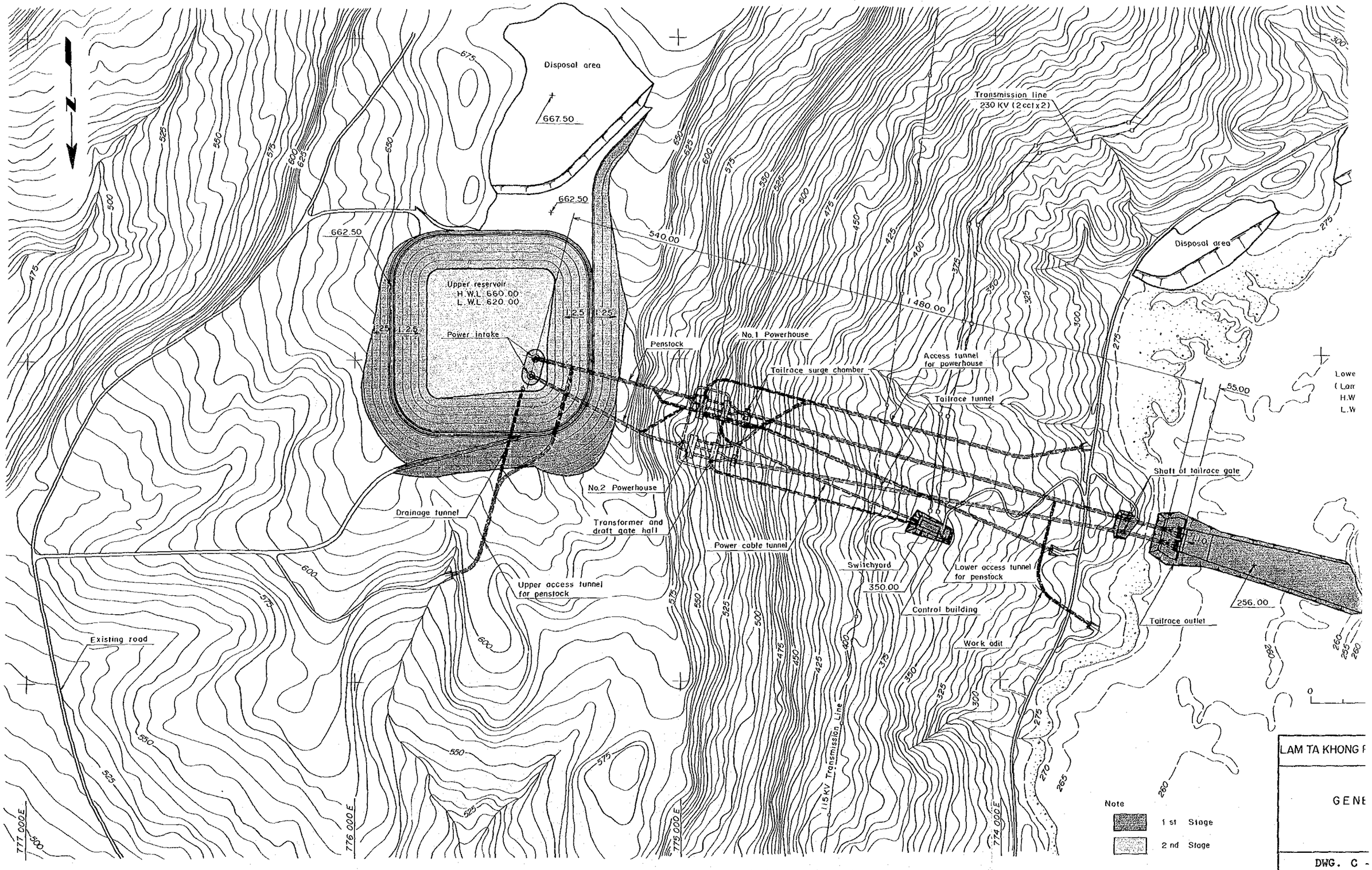
C-2 PRELIMINARY DESIGN OF CASE 2

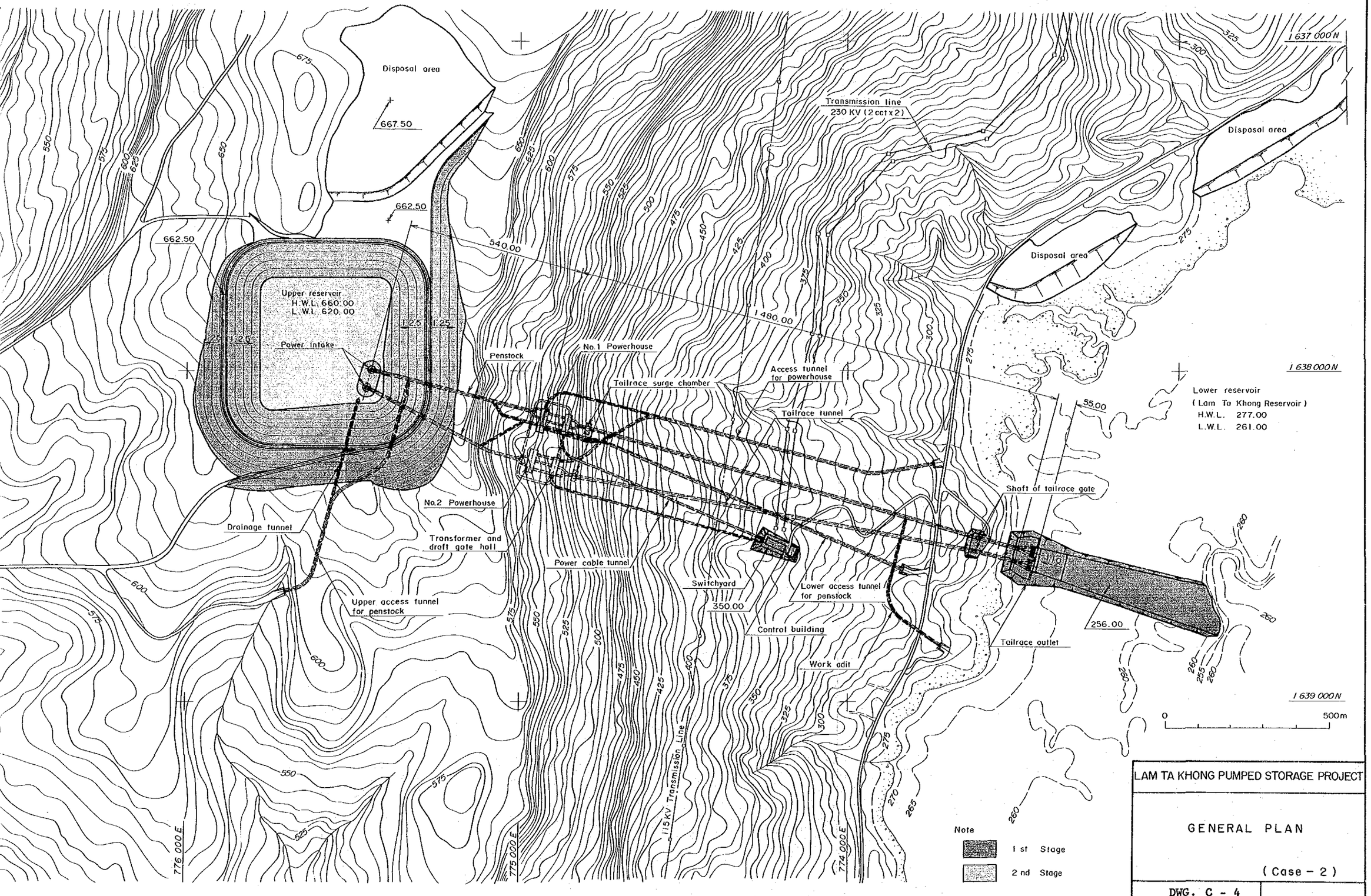
Table－2 Case －2

Item	Unit.	Statistics	
		1st Stage	2nd Stage
1. Hydroelectric Developement Plan			
Rated Intake Water Level	m.MSL.	653.00	
Rated Tailwater Level	m.MSL.	276.00	
Total head	m	377.00	
Loss Head	m	20.00	
Effective Head	m	357.00	
Discharge at Maximum Power Generating	m^3/sec	170	170
Maximum Output	MW	500	500
2. Upper Reservoir			
Dam Type		Rockfill Dam with Asphalt Facing	
Dam Height* Crest Length	m * m	60 * 2,210	
Dam Volume	$*10^3 m^3$	6,190	
High Water Level	m.MSL.	660.00	
Low Water Level	m.MSL.	620.00	
Effective Storage Capacity at H.W.L	$*10^3 m^3$	9,910	
Surfase Area at H.W.L	$*10^3 m^2$	339	
3. Lower Reservoir		(Lam Ta Khong Reservoir)	
Dam Type		Homogeneous Earth-fill Dam (Lam Ta Khong Dam)	
Dam Height* Crest Length	m * m	40.3 * 527	
Dam Volume	$*10^3 m^3$	853	
High Water Level	m.MSL.	277.00	
Low Water Level	m.MSL.	261.00 (L.L.W.L 259.00)	

Effective Storage Capacity at H.W.L	$*10^3 m^3$	290,000	
Surfase Area at H.W.L	$k m^2$	44	
4. Power Intake			
Type		Morning-glory Shape	
Inside Diameter * Length * Number of Set	m*m*-	(18.00~5.80D) * 51.00 * 2	——
5. Penstock			
Type		Inclined Shaft Embedded Steel	
Inside Diameter * Length * Number of Set	m*m*-	(5.80 ~2.60)*690.00* 1 5.80 *120.00* 1	(5.80 ~2.60) * 580.00 * 1
Gradient	°	51	51
Approximately Weight	t	4,160	3,410
6. Tailrace Tunnel			
Type		Concrete Lined Pressure Type	
Inside Diameter * Length * Number of Set	m*m*-	(4.90 ~6.60D)*1,470 * 1 4.90 * 210 * 1	(4.90 ~6.60D) *1,260.00 * 1
7. Tailrace Surge Chamber			
Type		Chamber Surge Tank	
-Set	-	1	1
-Shaft Chamber	m * m	(D) (H) 8.90 * 107.00	(D) (H) 8.90 * 107.00
-Upper Chamber	m*m*m	(W) (H) (L) 10.00 *10.00 * 35.00	(W) (H) (L) 10.00 *10.00 * 35.00
8. Tailrace Outlet			
Type		4 Continuous Box Culbert	
Length	m	55.00	——
Width * Height * Number of Set	m*m*-	(6.60 ~30.00) * (6.60~10.00) * 2	——

9. Powerhouse			
Type		Underground Type	
Width * Length * Height	m*m*m	22.00*72.50*45.70	22.00*71.50*45.70
10. Transformer Hall			
Type		Underground Type	
Width * Length * Height	m*m*m	20.00*63.50*25.50	20.00*59.70*25.50
11. Gate			
-Draft Gate			
-Type		Bonnet type	
-Size * Number of Set	m * -	ϕ 4.90 * 2	ϕ 4.90 * 2
-Tailrace Gate			
-Type		Roller Gate	
-Size * Number of Set	m*m*-	5.20*6.60*1	5.20*6.60*1


Disposal area
667.50
662.50
662.50
540.00
1 480.00
Upper reservoir
H.W.L. 660.00
L.W.L. 620.00
12.5
12.5
12.5
12.5
Power intake
Penstock
No.1 Powerhouse
Tailrace surge chamber
Access tunnel for powerhouse
Tailrace tunnel
Transmission line
230 KV (2 cct x 2)
Disposal area
55.00
Shaft of tailrace gate
No.2 Powerhouse
Drainage tunnel
Transformer and draft gate hall
Power cable tunnel
Switchyard
350.00
Lower access tunnel for penstock
Upper access tunnel for penstock
Control building
Tailrace outlet
256.00
Work adit
Existing road
115KV Transmission Line
777 000E
776 000E
775 000E
774 000E
Note
1 st Stage
2 nd Stage
LAM TA KHONG F
GENE
DWG. C -



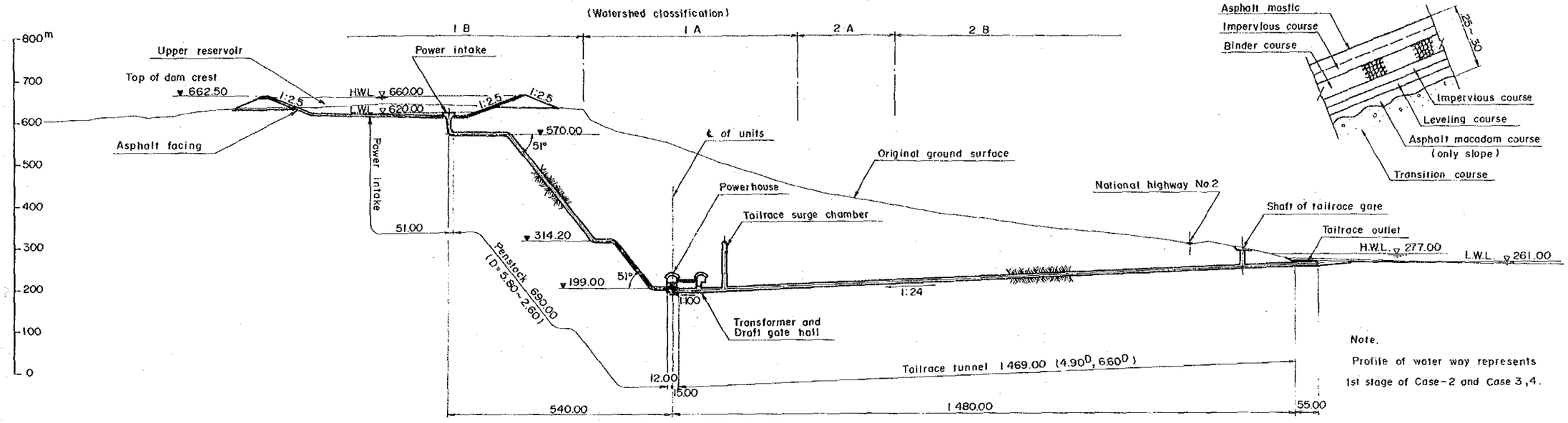
LAM TA KHONG PUMPED STORAGE PROJECT

GENERAL PLAN

(Case – 2)

DWG. C – 4

PROFILE OF WATER WAY

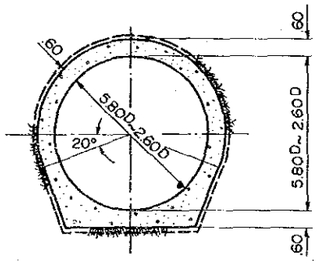


Composition of asphalt facing

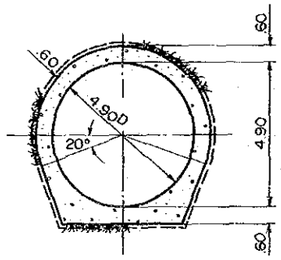
Note.
Profile of water way represents
1st stage of Case-2 and Case 3,4.

