Department of Alternative
Energy Development and Efficiency
MINISTRY OF ENERGY

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

VOLUME 4

DRAWINGS

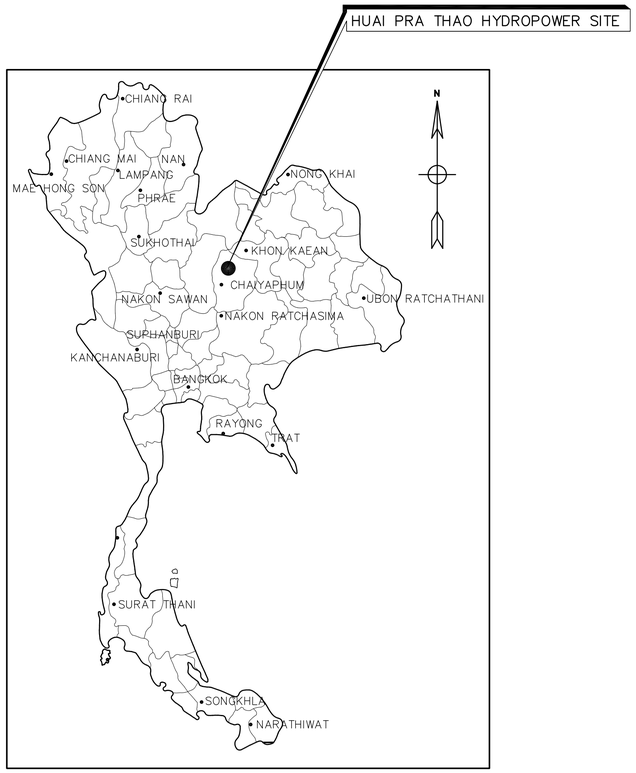
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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

LIST OF DRAWINGS

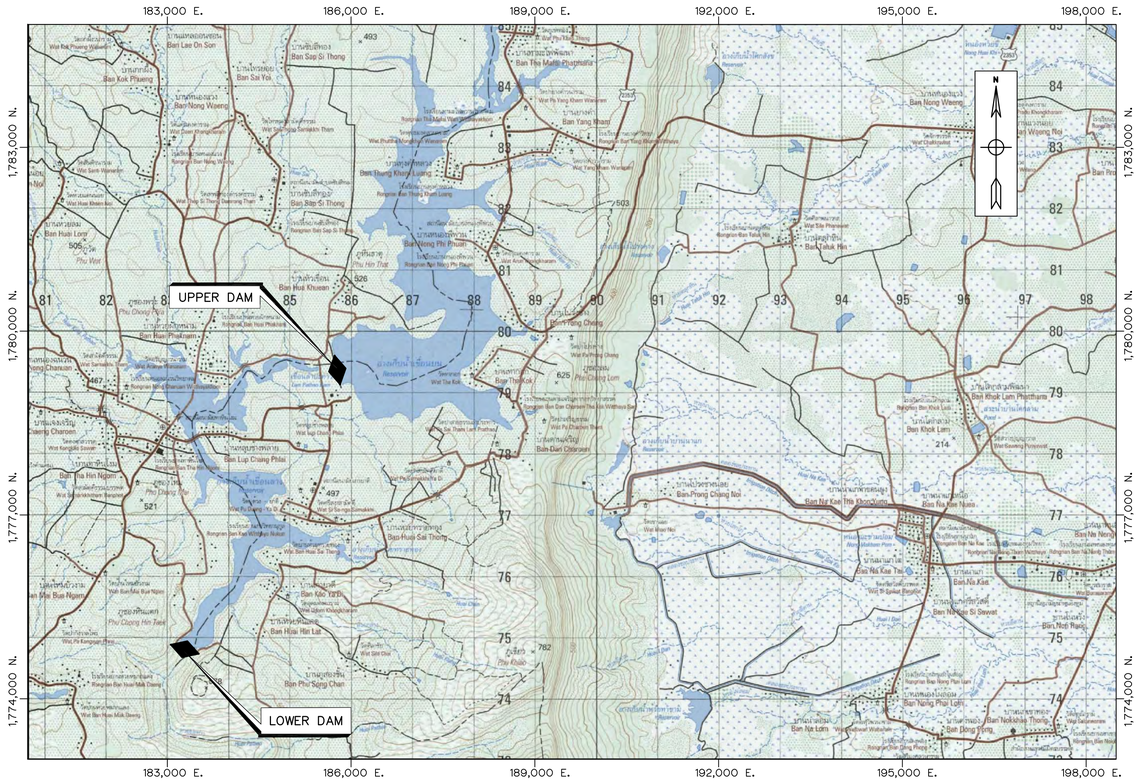
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30	HIA-SE-L10	LAYOUT OF SEDIMENT RETAINING



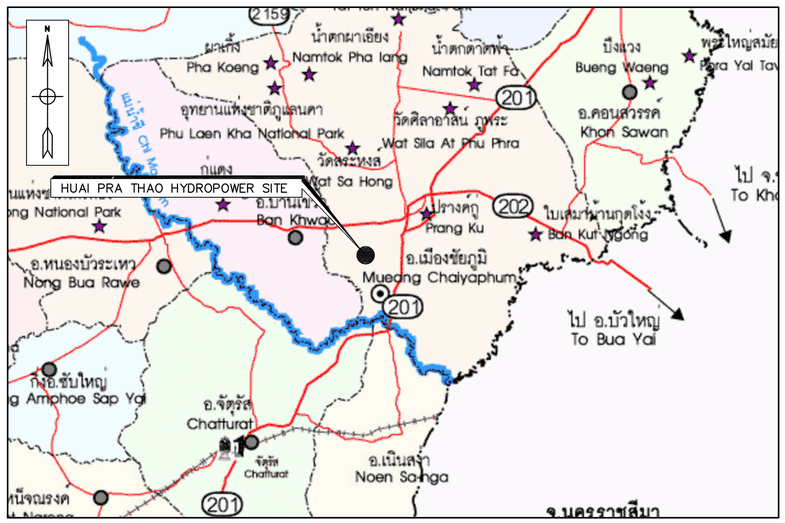
LOCATION MAP

NOT TO SCALE



PROJECT AREA MAP

SCALE 1:20,000



HUAI PRA THAO HYDROPOWER SITE LOCATION

NOT TO SCALE

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METRES, DISTANCES ARE IN KILOMETRES, UNLESS OTHERWISE SHOWN.
2. THE MAP OF HUAI PRA THAO DAM ON TOPOGRAPHIC MAPS, SCALE 1:50,000
   (SHEET 5441 III WGS 84) PUBLISHED BY THE ROYAL THAI SURVEY DEPARTMENT, 1999.

0 1,000 2,000 3,000 4,000 5,000

SCALE 1:50,000 M.

SYMBOLS :

- 201 — NATIONAL HIGHWAYS
- HIGHWAY DISTRICT OFFICE
- SUB-DIVISION, HIGHWAYS POLICE STATION
- HOSPITAL
- RIVER, CANAL
- DISTRICT

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

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

GENERAL

LOCATION MAP AND PROJECT AREA MAP

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
1				

CONSULTANTS: PANYA CONSULTANTS CO.,LTD.

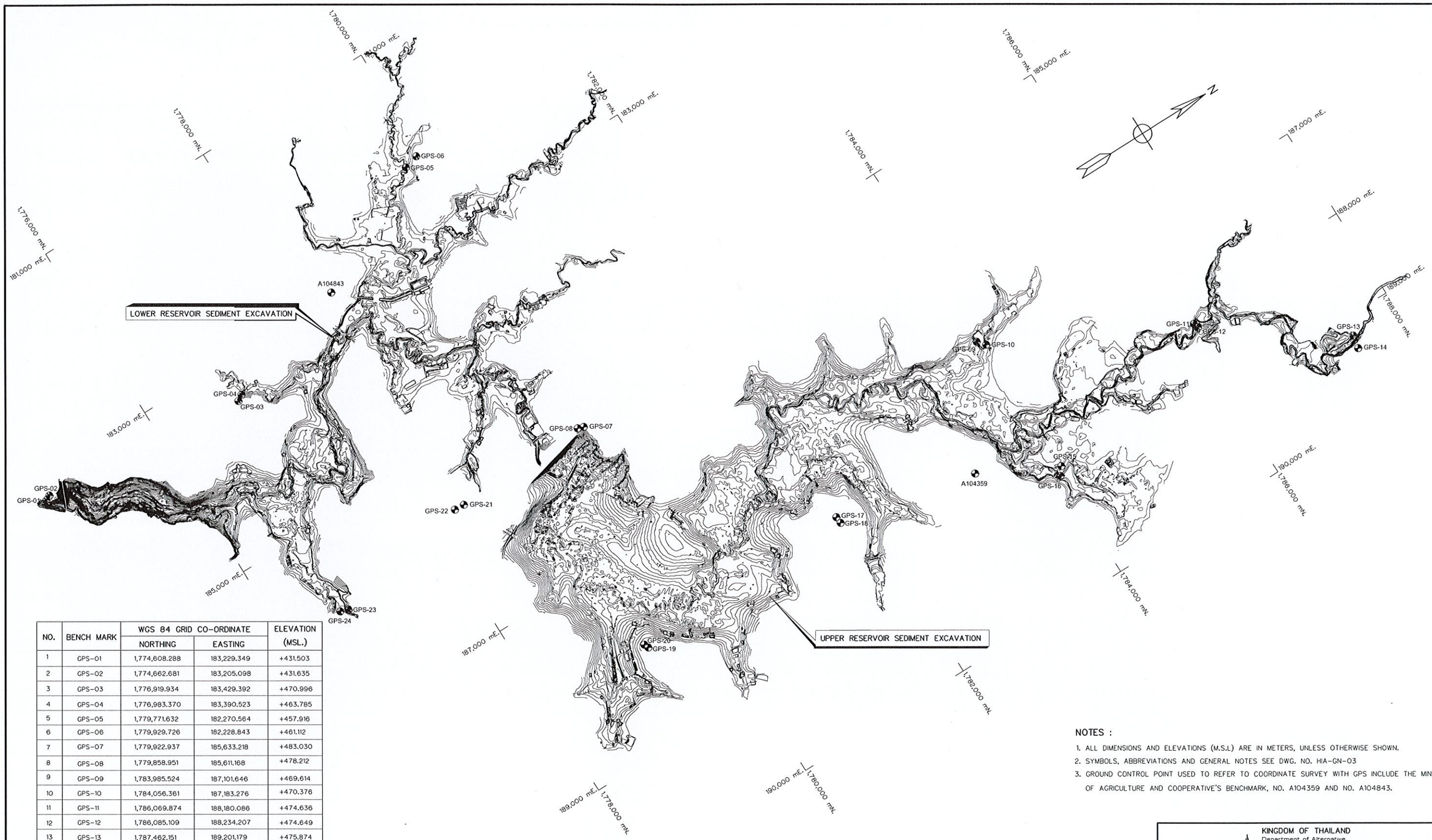
DEDE: Department of Alternative Energy Development and Efficiency, MINISTRY OF ENERGY

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DRAWN			SUBMITTED
CHECKED	วย.1957		RECOMMENDED
			APPROVED

PROJECT MANAGER — DATE: 10/08/2021

DRAWING NO. HIA-GN-01

SHEET NO. 1 OF 30



NO.	BENCH MARK	WGS 84 GRID CO-ORDINATE		ELEVATION (MSL.)
		NORTHING	EASTING	
1	GPS-01	1,774,608.288	183,229.349	+431.503
2	GPS-02	1,774,662.681	183,205.098	+431.635
3	GPS-03	1,776,919.934	183,429.392	+470.996
4	GPS-04	1,776,983.370	183,390.523	+463.785
5	GPS-05	1,779,771.632	182,270.564	+457.916
6	GPS-06	1,779,929.726	182,228.843	+461.112
7	GPS-07	1,779,922.937	185,633.218	+483.030
8	GPS-08	1,779,858.951	185,611.168	+478.212
9	GPS-09	1,783,985.524	187,101.646	+469.614
10	GPS-10	1,784,056.361	187,183.276	+470.376
11	GPS-11	1,786,069.874	188,180.086	+474.636
12	GPS-12	1,786,085.109	188,234.207	+474.649
13	GPS-13	1,787,462.151	189,201.179	+475.874
14	GPS-14	1,787,433.227	189,339.815	+480.188
15	GPS-15	1,784,054.599	188,710.060	+471.097
16	GPS-16	1,783,990.351	188,794.018	+470.610
17	GPS-17	1,781,714.014	187,888.248	+483.132
18	GPS-18	1,781,720.078	187,962.544	+483.542
19	GPS-19	1,779,260.527	187,992.536	+476.946
20	GPS-20	1,779,240.638	187,944.047	+475.702
21	GPS-21	1,778,387.328	185,652.756	+468.528
22	GPS-22	1,778,277.495	185,645.532	+474.394
23	GPS-23	1,776,743.366	185,938.265	+460.558
24	GPS-24	1,776,658.431	185,909.714	+461.656
25	A104359	1,783,224.744	188,283.782	+492.589
26	A104843	1,778,381.361	182,976.438	+465.987

GENERAL LAYOUT

SCALE 1:20,000

0 200 600 1,000 1,600 2,000

SCALE 1 : 20,000 M.

