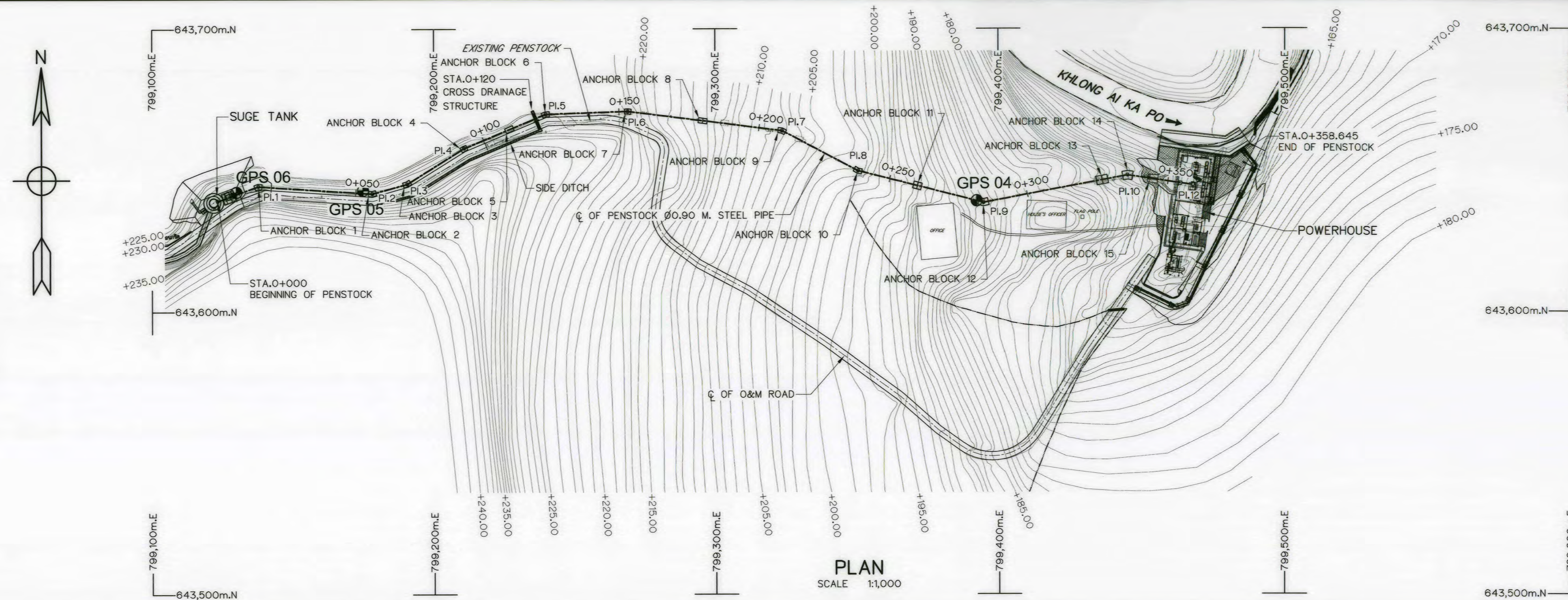
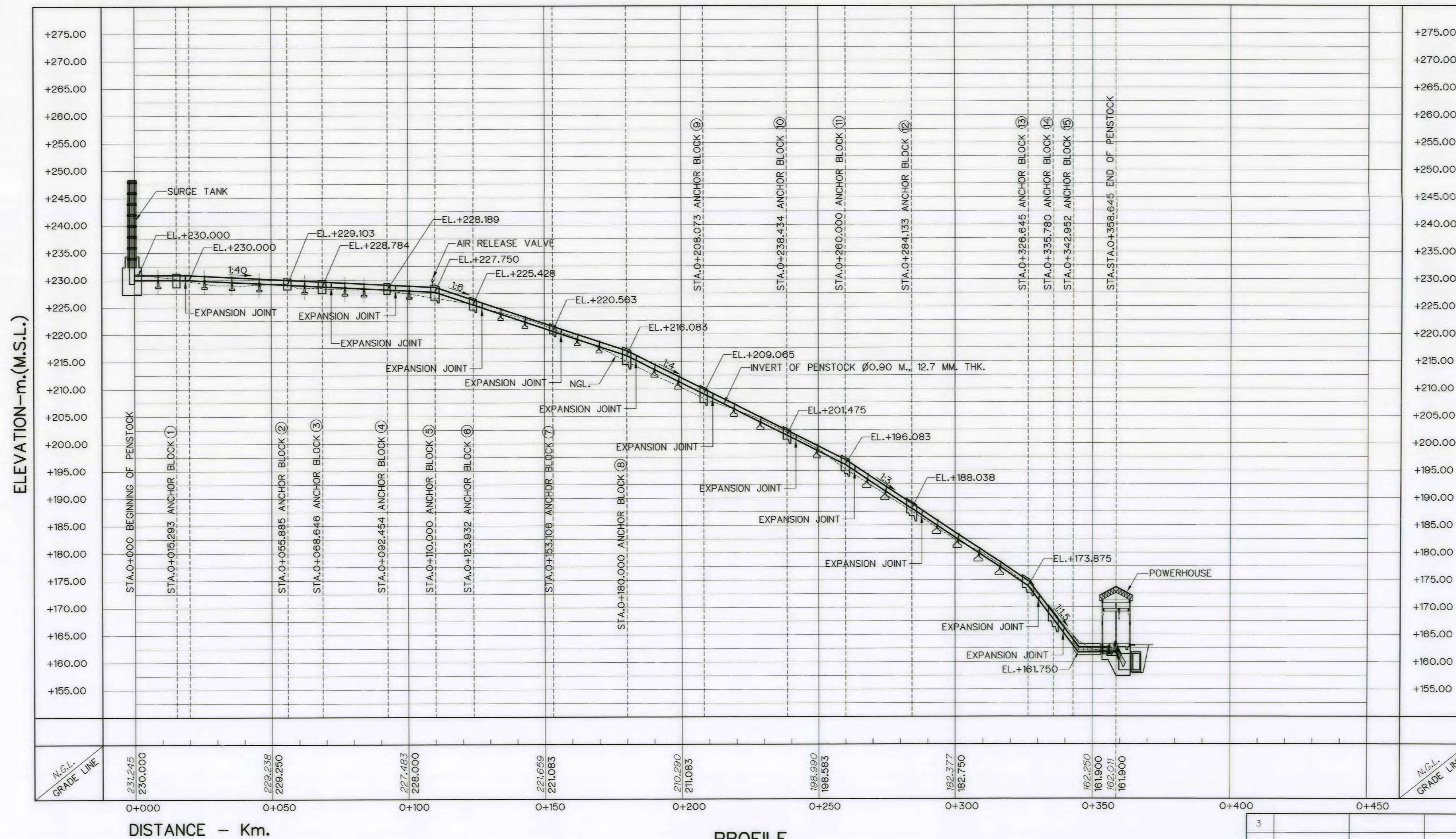


 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE SURGE TANK PILE FOOTING DETAILS	
 P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED 14/10/2021 281.8969	REVIEWED <i>BAO</i>
DRAWN	SUBMITTED <i>Yes</i>
CHECKED <i>[Signature]</i> 281.8231	APPROVED <i>notan</i>
PROJECT MANAGER	DRAWING NO. AKP-ST-11
DATE 28/10/2021	SHEET NO. 49 OF 129



HORIZONTAL ALINEMENT OF PENSTOCK

NO. PL	COORDINATE		PL - PL (m)	DEFLECTION ANGLE (° - ' - ")	PL STA. (km)	BEARING (N/S - ° - ' - " E/W)
	N	E				
B	643,639.173	799,123.320	-	-	0+000.000	-
PL1	643,644.392	799,137.695	15.293	23°-38'-46.26"	0+015.293	N 70°-02'-45.68"E
PL2	643,641.778	799,178.203	40.592	19°-12'-18.93"	0+055.885	S 86°-18'-28.07"E
PL3	643,645.191	799,190.499	12.761	16°-15'-10.98"	0+068.646	N 74°-29'-13.00"E
PL4	643,657.725	799,210.741	23.808	09°-10'-50.97"	0+092.454	N 58°-14'-02.02"E
PL5	643,669.814	799,239.804	31.477	20°-40'-12.39"	0+123.932	N 67°-24'-52.99"E
PL6	643,670.789	799,268.962	29.174	09°-07'-39.32"	0+153.106	N 88°-05'-05.38"E
PL7	643,663.888	799,323.494	54.967	20°-41'-40.80"	0+208.073	S 82°-47'-15.30"E
PL8	643,649.678	799,350.324	30.361	13°-37'-57.89"	0+238.434	S 62°-05'-34.50"E
PL9	643,638.410	799,394.613	45.700	24°-56'-46.05"	0+284.133	S 75°-43'-32.39"E
PL10	643,647.974	799,445.386	51.646	19°-17'-03.15"	0+335.780	N 79°-19'-41.56"E
E	643,644.550	799,467.973	22.865	-	0+358.645	S 81°-23'-15.29"E

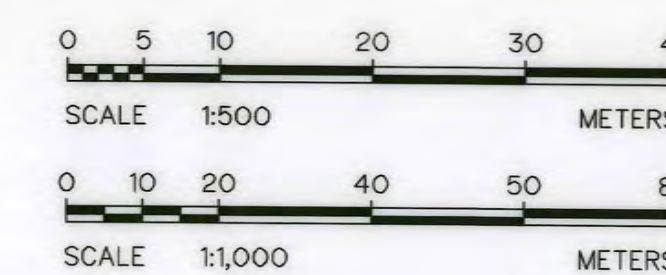


NOTES :

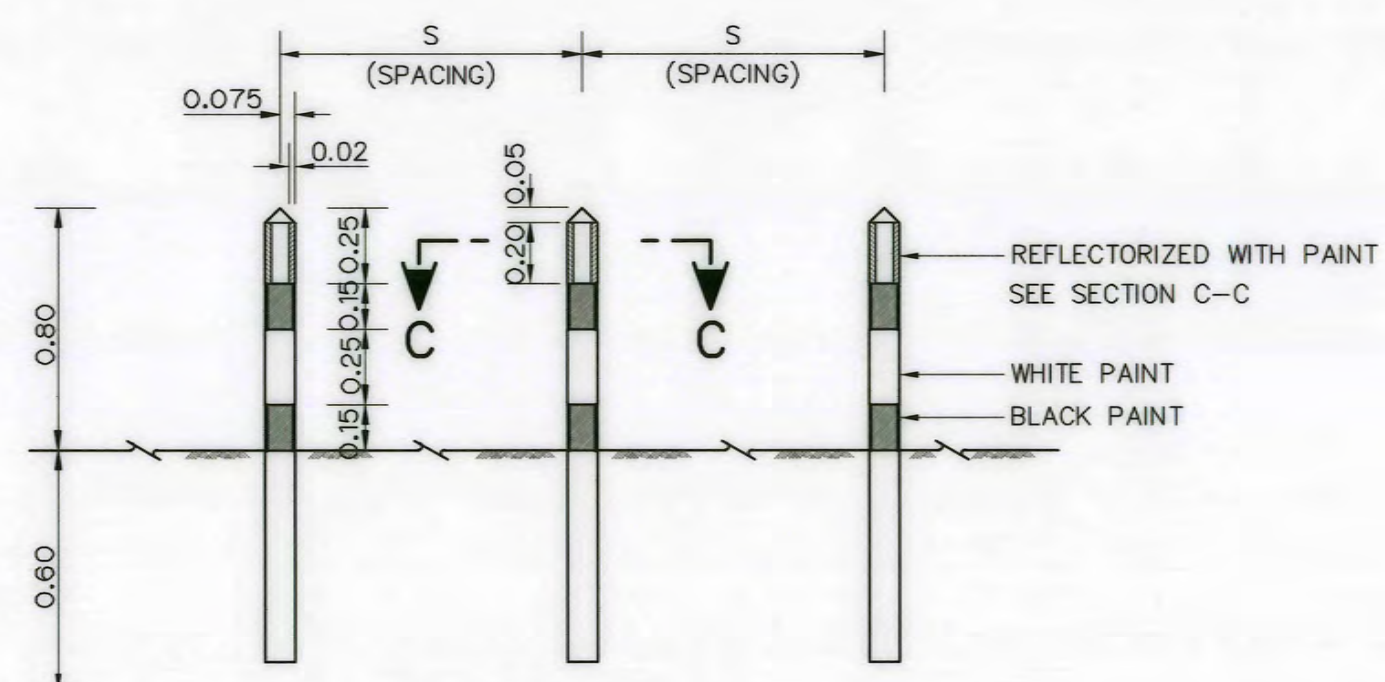
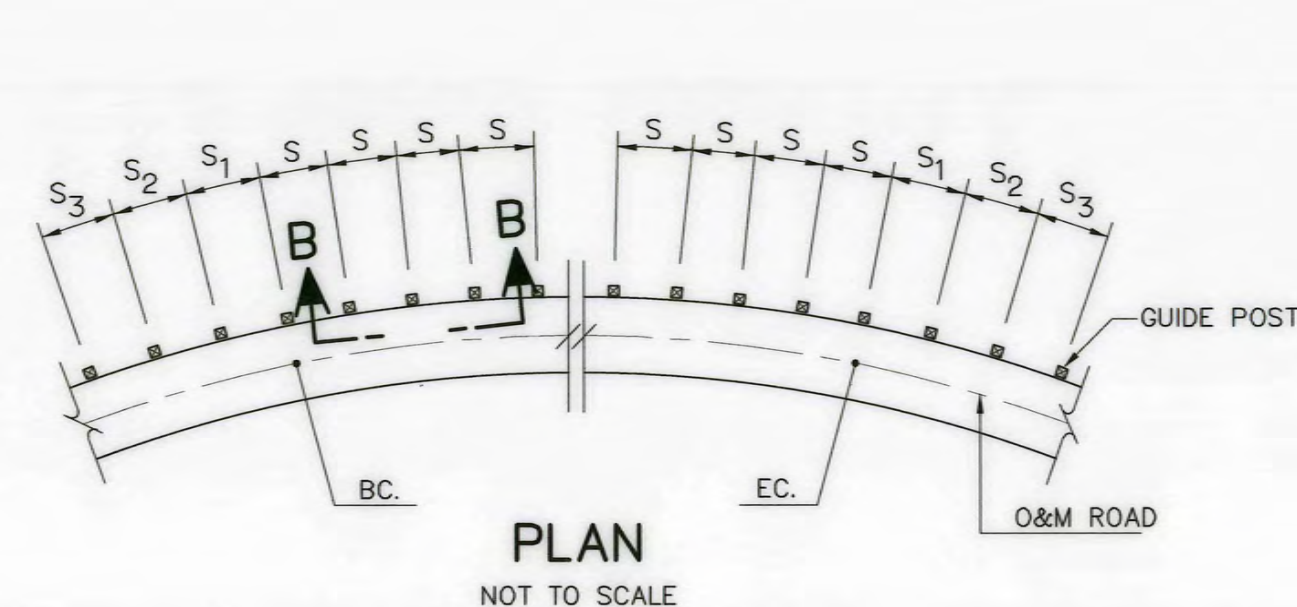
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
- THE ALIGNMENT OF THE PENSTOCK AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO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

REFERENCE DRAWINGS :

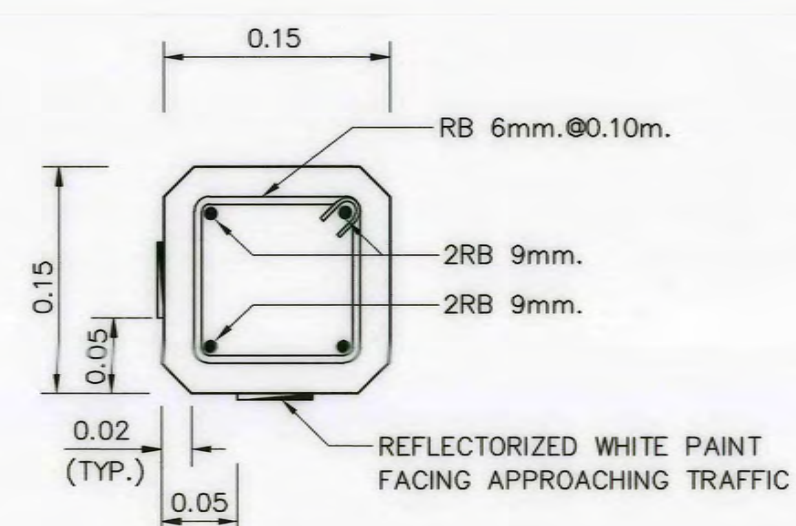
- PENSTOCK, TYPICAL SECTIONS AND DETAILS AKP-PS-02
- PENSTOCK, TYPICAL OF PENSTOCK, PIER AND RING GIRDER AKP-PS-03
- PENSTOCK, ANCHOR BLOCK DETAILS AKP-PS-04 TO 08
- PENSTOCK, WYE, PLAN, SECTIONS AND DETAILS AKP-PS-09
- PENSTOCK, EXPANSION JOINT, PLAN, SECTIONS AND DETAILS AKP-PS-10
- PENSTOCK, BEND DETAILS AKP-PS-11
- PENSTOCK, WELDING DETAILS AKP-PS-12
- PENSTOCK, CROSS DRAINAGE STRUCTURE AKP-PS-13



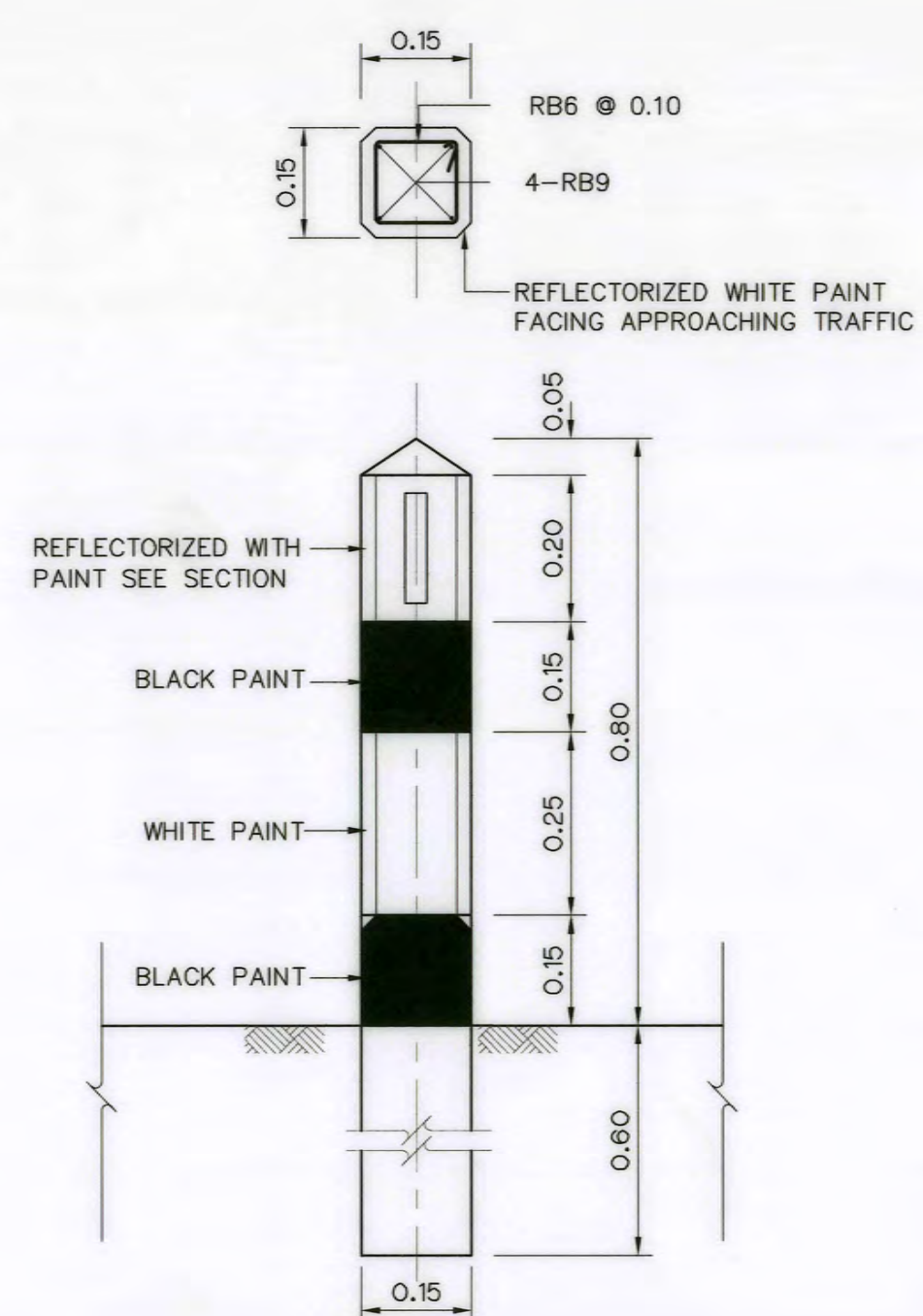
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK PLAN AND PROFILE, STA.0+000 TO STA.0+358.645	
DESIGNED: <i>Man</i> 281.29074 281.9462	REVIEWED: <i>Man</i>
DRAWN: <i>Man</i>	SUBMITTED: <i>Man</i>
CHECKED: <i>Man</i> 281.8231	RECOMMENDED: <i>Man</i>
APPROVED: <i>Man</i> 28/10/2021	APPROVED: <i>Man</i>
PROJECT MANAGER	DRAWING NO. AKP-PS-01 SHEET NO. 50 OF 129



