

**THE PREPARATORY SURVEY ON
THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT
IN THE SOCIALIST REPUBLIC OF VIET NAM**

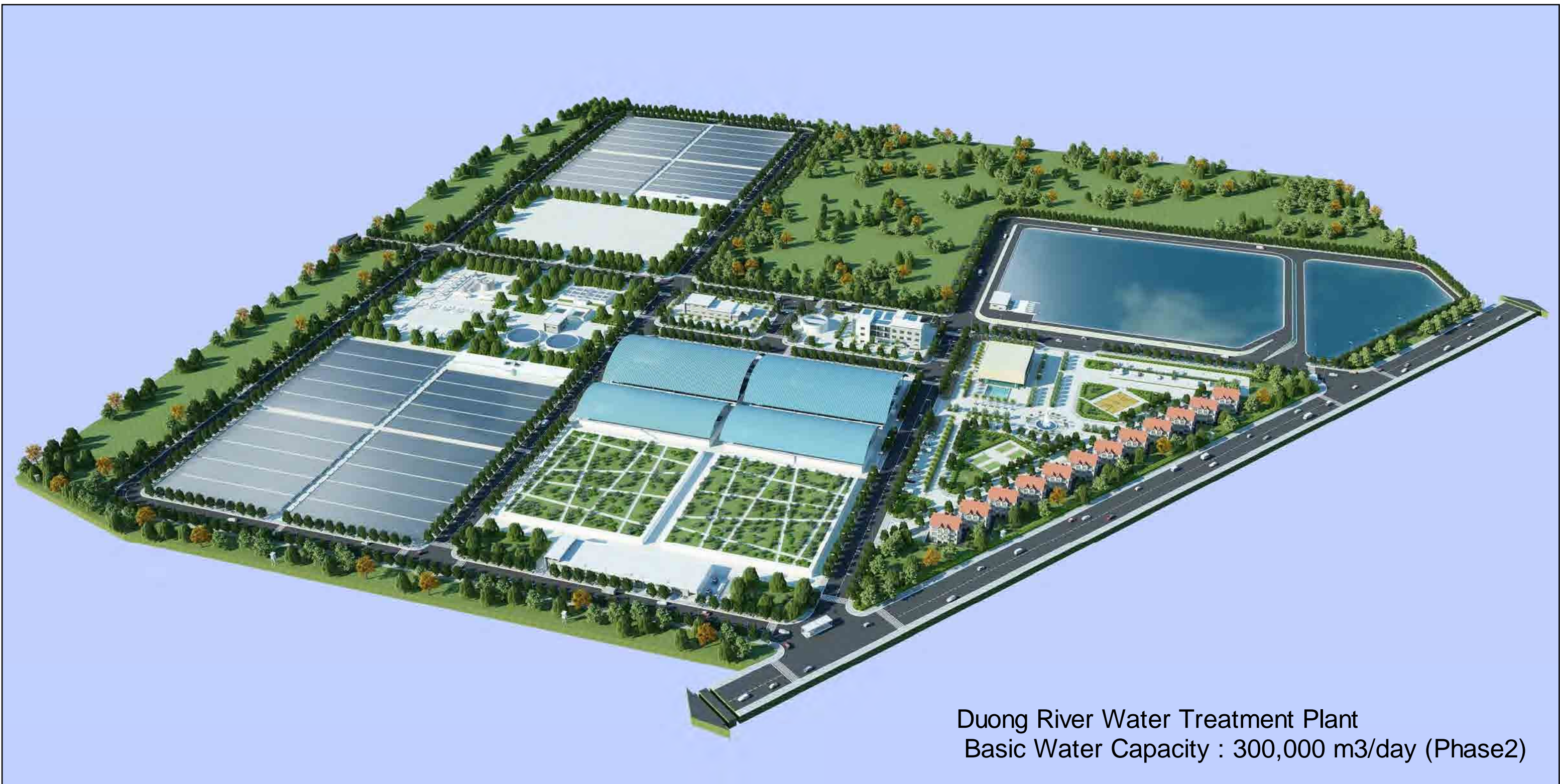
**FINAL REPORT
VOLUME III DESIGN DRAWINGS**

APPENDIX- 1 CIVIL AND MECHANICAL, ELECTRICAL DRAWINGS

May 2012

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**METAWATER CO., LTD
TOKYO ENGINEERING CONSULTANTS CO., LTD
KUBOTA CORPORATION
PRICewaterHOUSE COOPERS CO., LTD**



Duong River Water Treatment Plant
Basic Water Capacity : 300,000 m³/day (Phase2)

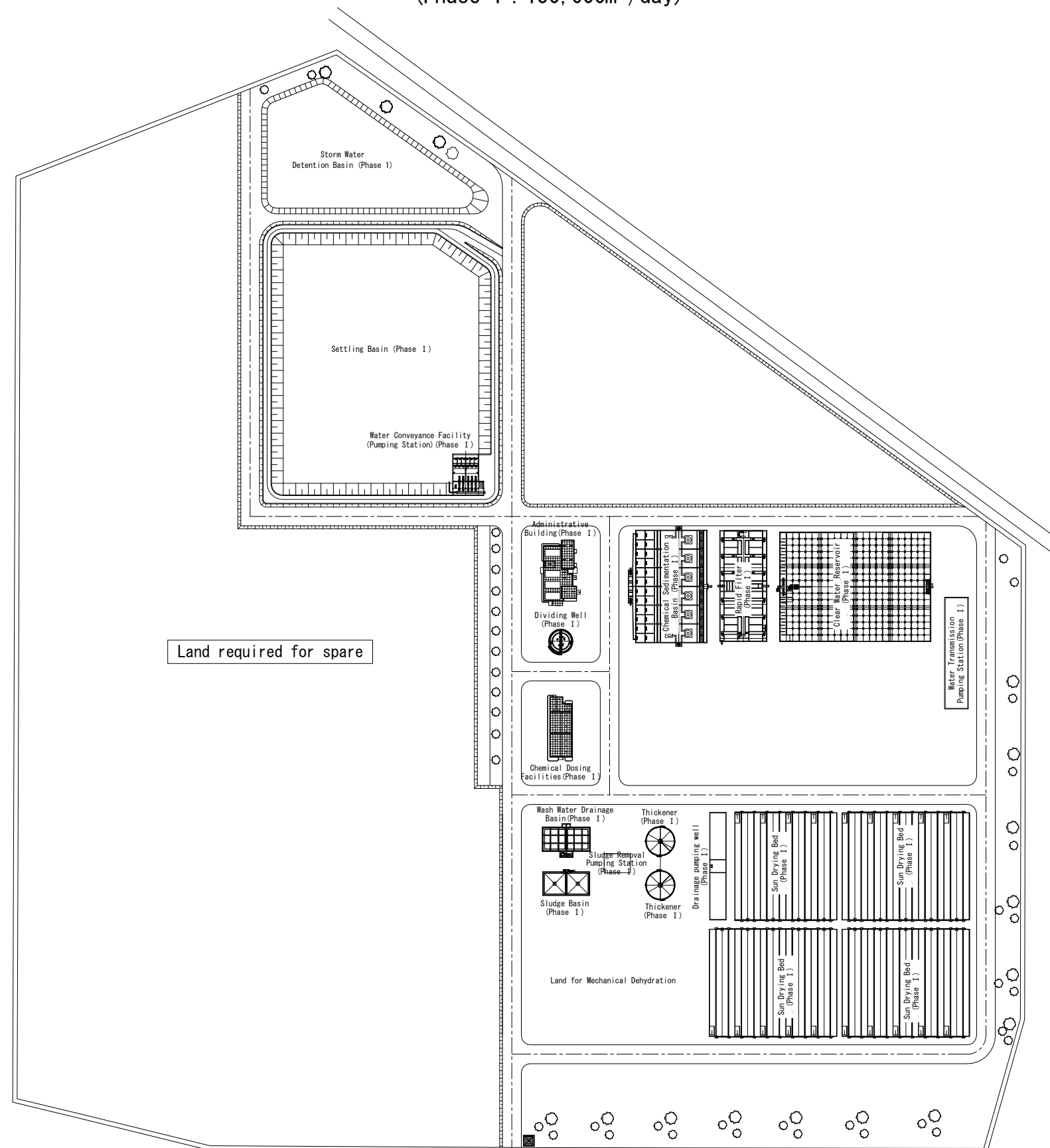
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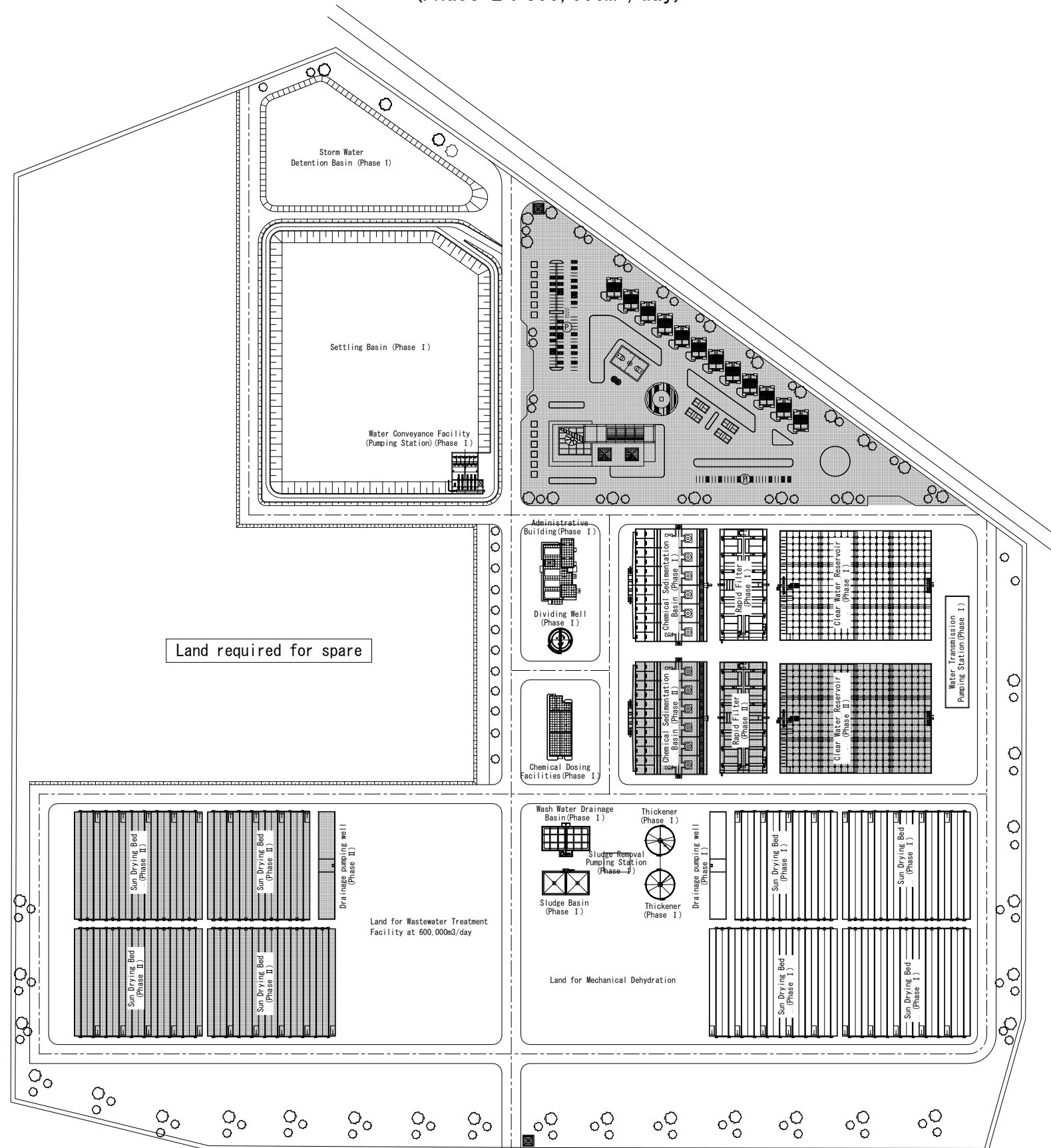
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General Plan s=1:2000
 (Phase 1 : 150,000m³/day)



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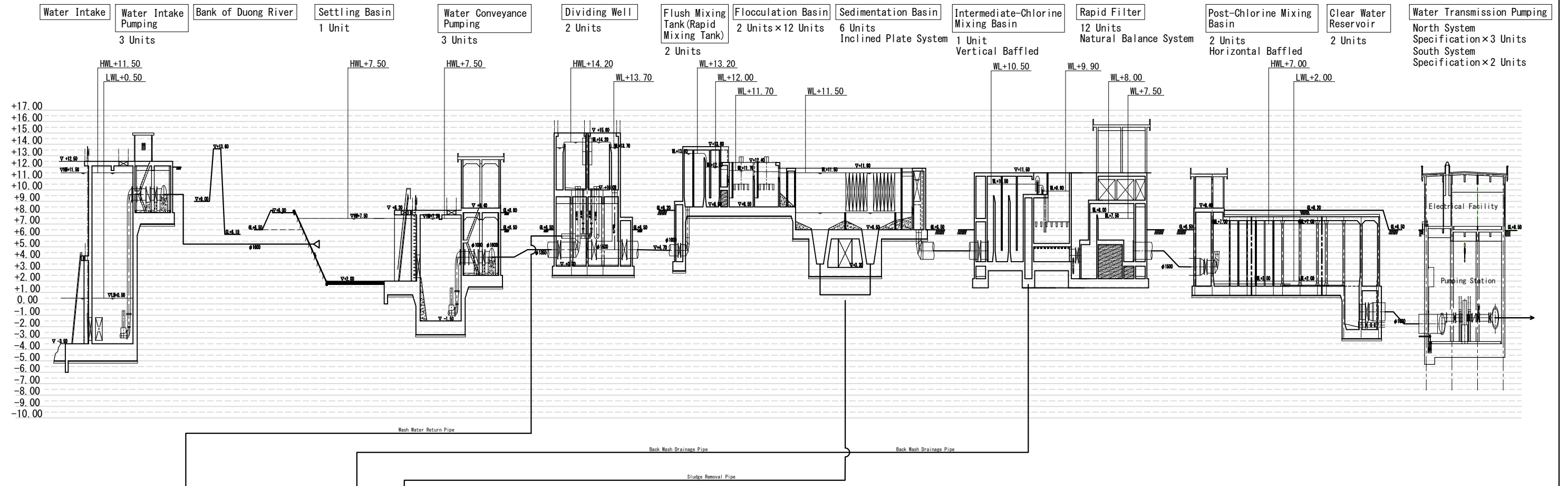
General Plan s=1:2000
(Phase 2 : 300,000m³/day)



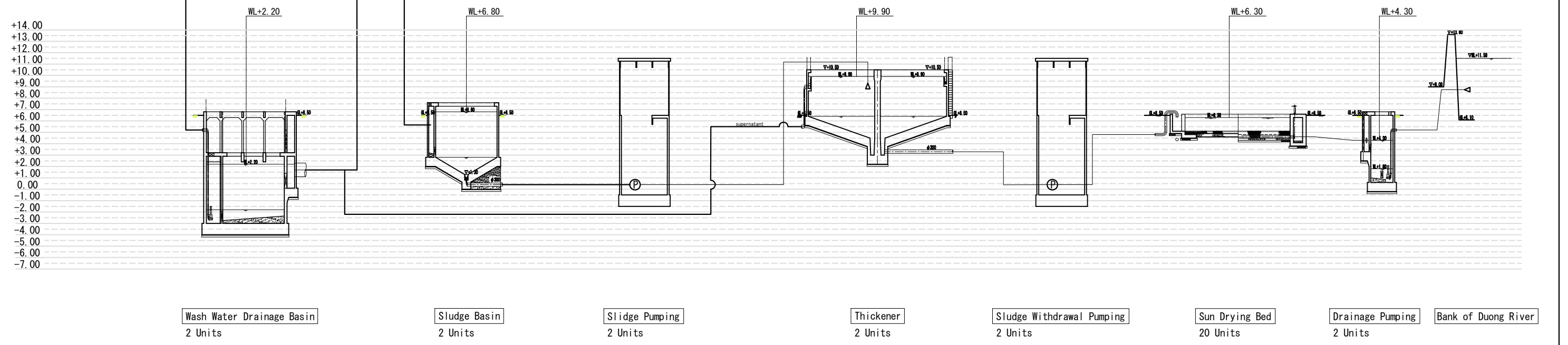
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Water Level Chart H=1:350

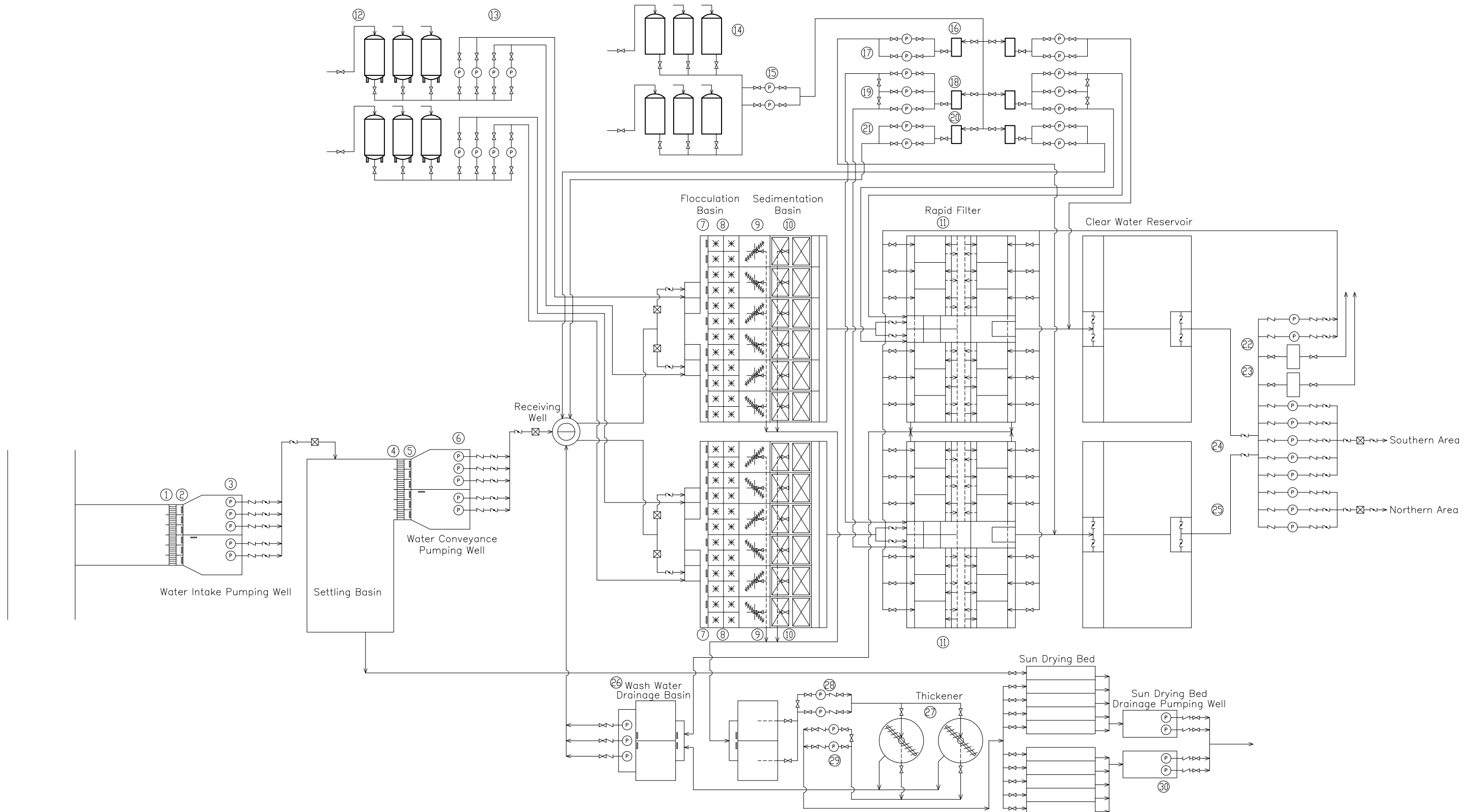
[Water Treatment System]



[Wastewater Treatment System]



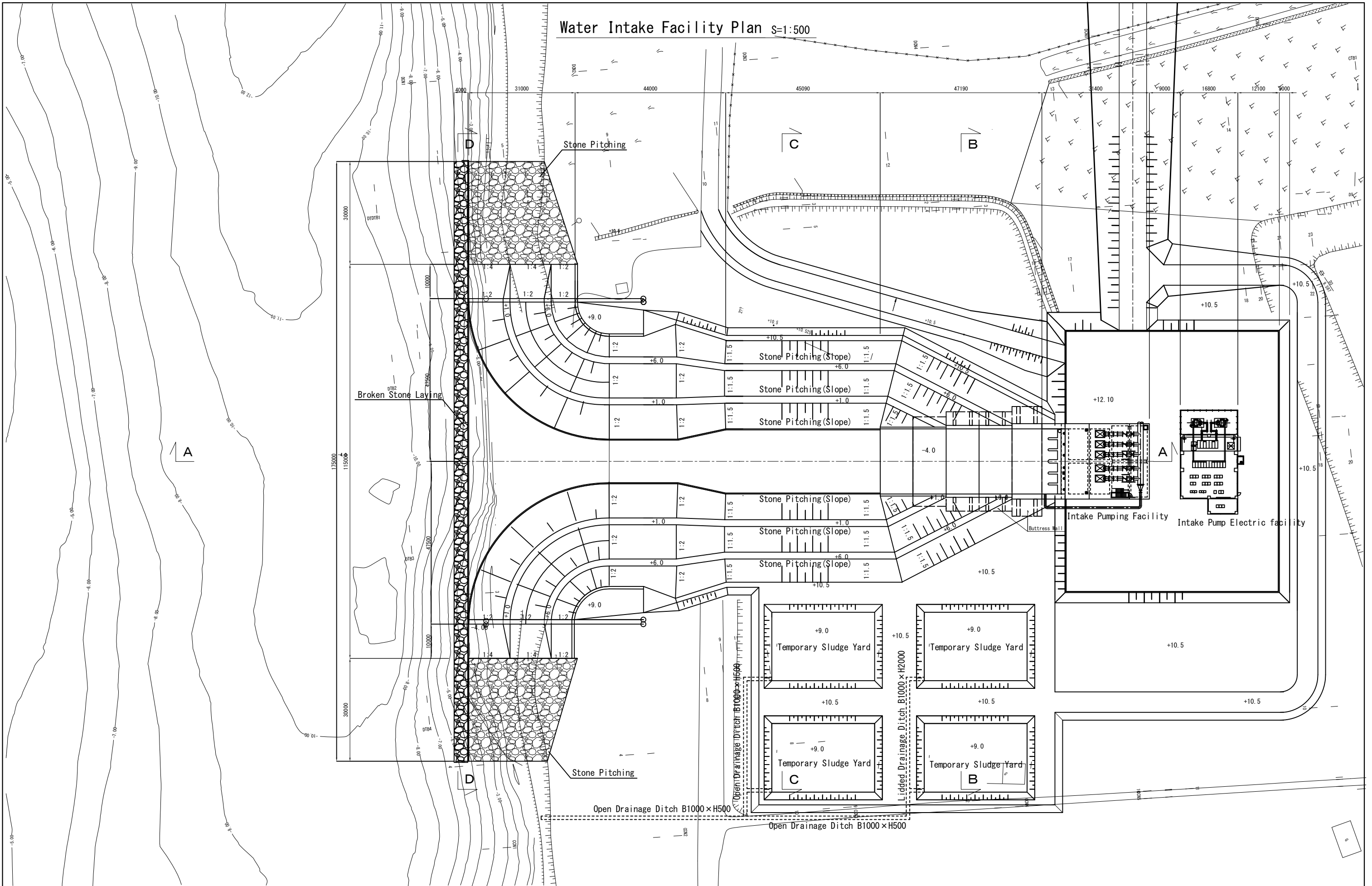
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THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT IN THE SOCIALIST REPUBLIC OF VIET NAM				Date. NOV. 2011	Duong River Water Treatment Plant	Drawing No	
				Scale non	Water Level Chart	3	



No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	
Name	Water Intake Pumping Well	Water Intake Pumping Well	Water Intake Pump	Water Conveyance Pumping Well	Water Conveyance Pumping Well	Water Conveyance Pump	Flocculation Basin	Flocculator	Sedimentation Basin	Sedimentation Basin	Rapid Filter	PAC Storage Tank	PAC Dosing Pump	Chlorine Storage Tank	Chlorine Transfer pump	Post-chlorine	
Type	Screen	Inflow Gate		Screen	Inflow Gate				Sludge Scraper	Inclined Pipe	Syphon					Service Tank	
Number (Phase1/Phase2)	6 / 0	6 / 0	3 / 2	6 / 0	6 / 0	3 / 2	12 / 12	24 / 24	6 / 6	6 / 6	12 / 12	3 / 3	4 / 4	3 / 3	2 / 0	1 / 1	
Remarks																	

No.	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘	㉙	㉚	㉛
Name	Post-chlorine	Intermediate-chlorine	Intermediate-chlorine	Pre-chlorine	Pre-chlorine	Rapid Filter	Feed-water Unit	(Southern Area)	(Northern Area)	Back-washing water	Thickener	Sludge Basin	Thickener	Sun Drying Bed	
Type	Dosing Pump	Service Tank	Dosing Pump	Service Tank	Dosing Pump	Surface-washing pump		Transmission Pump	Transmission Pump	Returning pump	Sludge Scraper	Drainage Pump	Drainage Pump	Drainage Pump	
Number (Phase1/Phase2)	2 / 2	1 / 1	3 / 3	1 / 1	2 / 2	2 / 0	1 / 1	3 / 2	2 / 1	2 / 1	2 / 0	2 / 0	2 / 0	2 / 2	
Remarks															

Water Intake Facility Plan S=1:500



JICA Study Team

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THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT
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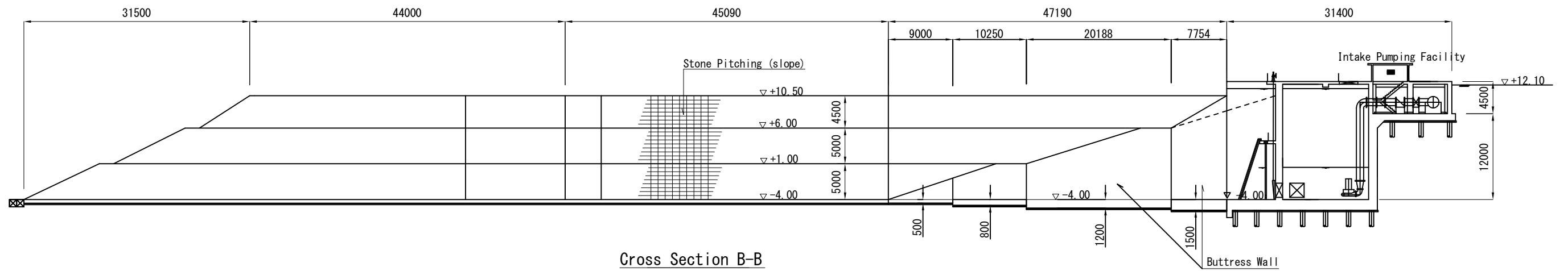
Date.
NOV. 2011
Scale
1/500

Duong River Water Treatment Plant
Water Intake Facility Plan

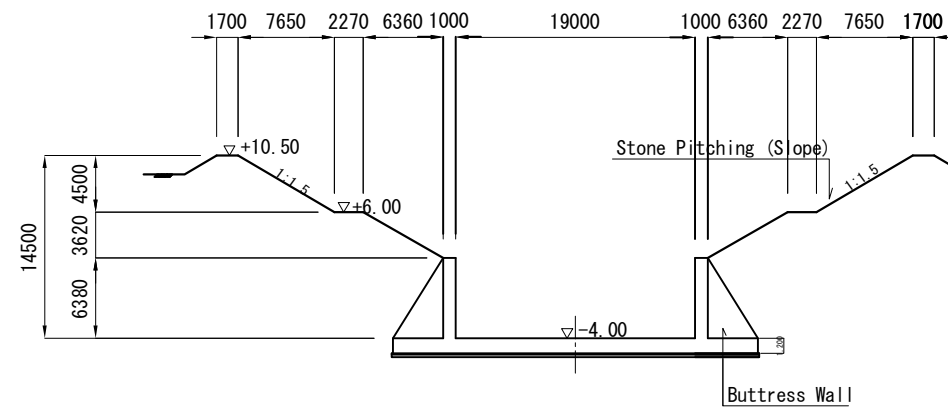
Drawing No
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Water Intake Facility Cross Section S=1:300

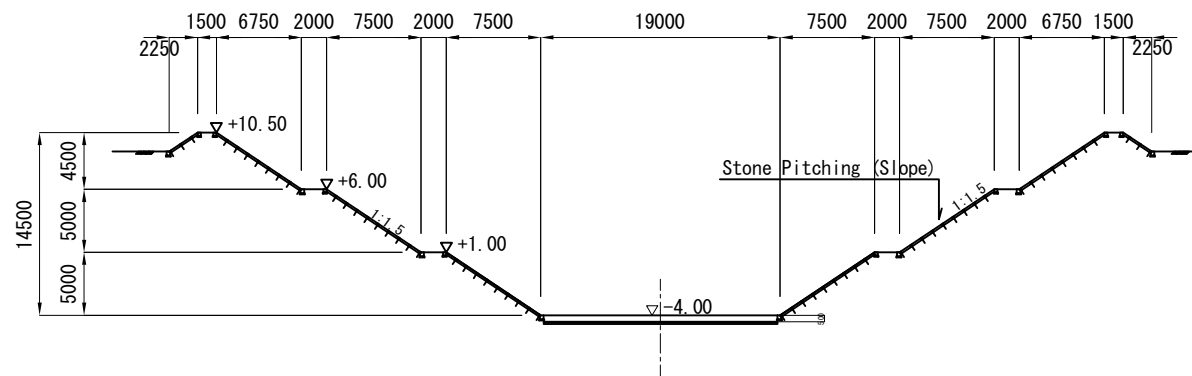
Cross Section A-A



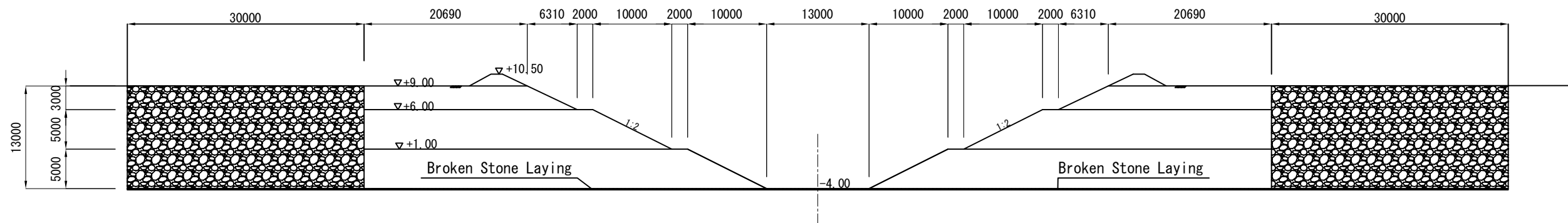
Cross Section B-B



Cross Section C-C

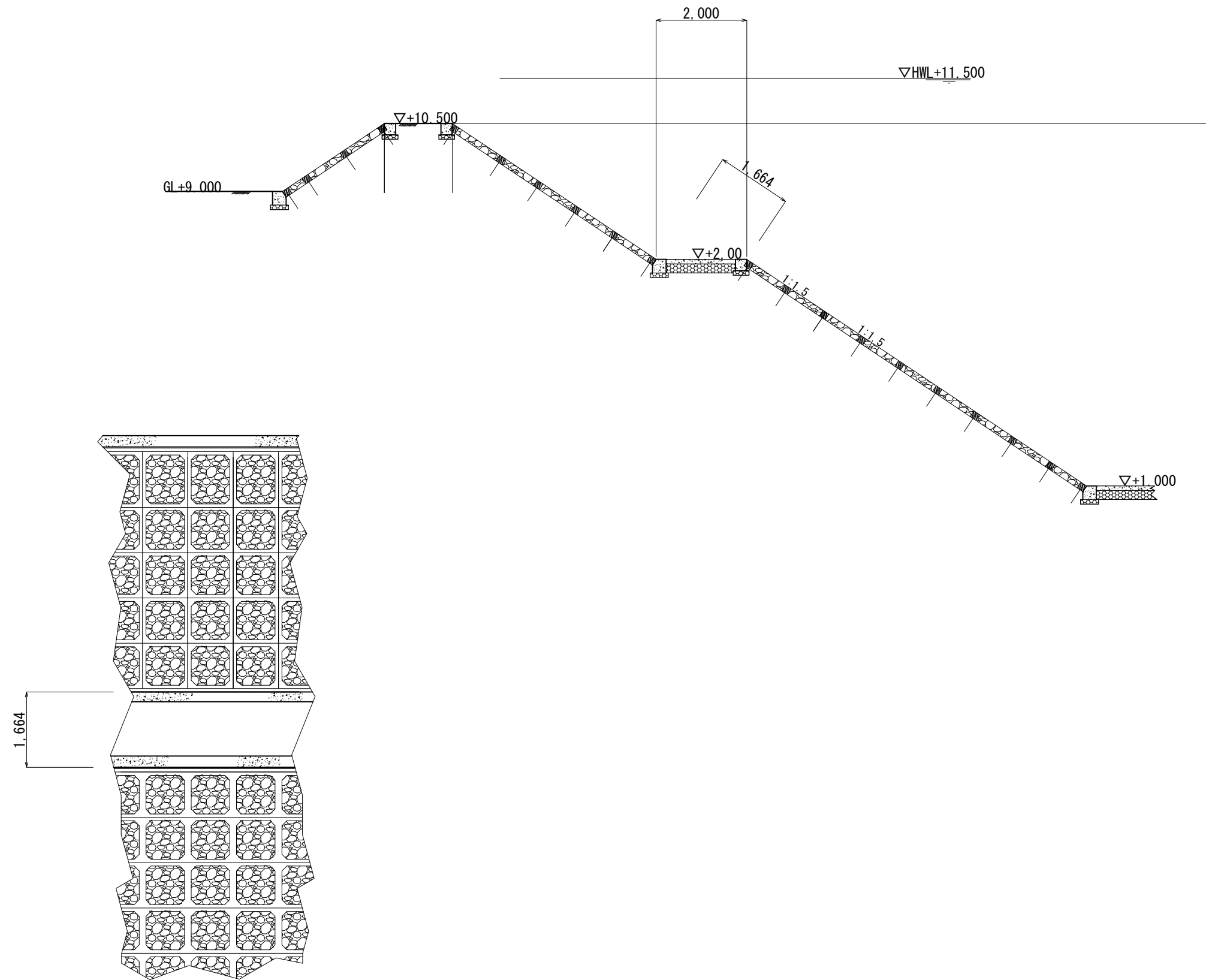


Cross Section D-D



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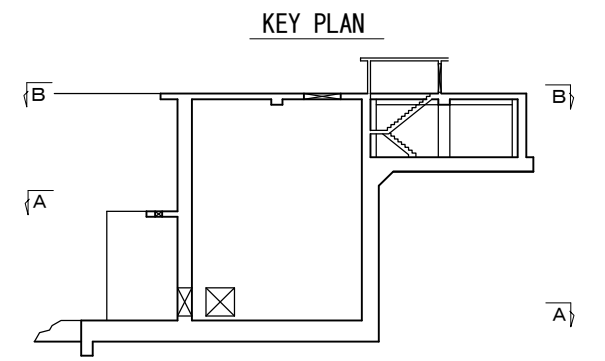
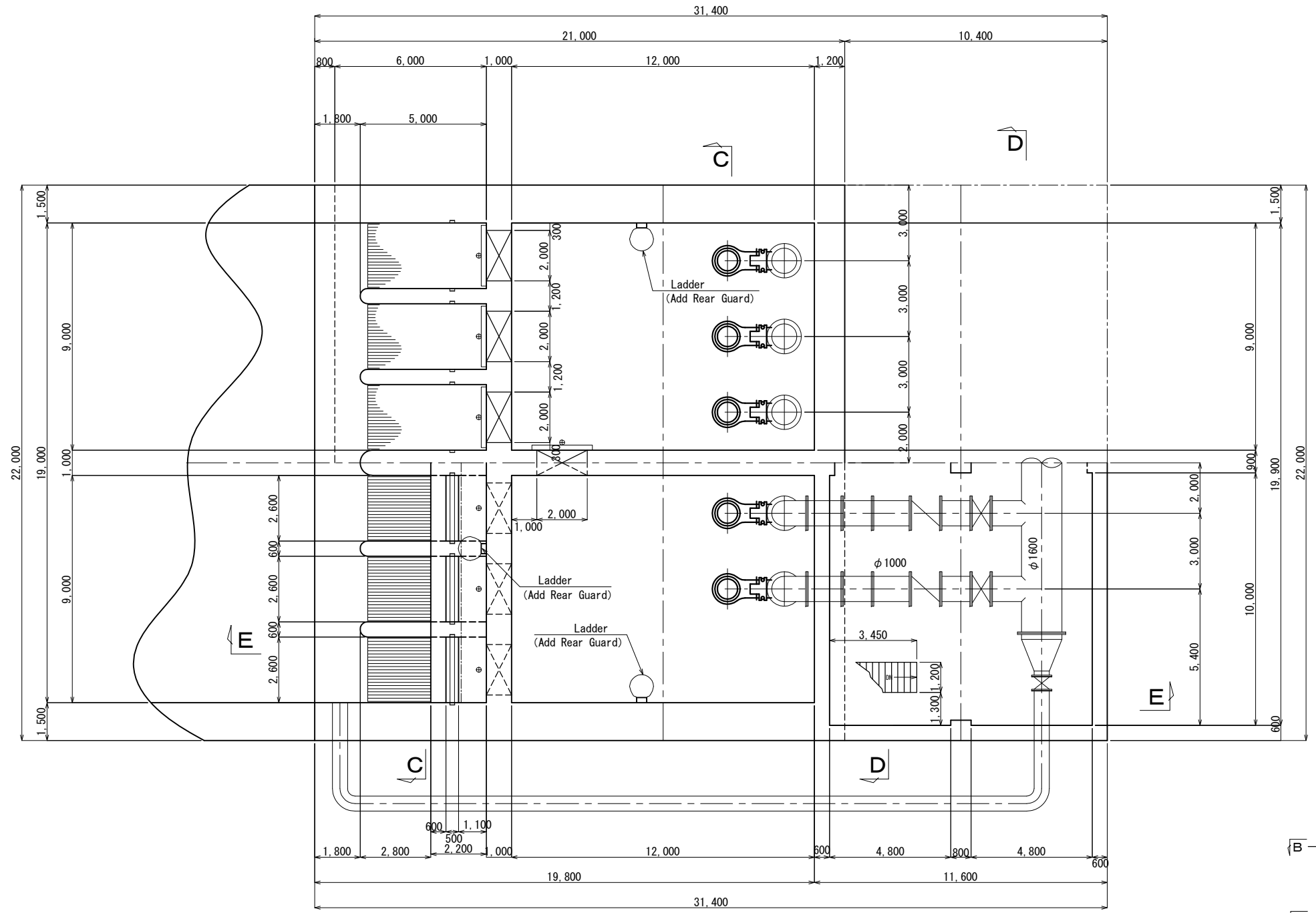
Water Intake Facility Standard Cross Section s=1:50



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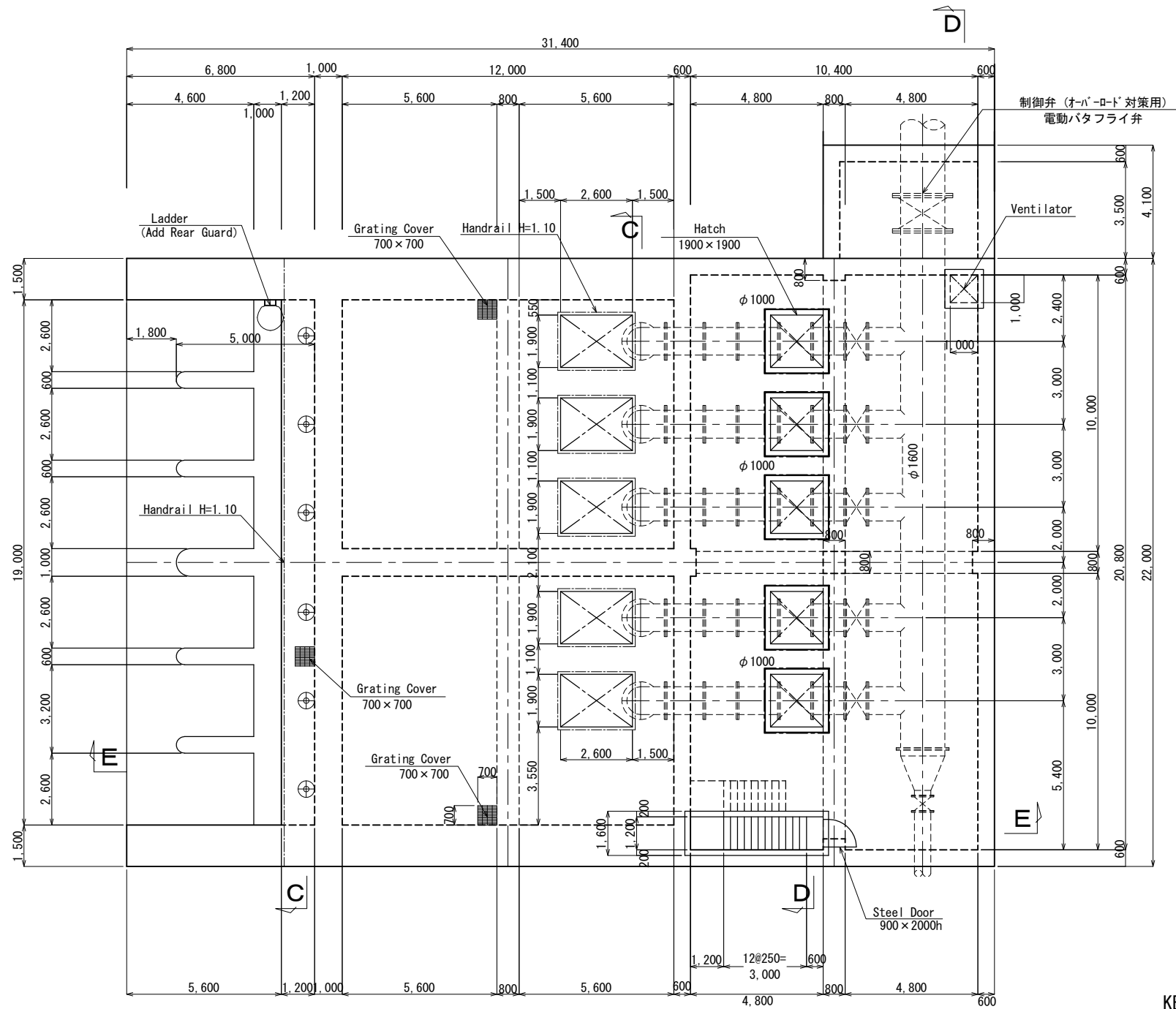
Water Intake Facility (Pumping Station) 1/3

Cross Section A-A

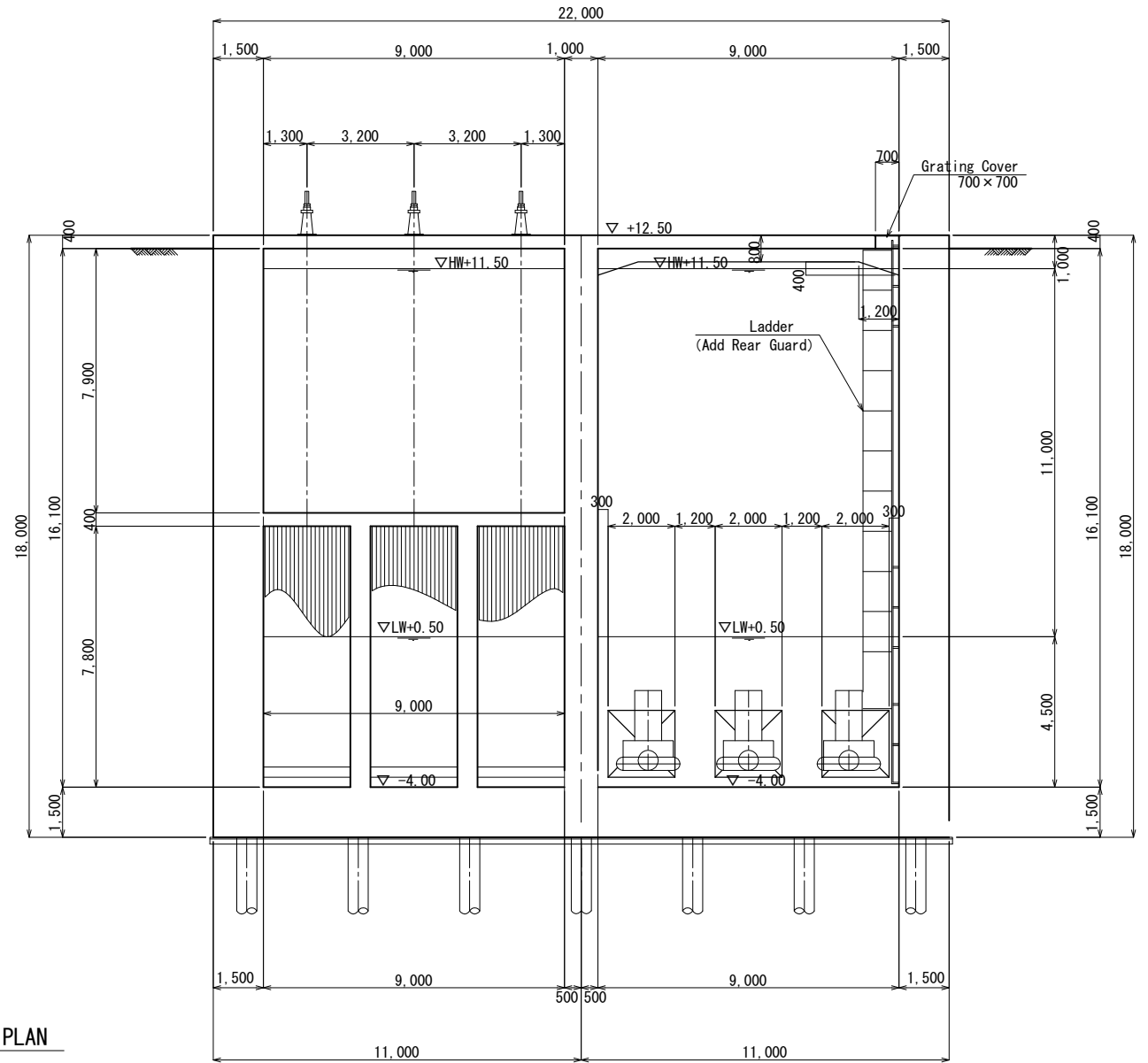


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	No.		NOV. 2011	Water Intake Facility (Pumping Station) 1/3	8
			Scale		
			1/100		

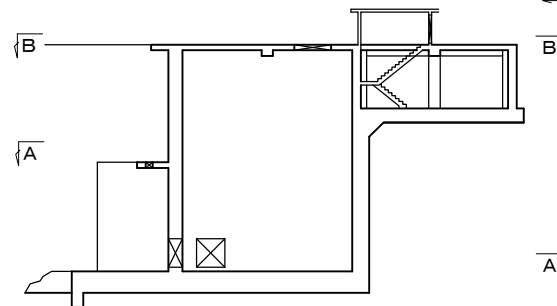
Cross Section B-B



Cross Section C-C

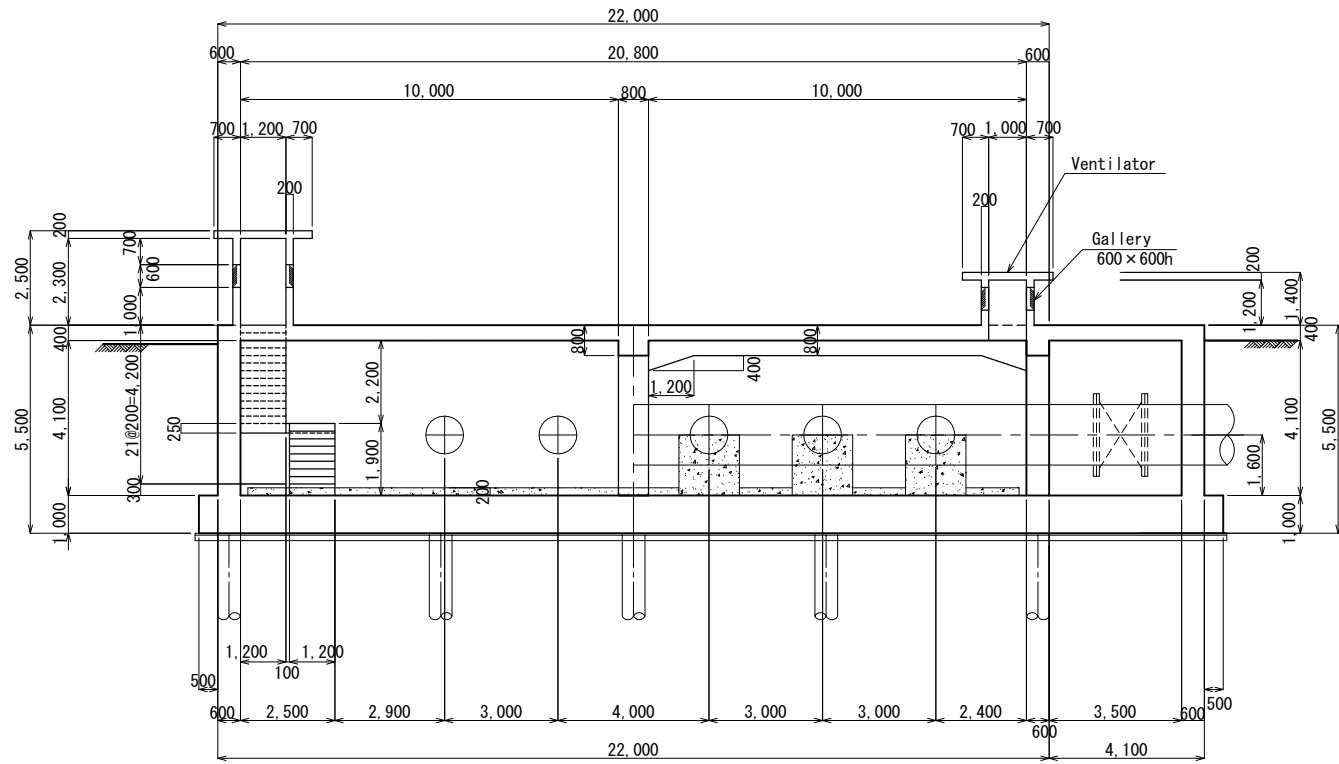


KEY PLAN

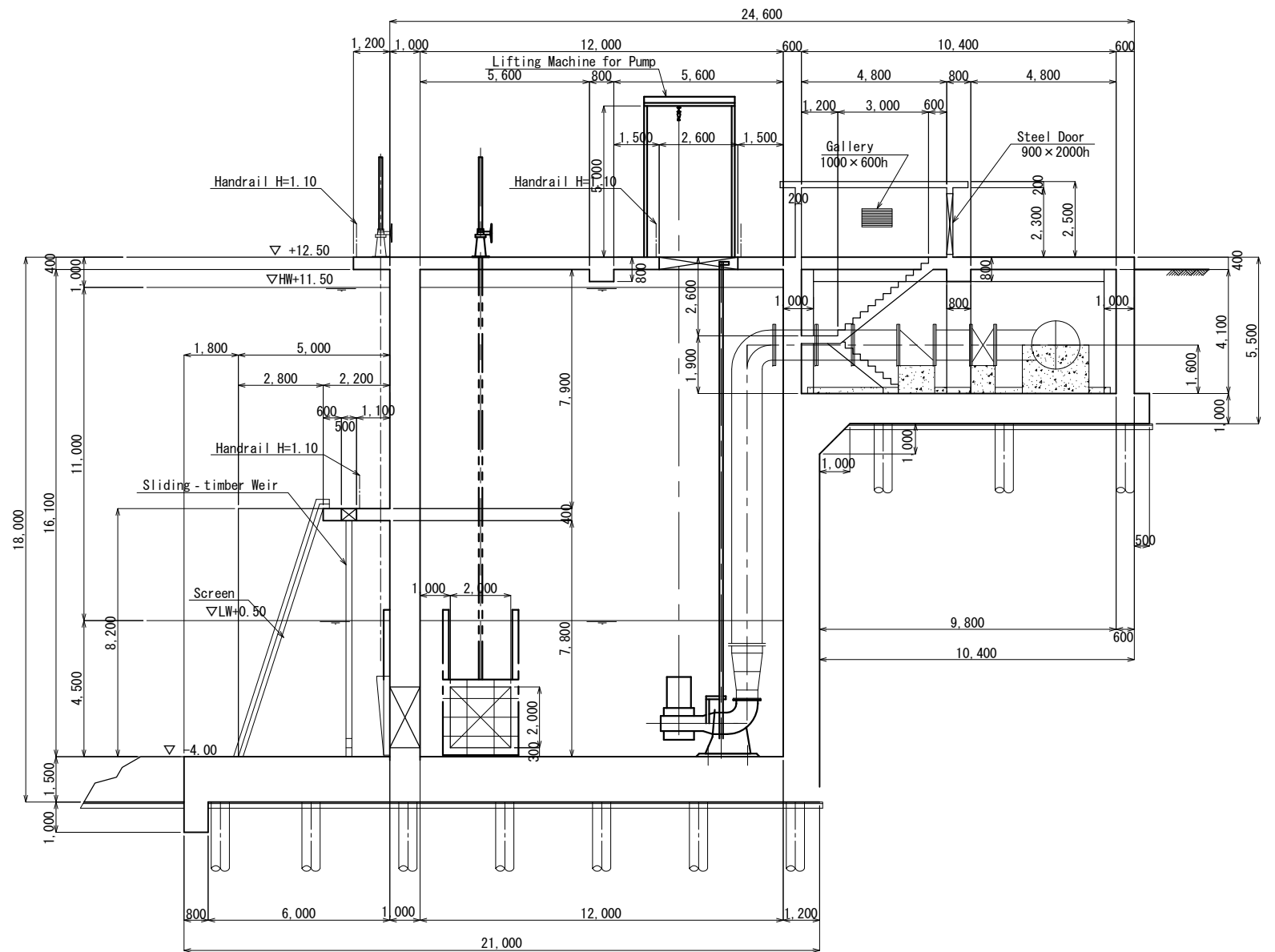


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Cross Section D-D

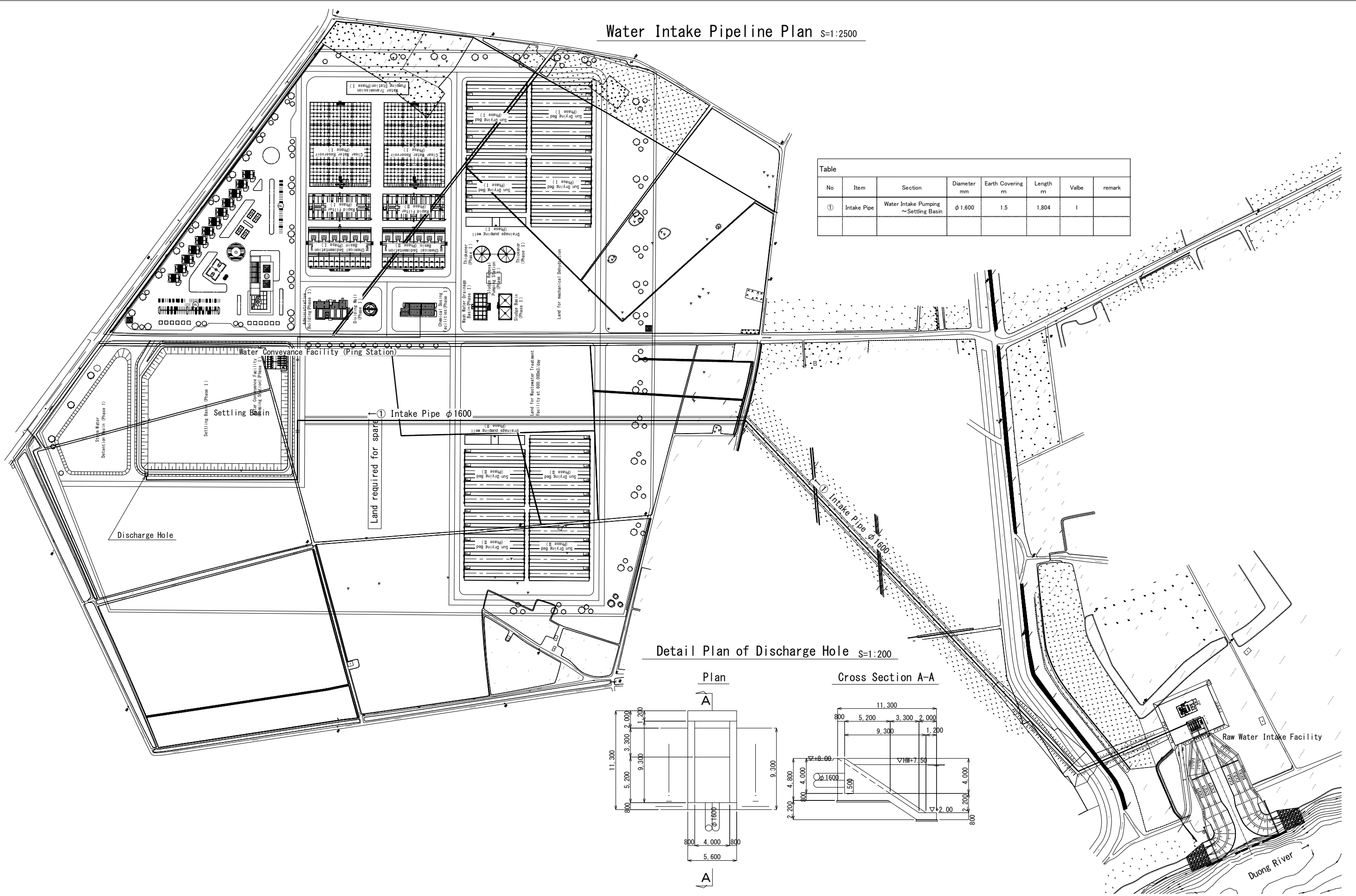


Cross Section E-E



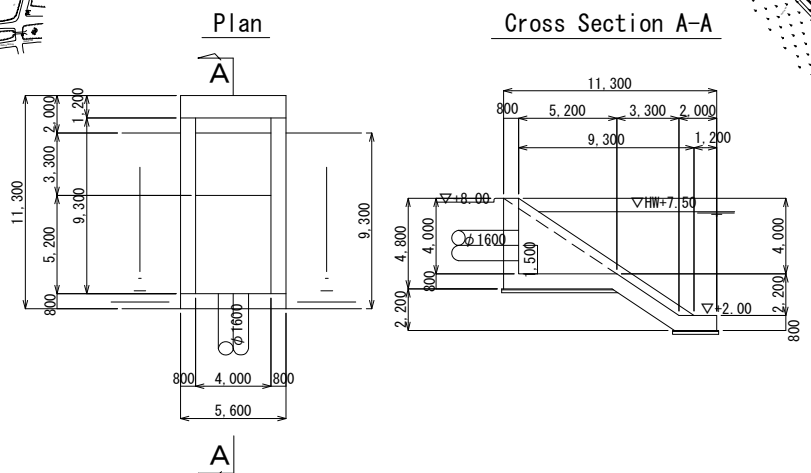
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Water Intake Pipeline Plan S=1:2500



No	Item	Section	Diameter mm	Earth Covering m	Length m	Valve	remark
①	Intake Pipe	Water Intake Pumping ~ Settling Basin	φ 1,600	1.5	1,804	1	

Detail Plan of Discharge Hole S=1:200



JICA Study Team	No.		

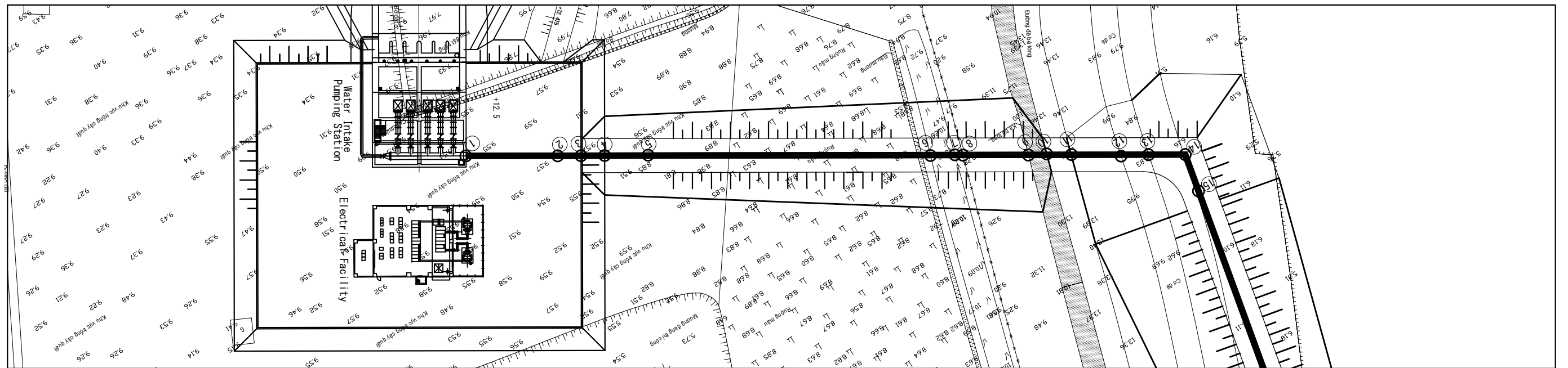
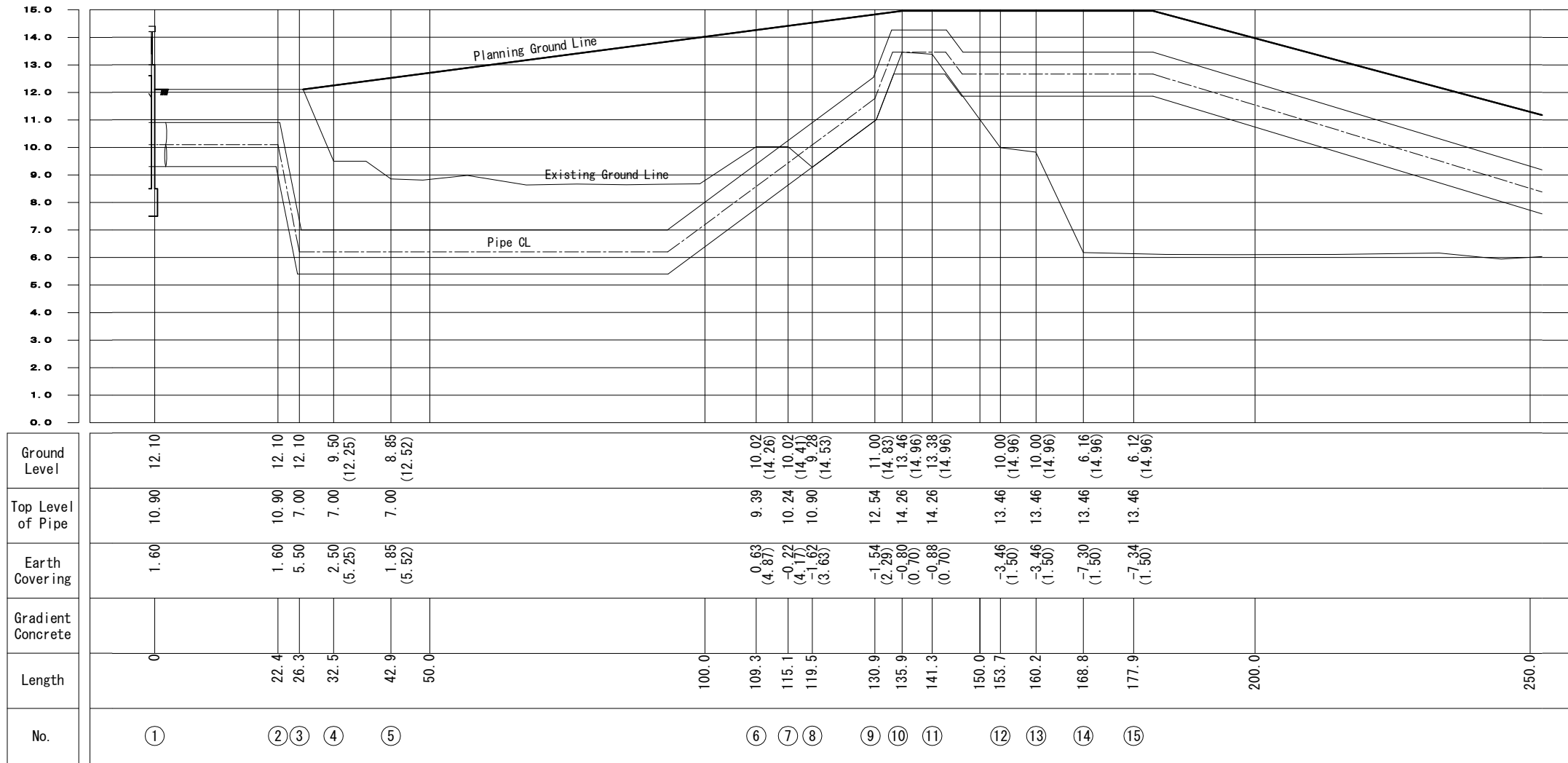
THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT
IN THE SOCIALIST REPUBLIC OF VIET NAM

Date:
NOV. 2011
Scale
1/2500

Duong River Water Treatment Plant
Water Intake Pipeline Plan

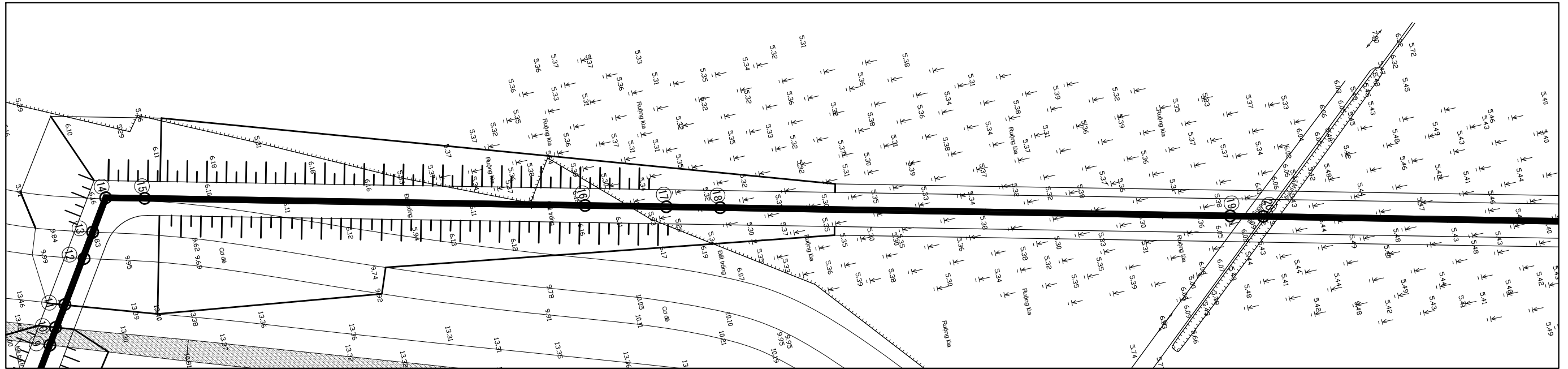
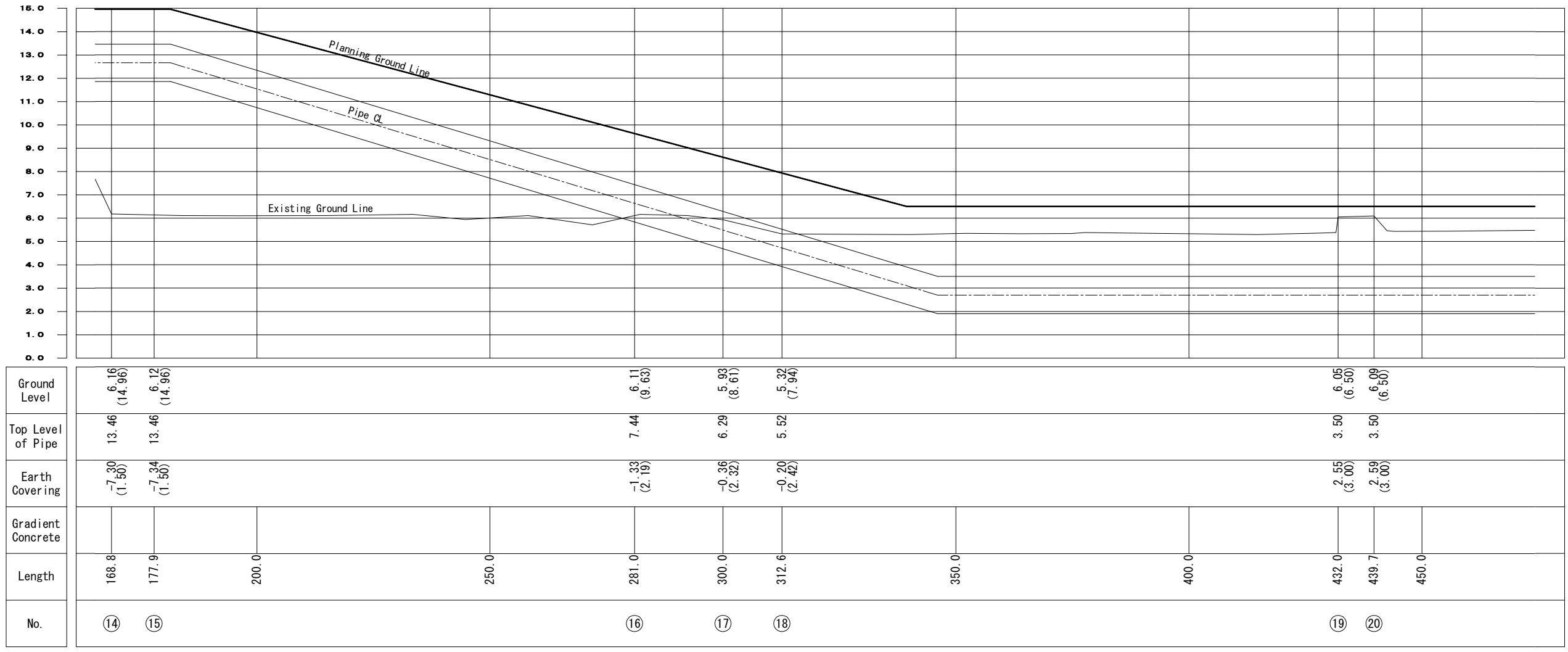
Drawing No
11

Intake Pipe Plan (1/6)



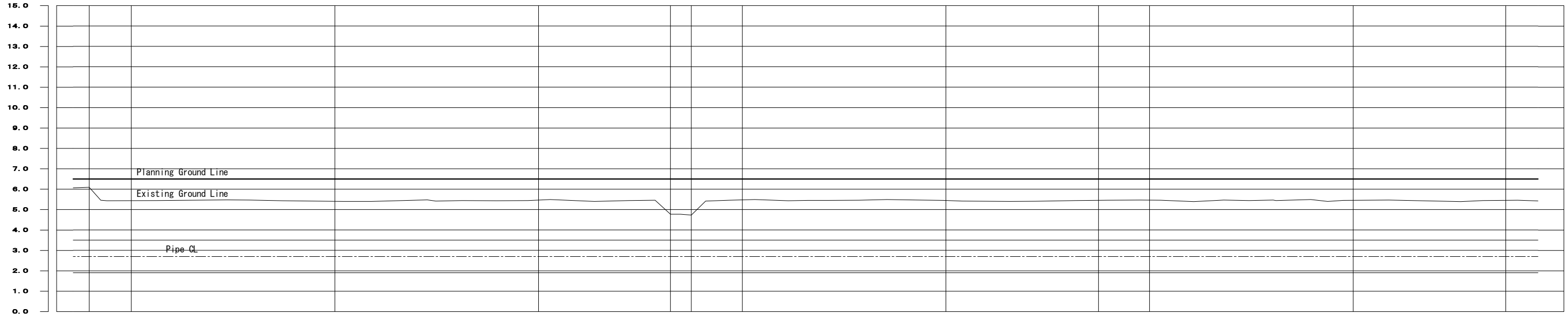
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Intake Pipe Plan (2/6)

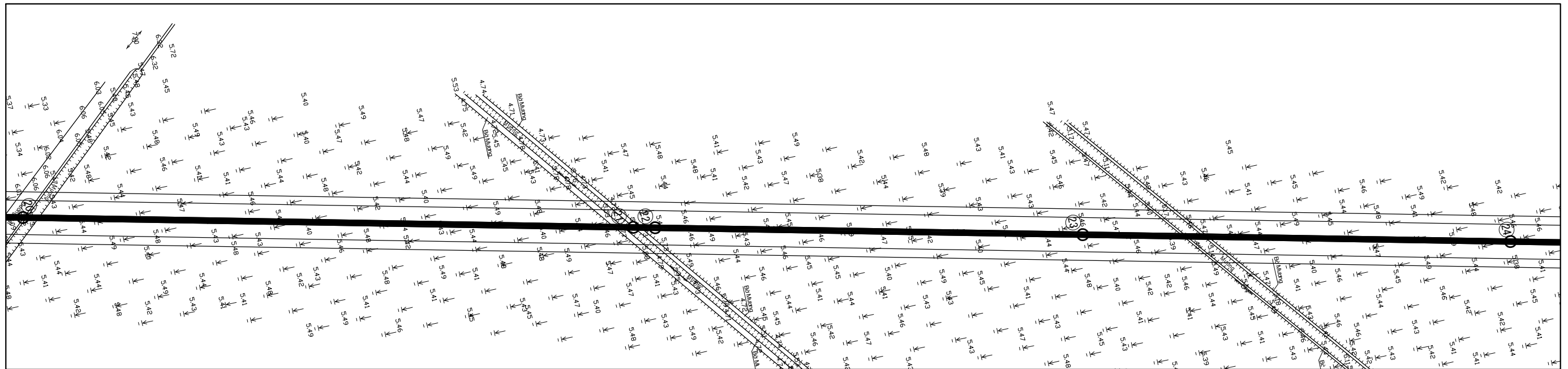


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Intake Pipe Plan (3/6)



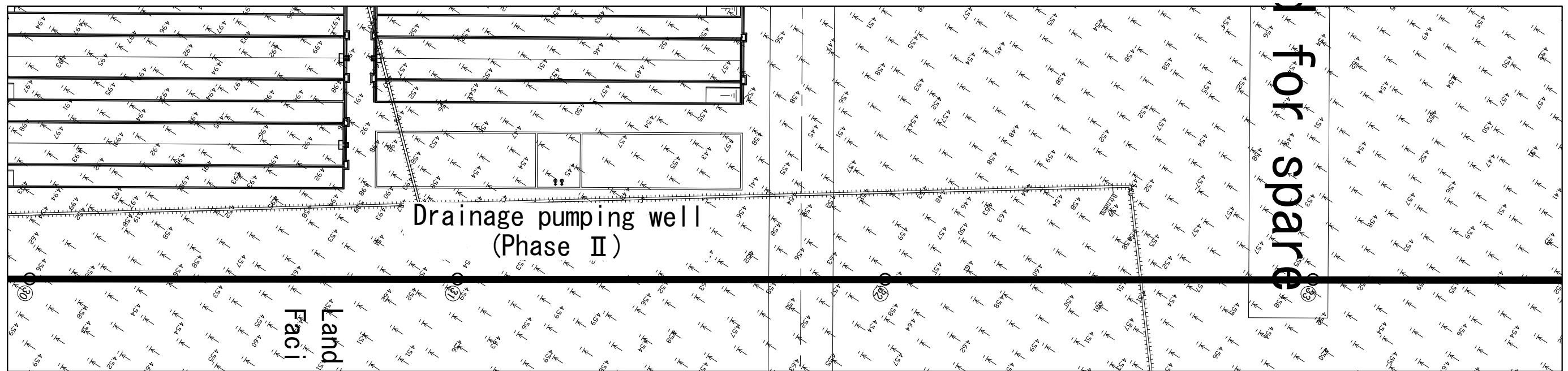
No.	Length	Gradient Concrete	Earth Covering	Top Level of Pipe	Ground Level
20	439.7		2.59 (3.00)	3.50	6.09 (6.50)
	450.0				
21	582.4		1.27 (3.00)	3.50	4.77 (6.50)
	587.5		1.23 (3.00)	3.50	4.73 (6.50)
22	600.0				
	650.0				
23	687.5		1.95 (3.00)	3.50	5.45 (6.50)
	700.0				
24	787.5		1.95 (3.00)	3.50	5.45 (6.50)



No.			
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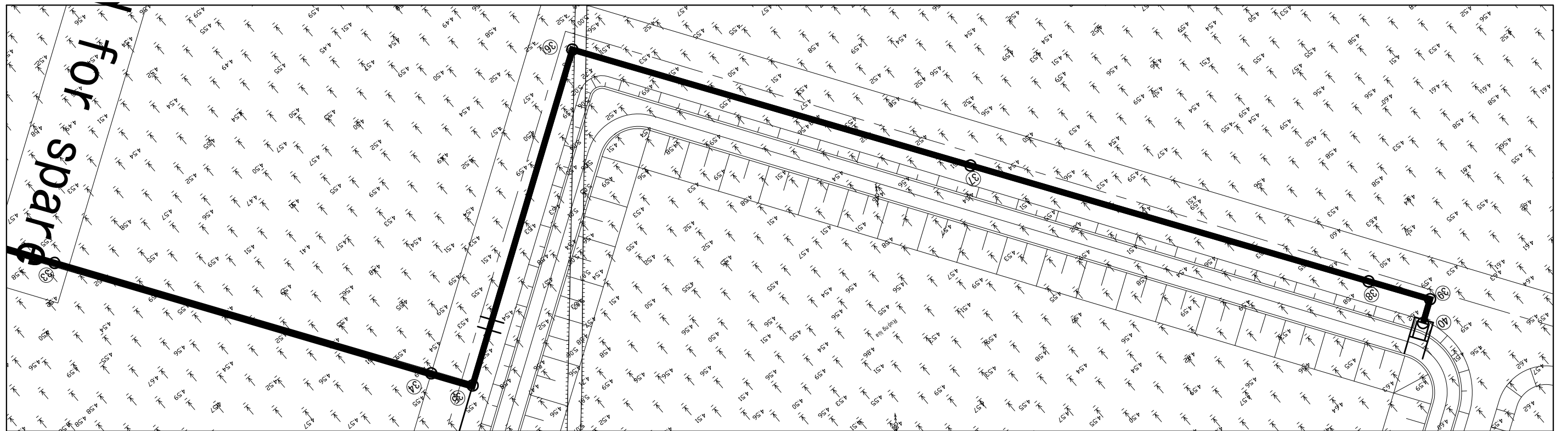
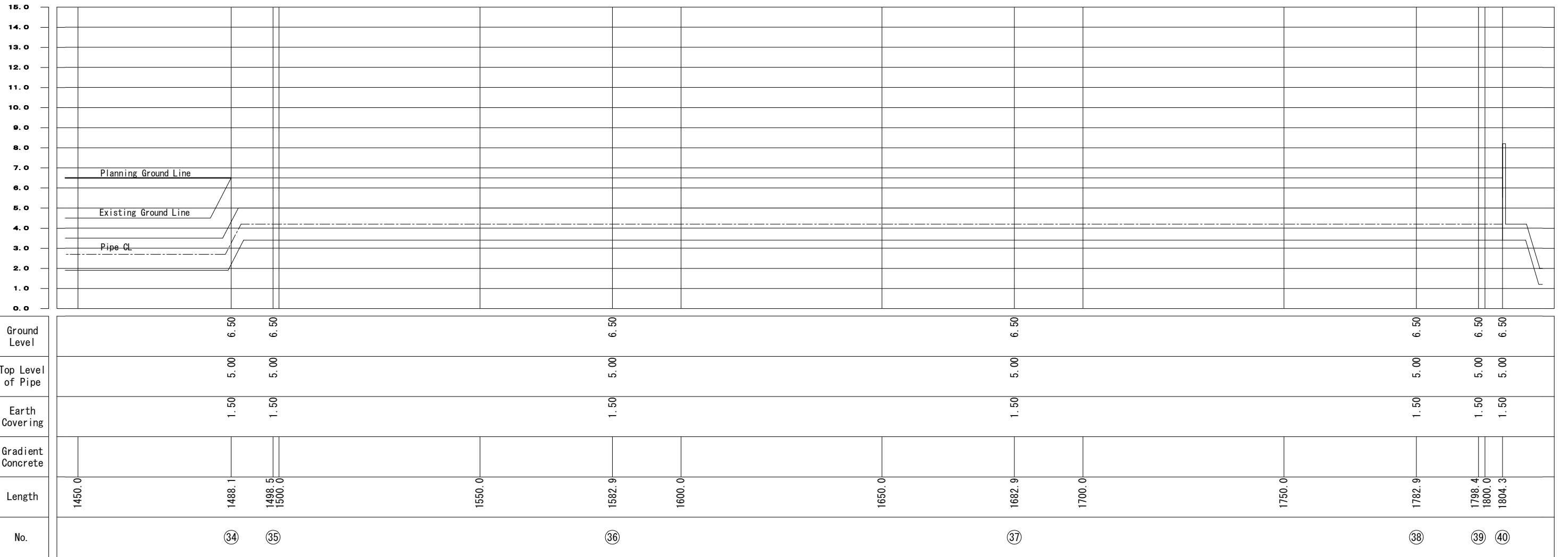
Intake Pipe Plan (5/6)

