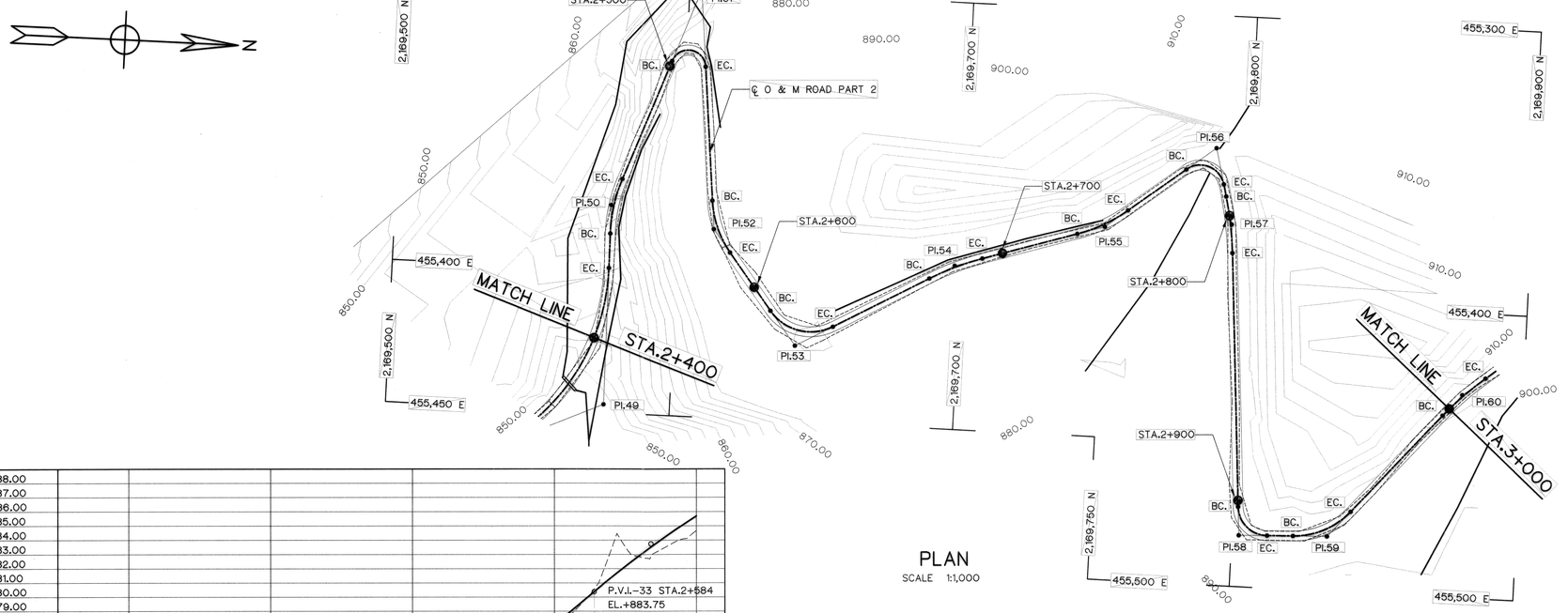
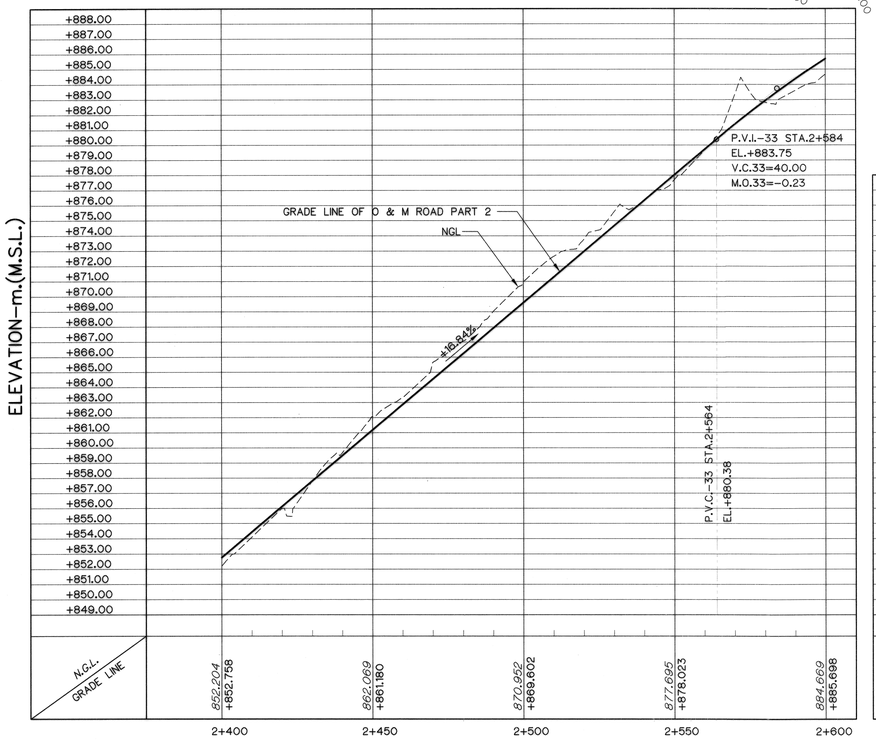
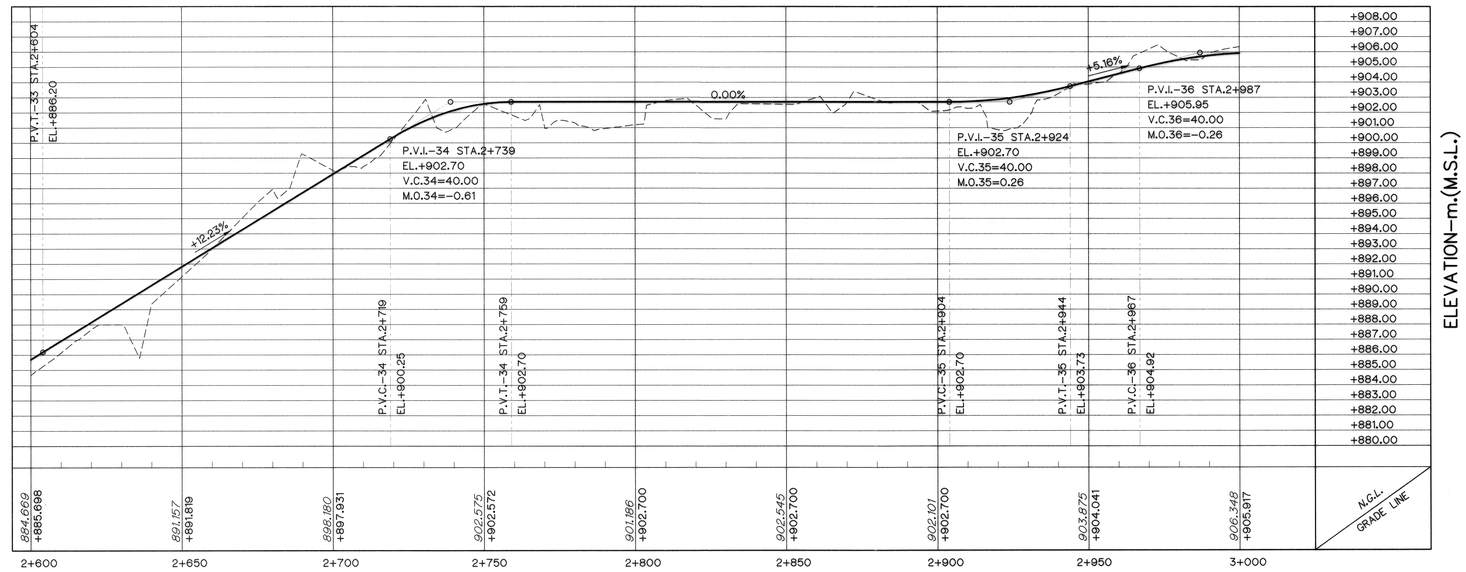


PLAN

SCALE 1:1,000





PROFILE

VERTICAL SCALE 1:200

HORIZONTAL SCALE 1:1,000

NOTES :

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

REFERENCE DRAWINGS :

1. O&M ROAD PART 3 PLAN AND PROFILE, STA. 1+800 TO STA. 2+400	MH-OM-04
2. O&M ROAD PART 3 PLAN AND PROFILE, STA. 3+000 TO STA. 3+600	MH-OM-06
3. O&M ROAD TYPICAL SECTIONS AND DETAILS	MH-OM-10

0 5 10 15
SCALE 1:200 METERS

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

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
O&M ROAD PART 2
PLAN AND PROFILE, STA. 2+400 TO STA. 3+000

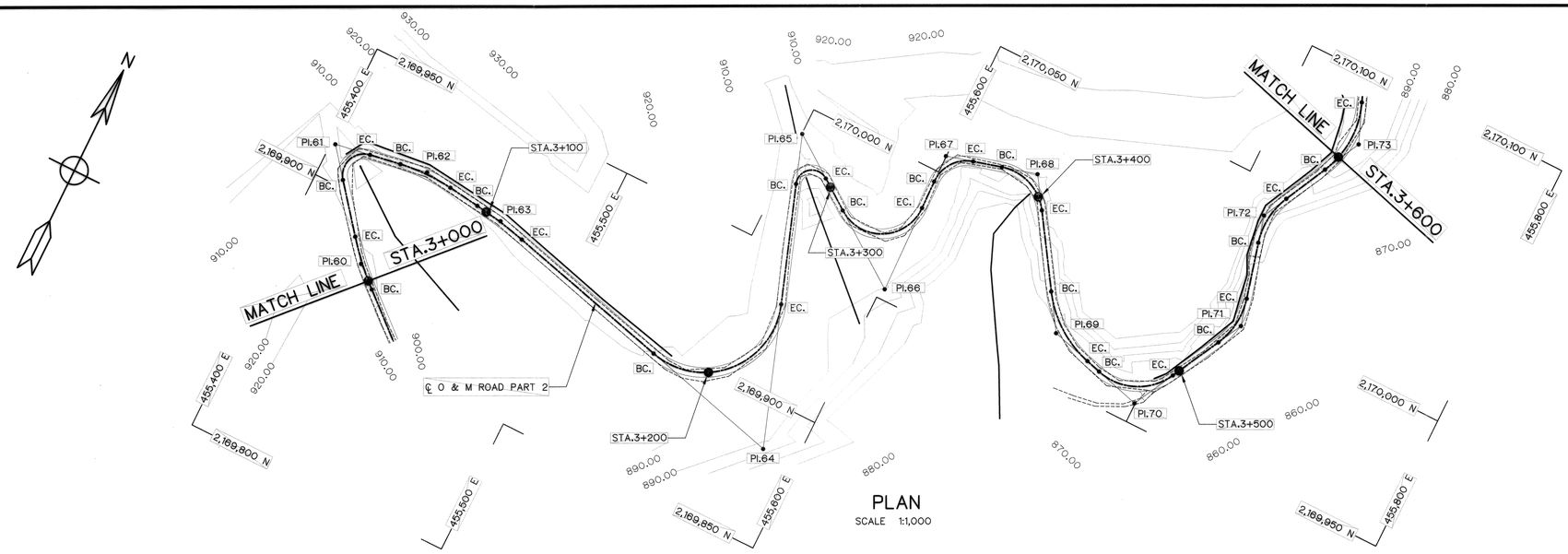
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

DESIGNED	วิศ.64624 - วิศ.6226
DRAWN	
CHECKED	วิศ.6226
PROJECT MANAGER	DATE 08/09/2559
REVIEWED	
SUBMITTED	
RECOMMENDED	
APPROVED	P. Hanwoff

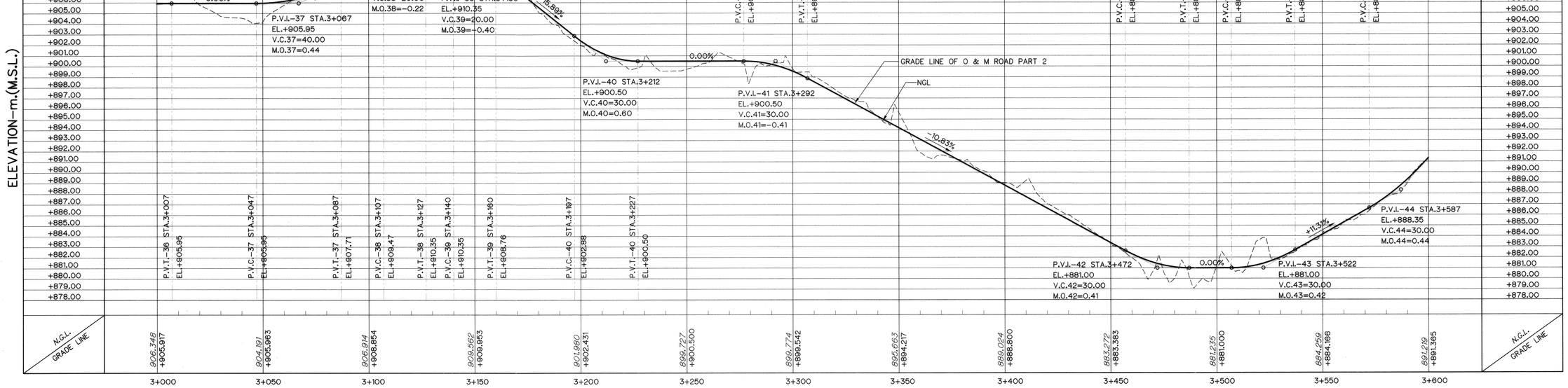
DRAWING NO. MH-OM-05

SHEET NO. 24 OF 51



PLAN

SCALE 1:1,000



PROFILE

VERTICAL SCALE 1:200

HORIZONTAL SCALE 1:1,000

NOTES :

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

REFERENCE DRAWINGS :

1.	O&M ROAD PART 3 PLAN AND PROFILE, STA. 2+400 TO STA. 3+000	MH-OM-05
2.	O&M ROAD PART 3 PLAN AND PROFILE, STA. 3+600 TO STA. 4+149.212	MH-OM-07
3.	O&M ROAD TYPICAL SECTIONS AND DETAILS	MH-OM-10

0 5 10 15

SCALE 1:200 METERS

0 10 20 40 50 80

SCALE 1:1,000 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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

MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT
O&M ROAD PART 2
PLAN AND PROFILE, STA. 3+000 TO STA. 3+600

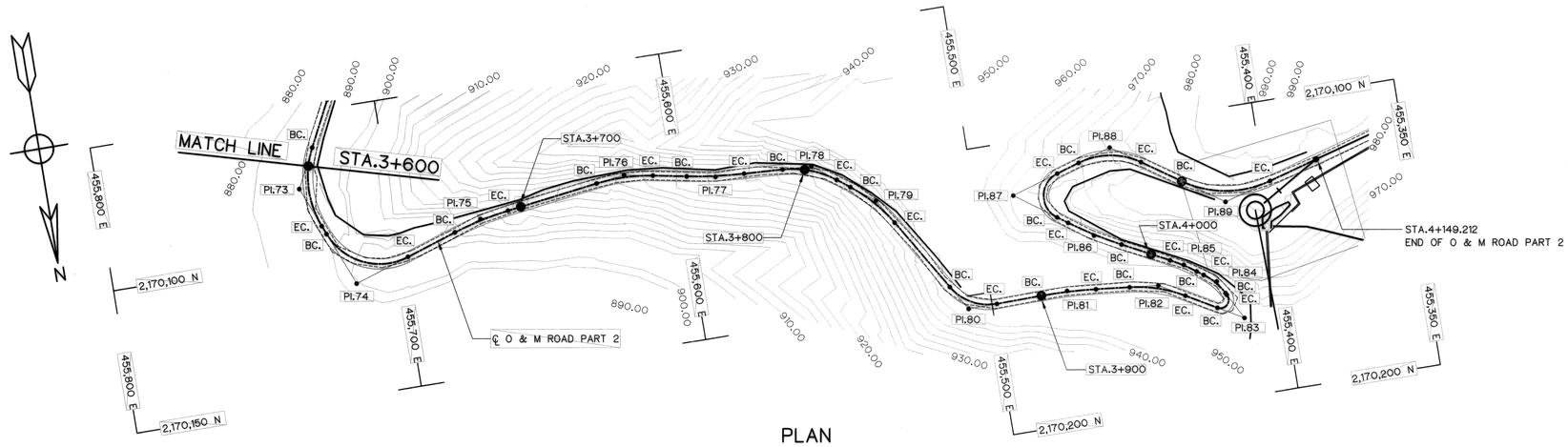
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	วิศ.64624	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	วิศ.6226	RECOMMENDED	
PROJECT MANAGER	08/08/2559 DATE	APPROVED	P. Hansell.

DRAWING NO. MH-OM-06

SHEET NO. 25 OF 51



PLAN

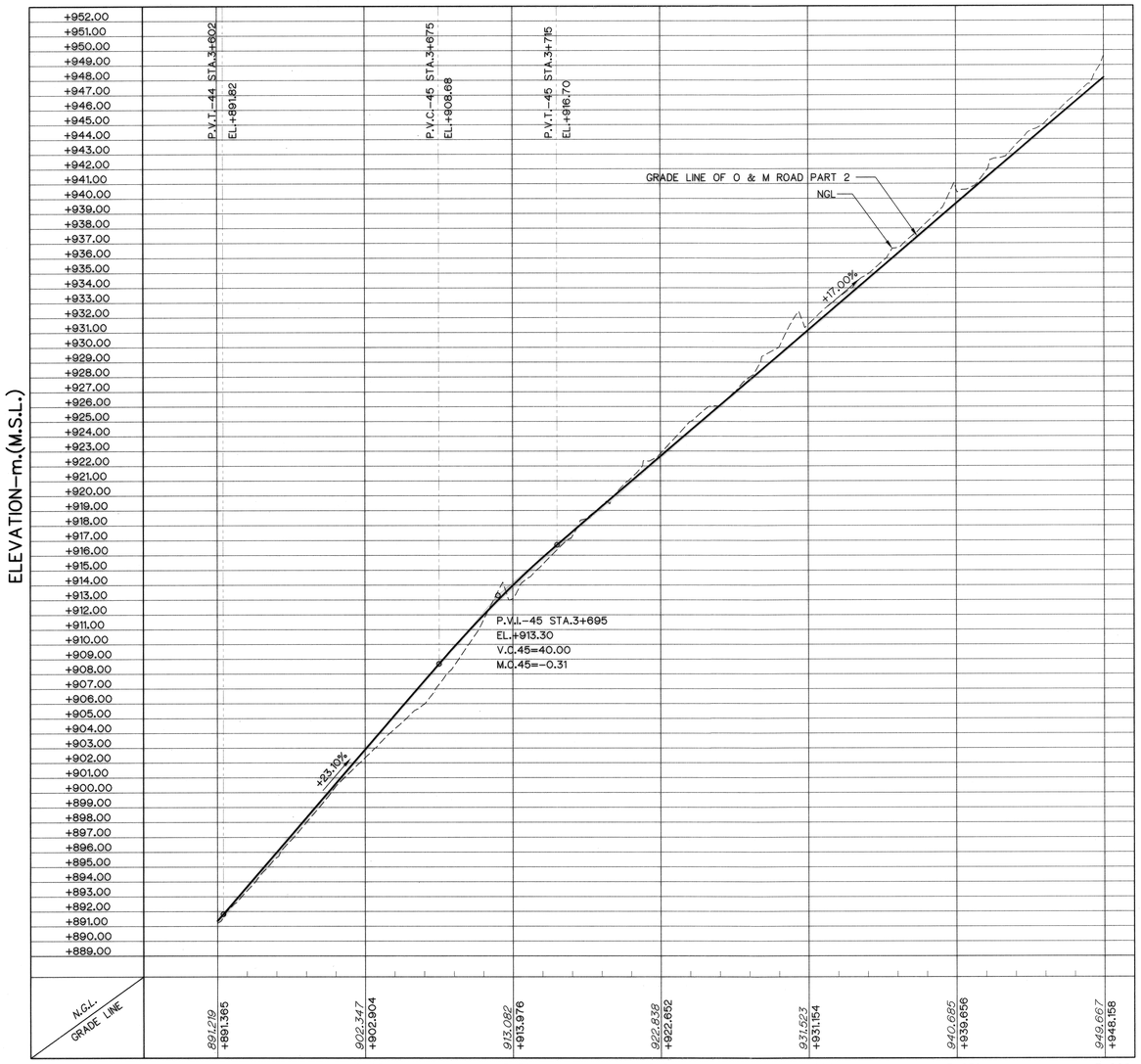
SCALE 1:1,000

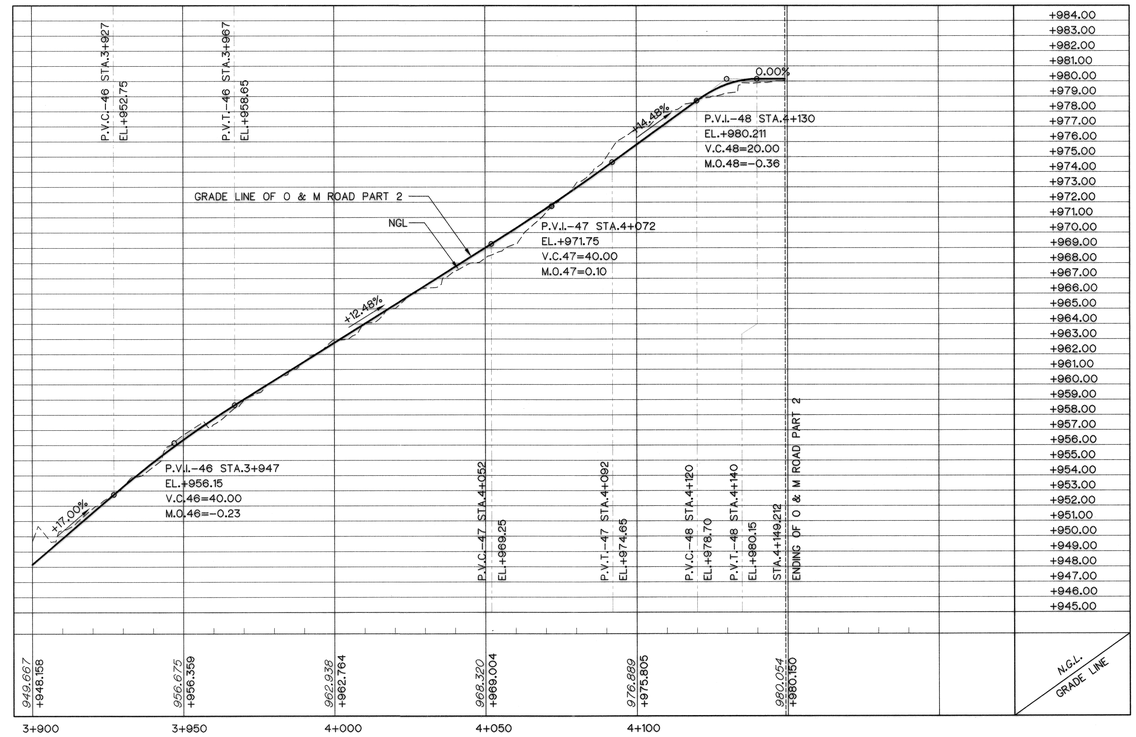
NOTES :

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

REFERENCE DRAWINGS :

1. O&M ROAD PART 3 PLAN AND PROFILE, STA. 3+000 TO STA. 3+600	MH-OM-06
2. O&M ROAD TYPICAL SECTIONS AND DETAILS	MH-OM-10





PROFILE

VERTICAL SCALE 1:200

HORIZONTAL SCALE 1:1,000

0 5 10 15

SCALE 1:200 METERS

0 10 20 40 50 80

SCALE 1:1,000 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

CONSULTANTS | DEDE

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

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT

O&M ROAD PART 2

PLAN AND PROFILE, STA. 3+600 TO STA. 4+149.212

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

DESIGNED	วิ.64624	วิ.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED		วิ.6226	RECOMMENDED
PROJECT MANAGER	08/03/2564 DATE		APPROVED

