



Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

KLONG THUNG PHEN 2 HYDROPOWER PROJECT

AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI

PART 1 : CIVIL WORKS

PART 2 : ELECTRO-MECHANICAL EQUIPMENT

PART 3 : TRANSMISSION LINE

VOLUME 4

DRAWINGS



P&C MANAGEMENT CO.,LTD.

KLONG THUNG PHEN 2 HYDROPOWER PROJECT

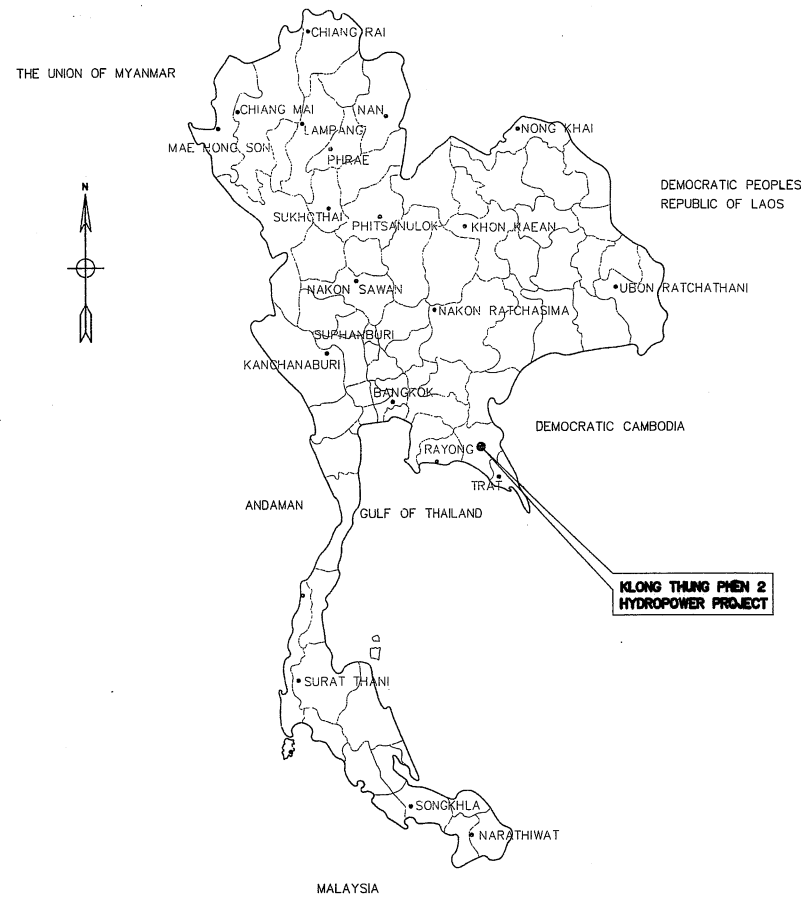
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TRANSMISSION LINE		
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81	KTP2-TS-02	22 kV., PLAN AND PROFILE, KM. 0+000 TO KM. 0+600
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83	KTP2-TS-04	22 kV., PLAN AND PROFILE, KM. 1+200 TO KM. 1+800
84	KTP2-TS-05	22 kV., PLAN AND PROFILE, KM. 1+800 TO KM. 2+400
85	KTP2-TS-06	22 kV., PLAN AND PROFILE, KM. 2+400 TO KM. 3+000
86	KTP2-TS-07	22 kV., PLAN AND PROFILE, KM. 3+000 TO KM. 3+600
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88	KTP2-TS-09	22 kV., PLAN AND PROFILE, KM. 0+000 TO KM. 0+600 (TO CONTROL HOUSE)
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90	KTP2-TS-11	22 kV. PLAN AND PROFILE, KM. 1+200 TO KM. 1+351.80 (TO CONTROL HOUSE)
91	KTP2-TS-12	22 kV., POLE TYPE "A" AND "B"
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95	KTP2-TS-16	22 kV., POLE ASSEMBLY ACCESSORIES, ANCHOR BOLT FOR GUY
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LIST OF EXISTING STRUCTURE DRAWINGS

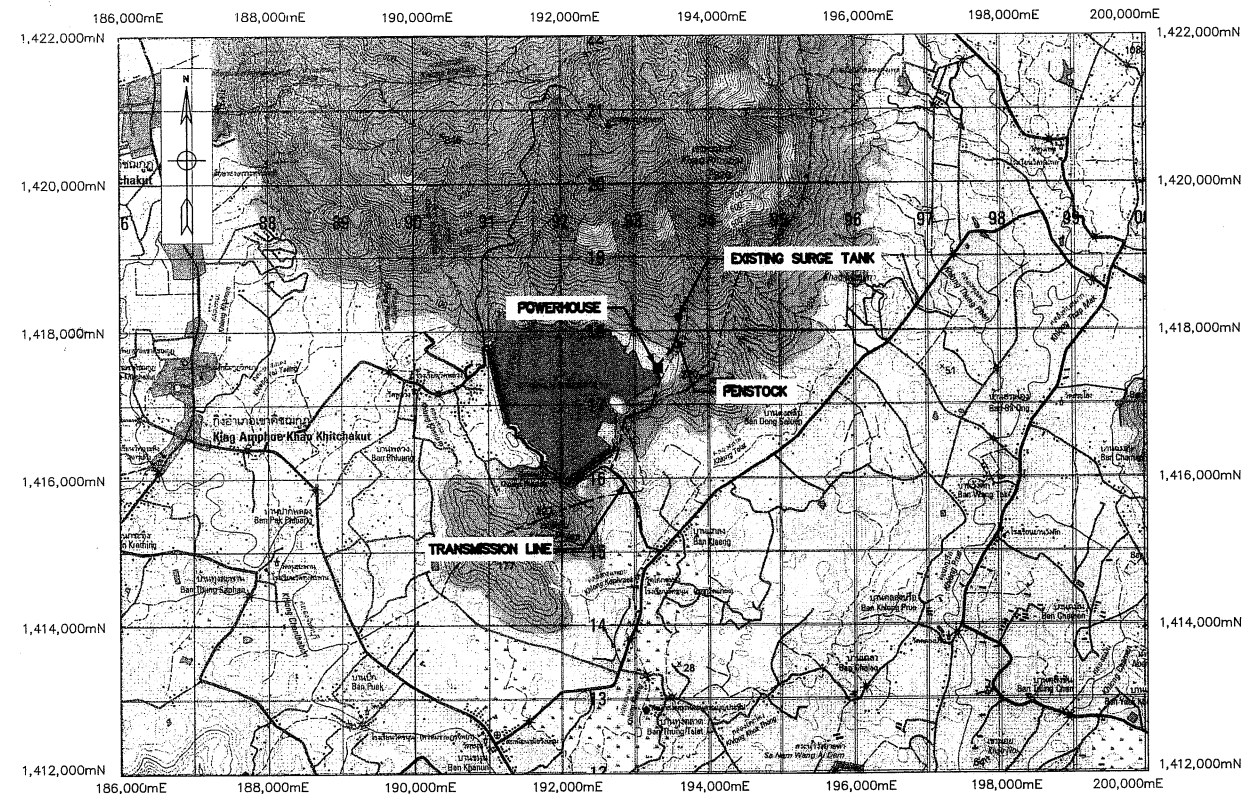
SHEET NO.	DRAWING NO.	DRAWING DETAILS
IN HEADRACE TUNNEL TO POWER STATION		
1	TPUS-C1-W303/1	PLAN AND SECTION
PENSTOCK CROSSING AND IMPROVEMENT OF EXISTING FOR IRRIGATION AREA		
2	TPUS-C1-W310-ADD/1	GENERAL LAYOUT PLAN
POWER STATION AND TAILRACE CANAL		
3	TPUS-C1-P001	GENERAL ARRANGMENT



LOCATION MAP
NOT TO SCALE



KLONG THUNG PHEN 2 HYDROPOWER PROJECT SITE LOCATION
NOT TO SCALE



PROJECT AREA

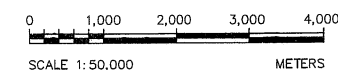
SCALE 1:50,000

LEGEND :

- 3322 NATIONAL HIGHWAYS
- RIVER, CANAL
- PROVINCE LOCATION
- DISTRICT
- TOURIST ATTRACTION
- GAS STATION

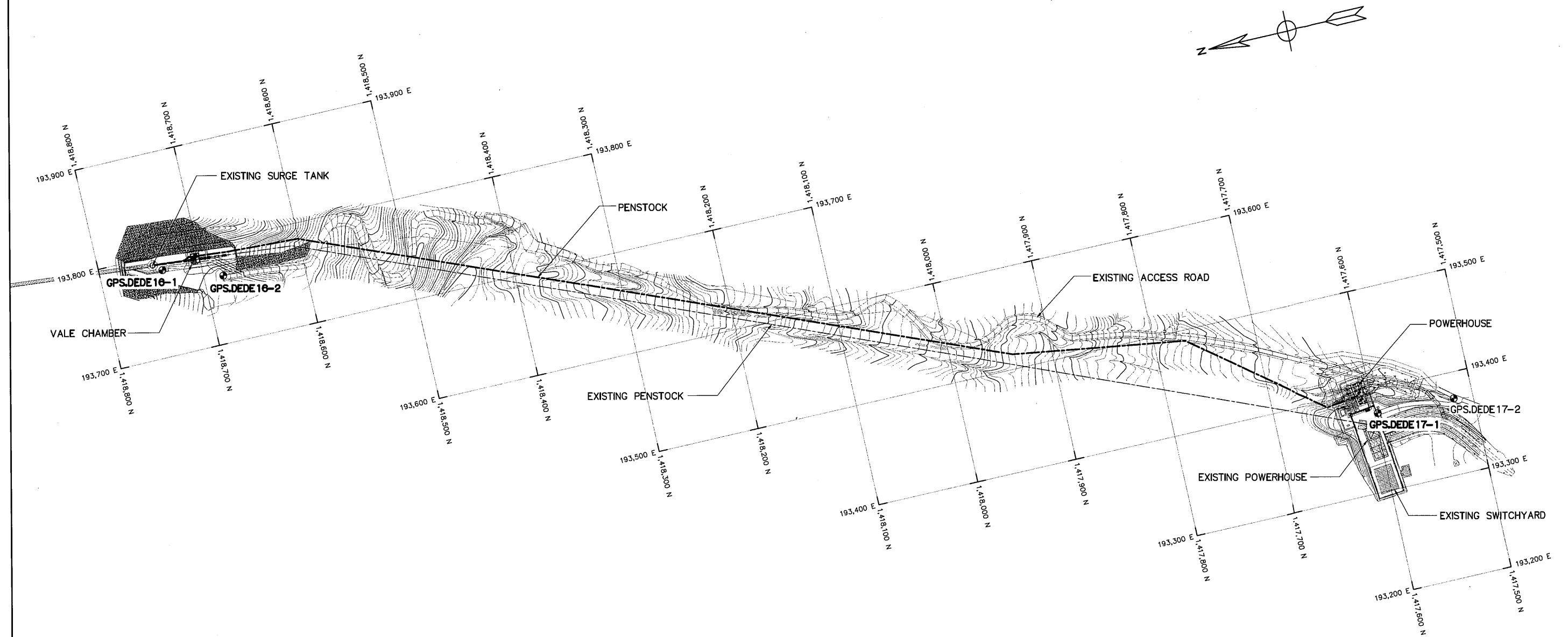
NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METRES, DISTANCES ARE IN KILOMETRES, UNLESS OTHERWISE SHOWN.
- SITE LOCATION MAP IS BASED ON THE HIGHWAY MAP 1:1,000,000 SCALE, PUBLISHED BY TOURISM AUTHORITY OF THAILAND.
- THE MAP OF KLONG THUNG PHEN 2 HYDROPOWER PROJECT SITE AND RESERVOIR IS BASED ON TOPOGRAPHIC MAPS, SCALE 1:50,000 (SHEET 5434IV WGS 84) PUBLISHED BY THE ROYAL THAI SURVEY DEPARTMENT, 1999.



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
CONSULTANTS		DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS GENERAL LOCATION MAP AND PROJECT AREA MAP			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED		APPROVED	
PROJECT MANAGER	17/03/2020	DRAWING NO.	KTP2-GN-01
DATE		SHEET NO.	1 OF 97



GENERAL LAYOUT
SCALE 1:2,000

NO.	BENCH MARK	WGS 84 GRID CO-ORDINATE		ELEVATION M. (M.S.L)	AZIMUTH	DISTANCE (M.)	REMARK
		NORTHING	EASTING				
1	GPS. DEDE16-1	1,418,738.276	193,784.797	+243.144			BRASS PINS BURIED IN A CONCRETE RETAINING WALL BESIDE THE SURGE TANK
					198° 10' 17.1"	60.634	DISTANCE & AZIMUTH FROM GPS DEDE 16-1 TO GPS DEDE 16-2
2	GPS. DEDE16-2	1,418,680.666	193,765.888	+238.101			BRASS PIN BURIED IN THE CONCRETE ROAD SURFACE AT THE END OF THE ROAD
3	GPS. DEDE17-1	1,417,596.587	193,376.896	+73.401			BRASS PINS BURIED IN THE MIDDLE OF THE CONCRETE IN THE MIDDLE OF THE POWER HOUSE ENTRANCE KLONG THUNG PHEN PROJECT
					182° 01' 47.8"	77.458	DISTANCE & AZIMUTH FROM GPS DEDE 17-1 TO GPS DEDE 17-2
4	GPS. DEDE17-2	1,417,519.177	193,374.153	+74.376			BRASS PINS BURIED ON CONCRETE AT THE CORNER OF THE ENTRANCE TO THE POWER PLANT OF KLONG THUNG PHEN PROJECT

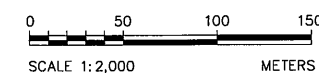
NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

1. CONTROL HOUSE, GENERAL LAYOUT
2. PENSTOCK, PLAN AND PROFILE, KM. 0+000 TO KM. 0+600
3. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860
4. POWERHOUSE, GENERAL LAYOUT
5. TAILRACE, LAYOUT PLAN

KTP2-CH-01
KTP2-PS-01
KTP2-PS-02
KTP2-PH-01
KTP2-TR-01



NO.	DATE	REVISIONS	CHECKED	APPROVED
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			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS GENERAL GENERAL LAYOUT			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		REVIEWED	
28/1/57		SUBMITTED	
DRAWN		RECOMMENDED	
28/1/57		APPROVED	
17/03/2020		DRAWING NO.	
PROJECT MANAGER		DATE	
		KTP2-GN-02	
		SHEET NO.	
		2 OF 97	

ABBREVIATIONS :

A	CROSS-SECTION AREA OF FLOW	MAX.	MAXIMUM
AC.	ASBESTOS CEMENT PIPE	M.S.L.	MEAN SEA LEVEL
AGG.	AGGREGATE	MISC.	MISCELLANEOUS
ALT.	ALTERNATIVE	N.	NORTH
APPROX.	APPROXIMATE	n.	MANNING'S ROUGHNESS COEFFICIENT
AZ.	AZIMUTH	N.F.	NEAR FACE
B.	BEGINNING OF SURVEY	NGL.	NATURAL GROUND LEVEL
BC.	BEGINNING OF CURVE	NO. OR #	NUMBER
BF.	BOTTOM FACE	N.W.L.	NORMAL WATER LEVEL
B	BEAM	OD.	OUTSIDE DIAMETER
B.M.	BENCH MARK	O.F.	OUTSIDE FACE
BOTT.	BOTTOM	O&M	OPERATION & MAINTENANCE
BRG.	BEARING	PC.	POINT OF HORIZONTAL CURVATURE
C.B.R.	CALIFORNIA BEARING RATIO	PI.	POINT OF HORIZONTAL INTERSECTION
C/C	CENTER TO CENTER	PL.	PLATE
CL	CENTER LINE	P.O.C.	POINT ON CURVE
CL.	CLEARANCE	P.O.T.	POINT ON TANGENT
CM. OR cm.	CENTIMETER	P.O.S.T.	POINT ON SUB-TANGENT
CMS. OR cms.	CUBIC METER PER SECOND	PRC.	POINT OF HORIZONTAL REVERSE CURVE
COL.	COLUMN	PT.	POINT OF TANGENT
CONC.	CONCRETE	PVC.	POLYVINYL CHLORIDE
D	DEGREE OF CURVE	PVC.	POINT OF VERTICAL CURVATURE
DB.	DEFORM BAR	PVI.	POINT OF VERTICAL INTERSECTION
d.	DEPTH OF WATER	PVRC.	POINT OF VERTICAL REVERSE CURVE
DIA. OR Ø	DIAMETER	PVT.	POINT OF VERTICAL TANGENT
DOH.	DEPARTMENT OF HIGHWAY	Q.	DISCHARGE
DWG.	DRAWING	QTY. QUAN.	QUANTITY
DEDE.	DEPARTMENT OF ALTERNATIVE ENERGY	R	RADIUS OF CURVATURE
	DEVELOPMENT AND EFFICIENCY	r	HYDRAULIC RADIUS
E	EAST	RB.	ROUND BAR
E	END OF SURVEY	RC.	REINFORCED CONCRETE
EA.	EACH	RD.	ROAD
E.C.	END OF CURVE	REF.	REFERENCE
E.I.T.	THE ENGINEERING INSTITUTE OF THAILAND	REINF.	REINFORCEMENT
	UNDER H.M. THE KINGS PATRONAGE	REQ'D	REQUIRED
E.F.	END OF FACE	RID.	ROYAL IRRIGATION DEPARTMENT
EL. OR ELEV.	ELEVATION	R.W.L.	RETENTION WATER LEVEL
EXIST.	EXISTING	SCH.	SCHEDULE
EXP.	EXPANSION	SE.	SUPERELEVATION
EXT.	EXTERIOR	SETC.	SECTION
EX.	EXTERNAL DISTANCE OF CURVE	S.P.C.T.	STANDARD PROCTOR COMPACTION TEST
f	FREE BOARD , FINISH	S.S.	SIDE SLOPE
F.F.	FAR FACE	STIR.	STIRRUP
F.S.L.	FULL SUPPLY LEVEL	STA.	STATION
FTG.	FOOTING	STD.	STANDARD
HD.	HEAD	STR.	STRUCTURE
HEX.	HEXAGONAL	SYMM.	SYMMETRICAL
HOR.	HORIZONTAL	T.	TANGENT LENGTH , THICKNESS
H.W.L.	HIGH WATER LEVEL	T	TON
I.D.	INSIDE DIAMETER	THK.	THICKNESS
I.F.	INSIDE FACE	T.F.	TOP FACE
IN. OR "	INCH	T.I.S.	THAI INDUSTRIAL STANDARD
INT.	INTERIOR	Ts.	SUPERELEVATION TRANSITION LENGTH
INV.	INVERT	TYP.	TYPICAL
Kg.	KILOGRAM	V.	VELOCITY OF FLOW
Km.	KILOMETER	V.C.	VERTICAL CURVE
KPH.	KILOMETER PER HOUR	Vc.	LENGTH OF VERTICAL CURVE
KSC.	KILOGRAM PER SQUARE CENTIMETER	VER.	VERTICAL
L	LENGTH OF CURVE	VOL.	VOLUME
LC.	LENGTH OF HORIZONTAL CURVE	W/	WITH
LONG.	LONGITUDINAL	W.C.	WATER CLOSET
LT.	LEFT	°	ANGLE
L.W.L.	LOW WATER LEVEL	△	DEFLECTION ANGLE
M. OR m.	METER		
M ² OR m. ²	SQUARE METER		
M ³ OR m. ³	CUBIC METER		
MM. OR mm.	MILLIMETER		
M./S OR m./s	METER PER SECOND		
MIN.	MINIMUM		

SYMBOLS :

	TYPICAL NORTH ARROW
	CENTER LINE
	PAVED ROAD
	DIRT ROAD, LATEITE ROAD OR TRACK
	VILLAGE
	CITY OR DISTRICT
	POND OR SWAMP
	CULVERT UNDER ROAD
	BRIDGE
	POLE
	TEST PIT
	EXISTING HAND AUGER
	EXISTING BOREHOLES
	BOREHOLES
	DEGREE, MINUTE, SECOND
	AT EQUAL DISTANCE BETWEEN CENTER TO CENTER
	B.M.
	STATION
	BC., EC., PC., PL., PT., PCV., PVT.
	WATER LEVEL
	PLAN OF RIPRAP
	PLAN OF SLOPE RIPRAP
	SECTION OF DUMPED RIPRAP
	SECTION OF HAND PLACED RIPRAP
	SECTION OF SAND
	SECTION OF GRAVEL OR COARSE AGGREGATE
	SECTION OF ROCK
	SECTION OF EARTH
	SECTION OF BACKFILL
	SECTION OF CONCRETE
	STEEL SECTION
	ELEVATION OR PLAN OF EARTH CUT OR FILL
	ELEVATION OR PLAN OF ROCK CUT
	ELEVATION OR PLAN OF SLOPE
	NATURAL GROUND LEVEL
	CONTOUR LINE
	RIVER, STREAM OR NATURAL DRAIN
	FLOW DIRECTION
	SLOPE DIRECTION
	SLOPE RATIO

GENERAL NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS UNLESS OTHERWISE SHOWN.
- DURING THE CONSTRUCTION PERIOD, IT IS THE CONTRACTOR'S OBLIGATION TO CHECK THE CORRECTION OF ALL RELEVANT LOCATIONS, DIMENSIONS, ELEVATIONS AND OTHER DATA AS PROVIDED BY THE DRAWINGS AND TECHNICAL SPECIFICATIONS BEFORE IMPLEMENTATION OF THE WORKS.
- IN CASE OF ANY DETAILS NOT MENTIONED OR NOT SHOWN IN THE DRAWINGS OR TECHNICAL SPECIFICATIONS, OR IN CASE OF ANY DISCREPANCY, DEFECTIVE DESCRIPTION, ERROR, DIMENSION OR AMBIGUITY BETWEEN OR IN ANY OF THE DRAWINGS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO CORRECT AND/OR ADJUST THE RELEVANT DRAWINGS TO OBTAIN FIELD ENGINEER APPROVAL.
- ADDITIONAL SYMBOLS, IF REQUIRED, ARE DEFINED IN THE RESPECTIVE DRAWINGS.
- THE SPECIFICATIONS AND THE QUANTITIES OF MATERIALS ARE SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
- ALL PLAIN CONCRETE CORNERS ARE TO BE CHAMFERED 2 cm. UNLESS OTHERWISE SHOWN.
- SLOPE IN CUT AND FILL SECTIONS, UNLESS OTHERWISE SHOWN, SHALL BE CONFORMED TO THE FOLLOWING TABLE OR AS DIRECTED BY FIELD ENGINEER.

EXISTING GROUND SLOPE 1:S	EARTH		HARD ROCK	
	CUT 1:S	FILL 1:S	CUT 1:S	FILL 1:S
OVER 1:1	OVER 1:0.5 $\frac{2}{1}$	$\frac{1}{1}$	1:0	$\frac{1}{1}$
1:1 - 1:1.5	1:0.5	1	1:0	$\frac{1}{1}$
1:1.5 - 1:2	1:1	1:1	1:0	1:1
1:2 - 1:3	1:1	1:1.5	1:0	1:1.5
LOWER 1:3	1:1	1:2	1:0	1:2

$\frac{2}{1}$ = FILL SHOULD BE AVOIDED
 $\frac{1}{1}$ = FOR DOUBTFUL CASES CONSULT FIELD ENGINEER

STRUCTURAL DESIGN NOTES :

- THE ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE OF STANDARD CYLINDER (Ø0.15x0.30 m.) TEST AT AGE 28 DAYS SHALL BE AS THE FOLLOWING, UNLESS OTHERWISE SHOWN.

fc' (ksc)	DESCRIPTION
350	PRESTRESS CONCRETE
210	1. CONTROL HOUSE
	2. POWERHOUSE
	3. TAILRACE
	4. MANHOLE
	5. ANCHOR BLOCK, PIPE SUPPORT
	6. BOX CULVERT
210	SECONDARY CONCRETE
140	LEAN CONCRETE

- UNLESS OTHERWISE SHOWN, THE FOLLOWING CLEAR COVER OF CONCRETE OVER OF THE REINFORCEMENT SHALL BE USED :
 - FACE EXPOSED TO SCOUR 5.0 cm.
 - FACE EXPOSED TO EARTH OR WEATHER 5.0 cm.
 - FACE UNEXPOSED TO EARTH OR WEATHER 3.0 cm.
- THE REINFORCEMENT LAP SPLICES SHALL NOT BE LESS THAN 50 DIAMETERS OF BIGGER THAN BAR WITH HOOKS, UNLESS OTHERWISE SHOWN.
- EMBEDDED METALWORK SHALL BE SECURELY FASTENED IN POSITION BEFORE PLACING CONCRETE.
- ALL CONSTRUCTION JOINT SHOULD BE TREATED AS DIRECTED IN ORDER TO ASSURE THE BEST BOND.
- A 5 cm. (MIN.) LAYER OF LEAN CONCRETE (1:3:5 BY VOLUME) SHOULD BE PLACED BELOW CONCRETE STRUCTURES.
- THE STRUCTURES SHOULD BE PLACED ON UNDISTURBED SOILS OR COMPACTED FILL AND BACKFILL AROUND THE STRUCTURES SHOULD BE COMPACTED.
- THE FOUNDATION ELEVATIONS ARE SUBJECT TO CHANGE AS DIRECTED ACCORDING TO THE SOIL CONDITIONS.
- ALL SIZES OF REINFORCING BARS AND STRUCTURAL STEELS ARE IN MILLIMETERS.
- ALL STRUCTURAL STEELS ARE THOSE OF T.I.S. DESIGNATION Fe24.
- REINFORCED STEEL BARS SHALL BE CONFORM TO T.I.S. AS FOLLOW :
 - DEFORMED BARS (SD30) - T.I.S. 24-2559
 - ROUND BARS (SR24) - T.I.S. 20-2559
- ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN AS FOLLOW :
 - CONTROL HOUSE $Q_d = 15 \text{ T/M.}^2$
 - PENSTOCK $Q_d = 15 \text{ T/M.}^2$
 - POWERHOUSE & TAILRACE $Q_d = 30 \text{ T/M.}^2$

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS GENERAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES	
 P&C MANAGEMENT CO.,LTD.	DESIGNED 28.1957 SUBMITTED 28.1957 APPROVED 17/03/2020 PROJECT MANAGER
REVIEWED 28.1957 RECOMMENDED 28.1957 APPROVED 17/03/2020 DATE	DRAWING NO. KTP2-GN-03 SHEET NO. 3 OF 97

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

TABLE 1 CLIMATOLOGICAL DATA FOR THE PERIOD 1988-2017

Station	Amphoe Mueang Changwat Chanthaburi				Elevation of station above M.S.L.				2.68 Meters					
Index station	48480				Height of barometer above M.S.L.				3.60 Meters					
Latitude	12° 37' 0.0" N				Height of thermometer above ground				1.25 Meters					
Longitude	102° 6' 48.0" E				Height of wind vane above ground				12.00 Meters					
					Height of rain gauge				1.00 Meters					
Elements	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL	
Temperature (Celcius)														
Mean	15.0	15.4	17.7	22.2	22.1	21.9	21.4	21.4	22.1	18.7	16.5	13.1	13.1	
Relative Humidity (%)														
Mean	69	74	77	78	83	84	84	84	86	82	72	66	78.4	
Mean Max.	85	89	92	92	94	94	94	94	95	93	85	81	90.7	
Mean Min.	49	55	59	60	67	70	71	71	71	65	56	49	61.8	
Ext.Min.	24	23	33	37	39	51	51	43	41	30	28	19	19	
Pan Evaporation (mm.)														
Mean	138.5	125.0	144.4	140.5	121.9	108.6	108.6	107.1	94.7	118.9	135.4	145.5	1,489.1	

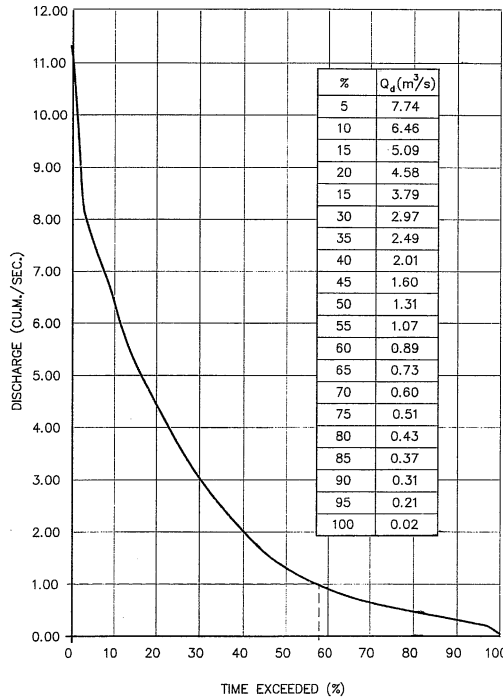


FIGURE 2 FLOW DURATION CURVE AT THUNG PHEN DAM

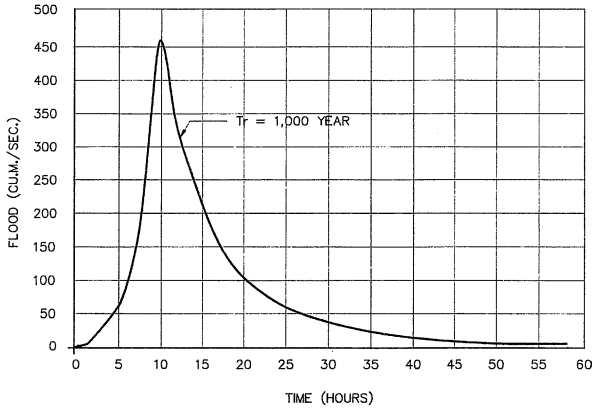


FIGURE 3 RETURN PERIOD 1,000 YEAR AT THUNG PHEN DAM

MONTH	DISCHARGE (CMS.)
APR	0.45
MAY	0.95
JUN	2.99
JUL	4.77
AUG	5.81
SEP	5.71
OCT	3.52
NOV	1.26
DEC	1.05
JAN	1.01
FEB	0.62
MAR	0.82

FIGURE 5 AVERAGE MONTHLY DISCHARGE AT THUNG PHEN DAM

MONTH	RAINFALL (mm.)
APR	111.00
MAY	301.04
JUN	400.38
JUL	452.74
AUG	422.36
SEP	429.27
OCT	260.52
NOV	36.10
DEC	7.15
JAN	19.48
FEB	28.98
MAR	76.85

FIGURE 6 AVERAGE MONTHLY RAINFALL AT THUNG PHEN DAM

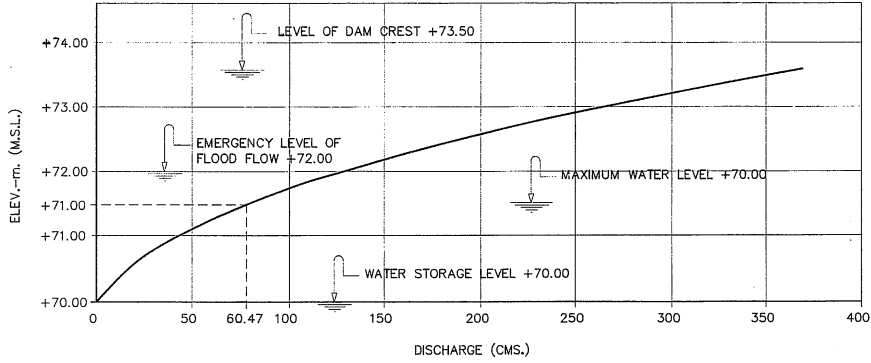


FIGURE 1 RELATIONSHIP BETWEEN TAIL WATER LEVEL AND DISCHARGE AT PHLUANG DAM

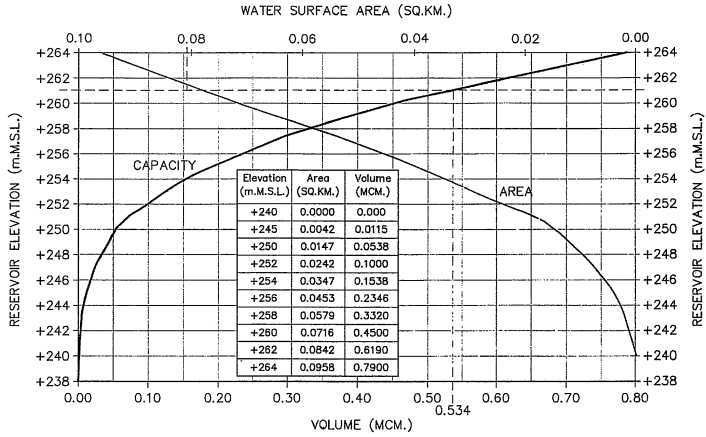
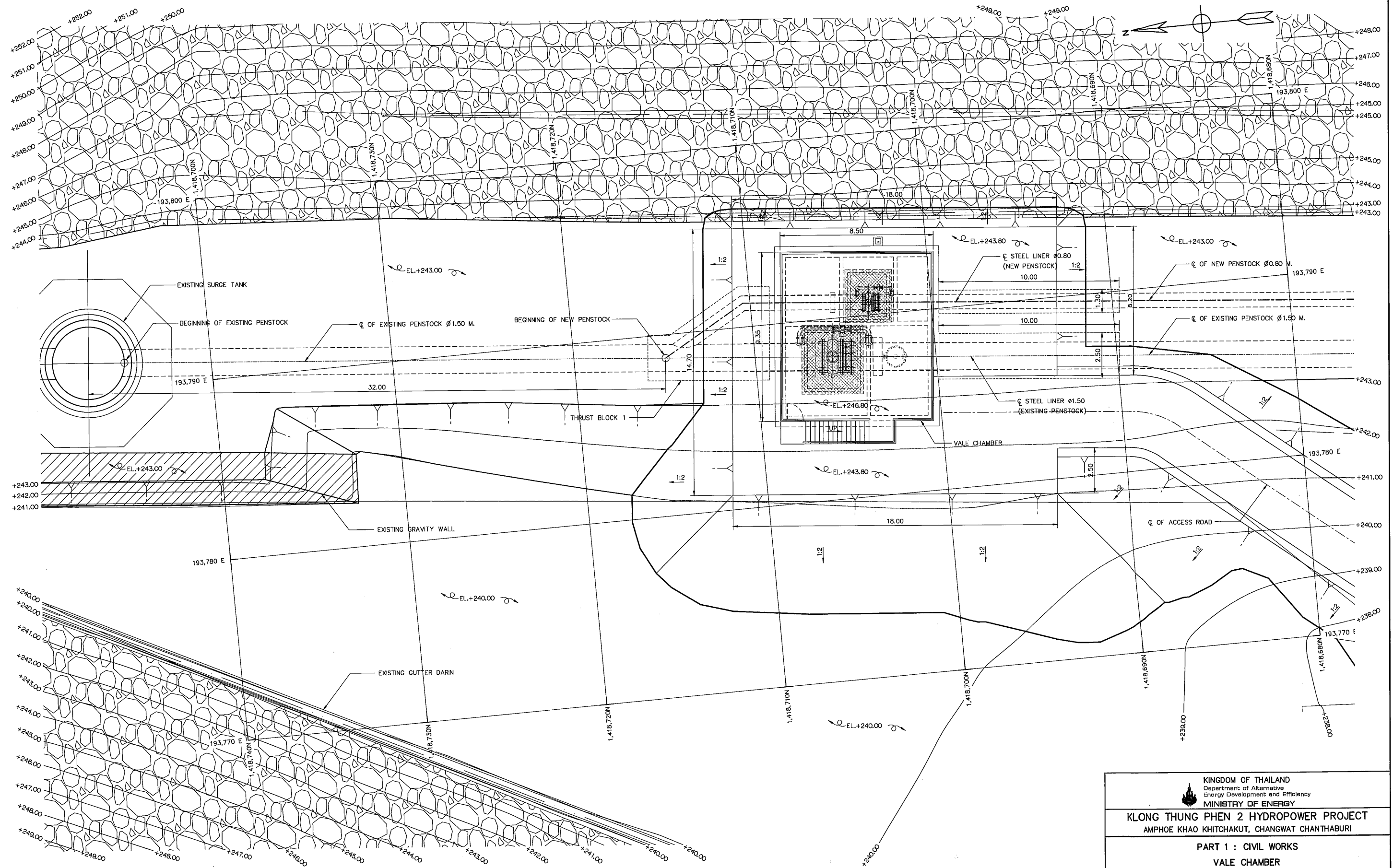


FIGURE 4 RELATIONSHIP BETWEEN AREA AND VOLUME CURVE AT THUNG PHEN DAM

- NOTES :
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - DATA TABLE 1 OBTAINED FROM OUTFLOW RECORDS OF AMPHOE MUEANG CHANGWAT CHANTHABURI BY ROYAL IRRIGATION DEPARTMENT DURING 1988-2017.

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS GENERAL HYDROLOGY DATA			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	78/1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	78/1957	RECOMMENDED	
APPROVED		APPROVED	
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	17/03/2020
KTP2-GN-04		SHEET NO. 4 OF 97	



GENERAL LAYOUT
SCALE 1:100

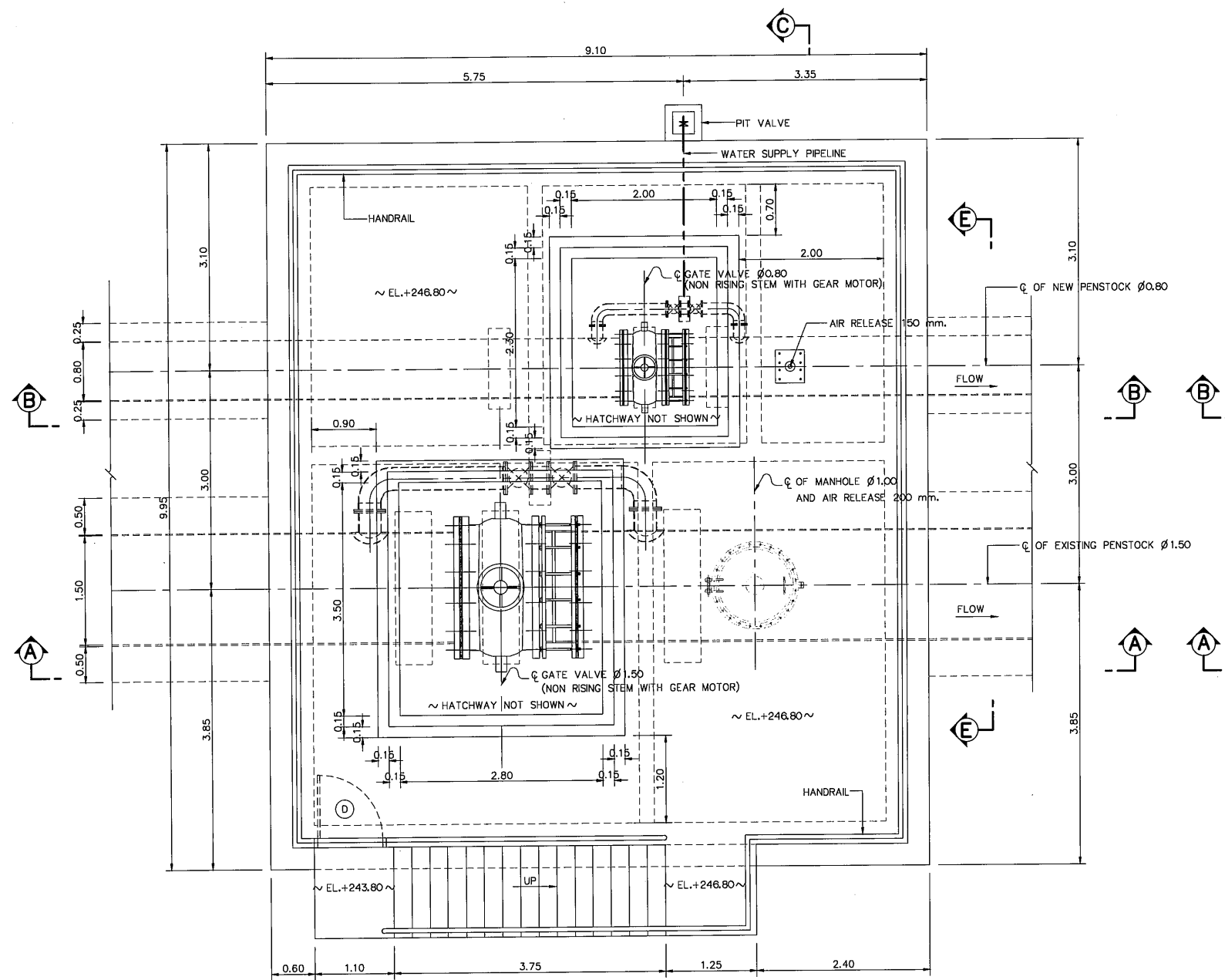
0 1 2 3 4 5 6 7 8
SCALE 1:100 METERS

- NOTES:
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 3. ALIGNMENT OF PENSTOCK SHALL BE JUSTIFIED BY FIELD ENGINEER IN THE FIELD TO SUIT THE TOPOGRAPHY

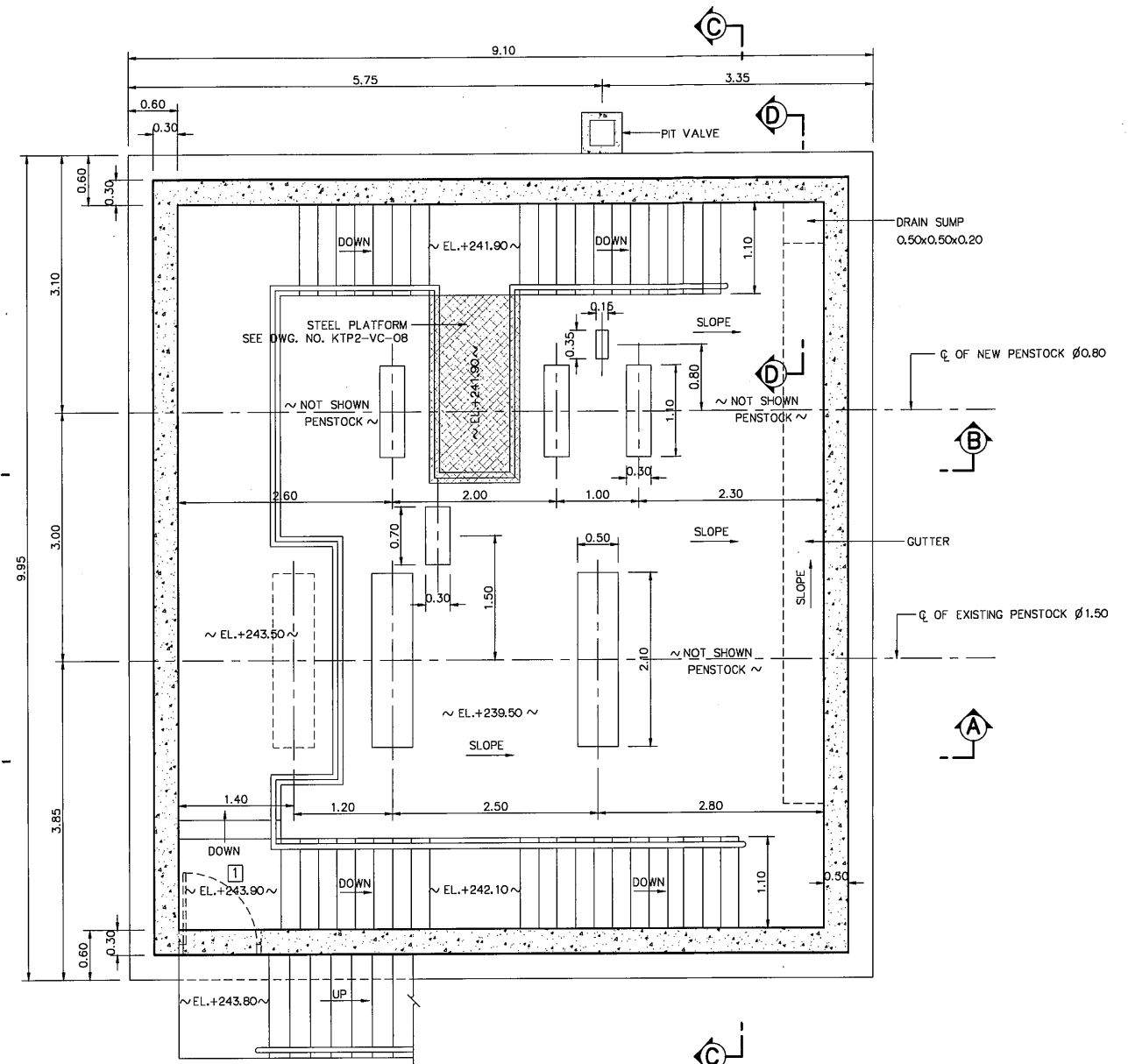
REFERENCE DRAWING :
1. VALE CHAMBER, PLAN

KTP2-VC-02

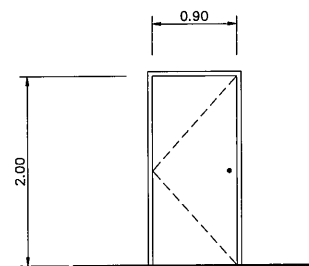
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS VALE CHAMBER GENERAL LAYOUT			
P&C MANAGEMENT CO., LTD. DESIGNED DRAWN NO. DATE REVISIONS CHECKED APPROVED		REVIEWED SUBMITTED RECOMMENDED APPROVED PROJECT MANAGER DATE	
17/03/2020		28.1957 28.1957 17/03/2020	
CONSULTANTS		DEDE	
KTP2-VC-01		SHEET NO. 7 OF 97	



PLAN
SCALE 1:40
(EL.+246.80)



PLAN
SCALE 1:40
(EL.+239.50)



STEEL FRAME AND STEEL PANEL
WITH PAINTED

DETAIL OF DOOR D

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. KTP2-GN-03
3. ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN 30 TONS/M.
4. THE CONTRACTOR SHALL DESIGN THE MECHANICAL COUPLING AND INSTALLATION. THE SHOP DRAWINGS SHALL BE SUBMITTED TO DEDE, FOR APPROVAL PRIOR TO THE CONSTRUCTION.

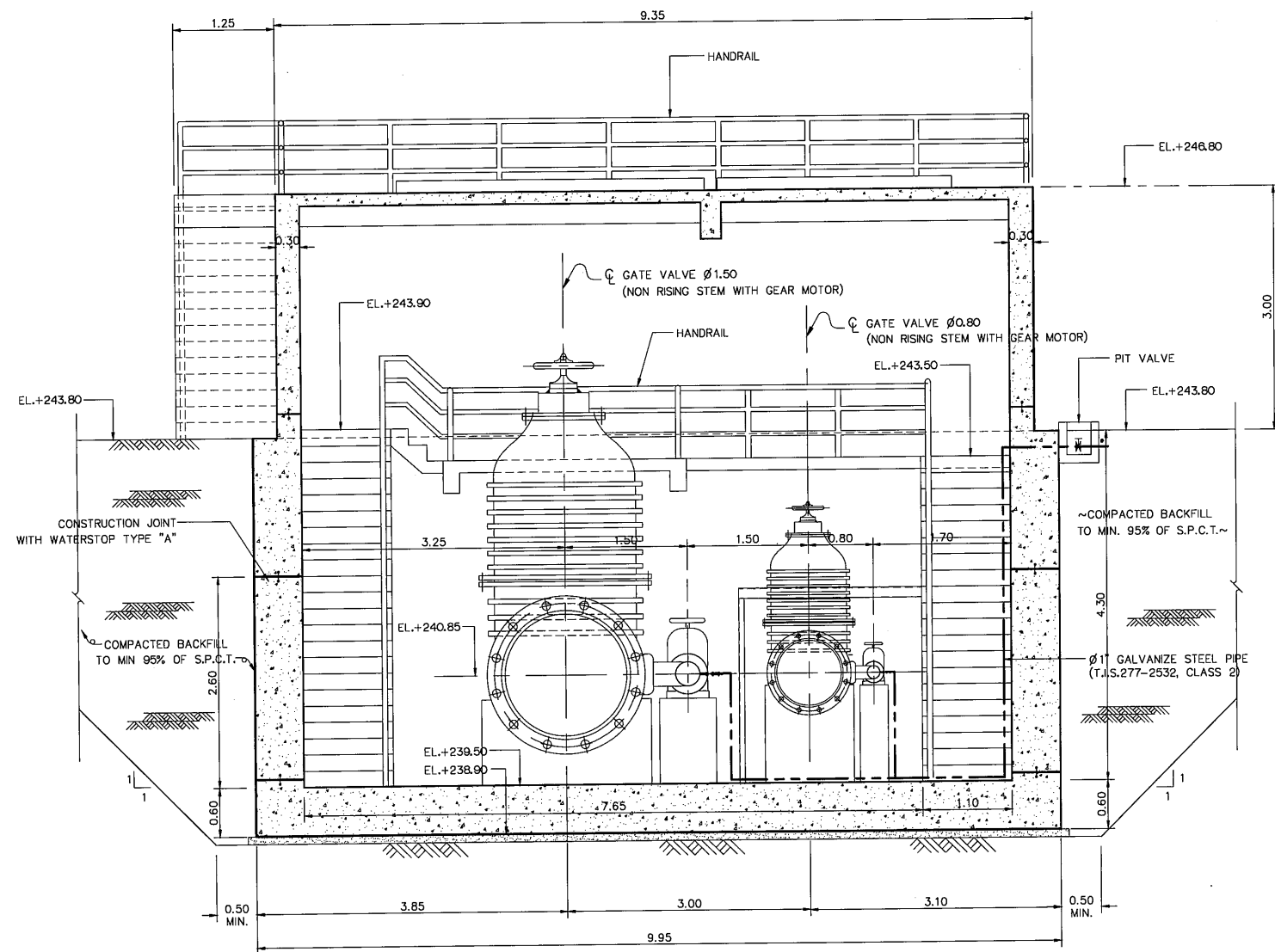
REFERENCE DRAWINGS :

1. VALVE CHAMBER, GENERAL LAYOUT
2. VALVE CHAMBER, SECTIONS (SHEET 1/2)
3. VALVE CHAMBER, SECTIONS (SHEET 2/2)
4. VALVE CHAMBER, REINFORCEMENT DETAILS (SHEET 3/3)

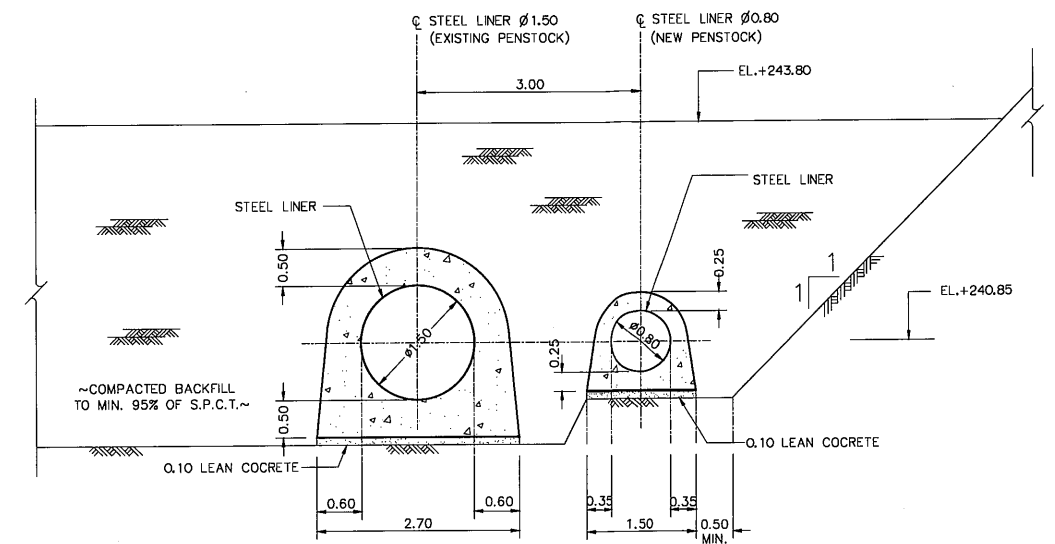
KTP2-VC-01
KTP2-VC-03
KTP2-VC-04
KTP2-VC-08

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

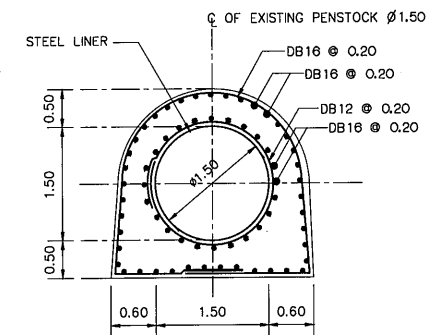
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS VALVE CHAMBER PLAN			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		REVIEWED	
DRAWN		SUBMITTED	
CHECKED		RECOMMENDED	
APPROVED		APPROVED	
PROJECT MANAGER		DRAWING NO.	
DATE		SHEET NO.	
17/03/2020		KTP2-VC-02	
		8 OF 97	



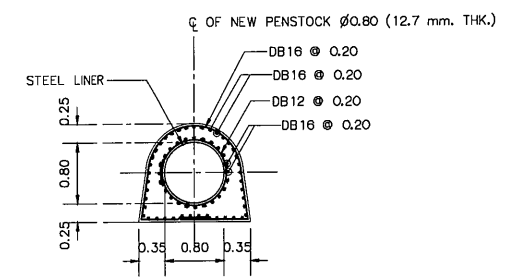
SECTION C-C
SCALE 1:50



SECTION E-E
SCALE 1:50

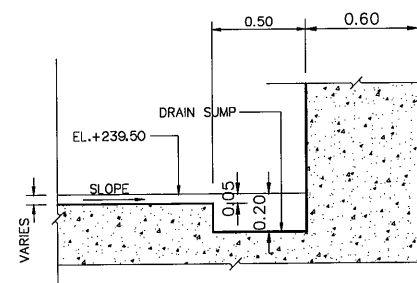


EXISTING PENSTOCK Ø1.50
SCALE 1:50



NEW PENSTOCK Ø0.80
SCALE 1:50

STEEL LINER REINFORCEMENT DETAILS



SECTION D-D
SCALE 1:20

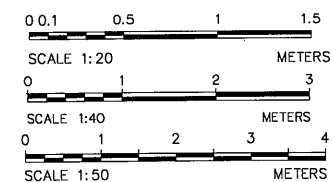
NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN 30 TONS/M.
4. THE CONTRACTOR SHALL DESIGN THE MECHANICAL COUPLING AND INSTALLATION. THE SHOP DRAWINGS SHALL BE SUBMITTED TO DEDE. FOR APPROVAL PRIOR TO THE CONSTRUCTION.

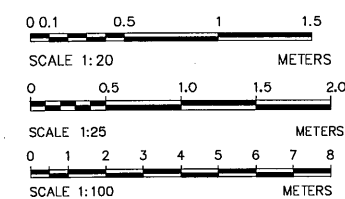
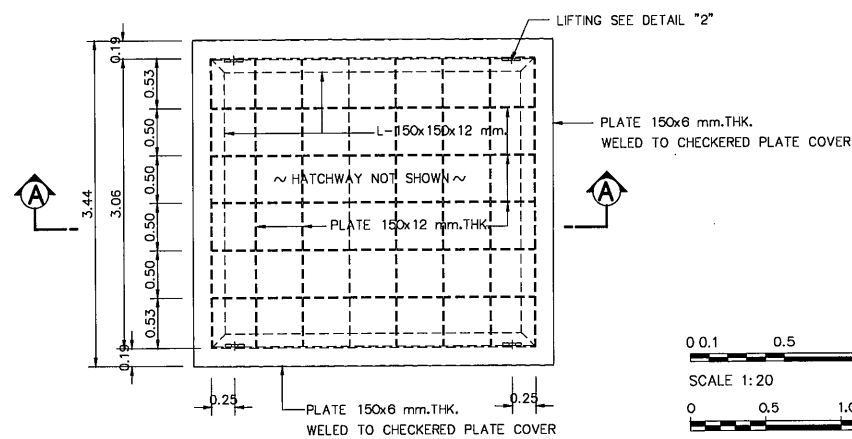
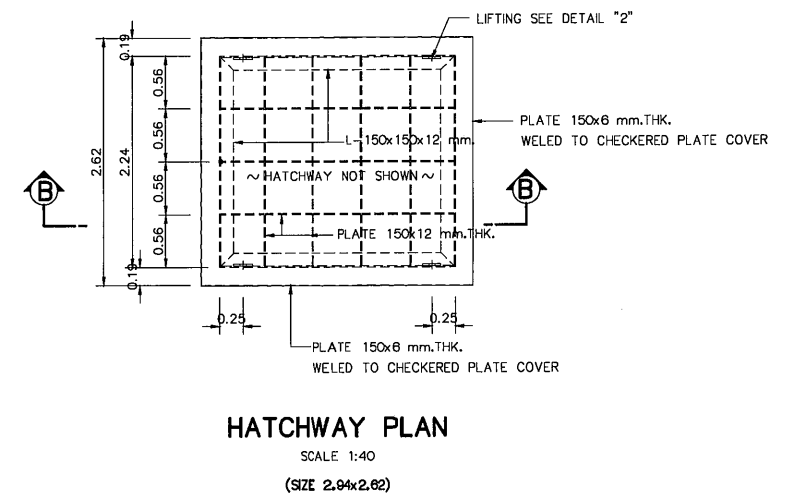
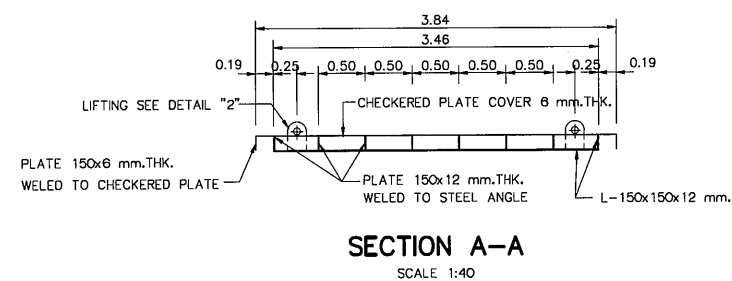
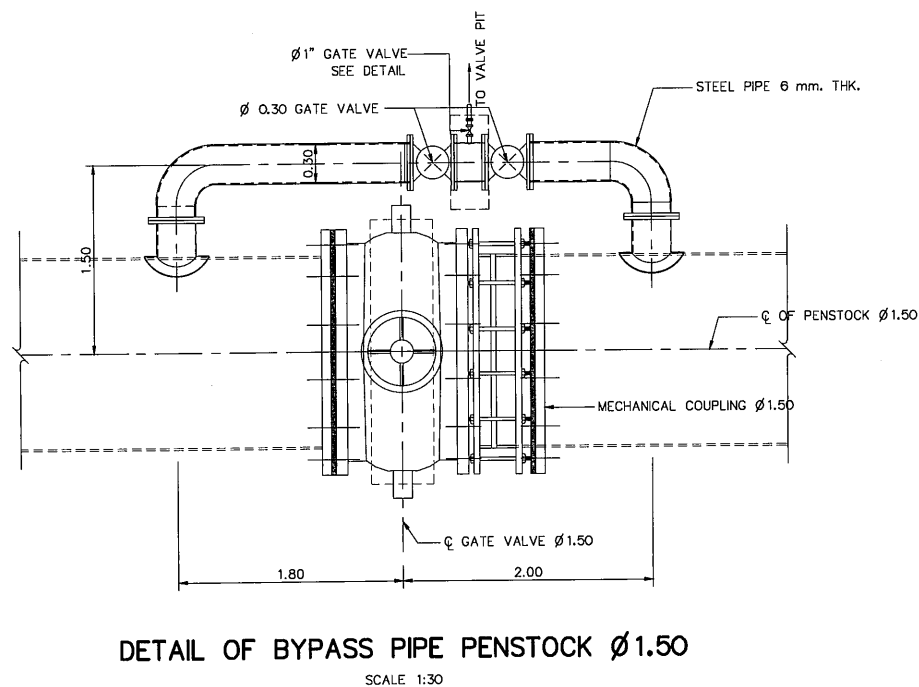
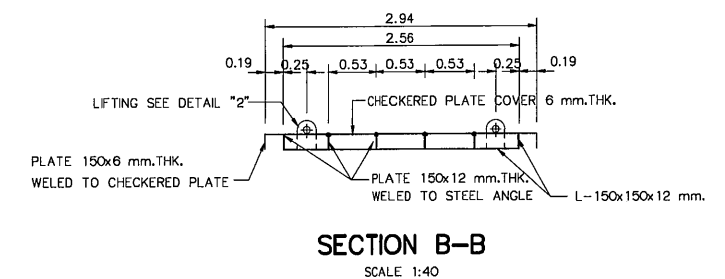
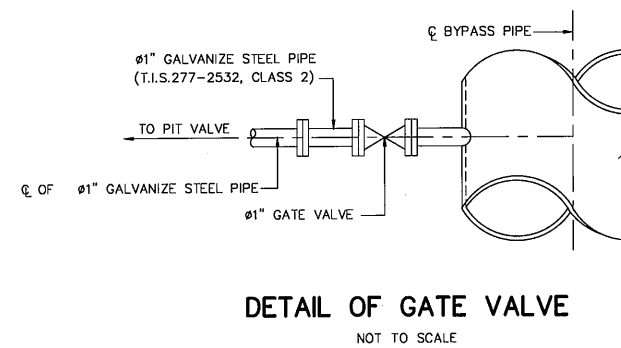
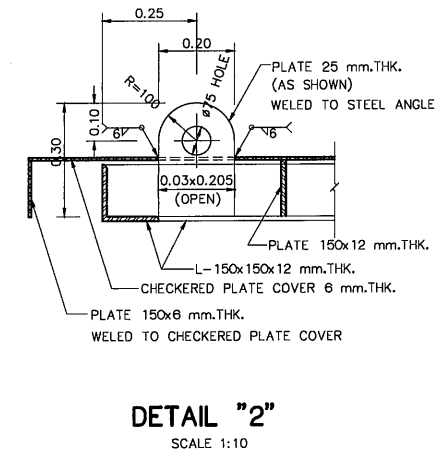
REFERENCE DRAWINGS :

1. VALVE CHAMBER, PLAN

KTP2-VC-02



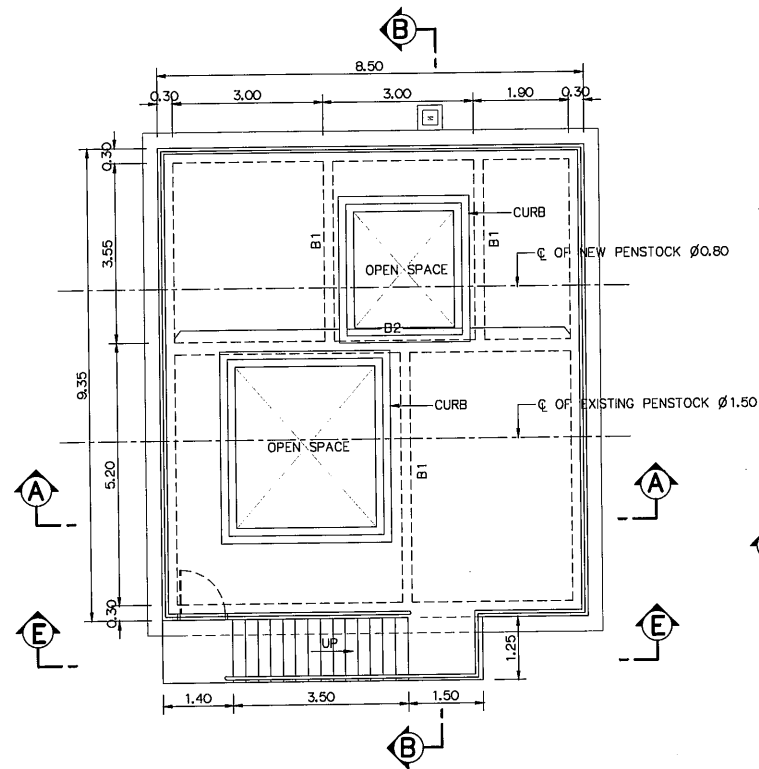
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS VALVE CHAMBER SECTIONS (SHEET 2/2)			
DESIGNED 28.1957		REVIEWED 28.1957	
DRAWN 28.1957		SUBMITTED 28.1957	
CHECKED 17/03/2020		APPROVED 17/03/2020	
CONSULTANTS		DEDE	
PROJECT MANAGER		SHEET NO. 10 OF 97	



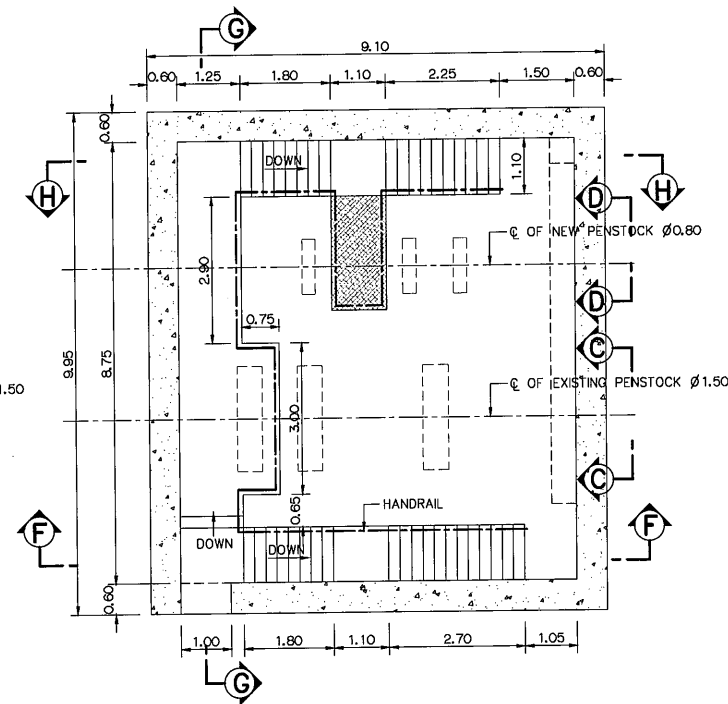
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. WELDING CONNECTION USE 6 MM. UNLESS OTHERWISE SHOWN.

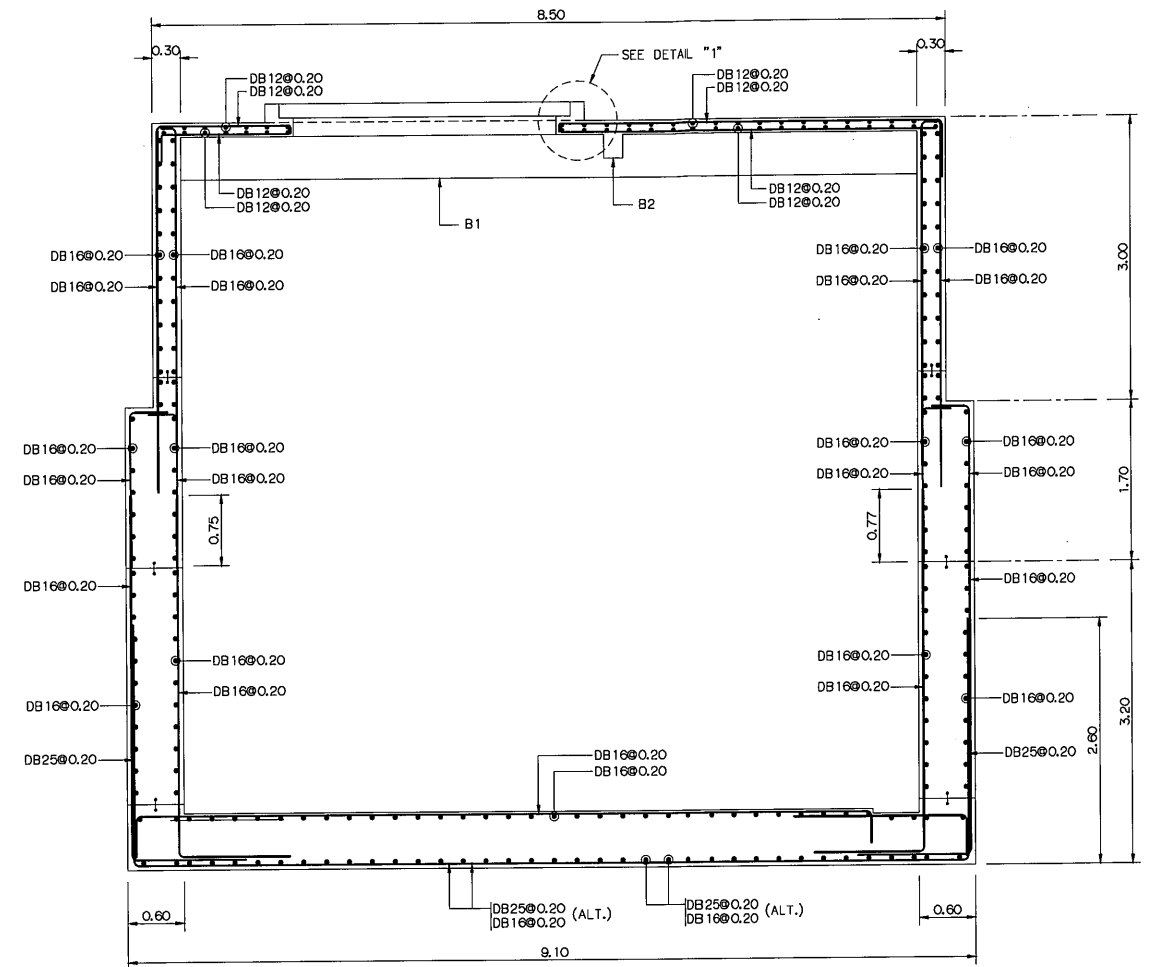
3					DESIGNED	28.1957	REVIEWED	28.1957
2					DRAWN		SUBMITTED	
1					CHECKED	28.1957	RECOMMENDED	
NO.	DATE	REVISIONS	CHECKED	APPROVED	CHECKED	17/03/2020	APPROVED	21/2/2018
CONSULTANTS				DEDE	PROJECT MANAGER		DRAWING NO.	SHEET NO.
					DATE		KTP2-VC-05	11 OF 97



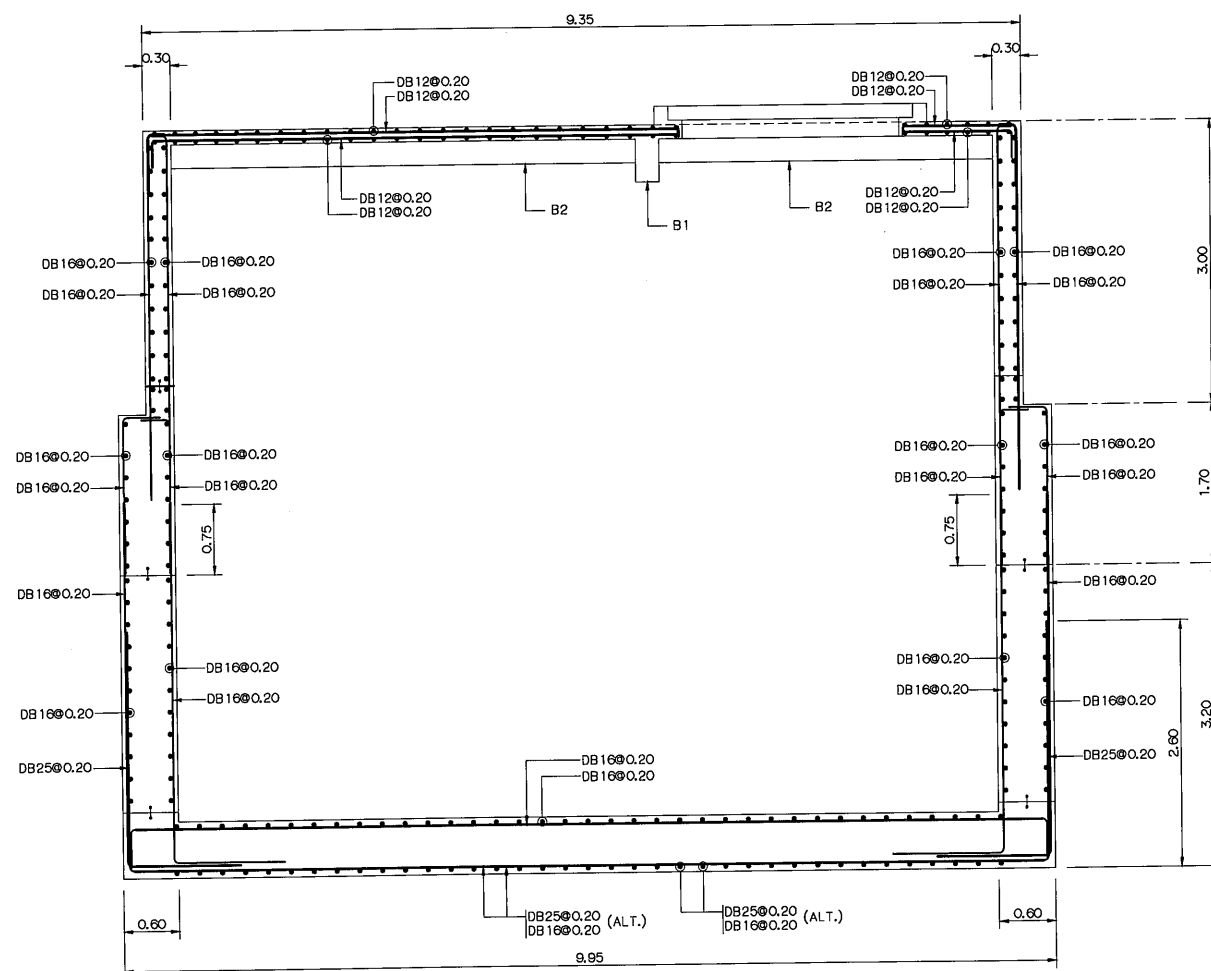
FRAMING PLAN
SCALE 1:75
(EL.+246.80)



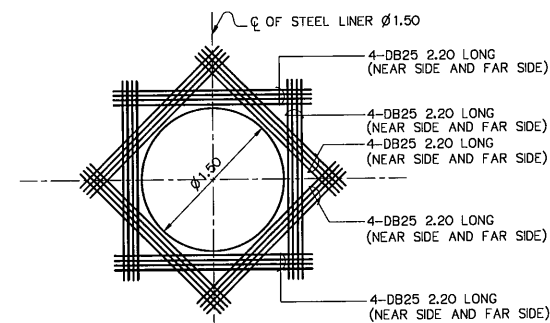
FRAMING PLAN
SCALE 1:75
(EL.+239.50)



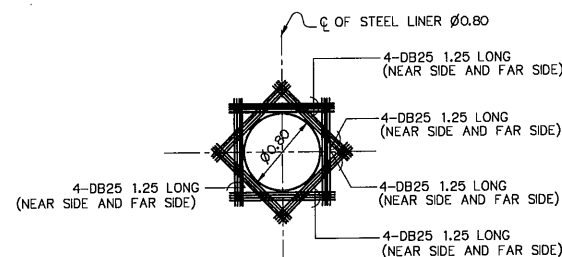
SECTION A-A
SCALE 1:40



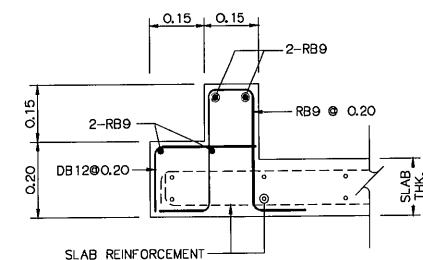
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SCALE 1:40



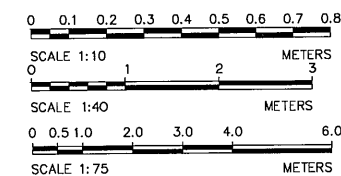
SECTION C-C
SCALE 1:40



SECTION D-D
SCALE 1:40



DETAIL "1"
SCALE 1:10



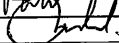
- NOTES :**
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 - ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN 30 TON/M²

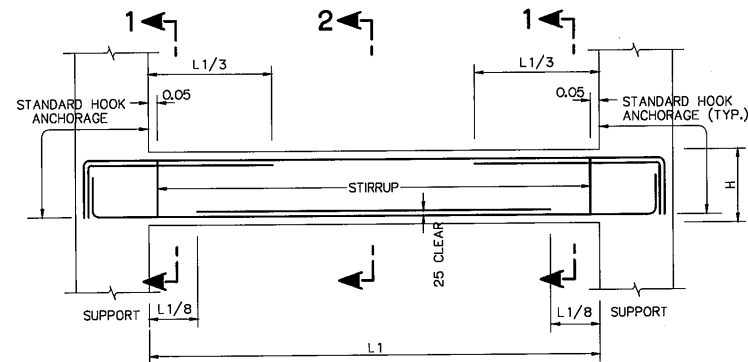
REFERENCE DRAWING :
1. VALVE CHAMBER, REINFORCEMENT DETAILS (SHEET 2/3) KTP2-VC-07

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS VALVE CHAMBER REINFORCEMENT DETAILS (SHEET 1/3)	
PCM P&C MANAGEMENT CO.,LTD. DESIGNED: [Signature] 28.1957 DRAWN: [Signature] CHECKED: [Signature] 28.1957 PROJECT MANAGER: [Signature] 17/03/2020	REVIEWED: [Signature] SUBMITTED: [Signature] RECOMMENDED: [Signature] APPROVED: [Signature] 21/2/18 DRAWING NO. KTP2-VC-06 SHEET NO. 12 OF 97



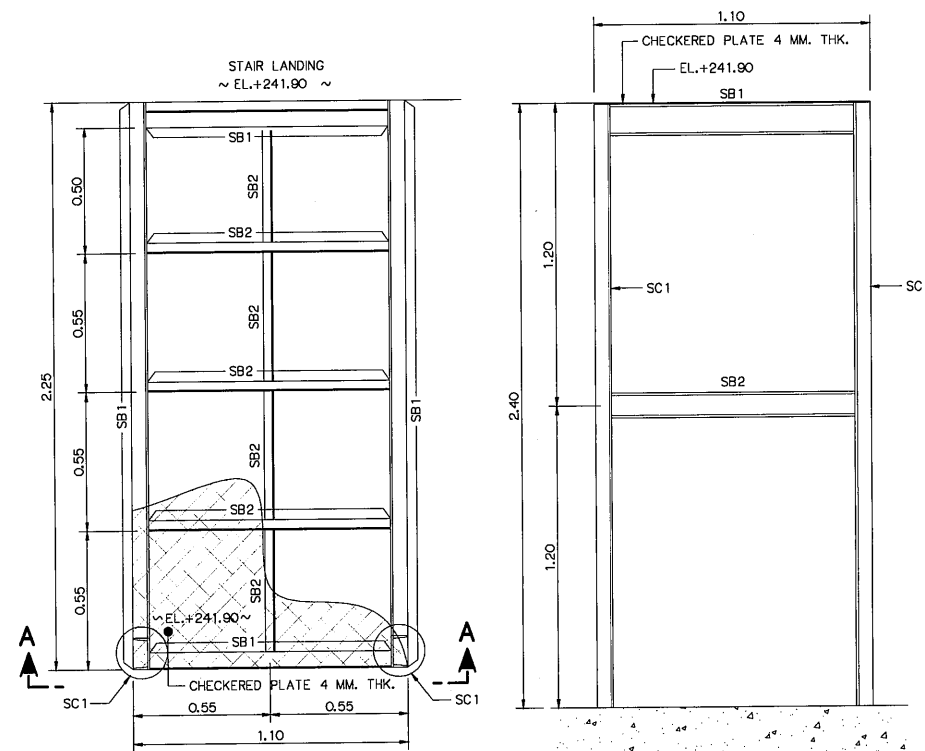
 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS VALVE CHAMBER REINFORCEMENT DETAILS (SHEET 2/3)			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED 		REVIEWED 	
DRAWN 		SUBMITTED	
CHECKED 		RECOMMENDED	
17/03/2020		APPROVED 	
PROJECT MANAGER		DRAWING NO.	
DATE		KTP2-VC-07	
		SHEET NO.	
		13 OF 97	



TYPICAL SIMPLE BEAM DETAIL
NOT TO SCALE

BEAM SCHEDULE (SCALE 1:25)

SECTION NO. BEAM NO.	SECTION 1	SECTION 2	REMARK
B1			SIMPLE BEAM
B2			SIMPLE BEAM



PLAN OF STEEL PLATFORM
SCALE 1:15

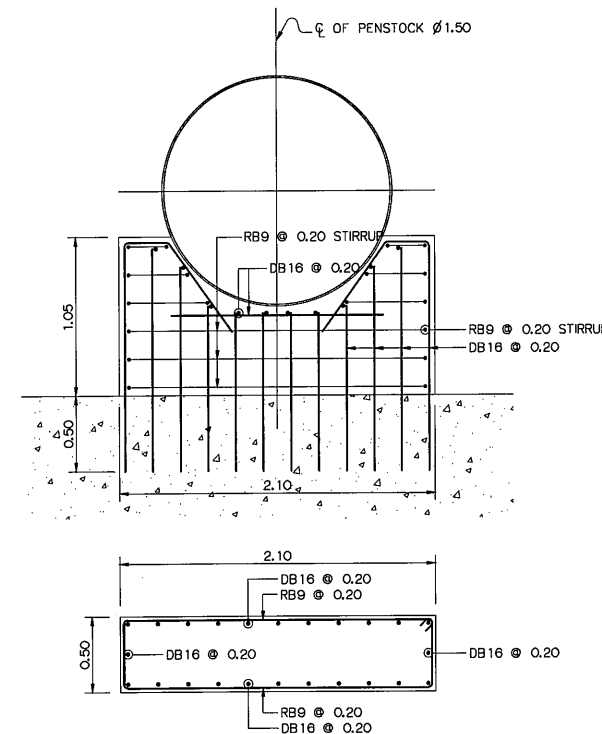
SECTION A-A
SCALE 1:15

STRUCTURAL NOTES:

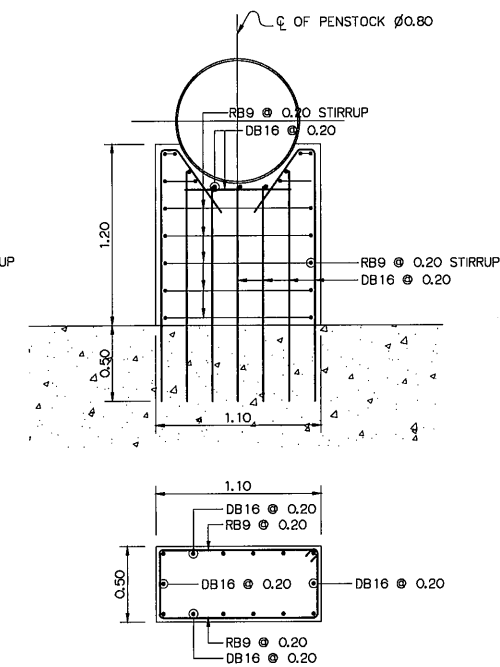
- SC1 [- 125x65x13.4 Kg/m.
- SB1 [- 125x65x13.4 Kg/m.
- SB2 [- 100x50x9.36 Kg/m.