TYPICAL CROSS SECTION

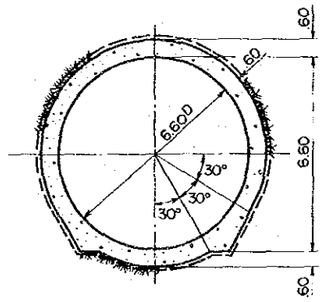
PENSTOCK TUNNEL



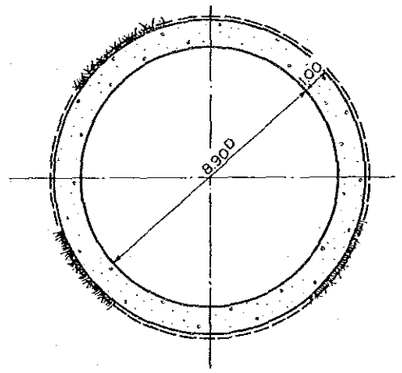
TAILRACE TUNNEL (4.90D)



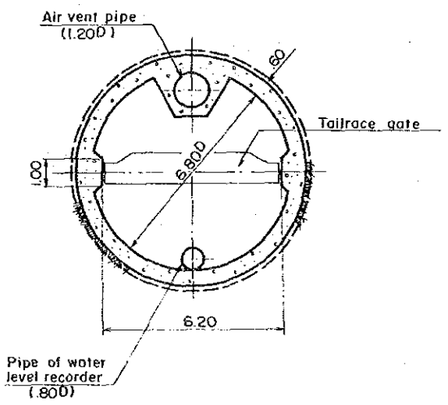
TAILRACE TUNNEL (6.60D)



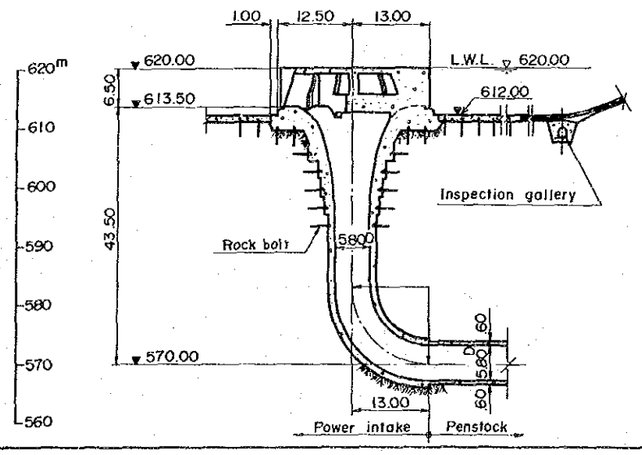
SHAFT OF TAILRACE SURGE CHAMBER



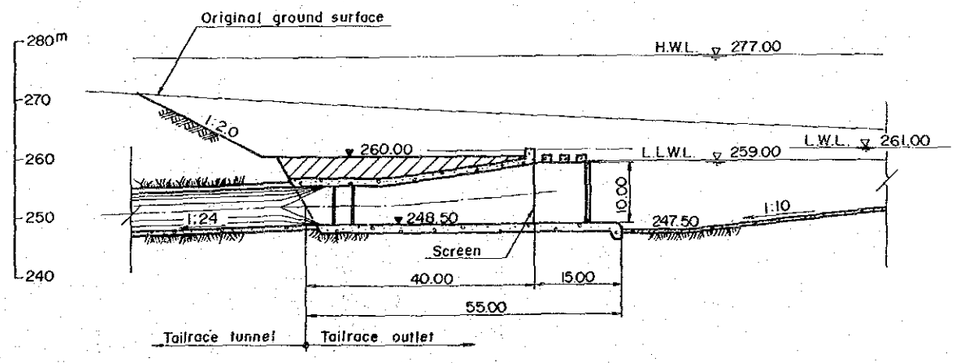
SHAFT OF TAILRACE GATE

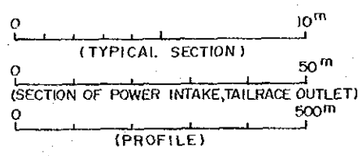


SECTION OF POWER INTAKE



SECTION OF TAILRACE OUTLET



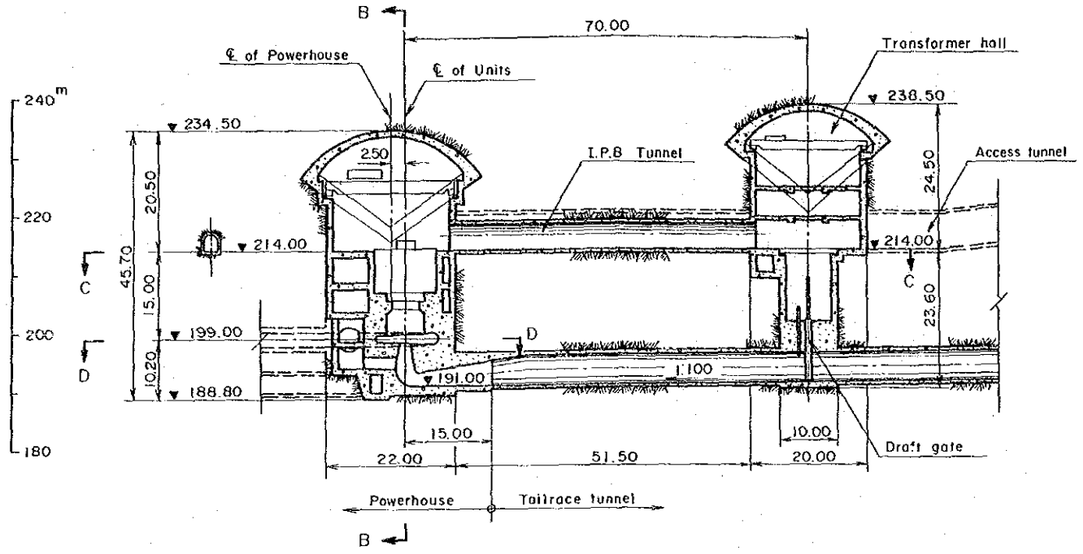


LAM TA KHONG PUMPED STORAGE PROJECT

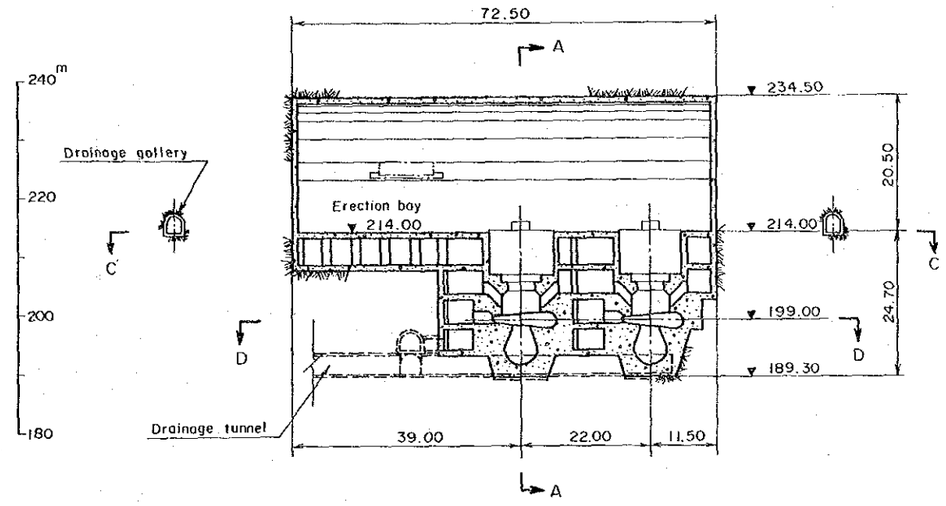
WATER WAY
PROFILE AND SECTION
(CASE – 2 ~ 4)

DWG. C-5

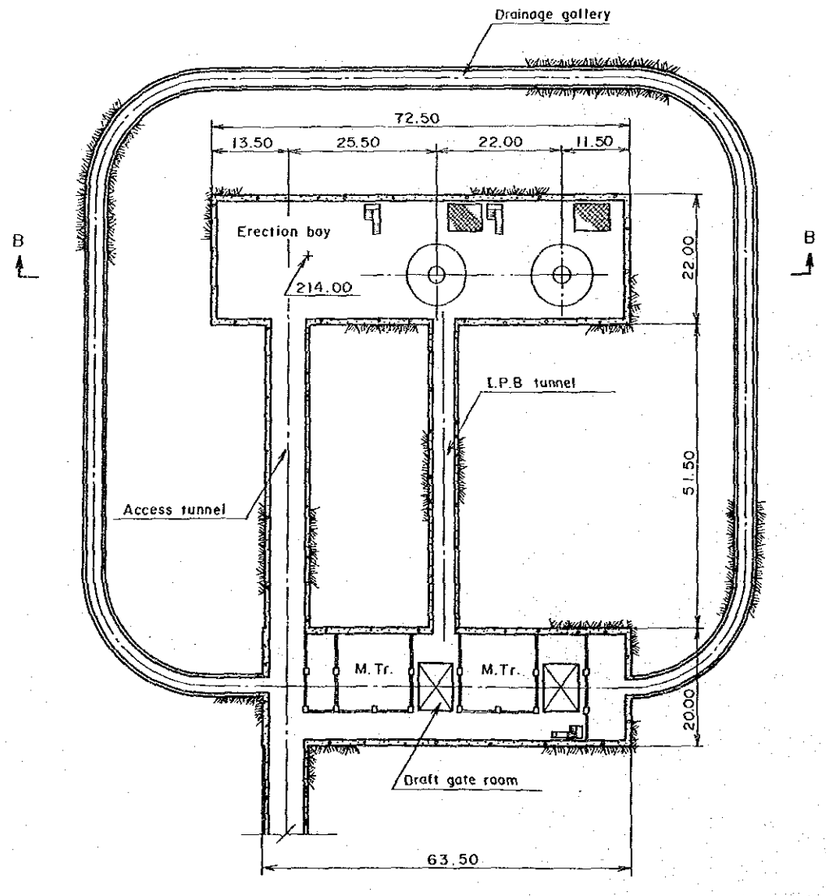
SECTION A – A



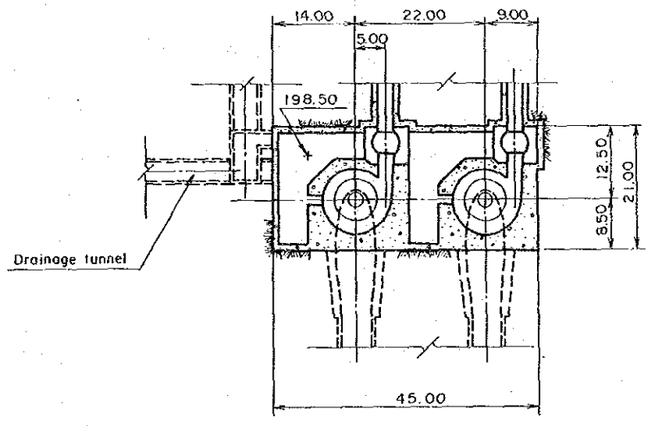
SECTION B – B



SECTION C – C



SECTION D – D



0 50m

Note:
This drawing represents No.1 Powerhouse.