DRAWING NO. MH-OM-07

SHEET NO. 26 OF 51

HORIZONTAL CURVE OF O&M ROAD PART 2

NO. PI.	COORDINATE N	COORDINATE E	PI. – PI. (m)	DEFLECTION ANGLE (△) (° – ' – ")	TL. (m)	R (m)	LC. (m)	BC. STA. (km)	PI. STA. (km)	EC. STA. (km)	BEARING (N/S ° – ' – " E/W)
BEG.	2,169,520.242	456,364.022	–	–	–	–	–	–	0+000.000	–	–
1	2,169,503.052	456,355.583	19.150	22°–45'–03.09"	6.000	29.823	11.842	0+013.150	0+019.150	0+024.992	S26°–08'–51.27"W
2	2,169,497.255	456,348.939	8.818	108°–29'–01.32"	–	–	–	–	0+027.809	–	S48°–53'–54.35"W
3	2,169,489.091	456,362.847	16.128	08°–49'–51.86"	6.000	77.702	11.976	0+037.937	0+043.937	0+049.913	S59°–35'–06.97"E
4	2,169,481.371	456,382.361	20.986	05°–45'–56.73"	10.000	198.577	19.983	0+054.899	0+064.899	0+074.882	S68°–24'–58.83"E
5	2,169,451.073	456,440.938	65.948	16°–05'–55.99"	15.000	106.066	29.802	0+115.830	0+130.830	0+145.633	S62°–39'–02.09"E
6	2,169,419.451	456,474.321	45.982	38°–31'–58.14"	15.000	42.914	28.861	0+161.615	0+176.615	0+190.476	S46°–33'–06.10"E
7	2,169,353.003	456,483.682	67.104	16°–54'–52.86"	20.000	134.508	39.709	0+222.580	0+242.580	0+262.289	S08°–01'–07.97"E
8	2,169,292.008	456,474.135	61.738	06°–24'–44.24"	20.000	357.039	39.958	0+284.027	0+304.027	0+323.985	S08°–53'–44.89"W
9	2,169,199.834	456,448.905	95.565	04°–09'–46.19"	20.000	550.304	39.982	0+379.550	0+399.550	0+419.532	S15°–18'–29.13"W
10	2,169,096.423	456,428.532	105.398	38°–02'–14.19"	15.000	43.517	28.890	0+489.931	0+504.931	0+518.821	S11°–08'–42.94"W
11	2,169,076.780	456,405.789	30.051	33°–41'–18.23"	10.000	33.029	19.420	0+523.872	0+533.872	0+543.292	S49°–10'–57.13"W
12	2,169,073.862	456,382.458	23.513	71°–37'–17.19"	10.000	13.860	17.325	0+546.805	0+556.805	0+564.130	S82°–52'–15.36"W
13	2,169,098.349	456,370.774	27.132	40°–38'–51.89"	10.000	26.999	19.154	0+571.262	0+581.262	0+590.416	N25°–30'–27.45"W
14	2,169,181.911	456,393.384	86.567	07°–05'–49.34"	20.000	322.515	39.949	0+646.983	0+666.983	0+686.932	N15°–08'–24.44"E
15	2,169,242.339	456,401.923	61.028	03°–05'–36.08"	10.000	370.354	19.995	0+717.960	0+727.960	0+737.955	N08°–02'–35.10"E
16	2,169,300.854	456,413.441	59.638	40°–02'–26.61"	20.000	54.889	38.359	0+767.593	0+787.593	0+805.951	N11°–08'–11.18"E
17	2,169,349.962	456,386.328	56.096	39°–18'–17.42"	5.000	14.001	9.605	0+837.047	0+842.047	0+846.652	N28°–54'–15.43"W
18	2,169,357.386	456,367.757	20.000	116°–07'–37.77"	15.000	9.350	18.950	0+846.652	0+861.652	0+865.602	N68°–12'–32.85"W
19	2,169,337.443	456,369.269	20.000	17°–00'–33.95"	5.000	33.437	9.926	0+865.602	0+870.602	0+875.529	S04°–20'–10.62"E
20	2,169,295.955	456,385.483	44.544	38°–54'–10.68"	15.000	42.473	28.838	0+900.072	0+915.072	0+928.911	S21°–20'–44.56"E
21	2,169,233.720	456,365.791	65.277	48°–25'–42.83"	20.000	44.472	37.590	0+959.187	0+979.187	0+996.777	S17°–33'–26.12"W
22	2,169,214.694	456,323.087	46.751	73°–03'–41.84"	15.000	20.249	25.820	1+008.528	1+023.528	1+034.348	S65°–59'–08.95"W
23	2,169,249.422	456,292.949	45.982	17°–22'–02.34"	15.000	98.213	29.770	1+050.330	1+065.330	1+080.100	N40°–57'–09.20"W
24	2,169,356.687	456,246.118	117.042	29°–01'–30.75"	20.000	77.264	39.141	1+162.143	1+182.143	1+201.284	N23°–35'–06.87"W
25	2,169,375.385	456,221.654	30.791	05°–36'–18.38"	6.000	122.567	11.990	1+206.075	1+212.075	1+218.065	N52°–36'–37.62"W
26	2,169,383.755	456,208.146	15.891	05°–27'–49.35"	–	–	–	–	1+227.956	–	N58°–12'–56.00"W
27	2,169,423.729	456,155.574	66.043	27°–47'–32.64"	20.000	80.839	39.213	1+274.000	1+294.000	1+313.213	N52°–45'–06.66"W
28	2,169,487.644	456,125.825	70.499	55°–46'–58.84"	20.000	37.787	36.789	1+343.712	1+363.712	1+380.501	N24°–57'–34.02"W
29	2,169,500.623	456,046.197	80.679	143°–44'–59.70"	23.000	7.529	18.889	1+418.180	1+441.180	1+437.069	N80°–44'–32.86"W
30	2,169,461.965	456,084.176	54.193	65°–52'–20.78"	13.000	20.067	23.071	1+455.261	1+468.261	1+478.332	S44°–29'–32.55"E
31	2,169,421.239	456,068.232	43.736	20°–10'–37.85"	7.000	39.343	13.855	1+502.068	1+509.068	1+515.923	S21°–22'–48.23"W
32	2,169,365.994	456,067.072	55.257	65°–36'–53.97"	38.000	58.948	67.507	1+526.180	1+564.180	1+593.687	S01°–12'–10.38"W
33	2,169,345.310	456,018.771	52.543	27°–28'–45.20"	8.000	32.719	15.692	1+600.230	1+608.230	1+615.922	S66°–49'–04.35"W
34	2,169,351.143	455,941.142	77.848	57°–28'–23.42"	10.000	18.238	18.294	1+675.770	1+685.770	1+694.064	N85°–42'–10.45"W
35	2,169,402.698	455,913.464	58.515	23°–13'–07.47"	9.000	43.808	17.753	1+733.579	1+742.579	1+751.332	N28°–13'–47.03"W
36	2,169,415.007	455,898.018	19.751	31°–28'–51.77"	9.000	31.932	17.545	1+753.083	1+762.083	1+770.628	N51°–26'–54.50"W
37	2,169,416.996	455,881.982	16.159	22°–09'–31.47"	7.000	35.747	13.825	1+770.787	1+777.787	1+784.612	N82°–55'–46.27"W
38	2,169,430.644	455,857.591	27.950	22°–05'–54.78"	15.000	76.816	29.627	1+790.561	1+805.561	1+820.189	N60°–46'–14.80"W
39	2,169,436.415	455,811.460	46.491	35°–53'–03.53"	10.000	30.883	19.342	1+841.679	1+851.679	1+861.021	N82°–52'–09.58"W
40	2,169,457.012	455,789.384	30.192	30°–27'–11.10"	10.000	36.739	19.527	1+871.214	1+881.214	1+890.741	N46°–59'–06.05"W
41	2,169,468.530	455,737.694	52.958	142°–52'–32.16"	28.000	9.402	23.446	1+905.698	1+933.698	1+929.145	N77°–26'–17.16"W
42	2,169,420.697	455,778.279	62.731	127°–30'–47.43"	13.000	6.409	14.263	1+950.876	1+963.876	1+965.139	S40°–18'–49.32"E
43	2,169,419.520	455,754.218	24.090	15°–41'–24.07"	10.000	72.578	19.875	1+966.229	1+976.229	1+986.104	S87°–11'–58.11"W
44	2,169,401.329	455,699.821	57.358	27°–12'–27.70"	25.000	103.307	49.057	2+008.462	2+033.462	2+057.519	S71°–30'–34.04"W
45	2,169,416.644	455,599.937	101.051	06°–51'–00.90"	10.000	167.082	19.976	2+123.570	2+133.570	2+143.546	N81°–16'–58.26"W

HORIZONTAL CURVE OF O&M ROAD PART 2(CONTINUED)

NO. PI.	COORDINATE N	COORDINATE E	PI. – PI. (m)	DEFLECTION ANGLE (△) (° – ' – ")	TL. (m)	R (m)	LC. (m)	BC. STA. (km)	PI. STA. (km)	EC. STA. (km)	BEARING (N/S ° – ' – " E/W)
46	2,169,418.466	455,544.039	55.928	06°–28'–31.36"	10.000	176.777	19.979	2+179.474	2+189.474	2+199.452	N88°–07'–59.16"W
47	2,169,424.511	455,502.815	41.665	65°–56'–29.58"	25.000	38.540	44.355	2+206.117	2+231.117	2+250.472	N81°–39'–27.80"W
48	2,169,503.106	455,480.699	81.647	08°–46'–11.14"	10.000	130.411	19.961	2+297.120	2+307.120	2+317.081	N15°–42'–58.23"W
49	2,169,576.810	455,447.132	80.988	66°–02'–48.59"	48.000	73.847	85.126	2+340.069	2+388.069	2+425.195	N24°–29'–09.37"W
50	2,169,576.159	455,377.123	70.012	20°–33'–19.40"	10.000	55.148	19.785	2+437.207	2+447.207	2+456.992	S89°–28'–02.04"W
51	2,169,604.237	455,300.074	82.006	154°–18'–00.47"	27.000	6.159	16.586	2+501.998	2+528.998	2+518.584	N69°–58'–38.56"W
52	2,169,612.558	455,383.776	84.115	32°–02'–01.72"	10.000	34.835	19.476	2+565.699	2+575.699	2+585.175	N84°–19'–21.91"E
53	2,169,643.066	455,423.233	49.876	81°–36'–08.46"	15.000	17.377	24.749	2+610.051	2+625.051	2+634.800	N52°–17'–20.19"E
54	2,169,697.928	455,392.429	62.918	11°–57'–12.57"	10.000	95.517	19.927	2+672.718	2+682.718	2+692.645	N29°–18'–48.26"W
55	2,169,749.986	455,376.155	54.542	20°–36'–23.01"	10.000	55.009	19.784	2+727.188	2+737.188	2+746.972	N17°–21'–35.70"W
56	2,169,787.858	455,346.602	48.038	113°–47'–19.83"	13.000	8.476	16.834	2+772.010	2+785.010	2+788.844	N37°–57'–58.70"W
57	2,169,794.558	455,373.124	27.355	10°–01'–04.61"	10.000	114.095	19.949	2+793.199	2+803.199	2+813.148	N75°–49'–21.12"E
58	2,169,802.471	455,481.931	109.094	87°–58'–33.02"	10.000	10.360	15.907	2+902.243	2+912.243	2+918.150	N85°–50'–25.73"E
59	2,169,833.528	455,480.773	31.079	46°–50'–50.39"	12.000	27.699	22.648	2+927.228	2+939.228	2+949.876	N02°–08'–07.29"W
60	2,169,878.675	455,428.869	68.792	10°–27'–49.51"	10.000	109.208	19.944	2+996.667	3+006.667	3+016.612	N48°–58'–57.68"W
61	2,169,912.867	455,401.653	43.701	119°–01'–35.51"	13.000	7.654	15.899	3+037.313	3+050.313	3+053.213	N38°–31'–08.17"W
62	2,169,918.547	455,435.623	34.442	16°–38'–56.87"	10.000	68.342	19.859	3+064.654	3+074.654	3+084.513	N80°–30'–27.34"E
63	2,169,914.610	455,466.978	31.601	07°–19'–33.38"	10.000	156.206	19.973	3+096.114	3+106.114	3+116.087	S82°–50'–35.79"E
64	2,169,883.455	455,587.596	124.577	123°–45'–27.66"	52.000	27.790	60.026	3+178.664	3+230.664	3+238.690	S75°–31'–02.41"E
65	2,169,990.465	455,550.174	113.365	144°–52'–57.55"	18.000	5.696	14.402	3+282.055	3+300.055	3+296.457	N19°–16'–30.07"W
66	2,169,953.822	455,601.342	62.935	127°–14'–14.54"	32.000	15.872	35.247	3+309.392	3+341.392	3+344.639	S54°–23'–32.53"E
67	2,170,006.226	455,599.851	52.425	76°–15'–57.23"	10.000	12.738	16.956	3+355.065	3+365.065	3+372.021	N01°–37'–47.07"W
68	2,170,015.104	455,632.162	33.509	72°–16'–57.63"	13.000	17.800	22.457	3+382.529	3+395.529	3+404.986	N74°–38'–10.16"E
69	2,169,967.126	455,663.416	57.260	41°–33'–55.39"	15.000	39.524	28.673	3+434.246	3+449.246	3+462.918	S33°–04'–52.21"E
70	2,169,957.153	455,699.738	37.666	77°–37'–23.08"	17.000	21.135	28.633	3+468.584	3+485.584	3+497.218	S74°–38'–47.60"E
71	2,169,998.904	455,721.686	47.168	42°–18'–07.32"	10.000	25.847	19.083	3+517.386	3+527.386	3+536.469	N27°–43'–49.32"E
72	2,170,038.065	455,711.506	40.463	41°–21'–22.21"	10.000	26.495	19.124	3+556.932	3+566.932	3+576.056	N14°–34'–18.00"W
73	2,170,075.902	455,730.606	42.385	48°–49'–04.86"	15.000	33.054	28.163	3+593.440	3+608.440	3+621.603	N26°–47'–04.21"E
74	2,170,111.340	455,716.264	38.230	85°–58'–21.12"	20.000	21.458	32.197	3+624.833	3+644.833	3+657.031	N22°–02'–00.65"W
75	2,170,096.375	455,670.223	48.412	10°–22'–12.63"	10.000	110.199	19.945	3+675.443	3+685.443	3+695.388	S71°–59'–38.23"W
76	2,170,089.456	455,618.614	52.071	17°–58'–48.03"	10.000	63.209	19.836	3+727.459	3+737.459	3+747.294	S82°–21'–50.86"W
77	2,170,095.147	455,587.435	31.694	07°–08'–55.65"	10.000	160.087	19.974	3+758.988	3+768.988	3+778.963	N79°–39'–21.10"W
78	2,170,097.008	455,554.100	33.387	34°–02'–32.25"	10.000	32.665	19.408	3+792.349	3+802.349	3+811.758	N86°–48'–16.75"W
79	2,170,112.357	455,533.906	25.365	21°–24'–13.69"	10.000	52.914	19.767	3+817.123	3+827.123	3+836.890	N52°–45'–44.50"W
80	2,170,154.460	455,508.248	49.305	59°–35'–09.18"	10.000	17.466	18.164	3+866.195	3+876.195	3+884.359	N31°–21'–30.81"W
81	2,170,153.888	455,473.550	34.703	06°–52'–47.60"	10.000	166.360	19.976	3+899.062	3+909.062	3+919.037	S89°–03'–20.01"W
82	2,170,157.168	455,442.001	31.719	23°–52'–09.17"	10.000	47.312	19.710	3+930.757	3+940.757	3+950.466	N84°–03'–52.39"W
83	2,170,173.004	455,414.355	31.860	148°–07'–23.99"	10.000	2.856	7.383	3+962.327	3+972.327	3+969.710	N60°–11'–43.22"W
84	2,170,159.084	455,421.856	15.812	25°–32'–04.54"	5.000	22.066	9.834	3+970.522	3+975.522	3+980.356	S28°–19'–07.22"E
85	2,170,151.569	455,432.144	12.740	08°–54'–55.80"	5.000	64.136	9.980	3+983.096	3+988.096	3+993.076	S53°–51'–11.76"E
86	2,170,136.591	455,461.249	32.733	08°–29'–19.04"	10.000	134.747	19.963	4+010.809	4+020.809	4+030.773	S62°–46'–07.56"E
87	2,170,118.341	455,486.628	31.259	127°–13'–46.72"	17.000	8.433	18.727	4+035.032	4+052.032	4+053.759	S54°–16'–48.53"E
88	2,170,107.415	455,451.003	37.263	51°–23'–36.04"	12.000	24.938	22.369	4+062.022	4+074.022	4+084.391	S72°–56'–58.20"W
89	2,170,132.424	455,414.400	44.331	50°–03'–51.10"	17.000	36.403	31.809	4+099.722	4+116.722	4+131.530	N55°–39'–25.77"W
END	2,170,123.027	455,381.016	34.682	–	–	–	–	–	4+149.212	–	S74°–16'–43.14"W

NO.	DATE	REVISIONS	CHECKED	APPROVED
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MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT
O&M ROAD PART 2
HORIZONTAL CURVE

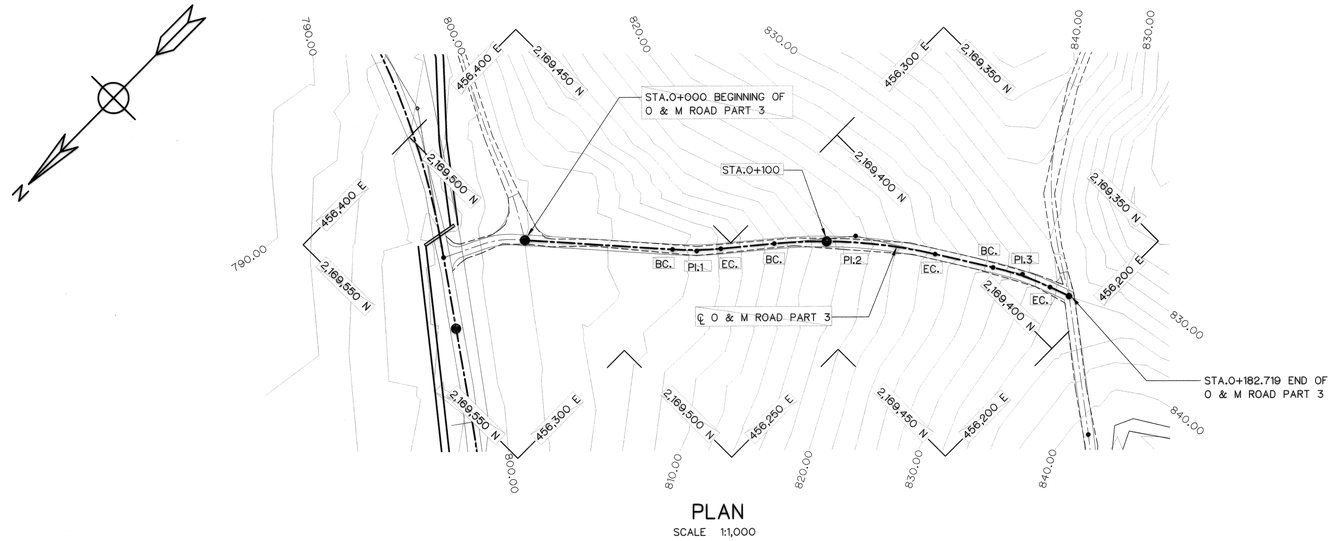
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

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DRAWN
CHECKED สย.6226
PROJECT MANAGER DATE 08/03/2559

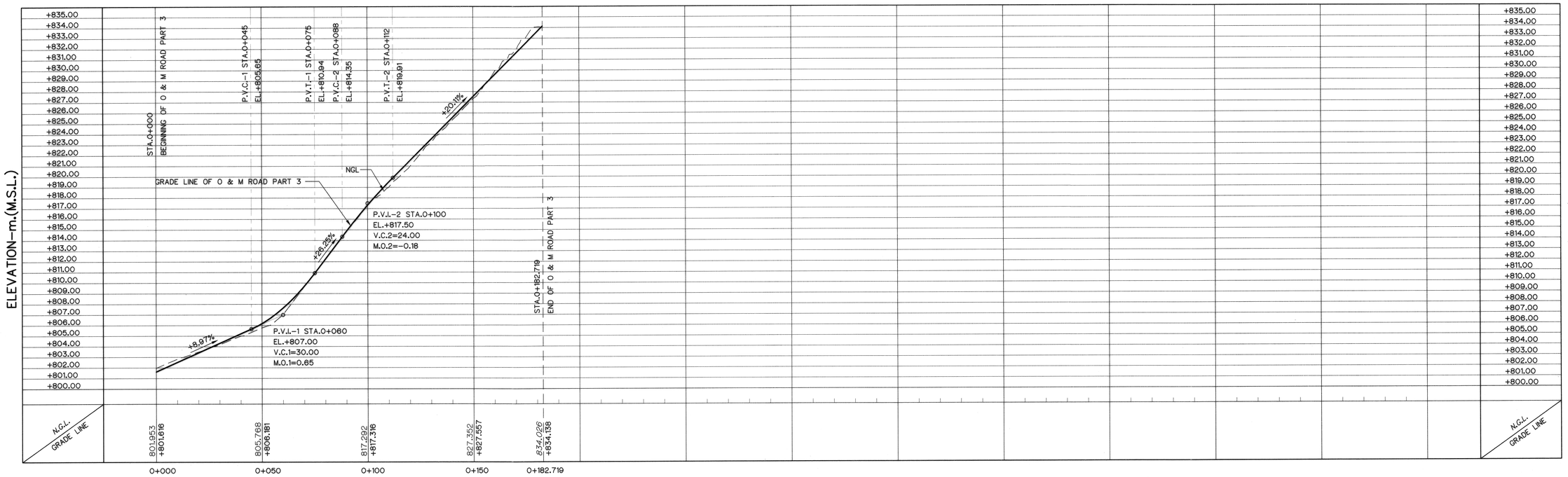
REVIEWED
SUBMITTED
RECOMMENDED
APPROVED

DRAWING NO. MH–OM–08
SHEET NO. 27 OF 51



PLAN

SCALE 1:1,000



HORIZONTAL CURVE OF O&M ROAD PART 3

NO. PI.	COORDINATE N	COORDINATE E	PI. – PI. (m)	DEFLECTION ANGLE (△) (° _ ' _ ")	TL. (m)	R (m)	LC. (m)	BC. STA. (km)	PI. STA. (km)	EC. STA. (km)	BEARING (N/S ° – ' – " E/W)
BEG.	2,169,497.256	456,348.939	–	–	–	–	–	–	0+000.000	–	–
1	2,169,459.822	456,306.030	56.943	09°–03'–08.29"	8.000	101.060	15.967	0+048.943	0+056.943	0+064.910	S48°–53'–54.80"W
2	2,169,419.324	456,272.233	52.748	18°–16'–59.79"	27.000	167.786	53.541	0+082.657	0+109.657	0+136.198	S39°–50'–46.50"W
3	2,169,389.417	456,224.130	56.642	12°–21'–54.58"	10.000	92.313	19.922	0+155.840	0+165.840	0+175.763	S58°–07'–46.29"W
END	2,169,383.755	456,208.146	16.957	–	–	–	–	–	0+182.719	–	S70°–29'–40.87"W

PROFILE

VERTICAL SCALE 1:200

HORIZONTAL SCALE 1:1,000

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS UNLESS OTHERWISE SHOWN.
2. SYMBOL, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO.MH–GN–03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECKED AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. O&M ROAD TYPICAL SECTION AND DETAILS MH–OM–10

0 5 10 15
SCALE 1:200 METERS

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

NO.	DATE	REVISIONS	CHECKED	APPROVED
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MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT

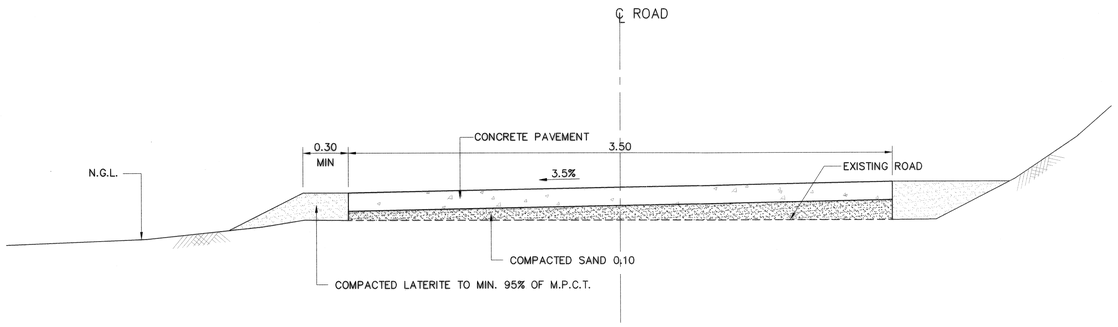
O&M ROAD PART 3

PLAN AND PROFILE, STA. 0+000 TO STA. 0+182.719

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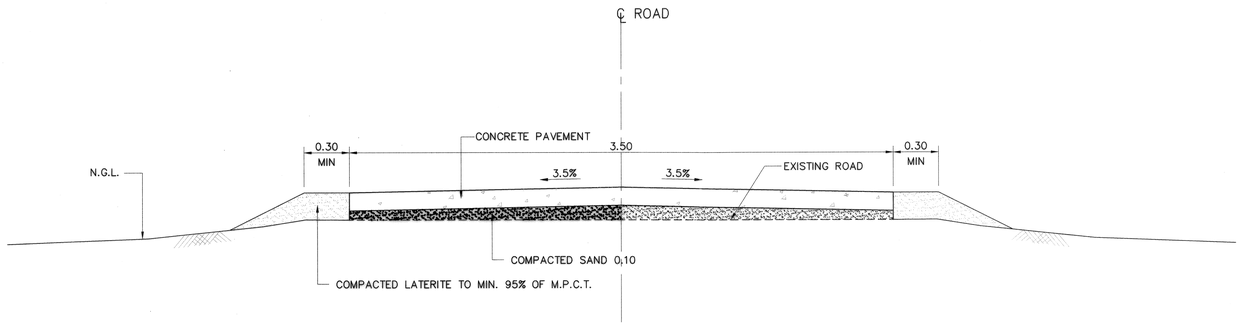
Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED		REVIEWED	
DRAWN		SUBMITTED	
CHECKED		RECOMMENDED	
CHECKED		APPROVED	P. Hanwong
PROJECT MANAGER	01/03/2559 DATE	DRAWING NO.	MH–OM–09
		SHEET NO.	28 OF 51



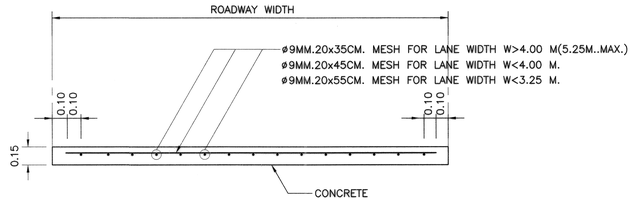
TYPICAL SECTION FOR HILLSIDE

NOT TO SCALE



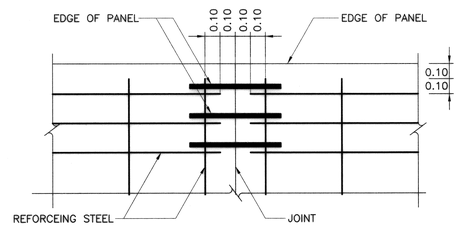
TYPICAL SECTION FOR FLAT AREA

NOT TO SCALE



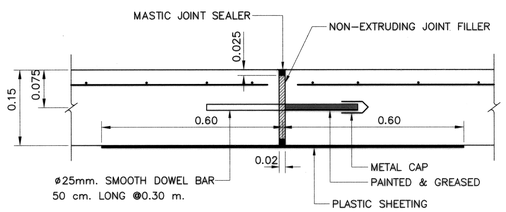
REINFORCEMENT DETAIL OF CONCRETE PAVEMENT CROSS-SECTION

NOT TO SCALE



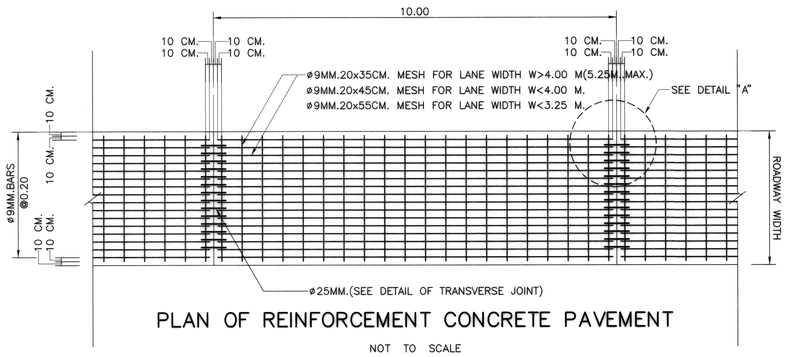
DETAIL "A"

NOT TO SCALE



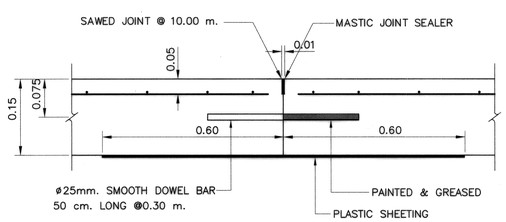
DETAIL OF EXPANSION JOINT

NOT TO SCALE



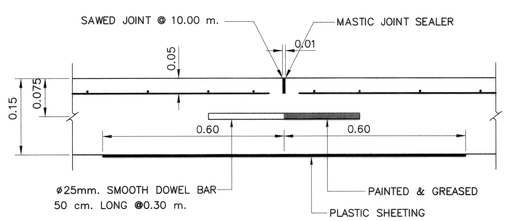
PLAN OF REINFORCEMENT CONCRETE PAVEMENT

NOT TO SCALE



DETAIL OF CONSTRUCTION JOINT

NOT TO SCALE



DETAIL OF CONTRACTION JOINT

NOT TO SCALE

NOTES 1 :

1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
2. EXPANSION JOINT SHALL BE CONSTRUCTED AT THE INTERVAL OF 90 METERS.
3. MASTIC JOINT SEALER SHALL BE OF THE HOT POURED ELASTIC TYPE CONFORMING TO TIS.479.
4. JOINT FILLER SHALL CONFORM TO THE AASHTO M.213-74 OR ASTM.D1751-73 SPECIFICATION.
5. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 300 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS.
6. REINFORCING STEEL SHALL CONFORM TIS.20 GRADE SR 24 FOR ROUND BARS AND TIS.24 GRADE SD 30 FOR DEFORMED BAR.
7. PLASTIC SHEET USED IN CONSTRUCTION SHALL HAVE THE FOLLOWING REQUIREMENTS :
   - 7.1 THICKNESS OF 0.07 MM. WITH A TOLERANCE OF NOT MORE THAN 7 % SHALL BE REQUIRED.
   - 7.2 WIDTH SHALL NOT BE LESS THAN 1.20 M.
   - 7.3 IT SHALL BE COLOURLESS,TRANSPARENT AND WATERPROOF, FREE FROM POROUS AREA, TURN AREA AND BLISTERING AREA WHICH ARE VISIBLE BY NAKED EYE. EDGE SHALL BE STRAIGHT.
   - 7.4 CONTINUOUS LENGTH SHALL BE REQUIREMENT TO THE WIDTH OF TRAFFIC LANES. CONNECTION ALLOWED AT LONGITUDINAL JOINTS WITH NOT LESS. THAN 20 CM. OVERLAPPING SHALL BE REQUIRED.

