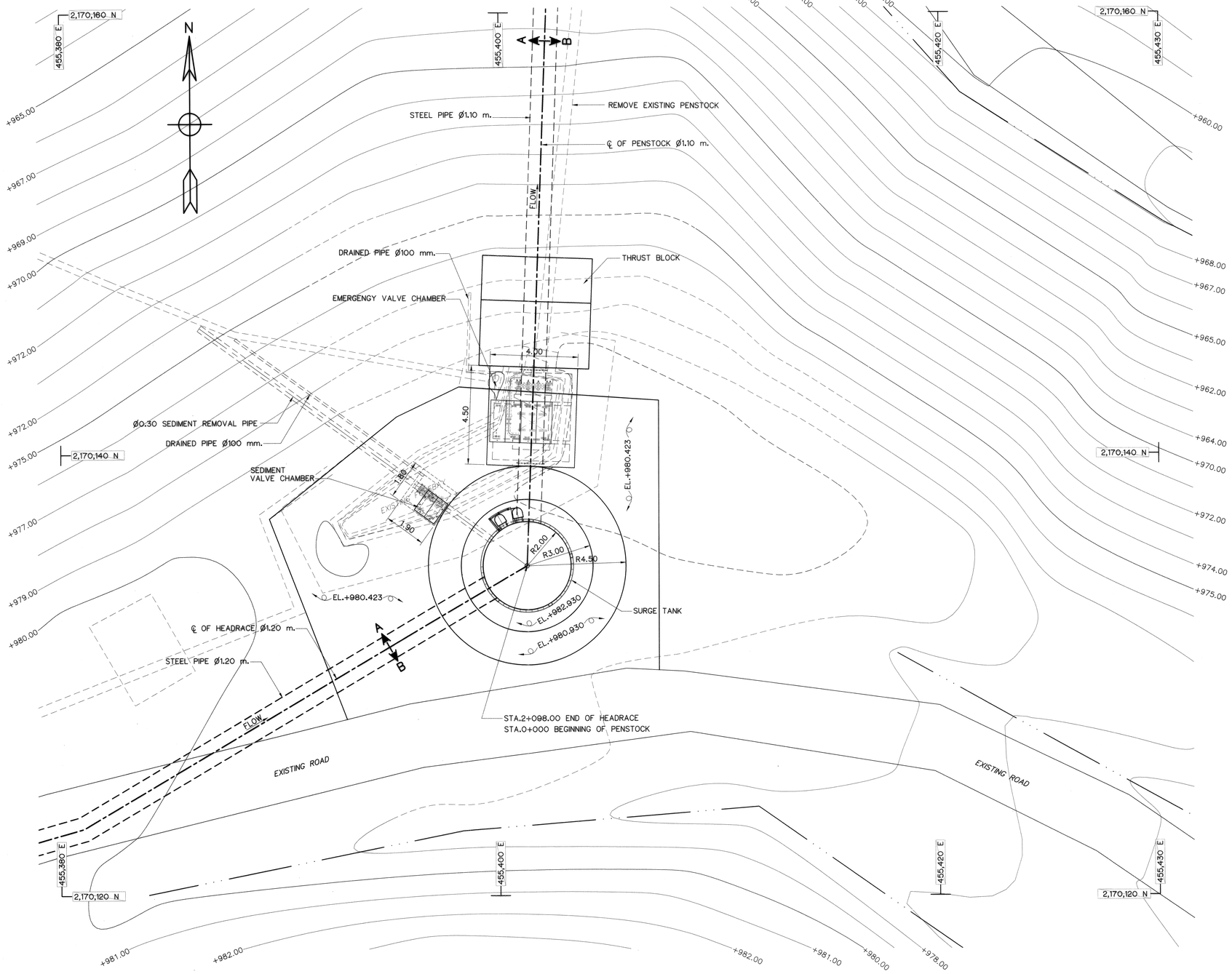


GENERAL LAY-OUT

SCALE 1:100

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWIRE SHOWN.
2. STEEL PIPE SHELL CONFORM TO JIS G 3101 SS34
3. BASE OF CONCRETE FOUNDATION SHALL BE DETERMINED IN FIELD BY EMBEDING TO STABLE ROCK FOUNDATION WITH A ALLOWABLE BEARING CAPACITY NOT LESS THAN 25 T/m^2
4. COROSINE PROTECTION OF STEEL PIPE OR GARDRAIL
   IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
5. STEEL TANK , GIRDER AND STIFFENER SHALL
   CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1.	SURGE TANK SECTIONS	MH-ST-02
2.	EMERGENCY VALVE CHAMBER PLAN SECTIONS AND DETAILS	MH-ST-07
3.	SEDIMENT VALVE CHAMBER PLAN SECTIONS AND DETAILS	MH-ST-09

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
GENERAL LAY-OUT

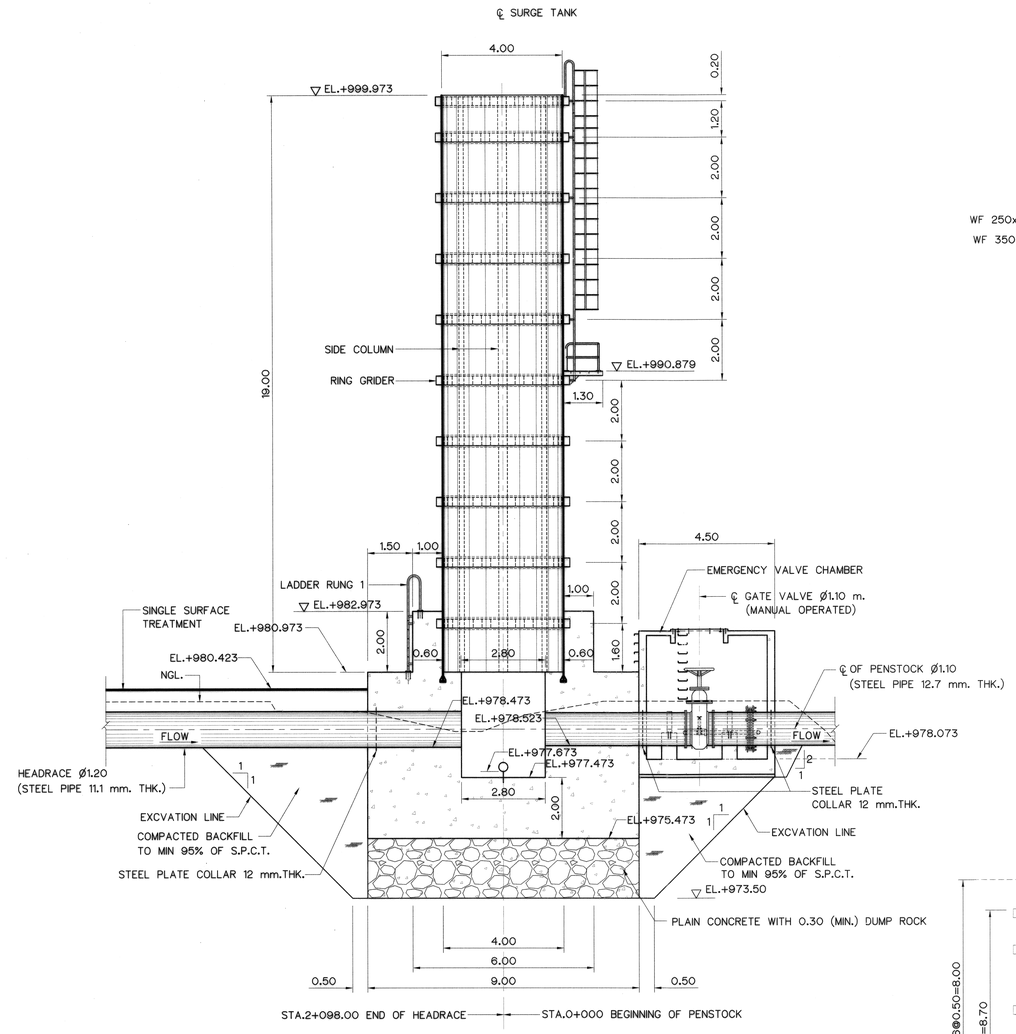
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วิชิต.64624	วิ.6226	SUBMITTED
DRAWN			RECOMMENDED
CHECKED	วิ.6226		APPROVED
PROJECT MANAGER		08/03/2564 DATE	

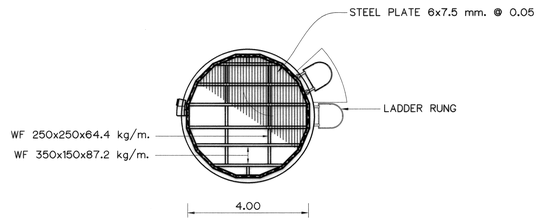
DRAWING NO. MH-ST-01

SHEET NO. 62 OF 130



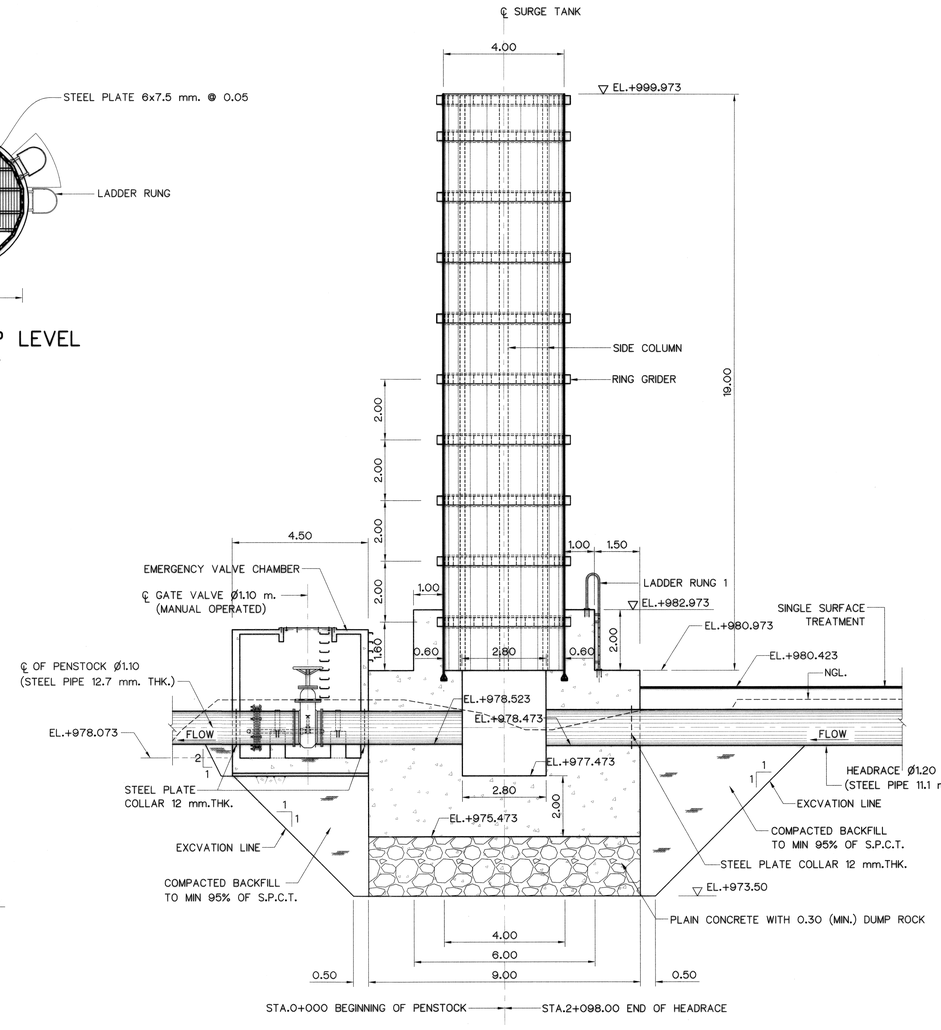
SECTION A–A

SCALE 1:100



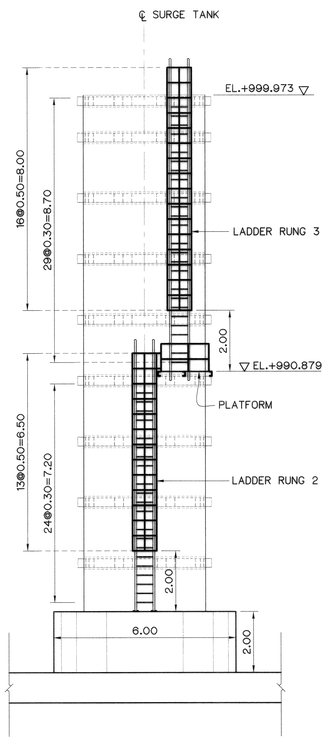
PLAN ON TOP LEVEL

SCALE 1:100



SECTION B–B

SCALE 1:100



LADDER RUNG 2&3 ELEVATION

SCALE 1:100

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWIRE SHOWN.
2. STEEL PIPE SHELL CONFORM TO JIS G 3101 SS34
3. BASE OF CONCRETE FOUNDATION SHALL BE DETERMINED IN FIELD BY EMBEDING TO STABLE ROCK FOUNDATION WITH A ALLOWABLE BEARING CAPACITY NOT LESS THAN 25 T/m^2
4. COROSINE PROTECTION OF STEEL PIPE OR GARDRAIL IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
5. STEEL TANK , GIRDER AND STIFFENER SHALL CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1.	SURGE TANK GENERAL LAY-OUT	MH-ST-01
2.	LADDER RUNG DETAILS	MH-ST-03
3.	PLATFORM DETAILS	MH-ST-04
4.	RING GRIDER AND HANDRAIL	MH-ST-05

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

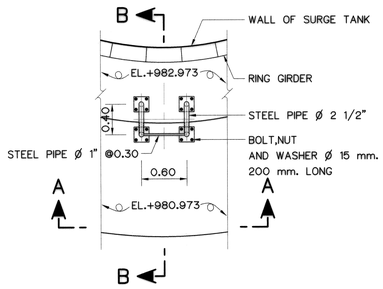
MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

SURGE TANK

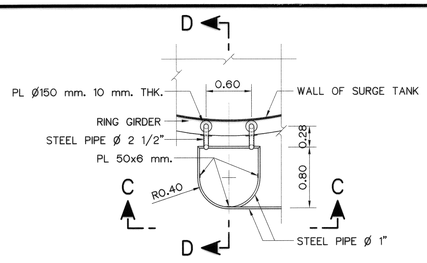
SECTIONS

P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
	REVIEWED
DESIGNED วิศ.64624 วิศ.6226	SUBMITTED
DRAWN	RECOMMENDED
CHECKED วิศ.6226	APPROVED
PROJECT MANAGER 08/03/2559 DATE	DRAWING NO. MH-ST-02 / SHEET NO. 63 OF 130



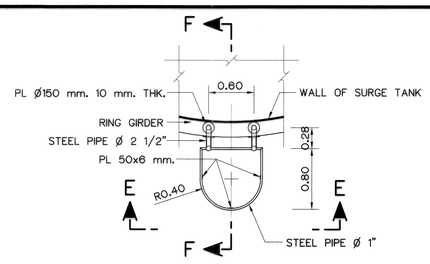
PLAN LADDER RUNG 1

SCALE 1:40



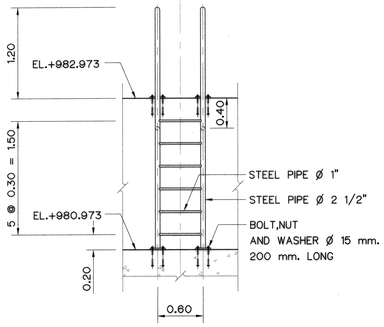
PLAN LADDER RUNG 2

SCALE 1:40



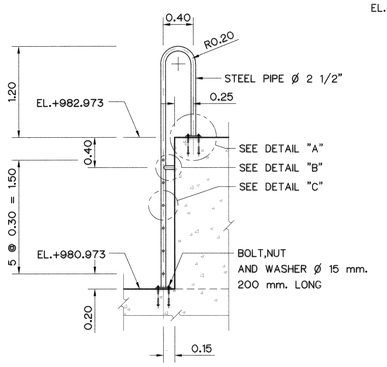
PLAN LADDER RUNG 3

SCALE 1:40



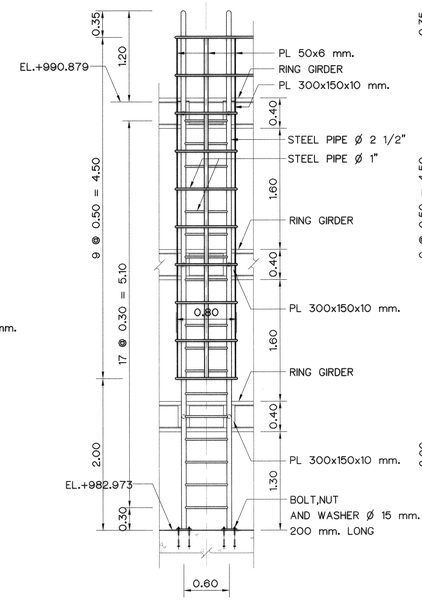
SECTION A–A

SCALE 1:40



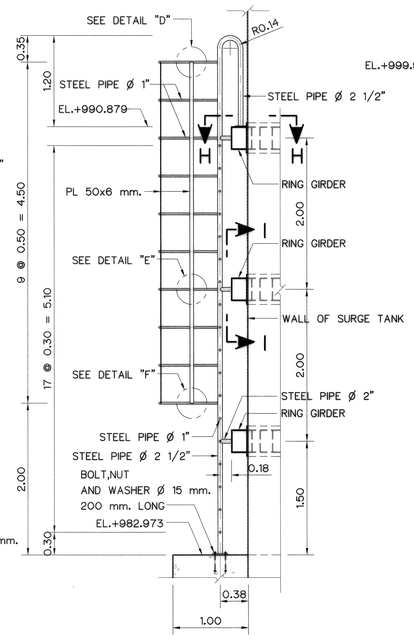
SECTION B–B

SCALE 1:40



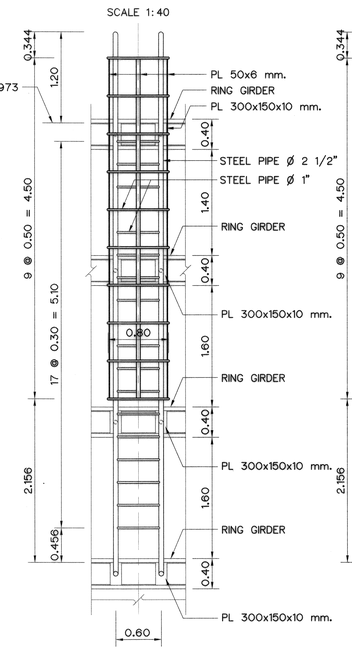
SECTION C–C

SCALE 1:40



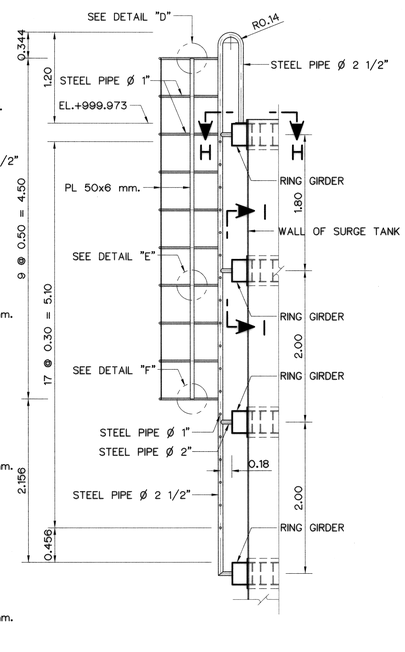
SECTION D–D

SCALE 1:40



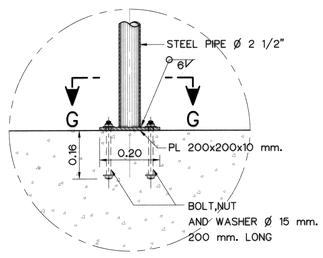
SECTION E–E

SCALE 1:40



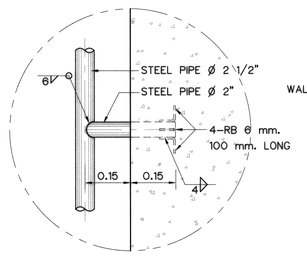
SECTION F–F

SCALE 1:40



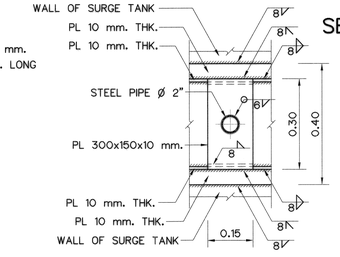
DETAIL "A"

SCALE 1:25



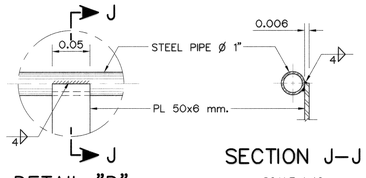
DETAIL "B"

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SECTION I–I

SCALE 1:25

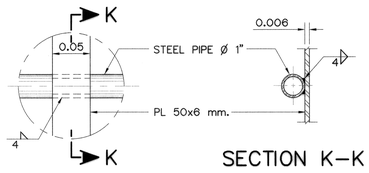


DETAIL "D"

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SECTION J–J

SCALE 1:10

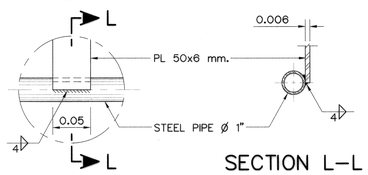


DETAIL "E"

SCALE 1:10

SECTION K–K

SCALE 1:10

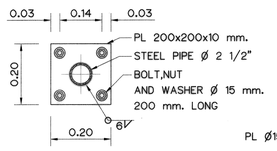


DETAIL "F"

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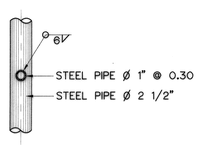
SECTION L–L

