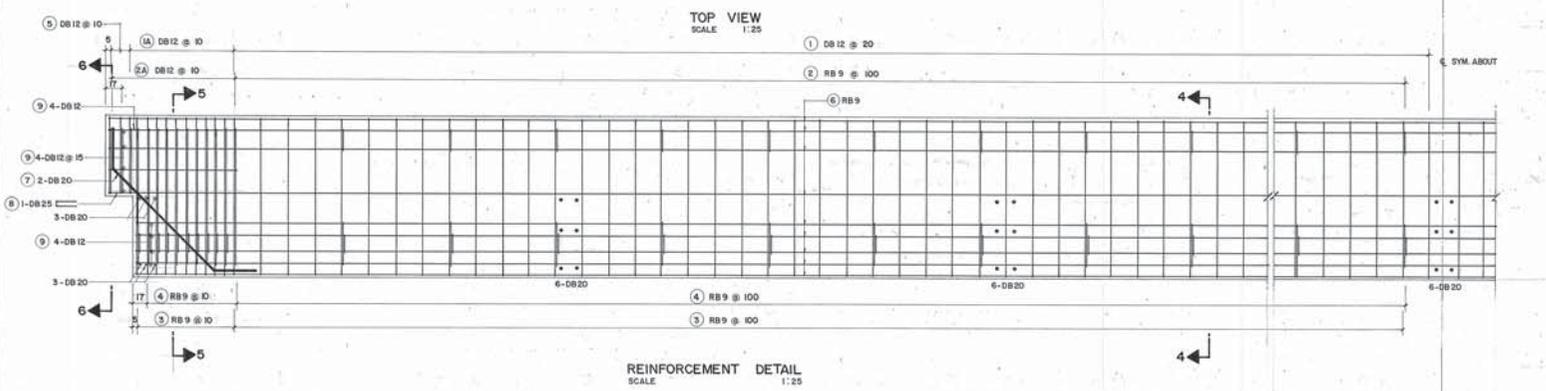
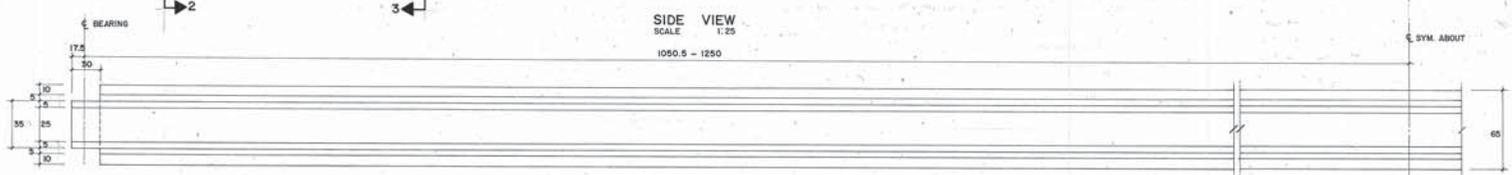
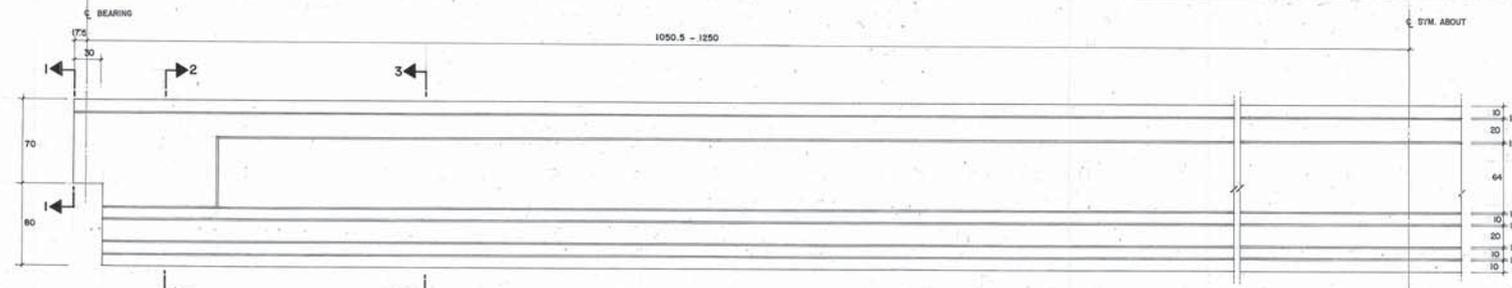


