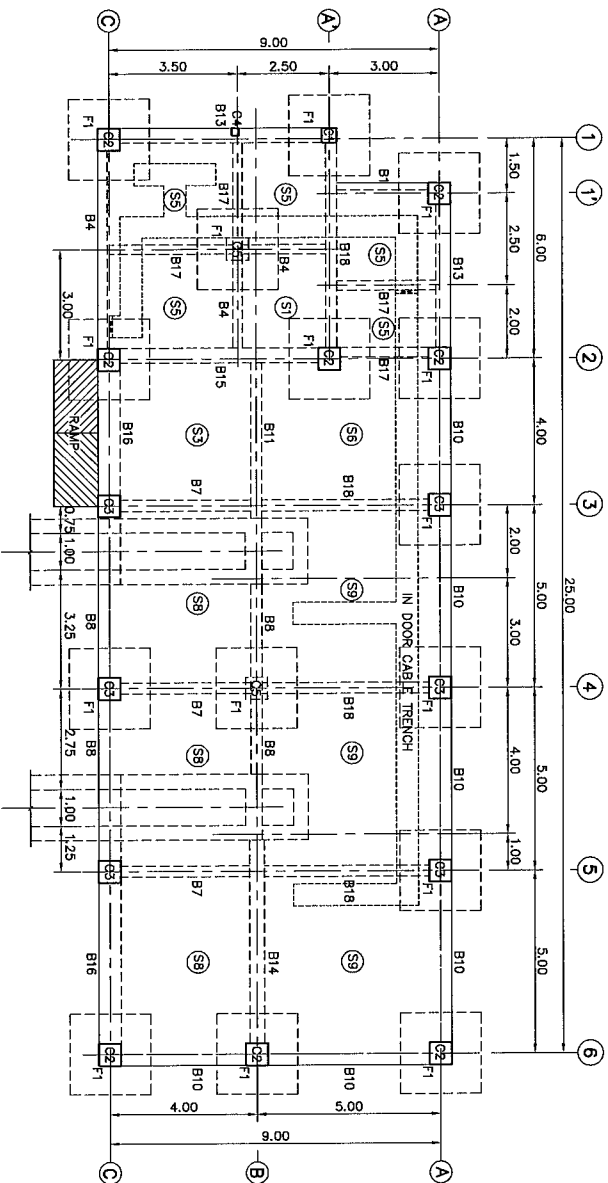
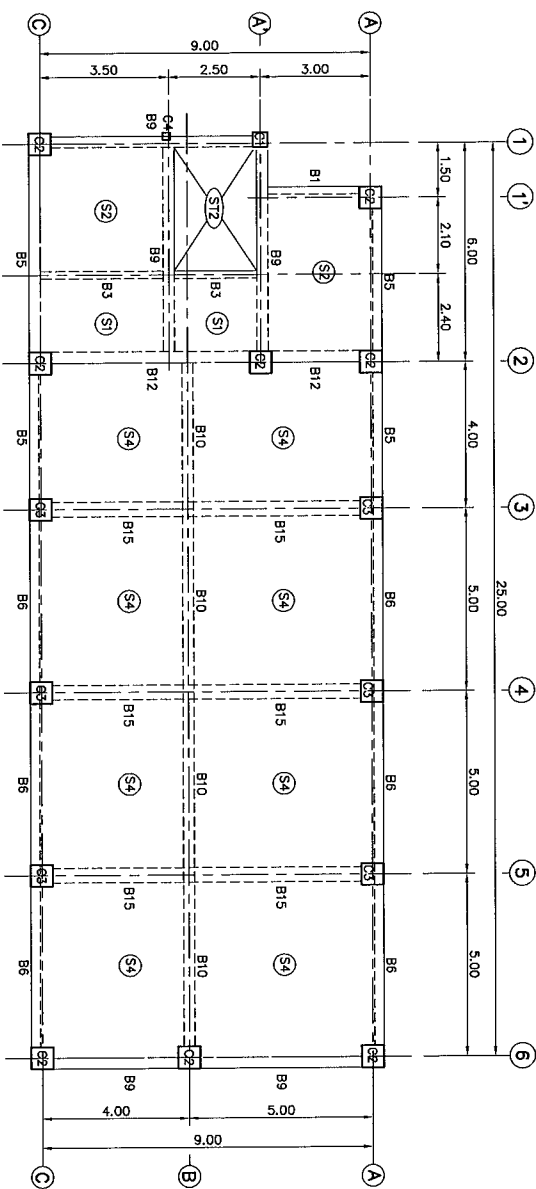




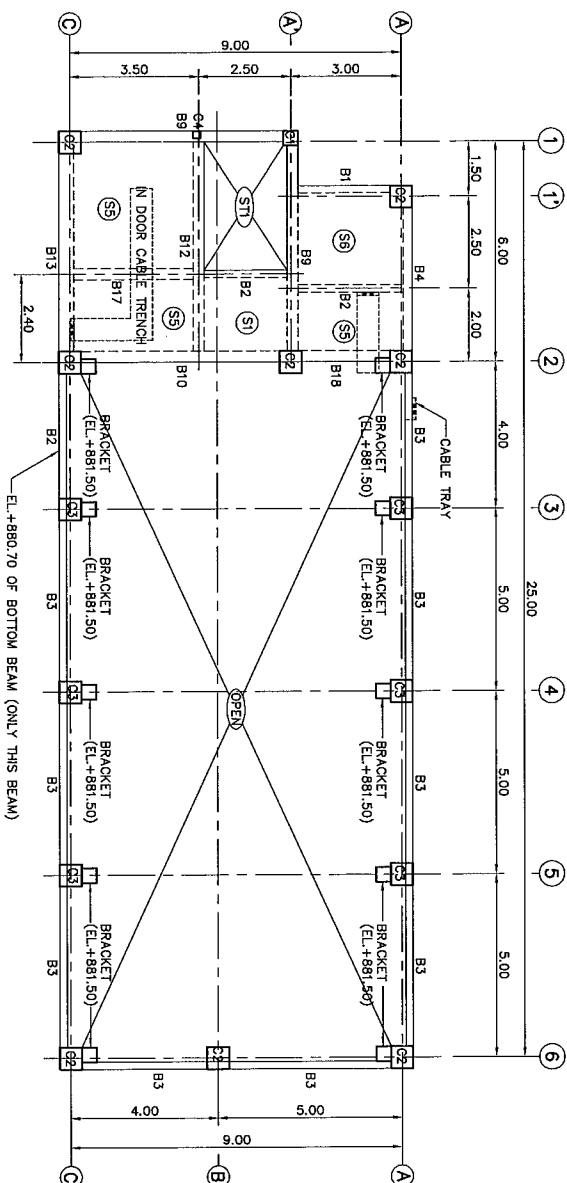
GROUND FLOOR PLAN (EL.+876.20)

SCALE 1:100



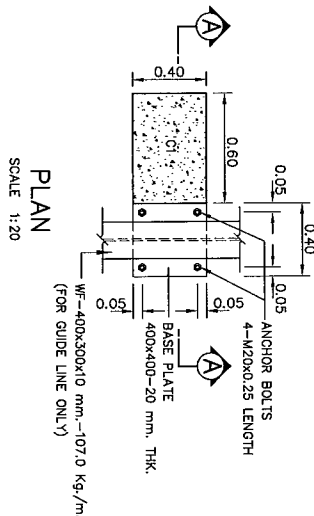
ROOF DECK PLAN (EL.+884.20)

SCALE 1:100



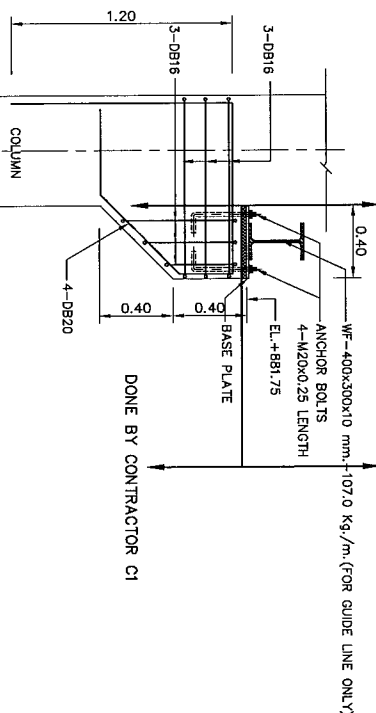
SECOND FLOOR PLAN (EL.+880.20)

SCALE 1:100



PLAN

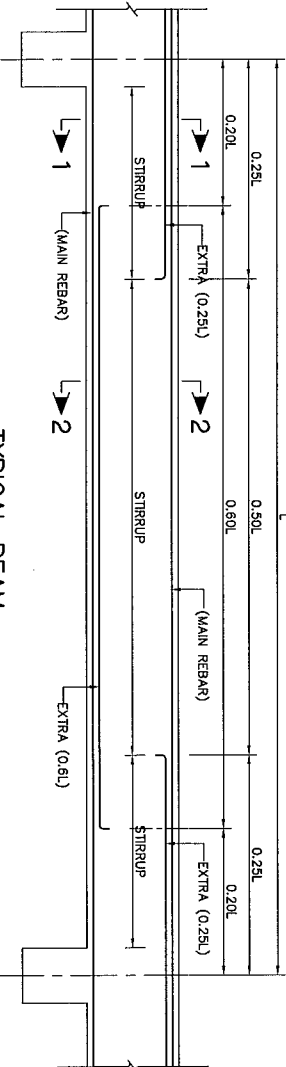
SCALE 1:20



SECTION A-A

SCALE 1:20

BRACKET



TYPICAL BEAM

NOT TO SCALE

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
2. REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
3. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-0N-01.

REFERENCE DRAWINGS :

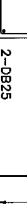
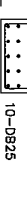
1. POWERHOUSE, PLANS
2. POWERHOUSE, BEAM REINFORCEMENT DETAILS
3. POWERHOUSE, SLAB AND COLUMN REINFORCEMENT DETAILS
4. POWERHOUSE, SLAB, STAIR AND FOOTING REINFORCEMENT DETAILS
5. POWERHOUSE, CABLE TRENCH DETAILS
6. POWERHOUSE, REINFORCEMENT DETAILS (SHEET 2/3)

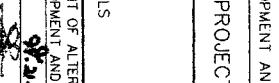
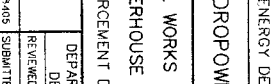
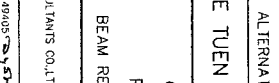
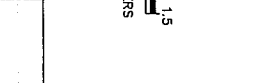
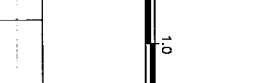
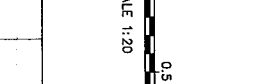
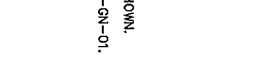
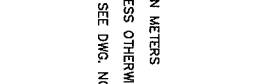
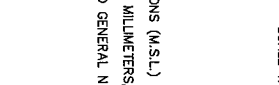
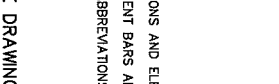
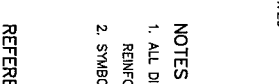
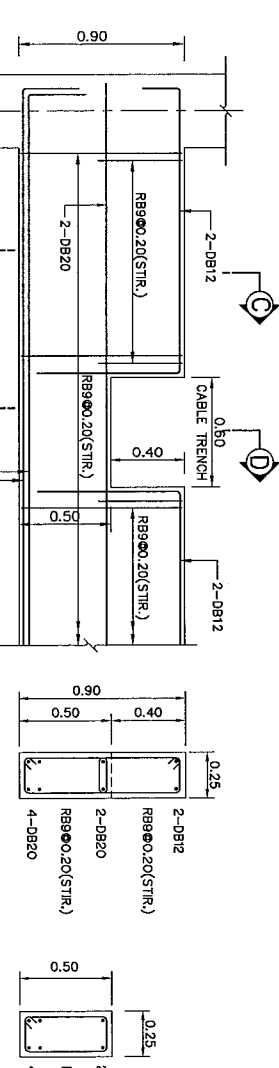
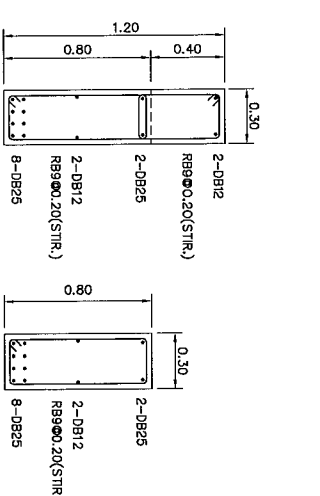
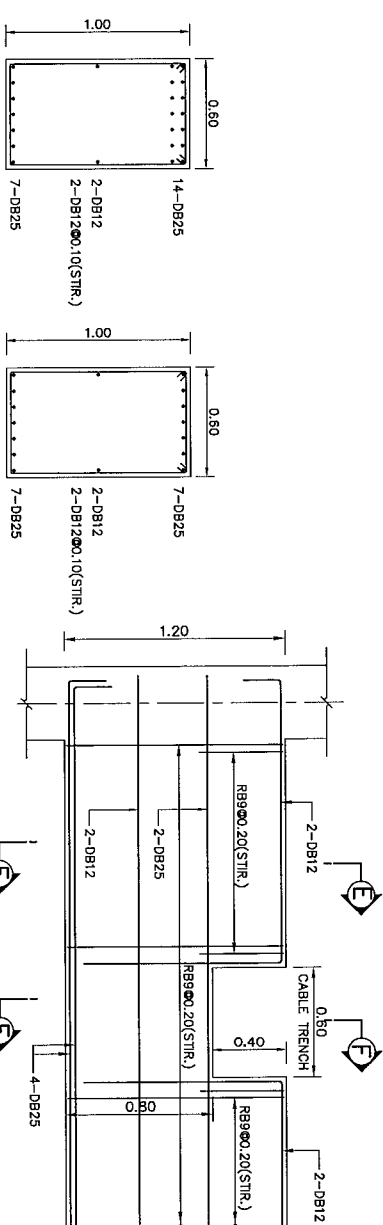
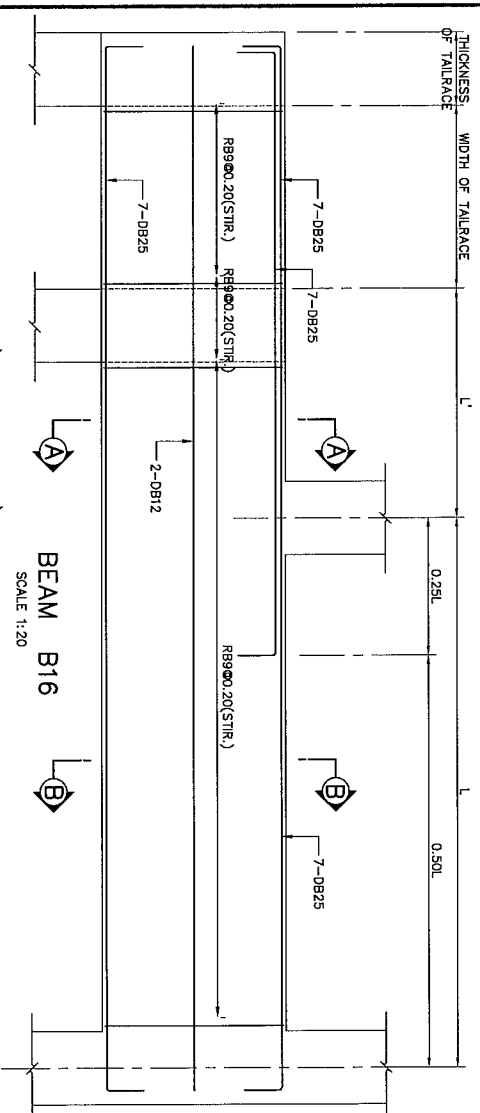
KINGDOM OF THAILAND			
MINISTRY OF ENERGY			
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS			
POWERHOUSE			
KEY PLAN AND REINFORCEMENT DETAILS			
DESIGNED BY: <i>[Signature]</i>		REVIEWED BY: <i>[Signature]</i>	
CHECKED BY: <i>[Signature]</i>		APPROVED BY: <i>[Signature]</i>	
DATE: 27/05/13		DATE: 27/05/13	
PROJECT MANAGER: <i>[Signature]</i>		PROJECT MANAGER: <i>[Signature]</i>	
SHEET NO. 69 OF 98		SHEET NO. 69 OF 98	

BEAM SCHEDULE

BEAM	B1	B2	B3	B4	B5
SIZE	0.20X0.40 M.	0.20X0.40 M.	0.20X0.40 M.	0.25X0.50 M.	0.25X0.50 M.
	ALL SPAN	ALL SPAN	SUPPORT END.	MIDDLE SPAN	SUPPORT CONTINUE.
	2-DB16 R8900.15(STIR.) 3-DB16	2-DB20 R8900.15(STIR.) 3-DB20	2-DB16 R8900.15(STIR.) 3-DB16	2-DB25 R8900.20(STIR.) 3-DB25	2-DB25 R8900.20(STIR.) 3-DB25

BEAM	B6	B7	B8	B9
SIZE	0.25x0.50 M.	0.30x0.60 M.	0.30x0.60 M.	0.30x0.70 M.
SUPPORT END.				
MIDDLE SPAN				
SUPPORT CONTINUE.				
MIDDLE SPAN				
SUPPORT CONTINUE.				
MIDDLE SPAN				
SUPPORT CONTINUE.				
MIDDLE SPAN				
SUPPORT CONTINUE.				
MIDDLE SPAN				
SUPPORT CONTINUE.				
MIDDLE SPAN				
SUPPORT CONTINUE.				
MIDDLE SPAN				
SUPPORT CONTINUE.				

BEAM	B10		B11		B12		B13		B14		B15					
SIZE	0.30x0.70 M.		0.30x0.80 M.		0.30x0.70 M.		0.40x1.00 M.		0.40x1.00 M.		0.40x1.20 M.					
SUPPORT END.	MIDDLE SPAN		SUPPORT CONTINUE.		SUPPORT END.		MIDDLE SPAN		SUPPORT CONTINUE.		ALL SPAN					
																



NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01

REFERENCE DRAWINGS :

1. POWERHOUSE, KEY PLAN AND REINFORCEMENT DETAILS
2. POWERHOUSE, SLAB, STAIR AND FOOTING REINFORCEMENT DETAILS

MT-PH-C

MT-PH-1

0 0.5 1.0 1
SCALE 1:20 METER

MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS
POWERHOUSE

BEAM REINFORCEMENT DETAILS

DEPARTMENT OF ALTERNATIVE ENERGY
DEVELOPMENT AND EFFICIENCY

RECEIVED	NOV 19 1945	RECEIVED	SUBMITTED
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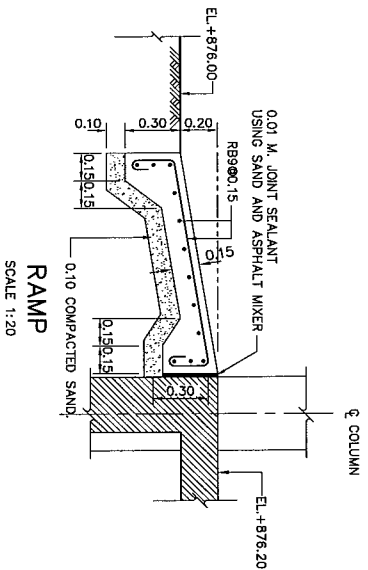
RECOVERABLE

REF ID: A66098
RU.3036
APPROVED

PROJECT MANAGER _____ DATE _____ MT-PH-09 70 OF 98

PROJECT MANAGER _____ DATE _____ MT-PH-09 70 OF 98

COLUMNS		C1	C2	C3	C4	C5
ROOF DECK (EL.+895.10,EL.+896.70)						
ROOF DECK (EL.+884.20)						
SECOND FLOOR (EL.+880.20)						
SECOND FLOOR (EL.+880.20)						
GROUND FLOOR (EL.+876.20)						
GROUND FLOOR (EL.+876.20)						
GROUND FLOOR (EL.+876.20)						
FOOTING (EL.+873.00)						



0 0.5 1.0 1.5
SCALE 1:20
METERS

3					REVIEWED	98-2-5.
2					SUBMITTED	<i>[Signature]</i>
1					RECOMMENDED	<i>[Signature]</i>
NO.	DATE	REVISIONS	CHECKED	APPROVED	7/24/98	<i>[Signature]</i>
	CONSULTANTS			DATE	DRAWING NO.	SHEET NO.
					MT-PH-10	71 of 98

SLAB AND COLUMN REINFORCEMENT DETAILS

CIVIL WORKS
POWERHOUSE

MAE TUEN HYDROPOWER PROJECT

DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

MINISTRY OF ENERGY

SLAB 5b (LONG)

SLAB S6(SHORT)

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

SCALE 1:20

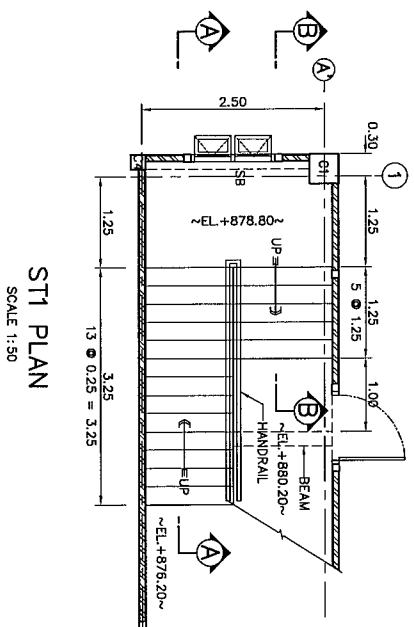
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SCALE 1:20

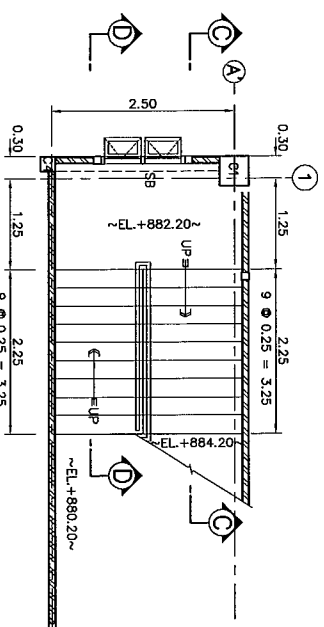
SCALE 1:20

SCALE 1:20

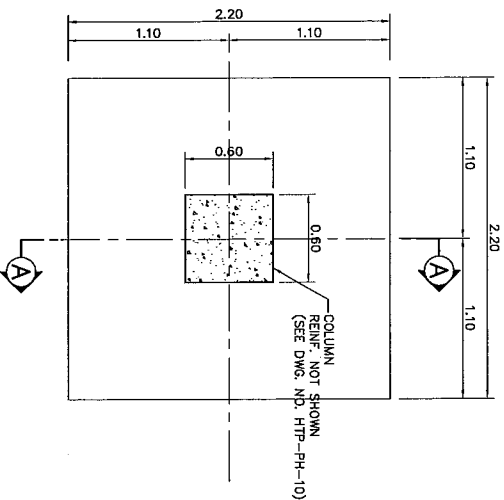
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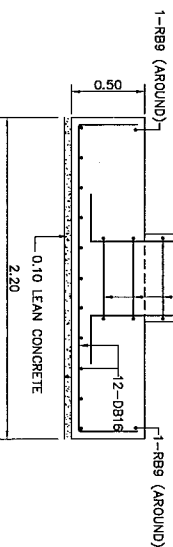
ST1 PLAN
SCALE 1:50



