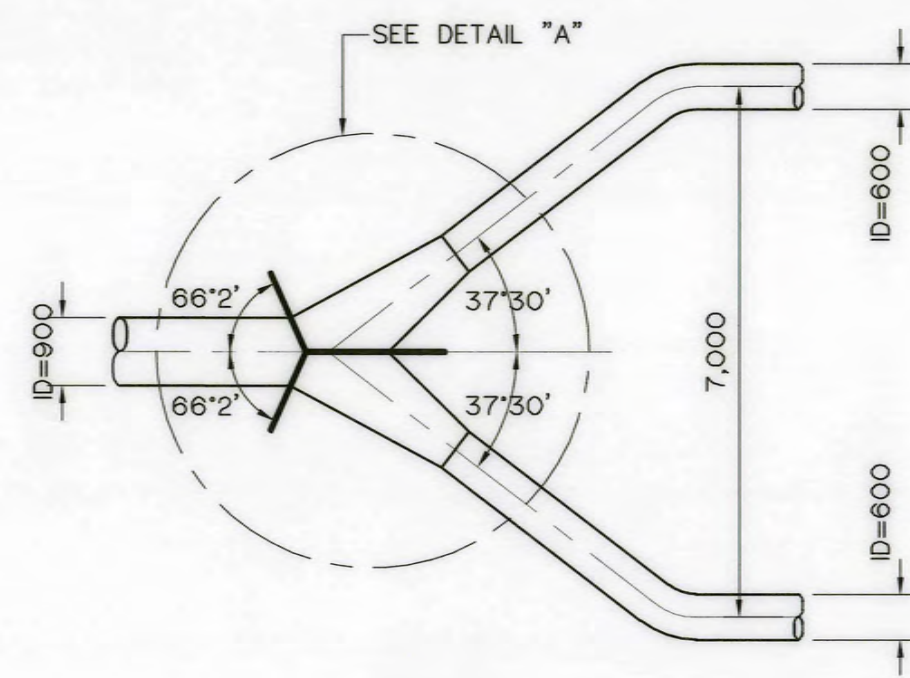
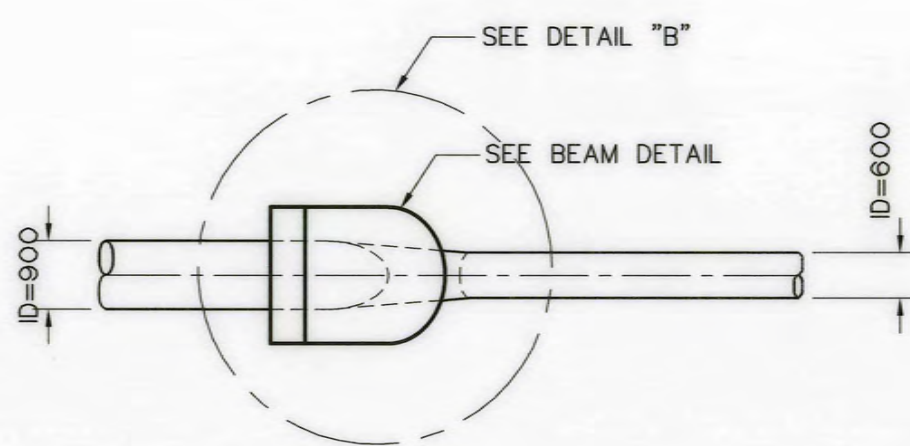
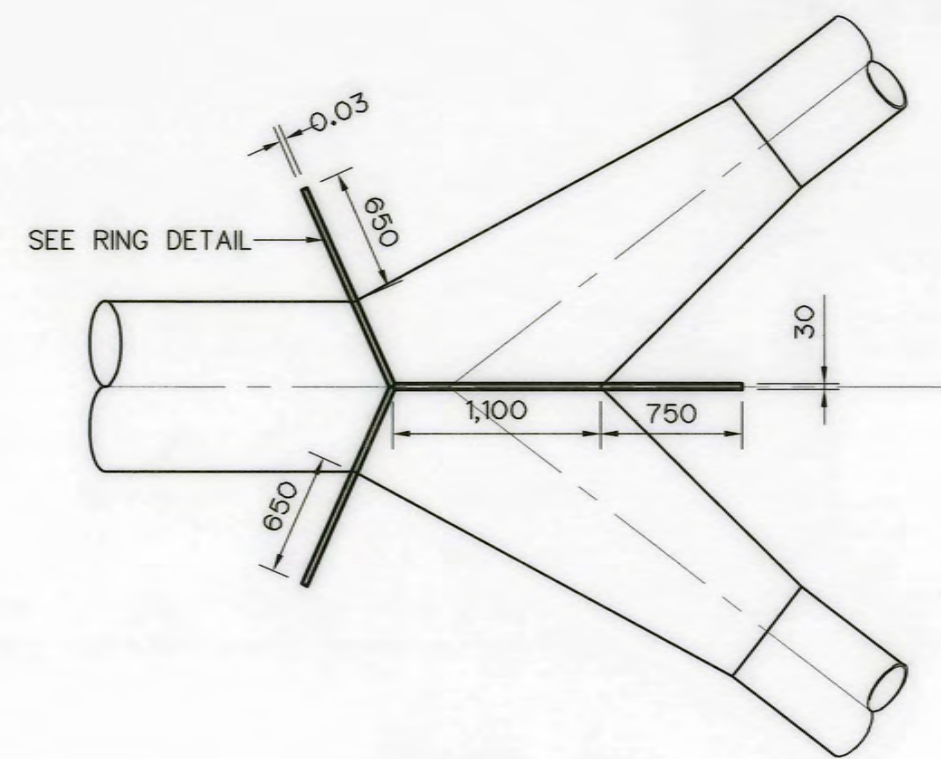




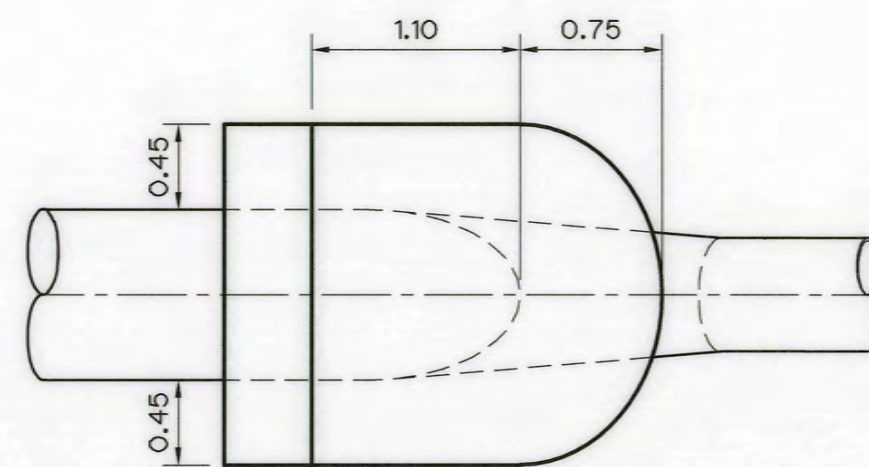
PLAN
NOT TO SCALE



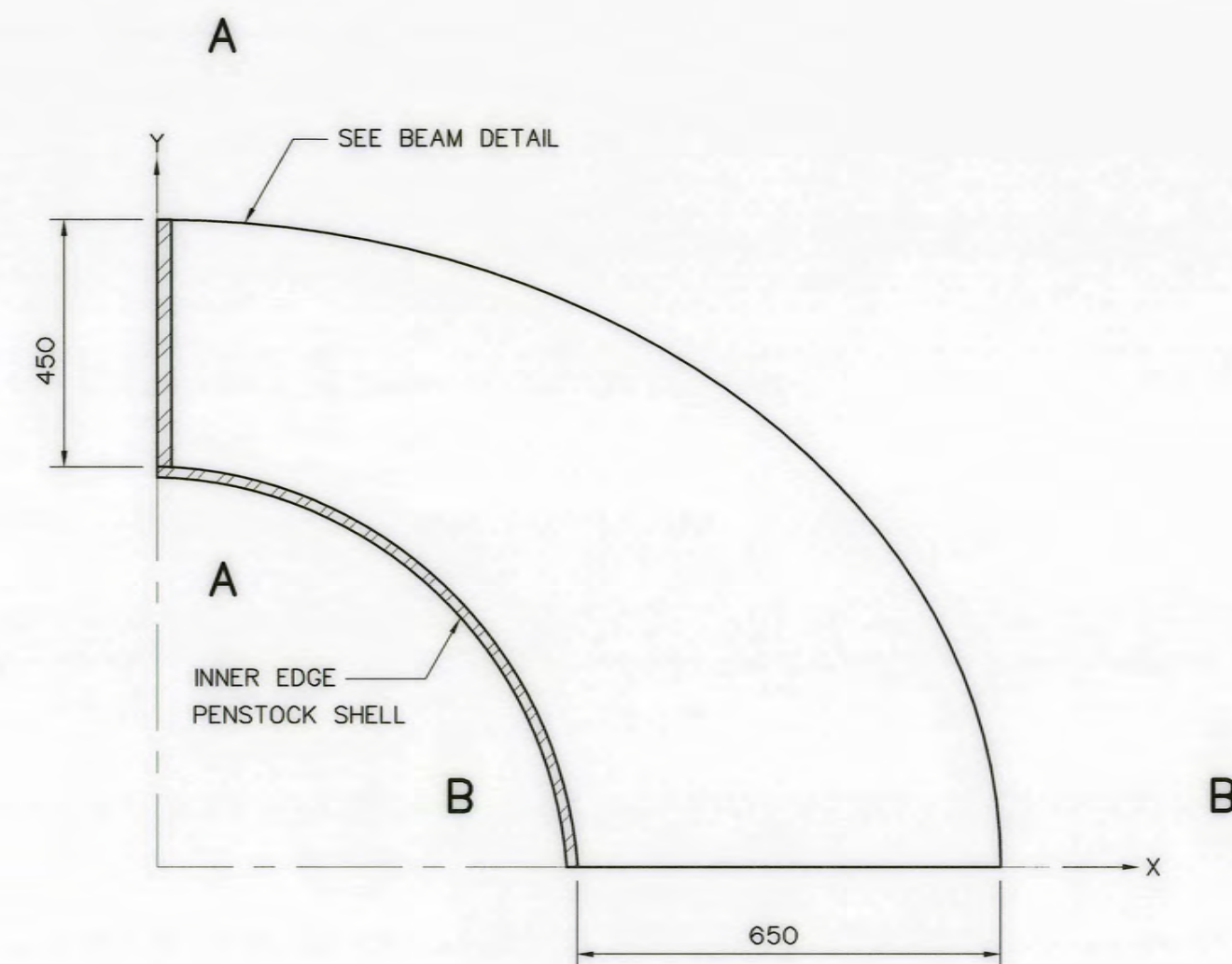
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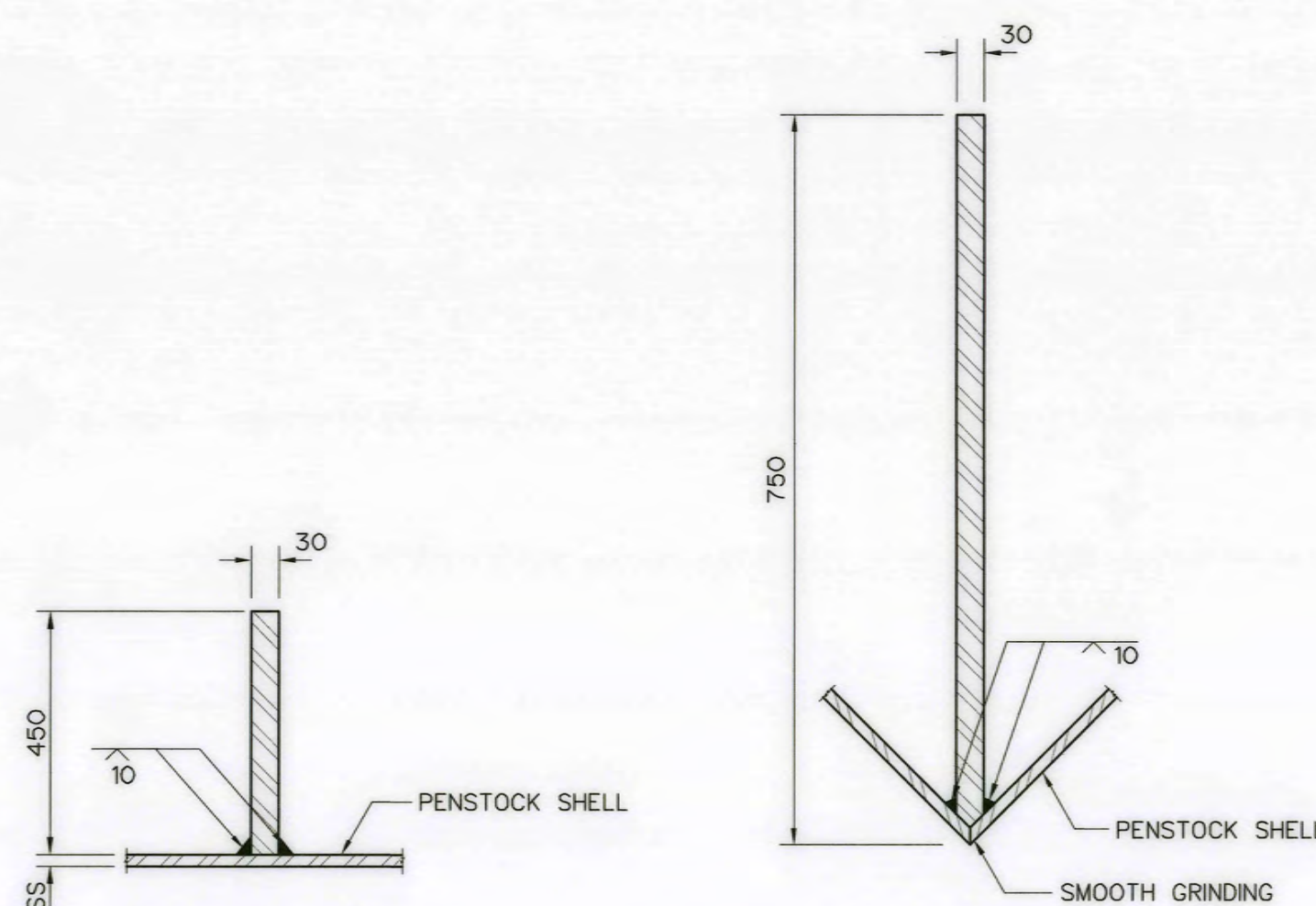
DETAIL "A"
SCALE 1:40



