



Department of Alternative
Energy Development Efficiency
MINISTRY OF ENERGY

HUAI MAE SOT HYDROPOWER PROJECT

TAK PROVINCE

CONTRACT C1/1

CIVIL WORKS

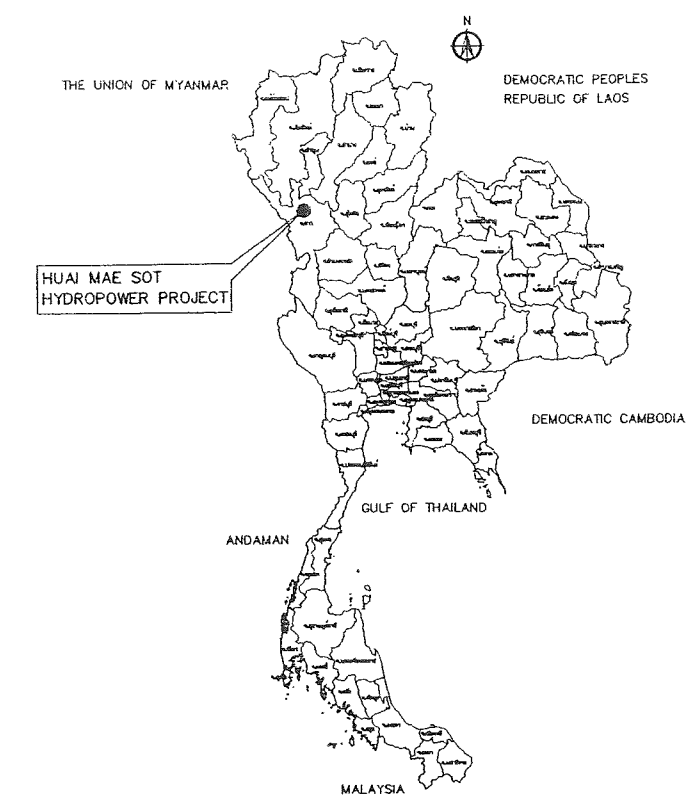
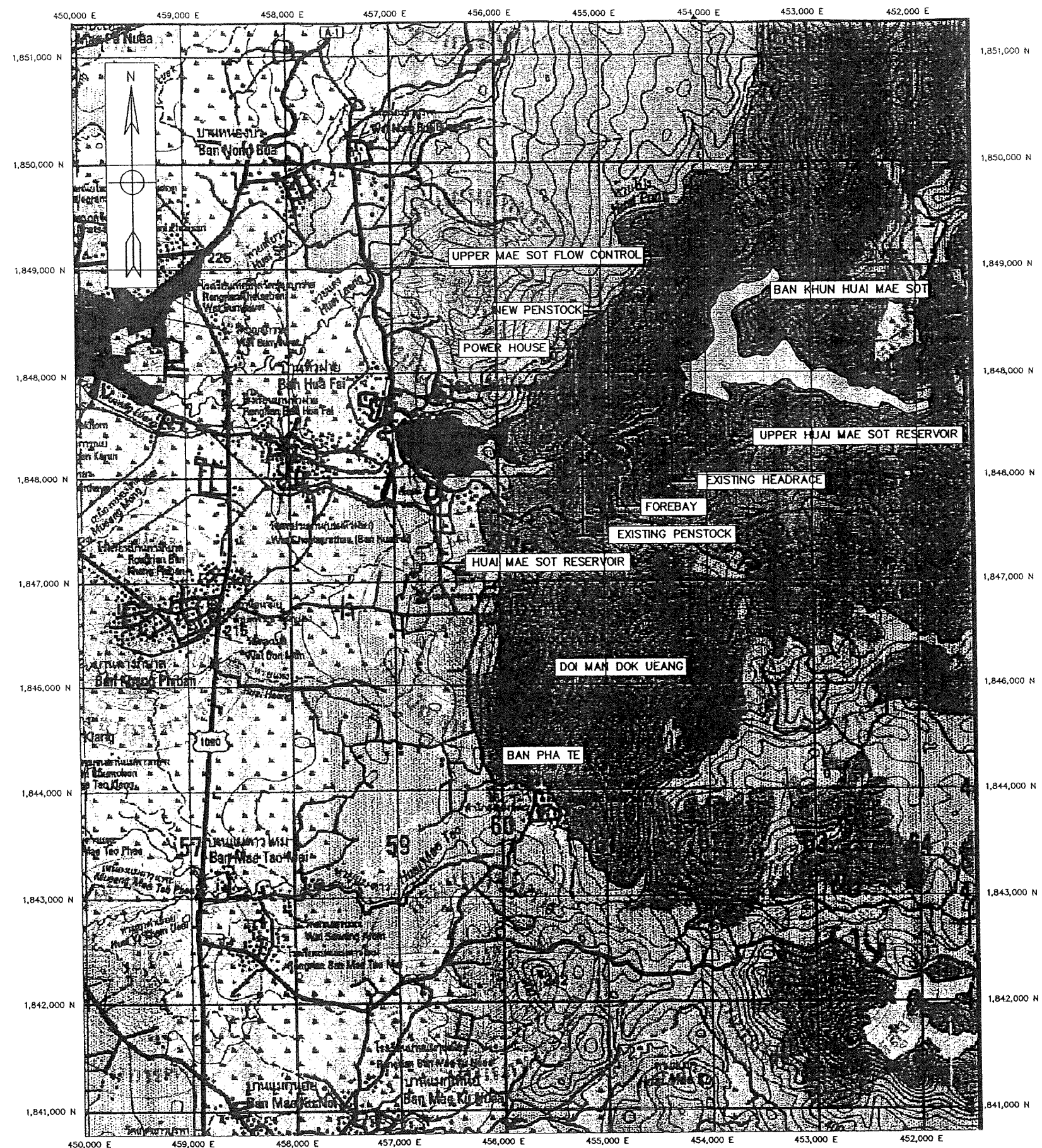
VOLUME 4

DRAWINGS

MAHA NAKORN CONSULTANTS CO.,LTD.

LIST OF DRAWINGS
HUI MAE SOT HYDROPOWER PROJECT
CONTRACT C1: CIVIL WORKS

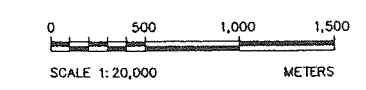
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LOCATION MAP
NOT TO SCALE

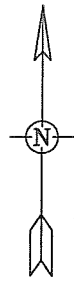
LEGENDS :

- HIGHWAY
- STREAM
- DAM
- HEADRACE
- FOREBAY
- PENSTOCK
- POWERHOUSE
- EXISTING ROAD
- ACCESS ROAD
- BRIDGE



KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS GENERAL LOCATION MAP			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	DATE	REVIEWED	DATE
DRAWN	DATE	SUBMITTED	DATE
CHECKED	DATE	RECOMMENDED	DATE
APPROVED	DATE	APPROVED	DATE
PROJECT MANAGER		DATE	
DRAWING NO.		SHEET NO.	
HMS-GN-01		1 OF 39	

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED



E.461,000
+ N.1,847,500

NOTES :

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

REFERENCE DRAWING

1. PENSTOCK NO. 1. PLAN AND PROFILE,STA. 0+000.000 TO STA.0+500.000
2. PENSTOCK NO. 2. PLAN AND PROFILE,STA. 0+500.000 TO STA.1+000.000
3. PENSTOCK NO. 3. PLAN AND PROFILE,STA. 1+000.000 TO STA.1+460.825

E.461,600
+ N.1,847,500

แนวแกนเขื่อนชลประทาน

+ N.1,847,500

E.462100
+ N.1,847,300

N.1,847,300 +

N.1,847,300 +

จุดสิ้นสุดแนวท่อกอง C1/1
Sta.0+900.674

ขอบเขตงาน C1/1

ขอบเขตงาน C1/2

POWER HOUSE

HUAI MAE SOT

OF SEPARATE NEW PENSTOCK

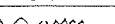
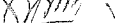
EXITING PENSTOCK

SITE PLAN
NOT TO SCALE

จุดเริ่มต้นแนวท่อกอง C1/1
Sta.1+230.674

1846789.478 461086.017 289.09 RID002
1846777.966 461186.871 294.73 RID001

RID002
RID001

3					DESIGNED		SUBMITTED		30.9.59
2					DRAWN		RECOMMENDED		30.9.59
1									
NO.	DATE	REVISIONS	CHECK	APPROVE	CHECKED		APPROVED		30.9.59
CONSULTANTS		DEDE			PROJECT MANAGER		DRAWING NO.		SHEET NO.
					DATE		HMS-GN-02(S)		2 OF 39

ABBREVIATIONS :

A	CROSS-SECTION AREA OF FLOW
AC.	ASBESTOS CEMENT PIPE
AGG.	AGGREGATE
ALT.	ALTERNATIVE
APPROX.	APPROXIMATE
AZ.	AZIMUTH
B.	BEGINNING OF SURVEY
BC.	BEGINNING OF CURVE
BF.	BOTTOM FACE
B	BEAM
B.M.	BENCH MARK
BOTT.	BOTTOM
BRG.	BEARING
C.B.R.	CALIFORNIA BEARING RATIO
C/C	CENTER TO CENTER
C	CENTER LINE
CL	CLEARANCE
CM. OR cm.	CENTIMETER
CM./S OR cm./s	CENTIMETER PER SECOND
COL.	COLUMN
CONC.	CONCRETE
D	DEGREE OF CURVE
DB.	DEFORM BAR
d.	DEPTH OF WATER
DIA. OR Ø	DIAMETER
DOH.	DEPARTMENT OF HIGHWAY
DWG.	DRAWING
DEDE.	DEPARTMENT OF ALTERNATIVE ENERGY
E	EAST
E	END OF SURVEY
EA.	EACH
E.C.	END OF CURVE
E.F.	END OF FACE
EL. OR ELEV.	ELEVATION
EXIST.	EXISTING
EXP.	EXPANSION
EXT.	EXTERIOR
EX.	EXTERNAL DISTANCE OF CURVE
f	FREE BOARD, FINISH
F.F.	FAR FACE
F.S.L.	FULL SUPPLY LEVEL
FTG.	FOOTING
HD.	HEAD
HEX.	HEXAGONAL
HOR.	HORIZONTAL
I.D.	INSIDE DIAMETER
I.F.	INSIDE FACE
IN. OR "	INCH
INT.	INTERIOR
INV.	INVERT
Kg.	KILOGRAM
Km.	KILOMETER
KPH.	KILOMETER PER HOUR
KSC.	KILOGRAM PER SQUARE CENTIMETER
L	LENGTH OF CURVE
LC.	LENGTH OF HORIZONTAL CURVE
LONG.	LONGITUDINAL
LT.	LEFT
L.W.L.	LOW WATER LEVEL
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

MAX.	MAXIMUM
M.S.L.	MEAN SEA LEVEL
MISC.	MISCELLANEOUS
N.	NORTH
n.	MANNING'S ROUGHNESS COEFFICIENT
N.F.	NEAR FACE
NGL.	NATURAL GROUND LEVEL
NO. OR #	NUMBER
N.W.L.	NORMAL WATER LEVEL
OD.	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
O&M	OPERATION & MAINTENANCE
PC.	POINT OF HORIZONTAL CURVATURE
PI.	POINT OF HORIZONTAL INTERSECTION
PL	PLATE
P.O.C.	POINT ON CURVE
P.O.T.	POINT ON TANGENT
P.O.S.T.	POINT ON SUB-TANGENT
PRC.	POINT OF HORIZONTAL REVERSE CURVE
PT.	POINT OF TANGENT
PVC.	POLYVINYL CHLORIDE
PVC.	POINT OF VERTICAL CURVATURE
PVI.	POINT OF VERTICAL INTERSECTION
PVRC.	POINT OF VERTICAL REVERSE CURVE
PVT.	POINT OF VERTICAL TANGENT
Q.	DISCHARGE
QTY. QUAN.	QUANTITY
R	RADIUS OF CURVATURE
r	HYDRAULIC RADIUS
RØ, Ø	ROUND BAR
RC.	REINFORCED CONCRETE
RD.	ROAD
REF.	REFERENCE
REINF.	REINFORCEMENT
REQ'D	REQUIRED
RID.	ROYAL IRRIGATION DEPARTMENT
SCH.	SCHEDULE
SE.	SUPERELEVATION
SETC.	SECTION
S.P.C.T.	STANDARD PROCTOR COMPACTION TEST
S.S.	SIDE SLOPE
STIR.	STIRRUP
STA.	STATION
STD.	STANDARD
STR.	STRUCTURE
SYMM.	SYMMETRICAL
T.	TANGENT LENGTH, THICKNESS
T	TON
THK.	THICKNESS
T.F.	TOP FACE
T.I.S.	THAI INDUSTRIAL STANDARD
Ts	SUPERELEVATION TRANSITION LENGTH
TYP.	TYPICAL
V.	VELOCITY OF FLOW
V.C.	VERTICAL CURVE
Vc.	LENGTH OF VERTICAL CURVE
VER.	VERTICAL
VOL.	VOLUME
W/	WITH
W.C.	WATER CLOSET
Ø	ANGLE
Δ	DEFLECTION ANGLE

SYMBOLS :

	TYPICAL NORTH ARROW
	CENTER LINE
	PAVED ROAD
	DIRT ROAD, LAÏTE ROAD OR TRACK
	VILLAGE
	CITY OR DISTRICT
	POND OR SWAMP
	CULVERT UNDER ROAD
	BRIDGE
	POLE
	TEST PIT
	EXISTING HAND AUGER
	EXISTING DRILL HOLES
	DRILL HOLES
	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 DUTY TO CHECK THE CORRECTION OF ALL RELEVANT LOCATIONS, DIMENSIONS, ELEVATIONS AND OTHER DATA AS PROVIDED BY THE DRAWING AND TECHNICAL SPECIFICATIONS BEFORE THE IMPLEMENTATION OF THE WORKS.
- IN CASE OF ANY DETAILS BEING NOT MENTIONED OR NOT SHOWN IN THE DRAWING 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 CONFORM TO THE FOLLOWING TABLE OR AS DIRECTED BY FIELD ENGINEER.

EXISTING GROUND SLOPE 1:S	EARTH		HARD ROCK	
	1:S	1:S	1:S	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

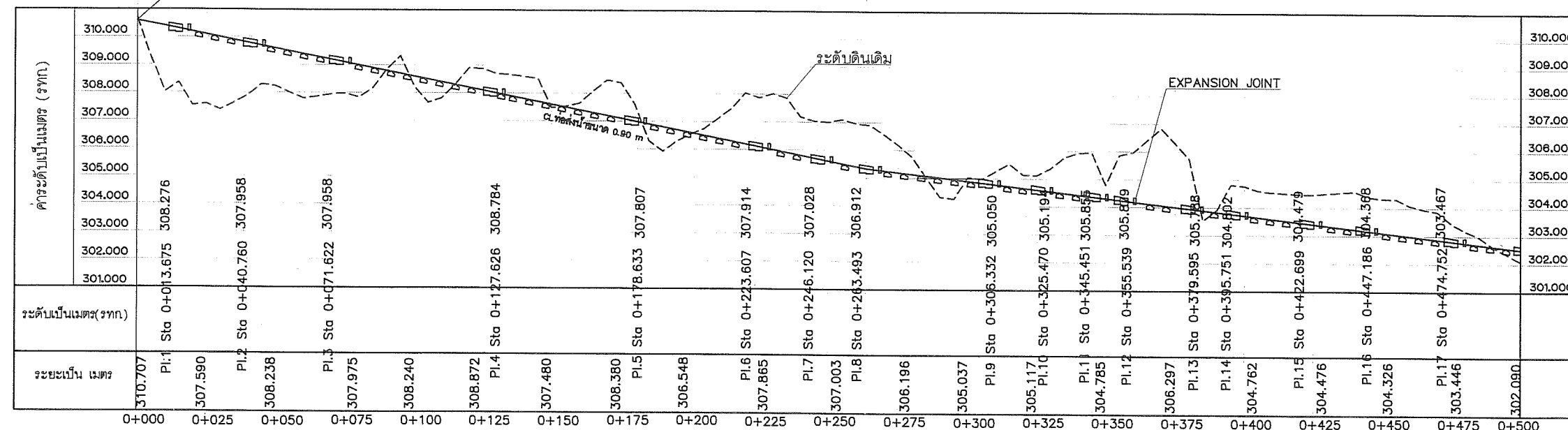
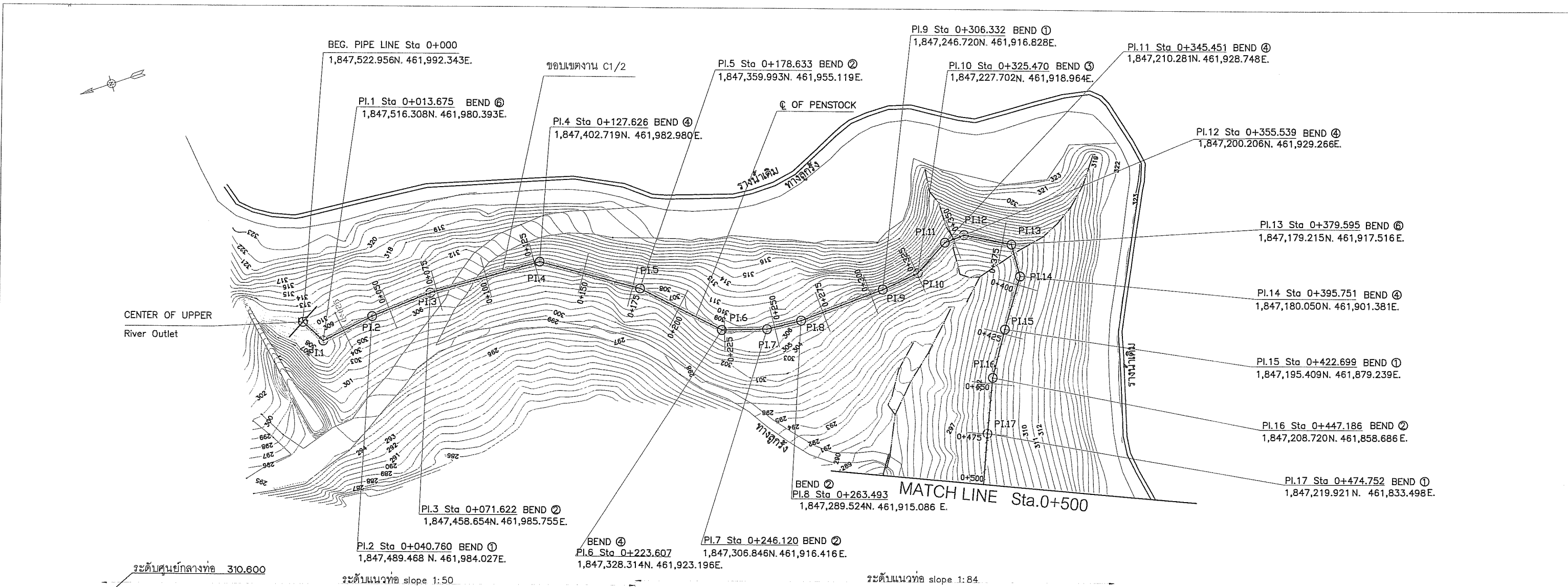
STRUCTURAL DESIGN NOTES :

- 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. POWER HOUSE
	2. TAILRACE
175	1. ANCHOR
140	1. 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. 24-2548
 - ROUND BARS (SR24) - T.I.S. 20-2543
- ALLOWABLE BEARING CAPACITY OF FOUNDATION SHALL NOT BE LESS THAN AS FOLLOW :
 - POWERHOUSE Q₀ = 15 T/M.²
 - PENSTOCK Q₀ = 20 T/M.²

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS GENERAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	BY: 01.10.04	REVIEWED	BY: 01.10.04
DRAWN	BY: 01.10.04	RECOMMENDED	BY: 01.10.04
CHECKED	BY: 01.10.04	APPROVED	BY: 01.10.04
NO.	DATE	REVISIONS	CHECKED
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
HMS-GN-03		SHEET NO. 3 OF 39	



หมายเหตุ

การวางท่อทั้งหมดจะต้องสำรวจกำหนดแนวก่อสร้างเพื่อพิจารณาการวางท่อบนดิน (pipe support) หรือวางท่อใต้ดิน (Encased steel pipe) โดยอยู่ในดุลยพินิจของผู้ควบคุมงาน

Pipe Support

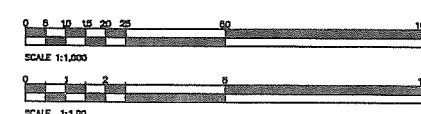
Provide Pipe Support Spacing <6 m.,length

REFERENCE DRAWINGS :

1. ABBREVIATION SYMBOLS AND GENERAL NOTES
2. PENSTOCK NO.1 PLAN AND PROFILE,STA.0+000.000 TO STA.0+500.000
3. PENSTOCK NO.2 PLAN AND PROFILE,STA.0+500.000 TO STA.1+000.000
4. PENSTOCK NO.3 PLAN AND PROFILE,STA.1+000.000 TO STA.1+460.825

HMS-GN-03
HMS-PS-01
HMS-PS-02
HMS-PS-03

HORIZONTAL SCALE 1:1,000
VERTICAL SCALE 1:100



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

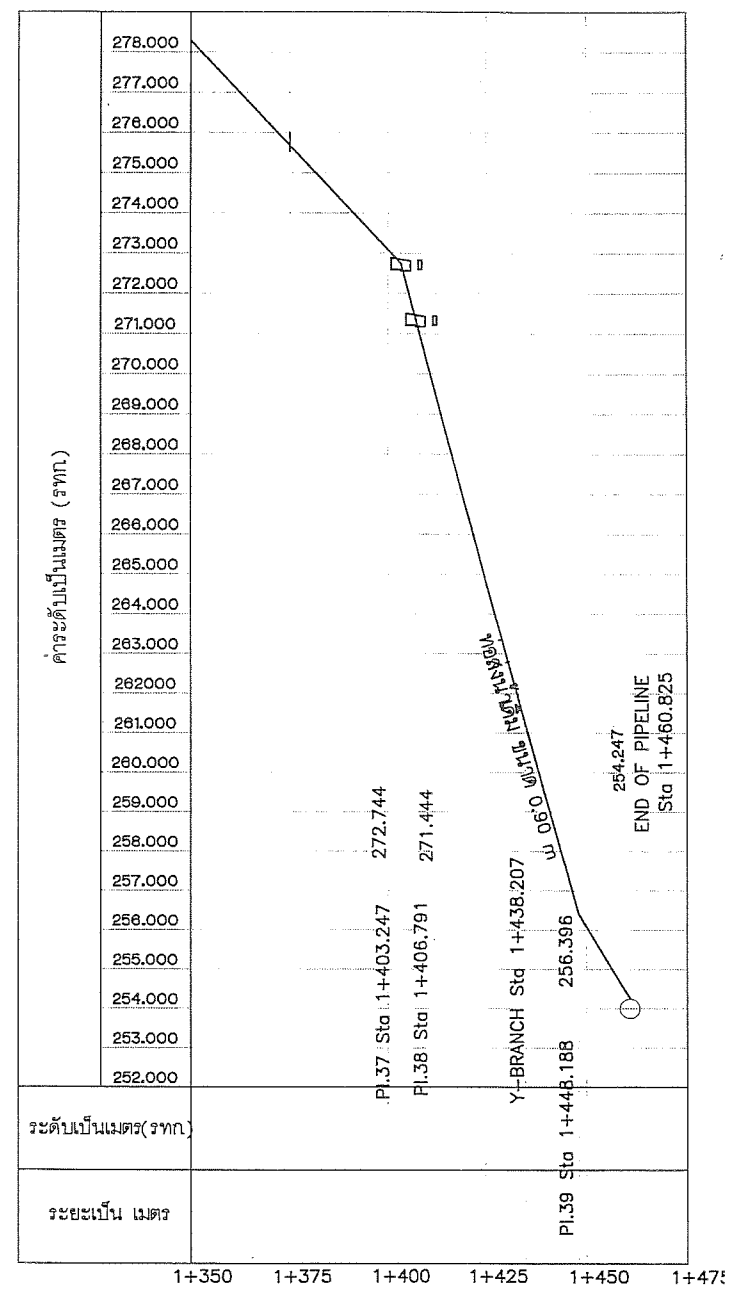
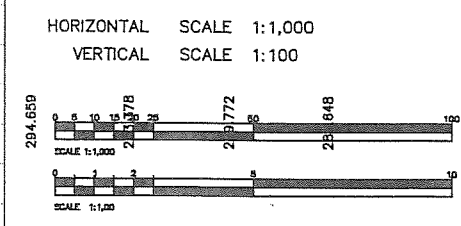
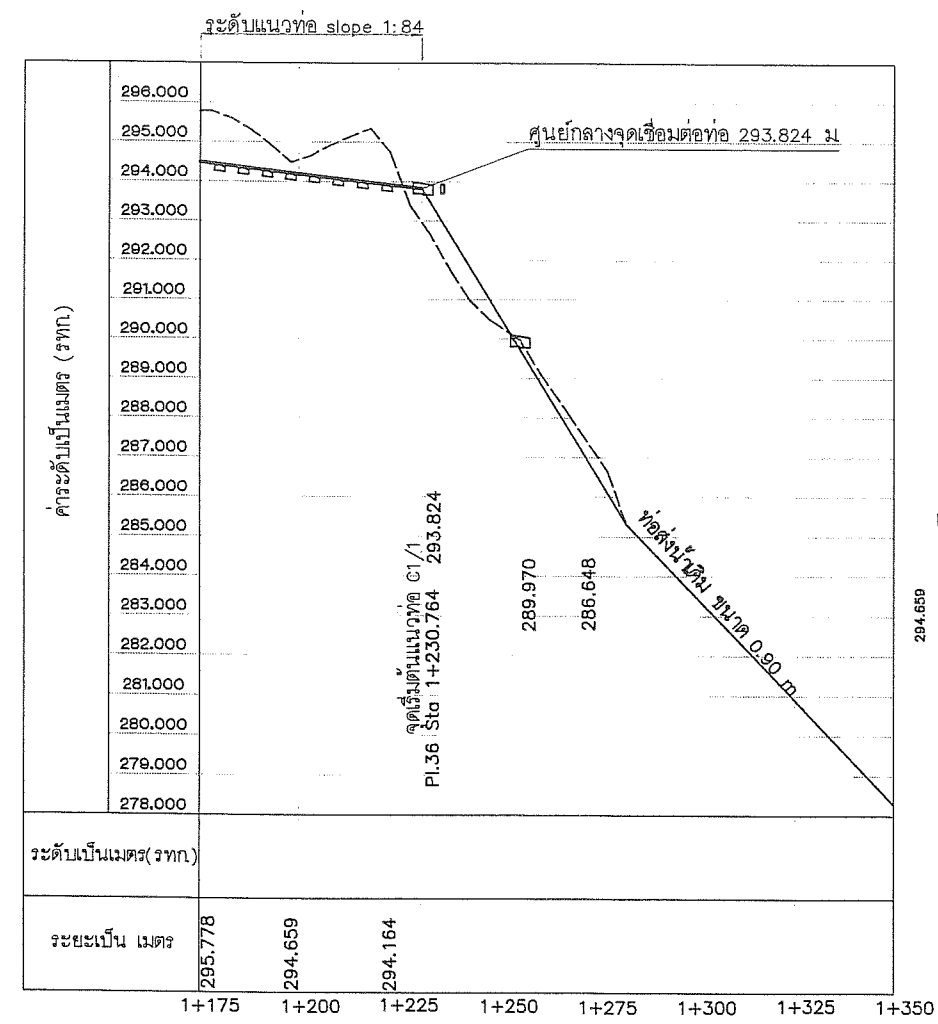
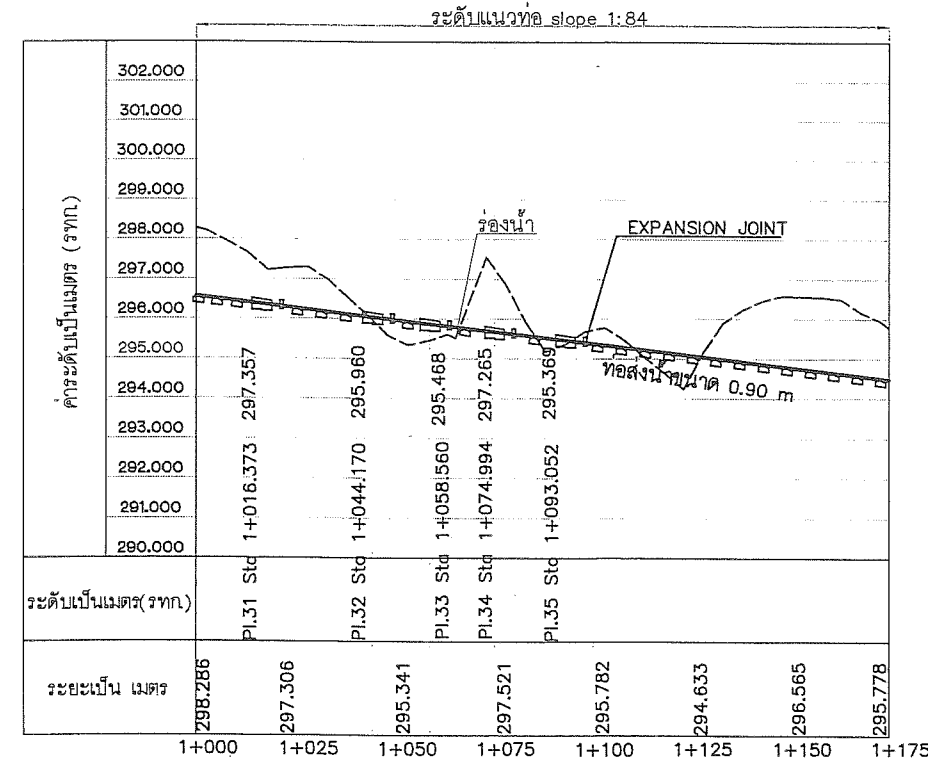
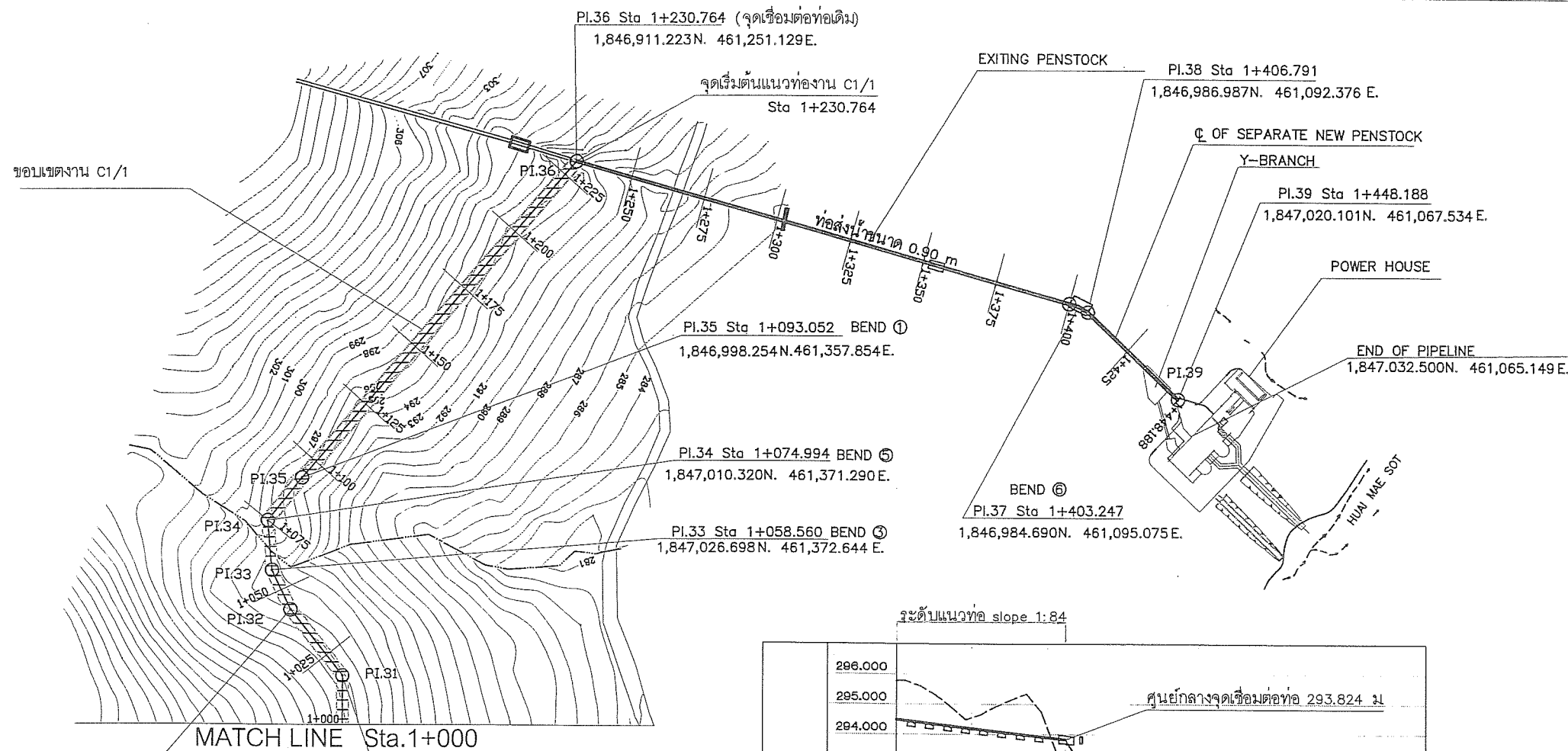
HUAI MAE SOT HYDROPOWER PROJECT

PENSTOCK
CIVIL WORKS

NO.1, PLAN AND PROFILE, STA.0+000.000 TO STA.0+500.000

SURVEY	DESIGNED	DRAWN	CHECKED	APPROVED
REVIEWED	SUBMITTED	RECOMMENDED	APPROVED	
PROJECT MANAGER	DATE	DRAWING NO. HMS-PS-01(S)	SHEET NO. 4 OF 39	

3				
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NO.	DATE	REVISIONS	CHECK	APPROVE



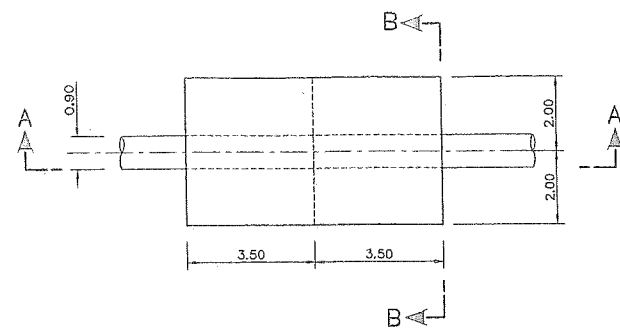
หมายเหตุ
การวางท่อทั้งหมดจะต้องสำรวจกำหนดแนวก่อสร้างเพื่อพิจารณาการวางท่อนดิน (pipe support) หรือวางท่อใต้ดิน (Encased steel pipe) โดยอยู่ในดุลยพินิจของผู้ควบคุมงาน