ST2 PLAN
SCALE 1:50

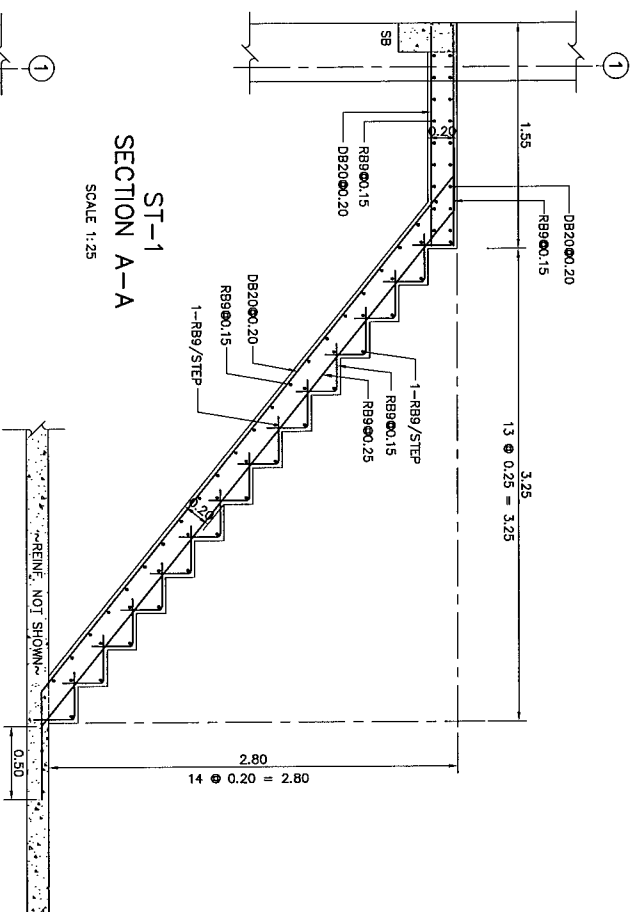


PLAN
SCALE 1:25

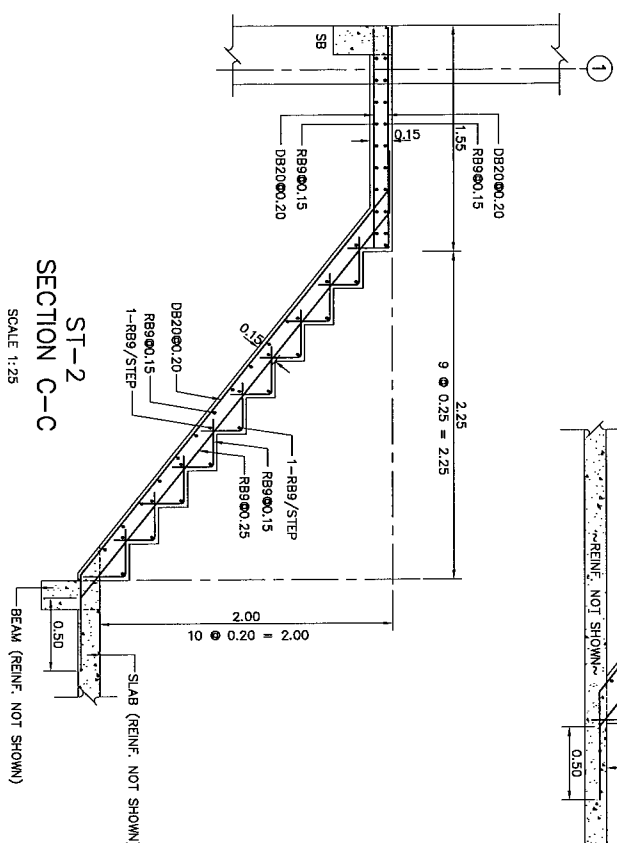


SECTION A-A
SCALE 1:25

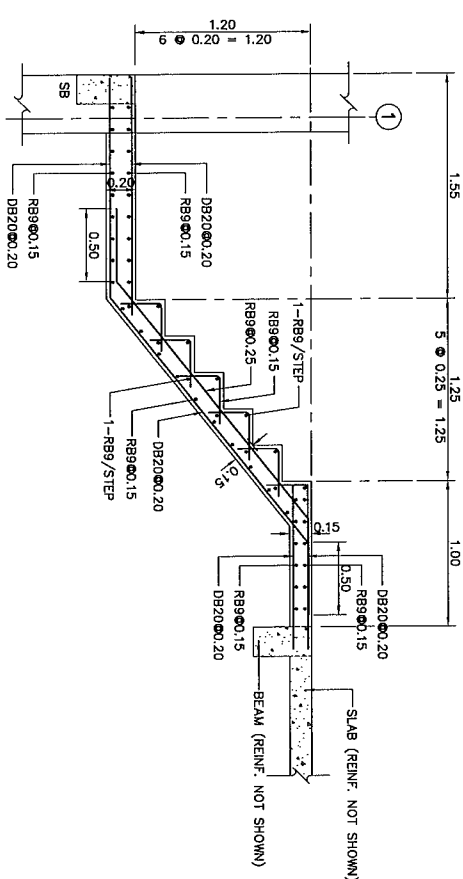
DETAIL OF FOOTING F1



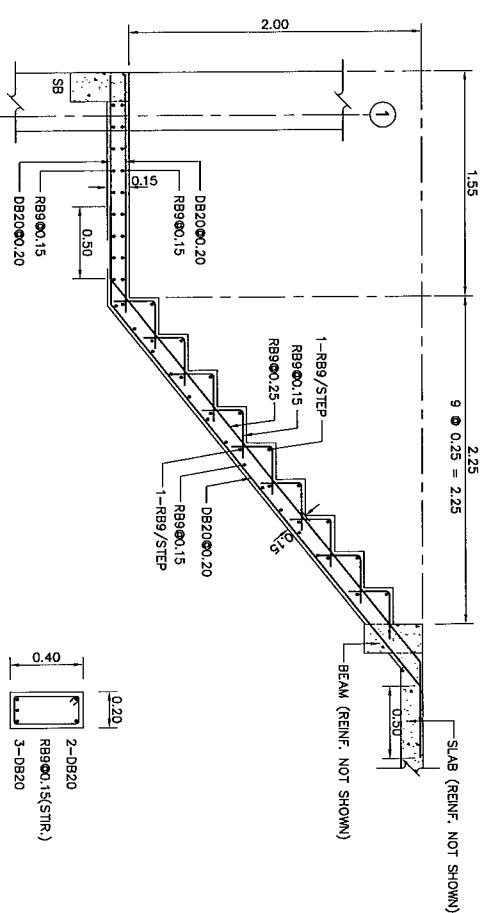
ST-1
SECTION A-A
SCALE 1:25



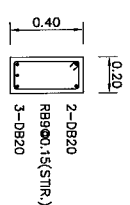
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SECTION C-C
SCALE 1:25



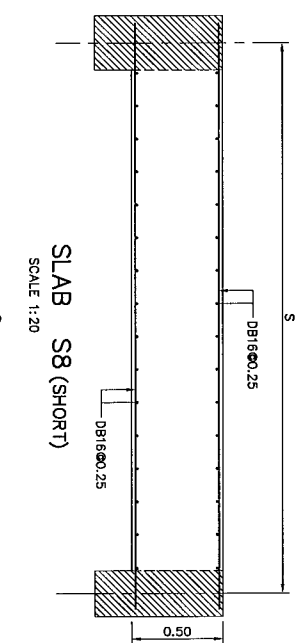
ST-1
SECTION B-B
SCALE 1:25



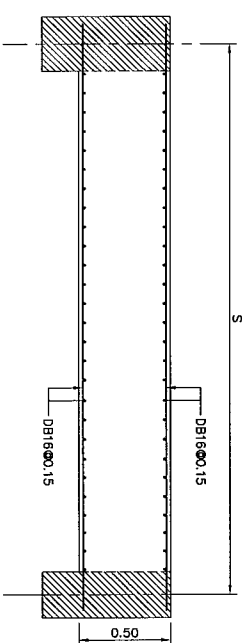
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SECTION D-D
SCALE 1:25



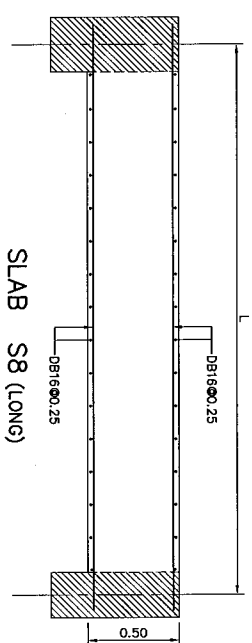
SB DETAIL
SCALE 1:20



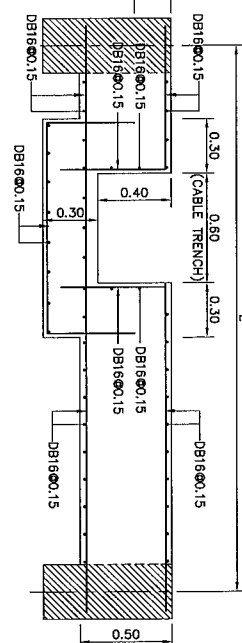
SLAB S8 (SHORT)
SCALE 1:20



SLAB S9 (SHORT)
SCALE 1:20



SLAB S8 (LONG)
SCALE 1:20



SLAB S9 (LONG)
SCALE 1:20

NOTES :

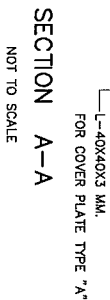
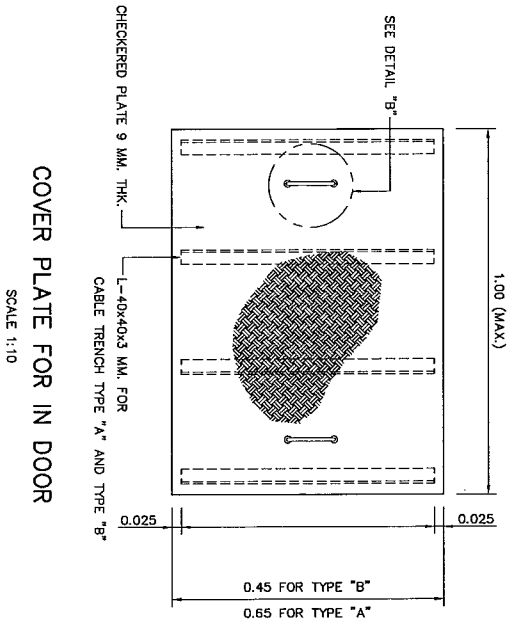
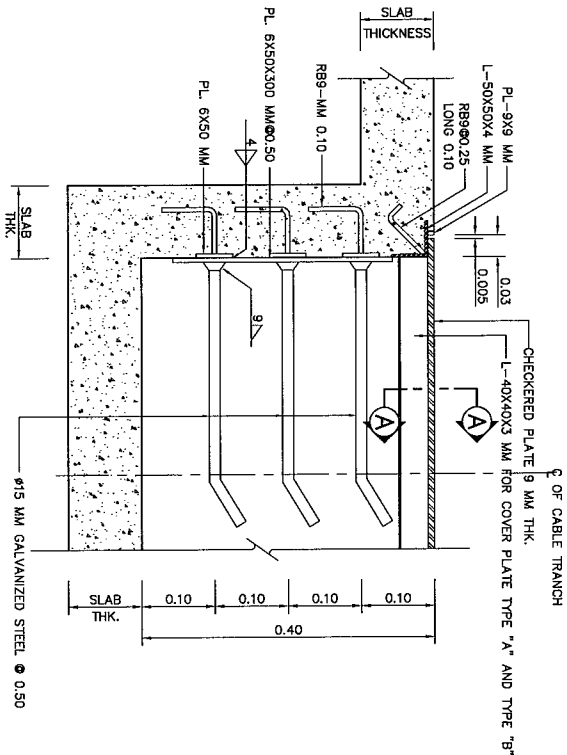
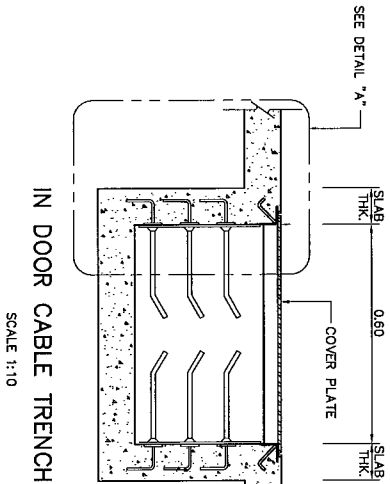
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
2. REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
3. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-PH-01.

REFERENCE DRAWINGS :

1. POWERHOUSE, KEY PLAN AND REINFORCEMENT DETAILS
2. POWERHOUSE, BEAM REINFORCEMENT DETAILS

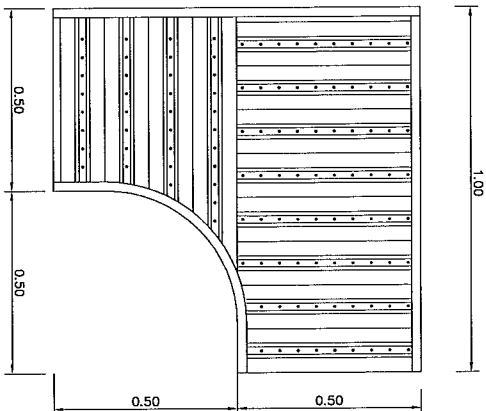
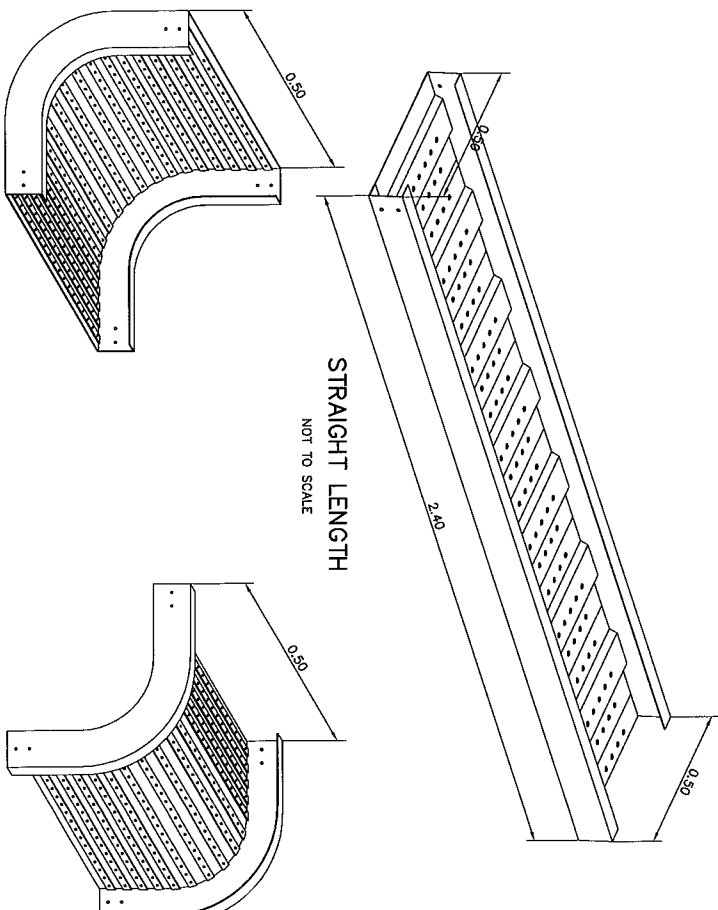
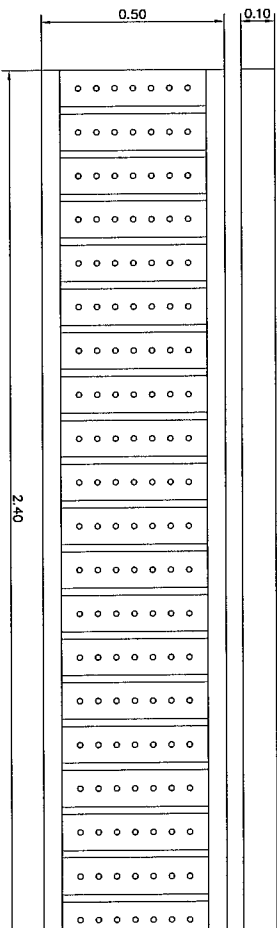
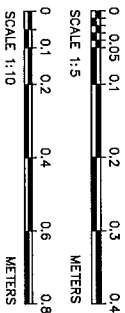
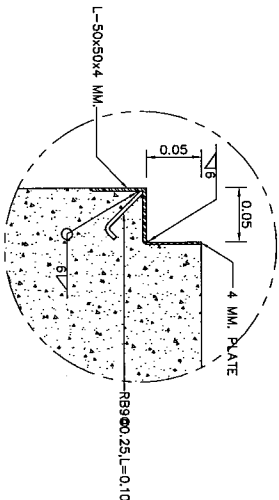
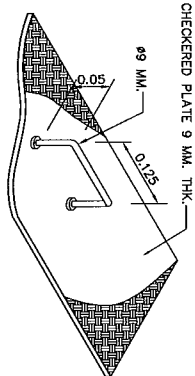
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KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY				MAE TUN HYDROPOWER PROJECT			
CIVIL WORKS				POWERHOUSE			
SLAB, STAIR AND FOOTING REINFORCEMENT DETAILS							
PANYA CONSULTANTS CO. LTD.				DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
DESIGNED BY: PANYA CONSULTANTS CO. LTD.				REVIEWED BY: PANYA CONSULTANTS CO. LTD.			
DRAWN BY: PANYA CONSULTANTS CO. LTD.				RECOMMENDED BY: PANYA CONSULTANTS CO. LTD.			
CHECKED BY: PANYA CONSULTANTS CO. LTD.				APPROVED BY: PANYA CONSULTANTS CO. LTD.			
DATE: 27/06/13				DRAWING NO: MT-PH-11			
PROJECT MANAGER				SHEET NO: 72 OF 98			



- NOTES :
- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.
 - STEEL COVER FOR IN DOOR TRENCH SHALL BE COATED WITH NON BLEEDING TYPE COAL TAR EPOXY.
- REFERENCE DRAWINGS :
- POWERHOUSE PLANS
 - POWERHOUSE, KEY PLAN AND REINFORCEMENT DETAILS

MT-PH-02
MT-PH-08



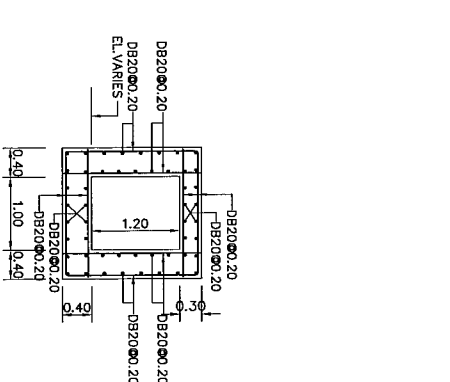
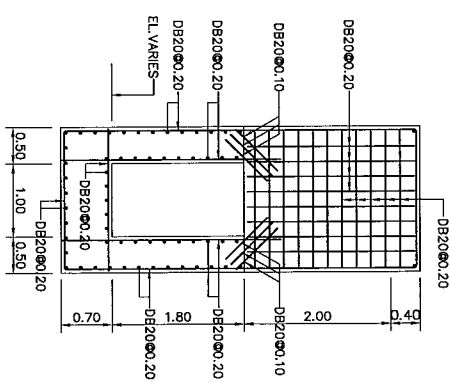
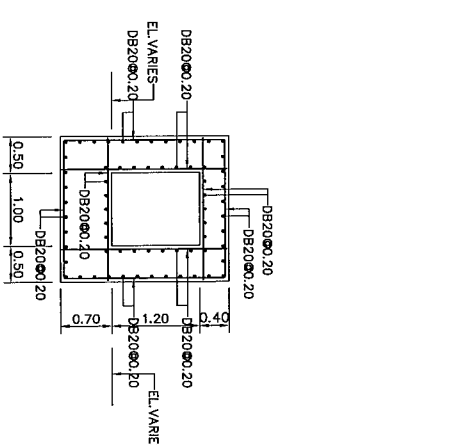
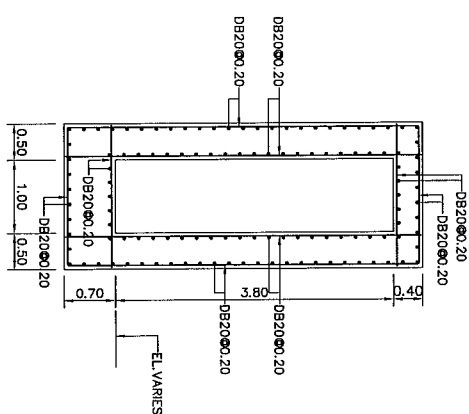
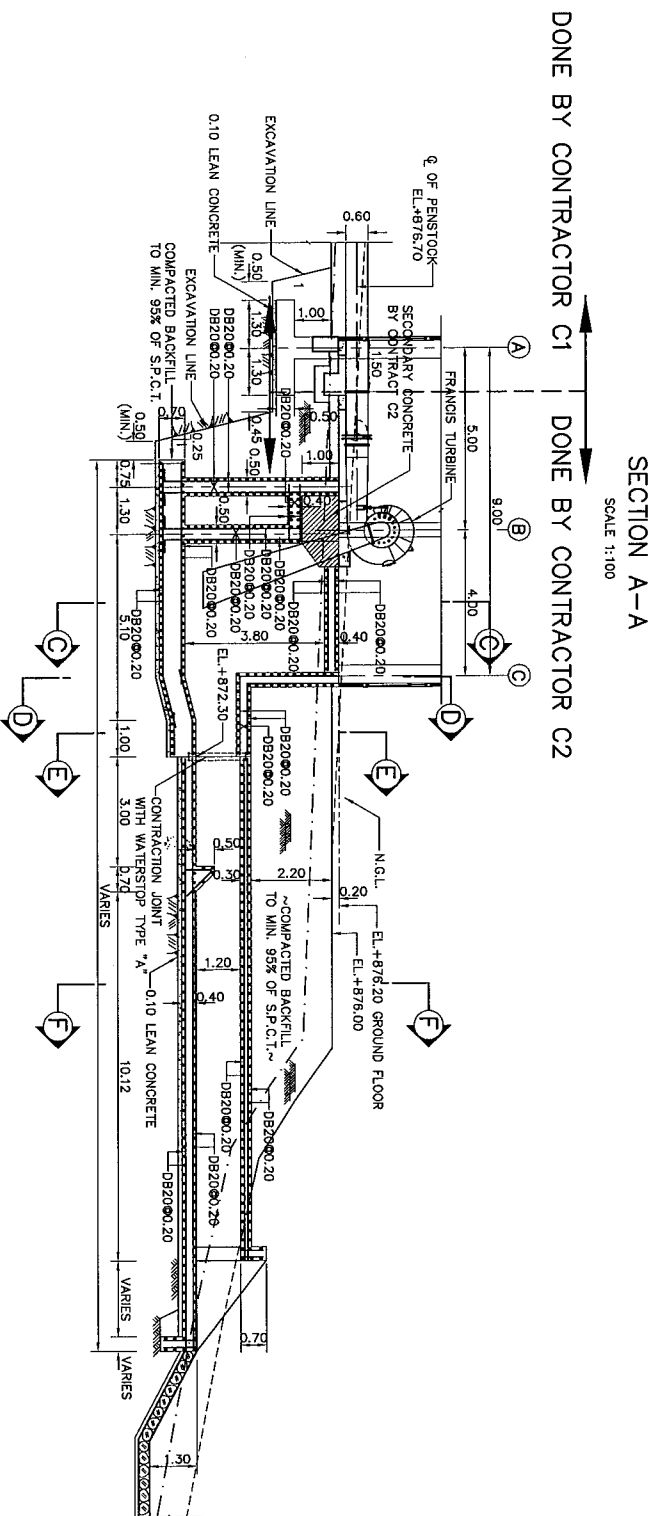
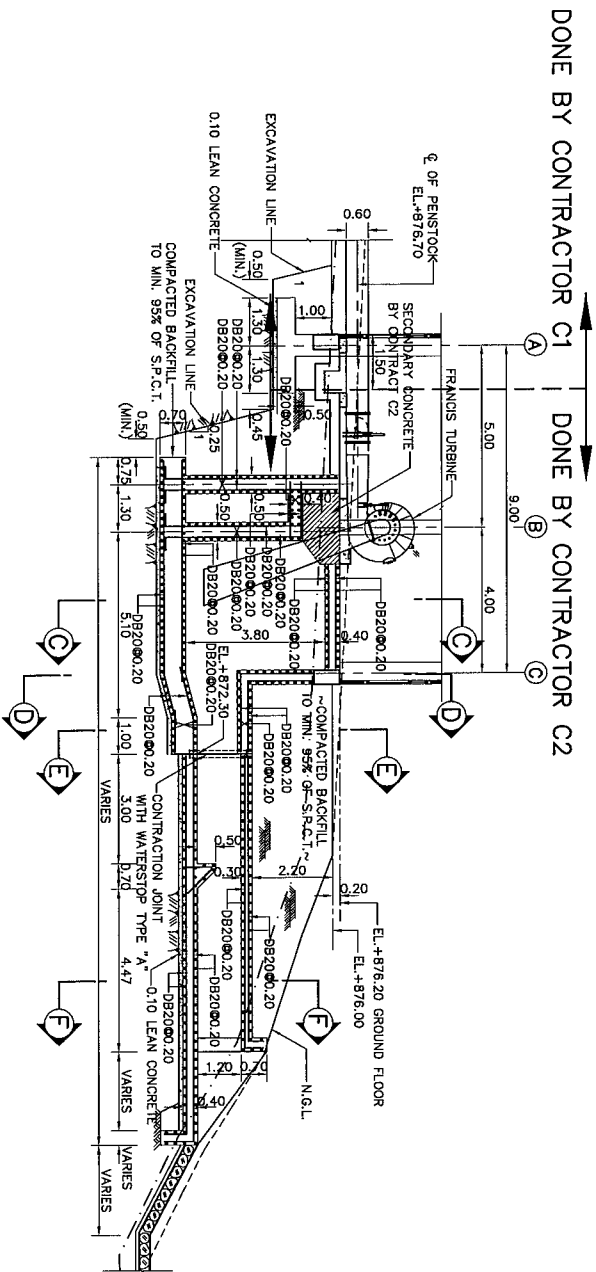
HORIZONTAL 90 ELBOWS
NOT TO SCALE