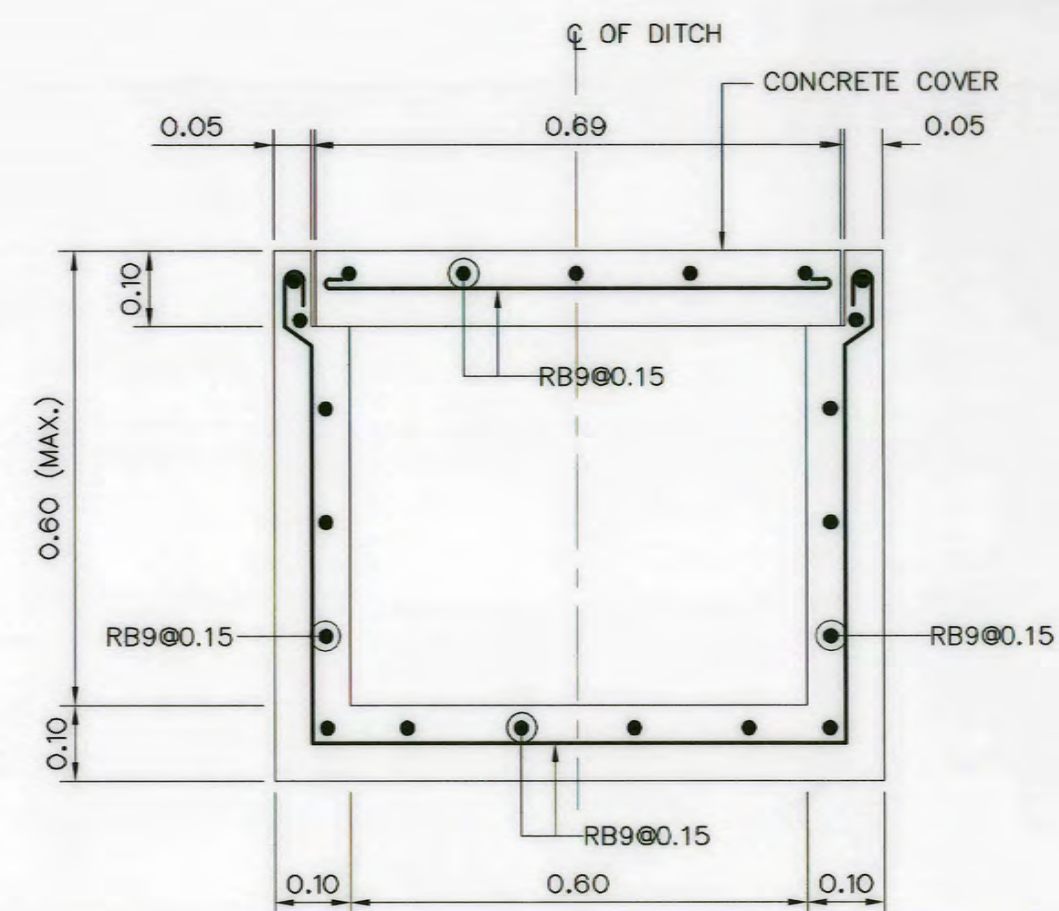
SECTION B-B
NOT TO SCALE
GUIDE POSTS



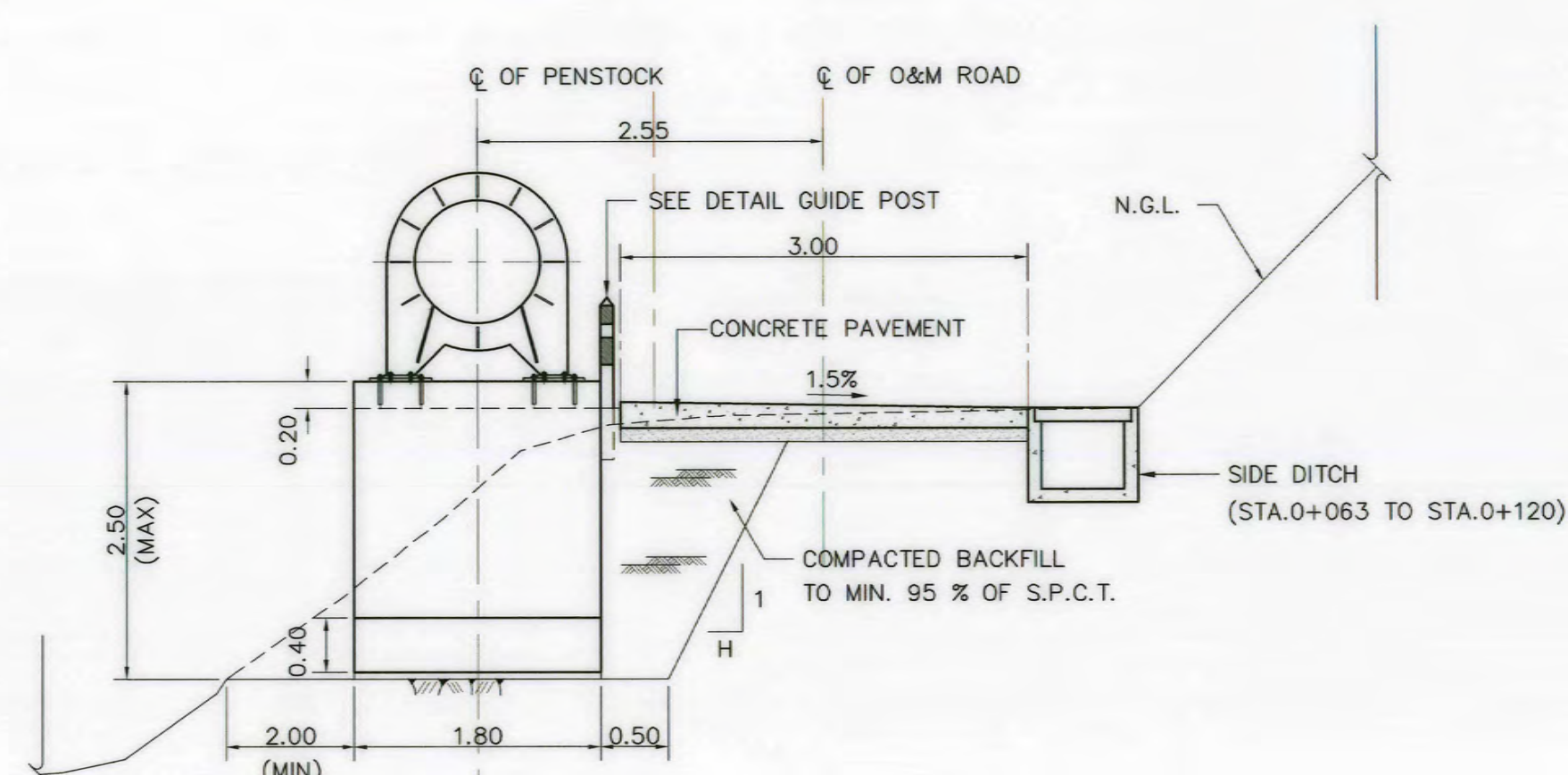
SECTION C-C
NOT TO SCALE



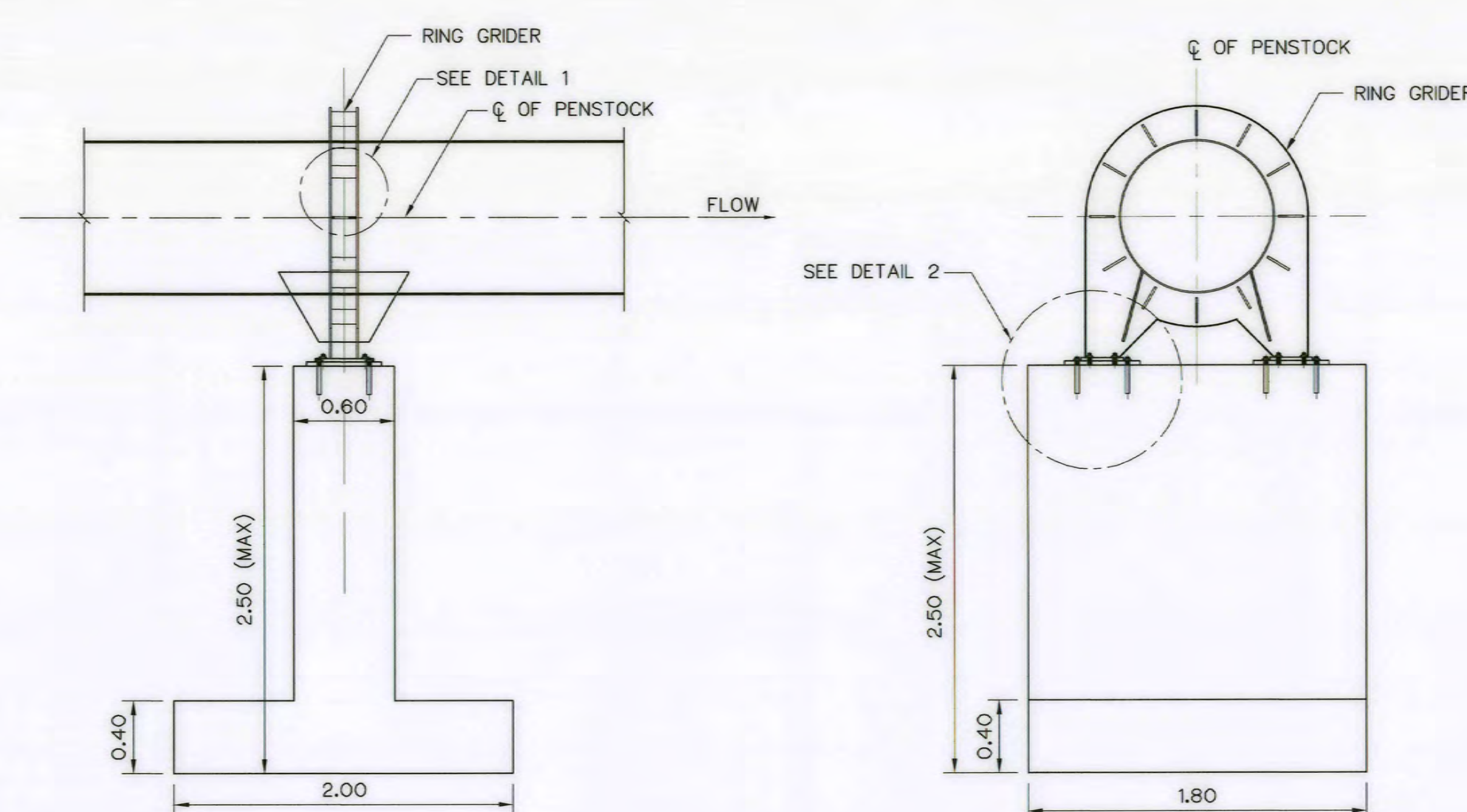
DETAIL OF GUIDE POST
SCALE 1:10



DETAIL OF DITCH
SCALE 1:10



TYPICAL SECTIONS AND DETAIL OF PENSTOCK
SCALE 1:50



HORIZONTAL PIER
(GENERAL SECTION)
NOT TO SCALE

TABLE 1 TABLE OF CUT SLOPE

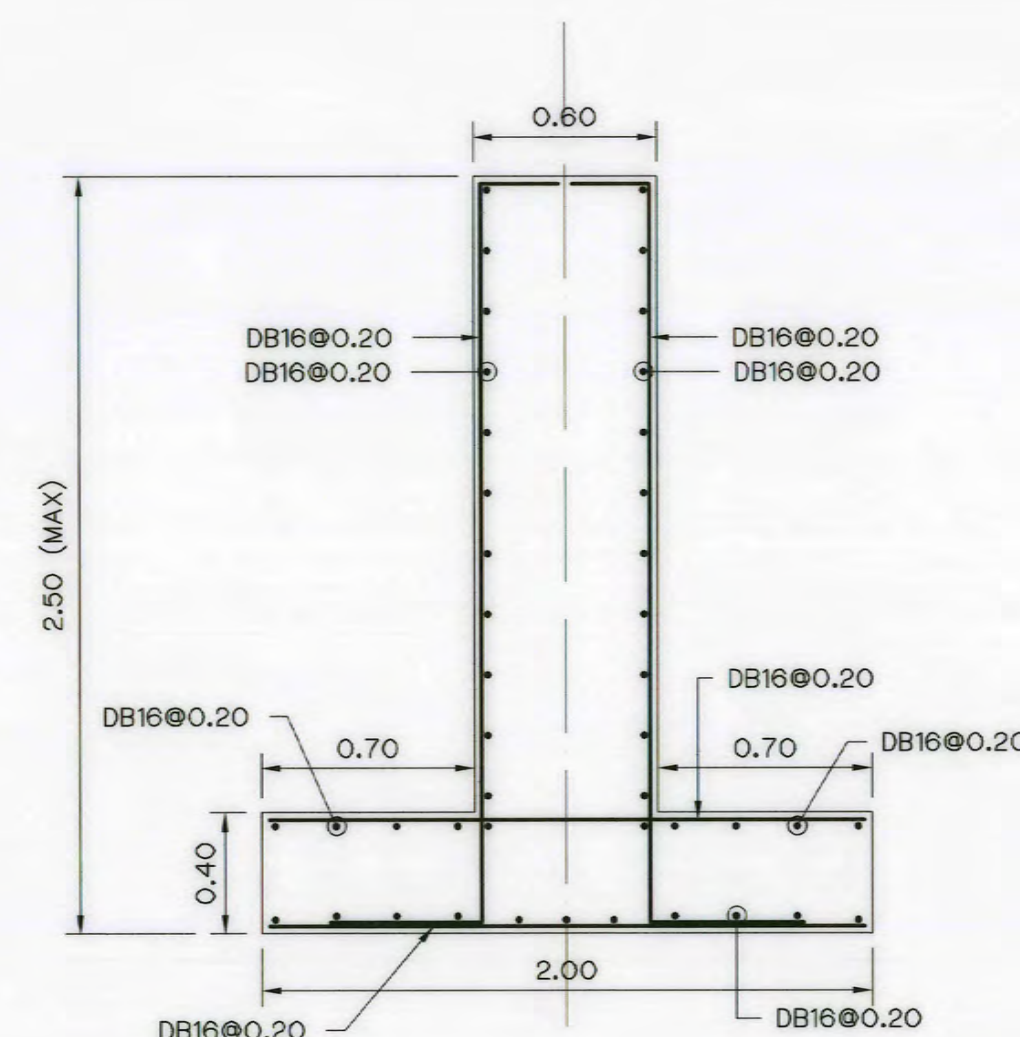
TYPE OF GROUND	SLOPE 1:H
EARTH	1:1
MODERATELY WEATHERED ROCK	1:0.5
FRESH ROCK	1:0.25

TABLE 2 TABLE OF FILL SLOPE

TYPE OF GROUND	SLOPE 1:H
EARTH	1:1.5
MODERATELY WEATHERED ROCK	1:1
FRESH ROCK	1:1

TABLE 3

SPACING OF GUIDE POSTS				
RADIUS M.	S M.	S1 M.	S2 M.	S3 M.
15 - 74	4	8	12	24
75 - 99	6	12	18	36
LARGER THAN 100	NO GUIDE POSTS INSTALLED			



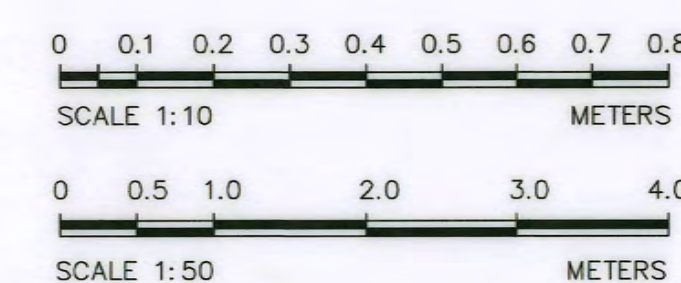
HORIZONTAL PIER
(REINFORCEMENT DETAIL)
NOT TO SCALE

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
- GUIDE POSTS ARE REQUIRED AT EVERY BENDS AND BETWEEN BENDS WITH MAXIMUM 10.00 M. SPACING.
- THE SOIL/ROCK TYPE SHALL BE CONSIDERED DIRECT BY FIELD ENGINEER.
- BEFORE EXCAVATION SHOULD BE EVALUATED AND ANALYSIS BY FIELD GEOTECHNICAL ENGINEER OR ENGINEERING GEOLOGIST.
- IN THE EVENT THAT THE CONDITION OF FOUNDATION IS POOR. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CORRECT AND/OR ADJUST THE RELEVANT DRAWINGS TO SUIT THE FIELD CONDITIONS. AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL.
- IN CASE OF DEEP CUT/HIGH FILL AT DOUBTFUL AREA, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CORRECT AND/OR ADJUST THE RELEVANT DRAWINGS TO OBTAIN FIELD ENGINEER APPROVAL.
- BENCHING SHALL BE REQUIRED ON EXISTING GROUND SLOPE IN THE PORTION OF EMBANKMENT. THE NUMBER OF STEPS DEPENDED UPON THE HEIGHT AND STABILITY OF SLOPE CONSIDERED BY FIELD ENGINEER. THE WIDTH SHALL BE PERMITTED FOR COMPACTED EQUIPMENT. DENSITY OF COMPACTED MATERIAL SHALL NOT BE LESS THAN 95% OF STANDARD PROCTOR.

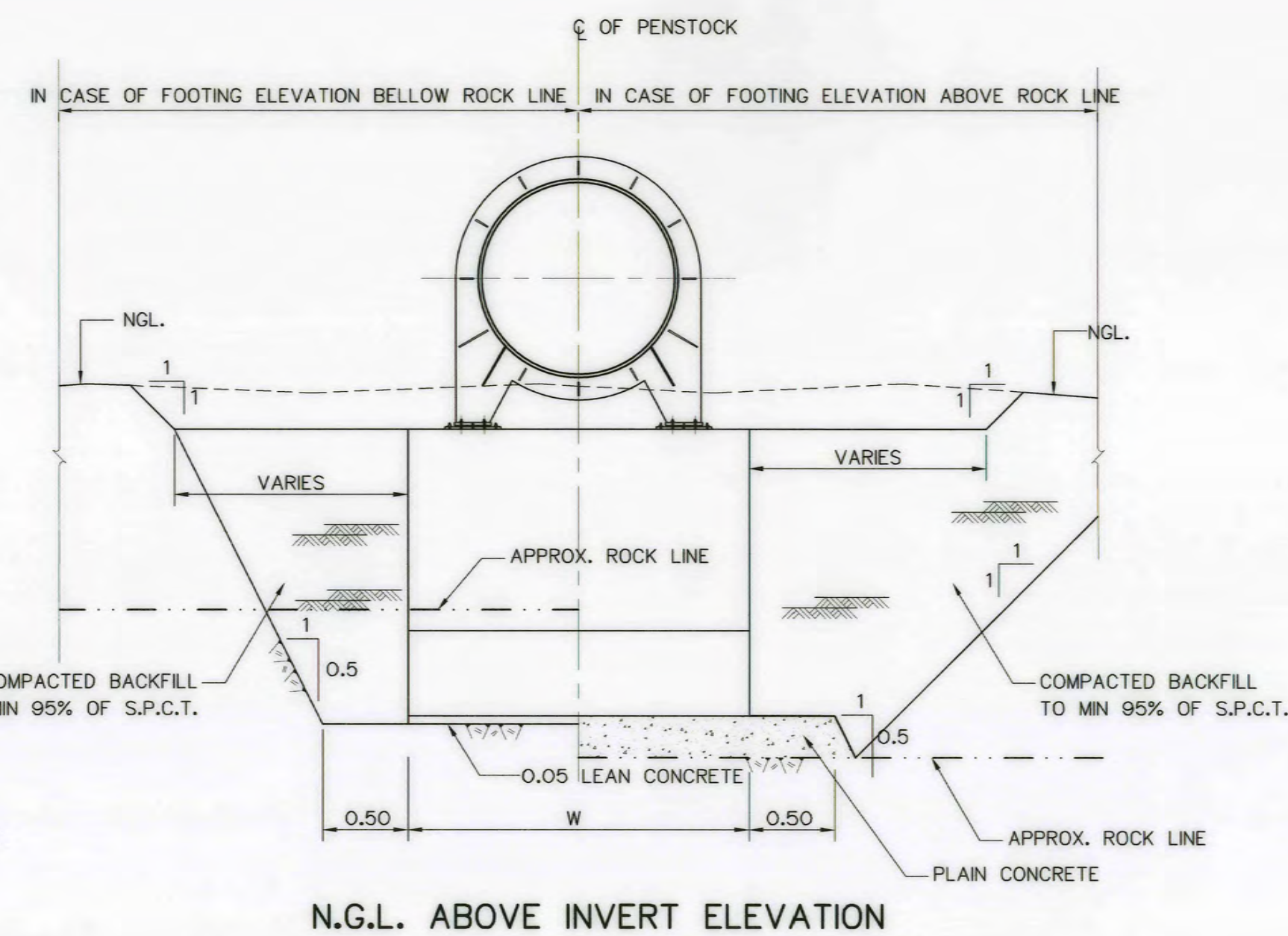
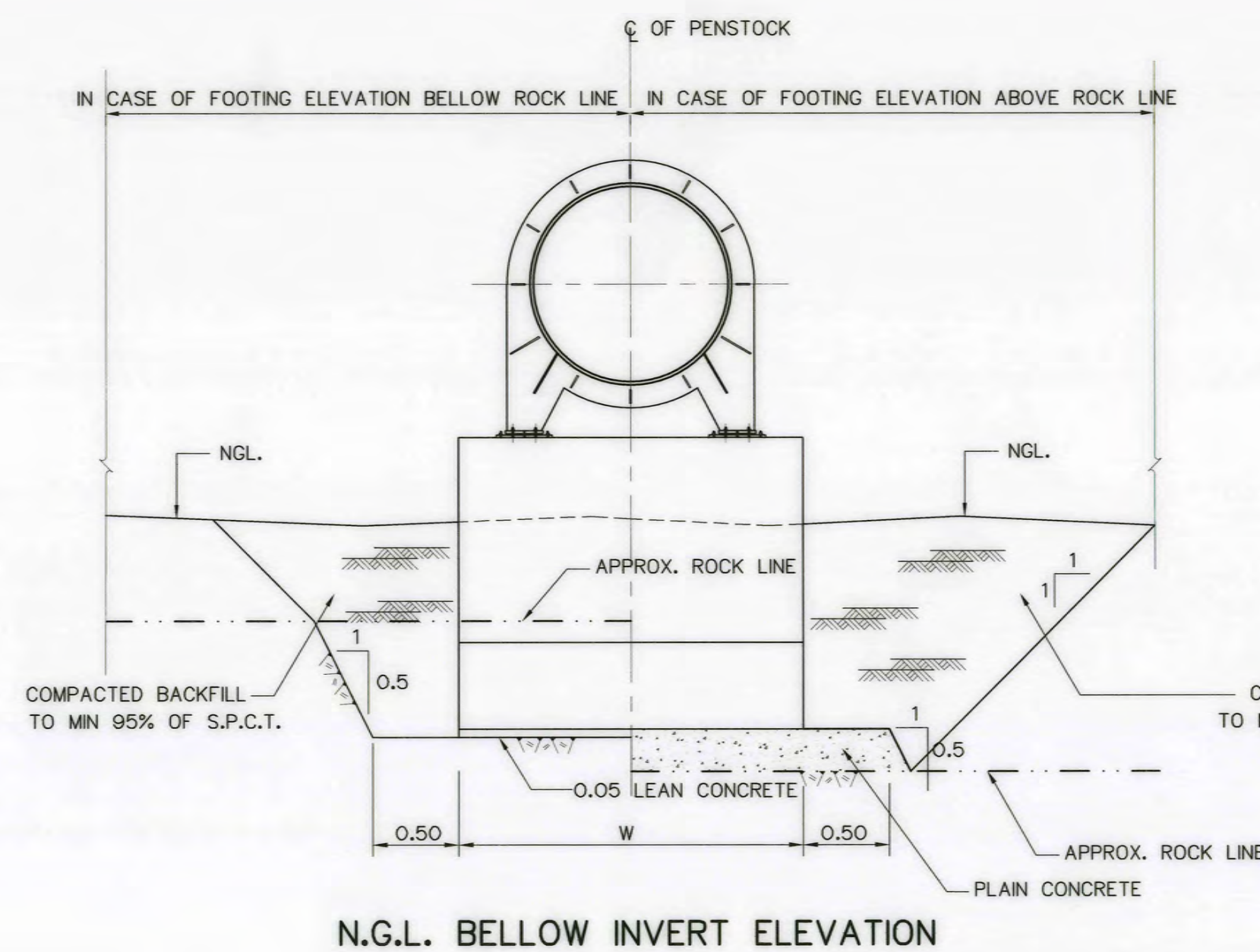
REFERENCE DRAWINGS :

- PENSTOCK, PLAN AND PROFILE, KM. 0+000 TO KM. 0+358.645 AKP-PS-01
- PENSTOCK, RING GRIDER, DETAIL "1" AND DETAIL "2" AKP-PS-03