SECTION B - B 1:20



SECTION C - C 1:20

KINGDOM OF THAILAND MINISTRY OF TRANSPORT AND COMMUNICATIONS DEPARTMENT OF HIGHWAYS		
STANDARD DRAWING PEDESTRIAN BRIDGE		
CONSTRUCTION SPECIFICATION AND MISCELLANEOUS DETAILS		
DESIGNER : DOM & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE JULY 1994
SUBMITTED :	<i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> (DIRECTOR GENERAL)	DWG. NO. PS-12
		SHEET NO. 211



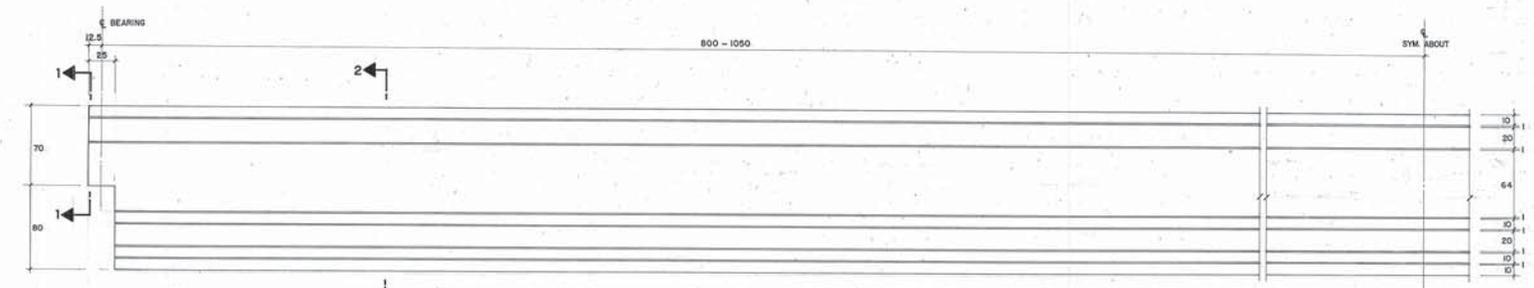
- NOTES :**
- ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
 - NO CHAMFERS SHALL BE PROVIDED.
 - PRESTRESSING SYSTEM SHALL CONFORM TO THE LATEST AASHTO OR BRITISH STANDARD.
 - PRESTRESSING TENDONS HAVE 2 CABLES WITH EACH BEARING LOAD NOT LESS THAN 2,200 KN WITH THE CORRESPONDING YIELD STRENGTH AND ULTIMATE STRENGTH NOT LESS THAN 1,670 AND 1,860 N/mm² RESPECTIVELY.
 - JACKING FORCE OF EACH CABLE SHALL BE 1,540 KN, EXCLUDING PROVISION FOR SLIPPING.
 - GROUT ALL CABLE DUCTS WITH CEMENT SLURRY APPLY EPOXY RESIN TO THE RECESSES AT BOTH ENDS OF THE GIRDER JUST BEFORE FILLING THEM WITH MORTAR.
 - CLEAR CONCRETE COVER SHALL BE 3 CM, UNLESS OTHERWISE INDICATED.
- REINFORCING STEEL**
- ROUND BAR (RB) SHALL CONFORM TIS 20 CLASS SR 24.
 - DEFORMED BAR (DB) SHALL CONFORM TIS 24 CLASS SD 30.
- CONCRETE**
- CONCRETE SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH, BASED ON 15x15x15 CM. CUBE SAMPLES, OF 40 N/mm² AND MAXIMUM SLUMP OF 8 CM.
- BRIDGE BEARING**
- BRIDGE BEARINGS SHALL BE LAMINATED BEARING CONFORMING TO THE LATEST AASHTO OR BRITISH STANDARD AND SHALL MEET WITH THE FOLLOWING PERFORMANCE REQUIREMENTS
- | | |
|---------------------------------|-------------|
| MAX. VERT. LOAD | = 300 KN. |
| MIN. VERT. LOAD | = 150 KN. |
| HOR. LONG. LOAD (FIXED BEARING) | = 10 KN. |
| HOR. TRANS. LOAD | = 8 KN. |
| HOR. MOVEMENT (FREE BEARING) | = - |
| EXPANSION | = 3 MM. |
| CONTRACTION | = 8 MM. |
| ROTATION | = 0.05 RAD. |
- BRIDGE BEARING MUST BE PLACED HORIZONTALLY. NON SHRINKAGE MATERIAL SHALL BE USED IF ANY ADJUSTMENT TO THE BRIDGE BEARING SEATINGS IS REQUIRED.