CABLE TRAY DETAIL
NOT TO SCALE

NO.	DATE	REVISIONS	CHECKED	APPROVED
1				
2				
3				

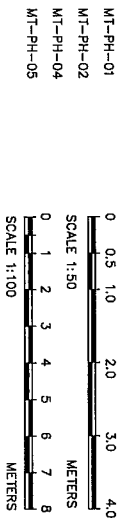
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE			
CABLE TRENCH AND CABLE TRAY DETAILS			
NO.	REVISIONS	CHECKED	APPROVED
1			
2			
3			
NO.	DATE	REVISIONS	CHECKED
1	27/06/13		
2			
3			
NO.	DATE	REVISIONS	CHECKED
1	27/06/13		
2			
3			
NO.	DATE	REVISIONS	CHECKED
1	27/06/13		
2			
3			

MATERIALS : SHEET STEEL 1.5MM.
SURFACE FINISH : POWDER
COATED IN TEXTURED PAI
7032 OR HOT-DIP GALVANIZED
(UPON YOUR REQUIREMENTS)
ASSEMBLY : WELDING METHOD
APPLICATION : USING FOR INDOOR & OUTDOOR INSTALLATION WORK

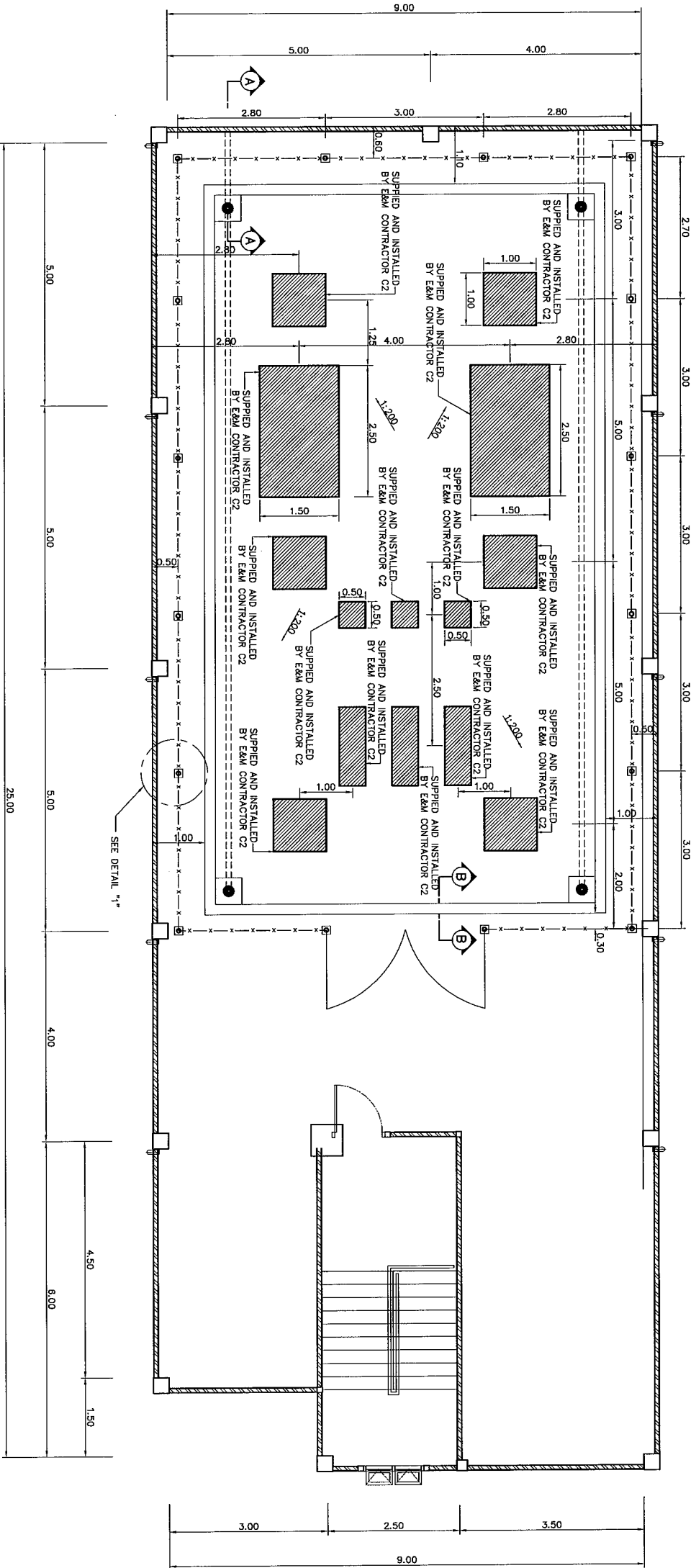


- NOTES :
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
 2. REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
 3. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-CN-01.

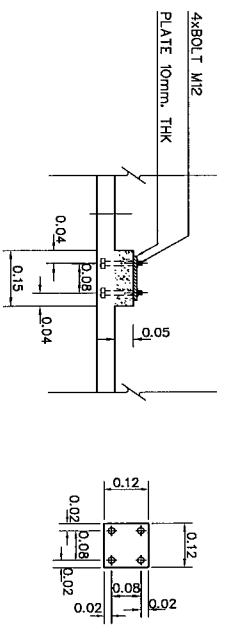
- REFERENCE DRAWINGS :
1. POWERHOUSE, LAY-OUT
 2. POWERHOUSE, PLANS
 3. POWERHOUSE, SECTIONS (SHEET 1/2)
 4. POWERHOUSE, SECTIONS (SHEET 2/2)



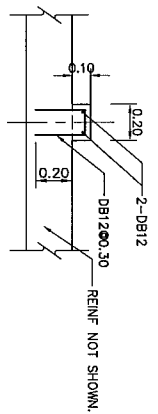
KINGDOM OF THAILAND				DEPARTMENT OF ALTERNATIVE ENERGY			
MINISTRY OF ENERGY				DEPARTMENT OF ALTERNATIVE ENERGY			
MAE TUEN HYDROPOWER PROJECT				DEPARTMENT OF ALTERNATIVE ENERGY			
CIVIL WORKS				DEPARTMENT OF ALTERNATIVE ENERGY			
POWERHOUSE				DEPARTMENT OF ALTERNATIVE ENERGY			
REINFORCEMENT DETAILS				DEPARTMENT OF ALTERNATIVE ENERGY			
DESIGNED BY <i>[Signature]</i>				REVIEWED BY <i>[Signature]</i>			
DRAWN BY <i>[Signature]</i>				RECOMMENDED BY <i>[Signature]</i>			
CHECKED BY <i>[Signature]</i>				APPROVED BY <i>[Signature]</i>			
PROJECT MANAGER				DRAWING NO.			
DATE				MT-PH-15			
				SHEET NO.			
				76 OF 98			



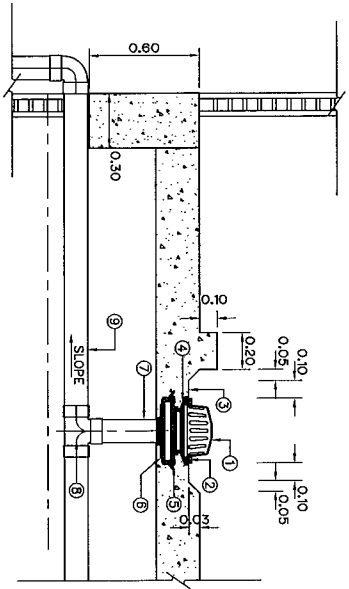
SWITCHYARD PLAN LAYOUT
SCALE 1:150



DETAIL "1"
SCALE 1:10



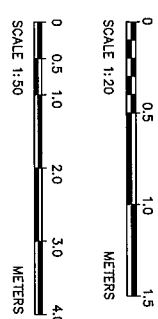
SECTION B-B
SCALE 1:20



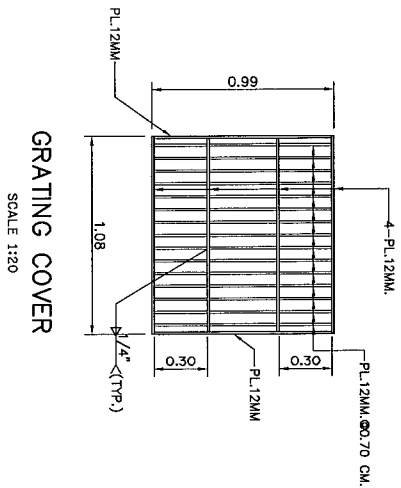
SECTION A-A
SCALE 1:20

- DESCRIPTIONS :
- ① DEBRIS GUARD SLOTS
 - ② SECURING SCREW
 - ③ GUTTER
 - ④ ADJUSTABLE HOUSING
 - ⑤ CLAMPING COLLAR
 - ⑥ CAST IRON BODY W/FLASHING FLANGE
 - ⑦ ADAPTOR
 - ⑧ T BEND
 - ⑨ DRAIN PIPE

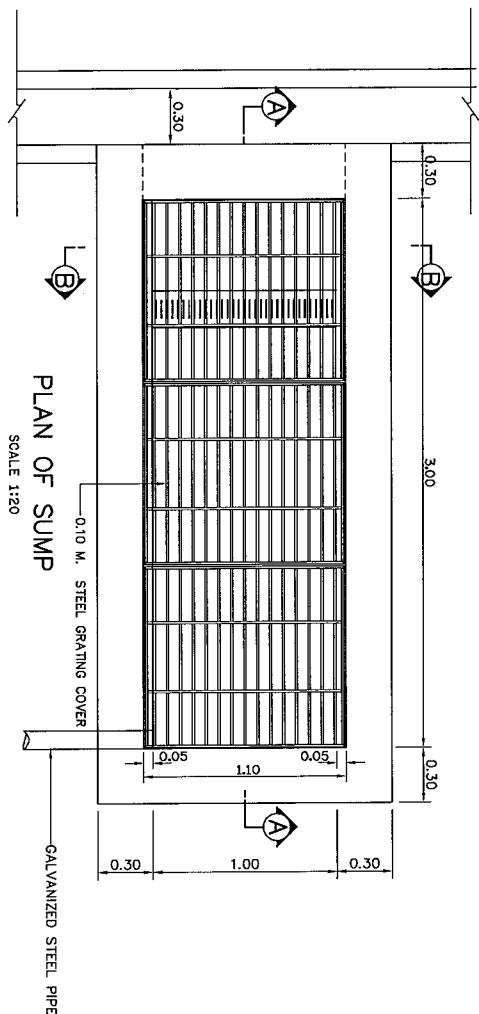
- NOTES :
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
 2. REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
 3. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-QN-01.
- REFERENCE DRAWINGS :
- 1. POWERHOUSE, PLANS MT-PH-02
 - 2. POWERHOUSE, KEY PLAN AND REINFORCEMENT DETAILS MT-PH-08



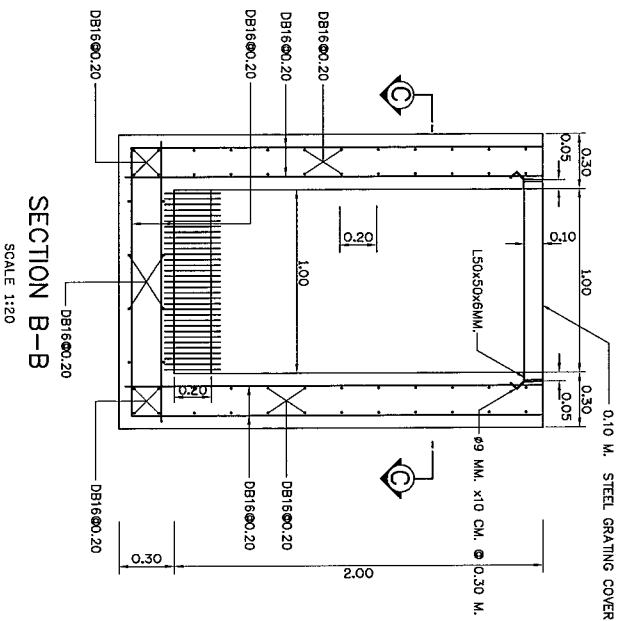
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE REINFORCEMENT DETAILS			
PANYA CONSULTANTS CO. LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
3	REVISIONS	CHECKED	APPROVED
2	DATE	27/08/13	DATE
1	NO.	MT-PH-16	SHEET NO.
PROJECT MANAGER		77 OF 98	



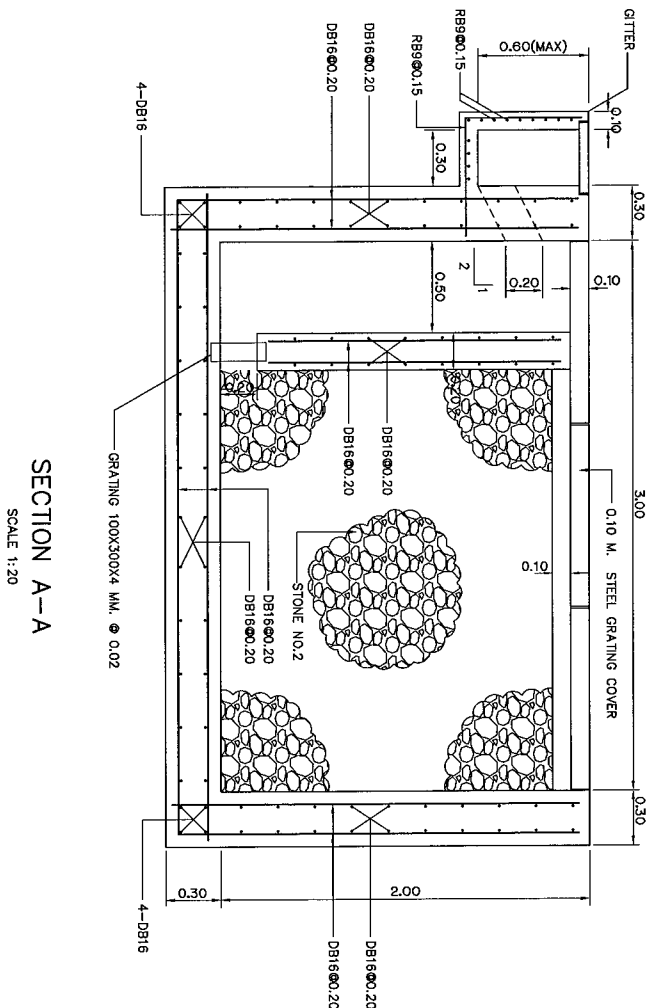
GRATING COVER
SCALE 1:20



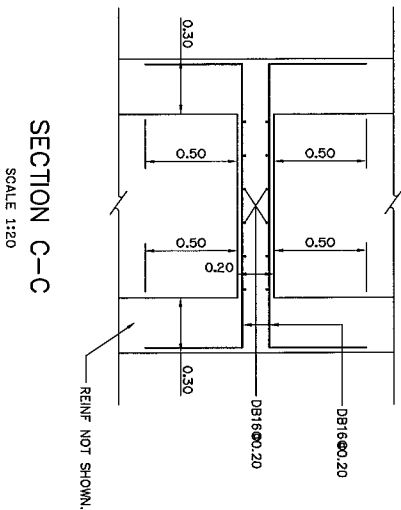
PLAN OF SUMP
SCALE 1:20



SECTION B-B
SCALE 1:20



SECTION A-A
SCALE 1:20



SECTION C-C
SCALE 1:20

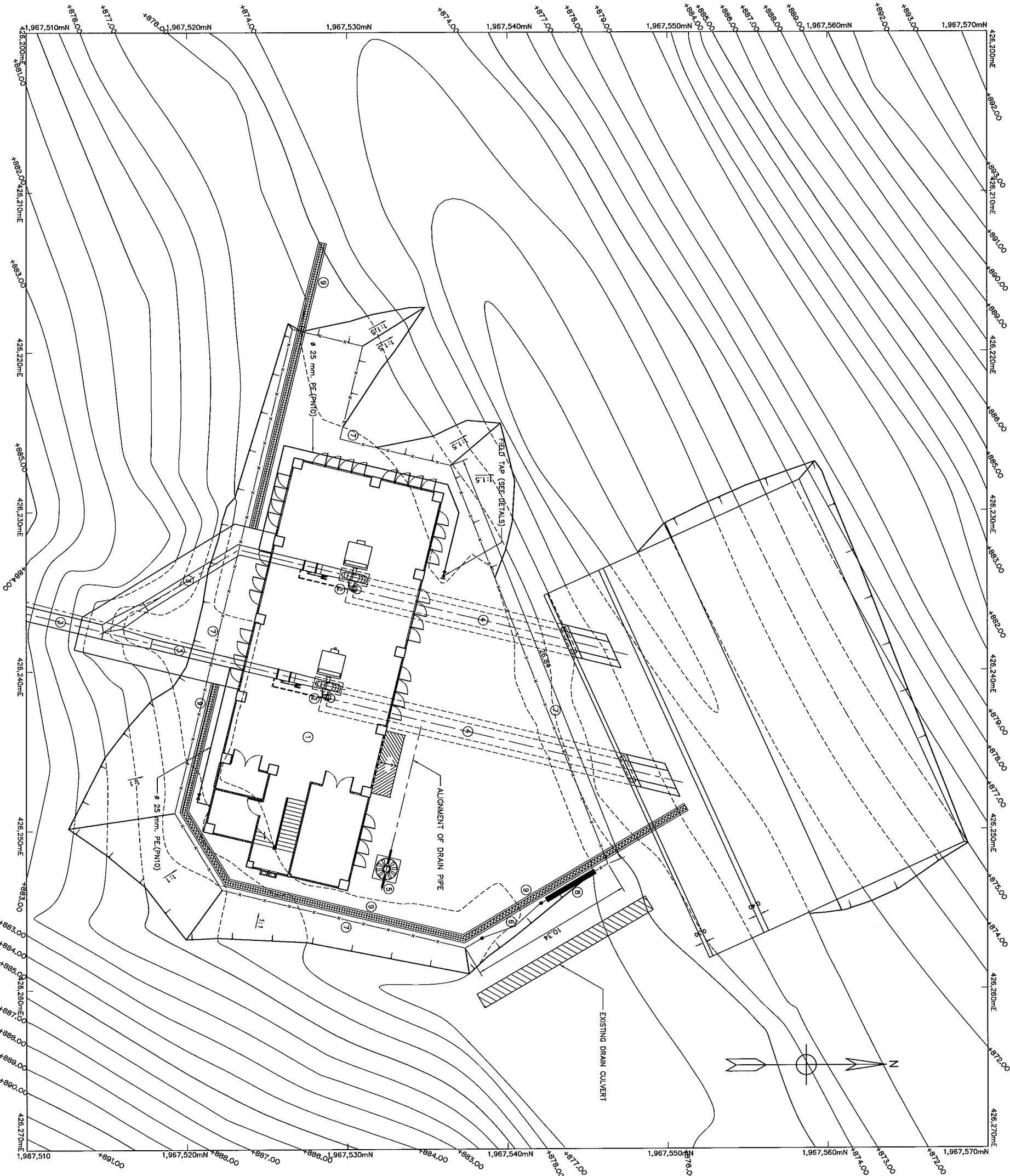
- NOTES :
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
 2. REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
 3. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.
 4. STRUCTURAL STEEL AND FLAT PLATE STEEL SHALL BE PAINTED WITH RUST-OLEUM PAINT OR EQUIVALENT TWICE AND WITH OIL PAINT ONCE.
- REFERENCE DRAWINGS :
1. POWERHOUSE, LAY-OUT

MT-PH-01

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

KINGDOM OF THAILAND			
MINISTRY OF ENERGY			
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEH HYDROPOWER PROJECT			
CIVIL WORKS			
POWERHOUSE			
REINFORCEMENT DETAILS			
DESIGNED BY		CHECKED BY	
DRAWN BY		APPROVED BY	
CHECKED BY		PROJECT MANAGER	
DATE		SHEET NO.	
27/05/13		MT-PH-17	
		78 OF 98	





WATER SUPPLY PIPELINE SYSTEM LAY-OUT

SCALE 1:125



SCALE 1:125 METERS

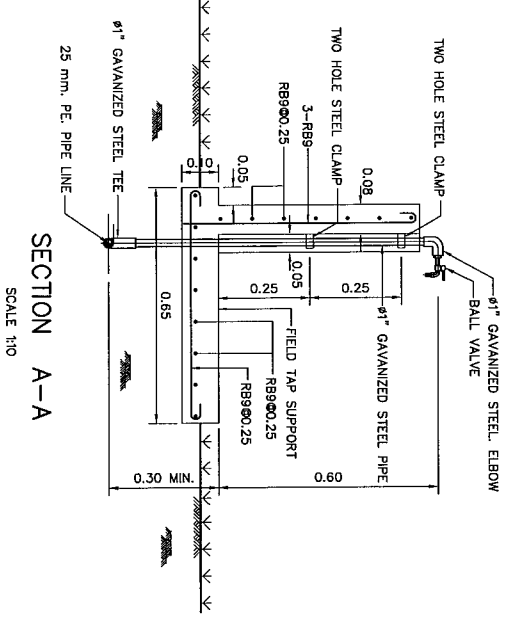
NO.	DATE	REVISIONS	CHECKED	APPROVED
1				
2				
3				

CONSULTANTS	DATE

DESIGNED BY: <i>[Signature]</i>		SUBMITTED BY: <i>[Signature]</i>	
CHECKED BY: <i>[Signature]</i>		APPROVED BY: <i>[Signature]</i>	
PROJECT MANAGER: <i>[Signature]</i>		DATE: 27/09/13	
		DRAWING NO. MT-PH-18	
		SHEET NO. 79 OF 98	

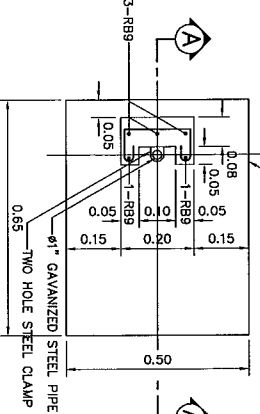
PAVIA CONSULTANTS CO. LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
		REVIEWED BY: <i>[Signature]</i>	
		APPROVED BY: <i>[Signature]</i>	

KINGDOM OF THAILAND		MINISTRY OF ENERGY	
		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
		MAE TUEH HYDROPOWER PROJECT	
		CIVIL WORKS	
		POWERHOUSE	
		WATER SUPPLY PIPELINE SYSTEM LAY-OUT AND DETAILS	



PLAN OF FIELD TAP

SCALE 1:10



- LEGENDS :
- 1 POWERHOUSE
 - 2 FRANCIS TURBINE
 - 3 PENSTOCK
 - 4 TAILRACE
 - 5 SEEPAGE TANK
 - 6 GATE
 - 7 CHAIN LINK FENCE
 - 8 SIGNBOARD
 - 9 GUTTER
 - EXISTING STRUCTURE

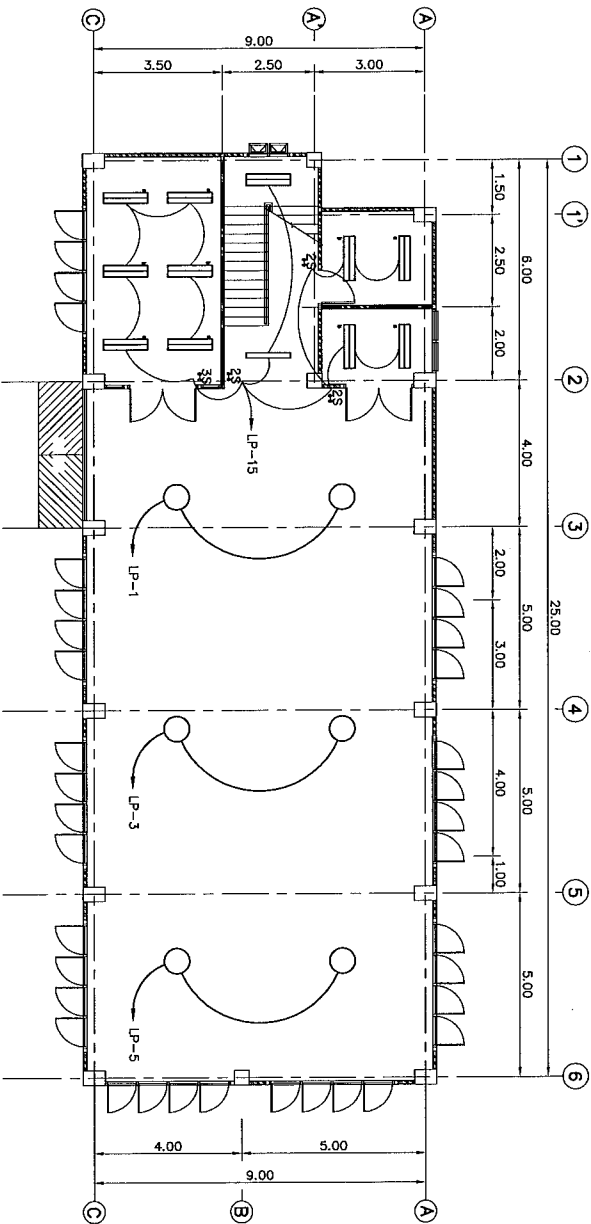
NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-QN-01.