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. HIA-GN-03
3. GROUND CONTROL POINT USED TO REFER TO COORDINATE SURVEY WITH GPS INCLUDE THE MINISTRY OF AGRICULTURE AND COOPERATIVE'S BENCHMARK, NO. A104359 AND NO. A104843.

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

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
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CIVIL WORKS

GENERAL

GENERAL LAYOUT

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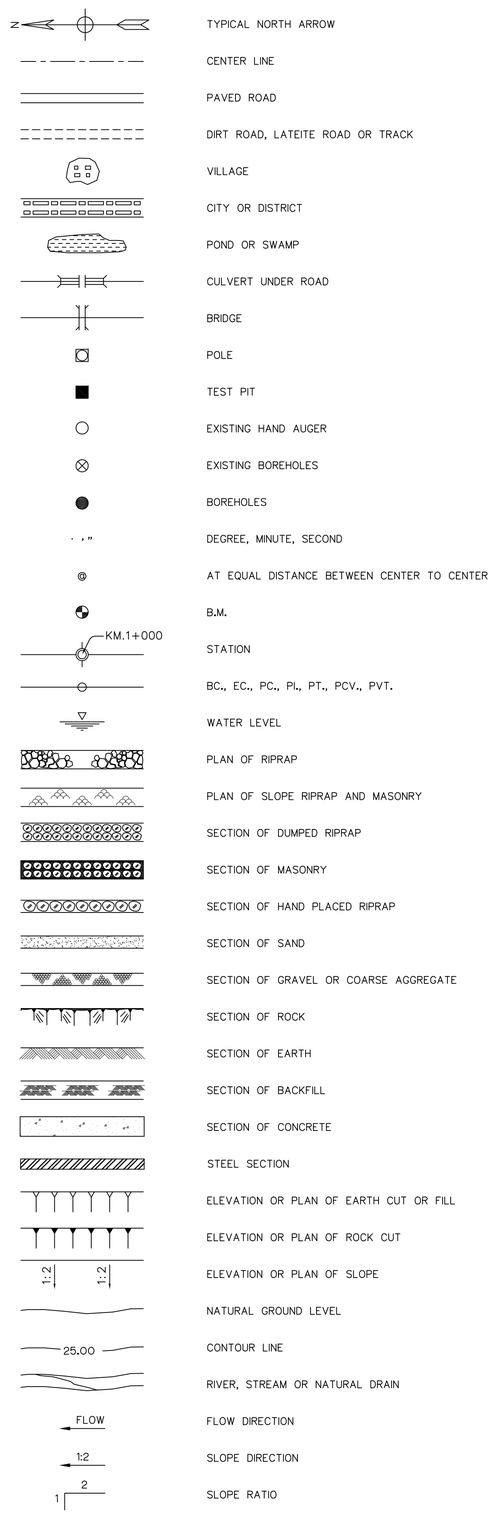
DRAWING NO. HIA-GN-02

SHEET NO. 2 OF 30

ABBREVIATIONS :

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

SYMBOLS :



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

GENERAL NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS UNLESS OTHERWISE SHOWN.
2. 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.
3. 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 RELEVENT DRAWINGS TO OBTAIN FIELD ENGINEER APPROVAL.
4. ADDITIONAL SYMBOLS, IF REQUIRED, ARE DEFINED IN THE RESPECTIVE DRAWINGS.
5. THE SPECIFICATIONS AND THE QUANTITIES OF MATERIALS ARE SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
6. ALL PLAIN CONCRETE CORNERS ARE TO BE CHAMFERED 2 cm. UNLESS OTHERWISE SHOWN.
7. SODDING ON 0.10 M TOP SOIL SHALL BE PROVIDED ON EMBANKMENT SLOPES AND BERMS, OR THE PLACES DIRECTED BY THE ENGINEER.
8. IN CASE SILTSTONE OR SHALE OR MUDSTONE FOUNDATION; AS SOON AS FINISHED EXCAVATION TO FOUNDATION ELEVATION, SHOTCRETE OR LEAN CONCRETE MUST BE APPLIED IMMEDIATELY.
9. SLOPE IN CUT AND FILL SECTIONS, UNLESS OTHERWISE SHOWN, SHALL BE CONFORMED TO THE FOLLOWING TABLE OR AS DIRECTED BY FIELD ENGINEER.

TYPE OF GROUND	CUT SLOPE 1:H	FILL SLOPE 1:H
EARTH	1:1	1:1.5
MODERATELY WEATHERED ROCK	1:0.5	1:1
FRESH ROCK	1:0.25	1:1

STRUCTURAL DESIGN NOTES :

1. THE ULTIMATE COMPRESSIVE STRENGTH OF CONCRETE OF STANDARD CYLINDER (ø0.15x0.30 m.) TEST AT AGE 28 DAYS SHALL BE AS THE FOLLOWING, UNLESS OTHERWISE SHOWN.

fc' (ksc)	DESCRIPTION
210	REINFORCED CONCRETE AND SECONDARY CONCRETE
140	LEAN CONCRETE

2. 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.
3. THE REINFORCEMENT LAP SPLICES SHALL NOT BE LESS THAN 50 DIAMETERS OF BIGGER THAN BAR WITH HOOKS, UNLESS OTHERWISE SHOWN.
4. EMBEDDED METALWORK SHALL BE SECURELY FASTENED IN POSITION BEFORE PLACING CONCRETE.
5. ALL CONSTRUCTION JOINT SHALL BE TREATED AS DIRECTED IN ORDER TO ASSUME THE BEST BOND.
6. A 5 cm. (MIN.) LAYER OF LEAN CONCRETE SHALL BE PLACED BELOW CONCRETE STRUCTURES.
7. THE STRUCTURES SHALL BE PLACED ON UNDISTURBED SOILS AND BACKFILL AROUND THE STRUCTURES SHALL BE WELL COMPACTED.
8. THE FOUNDATION ELEVATIONS ARE SUBJECT TO CHANGE AS DIRECTED ACCORDING TO THE SOIL CONDITIONS.
9. ALL SIZES OF REINFORCING BARS AND STRUCTURAL STEELS ARE IN MILLIMETERS.
10. ALL STRUCTURE STEELS SHALL BE CONFORMED TO T.I.S. 1227-2558
11. REINFORCED STEEL BARS SHALL BE CONFORMED TO T.I.S. AS FOLLOW :
    - DEFORMED BARS (SD30) - T.I.S. 24-2559
    - ROUND BARS (SR24) - T.I.S. 20-2559
12. THE E.I.T. STANDARDS SHALL BE APPLIED FOR ALL STRUCTURES WHICH ARE NOT SPECIFILED IN STRUCTURAL DESIGN NOTE 1 TO 11.

NO.	DATE	REVISIONS	CHECKED	APPROVED
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CIVIL WORKS

GENERAL

SYMBOLS, ABBREVIATIONS AND GENERAL NOTES

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DRAWN			SUBMITTED
CHECKED	28.1957		RECOMMENDED
PROJECT MANAGER	10/08/2021 DATE		APPROVED

DRAWING NO. HIA-GN-03

SHEET NO. 3 OF 30

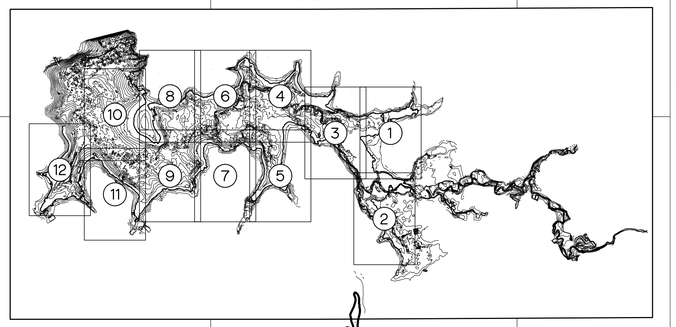
1,778,000 N | 1,779,000 N | 1,780,000 N | 1,781,000 N | 1,782,000 N | 1,783,000 N | 1,784,000 N | 1,785,000 N | 1,785500 N

186,000 E | 187,000 E | 188,000 E | 189,000 E | 190,000 E

UPPER DAM

N

INDEX



A | B | C | D | E | F | G

SEDIMENT EXCAVATION AREA

EL.+472.00
UPPER RESERVOIR PROJECT AREA

SYMBOLS :

SECTION OF SEDIMENT EXCAVATION

SEDIMENT EXCAVATION AREA

LAYOUT

SCALE 1:10,000

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

SCALE 1 : 10,000 KILOMETER

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (MSL.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. THE TOTAL EXCAVATION VOLUME IS APPROXIMATELY 3.80 MILLION CUBIC METERS.

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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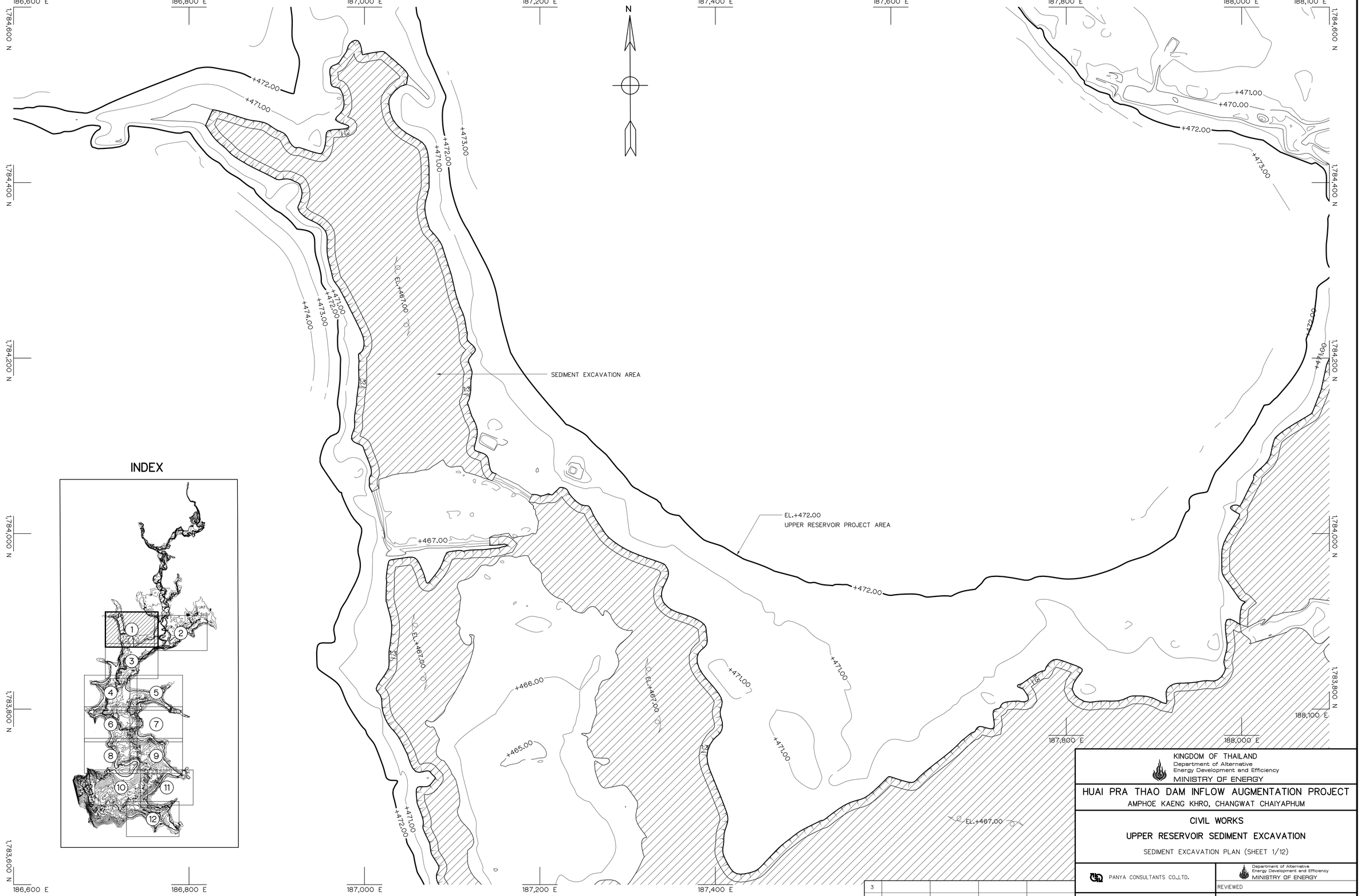
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CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