NOTES :

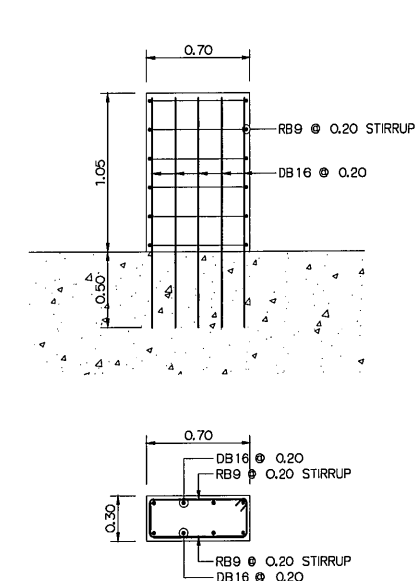
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. WELDING CONNECTION USE 5 MM, UNLESS OTHERWISE SHOWN



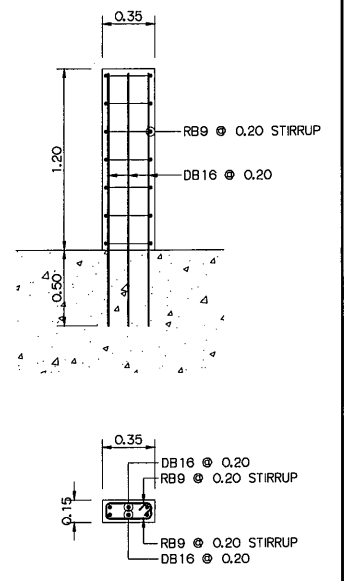
DETAIL OF PIPE SUPPORT
FOR PENSTOCK Ø1.50
SCALE 1:25



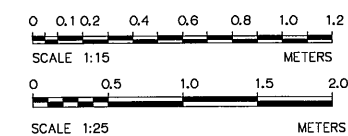
DETAIL OF PIPE SUPPORT
FOR PENSTOCK Ø0.80
SCALE 1:25



DETAIL OF PIPE SUPPORT
FOR BYPASS PIPE
SCALE 1:25



DETAIL OF PIPE SUPPORT
FOR BYPASS PIPE
SCALE 1:25



3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

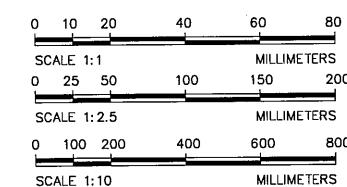
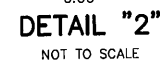
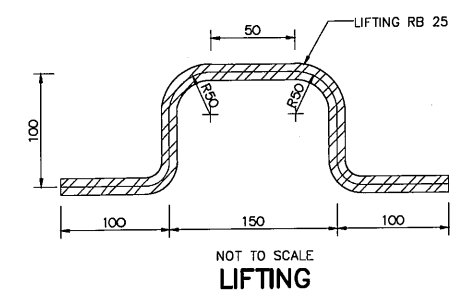
CONSULTANTS

DEDE

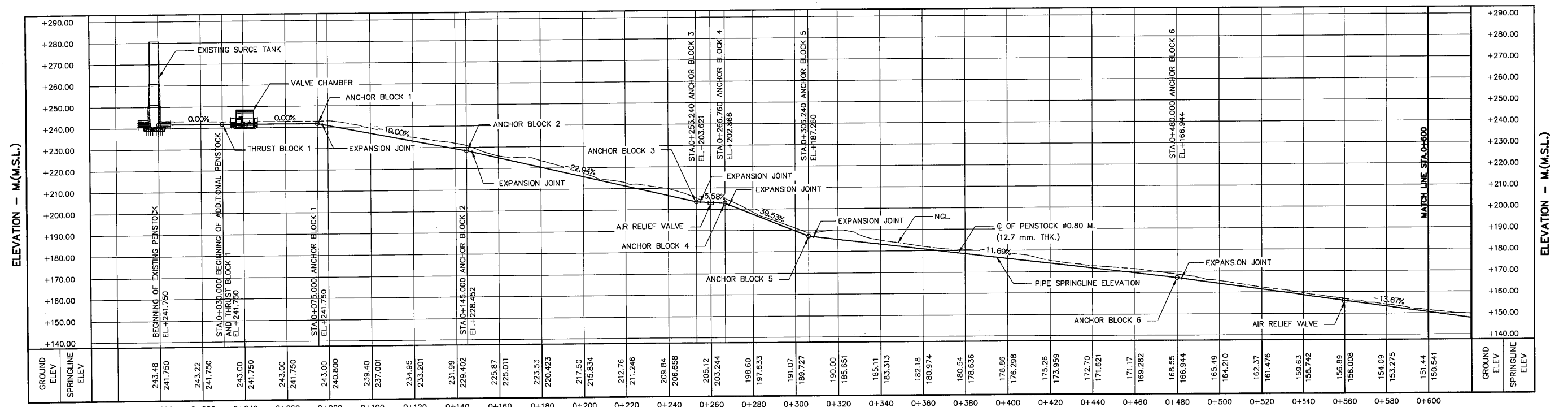
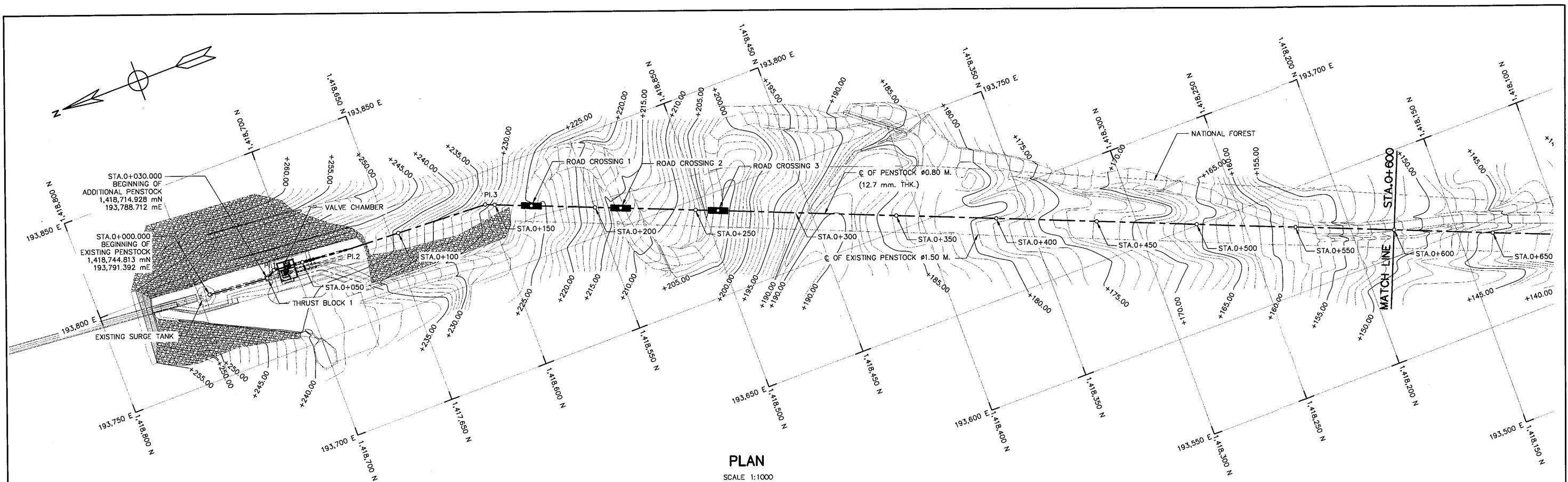
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS VALVE CHAMBER REINFORCEMENT DETAILS (SHEET 3/3)	
P&C MANAGEMENT CO., LTD. DESIGNED DRAWN CHECKED PROJECT MANAGER	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY REVIEWED SUBMITTED RECOMMENDED APPROVED DATE 17/03/2020
DRAWING NO. KTP2-VC-08	SHEET NO. 14 OF 97



NO.	DISCRIPTIONS	REQ.	MATERIALS
1	NOZZEL BARREL	1	JIS G3106 :GRADE 50C
2	NOZZEL FLANGE	1	JIS G3106 :GRADE 50C
3	COVER PLATE	1	JIS G3106 :GRADE 50C
4	HANDLING LUG	1	JIS G3106 :GRADE 50C
5	HINGE PLATE	2	JIS G3106 :GRADE 50C
6	HINGE PLATE	2	JIS G3106 :GRADE 50C
7	HINGE PLATE	2	JIS G3106 :GRADE 50C
8	HINGE PIN WITH NUTS AND WASHERS	1	ASTM A325
9	OUTER SPACER TUBE	1	ASTM A325
10	COVER PL BOLTS WITH NUTS AND WASHERS	24	ASTM A325
11	COVER PL HANDLE	2	ASTM A325
12	"O" RING SEAL (MANHOLE) Ø 10 MIN.	1	RUBBER HARDNESS 65"
13	INTER SPACER TUBE	1	



3						DESIGNED	28.1957	REVIEWED	
2						DRAWN		SUBMITTED	
1						CHECKED	28.1957	RECOMMENDED	
NO.	DATE	REVISIONS	CHECKED	APPROVED		CHECKED	28.1957	APPROVED	
CONSULTANTS					DEDE				
					PROJECT MANAGER DATE				
					DRAWING NO. KTP2-CH-09				
					SHEET NO. 15 OF 97				



HORIZONTAL CURVE

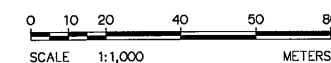
NO. OF CURVE	PI. Sta.	PI. TO PI. m.	COORDINATE OF PI.		ANGLE I	BEARING
			N	E		
BEGIN	0+030.00	5.00	1,418,744.8093	193,791.3915		
PI. 1	0+035.23	40.045	1,418,714.9292	193,788.7116	35° 0' 16.31"	S5° 07' 30"W
PI. 2	0+075.28	69.984	1,418,710.3931	193,791.3169	2° 30' 8.82"	S29° 52' 12"E
PI. 3	0+145.26	715.00	1,418,670.5083	193,787.7405	19° 33' 48.06"	S5° 07' 26"W
PI. 4	0+860.28	171.00	1,418,600.5977	193,784.5388	13° 46' 18.57"	S22° 11' 07"W
PI. 5	1+031.26	157.15	1,417,938.5310	193,514.5523	29° 12' 32.27"	S8° 24' 48"W
PI. 6	1+188.41	32.447	1,417,769.3713	193,489.5323	45° 18' 9.22"	S37° 37' 21"W
END	1+220.86		1,417,644.8997	193,393.5984		

NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KIP2-GN-03
- ALIGNMENT OF PENSTOCK SHALL BE JUSTIFIED BY FIELD ENGINEER IN THE FIELD TO SUIT THE TOPOGRAPHY
- THE CONTRACTOR SHALL SUBMIT DETAILED WORKSHOP DRAWING FOR APPROVAL BY THE ENGINEER BEFORE MANUFACTURE OF PENSTOCK

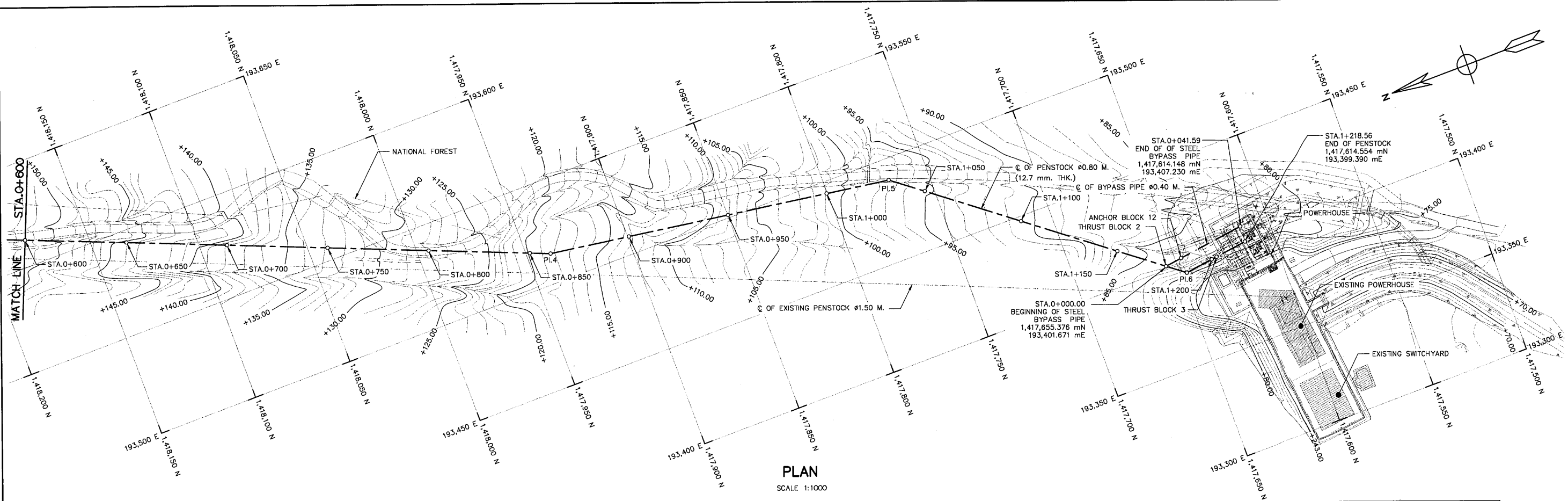
REFERENCE DRAWING :

- PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860 KIP2-PS-02
- PENSTOCK, THRUST BLOCK NO. 4 - PLAN AND SECTIONS AND TYPICAL SECTION KIP2-PS-09

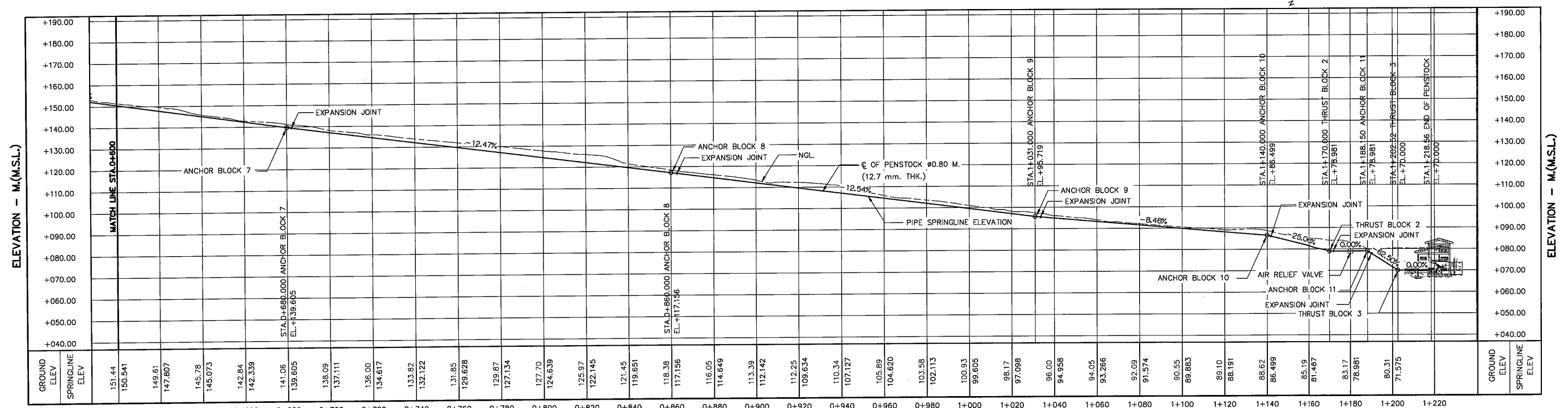


NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK PLAN AND PROFILE, KM. 0+000 TO KM. 0+600			
 P&C MANAGEMENT CO., LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED	17/03/2020	APPROVED	
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		KTP2-PS-01	16 OF 97



PLAN
SCALE 1:1000



PROFILE
HORIZONTAL SCALE 1:1000
VERTICAL SCALE 1:1000

HORIZONTAL CURVE

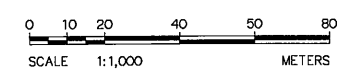
NO. OF CURVE	PI. Sta.	PI. TO PI. m.	COORDINATE OF PI.		ANGLE I	BEARING
			N	E		
BEGIN	0+030.00	5.00	1,418,744.8093	193,791.3915	35° 0' 16.31"	S5° 07' 30"W
PI. 1	0+035.23	40.045	1,418,714.9292	193,788.7118	S29° 52' 12"E	
PI. 2	0+075.28	69.894	1,418,710.3931	193,791.3169	2° 30' 6.82"	S5° 07' 28"W
PI. 3	0+145.26	715.00	1,418,670.5083	193,787.7405	19° 33' 48.06"	S2° 37' 20"W
PI. 4	0+860.26	171.00	1,418,600.5977	193,784.5388	13° 46' 18.57"	S22° 11' 07"W
PI. 5	1+031.26	157.15	1,417,938.5310	193,514.5523	29° 12' 32.27"	S8° 24' 49"W
PI. 6	1+188.41	32.447	1,417,769.3713	193,489.5323	45° 18' 9.22"	S37° 37' 21"W
END	1+220.86		1,417,644.8997	193,393.5984		

NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- ALIGNMENT OF PENSTOCK SHALL BE JUSTIFIED BY FIELD ENGINEER IN THE FIELD TO SUIT THE TOPOGRAPHY
- THE CONTRACTOR SHALL SUBMIT DETAILED WORKSHOP DRAWING FOR APPROVAL BY THE ENGINEER BEFORE MANUFACTURE OF PENSTOCK

REFERENCE DRAWING :

- PENSTOCK, PLAN AND PROFILE, KM. 0+000 TO KM. 0+600 KTP2-PS-01
- PENSTOCK, THRUST BLOCK NO. 4 - PLAN AND SECTIONS AND TYPICAL SECTION KTP2-PS-09



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

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

KLONG THUNG PHEN 2 HYDROPOWER PROJECT
AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI

PART 1 : CIVIL WORKS
PENSTOCK

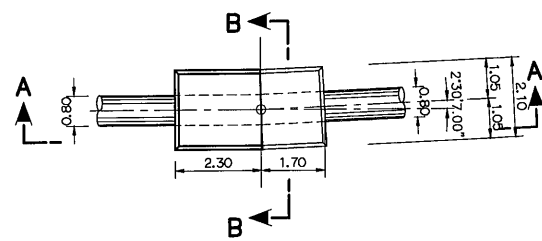
PLAN AND PROFILE, KM. 0+600 TO KM. 1+218.56

PCM P&C MANAGEMENT CO., LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		RECOMMENDED	
CHECKED	28.1957	APPROVED	21/2/68
PROJECT MANAGER 17/03/2020		DRAWING NO. KTP2-PS-02	
CONSULTANTS		DEDE	

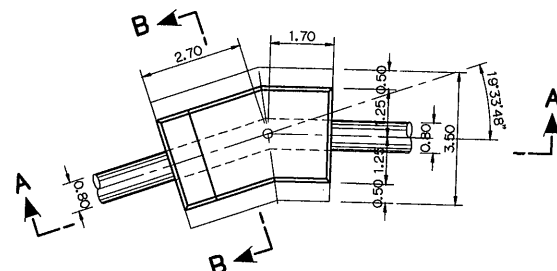
ELEVATION - M.(M.S.L.)

ELEVATION - M.(M.S.L.)

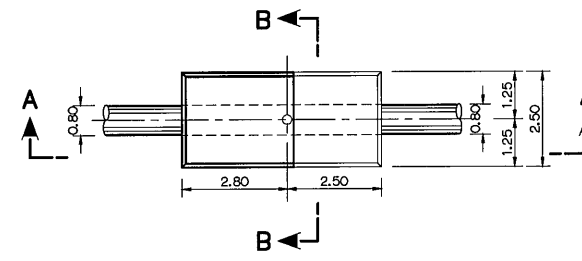
DISTANCE - Km.



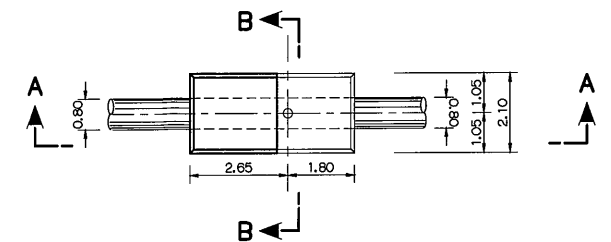
PLAN
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SCALE 1:100



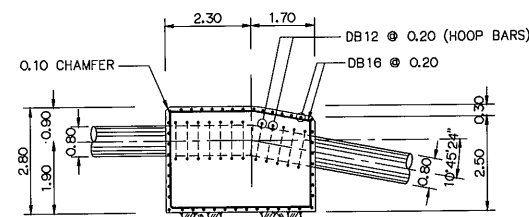
PLAN
ANCHOR BLOCK ②
SCALE 1:100



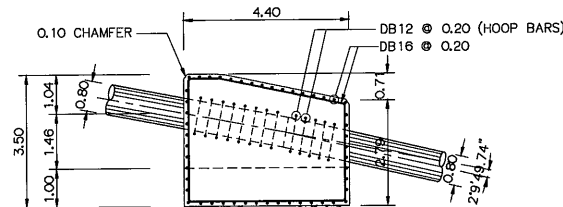
PLAN
ANCHOR BLOCK ③
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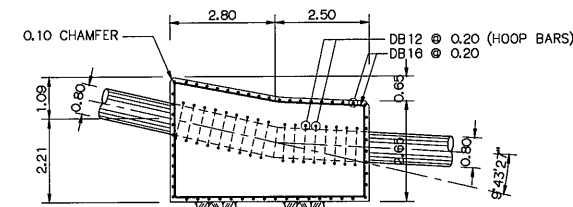
PLAN
ANCHOR BLOCK ④
SCALE 1:100



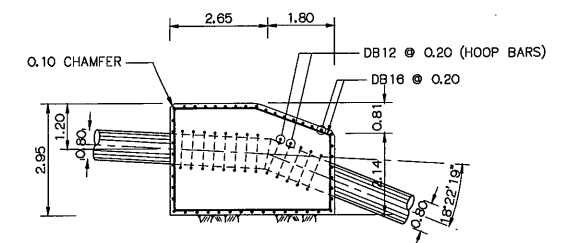
SECTION A-A
ANCHOR BLOCK ①
SCALE 1:100



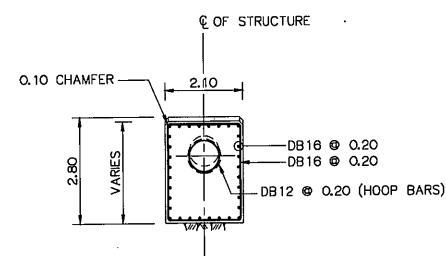
SECTION A-A
ANCHOR BLOCK ②
SCALE 1:100



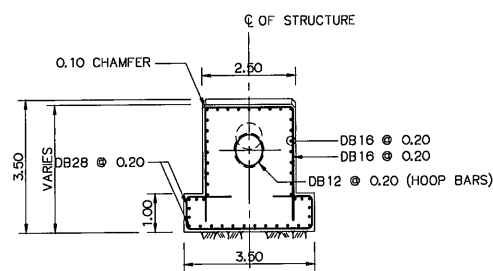
SECTION A-A
ANCHOR BLOCK ③
SCALE 1:100



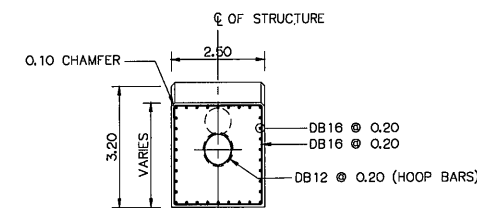
SECTION A-A
ANCHOR BLOCK ④
SCALE 1:100



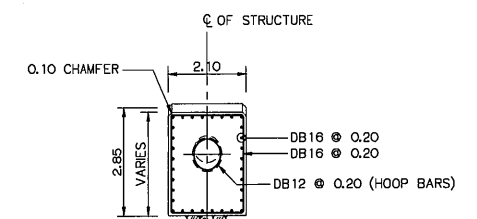
SECTION B-B
ANCHOR BLOCK ①
SCALE 1:100



SECTION B-B
ANCHOR BLOCK ②
SCALE 1:100



SECTION B-B
ANCHOR BLOCK ③
SCALE 1:100



SECTION B-B
ANCHOR BLOCK ④
SCALE 1:100

NOTES :

- ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- CONCRETE COVER OF STEEL BARS 8.0 CM.
- REINFORCED CONCRETE IS PLAIN CONCRETE WITH 40% DUMPED ROCK
- CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

REFERENCE DRAWING :

- PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+600

KTP2-PS-01

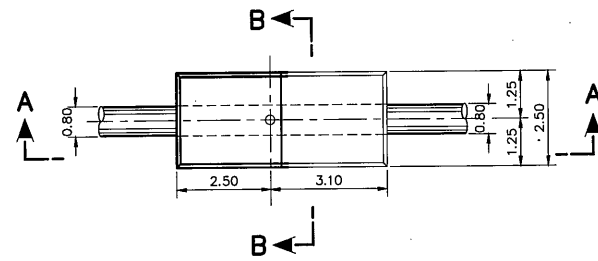


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NO.	DATE	REVISIONS	CHECKED	APPROVED

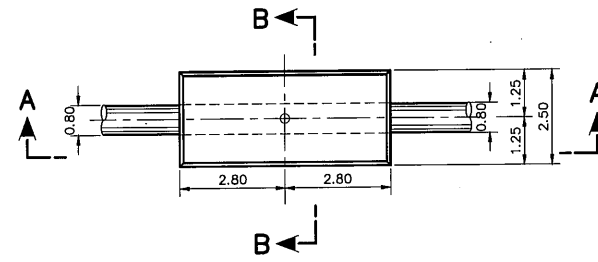
CONSULTANTS

DEDE

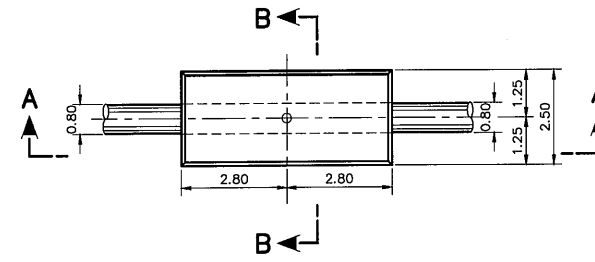
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK ANCHOR BLOCK NO. 1, 2, 3 AND 4 -- PLAN AND SECTIONS			
PCM P&C MANAGEMENT CO.,LTD. DESIGNED DRAWN CHECKED PROJECT MANAGER	28.1957 28.1957 17/03/2020 DATE	REVIEWED SUBMITTED RECOMMENDED APPROVED DRAWING NO. KTP2-PS-04	SHEET NO. 19 OF 97



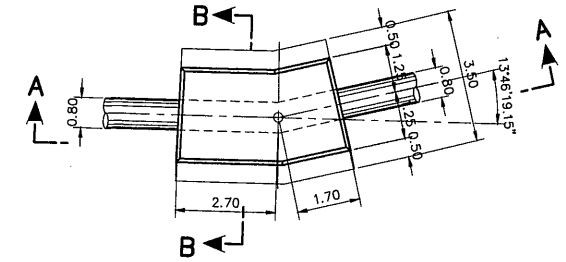
PLAN
ANCHOR BLOCK ⑤
SCALE 1:100



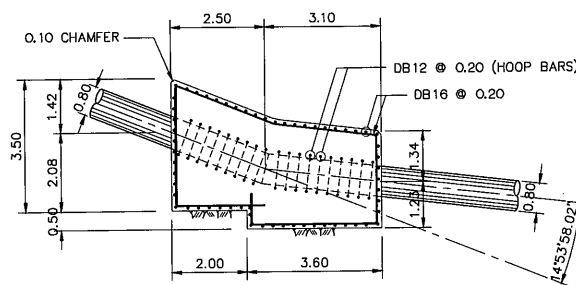
PLAN
ANCHOR BLOCK ⑥
SCALE 1:100



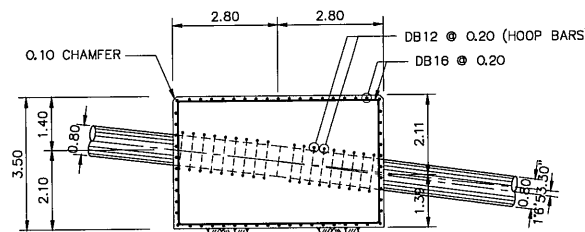
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ANCHOR BLOCK ⑦
SCALE 1:100



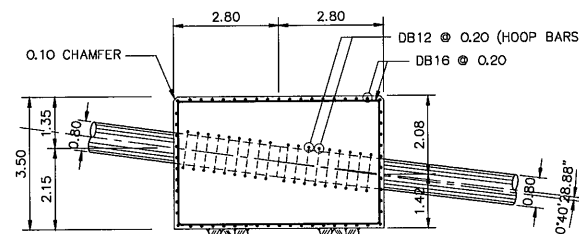
PLAN
ANCHOR BLOCK ⑧
SCALE 1:100



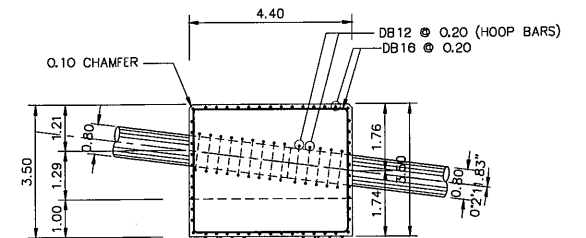
SECTION A-A
ANCHOR BLOCK ⑤
SCALE 1:100



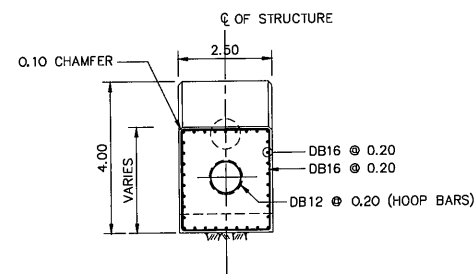
SECTION A-A
ANCHOR BLOCK ⑥
SCALE 1:100



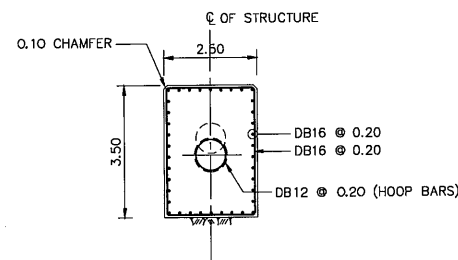
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ANCHOR BLOCK ⑦
SCALE 1:100



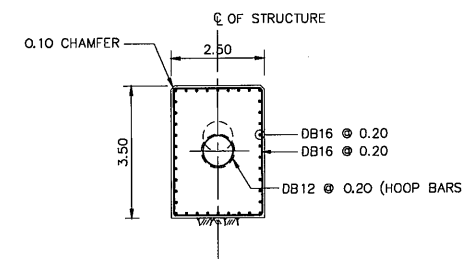
SECTION A-A
ANCHOR BLOCK ⑧
SCALE 1:100



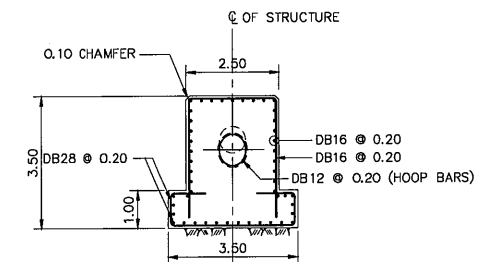
SECTION B-B
ANCHOR BLOCK ⑤
SCALE 1:100



SECTION B-B
ANCHOR BLOCK ⑥
SCALE 1:100



SECTION B-B
ANCHOR BLOCK ⑦
SCALE 1:100



SECTION B-B
ANCHOR BLOCK ⑧
SCALE 1:100

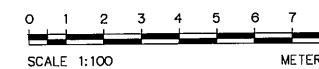
NOTES :

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. CONCRETE COVER OF STEEL BARS 8.0 CM.
4. REINFORCED CONCRETE IS PLAIN CONCRETE WITH 40% DUMPED ROCK
5. CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

REFERENCE DRAWING :

1. PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+600
2. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860

KTP2-PS-01
KTP2-PS-02



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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1				
	17/03/2020			

CONSULTANTS

DEDE

PROJECT MANAGER

DATE

DRAWING NO.
KTP2-PS-05

SHEET NO.
20 OF 97

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

KLONG THUNG PHEN 2 HYDROPOWER PROJECT
AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI

PART 1 : CIVIL WORKS

PENSTOCK

ANCHOR BLOCK NO. 5, 6, 7 AND 8 - PLAN AND SECTIONS

PCM P&C MANAGEMENT CO.,LTD.

Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

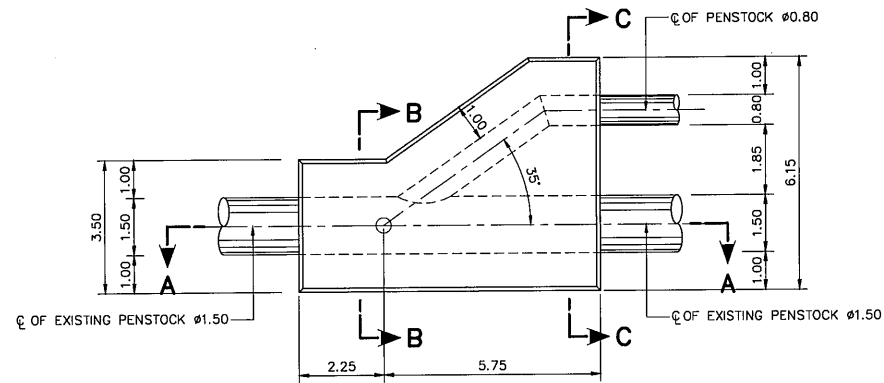
REVIEWED

SUBMITTED

RECOMMENDED

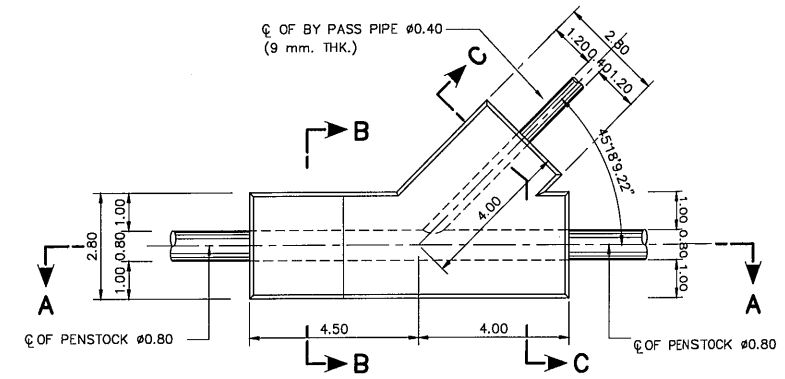
APPROVED

DATE



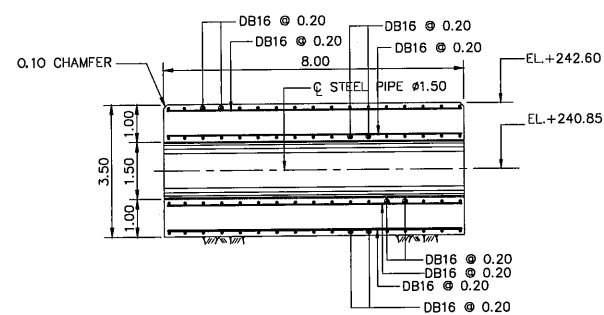
PLAN OF THRUST BLOCK ①

SCALE 1:100



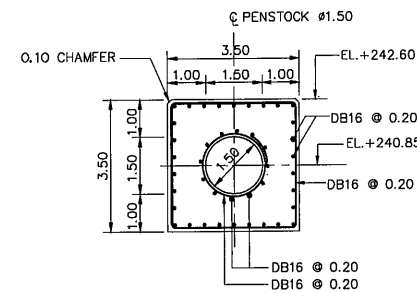
PLAN OF THRUST BLOCK ②

SCALE 1:100



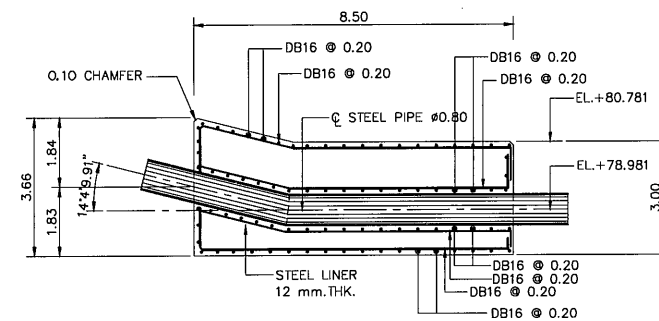
SECTION A-A

SCALE 1:100



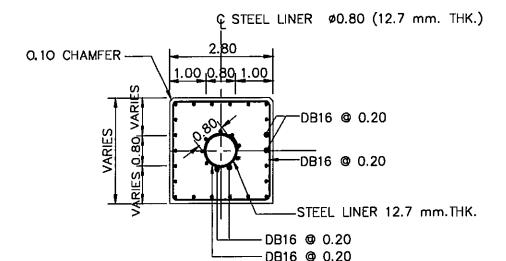
SECTION B-B

SCALE 1:100



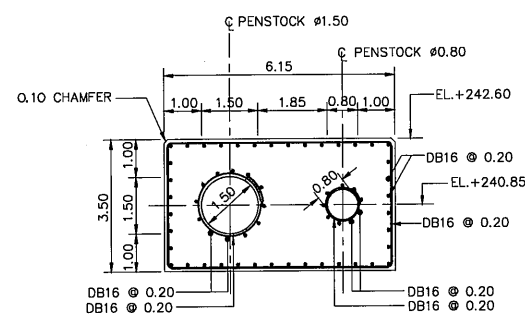
SECTION A-A

SCALE 1:100



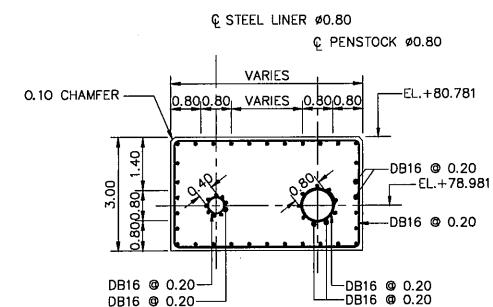
SECTION B-B

SCALE 1:100



SECTION C-C

SCALE 1:100



SECTION C-C

SCALE 1:100

NOTES :

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. CONCRETE COVER OF STEEL BARS 8.0 CM.
4. REINFORCED CONCRETE IS PLAIN CONCRETE WITH 40% DUMPED ROCK
5. CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

REFERENCE DRAWING :

1. PENSTOCK, PLAN AND PROFILE, STA. 0+000 TO STA. 0+600
2. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860

KTP2-PS-01

KTP2-PS-02



SCALE 1:100 METERS

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			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK			
THRUST BLOCK NO. 1 AND 2 - PLAN AND SECTIONS			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		RECOMMENDED	
CHECKED	28.1957	APPROVED	
DATE	17/03/2020	DRAWING NO.	KTP2-PS-07
PROJECT MANAGER	DATE	SHEET NO.	22 OF 97

PLAN
ANCHOR BLOCK (3)
SCALE 1:100

SECTION D-D
SCALE 1:50

SECTION C-C
SCALE 1:50

SECTION B-B
SCALE 1:50

SECTION E-E
SCALE 1:50

SECTION A-A
SCALE 1:50

SECTION F-F
SCALE 1:50

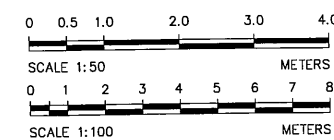
TYPICAL HOOP BAR
SCALE 1:50

NOTES :

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. CONCRETE COVER OF STEEL BARS 8.0 CM.
4. REINFORCED CONCRETE IS PLAIN CONCRETE WITH 40% DUMPED ROCK
5. CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

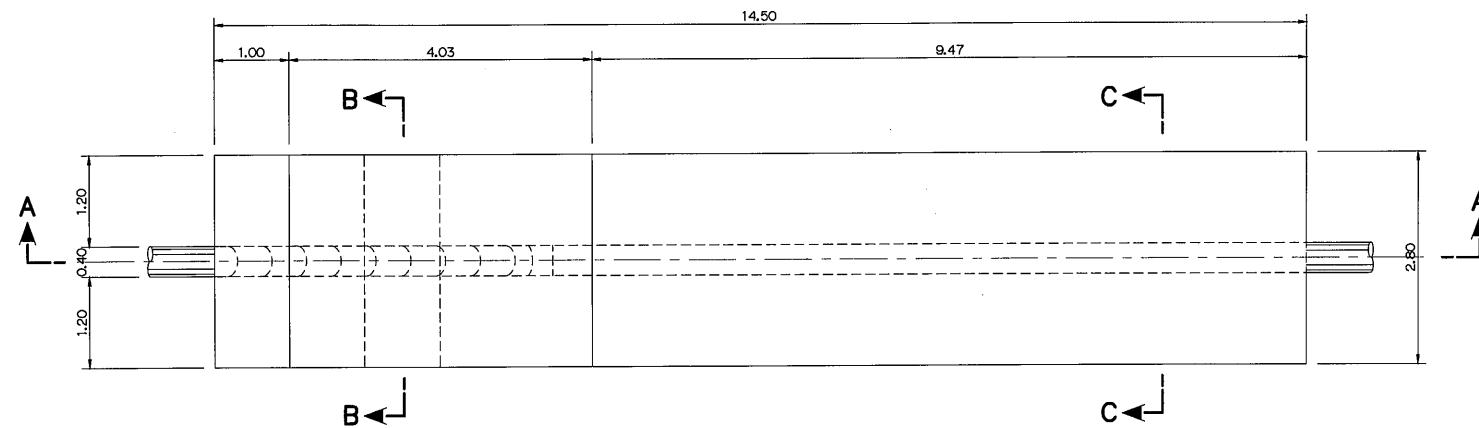
REFERENCE DRAWING :

1. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860 KTP2-PS-02



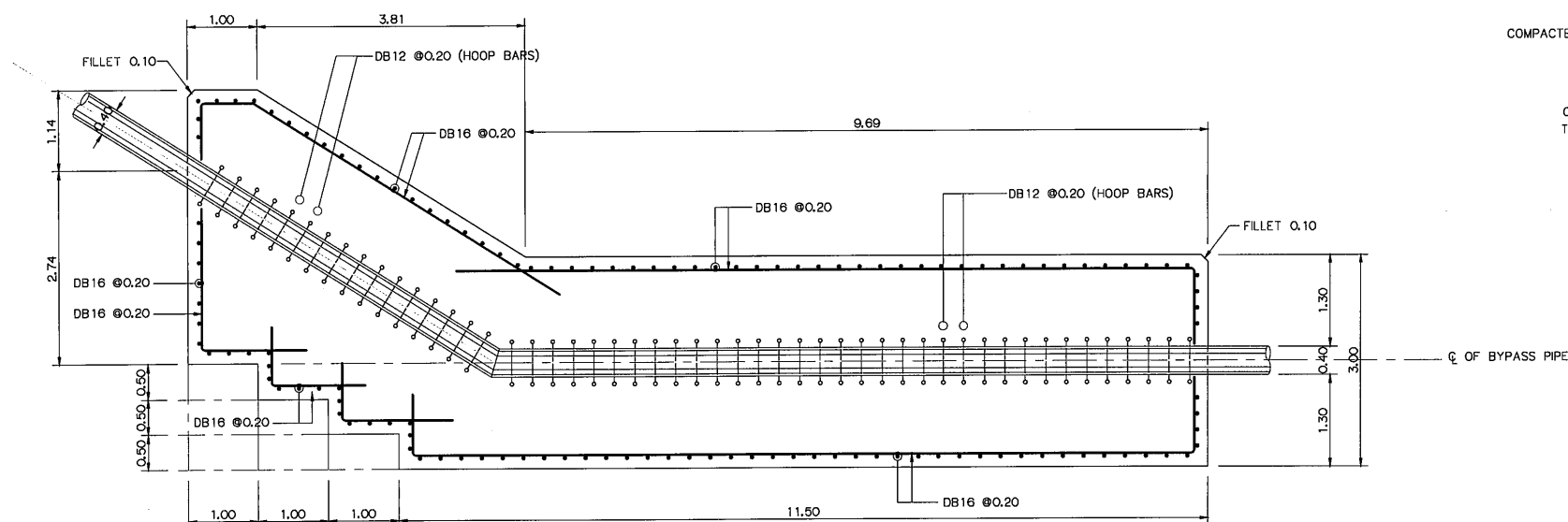
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
	CONSULTANTS		DEDE	

	KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHIATCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS PENSTOCK	
THRUST BLOCK NO. 3 – PLAN AND SECTIONS	
	P&C MANAGEMENT CO.,LTD.
	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED	28.1957
DRAWN	28.1957
CHECKED	17/03/2020
PROJECT MANAGER	
DATE	



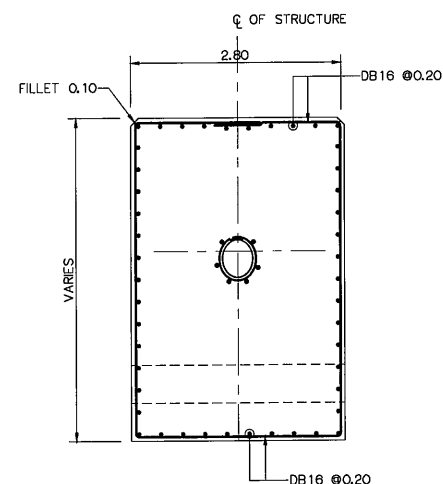
PLAN OF THRUST BLOCK ④

SCALE 1:50



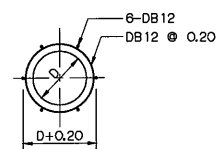
SECTION A-A

SCALE 1:50



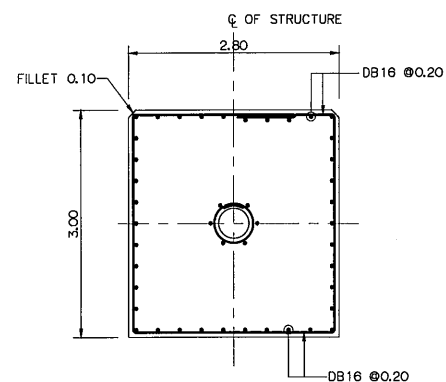
SECTION B-B

SCALE 1:50



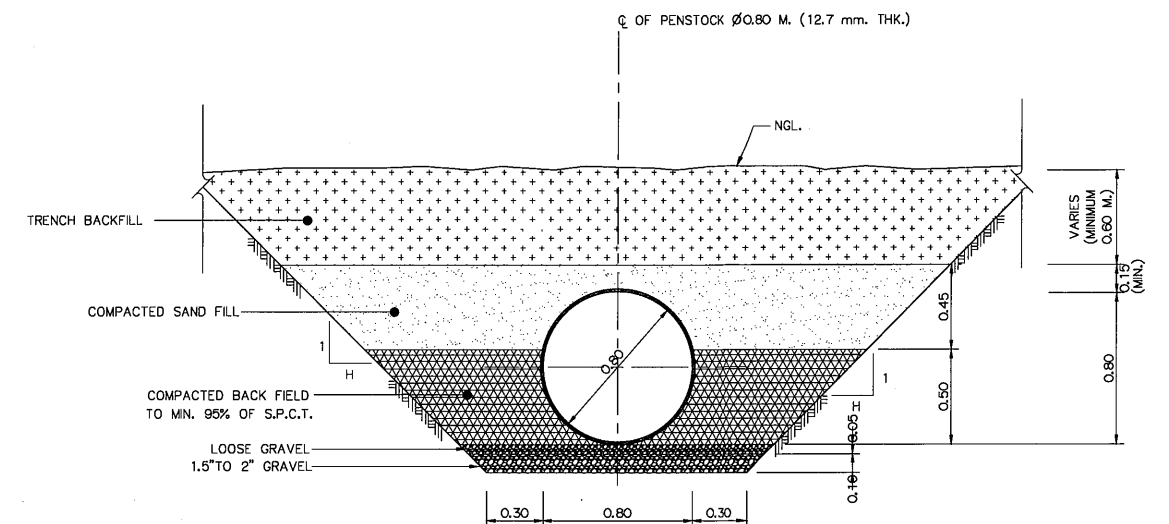
TYPICAL HOOP BAR

SCALE 1:50



SECTION C-C

SCALE 1:50



TYPICAL SECTION OF BURIED PENSTOCK

SCALE 1:20

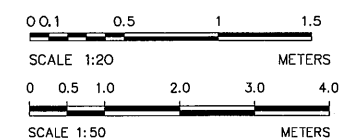
NOTES :

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. CONCRETE COVER OF STEEL BARS 8.0 CM.
4. REINFORCED CONCRETE IS PLAIN CONCRETE WITH 40% DUMPED ROCK
5. CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

REFERENCE DRAWING :

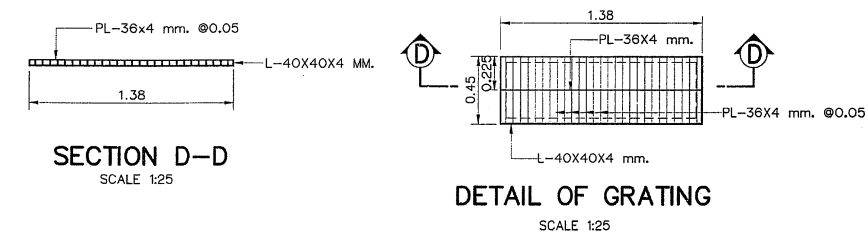
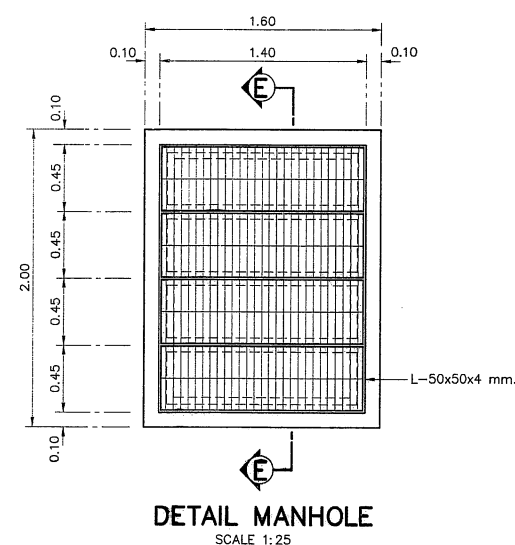
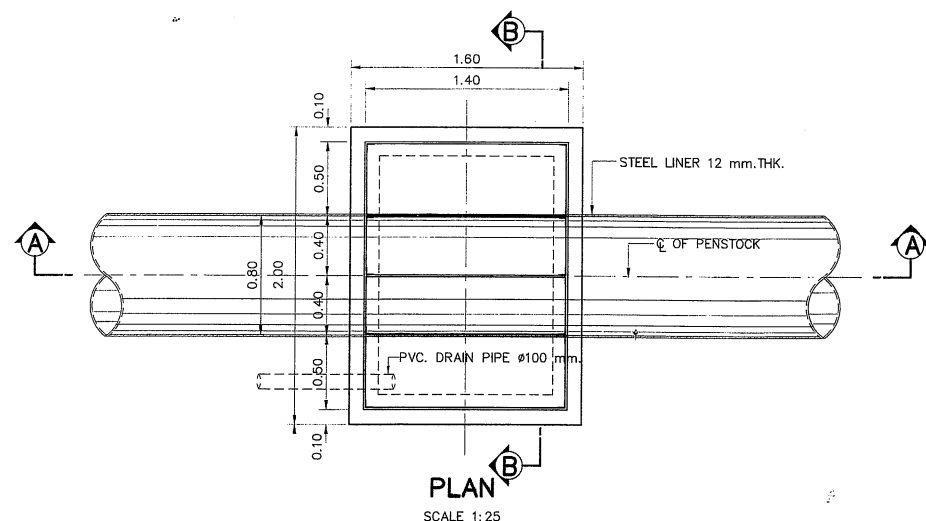
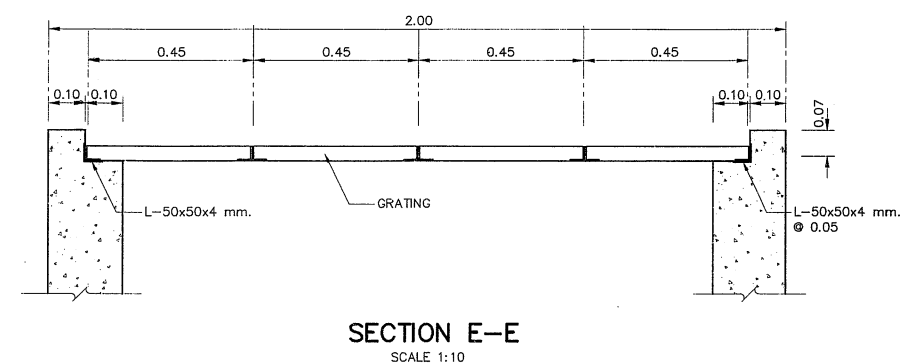
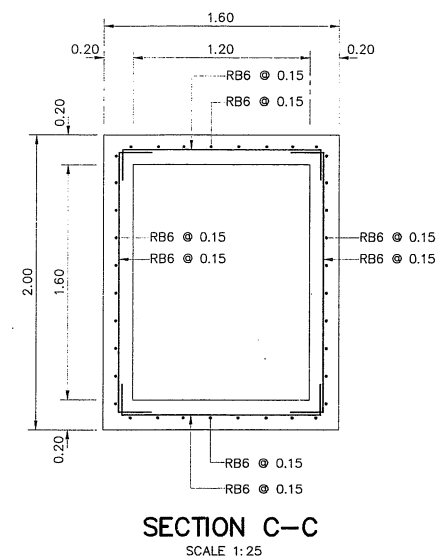
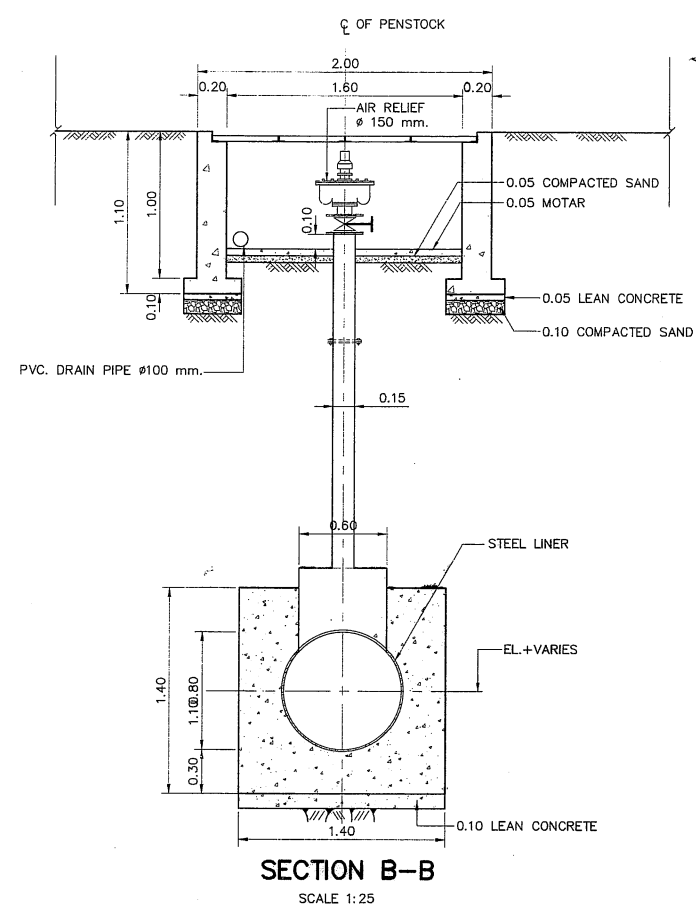
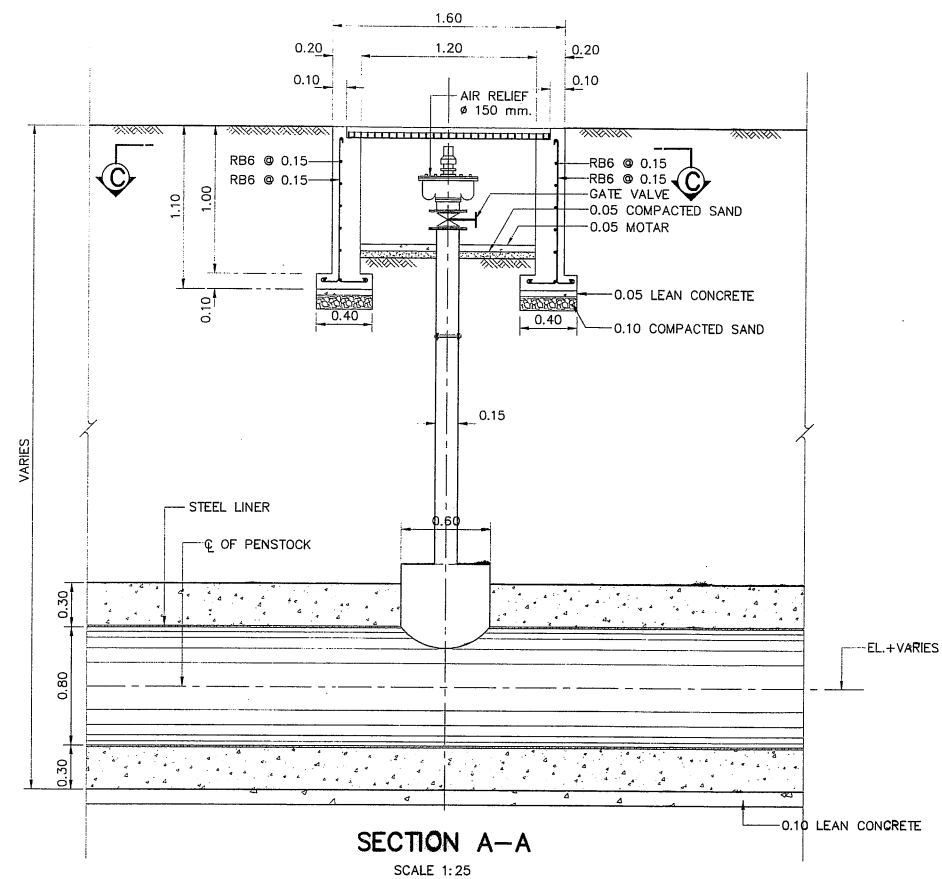
1. PENSTOCK, PLAN AND PROFILE OF BYPASS PIPE, KM. 0+000 TO KM. 0+43.70

KTP2-PS-03



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK			
THRUST BLOCK NO. 4 - PLAN AND SECTIONS AND TYPICAL SECTION			
DESIGNED DRAWN CHECKED PROJECT MANAGER		REVIEWED SUBMITTED RECOMMENDED APPROVED DATE	
17/03/2020		DRAWING NO. KTP2-PS-09	
24 OF 97		SHEET NO.	



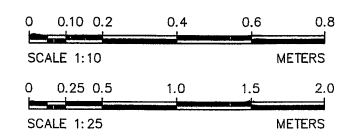
NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

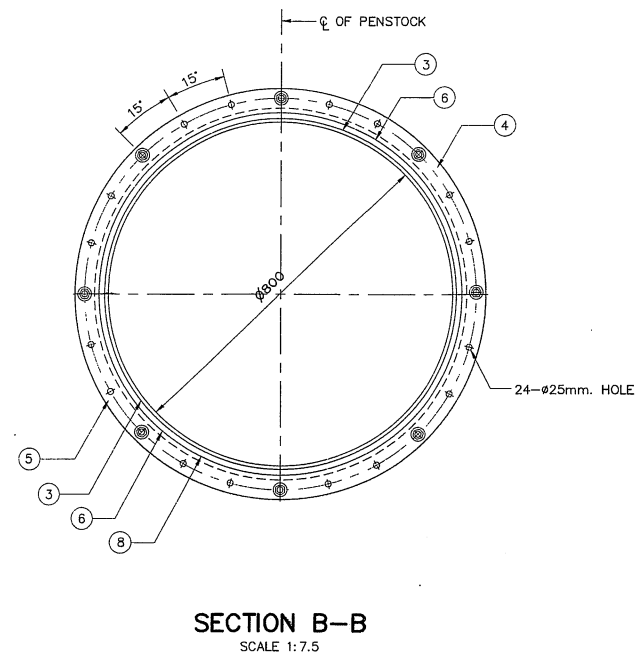
REFERENCE DRAWINGS :

1. PENSTOCK, PLAN AND PROFILE, KM. 0+000 TO KM. 0+600
2. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860

KTP2-PS-01
KTP2-PS-02

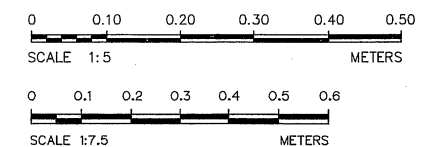
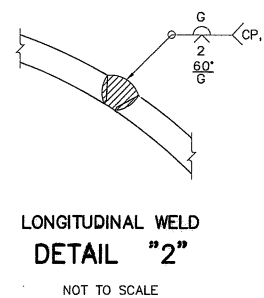


					PCM P&C MANAGEMENT CO.,LTD.		MINISTRY OF ENERGY	
3					DESIGNED	28.1957	REVIEWED	4
2					DRAWN	<i>giam</i>	SUBMITTED	<i>giam</i>
1					CHECKED	<i>giam</i>	RECOMMENDED	<i>giam</i>
NO.	DATE	REVISIONS	CHECKED	APPROVED	CHECKED	28.1957	APPROVED	<i>ML</i>
CONSULTANTS				DEDE		DRAWING NO.		SHEET NO.
				PROJECT MANAGER		KTP2-PS-10		25 OF 97
				DATE				
				17/03/2020				



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	#25 mm. BOLTS	ASTM A-325	24	--
11	#25 mm. NUT	ASTM A-325	72	--
12	#25 mm. WASHER	ASTM A-325	48	--
13	PACKING RINGS (16 mm. S.Q. RING)	ASBESTOS--GRAPHITE	6	NOTE 5

1. 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")
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 MILLIMETER UNLESS OTHERWISE SHOWN
6. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03



 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK EXPANSION JOINT, PLAN, SECTIONS AND DETAILS			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		28.1957	REVIEWED 
DRAWN			SUBMITTED 
CHECKED		28.1957	APPROVED 
		17/03/2020	DRAWING NO.
PROJECT MANAGER		DATE	KTP2-PS-11
			SHEET NO.
			26 OF 97

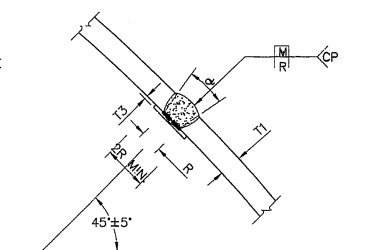
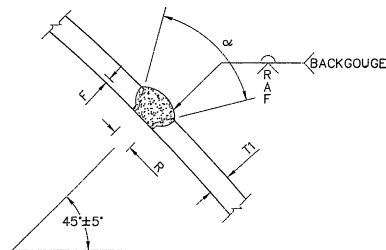
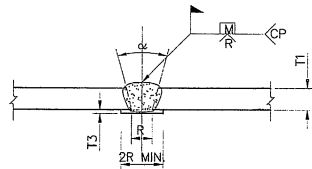
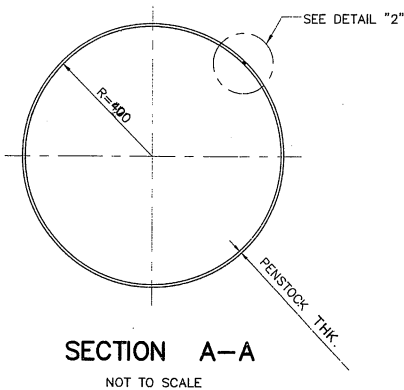
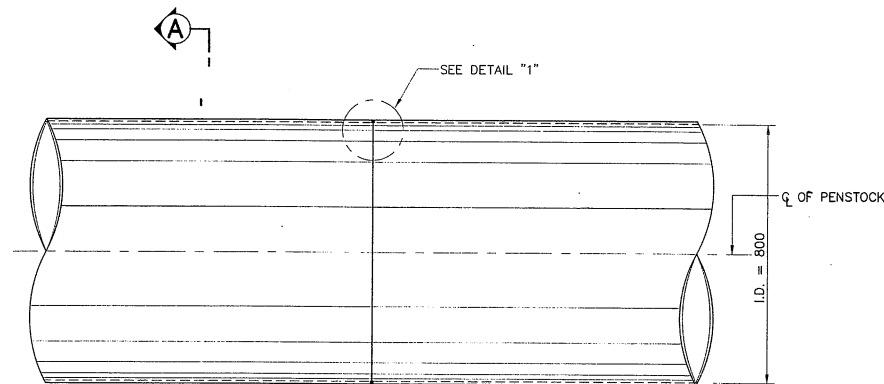


TABLE OF TYPE "1" SINGLE-V-GROOVE WELD, BUTT JOINT

WELDING PROCESS	JOINT DESIGNATION	BASE METAL THICKNESS (U= UNLIMITED)		GROOVE PREPARATION		ALLOWED WELDING POSITIONS	GAS SHIELDING FOR FCAW	REMARK	TOLERANCES	
		T1	T3	ROOT OPENING	GROOVE ANGLE				AS DETAILED	AS FIT-UP
SMAW	B-U2a	U	10	R = 6	$\alpha = 45^\circ$	ALL	-	e,j	R = +2,-0 $\alpha = +10^\circ,-0^\circ$	+6,-2 +10,-5
				R = 10	$\alpha = 30^\circ$	F,V,OH	-	e,j		
				R = 12	$\alpha = 20^\circ$	F,V,OH	-	e,j		
GMAW FCAW	B-U2a-GF	U	10	R = 5	$\alpha = 30^\circ$	F,V,OH	REQUIRED	a,j		
				R = 10	$\alpha = 30^\circ$	F,V,OH	NOT REQ.	a,j		
				R = 6	$\alpha = 45^\circ$	F,V,OH	NOT REQ.	a,j		
GMAW	B-L2a-S	50 MAX.	10	R = 6	$\alpha = 30^\circ$	F	-	j		
GMAW	B-L2-S	U	10	R = 16	$\alpha = 20^\circ$	F	-	j		

TABLE OF TYPE "2" SINGLE-V-GROOVE WELD, BUTT JOINT

WELDING PROCESS	JOINT DESIGNATION	BASE METAL THICKNESS (U= UNLIMITED)		GROOVE PREPARATION		ALLOWED WELDING POSITIONS	GAS SHIELDING FOR FCAW	REMARK
		T1	T3	ROOT OPENING ROOT FACE GROOVE ANGLE	TOLERANCES AS DETAILED AS FIT-UP			
SMAW	B-U2	U	10	R = 0-3 f = 0 TO 3 $\alpha = 60^\circ$	+2,-0 +2,-0 +10,-0	ALL	-	d,e,j
GMAW FCAW	B-U2-GF	U	10	R = 0-3 f = 0 TO 3 $\alpha = 60^\circ$	+2,-0 +2,-0 +10,-0	ALL	NOT REQ.	a,d,j
SAW	B-L2c-s	OVER 12 TO 25	10	R = 0 f = 6 MAX. $\alpha = 60^\circ$	R = +0,-0 f = +0,-f $\alpha = +10^\circ,-0^\circ$	F	-	d,j
		OVER 12 TO 38	10	R = 0 f = 6 MAX. $\alpha = 60^\circ$	+2,-0 +2,-2 +10,-5			
		OVER 38 TO 50	10	R = 0 f = 6 MAX. $\alpha = 60^\circ$	+2,-0 +2,-2 +10,-5			

REMARK :

- a : NOT PREQUALIFIED FOR GMAW-S NOR GTAW.
d : BACKGOUGE ROOT TO SOUND METAL BEFORE WELDING SECOND SIDE.
e : SMAW DETAILED JOINTS MAY BE USED FOR PREQUALIFIED GMAW (EXCEPT GMAW-S) AND FCAW.
j : THE ORIENTATION OF THE TWO MEMBERS IN THE JOINTS MAY VARY FROM 135° TO 180° FOR BUTT JOINTS, OR 45° TO 135° FOR CORNER JOINTS, OR 45° TO 90° FOR T-JOINTS.

