



Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

MAE TUEEN HYDROPOWER PROJECT

CHIANGMAI PROVINCE

CONTRACT C1

CIVIL WORKS AND TRANSMISSION LINE

VOLUME 4

DRAWINGS

MAE TUEN HYDROPOWER PROJECT
CIVIL WORKS
LIST OF DRAWINGS

SHEET NO.	DWG. NO.	DRAWING DETAILS
GENERAL		
00	MT-GN-00	GENERAL, LIST OF DRAWINGS
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02	MT-GN-02	GENERAL, HYDROLOGY DATA
03	MT-GN-03	GENERAL, LOCATION MAP AND PROJECT AREA MAP
04	MT-GN-04	GENERAL, SITE PLAN
05	MT-GN-05	GENERAL, GEOLOGICAL DATA
WEIR		
06	MT-WE-01	WEIR, CONCRETE COVER
07	MT-WE-02	WEIR, INTAKE, PLAN SECTIONS AND DETAILS
08	MT-WE-03	WEIR, 1.1X1.1 M. SLUICE GATE DETAILS
09	MT-WE-04	WEIR, TYPICAL SLIDE GATE, DIA 1.20 M. VERTICAL GATE, GATE INSTALLATION
10	MT-WE-05	WEIR, TYPICAL SLIDE GATE, DIA 1.20 M. VERTICAL GATE
11	MT-WE-06	WEIR, GATE LIFT, CAPACITY 3 TONS
HEADRACE		
12	MT-HR-01	HEADRACE, ACCESS ROAD, PLAN & PROFILE (SHEET 1/5)
13	MT-HR-02	HEADRACE, ACCESS ROAD, PLAN & PROFILE (SHEET 2/5)
14	MT-HR-03	HEADRACE, ACCESS ROAD, PLAN & PROFILE (SHEET 3/5)
15	MT-HR-04	HEADRACE, ACCESS ROAD, PLAN & PROFILE (SHEET 4/5)
16	MT-HR-05	HEADRACE, ACCESS ROAD, PLAN & PROFILE (SHEET 5/5)
17	MT-HR-06	HEADRACE, ALIGNMENT DATA CURVE OF HEADRACE
18	MT-HR-07	HEADRACE, ALIGNMENT DATA CURVE OF ACCESS ROAD
19	MT-HR-08	HEADRACE, CROSS SECTIONS KM.0+000 TO KM.0+300
20	MT-HR-09	HEADRACE, CROSS SECTIONS KM.0+320 TO KM.0+620
21	MT-HR-10	HEADRACE, CROSS SECTIONS KM.0+640 TO KM.0+940
22	MT-HR-11	HEADRACE, CROSS SECTIONS KM.0+960 TO KM.1+260
23	MT-HR-12	HEADRACE, CROSS SECTIONS KM.1+280 TO KM.1+580
24	MT-HR-13	HEADRACE, CROSS SECTIONS KM.1+580 TO KM.1+880
25	MT-HR-14	HEADRACE, CROSS SECTIONS KM.1+900 TO KM.2+220
26	MT-HR-15	HEADRACE, CROSS SECTIONS KM.2+240 TO KM.2+520
27	MT-HR-16	HEADRACE, CROSS SECTIONS KM.2+540 TO KM.2+840
28	MT-HR-17	HEADRACE, CROSS SECTIONS KM.2+860 TO KM.3+160
29	MT-HR-18	HEADRACE, CROSS SECTIONS KM.3+180 TO KM.3+460
30	MT-HR-19	HEADRACE, TYPICAL SECTION
31	MT-HR-20	HEADRACE, BEGINNING, PLAN & PROFILE, KM.0+000 TO KM.0+160.864
32	MT-HR-21	HEADRACE, END, PLAN & PROFILE, KM.3+492.426 TO KM.3+537.030
33	MT-HR-22	HEADRACE, PIPE SUPPORT
34	MT-HR-23	HEADRACE, INTAKE, PLAN SECTIONS AND DETAILS
35	MT-HR-24	HEADRACE, DRAIN CULVERT, KM. 0+358.000
36	MT-HR-25	HEADRACE, DRAIN CULVERT, KM. 0+516.000
37	MT-HR-26	HEADRACE, DRAIN CULVERT, KM. 0+784.000
38	MT-HR-27	HEADRACE, DRAIN CULVERT, KM. 1+292.000
39	MT-HR-28	HEADRACE, DRAIN CULVERT, KM. 1+641.000
40	MT-HR-29	HEADRACE, DRAIN CULVERT, KM. 1+727.000
41	MT-HR-30	HEADRACE, DRAIN CULVERT, KM. 1+949.000
42	MT-HR-31	HEADRACE, DRAIN CULVERT, KM. 2+117.000
43	MT-HR-32	HEADRACE, DRAIN CULVERT, KM. 2+277.000
44	MT-HR-33	HEADRACE, DRAIN CULVERT, KM. 2+364.000
45	MT-HR-34	HEADRACE, DRAIN CULVERT, KM. 2+460.000
46	MT-HR-35	HEADRACE, DRAIN CULVERT, KM. 2+644.000
47	MT-HR-36	HEADRACE, DRAIN CULVERT, KM. 2+768.000
48	MT-HR-37	HEADRACE, DRAIN CULVERT, KM. 2+824.000
49	MT-HR-38	HEADRACE, DRAIN CULVERT, KM. 3+189.000
50	MT-HR-39	HEADRACE, DRAIN CULVERT, KM. 3+390.000
51	MT-HR-40	HEADRACE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
52	MT-HR-41	HEADRACE, MANHOLE DETAILS

SHEET NO.	DRAWING NO.	DRAWING DETAILS
HEADRACE		
53	MT-HR-42	HEADRACE, INLET AND OUTLET TRANSITIONS
54	MT-HR-43	HEADRACE, STANDARD PVC WATERSTOP, SECTION AND DETAILS
55	MT-HR-44	HEADRACE, BEND DETAILS
FOREBAY		
56	MT-FB-01	FOREBAY, PLAN AND SECTIONS
57	MT-FB-02	FOREBAY, REINFORCEMENT DETAILS
PENSTOCK		
58	MT-PS-01	PENSTOCK, PLAN AND PROFILE
59	MT-PS-02	PENSTOCK, ANCHOR BLOCK AND PIPE SUPPORT
60	MT-PS-03	PENSTOCK, WYE PLAN SECTIONS AND DETAILS
61	MT-PS-04	PENSTOCK, WELDING DETAILS
POWERHOUSE		
62	MT-PH-01	POWERHOUSE, LAY-OUT
63	MT-PH-02	POWERHOUSE, PLANS
64	MT-PH-03	POWERHOUSE, ELEVATIONS
65	MT-PH-04	POWERHOUSE, SECTIONS
66	MT-PH-05	POWERHOUSE, SECTIONS
67	MT-PH-06	POWERHOUSE, DETAILS OF TOILET, SEPTIC AND SEEPAGE TANK
68	MT-PH-07	POWERHOUSE, DETAILS OF DOORS, WINDOWS AND SIGNBOARD
69	MT-PH-08	POWERHOUSE, KEY PLAN AND BEAM REINFORCEMENT DETAILS
70	MT-PH-09	POWERHOUSE, BEAM REINFORCEMENT DETAILS
71	MT-PH-10	POWERHOUSE, SLAB AND COLUMN REINFORCEMENT DETAILS
72	MT-PH-11	POWERHOUSE, SLAB, STAIR AND FOOTING REINFORCEMENT DETAILS
73	MT-PH-12	POWERHOUSE, CABLE TRENCH AND CABLE TRAY DETAILS
74	MT-PH-13	POWERHOUSE, MISCELLANEOUS DETAILS
75	MT-PH-14	POWERHOUSE, CHAIN LINK FENCE AND GATE WIDTH 1.00 M.
76	MT-PH-15	POWERHOUSE, REINFORCEMENT DETAILS
77	MT-PH-16	POWERHOUSE, REINFORCEMENT DETAILS
78	MT-PH-17	POWERHOUSE, REINFORCEMENT DETAILS
79	MT-PH-18	POWERHOUSE, WATER SUPPLY PIPELINE SYSTEM LAY-OUT AND DETAILS
80	MT-PH-19	POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 1/3)
81	MT-PH-20	POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 2/3)
82	MT-PH-21	POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 3/3)
83	MT-PH-22	POWERHOUSE, GROUNDING SYSTEM AND LOAD SCHEDULE
84	MT-PH-23	POWERHOUSE, LIGHTING SYSTEM
85	MT-PH-24	POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM
ACCESS ROAD		
86	MT-AR-01	ACCESS ROAD, NO.1 PLAN AND PROFILE KM.0+000 TO KM.0+600
87	MT-AR-02	ACCESS ROAD, NO.1 PLAN AND PROFILE KM.0+600 TO KM.0+803.854
88	MT-AR-03	ACCESS ROAD, NO.2 PLAN AND PROFILE KM.0+000 TO KM.0+600
89	MT-AR-04	ACCESS ROAD, NO.2 PLAN AND PROFILE KM.0+600 TO KM.0+990.474
90	MT-AR-05	ACCESS ROAD, TYPICAL SECTIONS AND DETAILS (SHEET 1/2)
91	MT-AR-06	ACCESS ROAD, TYPICAL SECTIONS AND DETAILS (SHEET 2/2)
92	MT-AR-07	ACCESS ROAD, BARRIER DETAILS
93	MT-AR-08	ACCESS ROAD, GUARDRAIL DETAILS
94	MT-AR-09	ACCESS ROAD, TYPICAL RC. PIPE INSTALLATION AND REINFORCEMENT
95	MT-AR-10	ACCESS ROAD, BRIDGE, PLAN AND PROFILE
96	MT-AR-11	ACCESS ROAD, TYPICAL SLAB BRIDGE
97	MT-AR-12	ACCESS ROAD, SPREAD FOUNDATION ABUTMENT
98	MT-AR-13	ACCESS ROAD, TYPICAL SPREAD FOUNDATION PIER

CANCELED

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS GENERAL LIST OF DRAWING			
PANYA CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	REVIEWED	SUBMITTED	
DRAWN	RECOMMENDED	APPROVED	
CHECKED	DATE	DATE	
PROJECT MANAGER	DATE	DRAWING NO.	SHEET NO.
		MT-GN-00	00 OF 98

ABBREVIATIONS :

A	CROSS-SECTION AREA OF FLOW	MAX.
AC.	ASBESTOS CEMENT PIPE	M.S.L.
AGO.	AGGREGATE	MISC.
ALT.	ALTERNATIVE	N.
APPROX.	APPROXIMATE	n.
AZ.	AZIMUTH	N.F.
B.	BEGINNING OF SURVEY	NGL.
BC.	BEGINNING OF CURVE	NO. OR #
BF.	BOTTOM FACE	N.M.L.
B.M.	BEAM	OD.
BOTT.	BENCH MARK	O.F.
BRG.	BOTTOM	O&M
C.B.R.	BEARING	PC.
C/C	CALIFORNIA BEARING RATIO	PL.
CL	CENTER TO CENTER	P.L.
CL	CENTER LINE	P.O.C.
CL	CLEARANCE	P.O.T.
CM. OR cm.	CENTIMETER	P.O.S.T.
CM./S OR cm./s	CENTIMETER PER SECOND	PRC.
COL.	COLUMN	PT.
CONC.	CONCRETE	PVC.
D	DEGREE OF CURVE	PVC.
DB.	DEFORM BAR	P.VI.
d.	DEPTH OF WATER	P.VRC.
DIA. OR Ø	DIAMETER	P.VT.
DOH.	DEPARTMENT OF HIGHWAY	Q.
DWG.	DRAWING	QTY. QUAN.
DEDE.	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	R
E	EAST	RB.
E	END OF SURVEY	RC.
EA.	EACH	RD.
E.C.	END OF CURVE	REF.
E.I.T.	THE ENGINEERING INSTITUTE OF THAILAND UNDER H.M. THE KING'S PATRONAGE	REINF.
E.F.	END OF FACE	RECD
EL. OR ELEV.	ELEVATION	RID.
EXIST.	EXISTING	SCH.
EXP.	EXPANSION	SE.
EXT.	EXTERIOR	SECT.
EX.	EXTERNAL DISTANCE OF CURVE	S.P.C.T.
f	FREE BOARD , FINISH	STR.
F.F.	FAR FACE	STA.
F.S.L.	FULL SUPPLY LEVEL	STD.
FTG.	FOOTING	STR.
HD.	HEAD	SYMM.
HEX.	HEXAAGONAL	T.
HOR.	HORIZONTAL	THK.
ID.	INSIDE DIAMETER	T.F.
I.F.	INSIDE FACE	T.I.S.
IN. OR "	INCH	Ta.
INT.	INTERIOR	TYP.
INV.	INVERT	V.
Kg.	KILOGRAM	V.C.
Km.	KILOMETER	Vc.
KPH.	KILOMETER PER HOUR	VER.
KSC.	KILOGRAM PER SQUARE CENTIMETER	VOL.
L	LENGTH OF CURVE	W/
LC.	LENGTH OF HORIZONTAL CURVE	W.C.
LONG.	LONGITUDINAL	W.C.
LT.	LEFT	W.C.
L.W.L.	LOW WATER LEVEL	W.C.
M. OR m.	METER	W.C.
m ² OR m ²	SQUARE METER	W.C.
m ³ OR m ³	CUBIC METER	W.C.
MM. OR mm.	MILLIMETER	W.C.
M./S OR m./s	METER PER SECOND	W.C.
MIN.	MINIMUM	W.C.

SYMBOLS :

	TYPICAL NORTH ARROW
	CENTER LINE
	PAVED ROAD
	DIRT ROAD, LATITE 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
	B.C., Ec., P.C., P.L., P.V., P.VT.
	WATER LEVEL
	PLAN OF RIPRAP
	PLAN OF SLOPE RIPRAP
	SECTION OF DUMPED RIPRAP
	SECTION OF HAND PLACED RIPRAP
	SECTION OF GRAVEL OR COARSE AGGREGATE
	SECTION OF SAND
	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
	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 PLAN CONCRETE CORNERS ARE TO BE CHAMFERED 2 cm. UNLESS OTHERWISE SHOWN.
- SODDING ON 0.10 M TOP SOIL SHALL BE PROVIDED ON EMBANKMENT SLOPES
- AND BENSMS, OR THE PLACES DIRECTED BY THE ENGINEER.
- IN CASE SILSTONE OR SHALE OR MDOSTONE FOUNDATION; AS SOON AS FINISHED EXCAVATION TO FOUNDATION ELEVATION, SHOTCRETE OR LEAN CONCRETE MUST BE APPLIED IMMEDIATELY.

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.

DESCRIPTION	f _c (ksc)
PRESTRESSED CONCRETE	350
REINFORCEMENT CONCRETE	210
LEAN CONCRETE	140

- UNLESS OTHERWISE SHOWN, THE FOLLOWING CLEAR COVERING OF CONCRETE OVER REINFORCEMENT SHALL BE USED :
 - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH 7.5 cm.
 - CONCRETE EXPOSED TO EARTH OR WEATHER 5.0 cm.
 - CONCRETE NOT EXPOSED TO EARTH OR WEATHER 2.5 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 SHALL BE DIRECTED IN ORDER TO ASSUME THE BEST BOND.
- A 5 cm. (MIN.) LAYER OF LEAN CONCRETE SHALL BE PLACED BELOW CONCRETE STRUCTURES.
- THE STRUCTURES SHALL BE PLACED ON UNDISTURBED SOILS AND BACKFILL AROUND THE STRUCTURES SHALL BE WELL COMPACTED.
- THE FOUNDATION ELEVATIONS ARE SUBJECT TO CHANGE AS DIRECTED ACCORDING TO THE SOIL CONDITIONS.
- ALL SIZES OF REINFORONG BARS AND STRUCTURAL STEELS ARE IN MILLIMETERS.
- ALL STRUCTURE STELS SHALL BE CONFORMED TO T.I.S. 1227-2539.
- REINFORCED STEEL BARS SHALL BE CONFORMED TO T.I.S. AS FOLLOW :
 - DEFORMED BARS (SD30) – T.I.S. 24-2548
 - ROUND BARS (SR24) – T.I.S. 20-2543
- THE E.I.T. STANDARDS SHALL BE APPLIED FOR ALL STRUCTURES WHICH ARE NOT SPECIFIED IN STRUCTURAL DESIGN NOTE 1 TO 11.