LAM TA KHONG PUMPED STORAGE PROJECT	
POWERHOUSE SECTION (Case – 2)	
DWG. C-6	

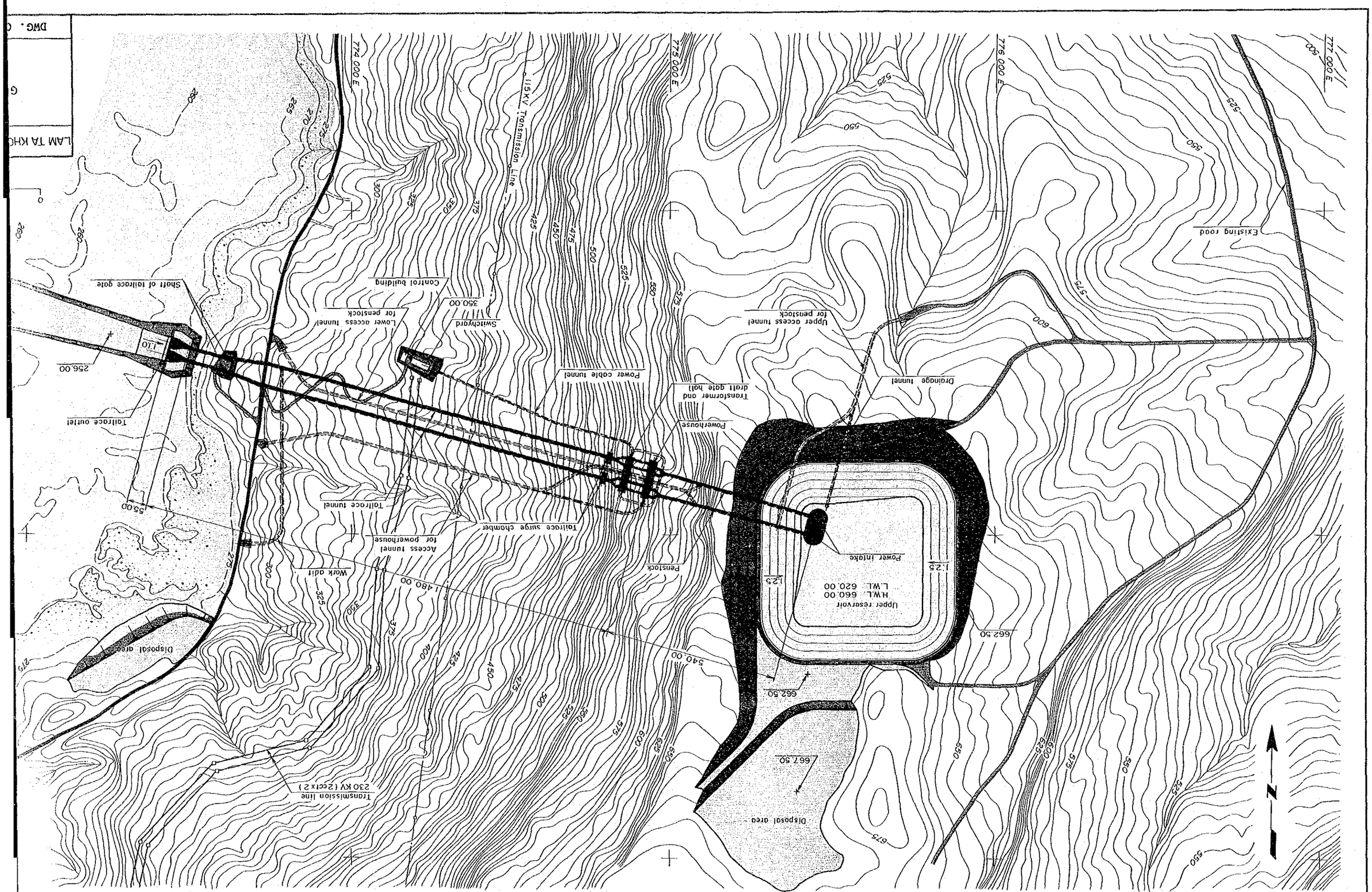
C-3 PRELIMINARY DESIGN OF CASE 3

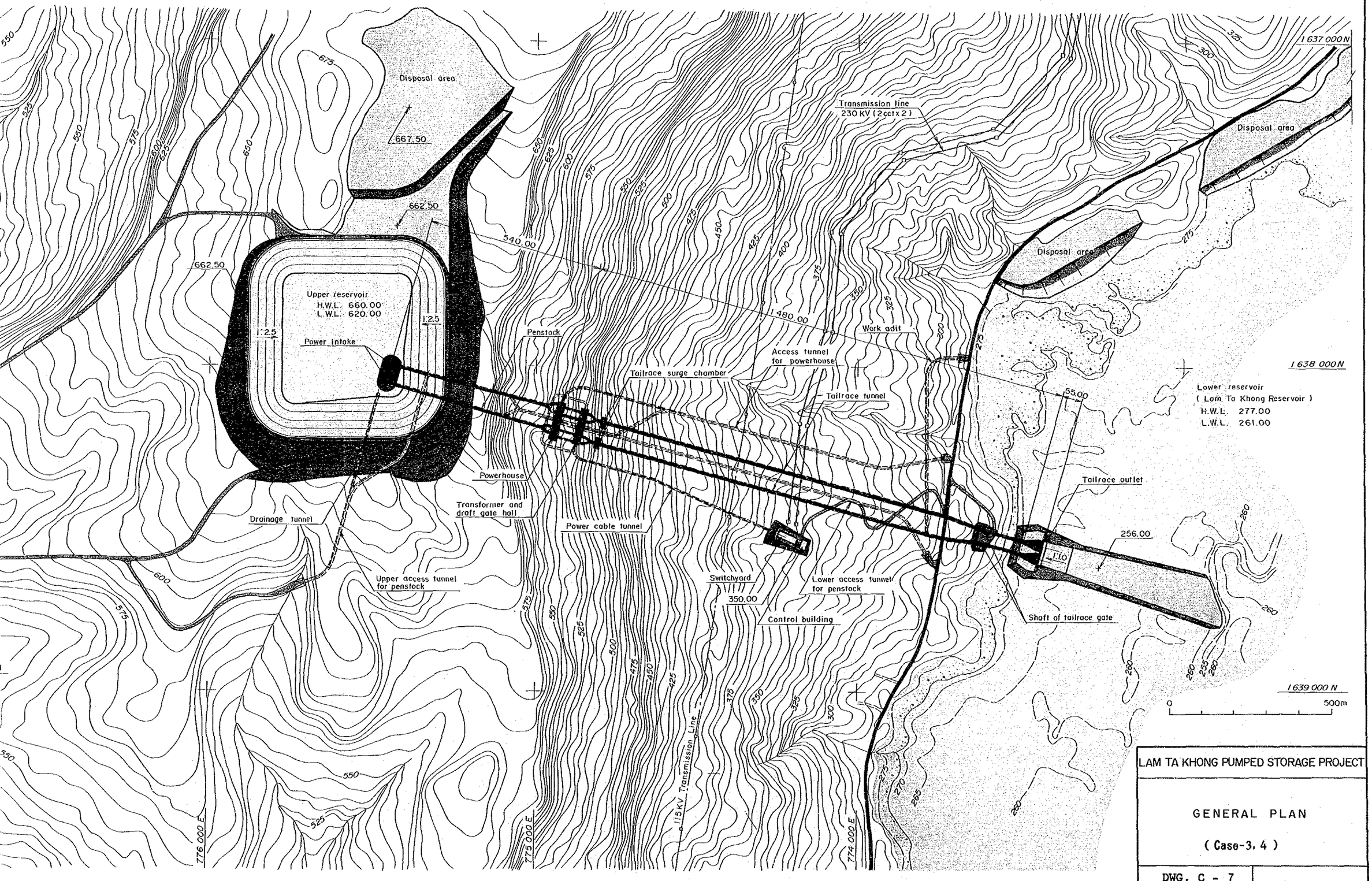
Table－3 Case －3

Item	Unit.	Statistics	
		1st Stage	2nd Stage
1. Hydroelectric Developement Plan			
Rated Intake Water Level	m.MSL.	653.00	
Rated Tailwater Level	m.MSL.	276.00	
Total head	m	377.00	
Loss Head	m	20.00	
Effective Head	m	357.00	
Discharge at Maximum Power Generating	m^3/sec	170	170
Maximum Output	MW	500	500
2. Upper Reservoir			
Dam Type		Rockfill Dam with Asphalt Facing	
Dam Height* Crest Length	m * m	60 * 2,210	
Dam Volume	$*10^3 m^3$	6,190	
High Water Level	m.MSL.	660.00	
Low Water Level	m.MSL.	620.00	
Effective Storage Capacity at H.W.L	$*10^3 m^3$	9,910	
Surfase Area at H.W.L	$*10^3 m^2$	339	
3. Lower Reservoir		(Lam Ta Khong Reservoir)	
Dam Type		Homogeneous Earth-fill Dam (Lam Ta Khong Dam)	
Dam Height* Crest Length	m * m	40.3 * 527	
Dam Volume	$*10^3 m^3$	853	
High Water Level	m.MSL.	277.00	
Low Water Level	m.MSL.	261.00 (L.L.W.L 259.00)	

Effective Storage Capacity at H.W.L	$*10^3 m^3$	290,000
Surfase Area at H.W.L	k m^2	44
4. Power Intake		
Type		Morning-glory Shape
Inside Diameter * Length * Number of Set	m*m*-	(18.00~5.80D) * 51.00 * 2 | ——
5. Penstock		
Type		Inclined Shaft Embedded Steel
Inside Diameter * Length * Number of Set	m*m*-	(5.80 ~2.60)*690.00* 2
Gradient	°	51
Approximately Weight	t	7,500 | 30
6. Tailrace Tunnel		
Type		Concrete Lined Pressure Type
Inside Diameter * Length * Number of Set	m*m*-	(4.90 ~6.60D) * 1,470 * 2
7. Tailrace Surge Chamber		
Type		Chamber Surge Tank
-Set	-	2
-Shaft Chamber	m * m	(D) (H) 8.90 * 107.00
-Upper Chamber	m*m*m	(W) (H) (L) 10.00 *10.00 * 35.00
8. Tailrace Outlet		
Type		4 Continuous Box Culbert
Length	m	55.00
Width * Height * Number of Set	m*m*-	(6.60 ~30.00) * (6.60~10.00) * 2

9. Powerhouse		
Type		Underground Type
Width * Length * Height	m*m*m	22.00 * 117.00 * 45.70
10. Transformer Hall		
Type		Underground Type
Width * Length * Height	m*m*m	20.00 *108.00 * 25.50
11. Gate		
-Draft Gate		
-Type		Bonnet type
-Size * Number of Set	m * -	ϕ 4.90 * 4
-Tailrace Gate		
-Type		Roller Gate
-Size * Number of Set	m*m*-	5.20 * 6.60 * 2


774 000 E
775 000 E
776 000 E
777 000 E
115kV Transmission Line
Control building
Switchyard
350.00
Lower access tunnel for penstock
Shaft of tailrace gate
256.00
Tailrace outlet
55.00
Tailrace tunnel
Access tunnel for powerhouse
Work adit
1480.00
540.00
Disposal area
Transmission line 230 kV (2cct x 2)
Power cable tunnel
Transformer and draft gate hall
Powerhouse
Penstock
Tailrace surge chamber
Upper access tunnel for penstock
Dringage tunnel
Existing road
Power intake
Upper reservoir
H.W.L. 660.00
L.W.L. 620.00
662.50
667.50
Disposal area
N



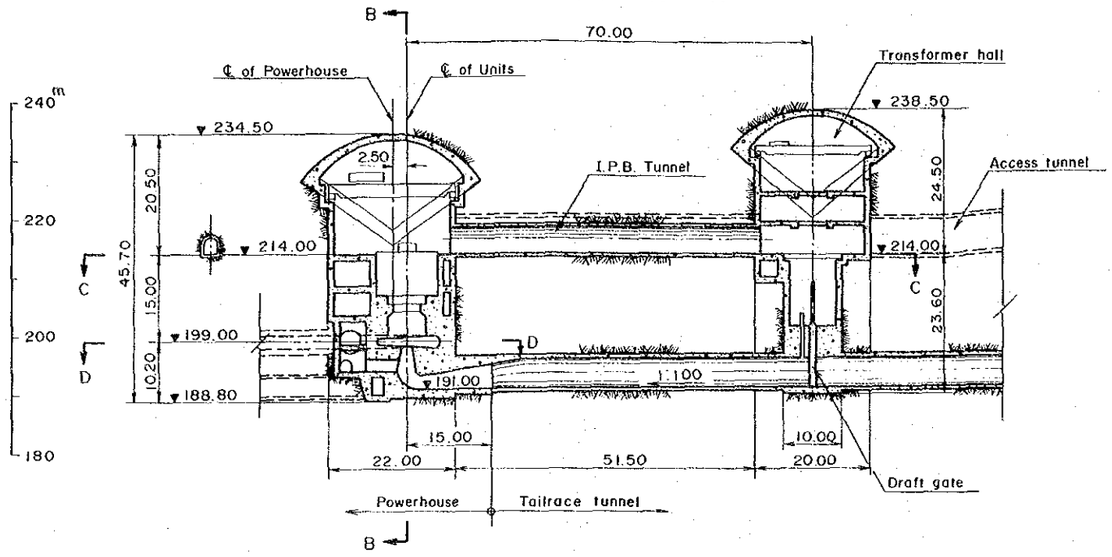
LAM TA KHONG PUMPED STORAGE PROJECT

GENERAL PLAN

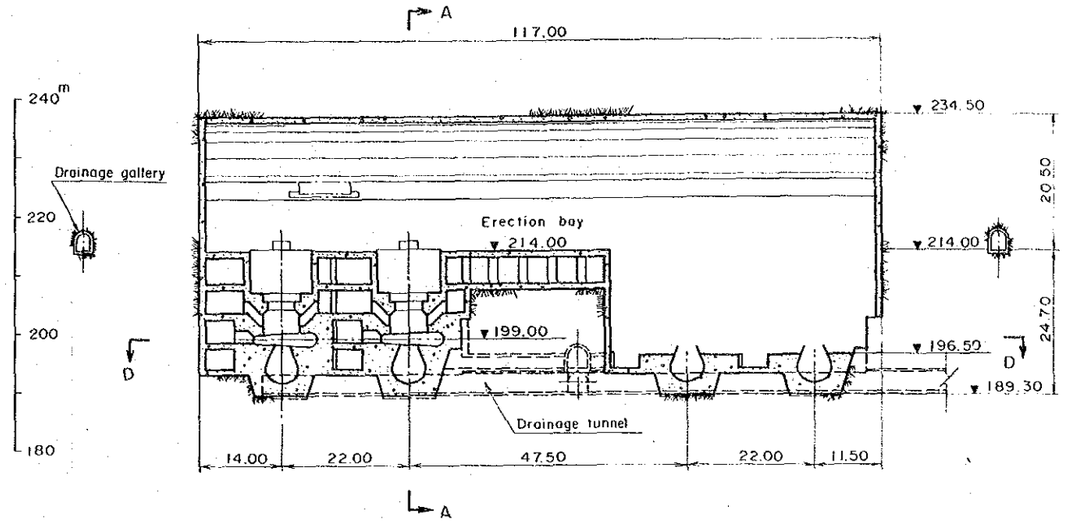
(Case-3, 4)