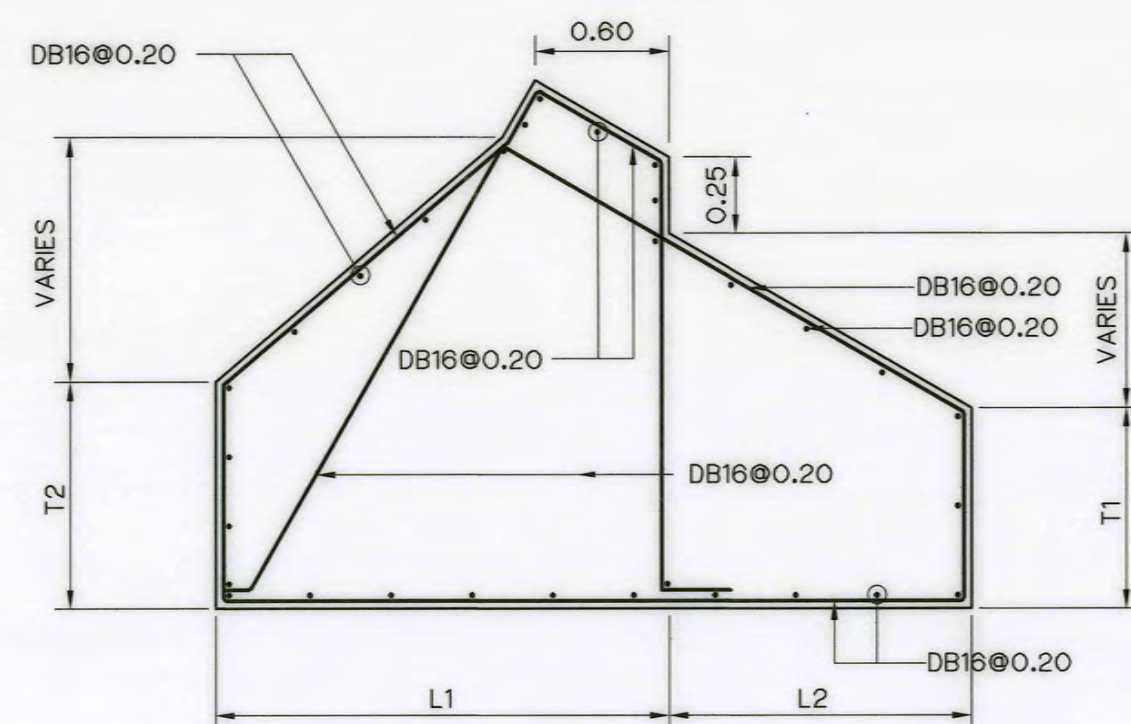
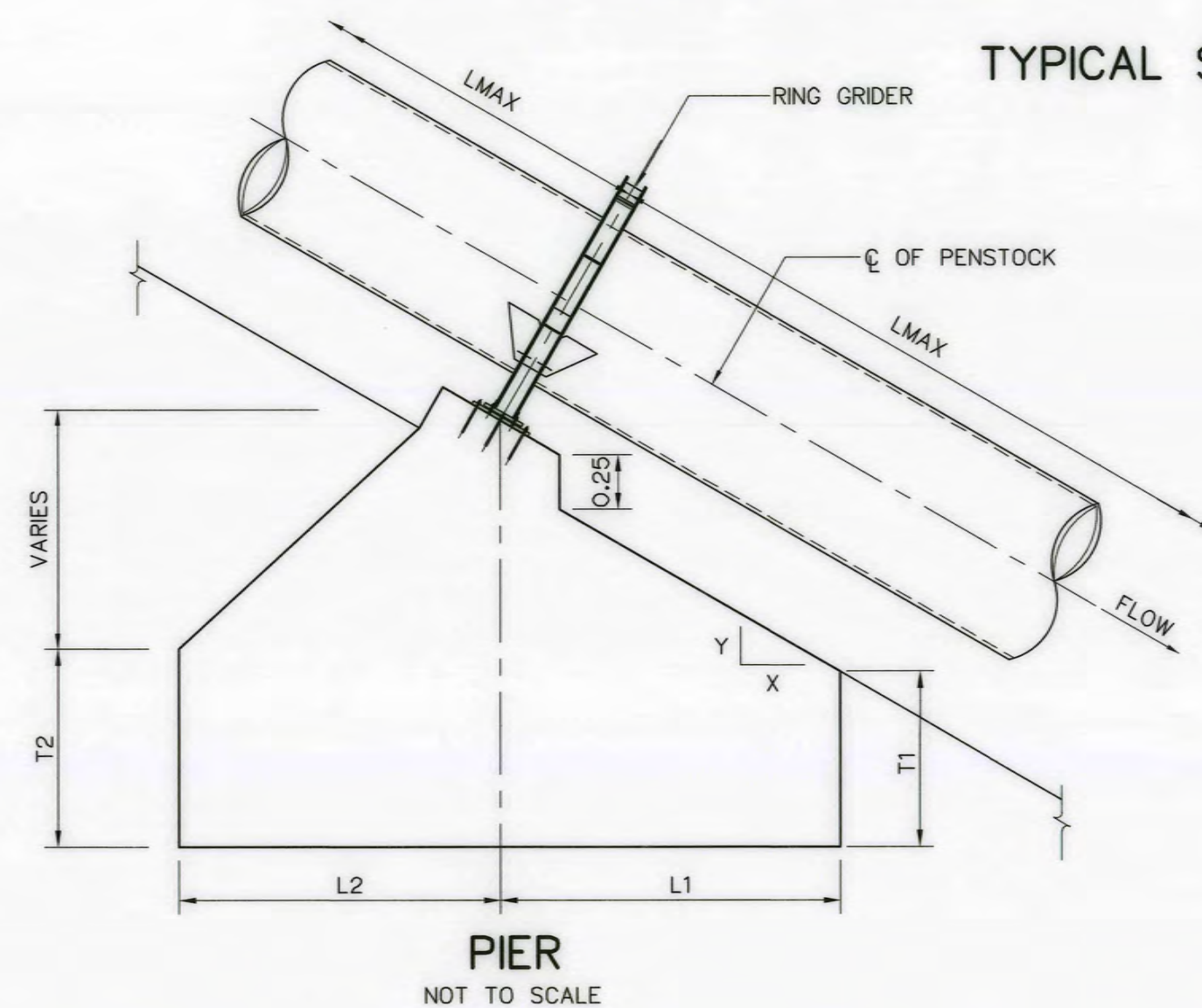


3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
			CONSULTANTS	DEDE

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 TYPICAL 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 DRAWN <i>[Signature]</i> CHECKED <i>[Signature]</i> 28/10/2021	REVIEWED <i>[Signature]</i> SUBMITTED <i>[Signature]</i> RECOMMENDED <i>[Signature]</i> APPROVED <i>[Signature]</i> 28/10/2021
PROJECT MANAGER DATE	DRAWING NO. AKP-PS-02 SHEET NO. 51 OF 129

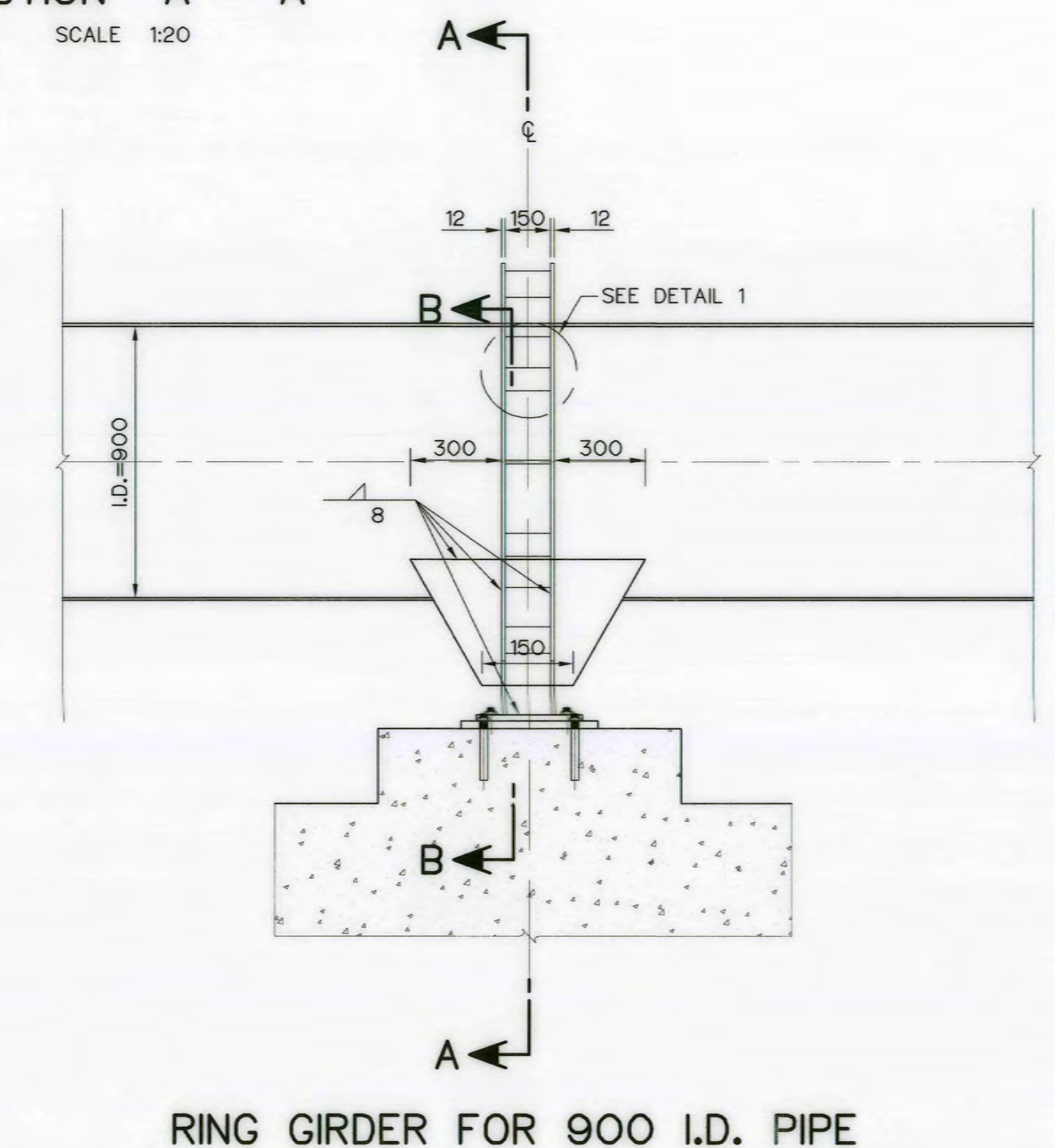
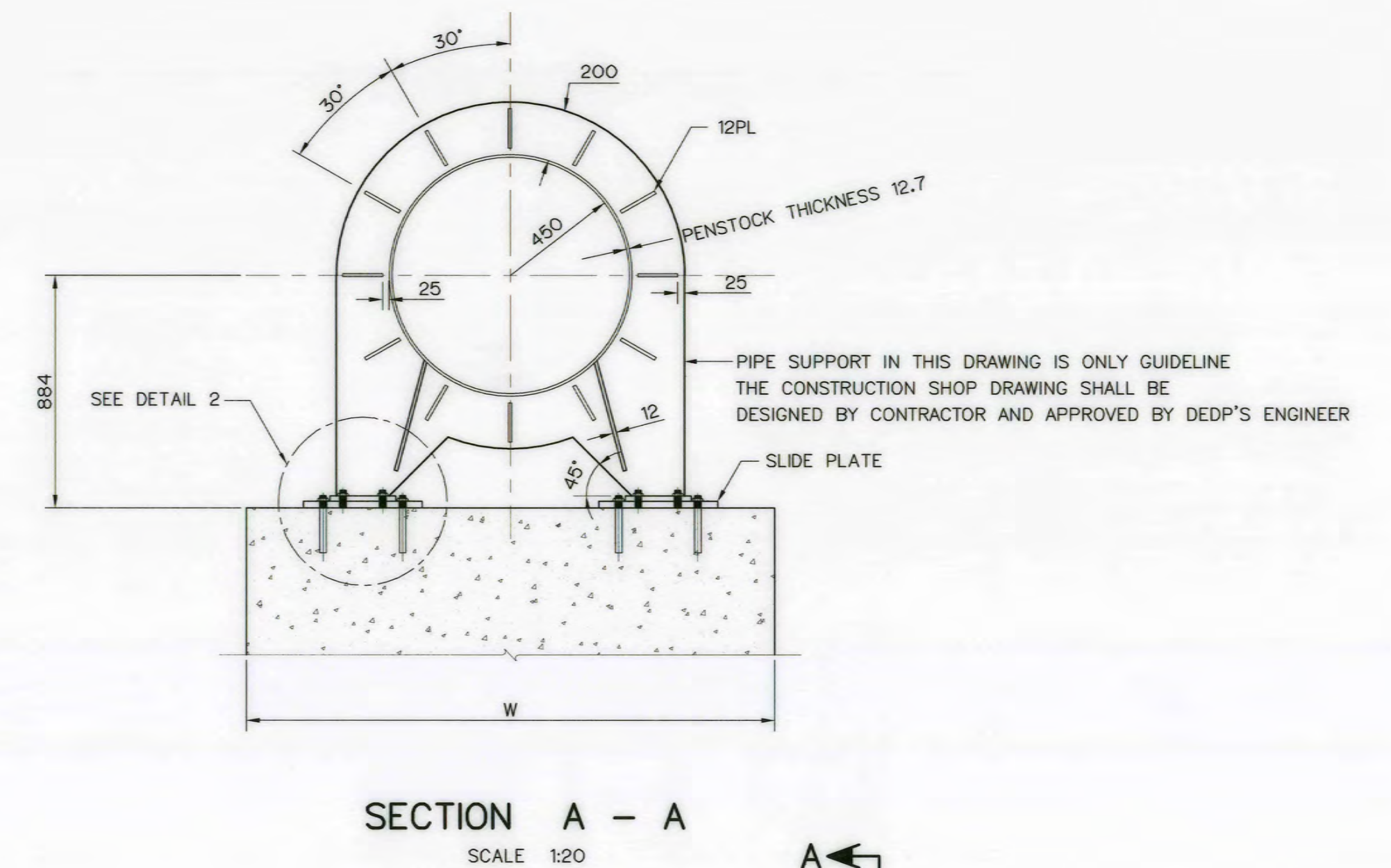
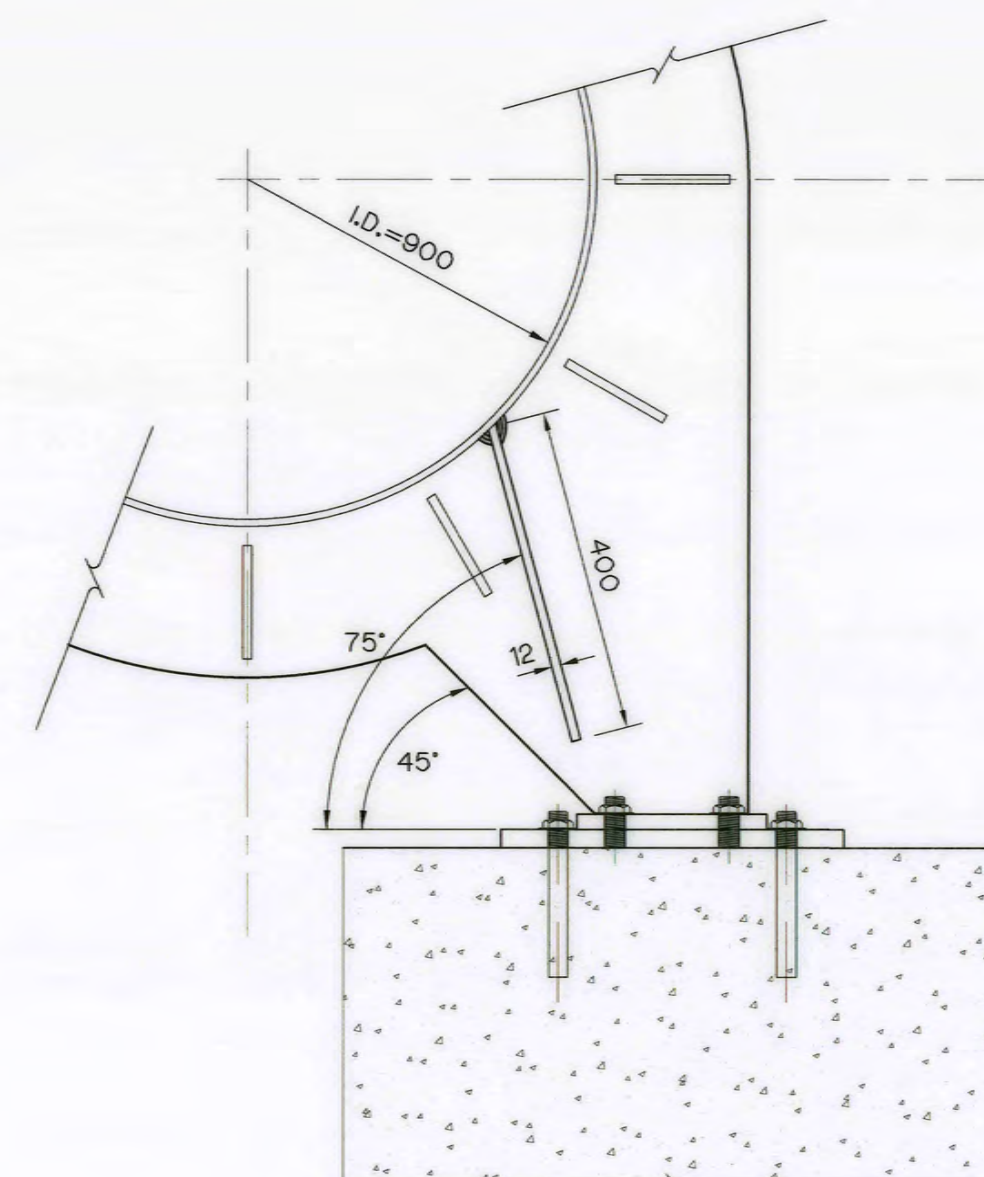
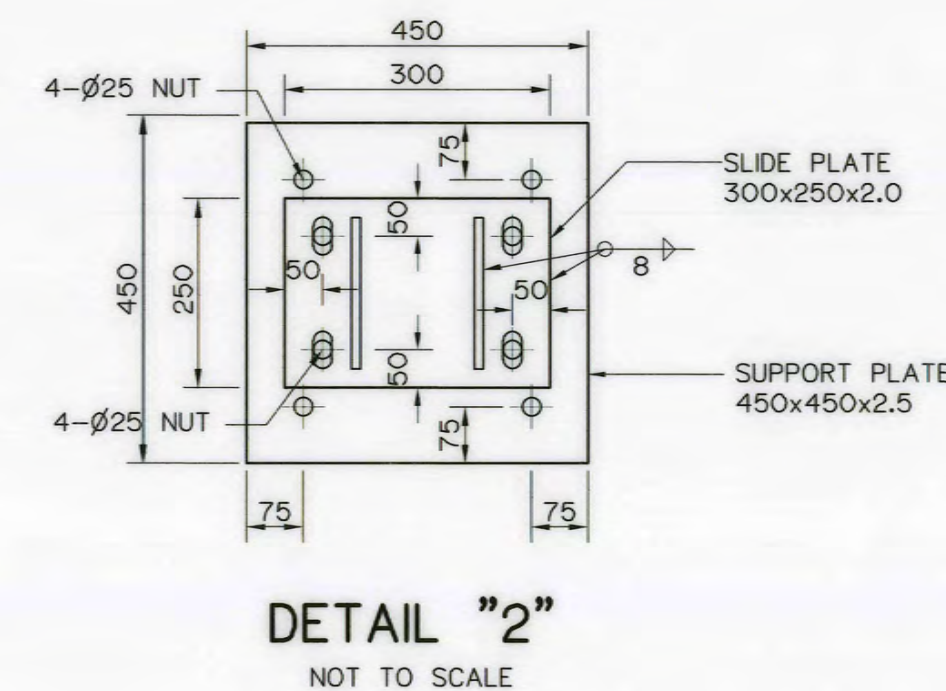
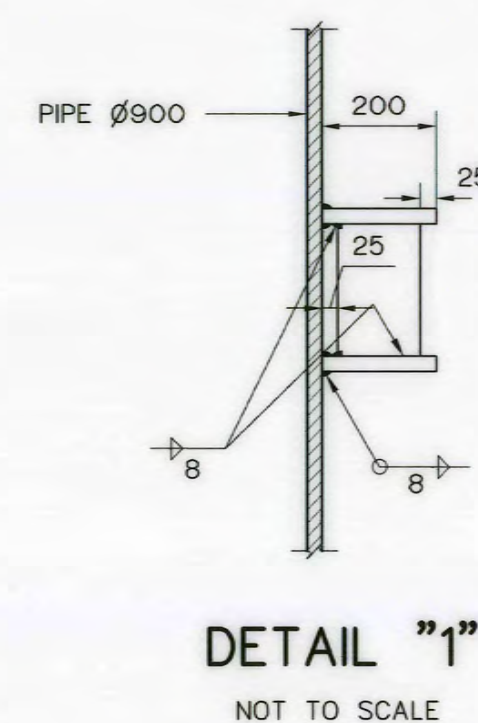


TYPICAL SECTION OF PENSTOCK
NOT TO SCALE



DIMENSIONS FOR PIER

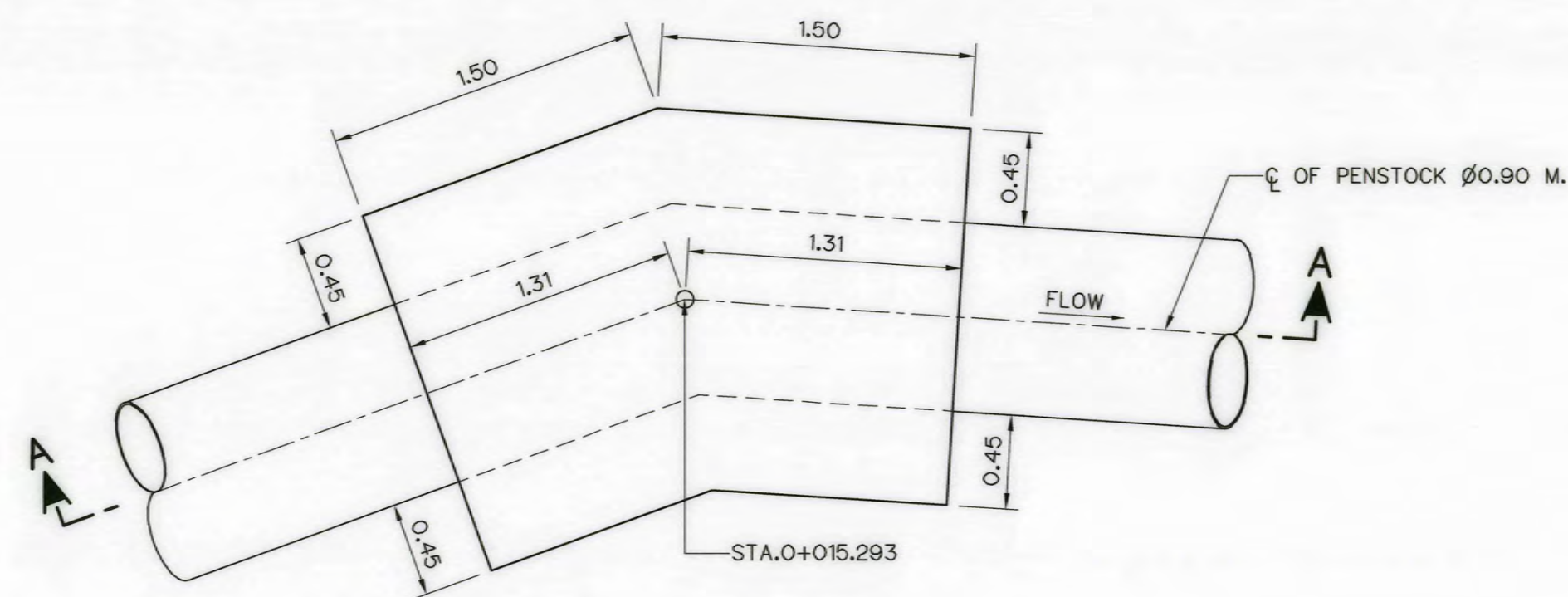
PIPE SLOPE	L1	L2	T1	T2	W	LMAX
Y:X	(m.)	(m.)	(m.)	(m.)	(m.)	(m.)
1:6	1.30	0.70	0.30	0.40	1.80	8.00
1:4	1.50	1.00	0.40	0.40	1.80	8.00
1:3	2.00	1.00	0.40	0.40	1.80	8.00
1:1.5	2.00	1.50	0.40	0.50	1.80	8.00



