

REPUBLIC OF INDIA
BANGALORE WATER SUPPLY AND SEWERAGE BOARD

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)

IN

THE STATE OF KARNATAKA, INDIA

FINAL REPORT

(Drawings)

NOVEMBER 2017

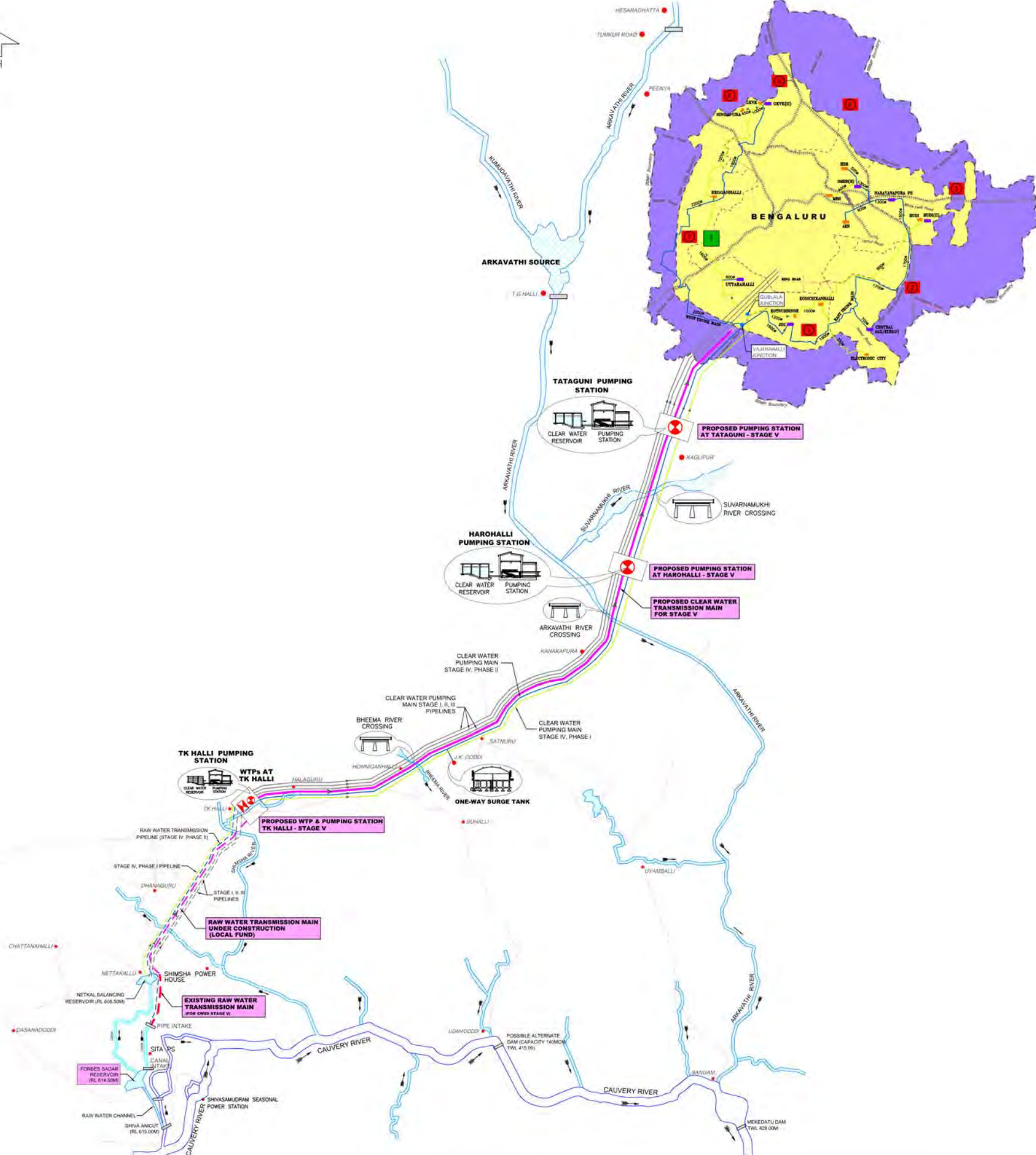
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

NJS CONSULTANTS CO., LTD. (NJS)

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17-062

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- LEGENDS :**
- - RAW WATER TRANSMISSION MAIN UNDER CONSTRUCTION
 - - RAW WATER TRANSMISSION MAIN (STAGE IV, PHASE I)
 - - RAW WATER TRANSMISSION MAIN (STAGE IV, PHASE II)
 - - PROPOSED CLEAR WATER TRANSMISSION MAIN FOR STAGE V
 - - STAGE IV, PHASE I PIPELINE
 - - STAGE IV, PHASE II PIPELINE
 - - STAGE I, II, III & EXISTING PIPELINES
 - STAGE IV, PHASE I GROUND LEVEL RESERVOIR
 - STAGE IV, PHASE II GROUND LEVEL RESERVOIR
 - WATER TREATMENT PLANT (WTP)
 - PUMPING STATION
 - PROPOSED GLR (STAGE V)

- ABBREVIATIONS :**
- PS - PUMPING STATION
 - Ø - DIAMETER
 - L - LENGTH OF PIPELINE
 - D - DIAMETER OF PIPELINE
 - GLR - GROUND LEVEL RESERVOIR
 - PH - PHASE

LOCATION OF PROPOSED GROUND LEVEL RESERVOIR(GLR) :

ID	NAME OF PROPOSED GLR
①	GOTTIGERE
②	DODDAKANAHALLI
③	KADUGODI
④	CHOKKANAHALLI
⑤	VASUDEVAPURA
⑥	SINGAPURA
⑦	LINGADERANAHALLI
	HEGGANAHALLI-2 (EXISTING)

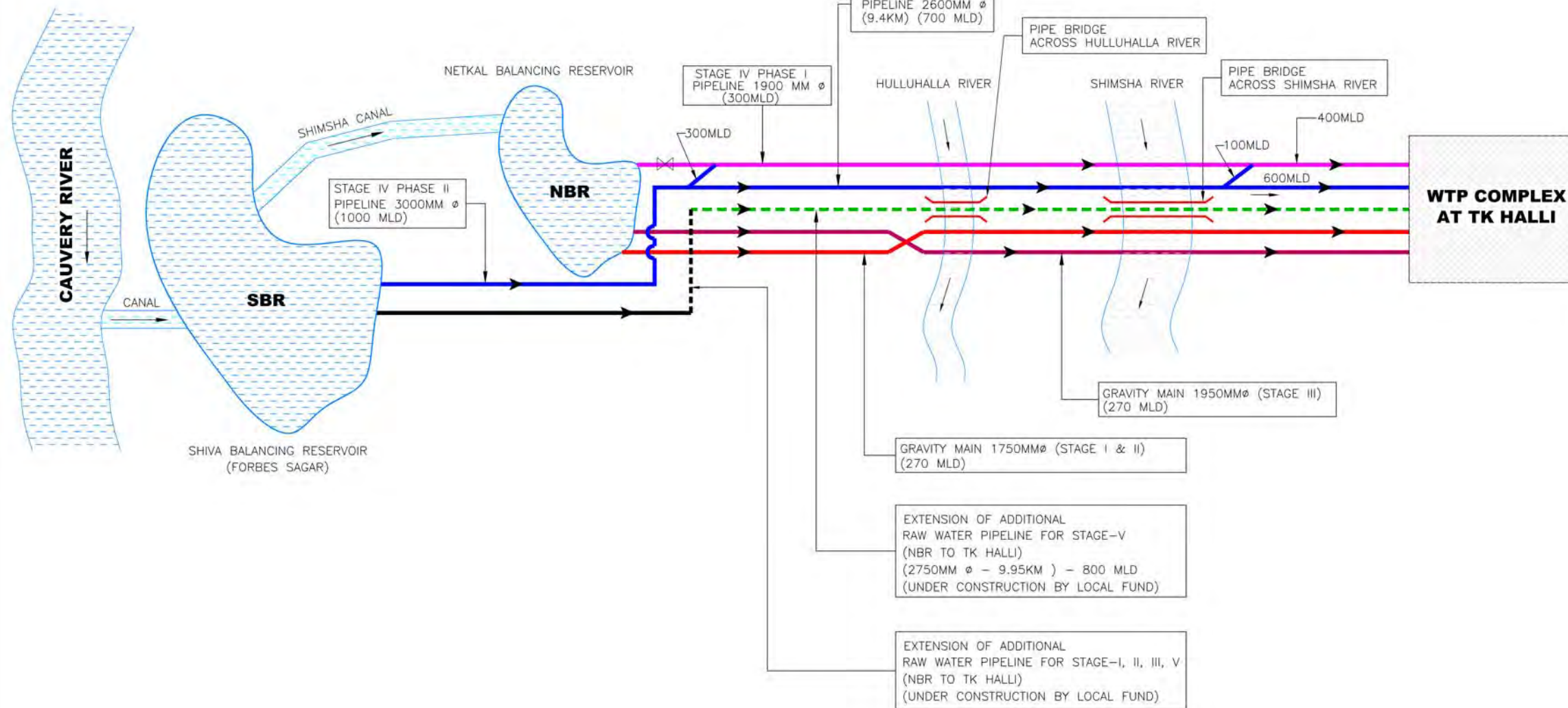
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガールール上下水道整備事業(フェーズ3)

JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE
**CAUVERY WATER SUPPLY SCHEME
 (STAGE I TO STAGE V)**

SCALE
NTS
 DRAWING NO.
W-001



LEGENDS :

- - STAGE-I & II RAW WATER PIPE LINE
- - STAGE-III RAW WATER PIPE LINE
- - STAGE-IV, PHASE-I RAW WATER PIPE LINE
- - STAGE-IV, PHASE-II RAW WATER PIPE LINE
- - - - ADDITIONAL RAW WATER PIPELINE

ABBREVIATIONS :

- ϕ - DIAMETER
- WTP - WATER TREATMENT PLANT
- CWR - CLEAR WATER RESERVOIR
- MLD - MILLION LITERS PER DAY

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE
 EXISTING RAW WATER CONVEYANCE SYSTEM

SCALE
 NTS
 DRAWING NO.
 W-002

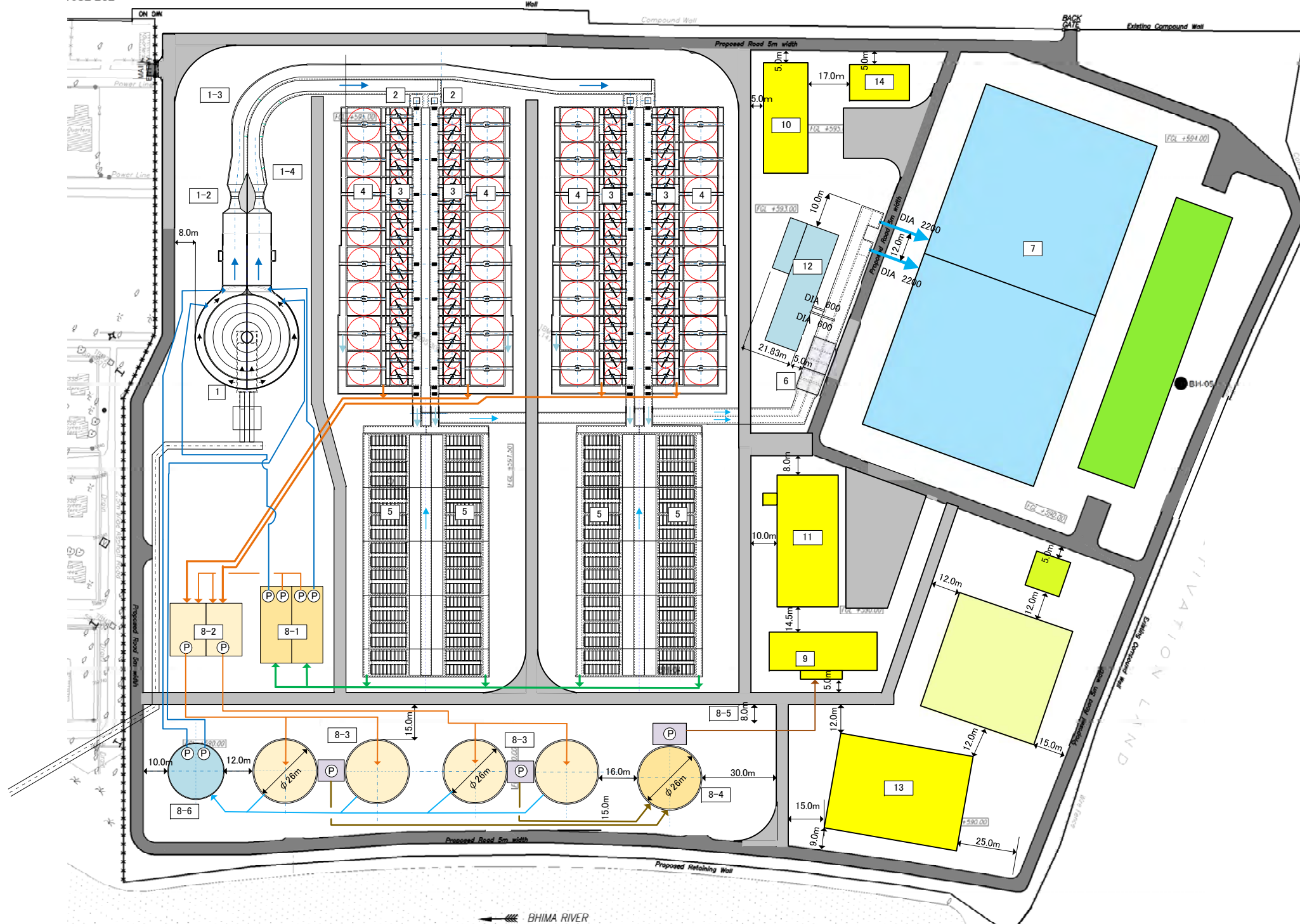


- LEGEND :**
- 1. ASPHALT ROAD,
 - 2. DRAIN, BUILDING, CULVERT, FENCE,
 - 3. COMPOUND WALL WITH GATE, TREE,
 - 4. TRANSFORMER, POWER LINE WITH POLE, OFC,
 - 5. BORE WELL, HAND PUMP, NAME BOARD,
 - 6. TRAVERSE POINTS, BENCH MARKS
 - 7. CONTOUR WITH TEXT, SPOT LEVELS.

- NOTES :**
1. ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS NOTED.
 2. TOTAL AREA OF PROPOSED LAYOUT = 38.00 Acres
 3. TOTAL ROAD LENGTH INSIDE STAGE-V PUMPING STATION = 920M


BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
JAPAN INTERNATIONAL COOPERATION AGENCY	
NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
TOPOGRAPHIC SURVEY FOR PROPOSED WATER TREATMENT PLANT	NTS
	DRAWING NO. W-003

TCE 7893



1	Cascade Aerator
1-2	Parshall Flume
1-3	Raw Water Channel 1
1-4	Raw Water Channel 2
2	Flash Mixer
3	Flocculator
4	Sedimentation with Tube Settler
5	Rapid Sand Filters
6	Chlorine Mixing Basin
7	Clear Water Reservoir (CWR)
8-1	Backwash Water Recovery Tank
8-2	Sludge Balancing Tank
8-3	Primary Sludge Thickener
8-4	Secondary Sludge Thickener
8-5	Thickened Sludge Storage Tank
8-6	Supernatant Tank
9	Centrifuge Building
10	Chemical Building
11	Chlorine Building
12	Filter Annex Building
13	Electrical Switch Yard
14	Electrical Sub Station

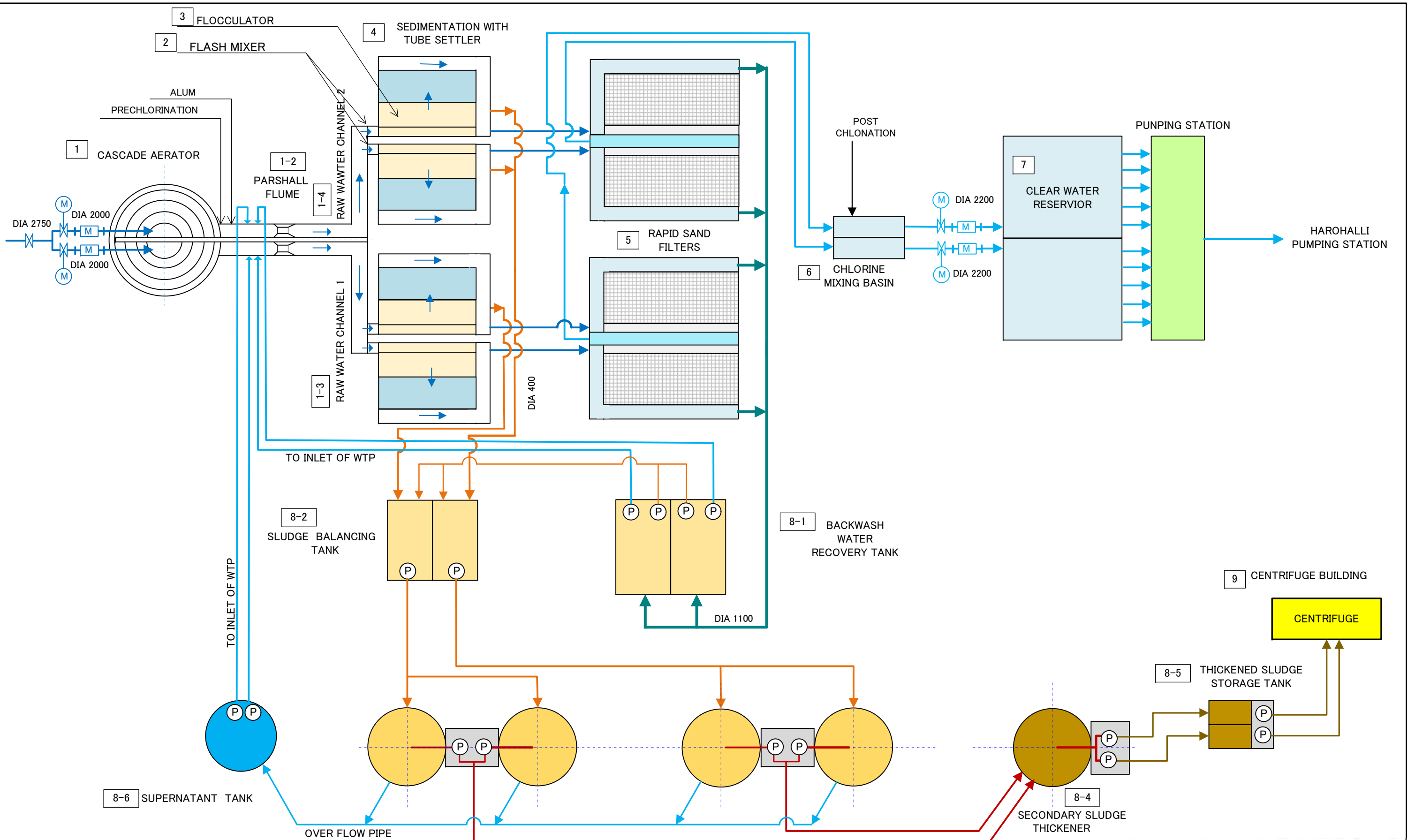
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

 JAPAN INTERNATIONAL COOPERATION AGENCY

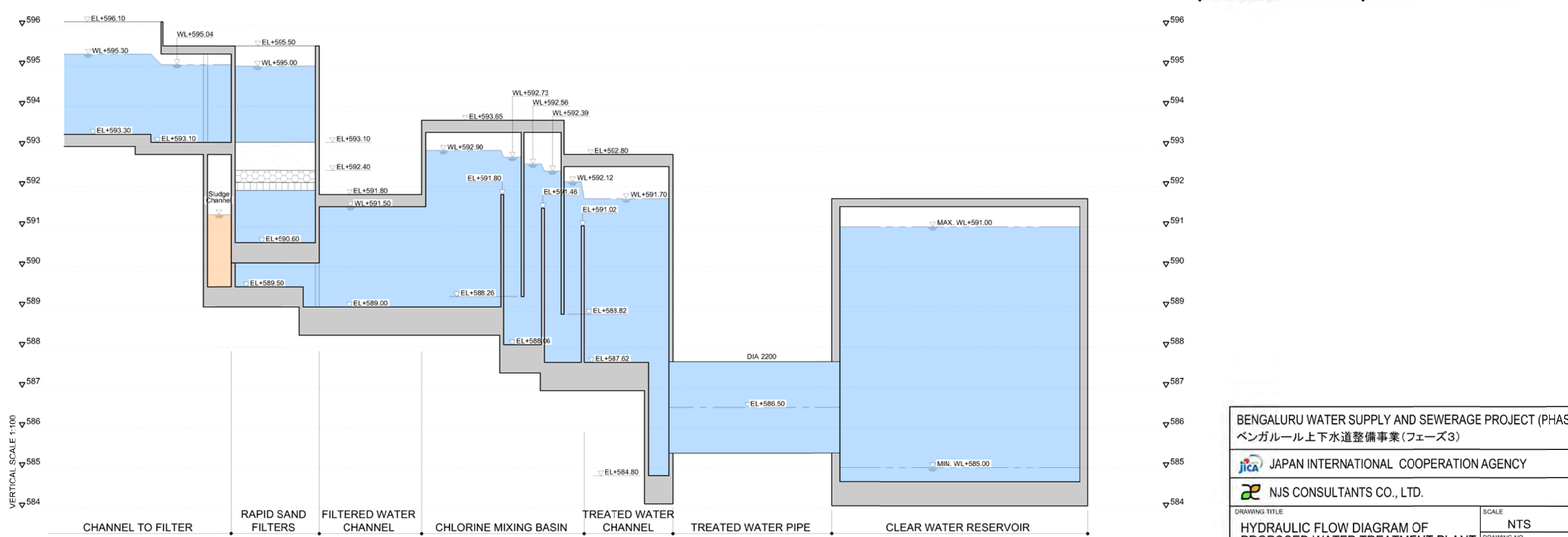
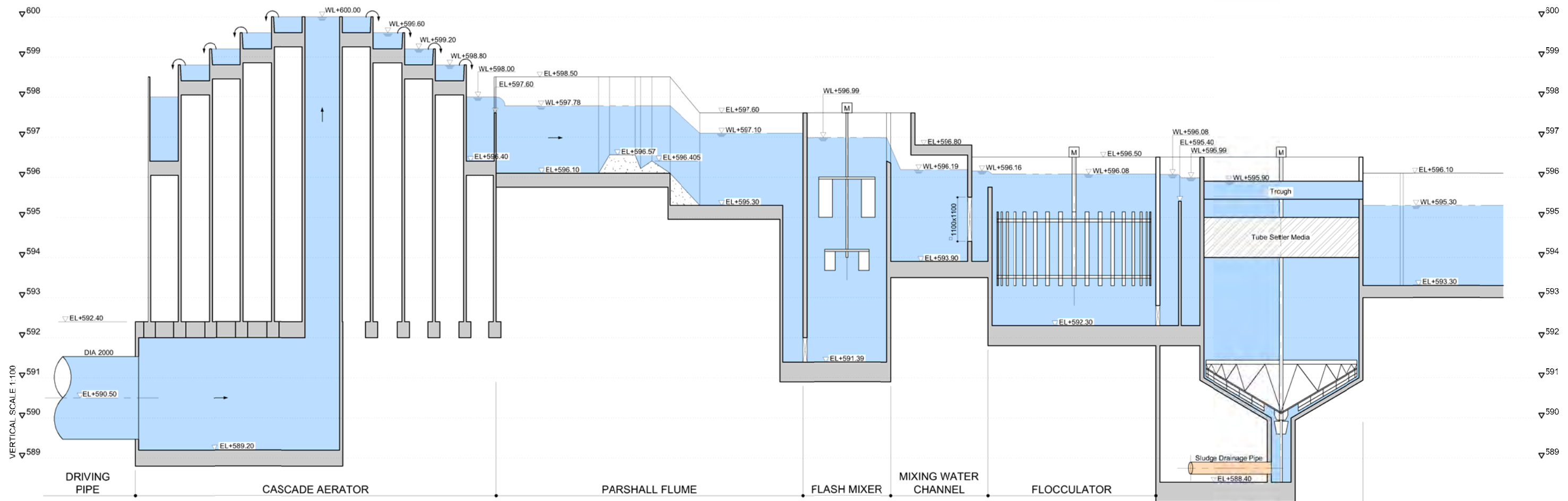
 NJS CONSULTANTS CO., LTD.