REFERENCE DRAWINGS :

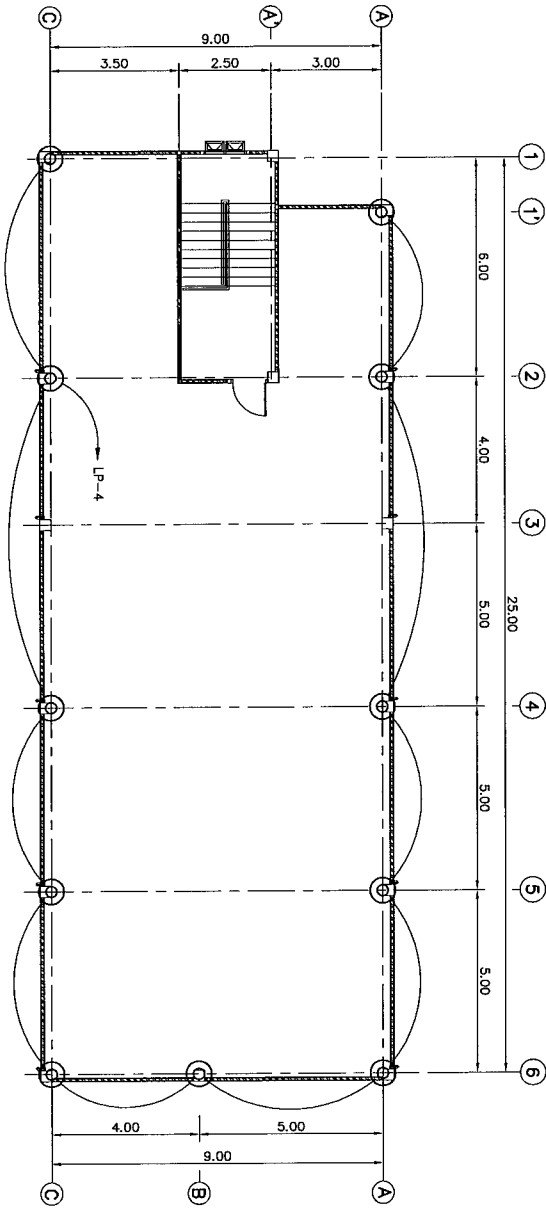
- POWERHOUSE, LAY-OUT

MT-PH-01



GROUND FLOOR PLAN (EL.+876.20)

SCALE 1:100



ROOF DECK PLAN (EL.+884.20)

SCALE 1:100

LEGENDS :

- 2x28 W. TL-5 FLUORESCENT LAMP (HANGING OR CEILING TYPE) WITH ELECTRONICS
- BALLASTS AT SWITCH 'd'
- 2x28 W. TL-5 FLUORESCENT LAMP (CORROSION PROOF) WITH ELECTRONIC BALLASTS
- AT SWITCH 'd'
- 1x28 W. TL-5 FLUORESCENT LAMP (CORROSION PROOF) WITH ELECTRONIC BALLASTS
- 1x20 W. COMPACT FLUORESCENT (WALL TYPE, OUTDOOR IP54)
- 3S₀-c SWITCH 'S' SETS FOR SWITCH 'd' TO 'c'
- S' TWO-WAYS SWITCH
- ⊖ SIMPLEX RECEPTACLE WITH GROUND, 10 A, 220 VAC.
- 20 W. COMPACT FLUORESCENT
- ⊖ EXHAUST FAN 12"
- ⊙ OUTDOOR BOLLARD TYPE WITH 20 W. COMPACT FLUORESCENT
- LP LOAD PANEL, 3 PHASE (18 CIRCUITS) WITH MAIN CIRCUIT BREAKER
- LCPI LIGHTING CONTROL PANEL
- THW. CABLE IN EMT CONDUIT SURFACE MOUNTING INSTALLATION FOR LIGHTING CIRCUIT
- ⊖ DUPLEX RECEPTACLE WITH GROUND, 10 A, 220 VAC.
- POWER RECEPTACLE 3P+N+E 32 A, 400 VAC.
- HIGH BAY FIXTURE 1x400 W. HIGH PRESSURE SODIUM
- ⊗ HIGH BAY FIXTURE 1x250 W. HIGH PRESSURE SODIUM
- ⊗ HIGH BAY FIXTURE 1x250 W. HIGH PRESSURE SODIUM
- ⊗ EMERGENCY LIGHTING 2x55 W. HALOGEN W/SEALED LEAD ACID BATTERY BACKUP 2 HOURS
- ⊗ AIR CONDITIONING, SPLIT TYPE

REFERENCE DRAWINGS :

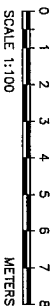
- 1. POWERHOUSE, PLANS
- 2. POWERHOUSE, GROUNDING SYSTEM AND LOAD SCHEDULE

MT-PH-02

MT-PH-22

SECOND FLOOR PLAN (EL.+880.20)

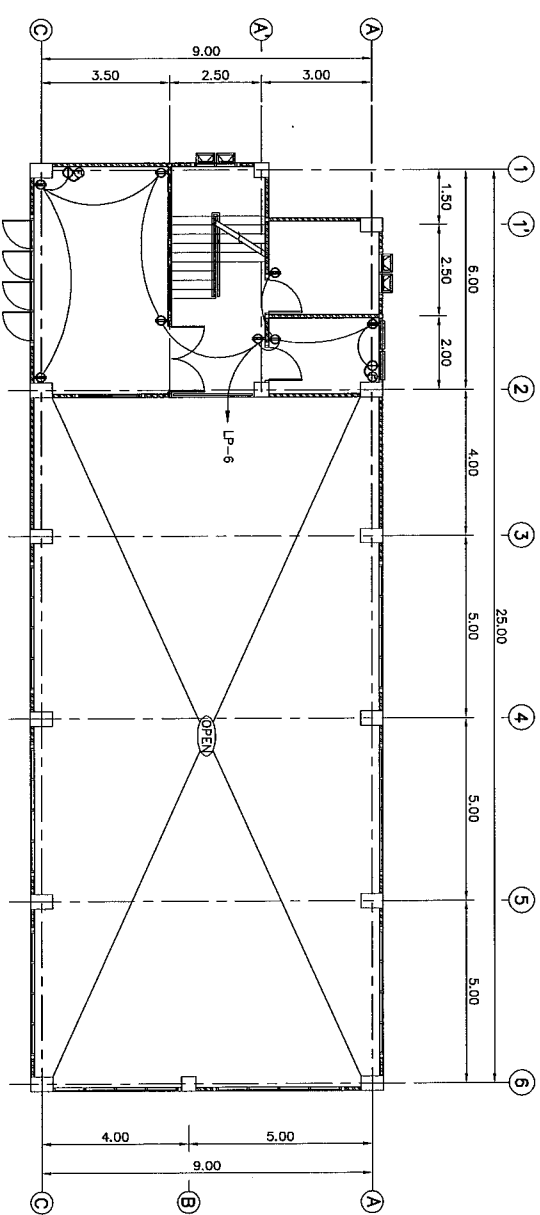
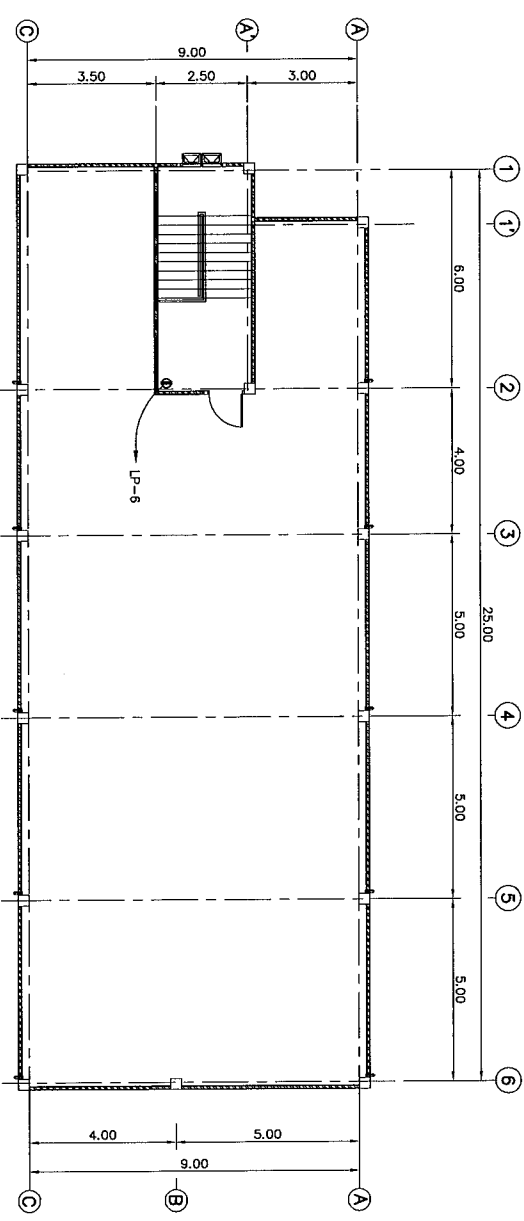
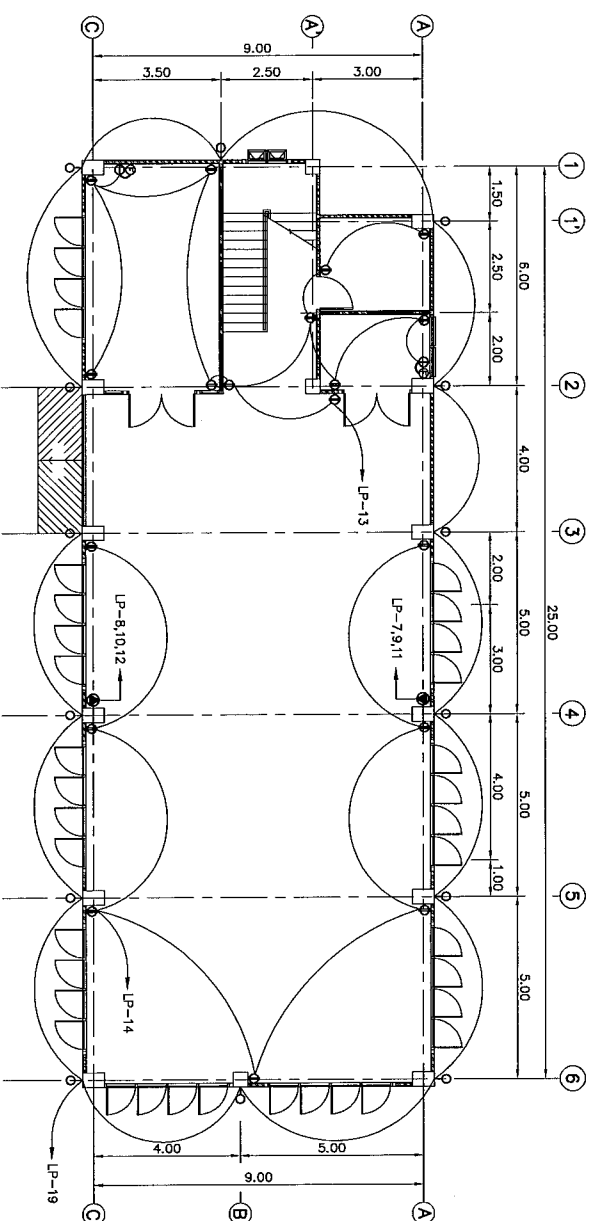
SCALE 1:100



SCALE 1:100

METERS

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE			
POWER ELECTRIC AND LIGHTING SYSTEM			
DESIGNED BY: PANYA CONSULTANTS CO., LTD.		REVIEWED BY: PANYA CONSULTANTS CO., LTD.	
DRAWN BY: PANYA CONSULTANTS CO., LTD.		RECOMMENDED BY: PANYA CONSULTANTS CO., LTD.	
CHECKED BY: PANYA CONSULTANTS CO., LTD.		APPROVED BY: PANYA CONSULTANTS CO., LTD.	
PROJECT MANAGER: PANYA CONSULTANTS CO., LTD.		DATE: 27/08/73	
DRAWING NO: MT-PH-19		SHEET NO: 80 OF 98	



LEGENDS :

- | | |
|--|---|
| | 2x28 W. TL-5 FLUORESCENT LAMP (HANGING OR CEILING TYPE) WITH ELECTRONICS BALLASTS AT SWITCH 'o' |
| | 2x28 W. TL-5 FLUORESCENT LAMP (CORROSION PROOF) WITH ELECTRONIC BALLASTS AT SWITCH 'o' |
| | 1x28 W. TL-5 FLUORESCENT LAMP (CORROSION PROOF) WITH ELECTRONIC BALLASTS |
| | 1x20 W. COMPACT FLUORESCENT (WALL TYPE, OUTDOOR IP54) |
| | SWITCH '3' SETS FOR SWITCH 'o' TO 'o' |
| | TWO-WAYS SWITCH |
| | SIMPLEX RECEPTACLE WITH GROUND, 10 A, 220 VAC. |
| | 20 W. COMPACT FLUORESCENT |
| | EXHAUST FAN 12' |
| | OUTDOOR BOLLARD TYPE WITH 20 W. COMPACT FLUORESCENT |
| | LOAD PANEL, 3 PHASE (18 CIRCUITS) WITH MAIN CIRCUIT BREAKER |
| | LIGHTING CONTROL PANEL |
| | THW. CABLE IN EMT CONDUIT SURFACE MOUNTING INSTALLATION FOR LIGHTING CIRCUIT |
| | DUPLEX RECEPTACLE WITH GROUND, 10 A, 220 VAC. |
| | POWER RECEPTACLE 3P+N+E 3E, 400 VAC. |
| | HIGH BAY FIXTURE 1x400 W. HIGH PRESSURE SODIUM |
| | HIGH BAY FIXTURE 1x250 W. HIGH PRESSURE SODIUM |
| | EMERGENCY LIGHTING 2x85 W. HALOGEN W/SEALED LEAD ACID BATTERY BACKUP 2 HOURS |
| | AIR CONDITIONING, SPLIT TYPE |

REFERENCE DRAWINGS :

- | | |
|---|----------|
| 1. POWERHOUSE, PLANS | MT-PH-02 |
| 2. POWERHOUSE, GROUNDING SYSTEM AND LOAD SCHEDULE | MT-PH-22 |

NO.	DATE	REVISIONS	CHECKED	APPROVED	DESIGNED	SUBMITTED	RECOMMENDED	APPROVED	DRAWING NO.	SHEET NO.
1					<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	MT-PH-20	81 OF 98
2					<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		
3					<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>		

SCALE 1:100

METERS

0 1 2 3 4 5 6 7 8

PROJECT: TANKS

PROJECT MANAGER: *[Signature]* DATE: 27/06/13

The floor plan shows a building with a grid system. The horizontal grid lines are labeled A, B, and C from right to left. The vertical grid lines are labeled 1, 2, 3, 4, 5, and 6 from top to bottom. The total width of the building is 9.00m, and the total depth is 25.00m. The plan includes a staircase, several rooms, and a large open area. Dimensions are provided in meters.

Grid Line	Horizontal Dimension (m)	Vertical Dimension (m)
A to B	3.00	1.50
B to C	2.50	2.50
C to 1	3.50	6.00
1 to 2	2.50	2.00
2 to 3	4.00	4.00
3 to 4	2.00	5.00
4 to 5	3.00	5.00
5 to 6	4.00	5.00
6 to 7	5.00	1.00
7 to 8	4.00	5.00
8 to 9	5.00	5.00
9 to 10	4.00	5.00
10 to 11	5.00	5.00
11 to 12	4.00	5.00
12 to 13	5.00	5.00
13 to 14	4.00	5.00
14 to 15	5.00	5.00
15 to 16	4.00	5.00
16 to 17	5.00	5.00
17 to 18	4.00	5.00
18 to 19	5.00	5.00
19 to 20	4.00	5.00
20 to 21	5.00	5.00
21 to 22	4.00	5.00
22 to 23	5.00	5.00
23 to 24	4.00	5.00
24 to 25	5.00	5.00
25 to 26	4.00	5.00
26 to 27	5.00	5.00
27 to 28	4.00	5.00
28 to 29	5.00	5.00
29 to 30	4.00	5.00
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63 to 64	4.00	5.00
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65 to 66	4.00	5.00
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67 to 68	4.00	5.00
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70 to 71	5.00	5.00
71 to 72	4.00	5.00
72 to 73	5.00	5.00
73 to 74	4.00	5.00
74 to 75	5.00	5.00
75 to 76	4.00	5.00
76 to 77	5.00	5.00
77 to 78	4.00	5.00
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91 to 92	4.00	5.00
92 to 93	5.00	5.00
93 to 94	4.00	5.00
94 to 95	5.00	5.00
95 to 96	4.00	5.00
96 to 97	5.00	5.00
97 to 98</		

SCALE 1:100

- GROUND ROD
- ⊗ GROUND POINT FOR POWER PLANT EQUIPMENT GROUNDING
- BARE COPPER CONDUCTOR

1. POWERHOUSE, PLANS
2. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 1/3)
3. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 2/3)
4. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 3/3)

- | PANEL : LP | | LOCATION : POWERHOUSE | | | | | | |
|------------------|--|-----------------------|--------|-----------------|---|-----|-----|-----|
| CCT No. | DESCRIPTION | LOAD IN VA | | CIRCUIT BREAKER | | | | |
| | | R | S | T | P | AT | AF | KA. |
| LP-1 | INTERNAL LIGHTING 1 (HIGH BAY LUMINAIRE) | 590 | | | 1 | 15 | 60 | 10 |
| LP-3 | INTERNAL LIGHTING 2 (HIGH BAY LUMINAIRE) | | 590 | | 1 | 15 | 60 | 10 |
| LP-5 | INTERNAL LIGHTING 3 (HIGH BAY LUMINAIRE) | | | 590 | 1 | 15 | 60 | 10 |
| LP-7 | | 2,309 | | | | | | |
| LP-9 | MACHINE HALL POWER RECEPTACLE | | 2,309 | | 3 | 15 | 60 | 10 |
| LP-11 | | | | 2,309 | | | | |
| LP-13 | THE FIRST FLOOR RECEPTACLE | 2,600 | | | 1 | 20 | 60 | 10 |
| LP-15 | THE FIRST FLOOR LIGHTING | | 851 | | 1 | 15 | 60 | 10 |
| LP-17 | THE SECOND FLOOR LIGHTING | | | 877 | 1 | 15 | 60 | 10 |
| LP-19 | OUTDOOR LIGHTING | 294 | | | 1 | 15 | 60 | 10 |
| LP-21 | CONTROL ROOM AIR CONDITION 36,000 BTU/HR | | 3,000 | | 1 | 20 | 60 | 10 |
| LP-23 | THE SECOND FLOOR EMERGENCY LIGHTING | | | 1,000 | 1 | 15 | 60 | 10 |
| LP-2 | OUTDOOR AREA LIGHTING | 900 | | | 1 | 15 | 60 | 10 |
| LP-4 | ROOF DECK LIGHTING | | 231 | | 1 | 15 | 60 | 10 |
| LP-6 | THE SECOND FLOOR RECEPTACLE | | | 2,200 | 1 | 20 | 60 | 10 |
| LP-8 | | 2,309 | | | | | | |
| LP-10 | MACHINE HALL POWER RECEPTACLE | | 2,309 | | 3 | 15 | 60 | 10 |
| LP-12 | | | | 2,309 | | | | |
| LP-14 | MACHINE HALL RECEPTACLE | 1,400 | | | 1 | 15 | 60 | 10 |
| LP-16 | THE FIRST FLOOR EMERGENCY LIGHTING | | 1,000 | | 1 | 15 | 60 | 10 |
| LP-18 | MACHINE HALL EMERGENCY LIGHTING | | | 1,000 | 1 | 15 | 60 | 10 |
| LP-20 | SPARE | 2,300 | | | 1 | 15 | 60 | 10 |
| LP-22 | SPARE | | 2,300 | | 1 | 15 | 60 | 10 |
| LP-24 | SPARE | | | 2,300 | 1 | 15 | 60 | 10 |
| TOTAL LOAD IN VA | | 12,702 | 12,590 | 12,585 | 3 | 100 | 125 | 25 |
| | | 37,877 | | | | | | |

1. GROUNDING CONDUCTOR, TAP AND RISER FROM GROUNDING NETWORK TO POWER EQUIPMENT SHALL BE FORMED BY BARE COPPER CONDUCTOR NOT LESS THAN 95 SOLMA.
2. GROUNDING SYSTEM RESISTANCE WILL NOT EXCEED 5 OHM.
3. CONNECTOR TO WITH IN & BETWEEN THE GROUNDING NETWORK TO POWER PLANT EQUIPMENT WILL BE MADE BY THERMAL CADWELDED.
4. GROUND ROD WILL BE COPPER COVER STEEL, DIAMETER 15.87 MM, 2.400 MM, LONG
5. THIS DRAWING USE FOR GUIDE ONLY

MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS
POWERHOUSE

GROUNDING SYSTEM AND LOAD SCHEDULE

DEPARTMENT OF ALTERNATIVE ENERGY

Pd FANYA CONSULTANTS CO., LTD

REVIEWED
By *[Signature]*

SUBMITTED

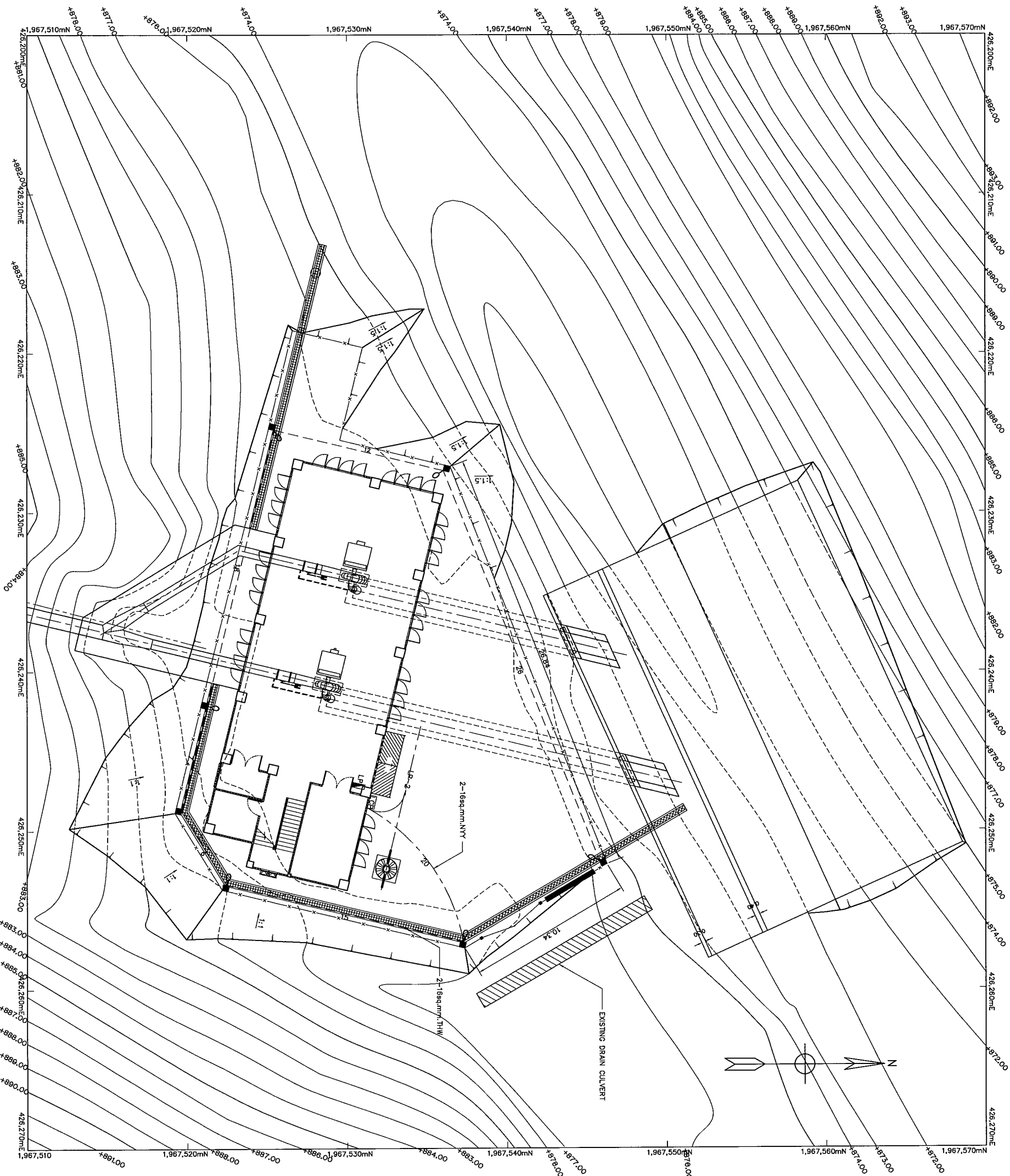
RECOMMENDED
P. H. B. 10-6/89

APPROVED

DRAWING NO.