15.0																
14.0																
13.0																
12.0																
11.0																
10.0																
9.0																
8.0																
7.0	Planning Ground Line															
6.0																
5.0	Existing Ground Line															
4.0																
3.0	Pipe CL															
2.0																
1.0																
0.0																
Ground Level	4.50 (6.50)				4.50 (6.50)				4.50 (6.50)		4.50 (6.50)					
Top Level of Pipe	3.50				3.50				3.50		3.50					
Earth Covering	1.00 (3.00)				1.00 (3.00)				1.00 (3.00)		1.00 (3.00)					
Gradient Concrete																
Length	1093.5	1100.0	1150.0		1193.5	1200.0	1250.0		1293.5	1300.0	1350.0		1393.5	1400.0	1450.0	
No.	③①				③②				③③				③④			

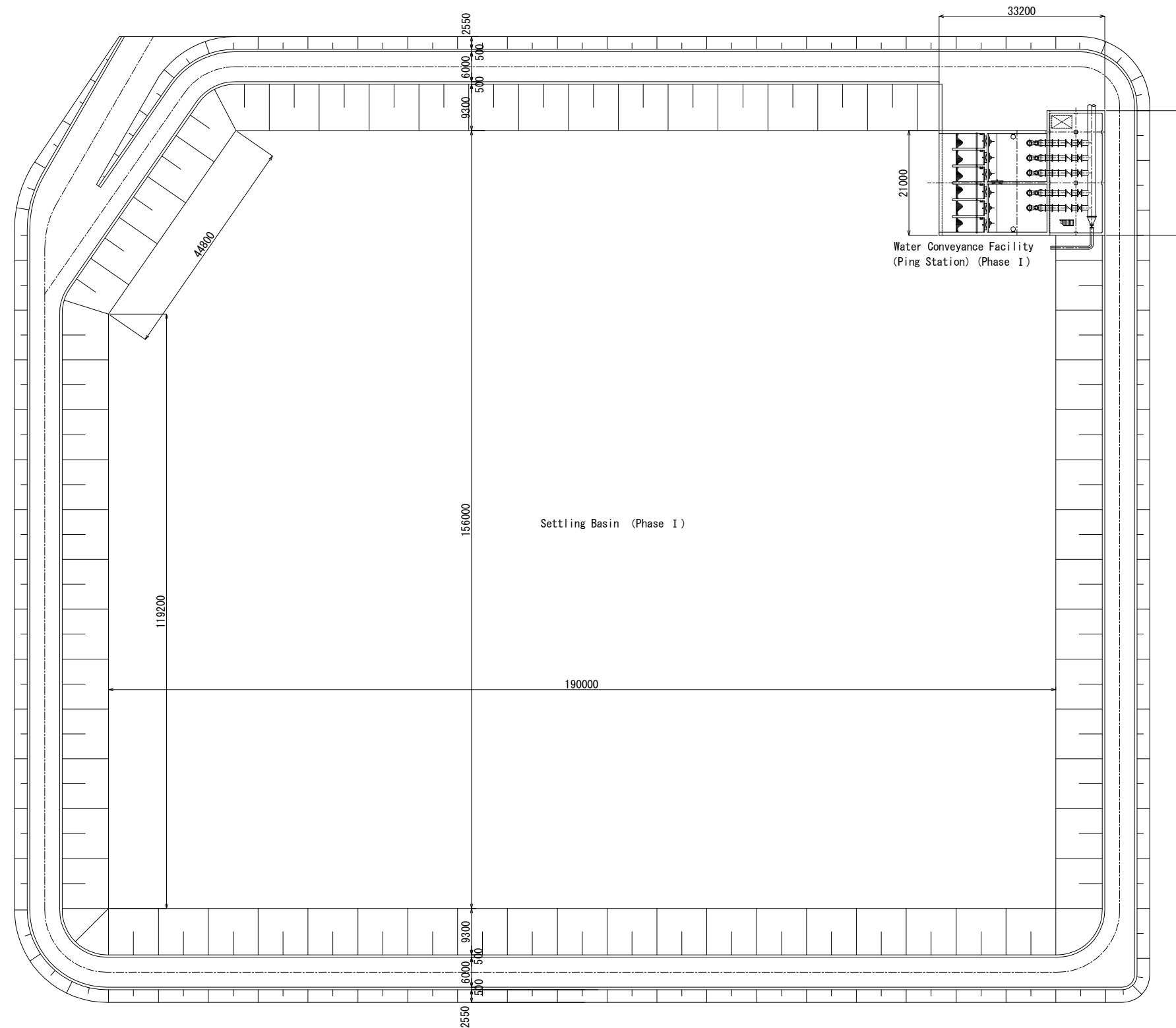


JICA Study Team				THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT IN THE SOCIALIST REPUBLIC OF VIET NAM	Date. NOV. 2011	Duong River Water Treatment Plant	Drawing No
	No.				Scale 1/500	Intake Pipe Plan (5/6)	16

Intake Pipe Plan (6/6)

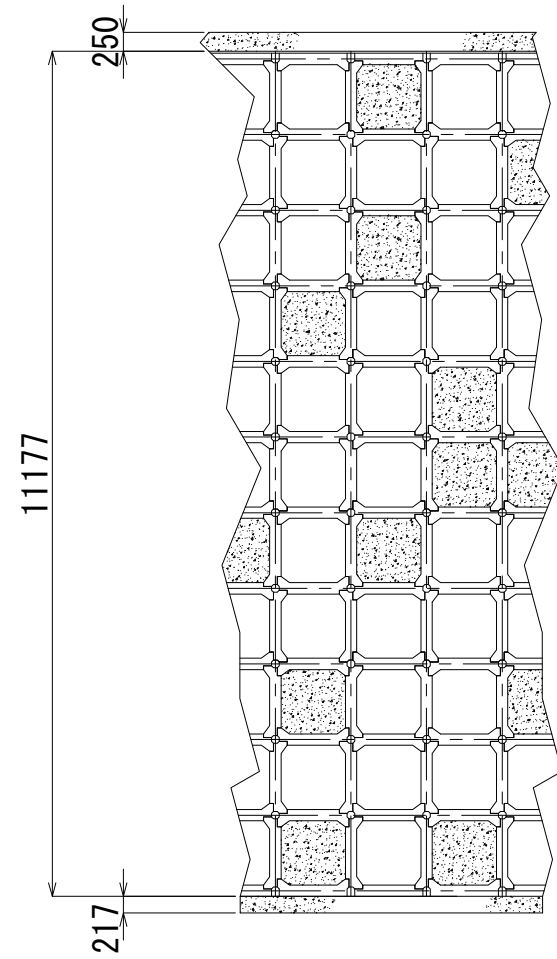
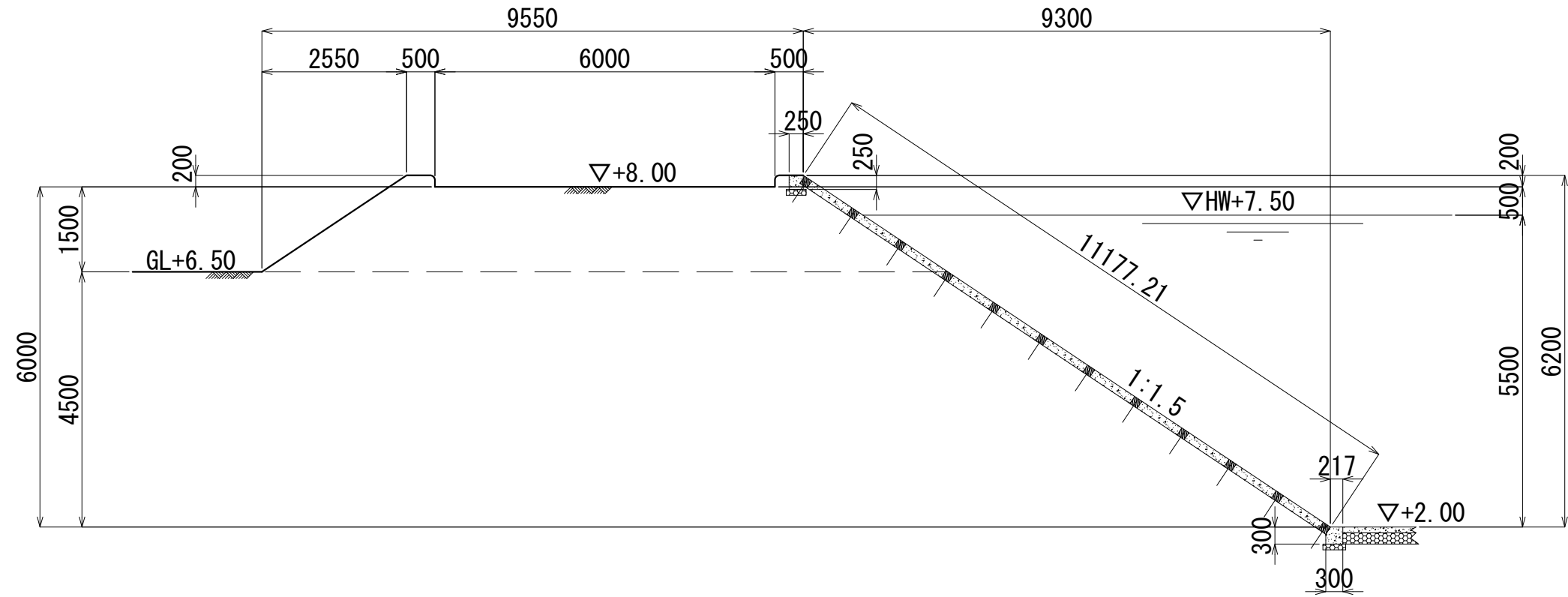


Settling Basin Plan s=1/500



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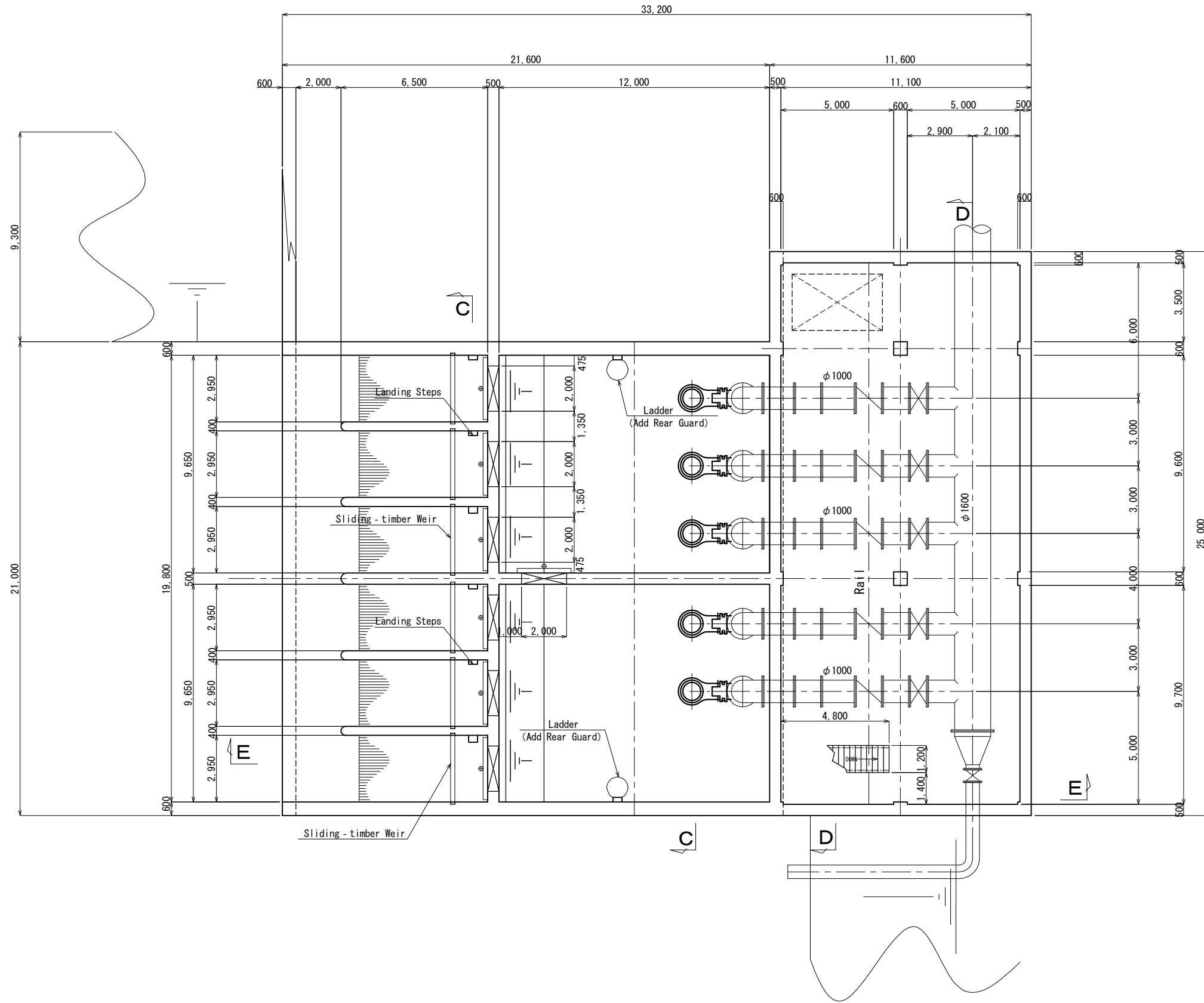
Settling Basin Cross Section $s=1/50$



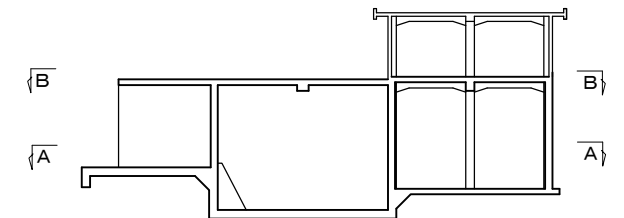
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Water Conveyance Facility (Pumping Station) 1/4

Cross Section A-A



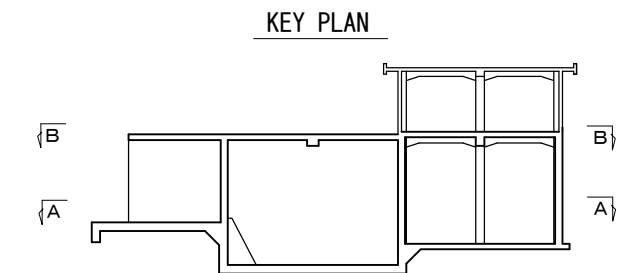
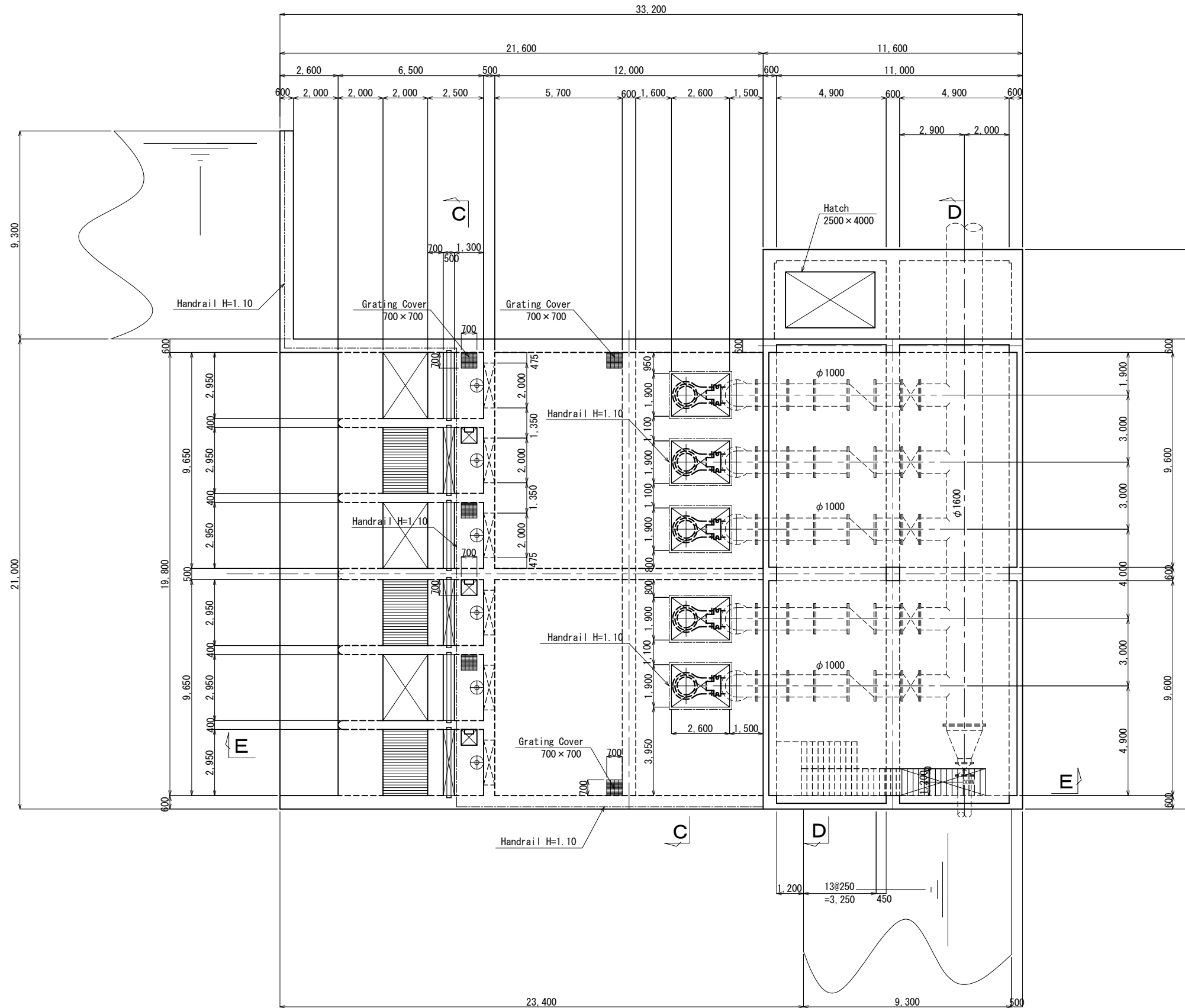
KEY PLAN



No.			
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Water Conveyance Facility (Pumping Station) 2/4

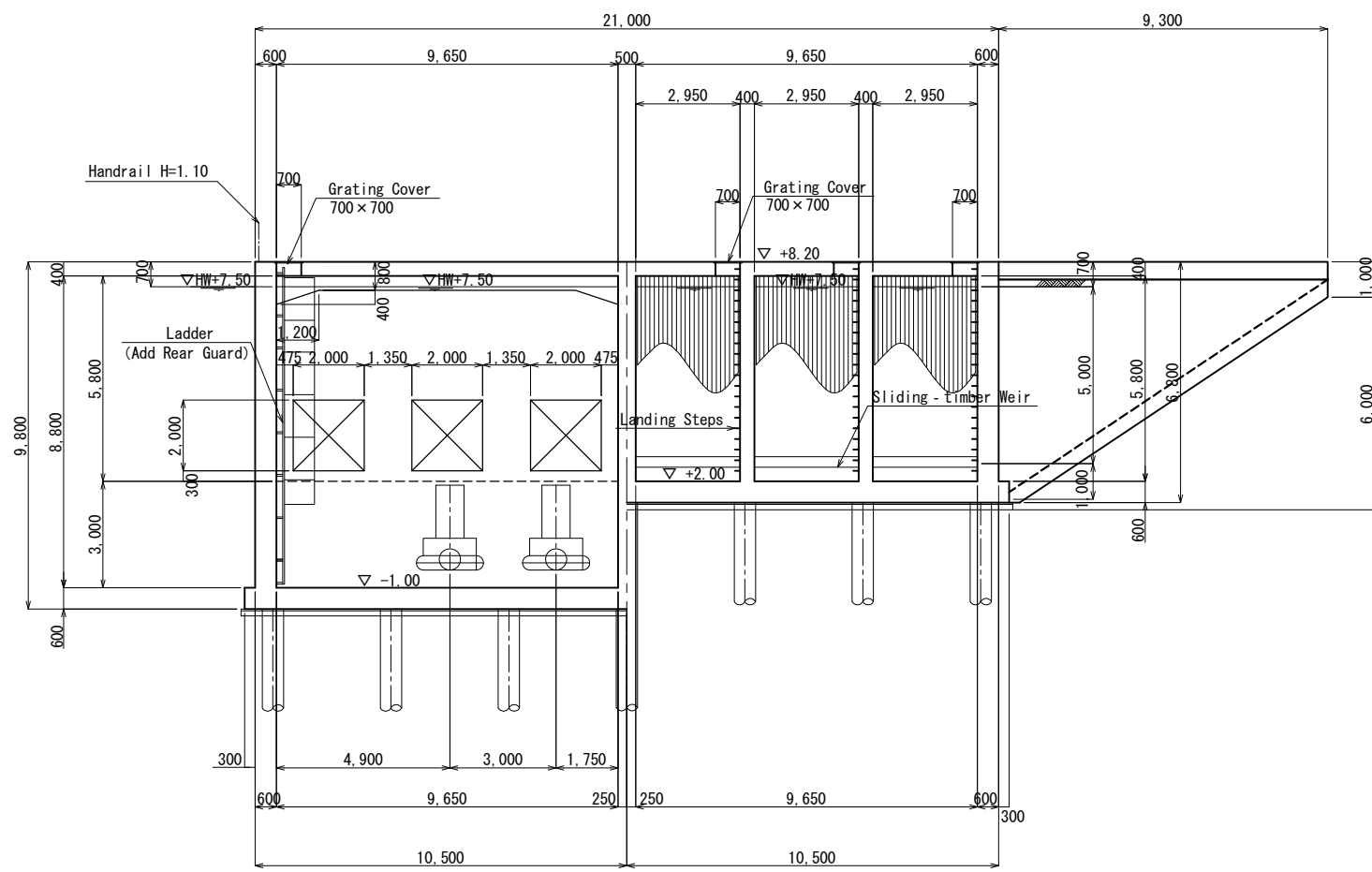
Cross Section B-B



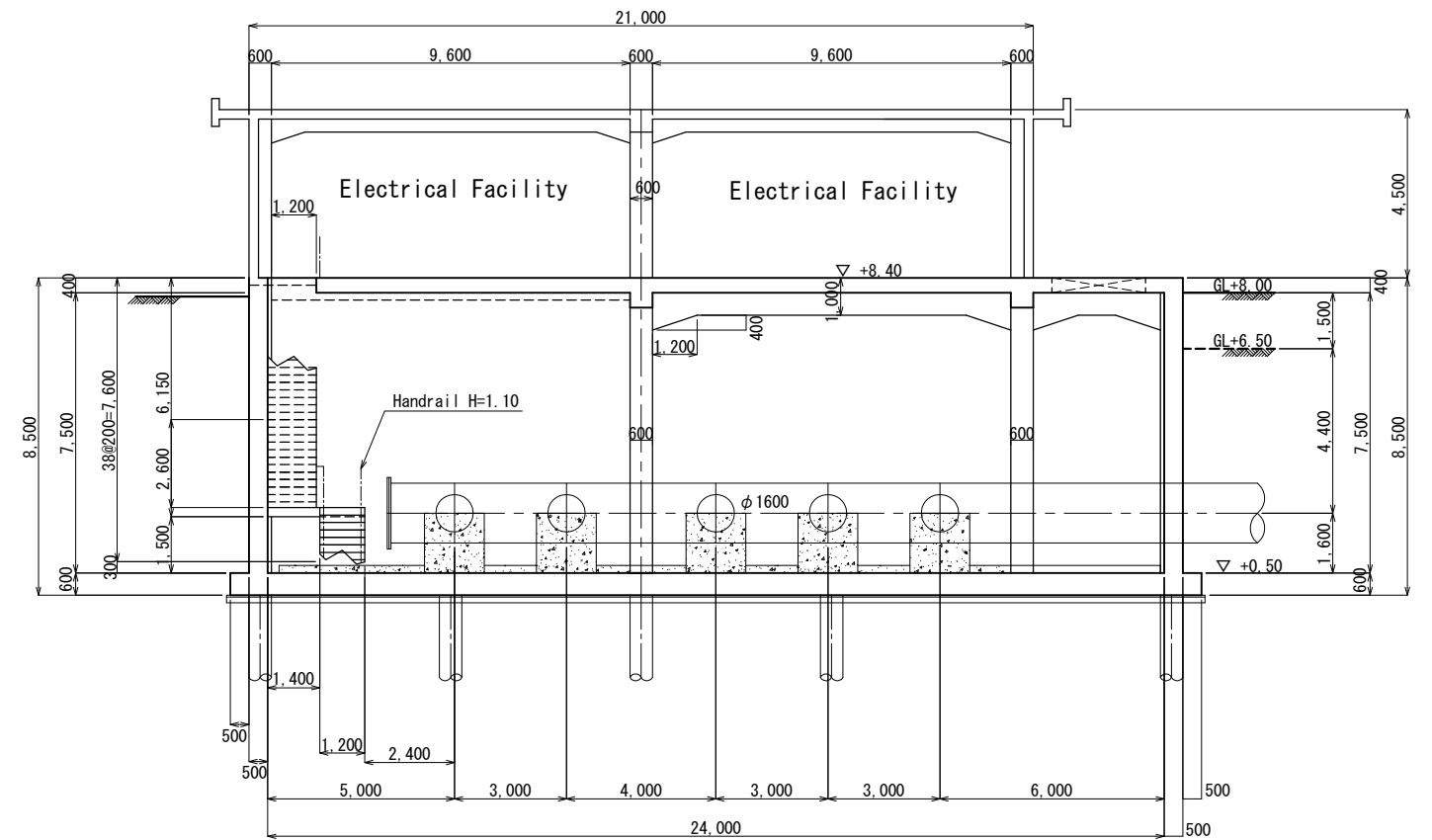
JICA Study Team				THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT IN THE SOCIALIST REPUBLIC OF VIET NAM	Date. NOV. 2011	Duong River Water Treatment Plant	Drawing No
	No.				Scale 1/100	Water Conveyance Facility(Pumping Station) 2/4	21

Water Conveyance Facility (Pumping Station) 3/4

Cross Section C-C



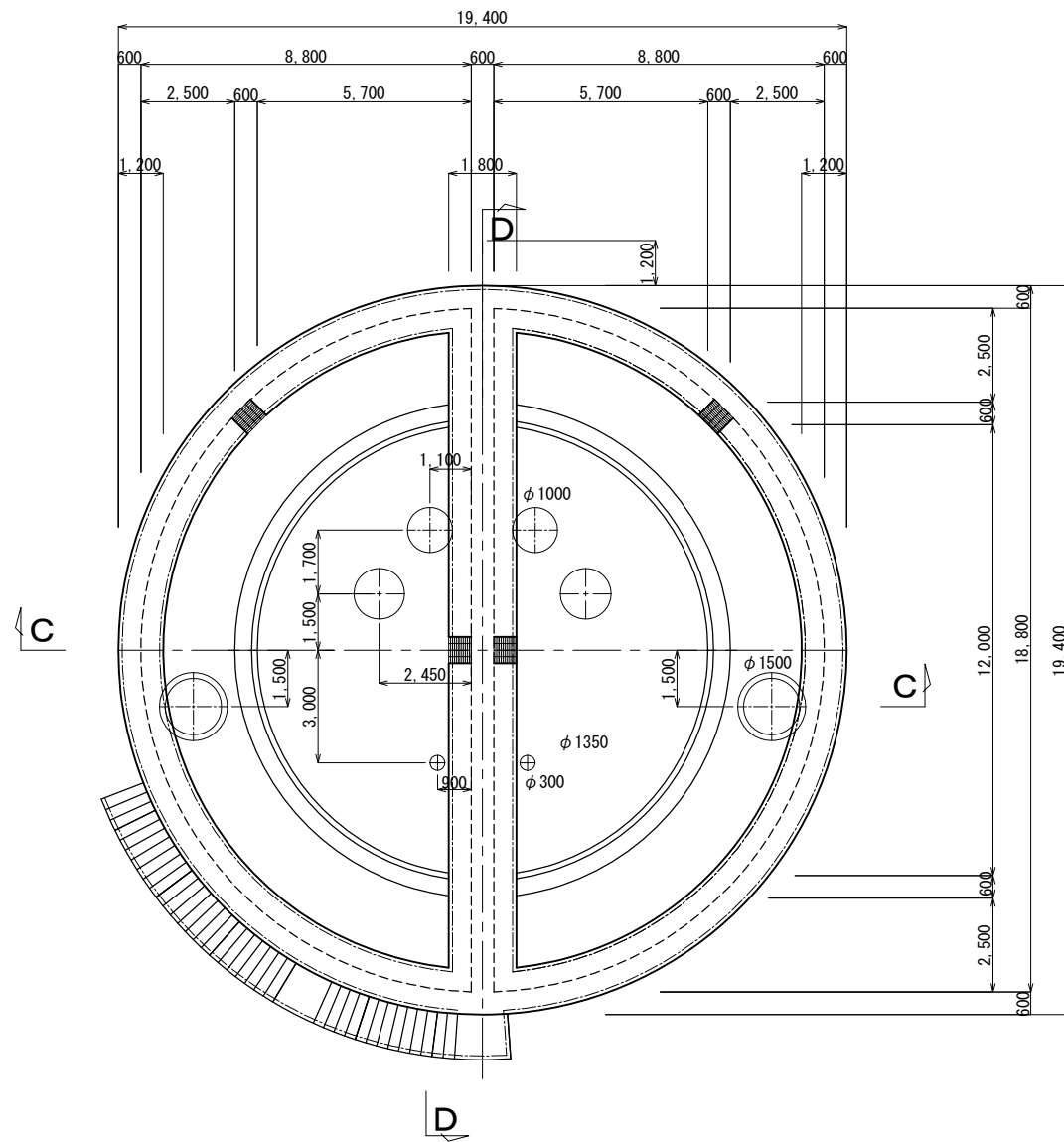
Cross Section D-D



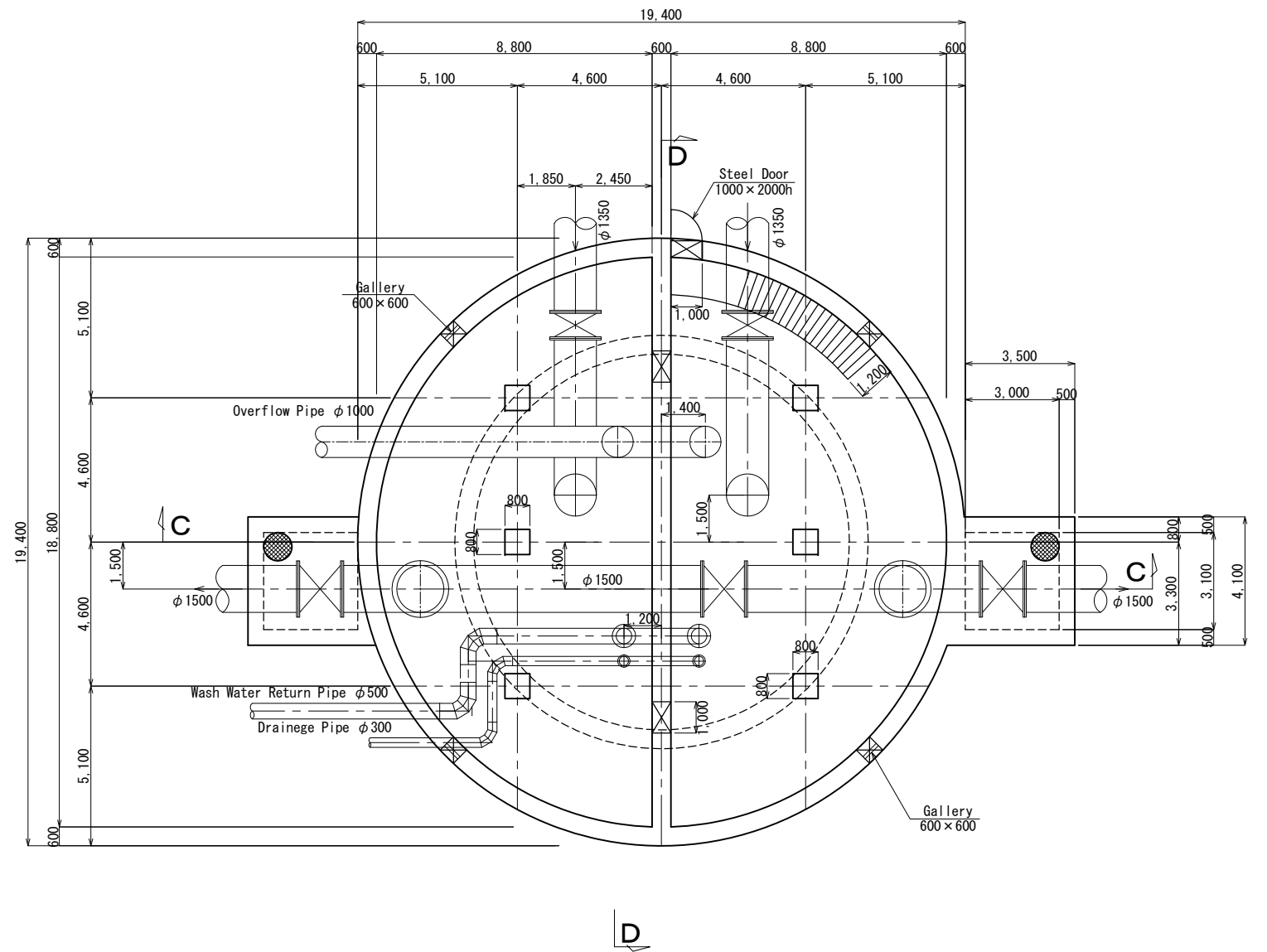
No.			

Dividing Well 1/2

Cross Section A-A



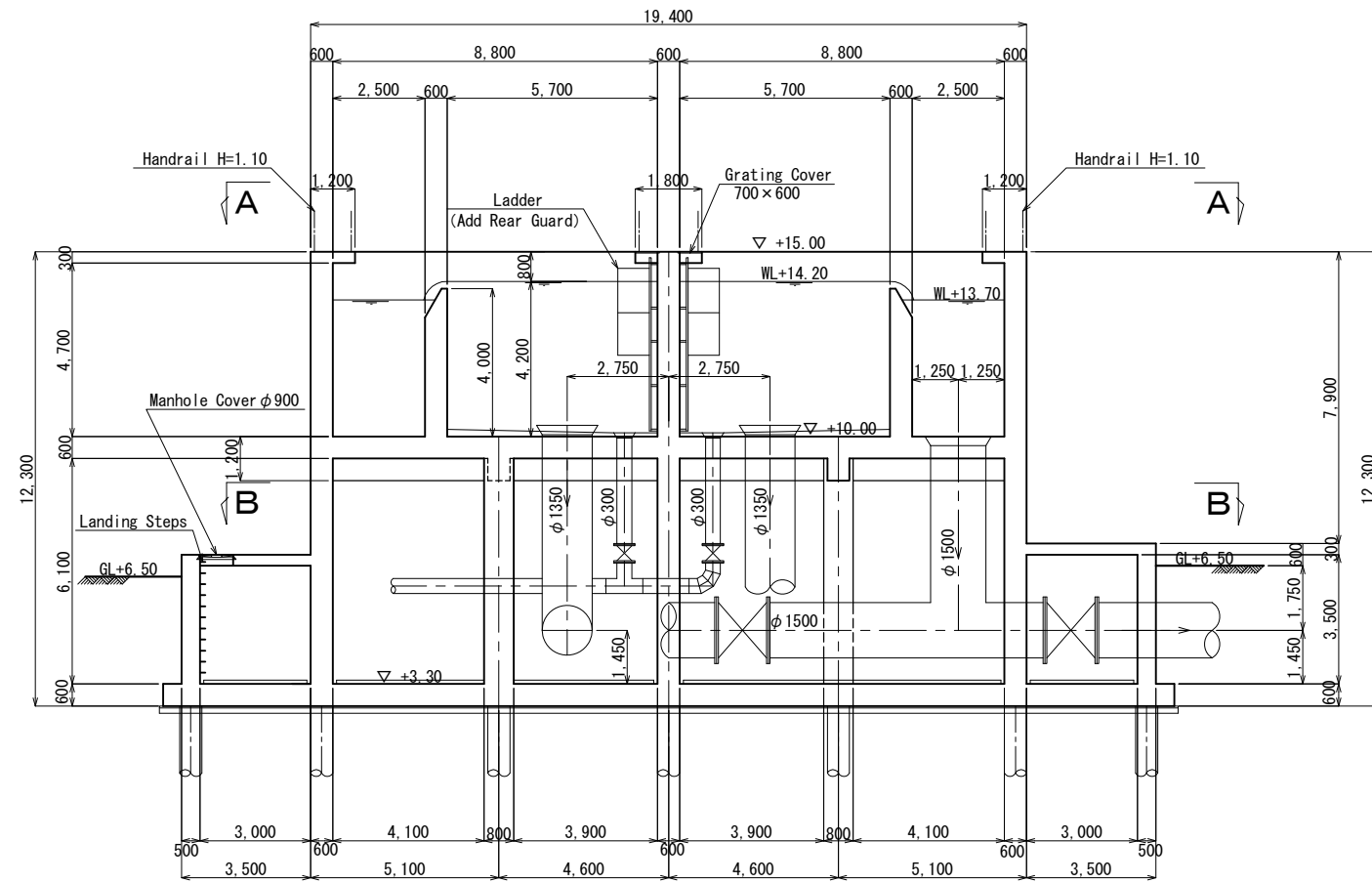
Cross Section B-B



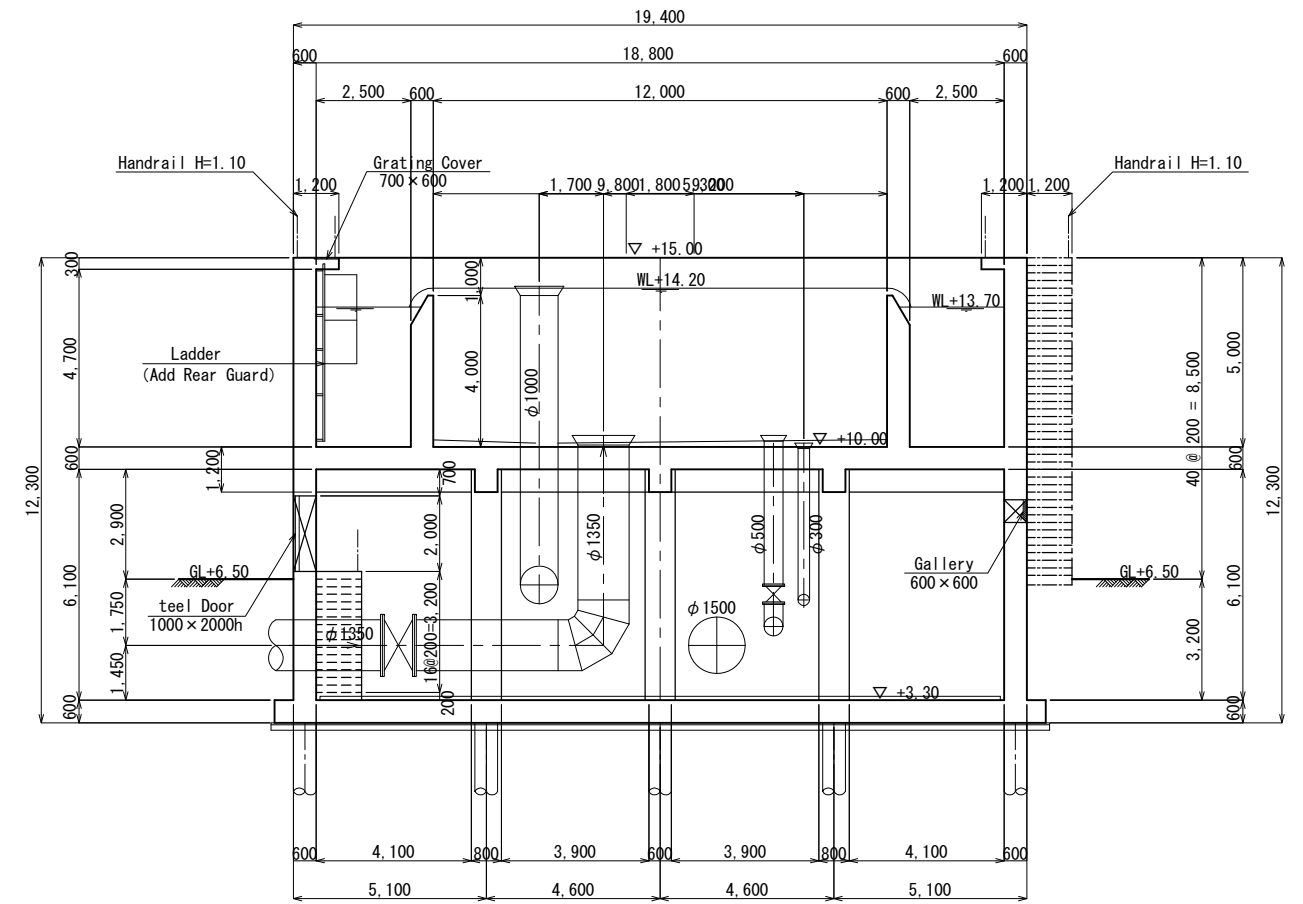
No.			
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Dividing Well 2/2

Cross Section C-C



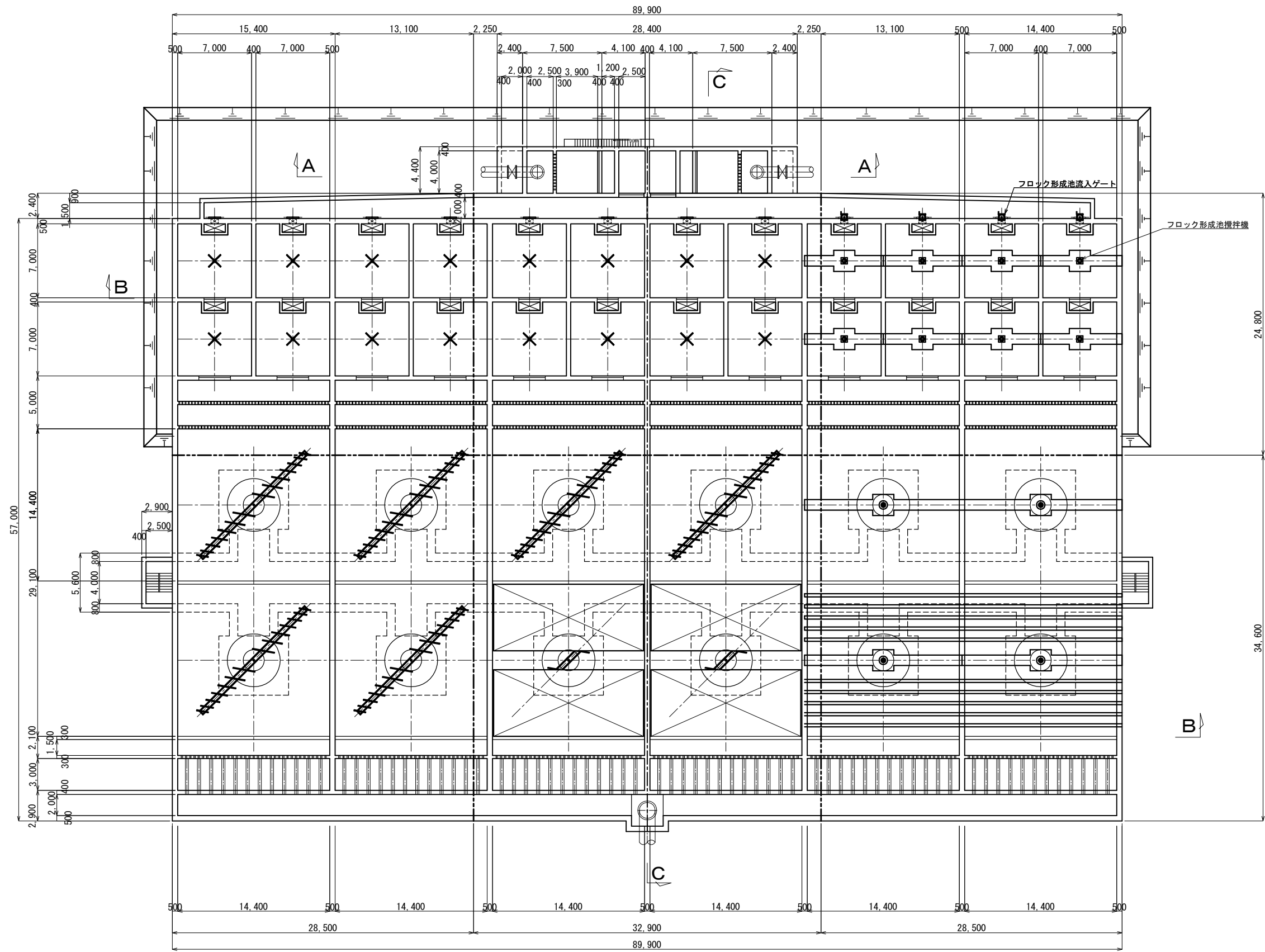
Cross Section D-D



No.			

General Plan(1/2)

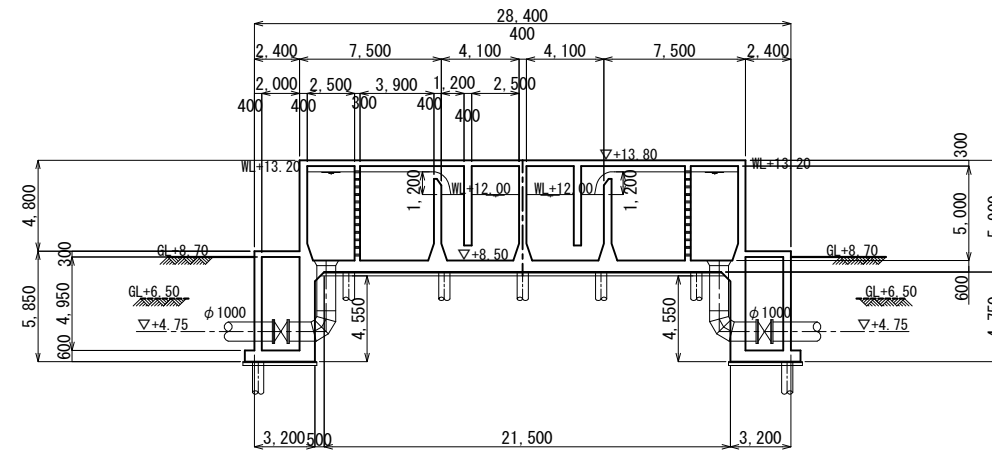
Standard Plan S=1:200



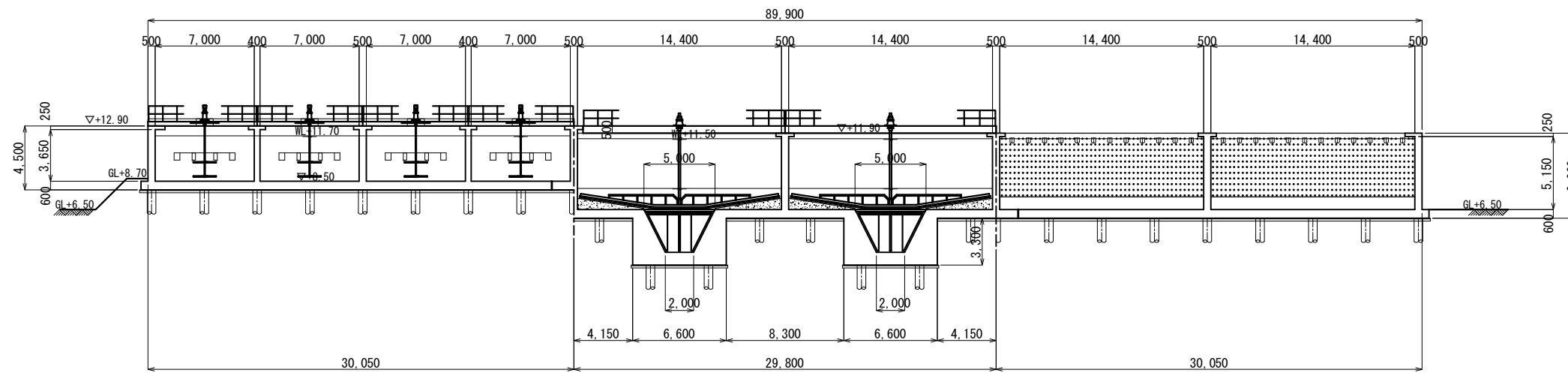
No.			
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General Plan(2/2)

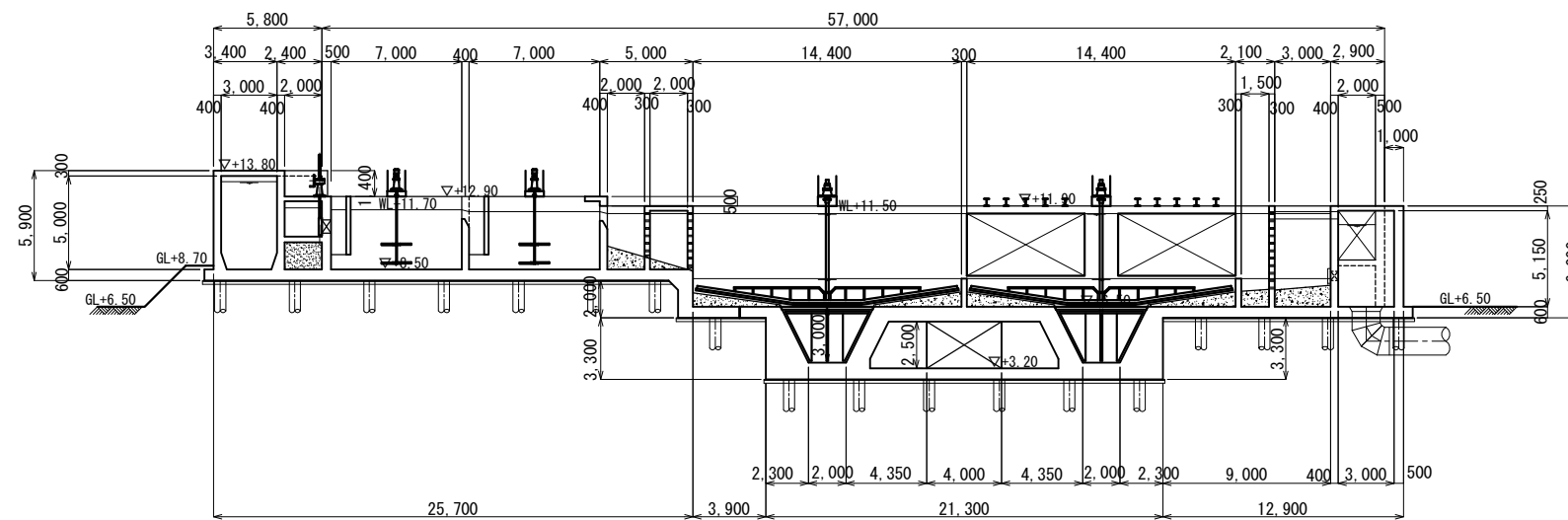
Cross Section A-A s=1:200



Cross Section B-B s=1:200



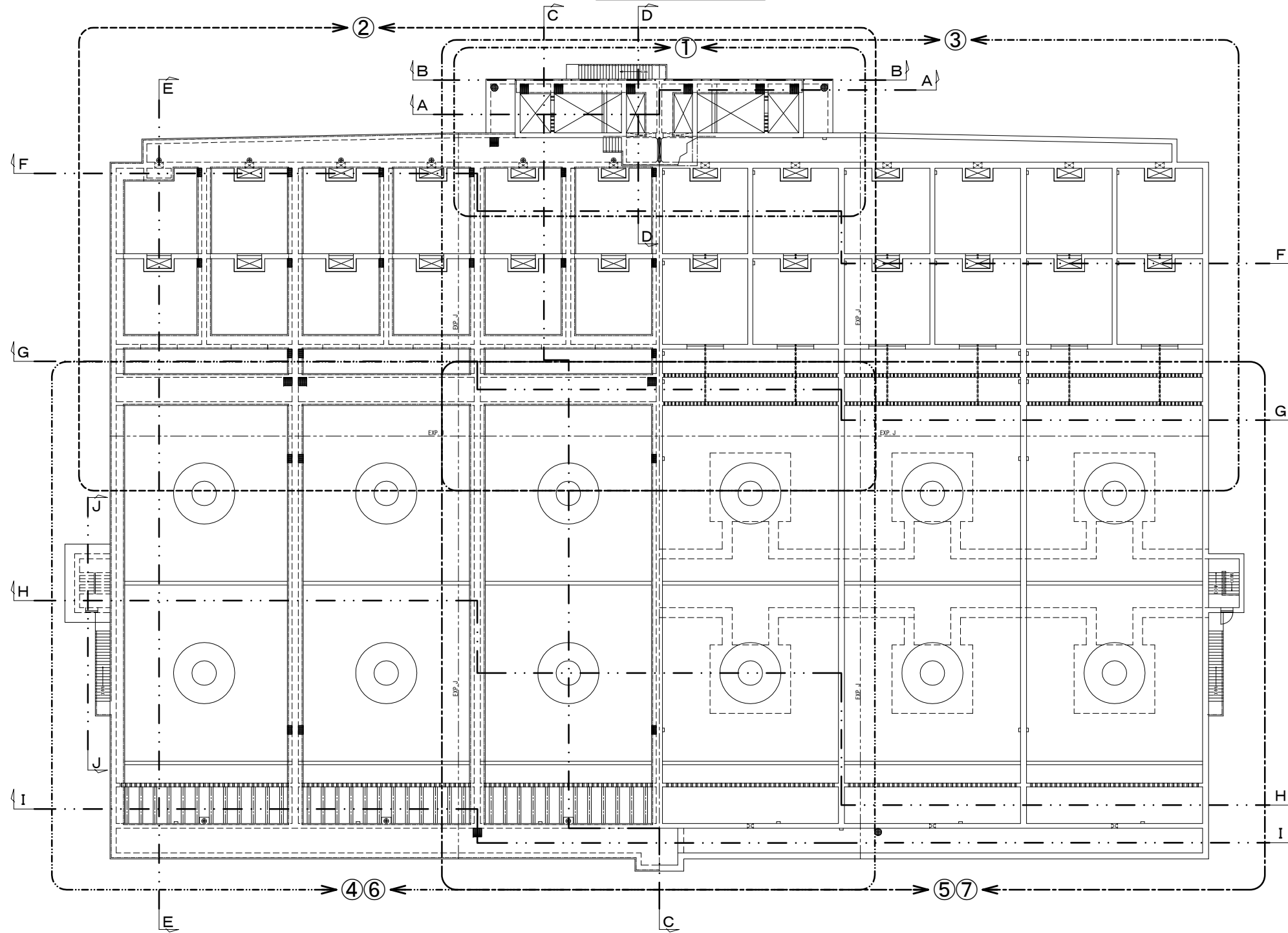
Cross Section C-C s=1:200



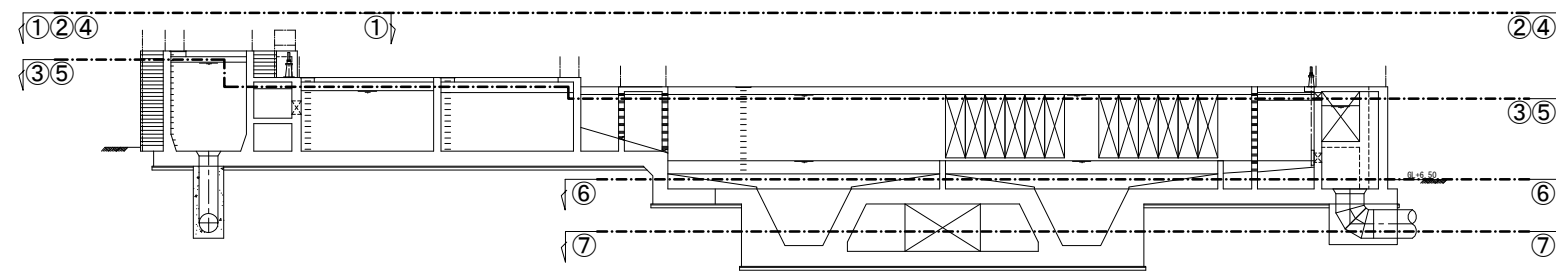
No.			
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Detail Plan(1/13)

KEY PLAN S=1:200



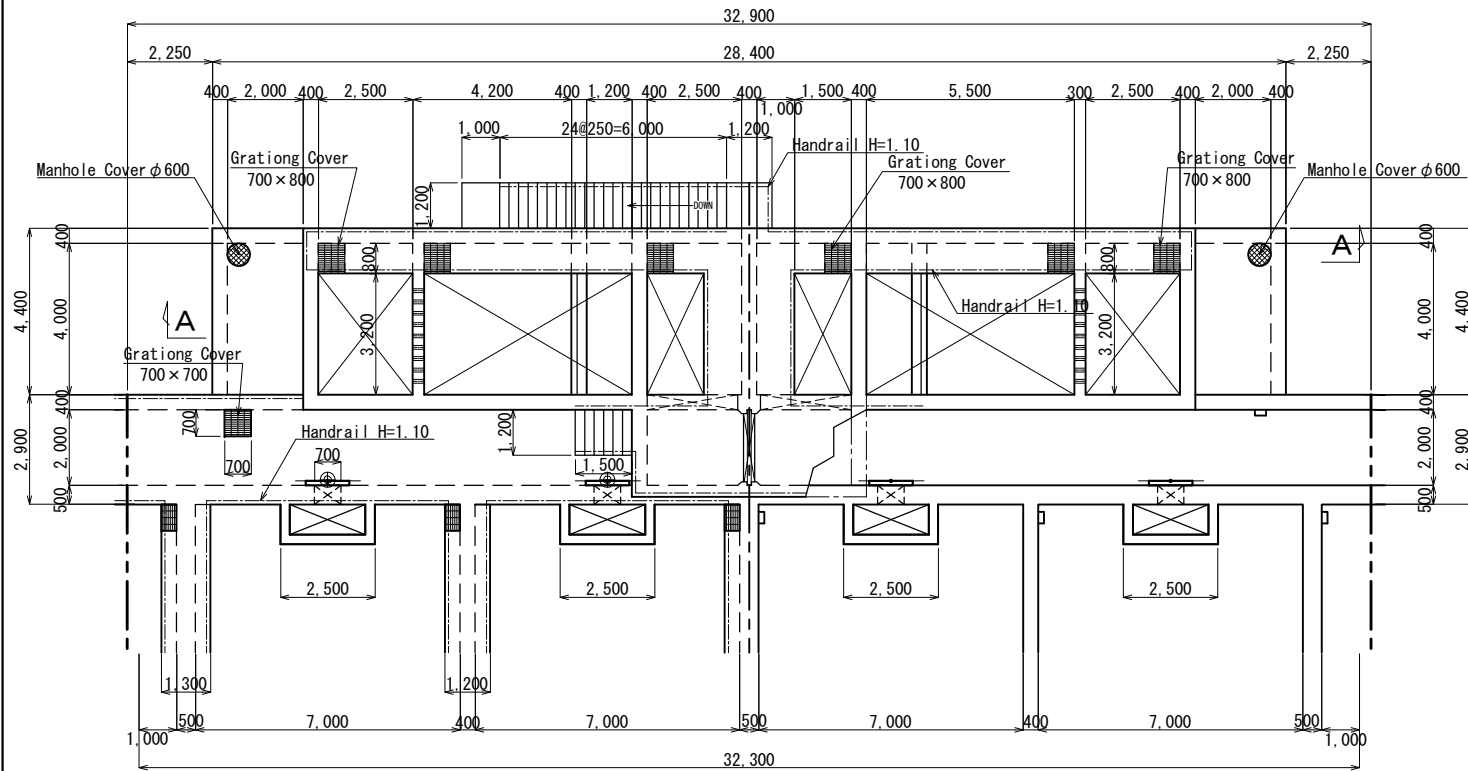
KEY PLAN S=1:200



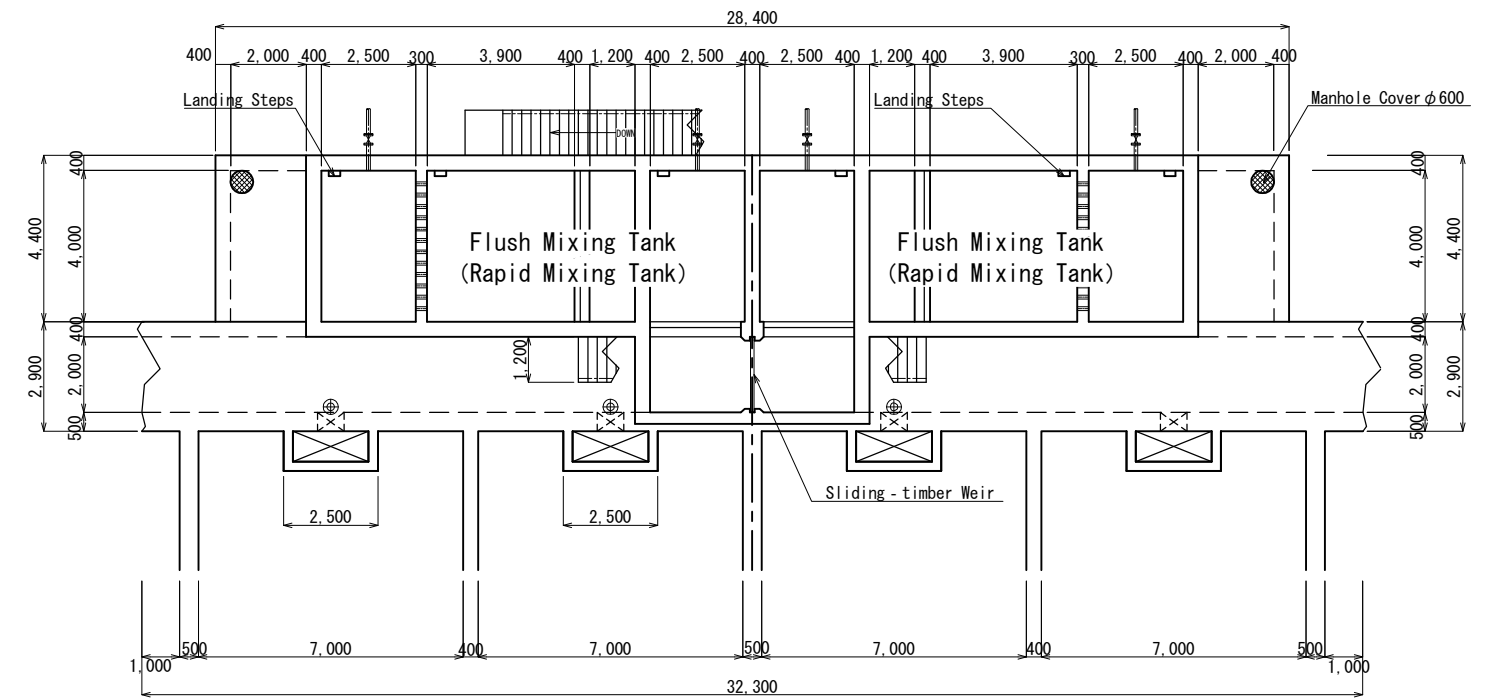
No.			
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Detail Plan(2/13)

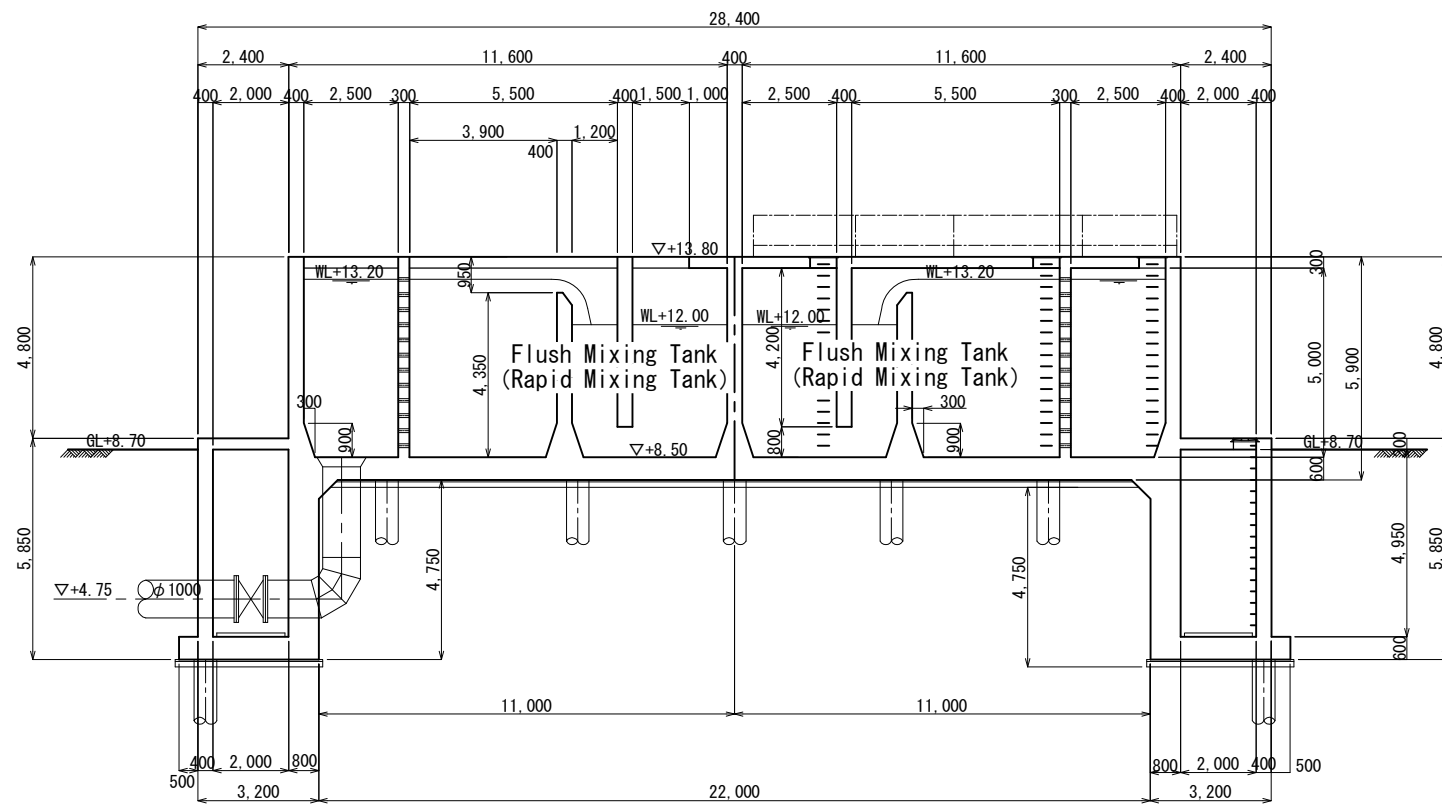
① Plan(Upper) S=1:100



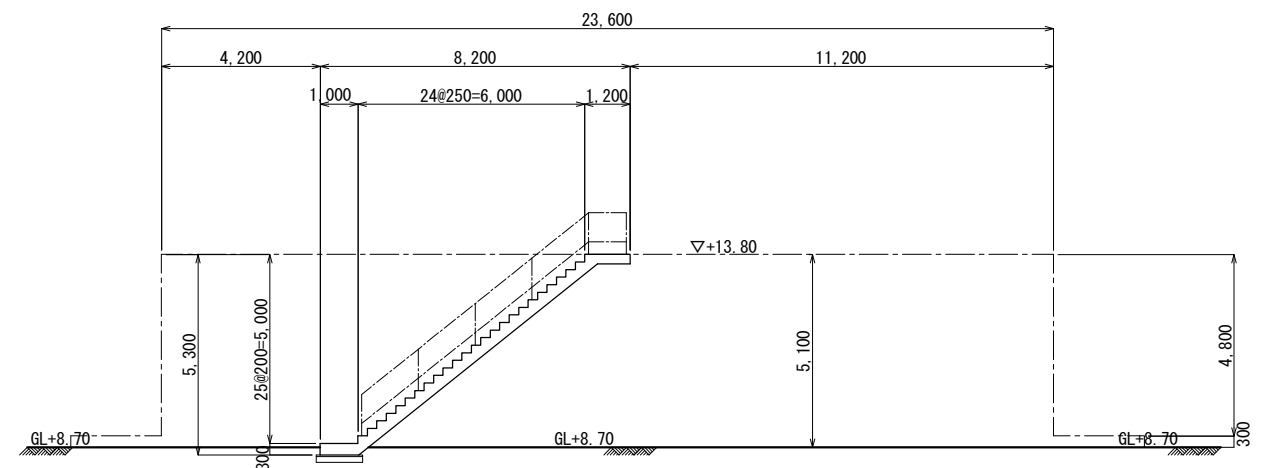
① Plan(Lower) S=1:100



Cross Section A-A S=1:100



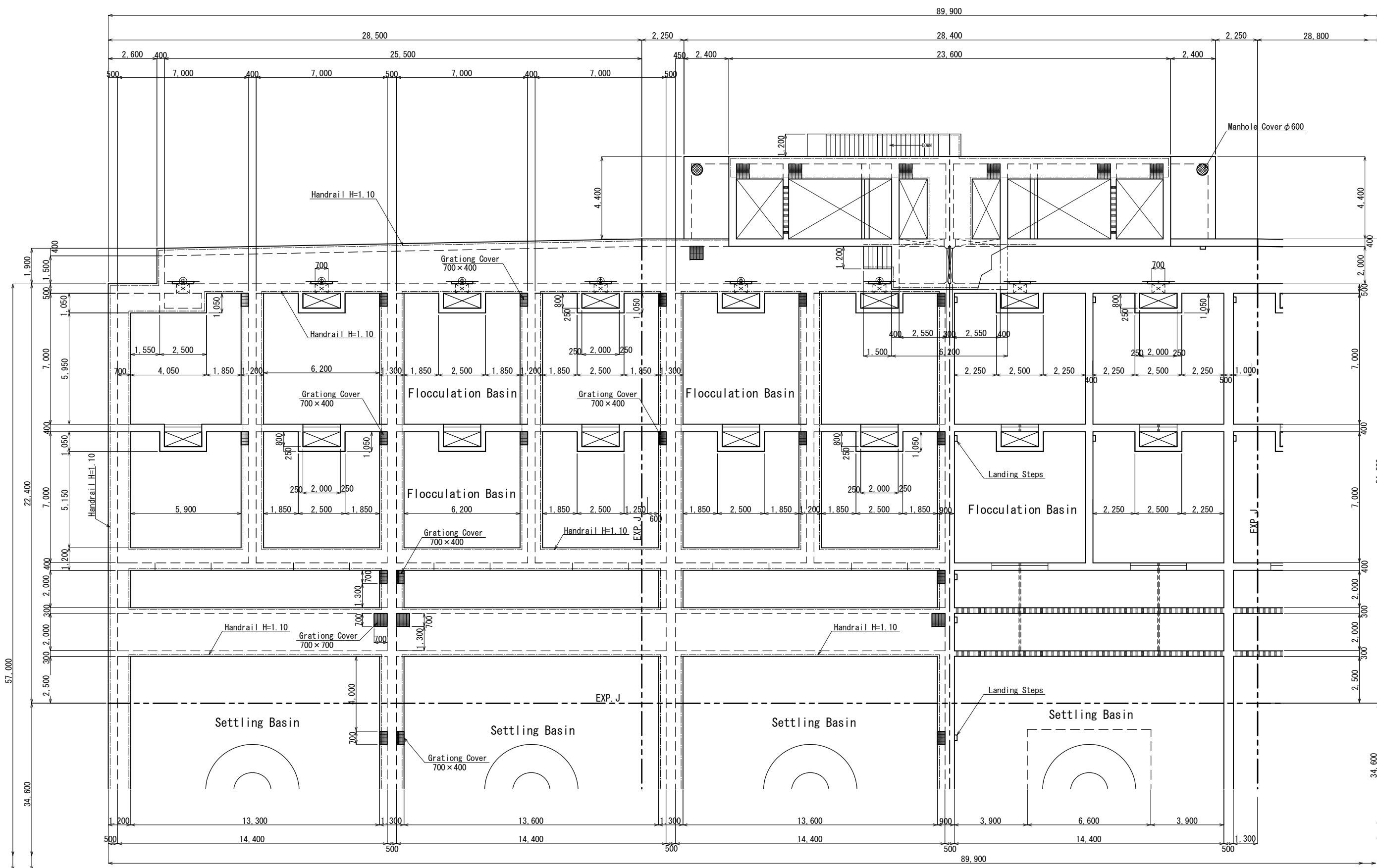
Cross Section B-B S=1:100



No.			
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Detail Plan(3/13)

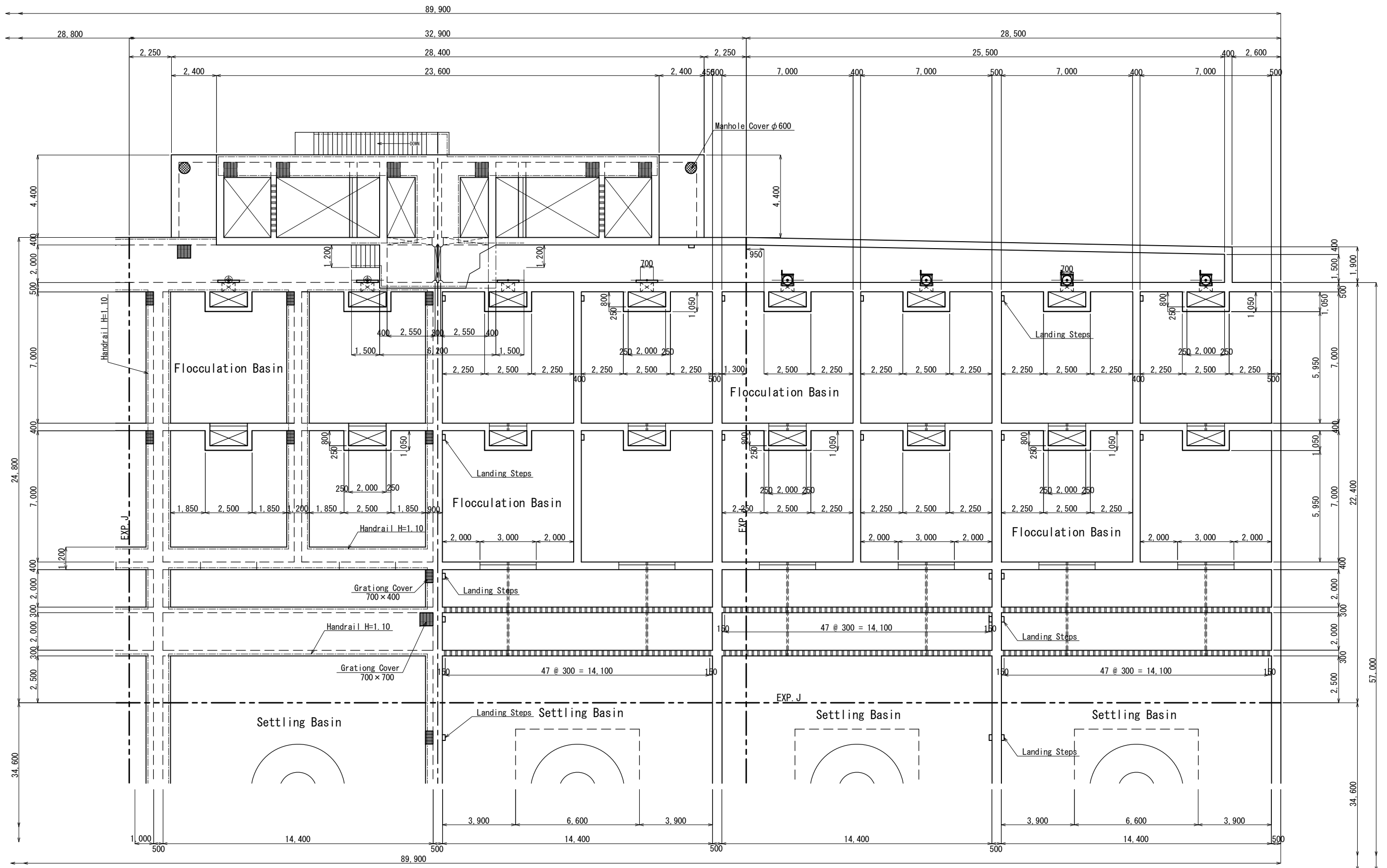
② Plan S=1:100



No.			
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Detail Plan(4/13)

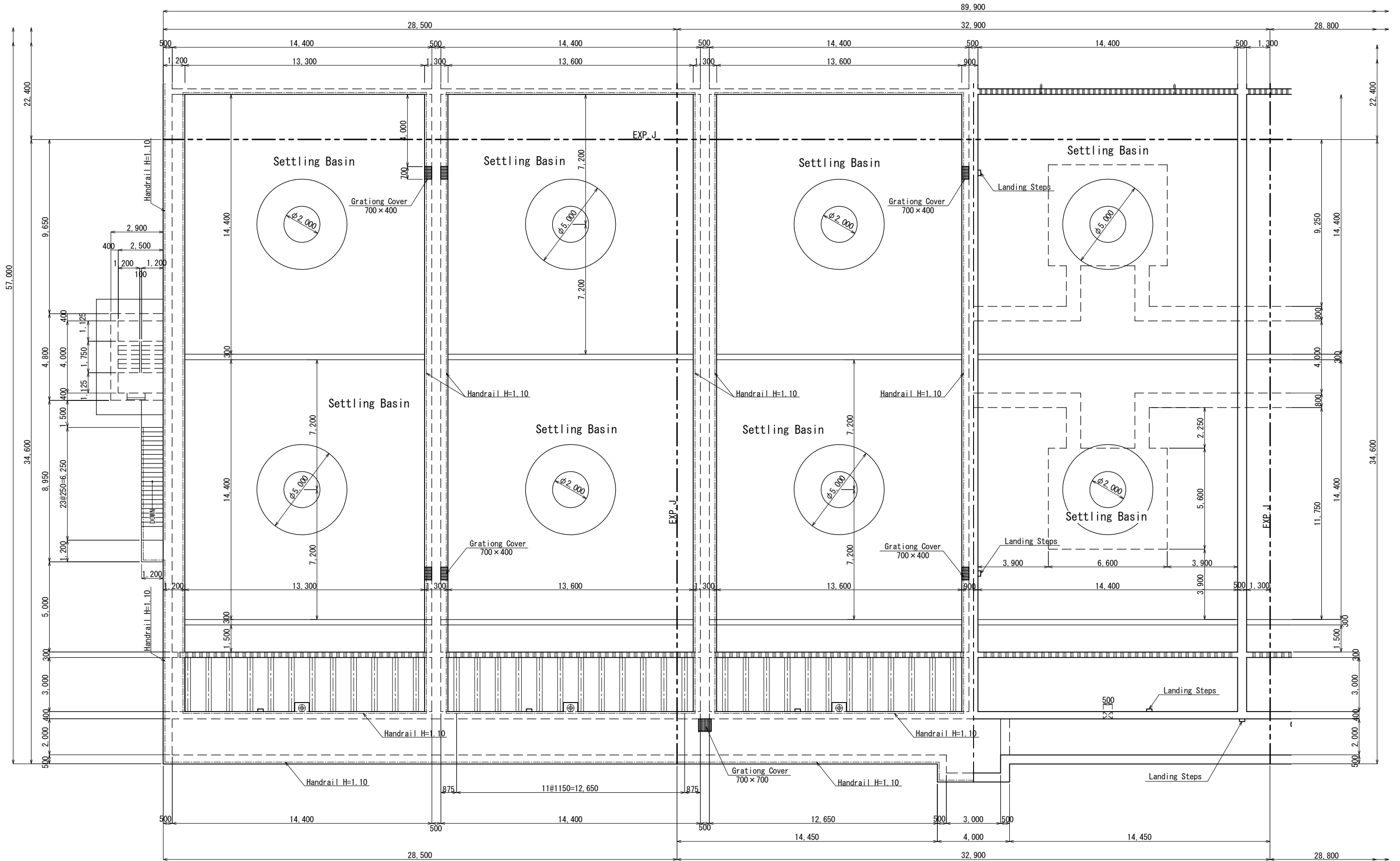
③ Plan S=1:100



No.			
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Detail Plan (5/13)