SCALE 1:10



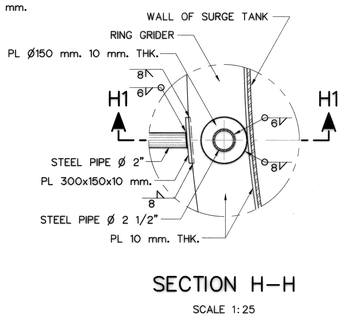
SECTION G–G

SCALE 1:25



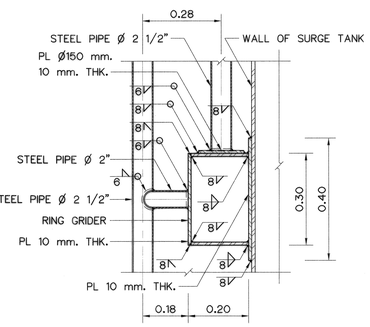
DETAIL "C"

SCALE 1:25



SECTION H–H

SCALE 1:25



SECTION H1–H1

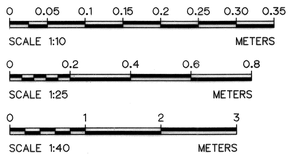
SCALE 1:25

NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
2. STEEL PIPE CONFORM TO JIS G 3101 SS34
3. COROSION PROTECTION OF STEEL PIPE OR GARDRAIL IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
4. STEEL TANK , GIRDER AND STIFFENEL SHALL CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1.	SURGE TANK GENERAL LAY–OUT	MH–ST–01
2.	SURGE TANK SECTIONS	MH–ST–02
3.	SURGE TANK LADDER RUNG DETAILS 2	MH–ST–04
4.	SURGE TANK RING GRIDER AND RAILING FALL DETAILS	MH–ST–05



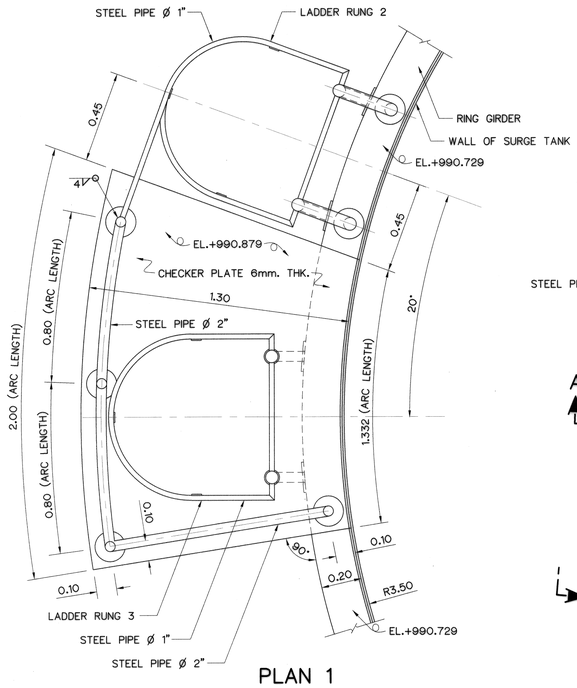
NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

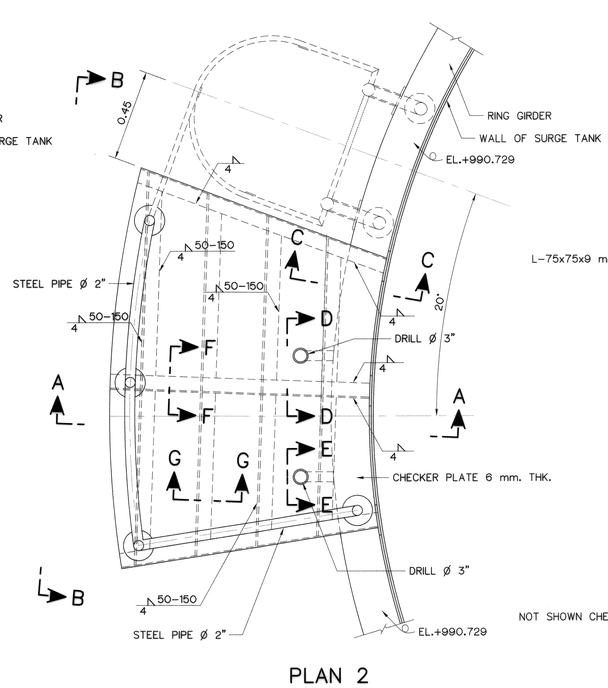
CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
LADDER RUNG DETAILS

P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED สิริ.64624	REVIEWED
DRAWN	SUBMITTED
CHECKED สิริ.6226	RECOMMENDED
PROJECT MANAGER 08/03/2559 DATE	APPROVED สิริ.6226
DRAWING NO. MH–ST–03	SHEET NO. 64 OF 130



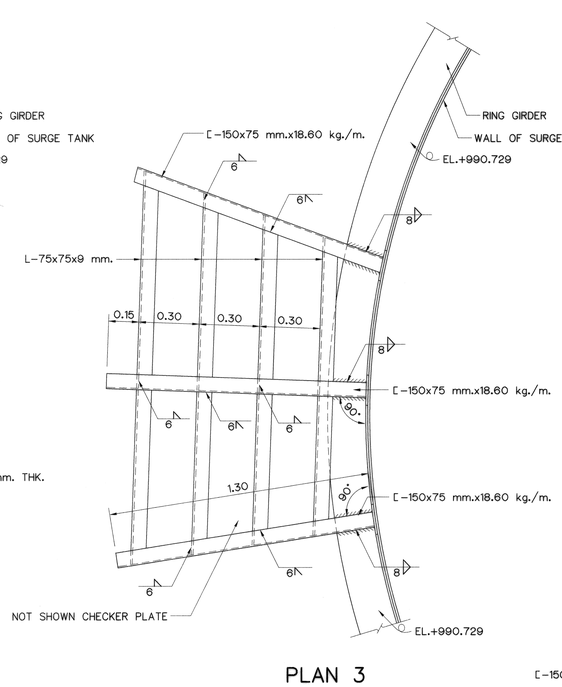
PLAN 1

SCALE 1:15



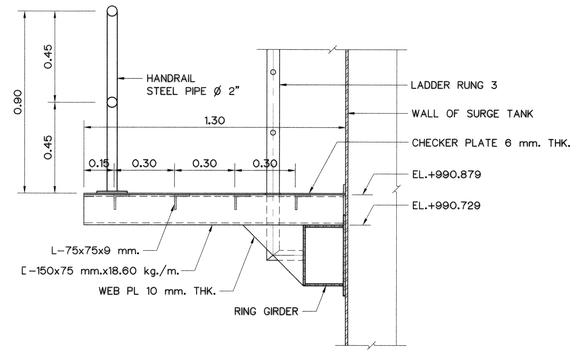
PLAN 2

SCALE 1:15



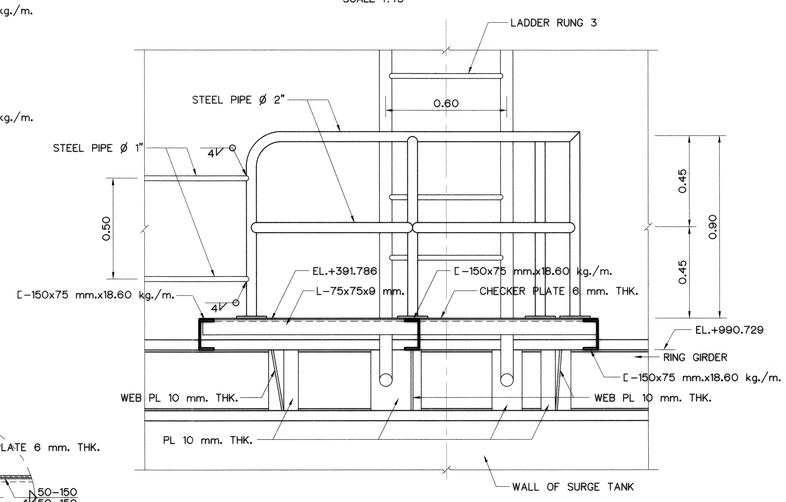
PLAN 3

SCALE 1:15



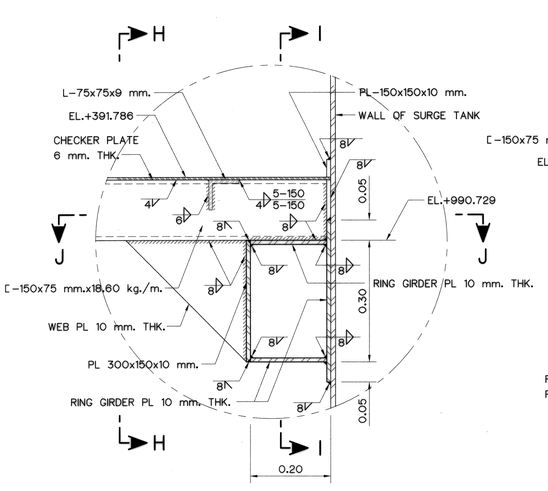
SECTION A-A

SCALE 1:15



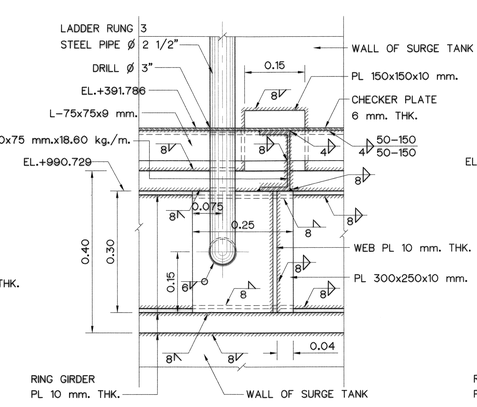
SECTION B-B

SCALE 1:15



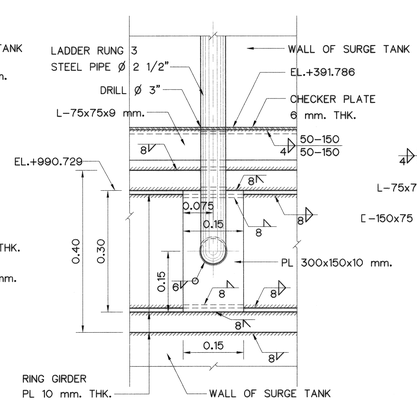
SECTION C-C

SCALE 1:7.5



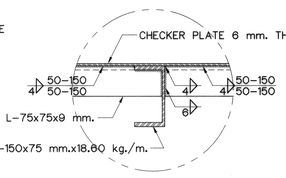
SECTION D-D

SCALE 1:7.5



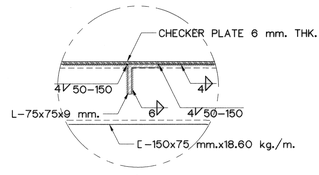
SECTION E-E

SCALE 1:7.5



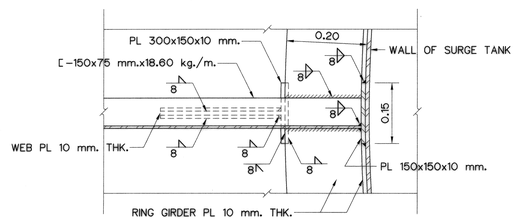
SECTION F-F

SCALE 1:7.5



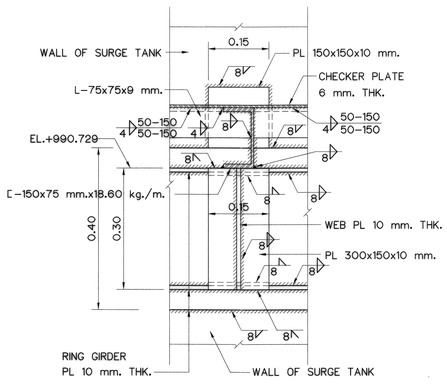
SECTION G-G

SCALE 1:7.5



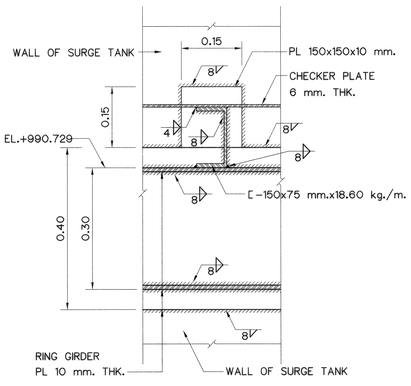
SECTION J-J

SCALE 1:7.5



SECTION H-H

SCALE 1:7.5



SECTION I-I

SCALE 1:7.5

NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
2. STEEL PIPE CONFORM TO JIS G 3101 SS34
3. COROSION PROTECTION OF STEEL PIPE OR GARDRAIL IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
4. STEEL TANK , GIRDER AND STIFFENEL SHALL CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1.	SURGE TANK GENERAL LAY-OUT	MH-ST-01
2.	SURGE TANK SECTIONS	MH-ST-02
3.	SURGE TANK LADDER RUNG DETAILS 1	MH-ST-03
4	SURGE TANK RING GRIDER AND RAILING FALL DETAILS	MH-ST-05

0 0.075 0.15 0.30 0.45 0.60
SCALE 1:7.5 METERS

0 0.15 0.3 0.6 0.9 1.2
SCALE 1:15 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
PLATFORM DETAILS

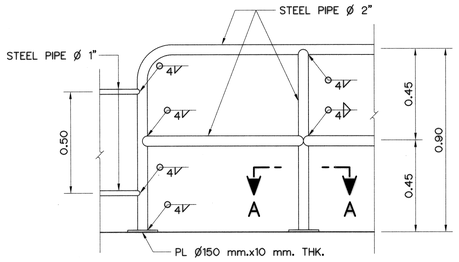
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วิศ.64624	วิศ.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED	วิศ.6226		RECOMMENDED
PROJECT MANAGER	09/03/2559 DATE		APPROVED

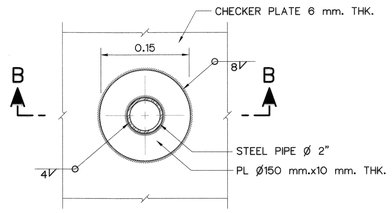
DRAWING NO. MH-ST-04

SHEET NO. 65 OF 130



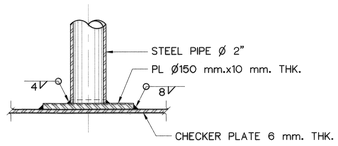
GUARDRAIL DETAILS

SCALE 1:15



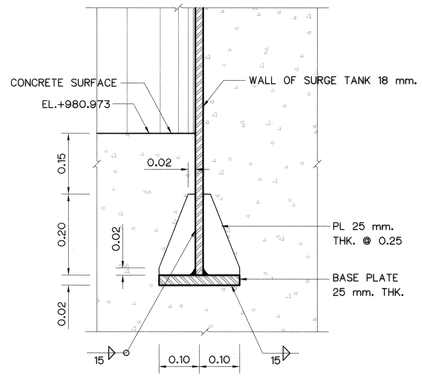
SECTION A–A

SCALE 1:5



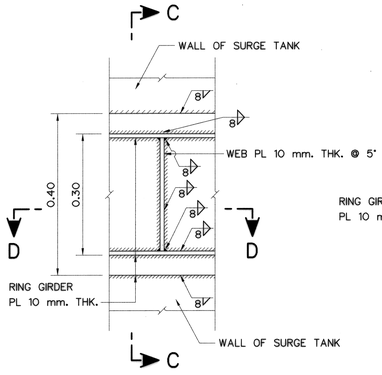
SECTION B–B

SCALE 1:5



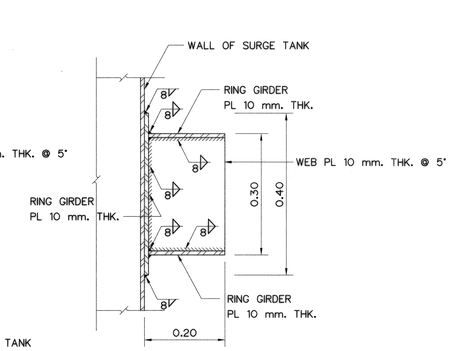
DETAIL "A"

SCALE 1:10



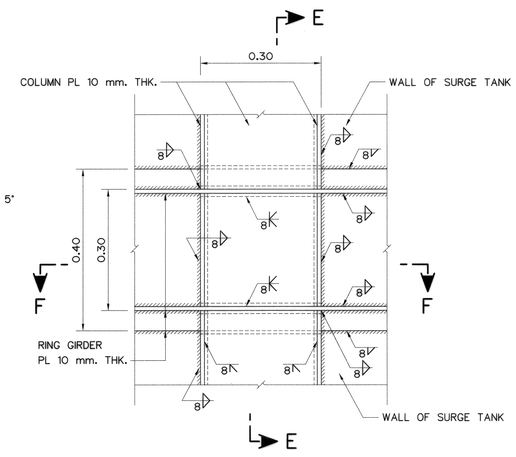
SIDE VIEW OF RING GIRDER

SCALE 1:7.5



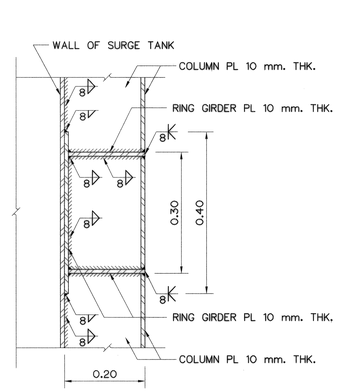
SECTION C–C

SCALE 1:7.5



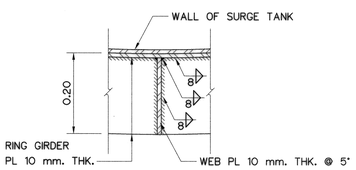
SIDE VIEW OF COLUMN AND RING GIRDER

SCALE 1:7.5



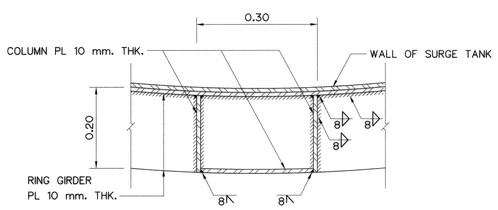
SECTION E–E

SCALE 1:7.5



SECTION D–D

SCALE 1:7.5



SECTION F–F

SCALE 1:7.5

RING GRIDER DETAILS

NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
2. STEEL PIPE CONFORM TO JIS G 3101 SS34
3. COROSION PROTECTION OF STEEL PIPE OR GARDRAIL IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
4. STEEL TANK , GIRDER AND STIFFENEL SHALL CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1.	SURGE TANK GENERAL LAY–OUT	MH–ST–01
2.	SURGE TANK SECTIONS	MH–ST–02
3.	SURGE TANK LADDER RUNG DETAILS 1	MH–ST–03
4	SURGE TANK LADDER RUNG DETAILS 2	MH–ST–04

0 0.05 0.1 0.2 0.3 0.4
SCALE 1:5 METERS

0 0.075 0.15 0.30 0.45 0.60
SCALE 1:7.5 METERS

0 0.1 0.2 0.4 0.6 0.8
SCALE 1:10 METERS

0 0.15 0.3 0.6 0.9 1.2
SCALE 1:15 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
RING GRIDER AND HANDRAIL

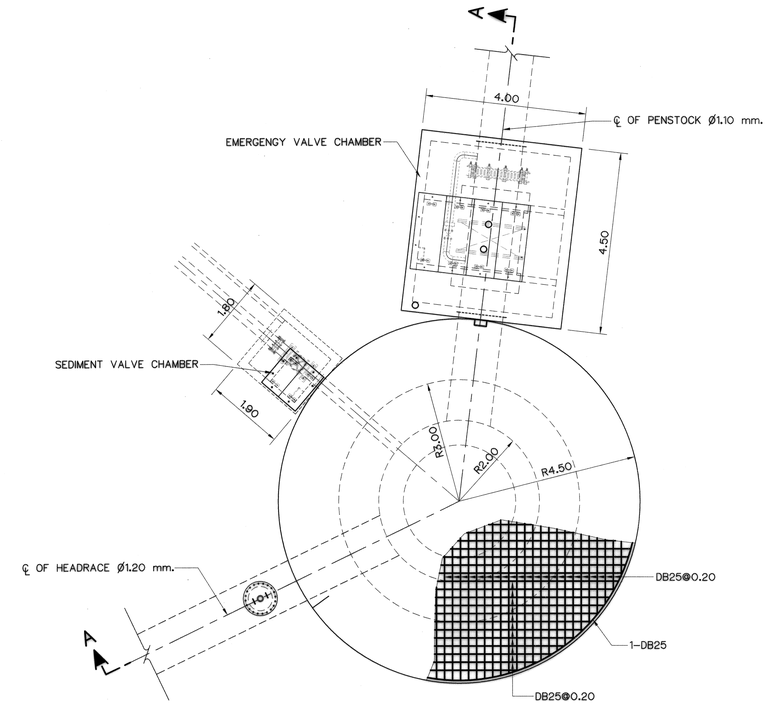
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