REFERENCE DRAWINGS :

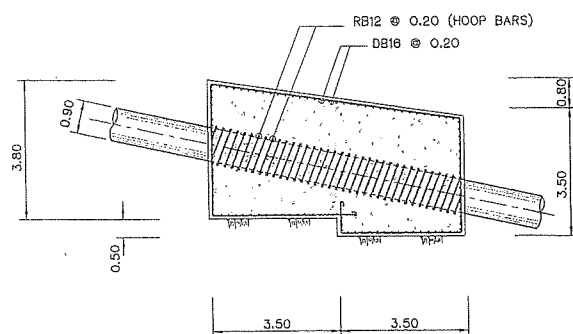
- | | |
|---|-----------|
| 1. ABBREVIATION SYMBOLS AND GENERAL NOTES | HMS-GN-03 |
| 2. PENSTOCK NO.1 PLAN AND PROFILE, STA.0+000.000 TO STA.0+500.000 | HMS-PS-01 |
| 3. PENSTOCK NO.2 PLAN AND PROFILE, STA.0+500.000 TO STA.1+000.000 | HMS-PS-02 |
| 4. PENSTOCK NO.3 PLAN AND PROFILE, STA.1+000.000 TO STA.1+460.825 | HMS-PS-03 |

3				
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NO.	DATE	REVISIONS	CHECK	APPROVE
		CONSULTANTS		DEDE

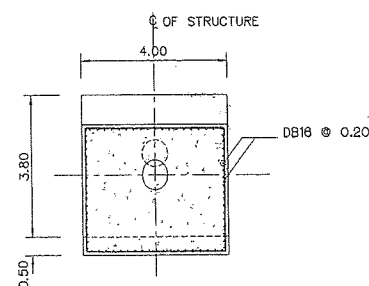
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SURVEY	DESIGNED	DRAWN	CHECKED
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PROJECT MANAGER		DATE	
DRAWING NO. HMS-PS-03(S)		SHEET NO. 6 OF 39	



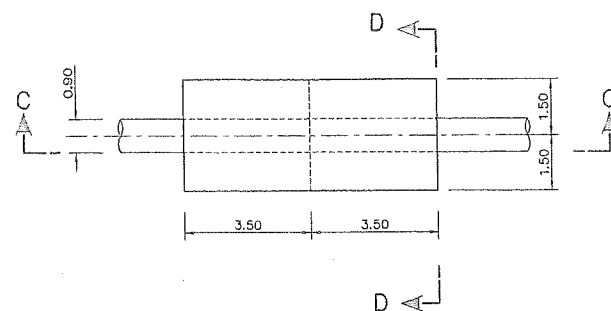
PLAN
ANCHOR ①
SCALE 1:100



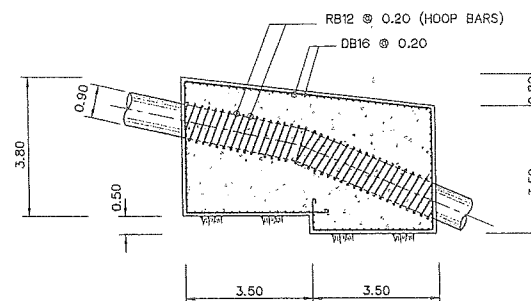
SECTION A-A
ANCHOR ①
SCALE 1:100



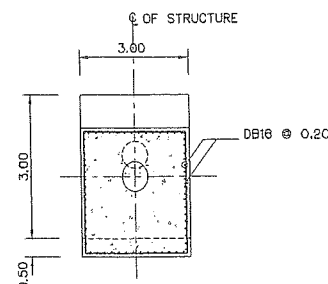
SECTION B-B
ANCHOR ①
SCALE 1:100



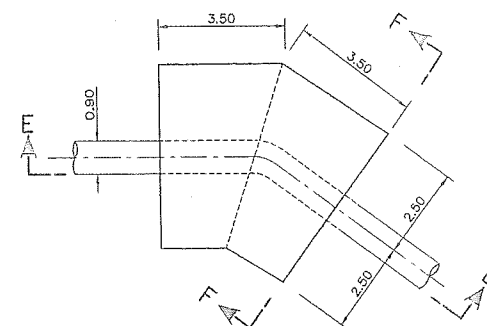
PLAN
ANCHOR ②
SCALE 1:100



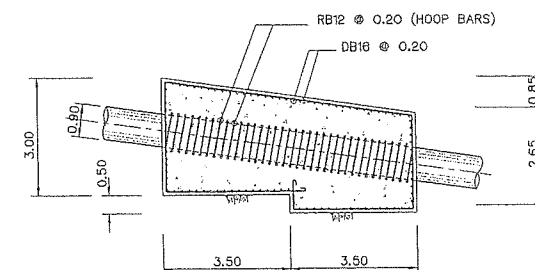
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ANCHOR ②
SCALE 1:100



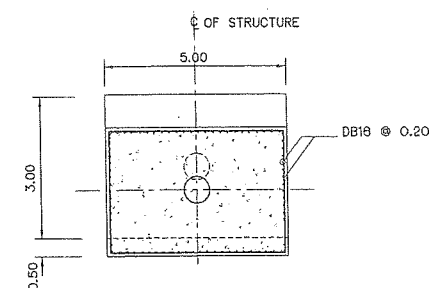
SECTION D-D
ANCHOR ②
SCALE 1:100



PLAN
ANCHOR ③
SCALE 1:100



SECTION E-E
ANCHOR ③
SCALE 1:100



SECTION F-F
ANCHOR ③
SCALE 1:100

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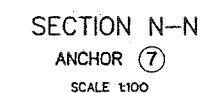
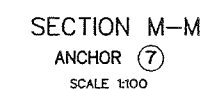
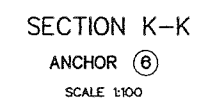
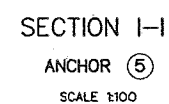
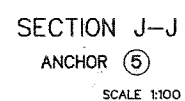
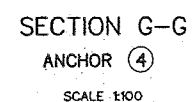
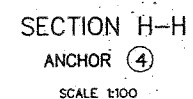
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. HMS-GN-03
3. CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED

CONSULTANTS

DEDE

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS PENSTOCK ANCHOR BLOCK NO. 1,2,3 PLAN AND SECTION			
MAHA NAKORN CONSULTANTS CO.,LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	21.49.520	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	21.5220	RECOMMENDED	
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		HMS-PS-04	7 OF 39



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

					MHA NAKORN CONSULTANTS CO.LTD.		DEVELOPMENT AND EFFICIENCY	
3					DESIGNED	20.48520	REVIEWED	20.48520
2					DRAWN	20.48520	SUBMITTED	20.48520
1					CHECKED	20.48520	RECOMMENDED	20.48520
NO.	DATE	REVISIONS	CHECKED	APPROVED				
CONSULTANTS					DEDE			
					PROJECT MANAGER		DATE	
					HMS-PS-05		SHEET NO.	
					8 OF 39			

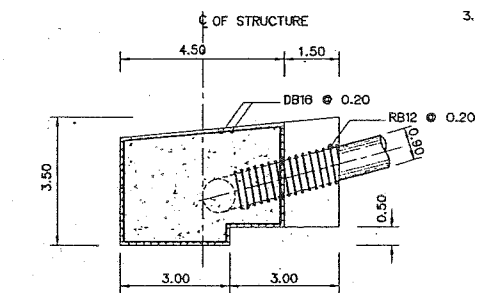
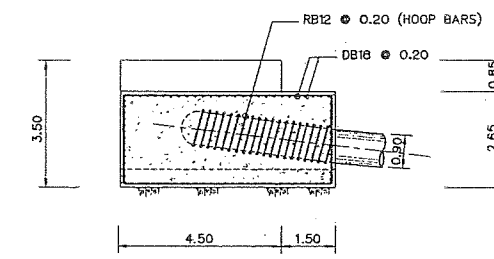
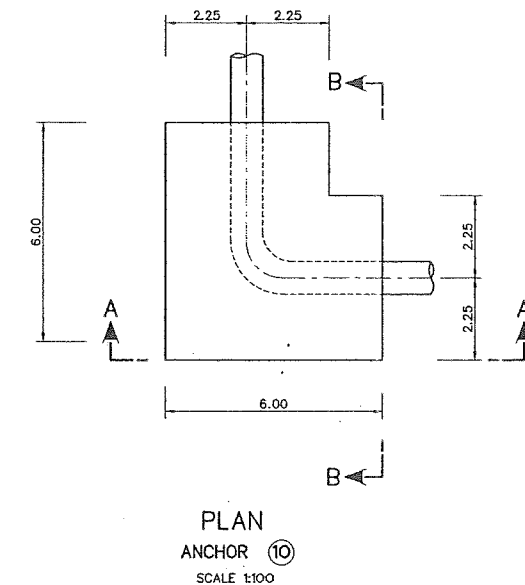
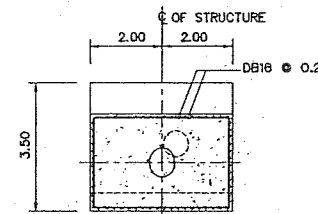
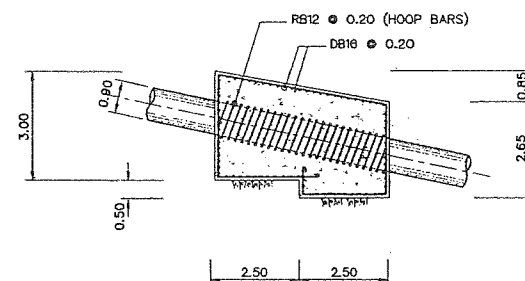
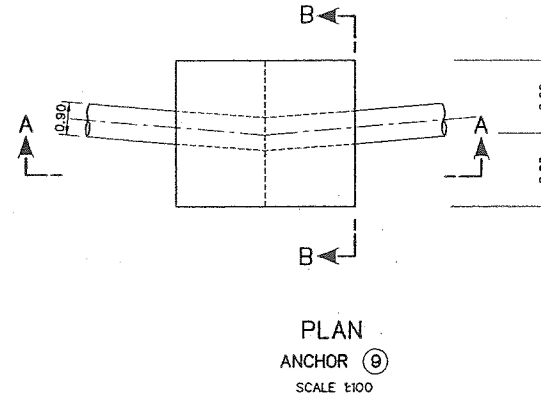
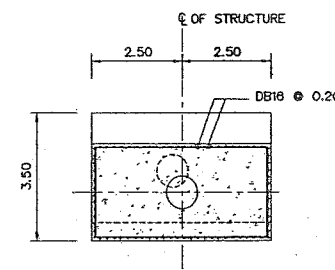
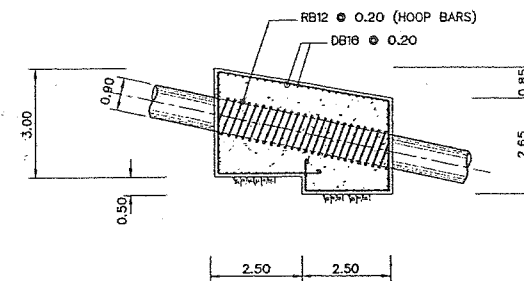
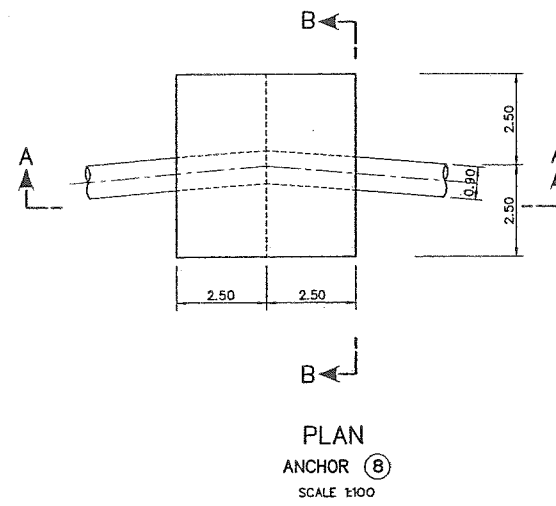
KINGDOM OF THAILAND
MINISTRY OF ENERGY
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

HUA MAE SOT HYDROPOWER PROJECT

CIVIL WORKS
PENSTOCK
ANCHOR BLOCK NO. 4,5,6,7 PLAN AND SECTION

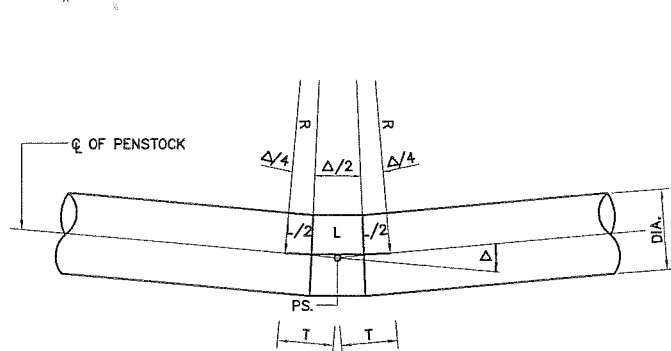
MAHA NAKORN CONSULTANTS CO.,LTD.	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY
--	--

DESIGNED	Amr 21.49520	21.5083	REVIEWED	W. coat
DRAWN	Amr		SUBMITTED	606m
CHECKED	Amr	21.5220	RECOMMENDED	
	Amr	21.5220	APPROVED	Amr
PROJECT MANAGER	DATE		DRAWING NO.	SHEET NO.
			HMS-PS-05	8 OF 39



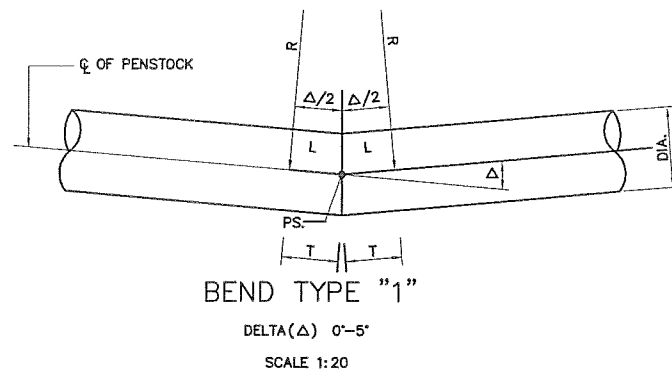
- NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. HMS-CN-03
 3. CORROSIVE PROTECTION IS WARNED TO STRICTLY FOLLOW PAINTING SPECIFICATION

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAIE MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS PENSTOCK ANCHOR BLOCK NO. 8,9,10 PLAN AND SECTION			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	25/11/58	REVIEWED	25/11/58
DRAWN	25/11/58	SUBMITTED	25/11/58
CHECKED	25/11/58	RECOMMENDED	25/11/58
APPROVED	25/11/58	APPROVED	25/11/58
PROJECT MANAGER	DATE	HMS-PS-06	SHEET NO. 8 OF 30



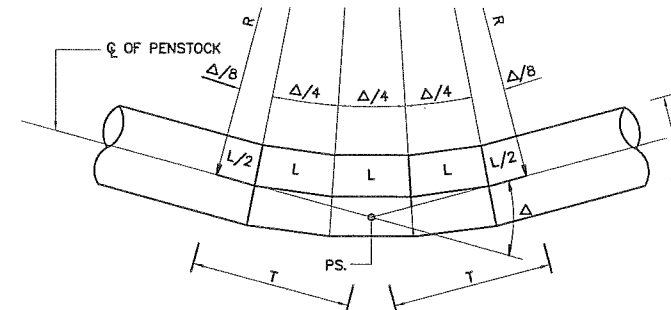
BEND TYPE "1"

DELTA(Δ) 0°-5°
SCALE 1:20



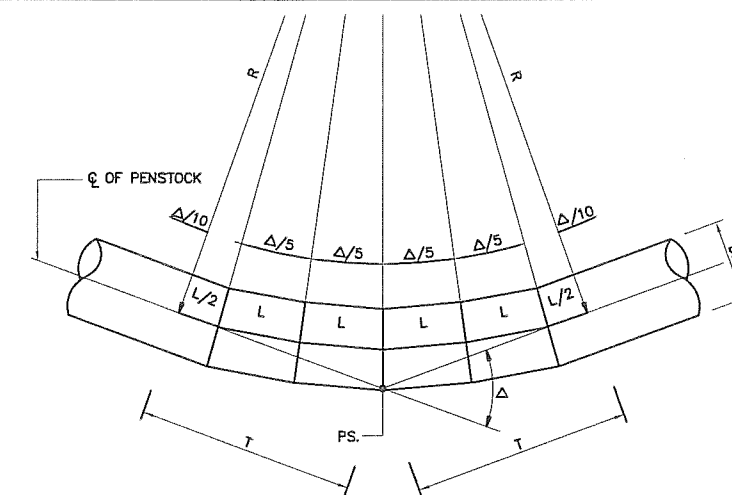
BEND TYPE "2"

DELTA(Δ) 5°-15°
SCALE 1:20



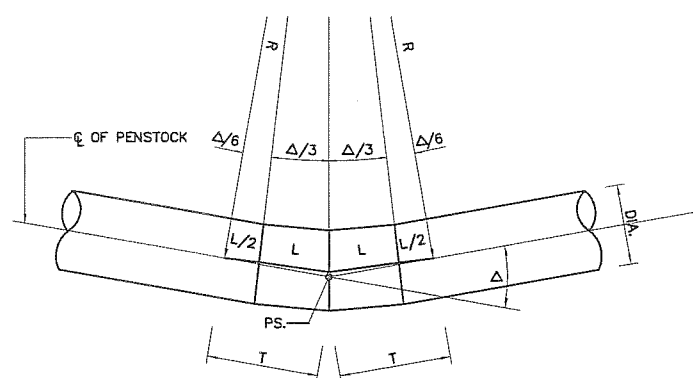
BEND TYPE "3"

DELTA(Δ) 15°-25°
SCALE 1:20



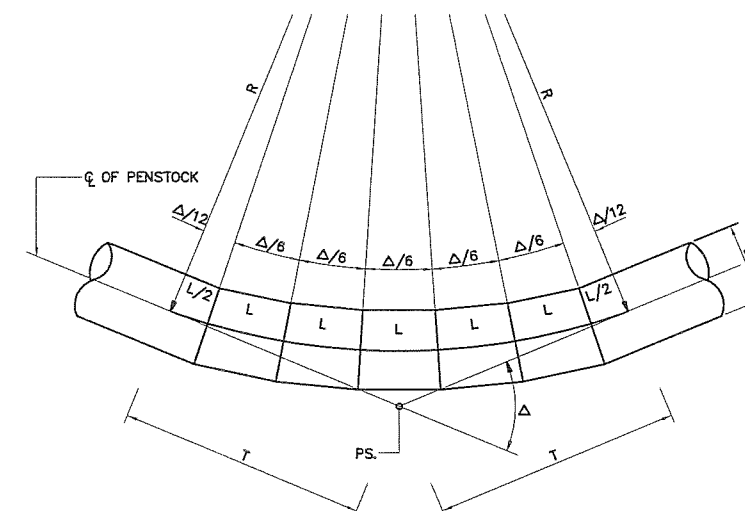
BEND TYPE "4"

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 NO.	PI NO.	KM. OF PI - PS	COORDINATE		Δ (DEGREE)	BEND TYPE	T (m.)	R (m.)	DIA. (m.)	Length Of Curve (m.)	THICKNESS (mm.)
			N	E							
SEA PIPELINE	PI.0	0+000.000	1,847,522.956	461,992.343	-	-	-	-	0.90	-	7.9
1	PI.1	0+013.675	1,847,516.308	461,980.393	68°-37'-21.7"	6	0.450	0.659	0.90	0.759	7.9
2	PI.2	0+040.760	1,847,489.468	461,984.027	4°-30'-03.5"	1	0.100	2.545	0.90	0.200	7.9
3	PI.3	0+071.622	1,847,458.654	461,985.755	06°-02'-00.0"	2	0.450	8.539	0.90	0.899	7.9
4	PI.4	0+127.626	1,847,402.719	461,982.980	30°-16'-03.4"	4	0.450	1.664	0.90	0.879	7.9
5	PI.5	0+178.633	1,847,359.993	461,955.119	12°-06'-43.3"	2	0.450	4.242	0.90	0.897	7.9
6	PI.6	0+223.607	1,847,328.314	461,923.196	27°-41'-33.7"	4	0.450	1.826	0.90	0.882	7.9
7	PI.7	0+246.120	1,847,306.846	461,916.416	13°-08'-11.4"	2	0.450	3.908	0.90	0.896	7.9
8	PI.8	0+263.493	1,847,289.524	461,915.086	06°-43'-16.0"	2	0.450	7.663	0.90	0.899	7.9
9	PI.9	0+306.332	1,847,246.720	461,916.828	04°-04'-40.1"	1	0.100	2.809	0.90	0.200	7.9
10	PI.10	0+325.470	1,847,227.702	461,918.964	22°-54'-40.3"	3	0.450	2.221	0.90	0.888	7.9
11	PI.11	0+345.451	1,847,210.281	461,928.748	26°-22'-34.5"	4	0.450	1.920	0.90	0.884	7.9
12	PI.12	0+355.539	1,847,200.206	461,929.266	32°-10'-54.3"	4	0.450	1.560	0.90	0.876	7.9
13	PI.13	0+379.595	1,847,179.215	461,917.516	63°-43'-26.2"	6	0.450	0.724	0.90	0.805	7.9
14	PI.14	0+395.751	1,847,180.050	461,901.381	31°-47'-06.0"	4	0.450	1.581	0.90	0.877	7.9
15	PI.15	0+422.699	1,847,195.409	461,879.239	01°-49'-07.1"	1	0.100	6.300	0.90	0.200	7.9
16	PI.16	0+447.186	1,847,208.720	461,858.686	08°-57'-15.5"	2	0.450	5.747	0.90	0.898	7.9
17	PI.17	0+474.752	1,847,219.921	461,833.498	01°-06'-55.8"	1	0.100	10.272	0.90	0.200	7.9
18	PI.18	0+501.161	1,847,230.180	461,809.163	22°-14'-20.5"	3	0.450	2.290	0.90	0.889	7.9
19	PI.19	0+542.378	1,847,230.626	461,767.948	03°-40'-03.0"	1	0.100	3.124	0.90	0.200	7.9
20	PI.20	0+583.103	1,847,228.461	461,727.281	28°-21'-55.1"	4	0.450	1.781	0.90	0.882	7.9
21	PI.21	0+621.275	1,847,208.566	461,694.704	09°-16'-02.3"	2	0.450	5.552	0.90	0.898	7.9
22	PI.22	0+666.361	1,847,179.177	461,660.512	13°-27'-08.6"	2	0.450	3.816	0.90	0.896	7.9
23	PI.23	0+714.437	1,847,157.181	461,617.763	03°-01'-33.5"	1	0.100	3.786	0.90	0.200	7.9
24	PI.24	0+759.399	1,847,138.749	461,576.753	11°-33'-43.1"	2	0.450	4.445	0.90	0.897	7.9
25	PI.25	0+804.656	1,847,128.846	461,532.593	12°-19'-54.8"	2	0.450	4.165	0.90	0.897	7.9
26	PI.26	0+844.684	1,847,128.631	461,492.565	08°-30'-03.5"	2	0.450	6.055	0.90	0.898	7.9
27	PI.27	0+893.223	1,847,121.198	461,444.599	08°-05'-52.9"	2	0.450	6.357	0.90	0.899	7.9
28	PI.28	0+937.888	1,847,120.644	461,399.937	23°-48'-31.3"	3	0.450	2.135	0.90	0.887	7.9
29	PI.29	0+971.026	1,847,106.892	461,369.788	30°-59'-07.7"	4	0.450	1.623	0.90	0.878	7.9
30	PI.30	0+988.115	1,847,092.807	461,360.109	24°-56'-22.2"	3	0.450	2.035	0.90	0.886	7.9
31	PI.31	1+016.373	1,847,064.941	461,355.418	38°-13'-23.3"	5	0.450	1.299	0.90	0.866	7.9
32	PI.32	1+044.170	1,847,040.552	461,368.753	12°-58'-46.9"	2	0.450	3.956	0.90	0.896	7.9
33	PI.33	1+058.560	1,847,026.698	461,372.644	20°-24'-49.7"	3	0.450	2.499	0.90	0.890	7.9
34	PI.34	1+074.994	1,847,010.320	461,371.290	43°-20'-56.6"	5	0.450	1.132	0.90	0.857	7.9
35	PI.35	1+093.052	1,846,998.254	461,357.854	02°-43'-43.5"	1	0.100	4.199	0.90	0.200	7.9
36	PI.36	1+230.764	1,846,911.223	461,251.129	64°-24'-22.6"	6	0.450	0.715	0.90	0.803	7.9
37	PI.37	1+403.247	1,846,984.690	461,095.075	15°-11'-22.4"	3	0.450	3.375	0.90	0.895	7.9
38	PI.38	1+406.791	1,846,986.987	461,092.376	12°-43'-23.8"	2	0.450	4.036	0.90	0.896	7.9
39	PI.39	1+448.188	1,847,020.101	461,067.534	33°-17'-47.4"	4	0.450	1.505	0.90	0.875	7.9
40	END OF PIPELINE	1+460.825	1,847,032.500	461,065.149			0.450		0.90		7.9

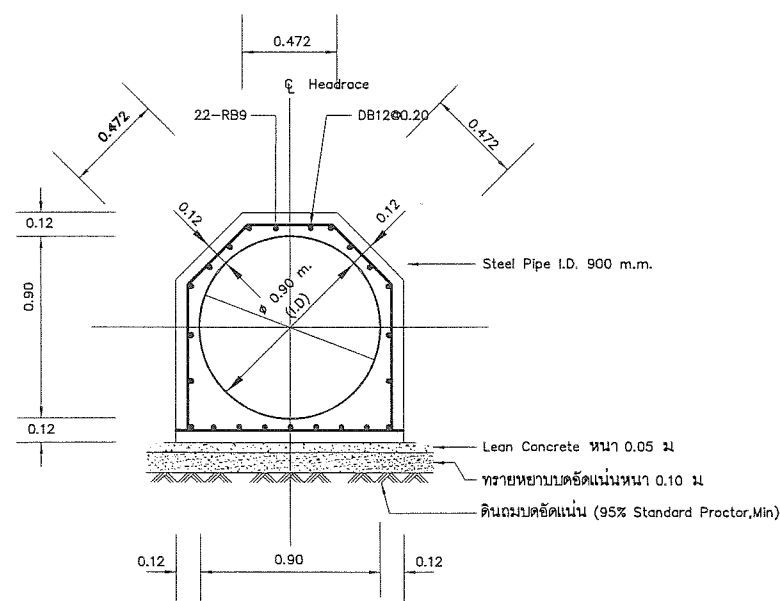


NOTES :

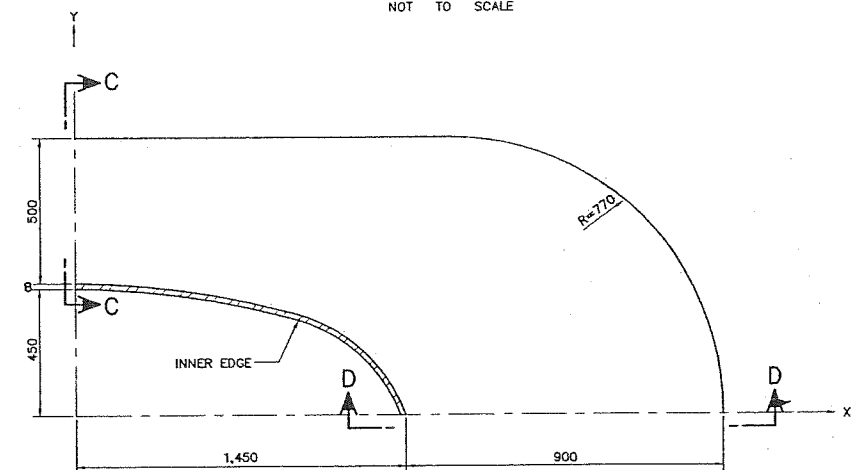
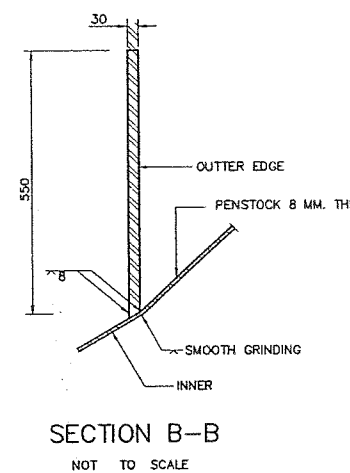
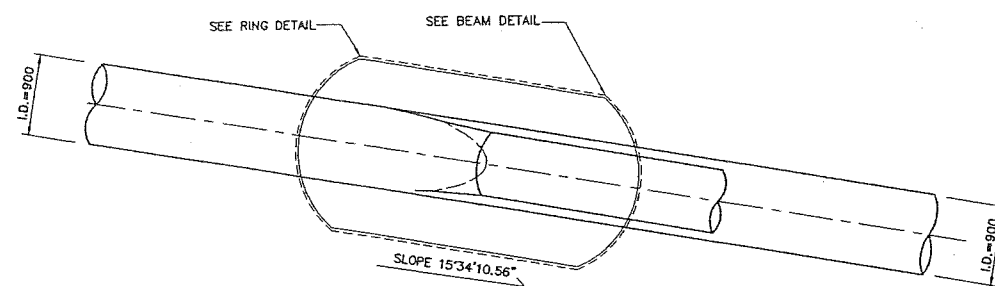
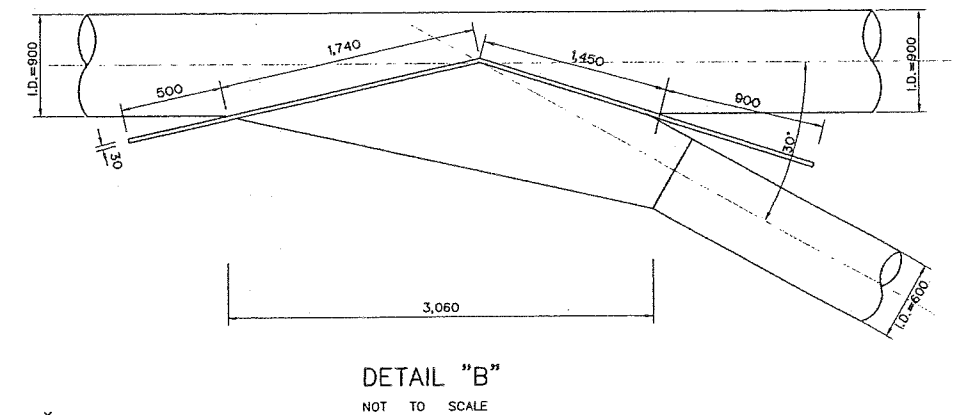
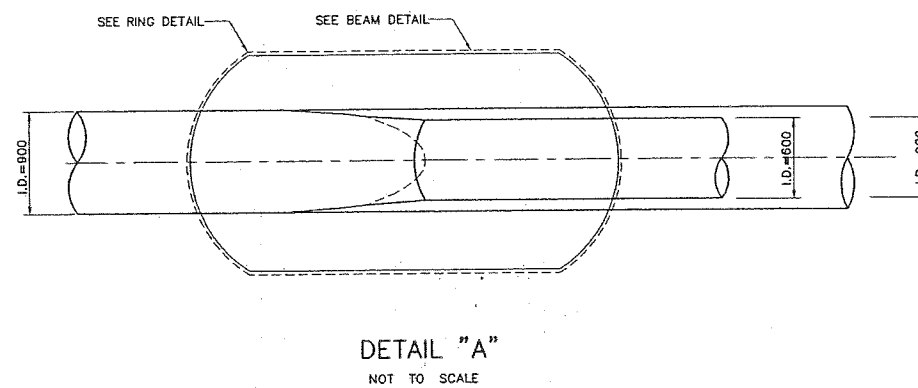
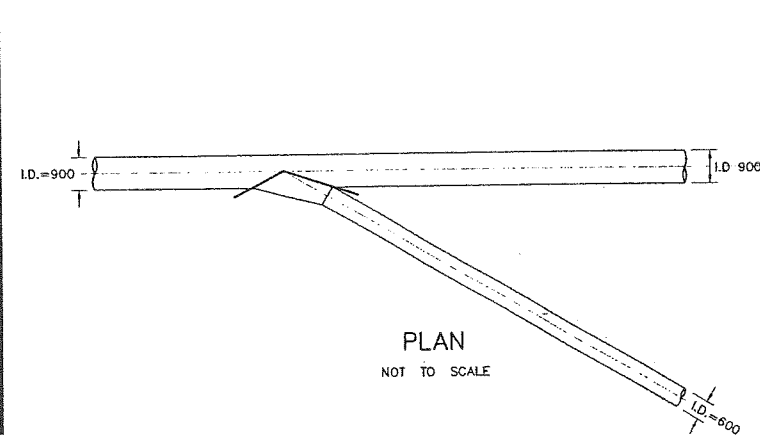
1. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. HMS-GN-03

TYPICAL SECTION OF ENCASED STEEL PIPE

(แบบขยายท่อวางใต้ดิน)

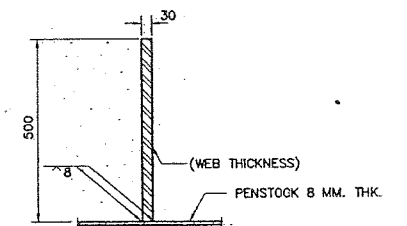
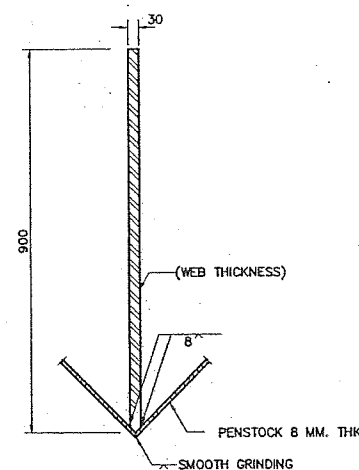
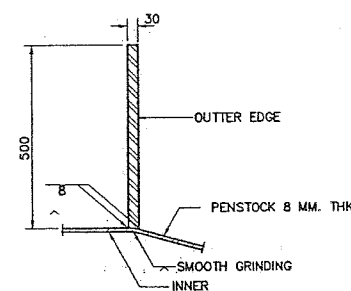
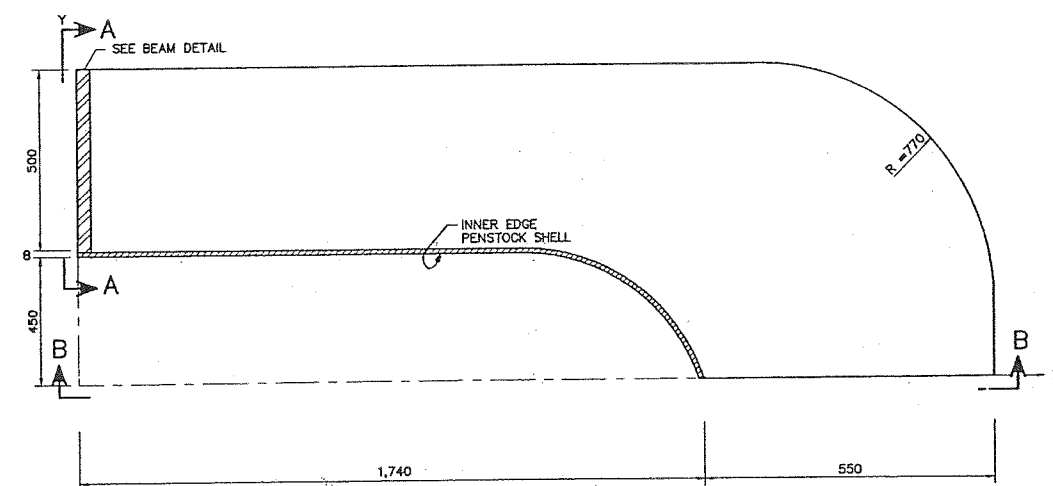


KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
PENSTOCK CIVIL WORKS BEND DETAILS			
SURVEY	DESIGNED	DRAWN	CHECKED
REVIEWED	SUBMITTED	RECOMMENDED	APPROVED
PROJECT MANAGER	DATE	DRAWING NO. HMS-PS-08 (S)	SHEET NO. 11 OF 39



ELEVATION
NOT TO SCALE

BEAM DETAIL
NOT TO SCALE



SECTION A-A
NOT TO SCALE

SECTION D-D
NOT TO SCALE

SECTION C-C
NOT TO SCALE

NOTES :

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

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY					
HUAI MAE SOT HYDROPOWER PROJECT					
CIVIL WORKS PENSTOCK WYE, PLAN, SECTIONS AND DETAILS					
DESIGNED <i>asw</i> 25/10/04			REVIEWED <i>asw</i>		
DRAWN <i>asw</i>			SUBMITTED <i>asw</i>		
CHECKED <i>asw</i>			RECOMMENDED <i>asw</i>		
DATE 25/10/04			APPROVED <i>asw</i>		
CONSULTANTS			DEDE		
PROJECT MANAGER			DATE		
DRAWING NO. HMS-PS-09			SHEET NO. 12 OF 39		

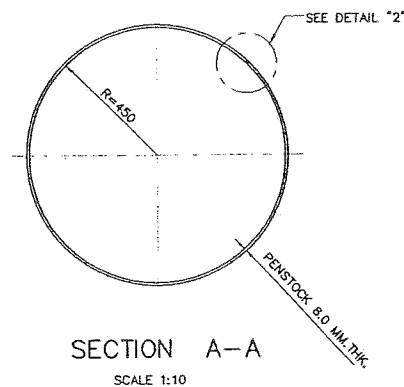
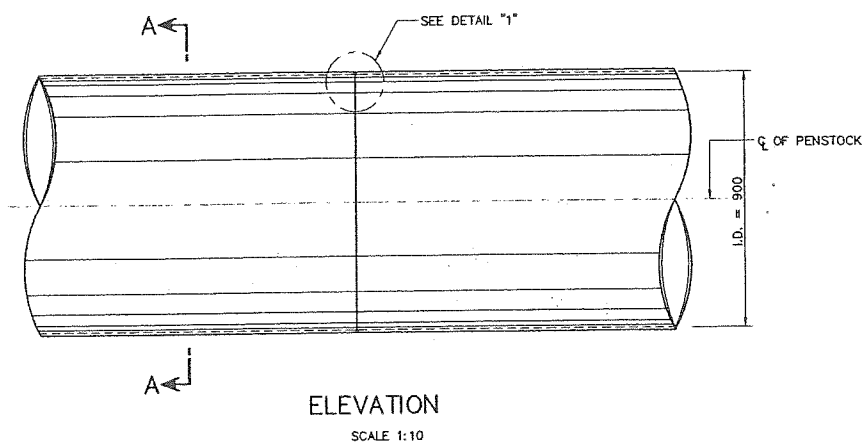


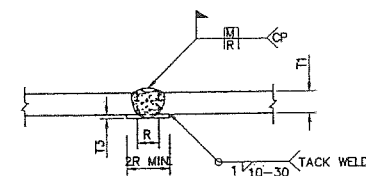
TABLE OF DETAIL "1" SQUARE-GROOVE WELD, BUTT JOINT

WELDING PROCESS	DESIGNATION	BASE METAL THICKNESS		GROOVE PREPARATION		TOLERANCES		REMARKS
		T1	T3	ROOT OPENING	GROOVE ANGLE	ROOT OPENING	GROOVE ANGLE	
SMAW	B-L1a	8.0	1.0	R = T1	—	+1.0, -0	—	SINGLE-PASS WELD
GMAW FCAW	B-L1a-GF	8.0	1.0	R = T	—	+1.0, -0	—	SINGLE-PASS WELD

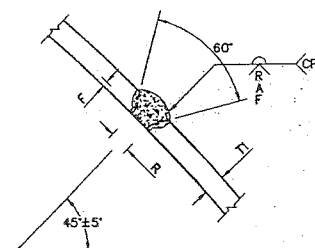
SMAW = SHIELD METAL ARC WELDING

GMAW = GAS METAL ARC WELDING

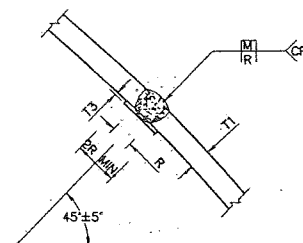
FCAW = FLUX CORED ARC WELDING



CIRCULAR BUTT JOINT
DETAIL "1"



LONGITUDINAL BUTT JOINT
TYPE "A"



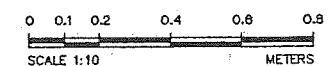
LONGITUDINAL BUTT JOINT (ALTERNATIVE)
TYPE "B"

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

TYPE	WELDING PROCESS	DESIGNATION	BASE METAL THICKNESS		GROOVE PREPARATION			TOLERANCES			REMARKS
			T1	T3	ROOT OPENING	GROOVE ANGLE	ROOT FACE	R	A	F	
A	SMAW	B-U2	8.0	—	R = 2.0	A = 60°	F = 1.5	+1.0, -0	+5°, -0°	+1.5, -0	SINGLE-PASS WELD
	SMAW	B-U2	8.0	—	R = 2.0	A = 60°	F = 2.0	+1.0, -0	+5°, -0°	+1.5, -0	SINGLE-PASS WELD
B	SMAW	B-L1a-GF	8.0	1.0	R = 6.0	—	—	+1.0, -0	—	—	SINGLE-PASS WELD
	GMAW FCAW	B-L1a-GF	8.0	1.0	R = 9.0	—	—	+1.0, -0	—	—	SINGLE-PASS WELD

NOTES :

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

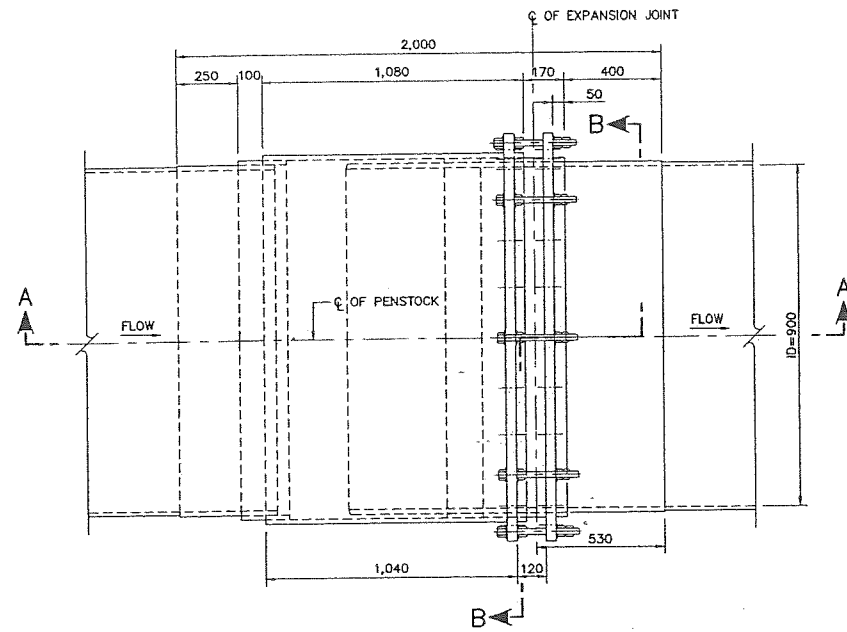


WELDING SYMBOLS

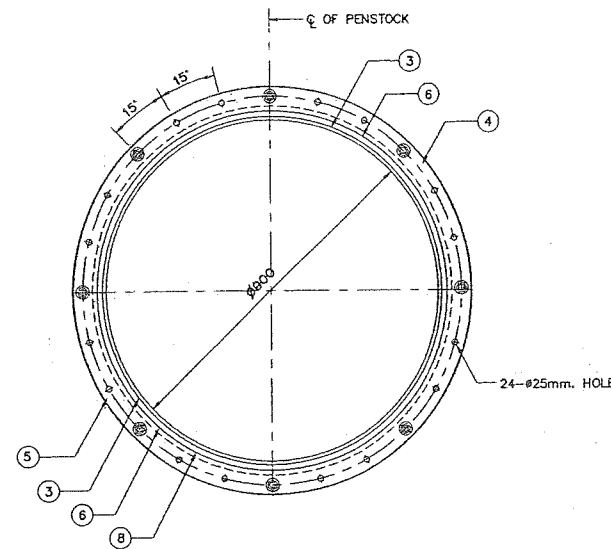
FIELD WELD SYMBOL	WELD - ALL - AROUND SYMBOL	SQUARE GROOVE WELDING SYMBOL R=ROOT OPENING	V-GROOVE WELDING SYMBOL R=ROOT OPENING A=GROOVE ANGLE F=ROOT FACE	BACKING SYMBOL (MATERIAL OF BACKING THE SAME AS OF PIPE)	COMPLETE JOINT PENETRATION WELD	FILLET WELD S=WELDING SIZE L=LENGTH OF WELD P=PITCH (CENTER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

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
HUA MAE SOT HYDROPOWER PROJECT	
CIVIL WORKS PENSTOCK WELDING DETAILS	
MAHA NAKORN CONSULTANTS CO., LTD.	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY
DESIGNED <i>an</i> 11/18/804 <i>an</i> 11/5083	REVIEWED <i>an</i>
DRAWN <i>an</i>	SUBMITTED <i>an</i>
CHECKED <i>an</i>	RECOMMENDED <i>an</i>
APPROVED <i>an</i>	APPROVED <i>an</i>
DATE 25/10/82	DRAWING NO. HMS-PS-10
PROJECT MANAGER	SHEET NO. 13 OF 39

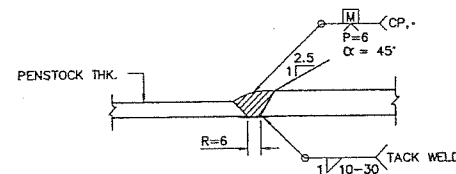
NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				



ELEVATION
SCALE 1:7.5

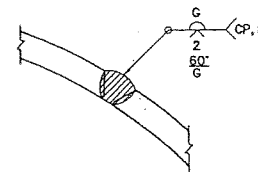


SECTION B-B
SCALE 1:7.5



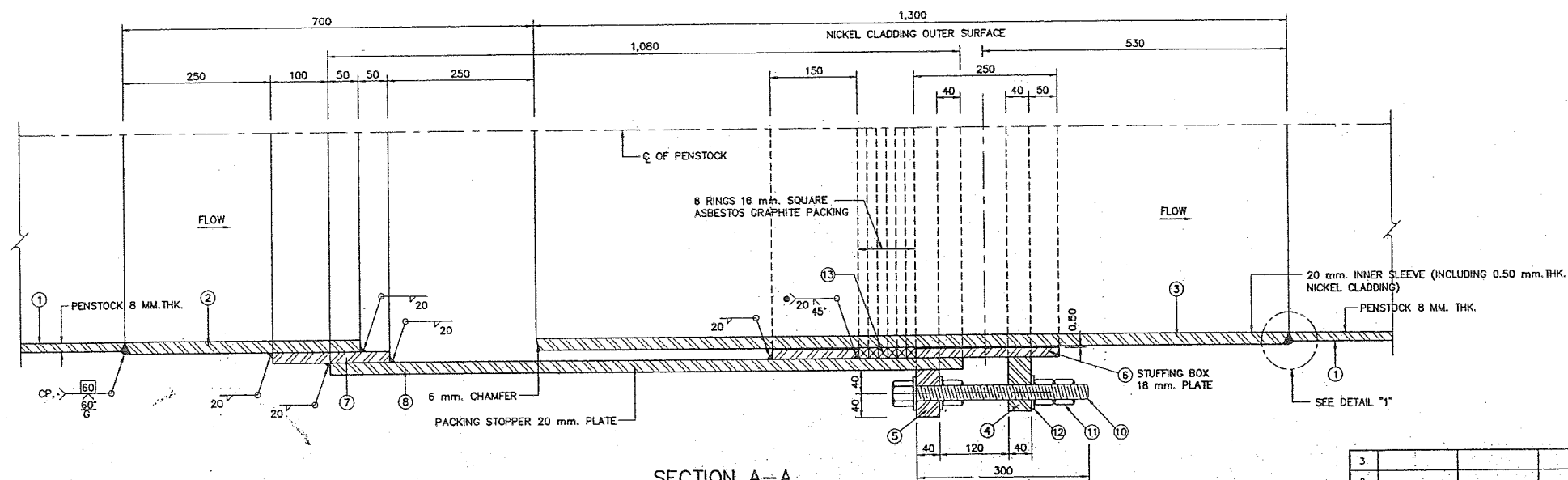
TRANSITION THICKNESS OF
BUTT JOINT IN PARTS OF
UNEQUAL THICKNESS

DETAIL "1"
NOT TO SCALE



LONGITUDINAL WELD
DETAIL "2"

NOT TO SCALE



SECTION A-A
SCALE 1:5

TABLE OF DETAIL 1 SQUARE - GROOVE WELD, BUTT JOINT

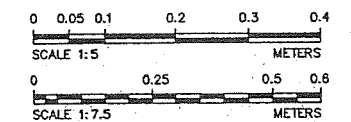
ITEM	DESCRIPTION	MATERIAL	QUANT.	REMARKS
1	PENSTOCK	ASTM A-283, GRADE D	—	—
2	PENSTOCK	ASTM A-283, GRADE D	1	NOTE 2 & 3
3	INNER SLEEVE	ASTM A-283, GRADE D	1	NOTE 2 & 4
4	GRAND RING	ASTM A-283, GRADE D	1	SEAMLESS, NOTE 3
5	OUTER RING	ASTM A-283, GRADE D	1	SEAMLESS, NOTE 3
6	STUFFING BOX	ASTM A-283, GRADE D	1	NOTE 2 & 3
7	DOUBLING PLATE	ASTM A-283, GRADE D	1	NOTE 2 & 3
8	OUTER SLEEVE	ASTM A-283, GRADE D	1	NOTE 2 & 3
9	PACKING STOPPER	ASTM A-283, GRADE D	1	NOTE 2 & 3
10	#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 4

NOTES :

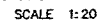
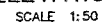
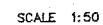
- LONGITUDINAL SEAMS HAVE TO BE COMPLETE JOINT PENETRATION WELDS BY COMBINING SINGLE-V-GROOVE WITH BACKING WELDS AND GROUND FLUSH WELDING WITH BASE METAL AS REQUIRED (SEE DETAIL "2")
- GALVANIZED ALL SURFACES WITH 0.10 mm. THK.
- NICKEL CLADDING ON OUTER SURFACE WITH 0.50 mm. THK. AND GALVANIZED INNER SURFACE WITH 0.10 mm. THK.
- EACH JOINT OF EACH PACKING RING SHALL BE MIN. 25 cm. APART DO NOT LINE UP JOINTS
- ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE SHOWN
- SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. HMS-GN-03
- MATERIAL GRADE CAN BE CHANGE AS SHOWN IN CHAP 8 OF CONTRACT C1 VOL.2

WELDING NOTATION :

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

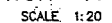
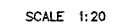
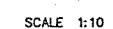
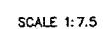


KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS PENSTOCK EXPANSION JOINT, PLAN, SECTIONS AND DETAILS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	BY 10804	REVIEWED	BY 10803
DRAWN	BY 10804	SUBMITTED	BY 10803
CHECKED	BY 10804	RECOMMENDED	BY 10803
APPROVED	BY 10804	APPROVED	BY 10803
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		HMS-PS-11	14 OF 39



NOTES :

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

MAHA NAKORN CONSULTANTS CO., LTD.

DEPARTMENT OF ALTERNATIVE ENERGY
DEVELOPMENT AND EFFICIENCY

DESIGNED BY: J. L. 16804 *ML* 11.506

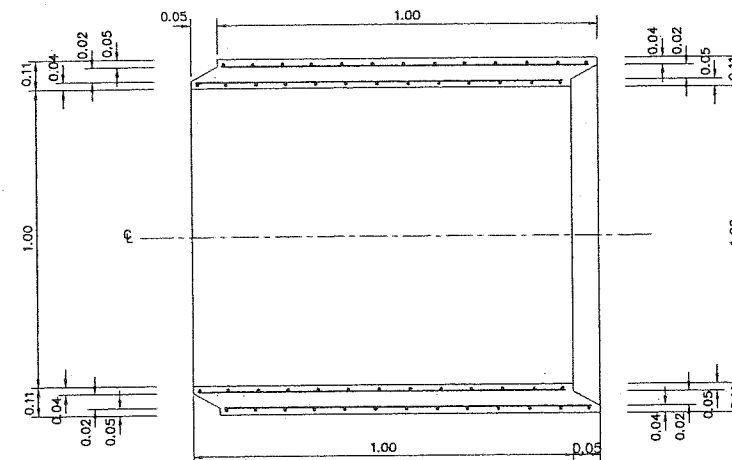
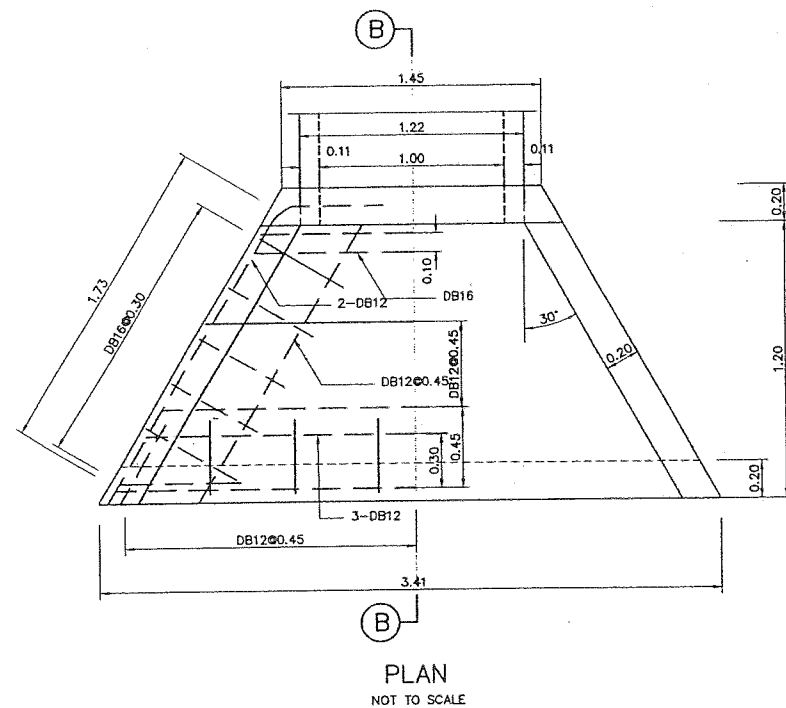
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SUBMITTED	<i>[Signature]</i>

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CHECKED	01/16/02 01/16/02

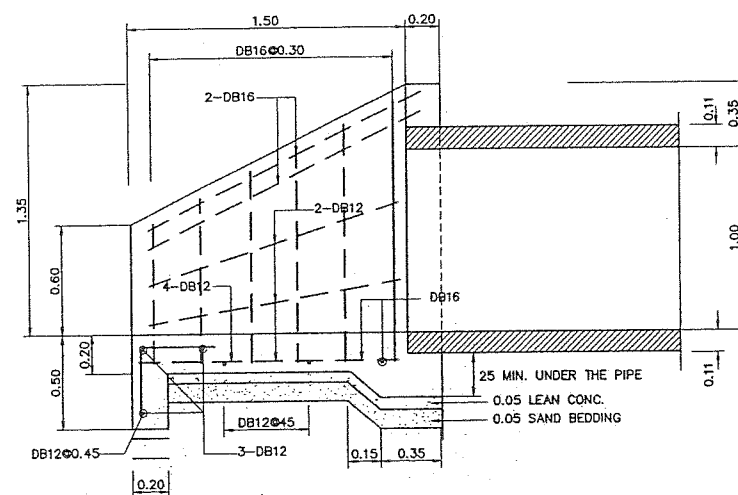
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APPROVED	<i>[Signature]</i>

CHECKED	DATE
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PROJECT MANAGER	DATE

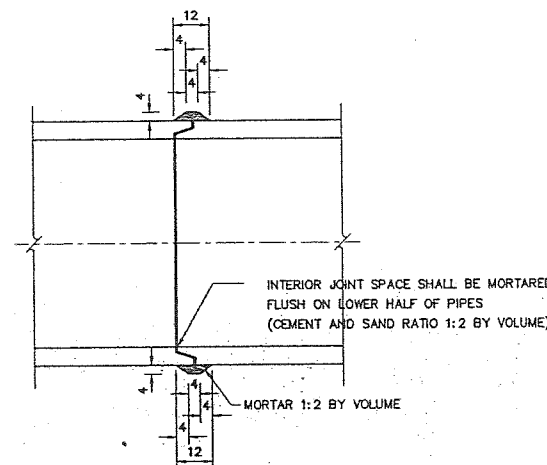
DRAWING NO. HMS-PS-12	SHEET NO. 15 OF 39
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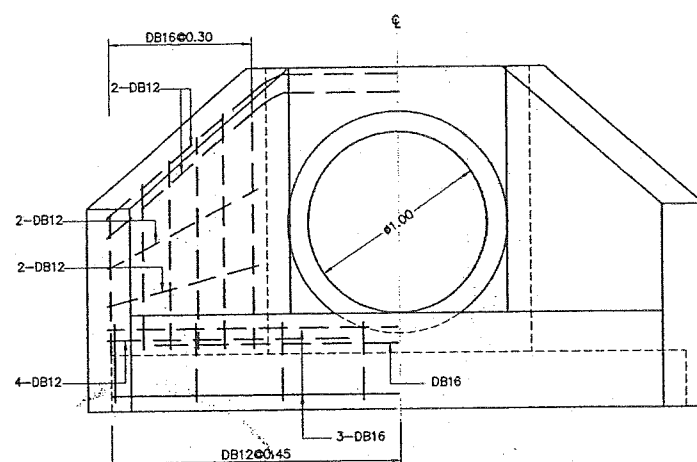
R.C. PIPE DETAIL
NOT TO SCALE



SECTION B-B
NOT TO SCALE



PIPE CONNECTION DETAILS
DIMENSIONS ARE IN CENTIMETERS



END VIEW
DETAILS FOR R.C. HEAD WALL
NOT TO SCALE

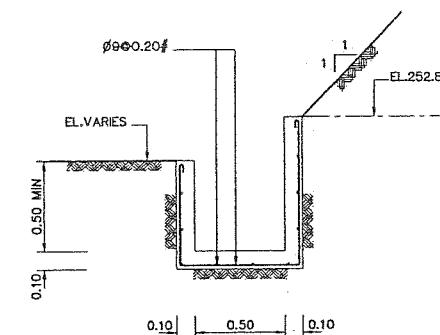
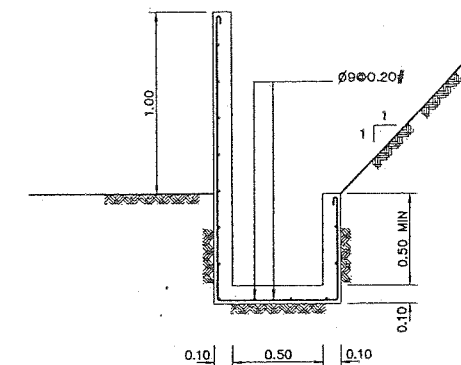
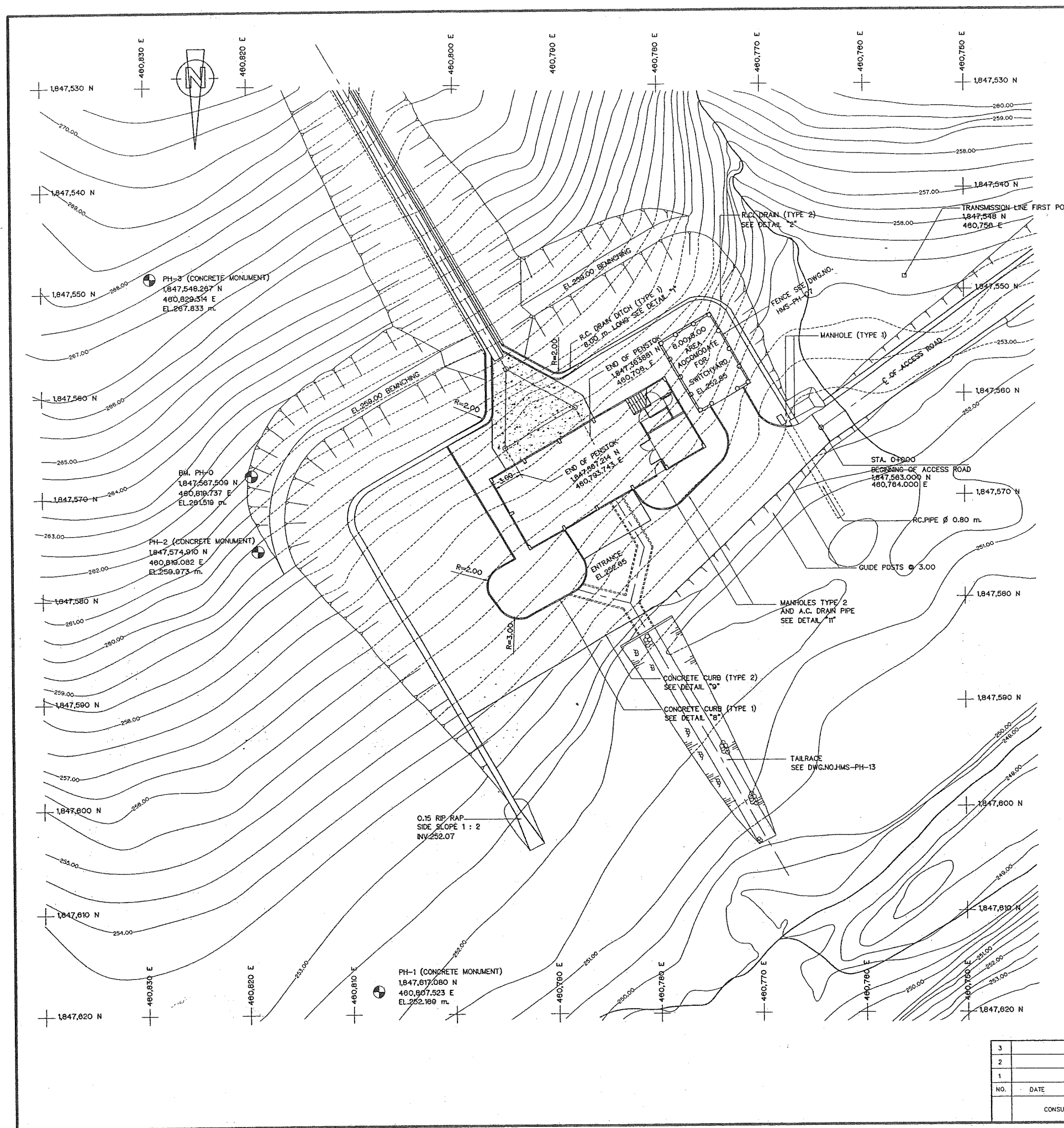
DETAILS FOR R.C. PIPE CULVERT
NOT TO SCALE

NOTES :

- ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
- REINFORCED CONCRETE PIPE CULVERT CLASSES 2 AND 3 SHALL CONFORM TO TIS.128 OR EQUIVALENT.
- CEMENT, STEEL REINFORCEMENT, AGGREGATES AND TEST METHODS USED FOR R.C. PIPE CULVERT SHALL CONFORM TO THE REQUIREMENT OF TIS.128 OR EQUIVALENT.
 - CEMENT CONTENT USED FOR CONCRETE MIX SHALL NOT BE LESS THAN 335 KILOGRAM PER CUBIC METER OF CONCRETE
 - CONCRETE COVER FOR SINGLE LAYER CIRCULAR REINFORCEMENT SHALL BE 0.35 TO 0.5 TIME OF WALL THICKNESS (MEASURED FROM INNER WALL)
 - CONCRETE COVER FOR DOUBLE LAYERS CIRCULAR REINFORCEMENT SHALL BE 2.5 CM. IN AVERAGE BUT NOT LESS THAN 1.5 CM.
 - LONGITUDINAL REINFORCEMENT SPACING SHALL BE A MINIMUM OF 8-#4 MM. BARS
 - CIRCULAR REINFORCEMENT SPACING SHALL BE 15 CM. OR LESS BUT NOT MORE THAN WALL THICKNESS.
- THE CULVERT WHICH HAVING TRANSVERSE REINFORCEMENT IN ELLIPTICAL CAGE AS SPECIFIED IN THE TIS. 128 SHALL NOT BE USED.
- CULVERT JOINTS SHALL BE MORTARED AS SHOWN ON THE DRAWING WITH CEMENT MORTAR (1:2 BY VOLUME)
- FOR R.C. HEADWALL
 - CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAY AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS:

PORTLAND CEMENT TYPE 1	350	KG. (MIN)
SAND	0.43	M ³
CRUSHED ROCK OR GRAVEL	0.86	M ³
CONCRETE SLUMP	10	CM. (MAC.)
 - REINFORCING STEEL SHALL BE DEFROMED BARS CONFORMING TO TIS.24 GRADE SD 30
 - DESIGN WORKING STRESSES :-
 - CONCRETE, $f_c = 70$ KSC.
 - STEEL, $f_s = 1400$ KSC. $n = 10$
- THIS DRAWING IS ADAPTED FROM DOH DWG NO.DS-101,DS-104

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS PENSTOCK R.C. PIPE CULVERT			
MAHA NAKORN CONSULTANTS CO.,LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	201.18804	REVIEWED	201.5083
DRAWN	201.5220	SUBMITTED	201.5220
CHECKED	201.5220	RECOMMENDED	201.5220
APPROVED	201.5220	APPROVED	201.5220
DATE	201.5220	DATE	201.5220
CONSULTANTS	DEDE	PROJECT MANAGER	DATE
HMS-PS-13		SHEET NO. 18 OF 38	