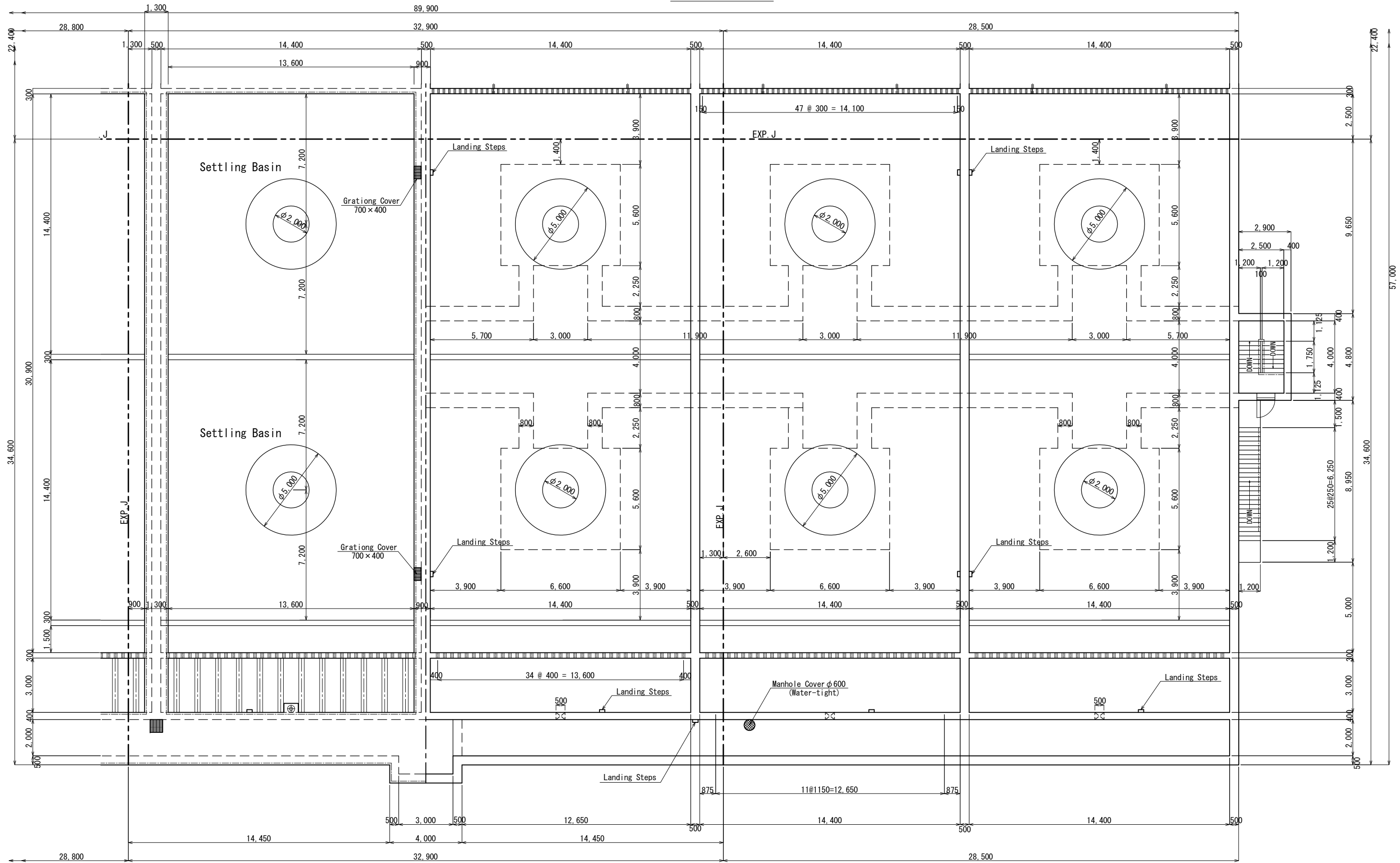
④ Plan S=1:100



No.			
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Detail Plan (6/13)

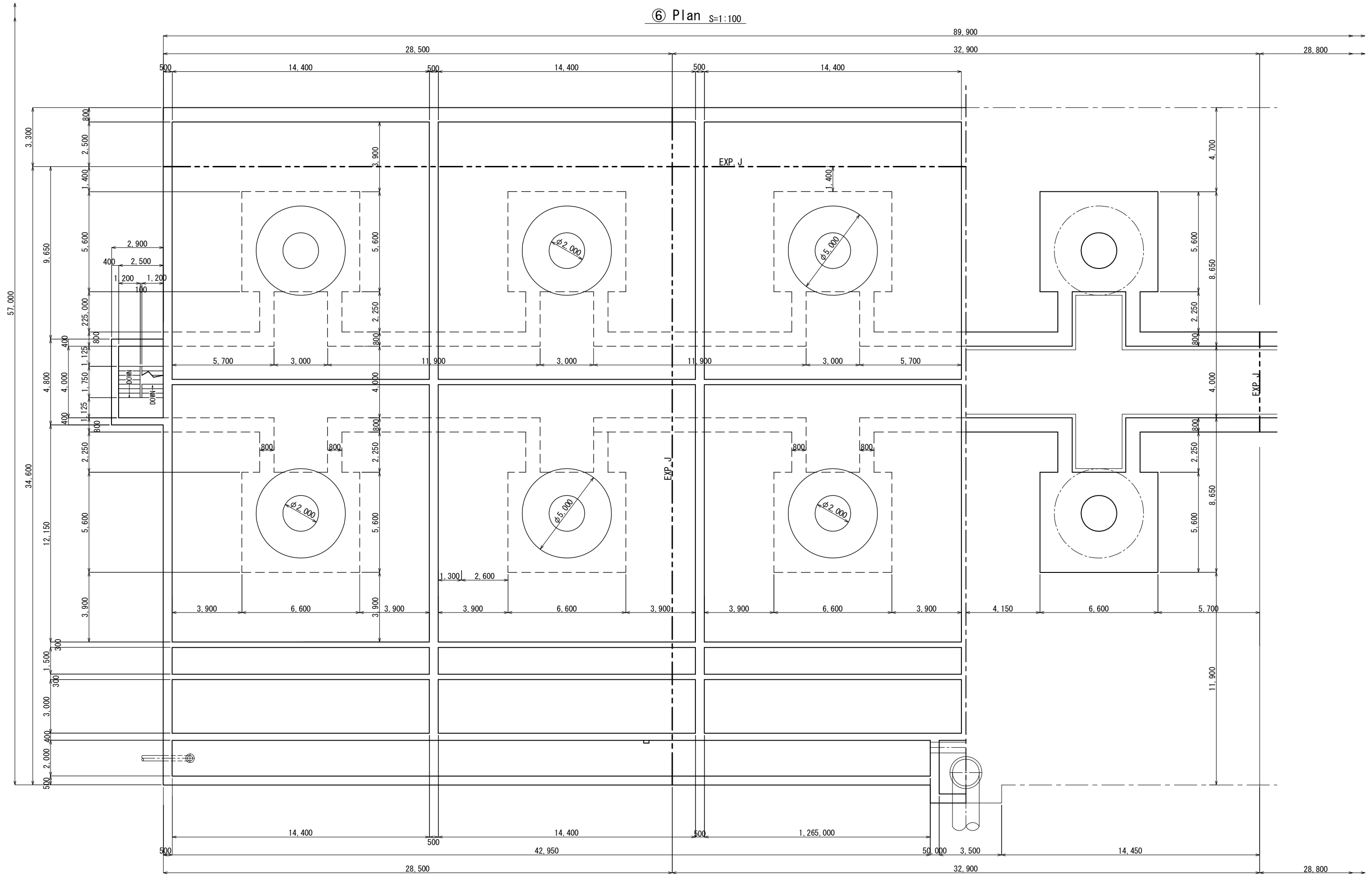
⑤ Plan S=1:100



No.			
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Detail Plan(7/13)

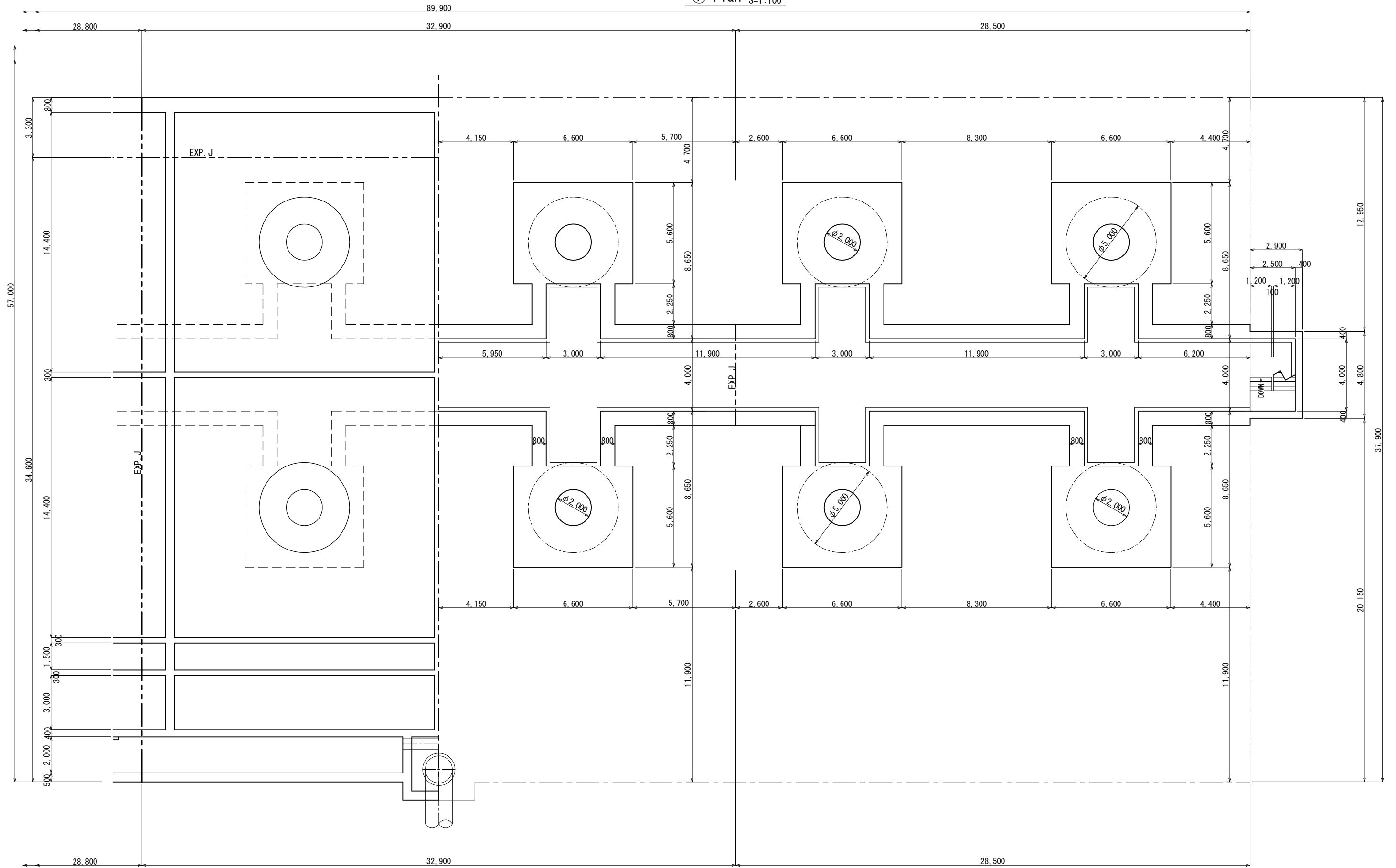
⑥ Plan S=1:100



No.			

Detail Plan(8/13)

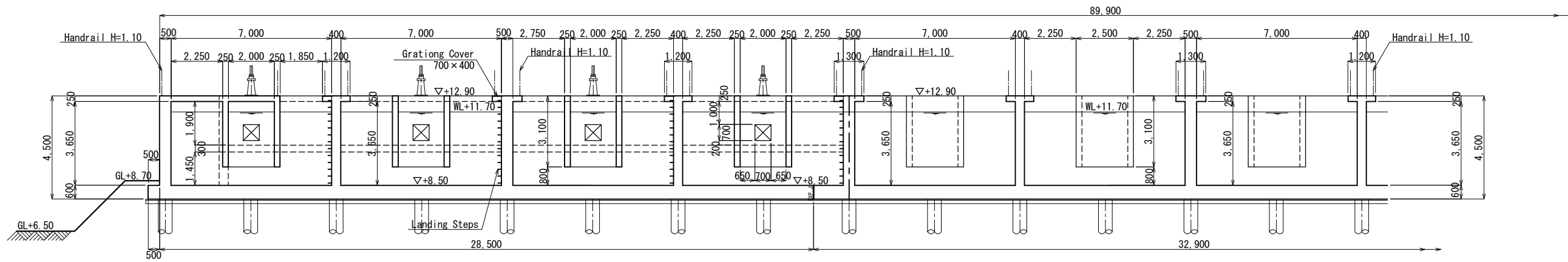
⑦ Plan S=1:100



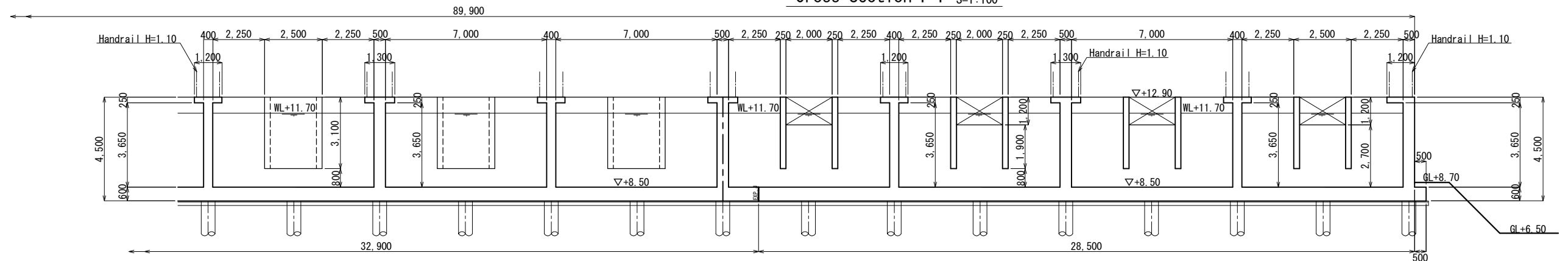
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Detail Plan(10/13)

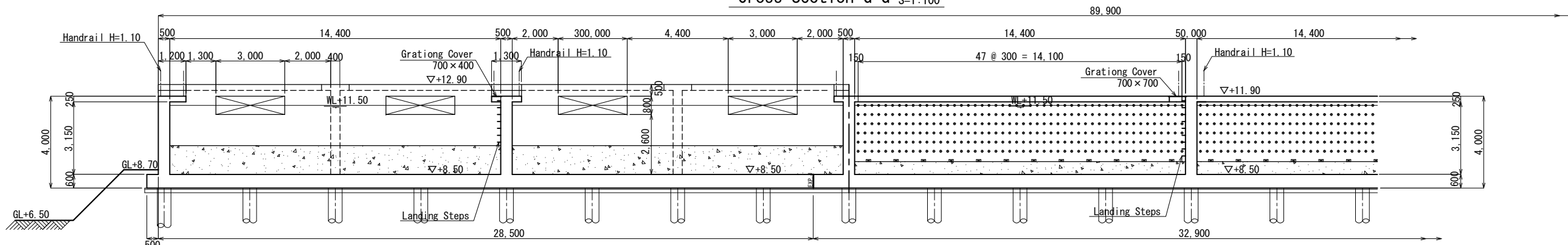
Cross Section F-F S=1:100



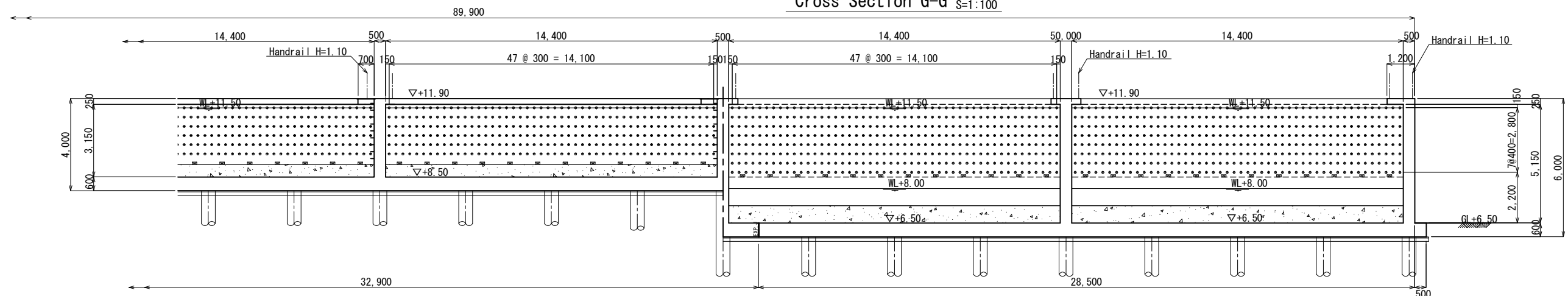
Cross Section F-F S=1:100



Cross Section G-G S=1:100



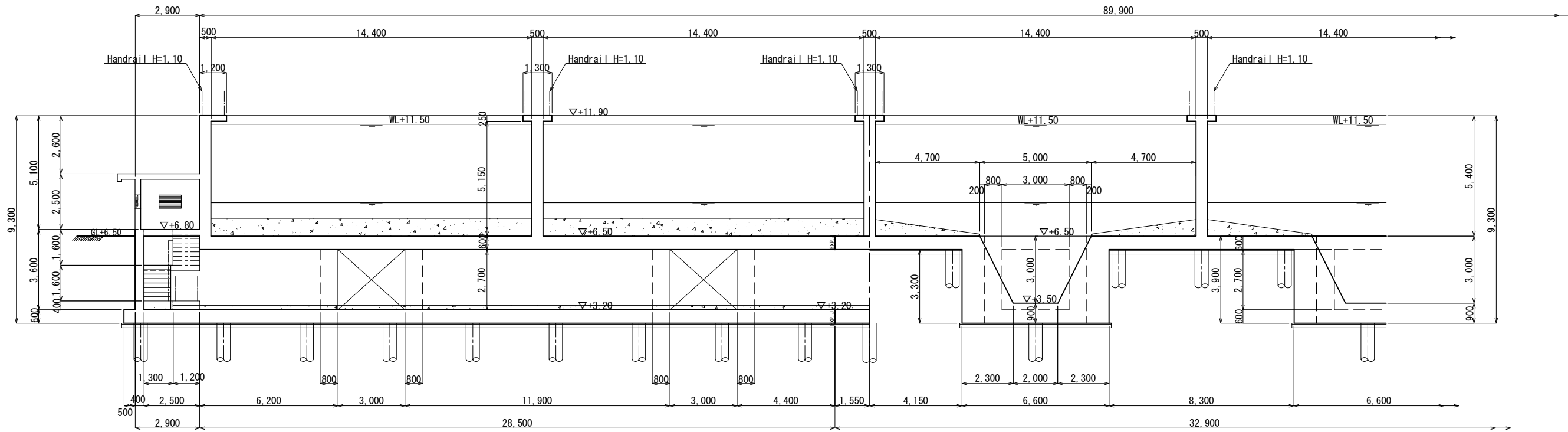
Cross Section G-G S=1:100



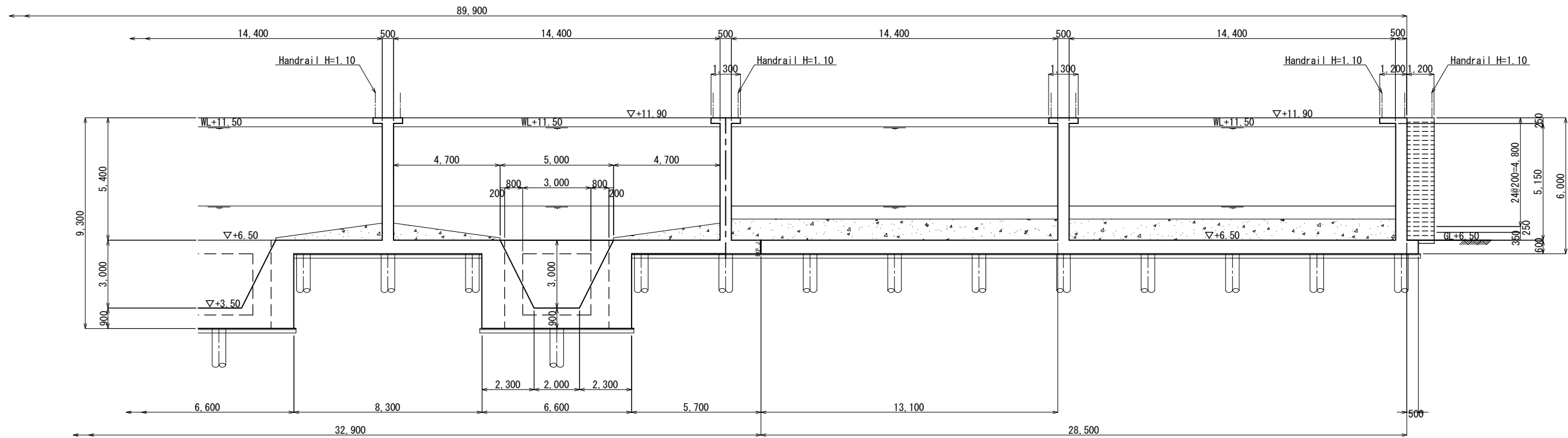
No.			
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Detail Plan(11/13)

Cross Section H-H S=1:100



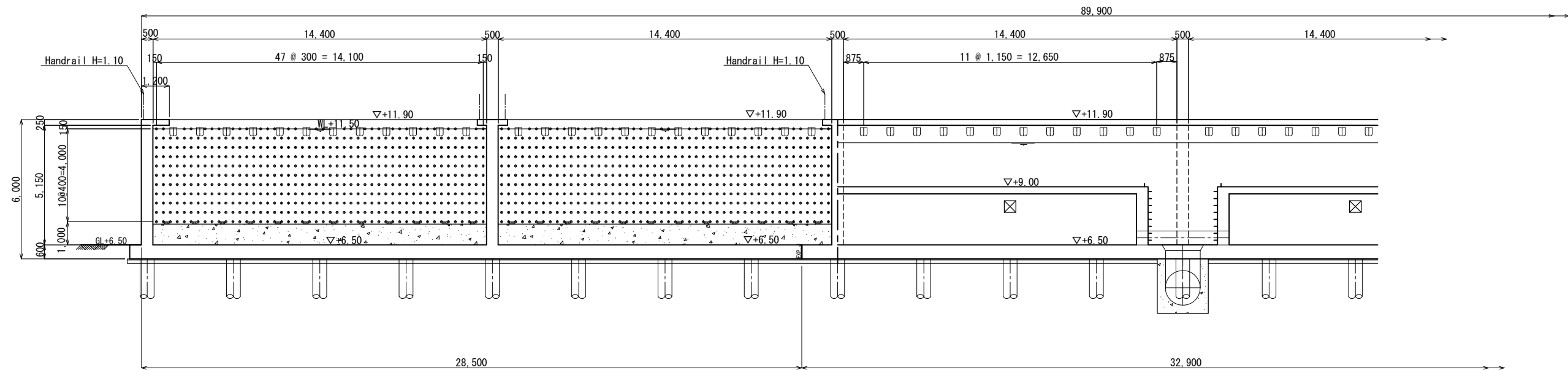
Cross Section H-H S=1:100



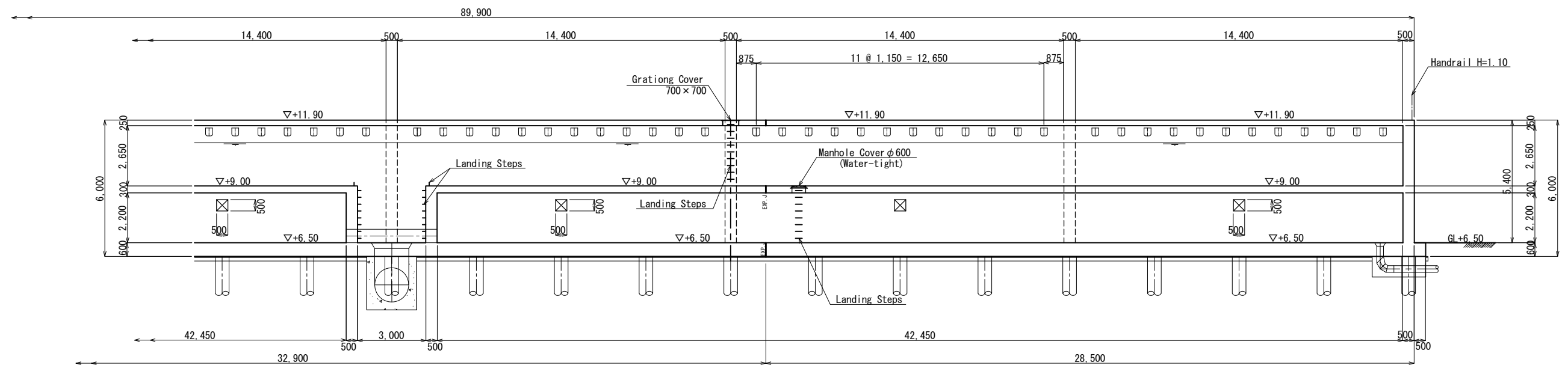
No.			
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Detail Plan(12/13)

Cross Section I-I s=1:100



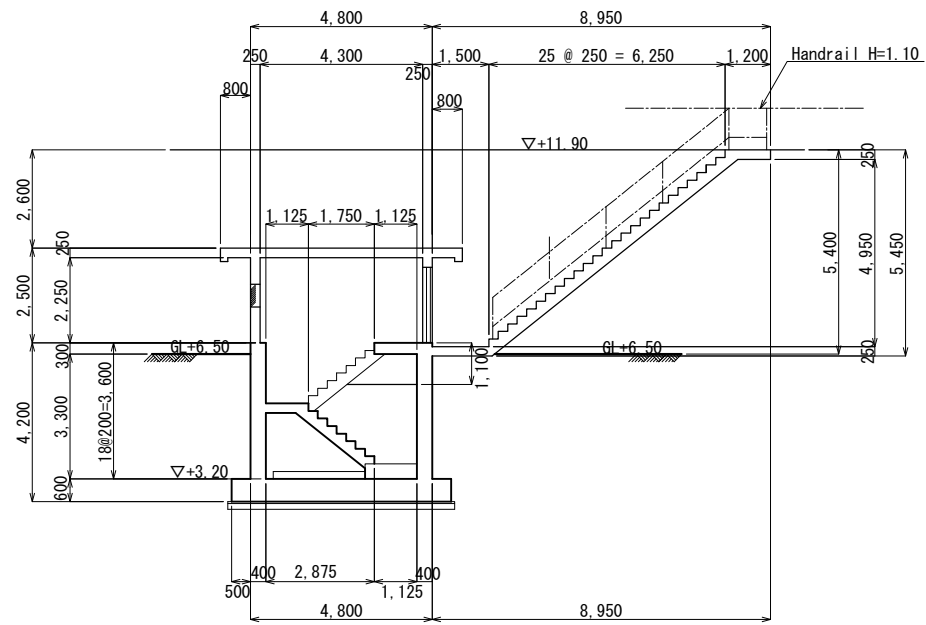
Cross Section I-I s=1:100



No.			
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Detail Plan(13/13)

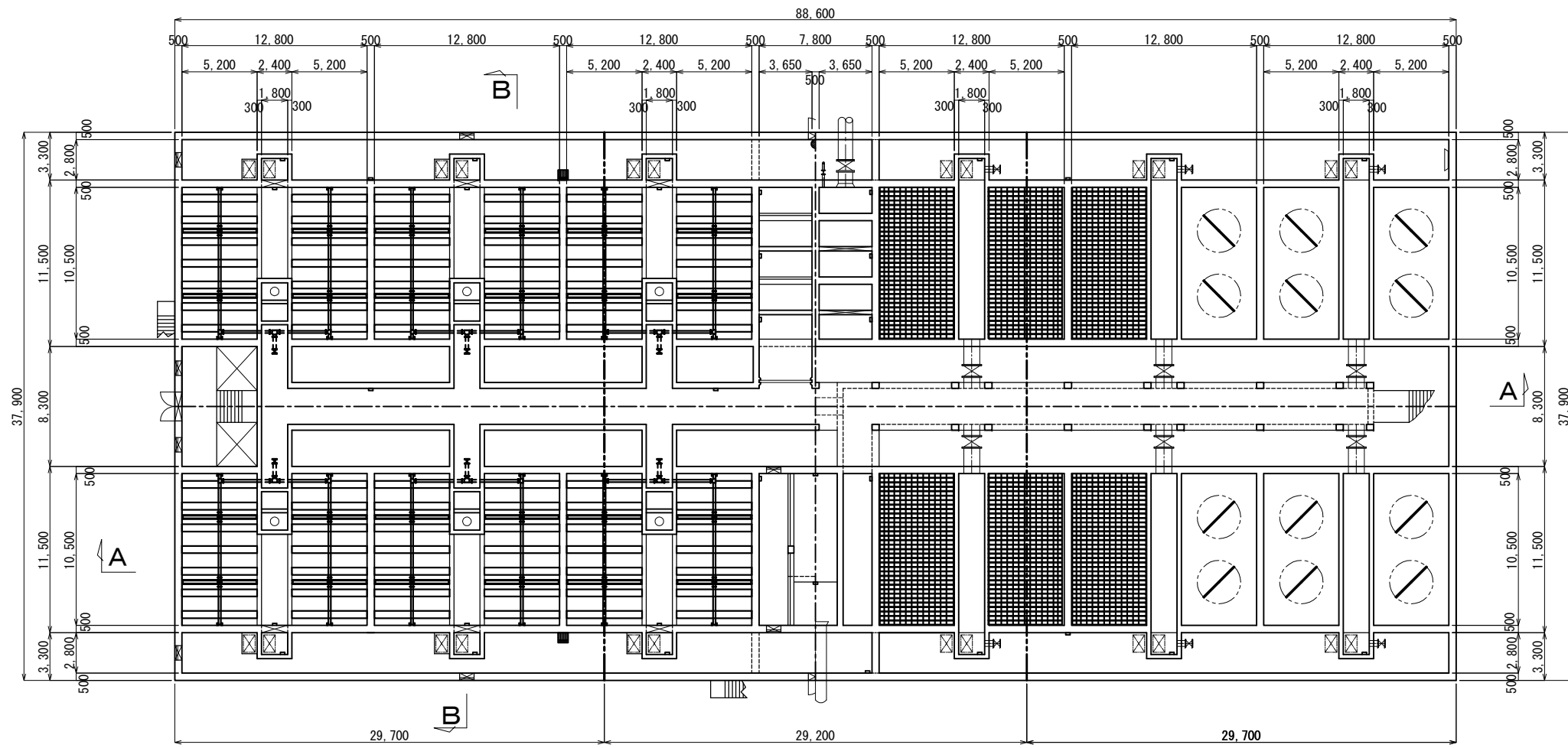
Cross Section J-J s=1:100



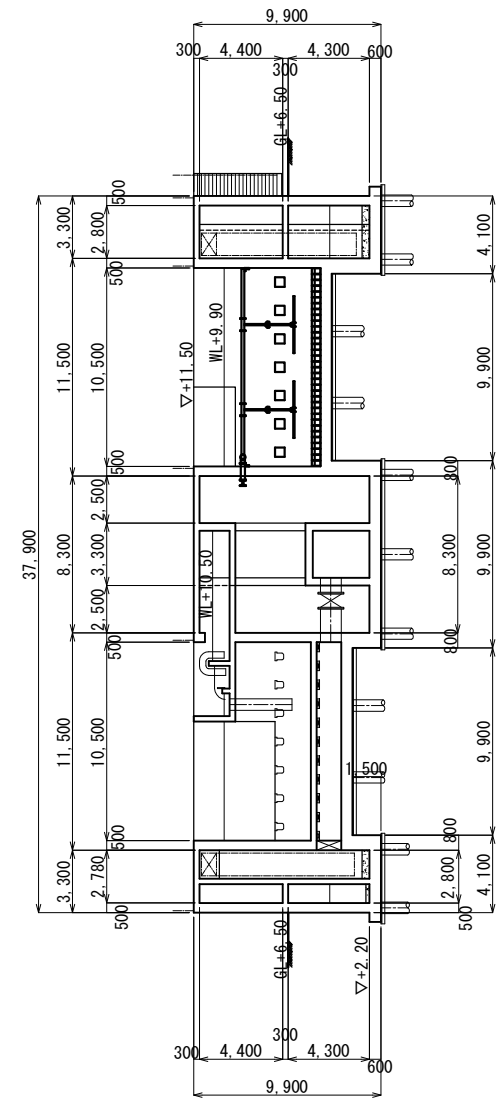
No.			

Rapid Filter Structural Plan s=1:200

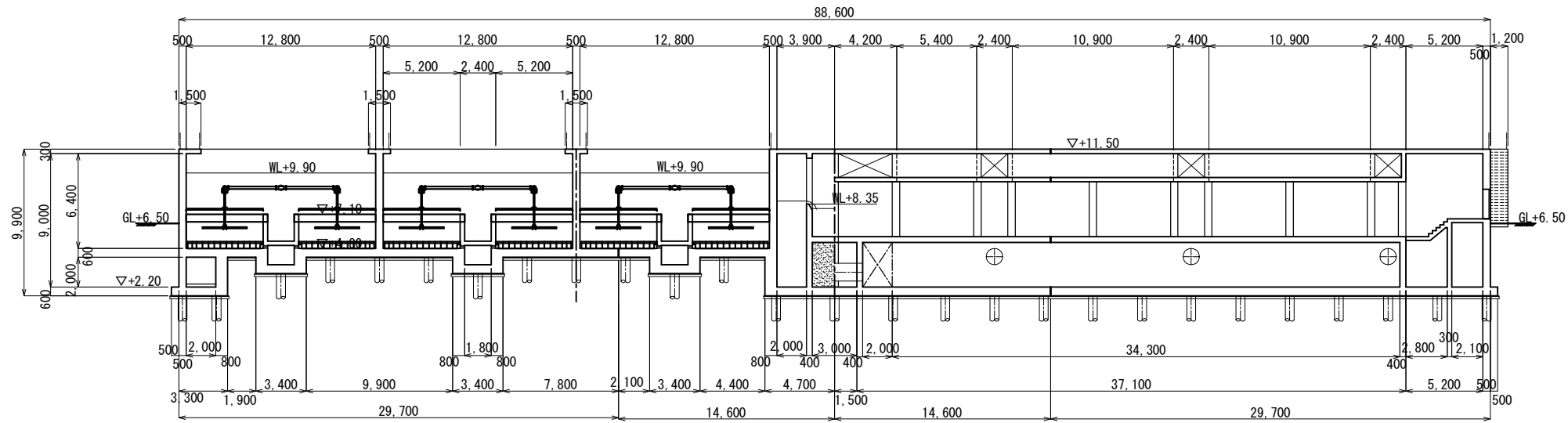
Plan



Cross Section B-B



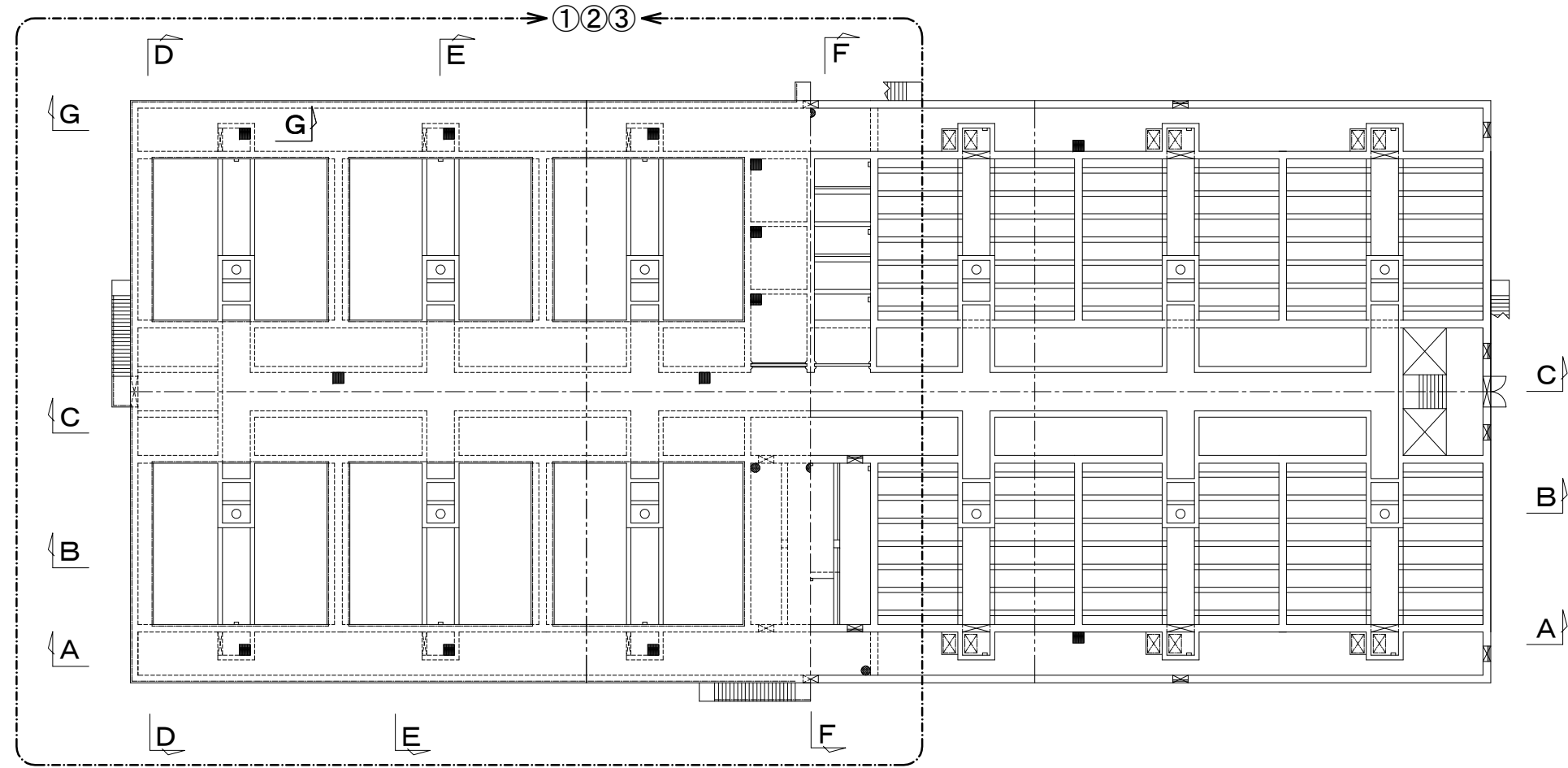
Cross Section A-A



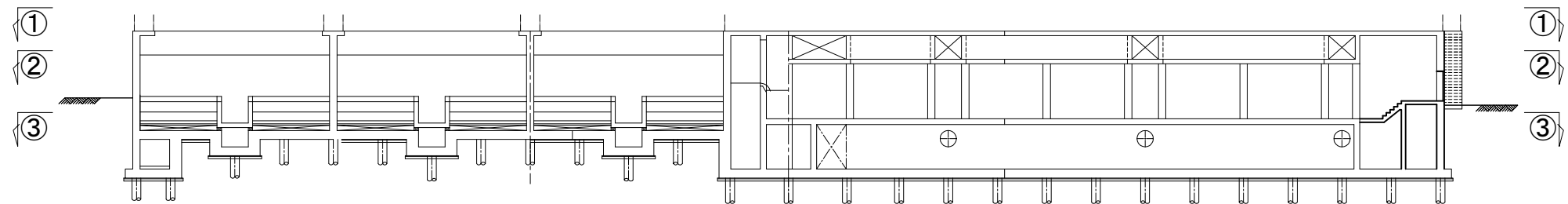
JICA Study Team	No.	THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT IN THE SOCIALIST REPUBLIC OF VIET NAM	Date. NOV. 2011	Duong River Water Treatment Plant	Drawing No
			Scale 1/200	Rapid Filter Structural Plan	41

Detail Plan (1/9)

KEY PLAN S=1:200



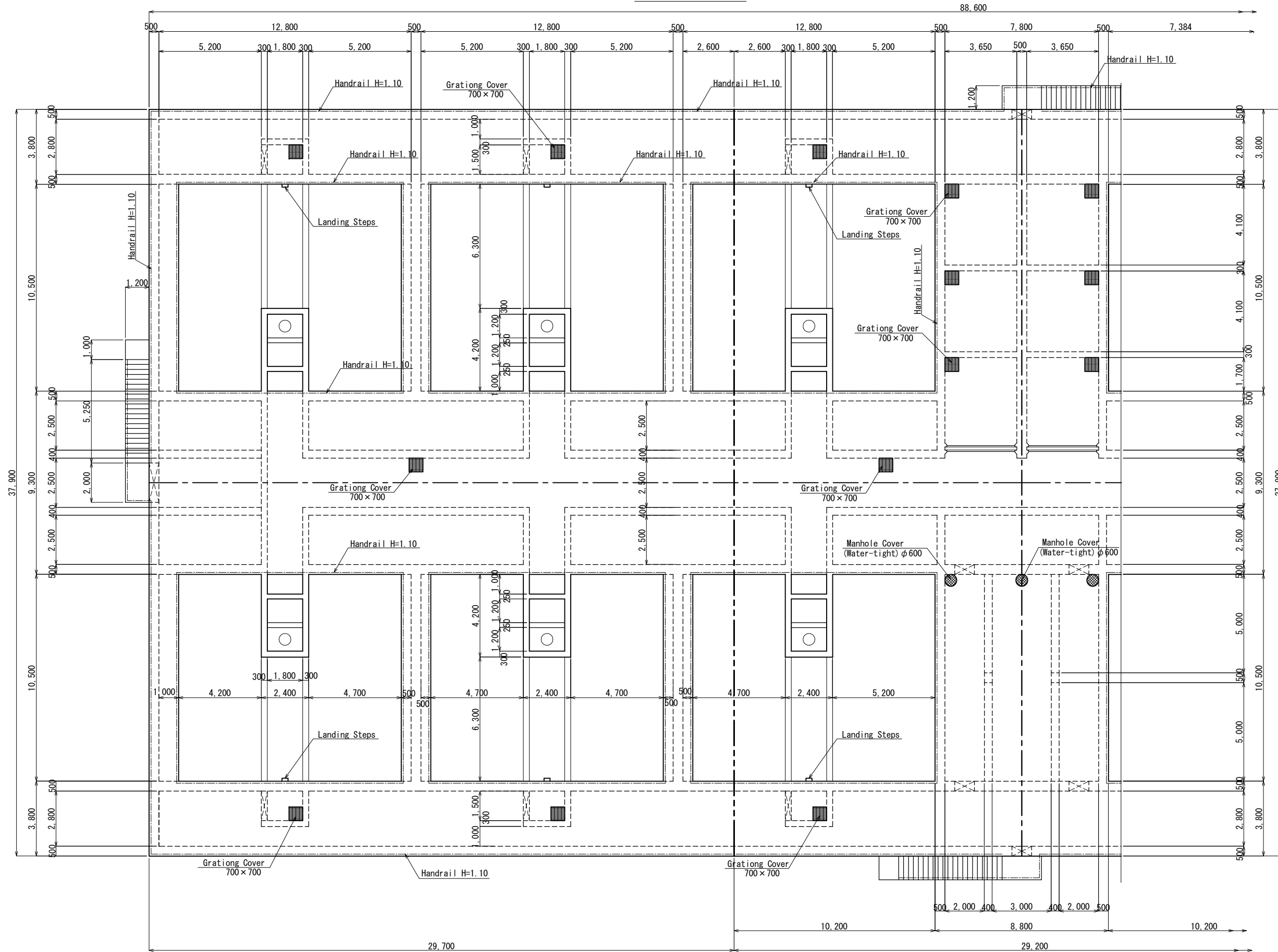
KEY PLAN S=1:200
(B-C)



No.			
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Detail Plan (2/9)

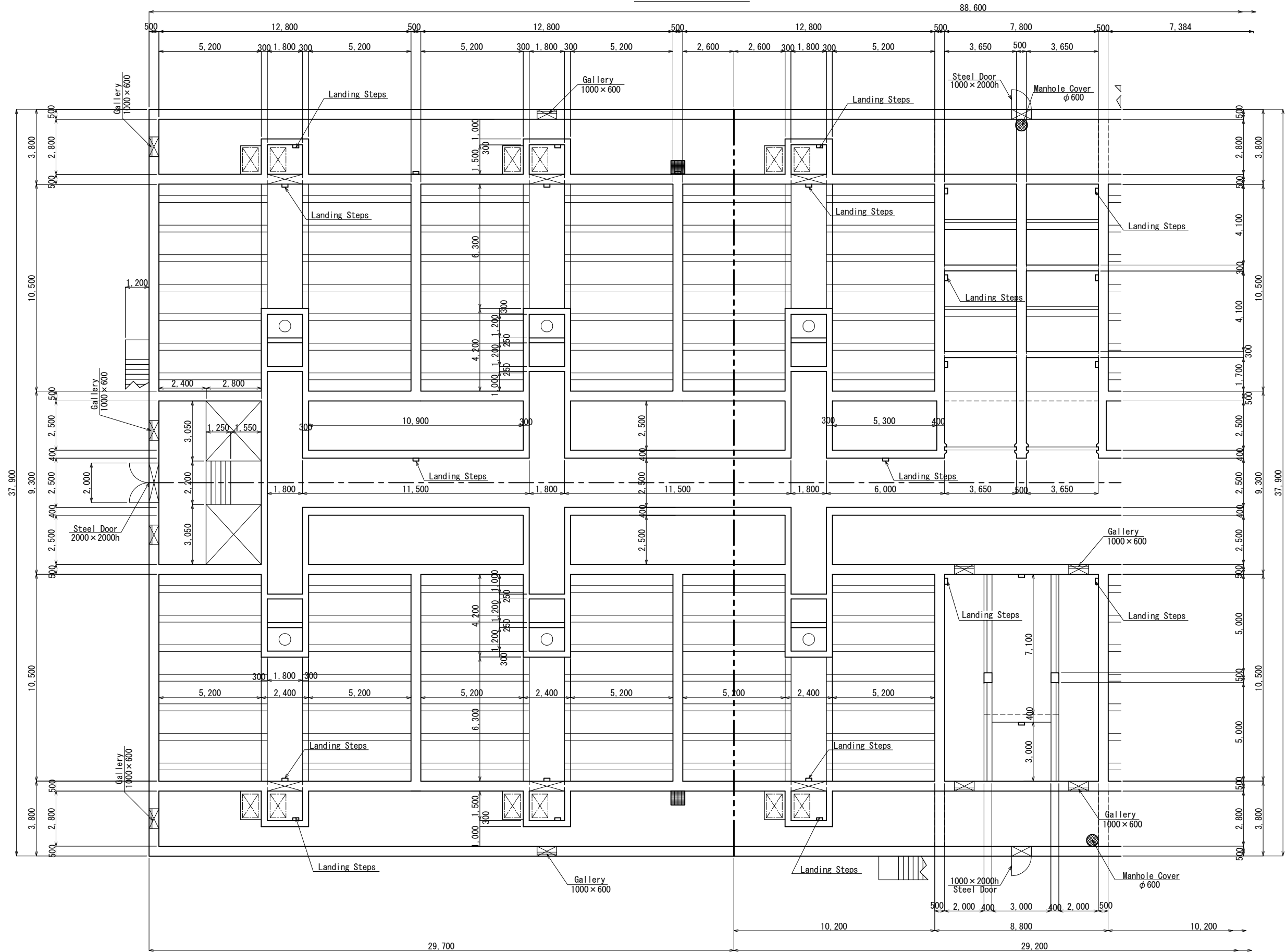
① Plan S=1:100



No.			
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Detail Plan (3/9)

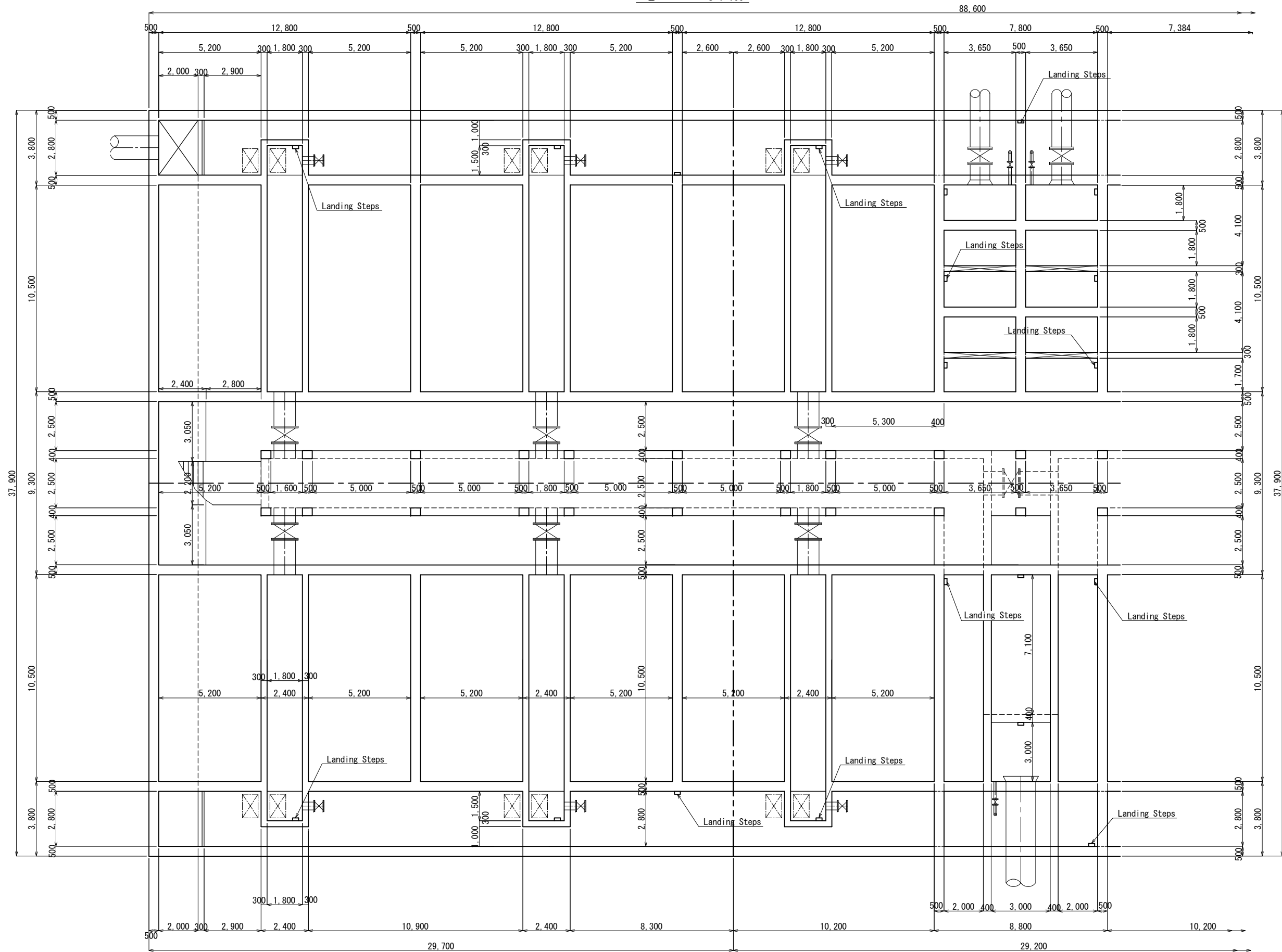
② Plan S=1:100



No.			
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Detail Plan (4/9)

③ Plan s=1:100



JICA Study Team

No.			
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THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT
IN THE SOCIALIST REPUBLIC OF VIET NAM

Date.
NOV. 2011

Scale
1/100

Duong River Water Treatment Plant

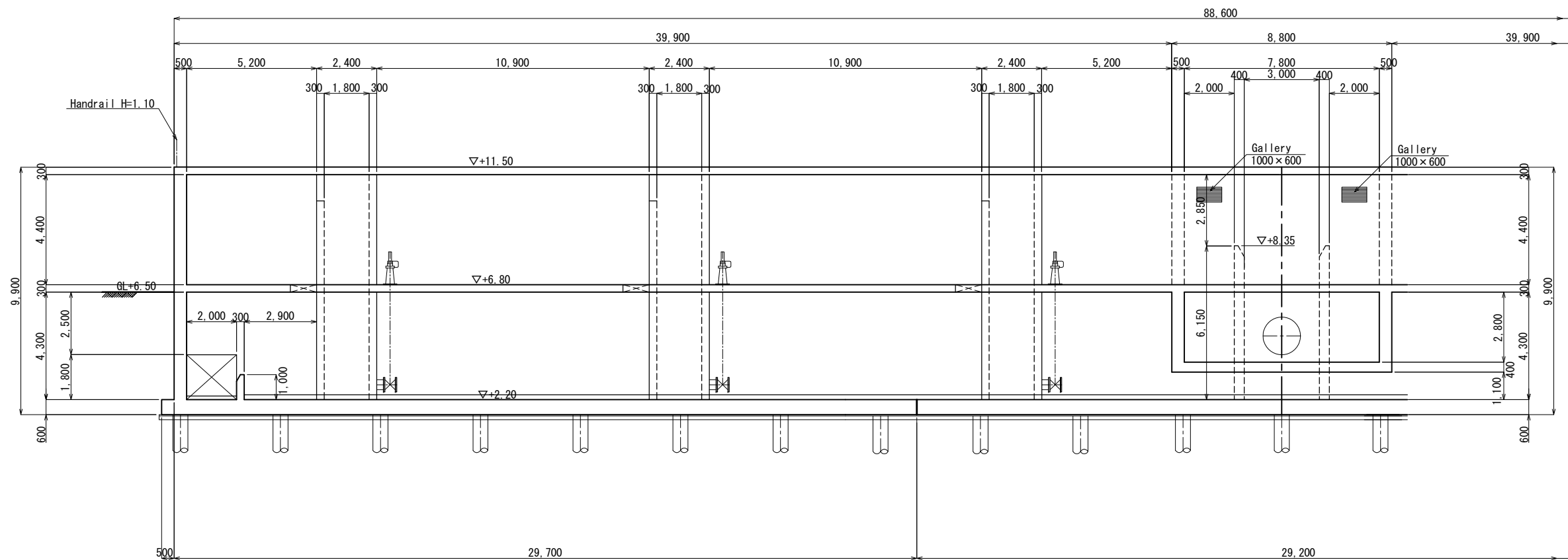
Detail Plan (4/9)

Drawing No

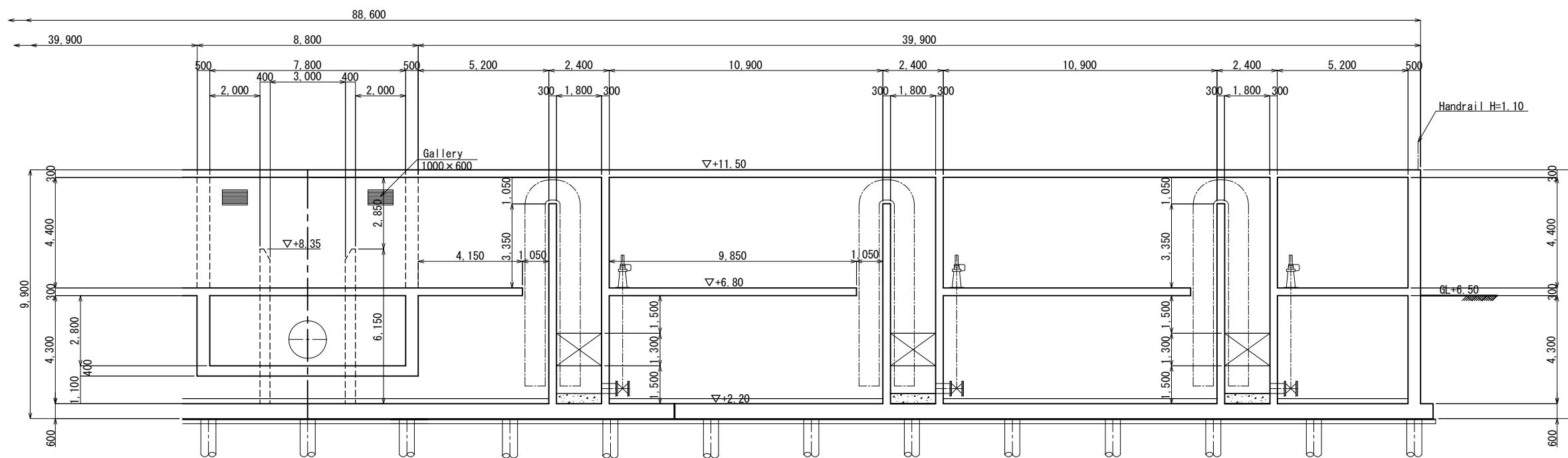
45

Detail Plan (5/9)

Cross Section A-A S=1:100



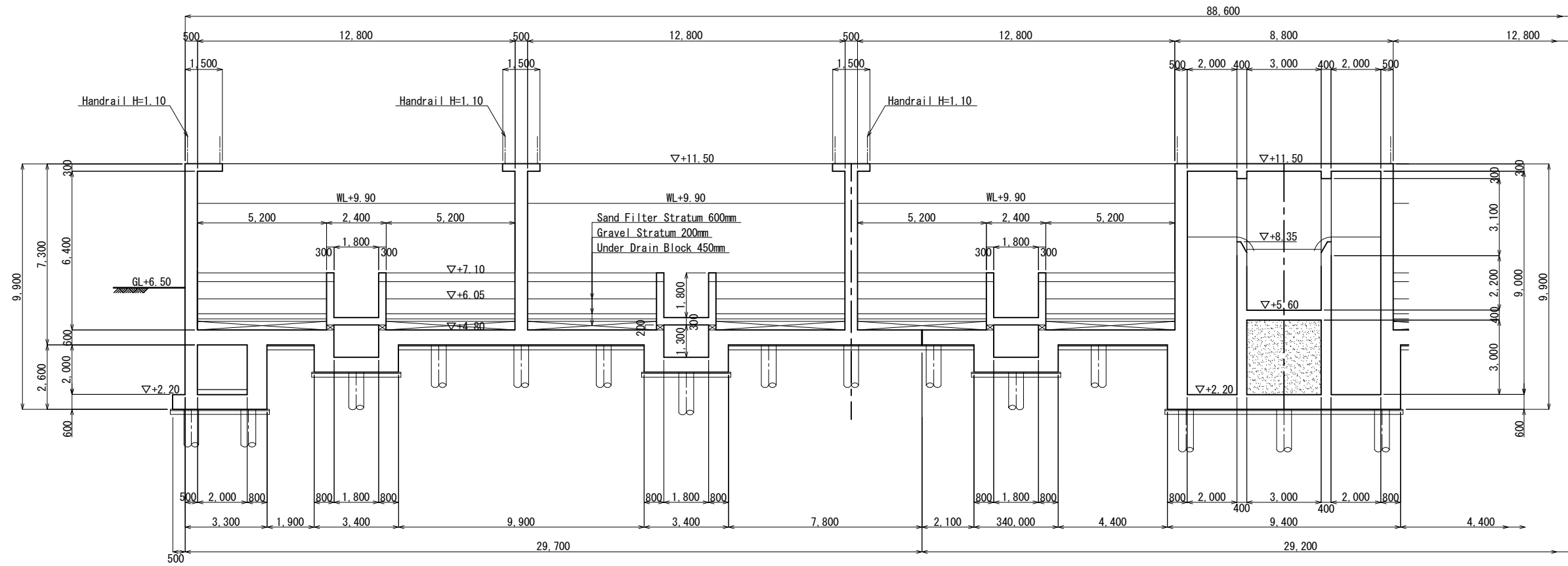
Cross Section A-A S=1:100



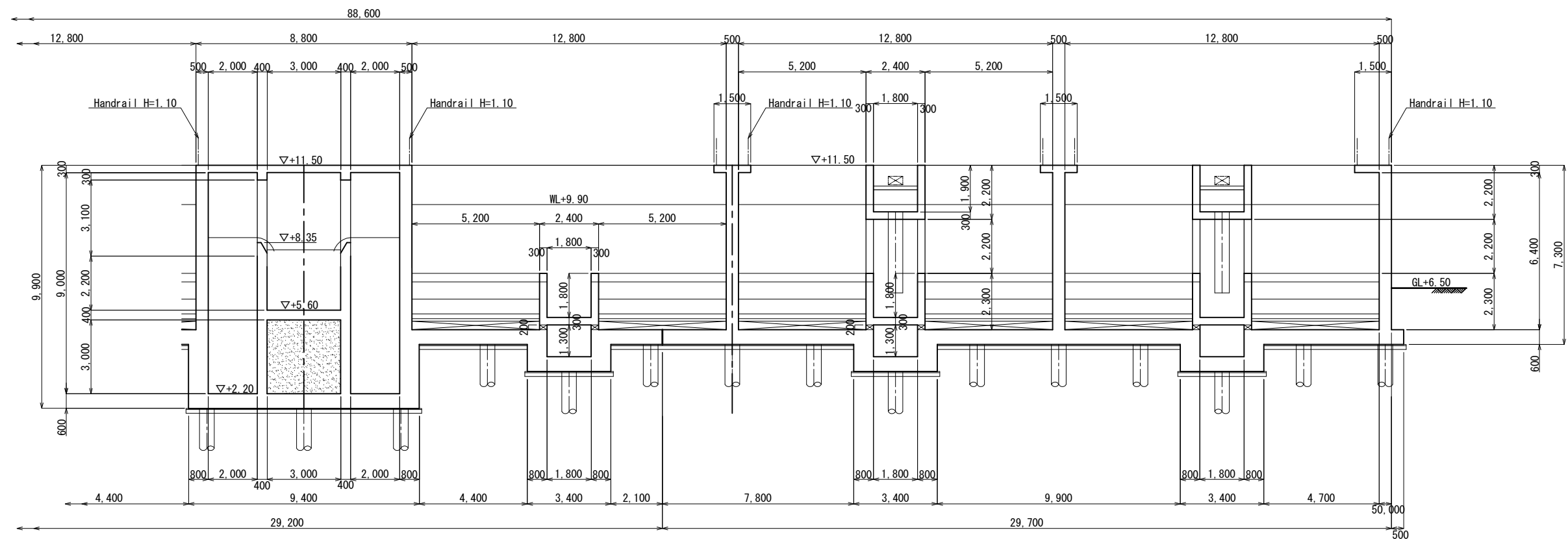
No.			
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Detail Plan (6/9)

Cross Section B-B S=1:100



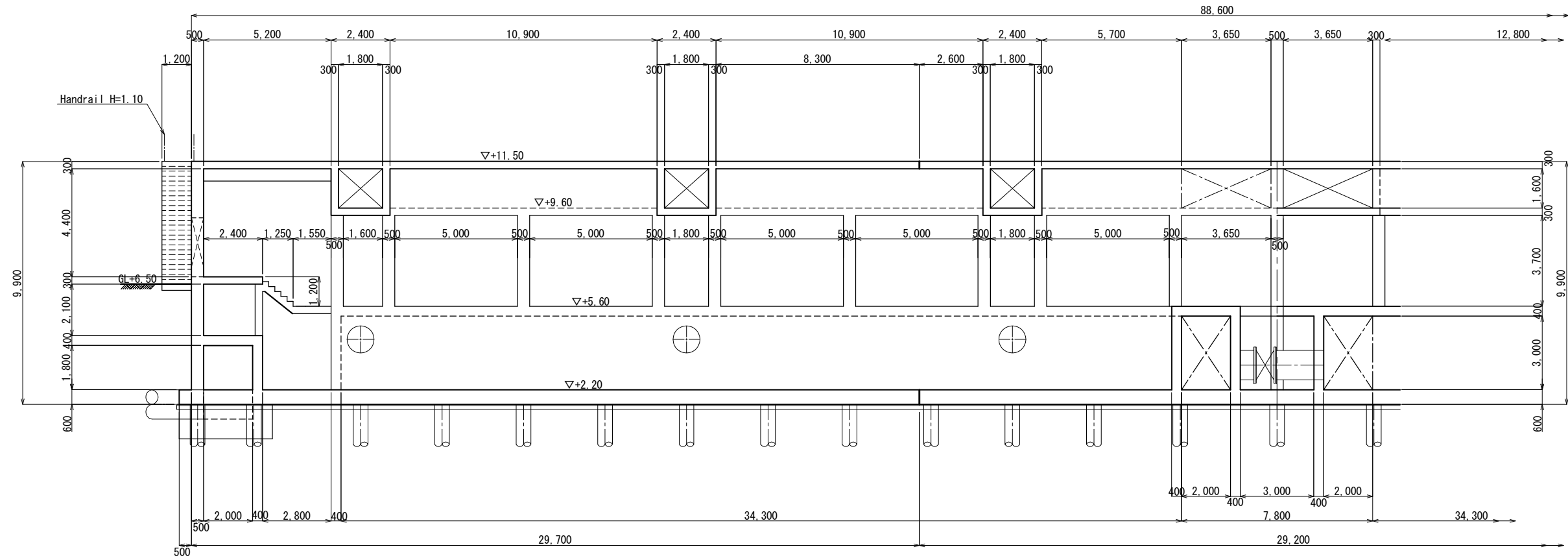
Cross Section B-B S=1:100



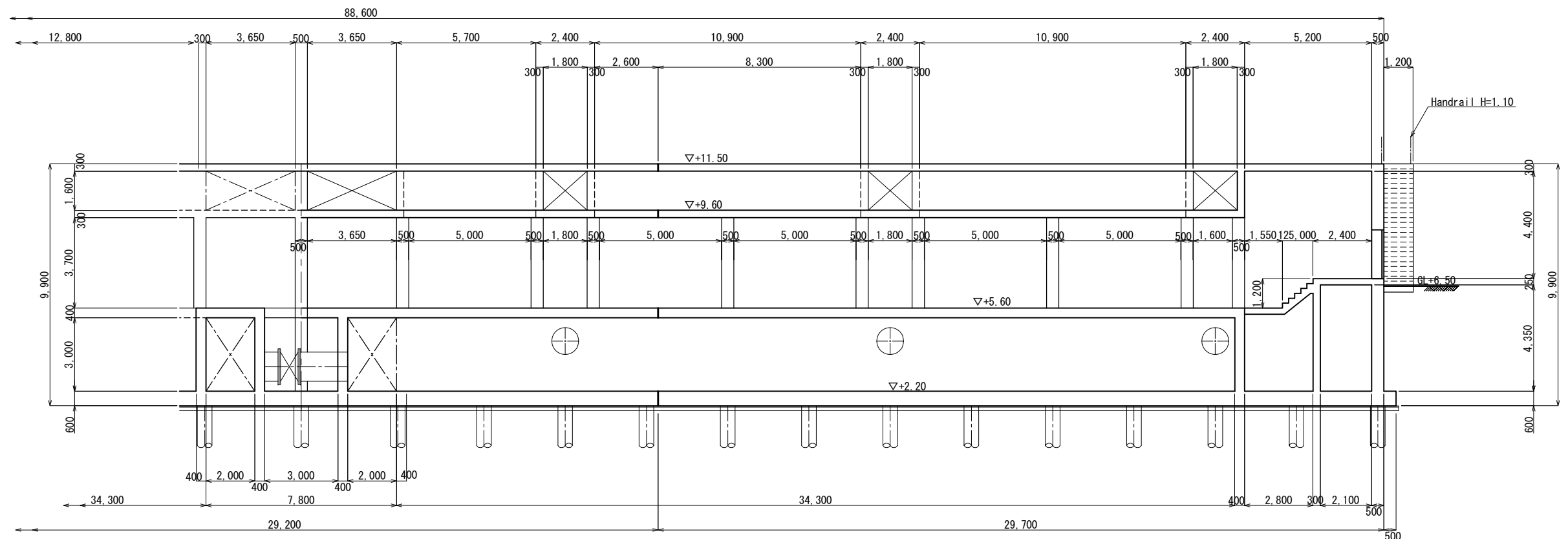
No.			
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Detail Plan (7/9)

Cross Section C-C s=1:100



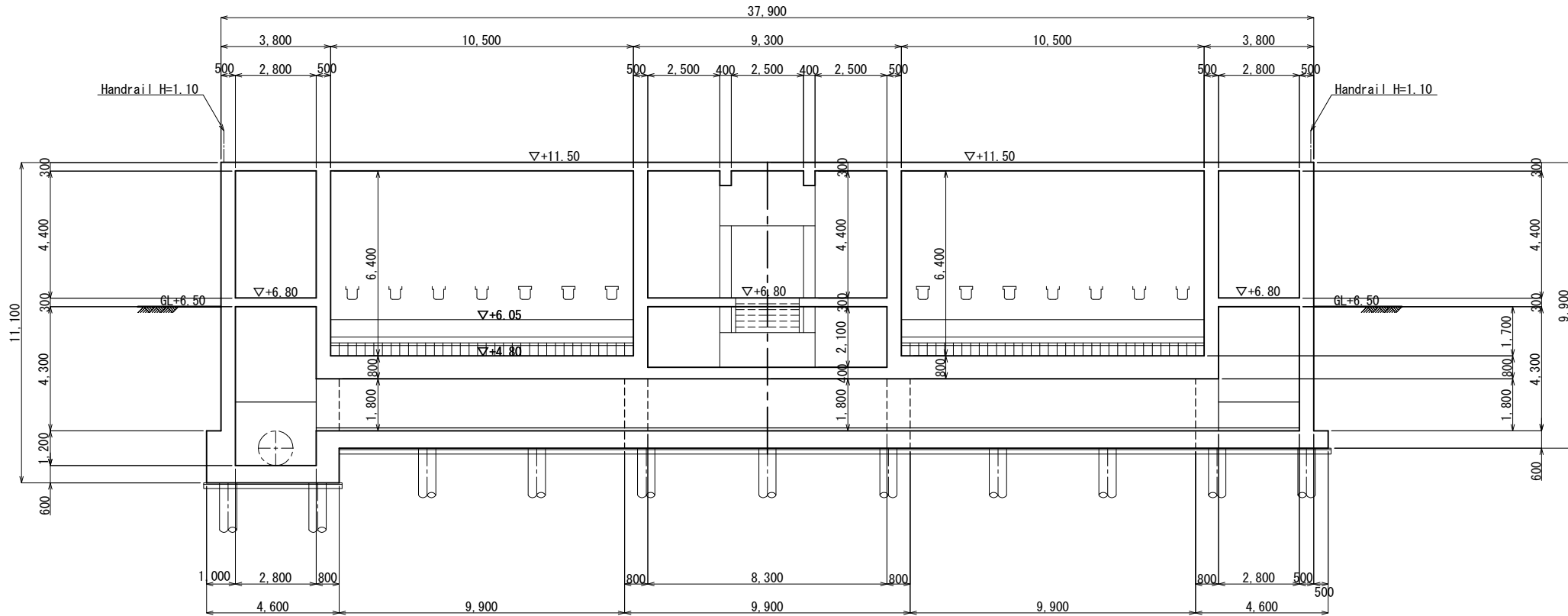
Cross Section C-C s=1:100



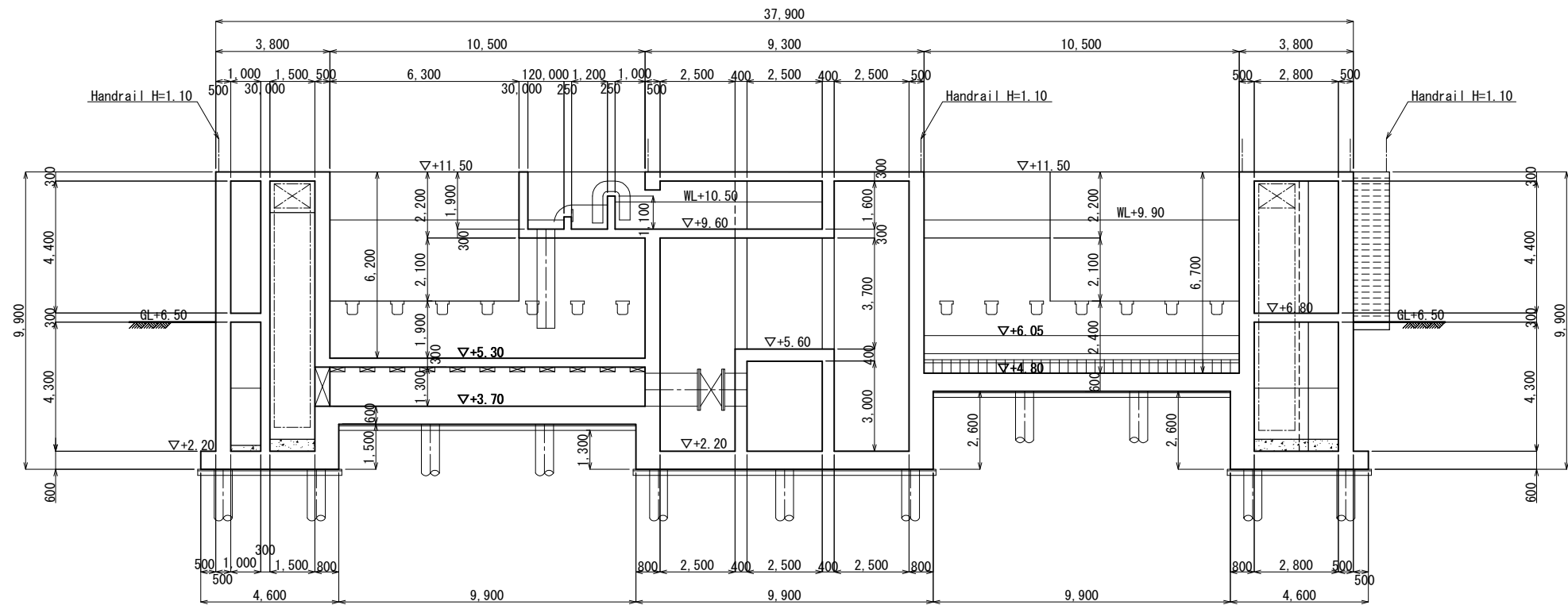
No.			
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Detail Plan (8/9)

Cross Section D-D S=1:100



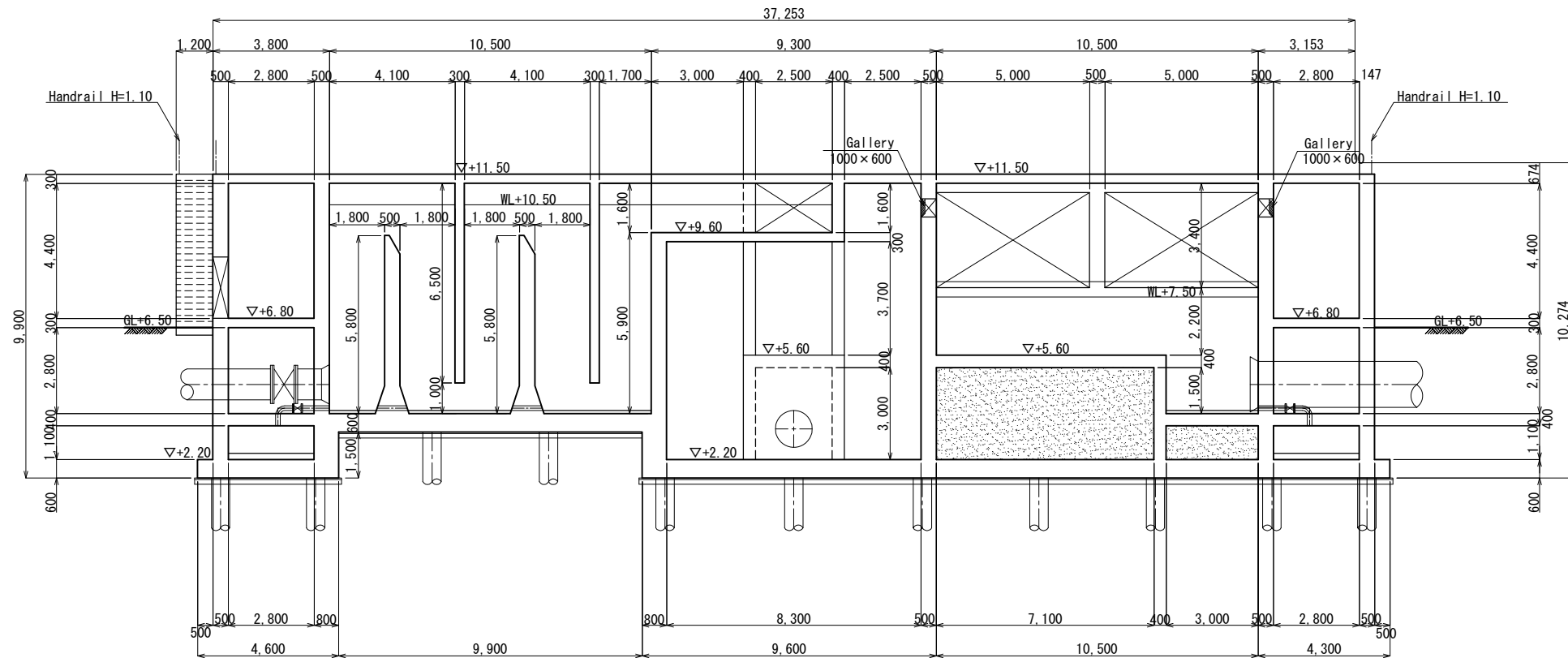
Cross Section E-E S=1:100



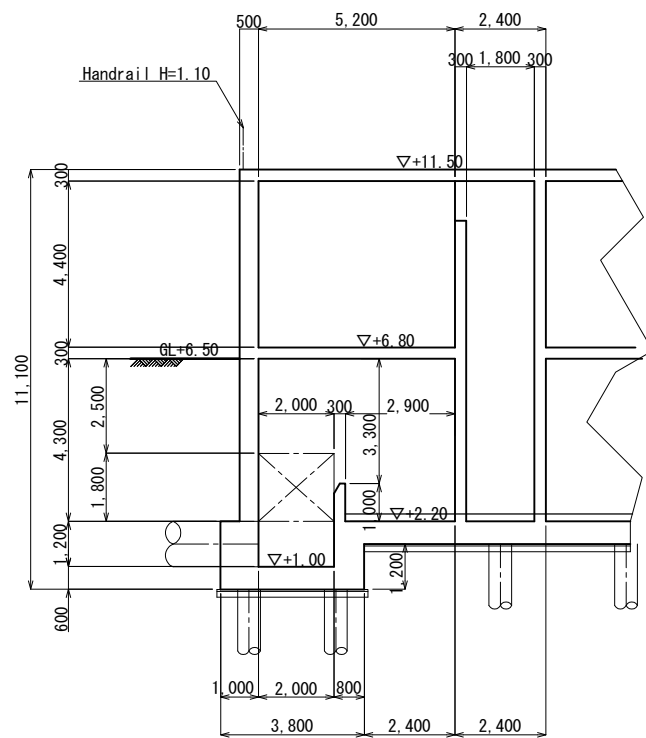
No.			
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Detail Plan (9/9)