DWG. C - 7

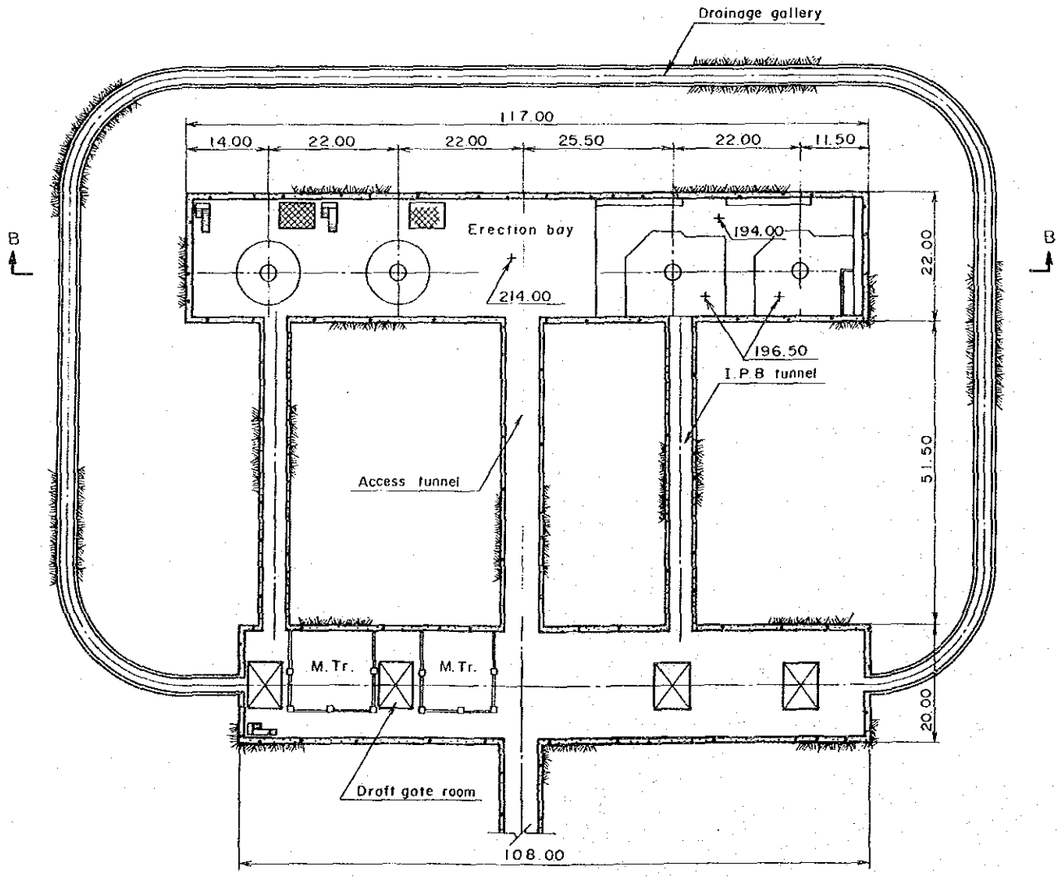
SECTION A – A



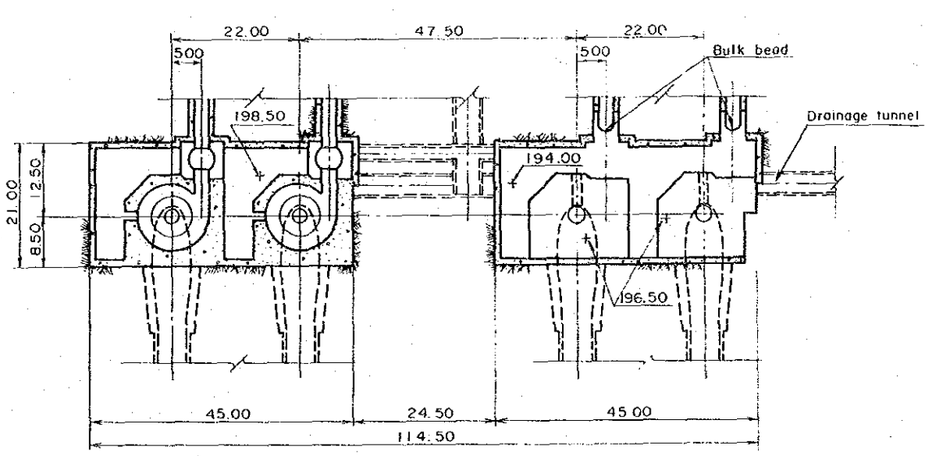
SECTION B – B



SECTION C – C



SECTION D – D



0 50m

Note:
This drawing represents 1st stage.

LAM TA KHONG PUMPED STORAGE PROJECT

POWERHOUSE
SECTION
(Case – 3)

DWG. C-8

C-4 PRELIMINARY DESIGN OF CASE 4

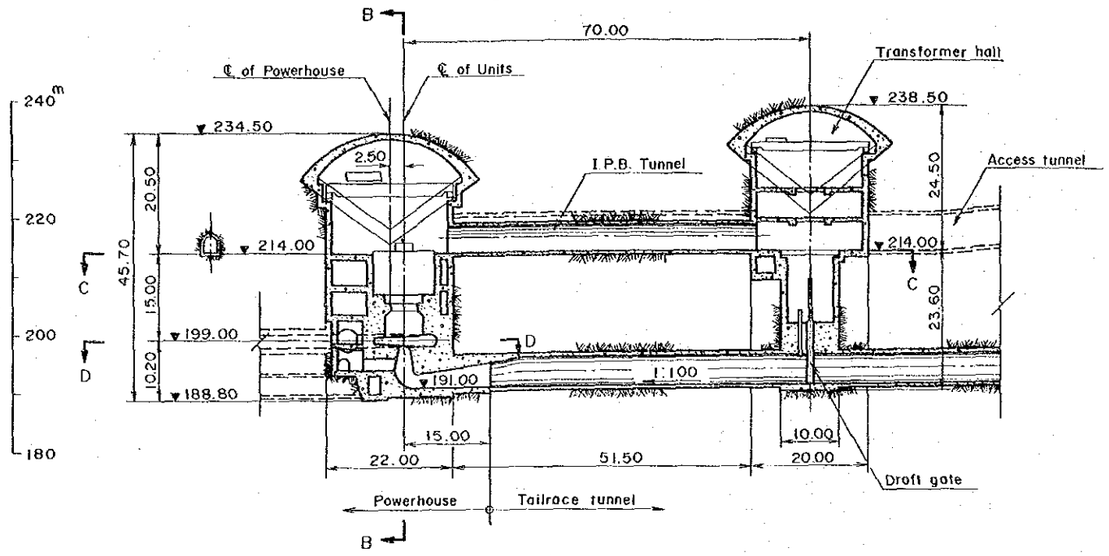
Table－4 Case －4

Item	Unit.	Statistics
1. Hydroelectric Developement Plan		
Rated Intake Water Level	m.MSL.	653.00
Rated Tailwater Level	m.MSL.	276.00
Total head	m	377.00
Loss Head	m	20.00
Effective Head	m	357.00
Discharge at Maximum Power Generating	m^3/sec	340
Maximum Output	MW	1,000
2. Upper Reservoir		
Dam Type		Rockfill Dam with Asphalt Facing
Dam Height* Crest Length	m * m	60 * 2,210
Dam Volume	$*10^3 m^3$	6,190
High Water Level	m.MSL.	660.00
Low Water Level	m.MSL.	620.00
Effective Storage Capacity at H.W.L	$*10^3 m^3$	9,910
Surfase Area at H.W.L	$*10^3 m^2$	339
3. Lower Reservoir		(Lam Ta Khong Reservoir)
Dam Type		Homogeneous Earth-fill Dam (Lam Ta Khong Dam)
Dam Height* Crest Length	m * m	40.3 * 527
Dam Volume	$*10^3 m^3$	853
High Water Level	m.MSL.	277.00
Low Water Level	m.MSL.	261.00 (L.L.W.L 259.00)

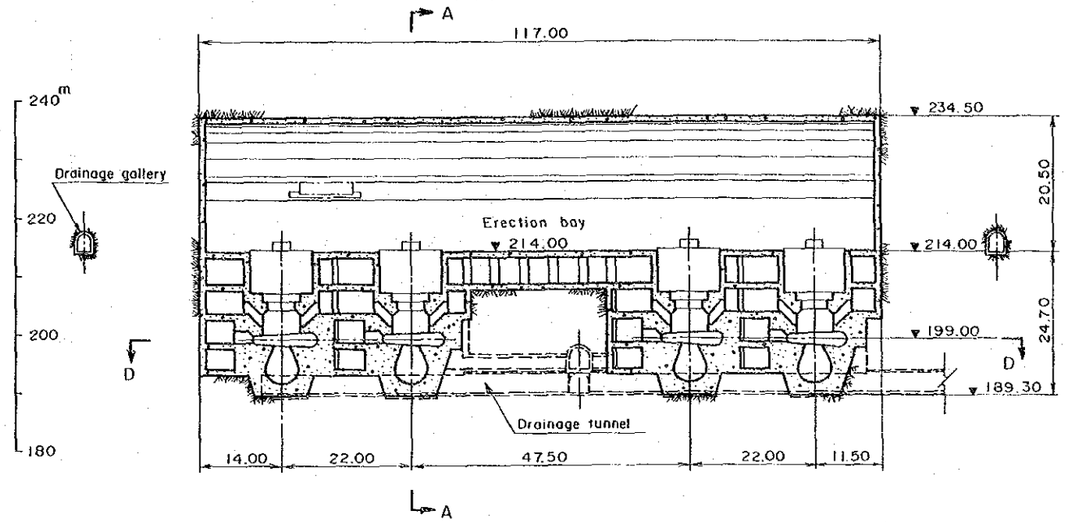
Effective Storage Capacity at H.W.L	$*10^3 m^3$	290,000
Surfase Area at H.W.L	$k m^2$	44
4. Power Intake		
Type		Morning-glory Shape
Inside Diameter * Length * Number of Set	m*m*-	(18.00~5.80D) * 51.00 * 2
5. Penstock		
Type		Inclined Shaft Embedded Steel
Inside Diameter * Length * Number of Set	m*m*-	(5.80 ~2.60)*690.00* 2
Gradient	°	51
Approximately Weight	t	7,580
6. Tailrace Tunnel		
Type		Concrete Lined Pressure Type
Inside Diameter * Length * Number of Set	m*m*-	(4.90 ~6.60D) * 1,470 * 2
7. Tailrace Surge Chamber		
Type		Chamber Surge Tank
-Set	-	2
-Shaft Chamber	m * m	(D) (H) 8.90 * 107.00
-Upper Chamber	m*m*m	(W) (H) (L) 10.00 *10.00 * 35.00
8. Tailrace Outlet		
Type		4 Continuous Box Culbert
Length	m	55.00
Width * Height * Number of Set	m*m*-	(6.60 ~30.00) * (6.60~10.00) * 2

9. Powerhouse		
Type		Underground Type
Width * Length * Height	m*m*m	22.00 * 117.00 * 45.70
10. Transformer Hall		
Type		Underground Type
Width * Length * Height	m*m*m	20.00 *108.00 * 25.50
11. Gate		
-Draft Gate		
-Type		Bonnet type
-Size * Number of Set	m * -	ϕ 4.90 * 4
-Tailrace Gate		
-Type		Roller Gate
-Size * Number of Set	m*m*-	5.20 * 6.60 * 2

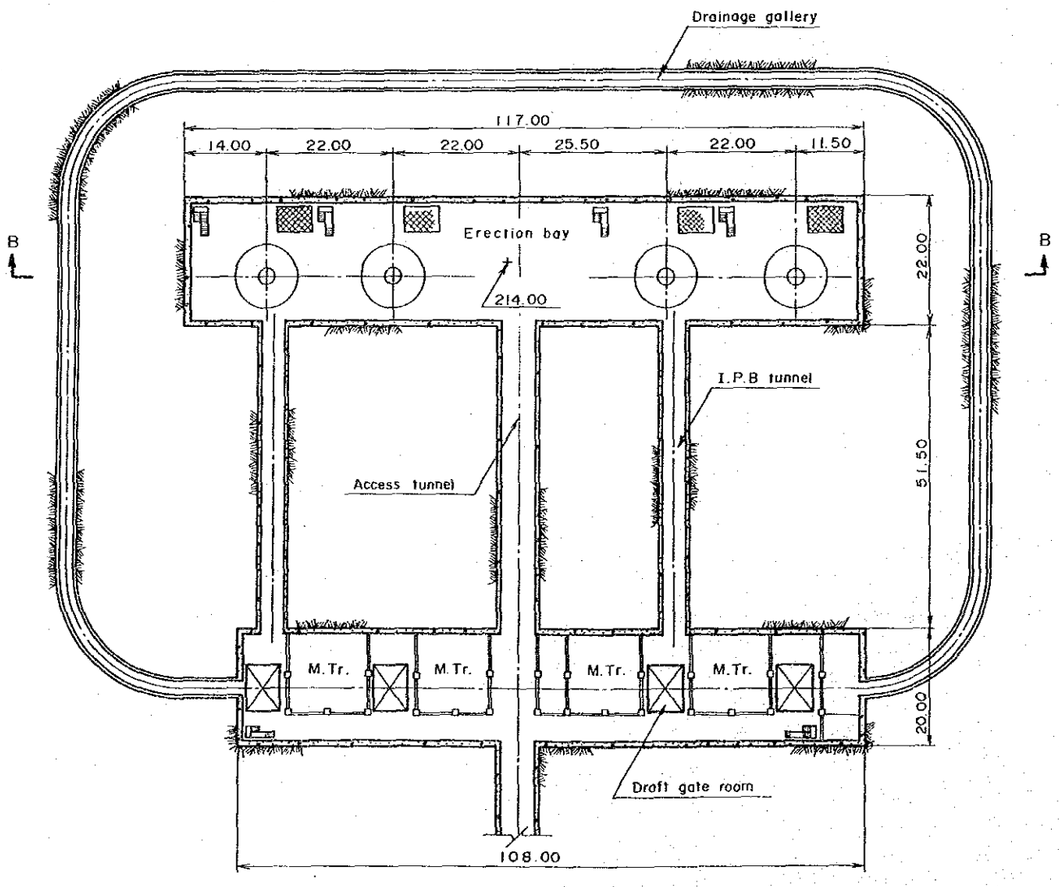
SECTION A – A



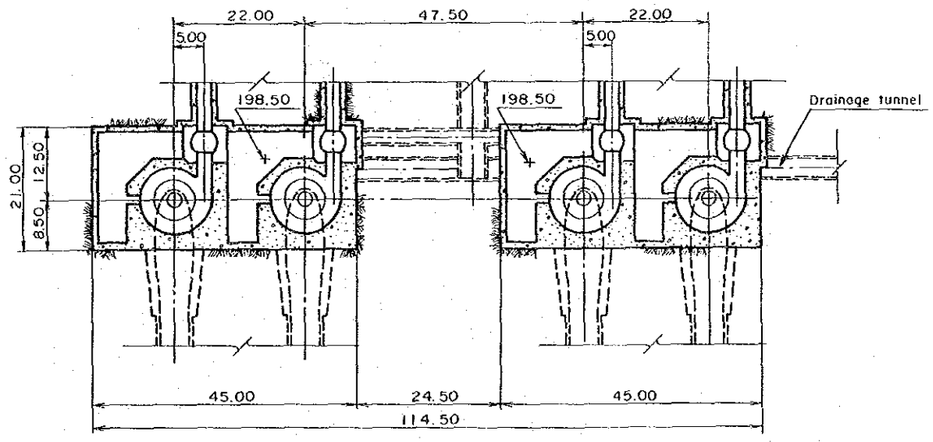
SECTION B – B



SECTION C – C



SECTION D – D



0 50m

LAM TA KHONG PUMPED STORAGE PROJECT	
POWERHOUSE SECTION (Case – 4)	
DWG. C-9	

C-5 PRELIMINARY DESIGN OF ALTERNATIVE 1

Appendix C-5

Design Outline of Alternative-1

The Alternative-1 is designed to construct the upper reservoir with 2 stages, the ultimate scale of which is the same as that of the upper reservoir in Case-2, in order to facilitate a prompt procurement of land for the upper reservoir.