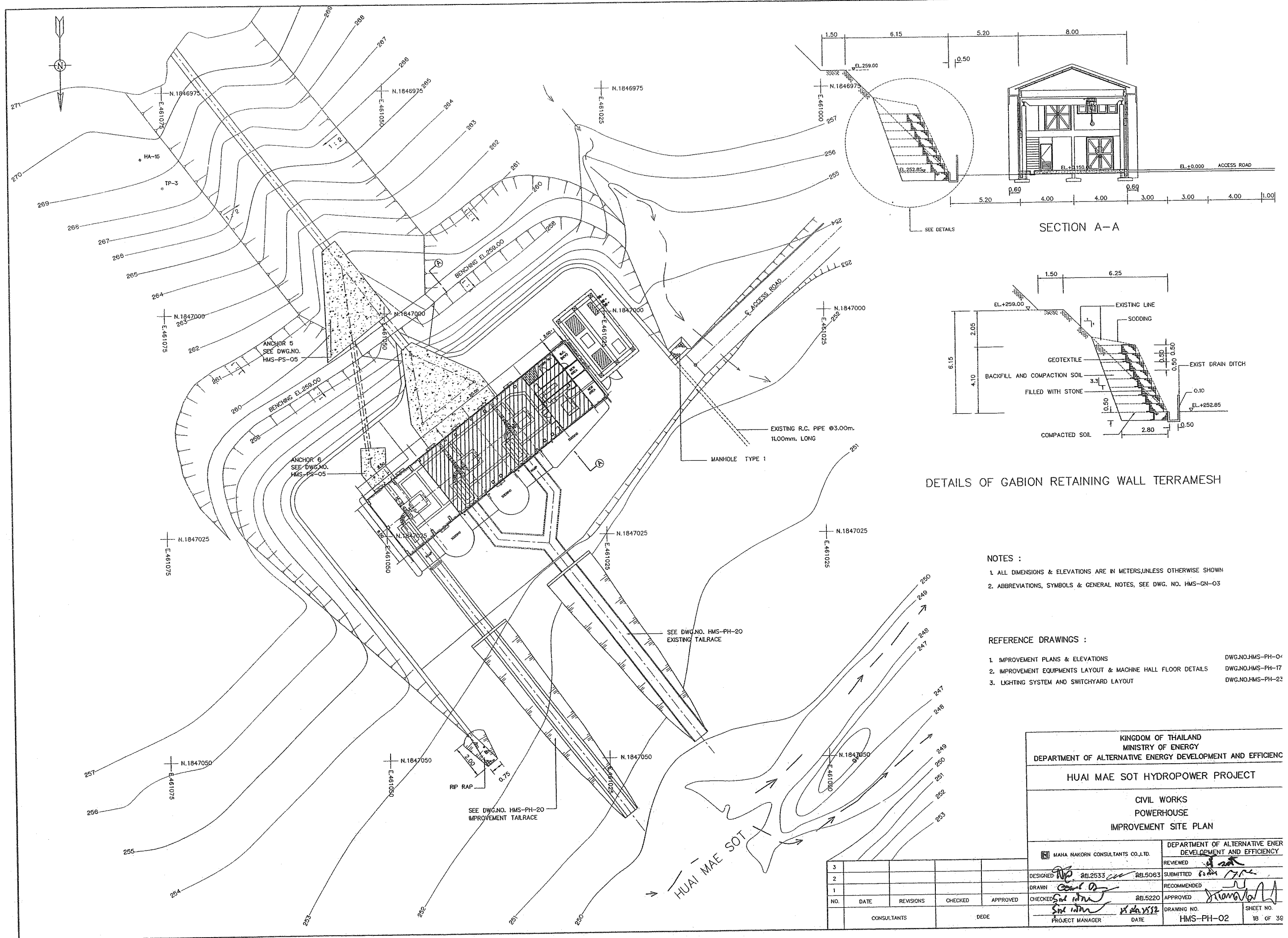
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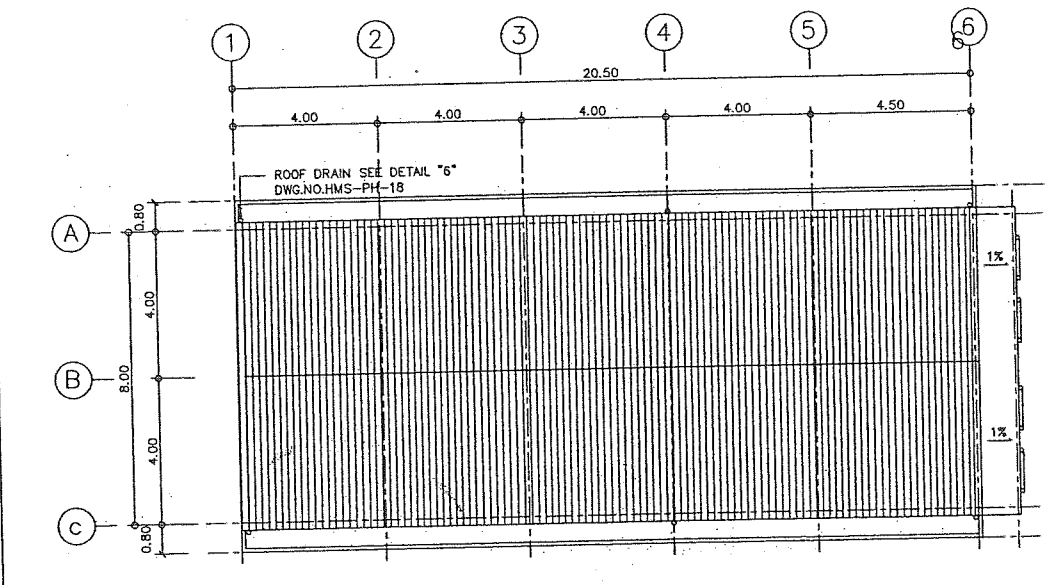
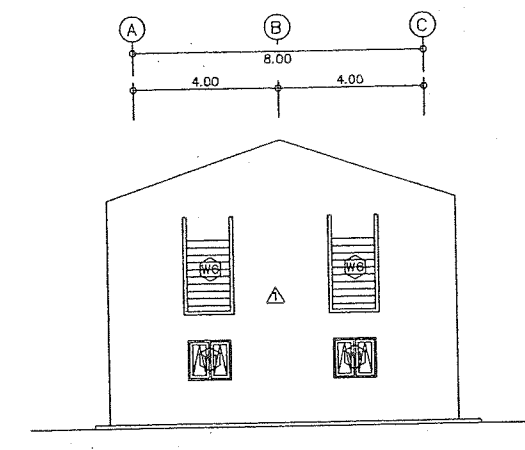
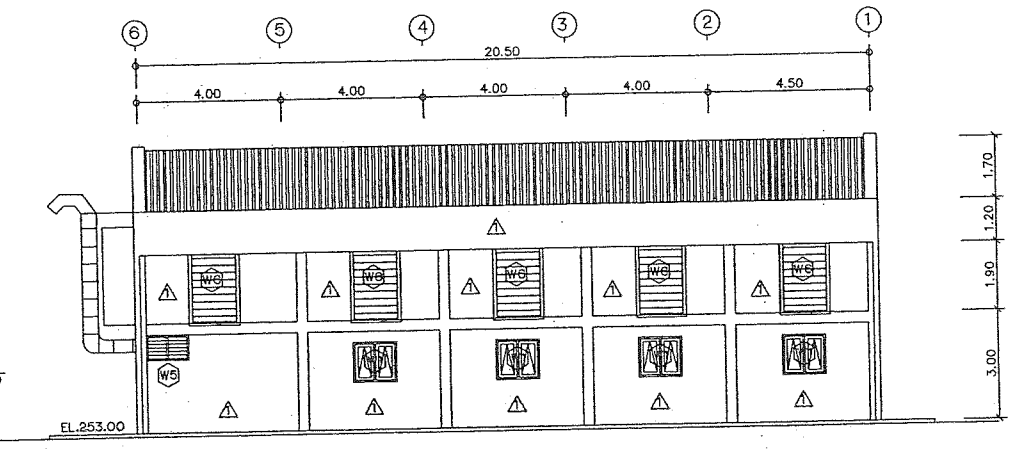
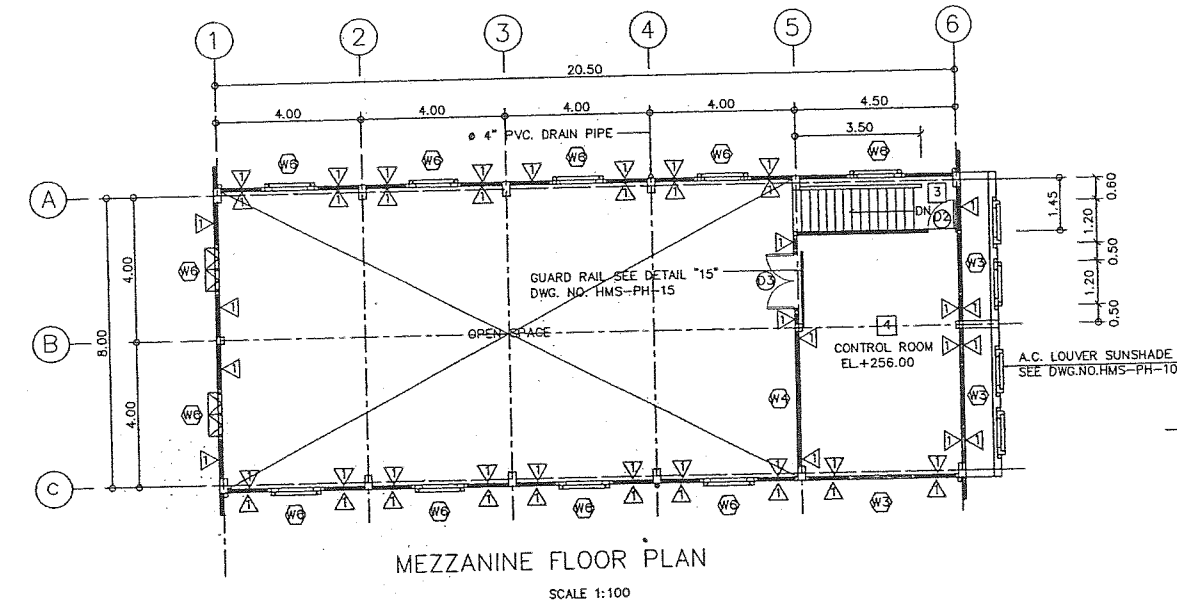
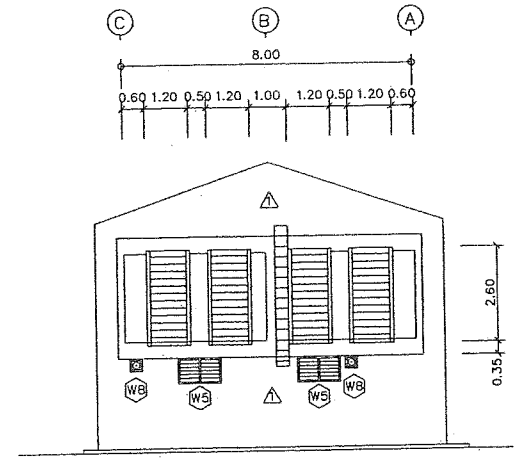
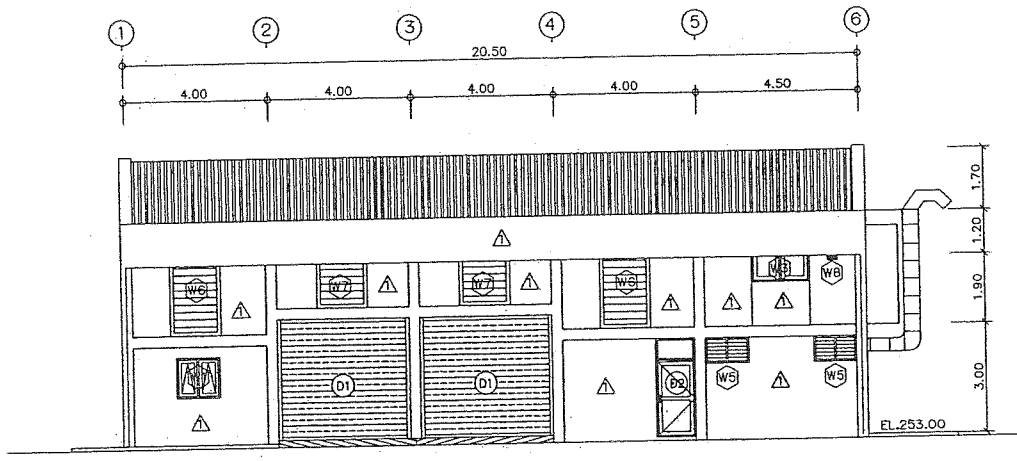
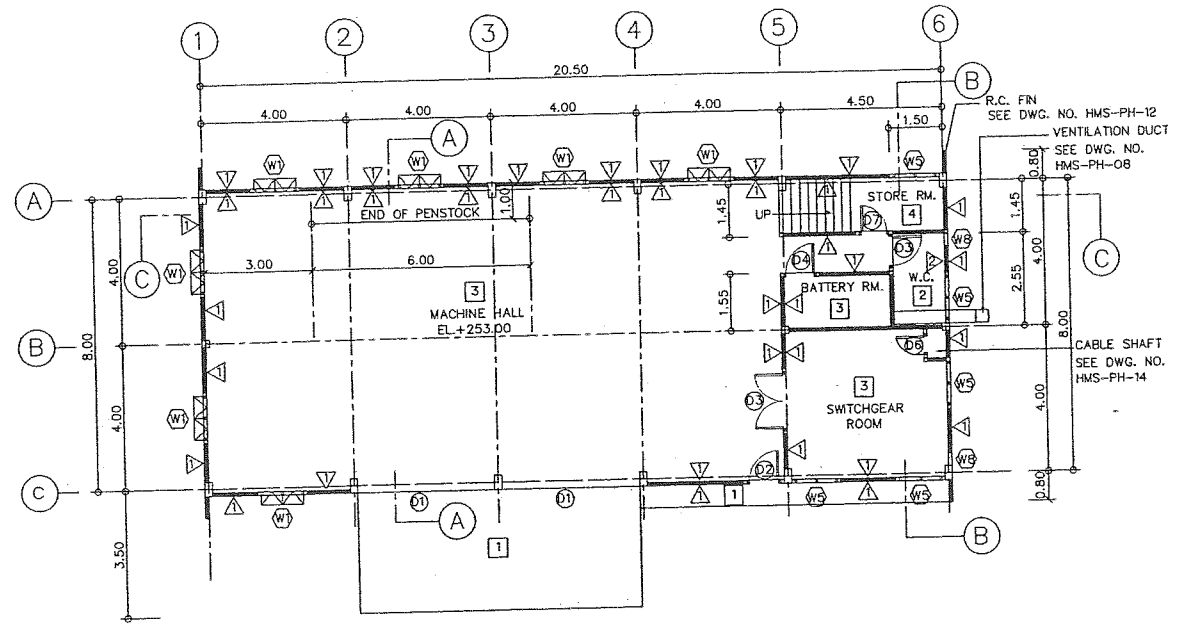
1. THIS DRAWING SHOWN EXISTING LAYOUT OF HUAI MAE SOT PROJECT AND SHOWN FOR REFERENCE ONLY.
2. ALL DIMENSIONS & ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN

REFERENCE DRAWINGS :

1. EXISTING PLANS & ELEVATIONS DWG.NO.HMS-PH-03
2. EXISTING EQUIPMENTS LAYOUT & MACHINE HALL FLOOR DETAILS DWG.NO.HMS-PH-18

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE EXISTING GENERAL SITE PLAN			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	REVIEWED	SUBMITTED	APPROVED
DRAWN	CHECKED	RECOMMENDED	APPROVED
NO.	DATE	REVISIONS	CHECKED
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
HMS-PH-01		17 OF 39	





- GENERAL SYMBOLS
- ⑥ ELEVATION INDEX
 - BRICK MASONRY WALL (COMMON BRICK)
 - F FIXED GLASS
 - DOOR OR WINDOW HINGED AT LEFT HAND SIDE
 - DOOR OR WINDOW HINGED AT TOP
 - CONCRETE
 - WINDOW NO.1 (SEE WINDOW SCHEDULE)
 - DOOR NO.1 (SEE DOOR SCHEDULE)
 - BRASS FAUCET Ø1"

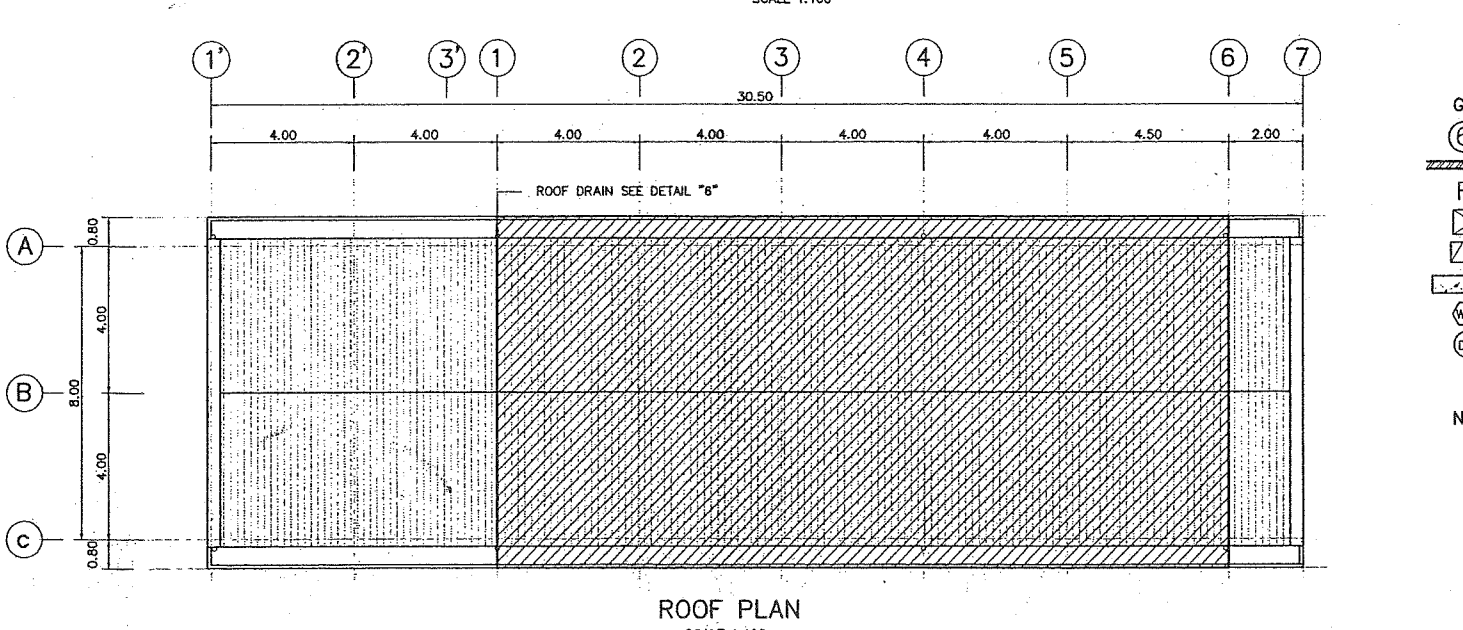
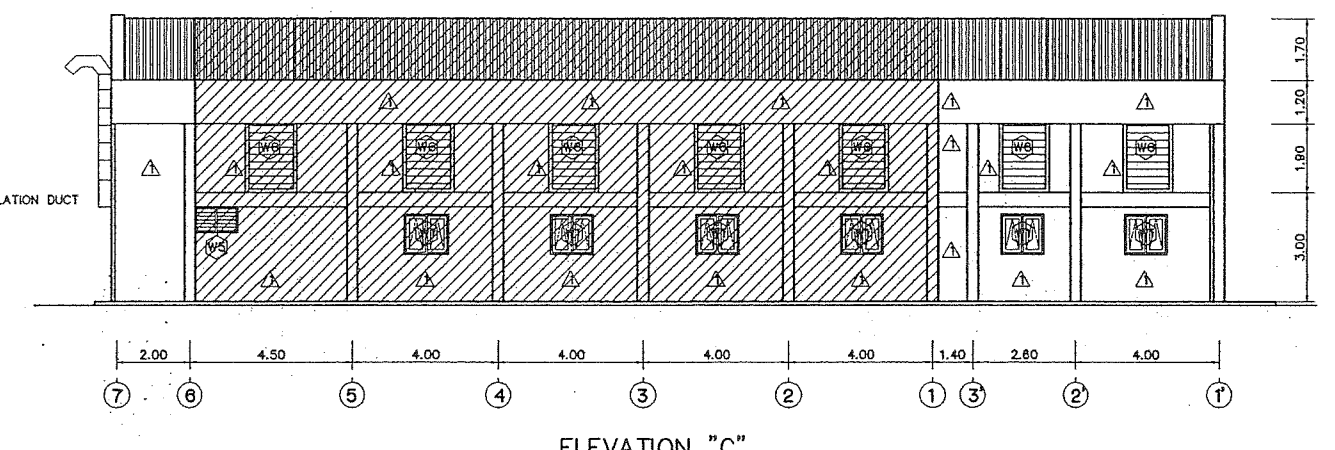
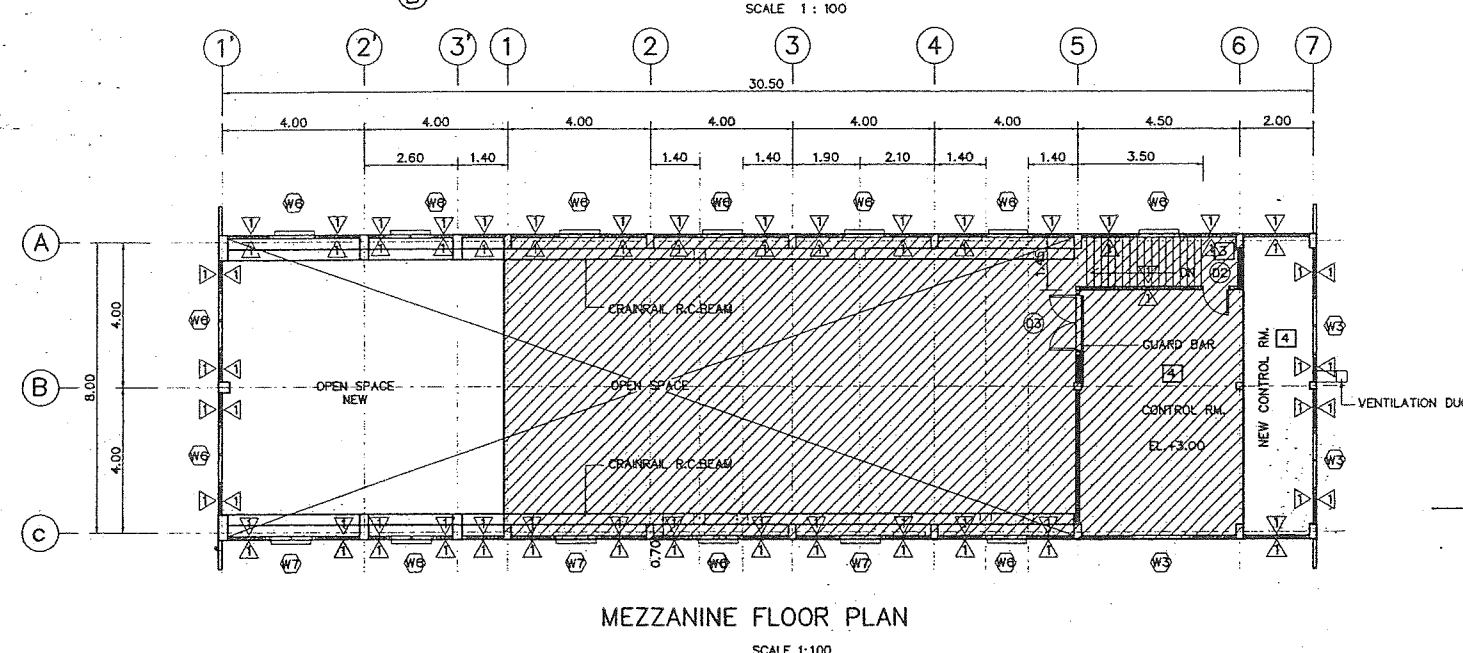
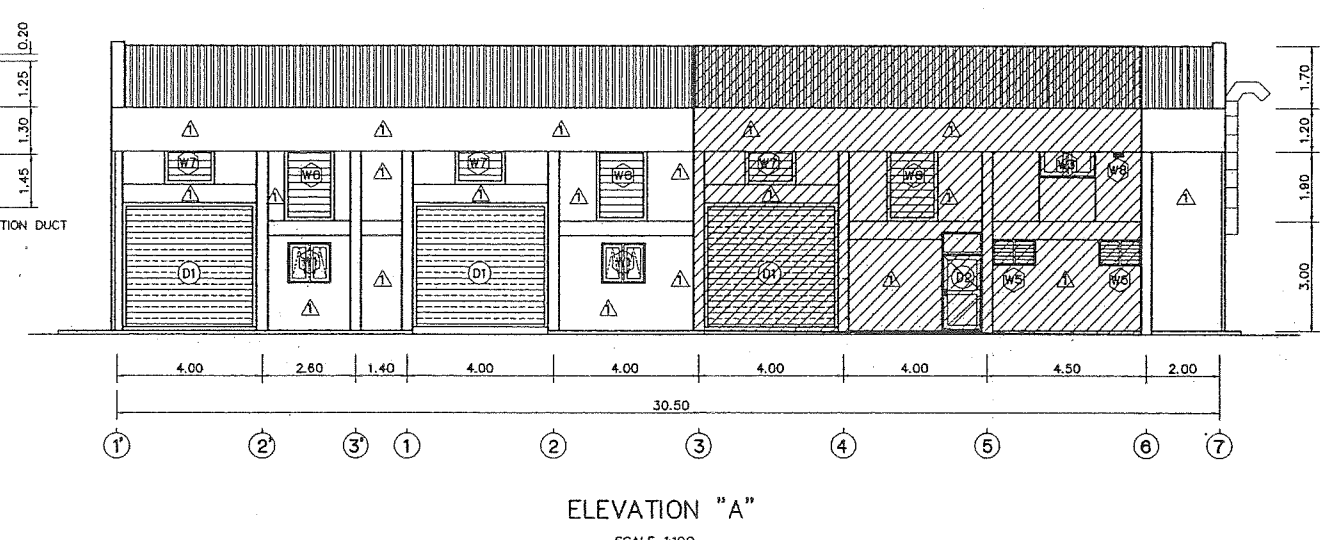
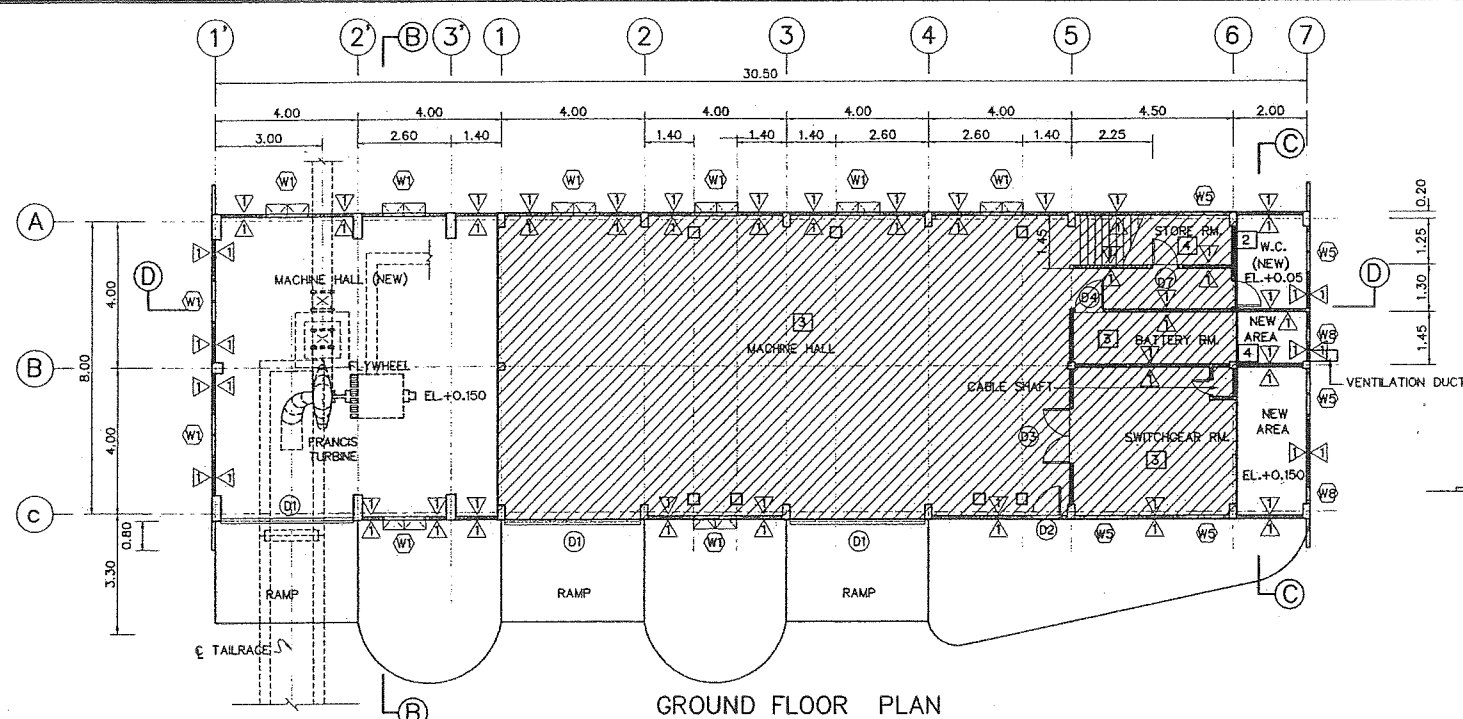
- FLOOR FINISHING SYMBOLS
- 1 COARSE FINISHED
 - 2 2"x2" MOSAIC FLOOR TILES
 - 3 COATED WITH EPOXY RESIN 8"x8" VINYL TILES

- WALL FINISHING SYMBOLS
- 1 CEMENT PLASTER
 - 2 4"x4" VITREOUS WALL TILE

- NOTES :
- ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN
 - THIS DWG. SHOWN EXISTING DETAILS OF HUAI MAE SOT POWERHOUSE AND FOR REFERENCE ONLY

- REFERENCE DRAWINGS :
- | | |
|--|--------------------|
| 1. EXISTING SECTIONS & R.C. PLANS | DWG. NO. HMS-PH-06 |
| 2. EXISTING DETAILS OF W.C. | DWG. NO. HMS-PH-08 |
| 3. MISCELLANEOUS DETAILS | DWG. NO. HMS-PH-18 |
| 4. EXISTING DETAILS OF DOOR & WINDOW | DWG. NO. HMS-PH-10 |
| 5. EXISTING STRUCTURAL REINFORCEMENT | DWG. NO. HMS-PH-12 |
| 6. EXISTING STRUCTURAL REINFORCEMENT & DETAILS | DWG. NO. HMS-PH-14 |

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
CIVILWORK POWERHOUSE EXISTING PLANS & ELEVATIONS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	2512533	REVIEWED	2512533
DRAWN	2512533	SUBMITTED	2512533
CHECKED	2512520	APPROVED	2512520
PROJECT MANAGER		DATE	
CONSULTANTS		DEDE	
HMS-PH-03		SHEET NO. 19 OF 39	

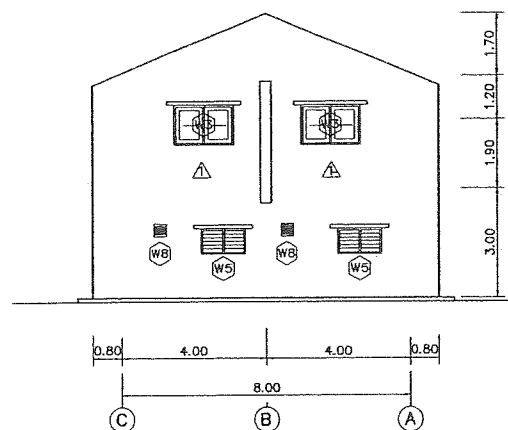


- GENERAL SYMBOLS**
- ⑥ ELEVATION INDEX
 - BRICK MASONRY WALL (COMMON BRICK)
 - F FIXED GLASS
 - DOOR OR WINDOW HINGED AT LEFT HAND SIDE
 - DOOR OR WINDOW HINGED AT TOP
 - CONCRETE
 - WINDOW NO (SEE WINDOW SCHEDULE)
 - DOOR NO (SEE DOOR SCHEDULE)
- FLOOR FINISHING SYMBOLS**
- 1 COARSE FINISHED
 - 2 8"x8" MOSAIC FLOOR TILES
 - 3 COATED WITH EPOXY RESIN ④ 8"x8" VINYL TILES
- WALL FINISHING SYMBOLS**
- 1 CEMENT PLASTER
 - 2 8"x8" VITREOUS WALL TILE

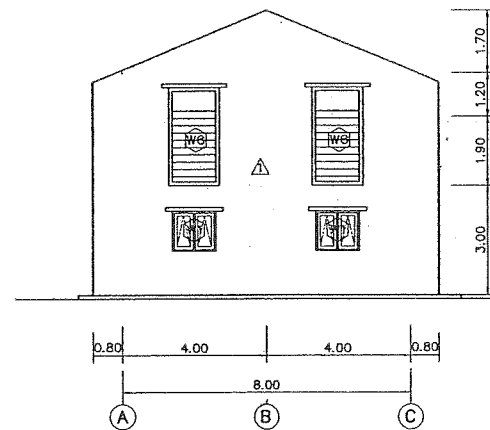
NOTES: DARK SHADE SHOWN EXISTING STRUCTURES

- REFERENCE DRAWING**
- 1. IMPROVEMENT SECTION & ELEVATIONS HMS-PH-05
 - 2. IMPROVEMENT DETAILS W.C. SEPTICTANK AND VENTILATION DUCT HMS-PH-09
 - 3. IMPROVEMENT: DETAIL OF DOOR & WINDOW HMS-PH-11

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORK POWERHOUSE IMPROVEMENT PLAN & ELEVATIONS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	REVIEWED	SUBMITTED	
DRAWN	RECOMMENDED	APPROVED	
NO.	DATE	REVISIONS	CHECKED
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	SHEET NO.
HMS-PH-04			20 OF 39



ELEVATION "B"
SCALE 1:100



ELEVATION "D"
SCALE 1:100

GENERAL SYMBOLS

- ⑥ ELEVATION INDEX
- BRICK MASONRY WALL (COMMON BRICK)
- F FIXED GLASS
- DOOR OR WINDOW HINGED AT LEFT HAND SIDE
- DOOR OR WINDOW HINGED AT TOP
- CONCRETE
- WB WINDOW NO (SEE WINDOW SCHEDULE)
- D2 DOOR NO (SEE DOOR SCHEDULE)

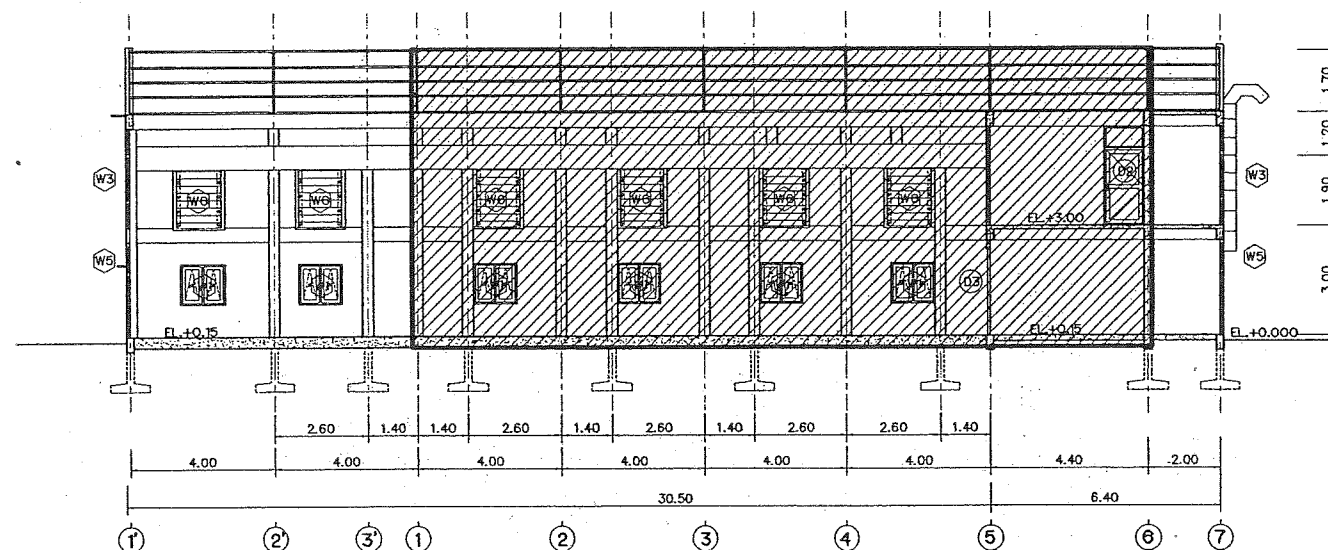
WALL FINISHING SYMBOLS

- 1 CEMENT PLASTER
- 2 8"x8" VITREOUS WALL TILE

REFERENCE DRAWING

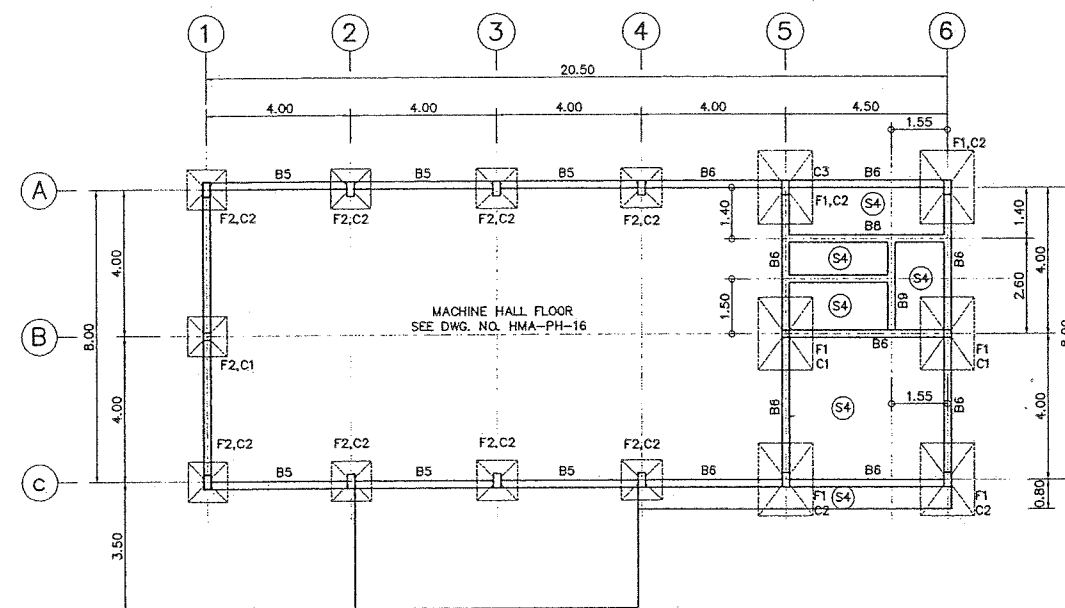
- 1. IMPROVEMENT PLAN & ELEVATIONS HMS-PH-04
- 2. IMPROVEMENT DETAILS W.C. SEPTICTANK AND VENTILATION DUCT HMS-PH-09
- 3. IMPROVEMENT: DETAIL OF DOOR & WINDOW HMS-PH-11