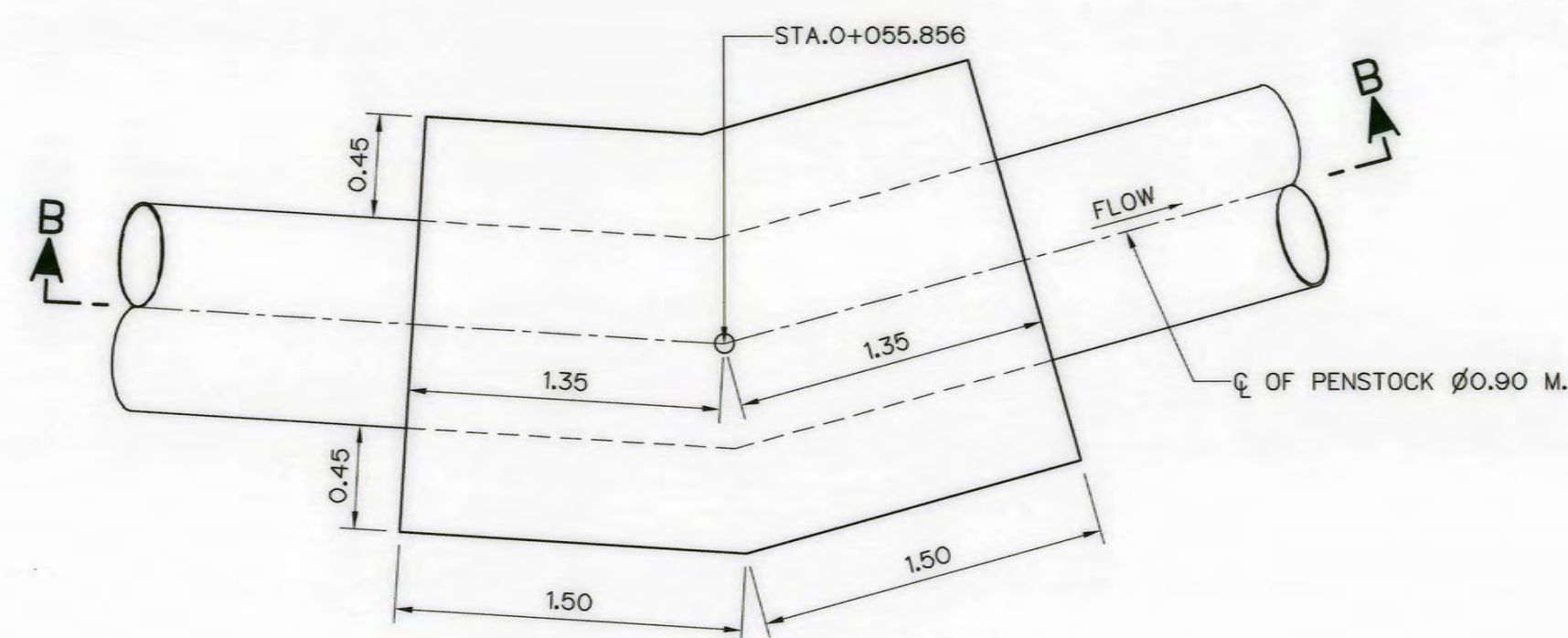
- NOTES :
- ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
 - CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
AI KA PO HYDROPOWER PROJECT TAMBOON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT			
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK TYPICAL OF PENSTOCK, PIER AND RING GIRDER			
PCM P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	DESIGNED W. W. W. 28/10/21 28.10.21	REVIEWED D. B. B.	SUBMITTED J. S. S.
DRAWN J. S. S.	CHECKED J. S. S.	APPROVED J. S. S.	RECOMMENDED J. S. S.
CONSULTANTS		DEDE	
PROJECT MANAGER DATE 28/10/2021		DRAWING NO. AKP-PS-03 SHEET NO. 52 OF 129	

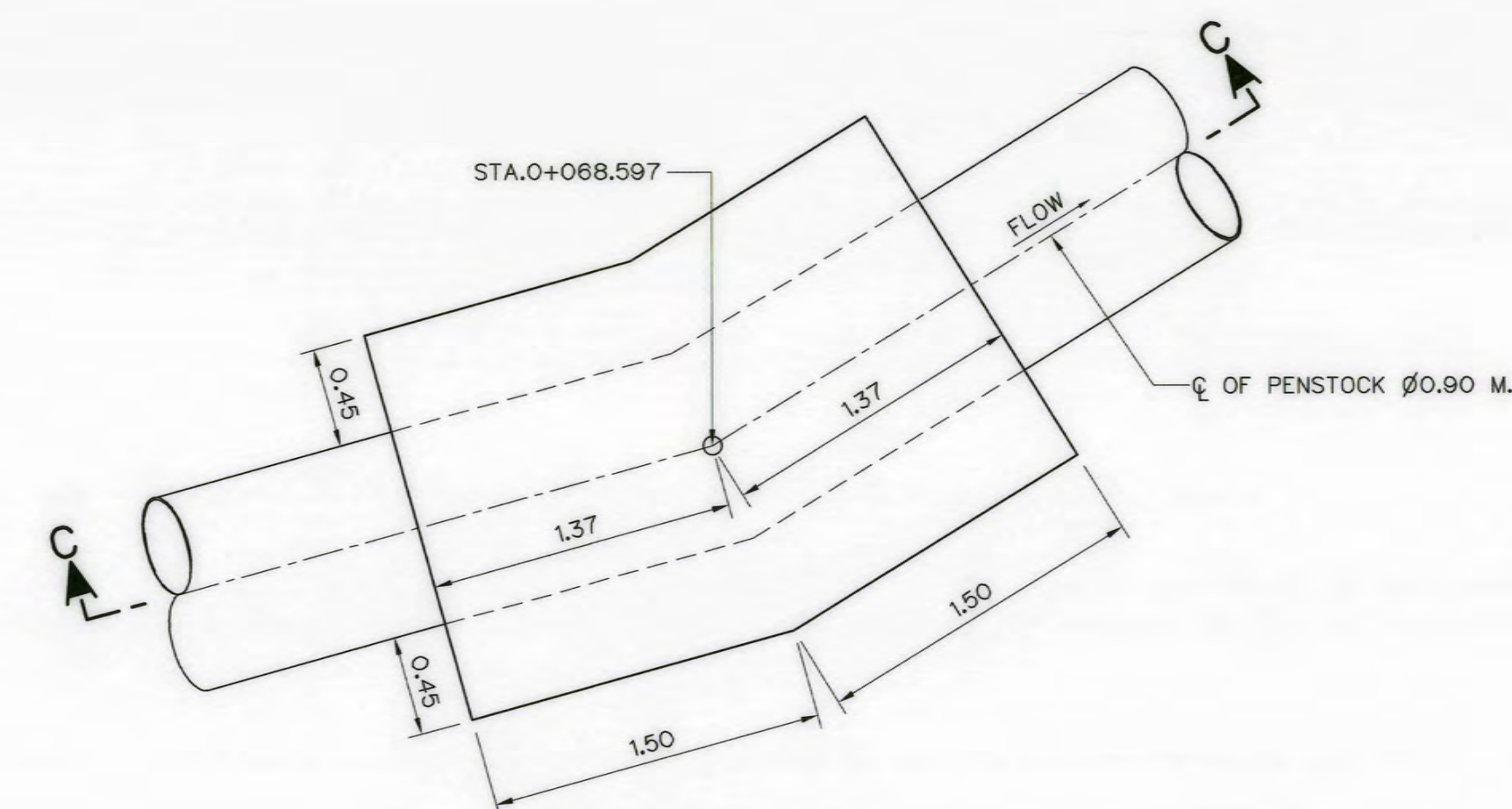
0 0.5 1.0 1.5
SCALE 1:20 METERS



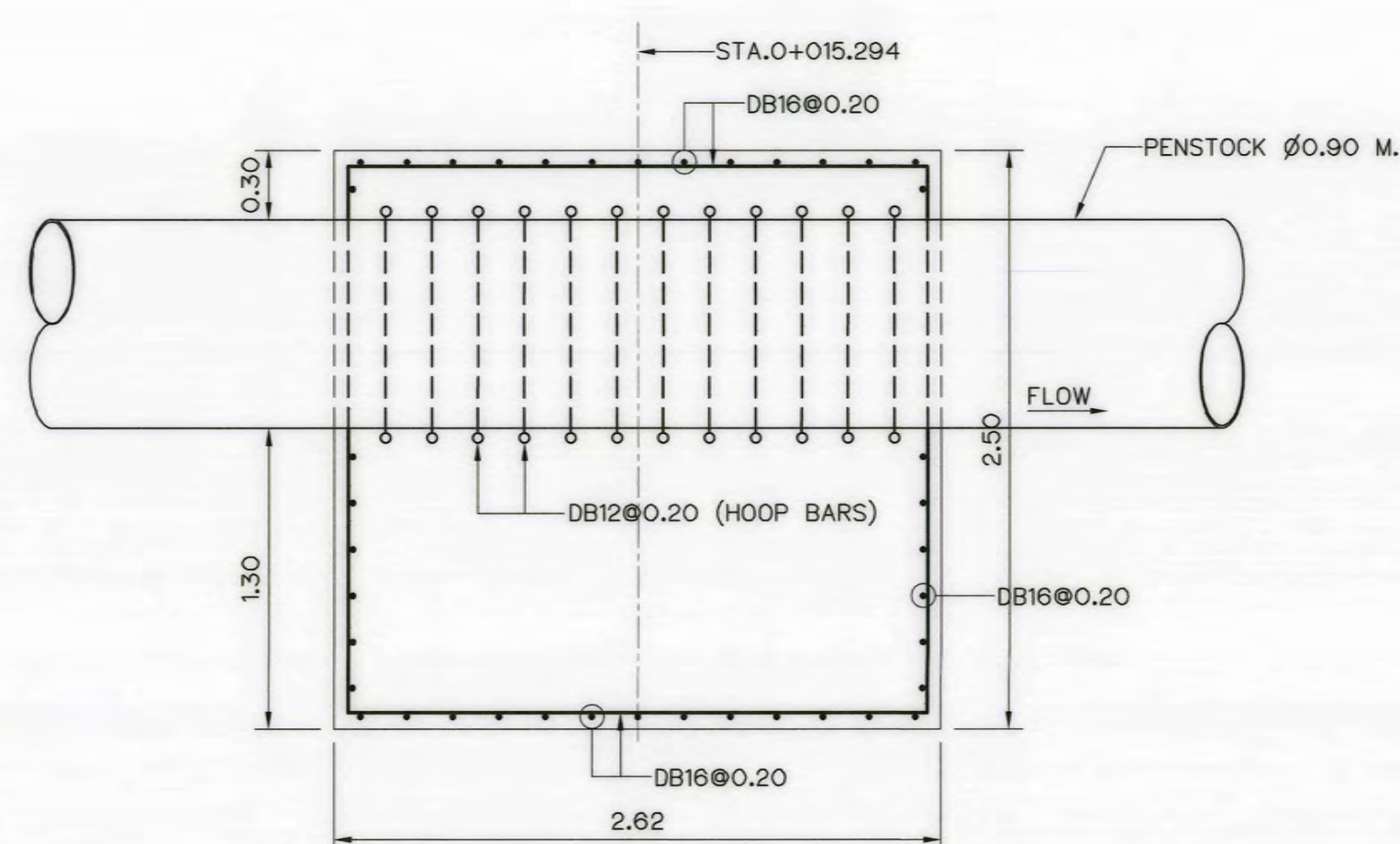
PLAN ANCHOR BLOCK ① (STA.0+015.293)
SCALE 1:30



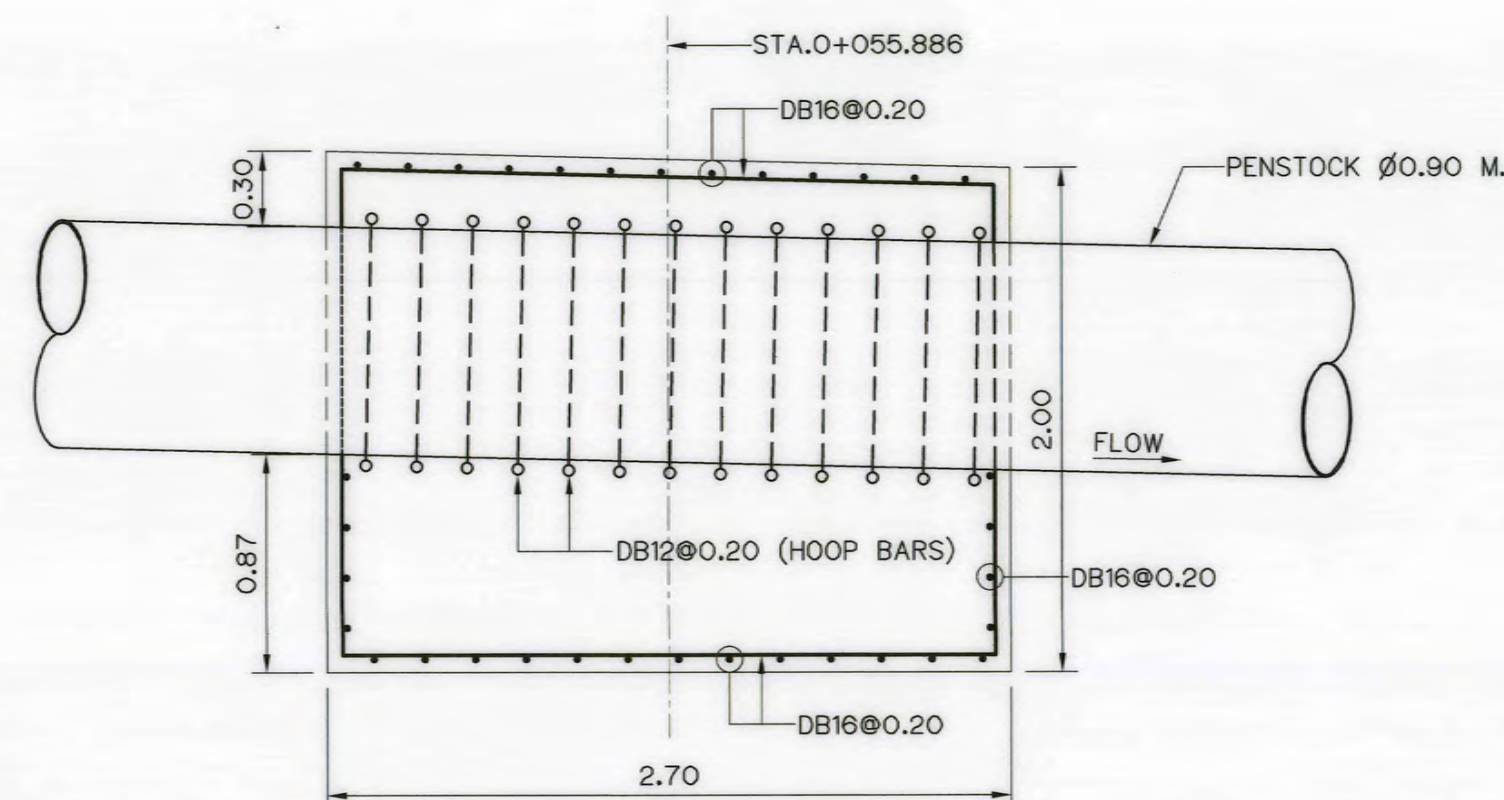
PLAN ANCHOR BLOCK ② (STA.0+055.885)
SCALE 1:30



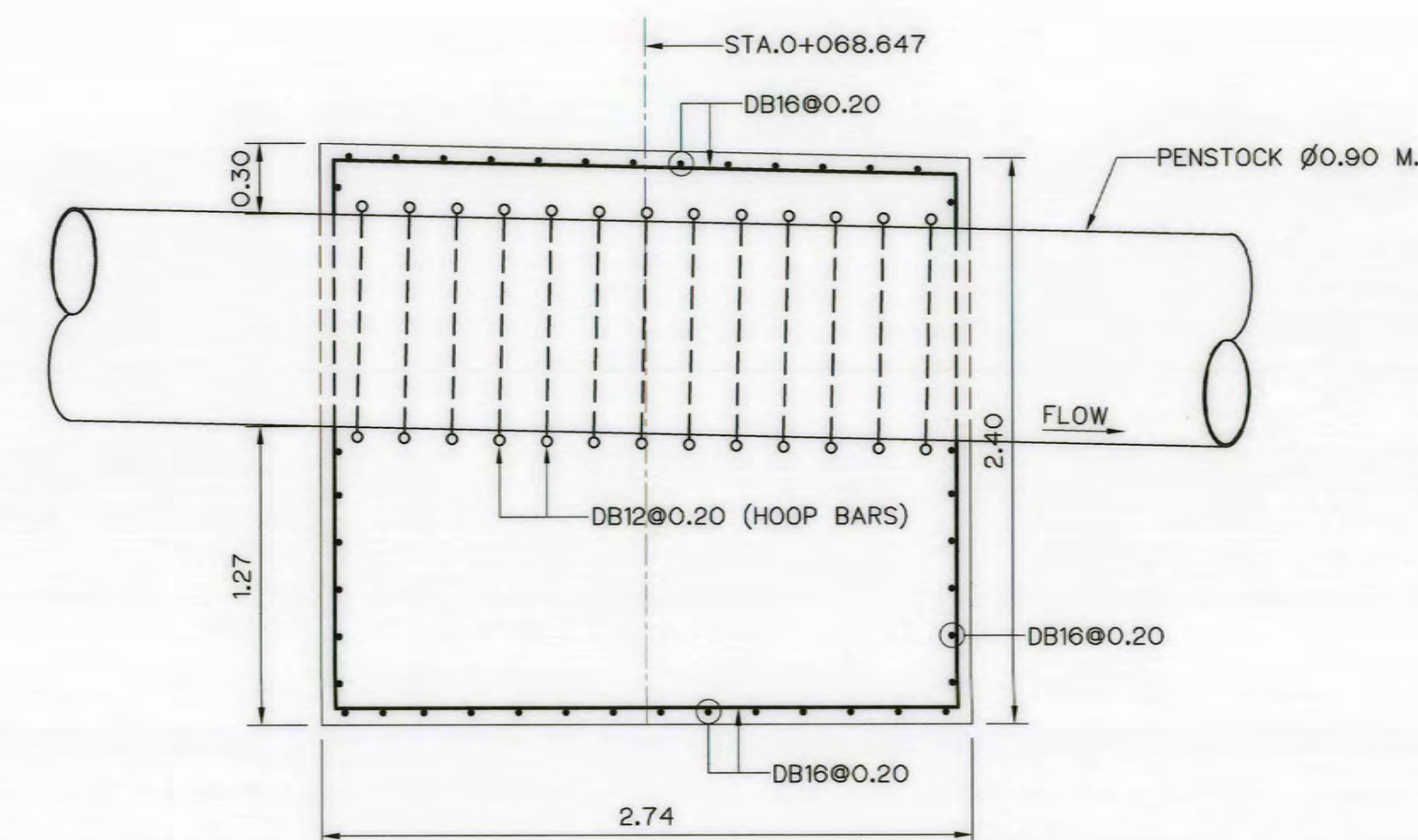
PLAN ANCHOR BLOCK ③ (STA.0+068.646)
SCALE 1:30



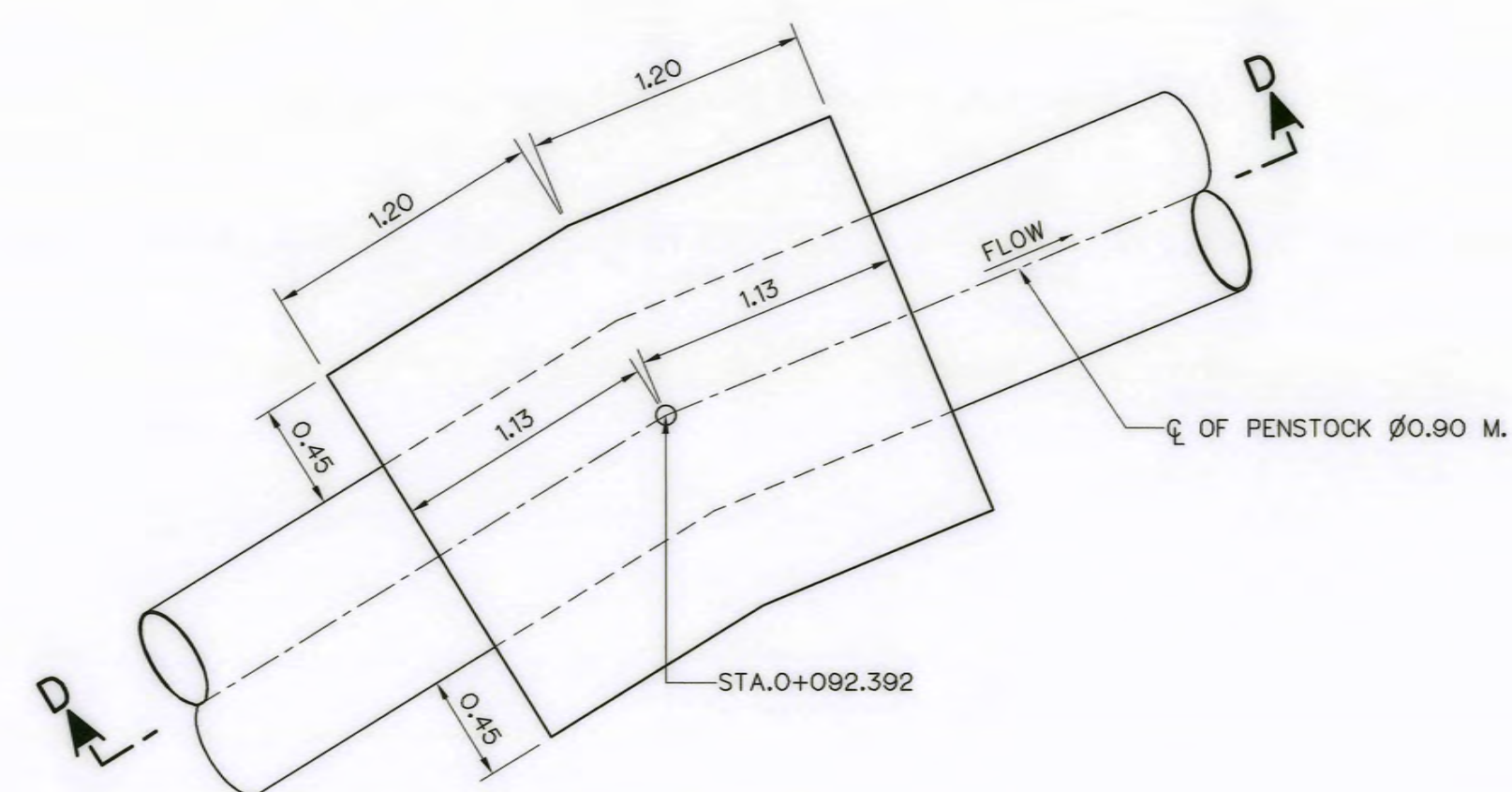
SECTION A-A
SCALE 1:30



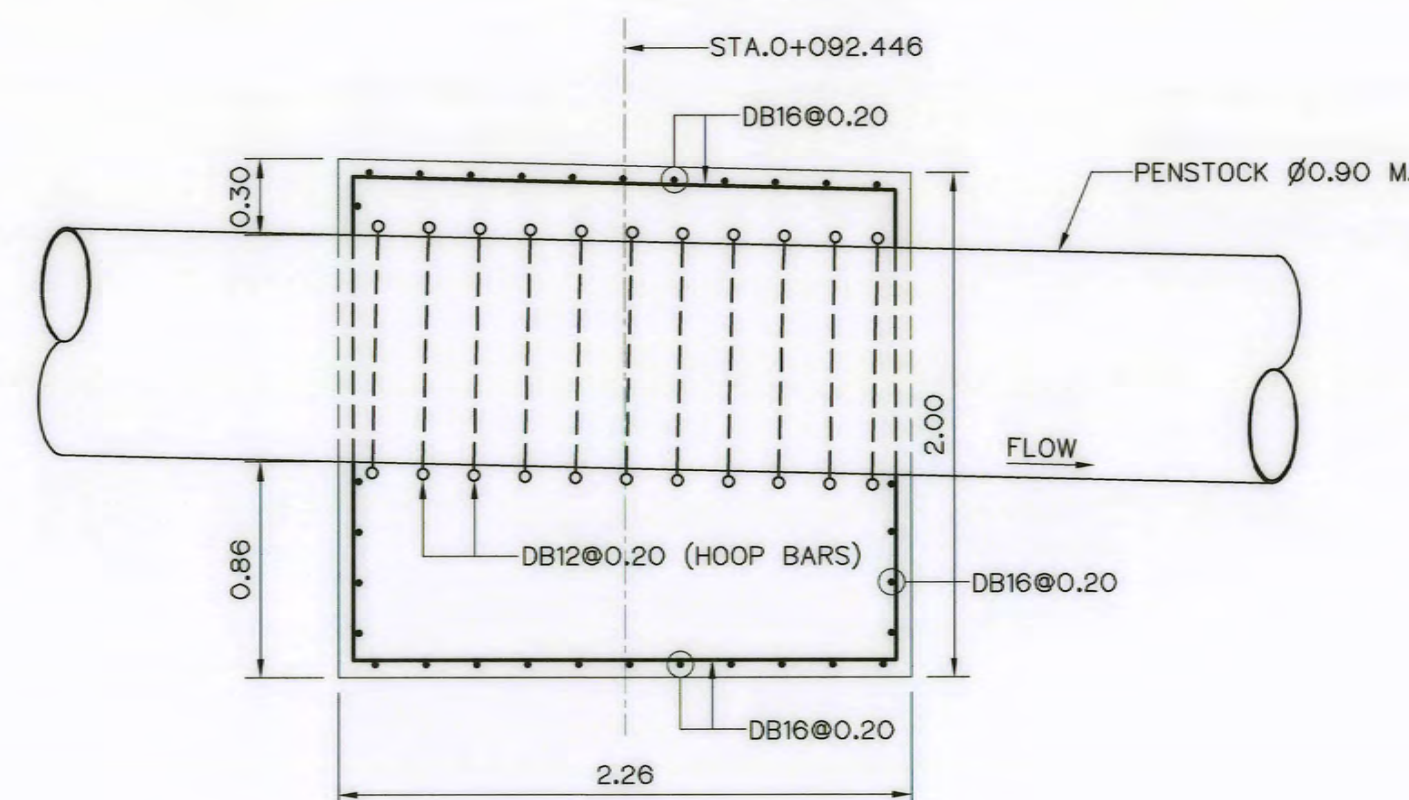
SECTION B-B
SCALE 1:30



SECTION C-C
SCALE 1:30



PLAN ANCHOR BLOCK ④ (STA.0+092.454)
SCALE 1:30



SECTION D-D
SCALE 1:30

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
3. THE ALIGNMENT OF THE PENSTOCK 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 :