NO.	DATE	REVISIONS	CHECKED	APPROVED
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MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
O&M ROAD
TYPICAL SECTION AND DETAILS

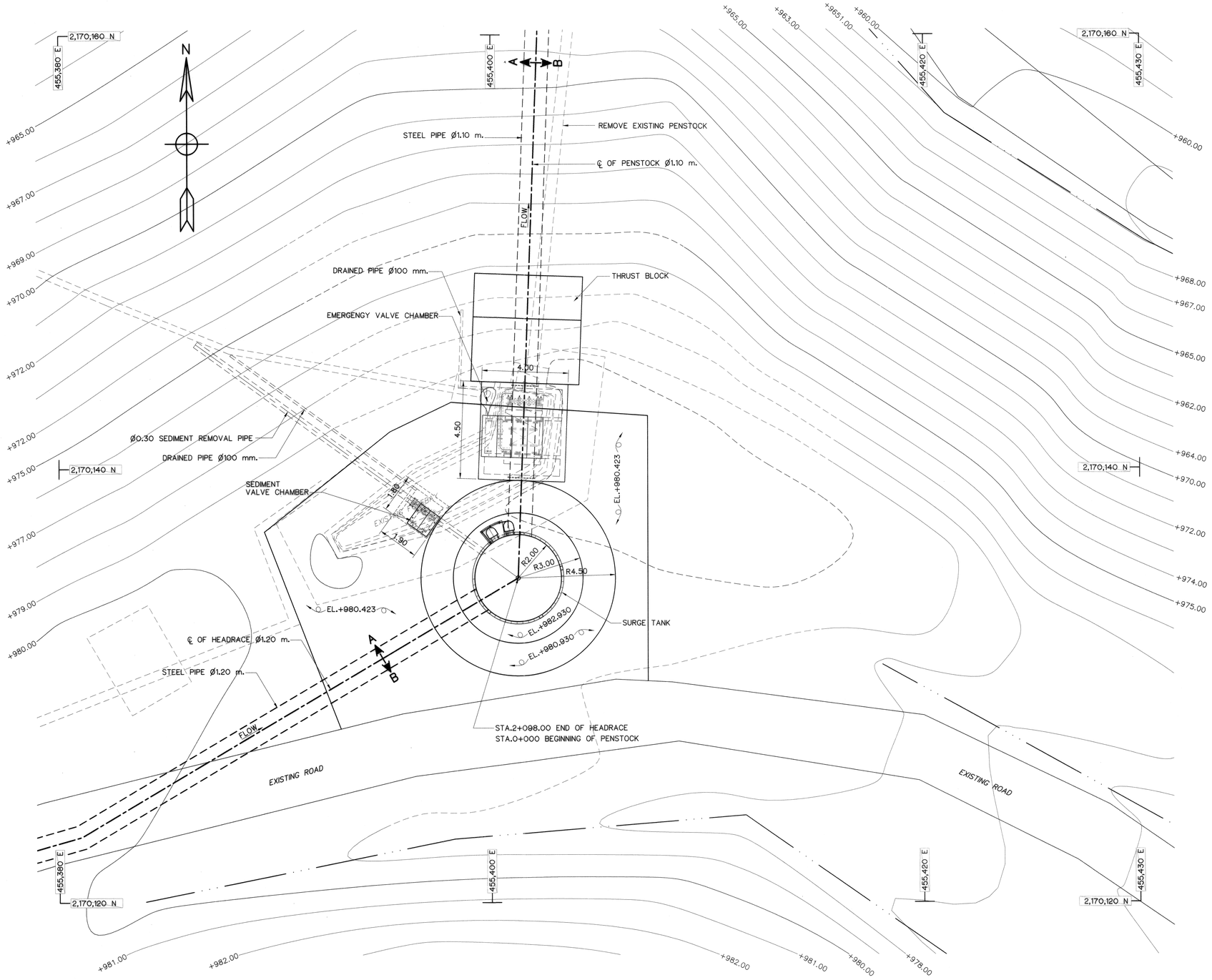
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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

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DRAWN
CHECKED ณัฐ.6226
PROJECT MANAGER 03/03/2564 DATE

REVIEWED
SUBMITTED
RECOMMENDED
APPROVED P. Hanwall

DRAWING NO. MH-OM-10
SHEET NO. 29 OF 51



GENERAL LAY-OUT

SCALE 1:100

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWIRE SHOWN.
2. STEEL PIPE SHELL CONFORM TO JIS G 3101 SS34
3. BASE OF CONCRETE FOUNDATION SHALL BE DETERMINED IN FIELD BY EMBEDING TO STABLE ROCK FOUNDATION WITH A ALLOWABLE BEARING CAPACITY NOT LESS THAN 25 T/m^2
4. COROSINE PROTECTION OF STEEL PIPE OR GARDRAIL
   IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
5. STEEL TANK , GIRDER AND STIFFENER SHALL
   CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1. SURGE TANK SECTIONS — MH-ST-02

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

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
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MAE HAT HYDROPOWER PROJECT

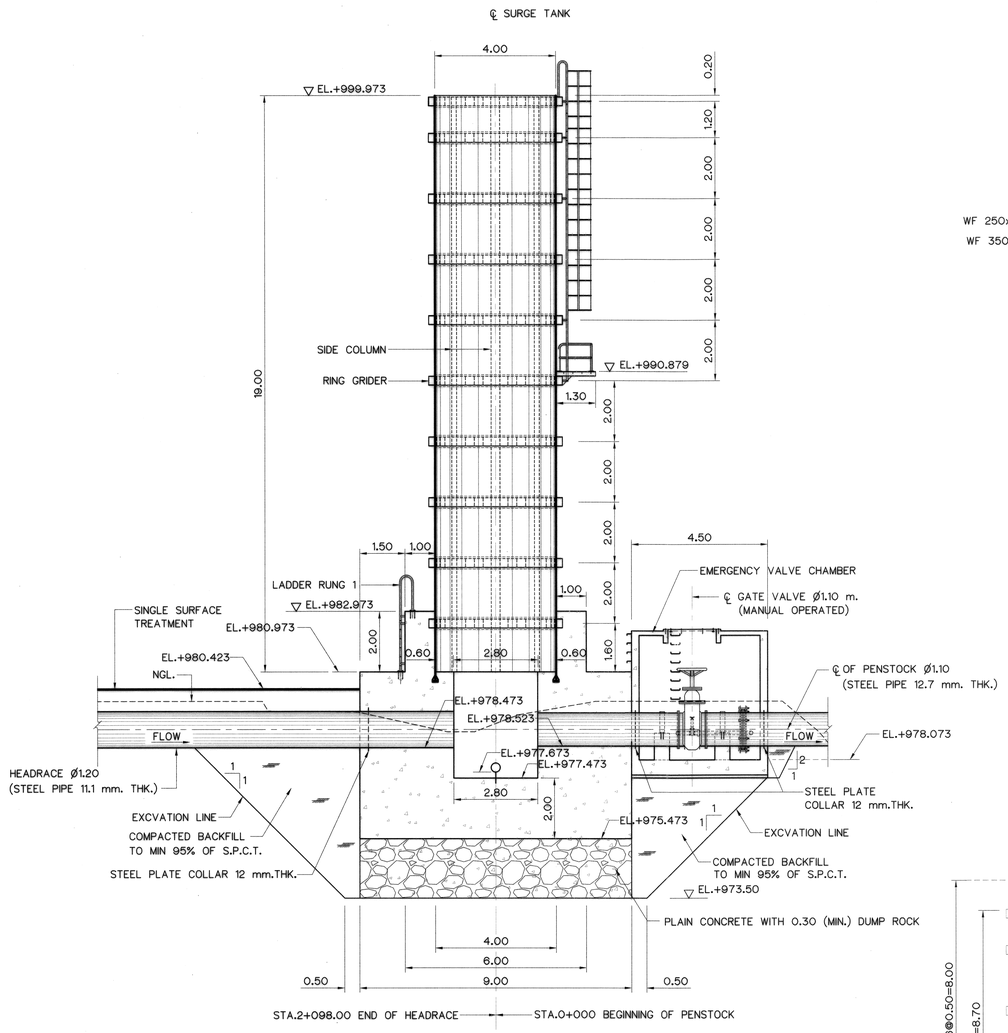
ELECTRO-MECHANICAL EQUIPMENT
SURGE TANK
GENERAL LAY-OUT

P&C MANAGEMENT CO.,LTD.

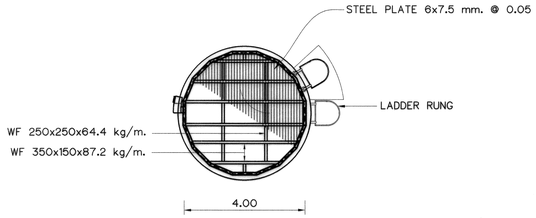
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PROJECT MANAGER	08/02/2564 DATE

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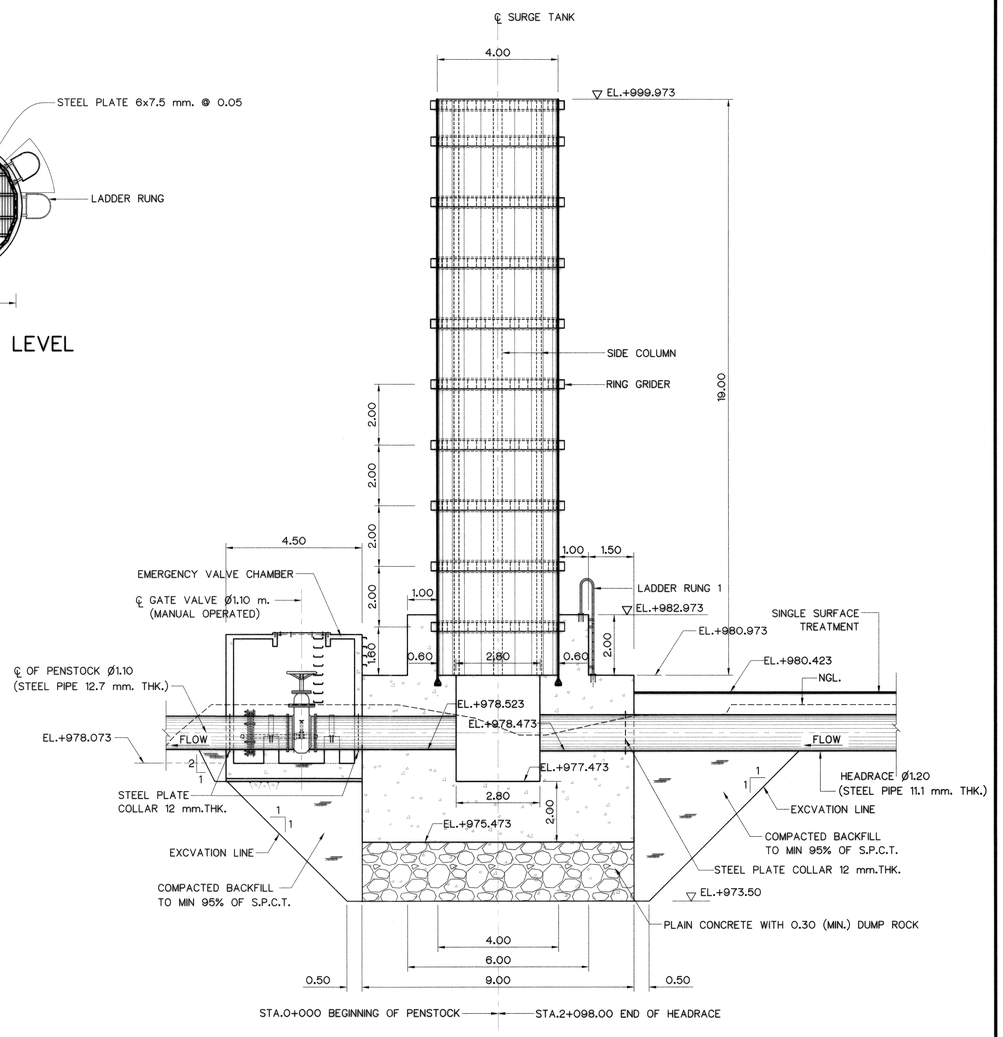
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SUBMITTED	
RECOMMENDED	
APPROVED	P.Hanna
DRAWING NO.	MH-ST-01
SHEET NO.	30 OF 51



SECTION A–A
SCALE 1:100



PLAN ON TOP LEVEL
SCALE 1:100



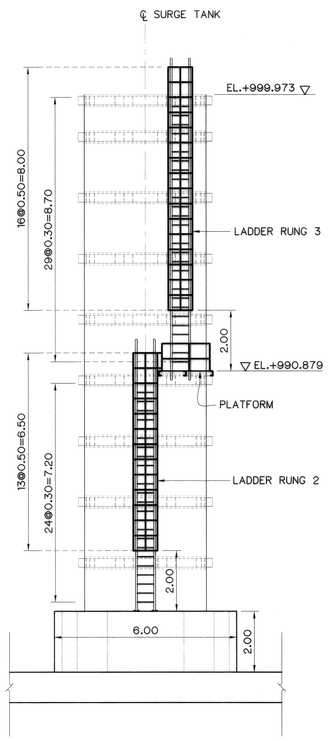
SECTION B–B
SCALE 1:100

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS OTHERWIRE SHOWN.
2. STEEL PIPE SHELL CONFORM TO JIS G 3101 SS34
3. BASE OF CONCRETE FOUNDATION SHALL BE DETERMINED IN FIELD BY EMBEDING TO STABLE ROCK FOUNDATION WITH A ALLOWABLE BEARING CAPACITY NOT LESS THAN 25 T/m^2
4. COROSINE PROTECTION OF STEEL PIPE OR GARDRAIL IS WARNED TO STRICTLY FOLLOW GALVANIZE SPECIFICATION
5. STEEL TANK , GIRDER AND STIFFENER SHALL CONFORM TO JIS G 3101 SS34

REFERENCE DRAWING :

1. SURGE TANK GENERAL LAY-OUT — MH-ST-01



LADDER RUNG 2&3 ELEVATION
SCALE 1:100

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

NO.	DATE	REVISIONS	CHECKED	APPROVED
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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

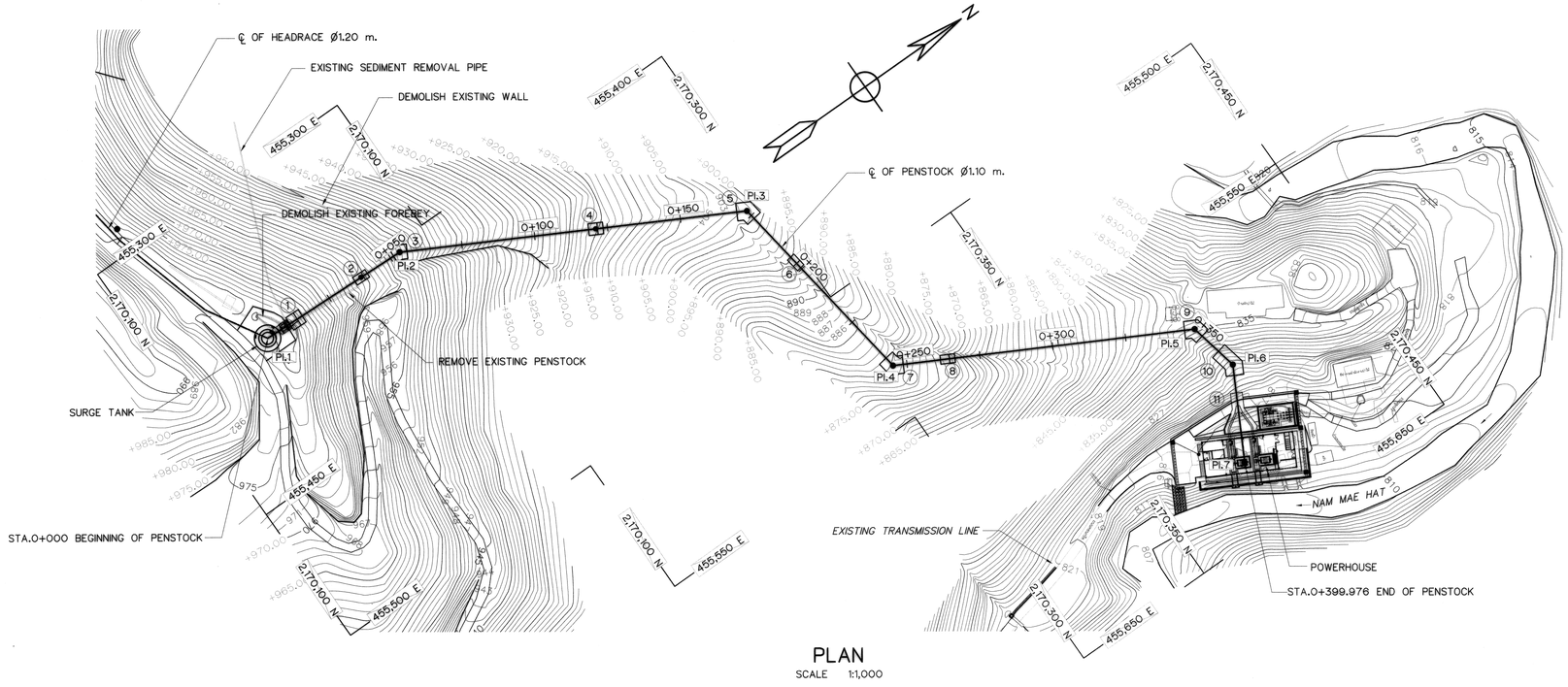
ELECTRO–MECHANICAL EQUIPMENT
SURGE TANK
SECTIONS

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CHECKED	วิศ.6226		RECOMMENDED
PROJECT MANAGER	08/05/2559 DATE		APPROVED

DRAWING NO. MH-ST-02
SHEET NO. 31 OF 51



PLAN

SCALE 1:1,000

HORIZONTAL CURVE OF PENSTOCK

NO. PI.	COORDINATE OF PI.		PI. TO PI.	DEFLECTION ANGLE (△)	PI. STA.	BEARING
	N	E	(m)	(° – ' – ")	(km)	(N/S ° – ' – " E/W)
PI.1	2,170,134.951	455,401.241	–	–	0+000.000	–
PI.2	2,17,0188.62	455,403.218	53.705	2°– 11'– 18.03"	0+053.705	N 02°– 06'–34.72" E
PI.3	2,170,293.544	455,459.709	119.165	53°– 23'– 21.94"	0+172.870	N 28°– 17'– 52.76" E
PI.4	2,170,304.008	455,531.327	72.378	53°– 27'– 12.97"	0+245.248	N 81°– 41'– 14.70" E
PI.5	2,170,395.148	455,580.265	103.448	49°– 36'– 01.30"	0+348.695	N 28°– 14'– 01.73" E
PI.6	2,170,398.886	455,597.605	17.738	40°– 24'– 01.65"	0+366.433	N 77°– 50'–03.03" E
PI.7	2,170,383.018	455,627.156	33.542		0+399.976	

PROFILE

VERTICAL SCALE 1:500

HORIZONTAL SCALE 1:1,000

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. UNLESS OTHERWISE SHOWN.
2. SYMBOLE, ABBREVIATIONS AND CENERAL NOTES SEE DWG. NO.MH–GN–03
3. THE ALIGNMENT OF THE HEADRACE AND RELATED STRUCTURES SHALL BE CHECK AND CORRECTED BY THE CONTRACTOR TO SUIT THE FIELD CONDITIONS AND SHALL BE SUBMITTED TO DEDE'S FIELD ENGINEER FOR APPROVAL

REFERENCE DRAWINGS :

1. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 1/4 MH–PS–02
2. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 2/4 MH–PS–03
3. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 3/4 MH–PS–04
4. PENSTOCK THRUST BLOCK PLAN ,SECTIONS REINFORCEMENT DETAILS 4/4 MH–PS–05
5. PENSTOCK PIPE SUPPORT SECTIONS AND DETAILS MH–PS–06
6. PENSTOCK WYE, PLAN, SECTIONS AND DETAILS MH–PS–07

0 5 10 20 30 40
SCALE 1:500 METERS

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

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MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT

PENSTOCK

PLAN AND PROFILE, STA. 0+000 TO STA. 0+389.376

NO.	DATE	REVISIONS	CHECKED	APPROVED
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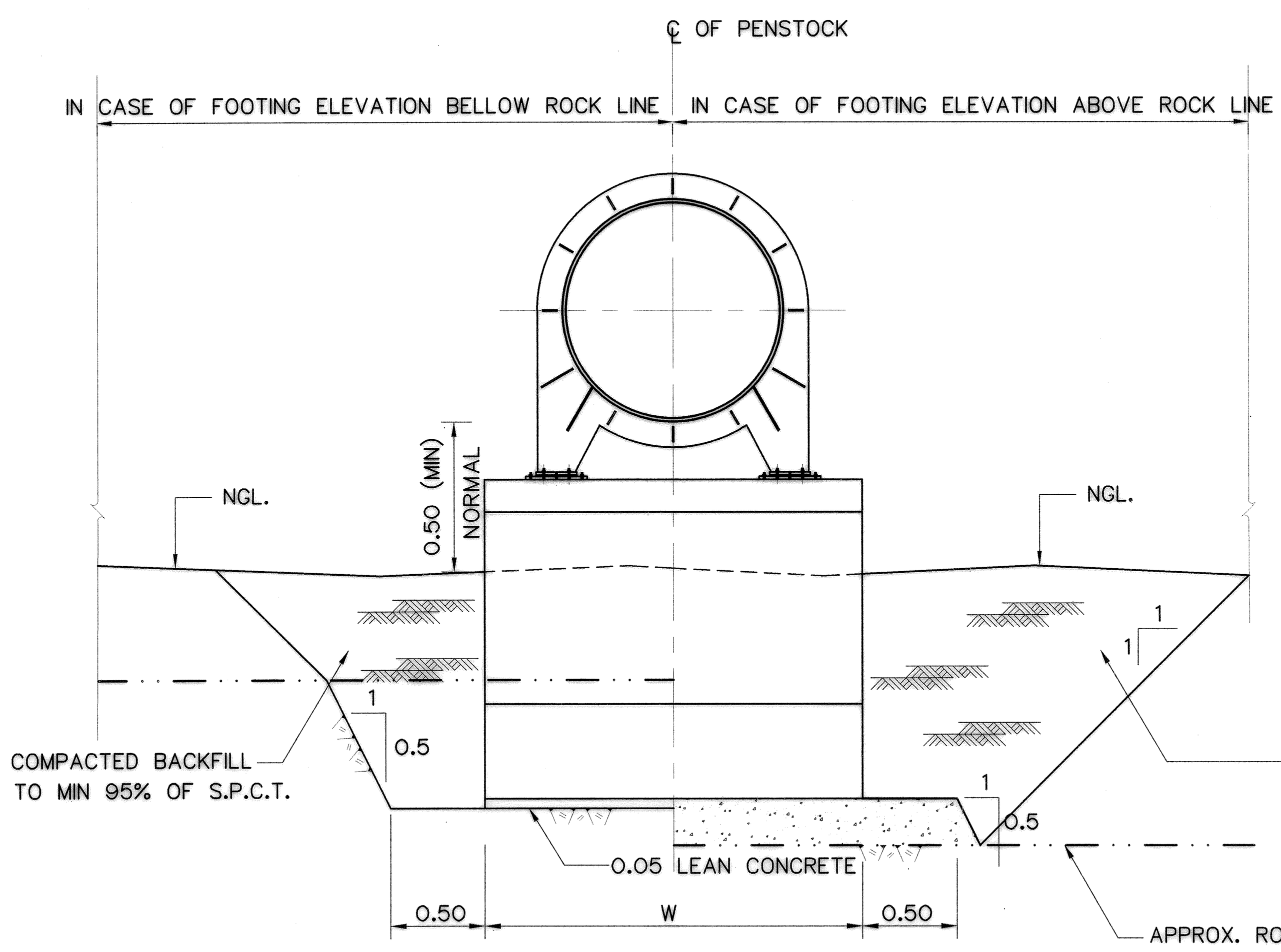
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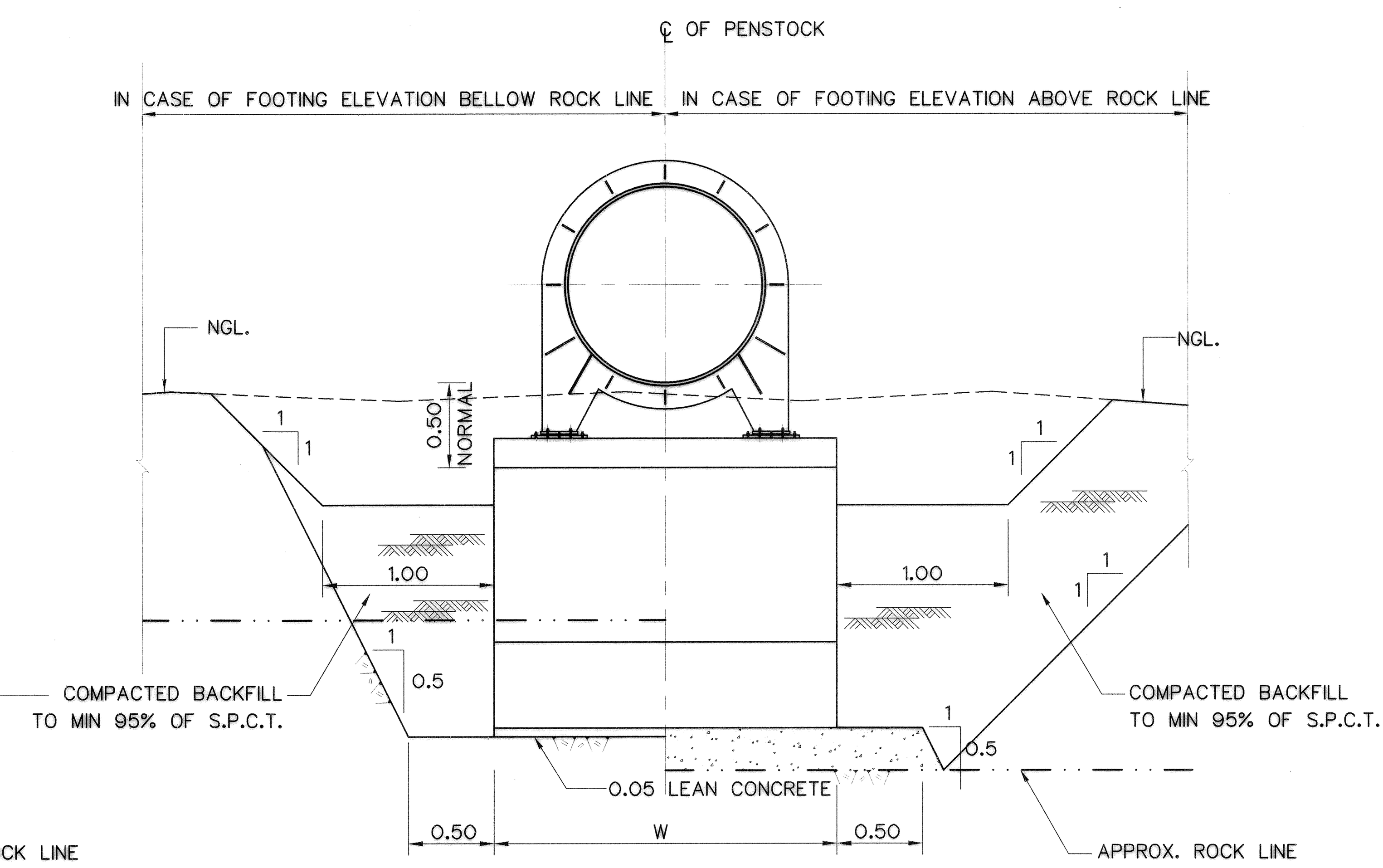
REVIEWED SUBMITTED RECOMMENDED APPROVED P. Hongsakul