NOTES: DARK SHADE SHOWN EXISTING STRUCTURES

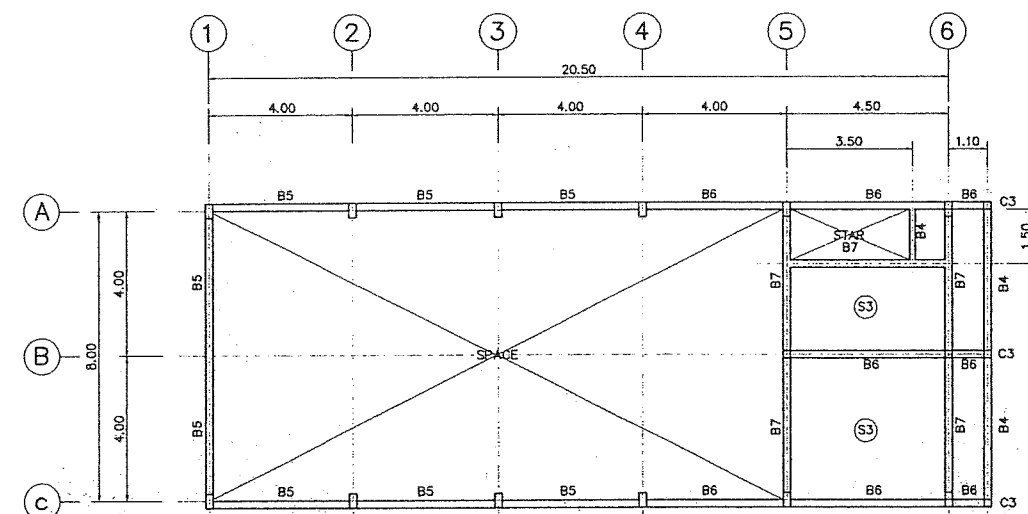


SECTION D-D
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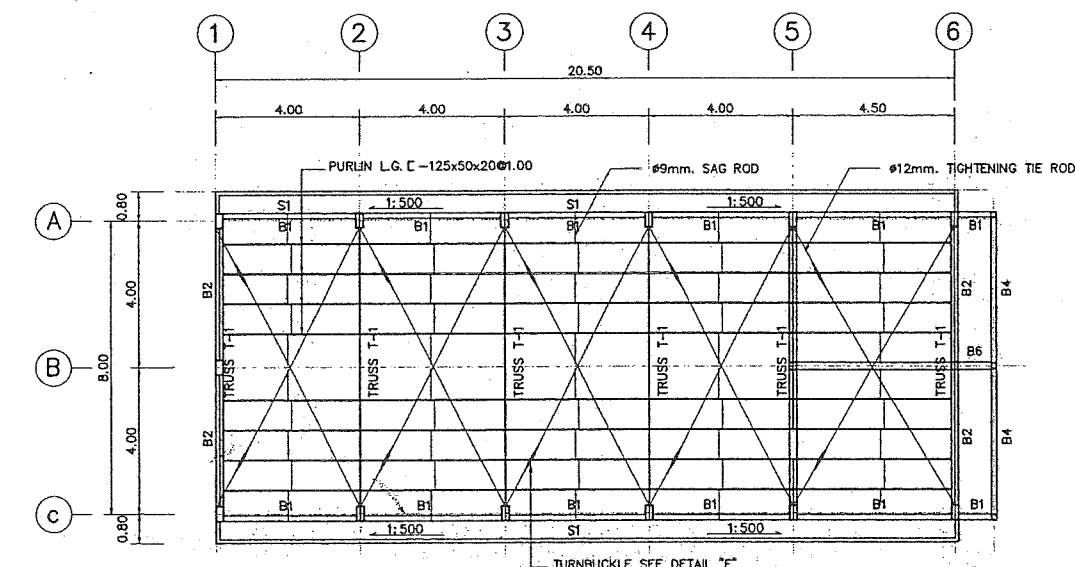
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HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE IMPROVEMENT SECTION & ELEVATIONS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	25/2533	REVIEWED	25/5063
DRAWN	25/2533	SUBMITTED	25/5063
CHECKED	25/2533	RECOMMENDED	25/5063
APPROVED	25/2533	APPROVED	25/5063
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
HMS-PH-05		SHEET NO. 21 OF 39	



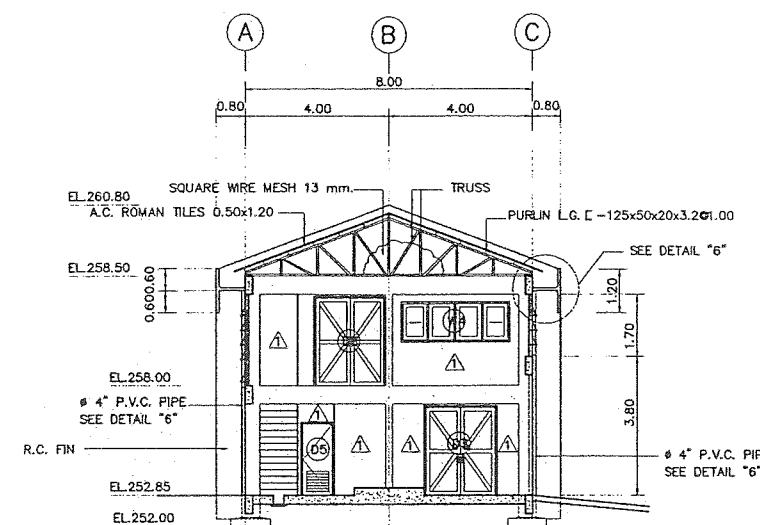
GROUND FLOOR R.C. PLAN
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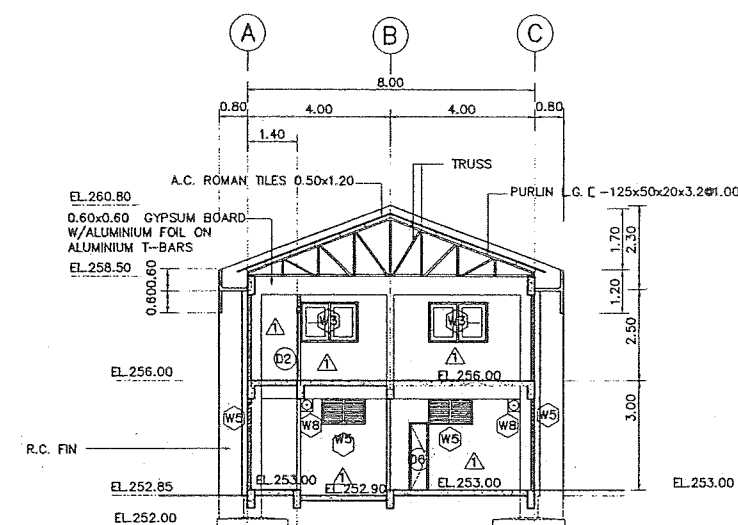
MEZZANINE FLOOR R.C. PLAN
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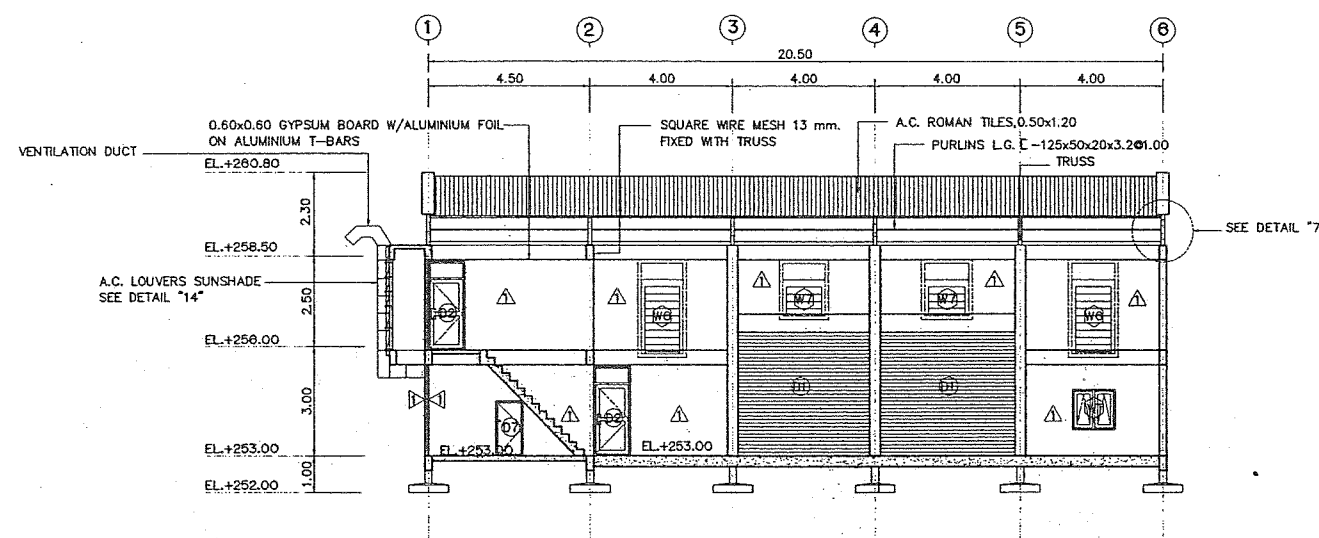
ROOF TRUSSES & GUTTER SLAB
NOT TO SCALE



SECTION B-B
NOT TO SCALE



SECTION C-C
NOT TO SCALE



SECTION D-D
NOT TO SCALE

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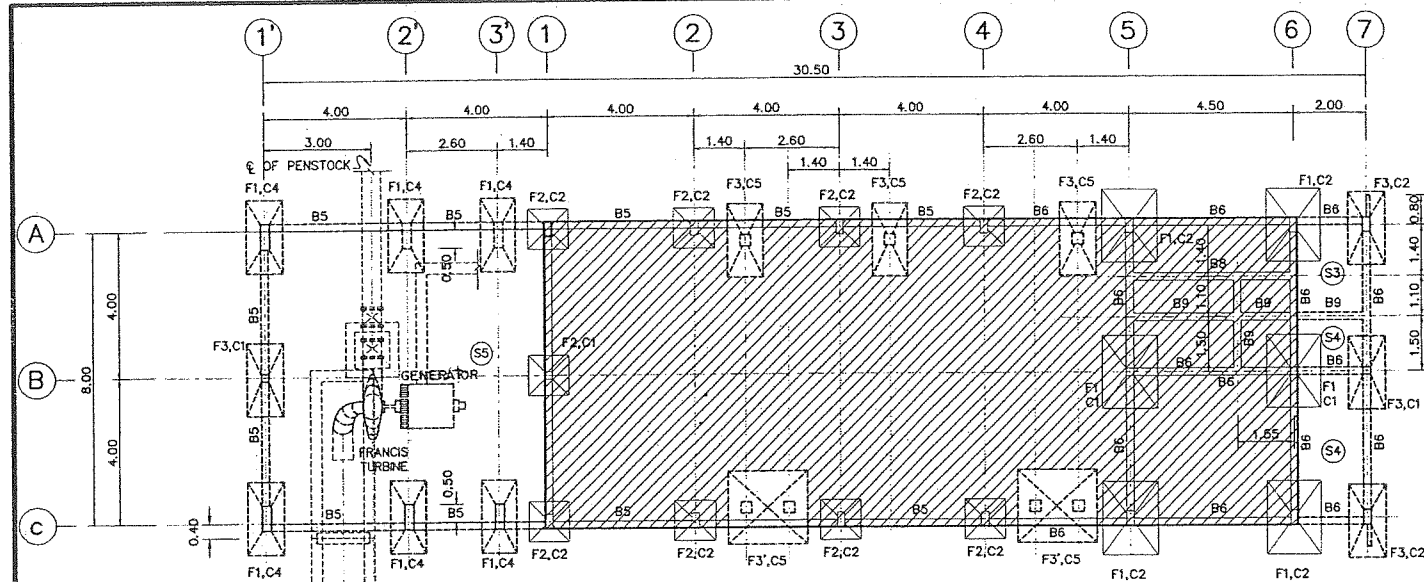
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2. THIS DRAWING COPY FROM EXISTING DRAWINGS DONE BY NEA IN AUGUST 1987 AND FOR REFERENCE ONLY

REFERENCE DRAWINGS : EXISTING

1. PLANS & ELEVATIONS
2. DETAILS OF W.C. SEPTIC TANK AND VENTILATION DUCT
3. MISCELLANEOUS DETAILS
4. DETAILS OF DOOR & WINDOW
5. STRUCTURAL REINFORCEMENTS
6. STRUCTURAL REINFORCEMENTS AND DETAILS
7. EQUIPMENTS LAYOUT & MACHINE HALL FLOOR DETAILS
8. ROOF TRUSS & DETAILS

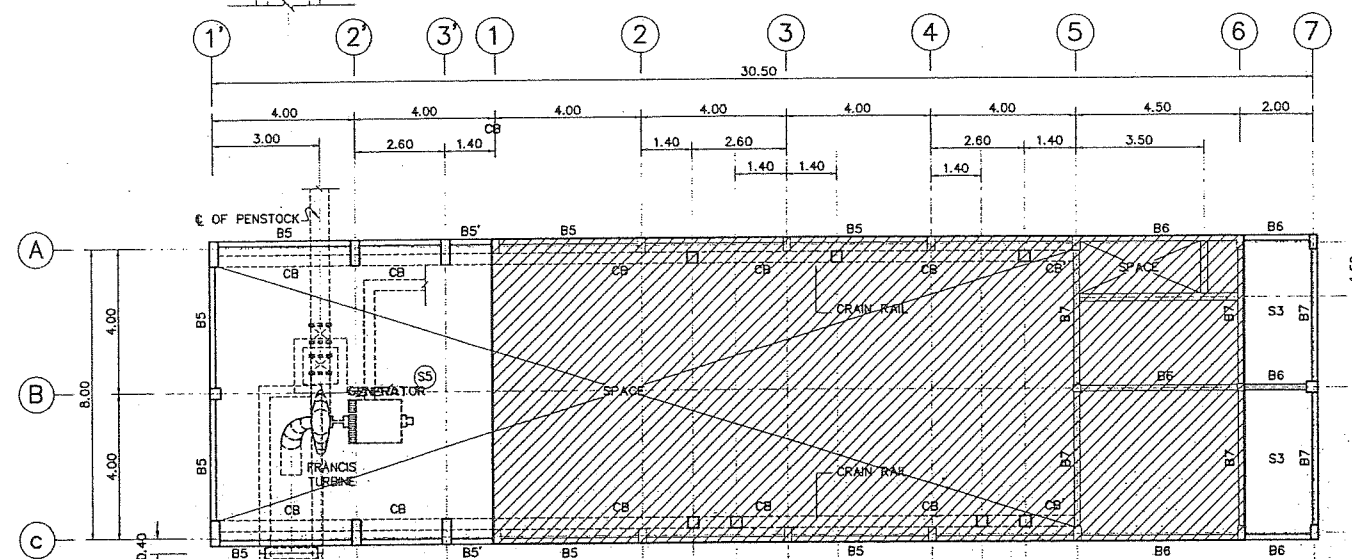
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DWG.NO.HMS-PH-08
DWG.NO.HMS-PH-13
DWG.NO.HMS-PH-10
DWG.NO.HMS-PH-12
DWG.NO.HMS-PH-14
DWG.NO.HMS-PH-18
DWG.NO.HMS-PH-19

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE EXISTING SECTIONS & R.C. PLANS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	25.5083	25.5083	SUBMITTED
DRAWN	25.5083	25.5083	RECOMMENDED
CHECKED	25.5083	25.5083	APPROVED
DATE	25.5083	25.5083	DRAWING NO.
CONSULTANTS	DEDE	DATE	SHEET NO.
PROJECT MANAGER		HMS-PH-06	
22 OF 39			



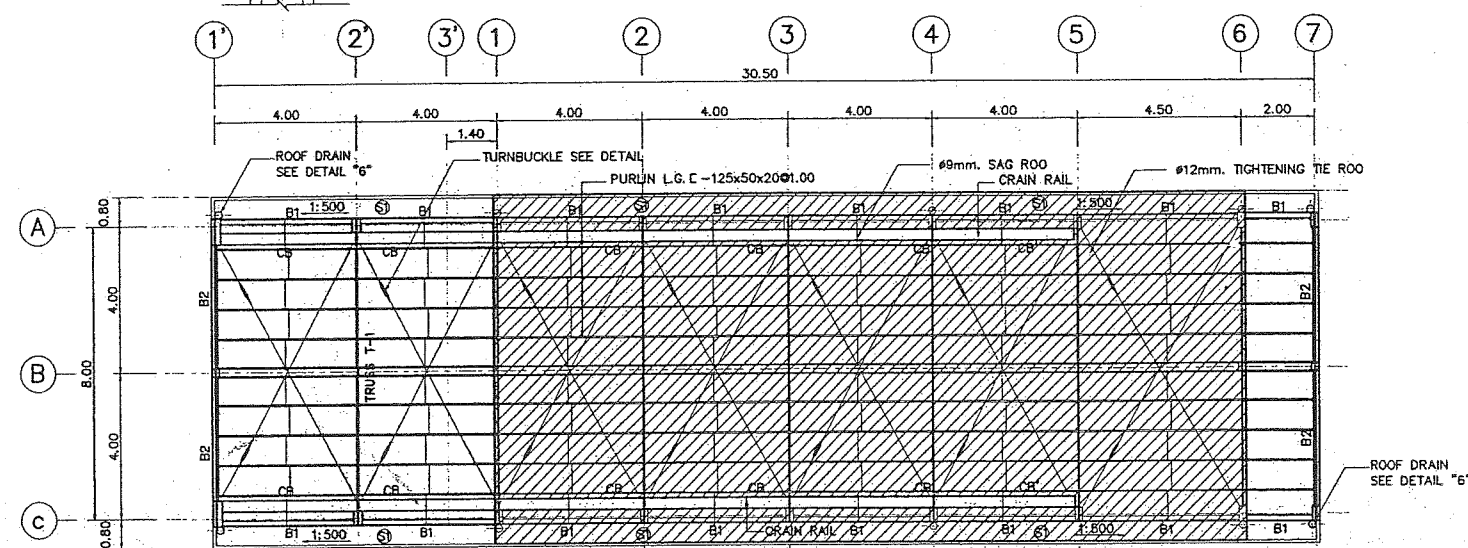
GROUND FOOTING R.C. PLAN

SCALE 1:100



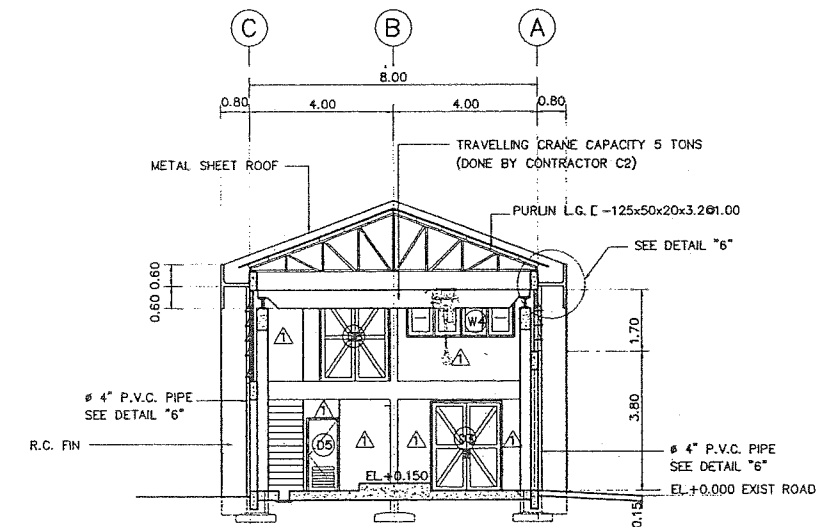
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SCALE 1:100



ROOF TRUSSES & GUTTER SLAB

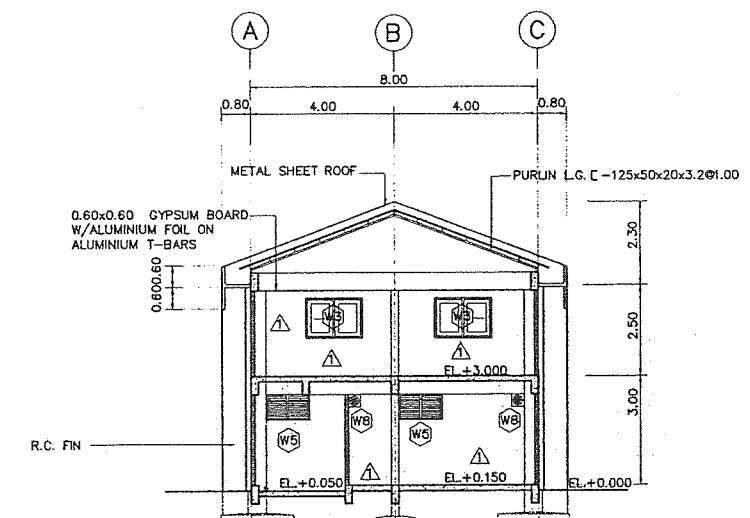
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SECTION B-B

(SEE DWG.NO.HMS-PH-04)

SCALE 1:100



SECTION C-C

(SEE DWG.NO.HMS-PH-04)

SCALE 1:100

NOTES:

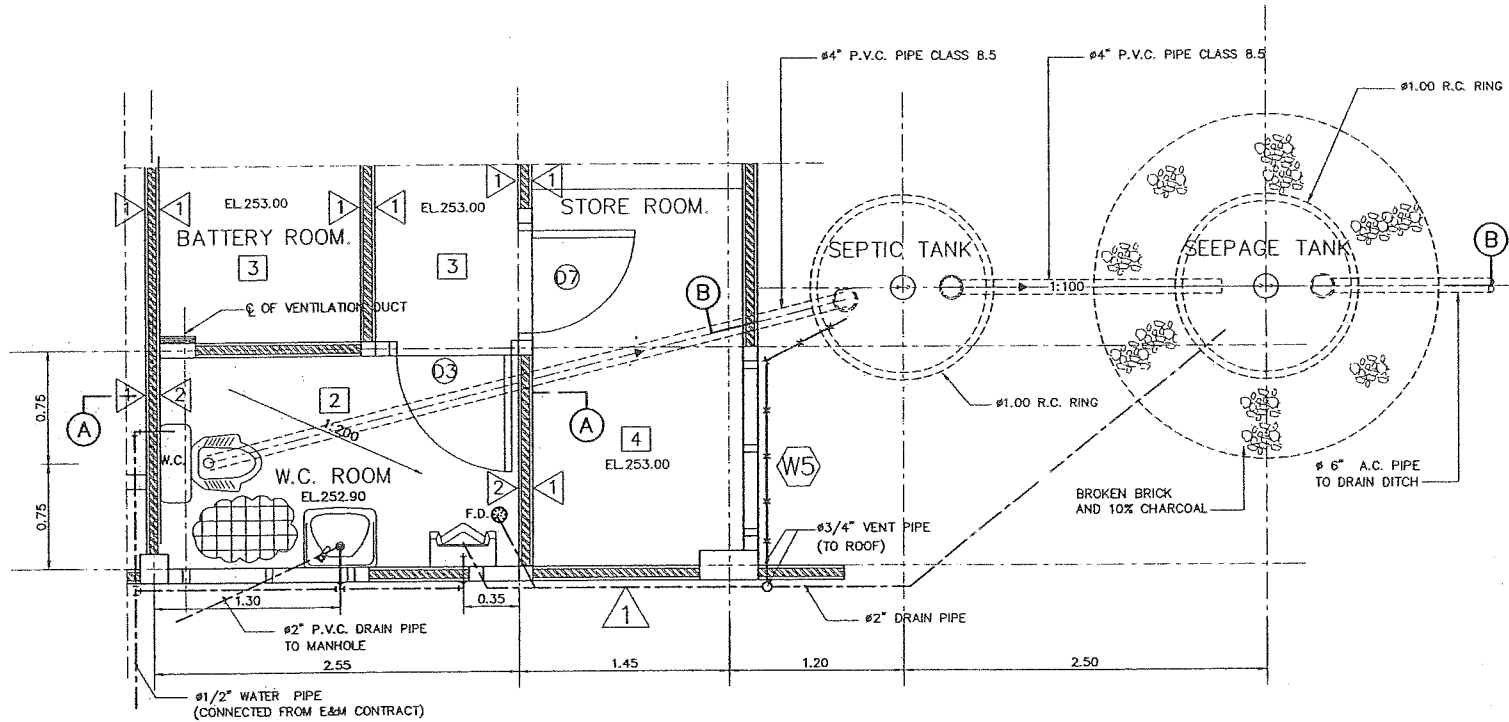
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2. DARK SHADE SHOWN EXISTING STRUCTURES FOR REFERENCE

REFERENCE DRAWINGS : IMPROVEMENT

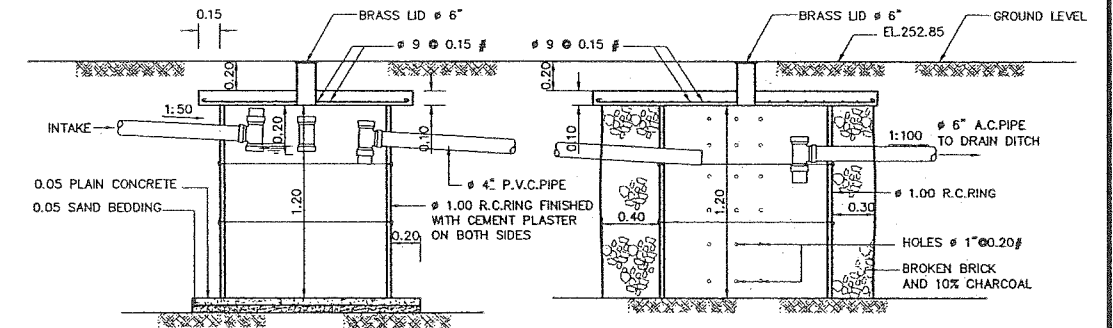
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|---|------------------|
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| 2. DETAILS OF W.C. SEPTIC TANK AND VENTILATION DUCT | DWG.NO.HMS-PH-06 |
| 3. MISCELLANEOUS DETAILS | DWG.NO.HMS-PH-08 |
| 4. DETAILS OF DOOR & WINDOW | DWG.NO.HMS-PH-11 |
| 5. STRUCTURAL REINFORCEMENTS | DWG.NO.HMS-PH-13 |
| 6. STRUCTURAL REINFORCEMENTS AND DETAILS | DWG.NO.HMS-PH-15 |
| 7. EQUIPMENTS LAYOUT & MACHINE HALL FLOOR DETAILS | DWG.NO.HMS-PH-17 |
| 8. ROOF TRUSS & DETAILS | DWG.NO.HMS-PH-19 |
| 9. PLAN, SECTIONS & DETAILS OF TAILRACE | DWG.NO.HMS-PH-20 |

3					
2					
1					
NO.	DATE	REVISIONS	CHECKED	APPROVED	
					CONSULTANTS
					DEDE

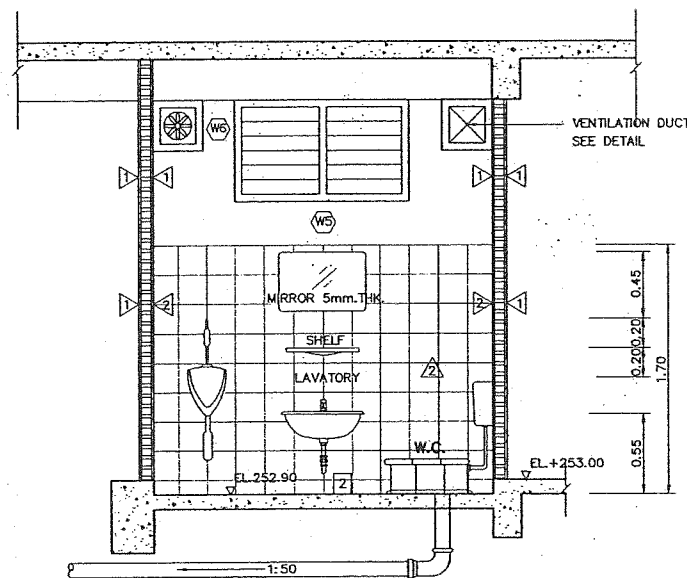
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
HUAI MAE SOT HYDROPOWER PROJECT	
CIVIL WORK POWERHOUSE IMPROVEMENT SECTIONS & R.C. PLANS	
Maha Nakorn Consultants Co., Ltd.	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY
DESIGNED: <i>[Signature]</i> 21.2533	REVIEWED: <i>[Signature]</i> 21.5083
DRAWN: <i>[Signature]</i>	RECOMMENDED: <i>[Signature]</i>
CHECKED: <i>[Signature]</i> 21.5220	APPROVED: <i>[Signature]</i>
PROJECT MANAGER	DRAWING NO. HMS-PH-07
DATE	SHEET NO. 23 OF 39



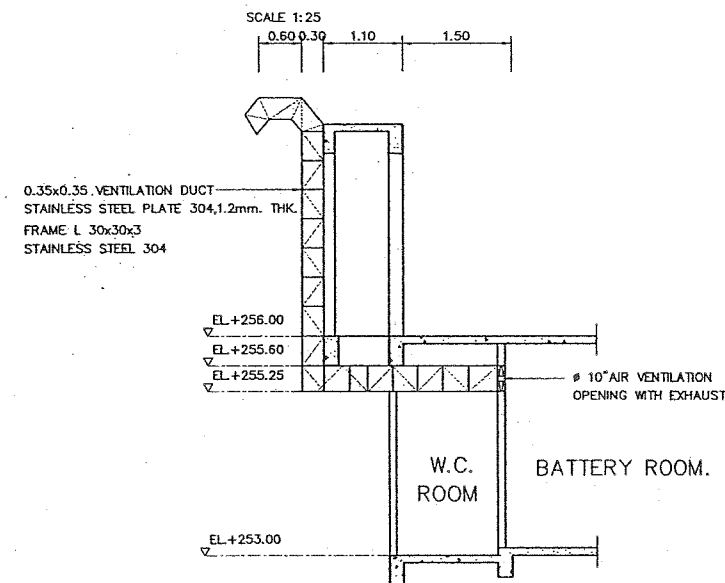
PLAN OF W.C., SEPTIC & SEEPAGE TANK
SCALE 1:25



SECTION B-B
SCALE 1:25



SECTION A-A
SCALE 1:25



VENTILATION DUCT DETAIL
SCALE 1:50

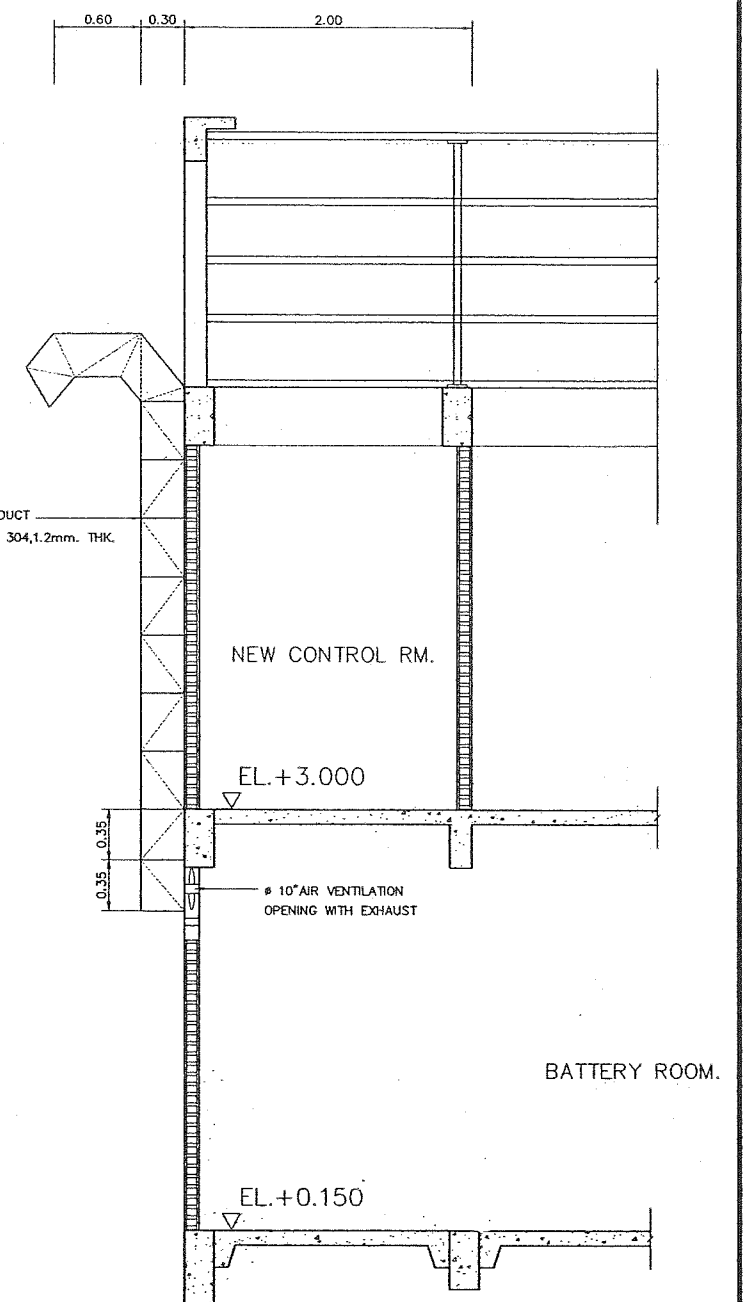
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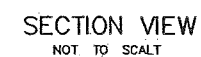
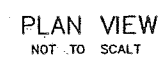
NOTES.