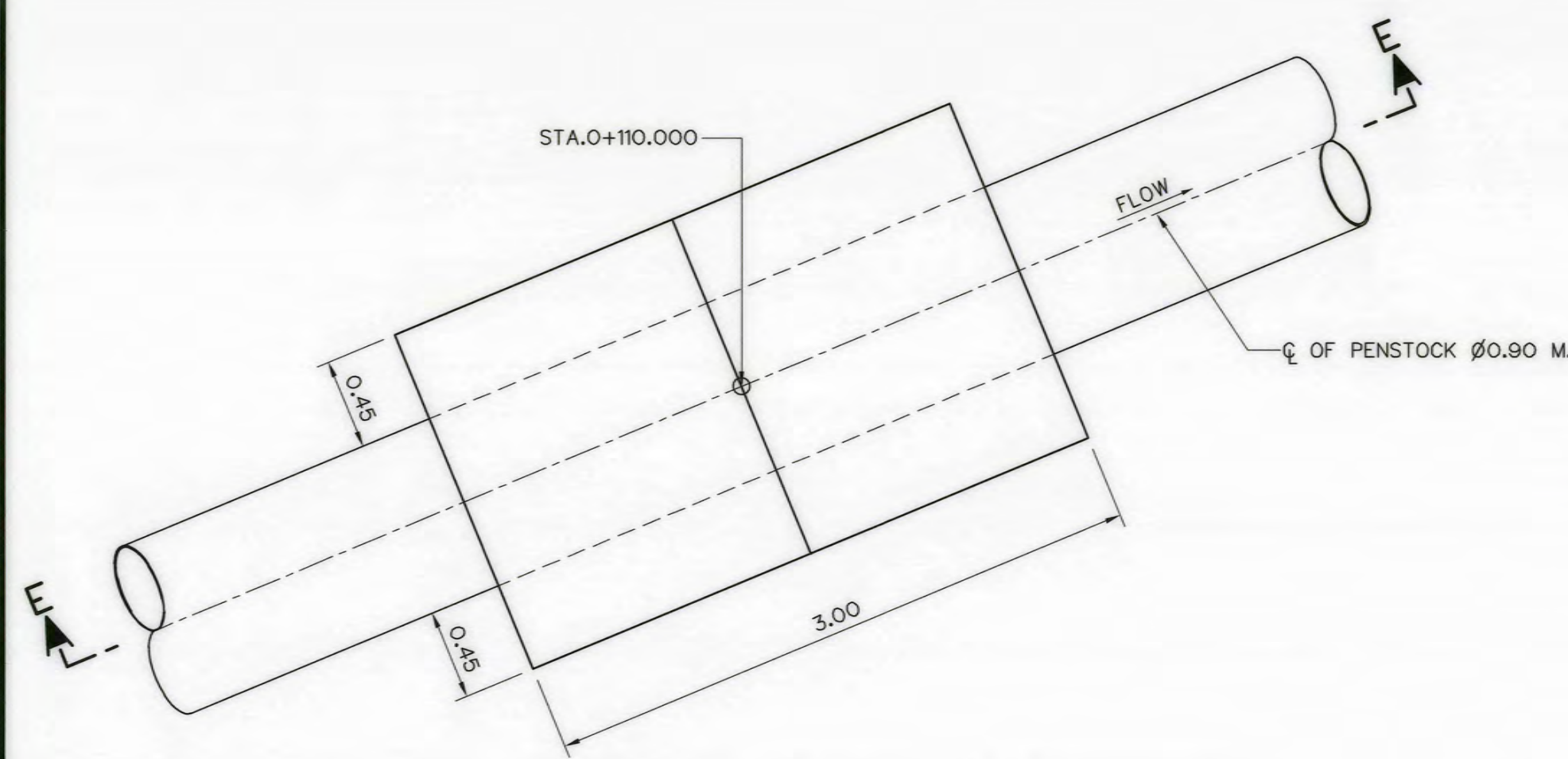
1. PENSTOCK PLAN AND PROFILE, STA. 0+000 TO STA.0+358.645 AKP-PS-01



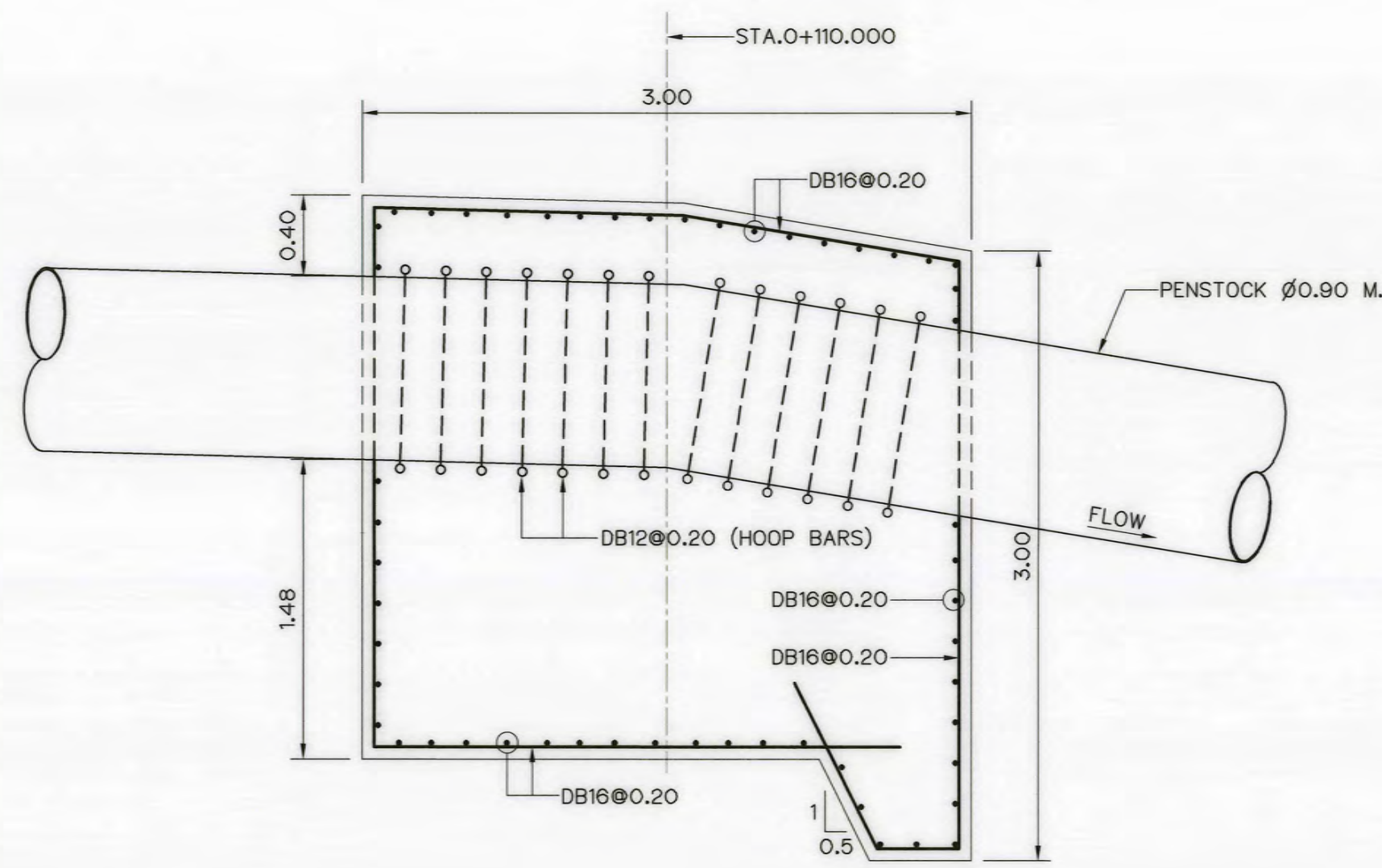
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS DEDE

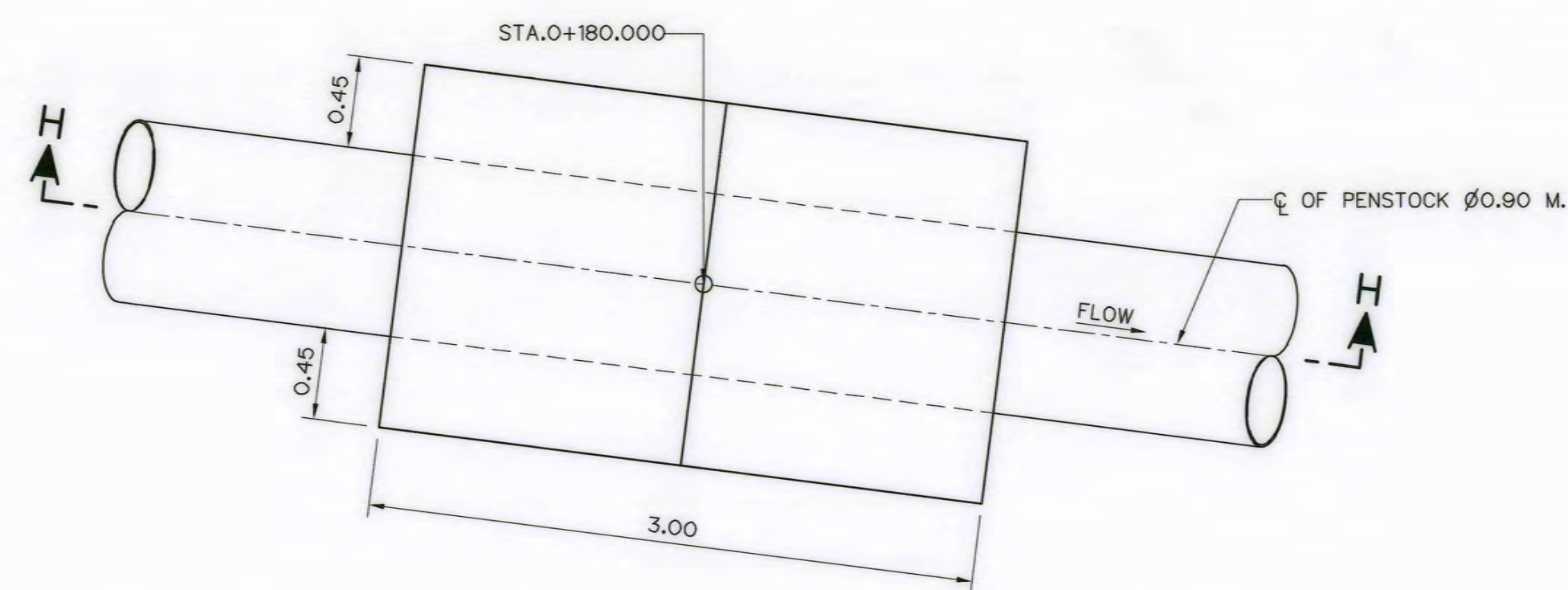
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK ANCHOR BLOCK DETAILS (SHEET 1/5)	
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>[Signature]</i> 28/10/2021 28/10/2021 DRAWN <i>[Signature]</i> CHECKED <i>[Signature]</i> 28/10/2021	REVIEWED <i>[Signature]</i> SUBMITTED <i>[Signature]</i> RECOMMENDED <i>[Signature]</i> APPROVED <i>[Signature]</i> 28/10/2021
PROJECT MANAGER DATE	SHEET NO. AKP-PS-04 53 OF 129



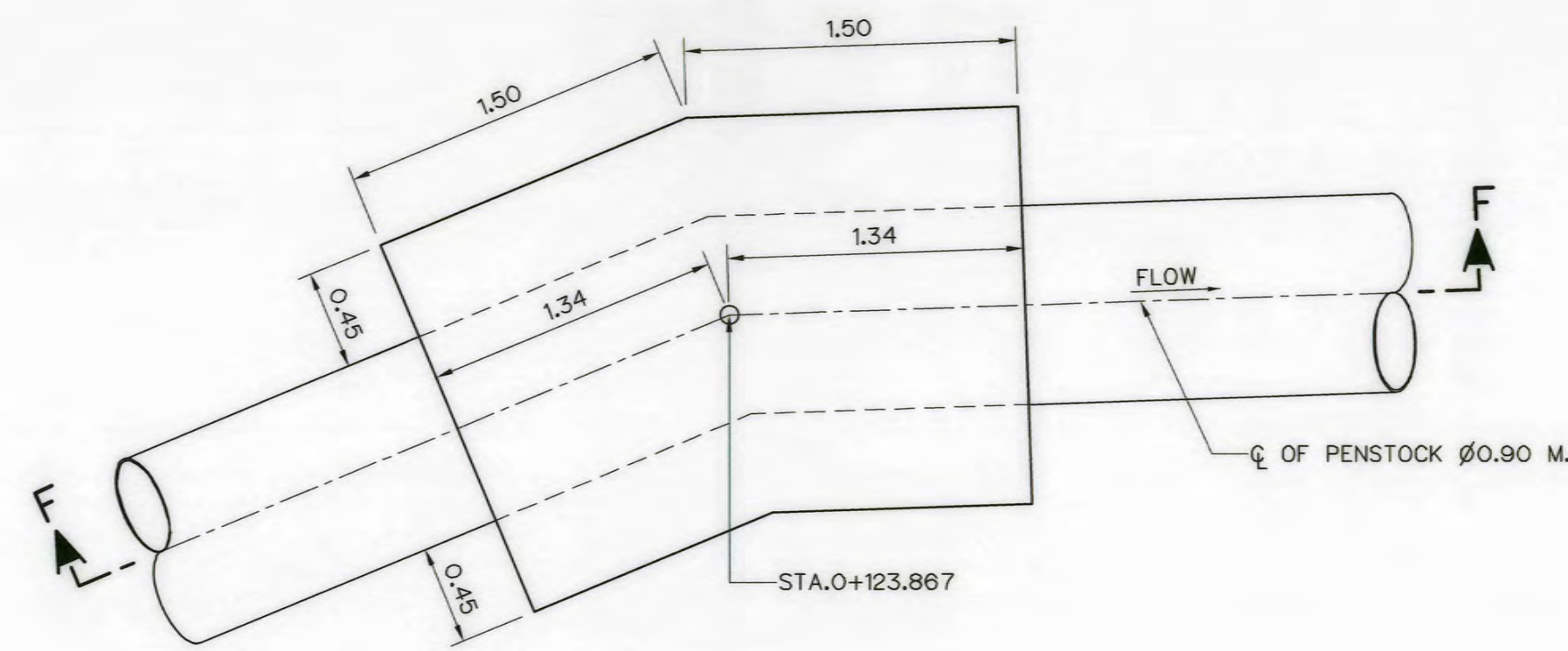
PLAN ANCHOR BLOCK ⑤ (STA.O+110.000)
SCALE 1:30



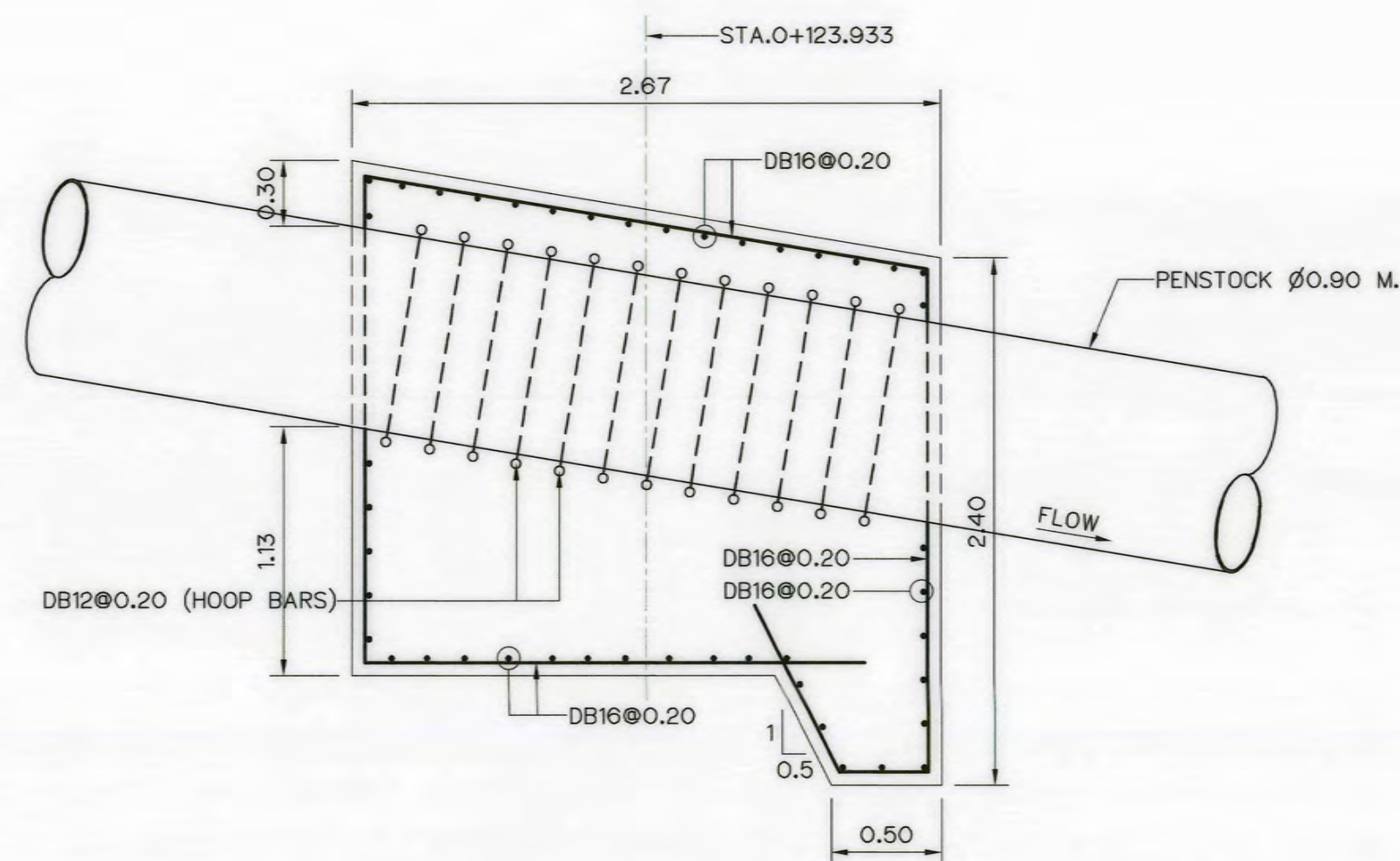
SECTION E-E
SCALE 1:30



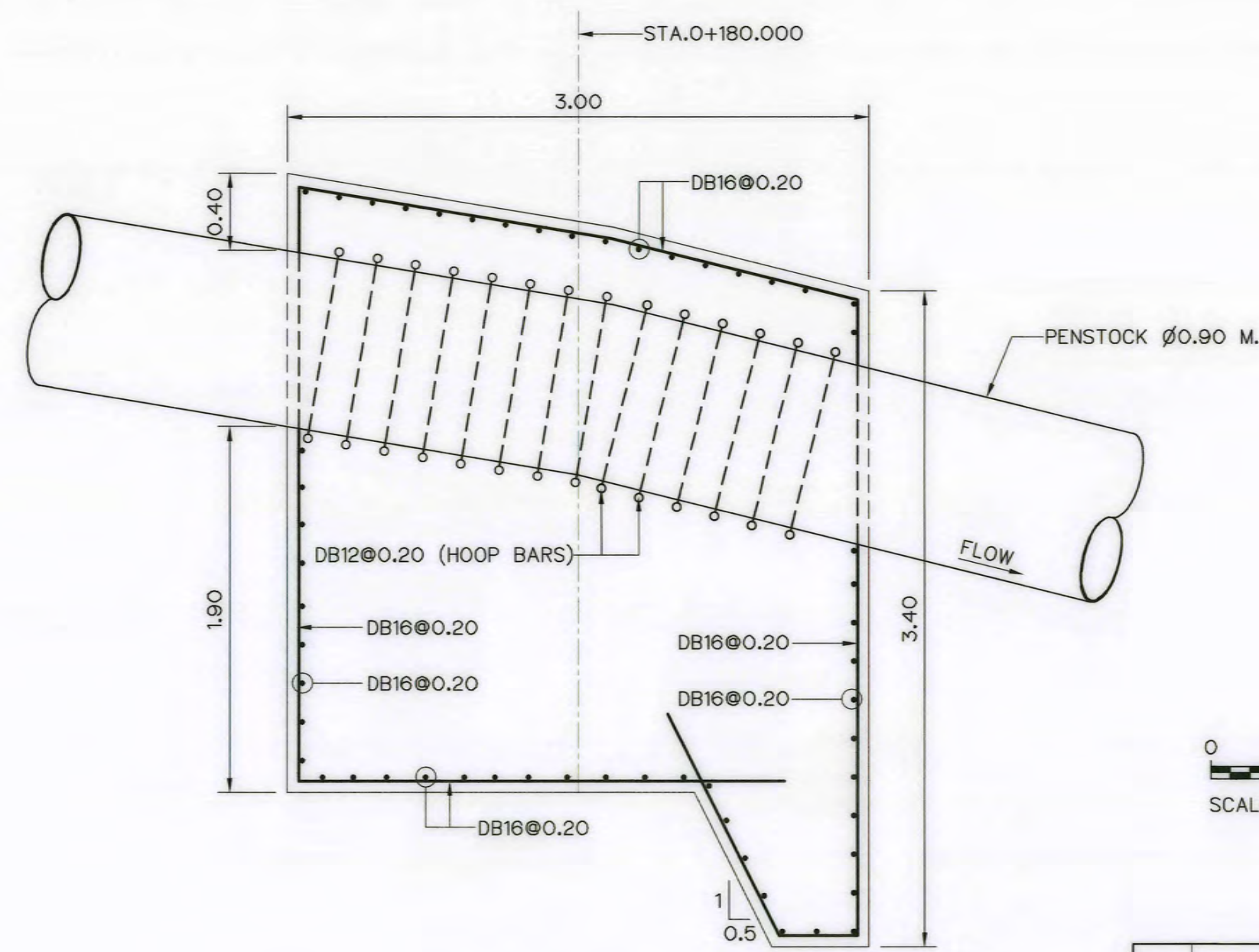
PLAN ANCHOR BLOCK ⑧ (STA.O+180.000)
SCALE 1:30