DRAWING TITLE
 LAYOUT PLAN OF PROPOSED WATER
 TREATMENT PLAN

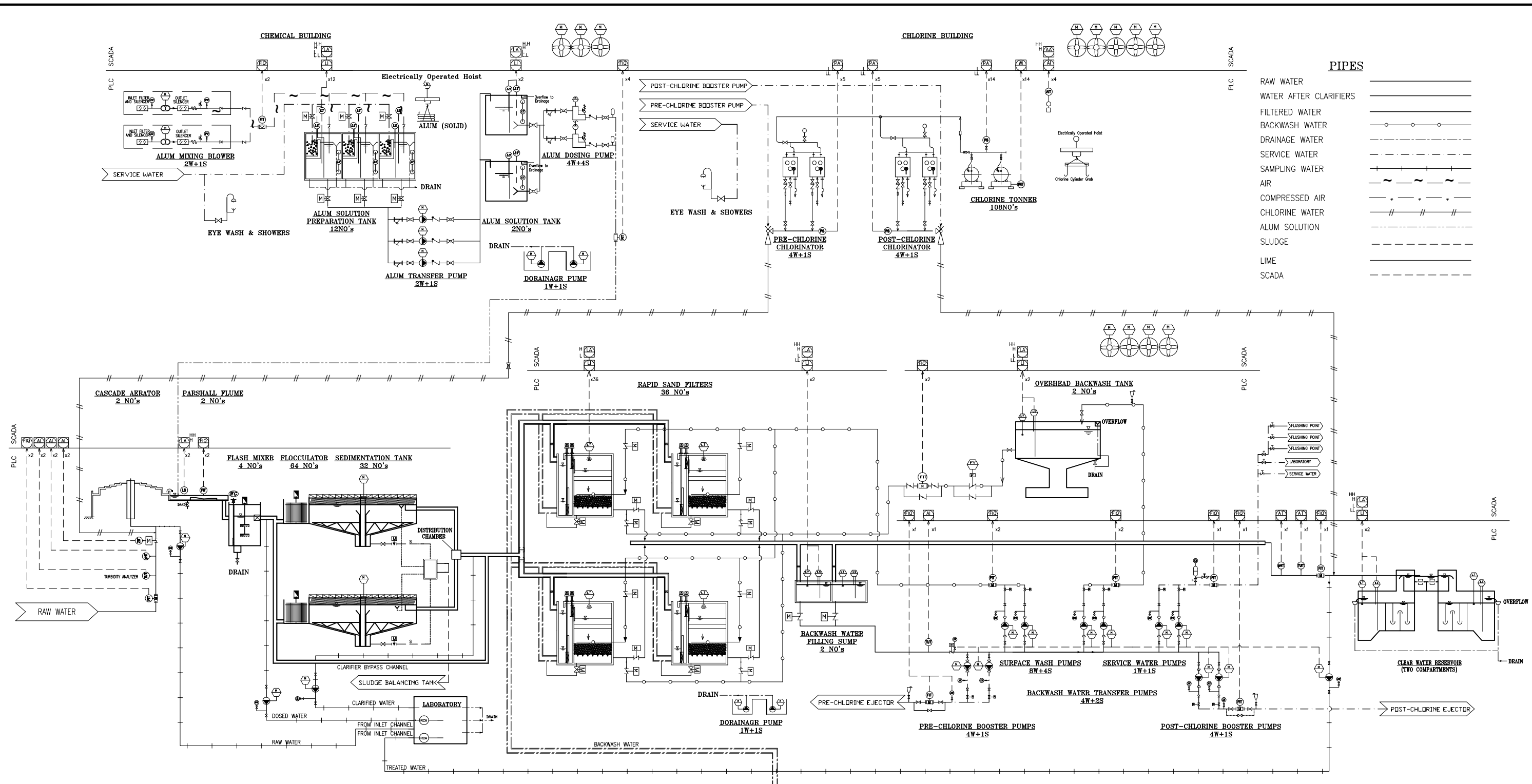
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 DRAWING NO.
 W-004



BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
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DRAWING TITLE PROCESS FLOW DIAGRAM FOR PROPOSED WATER TREATMENT PLANT	SCALE NTS DRAWING NO. W-005



BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
JAPAN INTERNATIONAL COOPERATION AGENCY	
NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
HYDRAULIC FLOW DIAGRAM OF PROPOSED WATER TREATMENT PLANT	NTS
	DRAWING NO. W-006



PIPES

RAW WATER	—————
WATER AFTER CLARIFIERS	—————
BACKWASH WATER	—○—○—○—
DRAINAGE WATER	—○—○—○—
SERVICE WATER	- - - - -
SAMPLING WATER	—○—○—○—
AIR	~ ~ ~ ~ ~
COMPRESSED AIR	—•—•—•—
CHLORINE WATER	—//—//—//—
ALUM SOLUTION	—//—//—//—
SLUDGE	- - - - -
LIME	—————
SCADA	—————

LEGEND			ABBREVIATIONS			
GATE VALVE		NORMALLY CLOSED VALVE		PROGRESSIVE CAVITY PUMP		FLOW TRANSMITTER
JWAVE VALVE		PRESSURE RELIEF VALVE		CENTRIFUGAL PUMP		LIMIT SWITCH
BUTTERFLY VALVE		FLOW REGULATION VALVE		MOTOR ACTUATED VALVE (AV)		PRESSURE SWITCH
OIL FILTER		NON RETURN VALVE		PNEUMATIC VALVE (PV)		PRESSURE TRANSMITTER
CARBON FILTER		SUCTION STAINER		CHLORINE CONTROL VALVE		LOSS OF ROTATION SWITCH
AIR VALVE		KINETIC AIR VALVE		LIQUID TRAP AND HEATER		PH METER
STOP LOG		SUBMERSIBLE PUMP		BLOWER		DEWATERING
EJECTOR		FLEXIBLE CONNECTION		DORROT PRESSURE RELEASE VALVE		LEVEL TRANSMITTER
STATIC MIXER		FLASH MIXER/FLOCCULATOR		RESSURE LOADING (ANTI SIPHON) VALVE		LEVEL SWITCH
FLOW METER		MANUAL WALL GATE		LIFTING DEVICE		TEMPERATURE TRANSMITTER
MANUAL VALVE		ACTUATED WALL GATE		CHLORINE TANK WEIGHT		pH TRANSMITTER
JIB CRANE		PULSATION DAMPENER		CHLORINE GAS DETECTOR		PNEUMATIC VALVE
FAN		PRESSURE TANK		CHEMICAL MIXER		LEVEL ALARM
DOSING PUMP		PNEUMATIC VALVE		SUBMERSIBLE MIXER		TOTAL CHLORINE TRANSMITTER
						TURBIDITY TRANSMITTER
						TEMPERATURE INDICATOR
						PRESSURE GAUGE
						PRESSURE INDICATOR TRANSMITTER
						TOTAL ORGANIC CARBON METER
						WALL GATE
						WIER GATE
						AIR FLOW TRANSMITTER
						DIFFERENTIAL PRESSURE TRANSMITTER
						RESIDUAL CI ANALYSER
						FLOW INDICATING TRANSMITTER
						FLOW INDICATING TOTALIZER



BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガール上下水道整備事業(フェーズ3)

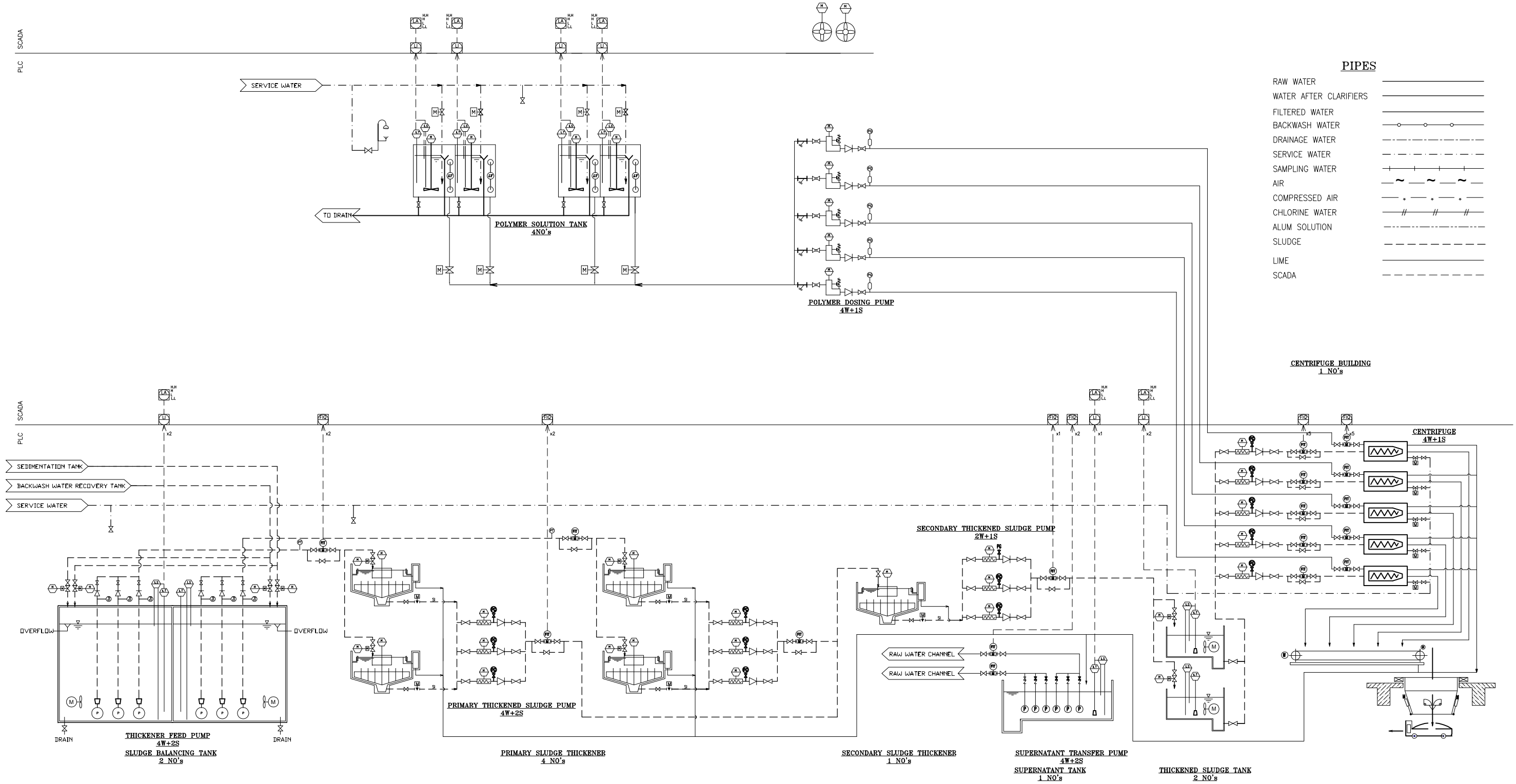
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DRAWING TITLE: **INSTRUMENTATION DIAGRAM OF PROPOSED WATER TREATMENT PLANT (1/2)**

SCALE: **NTS**

DRAWING NO.: **W-007**



PIPES

RAW WATER	—————
WATER AFTER CLARIFIERS	—————
FILTERED WATER	—————
BACKWASH WATER	—○—○—○—
DRAINAGE WATER	- - - - -
SERVICE WATER	- - - - -
SAMPLING WATER	- · - · - · -
AIR	- · - · - · -
COMPRESSED AIR	- · - · - · -
CHLORINE WATER	—//—//—//—
ALUM SOLUTION	- - - - -
SLUDGE	- - - - -
LIME	- - - - -
SCADA	- - - - -

LEGEND

GATE VALVE	NORMALLY CLOSED VALVE	PROGRESSIVE CAVITY PUMP	FLOW TRANSMITTER	TOTAL CHLORINE TRANSMITTER
3WAY VALVE	PRESSURE RELIEF VALVE	CENTRIFUGAL PUMP	LIMIT SWITCH	TURBIDITY TRANSMITTER
BUTTERFLY VALVE	FLOW REGULATION VALVE	MOTOR ACTUATED VALVE (AV)	PRESSURE SWITCH	TEMPERATURE INDICATOR
OIL FILTER	NON RETURN VALVE	PNEUMATIC VALVE (PV)	PRESSURE TRANSMITTER	PRESSURE GAUGE
CARBON FILTER	SUCTION STAINER	CHLORINE CONTROL VALVE	LOSS OF ROTATION SWITCH	PRESSURE INDICATOR TRANSMITTER
AIR VALVE	KINETIC AIR VALVE	LIQUID TRAP AND HEATER	PH METER	TOTAL ORGANIC CARBON METER
STOP LOG	SUBMERSIBLE PUMP	BLOWER	DEWATERING	WALL GATE
EJECTOR	FLEXIBLE CONNECTION	DORROT PRESSURE RELEASE VALVE	LEVEL TRANSMITTER	WIER GATE
STATIC MIXER	FLASH MIXER/FLOCCULATOR	RESSURE LOADING (ANTI SIPHON) VALVE	LEVEL SWITCH	AIR FLOW TRANSMITTER
FLOW METER	MANUAL WALL GATE	LIFTING DEVICE	TEMPERATURE TRANSMITTER	DIFFERENTIAL PRESSURE TRANSMITTER
MANUAL VALVE	ACTUATED WALL GATE	CHLORINE TANK WEIGHT	pH TRANSMITTER	RESIDUAL CI ANALYSER
JIB CRANE	PULSATION DAMPENER	CHLORINE GAS DETECTOR	PNEUMATIC VALVE	FLOW INDICATING TRANSMITTER
FAN	PRESSURE TANK	CHEMICAL MIXER	LEVEL ALARM	FLOW INDICATING TOTALIZER
DOSING PUMP	PNEUMATIC VALVE	SUBMERSIBLE MIXER		

ABBREVIATIONS

LE	LEVEL ELEMENT
LS	LEVEL SWITCH
LI	LEVEL INDICATOR
LT	LEVEL TRANSMITTER
LALL	LEVEL ALARM LOW LOW
LAHH	LEVEL ALARM HIGH HIGH
LAL	LEVEL ALARM LOW
LAH	LEVEL ALARM HIGH
PI/PG	PRESSURE INDICATOR/GAUGE
FIT	FLOW INDICATING TRANSMITTER
FIQ	FLOW TOTALISER AND INDICATOR
PT	PRESSURE TRANSMITTER
AI	ANALYSIS INDICATOR
AIT	ANALYSIS INDICATOR TRANSMITTER

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガールール上下水道整備事業(フェーズ3)

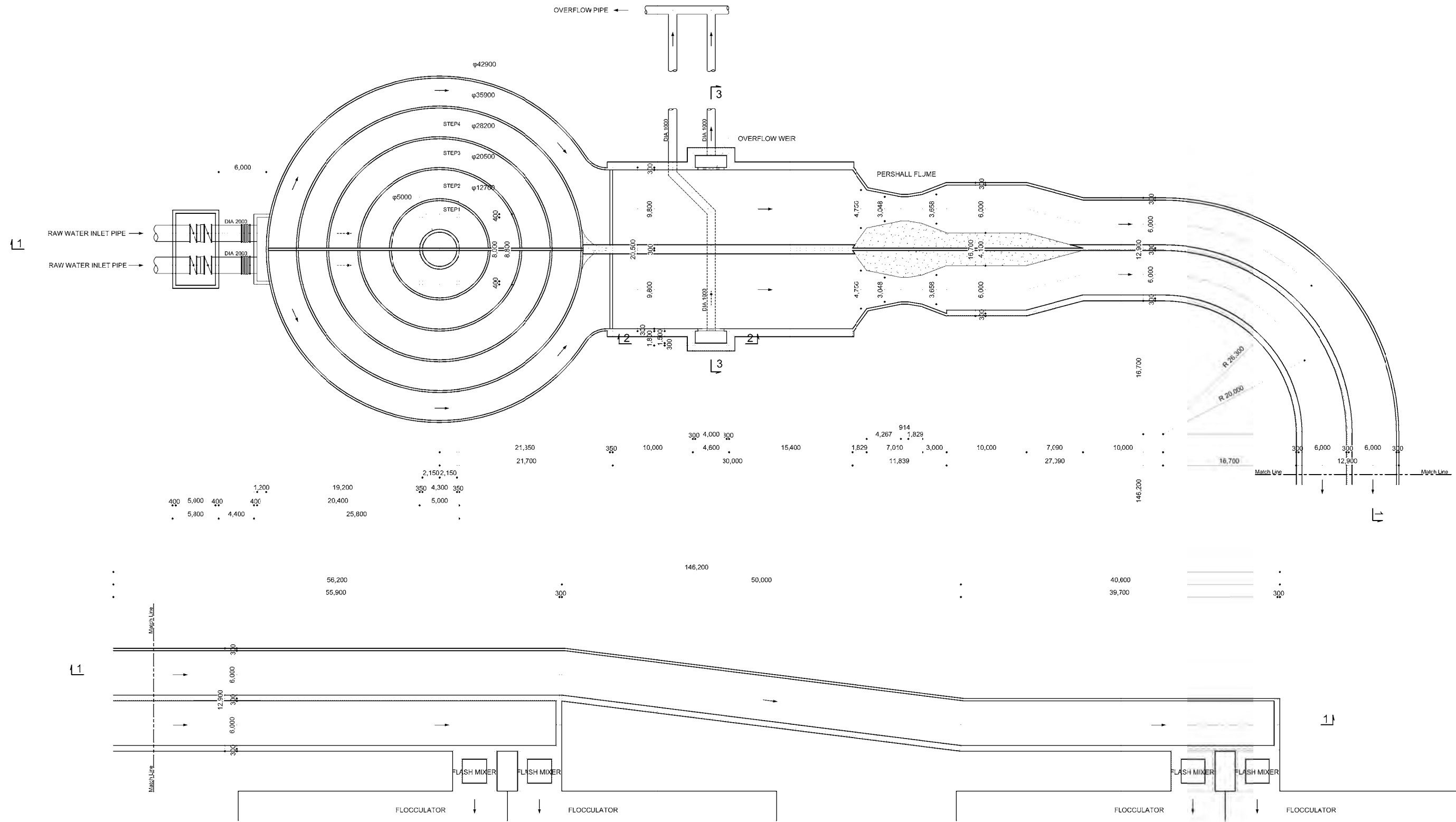
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DRAWING TITLE: **INSTRUMENTATION DIAGRAM OF PROPOSED WATER TREATMENT PLANT (2/2)**