DESIGNED	วิ.64624	วิ.6226
DRAWN		
CHECKED		วิ.6226
PROJECT MANAGER		08/03/2564 DATE

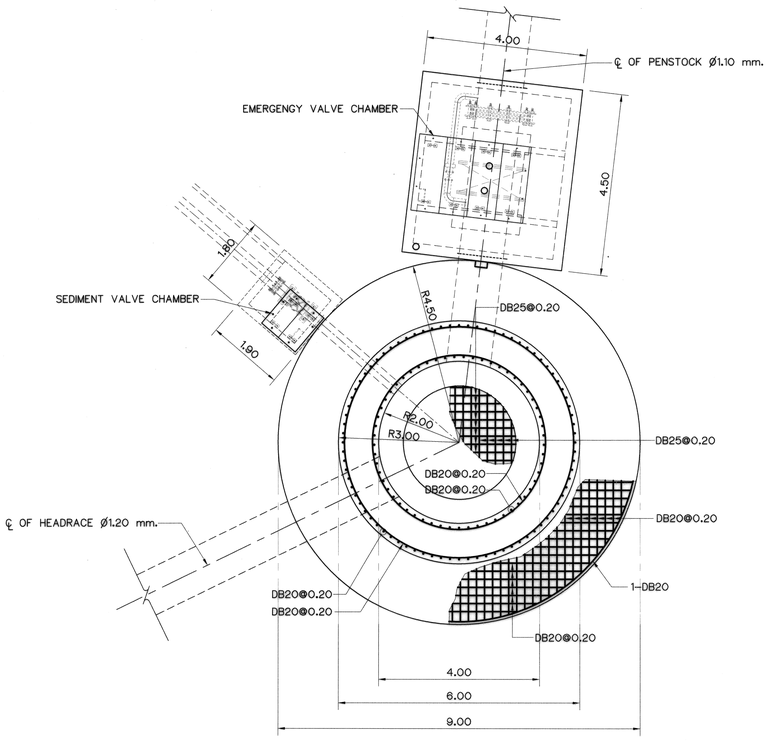
REVIEWED
SUBMITTED
RECOMMENDED
APPROVED

DRAWING NO. MH–ST–05
SHEET NO. 66 OF 130



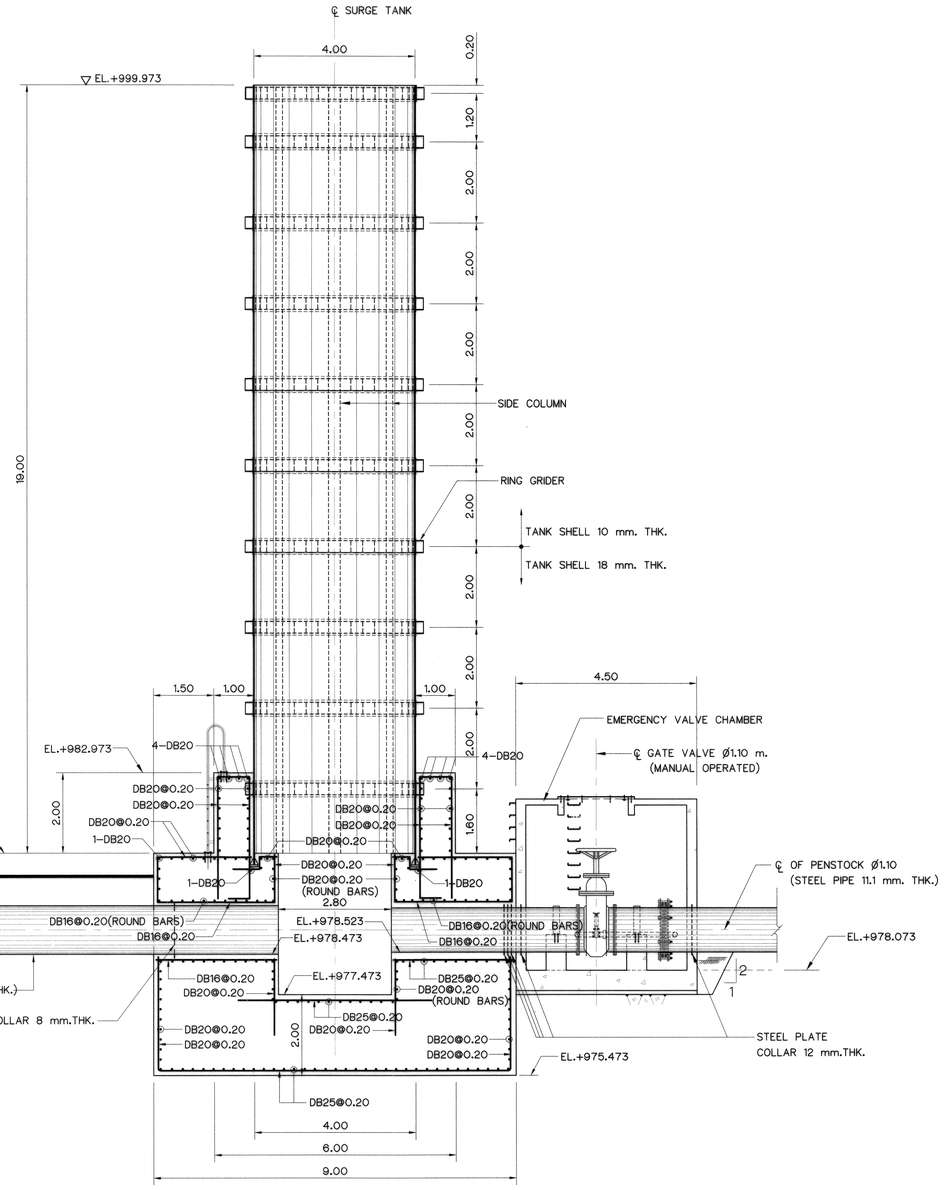
LOWER STEEL PLAN

SCALE 1:75



UPPER STEEL PLAN

SCALE 1:75



SECTION A–A

SCALE 1:75

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
2. STEEL PIPE CONFORM TO JIS G 3101 SS34
3. BASE OF CONCRETE FOUNDATION SHALL BE DETERMINED IN FIELD BY EMBEDING TO STABLE ROCK FOUNDATION WITH A ALLOWABLE BEARING CAPACITY NOT LESS THAN 25 T/m^2
4. COROSINE PROTECTION OF STEEL PIPE OR GARDRAIL IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
5. STEEL TANK , GIRDER AND STIFFENER SHALL CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1.	SURGE TANK, GENERAL LAY-OUT	MH-ST-01
2.	SURGE TANK, PLAN AND SECTIONS	MH-ST-02

0 0.5 1 1.5 2
SCALE 1:25 METERS

0 1 2 3 4 5 6
SCALE 1:75 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

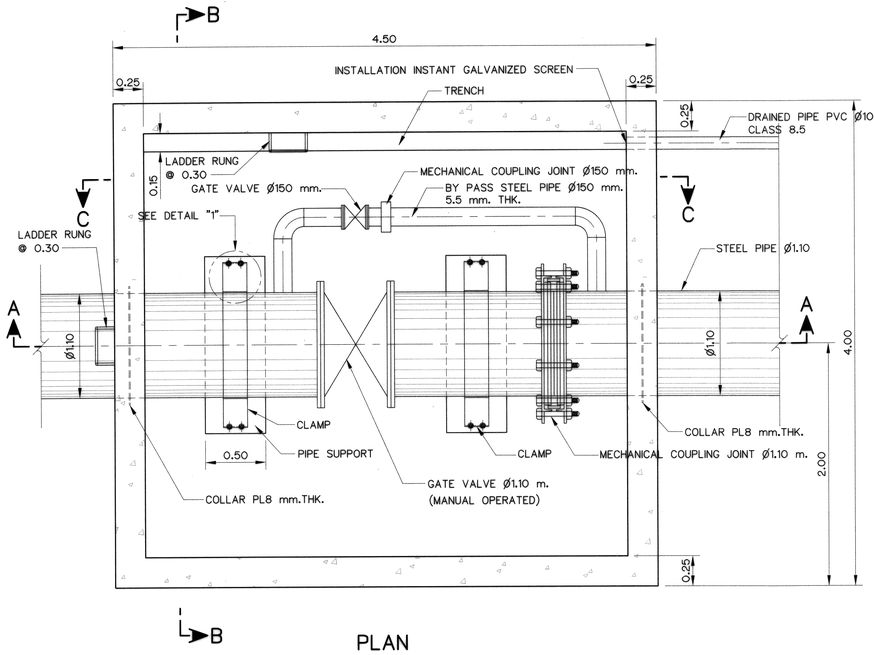
CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
REINFORCEMENT DETAILS

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

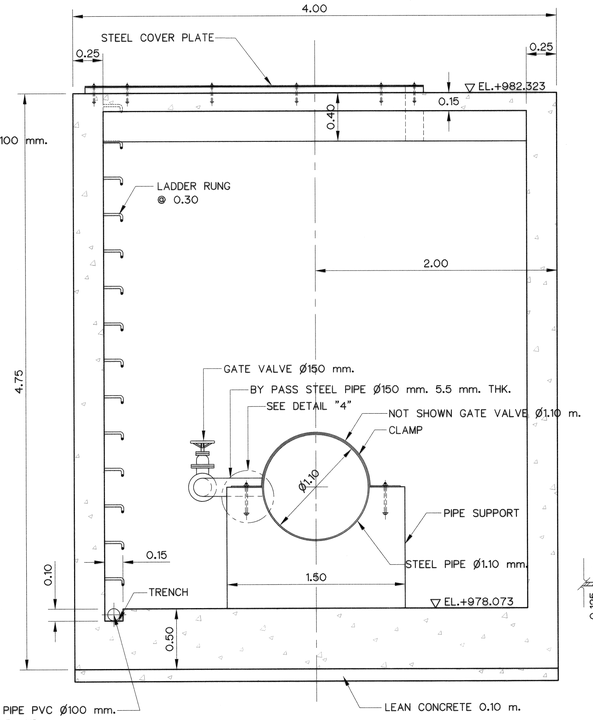
DESIGNED	วิศ.64624	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	วิศ.6226	RECOMMENDED	
PROJECT MANAGER	09/02/2539 DATE	APPROVED	

DRAWING NO. MH-ST-06
SHEET NO. 67 OF 130



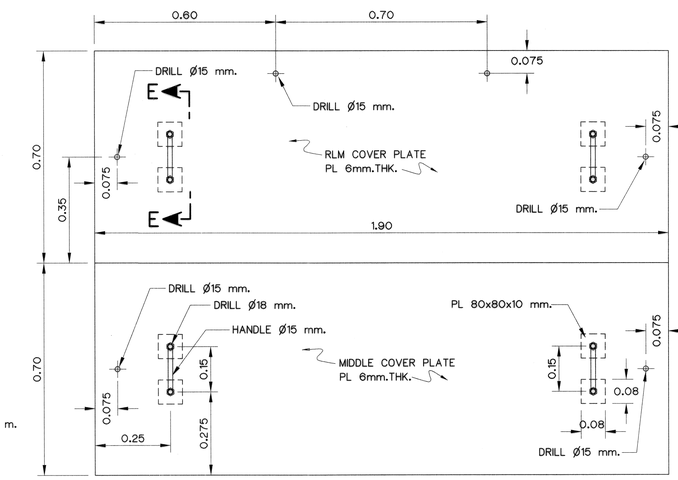
PLAN

SCALE 1:25



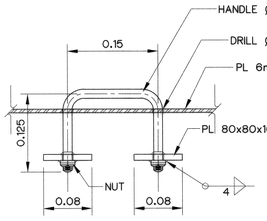
SECTION B–B

SCALE 1:25



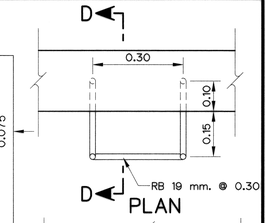
PLAN STEEL COVER PLATE

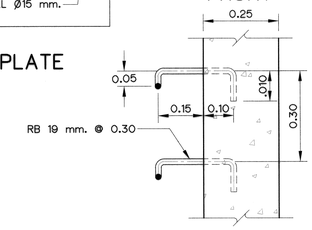
SCALE 1:10



SECTION E–E

SCALE 1:5

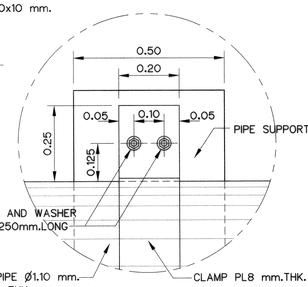




SECTION D–D

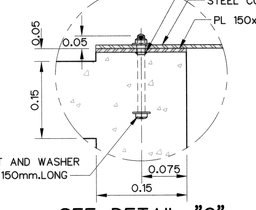
DETAIL OF LADDER RUNG

SCALE 1:10



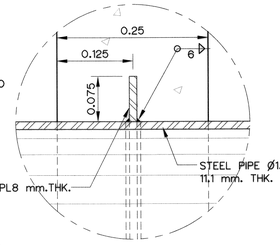
SEE DETAIL "1"

SCALE 1:10



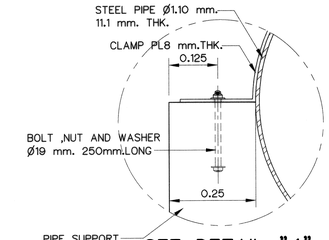
SEE DETAIL "2"

SCALE 1:5



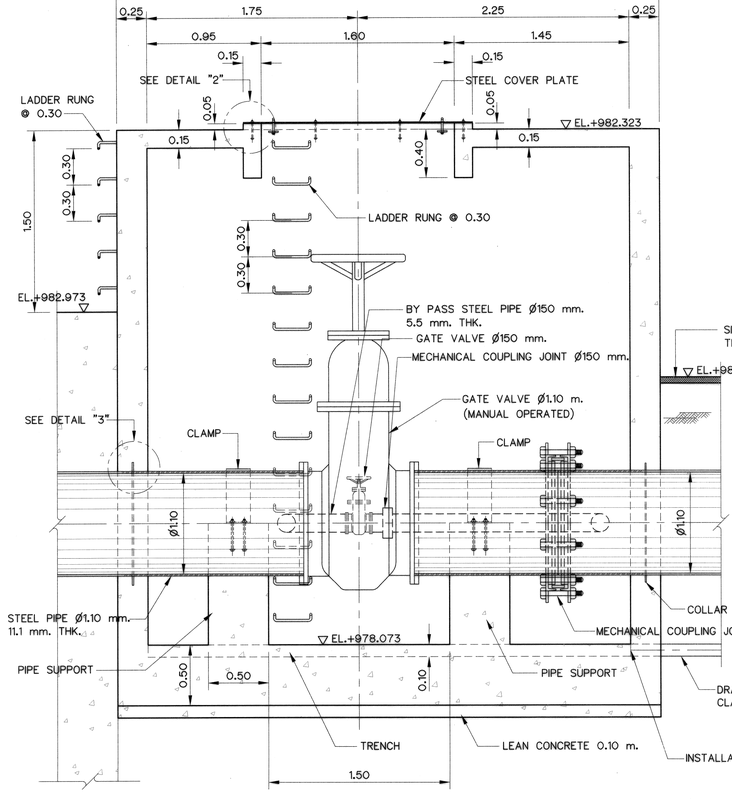
SEE DETAIL "3"

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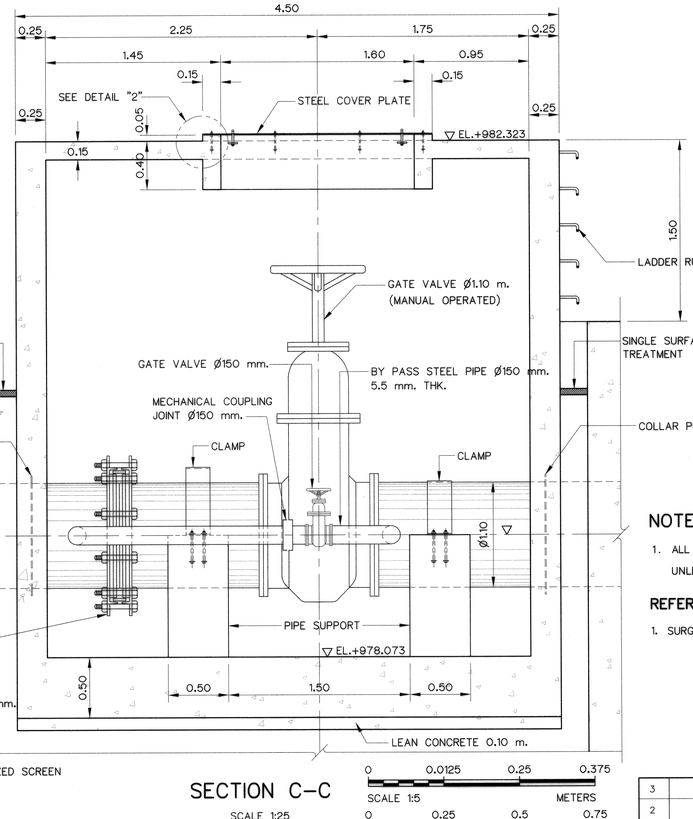
SEE DETAIL "4"

SCALE 1:10



SECTION A–A

SCALE 1:25



SECTION C–C

SCALE 1:25

0 0.0125 0.25 0.375
SCALE 1:5 METERS

0 0.25 0.5 0.75
SCALE 1:10 METERS

0 0.5 1 1.5 2
SCALE 1:25 METERS

NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN

REFERENCE DRAWING :

1. SURGE TANK, GENERAL LAY–OUT MH–ST–01

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

SURGE TANK

EMERGENCY VALVE CHAMBER PLAN SECTIONS AND DETAILS

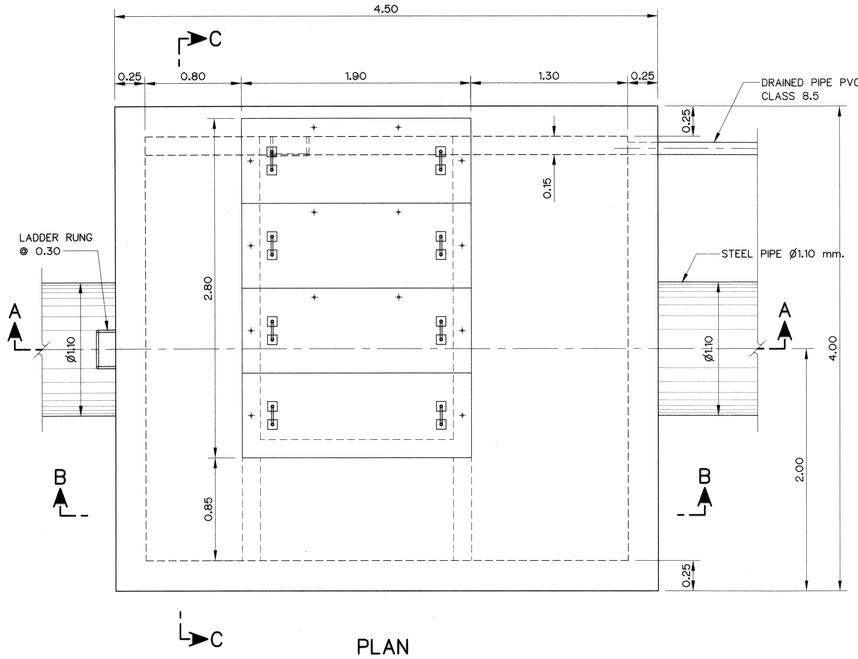
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	สมิ.64624	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	สมิ.6226	RECOMMENDED	
PROJECT MANAGER	08/03/2559 DATE	APPROVED	

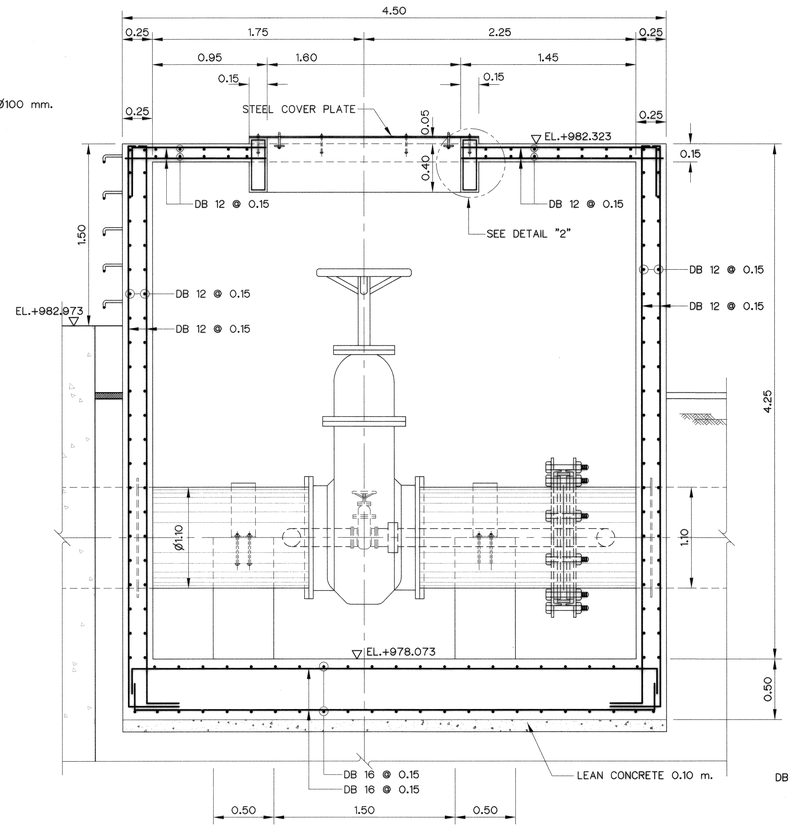
DRAWING NO. MH–ST–07

SHEET NO. 68 OF 130



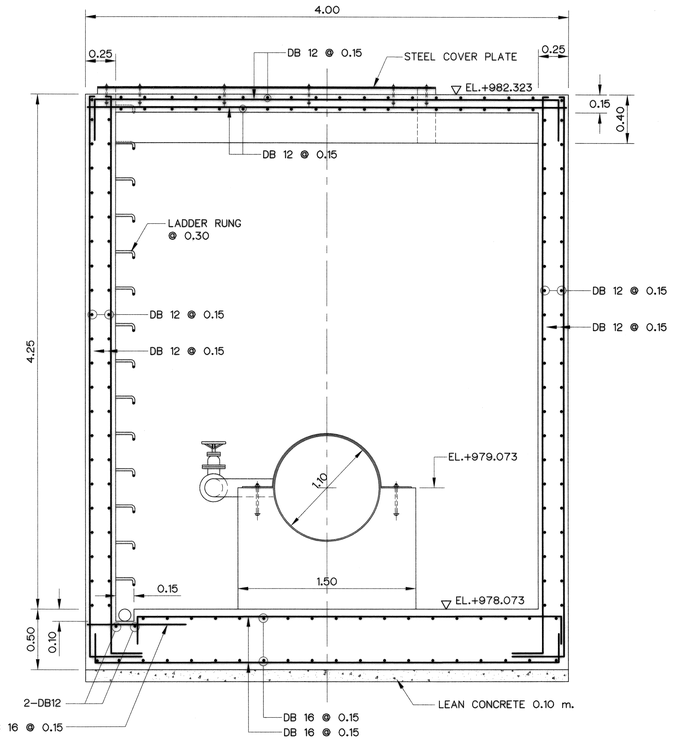
PLAN

SCALE 1:25



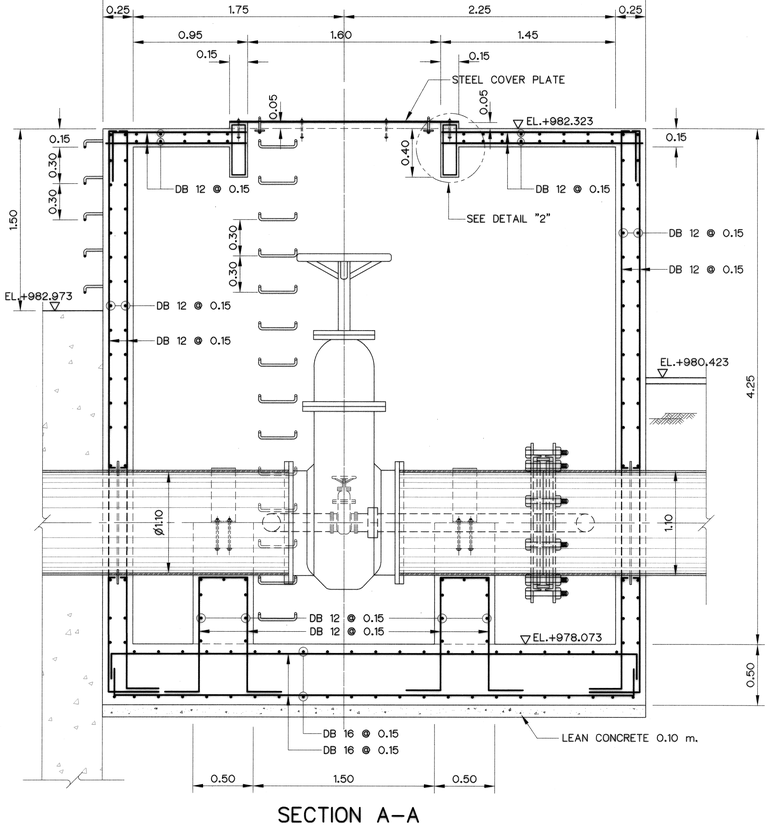
SECTION B–B

SCALE 1:25



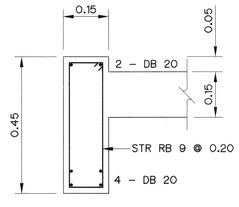
SECTION C–C

SCALE 1:25



SECTION A–A

SCALE 1:25



DETAIL "2"