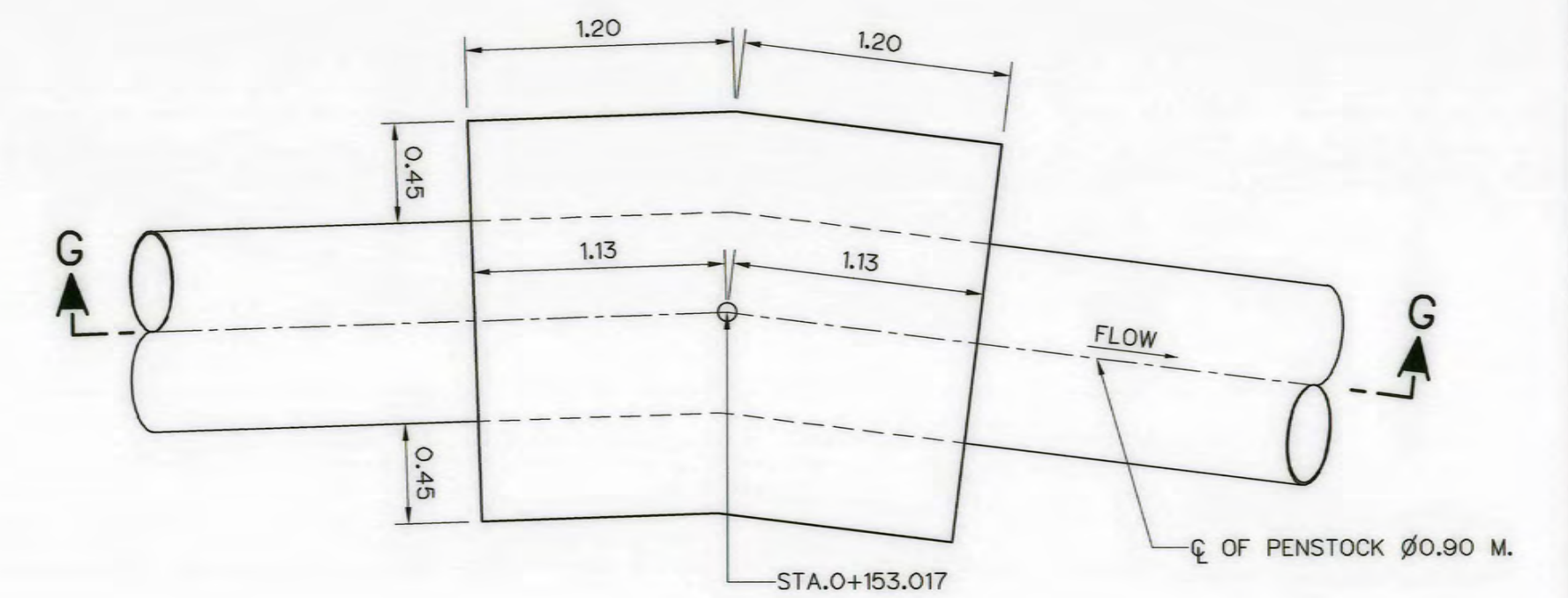
PLAN ANCHOR BLOCK ⑥ (STA.O+123.932)
SCALE 1:30



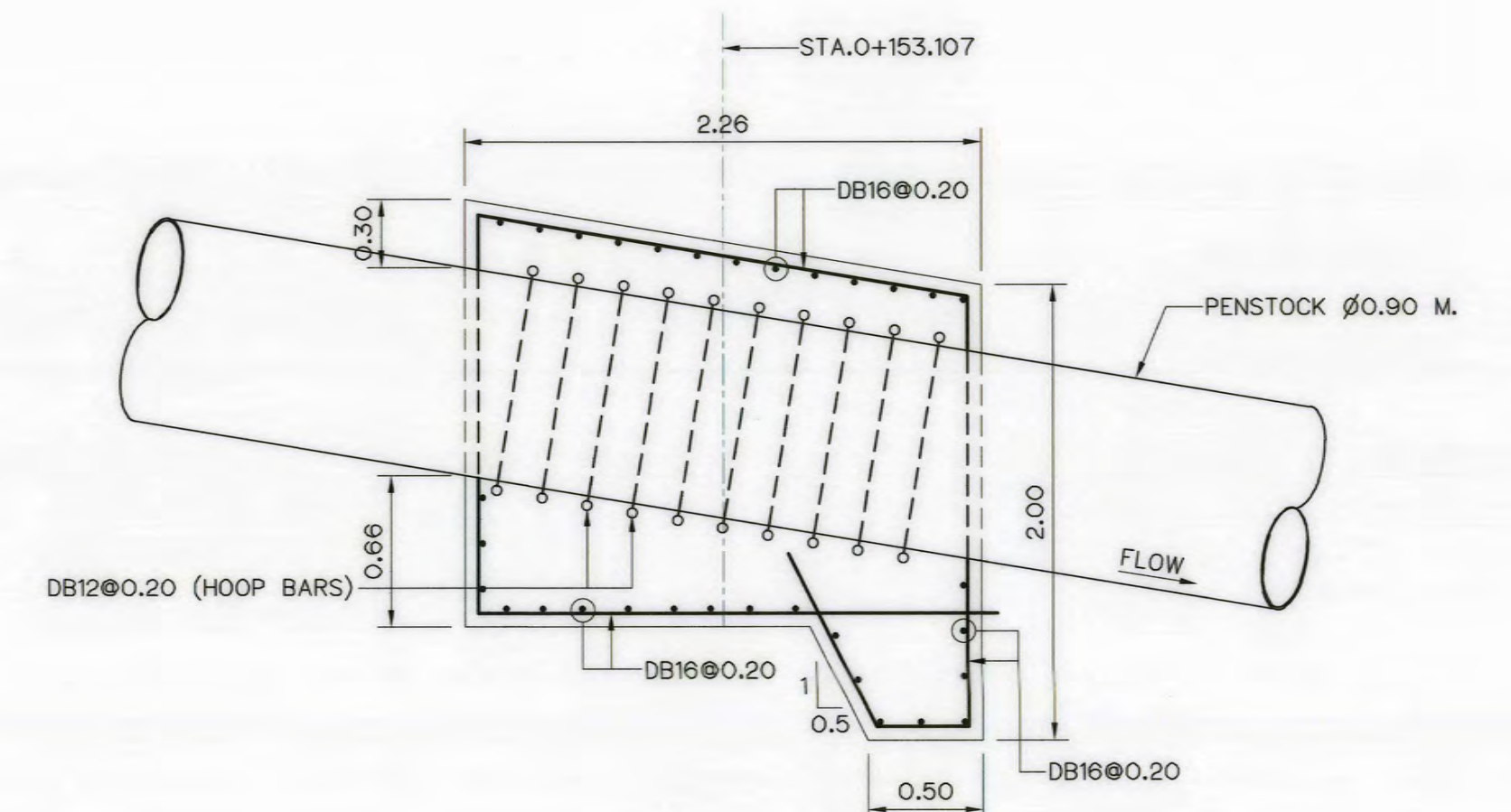
SECTION F-F
SCALE 1:30



SECTION H-H
SCALE 1:30



PLAN ANCHOR BLOCK ⑦ (STA.O+153.106)
SCALE 1:30



SECTION G-G
SCALE 1:30

NOTES :

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

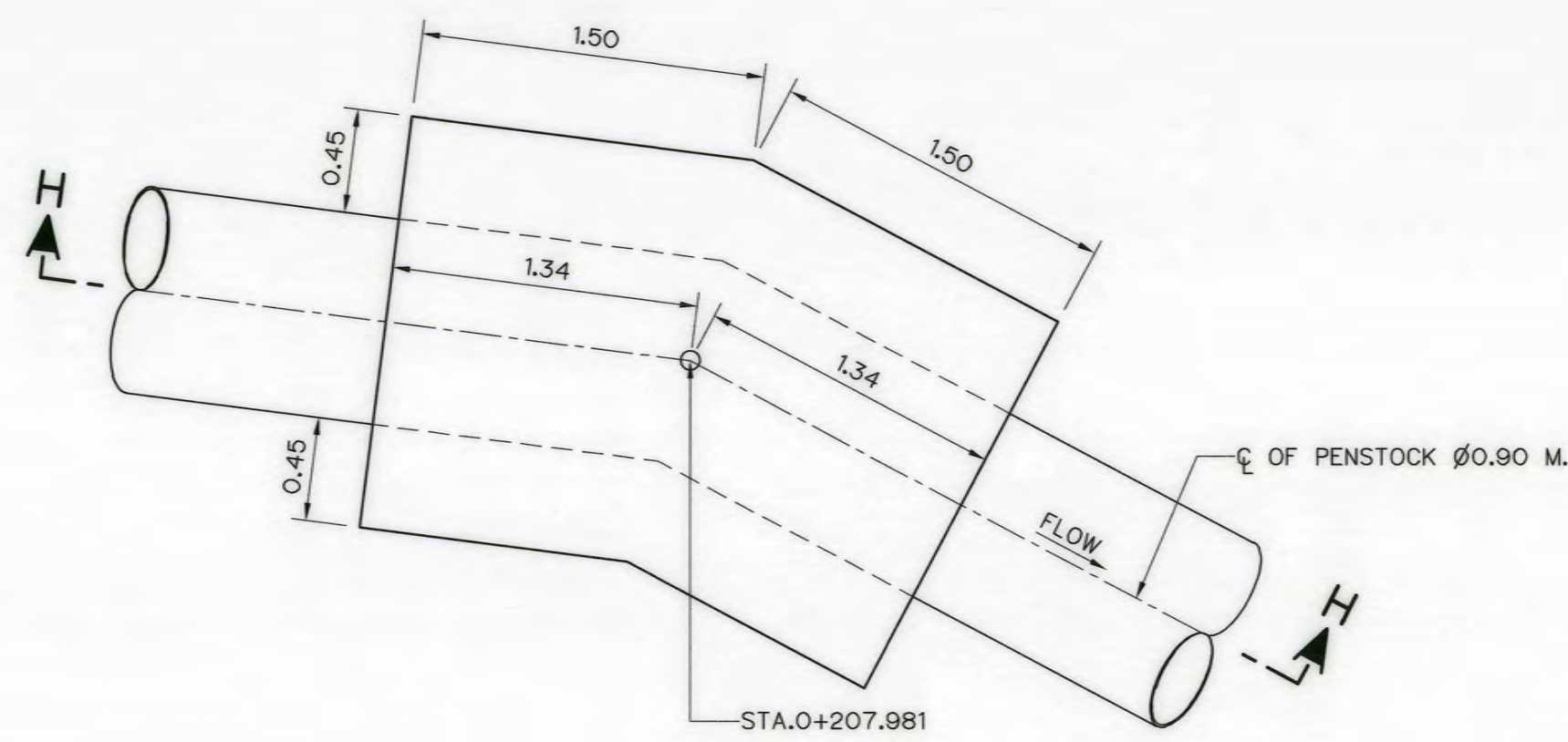
REFERENCE DRAWINGS :

1. PENSTOCK PLAN AND PROFILE, STA. 0+000 TO STA.O+358.645 AKP-PS-01

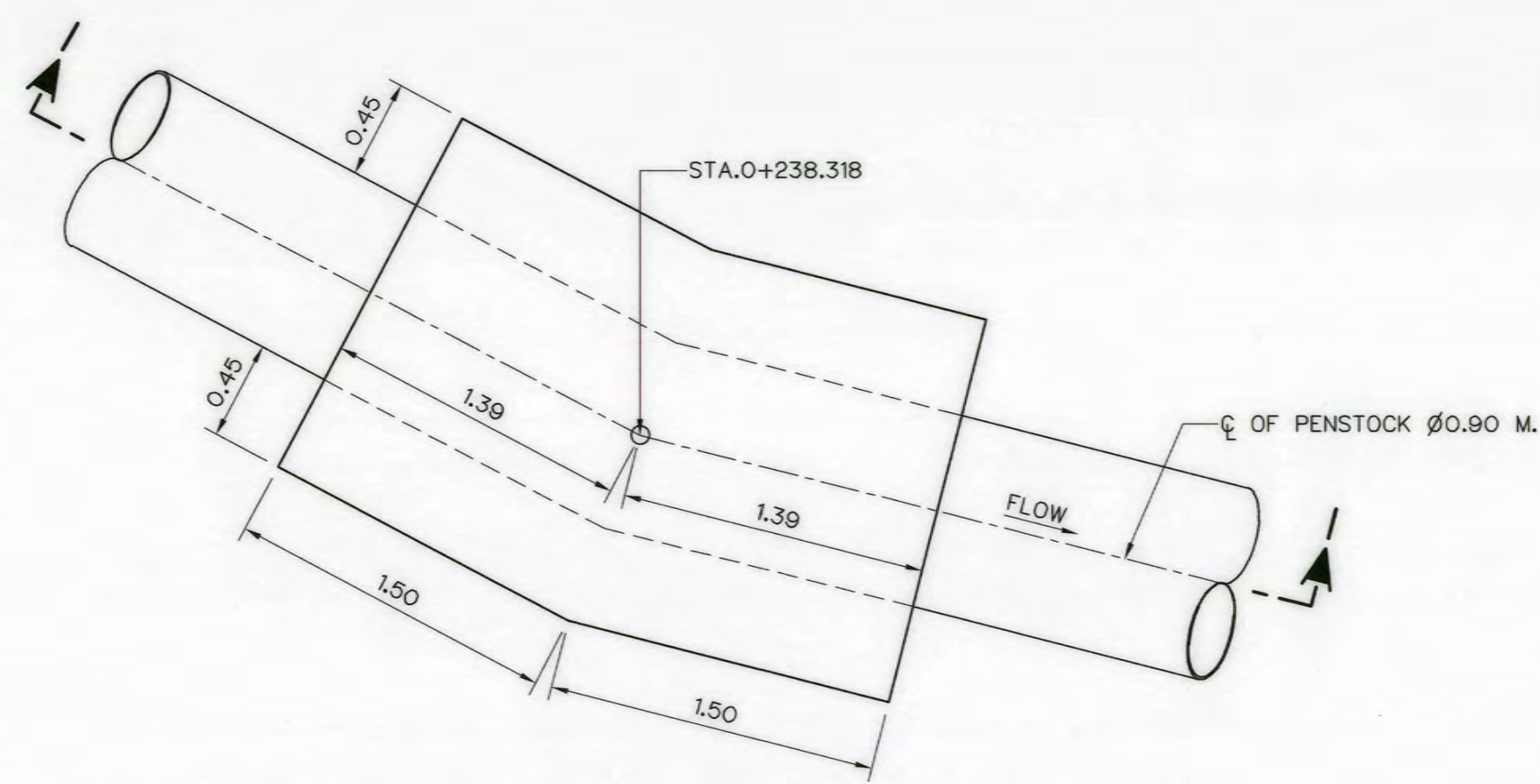


KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK ANCHOR BLOCK DETAILS (SHEET 2/5)	
DESIGNED <i>[Signature]</i> 28.9462 DRAWN <i>[Signature]</i> 28.8231 CHECKED <i>[Signature]</i> 28/10/2021 PROJECT MANAGER	REVIEWED <i>[Signature]</i> SUBMITTED <i>[Signature]</i> RECOMMENDED <i>[Signature]</i> APPROVED <i>[Signature]</i> DRAWING NO. 28/10/2021 SHEET NO. 54 OF 129

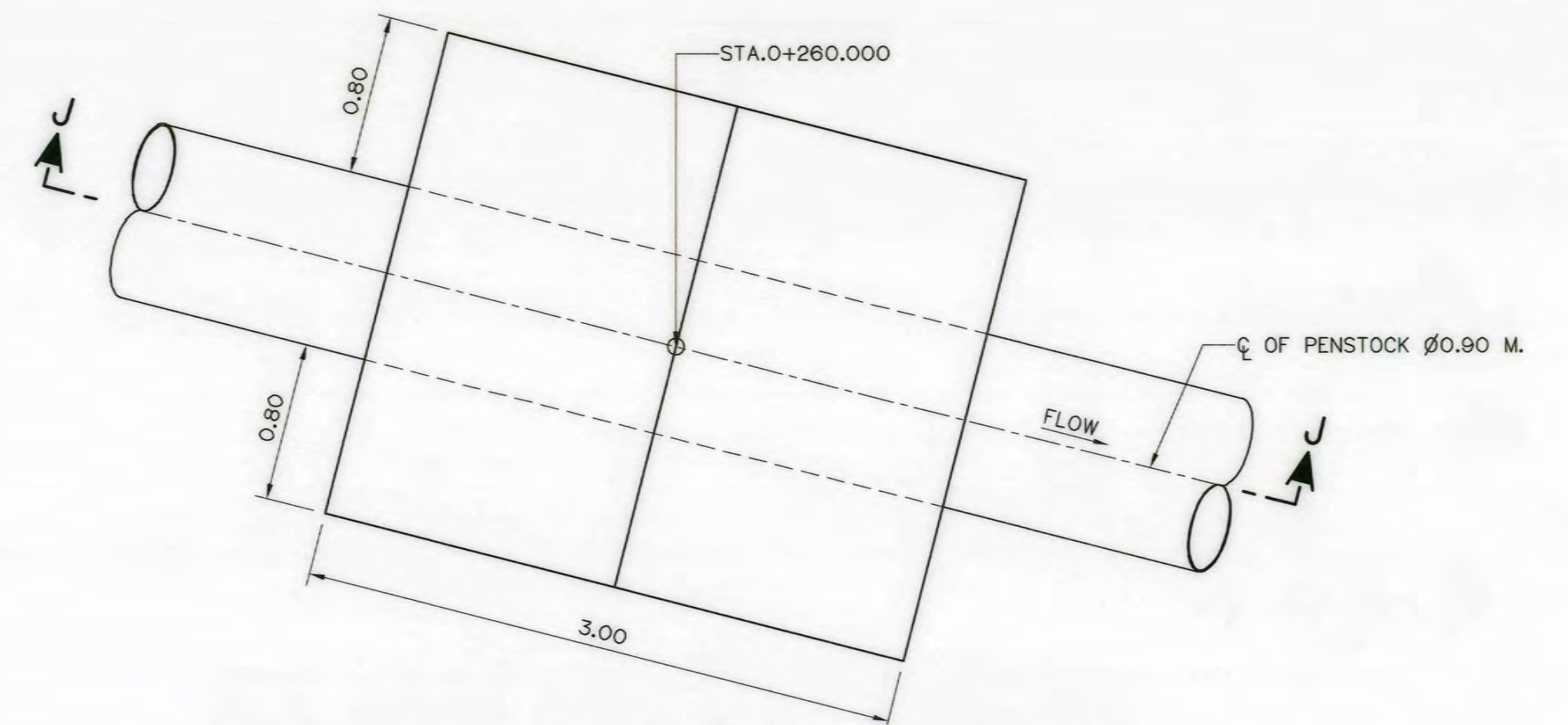
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2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED



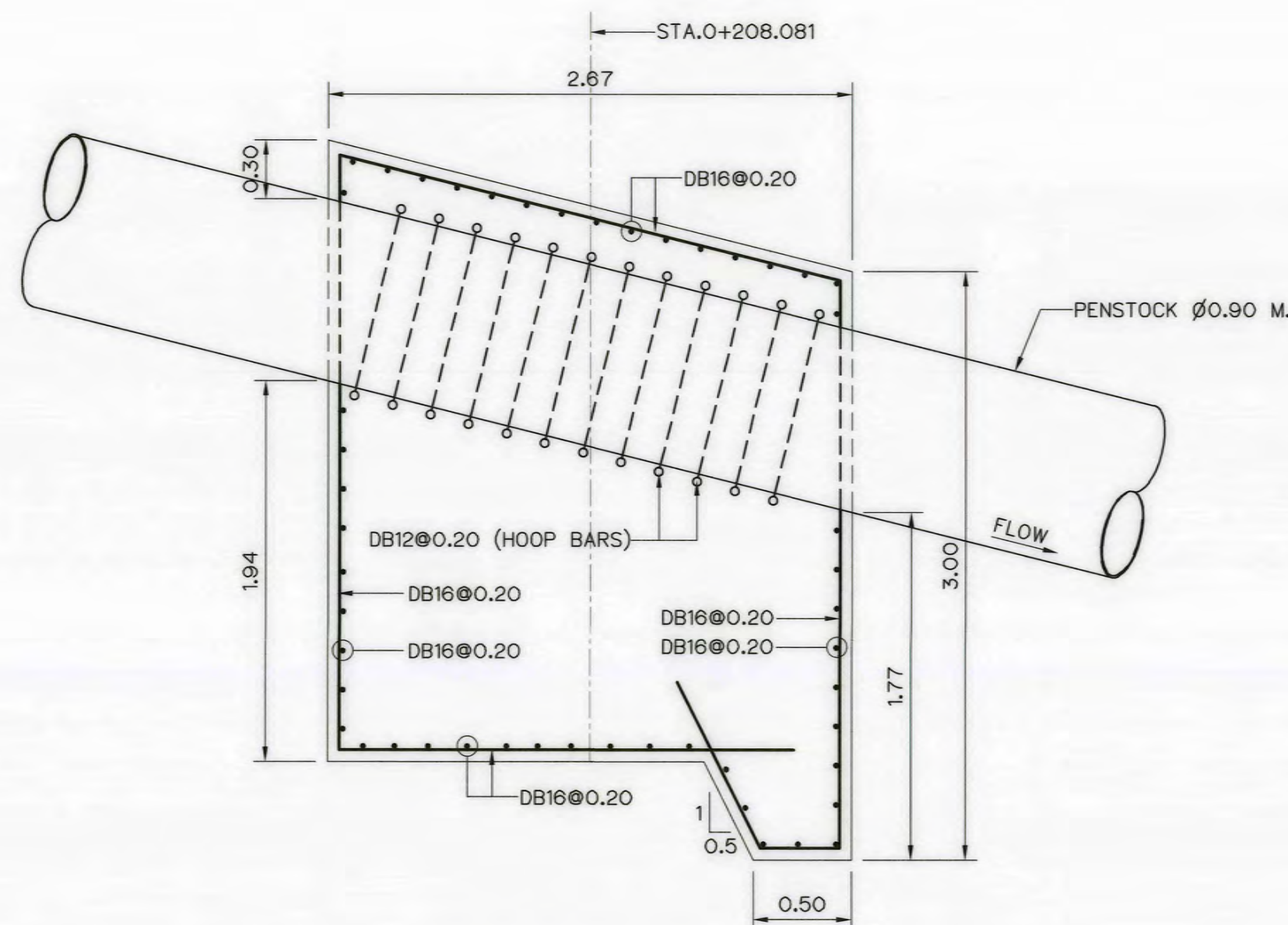
PLAN ANCHOR BLOCK ⑨ (STA.O+208.073)
SCALE 1:30