LEGEND :

WELDING PROCESSES	WELDING POSITIONS
SMAW = SHIELD METAL ARC WELDING	F = FLAT
GMAW = GAS METAL ARC WELDING	H = HORIZONTAL
FCAW = FLUX CORED ARC WELDING	V = VERTICAL
SAW = SUBMERGED ARC WELDING	OH = OVERHEAD

NOTES :

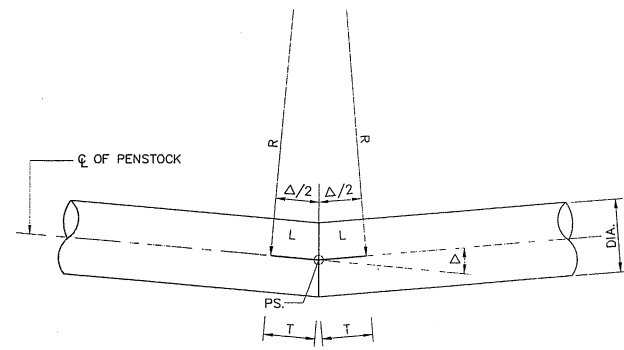
- ALL DIMENSION ARE IN MILLIMETER, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- GROOVE WELD MADE AFTER WELDING OTHER SIDE
- USE WELDING ELECTRODE TYPE "E" 70XX
- MATERIAL OF BACKING IS THE SAME AS OF PIPE
- WELDED JOINT SHALL CONFORM TO AWS D1.1

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

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
			CONSULTANTS	DEDE

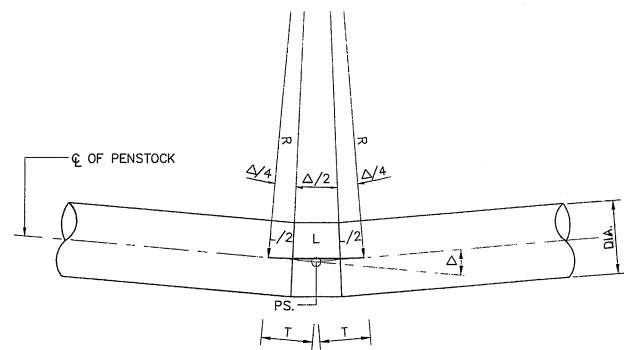
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK WELDING DETAILS			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	SUBMITTED	
DRAWN		RECOMMENDED	
CHECKED	28.1957	APPROVED	
17/03/2020 PROJECT MANAGER		DRAWING NO. KTP2-PS-12	
DATE		SHEET NO. 27 OF 97	



BEND TYPE "1"

DELTA (Δ) 0°-5°

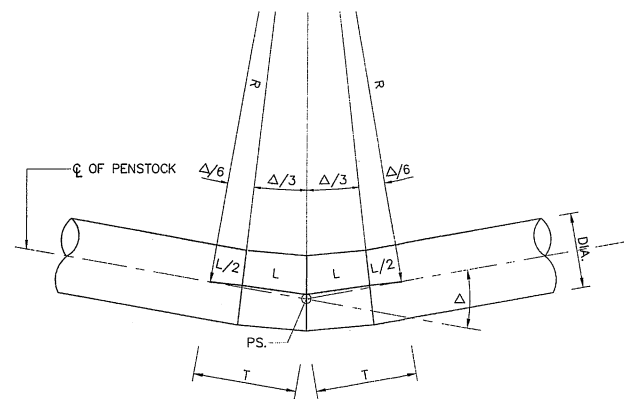
SCALE 1:20



BEND TYPE "2"

DELTA (Δ) 5°-15°

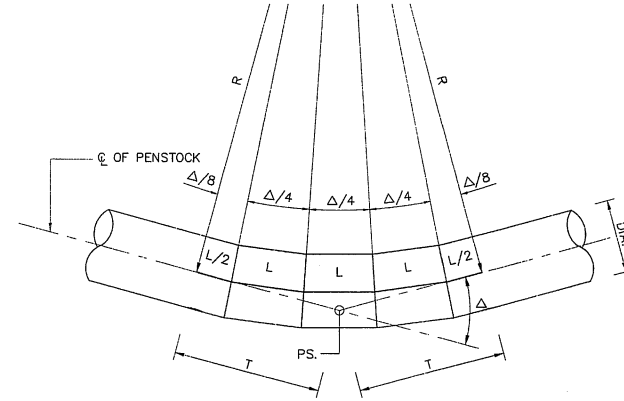
SCALE 1:20



BEND TYPE "3"

DELTA (Δ) 15°-25°

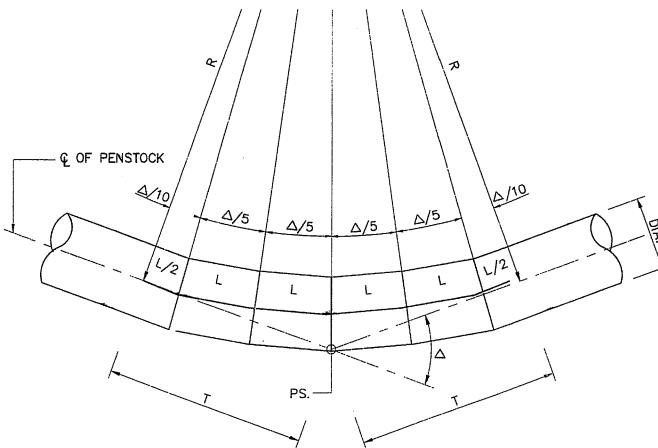
SCALE 1:20



BEND TYPE "4"

DELTA (Δ) 25°-35°

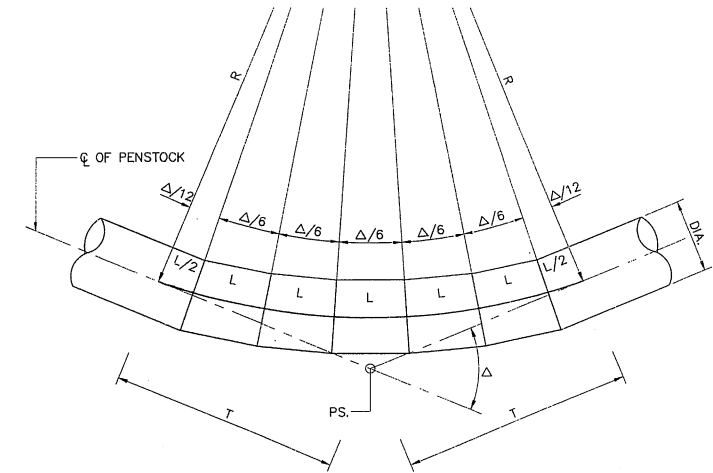
SCALE 1:20



BEND TYPE "5"

DELTA (Δ) 35°-45°

SCALE 1:20



BEND TYPE "6"

DELTA (Δ) 45°-OVER

SCALE 1:20

DIMENSIONS OF BENDS

BEND	KM. OF PS.	PS. NO.	Δ (DEGREE)	TYPE	DIA. (m.)	THICKNESS (mm.)
1	0+035.23	PL1	35°0'16.31"	5	0.80	12
2	0+075.28	PL2	2°30'6.82"	1	0.80	12
3	0+145.26	PL3	19°33'48.06"	3	0.80	12
4	0+860.26	PL4	13°46'18.57"	2	0.80	12
5	1+031.26	PL5	29°12'32.27"	4	0.80	12
6	1+188.41	PL6	45°18'9.22"	6	0.80	12

NOTE :

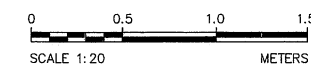
1. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
2. THIS DRAWING USE FOR GUIDE ONLY, THE CONTRACTOR HAS TO SUBMITTED SHOP DRAWING TO FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWING :

1. PENSTOCK, PLAN AND PROFILE, KM. 0+000 TO KM. 0+600
2. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860

KTP2-PS-01

KTP2-PS-02

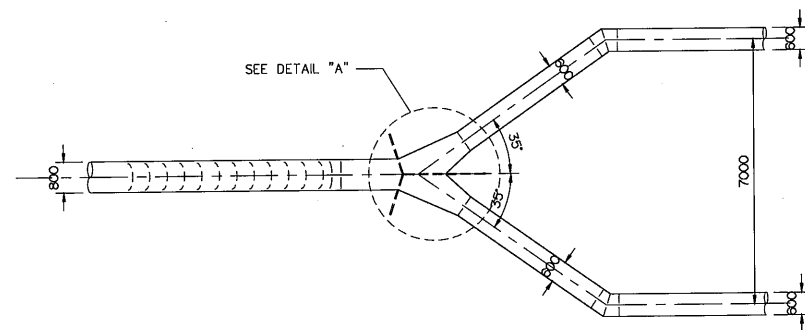


3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS

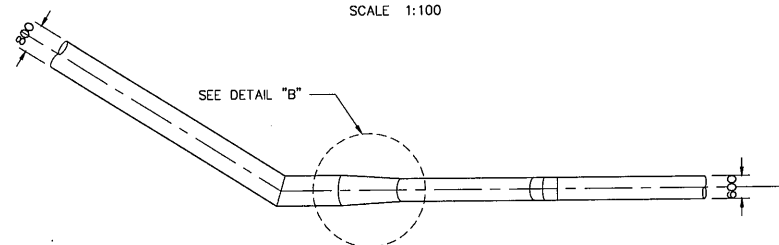
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KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK BEND DETAILS			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED	17/03/2020	APPROVED	
PROJECT MANAGER		DRAWING NO.	SHEET NO.
		KTP2-PS-13	28 OF 97



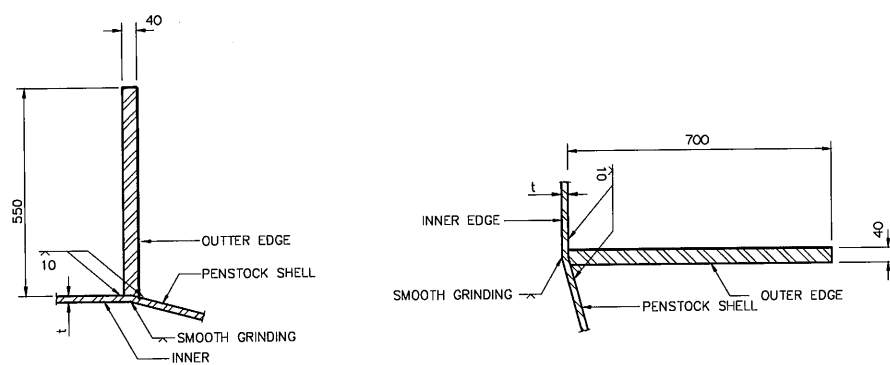
PLAN

SCALE 1:100



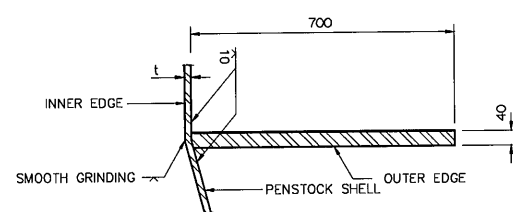
ELEVATION

SCALE 1:100



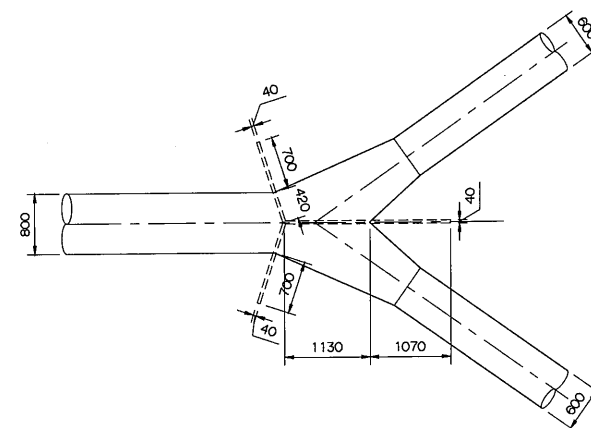
SECTION A-A

SCALE 1:10



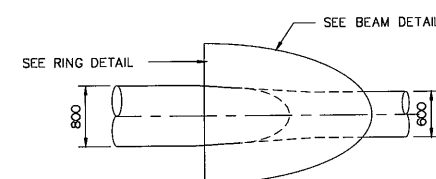
SECTION B-B

SCALE 1:10



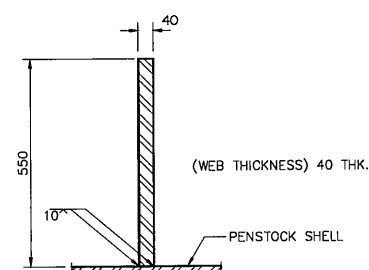
DETAIL "A"

SCALE 1:50



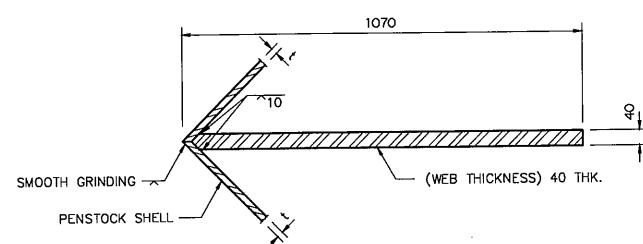
DETAIL "B"

SCALE 1:50



SECTION C-C

SCALE 1:10



SECTION D-D

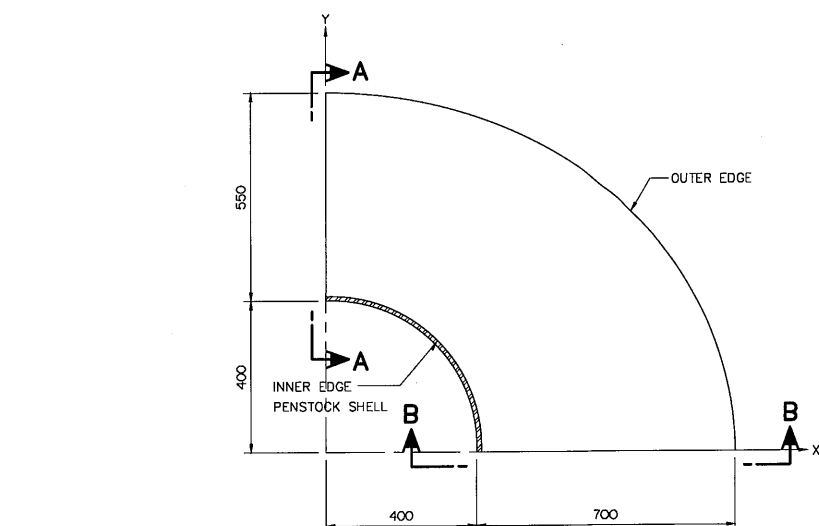
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- NOTES :**

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. THIS DRAWING USE FOR GUIDE ONLY, THE CONTRACTOR
HAS TO SUBMITTED SHOP DRAWING TO FIELD ENGINEER FOR APPROVAL

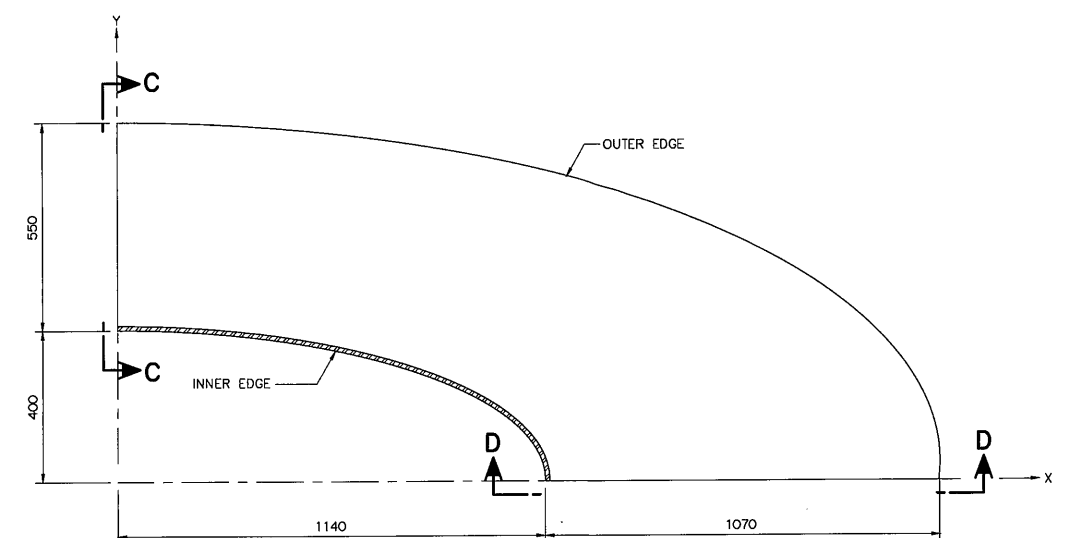
REFERENCE DRAWING :

1. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.860 KTP2-PS-02



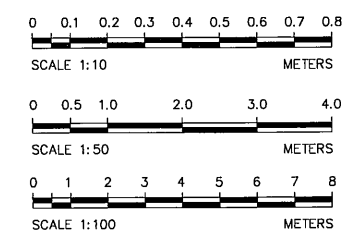
RING DETAIL

SCALE 1:10

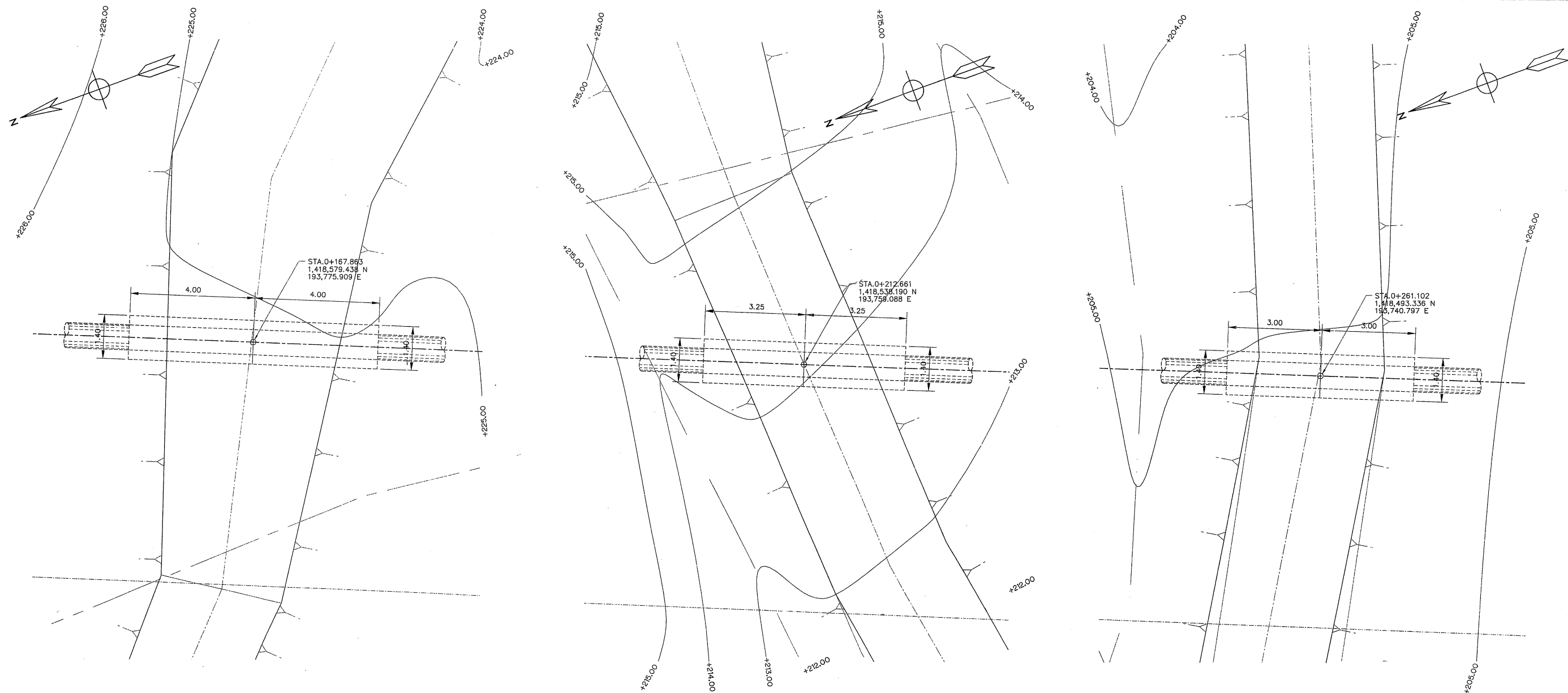


BEAM DETAIL

SCALE 1:10



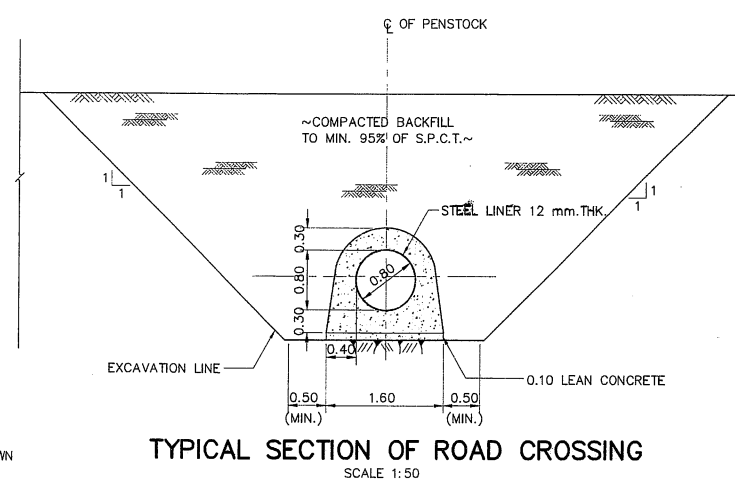
					 P&C MANAGEMENT CO. LTD.  MINISTRY OF ENERGY	REVIEWED				
3						DESIGNED		28.1957	SUBMITTED	
2						DRAWN			RECOMMENDED	
1						CHECKED		28.1957	APPROVED	
NO.	DATE	REVISIONS	CHECKED	APPROVED						
CONSULTANTS					DEDE	17/03/2020		DRAWING NO.	SHEET NO.	
						PROJECT MANAGER		DATE	KTP2-PS-14	
									29 OF 97	



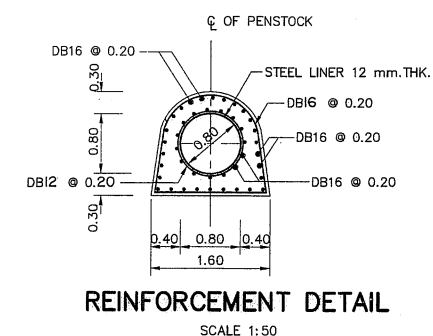
PLAN OF ROAD CROSSING 1 STA.0+167.863
SCALE 1:150

PLAN OF ROAD CROSSING 2 STA.0+212.661
SCALE 1:150

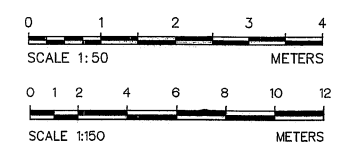
PLAN OF ROAD CROSSING 3 STA.0+261.102
SCALE 1:150



TYPICAL SECTION OF ROAD CROSSING
SCALE 1:50



REINFORCEMENT DETAIL
SCALE 1:50



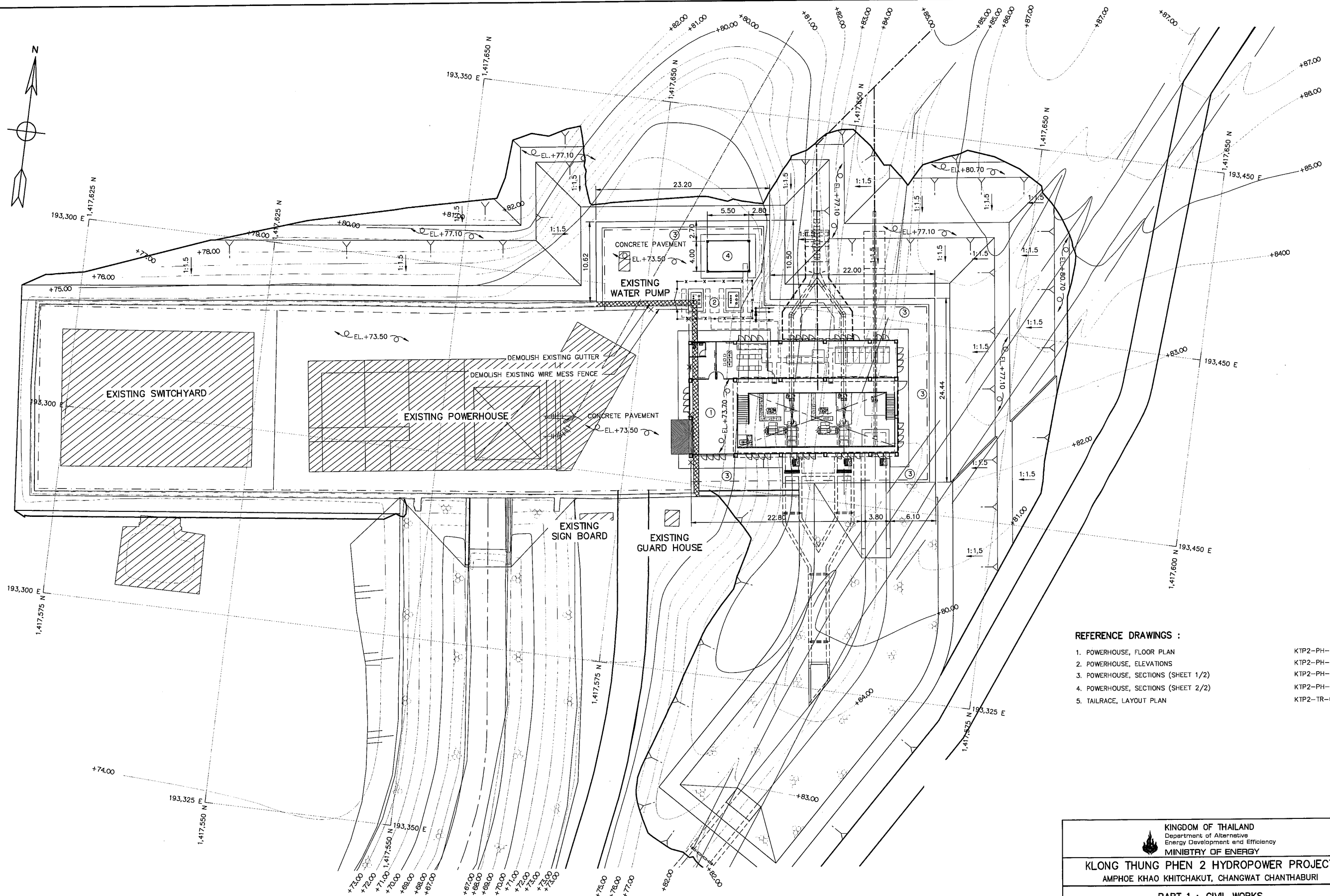
- NOTES:
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 3. ALIGNMENT OF PENSTOCK SHALL BE JUSTIFIED BY FIELD ENGINEER IN THE FIELD TO SUIT THE TOPOGRAPHY
 4. THE CONTRACTOR SHALL SUBMIT DETAILED WORKSHOP DRAWING FOR APPROVAL BY THE ENGINEER BEFORE MANUFACTURE OF PENSTOCK

REFERENCE DRAWING :

1. PENSTOCK, PLAN AND PROFILE, KM. 0+600 TO KM. 1+220.880

KTP2-PS-02

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS PENSTOCK ROAD CROSSING, PLAN AND TYPICAL SECTION			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED		APPROVED	
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
17/03/2020		DRAWING NO. KTP2-PS-15	
SHEET NO. 30 OF 97			



GENERAL LAYOUT

SCALE 1:250

LEGENDS :

- ① POWERHOUSE
- ② SWITCHYARD
- ③ NEW WIRE MESS FENCE
- ④ EDG. 50KVA

NOTES :

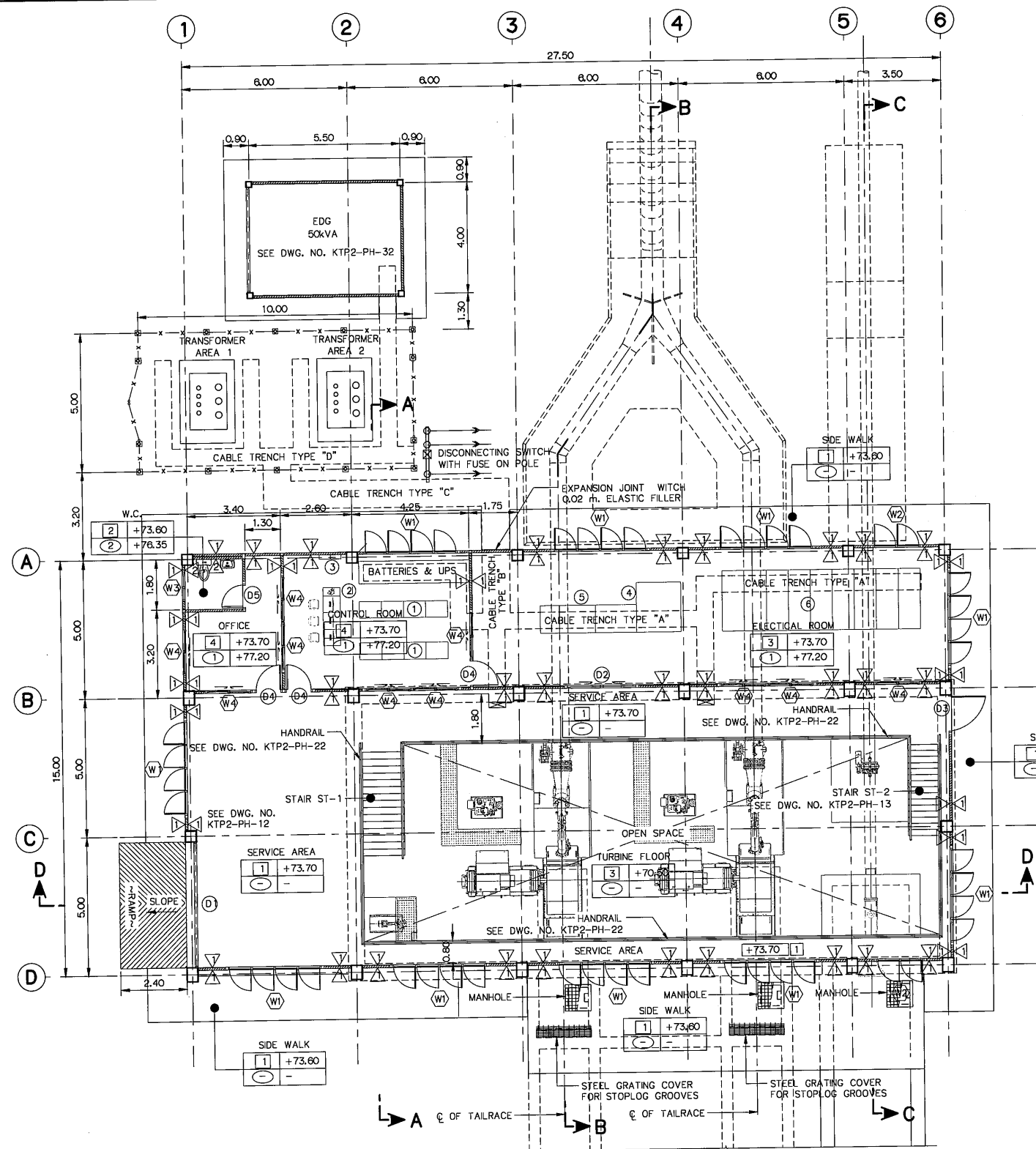
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

1. POWERHOUSE, FLOOR PLAN
2. POWERHOUSE, ELEVATIONS
3. POWERHOUSE, SECTIONS (SHEET 1/2)
4. POWERHOUSE, SECTIONS (SHEET 2/2)
5. TAILRACE, LAYOUT PLAN

- KTP2-PH-02
- KTP2-PH-04
- KTP2-PH-05
- KTP2-PH-06
- KTP2-TR-01

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE GENERAL LAYOUT	
PCM P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED 28.1957	REVIEWED
DRAWN	SUBMITTED
CHECKED 28.1957	RECOMMENDED
APPROVED	APPROVED
PROJECT MANAGER	DRAWING NO. 17/03/2020
DATE	SHEET NO. 31 OF 97



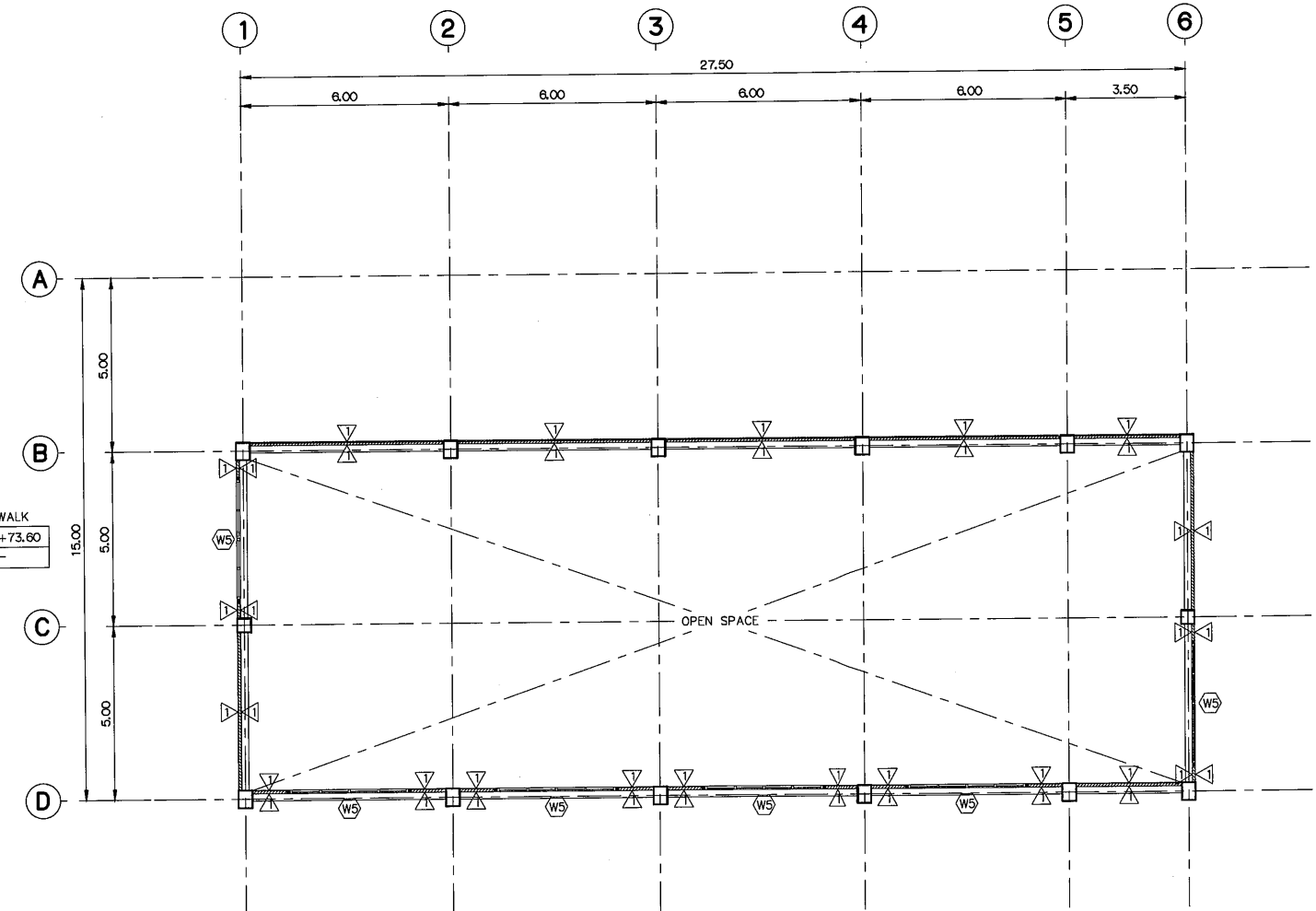
FLOOR PLAN
SCALE 1:100

- 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 :**
- △ CEMENT PLASTER
 - △ 8"x8" CERAMIC WALL TILES

- CEILING SYMBOLS :**
- ① PLASTERING W/PAINT
 - ② 9 mm.THK. GYPSUM BOARD WITH T-BAR STUD 0.60X0.60

- DESCRIPTION :**
- ① ELECTRICAL AND CONTROL CABINET
 - ② CONTROL DESK
 - ③ LIGHTING AND FIRE ALARM PANEL
 - ④ AUXILIARY TRANSFORMER
 - ⑤ MDB
 - ⑥ 22kV SWGR

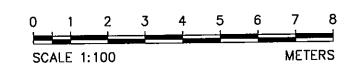


PLAN (EL.+77.95)
SCALE 1:100

- NOTES :**
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 - PORTABLE FIRE EXTINGUISHERS SHALL BE MOUNTED ON SUITABLE BRAEKET ON THE WALL AT LOCATION TO BE ADVISED BY ENGINEER
 - GUTTER FOR TURBINE DRAIN IN POWERHOUSE SHOULD BE DESIGN AND LOCATED BY E&M CONTRACTOR

- REFERENCE DRAWINGS :**
- POWERHOUSE, GENERAL LAYOUT
 - POWERHOUSE, ELEVATIONS
 - POWERHOUSE, SECTIONS (SHEET 1/2)
 - POWERHOUSE, SECTIONS (SHEET 2/2)
 - POWERHOUSE, DETAIL OF DOORS AND WINDOWS

- KTP2-PH-01
- KTP2-PH-04
- KTP2-PH-05
- KTP2-PH-06
- KTP2-PH-07



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
CONSULTANTS		DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE FLOOR PLAN			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED	17/03/2020	APPROVED	
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		KTP2-PH-02	32 OF 97



- ① TURBINE CASING
- ② GENERATOR
- ③ HYDRAULIC PRESSURE UNIT
- ④ BUTTERFLY VALVE DN 600
- ⑤ LAVT, NGT CUBICLE
- ⑥ DRAINAGE SYSTEM

 FIRST STAGE CONCRETE
 SECOND STAGE CONCRETE
 THIRD STAGE CONCRETE

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. PORTABLE FIRE EXTINGUISHERS SHALL BE MOUNTED ON SUITABLE BRACKET ON THE WALL AT LOCATION TO BE ADVISED BY ENGINEER
4. GUTTER FOR TURBINE DRAIN IN POWERHOUSE SHALL BE DESIGN AND LOCATED BY E&M CONTRACTOR
5. ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN 30 TON/M².

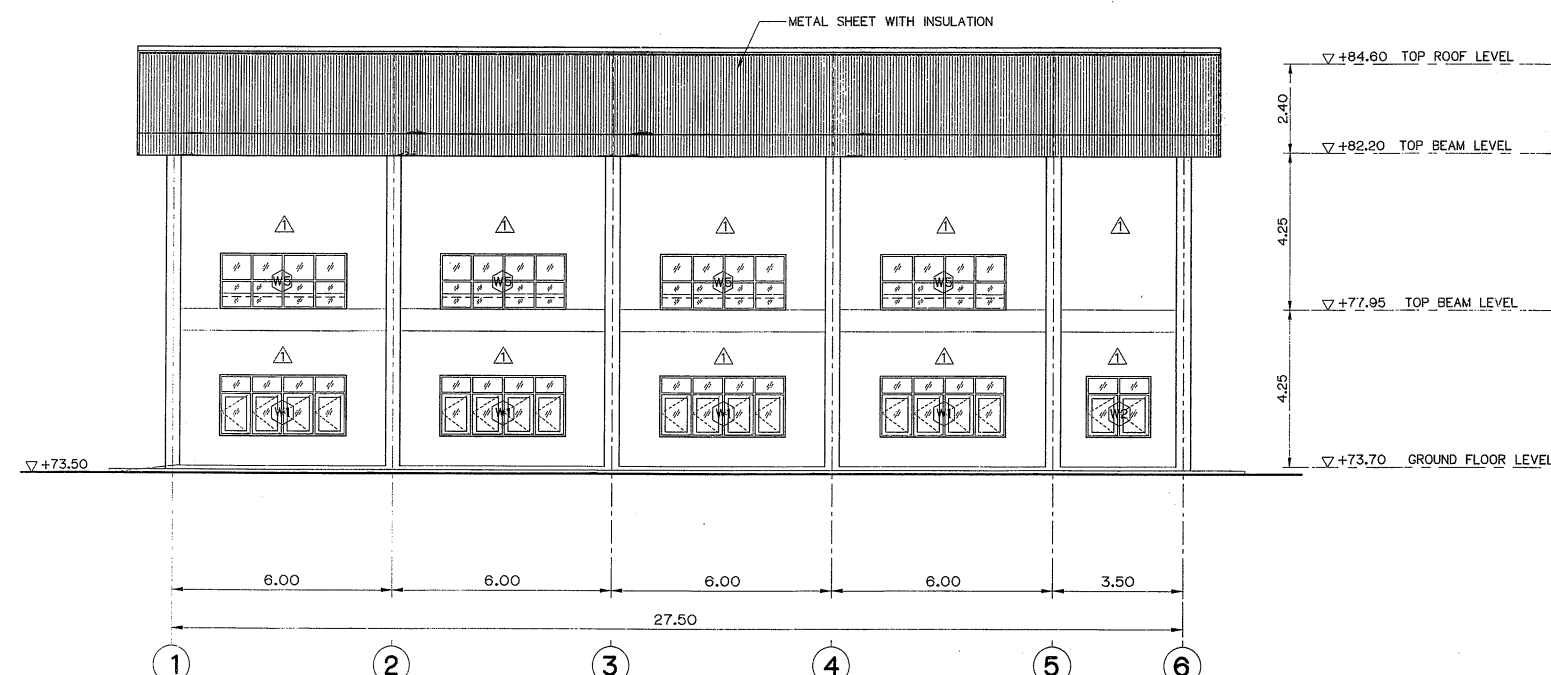
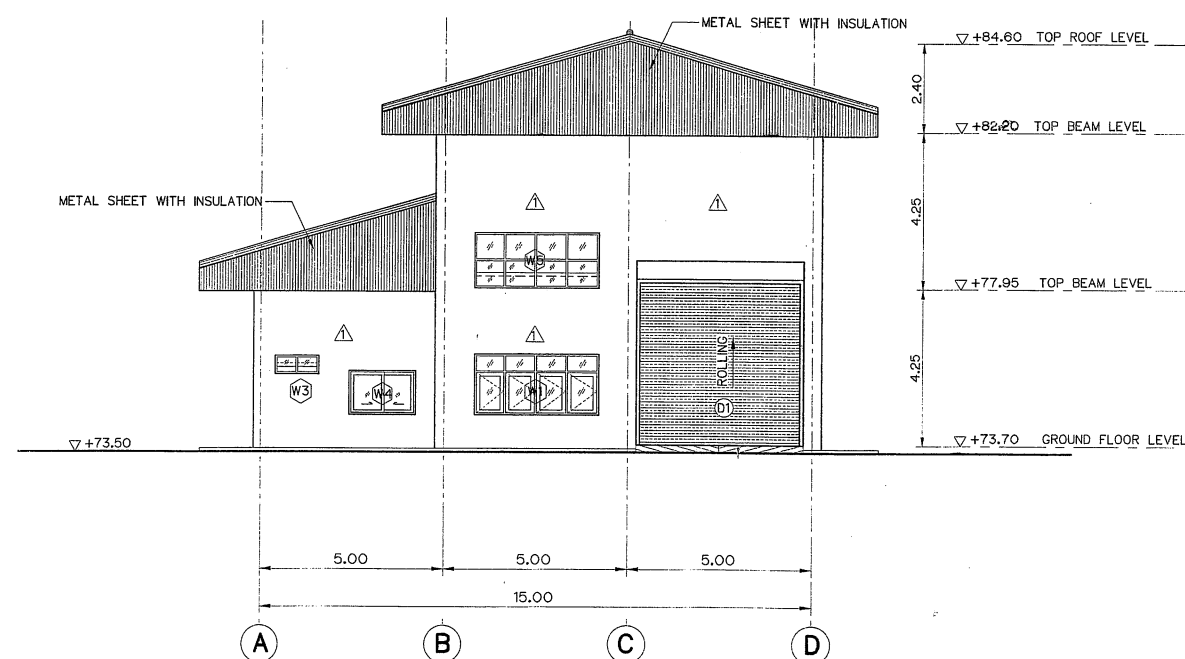
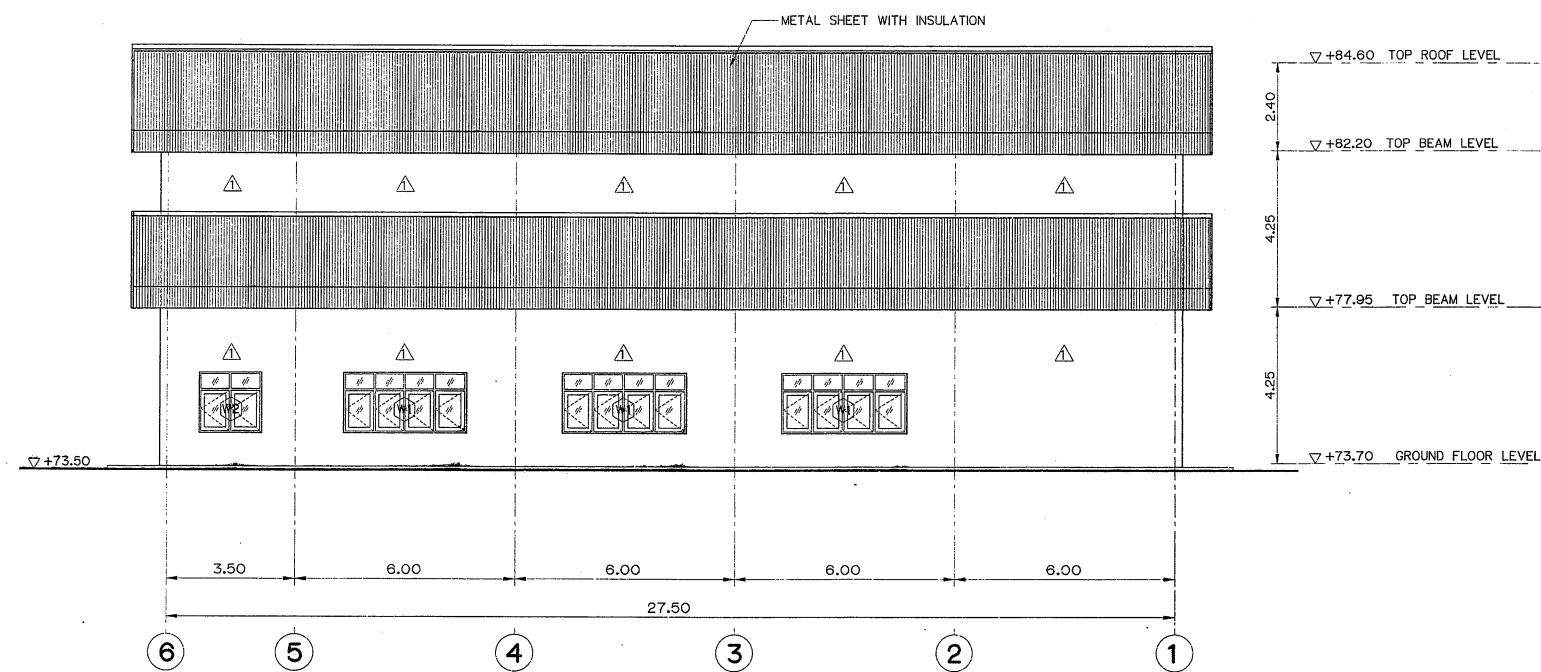
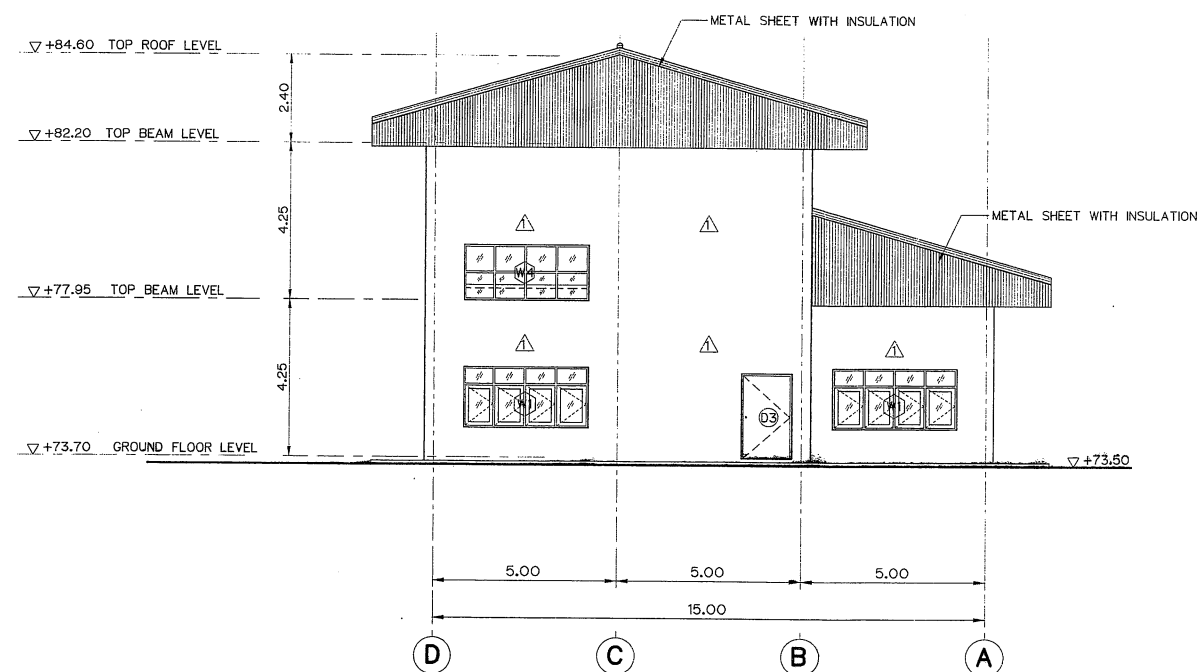
1. POWERHOUSE, GENERAL LAYOUT
2. POWERHOUSE, ELEVATIONS
3. POWERHOUSE, SECTIONS (SHEET 1/2)
4. POWERHOUSE, SECTIONS (SHEET 2/2)

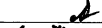
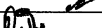
KTP2-PH-01
KTP2-PH-04
KTP2-PH-05
KTP2-PH-06

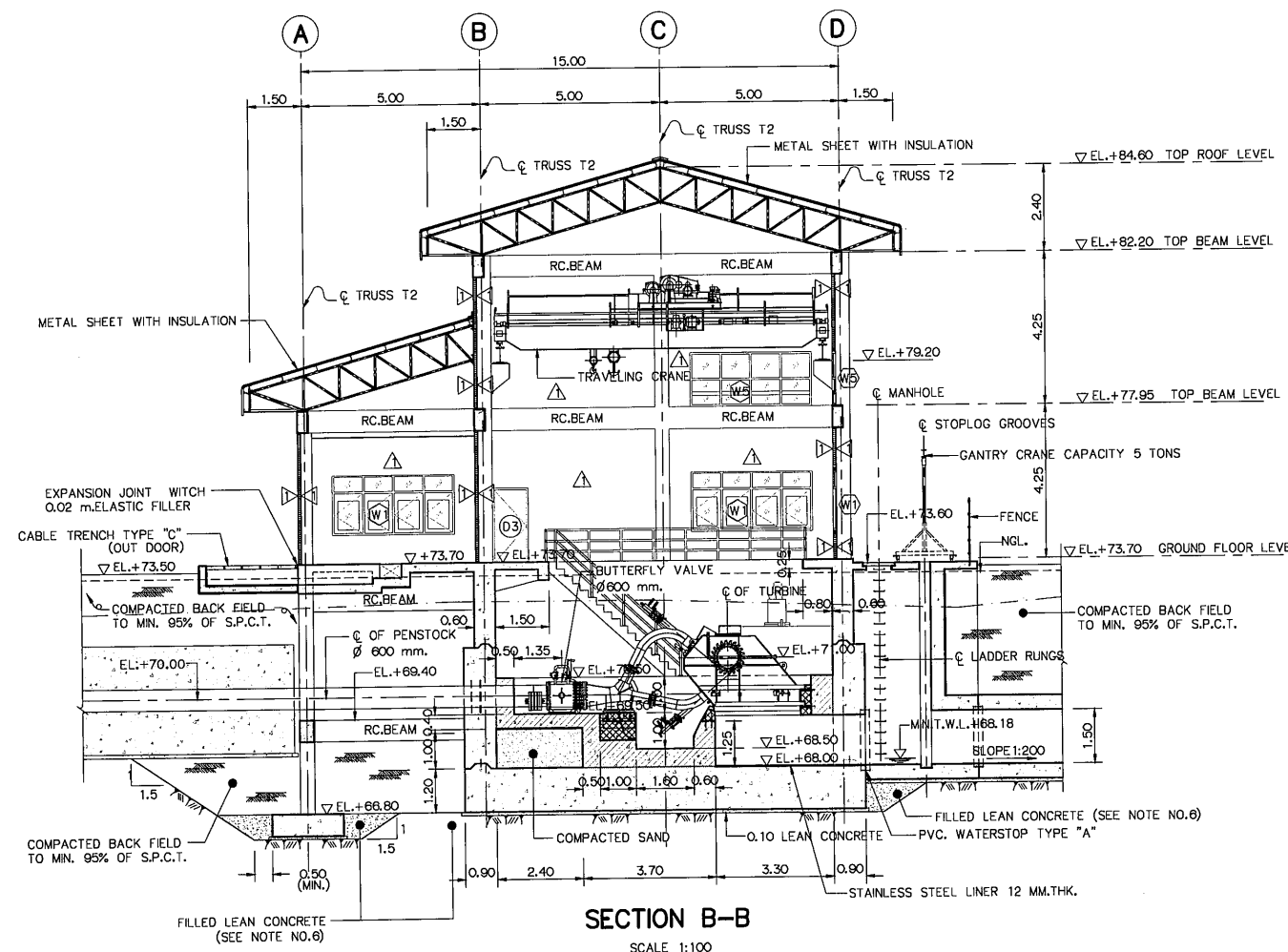
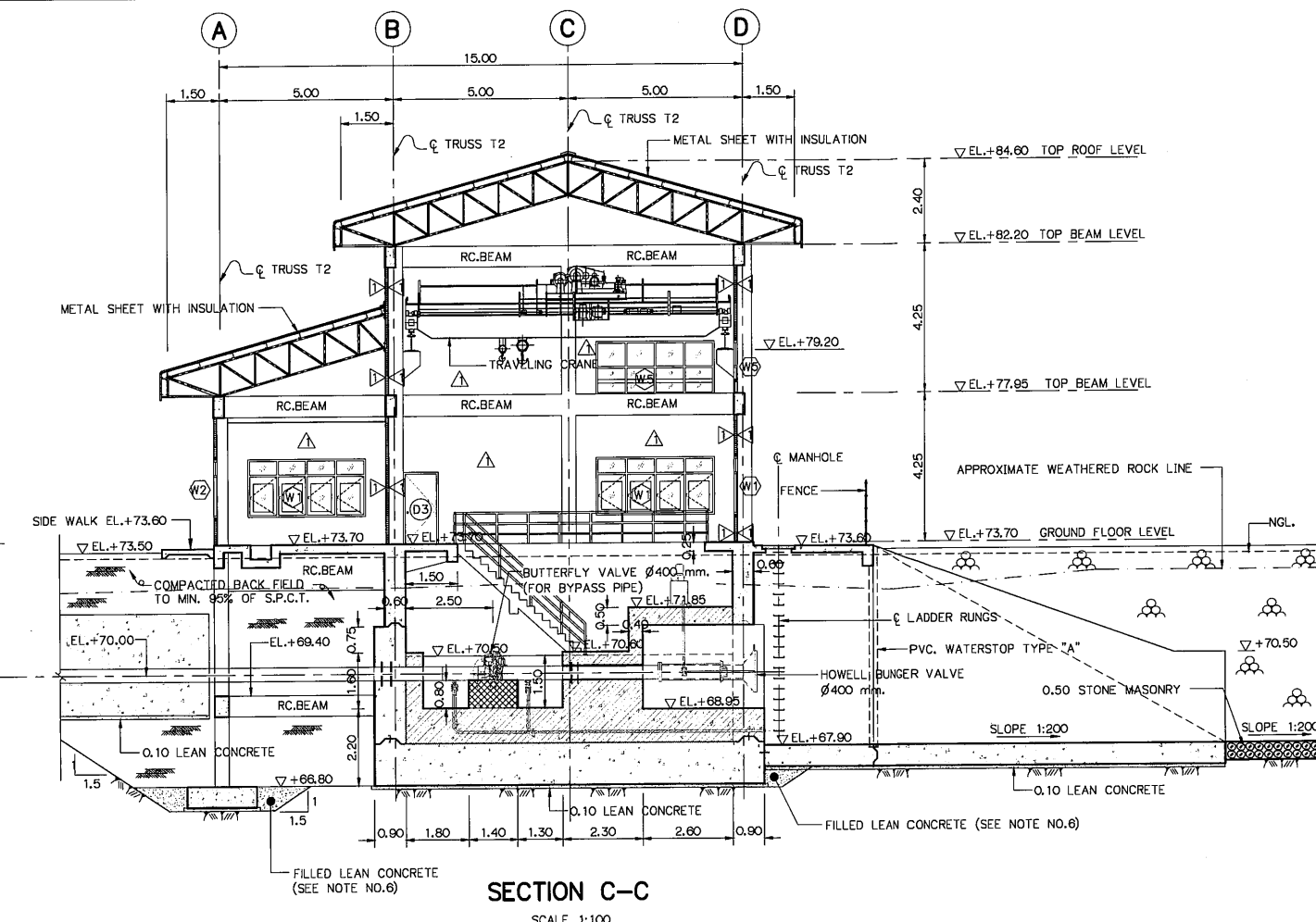
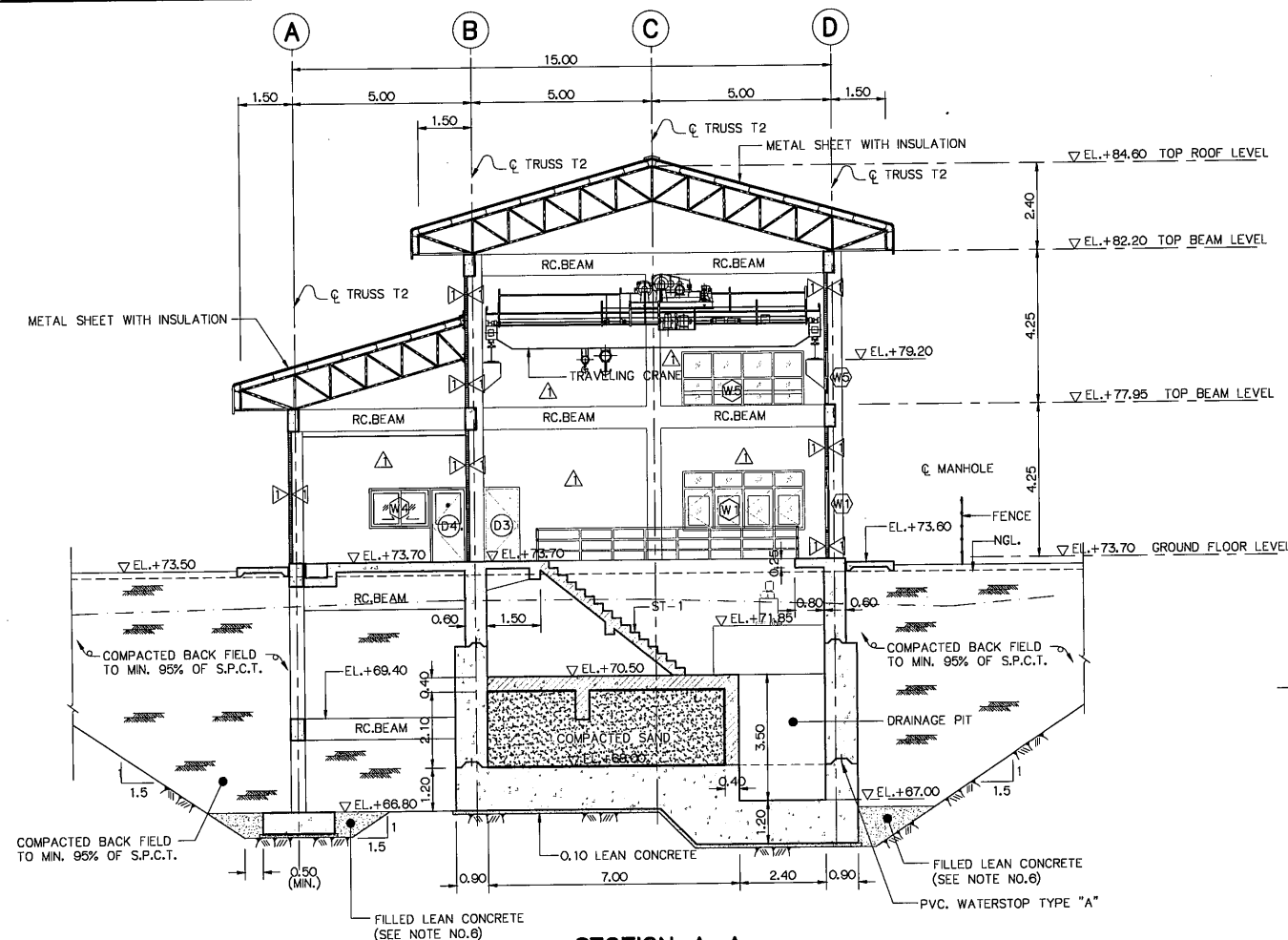


3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVE
	CONSULTANTS		DEDE	

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY		KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
		KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE			
TURBINE AND GALLERY FLOOR PLAN			
 P&C MANAGEMENT CO., LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	<i>[Signature]</i>	28.1987	REVIEWED <i>[Signature]</i>
DRAWN	<i>[Signature]</i>		SUBMITTED
CHECKED	<i>[Signature]</i>	28.1987	RECOMMENDED
	<i>[Signature]</i>		APPROVED <i>[Signature]</i> 21/2
PROJECT MANAGER		DATE	DRAWING NO.
			KTP2-PH-03
			SHEET NO.
			33 OF 97



 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE ELEVATIONS			
PCM P&C MANAGEMENT CO.,LTD.		REVIEWED 	
DESIGNED  28/1957		SUBMITTED 	
DRAWN 		RECOMMENDED 	
CHECKED  28/1957		APPROVED 	
PROJECT MANAGER 		DRAWING NO.	
DATE		KTP2-PH-04	
17/03/2020		SHEET NO.	
34		OF 97	



NOTES :

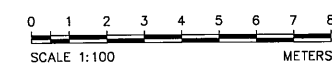
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- LOCATIONS, DIMENSIONS OF TURBINE, GENERATOR AND TRENCHES FOUNDATION SHOWN ON THIS DRAWING ARE APPROXIMATELY THE FINAL DESIGN OF FOUNDATIONS SHALL BE DONE BY THE E&M CONTRACTOR AND HAVE TO SUBMITTED TO DEDE. FOR APPROVAL.
- FOOTING SHALL BE PLACED ON BED ROCK FOUNDATION. THE CONTRACTOR SHALL REMOVE UNSUITABLE MATERIAL AND REPLACE OR BACKFILL IT WITH LEAN CONCRETE UP TO THE FOUNDATION ELEVATION
- FOUNDATION SHALL HAVE MINIMUM 30 TON/M² (ULTIMATE CAPACITY)
- COMPACTED BACKFILL SHALL BE DONE AFTER THE CONCRETE STRUCTURES HAVE BEEN FINISHED AND HAVE THE MINIMUM DESIGN STRENGTH TO SUPPORT THE FULL LOAD

REFERENCE DRAWINGS :

- | | |
|---|------------|
| 1. POWERHOUSE, GENERAL LAYOUT | KTP2-PH-01 |
| 2. POWERHOUSE, FLOOR PLAN | KTP2-PH-02 |
| 3. POWERHOUSE, TURBINE AND GALLERY FLOOR PLAN | KTP2-PH-03 |
| 4. POWERHOUSE, ELEVATIONS | KTP2-PH-04 |
| 5. POWERHOUSE, DETAIL OF DOORS AND WINDOWS | KTP2-PH-07 |

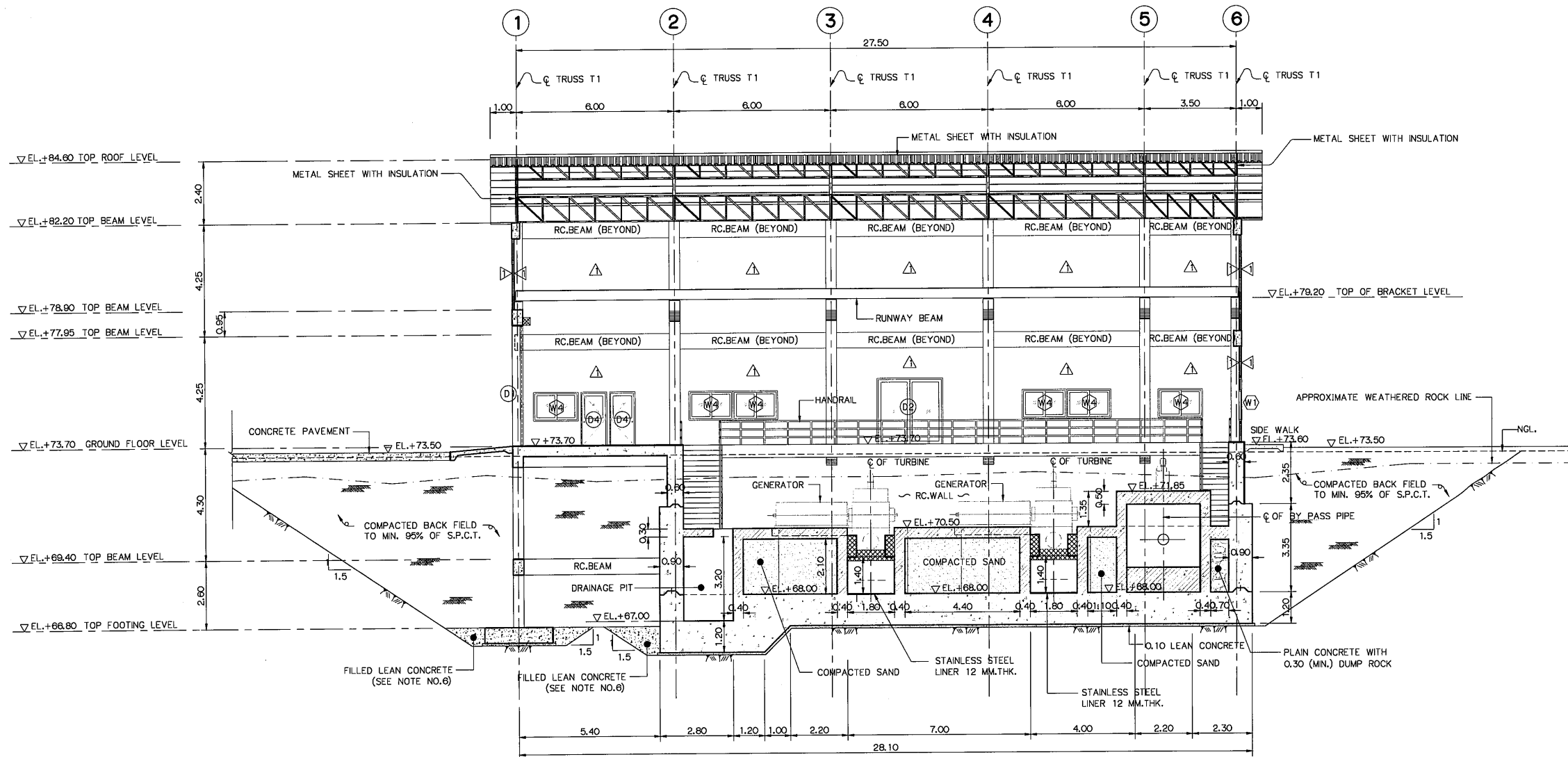
LEGEND :

- | | |
|--|-----------------------|
| | FIRST STAGE CONCRETE |
| | SECOND STAGE CONCRETE |
| | THIRD STAGE CONCRETE |



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS			DEDE	

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITACHUK, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE SECTIONS (SHEET 1/2)			
P&C MANAGEMENT CO.,LTD. DESIGNED DRAWN NO.	26.1957 26.1957 17/03/2020	REVIEWED SUBMITTED RECOMMENDED APPROVED	PROJECT MANAGER DATE
KTP2-PH-05		SHEET NO. 35 OF 97	



SECTION D-D

SCALE 1:100

LEGEND :

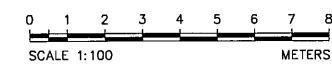
- FIRST STAGE CONCRETE
- SECOND STAGE CONCRETE
- THIRD STAGE CONCRETE

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. LOCATIONS, DIMENSIONS OF TURBINE, GENERATOR AND TRENCHES FOUNDATION SHOWN ON THIS DRAWING ARE APPROXIMATELY THE FINAL DESIGN OF FOUNDATIONS SHALL BE DONE BY THE E&M CONTRACTOR AND HAVE TO SUBMITTED TO DEDE. FOR APPROVAL.
4. FOOTING SHALL BE PLACED ON BED ROCK FOUNDATION. THE CONTRACTOR SHALL REMOVE UNSUITABLE MATEIAL AND REPLACE OR BACKFILL IT WITH LEAN CONCRETE UPTO THE FOUNDATION ELEVATION
5. FOUNDATION SHALL HAVE MINIMUM 30 TON/M.² (ULTIMATE CAPACITY)
6. COMPACTED BACKFILL SHALL BE DONE AFTER THE CONCRETE STRUCTURES HAVE BEEN FINISHED AND HAVE THE MINIMUM DESIGN STRENGTH TO SUPPORT THE FULL LOAD

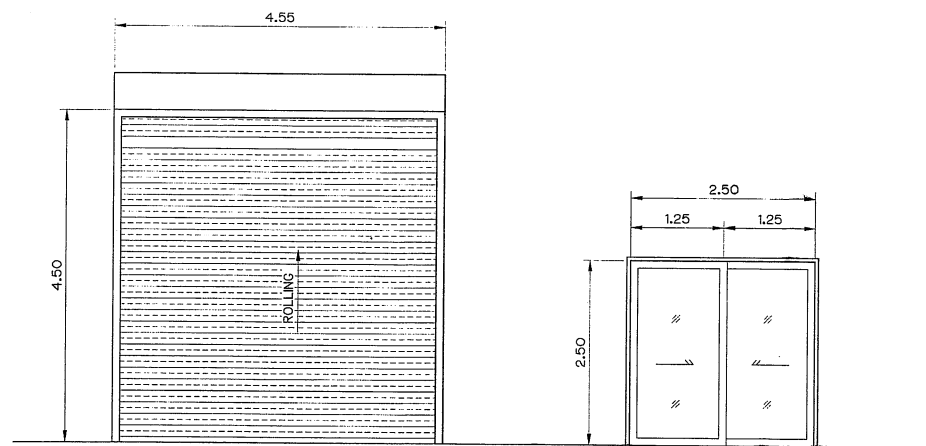
REFERENCE DRAWINGS :

- | | |
|---|------------|
| 1. POWERHOUSE, GENERAL LAYOUT | KTP2-PH-01 |
| 2. POWERHOUSE, FLOOR PLAN | KTP2-PH-02 |
| 3. POWERHOUSE, TURBINE AND GALLERY FLOOR PLAN | KTP2-PH-03 |
| 4. POWERHOUSE, ELEVATIONS | KTP2-PH-04 |
| 5. POWERHOUSE, DETAIL OF DOORS AND WINDOWS | KTP2-PH-07 |



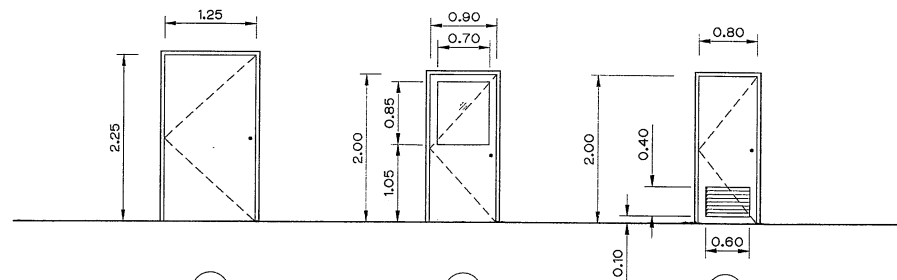
NO.	DATE	REVISIONS	CHECKED	APPROVED
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2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE SECTIONS (SHEET 2/2)	
P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED DRAWN CHECKED PROJECT MANAGER	REVIEWED SUBMITTED RECOMMENDED APPROVED DRAWING NO. KTP2-PH-06 SHEET NO. 36 OF 97



D1
ROLLING DOOR
SCALE 1:50

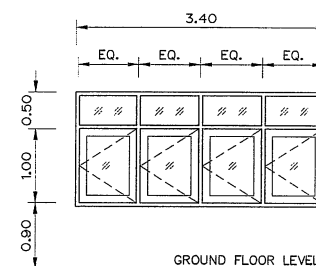
D2
SLIDE DOOR
SCALE 1:50



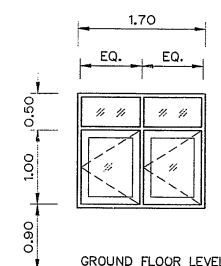
D3
OPENING DOOR
SCALE 1:50

D4
OPENING DOOR
SCALE 1:50

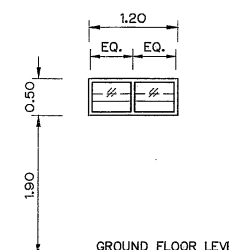
D5
OPENING DOOR
SCALE 1:50



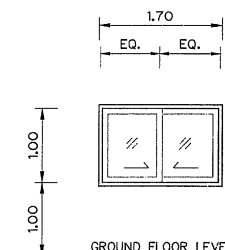
W1
OPENING WINDOW
SCALE 1:50



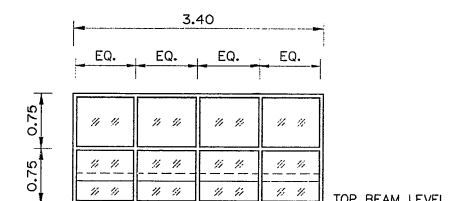
W2
OPENING WINDOW
SCALE 1:50



W3
FIX GRASS WINDOW
SCALE 1:50



W4
SLIDING WINDOW
SCALE 1:50



W5
FIX GRASS WINDOW
SCALE 1:50

SYMBOL	DESCRIPTIONS	SIZE		FRAME	RAIL & STILE	PANEL	HINGE	LOCKSET	HANDLE	REMARKS
		WIDTH	HEIGHT							
D1	ROLLING DOOR (STEEL NO.18,1.2 mm. Thk.)	4.55	4.50	GALVANIZED STEEL	—	—	—	NORMAL KEY	—	MOTOR OPERATING
D2	SLIDE DOOR	2.50	2.50	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk.	—	CYLINDER LOCK	—	FULL SET OF ACCESSORIES FROM MANUFACTURER
D3	OPENING DOOR	1.25	2.25	GALVANIZED STEEL	—	GALVANIZED STEEL WITH POWDER COATING	STAINLESS STEEL 4"x3"x2.5mm.	CYLINDER LOCK	—	
D4	OPENING DOOR	0.90	2.00	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk. & TEAK LOUVER	STAINLESS STEEL 4"x3"x2.5mm.	CYLINDER LOCK	—	
D5	OPENING DOOR	0.80	2.00	P.V.C. 2"x 4"	—	P.V.C.	STAINLESS STEEL 4"x3"x2.5mm.	CYLINDER LOCK	—	
W1	OPENING WINDOW	3.40	1.50	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk.	●	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
W2	OPENING WINDOW	1.70	1.50	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk.	—	—	—	
W3	FIXED GLASS WINDOW	1.20	0.50	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk.	—	—	—	
W4	SLIDING WINDOW	1.70	1.00	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk.	—	—	—	
W5	FIXED GLASS WINDOW	3.40	1.50	ALUMINIUM(NA) 2"x 4"	—	GLASS 5 mm.thk.	—	—	—	
● SHALL BE USED SPECIFIED ACCESSORIES										

NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- FOR PAINTING WORKS SEE TECHNICAL SPECIFICATION

REFERENCE DRAWINGS :

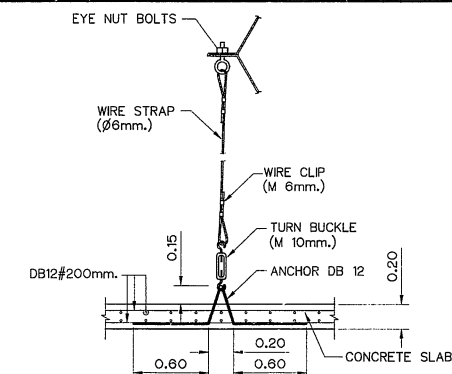
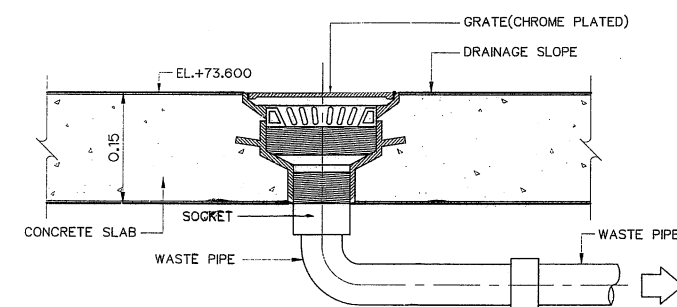
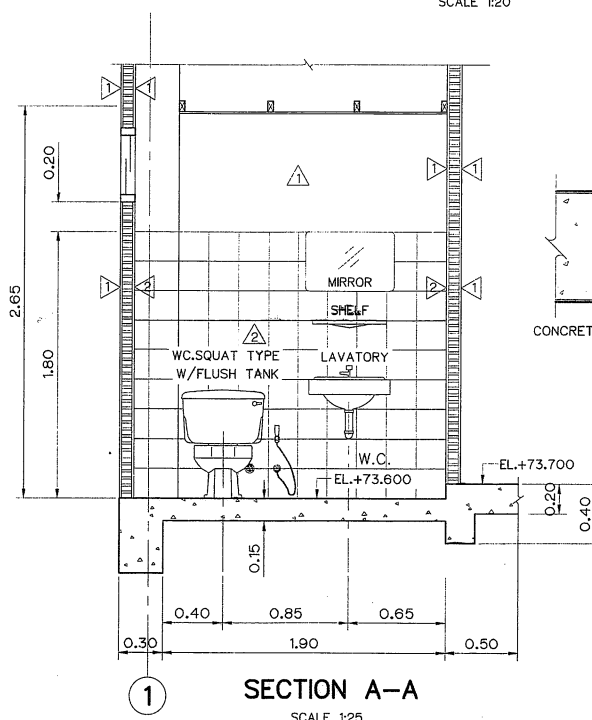
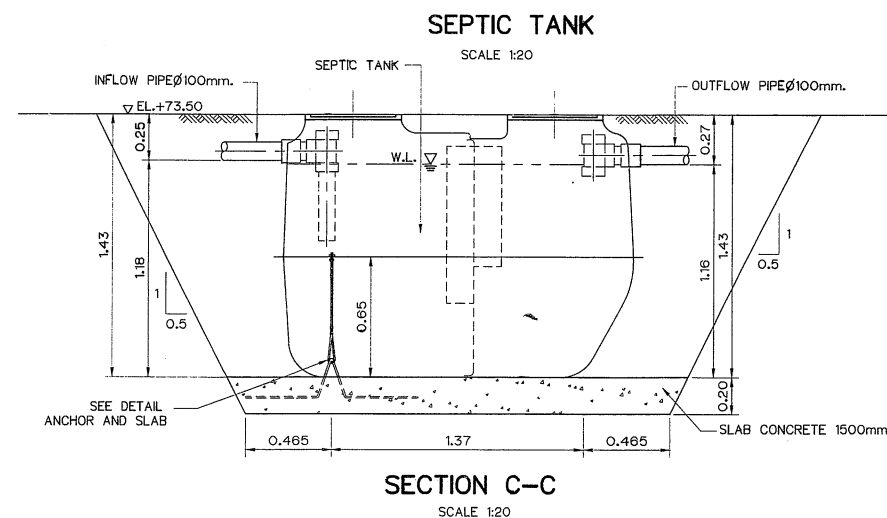
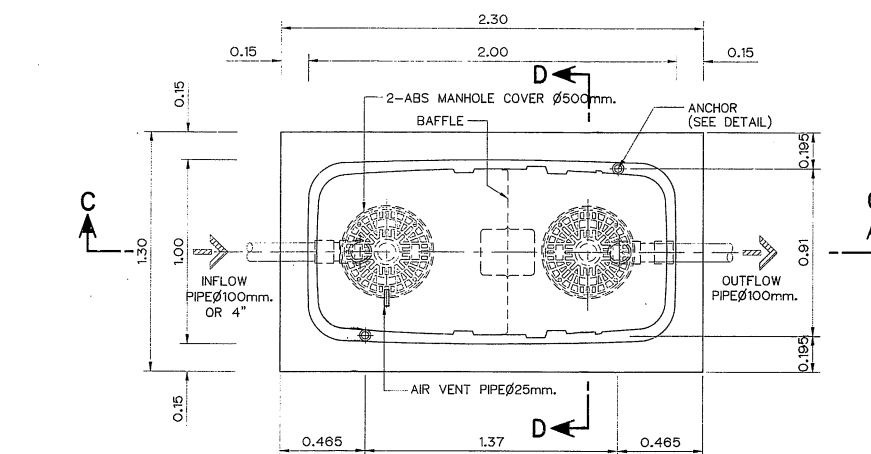
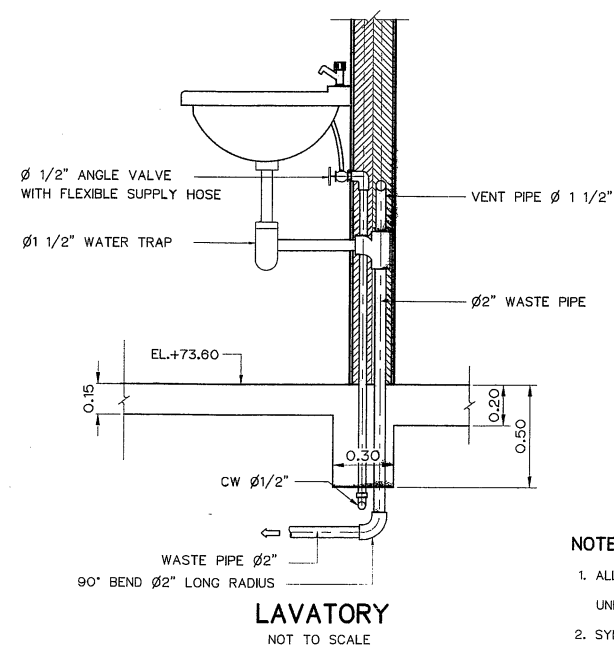
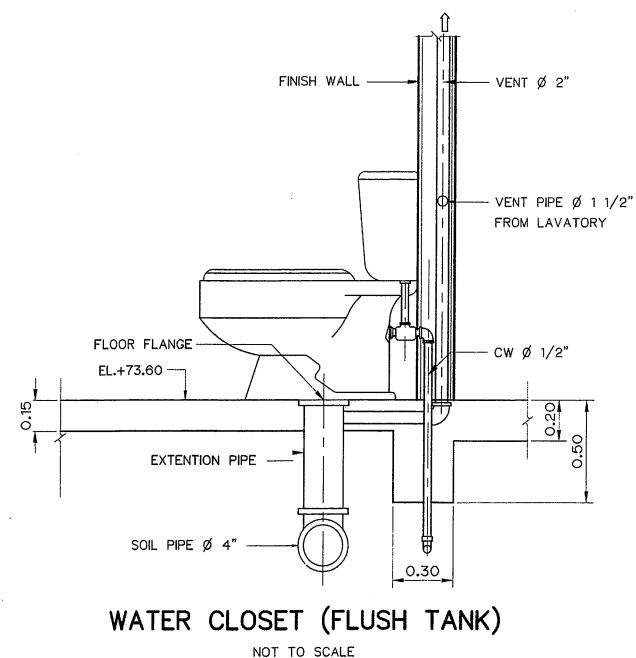
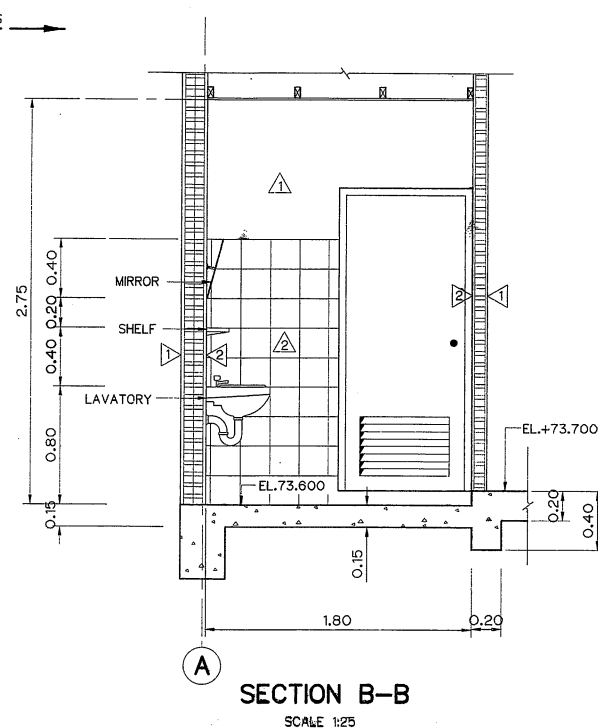
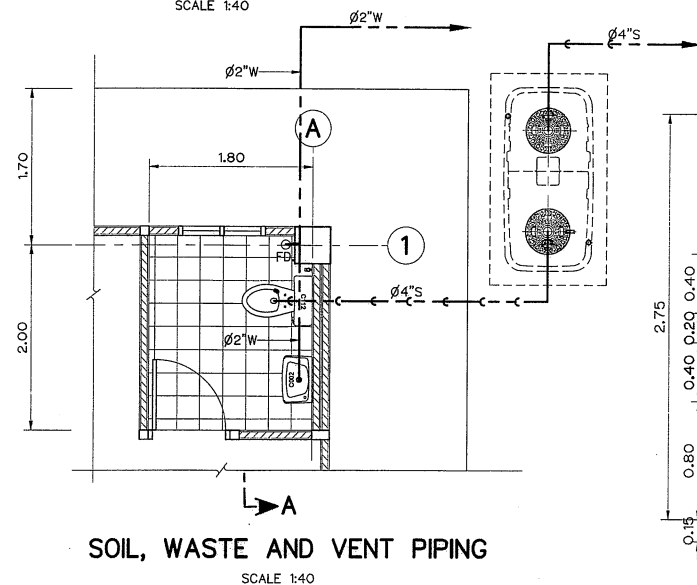
- POWERHOUSE, GENERAL LAYOUT
- POWERHOUSE, FLOOR PLAN
- POWERHOUSE, ELEVATIONS
- POWERHOUSE, SECTIONS (SHEET 1/2)
- POWERHOUSE, SECTIONS (SHEET 2/2)

KTP2-PH-01
KTP2-PH-02
KTP2-PH-04
KTP2-PH-05
KTP2-PH-06

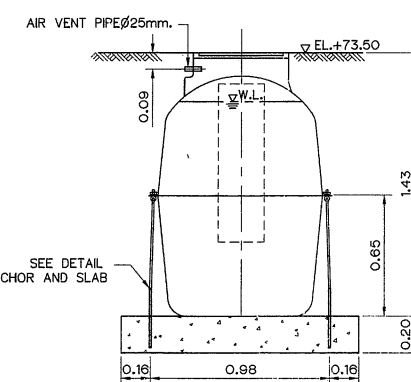
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SCALE 1:50 METERS

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NO.	DATE	REVISIONS	CHECKED	APPROVED	
CONSULTANTS		DEDE			

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE DETAIL OF DOORS AND WINDOWS			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED		APPROVED	
PROJECT MANAGER		DATE	
KTP2-PH-07		SHEET NO. 37 OF 97	



SPECIFICATION TABLE		
No.	ITEM	CONTENT
1	CAPACITY	
	1.1 SEPTIC TANK	1.500 m ³
2	MATERIAL	
	2.1 CHAMBER	FRP
	2.2 SEPARATION PLATE , BAFFLE	FRP
	2.3 MANHOLE COVER	ABS
	2.4 INFLOW OUTFLOW PIPE	PVC(φ100mm)



SYMBOLS :

 SOIL PIPE
 WASTE PIPE
 COLD WATER PIPE
 VENT PIPE

REFERENCE DRAWING :

- | | |
|--|------------|
| 1. POWERHOUSE, GENERAL LAYOUT | KTP2-PH-01 |
| 2. POWERHOUSE, PLAN | KTP2-PH-02 |
| 3. POWERHOUSE, WATER SUPPLY SYSTEM LAY-OUT AND TYPICAL DETAILS | KTP2-PH-29 |

	KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
	KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI

PART 1 : CIVIL WORKS

POWERHOUSE

DETAILS OF TOILET AND SEPTIC TANK

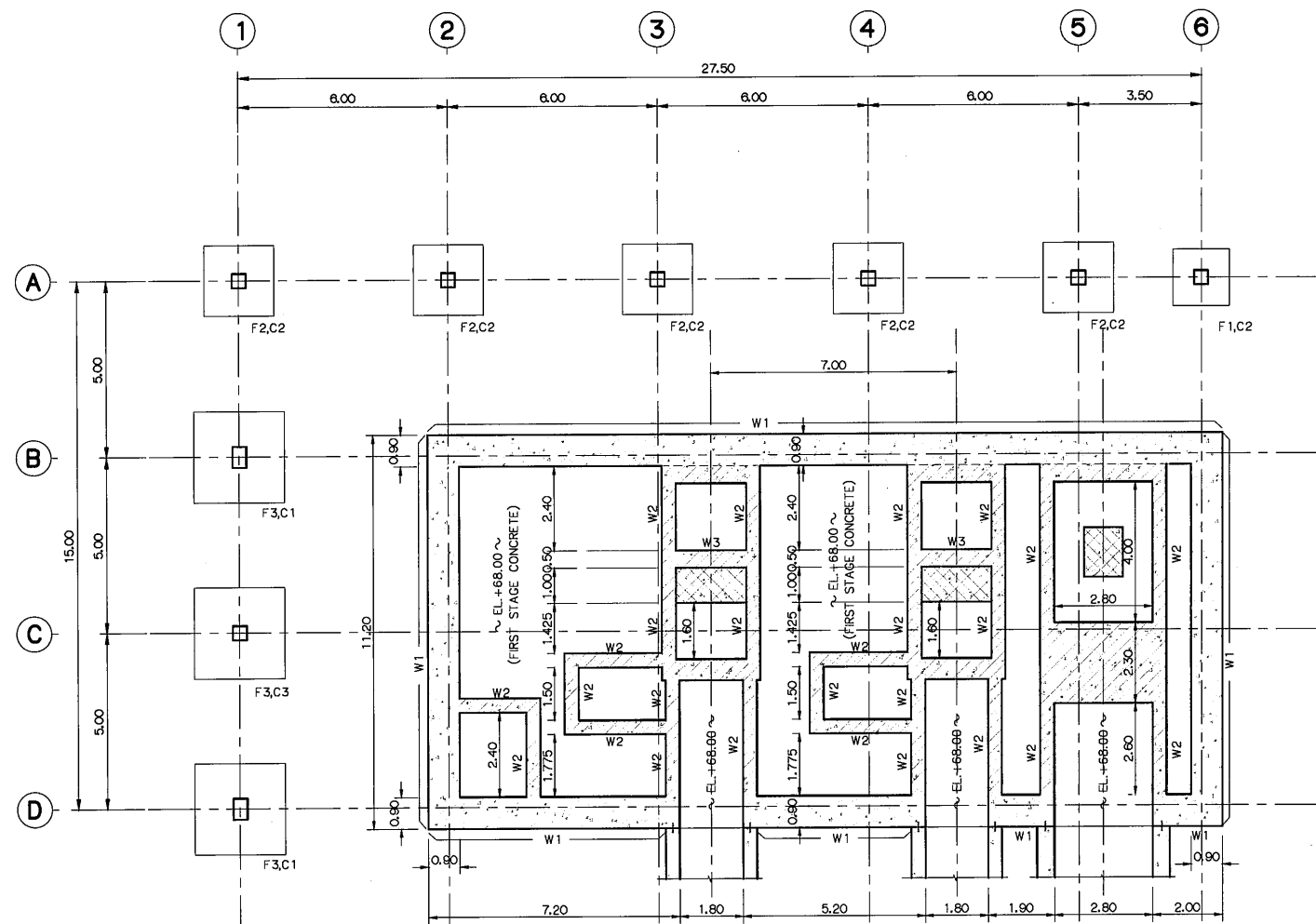
PCM P&C MANAGEMENT CO.,LTD

 Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

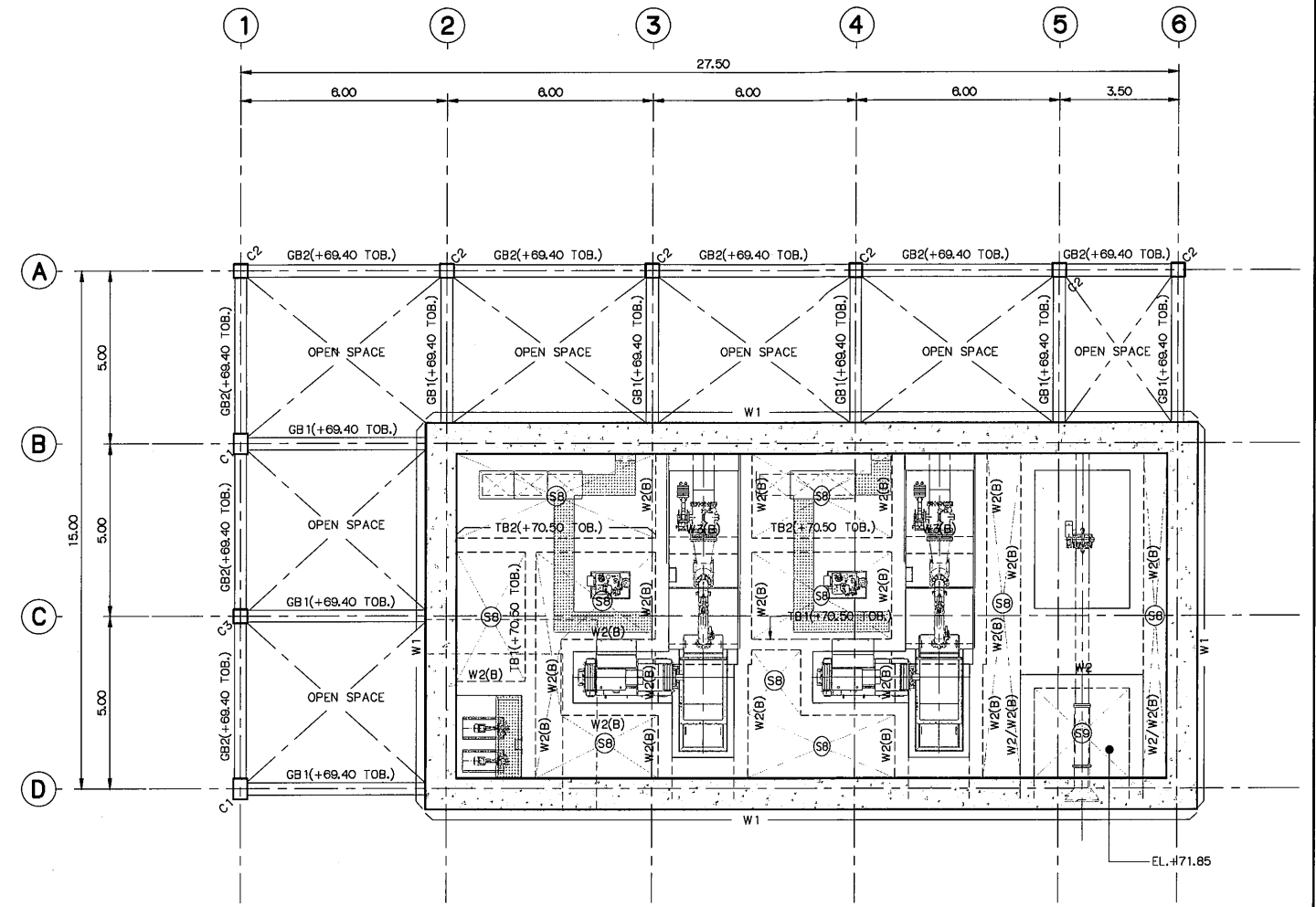
DESIGNED	<i>[Signature]</i>	28.1957	SUBMITTED	<i>[Signature]</i>
DRAWN	<i>[Signature]</i>		RECOMMENDED	<i>[Signature]</i>
CHECKED	<i>[Signature]</i>	28.1957	APPROVED	<i>[Signature]</i>
PROJECT MANAGER		17/03/2026	DRAWING NO. KTP2-PH-08	
DATE			SHEET NO. 38 OF 97	

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS,
UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03



FOOTING PLAN
SCALE 1:100



FRAMING PLAN (EL.+69.40, EL.+70.50)
SCALE 1:100

NOTES :

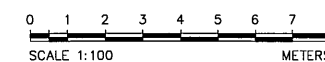
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. THE MAIN CONTRACTOR SHALL BE CALCULATED EXACT TOP OF FOOTING BEFORE START CONSTRUCTION.