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA. (MM.)	BAR BENDING DIAGRAM
1	DB 12	
1A	DB 12	
2	RB 9	
2A	DB 12	
3	RB 9	
4	RB 9	
5	DB 12	
5A	DB 12	
6	RB 9	
7	DB 20	
8	DB 25	
9	DB 12	

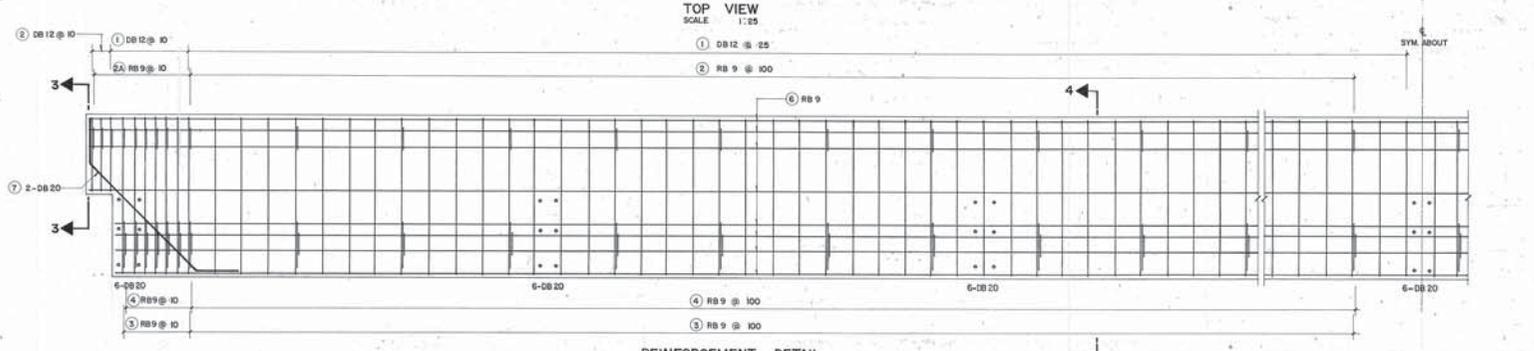
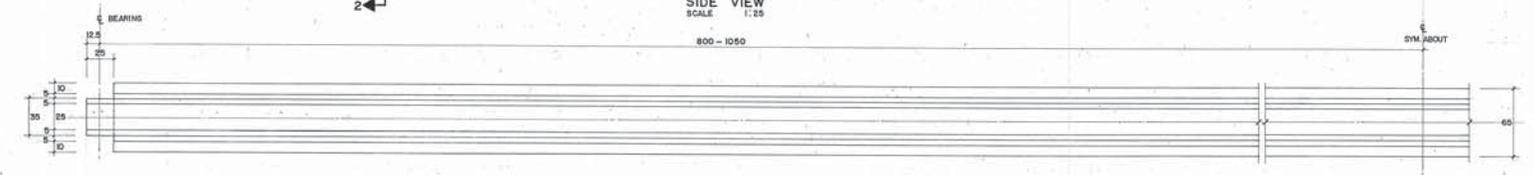
KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PRESTRESSED CONCRETE GIRDER
 FOR SPAN 21.01 - 25.00 M. (PC 8801)

DESIGNED : DOH & CONSULTANTS	CHECKED : <i>[Signature]</i>	DATE : JULY 1994
SUBMITTED :	<i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN
APPROVED :	<i>[Signature]</i> P.C. (DIRECTOR GENERAL)	DWG. NO. : PS-13
		SHEET NO. 212