LAYOUT

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DRAWN	SUBMITTED
CHECKED วิ.1957	RECOMMENDED
PROJECT MANAGER 10/08/2021 DATE	APPROVED
DRAWING NO. HIA-SE-U01	SHEET NO. 4 OF 30



INDEX

0 50 100 150 200

SCALE 1 : 2,000 M.

PLAN

SCALE 1:2,000

NO.	DATE	REVISIONS	CHECKED	APPROVED
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CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 1/12)

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DRAWN			RECOMMENDED
CHECKED		วสิ.1957	APPROVED

10/08/2021
PROJECT MANAGER — DATE

DRAWING NO. HIA-SE-U02

SHEET NO. 5 OF 30

188,000 E
188,200 E
188,400 E
188,600 E
188,800 E
189,000 E
189,200 E
189,400 E
189,500 E
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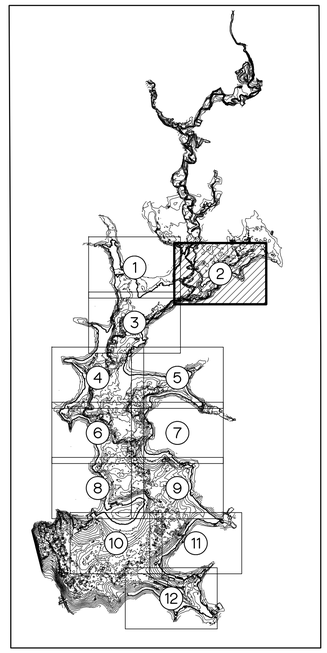
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EL.+467.00
EL.+467.00
EL.+467.00

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UPPER RESERVOIR PROJECT AREA

SEDIMENT EXCAVATION AREA

INDEX



0 50 100 150 200
SCALE 1 : 2,000 M.

PLAN
SCALE 1:2,000

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
2				
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CONSULTANTS | DEDE

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

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS
UPPER RESERVOIR SEDIMENT EXCAVATION
SEDIMENT EXCAVATION PLAN (SHEET 2/12)

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

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CHECKED พ.ย.1957	RECOMMENDED
PROJECT MANAGER 10/08/2021 DATE	APPROVED
DRAWING NO. HIA-SE-U03	SHEET NO. 6 OF 30



PLAN

SCALE 1:2,000

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 3/12)

NO.	DATE	REVISIONS	CHECKED	APPROVED
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CONSULTANTS: PANYA CONSULTANTS CO.,LTD.

DEDE: Department of Alternative Energy Development and Efficiency, MINISTRY OF ENERGY

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PROJECT MANAGER	10/08/2021 (DATE)
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SUBMITTED	
RECOMMENDED	
APPROVED	
DRAWING NO.	HIA-SE-U04
SHEET NO.	7 OF 30

186,000 E | 186,200 E | 186,400 E | 186,600 E | 186,800 E | 187,000 E | 187,200 E | 187,400 E | 187,500 E

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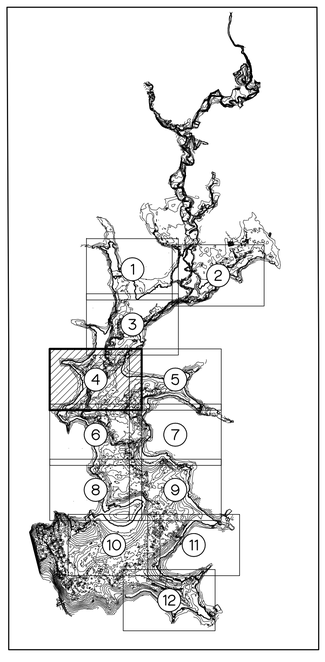
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UPPER RESERVOIR PROJECT AREA

SEDIMENT EXCAVATION AREA

EL.+467.00

+465.00
+466.00
+472.00
+471.00
+463.00
+464.00

INDEX



0 50 100 150 200

SCALE 1 : 2,000 M.

PLAN

SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 4/12)

NO.	DATE	REVISIONS	CHECKED	APPROVED
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	CONSULTANTS		DEDE	

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MINISTRY OF ENERGY

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CHECKED ณัฐ.1957	RECOMMENDED
PROJECT MANAGER 10/08/2021 DATE	APPROVED
DRAWING NO. HIA-SE-U05	SHEET NO. 8 OF 30



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SCALE 1 : 2,000 M.

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

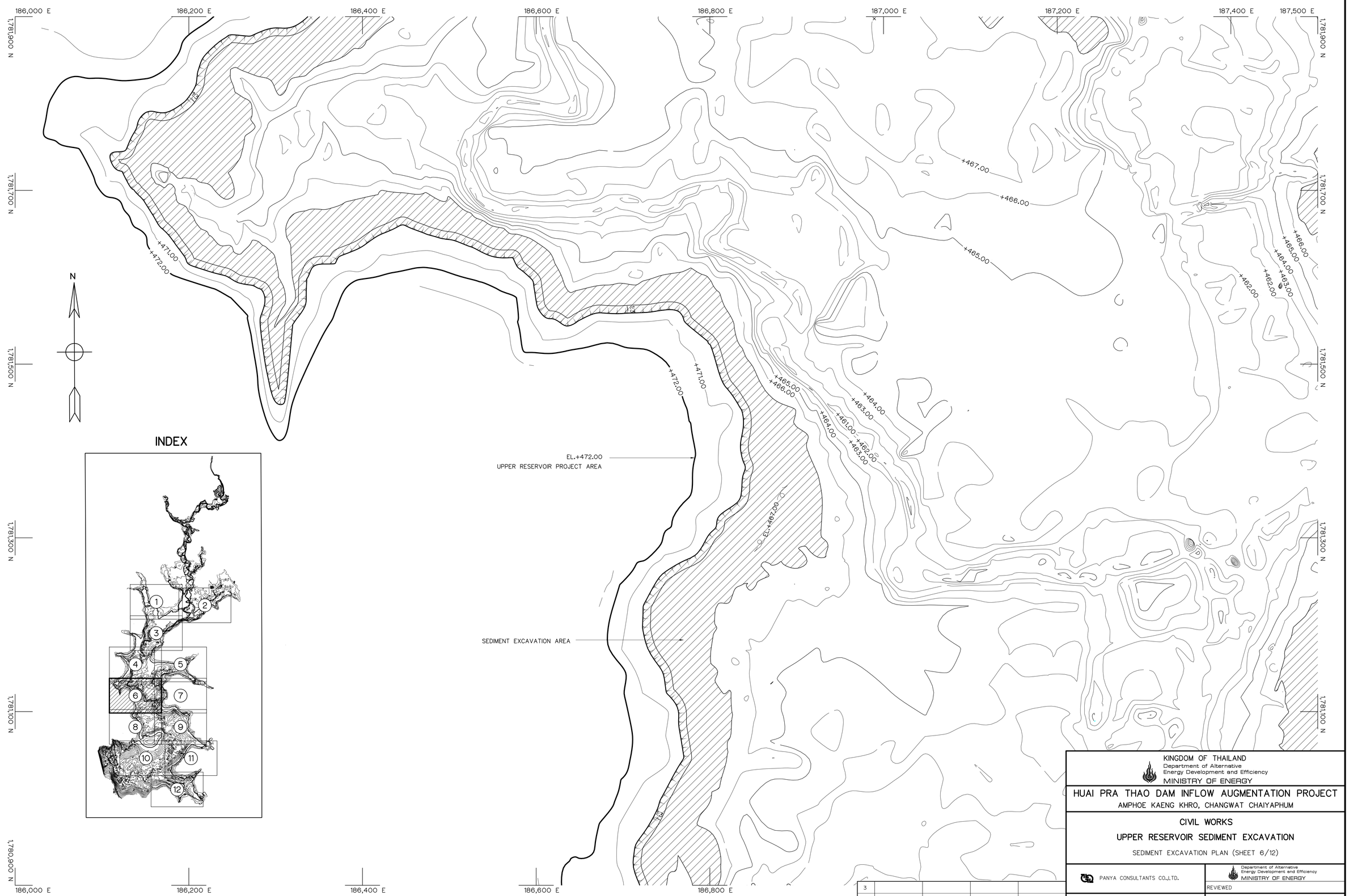
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 5/12)

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CHECKED วิ.1957	APPROVED
PROJECT MANAGER — 10/08/2021 DATE	DRAWING NO. HIA-SE-U06
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PLAN

SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

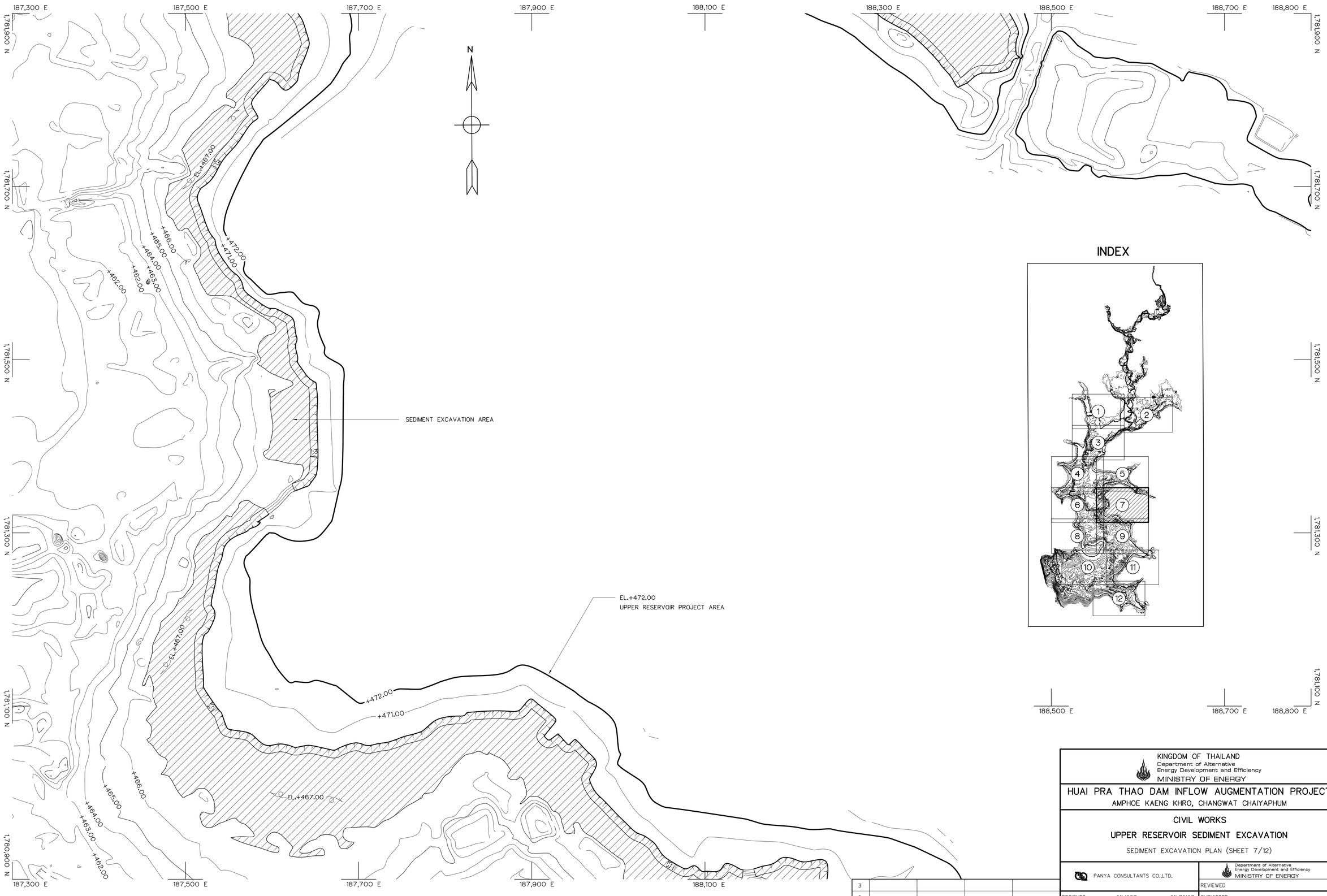
SEDIMENT EXCAVATION PLAN (SHEET 6/12)

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0 50 100 150 200

SCALE 1 : 2,000 M.