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS UNLESS OTHERWISE SHOWN
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HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE EXISTING DETAILS WC, SEPTIC TANK AND VENTILATION DUCT			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	28.12.533	REVIEWED	28.5083
DRAWN	28.12.533	RECOMMENDED	28.5083
CHECKED	28.12.533	APPROVED	28.5083
NO.	DATE	REVISIONS	CHECKED
CONSULTANTS		DEDE	
PROJECT MANAGER		DATE	
DRAWING NO.		SHEET NO.	
HMS-PH-08		24 OF 30	

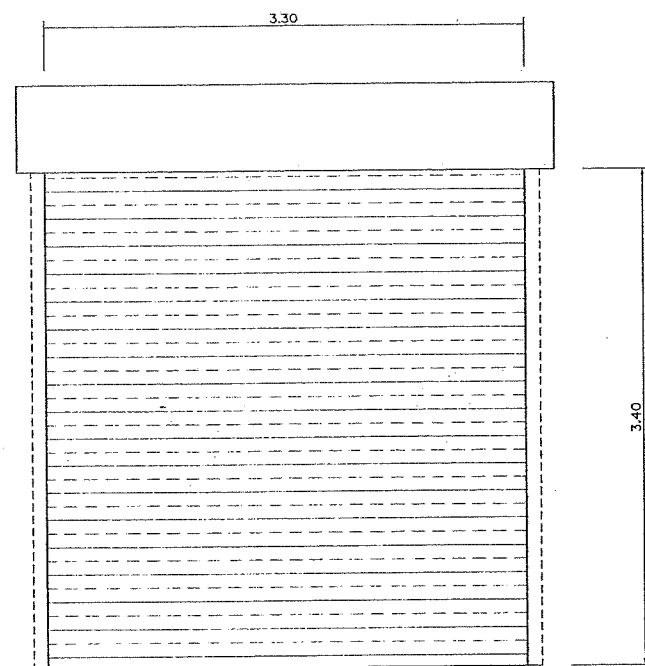


SECTION Q-Q
VENTILATION DUCT DETAIL
SCALE 1:25

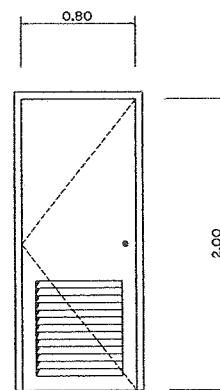


MINIMUM CAPACITY 1 CU.M. AND
APPROVE BY FIELD ENGINEER

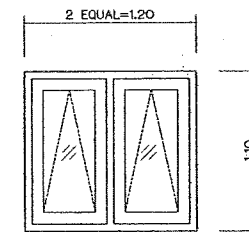
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2					DRAWN	28.5083		SUBMITTED	6.04M
1					CHECKED	28.5220		RECOMMENDED	
NO.	DATE	REVISIONS	CHECKED	APPROVED	CHECKED	28.5220		APPROVED	
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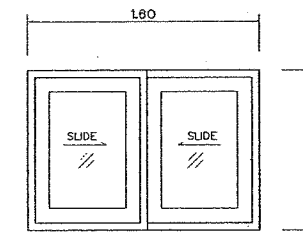
(D1)
ROLLING DOOR
SCALE 1:25



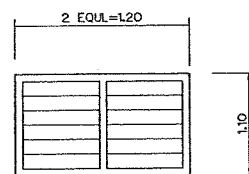
(D5)
OPENNING DOOR
SCALE 1:25



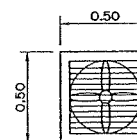
(W1)
TOP HUNG WINDOW
SCALE 1:25



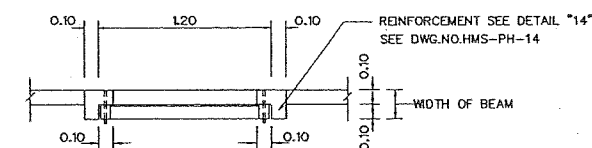
(W3)
SLIDING WINDOW
SCALE 1:25



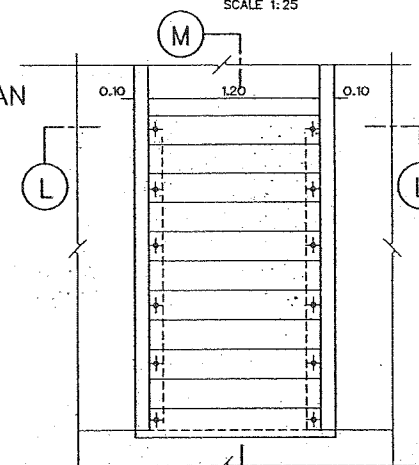
(W5)
FIXED GLASS LOUVER WINDOW
SCALE 1:25



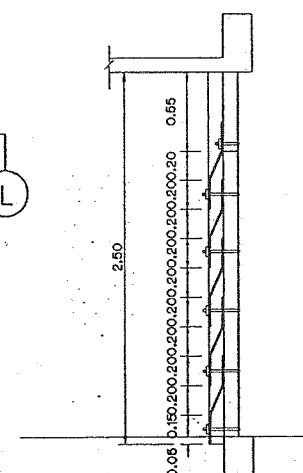
(W8)
AIR VENTILATION OPENING WITH EXHAUST FAN
SCALE 1:20



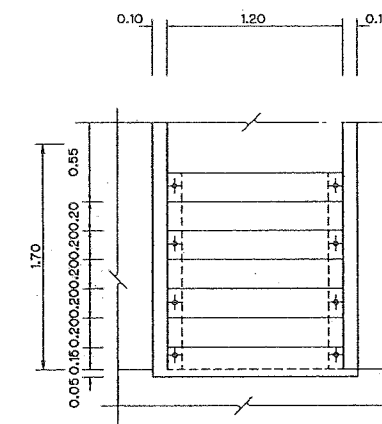
SECTION L-L
SCALE 1:25



(W6)
SCALE 1:25



SECTION M-M
SCALE 1:25



(W7)
SCALE 1:25

DOORS & WINDOWS SCHEDULE

SYMBOL	DESCRIPTIONS	SIZE		FRAME	RAIL & STILE	PANEL	HINGE	LOCKSET	HANDLE	REMARKS
		WIDTH	HEIGHT							
(D1)	ROLLING DOOR (STEEL NO.18,1.2 mm. Thk.)	3.30	3.40	GALVANIZED STEEL	—	—	—	NORMAL KEY	—	OPERATING BY CHAIN GEAR
(D5)	OPENNING DOOR	2.00	2.50	HARD WOOD 2"x 4"	—	TEAK PLYWOOD & TEAK LOUVER	BRASS 3-4"	FOR W.C.	●	
(W1)	TOP HUNG WINDOW	1.20	1.10	GALVANIZED STEEL	GALVANIZED STEEL	GLASS 5 mm.thk.	●	●	●	FULL SET OF ACCESSORIES FROM MANUFACTURER
(W3)	SLIDING WINDOW	1.60	1.10	ANODIZED ALUMINIUM	ANODIZED ALUMINIUM	GLASS 6 mm.thk.	—	●	●	
(W5)	FIXED GLASS LOUVER WINDOW	1.20	0.70	ALUMINIUM(NA) 2"x 4"	—	GLASS 8-11/2" 6mm. THK.	—	—	—	
(W6)	METAL SHEET LOUVER WINDOW	1.20	2.50	—	—	METAL SHEET LOUVER	—	—	—	FULL SET OF ACCESSORIES FROM MANUFACTURER
(W7)	METAL SHEET LOUVER WINDOW	1.20	1.70	—	—	METAL SHEET LOUVER	—	—	—	FULL SET OF ACCESSORIES FROM MANUFACTURER
(W8)	AIR VENTILATION OPENING WITH EXHAUST FAN	—	—	HARD WOOD 2"x 4"	—	—	—	—	—	SIZE - 10" NATIONAL OR EQUIVALENT

● SHALL BE USED SPECIFIED ACCESSORIES

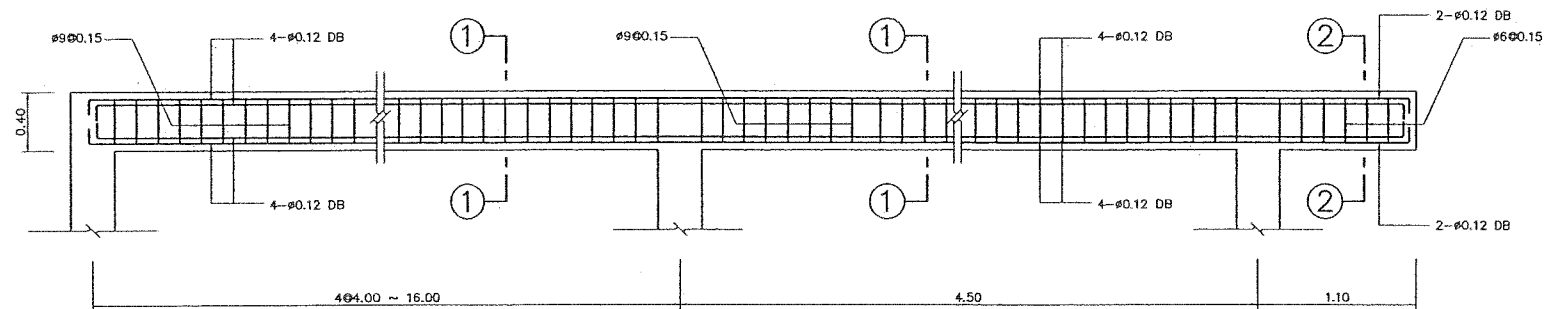
NOTES :

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

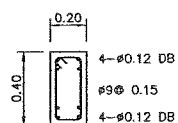
NO.	DATE	REVISIONS	CHECKED	APPROVED
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CONSULTANTS DEDE

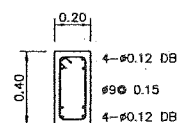
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
HUA MAE SOT HYDROPOWER PROJECT	
CIVIL WORKS POWERHOUSE IMPROVEMENT : DETAILS OF DOOR & WINDOW	
Maha Nakorn Consultants Co., Ltd.	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY
DESIGNED BY 251.2533	REVIEWED 251.5083
DRAWN 251.5220	SUBMITTED 251.5220
CHECKED 251.5220	RECOMMENDED 251.5220
PROJECT MANAGER	DATE 25.09.52
DRAWING NO. HMS-PH-11	SHEET NO. 27 OF 39



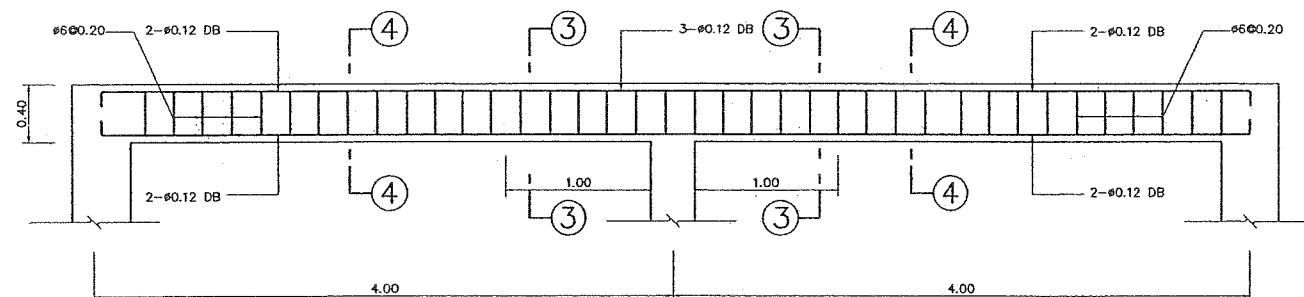
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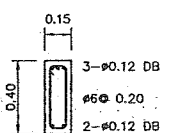
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SCALE 1:20



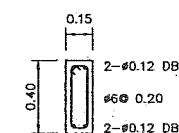
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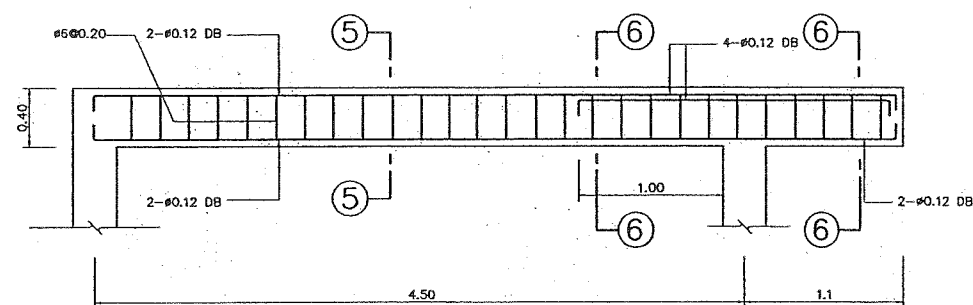
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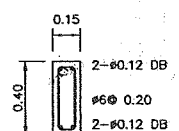
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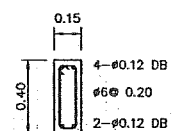
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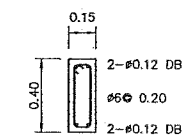
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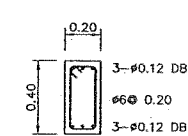
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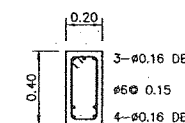
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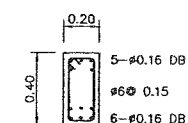
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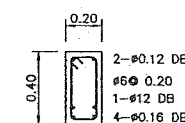
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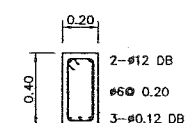
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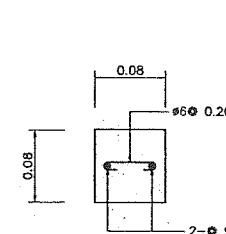
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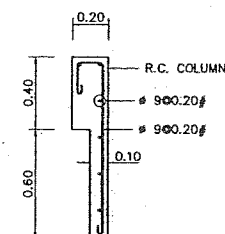
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SCALE 1:20



BEAM B9
SCALE 1:20

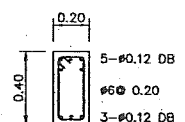


R.C. LINTEL
NOT TO SCALE



R.C. FIN
SCALE 1:20

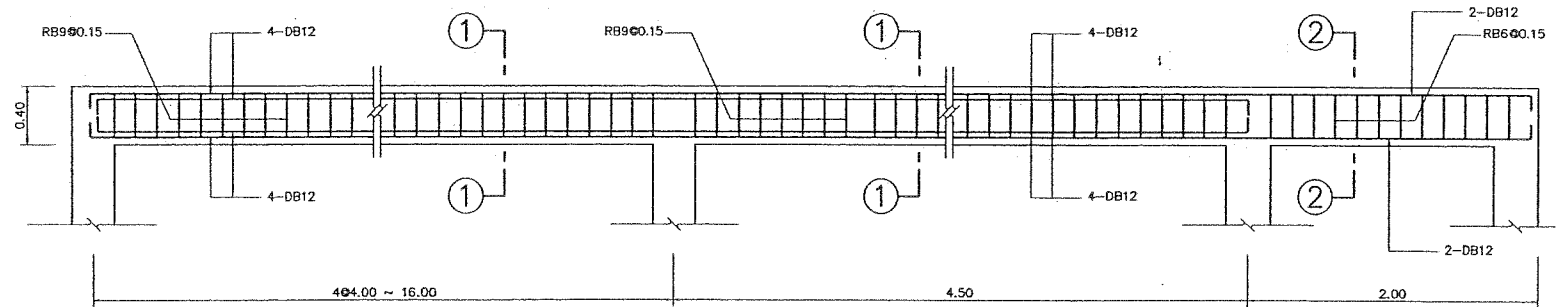
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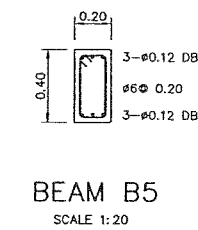
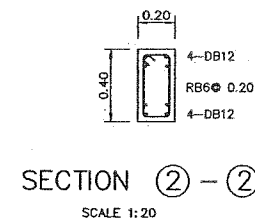
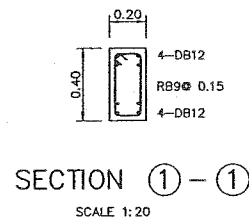
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KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE EXISTING STRUCTURAL REINFORCEMENT			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	25.533	25.5083	REVIEWED
DRAWN	25.5083	25.5083	SUBMITTED
CHECKED	25.5220	25.5220	RECOMMENDED
APPROVED	25.5220	25.5220	APPROVED
PROJECT MANAGER	DATE	HMS-PH-12	SHEET NO. 28 OF 39

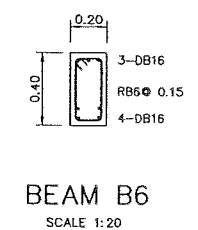
NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				



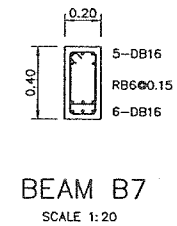
BEAM B1
SCALE 1:25



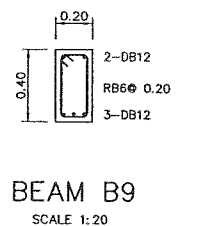
BEAM B5
SCALE 1:20



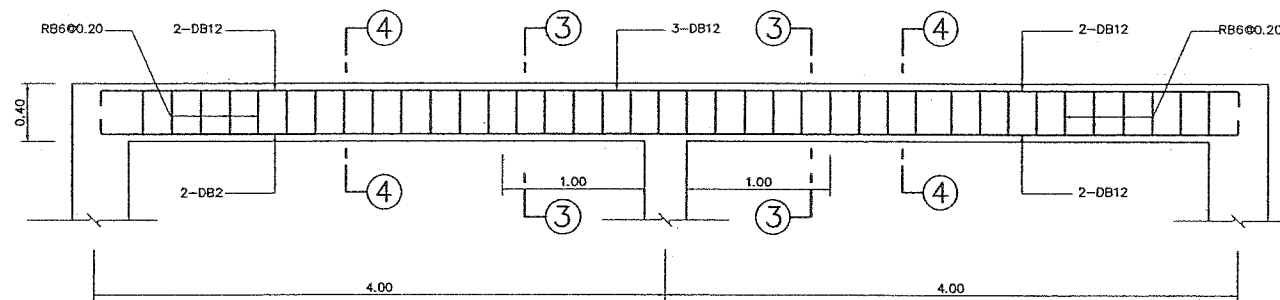
BEAM B6
SCALE 1:20



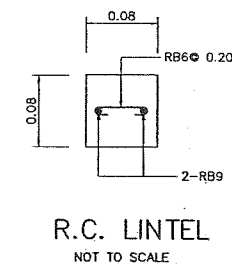
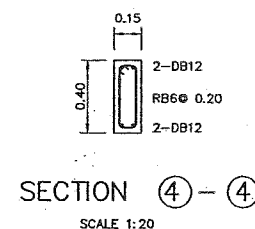
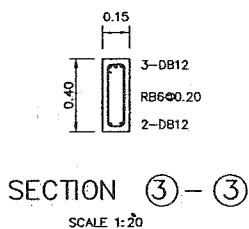
BEAM B7
SCALE 1:20



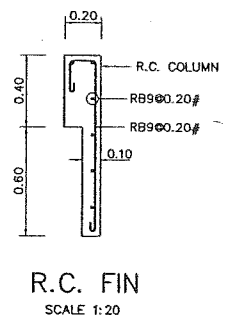
BEAM B9
SCALE 1:20



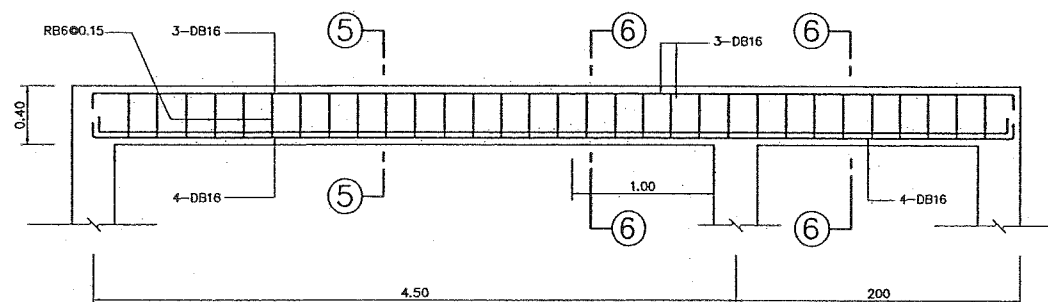
BEAM B2
SCALE 1:25



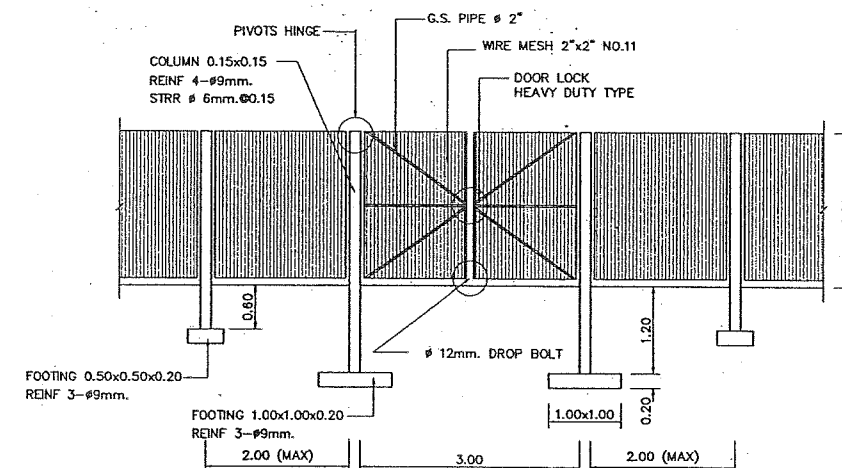
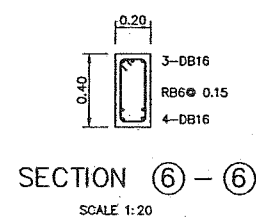
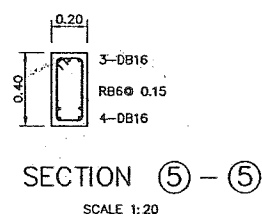
R.C. LINTEL
NOT TO SCALE



R.C. FIN
SCALE 1:20



BEAM B6
SCALE 1:25

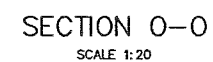
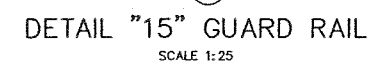
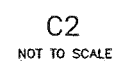
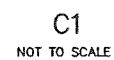


DETAIL GATE AND FENCE OF SWITCHYARD
SCALE 1:50

NOTES :

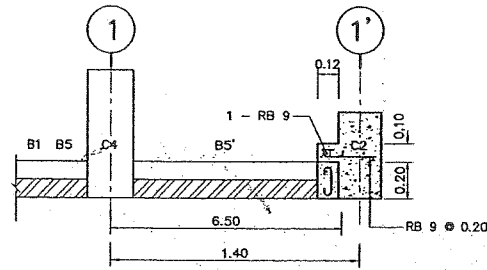
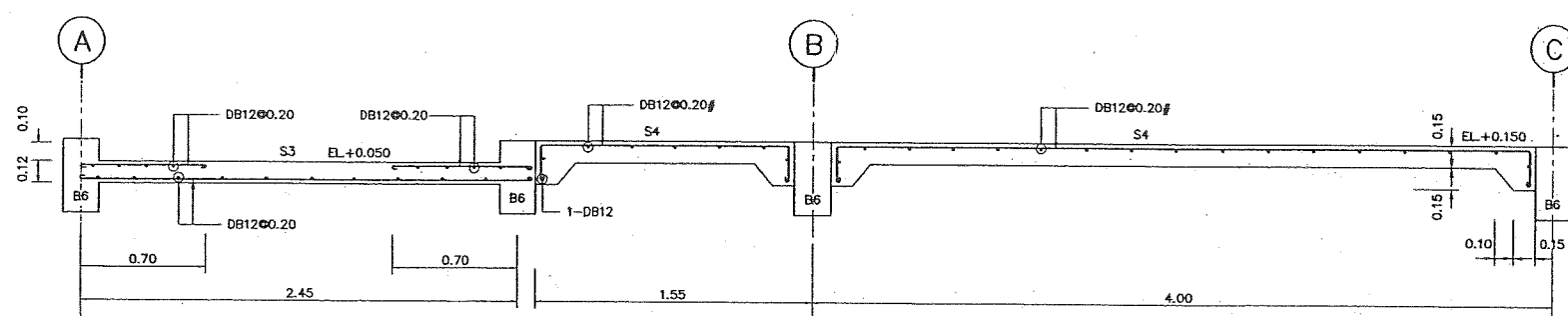
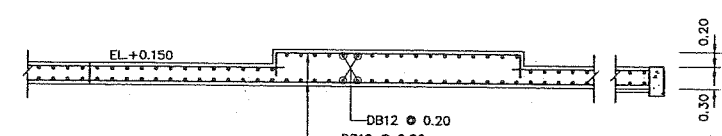
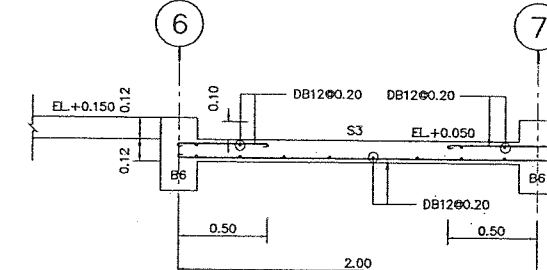
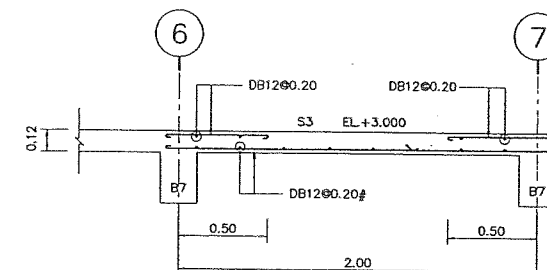
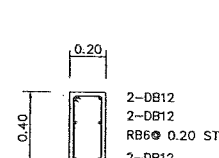
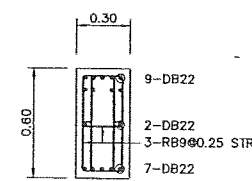
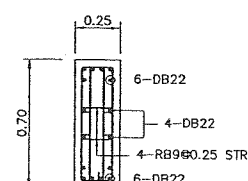
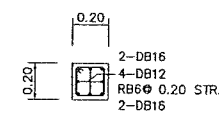
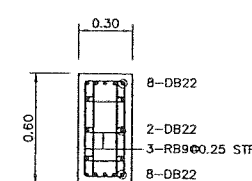
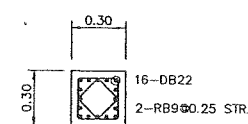
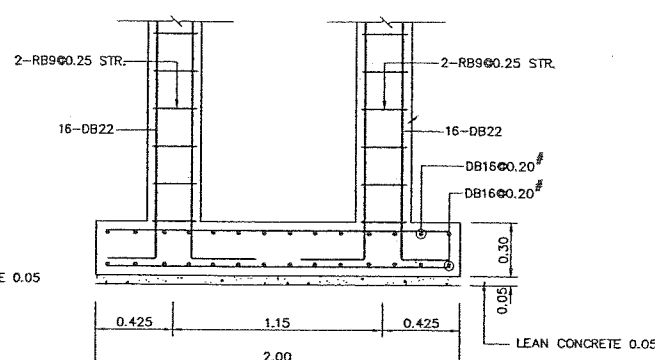
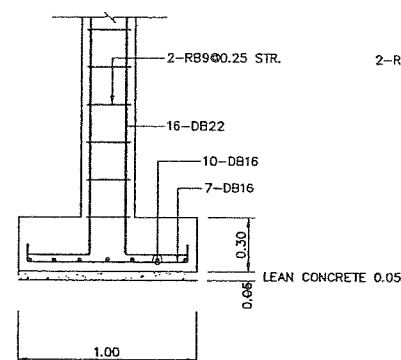
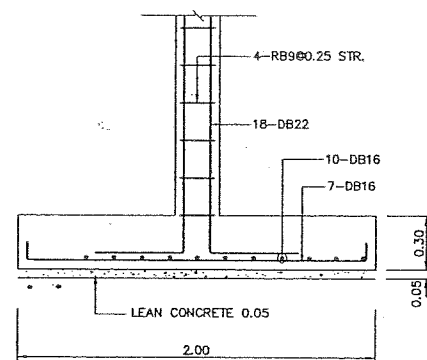
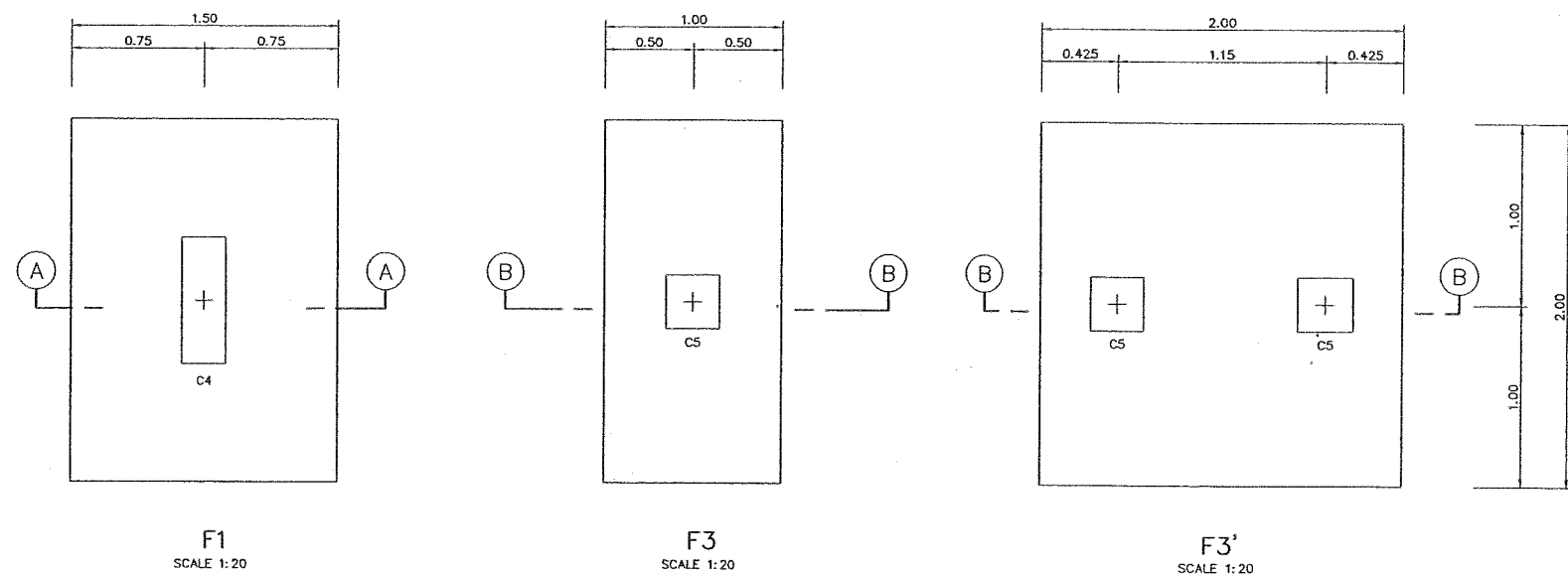
1. ALL DIMENSIONS ELEVATION ARE IN METERS, UNLESS OTHERWISE SHOWN
2. ABBREVIATIONS, SYMBOLS AND GENERAL NOTES SEE DWG. NO. HMS-GN-03
3. CONCRETE SHALL HAVE A MINIMUM ULTIMATE STRENGTH OF 210 kg. FOR STRUCTURAL AND 175 kg FOR TAIL RACE AND STANDARD CYLINDER AT 28 DAYS

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUAI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE IMPROVEMENT STRUCTURAL REINFORCEMENT			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	281.2533	REVIEWED	281.2503
DRAWN	281.2503	SUBMITTED	281.2503
CHECKED	281.5220	RECOMMENDED	281.5220
APPROVED	281.5220	APPROVED	281.5220
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		HMS-PH-13	29 OF 39



1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS,
UNLESS OTHERWISE SHOWN.
2. THIS DRAWING COPY FROM EXISTING DRAWINGS DONE BY NEA IN AUGUST
1987 AND FOR REFERENCE ONLY

30 of 39

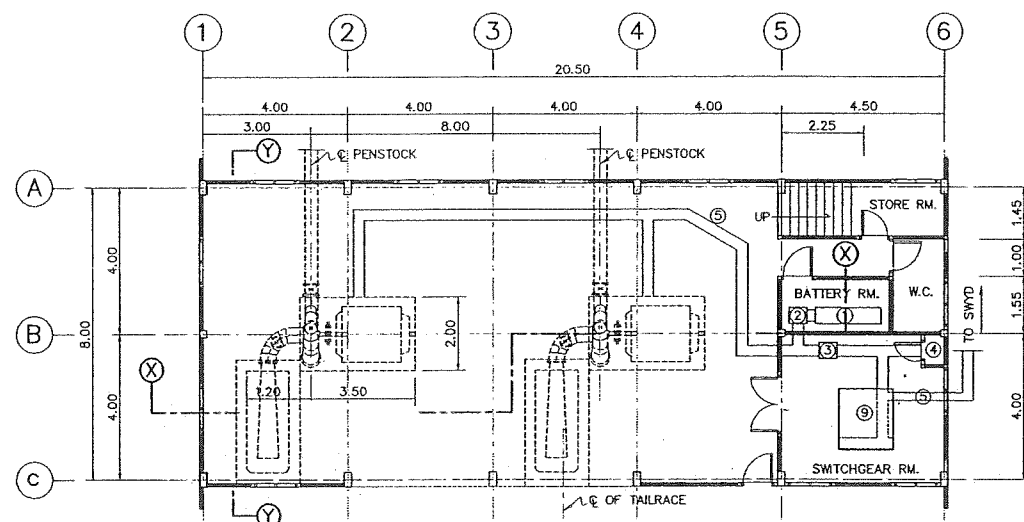


NOTES :