DETAIL "B"
SCALE 1:50

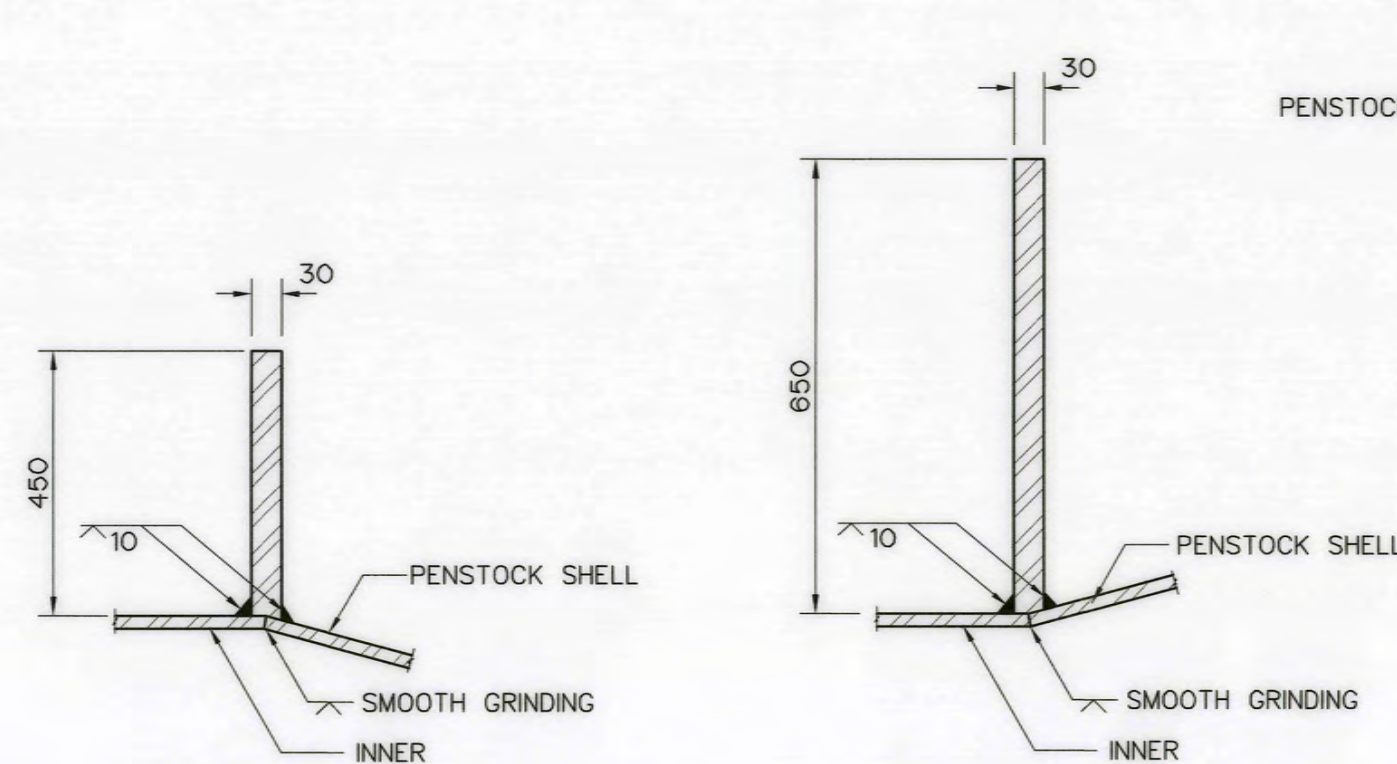


RING DETAIL
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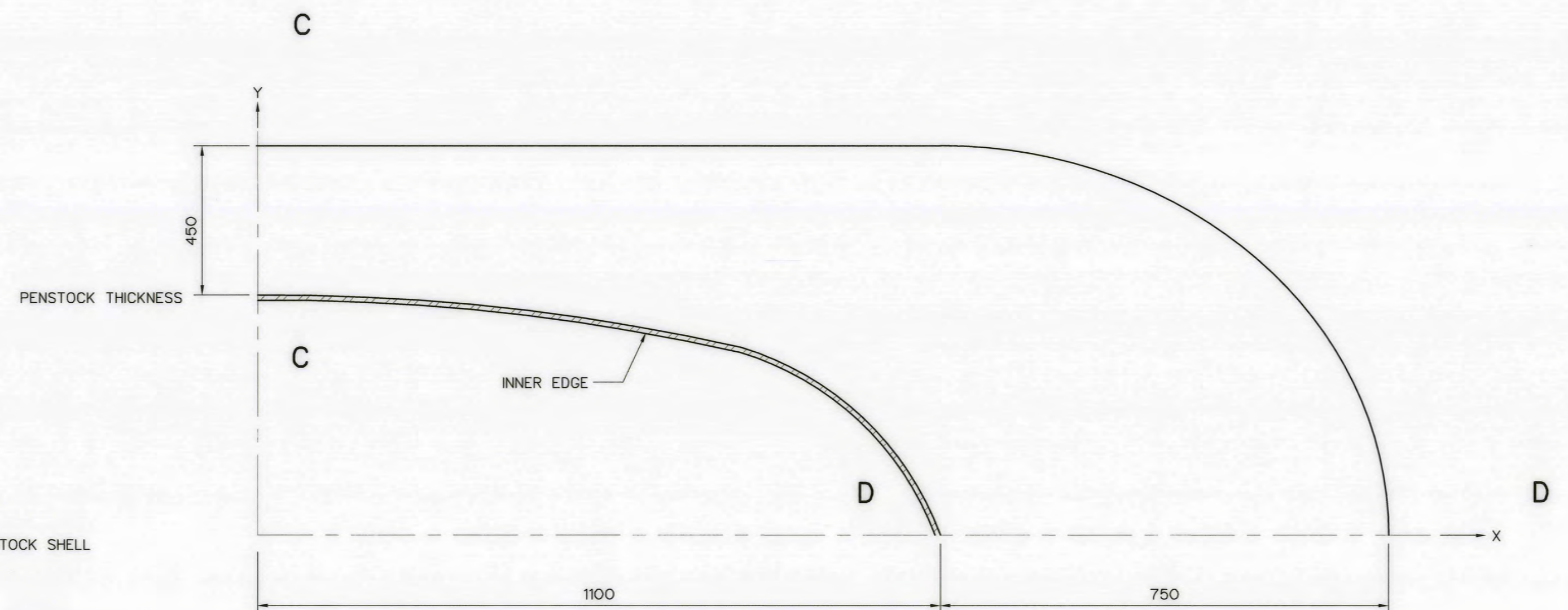
SECTION C-C
NOT TO SCALE

SECTION D-D
NOT TO SCALE



SECTION A-A
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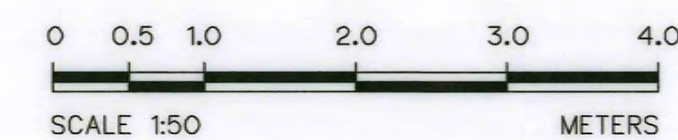
SECTION B-B
NOT TO SCALE



BEAM DETAIL
NOT TO SCALE

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
3. THIS DRAWING IS DESIGNED FOR GUIDELINE ONLY,
SHOP DRAWING SHALL BE DESIGNED BY CONTRACTOR
UNDER APPROVAL BY FIELD ENGINEER.



3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS

DEDE

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK WYE, PLAN, SECTIONS AND DETAILS	
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>Wan</i> 28/10/21	REVIEWED <i>Wan</i>
DRAWN <i>Wan</i>	SUBMITTED <i>Wan</i>
CHECKED <i>Wan</i> 28/10/21	RECOMMENDED <i>Wan</i>
APPROVED <i>Wan</i>	APPROVED <i>Wan</i>
PROJECT MANAGER	SHEET NO.
DATE	AKP-PS-09 58 OF 129