SCALE 1:10

0 0.25 0.5 0.75

SCALE 1:10 METERS

0 0.5 1 1.5 2

SCALE 1:25 METERS

NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN

REFERENCE DRAWING :

1. EMERGENCY VALVE CHAMBER PLAN SECTIONS AND DETAILS MH-ST-07

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

SURGE TANK

EMERGENCY VALVE CHAMBER REINFORCEMENT DETAILS

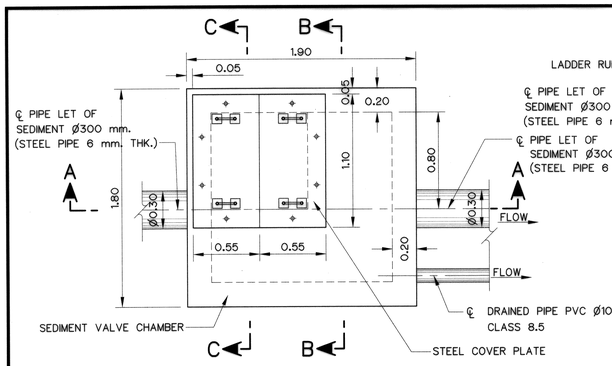
P&C MANAGEMENT CO.,LTD.

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DESIGNED	วิศ.64624	วิศ.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED	วิศ.6226		RECOMMENDED
PROJECT MANAGER	08/03/2559 DATE		APPROVED

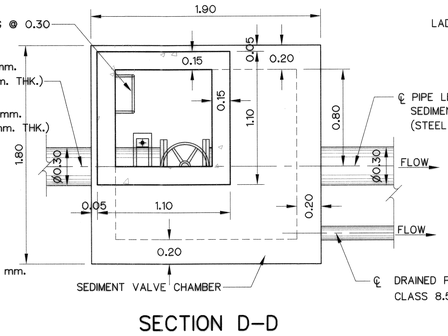
DRAWING NO. MH-ST-08

SHEET NO. 69 OF 130



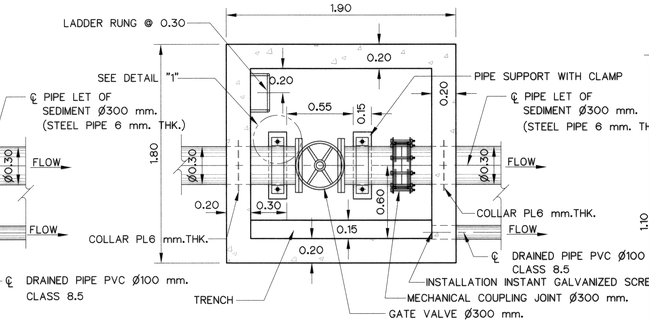
PLAN

SCALE 1:25



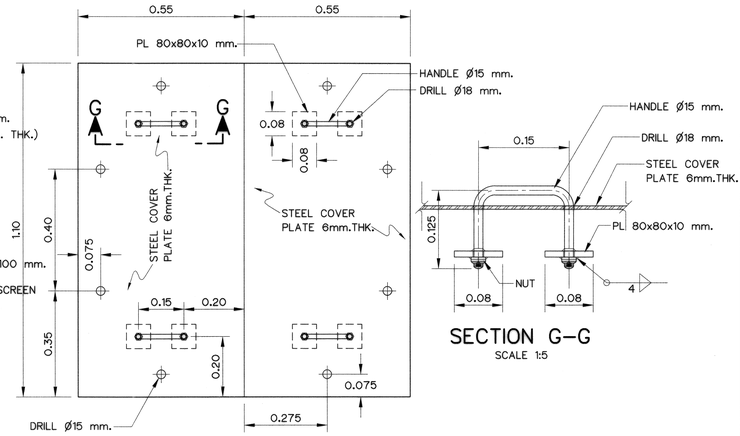
SECTION D–D

SCALE 1:25



SECTION E–E

SCALE 1:25

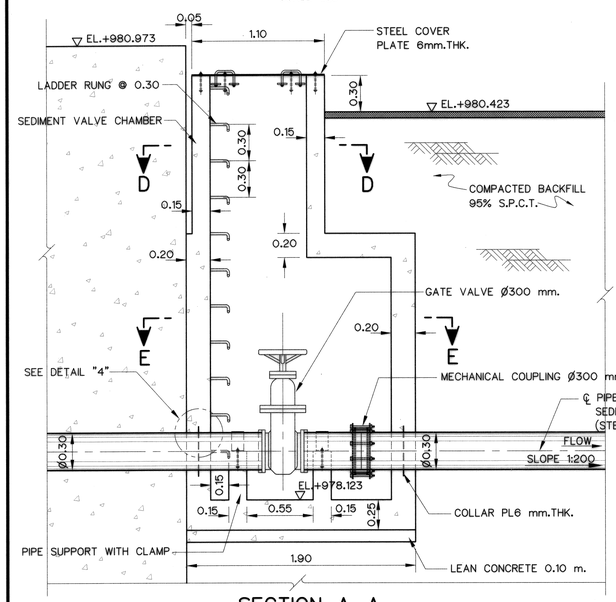


PLAN STEEL COVER PLATE

SCALE 1:10

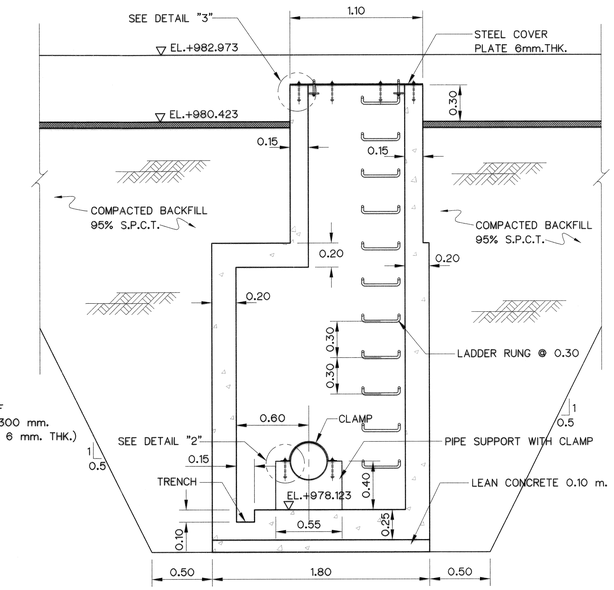
SECTION G–G

SCALE 1:5



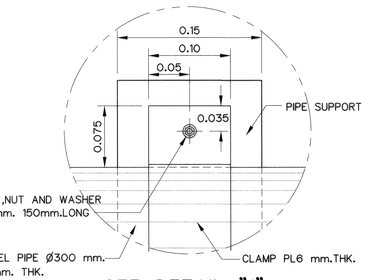
SECTION A–A

SCALE 1:25



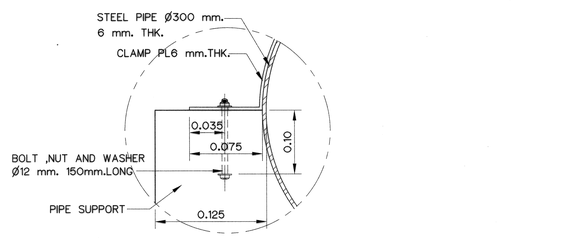
SECTION C–C

SCALE 1:25



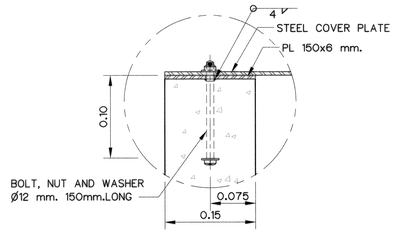
SEE DETAIL "1"

NOT TO SCALE



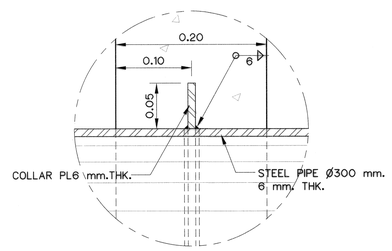
SEE DETAIL "2"

NOT TO SCALE



SEE DETAIL "3"

NOT TO SCALE



SEE DETAIL "4"

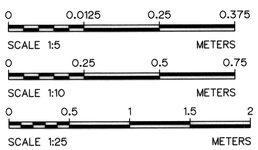
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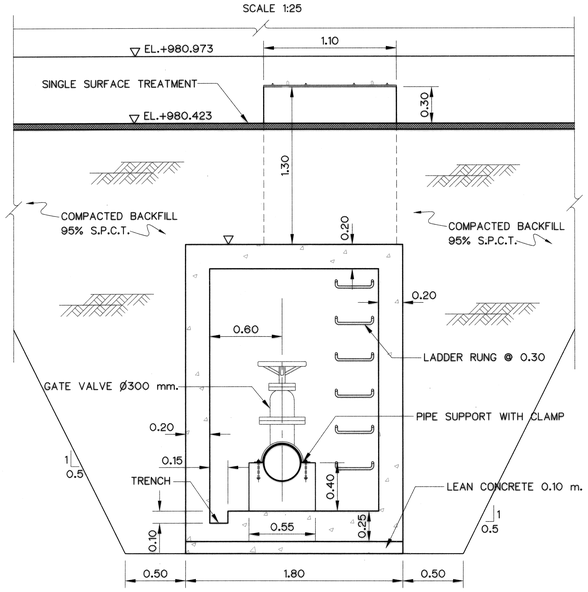
NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN

REFERENCE DRAWING :

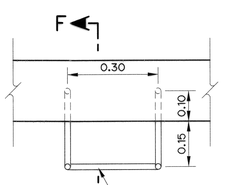
1. SURGE TANK, GENERAL LAY-OUT MH-ST-01

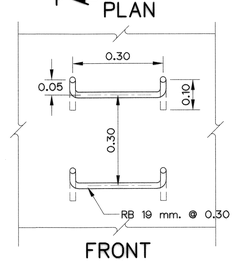




SECTION B–B

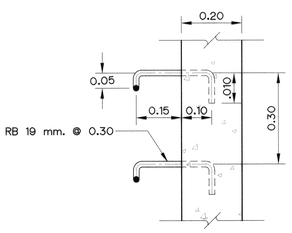
SCALE 1:25





DETAIL OF LADDER RUNG

SCALE 1:10



SECTION F–F

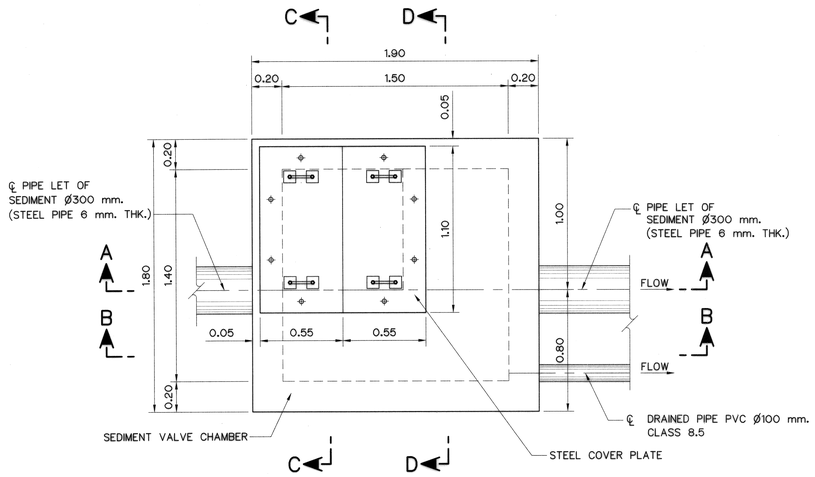
NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
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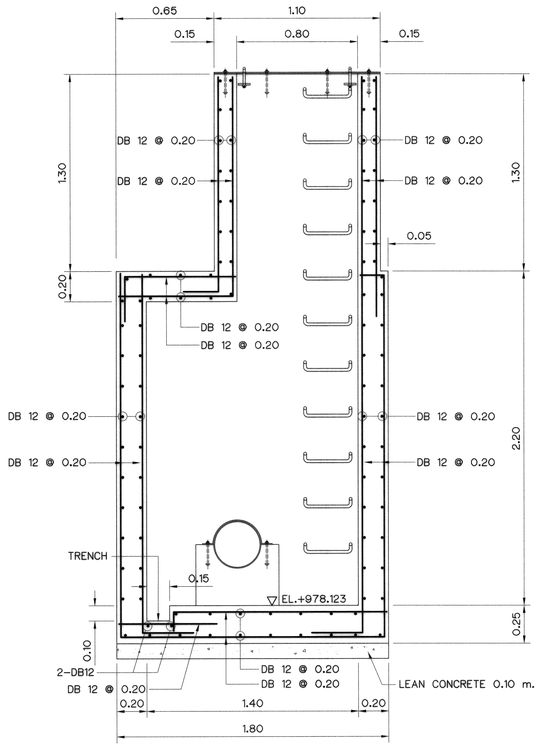
MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
SEDIMENT VALVE CHAMBER PLAN SECTIONS AND DETAILS

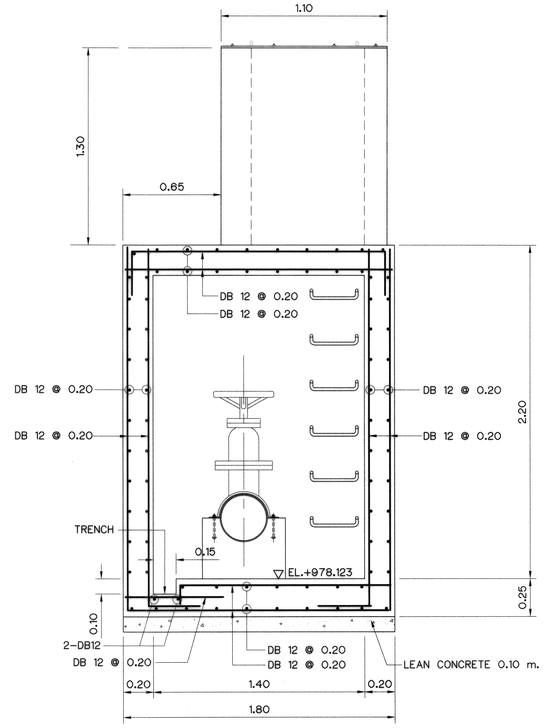
P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED ณัฐ.64624 ณัฐ.6226	REVIEWED
DRAWN	SUBMITTED
CHECKED ณัฐ.6226	RECOMMENDED
PROJECT MANAGER 08/03/2559 DATE	APPROVED P. Hansali
	DRAWING NO. MH-ST-09
	SHEET NO. 70 OF 130



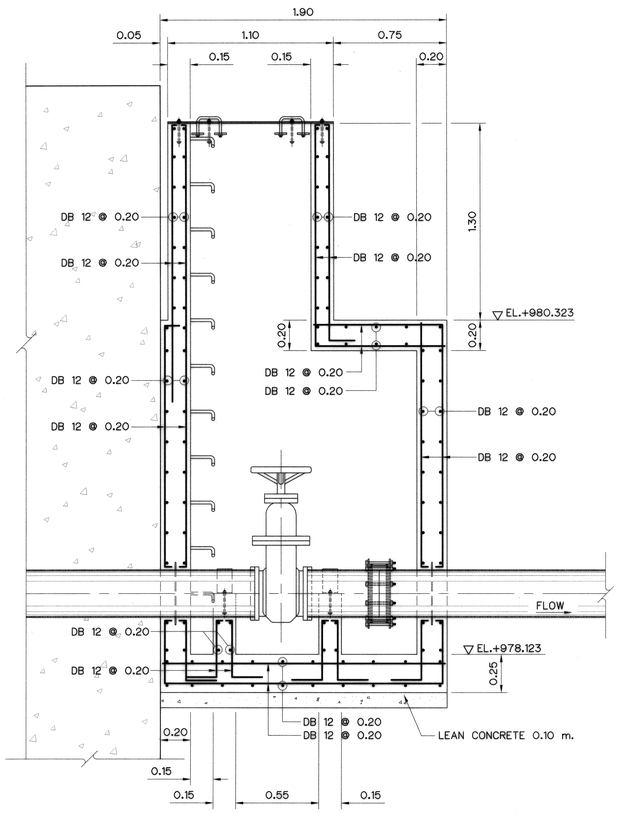
PLAN
SCALE 1:20



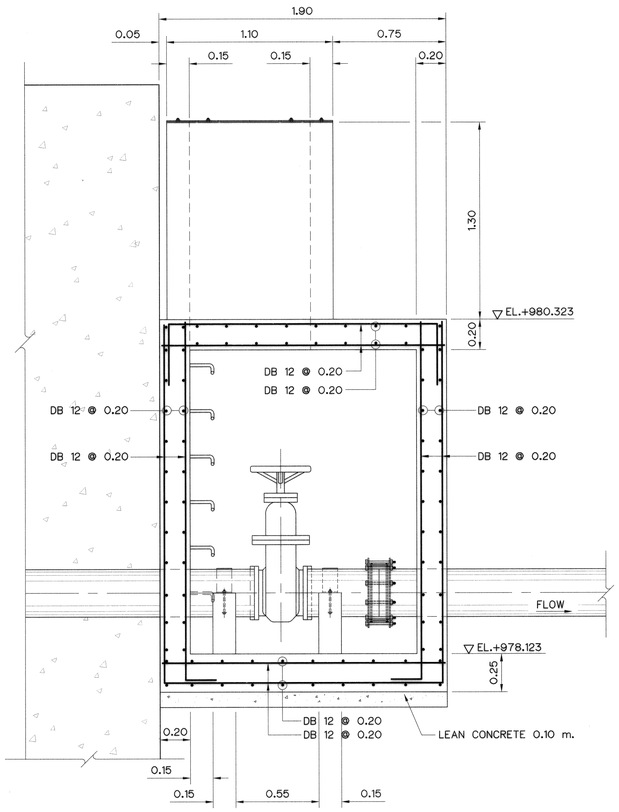
SECTION C–C
SCALE 1:20



SECTION D–D
SCALE 1:20



SECTION A–A
SCALE 1:20



SECTION B–B
SCALE 1:20

NOTE :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN

REFERENCE DRAWING :

1. SEDIMENT VALVE CHAMBER PLAN SECTIONS AND DETAILS MH–ST–09

0 0.5 1 1.5
SCALE 1:20 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
SEDIMENT VALVE CHAMBER REINFORCEMENT DETAILS