REFERENCE DRAWINGS :

1. POWERHOUSE, GENERAL LAYOUT KTP2-PH-01
2. POWERHOUSE, ELEVATIONS KTP2-PH-04
3. POWERHOUSE, SECTIONS (SHEET 1/2) KTP2-PH-05
4. POWERHOUSE, SECTIONS (SHEET 2/2) KTP2-PH-06

LEGEND

- TOB. = TOP OF BEAM
TOW. = TOP OF WALL
(B) = BELOW

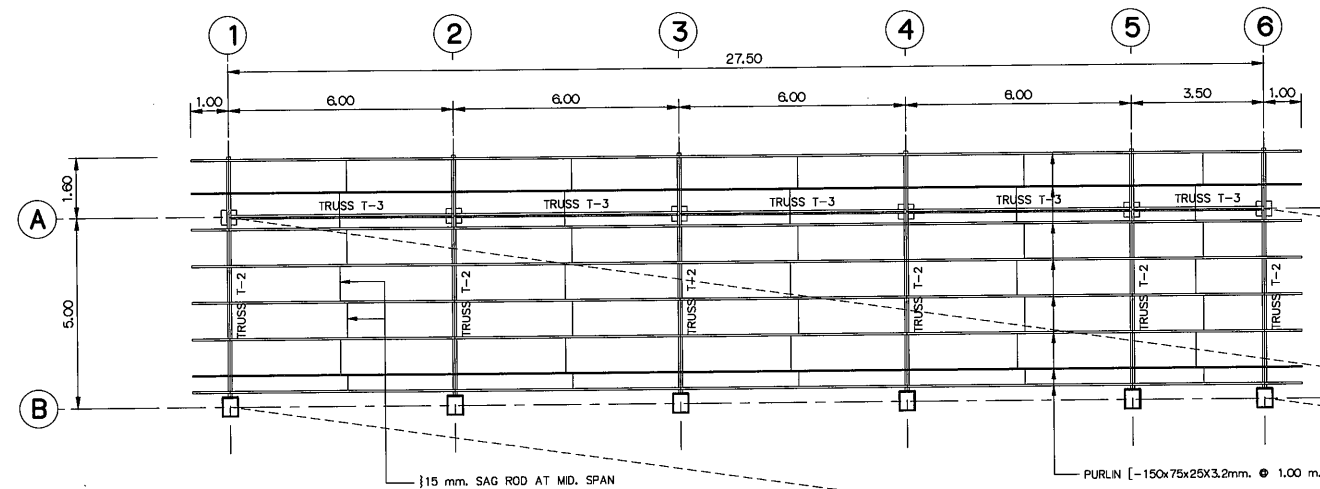


NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

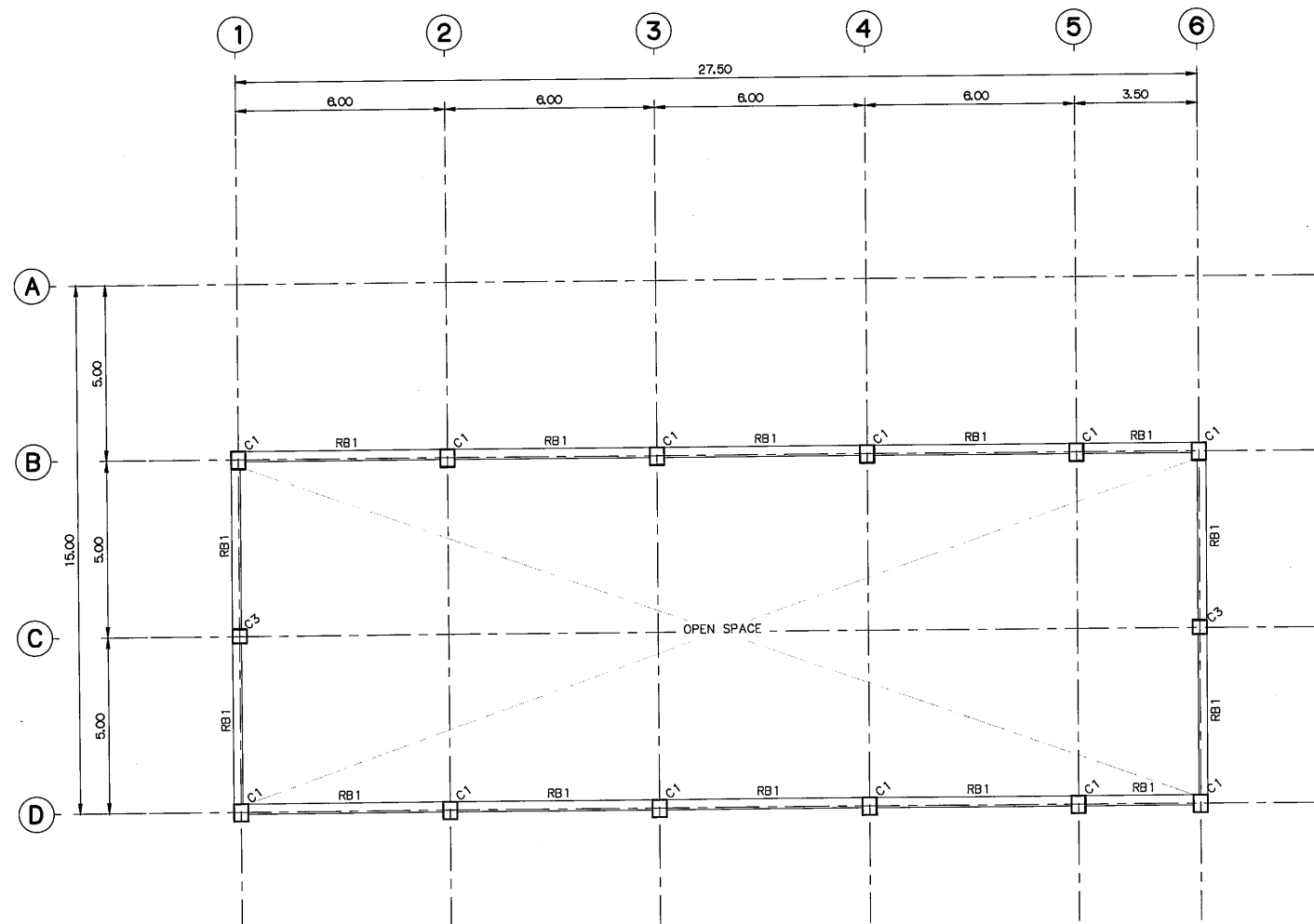
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE FOOTING PLAN AND PLAN OF BEAM (EL.+69.40, EL.+70.50)			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	APPROVED	
PROJECT MANAGER	17/03/2020	DATE	
KTP2-PH-09		SHEET NO. 39 OF 97	



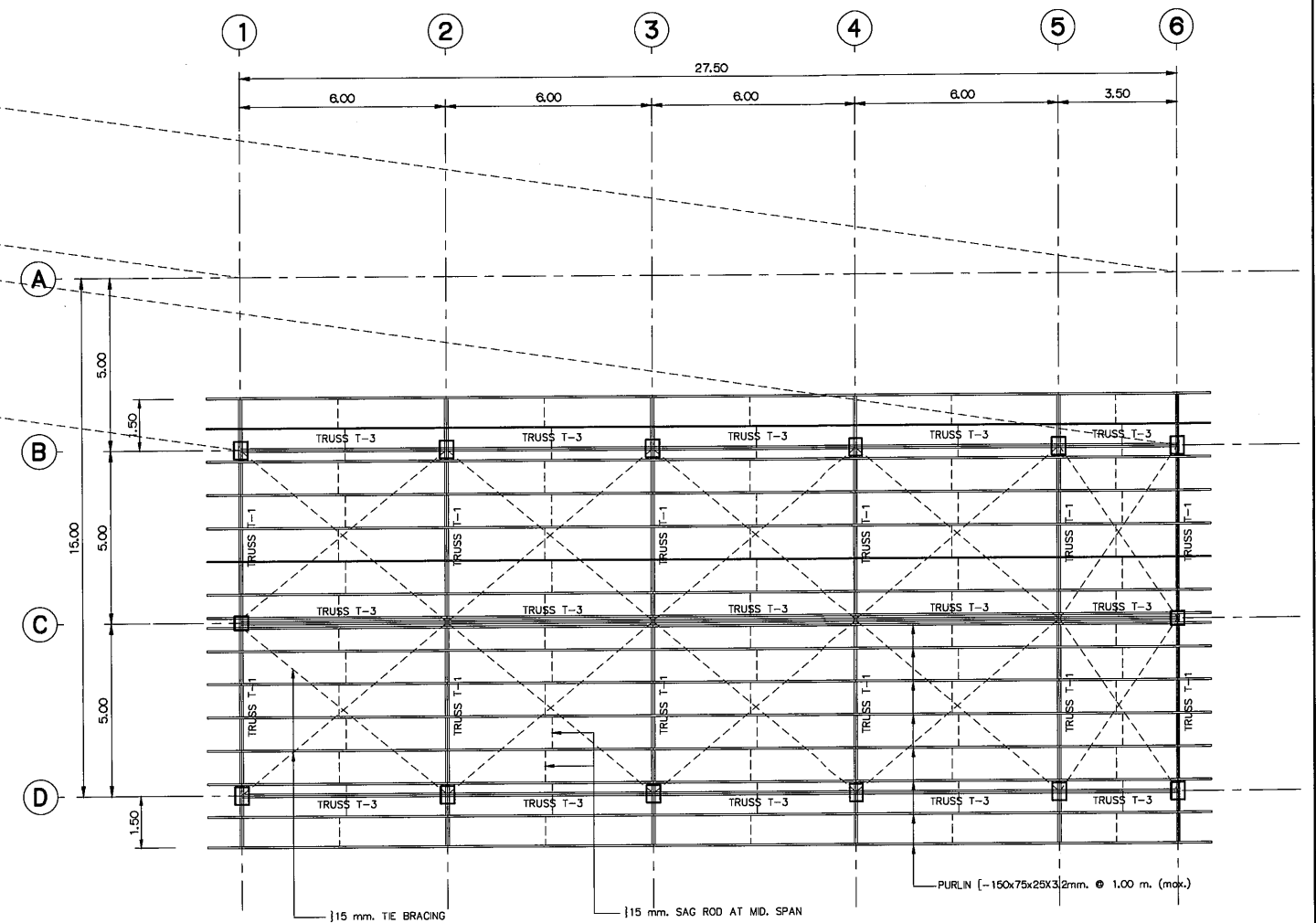
 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE	
FRAMING PLAN EL.+73.70 AND FRAMING PLAN EL.+77.95	
 P&C MANAGEMENT CO., LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>[Signature]</i> 2B.1957	REVIEWED <i>[Signature]</i>
DRAWN <i>[Signature]</i>	SUBMITTED <i>[Signature]</i>
CHECKED <i>[Signature]</i> 2B.1957	APPROVED <i>[Signature]</i>
PROJECT MANAGER <i>[Signature]</i>	DRAWING NO. KTP2-PH-10
DATE 17/03/2020	SHEET NO. 40 OF 97



ROOF PLAN (EL.+77.95)
SCALE 1:100



FRAMING PLAN (EL.+82.20)
SCALE 1:100



ROOF PLAN (EL.+82.20)
SCALE 1:100

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

1. DETAILS TRUSS T-1, T-2, T-3 AND T-4 (1/2) KTP2-PH-19

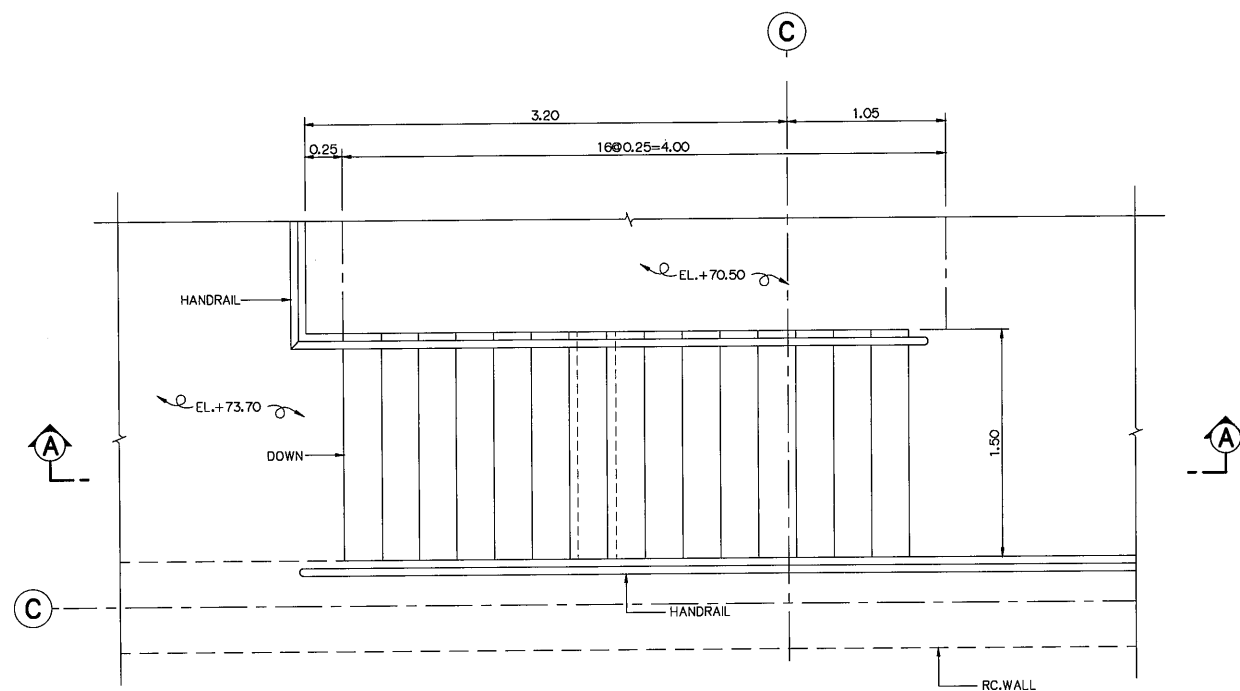


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NO.	DATE	REVISIONS	CHECKED	APPROVED

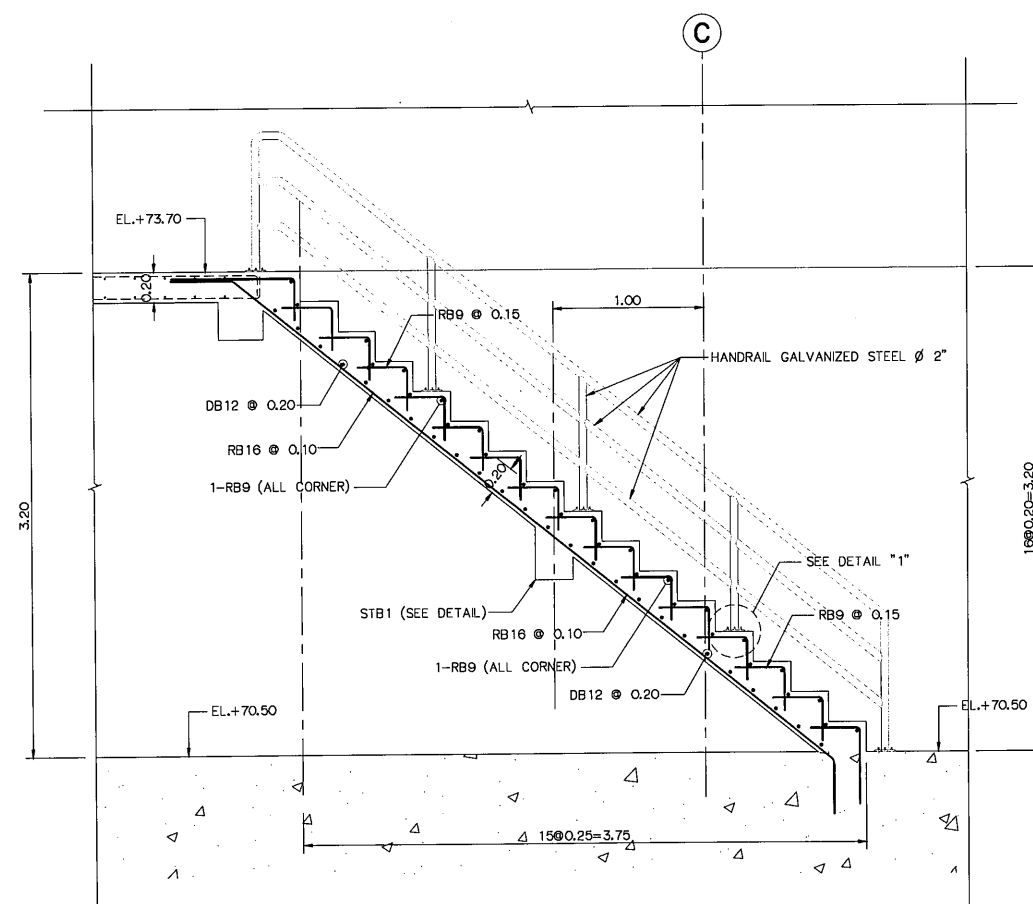
CONSULTANTS

DEDE

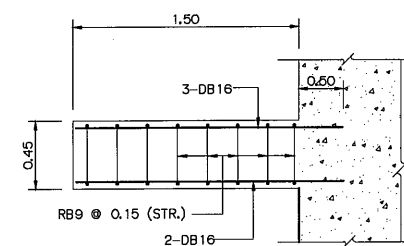
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE PLAN OF ROOF BEAM AND PLAN OF TRUSS	
DESIGNED 28.1967 DRAWN CHECKED 28.1967 17/03/2020 PROJECT MANAGER	REVIEWED SUBMITTED RECOMMENDED APPROVED 21/2/68 DRAWING NO. KTP2-PH-11 SHEET NO. 41 OF 97



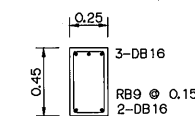
STAIR ST-1 PLAN
SCALE 1:25



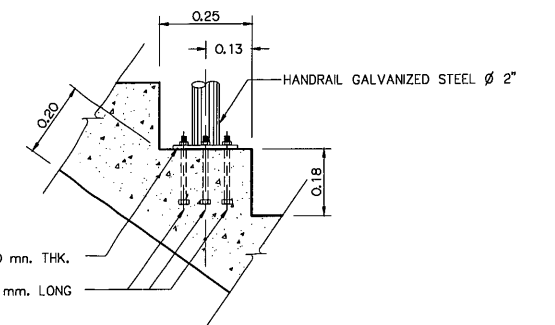
SECTION A-A
SCALE 1:25



STB1 DETAIL
SCALE 1:25



STB1 DETAIL
SCALE 1:25



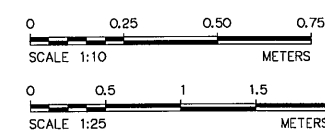
DETAIL "1"
SCALE 1:10

NOTES :

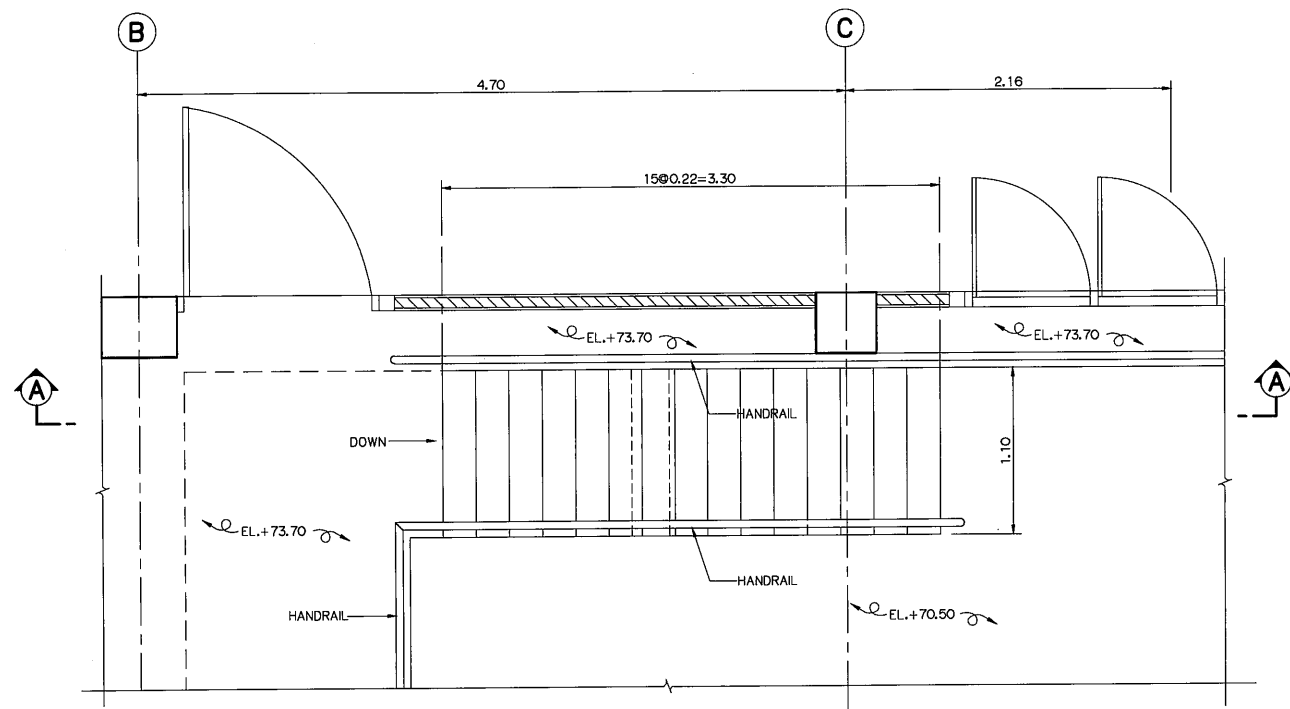
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

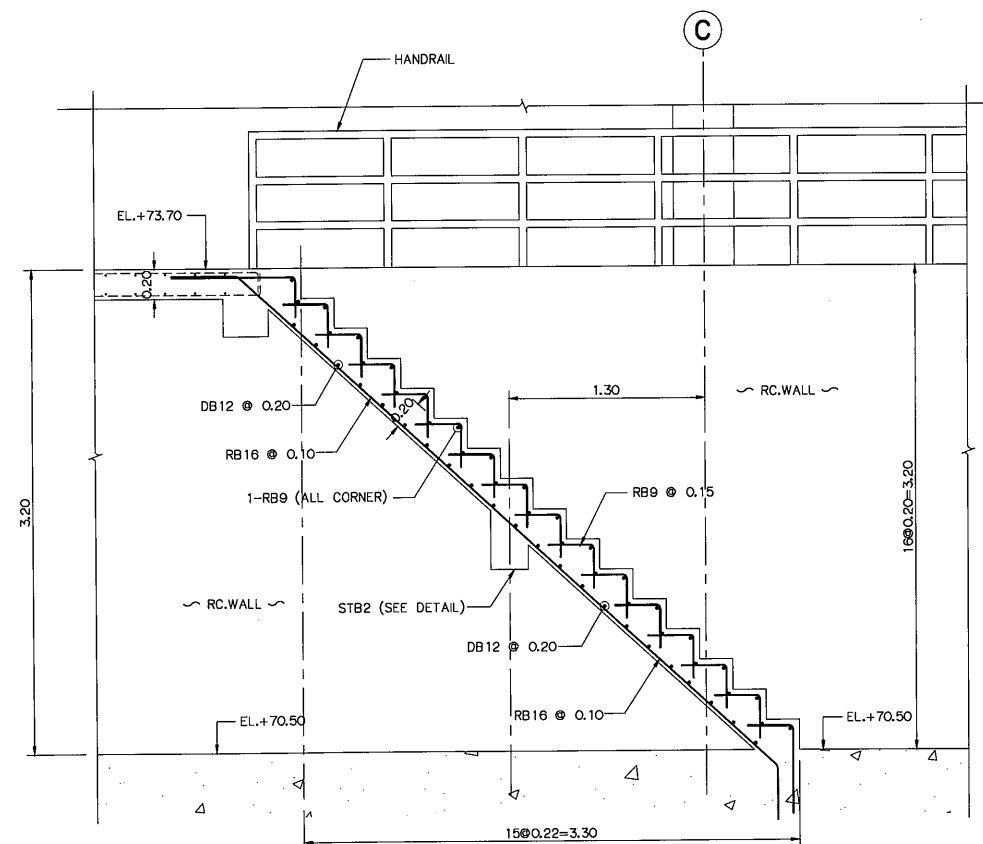
1. POWERHOUSE, FLOOR PLAN KTP2-PH-02
2. POWERHOUSE, SECTIONS (SHEET 1/2) KTP2-PH-05
3. POWERHOUSE, SECTIONS (SHEET 2/2) KTP2-PH-06



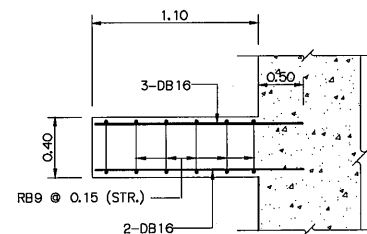
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE RC. STAIR ST-1, PLAN AND REINFORCEMENT DETAIL	
PCMC P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED 28.1957	REVIEWED
DRAWN 28.1957	SUBMITTED
CHECKED 28.1957	RECOMMENDED
APPROVED 17/03/2020	APPROVED 21/2/2020
CONSULTANTS	DEDE
PROJECT MANAGER	DATE
KTP2-PH-12	SHEET NO. 42 OF 97



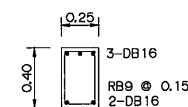
STAIR ST-2 PLAN
SCALE 1:25



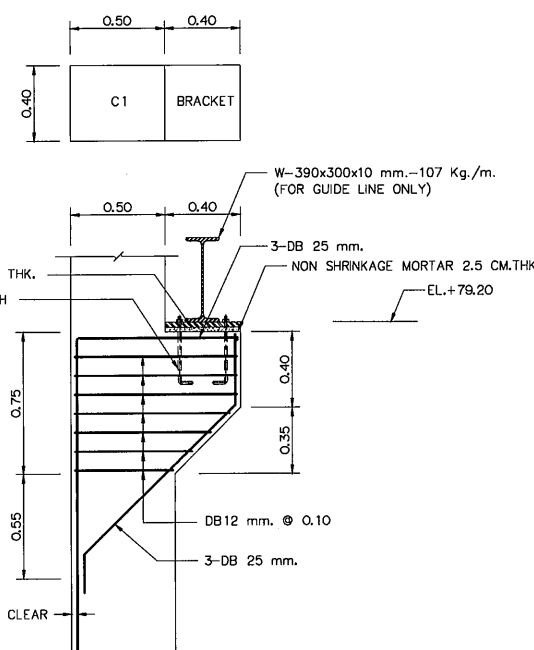
SECTION A-A
SCALE 1:25



STB2 DETAIL
SCALE 1:25



STB2 DETAIL
SCALE 1:25



BRACKET
SCALE 1:20

COLUMN SCHEDULE

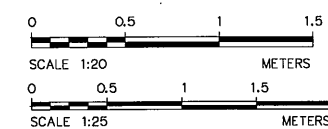
COLUMNS	C1	C2	C3
LEVEL			
ROOF (EL.+82.20)			
(EL.+77.95)			
(EL.+77.95)			
GROUND FLOOR			
GROUND FLOOR			
FOOTING			

NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

- POWERHOUSE, FLOOR PLAN KTP2-PH-02
- POWERHOUSE, SECTIONS (SHEET 1/2) KTP2-PH-05
- POWERHOUSE, SECTIONS (SHEET 2/2) KTP2-PH-06

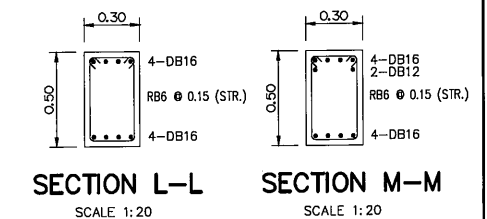
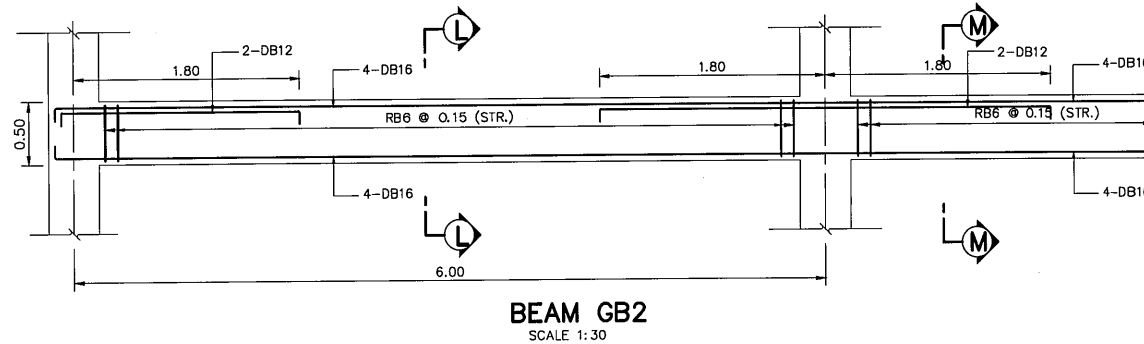
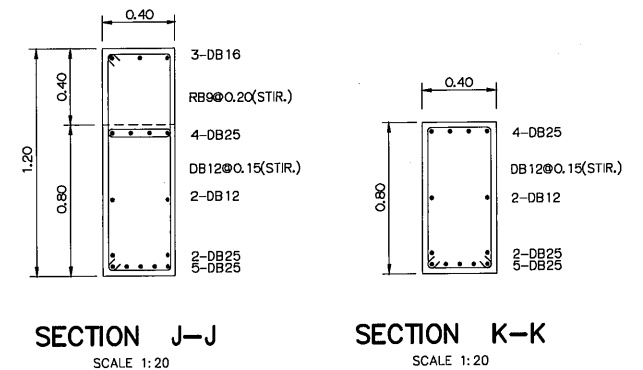
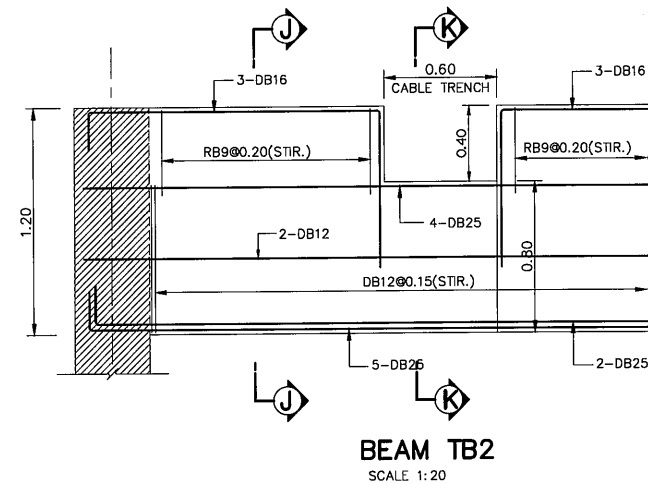
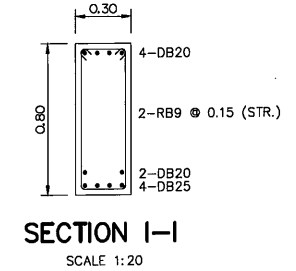
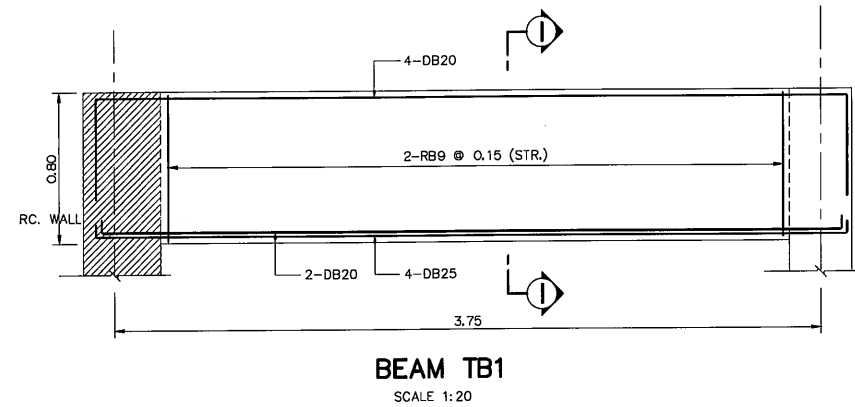
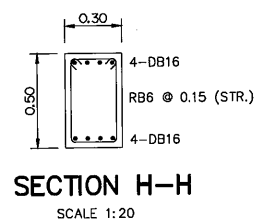
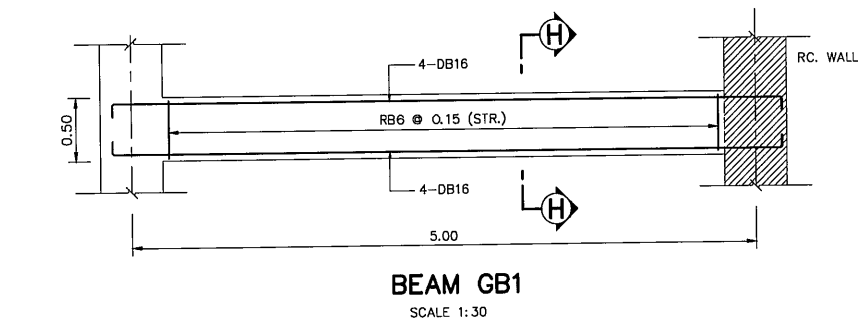
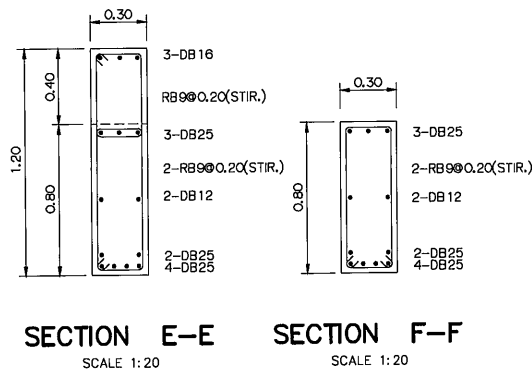
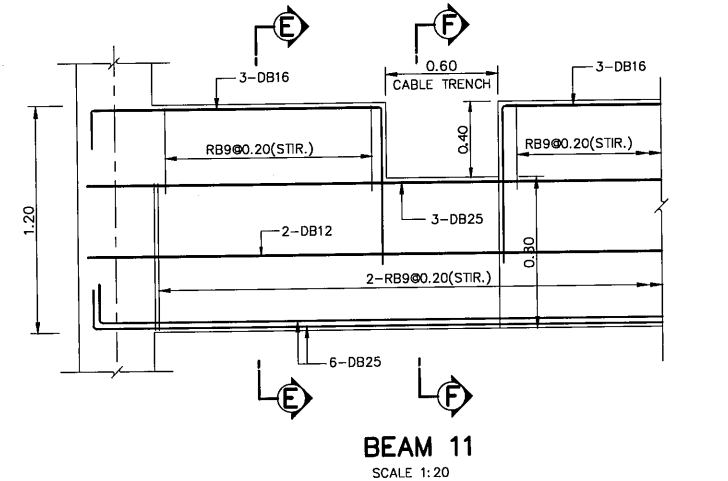
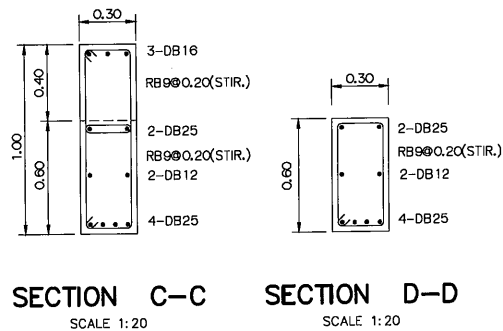
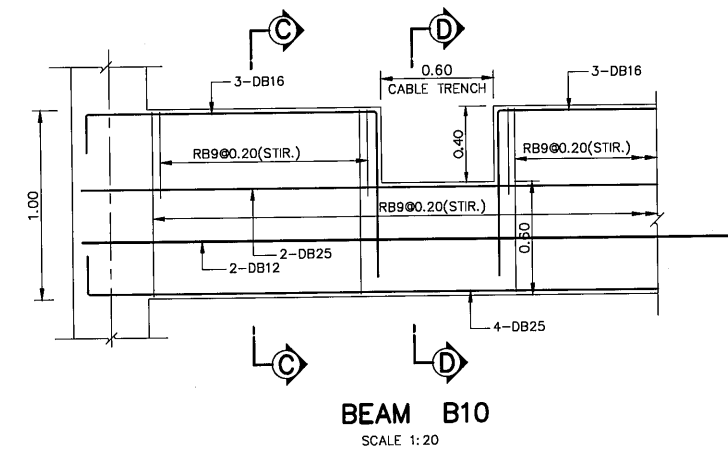
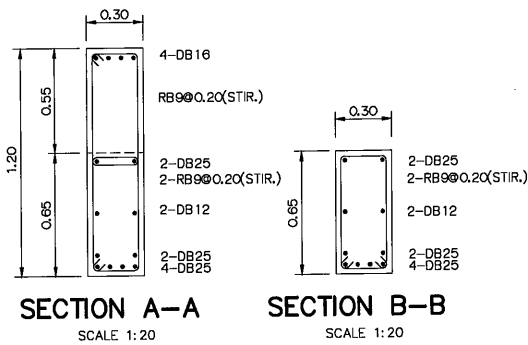
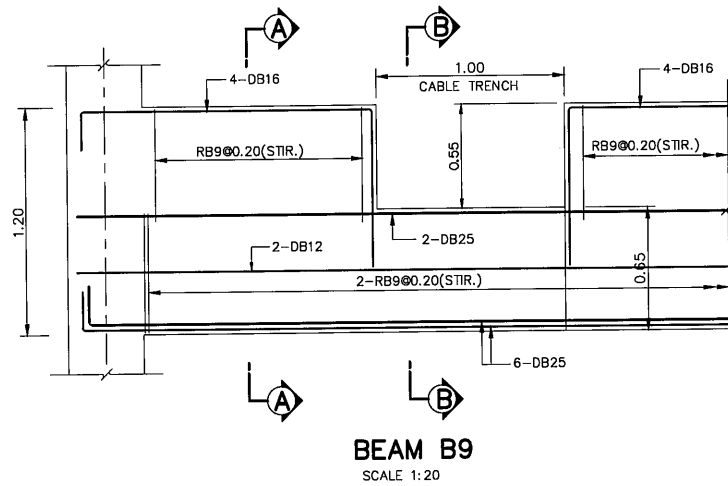


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NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS

DEDE

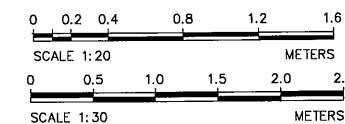
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE RC. STAIR ST-2 AND COLUMN AND BRACKET REINFORCEMENT DETAIL	
DESIGNED DRAWN CHECKED PROJECT MANAGER	REVIEWED SUBMITTED RECOMMENDED APPROVED DATE 17/03/2020
P&C MANAGEMENT CO.,LTD.	SHEET NO. 43 OF 97



- NOTES :**
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

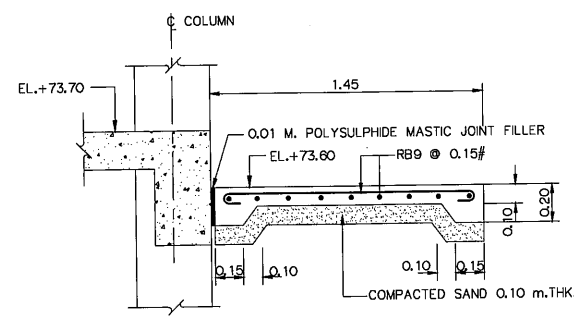
- REFERENCE DRAWING :**
- POWERHOUSE, FRAMING PLAN EL.+73.70 AND FRAMING PLAN EL.+77.95
 - POWERHOUSE, PLAN OF ROOF BEAM AND PLAN OF TRUSS

KTP2-PH-10
KTP2-PH-11

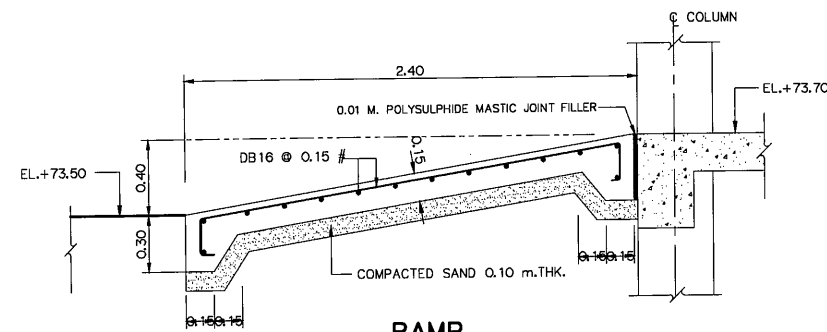


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NO.	DATE	REVISIONS	CHECKED	APPROVED

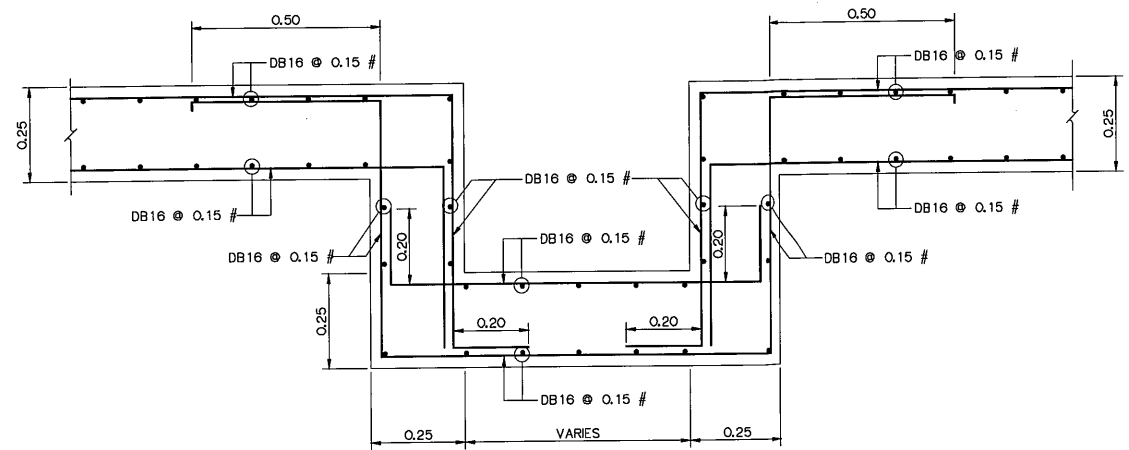
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE BEAM REINFORCEMENT DETAILS (SHEET 2/2)	
P&C MANAGEMENT CO.,LTD. DESIGNED DRAWN CHECKED PROJECT MANAGER	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY REVIEWED SUBMITTED RECOMMENDED APPROVED DRAWING NO. SHEET NO.
17/03/2020 DATE	45 OF 97



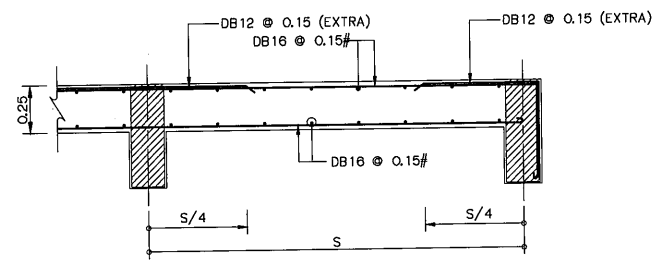
SLAB GS
SCALE 1:20



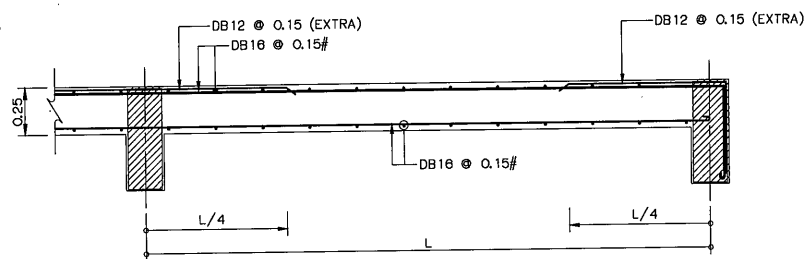
RAMP
SCALE 1:20



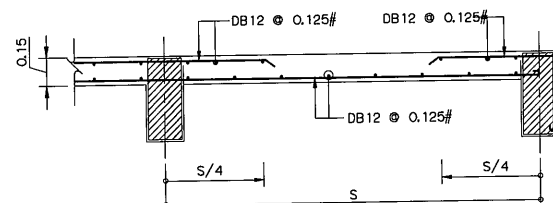
REINFORCEMENT DETAILS OF CABLE TRENCH AT SLAB S1
SCALE 1:10



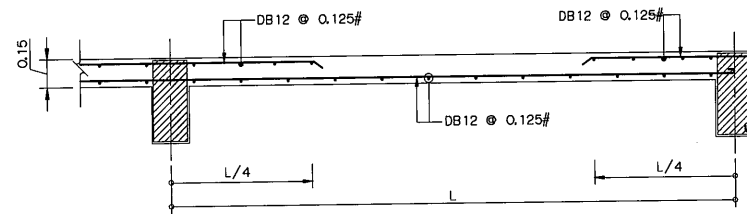
SLAB S1(SHOT)
SCALE 1:20



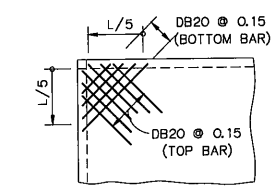
SLAB S1(LONG)
SCALE 1:20



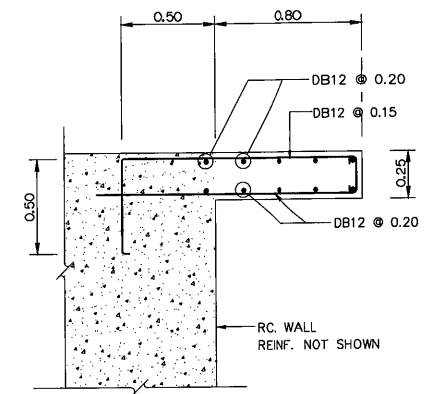
SLAB S2(SHOT)
SCALE 1:20



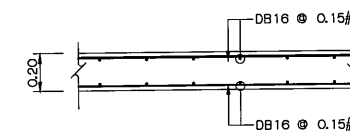
SLAB S2(LONG)
SCALE 1:20



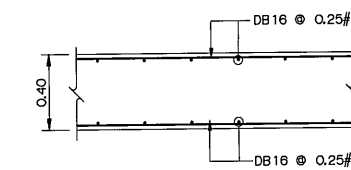
TYP. ALL CORNER
SCALE 1:20



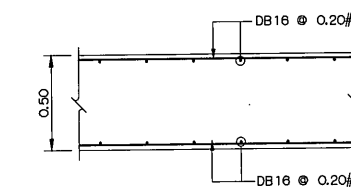
SLAB S7
SCALE 1:20



SLAB S6
SCALE 1:20



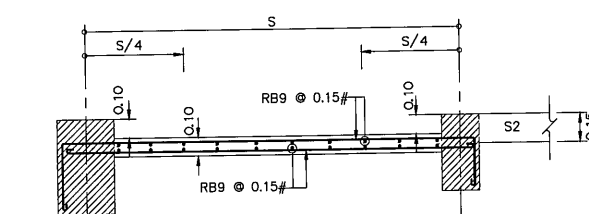
SLAB S8
SCALE 1:20



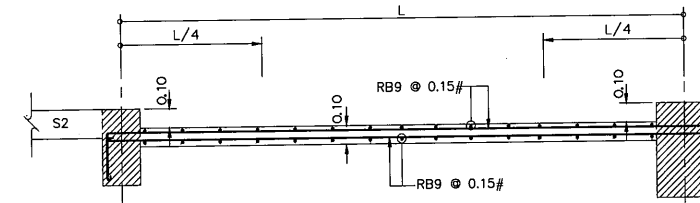
SLAB S9
SCALE 1:20

- NOTES :**
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

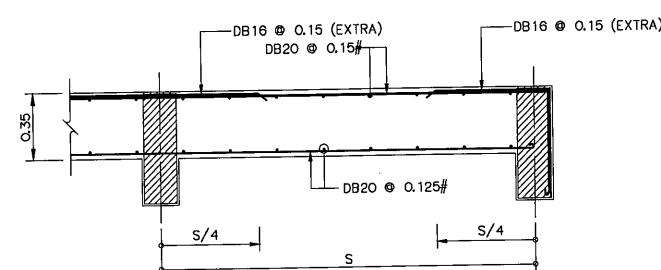
- REFERENCE DRAWINGS :**
1. POWERHOUSE, FRAMING PLAN EL.+73.70 AND FRAMING PLAN EL.+77.95
- KTP2-PH-10



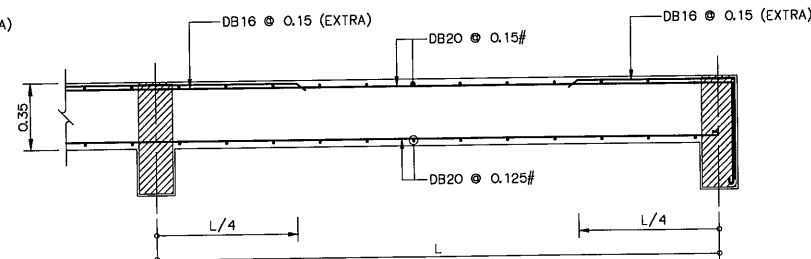
SLAB S3(SHORT)
SCALE 1:20



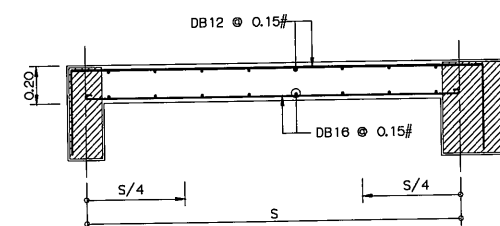
SLAB S3(LONG)
SCALE 1:20



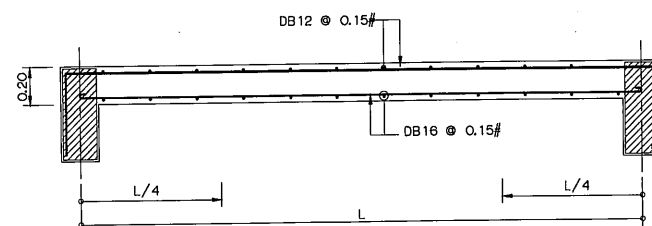
SLAB S4(SHOT)
SCALE 1:20



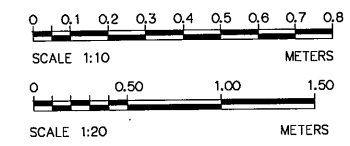
SLAB S4(LONG)
SCALE 1:20



SLAB S5(SHOT)
SCALE 1:20

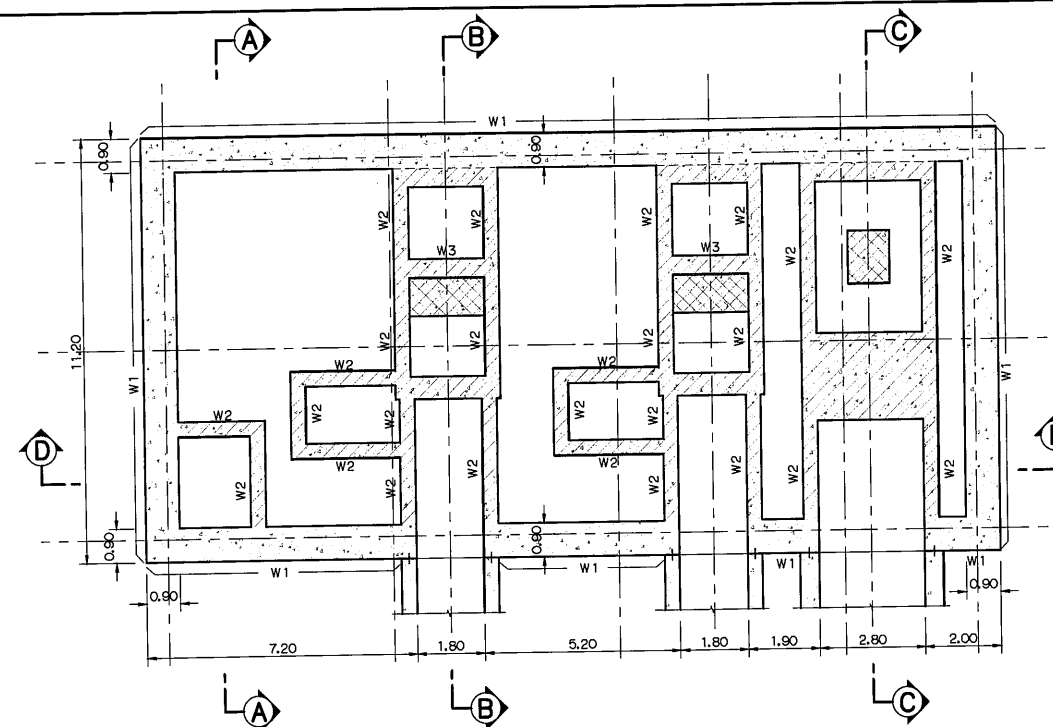


SLAB S5(LONG)
SCALE 1:20

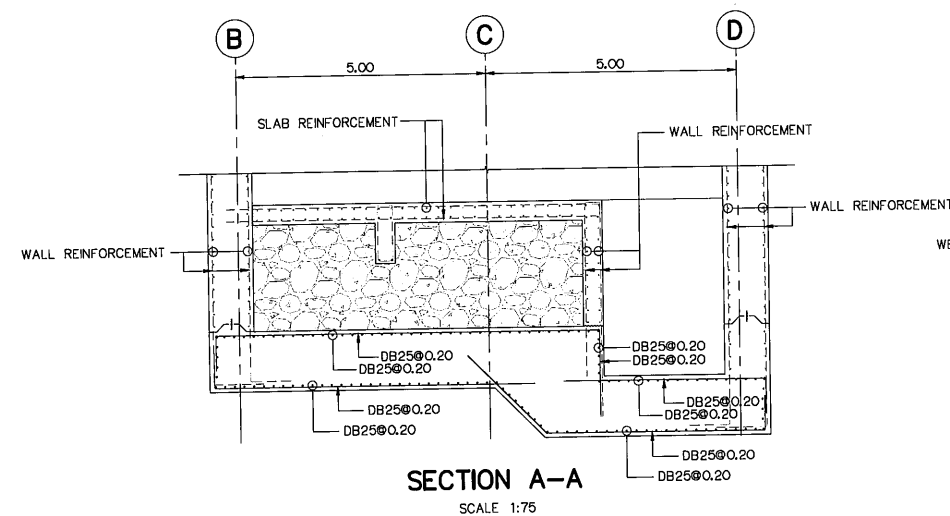


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NO.	DATE	REVISIONS	CHECKED	APPROVED

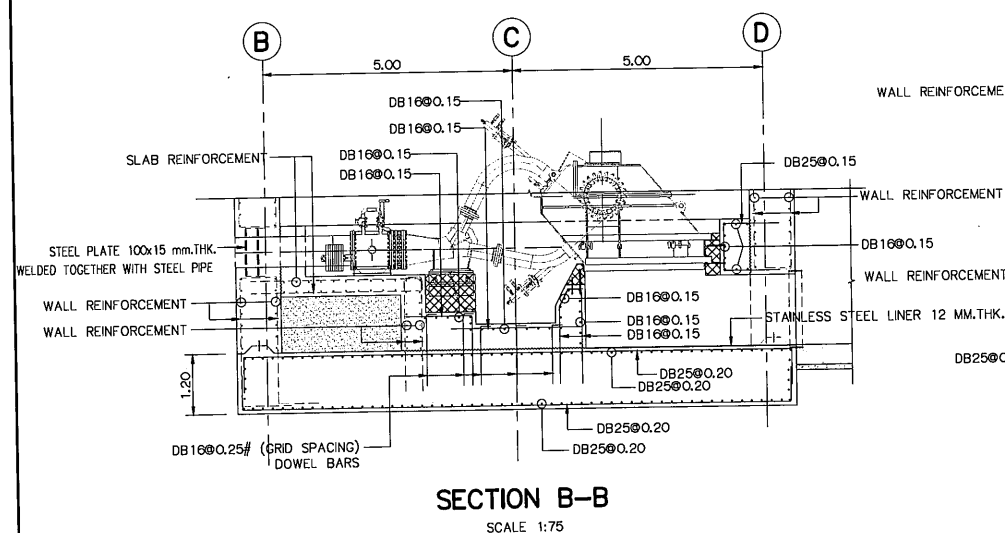
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE SLAB REINFORCEMENT DETAILS	
DESIGNED DRAWN CHECKED PROJECT MANAGER	28.1957 28.1957 17/03/2020 DATE
REVIEWED SUBMITTED RECOMMENDED APPROVED	SHEET NO. 46 OF 97



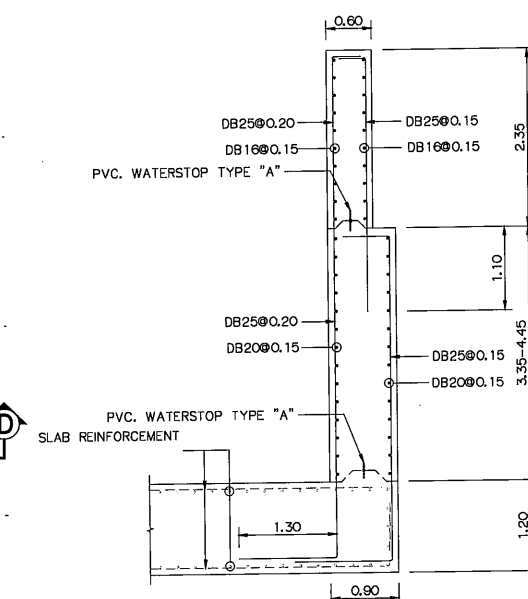
KEY PLAN
SCALE 1:100



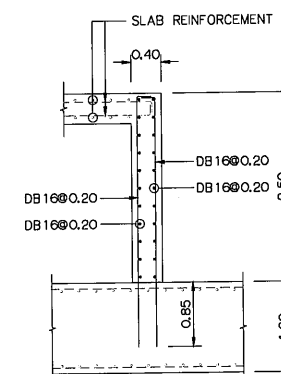
SECTION A-A
SCALE 1:75



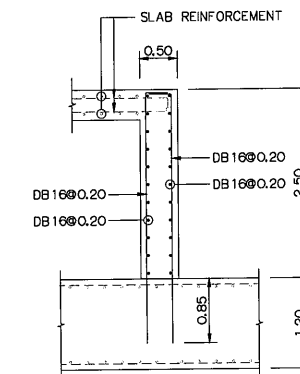
SECTION B-B
SCALE 1:75



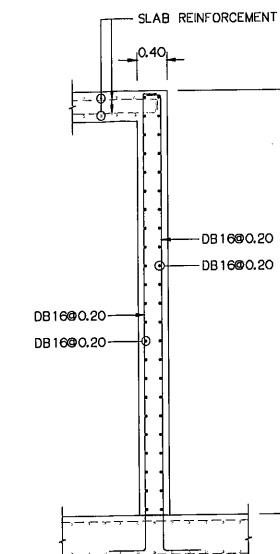
W1 DETAIL
SCALE 1:50



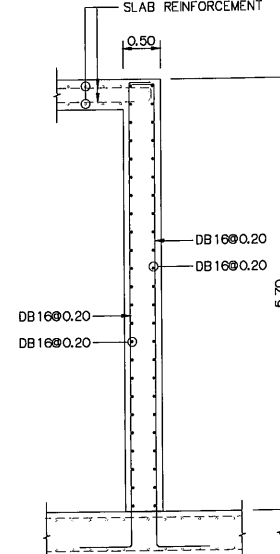
W2 DETAIL
SCALE 1:50



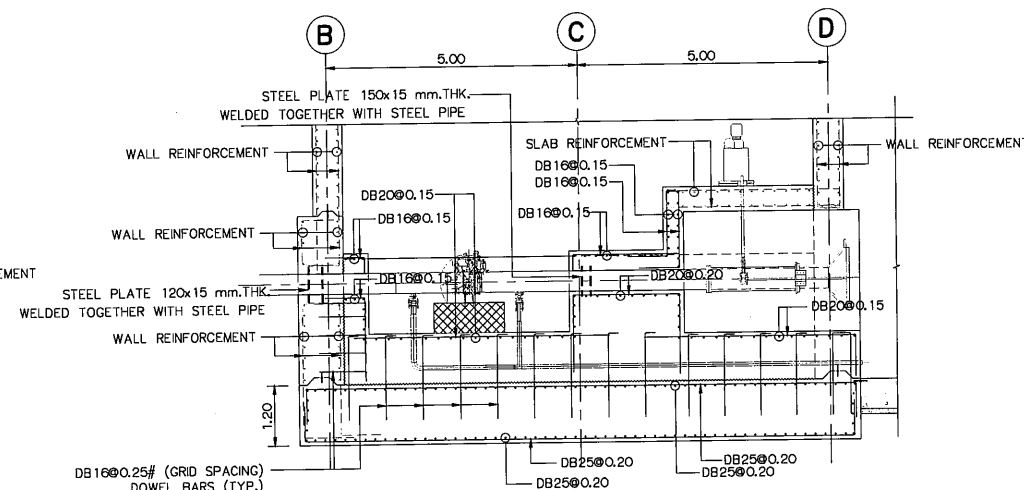
W3 DETAIL
SCALE 1:50



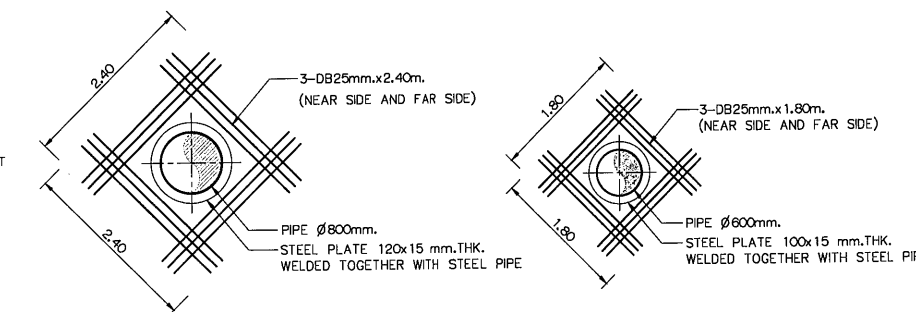
W4 DETAIL
SCALE 1:50



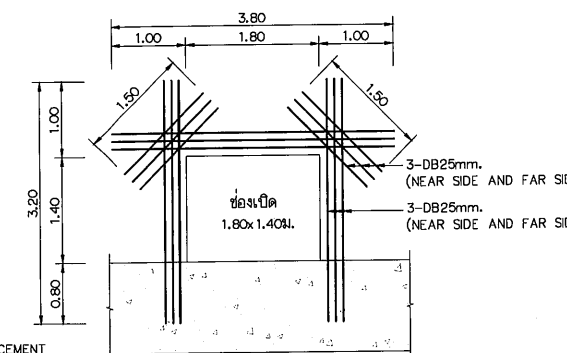
W5 DETAIL
SCALE 1:50



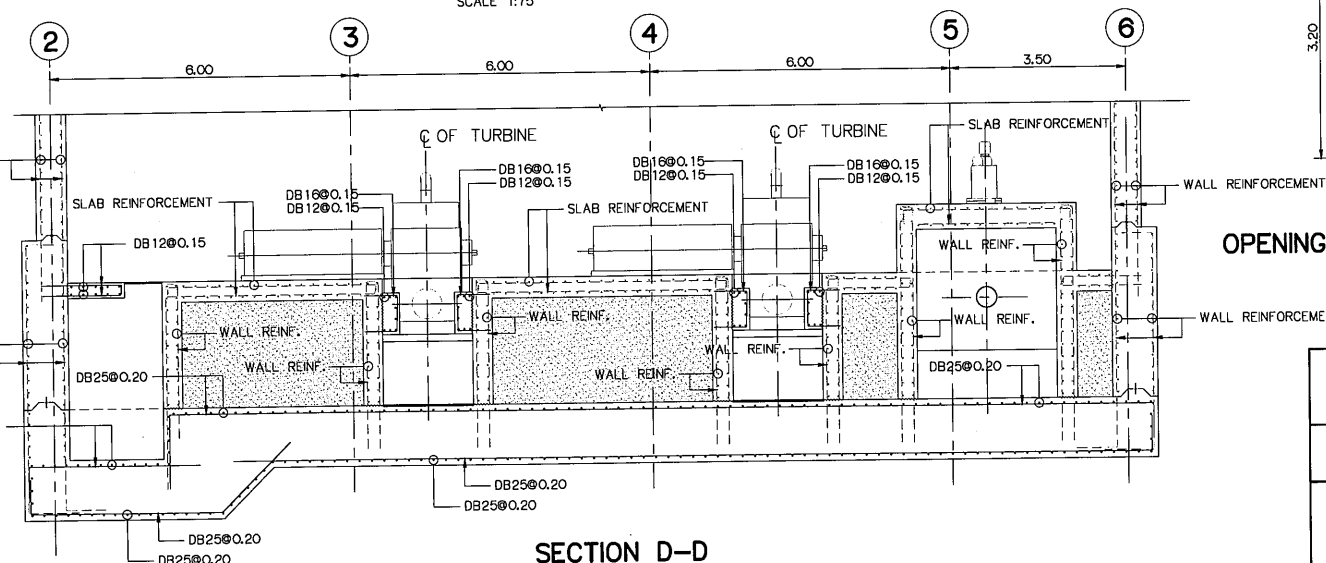
SECTION C-C
SCALE 1:75



PIPE THROUGH WALL REINFORCEMENT DETAIL
SCALE 1:50



OPENING THROUGH WALL REINFORCEMENT DETAIL
SCALE 1:50



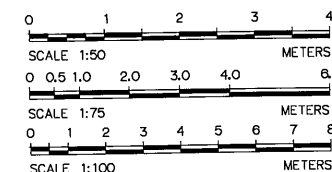
SECTION D-D
SCALE 1:75

NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

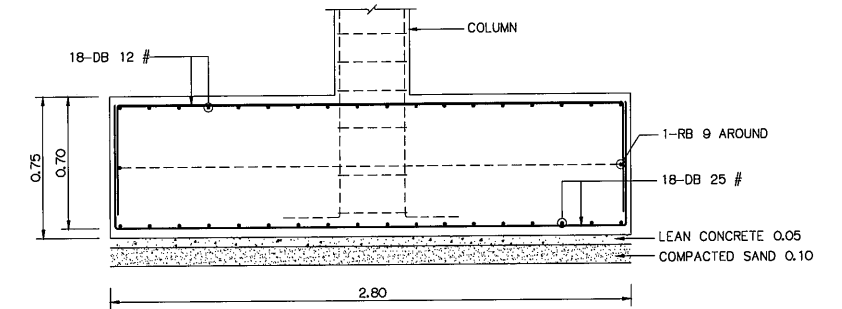
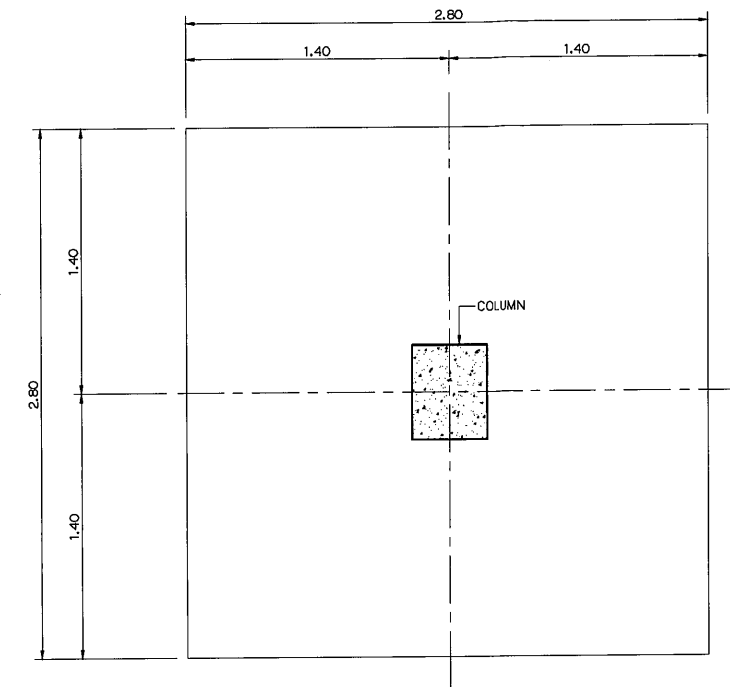
REFERENCE DRAWINGS :

- POWERHOUSE, TURBINE AND GALLERY FLOOR PLAN KTP2-PH-03
- POWERHOUSE, SECTIONS (SHEET 1/2) KTP2-PH-05
- POWERHOUSE, SECTIONS (SHEET 2/2) KTP2-PH-06



NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE TURBINE FLOOR REINFORCEMENT DETAILS			
DESIGNED 28.1957 DRAWN 28.1957 CHECKED 17/03/2020		SUBMITTED RECOMMENDED APPROVED DRAWING NO. KTP2-PH-17 SHEET NO. 47 OF 97	



FOOTING (F3)

SCALE 1:20

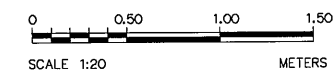
NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS,
UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

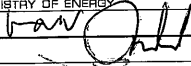
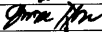
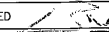
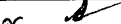
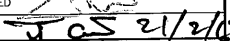
REFERENCE DRAWINGS :

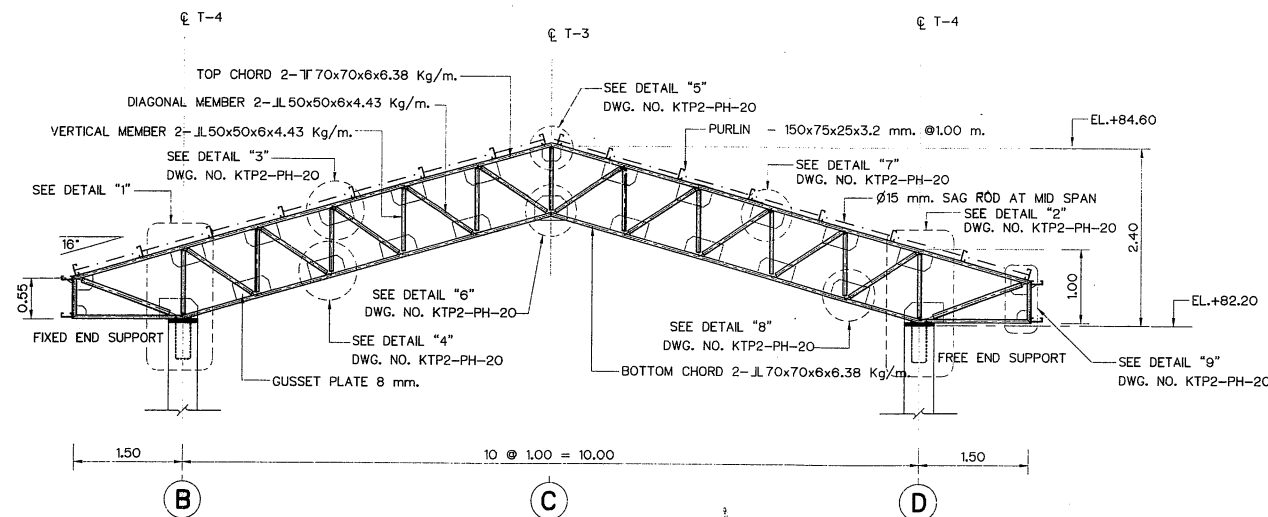
1. POWERHOUSE, FOOTING PLAN AND PLAN OF BEAM (EL.+68.10, EL.+70.90)

KTP2-PH-09

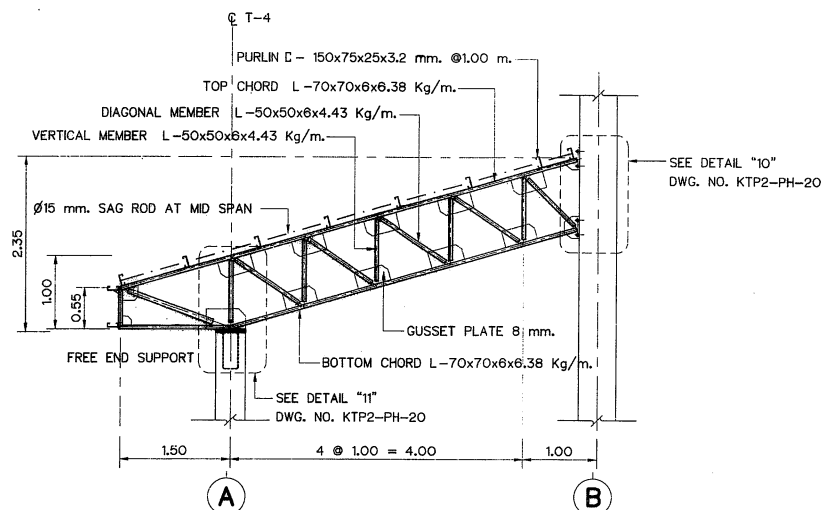


3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVE
	CONSULTANTS		DEDE	

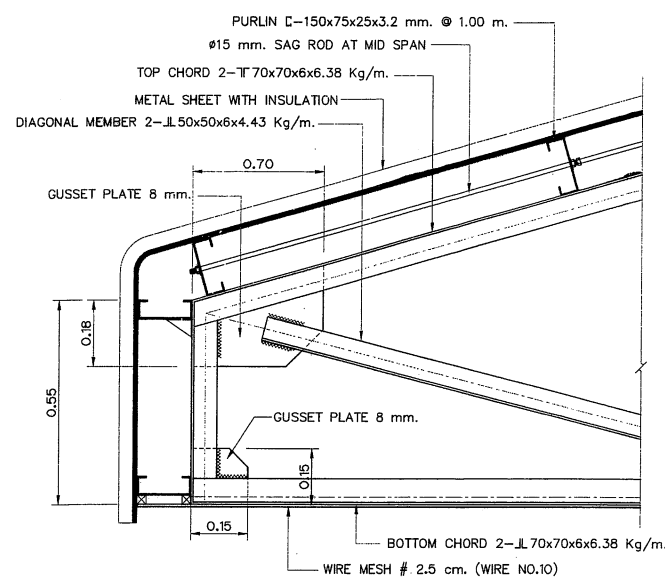
 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE			
FOOTING REINFORCEMENT DETAILS			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		28.1.1957	REVIEWED 
DRAWN			RECOMMENDED 
CHECKED		28.1.1957	APPROVED 
		17/03/2020	DRAWING NO.
PROJECT MANAGER		DATE	KTP2-PH-18
			Sheet No. 48 of 97



