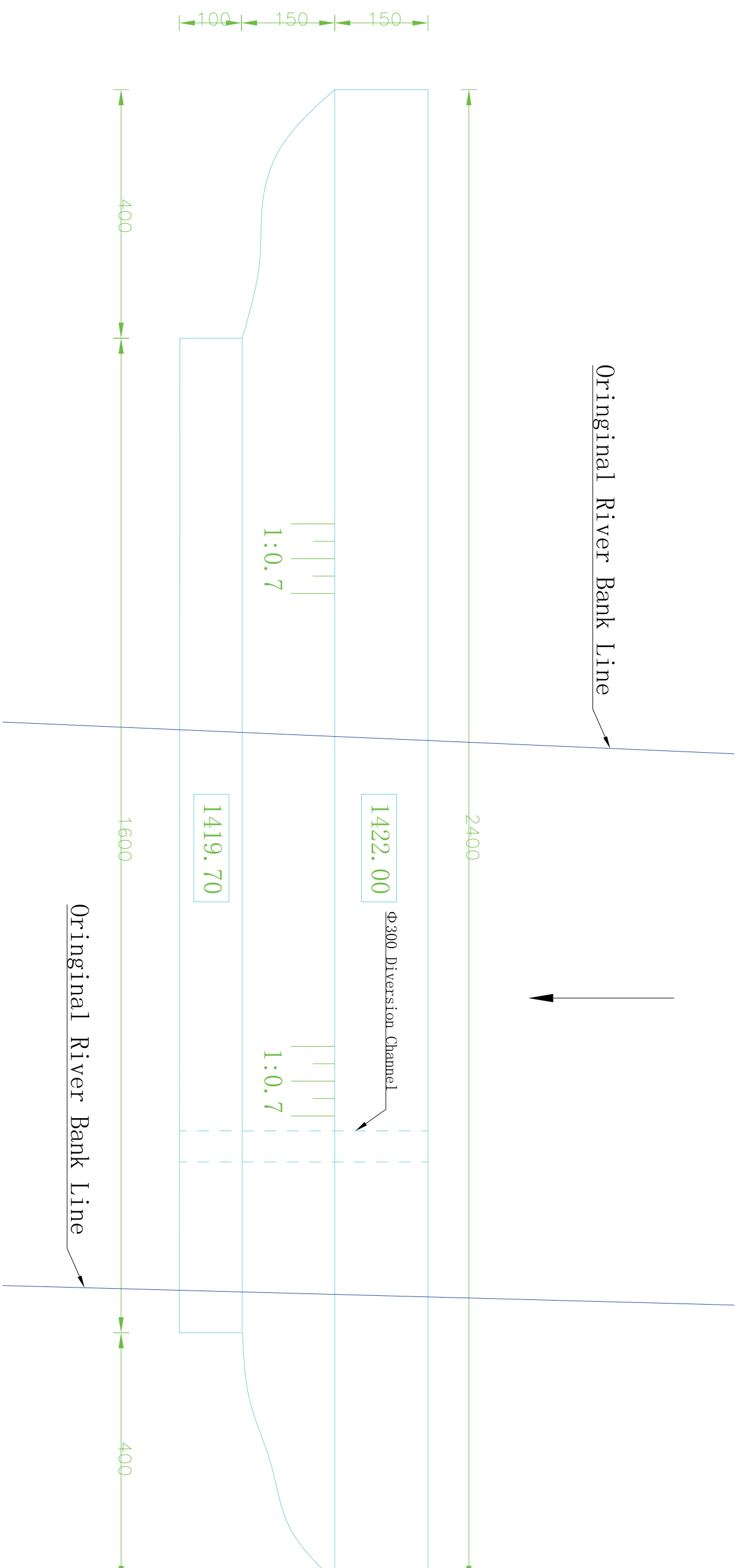
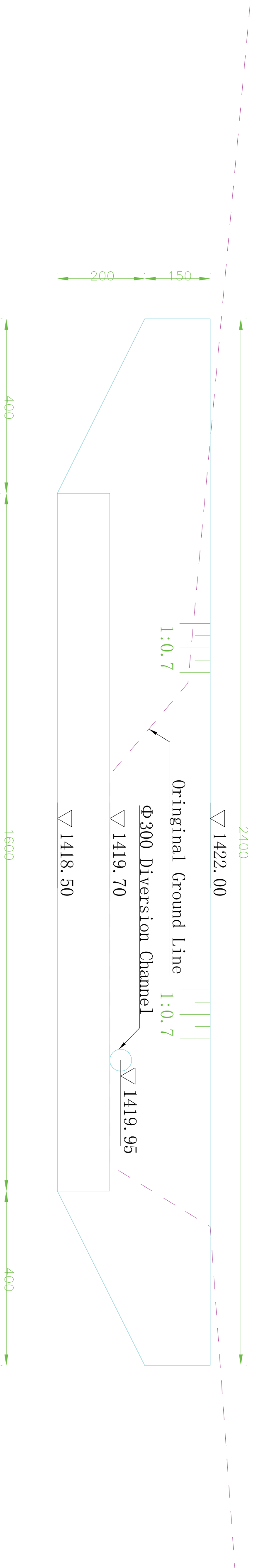




Vertical View of Dam 1:100

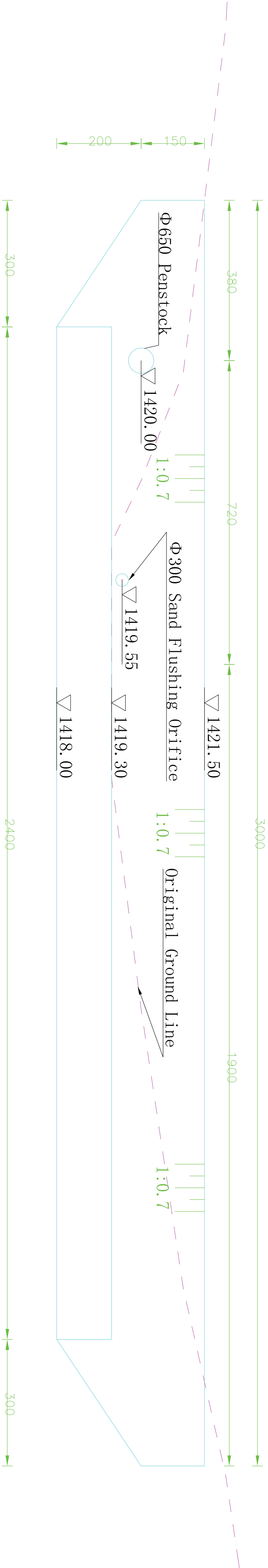
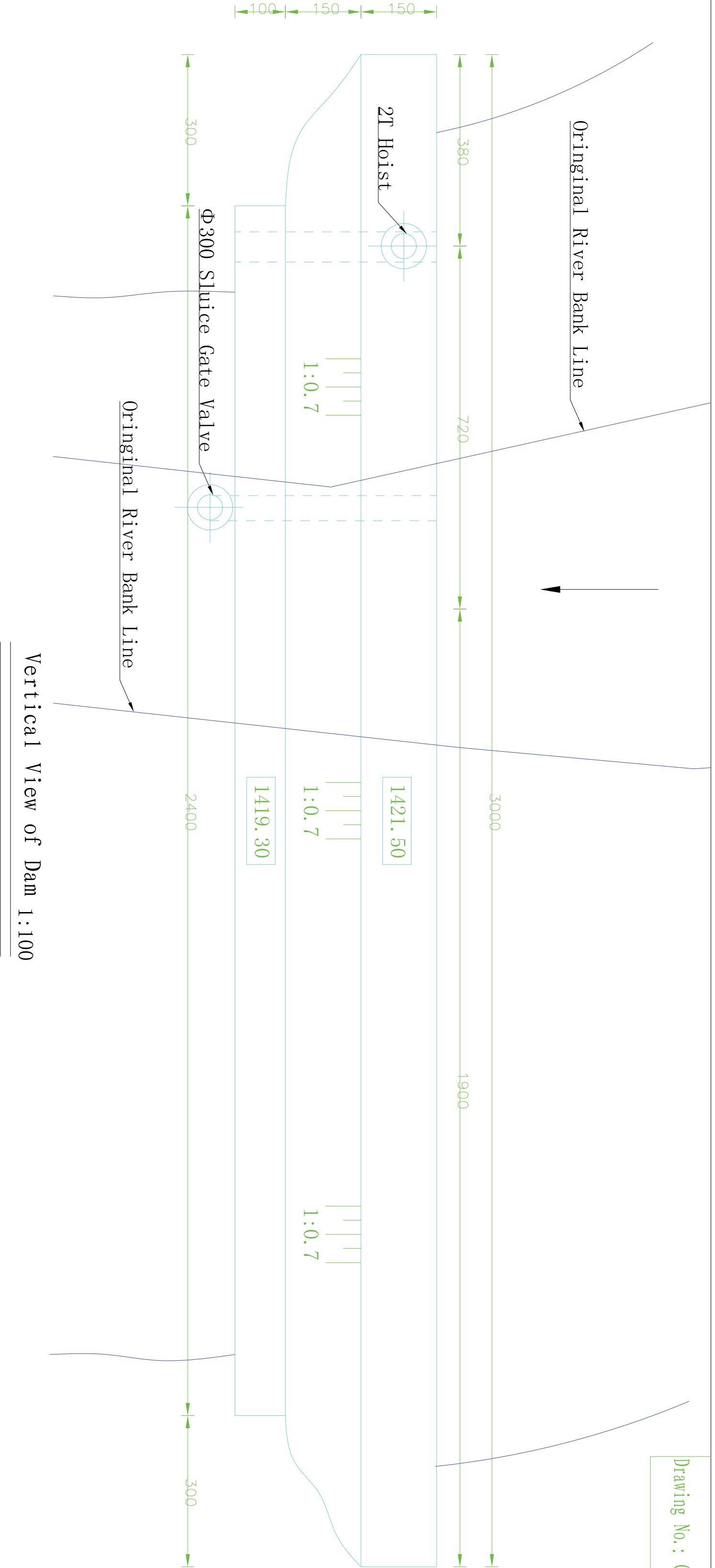


Downstream Elevation View of Dam
1:100

Specifications:

1. The unit of elevation is m, and the rest is mm;
2. The excavation of dam foundation requires to reach 0.5m below the intact rock mass, and the cutoff trench should be set at upstream;
3. The pouring of dam body will adopt C20 rubble concrete;
4. The construction of dam body should be subject to relevant regulations and specifications.

Hangzhou Guowang Technology Co., Ltd.	Design Certificate No.	Approval		Examine		Design		CHPOTA FALLS Station Feasibility Study	Design Diagram of Dam (Compared Plan)	Feasibility Study	Ratio	1:100
				Check		Drawing				Hydraulic	Date	2016.08

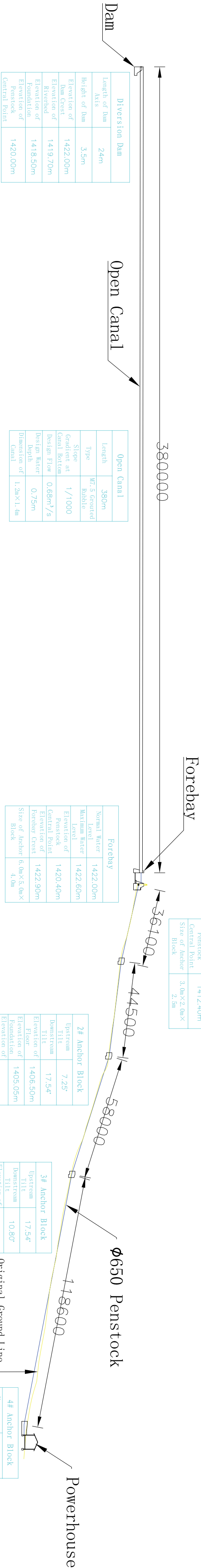


- Specifications:
1. The unit of elevation is m, and the rest is mm;
 2. The excavation of dam foundation requires to reach 0.5m below the intact rock mass, and the cutoff trench should be set at upstream;
 3. The pouring of dam body will adopt C20 rubble concrete;
 4. The construction of dam body should be subject to relevant regulations and specifications.

Hangzhou Guowang Technology Co., Ltd.			Design Certificate No.		Approval		Examine		Design		CHIP07A FALLS Station Feasibility Study		Design Diagram of Dam (Recommended Plan)		Feasibility Study		Ratio	1:100
							Check		Drawing						Hydraulic		Date	2016. 08

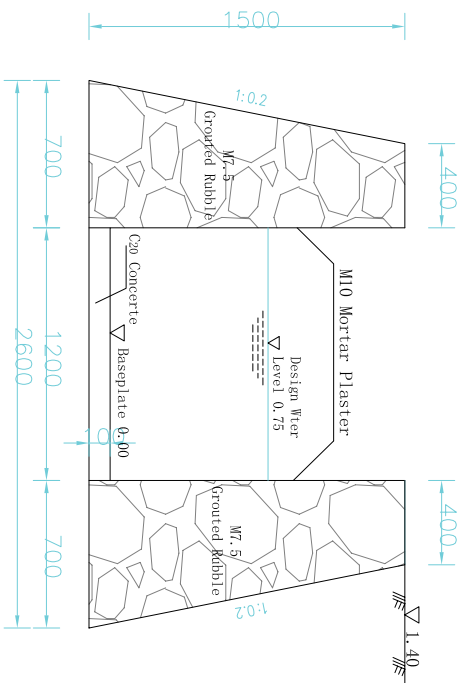
Section of Diversion System

1 : 2000



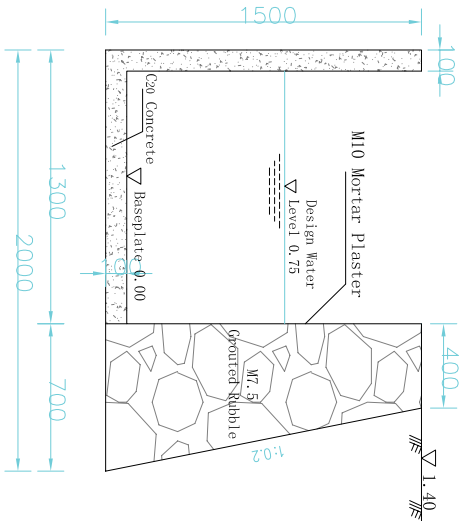
Horizontal Section of Canal (Earthwork Section)