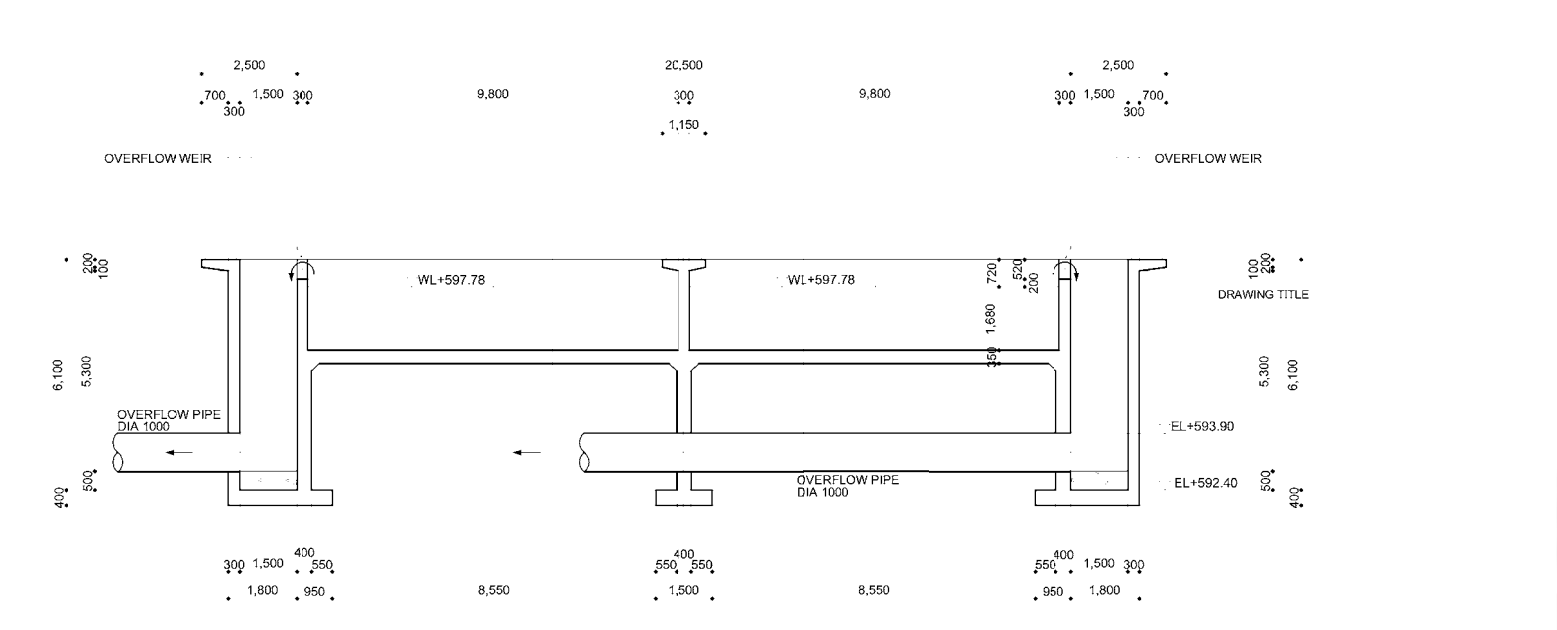
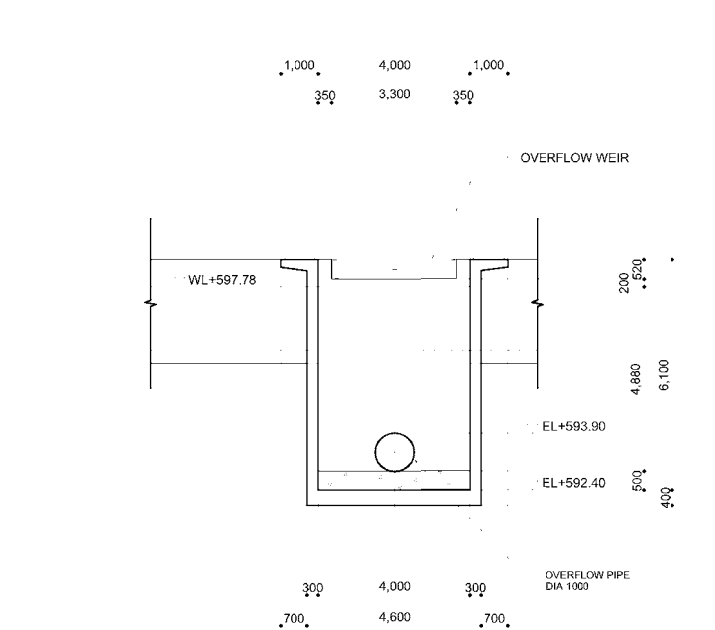
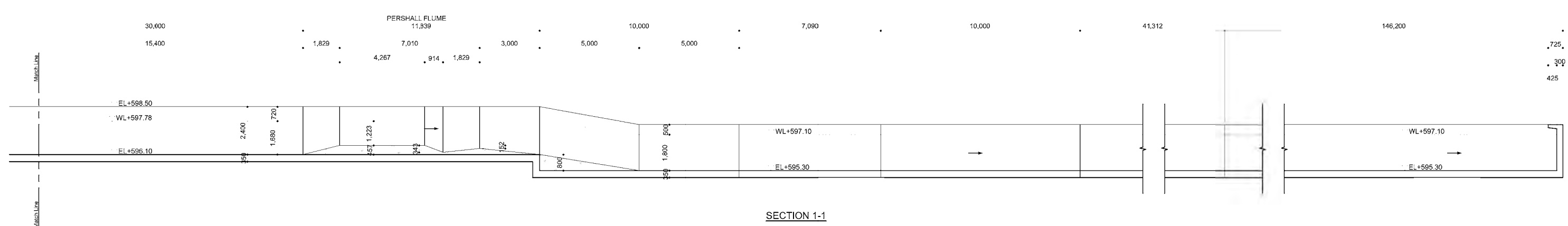
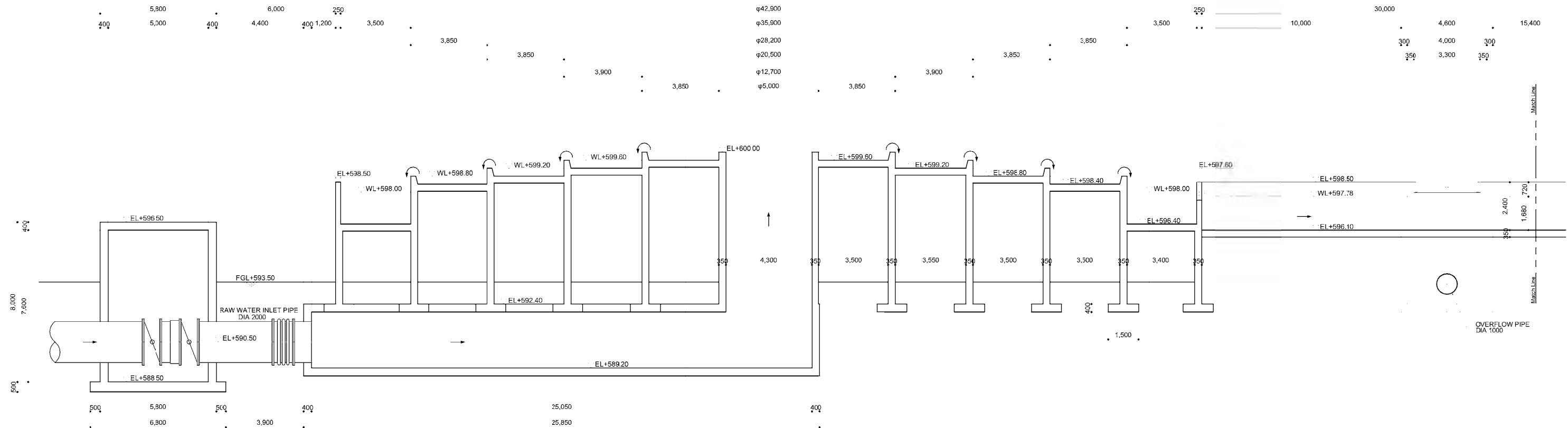
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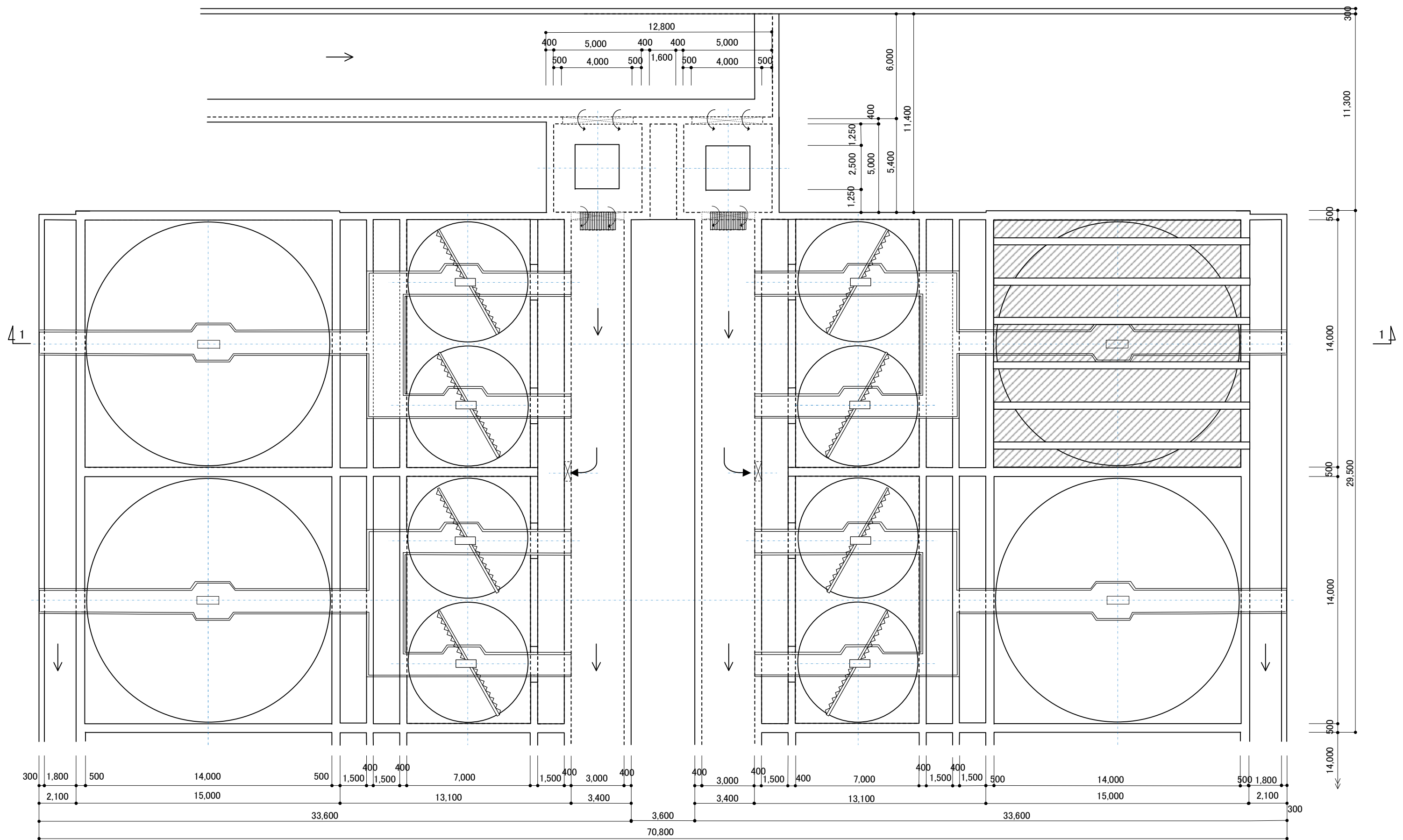


PLAN

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
JAPAN INTERNATIONAL COOPERATION AGENCY	
NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN OF CASCADE AERATOR , PARSHALL FLUME AND FLASH MIXER	1:250
DRAWING NO.	
W-009	

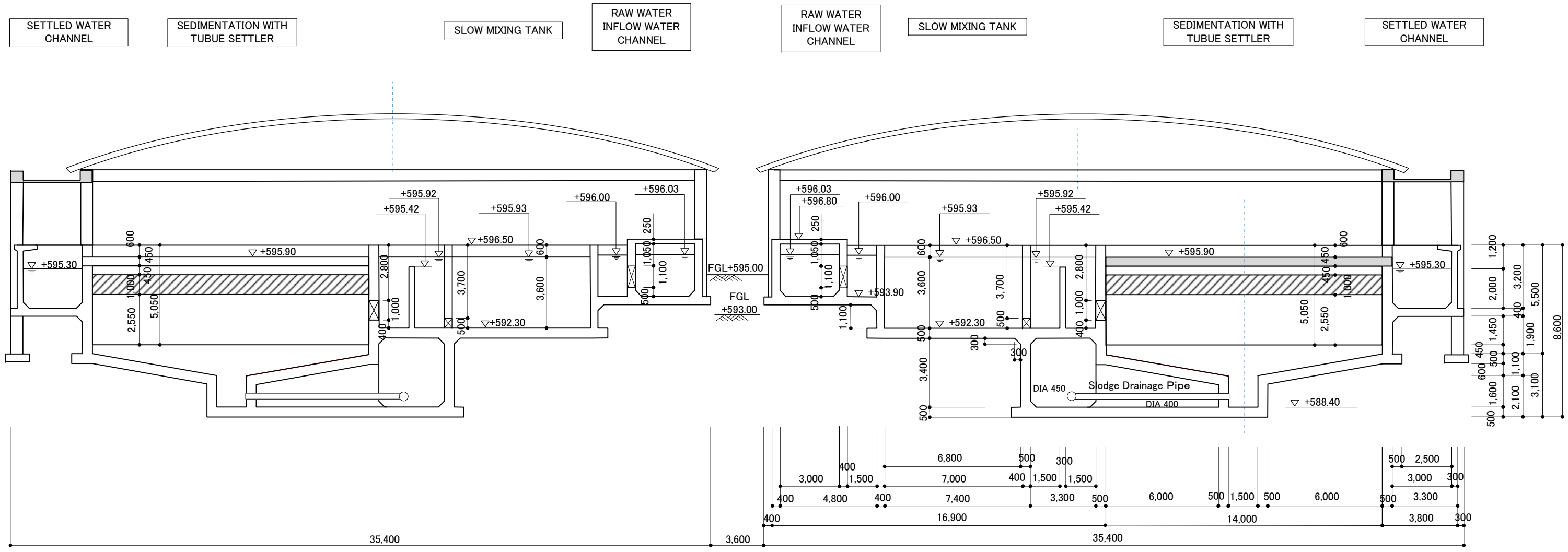


BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
NJS CONSULTANTS CO., LTD.	
DRAWING TITLE SECTION OF CASCADE AERATOR, PARSHALL FLUME AND FLASH MIXER	SCALE 1:100
	DRAWING NO. W-010



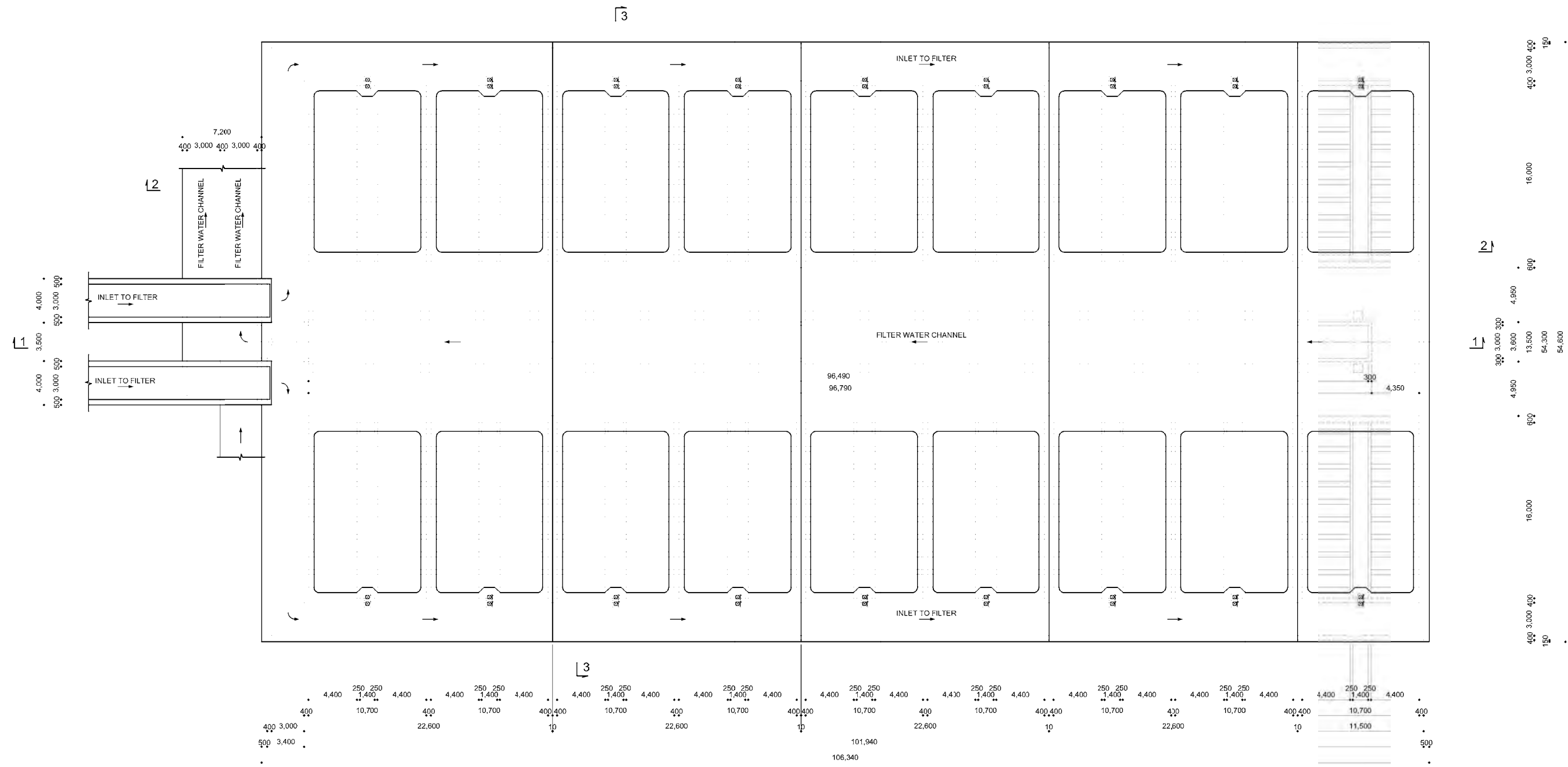
PLAN
(SCALE 1:100)

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
 JAPAN INTERNATIONAL COOPERATION AGENCY	
 NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN OF FLOCCULATOR AND SEDIMENTATION TANK	1:100
DRAWING NO.	
W-011	

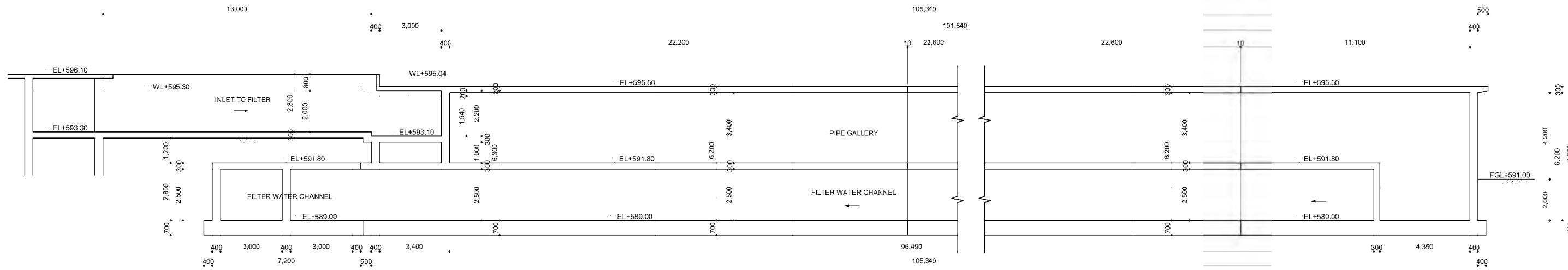


SECTION 1-1
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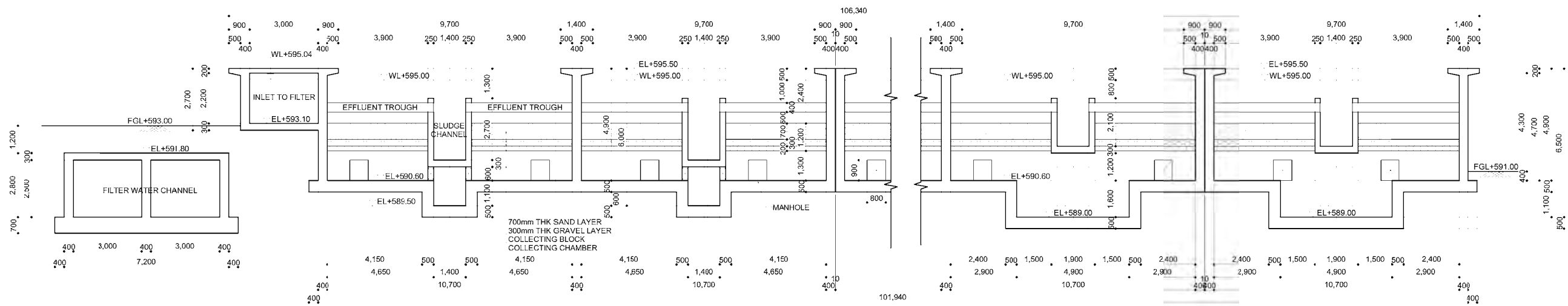
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
SECTION OF FLOCCULATOR AND SEDIMENTATION TANK	1:100
DRAWING NO.	DRAWING NO.
	W-012



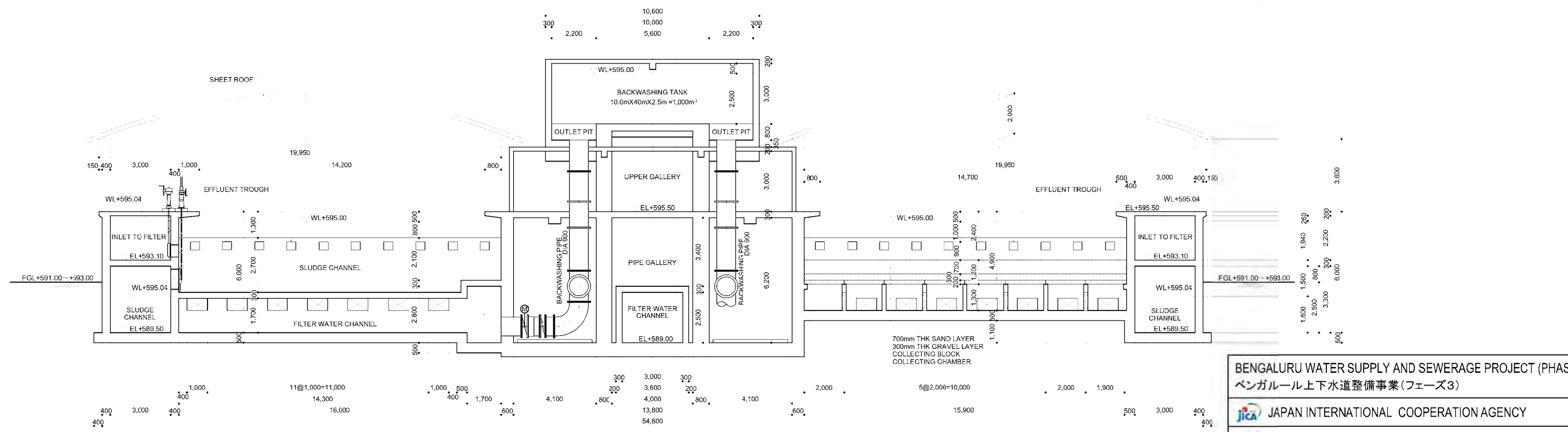
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
 JAPAN INTERNATIONAL COOPERATION AGENCY	
 NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN OF RAPID SAND FILTER	1:200
DRAWING NO.	
W-013	



SECTION 1-1



SECTION 2-2



SECTION 3-3

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

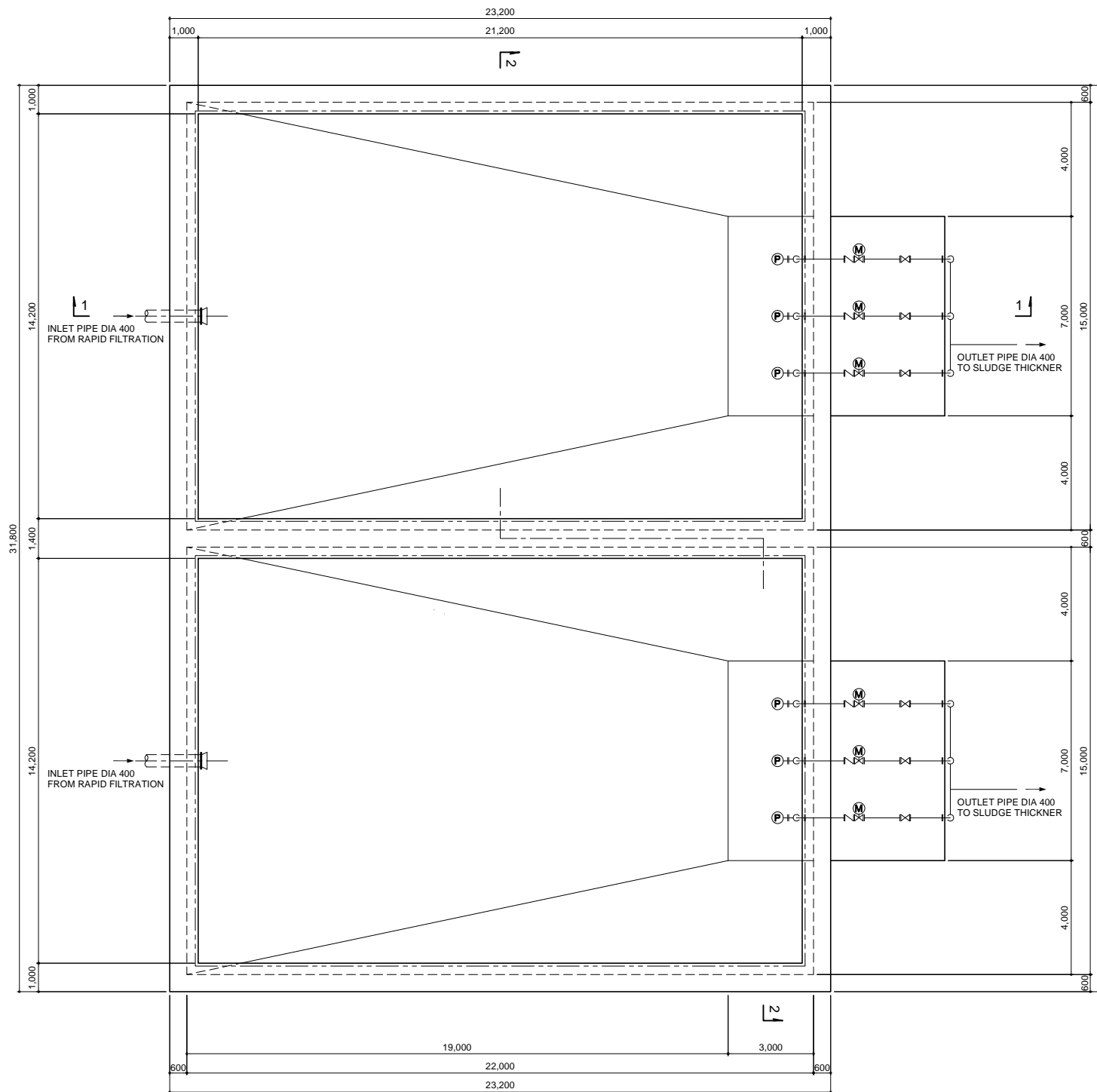
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