PLAN

SCALE 1:2,000

NO.	DATE	REVISIONS	CHECKED	APPROVED
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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

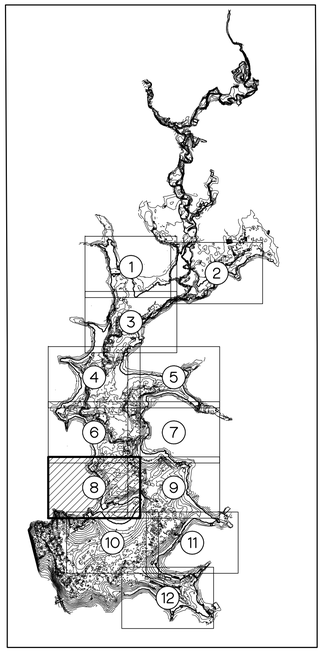
UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 7/12)

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EL.+472.00
UPPER RESERVOIR PROJECT AREA

SEDIMENT EXCAVATION AREA

EL.+467.00

PLAN

SCALE 1:2,000

SCALE 1 : 2,000

0 50 100 150 200 M.

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

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DRAWING NO. HIA-SE-U09

SHEET NO. 12 OF 30

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1,781,000 N | 1,780,800 N | 1,780,600 N | 1,780,400 N | 1,780,200 N | 1,780,000 N

+462.00 +463.00 +464.00 +465.00 +466.00 +472.00 +473.00 +474.00 +475.00 +471.00

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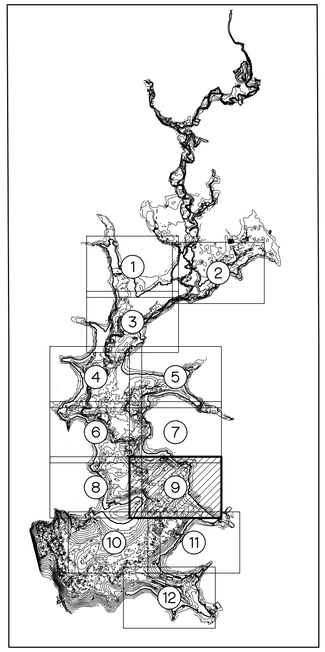
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UPPER RESERVOIR PROJECT AREA

SEDIMENT EXCAVATION AREA

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0 50 100 150 200
SCALE 1 : 2,000 M.

PLAN
SCALE 1:2,000

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	CONSULTANTS		DEDE	

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS
UPPER RESERVOIR SEDIMENT EXCAVATION
SEDIMENT EXCAVATION PLAN (SHEET 9/12)

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PROJECT MANAGER	10/08/2021 DATE	DRAWING NO. HIA-SE-U10	SHEET NO. 13 OF 30

186,300 E | 186,500 E | 186,700 E | 186,900 E | 187,100 E | 187,300 E | 187,500 E | 187,700 E | 187,800 E

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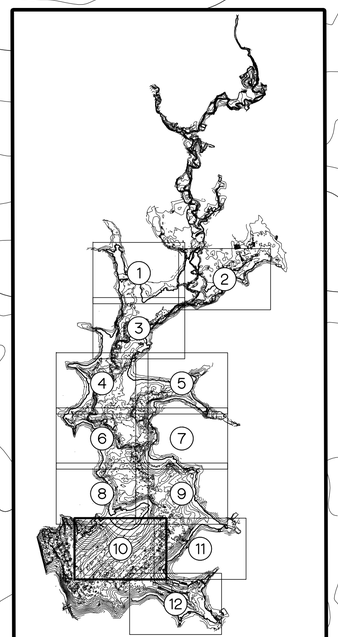
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N

INDEX



0 | 50 | 100 | 150 | 200 M.

SCALE 1 : 2,000

PLAN

SCALE 1:2,000

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

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 10/12)

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	APPROVED

PROJECT MANAGER | DATE: 10/08/2021

DRAWING NO.: HIA-SE-U11

SHEET NO.: 14 OF 30

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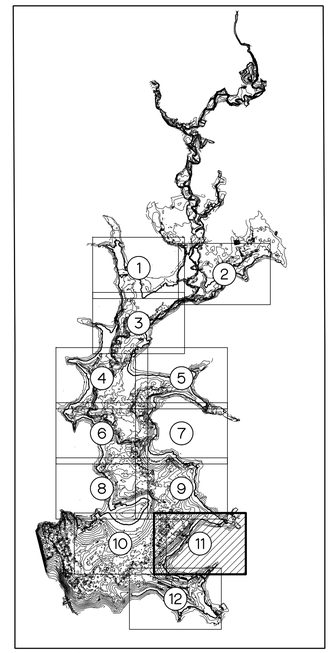
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+472.00
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SEDIMENT EXCAVATION AREA

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UPPER RESERVOIR PROJECT AREA

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0 50 100 150 200

SCALE 1 : 2,000 M.

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SCALE 1:2,000

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PROJECT MANAGER	10/08/2021 DATE		APPROVED

DRAWING NO. HIA-SE-U12

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187,200 E | 187,400 E | 187,600 E | 187,800 E | 188,000 E | 188,200 E | 188,400 E | 188,600 E | 188,700 E

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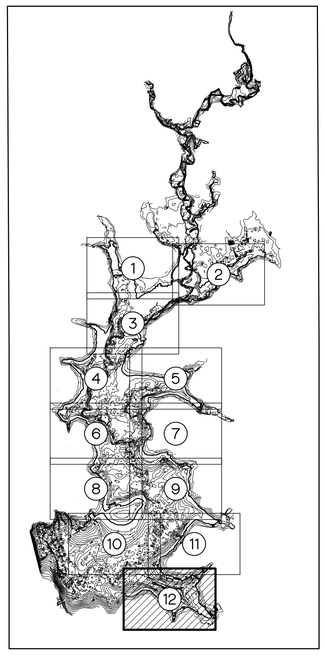
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UPPER RESERVOIR PROJECT AREA

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0 50 100 150 200

SCALE 1 : 2,000 M.

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SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

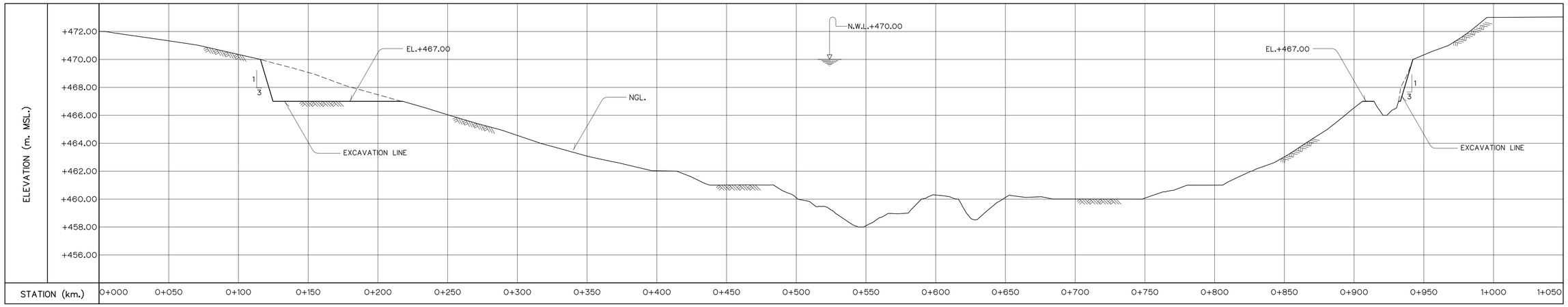
SEDIMENT EXCAVATION PLAN (SHEET 12/12)

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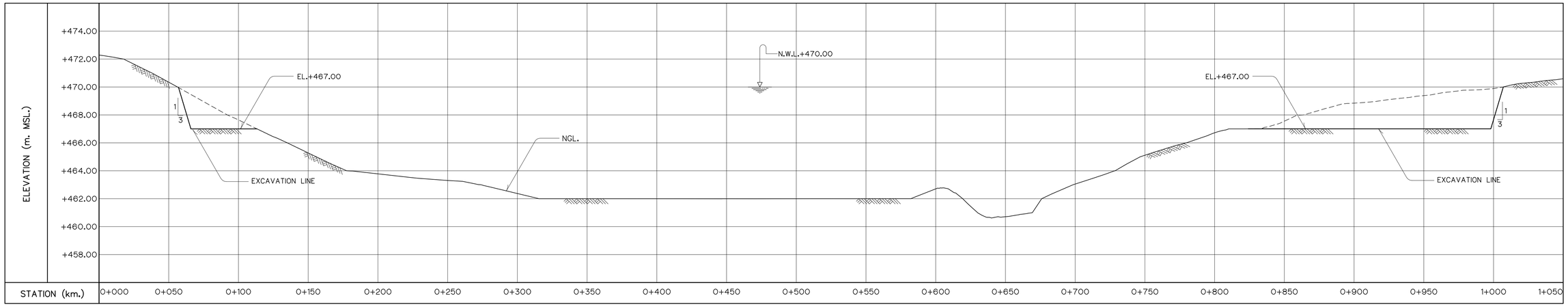
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SECTION A–A

HORIZONTAL SCALE 1:1,500

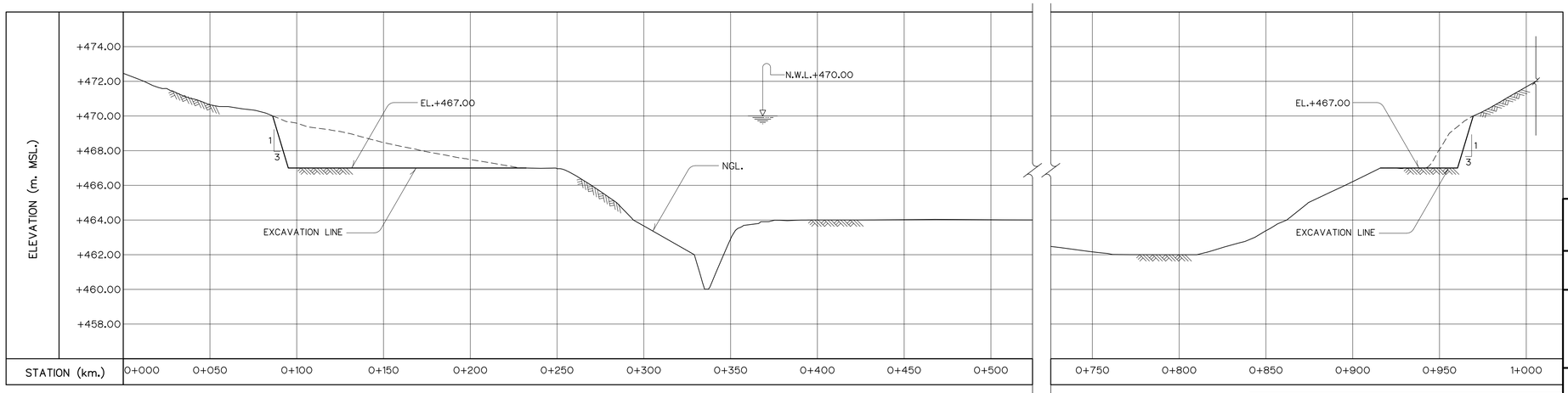
VERTICAL SCALE 1:150



SECTION B–B

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150



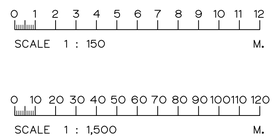
SECTION C–C

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150

NOTES :