MT-PH-22

[illegible]



WATER SUPPLY PIPELINE SYSTEM LAY-OUT
SCALE 1:125

NOTES:

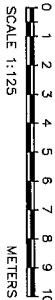
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

REFERENCE DRAWINGS :

1. POWERHOUSE, LAY-OUT MT-PH-01
2. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM MT-PH-24

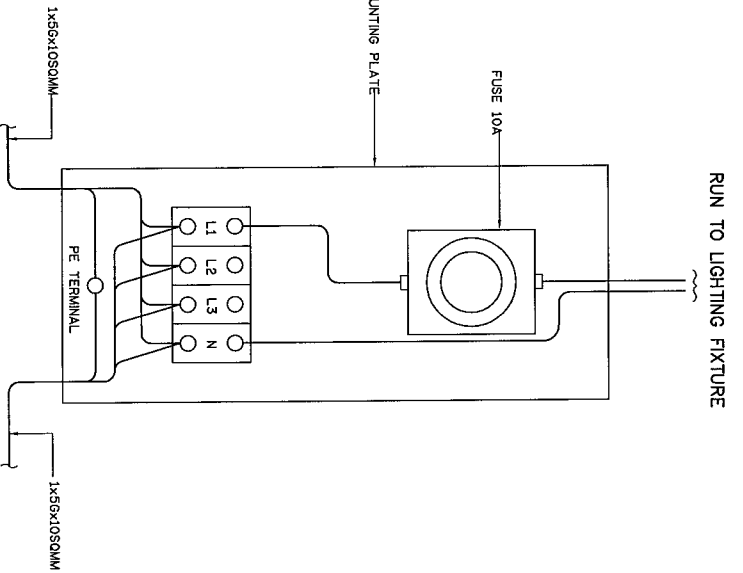
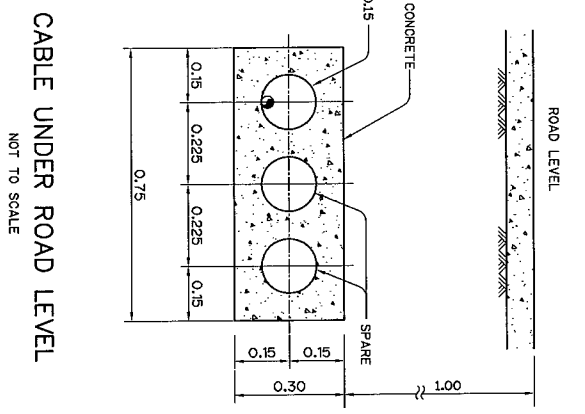
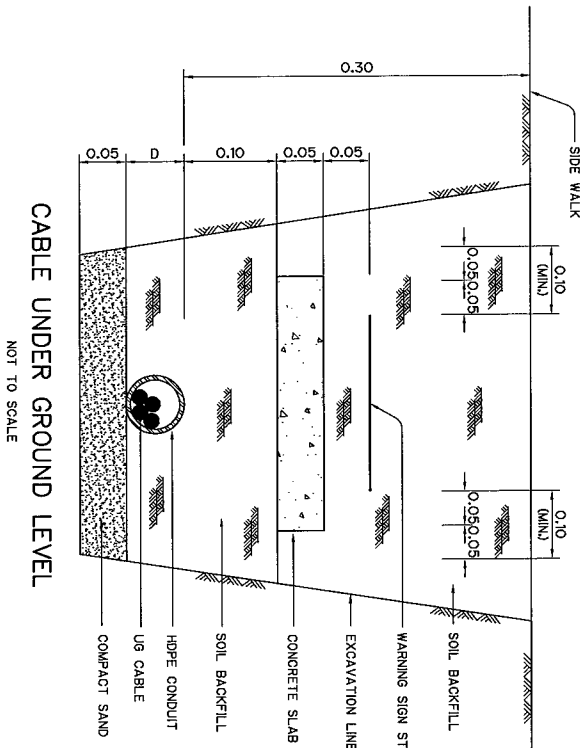
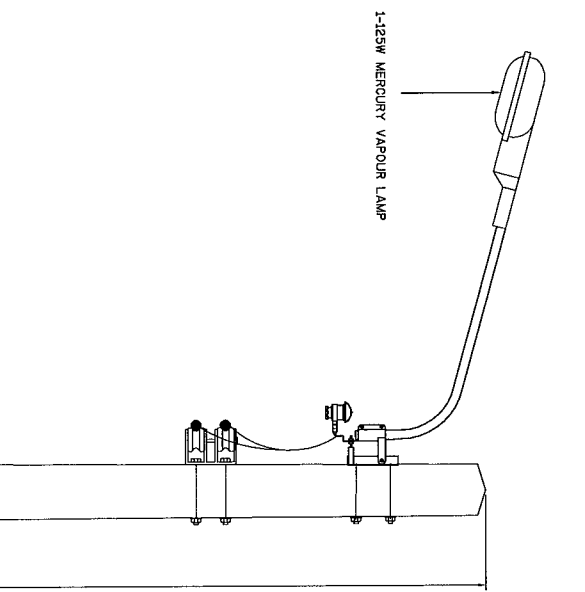
LEGENDS :

- STREET LIGHTING FIXTURE, 1x25 W MERCURY LAMP, ON STEEL POLE 6M
- STREET LIGHTING FIXTURE, 1x25 W MERCURY LAMP, ON CONCRETE POLE
- SECONDARY LINES, 400/250 V OVERHEAD INSULATED CABLES, 3Φ 4 WIRE
- UNDERGROUND WIRING IN CONDUIT
- PHOTO SWITCH
- LIGHTING CONTROL PANEL
- CONTACT
- SELECTOR SWITCH : 3 POSITIONS, OFF-AUTO MANUAL



3				
2				
1				
NO	DATE	BY	CHECKED	APPROVED
CONSULTANTS				
DEDE				

KINGDOM OF THAILAND				
MINISTRY OF ENERGY				
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY				
MAE TUN HYDROPOWER PROJECT				
CIVIL WORKS				
POWERHOUSE				
LIGHTING SYSTEM				
DESIGNED BY		CHECKED BY		APPROVED BY
HANYA CONSULTANTS CO., LTD.		HANYA CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY
SUBMITTED		RECOMMENDED		DEVELOPMENT AND EFFICIENCY
DATE		DATE		
27/06/73		27/06/73		
PROJECT MANAGER		DRAWING NO.		SHEET NO.
MT-PH-23		MT-PH-23		94 OF 98

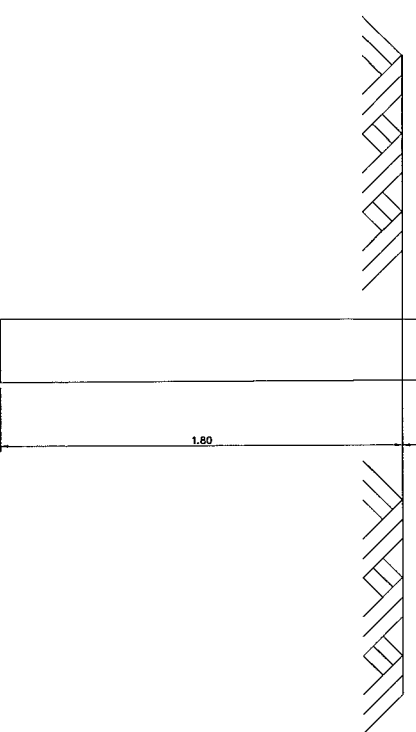


TYPICAL FOR FUSE PLATE
NOT TO SCALE

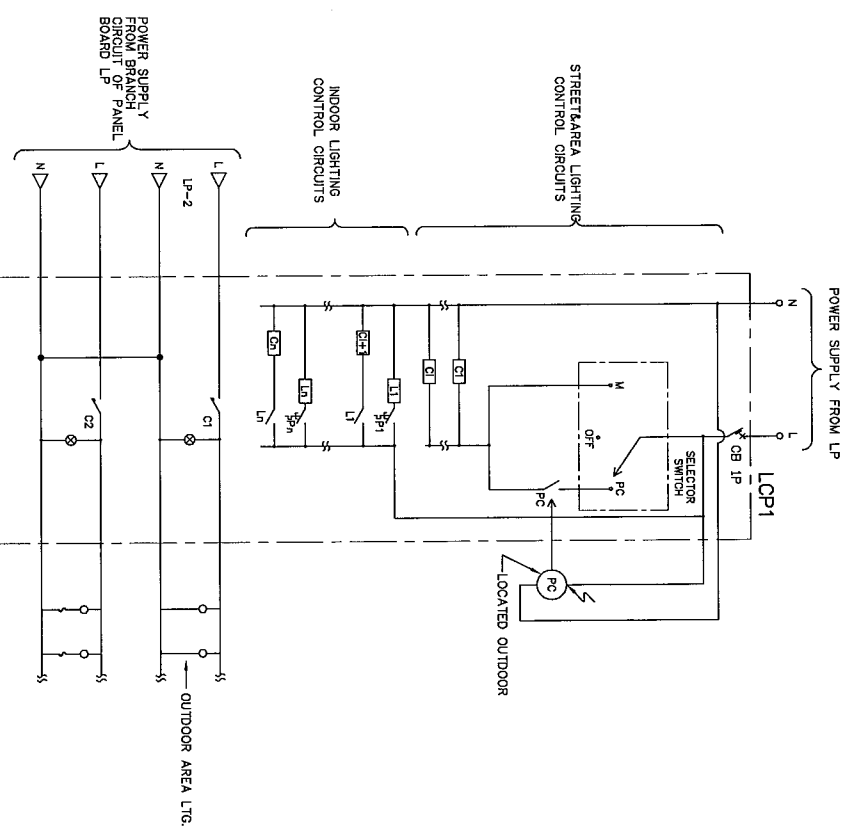
DETAIL OF CABLE UNDERGROUND
NOT TO SCALE

CABLE UNDER GROUND LEVEL
NOT TO SCALE

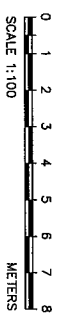
CABLE UNDER ROAD LEVEL
NOT TO SCALE



STREET LIGHTING WITH CONCRETE POLE
INSTALLATION TYPICAL
NOT TO SCALE

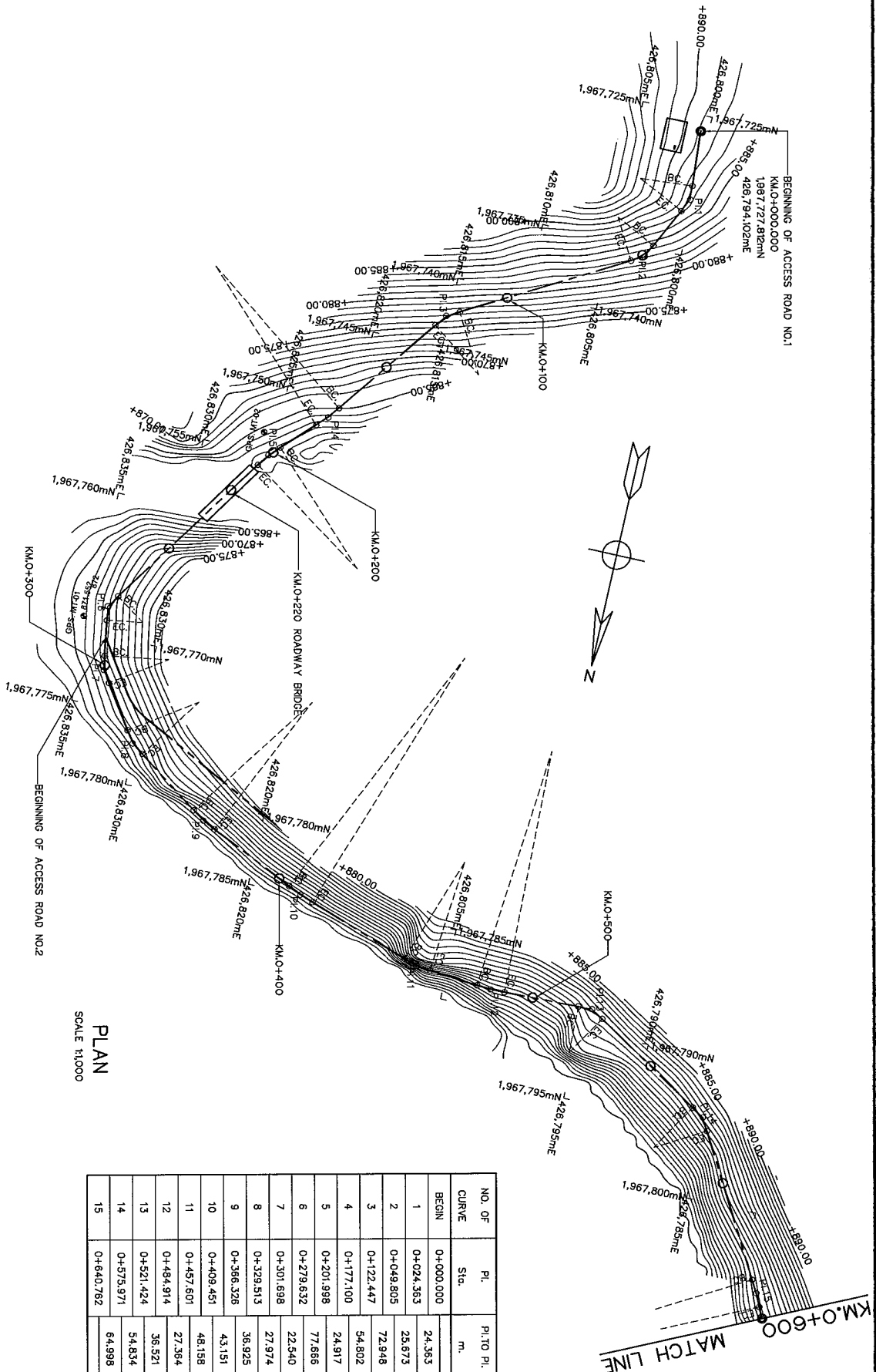


LIGHTING CONTROL PANEL(LCP1) DIAGRAM



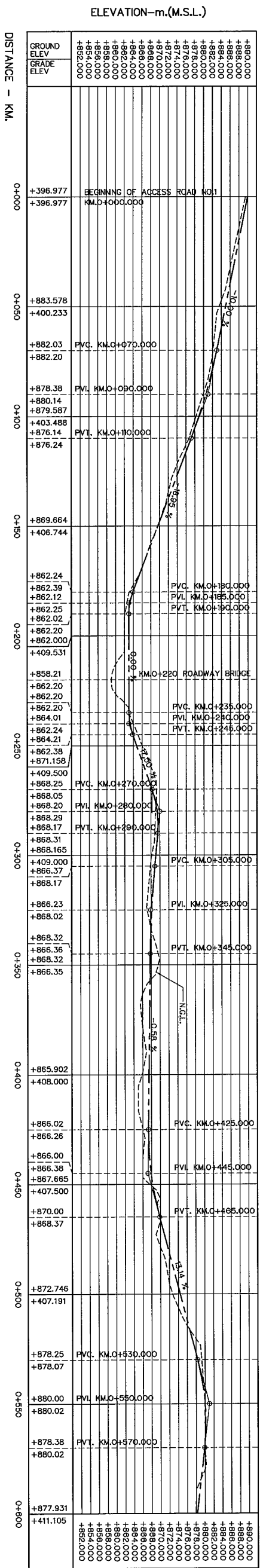
NO.	DATE	REVISIONS	CHECKED	APPROVED	DESE
1					
2					
3					

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
MAE TUEN HYDROPOWER PROJECT	
CIVIL WORKS POWERHOUSE POWER ELECTRIC AND LIGHTING SYSTEM	
DESIGNED 27/04/04 SUBMITTED 27/04/04 RECOMMENDED 27/04/04	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY REVIEWED 27/04/04 APPROVED 27/04/04
PROJECT MANAGER DATE 27/04/04	DRAWING NO. MT-PH-24 SHEET NO. 85 OF 98



NO. OF CURVE	PI.	PI TO PI	COORDINATE OF PI		ANGLE	T	R	L	BC	EC	BEARING
			N	E		m.	m.	m.	Sta.	Sta.	
BEGIN	0+000.000	24.353	1967,727.810	426,794.102							
1	0+024.353	25.673	1967,728.137	426,786.797	30°-04'-38"	5.000	18.810	8.768	0+019.383	0+028.132	S 86°-03'-25" W
2	0+049.805	72.948	1967,737.445	426,748.749	34°-36'-16"	5.000	18.035	9.894	0+044.805	0+054.498	N 83°-57'-57" W
3	0+122.447	54.802	1967,801.108	426,711.330	24°-10'-48"	5.000	23.343	9.851	0+117.447	0+127.288	N 28°-13'-40" W
4	0+177.100	24.917	1967,833.774	426,687.128	8°-35'-48"	5.000	68.521	9.881	0+172.100	0+182.081	N 53°-24'-29" W
5	0+201.998	77.868	1967,851.451	426,648.588	11°-12'-33"	5.000	50.882	9.888	0+189.988	0+208.968	N 44°-48'-40" W
6	0+278.832	22.540	1967,894.858	426,685.164	43°-00'-32"	5.000	12.890	9.528	0+274.832	0+284.158	N 58°-07'-13" W
7	0+301.698	27.974	1967,891.321	426,692.904	24°-59'-20"	5.000	22.884	9.841	0+298.698	0+308.539	S 80°-58'-14" W
8	0+329.513	35.925	1967,875.571	426,538.717	20°-59'-31"	5.000	27.054	9.888	0+324.513	0+334.401	S 55°-58'-54" W
9	0+386.336	43.151	1967,845.438	426,518.517	10°-08'-38"	5.000	58.335	9.874	0+381.386	0+391.300	S 35°-02'-23" W
10	0+409.451	48.158	1967,808.297	426,500.352	5°-38'-39"	5.000	101.431	9.892	0+404.451	0+414.443	S 24°-53'-44" W
11	0+457.601	27.364	1967,760.833	426,484.473	14°-11'-58"	5.000	40.144	9.949	0+452.601	0+462.550	S 19°-15'-05" W
12	0+484.914	35.521	1967,733.576	426,482.064	8°-35'-27"	5.000	88.836	9.889	0+478.914	0+488.903	S 5°-03'-08" W
13	0+521.424	54.834	1967,687.068	426,453.044	33°-33'-01"	5.000	16.587	9.713	0+516.424	0+526.137	S 1°-32'-18" E
14	0+575.971	64.998	1967,650.571	426,453.977	28°-30'-09"	5.000	19.686	9.793	0+570.971	0+580.784	S 32°-00'-41" W
15	0+640.762		1967,616.578	426,397.398	4°-25'-41"	5.000	128.328	9.995	0+635.782	0+645.757	S 80°-30'-47" W

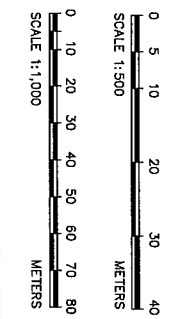
ALIGNMENT DATA CURVE



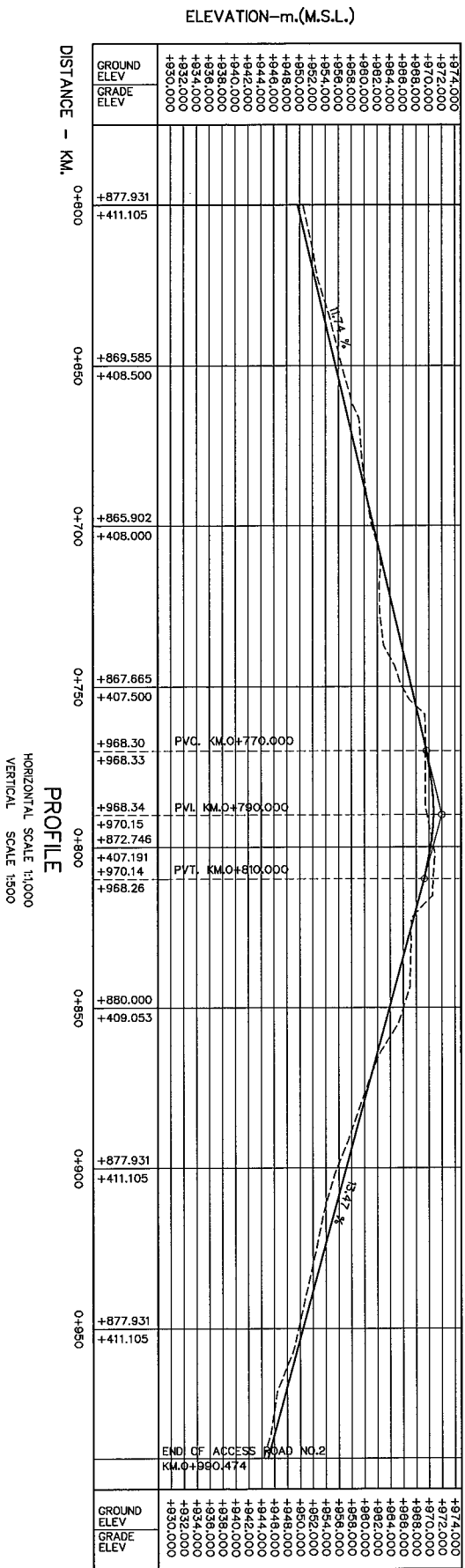
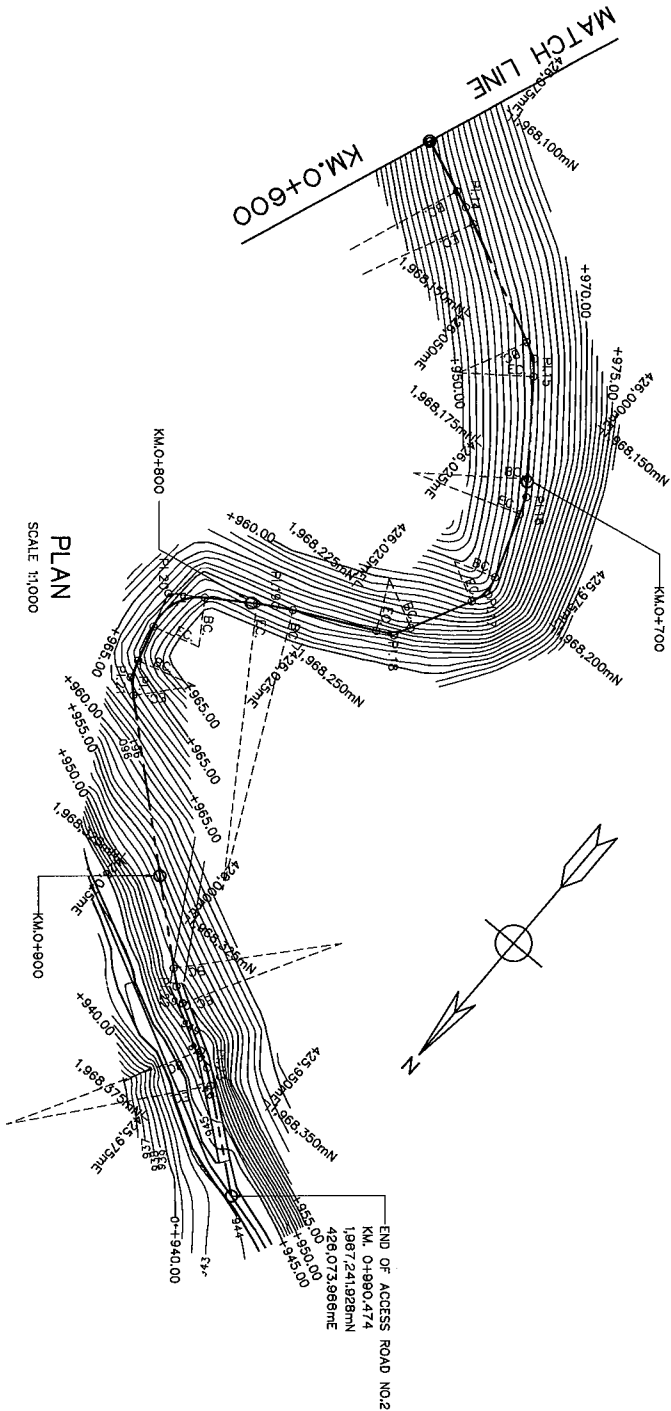
PROFILE
HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:500

- NOTES :
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS.
 2. UNLESS OTHERWISE SHOWN.
 3. THE ACCESS ROAD WAS DESIGNED BASED ON THE DIGITAL ELEVATION MODEL. THE CONSTRUCTOR SHALL CONDUCT SURVEYS AND PREPARE DRAWINGS TO BE SUBMITTED TO THE PROJECT OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.