At the 1st stage the capacity of the upper reservoir is 500 MW - 8 hours, and at the 2nd stage it is 1,000 MW - 8 hours.

Excavation muck of the dam is diverted to the dam embankment and the remainder is disposed of in the spoil area. At the 2nd stage the embankment material of the dam is taken from the spoil area.

Table－5 Statics of Alternative－1

Item	Unit.	Statistics	
		1st Stage	2nd Stage
1. Hydroelectric Developement Plan			
Rated Intake Water Level	m.MSL.	639.50	653.00
Rated Tailwater Level	m.MSL.	276.00	276.00
Total head	m	363.50	377.00
Loss Head	m	20.00	20.00
Effective Head	m	343.50	357.00
Discharge at Maximum Power Generating	m^3/sec	180 (170) *2nd st.	170
Maximum Output	MW	500	500
2. Upper Reservoir			
Dam Type		Rockfill Dam with Asphalt Facing	
Dam Height* Crest Length	m * m	45 * 1,990	(45+15) * 2,210
Dam Volume	$*10^3 m^3$	2,630(4,920) *Embankment	1,270
High Water Level	m.MSL.	645.00	660.00
Low Water Level	m.MSL.	620.00	620.00
Effective Storage Capacity at H.W.L	$*10^3 m^3$	5,240	9,910
Surfase Area at H.W.L	$*10^3 m^2$	263	339
3. Lower Reservoir		(Lam Ta Khong Reservoir)	
Dam Type		Homogeneous Earth-fill Dam (Lam Ta Khong Dam)	
Dam Height* Crest Length	m * m	40.3 * 527	
Dam Volume	$*10^3 m^3$	853	
High Water Level	m.MSL.	277.00	
Low Water Level	m.MSL.	261.00 (L.L.W.L 259.00)	

Effective Storage Capacity at H.W.L	$*10^3 m^3$	290,000	
Surfase Area at H.W.L	$k m^2$	44	
4. Power Intake			
Type		Morning-glory Shape	
Inside Diameter * Length * Number of Set	m*m*-	(18.00~5.90D) * 51.00 * 1 (18.00~5.80D) * 51.00 * 1	——
5. Penstock			
Type		Inclined Shaft Embedded Steel	
Inside Diameter * Length * Number of Set	m*m*-	(5.90 ~2.60)*690.00* 1 5.80 *120.00* 1	(5.80 ~2.60) * 580.00 * 1
Gradient	°	51	51
Approximately Weight	t	4,260	3,400
6. Tailrace Tunnel			
Type		Concrete Lined Pressure Type	
Inside Diameter * Length * Number of Set	m*m*-	(5.00 ~6.70D)*1,470* 1 4.90 * 210* 1	(4.90 ~6.60D) *1,260 * 1
7. Tailrace Surge Chamber			
Type		Chamber Surge Tank	
-Set	-	1	1
-Shaft Chamber	m * m	(D) (H) 9.00 * 107.00	(D) (H) 8.90 * 107.00
-Upper Chamber	m*m*m	(W) (H) (L) 10.00 *10.00 * 35.00	(W) (H) (L) 10.00 *10.00 * 35.00
8. Tailrace Outlet			
Type		4 Continuous Box Culbert	
Length	m	55.00	——
Width * Height * Number of Set	m * m	(6.70 ~30.00) * (6.70~10.00) * 2	——

9. Powerhouse			
Type		Underground Type	
Width * Length * Height	m*m*m	22.00*72.50*45.70	22.00*71.50*45.70
10. Transformer Hall			
Type		Underground Type	
Width * Length * Height	m*m*m	20.00*63.50*25.50	20.00*59.70*25.50
11. Gate			
-Draft Gate			
-Type		Bonnet type	
-Size * Number of Set	m * -	ϕ 5.00 * 2	ϕ 4.90 * 2
-Tailrace Gate			
-Type		Roller Gate	
-Size * Number of Set	m*m*-	5.30*6.70*1	5.20*6.60*1

N

Disposal area

670.00

662.50

635.00

540.00

Upper reservoir
H.W.L. 645.00
L.W.L. 620.00

647.50

Power intake

647.50

Penstock

No.1 Powerhouse

Tailrace surge chamber

Transmission line
230 KV (2 cct x 2)

Access tunnel
for powerhouse

Tailrace tunnel

1480.00

Disposal area

55.00

Shaft of tailrace gate

No.2 Powerhouse

Drainage tunnel

Transformer and
draft gate hall

Power cable tunnel

Switchyard

350.00

Lower access tunnel
for penstock

Upper access tunnel
for penstock

Control building

Tailrace outlet

256.00

Work adit

Existing road

115 KV Transmission Line

777 000 E

776 000 E

775 000 E

774 000 E

Note

1 st Stage

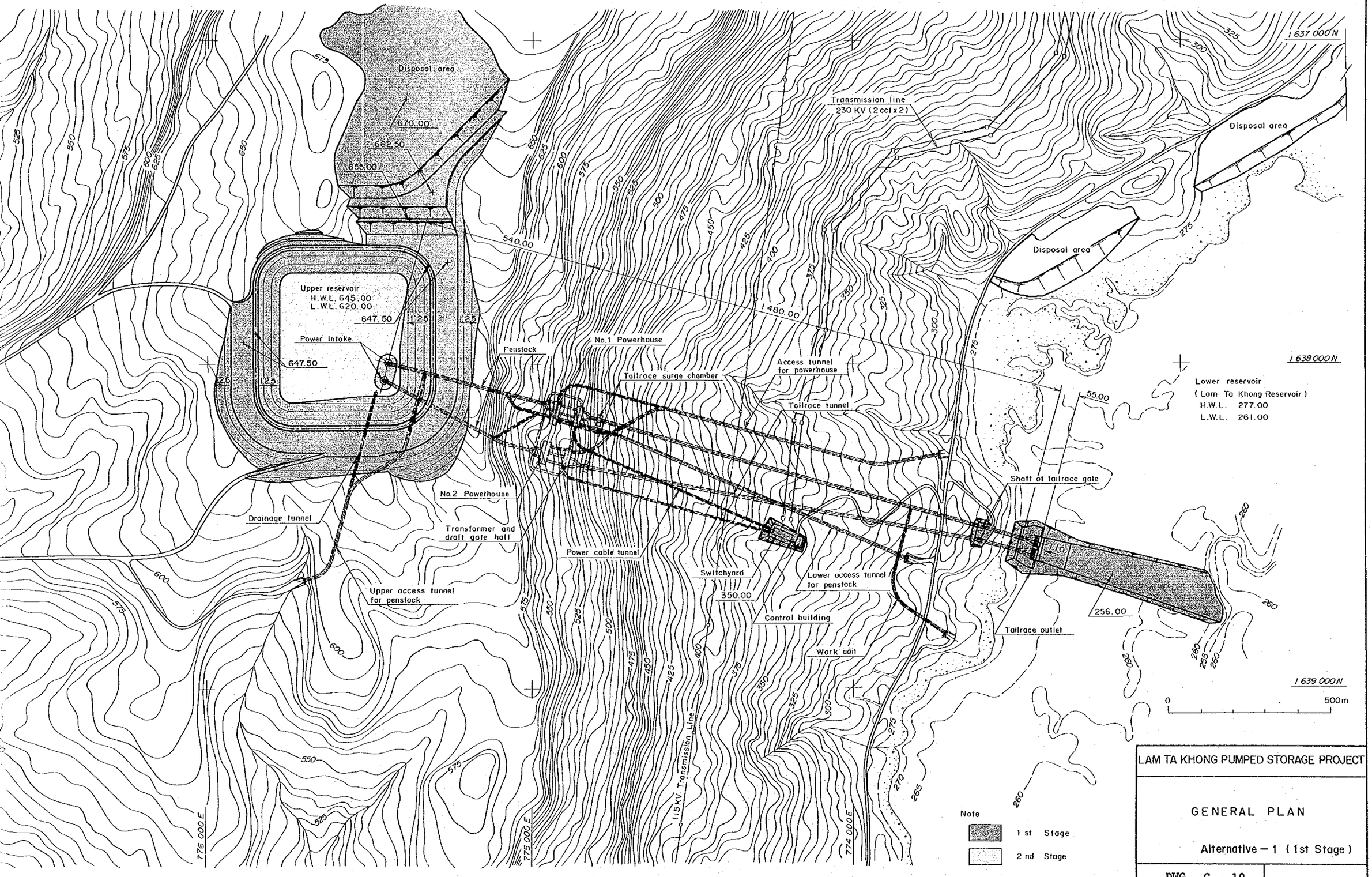
2 nd Stage

LAM TA KHONG

GE

Alt

DWG. C



LAM TA KHONG PUMPED STORAGE PROJECT

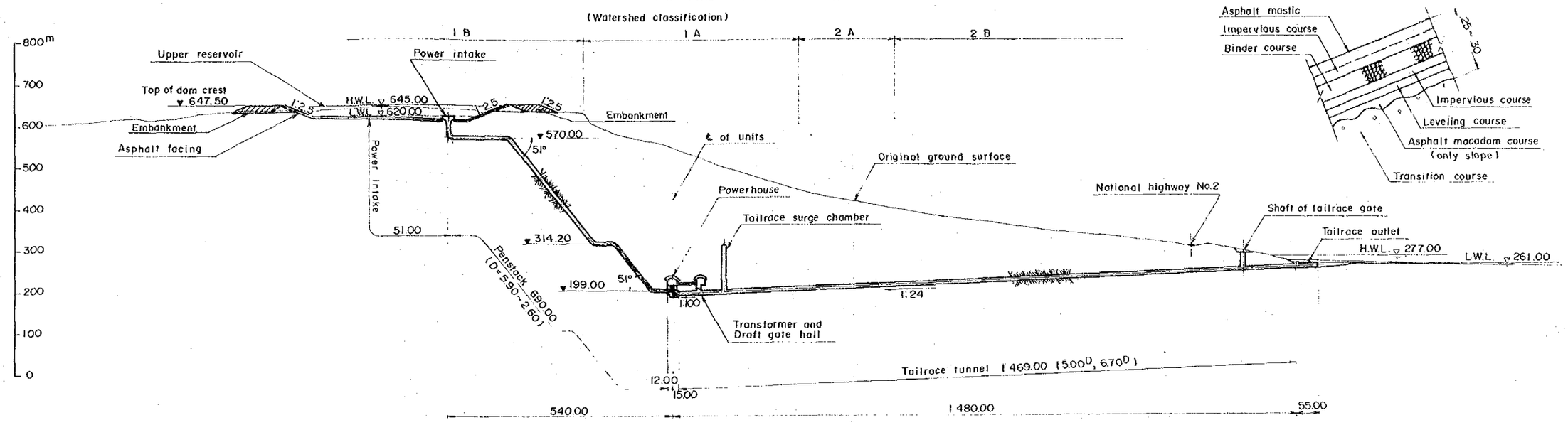
GENERAL PLAN

Alternative – 1 (1st Stage)

DWG. C - 10

PROFILE OF WATER WAY

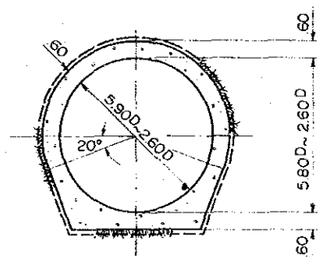
(Watershed classification)



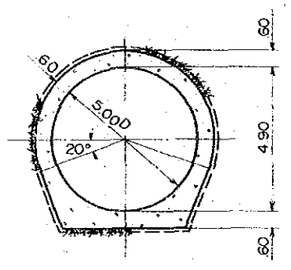
Composition of asphalt facing

TYPICAL CROSS SECTION

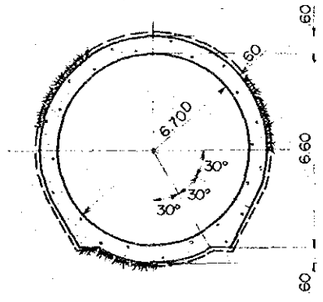
PENSTOCK TUNNEL



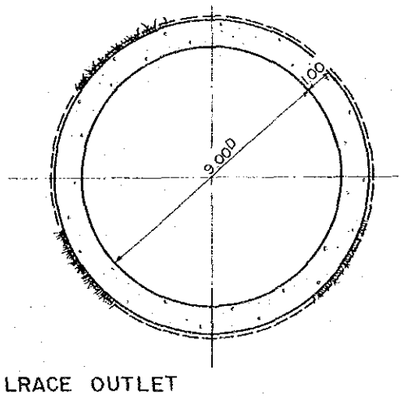
TAILRACE TUNNEL (5.00D)



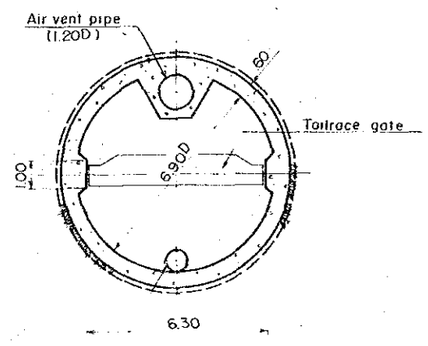
TAILRACE TUNNEL (6.70D)