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



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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

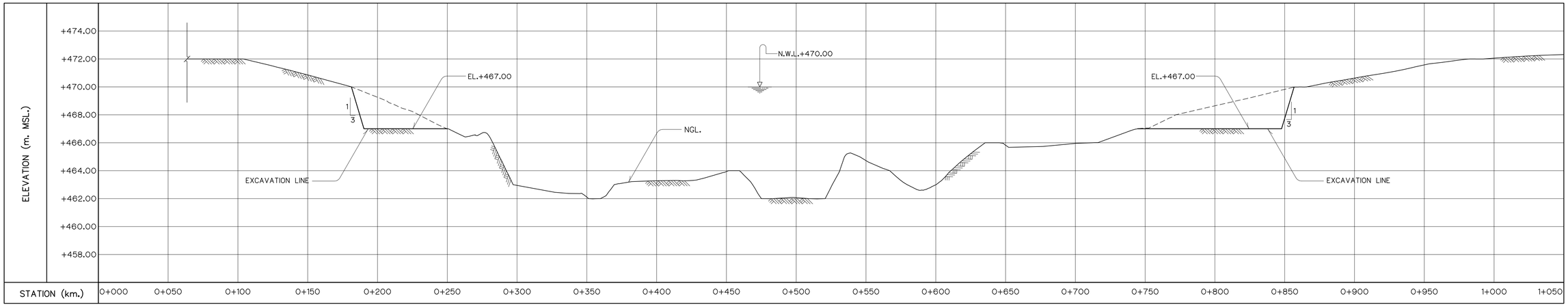
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION SECTION (SHEET 1/3)

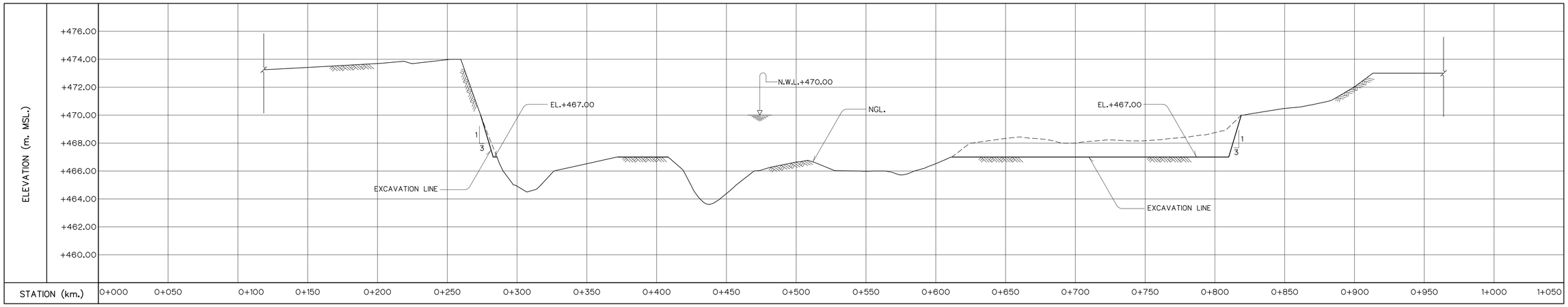
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SECTION D–D

HORIZONTAL SCALE 1:1,500

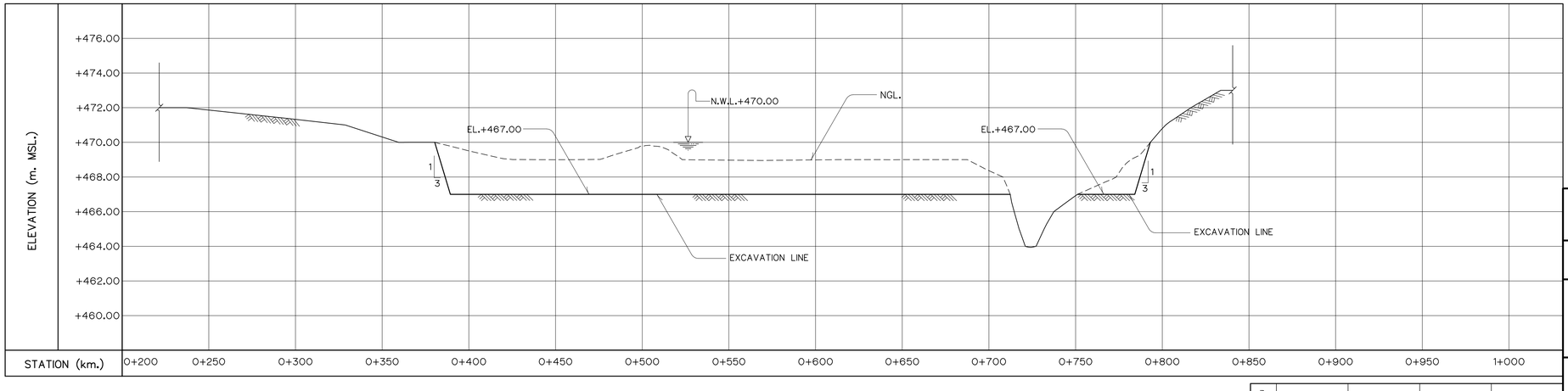
VERTICAL SCALE 1:150



SECTION E–E

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150



SECTION F–F

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150

0 1 2 3 4 5 6 7 8 9 10 11 12 M.

SCALE 1 : 150

0 10 20 30 40 50 60 70 80 90 100 110 120 M.

SCALE 1 : 1,500

NOTES :

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

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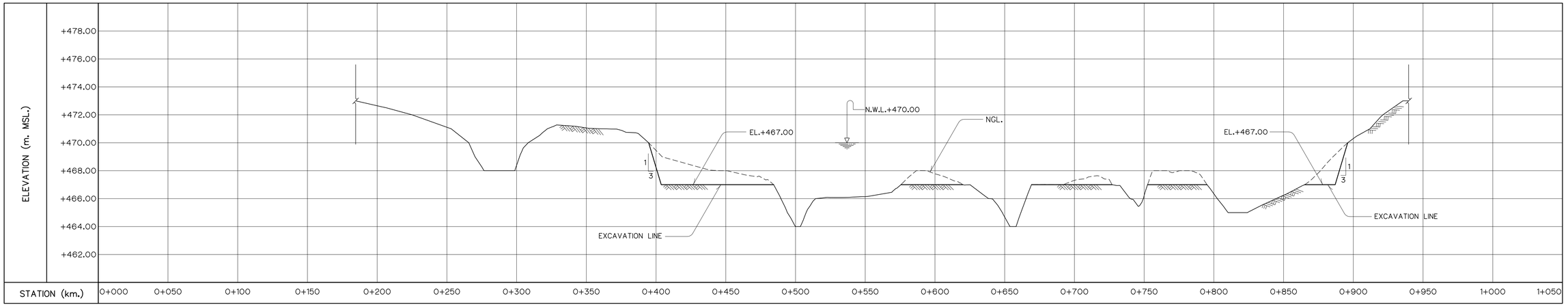
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CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION SECTION (SHEET 2/3)

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SECTION G–G

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150

NOTES :

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

0 1 2 3 4 5 6 7 8 9 10 11 12

SCALE 1 : 150 M.

0 10 20 30 40 50 60 70 80 90 100 110 120

SCALE 1 : 1,500 M.

KINGDOM OF THAILAND
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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

UPPER RESERVOIR SEDIMENT EXCAVATION

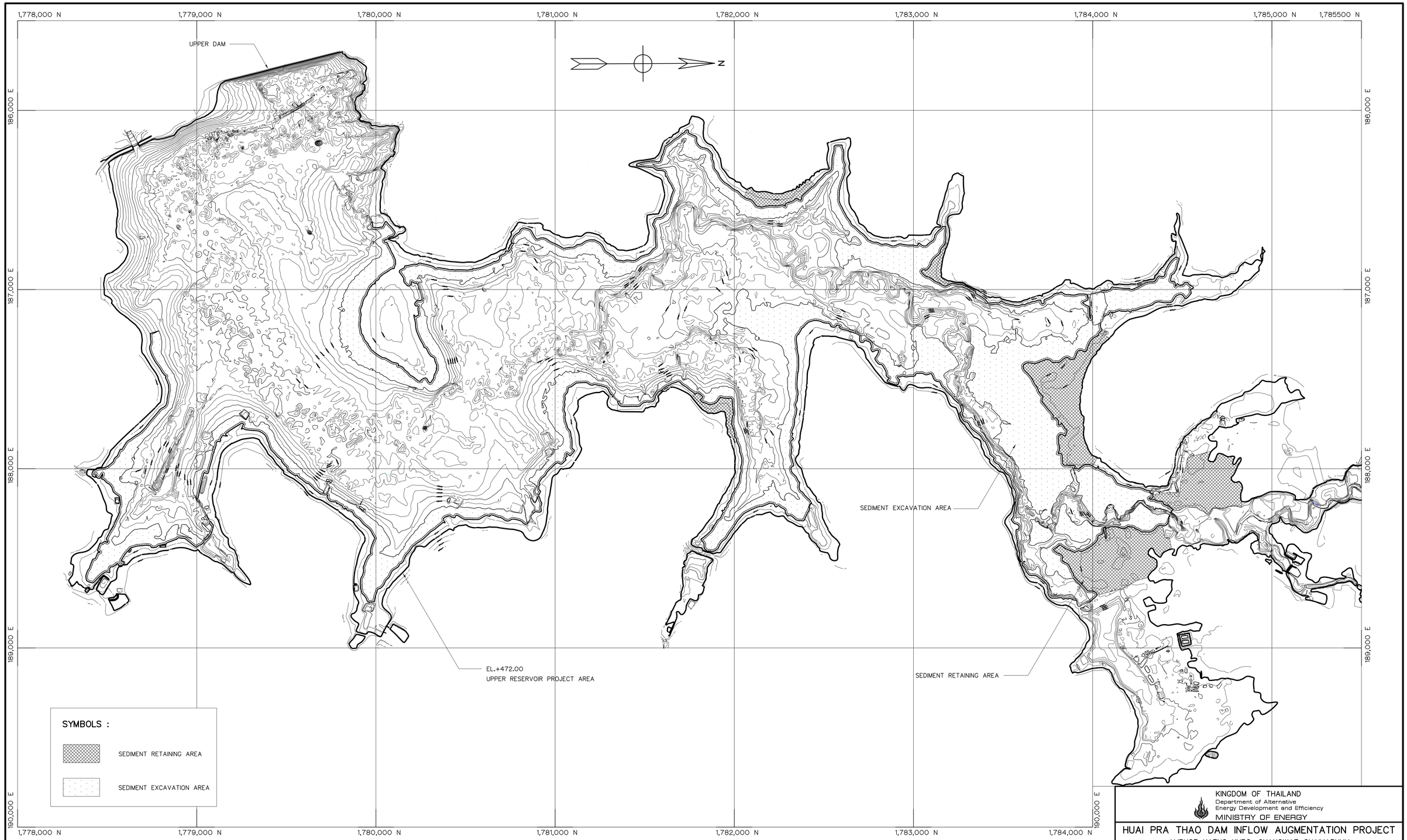
SEDIMENT EXCAVATION SECTION (SHEET 3/3)