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS			
SYMBOLS, ABBREVIATIONS AND GENERAL NOTES			
DESIGNED <i>[Signature]</i> 20.12.2014		SUBMITTED <i>[Signature]</i> 20.12.2014	
CHECKED <i>[Signature]</i> 20.12.2014		RECOMMENDED <i>[Signature]</i> 20.12.2014	
APPROVED <i>[Signature]</i> 27/05/15		APPROVED <i>[Signature]</i> 27/05/15	
PROJECT MANAGER		SHEET NO. 01 OF 98	

TABLE 1 CLIMATOLOGICAL DATA FOR THE PERIOD 1981-2010

Station	BHUMBOL DAM	Elevation of station above M.S.L.	143 Meters											
Index station	48377	Height of barometer above M.S.L.	144 Meters											
Latitude	17o 14' 00" N	Height of thermometer above ground	125 Meters											
Longitude	98o 03' 00" E	Height of wind vane above ground	15.30 Meters											
		Height of rain gauge	100 Meters											
Elements	N-YEARS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Pressure(hPa)														
Mean	30	1012.9	1010.8	1008.7	1007.1	1006.1	1005.2	1005.3	1005.5	1007.5	1010.4	1012.7	1014.2	1008.8
Mean Daily Range	30	2.7	2.9	3	2.7	1.7	0.7	0.5	0.9	1.6	1.7	1.9	2.3	1.9
ExLMax.	29	1026.4	1023.6	1027.1	1017.4	1014.2	1012.4	1013.5	1012.4	1015	1019.3	1023.6	1025.6	1027.1
ExLMin.	29	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010	1010.2	1010
Temperature(Celsius)														
Mean Max.	30	31.9	34.9	37.2	36.2	35.2	33.4	33	33	33	32.1	31.2	30.2	33.6
ExLMax.	30	37.9	40.8	42.3	43.7	43	39.5	39	38.5	39	36.7	37.4	35.7	43.7
Mean Min.	30	17.5	19.9	23	25.2	25	24.8	24.6	24.4	23.7	22.6	20.2	17.2	22.3
ExLMin.	30	16.7	18.9	21	23.4	24.1	24.2	24.2	23.7	23.1	22	19.4	16.9	19.9
Mean	30	23.7	26.7	28.7	30.9	29.2	28.5	28.2	28.1	27.5	26.4	24.8	22.7	27.2
Dew Point Temp(Celsius)														
Mean	30	16.9	16.5	16.1	21.1	23.1	23	22.6	22.8	23.4	23	20.5	17.5	20.7
Relative Humidity(%)														
Mean	30	69	57	54	59	72	74	73	74	80	83	79	75	71
Mean Max.	30	86	78	74	77	87	88	86	88	83	95	94	83	87
Mean Min.	30	42	35	34	40	54	59	59	59	62	63	56	48	51
ExLMin.	30	52	43	47	52	47	59	62	58	62	57	60	54	43
Visibility(km.)														
07.00LST	30	6	6	6	8	11	11	12	11	11	9	8	7	9
Cloud Amount(1-10)														
Mean	30	2	2	2	3	6	8	8	8	9	6	4	2	5
Pan Evaporation(mm.)														
Mean	30	108	135	183	183	159	133	134	129	119	104	98	97	133
Wind (Knots)														
Prev.Wind	30	E	W	W	W	W	W	W	W	W	E	E	E	-
Mean	30	0.8	1.3	1.7	1.8	1.5	1.8	1.9	2	0.9	0.4	0.4	0.5	1.2
Max.	30	23	30	30	40	30	30	33	30	28	25	38	30	40
Rainfall(mm)														
Mean	30	2.8	7.7	21.8	66.1	187.6	106.5	66.7	112	207.6	204.3	47.9	8	87.4
Mean Rainy Day	30	1	1	2	5	14	15	14	16	17	14	5	1	9
Daily Max.	30	36.7	87.6	72	93.9	247.1	85.7	44.7	80.6	100.7	155.3	68.4	64.9	247.1
Phenomena(Days)														
Fog	30	0	0	0	0	0	0	0	0	0	0	0	0	0
Haze	30	29	27	29	21	3	0	0	0	2	9	18	25	14
Hail	30	0	0	0	0	0	0	0	0	0	0	0	0	0
ThunderStorm	30	0	0	2	5	8	4	2	3	6	5	1	0	3
Squall	30	0	0	0	0	0	0	0	0	0	0	0	0	0

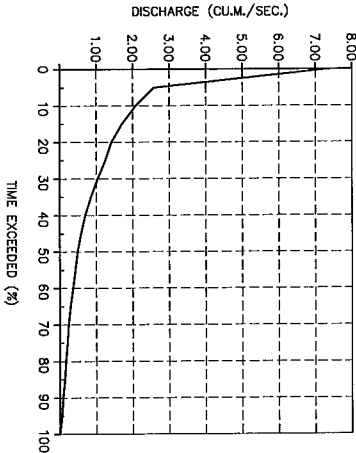


FIGURE 1 FLOW DURATION CURVE

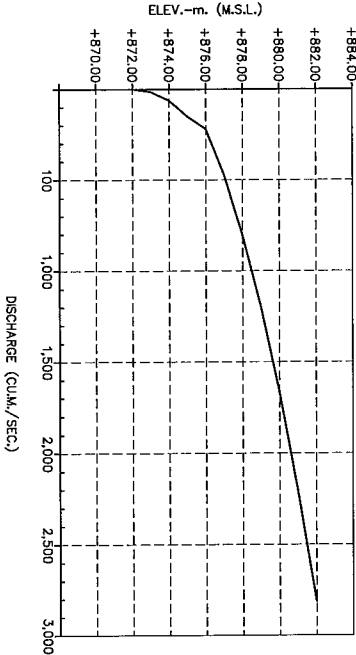
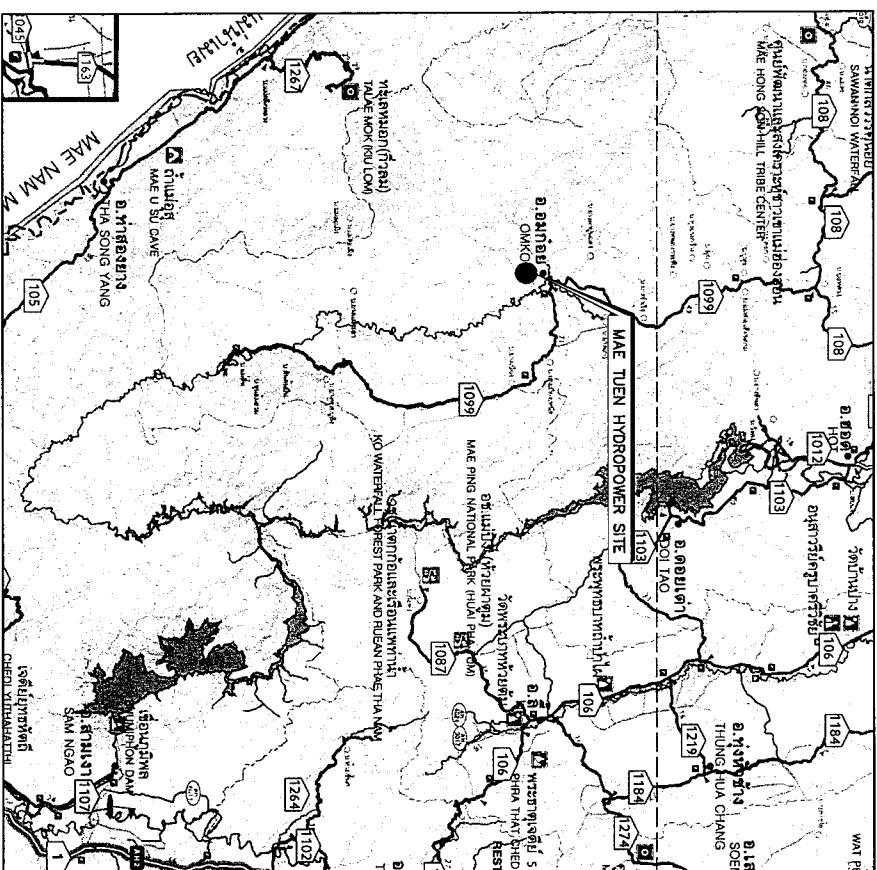
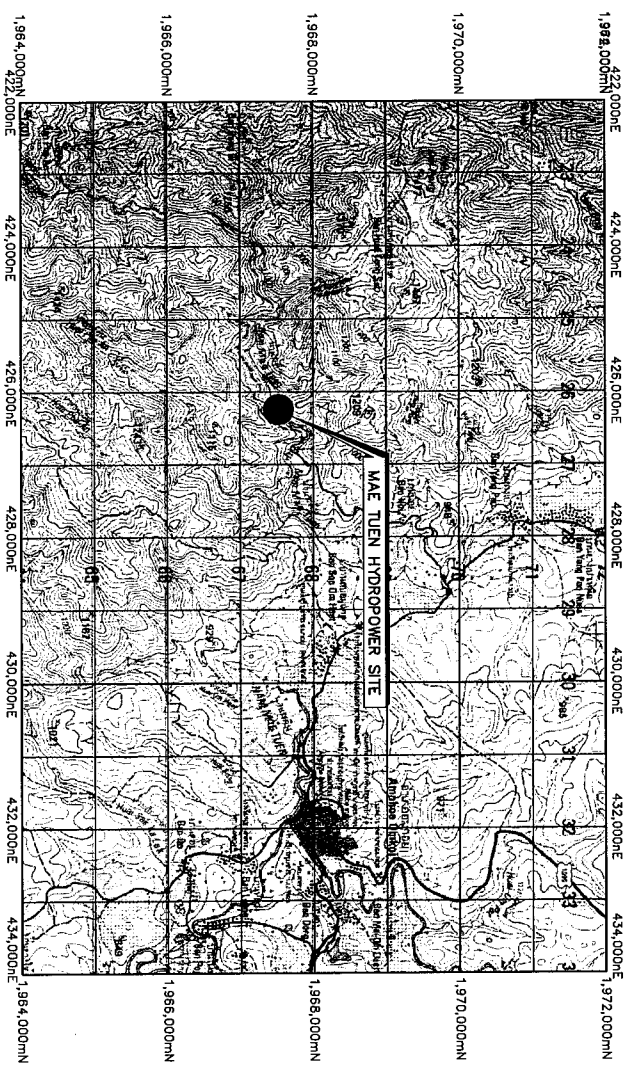
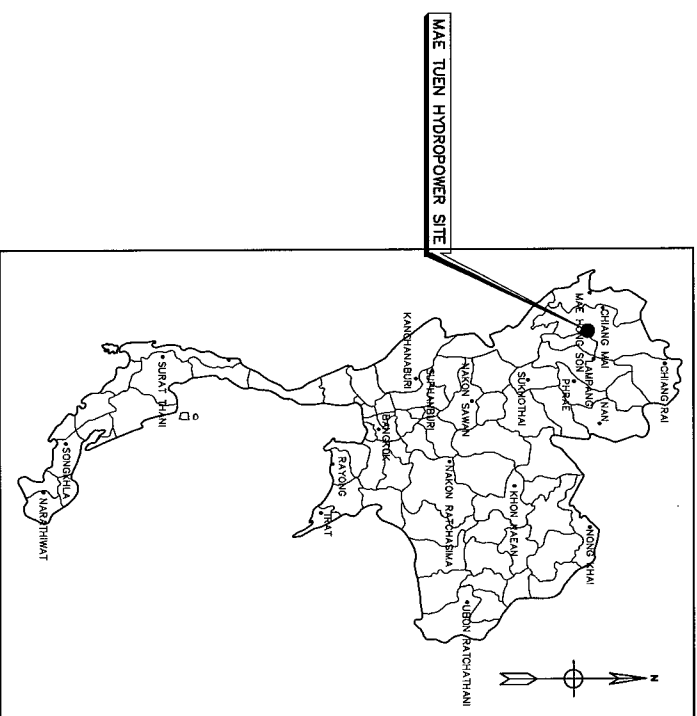


FIGURE 2 RELATIONSHIP BETWEEN TAIL WATER LEVEL AND DISCHARGE AT POWERHOUSE

- NOTES :
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

KINGDOM OF THAILAND				DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MINISTRY OF ENERGY							
MAE TUEN HYDROPOWER PROJECT							
CIVIL WORKS							
GENERAL							
HYDROLOGY DATA							
PANYA CONSULTANTS CO.,LTD.				DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
DESIGNED BY RA22514				SUBMITTED BY			
DRAWN BY				RECOMMENDED BY			
CHECKED BY				APPROVED BY			
PROJECT MANAGER				DRAWING NO. MT-GN-02		SHEET NO. 02 OF 98	
DATE 27/09/13							

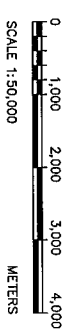


SYMBOLS :