DRAWING NO. MH–PS–01

SHEET NO. 32 OF 51



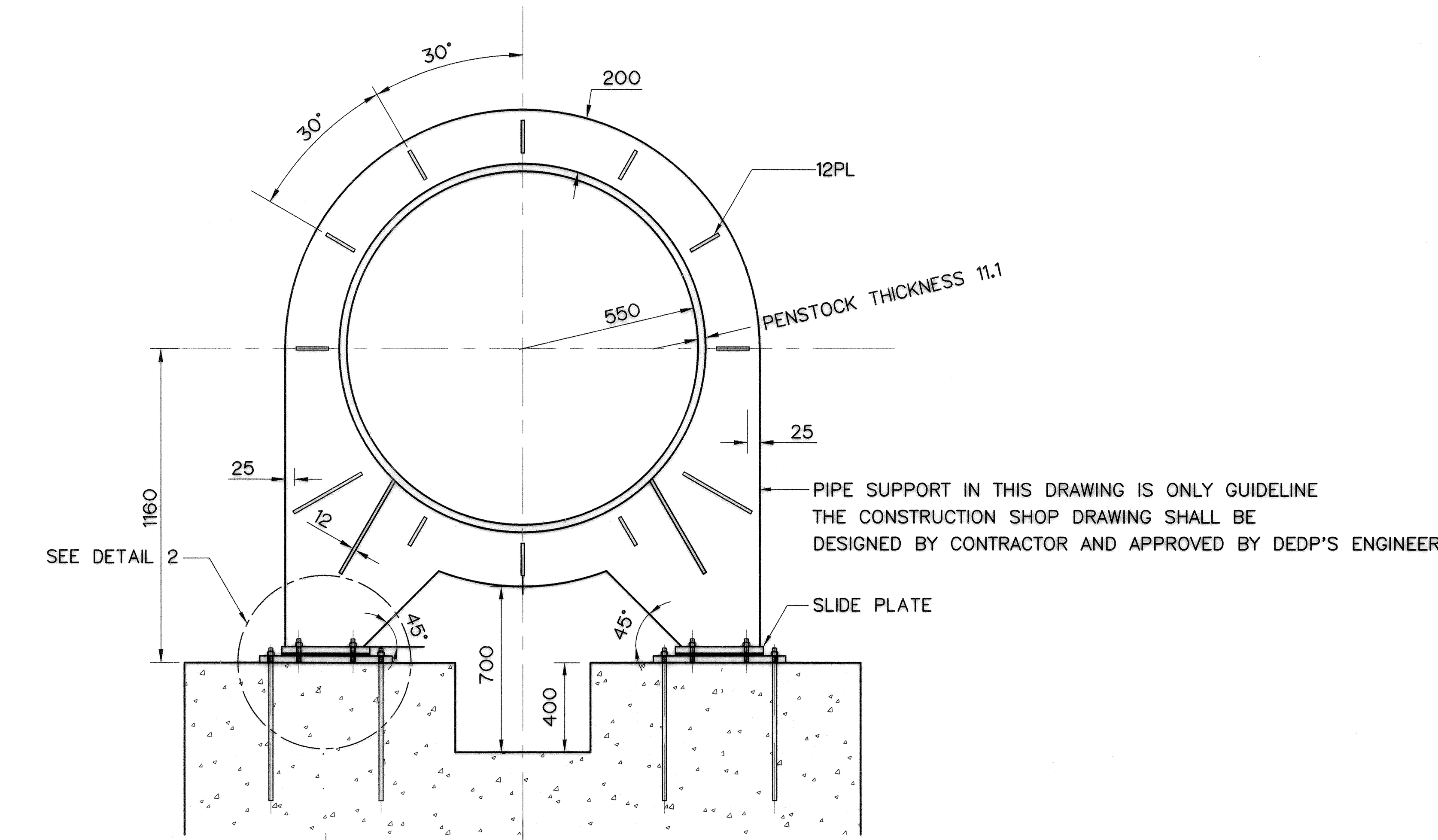
N.G.L. BELLOW INVERT ELEVATION



N.G.L. ABOVE INVERT ELEVATION

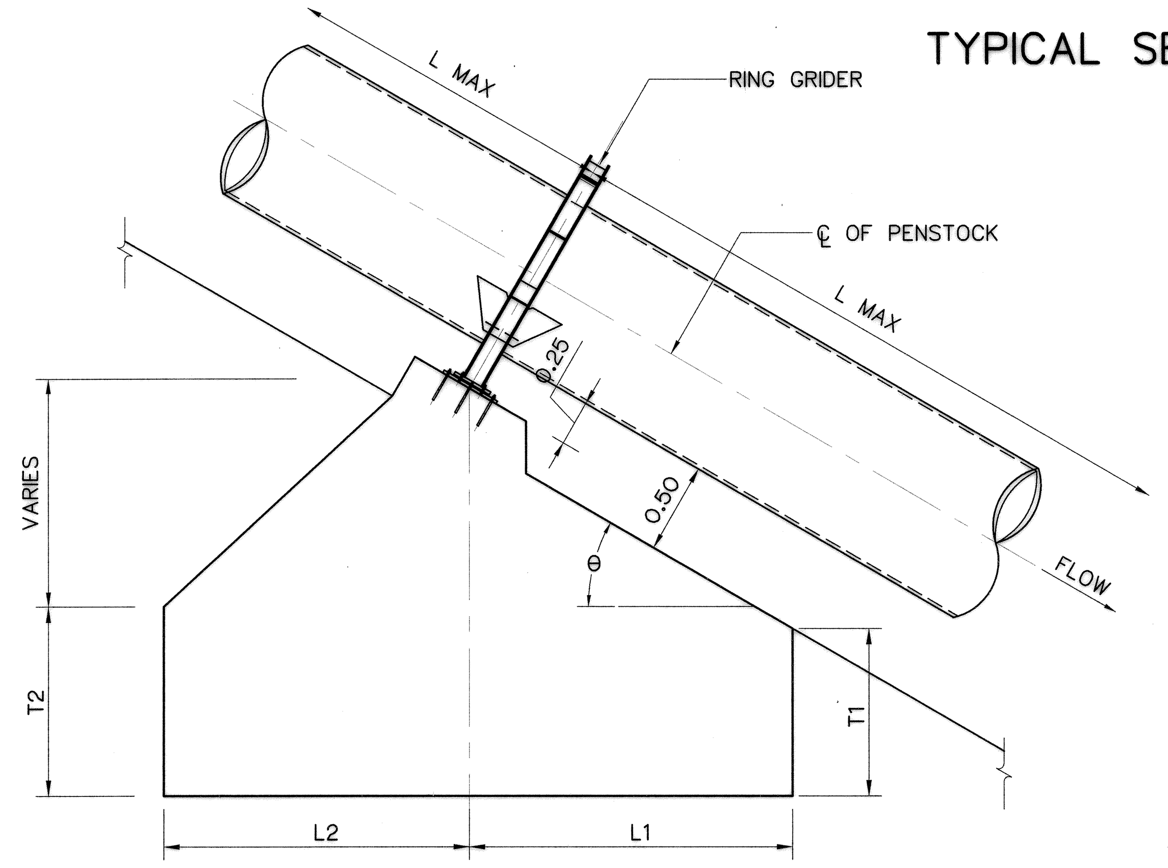
TYPICAL SECTION OF PENSTOCK

NOT TO SCALE



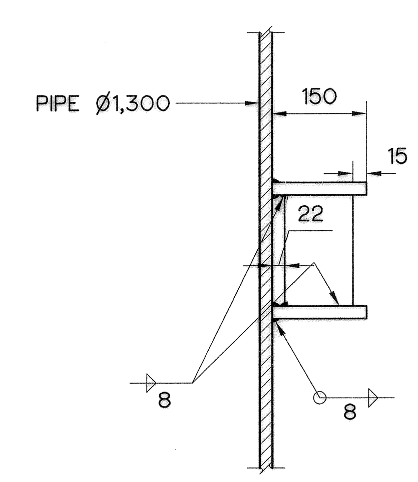
SECTION A – A

SCALE 1:20



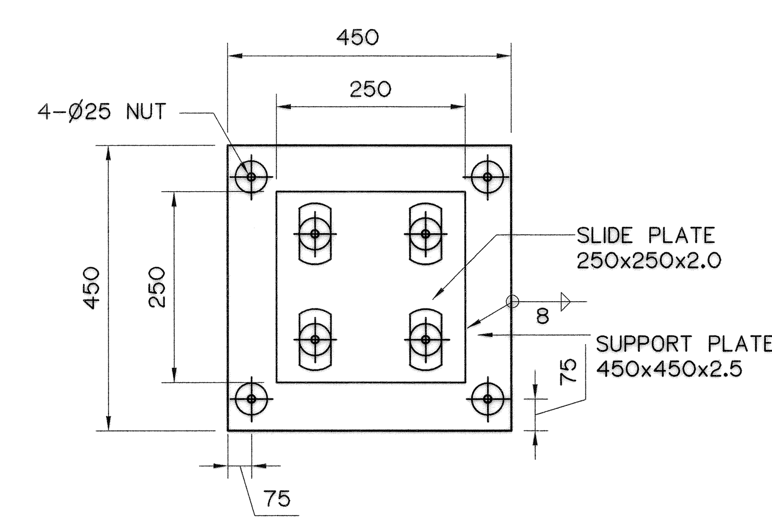
PIER

NOT TO SCALE



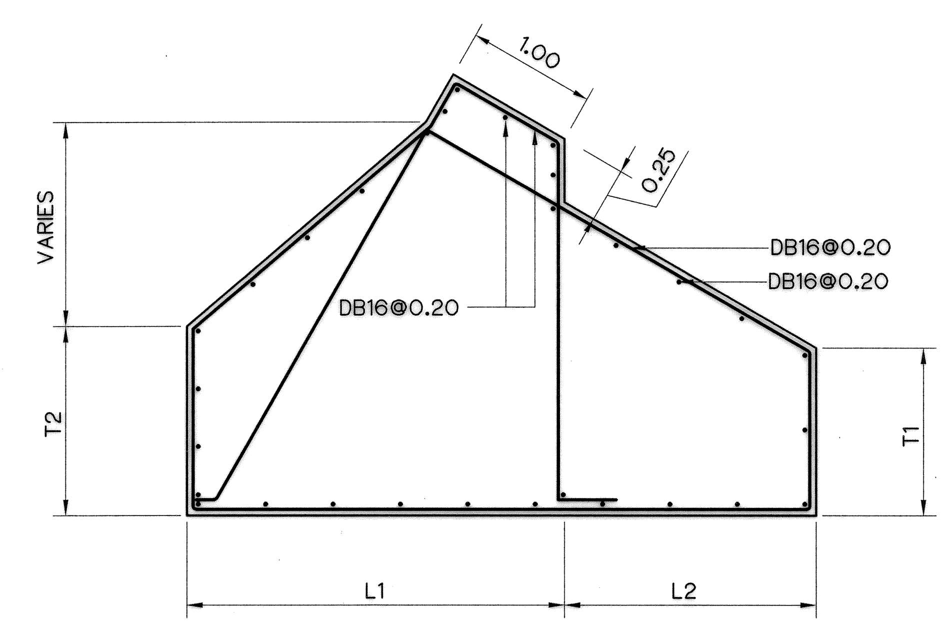
DETAIL "1"

SCALE 1:20



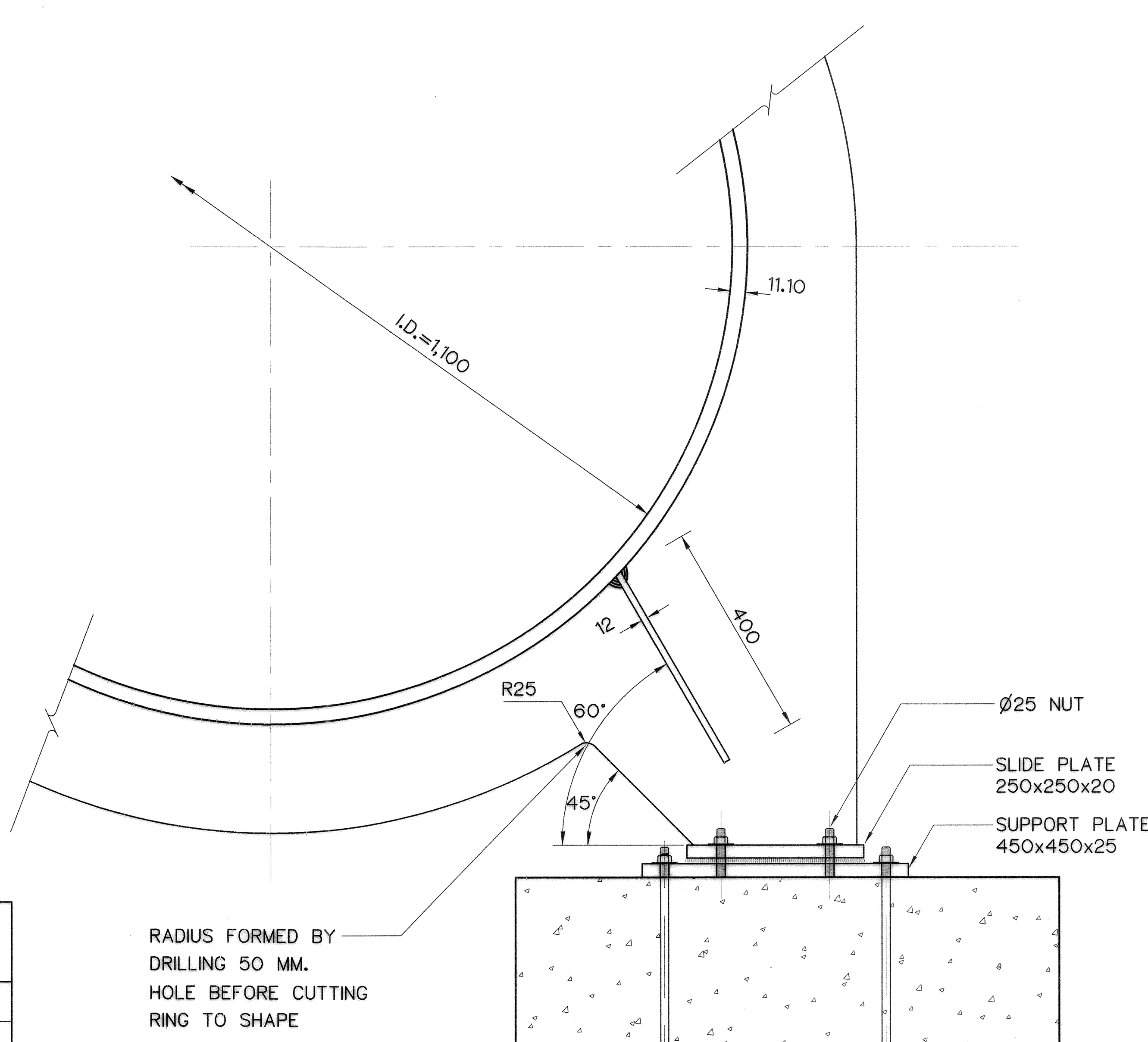
DETAIL "2"

SCALE 1:10



PIER (REINFORCEMENT DETAIL)

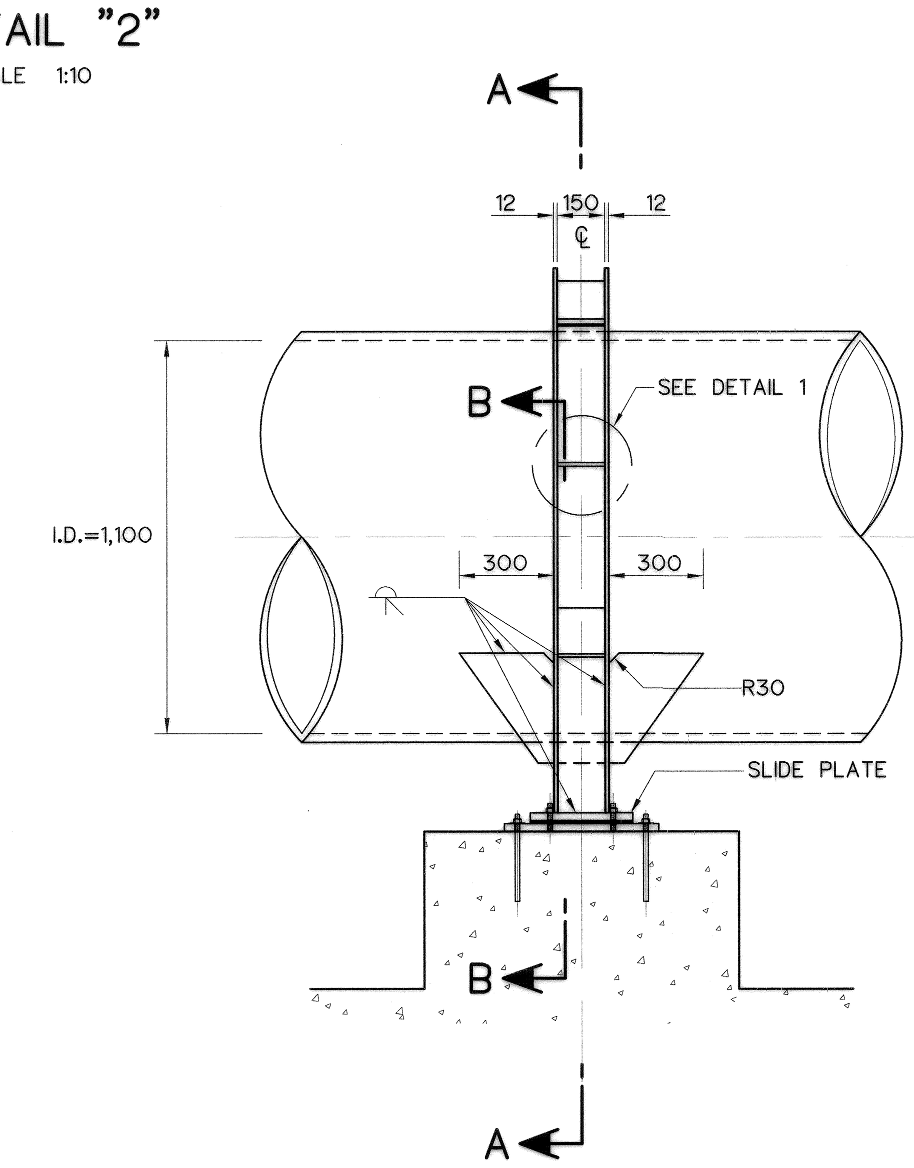
NOT TO SCALE



SECTION B – B

0 0.5 1.0 1.5

SCALE 1:20 METERS



RING GIRDER FOR 1,100 I.D. PIPE

DIMENSIONS FOR PIER

STA.		SLOPE (θ)	L1	L2	T1	T2	W	LMAX
FROM	TO	DEGREE	(m.)	(m.)	(m.)	(m.)	(m.)	(m.)
0+011.500	0+038.000	33.69	2.00	1.50	1.00	1.40	3.00	8.00
0+038.000	0+121.000	29.47	2.00	1.50	1.00	1.50	3.00	8.00
0+121.000	0+197.000	14.46	2.00	1.00	0.50	0.90	3.00	8.00
0+197.000	0+264.000	18.10	2.00	1.00	0.50	1.05	3.00	8.00
0+264.000	0+362.000	25.17	2.00	1.00	0.50	0.90	3.00	8.00

NOTES :

1. ALL DIMENSIONS ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH–GN–03
3. CORROSIVE PROTECTION IS WARNED TO STRICTLY FLOW PAINTING SPECIFICATION

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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	CONSULTANTS		DEDE	

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MINISTRY OF ENERGY

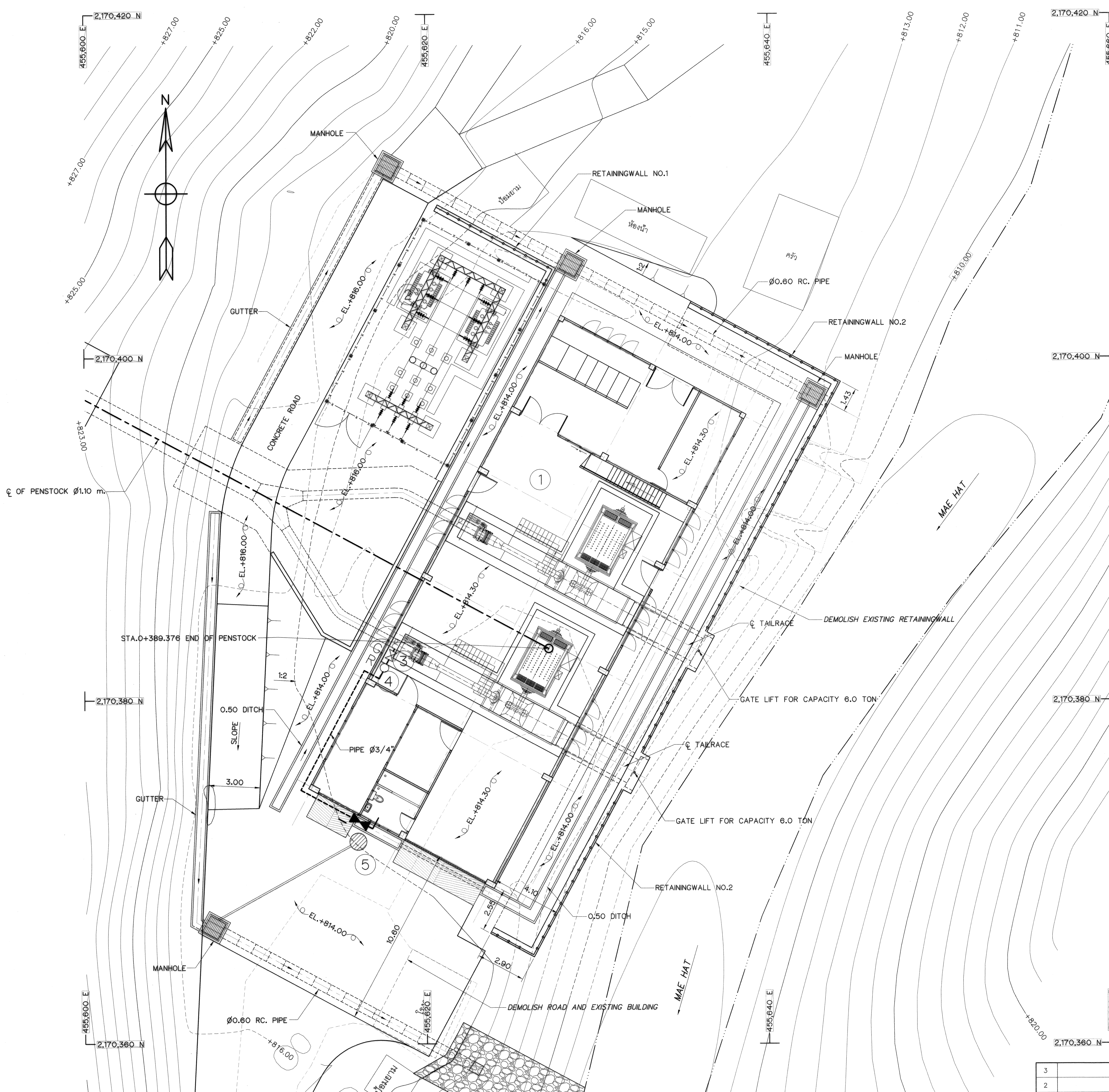
MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT
PENSTOCK
PIPE SUPPORT SECTIONS AND DETAILS

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED ภย.64624 สย.6226	REVIEWED
DRAWN	SUBMITTED Chanit
CHECKED สย.6226	RECOMMENDED
PROJECT MANAGER — DATE 08/03/2559	APPROVED P. Hansell
DRAWING NO. MH–PS–02	SHEET NO. 33 OF 51



GENERAL LAY-OUT

SCALE 1:125

LISTS :

1. POWER HOUSE
2. SWITCHYARD
3. GATE VALVE Ø3/4"
4. PRESSURE REDUCING VALVE
5. SEPTICK TANK

NOTES :

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

REFERENCE DRAWINGS :

1. POWERHOUSE, PLAN 1st FLOOR AND PLAN 2nd FLOOR	MH-PH-02
2. POWERHOUSE, ELEVATIONS	MH-PH-04
3. POWERHOUSE, SECTIONS (SHEET 1/2)	MH-PH-05
4. POWERHOUSE, SECTIONS (SHEET 2/2)	MH-PH-06

0 1 2 4 6 8 10

SCALE 1:125 METERS

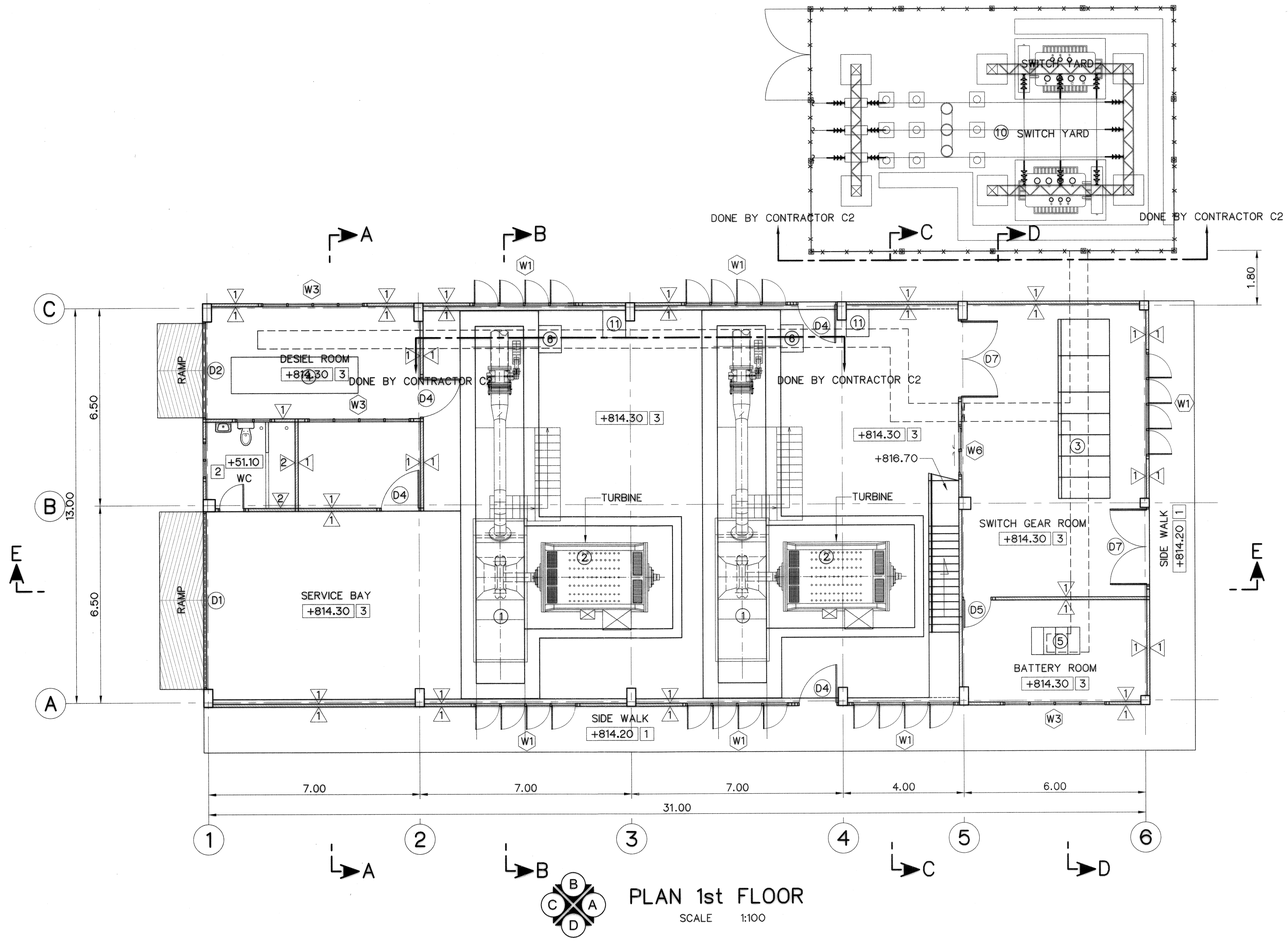
NO.	DATE	REVISIONS	CHECKED	APPROVED
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Department of Alternative Energy Development and Efficiency
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MAE HAT HYDROPOWER PROJECT