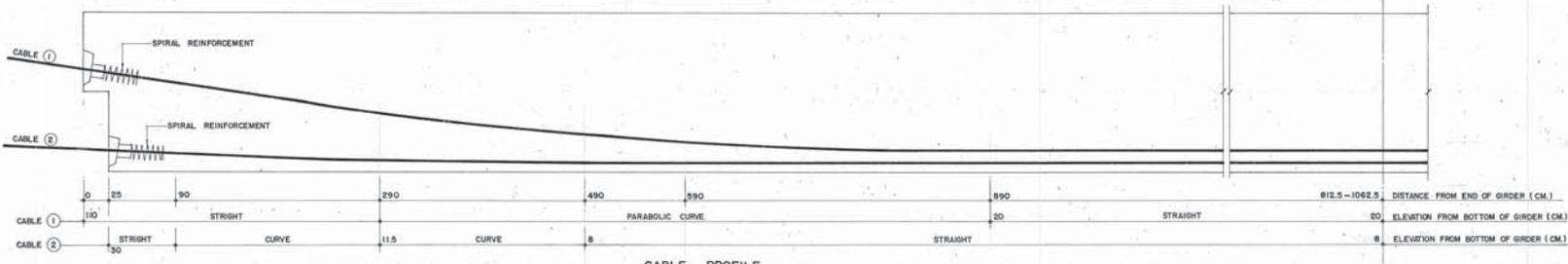


SIDE VIEW
SCALE 1:25

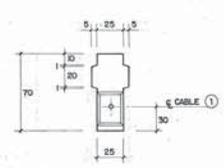


TOP VIEW
SCALE 1:25

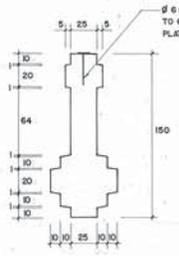
REINFORCEMENT DETAIL
SCALE 1:25



CABLE PROFILE
SCALE 1:25



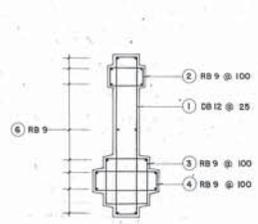
SECTION 1 - 1
SCALE 1:25



SECTION 2 - 2
SCALE 1:25



SECTION 3 - 3
SCALE 1:25



SECTION 4 - 4
SCALE 1:25

NOTES:

1. ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED.
2. NO CHAMFERS SHALL BE PROVIDED.
3. PRESTRESSING SYSTEM SHALL CONFORM TO THE LATEST AASHTO OR BRITISH STANDARD.
4. PRESTRESSING TENDONS HAVE 2 CABLES WITH EACH BEARING LOAD NOT LESS THAN 1,250 KN. WITH THE CORRESPONDING YIELD STRENGTH AND ULTIMATE STRENGTH NOT LESS THAN 1,670 AND 1,860 N/mm² RESPECTIVELY.
5. JACKING FORCE OF EACH CABLE SHALL BE 875 KN EXCLUDING PROVISION FOR SLIPPING.
6. GROUT ALL CABLE DUCTS WITH CEMENT SLURRY APPLY EPOXY RESIN TO THE RECESSES AT BOTH ENDS OF THE GIRDER JUST BEFORE FILLING THEM WITH MORTAR.
7. CLEAR CONCRETE COVER SHALL BE 3 CM. UNLESS OTHERWISE INDICATED.
8. REINFORCING STEEL
 - 8.1 ROUND BAR (RB) SHALL CONFORM TIS 20 CLASS SR24.
 - 8.2 DEFORMED BAR (DB) SHALL CONFORM TIS 24 CLASS SD 30.
9. CONCRETE SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH, BASE ON 15x15x15 CM. CUBE SAMPLES, OF 40 N/mm² AND MAXIMUM SLUMP OF 8 CM.
10. BRIDGE BEARING
 - 10.1 BRIDGE BEARINGS SHALL BE LAMINATED BEARING CONFORMING TO THE LATEST AASHTO OR BRITISH STANDARD SHALL MEET WITH THE FOLLOWING PERFORMANCE REQUIREMENTS:

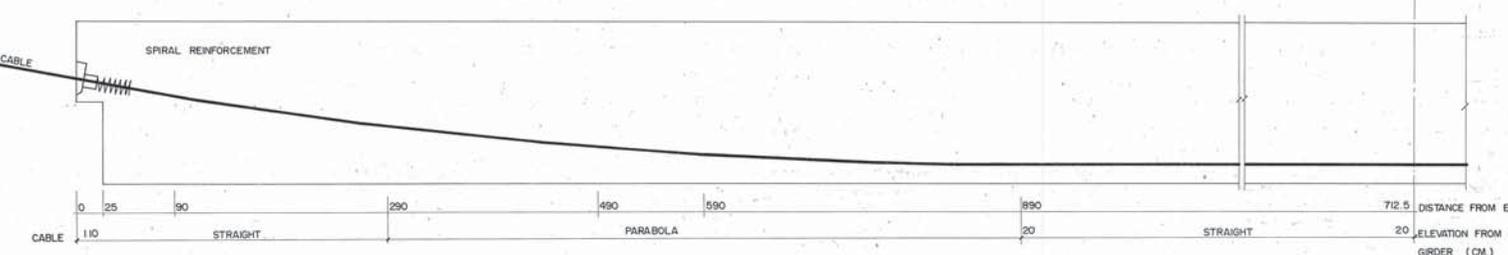
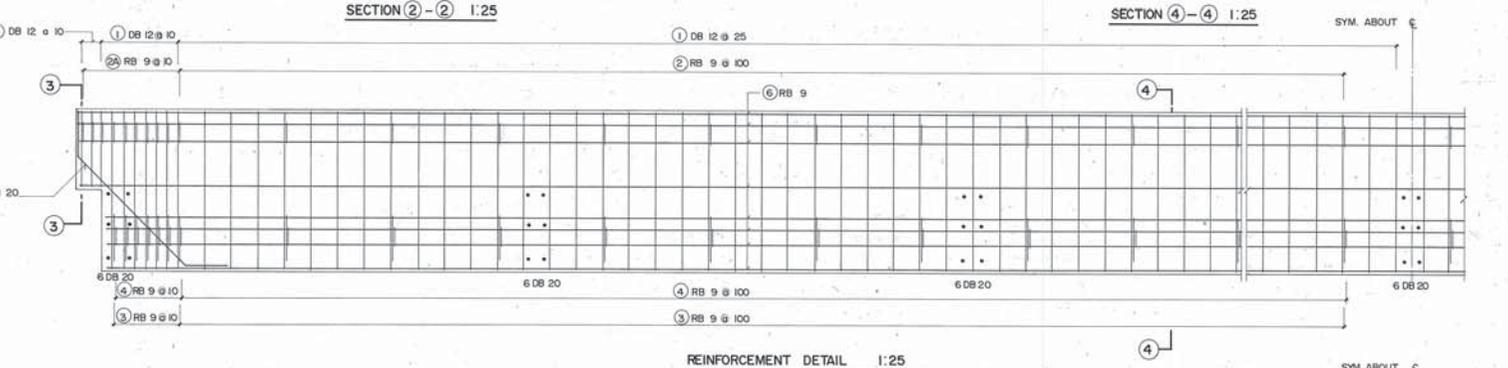
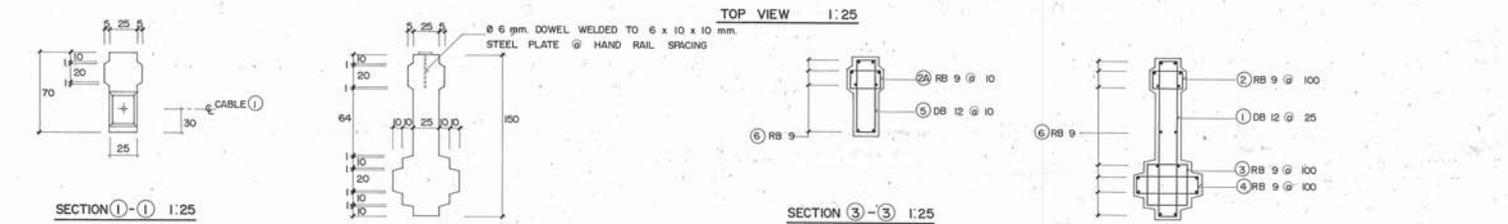
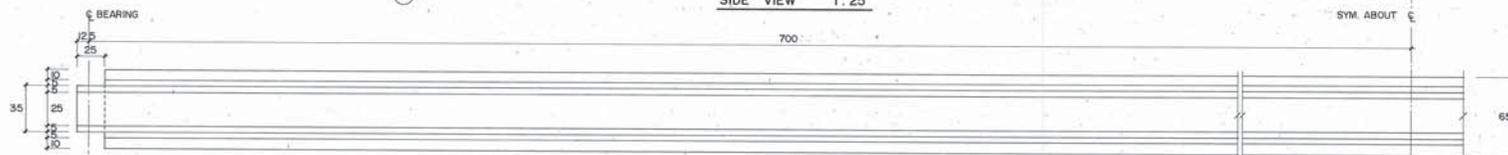
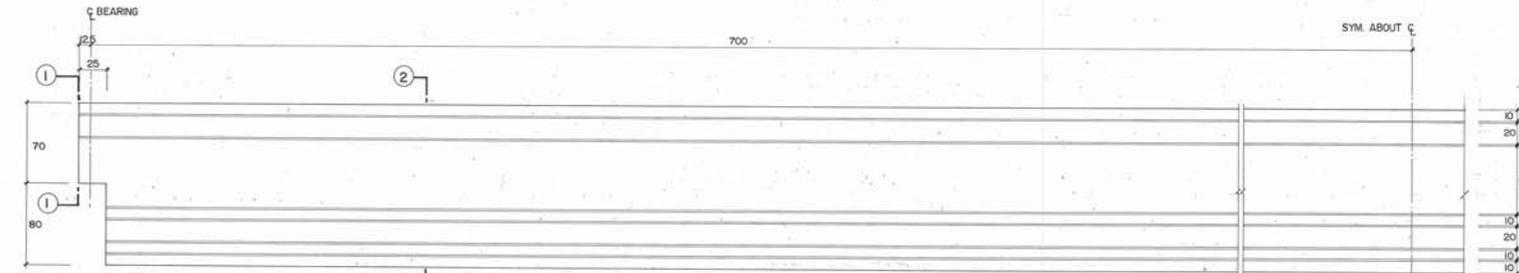
MAX. VERT. LOAD	= 250 KN.
MIN. VERT. LOAD	= 125 KN.
HOR. LONG. LOAD (FIXED BEARING)	= 10 KN.
HOR. TRANS. LOAD	= 8 KN.
HOR. MOVEMENT (FREE BEARING)	=
EXPANSION	= 3 MM.
CONTRACTION	= 8 MM.
ROTATION	= 0.05 RAD.
 - 10.2 BRIDGE BEARING MUST BE PLACED HORIZONTALLY. NON SHRINKAGE MATERIAL SHALL BE USED IF ANY ADJUSTMENT TO THE BRIDGE BEARING SEATINGS IS REQUIRED.