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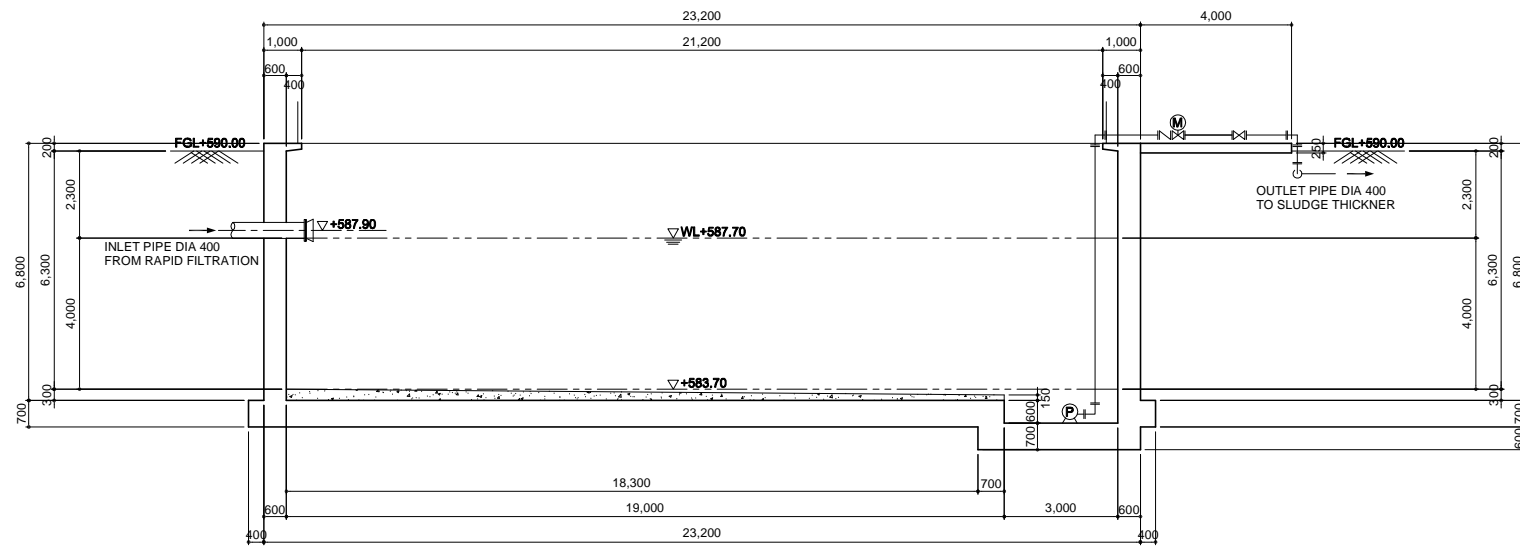
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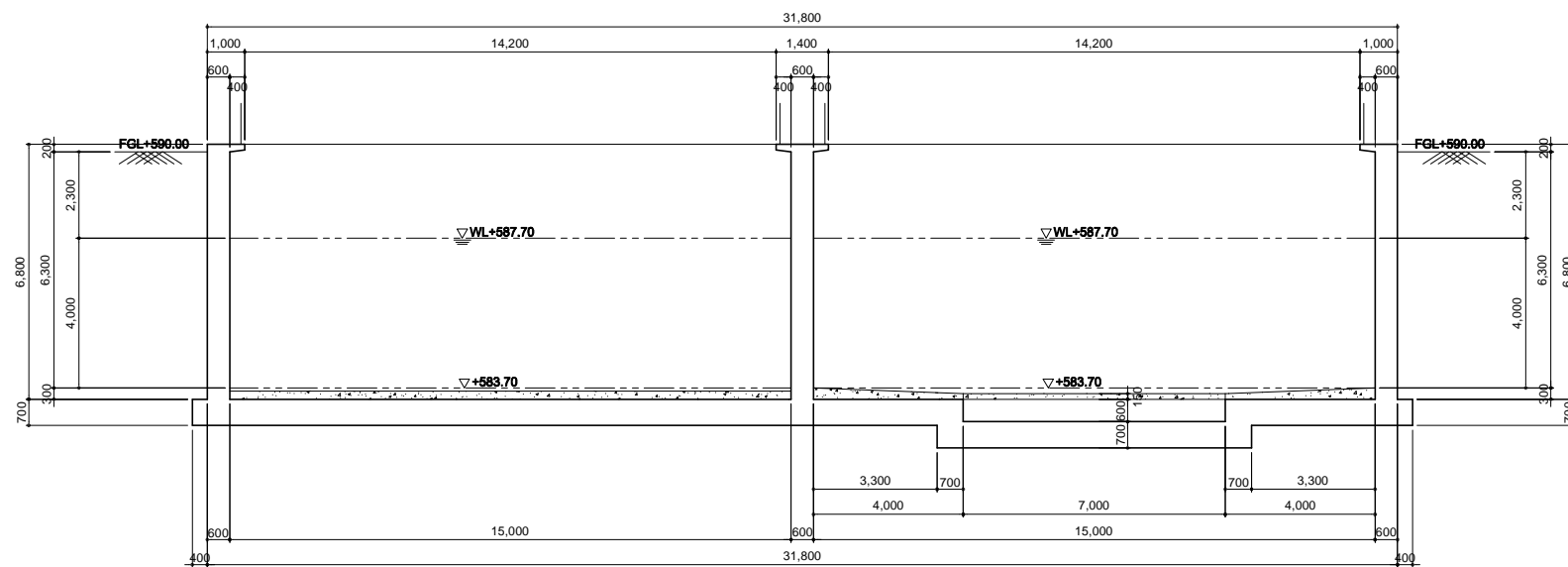


PLAN
(SCALE 1:100)

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN OF SLUDGE BALANCING TANK	1:100
	DRAWING NO.
	W-015



SECTION 1-1
(SCALE 1:100)



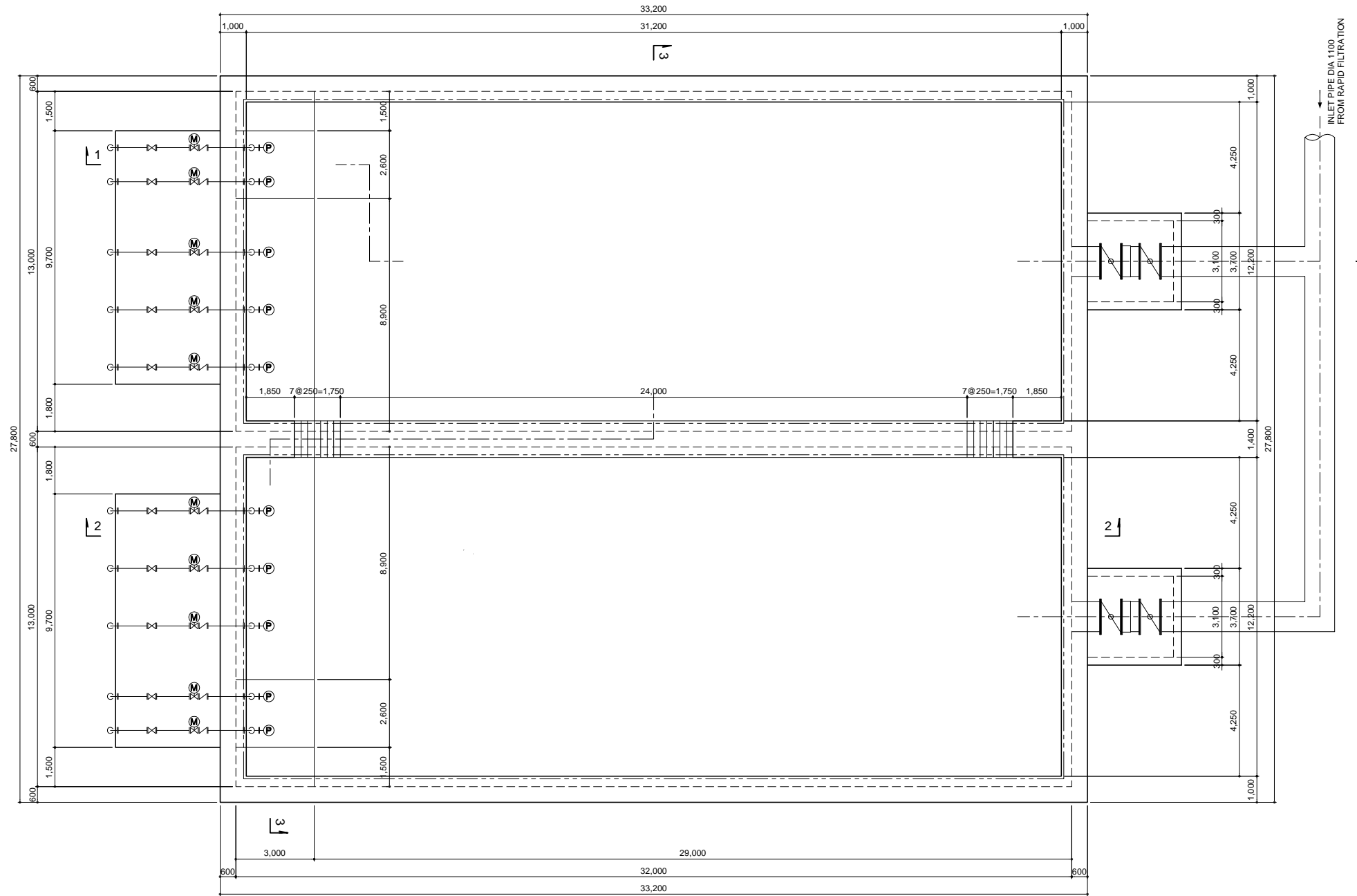
SECTION 2-2
(SCALE 1:100)

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

 JAPAN INTERNATIONAL COOPERATION AGENCY

 NJS CONSULTANTS CO., LTD.

DRAWING TITLE	SCALE
SECTION OF SLUDGE BALANCING TANK	1:100
DRAWING NO.	
	W-016



PLAN
(SCALE 1:100)

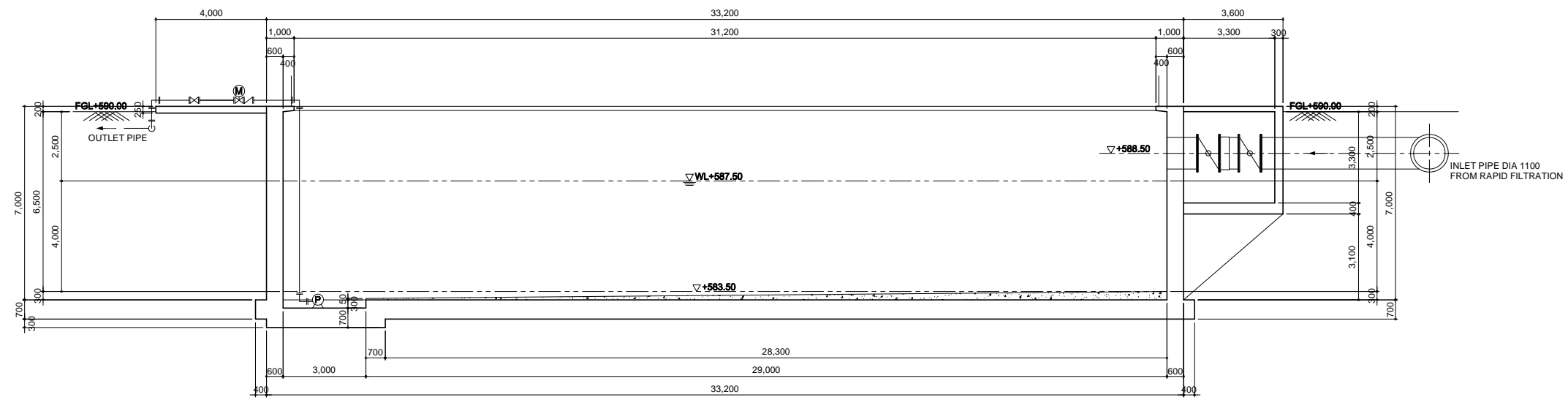
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

 JAPAN INTERNATIONAL COOPERATION AGENCY

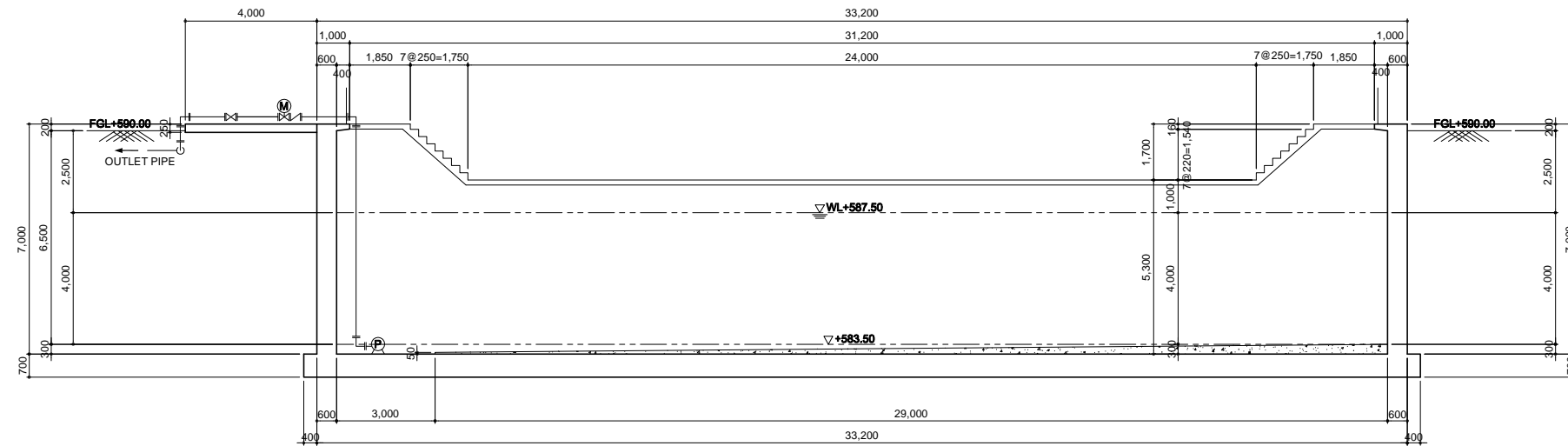
 NJS CONSULTANTS CO., LTD.

DRAWING TITLE
PLAN OF BACKWASH WATER RECOVERY TANK

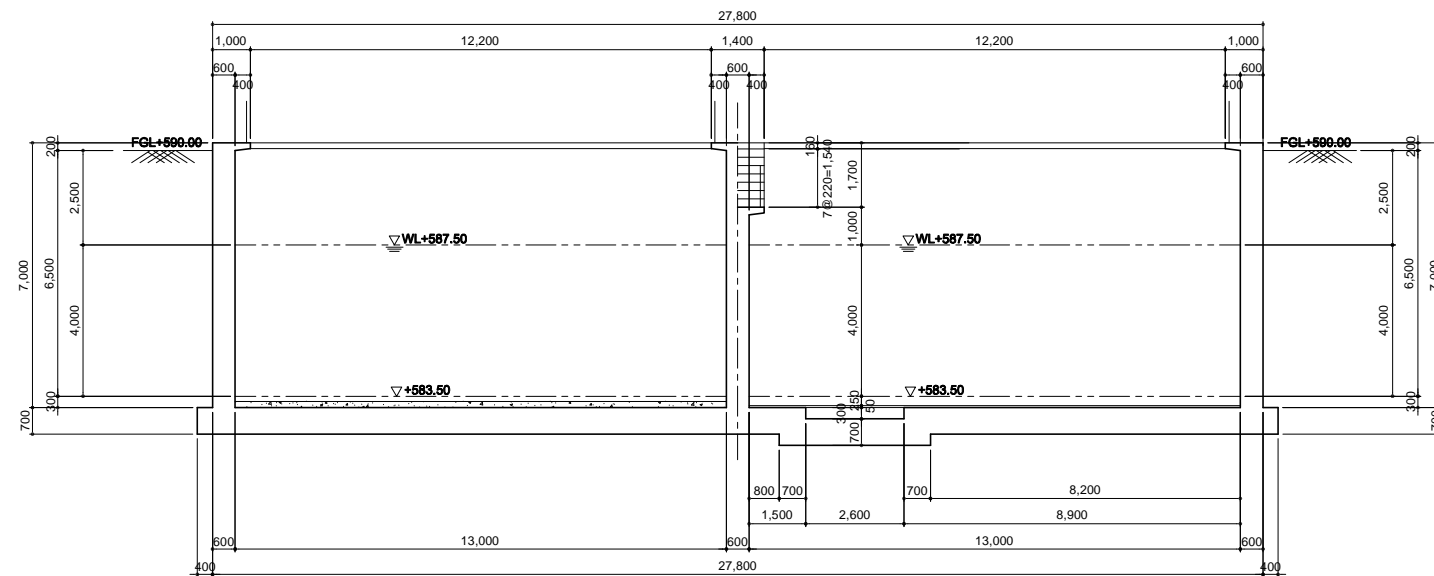
SCALE
 1:100
 DRAWING NO.
W-017



SECTION 1-1
(SCALE 1:100)



SECTION 2-2
(SCALE 1:100)



SECTION 3-3
(SCALE 1:100)

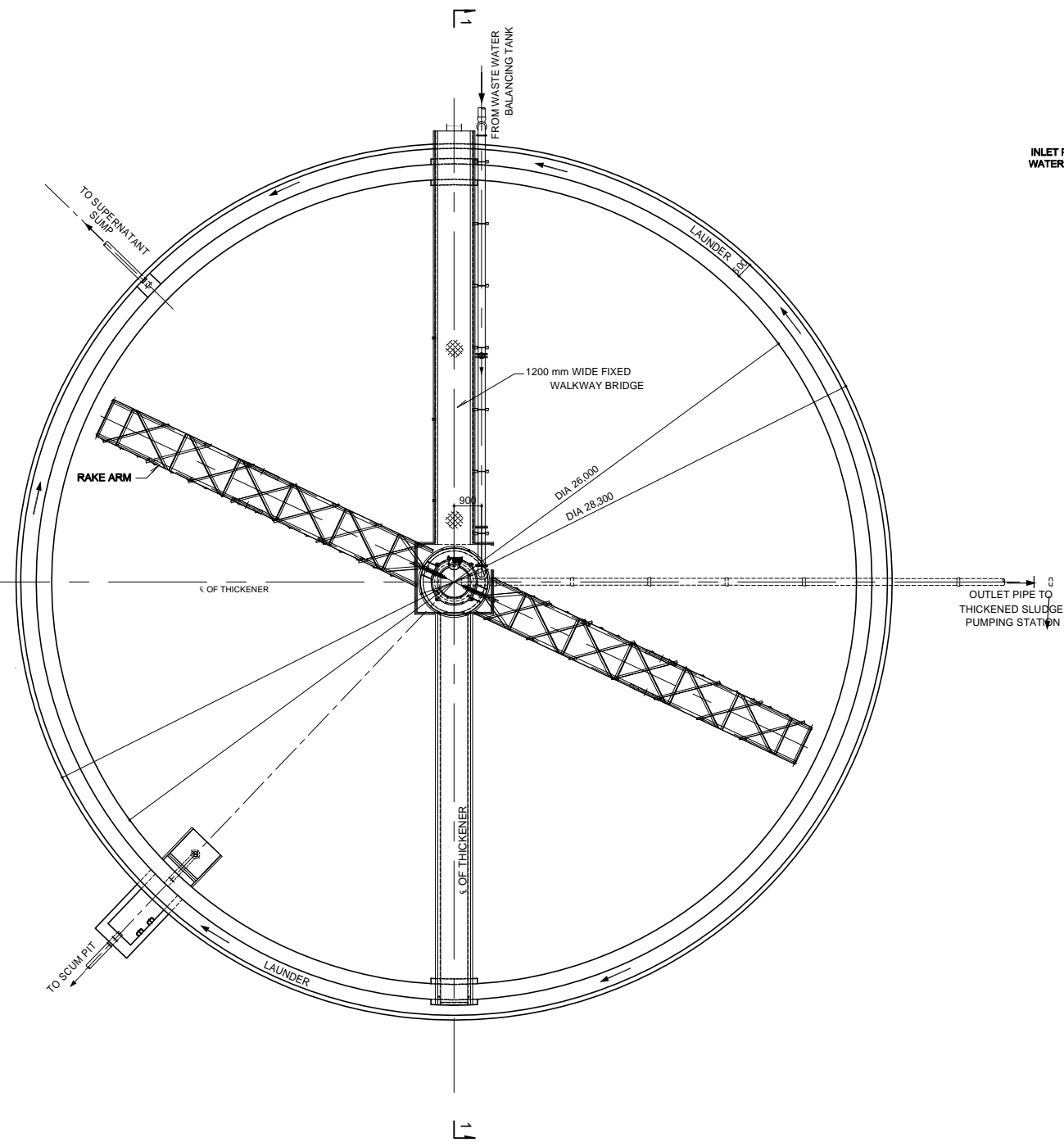
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

 JAPAN INTERNATIONAL COOPERATION AGENCY

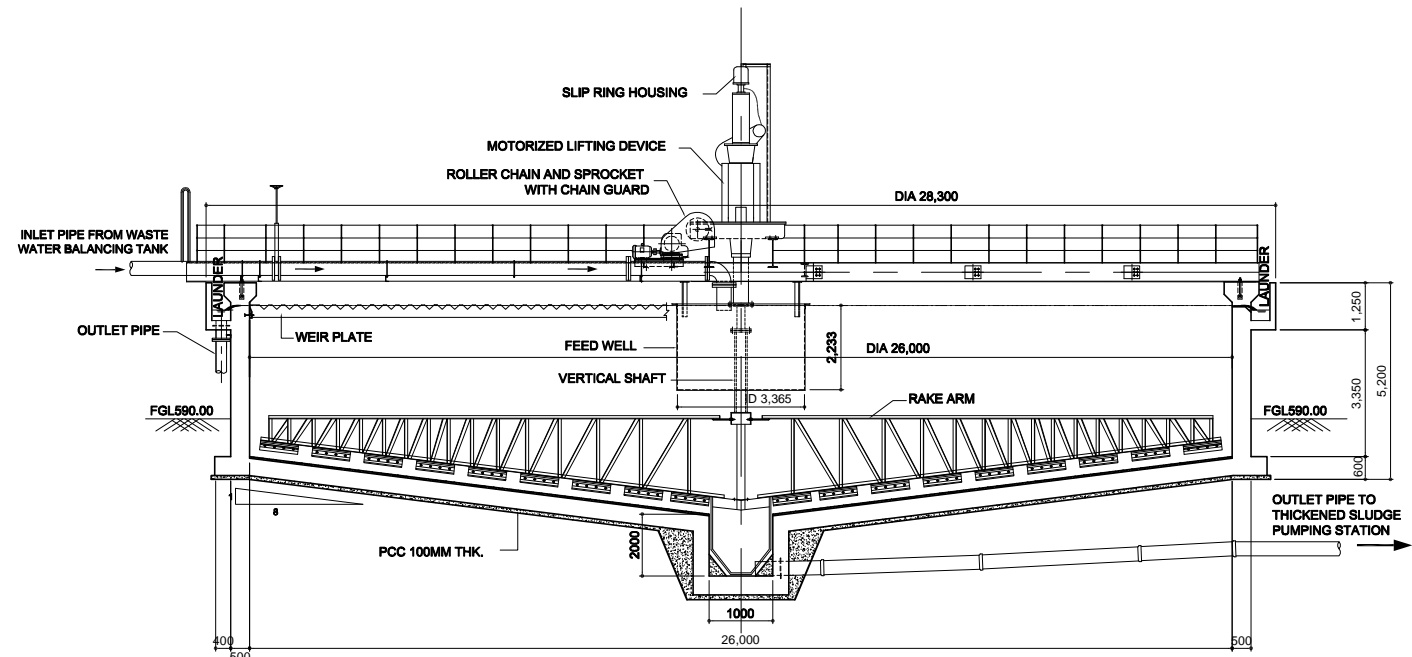
 NJS CONSULTANTS CO., LTD.