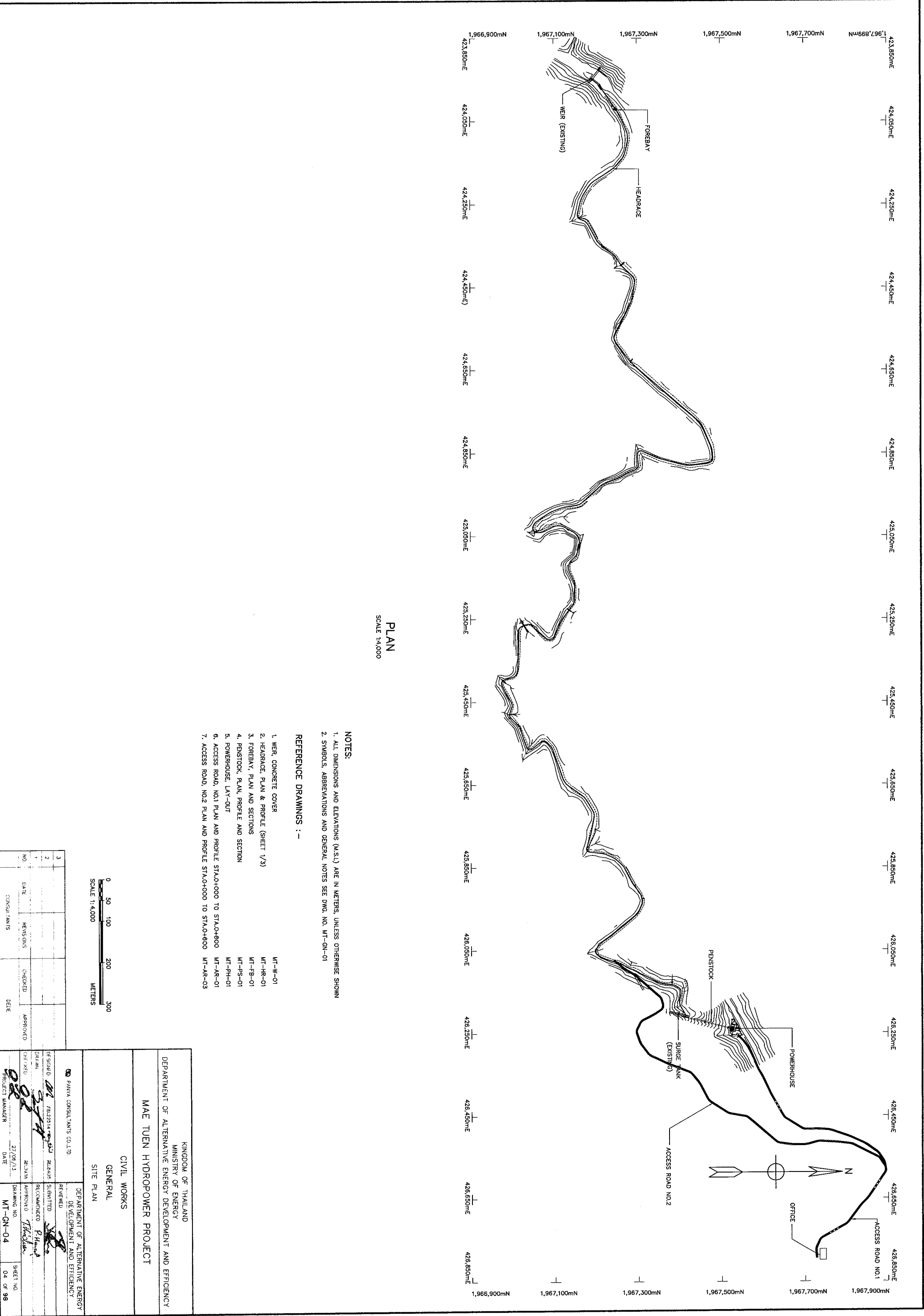


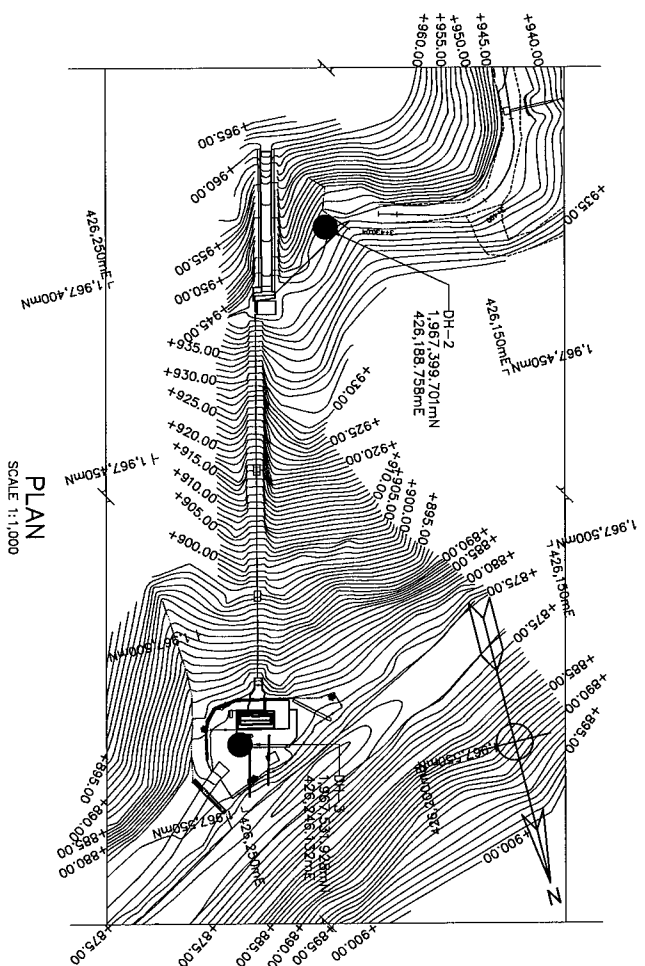
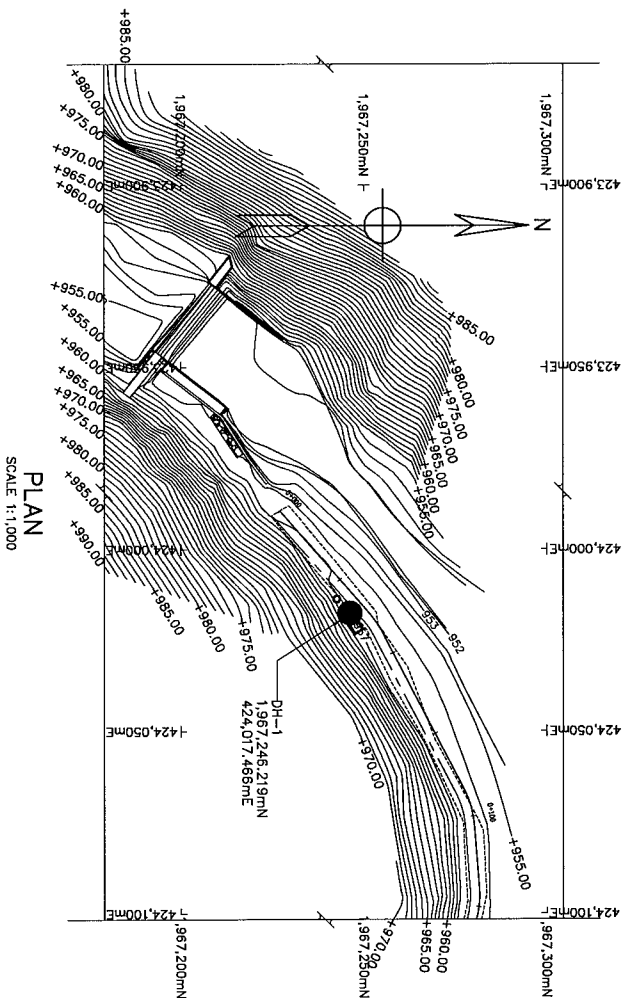
NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METRES. DISTANCES ARE IN KILOMETRES, UNLESS OTHERWISE SHOWN.
2. SITE LOCATION MAP IS BASED ON THE HIGHWAY MAP 1:1,000,000 SCALE, PUBLISHED BY ROADS ASSOCIATION OF THAILAND, 2012.
3. THE MAP OF MAE TUDEN HYDROPOWER SITE AND RESERVOIR IS BASED ON TOPOGRAPHIC MAPS, SCALE 1:50,000 (SHEET 4644 WGS 84) PUBLISHED BY THE ROYAL THAI SURVEY DEPARTMENT, 1999



KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS GENERAL			
LOCATION MAP AND PROJECT AREA MAP			
DESIGNED DRAWN CHECKED DATE		RECOMMENDED APPROVED SHEET NO.	
3 2 1 NO. DATE REVISIONS CHECKED APPROVED CONSULTANTS DECE		3 2 1 NO. DATE REVISIONS CHECKED APPROVED CONSULTANTS DECE	





ELEVATIONS-m (M.S.L.)	
+957.00	
+956.00	
+955.00	
+954.00	
+953.00	
+952.00	
+951.00	
+950.00	
+949.00	
+948.00	
+947.00	
+946.00	
+945.00	
+944.00	

DH-1

(+955.00)

25/05/58

SM

SLTY SAND,ABOUT 80% FINE TO COARSE SAND,ABOUT 8% FINES WITH LOW-PLASTICITY,ABOUT 8% GRAVELS,MAX. SIZE 2.0mm-4.75mm-BROWN

4.00 m

GRANITE

8.00 m

GRANITE LIGHT GRAY,MEDIUM TO COARSE

GRANITE GRANULATED,COMPOSED OF QUARTZ FELSPAR,RODITE AND MUSCOVITE,SLIGHTLY WEATHERED AND MEDIUM HARD TO HARD ROCK,JOINTED CORE

100% OF DR. 0

BOTTOM OF DRILL-HOLE

ELEVATIONS-m (M.S.L.)	
+947.00	
+946.00	
+945.00	
+944.00	
+943.00	
+942.00	
+941.00	
+940.00	
+939.00	
+938.00	
+937.00	
+936.00	
+935.00	
+934.00	

DH-2

(+945.00)

27/05/58

SM

SLTY SAND,ABOUT 75% FINE TO COARSE SAND,ABOUT 8% FINES WITH NON-PLASTICITY,ABOUT 8% GRAVELS,MAX. SIZE 1.5-2.0 mm,CLAY-BROWN

4.50 m

GRANITE

8.00 m

GRANITE LIGHT GRAY,MEDIUM TO COARSE

GRANITE GRANULATED,COMPOSED OF QUARTZ FELSPAR,RODITE AND MUSCOVITE,SLIGHTLY WEATHERED AND MEDIUM HARD TO HARD ROCK,VERY JOINTED CORE, FE-DOSE FILL IN SOME JOINT

100% OF DR. 0

BOTTOM OF DRILL-HOLE

DH-1 GEOLOGICAL LOG

DH-2 GEOLOGICAL LOG

ELEVATIONS-m (M.S.L.)	
+877.00	
+876.00	
+875.00	
+874.00	
+873.00	
+872.00	
+871.00	
+870.00	
+869.00	
+868.00	
+867.00	
+866.00	
+864.00	

DH-3

(+875.00)

29/05/58

SW

SAND,ABOUT 80% FINE TO COARSE SAND,ABOUT 8% FINES WITH LOW PLASTICITY,ABOUT 8% GRAVEL,BROWN

0.50 m

GRANITE

4.00 m

GRANITE LIGHT GRAY,MEDIUM TO COARSE

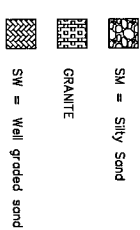
GRANITE GRANULATED,COMPOSED OF QUARTZ FELSPAR,RODITE AND MUSCOVITE,SLIGHTLY WEATHERED AND MEDIUM HARD TO HARD ROCK,VERY JOINTED CORE, FE-DOSE FILL IN SOME JOINT

100% OF DR. 0

BOTTOM OF DRILL-HOLE

DH-3 GEOLOGICAL LOG

Legends:



< 25% VERY POOR ROCK	VH	VERY HARD ROCK	FR	FRESH ROCK
25 - 50% POOR ROCK	H	HARD ROCK	SW	SLIGHTLY WEATHERED ROCK
50 - 75% FAIR ROCK	MH	MEDIUM HARD ROCK	MW	MODERATELY WEATHERED ROCK
75 - 90% GOOD ROCK	S	SOFT ROCK	HW	HIGHLY WEATHERED ROCK
90 - 100% VERY GOOD ROCK	VS	VERY SOFT ROCK	CW	COMPLETELY WEATHERED ROCK

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS

GENERAL

GEOLOGICAL DATA

REVIEWED

APPROVED

RECOMMENDED

DATE

REVIEWED

APPROVED

RECOMMENDED

DATE

PROJECT MANAGER

DATE

MT-GN-05

05 OF 98

0 10 20 30 40 50 60 70 80

SCALE 1:1,000

METERS

DATE MEASURED

1/06/54

GROUP SYMBOL

100 m

2.50 m

3.00 m

DEPTH

N-Value (Blow Count/foot)

100

200

300

400

500

600

700

800

900

1000

1100

1200

1300

1400

1500

1600

1700

1800

1900

2000

2100

2200

2300

2400

2500

2600

2700

2800

2900

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3100

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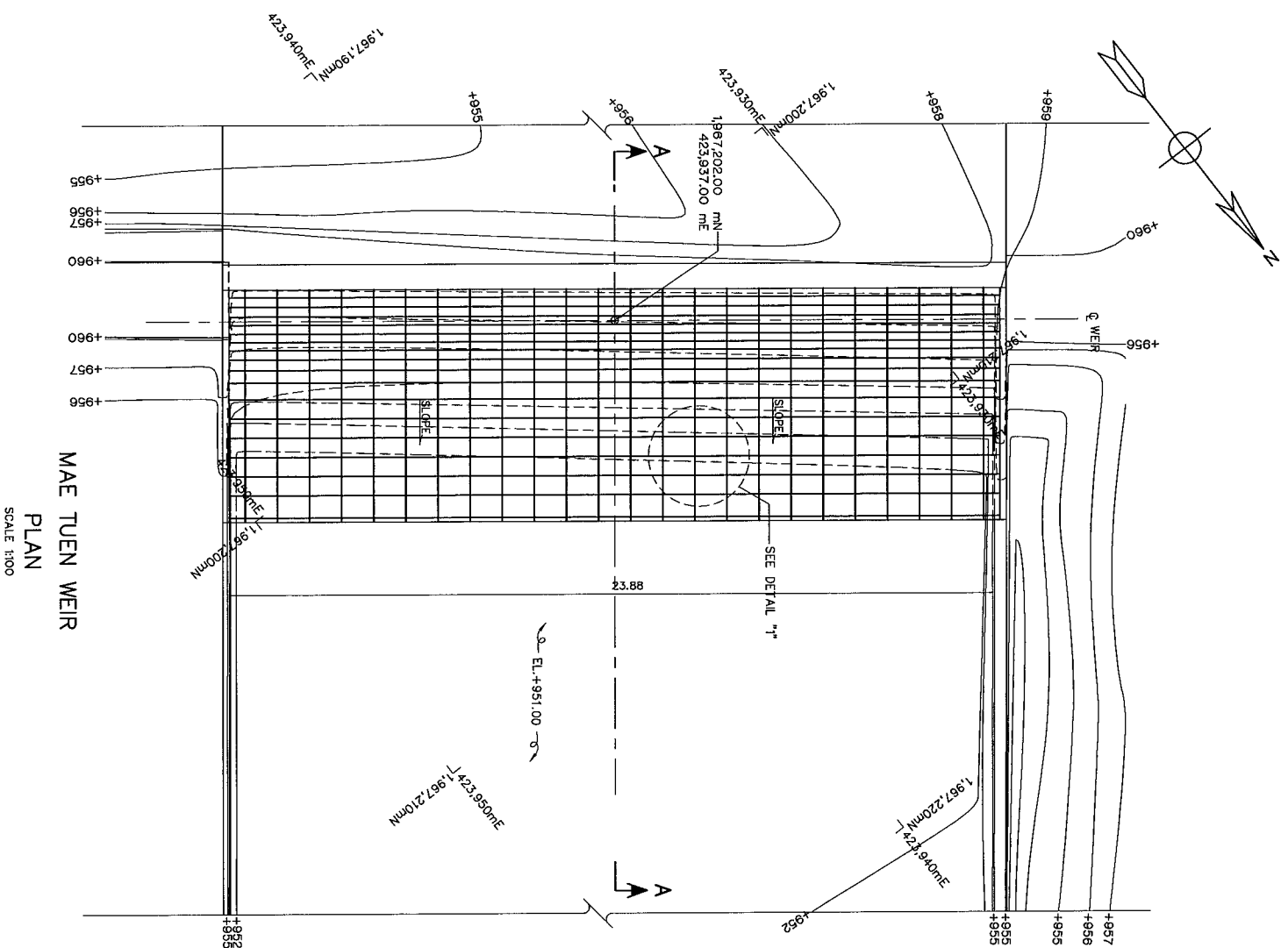
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MAE TUEN WEIR
PLAN
SCALE 1:100

SCALE 1:100

SCALE 1:100

NOTES :

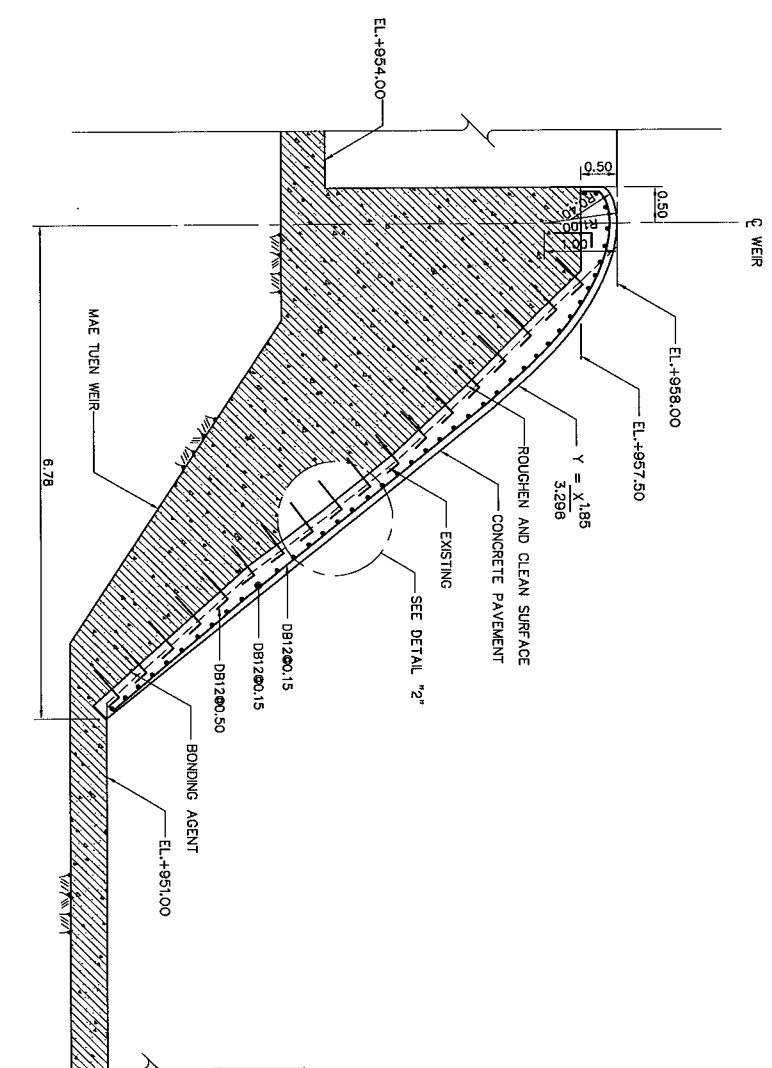
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2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

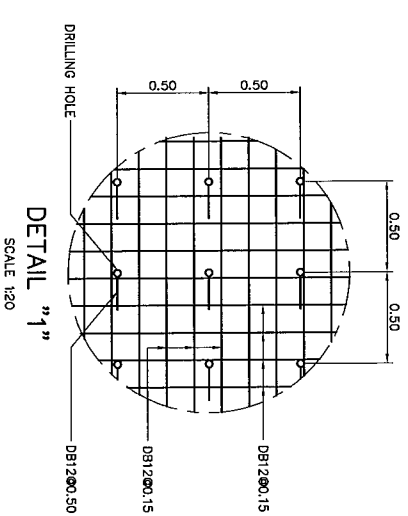
REFERENCE DRAWINGS :-

1. WEIR, INTAKE, PLAN SECTIONS AND DETAILS

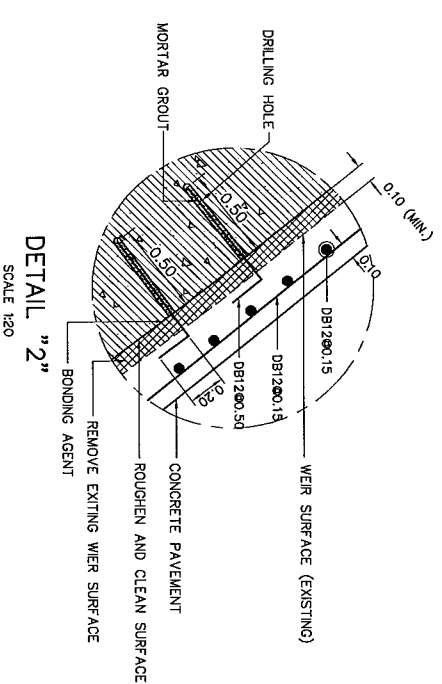
MT-WE-02



SECTION A-A
SCALE 1:50



DETAIL "1"
SCALE 1:20



DETAIL "2"
SCALE 1:20

SCALE 1:100 METERS

[illegible]