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA. (MM.)	BAR BENDING DIAGRAM
1	DB 12	
2, 2A	RB 9	
3	RB 9	
4	RB 9	
5	DB 12	
6	RB 9	
7	DB 20	

KINGDOM OF THAILAND
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
PRESTRESSED CONCRETE GIRDER
FOR SPAN 16.01 - 21.00 M. (PC 8802)

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN	
APPROVED: <i>[Signature]</i> P.C. (DIRECTOR GENERAL)	DWG. NO. PS-14	
		SHEET NO. 213



- NOTES**
- ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED
 - NO CHAMFERS SHALL BE PROVIDED
 - PRESTRESSING SYSTEM SHALL CONFORM TO THE LATEST AASHTO OR BRITISH STANDARD
 - PRESTRESSING TENDONS HAVE 1 CABLES WITH EACH BREAKING LOAD NOT LESS THAN 1250 KN WITH THE CORRESPONDING YIELD STRENGTH AND ULTIMATE STRENGTH NOT LESS THAN 1670 AND 1860 N/mm² RESPECTIVELY
 - JACKING FORCE OF EACH CABLE SHALL BE 875 KN, EXCLUDING PROVISION FOR SLIPING.
 - GROUT ALL CABLE DUCTS WITH CEMENT SLURRY APPLY EPOXY RESIN TO THE RECESSES AT BOTH ENDS OF GIRDER JUST BEFORE FILLING THEM WITH MORTAR.
 - CLEAR CONCRETE COVER SHALL BE 3 CM. UNLESS OTHERWISE INDICATED.
 - REINFORCING STEEL
 - Ø 1 ROUND BAR (RB) SHALL CONFORM TO S 20 CLASS SR 24
 - Ø 2 DEFORMED BAR (DB) SHALL CONFORM TO S 24 CLASS SD 30
 - CONCRETE SHALL HAVE THE 28 DAYS MINIMUM ULTIMATE COMPRESSIVE STRENGTH, BASED ON 15 x 15 x 15 CM. CUBE SAMPLES, OF 40 N/mm² AND MAXIMUM SLUMP OF 8 CM.
 - BRIDGE BEARING
 - BRIDGE BEARING SHALL BE LAMINATED BEARING CONFORMING TO THE LATEST AASHTO OR BRITISH STANDARD AND SHALL MEET WITH THE FOLLOWING PERFORMANCE REQUIREMENTS.

MAX VERT. LOAD	= 200 KN.
MIN VERT. LOAD	= 100 KN.
HOR. LONG. LOAD (FIXED BEARING)	= 10 KN.
HOR. TRANS. LOAD	= 8 KN.
HOR. MOVEMENT (FREE BEARING)	= -
EXPANSION	= 3 MM.
CONTRACTION	= 8 MM.
ROTATION	= 0.05 RAD.
 - BRIDGE BEARING MUST BE PLACED HORIZONTALLY. NON SHRINKAGE MATERIAL SHALL BE USED IF ANY ADJUSTMENT TO THE BRIDGE BEARING SEATINGS IS REQUIRED.

TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA. (mm.)	BAR BENDING DIAGRAM
1	DB 12	
2 & 2A	RB 9	
3	RB 9	
4	RB 9	
5	DB 12	
6	RB 9	
7	DB 20	

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE
 PRESTRESSED CONCRETE GIRDER FOR SPAN 14.00 M. (PC-8603)

DESIGNED: DOH & CONSULTANTS	CHECKED: <i>[Signature]</i>	DATE: JULY 1994
SUBMITTED: <i>[Signature]</i> (DIRECTOR OF LOCATION & DESIGN DIVISION)	SCALE AS SHOWN	
APPROVED: <i>[Signature]</i> Per. DIRECTOR GENERAL	DWG. NO. PS-15	
		SHEET NO. 214