- REFERENCE DRAWINGS :-
1. ACCESS ROAD, NO.1 PLAN AND PROFILE KM.0+800 TO KM.0+803.854
 2. ACCESS ROAD, NO.2 PLAN AND PROFILE KM.0+000 TO KM.0+800
 3. ACCESS ROAD, TYPICAL SECTIONS AND DETAILS
 4. ACCESS ROAD, BARRIER DETAILS
 5. ACCESS ROAD, GUARDRAIL DETAILS



KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
MAE TUEN HYDROPOWER PROJECT	
CIVIL WORKS ACCESS ROAD	
NO.1 PLAN AND PROFILE KM.0+000 TO KM.0+600	
PANYA CONSULTANTS CO.,LTD.	
DESIGNED DRAWN CHECKED APPROVED	REVIEWED RECOMMENDED APPROVED
DATE 27/08/13	SHEET NO. 86 OF 98



ALIGNMENT DATA CURVE

NO. OF CURVE	P.I. Sta.	P.I. TO P.I. m.	COORDINATE OF P.I.		ANGLE I	T m.	R m.	L m.	BC. Sta.	EC. Sta.	BEARING
			N	E							
14	0+620.867	61.564	1987.286.459	428.322.319	4°-12'-32"	5.000	138.068	9.898	0+615.867	0+625.863	S 21°-09'-30" W
15	0+668.307	45.644	1987.327.218	428.302.753	27°-38'-43"	5.000	20.322	9.805	0+661.307	0+671.112	S 25°-22'-02" W
16	0+704.222	36.110	1987.304.288	428.272.374	18°-07'-14"	5.000	31.355	9.817	0+699.222	0+709.138	S 53°-00'-45" W
17	0+732.722	28.583	1987.288.045	428.245.273	45°-12'-40"	5.000	12.008	9.478	0+727.722	0+737.388	S 71°-07'-58" W
18	0+760.316	28.118	1987.307.523	428.220.0725	37°-28'-03"	5.000	14.757	9.842	0+755.316	0+764.958	N 63°-39'-20" W
19	0+783.443	33.485	1987.337.582	428.205.2775	7°-13'-49"	5.000	79.140	9.887	0+788.443	0+798.430	N 28°-13'-18" W
20	0+822.788	29.358	1987.358.055	428.189.094	72°-38'-30"	10.000	13.803	17.246	0+812.788	0+830.032	N 33°-27'-08" W
21	0+845.247	85.795	1987.355.095	428.164.888	32°-33'-43"	5.000	17.120	9.729	0+840.247	0+849.878	S 73°-54'-24" W
22	0+830.771	23.889	1987.289.771	428.108.1033	12°-17'-38"	5.000	46.428	9.882	0+825.771	0+835.733	S 41°-20'-41" W
23	0+864.822	35.878	1987.289.771	428.098.5832	10°-02'-58"	5.000	58.888	9.874	0+849.822	0+859.898	S 29°-03'-03" W
END	0+880.474		1987.241.028	428.073.9867							S 39°-06'-02" W

- NOTES :
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-CN-01.
 - THE ACCESS ROAD WAS DESIGNED BASED ON THE DIGITAL ELEVATION MODEL. THE CONSTRUCTOR SHALL CONDUCT SURVEYS AND PREPARE DRAWINGS TO BE SUBMITTED TO THE PROJECT OWNER FOR APPROVAL PRIOR TO CONSTRUCTION.

REFERENCE DRAWINGS :-

- ACCESS ROAD, NO.2 PLAN AND PROFILE KM.0+000 TO KM.0+600
- ACCESS ROAD, TYPICAL SECTIONS AND DETAILS
- ACCESS ROAD, BARRIER DETAILS
- ACCESS ROAD, GUARDRAIL DETAILS

KINGDOM OF THAILAND
MINISTRY OF ENERGY
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS
ACCESS ROAD

NO.2 PLAN AND PROFILE KM.0+600 TO KM.0+990.474

DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

REVIEWED

DESIGNED

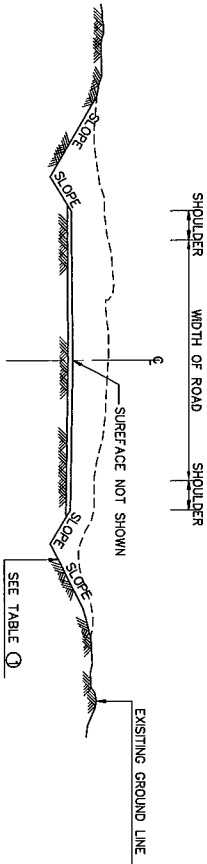
CHECKED

PROJECT MANAGER

DATE

DRAWING NO.

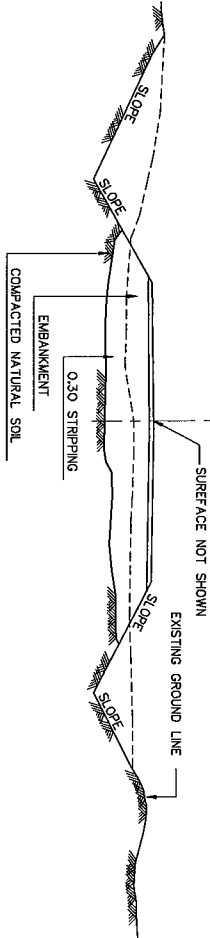
SHEET NO.



CUT SECTION

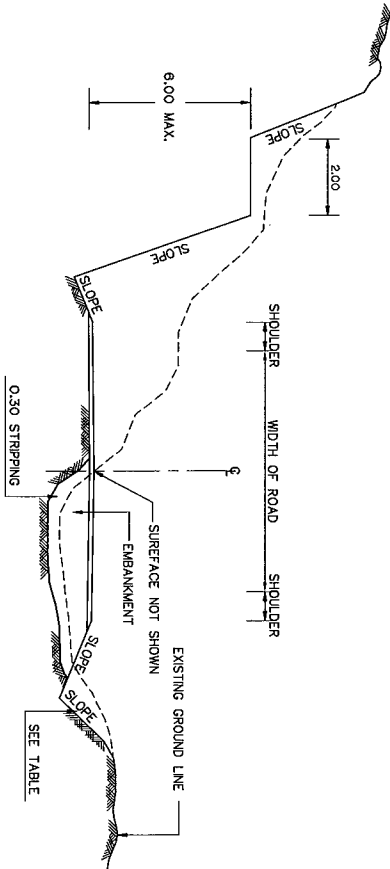
NOT TO SCALE

SHOULDER WIDTH OF ROAD SHOULDER



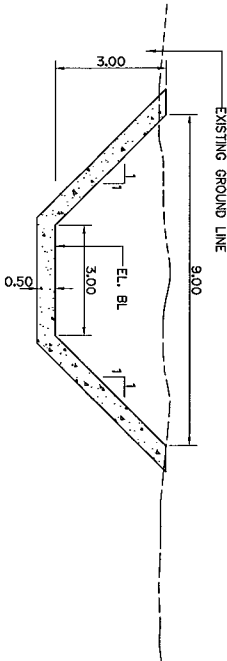
FILL SECTION

NOT TO SCALE



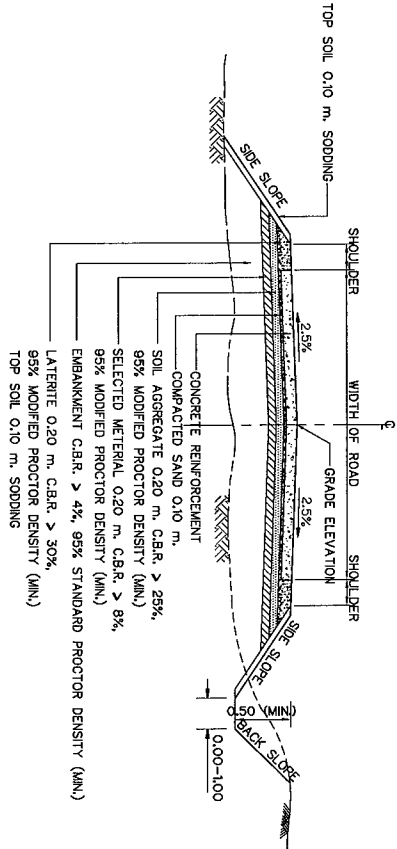
CUT & FILL SECTION

NOT TO SCALE



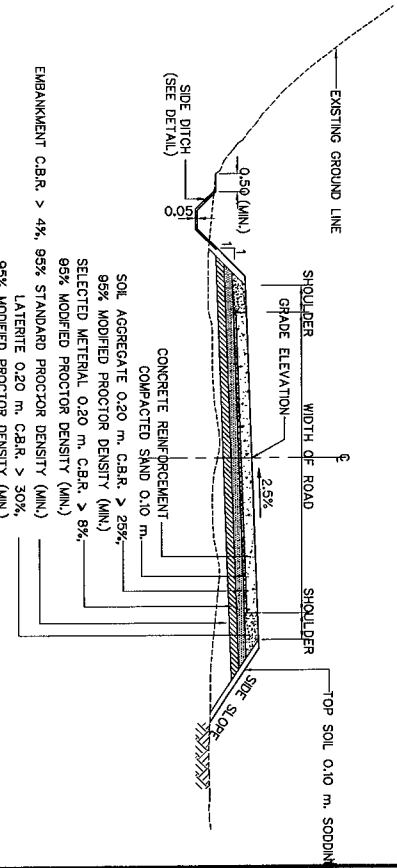
SIDE DITCH

NOT TO SCALE



TYPICAL SECTION OF ACCESS ROAD TYPE 1

NOT TO SCALE



TYPICAL SECTION OF ACCESS ROAD TYPE 2

NOT TO SCALE

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. THE PROPERTIES OF MATERIALS NOT INDICATED IN THE DRAWING AND ROAD CONSTRUCTION METHODS SHALL CONFORM TO CONSTRUCTION STANDARD OF 1974:201 - 1974:2017 AND 1974:2018 - 1974:2021 (ONLY IN RELATED PART).
3. CLEARING AND GRUBBING METHOD SHALL CONFORM TO THE REQUIREMENTS AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
4. SIDE DITCH SHALL BE PROVIDES FOR ROAD IN CUT SECTION AND IN FILL SECTION WHERE HEIGHT OF FILL FROM CARRIAGE WAY EDGE TO EXISTING GROUND LINE IS LESS THAN 0.30 METERS.
5. ACCESS ROAD ALIGNMENT MAY BE RE-ADJUSTED TO SUIT THE FIELD CONDITIONS, BUT UNDER THE APPROVAL OF FIELD ENGINEER.
6. THE FIELD ENGINEER MAY ORDER SIDE SLOPE IN DIFFERENCE FROM TYPICALLY SHOWN IN THIS DRAWING.
7. RC. PIPES ARE GROOVE AND TONGUE TYPE WHICH SPECIFIED IN THE TECHNICAL SPECIFICATIONS LOCATION AND SIZE OF RC. PIPE CULVERTS AS SHOWN IN PLAN AND PROFILE, MAY BE RE-ADJUSTED BY FIELD ENGINEER TO FIT WITH THE TERRAIN.
8. ALL RC. PIPE CULVERTS SHALL BE INSTALLED IN MANUFACTURED LENGTH WITHOUT FIELD CUTTINGS.
9. INVERT ELEVATIONS OF RC. PIPE CULVERTS WILL BE SET ON SITE, THE LENGTH SHOWN IN PLAN AND PROFILE SHEETS MAY BE VARIED TO SUIT FIELD CONDITIONS.
10. THE PAVEMENT OF ACCESS ROAD IS CONCRETE SURFACE TREATMENT, PLAN AND PROFILE DRAWING OR AS DIRECTED BY THE CONTRACTOR AND APPROVED BY FIELD ENGINEER.

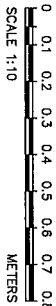
EXISTING GROUND SLOPE 1:5	EARTH		HARD ROCK	
	CUT 1:5	FILL 1:5	CUT 1:5	FILL 1:5
OVER 1 : 1	OVER 10.5	1:1	10.25	1:1
1:1 - 1:1.5	10.5	1:1	10.25	1:1
1:1.5 - 1:2	1:1	1:1	10.25	1:1
1:2 - 1:3	1:1	1:1.5	10.25	1:1.5
LOWER 1:3	1:1	1:2	10.25	1:2

1/ = FOR DOUBTFUL CASES APPROVED BY FIELD ENGINEER

TABLE

SPACING OF GUIDE POSTS				
RADIUS M.	S M.	S1 M.	S2 M.	S3 M.
15 - 74	4	8	12	24
75 - 99	8	12	18	36
LARGER THAN 100	NO GUIDE POSTS INSTALLED			

ACCESS ROAD DETAILS			
ACCESS ROAD	WIDTH OF ROAD	SHOULDER	TYPE
NO.1	4.00	0.50	1
NO.2	4.00	0.50	2



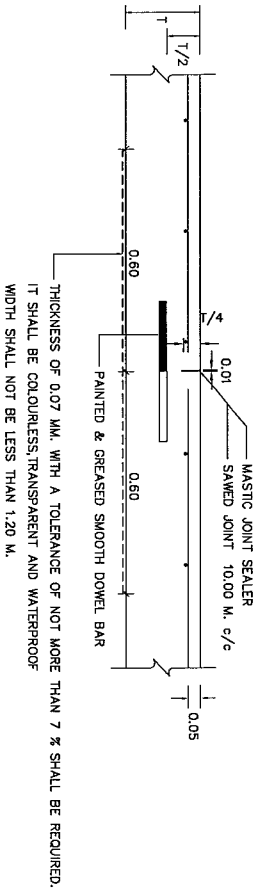
3									
2									
1									
NO.	DATE	REVISIONS	CHECKED	APPROVED	DATE	PROJECT MANAGER	DRAWING NO.	SHEET NO.	
							MT-AR-05	90 of 98	

KINGDOM OF THAILAND	DEPARTMENT OF ALTERNATIVE ENERGY
MINISTRY OF ENERGY	DEPARTMENT OF ALTERNATIVE ENERGY
MAE TUEN HYDROPOWER PROJECT	

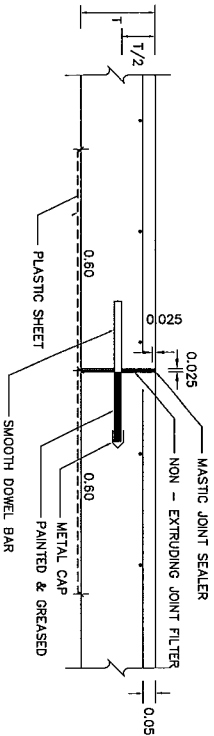
TYPICAL SECTIONS AND DETAILS (SHEET 1/22)

DESIGNED	REVIEWED	DEPARTMENT OF ALTERNATIVE ENERGY
CHECKED	APPROVED	DEVELOPMENT AND EFFICIENCY

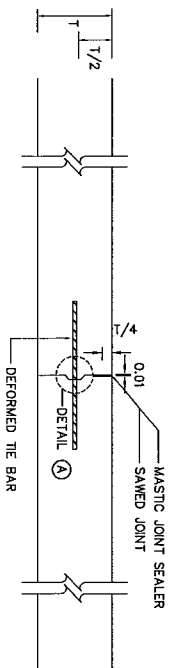
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
MT-AR-05	90 of 98		



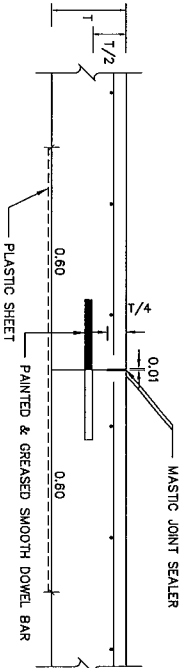
CONTRACTION JOINT
NOT TO SCALE



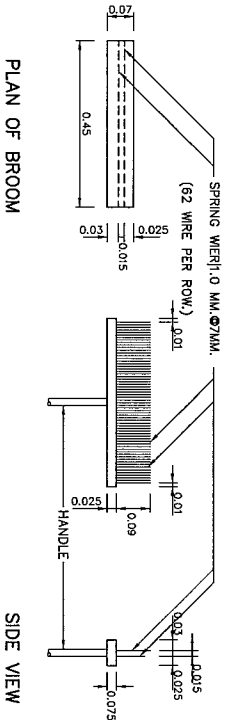
EXPANSION JOINT
NOT TO SCALE



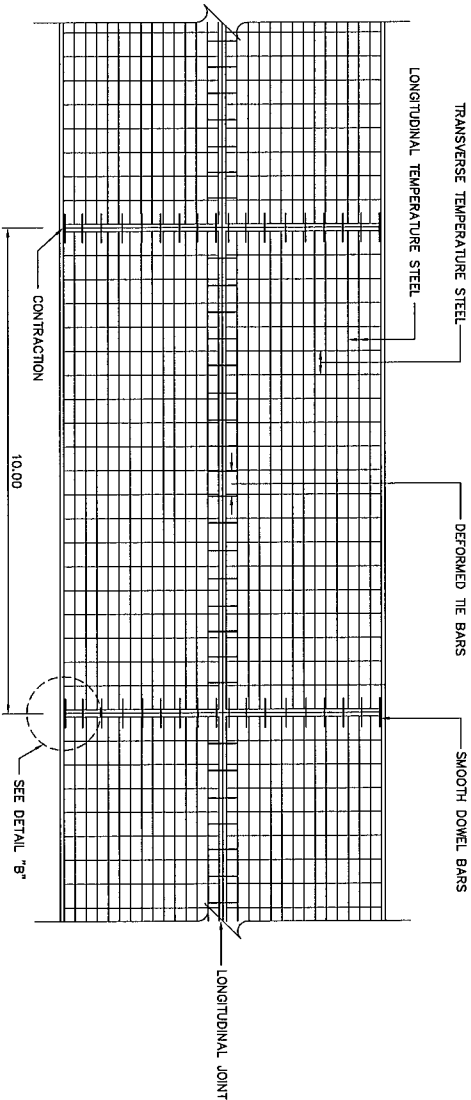
LONGITUDINAL JOINT
NOT TO SCALE



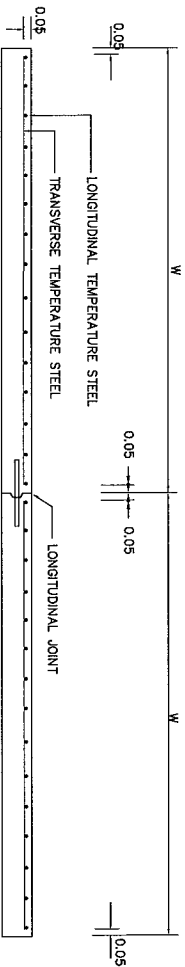
CONTRACTION JOINT
NOT TO SCALE



DETAIL OF BROOM SURFACE CONCRETE PAVEMENT
NOT TO SCALE



PLAN REINFORCEMENT DETAIL
NOT TO SCALE



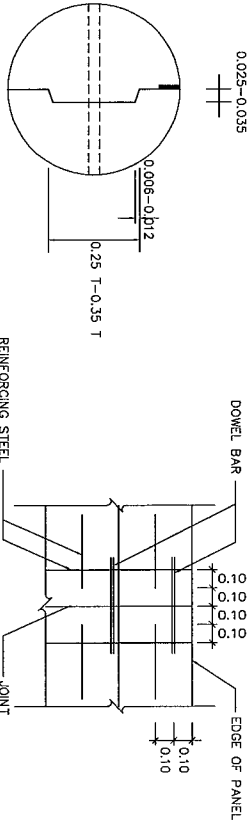
SECTION A-A
NOT TO SCALE

SLAB THICKNESS (CM.)	LONGITUDINAL REINFORCEMENT			TRANSVERSE REINFORCEMENT		
	ROUND BAR SIZE (ø 1200 kg)	STEEL AREA (Sq.m/m)	MINIMUM EQUIVALENT STEEL AREA (ø 1200 kg)	ROUND BAR SIZE (ø 1200 kg)	STEEL AREA (Sq.m/m)	MINIMUM EQUIVALENT STEEL AREA (ø 1200 kg)
18	8mm, Ø 23m	277	121	8mm, Ø 20m	141	62
				6mm, Ø 20m	141	62
				6mm, Ø 15m	188	82
				6mm, Ø 15m	188	82

TEMPERATURE STEEL

TIE BARS/DOWEL BARS	STEEL TYPE	DIMETER (mm)	LENGTH (cm)	SPACING (cm)
TIE BARS	D8	12	50	75
DOWEL BARS	R8	25	50	30

TIE BARS-DOWEL BARS



DETAIL "A"
NOT TO SCALE

DETAIL "B"
NOT TO SCALE

NOTES :

1. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 325 KSC. FOR 15x15x15 CM CUBE AT 28 DAYS
2. EXPANSION JOINT SHALL BE CONSTRUCTED AT THE INTERVAL OF 90-150 METERS
3. MASTIC JOINT SEALER SHALL CONFORM TO THE AASHTO M.173-60(1974), ASTM D.190-74
4. JOINT FILLER SHALL CONFORM TO THE AASHTO M.153-70, ASTM.1752-67(1973)
5. WELDED WIRE CAN BE USED IN PLACE OF BAR MESH
6. JOINT FILLER SHALL CONFORM TO THE TIS-20-2527 AND TIS-24-2527
7. ROAD CONSTRUCTION MATERIAL NOT SPECIFIED IN THIS DRAWING SHALL CONFORM TO THE STANDARD OF THE DEPARTMENT OF HIGHWAYS, UNLESS OTHERWISE SHOWN.
8. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
9. ALL JOINT EXCEPT EXPANSION JOINT SHALL BE MADE BY SLOT CUTTING MACHINE ONLY.
10. CONCRETE PAVEMENT SHALL BE REQUIRED FOR CONCRETE POURING, IN CASE OF NECESSARY POURING CONCRETE BY MAN-POWER, CONCRETE SHALL BE POURED ONLY GAP SPACE NOT MORE THAN 30.00 METERS LONG.
11. THE BROOM SHALL BE DRAINED FROM ONE EDGE TO THE OTHER WITH STROKES SLIGHTLY OVERLAPPING IN SUCH A WAY AS TO CORRUGATE THE SURFACE UNIFORMLY TO A DEPTH OF NOT MORE THAN 2 MM.