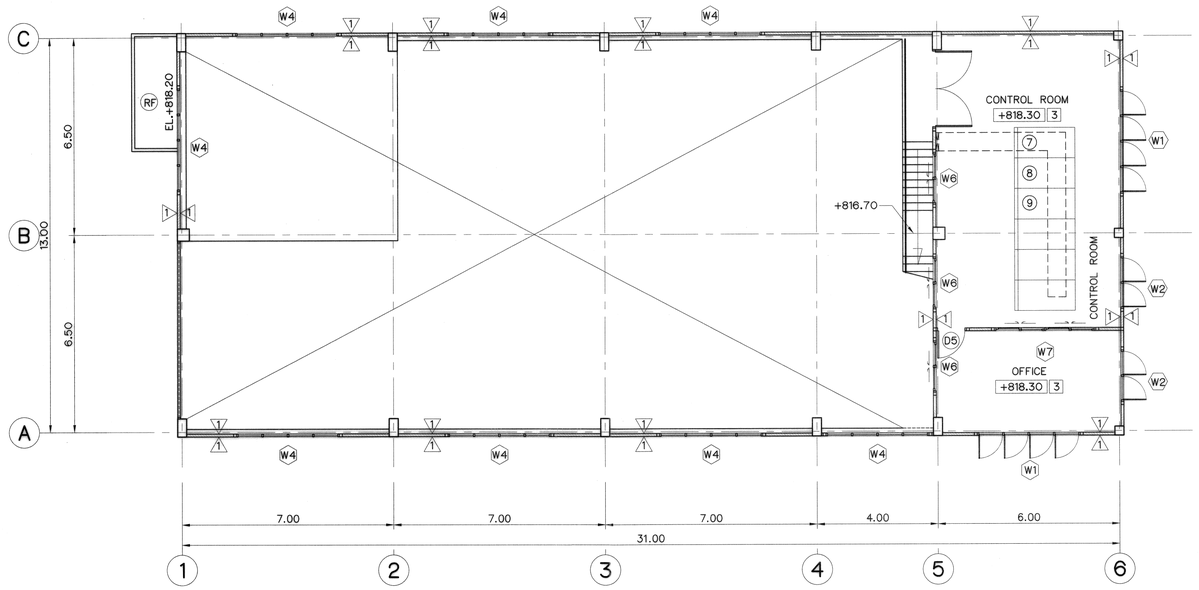
ELECTRO-MECHANICAL EQUIPMENT
POWERHOUSE
GENERAL LAY-OUT

P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
	REVIEWED
DESIGNED ภย.64624 สย.6226	SUBMITTED Chait
DRAWN	RECOMMENDED
CHECKED สย.6226	APPROVED P. Hansell.
PROJECT MANAGER — DATE 08/03/2559	DRAWING NO. MH-PH-01 — SHEET NO. 34 OF 51



PLAN 1st FLOOR

SCALE 1:100



PLAN 2nd FLOOR

SCALE 1:100

DESCRIPTIONS :

1. HORIZONTAL SHAFT KAPLAN TURBINE
2. GENERATOR
3. SWITCH GEAR CUBICLES
4. DIESEL GENERATOR SET
5. BATTERY AND RACK
6. OIL PRESSURE TANK
7. AC AND DC SWITCHBOARD AND
8. BATTERY CHAGER CUBICLE
9. MAIN CONTROL SWITCHBOARD
10. SWITCHYARD
11. NEUTRAL GROUNDING CUBICLE

FLOOR FINISH SYMBOLS :

1. COARSE FINISHED
2. 12"x12" CERAMIC FLOOR TILES
3. COATED WITH EPOXY RESIN

WALL FINISH SYMBOLS :

1. CEMENT PLASTER
2. 8"x8" CERAMIC WALL TILES
3. GLASS BLOCK

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MH-GN-03
3. CONTRACT C1 OF INCLUDE PENSTOCK BEYOND POWERHOUSE WALL 1.00 M. (INCLUDE FLANGE)

REFERENCE DRAWINGS :

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

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

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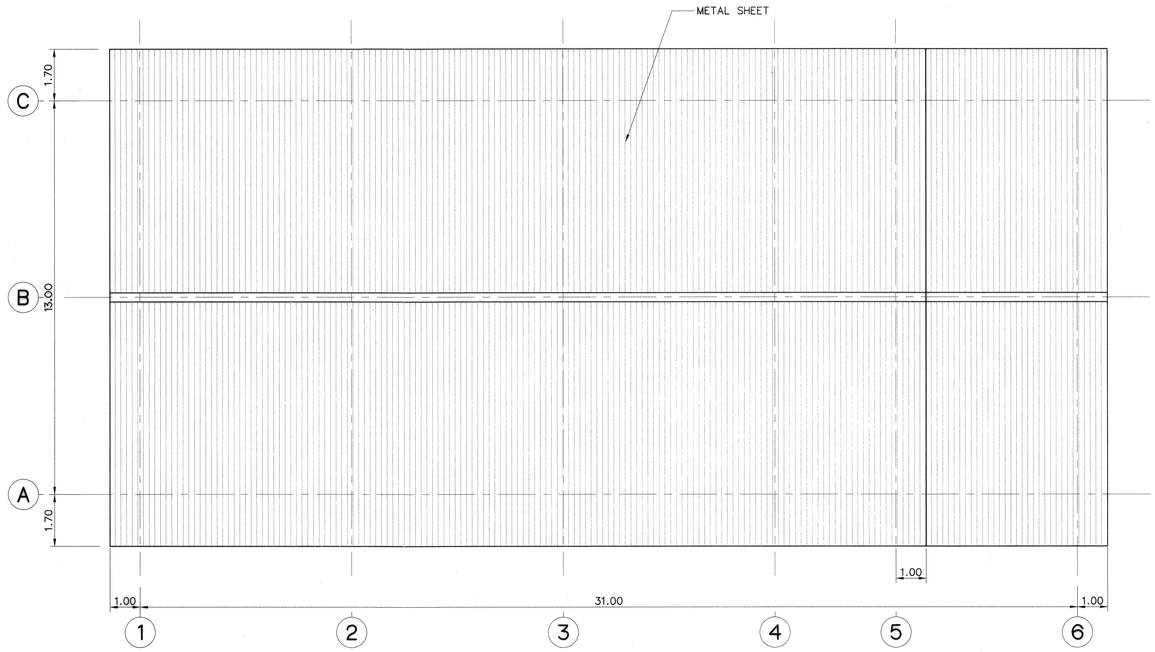
MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
POWERHOUSE
PLAN 1st FLOOR AND PLAN 2nd FLOOR

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

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CHECKED	วสิ.6226
PROJECT MANAGER	08/05/2564 DATE
REVIEWED	
SUBMITTED	
RECOMMENDED	
APPROVED	P. Hanwatt
DRAWING NO.	MH-PH-02
SHEET NO.	35 OF 51



ROOF PLAN

SCALE 1:100

NOTES :

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

REFERENCE DRAWINGS :

1. POWERHOUSE, GENERAL LAY-OUT	MH-PH-01
2. POWERHOUSE, PLAN 1st FLOOR AND PLAN 2nd FLOOR	MH-PH-02
3. POWERHOUSE, ELEVATIONS	MH-PH-04

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

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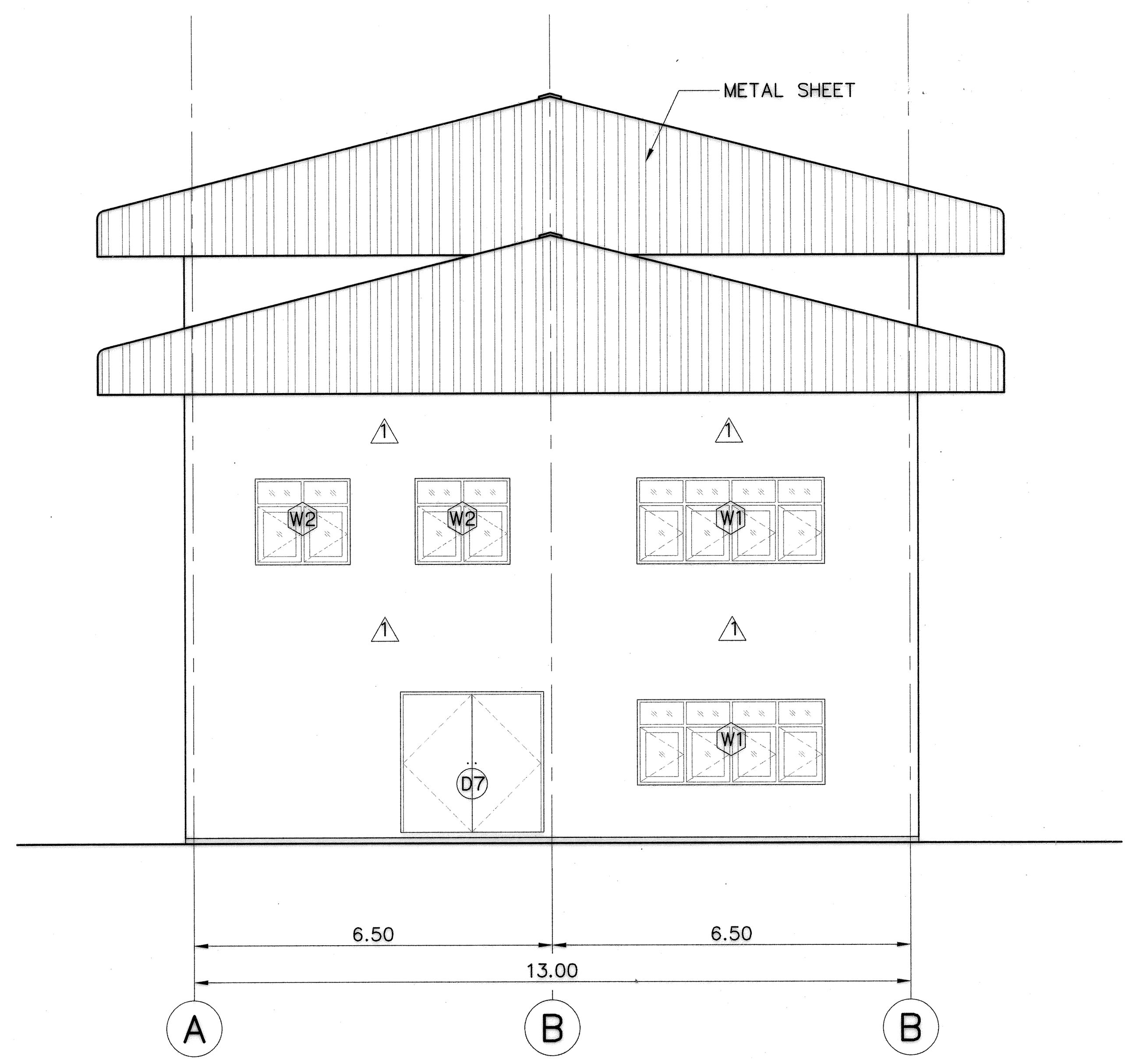
MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
POWERHOUSE
ROOF PLAN

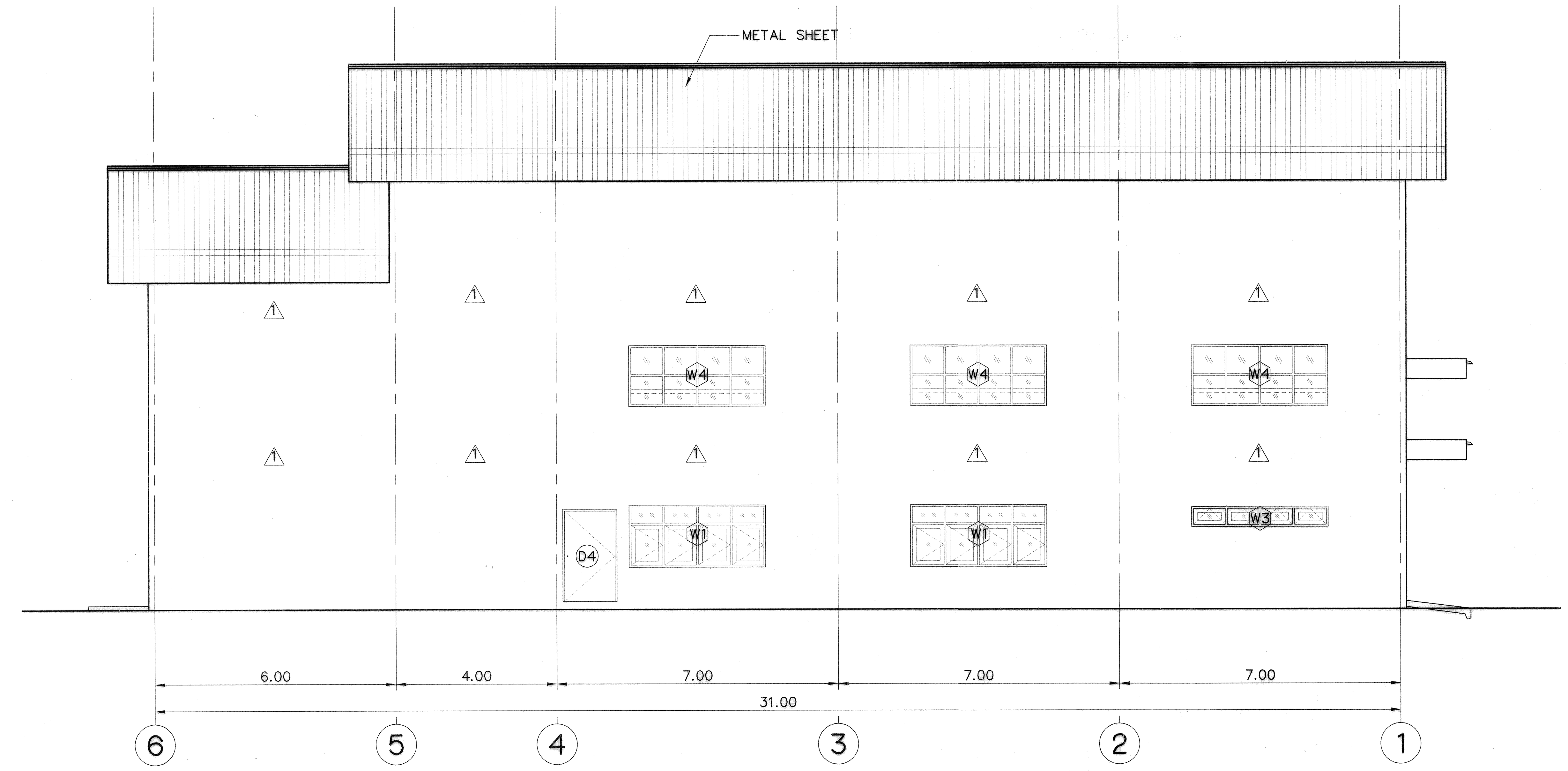
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MINISTRY OF ENERGY

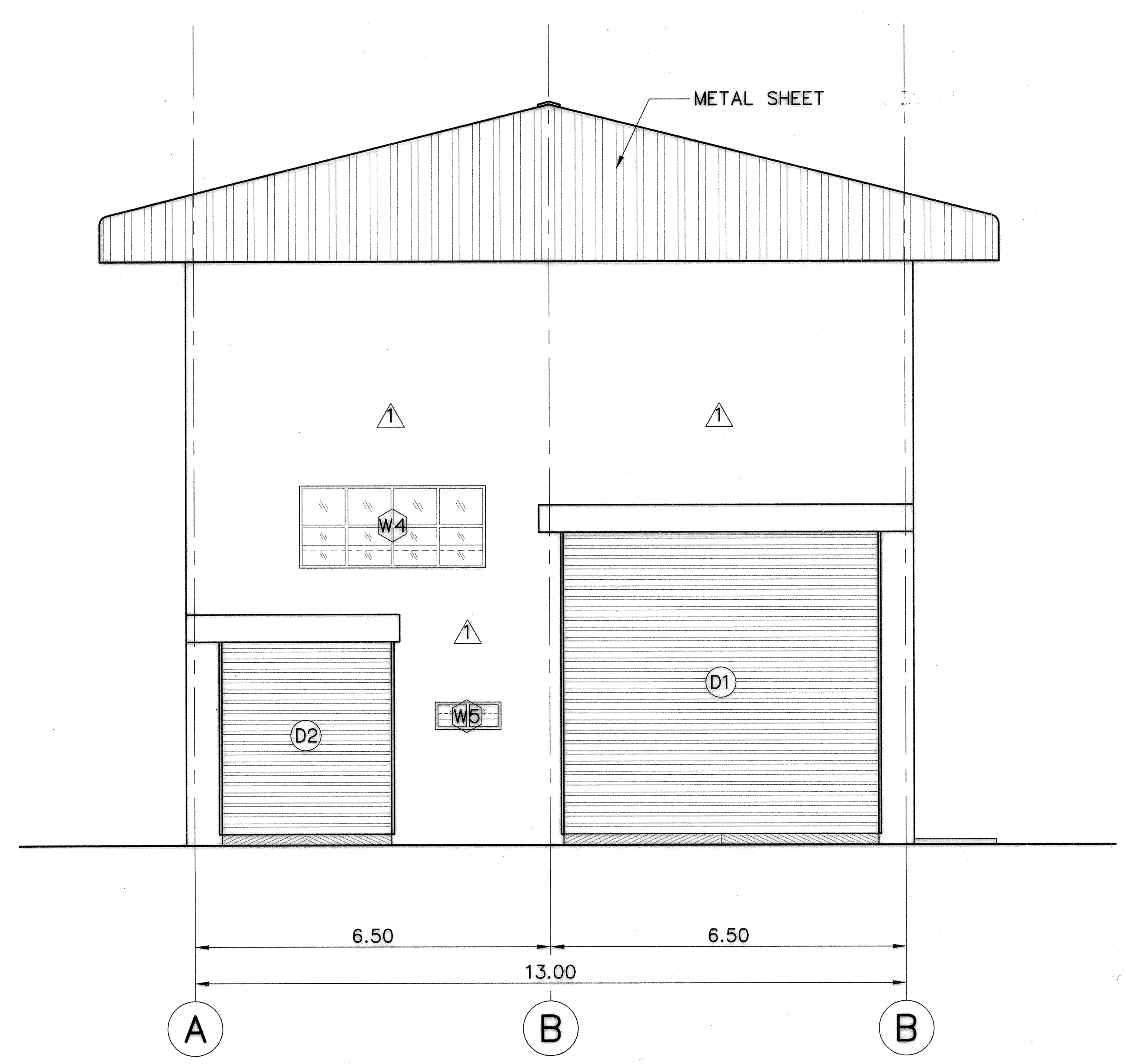
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DRAWING NO.	MH-PH-03
SHEET NO.	36 OF 51



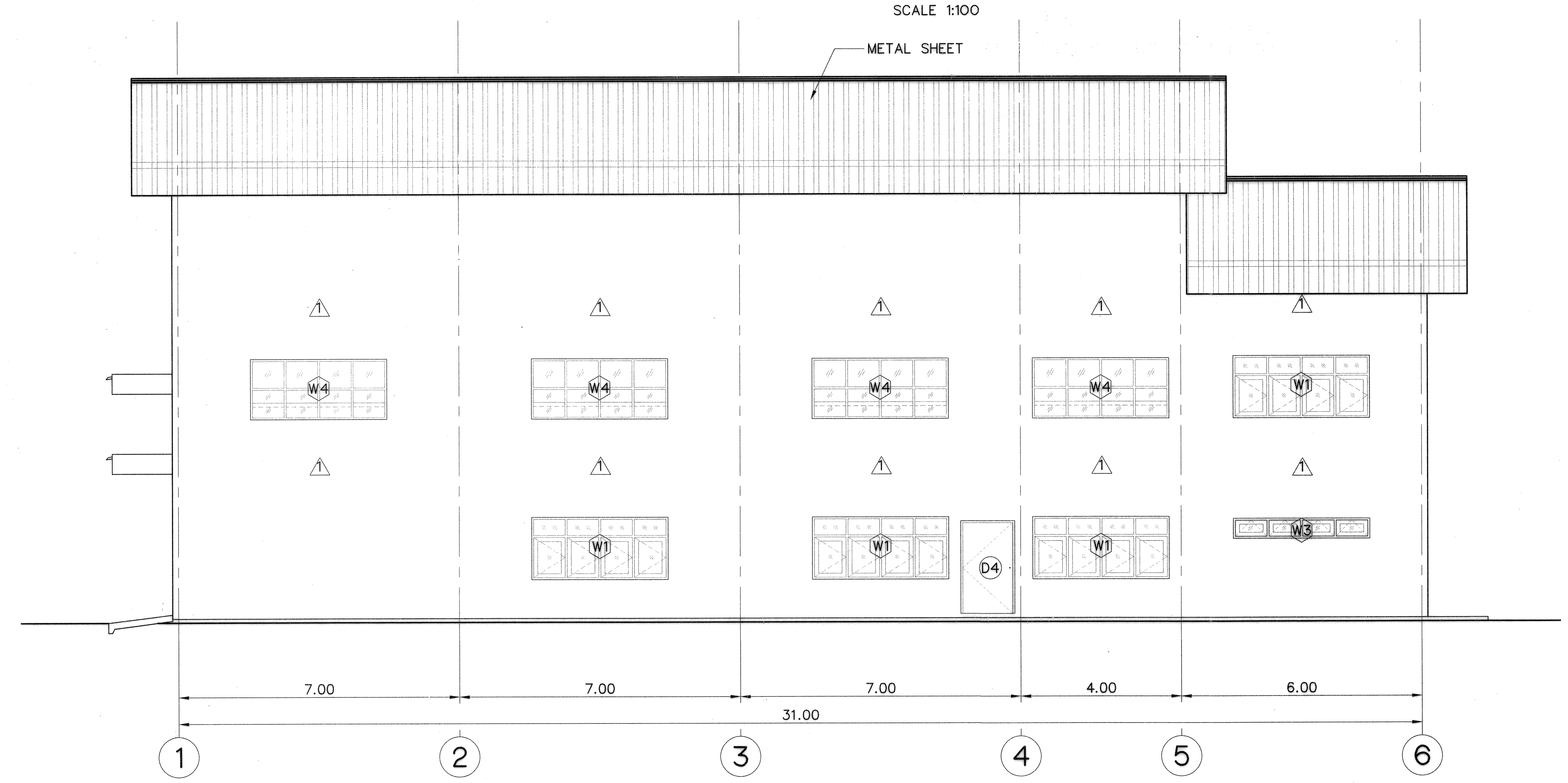
ELEVATION "A"
SCALE 1:100



ELEVATION "B"
SCALE 1:100



ELEVATION "C"
SCALE 1:100



ELEVATION "D"
SCALE 1:100

UNLESS OTHERWISE SHOWN.

2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. NMH-GN-03

REFERENCE DRAWINGS :

1. POWERHOUSE, PLAN 1st FLOOR AND PLAN 2nd FLOOR — NMH-PH-02
2. POWERHOUSE, SECTIONS (SHEET 1/2) — NMH-PH-05
3. POWERHOUSE, SECTIONS (SHEET 2/2) — NMH-PH-06

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

NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

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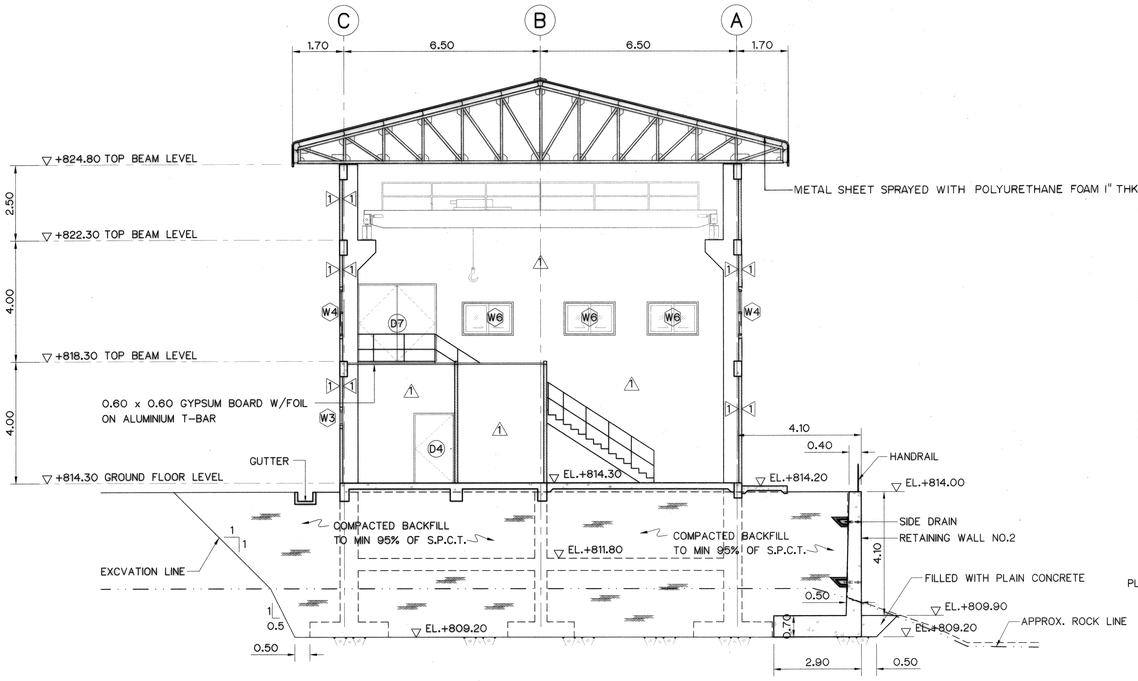
MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT
POWERHOUSE
ELEVATIONS

P&C MANAGEMENT CO.,LTD.