1 : 50



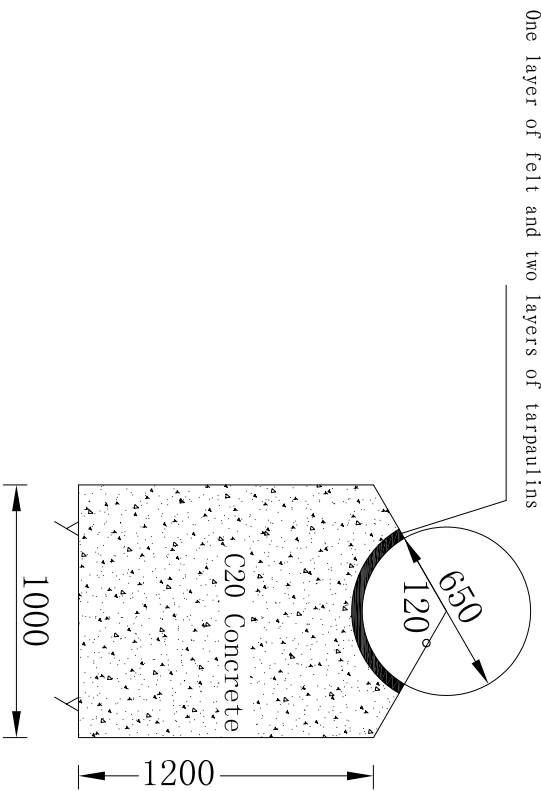
Horizontal Section of Canal (Stonework Section)

1 : 50



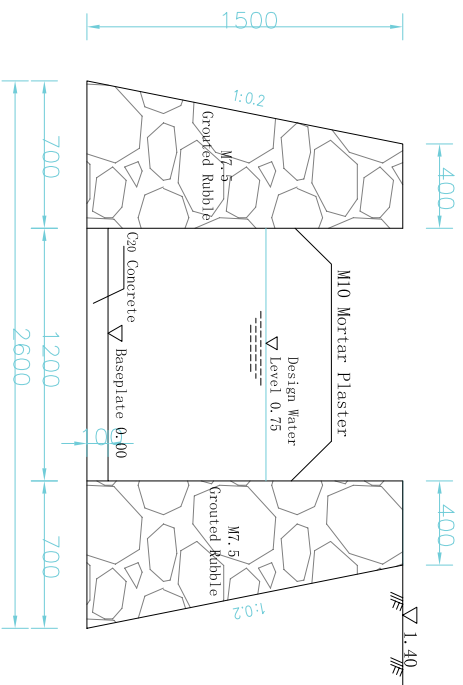
Horizontal Section of Pier

1 : 100



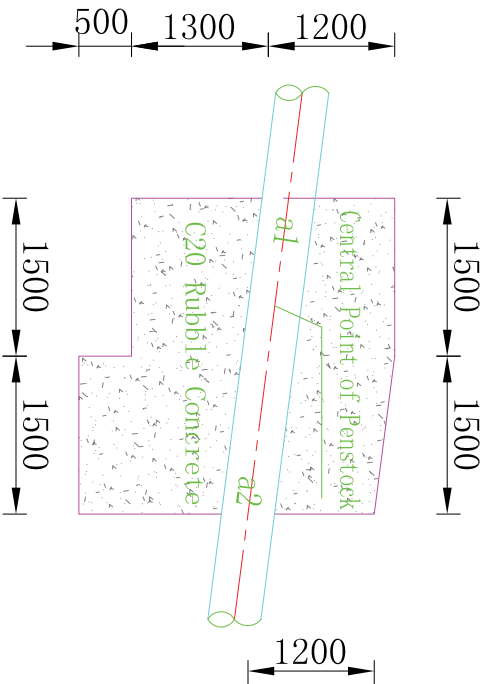
Horizontal Section of Tailrace

1 : 50



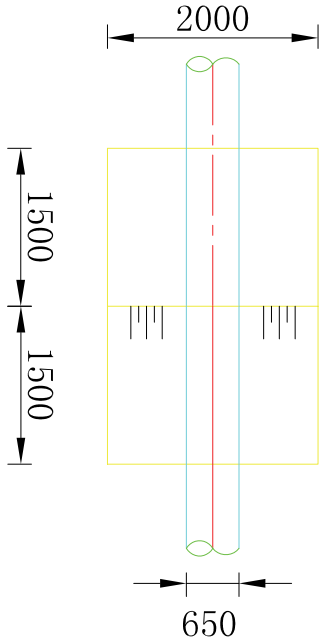
Vertical Section of Anchor Block (Typical Design)

1 : 100



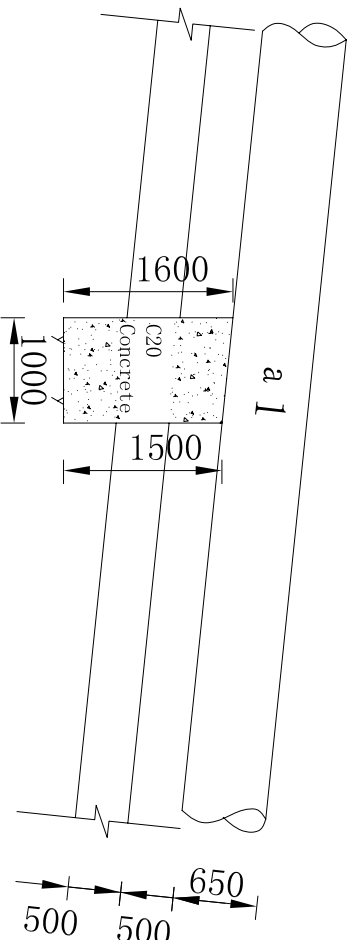
Horizontal Section of Anchor Block (Typical Design)

1 : 100



Vertical Section of Pier

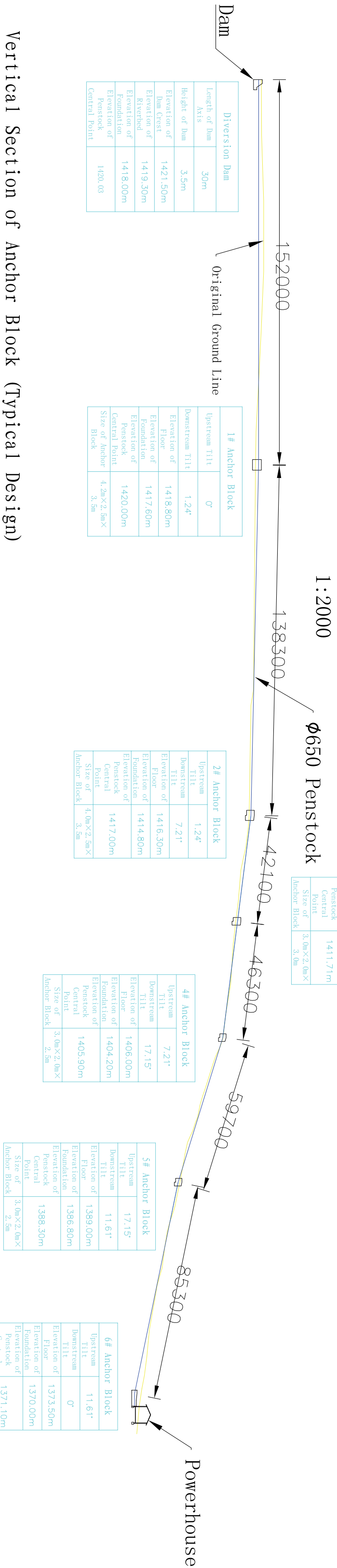
1 : 100



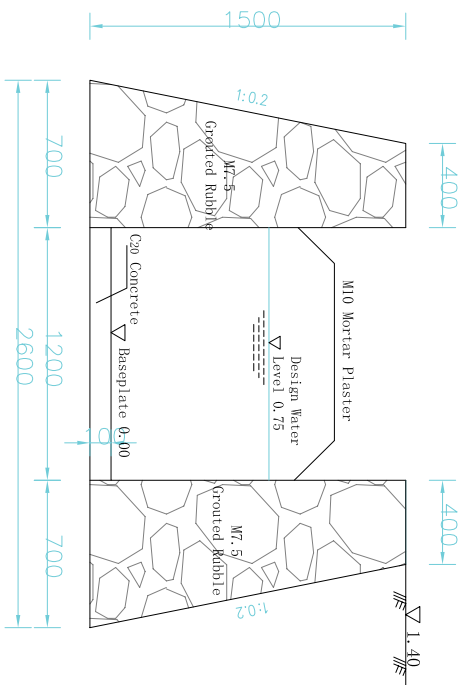
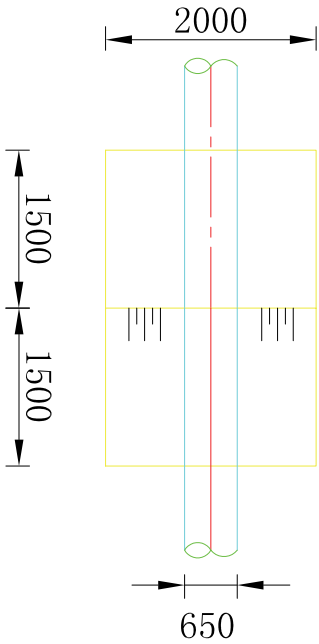
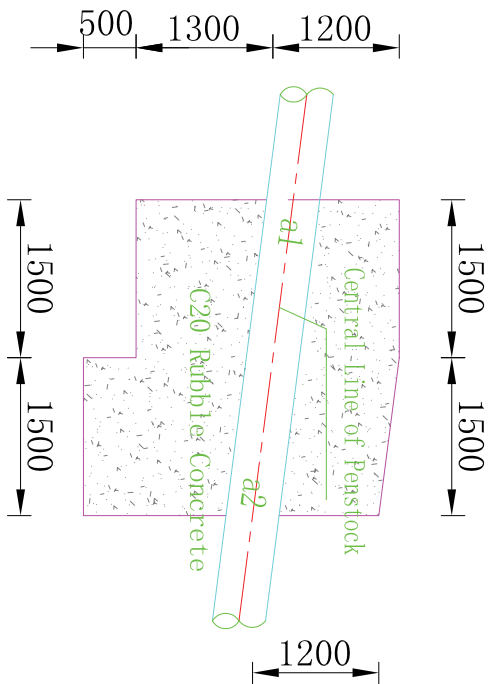
Specifications:

1. The unit of elevation and vertical section dimension is m, and the rest is mm;
2. The coating concrete of anchor block, pier and penstock adopts C20 Concrete. The temperature steel is set on the surface of anchor block;
3. The distance between piers is 5~8m, and a expansion joint is set 1.5m downstream from 1~3# anchor blocks respectively;
4. The foundation of anchor blocks and piers are rocks. If the penstock foundation in excavation section is soil, grouted rubbles of 300mm should be arranged on the bottom for protection;
5. Other constructions should be subject to relevant regulations and specifications.

Section of Diversion System

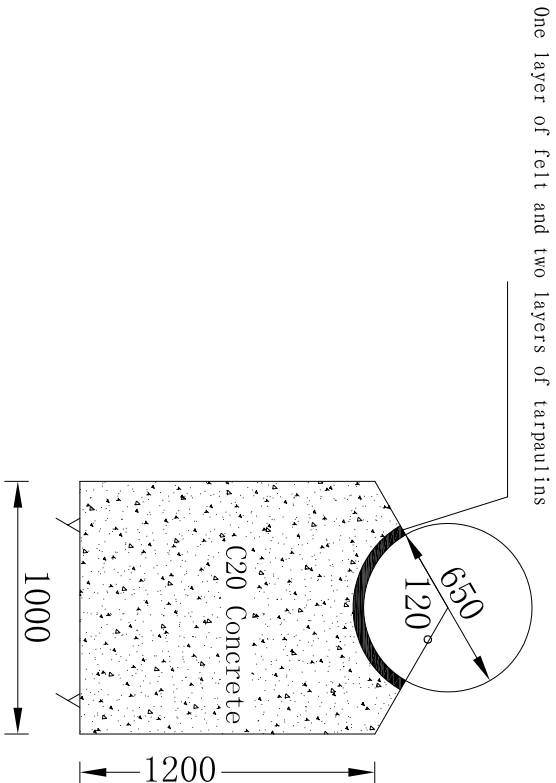


Horizontal Section of Tailrace



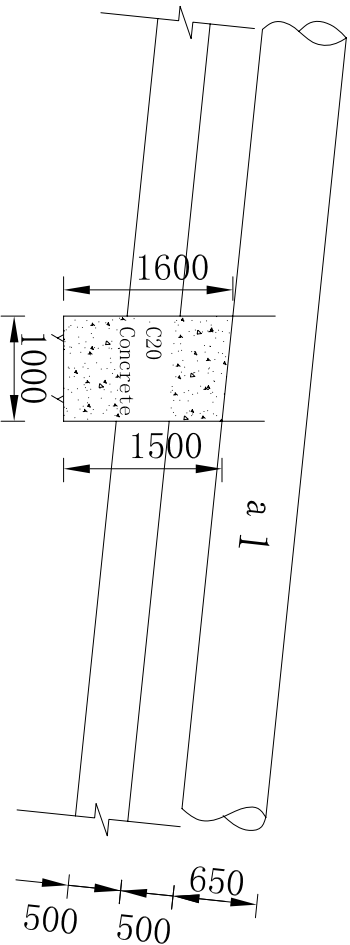
Horizontal Section of Pier

1:100



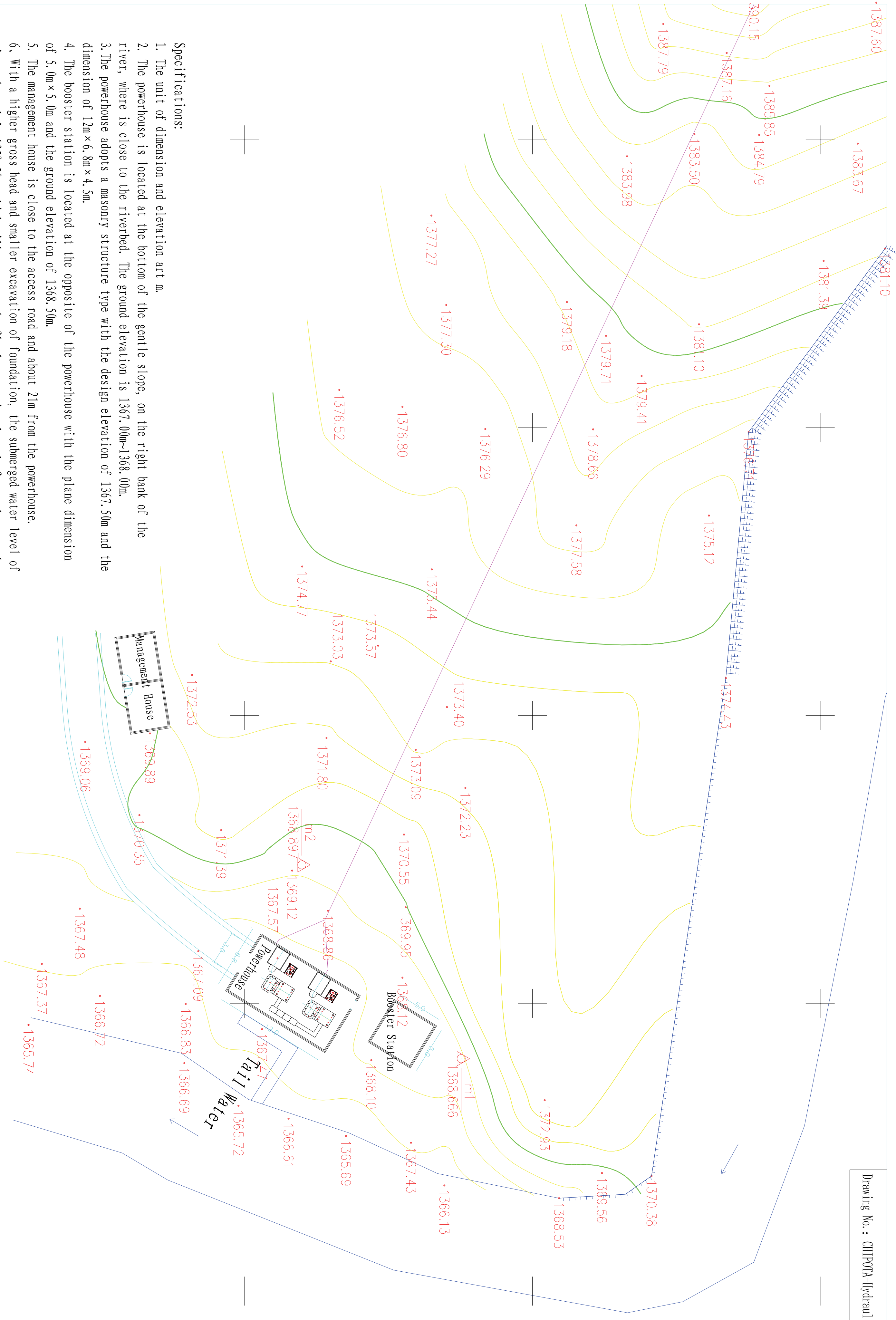
Vertical Section of Pier

1:100



Specifications:

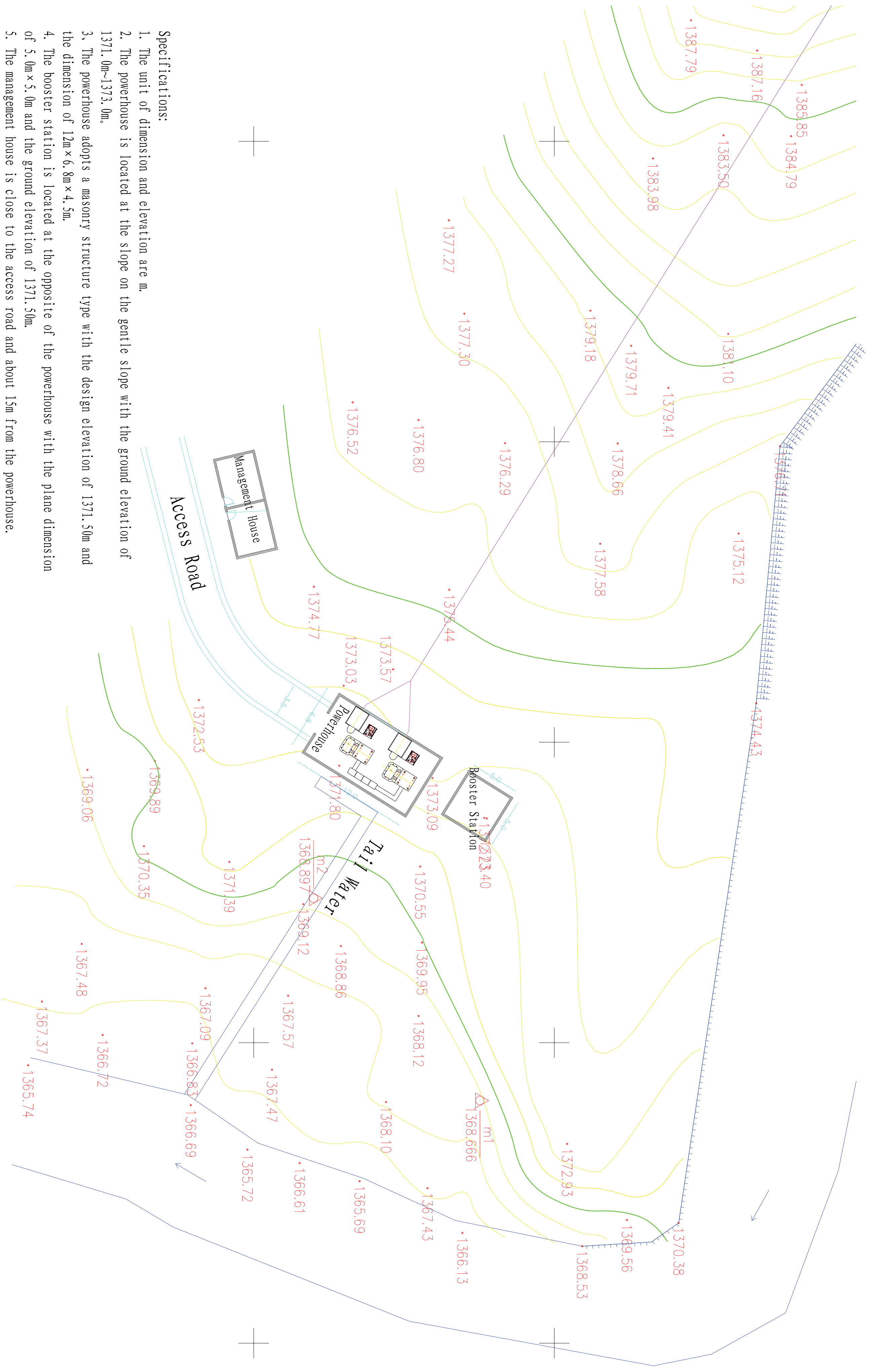
1. The unit of elevation and vertical section dimension is m, and the rest is mm;
2. The coating concrete of anchor block, pier and penstock adopts C20 Concrete. The temperature steel is set on the surface of anchor block;
3. The distance between piers is 5~8m, and a expansion joint is set 1.5m downstream from 1~5# anchor blocks respectively;
4. The foundation of anchor blocks and piers are rocks. If the penstock foundation in excavation section is soil, grouted rubbles of 300mm should be arranged on the bottom for protection;
5. Other constructions should be subject to relevant regulations andd specifications.



Specifications:

1. The unit of dimension and elevation art m.
2. The powerhouse is located at the bottom of the gentle slope, on the right bank of the river, where is close to the riverbed. The ground elevation is 1367.00m~1368.00m.
3. The powerhouse adopts a masonry structure type with the design elevation of 1367.50m and the dimension of 12m×6.8m×4.5m.
4. The booster station is located at the opposite of the powerhouse with the plane dimension of 5.0m×5.0m and the ground elevation of 1368.50m.
5. The management house is close to the access road and about 21m from the powerhouse.
6. With a higher gross head and smaller excavation of foundation, the submerged water level of river channel is 1359.50m, which will not meet the flood protection demand of powerhouse and booster station.

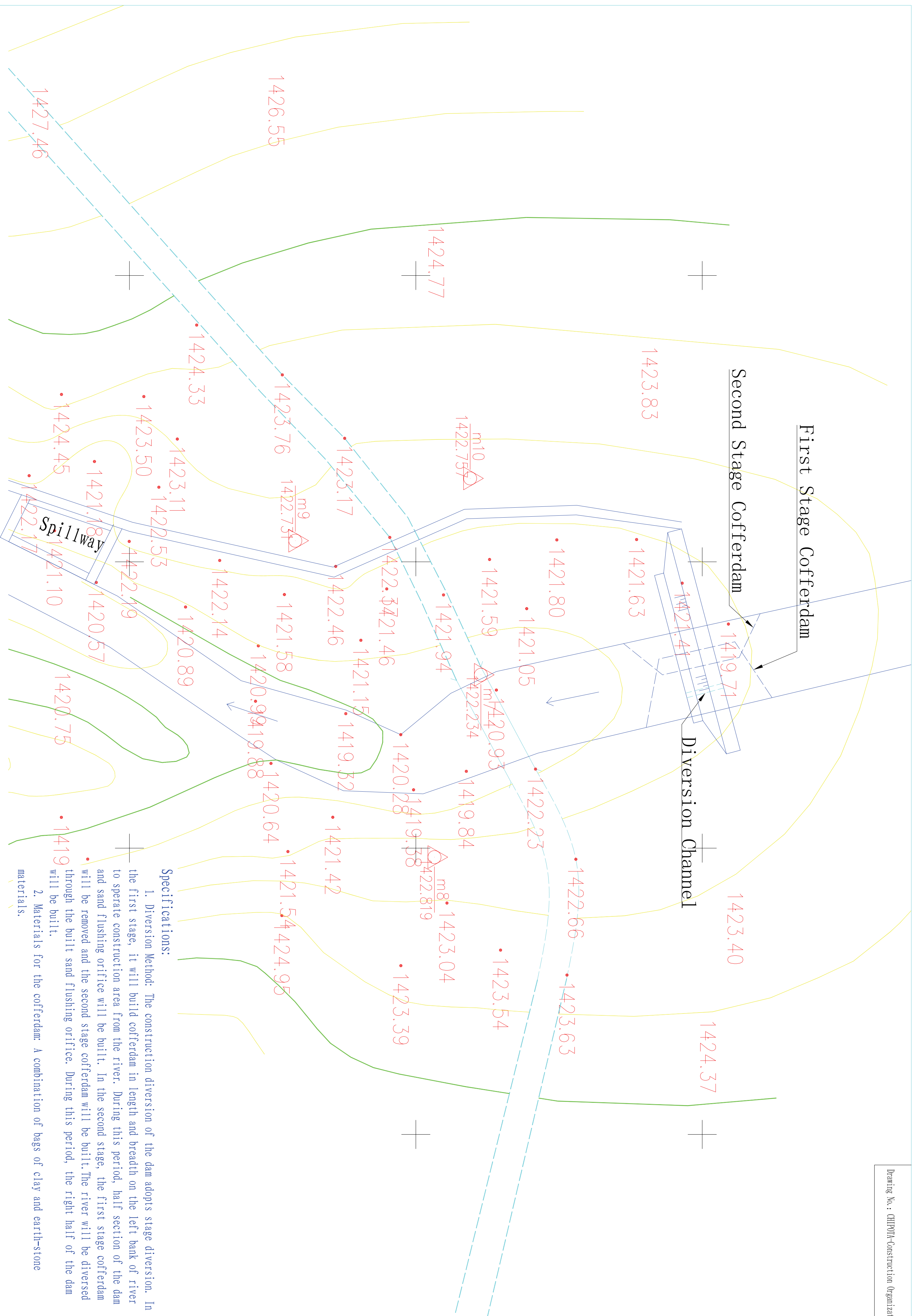
Hangzhou Guowang Technology Co., Ltd.			Design Certificate No.		Approval		Examine		Design		CHIPOTA FALLS Station		General Plane Layout of Plant Area		Feasibility Study	
							Check		Drawing		Feasibility Study		(Compared Plan)		Hydraulic	
															Ratio	
															1:50	
															Date	
															2016. 08	



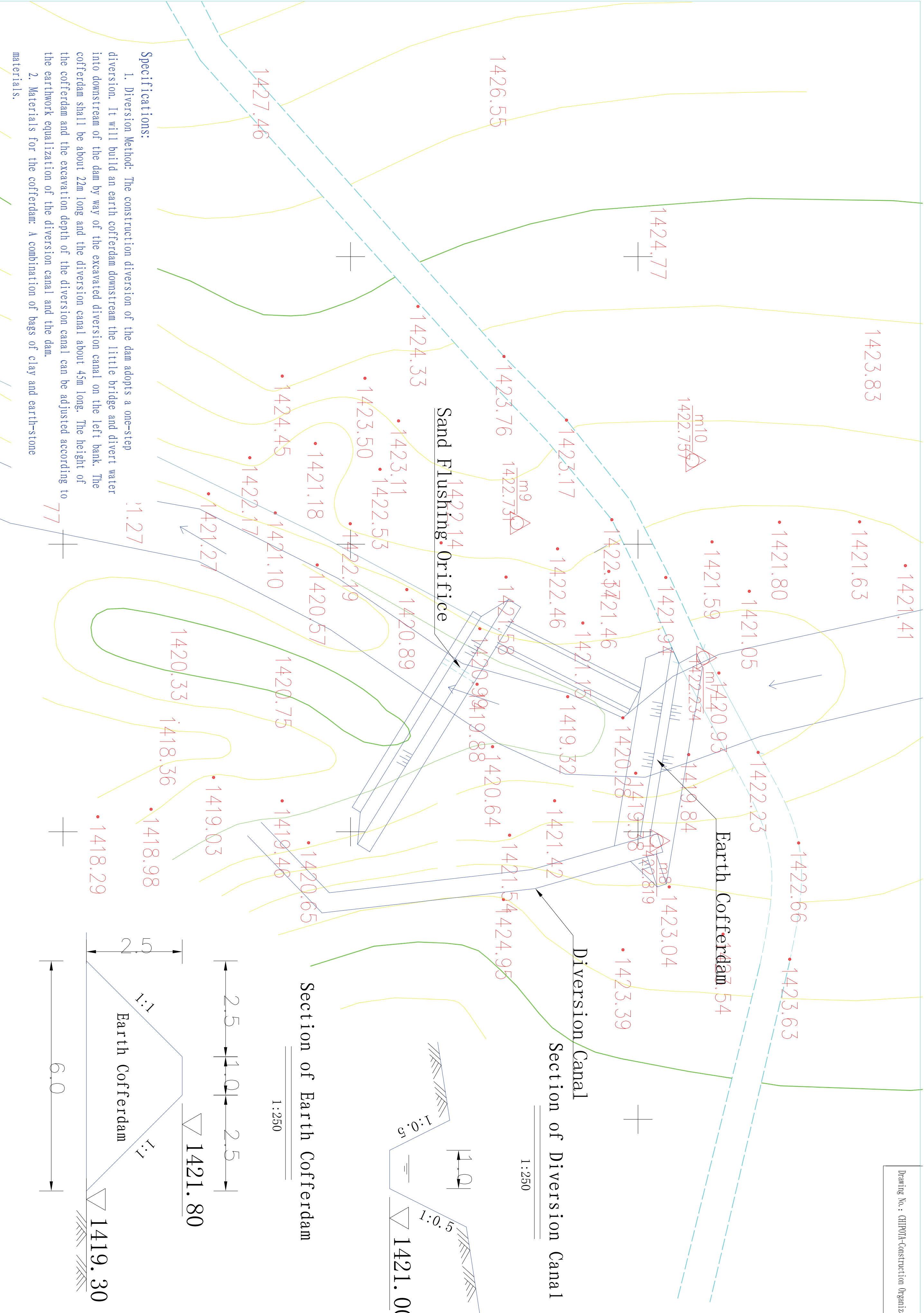
Specifications:

1. The unit of dimension and elevation are m.
2. The powerhouse is located at the slope on the gentle slope with the ground elevation of 1371.0m~1373.0m.
3. The powerhouse adopts a masonry structure type with the design elevation of 1371.50m and the dimension of 12m×6.8m×4.5m.
4. The booster station is located at the opposite of the powerhouse with the plane dimension of 5.0m×5.0m and the ground elevation of 1371.50m.
5. The management house is close to the access road and about 15m from the powerhouse.
6. The buildings in the plant area are close, which helps to construction and transportation of equipments.