2

NO.	DATE	RECEIVED	CHECKED	APPROVED
1	10-10-10			

NO.	DATE	REVISIONS	SHEET NO.	TOTAL SHEETS
1	10/10/19	1	1	1

CONSULTANTS	REPLY
-------------	-------

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	MAE TUN HYDROPOWER PROJECT
CIVIL WORKS WEIR CONCRETE COVER	DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY
PAVIA CONSULTANTS CO.LTD	

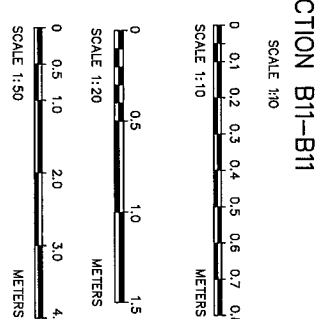
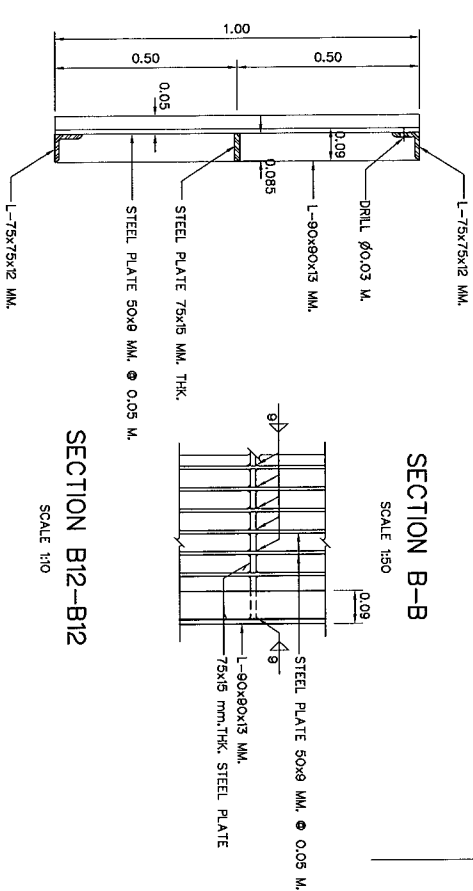
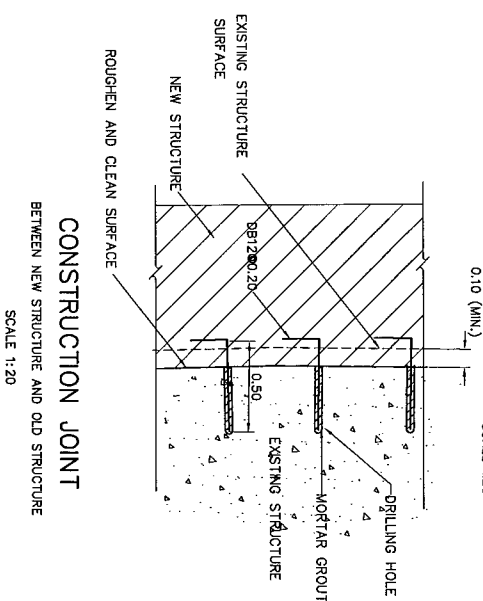
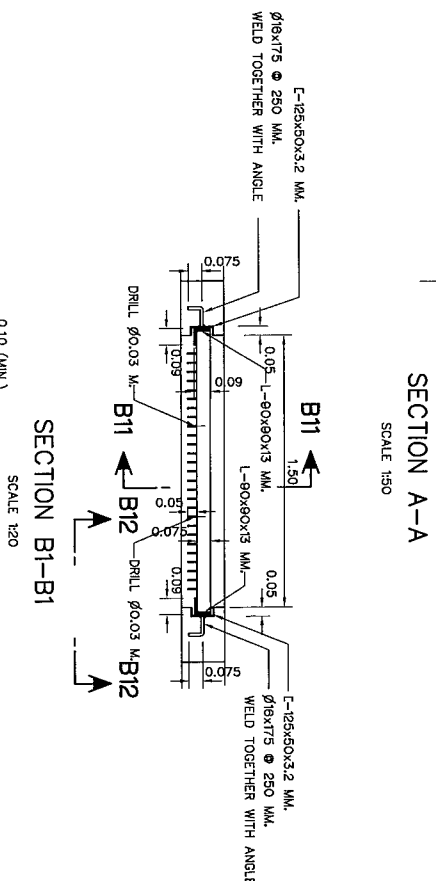
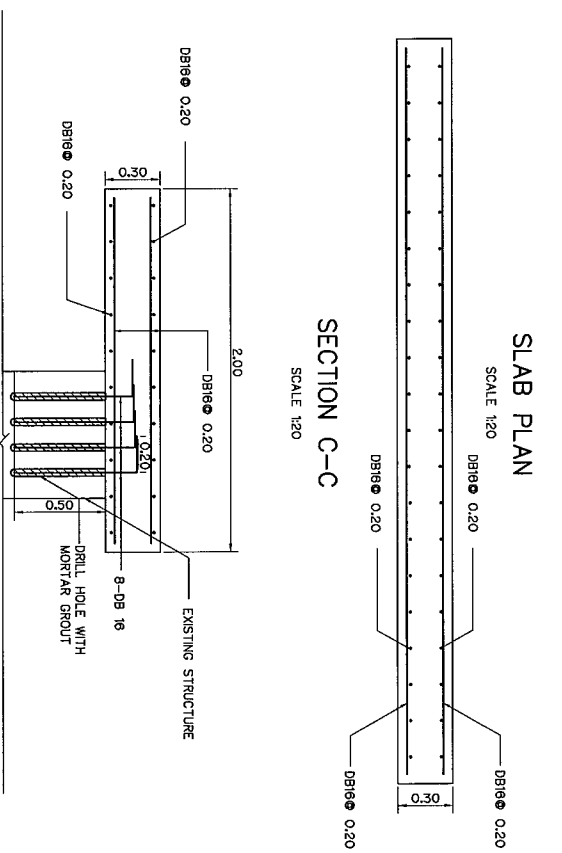
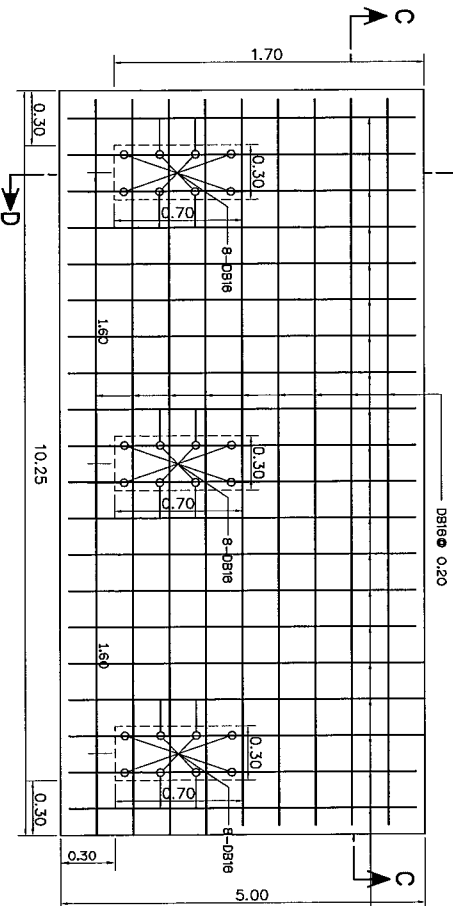
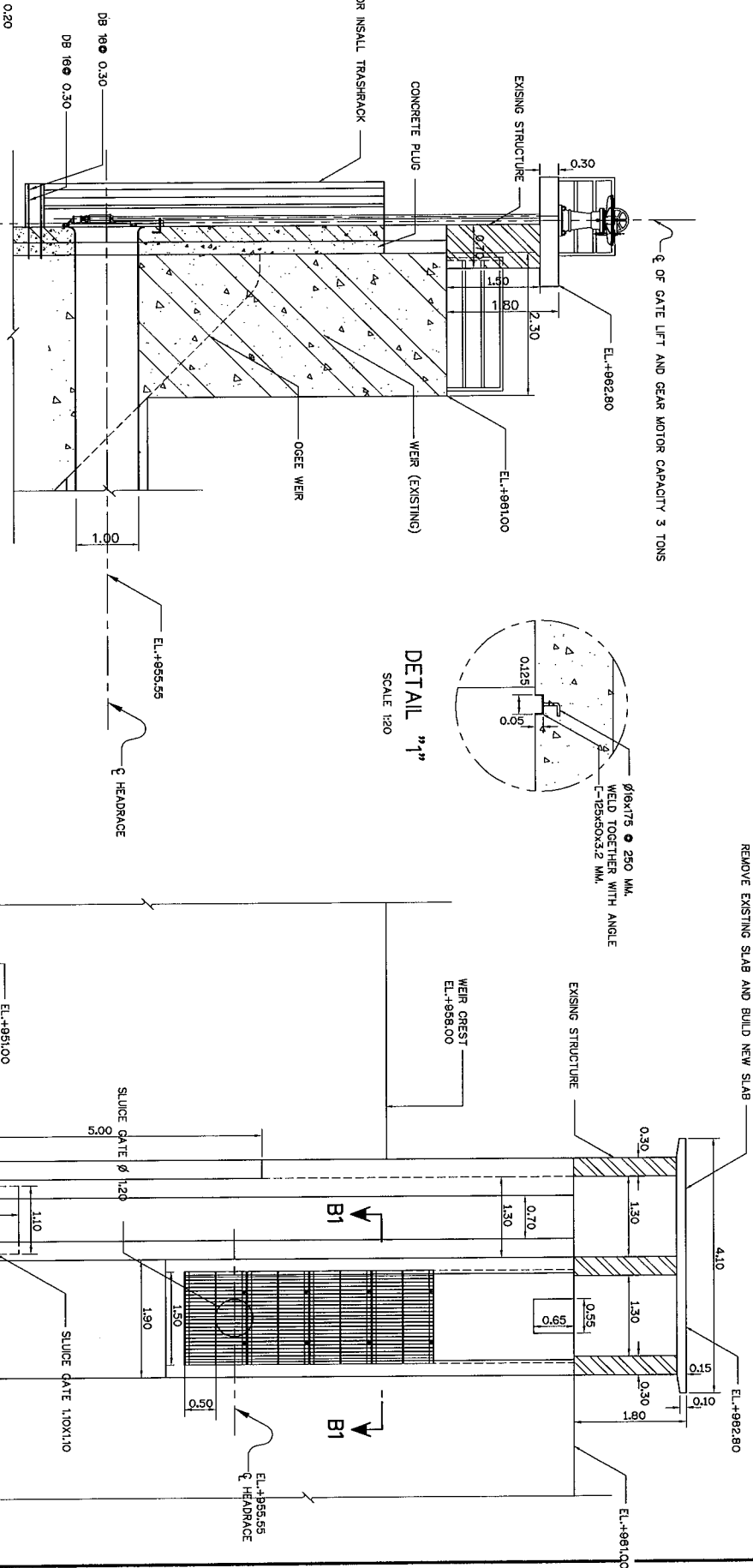
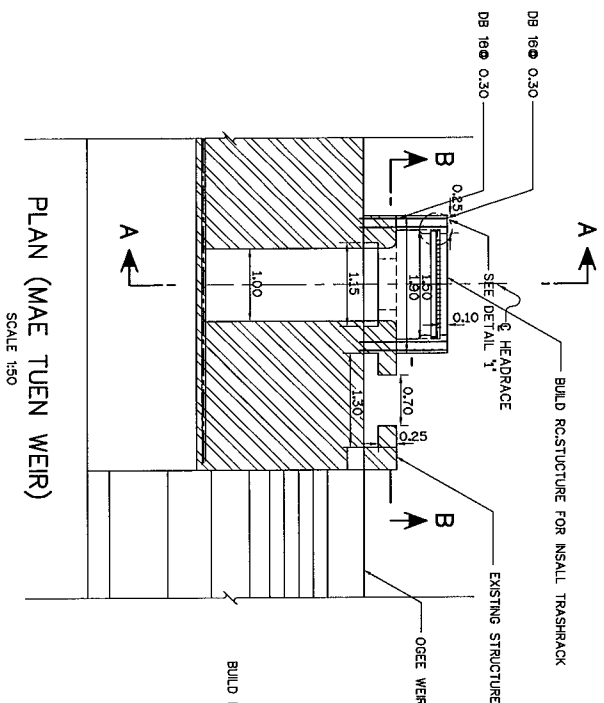
REVIEWED	1
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DESIGNED BY W FILED 7-25-68 SUBMITTED BY [Signature]

UNAVAIL	<i>[Signature]</i>	RECOMMENDED	<i>[Signature]</i>
CHECKED	<i>[Signature]</i>	APPROVED	<i>[Signature]</i>
	2011-09-28		