SHAFT OF TAILRACE SURGE CHAMBER

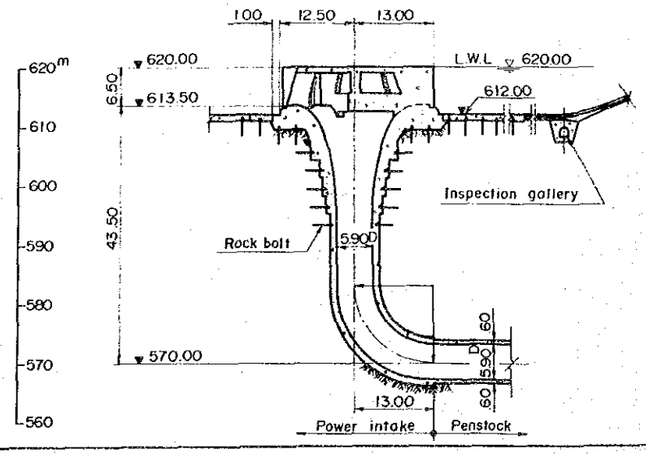


SHAFT OF TAILRACE GATE

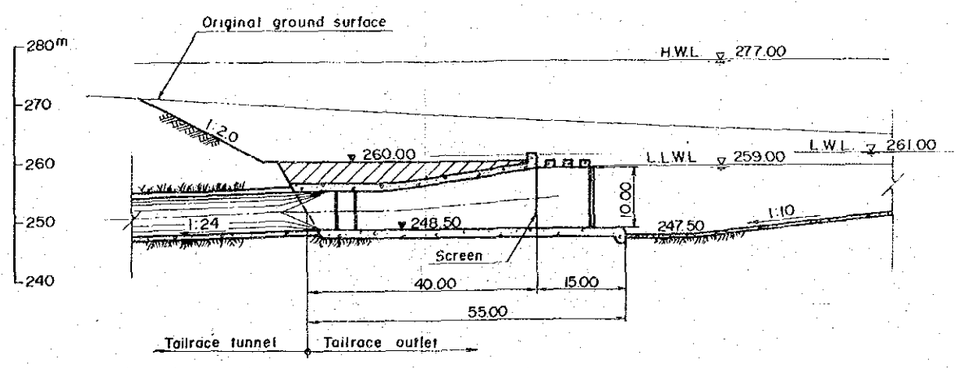


Pipe of water level recorder (80D)

SECTION OF POWER INTAKE



SECTION OF TAILRACE OUTLET



0 10m (TYPICAL SECTION)

0 50m (SECTION OF POWER INTAKE, TAILRACE OUTLET)

0 500m (PROFILE)

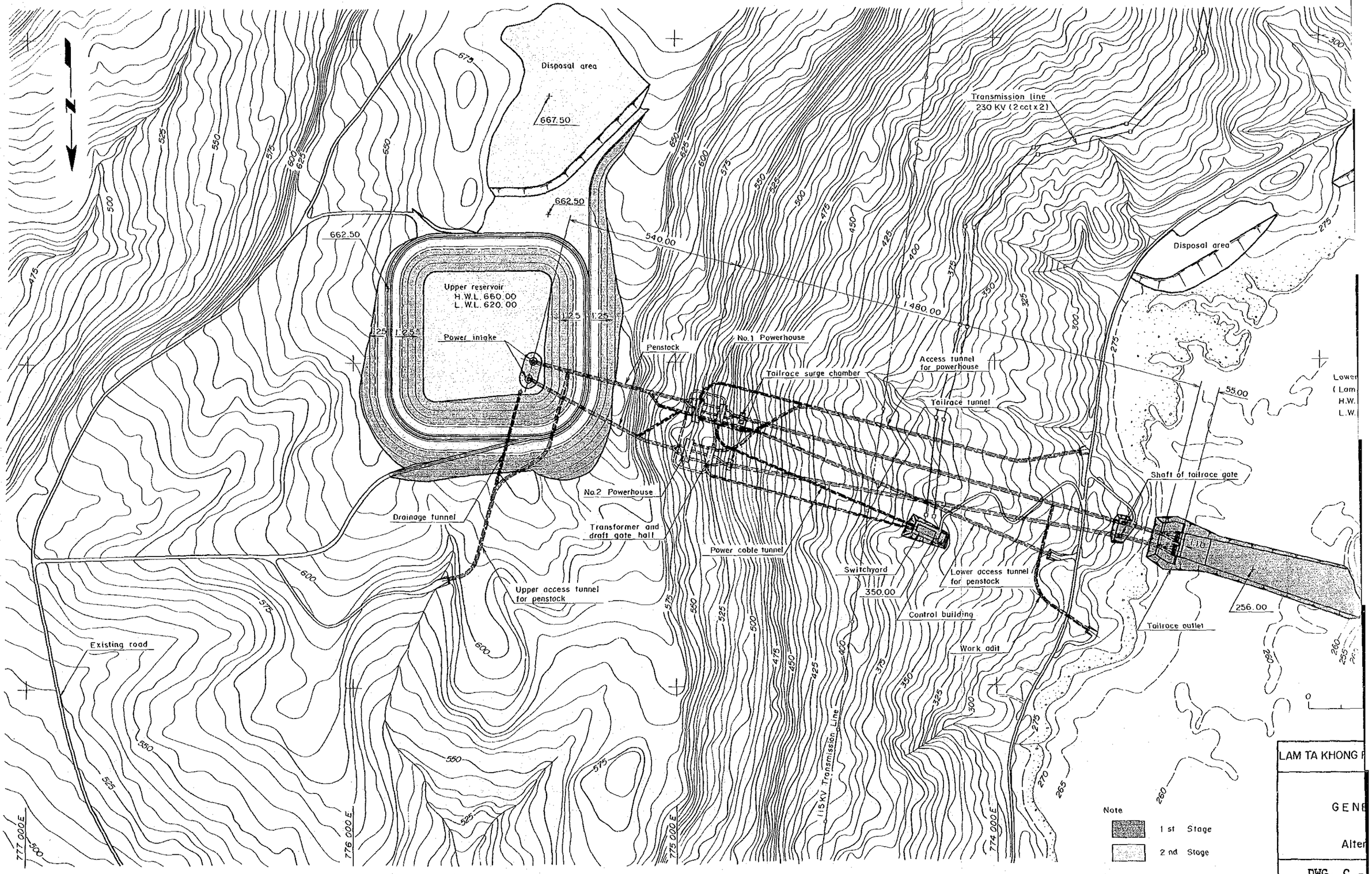
LAM TA KHONG PUMPED STORAGE PROJECT

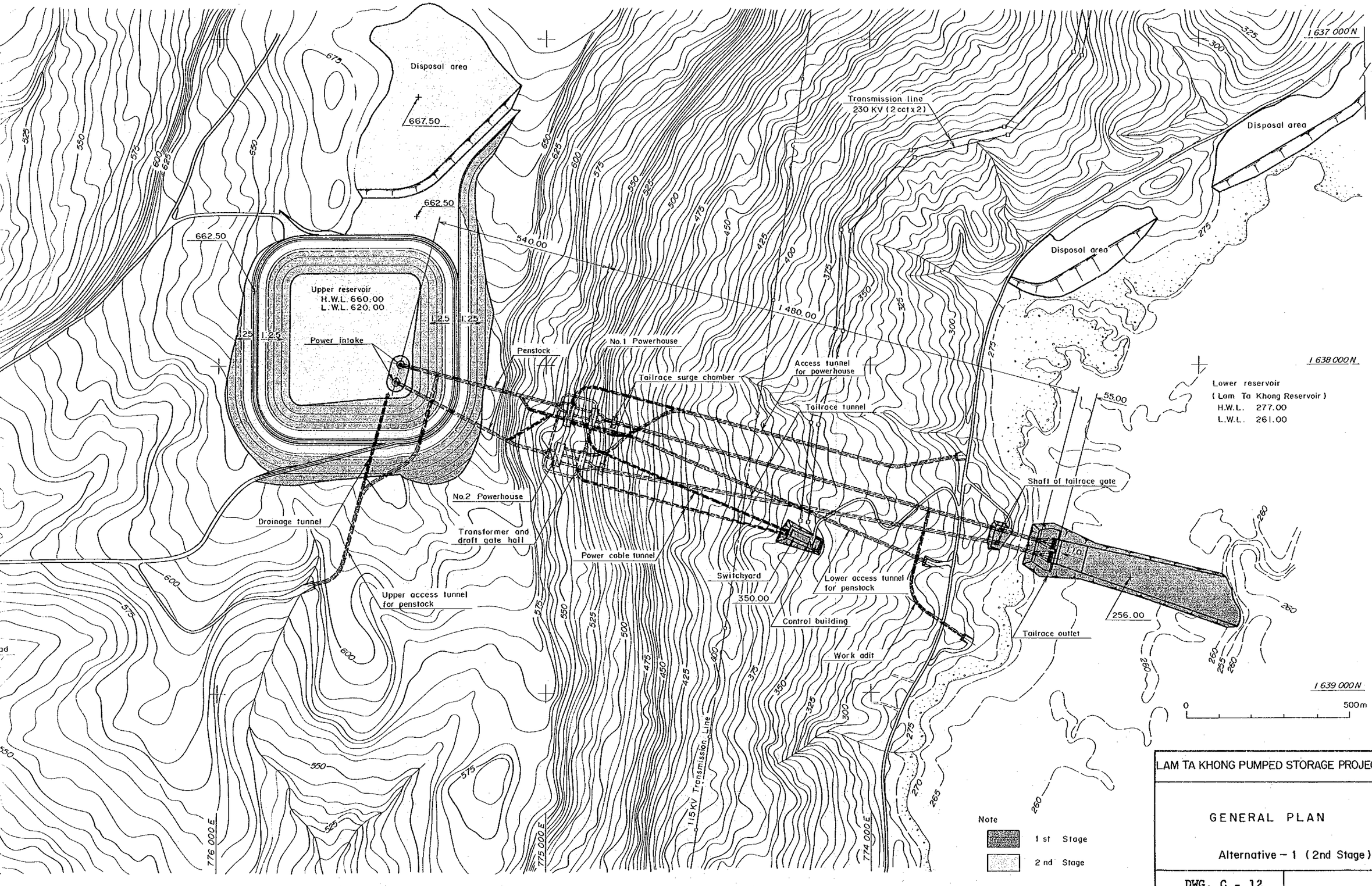
WATER WAY

PROFILE AND SECTION

Alternative – I (1st Stage)

DWG. C-11


N
Disposal area
667.50
662.50
662.50
540.00
1480.00
Upper reservoir
H.W.L. 660.00
L.W.L. 620.00
1:2.5
1:2.5
1:2.5
1:2.5
Power intake
Penstock
No.1 Powerhouse
Tailrace surge chamber
Access tunnel for powerhouse
Tailrace tunnel
Transmission line
230 KV (2 cct x 2)
Disposal area
55.00
Shaft of tailrace gate
No.2 Powerhouse
Drainage tunnel
Transformer and draft gate hall
Power cable tunnel
Switchyard
350.00
Lower access tunnel for penstock
Upper access tunnel for penstock
Control building
256.00
Tailrace outlet
Work adit
Existing road
115 KV Transmission Line
777 000 E
776 000 E
775 000 E
774 000 E
Note
1 st Stage
2 nd Stage
LAM TA KHONG
GENE
Alter
DWG. C -



LAM TA KHONG PUMPED STORAGE PROJECT

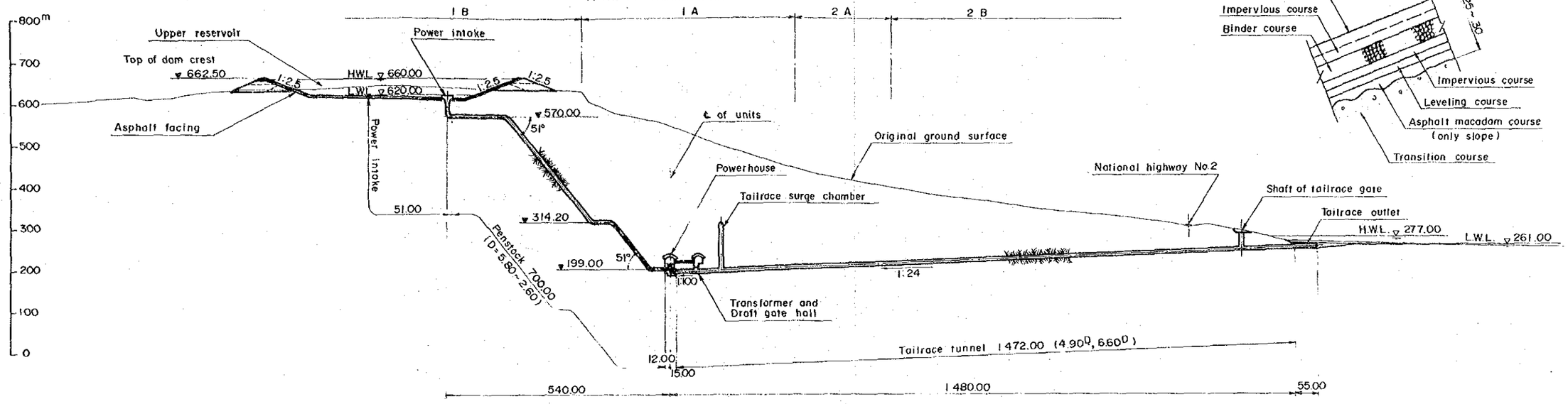
GENERAL PLAN

Alternative – 1 (2nd Stage)

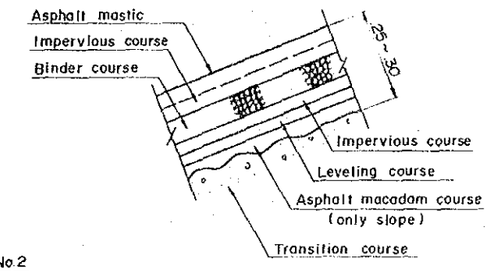
DWG. C - 12

PROFILE OF WATER WAY

(Watershed classification)