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LAYOUT OF SEDIMENT RETAINING

SCALE 1:10,000

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

SCALE 1 : 10,000 KILOMETER

NOTES :

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

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS
UPPER RESERVOIR SEDIMENT EXCAVATION
LAYOUT OF SEDIMENT RETAINING

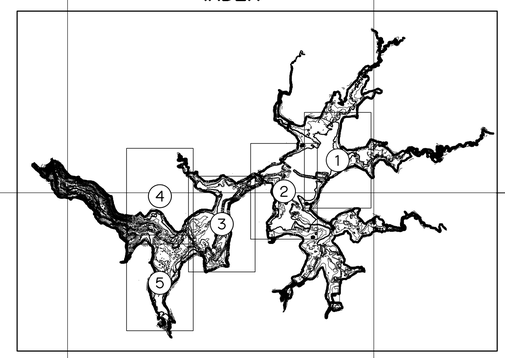
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PROJECT MANAGER 10/08/2021 DATE	APPROVED
DRAWING NO. HIA-SE-U17	SHEET NO. 20 OF 30

1,774,500 N | 1,775,500 N | 1,776,500 N | 1,777,500 N | 1,778,500 N | 1,779,500 N | 1,780,500 N | 1,781,500 N | 1,782,000 N

181,000 E | 182,000 E | 183,000 E | 184,000 E | 185,000 E | 186,000 E

N

INDEX



LOWER DAM

A | B | C | D | E | F | G | H | I

EL.+458.00
LOWER RESERVOIR PROJECT AREA

SEDIMENT EXCAVATION AREA

SYMBOLS :

SECTION OF SEDIMENT EXCAVATION

SEDIMENT EXCAVATION AREA

0.0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0

SCALE 1 : 10,000 KILOMETER

LAYOUT

SCALE 1:10,000

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (MSL.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. THE TOTAL EXCAVATION VOLUME IS APPROXIMATELY 2.57 MILLION CUBIC METERS.

NO.	DATE	REVISIONS	CHECKED	APPROVED
3				
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MINISTRY OF ENERGY

HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

LAYOUT

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PROJECT MANAGER	10/08/2021 DATE	DRAWING NO. HIA-SE-L01
		SHEET NO. 21 OF 30

182,400 E | 182,600 E | 182,800 E | 183,000 E | 183,200 E | 183,400 E | 183,600 E | 183,800 E | 183,900 E

1,780,000 N | 1,779,800 N | 1,779,600 N | 1,779,400 N | 1,779,200 N | 1,779,000 N

+454.00
+455.00
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EL.+458.00
LOWER RESERVOIR PROJECT AREA

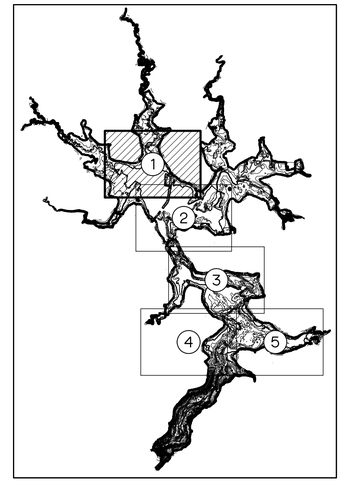
SEDIMENT EXCAVATION AREA

EL.+453.00

EL.+453.00

N

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0 50 100 150 200
SCALE 1 : 2,000 M.

PLAN
SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 1/5)

NO.	DATE	REVISIONS	CHECKED	APPROVED
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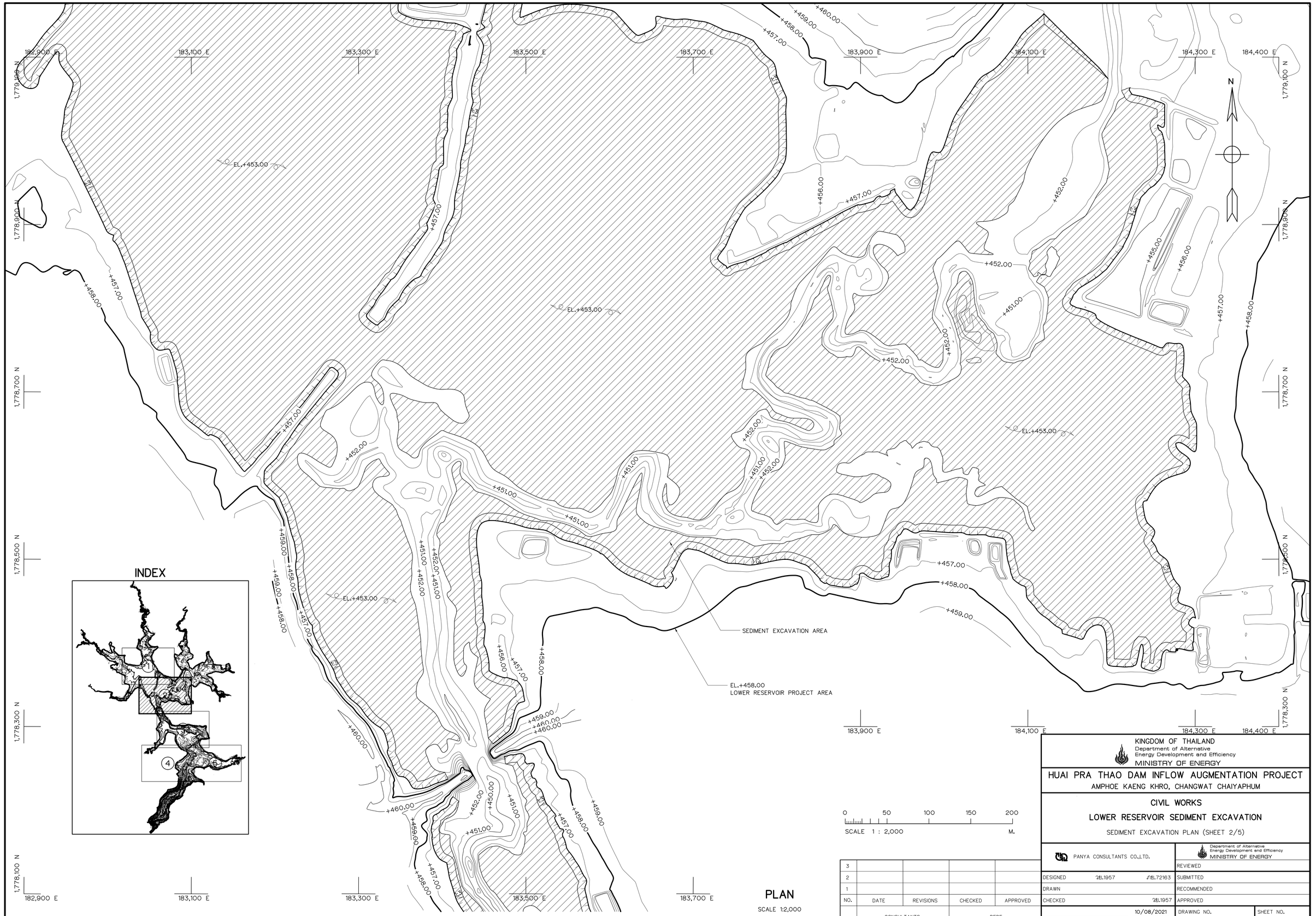
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	APPROVED

PROJECT MANAGER — 10/08/2021 DATE

DRAWING NO. HIA-SE-L02

SHEET NO. 22 OF 30



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0 50 100 150 200

SCALE 1 : 2,000 M.

PLAN

SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 2/5)

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183,500 E | 183,700 E | 183,900 E | 184,100 E | 184,300 E | 184,500 E | 184,700 E | 184,900 E

1,778,100 N | 1,777,900 N | 1,777,700 N | 1,777,500 N | 1,777,300 N | 1,777,100 N

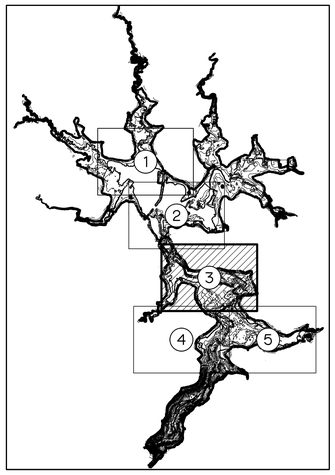
EL.+458.00
LOWER RESERVOIR PROJECT AREA

SEDIMENT EXCAVATION AREA

N

0 50 100 150 200
SCALE 1 : 2,000 M.

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PLAN
SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 3/5)

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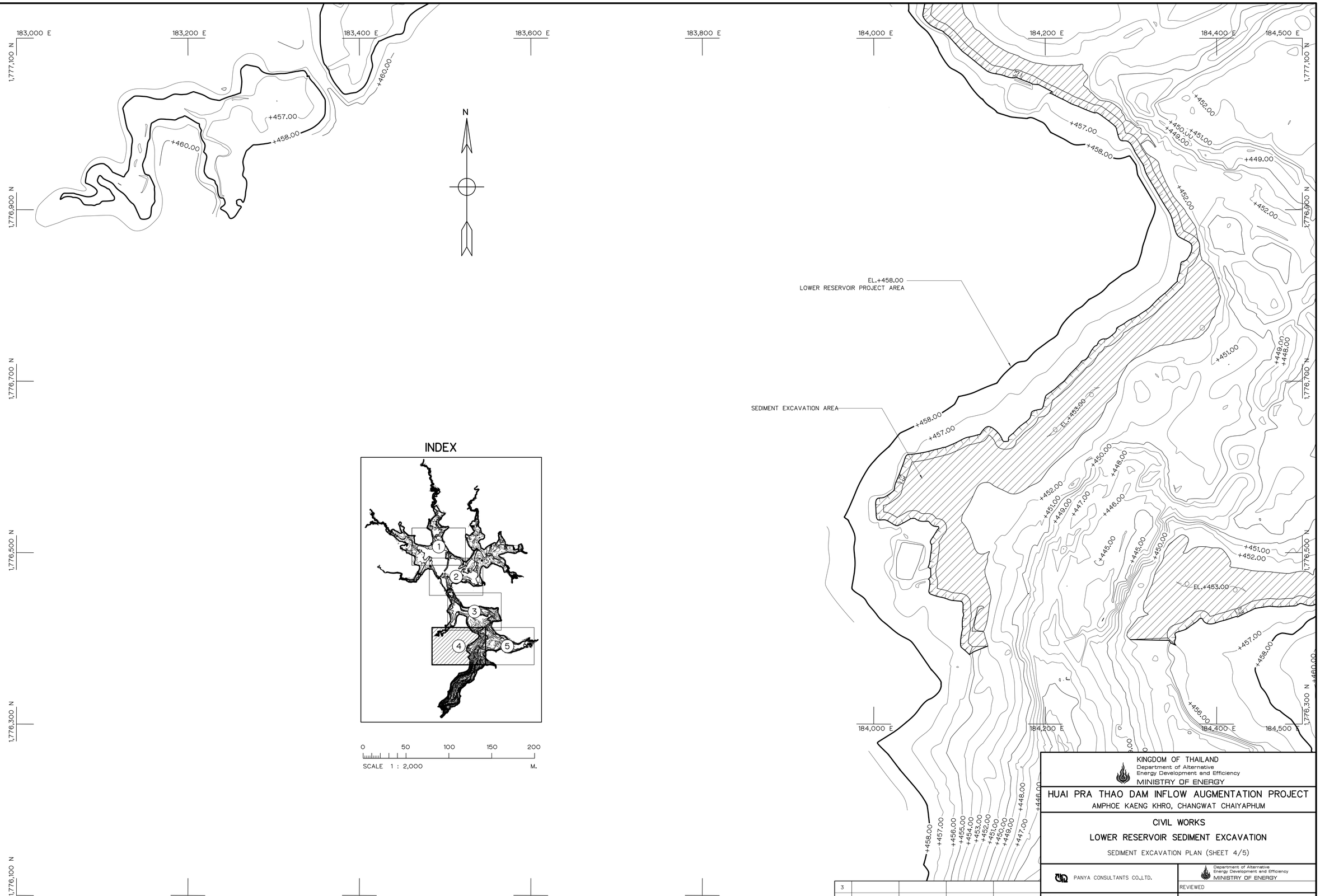
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PLAN

SCALE 1:2,000

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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 4/5)

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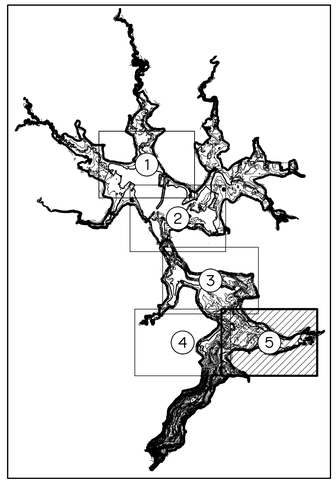
SEDIMENT EXCAVATION AREA

EL.+458.00
LOWER RESERVOIR PROJECT AREA

N

0 50 100 150 200
SCALE 1 : 2,000 M.