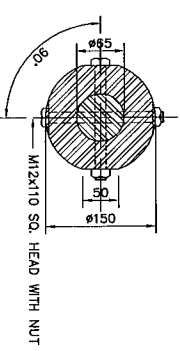
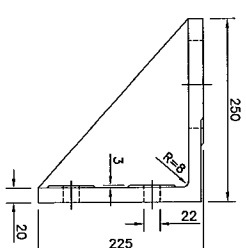
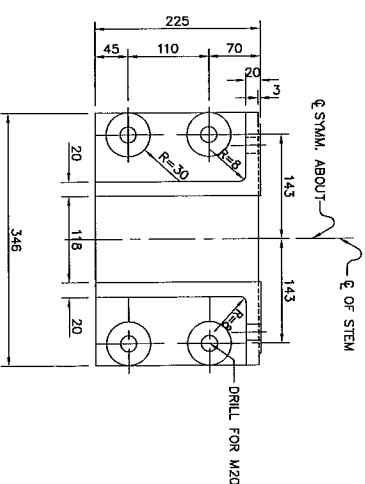
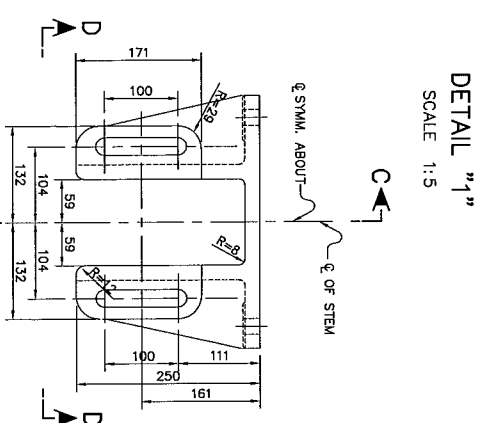
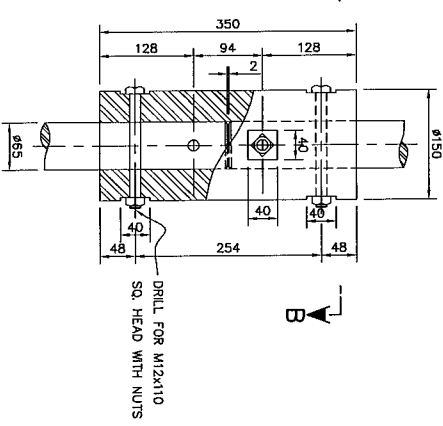
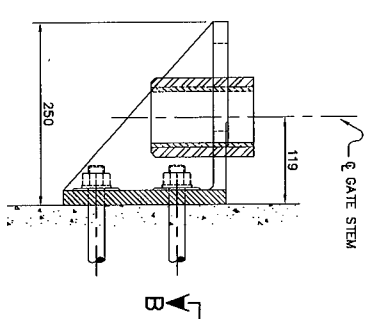
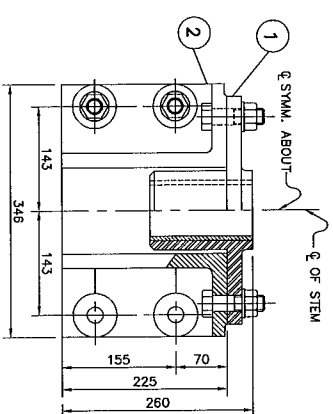
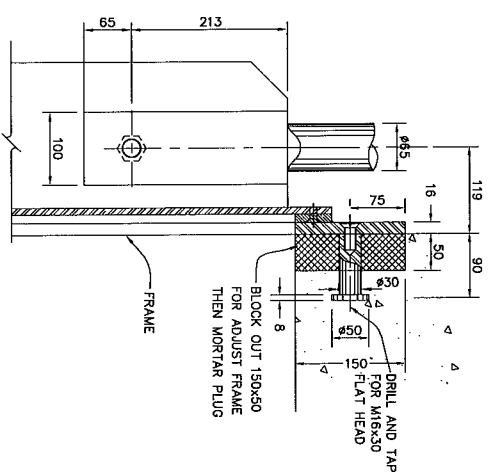
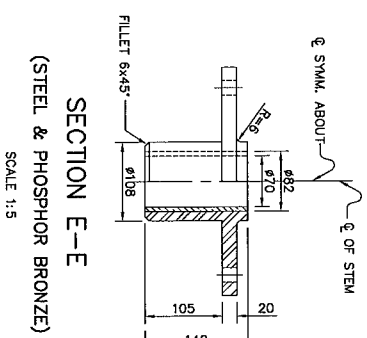
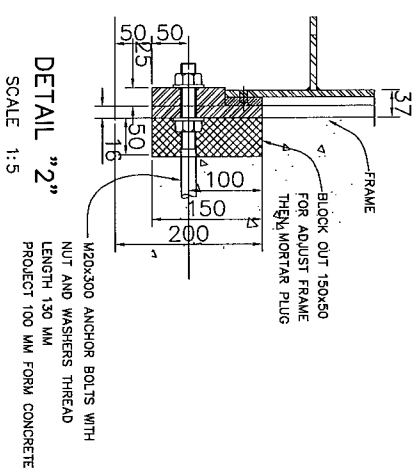
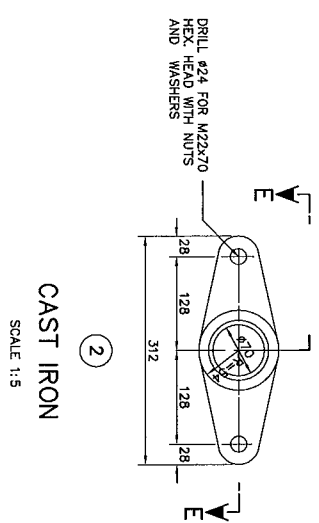
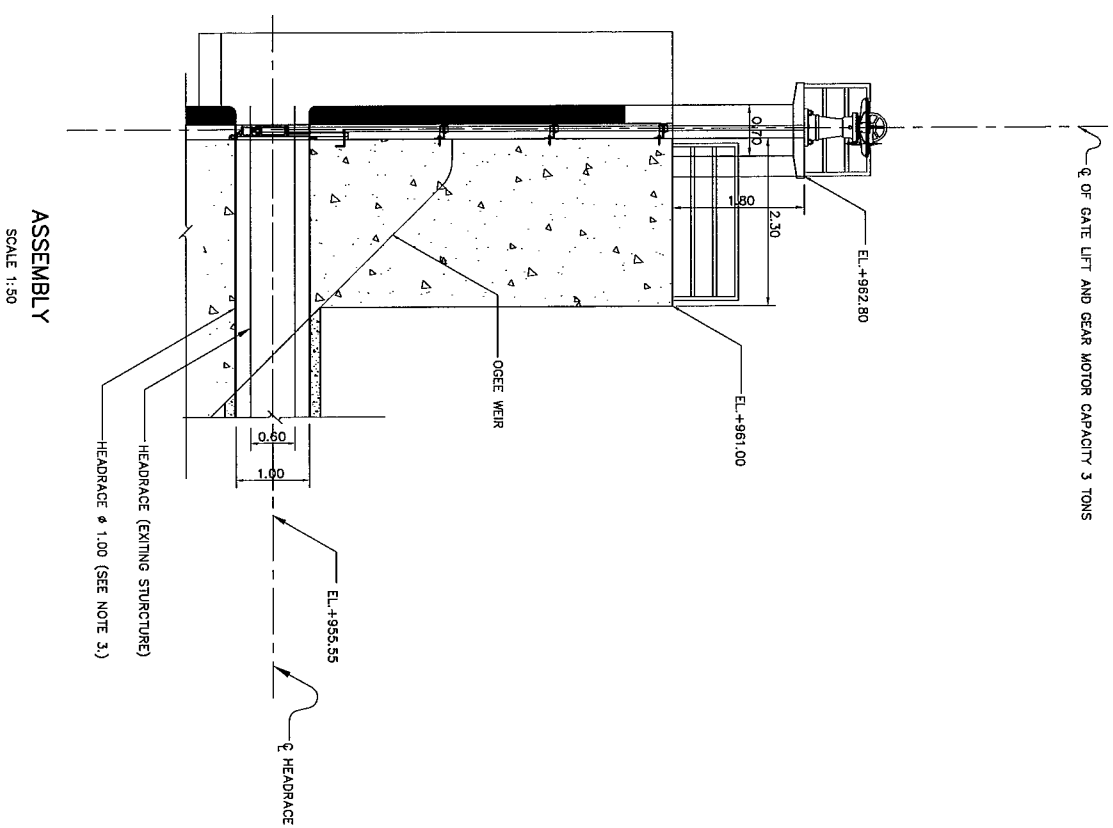
DATE	27/06/13	DRAWING NO.	SHEET NO.
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PROJECT MANAGER	DATE	MT--WE--01	06 OF 98
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NO.	DATE	REVISIONS	CHECKED	APPROVED	CONSULTANTS
1					
2					

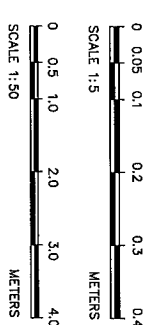
DESIGNED	DRAWN	CHECKED	APPROVED	PROJECT MANAGER
DATE	DATE	DATE	DATE	DATE
7/7/2013	7/7/2013	7/7/2013	7/7/2013	7/7/2013



- NOTES :**

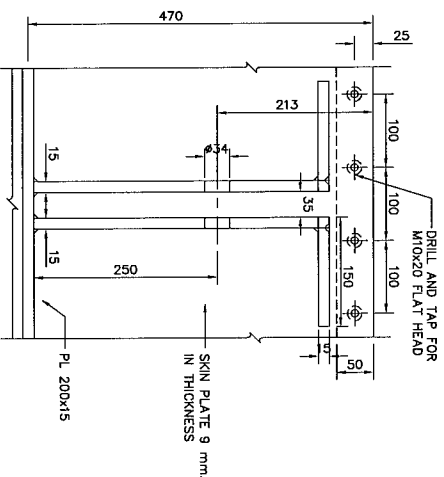
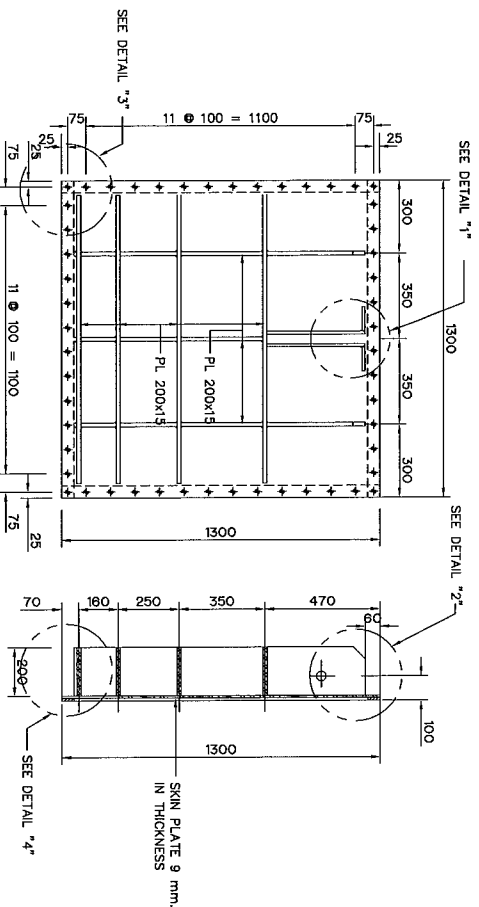
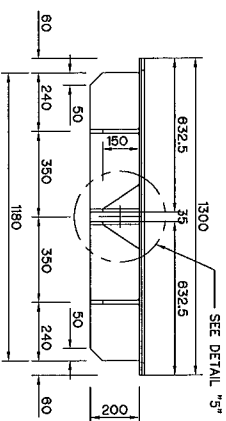
1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. ALL WELDING WILL BE 6 MILLIMETERS, UNLESS OTHERWISE SHOWN.
3. ALL BOLTS AND NUTS USE ASTM A325.
4. ALL STRUCTURAL STEELS ARE JIS G 3101 SS400
5. ALL STAINLESS STEEL PLATES ARE JIS G 4304 SUS 304.

- | | |
|--|----------|
| 1. WEIR, INTAKE, PLAN SECTIONS AND DETAILS | MT-WE-02 |
| 2. WEIR, TYPICAL SLIDE GATE, DIA. 120 M. VERTICAL GATE | MT-WE-05 |
| 3. WEIR, GATE LIFT, CAPACITY 3 TONS | MT-WE-06 |

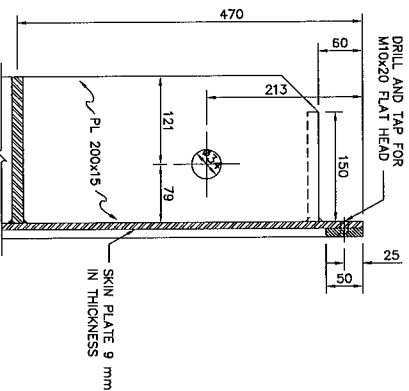


3			
2			
1			
NO.	DATE	REVISIONS	CHECKED
CONSULTANTS			APPROVED
			DATE

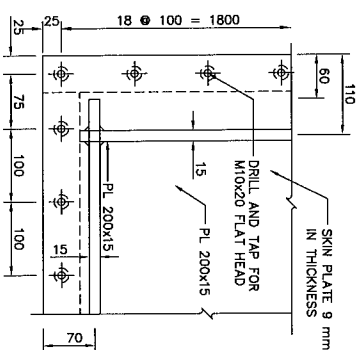
KINGDOM OF THAILAND MINISTRY OF ENERGY					
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY					
MAE TUEN HYDROPOWER PROJECT					
CIVIL WORKS					
WEIR					
TYPICAL SLIDE GATE, DIA 120 M VERTICAL GATE, GATE INSTALLATION					
NO. PANVA CONSULTANTS CO., LTD.					
DRAWN BY	DATE	CHECKED BY	DATE	SHEET NO.	OF
PANVA	27/06/73			09	98



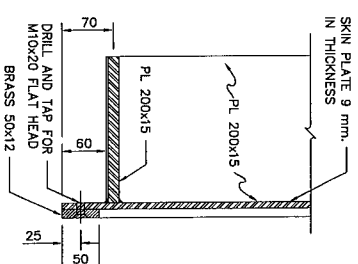
DETAIL "1"
SCALE 1:5



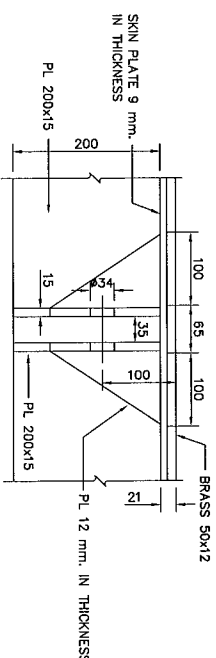
DETAIL "2"
SCALE 1:5



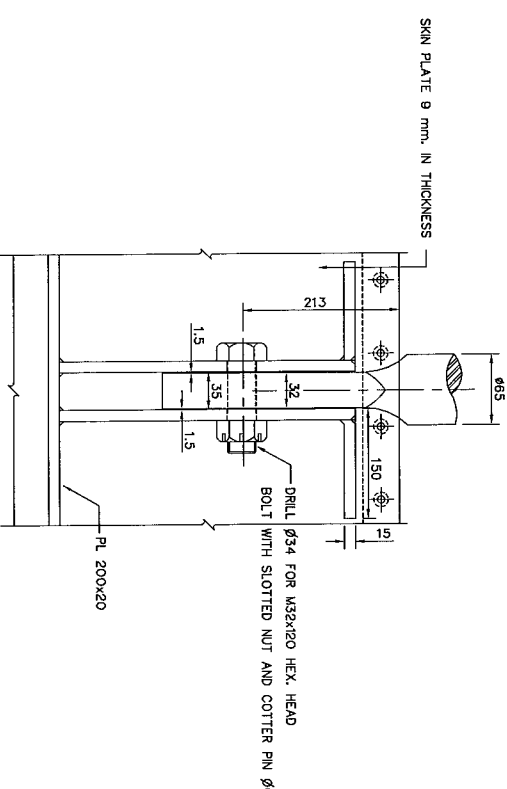
DETAIL "3"
SCALE 1:5



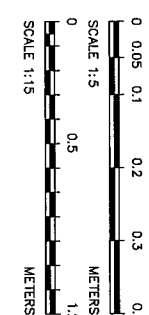
DETAIL "4"
SCALE 1:5



DETAIL "5"
SCALE 1:5



DETAIL "6"
SCALE 1:5



NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. ALL WELDING WILL BE 6 MILLIMETERS, UNLESS OTHERWISE SHOWN.
3. ALL BOLTS AND NUTS USE ASTM A325.
4. ALL STRUCTURAL STEELS ARE JIS G 3101 SS400
5. ALL STAINLESS STEEL PLATES ARE JIS G 4304 SUS 304.

REFERENCE DRAWINGS :

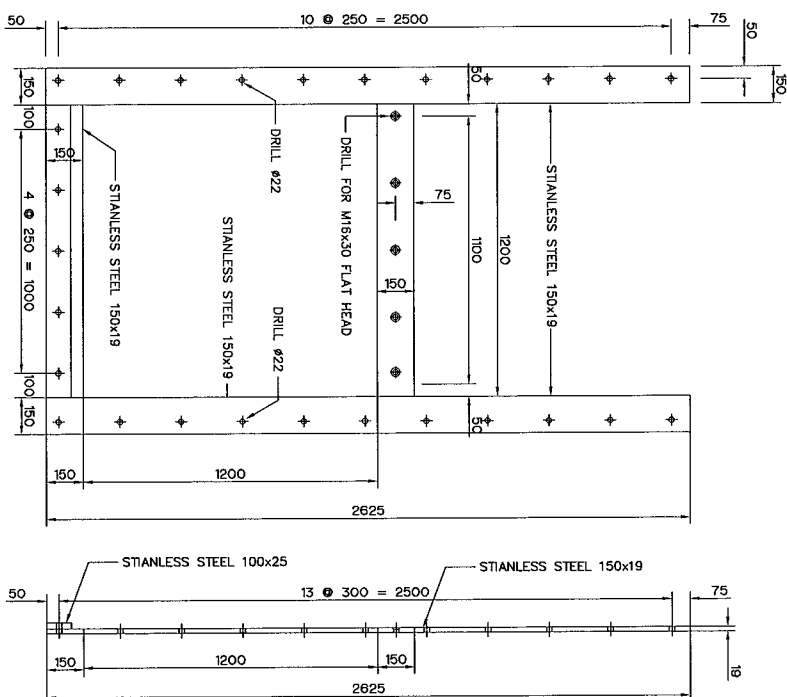
1. WEIR, TYPICAL SLIDE GATE, DIA 120 M, VERTICAL GATE, GATE INSTALLATION

MT-WE-04

GUIDE BAR
SCALE 1:15

FILLER
SCALE 1:15

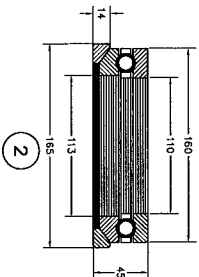
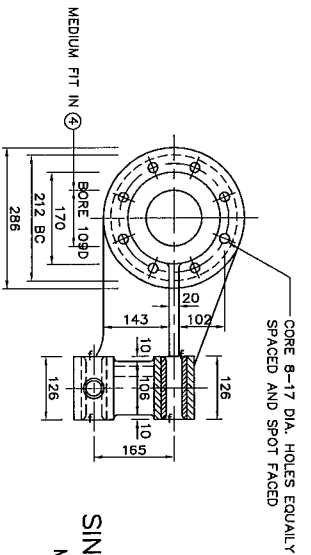
FRAME
SCALE 1:15



NO.	DATE	REVISIONS	CHECKED	APPROVED	DESIGNER
1					
2					
3					

KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
MAE TUEN HYDROPOWER PROJECT	
CIVIL WORKS	
WEIR	
TYPICAL SLIDE GATE, DIA 120 M VERTICAL GATE	
DESIGNED DRAWN CHECKED PROJECT MANAGER	SUBMITTED RECOMMENDED APPROVED DATE
MT-WE-05	SHEET NO. 10 OF 98

SINGLE THRUST BALL BEARING
MIN CAPACITY 9 TONNES @ 10 R.P.M.