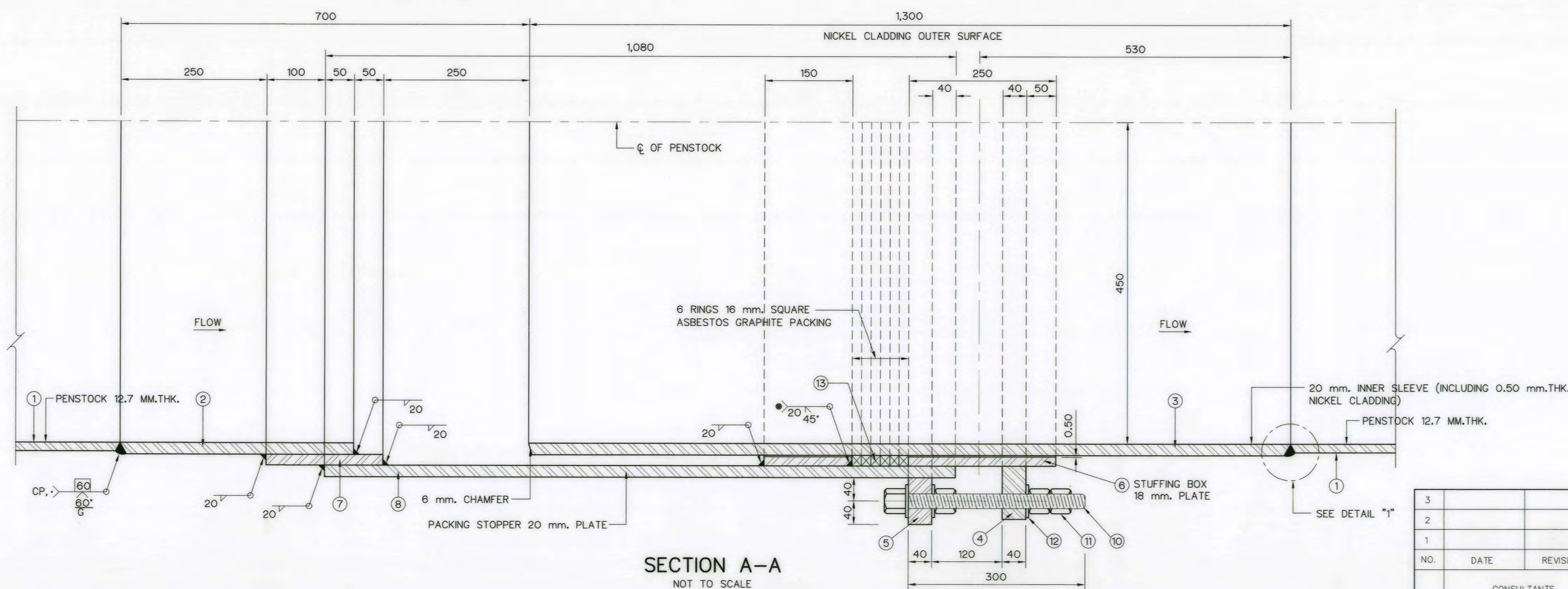
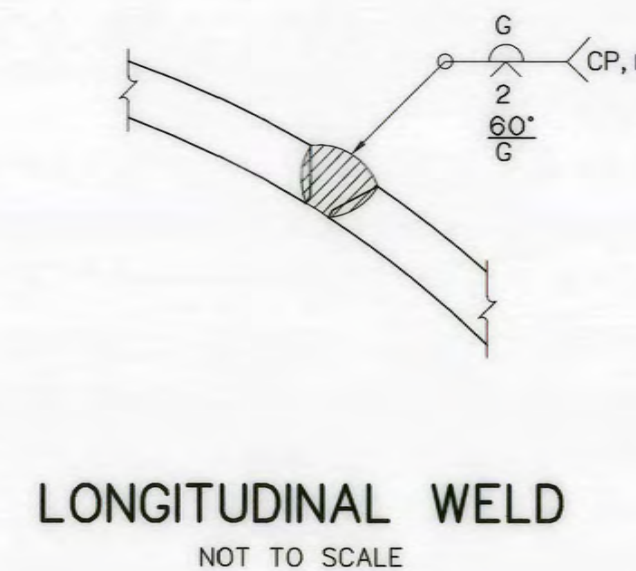
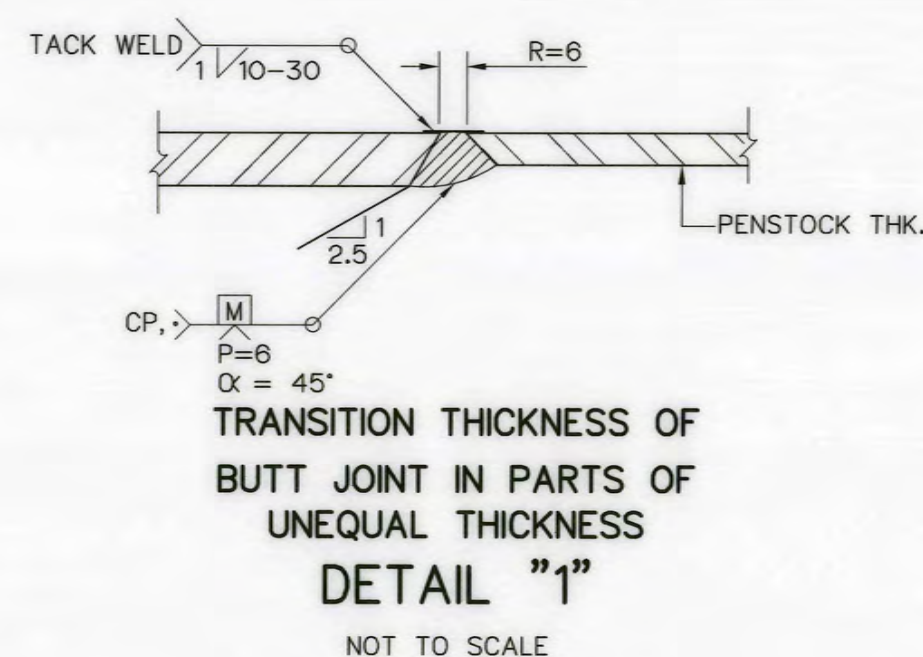
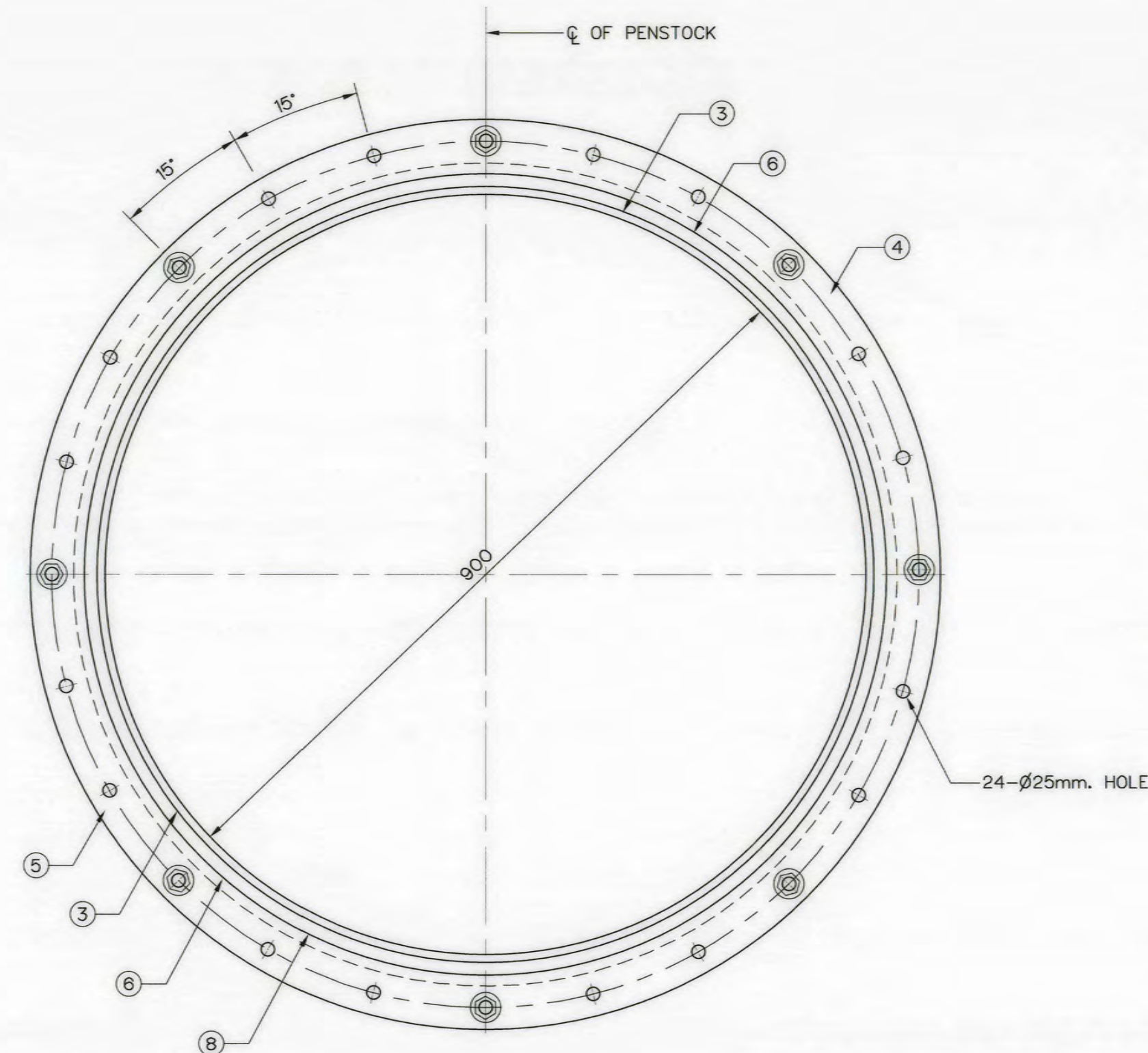
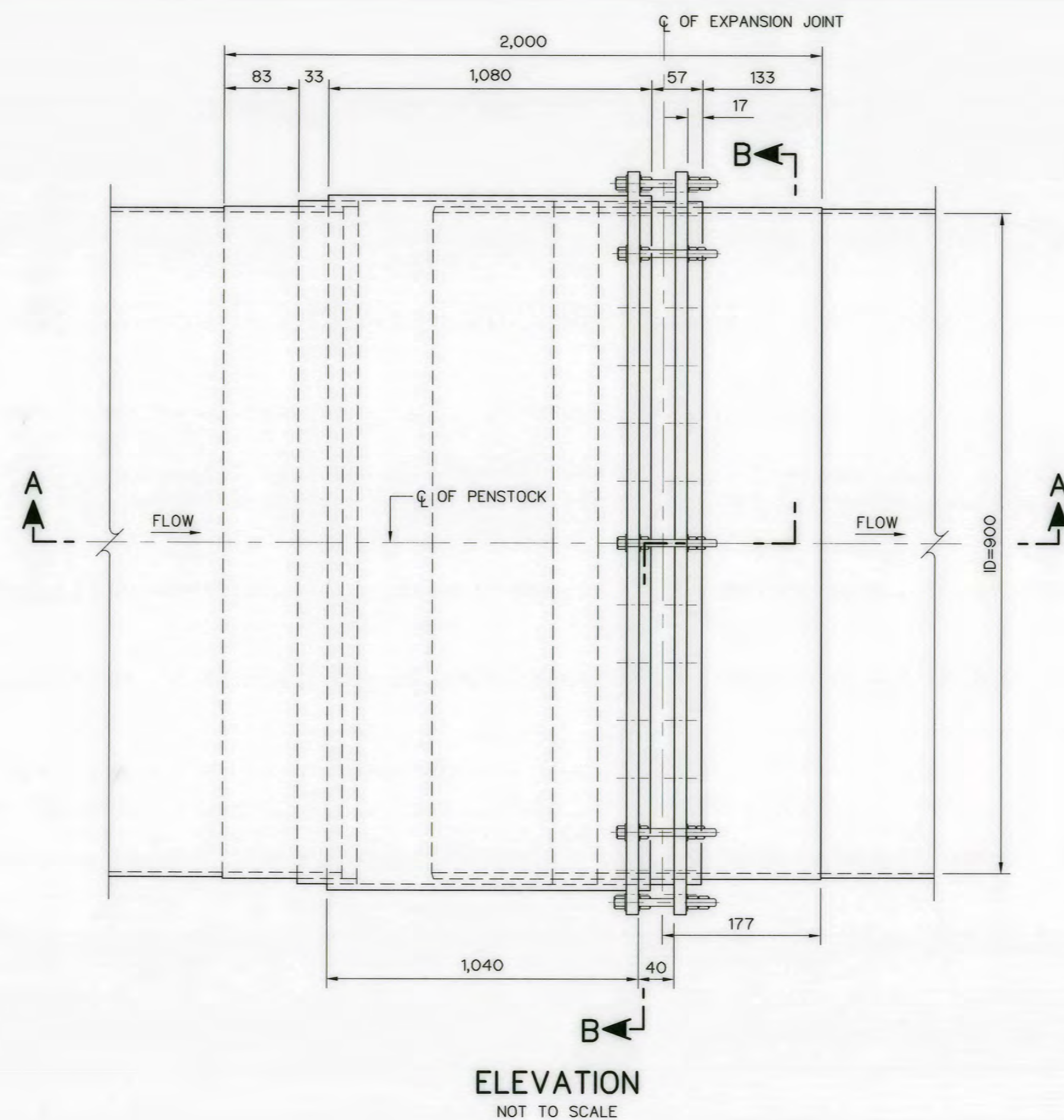


TABLE OF DETAIL 1 SQUARE - GROOVE WELD, BUTT JOINT

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

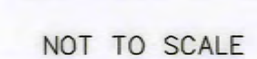
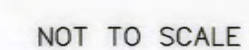
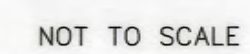
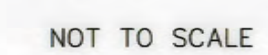
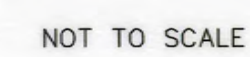
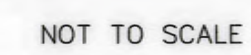
NOTES :

- LONGITUDINAL SEAMS HAVE TO BE COMPLETE JOINT PENETRATION WELDS BY COMBINING SINGLE-V-GROOVE WITH BACKING WELDS AND GROUND FLUSH WELDING WITH BASE METAL AS REQUIRED (SEE DETAIL "2")
- GALVANIZED ALL SURFACES WITH 0.10 mm. THK.
- NICKEL CLADDING ON OUTER SURFACE WITH 0.50 mm. THK. AND GALVANIZED INNER SURFACE WITH 0.10 mm. THK.
- EACH JOINT OF EACH PACKING RING SHALL BE MIN. 25 cm. APART DO NOT LINE UP JOINTS
- ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
- THIS DRAWING IS DESIGNED FOR GUIDELINE ONLY, THE CONTRACTOR HAS TO SUBMITTED SHOP DRAWING TO FIELD ENGINEER FOR APPROVAL.

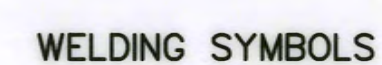
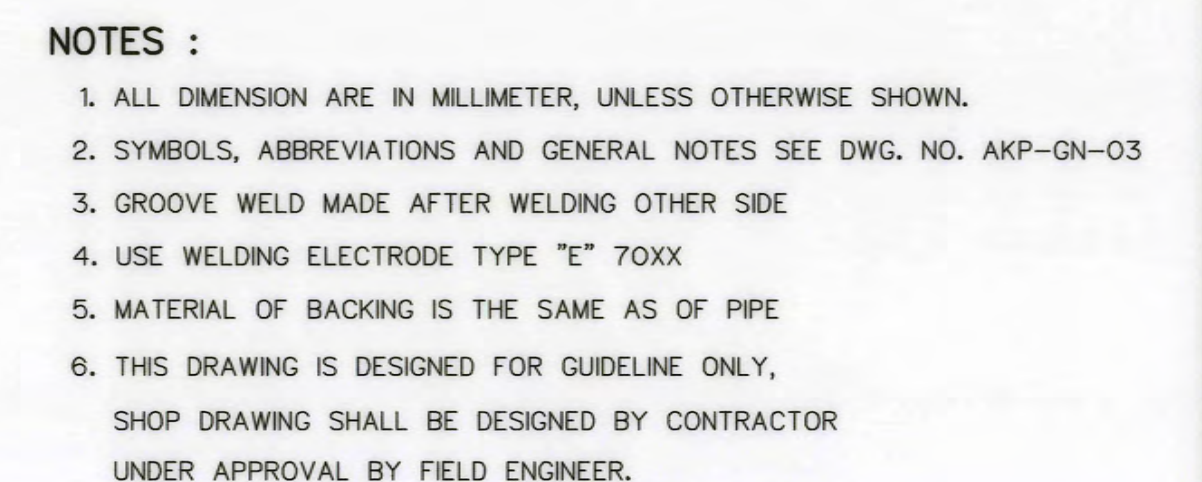
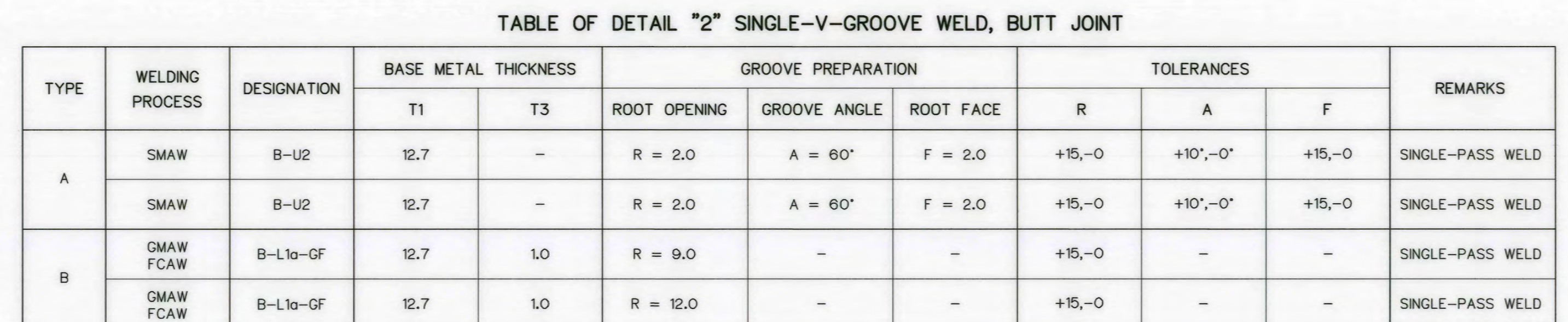
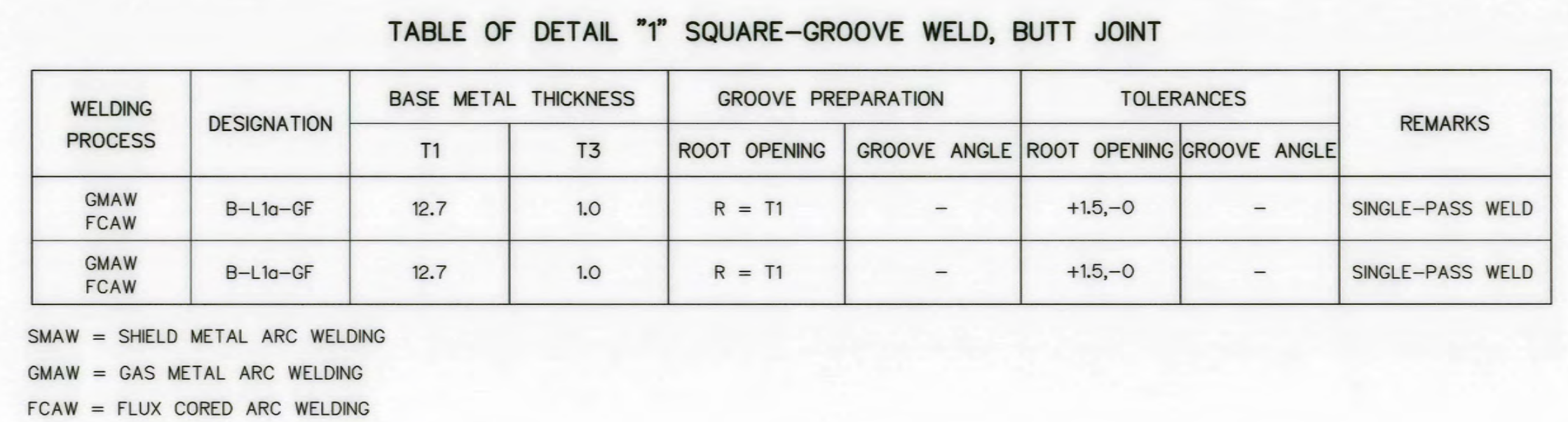
WELDING NOTATION :