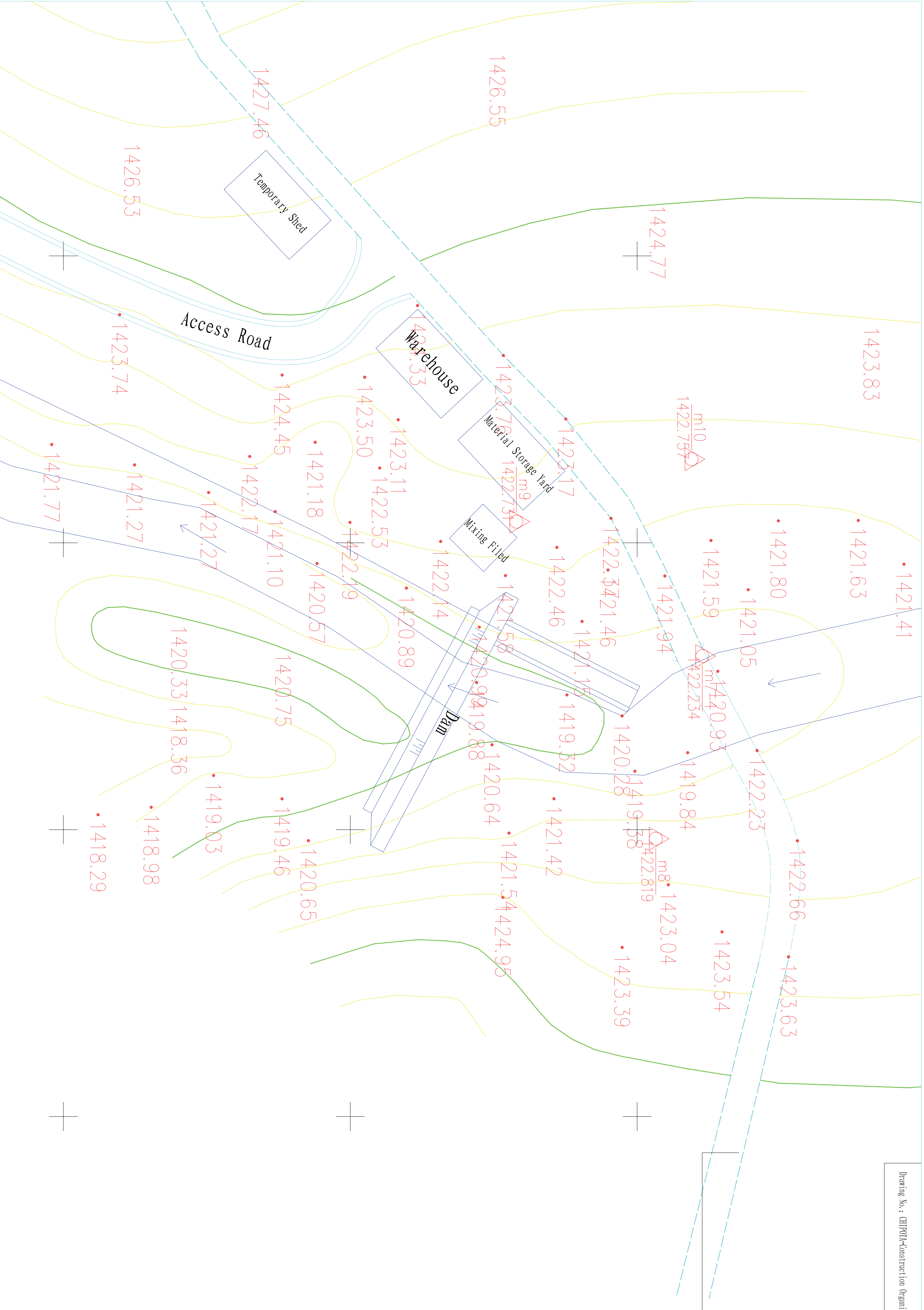
Hangzhou Guowang Technology Co., Ltd.	Design Certificate No.	Approval		Examine		Design		CHIPOTA FALLS Station Feasibility Study	General Plane Layout of Plant Area (Recommended Plan)	Feasibility Study	Ratio	1:50
				Check						Drawing		Hydraulic



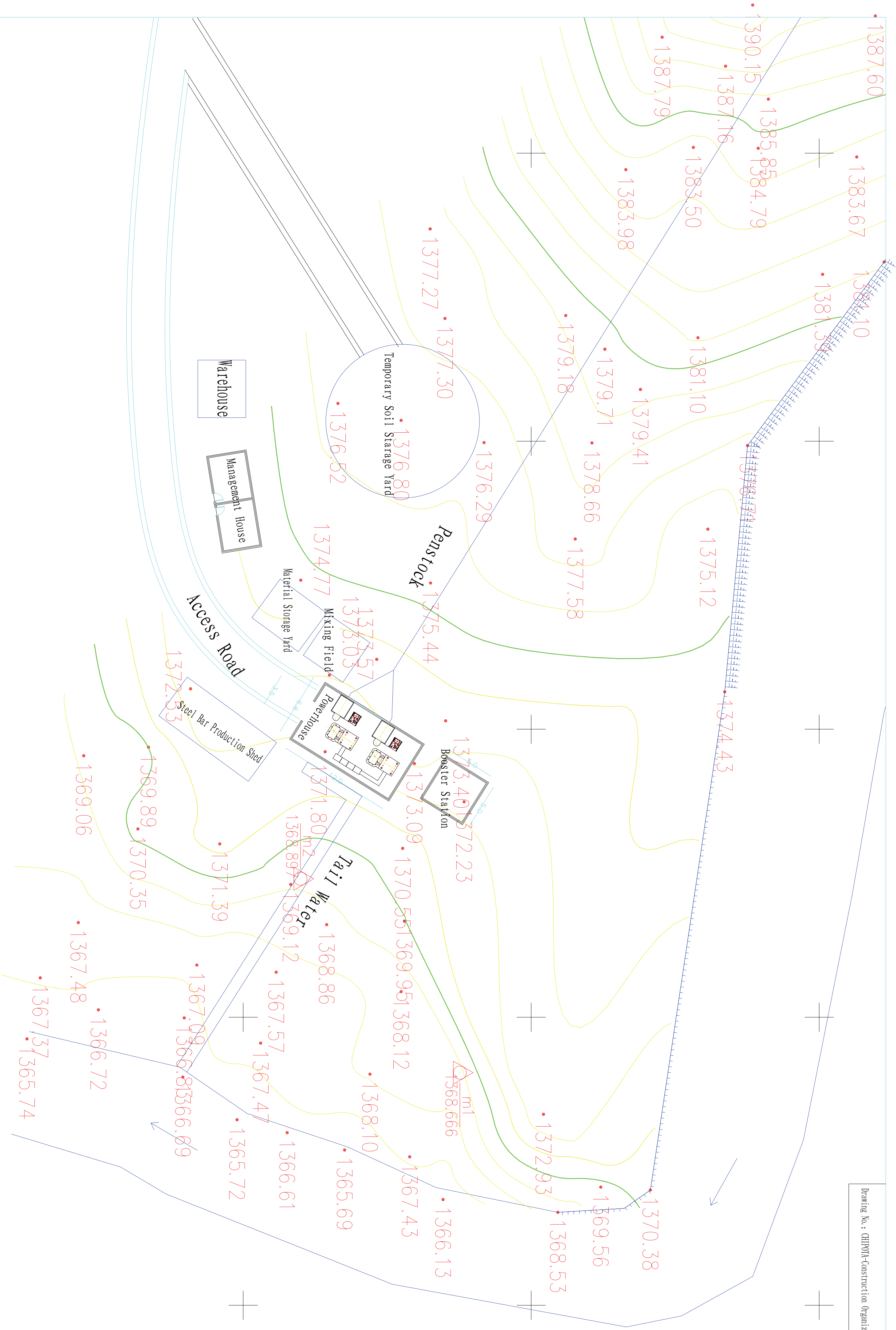
Hangzhou Guowang Technology Co., Ltd.	Design Certificate No.	Approval		Examine		Design		CHIPOTA FALLS Station Feasibility Study	Layout of Construction Diversion (Compared Plan)	Feasibility Study	Ratio	1:50
				Check						Drawing		Hydraulic



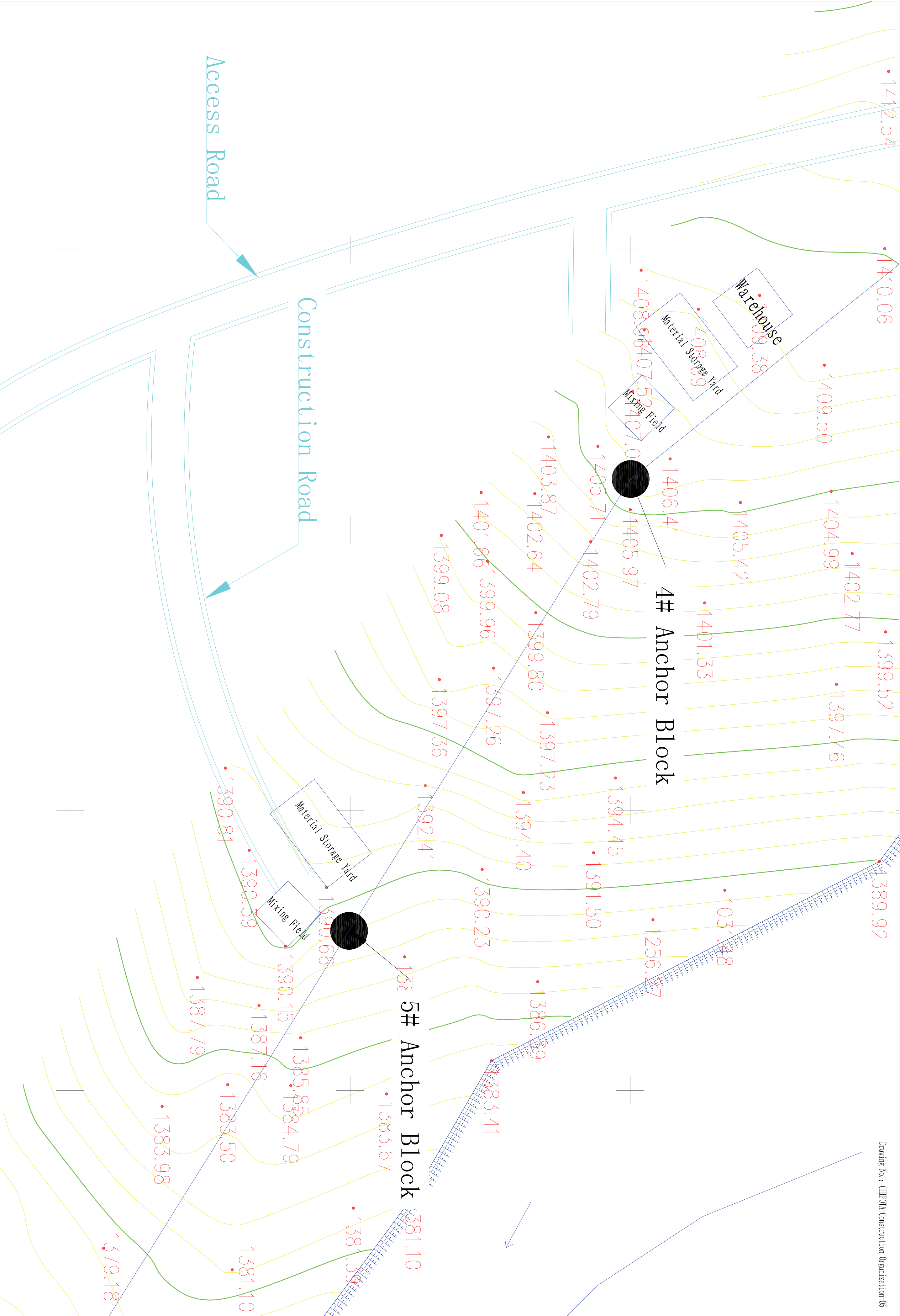
Hangzhou Guowang Technology Co., Ltd.			Design Certificate No.		Approval		Examine		Design		CHIPOTA FALLS Station Feasibility Study		Layout of Construction Diversion (Recommended Plan)		Feasibility Study		Ratio	
							Check								Hydraulic		1:50	
																	2016. 08	