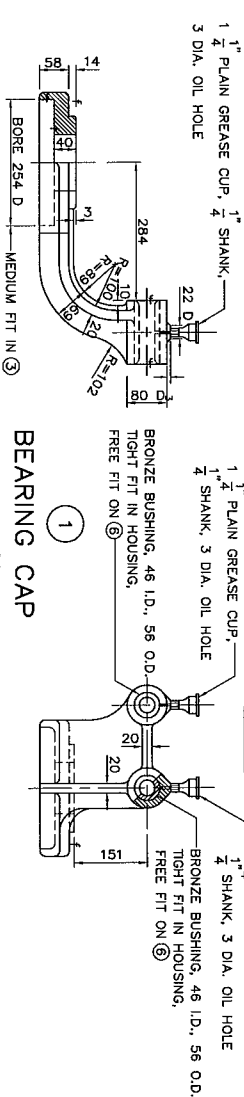
SCALE 1:3

BEARING CAP
CAST IRON GG-18

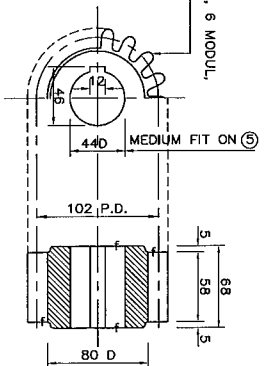
ONE REQ'D

SCALE 1:7.5

[40 KG.]



CUT 17 TEETH, 6 MODUL, 20° INVOLUTE



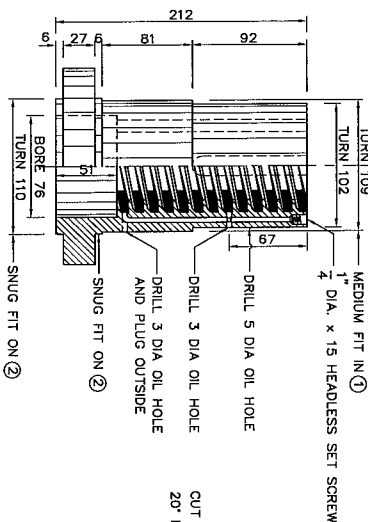
SMOOTH FINISH ALL OVER EXCEPT AS NOTED

LIFTING NUT
PHOSPHOR BRONZE

ONE REQ'D

SCALE 1:3

[17 KG.]

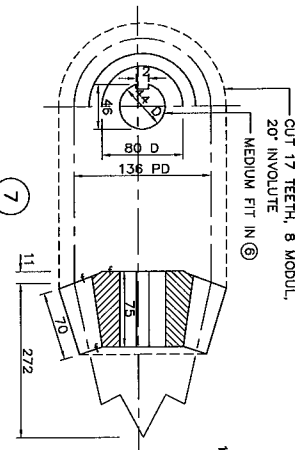


BEVEL PINION
STEEL, ST 6011

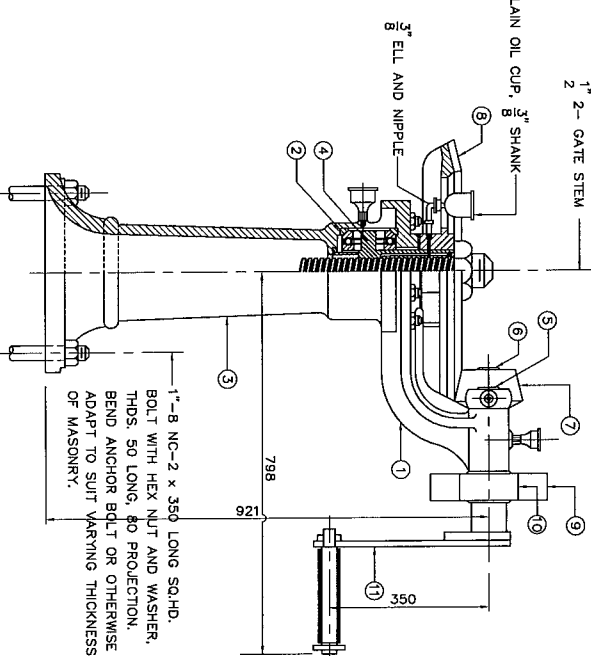
ONE REQ'D

SCALE 1:3

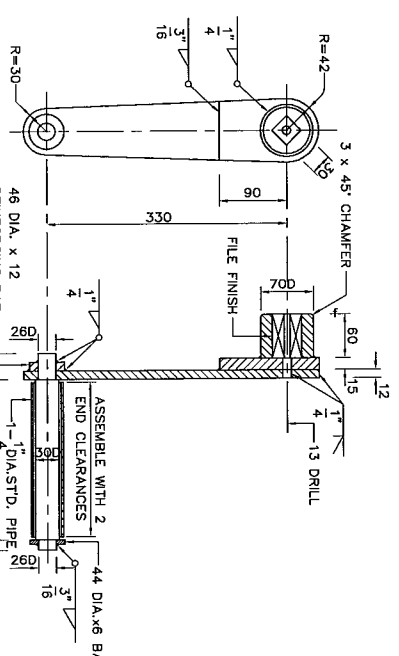
[5 KG.]



1 1/2" PLAIN OIL CUP, 3/8" SHANK
1/2" ELL AND NIPPLE



ASSEMBLY
SCALE 1:7.5

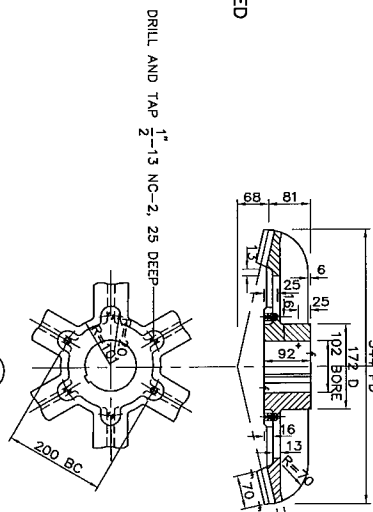


HAND CRANK
STEEL

ONE REQ'D

SCALE 1:5

[6 KG.]

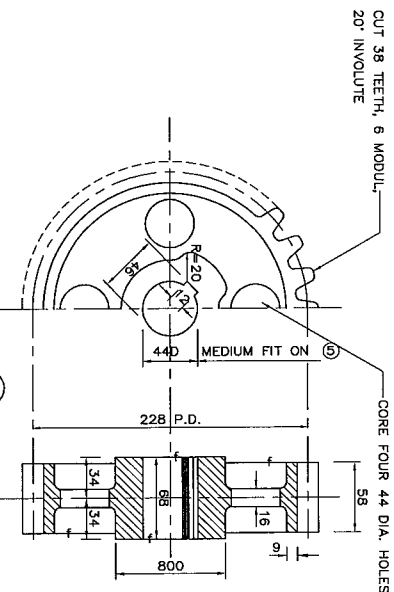


BEVEL GEAR
CAST IRON G.G-18

ONE REQ'D

SCALE 1:7.5

[40 KG.]

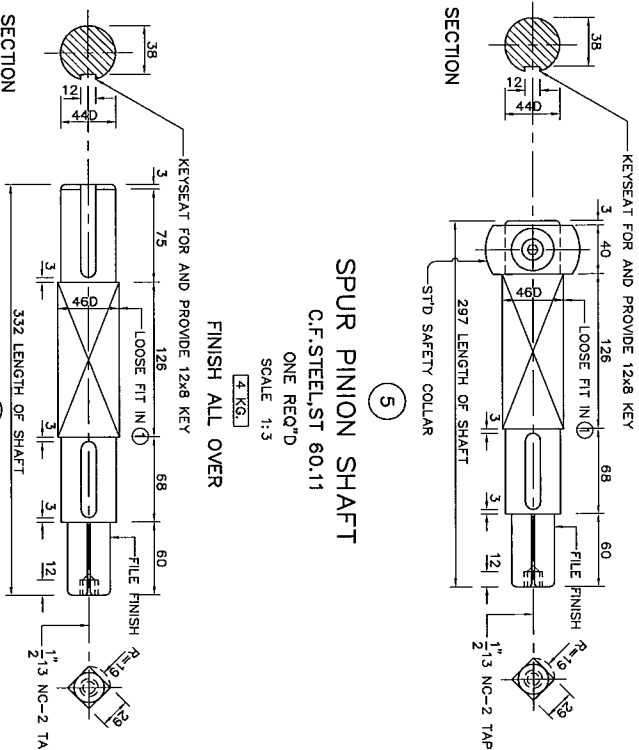


SPUR GEAR
CAST IRON GG-18

ONE REQ'D

SCALE 1:3

[16 KG.]

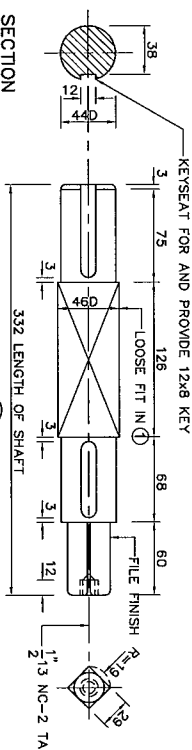


SPUR PINION SHAFT
C.F. STEEL, ST 60.11

ONE REQ'D

SCALE 1:3

[4 KG.]

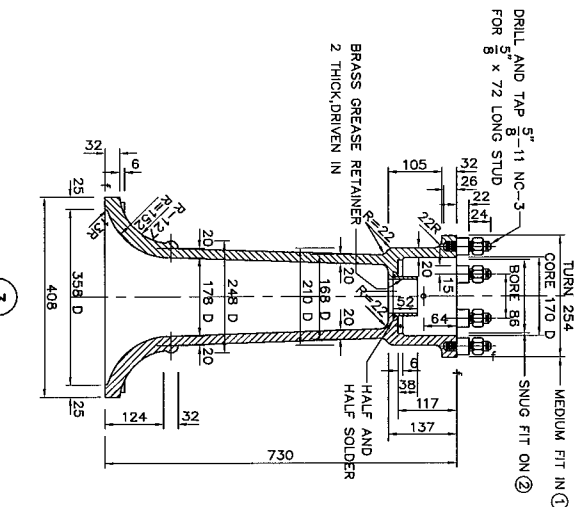


BEVEL PINION SHAFT
C.F. STEEL, ST 60.11

ONE REQ'D

SCALE 1:3

[4 KG.]



PEDESTAL
CAST IRON GG-18

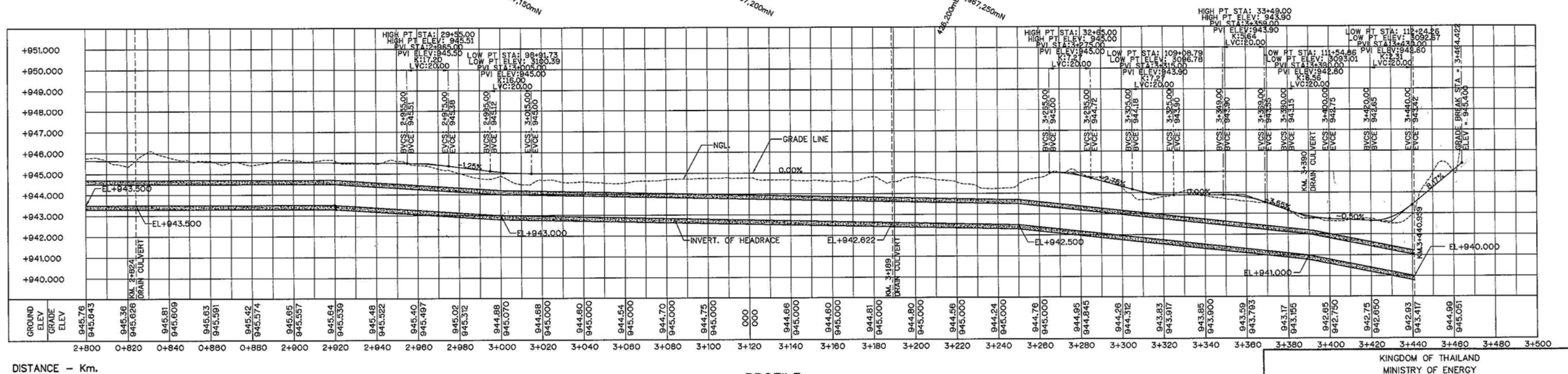
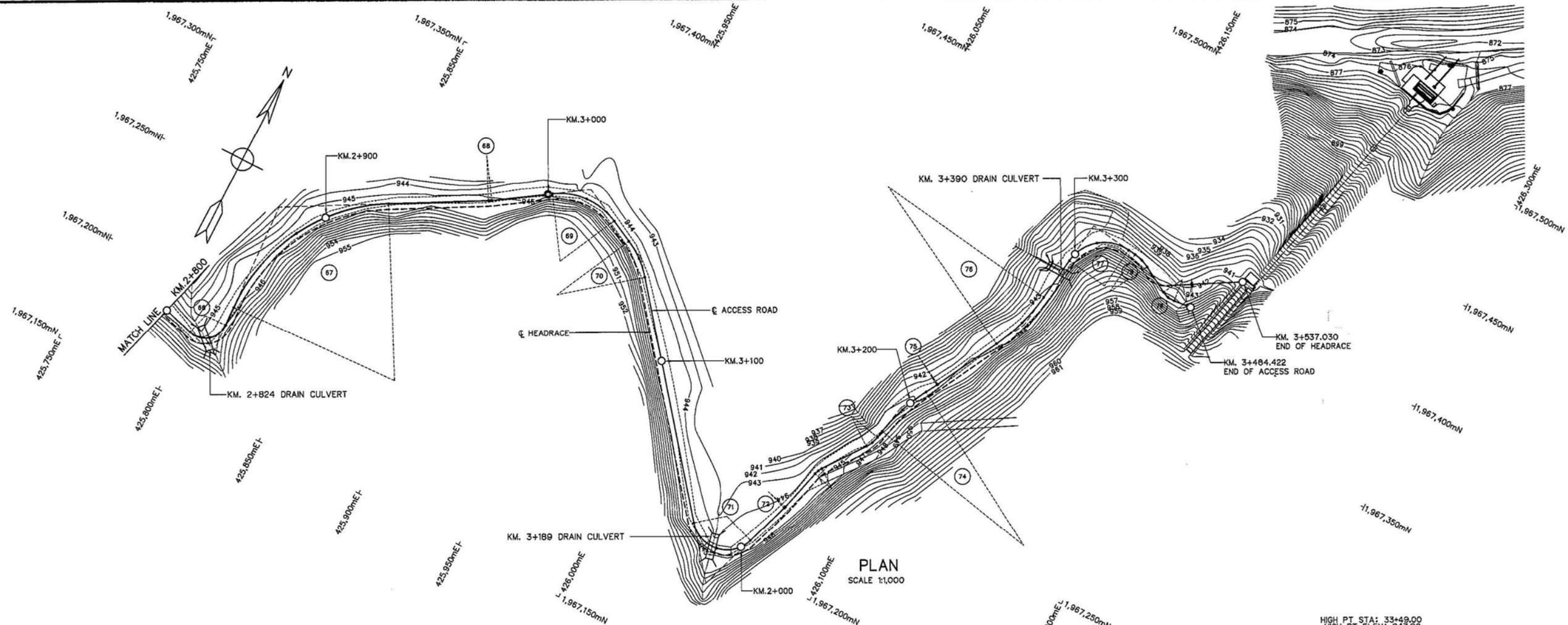
ONE REQ'D

SCALE 1:7.5

[140 KG.]

- NOTES :
1. DIMENSIONS TO BE READ IN MILLIMETERS EXCEPT WHERE DIMENSIONAL UNITS ARE NOTED.
 2. LIFTING NUT MAY BE TAPPED FOR EITHER SINGLE ACME THREADS OR MULTIPLE THREADS TO SECURE AS DESIRED THE TRAVELING SPEED OF GATE STEM.

KINGDOM OF THAILAND	
MINISTRY OF ENERGY	
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
MAE TUEEN HYDROPOWER PROJECT	
CIVIL WORKS	
WEIR	
GATE LIFT, CAPACITY 3 TONS	
PANYA CONSULTANTS CO., LTD.	
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	APPROVED
DRAWN	CHECKED
REVIEWED	APPROVED
DATE	DATE
PROJECT MANAGER	SHEET NO.



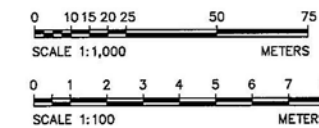
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01
3. THE CONTRACTOR SHALL CHECK THE EXISTING LINE OF WATER DISTRIBUTION PIPES OF PROJECT WATER USERS. IF CONSTRUCTION OF HEADRACES CAUSE DAMAGE TO WATER DISTRIBUTION PIPES, THE CONTRACTOR SHALL ADJUST THE WATER DISTRIBUTION PIPE LINE TO PREVENT IMPACTS ON WATER USERS.