Cross Section F-F $s=1:100$



Cross Section G-G $s=1:100$



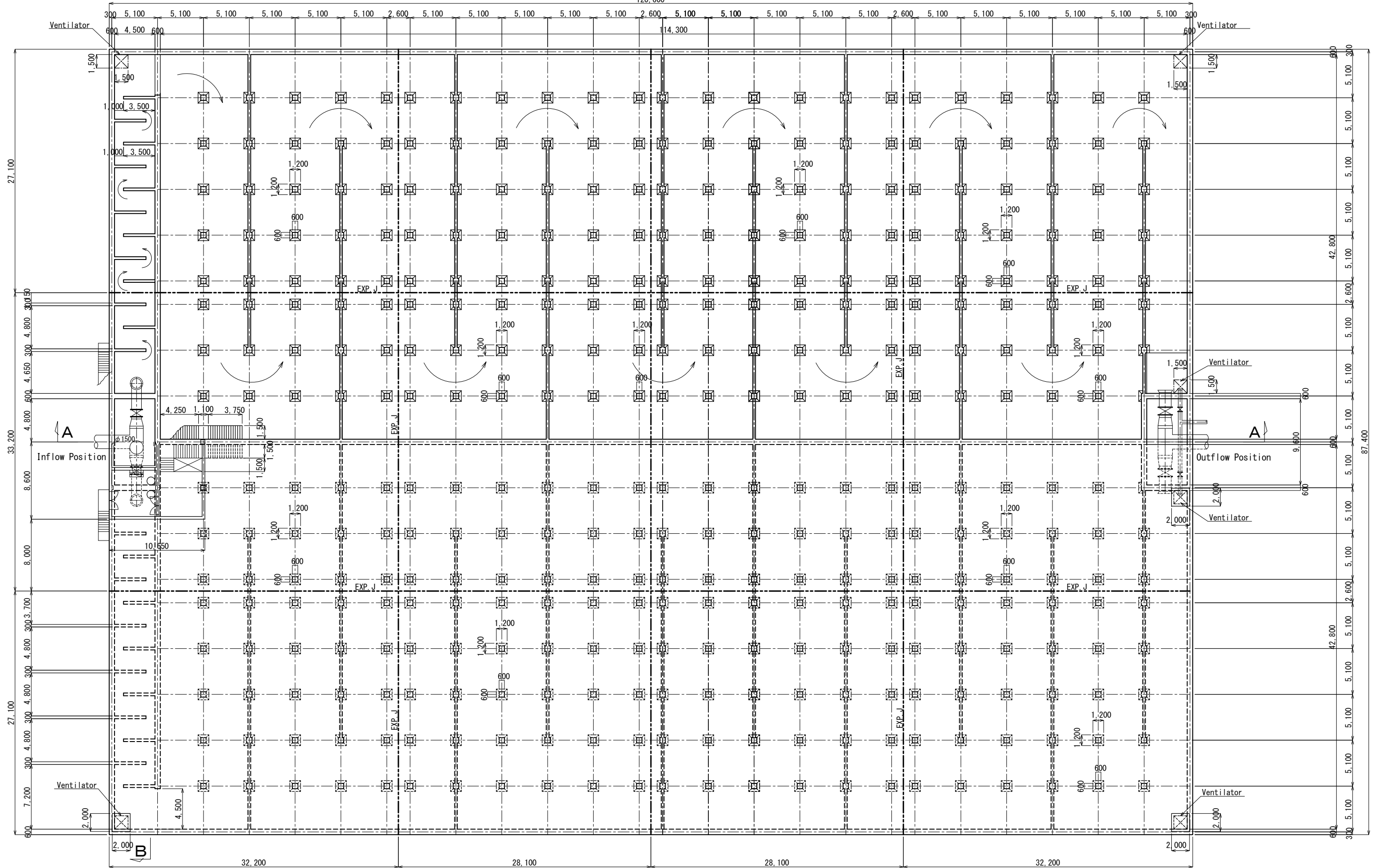
No.			
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Clear Water Reservoir (1/2) S=1:200

Plan

120.600

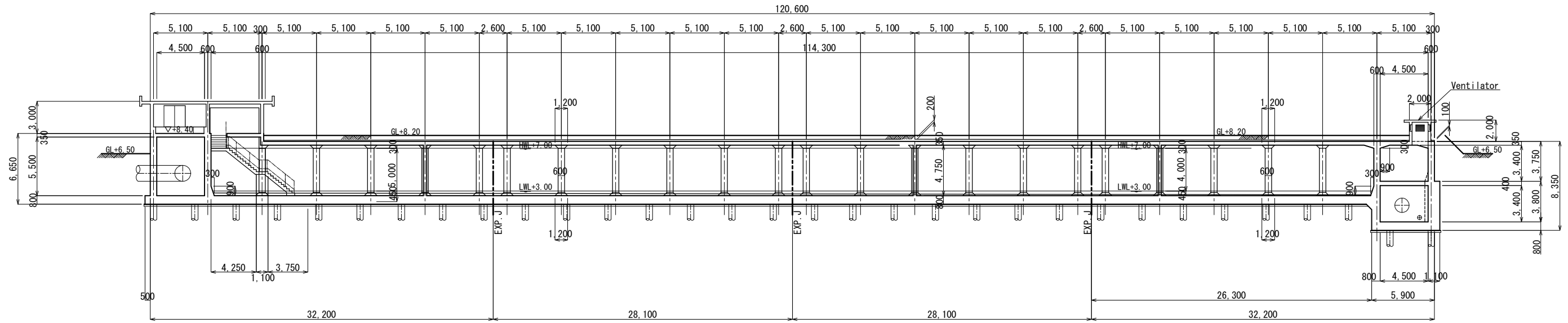
B



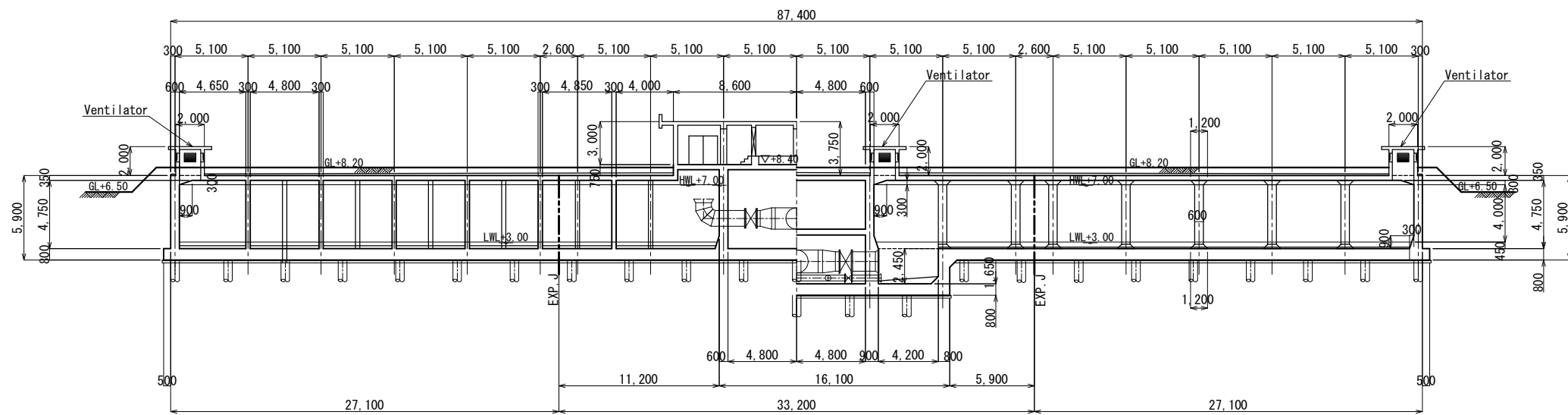
No.			
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Clear Water Reservoir (2/2) S=1:200

Cross Section A-A

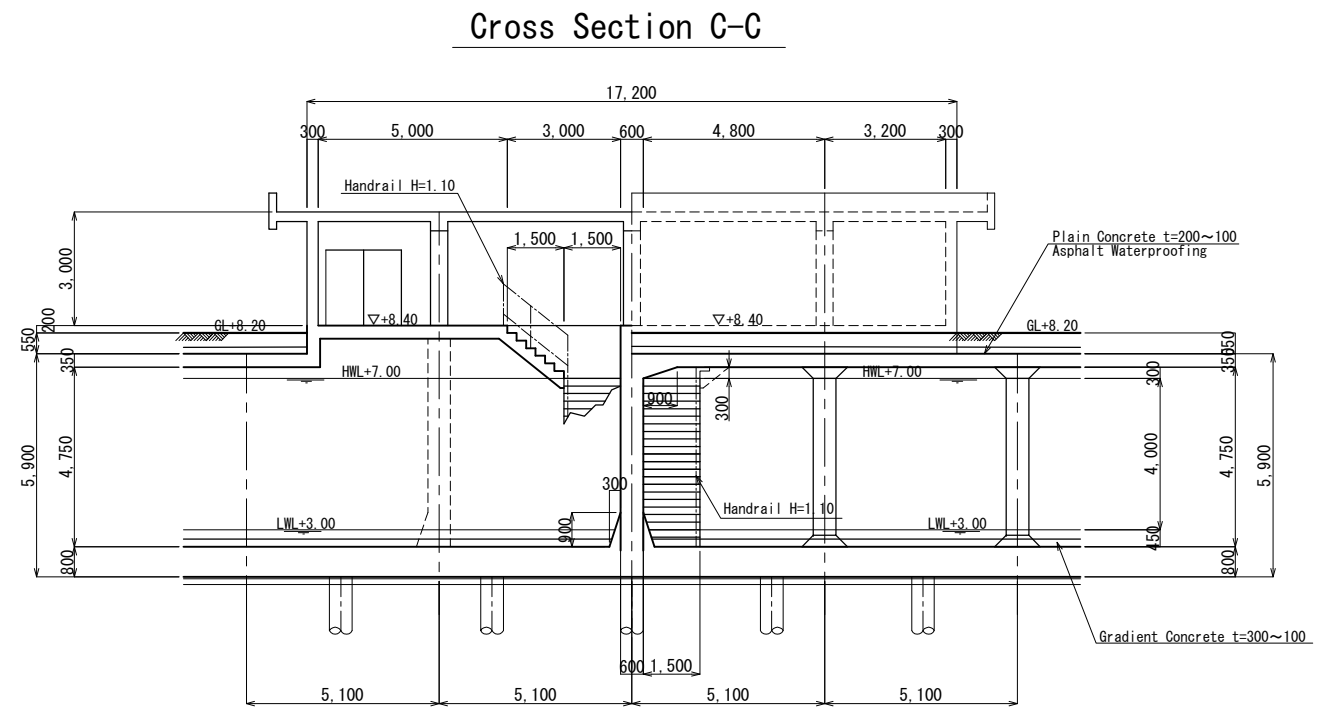
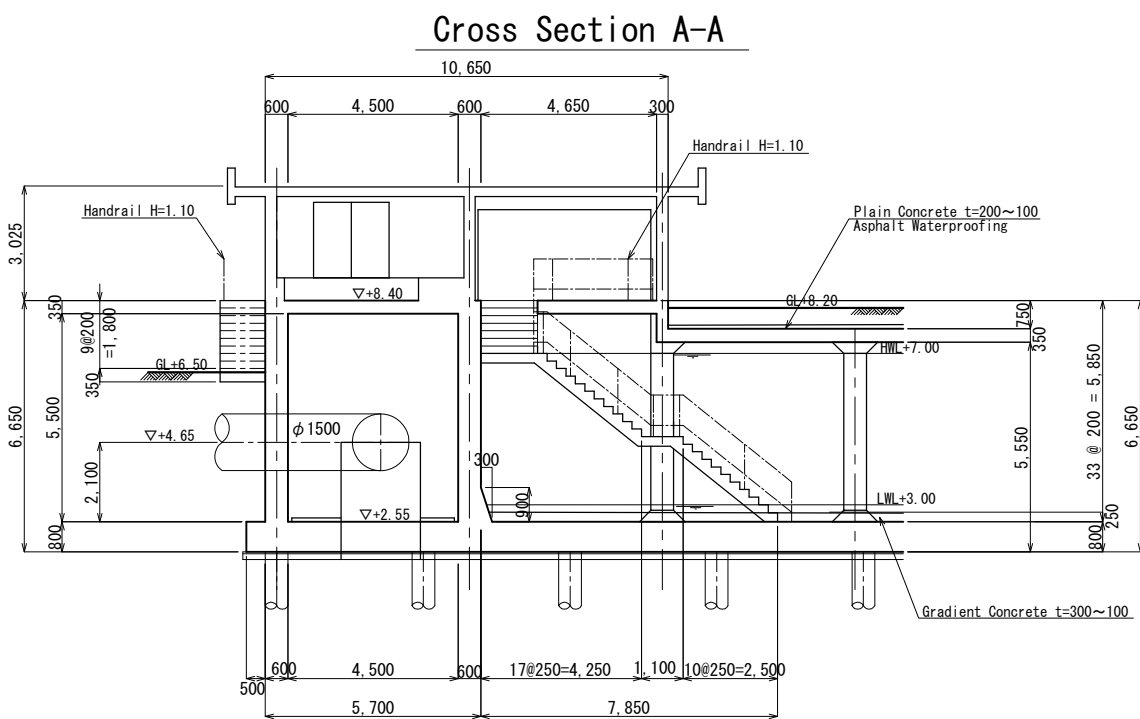
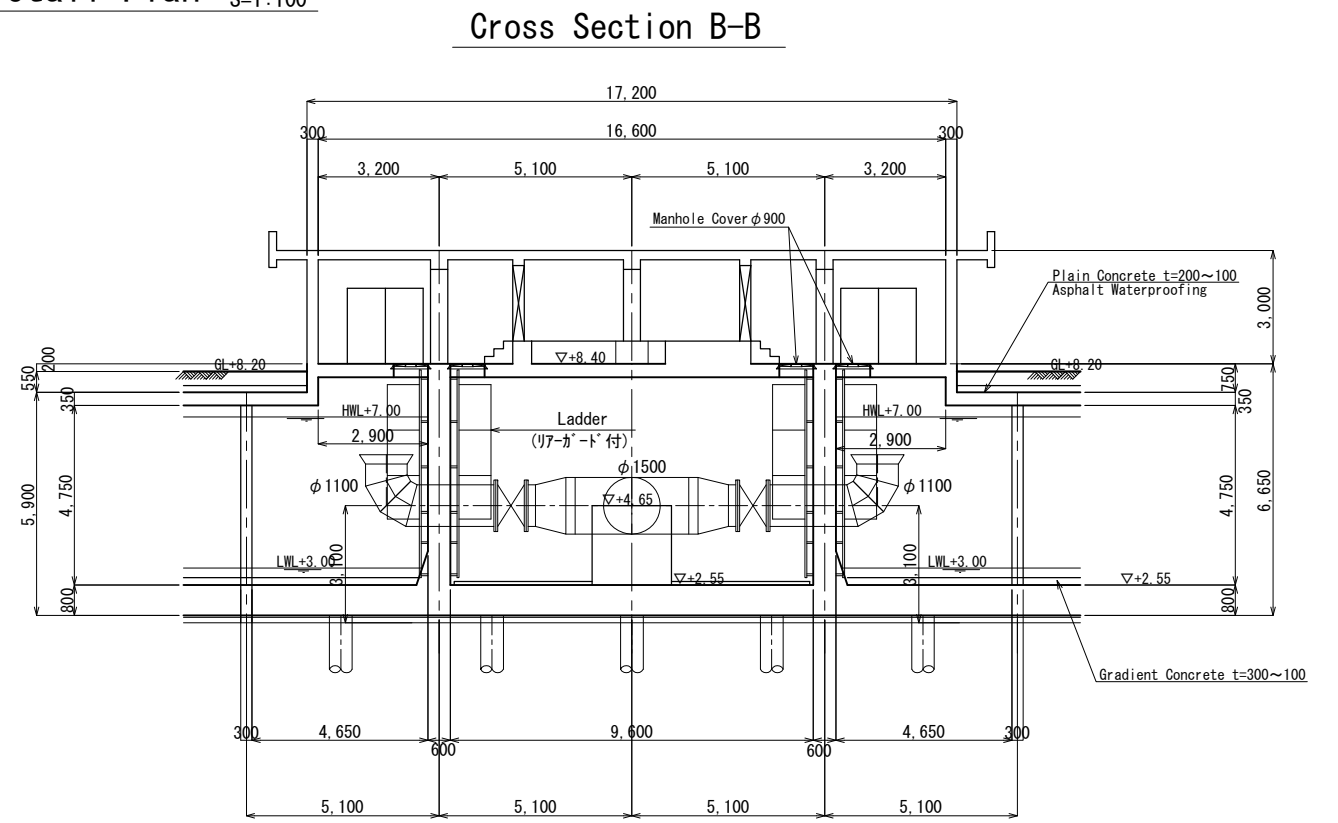
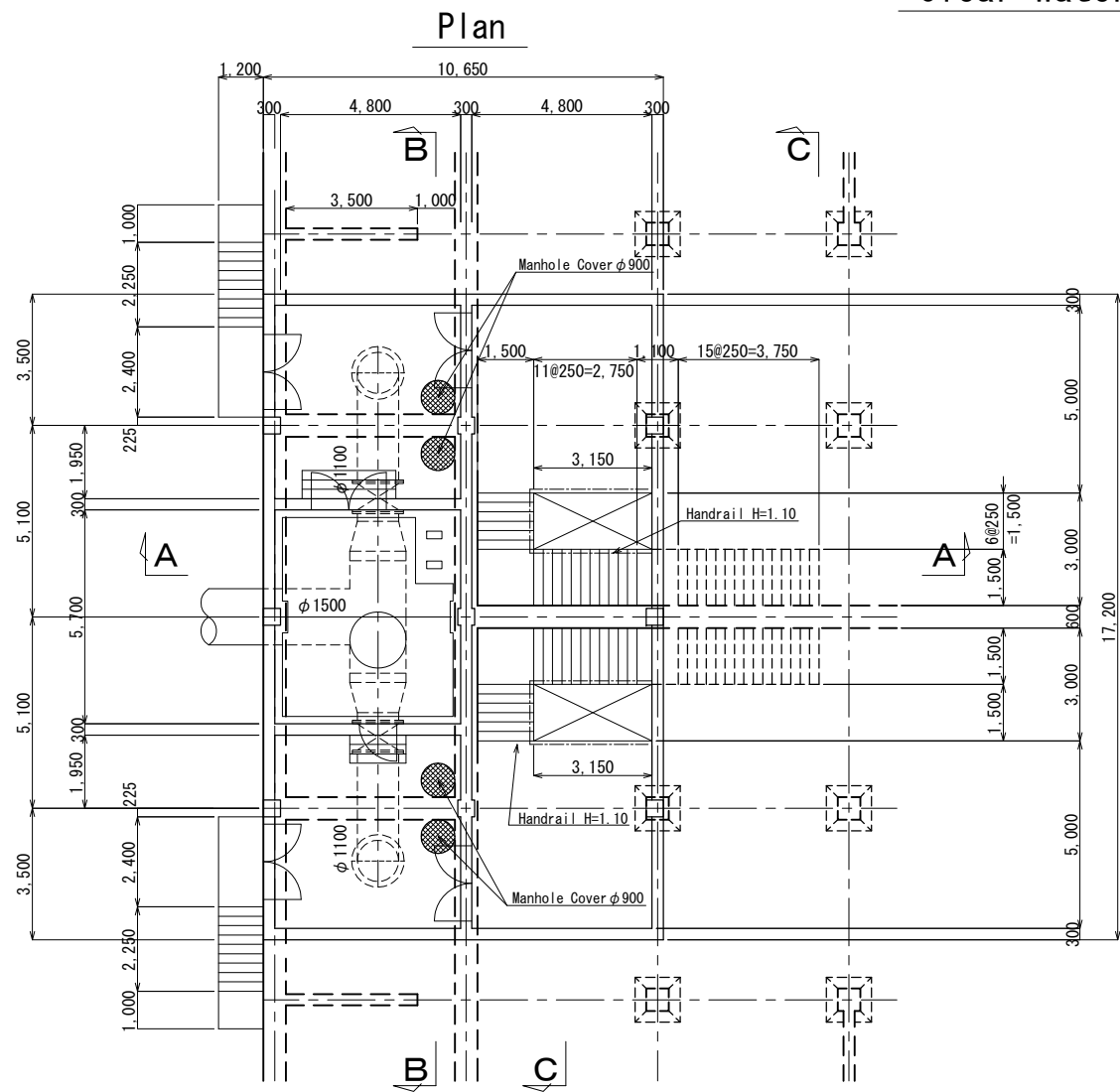


Cross Section B-B



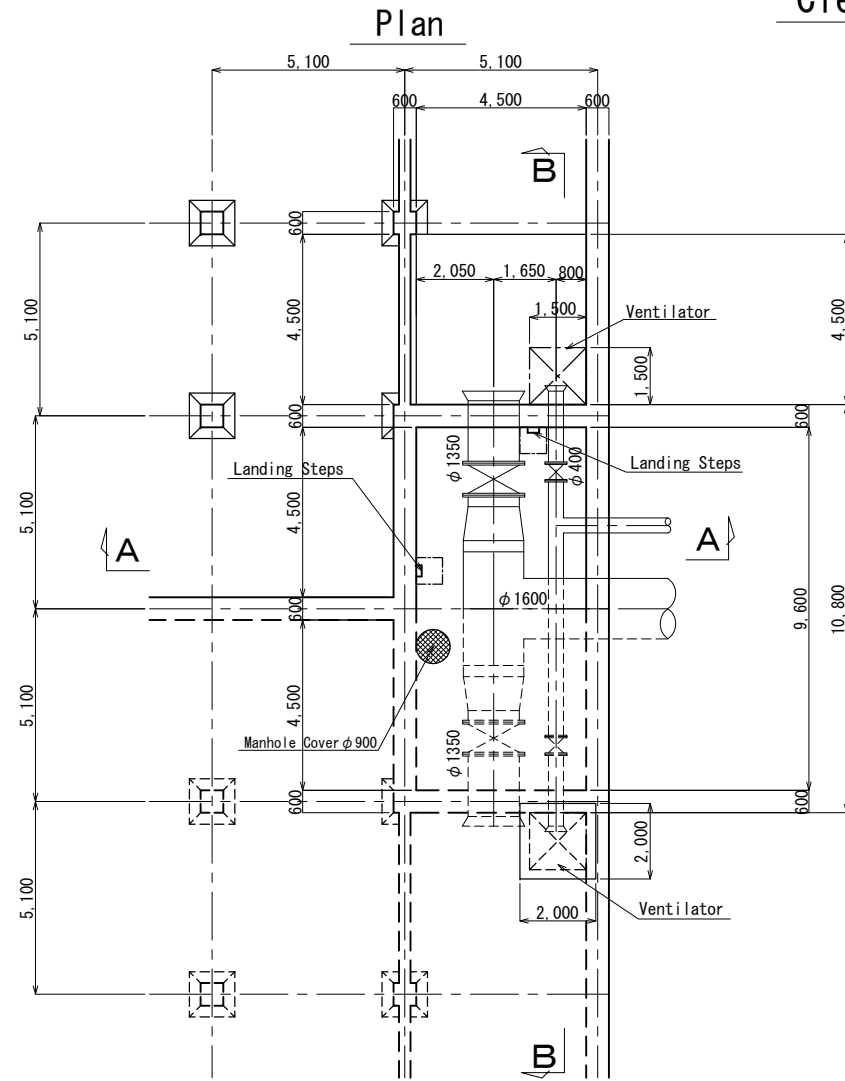
No.			
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Clear Water Reservoir Detail Plan (Inflow Part) S=1:100

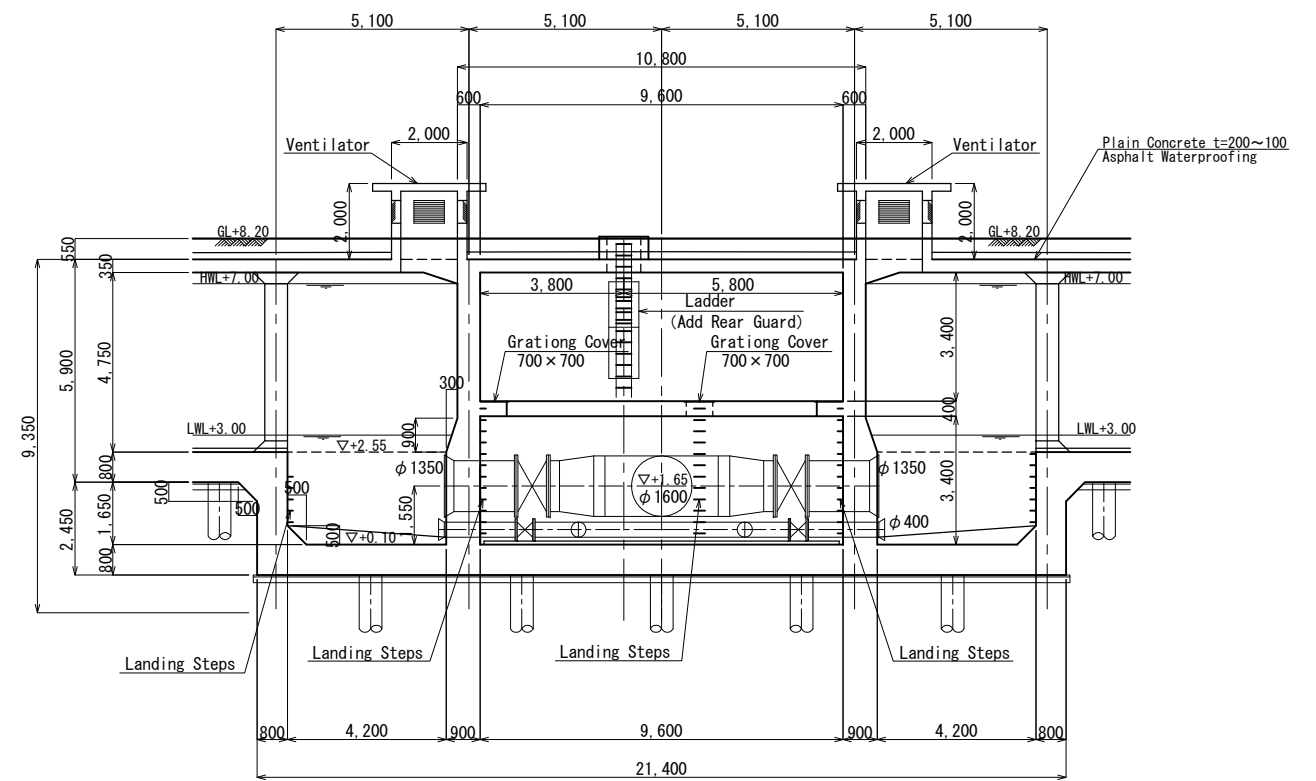


No.			
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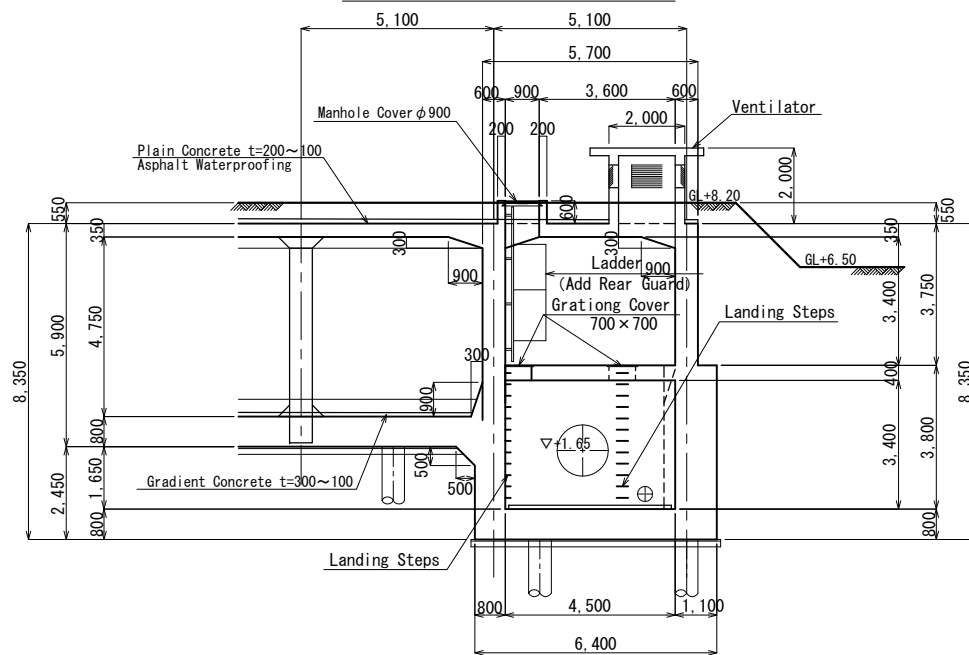
Clear Water Reservoir Detail Plan S=1:100
(Outflow Part)



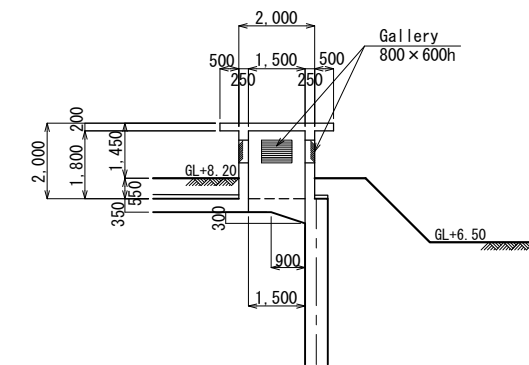
Cross Section B-B



Cross Section A-A

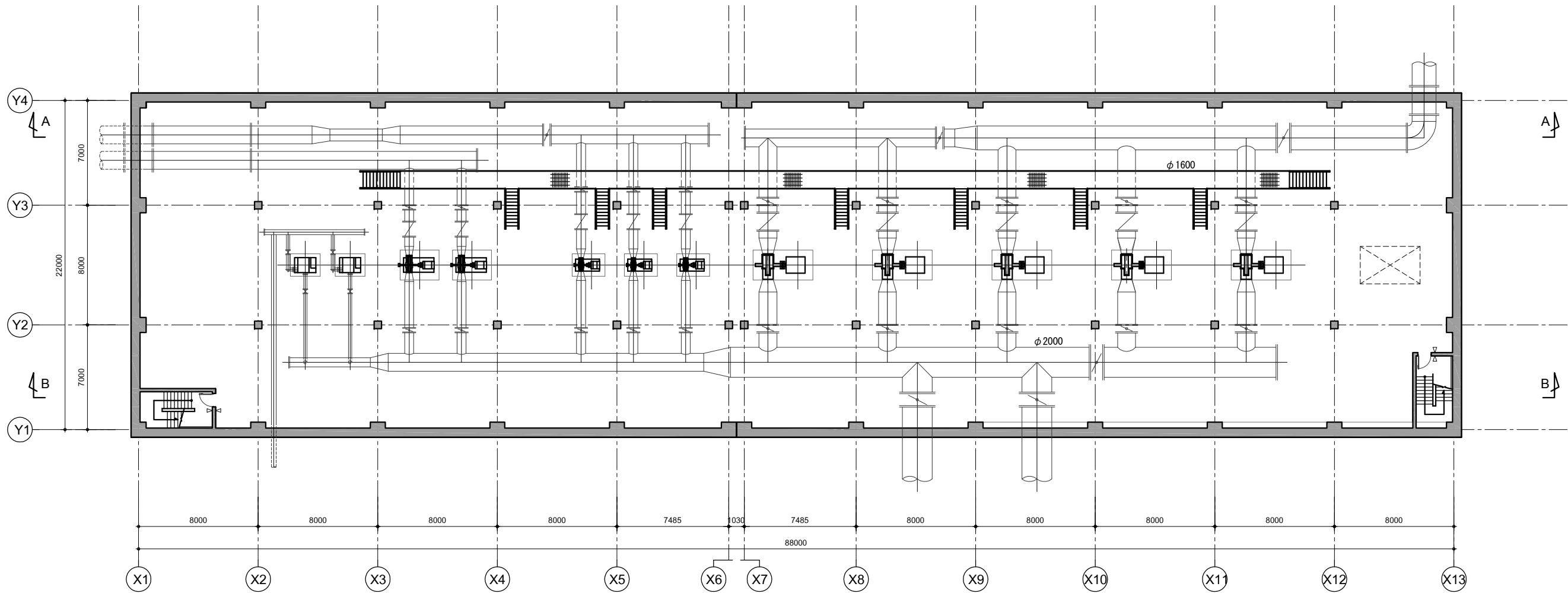


Detail Plan (Ventilator)



No.			
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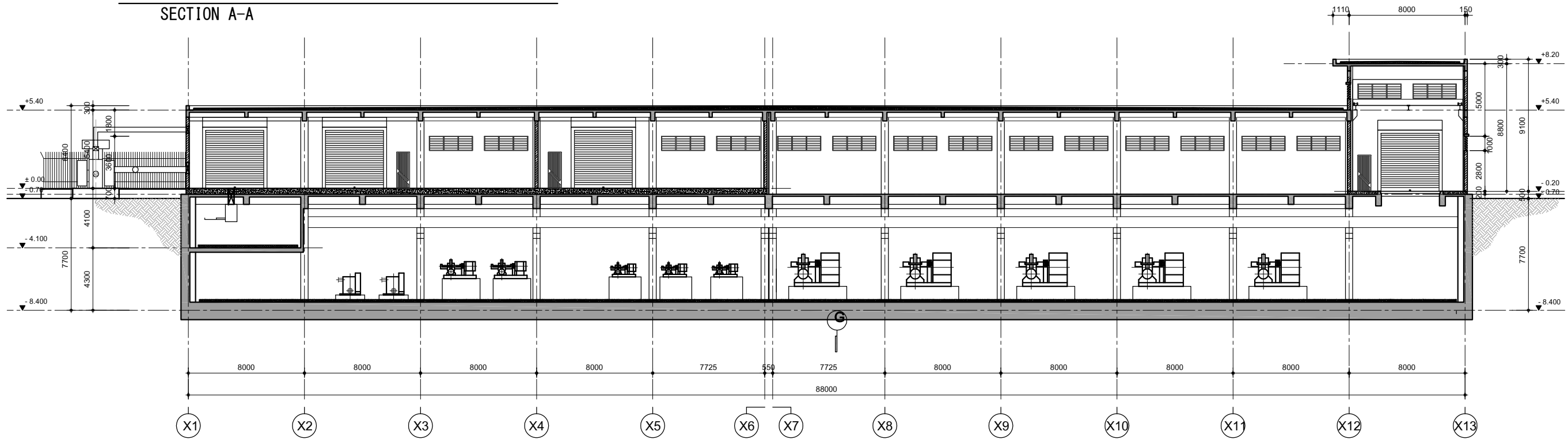
Water Transmission Pumping Station Plan



No.			

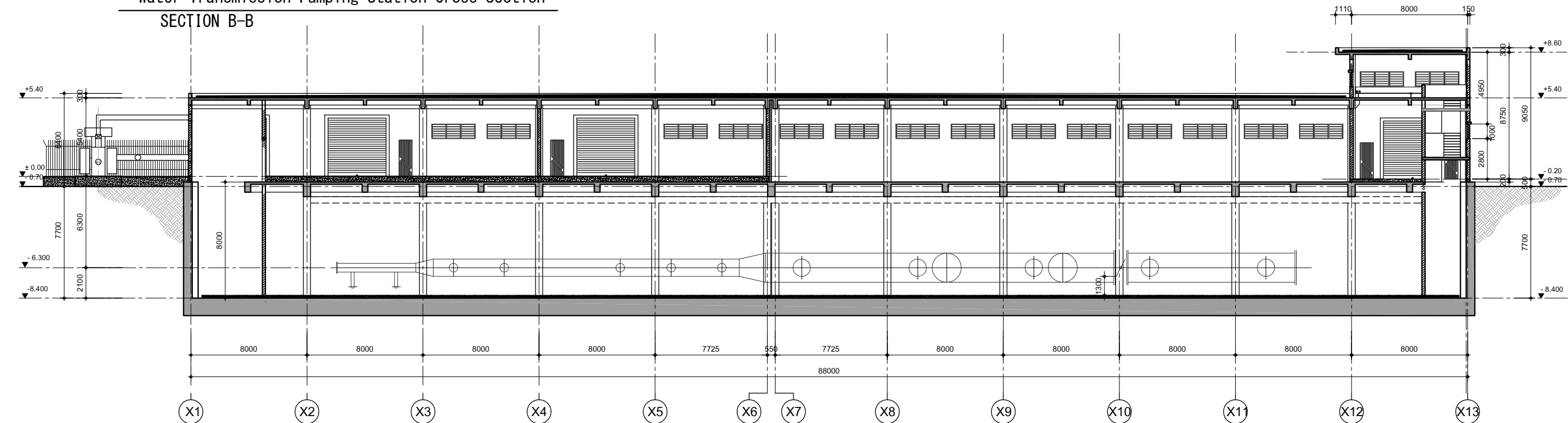
Water Transmission Pumping Station Cross Section

SECTION A-A



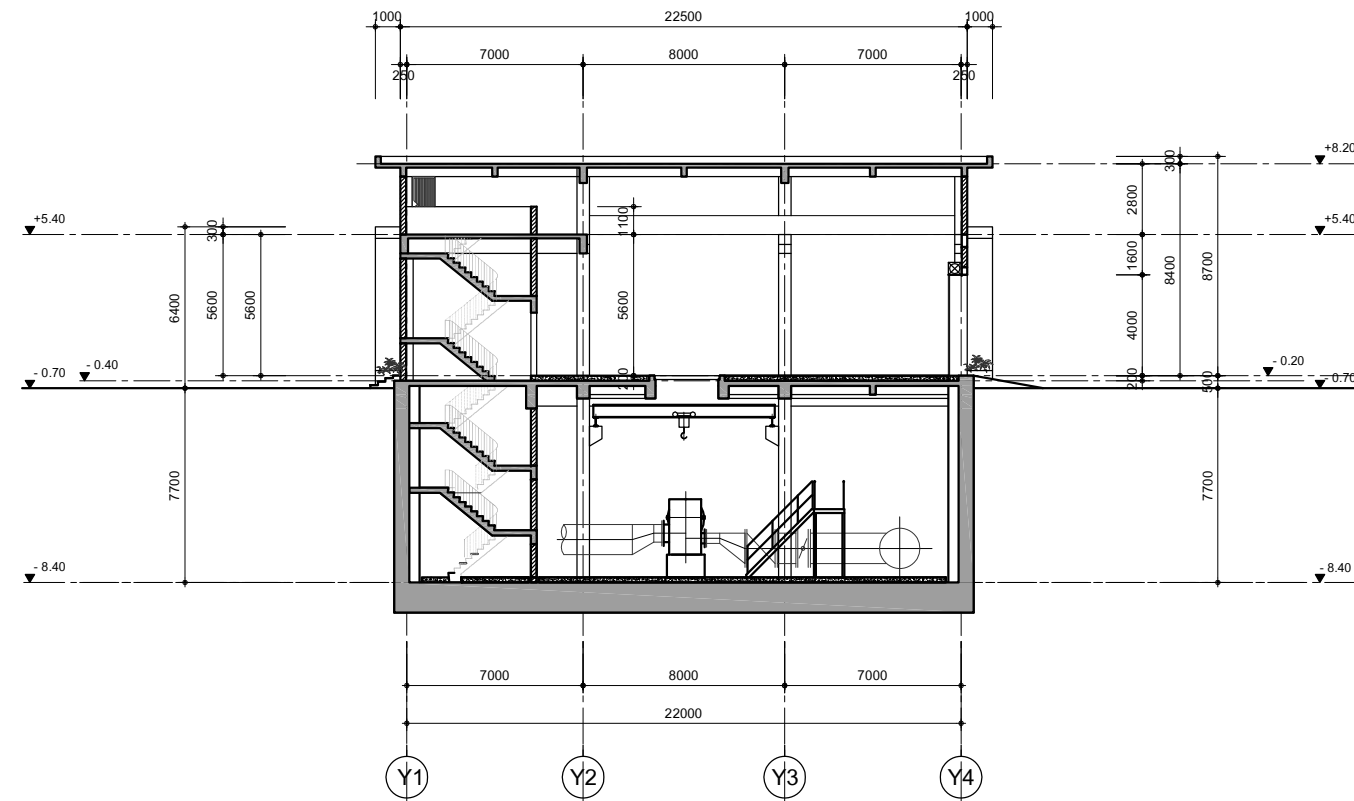
Water Transmission Pumping Station Cross Section

SECTION B-B

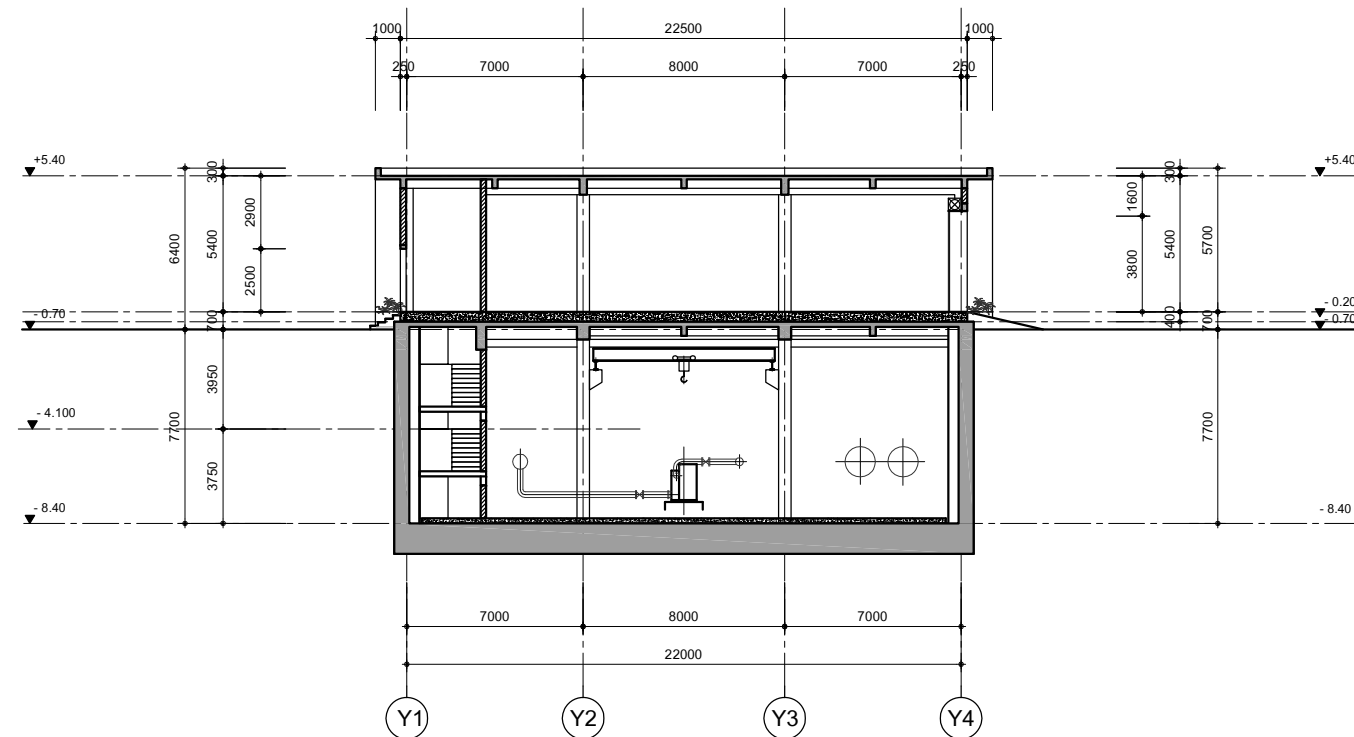


No.			
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Water Transmission Pumping Station Cross Section
SECTION C-C



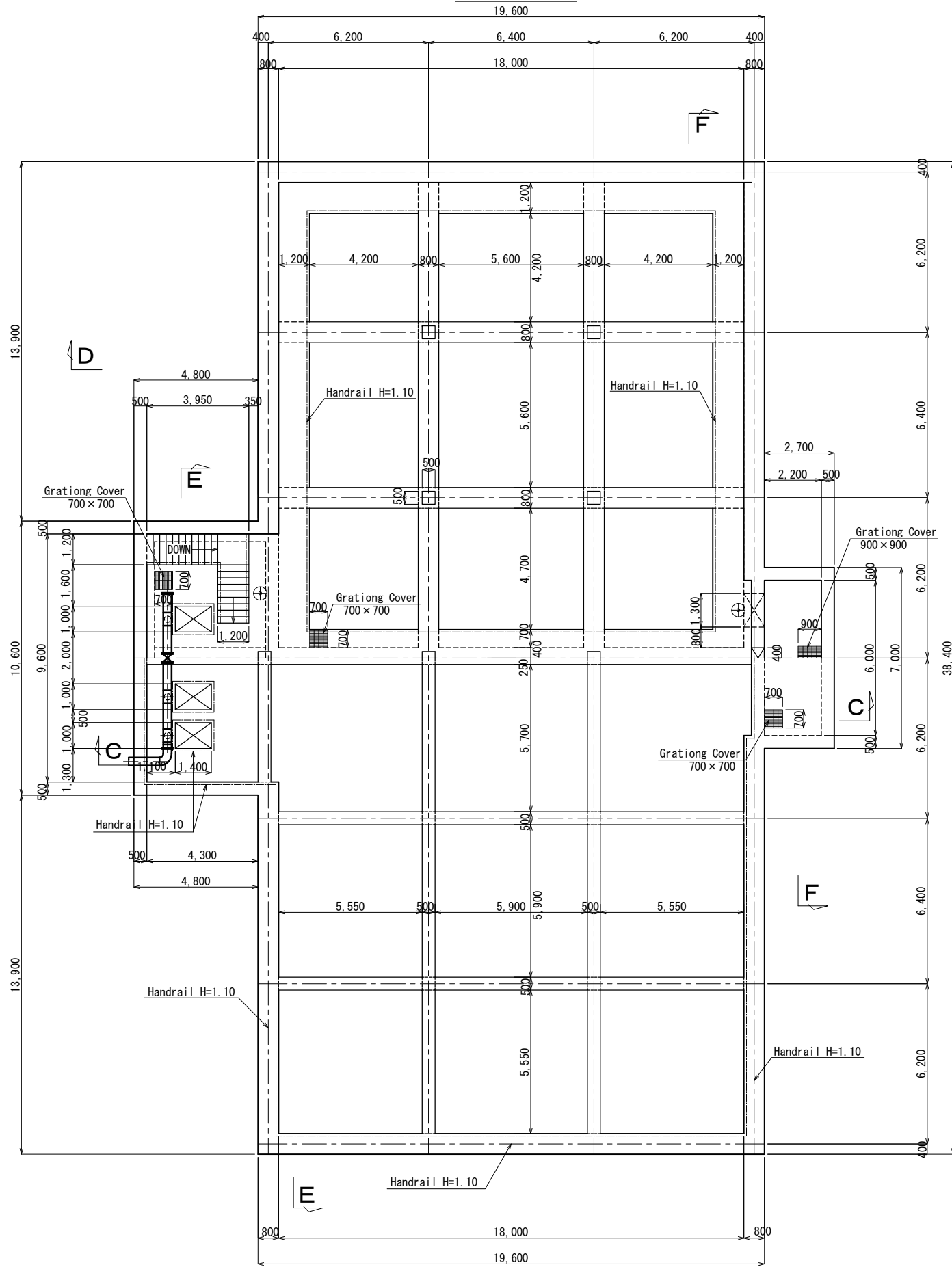
Water Transmission Pumping Station Cross Section
SECTION D-D



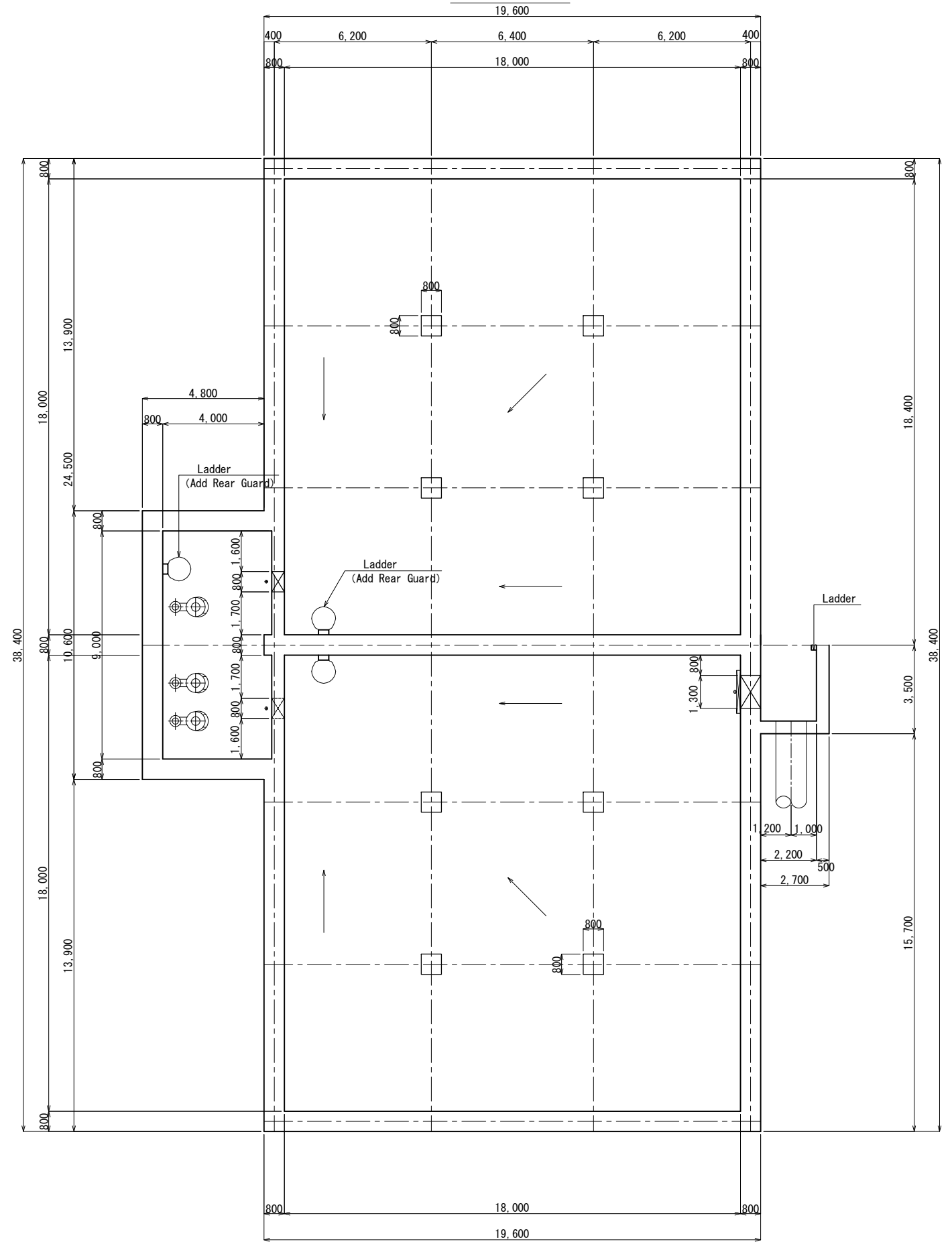
No.			

Wash Water Drainage Basin

Plan A-A

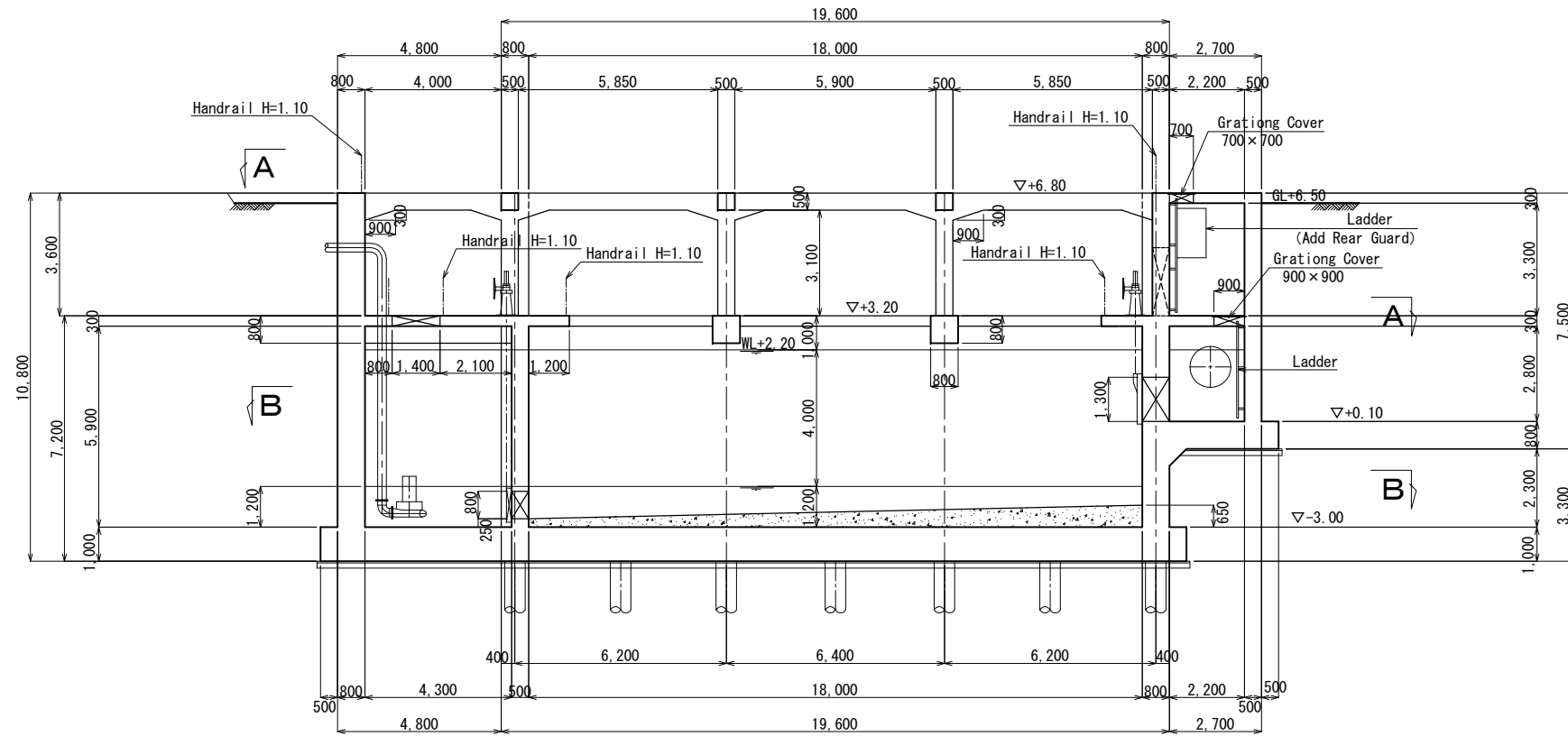


Plan B-B

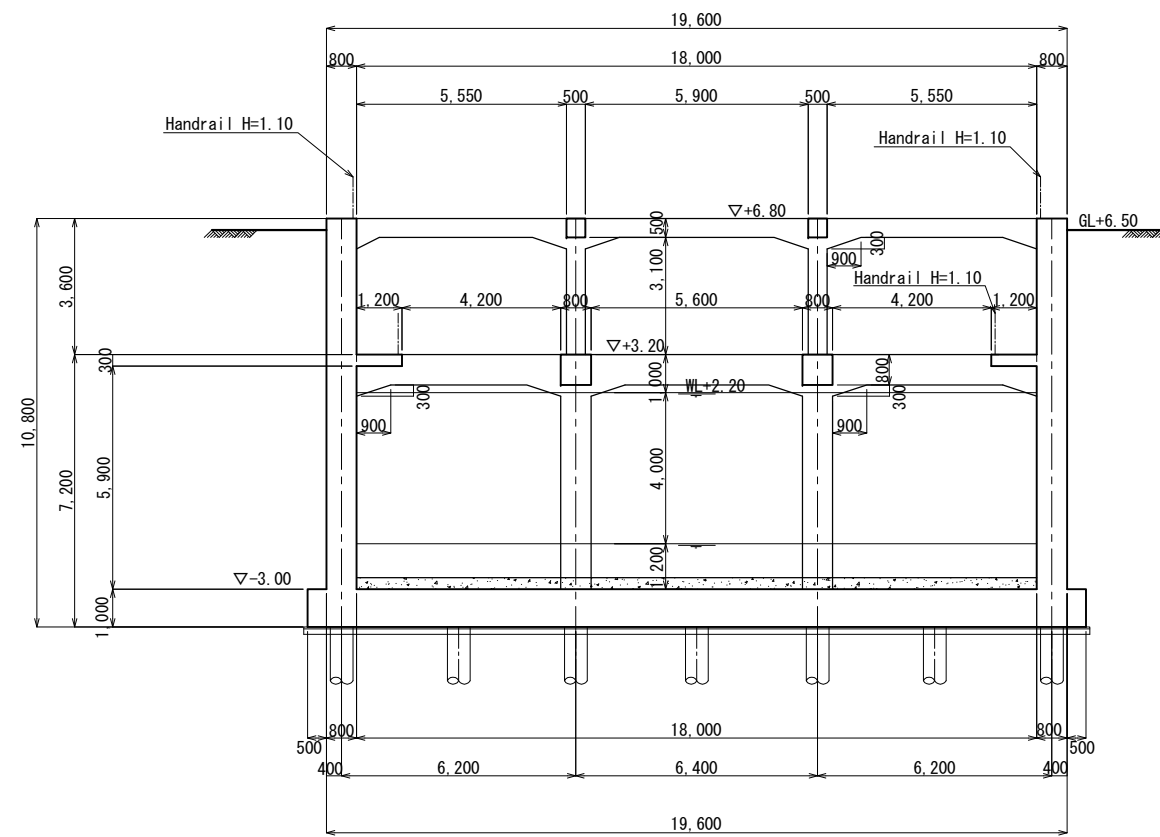


No.			
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Cross Section C-C

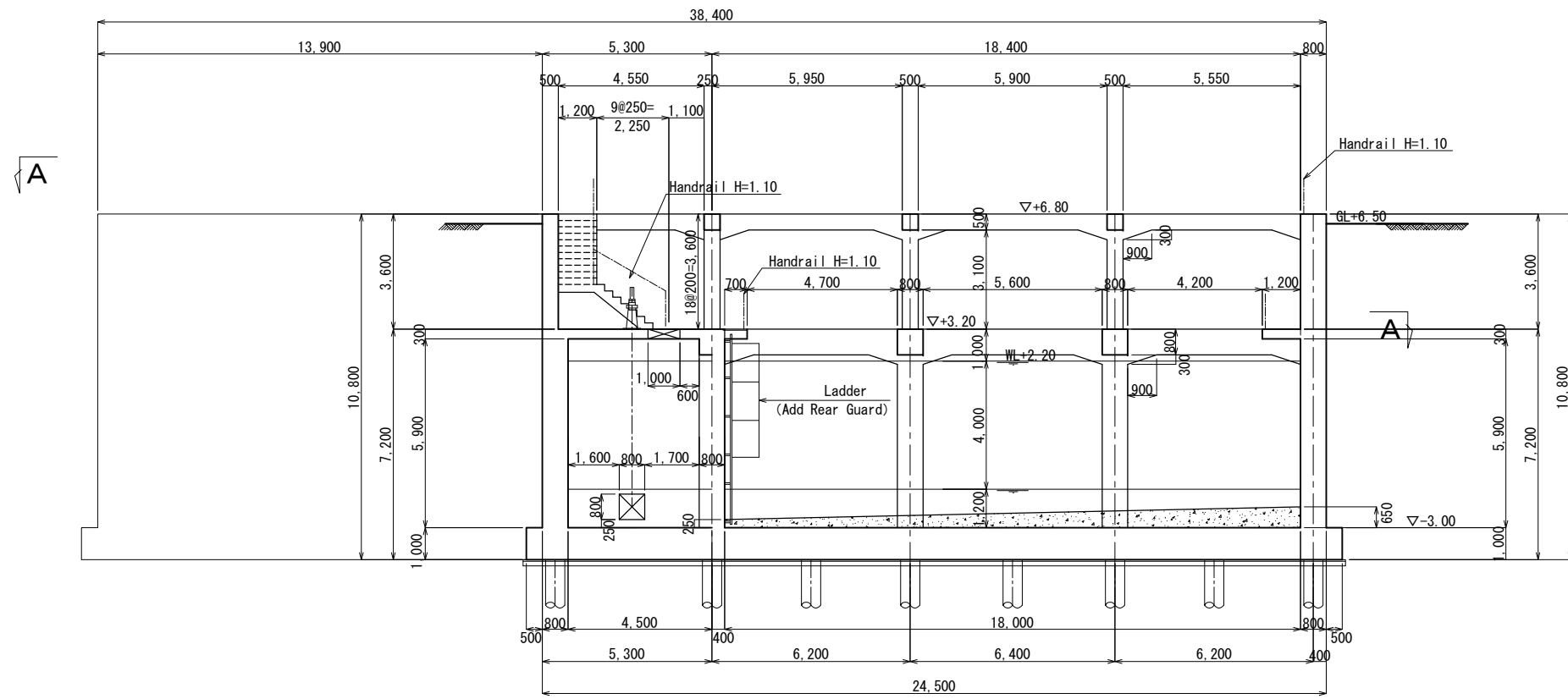


Cross Section D-D

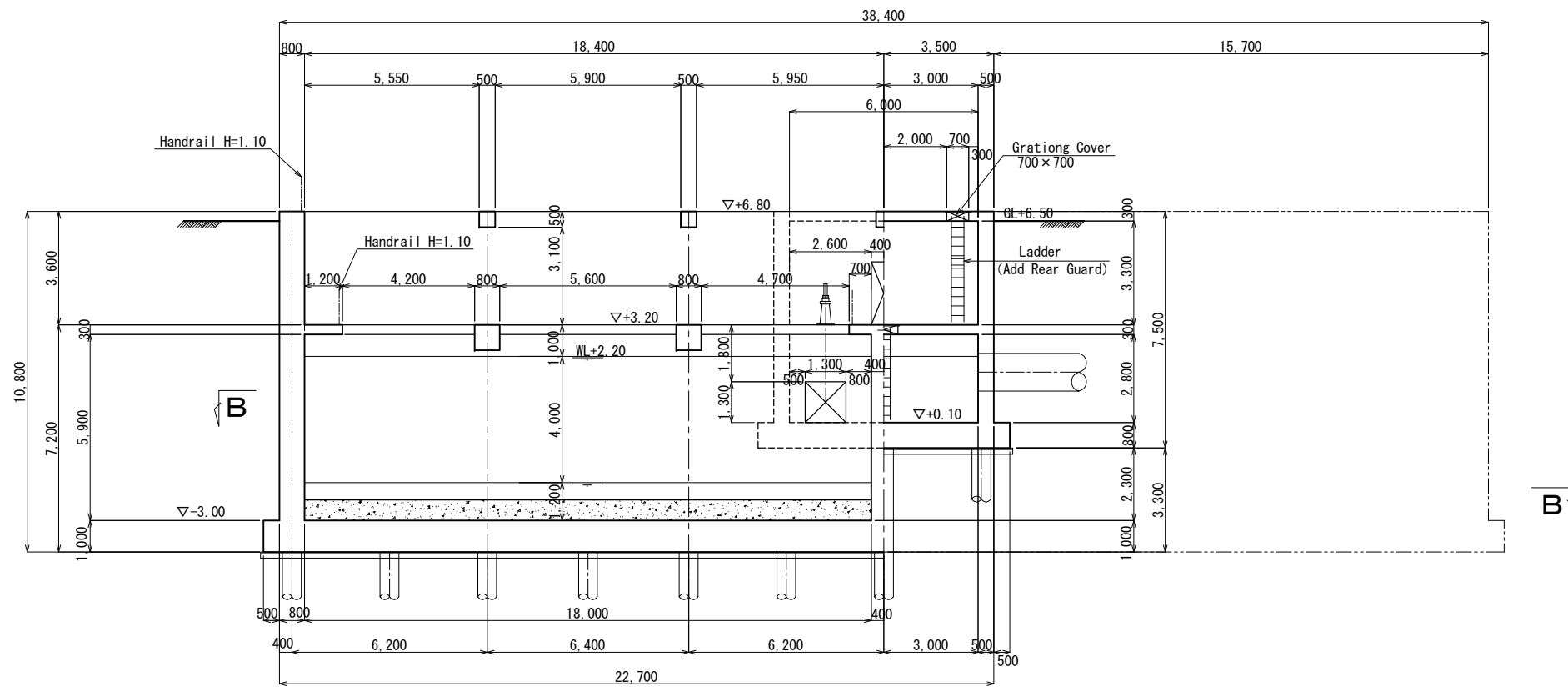


No.			
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Cross Section E-E

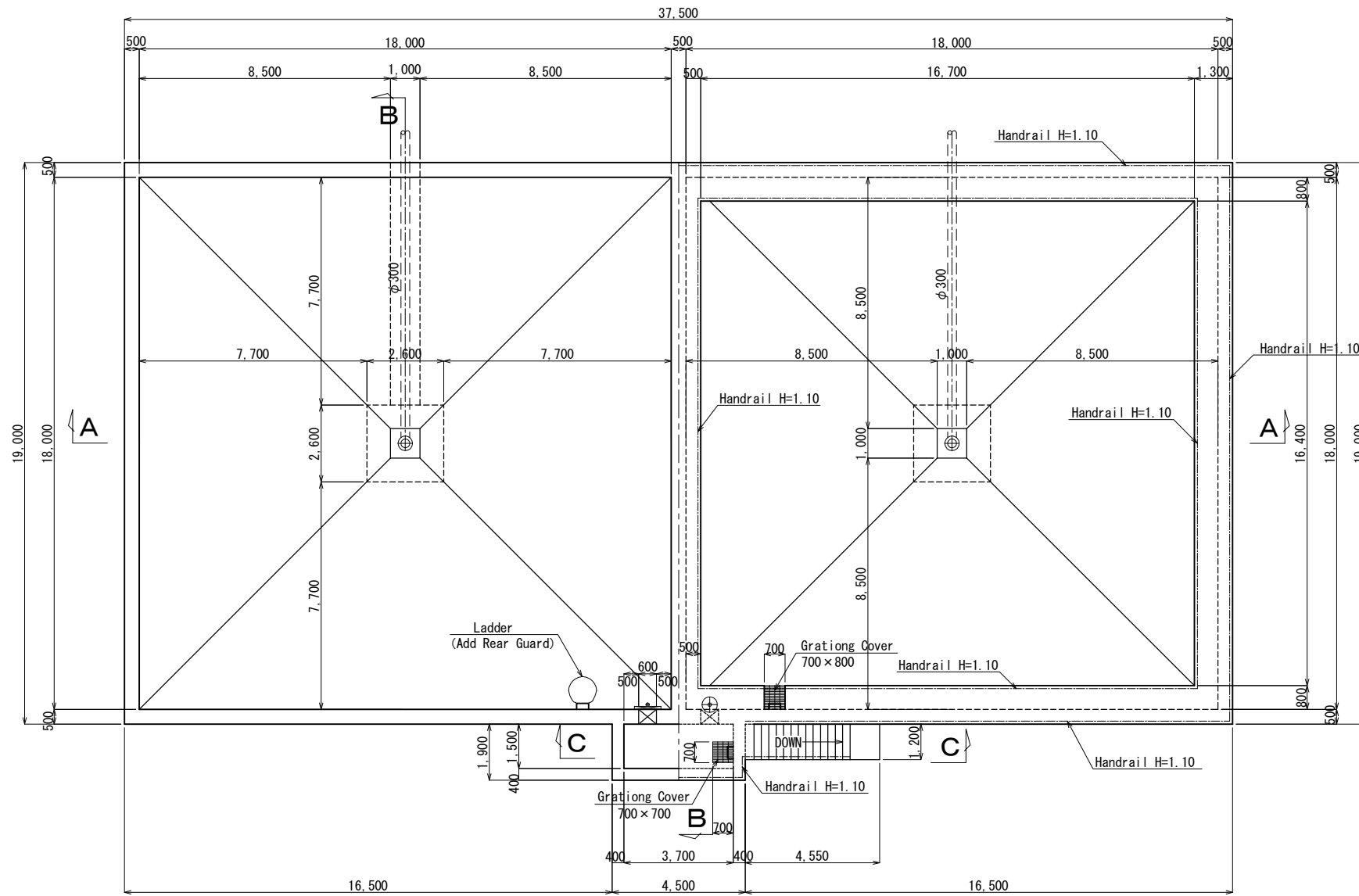


Cross Section F-F

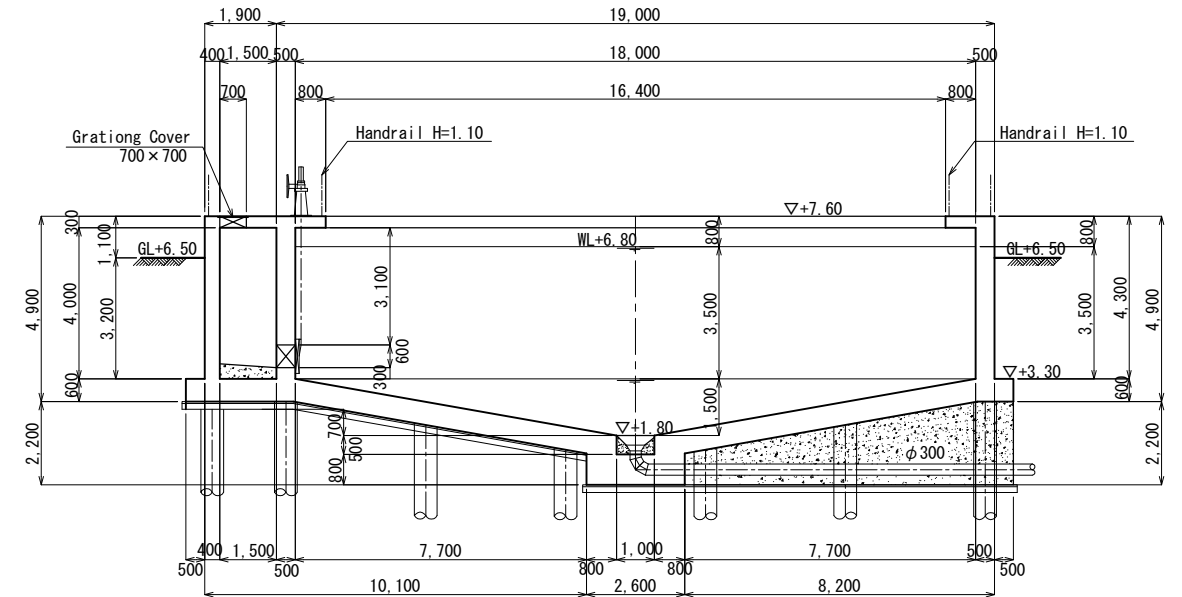


No.			
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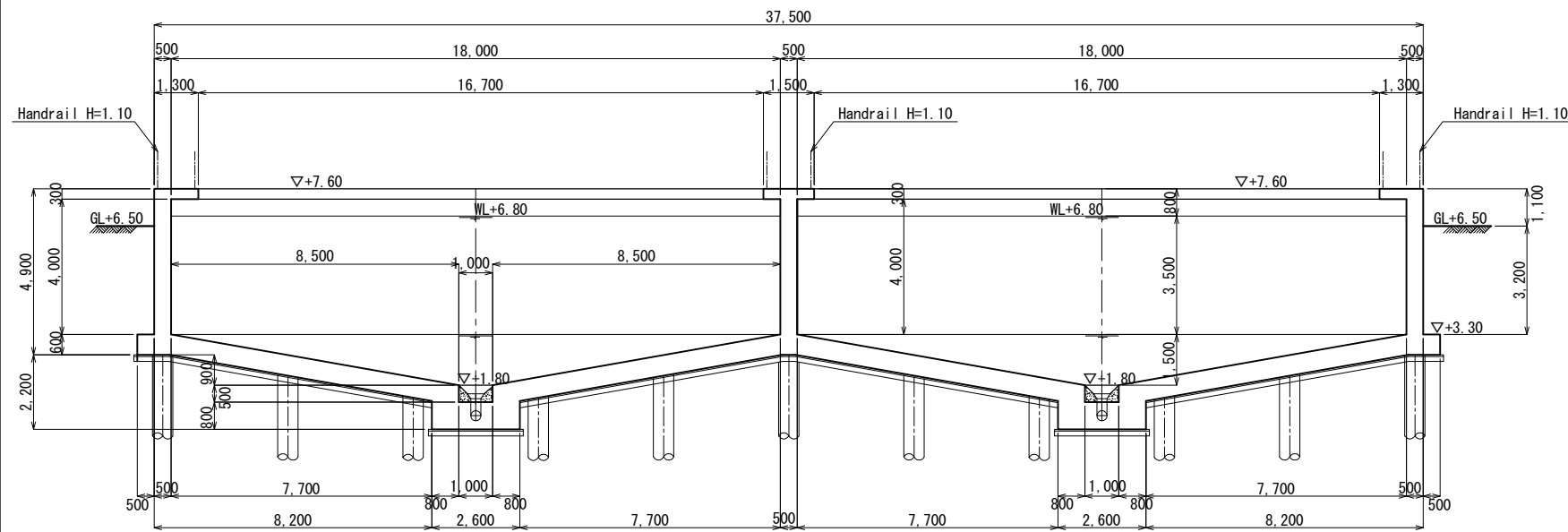
Sludge Basin Plan



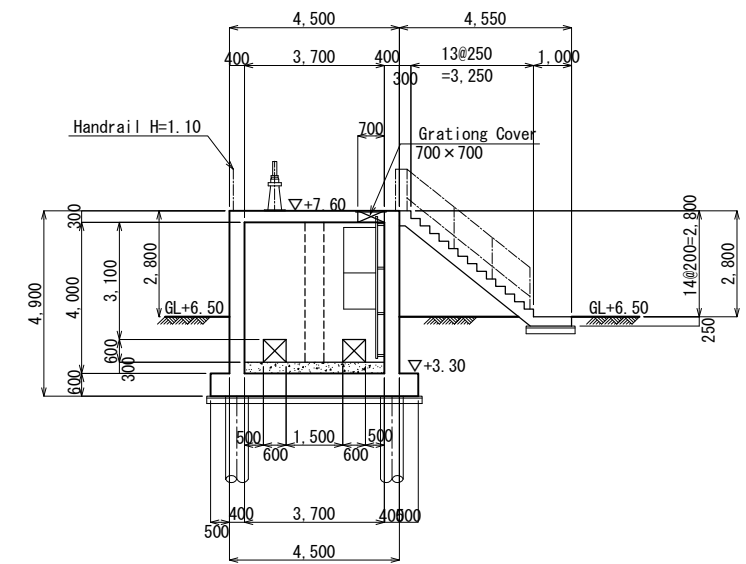
Cross Section B-B



Cross Section A-A

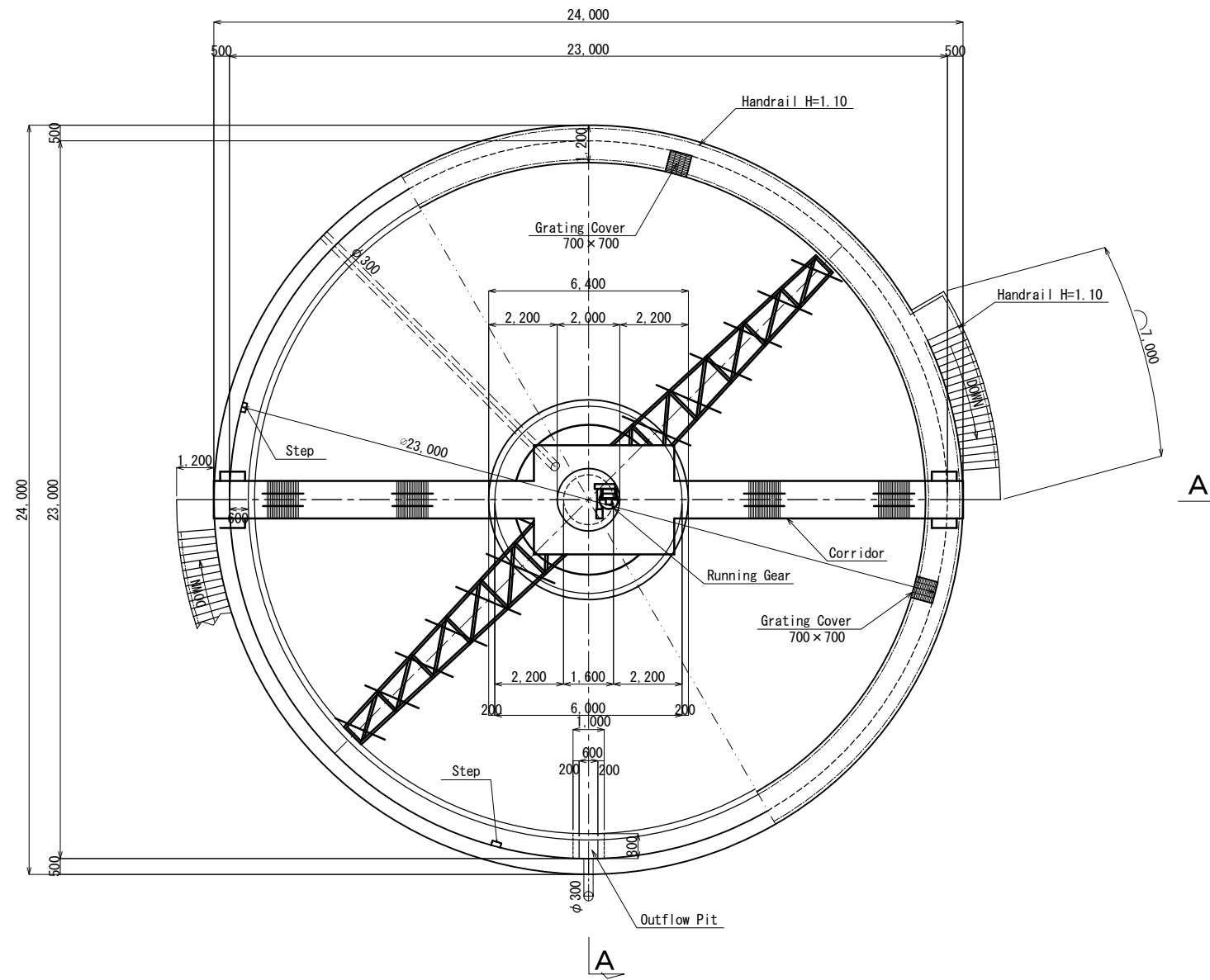


Cross Section C-C



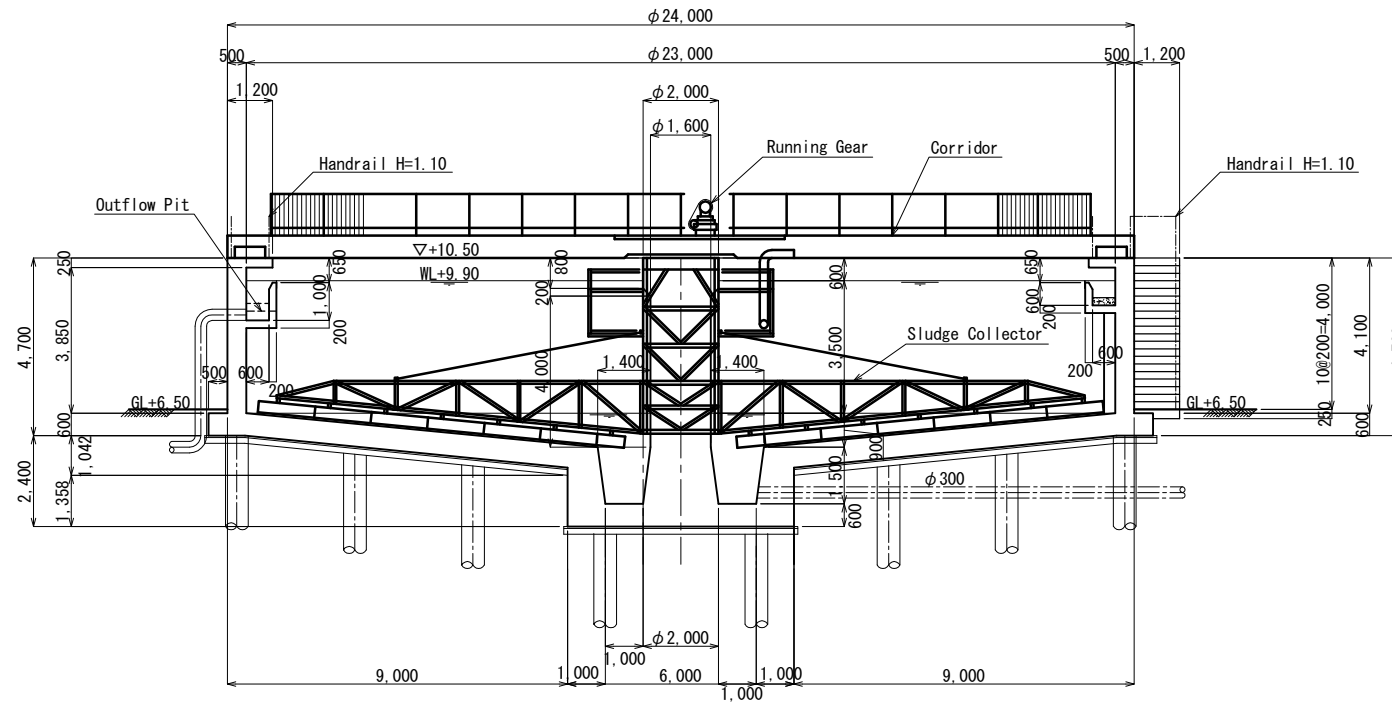
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Thickener Plan

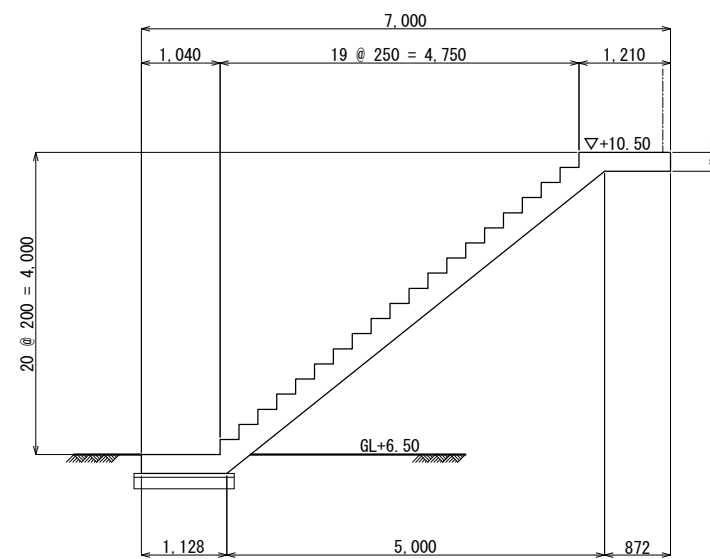


No.			