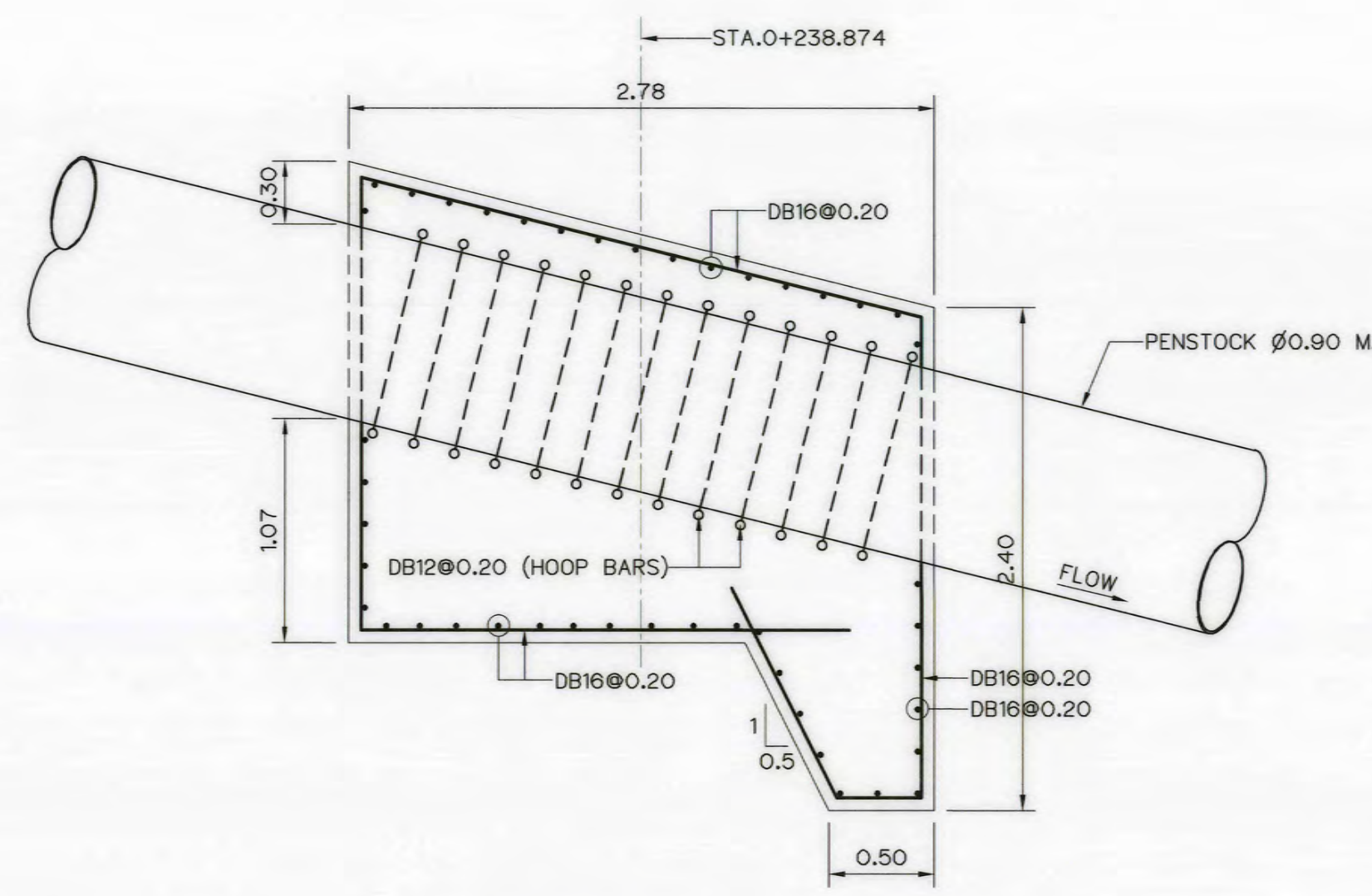
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SCALE 1:30



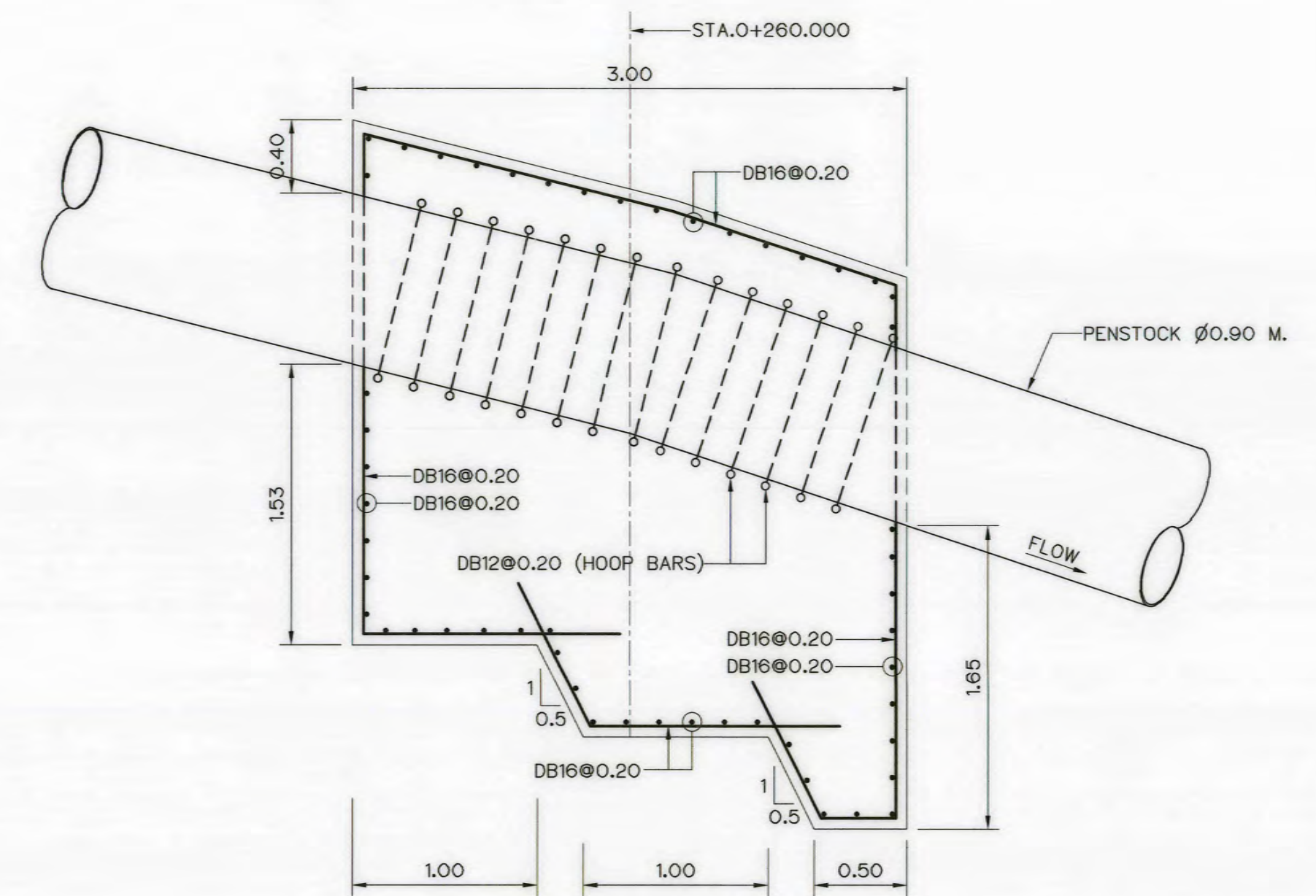
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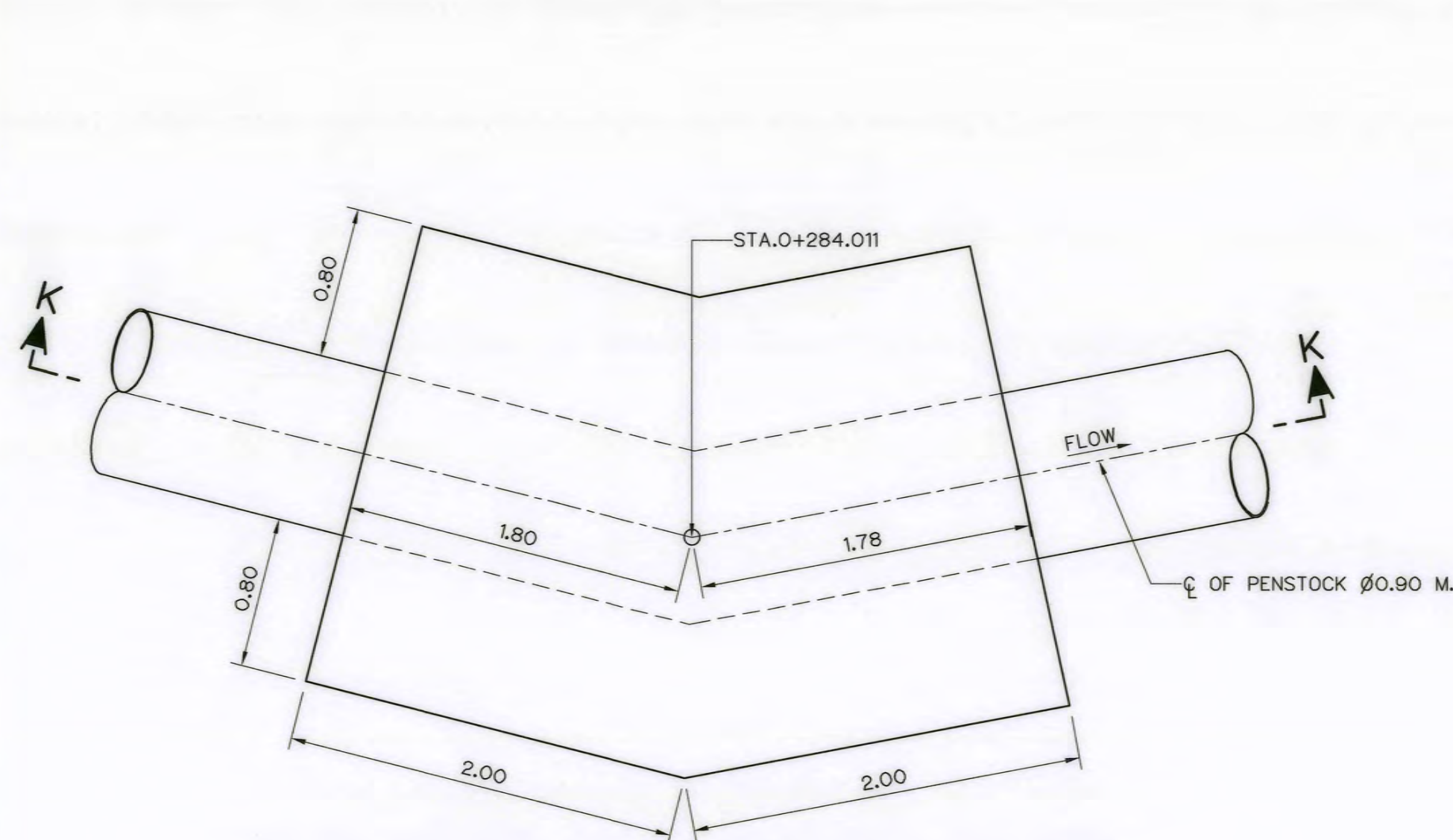
SECTION H-H
SCALE 1:30



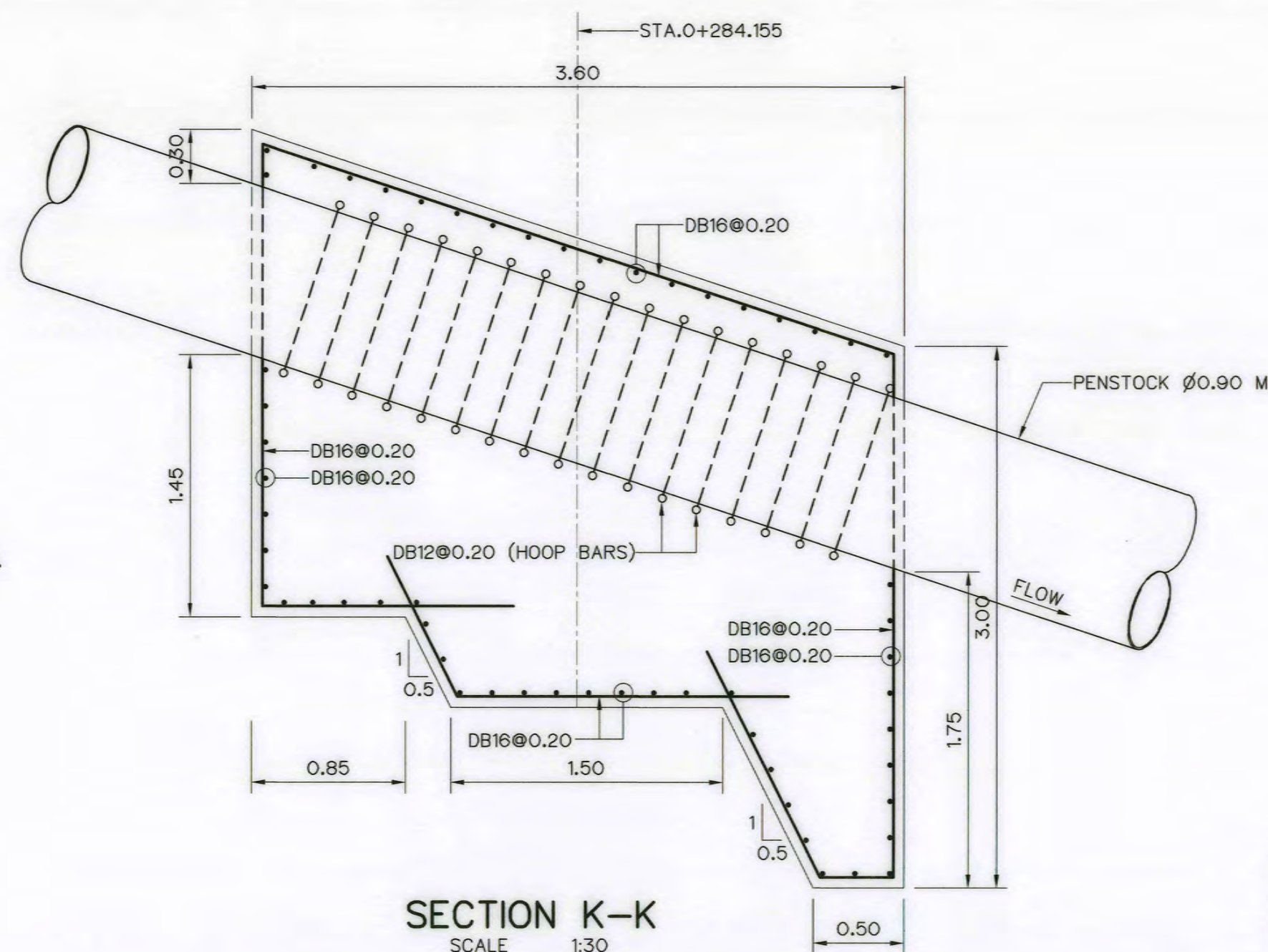
SECTION I-I
SCALE 1:30



SECTION J-J
SCALE 1:30



PLAN ANCHOR BLOCK ⑫ (STA.O+284.133)
SCALE 1:30



SECTION K-K
SCALE 1:30

NOTES :

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

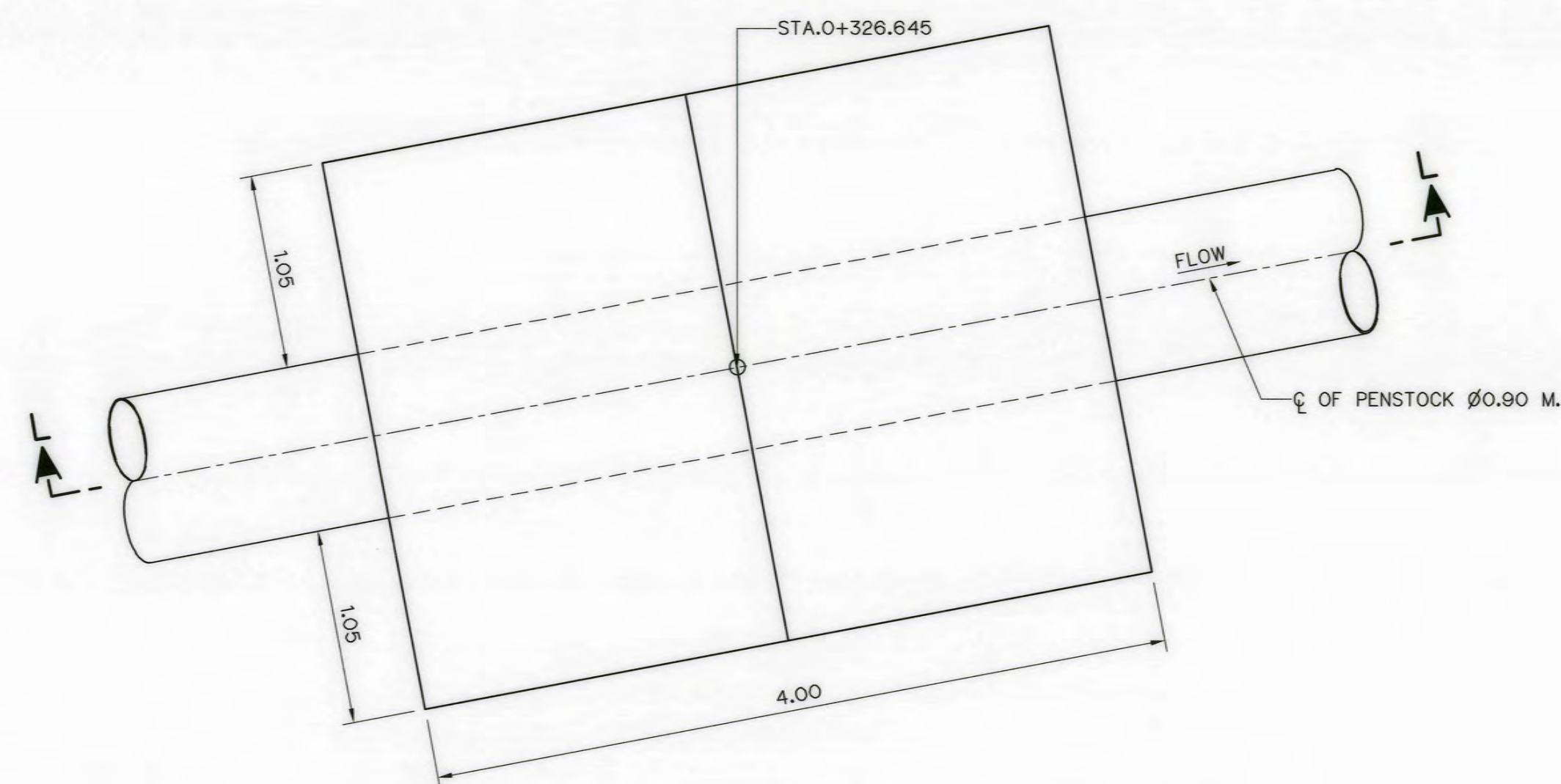
REFERENCE DRAWINGS :