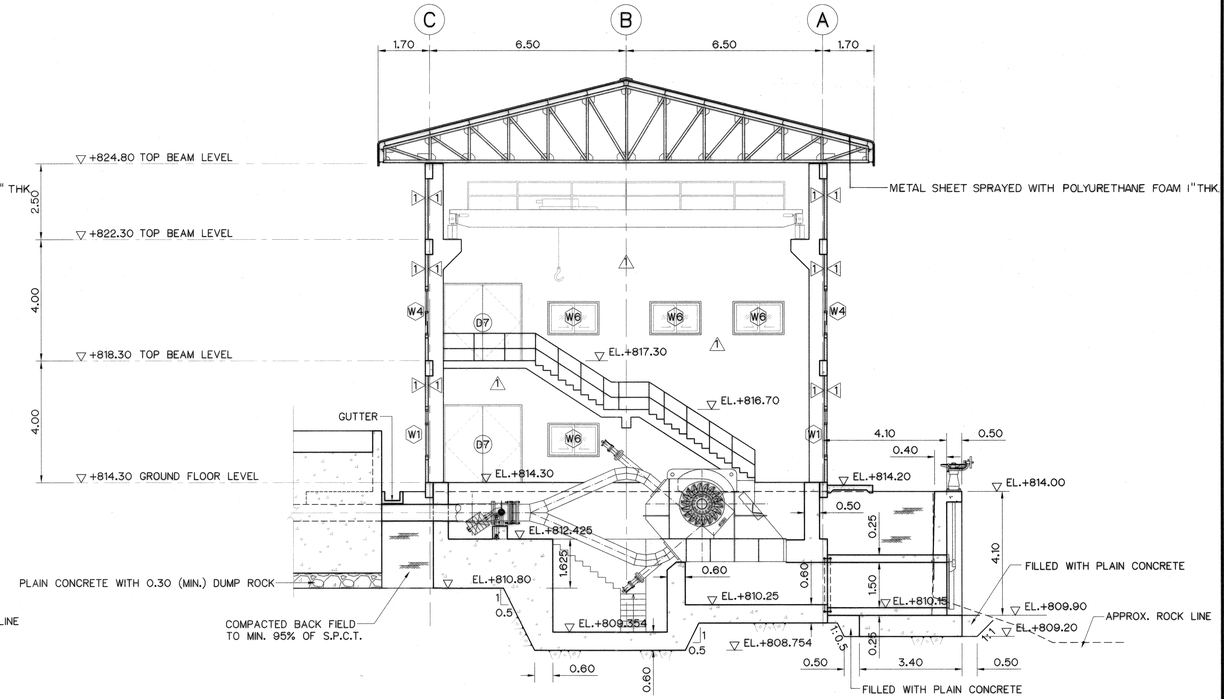
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RECOMMENDED	
APPROVED	P. Hansell
DRAWING NO.	MH–PH–04
SHEET NO.	37 OF 51



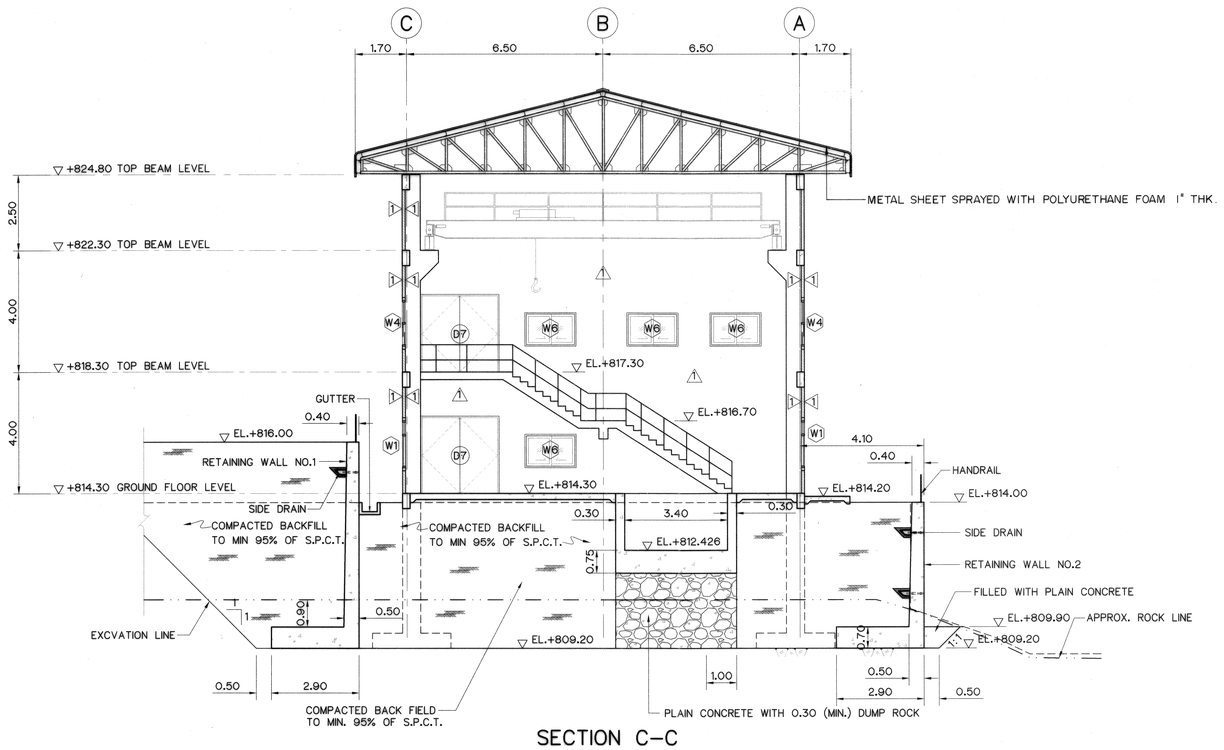
SECTION A–A

SCALE 1:100



SECTION B–B

SCALE 1:100



SECTION C–C

SCALE 1:100

NOTES :

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

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

REFERENCE DRAWINGS :

1. PLAN 1st FLOOR AND PLAN 2nd FLOOR	MH-PH-02
2. ELEVATIONS	MH-PH-04

NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

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MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT

POWERHOUSE

SECTIONS (SHEET 1/2)

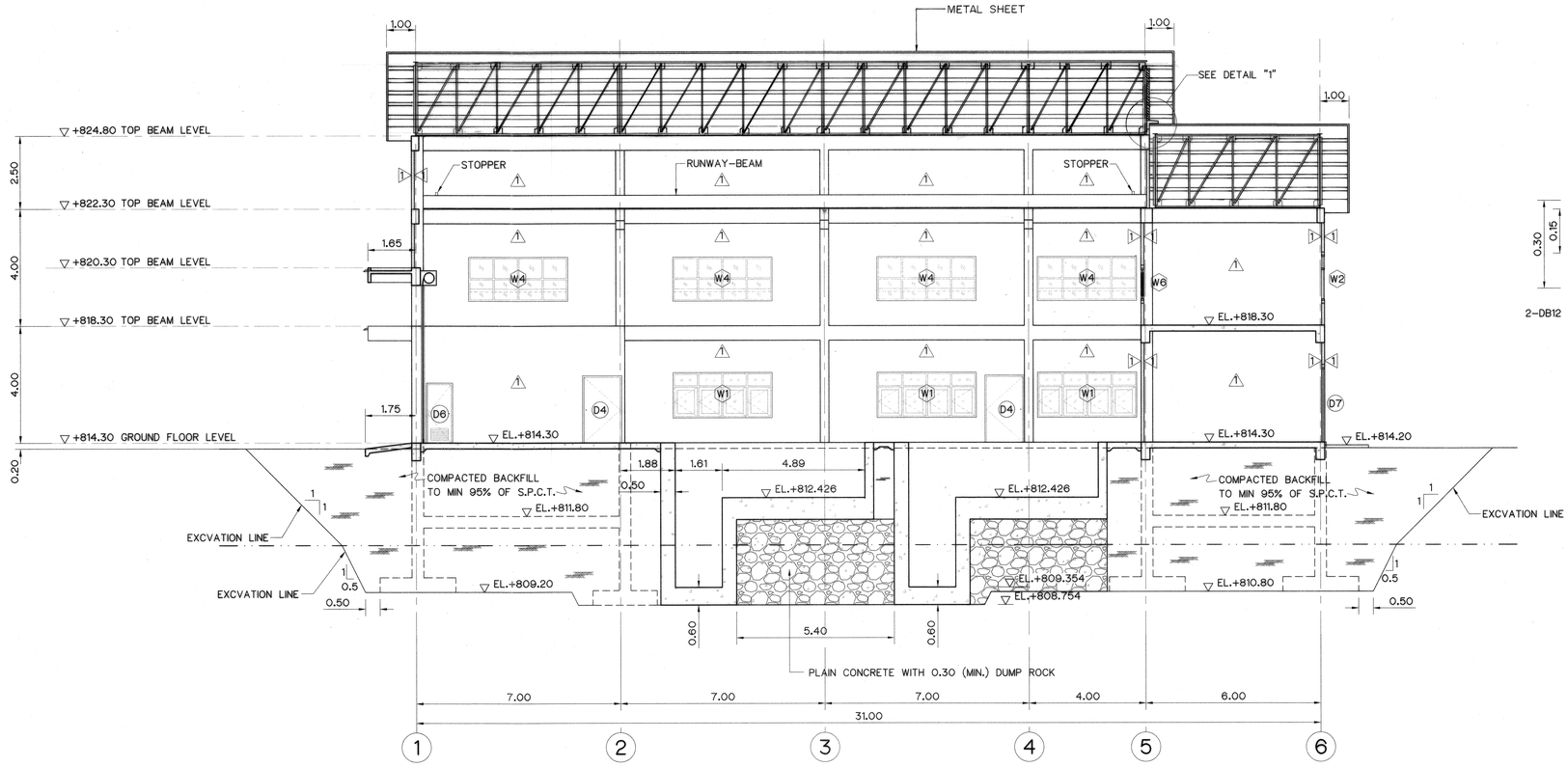
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CHECKED		วิชัย.6226	RECOMMENDED
PROJECT MANAGER		DATE 01/03/2564	APPROVED

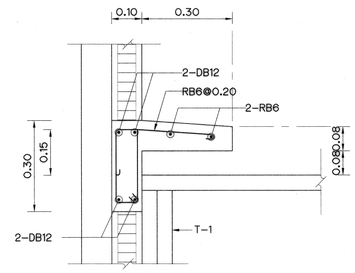
DRAWING NO. MH-PH-05

SHEET NO. 38 OF 51



SECTION E-E

SCALE 1:100



DETAIL "1"

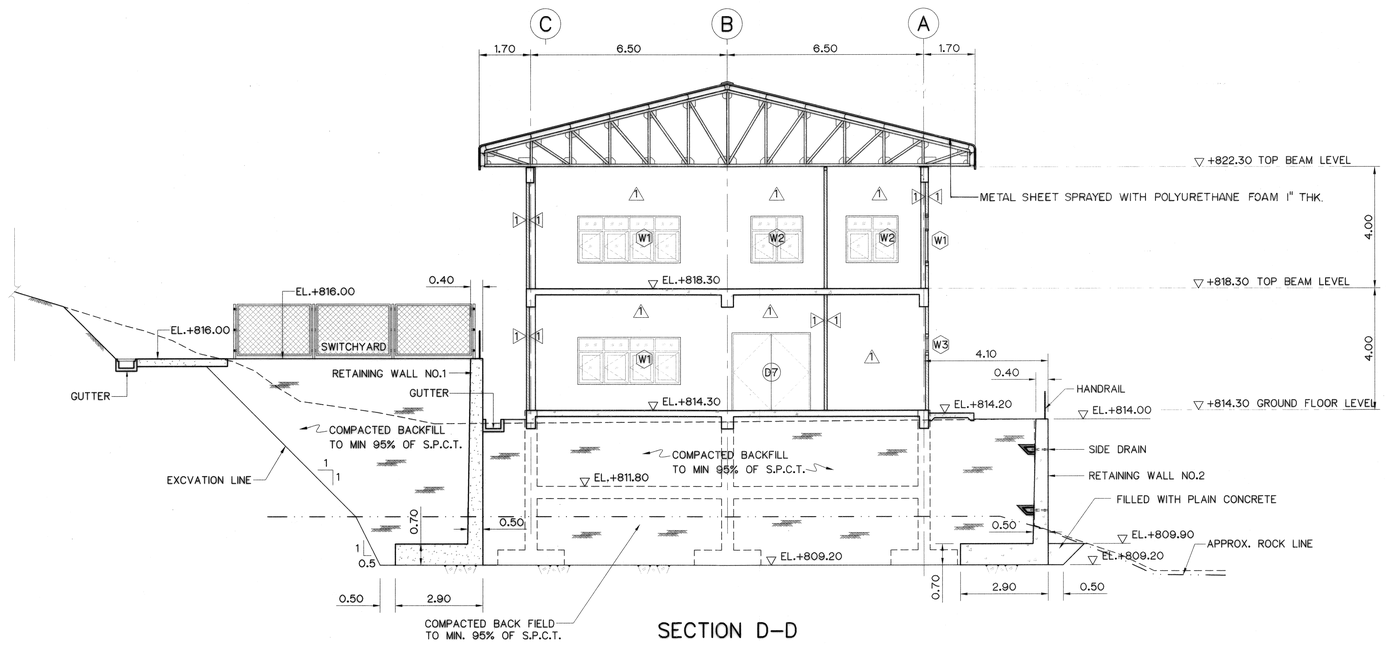
SCALE 1:10

NOTES :

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

REFERENCE DRAWINGS :

1. PLAN 1st FLOOR AND PLAN 2nd FLOOR	MH-PH-02
2. ELEVATIONS	MH-PH-04



SECTION D-D

SCALE 1:100

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
POWERHOUSE
SECTIONS (SHEET 2/2)

NO.	DATE	REVISIONS	CHECKED	APPROVED
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CONSULTANTS | DEDE

P&C MANAGEMENT CO.,LTD.

DESIGNED | CHECKED | DRAWN

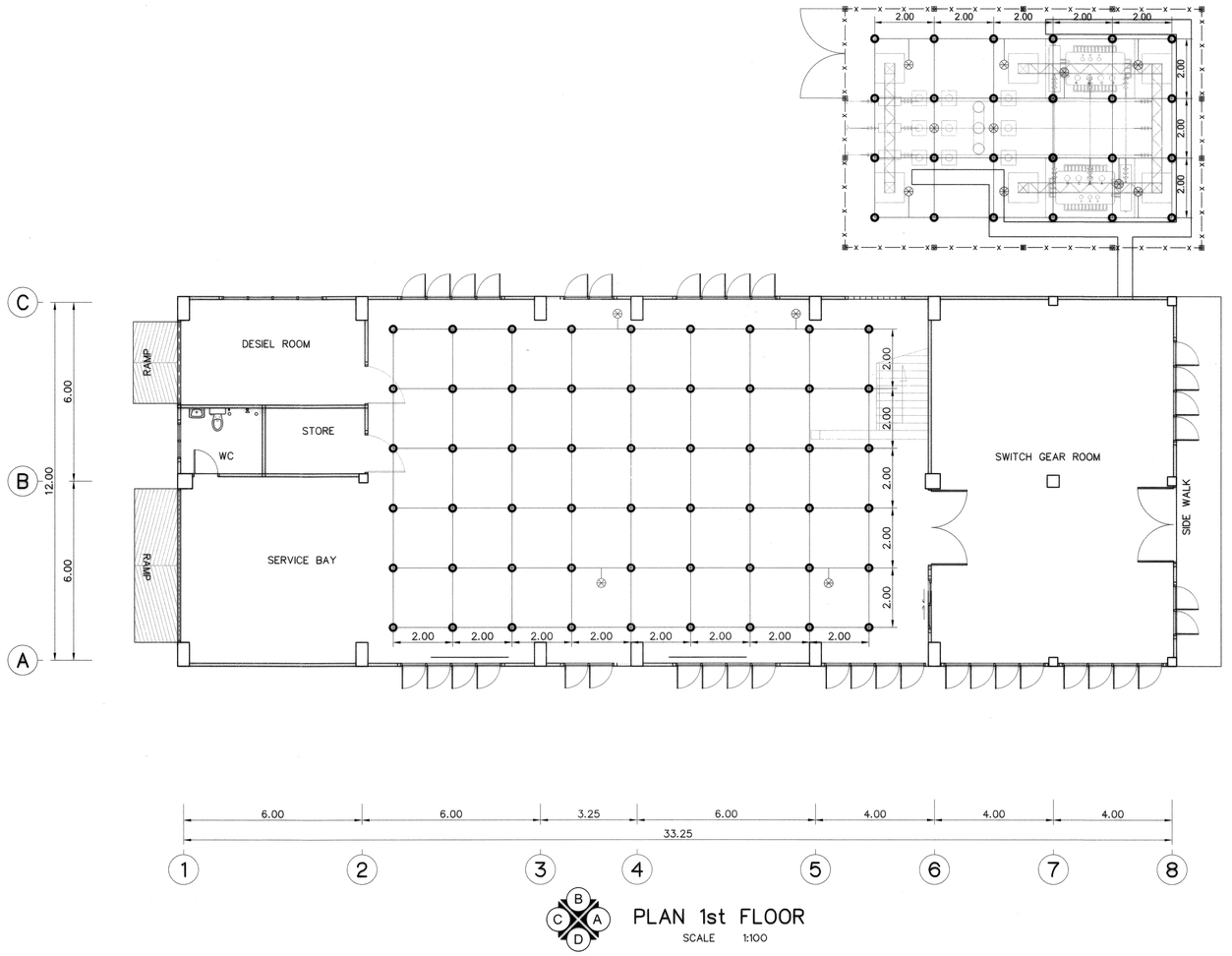
PROJECT MANAGER | DATE

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

REVIEWED | SUBMITTED | RECOMMENDED | APPROVED

DRAWING NO. MH-PH-06

SHEET NO. 39 OF 51



PLAN 1st FLOOR

SCALE 1:100

LEGENDS :

- GROUND ROD
- GROUND POINT FOR POWER PLANT EQUIPMENT GROUNDING
- BARE CUPPER CONDUCTOR

NOTE

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

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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	CONSULTANTS		DEDE	

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MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT

POWERHOUSE

GROUNDING SYSTEMS

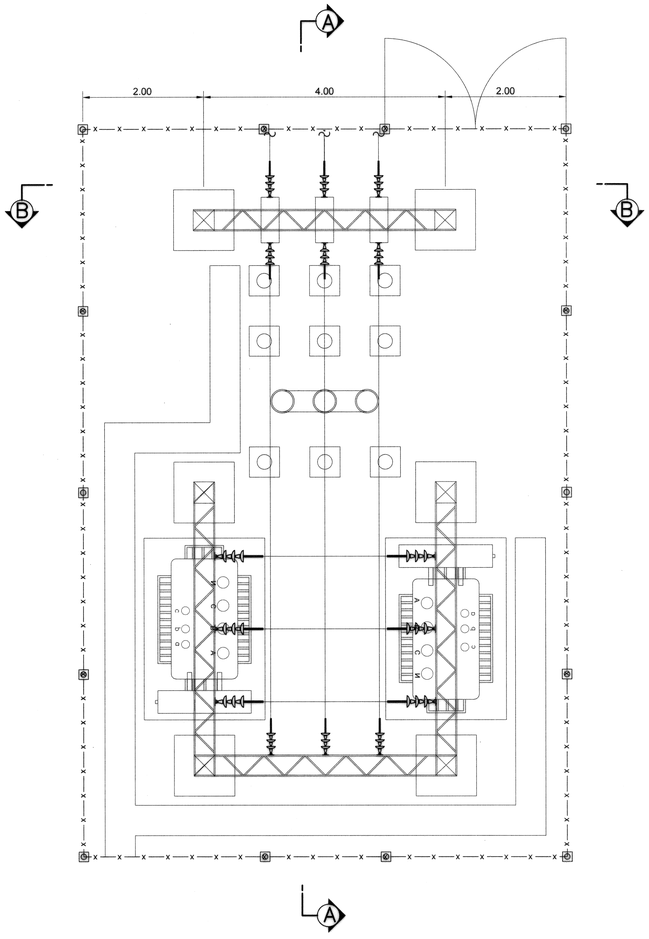
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Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

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PROJECT MANAGER 08/01/2551 DATE	APPROVED

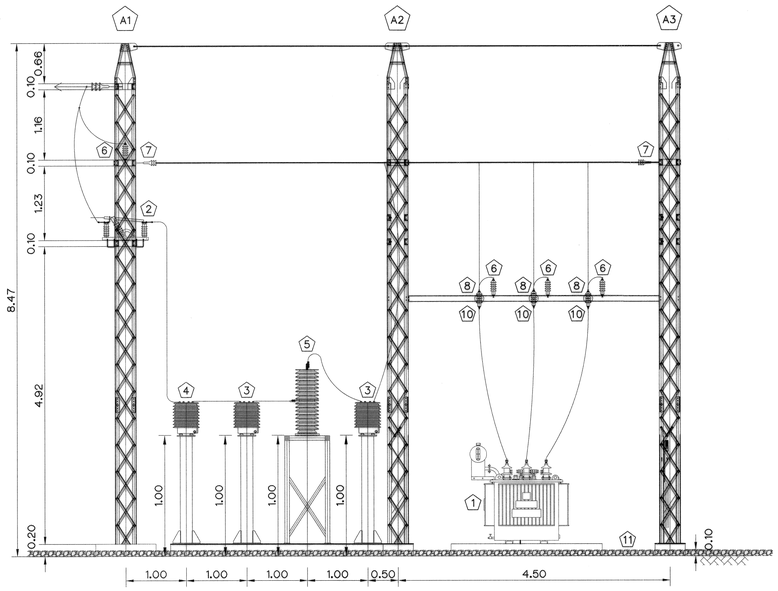
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SHEET NO. 40 OF 51



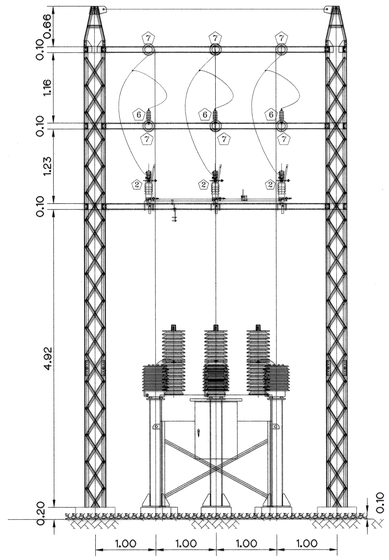
SWITCHYARD PLAN LAYOUT

SCALE 1:50



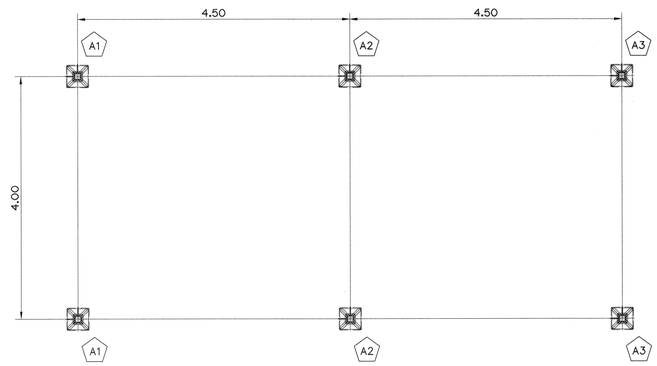
SECTION A–A

SCALE 1:50



SECTION B–B

SCALE 1:50



OVERHEAD GROUND WIRE PLAN

SCALE 1:50

ITEM.	DESCRIPTION	Q'TY.	REMARK.
1	MAIN TRANSFORMER 22000/3300 V.	2	
2	DISCONNECTING SWITCH	1	
3	OUTDOOR CURRENT TRANSFORMERS RATIO	6	
4	OUTDOOR VOLTGE TRANSFORMER RATIO	3	
5	SF6 CIRCUIT–BREAKER	1	
6	SURGE ARRESTERS	9	
7	SUSPENSION INSULATORS	45	
8	LINE POST INSULATORS	6	
9	LINE GROUND SWITCH	2	
10	22 KV. DROP OUT FUSE	6	
11	GRAVEL	1	

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MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT

POWERHOUSE

SWITCHYARD PLAN LAYOUT SECTIONS AND GROUND SYSTEM

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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	CONSULTANTS		DEDE	

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED 2พ.ค.04 REVIEWED

DRAWN SUBMITTED

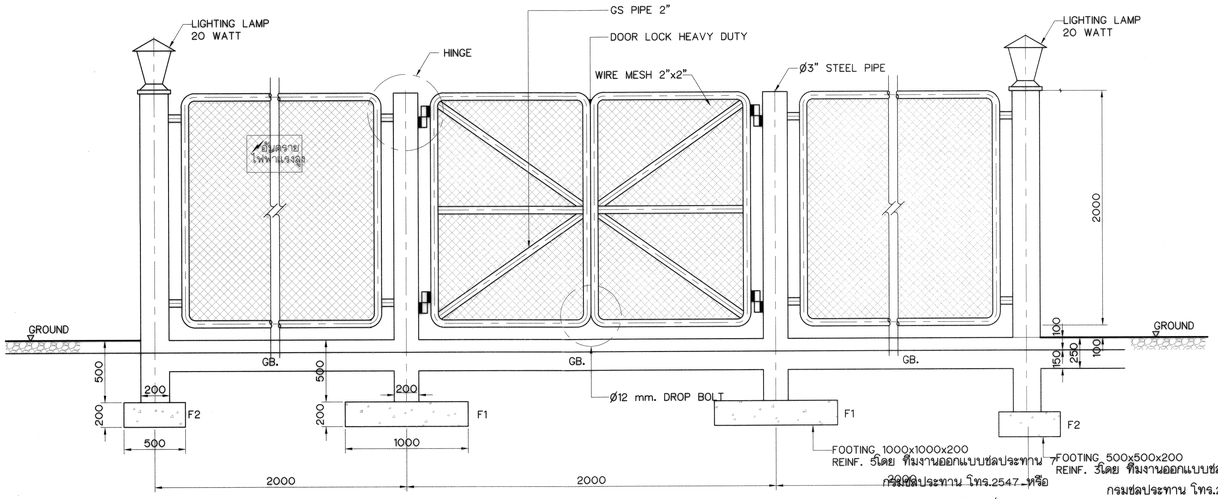
CHECKED 2พ.ค.04 RECOMMENDED

APPROVED P. Hanwell.

PROJECT MANAGER 08/05/2559 DATE

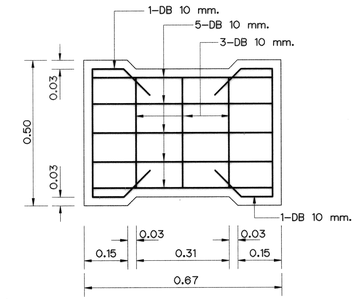
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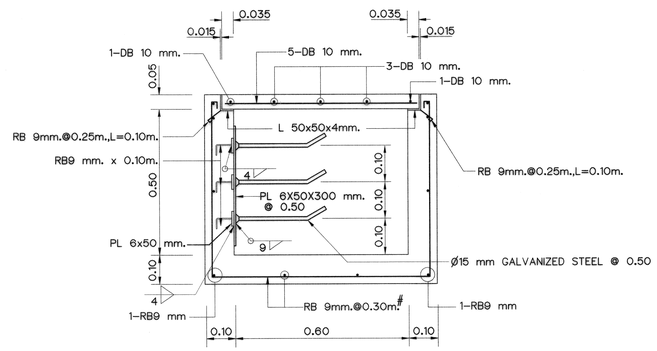
SHEET NO. 41 OF 51



FENCE DETAIL

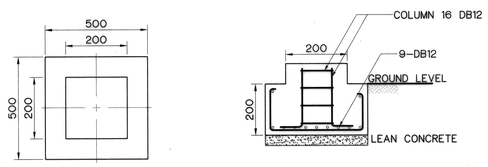
NOT TO SCALE





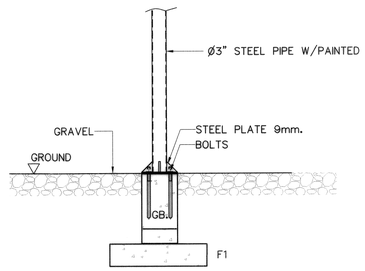
DETAIL CABLE TRENCH IN SWITCHYARD

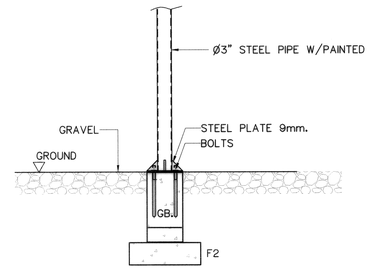
SCALE 1:10

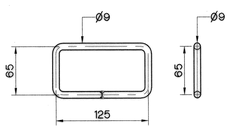


DETAIL COLUMN F2

NOT TO SCALE

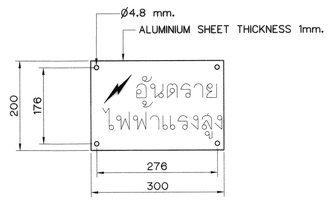






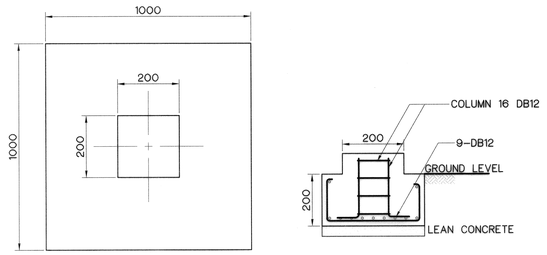
DETAIL "A"

NOT TO SCALE



WARNING SIGN

NOT TO SCALE



DETAIL COLUMN F1

NOT TO SCALE

0 0.05 0.1 0.2 0.3 0.4
SCALE 1:5 METERS

0 0.1 0.2 0.4 0.6 0.8
SCALE 1:10 METERS

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. HMP-GN-03
3. THE TRANSFORMER YARD WILL BE ACCORDING TO PEA STANDARD.