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PLAN

SCALE 1:2,000

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Department of Alternative Energy Development and Efficiency
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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

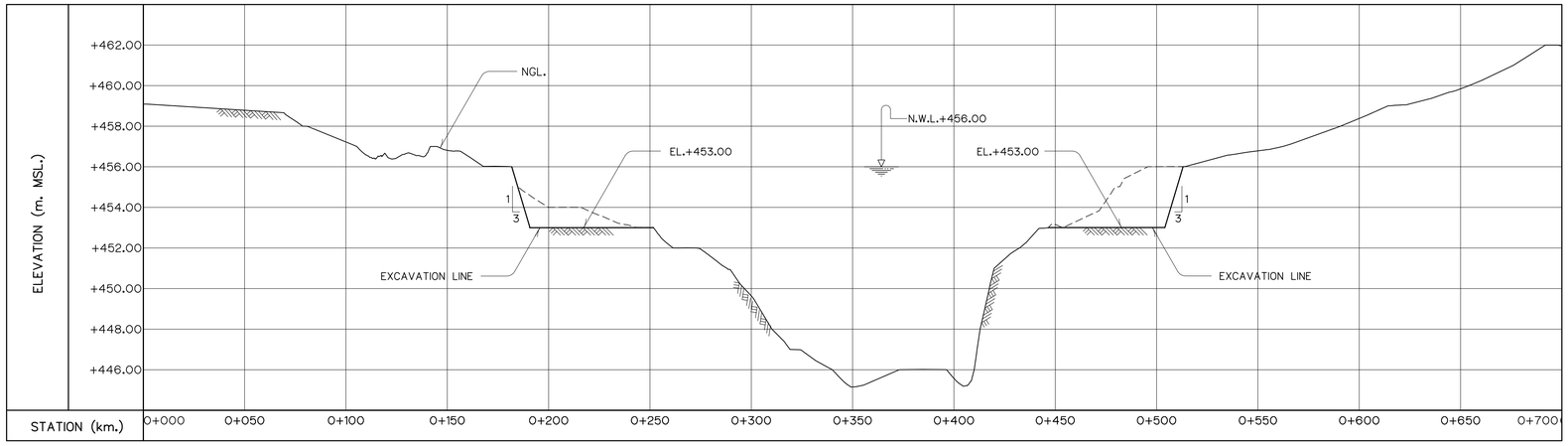
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION PLAN (SHEET 5/5)

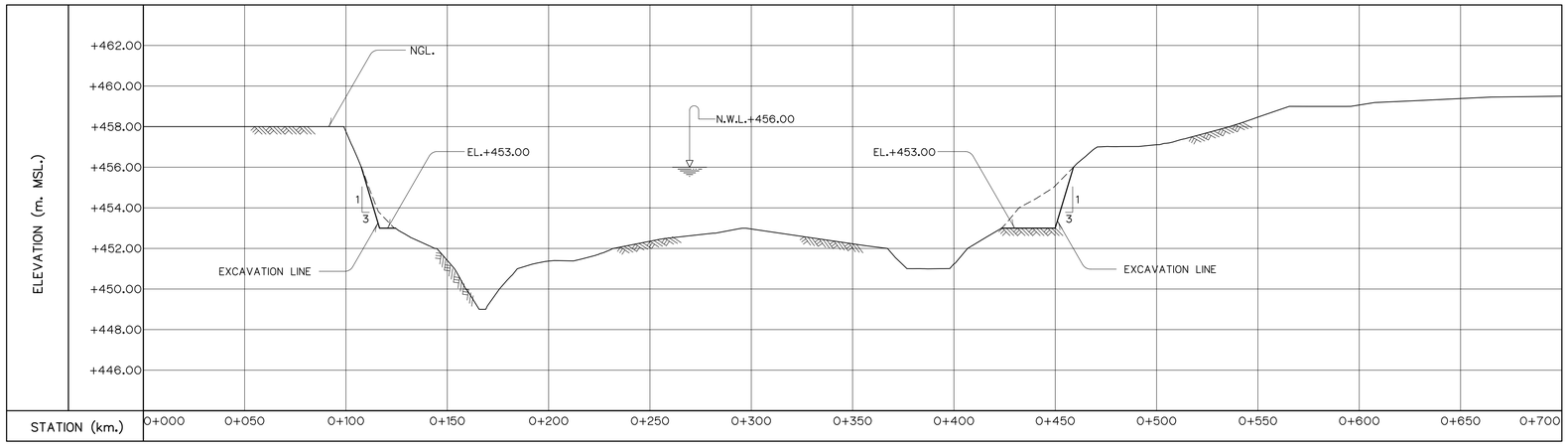
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SECTION A–A

HORIZONTAL SCALE 1:1,500

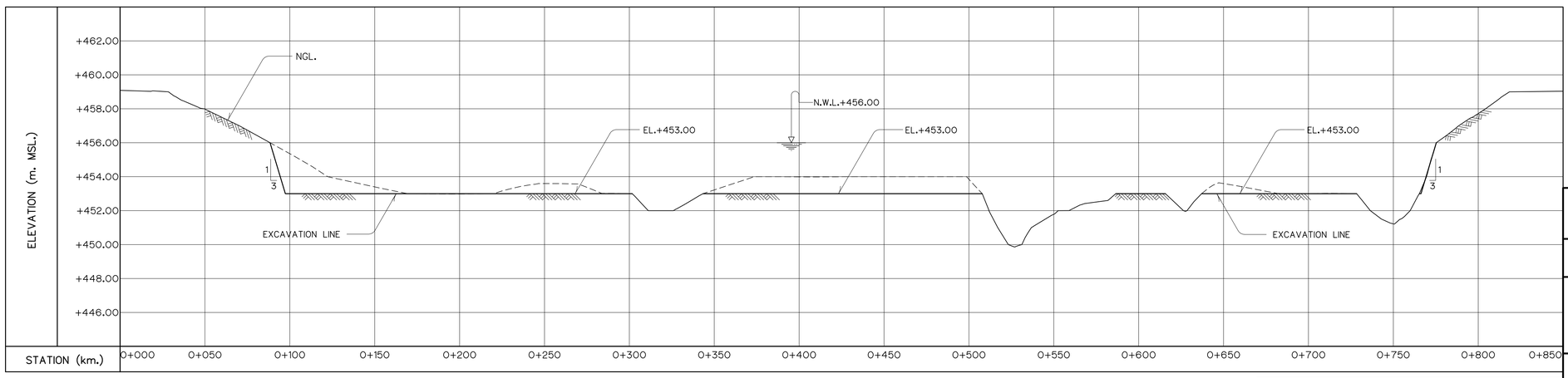
VERTICAL SCALE 1:150



SECTION B–B

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150



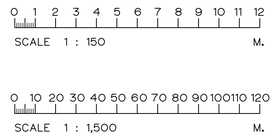
SECTION C–C

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150

NOTES :

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



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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT

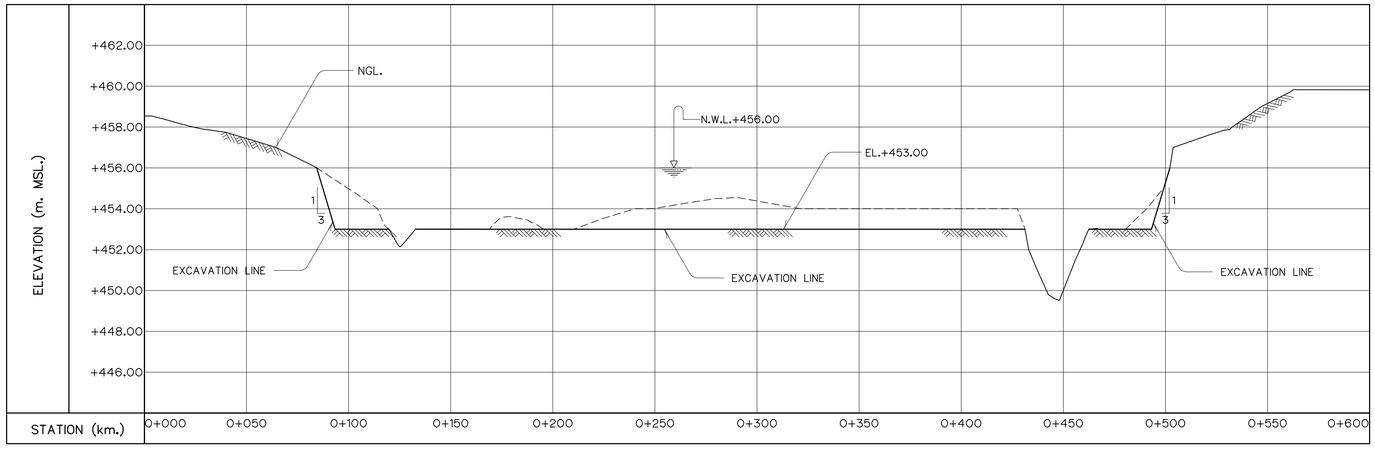
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION SECTION (SHEET 1/3)

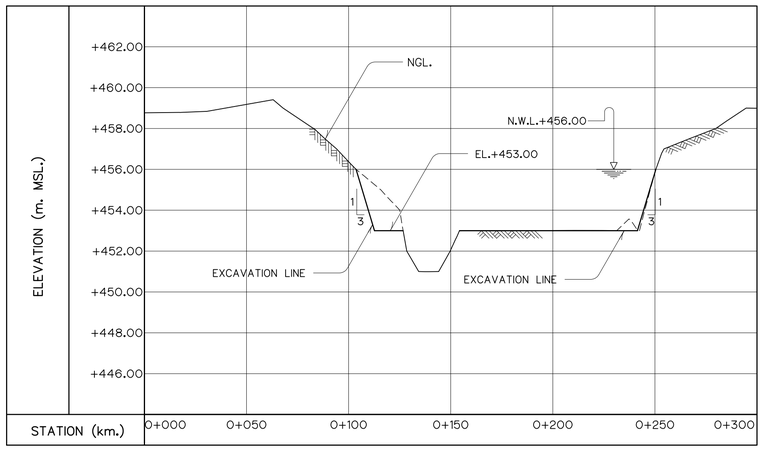
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SECTION D–D