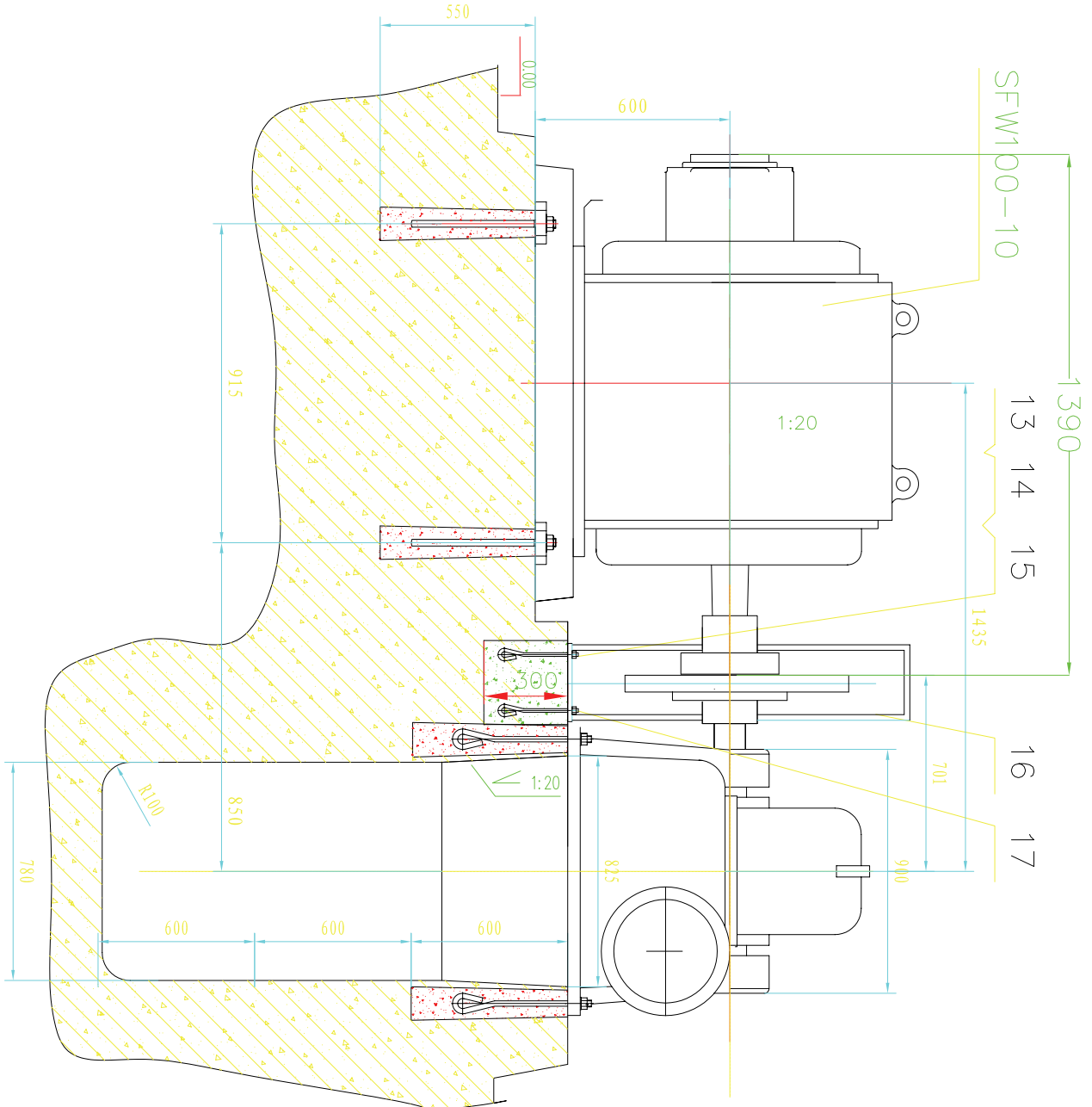
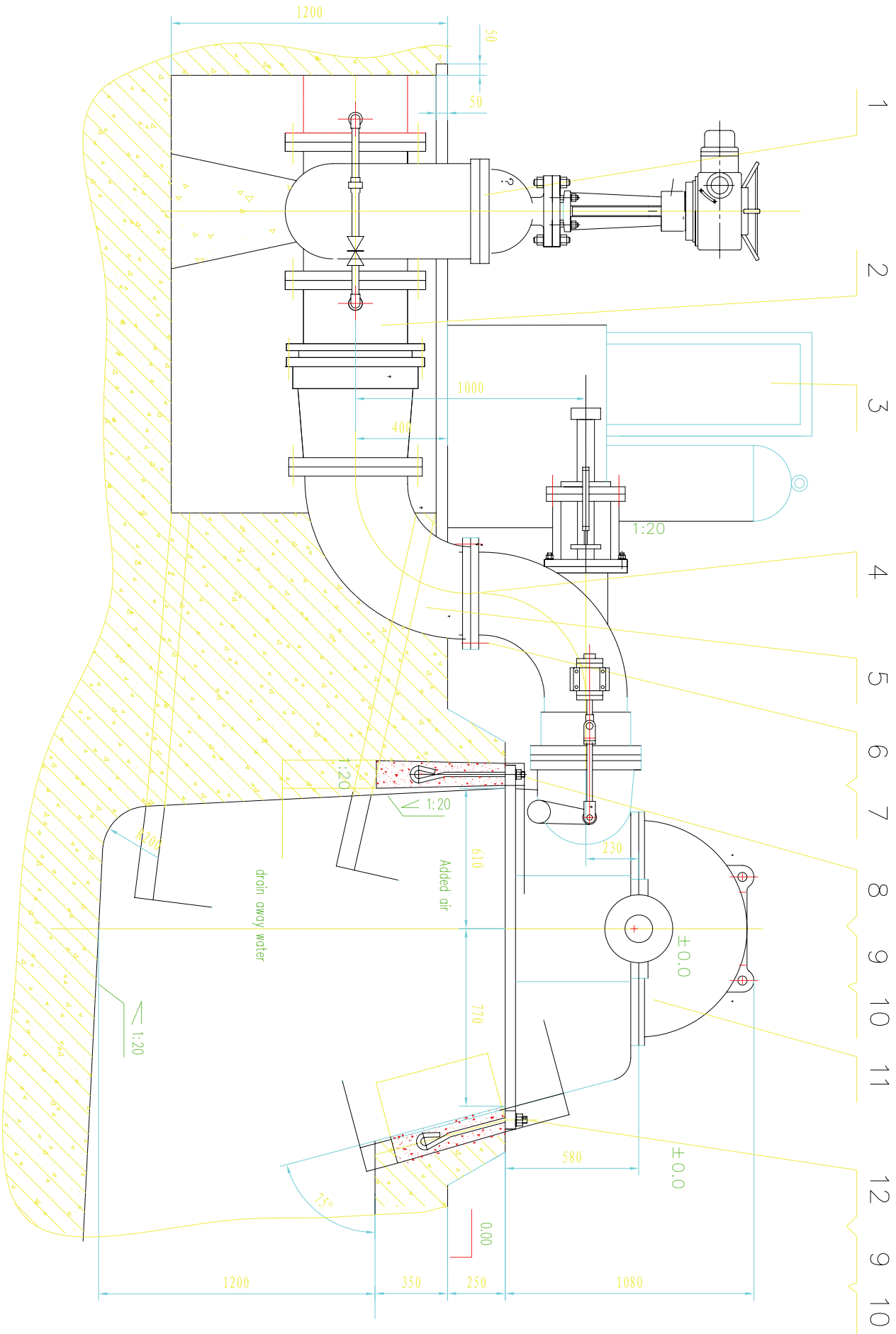
Hangzhou Guowang Technology Co., Ltd.		Design Certificate No.		Approval		Examine		Design		CHIPOTA FALLS Station Feasibility Study		Layout of Dam Construction Area (Recommended Plan)		Feasibility Study	
						Check		Drawing						Hydraulic	
														Ratio	
														1 : 50	
														Date	
														2016. 08	



Hangzhou Guowang Technology Co., Ltd.			Design Certificate No.		Approval		Examine		Design		CHIPOTA FALLS Station		Layout of Dam Construction Area		Feasibility Study		Ratio	
							Check		Drawing		Feasibility Study		(Recommended Plan)		Hydraulic		Date	
																	1 : 50	
																	2016. 08	



Hangzhou Guowang Technology Co., Ltd.		Design Certificate No.		Approval		Examine		Design		CHIPOTA FALLS Station		Layout of Penstock Construction		Feasibility Study		Ratio	
						Check		Drawing		Feasibility Study		Area (Recommended Plan)		Hydraulic		Date	
																1 : 50	
																2016. 08	

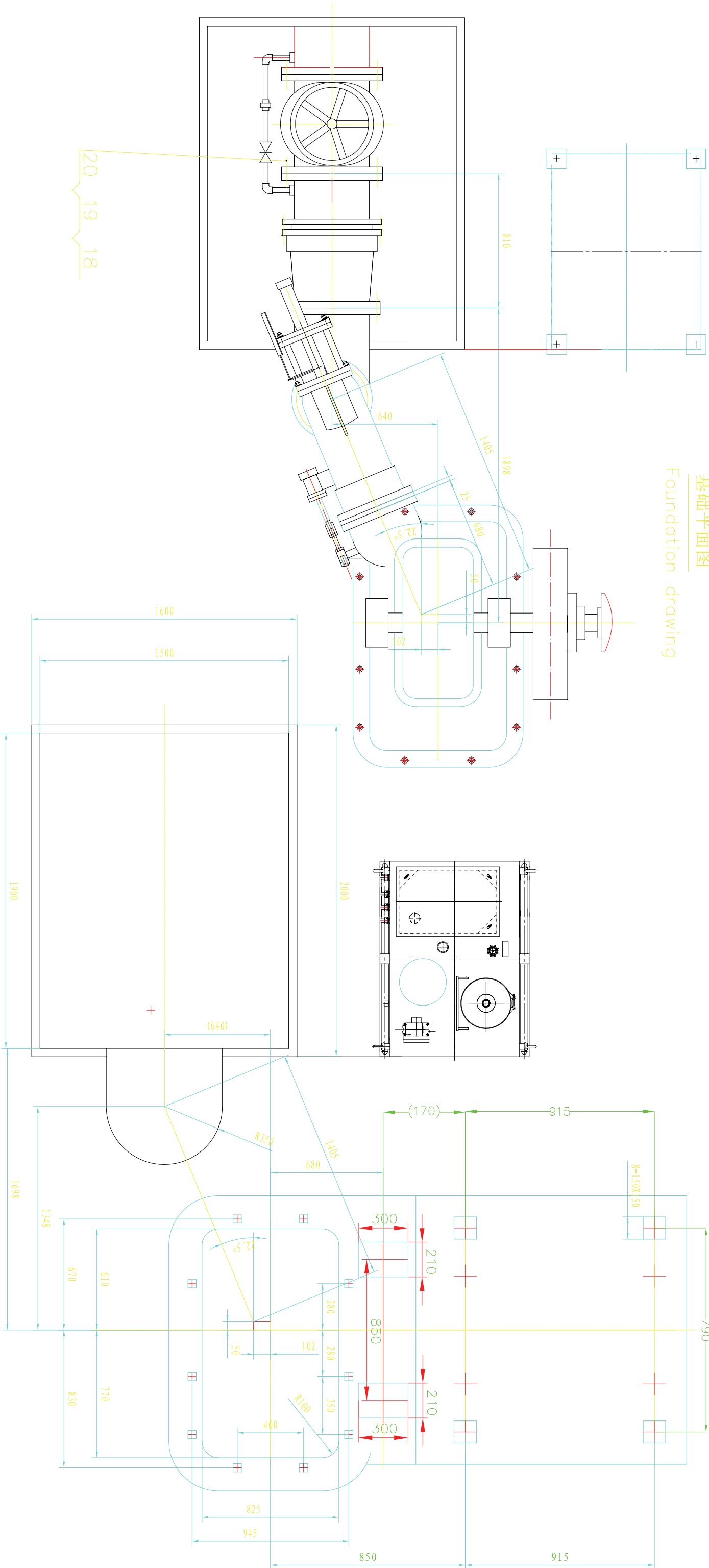


技术要求

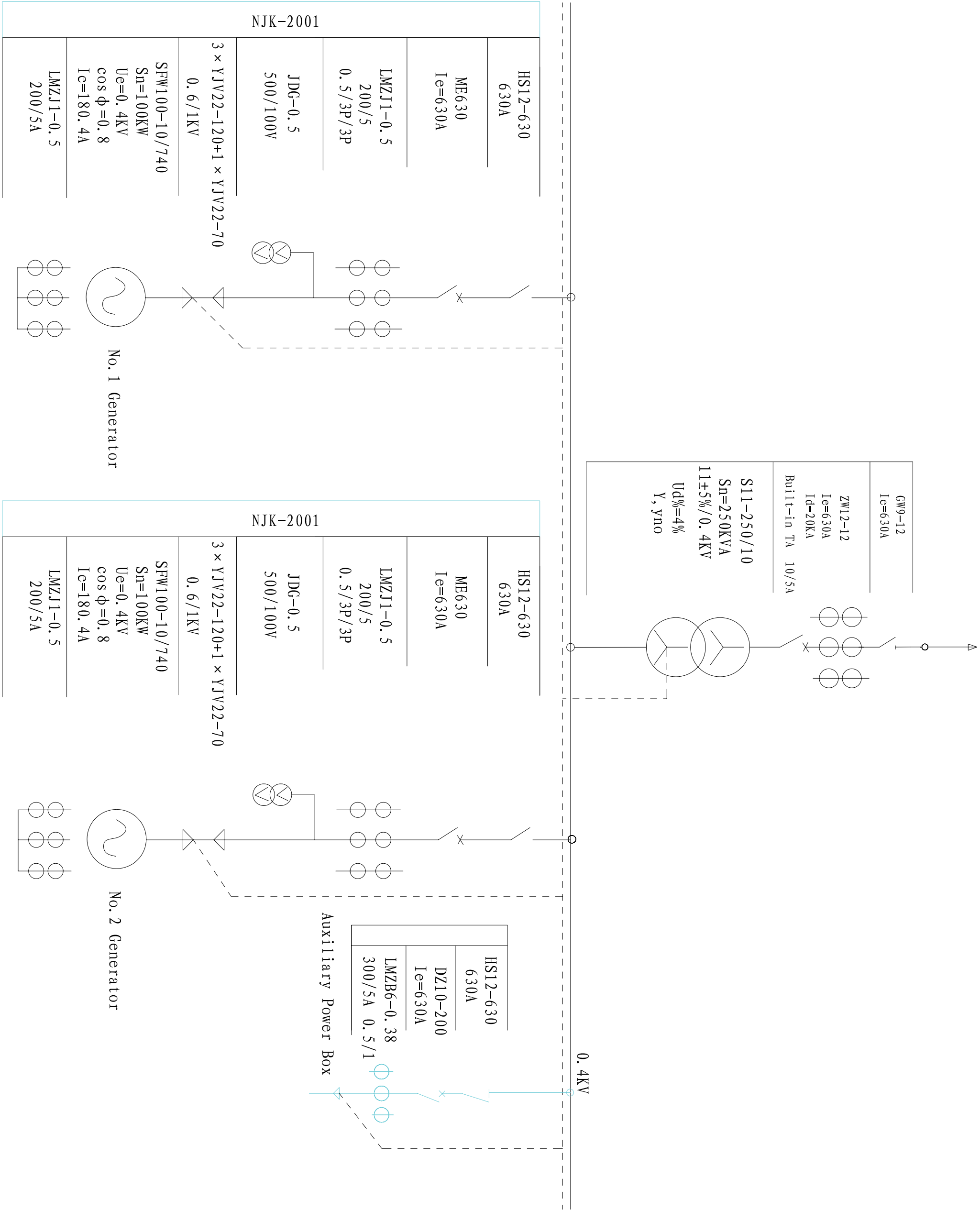
1. 本图供电站水轮机组安装布置参考之用,土建工程电站考虑.
 - 2 阀门在电站安装时,水泥支撑要求和阀门接触紧密,不允许阀门自重而下降.
 3. 泄水渠表面要求平整光滑,在每秒二米的水流冲刷下无脱层现象.
 - 4发电机的控制柜和复励装置的安装位置请电站自行安排.
- Technical Requirement
- 1 . This arrangement drawing is for your reference only on the arrangement of the turbine at a station and the civil engineering should be designed by user;
 2. When moutage of the valve , the contact between the valve and the concrete buttress should be kept tight and the sinking caused by itself weight is not allowable;
 3. The surface of tail channel is smooth and plane , it should be scoured without peeling off on condition that velocity of 2m/sec;
 4. The installation positions for the generator switchboard and the compound exciter should be arranged by customers themselves.