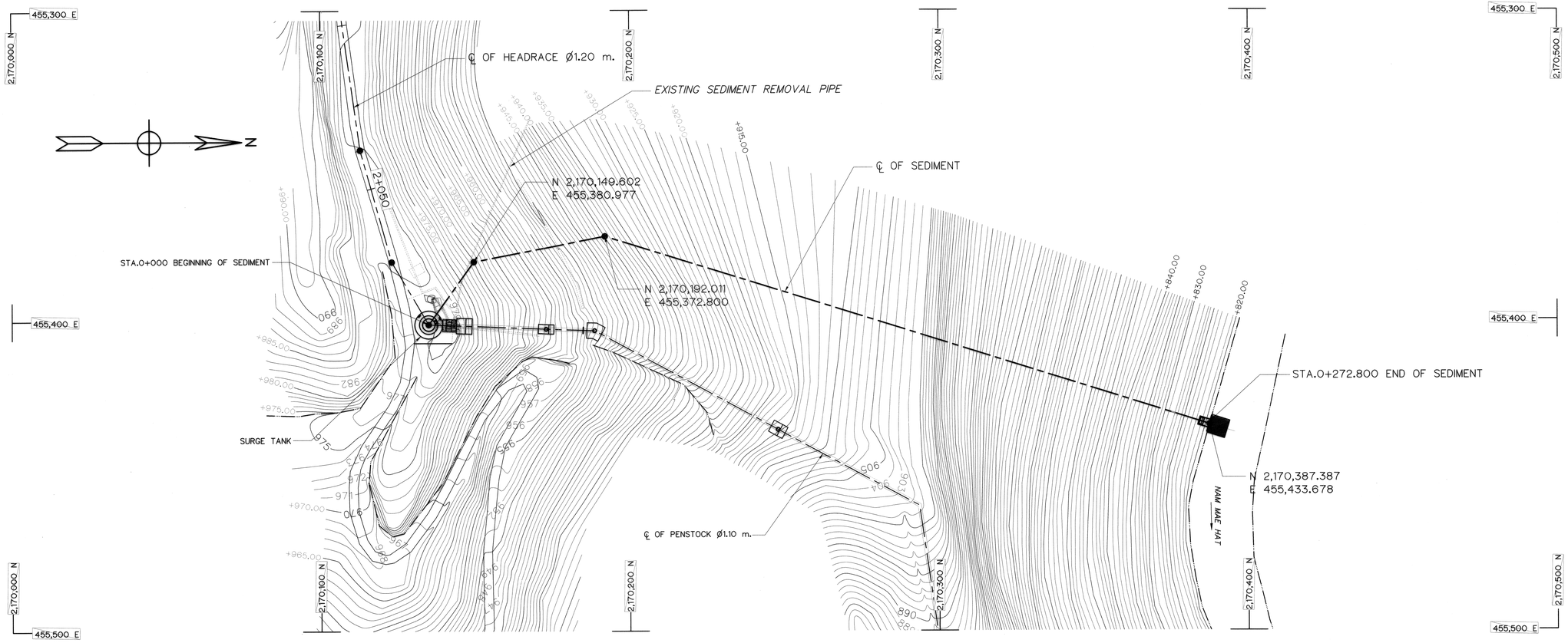
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DESIGNED นิติ.64624 สมิ.6226
DRAWN
CHECKED สมิ.6226
PROJECT MANAGER 01/03/2564 DATE

REVIEWED
SUBMITTED
RECOMMENDED
APPROVED

DRAWING NO. MH–ST–10
SHEET NO. 71 OF 130



PLAN
SCALE 1:750

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO.NMH-GN-03

REFERENCE DRAWINGS :

1. SURGE TANK SEDIMENT OUTLET PLAN SECTION AND DETAILS MH-PS-12

0 5 10 20 30 40 50 60
SCALE 1:750 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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MAE HAT HYDROPOWER PROJECT

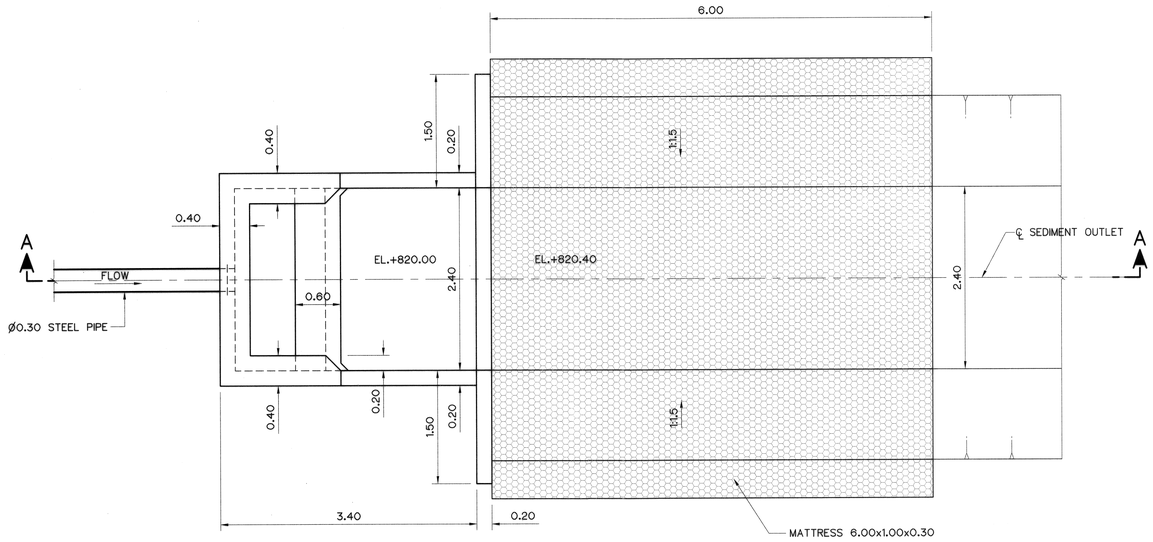
CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
PLAN, SEDIMENT STA. 0+000 TO STA. 0+272.800

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

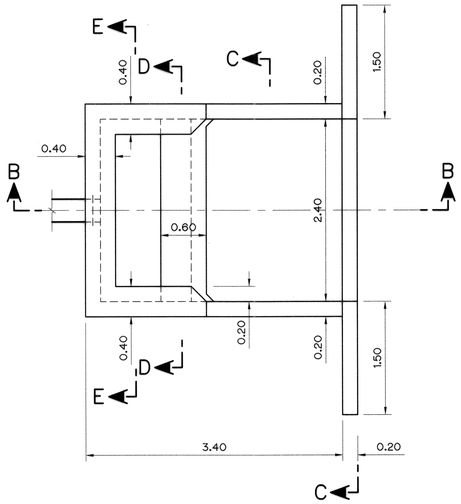
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DRAWN			SUBMITTED
CHECKED		วิชิ.6226	RECOMMENDED
PROJECT MANAGER		01/03/2564 DATE	APPROVED

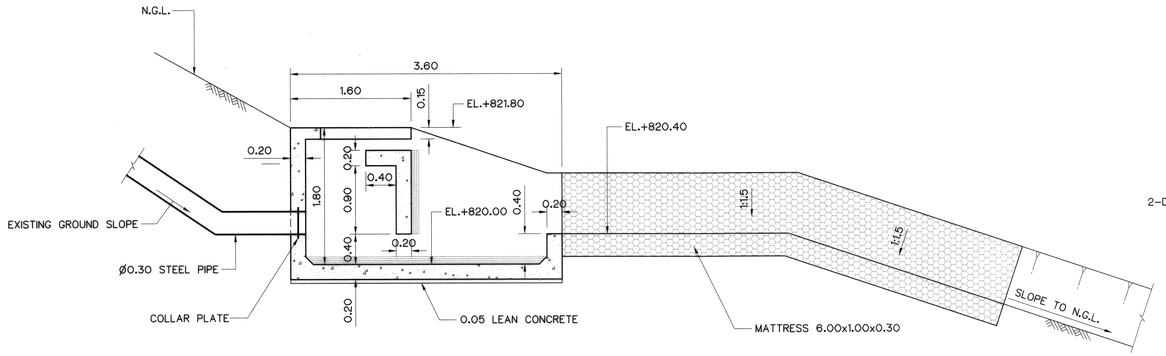
DRAWING NO. MH-ST-11
SHEET NO. 72 OF 130



PLAN

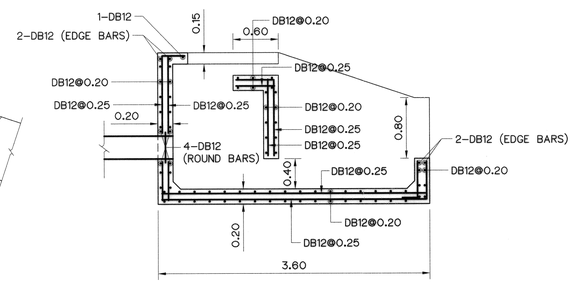
SCALE 1:40





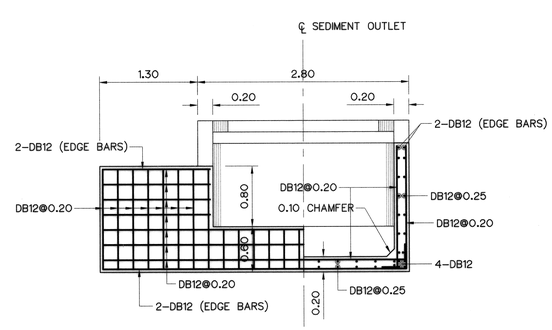
SECTION A–A

SCALE 1:40



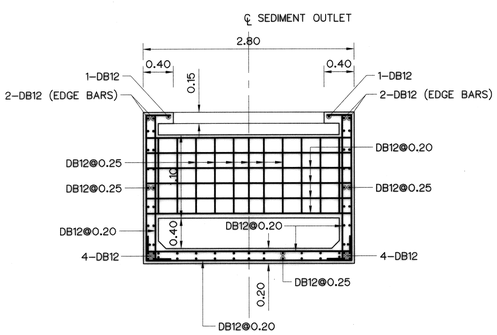
SECTION B–B

SCALE 1:40



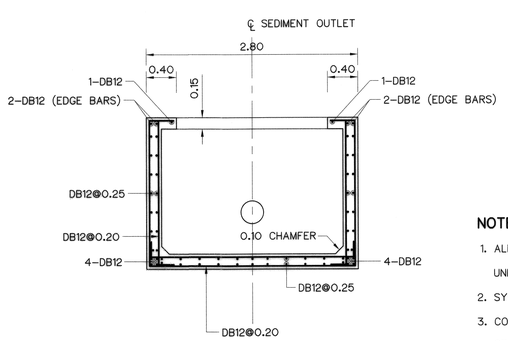
SECTION C–C

SCALE 1:40



SECTION D–D

SCALE 1:40



SECTION E–E

SCALE 1:40

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. NMH–GN–03
3. CONCRETE DESIGN BASED ON THE COMPRESSIVE STRENGTH OF 210 KSC, STANDARD CYLINDER Ø0.15x0.30 m. TEST AT AGE 28 DAYS. UNLESS OTHERWISE INDICATED IN SPECIFIC DRAWINGS.
4. BEARING CAPACITY NOT LESS THAN 5 T/sq m

REFERENCE DRAWINGS :

1. SURGE TANK PLAN, SEDIMENT STA. 0+000 TO STA. 0+272.800 NMH–ST–11

0 0.5 1 2 3

SCALE 1:40 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
SURGE TANK
SEDIMENT OUTLET PLAN SECTION AND DETAILS

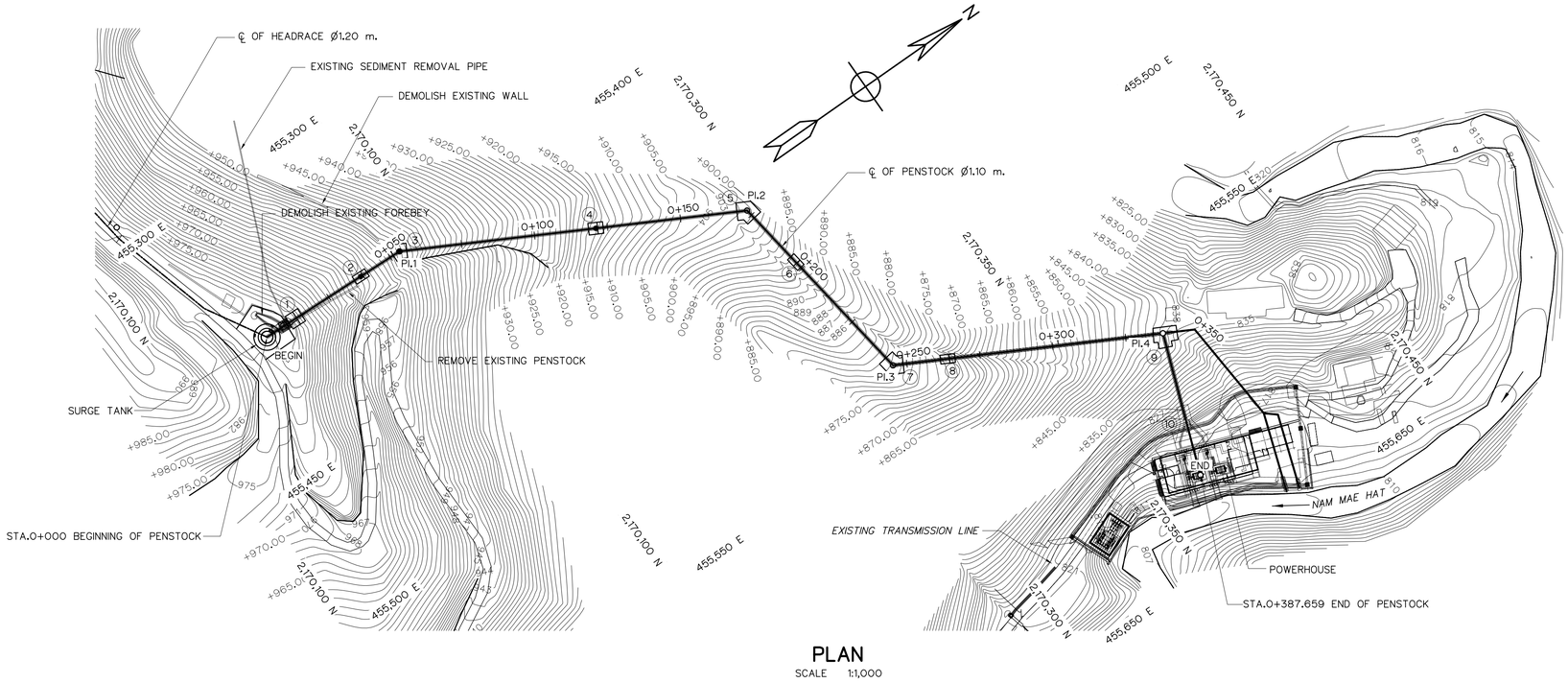
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Department of Alternative Energy Development and Efficiency
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DESIGNED	วิศ.64624	REVIEWED	
DRAWN		SUBMITTED	วิศ.6226
CHECKED	วิศ.6226	RECOMMENDED	
PROJECT MANAGER	08/03/2564 DATE	APPROVED	

DRAWING NO. MH–ST–12

SHEET NO. 73 OF 130

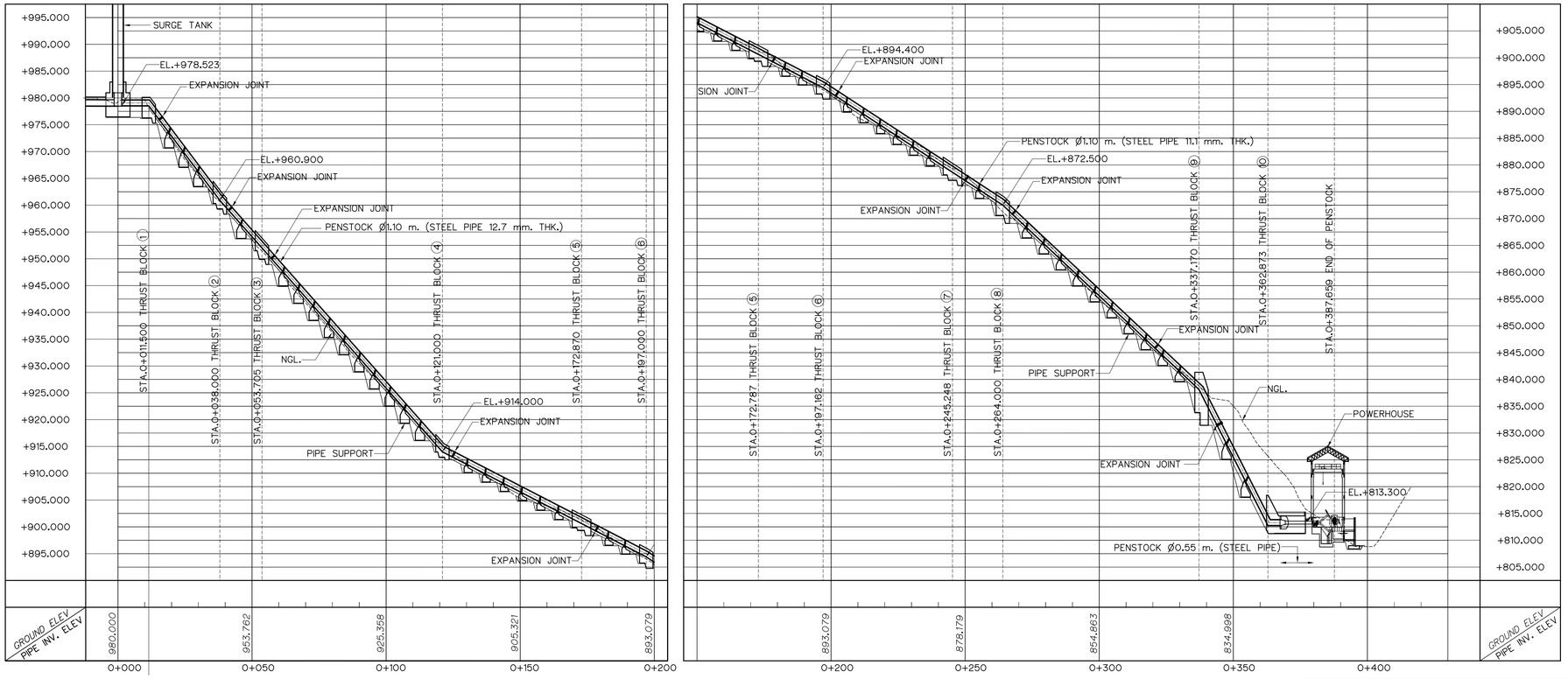


PLAN

SCALE 1:1,000

HORIZONTAL CURVE OF PENSTOCK

NO. OF CURVE	COORDINATE OF PI.		PI. TO PI.	DEFLECTION ANGLE (△)	PI. STA.	BEARING
	N	E	(m)	(° – ' – ")	(km)	(N/S ° – ' – " E/W)
BEGIN	2,170,134.951	455,401.241	–	–	0+000.000	–
PI.1	2,17,0188.62	455,403.218	53.705	2°– 11'– 18.03"	0+053.705	N 02°– 06'–34.72" E
PI.2	2,170,293.544	455,459.709	119.165	53°– 23'– 21.94"	0+172.870	N 28°– 17'– 52.76" E
PI.3	2,170,304.008	455,531.327	72.378	53°– 27'– 12.97"	0+245.248	N 81°– 41'– 14.70" E
PI.4	2,170,385.537	455,575.104	92.539	81°– 57'–32.70"	0+337.787	N 28°– 14'–1.42"
END	2,170,368.322	455,621.911	49.872	–	0+387.659	N 110°– 11'–34.12"



PROFILE

VERTICAL SCALE 1:500

HORIZONTAL SCALE 1:1,000

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO.MH-GN-03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 1/4	MH–PS–02
2. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 2/4	MH–PS–03
3. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 3/4	MH–PS–04
4. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 4/4	MH–PS–05
5. PENSTOCK PIPE SUPPORT SECTIONS AND DETAILS	MH–PS–06
6. PENSTOCK WYE, PLAN, SECTIONS AND DETAILS	MH–PS–07

0 5 10 20 30 40
SCALE 1:500 METERS

0 10 20 40 60 80
SCALE 1:1,000 METERS

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MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
PENSTOCK
PLAN AND PROFILE, STA. 0+000 TO STA. 0+387.659

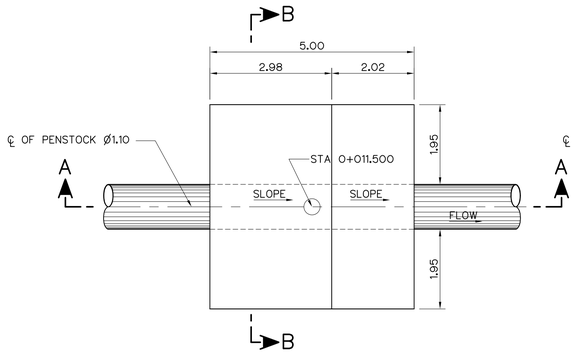
NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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	CONSULTANTS		DEDE	

P&C MANAGEMENT CO.,LTD.