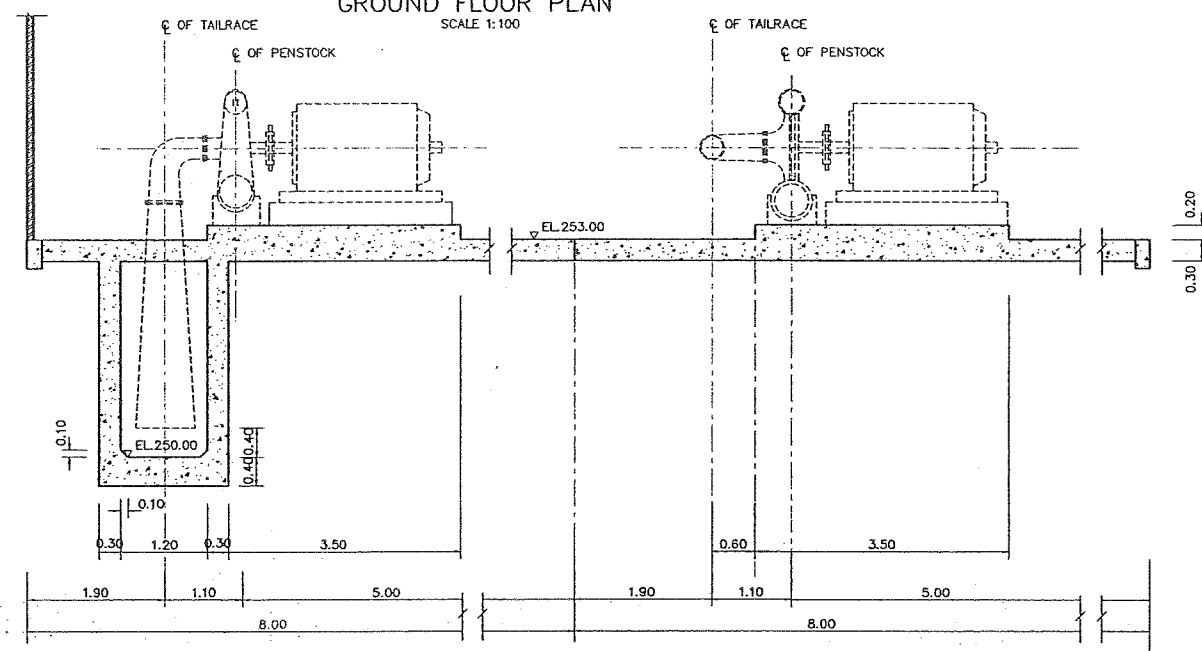
1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. ABBREVIATIONS SYMBOLS AND GENERAL NOTES SEE DWG. NO. HMS-GN-03
3. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 kg. FOR STANDARD CYLINDER AT 28 DAYS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
CONSULTANTS			DEDE	

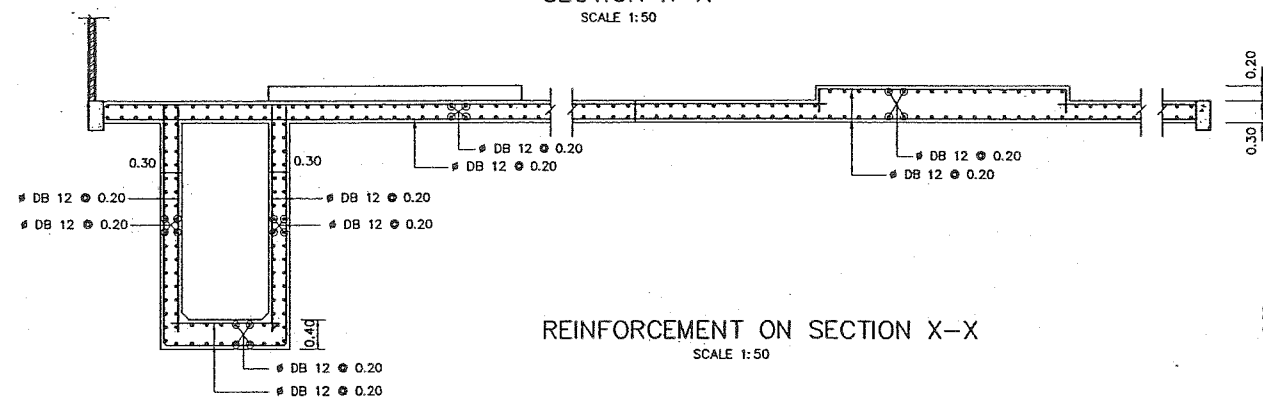
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
HUA MAE SOT HYDROPOWER PROJECT	
CIVIL WORKS POWERHOUSE IMPROVEMENT STRUCTURAL REINFORCEMENT & DETAILS	
Maha Nakorn Consultants Co., Ltd.	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY
DESIGNED <i>[Signature]</i> 2512533	REVIEWED <i>[Signature]</i> 2515063
DRAWN <i>[Signature]</i> 2515220	SUBMITTED <i>[Signature]</i> 2515063
CHECKED <i>[Signature]</i> 2515220	RECOMMENDED <i>[Signature]</i> 2515063
APPROVED <i>[Signature]</i> 2515220	APPROVED <i>[Signature]</i> 2515063
PROJECT MANAGER	DATE
HMS-PH-15	SHEET NO. 31 OF 39



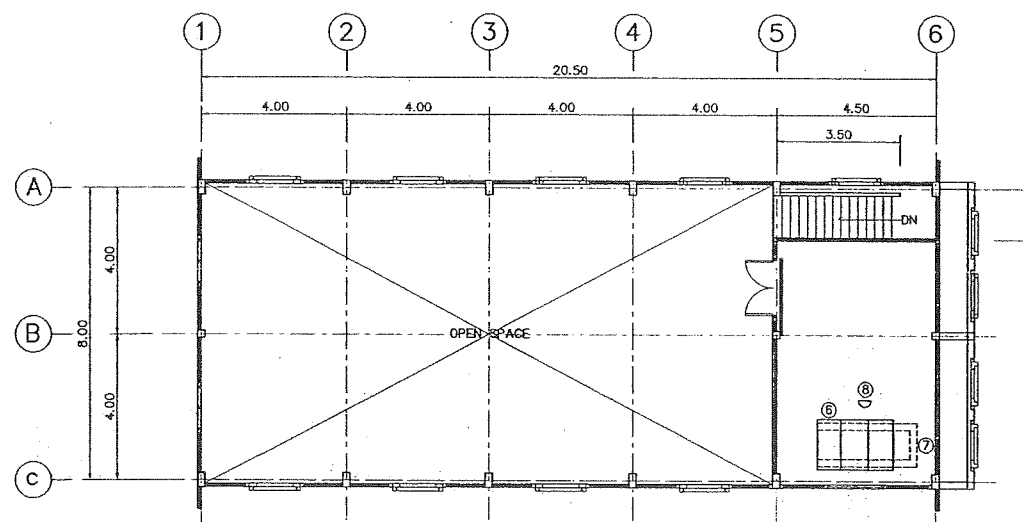
GROUND FLOOR PLAN
SCALE 1:100



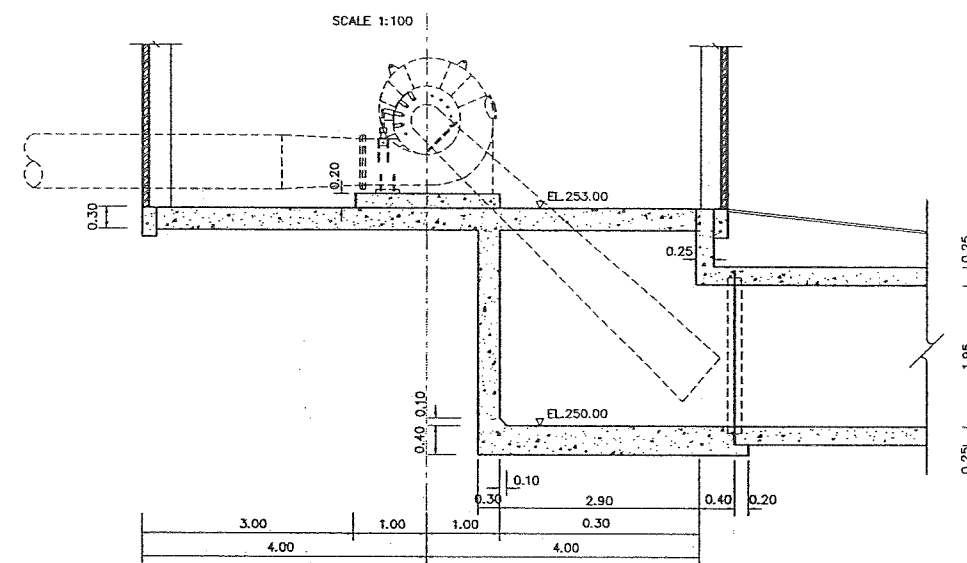
SECTION X-X
SCALE 1:50



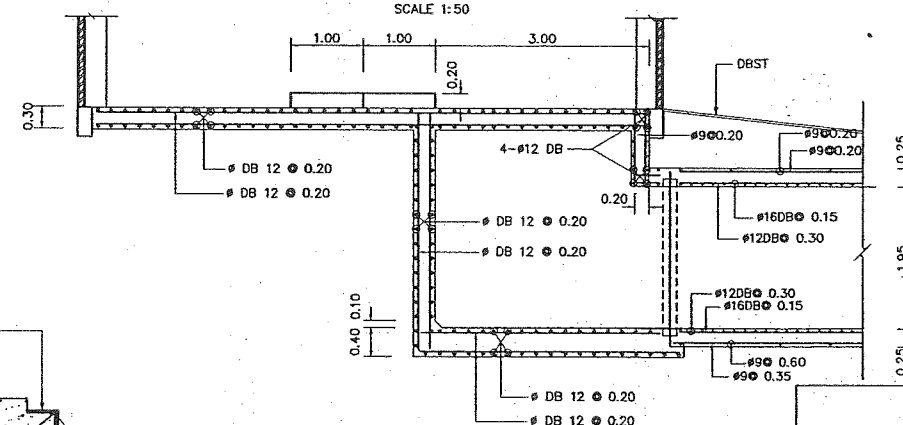
REINFORCEMENT ON SECTION X-X
SCALE 1:50



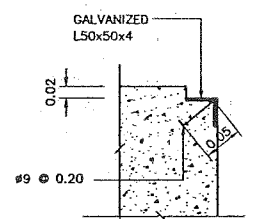
MEZZANINE FLOOR PLAN
SCALE 1:100



SECTION Y-Y
SCALE 1:50



REINFORCEMENT ON SECTION Y-Y
SCALE 1:50

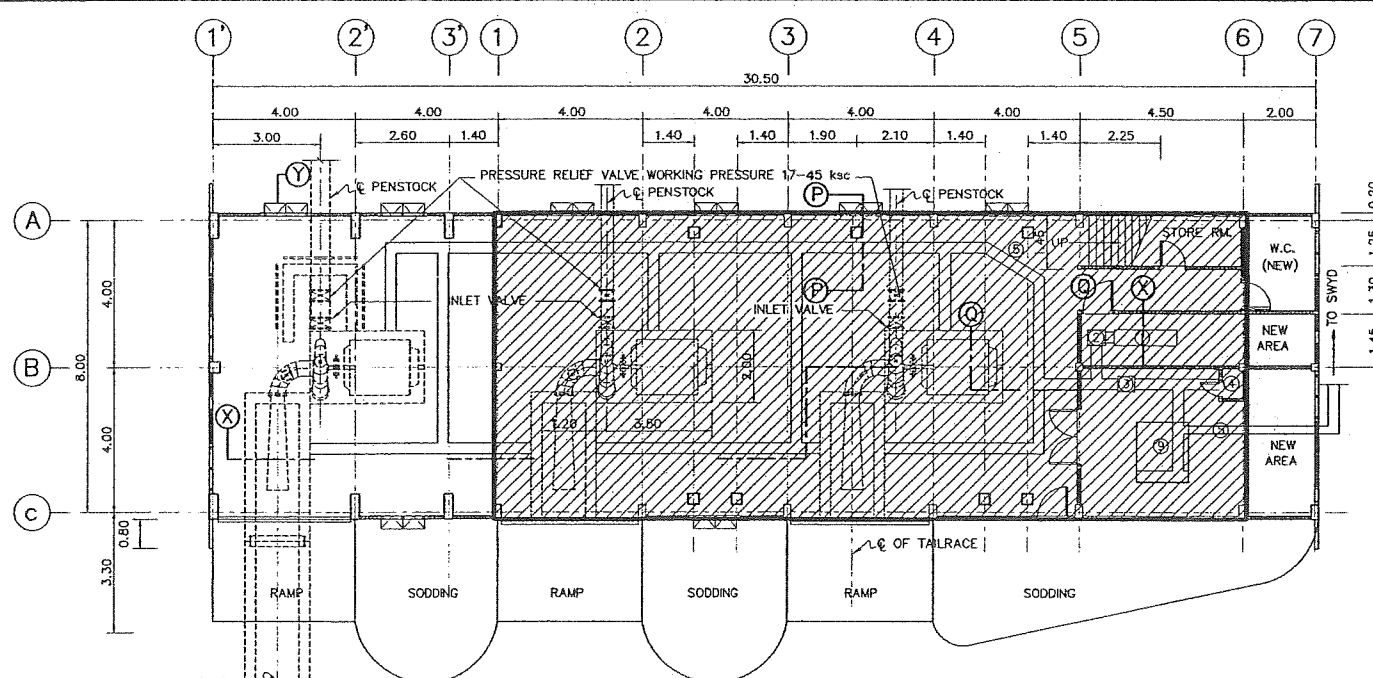


DETAIL COVER SEAT
SCALE 1:20

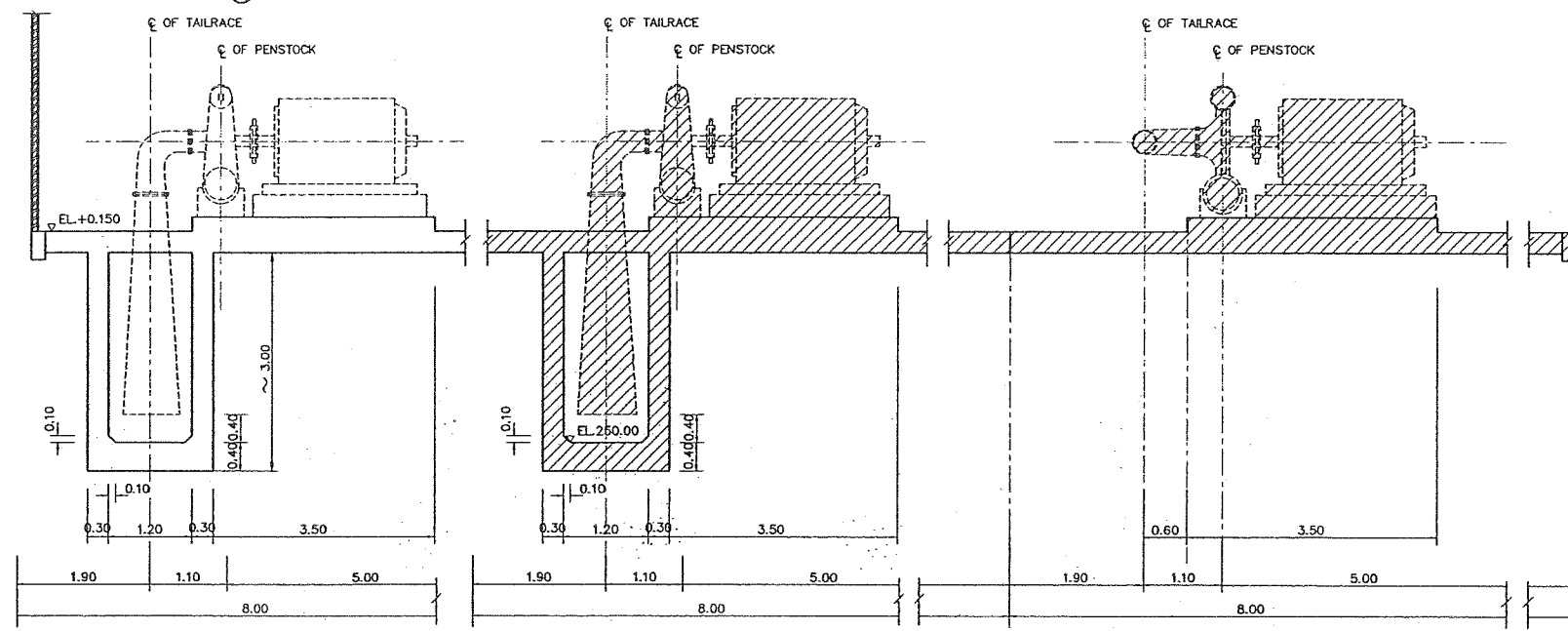
NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. THIS DRAWING COPY FROM EXISTING DRAWINGS DONE BY NEA IN AUGUST 1987 AND FOR REFERENCE ONLY

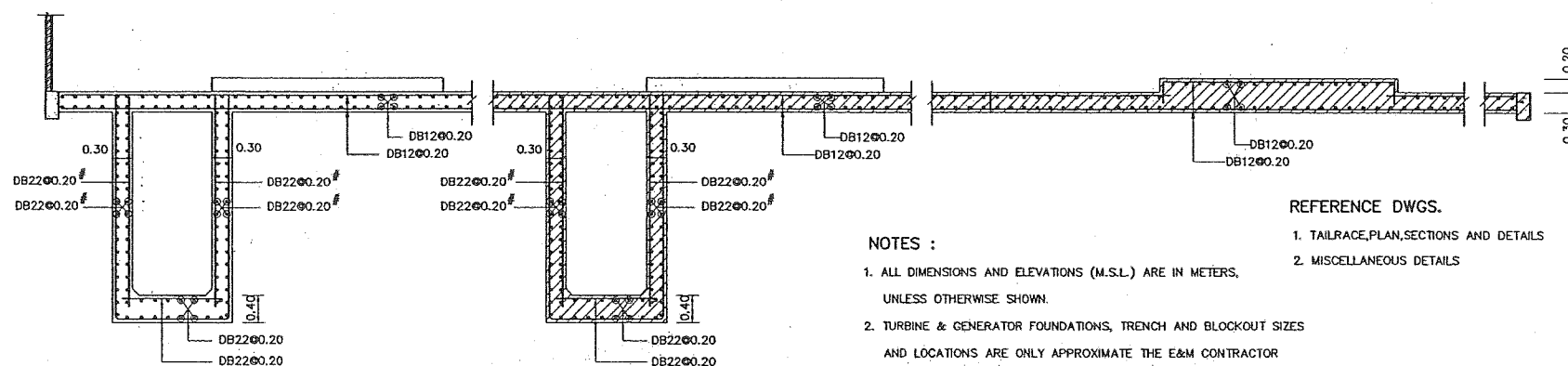
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE EXISTING EQUIPMENTS LAYOUT & MACHINE HALL FLOOR DETAILS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	201.2533	201.5003	REVIEWED
DRAWN	201.2533	201.5003	SUBMITTED
CHECKED	201.5220	201.5220	RECOMMENDED
APPROVED	201.5220	201.5220	APPROVED
PROJECT MANAGER		DATE	DRAWING NO.
			HMS-PH-16
			SHEET NO.
			32 OF 39



GROUND FLOOR PLAN
NOT TO SCALE



SECTION X-X
SCALE 1:50



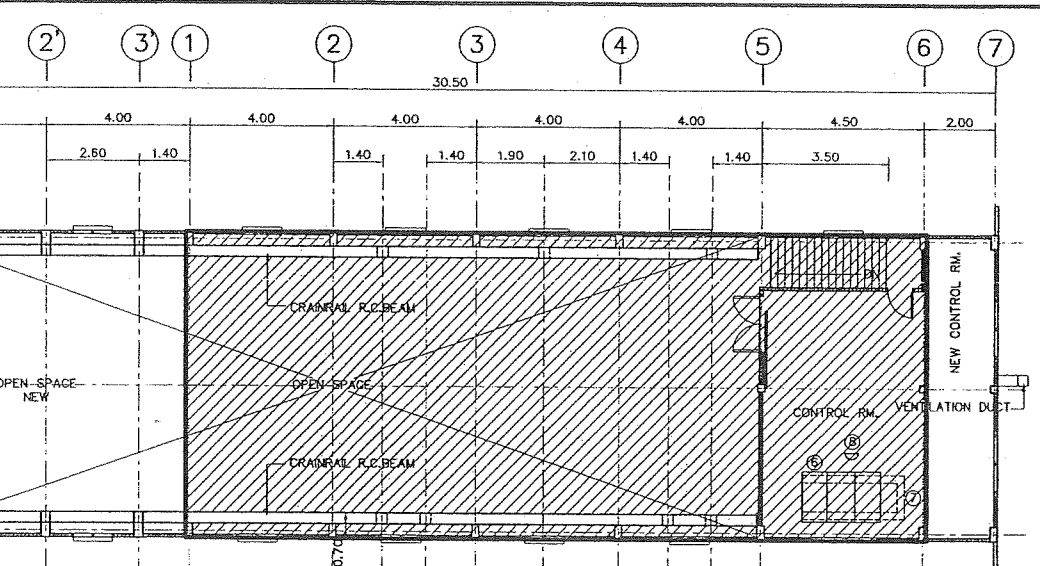
REINFORCEMENT ON SECTION X-X
SCALE 1:50

NOTES :

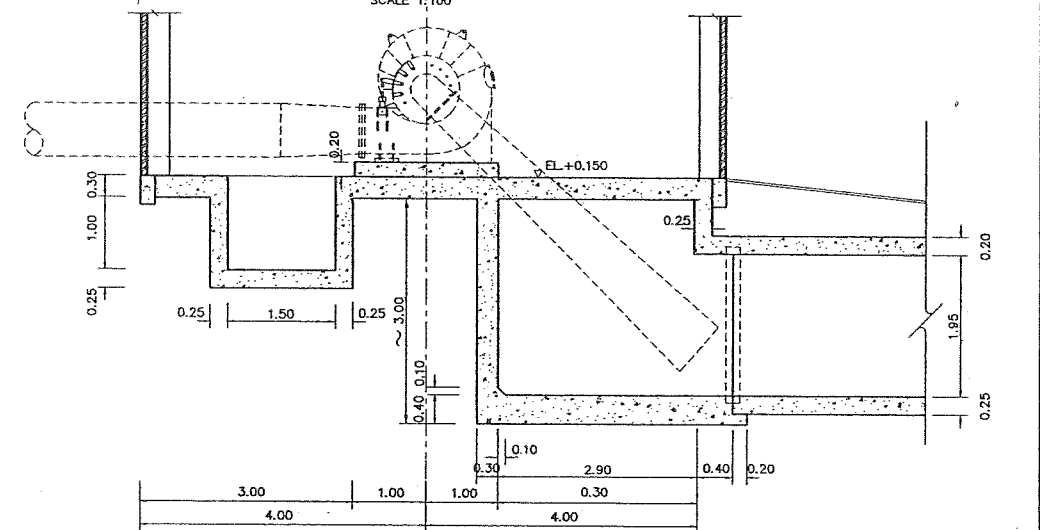
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. TURBINE & GENERATOR FOUNDATIONS, TRENCH AND BLOCKOUT SIZES AND LOCATIONS ARE ONLY APPROXIMATE THE E&M CONTRACTOR IS REQUIRED TO SUBMIT THE SHOP DRAWINGS INDICATED ALL FINAL SIZES AND LOCATIONS TO DEDE. FOR APPROVAL
3. ALL JOINTS OF GROUND FLOOR FILLED WITH ASPHALT AND SAND MIXTURE

REFERENCE DWGS.

1. TAILRACE, PLAN, SECTIONS AND DETAILS
2. MISCELLANEOUS DETAILS

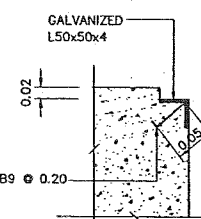


MEZZANINE FLOOR PLAN
SCALE 1:100



SECTION Y-Y
SCALE 1:50

REINFORCEMENT ON SECTION Y-Y
SCALE 1:50



DETAIL COVER SEAT
SCALE 1:20

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

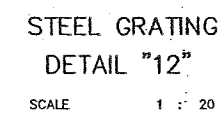
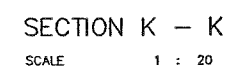
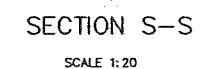
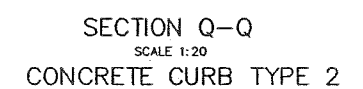
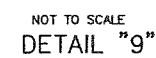
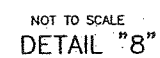
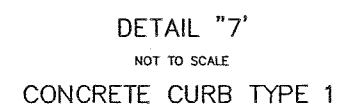
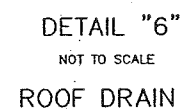
HUAI MAE SOT HYDROPOWER PROJECT

CIVIL WORK
POWERHOUSE
IMPROVEMENT EQUIPMENTS LAYOUT & MACHINE HALL FLOOR DETAILS

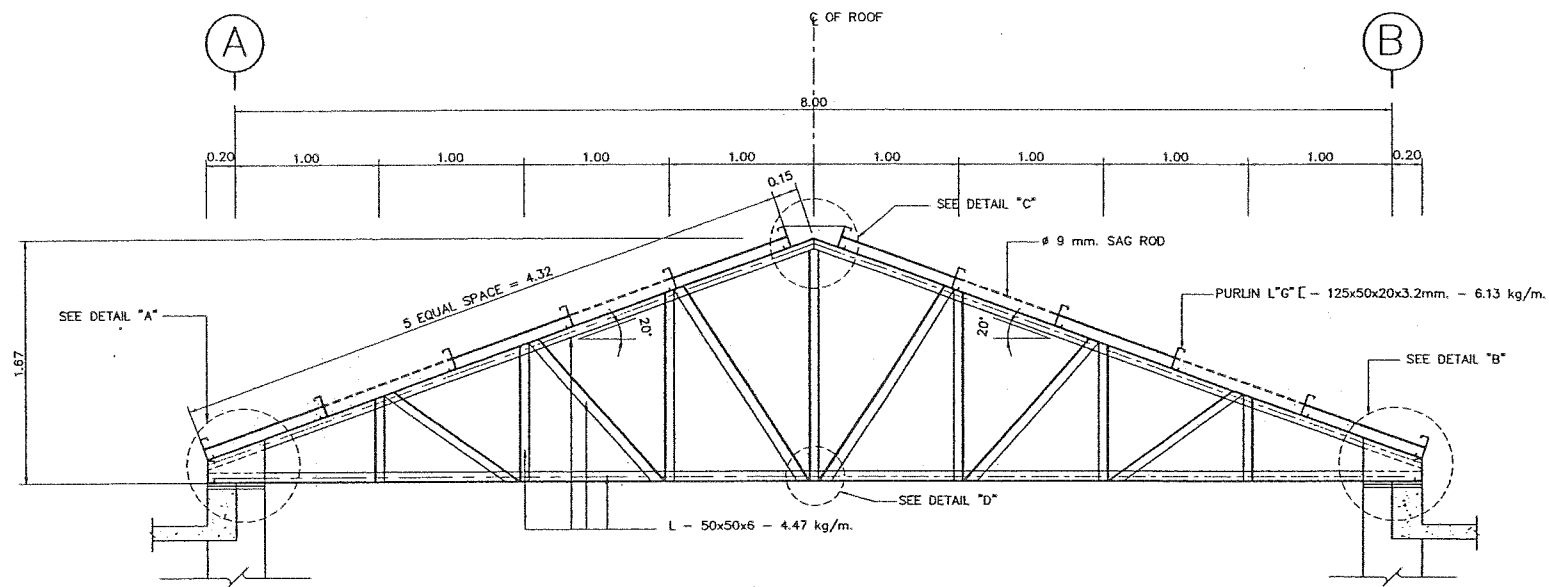
DESIGNED		REVIEWED	
28/5/53		28/5/53	
DRAWN		SUBMITTED	
28/5/53		28/5/53	
CHECKED		RECOMMENDED	
28/5/53		28/5/53	
APPROVED		APPROVED	
28/5/53		28/5/53	
PROJECT MANAGER		DATE	
28/5/53		28/5/53	
CONSULTANTS		DEDE	
28/5/53		28/5/53	

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

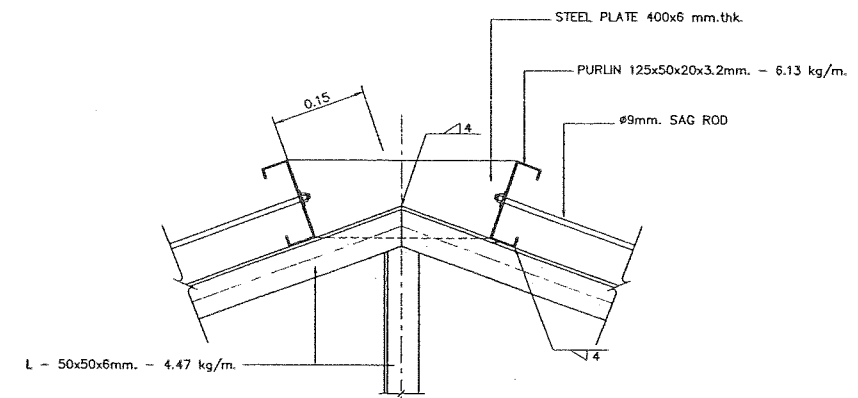
DRAWING NO. HMS-PH-17
SHEET NO. 33 OF 39



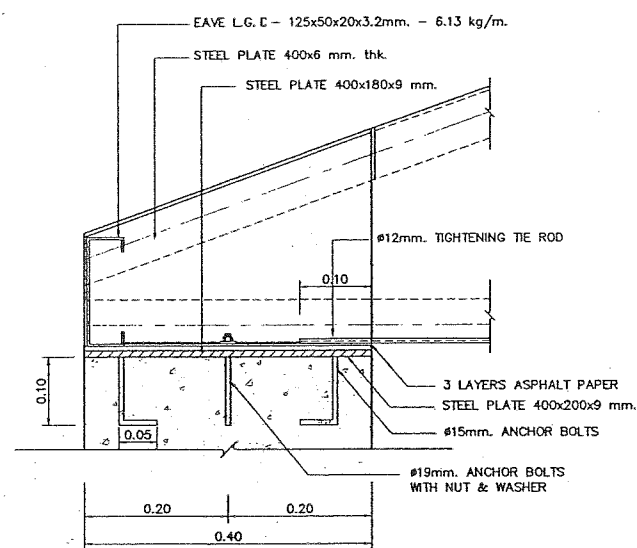
				MHA NAKORN CONSULTANTS CO.LTD.		DEVELOPMENT AND EFFICIENCY	
3						REVIEWED	<i>H. ant</i>
2				DESIGNED	<i>Ant</i> 28.2533	SUBMITTED	<i>6.8.11</i> <i>g. m.</i>
1				DRAWN	<i>Ant</i> 28.5083	RECOMMENDED	
NO.	DATE	REVISIONS	CHECKED	APPROVED	CHECKED	APPROVED	
CONSULTANTS				DEDE		DRAWING NO.	
				PROJECT MANAGER		HMS-PH-18	
				DATE		SHEET NO.	
				25.20.52		34 OF 39	



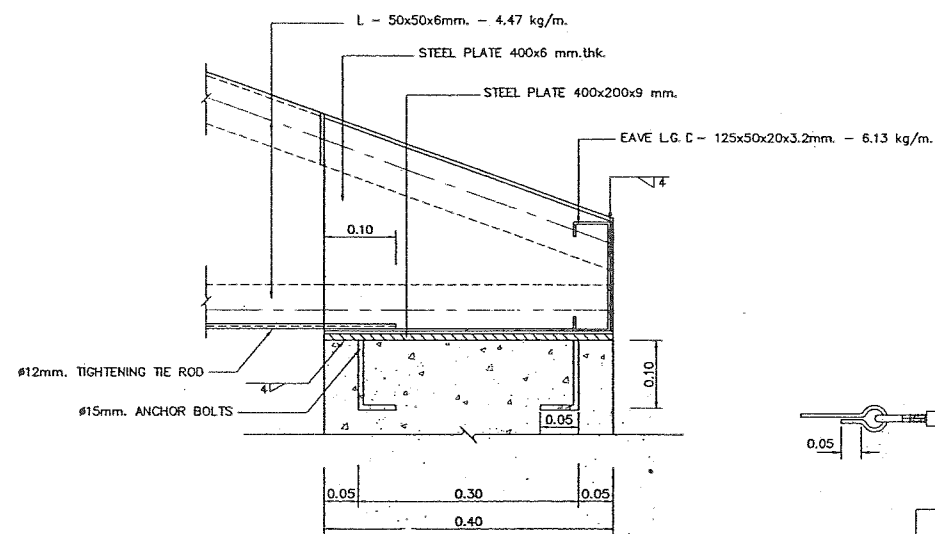
TRUSS T-1
SCALE 1 : 25



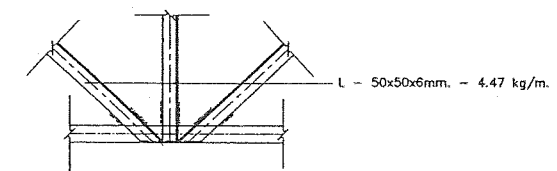
DETAIL "C"
SCALE 1 : 2



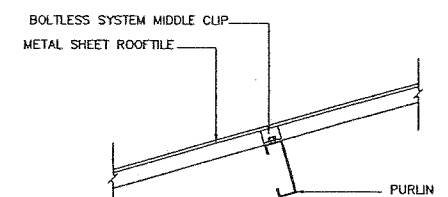
SECTION
SCALE 1 : 2



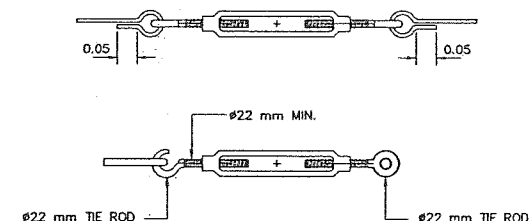
SECTION
SCALE 1 : 2



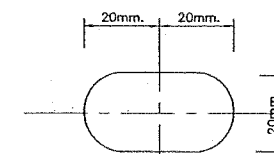
DETAIL "D"
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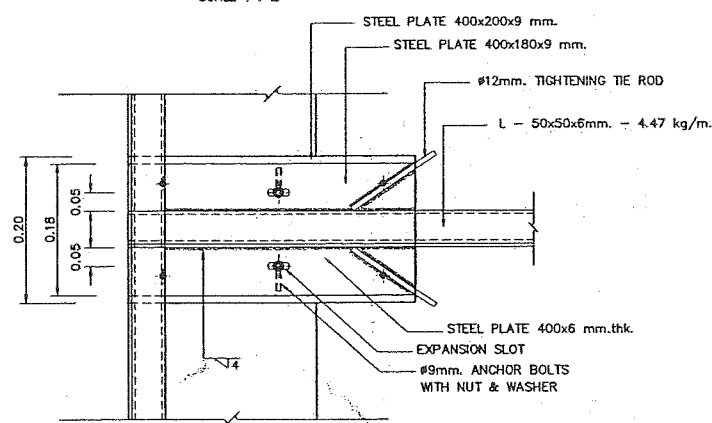
ROOFTILES INSTALLATION
SCALE 1:10