PREPARATION OF JOINT FOR MASTIC JOINT SEALER

1. THE JOINT SHALL BE CLEANED WITH A BLOWER TO GET RID OF ALL KINDS OF DIRT. THE JOINT SHALL BE COMPLETELY DRY.
2. PRIMER SHALL BE APPLIED TO THE JOINT WITH A BRUSH OR SPRAYER THE JOINT SHALL BE LET DRY BEFORE THE POURING OF MASTIC JOINT SEALER WHICH HAS BEEN BOILED AND DISSOLVED BY MEANS OF HEAT CONDUCTIVITY TO THE SPECIFIED TEMPERATURE
3. JOINTS SHALL BE CUT AND MASTIC JOINT SEALER SHALL BE DROPPED AS SOON AS POSSIBLE
4. MASTIC JOINT SEALER SHALL BE DROPPED WITH JOINT SEALANT APPLYING MACHINE

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEEN HYDROPOWER PROJECT			
CIVIL WORKS ACCESS ROAD			
TYPICAL SECTIONS AND DETAILS (SHEET 2/22)			
DESIGNED	REVIEWED	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DRAWN	SUBMITTED		
CHECKED	RECOMMENDED		
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
	27/06/13	MT-AR-06	91 OF 98

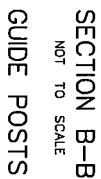
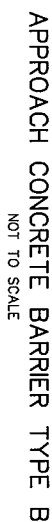
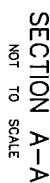
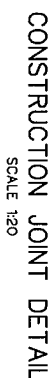
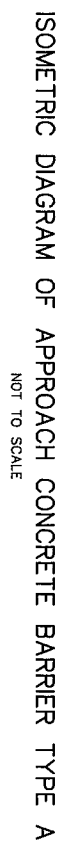


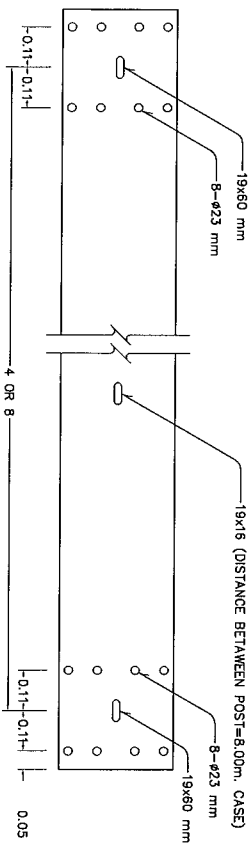
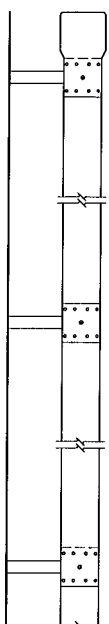
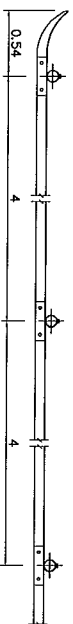
TABLE OF DIMENSIONS FOR APPROACH
CONCRETE BARRIER TYPE (A)

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. CLEAR CONCRETE COVER SHALL BE 5 CM.
3. CONSTRUCTION JOINT SHALL PROVIDED AT 10.00 M. INTERVAL.
4. EXPANSION JOINT WITH NON-EXTENDING JOINT FILTER SHALL BE PROVIDED AT
5. APPROACH CONCRETE BARRIER SHALL BE PAINTED IN BLACK AND WHITE STRIPS IN TWO COATS. THE PAINT SHALL CONFORM TIS.327
6. PRE-CAST CONCRETE BARRIER TYPE I ACCORDING TO DRAWING NO. RS-504 SHALL BE USED INSTEAD OF CAST-IN-SITU CONCRETE BARRIER

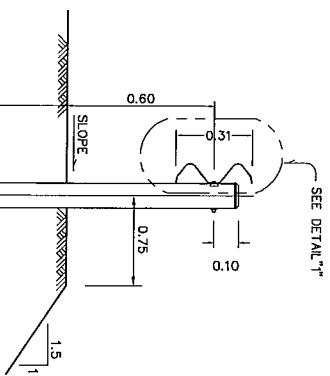
THIS BARRIER IS SUITABLE ONLY SPECIFIC LOCATIONS AND CERTAIN CONDITIONS, IT SHOULD BE APPLIED WITH THE FIRM INFORMATIONS CONCERNED AND RECOMMENDED BY THE ENGINEER



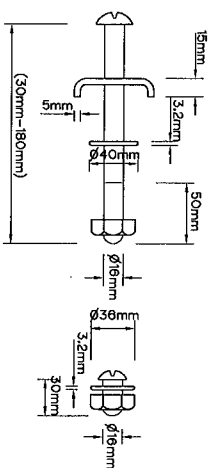
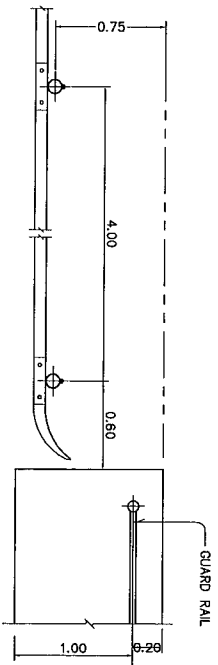
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY		MAE TUEN HYDROPOWER PROJECT	
CIVIL WORKS ACCESS ROAD BARRIER DETAILS		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED <i>AK</i> DRAWN <i>Surat</i> CHECKED <i>OP</i> PROJECT MANAGER <i>OP</i>	JUL 225-4 28/06/73	SUBMITTED RECOMMENDED APPROVED DRAWING NO.	JUL 225-4 28/06/73 MT-AR-07 SHEET NO. 92 OF 98
PANYA CONSULTANTS CO. LTD.		REVIEWED <i>Surat</i>	



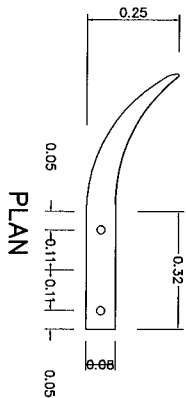
DETAIL OF RAIL
SCALE 1:30



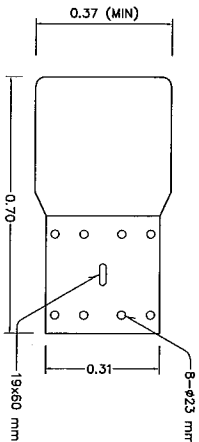
DETAIL OF POLE
SCALE 1:15



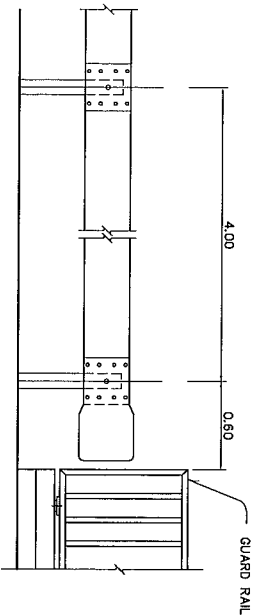
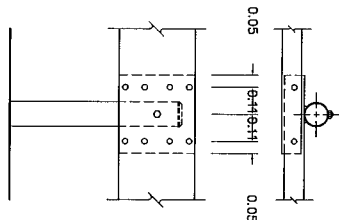
DETAIL OF BOLT & NUT
SCALE 1:3



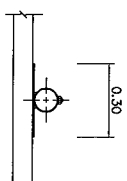
PLAN



DETAIL OF END RAIL
SCALE 1:10



DETAIL OF END RAIL (BRIDGE CONNECTION AT SPILLWAY)



DETAIL OF BACK-UP PLATE

SCALE 1:15

RAIL		MIN. RAIL THICKNESS (MILLIMETER)	MIN. WEIGHT ZINC COATING (GRAMS PER SQUARE METER)
CLASS	TYPE		
1	1	3.2	550
	2	3.2	1,000
2	1	2.5	550
	2	2.5	1,000

RAIL		MIN. ULTIMATE TENSILE STRENGTH (kg/mm ²)	MIN. PERCENTAGE OF ELONGATION	MAX. DEFLECTION			
CLASS	TYPE			MAX. LOAD TRAFFIC FACE UP kg	MAX. DEFLECTION (mm)	TRAFFIC FACE DOWN	MAX. DEFLECTION (mm)
1	1	41	21	910	50	750	50
	2			1,390	75	1,090	75
2	1	41	21	980	50	545	50
	2			910	75	720	75

RADIUS OF CURVE (m)	SPACING OF POSTS S(m)
ON TANGENT OR R $\geq$ 50	4.00
25-49	3.00
15-24	2.50
LESS THAN 15	2.00

13. POST SHALL BE GALVANIZED CARBON STEEL PIPE
14. THE GALVANIZING OF BOLTS, NUTS, WASHERS AND SIMILAR THREADED FASTENERS SHALL BE IN ACCORDANCE WITH THAI INDUSTRIAL STANDARD 171 CLASS 5.8
15. UNLESS OTHERWISE SPECIFIED, GUARDRAIL CLASS 1 SHALL BE USED FOR HIGHWAY CLASS B₁, F₁, S_1 , S_2 , S_3 , S_4 & F FOR OTHER HIGHWAY CLASSES, GUARDRAIL CLASS 2 SHALL BE USED.
16. IN CASE OF HIGH RESISTANCE TO CORROSION REQUIREMENT, GUARDRAIL TYPE 2 SHALL BE USED.
17. SPACING OF POSTS SHALL BE LOCATED AS FOLLOWS.
- | RADIUS OF CURVE
(m) | SPACING OF POSTS
5(m) |
|---------------------------|--------------------------|
| ON TANGENT OR R $\geq$ 50 | 4.00 |
| 25-49 | 3.00 |
| 15-24 | 2.50 |
| LESS THAN 15 | 2.00 |
18. AS DIRECTED BY THE LOCATION AND DESIGN DIVISION (DDH) GUARDRAIL, IN GENERAL, IS MORE SUITABLE THAN GUIDE POST ON HORIZONTAL CURVE SECTION WITH HIGH FILL MORE THAN 6.00 METERS.
19. GUARDRAIL INSTALLED IN CURVE WHERE RADIUS IS LESS THAN 50 m SHALL BE PRE-BENT FROM THE FACTORY
20. BACK-UP PLATE OF THE SAME CLASS AND TYPE AS THE RAIL WITH INTERMEDIATE POST SHALL BE PROVIDED WHERE SPACING OF POSTS IS 25 m
21. ALL METAL PARTS WHICH ARE GALVANIZED SHALL BE PAINTED WHITE JUST ONCE AS FIELD COAT.
22. UNLESS OTHERWISE SPECIFIED ON THIS DRAWING, GUARDRAIL SHALL BE IN ACCORDANCE WITH THAI INDUSTRIAL STANDARD 248
23. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED.

SCALE 130 METERS

SCALE 125 METERS

SCALE 115 METERS

SCALE 110 METERS

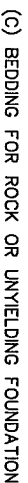
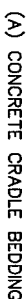
SCALE 105 METERS

No.	Date	Pensions	Chequed	Approved
1				
2				
3				

CONSULANTS

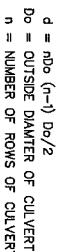
DEED

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE DEVELOPMENT AND EFFICIENCY		MAE TUEN HYDROPOWER PROJECT	
CIVIL WORKS		GUARDRAIL DETAILS	
ACCESS ROAD		CIVIL WORKS	
GUARDRAIL DETAILS		ACCESS ROAD	
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY		MAE TUEN HYDROPOWER PROJECT	
RECEIVED		CIVIL WORKS	
SUBMITTED		ACCESS ROAD	
RECOMMENDED		GUARDRAIL DETAILS	
APPROVED		CIVIL WORKS	
DRAWING NO. MT-AR-08		ACCESS ROAD	
SHEET NO. 93 OF 98		GUARDRAIL DETAILS	



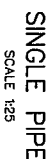
R.C. PIPE CULVERTS INSTALLATION BY TRENCH METHOD

NOT TO SCALE



LONGITUDINAL SECTION

NOT TO SCALE



SCALE 1:20

- REINFORCED CONCRETE CULVERT PIPE INSTALLATION**
(MAX. FILL HEIGHT 9.00 M.)
- A.) CONSTRUCTION METHODS WHEN FILL HEIGHT IS LESS THAN 1.20 M.**
 1. THE PROJECTION METHODS SHALL BE USED FOR PIPE INSTALLATION.
 2. THE PIPE LINE LAYOUT SHALL BE SUITABLE FOR THE TERRAIN/THE EXISTING GROUND ALONG THE LINE OF CULVERT SHALL BE PREPARED TO THE SPECIFIED SLOPE.
 3. PIPE BEDDING SHALL BE TYPE (A) , (B) OR (C) AS SHOWN ON THE DRAWING AND SHALL DEPEND UPON PREVAILING SOIL CONDITION AND THE JUDGEMENT OF THE ENGINEER.
 4. AFTER THE PPE HAS BEEN PLACED , THE SUBGRADE AND / OR PORTION OF PAVEMENT SECTION WHICH ARE TO BE LAD ALONG BOTH SIDES OF THE LINE WITH IN A DISTANCE OF 4 PPE DIAMETERS BUT NOT LESS THAN 5.00 M. FROM CENTRELINE OF THE PPE SHALL BE CONSTRUCTED LIGHT WEIGHT CONSTRUCTION EQUIPMENT USED FOR COMPACTION SHALL OPERATE IN A DIRECTION PERPENDICULAR TO CENTRELINE OF ROADWAY (OR PARALLEL TO PIPE LINE UNTIL THE BACKFILL HAS REACHED AN ELEVATION OF AT LEAST 30 CM. ABOVE THE TOP OF PIPE.

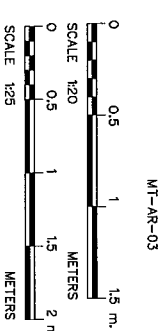
B.) CONSTRUCTION METHODS WHEN FILL HEIGHT EXCEEDS 1.20 M.

1. PIPE INSTALLATION SHALL BE BY TRENCH METHOD. SUBGRADE SHALL BE FIRST CONSTRUCTED TO AN ELEVATION $D/2$ OR AT LEAST 60 CM. OVER TOP OF PROPOSED PIPE. A TRENCH SHALL THEN BE EXCAVATED ALONG THE PROPOSED LINE AS SHOWN ON THE DRAWING. TRENCH WALLS SHALL HAVE A SMOOTH SURFACE AND SHALL BE CONSTRUCTED VERTICALLY.
2. THE TRENCH BED SHALL BE PREPARED TO THE SPECIFIED SLOPE BEDDING TYPE SHALL BE (A), (B) OR (C) DEPENDING ON FOUNDATION SOIL AND AS DIRECTED BY THE ENGINEER. PIPE SHALL BE INSTALLED ACCORDING TO SIZES SHOWN ON THE DRAWINGS. BACKFILLING OF PIPE CULVERTS SHALL NOT BE PERMITTED UNTIL AT LEAST 48 HOURS HAVE ELAPSED AFTER JOINT HAVE BEEN COMPLETED.
3. BACKFILL SHALL BE PLACED TO THE SUBGRADE ELEVATION AS DESCRIBED IN NOTE 1. BACKFILL SHALL BE A SELECT MATERIAL AND SHALL REQUIRE THE APPROVAL OF THE ENGINEER. METHOD OF COMPACTION OF BACKFILL SHALL BE THE SAME AS REQUIRED FOR SUBGRADE COMPACTION. EQUIPMENT SHALL BE APPROVED BY THE ENGINEER.

NOTES :

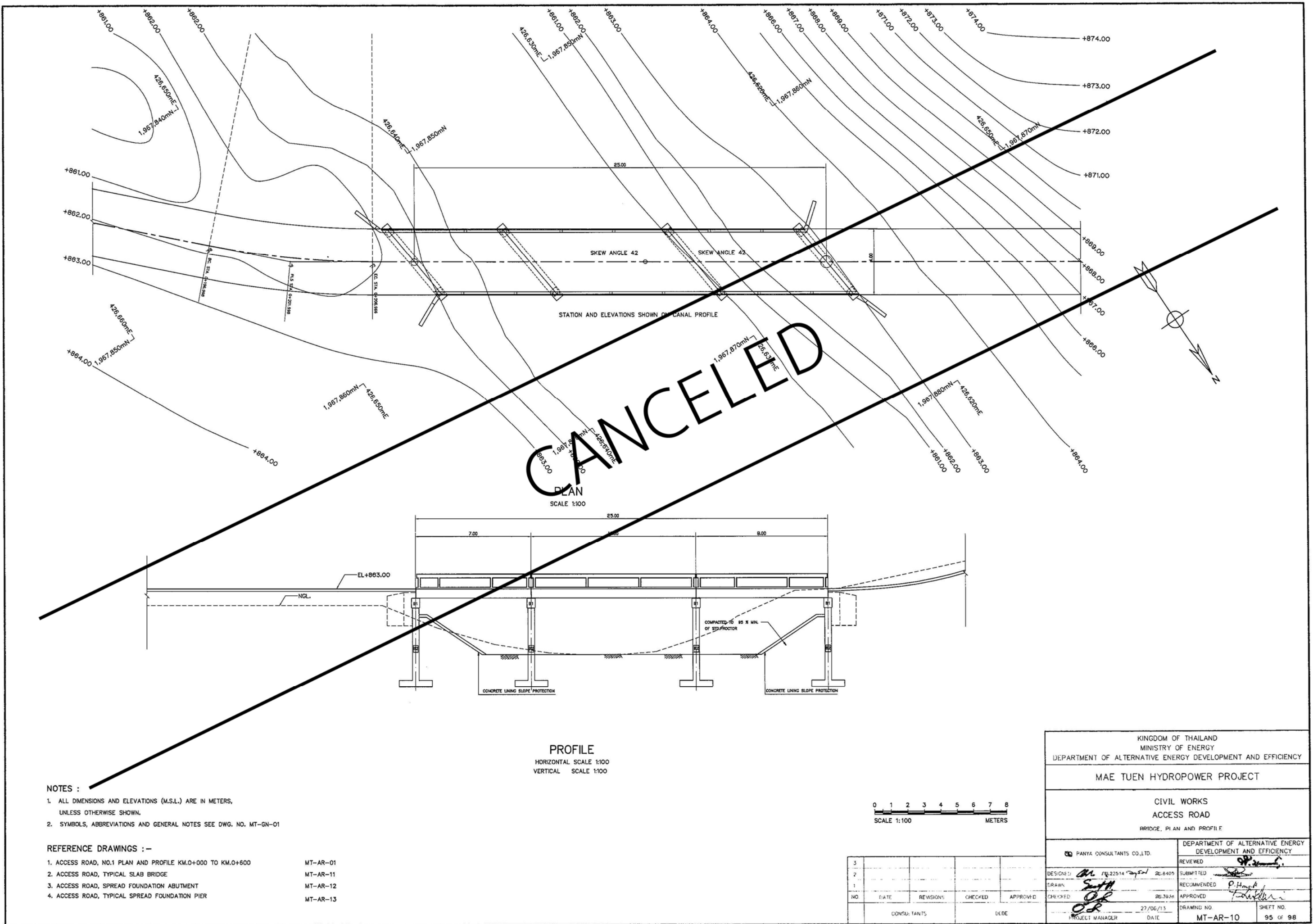
1. ALL DIMENSION ARE IN METERS, REINFORCEMENT BARS IN MILLIMETERS, UNLESS OTHERWISE INDICATED.
2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 175 KSG. FOR 15X15X15 CM. CUBE AT 28 DAYS. AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS :

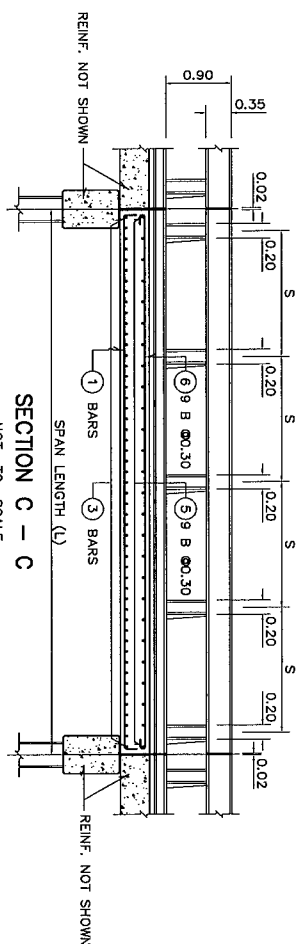
PORTLAND CEMENT TYPE 1	320	KG. (M/M)
SAND	0.43	M ³
CRUSHED ROCK OR GRAVEL	0.65	M ³
CONCRETE SLUMP	10	CM. (MAX.)
3. REINFORCED STEEL SHALL CONFORM TO IS:20 GRADE SR. 24 OR EQUIVALENT.
4. STEEL REINFORCED IN CONCRETE SLAB SHALL BE REQUIRED ONLY WHEN (Ø X L) IS MORE THAN 9.00 SQ.M.
5. FOR ROLLING AND MOUNTAINOUS TERRAINS, THESE HEADWALLS SHALL BE USED AS NECESSARY.
6. THIS DRAWING IS ADAPTED FROM DGH DWG NO.DS-102 AND DWG NO. DS-103.