Cross Section A-A

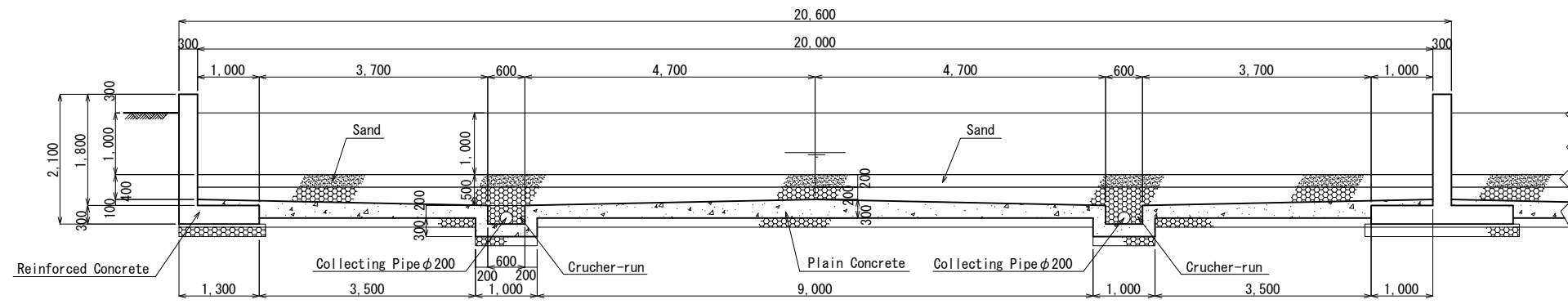


Cross Section B-B S=1:50



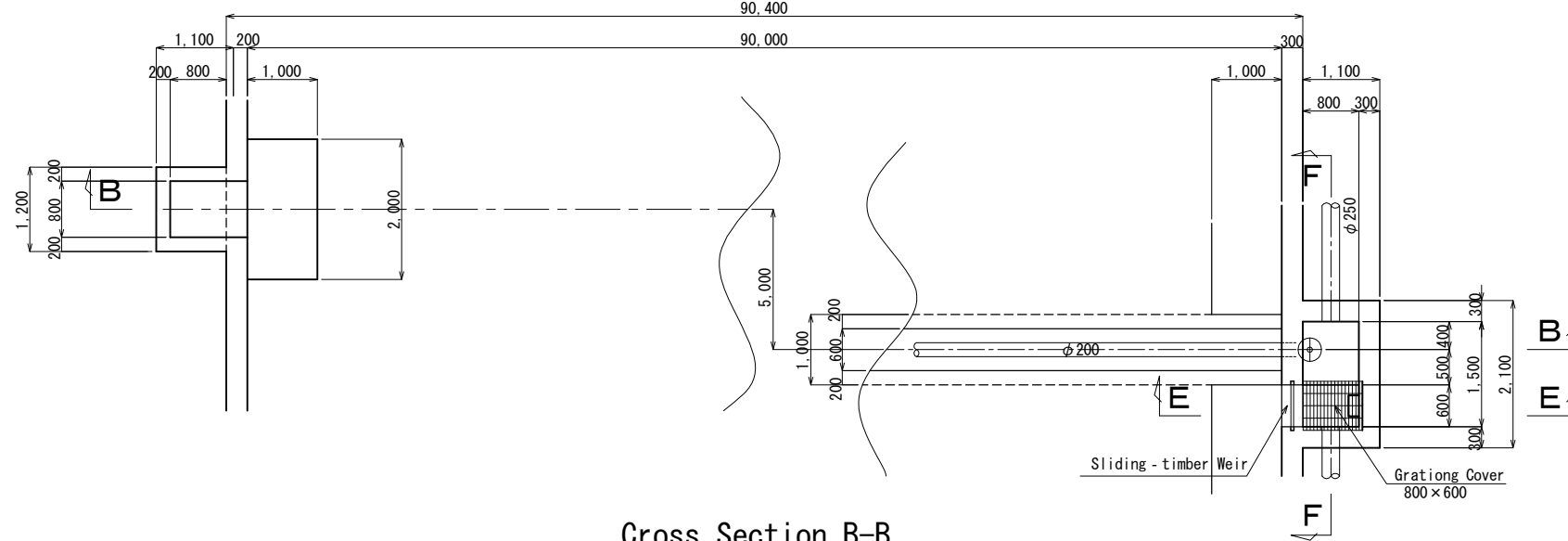
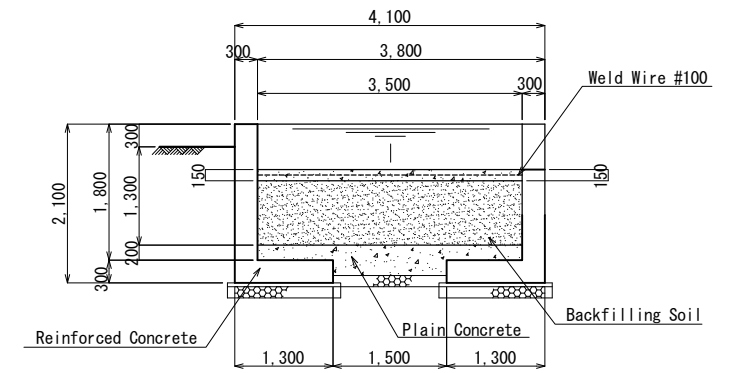
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Cross Section A-A



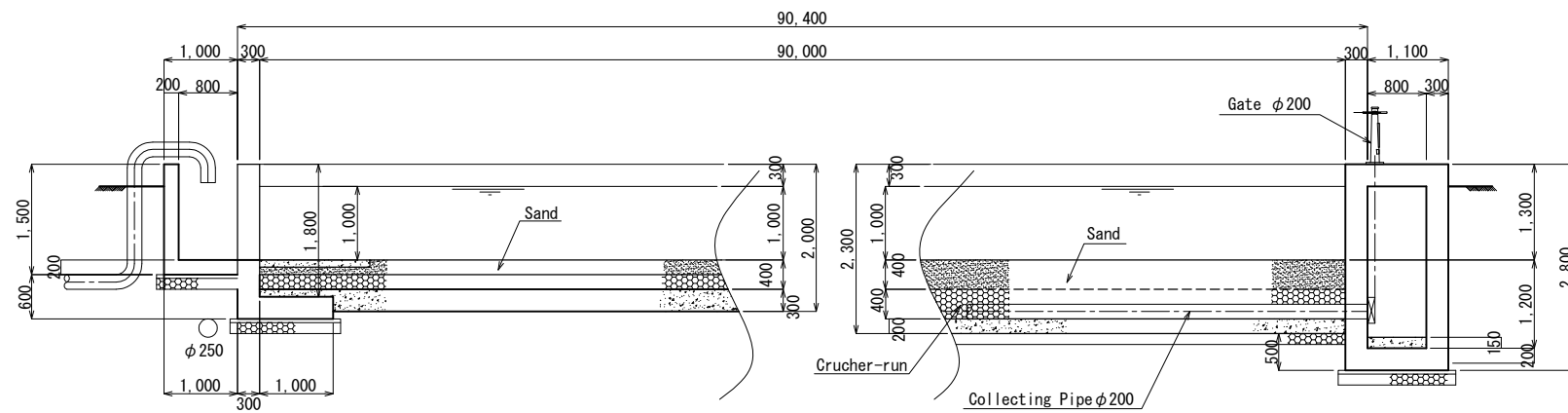
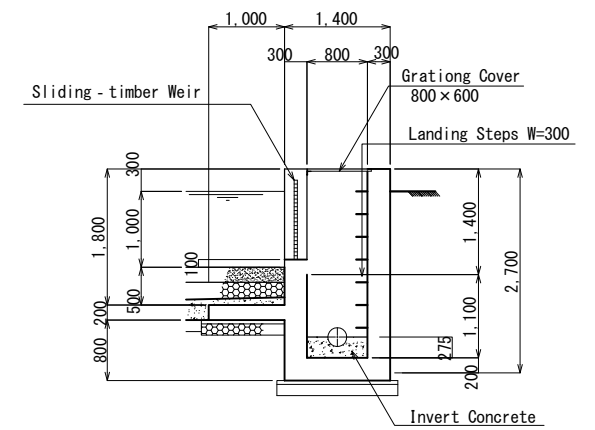
Plan

Cross Section C-C



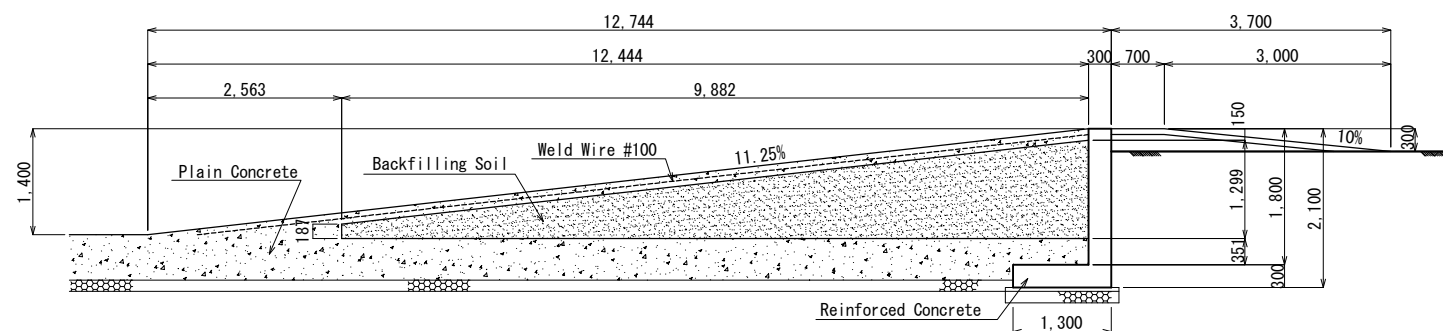
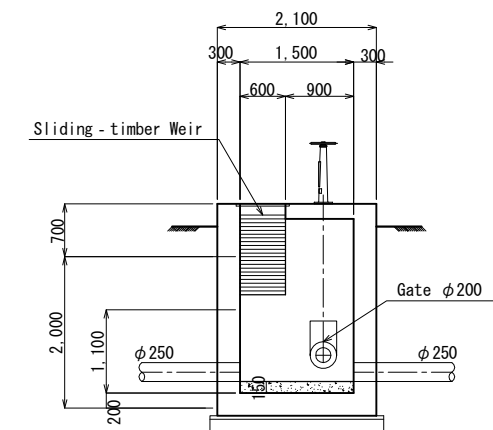
Cross Section B-B

Cross Section E-E



Cross Section D-D

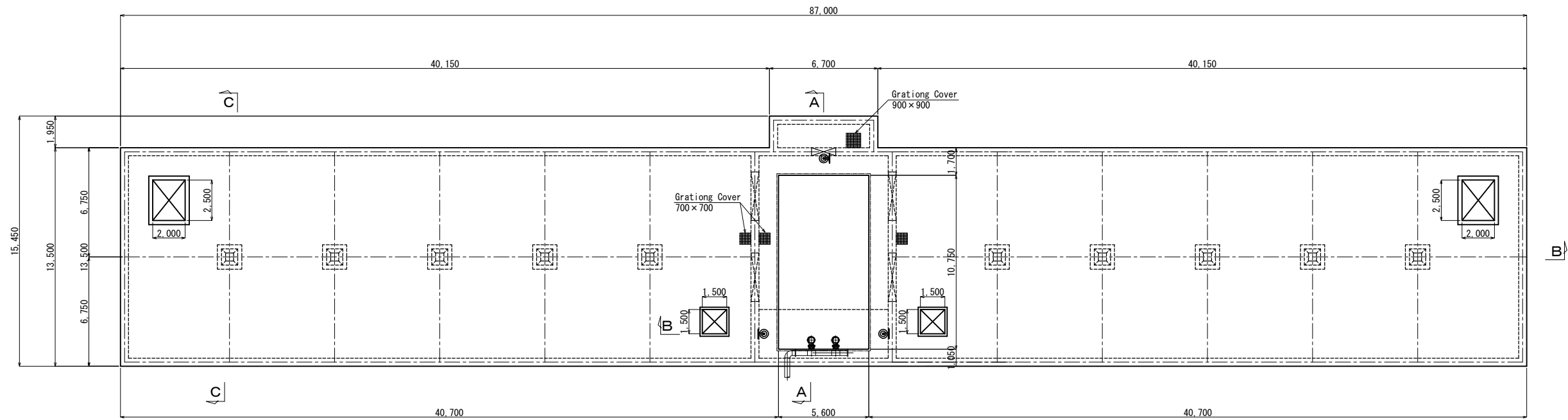
Cross Section F-F



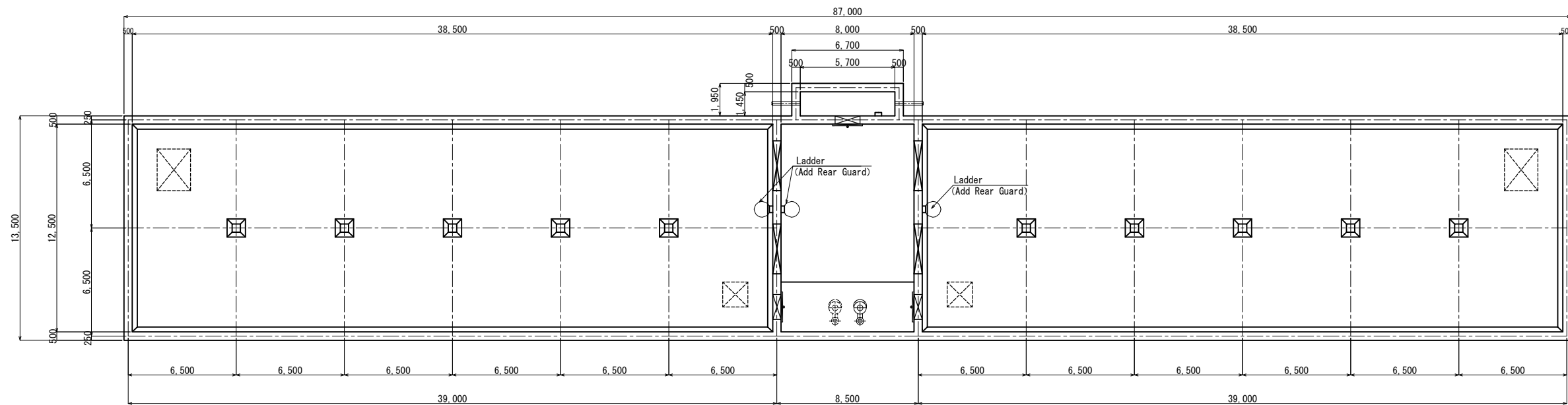
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Sun Drying Bed Drainage Pumping Well Plan

Upper Floor Plan



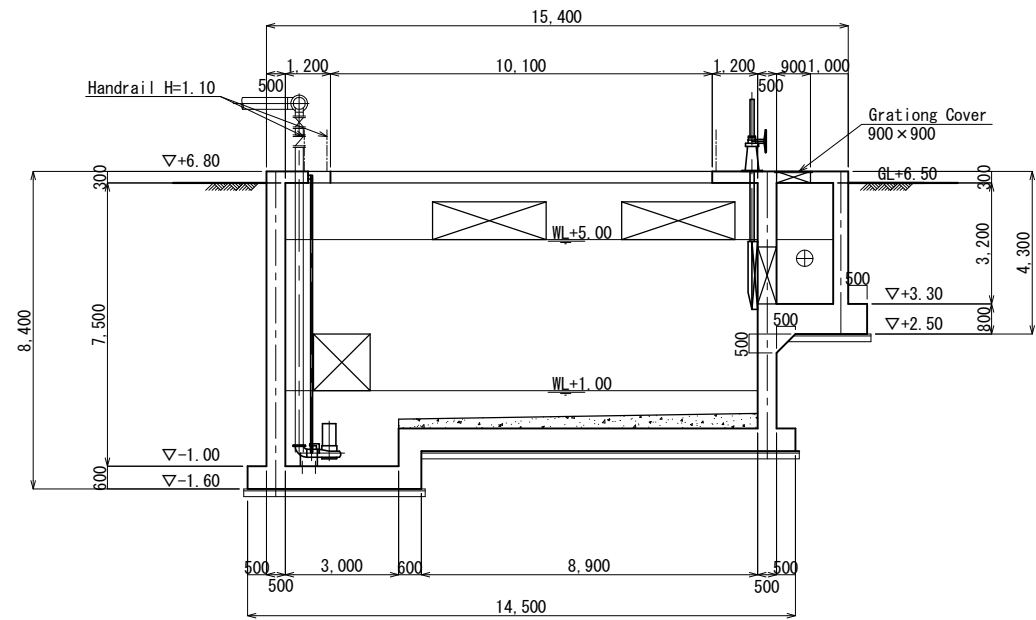
Lower Floor Plan



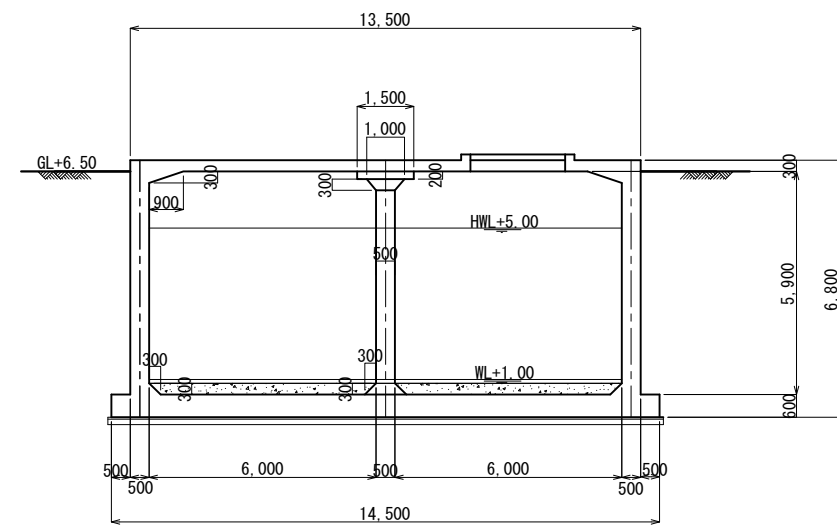
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Sun Drying Bed Drainage Pumping Well Section

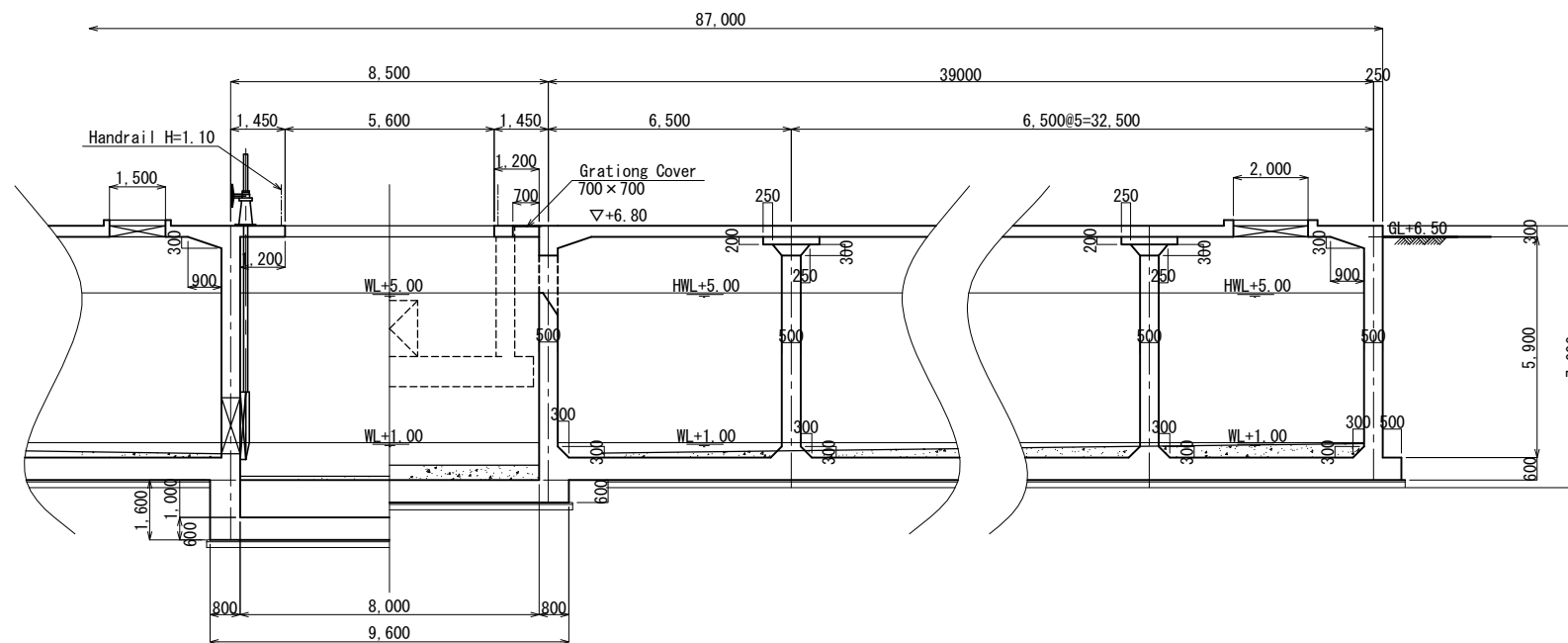
Cross Section A-A



Cross Section C-C

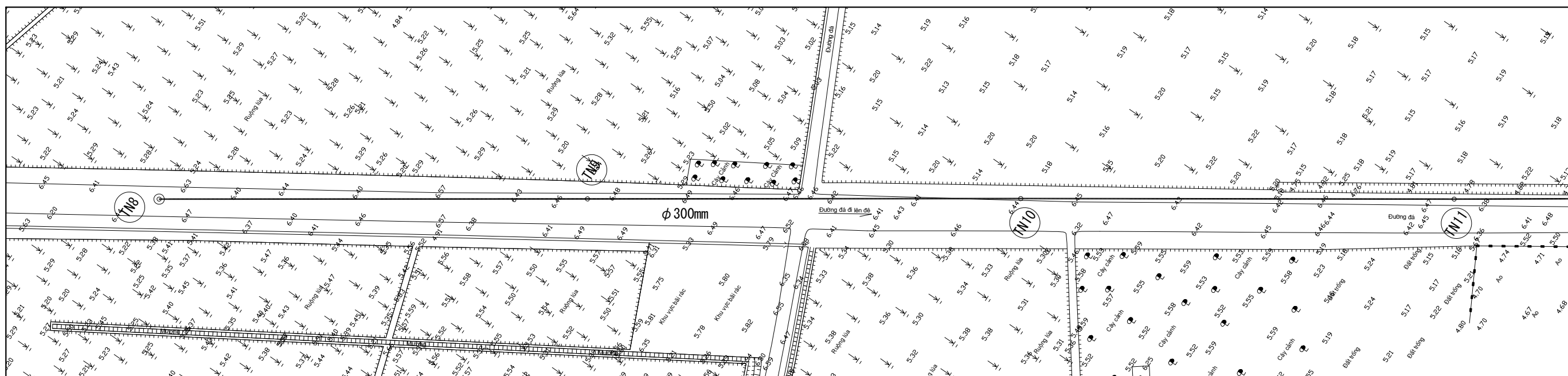
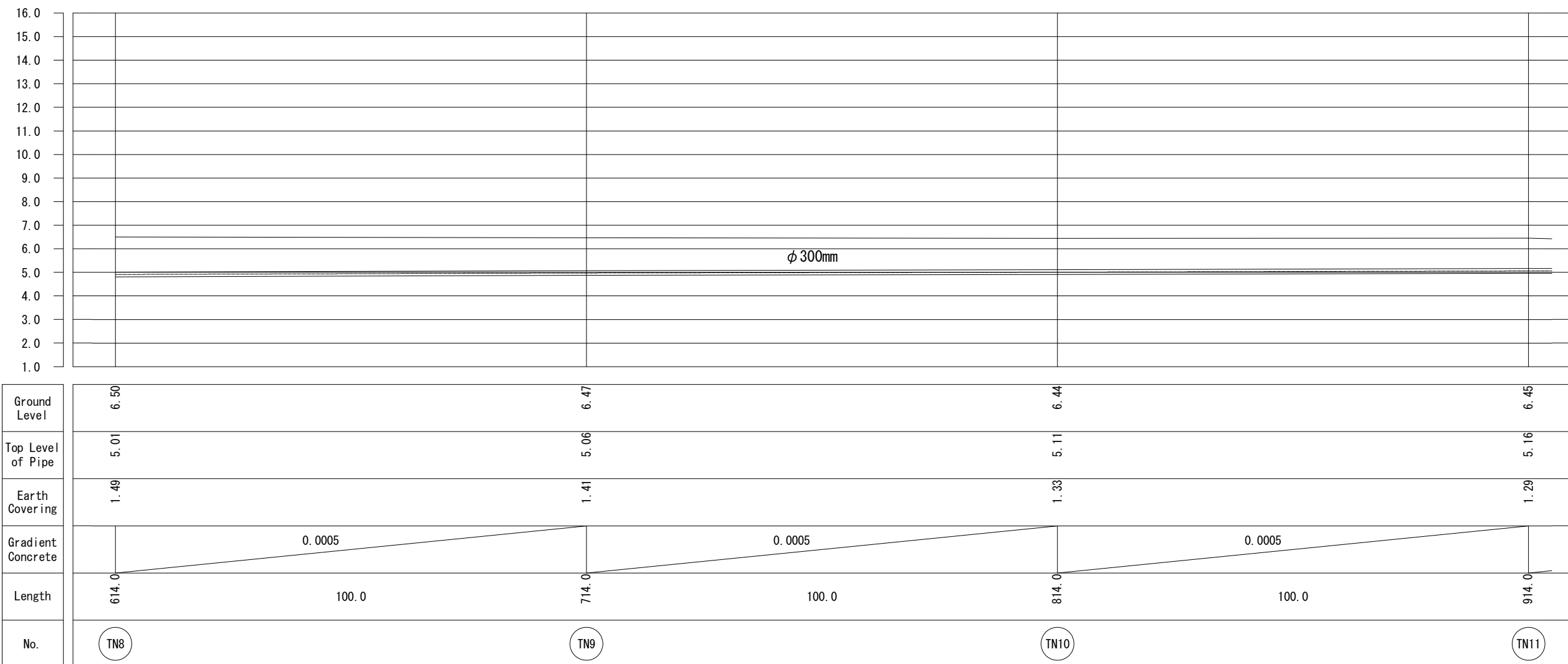


Cross Section B-B



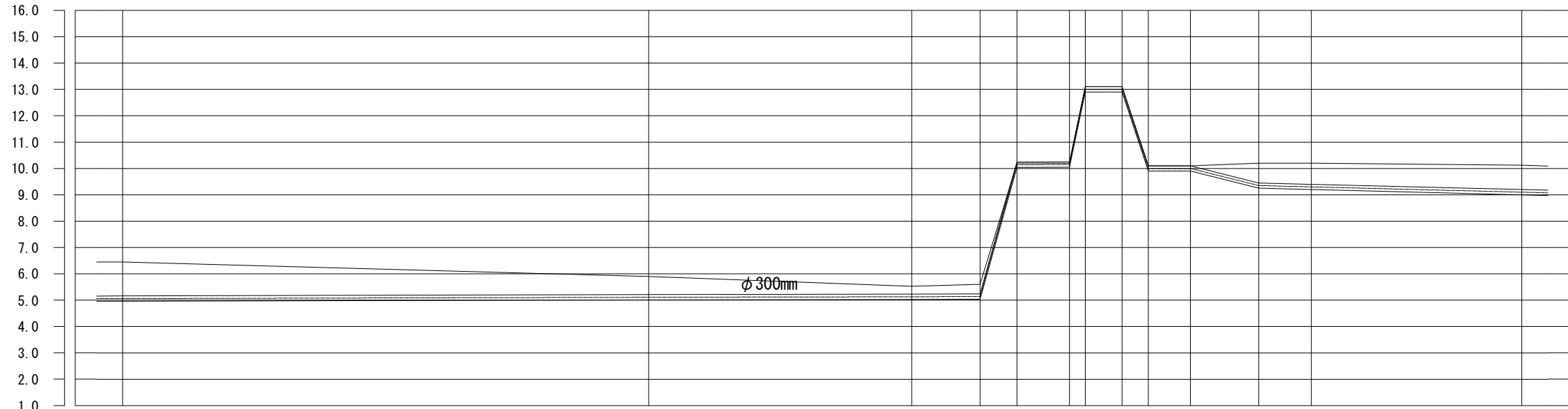
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Sun Drying Bed Drainage Pipe(1/5)

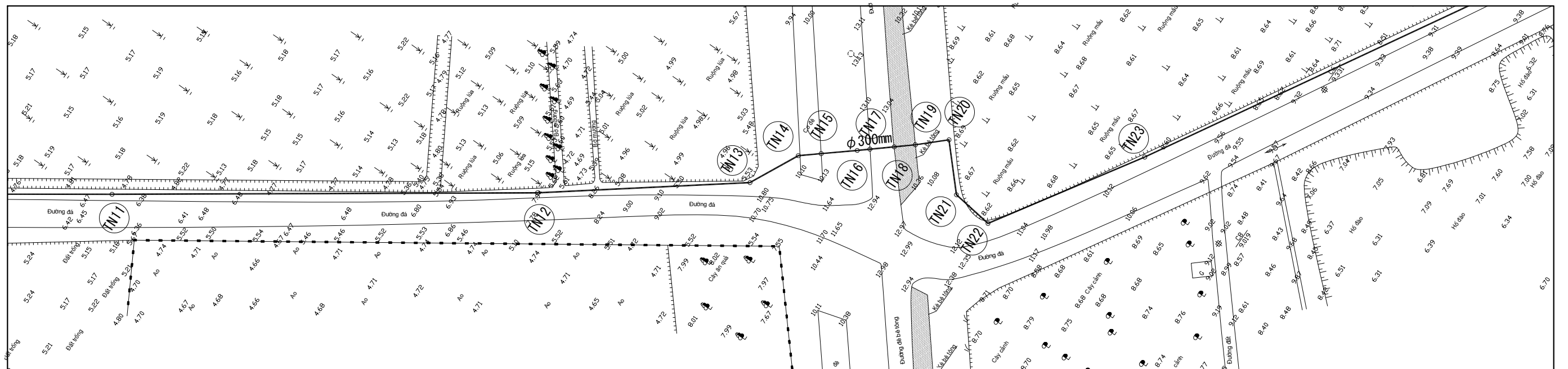


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Sun Drying Bed Drainage Pipe (2/5)

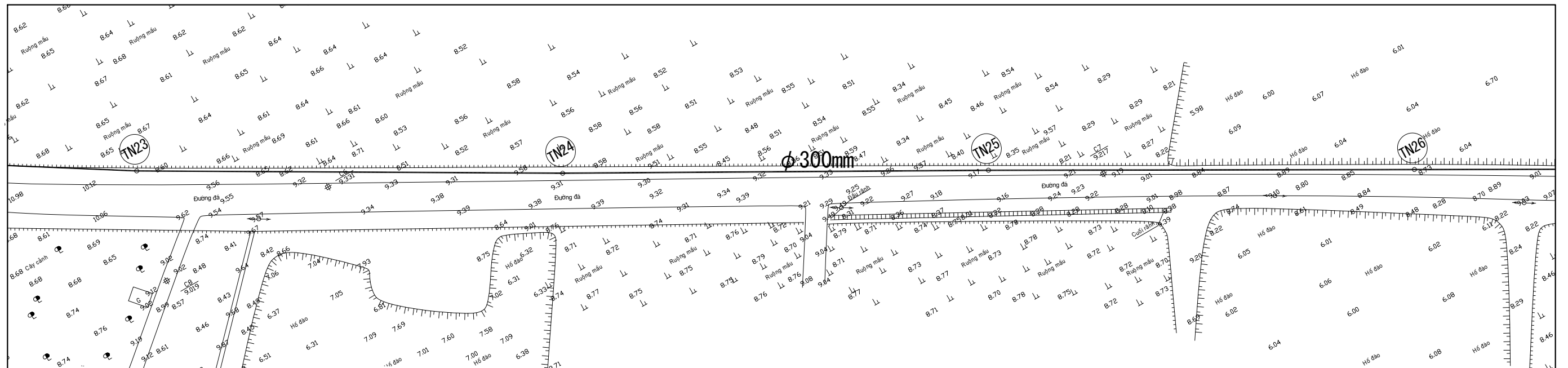
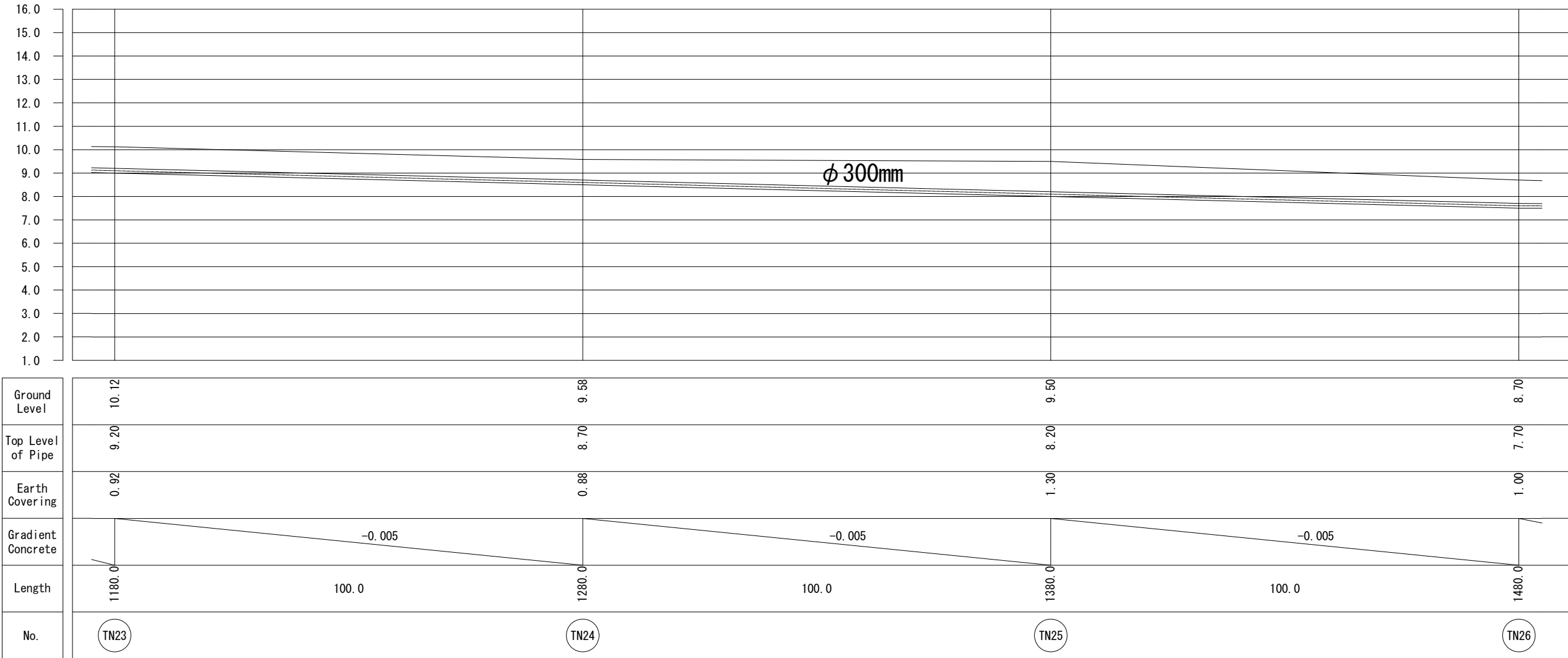


Ground Level	6.45		5.90		5.53	5.60	10.20	10.20	13.10	13.10	10.10	10.10	10.20	10.20		10.12			
Top Level of Pipe	5.16		5.21		5.23	5.24	10.24	10.25	13.10	13.10	10.10	10.10	9.45	9.40		9.20			
Earth Covering	1.29		0.69		0.30	0.36	0.04	0.05	0.00	0.00	0.00	0.00	0.75	0.80		0.92			
Gradient Concrete	0.0005		0.0005		1		0.05%	0.05%	-1	-0.05%	-0.05%	-0.05%	-0.005						
Length	914.0	100.0	1014.0	50.0	1064.0	13.0	1077.0	1084.0	1094.0	1097.0	1104.0	1109.0	1117.0	13.0	1130.0	10.0	1140.0	40.0	1180.0
No.	TN11		TN12		TN13		TN14	TN15	TN16	TN17	TN18	TN19	TN20	TN21	TN22		TN23		



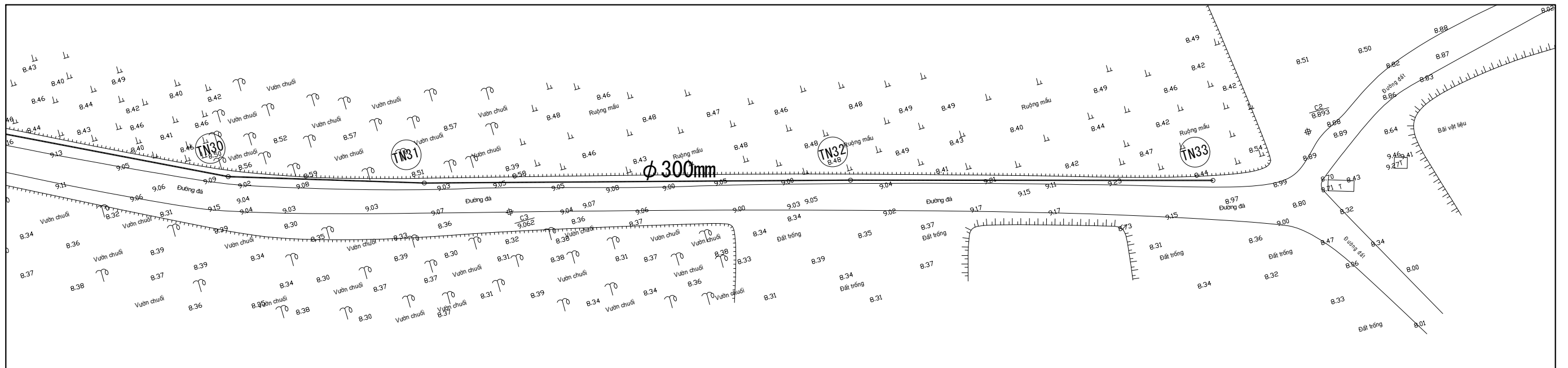
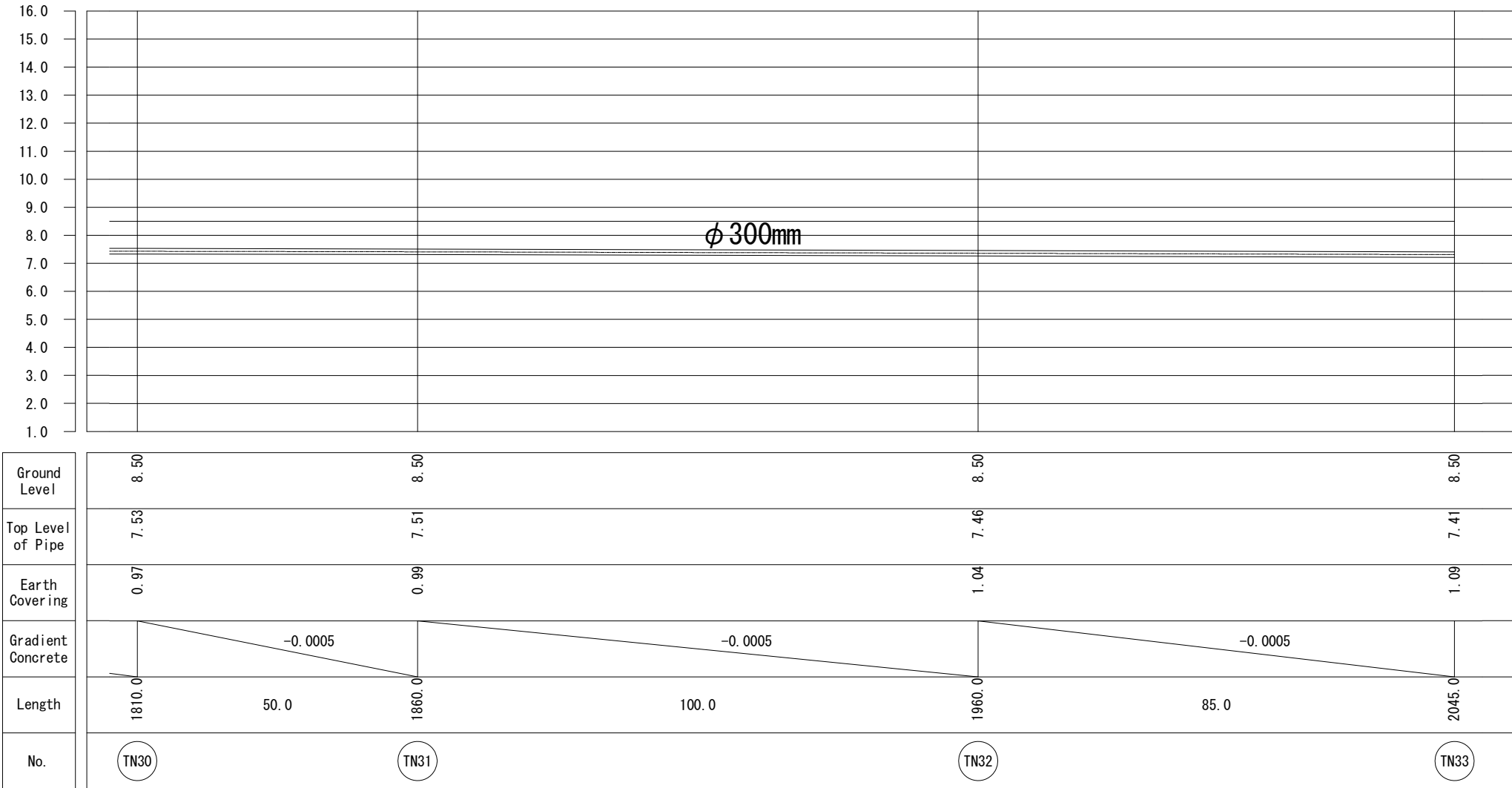
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Sun Drying Bed Drainage Pipe (3/5)



No.			
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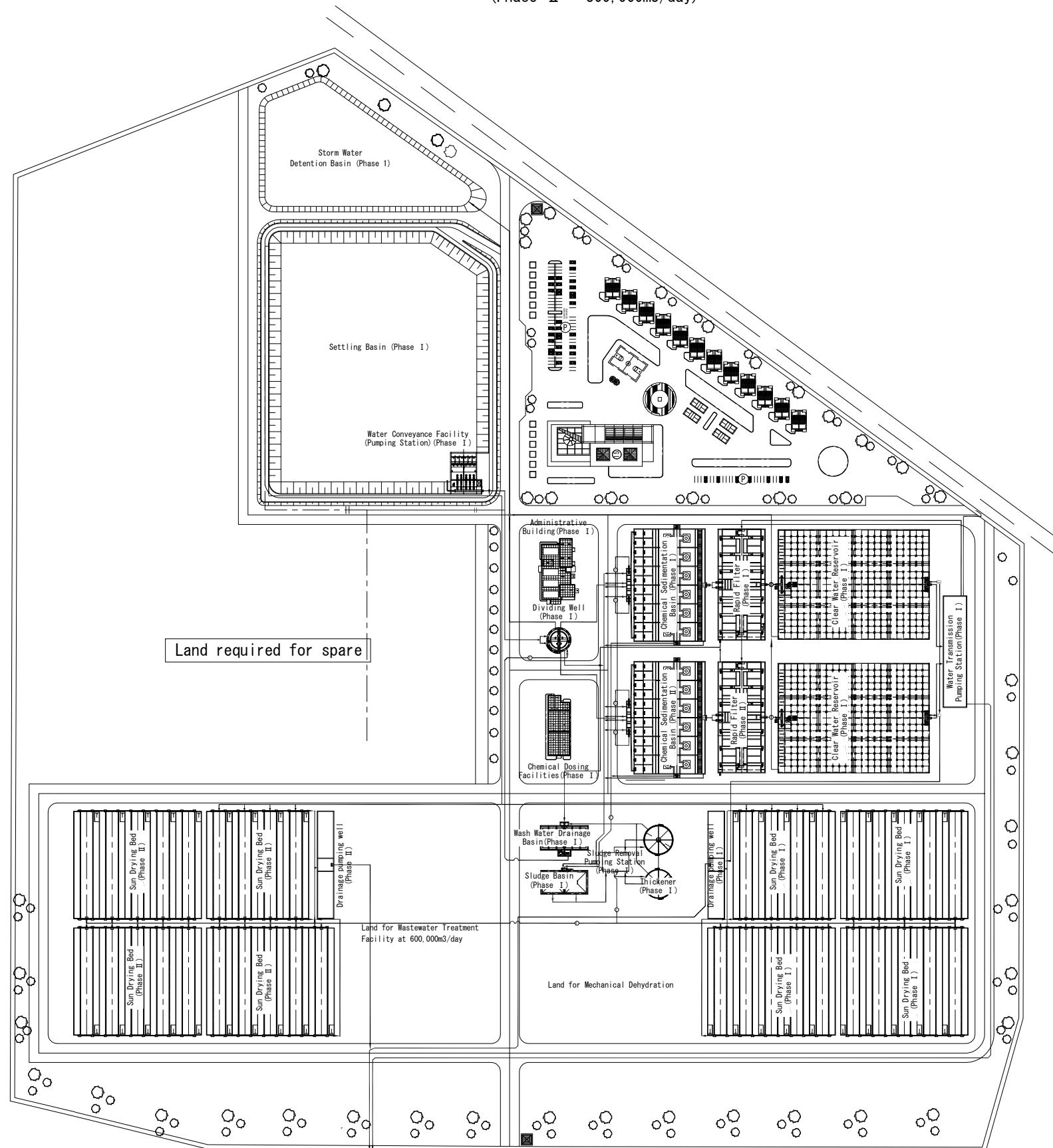
Sun Drying Bed Drainage Pipe (5/5)



No.			
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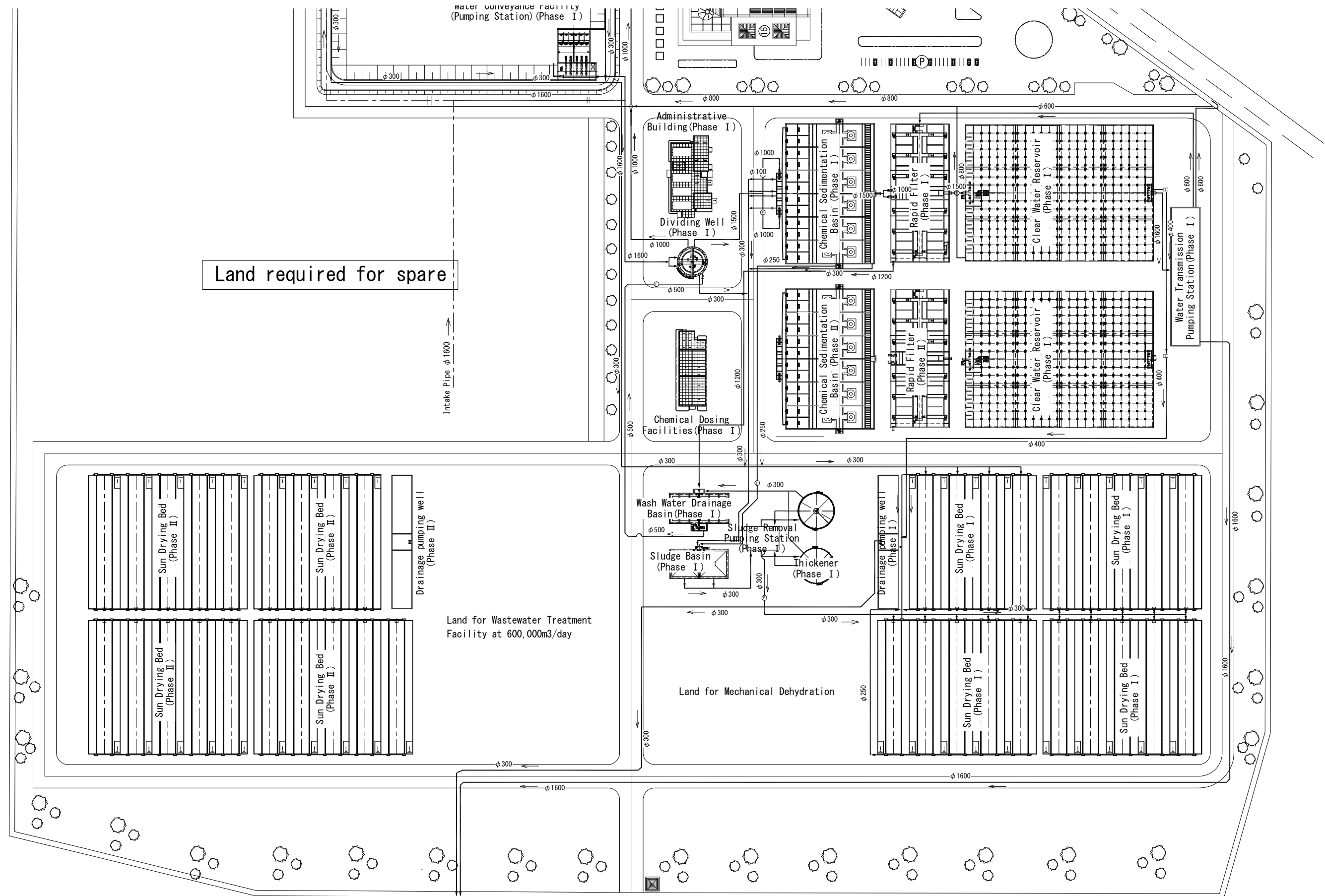
Connecting Pipeline Plan (Overall)

(Phase II 300,000m³/day)



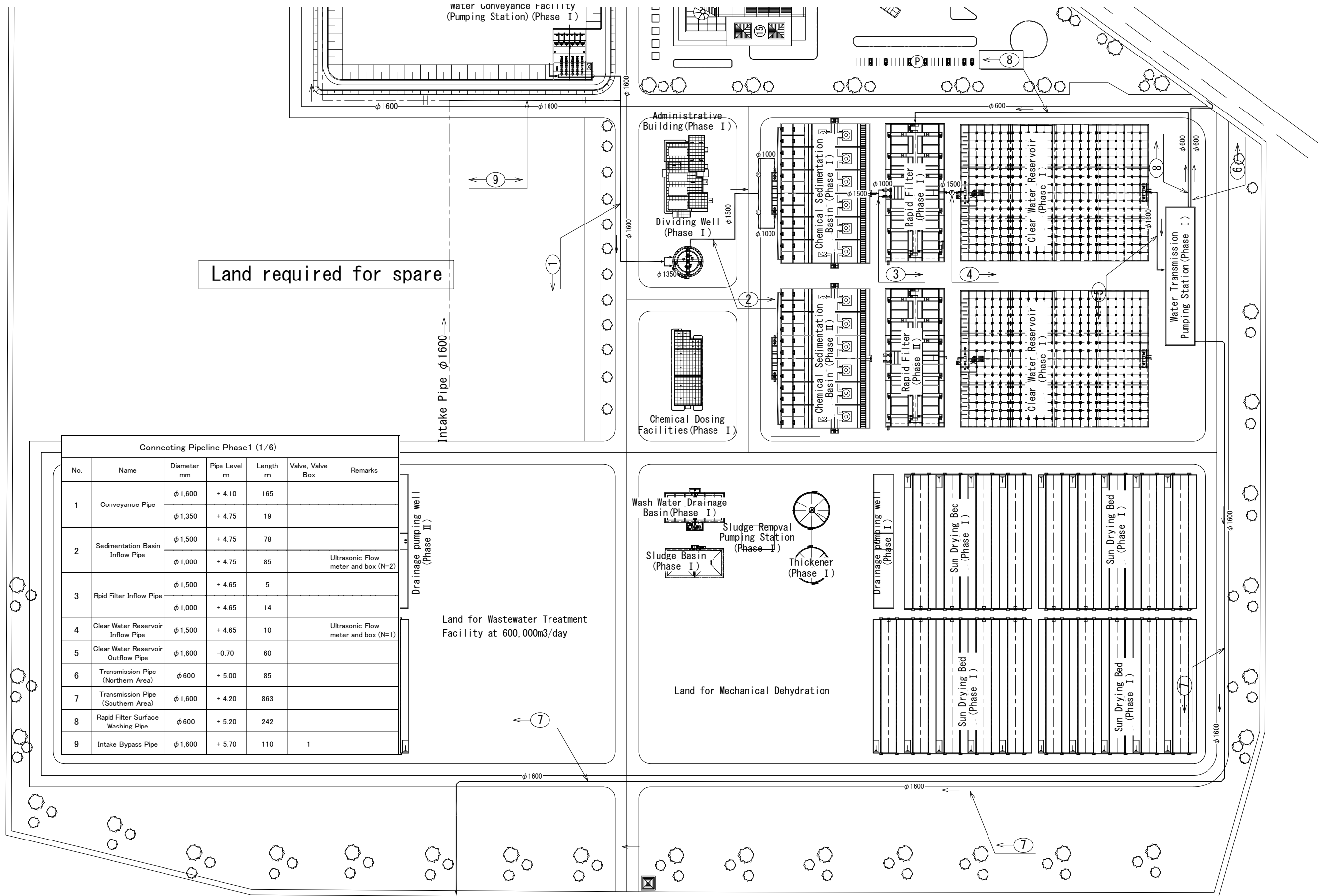
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Connecting Pipeline Plan (Phase1) Overall



No.			
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Connecting Pipeline Plan (Phase 1) 1/6



Land required for spare

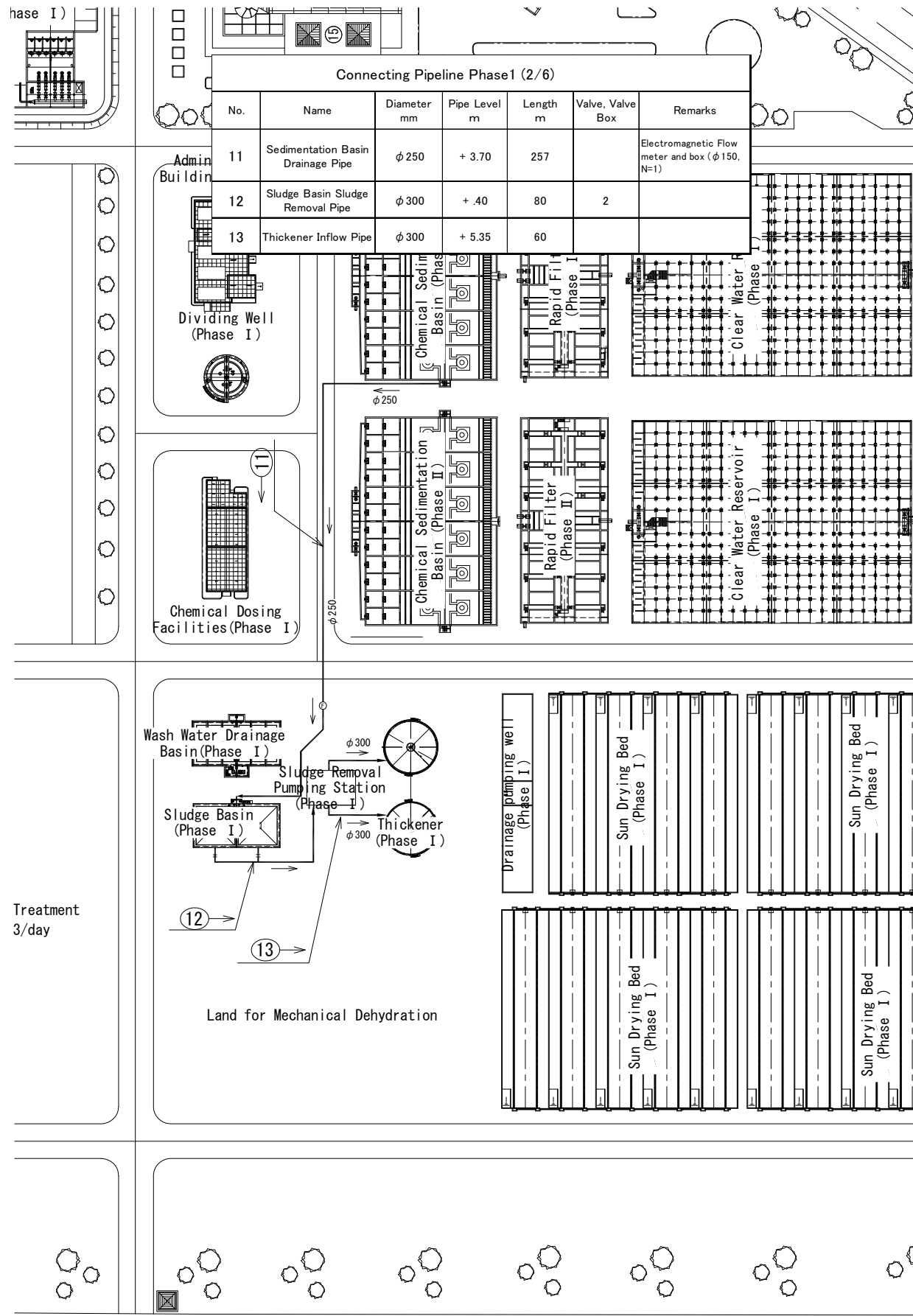
Connecting Pipeline Phase 1 (1/6)						
No.	Name	Diameter mm	Pipe Level m	Length m	Valve, Valve Box	Remarks
1	Conveyance Pipe	φ 1.600	+ 4.10	165		
		φ 1.350	+ 4.75	19		
2	Sedimentation Basin Inflow Pipe	φ 1.500	+ 4.75	78		
		φ 1.000	+ 4.75	85		Ultrasonic Flow meter and box (N=2)
3	Rapid Filter Inflow Pipe	φ 1.500	+ 4.65	5		
		φ 1.000	+ 4.65	14		
4	Clear Water Reservoir Inflow Pipe	φ 1.500	+ 4.65	10		Ultrasonic Flow meter and box (N=1)
5	Clear Water Reservoir Outflow Pipe	φ 1.600	-0.70	60		
6	Transmission Pipe (Northern Area)	φ 600	+ 5.00	85		
7	Transmission Pipe (Southern Area)	φ 1.600	+ 4.20	863		
8	Rapid Filter Surface Washing Pipe	φ 600	+ 5.20	242		
9	Intake Bypass Pipe	φ 1.600	+ 5.70	110	1	

Land for Wastewater Treatment Facility at 600,000m3/day

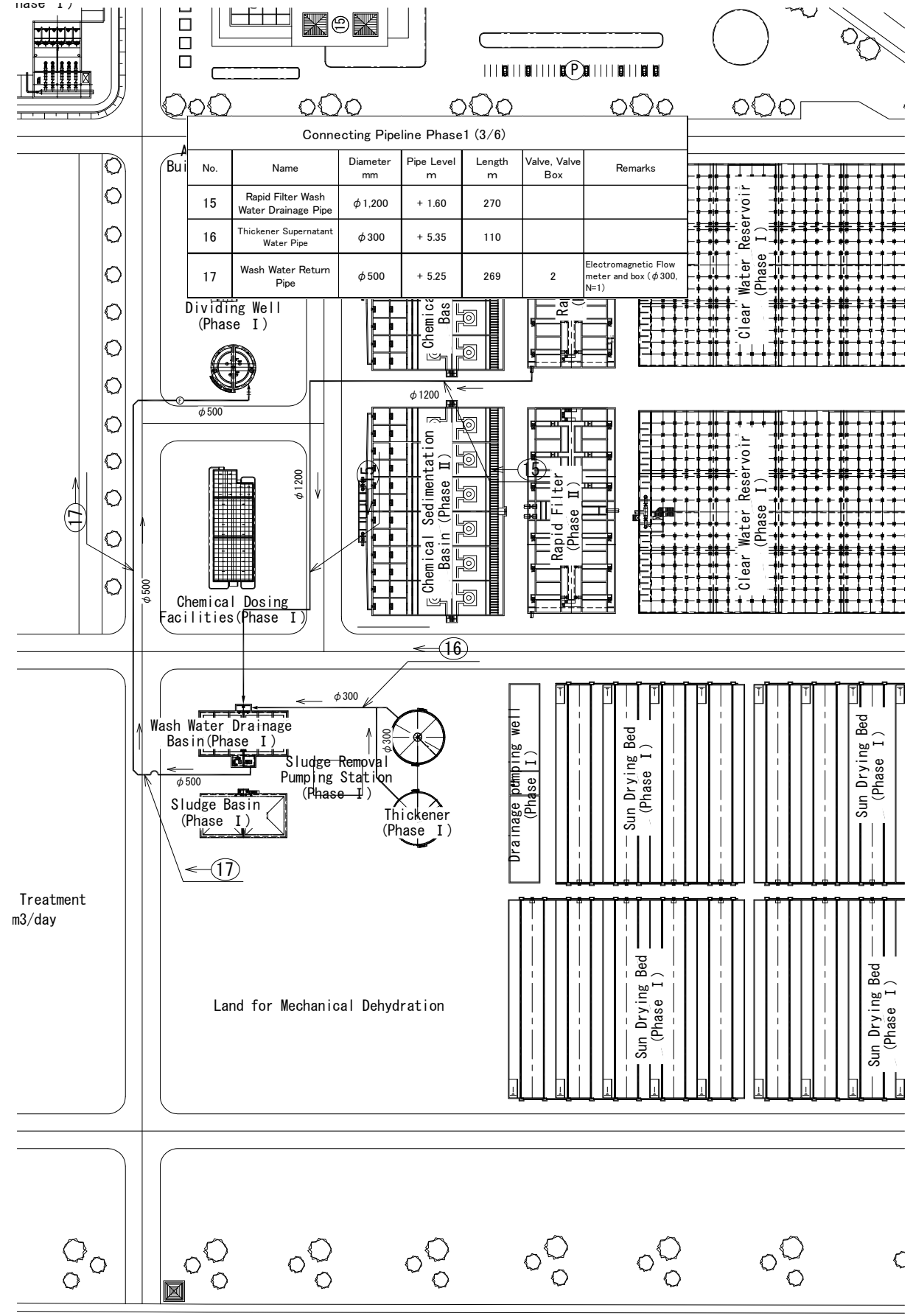
Land for Mechanical Dehydration

No.					
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Connecting Pipeline Plan (Phase 1) 2/6

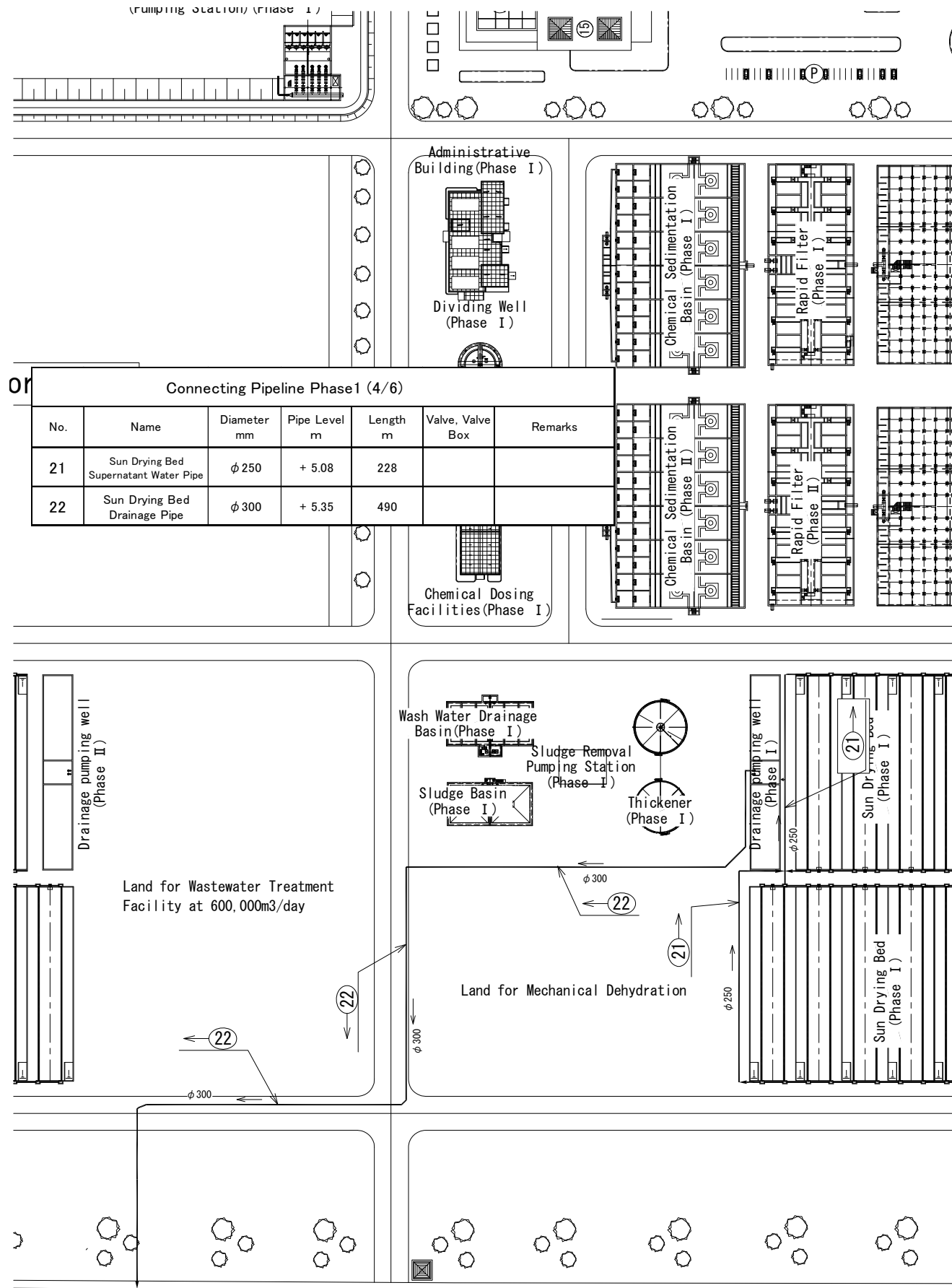


Connecting Pipeline Plan (Phase 1) 3/6

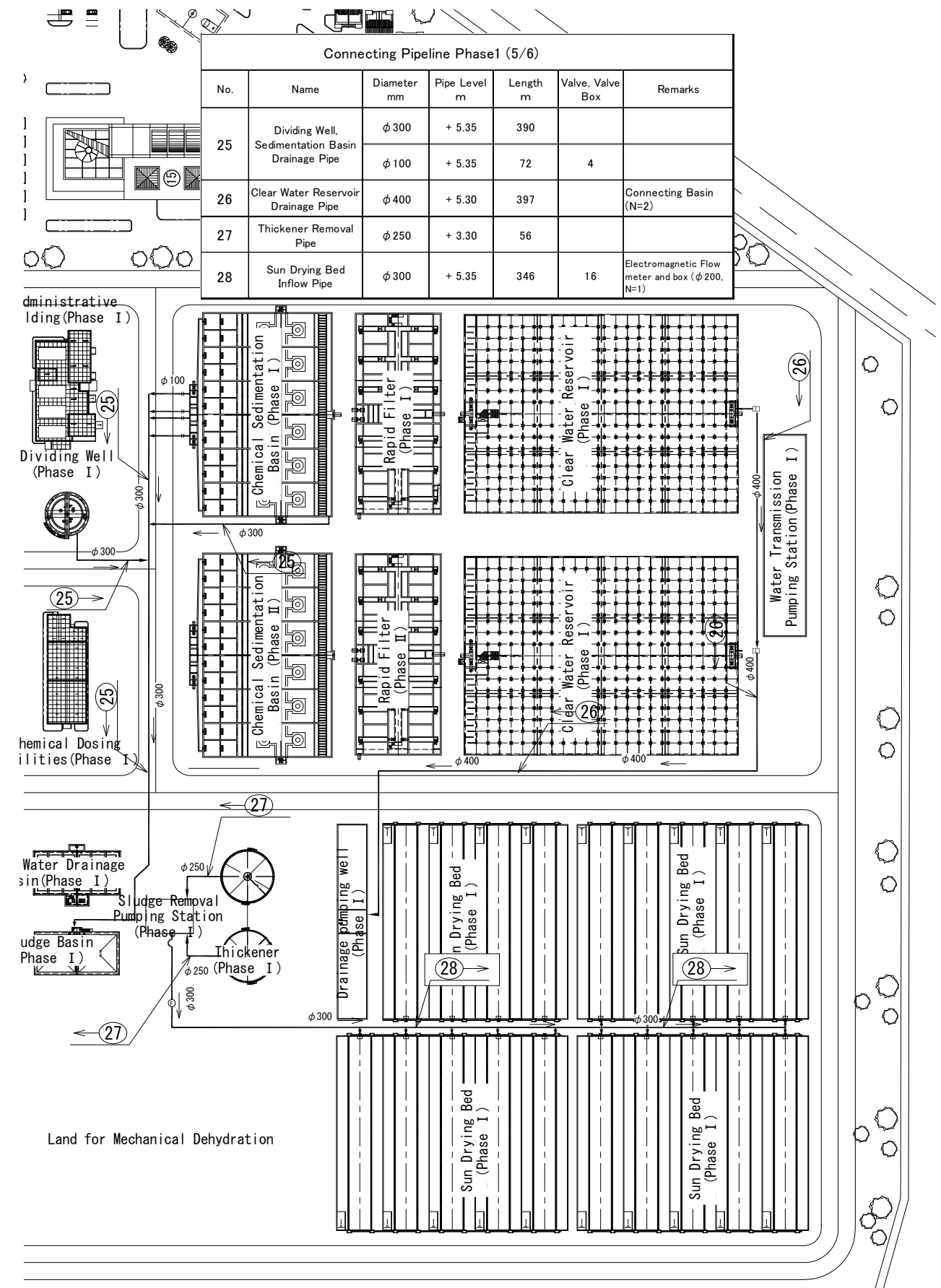


No.			
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Connecting Pipeline Plan (Phase 1) 4/6



Connecting Pipeline Plan (Phase 1) 5/6

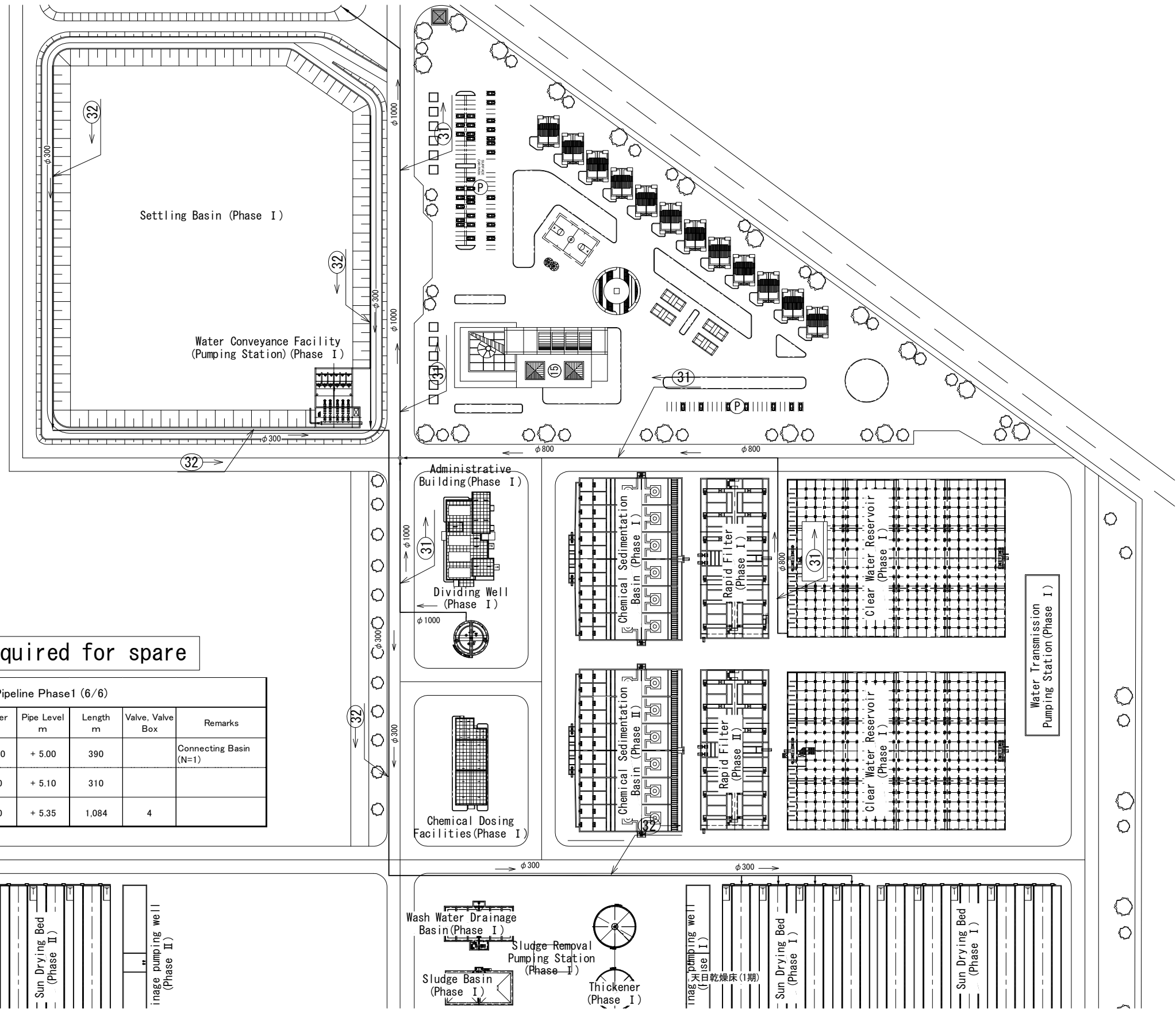


No.	Name	Diameter mm	Pipe Level m	Length m	Valve, Valve Box	Remarks
25	Dividing Well, Sedimentation Basin Drainage Pipe	φ 300	+ 5.35	390		
		φ 100	+ 5.35	72	4	
26	Clear Water Reservoir Drainage Pipe	φ 400	+ 5.30	397		Connecting Basin (N=2)
27	Thickener Removal Pipe	φ 250	+ 3.30	56		
28	Sun Drying Bed Inflow Pipe	φ 300	+ 5.35	346	16	Electromagnetic Flow meter and box (φ 200, N=1)

No.	Name	Diameter mm	Pipe Level m	Length m	Valve, Valve Box	Remarks
21	Sun Drying Bed Supernatant Water Pipe	φ 250	+ 5.08	228		
22	Sun Drying Bed Drainage Pipe	φ 300	+ 5.35	490		

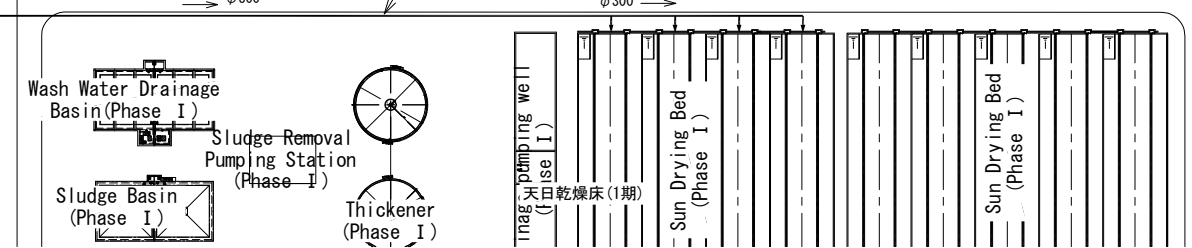
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Connecting Pipeline Plan (Phase 1) 6/6