DRAWING TITLE
**SECTION OF BACKWASH WATER
 RECOVERY TANK**

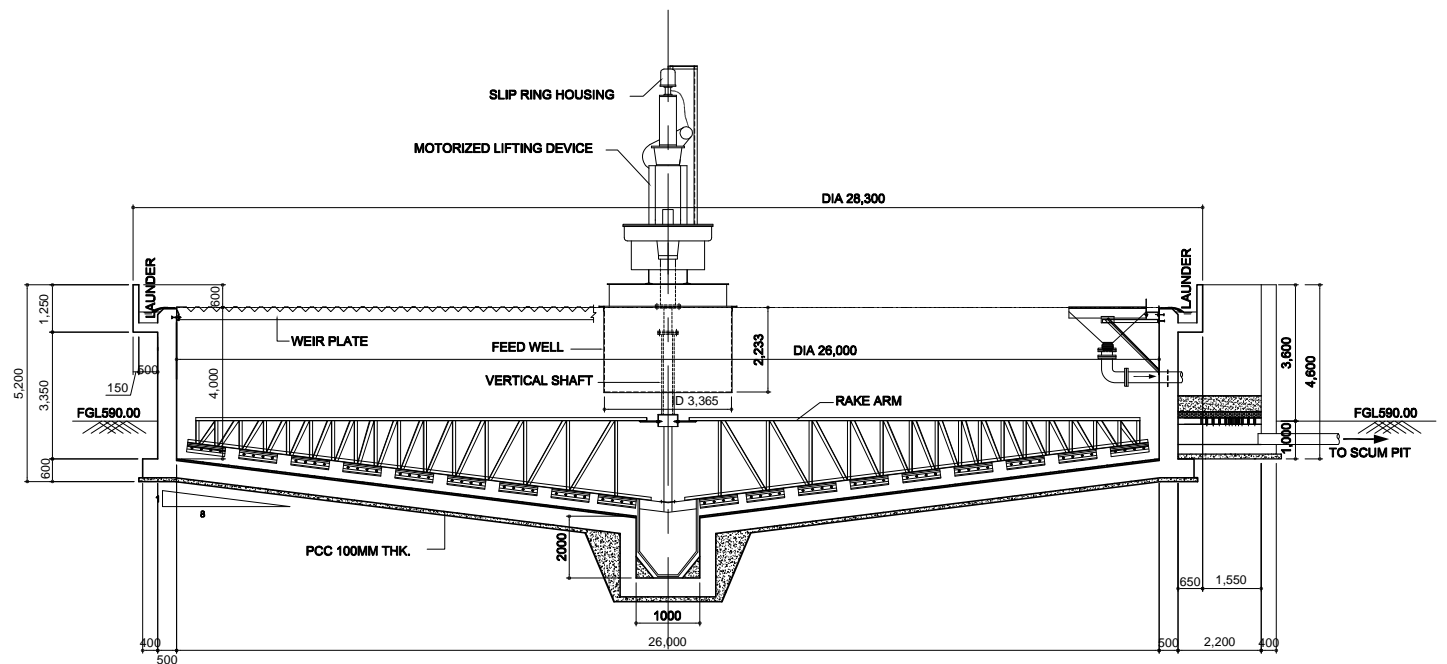
SCALE
 1:100
 DRAWING NO.
 W-018



PLAN
(SCALE 1:100)



SECTION 1-1
(SCALE 1:100)



SECTION 2-2
(SCALE 1:100)

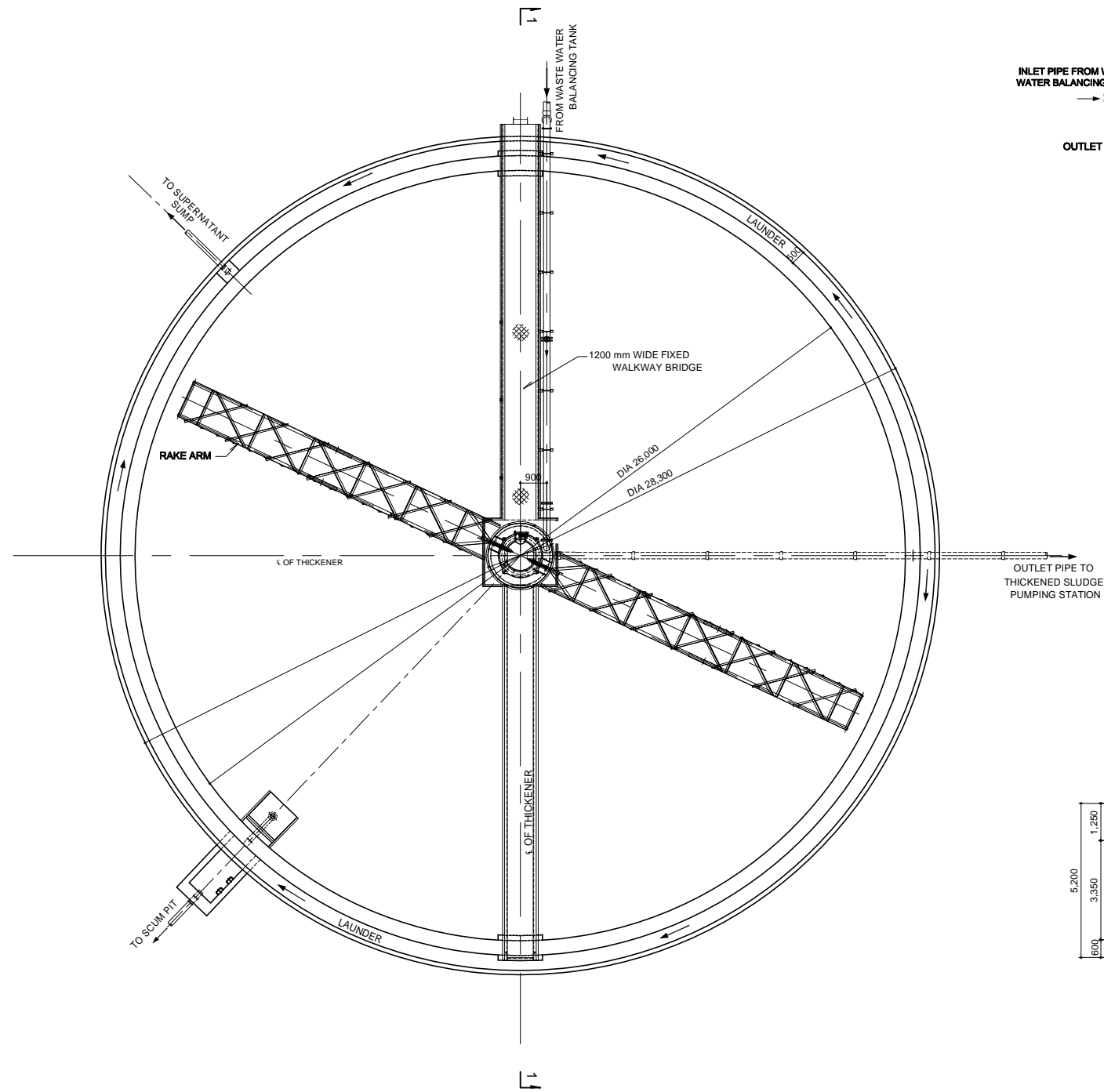
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

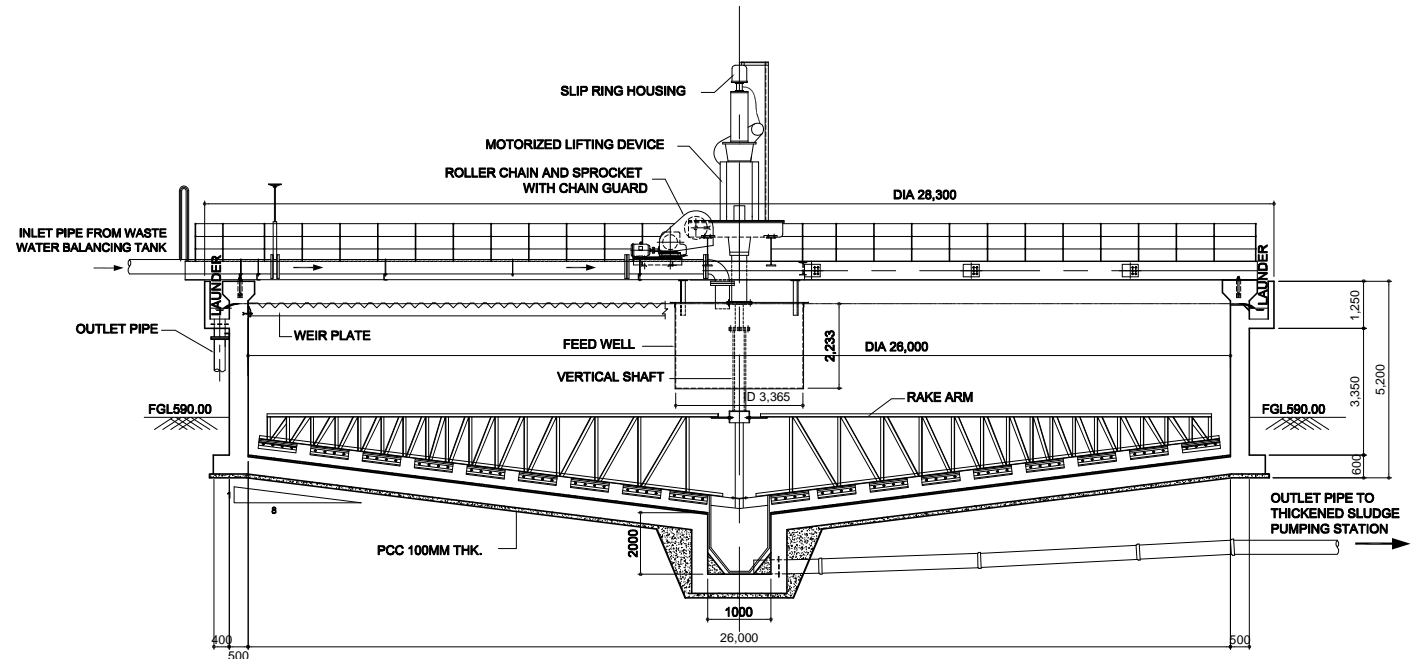
NJS CONSULTANTS CO., LTD.

DRAWING TITLE
**PLAN AND SECTION OF PRIMARY
 SLUDGE THICKENER**

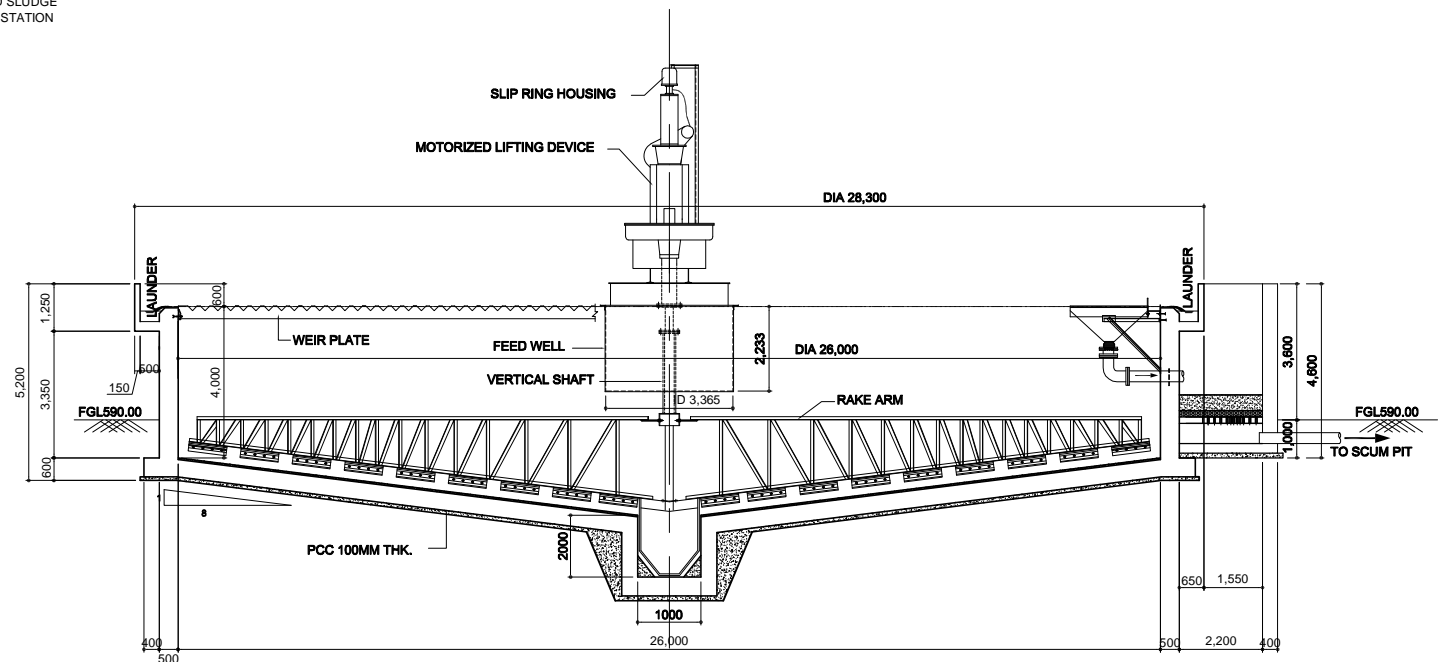
SCALE
 1:100
 DRAWING NO.
W-019



PLAN
(SCALE 1:100)



SECTION 1-1
(SCALE 1:100)



SECTION 2-2
(SCALE 1:100)

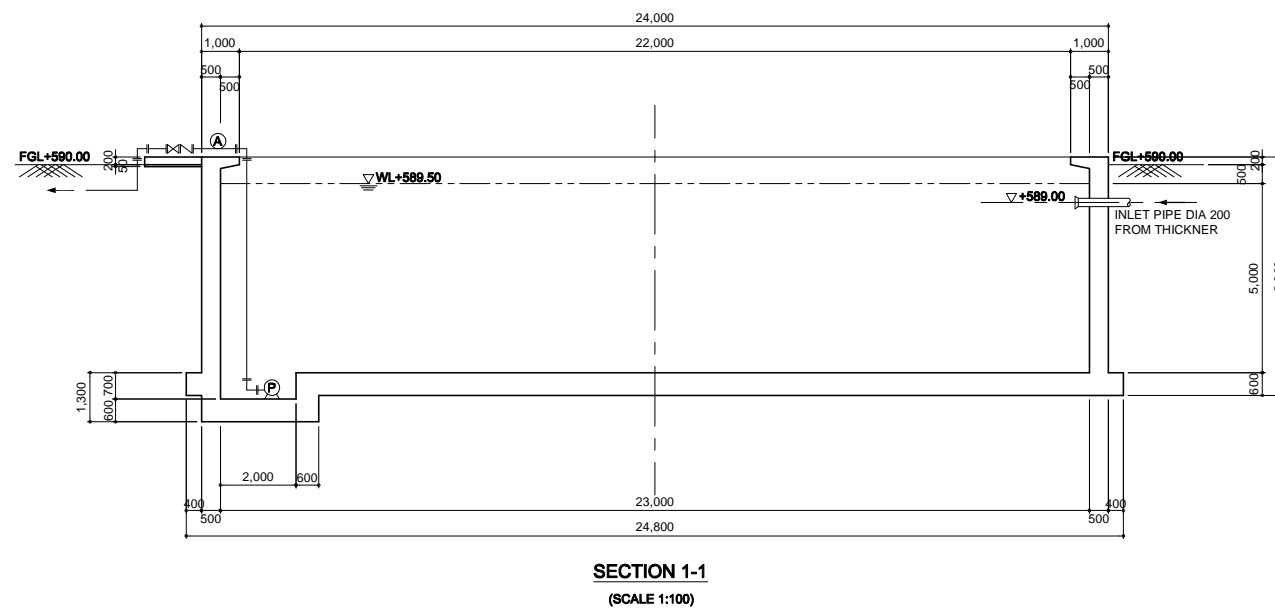
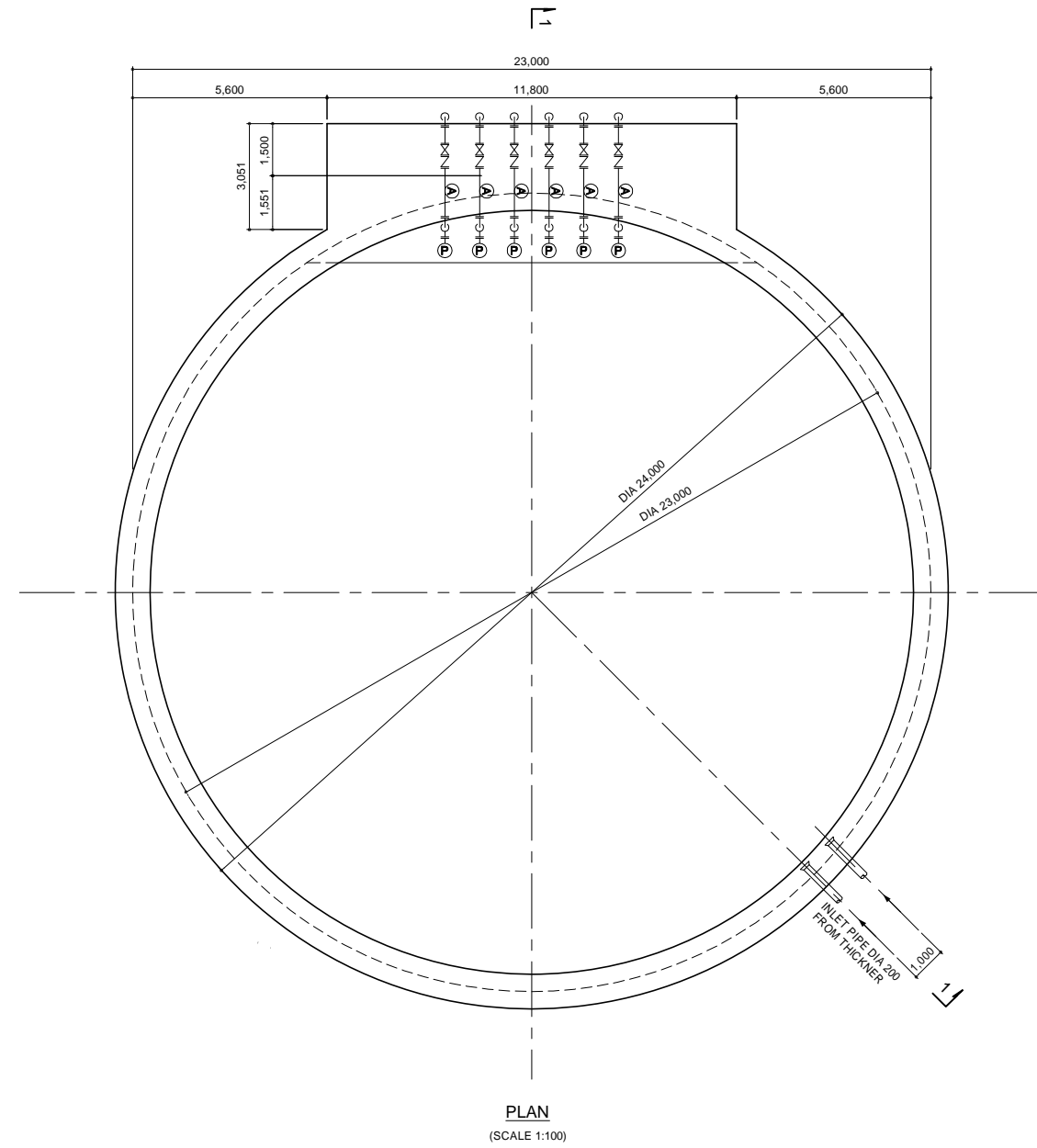
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

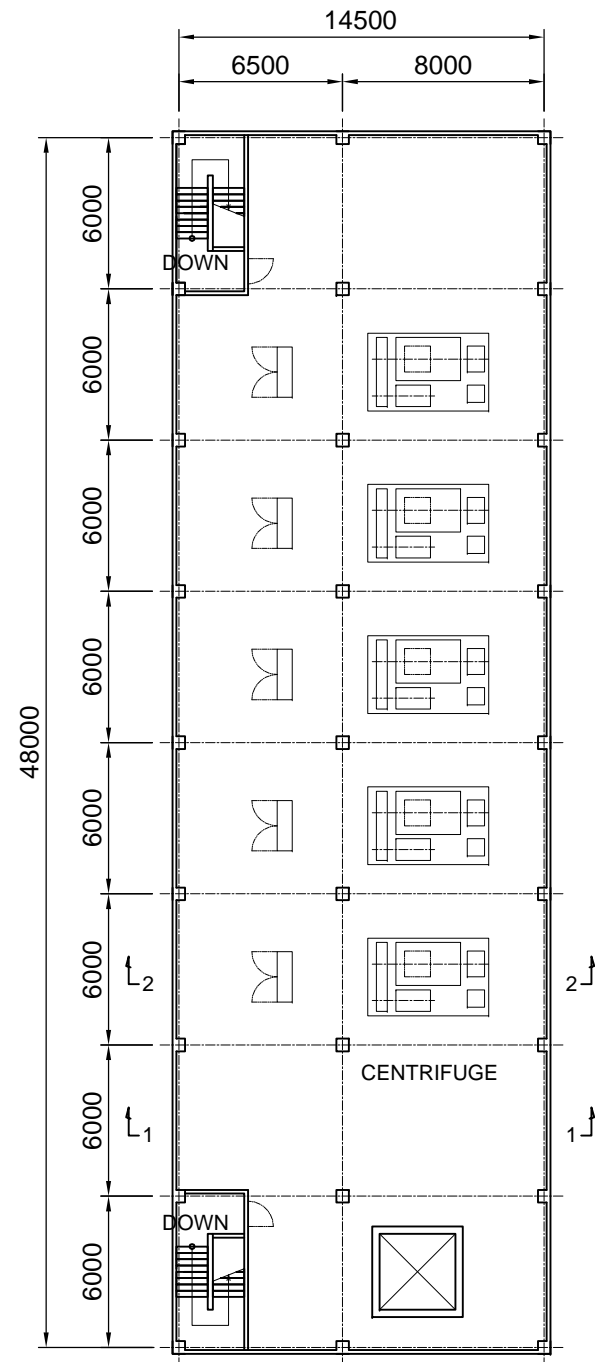
NJS CONSULTANTS CO., LTD.