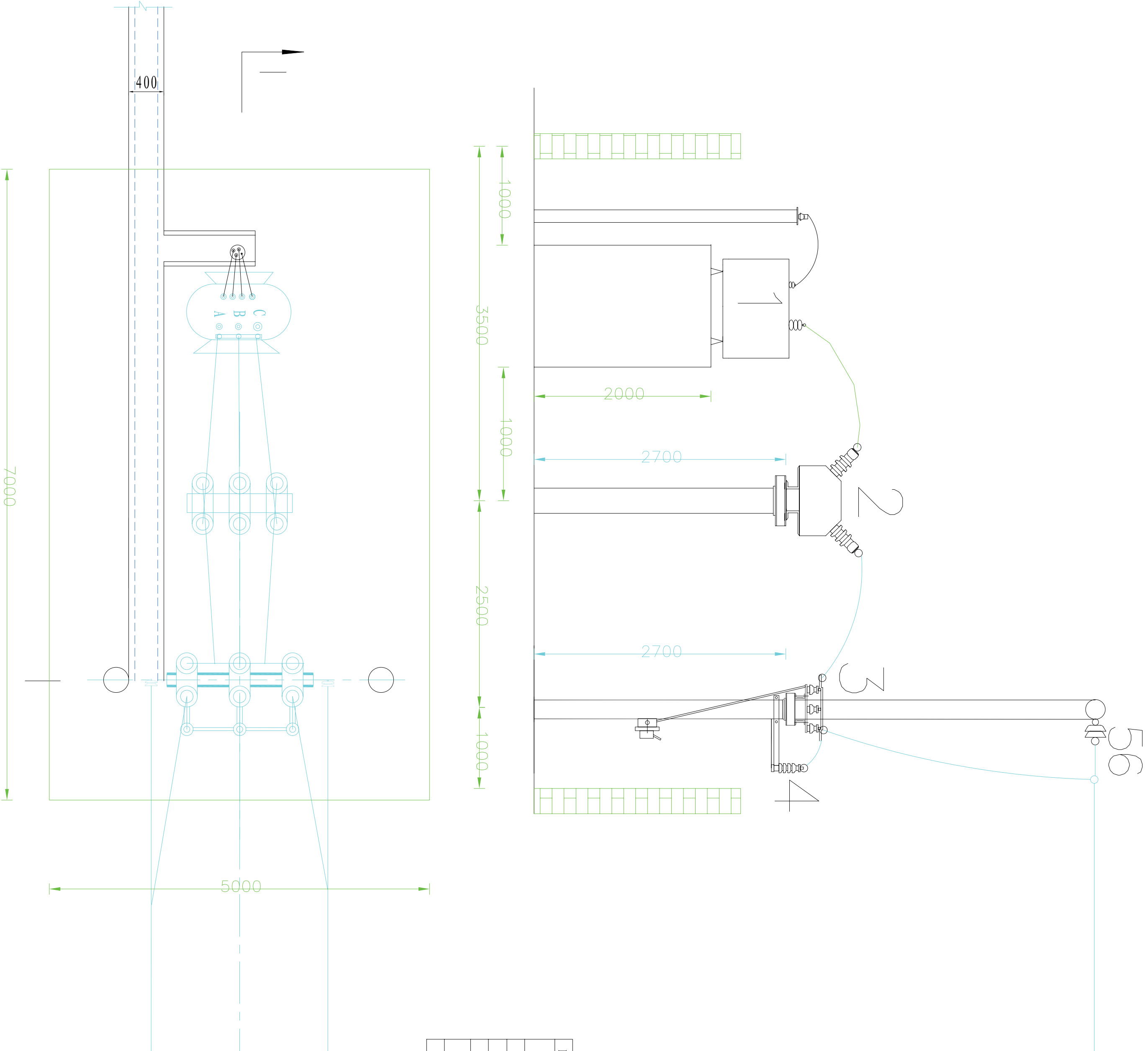
基础平面图
Foundation drawing

基础平面图
Foundation drawing



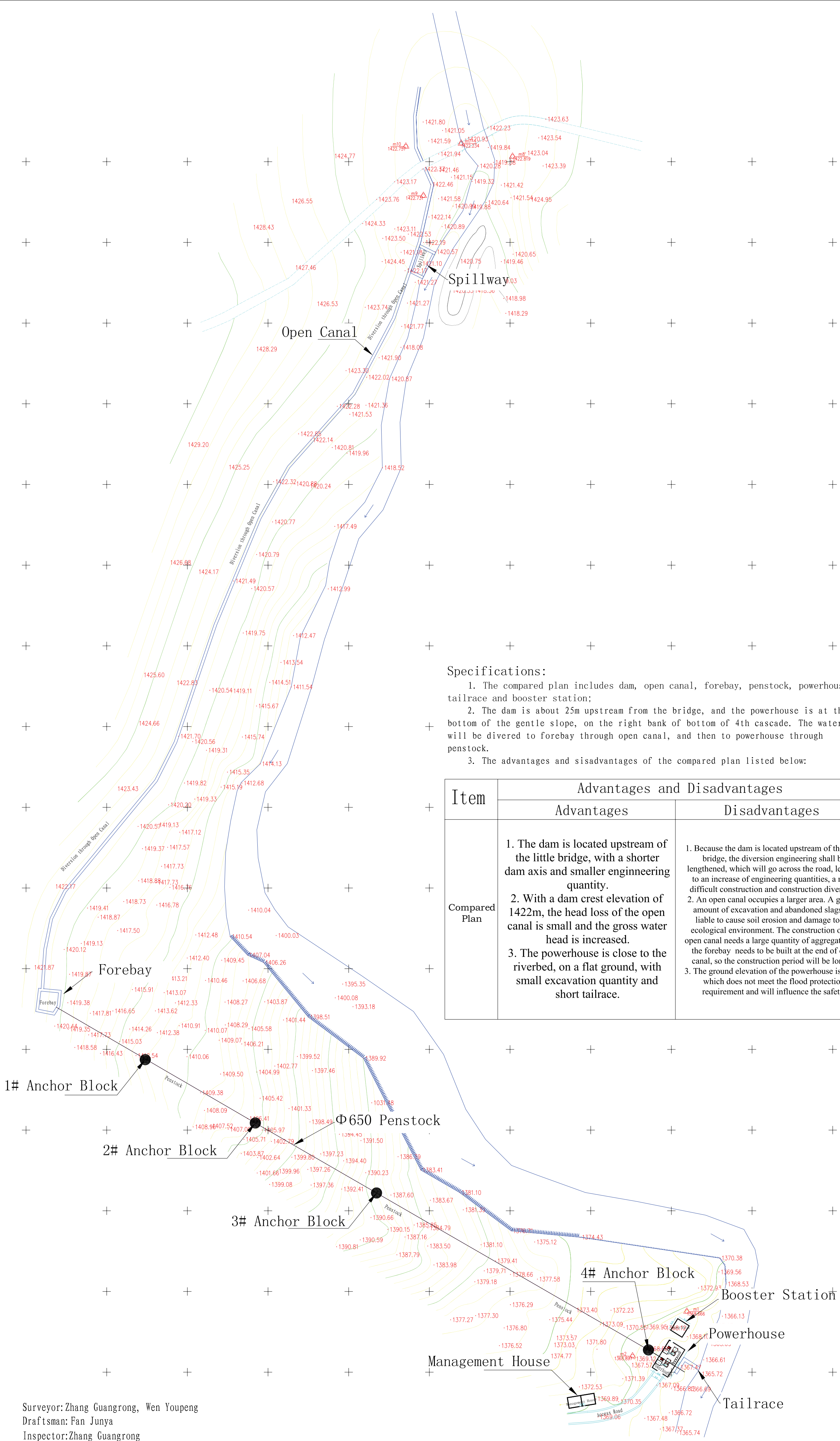
20	G097.1-85	垫圈 30	32	Q235-A	
19	G06170-86	螺母 M30	32	Q235-A	
118	G05782-86	螺栓 M30×120	32	Q235-A	
17	11XJC46.08.00	刹车装置	1		
16	11XJC46.06.00	飞轮重装配 Flywheel hood	1	Q235-A	
15	G097.1-85	垫圈 16	8	Q235-A	
14	G06170-86	螺母 M16	8	Q235-A	
13	G0799-88	地脚螺栓 M16×300	1	Q235-A	
712	T005.00.04	地脚螺栓 M24×400	2	Q235-A	G0799-88
611	16CJT46.01.00	水轮机装配 Turbine assembly	1		
10	G097.1-85	垫圈 24	10	Q235-A	
9	G06170-86	螺母 M24	10	Q235-A	
8	G0799-88	地脚螺栓 M24×500	8	Q235-A	
7	G06170-86	螺母 M22	16	Q235-A	
6	G05782-86	螺栓 M22×110	16	Q235-A	
5	78XSS0-001	进水管管 Conduic elbow	1	Q1700-7	
4	78XSS0-002	管衬垫 Spacer	1		
3	CJT5-1/4-4.0	调速器 Governor	1		
2	78XSS0-100A	伸縮节装配 Expansion joint assembly	1		
1	Z0411e-1.0	阀门 L=00Pa DN500	1		





List of Equipments and Materials

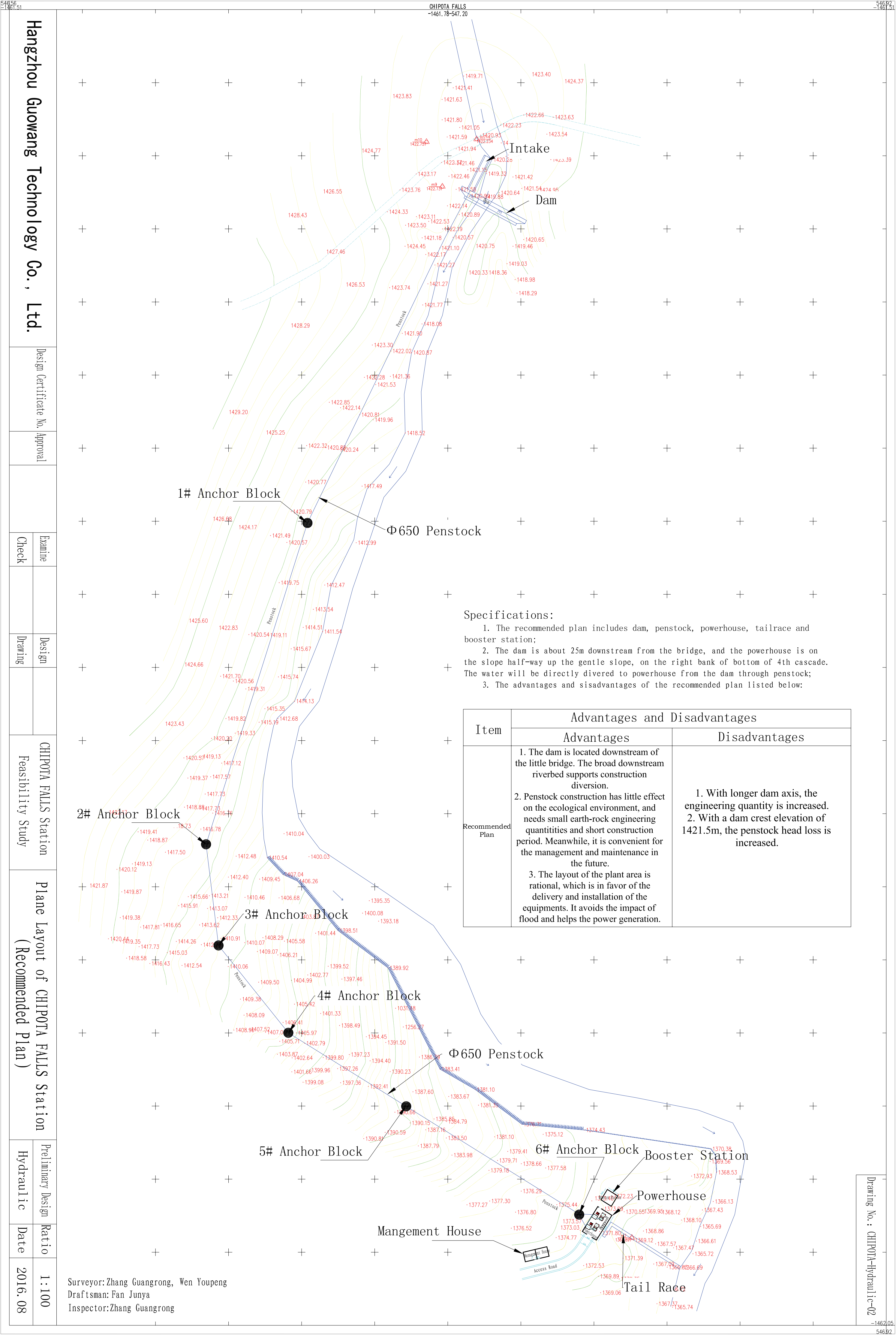
No.	Item	Specification	Unit	Quantity	Remarks
1	Transformer	S11-250/10 10±2×2.5%/0.4KV Y, yno U ₂ %=4.5	Set	1	
2	Circuit Breaker	ZW8-12/630, 630A	Set	1	
3	Insulation Switch	GW1-10/630A	Group	3	
4	lightening arrester	Y5W-12.7/42	Set	3	
5	Insulation Strings	2× (XP-4.5)	String	3	
6	Strain Clamp	NLD-1	Couple	3	



Specifications:

1. The compared plan includes dam, open canal, forebay, penstock, powerhouse, tailrace and booster station;
2. The dam is about 25m upstream from the bridge, and the powerhouse is at the bottom of the gentle slope, on the right bank of bottom of 4th cascade. The water will be diverted to forebay through open canal, and then to powerhouse through penstock.
3. The advantages and disadvantages of the compared plan listed below:

Item	Advantages and Disadvantages	
	Advantages	Disadvantages
Compared Plan	1. The dam is located upstream of the little bridge, with a shorter dam axis and smaller engineering quantity. 2. With a dam crest elevation of 1422m, the head loss of the open canal is small and the gross water head is increased. 3. The powerhouse is close to the riverbed, on a flat ground, with small excavation quantity and short tailrace.	1. Because the dam is located upstream of the little bridge, the diversion engineering shall be lengthened, which will go across the road, leading to an increase of engineering quantities, a more difficult construction and construction diversion. 2. An open canal occupies a larger area. A greater amount of excavation and abandoned slags are liable to cause soil erosion and damage to the ecological environment. The construction of the open canal needs a large quantity of aggregates and the forebay needs to be built at the end of open canal, so the construction period will be longer. 3. The ground elevation of the powerhouse is lower which does not meet the flood protection requirement and will influence the safety.