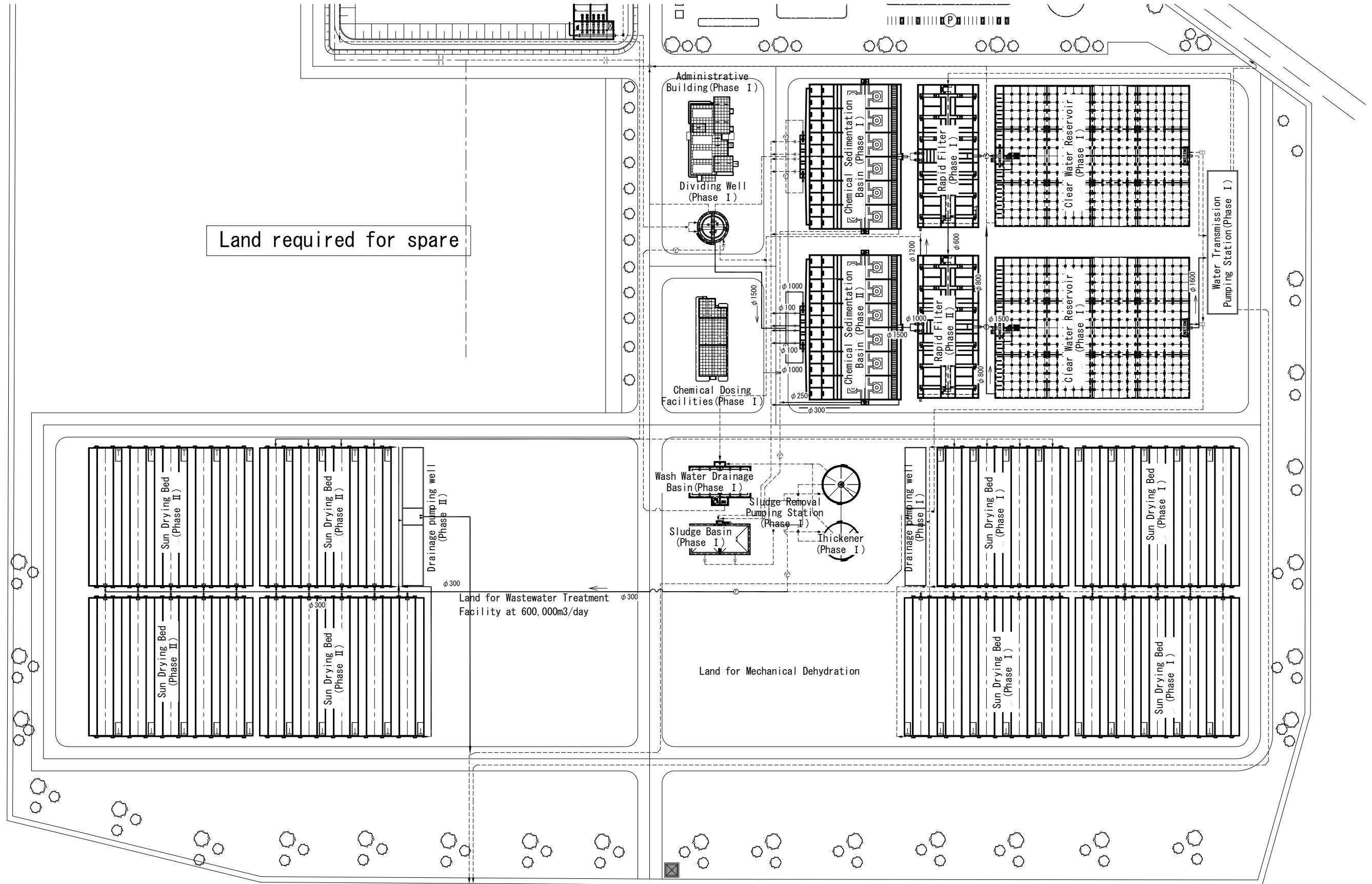
Land required for spare

Connecting Pipeline Phase 1 (6/6)						
No.	Name	Diameter mm	Pipe Level m	Length m	Valve, Valve Box	Remarks
31	Dividing Well, Clear Water Reservoir Overflow Pipe	φ 1,000	+ 5.00	390		Connecting Basin (N=1)
		φ 800	+ 5.10	310		
32	Settling Basin Drainage Pipe	φ 300	+ 5.35	1,084	4	



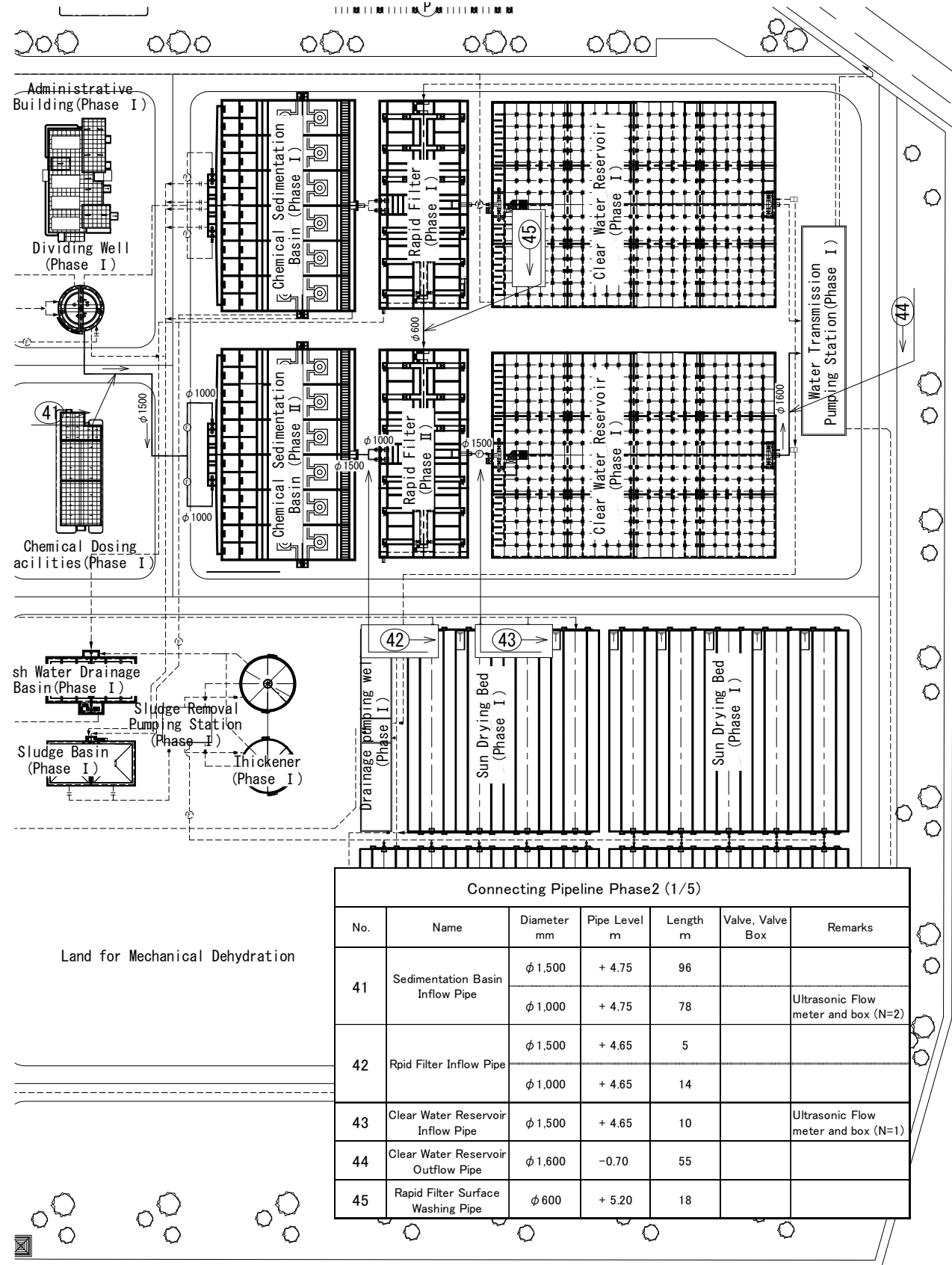
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Connecting Pipeline Plan (Phase 2) Overall

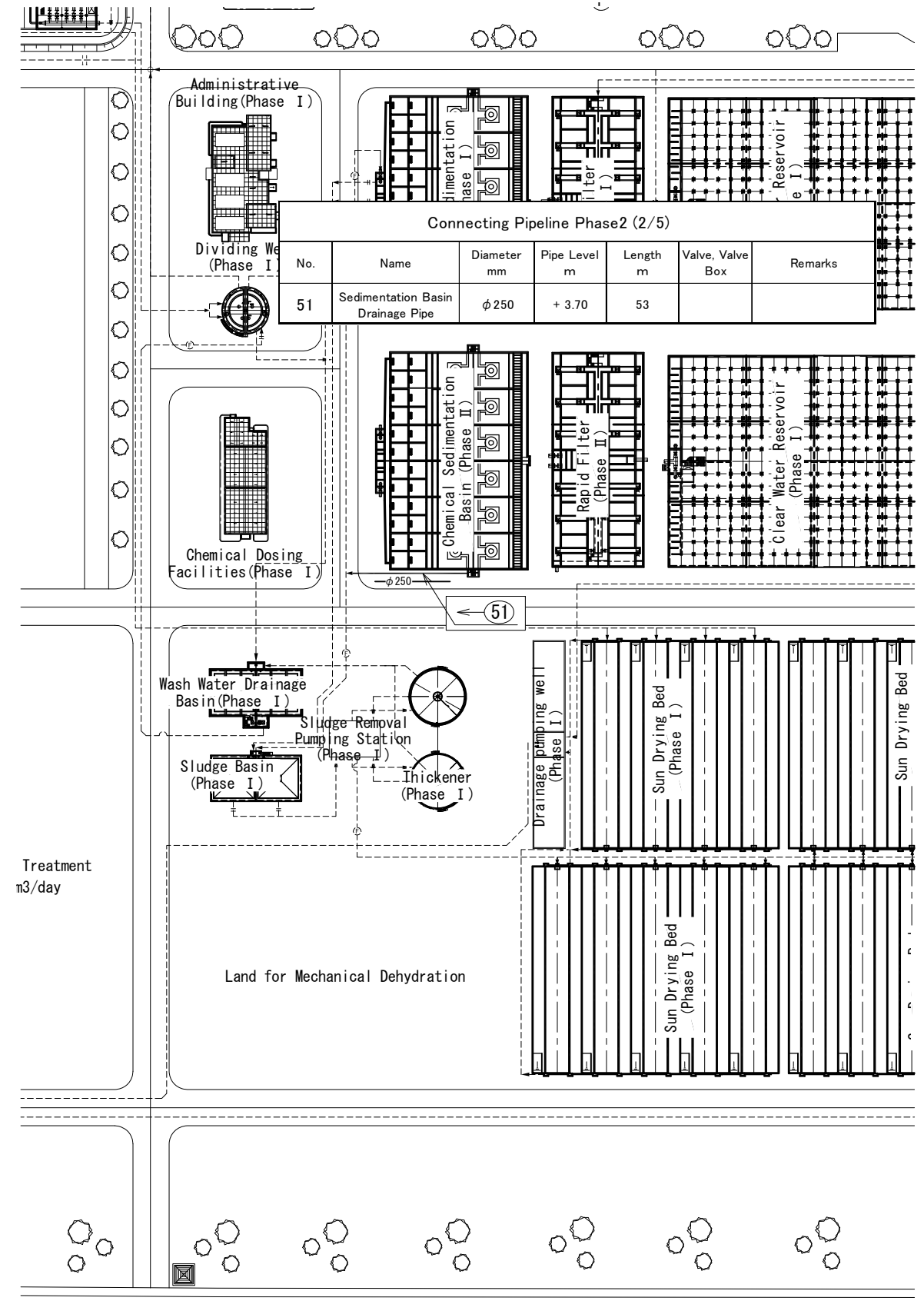


No.			
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Connecting Pipeline Plan (Phase 2) 1/5

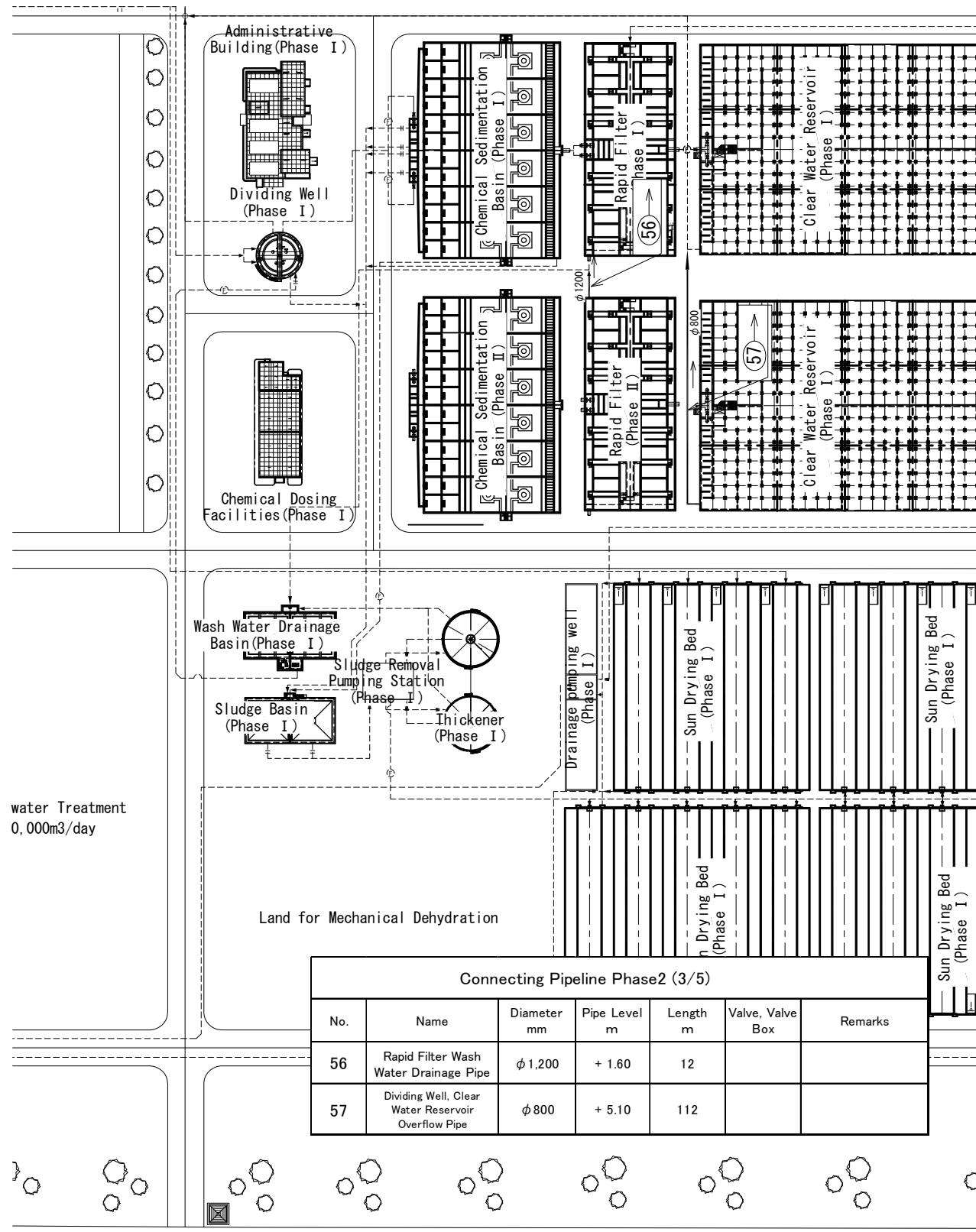


Connecting Pipeline Plan (Phase 2) 2/5



No.			
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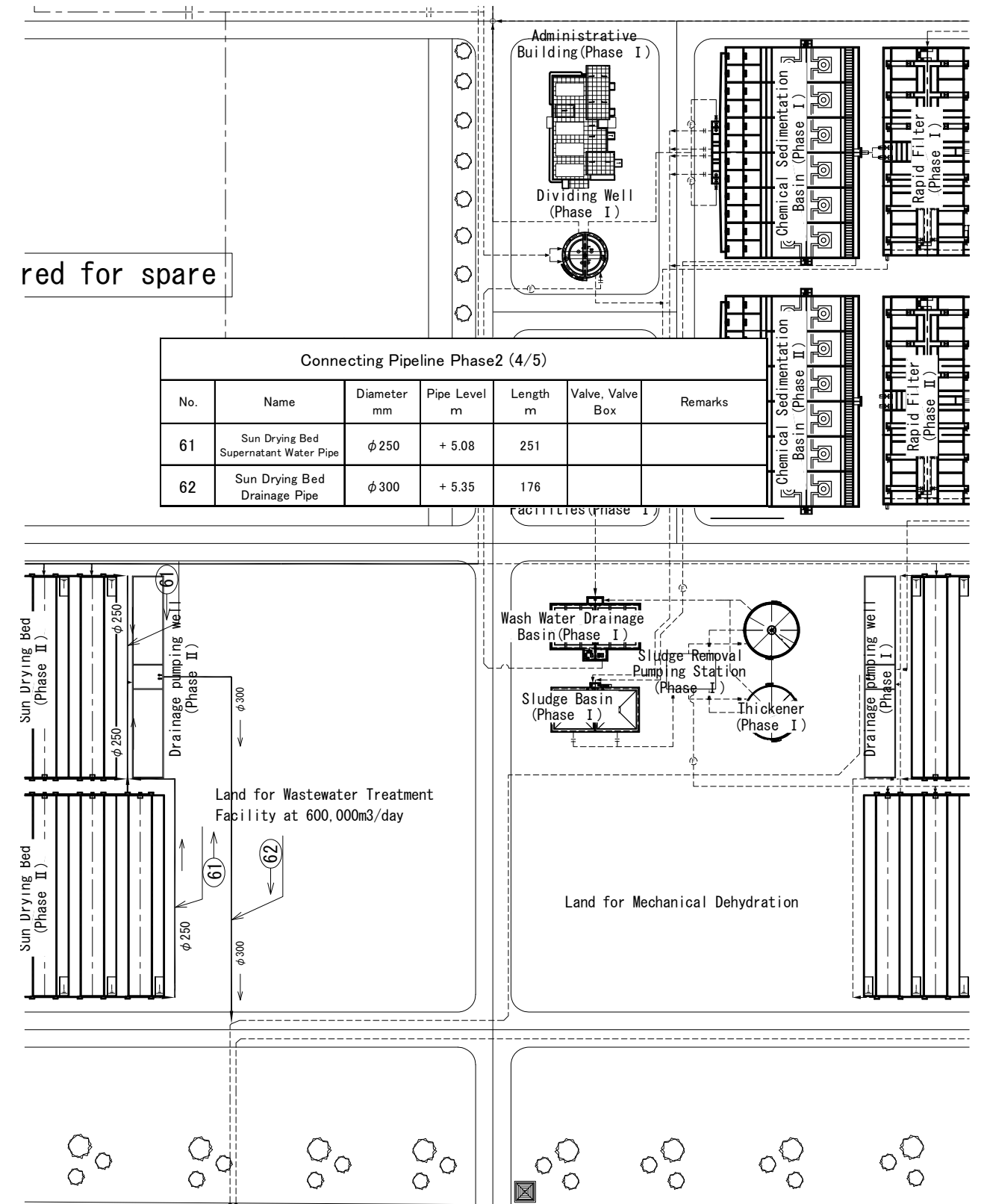
Connecting Pipeline Plan (Phase 2) 3/5



water Treatment
0,000m³/day

Land for Mechanical Dehydration

Connecting Pipeline Plan (Phase 2) 4/5



red for spare

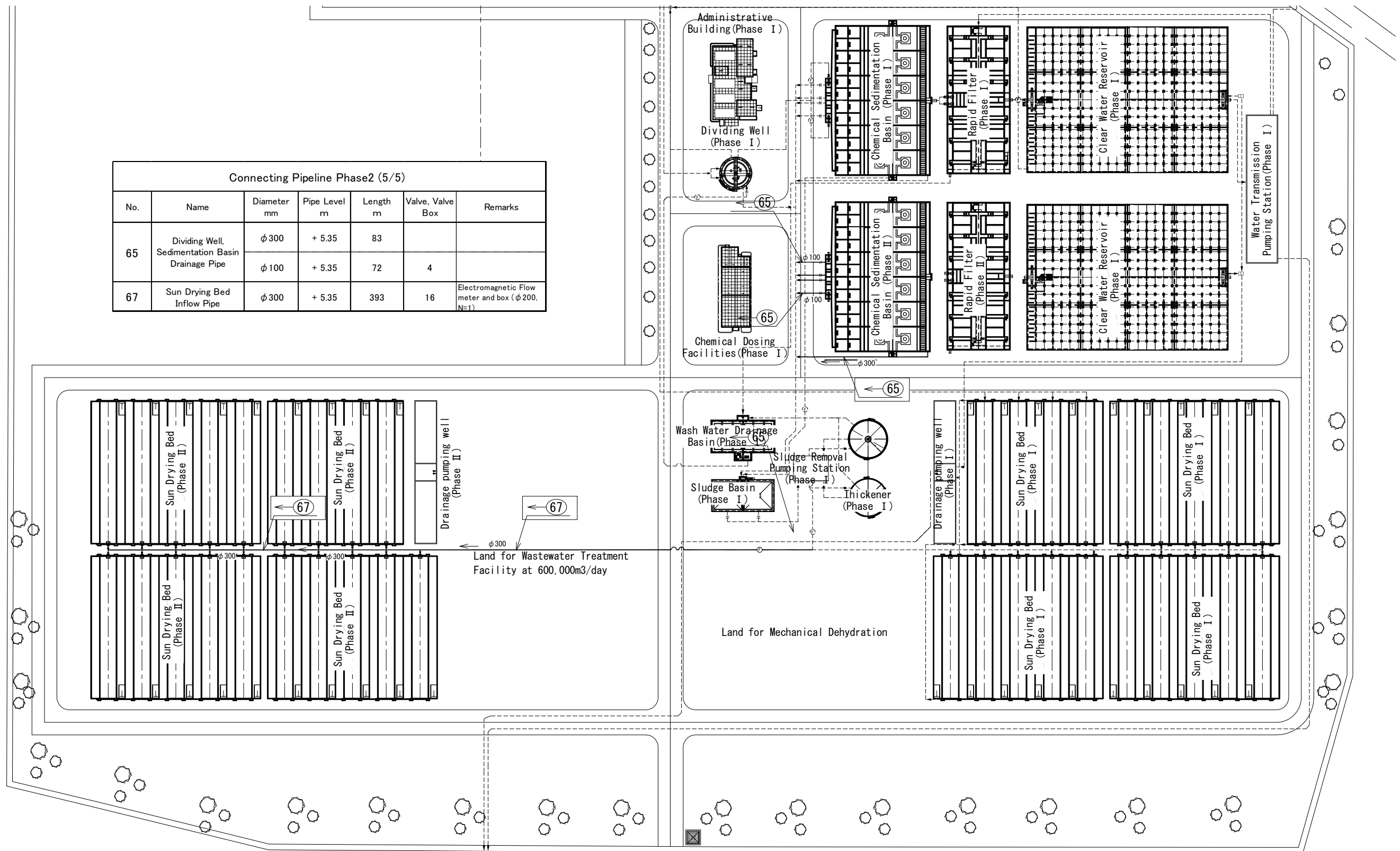
Land for Wastewater Treatment Facility at 600,000m³/day

Land for Mechanical Dehydration

No.			
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Connecting Pipeline Plan (Phase 2) 5/5

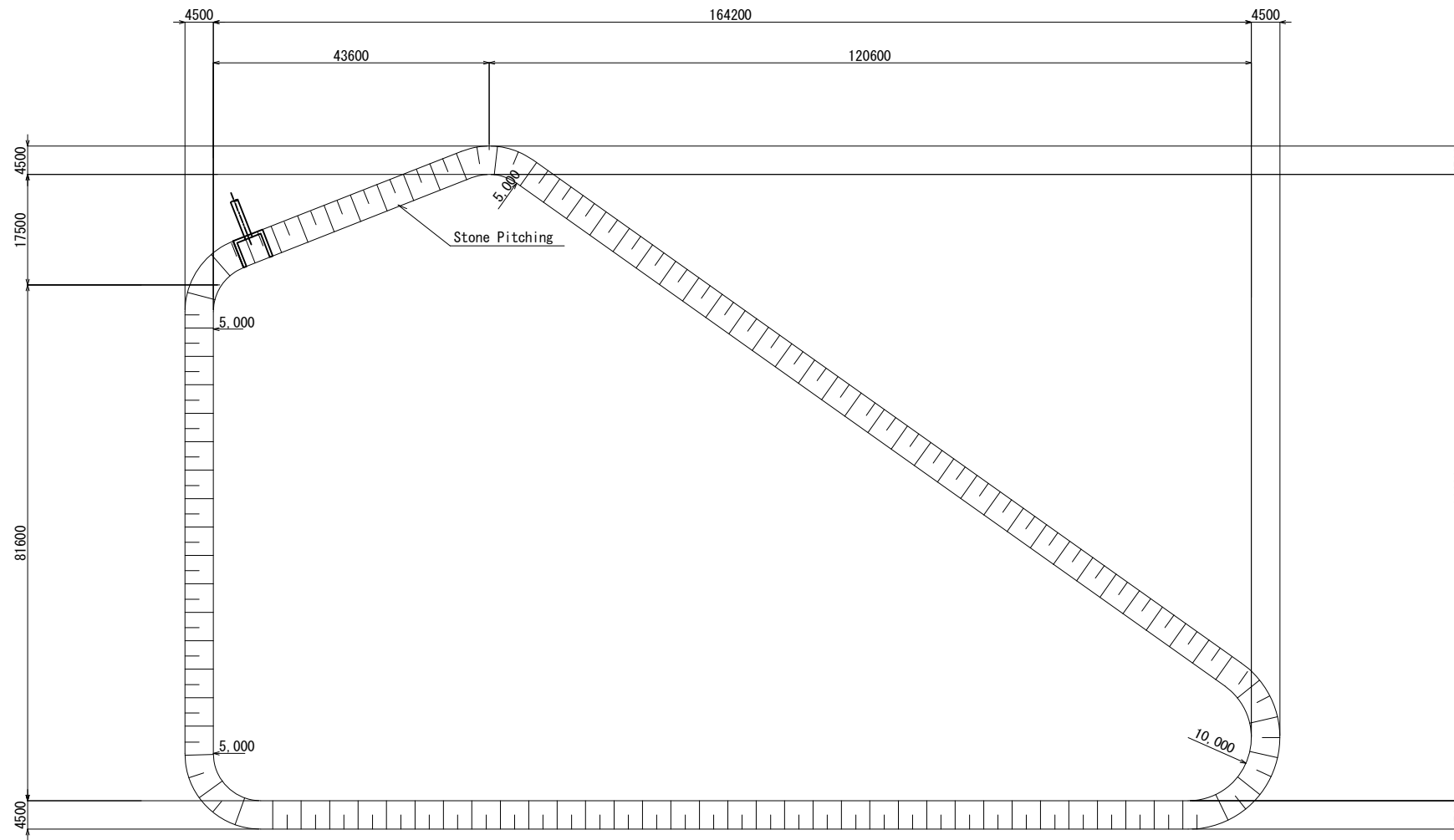
Connecting Pipeline Phase2 (5/5)						
No.	Name	Diameter mm	Pipe Level m	Length m	Valve, Valve Box	Remarks
65	Dividing Well, Sedimentation Basin Drainage Pipe	φ 300	+ 5.35	83		
		φ 100	+ 5.35	72	4	
67	Sun Drying Bed Inflow Pipe	φ 300	+ 5.35	393	16	Electromagnetic Flow meter and box (φ 200, N=1)



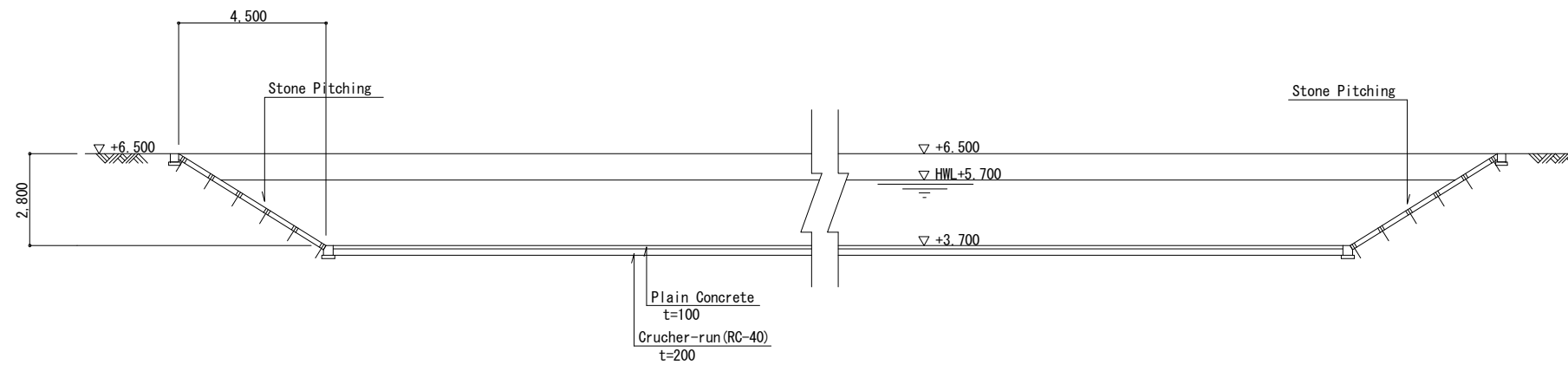
No.			
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Stormwater pond

Plan S=1/500



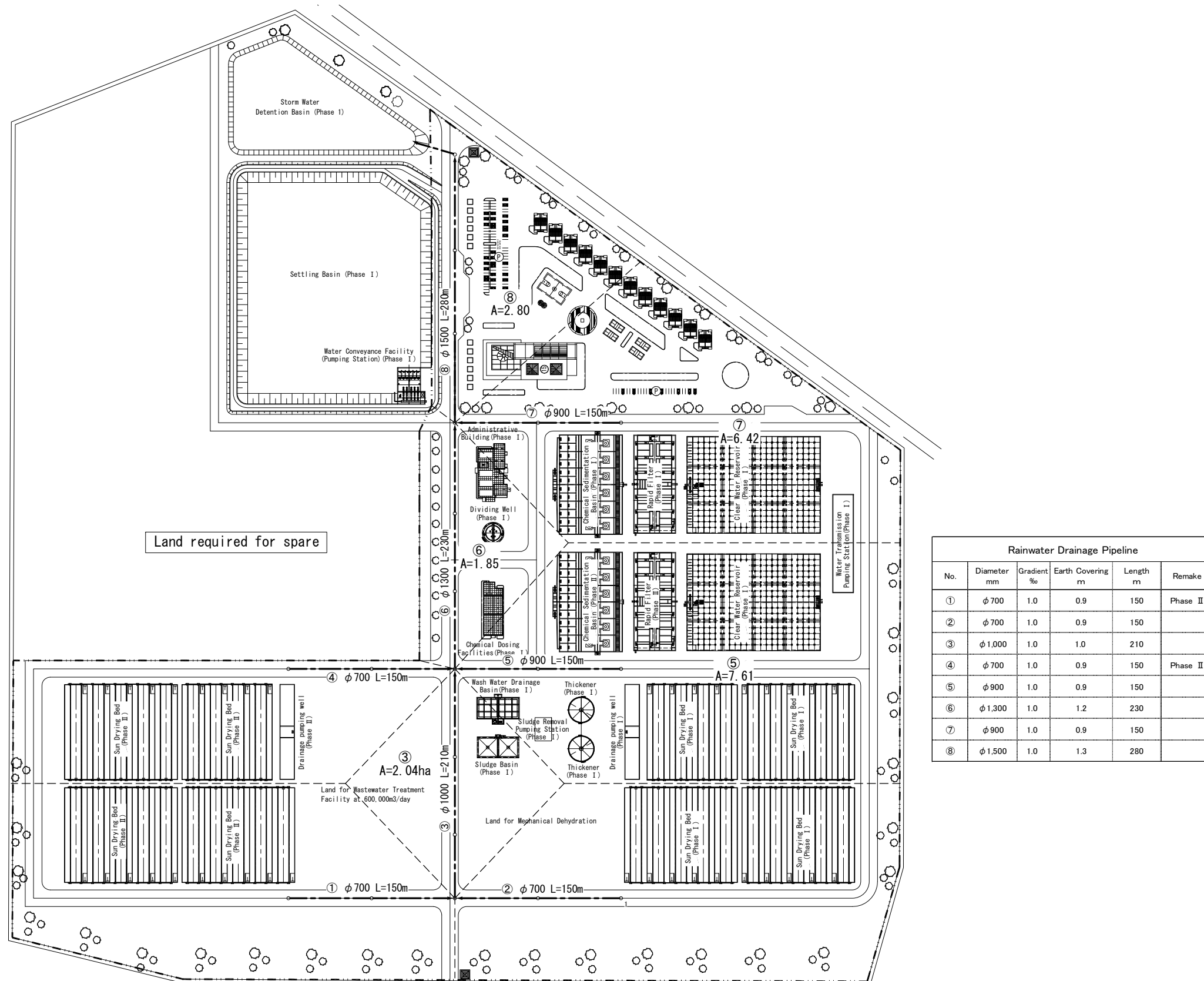
Cross section S=1/100



No.			
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Rainwater Drainage Pipeline Plan

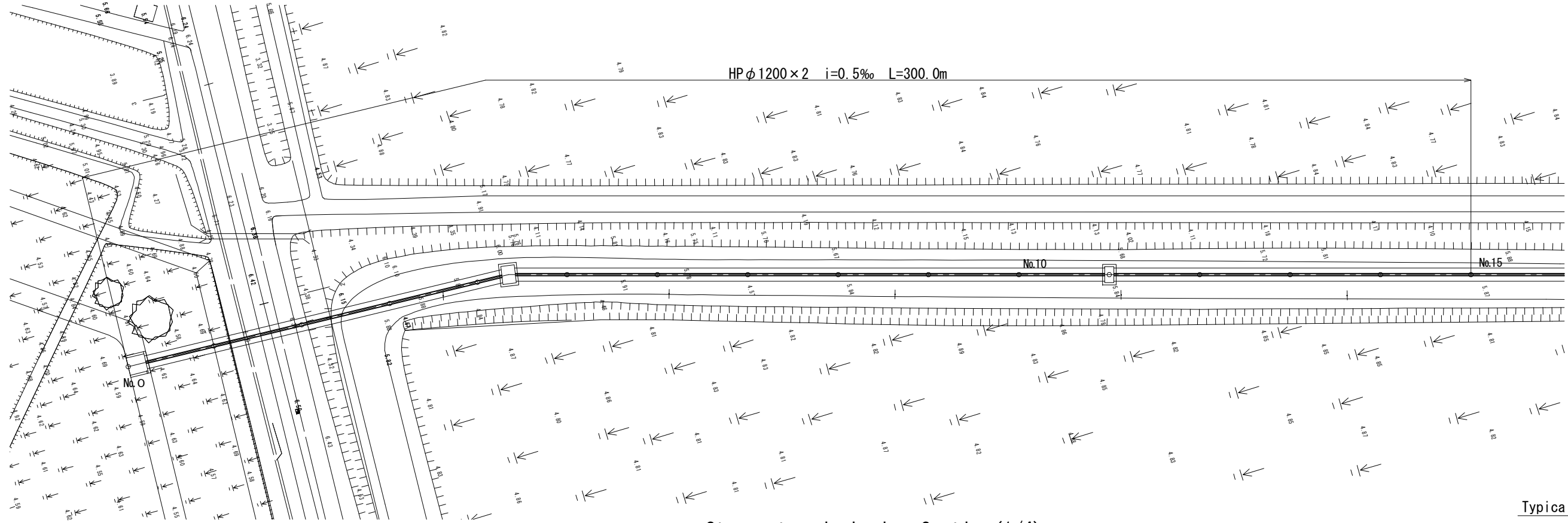
(Phase II 300,000m³/day)



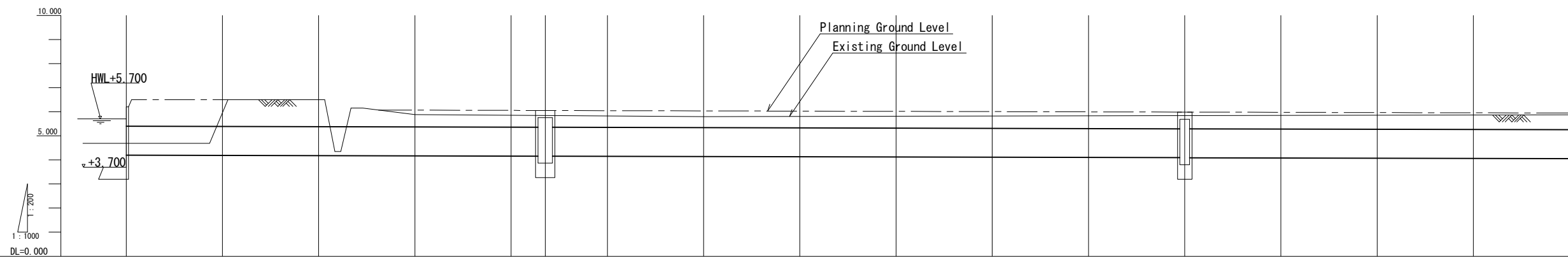
Rainwater Drainage Pipeline					
No.	Diameter mm	Gradient %	Earth Covering m	Length m	Remark
①	φ 700	1.0	0.9	150	Phase II
②	φ 700	1.0	0.9	150	
③	φ 1,000	1.0	1.0	210	
④	φ 700	1.0	0.9	150	Phase II
⑤	φ 900	1.0	0.9	150	
⑥	φ 1,300	1.0	1.2	230	
⑦	φ 900	1.0	0.9	150	
⑧	φ 1,500	1.0	1.3	280	

No.			
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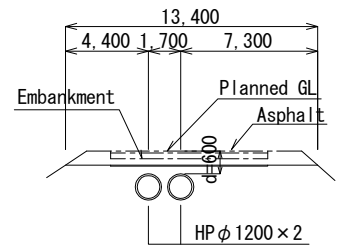
Stormwater drainpipe Plan(1/4)



Stormwater drainpipe Section(1/4)

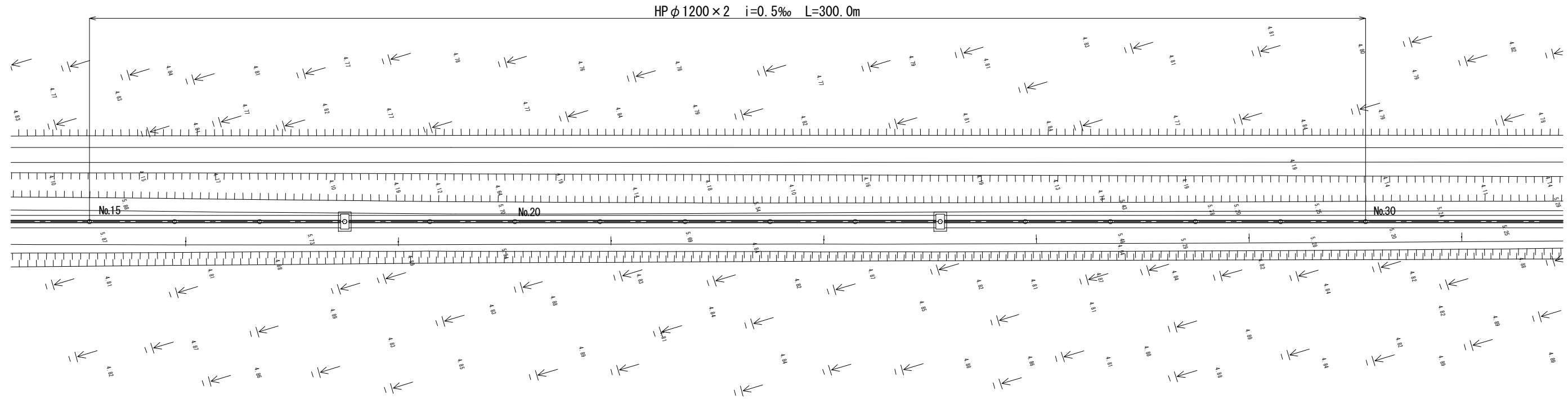


Typical Cross Section

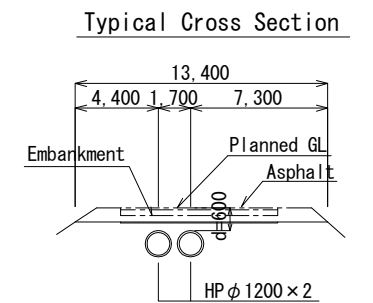
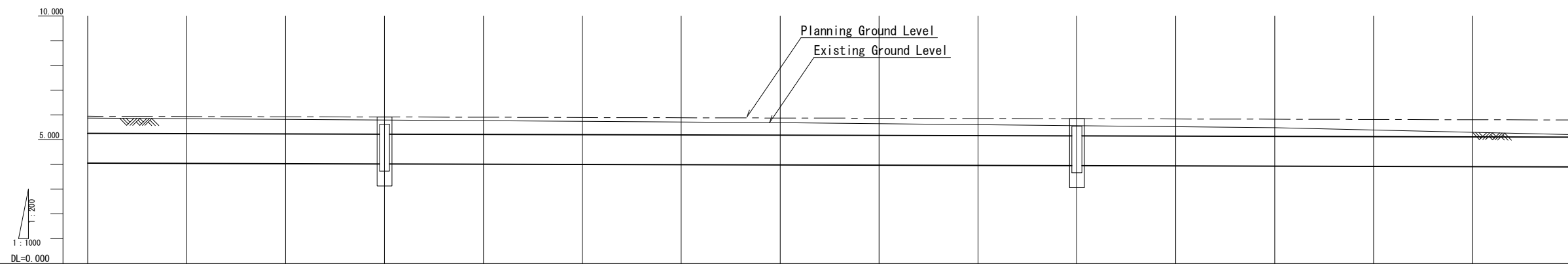


Bottom Level of Pipe		4.200	4.190	4.180	4.170	4.160	4.156	4.150	4.140	4.130	4.120	4.110	4.100	4.090	4.080	4.070	4.060	4.050	
Earth Covering		(1.01)	(1.02)	1.03	0.42 (0.60)	0.40 (0.60)	0.38 (0.60)	0.39 (0.60)	0.37 (0.60)	0.39 (0.60)	0.41 (0.60)	0.42 (0.60)	0.44 (0.60)	0.46 (0.60)	0.42 (0.60)	0.42 (0.60)	0.50 (0.60)	0.42 (0.60)	
Pipe Gradient		HP φ 1200 × 2 i=0.5‰																	
Ground Level (Planning)		6.50	6.50	6.50	5.47	5.46	5.45	5.45	5.44	5.43	5.42	5.41	5.40	5.39	5.38	5.37	5.36	5.35	
Ground Level		4.69	4.69	6.50	5.88	5.85	5.84	5.83	5.80	5.81	5.82	5.82	5.83	5.84	5.85	5.85	5.86	5.87	
Accumulated Distance		0.00	20.00	40.00	60.00	80.00	87.08	100.00	120.00	140.00	160.00	180.00	200.00	220.00	240.00	260.00	280.00	300.00	
Length		0.00	20.00	20.00	20.00	7.08	12.92	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	
Point		No.0	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8	No.9	No.10	No.11	No.12	No.13	No.14	No.15		

Stormwater drainpipe Plan(2/4)

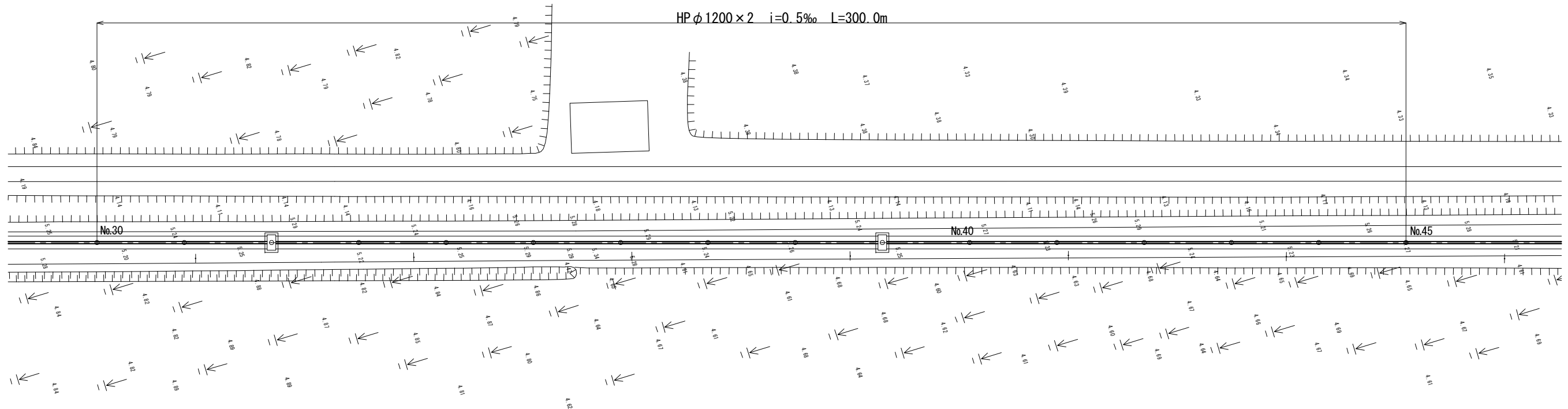


Stormwater drainpipe Section(2/4)

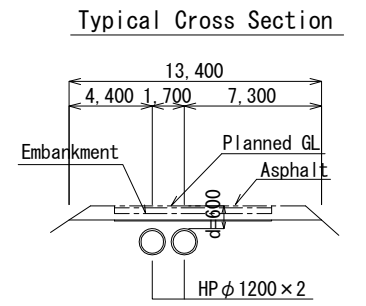
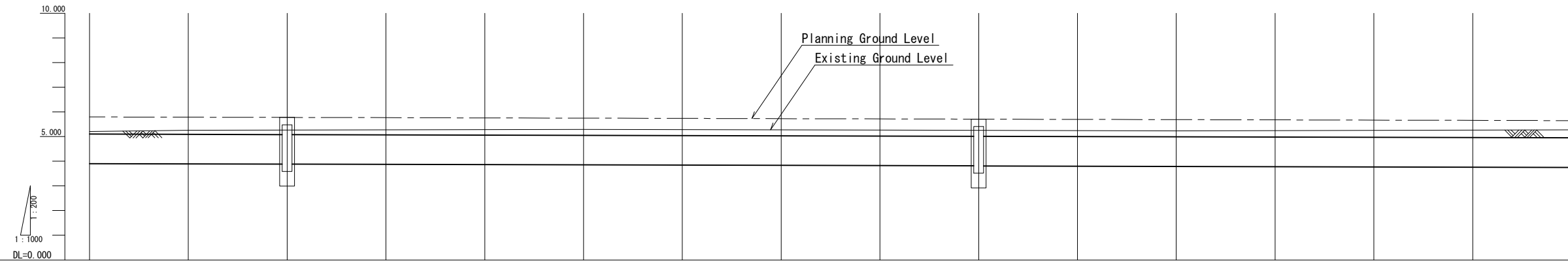


Bottom Level of Pipe	4.050	4.040	4.030	4.020	4.010	4.000	3.990	3.980	3.970	3.960	3.950	3.940	3.930	3.920	3.910	3.900
Earth Covering	0.42 (0.60)	0.51 (0.60)	0.50 (0.60)	0.48 (0.60)	0.47 (0.60)	0.45 (0.60)	0.44 (0.60)	0.42 (0.60)	0.39 (0.60)	0.36 (0.60)	0.32 (0.60)	0.29 (0.60)	0.26 (0.60)	0.18 (0.60)	0.09 (0.60)	0.01 (0.60)
Pipe Gradient	HP φ 1200 × 2 i=0.5‰															
Ground Level (Planning)	5.95	5.94	5.93	5.92	5.91	5.90	5.89	5.88	5.87	5.86	5.85	5.84	5.83	5.82	5.81	5.80
Ground Level	5.87	5.84	5.82	5.79	5.77	5.74	5.72	5.69	5.65	5.61	5.56	5.52	5.48	5.39	5.29	5.20
Accumulated Distance	300.00	320.00	340.00	360.00	380.00	400.00	420.00	440.00	460.00	480.00	500.00	520.00	540.00	560.00	580.00	600.00
Length	0.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Point	No.15	No.16	No.17	No.18	No.19	No.20	No.21	No.22	No.23	No.24	No.25	No.26	No.27	No.28	No.29	No.30

Stormwater drainpipe Plan(3/4)

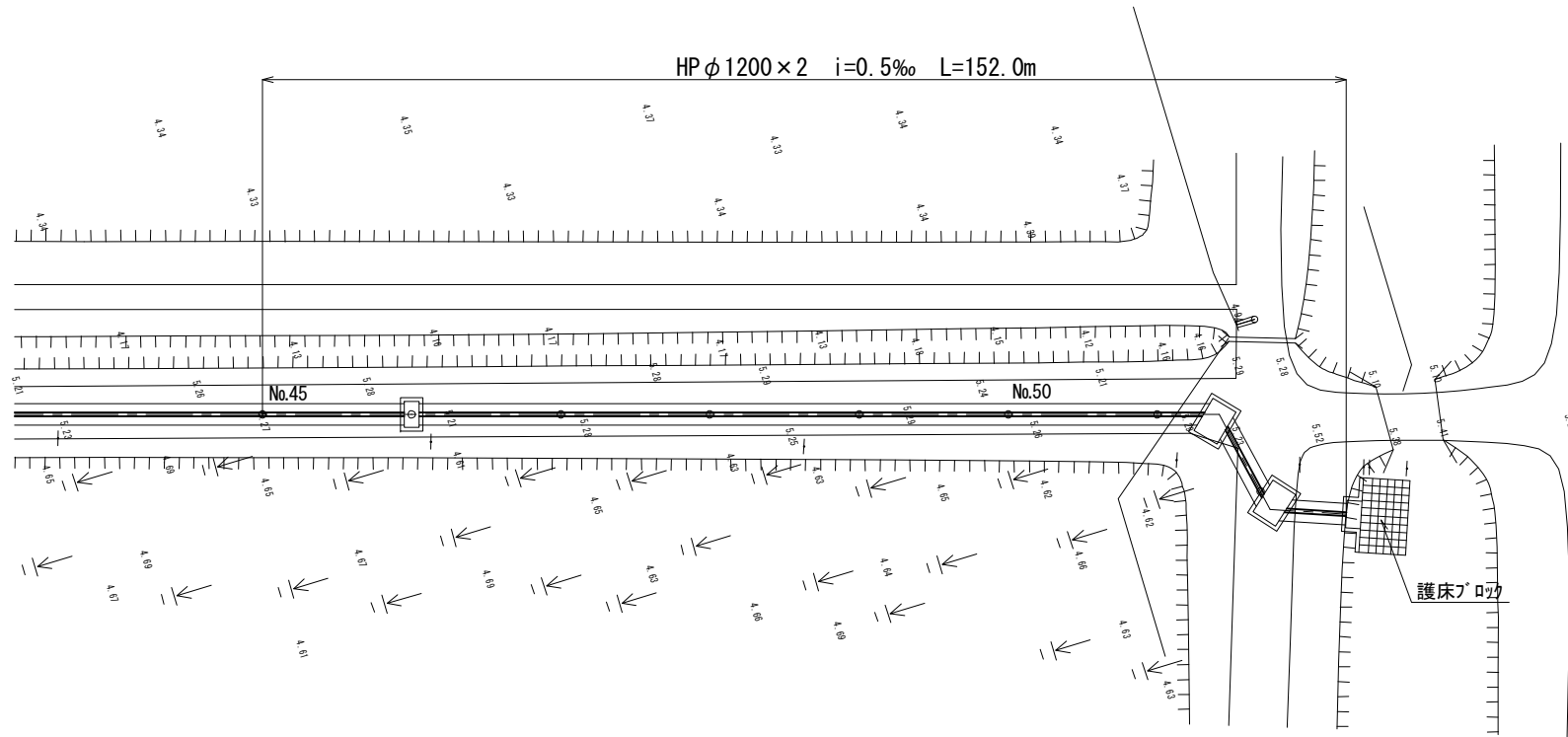


Stormwater drainpipe Section(3/4)

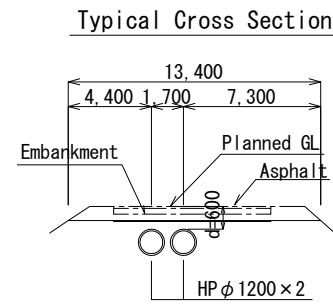
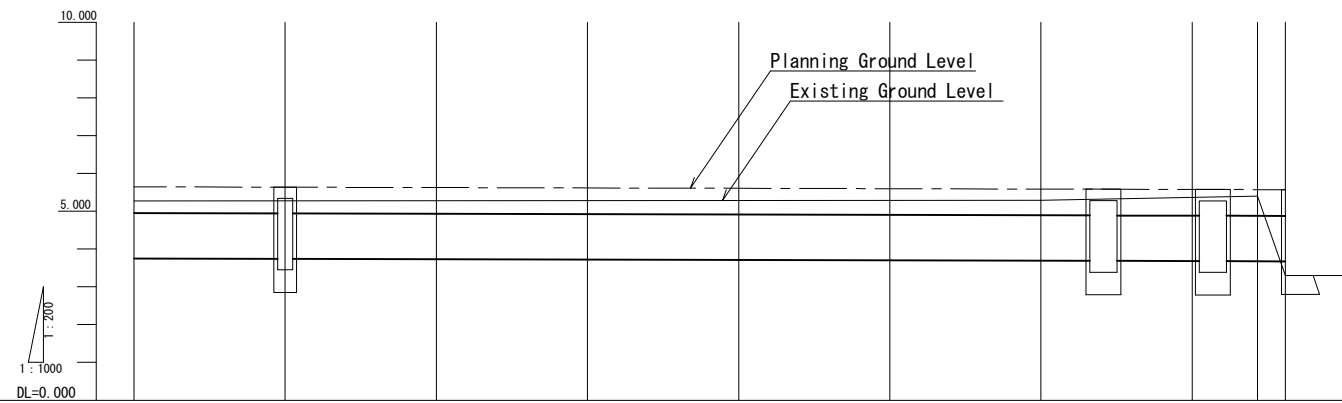


Bottom Level of Pipe	3.900	3.890	3.880	3.870	3.860	3.850	3.840	3.830	3.820	3.810	3.800	3.790	3.780	3.770	3.760	3.750
Earth Covering	0.01 (0.60)	0.07 (0.60)	0.08 (0.60)	0.11 (0.60)	0.13 (0.60)	0.15 (0.60)	0.15 (0.60)	0.15 (0.60)	0.15 (0.60)	0.15 (0.60)	0.15 (0.60)	0.15 (0.60)	0.17 (0.60)	0.19 (0.60)	0.21 (0.60)	0.23 (0.60)
Pipe Gradient	HP φ 1200 x 2 i=0.5‰															
Ground Level (Planning)	5.80	5.79	5.78	5.77	5.76	5.75	5.74	5.73	5.72	5.71	5.70	5.69	5.68	5.67	5.66	5.65
Ground Level	5.20	5.25	5.26	5.27	5.28	5.29	5.28	5.27	5.26	5.25	5.24	5.23	5.24	5.25	5.26	5.27
Accumulated Distance	600.00	620.00	640.00	660.00	680.00	700.00	720.00	740.00	760.00	780.00	800.00	820.00	840.00	860.00	880.00	900.00
Length	0.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
Point	NO.30	NO.31	NO.32	NO.33	NO.34	NO.35	NO.36	NO.37	NO.38	NO.39	NO.40	NO.41	NO.42	NO.43	NO.44	NO.45

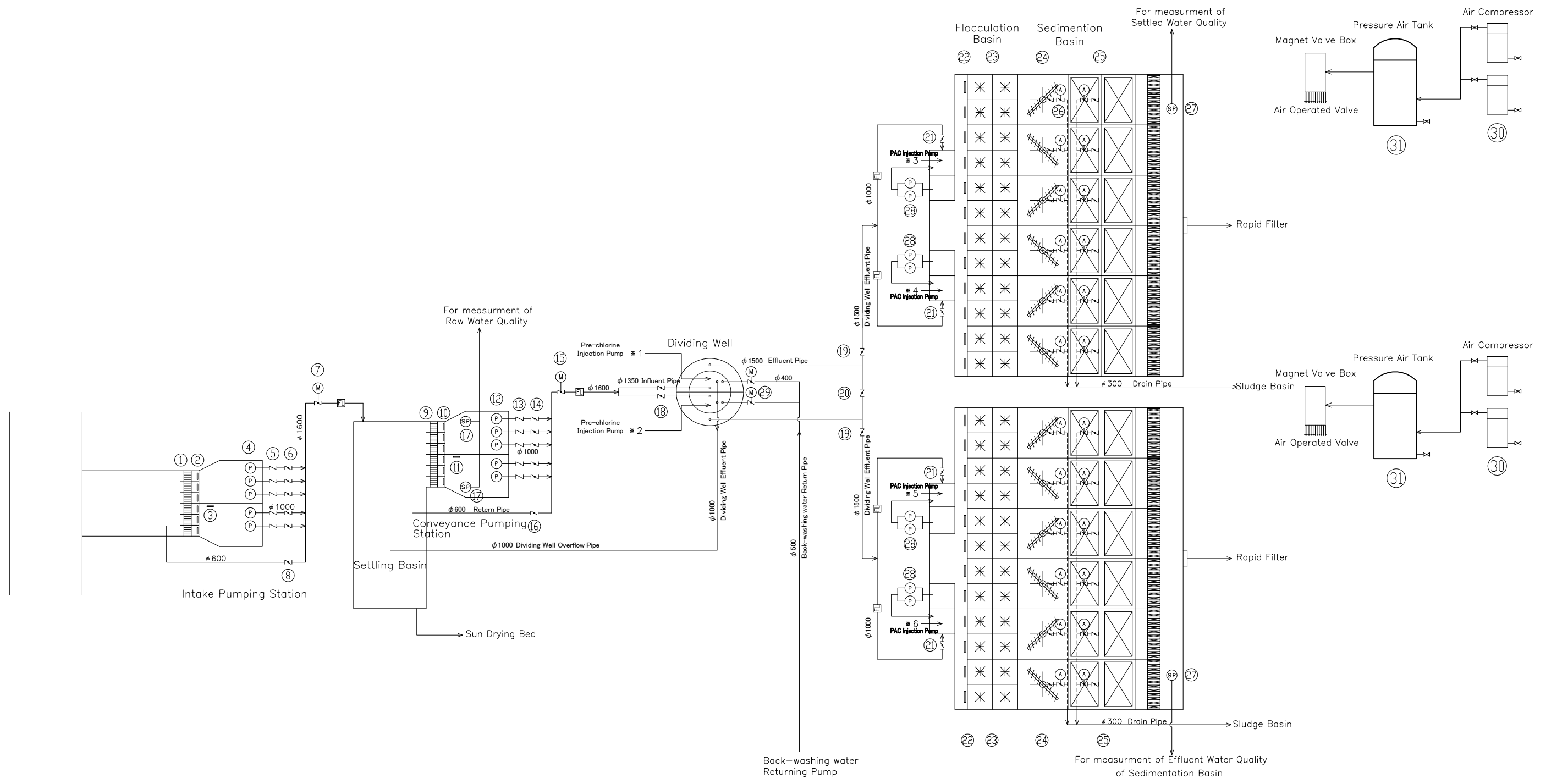
Stormwater drainpipe Plan(4/4)



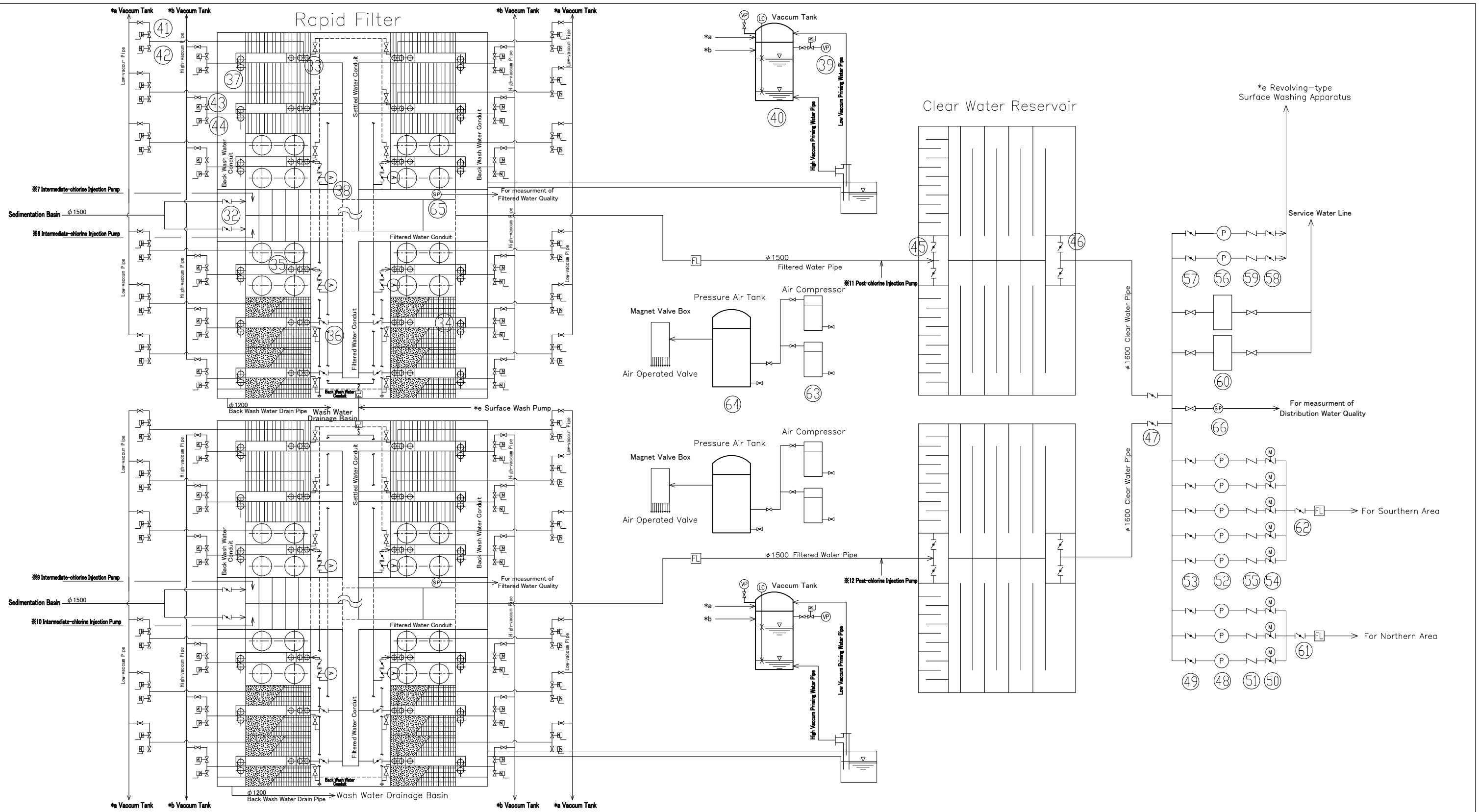
Stormwater drainpipe Section(4/4)



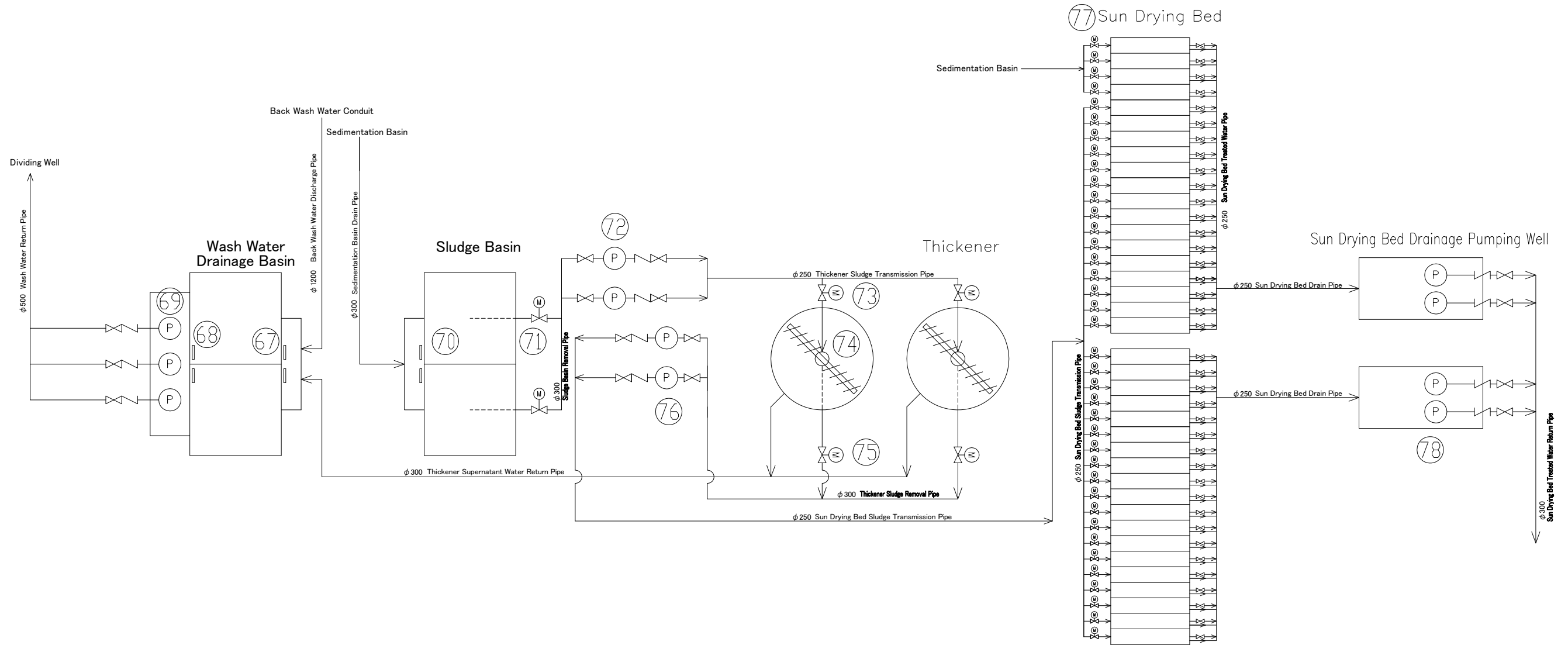
Bottom Level of Pipe	3.750	3.740	3.730	3.720	3.710	3.700	3.690	3.680	3.674
Earth Covering	0.23 (0.60)	0.24 (0.60)	0.26 (0.60)	0.27 (0.60)	0.28 (0.60)	0.30 (0.60)	0.31 (0.60)	0.40 (0.60)	0.60
Pipe Gradient	HP φ 1200 x 2 i=0.5‰								
Ground Level (Planning)	5.65	5.64	5.63	5.62	5.61	5.60	5.59	5.58	5.57
Ground Level	5.27	5.27	5.28	5.28	5.28	5.29	5.29	5.37	5.40
Accumulated Distance	900.00	920.00	940.00	960.00	980.00	1000.00	1020.00	1040.00	1052.33
Length	0.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	12.33
Point	No. 45	No. 46	No. 47	No. 48	No. 50	No. 51	No. 52	No. 53	No. 53 +12.33



No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯
Name	Water Intake Pumping Well Screen	Water Intake Pumping well Influent Gate	Water Intake Pumping well Communicating Gate	Water Intake Pump	Water Intake Pump Check Valve	Water Intake Pump Delivery Valve	Water Intake Flow Regulator Valve	Water Intake Return Valve	Water Conveyance Pumping Well Screen	Water Conveyance Pumping Well Influent Gate	Water Conveyance Pumping Well Communicating Gate	Water Conveyance Pump	Water Conveyance Pump Check Valve	Water Conveyance Pump Delivery Valve	Raw Water Flow Regulator Valve	Raw Water Return Valve
Type	Manual type Bar Screen	Manual type Square Gate	Manual type Square Gate	Removable Submersible Pump	Non-water hammer type	Manual Butterfly Valve	Electric Butterfly Valve	Manual Butterfly Valve	Manual type Screen	Manual type Square Gate	Manual type Square Gate	Removable Submersible Pump	Non-water hammer type	Manual Butterfly Valve	Electric Butterfly Valve	Manual Butterfly Valve
Number (Phase1/2)	6 / 0	6 / 0	1 / 0	3 / 2	3 / 2	1 / 0	1 / 0	6 / 0	1 / 0	1 / 0	3 / 2	3 / 2	1 / 0	1 / 0	1 / 0	
Remarks	Aperture 100mm	W2.0m×H2.0m	W2.0m×H2.0m	φ700mm×56m3/min 15m×200kw	φ1,000mm	φ1,000mm	φ1,600mm×2.2kw	φ600mm	Aperture 50mm	W2.0m×H2.0m	W2.0m×H2.0m	φ700mm×56m3/min 15m×200kw VWF Control	φ1,000mm	φ1,000mm	φ1,600mm×2.2kw	φ600mm
No.	⑰	⑱	⑲	⑳	㉑	㉒	㉓	㉔	㉕	㉖	㉗	㉘	㉙	㉚	㉛	㉜
Name	Raw Water Sampling Pump	Raw Water Influent Valve 1	Raw Water Influent Valve 2	Raw Water Influent Communicating Valve	Sedimentation Basin Influent Valve	Floculation Basin Influent Gate	Floculator	Sedimentation Basin Sludge Collector	Sedimentation Basin Inclined Pipe	Sedimentation Basin Drain Valve	Sedimentation Basin Sampling Pump	PAC Dilution Pump	Back-washing water Return Valve	Air Compressor	Pressure Air Tank	
Type	Self-priming Centrifugal Pump	Manual Butterfly Valve	Manual Butterfly Valve	Manual Butterfly Valve	Manual Butterfly Valve	Manual type Square Gate	Center Drive Suspended type	Center Drive Suspended type	Uplow-inclined pipe	Air Operated Eccentric Structure Valve	Self-priming Centrifugal Pump	Self-priming Centrifugal Pump	Electric Butterfly Valve	Nonlubricated Auxiliary Motor Driven Package type	Vertical Cylinder Tank	
Number (Phase1/2)	1 / 1	2 / 0	2 / 0	1 / 0	2 / 2	12 / 12	24 / 24	6 / 6	6 basins / 6 basins	12 / 12	1 / 1	4 / 4	2 / 0	2 / 2	1 / 1	
Remarks	φ32mm×50L/min 30m×1.5kw	φ1,350mm	φ1,500mm	φ1,500mm	φ1,000mm	W1.0m×H1.0m	Dimension: 7.0m×7.0m×3.5m / Paddle: φ3.5m×3.7kw	Dimension: 14.4m×14.4m×3.35m / 4column/2basin	φ200mm	φ32mm×50L/min 30m×1.5kw	φ50mm×0.3m3/min 10m×1.5kw	φ400mm×0.4kw	240L/min×0.8MPa×2.2kw			

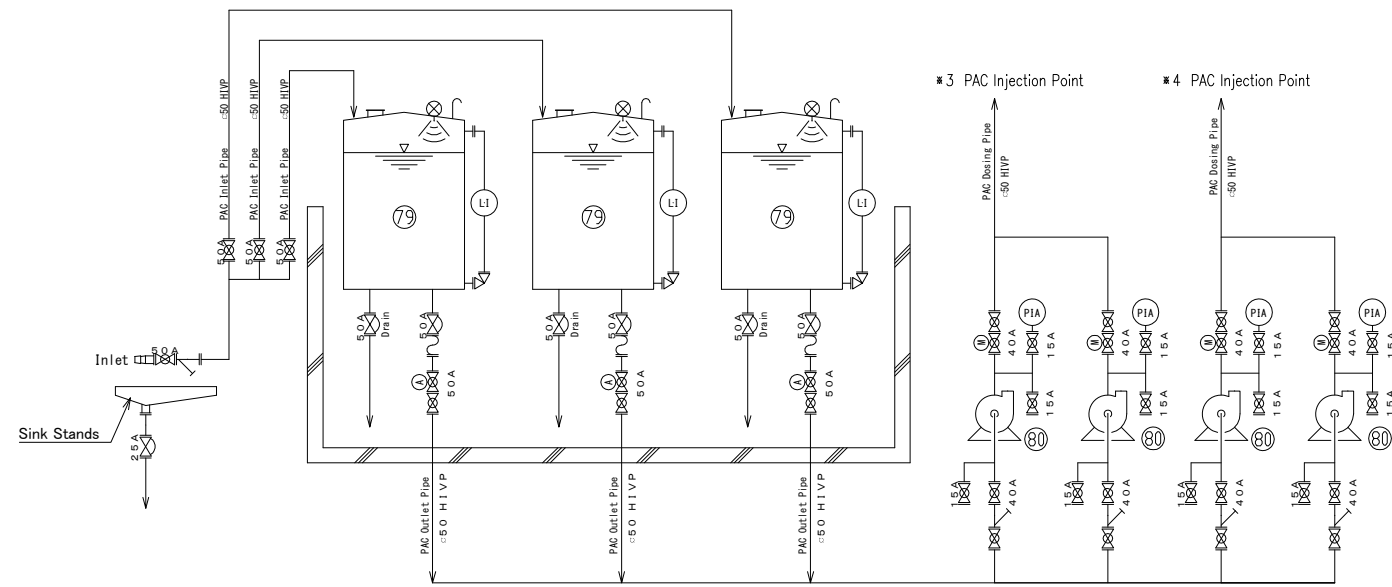


No.	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Name	Rapid Filter Influent Valve	Influent Syphon	Underdrain System	Surface Washing Apparatus	Communicating Valve	Discharge Syphon	Surface Wash Valve	Vacuum Pump	Vacuum Tank	Influent Vacuum Valve	Influent Vacuum Breaker	Discharge Vacuum Valve	Discharge Vacuum Breaker	Clear Water Reservoir Influent Valve	Clear Water Reservoir Effluent Valve	Transmission Pumping Station Influent Valve	Water Transmission Pump for Northern Area	Transmission Pump for North Suction Valve	Transmission Pump for North Delivery Valve	Transmission Pump for North Check Valve	Water Transmission Pump for Southern Area
Type	Manual Butterfly Valve	SUS	Self Back-washing type Perforated Block	Revolving-type Surface Washing Apparatus	Manual Butterfly Valve	SUS	Air Operated Butterfly Valve	Water Sealed Type		Air Operated Sluice Valve	Air Operated Sluice Valve	Air Operated Sluice Valve	Air Operated Sluice Valve	Manual Butterfly Valve	Manual Butterfly Valve	Manual Butterfly Valve	Horizontal Axis Double Suction Pump	Manual Butterfly Valve	Electric Butterfly Valve	Non-water hammer type	Horizontal Axis Double Suction Pump
Number (Phase 1/2)	2	12	12	12 Basins / 12 Basins	12	12	12	1	1	12	12	12	12	2	2	1	2	1	2	1	2
Remarks	φ 1,500mm	φ 550mm	12 Basins / 12 Basins Filtration Area 5.2m x 10.5m x 2 Bed Side Flume Type, Ceramic	4 Units / 1 Basin	φ 1,200mm	φ 1,200mm	φ 300mm	7.0m ³ /min - 450mmHG (ref) φ 80mm x 15kw	φ 1.8m x 2.5mH (ref)	φ 25mm (ref)	φ 25mm (ref)	φ 80mm (ref)	φ 80mm (ref)	φ 1,000mm	φ 1,500mm	φ 1,600mm	φ 300mm x 10.5m / motor 4kW x 132kw Flywheel, VWF Control	φ 500mm	φ 500mm x 1.5kw	φ 500mm	φ 700mm x 31.0m / motor 55kw x 300kw Flywheel, VWF Control
No.	53	54	55	56	57	58	59	60	61	62	63	64	65	66							
Name	Transmission Pump for South Suction Valve	Transmission Pump for South Delivery Valve	Transmission Pump for South Check Valve	Surface Wash Pump	Surface Wash Pump Suction Valve	Surface Wash Pump Check Valve	Surface Wash Pump Check Valve	Feed Water Unit	Transmission Pump for North Water Regulating Valve	Transmission Pump for South Water Regulating Valve	Air Compressor	Pressure Air Tank	Filtering Water Sampling Pump	Clear Water Sampling Pump							
Type	Manual Butterfly Valve	Electric Butterfly Valve	Non-water hammer type	Horizontal Axis Double Suction Pump	Manual Butterfly Valve	Electric Butterfly Valve	Non-water hammer type	Alternate+Parallel Run Type	Manual Butterfly Valve	Manual Butterfly Valve	Nonlubricated Auxiliary Motor Driven Package type	Vertical Cylinder Tank	Self-priming Centrifugal Pump	Self-priming Centrifugal Pump							
Number (Phase 1/2)	3	2	3	2	2	0	2	0	1	1	2	1	1	1	0						
Remarks	φ 1,000mm	φ 1,000mm x 2.2kw	φ 1,000mm	φ 400mm x 17.0m ³ /min x 30.0m x 132kw	φ 500mm	φ 500mm x 1.5kw	φ 500mm	φ 150mm x 3.2m ³ /min x 30.0m x 15kw	φ 700mm	φ 1,600mm	240L/min x 0.8MPa x 2.2kw	1	φ 32mm x 50L/min x 30m x 1.5kw	φ 32mm x 40L/min x 30m x 0.75kw							

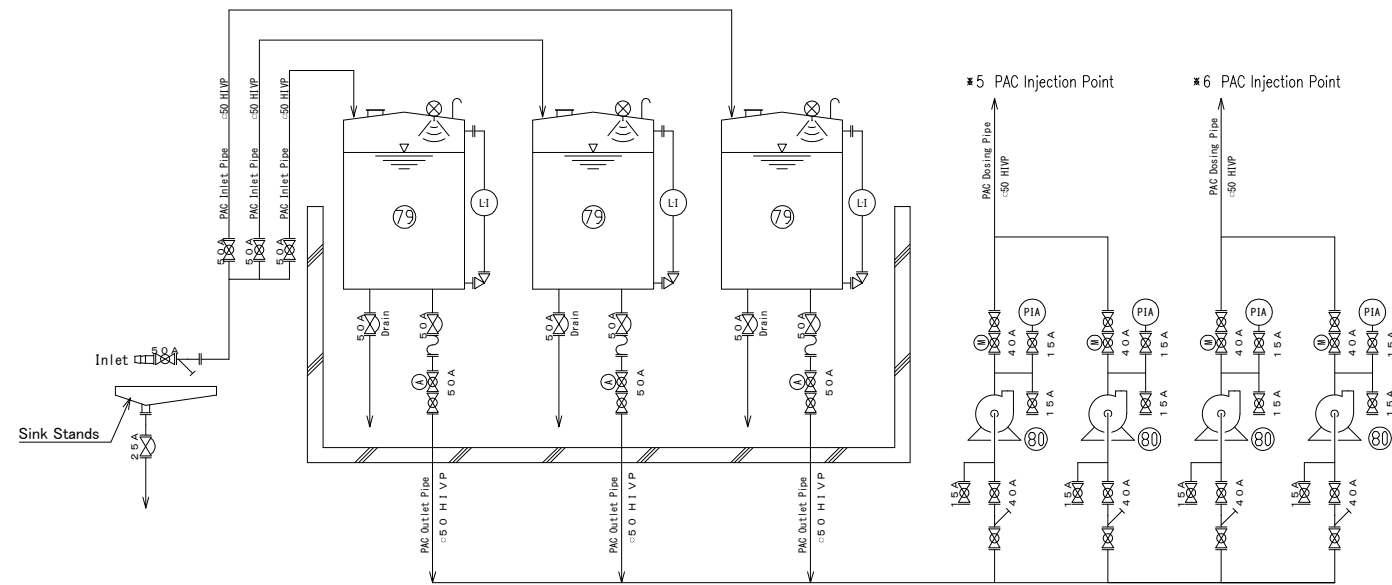


No.	67	68	69	70	71	72	73	74	75	76	77	78
Name	Wash Water Drainage Basin Influent Gate	Wash Water Drainage Basin Effluent Gate	Back Wash Water Return Pump	Sludge Basin Influent Gate	Sludge Basin Sludge Removal Valve	Sludge Basin Sludge Removal Pump	Thickener Sludge Influent Valve	Thickener Sludge Collector Center Drive Center Pillar Type	Thickener Sludge Removal Valve	Thickener Sludge Removal Pump	Sun Drying Bed Sludge Influent Valve	Sun Drying Bed Drain Pump
Type	Manual type Square Gate	Manual type Square Gate	Removable Submersible Pump	Manual type Square Gate	Electric Eccentric Structure Valve	Screw type Centrifugal Pump	Electric Sluice Valve	Center Drive Center Pillar Type	Electric Eccentric Structure Valve	Screw type Centrifugal Pump	Electric Sluice Valve	Removable Submersible Pump
Number (Phase1/2)	2 / 0	2 / 0	2 / 1	2 / 0	2 / 0	2 / 0	2 / 0	2 / 0	2 / 0	2 / 0	19 / 19	2 / 2
Remarks	W2.0m×H1.0m	W1.0m×H1.0m	φ250mm×9.0m/1min×20.0m×55kw	W2.0m×H1.0m	φ300mm×2.2kw	φ150mm×1.6m/1min×10.0m×7.5kw	φ250mm	φ23m×1.5kw	φ300mm×2.2kw	φ150mm×1.2m/1min×10.0m×5.5kw	φ250mm	φ200mm×4.0m/3min×10.0m×15kw