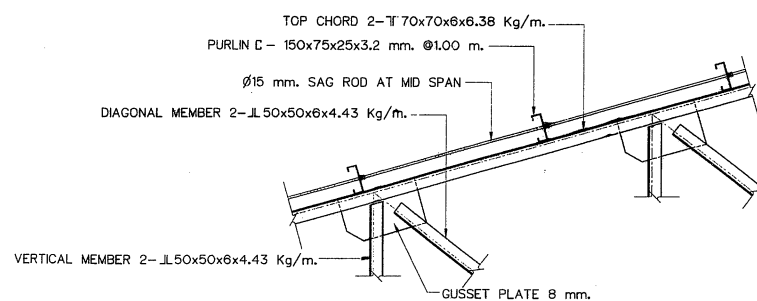
TRUSS T-1
SCALE 1:50



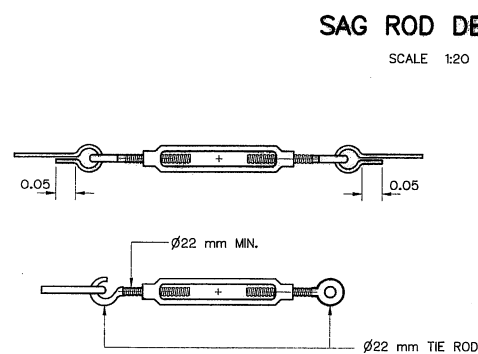
TRUSS T-2
SCALE 1:50



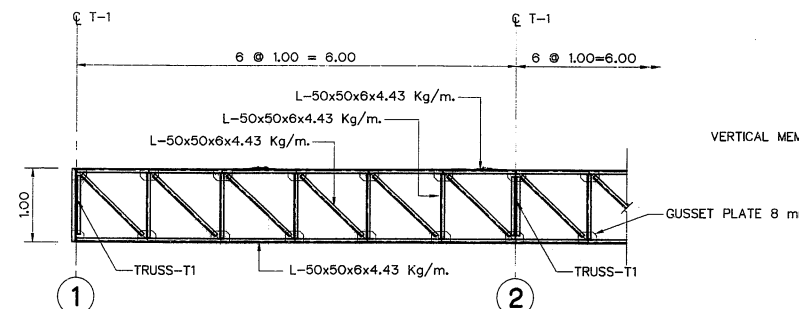
EAVES DETAIL
SCALE 1:10



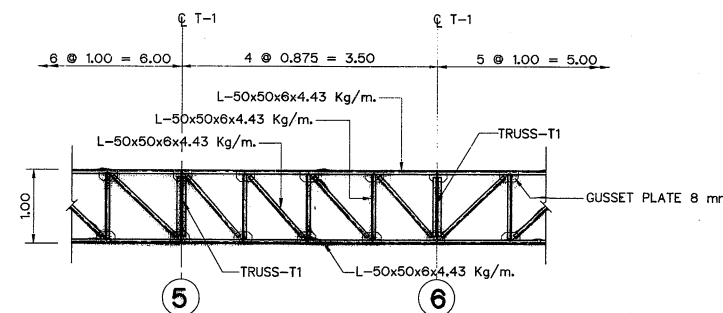
SECTION



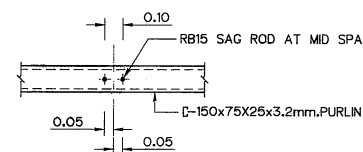
TURNBUCKLE
NOT TO SCALE



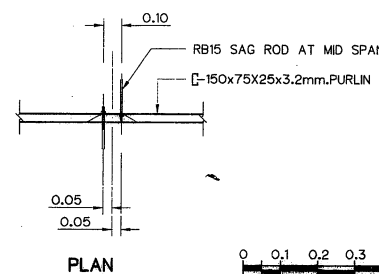
TRUSS T-3 (SPAN 6.00m.)
SCALE 1:50



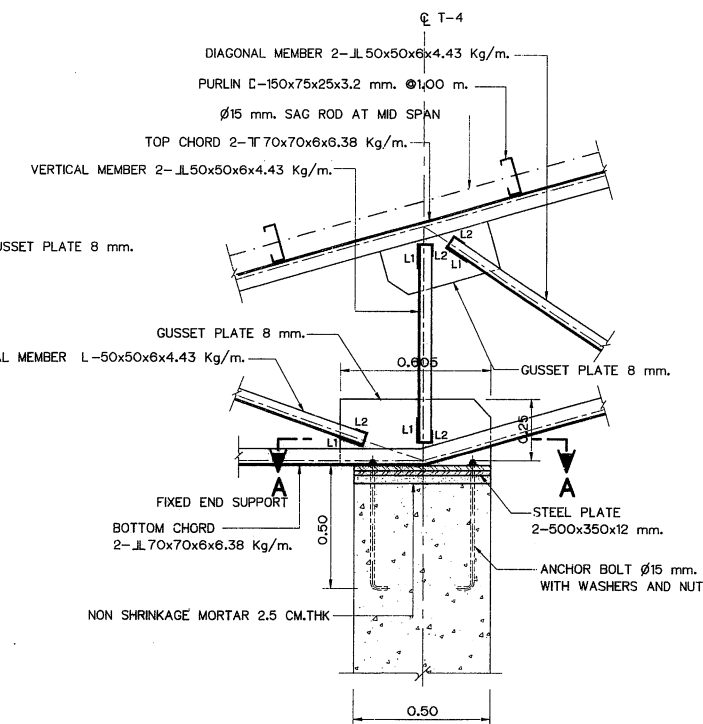
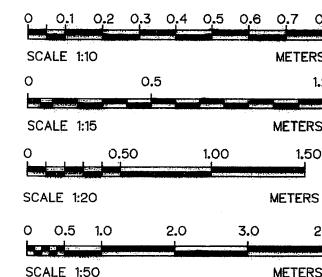
TRUSS T-3 (SPAN 3.50m.)
SCALE 1:50



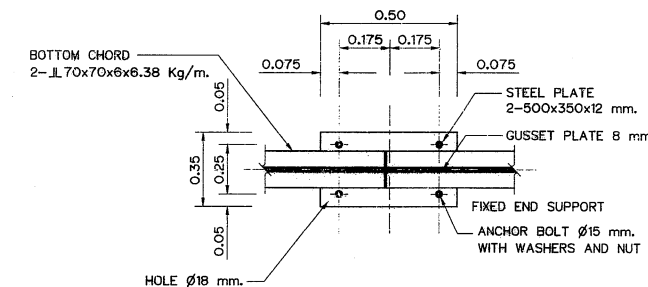
ELEVATION



PLAN



DETAILS "1"
SCALE 1:15

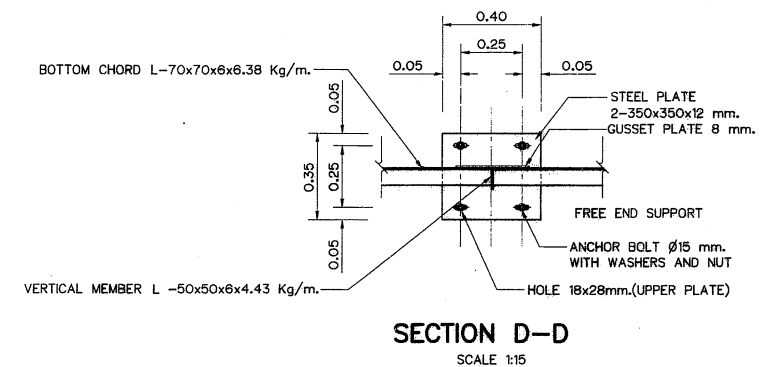
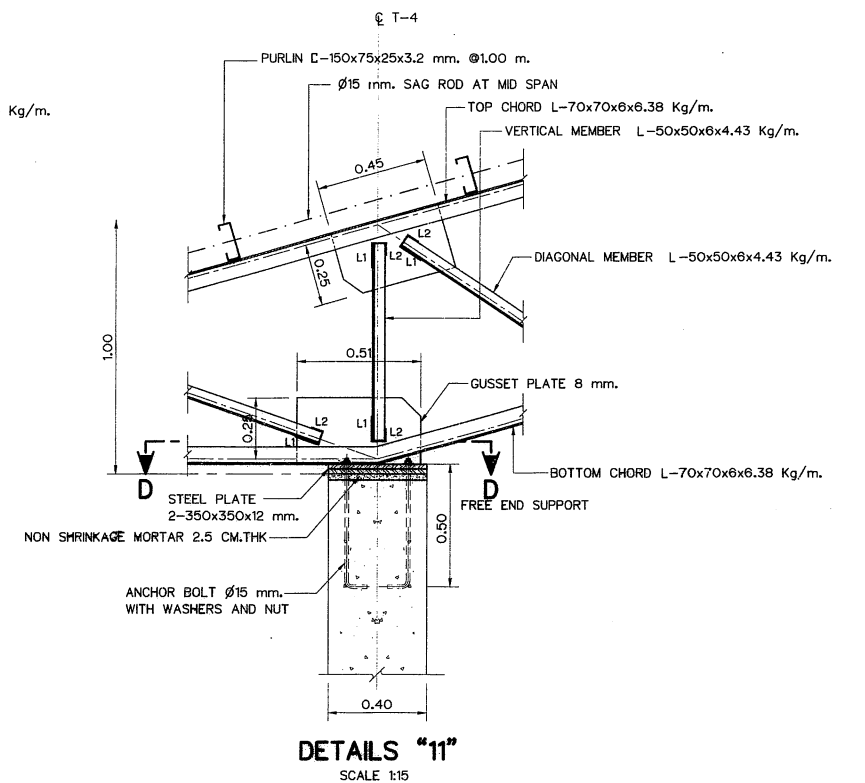
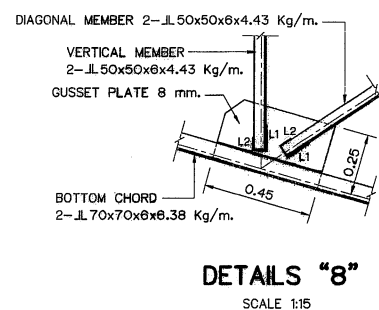
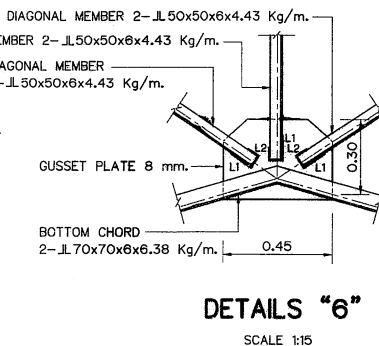
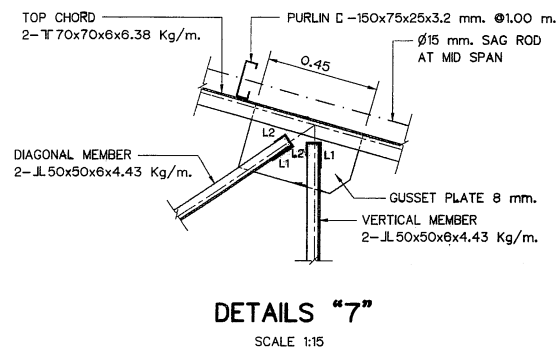
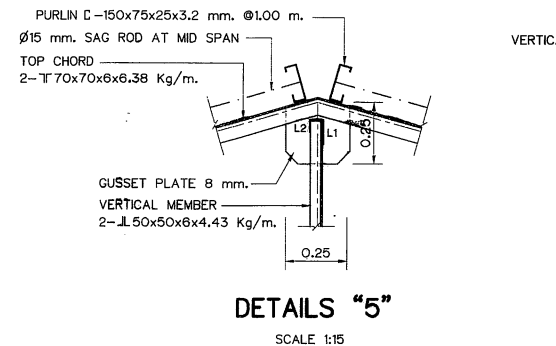
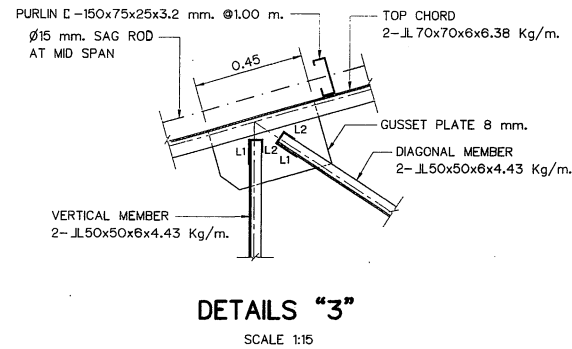
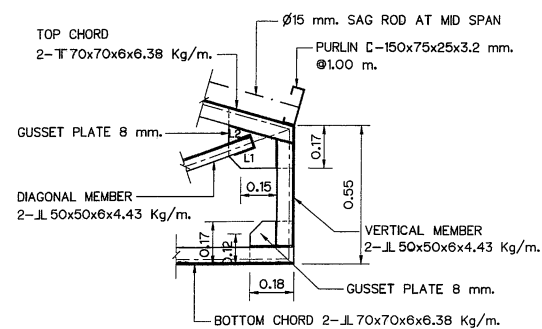
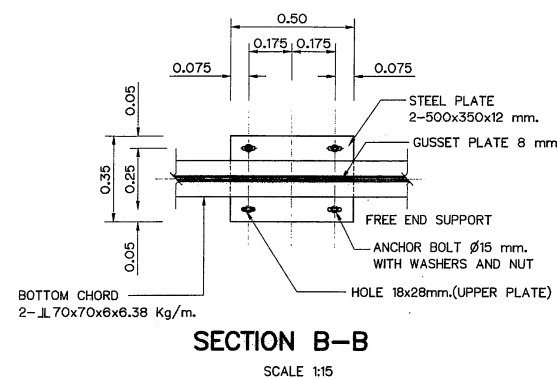
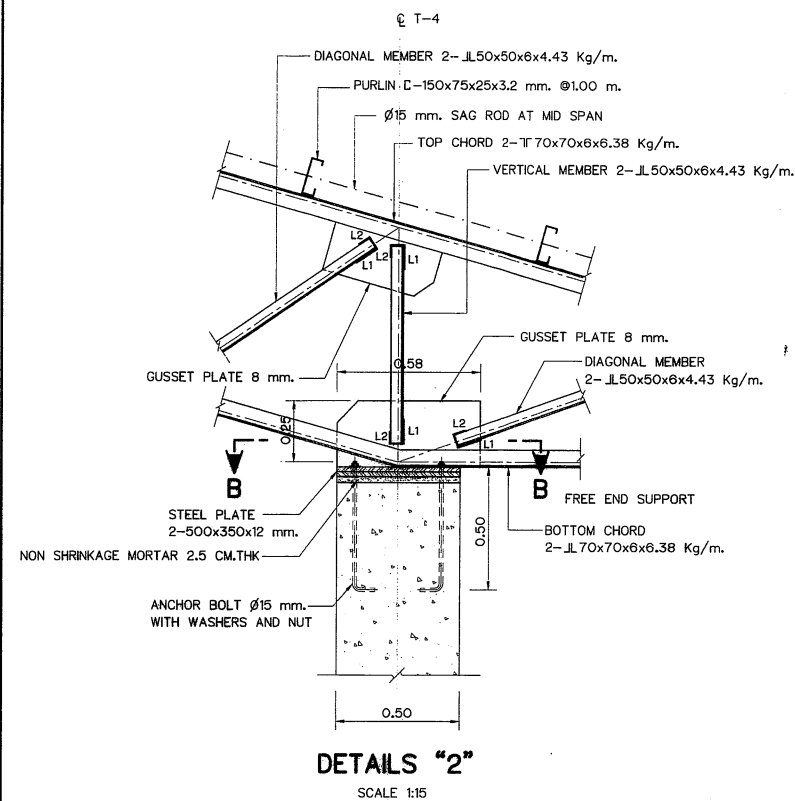


SECTION A-A
SCALE 1:15

- NOTES :**
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

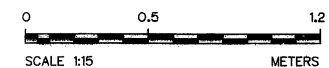
- REFERENCE DRAWINGS :**
- POWERHOUSE, ELEVATIONS KTP2-PH-04
 - POWERHOUSE, PLAN OF ROOF BEAM AND PLAN OF TRUSS KTP2-PH-11
 - POWERHOUSE, DETAILS TRUSS T-1, T-2, T-3 AND T-4 (2/2) KTP2-PH-20

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI PART 1 : CIVIL WORKS POWERHOUSE DETAILS TRUSS T-1, T-2, T-3 AND T-4 (1/2)		DESIGNED <i>[Signature]</i> 28.1957 DRAWN <i>[Signature]</i> 28.1957 CHECKED <i>[Signature]</i> 17/03/2020 PROJECT MANAGER	REVIEWED <i>[Signature]</i> SUBMITTED <i>[Signature]</i> RECOMMENDED <i>[Signature]</i> APPROVED <i>[Signature]</i> DATE	DRAWING NO. KTP2-PH-19 SHEET NO. 49 OF 97
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MEMBER SCHEDULE TABLE

TRUSS TYPE	MEMBER	FILLET WELD SIZE (mm)		
		L1	L2	t
TRUSS T-1	2-IL70x70x6x6.38 Kg/m.	125	75	5
TRUSS T-2	1-L70x70x6x6.38 Kg/m.	125	75	5
TRUSS T-3	1-L50x50x6x4.43 Kg/m.	100	50	5

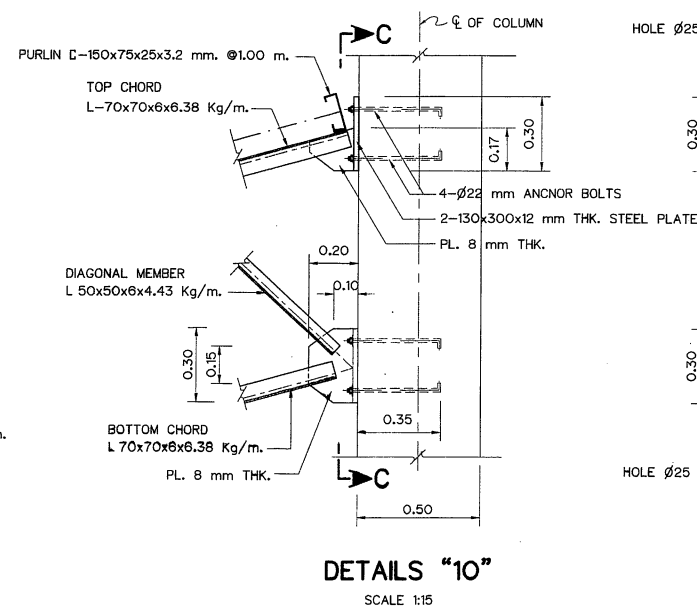
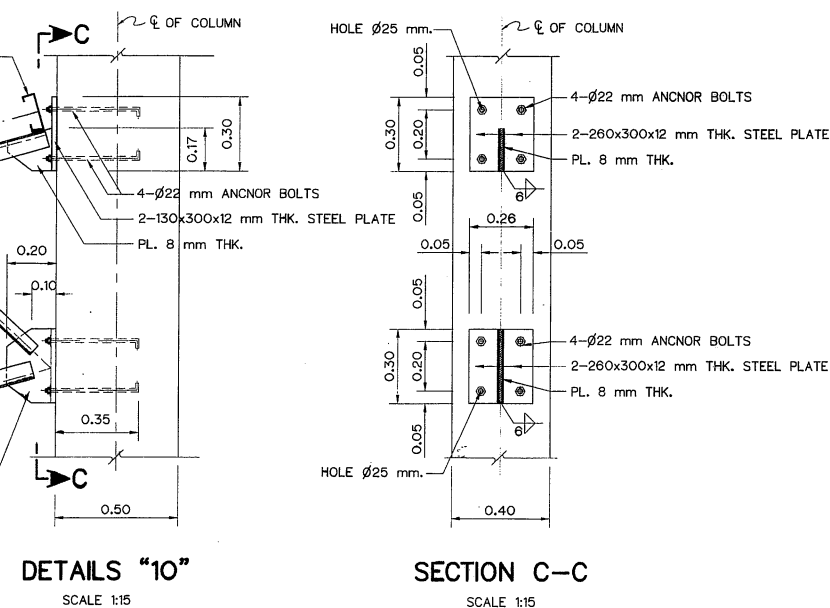


NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

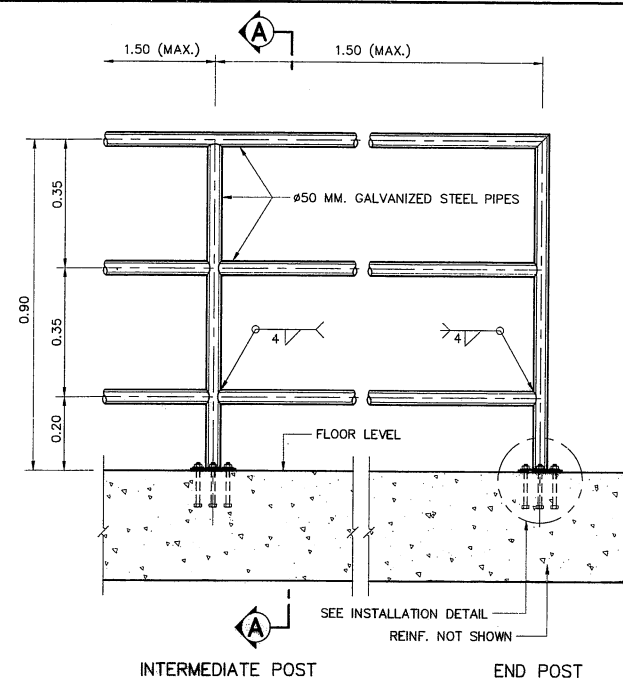
REFERENCE DRAWINGS :

1. POWERHOUSE, PLAN OF ROOF BEAM AND PLAN OF TRUSS KTP2-PH-11
2. POWERHOUSE, DETAILS TRUSS T-1, T-2, T-3 AND T-4 (1/2) KTP2-PH-19

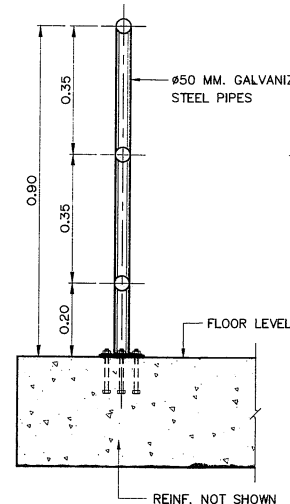


KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE DETAILS TRUSS T-1, T-2, T-3 AND T-4 (2/2)	
PCM P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED 28.1957	REVIEWED
DRAWN	SUBMITTED
CHECKED 28.1957	RECOMMENDED
APPROVED	APPROVED
PROJECT MANAGER	DRAWING NO. KTP2-PH-20
DATE 17/03/2020	SHEET NO. 50 OF 97

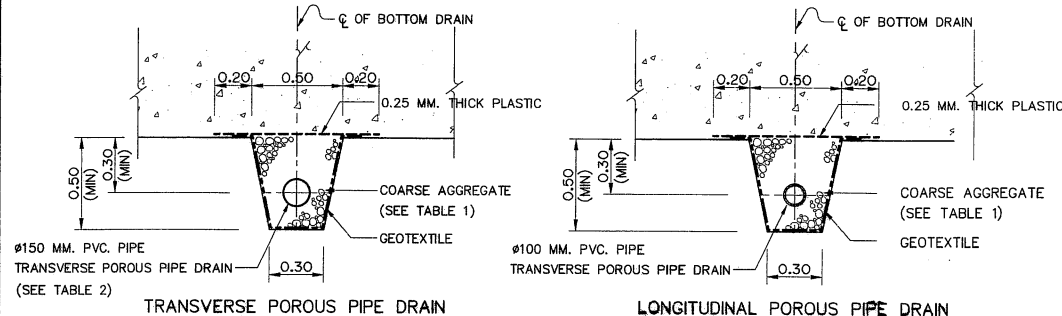
 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHIATCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE CABLE TRENCH DETAILS			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		28.1957	REVIEWED 
DRAWN			SUBMITTED 
CHECKED		28.1957	RECOMMENDED 
		17/03/2020	APPROVED 
PROJECT MANAGER		DATE	DRAWING NO. KTP2-PH-21
			SHEET NO. 51 OF 97



DETAILS OF HANDRAIL
NOT TO SCALE

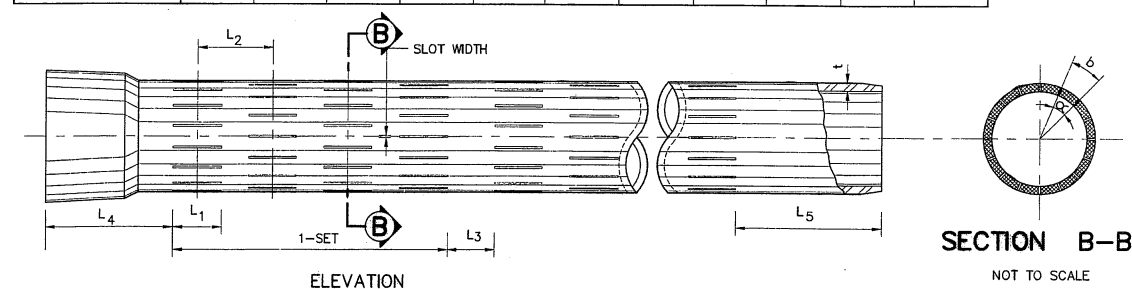


SECTION A-A
NOT TO SCALE



DETAILS OF BOTTOM DRAIN
SCALE 1:20

FILTER MATERIALS	PERCENT BY WEIGHT RETAINED ON STANDARD SIEVE										
	1 1/2"	3/4"	3/8"	No. 4	No. 8	No. 16	No. 30	No. 50	No. 100	No. 200	
COARSE AGGREGATE	0	20-35	40-60	0	60-80	75-90	95-100	-	-	-	-

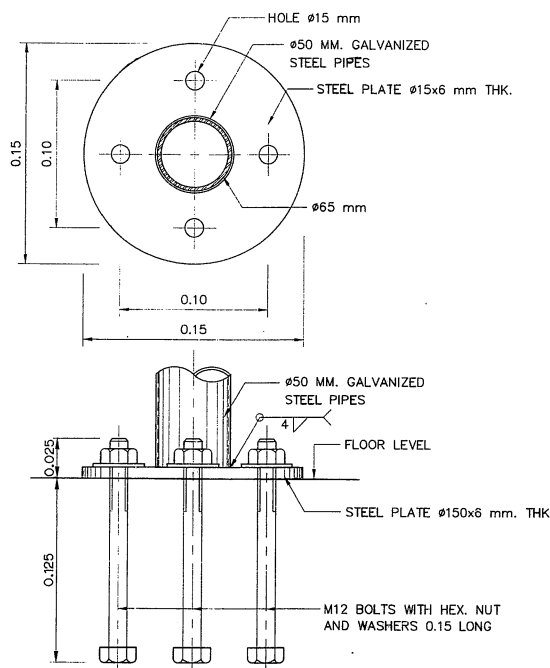


SLOTTED uPVC SCREEN PIPE OF BOTTOM DRAIN AND SIDE DRAIN DETAILS
NOT TO SCALE

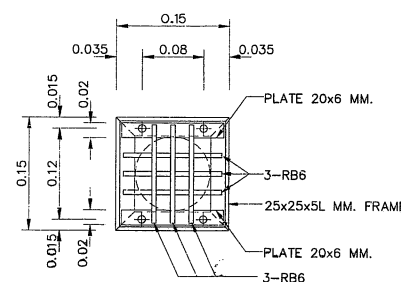
NOMINAL SIZE (MM.)	L ₁ (MM.)	L ₂ (MM.)	L ₃ (MM.)	L ₄ (MM.)	L ₅ (MM.)	SLOT WIDTH (MM.)	α (MM.)	b (MM.)	No. OF SLOT ON THE SAME CIRCUMFERENCE	No. OF SET PER LENGTH (4.00 M)	APPROX. OPENING AREA
55	80±10	120±10	80±10	215	220	2.4±0.2	45°	23.5	8	7	5.7 %
100	80±10	120±10	80±10	210	220	2.4±0.2	22.5°	22.4	16	7	6.0 %
150	80±10	120±10	80±10	200	220	2.4±0.2	18°	25.9	20	7	5.2 %

NOTES :

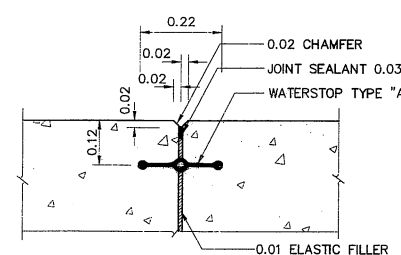
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03



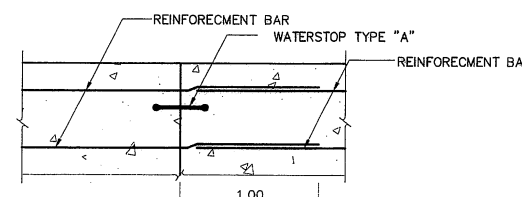
INSTALLATION DETAIL
NOT TO SCALE



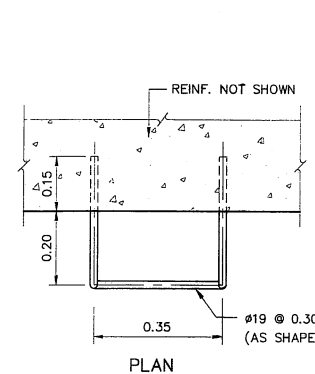
SECTION C-C
SCALE 1:5



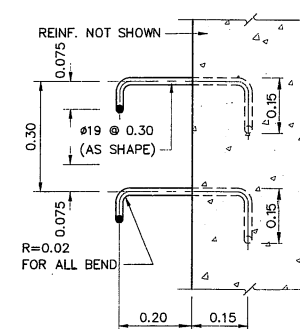
DETAILS OF EXPANSION JOINT
SCALE 1:10



DETAILS OF CONTROL JOINT
SCALE 1:10

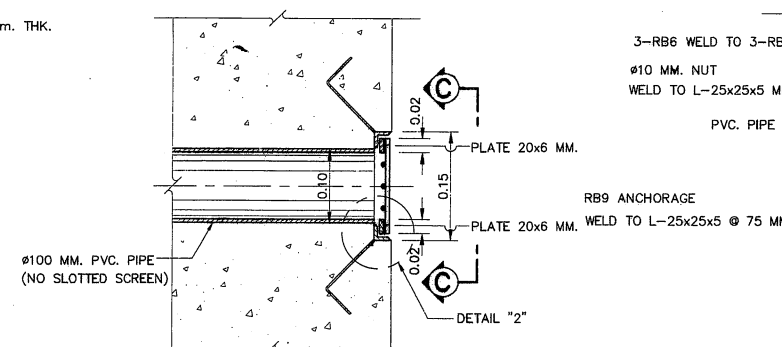


PLAN

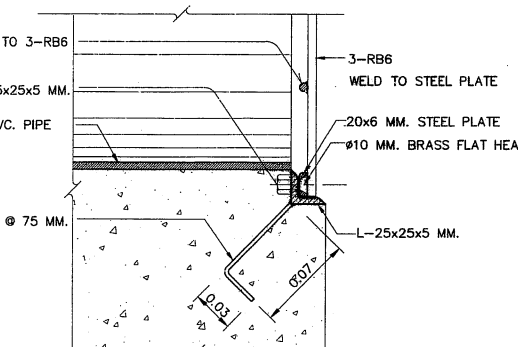


SECTION

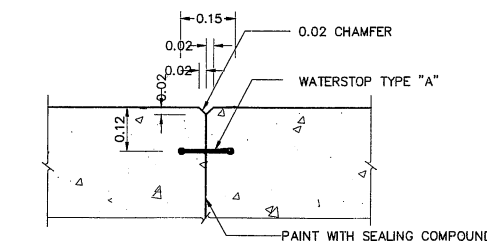
DETAIL OF LADDER RUNGS
NOT TO SCALE



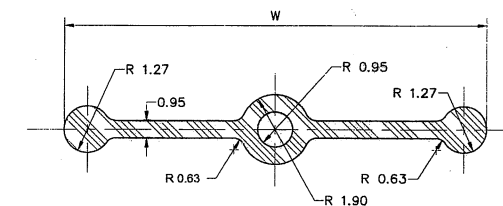
DETAILS OF 100 MM. PVC. PIPE
SCALE 1:5



DETAILS "2"
NOT TO SCALE



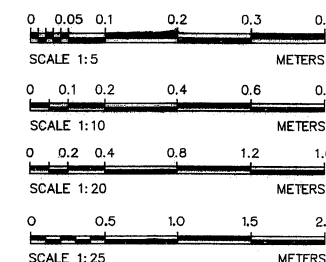
DETAILS OF CONTRACTION JOINT
SCALE 1:10



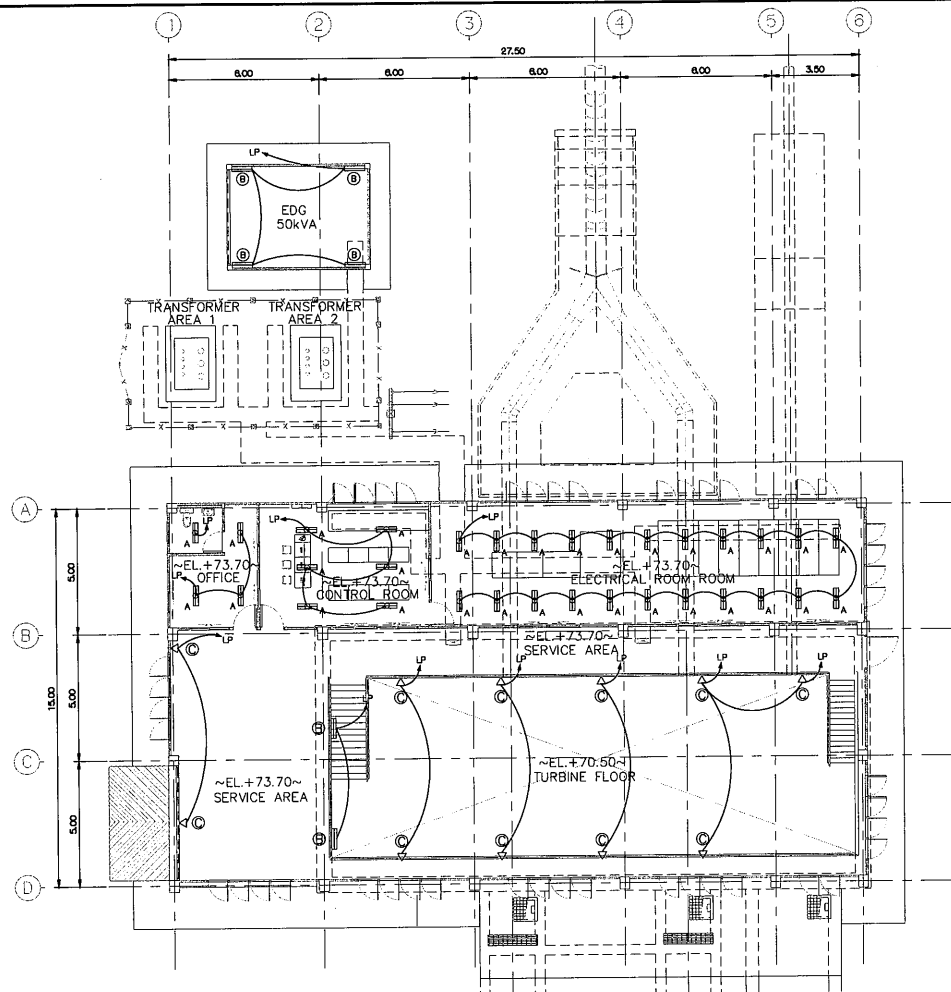
PVC. WATERSTOP TYPE "A"
NOT TO SCALE

TABLE OF DIMENSIONS

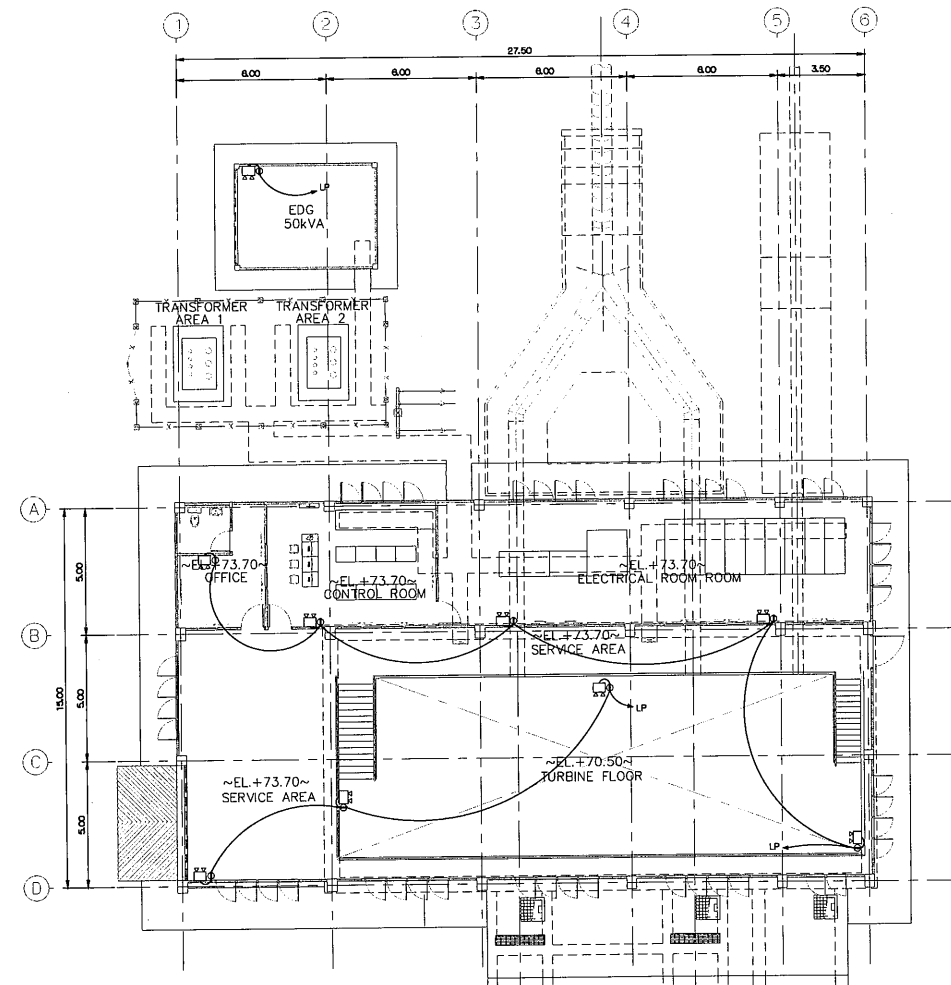
WATERSTOP TYPE	W	a	R
A	22.86	4	20



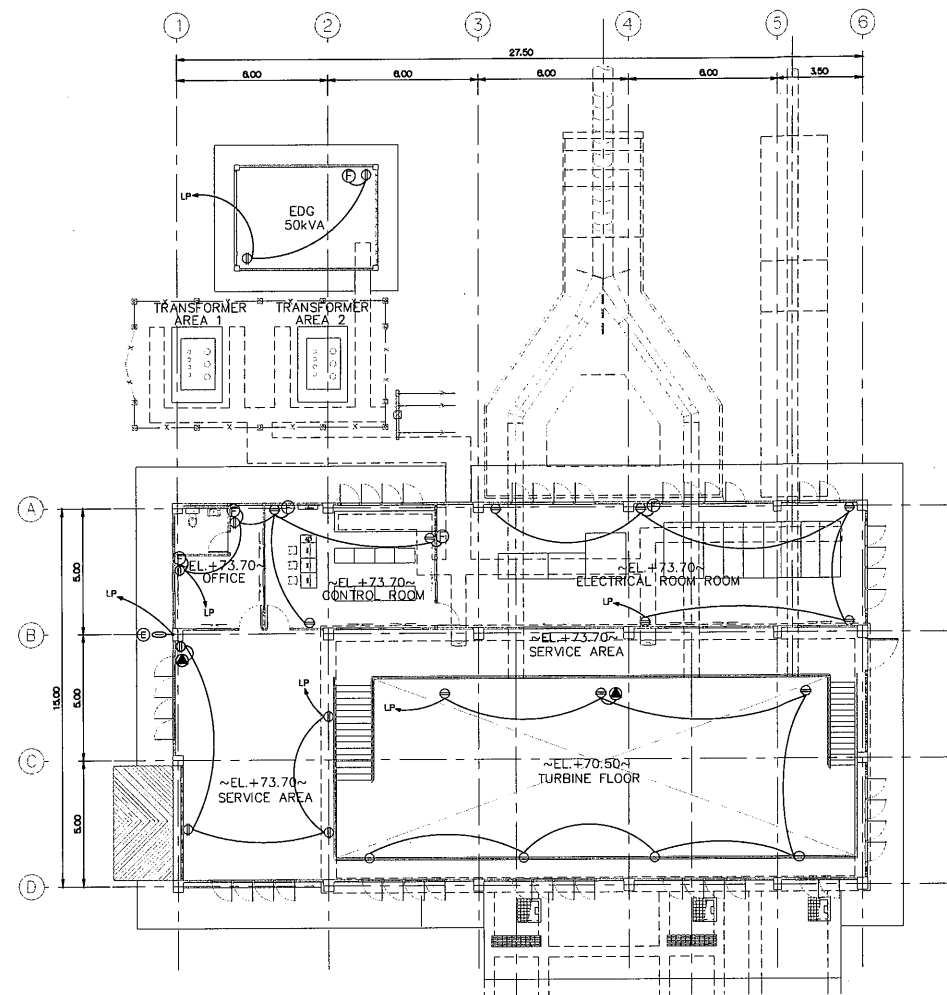
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE MISCELLANEOUS DETAILS			
P&C MANAGEMENT CO., LTD. DESIGNED: 28.1957 DRAWN: 28.1957 CHECKED: 17/03/2020 PROJECT MANAGER: DATE		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY REVIEWED: 28.1957 SUBMITTED: 28.1957 APPROVED: 17/03/2020 SHEET NO. 52 OF 97	



POWERHOUSE INDOOR LIGHTING
SCALE 1:150



POWERHOUSE EMERGENCY LIGHTING
SCALE 1:150



POWERHOUSE RECEPTACLE
SCALE 1:150

LEGENDS :

- (A) LOUVRED LUMINAIRE COMPOSED OF WHITE POLYESTER POWDER COATING STEEL HOUSING, ALUMINIUM PROFILE LOUVERS FOR REDUCING GLARE, PURITY ALUMINIUM REFLECTOR, BUILT IN COMPLETE WIRING OF ROTARY LOCK LAMP HOLDERS. (LED 2x14.5 WATT)
- (B) WEATHER PROOF LUMINAIRE COMPOSED OF ACID-RESISTANT POLYCARBONATE HOUSING, AND AND DIFFUSER TAMPER RESISTANCE BUILT-IN COMPLETED WIRING OF ROTARY LOCK LAMP HOLDER, IP65
- (C) FLOOD LIGHT LUMINAIRE COMPOSED OF DIE-CAST ALUMINIUM BODY, ALUMINIUM REFLECTOR, BODY, ALUMINIUM REFLECTOR, THERMAL SHOCK SAFETY GLASS WITH HINGE ALUMINIUM LOCK, IP65 (LED 1x120 WATT)
- (D) SAME AS TYPE E (LED 1x30 WATT)
- (E) FLOOD LIGHT LUMINARIES 1x120 WATT LED TYPE : MOUNTING ON CONCRETE POLE
- (F) EXHAUST FAN 12"
- DUPLEX RECEPTACLE WITH GROUND, 16 A. 220 VAC.
- POWER RECEPTACLE 3P+N+E 32 A. 400 VAC.
- HIGH BAY FIXTURE 1x400 W. HIGH PRESSURE SODIUM
- EMERGENCY LIGHTING 2x55 W. HALOGEN W/SEALED LEAD ACID BATTERY BACKUP 2 HOURS
- AIR CONDITIONING, SPLIT TYPE
- LOAD PANEL 3 PHASE (18 CIRCUITS) WITH MAIN CIRCUIT BREAKER
- LIGHTING CONTROL PANEL

NOTES

1. GROUNDING CONDUCTOR, TAP AND RISER FROM GROUNDING NETWORK TO POWER EQUIPMENT SHALL BE FORMED BY BARE COPPER CONDUCTOR NOT LESS THAN 95 SQ.MM.
2. GROUNDING SYSTEM RESISTANCE WILL NOT EXCEED 5 OHM.
3. CONNECTOR TO WITH IN & BETWEEN THE GROUNDING NETWORK TO POWER PLANT EQUIPMENT WILL BE MADE BY THERMAL CADWELD
4. GROUND ROD WILL BE COPPER COVER STEEL DIAMETER 15.87 MM. 2,400 MM. LONG
5. THIS DRAWING USE FOR GUIDE ONLY, THE CONSTRUCTION DRAWING SHALL CONFORM EIT'S STANDARD.

0 1 2 3 4
SCALE 1:50 METERS

3				
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NO.	DATE	REVISIONS	CHECKED	APPROVED

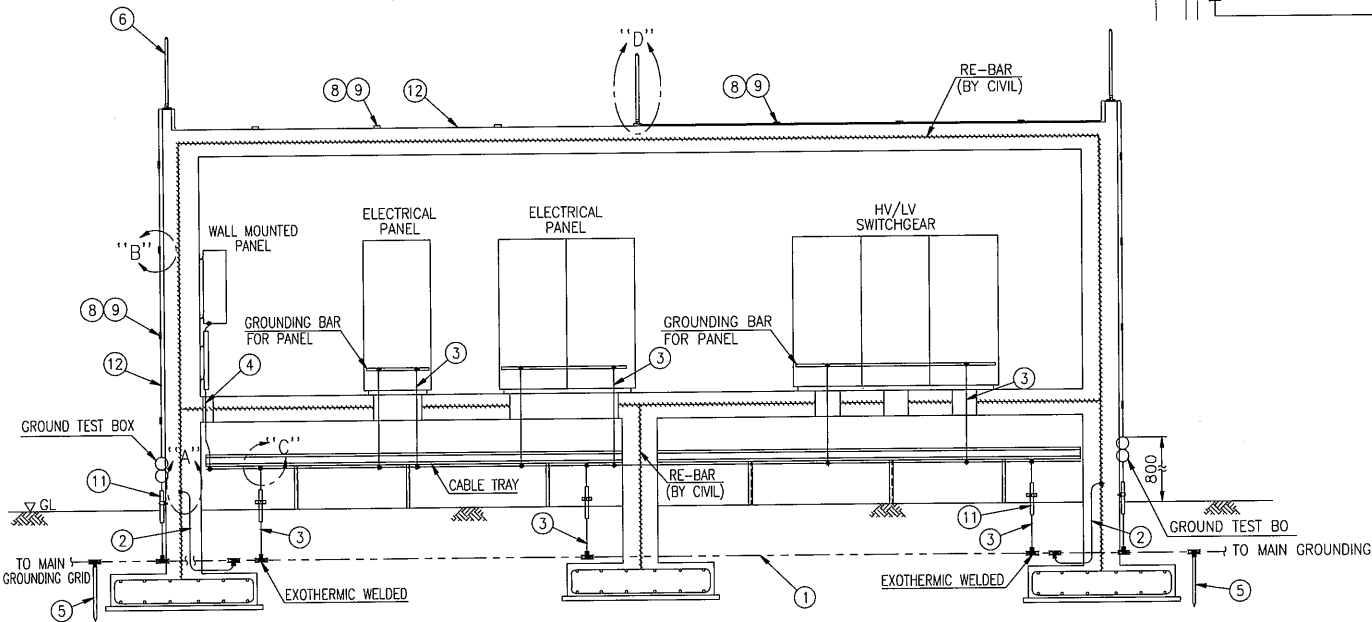
CONSULTANTS

DEDE

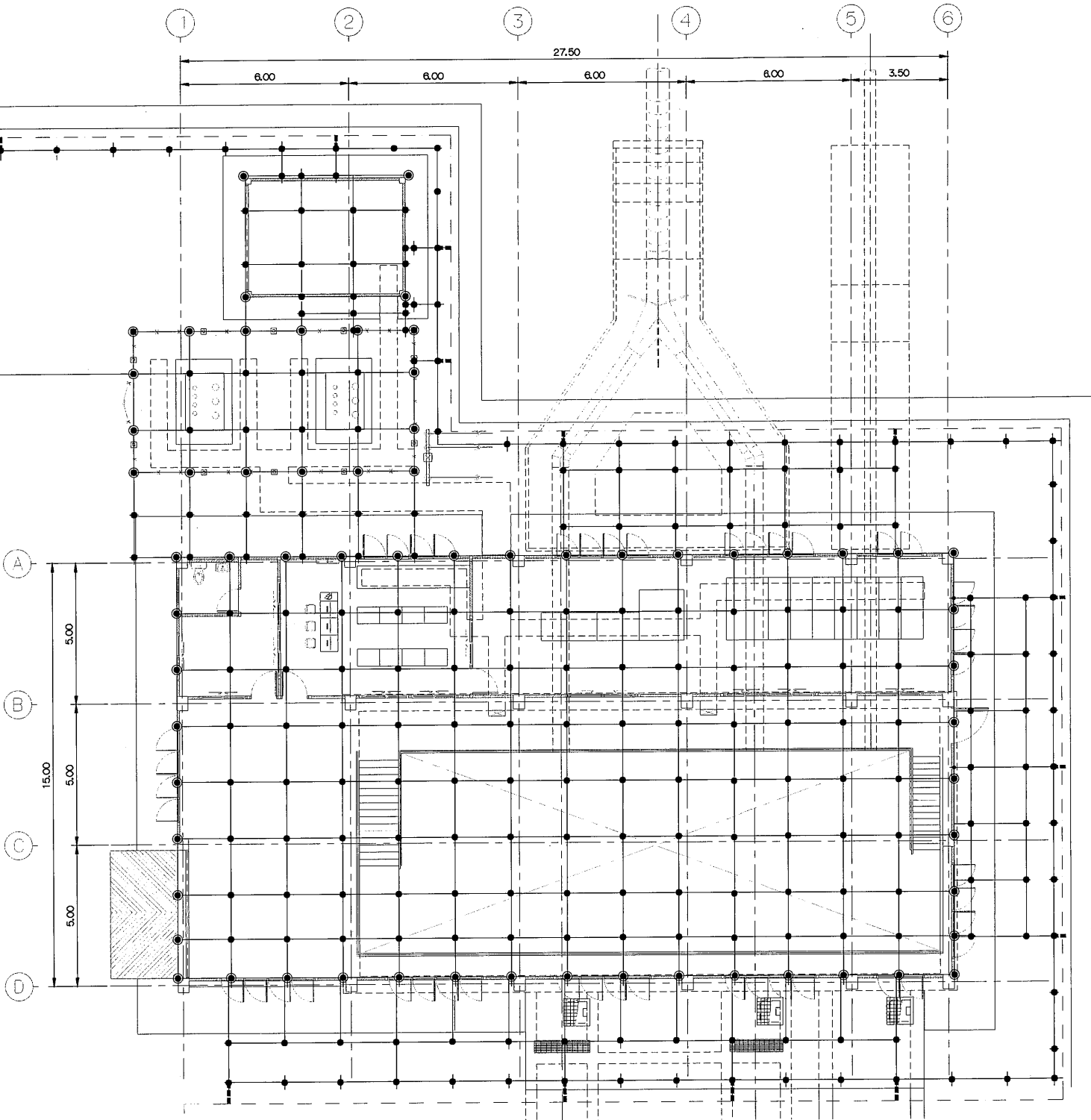
 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE LIGHTING AND SMALL POWER	
 P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED	REVIEWED
DRAWN	SUBMITTED
CHECKED	RECOMMENDED
APPROVED	APPROVED
17/03/2020	21/2/20
PROJECT MANAGER	DATE
KTP2-PH-23	SHEET NO. 53 OF 97

- NOTES
1. GRIDS SHALL BE DESIGNED SUCH THAT THE OVERALL RESISTANCE OF THE GROUNDING GRID IS WITHIN 5 OHM
 2. GROUNDING CONDUCTOR SIZE SHALL BE 120 SQ.MM. OR GREATER THAT BASE ON CALCULATION.
 3. TOUCH AND STEP VOLTAGES SHALL BE MAINTAINED WITHIN ACCEPTABLE LIMITS ACCORDING TO STANDARD
 4. THIS DRAWING USE FOR GUIDE ONLY

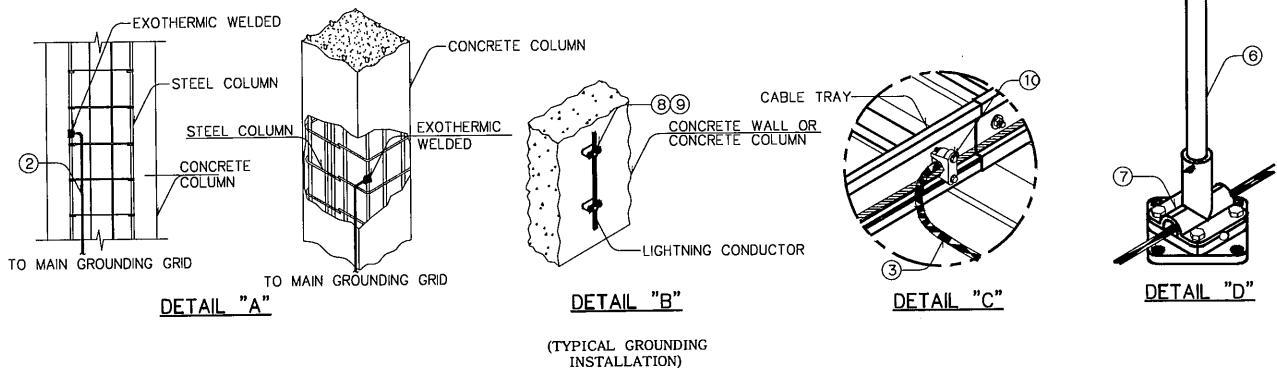
- LEGENDS :
- + GROUND CONNECTION CONNECTED BY EXOTHERMIC WELDING
 - GROUND ROD COPPER CLAD STEEL, Ø 20MM, 3M LONG
 - FENCE GROUNDING CONDUCTOR



ITEM	DESCRIPTION	MATERIAL SPEC	SIZING
1.	MAIN UNDERGROUND GROUNDING CONDUCTOR ANNEALED COPPER STRANDED WIRE	BAR COPPER	120 SQMM.
2.	BRACH GROUNDING WIRE	BAR COPPER	70 SQMM.
3.	BRACH GROUNDING WIRE (PVC INSULATION GREEN COLOR)	THW	120 SQMM.
4.	BRACH GROUNDING WIRE (PVC INSULATION GREEN COLOR)	THW	35 SQMM.
5.	GROUND ROD	COPPER-CLAD	DAI, 3/4", 6M. LONG



GROUNDING SYSTEM PLAN
SCALE 1:100



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

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NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE	
GROUNDING SYSTEM, PLAN AND TYPICAL DETAILS	
PCM P&C MANAGEMENT CO.,LTD.	REVIEWED
DESIGNED	SUBMITTED
DRAWN	RECOMMENDED
CHECKED	APPROVED
PROJECT MANAGER	DATE
17/03/2020	DATE
KTP2-PH-24	SHEET NO. 54 OF 97

LOAD SCHEDULE OF PANEL BOARD 3Ph 400V 50Hz

PANEL NO. LP		LOCATION : POWERHOUSE		
CCT No.	DESCRIPTION	LOAD IN VA		
		R	S	T
1	MECHANICAL AUXILIARY EQUIPMENT			
	WATER DRAINAGE SYSTEM			
	- DRAINAGE	625	625	625
2	WATER SUPPLY SYSTEM (COOLING WATER SYSTEM)	215	215	215
	- DEWATERING	125	125	125
3	PORTABLE AIR COMPRESSOR (IF APPLICABLE)	315	315	315
4	VENTILATION AND AIR CONDITIONING SYSTEM			
	- VENTILATION	180	180	180
	- AIR CONDITION	4300	4300	4300
5	OVERHEAD TRAVELING CRANE	3125	3125	3125
6	LIGHTING INDOOR	1250	1250	1250
7	LIGHTING OUTDOOR	500	500	500
8	RECEPTACLE	15000	15000	15000
SUM		25635	25635	25635
TOTAL			76905	

N/S

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5/G

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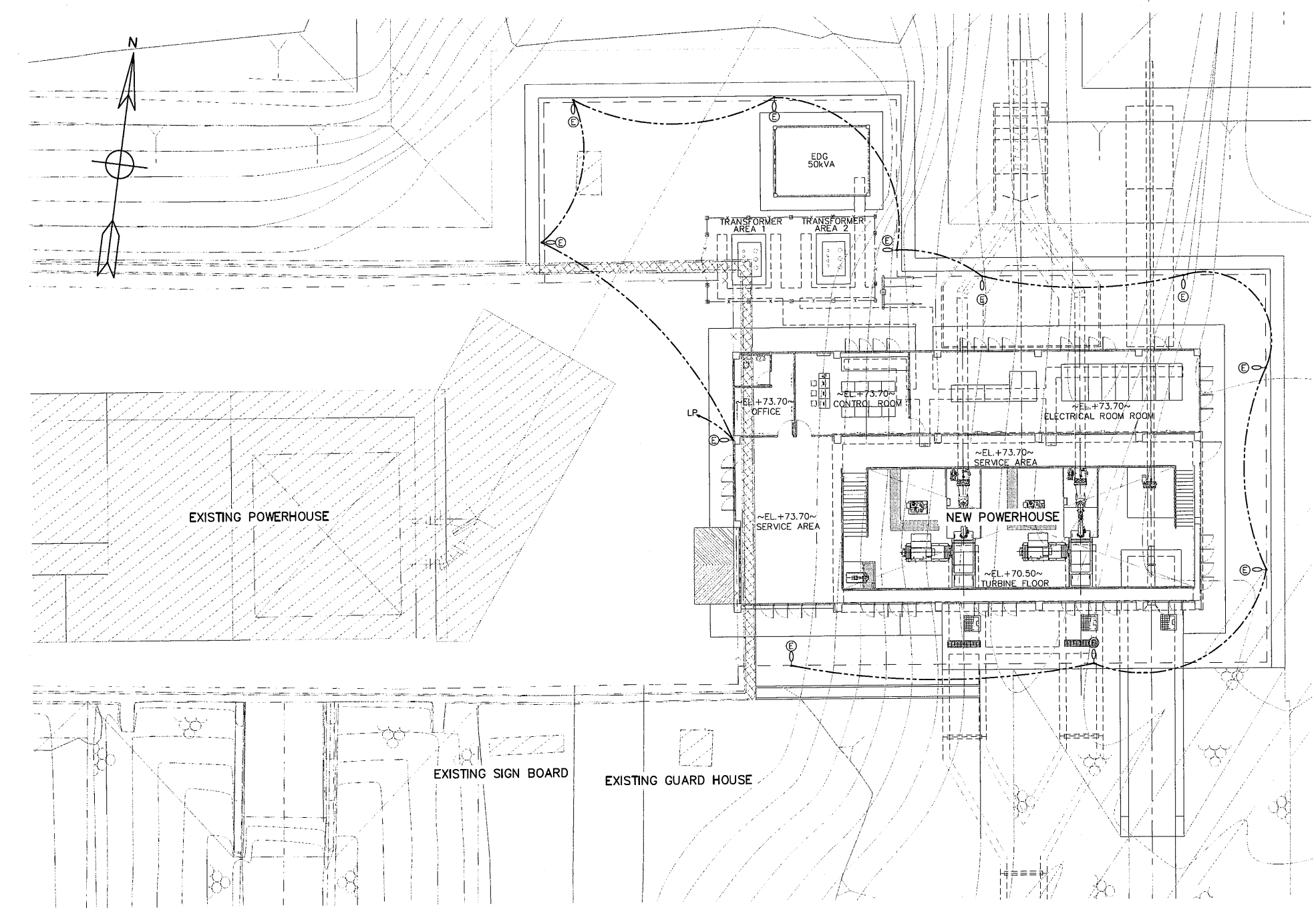
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33

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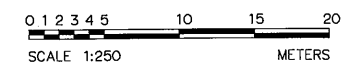
36



SWITCH YARD OUTDOOR LIGHTING
SCALE 1:150

- NOTES
- GROUNDING CONDUCTOR, TAP AND RISER FROM GROUNDING NETWORK TO POWER EQUIPMENT SHALL BE FORMED BY BARE COPPER CONDUCTOR NOT LESS THAN 95 SQ.MM.
 - GROUNDING SYSTEM RESISTANCE WILL NOT EXCEED 5 OHM.
 - CONNECTOR TO WITH IN & BETWEEN THE GROUNDING NETWORK TO POWER PLANT EQUIPMENT WILL BE MADE BY THERMAL CADWELD
 - GROUND ROD WILL BE COPPER COVER STEEL DIAMETER 15.87 MM. 2,400 MM. LONG
 - THIS DRAWING USE FOR GUIDE ONLY, THE CONSTRUCTION DRAWING SHALL CONFORM EIT'S STANDARD.

- LEGENDS :
- FLOOD LIGHT LUMINARIES 1x120 WATT LED TYPE : MOUNTING ON CONCRETE POLE
 - SECONDARY LINES, 380/220 V 50 MM THW OVERHEAD INSULATED CABLES, 3/4 WIRE



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NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

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

KLONG THUNG PHEN 2 HYDROPOWER PROJECT
AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI

PART 1 : CIVIL WORKS
POWERHOUSE
EXTERIOR LIGHTING AND LOAD SCHEDULE

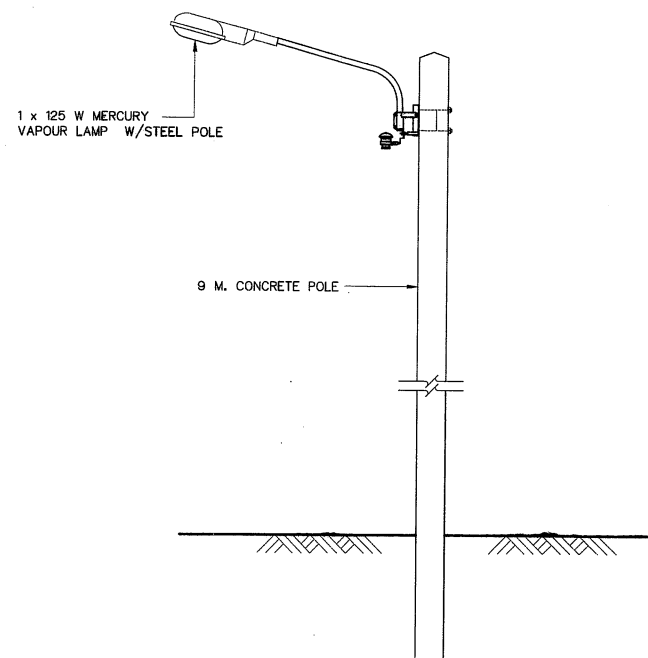
PCM P&C MANAGEMENT CO.,LTD.

DESIGNED 17/03/2020
DRAWN
CHECKED
PROJECT MANAGER

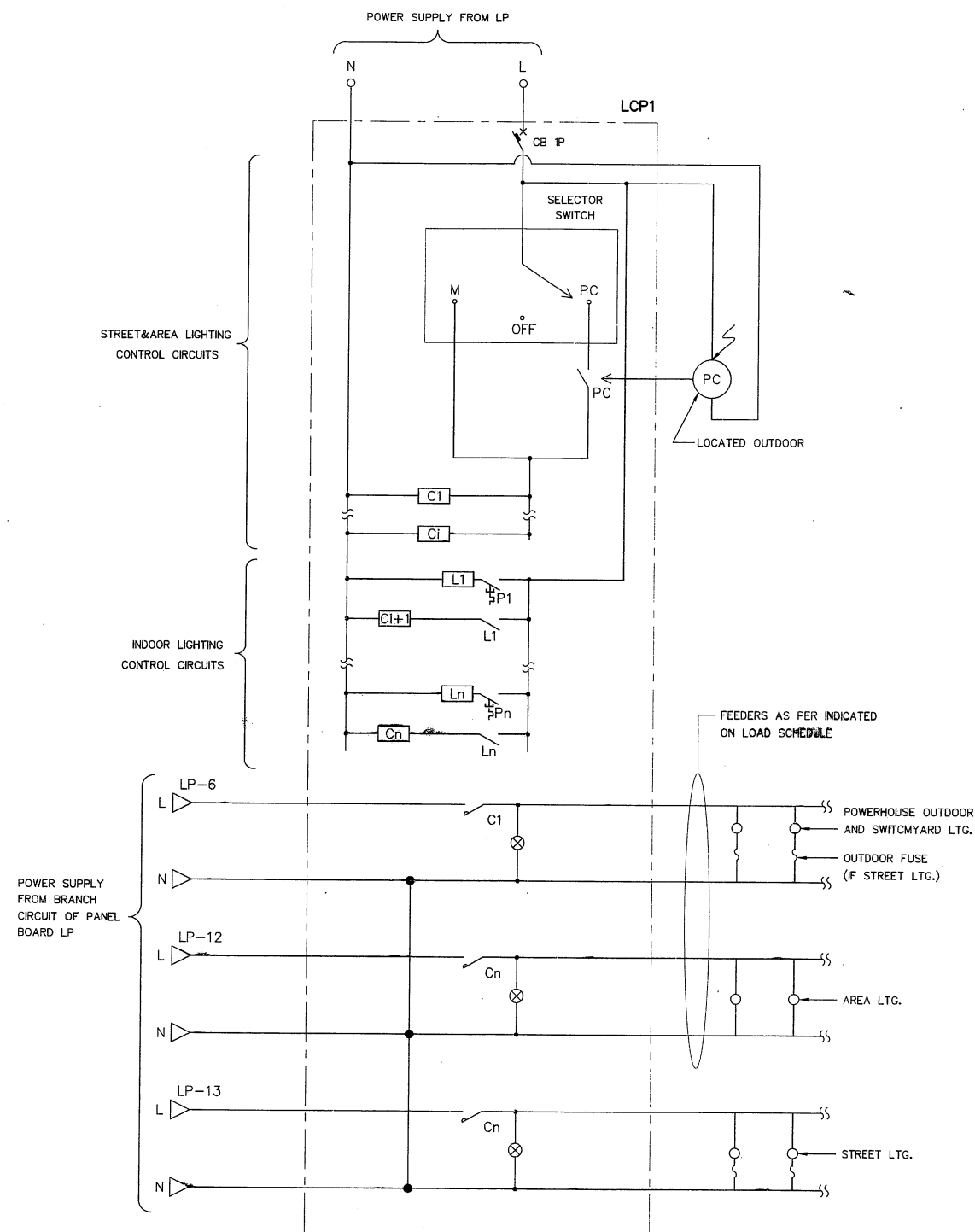
REVIEWED
SUBMITTED
RECOMMENDED
APPROVED 17/03/2020
DATE

DRAWING NO.
KTP2-PH-25

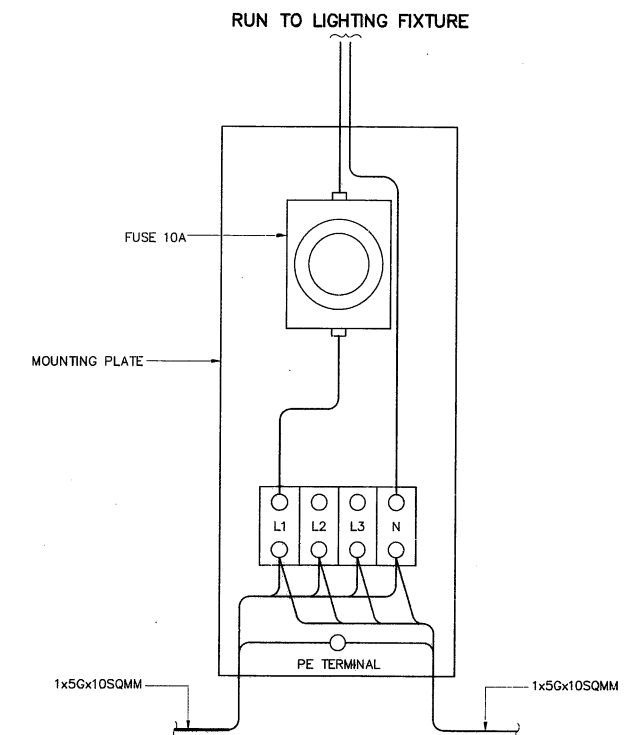
SHEET NO.
55 OF 97



STREET LIGHTING WITH CONCRETE POLE
INSTALLATION TYPICAL
NOT TO SCALE



LIGHTING CONTROL PANEL(LCP1) DIAGRAM



TYPICAL FOR FUSE PLATE
NOT TO SCALE

NOTE :

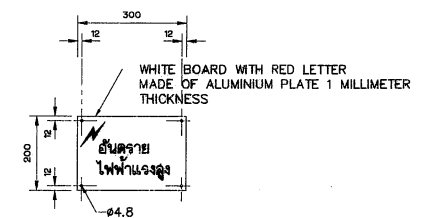
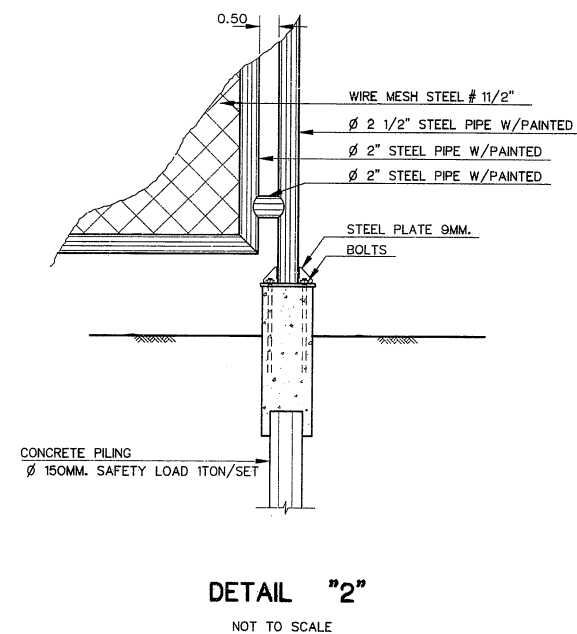
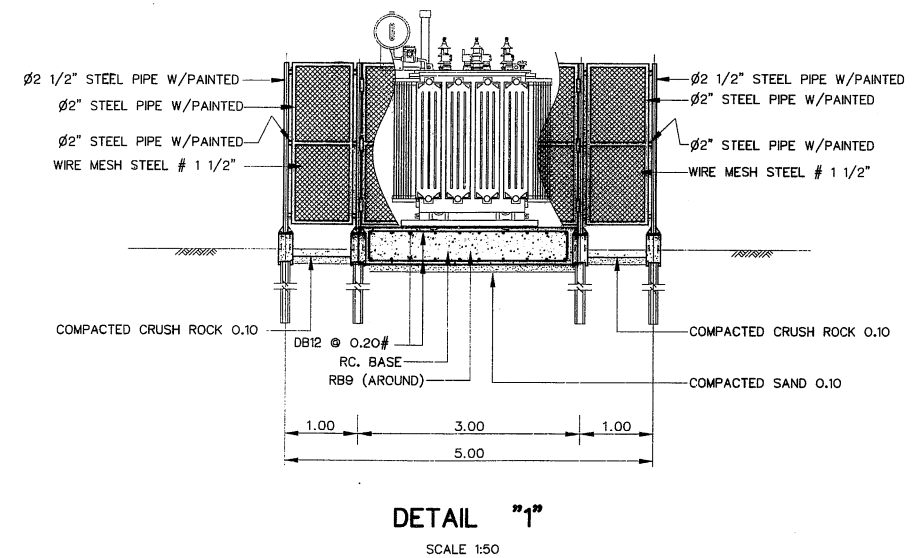
- ALL DIMENSIONS AND ELEVATIONS ARE IN METRES
UNLESS OTHERWISE SHOWN.
- ELEVATIONS ARE ASSUMED BY REFERRING THE DAM CREST LEVEL AS THE REFERENCE ELEVATION
- REINFORCEMENT BARS ARE IN MILLIMETRES.
- DISTANCES BETWEEN LAMP POST IS 40 METRES.
- ALL DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS OTHER WISE SHOWN.
- HANDHOLE MUST BE INSTALLED EVERY 20 METRES LENGTH FOR WIRING IN CONDUIT
UNDERGROUND, SIZE 0.3x0.3x0.3 METRES. W/COVER
- SIDE SLOPE SEE ACCESS ROAD DRAWING

LEGEND :

- PC = PHOTO CELL
- PC = PHOTO CELL SWITCH CONTACT
- Cn = MAGNETIC CONTACTOR n : 1, 2, 3...
- Ln = LATCHING CONTACTOR n : 1, 2, 3...
- Pn = PUSH BUTTON SWITCH, NON-LATCHED TYPE
- Cn = MAGNETIC RELAY n : 1, 2, 3...
- Ln = LATCHING RELAY n : 1, 2, 3...

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE DETAILS OF STREET LIGHTING AND LIGHTING CONTROL PANEL DIAGRAM	
PCM P&C MANAGEMENT CO.,LTD.	REVIEWED <i>[Signature]</i> SUBMITTED <i>[Signature]</i> RECOMMENDED <i>[Signature]</i> APPROVED <i>[Signature]</i>
DESIGNED <i>[Signature]</i> PH-804 DRAWN <i>[Signature]</i> PH-804 CHECKED <i>[Signature]</i> PH-804 PROJECT MANAGER	DATE 17/03/2020 SHEET NO. 56 OF 97

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1					
NO.	DATE	REVISIONS	CHECKED	APPROVED	

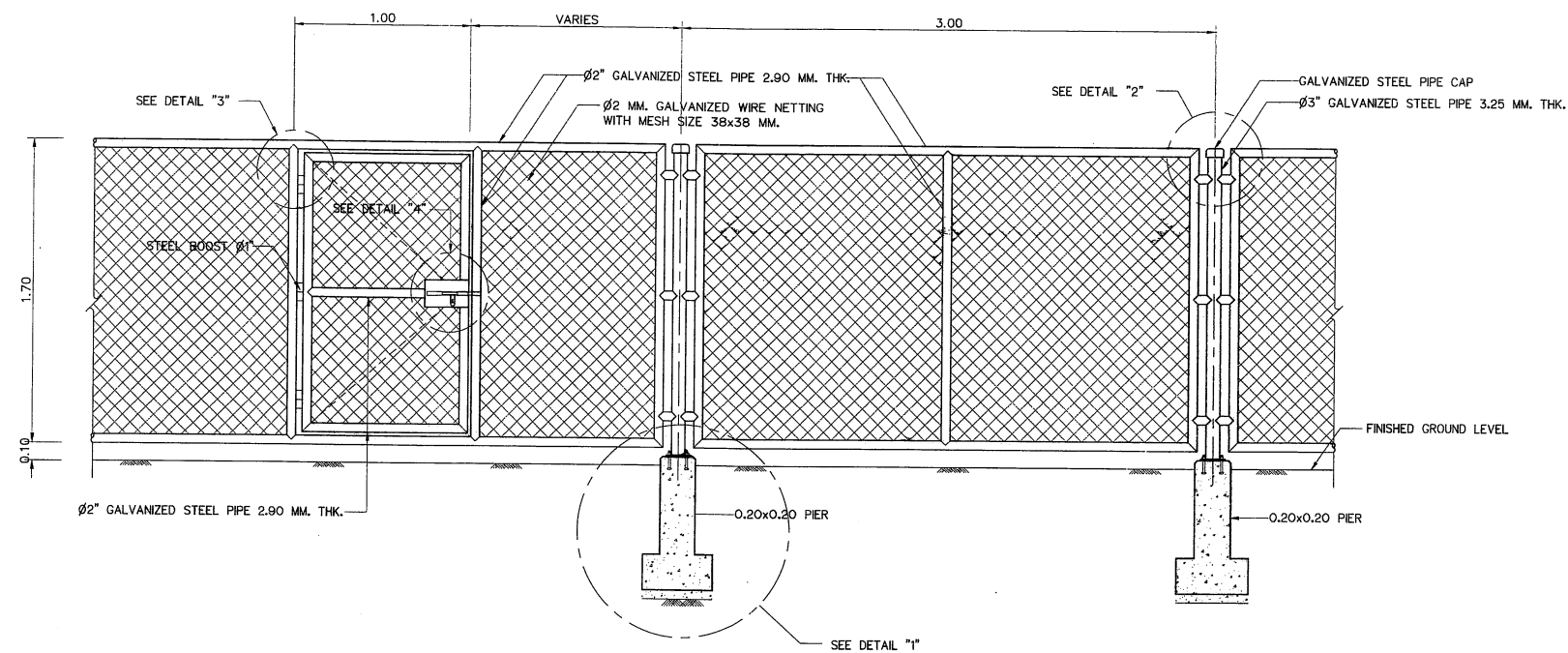


WARNING SIGN PLATE
NOT TO SCALE
(DIMENSIONS ARE IN MILLIMETER)

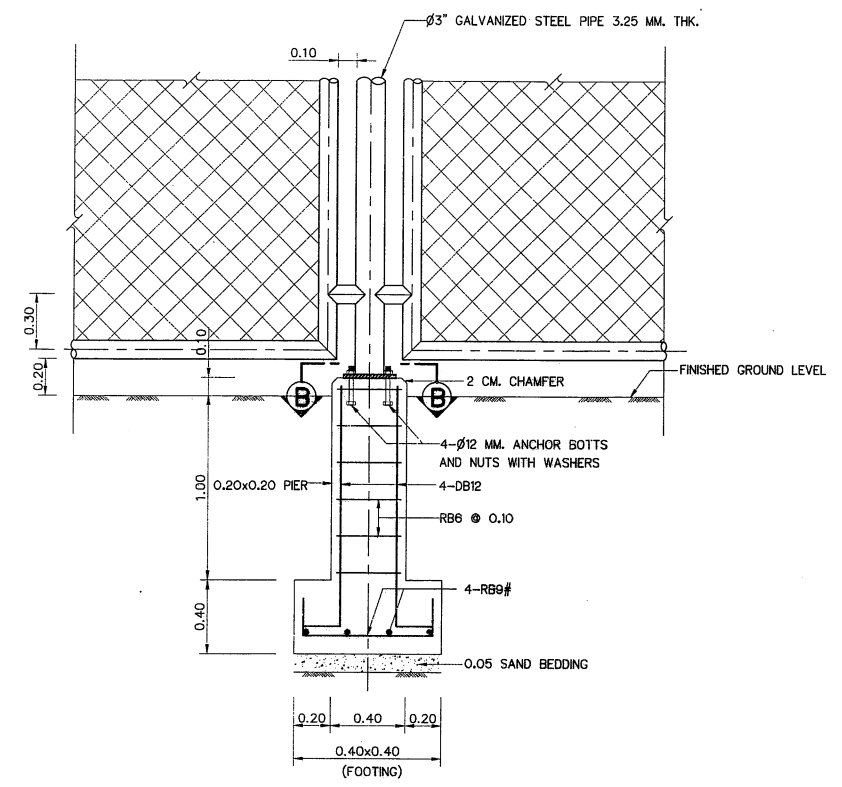
- NOTES :**
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 3. REINFORCEMENT BARS ARE IN MILLIMETRES, UNLESS OTHERWISE SHOWN.
 4. CONCRETE SHALL HAVE A MINIMUM ULTIMATE
COMPRESSIVE STRENGTH OF 175 ksc. FOR A STANDARD
CYLINDER AT 28 DAYS.
 5. THE TRANSFORMER AREA WILL BE ACCORDING TO PEA STANDARD.