DRAWING TITLE
**PLAN AND SECTION OF SECONDARY
 SLUDGE THICKENER AND CENTRIFUGE
 FEED PUMPING STATIONS**

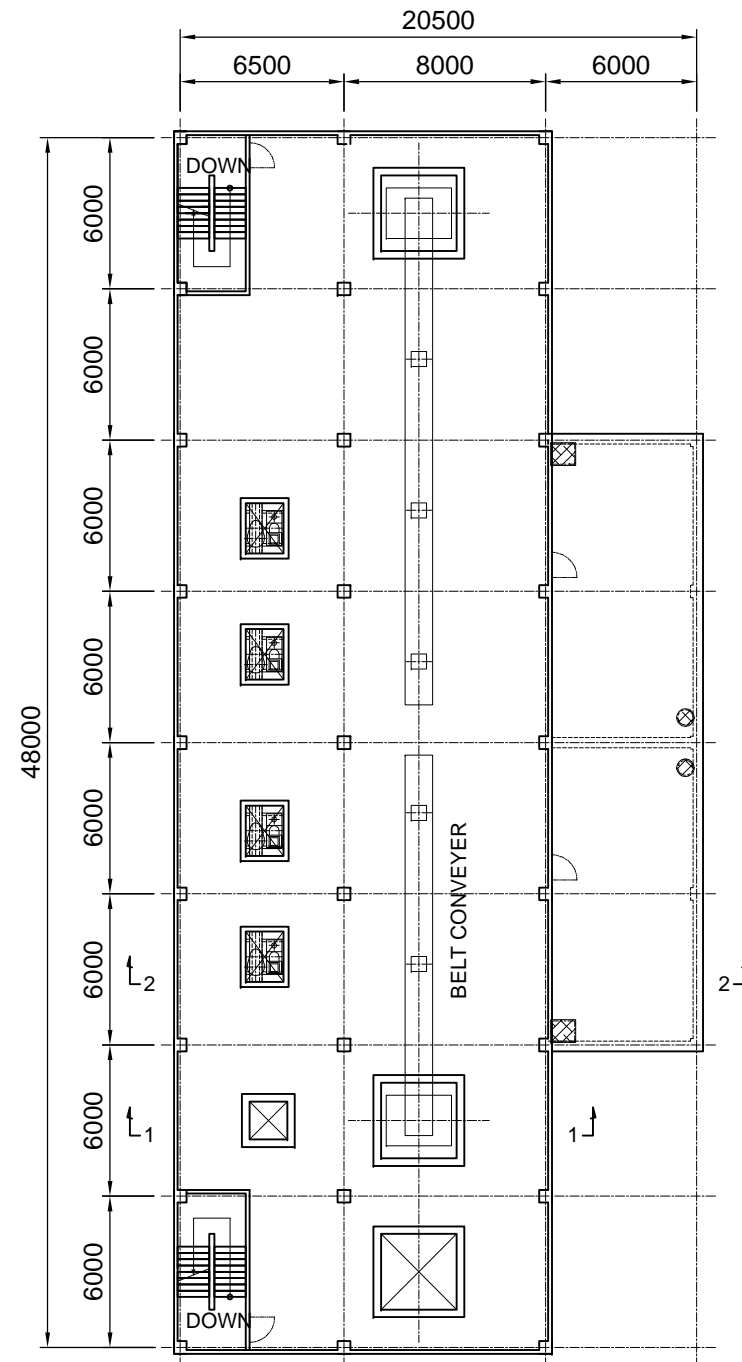
SCALE
 1:100
 DRAWING NO.
 W-020



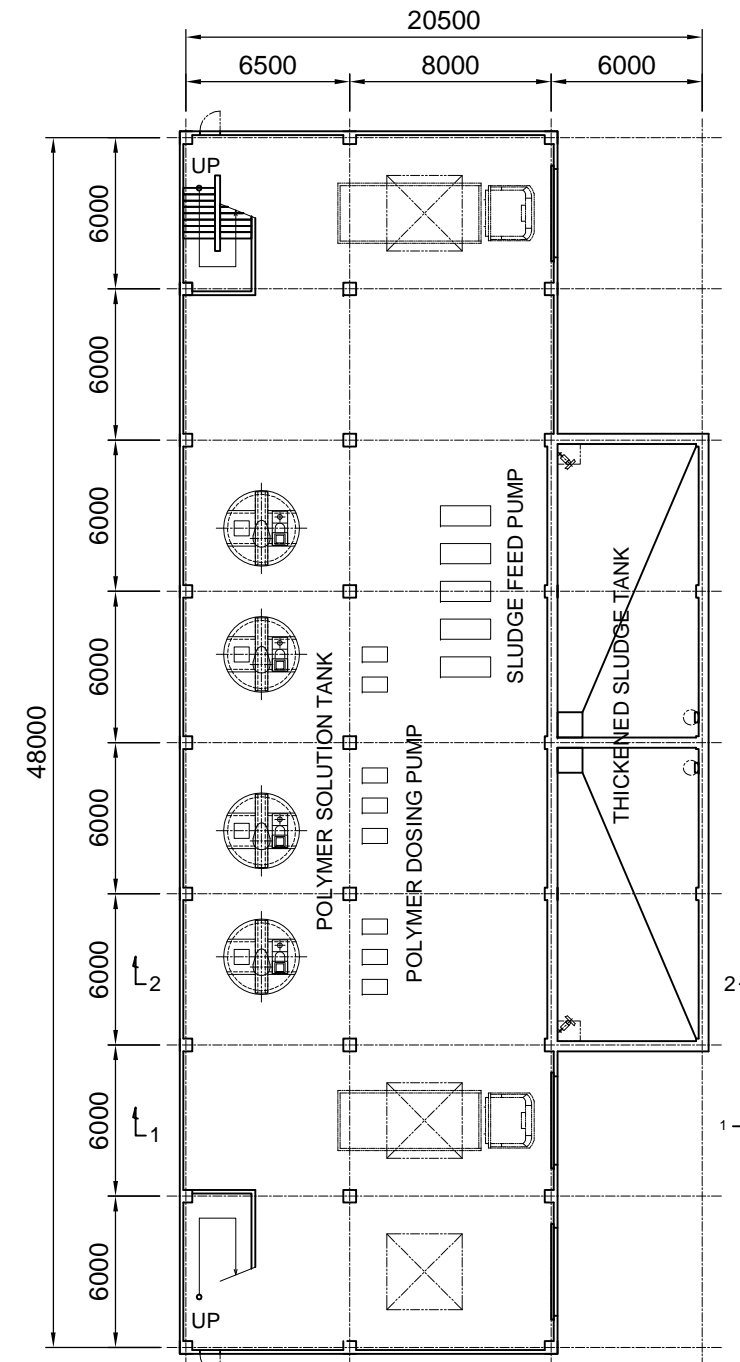
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
 JAPAN INTERNATIONAL COOPERATION AGENCY	
 NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN AND SECTION OF WASTE WATER BALANCING TANK	1:100
DRAWING NO.	
	W-021



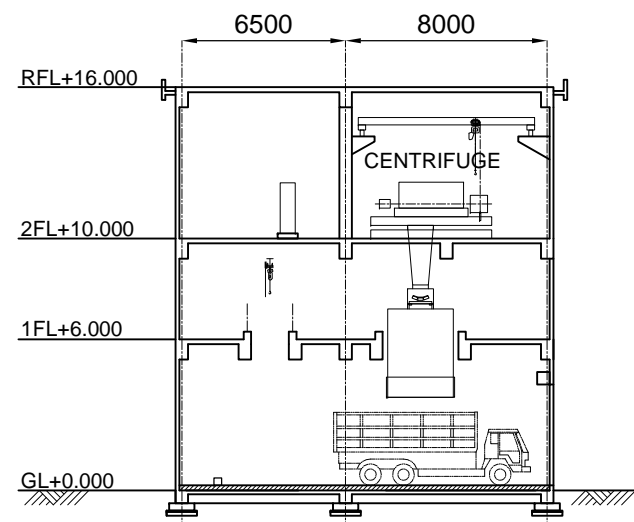
SRCOND FLOOR PLAN



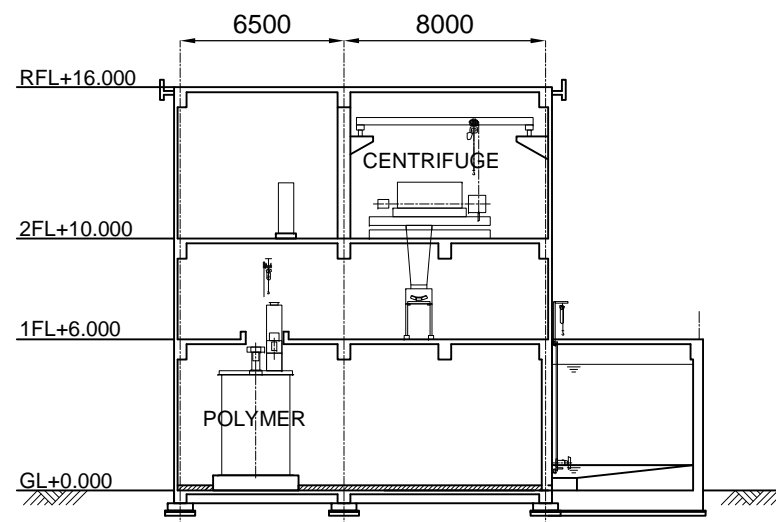
FIRST FLOOR PLAN



GROUND FLOOR PLAN



1-1 SECTION



2-2 SECTION

THICKENED SLUDGE TANK

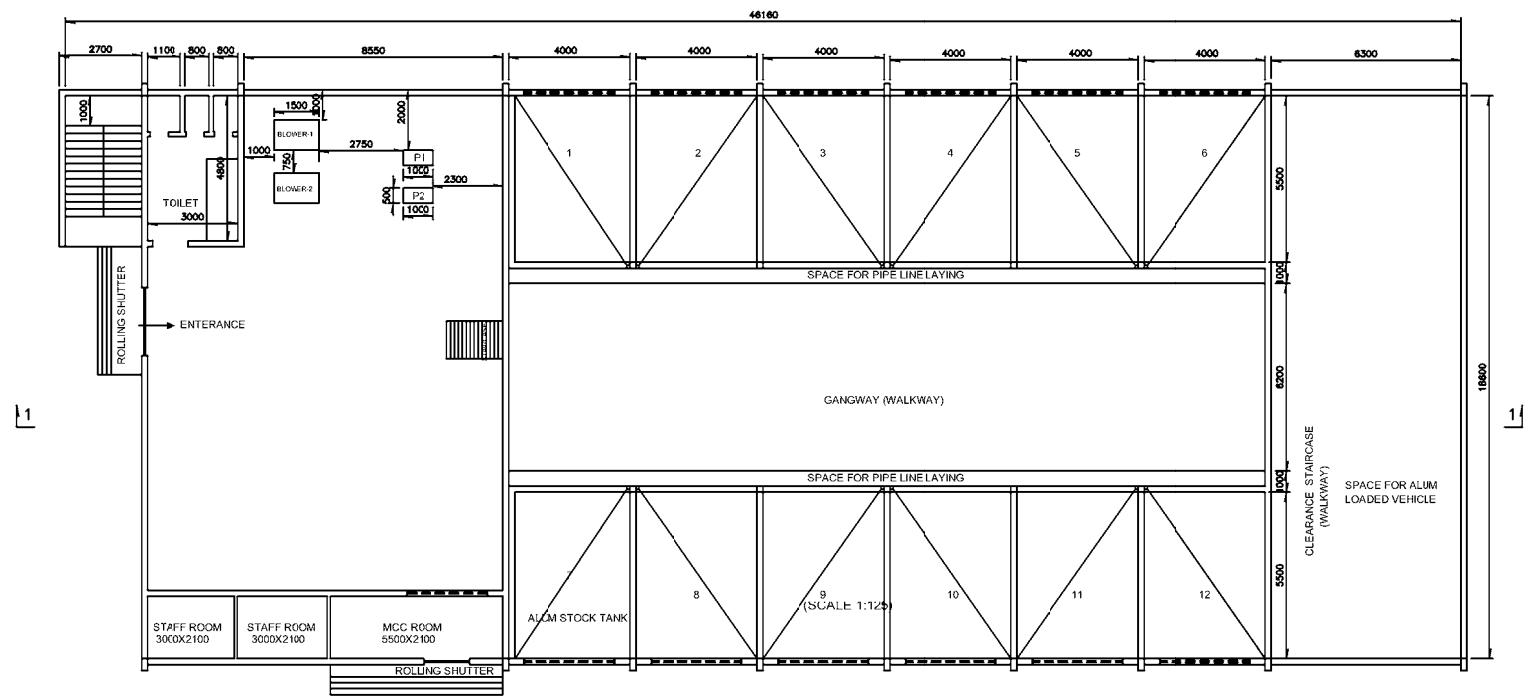
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

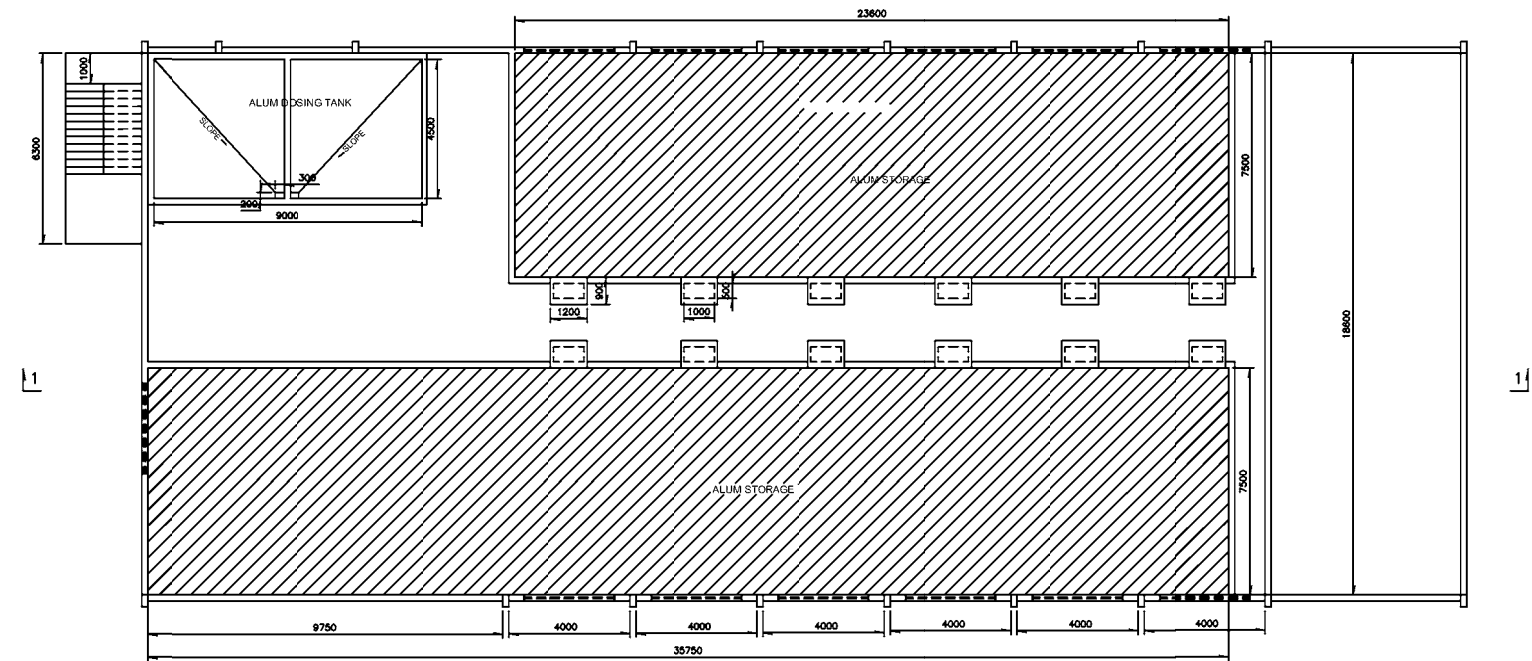
NJS CONSULTANTS CO., LTD.

DRAWING TITLE
**PLAN AND SECTION
 OF CENTRIFUGE BUILDING**

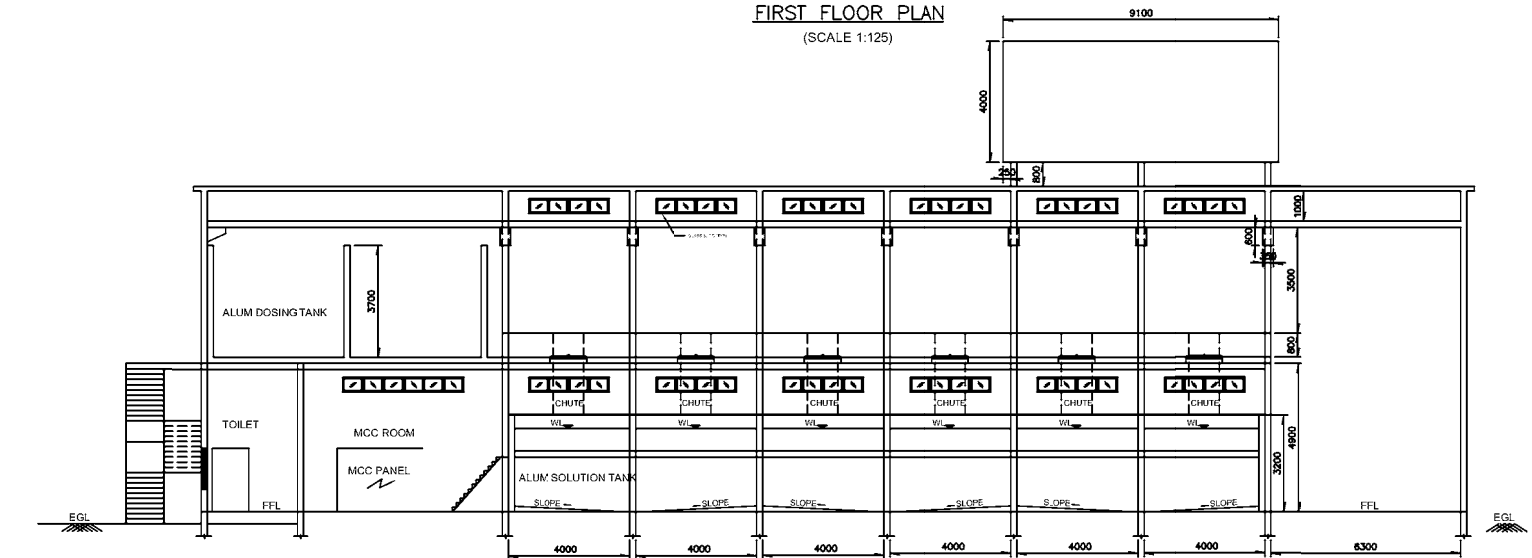
SCALE
 1:400
 DRAWING NO.
 W-022



GROUND FLOOR PLAN
(SCALE 1:125)



FIRST FLOOR PLAN
(SCALE 1:125)



SECTION 1-1
(SCALE 1:125)

NOTES :
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.

LEGENDS :
EGL - EXISTING GROUND LEVEL
FFL - FLOOR FINISH LEVEL
WL - WATER LEVEL

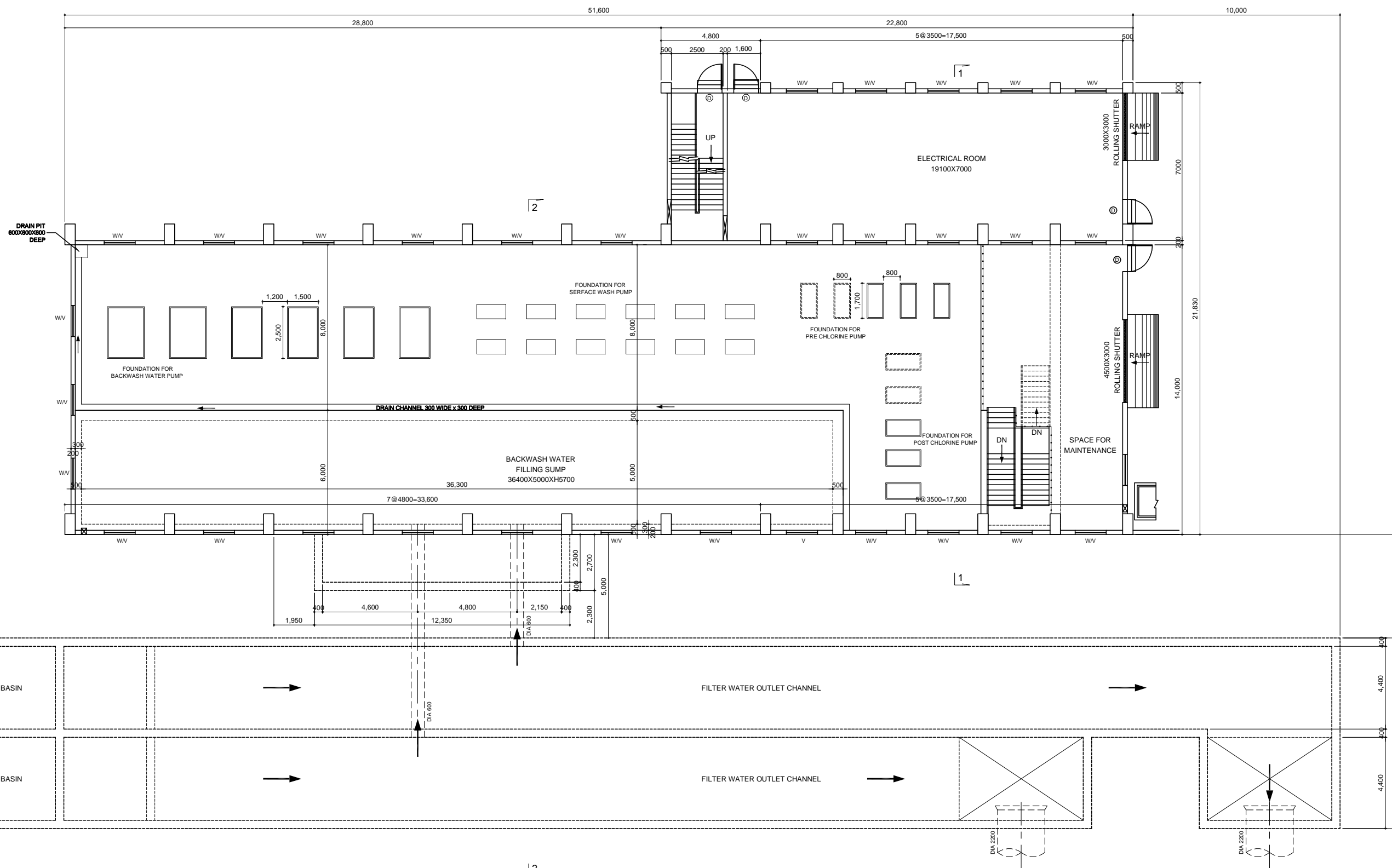
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