HORIZONTAL SCALE 1:1,500

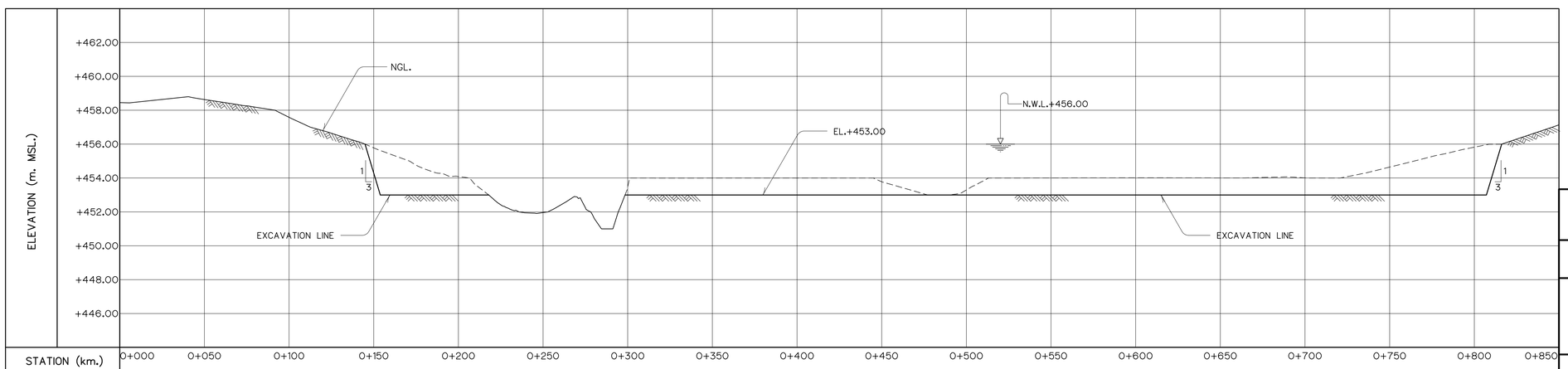
VERTICAL SCALE 1:150



SECTION E–E

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150



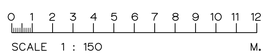
SECTION F–F

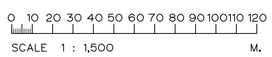
HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150

NOTES :

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





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HUAI PRA THAO DAM INFLOW AUGMENTATION PROJECT
AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

CIVIL WORKS

LOWER RESERVOIR SEDIMENT EXCAVATION

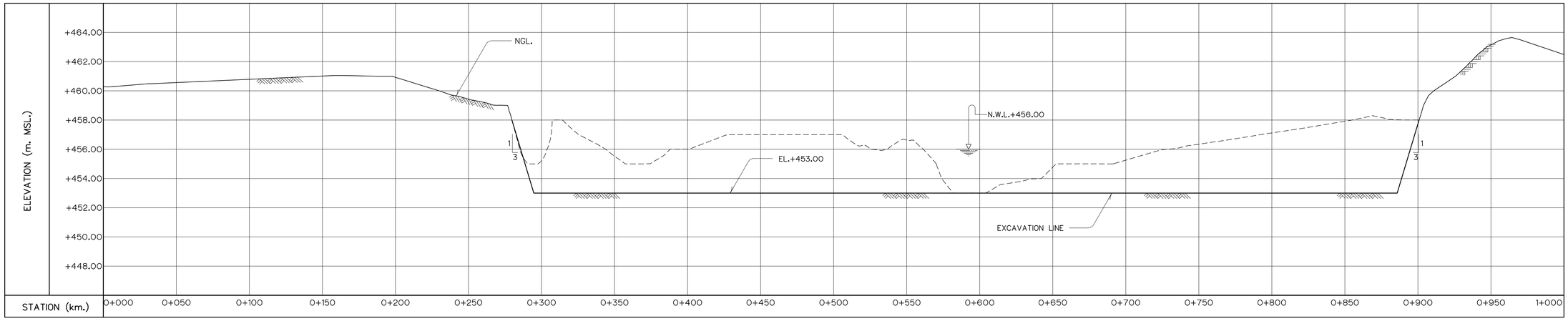
SEDIMENT EXCAVATION SECTION (SHEET 2/3)

NO.	DATE	REVISIONS	CHECKED	APPROVED
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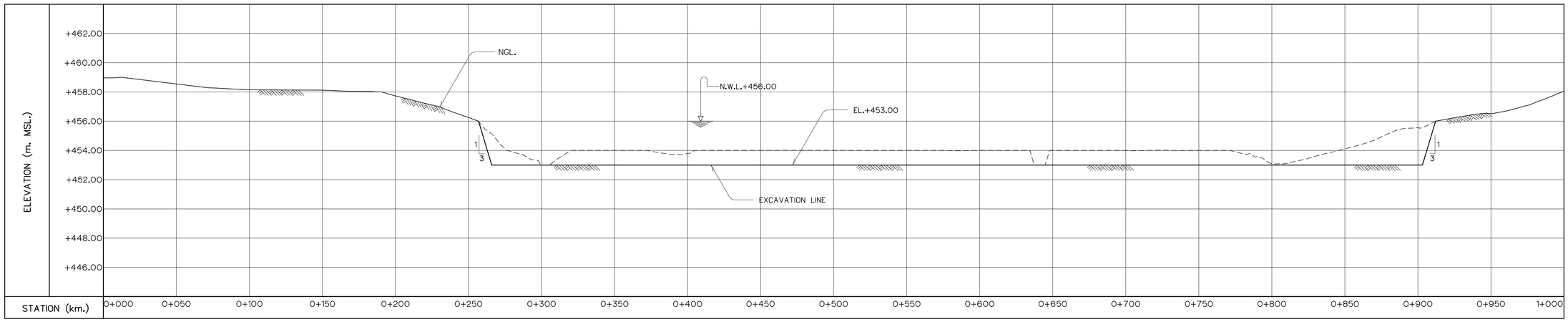
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SECTION G–G

HORIZONTAL SCALE 1:1,500

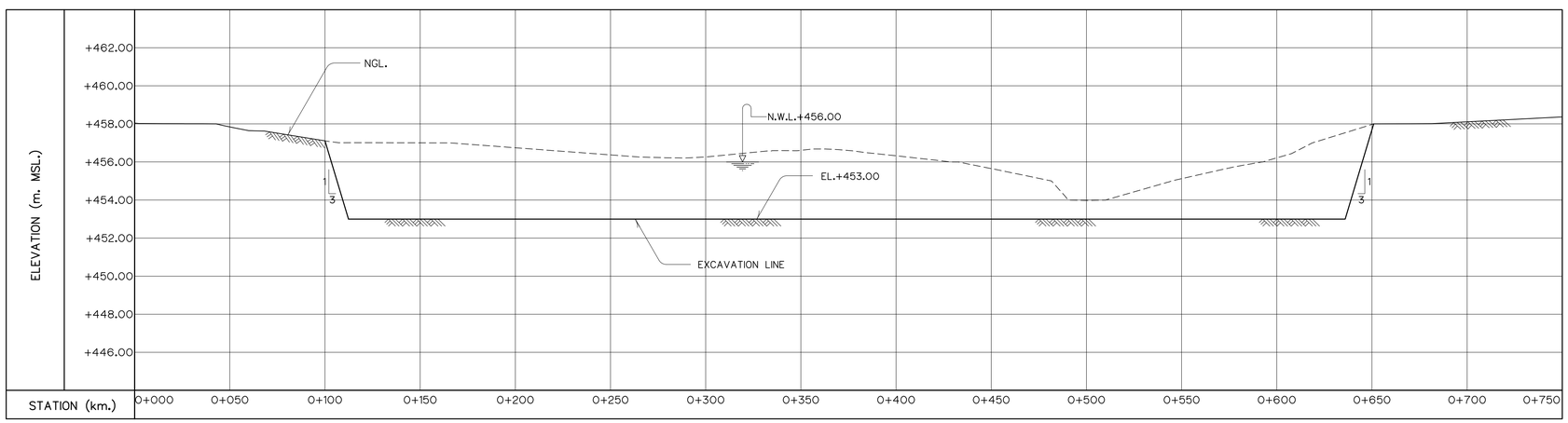
VERTICAL SCALE 1:150



SECTION H–H

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150



SECTION I–I

HORIZONTAL SCALE 1:1,500

VERTICAL SCALE 1:150

0 1 2 3 4 5 6 7 8 9 10 11 12

SCALE 1 : 150 M.

0 10 20 30 40 50 60 70 80 90 100 110 120

SCALE 1 : 1,500 M.

NOTES :

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

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LOWER RESERVOIR SEDIMENT EXCAVATION

SEDIMENT EXCAVATION SECTION (SHEET 3/3)

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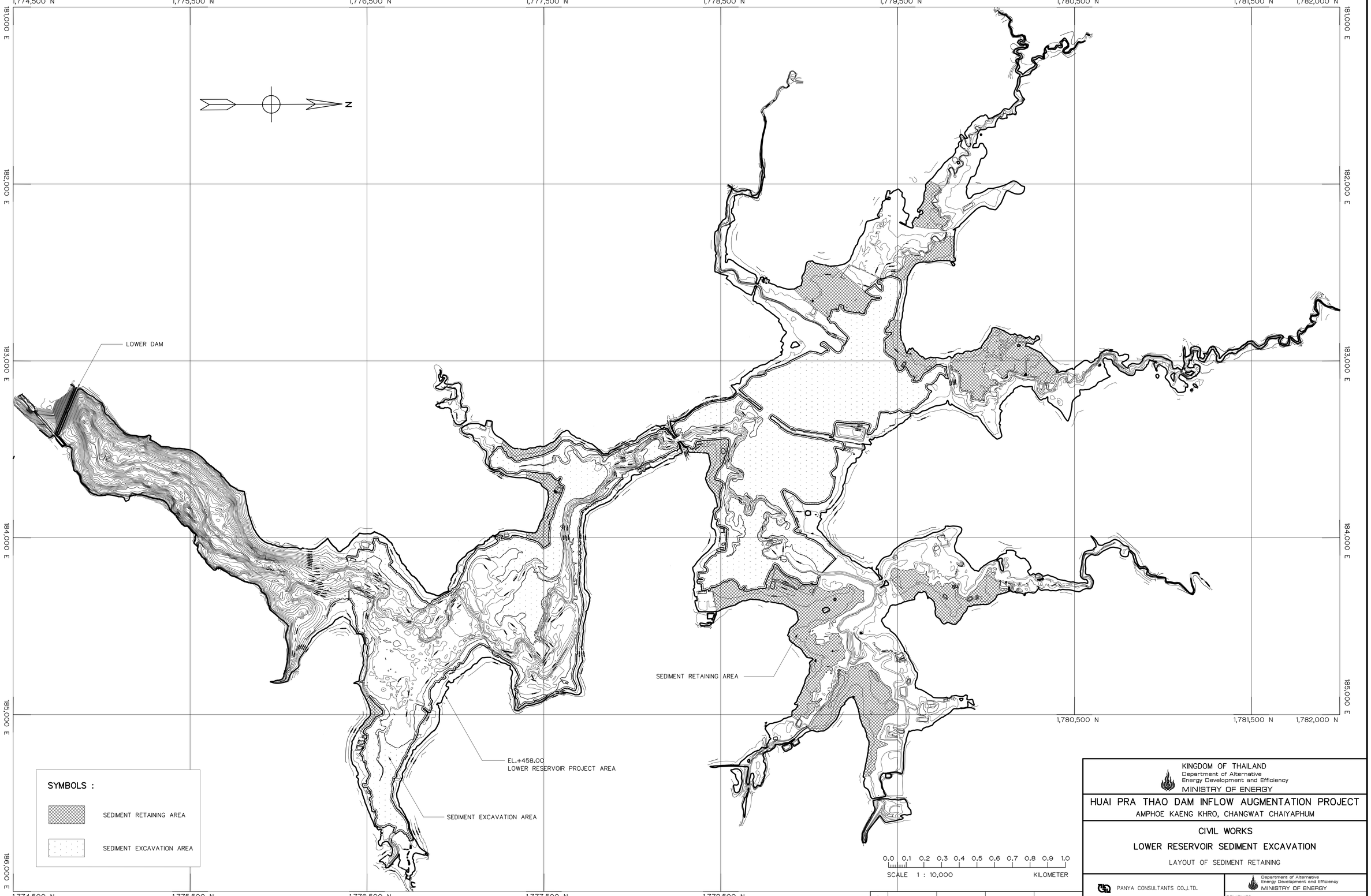
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LAYOUT OF SEDIMENT RETAINING

SCALE 1:10,000

NOTES :

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

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AMPHOE KAENG KHRO, CHANGWAT CHAIYAPHUM

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LOWER RESERVOIR SEDIMENT EXCAVATION

LAYOUT OF SEDIMENT RETAINING

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