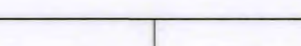
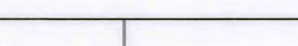
- CP = COMPLETE JOINT PENETRATION GROOVE WELD
 G = GRINDING WELD DEPOSITE FLUSH WITH BASE METAL
 • = BACKING PLATE SIZE 0.10x1.50 mm. AND SAME MATERIAL AS PENSTOCK
 ● = BEVEL PLATE 9 mm. BEFORE ROLLING CHIP SQUARE AFTER WELDING
 ▲ = ROOT OPENING R = 2.0 mm.
 ROOT FACE t = 3.0 mm.
 GROOVE ANGLE = 45°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

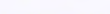
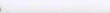
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT			
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK EXPANSION JOINT, PLAN, SECTIONS AND DETAILS			
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED <i>[Signature]</i> 28.10.2021		REVIEWED <i>[Signature]</i>	
DRAWN <i>[Signature]</i>		RECOMMENDED <i>[Signature]</i>	
CHECKED <i>[Signature]</i> 28.10.2021		APPROVED <i>[Signature]</i>	
PROJECT MANAGER		SHEET NO. 59 OF 129	

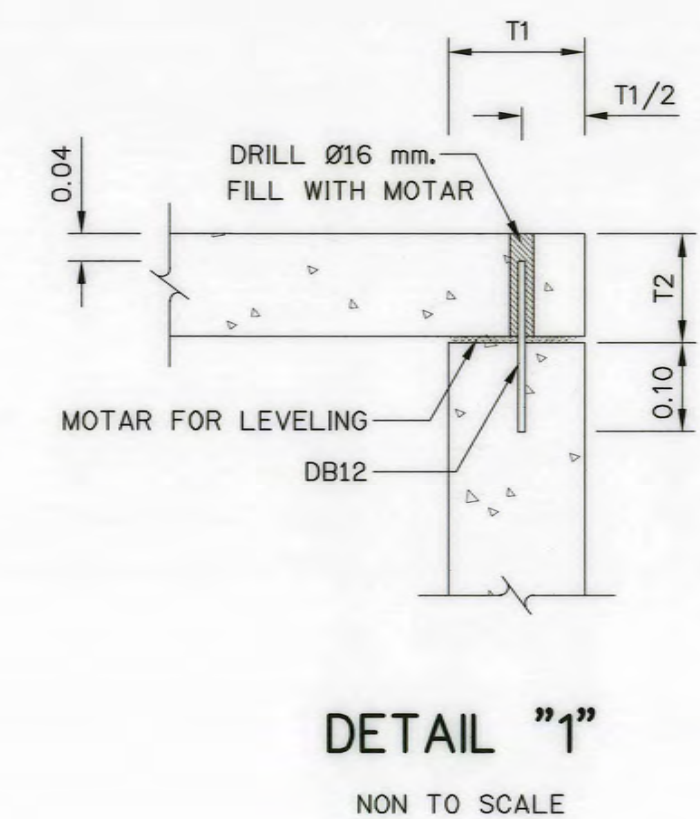
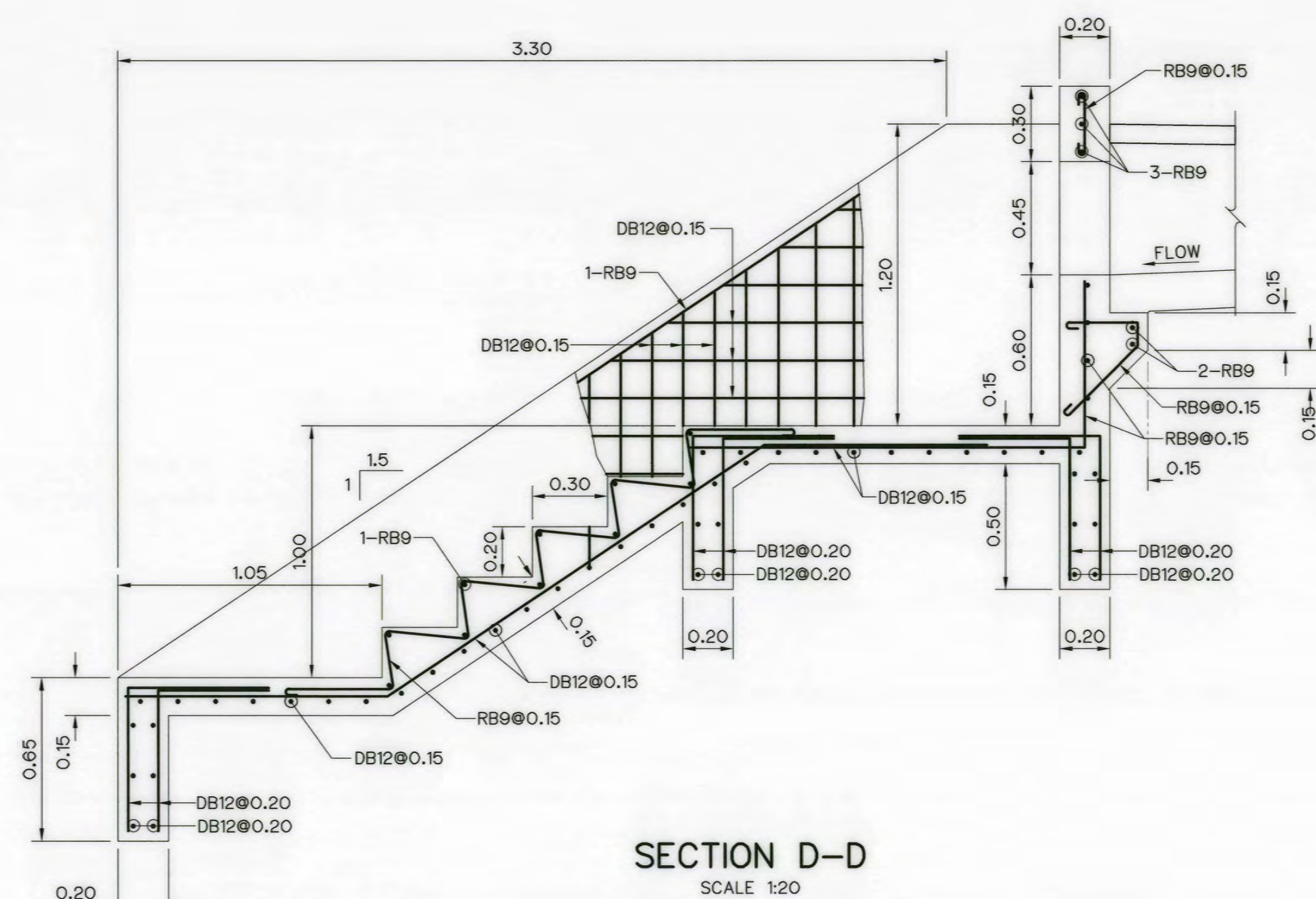
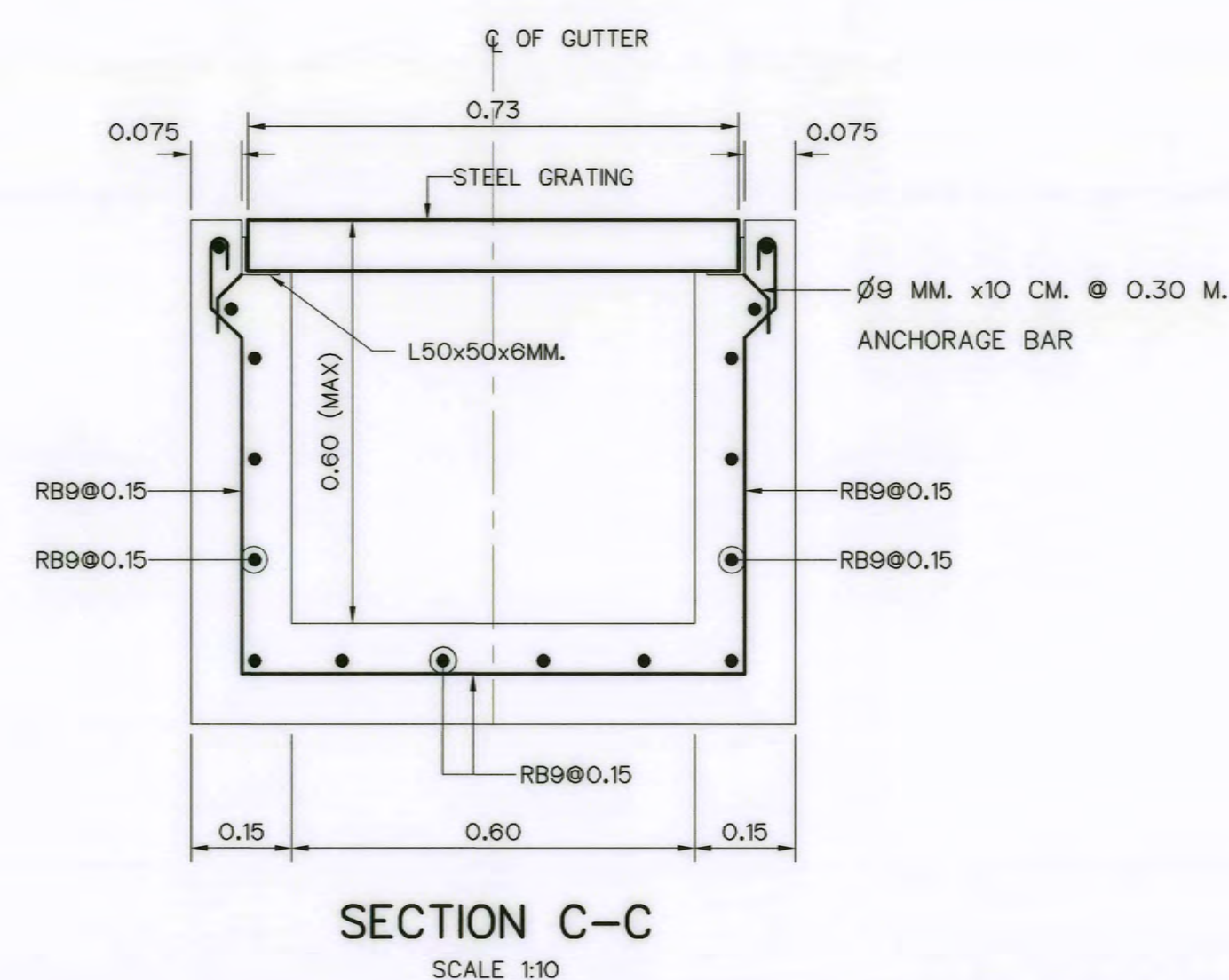
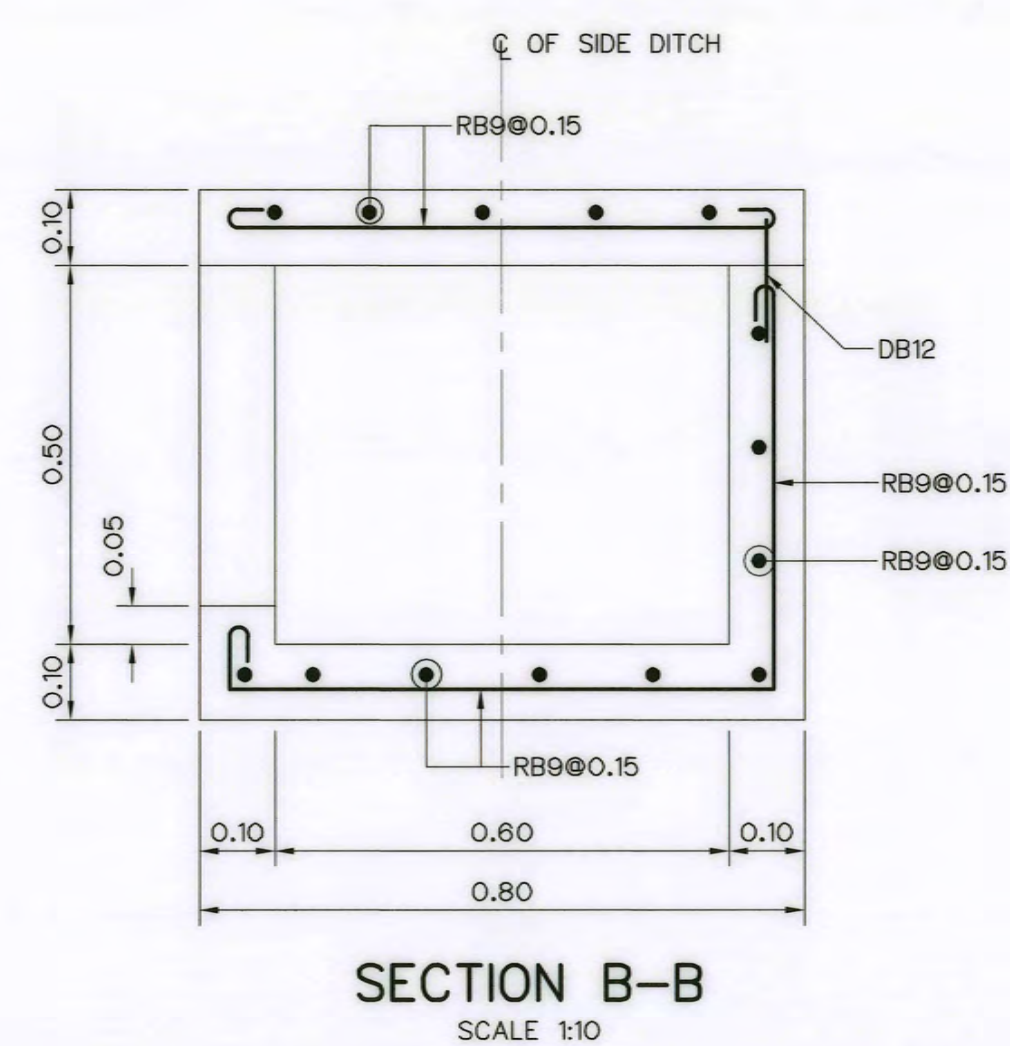
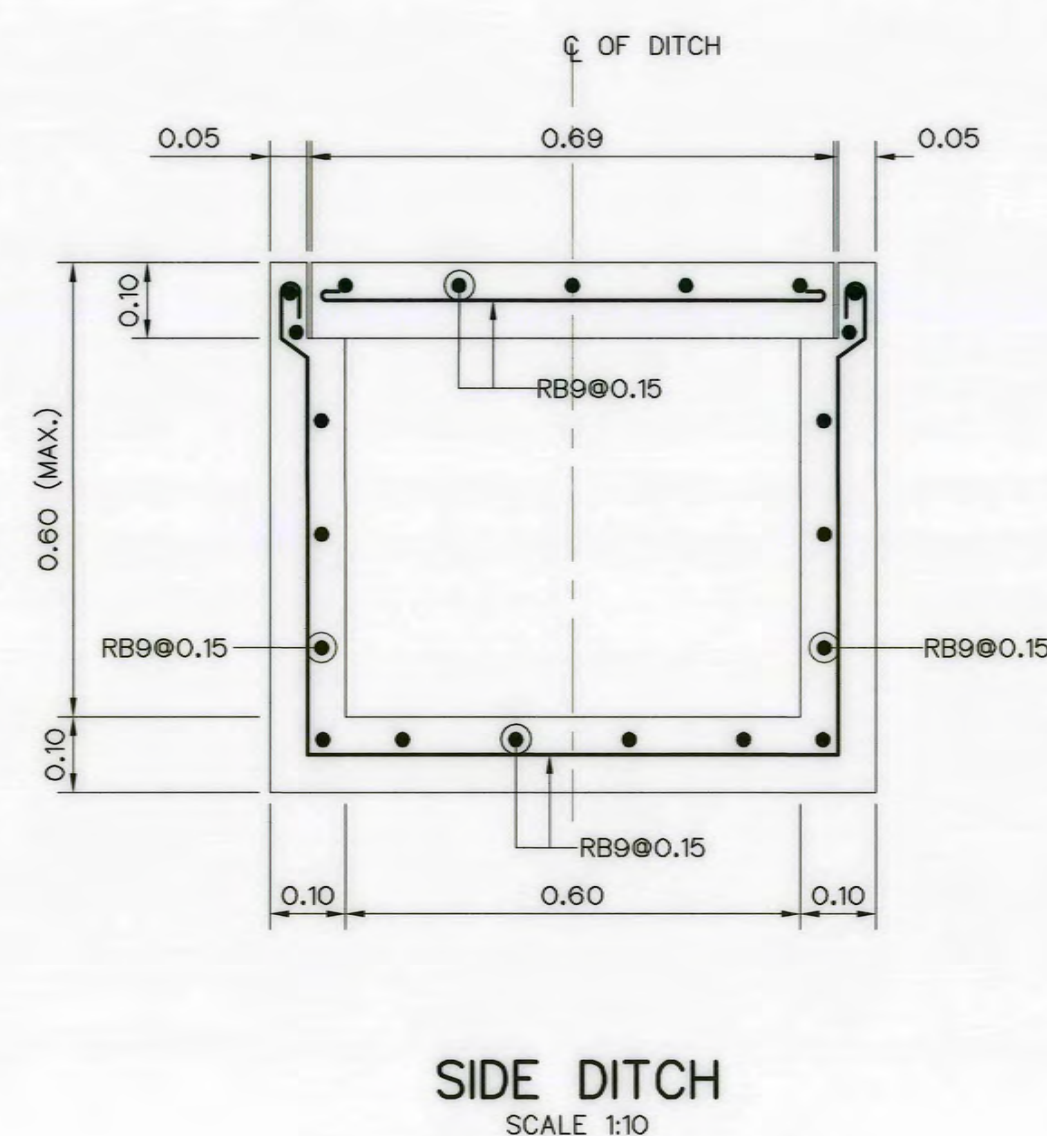
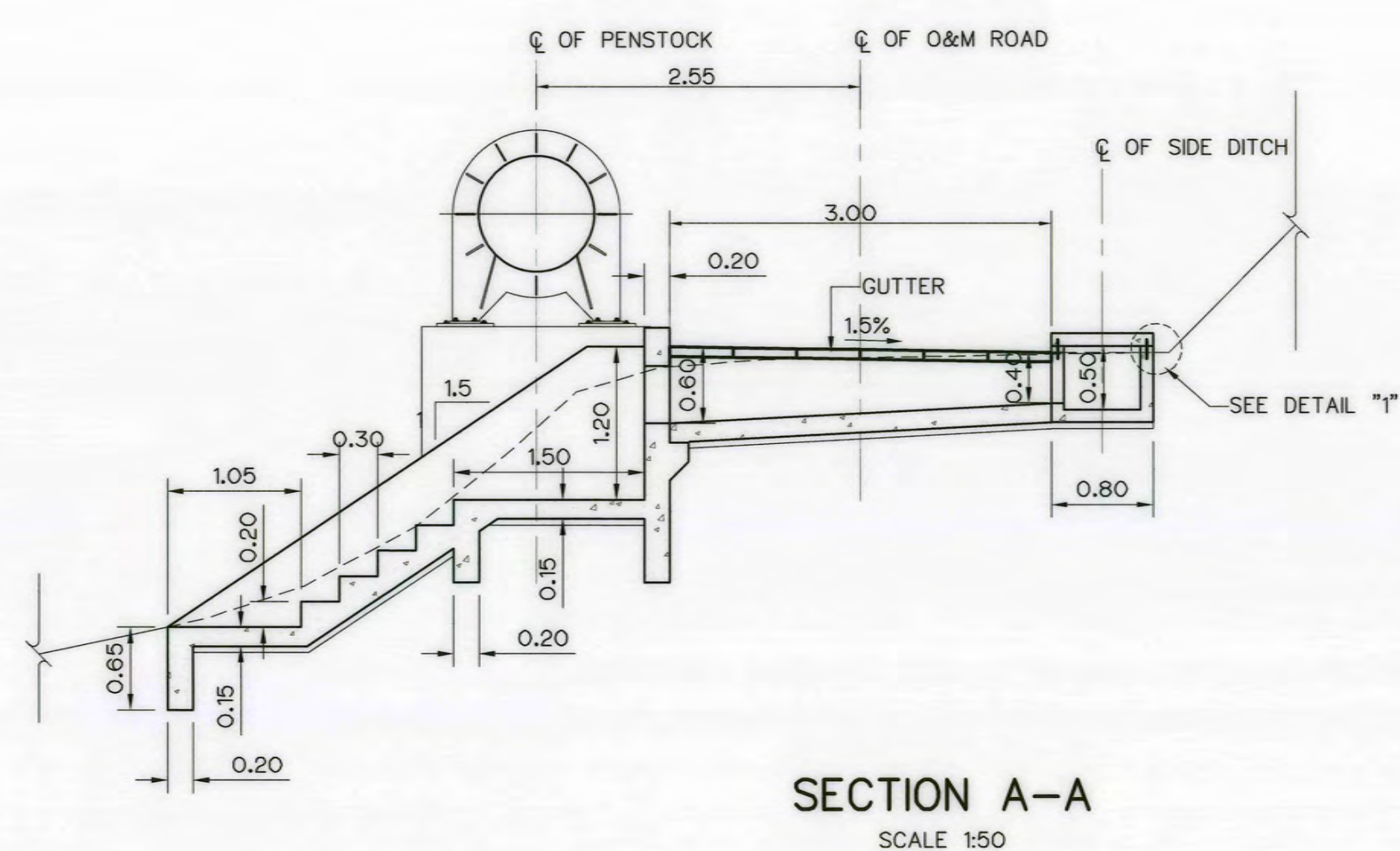