REFERENCE DRAWINGS :-

1. HEADRACE, PLAN & PROFILE (SHEET 4/5)
2. HEADRACE, CROSS SECTION, KM.0+000 TO KM.3+460
3. HEADRACE, ALIGNMENT DATA CURVE OF HEADRACE
4. HEADRACE, ALIGNMENT DATA CURVE OF ACCESS ROAD
5. HEADRACE, TYPICAL SECTIONS
6. HEADRACE, END PLAN & PROFILE, KM.3+492.426 TO KM.3+537.030
7. HEADRACE, DRAIN CULVERT, KM. 2+768
8. HEADRACE, DRAIN CULVERT, KM. 2+824
9. HEADRACE, DRAIN CULVERT, KM. 3+189
10. HEADRACE, DRAIN CULVERT, KM. 3+390
11. HEADRACE, BEND DETAILS

- MT-HR-04
MT-HR-08 TO MT-HR-18
MT-HR-06
MT-HR-07
MT-HR-19
MT-HR-21
MT-HR-36
MT-HR-37
MT-HR-38
MT-HR-39
MT-HR-44



KINGDOM OF THAILAND MINISTRY OF ENERGY DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY			
MAE TUEN HYDROPOWER PROJECT			
CIVIL WORKS HEADRACE			
ACCESS ROAD, PLAN & PROFILE (SHEET 5/5)			
PANYA CONSULTANTS CO., LTD.		DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY	
DESIGNED	REVIEWED	SUBMITTED	
DRAWN	RECOMMENDED	APPROVED	
CHECKED	DATE	PROJECT MANAGER	DRAWING NO. MT-HR-05
CONSULTANTS		DEDE	SHEET NO. 16 OF 98

ALIGNMENT DATA CURVE OF HEADRACE

NO. OF CURVE	P.L. Sta.	P.L. TO P.L. m.	COORDINATE OF P.L.		ANGLE l	T m.	R m.	L m.	B.C. Sta.	E.C. Sta.	BEARING
			N	E							
BEGIN	0+000.000		1967190.740	423947.570	-	-	-	-	-	-	
1	0+025.694	25.694	1967210.970	423963.410	17°-59'-58"	3.100	19.949	61.51	0+022.994	0+028.745	N 36°-03'-59" E
2	0+080.161	54.516	1967241.670	424008.460	6°-54'-03"	3.020	50.087	6.033	0+077.741	0+083.174	N 55°-43'-37" E
3	0+158.893	78.739	1967277.872	424078.383	22°-54'-21"	2.026	10.000	3.998	0+156.667	0+160.885	N 62°-31'-40" E
4	0+177.014	18.175	1967279.282	424096.503	16°-13'-16"	3.807	22.500	6.370	0+173.808	0+180.178	N 85°-32'-02" E
5	0+206.942	31.971	1967272.773	424127.903	16°-56'-31"	3.754	22.500	7.439	0+203.189	0+212.628	S 78°-14'-42" E
6	0+221.448	28.940	1967266.354	424138.616	9°-56'-37"	1.957	22.500	3.905	0+219.491	0+223.396	S 59°-18'-12" E
7	0+250.378	69.649	1967247.506	424160.576	15°-01'-00"	2.966	22.500	5.897	0+247.413	0+253.310	S 48°-21'-35" E
8	0+318.993	37.908	1967190.824	424199.304	20°-47'-37"	5.046	27.500	9.980	0+313.848	0+323.928	S 34°-20'-35" E
9	0+356.790	21.142	1967169.155	424230.408	16°-37'-34"	4.018	27.500	7.980	0+352.772	0+360.752	S 55°-08'-12" E
10	0+377.876	28.386	1967156.538	424250.489	5°-38'-02"	0.615	12.499	1.229	0+377.281	0+378.490	S 71°-45'-45" E
11	0+406.261	10.994	1967156.535	424278.190	40°-28'-45"	4.611	12.500	8.835	0+401.650	0+410.485	S 17°-23'-47" E
12	0+416.888	17.394	1967161.487	424287.906	54°-05'-53"	6.383	12.500	11.802	0+410.485	0+422.287	N 62°-06'-28" E
13	0+433.299	52.806	1967176.711	424290.330	54°-36'-03"	6.411	12.412	11.835	0+426.888	0+438.723	N 6°-00'-34" E
14	0+485.118	21.439	1967202.977	424337.230	13°-15'-01"	1.435	12.354	2.857	0+483.863	0+486.540	N 62°-38'-37" E
15	0+506.544	31.485	1967216.931	424353.506	16°-46'-30"	2.009	13.999	3.990	0+504.535	0+509.825	N 48°-23'-56" E
16	0+538.001	25.439	1967243.460	424370.482	24°-05'-56"	7.903	37.022	15.572	0+530.098	0+545.870	N 36°-41'-02" E
17	0+563.207	11.295	1967257.433	424391.721	8°-09'-20"	7.308	102.505	14.591	0+555.899	0+570.490	N 56°-41'-02" E
18	0+574.477	41.299	1967264.913	424400.184	4°-27'-20"	3.987	102.492	7.970	0+570.490	0+578.460	N 46°-31'-41" E
19	0+615.772	18.229	1967293.199	424428.910	50°-28'-34"	3.535	7.500	6.607	0+612.536	0+618.843	N 44°-04'-21" E
20	0+633.537	39.627	1967283.139	424441.081	7°-42'-35"	0.505	7.500	1.009	0+633.032	0+634.041	S 85°-27'-05" E
21	0+673.162	32.457	1967284.725	424465.805	11°-18'-48"	9.593	96.750	19.104	0+663.579	0+669.893	S 85°-41'-30" E
22	0+705.557	27.085	1967271.745	424515.553	11°-08'-16"	0.731	7.500	1.458	0+704.826	0+706.284	S 66°-23'-41" E
23	0+732.617	36.124	1967256.334	424537.802	15°-44'-22"	1.728	12.500	3.434	0+730.899	0+734.323	S 55°-17'-25" E
24	0+768.720	24.714	1967244.591	424571.984	45°-41'-45"	7.374	17.500	13.957	0+761.346	0+773.303	S 71°-01'-48" E
25	0+792.643	52.147	1967255.706	424594.038	7°-42'-51"	0.843	12.500	1.683	0+791.801	0+793.801	N 63°-16'-27" E
26	0+844.788	17.775	1967285.157	424637.070	31°-34'-17"	2.120	7.500	4.133	0+842.668	0+846.801	N 55°-33'-36" E
27	0+862.455	65.754	1967301.436	424644.214	19°-49'-34"	2.185	12.500	4.356	0+860.271	0+864.597	N 23°-59'-19" E
28	0+928.156	12.460	1967348.893	424689.793	3°-43'-42"	6.591	202.497	13.177	0+921.575	0+934.752	N 43°-48'-53" E
29	1+052.622	30.333	1967304.4105	424769.938	15°-24'-59"	0.659	4.867	1.310	1+051.863	1+053.273	N 40°-05'-10" E
30	1+082.937	47.760	1967461.279	424794.939	12°-37'-42"	1.383	12.501	2.755	1+081.554	1+084.309	N 55°-31'-09" E
31	1+130.686	32.376	1967479.099	424839.282	11°-41'-33"	1.280	12.500	2.551	1+129.406	1+131.957	N 68°-07'-51" E
32	1+163.053	59.884	1967484.789	424871.118	90°-45'-05"	12.665	12.500	19.799	1+150.388	1+170.187	N 79°-49'-24" E
33	1+217.406	74.994	1967425.713	424890.925	22°-46'-08"	1.510	7.500	2.980	1+215.996	1+218.676	S 9°-25'-31" E
34	1+292.359	45.699	1967352.743	424863.617	12°-44'-08"	10.881	97.500	21.672	1+281.819	1+303.151	S 13°-20'-37" W
35	1+337.969	12.478	1967311.697	424843.587	52°-02'-20"	5.153	10.556	9.588	1+332.816	1+342.404	S 25°-57'-35" E
36	1+349.729	36.864	1967300.479	424849.989	69°-30'-44"	7.325	10.556	12.807	1+342.404	1+355.111	S 25°-57'-35" E
37	1+384.750	21.980	1967303.994	424895.685	71°-56'-43"	9.078	12.500	15.703	1+375.672	1+381.375	N 64°-31'-41" E
38	1+404.277	36.789	1967283.336	424894.447	3°-13'-54"	0.635	22.500	1.269	1+403.642	1+404.911	S 23°-29'-36" E
39	1+441.046	37.499	1967250.995	424910.983	6°-28'-52"	1.037	12.500	2.068	1+440.009	1+442.077	S 26°-43'-30" E
40	1+478.539	73.963	1967215.181	424922.099	27°-06'-33"	3.014	12.500	5.914	1+475.566	1+481.470	S 17°-14'-38" E
41	1+562.389	44.650	1967162.294	424977.805	39°-11'-20"	6.010	22.500	15.390	1+544.380	1+559.770	S 44°-21'-11" E
42	1+596.410	24.849	1967187.826	424977.824	16°-15'-14"	3.927	27.500	7.801	1+592.843	1+600.284	S 5°-06'-51" E
43	1+621.206	46.312	1967094.692	424986.899	13°-58'-39"	3.371	27.500	6.709	1+617.935	1+624.544	S 21°-25'-05" E
44	1+667.485	22.906	1967056.940	425013.723	32°-58'-58"	5.181	17.500	10.074	1+662.304	1+672.378	S 35°-23'-43" E
45	1+690.103	10.534	1967048.499	425035.017	80°-02'-33"	10.497	12.500	17.463	1+679.607	1+687.070	S 66°-22'-42" E
46	1+697.107	7.391	1967057.473	425040.534	0°-20'-32"	0.037	12.497	0.075	1+697.070	1+697.145	N 31°-34'-45" E
47	1+704.498	50.100	1967063.793	425044.366	60°-56'-00"	7.353	12.500	13.294	1+697.145	1+710.439	N 31°-14'-13" E
48	1+753.166	65.666	1967107.312	425019.547	61°-33'-25"	22.335	37.500	40.289	1+730.850	1+771.139	N 29°-41'-48" W
49	1+814.470	45.946	1967163.085	425054.208	66°-23'-47"	11.892	17.500	20.891	1+802.578	1+823.469	N 31°-51'-37" E
50	1+857.522	26.234	1967154.904	425098.420	40°-50'-26"	4.654	12.500	8.910	1+852.989	1+861.779	S 79°-44'-36" E

NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-HR-01

REFERENCE DRAWINGS :-

1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)

MT-HR-01 TO MT-HR-05

ALIGNMENT DATA CURVE OF HEADRACE

NO. OF CURVE	P.L. Sta.	P.L. TO P.L. m.	COORDINATE OF P.L.		ANGLE I	T m.	R m.	L m.	B.C. Sta.	E.C. Sta.	BEARING
			N	E							
51	1+883.359	17.683	1967134.488	425115.895	52°-48'-51"	6.207	12.500	11.522	1+877.152	1+888.674	N 88°-16'-58" E
52	1+900.130	32.830	1967133.017	425133.550	22°-37'-45"	2.501	12.500	4.937	1+897.629	1+902.566	N 65°-39'-14" E
53	1+932.895	43.988	1967143.851	425163.461	23°-41'-01"	2.621	12.500	5.167	1+930.274	1+935.441	N 89°-20'-15" E
54	1+976.808	43.454	1967149.060	425207.446	36°-38'-37"	4.730	13.489	9.098	1+972.079	1+981.177	S 52°-01'-08" E
55	2+019.901	78.328	1967122.319	425214.697	13°-38'-51"	2.693	22.500	5.360	2+017.208	2+022.589	S 65°-40'-00" E
56	2+088.204	69.325	1967090.044	425313.067	11°-16'-19"	25.429	15.500	31.725	2+072.775	2+104.500	S 51°-36'-20" W
57	2+148.396	18.272	1967048.988	425288.733	61°-10'-44"	10.345	17.500	18.686	2+138.051	2+156.737	S 9°-34'-24" E
58	2+164.664	13.324	1967028.971	425261.772	11°-08'-46"	1.708	17.499	3.404	2+162.956	2+166.360	S 20°-43'-10" E
59	2+177.977	121.404	1967016.508	425366.486	67°-09'-10"	11.617	17.500	20.511	2+166.360	2+186.871	S 87°-52'-20" E
60	2+296.659	32.694	1967012.001	425387.806	77°-36'-00"	18.090	22.500	30.473	2+278.568	2+309.041	S 10°-16'-20" E
61	2+323.645	12.876	1966979.831	425393.636	40°-18'-51"	4.589	12.500	8.795	2+319.056	2+327.851	S 50°-35'-11" E
62	2+362.139	57.907	1966971.656	425403.594	67°-05'-17"	8.287	12.500	14.636	2+327.851	2+342.487	N 62°-19'-32" E
63	2+392.107	16.179	1966998.951	425454.867	44°-24'-48"	5.103	12.500	9.690	2+387.004	2+396.694	S 73°-15'-40" E
64	2+407.770	16.815	1966993.891	425470.360	11°-26'-18"	1.232	12.500	2.495	2+406.518	2+409.013	S 84°-41'-58" E
65	2+424.576	26.732	1966992.338	425487.103	52°-13'-02"	6.126	12.500	11.392	2+418.450	2+429.842	N 43°-05'-00" E
66	2+452.448	60.038	1967013.323	425506.729	26°-40'-10"	3.078	12.984	6.044	2+448.371	2+455.415	N 69°-45'-10" E
67	2+512.375	11.642	1967034.100	425565.057	46°-54'-41"	4.556	10.500	8.997	2+507.819	2+516.416	N 22°-50'-30" E
68	2+523.302	42.190	1967044.929	425587.576	68°-01'-31"	7.086	10.500	12.466	2+516.417	2+528.883	N 45°-11'-02" W
69	2+563.987	32.913	1967074.856	425537.648	94°-50'-01"	13.602	12.500	20.689	2+550.385	2+571.074	N 49°-59'-00" E
70	2+590.386	82.834	1967085.878	425567.731	22°-06'-00"	13.038	66.763	25.752	2+577.348	2+603.100	N 71°-45'-00" E
71	2+672.696	33.483	1967121.754	425644.208	29°-09'-13"	4.551	17.500	8.905	2+668.145	2+677.050	N 42°-35'-46" E
72	2+705.982	27.309	1967146.402	425663.870	15°-49'-46"	1.738	12.500	3.433	2+704.244	2+707.697	N 26°-46'-01" E
73	2+713.268	54.124	1967170.784	425678.489	31°-56'-59"	3.578	12.500	6.970	2+729.990	2+736.669	N 56°-45'-00" E
74	2+787.202	85.781	1967138.889	425722.424	47°-17'-02"	7.661	17.500	14.442	2+773.645	2+783.987	S 73°-59'-58" E
75	2+872.107	13.009	1967175.244	425690.482	43°-34'-02"	4.996	12.500	9.505	2+867.112	2+876.617	N 62°-26'-00" E
76	2+884.530	63.867	1967181.264	425616.414	65°-19'-57"	8.013	12.498	14.251	2+876.617	2+890.866	N 2°-53'-57" W
77	2+946.721	92.452	1967245.049	425613.184	63°-46'-19"	47.265	75.976	84.564	2+889.456	2+984.020	N 60°-52'-22" E
78	3+029.207	43.918	1967280.051	425693.945	4°-30'-00"	0.888	22.998	1.775	3+028.319	3+030.094	N 56°-22'-21" E
79	3+073.124	35.363	1967311.372	425530.513	60°-01'-17"	15.884	27.500	28.808	3+057.240	3+086.048	S 63°-36'-21" E
80	3+105.227	127.956	1967288.951	425562.190	25°-04'-56"	8.342	37.500	16.416	3+097.185	3+113.601	S 38°-31'-23" E
81	3+232.316	20.892	1967198.654	426014.885	52°-58'-45"	8.724	17.500	16.187	3+242.491	3+249.678	N 60°-22'-02" E
82	3+252.245	33.494	1967189.098	426068.770	69°-37'-10"	12.167	17.500	21.264	3+260.539	3+268.943	N 16°-26'-51" E
83	3+283.669	21.751	1967230.793	426077.598	4°-00'-03"	0.437	12.500	0.873	3+282.833	3+283.706	N 14°-51'-36" E
84	3+305.020	27.343	1967251.816	426079.176	21°-24'-31"	1.418	7.500	2.802	3+303.603	3+306.405	N 36°-16'-09" E
85	3+332.330	20.067	1967127.361	426095.352	24°-41'-37"	3.831	17.500	7.542	3+328.489	3+335.041	N 11°-34'-32" E
86	3+352.276	18.882	1967283.520	426098.378	16°-39'-31"	12.940	78.155	25.452	3+339.438	3+364.890	N 30°-14'-03" E
87	3+370.813	47.479	1967309.616	426108.876	2°-03'-44"	0.315	17.497	0.630	3+370.598	3+371.128	N 26°-10'-19" E
88	3+418.392	51.767	1967351.963	426131.291	20°-08'-55"	15.465	16.693	30.610	3+403.297	3+433.537	N 6°-00'-25" E
89	3+468.839	23.530	1967402.830	426135.502	89°-12'-41"	16.460	68.988	25.984	3+452.378	3+473.363	S 82°-48'-54" E
90	3+486.233	12.037	1967400.002	426161.647	22°-24'-07"	3.465	17.500	6.842	3+482.767	3+499.609	S 62°-22'-47" E
91	3+498.181	39.914	1967394.053	426172.111	56°-49'-48"	5.754	10.000	10.442	3+492.427	3+502.869	N 59°-47'-24" E
END	3+537.030	-	1967414.136	426206.604	132°-26'-00"	-	-	-	3+537.030	3+537.030	S 12°-13'-24" W