0 0.5 1 2 3
SCALE 1:50 METERS

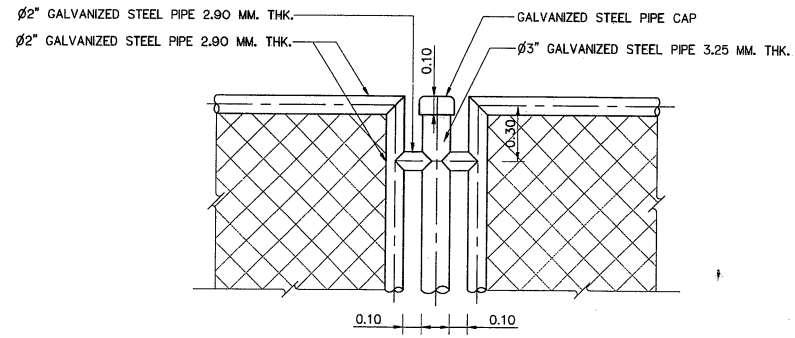
					 P&C MANAGEMENT CO.,LTD.		 MINISTRY OF ENERGY	
3							REVIEWED	<i>M. S. Kishor</i>
2					DESIGNED	<i>[Signature]</i> 28.10.97	SUBMITTED	
1					DRAWN	<i>[Signature]</i>	RECOMMENDED	<i>[Signature]</i>
NO.	DATE	REVISIONS	CHECKED	APPROVED	CHECKED	<i>[Signature]</i> 28.10.97	APPROVED	<i>P.V.</i>
CONSULTANTS					DEDE		DRAWING NO. 17/03/2020	
					PROJECT MANAGER		DATE	
							DRAWING NO. KTP2-PH-27	
							SHEET NO. 57 OF 97	



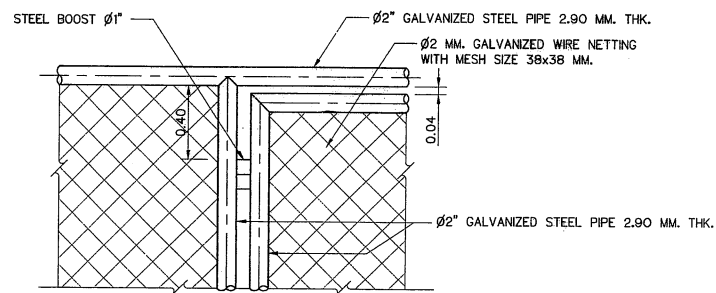
CHAIN LINK FENCE AND GATE WIDTH 1.00 M.
SCALE 1:20



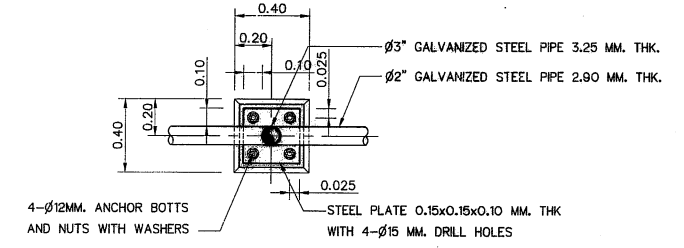
DETAIL "1"
SCALE 1:10



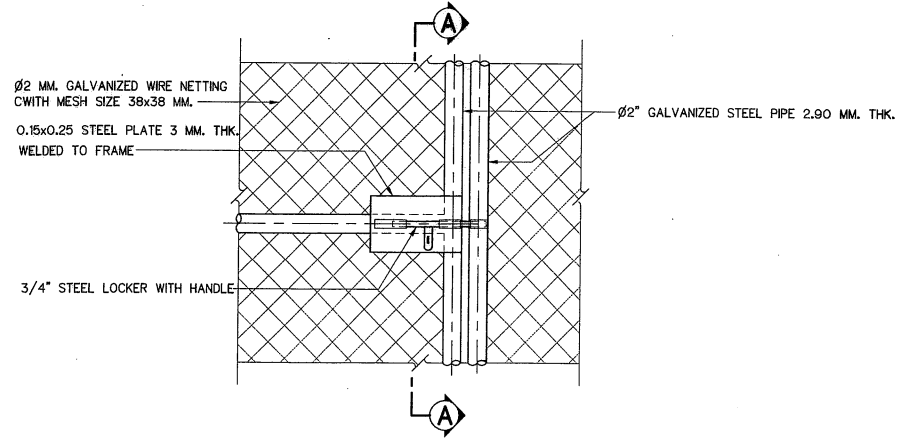
DETAIL "2"
SCALE 1:10



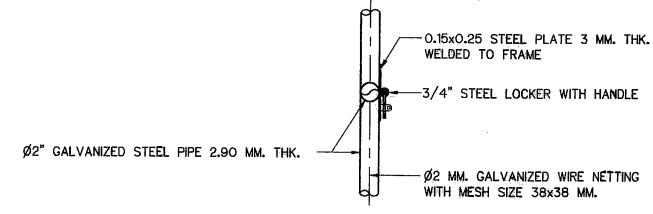
DETAIL "3"
SCALE 1:10



SECTION B-B
SCALE 1:10

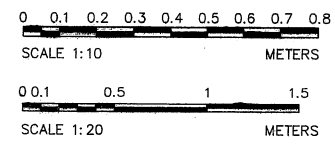


DETAIL "4"
SCALE 1:10



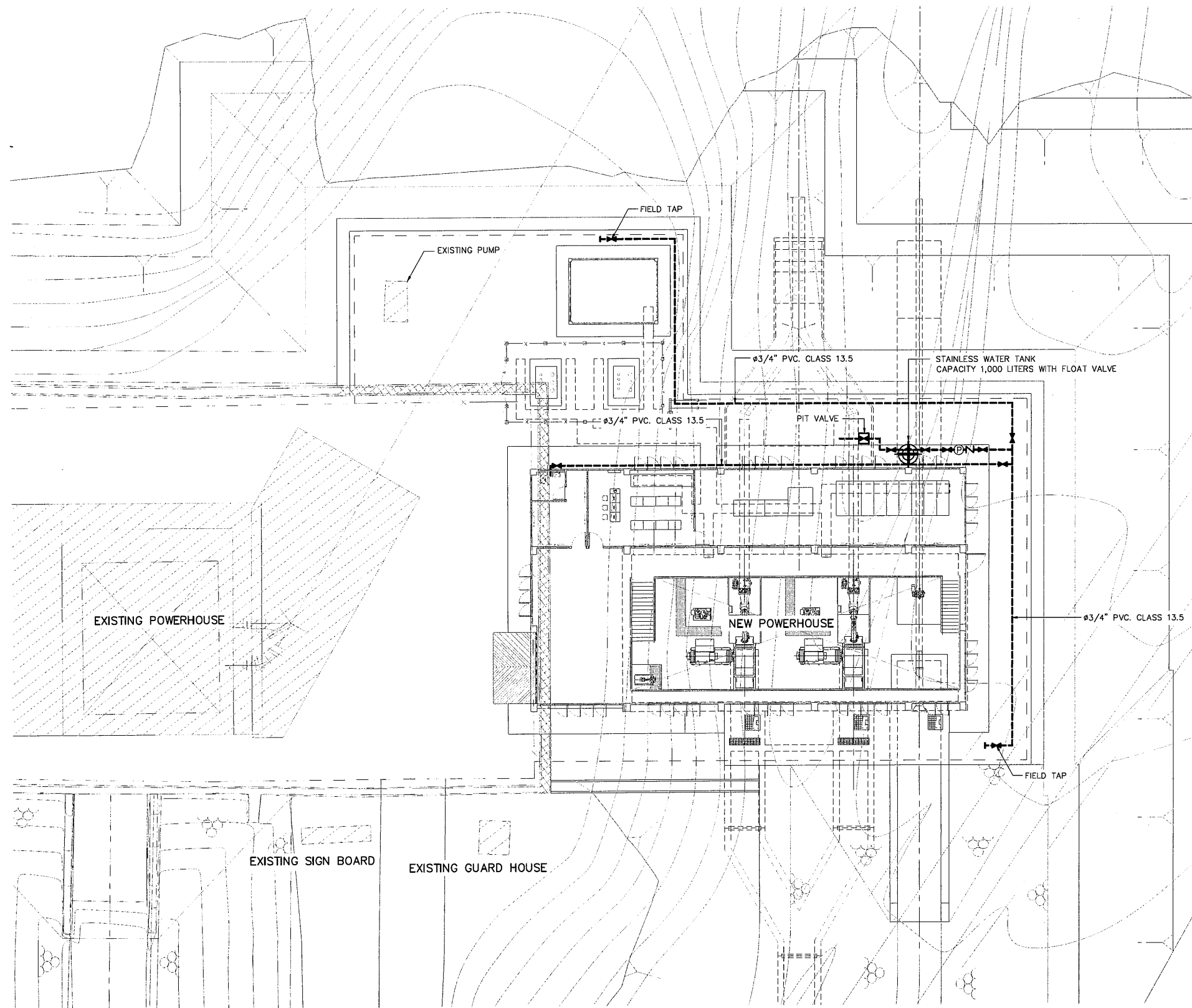
SECTION A-A
SCALE 1:10

- NOTES :
1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
 2. CHAIN LINK SHALL GALVANIZED AS SPECIFIED BY TIS 208



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NO.	DATE	REVISIONS	CHECKED	APPROVED

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE CHAIN LINK FENCE AND GATE WIDTH 1.00 M.			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	<i>[Signature]</i> 3/11/604	REVIEWED	<i>[Signature]</i>
DRAWN	<i>[Signature]</i>	SUBMITTED	<i>[Signature]</i>
CHECKED	<i>[Signature]</i> 3/11/604	APPROVED	<i>[Signature]</i>
PROJECT MANAGER		DATE	SHEET NO.
		17/03/2020	58 OF 97
CONSULTANTS		DEDE	
		KTP2-PH-28	



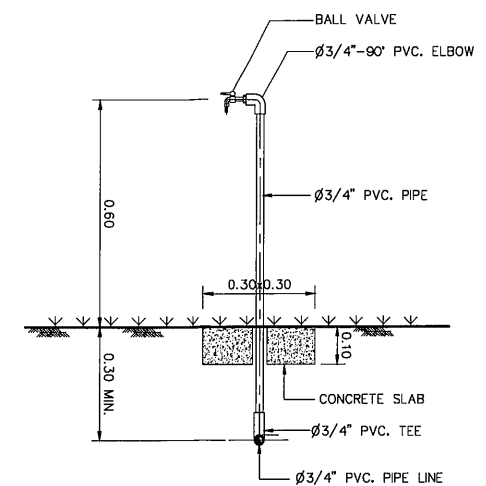
WATER SUPPLY SYSTEM LAY-OUT
SCALE 1:150

LEGENDS :

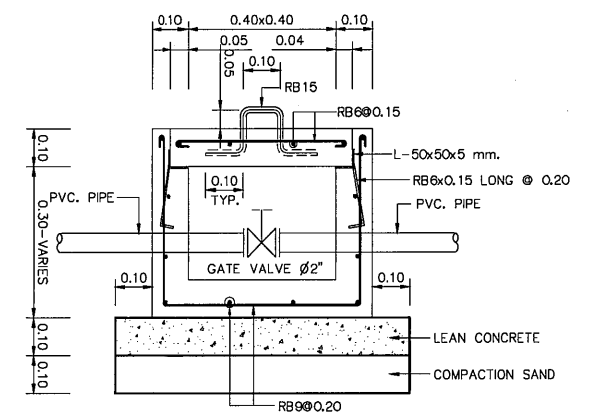
- PUMP
- GATE VALVE
- CHECK VALVE
- PVC. PIPE

NOTES :

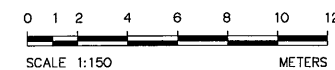
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03



FIELD TAP TYPICAL INSTALLATION
SCALE 1:10



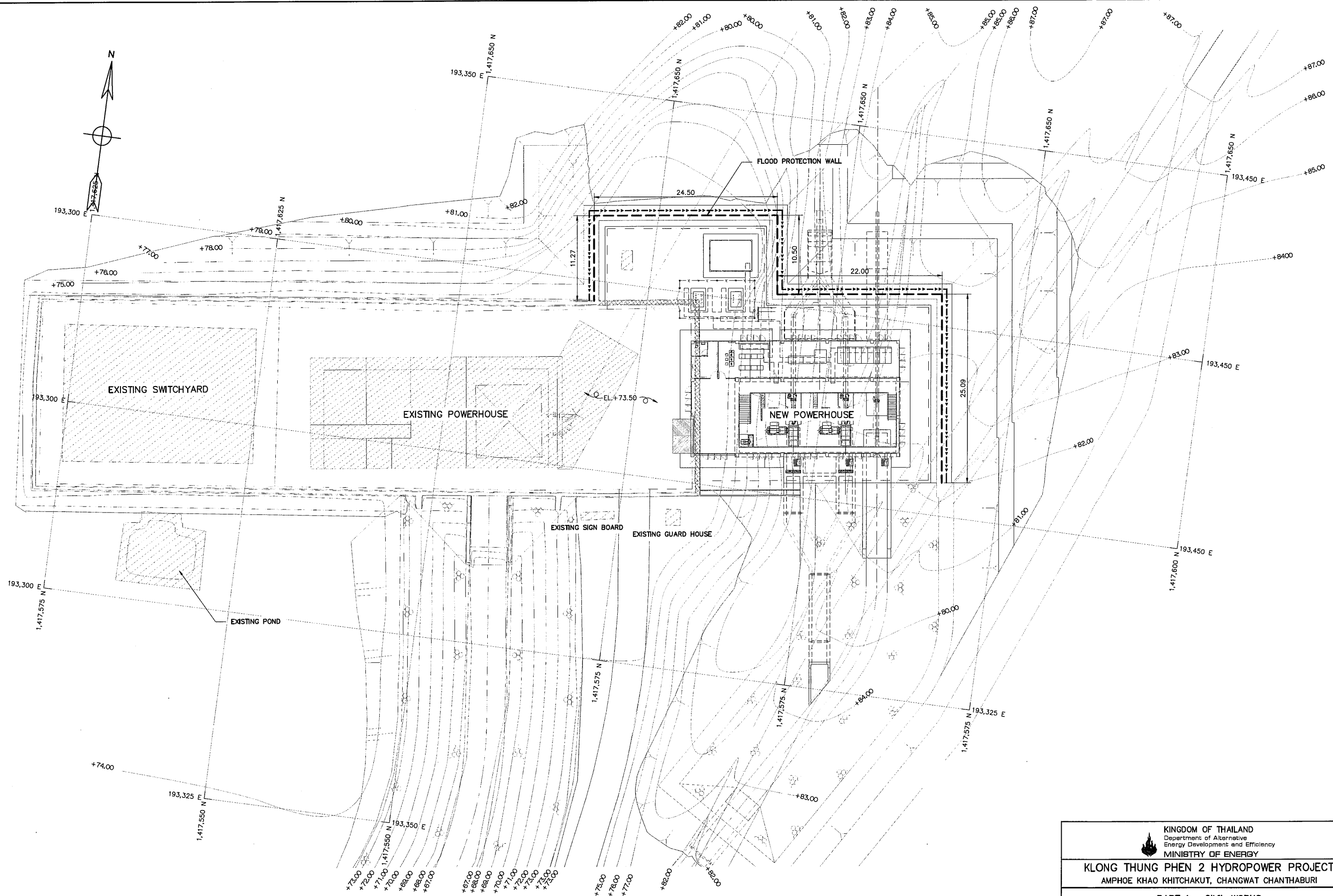
PIT VALVE DETAIL
SCALE 1:10



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NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS DEDE PROJECT MANAGER DATE

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE			
WATER SUPPLY SYSTEM LAY-OUT AND TYPICAL DETAILS			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	<i>[Signature]</i>
DRAWN		SUBMITTED	
CHECKED	28.1957	APPROVED	<i>[Signature]</i> 21/2/68
17/03/2020		DRAWING NO.	SHEET NO.
PROJECT MANAGER DATE		KTP2-PH-29	59 OF 97



LEGENDS :

- FLOOD PROTECTION WALL
- SIDE DRAINAGE

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. THE CONTRACTOR (C1) HAS TO SUBMIT THE SHOP DRAWINGS OF ALL HOUSING, GUARD HOUSE, ELEVATED TANK FLAG POLE, ENTRANCE GATE AND GATE WIDTH 6.00 M. TO FIELD ENGINEER FOR APPROVAL, BEFORE CONSTRUCTION.

FLOOD PROTECTION LAYOUT

SCALE 1:250

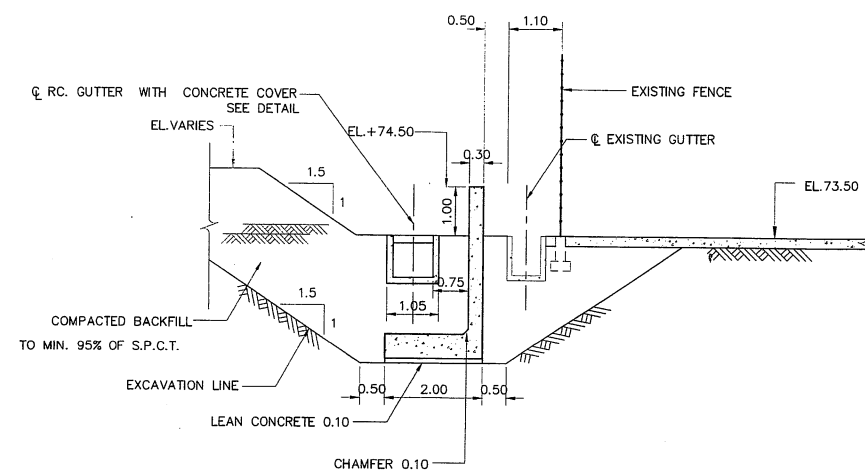
REFERENCE DRAWINGS :

1. POWERHOUSE, TYPICAL SECTION OF FLOOD PROTECTION WALL AND GENERAL DETAILS KTP2-PH-31

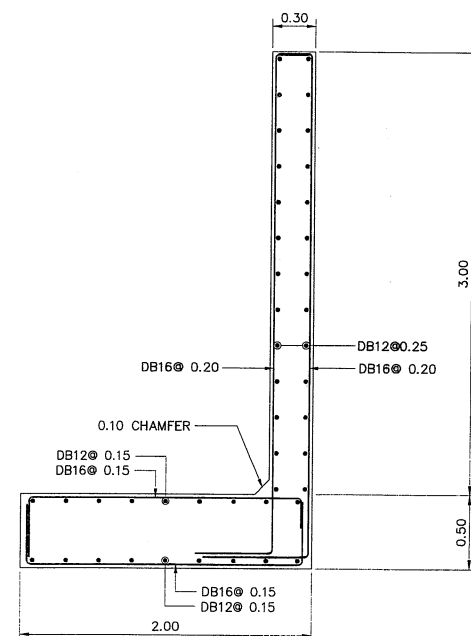
0 1 2 3 4 5 10 15 20
SCALE 1:250 METERS

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NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

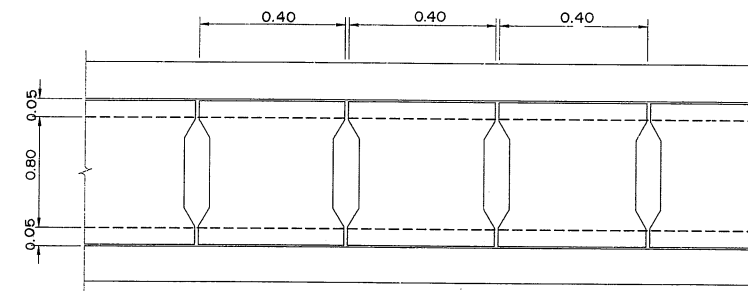
 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE FLOOD PROTECTION LAYOUT	
P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED	REVIEWED
DRAWN	SUBMITTED
CHECKED	RECOMMENDED
APPROVED	APPROVED
PROJECT MANAGER	DATE
17/03/2020	21/2/68
DRAWING NO.	SHEET NO.
KTP2-PH-30	60 OF 97



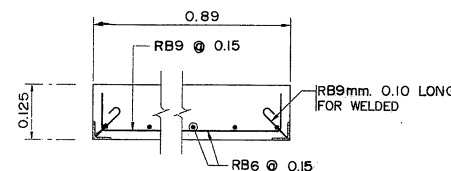
TYPICAL SECTION OF FLOOD PROTECTION WALL
SCALE 1:75



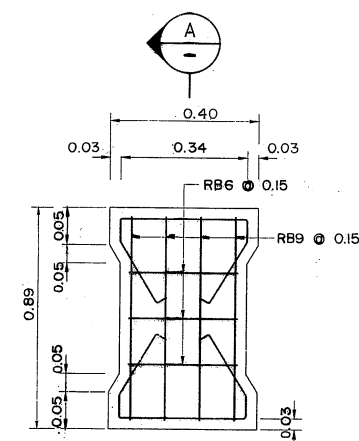
FLOOD PROTECTION WALL REINFORCEMENT DETAIL
SCALE 1:25



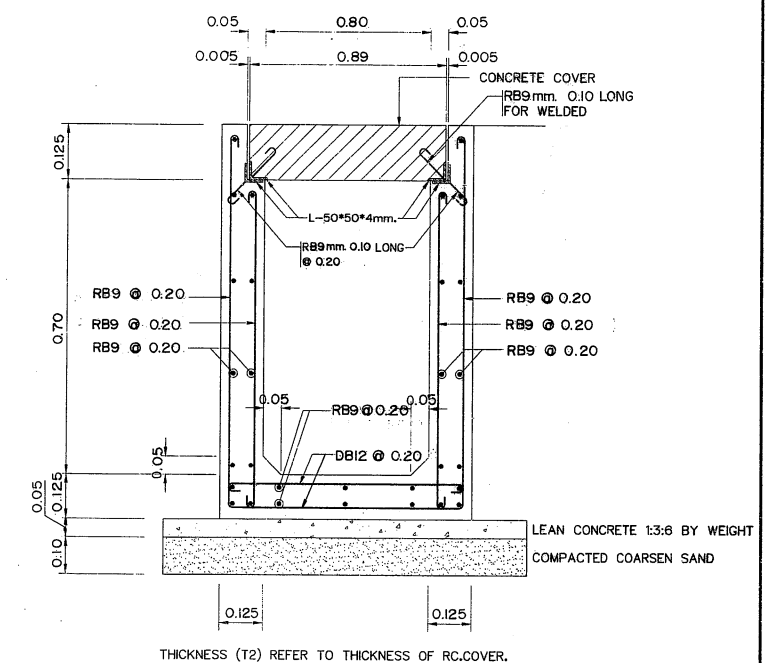
RC. COVER PLAN
SCALE 1:100



**SECTION A-A
RC. COVER LIGHT DUTY DETAIL**
SCALE 1:100



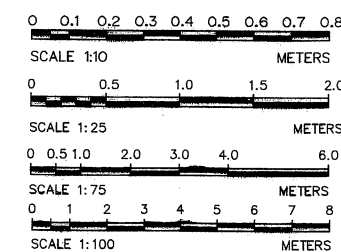
RC. COVER LIGHT DUTY DETAIL
SCALE 1:100



RC. GUTTER WITH CONCRETE COVER DETAIL
SCALE 1:100

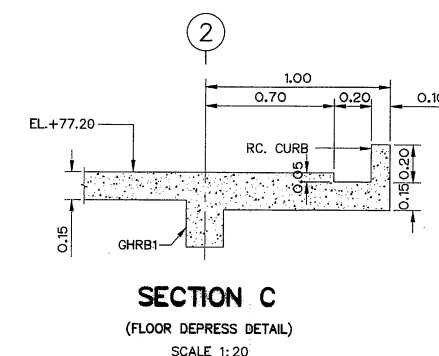
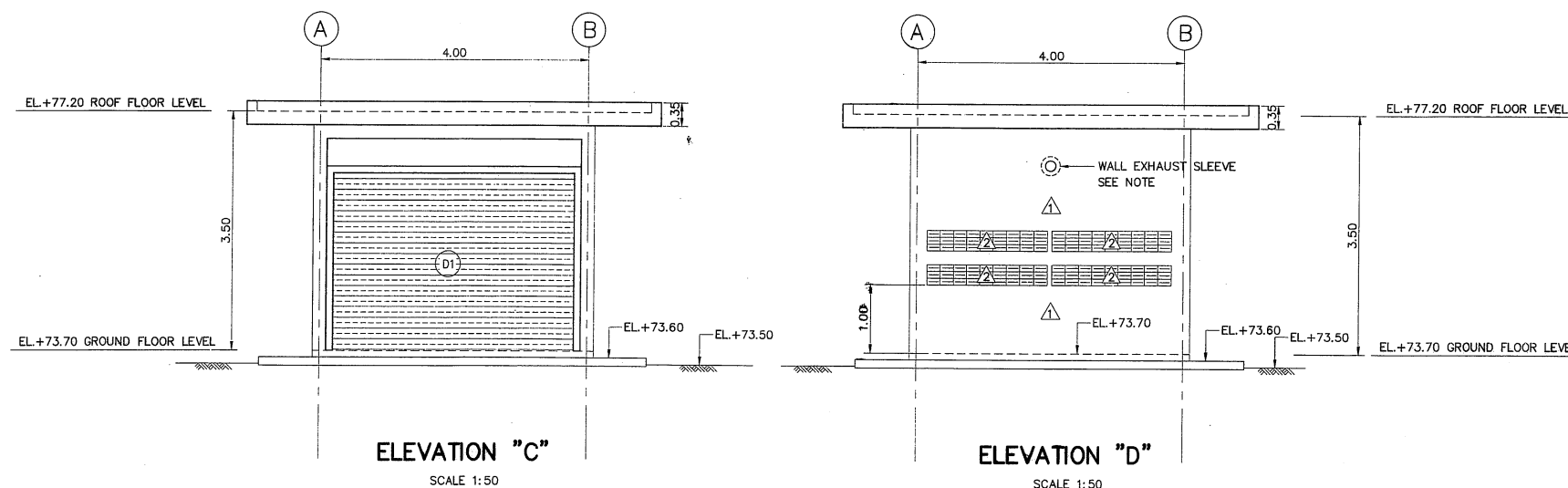
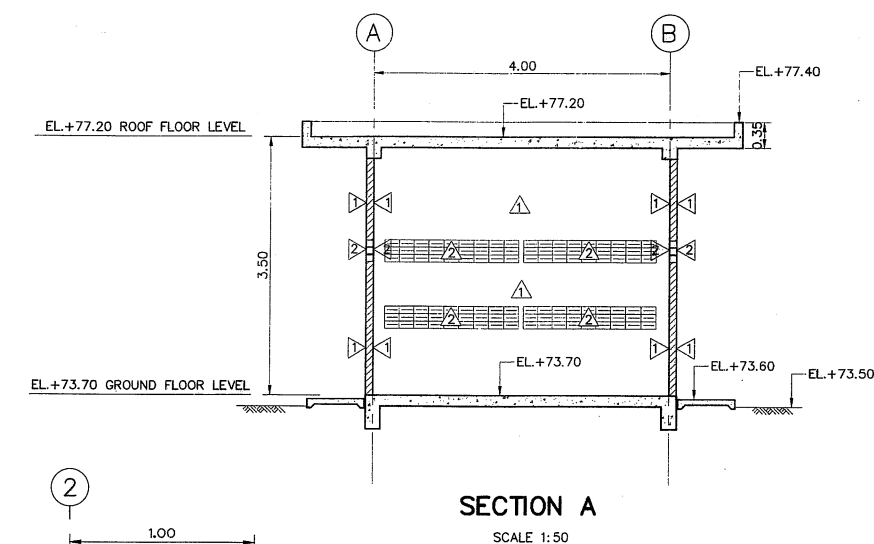
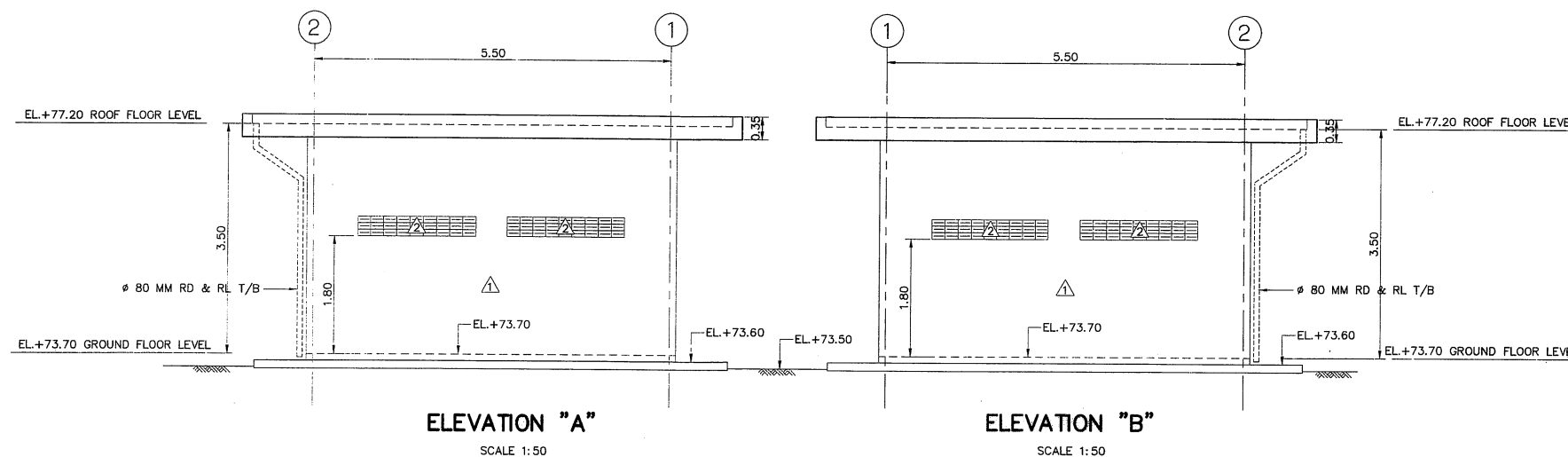
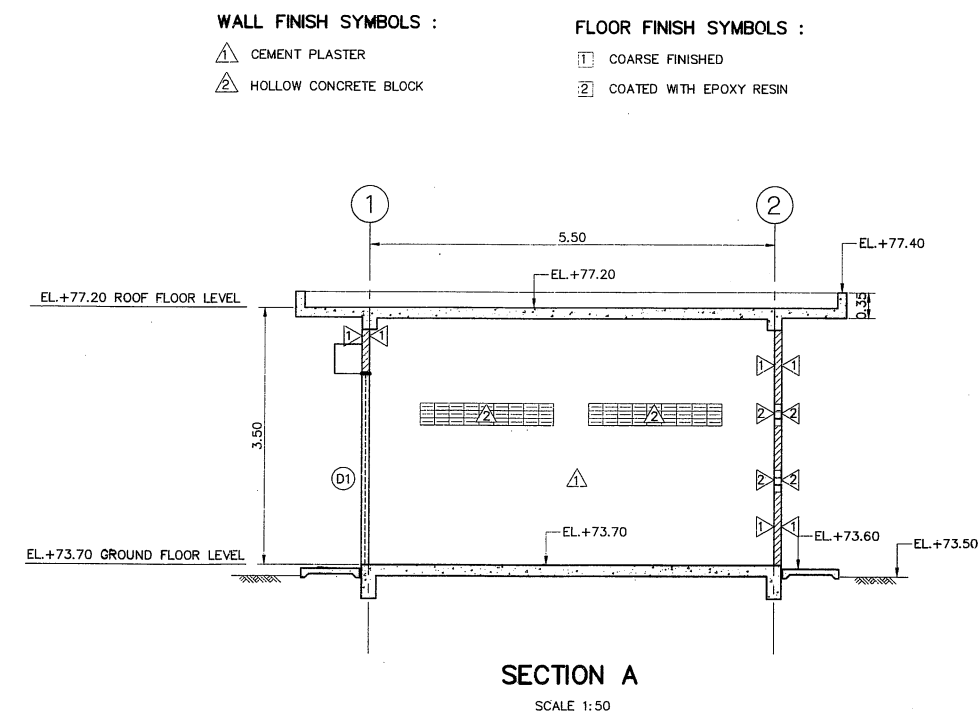
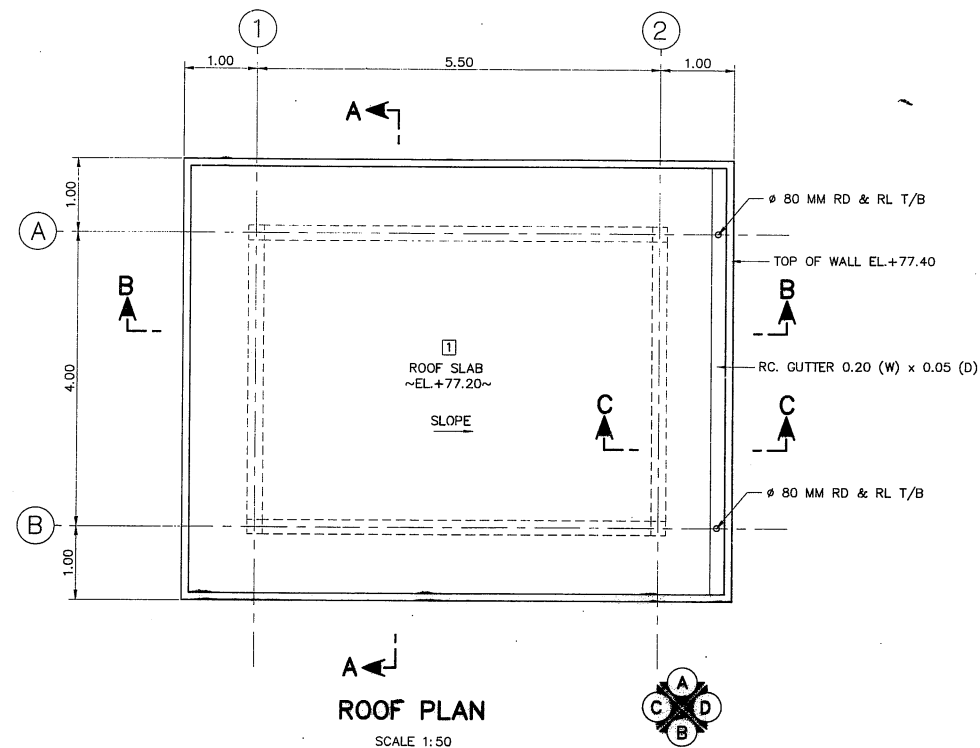
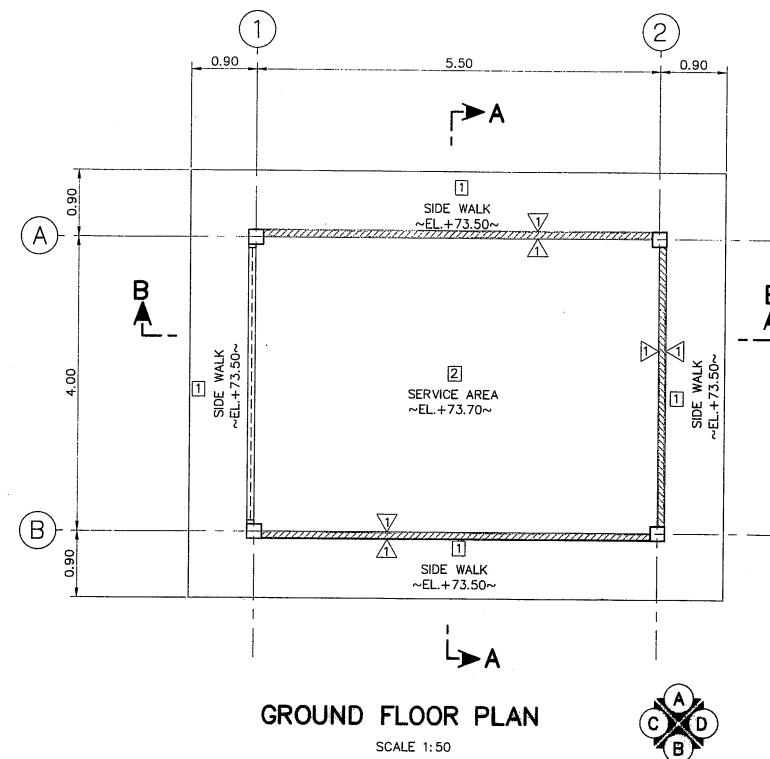
NOTES :

- 1.) ALL DIMENSIONS ARE IN METER UNLESS OTHERWISE INDICATED.
- 2.) WIDTH AND DEPTH OF RC GUTTER CAN BE VARIES BASED ON THE DRAINAGE PLAN
- 3.) CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 24 MPa.
- 4.) REINFORCING STEEL SHALL CONFORM TO TIS. 20 GRADE SR 24.
- 5.) FLAT PLATE STEEL SHALL CONFORM TO TIS. 55 GRADE SR 24.
- 6.) STRUCTURAL STEEL AND FLAT PLATE STEEL SHALL BE PAINTED WITH RUST-OLEUM PAINT OR EQUIVALENT TWICE AND WITH OIL PAINTED ONCE.
- 7.) ALL STEEL GRATING TO BE GALVANIZED AND FABRICATED IN SHOP FOLLOWING THE MANUFACTURER STANDARD (SIAM STEEL OR WEBFORGE BRAND). CONTRACTOR SHALL SUBMIT THE PROFILE OF GRATING TO CONSULTANT FOR APPROVAL PRIOR TO STARTING THE WORK.



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NO.	DATE	REVISIONS	CHECKED	APPROVED

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE			
TYPICAL SECTION OF FLOOD PROTECTION WALL AND GENERAL DETAILS			
DESIGNED 28.10.57		REVIEWED	
DRAWN		SUBMITTED	
CHECKED 28.10.57		RECOMMENDED	
17/03/2020		APPROVED	
PROJECT MANAGER		DRAWING NO. KTP2-PH-31	
DATE		SHEET NO. 61 OF 97	



NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. POSITION AND SIZE OF THE WALL EXHAUST SLEEVE IN THE WALL IS ASSIGN BY CONTRACTOR

REFERENCE DRAWINGS :

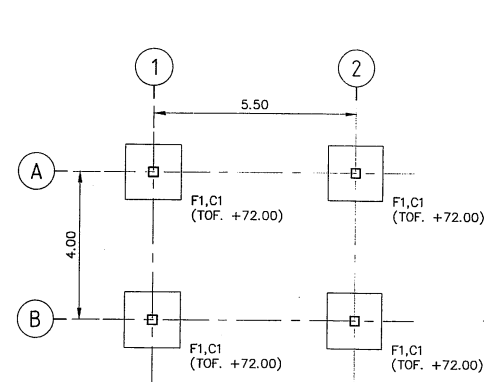
1. POWERHOUSE, GENERAL LAYOUT
2. POWERHOUSE, EDG. HOUSE DETAILS (SHEET 2/3)

KTP2-PH-01
KTP2-PH-33

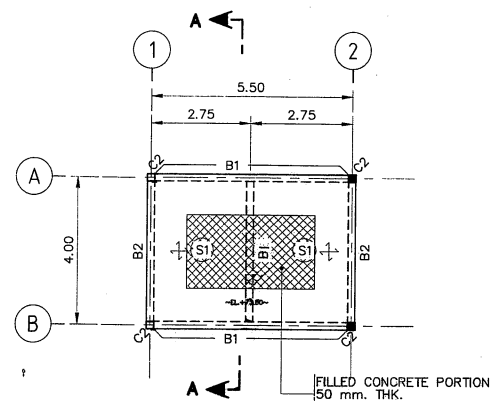
0 0.1 0.5 1 1.5
SCALE 1:20 METERS

0 1 2 3 4
SCALE 1:50 METERS

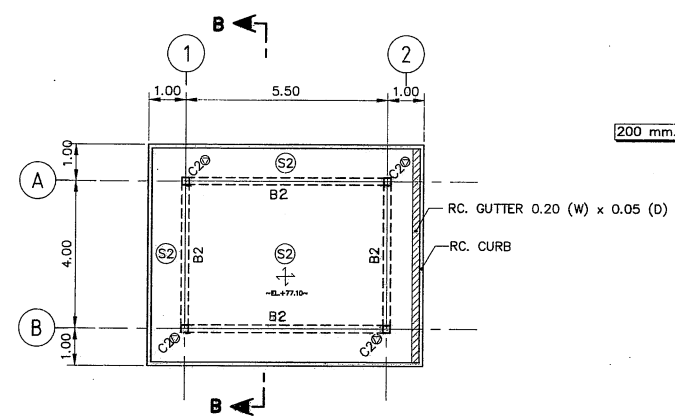
		KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
		KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS POWERHOUSE EDG. HOUSE DETAILS (SHEET 1/3)			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
		REVIEWED 	SUBMITTED 
DESIGNED 		28.1957	
DRAWN 			RECOMMENDED 
CHECKED 		28.1957	APPROVED 
PROJECT MANAGER 		17/03/2020 DATE	DRAWING NO. KTP2-PH-32
			SHEET NO. 62 OF 97



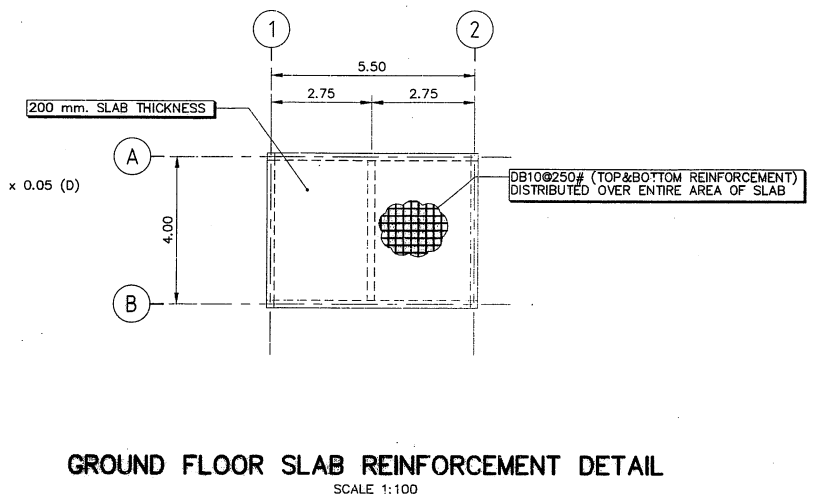
FOUNDATION LAYOUT PLAN
SCALE 1:100



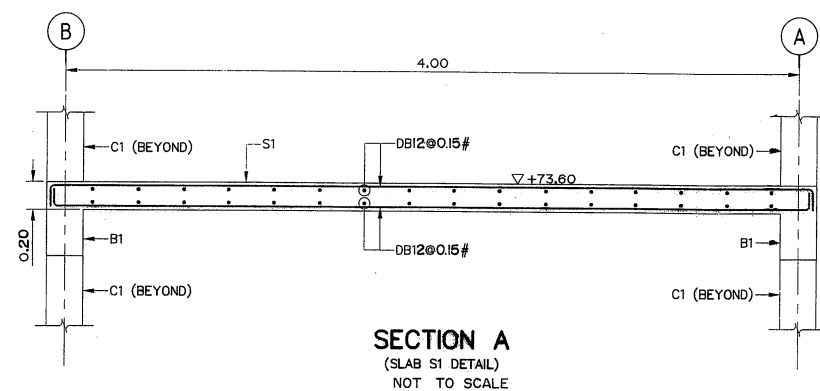
GROUND FLOOR FRAMING PLAN
SCALE 1:100



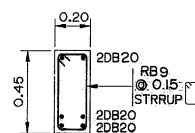
ROOF FLOOR FRAMING PLAN
SCALE 1:100



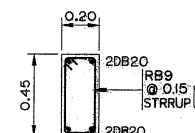
GROUND FLOOR SLAB REINFORCEMENT DETAIL
SCALE 1:100



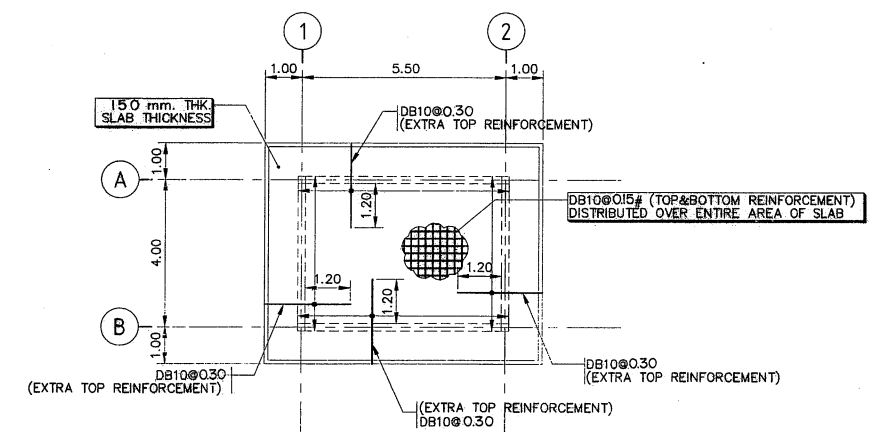
SECTION A
(SLAB S1 DETAIL)
NOT TO SCALE



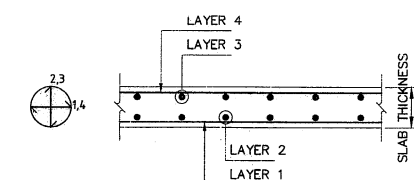
B1 DETAIL
SCALE 1:20



B2 DETAIL
SCALE 1:20

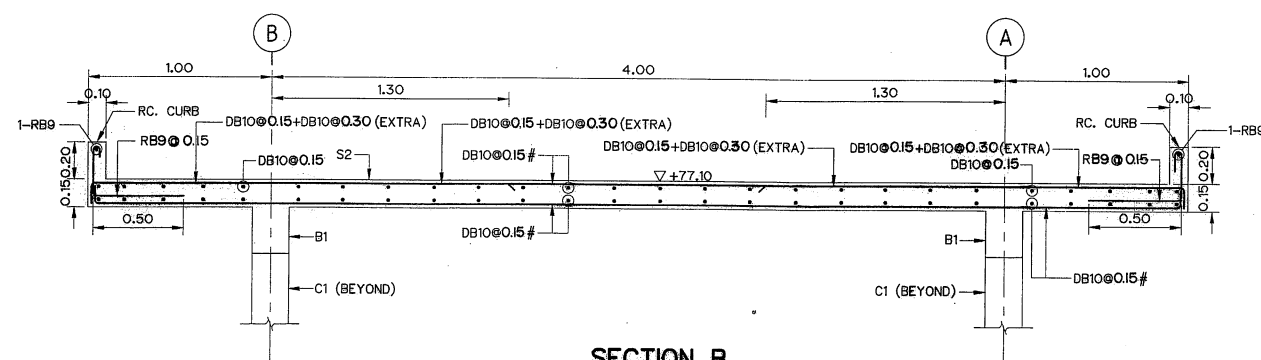


ROOF FLOOR SLAB REINFORCEMENT DETAIL
SCALE 1:100



SLAB BARS PLACING ORDER

- NOTES :
- # DENOTES EQUAL SPACING REINFORCEMENT IN BOTH DIRECTIONS, I.E., AT LAYER 1 AND LAYER 2 FOR BOTTOM REINFORCEMENT AND AT LAYER 3 AND LAYER 4 FOR TOP REINFORCEMENT.



SECTION B
(SLAB S2 DETAIL)
SCALE 1:20

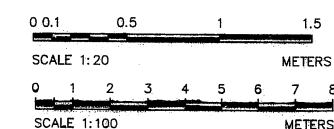
COLUMN SCHEDULE

COLUMNS	C1	C2
LEVEL		
ROOF FLOOR		
GROUND FLOOR		0.25x0.25 6DB12 MAIN RB9@0.15 TIES
GROUND FLOOR	0.25x0.25 6DB12 MAIN RB9@0.15 TIES	
FOOTING		

- NOTES :
- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 - SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 - THE MAIN CONTRACTOR SHALL BE CALCULATED EXACT TOP OF FOOTING BEFORE START CONSTRUCTION.
 - ALL SYMBOLS AND ABBREVIATIONS REPRESENT :
 - ⊕ DENOTES TWO-WAY SLAB SYSTEM.
 - ⊙ DENOTES COLUMN BELOW ONLY.
 - DENOTES COLUMN ABOVE ONLY.

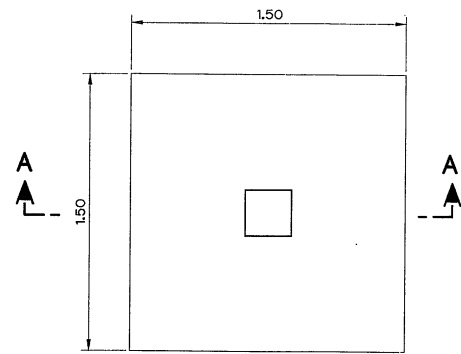
REFERENCE DRAWINGS :

- POWERHOUSE, EDG. HOUSE DETAILS (SHEET 1/3) KTP2-PH-32
- POWERHOUSE, EDG. HOUSE DETAILS (SHEET 3/3) KTP2-PH-34

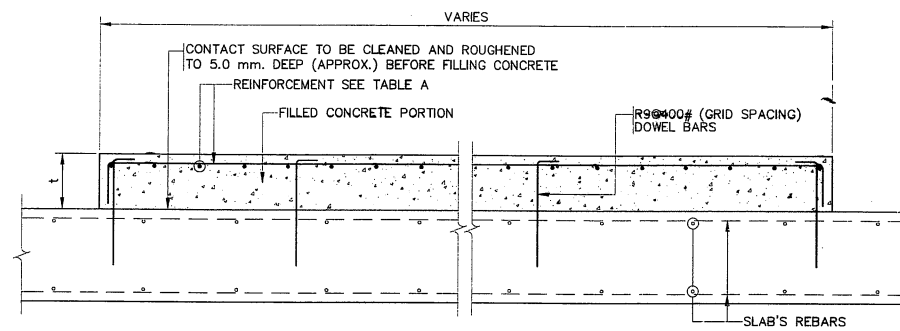


NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE EDG. HOUSE DETAILS (SHEET 2/3)			
P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	28.1957	RECOMMENDED	
APPROVED		APPROVED	
PROJECT MANAGER		DATE	17/03/2020
CONSULTANTS		DEDE	
DRAWING NO.		KTP2-PH-33	
SHEET NO.		63 OF 97	



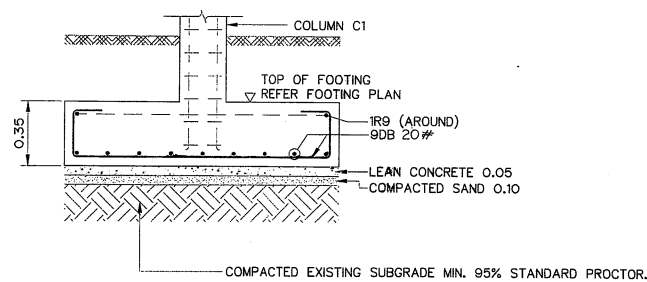
F1 DETAIL
SCALE 1:20



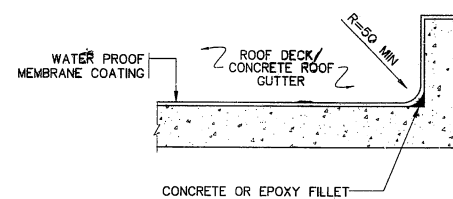
TYPICAL FILLED CONCRETE PORTION DETAILS
NOT TO SCALE

TABLE A

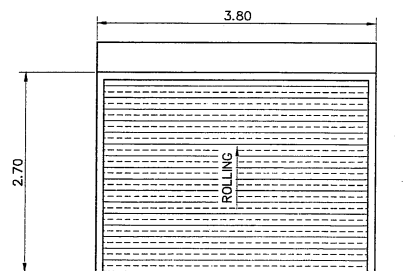
THICKNESS, t (mm.)	REINFORCEMENT	
	DEFORMED BAR	WIREMESH (Fy > 3,000 KSC)
50-200	DB12@300#	Ø9@200#
201-400	DB12@175#	-
401-600	2 LAYER-DB16@400#	-
601-900	2 LAYER-DB16@250#	-



SECTION A
SCALE 1:20



TYPICAL DETAILS FOR WATERPROOF MEMBRANE COATING AT CURB
NOT TO SCALE



(D1)
ROLLING DOOR
SCALE 1:50

SYMBOL	DESCRIPTIONS	SIZE		FRAME	RAIL & STILE	PANEL	HINGE	LOCKSET	HANDLE	REMARKS
		WIDTH	HEIGHT							
(D1)	ROLLING DOOR (STEEL NO.18,1.2 mm. Thk.)	3.80	2.70	GALVANIZED STEEL	—	—	—	NORMAL KEY	—	MOTOR OPERATING

NOTES :

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- THE MAIN CONTRACTOR SHALL BE CALCULATED EXACT TOP OF FOOTING BEFORE START CONSTRUCTION.

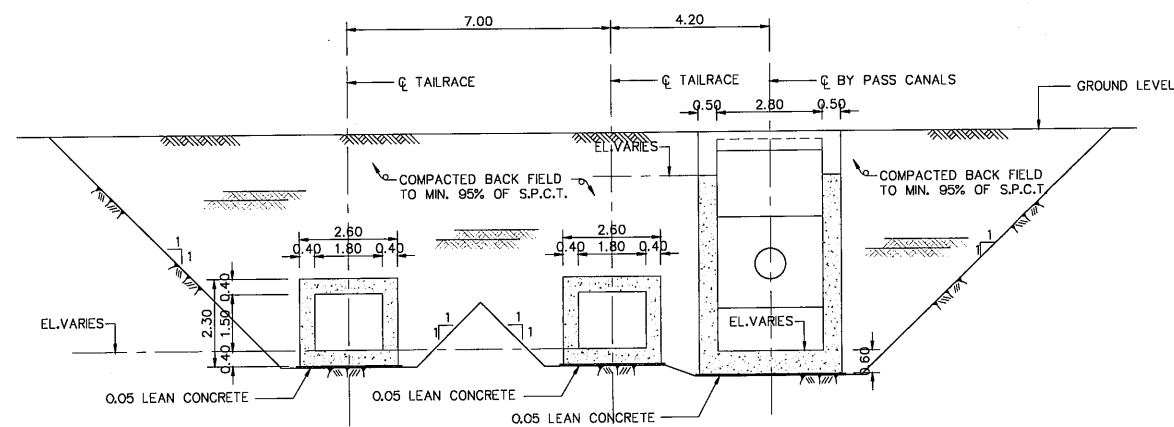
REFERENCE DRAWINGS :

- POWERHOUSE, EDG. HOUSE DETAILS (SHEET 1/3) KTP2-PH-32
- POWERHOUSE, EDG. HOUSE DETAILS (SHEET 2/3) KTP2-PH-33

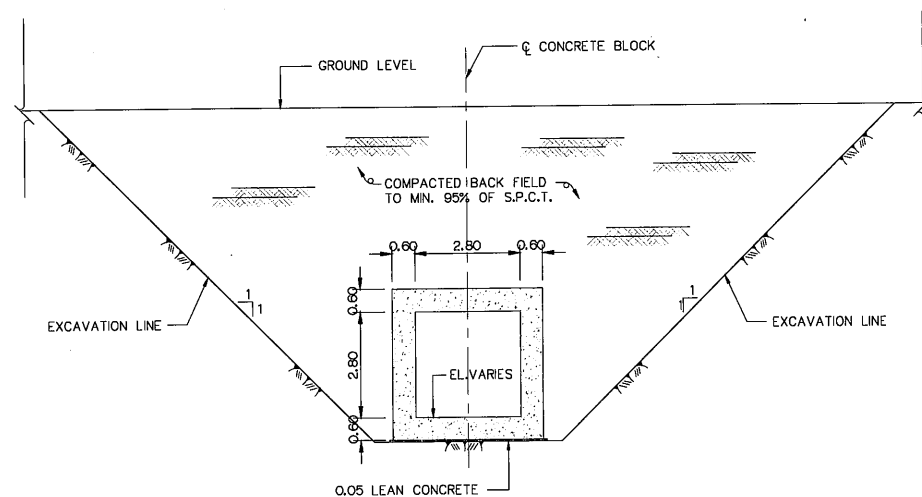
0 0.1 0.5 1 1.5
SCALE 1:20 METERS

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS		DEDE		

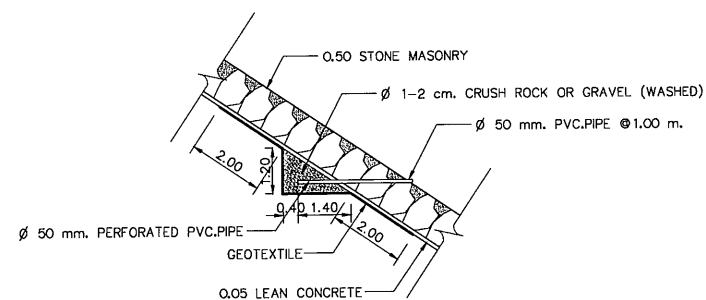
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS POWERHOUSE EDG. HOUSE DETAILS (SHEET 3/3)			
PCM P&C MANAGEMENT CO.,LTD. DESIGNED DRAWN CHECKED PROJECT MANAGER	28/1957 28/1957 17/03/2020	REVIEWED SUBMITTED RECOMMENDED APPROVED	DRAWING NO. KTP2-PH-34 SHEET NO. 64 OF 97



SECTION A-A
SCALE 1:100



SECTION C-C
SCALE 1:100



DETAIL "1" (PVC.DRAIN PIPE)
SCALE 1:50

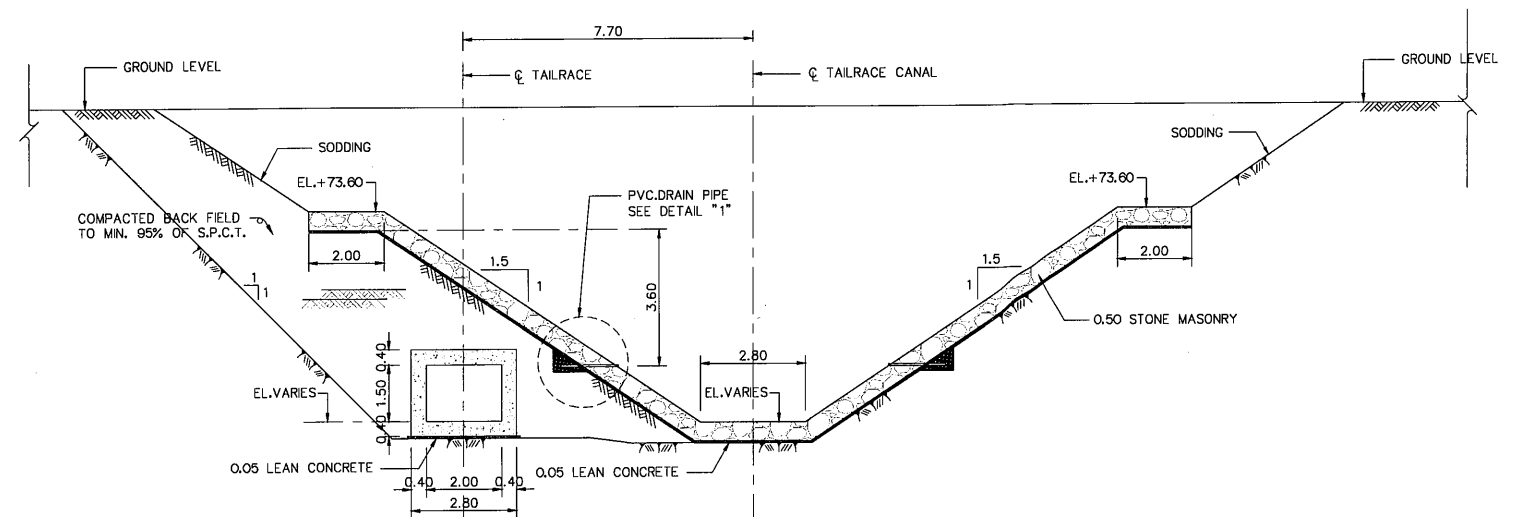
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN 30 TON/M²

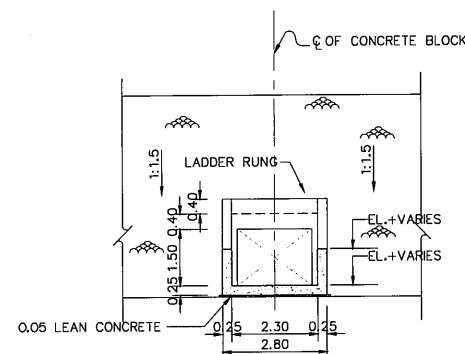
REFERENCE DRAWINGS :

1. TAILRACE, LAYOUT PLAN
2. TAILRACE, REINFORCEMENT DETAILS (SHEET 1/2)
3. TAILRACE, REINFORCEMENT DETAILS (SHEET 2/2)

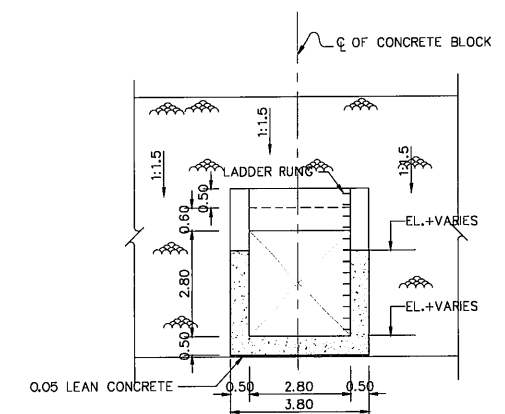
KTP2-TR-01
KTP2-TR-04
KTP2-TR-05



SECTION B-B
SCALE 1:100



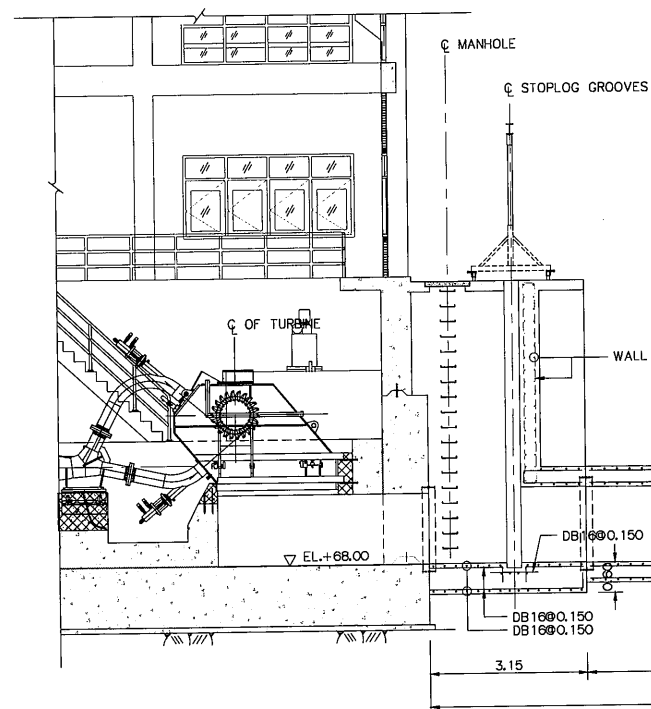
SECTION D-D
SCALE 1:100



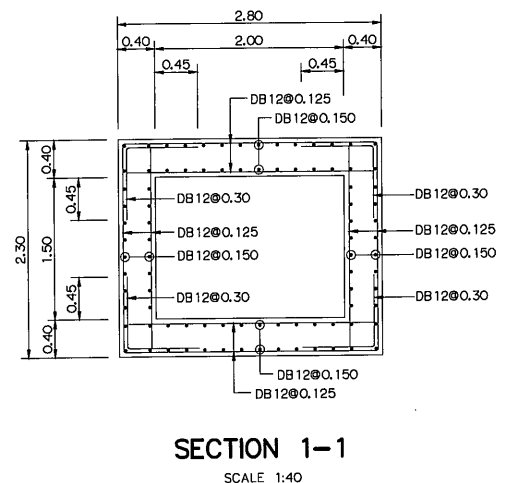
SECTION E-E
SCALE 1:100



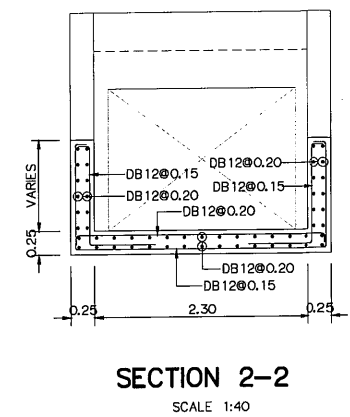
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS TAILRACE SECTION AND DETAILS (SHEET 1/2)			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
3		DESIGNED	28.1957
2		DRAWN	28.1957
1		CHECKED	28.1957
NO.	DATE	REVISIONS	CHECKED
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
DRAWING NO.		SHEET NO.	
KTP2-TR-02		66 OF 97	



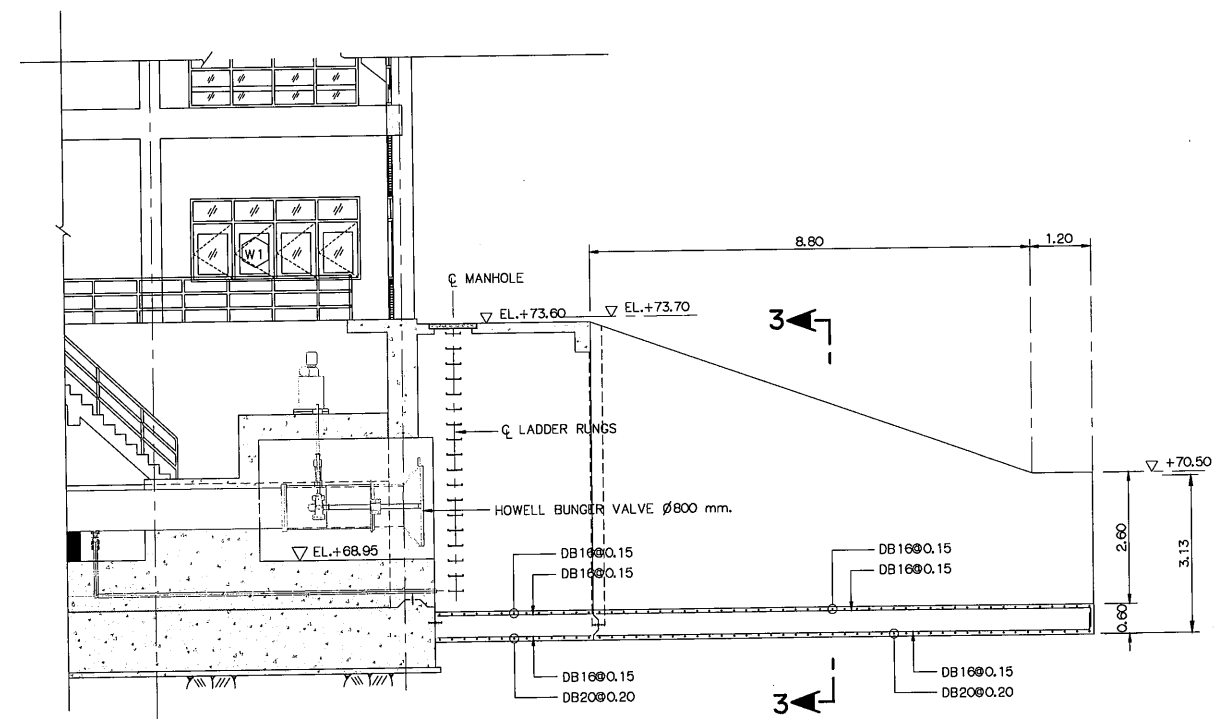
SECTION F-F
SCALE 1:75
(KTP2-TR-01)



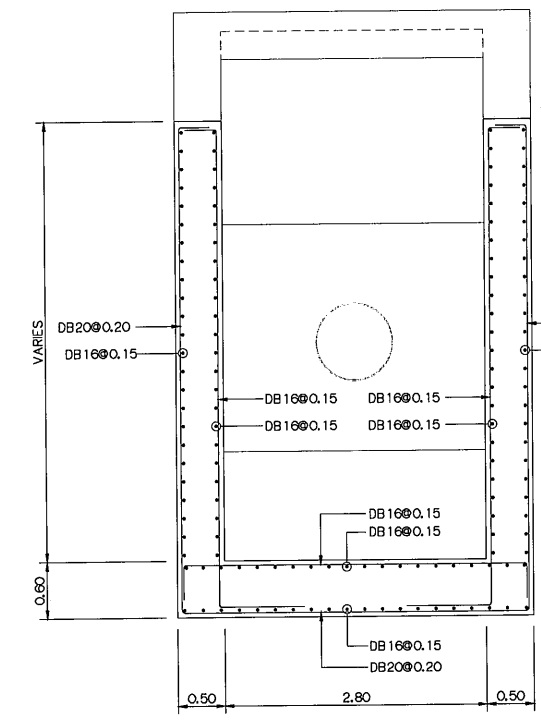
SECTION 1-1
SCALE 1:40



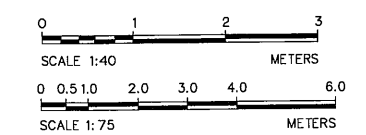
SECTION 2-2
SCALE 1:40



SECTION G-G
SCALE 1:75
(KTP2-TR-01)



SECTION 3-3
SCALE 1:40



NOTES:

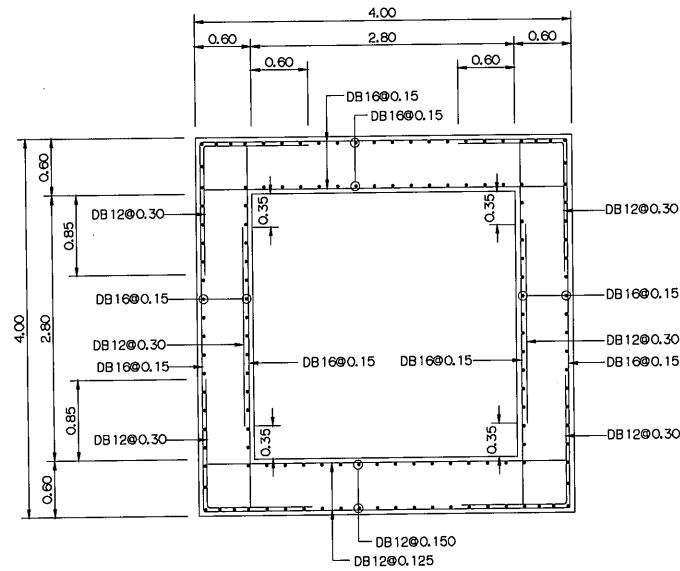
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

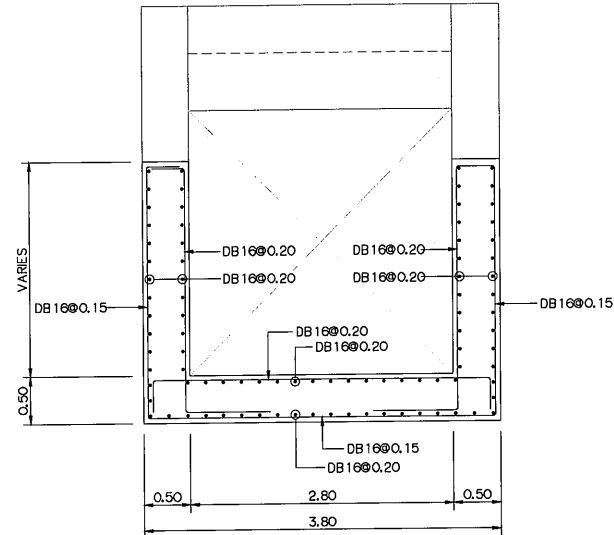
1. TAILRACE, LAYOUT PLAN KTP2-TR-01
2. TAILRACE, SECTION AND DETAILS (SHEET 2/2) KTP2-TR-03

3					
2					
1					
NO.	DATE	REVISIONS	CHECKED	APPROVED	
					CONSULTANTS
					DEDE

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 1 : CIVIL WORKS TAILRACE REINFORCEMENT DETAILS (SHEET 1/2)	
DESIGNED 28.1957 DRAWN 28.1957 CHECKED 17/03/2020 PROJECT MANAGER	REVIEWED SUBMITTED RECOMMENDED APPROVED DRAWING NO. KTP2-TR-04 SHEET NO. 68 OF 97



SECTION C-C
SCALE 1:40
(KTP2-TR-01)



SECTION E-E
SCALE 1:40
(KTP2-TR-01)

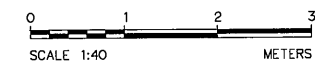
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS
REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

REFERENCE DRAWINGS :

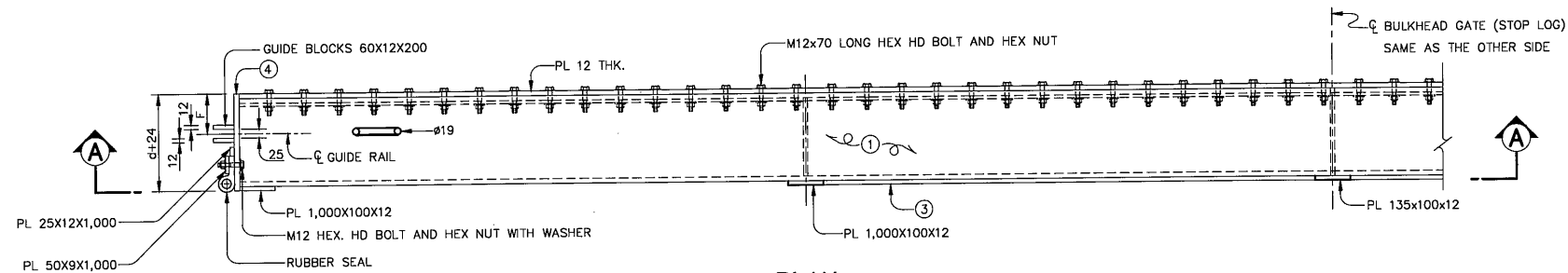
1. TAILRACE, LAYOUT PLAN

KTP2-TR-01

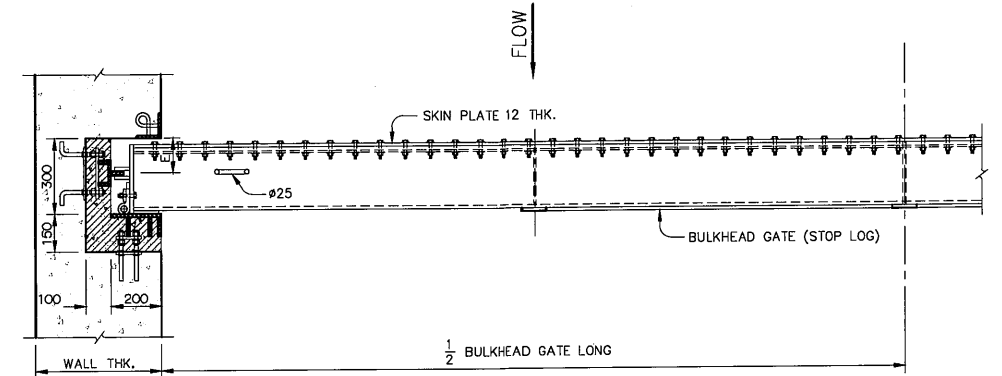


NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
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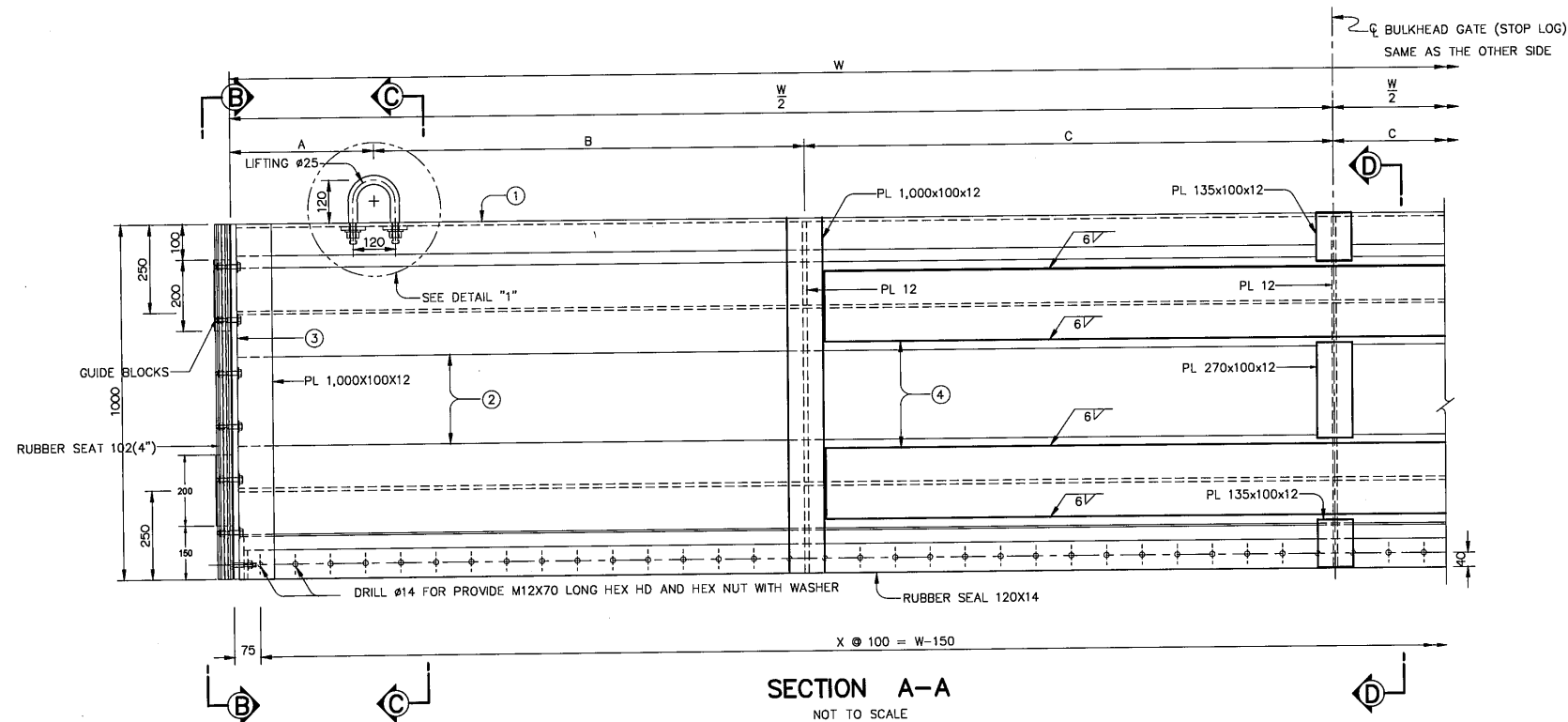
KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS TAILRACE REINFORCEMENT DETAILS (SHEET 2/2)			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		REVIEWED	
DRAWN		SUBMITTED	
CHECKED		RECOMMENDED	
DATE		DATE	
17/03/2020		28.1.1957	
PROJECT MANAGER		DRAWING NO.	
		KTP2-TR-05	
		SHEET NO.	
		69 OF 97	



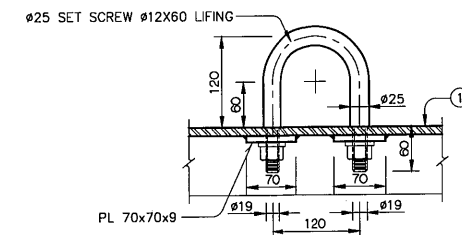
PLAN
BULKHEAD GATE
NOT TO SCALE



INSTALLATION
NOT TO SCALE



SECTION A-A
NOT TO SCALE



DETAIL "1"
NOT TO SCALE

BULKHEAD GATE PROPERTIES

BULKHEAD GATE (WIDTH, m.)	W	A	B	C	D	E	F	G	①	②	③	④
1.85	2000	250	500	750	200	138	62	89	[200x90x8	W' 200x200x8x12	PL 1000x224x15	PL 1380x160x12

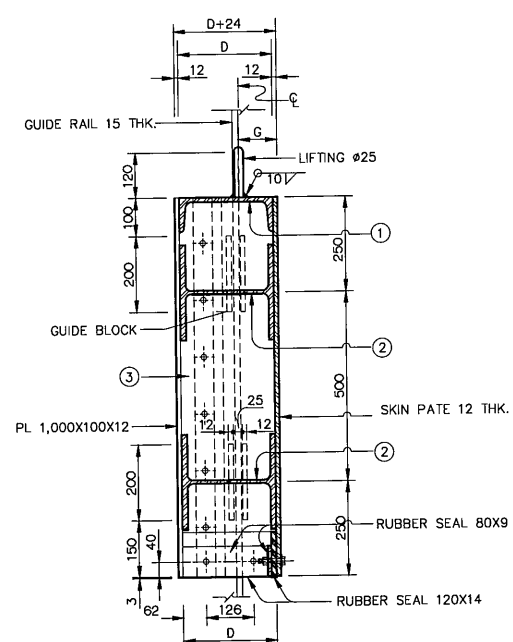
NOTES :

- ALL DIMENSIONS ARE IN MILLIMETER AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- WELDING CONNECTION USE 6 mm., UNLESS OTHERWISE SHOWN
- 12 SETS OF BULKHEAD GATES ARE REQUIRED

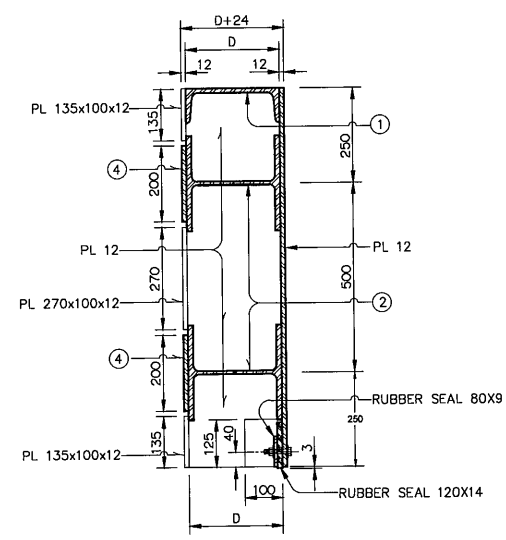
REFERENCE DRAWINGS :

- TAILRACE, LAYOUT PLAN
- TAILRACE, BULKHEAD GATE AND DETAILS

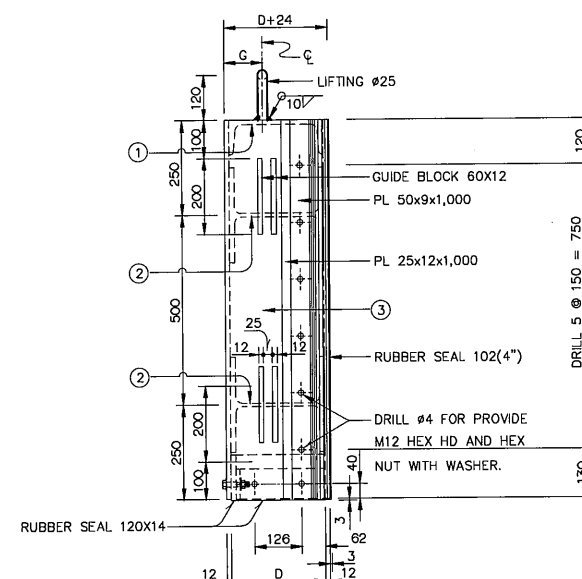
KTP2-TR-01
KTP2-TR-07



SECTION A-A
NOT TO SCALE

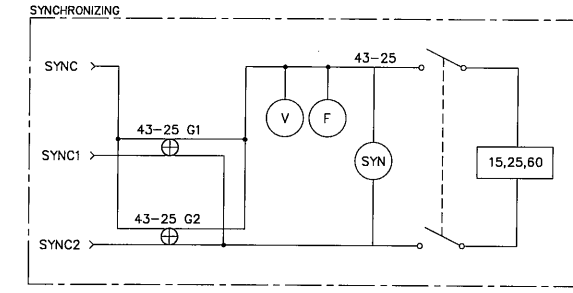
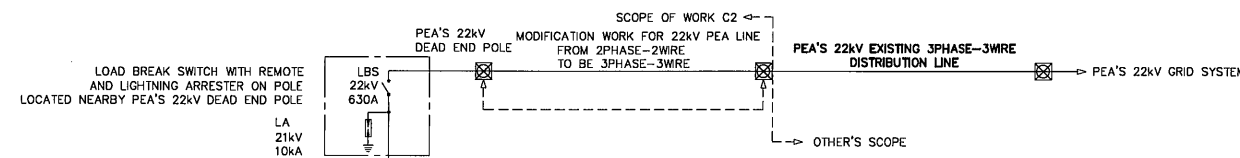


SECTION B-B
NOT TO SCALE



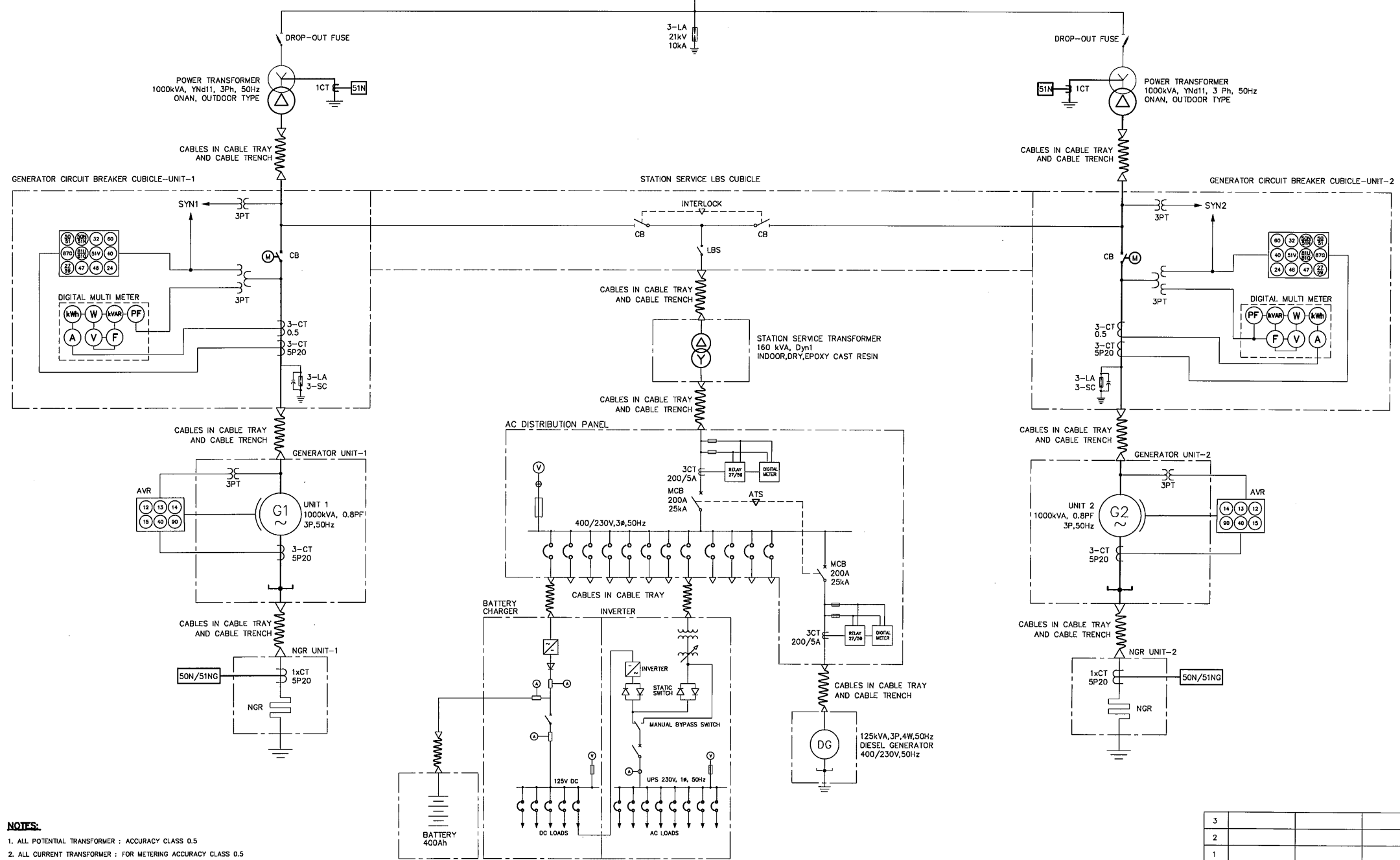
SECTION C-C
NOT TO SCALE

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 1 : CIVIL WORKS TAILRACE BLUKHEAD GATE, PLAN SECTIONS DETAILS AND INSTALLATION			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	28.1957	SUBMITTED	
DRAWN		RECOMMENDED	
CHECKED	28.1957	APPROVED	
DATE	17/03/2020	DRAWING NO.	KTP2-TR-06
CONSULTANTS	DEDE	PROJECT MANAGER	DATE
		SHEET NO. 70 OF 97	



LEGEND

	DROP OUT FUSE WITH CUTOUT
	TRANSFORMER
	CIRCUIT BREAKER (CB) MOTOR DRIVE
	CIRCUIT BREAKER (CB)
	LOAD BREAK SWITCH
	FUSE
	LIGHTNING ARRESTER
	MOLD CASE CIRCUIT BREAKER (MCB)
	NEUTRAL GROUNDING RESISTOR (NGR)
	BATTERY
	INVERTER
	BATTERY CHARGER
	MOTOR OPERATED EQUIPMENT
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	ATS
	OVER SPEED DEVICE
	SYNCHRONOUS SPEED DEVICE
	UNDER SPEED DEVICE
	SPEED OR FREQUENCY MATCHING DEVICE/RELAY
	VOLT PER HERTZ RELAY
	SYNCHRO CHECK RELAY
	REMANENT UNDER VOLTAGE RELAY
	UNDER AND OVER VOLTAGE RELAY
	REVERSE POWER RELAY
	LOSS OF EXCITATION
	PHASE UNBALANCE CURRENT RELAY
	PHASE UNBALANCE VOLTAGE RELAY
	BREAKER FAILURE
	PHASE OVERCURRENT RELAY
	GROUND OVERCURRENT RELAY
	VOLTAGE RESTRAINED TIME OVERCURRENT
	NEUTRAL OVERVOLTAGE RELAY
	VOLTAGE OR CURRENT UNBALANCE RELAY
	ROTOR EARTH FAULT RELAY
	STATOR EARTH FAULT RELAY
	GROUND FAULT PROTECTION RELAY
	DIRECTIONAL OVERCURRENT RELAY
	NEUTRAL DIRECTIONAL OVERCURRENT RELAY
	PHASE ANGLE MEASURING RELAY
	OVER FREQUENCY RELAY
	RATE OF CHANGE OF FREQUENCY RELAY (ROCF)
	STANDBY DIESEL GENERATOR
	POWER FACTOR METER
	FREQUENCY METER
	VOLT METER
	AMP METER
	WATT METER
	KILO WATT HOUR METER
	KILO VAR METER
	SYNCHRONIZING RELAY
	SYNCHRONOUS AC GENERATOR



NOTES:

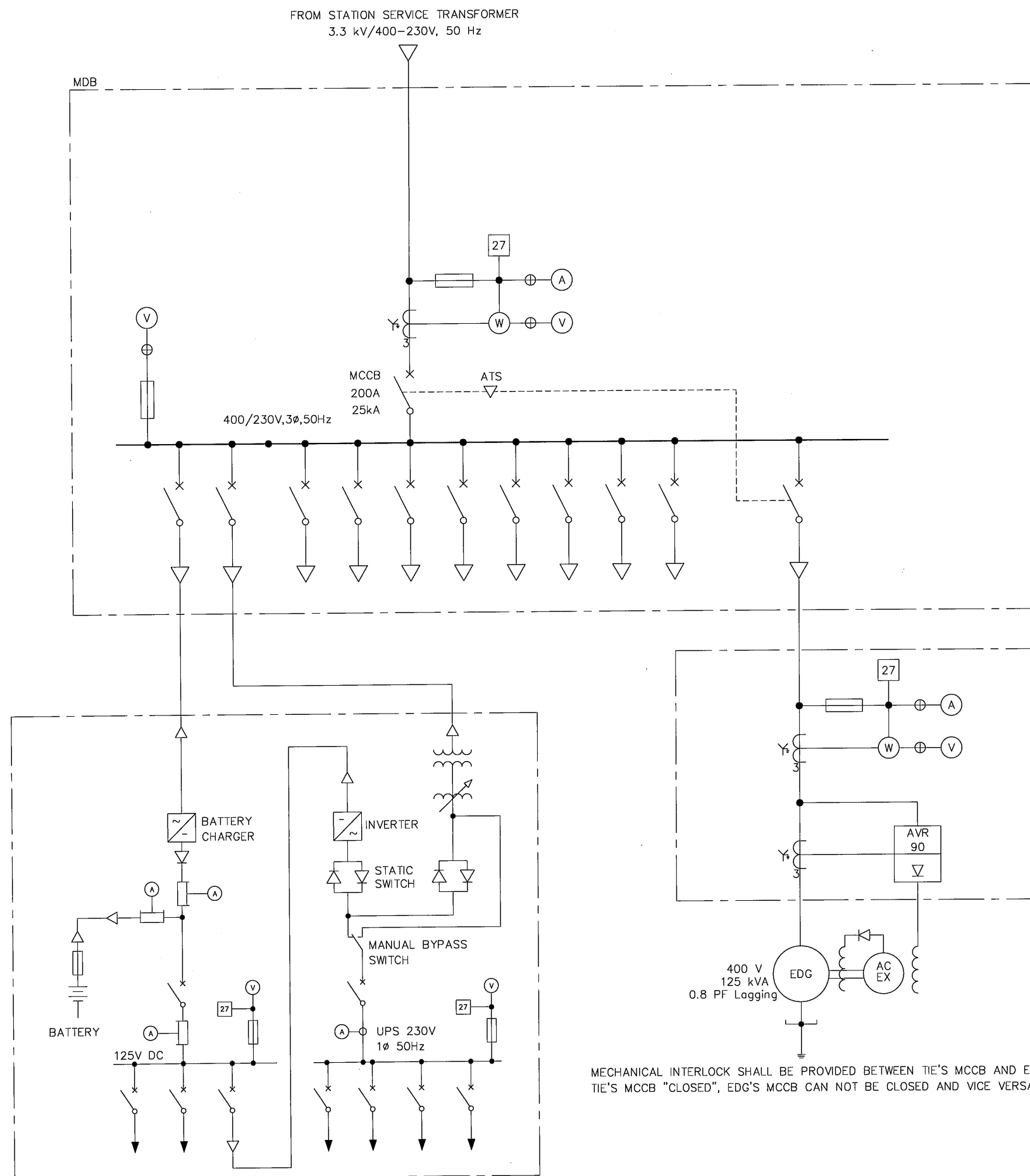
1. ALL POTENTIAL TRANSFORMER : ACCURACY CLASS 0.5
2. ALL CURRENT TRANSFORMER : FOR METERING ACCURACY CLASS 0.5
: FOR RELAY ACCURACY CLASS 5P 20
3. THIS DRAWING IS FOR GUIDE ONLY, CONTRACTOR SHALL DESIGN THE DETAILS AND SUBMITTED TO DEDE FOR APPROVAL
4. PROTECTION SYSTEM SHALL BE ACCORDING TO PEA'S REGULATION (POWER NETWORK SYSTEM INTERCONNECTION CODE)

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

KLONG THUNG PHEN 2 HYDROPOWER PROJECT
AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI

PART 2 : ELECTRO-MECHANICAL EQUIPMENT
E&M EQUIPMENT
OVERALL SINGLE LINE DIAGRAM

PCM P&C MANAGEMENT CO., LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	WNL/604	SUBMITTED	
DRAWN		RECOMMENDED	
NO.	DATE	REVISIONS	CHECKED
			APPROVED
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
17/03/2020		DRAWING NO.	
KTP2-EM-01		SHEET NO.	
72		OF 97	

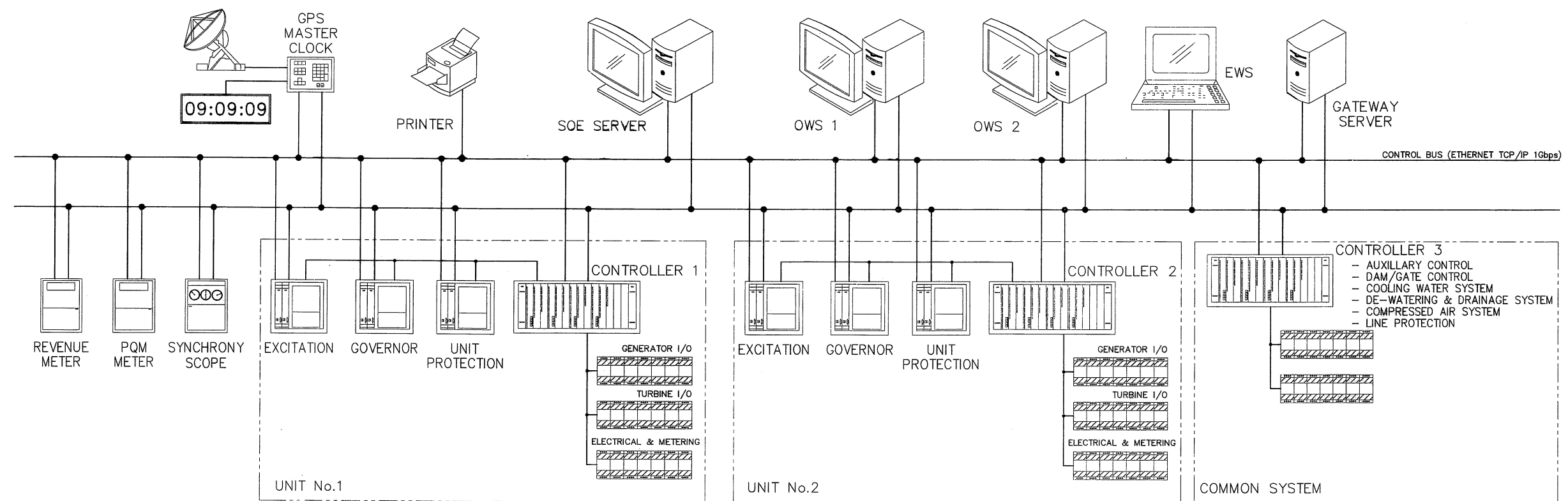


MECHANICAL INTERLOCK SHALL BE PROVIDED BETWEEN TIE'S MCCB AND EDG'S MCCB.
TIE'S MCCB "CLOSED", EDG'S MCCB CAN NOT BE CLOSED AND VICE VERSA.