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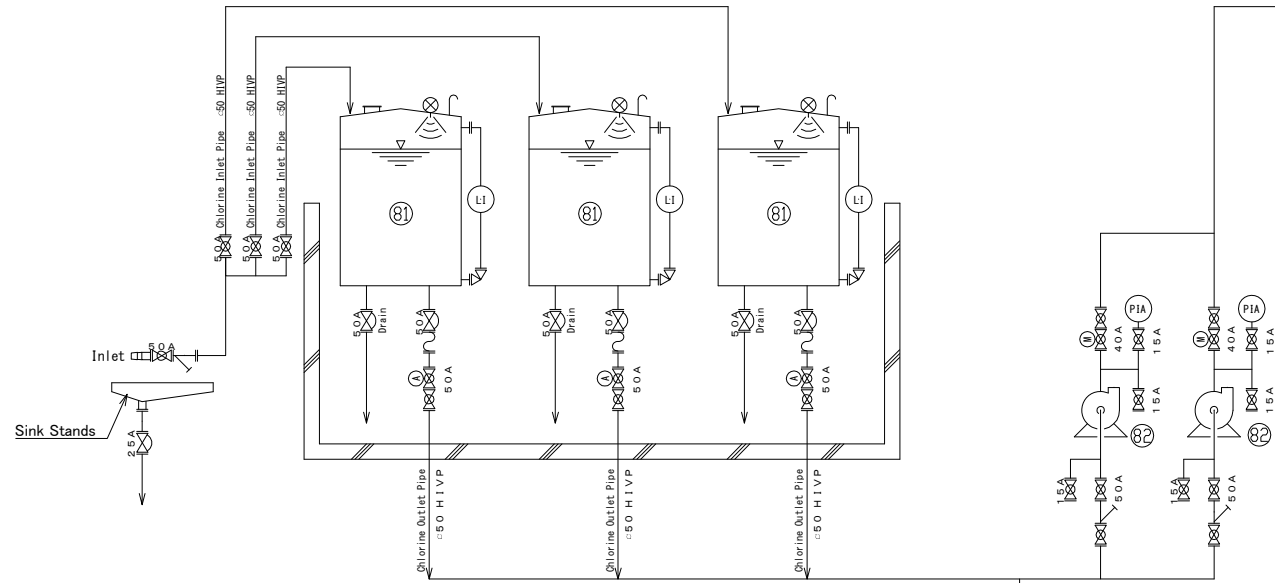
PAC Dosing Facility for 1st-system
Flow Diagram



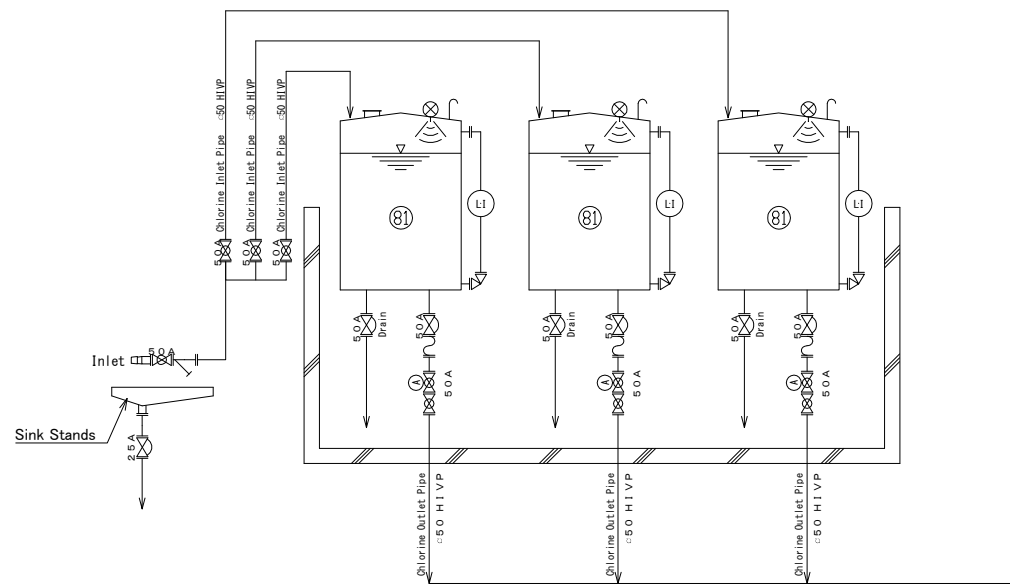
PAC Dosing Facility for 2nd-system
Flow Diagram

No.	79	80
Name	PAC Storage Tank	PAC Injection Pump
Type	Airtight Cylindrical Steel Tank	Diaphragm Metering Pump
Number (Phase 1 / 2)	3 / 3	4 / 4
Remarks	#2.91m x 6.5m H, Effective 38m ³ Plastic Tank	#25mm x 0.5-SL/min x 0.3MPa x 0.4kw

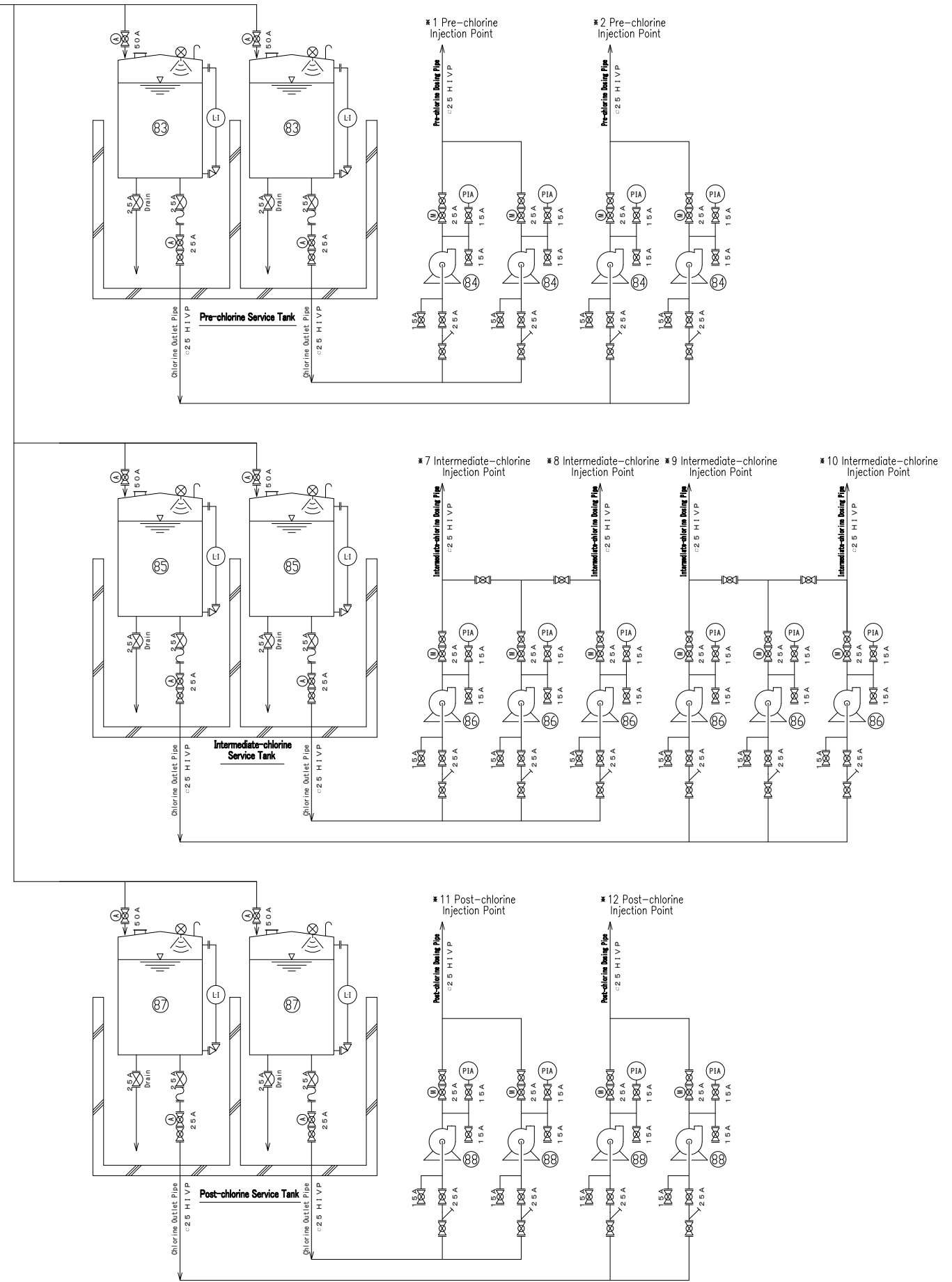
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Chlorine Storage Tank for 1st-system
Flow Diagram

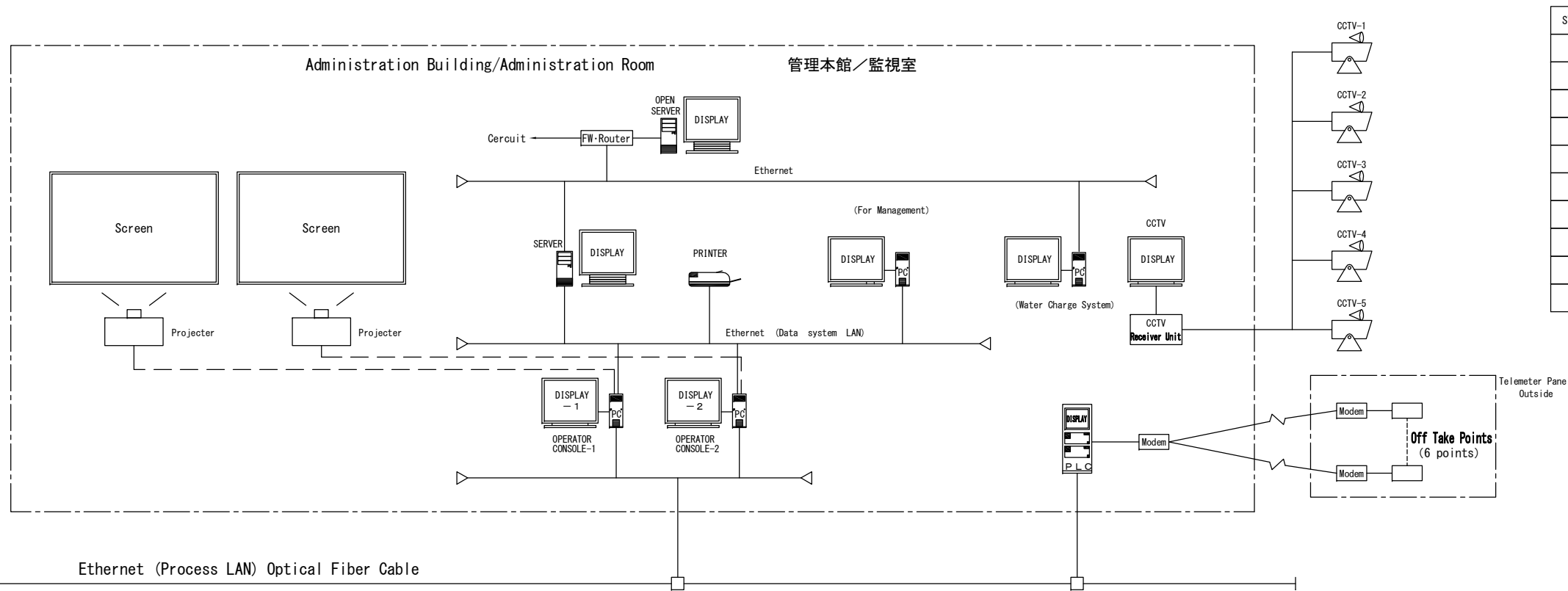


Chlorine Storage Tank for 2nd-system
Flow Diagram

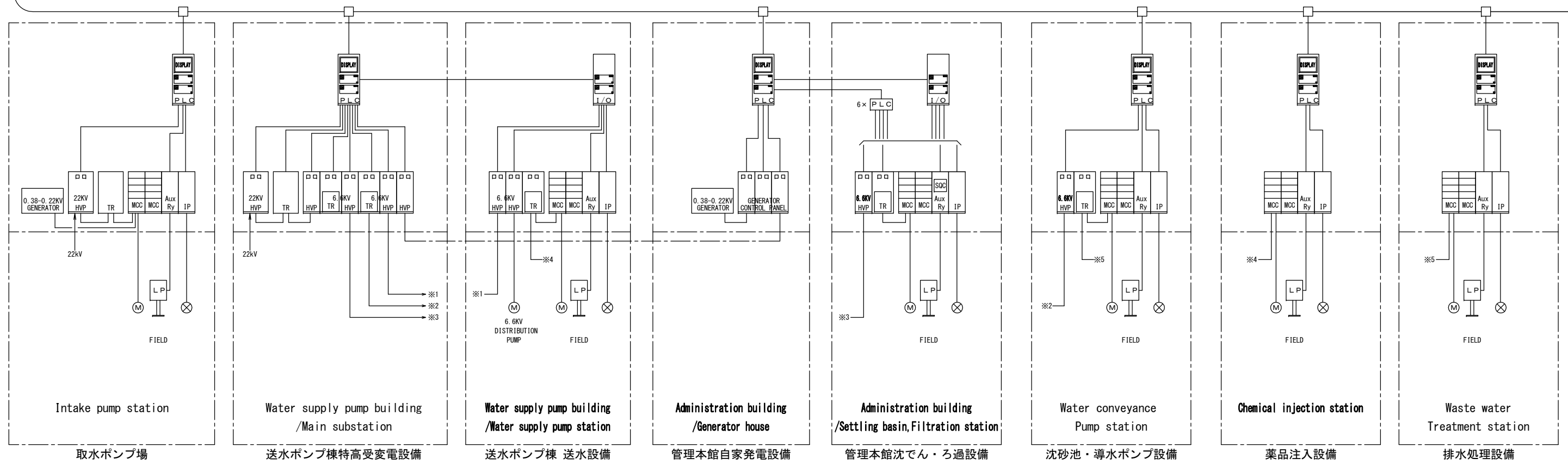


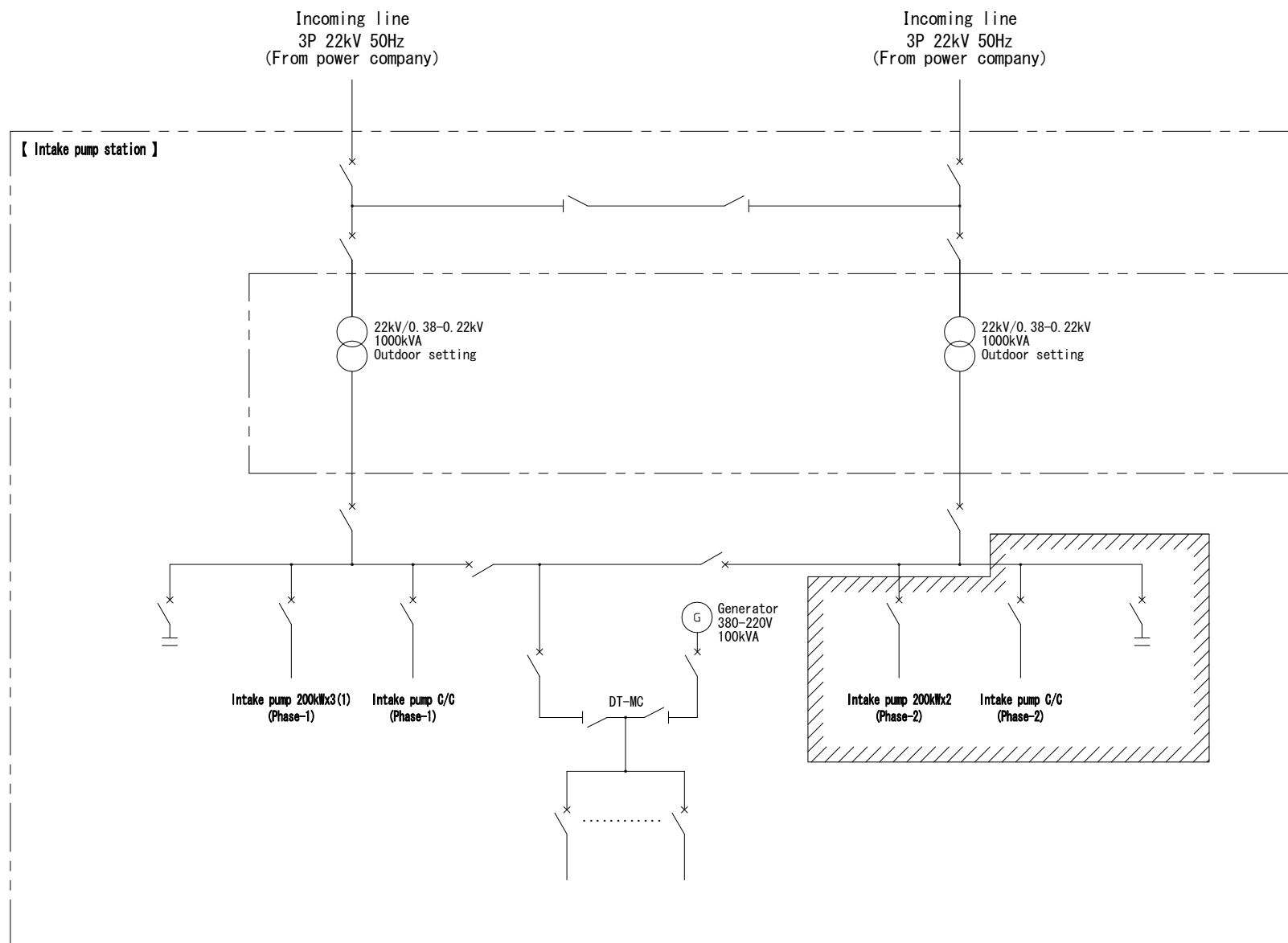
No.	61	62	63	64	65	66	67	68
Name	Chlorine Storage Tank	Chlorine Transfer Pump	Pre-chlorine Service Tank	Pre-chlorine Injection Pump	Intermediate-chlorine Service Tank	Intermediate-chlorine Injection Pump	Post-chlorine Service Tank	Post-chlorine Injection Pump
Type	Airtight Cylindrical Plastic Tank	Magnet Pump	Airtight Cylindrical Polyethylene Tank	Diaphragm Metering Pump	Airtight Cylindrical Polyethylene Tank	Diaphragm Metering Pump	Airtight Cylindrical Polyethylene Tank	Diaphragm Metering Pump
Number (Phase1/2)	3 / 3	2 / 0	1 / 1	2 / 2	1 / 1	3 / 3	1 / 1	2 / 2
Remarks	φ2.3m×6.5m H Effective 38m ³	φ50mm×200/min×20××3.7kw	φ0.76m×0.94m H 有效0.3m ³	φ25mm×1.1-1.0L/min×0.3MPa×0.2kw	φ1.4m×2.0m H Effective 2.0m ³	φ25mm×0.2-4.0L/min×0.3MPa×0.75kw	φ1.0m×0.9m H Effective 0.5m ³	φ25mm×0.2-2.0L/min×0.3MPa×0.2kw


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SYMBOL	LEGEND
PLC	PROGRAMMABLE LOGIC CONTROLLER
PC	PERSONAL COMPUTER
HVP	HIGH VOLTAGE PANEL
LVP	LOW VOLTAGE PANEL
TR	TRANSFORMER
MCC	MOTOR CONTROL CENTER / STARTER PANEL
Ry	AUXILIARY RELAY PANEL
LP	LOCAL CONTROL PANEL
M	MOTOR
IP	INSTRUMENT PANEL





Note1:  Shows the phase-2.
Besides, the phase-1 is shown.

Study Team

No.			

THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT
IN THE SOCIALIST REPUBLIC OF VIET NAM

Date.
NOV. 2011

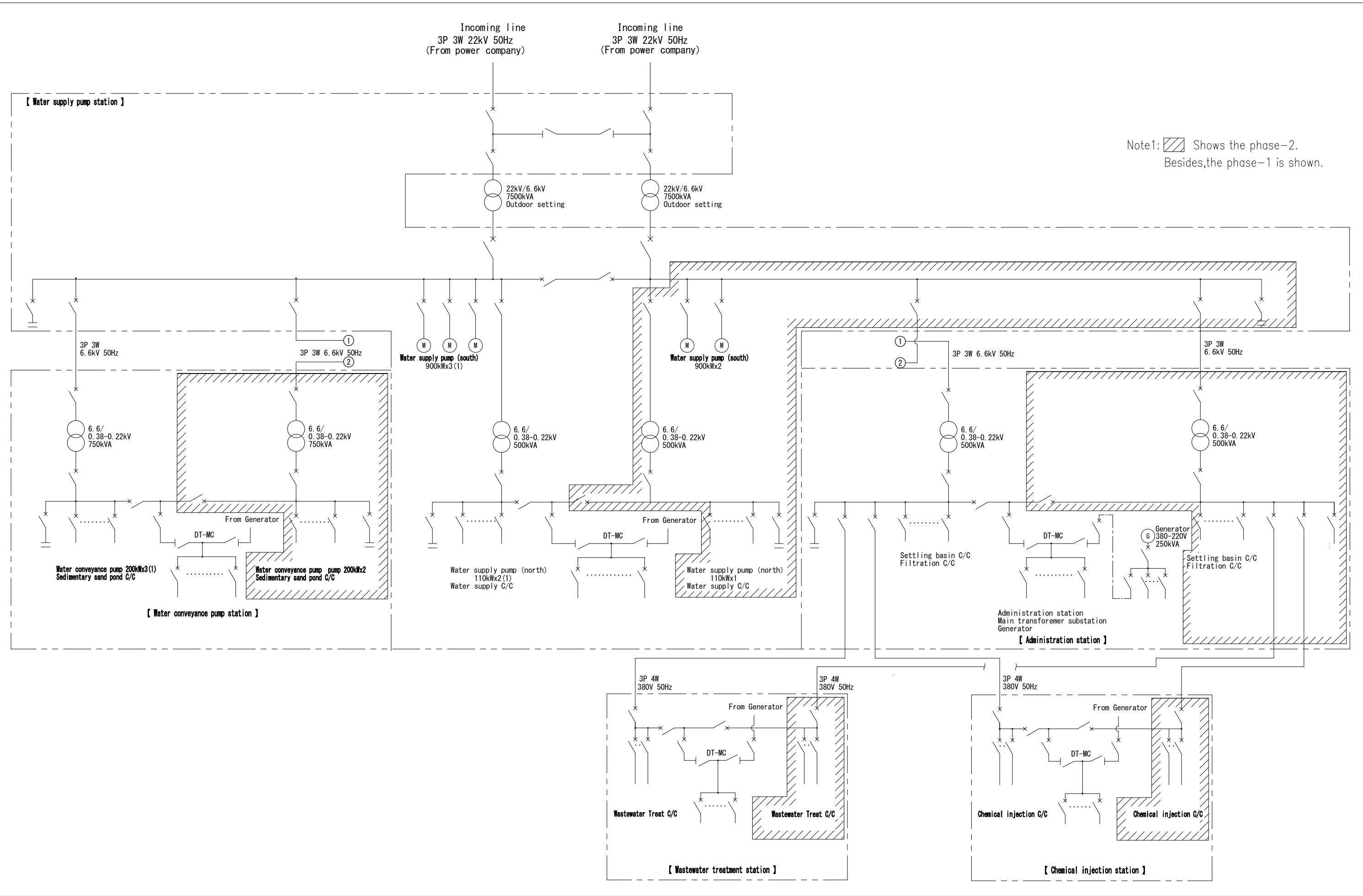
Scale
non

Duong River Water Treatment Plant (Intake pump)

A single line connection diagram (An outline)

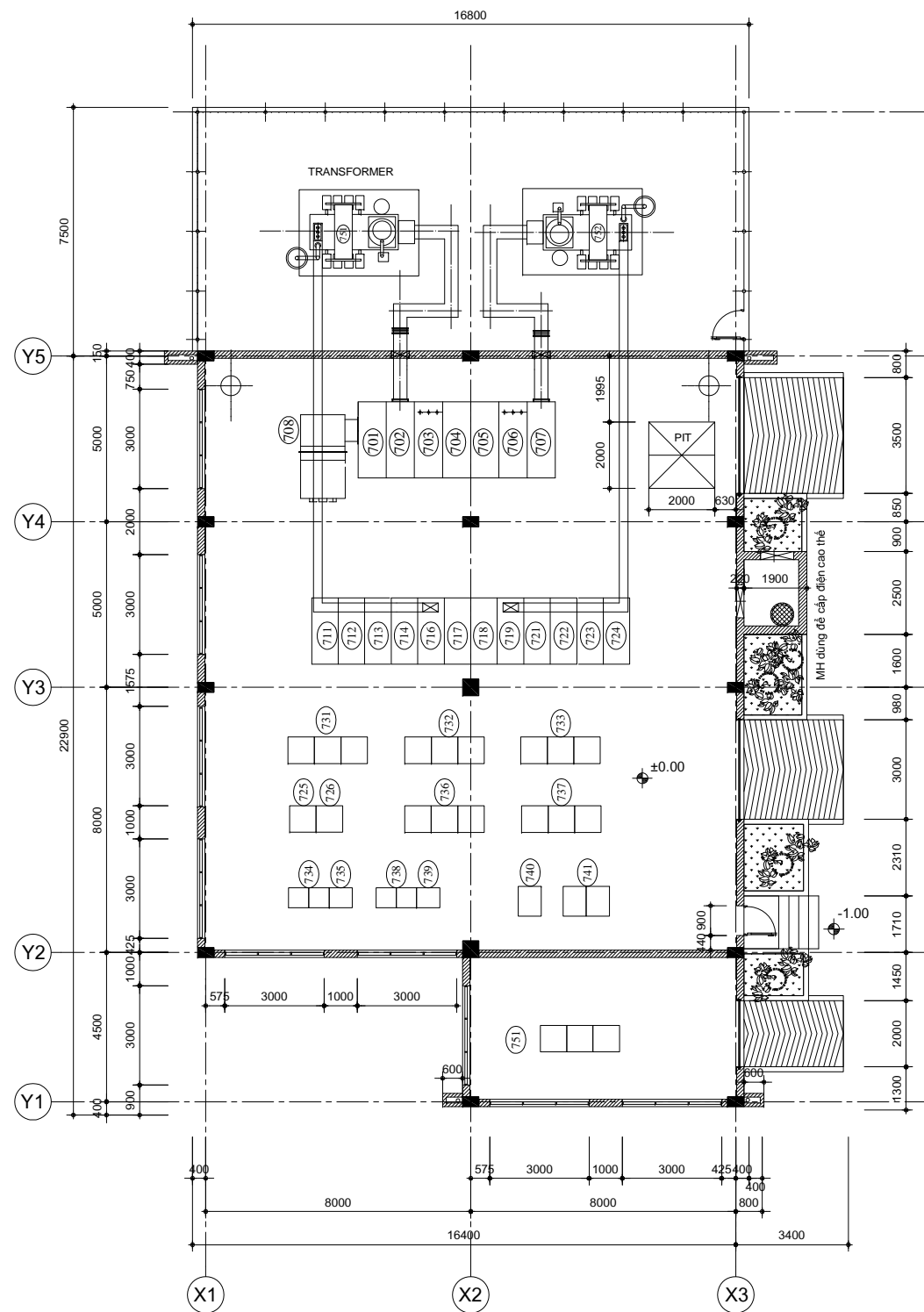
Drawing No

95



Study Team				THE PREPARATORY SURVEY ON THE DUONG RIVER WATER SUPPLY SYSTEM PROJECT IN THE SOCIALIST REPUBLIC OF VIET NAM	Date. NOV. 2011	Duong River Water Treatment Plant	Drawing No 96
	No.				Scale non	A single line connection diagram (An outline)	

Water Intake Electric Facility



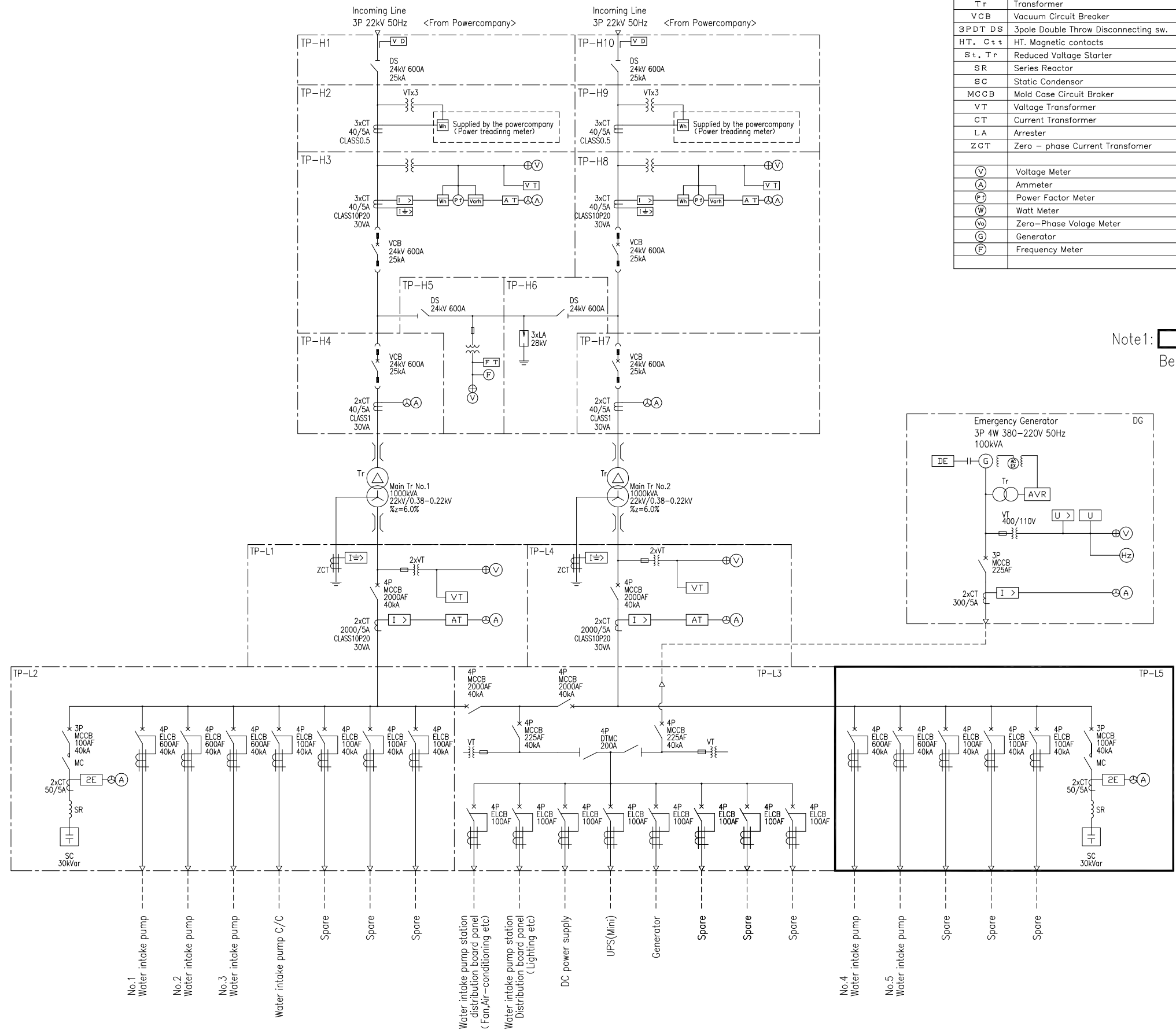
Equipment List

No.	Name	Mark	Remarks
701	No.1 Lead-in panel	TP-HP1	Phase 1
702	No.1 VCT panel	TP-HP2	"
703	No.1 Incoming panel	TP-HP3	"
704	No.1 Main transformer primary panel	TP-HP4	"
705	No.1 Bus-branch panel	TP-HP5	"
706	No.2 Bus-branch panel	TP-HP6	"
707	No.2 Main transformer primary panel	TP-HP7	"
708	No.2 Incoming panel	TP-HP8	"
751	Intake water quality rack (Turbidity,pH,electrical conductivity)	SP-10	Phase 1
752	2nd Main Transformer panel	P-T2	"

Equipment List

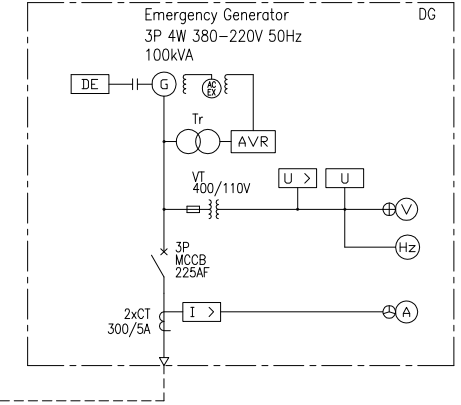
No.	Name	Mark	Remarks
711	No.1 Transformer secondary panel	TP-L1	Phase 1
712	No.1 Low voltage power branch panel	TP-L2	"
713	Building power· lighting branch panel	TP-L3	"
714	No.2 Low voltage power branch panel	TP-L4	"
715	No.2 Transformer secondary panel	TP-L5	"
716	No.1 Transformer secondary panel	P-L6	"
717	1st Bus-bar panel	P-L7	"
718	2nd Bus-bar panel	P-L8	"
719	No.2 Transformer secondary panel	P-L9	"
720	Unused Number		
721	1st Main transformer	TP-TR1	Phase 1
722	2nd Main transformer	TP-TR2	"
723	2nd No.1 phase advancing condenser panel	P-L14	"
724	2nd No.2 phase advancing condenser panel	P-L15	"
725	Power switch panel	P-L16	"
726	Building power· lighting branch panel	P-L17	"
731	No.1 Intake pump panel	TP-LP1	Phase 1
732	No.2 Intake pump panel	TP-LP2	"
733	No.3 Intake pump panel	TP-LP3	"
734	Intake pump facility CC	TP-CC	"
735	Intake pump facility RY	TP-RY	"
736	No.4 Intake pump panel	TP-LP4	Phase 2
737	No.5 Intake pump panel	TP-LP5	"
738	No.2 Intake pump facility CC	P-CC2	"
739	No.2 Intake pump facility RY	P-RY2	"
740	Intake pump facility instrumentation Signal converter panel	TP-KP	Phase 1
741	Intake pump facility control panel	TP-COT	"
751	Intake water quality rack (Turbidity,pH,electrical conductivity)	SP-10	Phase 1

No.			
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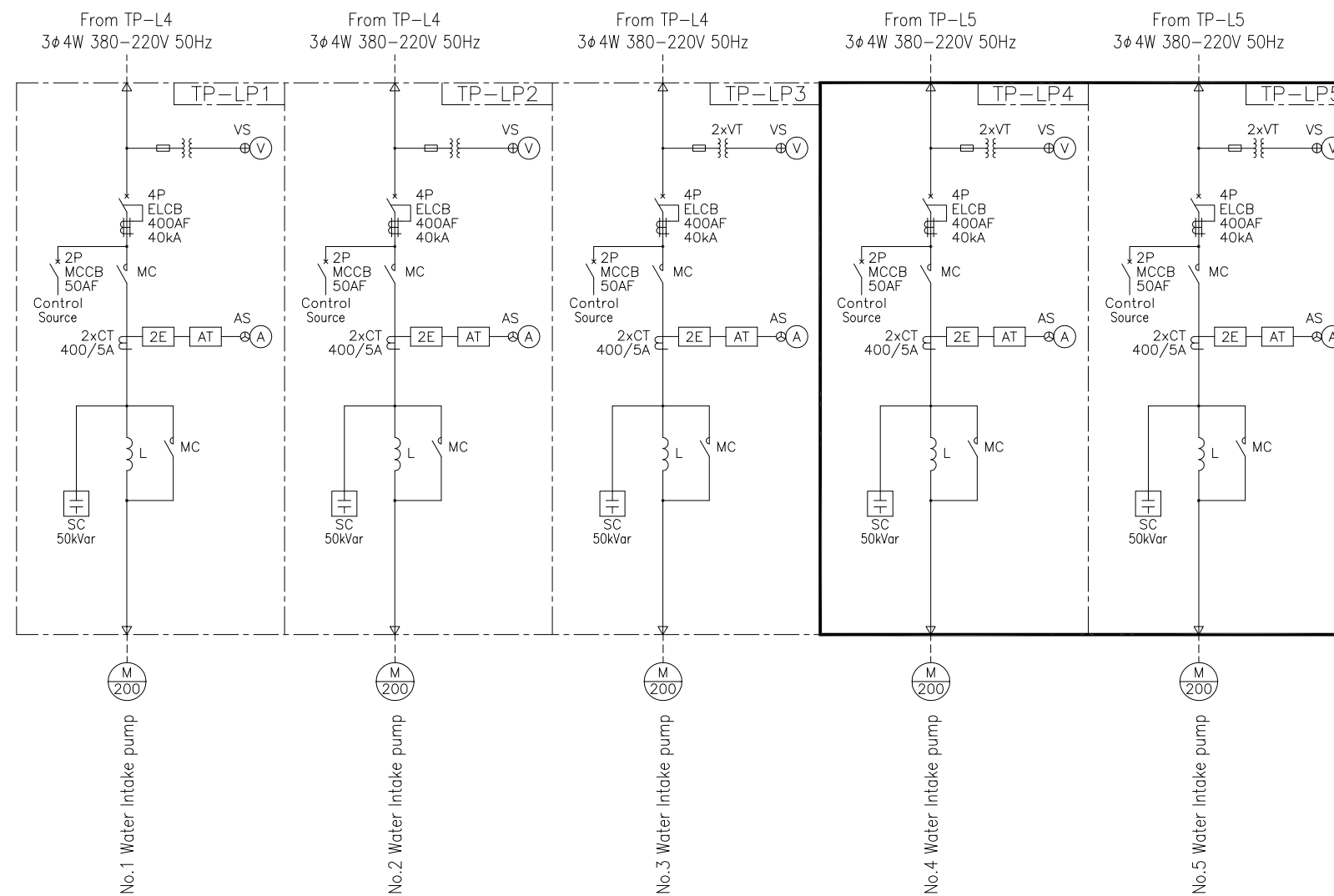


SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
Tr	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation
HT. C t t	HT. Magnetic contacts	Dff	Differential Relay
S t. T r	Reduced Voltage Starter	I >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensior	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	AVR	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	P T T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transfomer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter	Wh	Watt-Hour Meter
A	Ammeter	Whr	Tar-Hour Meter
PF	Power Factor Meter	V S	Voltage Selector Switch
W	Watt Meter	⊕	Current Selector Switch
V0	Zero-Phase Volage Meter		
G	Generator		
F	Frequency Meter		

Note1: Shows the phase-2. Besides, the phase-1 is shown.

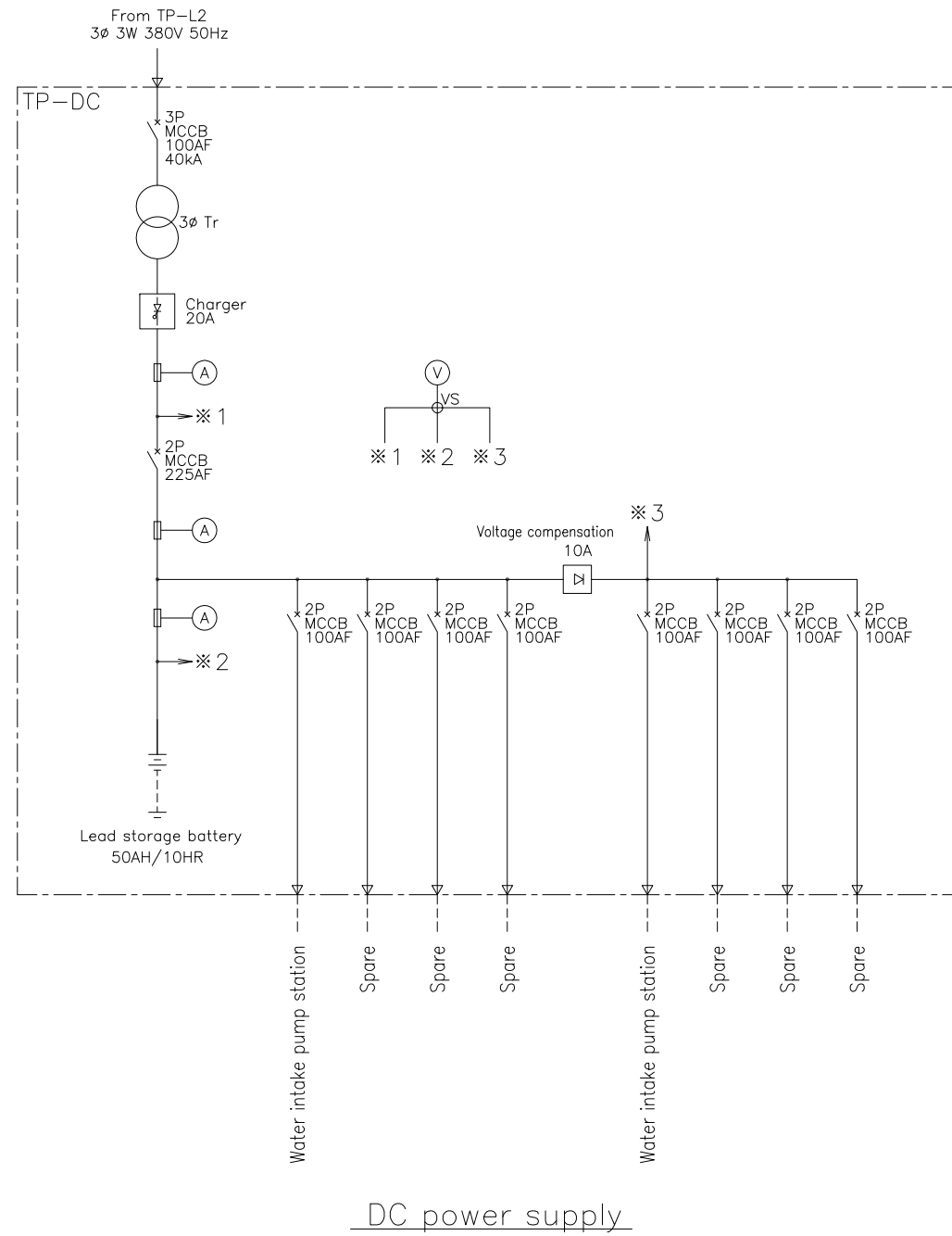


SYMBOL	NAME	SYMBOL	NAME
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T r	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation
H.T. C t t	HT. Magnetic contacts	Dff	Differential Relay
S t . T r	Reduced Voltage Starter	I >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensior	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	AVR	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	F T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transfomer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter		
A	Ammeter	wh	Watt-Hour Meter
F	Power Factor Meter	varh	Tar-Hour Meter
W	Watt Meter	⊙	Voltage Selector Switch
Vo	Zero-Phase Volage Meter	⊕	Current Selector Switch
G	Generator		
F	Frequency Meter		

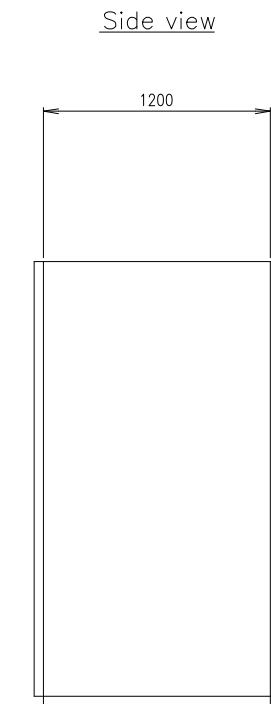
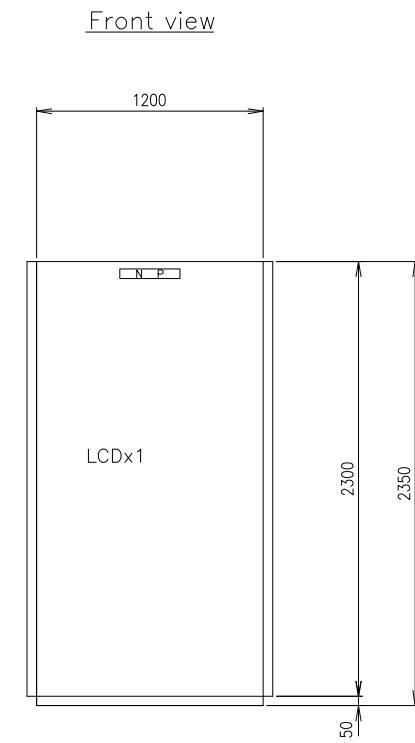
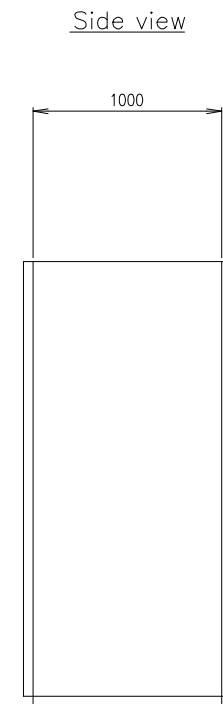
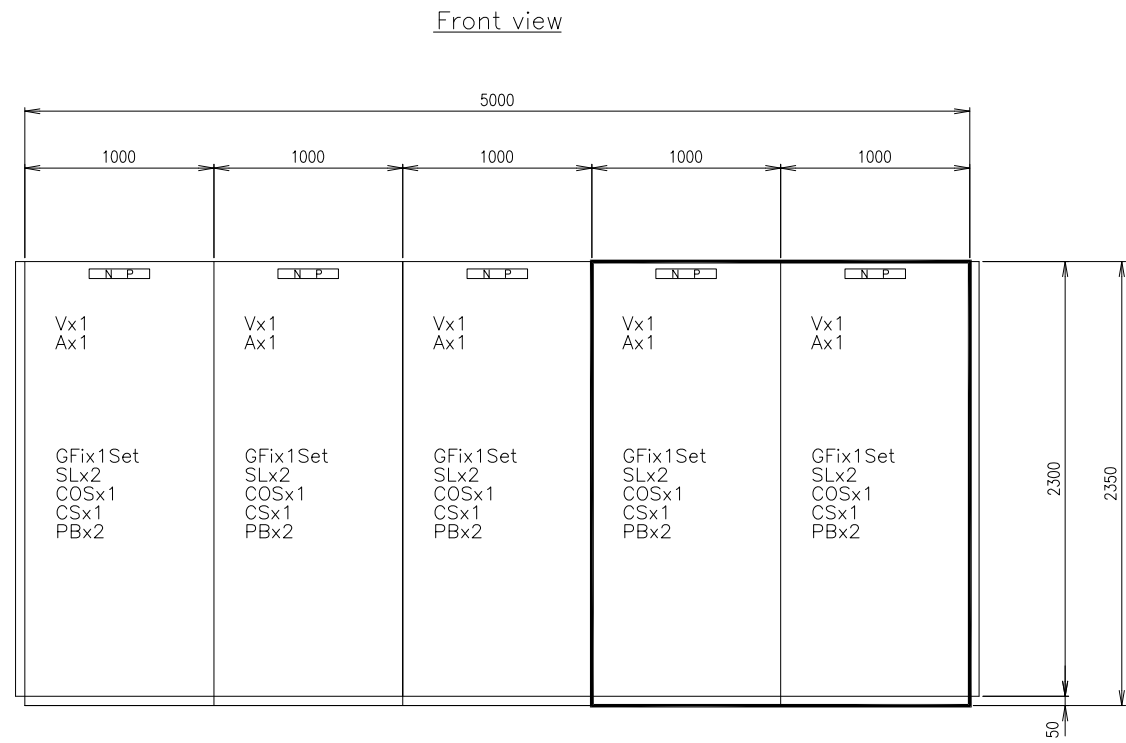


Note1: Shows the phase-2.
Besides, the phase-1 is shown.

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector	V	Voltage Meter
LDS	Load Switch	I >	Over Current Relay	A	Ammeter
Tr	Transformer	VCT	Voltage & Current Transformer	Pf	Power Factor Meter
VCB	Vacuum Circuit Breaker	D	Diesel Engine	W	Watt Meter
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation	Vo	Zero-Phase Volage Meter
HT. C t t	HT. Magnetic contacts	Dff	Differential Relay	G	Generator
S t. T r	Reduced Voltage Starter	I >	Directional earth Fault Relay	F	Frequency Meter
SR	Series Reactor	U <	Under Voltage Relay	Wh	Watt-Hour Meter
SC	Static Condensor	U >	Over Voltage Relay	varh	Tar-Hour Meter
MCCB	Mold Case Circuit Braker	AVR	Automatic Voltage Regulator	⊕	Voltage Selector Switch
VT	Voltage Transformer	A T	Current Transducer	⊕	Current Selector Switch
CT	Current Transformer	P f T	Power Factor Transducer		
LA	Arrester	W T	Watt Transducer		
ZCT	Zero - phase Current Transfomer	F T	Frequency Transducer		
		V T	Voltage Transducer		



Note1: This drawing Shows the phase-1.

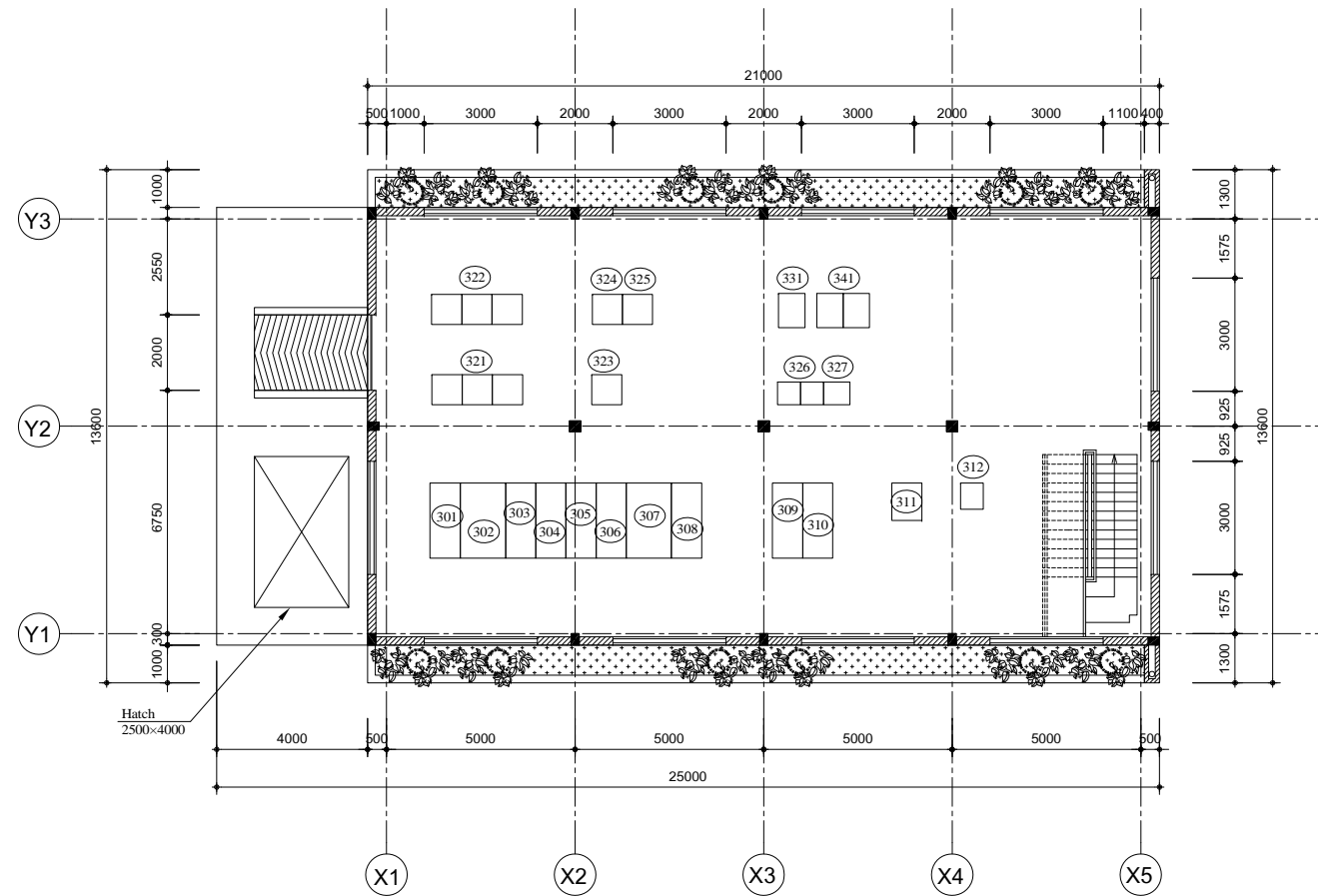


Name	No.1 Intake pump panel	No.2 Intake pump panel	No.3 Intake pump panel	No.4 Intake pump panel	No.5 Intake pump panel
Mark	TP-LP1	TP-LP2	TP-LP3	TP-LP4	TP-LP5

Direct current power panel
TP-DC

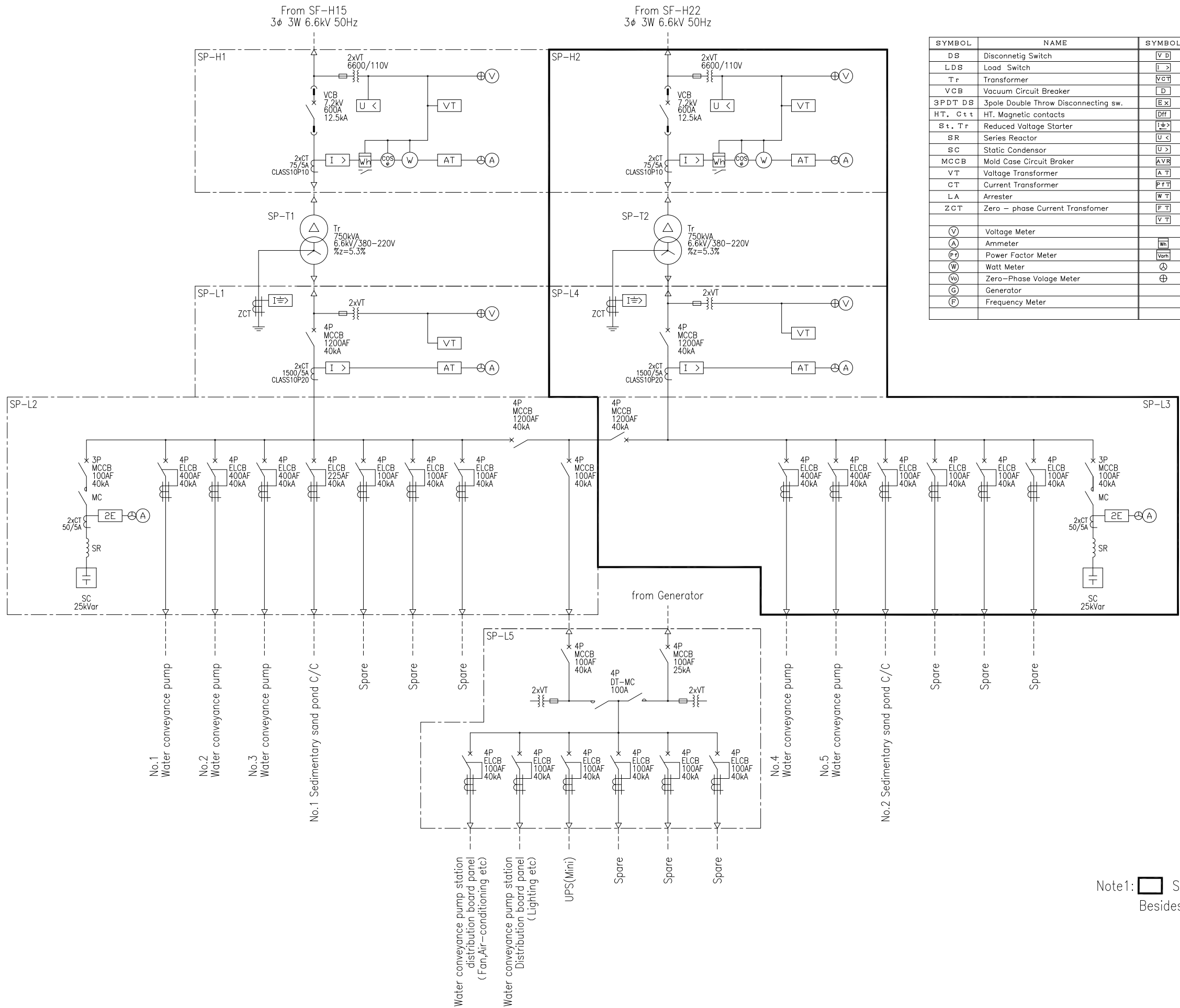
Symbol	Name
V	Voltage Meter
A	Ammeter
GFI	Group Fault Indicator
SL	Signal Lamp
COS	Selector Switch
CS	Control Switch
PB	Push Button Switch
27	Under Voltage Relay
51	Over Current Relay
59	Over Voltage Relay
64	Ground Over Voltage Relay
51G	Ground Over Current Relay
87	Differential Motion Ratio Rlay

Note1: Shows the phase-2.
Besides, the phase-1 is shown.



Equipment List

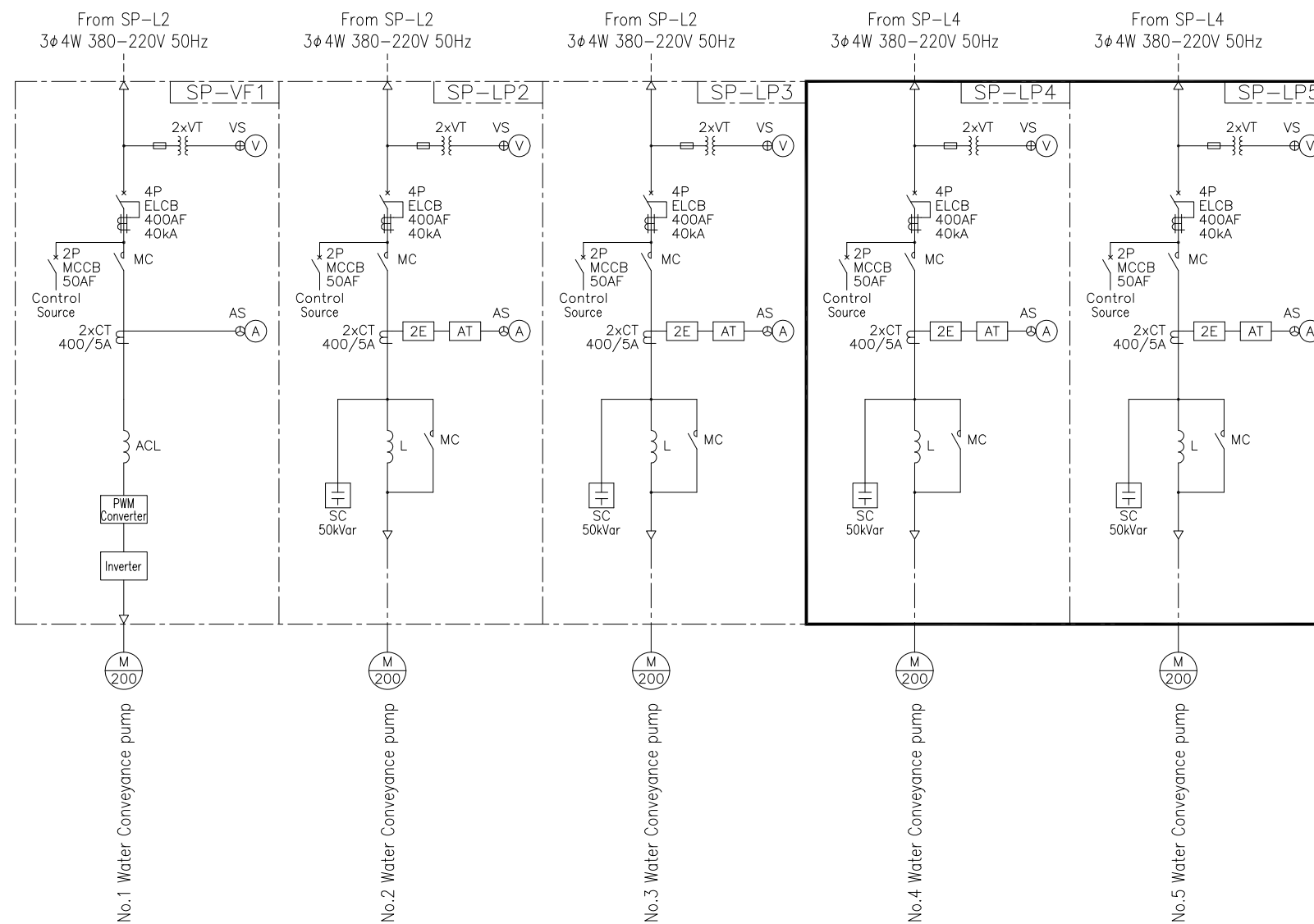
No.	Name	Symbol	Remarks	No.	Name	Symbol	Remarks
301	No.1 Incoming panel	SP-H1	Phase 1	321	No.1 Conveyance pump VWF panel	SP-VF	Phase 1
302	No.1 Transformer secondary Panel	SP-L1	"	322	No.2 Conveyance pump panel	SP-LP2	"
303	No.1 Low-voltage power branch panel	SP-L2	"	323	No.3 Conveyance pump panel	SP-LP3	"
304	No.2 Low-voltage power branch panel	SP-L3	"	324	No.4 Conveyance pump panel	SP-LP4	Phase 2
305	No.2 Transformer secondary Panel	SP-L4	"	325	No.5 Conveyance pump panel	SP-LP5	"
306	No.2 Incoming panel	SP-H2	"				
307	Building power and lighting branch panel	SP-L5	"				
308	No.1 Transformer	SP-T1	"				
309	No.2 Transformer	SP-T2	"				
310	Power for Building / Lighting Deverter Panel	SP-L6	"				
311	Direct current Power Panel	SP-DC	"	326	Sedimentary sand basin facility CC	SP-CC	Phase 1
312	Small UPS	SP-UPS	"	327	Sedimentary sand basin facility RY	SP-RY	"
				331	Sedimentary sand basin facility Instrumentation signal converter panel	SP-KP	"
				341	Sedimentary sand basin conveyance pump facility control panel	SP-COT	"



SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
Tr	Transformer	V CT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E x	Integrated Excitation
H.T. C t t	H.T. Magnetic contacts	Dff	Differential Relay
S t . T r	Reduced Voltage Starter	I > >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensar	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	A V R	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	P f T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transformer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter	W h	Watt-Hour Meter
A	Ammeter	W h m	Tar-Hour Meter
P f	Power Factor Meter	V S	Voltage Selector Switch
W	Watt Meter	C S	Current Selector Switch
V 0	Zero-Phase Volage Meter		
G	Generator		
F	Frequency Meter		

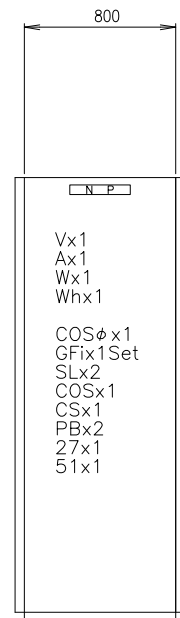
Note1: Shows the phase-2.
Besides, the phase-1 is shown.

SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
T r	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation
H.T. C t t	HT. Magnetic contacts	Dff	Differential Relay
S t. T r	Reduced Voltage Starter	I >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensior	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	A VR	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	F T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transfomer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter		
A	Ammeter	Wh	Watt-Hour Meter
F	Power Factor Meter	Tarh	Tar-Hour Meter
W	Watt Meter	V ⊕	Voltage Selector Switch
Vo	Zero-Phase Volage Meter	⊕	Current Selector Switch
G	Generator		
F	Frequency Meter		

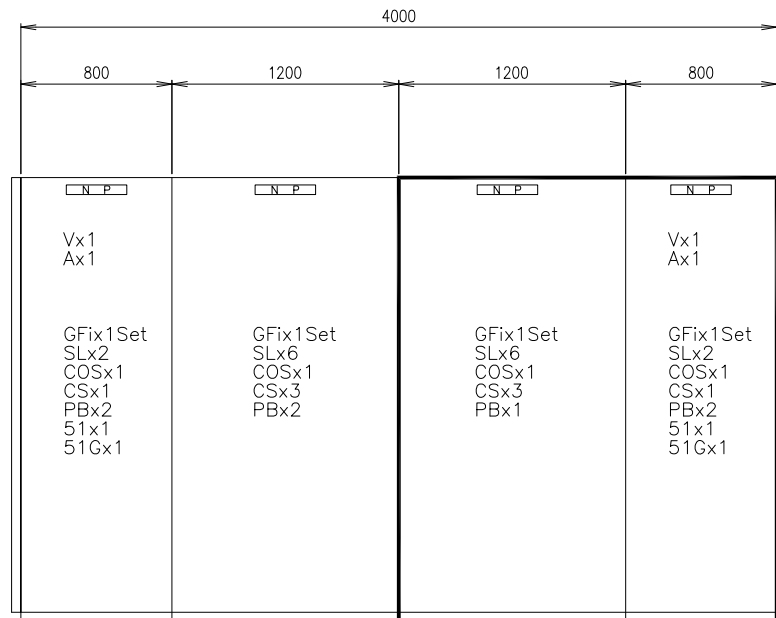


Note1: Shows the phase-2.
Besides, the phase-1 is shown.

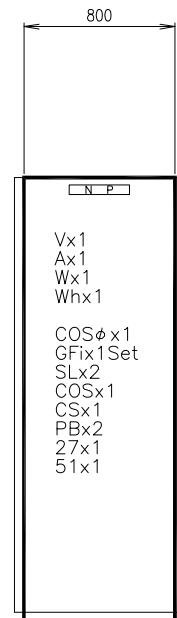
Front view



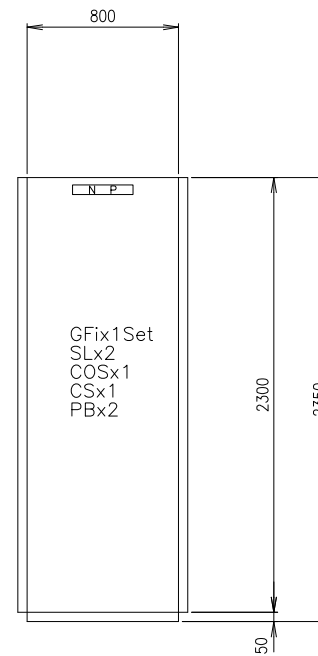
Front view



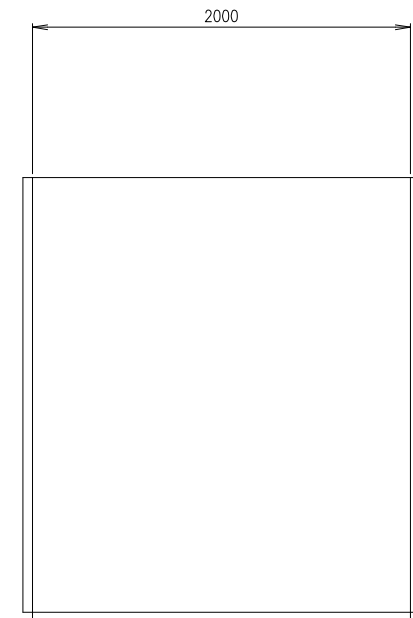
Front view



Front view



Side view



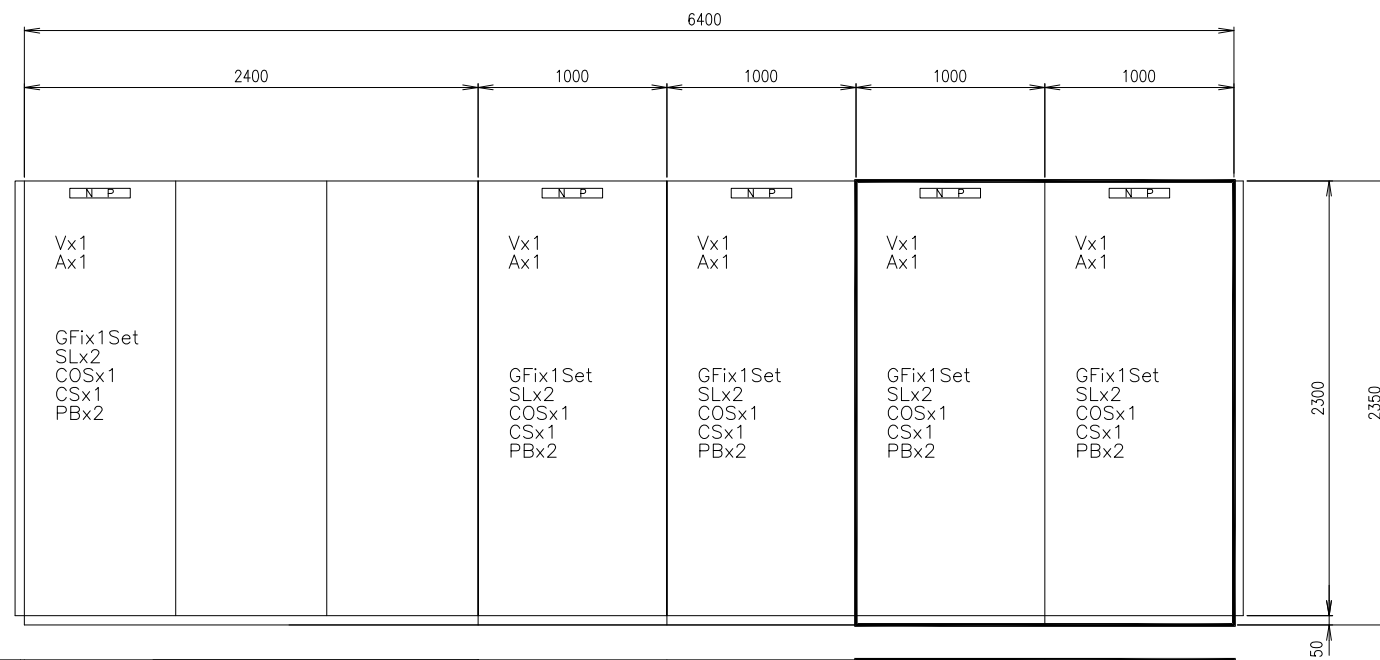
Name	No.1 Incoming panel
Mark	SP-H1

No.1 Transformer secondary Panel	No.1 Low-voltage power branch panel	No.2 Low-voltage power branch panel	No.2 Transformer secondary Panel
SP-L1	SP-L2	SP-L3	SP-L4

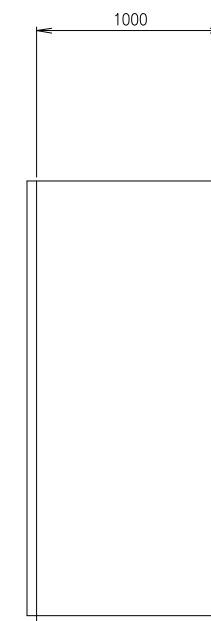
No.2 Incoming panel
SP-H2

Building power and lighting branch panel
SP-L5

Front view



Side view



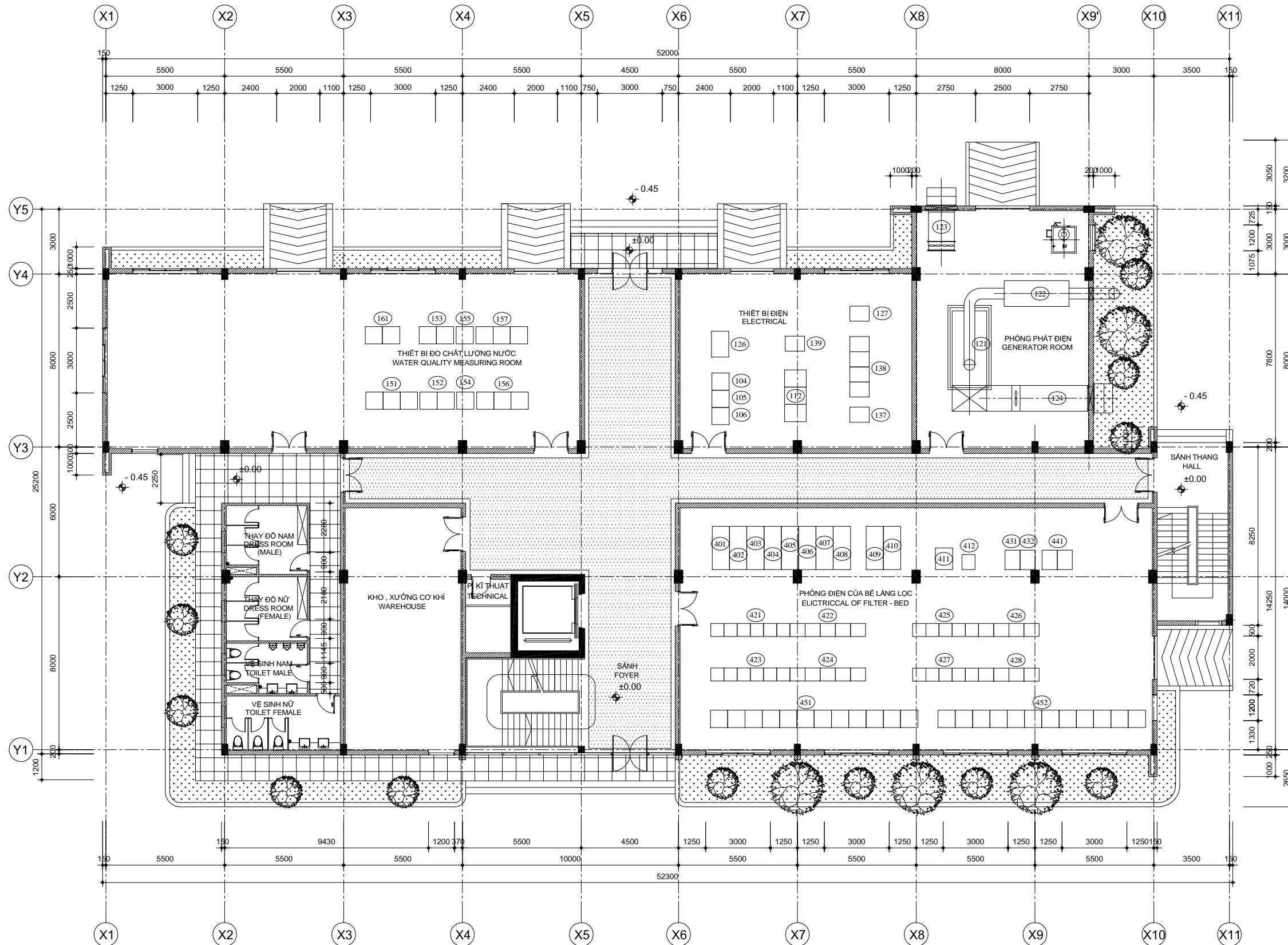
Symbol	Name
V	Voltage Meter
A	Ammeter
GFI	Group Fault Indicator
SL	Signal Lamp
COS	Selector Switch
CS	Control Switch
PB	Push Button Switch
27	Under Voltage Relay
51	Over Current Relay
59	Over Voltage Relay
64	Ground Over Voltage Relay
51G	Ground Over Current Relay
87	Differential Motion Ratio Relay

Note1: Shows the phase-2. Besides, the phase-1 is shown.