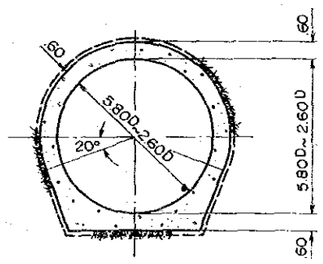


Composition of asphalt facing

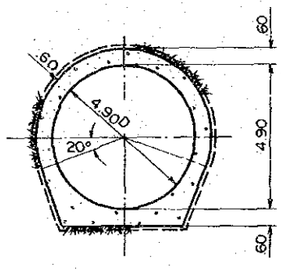


TYPICAL CROSS SECTION

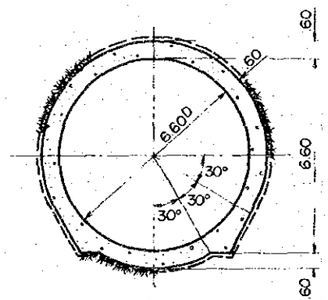
PENSTOCK TUNNEL



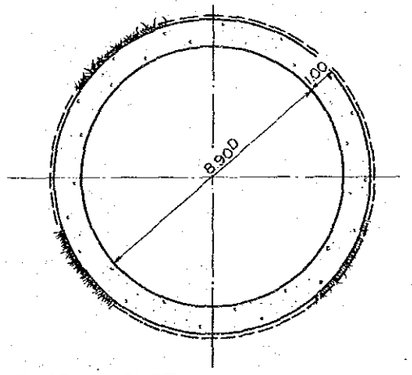
TAILRACE TUNNEL (4.90D)



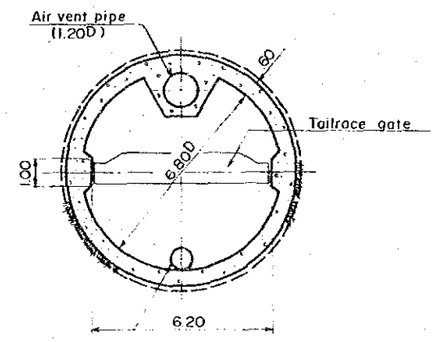
TAILRACE TUNNEL (6.60D)



SHAFT OF TAILRACE SURGE CHAMBER

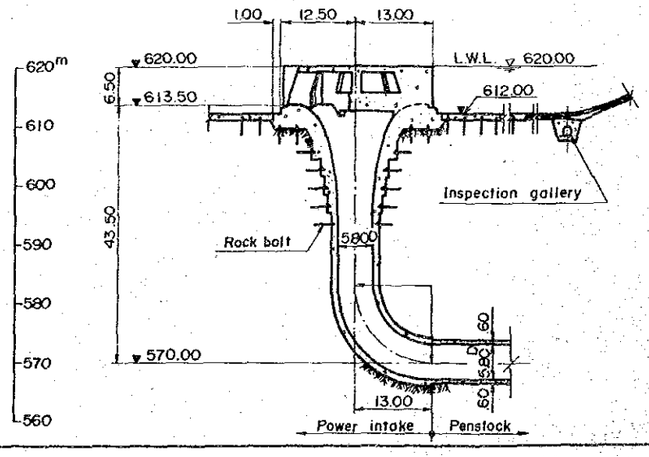


SHAFT OF TAILRACE GATE

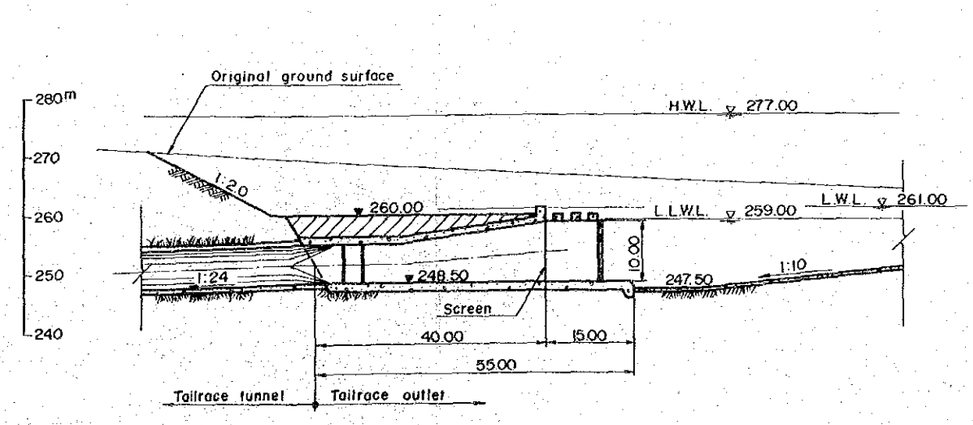


Pipe of water level recorder (.80D)

SECTION OF POWER INTAKE



SECTION OF TAILRACE OUTLET



0 10m (TYPICAL SECTION)

0 50m (SECTION OF POWER INTAKE, TAILRACE OUTLET)

0 500m (PROFILE)

LAM TA KHONG PUMPED STORAGE PROJECT

WATER WAY

PROFILE AND SECTION

Alternative – 1 (2nd Stage)

DWG. C-13

C-6 PRELIMINARY DESIGN OF ALTERNATIVE 2

Appendix C-6

Design Outline of Alternative-2

(1) General

Alternative 2 has been studied as a power generation plan having maximum output of 500 MW and the peak duration time of 8 hours. In this plan, all civil structures have been laid out to avoid "Watershed Classification 1A" defined by the National Environment Board.

The upper reservoir is located roughly at the same place as in the adopted plan, and the waterway was laid out along the ridge in the direction from north to north - northwest in order to avoid the area classified as "1A". The tailrace outlet has been planned at a location approximately 3 km to the upstream of Lam Ta Khong Dam, so that the total length of the waterway is minimized. The powerhouse is located underground near the dam, and the switchyard is located on the ground near the powerhouse.

Therefore, in the layout of Alternative-2, the total length of waterway is longer than the adopted plan, and the length of the access tunnels are also longer.

(2) Upper Reservoir

The upper reservoir is planned at a location roughly the same as the one in the adopted plan, which is designed to be constructed by excavating the ground at roughly 660 m elevation.

The inner surfaces of pool are covered with the asphalt concrete. The embankment is made by using some of the muck. The upper reservoir is large scale pool type reservoir with an allover asphalt facing fill-type dam.

The upper reservoir is a 500 m - square pool. The maximum output is 500 MW and the power can be generated for 8 hours.

The volume of excavation will be approximately 4,170 x 10^3 m^3, and the volume of embankment 2,860 x 10^3 m^3.

(3) Waterway

The waterway is underground type, and it is located along the ridge, thereby avoiding the area classified as "1A".

The power intake is Morning-glory shape, and installed at the bottom of the upper reservoir, which is connected to the penstocks through a vertical shaft.

The penstock consists of the upper, middle and lower horizontal sections and the upper and lower inclined tunnels (51°). There is only one line of penstock, which has inside diameter of 5.80 - 2.60 m, and the total length of approximately 585.00 m.

The tailrace is a circular pressure tunnel with a total length approximately 3,880 m x 2-1 ways, and the inside diameter is 4.90 - 6.60 m. As the tailrace tunnel is fairly long, a surge chamber is required against load built-up and load rejection. The construction of this tunnel form the critical path of the whole construction work.

The lower access tunnel for penstock branches from the access tunnel for powerhouse, and reaches the middle horizontal part of penstock.

(4) Powerhouse

The powerhouse is located at approximately 400 m underground, and equipped with two, 250 MW pump turbines, generators, and auxiliary equipments. This is an underground powerhouse accommodated in a large cavern which is 22 m wide, 45.7 m high, and 72.5 m long.

The access tunnel for powerhouse equipments starts from a point near the tailrace outlet, passes along the tailrace tunnel, and reaches to the erection bay of the powerhouse. This access tunnel for the powerhouse is very long, with the total length being 3,900 m. This tunnel is also

used to water draining passage for the powerhouse, and it is connected to the lower access tunnel for penstock and work adit of surge chamber.

The switchyard has been designed to be located on the ground near the powerhouse, in order to reduce the length of cable tunnel. As the gradient of the cable tunnel is steep, being 45°, there remains some problems with cable installation.

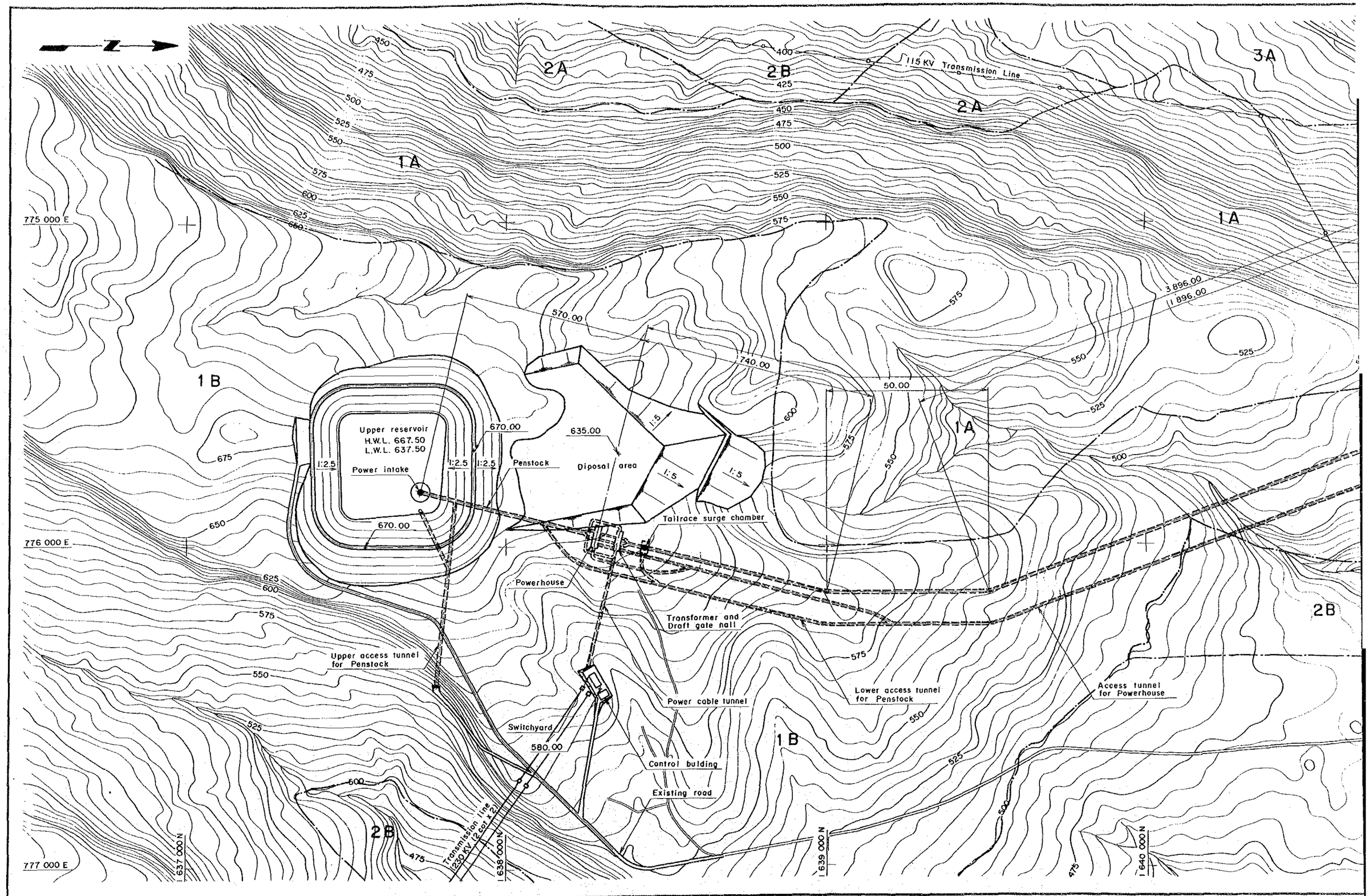
In the construction work of the powerhouse, the access tunnel for powerhouse forms the critical path. This work interferes with the construction works of the lower inclined tunnel of penstock, surge chamber, etc., and construction schedules of these works affect one another. Thus, sufficient study is required to assure construction time, safety, and ventilation inside the tunnels.