CABLE PROFILE 1:25

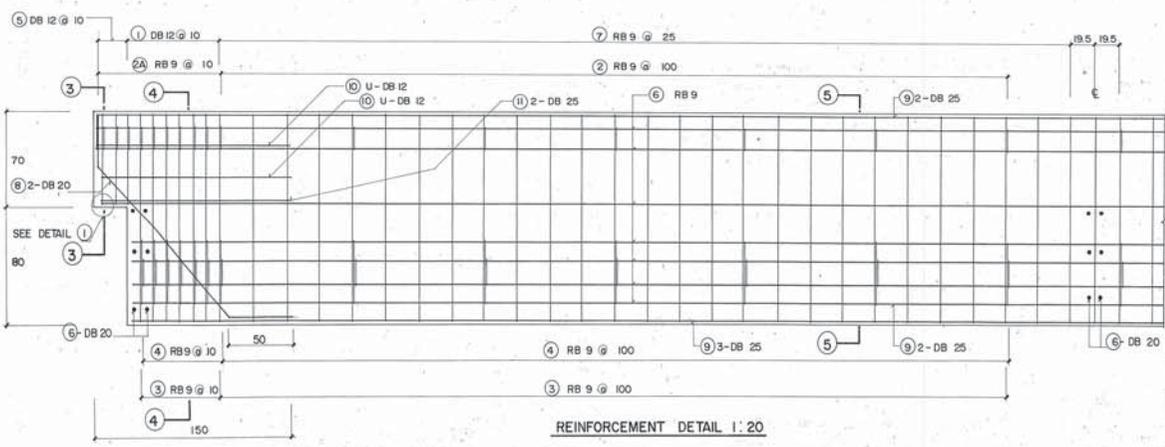
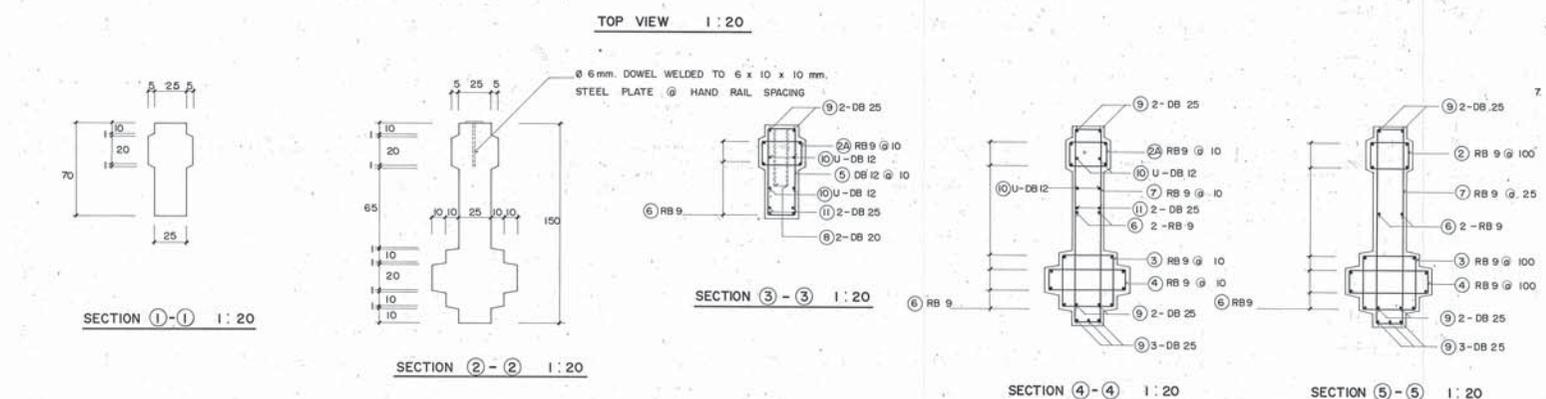
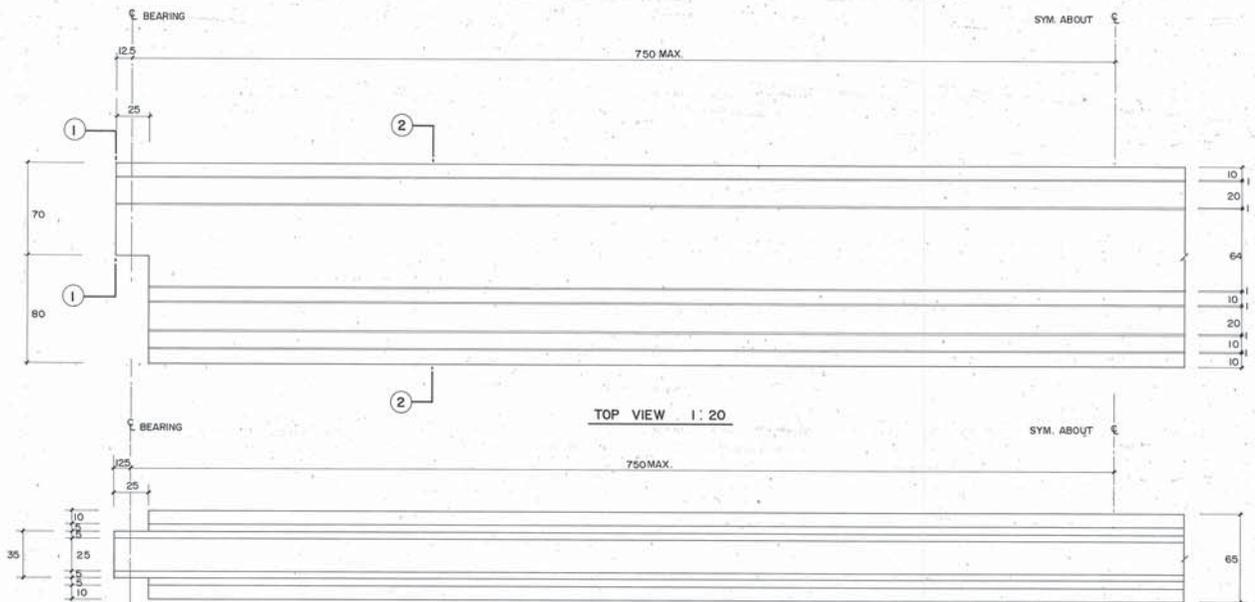