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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

MAE HAT HYDROPOWER PROJECT

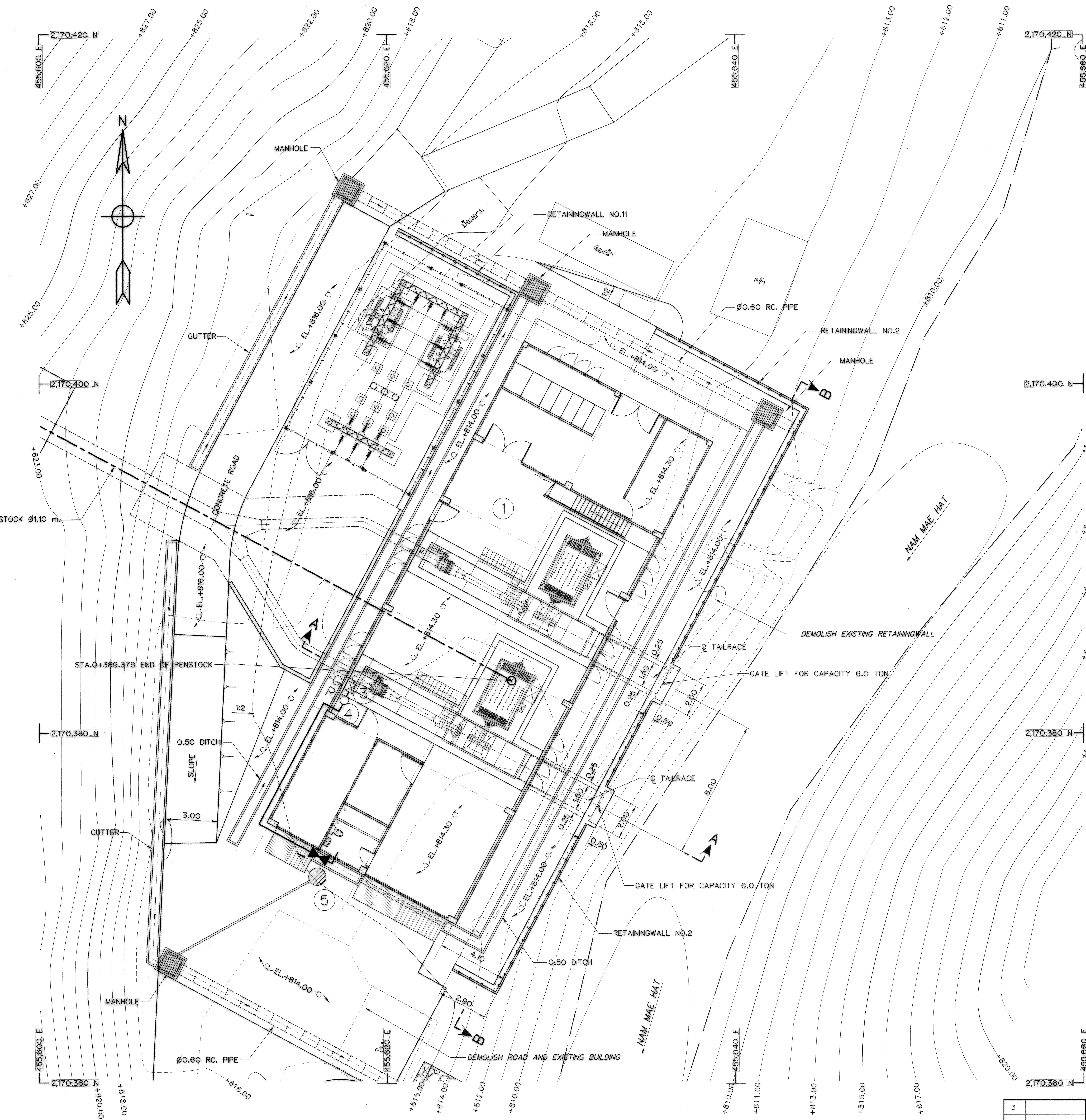
ELECTRO-MECHANICAL EQUIPMENT
POWERHOUSE
SWITCHYARD FENCE AND CABLE TRENCH

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	ก.ย.64624	ส.ค.6226	REVIEWED
DRAWN			SUBMITTED
CHECKED		ส.ค.6226	RECOMMENDED
PROJECT MANAGER		08/03/2564 DATE	APPROVED

DRAWING NO. MH-PH-09
SHEET NO. 42 OF 51



PLAN

SCALE 1:125

LISTS :

1. POWER HOUSE
2. SWITCHYARD
3. GATE VALVE Ø3/4"
4. PRESSURE REDUCING VALVE
5. SEPTICK TANK

NOTES :

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

REFERENCE DRAWINGS :

1. TAILRACE, SECTION AND DETAILS MH–TR–02

0 1 2 4 6 8 10

SCALE 1:125 METERS

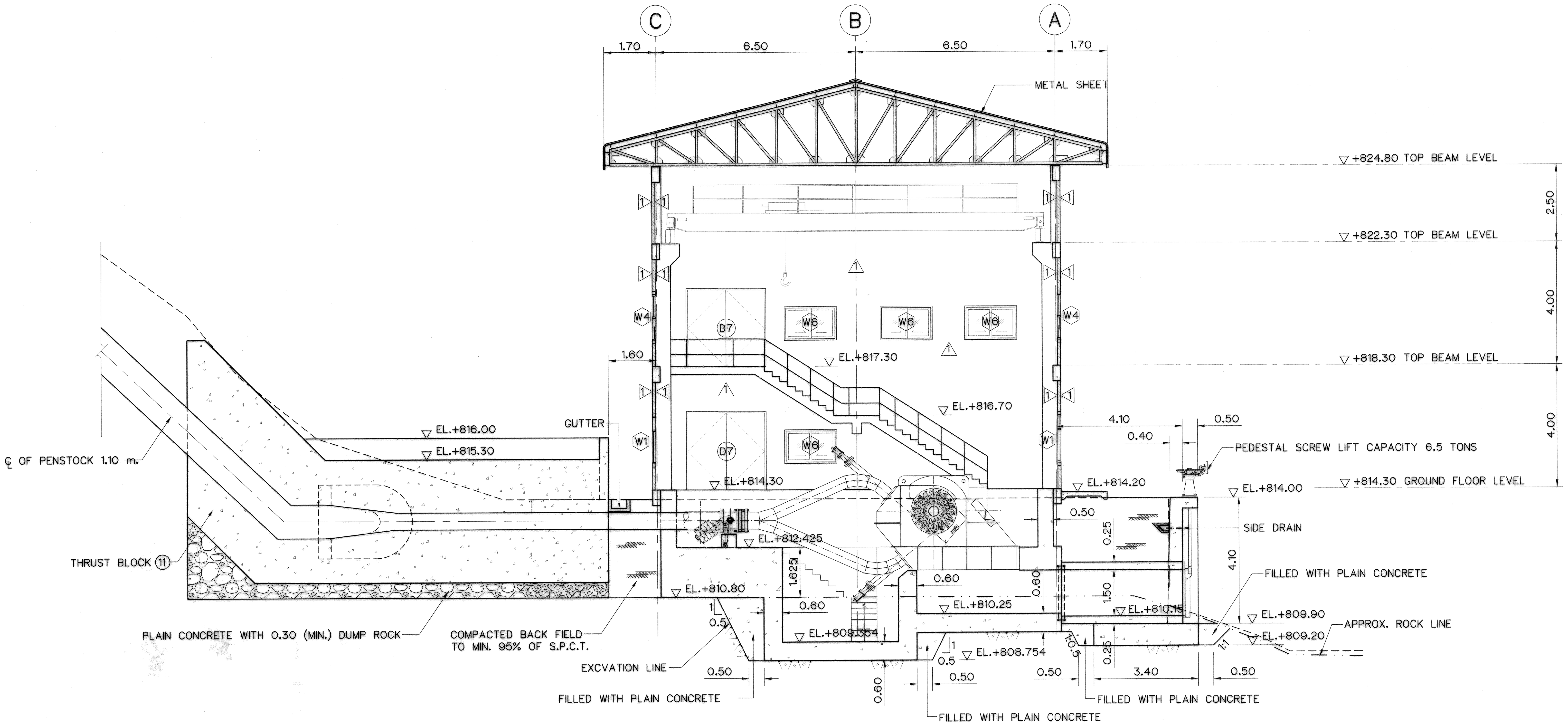
NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

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MAE HAT HYDROPOWER PROJECT

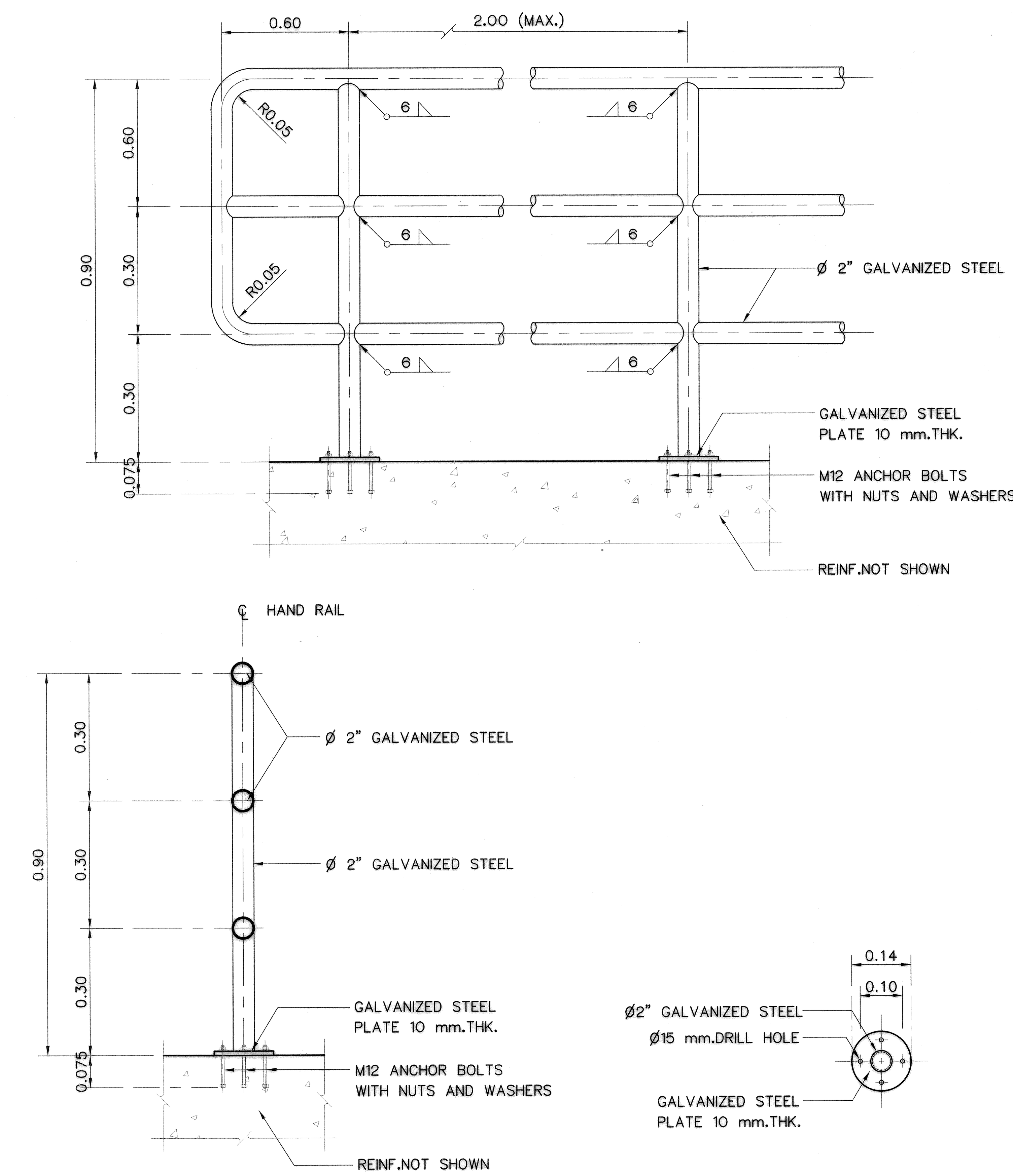
ELECTRO–MECHANICAL EQUIPMENT
TAILRACE
PLAN

P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
	REVIEWED
DESIGNED ภย.64624 สย.6226	SUBMITTED Chait
DRAWN	RECOMMENDED
CHECKED สย.6226	APPROVED P. Hanzell
PROJECT MANAGER — DATE 08/03/2559	DRAWING NO. MH–TR–01 — SHEET NO. 43 OF 51



SECTION A–A

SCALE 1:100



DETAIL OF HANDRAIL

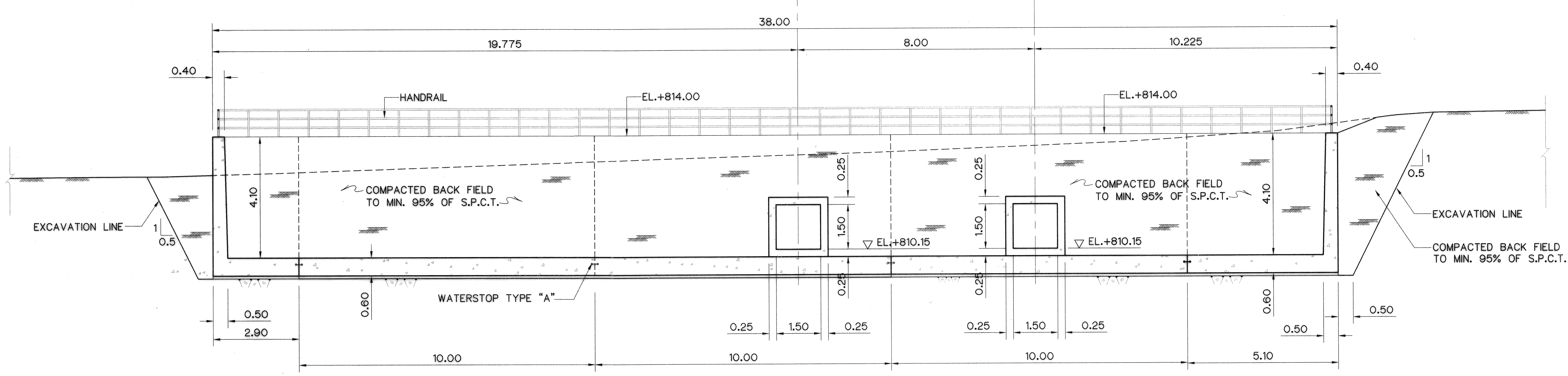
SCALE 1:20

NOTES :

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

REFERENCE DRAWINGS :

1. TAILRACE PLAN NMH-TR-01



SECTION B–B

SCALE 1:100

0 1 2 3 4 5 6 7 8

SCALE 1:100 METERS

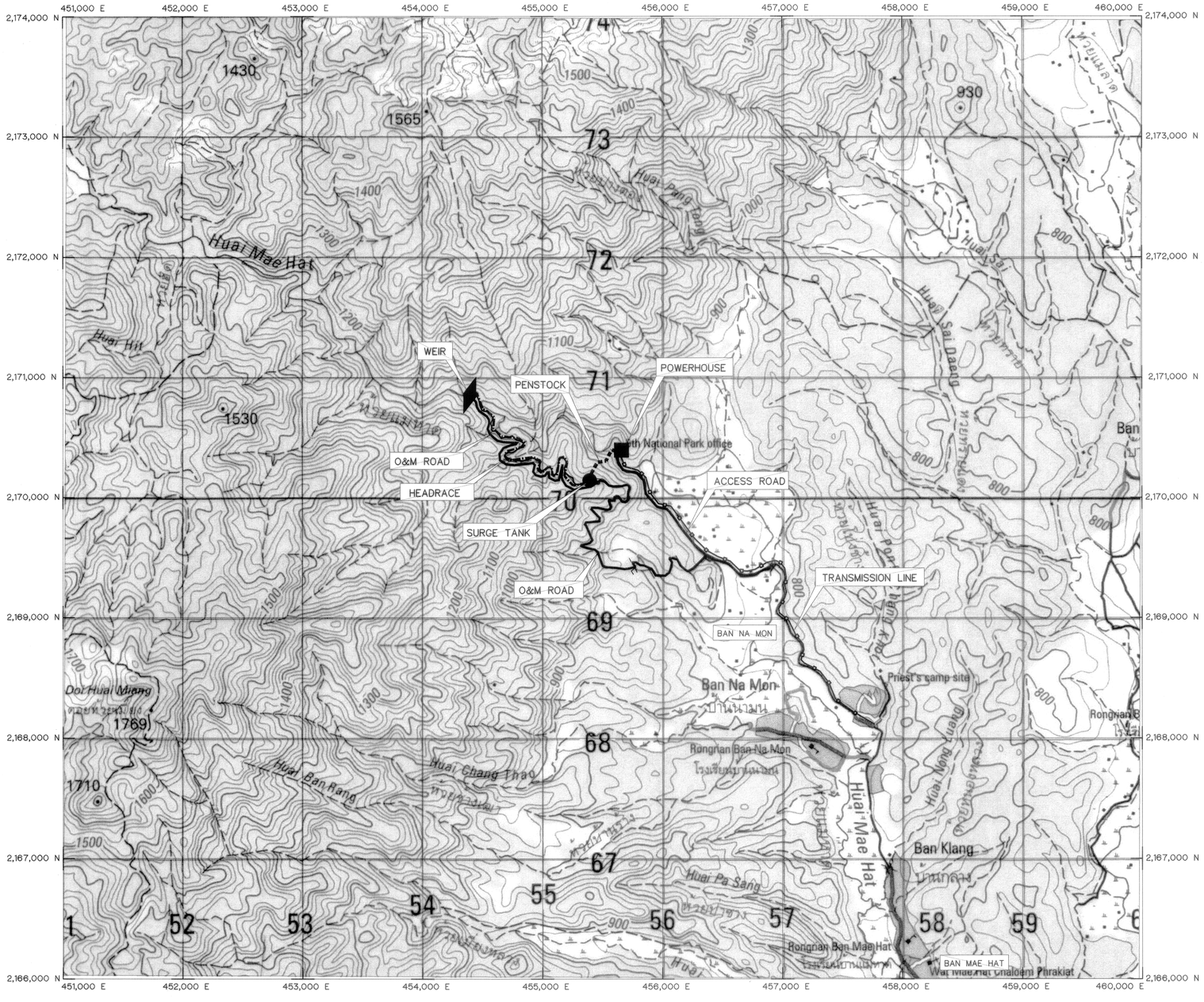
3				
2				
1				
NO.	DATE	REVISIONS	CHECKED	APPROVED
	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT
TAILRACE
SECTIONS

P&C MANAGEMENT CO.,LTD.		Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY	
DESIGNED	ภย.64624 สย.6226	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	สย.6226	RECOMMENDED	
		APPROVED	P. Hansell.
PROJECT MANAGER	DATE 08/03/2559	DRAWING NO. MH–TR–02	SHEET NO. 44 OF 51



PROJECT AREA MAP

SCALE 1:20,000

N

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
2. THE POLE OF TRANSMISSION LINE IS PRESTRESSED CONCRETE WITH 12.00 METERS HIGH

LEGENDS :

- STREAM
- WEIR
- HEADRACE
- SURGE TANK
- PENSTOCK
- POWERHOUSE
- ACCESS ROAD
- TRANSMISSION LINE

0 500 1,000 1,500

SCALE 1:20,000 METERS

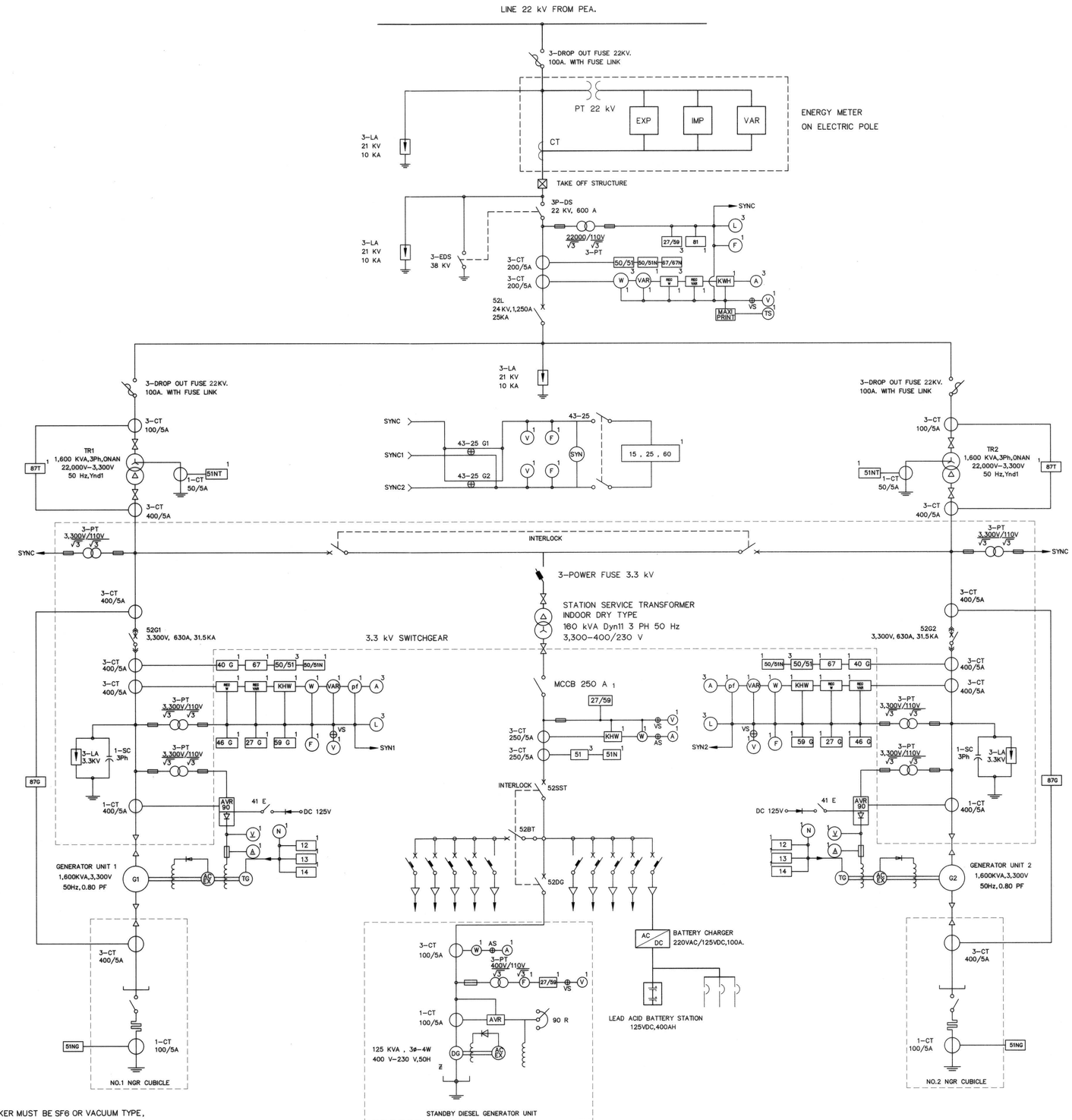
NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
TRANSMISSION LINE
GENERAL PLAN

P&C MANAGEMENT CO.,LTD.	Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY
DESIGNED มี.ค.64624	REVIEWED
DRAWN	SUBMITTED
CHECKED มี.ค.6226	RECOMMENDED
PROJECT MANAGER DATE 08/03/2564	APPROVED
DRAWING NO. MH-TS-01	SHEET NO. 45 OF 51



LEGEND :

12	OVERSPEED RELAY	43	MANUAL TRANSFER SWITCH
13	SYNCRONOUS SPEED RELAY	(L)	INDICATING LAMP
14	UNDERSPEED RELAY	(F)	FREQUENCY METER
15	SPEED OR FREQUENCY MATCHING RELAY	(V)	VOLT. METER
25	SYNCHRONING RELAY	(A)	AMP. METER
27	UNDERVOLTAGE RELAY	(W)	WATT. METER
32	REVERSE POWER RELAY	(VAR)	VAR METER
40	FIELD RELAY	(pf)	POWER FACTOR METER
46	REVERSE PHASE RELAY	(N)	RPN. SPEED METER
50	INSTANTANEOUS OVERCURRENT	(V)	DC. VOLT METER
51	TIME OVERCURRENT RELAY	(A)	DC. AMP. METER
59	OVERVOLTAGE RELAY	(TG)	TACHO-GENERATOR
60	VOLTAGE OR CURRENT BALANCE RELAY	(AC EX)	AC. EXCITOR
64	GROUND PROTECTIVE RELAY	(G1)	GENERATOR NO.1
67	DIRECTIONAL OVERCURRENT RELAY	3P-DF	3-PHASE DROP-OUT FUSE
81	FREQUENCY RELAY	3P-DS	3-PHASE DISCONNECTING SWITCH
87	DEFFERENTIAL PROTECTIVE RELAY	3-LA	3-PHASE LIGHTNING ARRESTER
⊕	SELECTOR SWITCH	3-CT	3-PHASE POTENTIAL TRANSFORMER
REC W	WATT RECORDER	3-CT	3-PHASE CURRENT TRANSFORMER
REC VAR	VAR RECORDER	3P-PF	3-PHASE POWER FUSE
kwh	KELOWATT HOUR METER	SYNC	SYNCRONISING SIGNAL
			CIRCUIT BREAKER
	CONTROL FUSE	VCB OR ACB	VACUUM CIRCUIT BREAKER OR AIR CIRCUIT BREAKER (DRAW OUT TYPE)
⊗	LAMP		
SYN	SYNCHRONOSCOPE		

NOTES :

1. 22 KV CIRCUIT BREAKER MUST BE SF6 OR VACUUM TYPE, 3.3 KV CIRCUIT BREAKER MUST BE VACUUM TYPE OR SF6 OR AIR CIRCUIT BREAKER
2. 3.3 KV CURRENT TRANSFORMER AND POTENTIAL TRANFORMER MUST BE DRY TYPE
3. 22 KV CURRENT TRANSFORMER AND POTENTIAL TRANFORMER MUST BE EPOXY RESIN MOLD
4. ALL POTENTIAL TRANSFORMER : ACCURACY CLASS 0.5
5. ALL CURRENT TRANSFORMER : FOR METERING ACCURACY CLASS 0.5
   : FOR RELAY ACCURACY CLASS 5P 20
6. THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, IT SHALL BE DESIGNED AND SPECIFIED BY CONTRACTOR FOR SUBMITTED TO FIELD ENGINEER APPROVAL LATER

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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