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CHECKED ณัฐ.6226
PROJECT MANAGER 08/03/2559 DATE

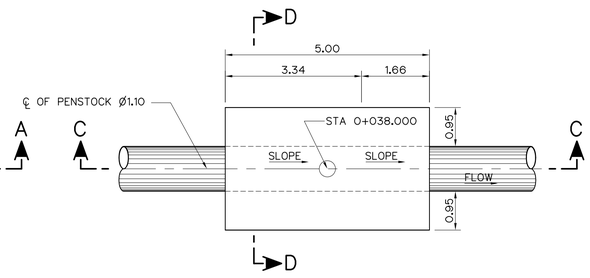
Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
REVIEWED
SUBMITTED
RECOMMENDED
APPROVED

DRAWING NO. MH–PS–01
SHEET NO. 74 OF 130



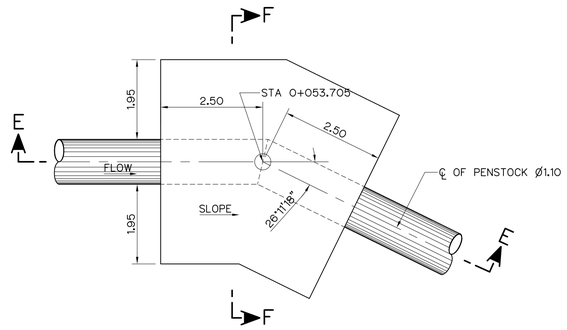
PLAN (THRUST BLOCK ①)

SCALE 1:75



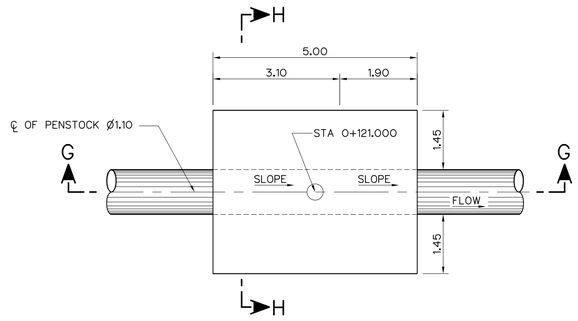
PLAN (THRUST BLOCK ②)

SCALE 1:75



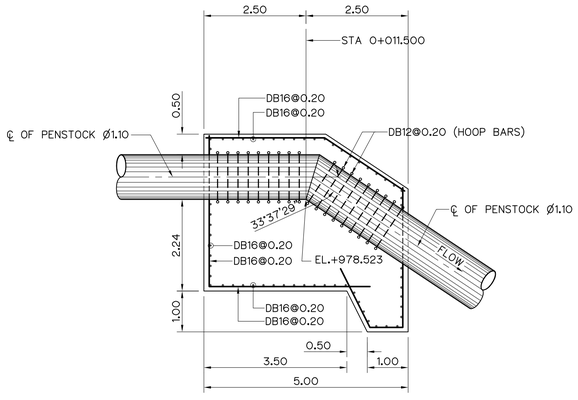
PLAN (THRUST BLOCK ③)

SCALE 1:75



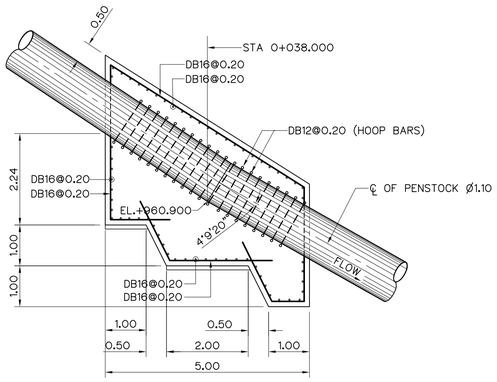
PLAN (THRUST BLOCK ④)

SCALE 1:75



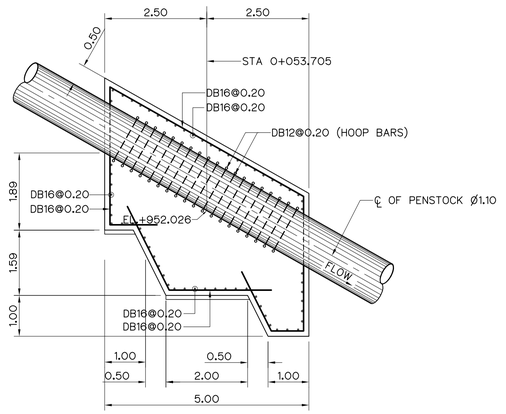
SECTION A–A

SCALE 1:75



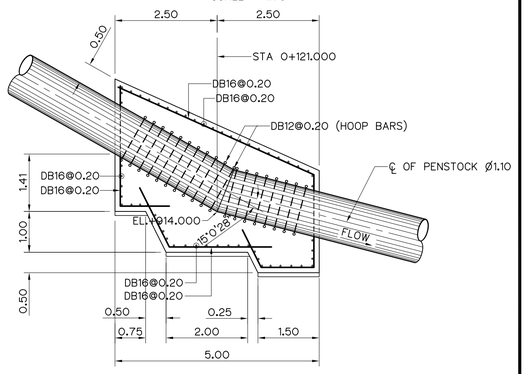
SECTION C–C

SCALE 1:75



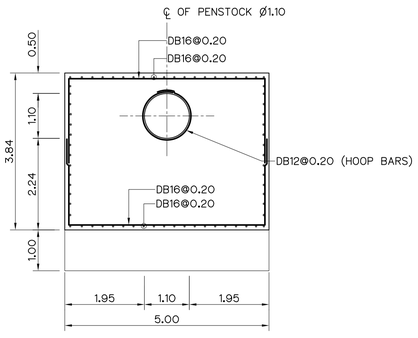
SECTION E–E

SCALE 1:75



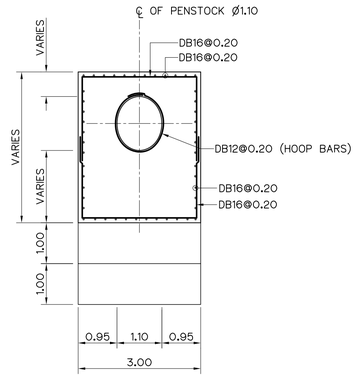
SECTION G–G

SCALE 1:75



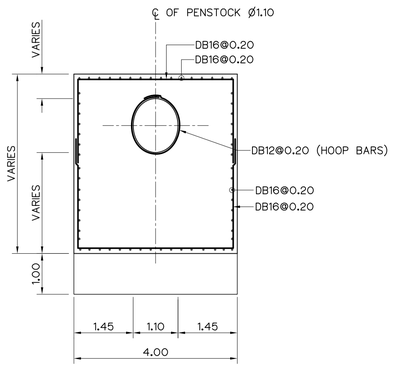
SECTION B–B

SCALE 1:75



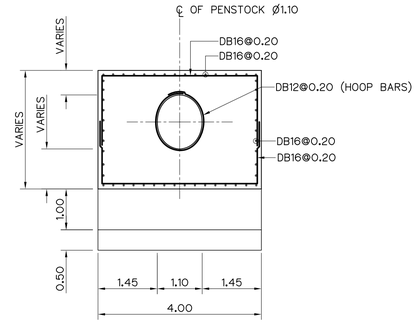
SECTION D–D

SCALE 1:75



SECTION F–F

SCALE 1:75



SECTION H–H

SCALE 1:75

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO. MH-GN-03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+387.659 MH-PS-01

0 1 2 3 4 5 6

SCALE 1:75 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

PENSTOCK

THRUST BLOCK PLAN, SECTIONS REINFORCEMENT DETAILS 1/4

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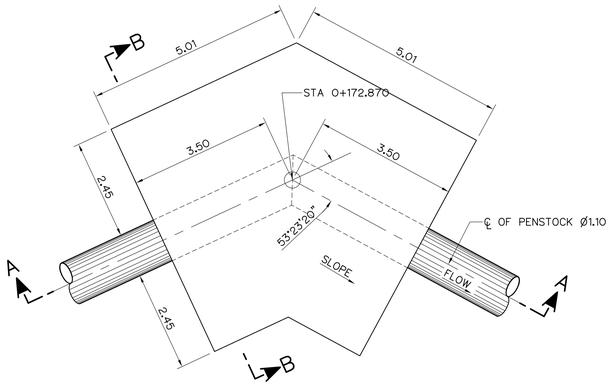
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

DESIGNED	วสิ.64624	วสิ.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED	วสิ.6226		RECOMMENDED
			APPROVED

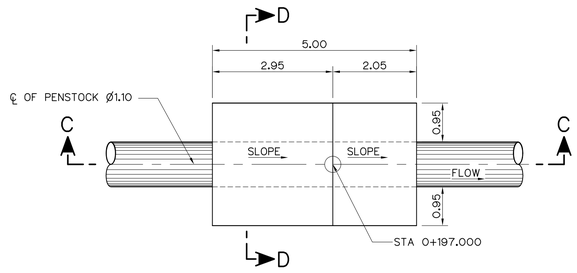
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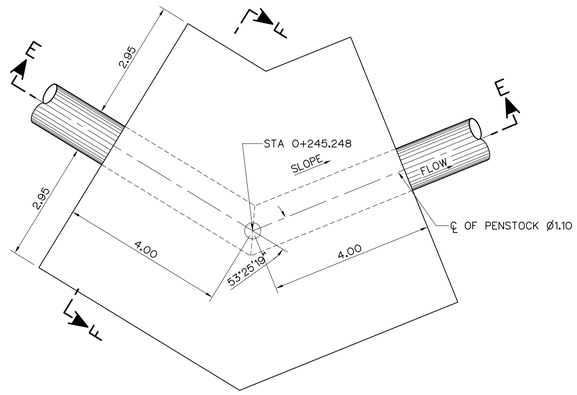
SHEET NO. 75 OF 130



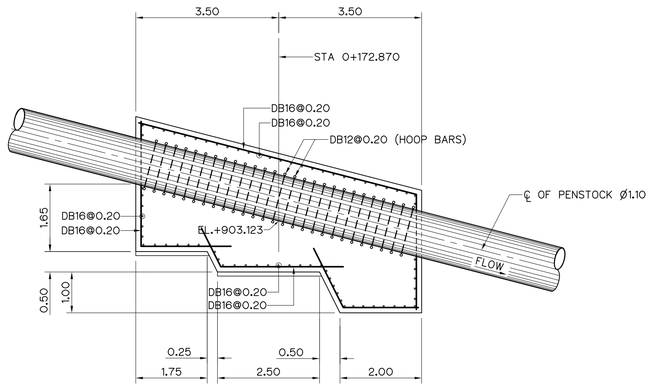
PLAN (THRUST BLOCK ⑤)
SCALE 1:75



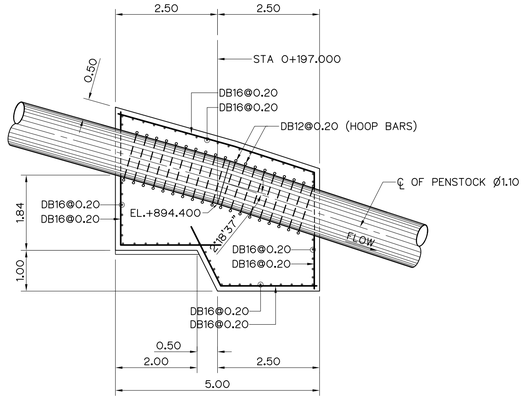
PLAN (THRUST BLOCK ⑥)
SCALE 1:75



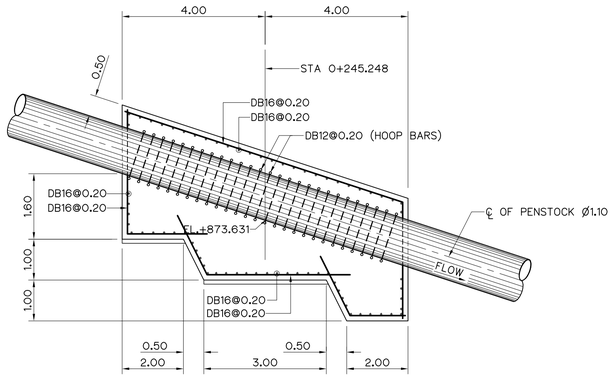
PLAN (THRUST BLOCK ⑦)
SCALE 1:75



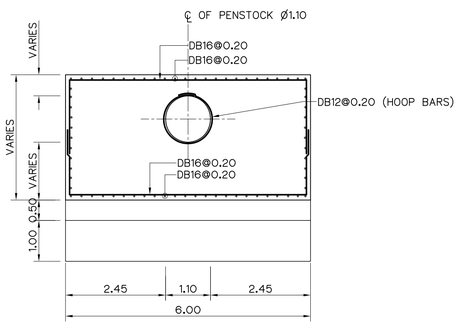
SECTION A–A
SCALE 1:75



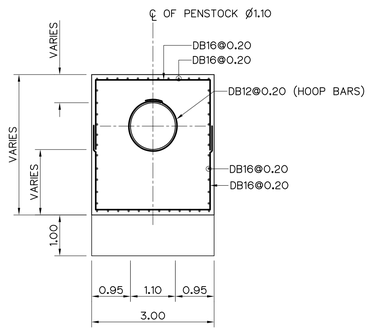
SECTION C–C
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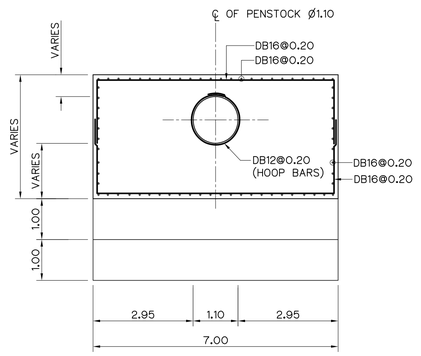
SECTION E–E
SCALE 1:75



SECTION B–B
SCALE 1:75



SECTION D–D
SCALE 1:75



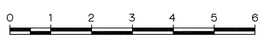
SECTION E–E
SCALE 1:75

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO. MH-GN-03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+387.659 MH-PS-01



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

PENSTOCK

THRUST BLOCK PLAN, SECTIONS REINFORCEMENT DETAILS 2/4

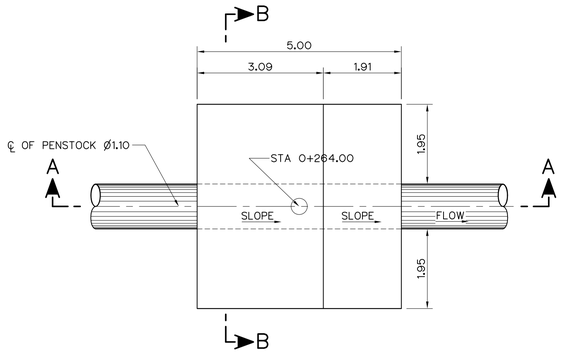
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED วิศ.64624 วิศ.6226
DRAWN
CHECKED วิศ.6226
PROJECT MANAGER 08/03/2559 DATE

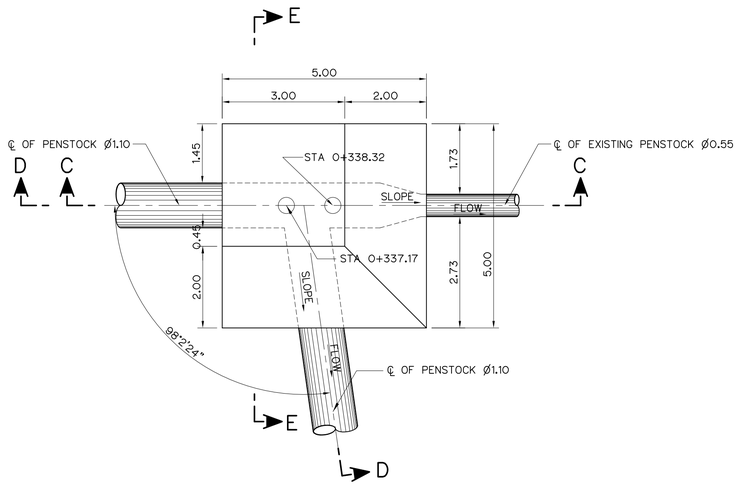
REVIEWED
SUBMITTED
RECOMMENDED
APPROVED

DRAWING NO. MH-PS-03
SHEET NO. 76 OF 130



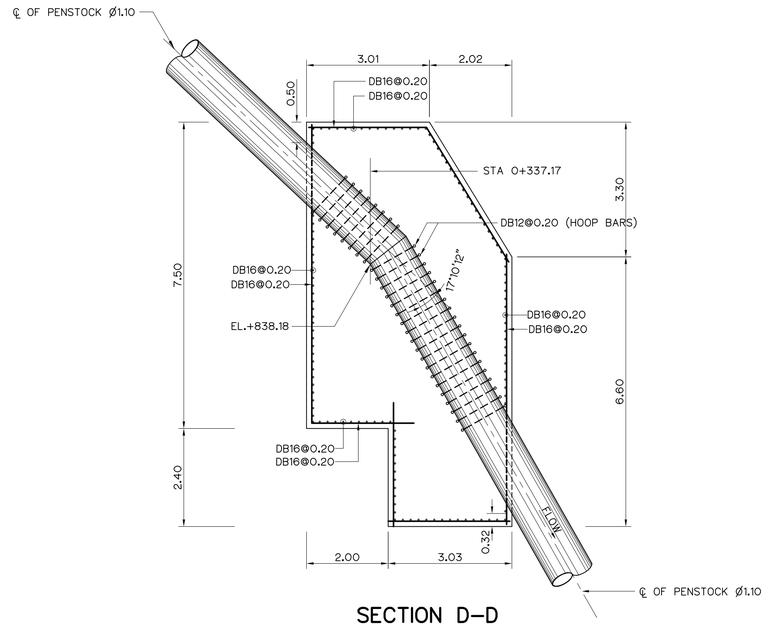
PLAN (THRUST BLOCK ⑧)

SCALE 1:75



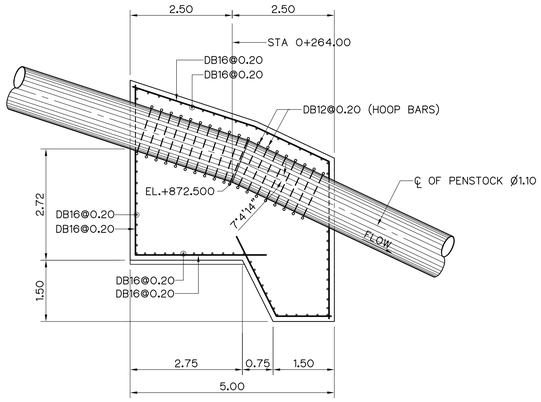
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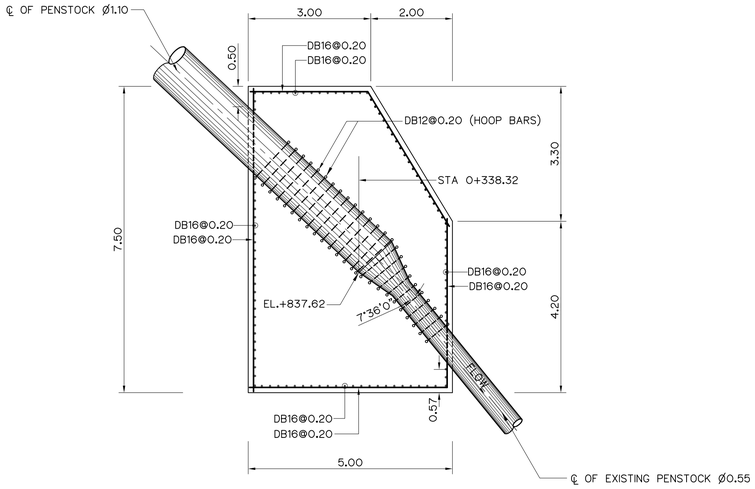
SECTION D–D

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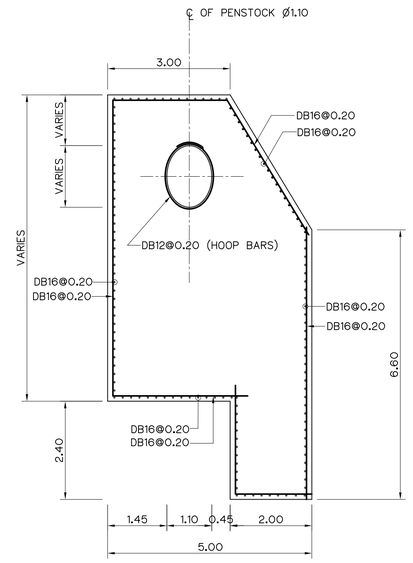
SECTION A–A

SCALE 1:75



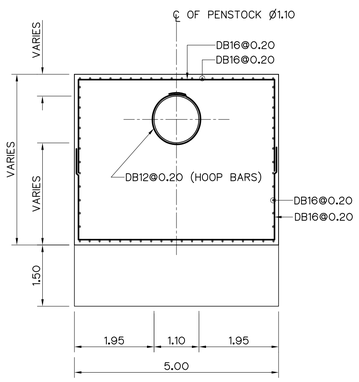
SECTION C–C

SCALE 1:75



SECTION E–E

SCALE 1:75



SECTION B–B

SCALE 1:75

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO. MH-GN-03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+387.659 MH-PS-01

0 1 2 3 4 5 6

SCALE 1:75 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

PENSTOCK

THRUST BLOCK PLAN, SECTIONS REINFORCEMENT DETAILS 3/4

P&C MANAGEMENT CO.,LTD.