3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
	CONSULTANTS		DEDE	



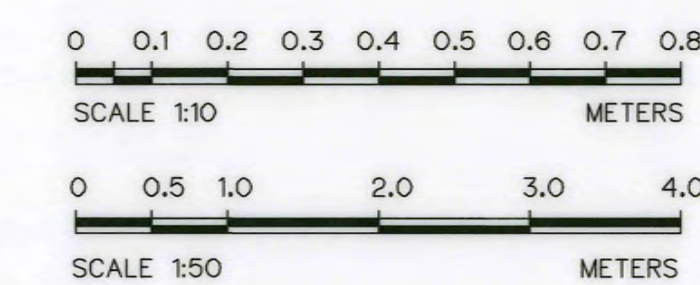
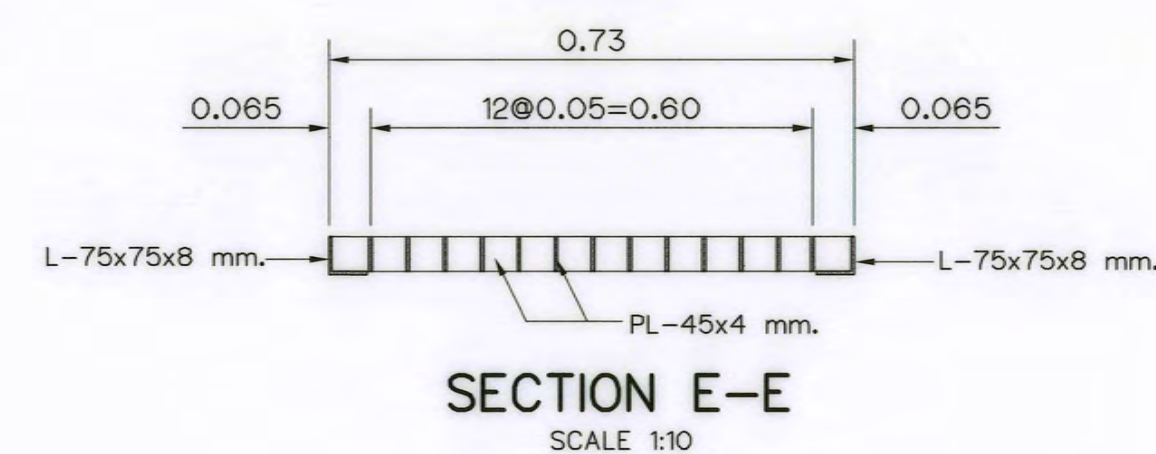
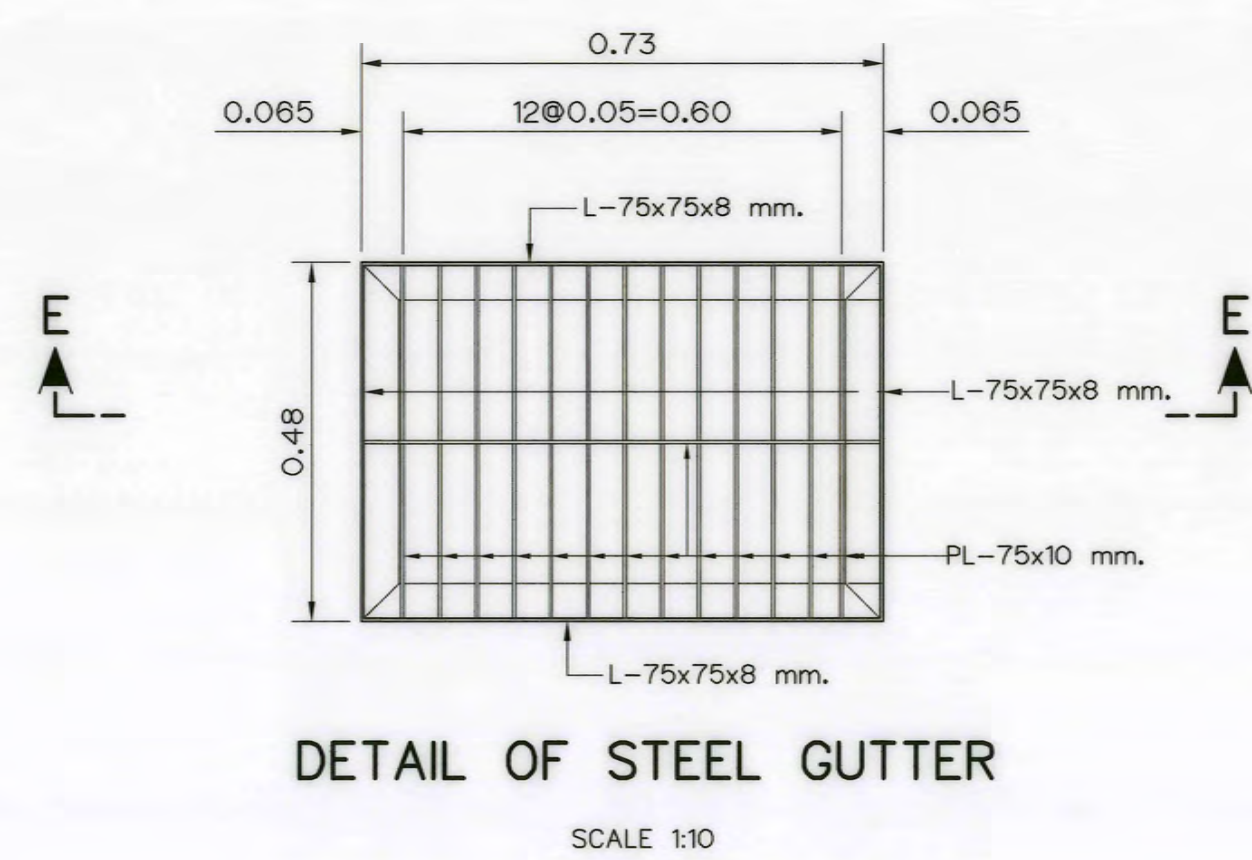
										