MAE HAT HYDROPOWER PROJECT

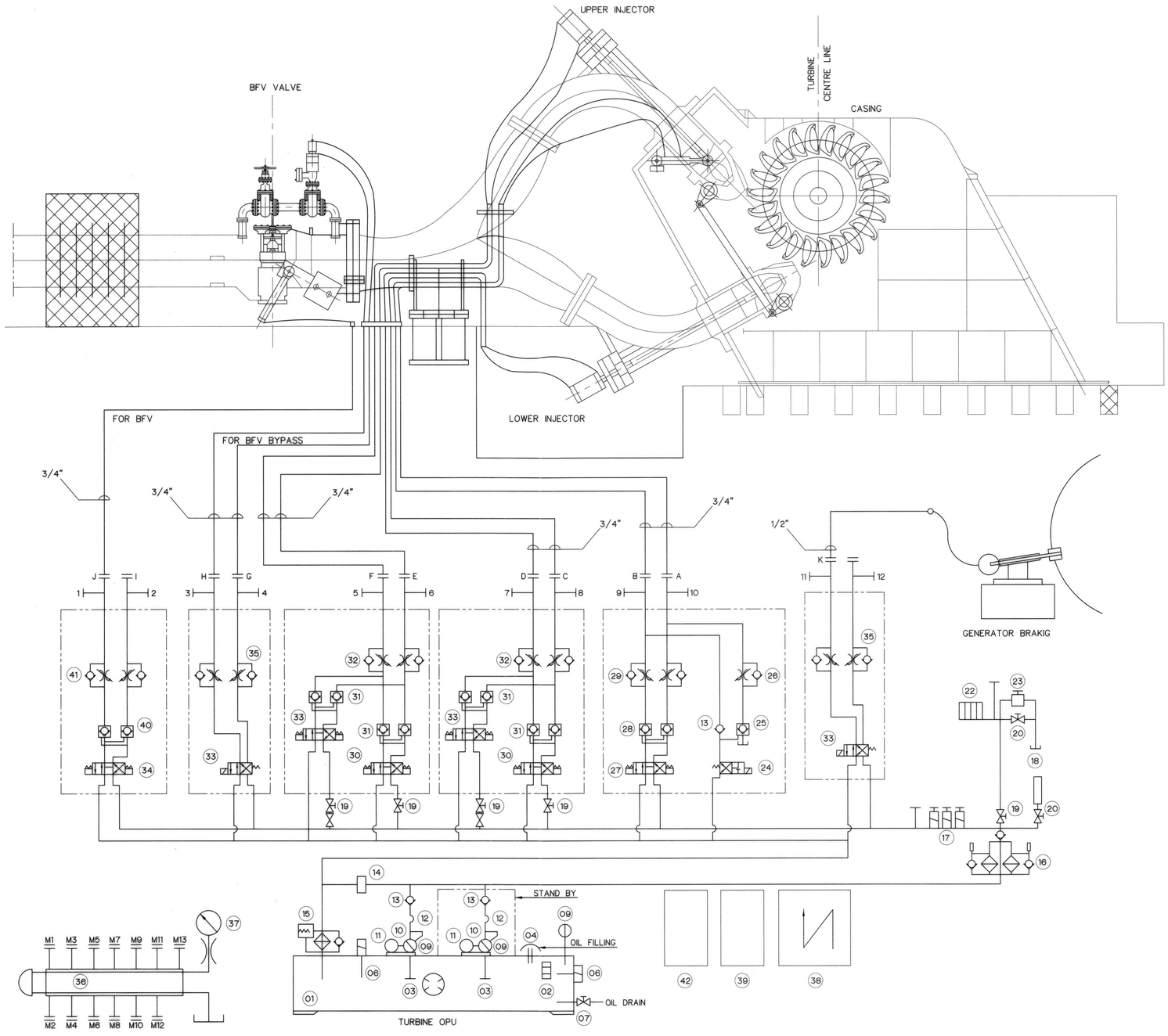
ELECTRO-MECHANICAL EQUIPMENT

MAIN POWER SINGLE LINE DIAGRAM

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	2พ.ค.๒๕๐๔
DRAWN	
CHECKED	2พ.ค.๒๕๐๔
PROJECT MANAGER	02/05/2562 DATE
REVIEWED	
SUBMITTED	
RECOMMENDED	
APPROVED	
DRAWING NO.	MH-EM-01
SHEET NO.	46 OF 51



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

NOTES:

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

QTY	SLNO	DESCRPTION	SPEC'N	REF/DWG
01	01	OIL RESERVOIR	750 Liters	-
01	02	OIL LEVEL INDICATOR	-	-
02	03	SUCTION STRAINER	-	-
01	04	OIL FILLER/BREATHER	10 Microns	-
01	05	TEMPERATURE GAUGE	-	-
01	06	OIL LEVEL SENSOR	-	-
01	07	GATE VALVE	-	-
01	08	RTD	-	-
02	09	VARIABLE DISPLACEMENT PUMP	23 LPM	-
02	10	FLEXIBLE DRIVE COUPLING	-	-
02	11	ELECTRIC MOTOR 3 PHASE	3.7 kW (5 hp) 1500 RPM B5 50 Hz 400v IP 55 Closs F Insulation	-
02	12	FLEXIBLEHOSE	-	-
02	13	INLINE TYPE CHECK VALVE	-	-
01	14	PILOT OPERATED RELIEF VALVE	-	-
01	15	RETURN LINE FILTER	-	-
01	16	OUPLEX PRESSURE LINE FILLTER	-	-
02	17	PRESSURE SWITCH	-	-
01	18	PRESSURE TRANSDUCER	-	-
01	19	SHUT OFF VALVE	3/4" Gasket mounted type	-
01	20	SHUT OFF VALVE	1/2" Gasket mounted type	-
01	21	SHUT OFF VALVE	3/4" Gasket mounted type	-
04	22	ACCUMULATOR (PISTON TYPE)	2 x 55 Ltrs	-
01	23	DIRET TYPE RELIEF VALVE	-	-
01	24	PILOT-OPERATED CHECK VALVE	-	-
01	25	MODULAR PILOT OPERATED CHECK VALVE	-	-
01	26	MODULAR THROTTLE & CHECK VALVE	-	-
01	27	SOLENOID OPERATED DIRECTION CONTROL VALVE	-	-
01	28	MODULAR PILOT OPERATED CHECK VALVE	-	-
01	29	MODULAR THROTTLE & CHECK VALVE	-	-
02	30	PROPOTIONAL VALVE	Diff P<5bar, command + 10 VDC	-
04	31	MODULAR PILOT OPERATED CHECK VALVE	-	-
03	32	MODULAR THROTTLE & CHECK VALVE	-	-
04	33	DIRECTION CONTROL CHECK VALVE	220V D.C	-
01	34	DIRECTION CONTROL CHECK VALVE	220V D.C	-
02	35	MODULAR THROTTLE & CHECK VALVE	-	-
01	36	MULTISTATION PRESSURE GAUGE ISOLATOR	SPECIAL	-
01	37	PRESSURE GAUGE	100 mm dia (4") 0-210 bars FB mounting glycerine filled	-
01	38	TERMINAL BOX	Retail make	-
01-each	39	ACCUMULATOR CHARGING KIT	-	-
01	40	MODULAR PILOT OPERATED CHECK VALVE	-	-
01	41	MODULAR THROTTLE & CHECK VALVE	-	-

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

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT

OIL PUMPING UNIT DIAGRAM (UNIT 1 AND 2) DETAIL

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

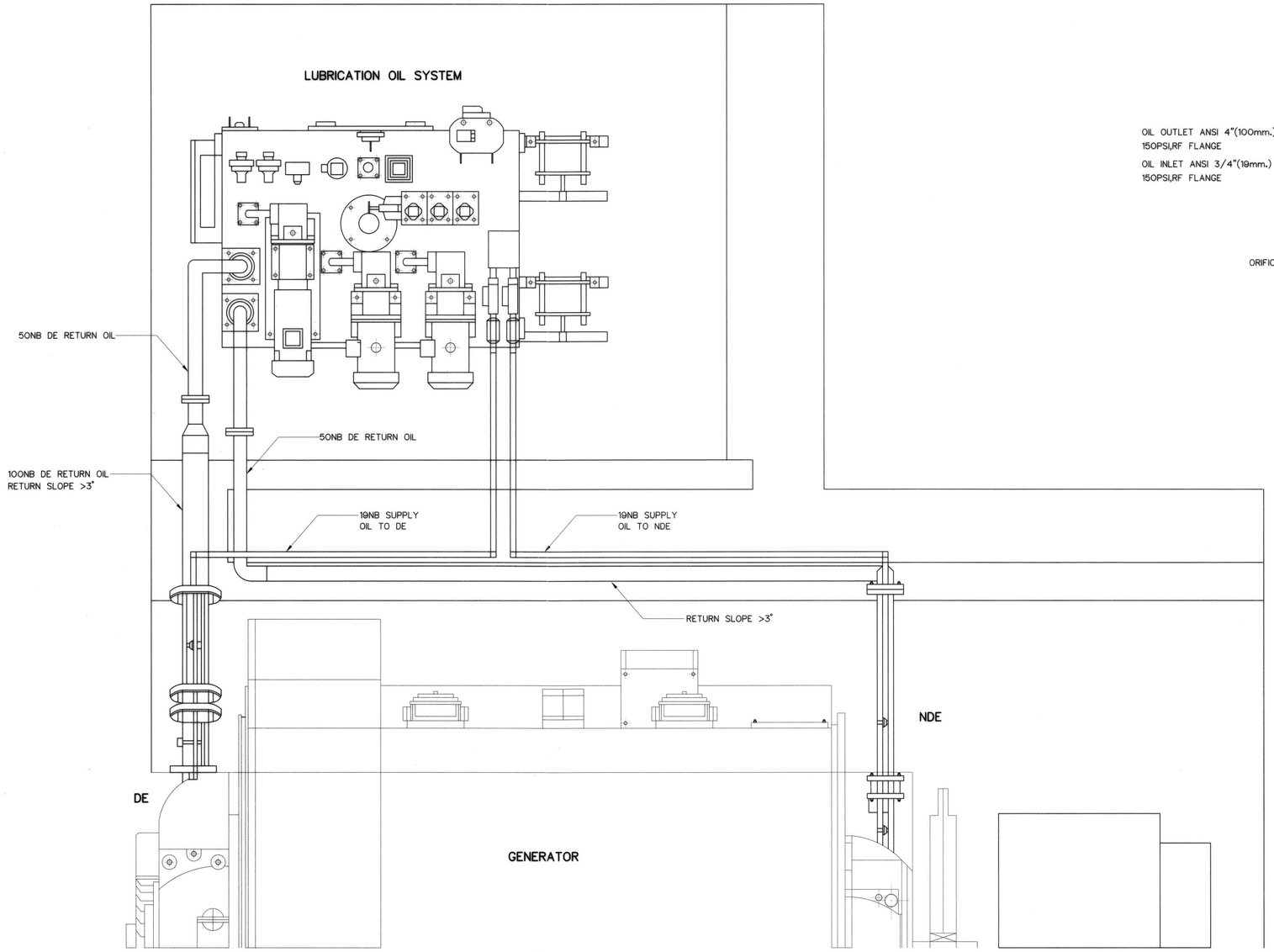
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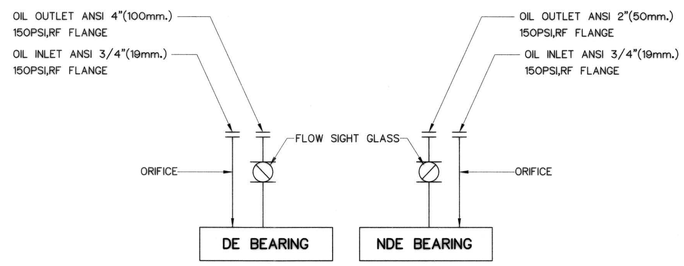
Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED	20.1950	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	20.1950	RECOMMENDED	
PROJECT MANAGER	08103123559 DATE	APPROVED	P. Hannell.

DRAWING NO. MH-EM-02

SHEET NO. 47 OF 51





PIPING FOR LUB.OIL

NOTE

1. ALL DIMENSION ARE IN MILLIMETER UNLESS OTHERWISE SHOW.
2. 3° MINIMUM SLOPE REQUIRED ON OIL OUTLET (RETURN) PIPING FROM BEARING TO TANK TO ENSURE GRAVITY FLOW OF OIL BACK TO TANK.
3. THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, IT SHALL BE
   DESIGNED AND SPECIFIED BY CONTRACTOR FOR SUBMITTED TO
   FIELD ENGINEER APPROVAL LATER

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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	CONSULTANTS		DEDE	

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Department of Alternative Energy Development and Efficiency
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MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
PIPE LINE OF LUBRICATION OIL SYSTEM
(UNIT 1 AND 2) DETAIL

P&C MANAGEMENT CO.,LTD.

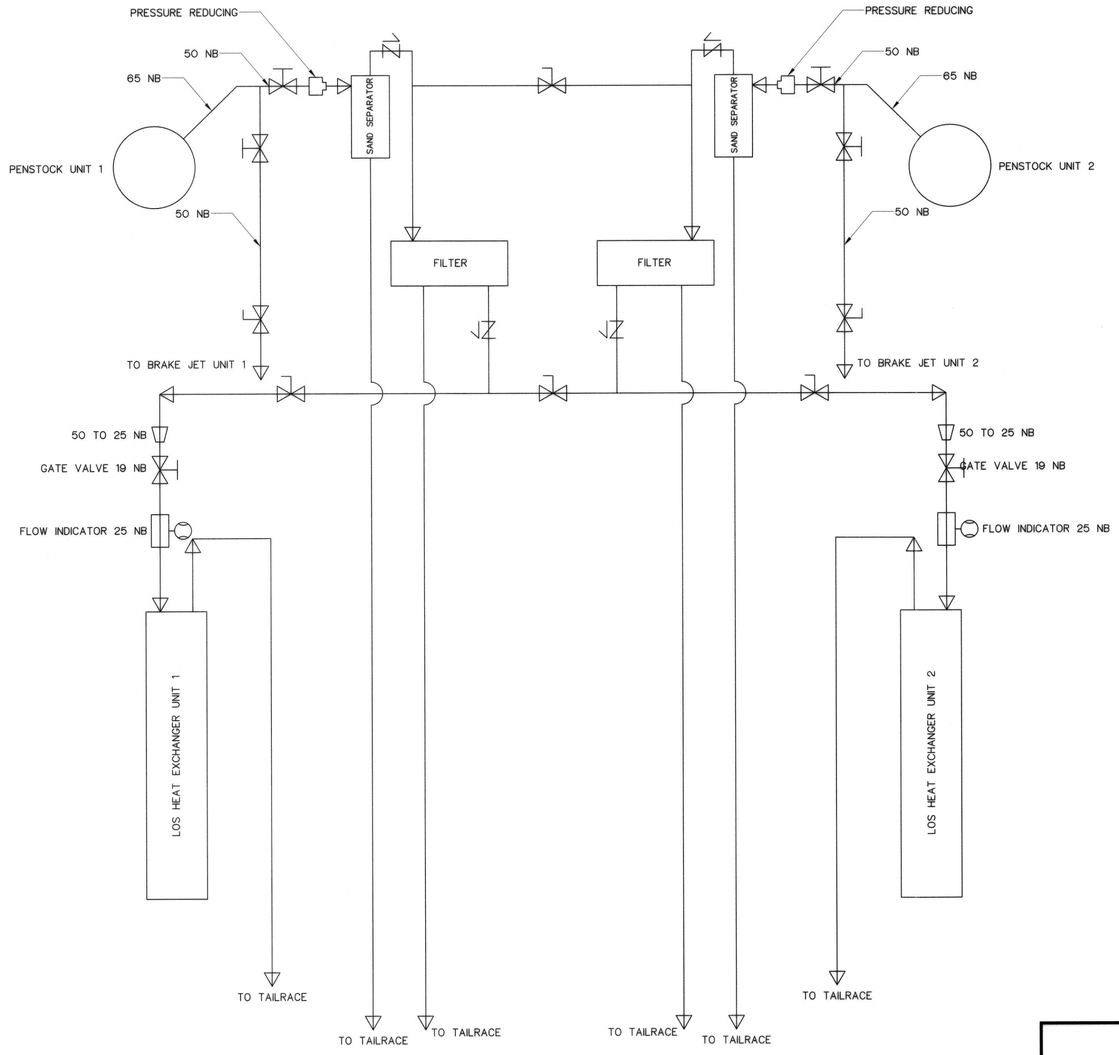
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MINISTRY OF ENERGY

DESIGNED	ส.ค.1950	REVIEWED	
DRAWN		SUBMITTED	
CHECKED	ส.ค.1950	RECOMMENDED	
PROJECT MANAGER	01/03/2551 DATE	APPROVED	

DRAWING NO. MH-EM-03

SHEET NO. 48 OF 51

No.	SYMBOL	DESCRIPTION
1		GATE VALVE
2		BALL VALVE
3		CHECK VALVE
4		PRESSURE REDUCING
5		REDUCE
6		FLOW INDICATOR



NOTE :

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NO.	DATE	REVISIONS	CHECKED	APPROVED
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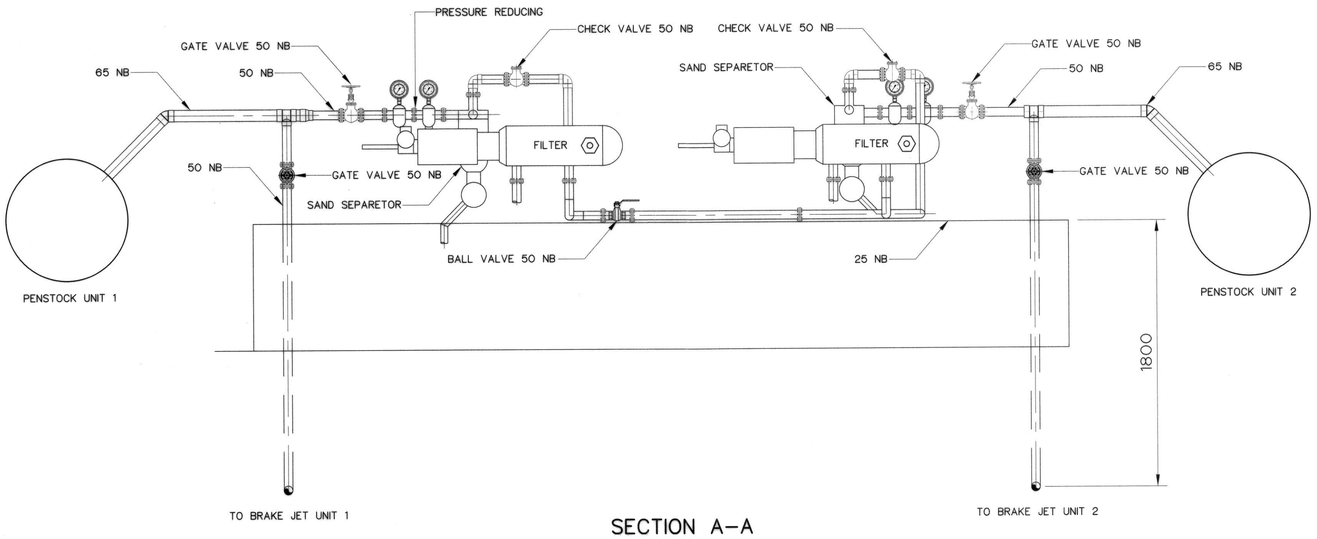
MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
COOLING WATER DIAGRAM
(UNIT 1 AND 2) DETAIL

P&C MANAGEMENT CO.,LTD.

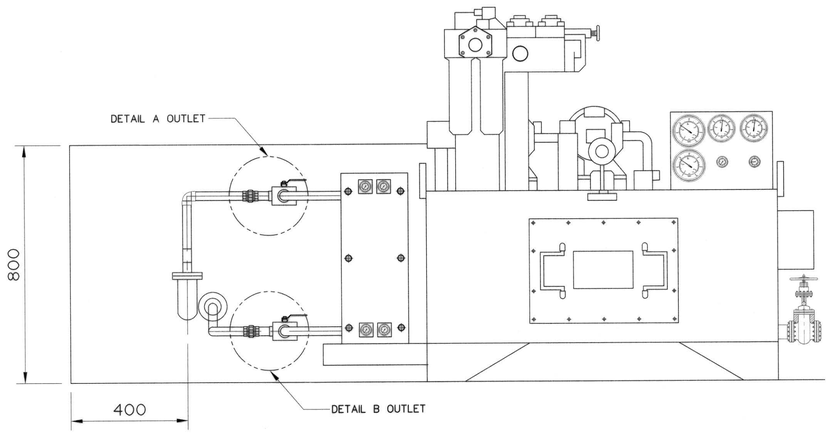
Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

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DRAWN		SUBMITTED	
CHECKED		RECOMMENDED	
PROJECT MANAGER	DATE	APPROVED	
		DRAWING NO.	SHEET NO.
		MH-EM-04	49 OF 51



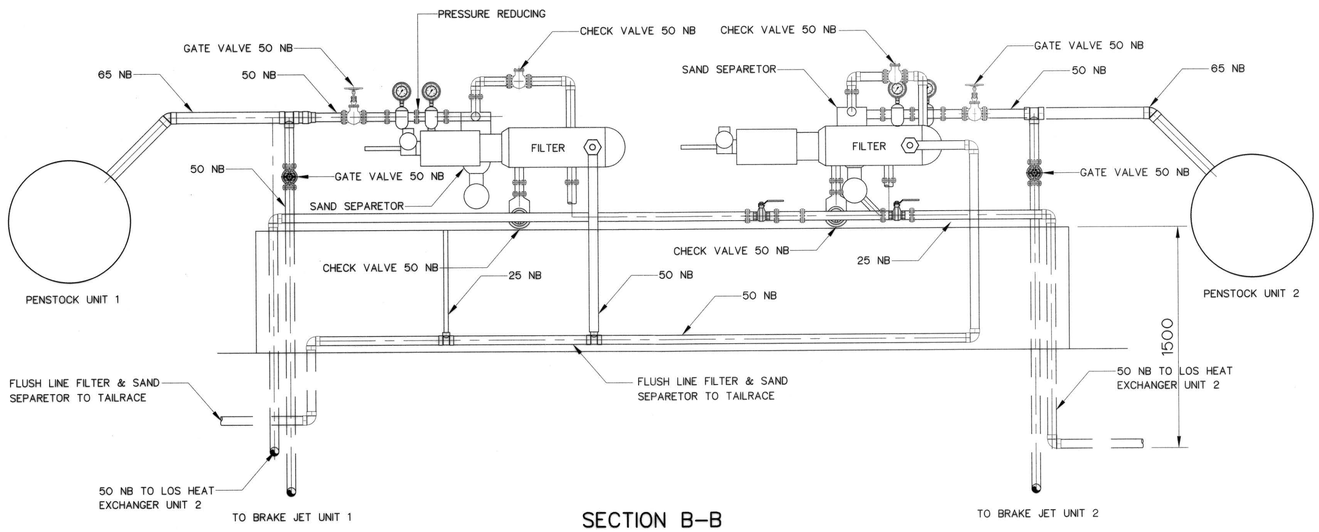
SECTION A–A

DETAILS WATER FROM PENSTOCK TO FILTER



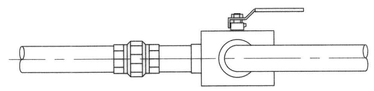
SECTION C–C

WATER INLET & OUTLET LOS HEAT EXCHANGER

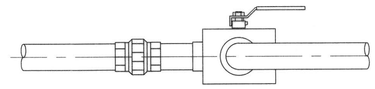


SECTION B–B

DETAILS WATER FROM FILTER TO LOS HEAT EXCHANGER



DETAIL A



DETAIL B

NOTE :

1. THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, IT SHALL BE DESIGNED AND SPECIFIED BY CONTRACTOR FOR SUBMITTED TO FIELD ENGINEER APPROVAL LATER

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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MINISTRY OF ENERGY

MAE HAT HYDROPOWER PROJECT

ELECTRO–MECHANICAL EQUIPMENT
COOLING WATER SYSTEM SECTION
(UNIT 1 AND 2) DETAIL

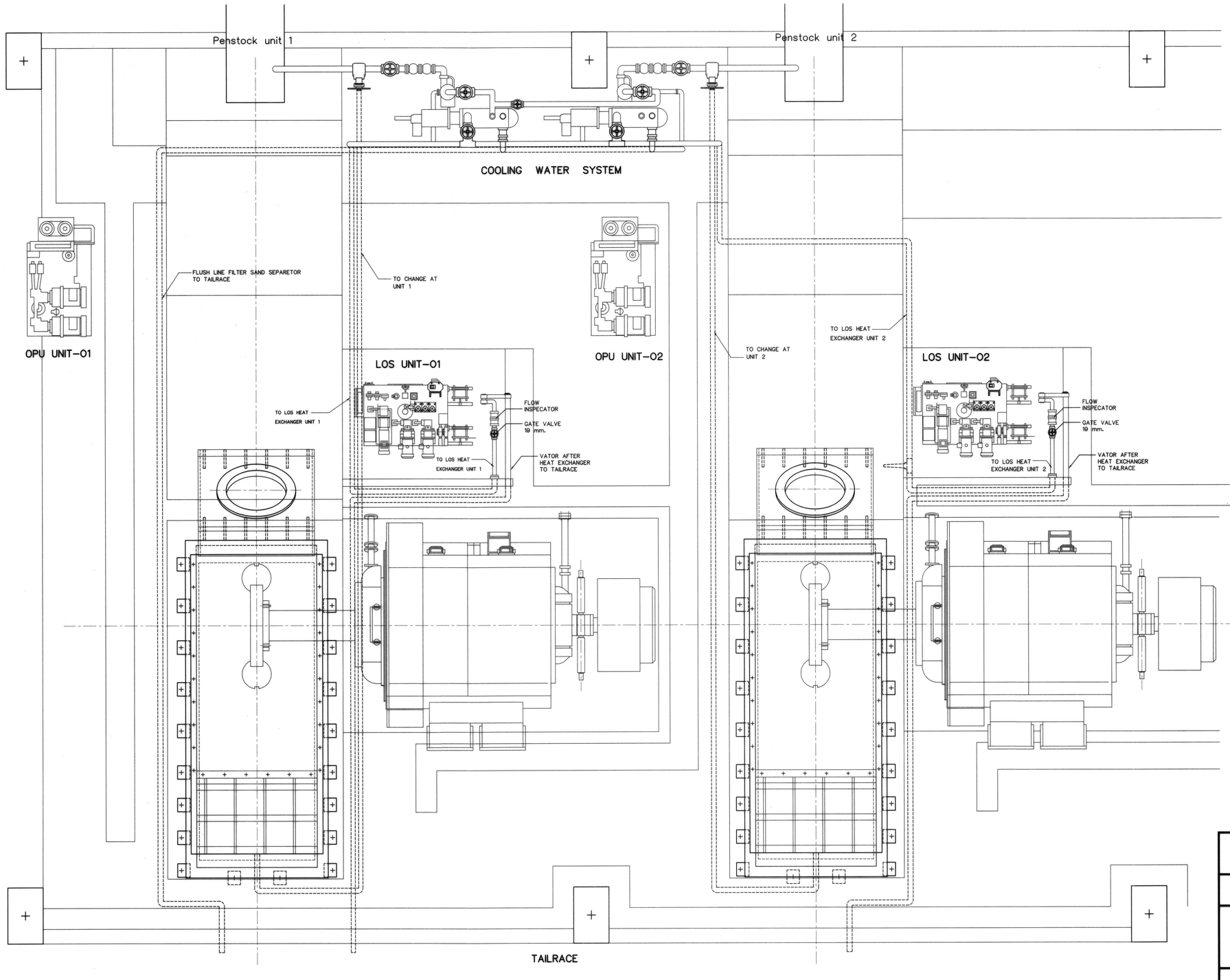
P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

DESIGNED		2n.1950	REVIEWED
DRAWN			SUBMITTED
CHECKED		2n.1950	RECOMMENDED
PROJECT MANAGER		08/05/2556 DATE	APPROVED

DRAWING NO. MH–EM–05

SHEET NO. 50 OF 51



NOTE :

1. THIS DRAWING IS DESIGNED FOR GUIDE LINE ONLY, IT SHALL BE DESIGNED AND SPECIFIED BY CONTRACTOR FOR SUBMITTED TO FIELD ENGINEER APPROVAL LATER

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				
	CONSULTANTS		DEDE	

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

MAE HAT HYDROPOWER PROJECT

ELECTRO-MECHANICAL EQUIPMENT
PLAN PIPE LINE OF COOLING WATER SYSTEM
(UNIT 1 AND 2) DETAIL

P&C MANAGEMENT CO.,LTD.

Department of Alternative Energy Development and Efficiency MINISTRY OF ENERGY

DESIGNED		REVIEWED	
DRAWN		SUBMITTED	
CHECKED		RECOMMENDED	
PROJECT MANAGER	08/05/2539 DATE	APPROVED	

DRAWING NO. MH-EM-06

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