TABLE OF REINFORCEMENT		
BAR MARK	BAR DIA. (mm.)	BAR BENDING DIAGRAM
1	DB 12	1
2	RB 9	2, 2a
3	RB 9	3
4	RB 9	4
5	DB 12	5
6	RB 9	6
7	RB 9	7
8	DB 20	8
9	DB 25	9
10	DB 12	10
11	DB 25	11

- NOTES**
- ALL DIMENSIONS ARE IN CENTIMETERS UNLESS OTHERWISE INDICATED
 - NO CHAMFERED SHALL BE PROVIDED
 - REINFORCING STEEL
 - ROUND BAR (RB) SHALL CONFORM TIS 20 CLASS SR 24
 - DEFORMED BAR (DB) SHALL CONFORM TIS 24 CLASS SD 30
 - CONCRETE
 - A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 30 N/mm² FOR A 15x15x15 CM. CUBE AT 28 DAYS
 - CONCRETE SLUMP, MAX 8.0 CM.
 - CLEAR CONCRETE COVER SHALL BE 3.0 CM. UNLESS OTHERWISE INDICATED
 - BEARING
 - BEARING SHALL BE LAMINATED BEARING CONFORMING TO THE LATEST AASHTO OR BRITISH STANDARDS AND SHALL MEET WITH THE FOLLOWING PERFORMANCE REQUIREMENTS

MAX VERT. LOAD	= 217 KN.
MIN VERT. LOAD	= 145 KN.
HOR. LONG LOAD (FIXED BEARING)	= 44 KN.
HOR. TRANS. LOAD	= 27 KN.
HOR. MOVEMENT	= 4 MM.
EXPANSION	= 2 MM.
CONTRACTION	= 3 MM.
ROTATION	= 0.003 RAD.
 - BEARING MUST BE PLACED HORIZONTALLY. NON SHRINKAGE MATERIAL SHALL BE USED IF ANY ADJUSTMENT TO THE BRIDGE BEARING SEATINGS IS REQUIRED.
 - LAP LENGTH SHALL NOT BE LESS THAN 40 DIAMETERS OF BIGGER BAR FOR PLAIN BAR AND 24 DIAMETERS OF BIGGER BAR FOR DEFORMED BAR.

KINGDOM OF THAILAND
 MINISTRY OF TRANSPORT AND COMMUNICATIONS
 DEPARTMENT OF HIGHWAYS

STANDARD DRAWING
 PEDESTRIAN BRIDGE

REINFORCED CONCRETE GIRDER FOR SPAN = 15.00 M. (RC-920/1)

DESIGNED BY: DOH & CONSULTANTS	CHECKED: <i>Kejap</i>	DATE: JULY 1994
SUBMITTED BY:	SCALE AS SHOWN	
APPROVED BY: <i>Shee</i>	DWG. NO. PS-16	
FOR DIRECTOR GENERAL		SHEET NO. 215