ALIGNMENT DATA CURVE OF ACCESS ROAD

NO. OF CURVE	PL Sta.	PL TO PL m.	COORDINATE OF PL		ANGLE I	T m.	R m.	L m.	PC Sta.	PT. Sta.	BEARING
			N	E							
BEGIN	0+000.000				-	-	-	-	-	-	
1	0+040.323	40.323	1.9671227.103	423.989.372	13°-34'-31"	2.976	25.000	5.923	0+037.347	0+043.270	N 49°-03'-16" E
2	0+097.362	57.067	1.967253.528	424.019.829	22°-54'-14"	5.064	25.000	9.994	0+092.297	0+102.291	N 62°-37'-47" E
3	0+123.462	26.233	1.9671291.907	424.036.683	16°-15'-17"	3.563	25.000	7.078	0+119.899	0+126.977	N 85°-32'-01" E
4	0+156.159	32.745	1.9671275.136	424.128.121	18°-56'-30"	4.171	25.000	8.265	0+151.989	0+160.254	S 76°-41'-42" E
5	0+169.292	13.209	1.9671268.393	424.140.079	9°-56'-37"	2.175	25.000	4.339	0+167.118	0+171.457	S 59°-18'-12" E
6	0+198.769	29.487	1.9671249.188	424.162.454	15°-01'-00"	3.295	25.000	6.552	0+195.474	0+202.056	S 49°-21'-35" E
7	0+267.281	68.520	1.9671192.613	424.201.109	20°-47'-37"	4.587	25.000	9.073	0+262.664	0+271.737	S 34°-20'-35" E
8	0+304.234	37.084	1.9671171.415	424.231.537	16°-37'-34"	3.653	25.000	7.254	0+300.581	0+307.835	S 55°-08'-12" E
9	0+324.836	20.654	1.9671164.951	424.251.153	5°-38'-02"	0.492	9.999	0.983	0+324.344	0+325.327	S 71°-45'-45" E
10	0+352.176	27.341	1.9671158.986	424.271.835	40°-29'-46"	3.689	10.000	7.068	0+348.487	0+355.555	S 77°-23'-47" E
11	0+380.682	8.793	1.9671163.100	424.285.608	54°-05'-52"	5.106	10.000	9.442	0+355.556	0+364.998	N 62°-06'-27" E
12	0+377.301	17.409	1.9671180.339	424.289.034	54°-49'-04"	7.702	14.912	14.219	0+369.599	0+383.817	N 62°-39'-39" E
13	0+439.920	53.805	1.9671205.063	424.335.822	13°-15'-05"	1.146	9.862	2.281	0+428.775	0+431.056	N 49°-23'-33" E
14	0+450.680	20.780	1.9671218.588	424.351.599	16°-48'-25"	1.638	11.090	3.253	0+449.052	0+452.305	N 32°-35'-08" E
15	0+482.316	31.650	1.9671245.286	424.368.643	24°-05'-54"	8.436	35.523	16.623	0+473.880	0+490.503	N 56°-41'-02" E
16	0+507.862	25.795	1.967259.424	424.390.199	6°-09'-20"	7.130	100.004	14.235	0+500.732	0+514.967	N 46°-31'-41" E
17	0+518.859	11.020	1.9671266.721	424.398.455	4°-27'-20"	3.890	99.992	7.776	0+514.968	0+522.744	N 44°-04'-21" E
18	0+561.234	42.380	1.9671297.170	424.427.933	50°-28'-34"	4.714	10.000	8.810	0+556.520	0+565.330	N 85°-27'-05" E
19	0+580.192	19.573	1.9671295.617	424.447.447	7°-42'-36"	0.674	9.999	1.346	0+579.518	0+580.864	S 77°-44'-30" E
20	0+602.233	40.043	1.9671287.115	424.466.578	11°-18'-48"	9.831	99.251	19.598	0+610.402	0+630.000	S 66°-25'-41" E
21	0+633.117	26.963	1.9671273.939	424.516.777	11°-08'-16"	0.975	10.000	1.944	0+652.142	0+654.096	S 55°-17'-25" E
22	0+680.074	34.725	1.9671298.586	424.535.047	15°-44'-22"	1.382	10.000	2.747	0+678.692	0+681.439	S 71°-01'-47" E
23	0+714.782	34.493	1.9671247.298	424.571.180	45°-41'-46"	6.320	15.000	11.963	0+709.461	0+720.434	N 63°-16'-27" E
24	0+737.597	51.271	1.9671257.866	424.592.783	7°-42'-51"	0.674	10.001	1.347	0+736.923	0+738.270	N 55°-33'-36" E
25	0+789.867	17.505	1.9671286.899	424.635.047	31°-24'-16"	1.414	5.000	2.795	0+787.453	0+790.208	N 23°-59'-20" E
26	0+806.300	66.109	1.9671302.892	424.642.164	15°-49'-33"	2.622	15.001	5.191	0+803.678	0+808.869	N 45°-48'-53" E
27	0+872.357	124.717	1.9671350.555	424.687.933	3°-43'-42"	6.510	199.999	13.014	0+865.847	0+878.861	N 4°-05'-11" E
28	0+997.069	30.938	1.9671445.973	424.768.243	15°-24'-58"	0.997	7.368	1.982	0+996.071	0+998.053	N 55°-30'-09" E
29	1+027.994	48.292	1.9671463.496	424.793.741	12°-37'-41"	1.660	15.000	3.306	1+026.534	1+028.640	N 68°-07'-51" E
30	1+076.273	35.165	1.9671491.484	424.838.558	11°-41'-33"	1.536	15.000	3.061	1+074.737	1+077.798	N 75°-48'-24" E
31	1+111.427	62.921	1.9671487.917	424.873.170	90°-45'-06"	15.198	15.000	23.759	1+096.229	1+119.989	S 6°-25'-30" E
32	1+167.711	75.777	1.9671428.666	424.883.474	22°-46'-08"	2.014	10.000	3.974	1+165.697	1+169.671	S 13°-20'-37" W
33	1+243.435	44.757	1.9671351.895	424.885.985	12°-44'-08"	1.160	99.999	22.228	1+232.275	1+254.503	S 26°-04'-46" W
34	1+289.100	9.823	1.9671311.694	424.846.309	52°-02'-21"	3.933	8.056	7.317	1+284.167	1+291.484	S 25°-57'-36" E
35	1+297.075	36.945	1.9671303.133	424.880.477	69°-30'-43"	5.590	8.056	9.774	1+291.485	1+301.259	N 64°-31'-41" E
36	1+332.614	23.725	1.9671306.666	424.887.254	71°-58'-42"	10.894	15.000	18.844	1+321.720	1+340.564	S 23°-29'-37" E
37	1+353.395	36.906	1.9671284.898	424.896.712	3°-13'-53"	0.564	20.002	1.128	1+352.831	1+353.989	S 26°-43'-30" E
38	1+390.301	37.104	1.9671251.934	424.913.309	5°-08'-52"	12.444	15.000	2.482	1+389.057	1+391.539	S 17°-14'-38" E
39	1+427.359	74.250	1.9671216.498	424.924.308	27°-06'-33"	2.411	10.000	4.732	1+424.988	1+428.720	S 44°-21'-11" E
40	1+501.559	45.183	1.9671183.406	424.976.215	39°-11'-21"	8.899	25.000	17.099	1+492.660	1+508.739	S 5°-09'-51" E
41	1+546.042	24.186	1.9671118.406	424.980.282	16°-15'-14"	3.570	25.000	7.092	1+542.472	1+549.564	S 21°-25'-04" E
42	1+570.180	45.286	1.9671093.891	424.998.114	13°-58'-39"	3.065	25.000	6.089	1+567.116	1+573.215	S 35°-23'-44" E
43	1+615.416	20.087	1.9671058.991	425.015.332	32°-58'-59"	4.441	15.000	8.635	1+610.975	1+619.610	S 68°-22'-42" E
44	1+635.236	8.427	1.9671051.597	425.033.987	80°-02'-34"	8.397	10.000	13.970	1+626.839	1+640.809	N 31°-34'-44" E
45	1+640.839	5.912	1.9671058.778	425.038.400	60°-56'-02"	0.030	9.999	0.060	1+640.809	1+640.869	N 31°-14'-14" E
46	1+646.751	50.118	1.9671063.832	425.041.466	60°-56'-02"	5.883	10.000	10.635	1+640.868	1+651.503	N 29°-41'-48" W
47	1+695.739	68.654	1.9671073.867	425.016.657	61°-33'-25"	23.824	40.000	42.975	1+671.914	1+714.899	N 31°-51'-37" E
48	1+739.919	48.576	1.9671165.848	425.052.982	68°-23'-48"	13.591	20.000	23.875	1+746.328	1+770.203	S 79°-44'-35" E
49	1+805.188	25.924	1.9671157.198	425.100.781	40°-50'-25"	5.585	15.000	10.692	1+799.603	1+810.295	S 36°-54'-10" E
50	1+830.635	15.921	1.9671137.024	425.117.061	52°-48'-50"	4.966	10.000	9.218	1+825.689	1+834.897	N 68°-16'-59" E

NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GR-01

REFERENCE DRAWINGS :-

1. HEADRADE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)

MT-HR-01 TO MT-HR-05

ALIGNMENT DATA CURVE OF ACCESS ROAD

NO. OF CURVE	PL Sta.	PL TO PL m.	COORDINATE OF PL		ANGLE I	T m.	R m.	L m.	PC Sta.	PT. Sta.	BEARING
			N	E							
51	1+845.842	32.854	1.9671137.501	425.132.975	22°-37'-46"	2.001	10.000	3.950	1+843.842	1+847.792	N 65°-39'-14° E
52	1+876.645	45.389	1.9671510.145	425.162.908	23°-41'-01"	3.145	15.000	6.200	1+875.500	1+881.700	N 89°-20'-15° E
53	1+923.943	44.031	1.9671515.570	425.208.294	36°-38'-38"	5.606	15.989	10.784	1+918.337	1+929.121	N 52°-01'-08° E
54	1+967.546	82.131	1.9671244.473	425.243.000	13°-38'-52"	2.393	20.001	4.764	1+965.153	1+989.917	S 65°-40'-00° E
55	2+049.655	71.949	1.9671090.632	425.317.834	11°-16'-20"	29.531	18.000	36.842	2+020.124	2+056.986	S 51°-36'-20° W
56	2+093.385	16.550	1.9671045.946	425.261.444	61°-10'-45"	8.867	15.000	16.017	2+090.517	2+106.534	S 9°-34'-25° E
57	2+114.217	11.421	1.9671029.627	425.264.187	11°-08'-44"	1.464	15.000	2.918	2+112.753	2+115.671	S 20°-43'-09° E
58	2+125.629	12.754	1.9671018.945	425.268.237	67°-09'-10"	9.957	15.000	17.590	2+115.672	2+133.252	S 87°-52'-20° E
59	2+245.049	33.786	1.9671014.424	425.388.908	77°-35'-00"	20.101	25.000	33.859	2+224.948	2+258.807	S 10°-16'-20° E
60	2+272.493	10.301	1.9669714.640	425.403.891	40°-18'-50"	3.671	10.000	7.036	2+268.822	2+275.858	S 50°-35'-10° E
61	2+282.488	57.271	1.9669714.640	425.403.891	67°-05'-18"	6.630	10.000	11.709	2+275.858	2+287.567	N 62°-19'-32° E
62	2+338.208	16.949	1.9671001.239	425.454.609	44°-24'-49"	6.123	15.000	11.627	2+332.095	2+343.712	N 62°-19'-32° E
63	2+354.536	15.339	1.966996.557	425.470.840	11°-26'-20"	1.002	9.999	1.996	2+353.536	2+355.532	S 73°-15'-39° E
64	2+369.670	28.100	1.966994.940	425.486.114	52°-13'-01"	4.901	10.000	9.114	2+364.969	2+374.093	S 84°-41'-59° E
65	2+397.282	59.546	1.9671015.453	425.505.308	26°-40'-09"	3.670	15.484	7.207	2+393.612	2+400.819	N 45°-05'-01° E
66	2+446.695	8.870	1.9671036.070	425.561.174	46°-54'-40"	3.471	8.000	6.550	2+453.224	2+459.774	N 69°-45'-10° E
67	2+465.173	43.223	1.9671044.245	425.564.617	68°-01'-31"	5.399	8.000	9.498	2+459.774	2+469.272	N 22°-50'-30° E
68	2+507.096	36.121	1.9671074.710	425.533.956	94°-50'-01"	16.382	15.000	24.827	2+490.775	2+515.602	N 45°-11'-01° W
69	2+535.401	82.472	1.9671098.097	425.561.484	22°-06'-01"	13.526	69.263	26.716	2+521.874	2+548.590	N 49°-38'-59° E
70	2+617.236	35.485	1.9671232.924	425.639.908	29°-09'-14"	3.901	15.000	7.633	2+613.635	2+621.268	N 71°-45'-00° E
71	2+649.653	27.677	1.9671147.838	425.661.795	15°-49'-45"	1.390	10.000	2.763	2+648.846	2+651.225	N 42°-35'-46° E
72	2+677.512	55.934	1.9671172.549	425.674.429	31°-56'-59"	4.294	15.000	8.364	2+673.618	2+689.582	N 26°-46'-01° E
73	2+733.822	65.877	1.9671201.594	425.722.061	47°-17'-02"	8.755	20.000	16.505	2+724.476	2+740.872	N 56°-43'-00° E
74	2+818.094	10.407	1.9671171.922	425.804.611	43°-34'-02"	3.996	10.000	7.604	2+814.097	2+821.701	S 73°-59'-58° E
75	2+828.512	63.880	1.9671182.739	425.813.836	65°-19'-57"	6.411	9.998	11.401	2+821.701	2+833.102	N 62°-26'-00° E
76	2+890.512	93.909	1.967246.477	425.810.608	63°-46'-20"	48.881	78.476	87.346	2+841.691	2+929.307	N 2°-55'-51° W
77	2+974.126	45.264	1.967292.187	425.892.642	4°-30'-01"	0.790	20.101	1.579	2+973.336	2+974.915	N 60°-52'-23° E
78	3+019.389	37.364	1.967317.253	425.930.331	60°-01'-17"	17.328	30.000	31.427	3+002.061	3+033.488	N 56°-22'-22° E
79	3+053.524	127.266	1.967300.643	425.963.800	25°-04'-58"	8.898	40.000	17.511	3+044.626	3+082.131	S 63°-36'-21° E
80	3+180.050	17.907	1.9671201.071	425.943.065	52°-58'-45"	7.478	15.000	13.874	3+173.027	3+186.850	S 38°-51'-24° E
81	3+197.730	31.668	1.967201.551	425.960.966	69°-37'-11"	10.429	15.000	18.226	3+186.901	3+205.127	N 86°-28'-51° E
82	3+262.566	27.269	1.967231.519	426.071.204	4°-00'-02"	0.349	9.998	0.698	3+262.017	3+266.115	N 18°-51° E
83	3+248.501	22.186	1.967252.914	426.076.881	21°-24'-30"	1.890	10.000	3.737	3+246.611	3+250.348	N 54°-51'-39° E
84	3+275.127	19.830	1.9671214.899	426.093.012	24°-41'-37"	3.283	15.000	6.455	3+272.443	3+278.808	N 16°-16'-09° E
85	3+285.555	19.228	1.967284.424	426.097.011	16°-39'-31"	13.250	80.666	26.666	3+282.305	3+308.871	N 11°-34'-32° E
86	3+314.949	46.989	1.967311.036	426.106.693	2°-03'-44"	0.270	14.996	0.540	3+314.279	3+318.819	N 30°-14'-03° E
87	3+361.536	53.789	1.967352.459	426.108.870	20°-08'-55"	15.021	84.473	29.730	3+346.517	3+376.647	N 26°-10'-19° E
88	3+413.532	26.291	1.9671405.123	426.136.378	89°-12'-42"	18.826	19.848	29.877	3+396.090	3+425.967	N 6°-00'-25° E
89	3+453.532	20.382	1.967402.420	426.182.432	22°-24'-04"	3.960	20.000	7.819	3+399.372	3+437.191	S 82°-46'-53° E
90	3+453.612	11.017	1.967382.446	426.180.171	35°-31'-23"	3.203	10.000	6.200	3+450.409	3+456.609	S 60°-22'-49° E
END	3+464.422		1.967383.479	426.191.129	-	-	-	-	3+464.422	3+464.422	N 64°-05'-47° E