- Specifications:
1. The recommended plan includes dam, penstock, powerhouse, tailrace and booster station;
 2. The dam is about 25m downstream from the bridge, and the powerhouse is on the slope half-way up the gentle slope, on the right bank of bottom of 4th cascade. The water will be directly divered to powerhouse from the dam through penstock;
 3. The advantages and sisadvantages of the recommended plan listed below:

Item	Advantages and Disadvantages	
	Advantages	Disadvantages
Recommended Plan	1. The dam is located downstream of the little bridge. The broad downstream riverbed supports construction diversion. 2. Penstock construction has little effect on the ecological environment, and needs small earth-rock engineering quantities and short construction period. Meanwhile, it is convenient for the management and maintenance in the future. 3. The layout of the plant area is rational, which is in favor of the delivery and installation of the equipments. It avoids the impact of flood and helps the power generation.	1. With longer dam axis, the engineering quantity is increased. 2. With a dam crest elevation of 1421.5m, the penstock head loss is increased.

Hangzhou Guowang Technology Co., Ltd.

Design Certificate No. Approval

Examine
Check

Design
Drawing

Feasibility Study

Plane Layout of CHIPOTA FALLS Station
(Recommended Plan)

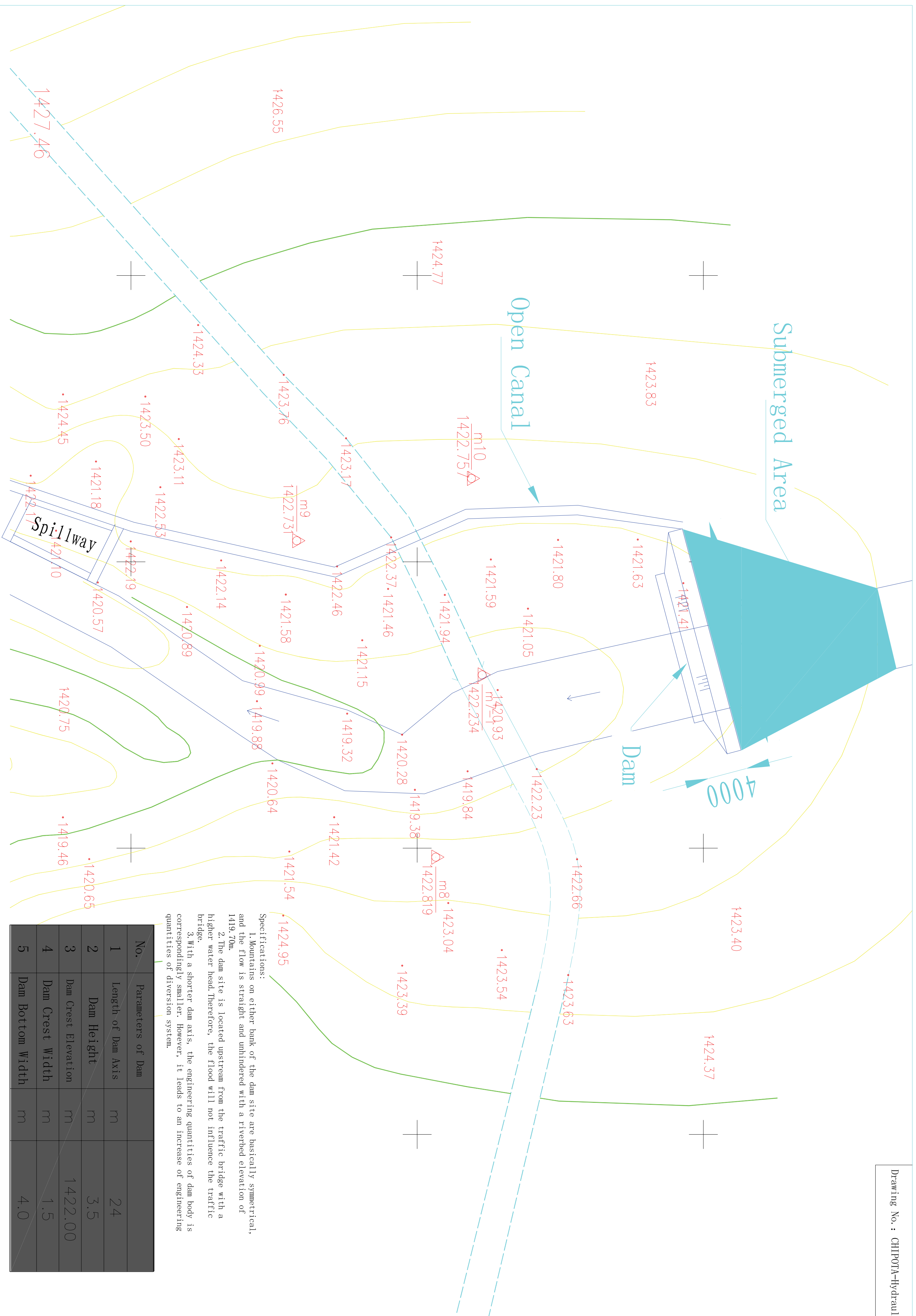
Preliminary Design

Ratio
Date

1:100
2016. 08

Surveyor:Zhang Guangrong, Wen Youpeng
Draftsman: Fan Junya
Inspector:Zhang Guangrong

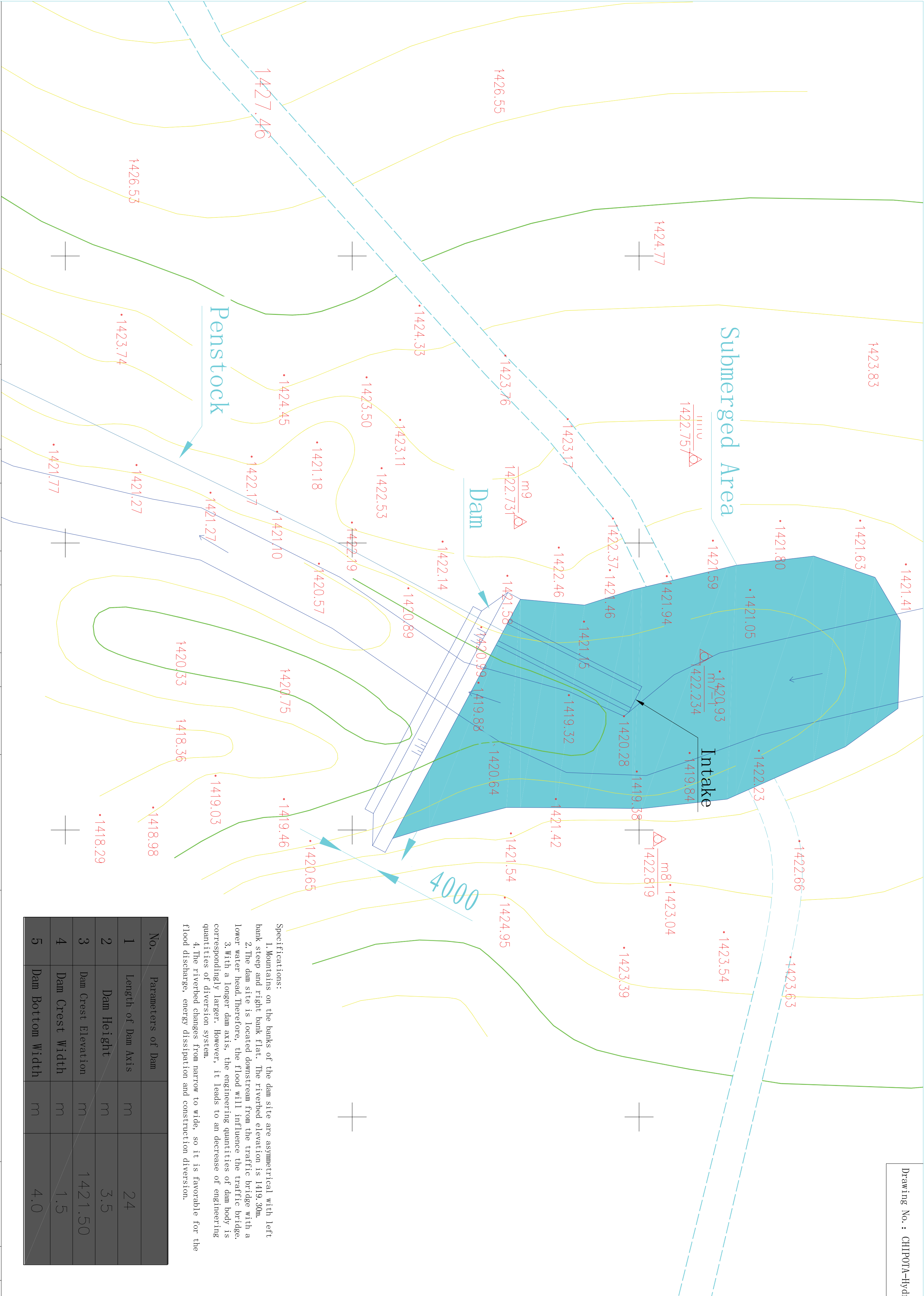
Drawing No.: CHIPOTA-Hydraulic-02

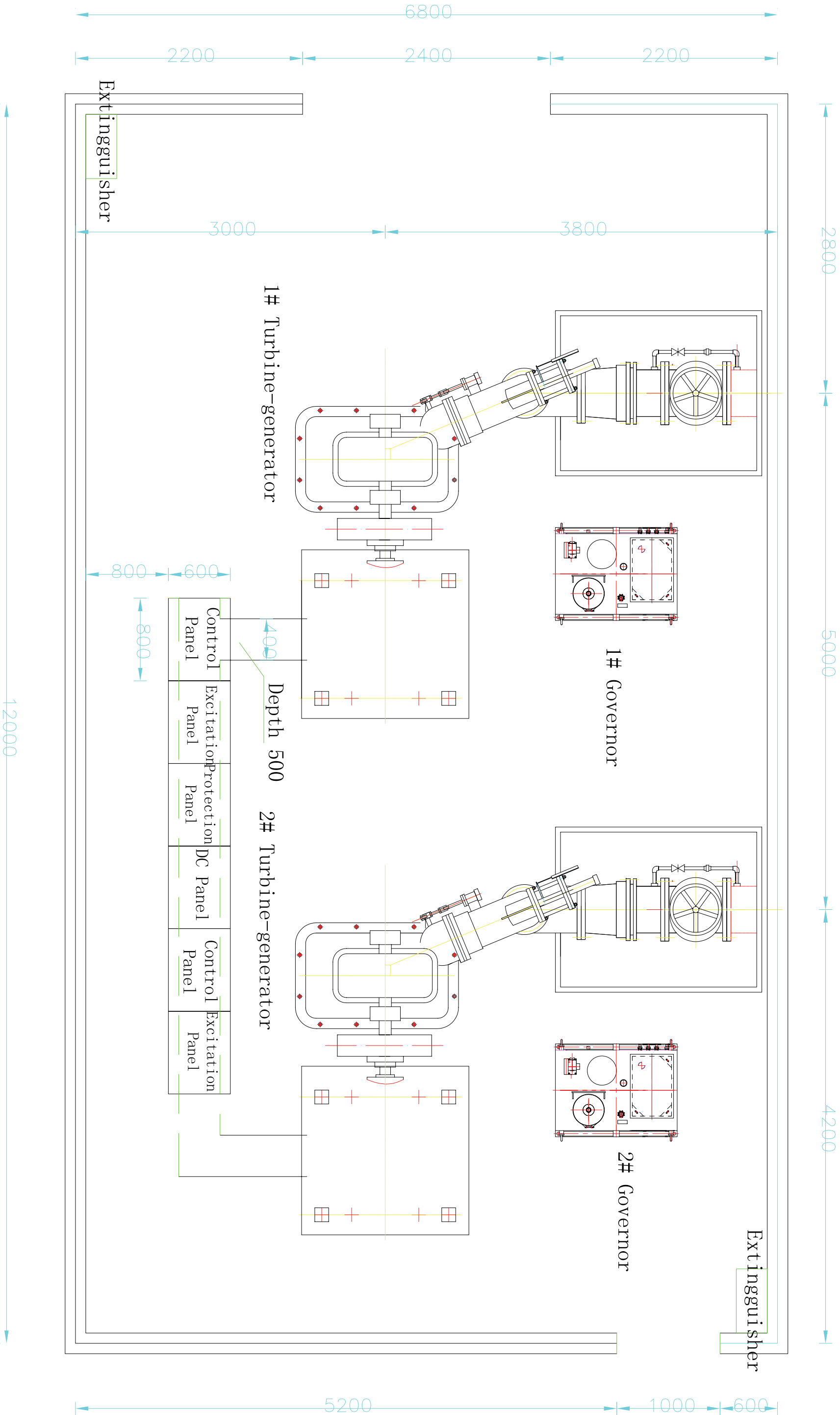


No.	Parameters of Dam		
1	Length of Dam Axis	m	24
2	Dam Height	m	3.5
3	Dam Crest Elevation	m	1422.00
4	Dam Crest Width	m	1.5
5	Dam Bottom Width	m	4.0

Specifications:

1. Mountains on either bank of the dam site are basically symmetrical, and the flow is straight and unhindered with a riverbed elevation of 1419.70m.
2. The dam site is located upstream from the traffic bridge with a higher water head. Therefore, the flood will not influence the traffic bridge.
3. With a shorter dam axis, the engineering quantities of dam body is correspondingly smaller. However, it leads to an increase of engineering quantities of diversion system.