FIELDWELD SYMBOL	WELD - ALL - AROUND SYMBOL	SQUARE GROOVE WELDING SYMBOL R=ROOT OPENING	V-GROOVE WELDING SYMBOL R=ROOT OPENING A=GROOVE ANGLE F=ROOT FACE	BACKING SYMBOL (MATERIAL OF BACKING THE SAME AS OF PIPE)	COMPLETE JOINT PENETRATION WELD	FILLET WELD S=WELDING SIZE L=LENGTH OF WELD P=PITCH (CENTER 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

					 SPT CONSULTANTS CO., LTD.		 MINISTRY OF ENERGY	
3					DESIGNED  01.29.074  01.9.462	REVIEWED 		
2					DRAWN 	SUBMITTED 		
1					CHECKED  01.8.231	RECOMMENDED 		
NO.	DATE	REVISIONS	CHECKED	APPROVED		APPROVED 		
CONSULTANTS					DEDE		28/10/2021	
					PROJECT MANAGER		DATE	DRAWING NO. AKP-PS-12
								SHEET NO. 61 of 129

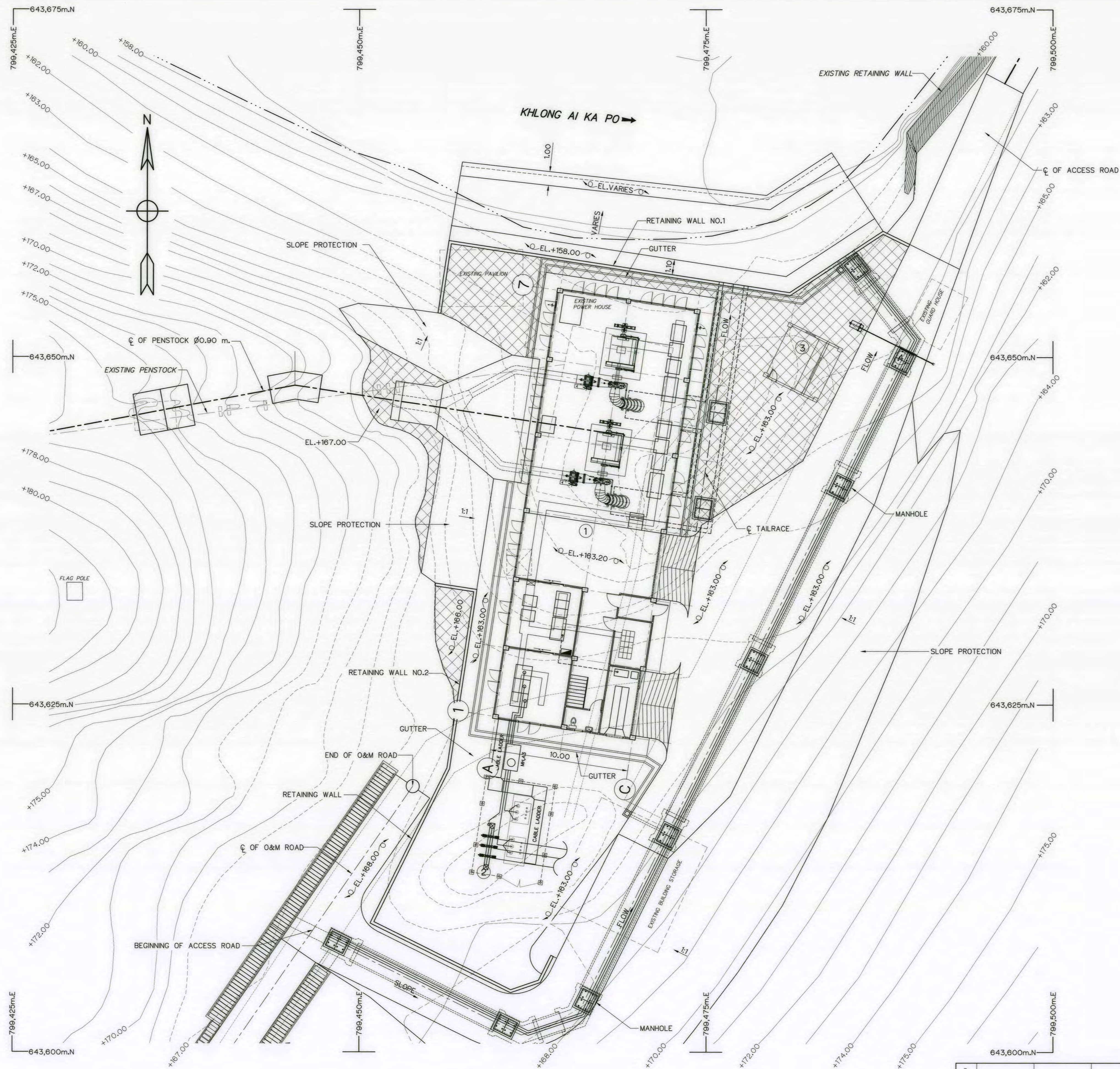


1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
3. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.

1. PENSTOCK, PLAN AND PROFILE, KM. 0+000 TO KM. 0+358.645



 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK TYPICAL CROSS DRAINAGE AND DETAILS	
 P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>Muay 21.29074</i> <i>Ch</i> 28/10/2021	REVIEWED <i>Ch</i>
DRAWN <i>Ch</i>	SUBMITTED <i>Ch</i>
CHECKED <i>Ch</i> 28/10/2021	RECOMMENDED <i>Ch</i>
	APPROVED <i>Ch</i>
PROJECT MANAGER	DATE
AKP-PS-13	SHEET NO. 62 OF 129



LEGENDS :

- ① POWER HOUSE
- ② SWITCHYARD
- ③ GUARD HOUSE
- ④ MOVABLE STEEL BARRICADE

NOTES :

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

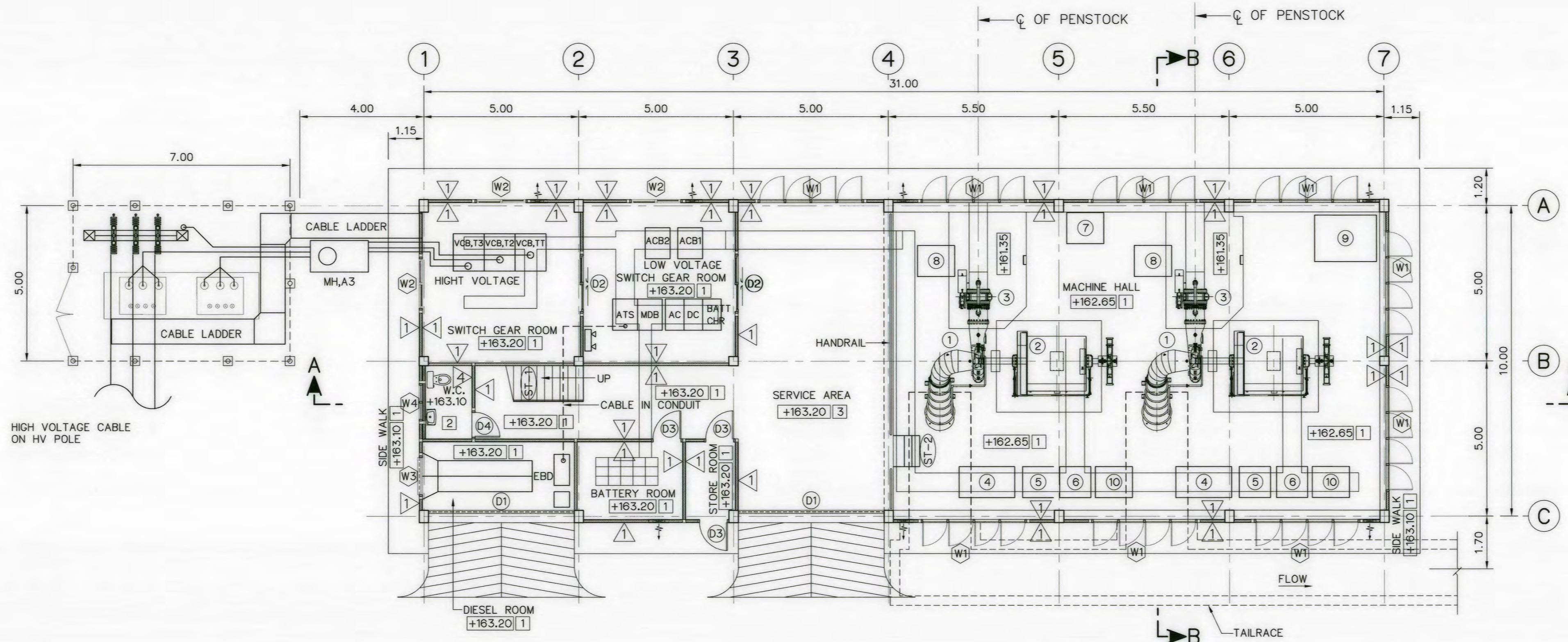
REFERENCE DRAWINGS :

- | | |
|--|-----------|
| 1. POWERHOUSE, PLANS | AKP-PH-02 |
| 2. POWERHOUSE, RETAININGWALL REINFORCEMENT DETAILS | AKP-PH-13 |
| 3. POWERHOUSE, MISCELLANEOUS DETAILS | AKP-PH-14 |



GENERAL LAY-OUT
SCALE 1:150

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT			
PART : 1 CIVIL WORKS AND TRANSMISSION LINE POWERHOUSE GENERAL LAYOUT			
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED <i>[Signature]</i> 28/10/2021		REVIEWED <i>[Signature]</i>	
DRAWN <i>[Signature]</i>		SUBMITTED <i>[Signature]</i>	
CHECKED <i>[Signature]</i> 28/10/2021		APPROVED <i>[Signature]</i>	
PROJECT MANAGER		SHEET NO. 63 OF 129	



GROUND FLOOR PLAN

SCALE 1:125



DESCRIPTION :

- ① TURBINE
- ② GENERATOR
- ③ INLET VALVE AND BYPASS VALVE AND MECHANICAL COUPLING
- ④ LUBRICANT UNIT
- ⑤ GOVERNOR AND TURBINE CONTROL PANEL
- ⑥ NGR CUBICLE
- ⑦ AIR PRESSURE TANK
- ⑧ PRESSURE OIL UNIT
- ⑨ DRAINAGE & DEWATERING SYSTEM
- ⑩ COOLING SYSTEM

FLOOR FINISH SYMBOLS :

- ① COARSE FINISHED
- ② 12"x12" CERAMIC FLOOR TILES
- ③ COATED WITH EPOXY RESIN
- ④ 12"x12" VINYL TILES

WALL FINISH SYMBOLS :

- ① CEMENT PLASTER
- ② GLASS BOX DIMENSIONS 19x19x9 cm.
- ③ AC. FLAT SHEET EAVES 6 mm. THK.
- ④ 8"x8" CERAMIC WALL TILES

SYMBOLS :

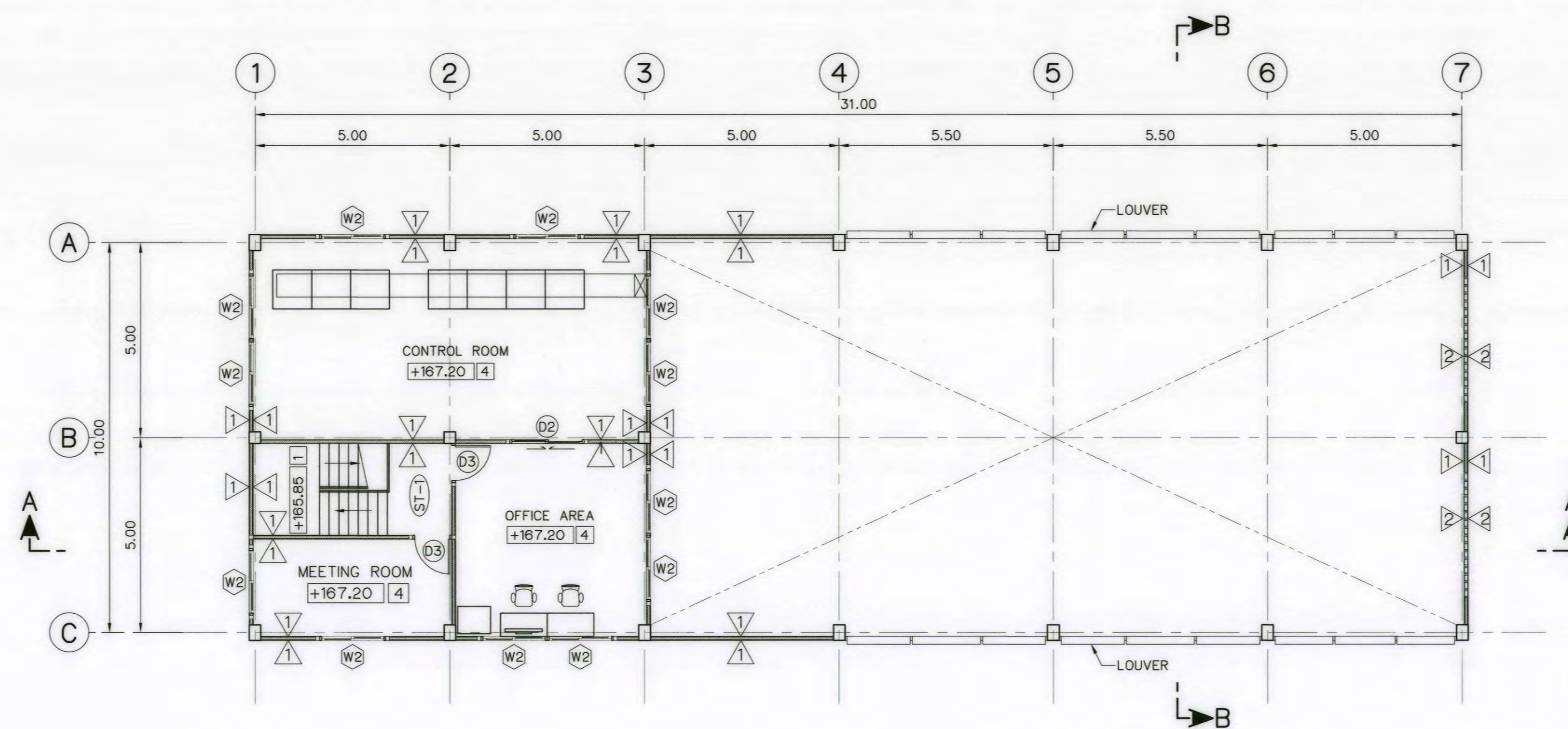
- ① EXHAUST FAN
- ② EMERGENCY LAMP
- ③ CABLE TRENCH
- ④ BLOCK OUT

NOTES :