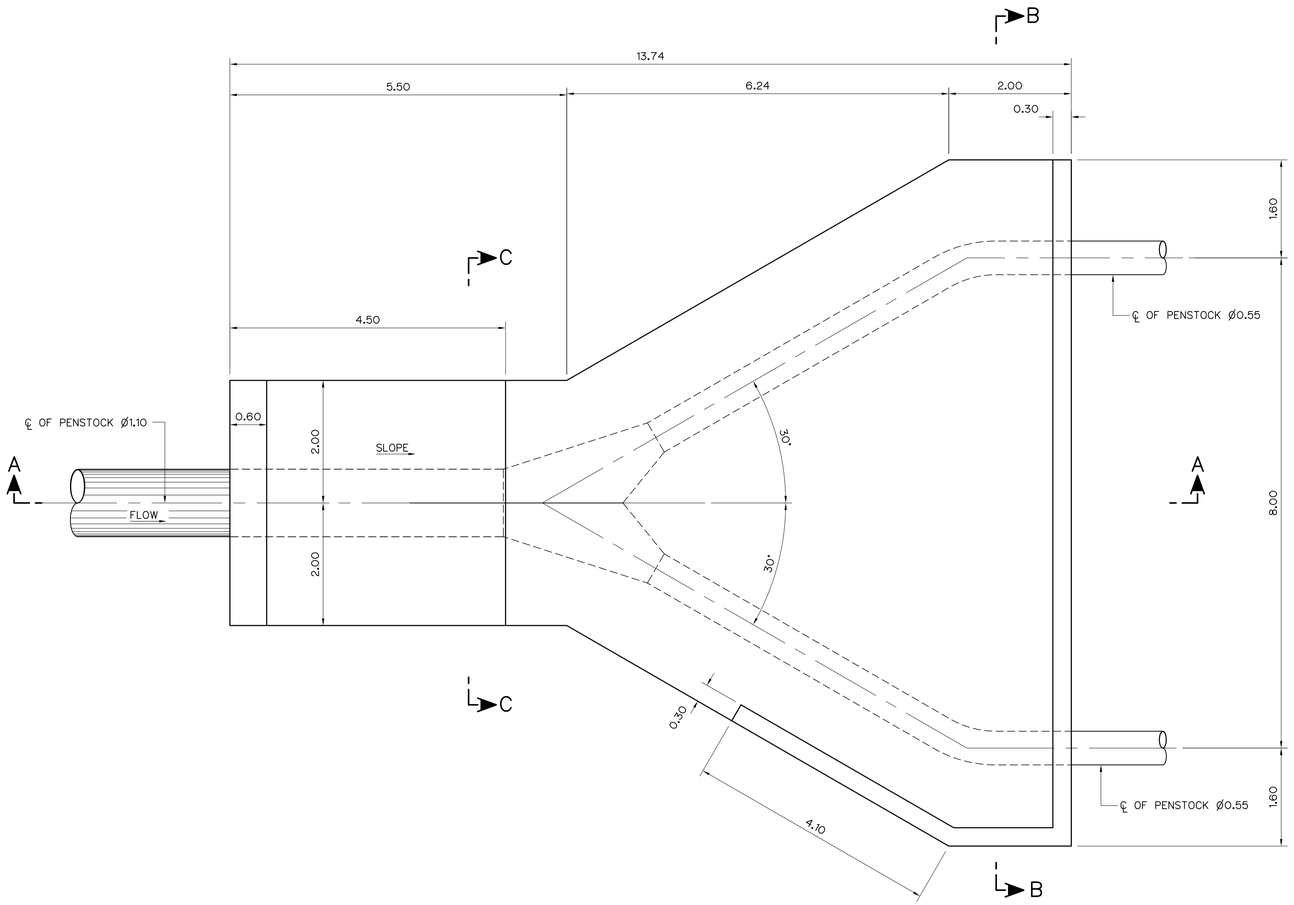
Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วศ.ภ.64624	วศ.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED	วศ.6226		RECOMMENDED
			APPROVED

PROJECT MANAGER 08/03/2559 DATE

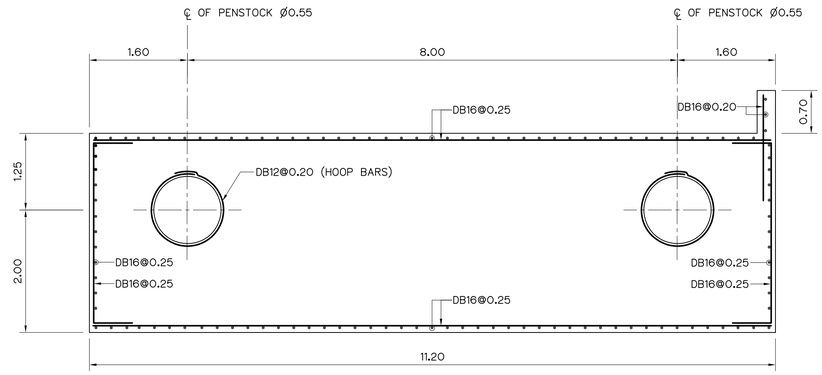
DRAWING NO. MH-PS-04

SHEET NO. 77 OF 130



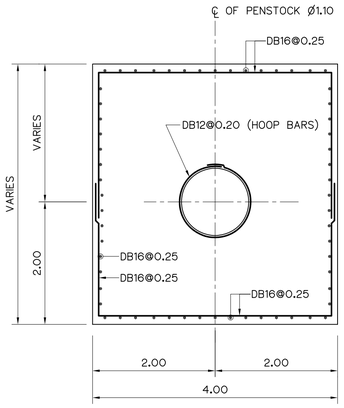
PLAN (THRUST BLOCK (10))

SCALE 1:50



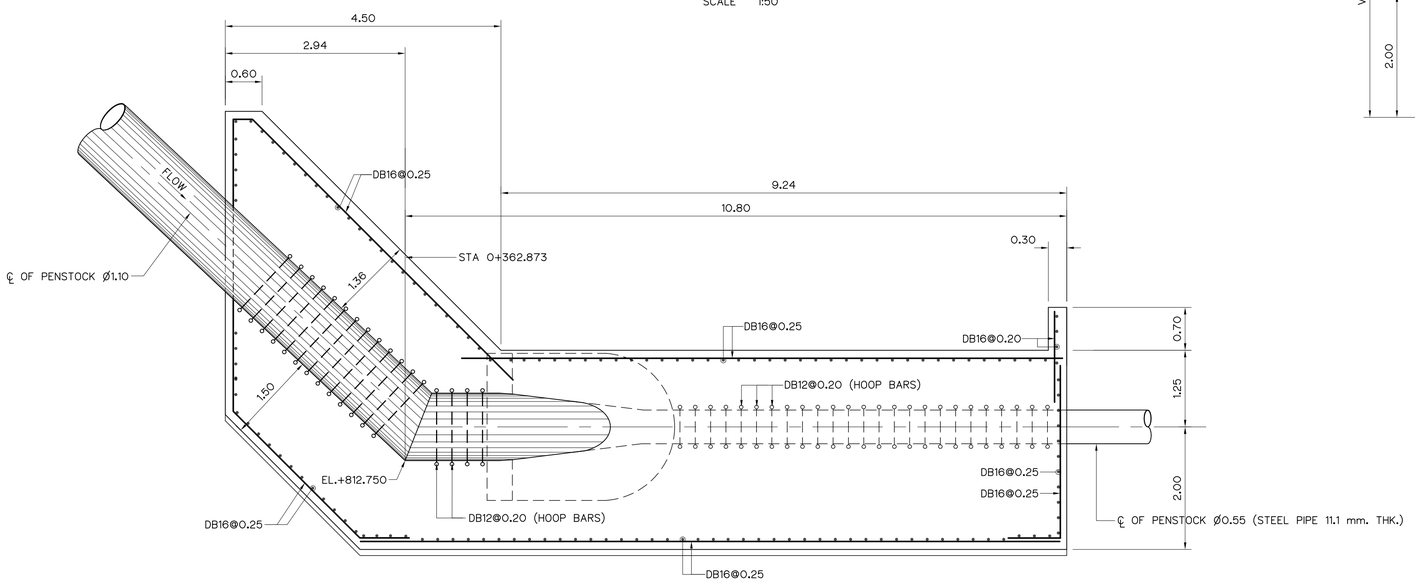
SECTION B–B

SCALE 1:50



SECTION C–C

SCALE 1:50



SECTION A–A

SCALE 1:50

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO. MH-GN-03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+387.659	MH-PS-01
2. PENSTOCK, WYE PLAN, SECTIONS AND DETAILS	MH-PS-07

0 0.5 1.0 2.0 3.0 4.0

SCALE 1:50 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

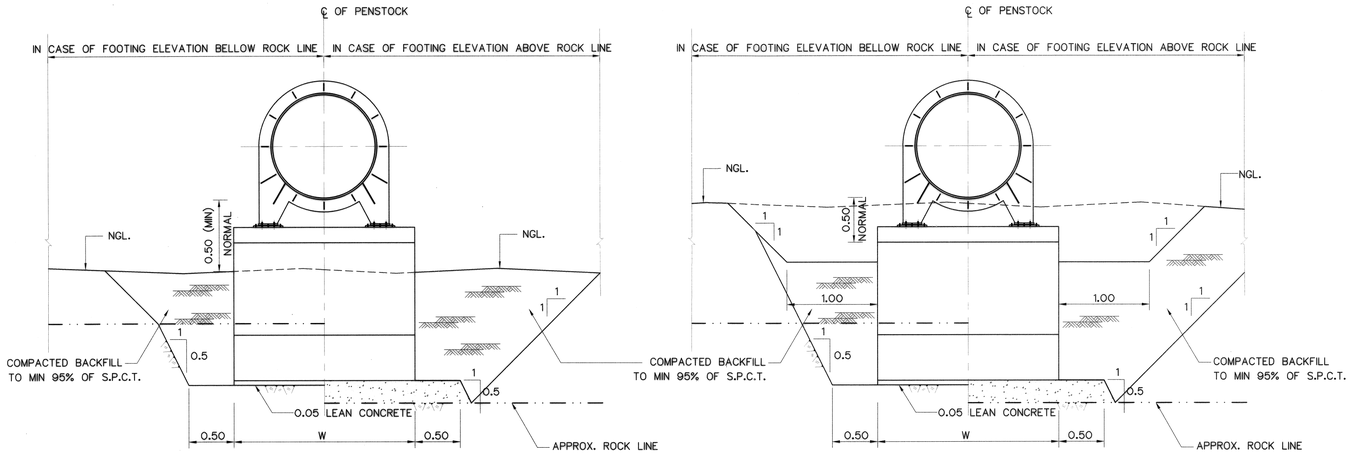
PENSTOCK

THRUST BLOCK PLAN, SECTIONS REINFORCEMENT DETAILS 4/4

P&C MANAGEMENT CO.,LTD.

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DESIGNED	ม.ล.64624 ส.ป.6226
DRAWN	
CHECKED	ส.ป.6226
PROJECT MANAGER	08/03/2559 DATE
REVIEWED	
SUBMITTED	
RECOMMENDED	
APPROVED	P. Hanwatt
DRAWING NO.	MH-PS-05
SHEET NO.	78 OF 130

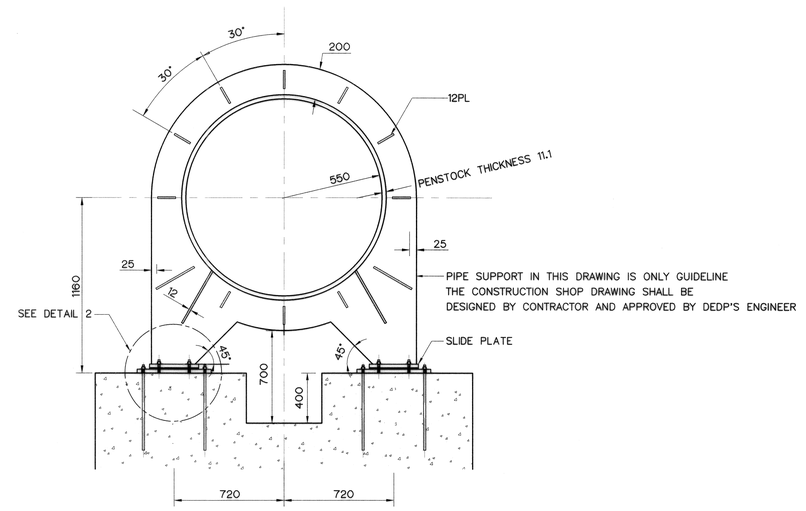


N.G.L. BELLOW INVERT ELEVATION

N.G.L. ABOVE INVERT ELEVATION

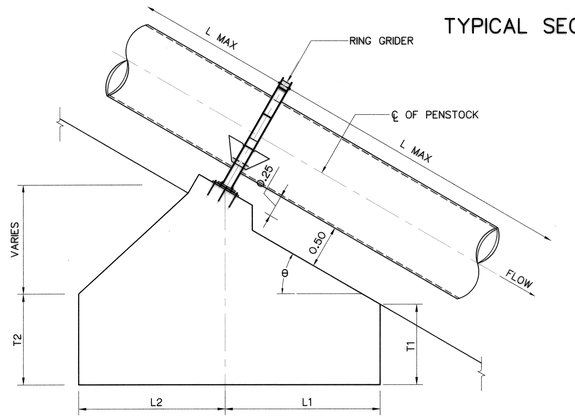
TYPICAL SECTION OF PENSTOCK

NOT TO SCALE



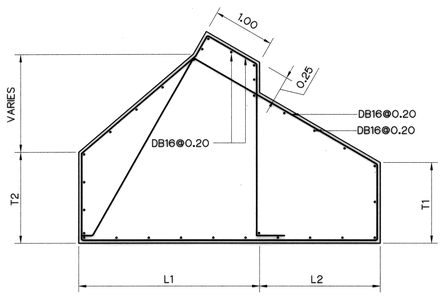
SECTION A – A

SCALE 1:20



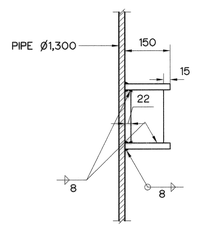
PIER

NOT TO SCALE



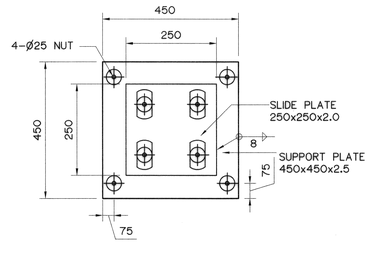
PIER (REINFORCEMENT DETAIL)

NOT TO SCALE



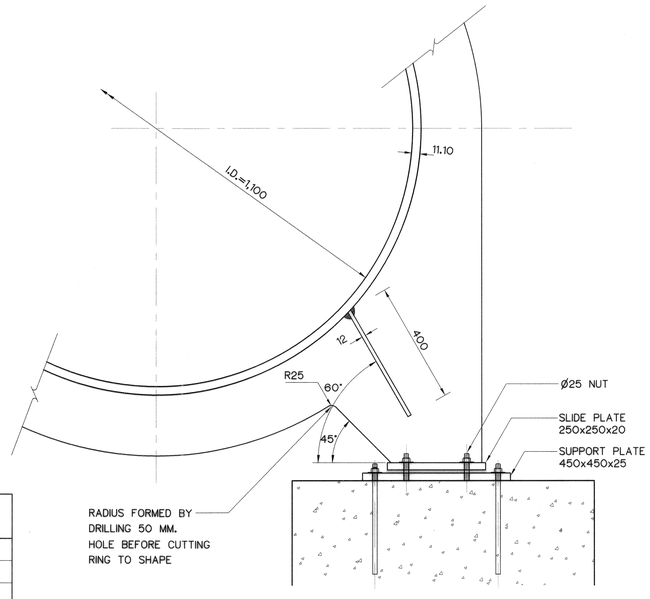
DETAIL "1"

SCALE 1:20

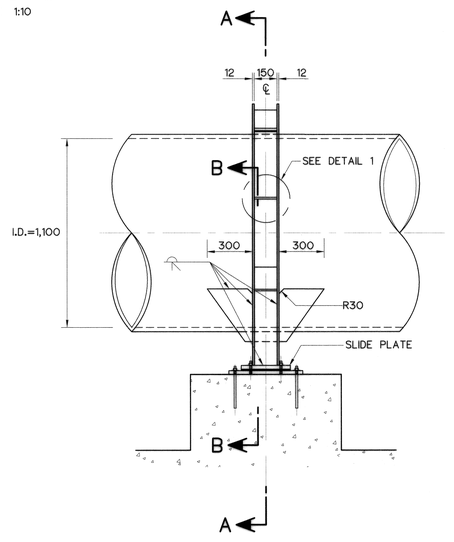


DETAIL "2"

SCALE 1:10



SECTION B – B



RING GIRDER FOR 1,100 I.D. PIPE

NOTES :

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH-GN-03
3. CORROSIVE PROTECTION IS WARNED TO STRICTLY FLOW PAINTING SPECIFICATION

DIMENSIONS FOR PIER

STA.		SLOPE (θ)	L1	L2	T1	T2	W	LMAX
FROM	TO	DEGREE	(m.)	(m.)	(m.)	(m.)	(m.)	(m.)
0+011.500	0+038.000	33.69	2.00	1.50	1.00	1.40	3.00	8.00
0+038.000	0+121.000	29.47	2.00	1.50	1.00	1.50	3.00	8.00
0+121.000	0+197.000	14.46	2.00	1.00	0.50	0.90	3.00	8.00
0+197.000	0+264.000	18.10	2.00	1.00	0.50	1.05	3.00	8.00
0+264.000	0+362.000	25.17	2.00	1.00	0.50	0.90	3.00	8.00

0 0.5 1.0 1.5

SCALE 1:20 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

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MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
PENSTOCK
PIPE SUPPORT SECTIONS AND DETAILS

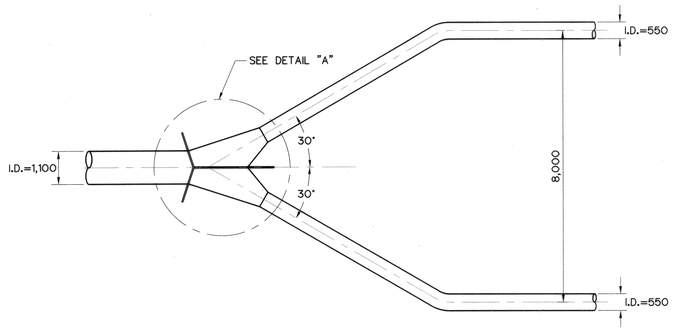
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วิศ.64624	REVIEWED	
DRAWN		SUBMITTED	วิศ.6226
CHECKED	วิศ.6226	RECOMMENDED	
PROJECT MANAGER	08/03/2559 DATE	APPROVED	

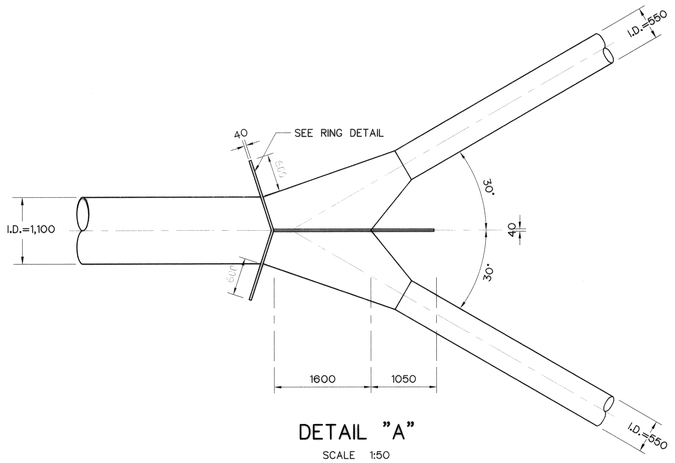
DRAWING NO. MH-PS-06

SHEET NO. 79 OF 130



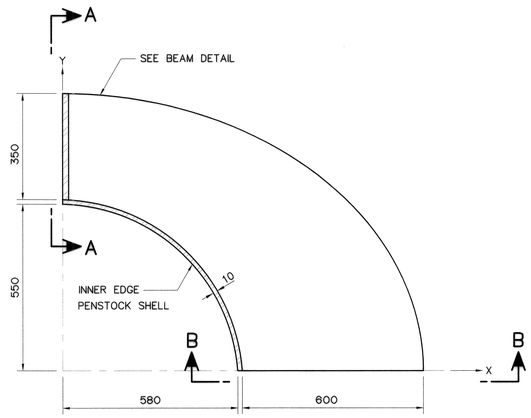
PLAN

SCALE 1:100



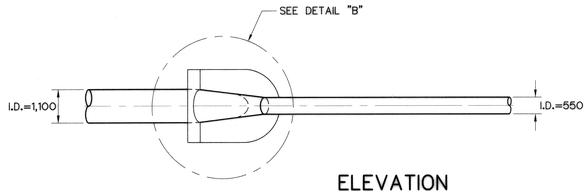
DETAIL "A"

SCALE 1:50



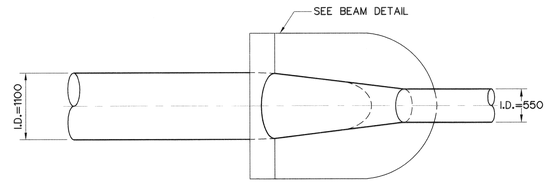
RING DETAIL

SCALE 1:10



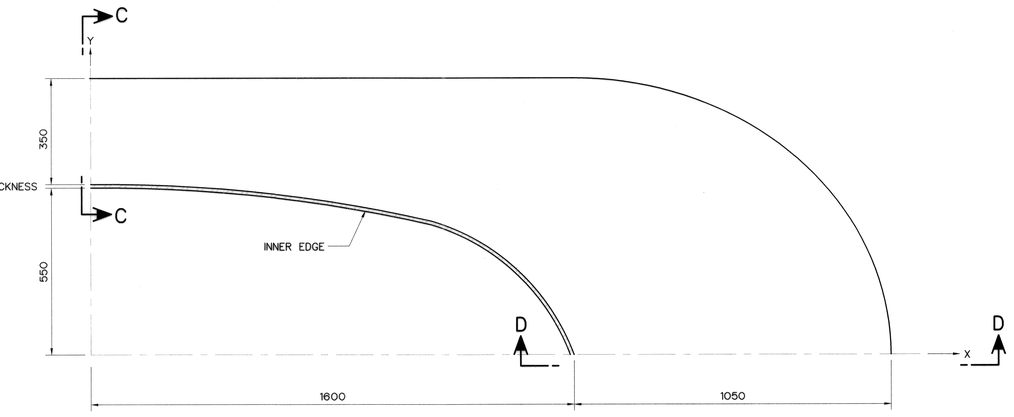
ELEVATION

SCALE 1:100



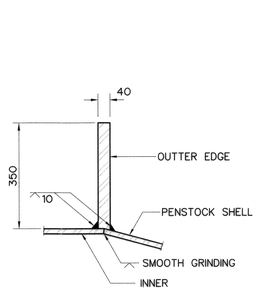
DETAIL "B"

SCALE 1:50



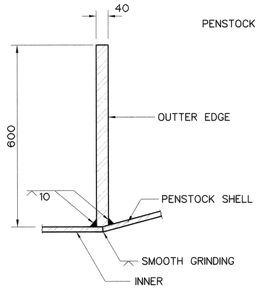
BEAM DETAIL

SCALE 1:10



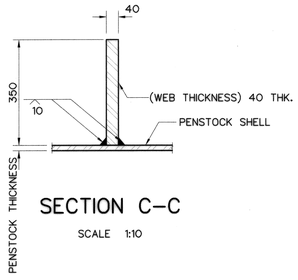
SECTION A–A

SCALE 1:10



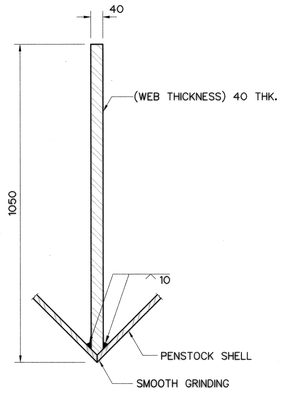
SECTION B–B

SCALE 1:10



SECTION C–C

SCALE 1:10

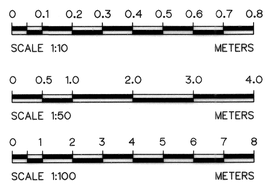


SECTION D–D

SCALE 1:10

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH-GN-03



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
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MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
PENSTOCK
WYE, PLAN, SECTIONS AND DETAILS