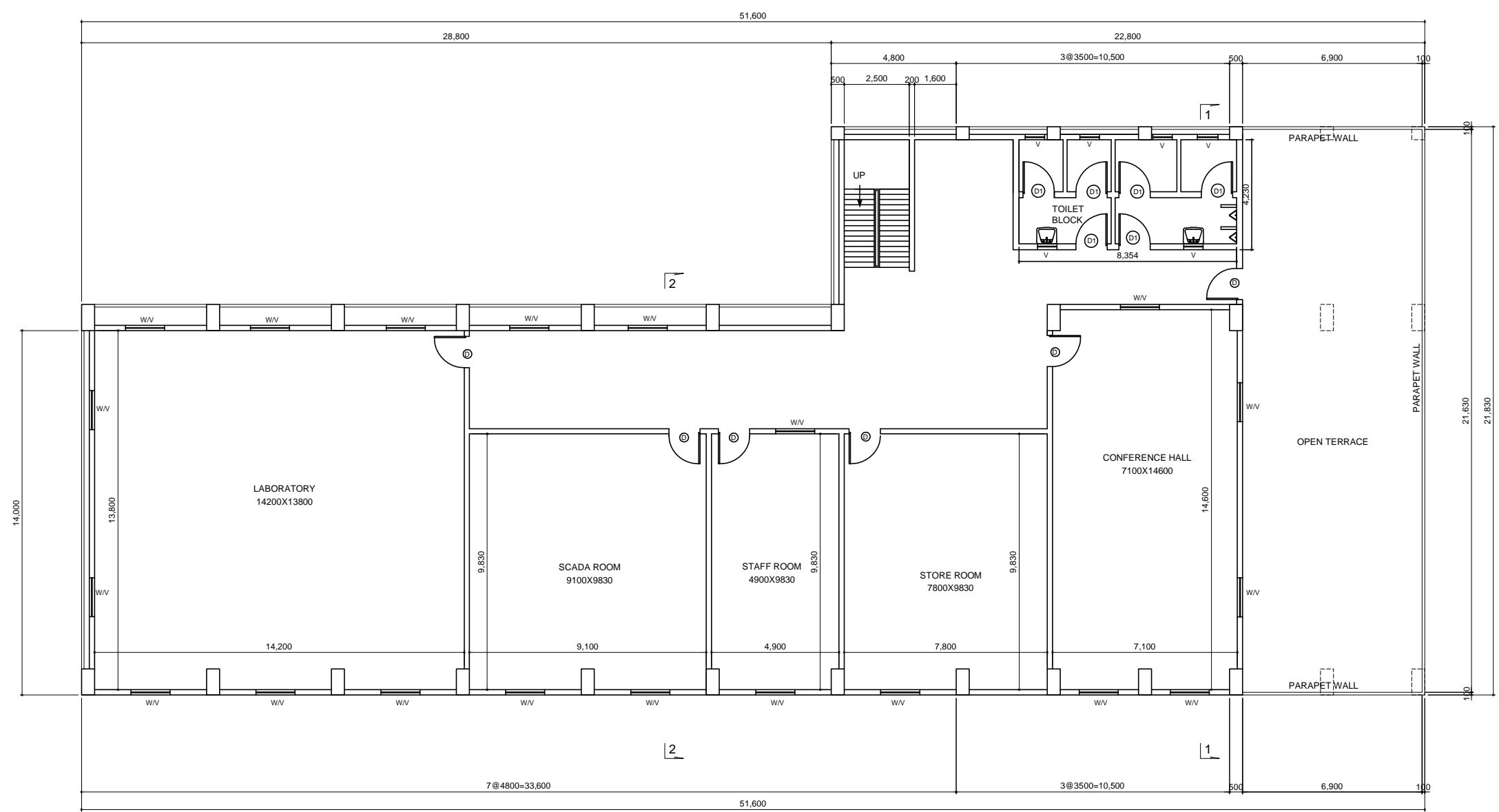
DRAWING TITLE
PLAN AND SECTION OF CHEMICAL BUILDING

SCALE
1:125
DRAWING NO.
W-023



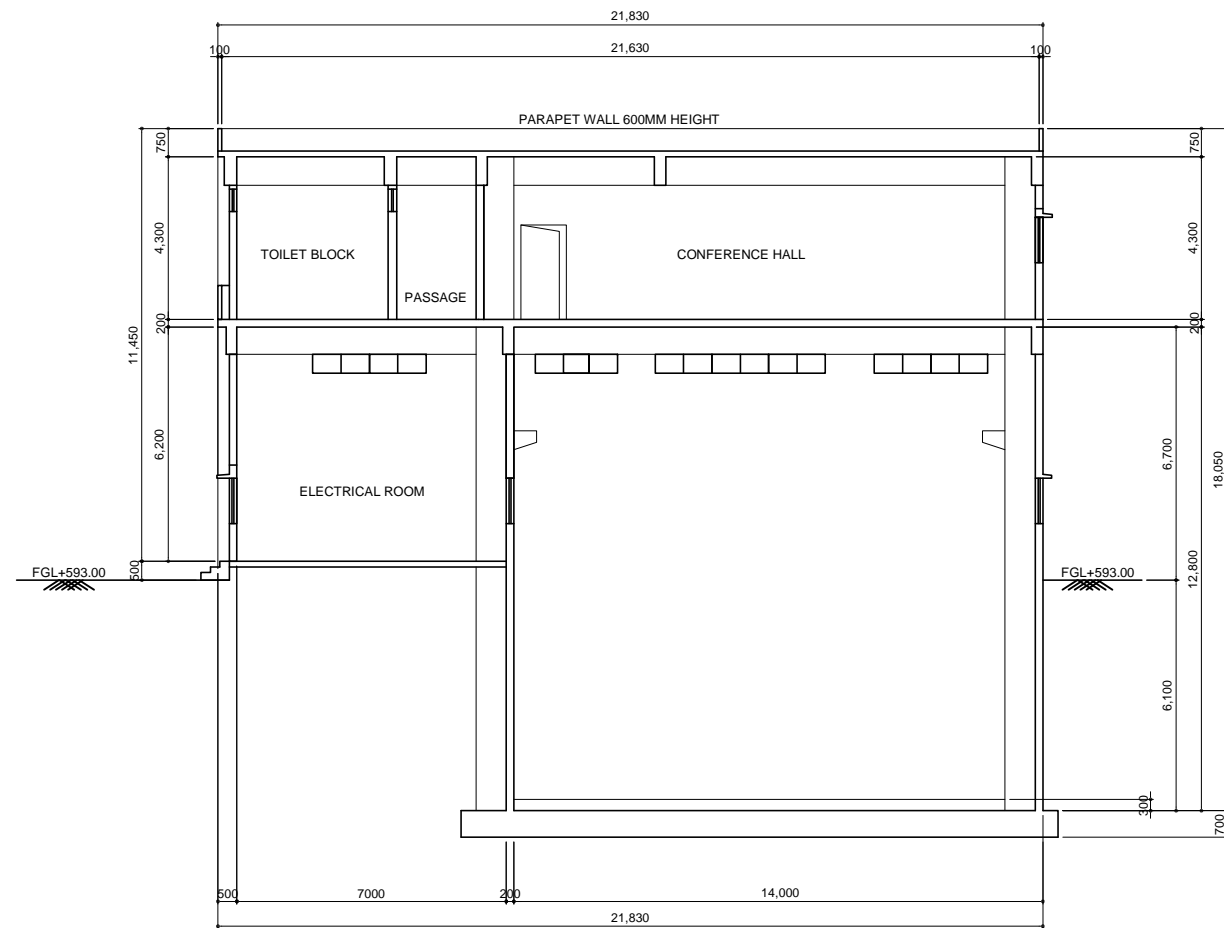
GROUND FLOOR & BASEMENT PLAN
(SCALE 1:100)

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
JAPAN INTERNATIONAL COOPERATION AGENCY	
NJS CONSULTANTS CO., LTD.	
DRAWING TITLE GROUND FLOOR & BASEMENT PLAN OF FILTER ANNEXE BUILDING	SCALE 1:100
DRAWING NO. W-024	

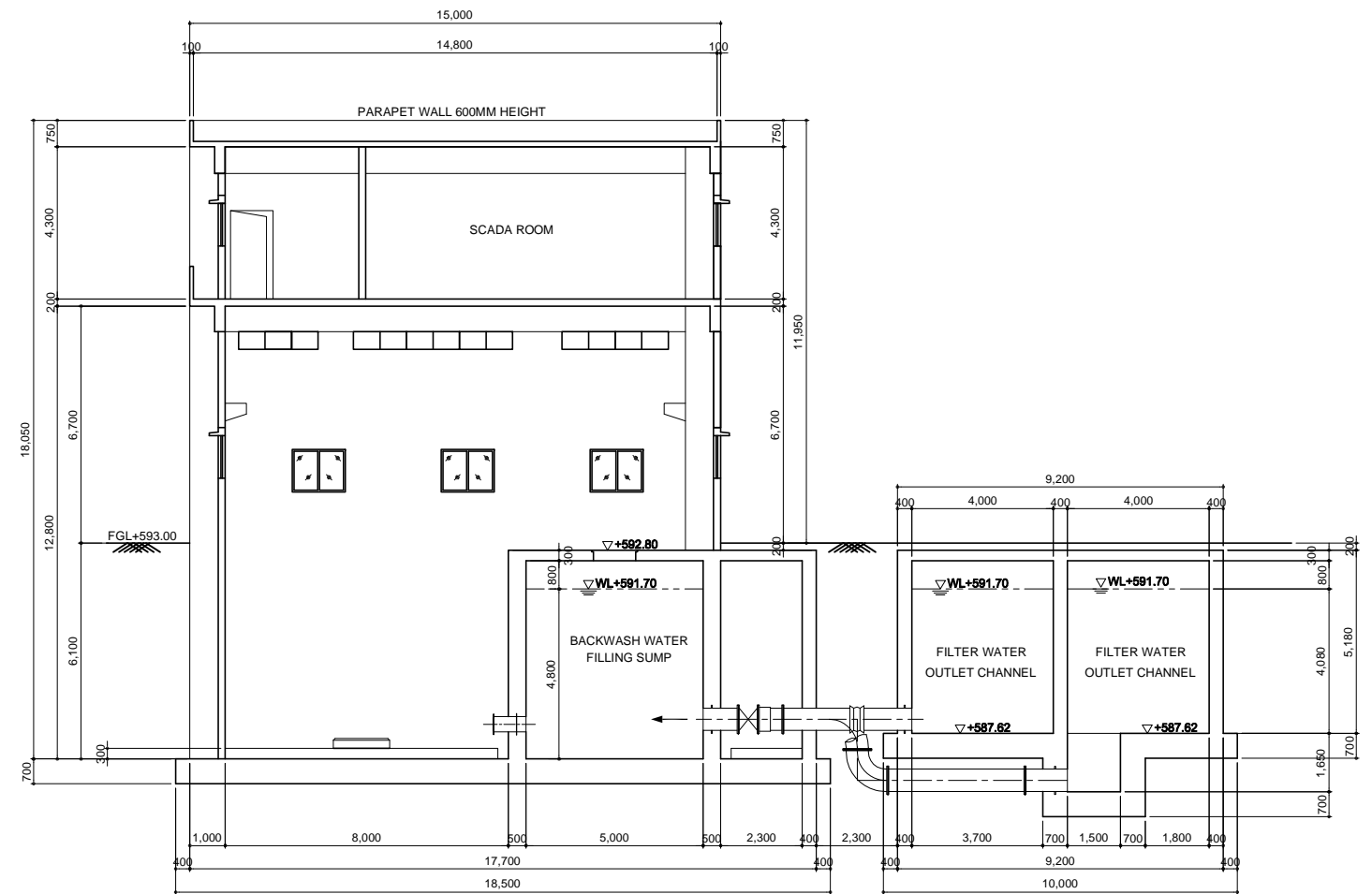


FIRST FLOOR PLAN
(SCALE 1:100)

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
 JAPAN INTERNATIONAL COOPERATION AGENCY	
 NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
FIRST FLOOR PLAN OF FILTER ANNEXE BUILDING	1:100
DRAWING NO.	
W-025	




SECTION 1-1
(SCALE 1:100)



SECTION 2-2
(SCALE 1:100)

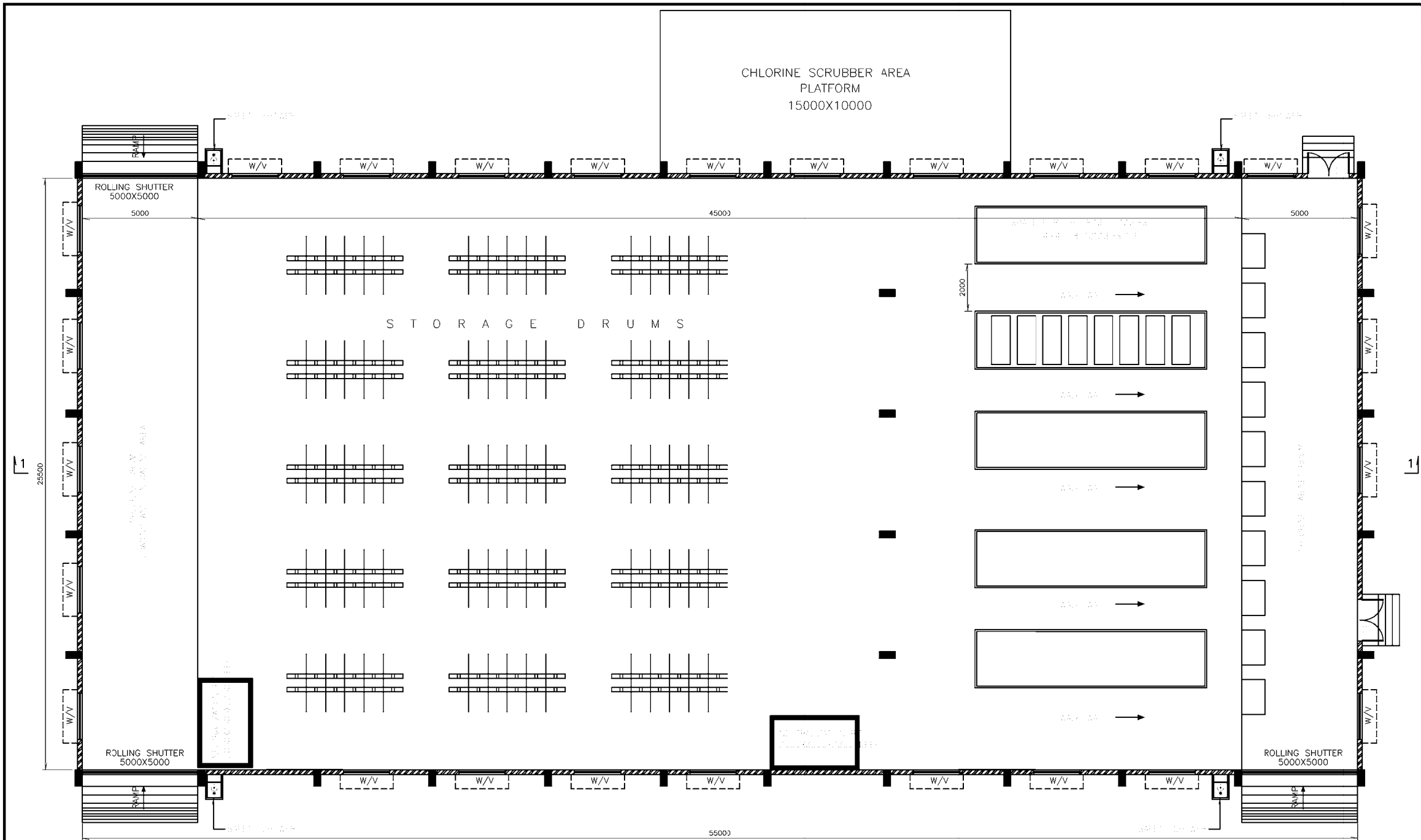
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

 JAPAN INTERNATIONAL COOPERATION AGENCY

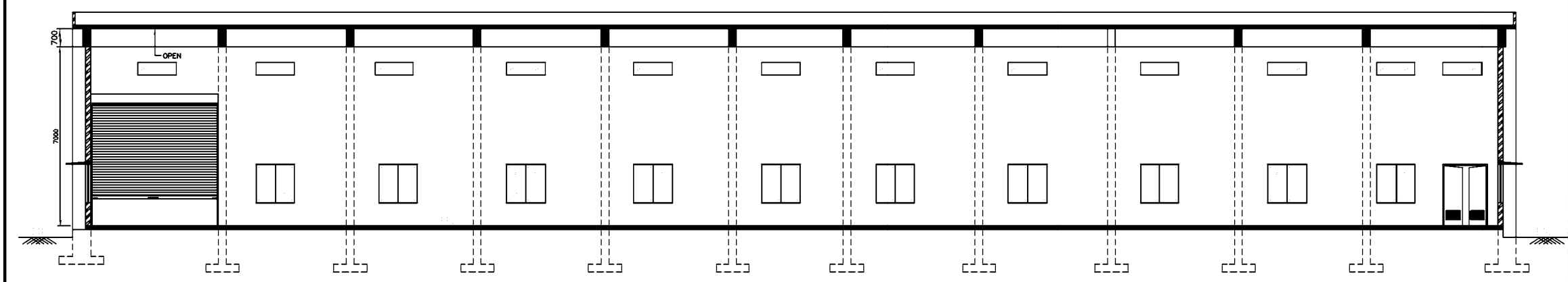
 NJS CONSULTANTS CO., LTD.

DRAWING TITLE
 SECTION OF FILTER ANNEXE BUILDING

SCALE
 1:100
 DRAWING NO.
 W-026



PLAN



SECTION 1-1

OPENING DETAIL		
	L	B
DOOR -D	1800	2100
WINDOW-W	2000	1200
VENTILATOR-V	2000	600

NOTES :
 1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.

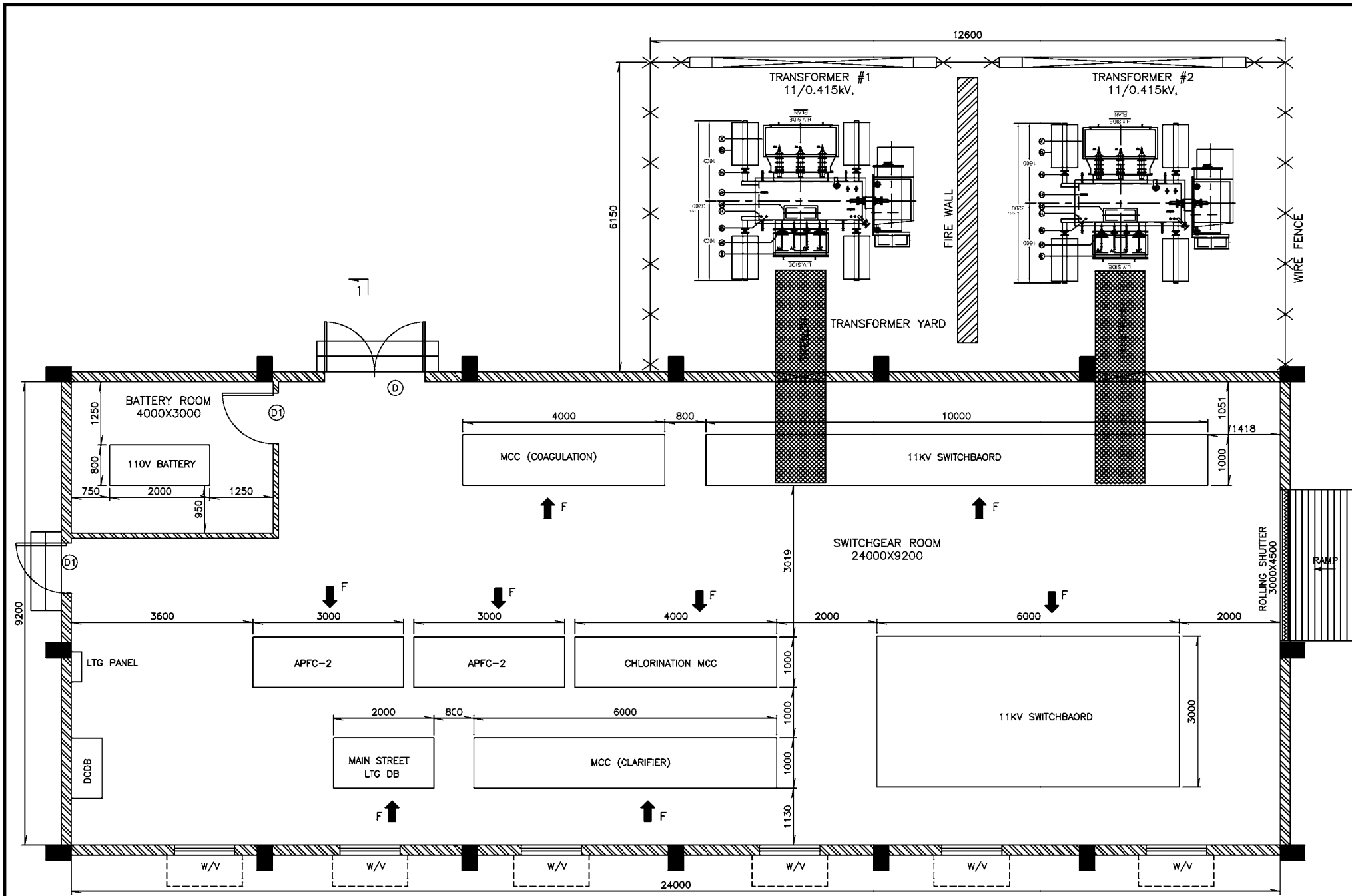
LEGENDS :
 EGL - EXISTING GROUND LEVEL
 FFL - FLOOR FINISH LEVEL
 WL - WATER LEVEL

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE	SCALE
PLAN AND SECTION OF CHLORINE BUILDING	1:100
DRAWING NO.	W-027

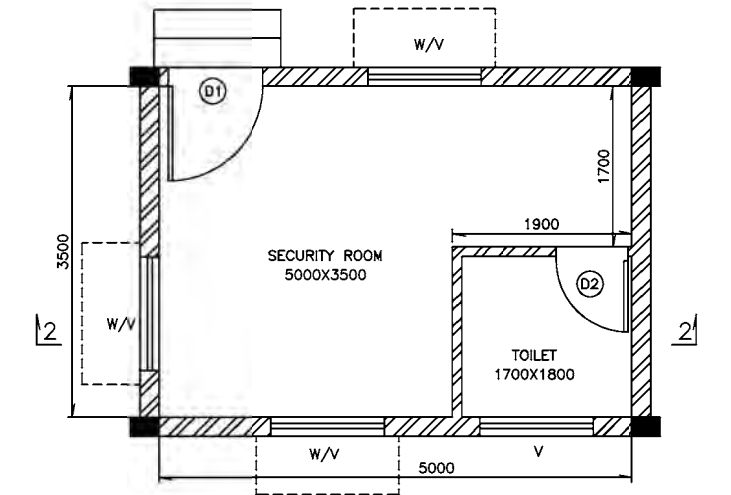


PLAN
(SCALE 1:50)

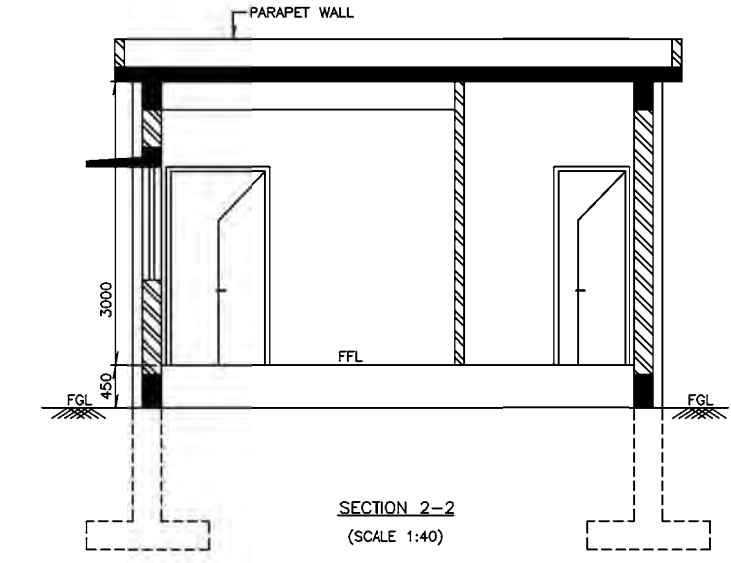
NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS IN METRES UNLESS NOTED.