LEGEND

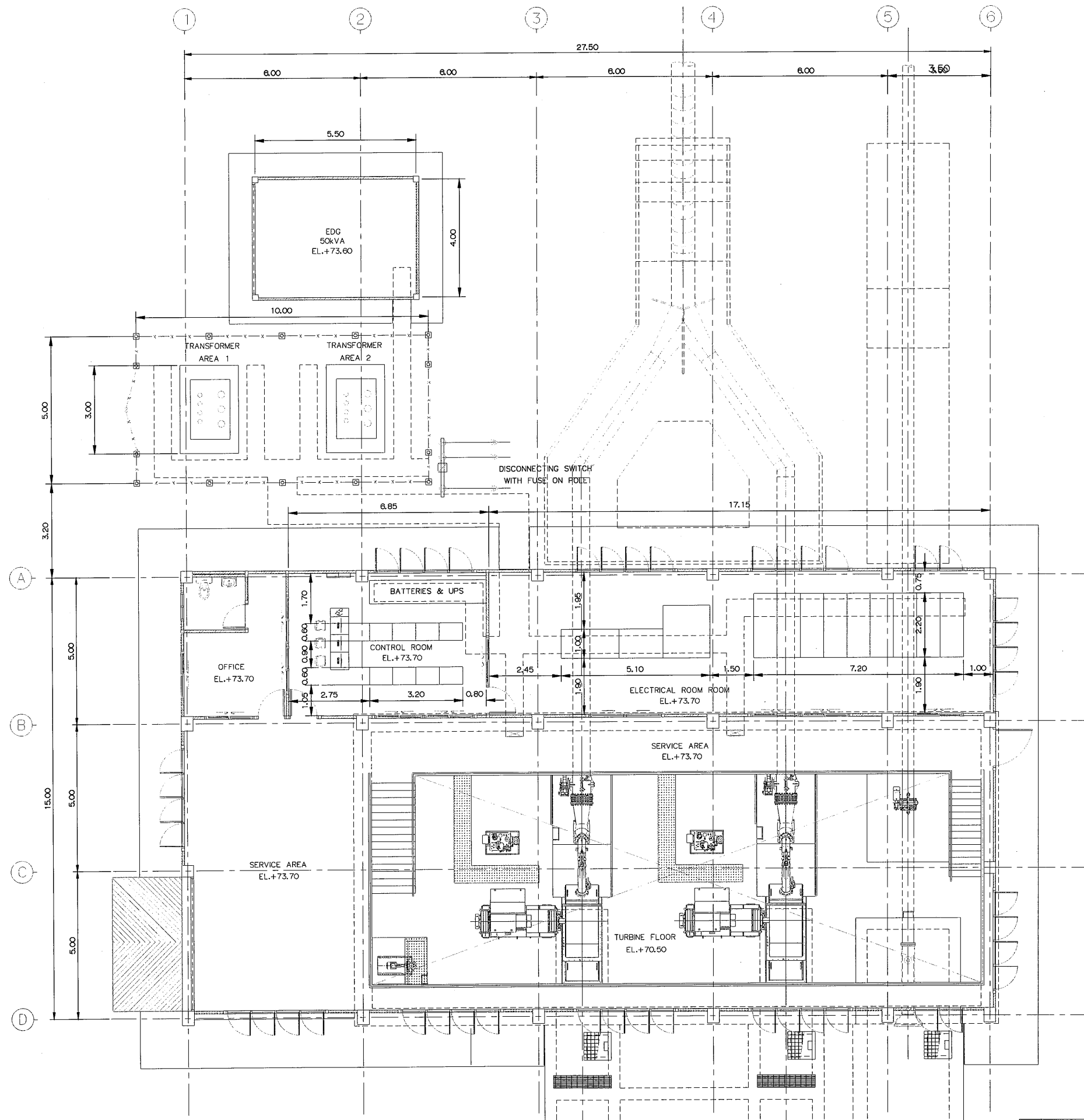
	STEP-UP POWER TRANSFORMER
	WITHDRAWABLE AIR CIRCUIT BRKAKER (ACB)
	MOLDED CASE CIRCUIT BREAKER (MCCB)
	DISCONNECTING OR ISOLATING SWITCH
	FUSE
	LIGHTNING ARRESTER
	FREQUENCY METER
	VOLT METER
	AMP METER
	WATT METER
	SELECTOR SWITCH
	CURRENT TRANSFORMER
	POTENTIAL TRANSFORMER
	SYNCHRO CHECK RELAY
	REMANENT UNDER VOLTAGE RELAY
	UNDER AND OVER VOLTAGE RELAY
	REVERSE POWER RELAY
	PHASE OVERCURRENT RELAY
	GROUND OVERCURRENT RELAY
	RESIDUAL VOLTAGE RELAY
	DIRECTIONAL PHASE FAULT RELAY
	DIRECTIONAL GROUD FAULT RELAY
	OVER FREQUENCY RELAY
	EMERGENCY DIESEL GENERATOR
	WYE CONNECTION
	DELTA CONNECTION
	OPENED DELTA CONNECTION
	BATTERY CHARGER
	INVERTER
	ISOLATION TRANSFORMER
	VOLTAGE REGURATOR
	STATIC SWITCH
	DIODE
	BATTERY BANK
	SHUNT AMP METER
	MANUAL BYPASS SWITCH
	MECHANICAL INTERLOCK

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 2 : ELECTRO-MECHANICAL EQUIPMENT E&M EQUIPMENT LV SINGLE LINE DIAGRAM (AC/DC/UPS)			
P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	20/1/1950	SUBMITTED	
DRAWN	20/1/1950	RECOMMENDED	
CHECKED	20/1/1950	APPROVED	
DATE	17/03/2020	DRAWING NO.	KTP2-EM-02
CONSULTANTS	DEDE	PROJECT MANAGER	DATE
		SHEET NO. 73 OF 97	



CONTROL CONFIGURATION DIAGRAM

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 2 : ELECTRO-MECHANICAL EQUIPMENT E&M EQUIPMENT CONTROL CONFIGURATION DIAGRAM	
 P&C MANAGEMENT CO.,LTD.  Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	REVIEWED <i>S.kitchai</i>
DRAWN	SUBMITTED
CHECKED	RECOMMENDED
APPROVED	APPROVED
NO. DATE REVISIONS CHECKED APPROVED 17/03/2020 PROJECT MANAGER DATE	
DRAWING NO. KTP2-EM-03 SHEET NO. 74 OF 97	



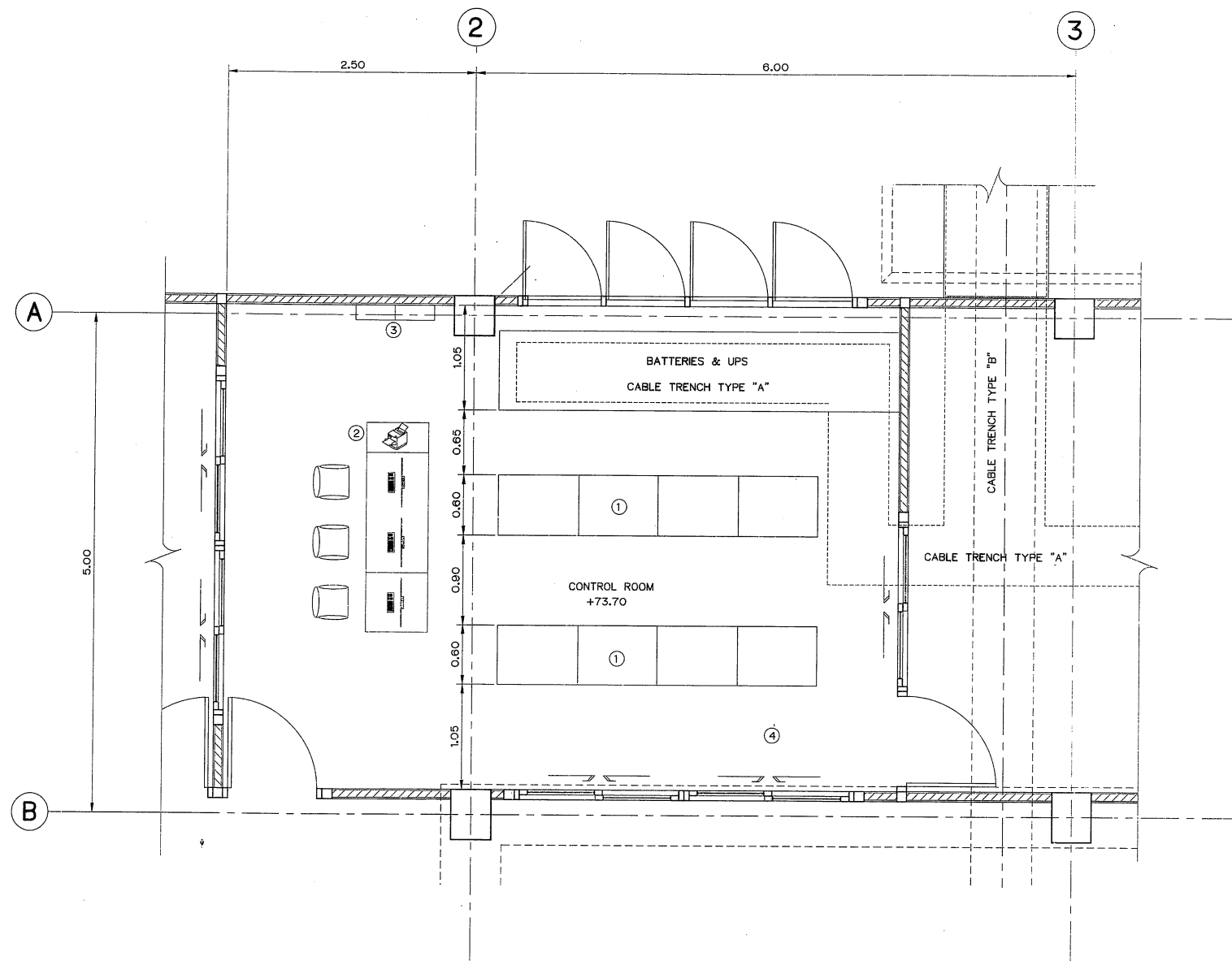
- NOTES :**
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

0 0.5 1.0 2.0 3.0 4.0 6.0
SCALE 1:75 METERS

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 2 : ELECTRO-MECHANICAL EQUIPMENT E&M EQUIPMENT CONTROL ROOM AND ELECTRICAL ROOM LAYOUT	
PCM P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>[Signature]</i> 21.10.20	REVIEWED <i>[Signature]</i>
DRAWN <i>[Signature]</i>	SUBMITTED <i>[Signature]</i>
CHECKED <i>[Signature]</i> 17/03/2020	RECOMMENDED <i>[Signature]</i>
APPROVED <i>[Signature]</i>	APPROVED <i>[Signature]</i> 21/2/20
PROJECT MANAGER	DRAWING NO. KTP2-EM-04 SHEET NO. 75 OF 97

CONTROL ROOM AND ELECTRICAL ROOM LAYOUT
SCALE 1:75

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

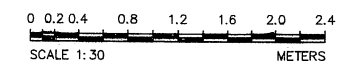


CONTROL ROOM LAYOUT
SCALE 1:30

- NOTES :**
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03

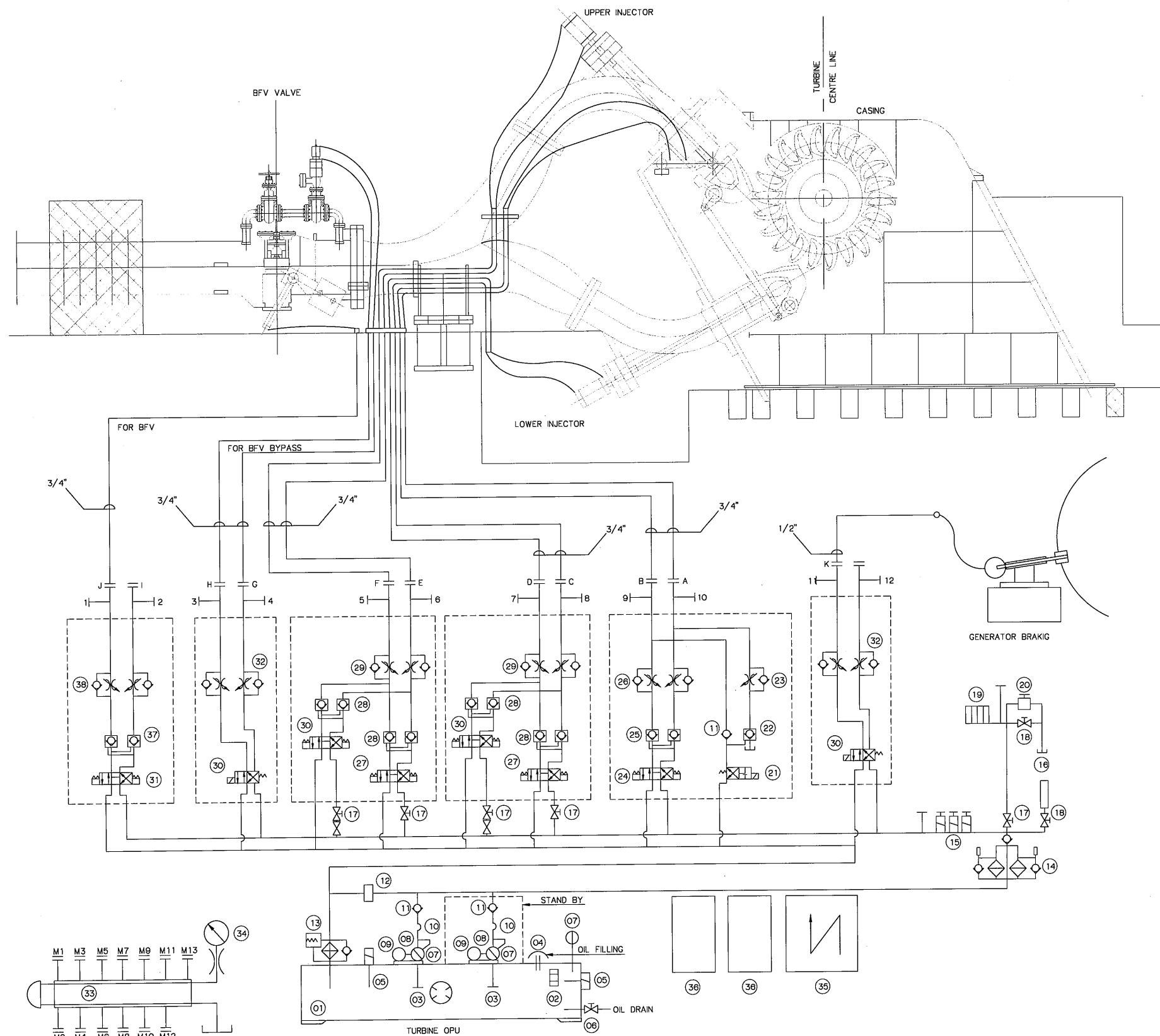
LEGENDS:

- 1 ELECTRICAL AND CONTROL CABINET
- 2 CONTROL DESK
- 3 LIGHTING AND FIRE ALARM PANEL
- 4 ANTI-STATIC FLOOR TILE RAISED FLOOR 40 cm. IN HEIGHT



3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
CONSULTANTS			DEDE	

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCAKUT, CHANGWAT CHANTHABURI	
PART 2 : ELECTRO-MECHANICAL EQUIPMENT E&M EQUIPMENT CONTROL ROOM LAYOUT	
PCM P&C MANAGEMENT CO.,LTD. DESIGNED <i>[Signature]</i> 20/10/50 DRAWN <i>[Signature]</i> CHECKED <i>[Signature]</i> 20/10/50 PROJECT MANAGER <i>[Signature]</i> 17/03/2020	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY REVIEWED <i>[Signature]</i> SUBMITTED <i>[Signature]</i> RECOMMENDED <i>[Signature]</i> APPROVED <i>[Signature]</i> DRAWING NO. KTP2-EM-05 SHEET NO. 76 OF 97



DESCRIPTION	SERVO SPECIFICATIONS				BUTTER FLY VALVE CYLINDERS	*GENERATOR BRAKING CYLINDERS
	DEFLECTOR	NEEDLE-1	NEEDLE-2	BFY BYPASS		
NO. OF CYLINDERS	1	1	1	1	1	1
BORE x ROD (mm)	80X45	160X70	160X70	80X45	160X70	90
STROKE (mm)	96	180	180	80	460	100
TIME (sec)	OPEN	20	20	20	80	30
	CLOSE	2	30	30	40	30
OP PRESSURE (Bar)	30-100	30-100	30-100	30-100	30-100	30-100

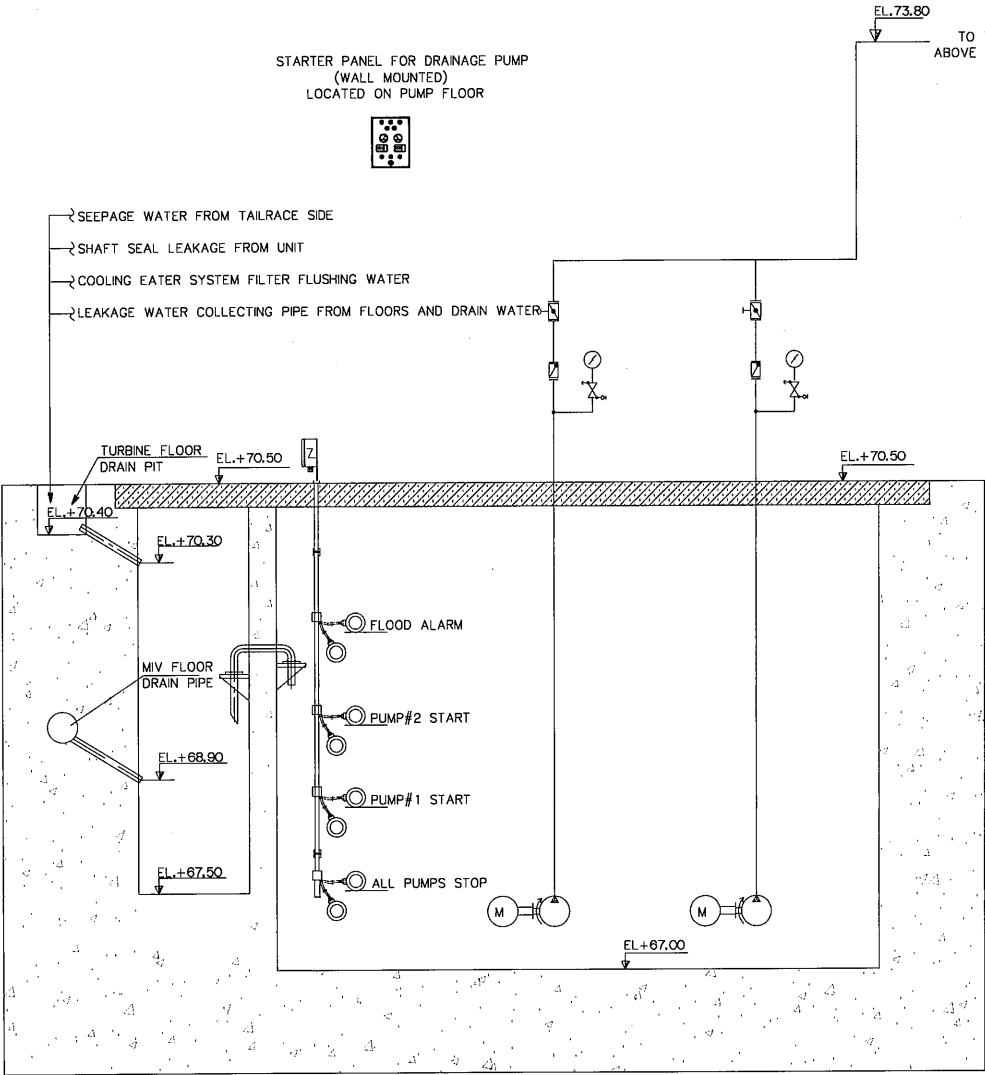
QTY	SINO	DESCRIPTION	SPEC'N	REF/DWG
01	01	OIL RESERVOIR	750 Liters	-
01	02	OIL LEVEL INDICATOR	-	-
02	03	SUCTION STRAINER	-	-
01	04	OIL FILLER/BREATHER	10 Microns	-
02	05	OIL LEVEL SENSOR	-	-
01	06	GATE VALVE	-	-
03	07	VARIABLE DISPLACEMENT PUMP	23 LPM	-
02	08	FLEXIBLE DRIVE COUPLING	-	-
02	09	ELECTRIC MOTOR 3 PHASE	3.7 kW (5 hp) 1500 RPM B5 60 Hz 400v IP 55 Class F insulation	-
02	10	FLEXIBLEHOSE	-	-
03	11	INLINE TYPE CHECK VALVE	-	-
01	12	PILOT OPERATED RELIEF VALVE	-	-
01	13	RETURN LINE FILTER	-	-
01	14	OUPLEX PRESSURE LINE FILTER	-	-
01	15	PRESSURE SWITCH	-	-
01	16	PRESSURE TRANSDUCER	-	-
05	17	SHUT OFF VALVE	3/4" Gasket mounted type	-
02	18	SHUT OFF VALVE	1/2" Gasket mounted type	-
01	19	ACCUMULATOR (PISTON TYPE)	2 x 55 Ltrs	-
01	20	DIRET TYPE RELIEF VALVE	-	-
01	21	PILOT-OPERATED CHECK VALVE	-	-
01	22	MODULAR PILOT OPERATED CHECK VALVE	-	-
01	23	MODULAR THROTTLE & CHECK VALVE	-	-
01	24	SOLENOID OPERATED DIRECTION CONTROL VALVE	-	-
01	25	MODULAR PILOT OPERATED CHECK VALVE	-	-
01	26	MODULAR THROTTLE & CHECK VALVE	-	-
02	27	PROPORTIONAL VALVE	Diff P<5bar, command + 10 VDC	-
04	28	MODULAR PILOT OPERATED CHECK VALVE	-	-
02	29	MODULAR THROTTLE & CHECK VALVE	-	-
04	30	DIRECTION CONTROL CHECK VALVE	220V D.C	-
01	31	DIRECTION CONTROL CHECK VALVE	220V D.C	-
02	32	MODULAR THROTTLE & CHECK VALVE	-	-
01	33	MULTISTATION PRESSURE GAUGE ISOLATOR	SPECIAL	-
01	34	PRESSURE GAUGE	100 mm dia (4") 0-210 bars FB mounting glycerine filled	-
01	35	TERMINAL BOX	Retail make	-
01-each	36	ACCUMULATOR CHARGING KIT	-	-
01	37	MODULAR PILOT OPERATED CHECK VALVE	-	-
01	38	MODULAR THROTTLE & CHECK VALVE	-	-

NOTES:

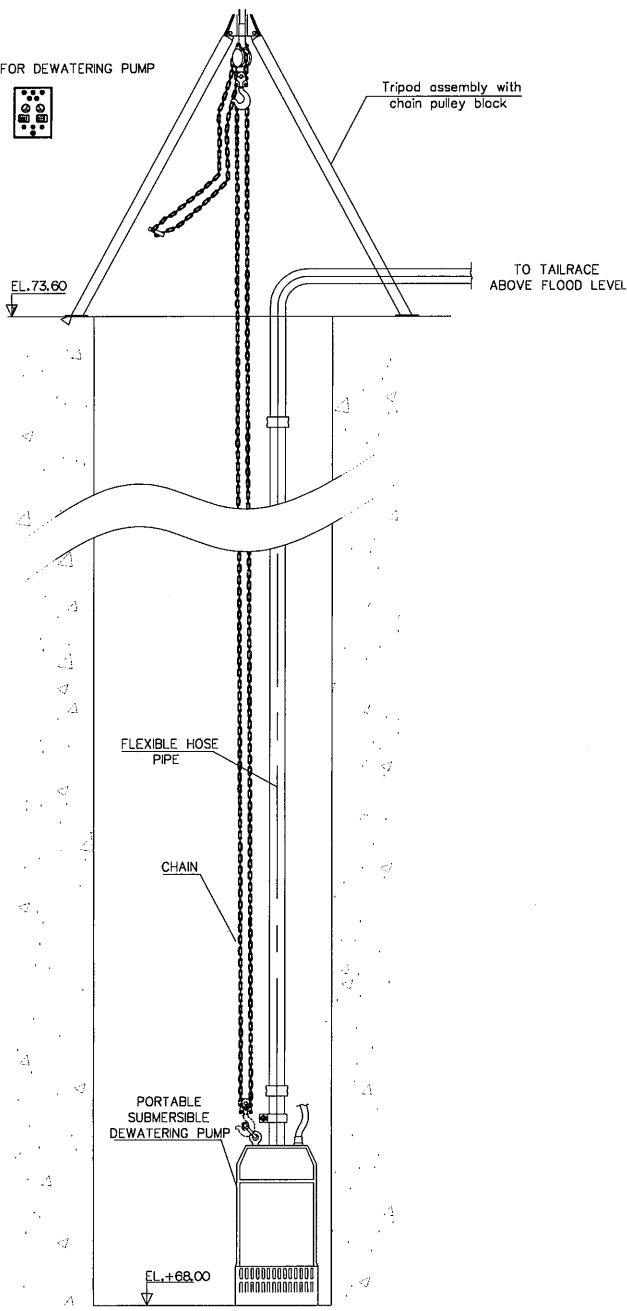
- THE 5NOS. DEFLECTORS ON THE TURBINE (1NO EACH FOR EACH NOZZLE) BOTH TOP AND BOTTOM DEFLECTORS ARE CONNECTED WITH LINK ARRANGEMENT TO A COMMON HYDRAULIC CYLINDER.
- PUMP SETTING-50 LPM @ 100 BAR.
- PRESSURE TRANSDUCER/SWITCH SETTING.
P>100 BAR PUMP OFF.
P>70 BAR PUMP ON.
P>60 BAR ALARM
P>50 BAR TRIP.
- PUMP SETTING-50 LPM @ 100 BAR.
PR. RELIFT VALVE SETTING = 110 BAR (ITEM No. 14)
SAFETY RELIEF VALVE SETTING + 120 BAR (ITEM No. 22)
- THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, IT SHALL BE DESIGNED AND SPECIFIED LATER BY CONTRACTOR AND SUBMITTED TO FIELD ENGINEER FOR APPROVAL.

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 2 : ELECTRO-MECHANICAL EQUIPMENT E&M EQUIPMENT			
OIL PUMPING UNIT DIAGRAM (UNIT 1 AND 2) DETAILS			
PCM P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	17/03/2020	REVIEWED	17/03/2020
DRAWN	17/03/2020	SUBMITTED	17/03/2020
CHECKED	17/03/2020	RECOMMENDED	17/03/2020
APPROVED	17/03/2020	APPROVED	17/03/2020
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
KTP2-EM-06		SHEET NO. 77 OF 97	

SYMBOL LEGEND					
NAME	CENTRIFUGAL PUMP MOTOR SET	ISOLATION VALVE (BUTTERFLY VALVE)	CHECK VALVE	INSTRUMENT ISOLATION VALVE	FOOT VALVE
SYMBOL					
NAME	PRESSURE GAUGE	LEVEL SWITCH	LEVEL SWITCH	SUBMERSIBLE PUMP MOTOR SET	
SYMBOL					



DRAINAGE PIT COMMON FOR ALL UNITS

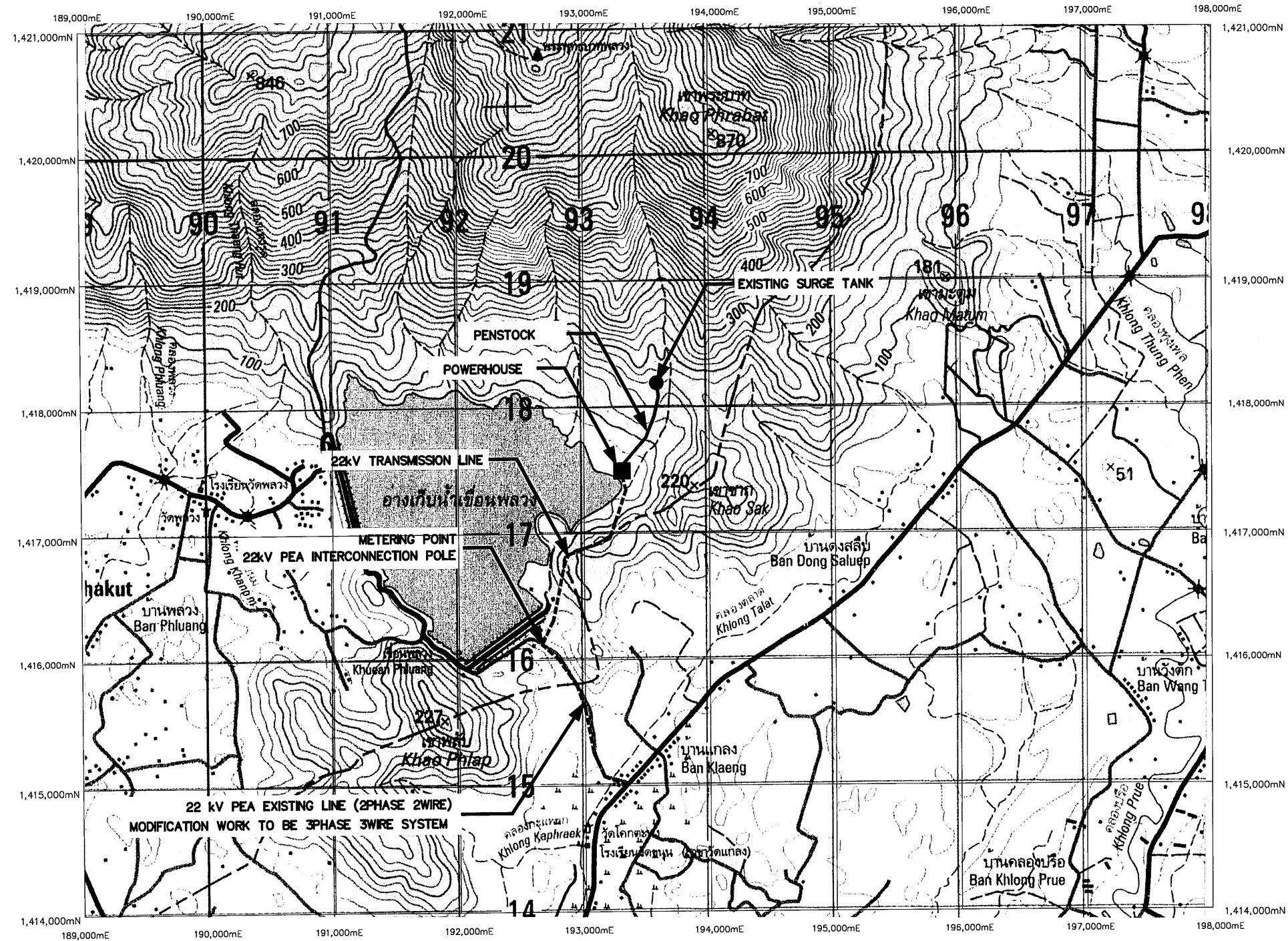
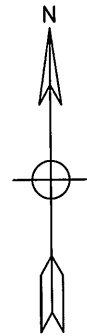


DEWATERING PIT SEPERATE FOR EACH UNIT

NOTES:

- ALL ELEVATIONS ARE IN METER.
- SUPPLY VOLTAGE: 400 VAC $\pm 10\%$ 3PH, 50 HZ -3% TO $+5\%$.
- MATERIAL OF CONSTRUCTION OF PIPES SHALL BE ERW CARBON STEEL AS PER IS:1239(M).
- ALL FITTINGS SHALL BE OF CARBON STEEL BUTT WELDED ASME B 16.9
- MOC FOR ALL VALVES SHALL BE BODY-CAST STEEL & INTERNAL-SS.
- THIS DRAWING IS DESIGN FOR GUIDE LINE ONLY, IT SHALL BE DESIGNED AND SPECIFICATION LATER BY CONTRACTOR AND SUBMITTED TO FIELD FOR APPROVAL

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 2 : ELECTRO-MECHANICAL EQUIPMENT E&M EQUIPMENT SCHEMATIC DIAGRAM FOR DRAINAGE & DEWATERING SYSTEM	
PCM P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED	REVIEWED
DRAWN	RECOMMENDED
CHECKED	APPROVED
NO.	DATE
CONSULTANTS	DEDE
PROJECT MANAGER	DATE
17/03/2020	KTP2-EM-08
79	OF 97



- LEGENDS :
- HIGHWAY
 - STREAM
 - SURGE TANK
 - PENSTOCK
 - POWERHOUSE
 - BRIDGE
 - 22 kV TRANSMISSION LINE

GENERAL LAYOUT
SCALE 1:20,000

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATION AND GENERAL NOT SEE DWG. NO. KTP2-GN-03
3. THE CONTRACTOR HAS TO SUBMIT SURVEYING AND DETAIL DESIGN TO FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWING :

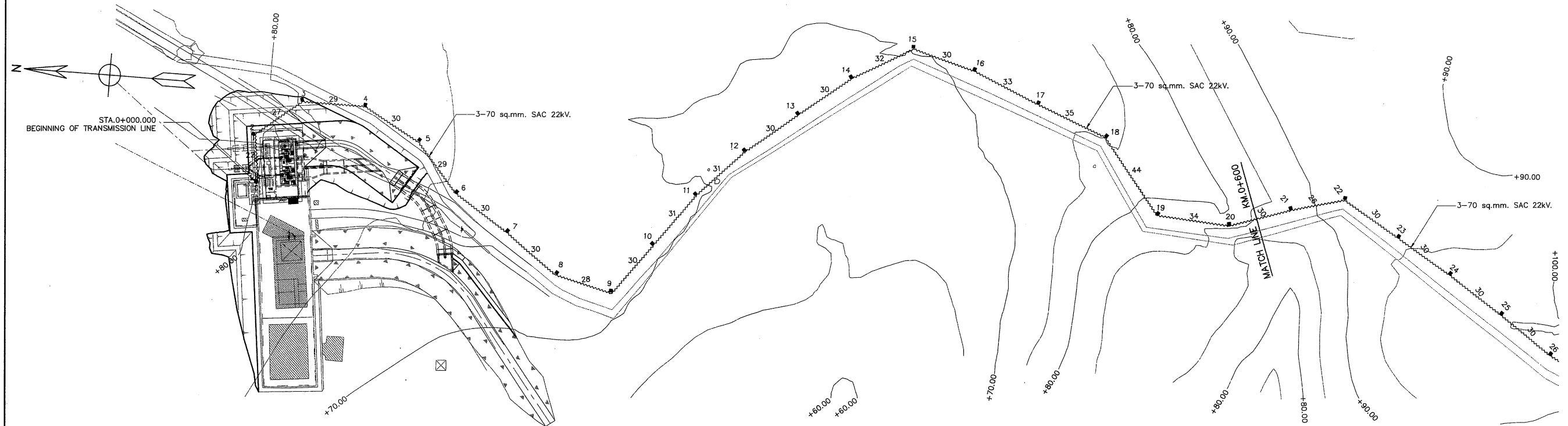
1. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 0+000 TO KM. 0+600
2. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 0+600 TO KM. 1+200
3. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 1+200 TO KM. 1+800
4. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 1+800 TO KM. 2+400
5. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 2+400 TO KM. 3+000
6. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 3+000 TO KM. 3+600
7. TRANSMISSION LINE, 22kV., PLAN AND PROFILE, KM. 3+600 TO KM. 3+840.71

KTP2-TS-02
KTP2-TS-03
KTP2-TS-04
KTP2-TS-05
KTP2-TS-06
KTP2-TS-07
KTP2-TS-08

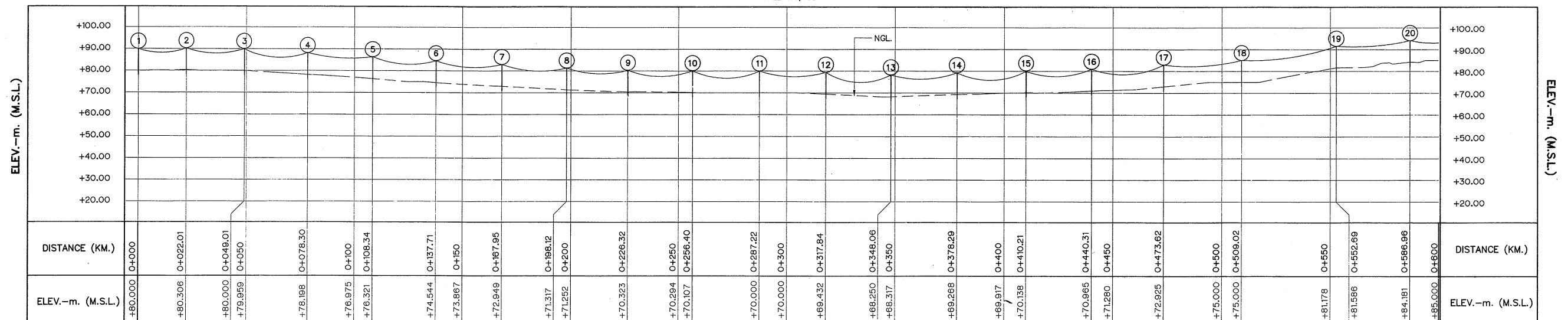
0 500 1,000 1,500
SCALE 1:20,000 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
CONSULTANTS		DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE GENERAL LAYOUT	
DESIGNED 24/11/2019	REVIEWED
DRAWN	SUBMITTED
CHECKED 17/03/2020	RECOMMENDED
APPROVED	APPROVED
PROJECT MANAGER	DRAWING NO. KTP2-TS-01
DATE	SHEET NO. 80 OF 97



PLAN
SCALE 1:1,000



PROFILE

HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:1,000

TRANSMISSION LINE PROPERTIES

TRANSFORMER LINE TAP OFF TABLE													
POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY										
			POLE TYPE					GUY TYPE					
			A	B	C	D	E	G1	G2	G3	G4	G5	G6
TAKE OFF STRUCTURE	0	0											
1	22	22			1			1					
2	27	49					1			1			
3	29	78		1						1			
4	30	108		1				1					
5	29	138		1				1					
6	30	168		1				1					
7	30	198		1									
8	28	226		1				1					
9	30	256					1						1
10	31	287		1									
11	31	318		1				1					
12	30	348		1				1					
13	30	378		1								1	
14	32	410		1				1					
15	30	440					1			1			
16	33	474		1				1					
17	35	509		1									
18	44	553			1					1			
19	34	587			1					1			
20	30	617			1			1					

NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY,
THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

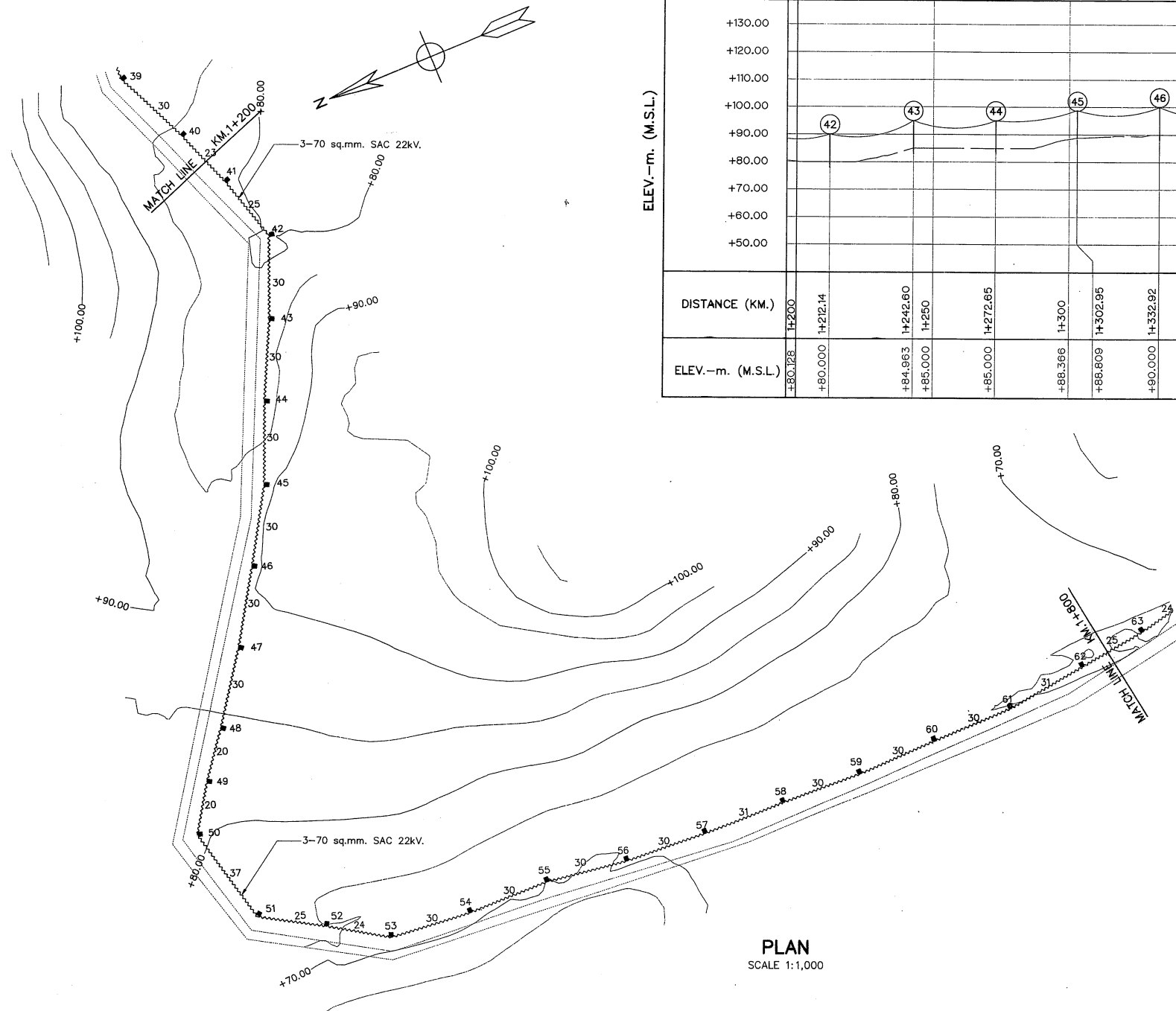
LEGENDS :

- 22 kV. SPACE AERIAL CABLE
- EXISTING 22 kV. PEA. OVERHEAD TRANSMISSION LINE
- NEW 12M. CONCRETE POLE
- EXISTING 12M. CONCRETE POLE
- REMOVE 12M. CONCRETE POLE
- 3 - 100A. FUSE CUTOFF 22 kV.
- GUY
- LOAD BREAK SWITCH, SF6, 630A, 22KV. WITH AUTOMATIC REMOTE CONTROLLED
- DISCONNECTING SWITCH 600A, 22KV.

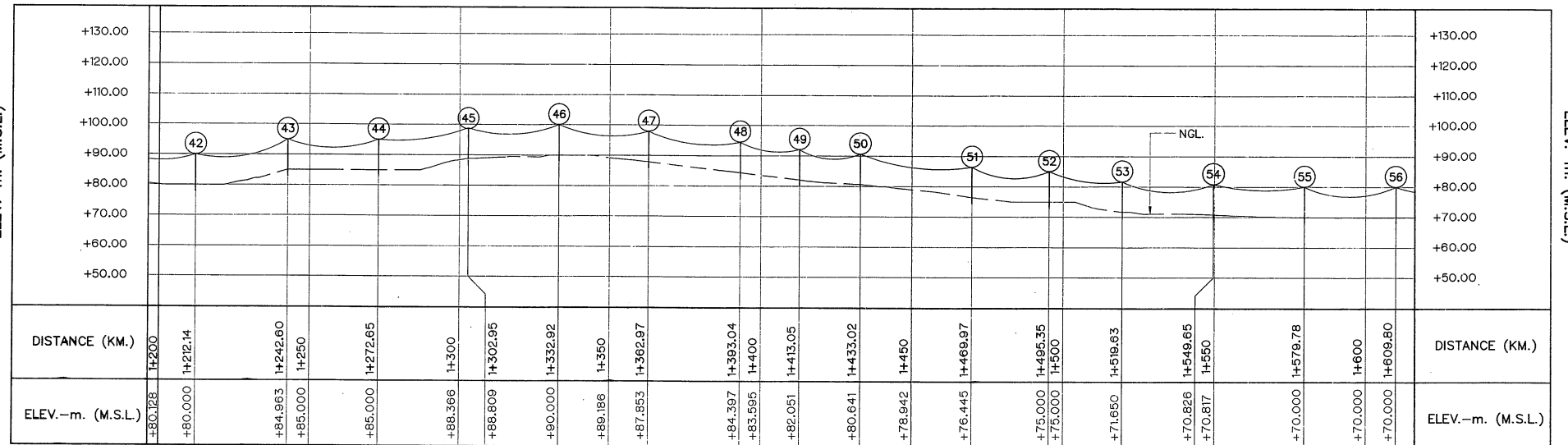
REFERENCE DRAWINGS :

- TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 0+600 TO KM. 1+200 KTP2-TS-03
- TRANSMISSION LINE, 22 kV., POLE TYPE "A" AND "B" KTP2-TS-12
- TRANSMISSION LINE, 22 kV., POLE TYPE "C" AND "D" KTP2-TS-13
- TRANSMISSION LINE, 22 kV., POLE TYPE "E" KTP2-TS-14
- TRANSMISSION LINE, 22 kV., TYPE OF ANCHOR GUY KTP2-TS-15

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22 kV., PLAN AND PROFILE, KM. 0+000 TO KM. 0+600	
PCM P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>[Signature]</i> 2/11/604	REVIEWED <i>[Signature]</i>
DRAWN <i>[Signature]</i>	RECOMMENDED <i>[Signature]</i>
CHECKED <i>[Signature]</i> 2/11/604	APPROVED <i>[Signature]</i>
NO. DATE REVISIONS CHECKED APPROVED	DRAWING NO. SHEET NO.
CONSULTANTS DEDE	PROJECT MANAGER DATE KTP2-TS-02 81 OF 97

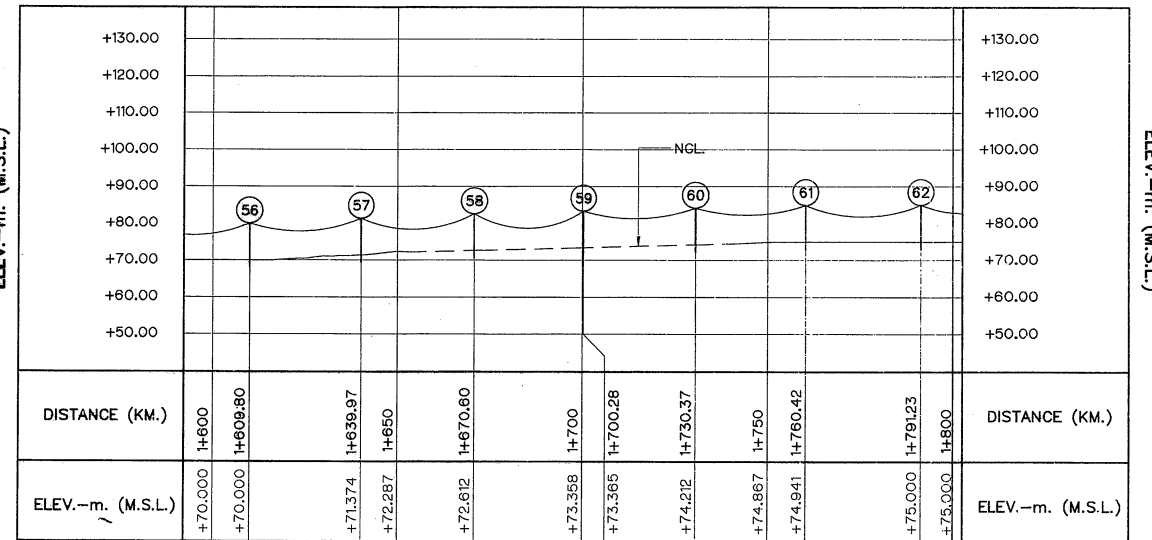


ELEV.-m. (M.S.L.)



ELEV.-m. (M.S.L.)

ELEV.-m. (M.S.L.)



ELEV.-m. (M.S.L.)

PLAN
SCALE 1:1,000

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

TRANSMISSION LINE PROPERTIES

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY											
			POLE TYPE					GUY TYPE						
			A	B	C	D	E	G1	G2	G3	G4	G5	G6	
41	25	1,212												
42	30	1,243			I					I				
43	30	1,273			I									
44	30	1,303				I								
45	30	1,333			I				I					
46	30	1,363			I									
47	30	1,393			I									
48	20	1,413			I									
49	20	1,433			I									
50	37	1,470					I			I				
51	25	1,495				I					I			
52	24	1,520			I									
53	30	1,550				I								
54	30	1,580			I				I					
55	30	1,610			I					I				
56	30	1,640			I									
57	31	1,671			I									
58	30	1,700			I									
59	30	1,730			I									
60	30	1,760			I									
61	31	1,791			I						I			
62	25	1,816			I									

NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY,
THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

LEGENDS :

- 22 kV. SPACE AERIAL CABLE
- EXISTING 22 kV. PEA. OVERHEAD TRANSMISSION LINE
- NEW 12M. CONCRETE POLE
- EXISTING 12M. CONCRETE POLE
- REMOVE 12M. CONCRETE POLE
- 3 - 100A. FUSE CUTOUT 22 kV.
- GUY
- LOAD BREAK SWITCH, SF6, 630A, 22KV. WITH AUTOMATIC REMOTE CONTROLLED
- DISCONNECTING SWITCH 600A, 22KV.

REFERENCE DRAWINGS :

- TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 0+600 TO KM. 1+200
- TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 1+800 TO KM. 2+400
- TRANSMISSION LINE, 22 kV., POLE TYPE "A" AND "B"
- TRANSMISSION LINE, 22 kV., POLE TYPE "C" AND "D"
- TRANSMISSION LINE, 22 kV., POLE TYPE "E"
- TRANSMISSION LINE, 22 kV., TYPE OF ANCHOR GUY

KTP2-TS-03
KTP2-TS-05
KTP2-TS-12
KTP2-TS-13
KTP2-TS-14
KTP2-TS-15

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22 kV., PLAN AND PROFILE, KM. 1+200 TO KM. 1+800	
DESIGNED <i>[Signature]</i> 27/01/2020 DRAWN <i>[Signature]</i> 27/01/2020 CHECKED <i>[Signature]</i> 27/01/2020 PROJECT MANAGER <i>[Signature]</i> 27/01/2020	REVIEWED <i>[Signature]</i> 27/01/2020 SUBMITTED <i>[Signature]</i> 27/01/2020 RECOMMENDED <i>[Signature]</i> 27/01/2020 APPROVED <i>[Signature]</i> 27/01/2020 DRAWING NO. KTP2-TS-04 SHEET NO. 83 OF 97



HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:1,000

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY											
			POLE TYPE					GUY TYPE						
			A	B	C	D	E	G1	G2	G3	G4	G5	G6	
62	25	1,816		I										
63	24	1,840		I										
64	30	1,870			I					I				
65	30	1,900		I						I				
66	39	1,939		I						I				
67	23	1,962			I					I				
68	30	1,992					I						I	
69	21	2,014			I									
70	18	2,031				I								
71	31	2,062				I				I				
72	30	2,092			I					I				
73	31	2,123			I					I				
74	22	2,145			I									
75	23	2,168			I									
76	30	2,198			I						I			
77	30	2,228			I									
78	30	2,258			I					I				
79	30	2,288			I					I				
80	30	2,318			I									
81	24	2,342			I					I				
82	14	2,355					I			I				
83	15	2,371				I								
84	30	2,400				I				I				
85	30	2,430				I								

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY,
THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

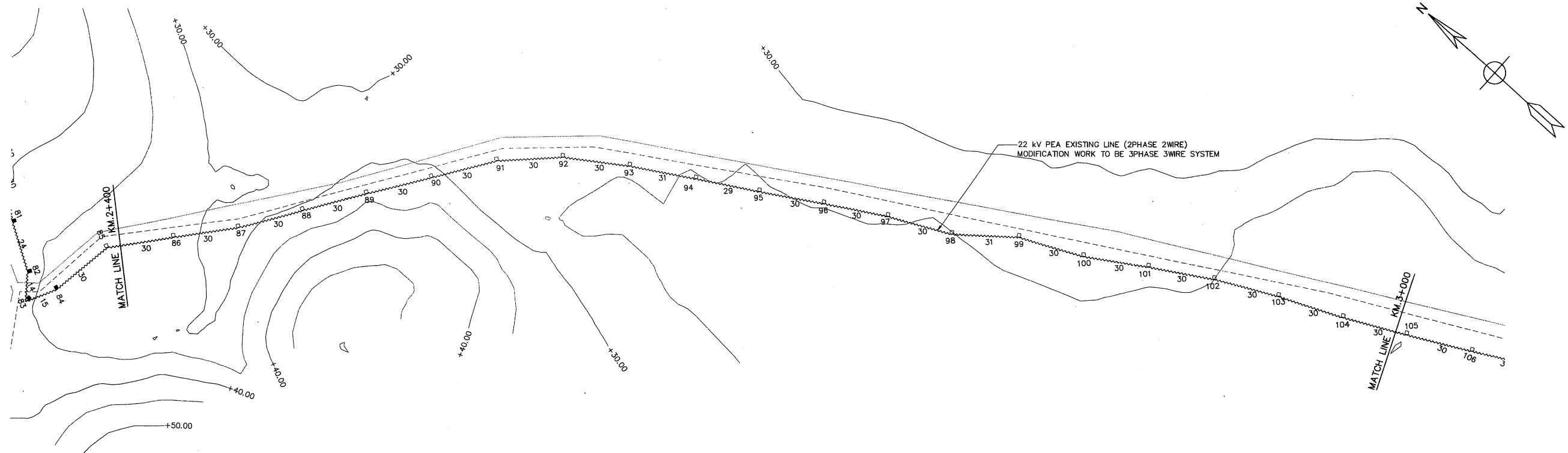
1.		22 KV. SPACE AERIAL CABLE
2.		EXISTING 22 KV. PEA. OVERHEAD TRANSMISSION LINE
3.		NEW 12M. CONCRETE POLE
4.		EXISTING 12M. CONCRETE POLE
5.		REMOVE 12M. CONCRETE POLE
6.		3 - 100A. FUSE C/TOUT 22 KV.
7.		GUY
8.		LOAD BREAK SWITCH, SF6, 630A, 22KV. WITH AUTOMATIC REMOTE CONTROLLED
9.		DISCONNECTING SWITCH 600A, 22KV.

1. TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 1+200 TO KM. 1+800	KTP2-TS-04
2. TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 2+400 TO KM. 3+000	KTP2-TS-06
3. TRANSMISSION LINE, 22 kV., POLE TYPE "A" AND "B"	KTP2-TS-12
4. TRANSMISSION LINE, 22 kV., POLE TYPE "C" AND "D"	KTP2-TS-13
5. TRANSMISSION LINE, 22 kV., POLE TYPE "E"	KTP2-TS-14
6 TRANSMISSION LINE, 22 kV., TYPE OF ANCHOR GUY	KTP2-TS-15

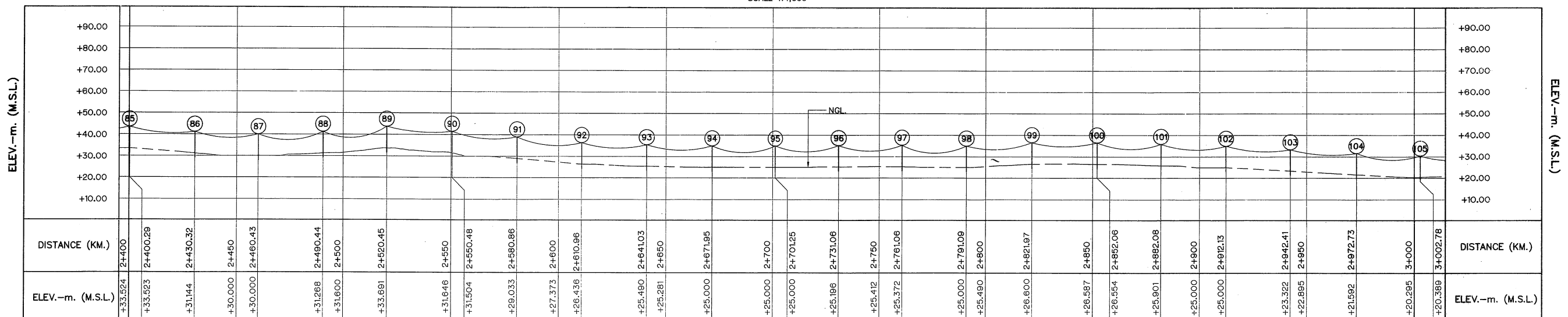
A horizontal scale bar with markings every 10 units from 0 to 80. Below the bar, the text "SCALE 1:1,000" is on the left and "METERS" is on the right.

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
	CONSULTANTS		DEDE	

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY		KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE			
22 KV., PLAN AND PROFILE, KM. 1+800 TO KM. 2+400			
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED		27/03/2020	REVIEWED <u>S.Kitichai</u>
DRAWN			SUBMITTED 
CHECKED		27/03/2020	RECOMMENDED 
		17/03/2020	APPROVED 
PROJECT MANAGER		DATE	DRAWING NO.
			KTP2-TS-05
			SHEET NO.
			84 OF 97



PLAN
SCALE 1:1,000



PROFILE

HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:1,000

TRANSMISSION LINE PROPERTIES

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY											
			POLE TYPE					GUY TYPE						
			A	B	C	D	E	G1	G2	G3	G4	G5	G6	
84	30	2,400			1			1						
85	30	2,430				1								
86	30	2,460			1									
87	30	2,490			1									
88	30	2,520			1			1						
89	30	2,550			1									
90	30	2,581			1									
91	30	2,611			1									
92	30	2,641			1			1						
93	31	2,672			1									
94	29	2,701			1									
95	30	2,731			1									
96	30	2,761			1									
97	30	2,791			1									
98	31	2,822			1			1						
99	30	2,852			1									
100	30	2,882			1			1						
101	30	2,912			1									
102	30	2,942			1									
103	30	2,973			1									
104	30	3,003			1									
105	30	3,033			1									

NOTES:

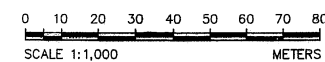
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY,
THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

LEGENDS :

1. 22 kV. SPACE AERIAL CABLE
2. EXISTING 22 kV. PEA. OVERHEAD TRANSMISSION LINE
3. NEW 12M. CONCRETE POLE
4. EXISTING 12M. CONCRETE POLE
5. REMOVE 12M. CONCRETE POLE
6. 3 - 100A. FUSE CUTOFF 22 kV.
7. GUY
8. LOAD BREAK SWITCH, SF6, 630A, 22KV. WITH AUTOMATIC REMOTE CONTROLLED
9. DISCONNECTING SWITCH 600A, 22KV.

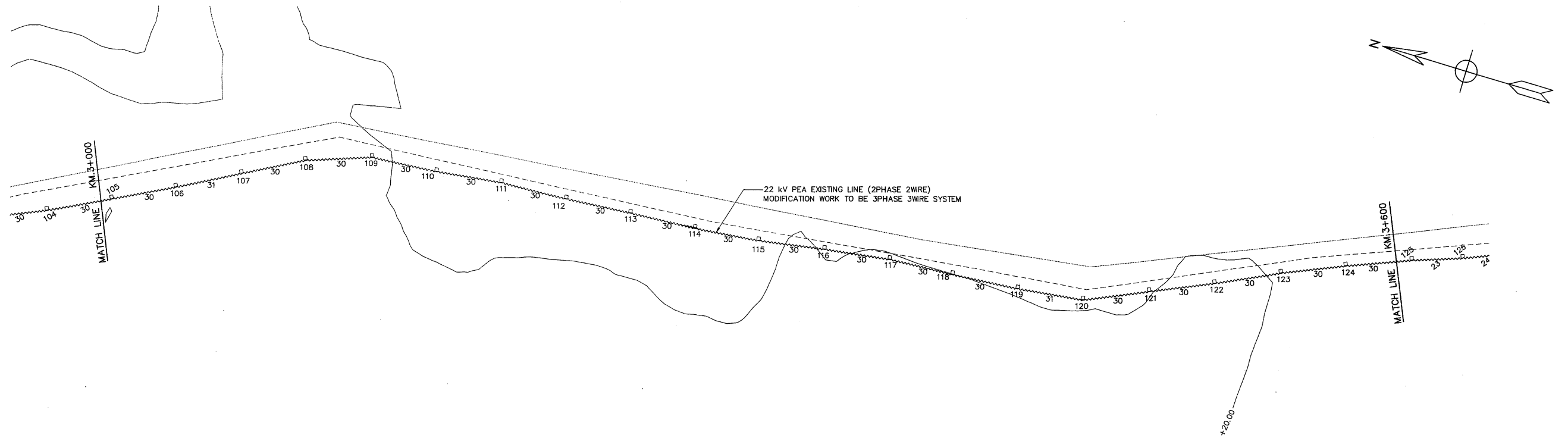
REFERENCE DRAWINGS :

1. TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 1+800 TO KM. 2+400 KTP2-TS-05
2. TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 3+000 TO KM. 3+600 KTP2-TS-07
3. TRANSMISSION LINE, 22 kV., POLE TYPE "A" AND "B" KTP2-TS-12
4. TRANSMISSION LINE, 22 kV., POLE TYPE "C" AND "D" KTP2-TS-13
5. TRANSMISSION LINE, 22 kV., POLE TYPE "E" KTP2-TS-14
6. TRANSMISSION LINE, 22 kV., TYPE OF ANCHOR GUY KTP2-TS-15

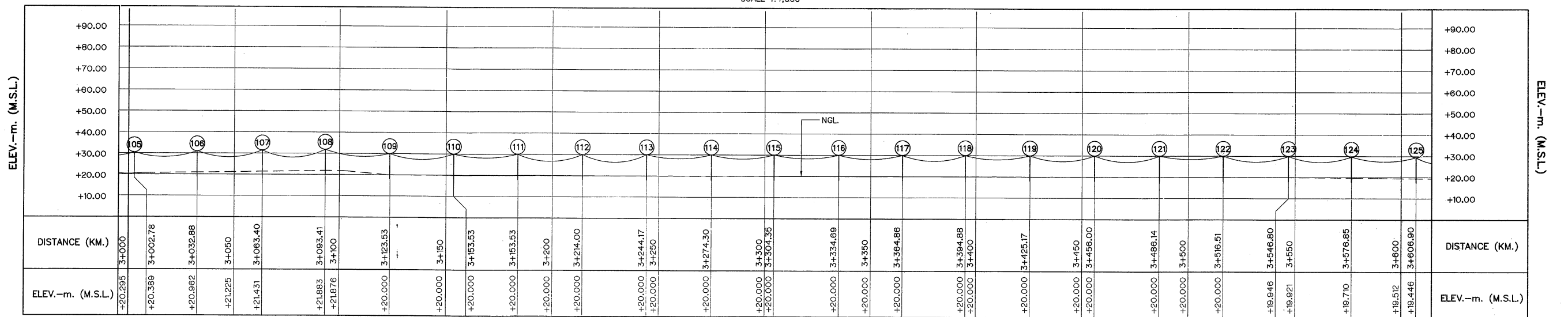


NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY			
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI			
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22 kV., PLAN AND PROFILE, KM. 2+400 TO KM. 3+000			
PCM P&C MANAGEMENT CO.,LTD.		REVIEWED S. Kitchai	
DESIGNED [Signature] 27/1/604		SUBMITTED [Signature]	
DRAWN [Signature]		RECOMMENDED [Signature]	
CHECKED [Signature] 17/03/2020		APPROVED [Signature]	
PROJECT MANAGER DATE		DRAWING NO. KTP2-TS-08	
CONSULTANTS		DEDE	
		SHEET NO. 85 OF 97	



PLAN
SCALE 1:1,000



PROFILE

HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:1,000

TRANSMISSION LINE PROPERTIES

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY												
			POLE TYPE					GUY TYPE							
			A	B	C	D	E	G1	G2	G3	G4	G5	G6		
104	30	3,003		1											
105	30	3,033		1											
106	31	3,063		1											
107	30	3,093		1											
108	30	3,124		1					1						
109	30	3,154		1					1						
110	30	3,184		1					1						
111	30	3,214		1											
112	30	3,244		1											
113	30	3,274		1											
114	30	3,304		1											
115	30	3,335		1											
116	30	3,365		1											
117	30	3,395		1											
118	30	3,425		1											
119	31	3,456		1											
120	30	3,486		1					1						
121	30	3,517		1											
122	30	3,547		1											
123	30	3,577		1											
124	30	3,607		1											
125	23	3,630		1											

NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
 3. THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY.
- THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

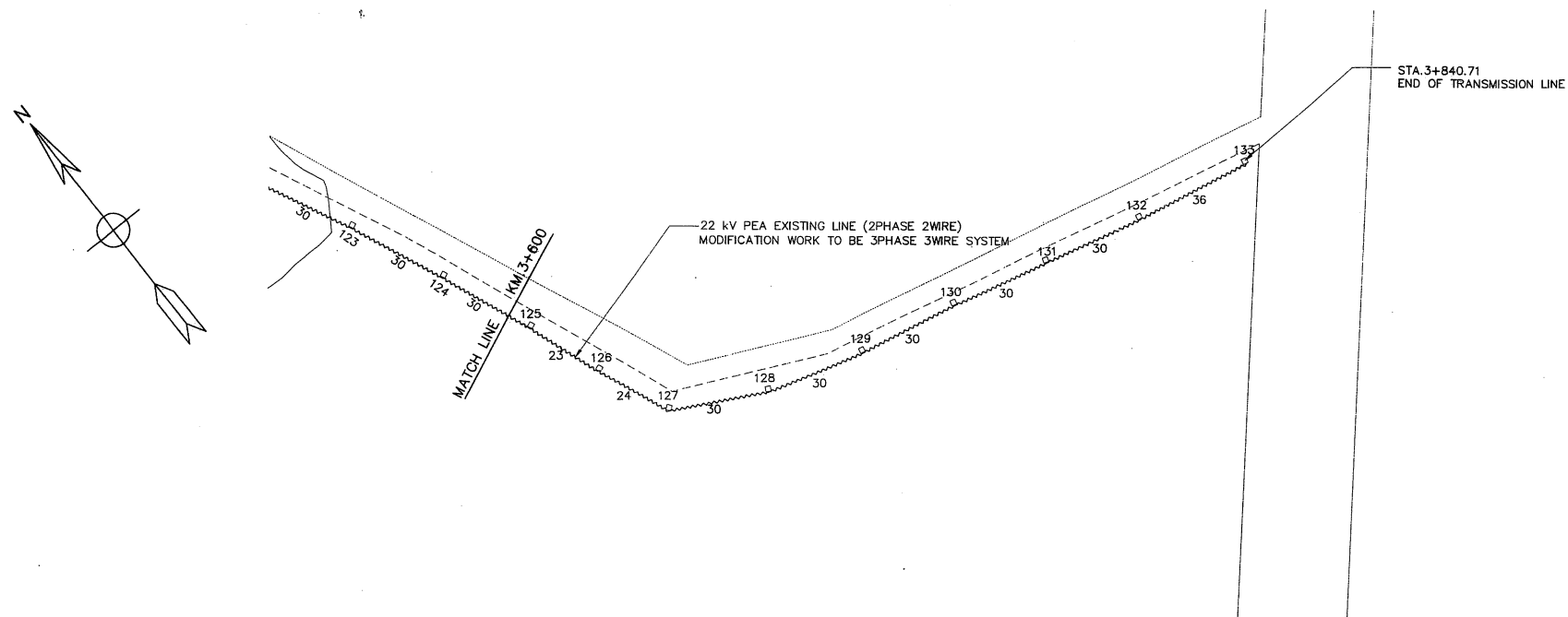
LEGENDS :

1. 22 kV. SPACE AERIAL CABLE
2. EXISTING 22 kV. PEA. OVERHEAD TRANSMISSION LINE
3. NEW 12M. CONCRETE POLE
4. EXISTING 12M. CONCRETE POLE
5. REMOVE 12M. CONCRETE POLE
6. 3 - 100A. FUSE CUTOFF 22 kV.
7. GUY
8. LOAD BREAK SWITCH, SF6, 630A, 22KV. WITH AUTOMATIC REMOTE CONTROLLED
9. DISCONNECTING SWITCH 600A, 22KV.