1. PENSTOCK PLAN AND PROFILE, STA. 0+000 TO STA.O+358.645 AKP-PS-01

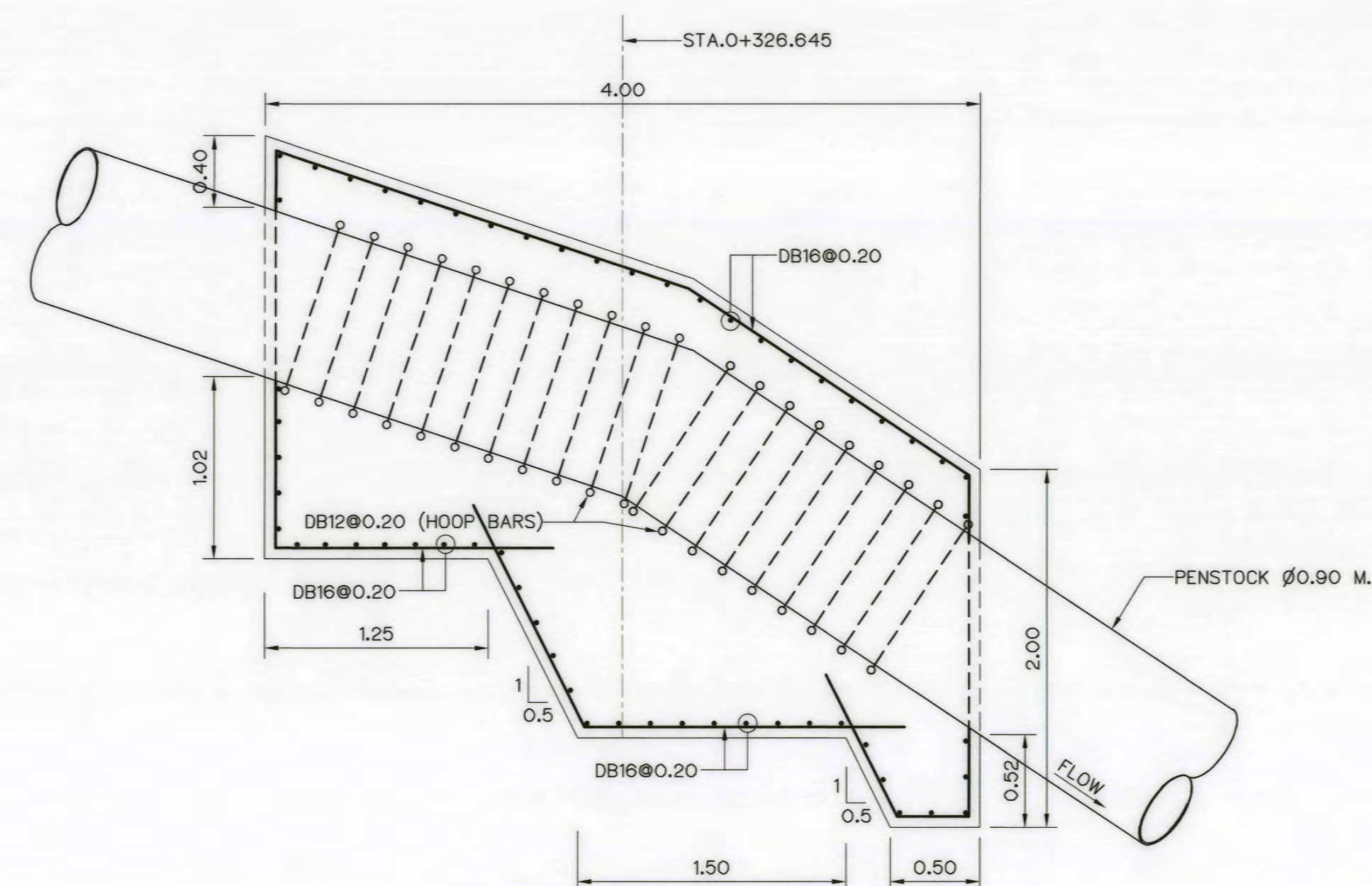


3				
2				
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NO.	DATE	REVISIONS	CHECKED	APPROVED
			CONSULTANTS	DEDE

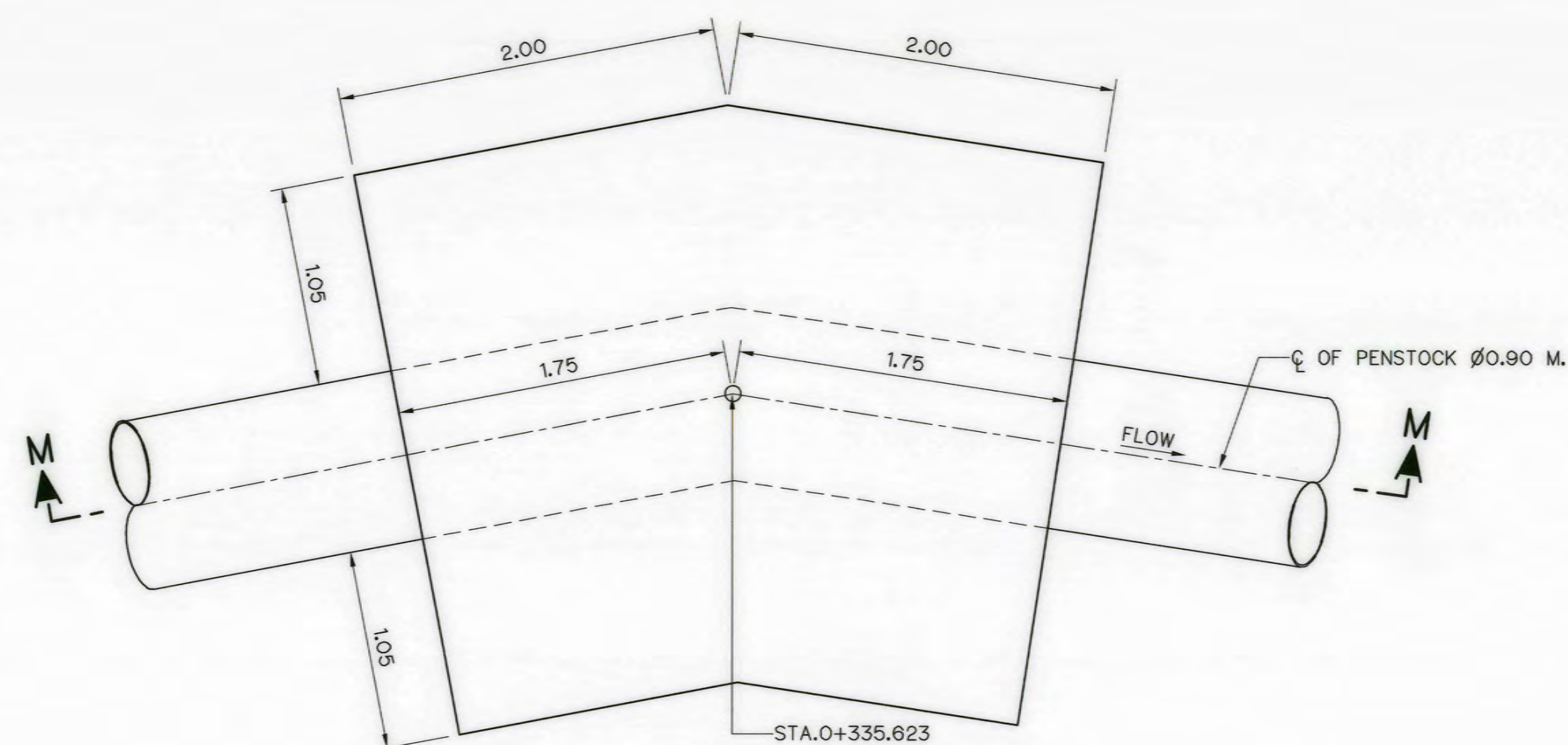
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
AI KA PO HYDROPOWER PROJECT TAMBON PHUKHAO THONG AMPHOE SUKHIRIN CHANGWAT NARATHIWAT	
PART : 1 CIVIL WORKS AND TRANSMISSION LINE PENSTOCK ANCHOR BLOCK DETAILS (SHEET 3/5)	
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED: <i>Wanwan</i> 28/10/2021 DRAWN: <i>Wanwan</i> CHECKED: <i>Wanwan</i> 28/10/2021 PROJECT MANAGER	REVIEWED: <i>Wanwan</i> SUBMITTED: <i>Wanwan</i> RECOMMENDED: <i>Wanwan</i> APPROVED: <i>Wanwan</i> 28/10/2021 DATE
AKP-PS-06	SHEET NO. 55 OF 129



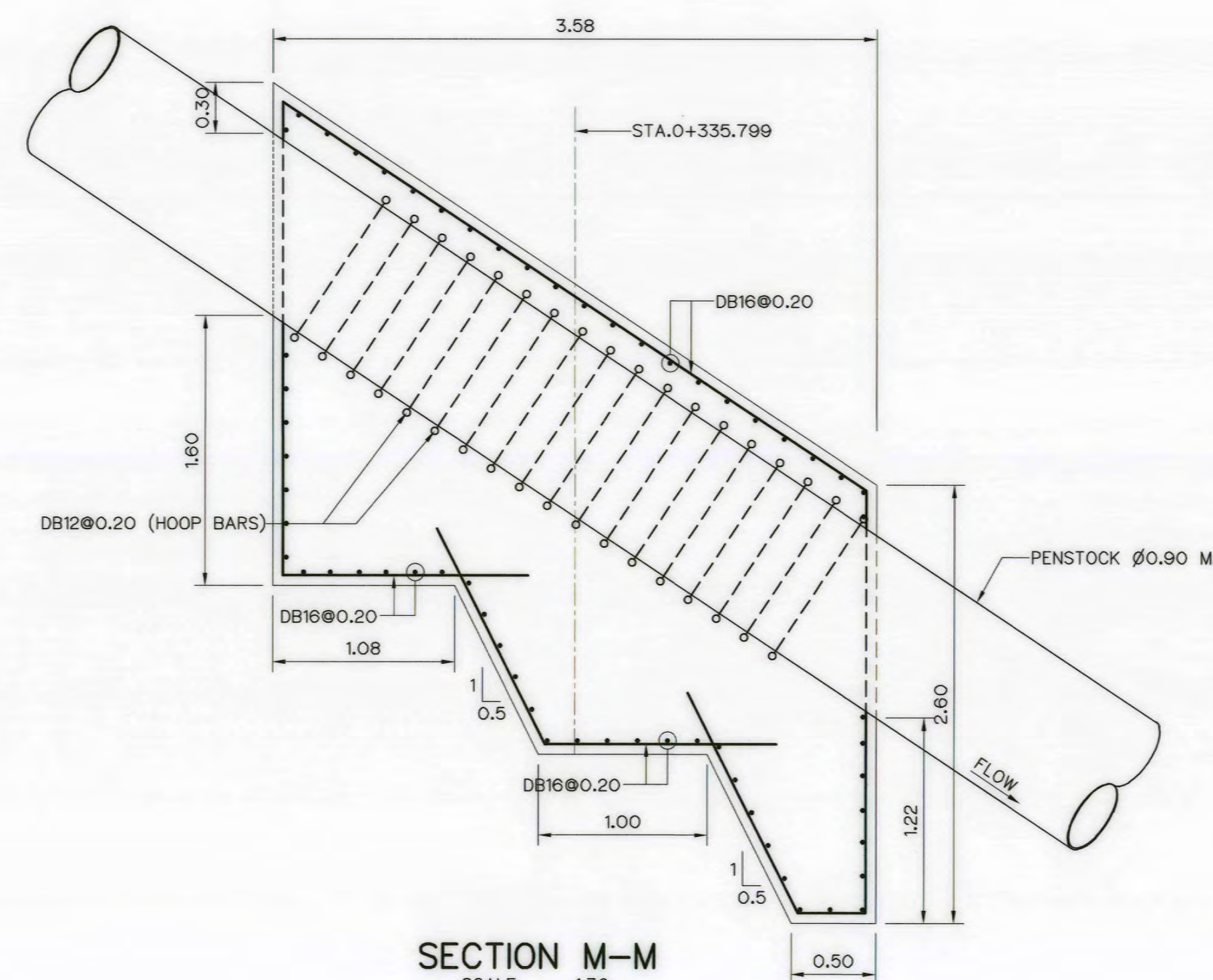
PLAN ANCHOR BLOCK 13 (STA.0+326.645)
SCALE 1:30



SECTION L-L
SCALE 1:30



PLAN ANCHOR BLOCK 14 (STA.0+335.780)
SCALE 1:30



SECTION M-M
SCALE 1:30

NOTES :

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

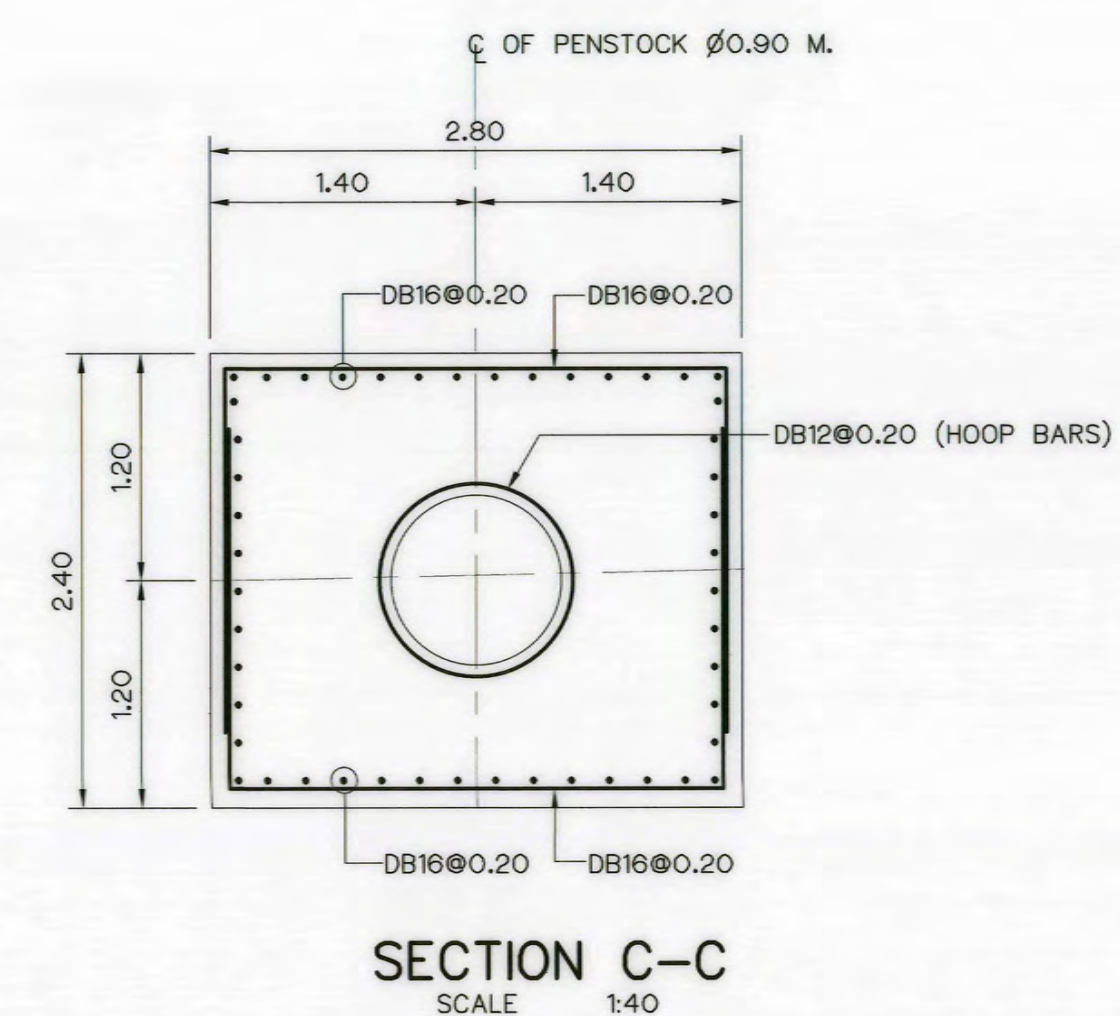
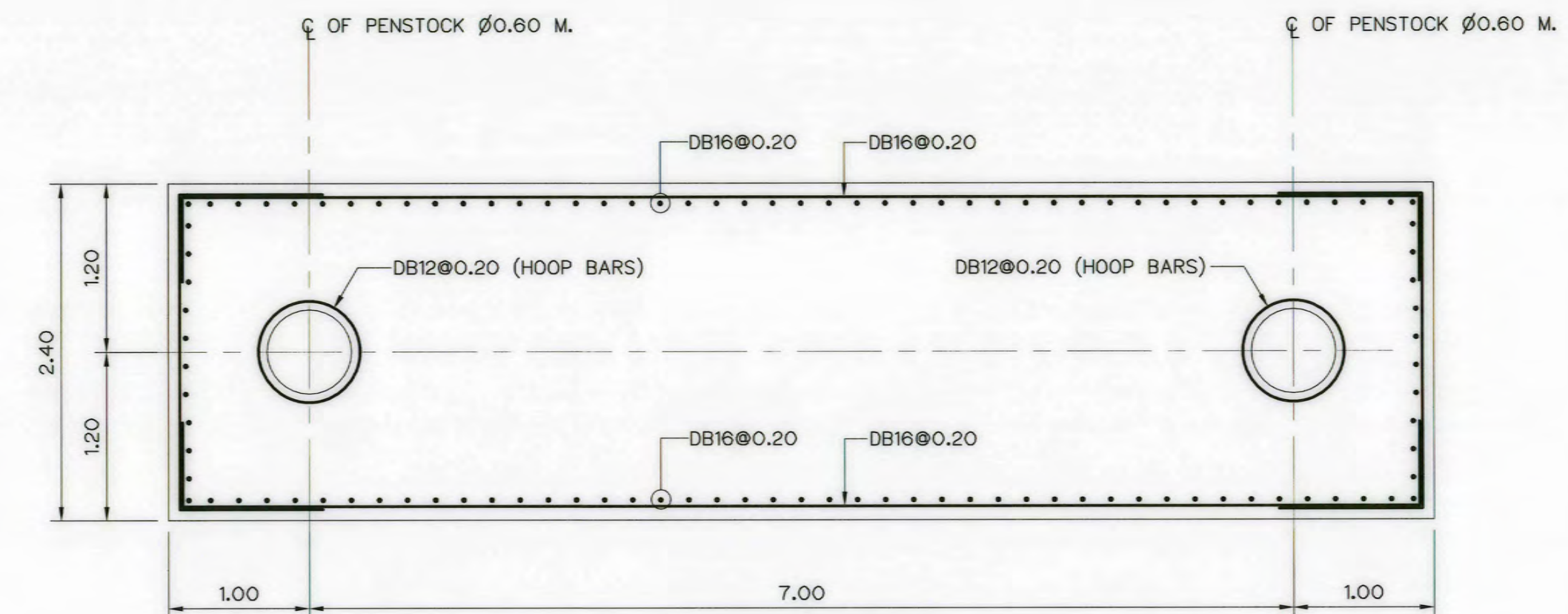
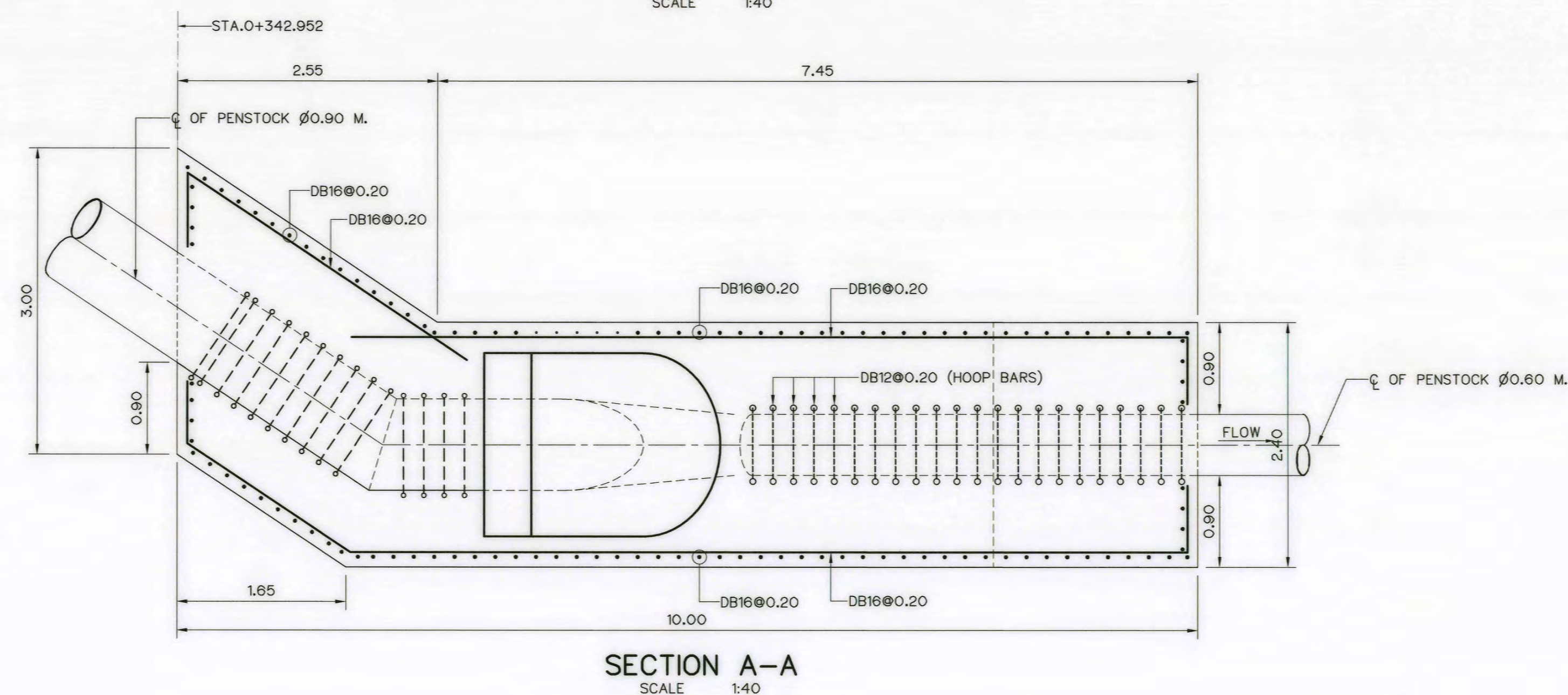
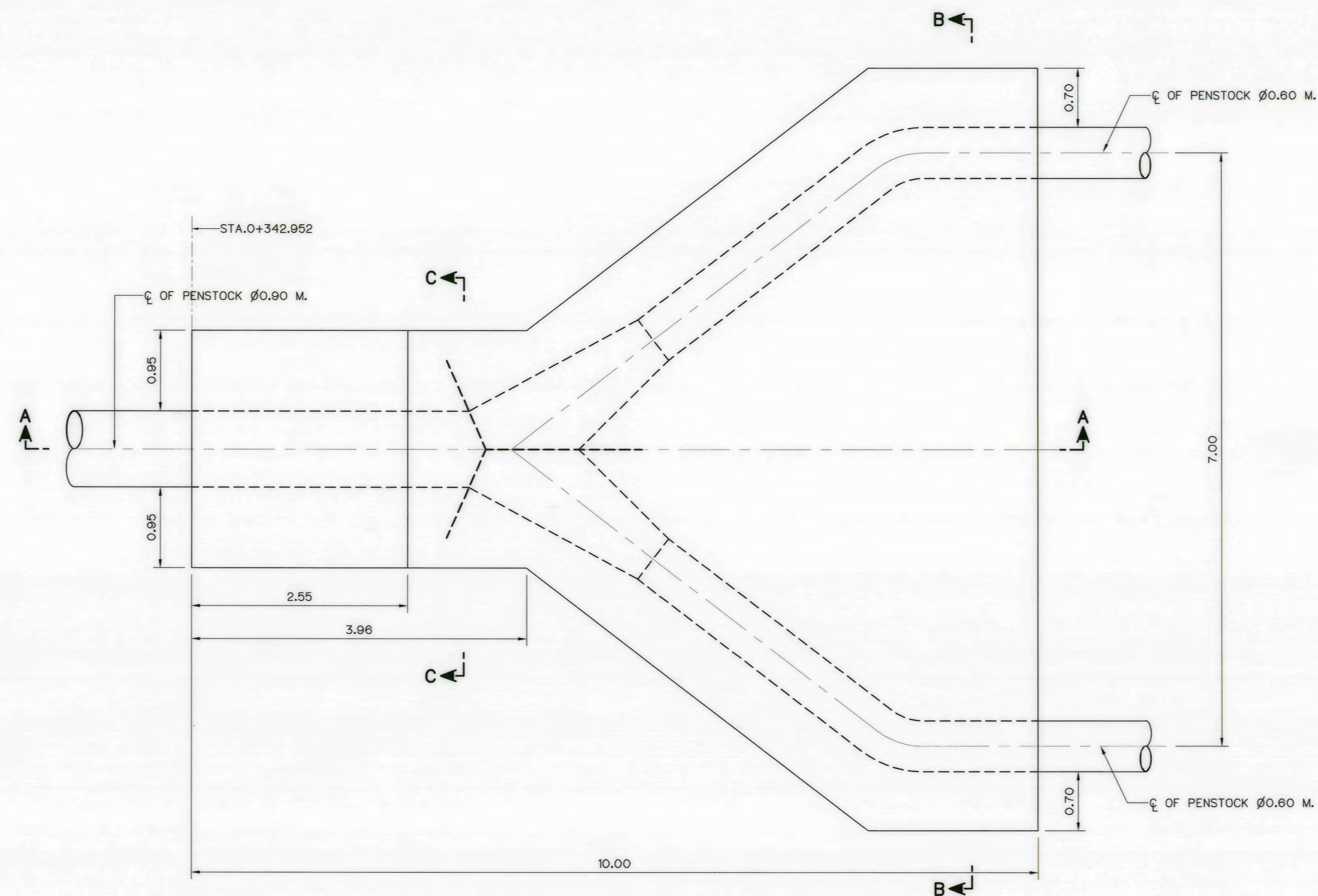
REFERENCE DRAWINGS :

1. PENSTOCK PLAN AND PROFILE, STA. 0+000 TO STA.0+358.645 AKP-PS-01



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 ANCHOR BLOCK DETAILS (SHEET 4/5)	
DESIGNED <i>Mun</i> 28/29074 28/9462 DRAWN <i>28/9462</i> CHECKED <i>28/9462</i> 28/10/2021 PROJECT MANAGER	REVIEWED <i>28/9462</i> SUBMITTED <i>28/9462</i> RECOMMENDED <i>28/9462</i> APPROVED <i>28/9462</i> 28/10/2021 DATE
SHEET NO. 56 OF 129	SHEET NO. 56 OF 129



NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. AKP-GN-03
3. THE ALIGNMENT OF THE PENSTOCK 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+358.645 AKP-PS-01



3				
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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 ANCHOR BLOCK DETAILS (SHEET 5/5)	
P&C MANAGEMENT CO., LTD. SPT CONSULTANTS CO., LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>28/10/2021</i>	REVIEWED <i>28/10/2021</i>
DRAWN <i>28/10/2021</i>	SUBMITTED <i>28/10/2021</i>
CHECKED <i>28/10/2021</i>	RECOMMENDED <i>28/10/2021</i>
APPROVED <i>28/10/2021</i>	APPROVED <i>28/10/2021</i>
PROJECT MANAGER	SHEET NO. 57 OF 129