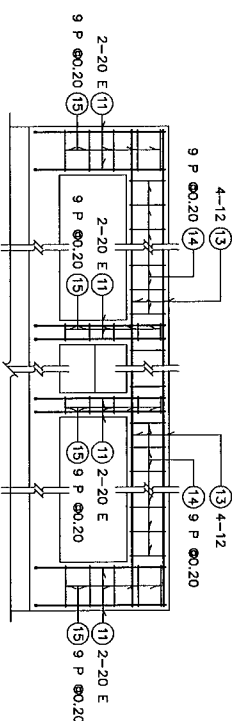
MT-AR-03

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY					
MAE TUEN HYDROPOWER PROJECT					
CIVIL WORKS ACCESS ROAD					
TYPICAL RC. PIPEINSTALLATION AND REINFORCEMENT					
DESIGNED BY Mr. JAL22214 report		REVISOR		SUBMITTED	
DRAWN CHUTKEU		CHECKED		APPROVED	
PROJECT MANAGER		DATE 27/08/73		DRAWING NO. MT-AR-09	
				SHEET NO. 94 OF 98	

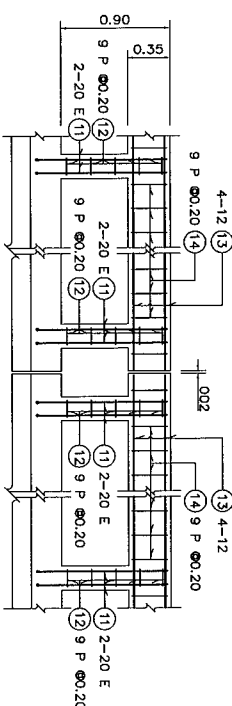




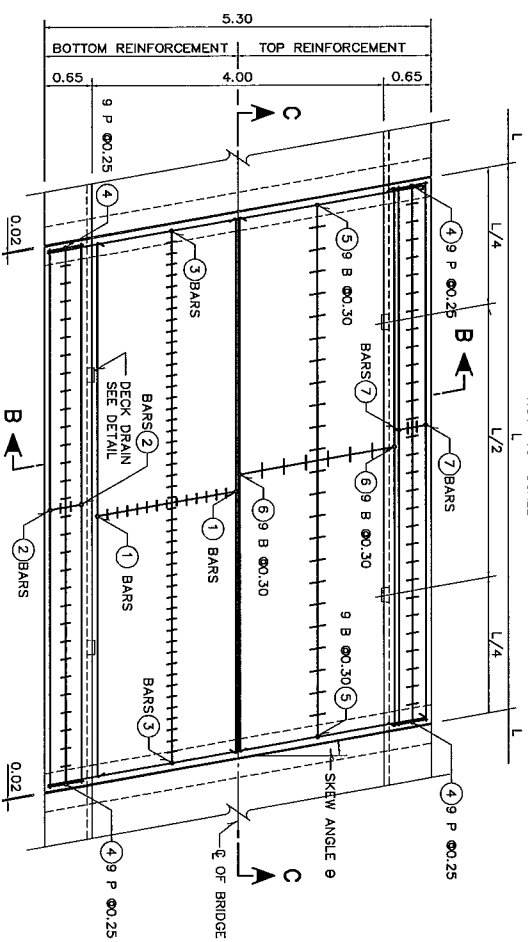
SECTION C - C
NOT TO SCALE



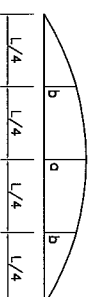
SECTION D - D
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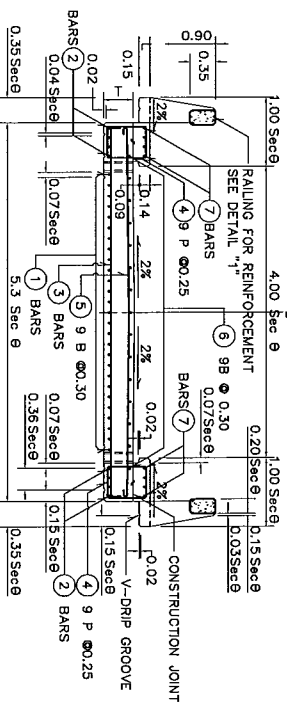
SECTION E - E
NOT TO SCALE



REINFORCEMENT PLAN



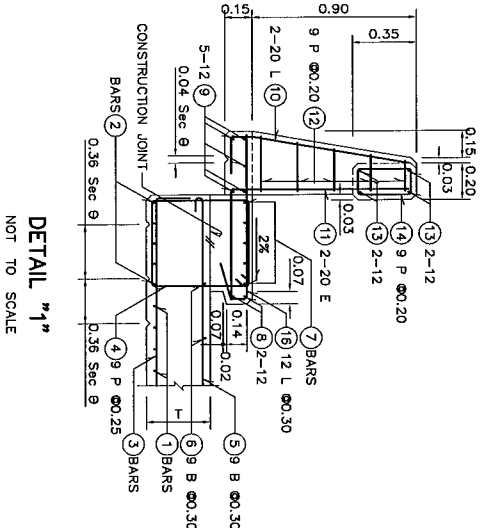
SPAN	CAMBER OF DEAD LOAD	
	a	b
5.00	0.0019	0.0014
6.00	0.0032	0.0023
7.00	0.0050	0.0036
8.00	0.0070	0.0050
9.00	0.0094	0.0067
10.00	0.0112	0.0080



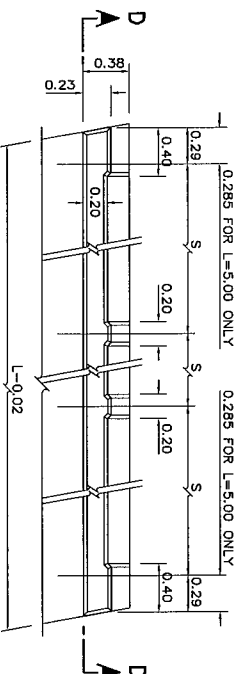
TRANSVERSAL SECTION B – B

BAR NO.	L = 5.00 M.				L = 6.00 M.				L = 7.00 M.				L = 8.00 M.				L = 9.00 M.				L = 10.00 M.				SHAPE																
	T	RAILING		T	RAILING		T	RAILING		T	RAILING		T	RAILING		T	RAILING		T	RAILING																					
		S	NO. OF POST		S	NO. OF POST		S	NO. OF POST		S	NO. OF POST		S	NO. OF POST		S	NO. OF POST		S	NO. OF POST	S	NO. OF POST																		
0.32	1.47	4	0.36	1.80	4	0.39	1.80	5	0.43	1.85	5	0.47	1.88	6	0.53	1.88	6	0.53	1.88	6	0.53	1.88	6																		
D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.	D/A, (mm.)	SPACING	QTY.																		
①	25	0.16	—	25	0.15	—	25	0.13	—	25	0.12	—	25	0.10	—	25	0.09	—	25	0.09	—	25	0.09																		
②	25	—	4	25	—	5	25	—	6	25	—	7	25	—	8	25	—	9	25	—	9	25																			
③	12	0.15	34	12	0.15	41	12	0.14	51	12	0.14	58	12	0.13	70	12	0.11	92	12	0.11	92	12																			
④	9	0.25	42	9	0.25	50	9	0.25	58	9	0.25	66	9	0.25	74	9	0.25	82	9	0.25	82	9																			
⑤	9	0.30	17	9	0.30	21	9	0.30	24	9	0.30	28	9	0.30	31	9	0.30	34	9	0.30	34	9																			
⑥	9	0.30	—	9	0.30	—	9	0.30	—	9	0.30	—	9	0.30	—	9	0.30	—	9	0.30	—	9																			
⑦	12	—	4	12	—	5	12	—	6	12	—	7	12	—	8	12	—	9	12	—	9	12																			
⑧	12	—	4	12	—	4	12	—	4	12	—	4	12	—	4	12	—	4	12	—	4	12																			
⑨	12	—	8	12	—	8	12	—	8	12	—	8	12	—	8	12	—	8	12	—	8	12																			
⑩	12	—	16	12	—	16	12	—	20	12	—	20	12	—	24	12	—	24	12	—	24	12																			
⑪	20	—	16	20	—	16	20	—	20	20	—	20	20	—	24	20	—	24	20	—	24	20																			
⑫	9	0.20	20	9	0.20	20	9	0.20	30	9	0.20	30	9	0.20	40	9	0.20	40	9	0.20	40	9																			
⑬	12	—	8	12	—	8	12	—	8	12	—	8	12	—	8	12	—	8	12	—	8	12																			
⑭	9	0.20	36	9	0.20	48	9	0.20	54	9	0.20	62	9	0.20	72	9	0.20	84	9	0.20	84	9																			
⑮	9	0.20	20	9	0.20	20	9	0.20	20	9	0.20	20	9	0.20	20	9	0.20	20	9	0.20	20	9																			
⑯	12	0.30	36	12	0.30	42	12	0.30	48	12	0.30	56	12	0.30	62	12	0.30	70	12	0.30	70	12																			
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TABLE OF DIMENSIONS AND SCHEDULE OF REINFORCEMENT

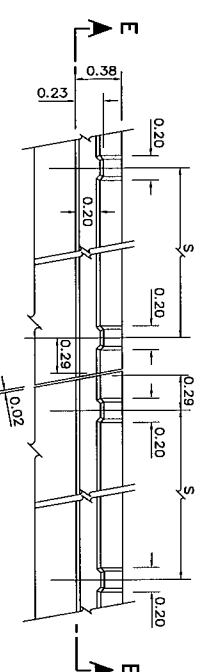


DETAIL "1"
NOT TO SCALE

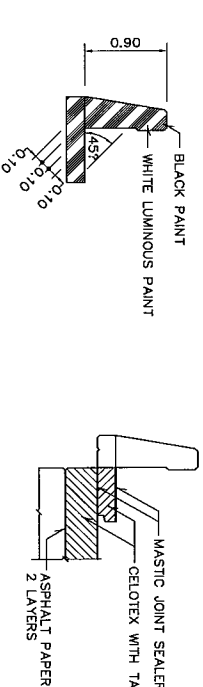


PLAN OF RAILING & POST AT END OF BRIDGE

NOT TO SCALE



PLAN OF RAILING & POST AT EXPANSION JOINT
NOT TO SCALE

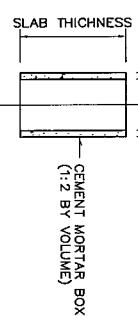
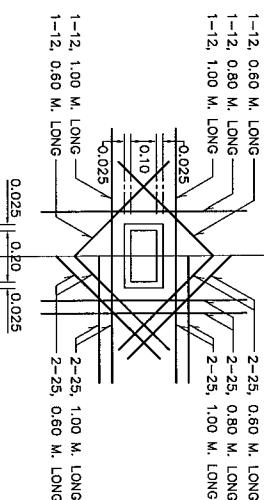


PAINTING AT BRIDGE END

EXPANSION JOINT DETAIL
NOT TO SCALE

- NOTES :**

1. ALL DIMENSIONS ARE IN METERS, EXCEPT DIAMETERS OF REINFORCING BARS ARE IN MILLIMETERS.
 2. THE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 210 Kg/cm² BY TESTING CYLINDER 90.15x30.30 M. AT AGE 28 DAYS.
 3. REINFORCING BARS HAVING DIAMETERS OF 12 MM. OR LARGER SHALL BE INTERMEDIATE GRADE DEFORMED BARS, EXCEPT THE BARS HAVING DIAMETER SMALLER THAN 12 MM. THE STRUCTURAL GRADE OF ROUND PLAIN BARS WILL BE USED.
 4. THE CLEAR CONCRETE COVER FOR TOP REINFORCEMENT IN SLAB BRIDGE SHALL BE 3.5 CM. ELSEWHERE OF SLAB BRIDGE SHALL BE 2.5 CM.
 5. THE FOLLOWING MINIMUM LAP SPLICES OF BARS SHALL BE USED: -
 - PLAIN ROUND BARS WITH HOOKS 50 DIAMETERS OF BARS.
 - DEFORMED BARS 30 DIAMETERS OF BARS.
 6. ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 2 CM.
 7. PAINTING SHALL BE PROVIDED ON ALL SURFACES AT BRIDGE ENDS WHICH EXPOSED TO TRAFFIC.
 8. BAR MARK (M) MAY BE TAKEN OUT TOP OF EACH SIDE OF THE BRIDGE WHEREVER THEY PASS THROUGH DRAIN PIPES IF THE LOCATIONS OF THESE BARS ARE NEAR V-DROP SUCH THAT CONCRETE COVER IS NOT ADEQUATE. THEY SHALL BE PLACED ON TOP OF (M) OTHER BARS WHICH PASS THROUGH DRAIN PIPES SHALL BE BENT AROUND THE PIPE.
- REFERENCE DRAWINGS : -
1. ACCESS ROAD, BRIDGE, PLAN AND PROFILE
- M/T-AR-10



DETAIL OF DECK DRAIN
& EXTRA BAR REINFORCEMENT
NOT TO SCALE

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

CONSULTANTS

DEUL

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY		MAE TUEN HYDROPOWER PROJECT CIVIL WORKS ACCESS ROAD TYPICAL SLAB BRIDGE	
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY REVIEWED <i>[Signature]</i>		PANYA CONSULTANTS CO., LTD. 27/06/13 21.10.98	
SUBMITTED RECOMMENDED APPROVED <i>[Signature]</i> <i>[Signature]</i> <i>[Signature]</i>		DESIGNED DRAWN CHECKED 27/06/13 DATE MT-AR-11 SHEET NO. 96 OF 98	

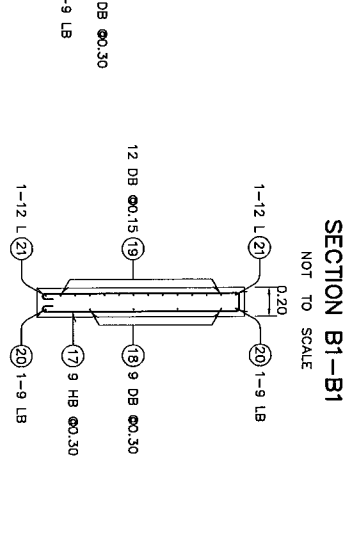
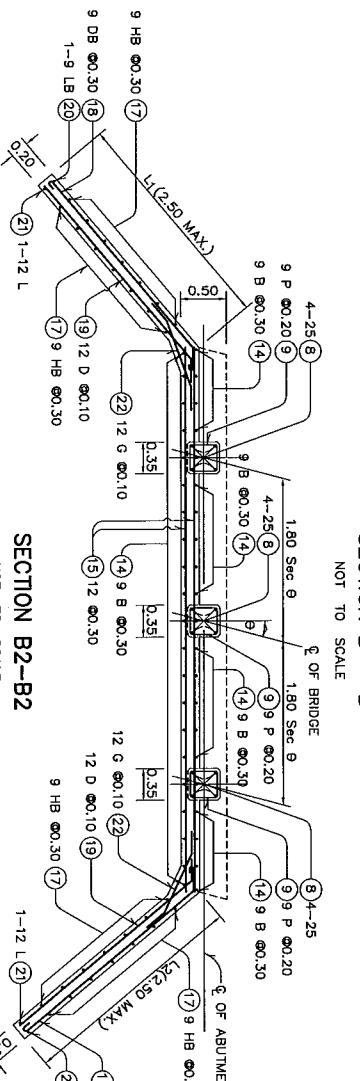
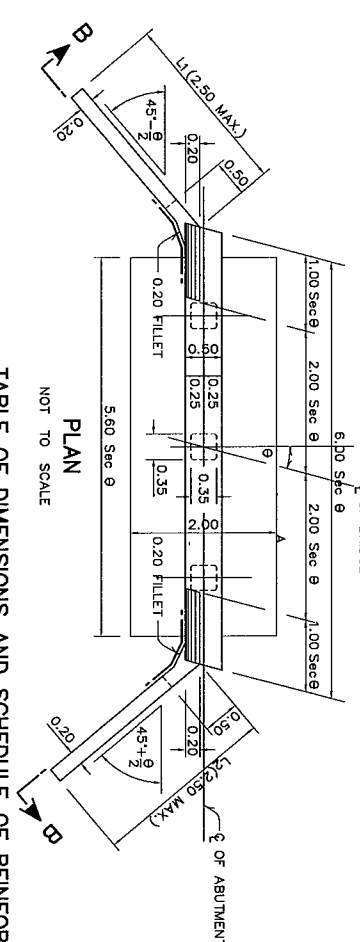
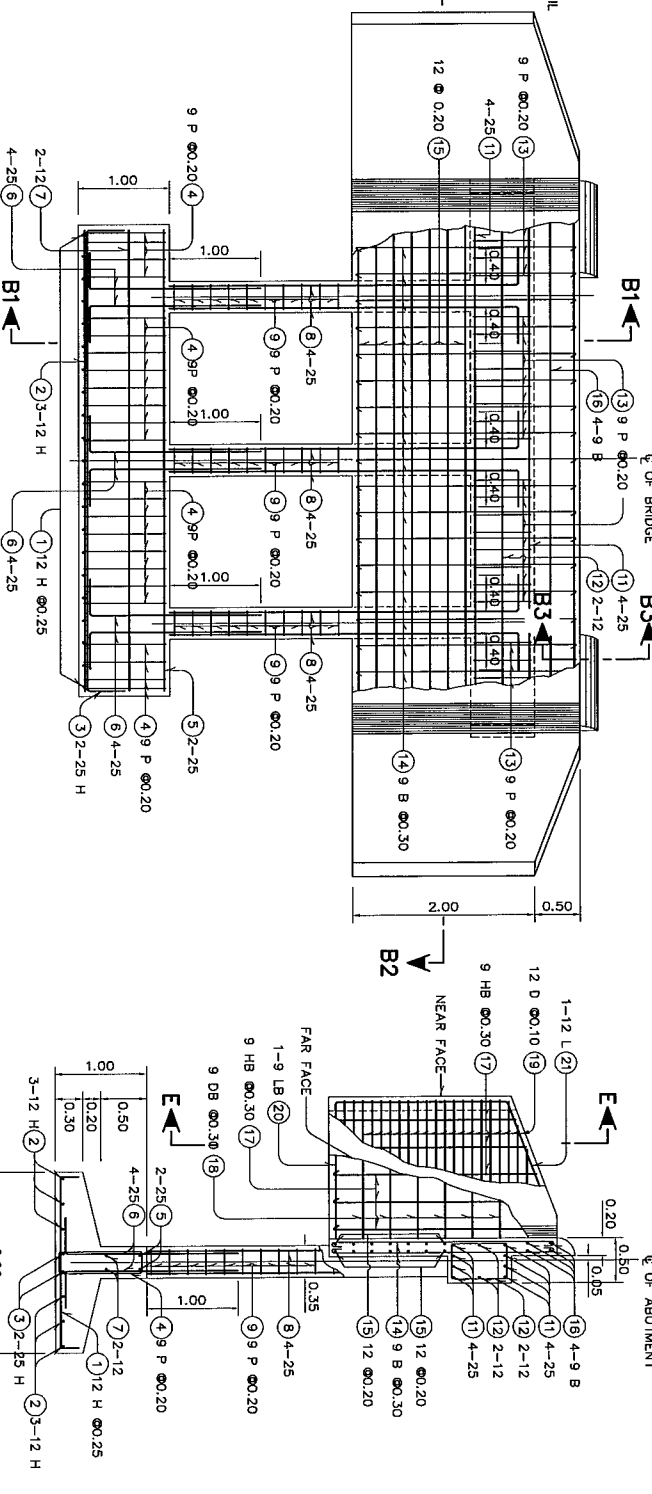
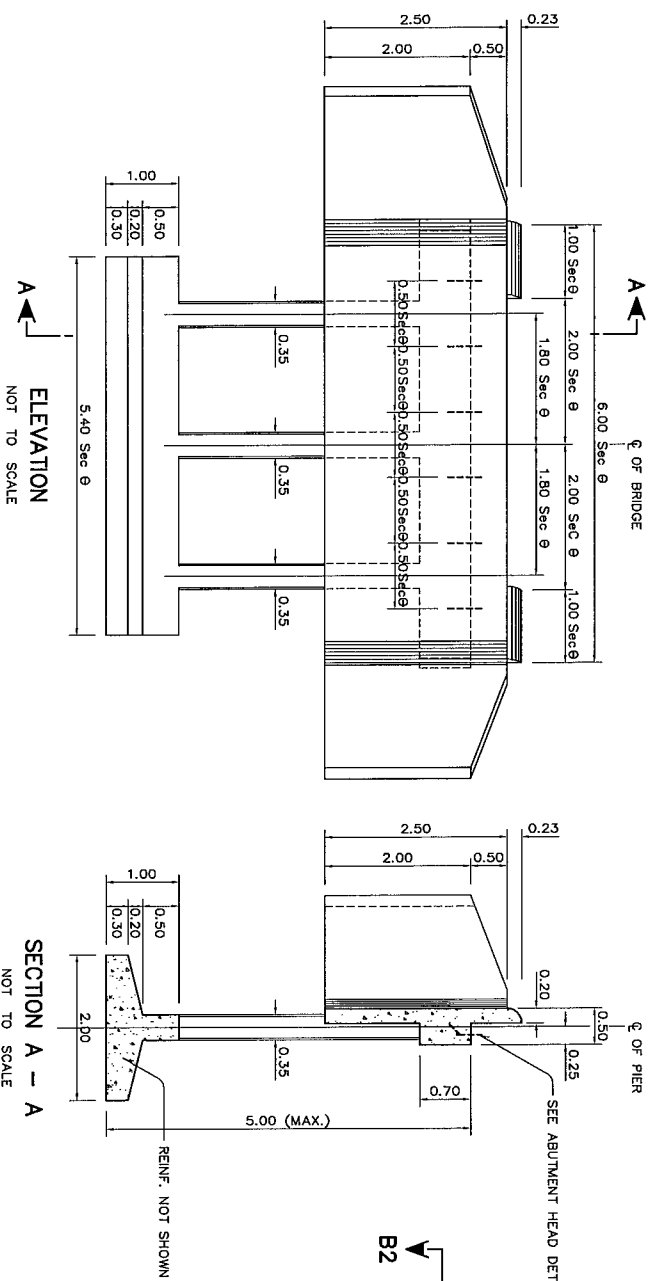


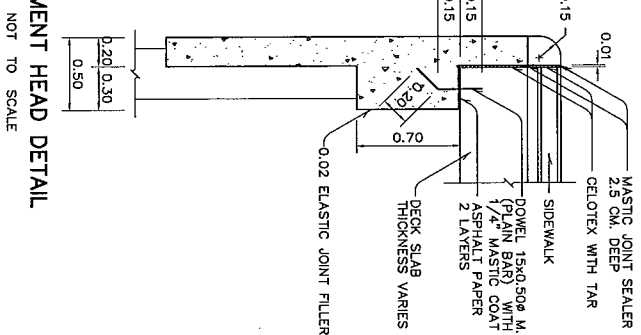
TABLE OF DIMENSIONS AND SCHEDULE OF REINFORCEMENT

BAR NO.	L = 5.00 M.		L = 6.00 M.		L = 7.00 M.		L = 8.00 M.		L = 9.00 M.		L = 10.00 M.		SHAPE
	DIA. (mm.)	SPACING QTY.	DIA. (mm.)	SPACING QTY.	DIA. (mm.)	SPACING QTY.	DIA. (mm.)	SPACING QTY.	DIA. (mm.)	SPACING QTY.	DIA. (mm.)	SPACING QTY.	
1	12	0.25	12	0.25	12	0.25	12	0.25	12	0.25	12	0.25	VARIES
2	12	6	12	6	12	6	12	6	12	6	12	6	VARIES
3	25	2	25	2	25	2	25	2	25	2	25	2	VARIES
4	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	VARIES
5	25	2	25	2	25	2	25	2	25	2	25	2	VARIES
6	25	12	25	12	25	12	25	12	25	12	25	12	VARIES
7	12	2	12	2	12	2	12	2	12	2	12	2	VARIES
8	25	12	25	12	25	12	25	12	25	12	25	12	VARIES
9	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	VARIES
10	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	VARIES
11	25	8	25	8	25	8	25	8	25	8	25	8	VARIES
12	12	2	12	2	12	2	12	2	12	2	12	2	VARIES
13	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	9	0.20	VARIES
14	9	0.30	9	0.30	9	0.30	9	0.30	9	0.30	9	0.30	VARIES
15	12	0.20	12	0.20	12	0.20	12	0.20	12	0.20	12	0.20	VARIES
16	9	4	9	4	9	4	9	4	9	4	9	4	VARIES
17	9	0.30	9	0.30	9	0.30	9	0.30	9	0.30	9	0.30	VARIES
18	9	0.30	9	0.30	9	0.30	9	0.30	9	0.30	9	0.30	VARIES
19	12	0.10	12	0.10	12	0.10	12	0.10	12	0.10	12	0.10	VARIES
20	9	2	9	2	9	2	9	2	9	2	9	2	VARIES
21	12	2	12	2	12	2	12	2	12	2	12	2	VARIES
22	12	0.10	12	0.10	12	0.10	12	0.10	12	0.10	12	0.10	VARIES
23	9	8	9	8	9	8	9	8	9	8	9	8	VARIES
NO. OF POST = 3		NO. OF POST = 3		NO. OF POST = 3		NO. OF POST = 3		NO. OF POST = 3		NO. OF POST = 3		NO. OF POST = 3	

LENGTH OF WING WALL	
L ₁ = 1.414 Sec (45° - 2)	
L ₂ = 1.414 Sec (45° + 2)	

REFERENCE DRAWINGS :-
1. ACCESS ROAD, BRIDGE, PLAN AND PROFILE

ABUTMENT HEAD DETAIL



- NOTES :
- ALL DIMENSIONS ARE IN METERS, EXCEPT DIAMETERS OF REINFORCING BARS ARE IN MILLIMETERS.
 - THE MINIMUM ALLOWABLE BEARING CAPACITY OF CONCRETE SHALL BE 12 TONS/M²
 - THE MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 210 KG/CM² BY TESTING CYLINDER Ø0.15x0.30 M. AT AGE 28 DAYS.
 - REINFORCING BARS HAVING DIAMETER OF 12 MM. OR LARGER SHALL BE INTERMEDIATE GRADE DEFORMED BARS EXCEPT THE BARS HAVING DIAMETER SMALLER THAN 12 MM. THE STRUCTURAL GRADE OF ROUND PLAIN BARS WILL BE USED.
 - THE CLEAR CONCRETE COVER FOR BOTTOM REINFORCEMENT AT FOOTING SHALL BE 6 CM. ELSEWHERE SHALL BE 2.5 CM.
 - THE FOLLOWING MINIMUM LAP SPACES OF BARS SHALL BE USED:-
 - PLAIN ROUND BARS WITH HOOKS - 50 DIAMETERS OF BARS.
 - DEFORMED BARS - 30 DIAMETERS OF BARS.
 - ALL EXPOSED CONCRETE CORNERS SHALL BE CHAMFERED 20M.
 - PAINING SHALL BE PROVIDED ON ALL SURFACES AT BRIDGE ENDS WHICH EXPOSED TO TRAFFIC.

NO.	DATE	REVISIONS	CHECKED	APPROVED
1				
2				

DESIGNED BY		CHECKED BY		APPROVED BY	
DATE		DATE		DATE	
PROJECT MANAGER		PROJECT MANAGER		PROJECT MANAGER	
MT-AR-10		MT-AR-10		MT-AR-10	
SHEET NO.		SHEET NO.		SHEET NO.	
97 OF 98		97 OF 98		97 OF 98	