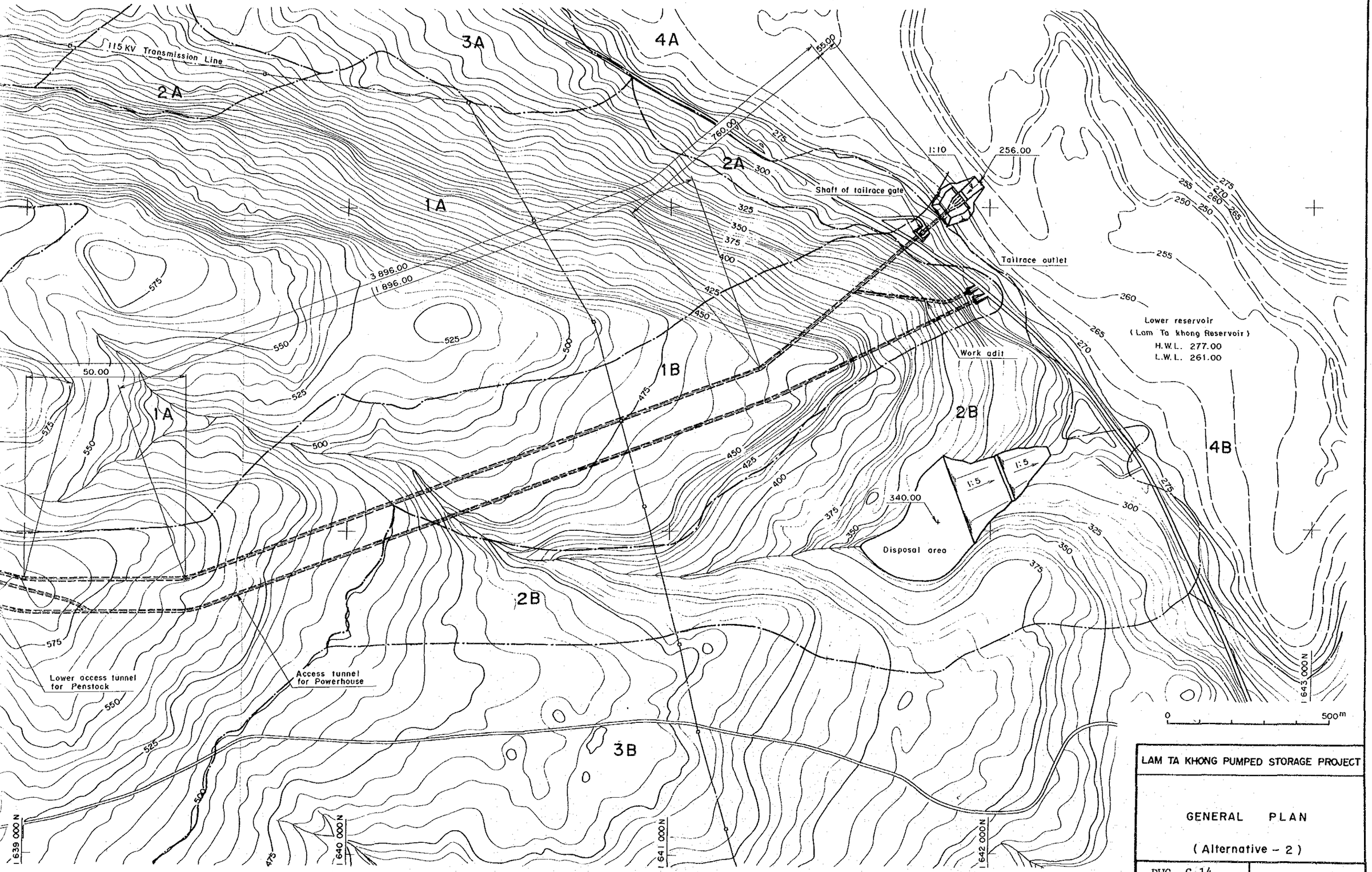
Table－6 Statics of Alternative－2

Item	Unit.	Statistics
1. Hydroelectric Developement Plan		
Rated Intake Water Level	m.MSL.	661.50
Rated Tailwater Level	m.MSL.	276.00
Total head	m	385.50
Loss Head	m	29.00
Effective Head	m	356.50
Discharge at Maximum Power Generating	m^3/sec	170.00
Maximum Output	MW	500
2. Upper Reservoir		
Dam Type		Rockfill Dam with Asphalt Facing
Dam Height* Crest Length	m * m	48 * 1,790
Dam Volume	$*10^3 m^3$	2,860
High Water Level	m.MSL.	667.50
Low Water Level	m.MSL.	637.50
Effective Storage Capacity at H.W.L	$*10^3 m^3$	4,930
Surfase Area at H.W.L	$*10^3 m^2$	220
3. Lower Reservoir		(Lam Ta Khong Reservoir)
Dam Type		Homogeneous Earth-fill Dam (Lam Ta Khong Dam)
Dam Height* Crest Length	m * m	40.3 * 527
Dam Volume	$*10^3 m^3$	853
High Water Level	m.MSL.	277.00
Low Water Level	m.MSL.	261.00 (L.L.W.L 259.00)

Effective Storage Capacity at H.W.L	$*10^3 m^3$	290,000
Surfase Area at H.W.L	km^2	44
4. Power Intake		
Type		Morning-glory Shape
Inside Diameter * Length * Number of Set	m*m*-	(18.00~5.80D) * 52.00 * 1
5. Penstock		
Type		Inclined Shaft Embedded Steel
Inside Diameter * Length * Number of Set	m*m*-	(5.80 ~2.60D) * 585.00 * 1
Gradient	°	51
Approximately Weight	t	3,910
6. Tailrase Tunnel		
Type		Concrete Lined Pressure Type
Inside Diameter * Length * Number of Set	m*m*-	(4.90 ~6.60D) * 3,880.00 * 1
7. Tailrace Surge Chamber		
Type		Chamber Surge Tank
-Set	-	1
-Shaft Chamber	m * m	(D) (H) 8.90 * 107.00
-Upper Chamber	m*m*m	(W) (H) (L) 10.00 *10.00 * 35.00
8. Tailrace Outlet		
Type		4 Continuous Box Culbert
Length	m	55.00
Width * Height * Number of Set	m * m	(6.70 ~30.00)* (6.70 ~10.00) * 1

9. Powerhouse		
Type		Underground Type
Width * Length * Height	m*m*m	22.00*72.50*45.70
10. Transformer Hall		
Type		Underground Type
Width * Length * Height	m*m*m	20.00*63.50*25.50
11. Gate		
-Draft Gate		
-Type		Bonnet type
-Size * Number of Set	m * -	ϕ 4.90 * 2
-Tailrace Gate		
-Type		Roller Gate
-Size * Number of Set	m*m*-	5.20*6.60*1


N
775 000 E
776 000 E
777 000 E
1637 000 N
1638 000 N
1639 000 N
1640 000 N
1A
1B
2A
2B
3A
115 KV Transmission Line
3896.00
1896.00
570.00
740.00
50.00
635.00
670.00
Upper reservoir
H.W.L. 667.50
L.W.L. 637.50
Power intake
Penstock
Diposal area
Tailrace surge chamber
Powerhouse
Transformer and
Draft gate hall
Upper access tunnel
for Penstock
Lower access tunnel
for Penstock
Access tunnel
for Powerhouse
Power cable tunnel
Switchyard
580.00
Control building
Existing road
Transmission line
(230 KV (2 cct x 2))
1:2.5
1:5



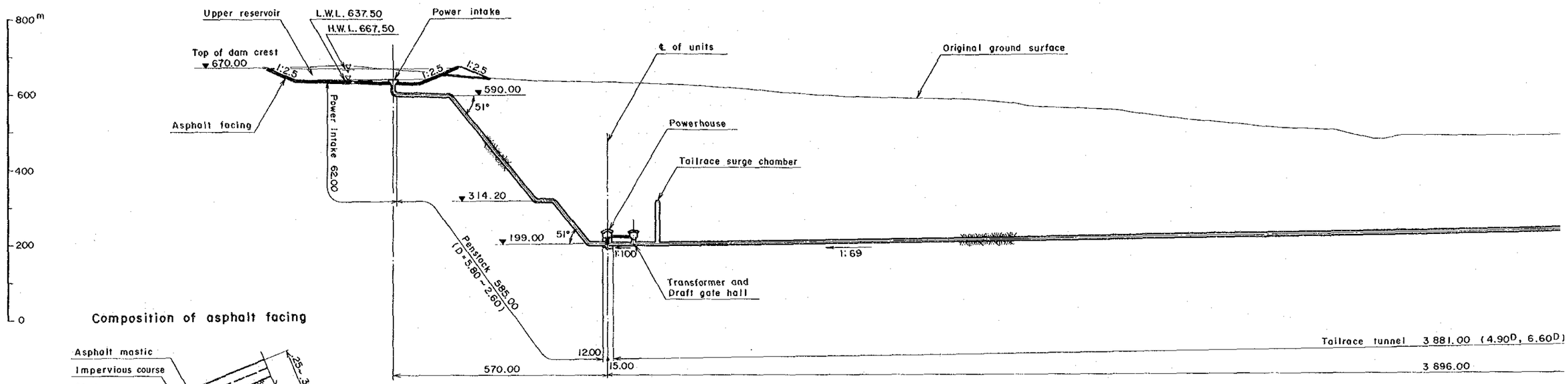
LAM TA KHONG PUMPED STORAGE PROJECT

GENERAL PLAN

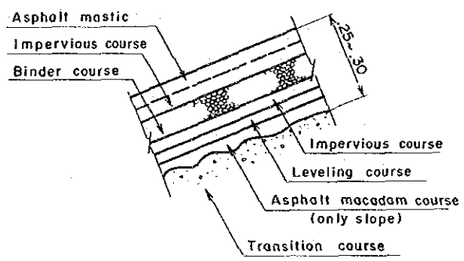
(Alternative - 2)

DWG. C-14

PROFILE OF WATER WAY

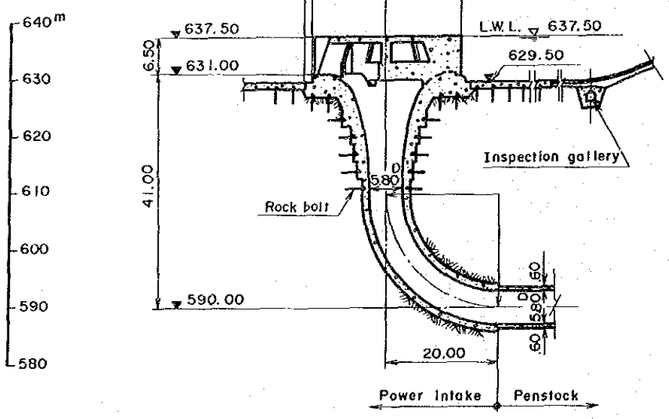


Composition of asphalt facing

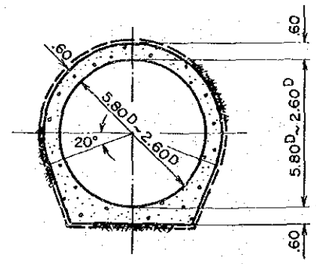


TYPICAL CROSS SECTION

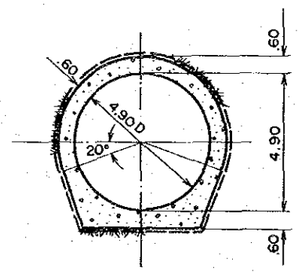
SECTION OF POWER INTAKE



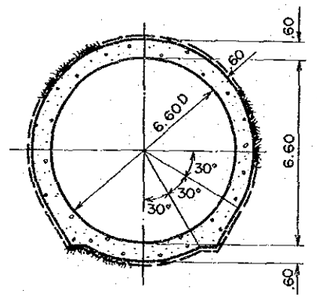
PENSTOCK TUNNEL



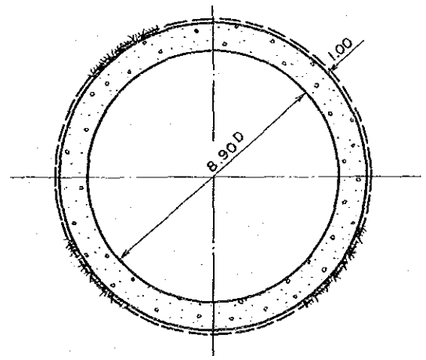
TAILRACE TUNNEL (4.90 D)



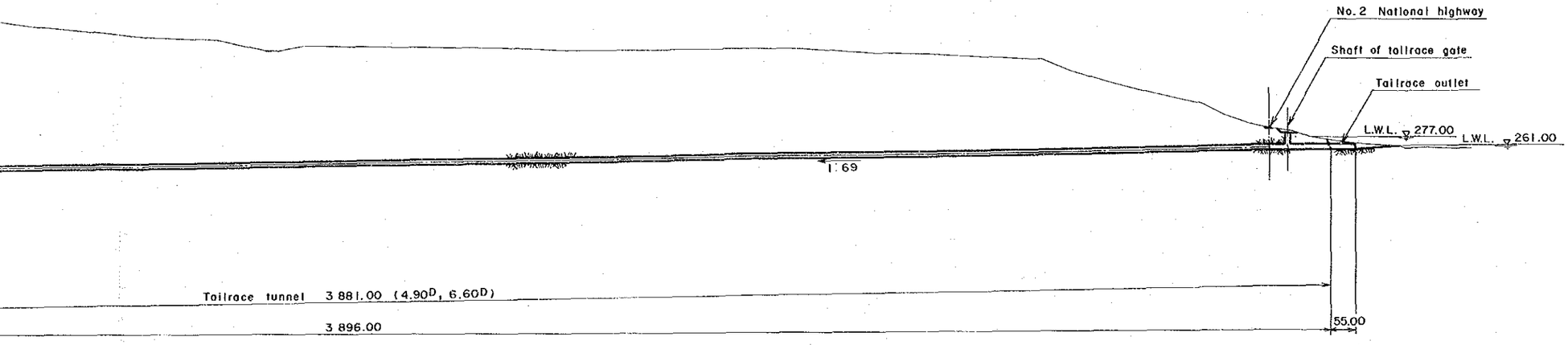
TAILRACE TUNNEL (6.60 D)



SHAFT OF TAILRACE SURGE CHAMBER

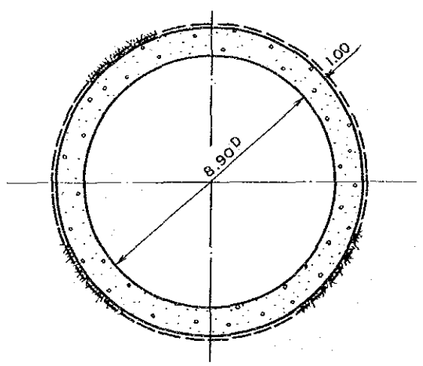


E OF WATER WAY

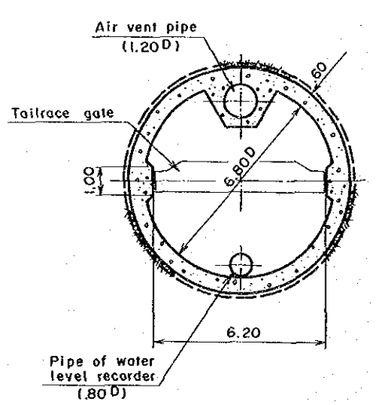


CTION

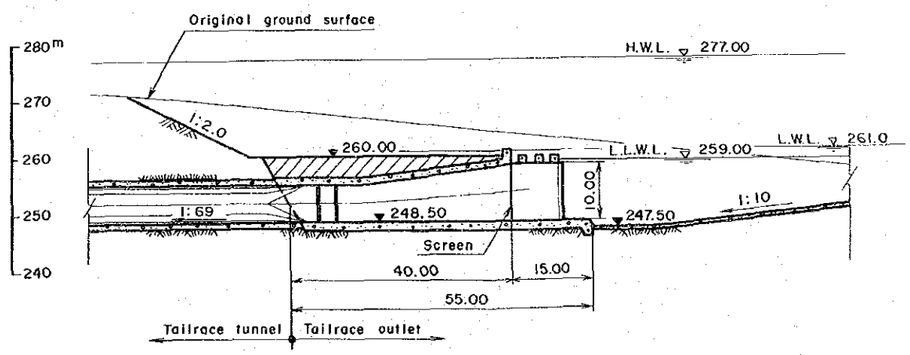
SHAFT OF TAILRACE SURGE CHAMBER

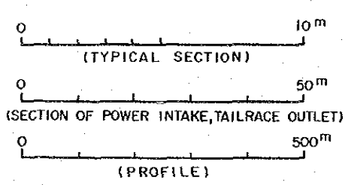


SHAFT OF TAILRACE GATE



SECTION OF TAILRACE OUTLET





LAM TA KHONG PUMPED STORAGE PROJECT

WATER WAY
PROFILE AND SECTION
(Alternative – 2)

DWG. C-15