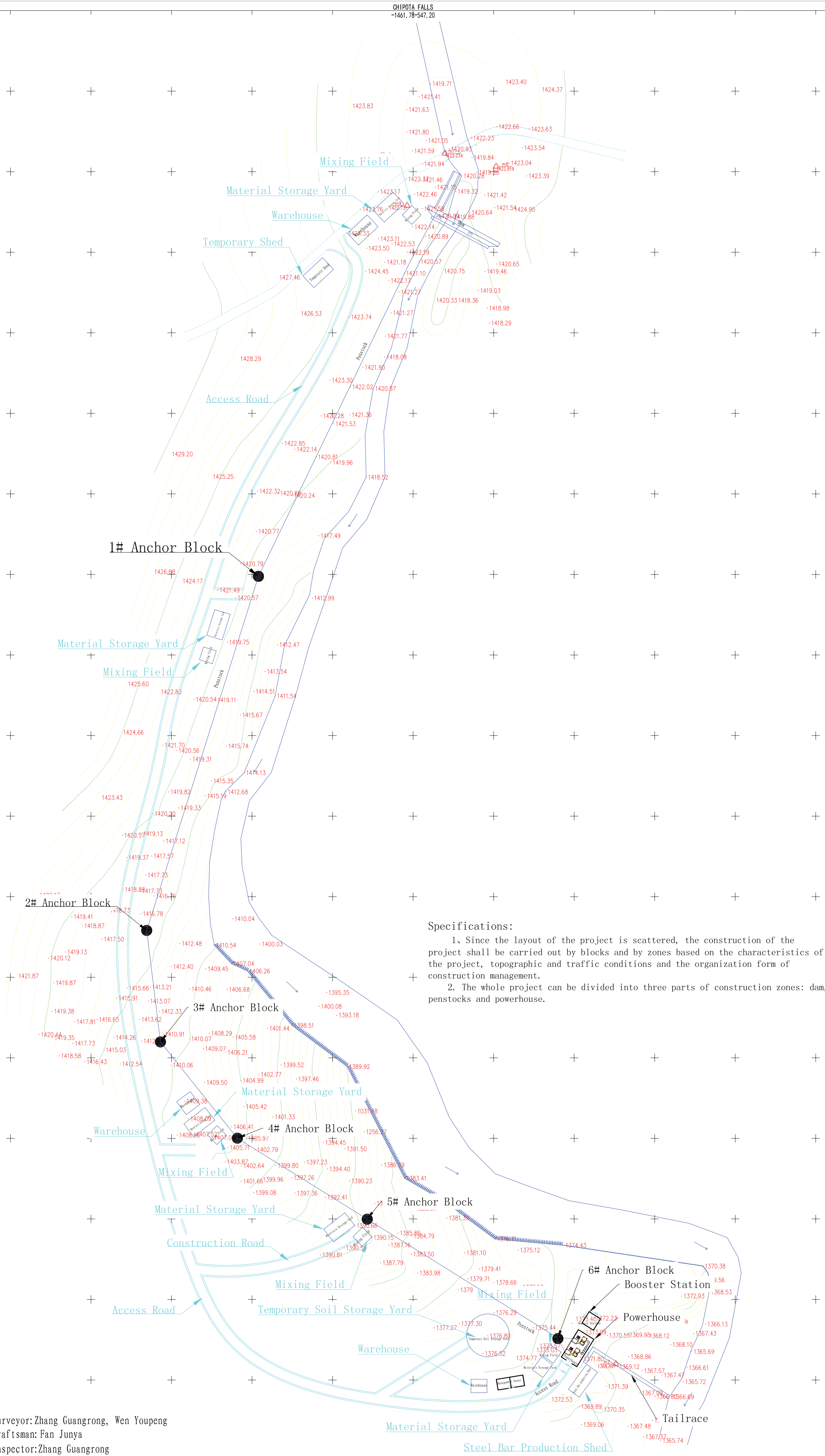




Specification:

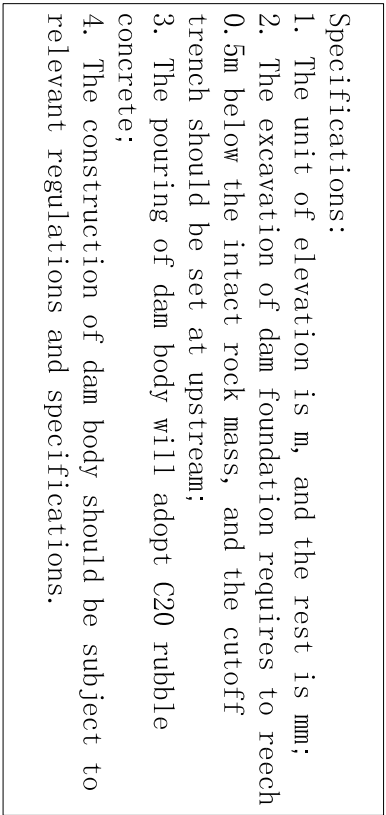
1. The unit of elevation is m, and the rest is mm;
2. Two sets of turbine-generators are installed in the powerhouse. The type of turbine is XJA-W-46/1×11, and the type of generator is SFW100-10/740. The installation elevation of turbine is 1372.33m;
3. The dimension of turbine pit should be subject to the installation diagram from manufacturer.

Hangzhou Guowang Technology Co., Ltd.		Design Certificate No.	Approval	Examine	Check	Design	Drawing	CHIPOTA FALLS Station Feasibility Study		Plane Layout of Electromechanical Equipments		Feasibility Study	Electric	Ratio	Date	1 : 50	2016. 08
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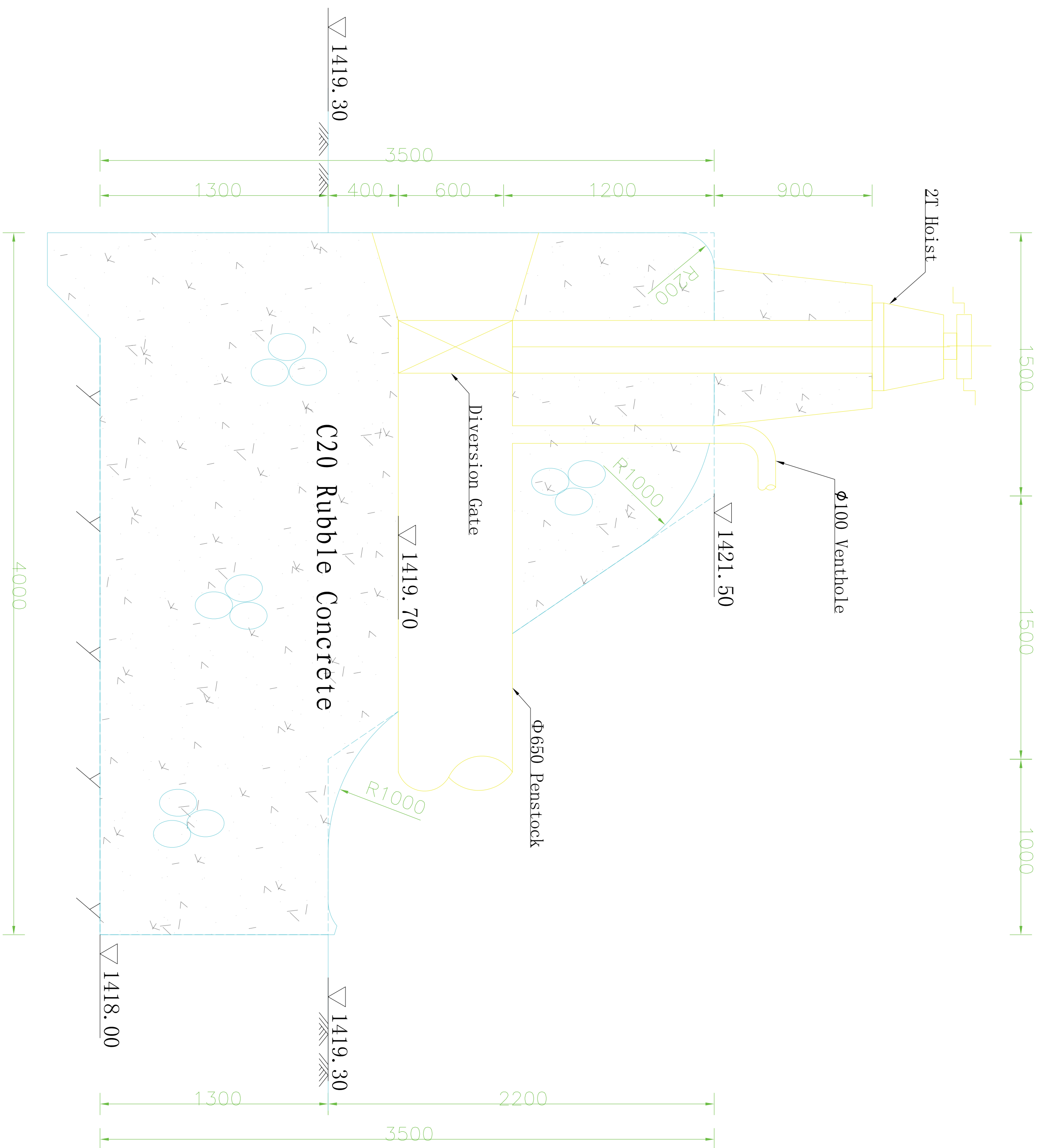
Specifications:

1. Since the layout of the project is scattered, the construction of the project shall be carried out by blocks and by zones based on the characteristics of the project, topographic and traffic conditions and the organization form of construction management.
2. The whole project can be divided into three parts of construction zones: dam, penstocks and powerhouse.



1:50

Hangzhou Guowang Technology Co., Ltd.		Design Certificate No.		Approval				Examine				Design				Vertical Section of Dam (Compared Plan)		Feasibility Study		Ratio		1:50	
						Check						Drawing						Hydraulic		Date		2016. 08	



- Specifications:
1. The unit of elevation is m , and the rest is mm ;
 2. The excavation of dam foundation requires to reach $0.5m$ below the intact rock mass, and the cutoff trench should be set at upstream;
 3. The pouring of dam body will adopt C20 rubble concrete;
 4. The construction of dam body should be subject to relevant regulations and specifications.

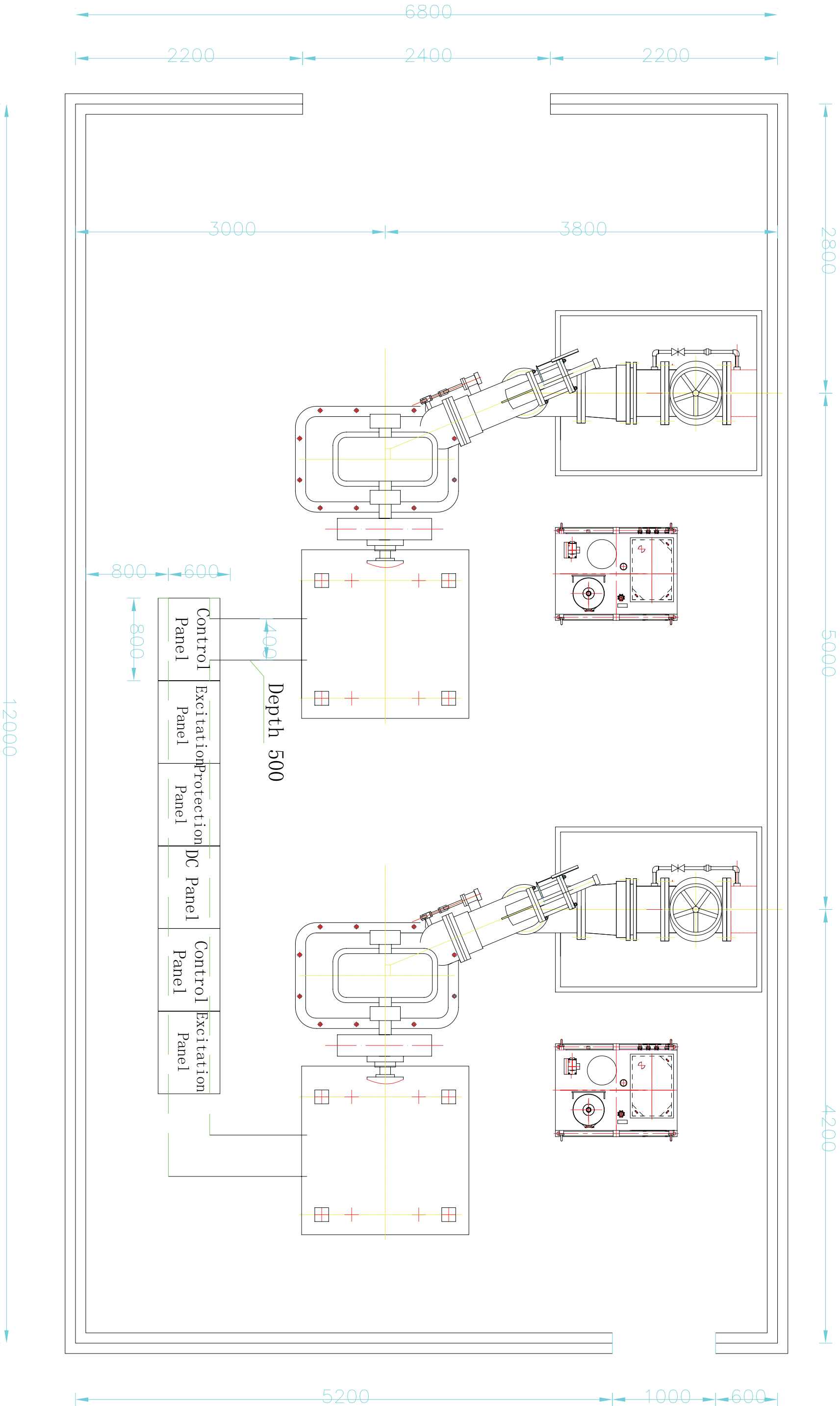
Vertical Section of Dam

1:50

Hangzhou Guowang Technology Co., Ltd.	Design Certificate No.	Approval		Examine	Design	CHIPOTA FALLS Station Feasibility Study	Vertical Section of Dam (Recommended Plan)		
				Check			Drawing	Feasibility Study	Ratio
				Hydraulic	Date		1:50		
					2016. 08				

Plane Layout of Powerhouse

1:50



Specification:

1. The unit of elevation is m, and the rest is mm;
2. Two sets of turbine-generators are installed in the powerhouse. The type of turbine is XJA-W-46/1×11, and the type of generator is SFW100-10/740. The installation elevation of turbine is 1372.33m;
3. The dimension of turbine pit should be subject to the installation diagram from manufacturer.

Hangzhou Guowang Technology Co., Ltd.		Design Certificate No.		Approval		Examine		Design		CHIP07A FALLS Station Feasibility Study		Plane Layout of Powerhouse		Feasibility Study		Ratio	
						Check		Drawing						Hydraulic		Date	
																1:50	
																2016. 08	

No.		Engineering Work		Construction Duration (Day)		Construction Progress												
						2016						2017						
						12	01	02	03	04	05	06	07	08	09	10	11	12
1	Cnstruction Preparation and Temporary Structures																	
2		Dam	30															
3		Penstock	50															
4	Hydraulic Engineering	Tailrace	10															
5		Powerhouse	50															
6		Installation of Turbine	25															
7	Electric Engineering	Installation of Generator	40															
8		Installation of Electral Equipments	40															
9		Booster Station	25															
10	Auxiliary Engineering	Access Road	30															
11		Management House	40															
12		Site-clearance and Testing	30															

Specifications:

The preparatory period of this project will be 2 months. The construction of this project will be started on 1st Dec. 2016, and be completed on 30th Dec. 2017. The total construction duration will be 13 moths.

Constrction Progress Chart

Hangzhou Guowang Technology Co., Ltd.		Design Certificate No.	Approval	Examine		Design	CHIPOTA FALLS Station Feasibility Study		Construction Progress Chart		Feasibility Study		Ratio	1:50
				Check		Drawing					Hydraulic		Date	2015.06