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

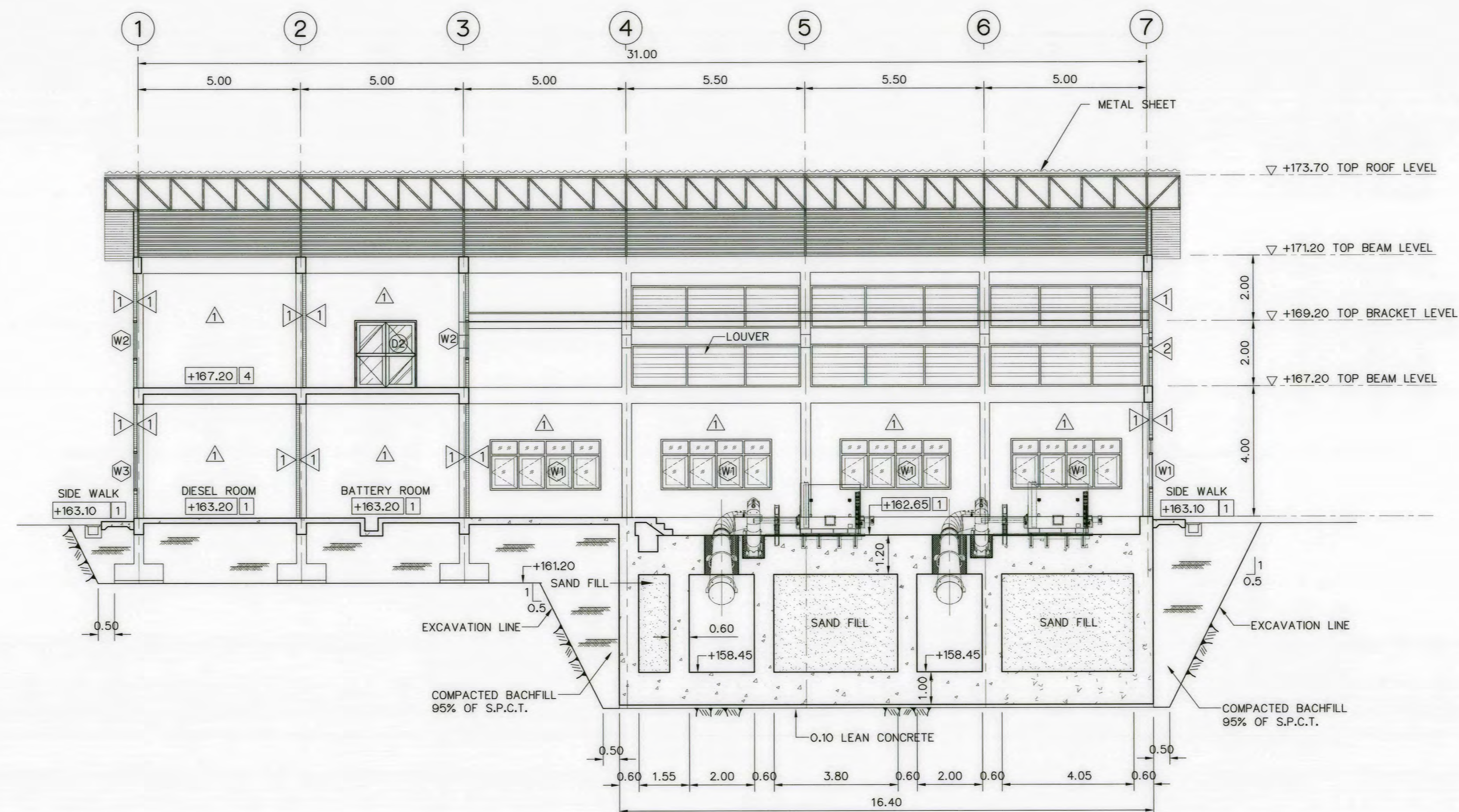
REFERENCE DRAWINGS :

1. POWERHOUSE, GENERAL LAYOUT AKP-PH-01
2. POWERHOUSE, ELEVATIONS AKP-PH-03
3. POWERHOUSE, SECTIONS AKP-PH-04
4. POWERHOUSE, DETAILS OF DOORS, WINDOWS AND SIGNBOARD AKP-PH-05
5. POWERHOUSE, DETAILS OF TOILET, SEPTIC AND SEEPAGE TANK AKP-PH-06



0 1 2 3 4 5 6 7 8
SCALE 1:100 METERS

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE POWERHOUSE PLANS	
DESIGNED SPT CONSULTANTS CO., LTD.	REVIEWED SPT CONSULTANTS CO., LTD.
DRAWN SPT CONSULTANTS CO., LTD.	SUBMITTED SPT CONSULTANTS CO., LTD.
CHECKED SPT CONSULTANTS CO., LTD.	RECOMMENDED SPT CONSULTANTS CO., LTD.
APPROVED SPT CONSULTANTS CO., LTD.	APPROVED SPT CONSULTANTS CO., LTD.
DATE 28/10/2021	DRAWING NO. AKP-PH-02
PROJECT MANAGER	SHEET NO. 64 OF 129

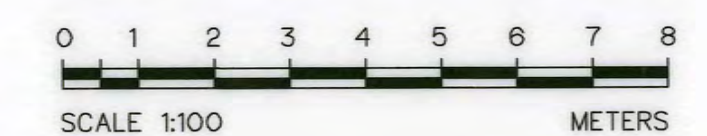
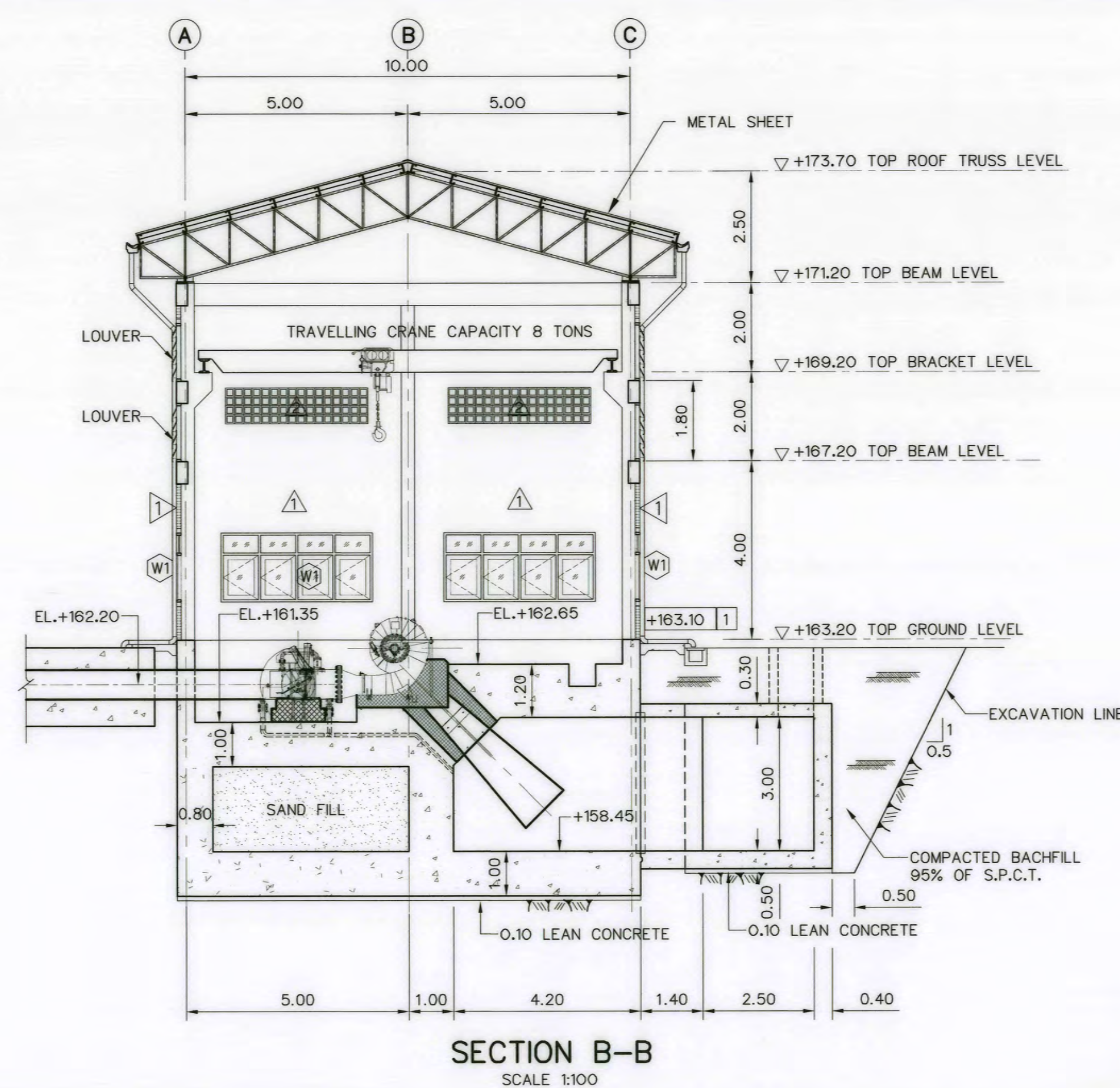