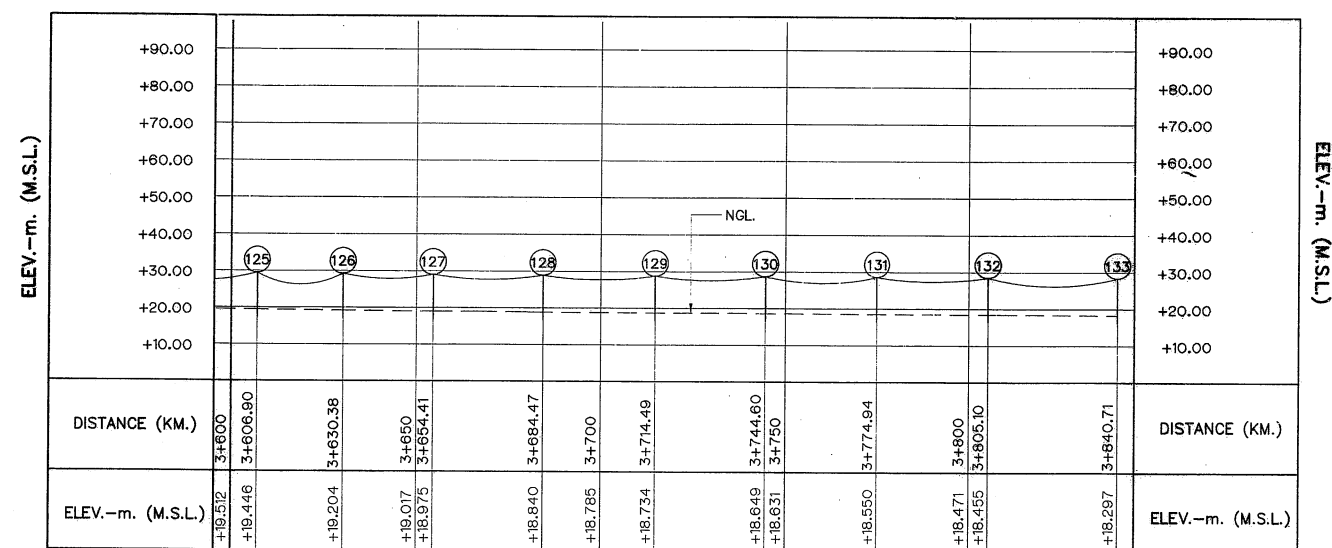
REFERENCE DRAWINGS :

1. TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 2+400 TO KM. 3+000 KTP2-TS-06
2. TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 3+000 TO KM. 3+840.71 KTP2-TS-08
3. TRANSMISSION LINE, 22 kV., POLE TYPE "A" AND "B" KTP2-TS-12
4. TRANSMISSION LINE, 22 kV., POLE TYPE "C" AND "D" KTP2-TS-13
5. TRANSMISSION LINE, 22 kV., POLE TYPE "E" KTP2-TS-14
6. TRANSMISSION LINE, 22 kV., TYPE OF ANCHOR GUY KTP2-TS-15

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22 kV., PLAN AND PROFILE, KM. 3+000 TO KM. 3+600	
PCM P&C MANAGEMENT CO.,LTD.	REVIEWED
DESIGNED	SUBMITTED
DRAWN	RECOMMENDED
CHECKED	APPROVED
DATE 17/03/2020	DRAWING NO. KTP2-TS-07
PROJECT MANAGER	SHEET NO. 86 OF 97



PLAN
SCALE 1:1,000



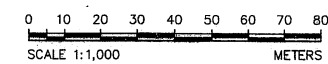
PROFILE
HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:1,000

TRANSMISSION LINE PROPERTIES

[illegible]

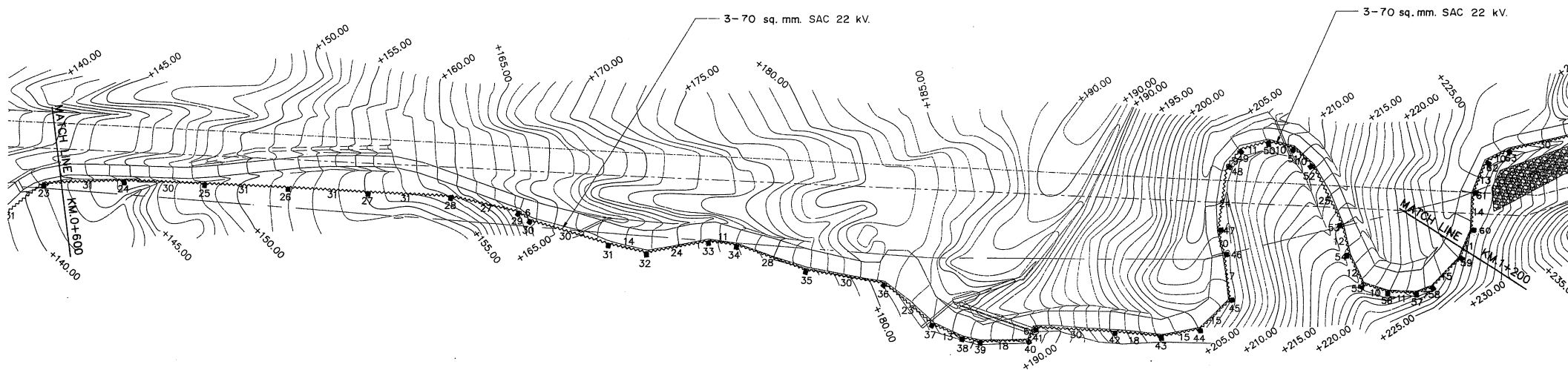
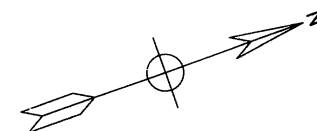
LEGENDS :

- | | | |
|----|---|--|
| 1. |  | 22 KV. SPACE AERIAL CABLE |
| 2. |  | EXISTING 22 KV. PEA. OVERHEAD TRANSMISSION LINE |
| 3. |  | NEW 12M. CONCRETE POLE |
| 4. |  | EXISTING 12M. CONCRETE POLE |
| 5. |  | REMOVE 12M. CONCRETE POLE |
| 6. |  | 3 - 100A. FUSE COUTUT 22 KV. |
| 7. |  | GUY |
| 8. |  | LOAD BREAK SWITCH, SF6, 630A, 22KV. WITH AUTOMATIC REMOTE CONTORLLED |
| 9. |  | DISCONNECTING SWITCH 600A, 22KV. |



3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
	CONSULTANTS		DEDE	

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHONG KHAO KITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE	
22 KV., PLAN AND PROFILE, KM. 3+600 TO KM. 3+840.71	
 P&C MANAGEMENT CO.,LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED 	REVIEWED S.Kitichai SUBMITTED 
DRAWN 	RECOMMENDED  APPROVED 
CHECKED  	DRAWING NO. KTP2-TS-08 SHEET NO. 87 OF 97
PROJECT MANAGER DATE	17/03/2020

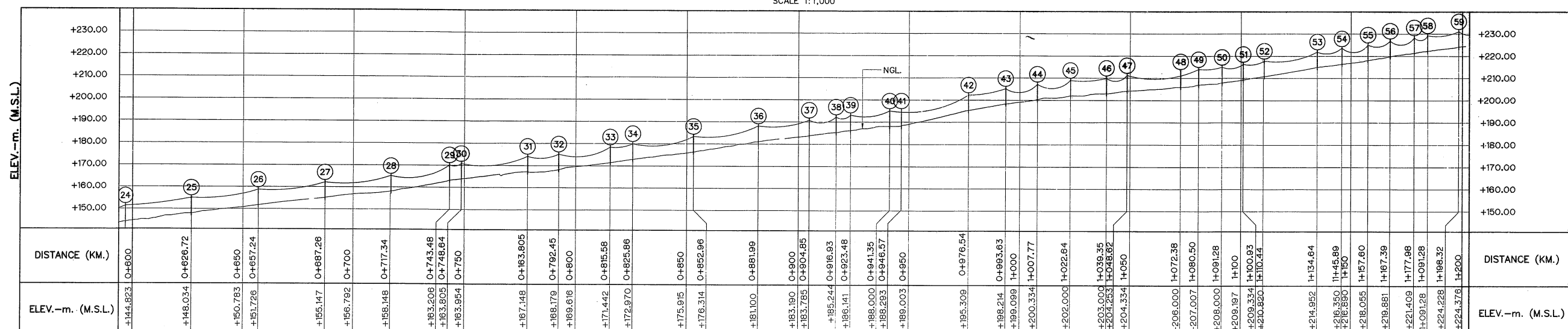


NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
3. THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY,
THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

PLAN

SCALE 1:1,000



TRANSMISSION LINE PROPERTIES

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY												
			POLE TYPE					GUY TYPE							
			A	B	C	D	E	G1	G2	G3	G4	G5	G6		
24	30	627		I											
25	31	658			I										
26	31	688			I										
27	31	718			I										
28	27	744				I				I					
29	6	749				I				I					
30	30	779				I				I					
31	14	793		I											
32	24	816				I				I					
33	11	826				I				I					
34	28	853				I				I					
35	30	882				I				I					
36	23	905				I					I				
37	13	917				I				I					
38	7	924				I				I					
39	18	942				I				I					
40	6	947					I							I	
41	30	977					I							I	
42	18	994	I												
43	15	1,008		I						I					
44	15	1,023		I							I				
45	17	1,040					I					I			
46	10	1,049		I						I					
47	24	1,073				I				I					
48	9	1,081		I							I				
49	11	1,092				I						I			
50	10	1,101				I				I					
51	10	1,111				I				I					

PROFILE

HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:1,000

TRANSMISSION LINE PROPERTIES

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY											
			POLE TYPE					GUY TYPE						
			A	B	C	D	E	G1	G2	G3	G4	G5	G6	
52	25	1,135			1	✓								
53	12	1,146		1	✓				1	✓				
54	12	1,158			1	✓			1	✓				
55	10	1,168			1	✓								
56	11	1,178		1	✓				1	✓				
57	7	1,185			1	✓			1	✓				
58	15	1,199			1	✓			1	✓				
59	11	1,210			1	✓								

LEGENDS :

1. 22 kv. SPACE AERIAL CABLE
2. 12 METER CONCRETE POLE
3. GUY

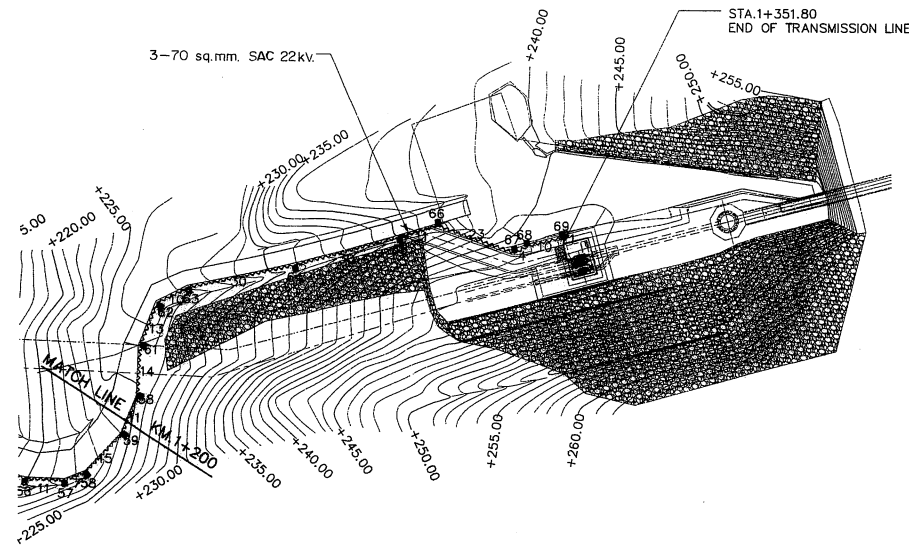
REFERENCE DRAWINGS :

1. TRANSMISSION LINE, 22 kv., PLAN AND PROFILE, KM. 0+000 TO KM. 0+600 KTP2-TS-09
2. TRANSMISSION LINE, 22 kv., PLAN AND PROFILE, KM. 1+200 TO KM. 1+351.80 KTP2-TS-11
3. TRANSMISSION LINE, 22 kv., POLE TYPE "A" AND "B" KTP2-TS-12
4. TRANSMISSION LINE, 22 kv., POLE TYPE "C" AND "D" KTP2-TS-13
5. TRANSMISSION LINE, 22 kv., POLE TYPE "E" KTP2-TS-14
6. TRANSMISSION LINE, 22 kv., TYPE OF ANCHOR GUY KTP2-TS-15

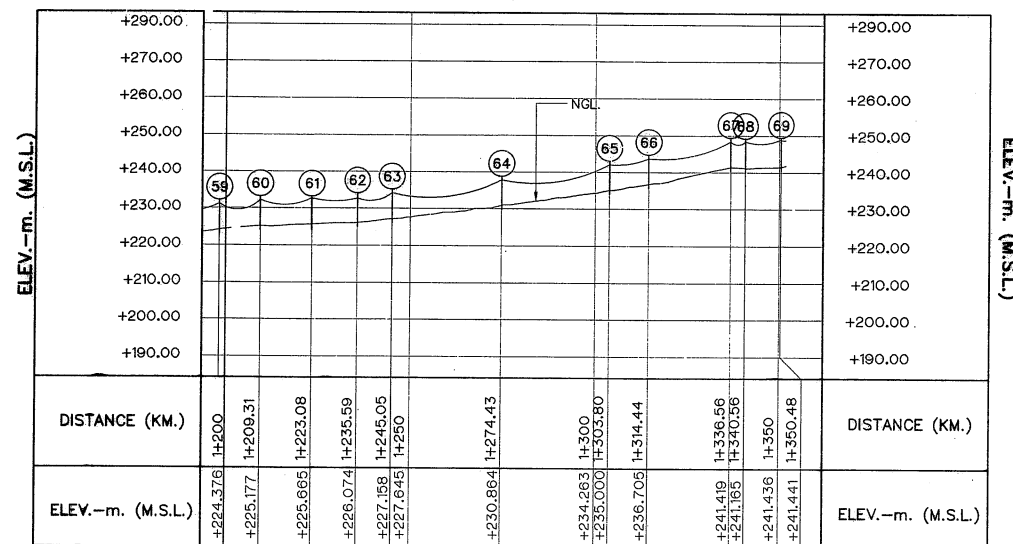
0 10 20 30 40 50 60 70 80
SCALE 1:1,000 METERS

3	1				
2					
1					
NO.	DATE	REVISIONS	CHECKED	APPROVED	
CONSULTANTS			DEDE		

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22KV, PLAN AND PROFILE, KM. 0+600 TO KM. 1+200 (TO CONTROL HOUSE)	
PCMC P&C MANAGEMENT CO., LTD.	REVIEWED S. Kitchai
DESIGNED [Signature] 7W/604	SUBMITTED [Signature]
DRAWN [Signature]	RECOMMENDED [Signature]
CHECKED [Signature] 7W/604	APPROVED [Signature]
DRAWING NO. 17/03/2020	SHEET NO. 89 OF 97
PROJECT MANAGER DATE	KTP2-TS-10



PLAN
SCALE 1:1,000



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

NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. KTP2-GN-03
- THE DRAWING IS DESIGNED FOR GUIDE LINE ONLY,
THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATION

REFERENCE DRAWINGS :

- TRANSMISSION LINE, 22 kV., PLAN AND PROFILE, KM. 0+000 TO KM. 1+200 KTP2-TS-10
- TRANSMISSION LINE, 22 kV., POLE TYPE "A" AND "B" KTP2-TS-12
- TRANSMISSION LINE, 22 kV., POLE TYPE "C" AND "D" KTP2-TS-13
- TRANSMISSION LINE, 22 kV., POLE TYPE "E" KTP2-TS-14
- TRANSMISSION LINE, 22 kV., TYPE OF ANCHOR GUY KTP2-TS-15

TRANSMISSION LINE PROPERTIES

POLE NO.	DISTANCE (METERS)	ACCUMULATIVE DISTANCE (METERS)	QUANTITY											
			POLE TYPE					GUY TYPE						
			A	B	C	D	E	G1	G2	G3	G4	G5	G6	
59	11	1,210												
60	14	1,224												
61	13	1,236												
62	10	1,246												
63	30	1,275												
64	30	1,304												
65	11	1,315												
66	23	1,337												
67	4	1,341												
68	10	1,351												
69	1	1,352												

LEGENDS :

- 22 kV. SPACE AERIAL CABLE
- 12 METER CONCRETE POLE
- GUY

0 10 20 30 40 50 60 70 80
SCALE 1:1,000 METERS

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS

DEDE

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22 kV., PLAN AND PROFILE, KM. 1+200 TO KM. 1+351.80 (TO CONTROL HOUSE)			
PCM P&C MANAGEMENT CO., LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	W.M. 604	SUBMITTED	S. Kitchai
DRAWN	W.M. 604	RECOMMENDED	W.M. 604
CHECKED	W.M. 604	APPROVED	W.M. 604
PROJECT MANAGER		DATE	
17/03/2020		KTP2-TS-11	
DRAWING NO.		SHEET NO.	
KTP2-TS-11		90 OF 97	

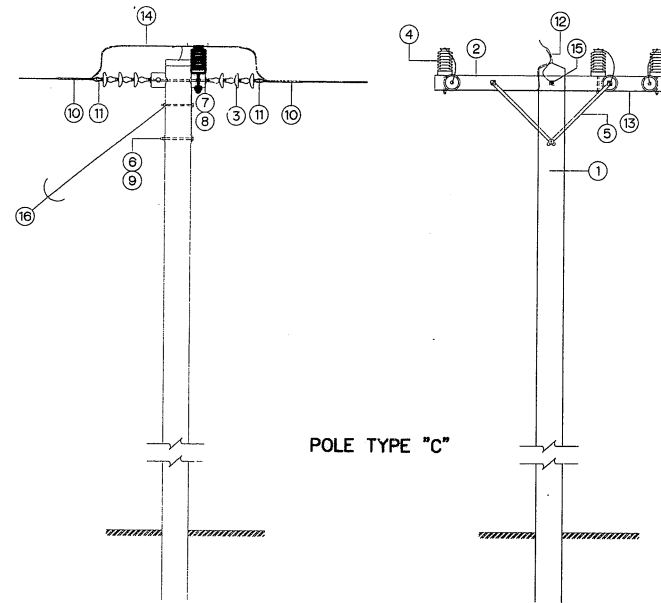


BILL OF MATERIAL POLE TYPE "A"

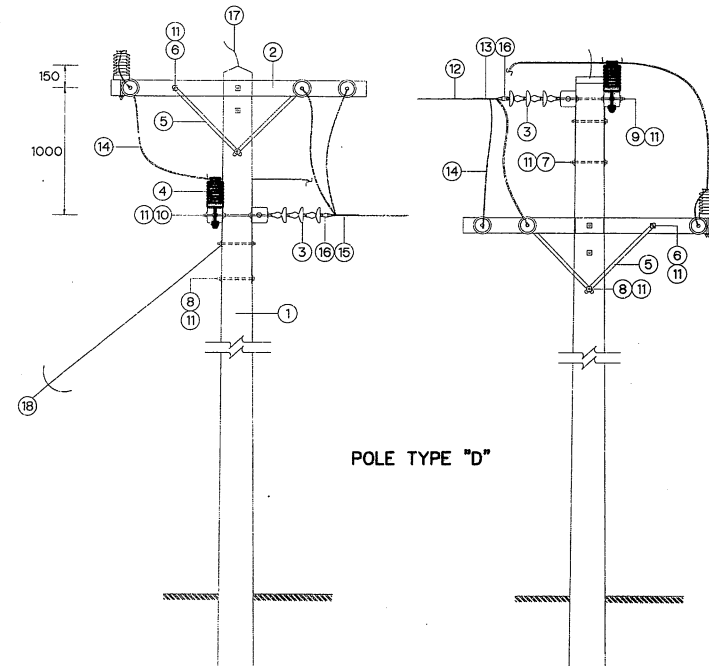
BILL OF MATERIAL POLE TYPE "B"

1. THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATIONS.

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY		KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
		PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22KV, POLE TYPE "A" AND "B"	
 P&C MANAGEMENT CO.,LTD.		 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED  7W1.604		REVIEWED S. Kitchai	
DRAWN 		SUBMITTED 	
CHECKED  7W1.604		RECOMMENDED 	
		APPROVED 	
PROJECT MANAGER		DRAWING NO. KTP2-TS-12	
DATE		SHEET NO. 91 OF 97	



BILL OF MATERIAL POLE TYPE "C"	
ITEM	DESCRIPTION
1	POLE CONCRETE 12.0 M. LONG
2	CROSSARM SPUN PRESTERSED CONCRETE 120x120x2,000 mm.
3	INSULATOR SUSPENSION TYPE TIS 354 TYPE A (CLASS 52-1)
4	INSULATOR LINE POST TYPE ANSI C 29.7 CLASS 57-2L
5	BRACE FLAT FOR CROSSARM 30x6x760 mm.
6	BOLT MACHINE M16x200 mm.
7	BOLT DOUBLE ARMING ROUND EYE M16x450 mm.
8	NUT EYE M 16 DIN 582
9	WASHE SQUARE FLAT 52x52x4.5 mm. HOLE Dia. 18 mm.TIS 258
10	PREFORMED DEAD-END FOR AERIAL CABLE 70 sq.mm.
11	CLEVIS THIMBLE FOR PREFORMED DEAD-END
12	CLAMP SINGLE U-BOLT M 8
13	WIRE STEEL SOLID Dia. 4 MM.
14	AERIAL CABLE 70 sq.mm. 25kV.
15	GROUND WIRE STEEL STRANDED 50/7 DIN 48201
16	GUY (STEEL STARNDARD WIRE 70 Sq.mm.)

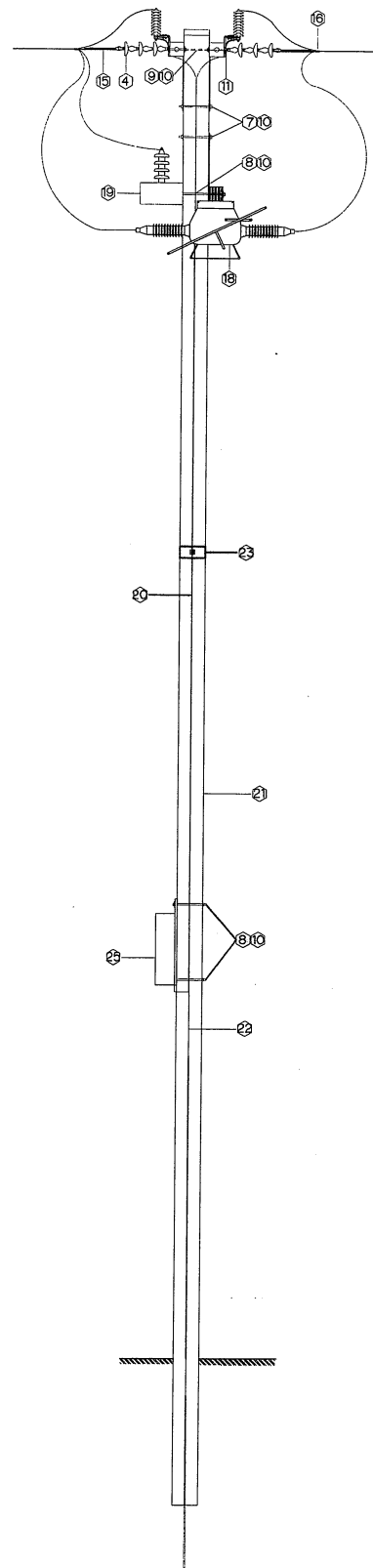


BILL OF MATERIAL POLE TYPE "D"	
ITEM	DESCRIPTION
1	POLE CONCRETE 12 M.LONG
2	CROSSARM SPUN PRESTERSED CONCRETE 120x120x2,000 mm.
3	INSULATOR SUSPENSION TYPE TIS 354 TYPE A (CLASS 52-1)
4	INSULATOR LINE POST TYPE ANSI C 29.7 CLASS 57-2L
5	BRACE FLAT FOR CROSSARM 30x6x760 mm.
6	BOLT MACHINE M16x170 mm.
7	BOLT MACHINE M16x200 mm.
8	BOLT MACHINE M16x250 mm.
9	BOLT DOUBLE ARMING ROUND EYE M16x450 mm.
10	BOLT DOUBLE ARMING ROUND EYE M16x500 mm.
11	WASHER SQUARE FLAT 52x52x4.5 mm. HOLE Dia.18 mm. TIS 258
12	AERIAL CABLE 70 sq.mm. 25 kV.
13	PERFOR DEAD-END FOR AERIAL CABLE 70 sq.mm.
14	AERIAL CABLE 70 sq.mm. 25 kV.
15	PERFOR DEAD-END FOR AERIAL CABLE 70 sq.mm.
16	CLEVIS THIMBLE FOR PERFORMED DEAD-END
17	CLAMP SINGLE U-BOLT M 8
18	GUY (STEEL STARNDARD WIRE 70 Sq.mm.)

NOTE :

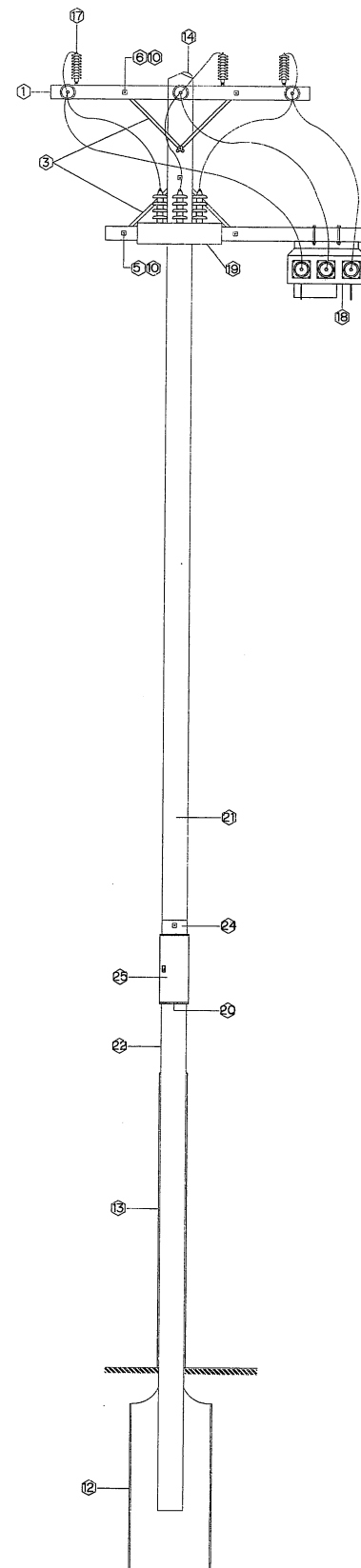
- THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATIONS.

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22kV., POLE TYPE "C" AND "D"	
PCM P&C MANAGEMENT CO.,LTD.	REVIEWED <i>S. Kitchai</i>
DESIGNED <i>W. W.</i> 27/11.604	SUBMITTED <i>W. W.</i>
DRAWN <i>W. W.</i>	RECOMMENDED <i>W. W.</i>
CHECKED <i>W. W.</i> 27/11.604	APPROVED <i>W. W.</i>
NO. DATE REVISIONS CHECKED APPROVED	DRAWING NO. KTP2-TS-13 SHEET NO. 92 OF 97
CONSULTANTS DEDE	PROJECT MANAGER DATE

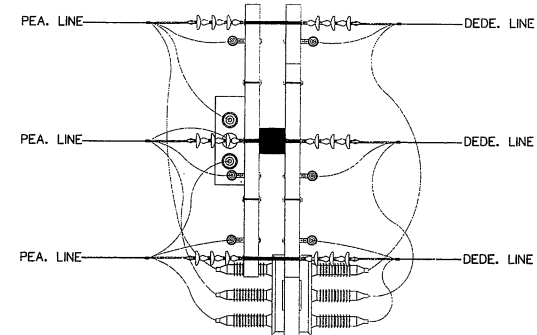


SIDE VIEW

POLE TYPE "E"



FRONT VIEW



TOP VIEW

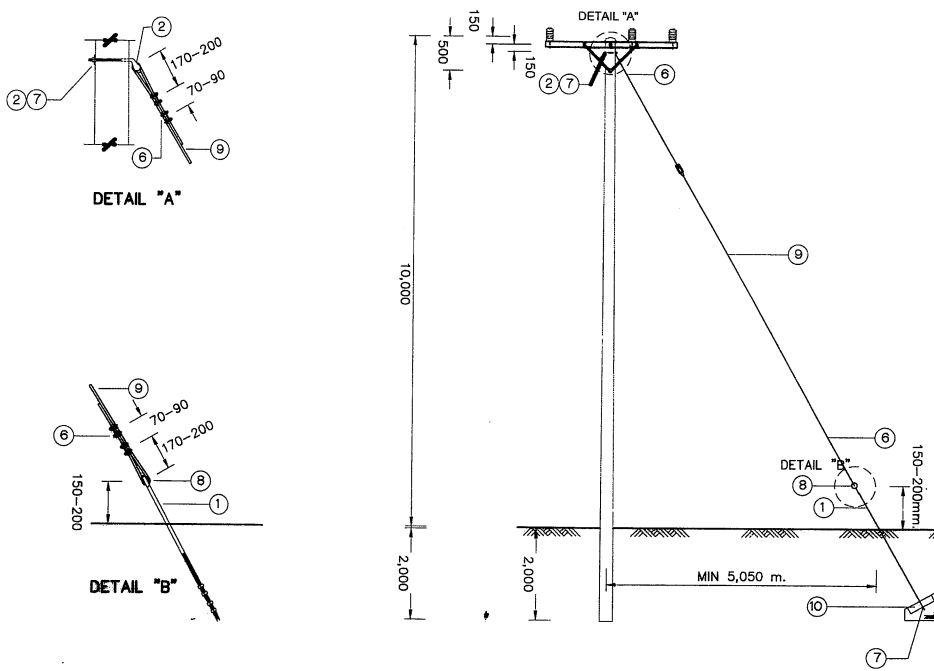
BILL OF MATERIAL POLE TYPE "E"	
ITEM	DESCRIPTION
1	CROSS ARM, SPUN, PRESTRESSED CONCRETE 120X120x2,000 mm.
2	STEEL, SQUARE, 100x3.2 mm., 2,000 mm. LONG
3	BRACE, FLAT FOR CROSS ARM 30X6X760 mm.
4	INSULATOR, SUSPENSION (TYPE D TIS.354) TYPE (CLASS 52-3)
5	BOLT, MACHINE M.16X130 mm. COMPLETE WITH SQUARE NUT
6	BOLT, MACHINE M.16X170 mm. COMPLETE WITH SQUARE NUT
7	BOLT, MACHINE M.16X250 mm. COMPLETE WITH SQUARE NUT
8	BOLT, MACHINE M.16X300 mm. COMPLETE WITH SQUARE NUT
9	BOLT, DOUBLE ARMING, ROUND EYE M.16X450 mm. COMPLETE WITH SQUARE NUT
10	WASHER, SQUARE, FLAT 50X50X5 mm. HOLE Dia.18 mm.
11	NUT, EYE M.16 DIN 582
12	ROD, GROUND, 60X60X5 mm. LONG
13	CONDUIT, PVC, RIGID, Dia. 20X2,500 mm. TIS.216
14	CLAMP, SINGLE U-BOLT, M.8 (WIRE ROPE CLIP)
15	PREFORMED DEAD-END, FOR AERIAL CABLE 25 KV. 70 sq.mm.
16	CONNECTOR, PARALLEL GROOVE, TRIPLE BOLT, AL, 70-185 sq.mm.
17	LIGHTING ARRESTER 21KV. 10 KA.
18	LOAD BREAK SWITCH, SF6, 630A, 24KV.
19	TRANSFORMER, VOLTAGE 3 PHASE, OUTDOOR, RATIO 22,000/400 V., 10 VA.
20	CONTROL CABLE
21	POLE, CONCRETE, 12 m. LONG
22	WIRE, STEEL STRANDED 50/7 sq.mm. TIS.404
23	PLATE, WOOD, SIZE 2X20X30 cm.
24	PLATE, WOOD, SIZE 2X20X60 cm.
25	CONTROL UNIT, AUTOMATIC REMOTE CONTROLLED, FOR SF6

NOTE :

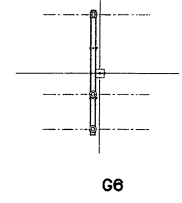
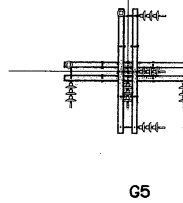
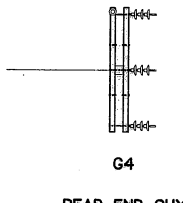
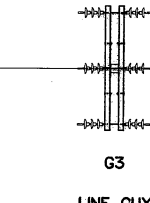
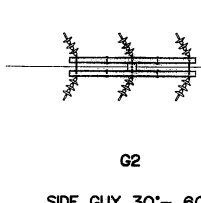
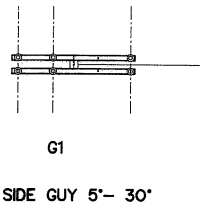
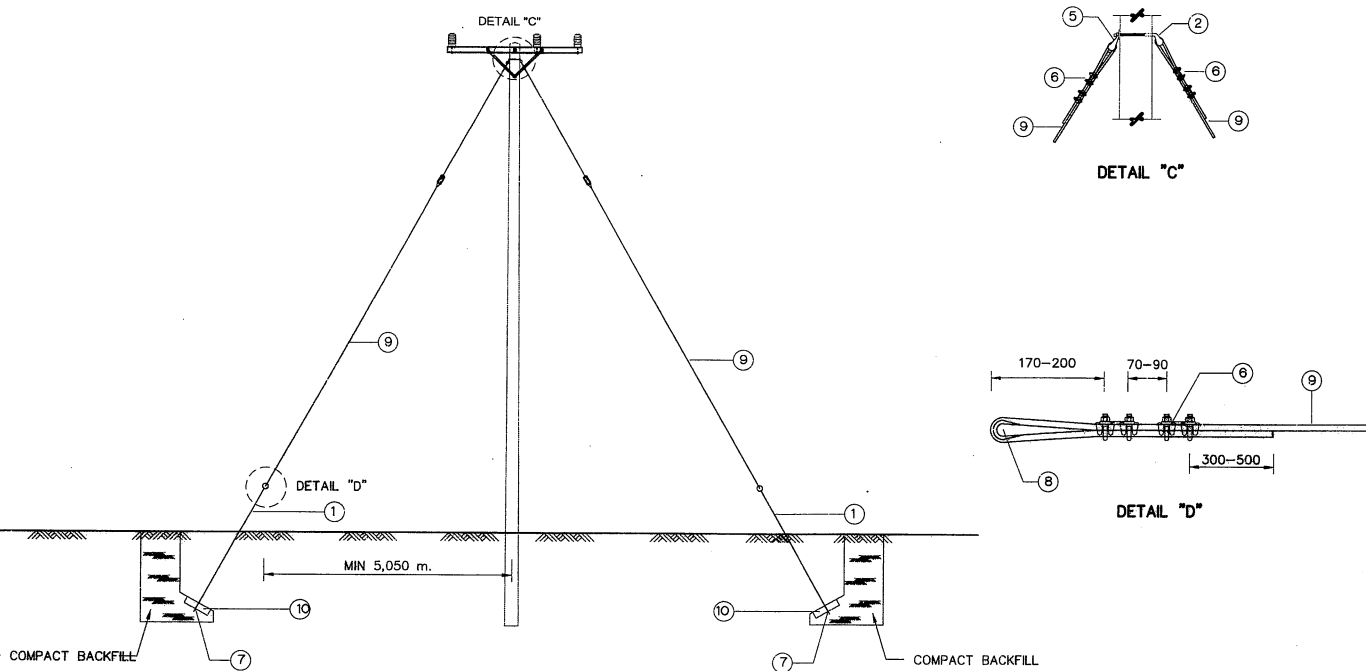
1. THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, THE CONSTRUCTION DRAWING SHALL CONFORM TO PEA'S STANDARD AND REGULATIONS.

 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22KV., POLE TYPE "E"	
PCM P&C MANAGEMENT CO.,LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>[Signature]</i> 27/1/604	REVIEWED <i>[Signature]</i> S. Kitiichai
DRAWN <i>[Signature]</i>	SUBMITTED <i>[Signature]</i>
CHECKED <i>[Signature]</i> 27/1/604	RECOMMENDED <i>[Signature]</i>
APPROVED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
CONSULTANTS	DEDE
PROJECT MANAGER	DATE
17/03/2020	KTP2-TS-14
SHEET NO.	93 OF 97

METHOD OF SINGLE ANCHOR GUY



METHOD OF DOUBLE ANCHOR GUY

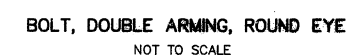
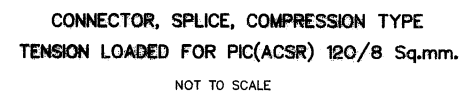
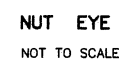
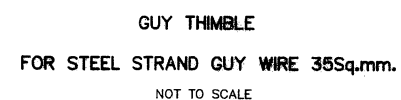
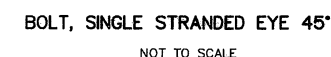
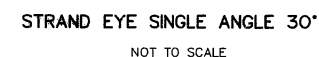
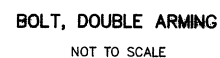


BILL OF MATERIAL FOR ANCHOR GUY

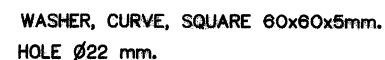
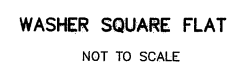
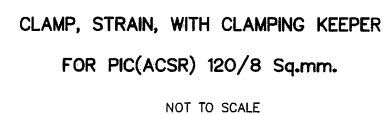
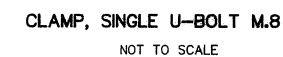
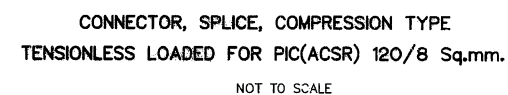
ITEM	DESCRIPTION	REQ'D					
		G1	G2	G3	G4	G5	G6
1	ANCHOR ROD, M. 16 x 2,000 mm. COMPLETE WITH SQUARE NUT	1	2	2	1	2	4
2	BOLT, SINGLE STRANDED EYE 45° M. 16 x 250 mm. COMPLETE WITH SQUARE NUT	1	1	1	1	2	2
3	BOLT, SINGLE STRANDED EYE 30° M. 16 x 250 mm. COMPLETE WITH SQUARE NUT	-	1	-	1	2	-
4	BOLT, DOUBLE ARMING, ROUND EYE, M. 16 x 200 mm. COMPLETE WITH SQUARE NUT	-	-	-	-	-	-
5	STRAND EYE SINGLE ANGLE 45°	-	-	1	-	-	2
6	CLAMP, DOUBLE U-BOLT, M. 16 mm.	4	8	8	8	16	16
7	WASHER, SQUARE FLAT 50 x 50 x 5 mm. HOLE Ø18 mm.	2	2	2	4	6	4
8	GUY, THIMBLE, FOR STEEL STRANDED WIRE 50 Sq.mm.	1	2	2	2	4	4
9	STEEL STRANDED WIRE 50 Sq.mm.	15 m.	35 m.	30 m.	35 m.	70	60
10	CONCRETE ANCHOR 550 x 550 x 180 mm.	1	1	2	2	2	4
11	STRAIN INSULATOR CLASS 54-4	1	1	2	2	2	4

NOTE :
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KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22kV., TYPE OF ANCHOR GUY	
PCM P&C MANAGEMENT CO.,LTD.	REVIEWED <i>S. Kitchai</i>
DESIGNED <i>W. W. W.</i> 27/11/604	SUBMITTED <i>W. W. W.</i>
DRAWN <i>W. W. W.</i>	RECOMMENDED <i>W. W. W.</i>
CHECKED <i>W. W. W.</i> 27/11/604	APPROVED <i>W. W. W.</i>
DATE 17/03/2020	DRAWING NO. KTP2-TS-15
PROJECT MANAGER	SHEET NO. 94 OF 97



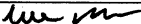
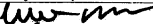
BOLT, MACHINE (D x L)	
1	M. 16 x 130 mm. (T = 35 mm.)
2	M. 16 x 170 mm. (T = 50 mm.)
3	M. 16 x 200 mm. (T = 50 mm.)
4	M. 16 x 250 mm. (T = 75 mm.)
5	M. 16 x 300 mm. (T = 75 mm.)
6	M. 16 x 400 mm. (T = 100 mm.)

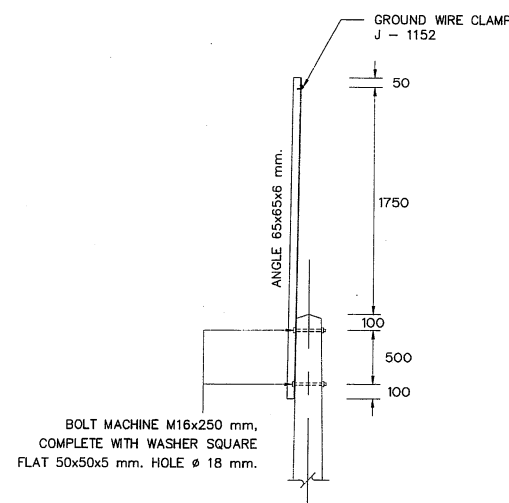
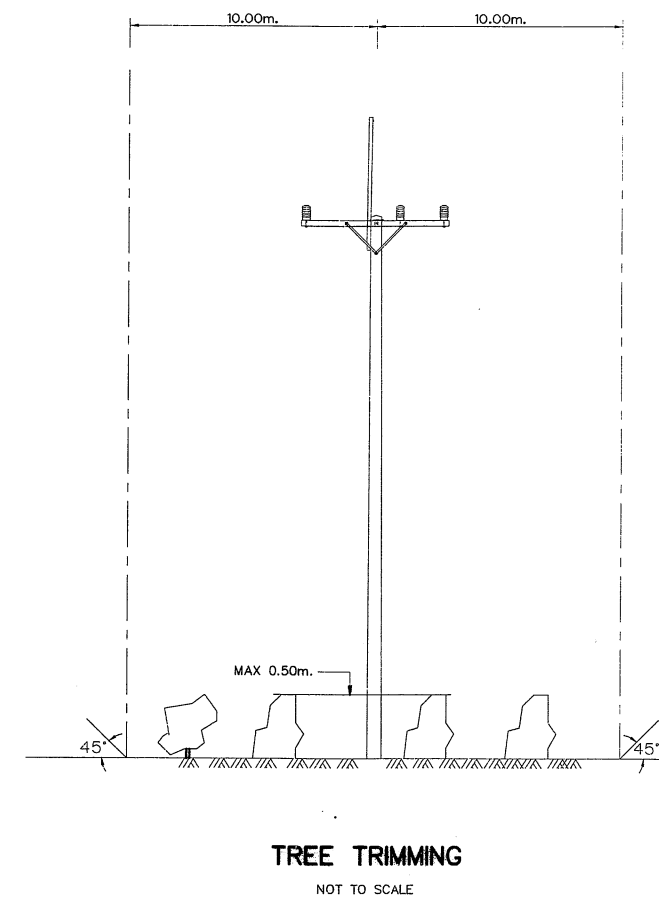
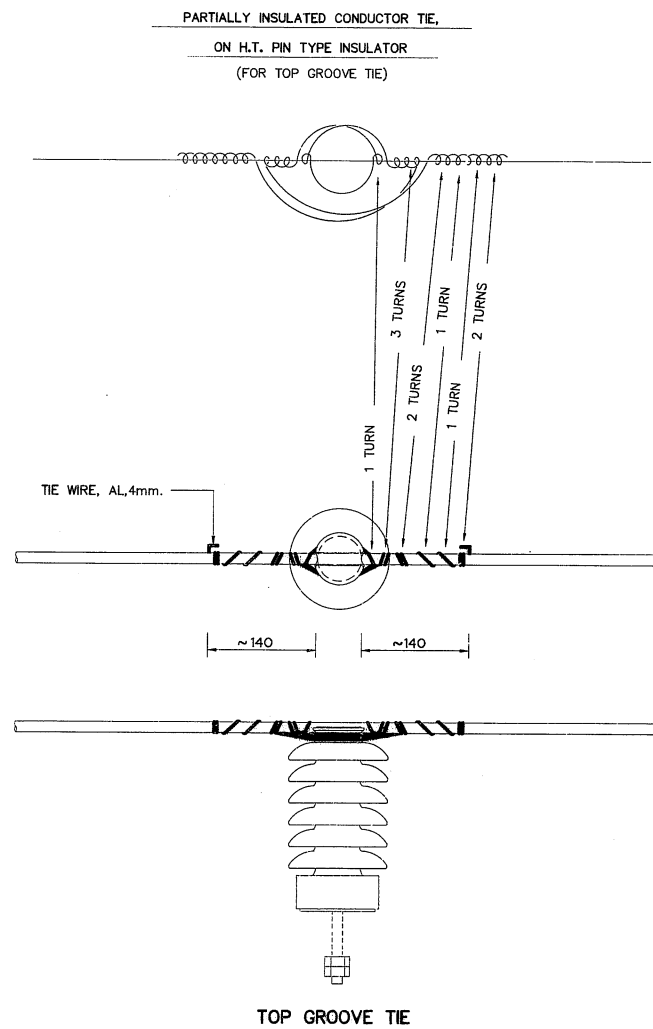
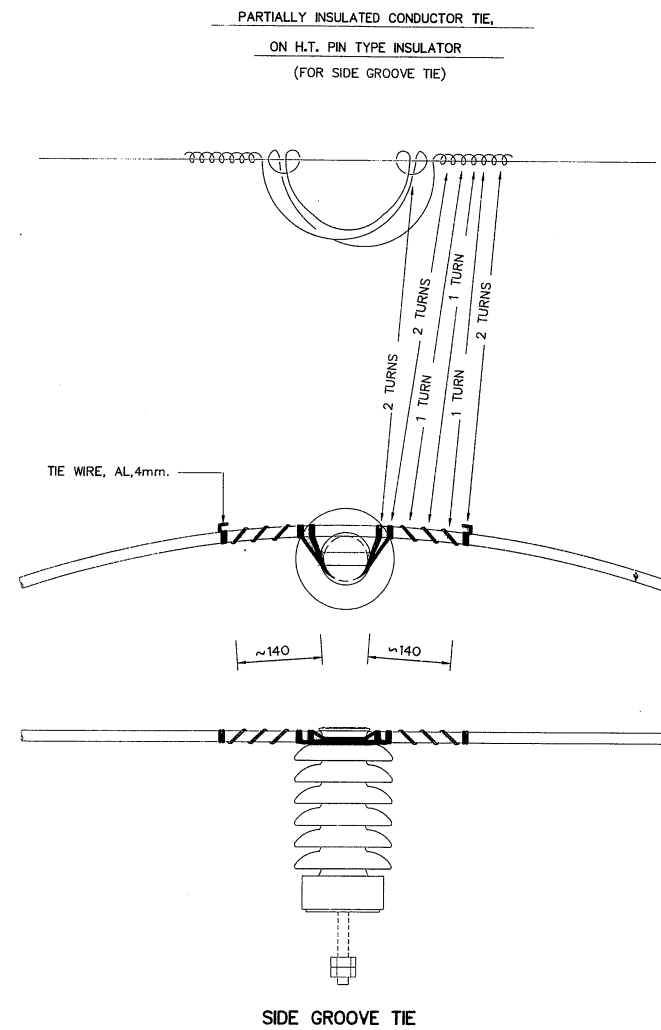


3						 P&C MANAGEMENT CO., LTD.	 MINISTRY OF ENERGY	REVIEWED	S. Kitchinai		
2					DESIGNED				27/01/604	SUBMITTED	
1					DRAWN					RECOMMENDED	
NO.	DATE	REVISIONS	CHECKED	APPROVED	CHECKED				27/01/604	APPROVED	
CONSULTANTS					DEDE						
					 17/03/2020 PROJECT MANAGER DATE					DRAWING NO. KTP2-TS-16 SHEET NO. 05 OF 07	

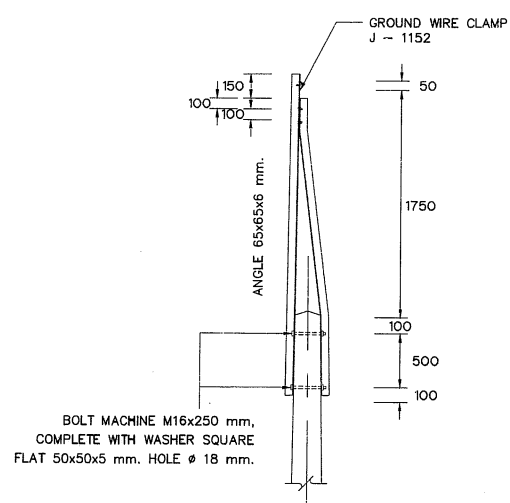
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 KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22kv., POLE ASSEMBLY ACCESSORIES, ANCHOR BOLT FOR GUY	
 P&C MANAGEMENT CO.,LTD.	 Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED 	REVIEWED S. khitchai
DRAWN 	SUBMITTED 
CHECKED 	RECOMMENDED 
 17/03/2020	APPROVED 
PROJECT MANAGER	DRAWING NO. KTP2-TS-16
DATE	SHEET NO. 95 OF 97



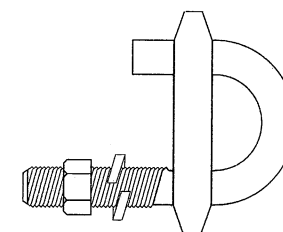
STRAIGHT BAYONET



CORNER BAYONET

OVER HEAD GROUND WIRE BAYONET ASSEMBLY

NOT TO SCALE



GROUND WIRE CLAMP J-1152

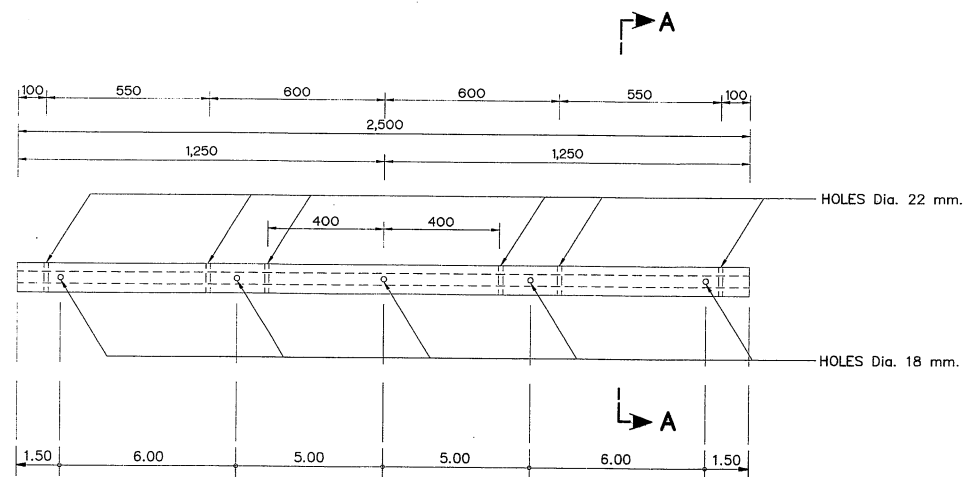
NOT TO SCALE

NOTE :

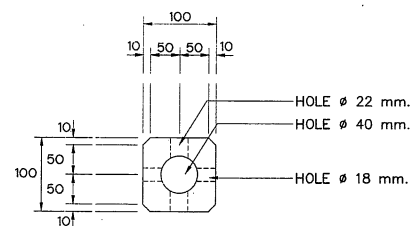
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KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22kV., OVERHEAD GROUND WIRE BAYONET ASSEMBLY	
PCM P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED <i>[Signature]</i> 2W/1.604	REVIEWED <i>[Signature]</i>
DRAWN <i>[Signature]</i>	SUBMITTED <i>[Signature]</i>
CHECKED <i>[Signature]</i> 2W/1.604	RECOMMENDED <i>[Signature]</i>
APPROVED <i>[Signature]</i>	APPROVED <i>[Signature]</i>
PROJECT MANAGER	DATE 17/03/2020
DRAWING NO. KTP2-TS-17	SHEET NO. 96 OF 97

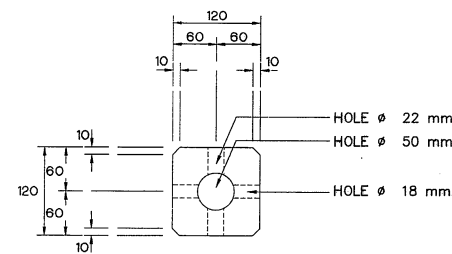
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1				
NO.	DATE	REVISIONS	CHECKED	APPROVED



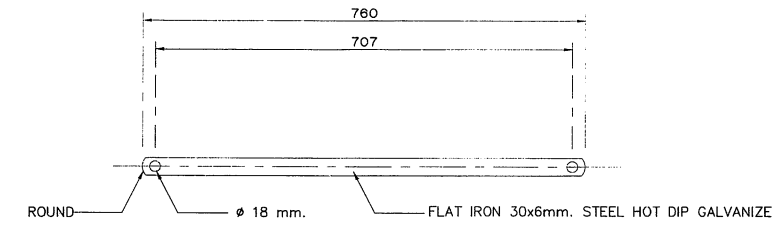
PRESTRESSED CROSS ARM 100x100x2,500mm.



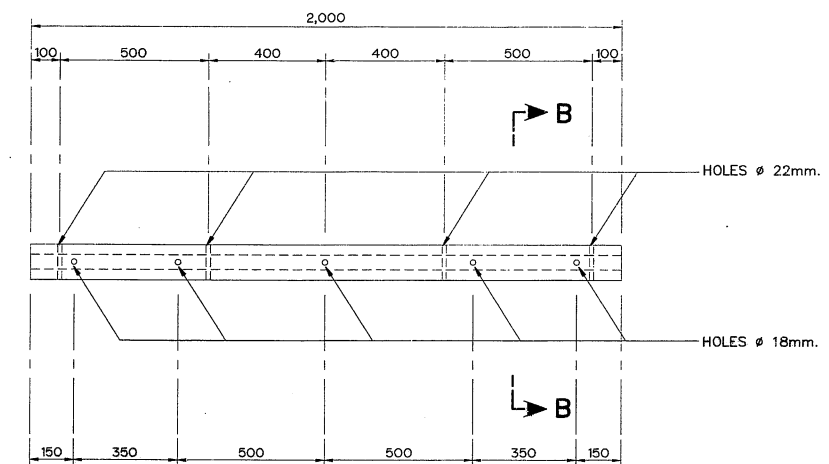
SECTION A-A



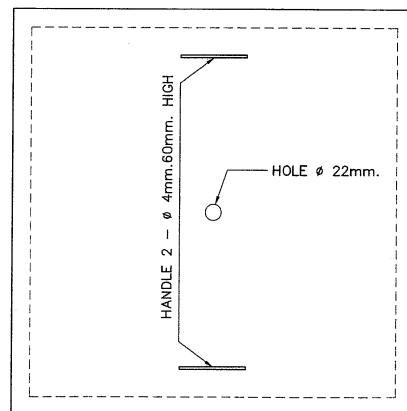
SECTION B-B



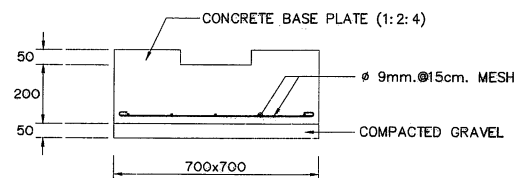
BRACE FLAT FOR CROSS ARM



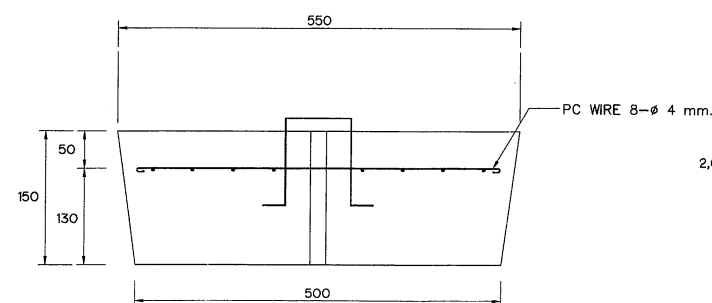
PRESTRESSED CROSS ARM 120X120x2,000mm.



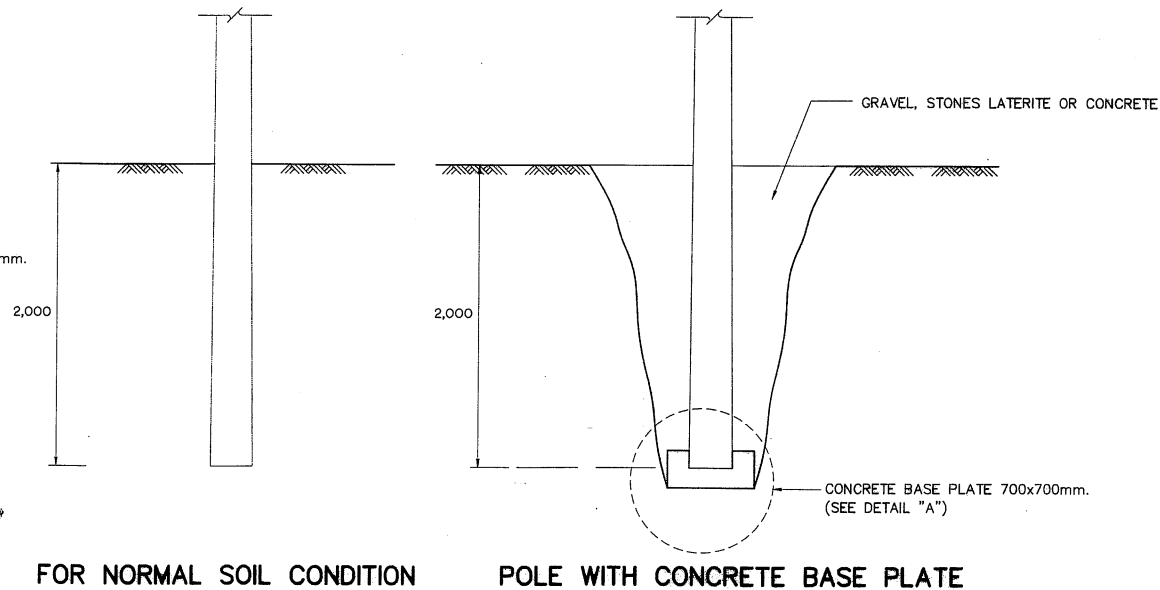
REINFORCED CONCRETE ANCHOR PLATE
550x550x180mm.



DETAIL "A"



REINFORCED CONCRETE ANCHOR PLATE
550x550x180mm.



FOR NORMAL SOIL CONDITION

POLE WITH CONCRETE BASE PLATE

NOTES :

- CONCRETE BASE PLATE WILL BE USE FOR
- POLES WITH ANCHOR GUY TYPES G5 AND G6
- POLES CONSTRUCTED ON SOFT SOIL WITH PRESSURE NOT MIN 1 kg/Sq.mm.
- CONTRACTOR SHALL INVESTIGATE THE SOIL CONDITION FOR EVERY POLES AND VERIFY TO USE CONCRETE BASE PLATE OR NOT. THE INVESTIGATION RESULT SHALL BE SUBMITTED TO FIELD ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION

KINGDOM OF THAILAND Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
KLONG THUNG PHEN 2 HYDROPOWER PROJECT AMPHOE KHAO KHITCHAKUT, CHANGWAT CHANTHABURI	
PART 3 : TRANSMISSION LINE TRANSMISSION LINE 22kV., BURYING DEPTH AND FOUNDATION	
DESIGNED <i>[Signature]</i> 7/11/604	REVIEWED <i>[Signature]</i> 7/11/604
DRAWN <i>[Signature]</i> 7/11/604	SUBMITTED <i>[Signature]</i> 7/11/604
CHECKED <i>[Signature]</i> 7/11/604	RECOMMENDED <i>[Signature]</i> 7/11/604
DATE 17/03/2020	DATE 17/03/2020
PROJECT MANAGER	SHEET NO. 97 OF 97

EXISTING STRUCTURE

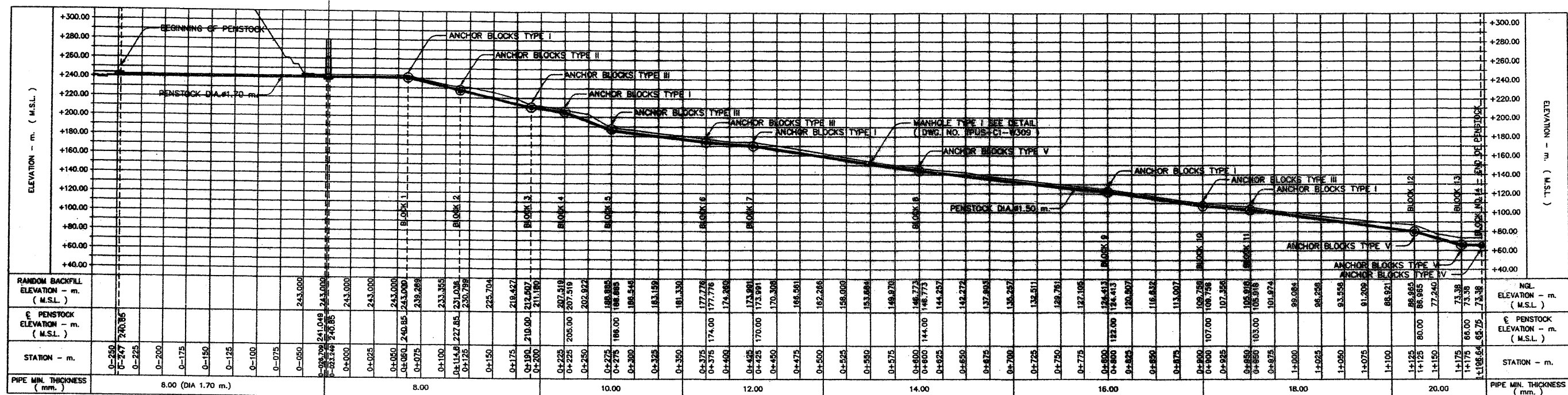
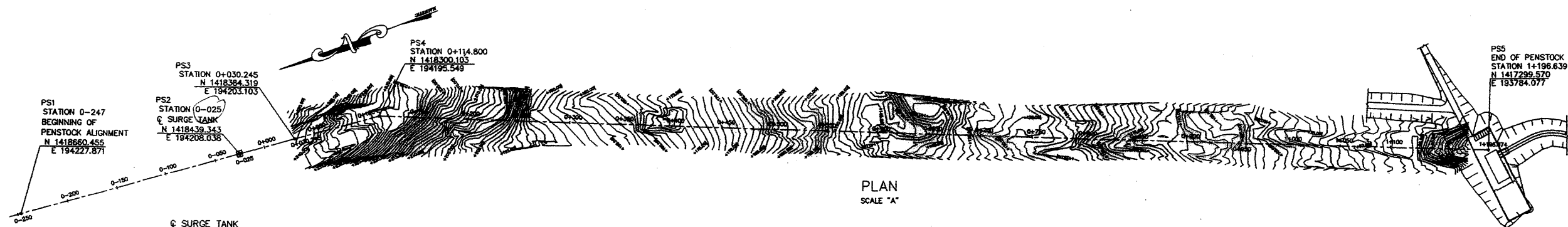


TABLE OF PENSTOCK ALIGNMENT

POINT	DESCRIPTION	COORDINATES		REMARK
		N	E	
PS1	BEGINNING OF PENSTOCK ALIGNMENT	1,418,660.455	194,227.871	PI-12
PS2	Q SURGE TANK	1,418,439.343	194,208.038	PI-8
PS3	PENSTOCK ALIGNMENT	1,418,384.319	194,203.103	-
PS4	PENSTOCK ALIGNMENT	1,418,300.103	194,195.549	-
PS5	END OF PENSTOCK ALIGNMENT	1,417,299.570	193,784.077	PI-10

TABLE OF DRILL HOLES

DRILL HOLE NO.	LOCATION	COORDINATES		DEPTH (m)	ANGLE
		N	E		
0-1	OUTLET PORTAL	1,418,464.269	194,205.506	30.00	VERTICAL
0-2	PENSTOCK ALIGNMENT	1,418,414.470	194,205.510	30.00	VERTICAL
0-3	OUTLET PORTAL	1,418,452.000	194,239.000	20.00	VERTICAL
0-4	SURGE TANK	1,418,439.370	194,207.740	25.00	VERTICAL
0-5	PENSTOCK ALIGNMENT	1,418,344.750	194,199.250	26.00	VERTICAL
0-6	PENSTOCK ALIGNMENT	1,418,224.368	194,188.455	30.00	VERTICAL
0-7	PENSTOCK ALIGNMENT	1,417,391.500	193,823.930	33.00	VERTICAL
0-8	POWER HOUSE	1,417,298.500	193,774.500	40.00	VERTICAL

NOTES:

- ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
- CONTOURS SHOWN ARE BASED ON MAPS TO THE SCALE 1:400 SURVEYED BY THE CONTACTOR IN DECEMBER 2001.
- AFTER INSTALLATION OF THE PENSTOCK TO THE APPROVAL OF THE ENGINEER, THE EXCAVATED PENSTOCK TRENCH SHALL BE BACKFILLED TO NATURAL GROUND LEVEL OR AS DIRECTED BY THE ENGINEER. THE TOP OF THE BACKFILL SHALL BE PROTECTED WITH 10 cm TOPSOIL AND SOODING.
- STEPPED CATCH DRAINS SHALL BE CONNECTED TO THE TOE DRAIN AT THE SURGE TANK AREA AND SHALL BE EXTENDED TO NATURAL GULLIES AND TO THE INTERCEPTION DITCH AT THE POWER STATION AS DIRECTED BY THE ENGINEER.
- STATIONS ALONG THE PENSTOCK ALIGNMENT ARE MEASURED HORIZONTALLY ALONG THE CENTRE LINE OF THE PENSTOCK.
- STEEL PLATE FOR PENSTOCK AND PENSTOCK COMPONENTS SHALL COMPLY WITH ASTM A516 GRADE 70.
- CONCRETE QUALITY FOR ANCHOR BLOCK AT BIFURCATION SHALL BE CLASS B21.
- THE CONTRACTOR SHALL SUBMIT DETAILED WORKSHOP DRAWINGS FOR APPROVAL BY THE ENGINEER BEFORE MANUFACTURE OF PENSTOCK.
- ONE CONTROL CABLE AND ONE POWER CABLE FROM THE POWER HOUSE TO THE ULTRASONIC FLOW MEASURING INSTRUMENT IN THE HEADRACE TUNNEL SHALL BE DESIGNED BY THE CONTRACTOR TO THE APPROVAL OF THE ENGINEER.
- ACCESS ROAD TO SURGE TANK AREA NOT SHOWN.
- THE DRAWING NO. TPUS-PS-001 PENSTOCK IS CANCELED AND REPLACED BY TPUS-PS-001A
- ANCHOR BLOCK DETAIL SEE DWG.NO. TPUS-PS-006A

LEGEND:

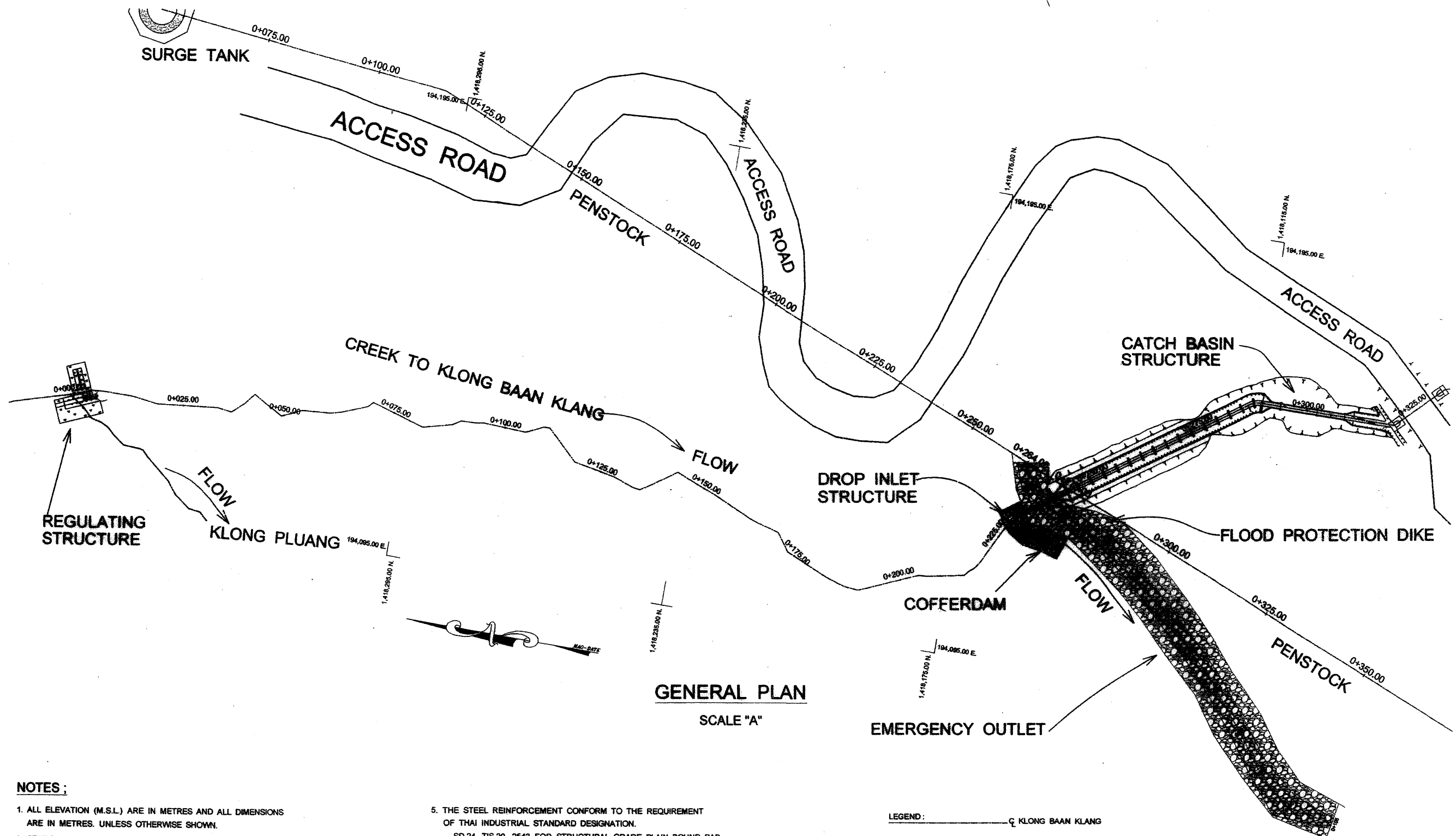
----- PENSTOCK ALIGNMENT

REFERENCE DRAWINGS:

- GENERAL DRAWINGS, PROJECT LAYOUT TPUS-GD-001
- HEADRACE TUNNEL, HEADRACE OUTLET PORTAL EXCAVATION, PLAN AND SECTIONS TPUS-HT-003
- POWER HOUSE, GENERAL LAYOUT TPUS-PH-001
- PENSTOCK, ANCHOR BLOCKS PLAN AND SECTIONS TPUS-PS-006
- PENSTOCK, DRAINAGE ARRANGEMENTS TPUS-C1-W304
- PENSTOCK, TYPICAL MANHOLE TPUS-C1-W309

SCALE "A" 0 20 40 60 80 100 200
ORIGINAL SCALE 1:4500

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
KLONG THUNG PHEN HYDROELECTRIC PROJECT UPPER SCHEME	
THUNG PHEN DAM PENSTOCK IN HEADRACE TUNNEL TO POWER STATION PLAN AND SECTIONS AS-BUILD DRAWING	
THAIWAT ENGINEERING CO.,LTD. SUBMITTED PROJECT ENGINEER	TEAM CONSULTING ENGINEERING AND MANAGEMENT C P&C MANAGEMENT CO.,LTD. CHECKED: Sommart Y. APPROVED: Sommart Y. RESIDENT ENGINEER
DATE 20/1/54	DRAWING NO. TPUS-C1-W303A

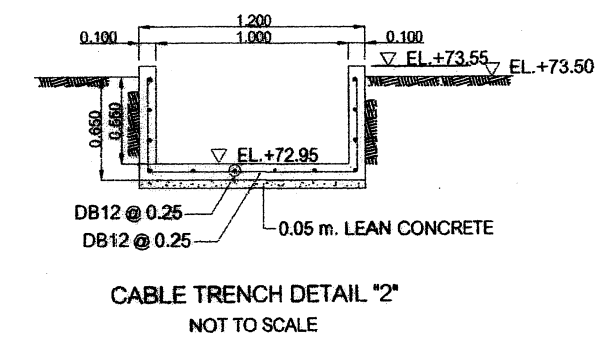
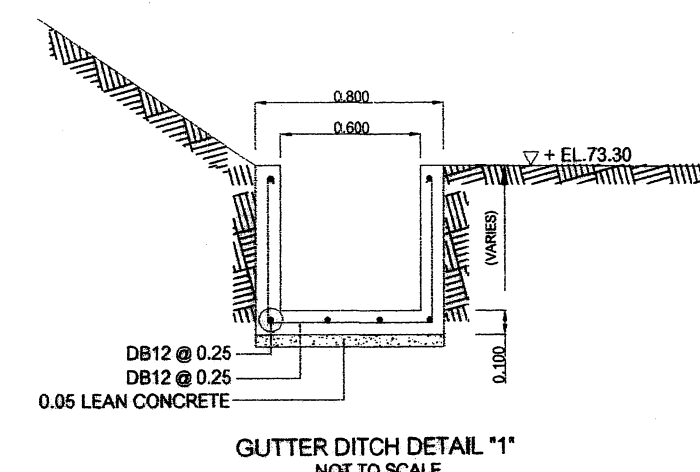
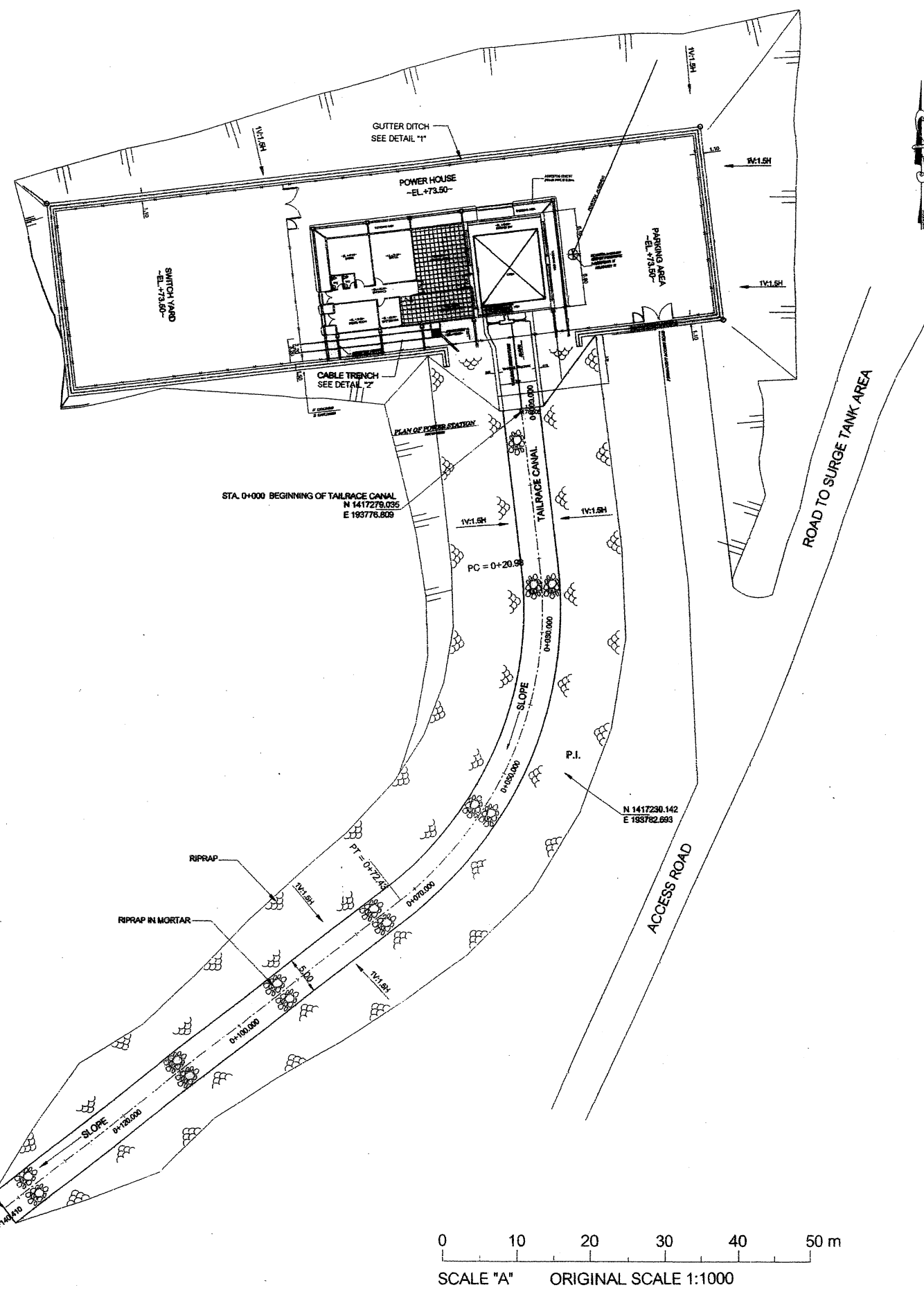


NOTES:

- ALL ELEVATION (M.S.L.) ARE IN METRES AND ALL DIMENSIONS ARE IN METRES. UNLESS OTHERWISE SHOWN.
- STATIONS ALONG THE CREEK TO KLONG BAAN KLANG ARE MEASURED HORIZONTALLY ALONG THE CENTER LINE OF THE CREEK TO KLONG BAAN KLANG.
- THE DROP INLET STRUCTURE, THE HEADWALL FOR RC PIPE CULVERT, THE DITCH LINING, THE RC DRAIN OUTLET AND THE CATCH BASIN SHALL BE FOLLOWED THE STANDARD DRAWING OF HIGHWAY DEPARTMENT DWG. NO. DS - 102, DS - 201, DS - 203 AND DS - 301.
- CONCRETE CLASS
 - STRUCTURAL CONCRETE, SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 210 ksc. IN 28 DAY BY Ø 0.15 x 0.30 M. CYLINDER TEST
 - CONCRETE LINING FOR SURFACE DRAINS, SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 150 ksc. IN 28 DAY BY Ø 0.15 x 0.30 M. CYLINDER TEST
 - LEAN CONCRETE, SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 150 ksc. IN 28 DAY BY Ø 0.15 x 0.30 M. CYLINDER TEST
- THE STEEL REINFORCEMENT CONFORM TO THE REQUIREMENT OF THAI INDUSTRIAL STANDARD DESIGNATION.
 - SD 24, TIS 20 - 2543 FOR STRUCTURAL GRADE PLAIN ROUND BAR
 - SD 40, TIS 24 - 2536 FOR STRUCTURAL GRADE PLAIN DEFORMED BAR
- THE CONTRACTOR SHALL NOT INTERFERE WITH THE NATURAL FLOW OF THE CREEK TO THE KLONG BAAN KLANG WITHOUT PRIOR APPROVAL BY THE ENGINEER.
- WHERE THE SIDE SLOPE IS POOR, DETAILED DRAWINGS SHALL BE RESUBMITTED FOR APPROVAL BY THE ENGINEER, OR AS DIRECTED BY THE ENGINEER.

SCALE "A"
SCALE 1: 1250
0 10 20 30
METERS

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
KLONG THUNG PHEN HYDROELECTRIC PROJECT UPPER SCHEME	
DAM AND POWER DEVELOPMENT THUNG PHEN DAM PENSTOCK CROSSING AND IMPROVEMENT OF EXISTING CREEK FOR BAAN KLANG IRRIGATION AREA GENERAL PLAN	
THAIWAT ENGINEERING CO., LTD.	TEAM CONSULTING ENGINEERING AND MANAGEMENT CO., LTD. P&C MANAGEMENT CO., LTD.
AS-BUILT DRAWING <i>[Signature]</i> CONTRACTOR REPRESENTATIVE	CHECKED <i>Sommart Y.</i> APPROVED <i>Sommart Y.</i> RESIDENT ENGINEER
DATE 24/2/56	DRAWING NO. TPUS-C1-W310-ADD1



- NOTE**
1. ALL ELEVATIONS (M.S.L.) AND DIMENSIONS ARE IN METRES. UNLESS OTHERWISE SHOWN.
- REFERENCE DRAWINGS**
1. POWER HOUSE AND TAILRACE CANAL. GENERAL ARRANGEMENT TPUS-C1-P001
 2. POWER HOUSE. GENERAL LAYOUT TPUS-C1-P101

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
KLONG THUNG PHEN HYDROELECTRIC PROJECT UPPER SCHEME	
THUNG PHEN DAM POWER STATION AND TAILRACE CANAL GENERAL ARRANGEMENT AS-BUILT DRAWING	
THAIWAT ENGINEERING CO., LTD.	TEAM CONSULTING ENGINEERING AND MANAGEMENT CO., LTD. P&C MANAGEMENT CO., LTD.
SUBMITTED <i>[Signature]</i> PROJECT ENGINEER	CHECKED <i>[Signature]</i> APPROVED <i>[Signature]</i> RESIDENT ENGINEER
DATE 22/10/56	DRAWING NO. TPUS-C1-P001 A4

รายการ แก้ไข-เพิ่มเติม (ADDENDUM)
งานปรับปรุงประสิทธิภาพและเพิ่มกำลังผลิต โครงการไฟฟ้าพลังน้ำคลองทุ่งเพล
ตำบลพลวง อำเภอบางขัน จังหวัดพัทลุง

แบบก่อสร้าง Klong Thung Phen 2 Hydropower Project Part 3 : Transmission Line Volume 4 Drawings

1. แก้ไขรายละเอียดแบบหน้า 81 – 84 Transmission Line 22 kV., Plan and Profile จากเดิมใช้เสาไฟฟ้าแรงสูง 12 เมตร เปลี่ยนเป็นใช้เสาไฟฟ้าแรงสูง 14 เมตร ทั้งนี้ให้เป็นไปตามมาตรฐานและระเบียบของการไฟฟ้าส่วนภูมิภาค
2. ยกเลิกแบบหน้า 88 – 90 : Transmission Line 22 kV., Plan and Profile (To Control House)