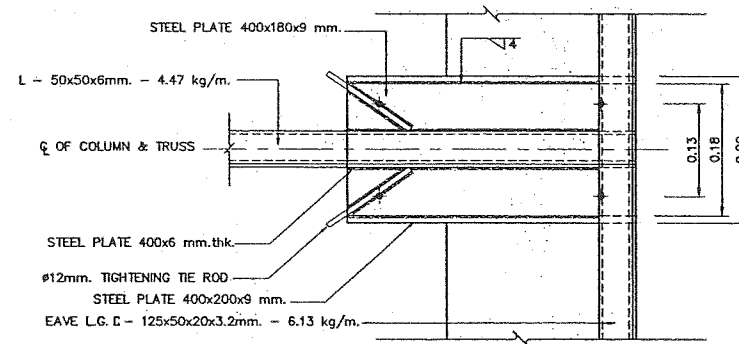
DETAIL "E" TURNBUCKLE
NOT TO SCALE



DETAIL OF
EXPANSION SLOT
NOT TO SCALE



PLAN
DETAIL "A"
SCALE 1 : 2

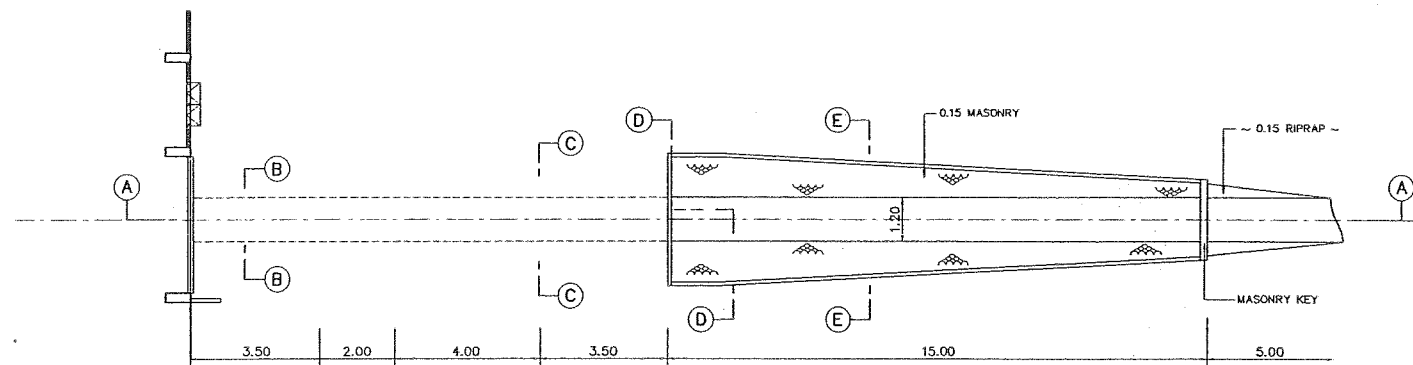


PLAN
DETAIL "B"
SCALE 1 : 2

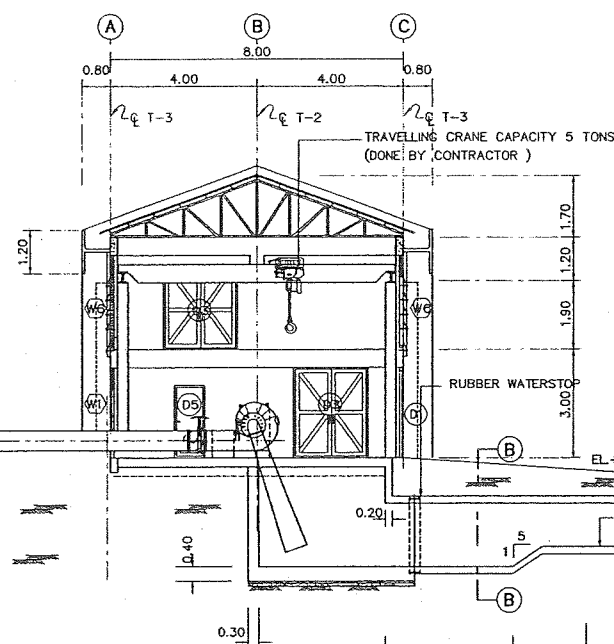
- NOTES :
1. ALL DIMENSIONS ARE IN METERS EXCEPT THE CHARACTERS OF STRUCTURAL STEELS ARE IN MILLIMETERS
 2. ALL WELDED JOINTS ARE 4 mm. FILLET WELDS

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWERHOUSE ROOF TRUSS & DETAILS			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	201.2533	REVIEWED	201.2533
DRAWN	201.2533	SUBMITTED	201.2533
CHECKED	201.2533	RECOMMENDED	201.2533
APPROVED	201.2533	APPROVED	201.2533
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		HMS-PH-10	35 OF 39

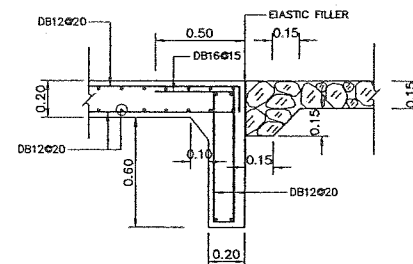
NO.	DATE	REVISIONS	CHECKED	APPROVED
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2				
1				
CONSULTANTS		DEDE		



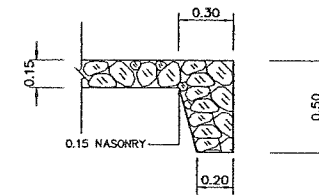
PLAN
NOT TO SCALE



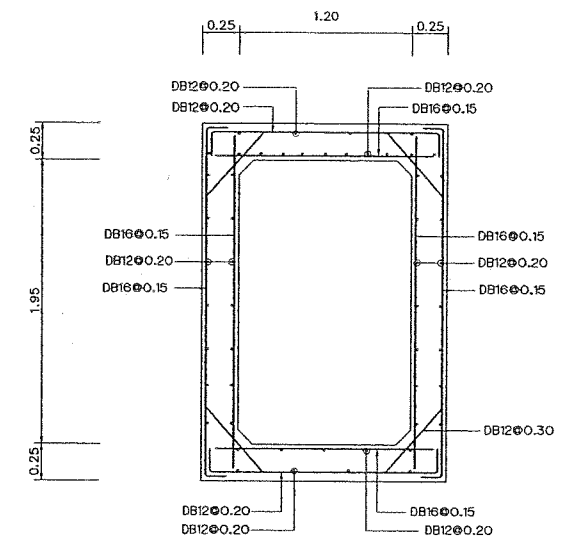
SECTION A-A
NOT TO SCALE



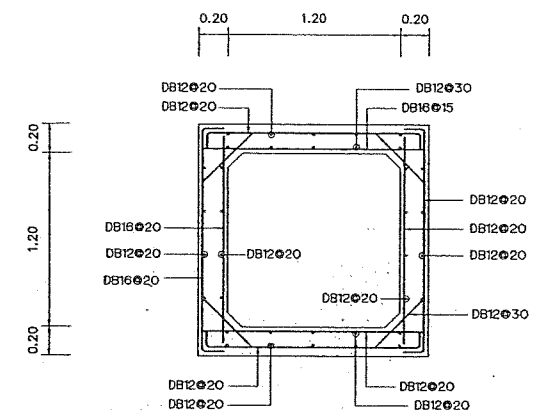
DETAIL "1"
SCALE 1:20



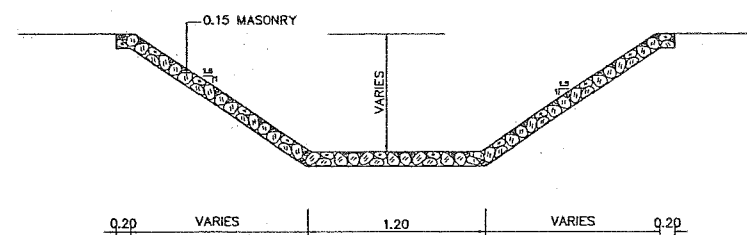
DETAIL "2"
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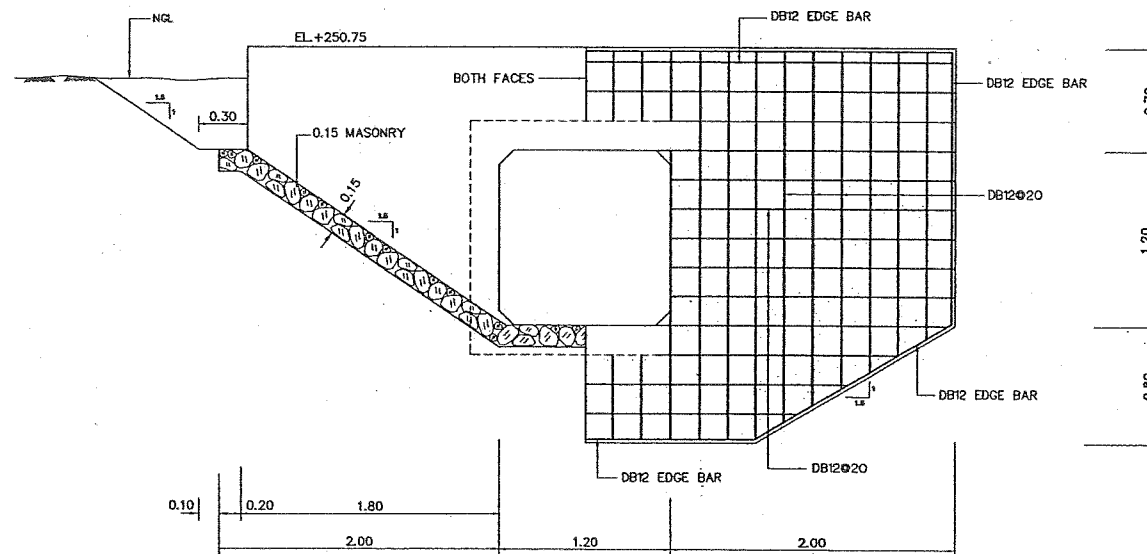
SECTION B-B
SCALE 1:25



SECTION C-C
SCALE 1:25



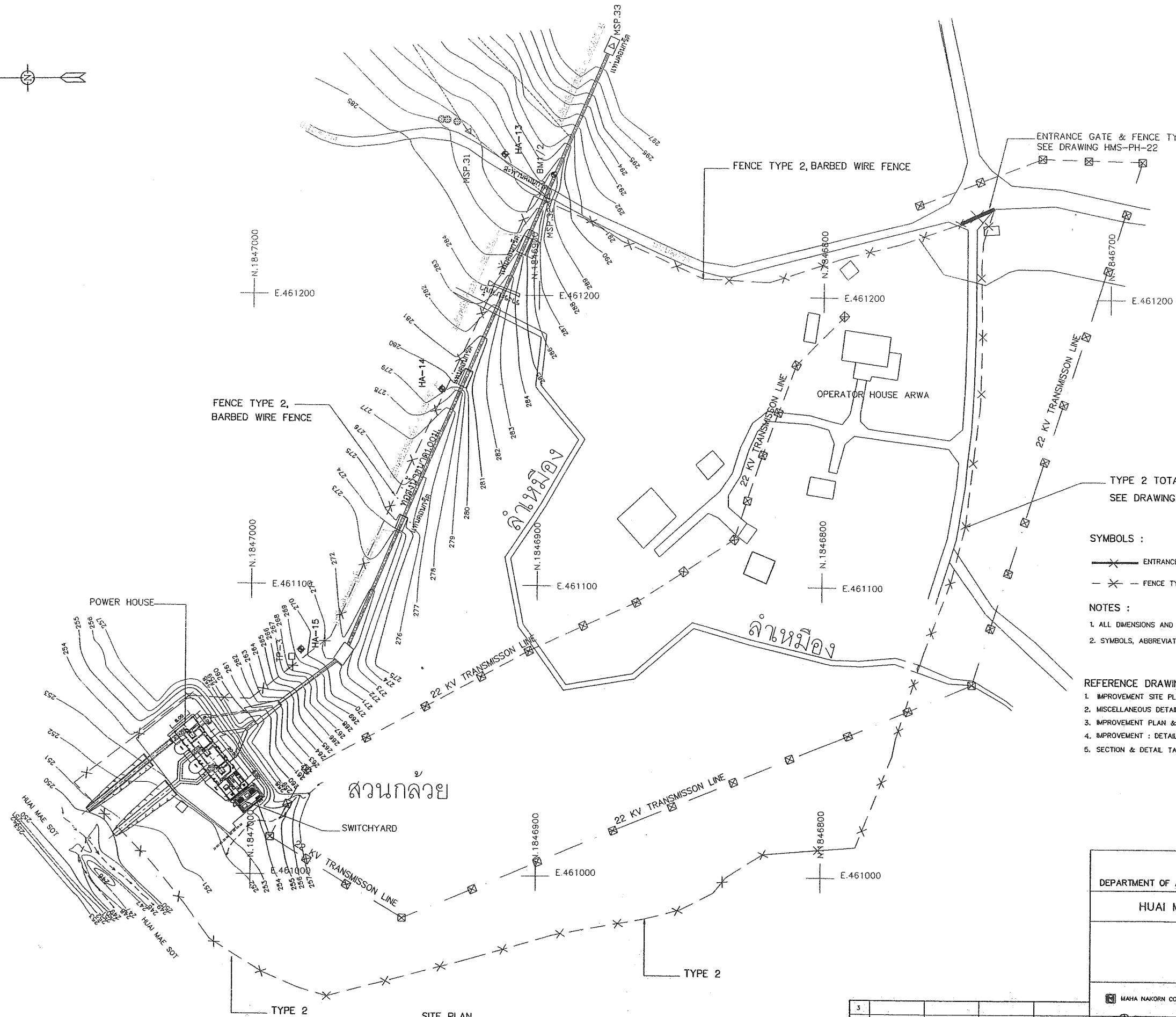
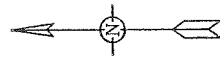
SECTION E-E
NOT TO SCALE



SECTION D-D
NOT TO SCALE

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWER HOUSE PLAN, SECTION AND DETAIL OF TAILRACE			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	REVIEWED	DESIGNED	REVIEWED
DRAWN	SUBMITTED	DRAWN	SUBMITTED
CHECKED	RECOMMENDED	CHECKED	RECOMMENDED
APPROVED	APPROVED	APPROVED	APPROVED
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		HMS-PH-20	36 OF 39

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
CONSULTANTS		DEDE		



ENTRANCE GATE & FENCE TYPE I
SEE DRAWING HMS-PH-22

FENCE TYPE 2, BARBED WIRE FENCE

FENCE TYPE 2,
BARBED WIRE FENCE

OPERATOR HOUSE ARWA

TYPE 2 TOTAL LENGTH 970 M.
SEE DRAWING NO. HMS-PH-22

SYMBOLS :

- ENTRANCE GATE & FENCE TYPE I CHAIN LINKNET
- FENCE TYPE I, BARBED WIRE FENCE

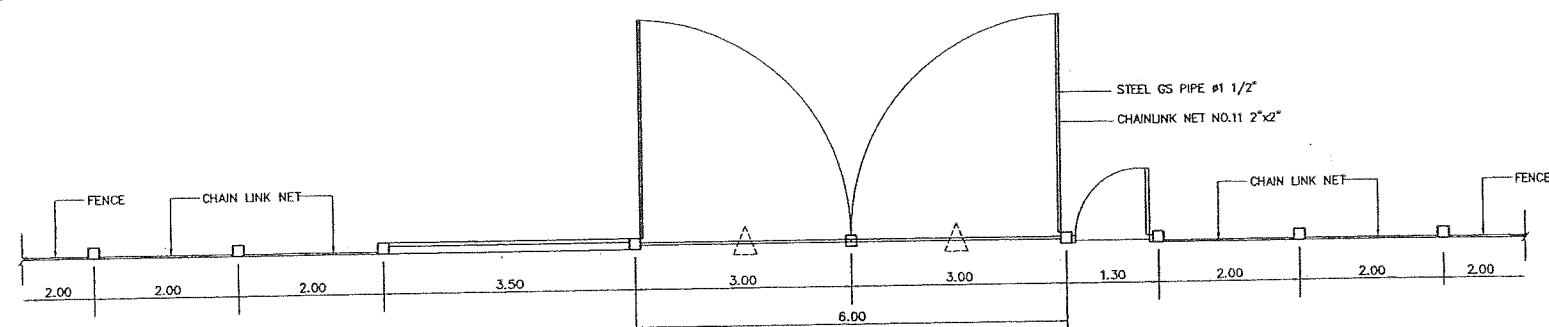
NOTES :

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

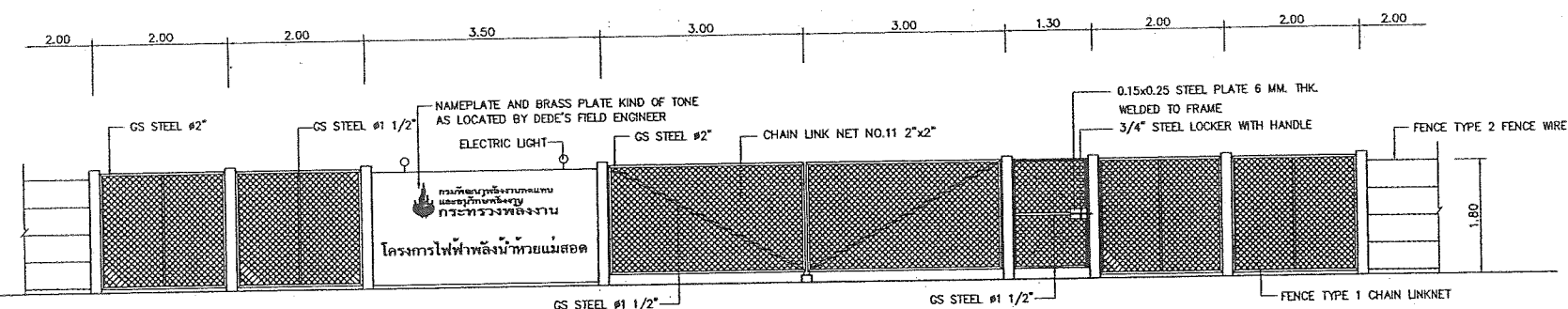
REFERENCE DRAWINGS :

- | | |
|---|-----------|
| 1. IMPROVEMENT SITE PLAN | HMS-PH-02 |
| 2. MISCELLANEOUS DETAILS | HMS-PH-18 |
| 3. IMPROVEMENT PLAN & ELEVATIONS | HMS-PH-04 |
| 4. IMPROVEMENT : DETAILS OF DOOR & WINDOW | HMS-PH-11 |
| 5. SECTION & DETAIL TAILRACE | HMS-PH-20 |

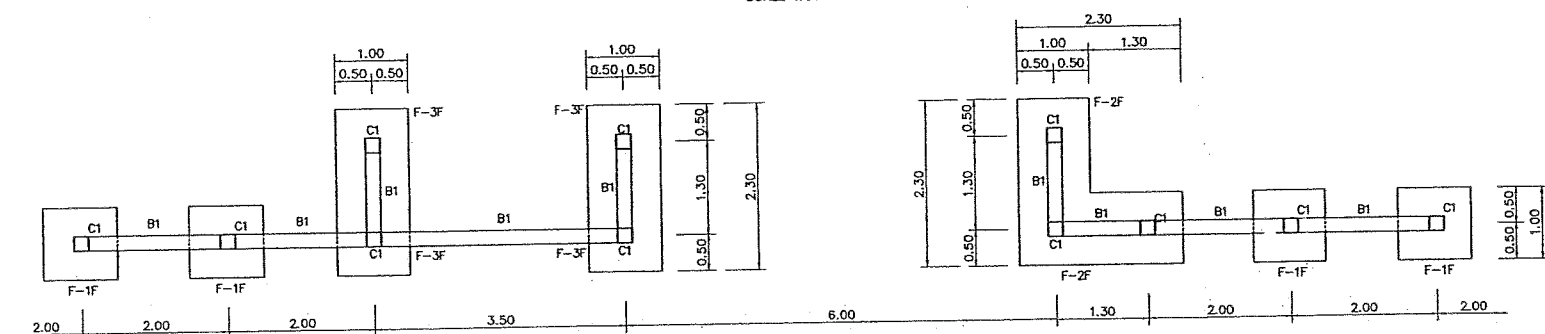
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUI MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWER HOUSE BOUNDARY OF DEDE. AREA			
MAHA NAKORN CONSULTANTS' CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	25/3/53	25/3/53	SUBMITTED
DRAWN	25/3/53	25/3/53	RECOMMENDED
CHECKED	25/3/53	25/3/53	APPROVED
PROJECT MANAGER		DATE	
HMS-PH-21		37 OF 39	



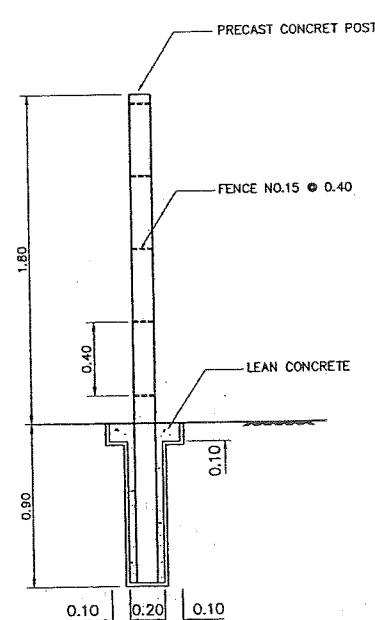
PLAN
SCALE 1:50



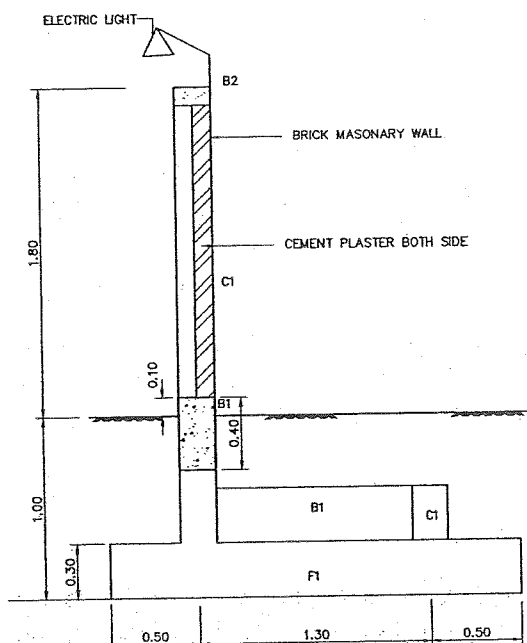
FRONT ELEVATION GATE AND FENCE FOR ENTRANCE
SCALE 1:50



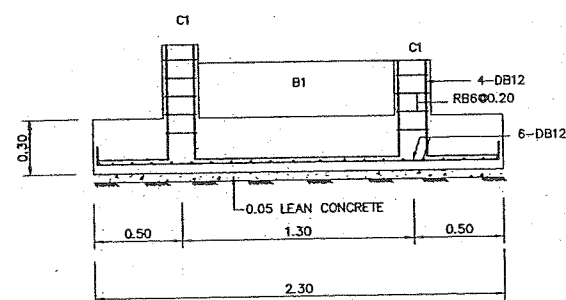
PLAN R.C. BEAM & COLUMN
SCALE 1:50



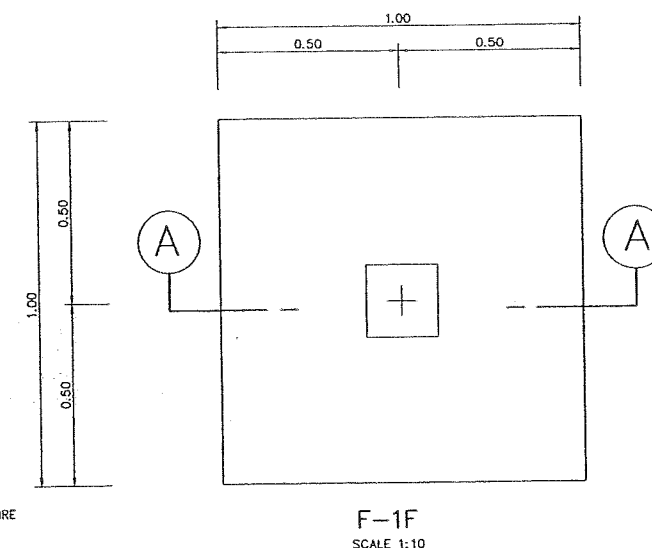
SECTION FENCE & PRECASTE CONCRETE POST
SCALE 1:20



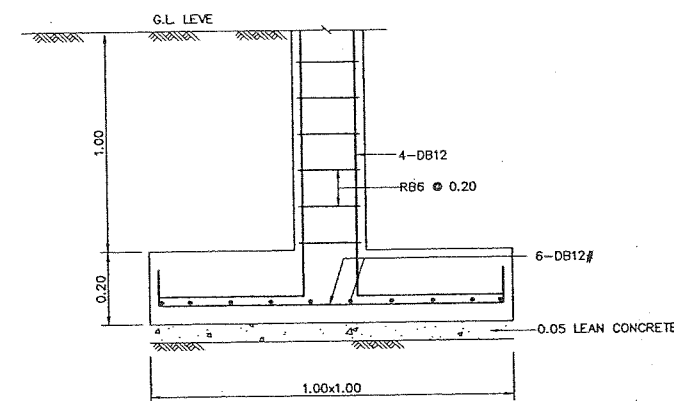
SECTION
SCALE 1:20



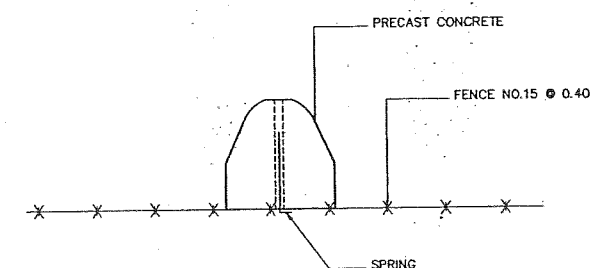
SECTION F-2F, F-3F
SCALE 1:20



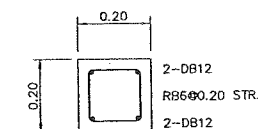
F-1F
SCALE 1:10



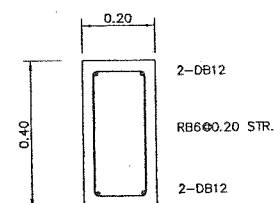
SECTION A-A
SCALE 1:10



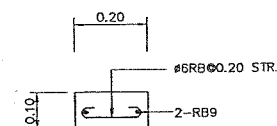
FENCE POST
SCALE 1:10



C1
SCALE 1:10



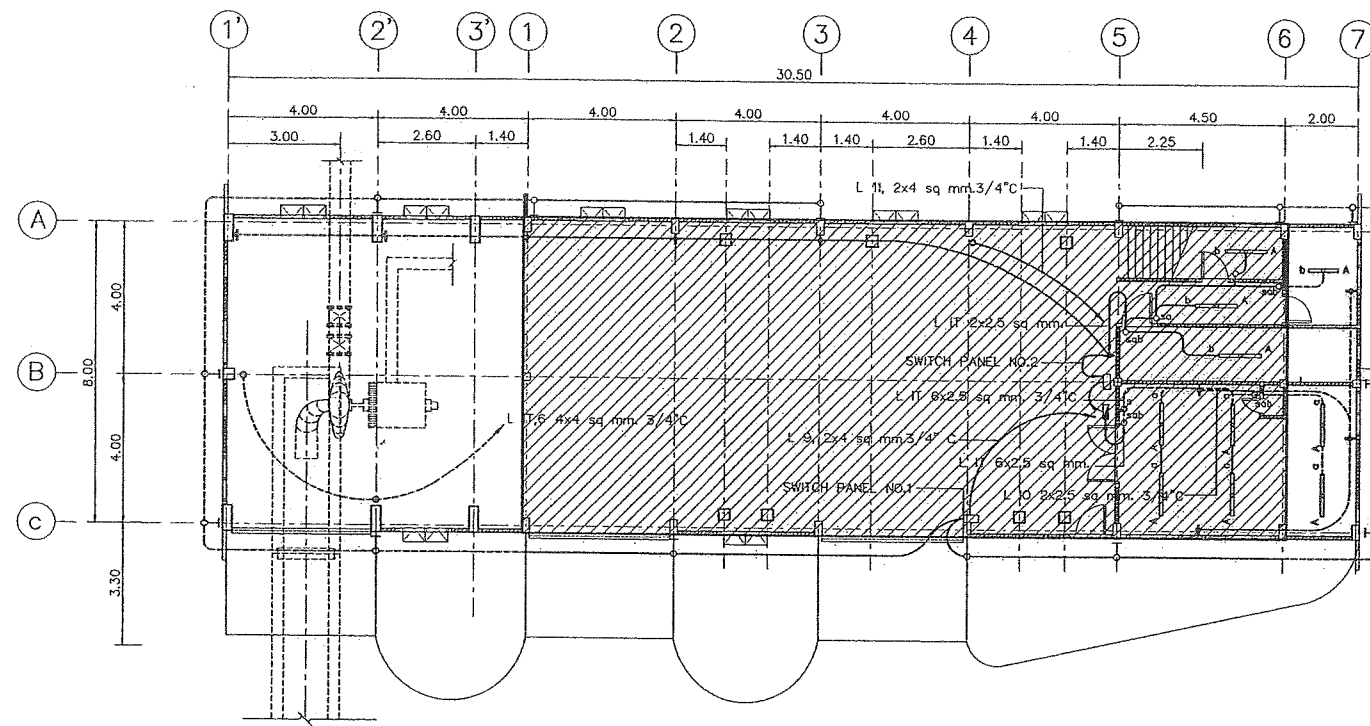
B1
SCALE 1:10



B2
SCALE 1:10

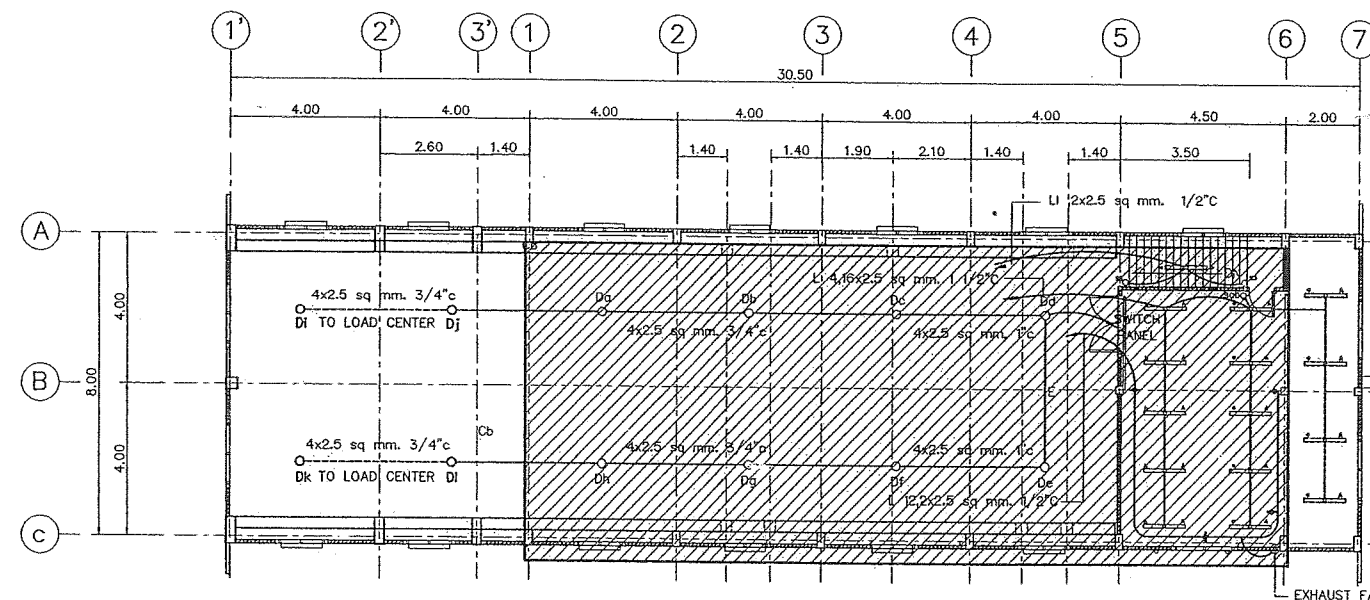
KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORKS POWER HOUSE DETAIL GATE AND FENCE			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	251.2533	REVIEWED	251.2533
DRAWN	251.5063	SUBMITTED	251.5063
CHECKED	251.5220	RECOMMENDED	251.5220
APPROVED	251.5220	APPROVED	251.5220
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		HMS-PH-22	38 of 39

3					
2					
1					
NO.	DATE	REVISIONS	CHECKED	APPROVED	



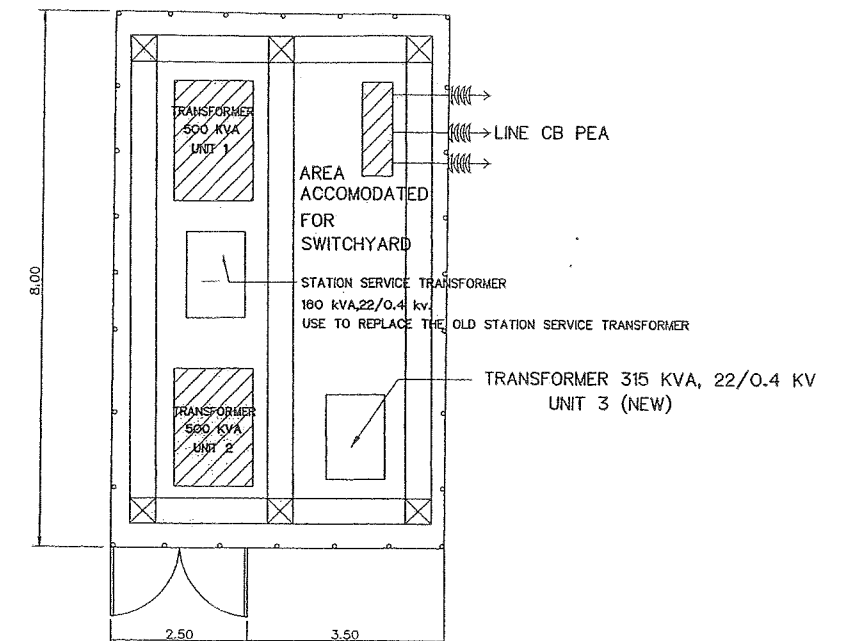
GROUND FLOOR PLAN

SCALE 1:100



MEZZANINE FLOOR PLAN

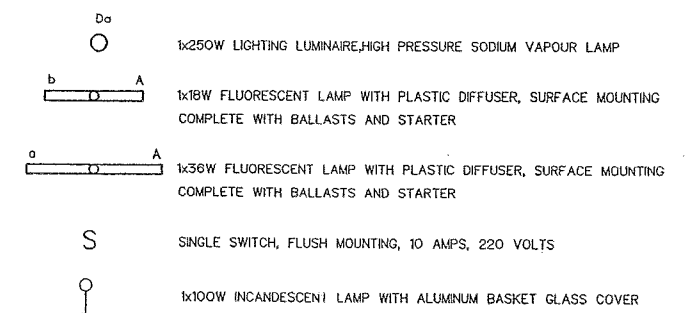
SCALE 1:100



SWITCHYARD

NOT TO SCALE

LIGHTING AND POWER SYMBOLS



KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
HUA MAE SOT HYDROPOWER PROJECT			
CIVIL WORK POWERHOUSE LIGHTING SYSTEM AND SWITCHYARD LAYOUT			
MAHA NAKORN CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	BY: 3053	REVIEWED	BY: 3053
DRAWN	BY: 3053	RECOMMENDED	BY: 3053
CHECKED	BY: 3053	APPROVED	BY: 3053
DATE	REVISIONS	DATE	REVISIONS
CONSULTANTS	DEDE	PROJECT MANAGER	DATE
HMS-PH-23		SHEET NO. 39 OF 39	