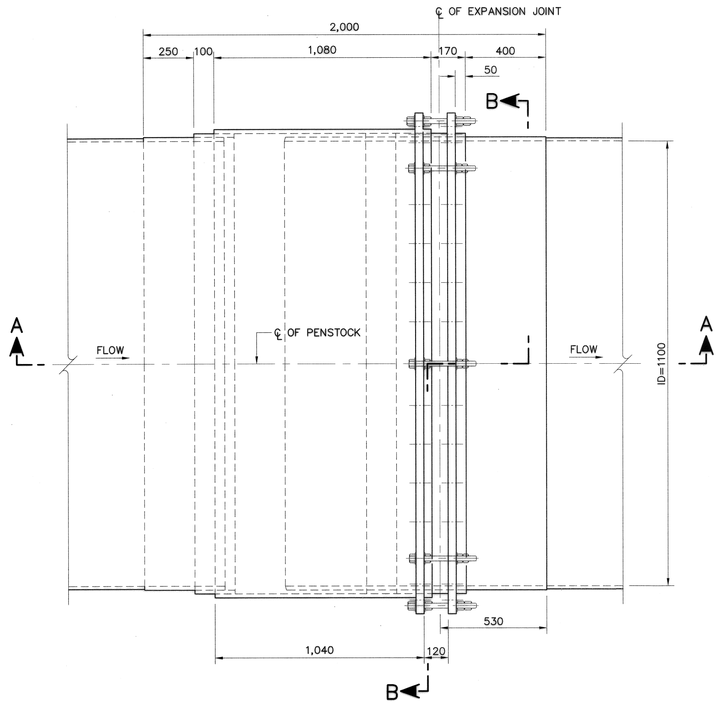
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Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

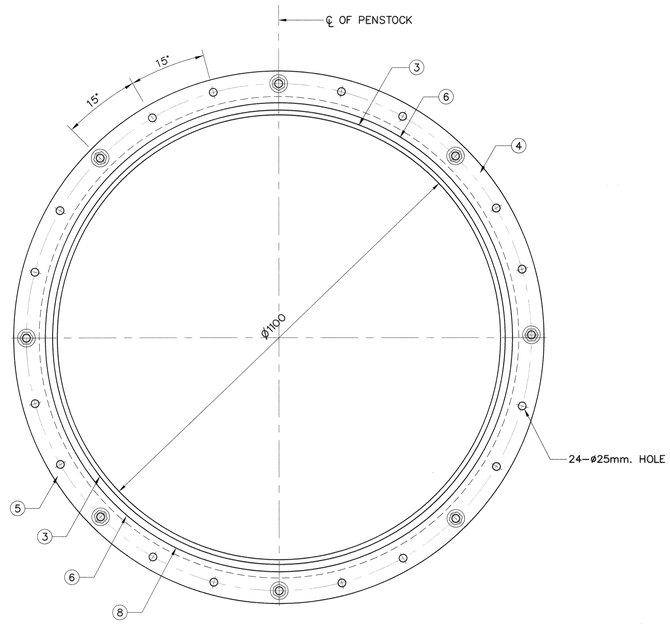
DESIGNED	ส.ต.64624	ส.ต.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED	ส.ต.6226		RECOMMENDED
PROJECT MANAGER	05/09/2564 DATE		APPROVED

DRAWING NO. MH-PS-07

SHEET NO. 80 OF 130



ELEVATION
SCALE 1:7.5



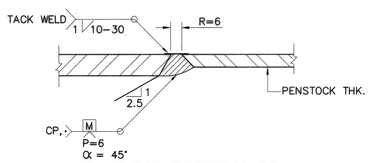
SECTION B–B
SCALE 1:7.5

TABLE OF DETAIL 1 SQUARE – GROOVE WELD , BUTT JOINT

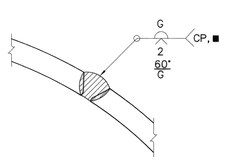
ITEM	DESCRIPTION	MATERIAL	QUANT.	REMARKS
1	PENSTOCK	ASTM A–283, GRADE D	–	––
2	PENSTOCK	ASTM A–283, GRADE D	1	NOTE 2 & 3
3	INNER SLEEVE	ASTM A–283, GRADE D	1	NOTE 2 & 4
4	GRAND RING	ASTM A–283, GRADE D	1	SEAMLESS, NOTE 3
5	OUTER RING	ASTM A–283, GRADE D	1	SEAMLESS, NOTE 3
6	STUFFING BOX	ASTM A–283, GRADE D	1	NOTE 2 & 3
7	DOUBLING PLATE	ASTM A–283, GRADE D	1	NOTE 2 & 3
8	OUTER SLEEVE	ASTM A–283, GRADE D	1	NOTE 2 & 3
9	PACKING STOPPER	ASTM A–283, GRADE D	1	NOTE 2 & 3
10	ø25 mm. BOLTS	ASTM A–325	24	––
11	ø25 mm. NUT	ASTM A–325	72	––
12	ø25 mm. WASHER	ASTM A–325	48	––
13	PACKING RINGS (16 mm. S.Q. RING)	ASBESTOS–GRAPHITE	6	NOTE 5

NOTES :

1. LONGITUDINAL SEAMS HAVE TO BE COMPLETE JOINT PENETRATION WELDS BY COMBINING SINGLE–V–GROOVE WITH BACKING WELDS AND GROUND FLUSH WELDING WITH BASE MATAL AS REQUIRED (SEE DETAIL "2")
2. GALVANIZED ALL SURFACES WITH 0.10 mm. THK.
3. NICKEL CLADDING ON OUTER SURFACE WITH 0.50 mm. THK. AND GALVANIZED INNER SURFACE WITH 0.10 mm. THK.
4. EACH JOINT OF EACH PACKING RING SHALL BE MIN. 25 cm. APART DO NOT LINE UP JOINTS
5. ALL DIMENSION ARE IN MILIMETER UNLESS OTHERWISE SHOWN
6. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH–GN–03



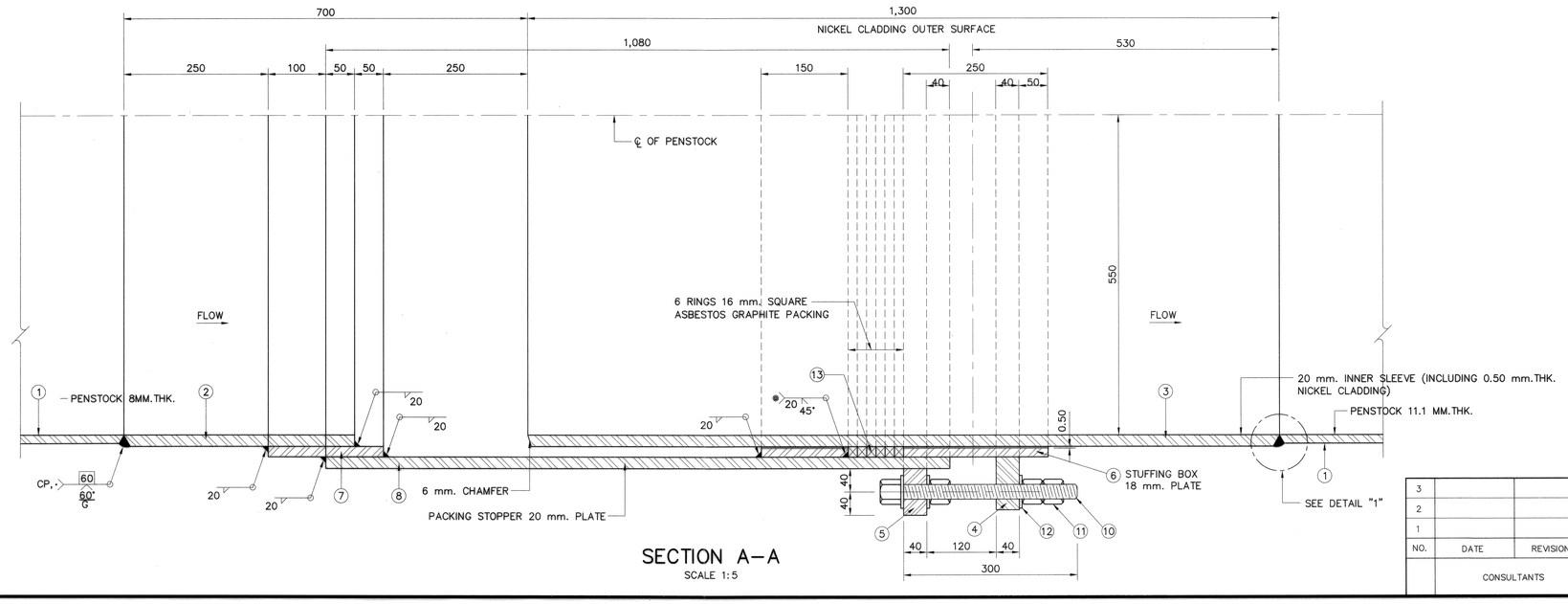
TRANSITION THICKNESS OF BUTT JOINT IN PARTS OF UNEQUAL THICKNESS
DETAIL "1"
NOT TO SCALE



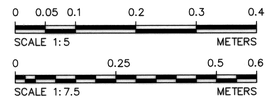
LONGITUDINAL WELD
NOT TO SCALE

WELDING NOTATION :

CP = COMPLETE JOINT PENETRATION GROOVE WELD
G = GRINDING WELD DEPOSITE FLUSH WITH BASE METAL
• = BACKING PLATE SIZE 0.10x1.50 mm. AND SAME METERIAL AS PENSTOCK
● = BEVEL PLATE 9 mm. BEFORE ROLLING CHIP SQUARE AFTER WELDING
▲ = ROOT OPENING R = 2.0 mm.
ROOT FACE t = 3.0 mm.
GROOVE ANGLE = 45°
■ = ROOT OPENING R = 2.0 mm.
ROOT FACE t = 2.0 mm.
GROOVE ANGLE = 60°



SECTION A–A
SCALE 1:5



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
		CONSULTANTS	DEDE	

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

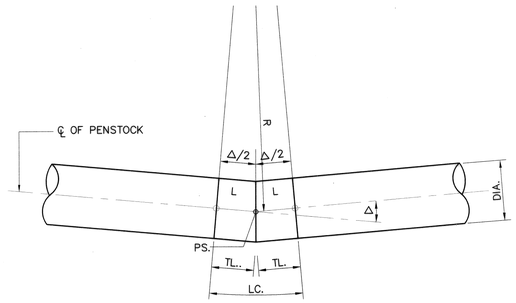
CIVIL WORKS AND TRANSMISSION LINE
PENSTOCK
EXPANSION JOINT, PLAN, SECTIONS AND DETAILS

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วิ.ย.64624	ส.ค.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED		ส.ค.6226	RECOMMENDED
PROJECT MANAGER		06/09/2564 DATE	APPROVED P. Hanwell

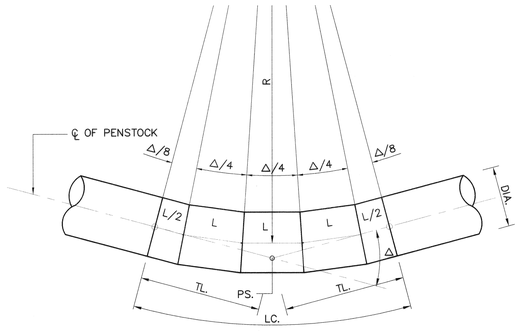
DRAWING NO. MH–PS–08
SHEET NO. 81 OF 130



BEND TYPE "1"

DELTA(Δ) 0°–5°

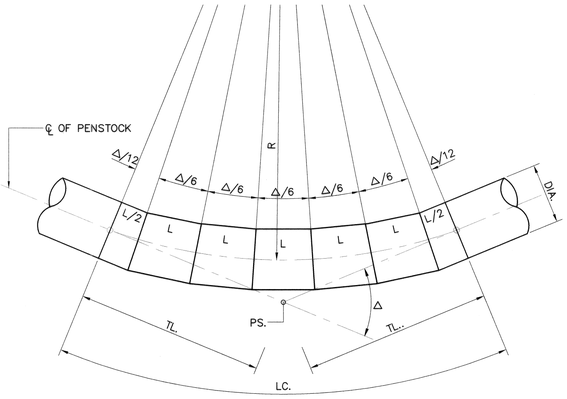
NOT TO SCALE



BEND TYPE "4"

DELTA(Δ) 25°–35°

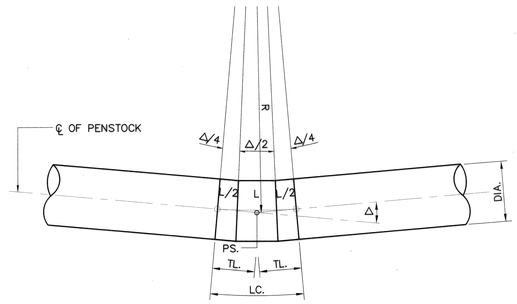
NOT TO SCALE



BEND TYPE "6"

DELTA(Δ) 55°–OVER

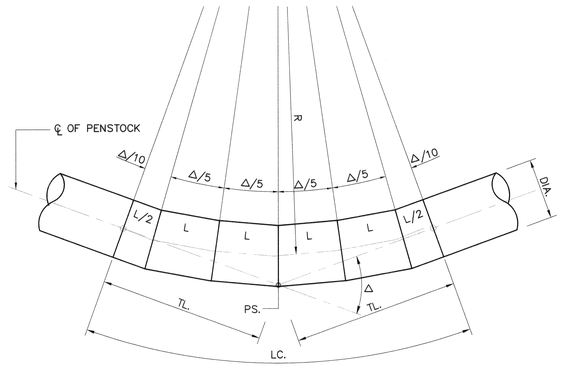
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BEND TYPE "2"

DELTA(Δ) 5°–15°

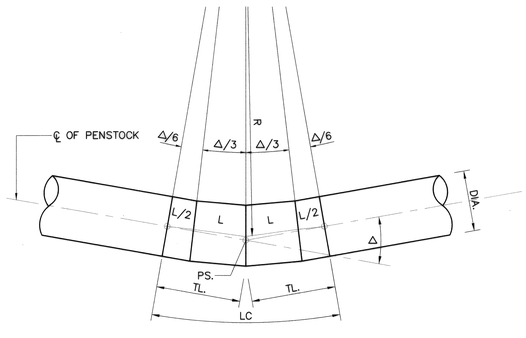
NOT TO SCALE



BEND TYPE "5"

DELTA(Δ) 35°–45°

NOT TO SCALE



BEND TYPE "3"

DELTA(Δ) 15°–25°

NOT TO SCALE

D	ELBOW							
	2–PIECE θ = 11.25°		3–PIECE θ = 22.25°		4–PIECE θ = 45°		5–PIECE θ = 45°	
	M	a	N	b	P	c	Q	d
150	100	250	175	225	275	225	375	250
200	100	250	200	225	300	225	450	250
250	100	250	225	200	350	225	500	250
300	125	275	250	275	400	275	575	300
400	150	350	300	325	500	325	700	350
500	175	350	350	325	550	325	825	350
600	200	350	400	350	650	350	650	350
700	225	400	450	400	725	400	950	375
800	225	475	500	450	800	450	1075	425
900	250	450	525	450	850	425	1175	475
1,000	250	525	550	500	875	500	1250	450
1,200	275	400	575	400	950	375	1300	525
1,500	300	475	675	475	1050	450	1375	400
1,800	325	450	700	425	1150	425	1575	550

NOTE :

1. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH–GN–03

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE

PENSTOCK

BEND DETAILS

P&C MANAGEMENT CO.,LTD.

DESIGNED วิ.64624 สิ.6226

DRAWN

CHECKED สิ.6226

PROJECT MANAGER

01/03/2564
DATE

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

REVIEWED

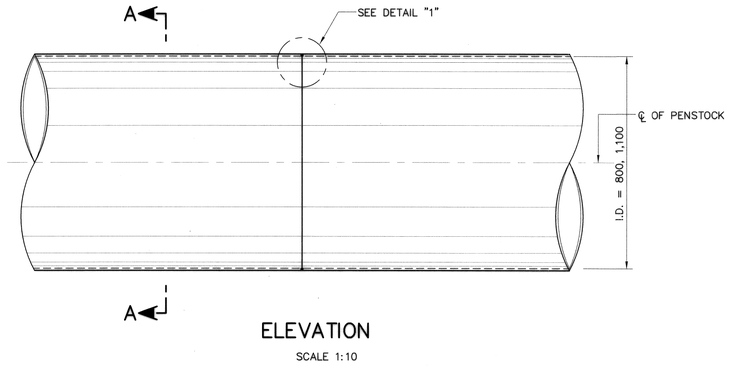
SUBMITTED

RECOMMENDED

APPROVED

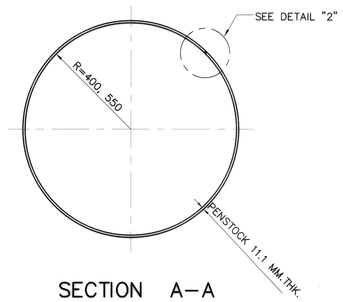
DRAWING NO. MH–PS–09

SHEET NO. 82 OF 130



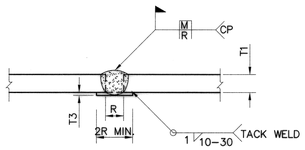
ELEVATION

SCALE 1:10



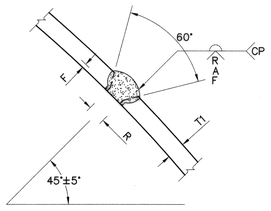
SECTION A–A

SCALE 1:10

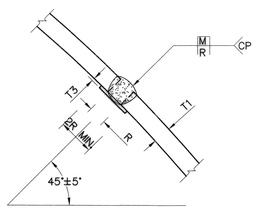


CIRCULAR BUTT JOINT

DETAIL "1"



LONGITUDINAL BUTT JOINT
TYPE "A"



LONGITUDINAL BUTT JOINT (ALTERNATIVE)
TYPE "B"

DETAIL "2"

TABLE OF DETAIL "1" SQUARE–GROOVE WELD, BUTT JOINT

WELDING PROCESS	DESIGNATION	BASE METAL THICKNESS		GROOVE PREPARATION		TOLERANCES		REMARKS
		T1	T3	ROOT OPENING	GROOVE ANGLE	ROOT OPENING	GROOVE ANGLE	
SMAW	B–L1a	11.1	1.0	R = T1	–	+1.5,–0	–	SINGLE–PASS WELD
GMAW FCAW	B–L1a–GF	11.1	1.0	R = T	–	+1.5,–0	–	SINGLE–PASS WELD

SMAW = SHIELD METAL ARC WELDING
GMAW = GAS METAL ARC WELDING
FCAW = FLUX CORED ARC WELDING

TABLE OF DETAIL "2" SINGLE–V–GROOVE WELD, BUTT JOINT

TYPE	WELDING PROCESS	DESIGNATION	BASE METAL THICKNESS		GROOVE PREPARATION			TOLERANCES			REMARKS
			T1	T3	ROOT OPENING	GROOVE ANGLE	ROOT FACE	R	A	F	
A	SMAW	B–U2	11.1	–	R = 2.0	A = 60°	F = 1.5	+15,–0	+10°,–0°	+15,–0	SINGLE–PASS WELD
	SMAW	B–U2	11.1	–	R = 2.0	A = 60°	F = 2.0	+15,–0	+10°,–0°	+15,–0	SINGLE–PASS WELD
B	SMAW	B–L1a–GF	11.1	1.0	R = 6.0	–	–	+15,–0	–	–	SINGLE–PASS WELD
	GMAW FCAW	B–L1a–GF	11.1	1.0	R = 9.0	–	–	+15,–0	–	–	SINGLE–PASS WELD

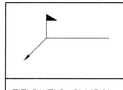
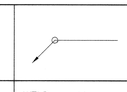
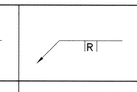
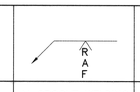
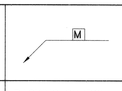
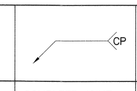
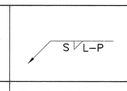
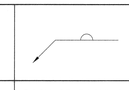
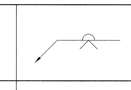
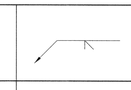
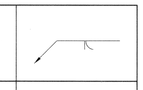
NOTES :

1. ALL DIMENSION ARE IN MILLIMETER, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH–GN–03
3. GROOVE WELD MADE AFTER WELDING OTHER SIDE
4. USE WELDING ELECTRODE TYPE "E" 70XX
5. MATERIAL OF BACKING IS THE SAME AS OF PIPE

0 0.1 0.2 0.4 0.6 0.8

SCALE 1:10 METERS

WELDING SYMBOLS

										
FIELDWELD SYMBOL	WELD – ALL – AROUND SYMBOL	SQUARE GROOVE WELDING SYMBOL R=ROOT OPENING	V–GROOVE WELDING SYMBOL R=ROOT OPENING A=GROOVE ANGLE F=ROOT FACE	BACKING SYMBOL (MATERIAL OF BACKING THE SAME AS OF PIPE)	COMPLETE JOINT PENETRATION WELD	FILLET WELD S=WELDING SIZE L=LENGTH OF WELD P=PITCH (CENTER TO CENTER OF WELD)	BACK OR BACKING WELD SYMBOL	COMBINED WELDS. BACKING WELD ON FAR SIDE AND V–GROOVE WELD ON NEAR SIDE	BEVEL GROOVE WELDING SYMBOL	FLARE–BEVEL GROOVE WELDING SYMBOL

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

KINGDOM OF THAILAND
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

CIVIL WORKS AND TRANSMISSION LINE
PENSTOCK
WELDING DETAILS

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วิชัย 28.6226	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.6226	RECOMMENDED	
PROJECT MANAGER	08/03/2559 DATE	APPROVED	P. Hanpaff.

DRAWING NO. MH–PS–10

SHEET NO. 83 OF 130