Name	No.1 Conveyance pump VWF panel	No.2 Conveyance pump panel	No.3 Conveyance pump panel	No.4 Conveyance pump panel	No.5 Conveyance pump panel
Mark	SP-VF	SP-LP2	SP-LP3	SP-LP4	SP-LP5

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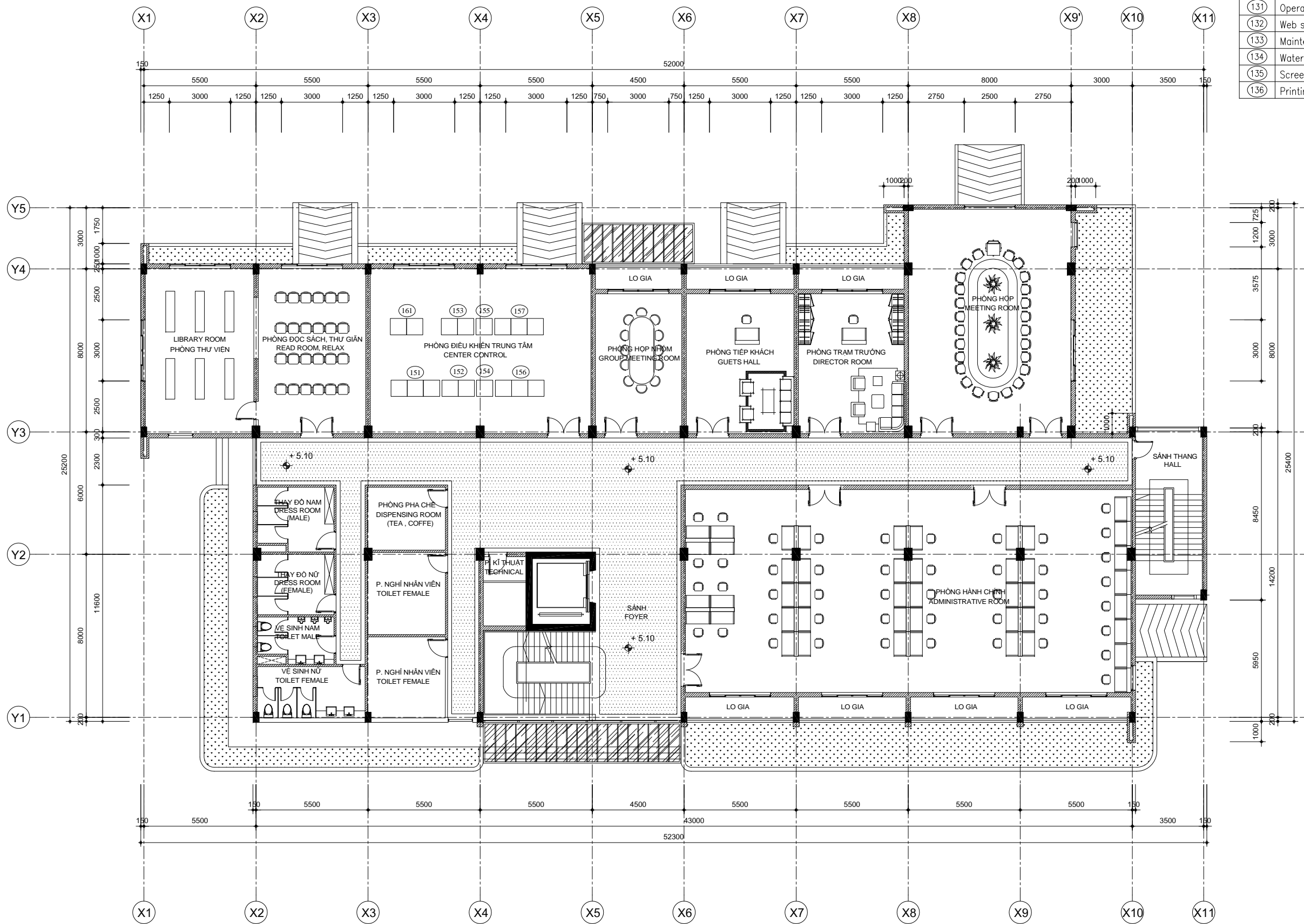
Administration Station Electric facility 1/2
(1st Floor)



No.	Name	Mark	Remarks
401	No.1 Incoming panel	M-H1	Phase 1
402	No.1 Transformer panel	M-T1	"
403	No.1 Transformer secondary panel	M-L1	"
404	No.1 low voltage power branch panel	M-L2	"
405	No.2 low voltage power branch panel	M-L3	"
406	No.2 Transformer secondary panel	M-L4	"
407	No.2 Transformer panel	M-T2	"
408	No.2 Incoming panel	M-H2	"
409	Power supply switch	M-L5	"
410	Building motor and lighting branch panel	M-L6	"
411	Direct current power panel	M-DC	"
412	UPS	M-UPS	"
421	No.1 Settling basin CC	W-CC1	Phase 1
422	No.1 Settling basin RY	W-RY1	"
423	No.2 Settling basin CC	W-CC2	Phase 2
424	No.2 Settling basin RY	W-RY2	"
425	No.1 Filtration basin CC	R-CC1	Phase 1
426	No.1 Filtration basin RY	R-RY1	"
427	No.2 Filtration basin CC	R-CC2	Phase 2
428	No.2 Filtration basin RY	R-RY2	"
431	No.1 settling/filtration basin instrumentation signal converter panel	WR-KP1	Phase 1
432	No.2 settling/filtration basin instrumentation signal converter panel	WR-KP2	Phase 2
441	settling/filtration basin I/O panel	WR-I/O	Phase 1
451	Green leaf control panel(x 12 faces)	Separate machine panel	Phase 1
452	Green leaf control panel(x 12 faces)	Separate machine panel	Phase 2
104	Low voltage power branch panel	M-L1	Phase 1
105	Power supply switch	M-L2	"
106	Building motor and lighting branch panel	M-L3	"
112	UPS	M-CVCF	Phase 1
121	Emergency power generator	DG	Phase 1
122	Exhaust muffler		"
123	Aeration muffler		"
124	Ventilation muffler		"
125	Fuel day tank		"
126	Emergency generator auxiliary panel	G-L1	"
127	Main control building control panel	M-COT	"
137	Monitoring control panel	COT	"
138	Telemeter panel	TM	"
139	Controlled source distribution panel	DB	"
151	Receiving well water quality rack (Turbidity,pH,Electrical conductivity)	SP-1	Phase 1
152	1st Settling basin water quality rack(Turbidity,pH)	SP-2A	"
153	2nd Settling basin water quality rack(Turbidity,pH)	SP-2B	Phase 2
154	1st Filtration basin water quality rack(Residual chlorine)	SP-3A	Phase 1
155	2nd Filtration basin water quality rack(Residual chlorine)	SP-3B	Phase 2
156	1st Clean water reservoir water quality rack (High sensitivity turbidity,pH,residual chlorine)	SP-4A	Phase 1
157	2nd Clean water reservoir water quality rack (High sensitivity turbidity,pH,residual chlorine)	SP-4A	Phase 2
161	Water quality meter panel	KP-SP	Phase 1

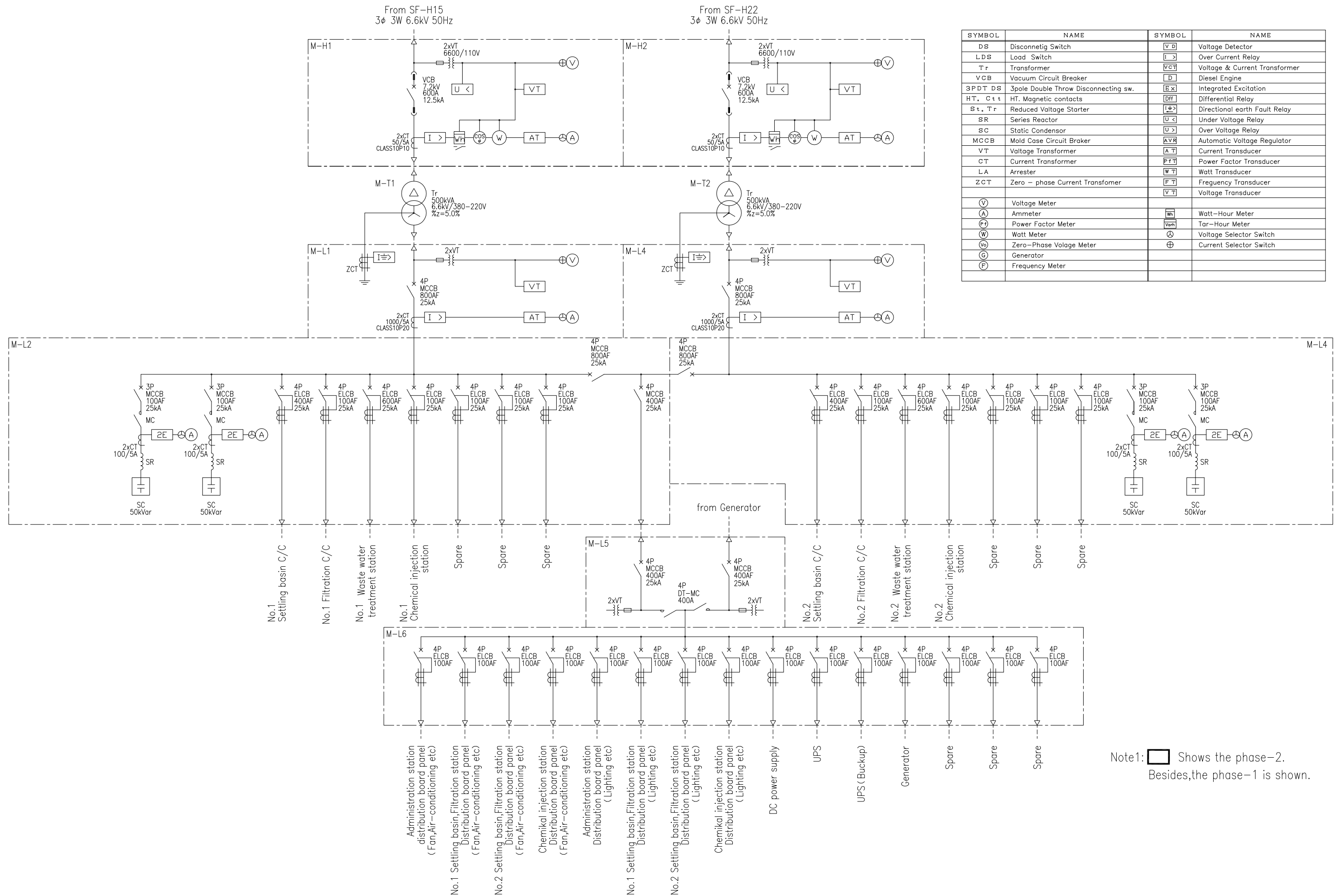
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Administration Station Electric facility 2/2
(2nd Floor)



Machinery list			
No.	Name	Mark	Remarks
131	Operator console 1~3	OS	Phase 1
132	Web server	WEB	"
133	Maintenance control computer	PC	"
134	Water tariff system	WPC	"
135	Screen	DP-1.2	"
136	Printing machine	PR	"

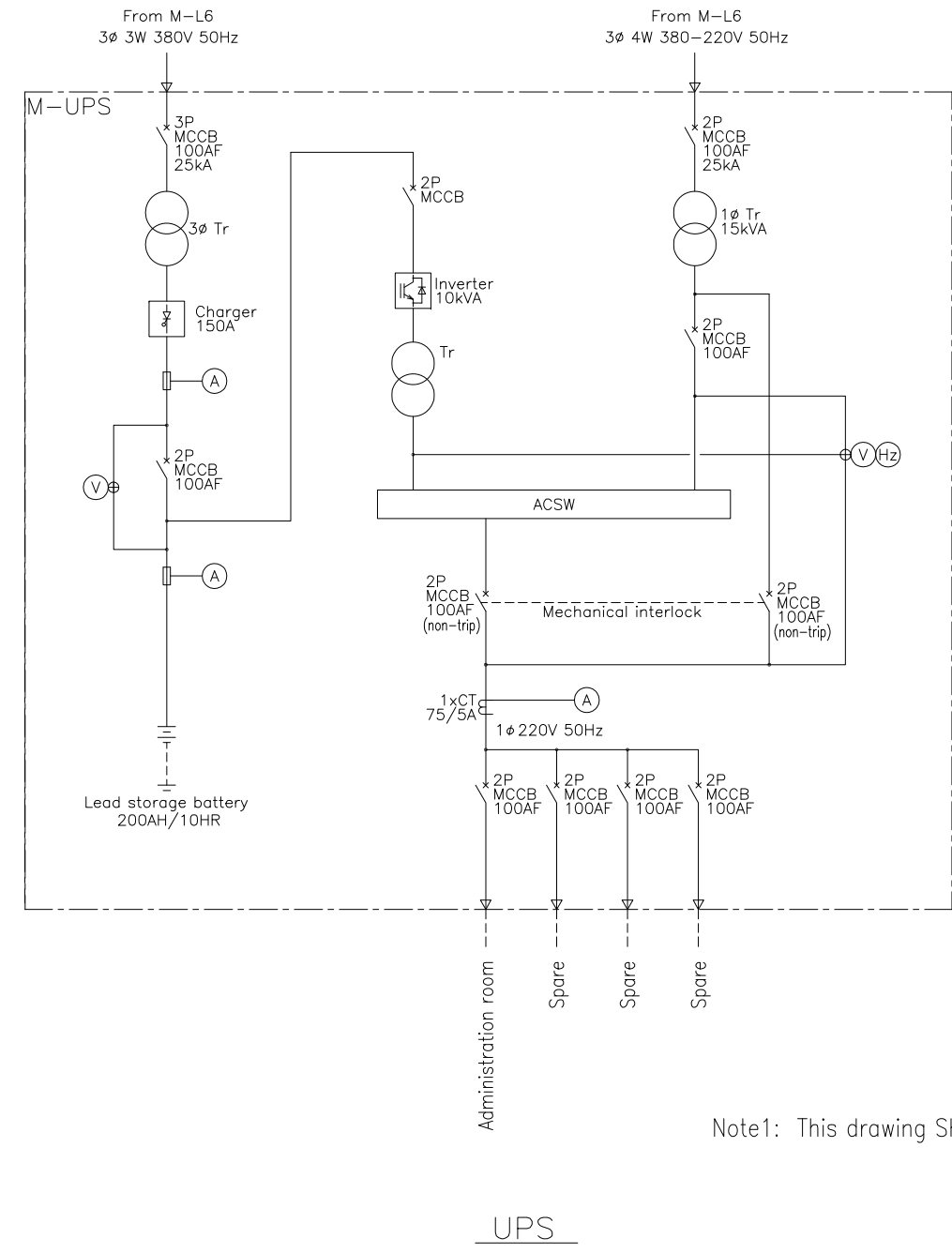
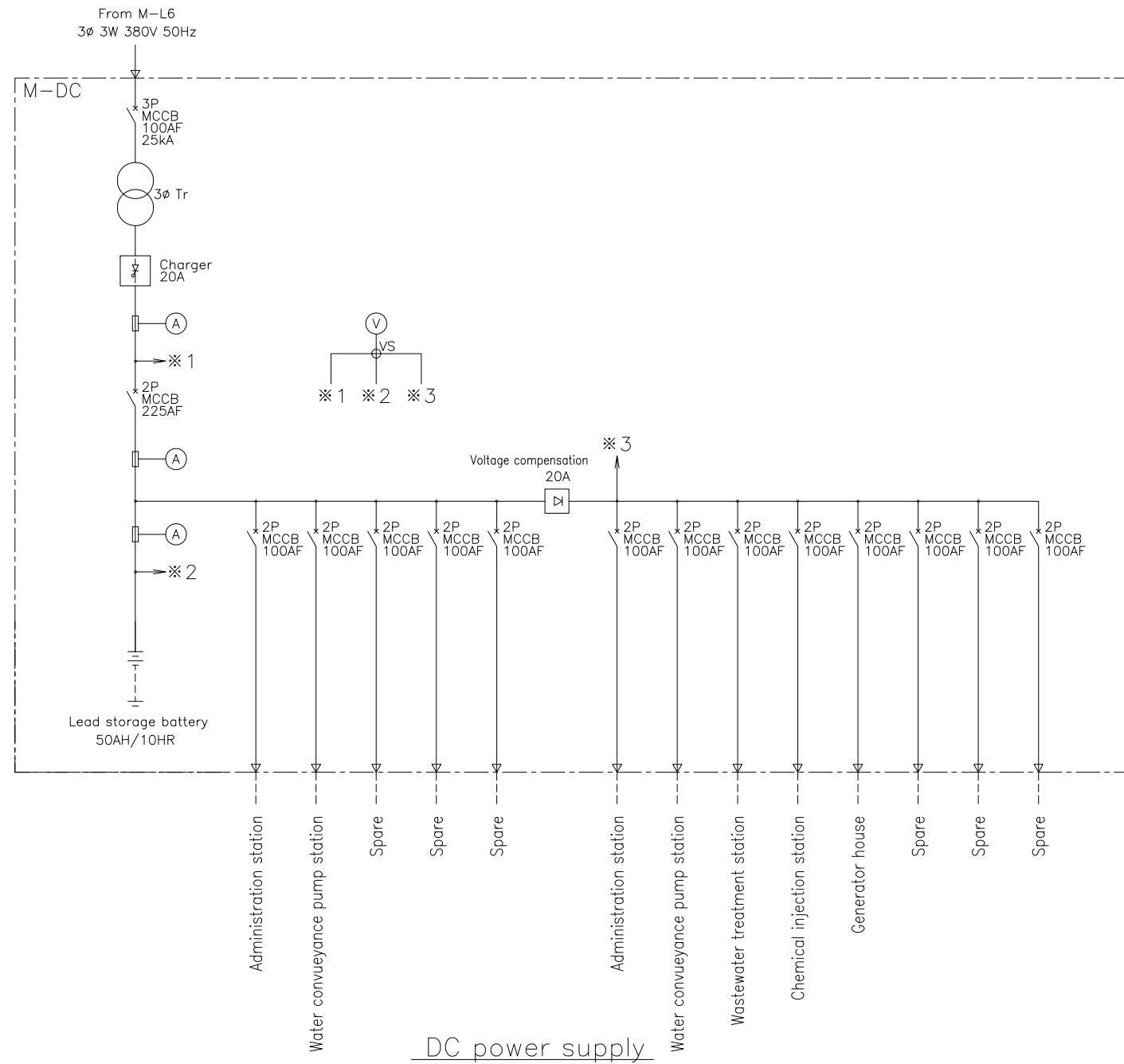
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SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
Tr	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E x	Integrated Excitation
HT. Ct t	HT. Magnetic contacts	Dff	Differential Relay
St. Tr	Reduced Valtage Starter	L >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensator	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	AVR	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	P T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transformer	F T	Frequency Transducer
		V T	Voltage Transducer
V	Voltage Meter		
A	Ammeter	Wh	Watt-Hour Meter
P	Power Factor Meter	Varn	Tar-Hour Meter
W	Watt Meter		
V0	Zero-Phase Volage Meter		
G	Generator		
F	Frequency Meter		

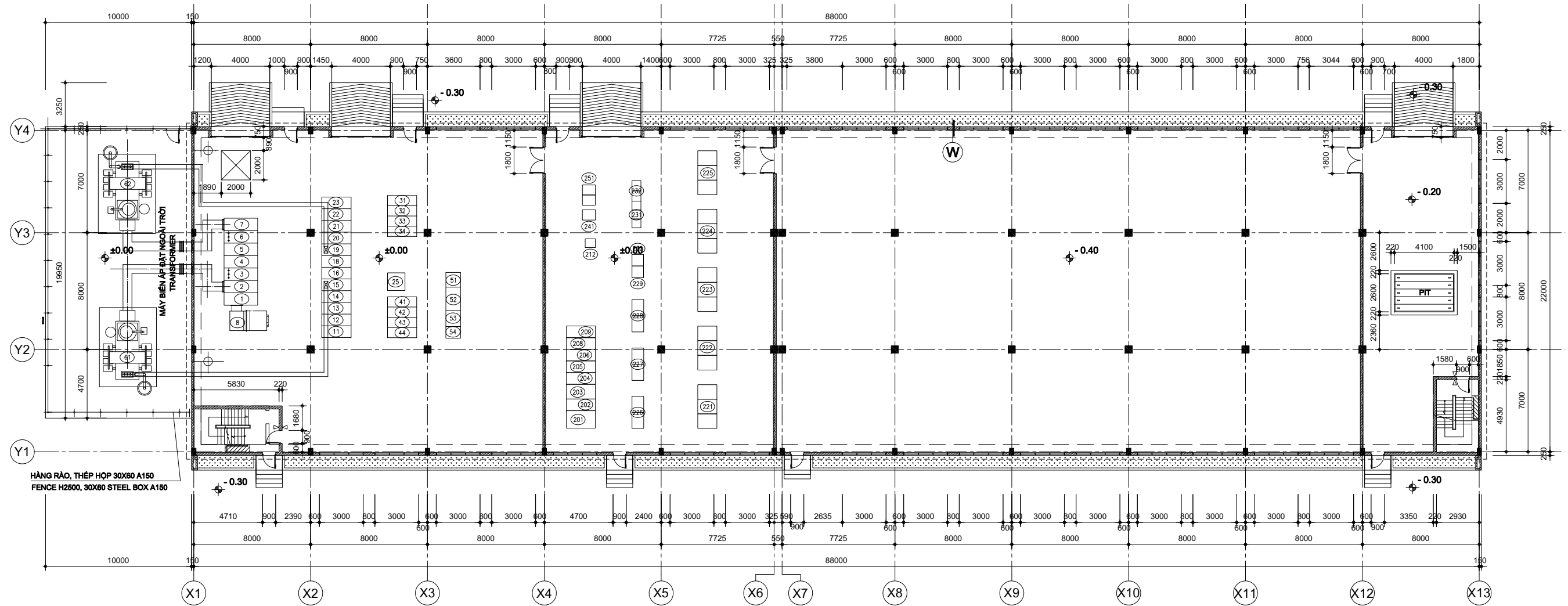
Note1: Shows the phase-2.
Besides, the phase-1 is shown.

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch		Voltage Detector		Voltage Meter
LDS	Load Switch		Over Current Relay		Ammeter
Tr	Transformer		Voltage & Current Transformer		Power Factor Meter
VCB	Vacuum Circuit Breaker		Diesel Engine		Watt Meter
3PDT DS	3pole Double Throw Disconnecting sw.		Integrated Excitation		Zero-Phase Volage Meter
HT. C t t	HT. Magnetic contacts		Differential Relay		Generator
S t. T r	Reduced Voltage Starter		Directional earth Fault Relay		Frequency Meter
SR	Series Reactor		Under Voltage Relay		Watt-Hour Meter
SC	Static Condensor		Over Voltage Relay		Tar-Hour Meter
MCCB	Mold Case Circuit Braker		Automatic Voltage Regulator		Voltage Selector Switch
VT	Voltage Transformer		Current Transducer		Current Selector Switch
CT	Current Transformer		Power Factor Transducer		
LA	Arrester		Watt Transducer		
ZCT	Zero - phase Current Transfomer		Frequency Transducer		
			Voltage Transducer		



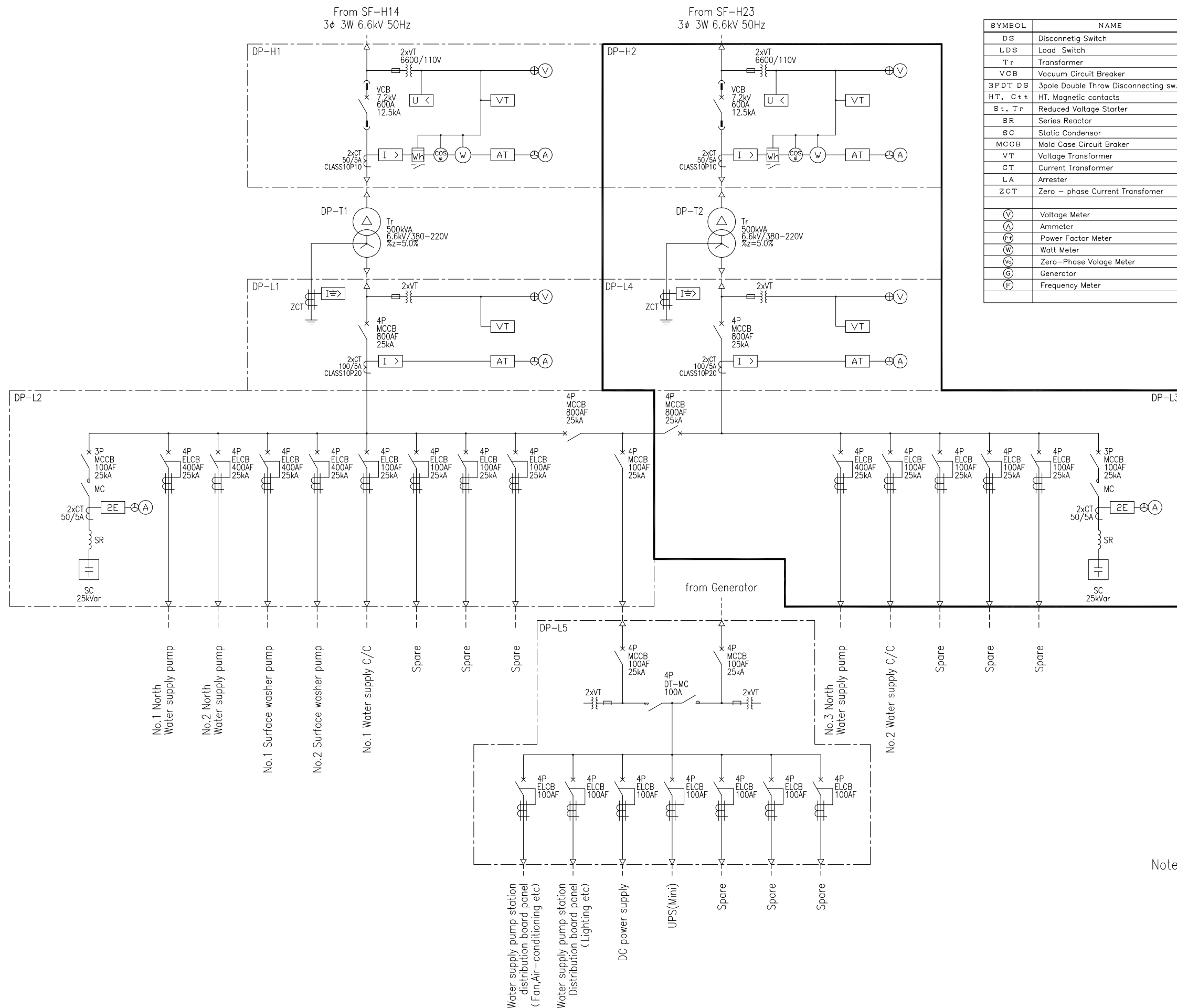
Note1: This drawing Shows the phase-1.

Water Transmission Electric Facility



Machinery list

No.	Name	Mark	Remarks	No.	Name	Mark	Remarks	No.	Name	Mark	Remarks	No.	Name	Mark	Remarks	No.	Name	Mark	Remarks
①	No.1 Lead-in panel	SF-H1	Phase 1	⑪	No.1 Phase leading condenser panel	SF-H11	Phase 1	③①	1st system No.1 phase advancing condenser panel	H31	Phase 1	②①	No.1 Incoming panel	DP-H1	Phase 1	②②①	No.1 Supply pump (south) VWF panel	DP-VF1	Phase 1
②	No.1 VCT panel	SF-H2	"	⑫	No.1 Conveyance/ No.1 control building feeding panel	SF-H12	"	③②	1st system No.2 phase advancing condenser panel	H32	"	②②②	No.2 Supply pump (south) VWF panel	DP-VF2	"	②②③	No.3 Supply pump(south) VWF panel	S-VF3	"
③	No.1 Incoming panel	SF-H3	"	⑬	No.1,2 Supply pump (south) primary panel	SF-H13	"	③③	1st system No.3 phase advancing condenser panel	H33	"	②②④	No.4 Supply pump(south) VWF panel	S-VF4	Phase 2	②②⑤	No.5 Supply pump(south) VWF panel	S-VF5	"
④	No.1 Main transformer primary panel	SF-H4	"	⑭	No.1 Supply transformer primary/ (Space) panel	SF-H14	"	③④	1st system No.4 phase advancing condenser panel	H34	"	②②⑤	No.2 Transformer secondary panel	DP-L4	"	②②⑥	No.1 Supply pump (nouth) VWF panel	DP-VF3	Phase 1
⑤	No.1 Bus junction panel	SF-H5	"	⑮	No.3 Supply pump (south) panel	SF-H15	"	④①	2nd system No.1 phase advancing condenser panel	H41	Phase 1	②②⑦	No.2 Incoming panel	DP-H2	"	②②⑦	No.2 Supply pump (nouth) VWF panel	DP-VF4	"
⑥	No.2 Bus junction panel	SF-H6	"	⑯	No.1 Extra-high voltage transformer Secondary panel	SF-H16	"	④②	2nd system No.2 phase advancing condenser panel	H42	"	②②⑧	No.1 Supply transformer	DP-T1	"	②②⑧	No.3 Supply pump (nouth) VWF panel	DP-VF5	Phase 2
⑦	No.1 Main transformer primary panel	SF-H7	"	⑰	Bus junction panel	SF-H17	"	④③	2nd system No.3 phase advancing condenser panel	H43	"	②②⑨	No.1 Supply transformer	DP-T2	Phase 2	②②⑨	No.1 Surface washing pump panel	DP-LP1	Phase 1
⑧	No.2 Incoming panel	SF-H8	"	⑱	No.2 Extra-high voltage transformer Secondary panel	SF-H18	"	④④	2nd system No.4 phase advancing condenser panel	H44	"	②③①	No.2 Surface washing pump panel	DP-LP2	"	②③②	Supply facility CC	DP-CC	Phase 1
⑥①	1st system transformer	SF-TR1	Phase 1	⑲	No.2 Conveyance/ No.2 control building feeding panel	SF-H19	Phase 2	⑤①	Extra-high protective relay panel	SF-TR	Phase 1	②③③	Supply facility RY	DP-RY	"	②④①	Supply facility instrumentation signal converter panel	DP-KP	"
⑥②	2nd system transformer	SF-TR2	"	⑳	No.2 Supply transformer primary/ (Space) panel	SF-H20	"	⑤②	Extra-high monitor control panel	SF-TK	"	②④②	Supply facility I/O panel	DP-I/O	"	②⑤①	Supply facility I/O panel	DP-I/O	"
				㉑	No.4 Supply pump (south) panel	SF-H21	"	⑤③	Relay terminal panel	SF-TB	"								
				㉒	No.5 Supply pump (south) panel	SF-H22	"	⑤④	Extra-high incoming and transforming facility control panel	SF-COT	"								
				㉓	No.2 Phase leading condenser panel	SF-H23	"												
				㉔	Unused Number														
				㉕	DC power panel	H-DC	Phase 1												
													②①②	Small UPS	DP-UPS	Phase 1			

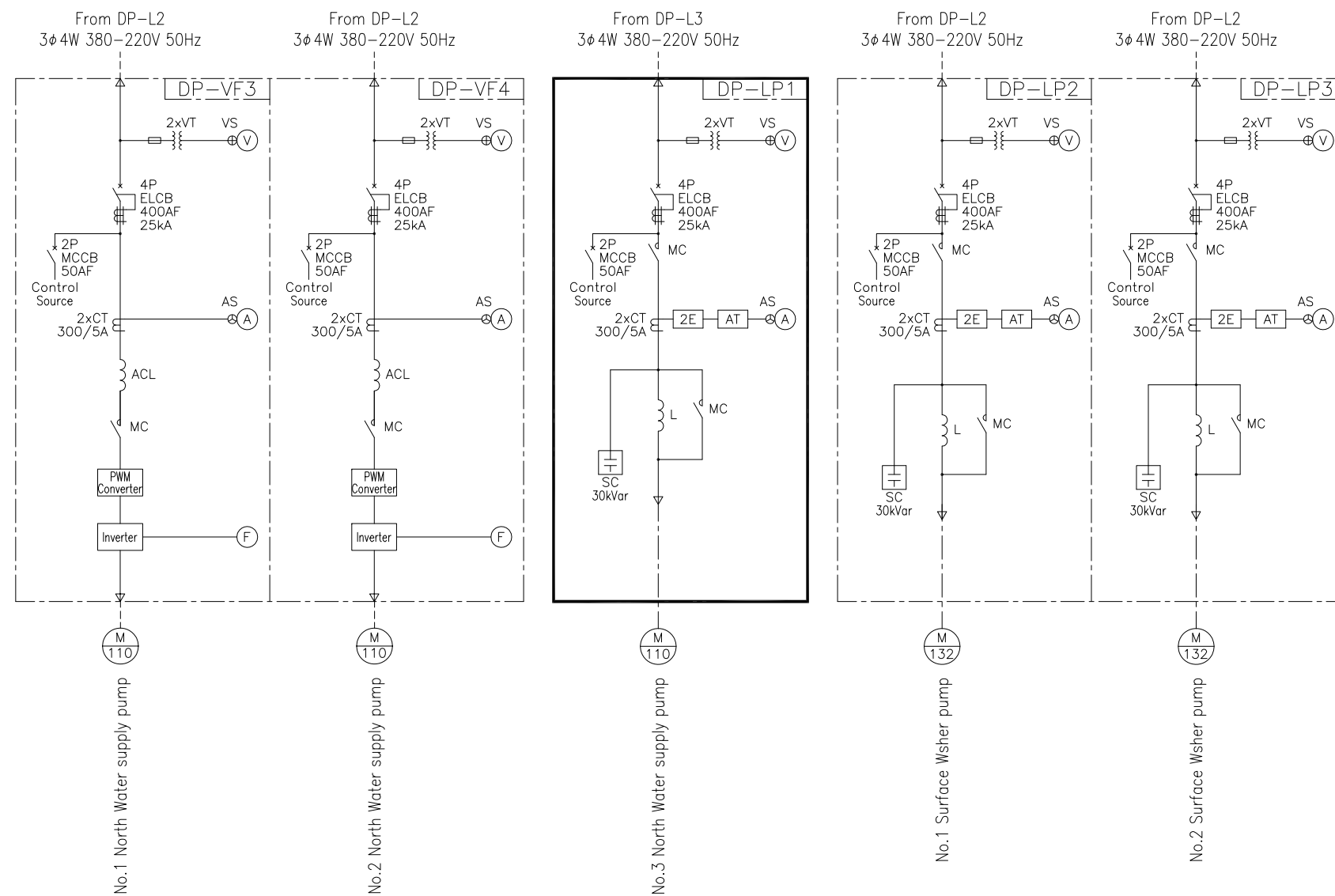


SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
Tr	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation
HT. C t t	HT. Magnetic contacts	Dff	Differential Relay
St. Tr	Reduced Voltage Starter	I ↓ >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensior	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	AVR	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	P T T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transformer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter		
A	Ammeter	wh	Watt-Hour Meter
P	Power Factor Meter	varh	Tar-Hour Meter
W	Watt Meter		
vo	Zero-Phase Volage Meter		
G	Generator		
F	Frequency Meter		

Note1: Shows the phase-2.
Besides, the phase-1 is shown.

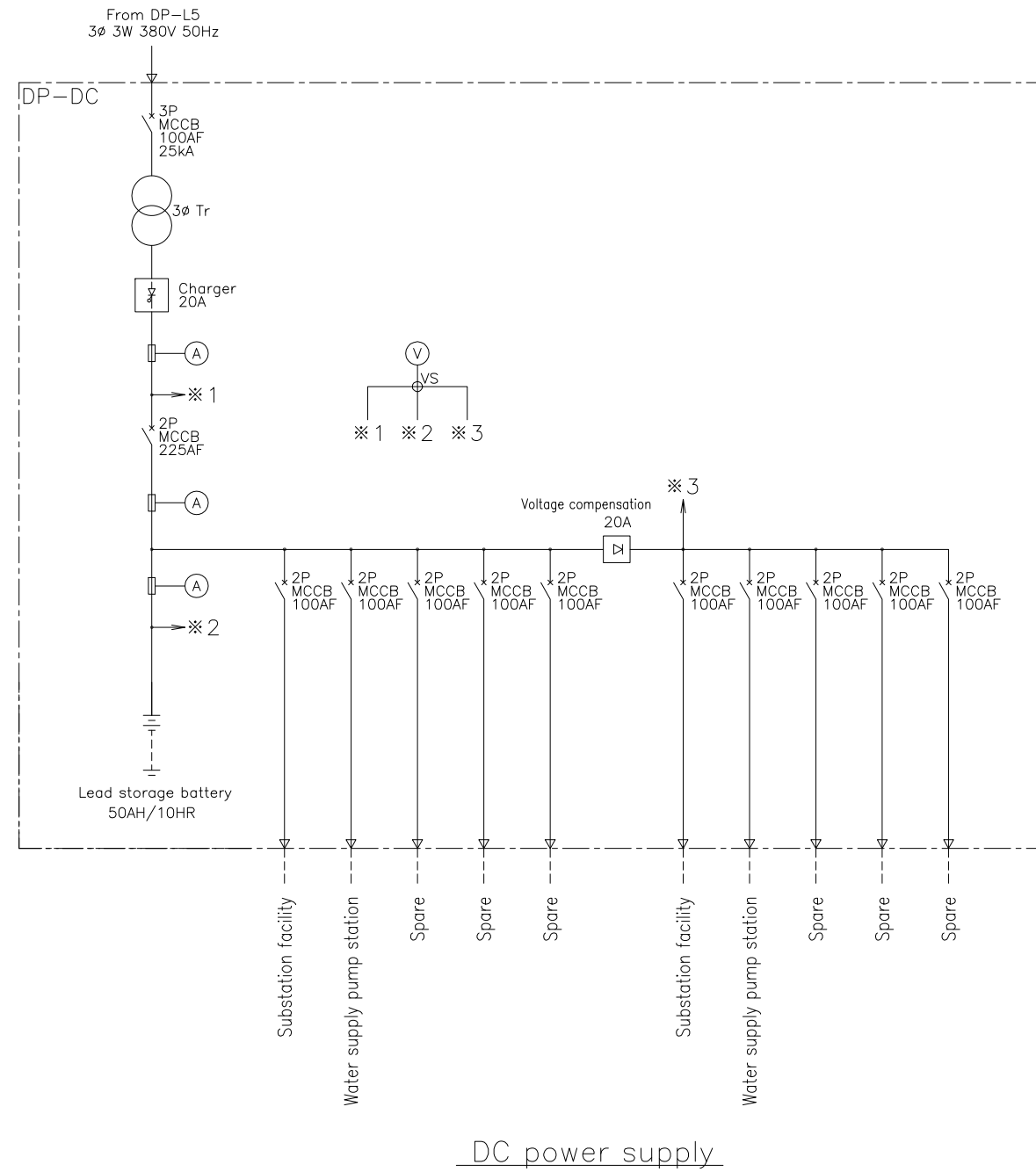
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SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
T r	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation
H.T. C t t	HT. Magnetic contacts	Dff	Differential Relay
S t. T r	Reduced Voltage Starter	I >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensior	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	A V R	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	F T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transfomer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter		
A	Ammeter	wh	Watt-Hour Meter
F	Power Factor Meter	varh	Tar-Hour Meter
W	Watt Meter		Voltage Selector Switch
Vo	Zero-Phase Volage Meter	+	Current Selector Switch
G	Generator		
F	Frequency Meter		



Note1: Shows the phase-2.
Besides, the phase-1 is shown.

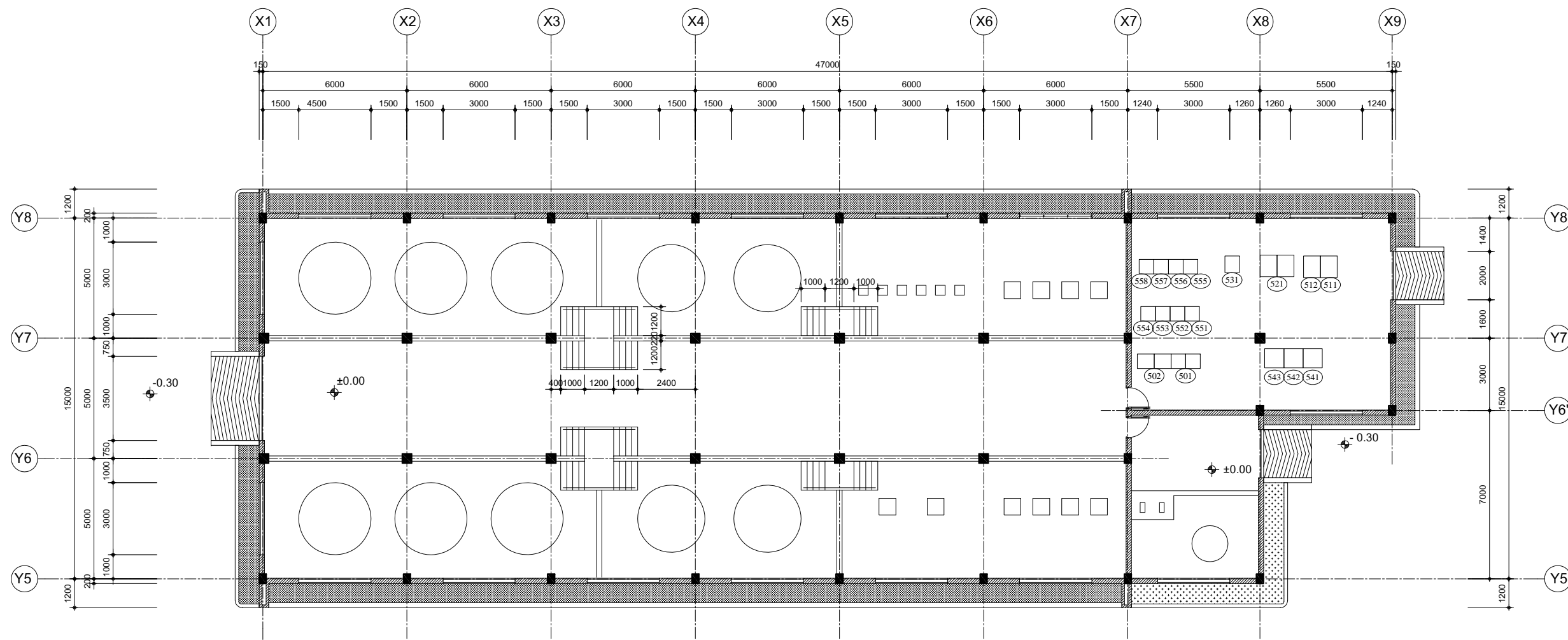
SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch		Voltage Detector		Voltage Meter
LDS	Load Switch		Over Current Relay		Ammeter
Tr	Transformer		Voltage & Current Transformer		Power Factor Meter
VCB	Vacuum Circuit Breaker		Diesel Engine		Watt Meter
3PDT DS	3pole Double Throw Disconnecting sw.		Integrated Excitation		Zero-Phase Volage Meter
HT. C t t	HT. Magnetic contacts		Differential Relay		Generator
S t . T r	Reduced Voltage Starter		Directional earth Fault Relay		Frequency Meter
SR	Series Reactor		Under Voltage Relay		Watt-Hour Meter
SC	Static Condensor		Over Voltage Relay		Tar-Hour Meter
MCCB	Mold Case Circuit Braker		Automatic Voltage Regulator		Voltage Selector Switch
VT	Voltage Transformer		Current Transducer		Current Selector Switch
CT	Current Transformer		Power Factor Transducer		
LA	Arrester		Watt Transducer		
ZCT	Zero - phase Current Transfomer		Frequency Transducer		
			Voltage Transducer		



Note1: This drawing Shows the phase-1.

No.			
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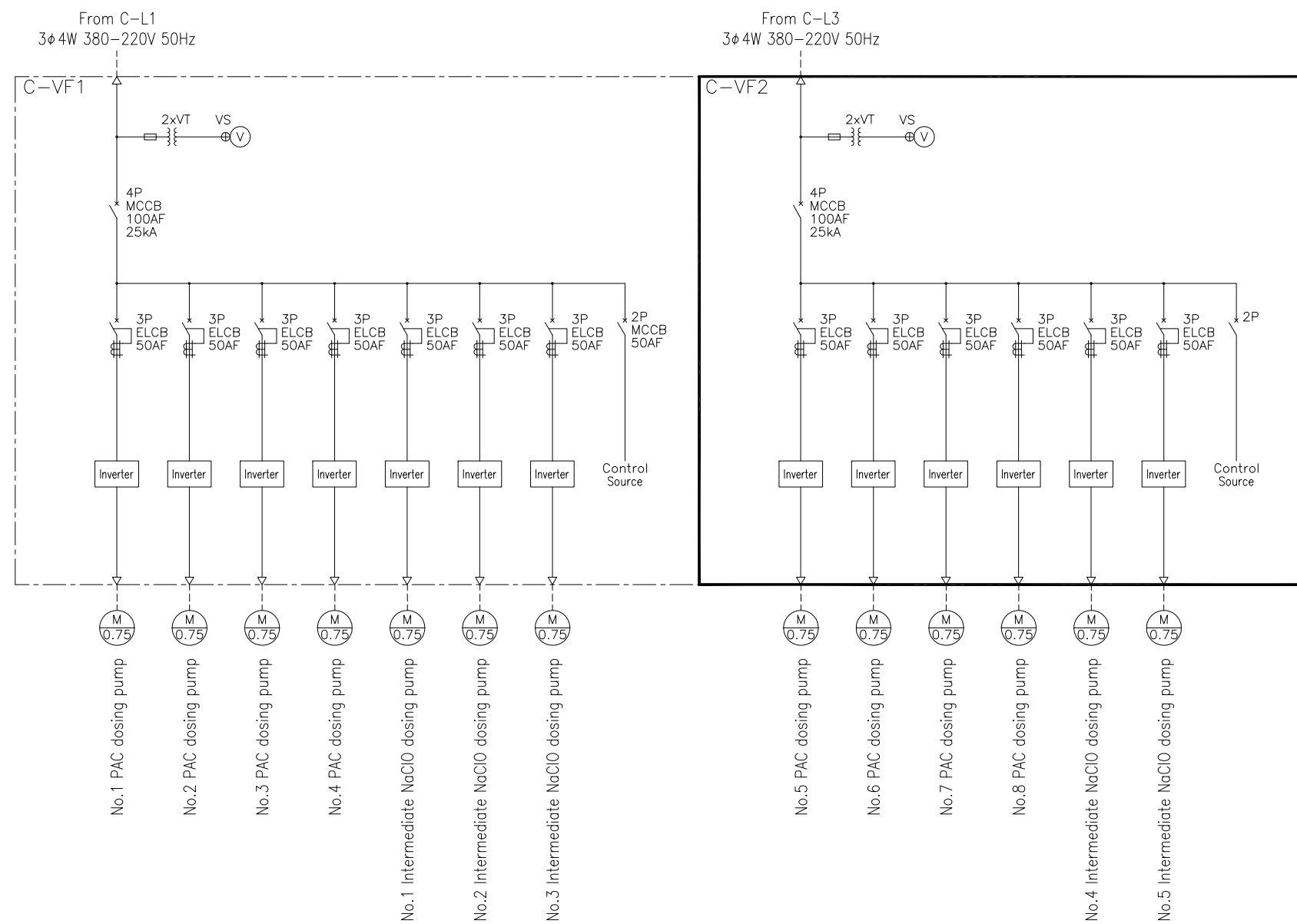
Chemical Dosing Electric Facility



Machinery list

No.	Name	Mark	Remarks	No.	Name	Mark	Remarks
(501)	No.1 Chemical injection facility CC	C-CC1	Phase 1	(551)	No.1 Chemical injection pump WVF panel	C-VF1	Phase 1
(502)	No.1 Chemical injection facility RY	C-RY1	"	(552)	No.2 Chemical injection pump WVF panel	C-VF2	Phase 2
(503)	No.2 Chemical injection facility CC	C-CC2	Phase 2	(553)	No.3 PAC injection pump WVF panel	Y-VF3	"
(504)	No.2 Chemical injection facility RY	C-RY2	"	(554)	No.4 PAC injection pump WVF panel	Y-VF4	"
				(555)	No.5 PAC injection pump WVF panel	Y-VF5	Phase 2
(511)	No.1 Chemical injection facility instrumentation signal converter panel	C-KP1	Phase 1	(556)	No.6 PAC injection pump WVF panel	Y-VF6	"
(512)	No.2 Chemical injection facility instrumentation signal converter panel	C-KP2	Phase 2	(557)	No.7 PAC injection pump WVF panel	Y-VF7	"
				(558)	No.8 PAC injection pump WVF panel	Y-VF8	"
(521)	Chemical injection facility control panel	C-COT	Phase 1	(561)	Building power panel	Y-AP	Separate building
(531)	Small UPS	C-UPS	Phase 1	(562)	Building lighting panel	Y-AL	"
				(563)	No.3 Pre-chlorine injection pump WVF panel	Y-VF11	Phase 2
				(564)	No.4 Pre-chlorine injection pump WVF panel	Y-VF12	"
(541)	No.1 Low voltage power bransh panel	C-L1	Phase 1	(571)	No.1 Post-chlorine injection pump WVF panel	Y-VF13	Phase 1
(542)	No.2 Low voltage power bransh panel	C-L2	Phase 2	(572)	No.2 Post-chlorine injection pump WVF panel	Y-VF14	"
(543)	Building motor and lighting branch panel	C-L3	Phase 1	(573)	No.3 Post-chlorine injection pump WVF panel	Y-VF15	Phase 2
				(574)	No.4 Post-chlorine injection pump WVF panel	Y-VF16	"

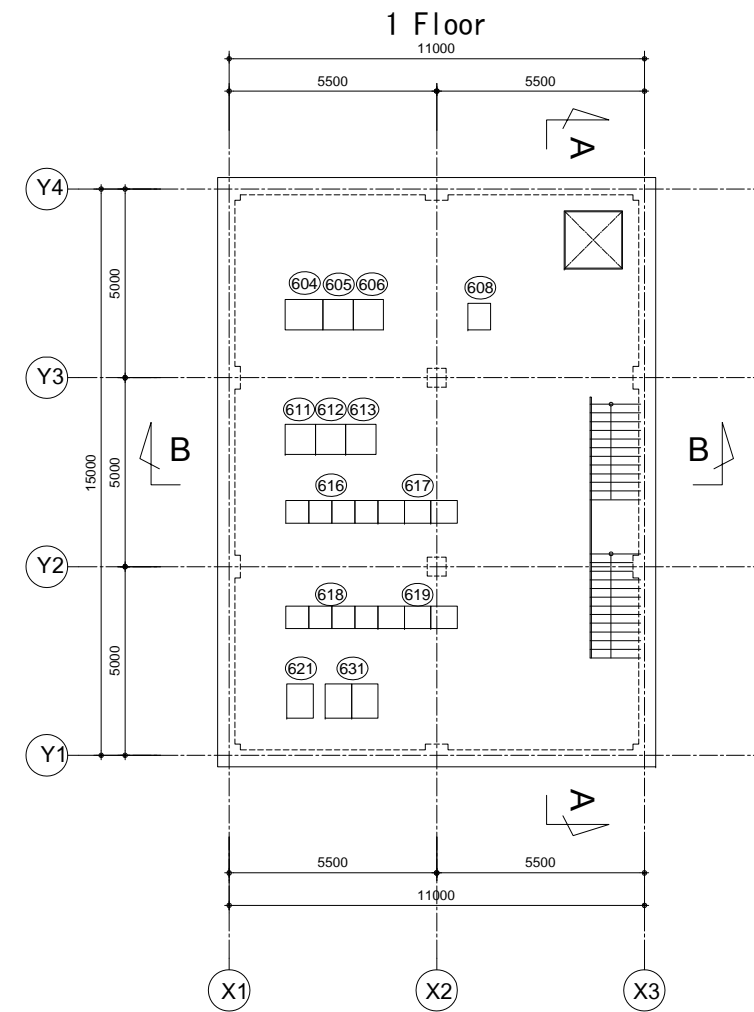
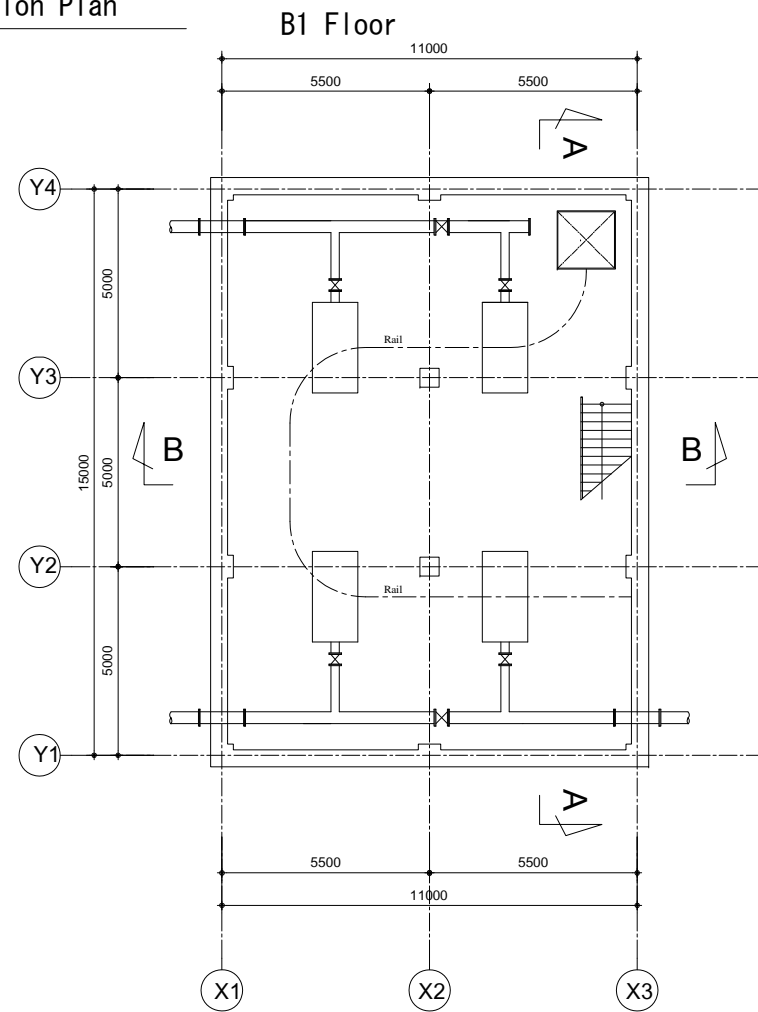
SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch		Voltage Detector
LDS	Load Switch		Over Current Relay
T r	Transformer		Voltage & Current Transformer
VCB	Vacuum Circuit Breaker		Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.		Integrated Excitation
HT. C t t	HT. Magnetic contacts		Differential Relay
S t. T r	Reduced Voltage Starter		Directional earth Fault Relay
SR	Series Reactor		Under Voltage Relay
SC	Static Condensor		Over Voltage Relay
MCCB	Mold Case Circuit Braker		Automatic Voltage Regulator
VT	Voltage Transformer		Current Transducer
CT	Current Transformer		Power Factor Transducer
LA	Arrester		Watt Transducer
ZCT	Zero - phase Current Transfomer		Frequency Transducer
			Voltage Transducer
	Voltage Meter		
	Ammeter		Watt-Hour Meter
	Power Factor Meter		Tar-Hour Meter
	Watt Meter		Voltage Selector Switch
	Zero-Phase Volage Meter		Current Selector Switch
	Generator		
	Frequency Meter		



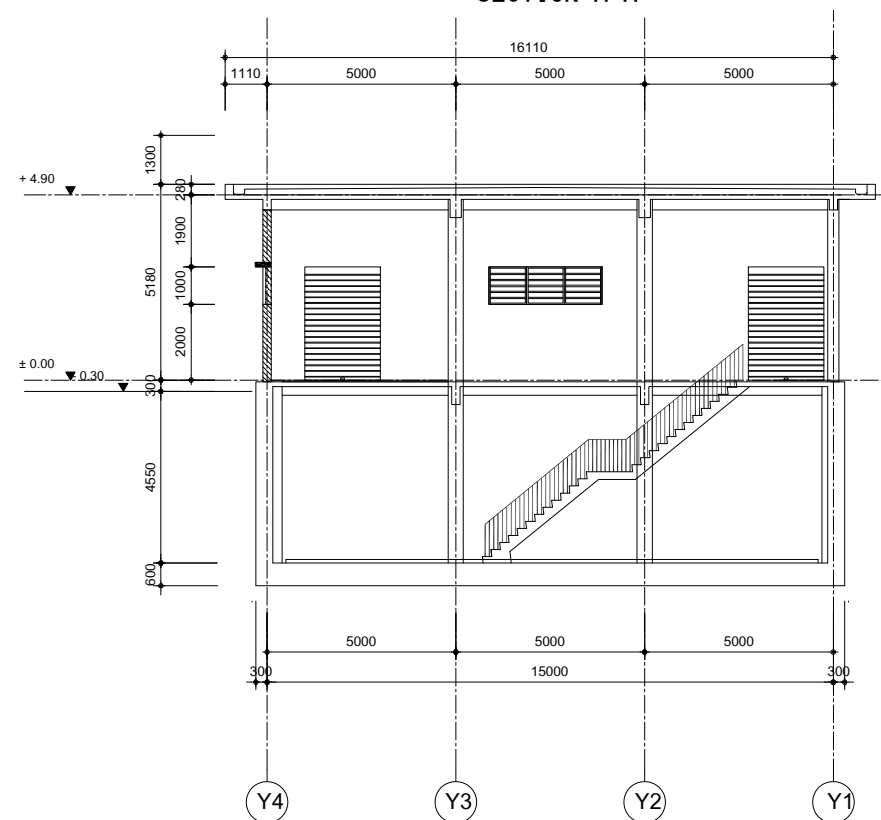
Note1: Shows the phase-2.
Besides, the phase-1 is shown.

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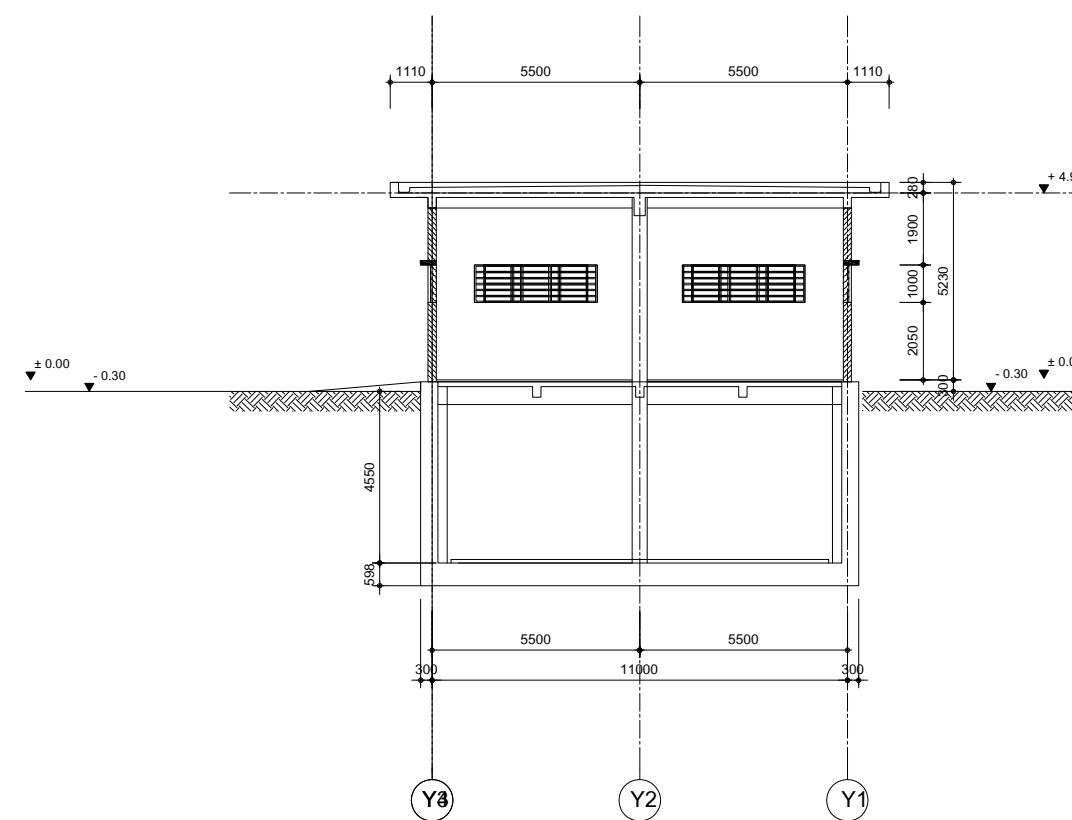
Sludge Removal Pumping Station Plan



SECTION A-A

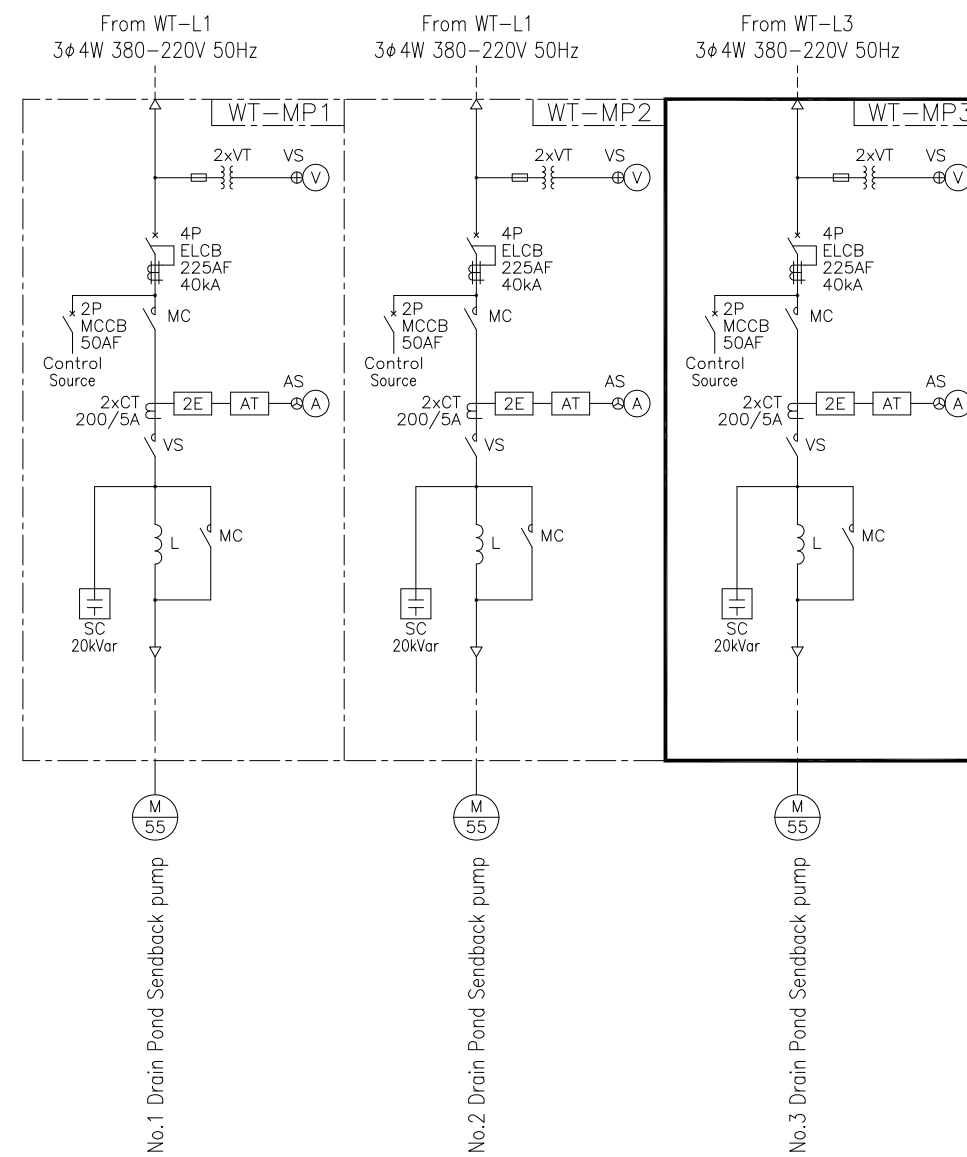


SECTION B-B

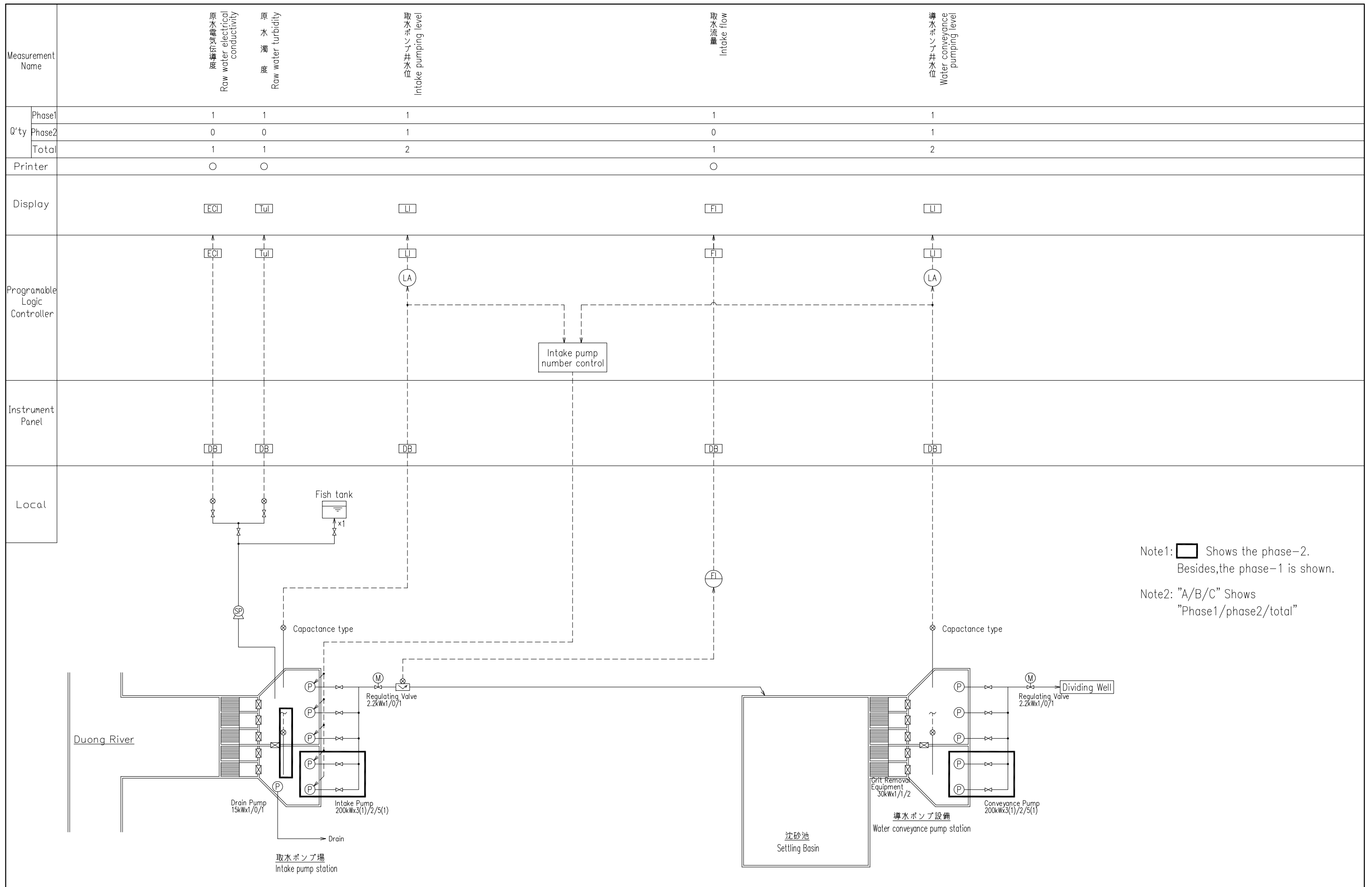


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SYMBOL	NAME	SYMBOL	NAME
DS	Disconnetig Switch	V D	Voltage Detector
LDS	Load Switch	I >	Over Current Relay
T r	Transformer	VCT	Voltage & Current Transformer
VCB	Vacuum Circuit Breaker	D	Diesel Engine
3PDT DS	3pole Double Throw Disconnecting sw.	E X	Integrated Excitation
H.T. C t t	HT. Magnetic contacts	Dff	Differential Relay
S t. T r	Reduced Voltage Starter	I >	Directional earth Fault Relay
SR	Series Reactor	U <	Under Voltage Relay
SC	Static Condensor	U >	Over Voltage Relay
MCCB	Mold Case Circuit Braker	A V R	Automatic Voltage Regulator
VT	Voltage Transformer	A T	Current Transducer
CT	Current Transformer	F T	Power Factor Transducer
LA	Arrester	W T	Watt Transducer
ZCT	Zero - phase Current Transfomer	F T	Freguency Transducer
		V T	Voltage Transducer
V	Voltage Meter		
A	Ammeter	wh	Watt-Hour Meter
Ff	Power Factor Meter	varh	Tar-Hour Meter
W	Watt Meter	⊕	Voltage Selector Switch
Vo	Zero-Phase Volage Meter	⊕	Current Selector Switch
G	Generator		
F	Frequency Meter		



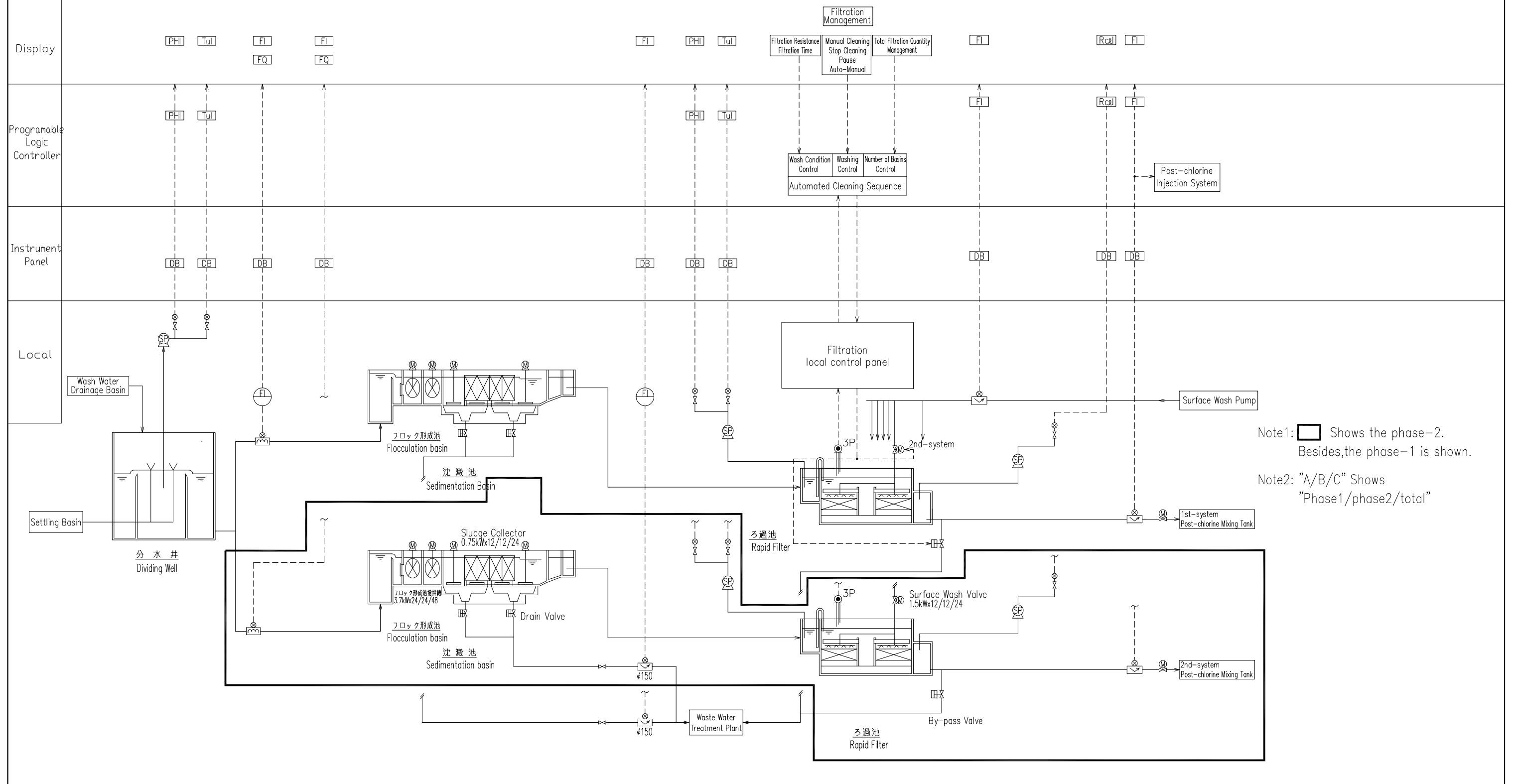
Note1: Shows the phase-2.
Besides, the phase-1 is shown.



Note1: Shows the phase-2. Besides, the phase-1 is shown.

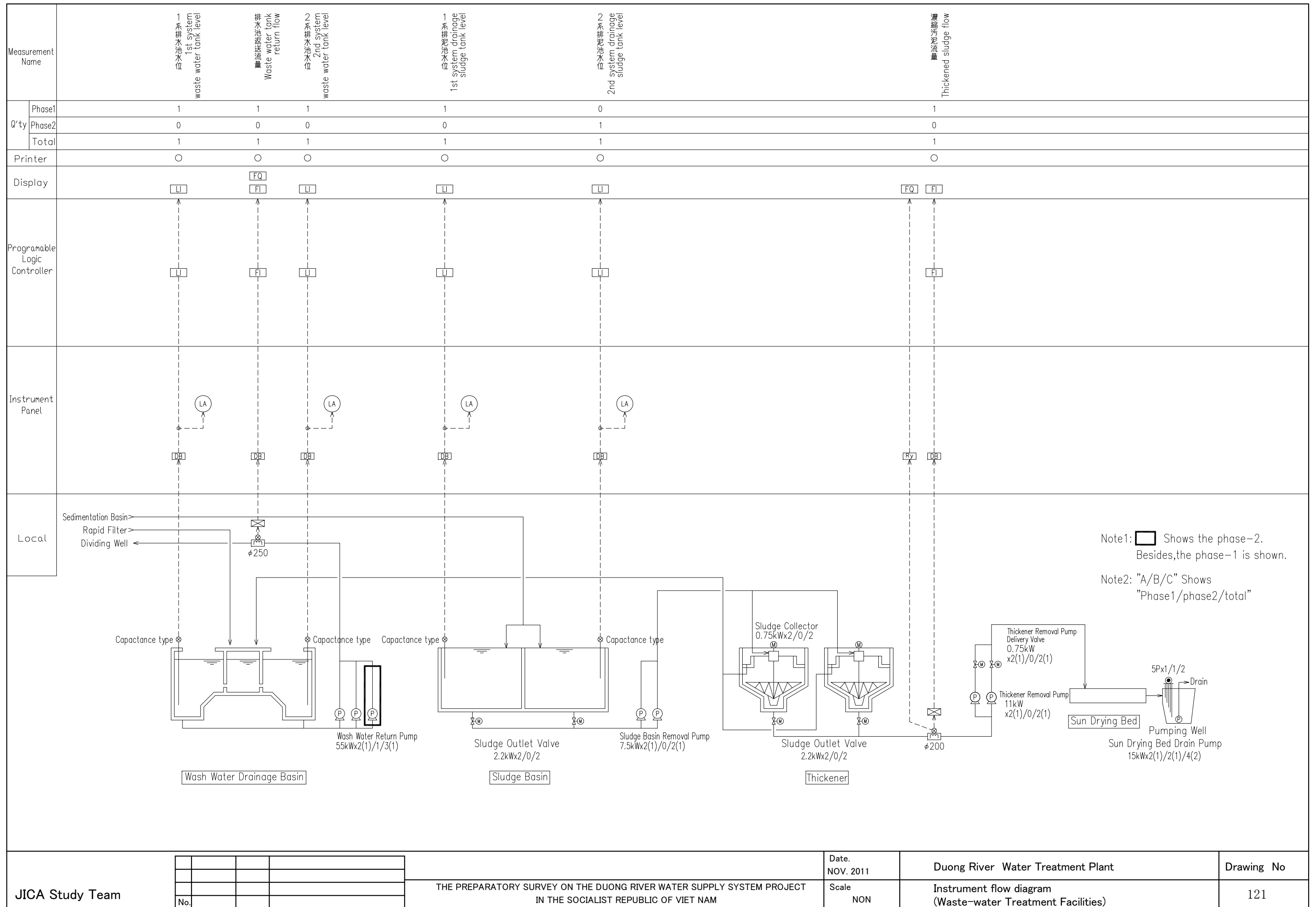
Note2: "A/B/C" Shows "Phase1/phase2/total"

Q'ty	Phase1	1	1	2	0	1	1	1	1	1	1	1
	Phase2	0	0	0	2	1	1	1	1	1	1	1
	Total	1	1	2	2	2	2	2	2	2	2	2
Printer		○	○	○	○	○	○	○	○	○	○	○

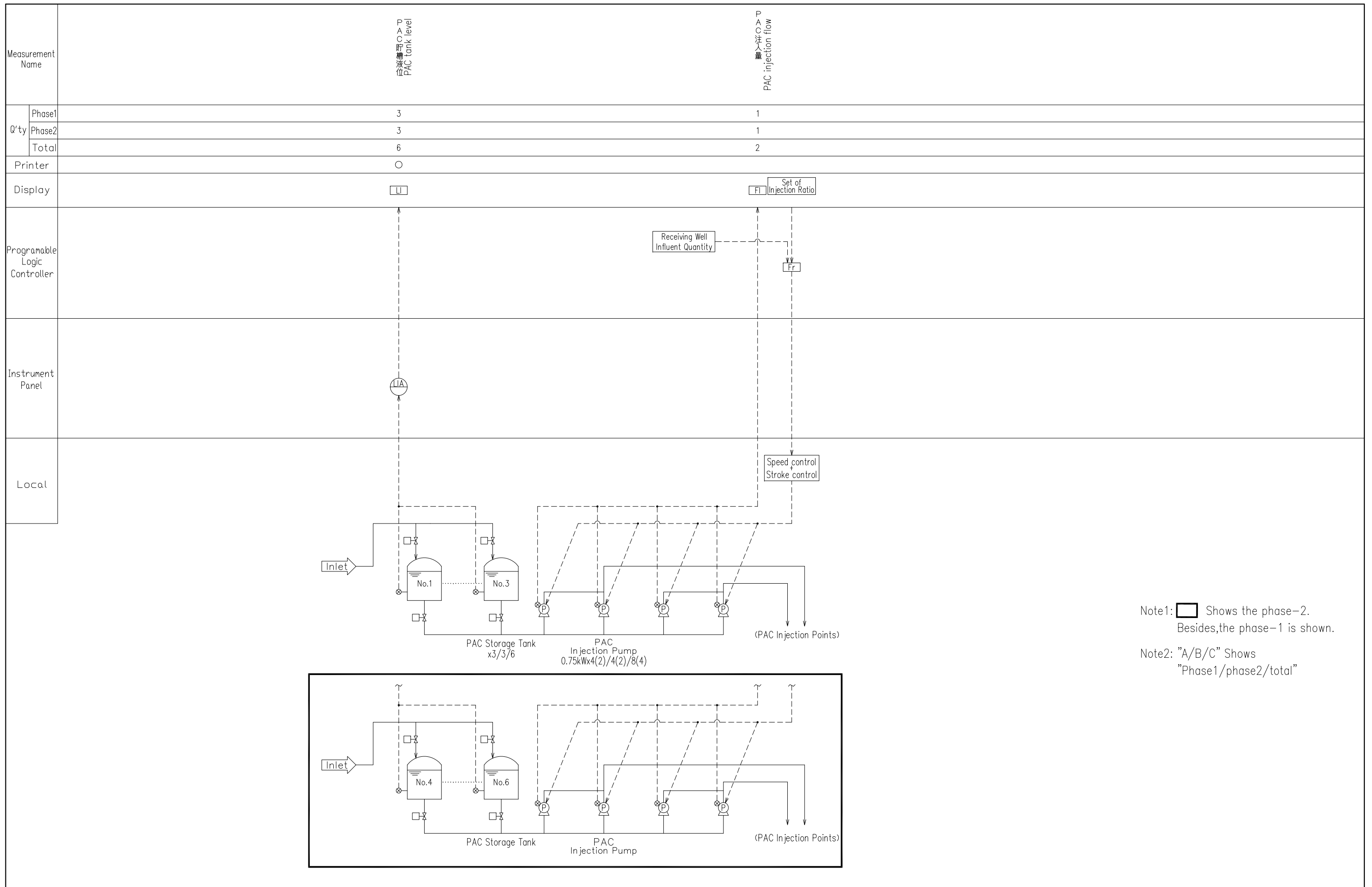


Note1: Shows the phase-2. Besides, the phase-1 is shown.

Note2: "A/B/C" Shows "Phase1/phase2/total"

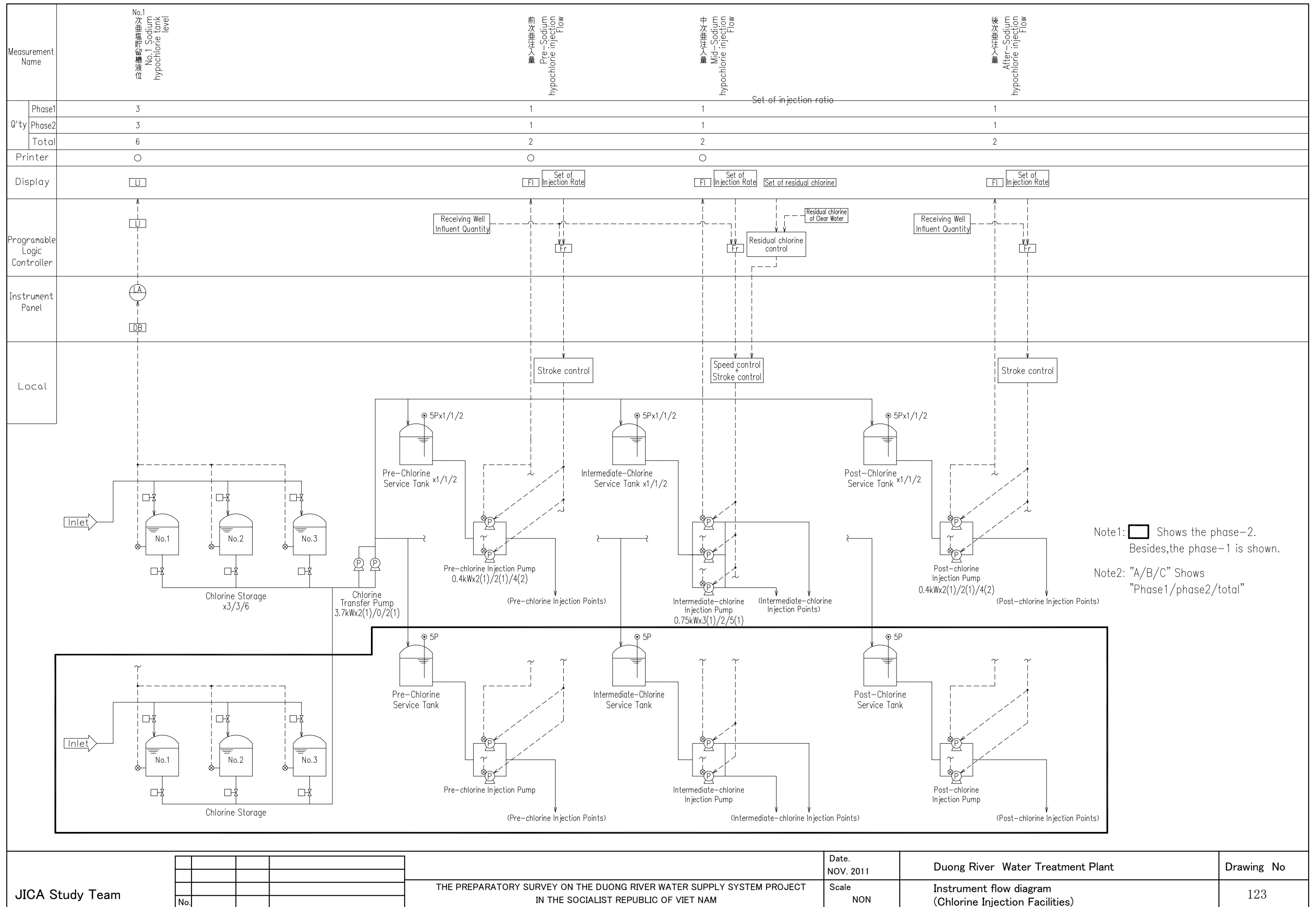


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Note1: Shows the phase-2.
Besides, the phase-1 is shown.

Note2: "A/B/C" Shows
"Phase1/phase2/total"



No.			