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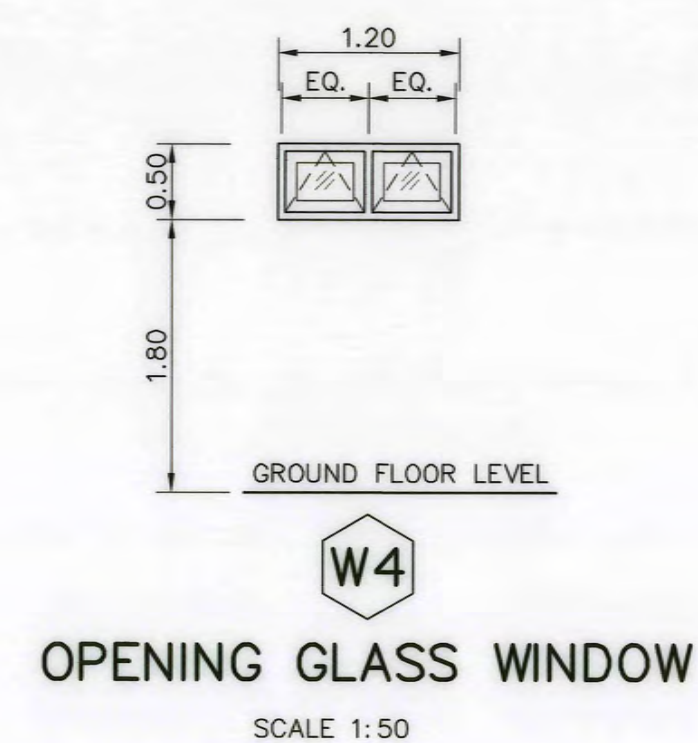
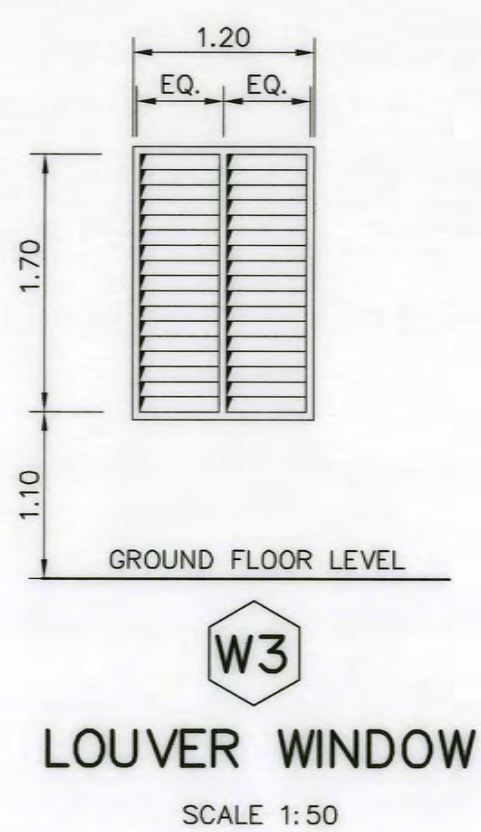
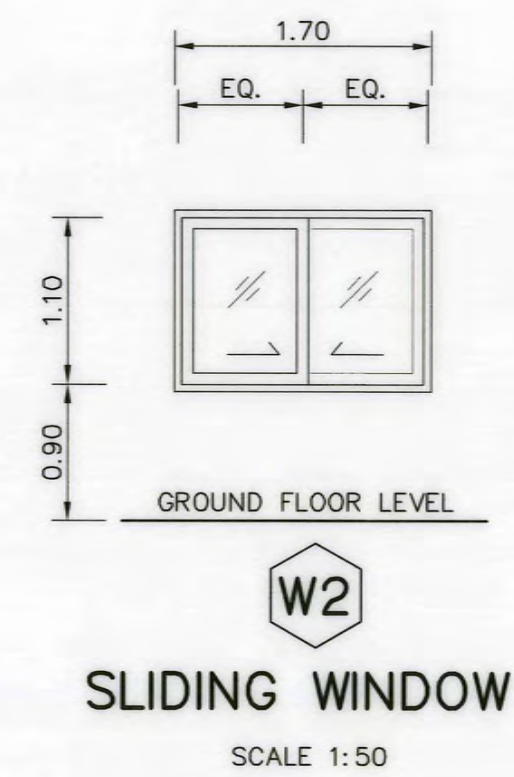
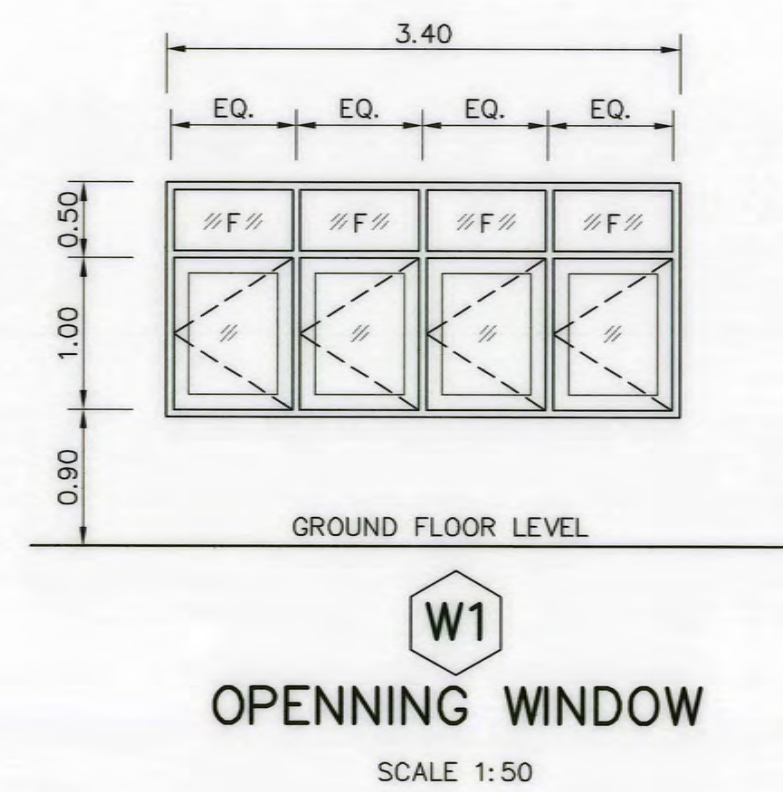
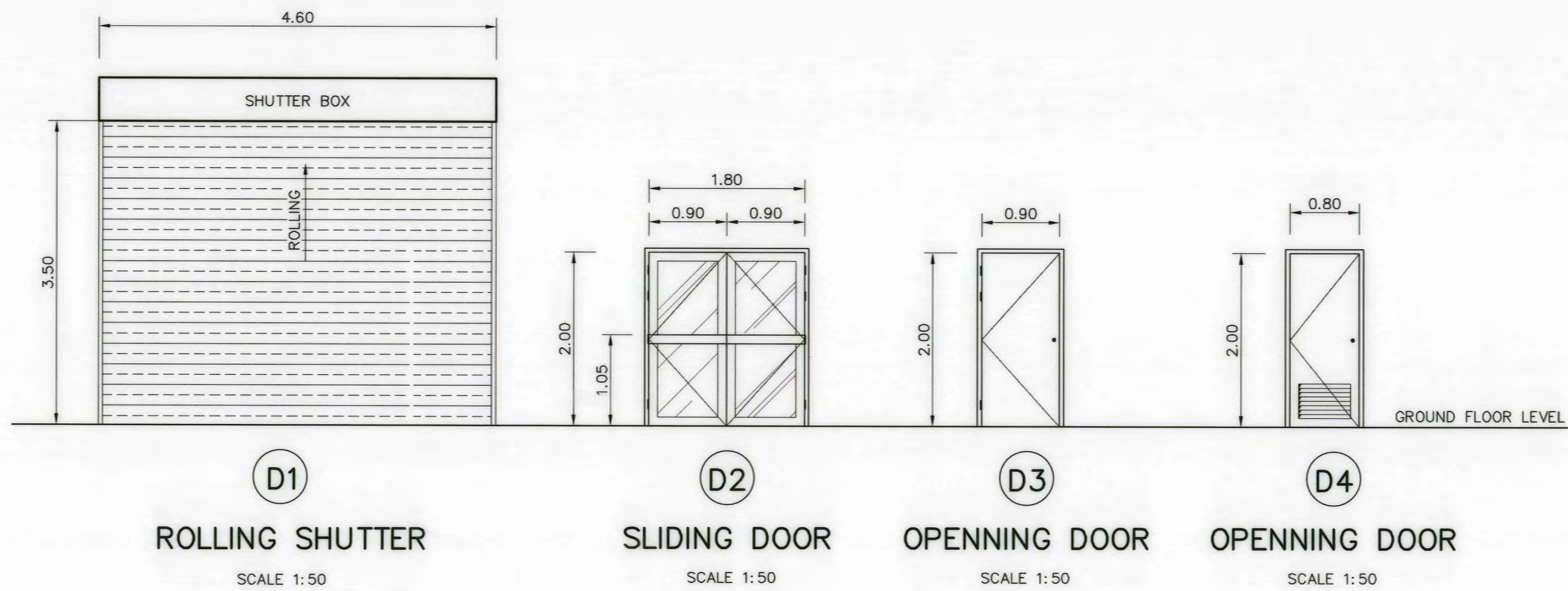
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
3. BEFORE EXCAVATION SHOULD BE EVALUATED AND ANALYSIS
BY FIELD GEOTECHNICAL ENGINEER OR ENGINEERING GEOLOGIST.

REFERENCE DRAWINGS :

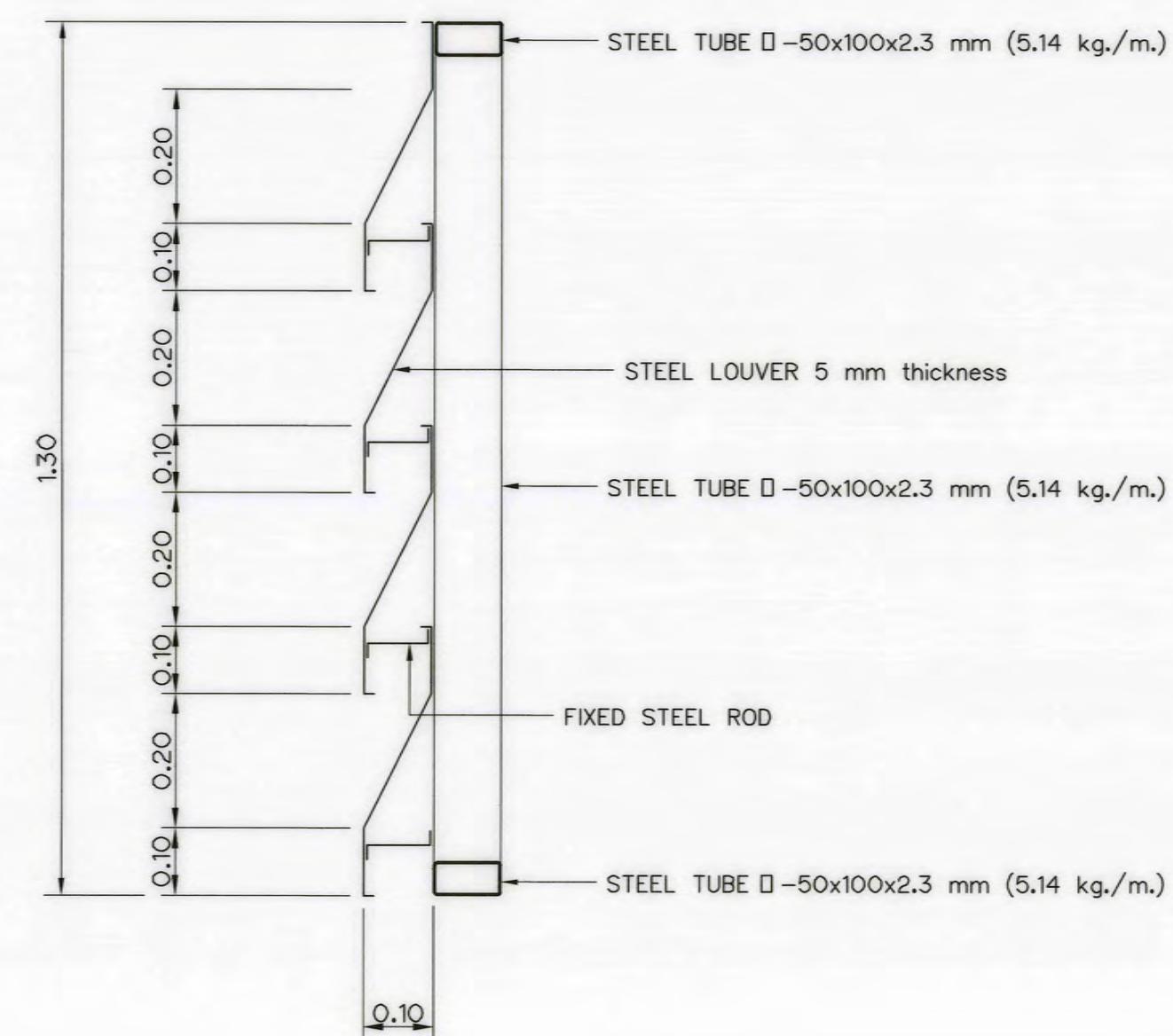
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|---------------------------|-----------|
| 1. POWERHOUSE, PLANS | AKP-PH-02 |
| 2. POWERHOUSE, ELEVATIONS | AKP-PH-03 |



 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE	
POWERHOUSE SECTIONS	
 P&C MANAGEMENT CO., LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
 SPT CONSULTANTS CO., LTD.	REVIEWED <i>Edo</i>
DESIGNED <i>Edo</i> FILE:29074 <i>Edo</i> SET:9462	SUBMITTED <i>Edo</i>
DRAWN <i>Edo</i>	RECOMMENDED <i>Edo</i>
CHECKED <i>Edo</i> SET:8231	APPROVED <i>Edo</i>
PROJECT MANAGER	DRAWING NO.
DATE	AKP-PH-04
28/10/2021	66 OF 129



SYMBOL	DESCRIPTIONS	SIZE		FRAME	RAIL & STILE	PANEL	HINGE	LOCKSET	HANDLE	REMARKS
		WIDTH	HEIGHT							
D1	ROLLER SHUTTER DOOR (STEEL 1.2 mm. THK.)	4.60	3.50	GALVANIZED STEEL	—	—	—	NORMAL KEY	—	MOTOR OPERATING
D2	SLIDING DOOR	1.80	2.00	ALUMINIUM 2"x 4"	—	GLASS 6 mm.thk.	●	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
D3	OPENNING DOOR	0.90	2.00	STEEL 2"x 4"	—	STEEL 1.6 mm.THK.	●	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
D4	OPENNING DOOR	0.80	2.00	P.V.C. 2"x 4"	—	P.V.C.	STAINLESS STEEL 4"x3"x2.5mm.	CYINDER LOCK	—	
W1	OPENNING WINDOW	3.40	1.50	ALUMINIUM 1.5 mm.thk.	GALVANIZED STEEL	GLASS 6 mm.thk.	●	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
W2	SLIDING WINDOW	1.70	1.10	ALUMINIUM 1.5 mm.thk.	—	GLASS 6 mm.thk.	—	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
W3	LOUVER WINDOW	1.20	1.70	ALUMINIUM 1.5 mm.thk.	—	GLASS 6 mm.thk.	—	—	—	
W4	OPENNING GLASS WINDOW	1.20	0.50	ALUMINIUM 1.5 mm.thk.	—	GLASS 6 mm.thk.	●	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
●	SHALL BE USED SPACIFIED ACCESSORIES									

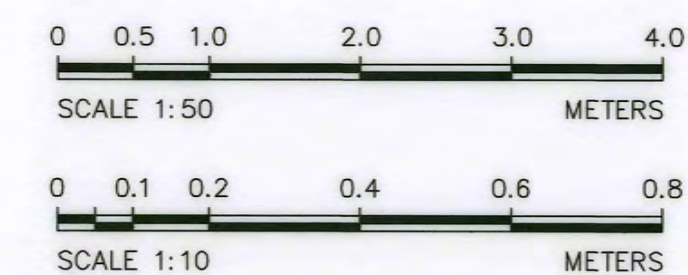


NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03.

REFERENCE DRAWINGS :

- POWERHOUSE, PLANS AKP-PH-02
- POWERHOUSE, DETAILS OF TOILET, SEPTIC AND SEEPAGE TANK AKP-PH-06



3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
			CONSULTANTS	DEDE

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE POWERHOUSE DETAILS OF DOORS, WINDOWS AND SIGNBOARD	
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>Phon</i> 28J.29074 DRAWN <i>Phon</i> CHECKED <i>Phon</i> PROJECT MANAGER	REVIEWED <i>Phon</i> SUBMITTED <i>Phon</i> RECOMMENDED <i>Phon</i> APPROVED <i>Phon</i> DATE 28/10/2021
DRAWING NO. AKP-PH-05	SHEET NO. 67 OF 129