LEGEND:
FFL - FINISHED FLOOR LEVEL
EGL - EXISTING GROUND LEVEL
? - CENTER LINE
TYP - TYPICAL

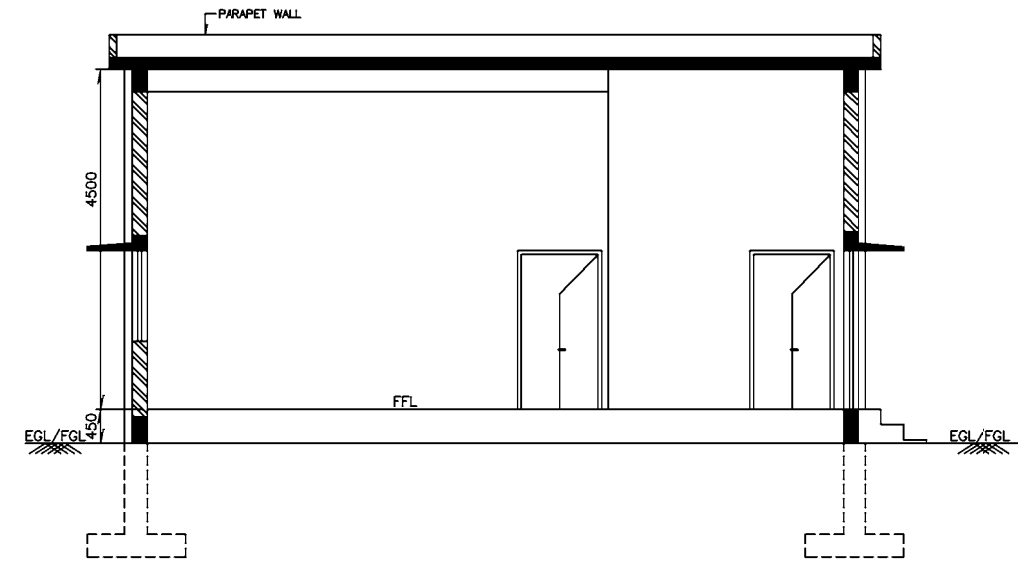
- RCC
 - PCC
 - BLOCK WALL



PLAN OF SECURITY ROOM
(SCALE 1:40)



SECTION 2-2
(SCALE 1:40)



SECTION 1-1
(SCALE 1:50)

OPENING DETAIL		
	L	B
DOOR -D	1800	2100
DOOR -D1	1000	2100
DOOR -D2	750	2100
WINDOW -W	1200	1200
VENTILATOR -V	1200	600

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

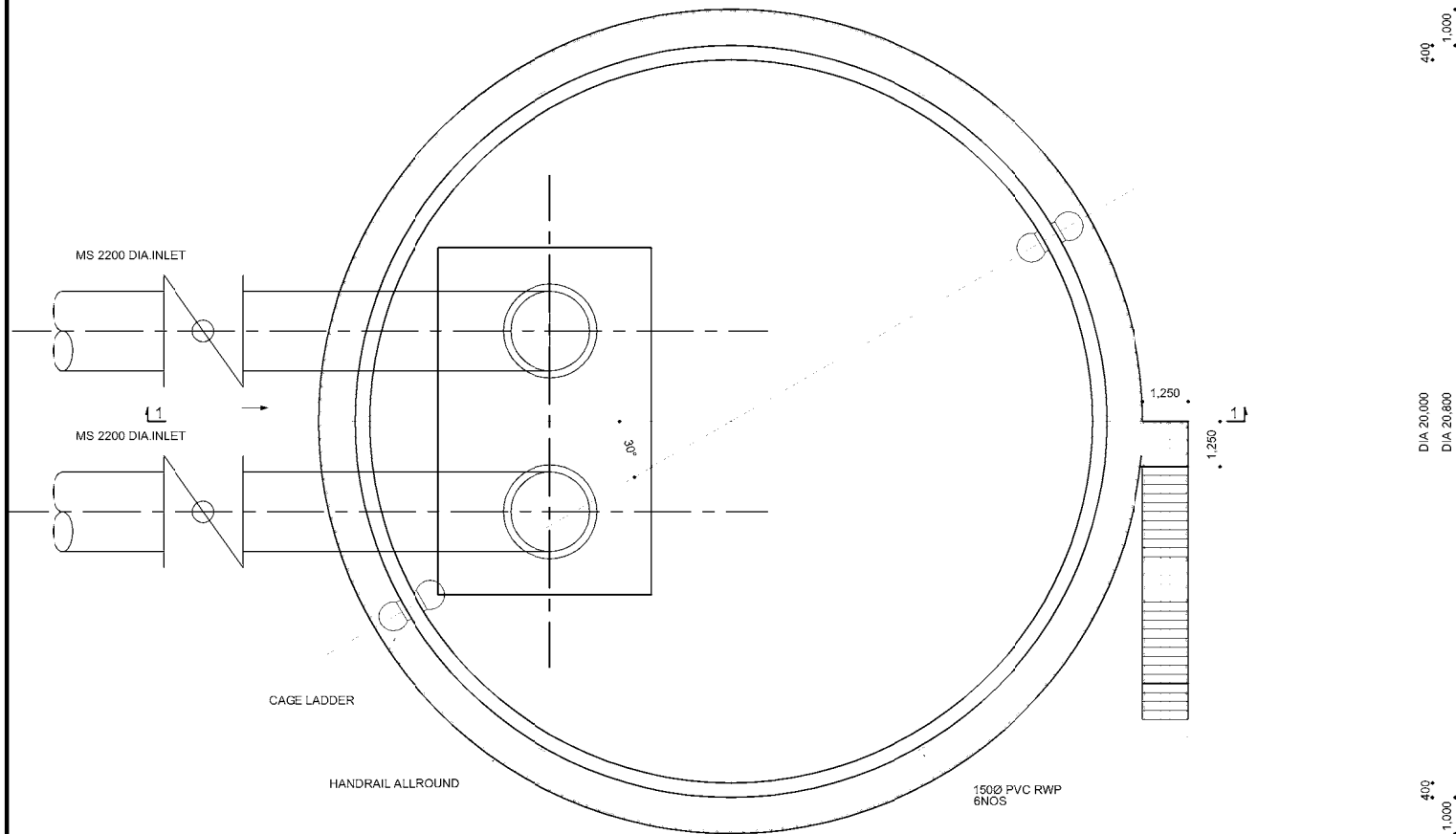
JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

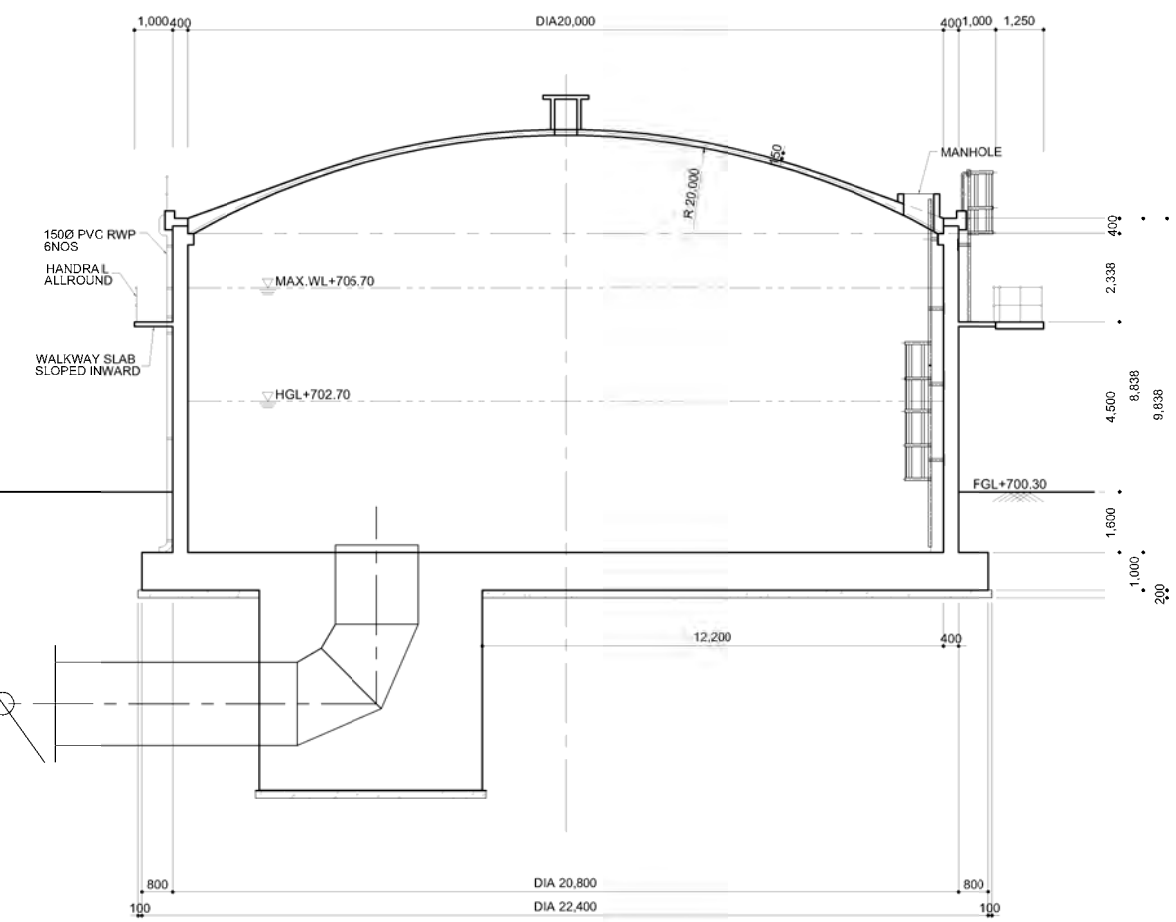
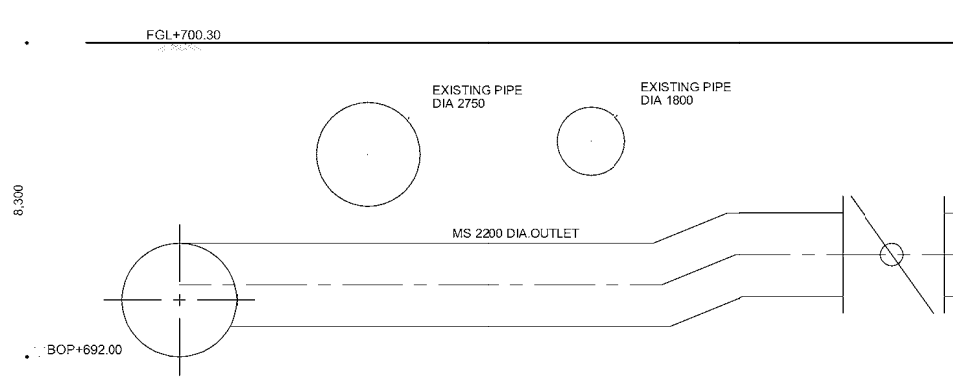
DRAWING TITLE: PLAN AND SECTION OF SWITCHGEAR BUILDING

SCALE: 1:50, 1:40

DRAWING NO.: W-028

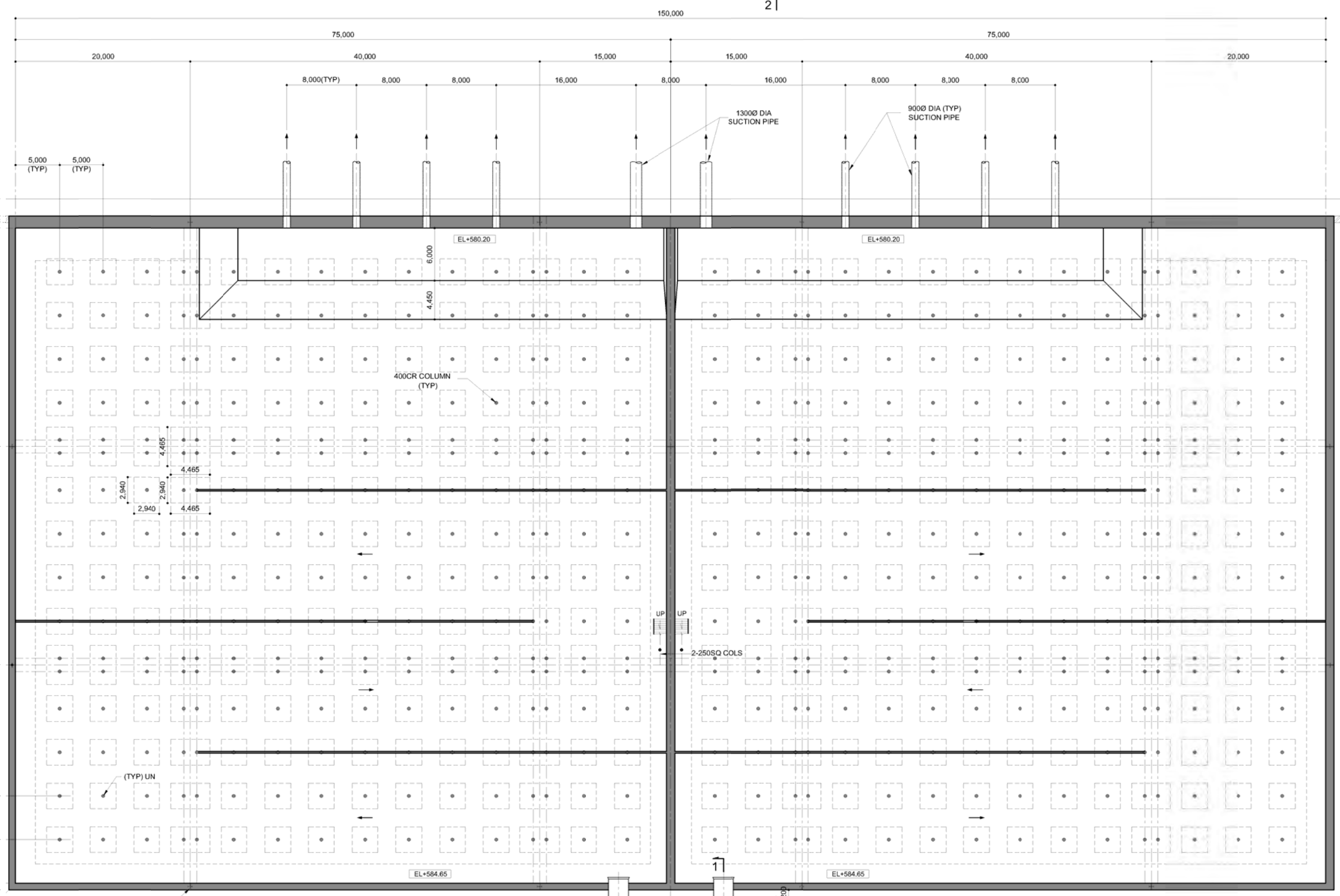


PLAN



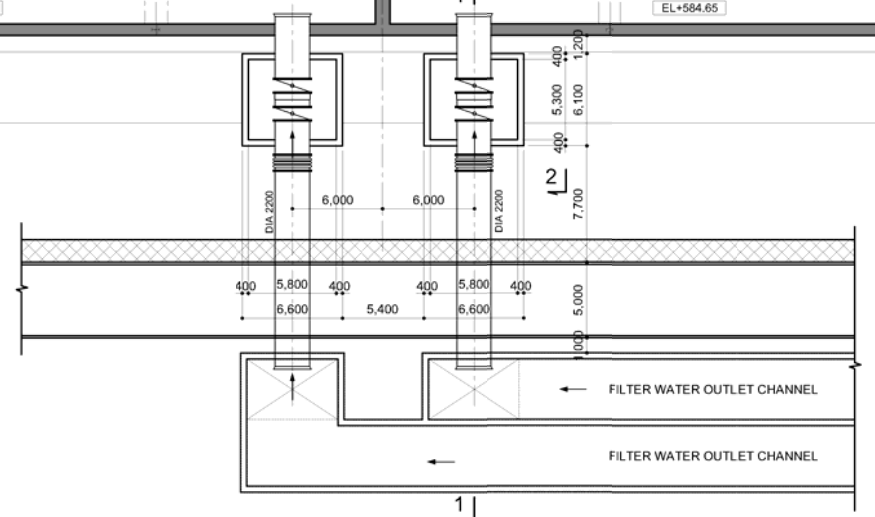
SECTION 1-1

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
PLAN AND SECTION OF CONVENTIONAL SURGE TANK FOR STAGE V AT JK DODDI	SCALE 1:100
	DRAWING NO. W-029



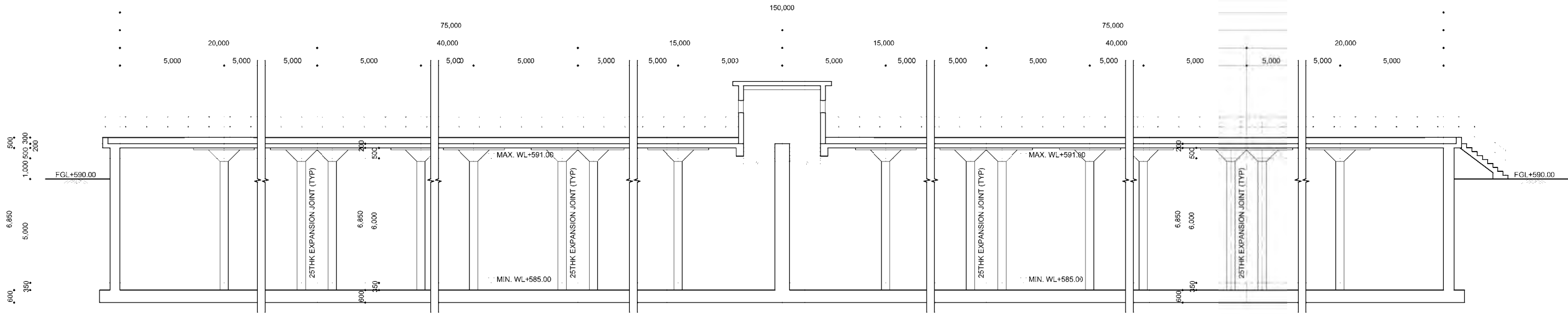
25THK EXPANSION JOINT (TYP)

COMPACTED EARTH FILL WITH 200THK
COMPACTED EARTH FILL WITH 200THK TOP SOIL GRASS TURFING

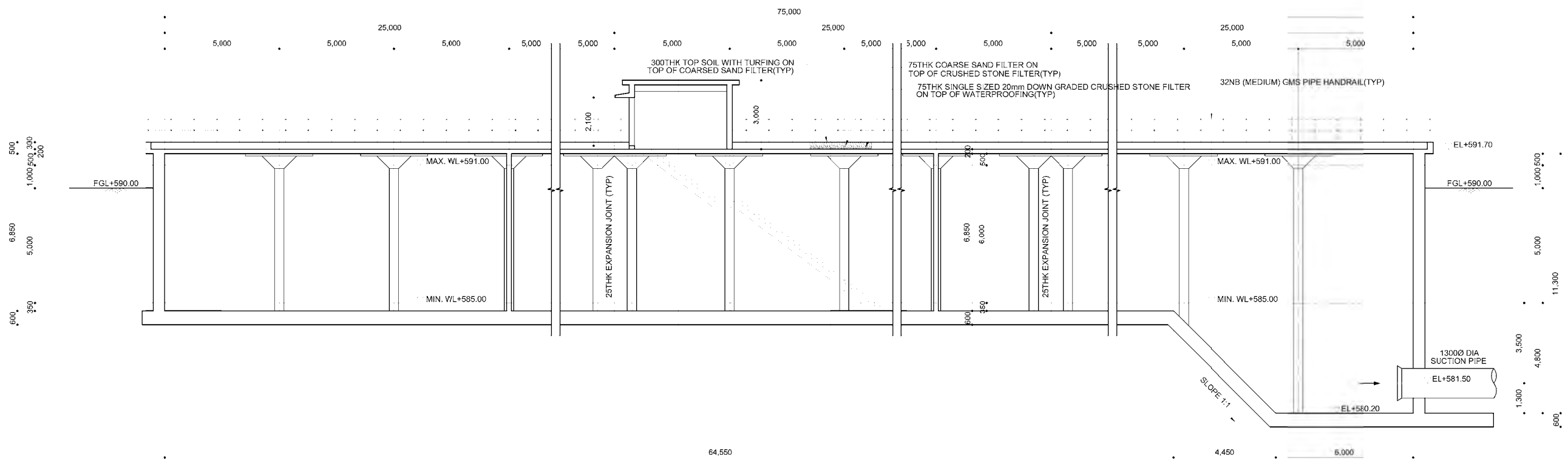


PLAN AT BASE SLAB TOP LEVEL

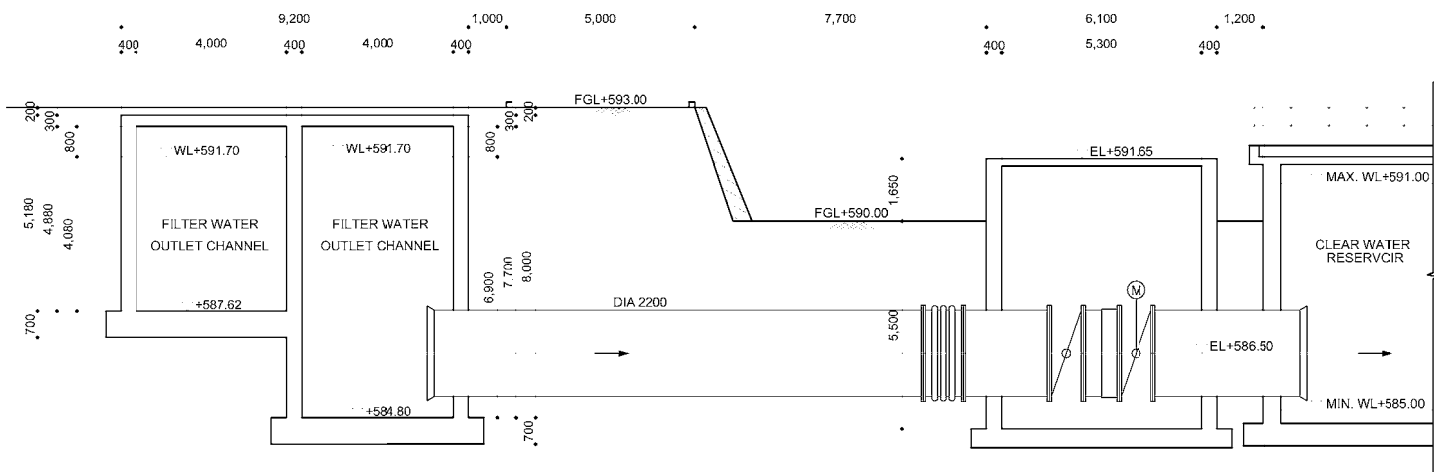
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN OF CLEAR WATER RESERVOIR FOR STAGE V AT TK HALLI	1:250
DRAWING NO.	
W-030	



SECTION 3-3

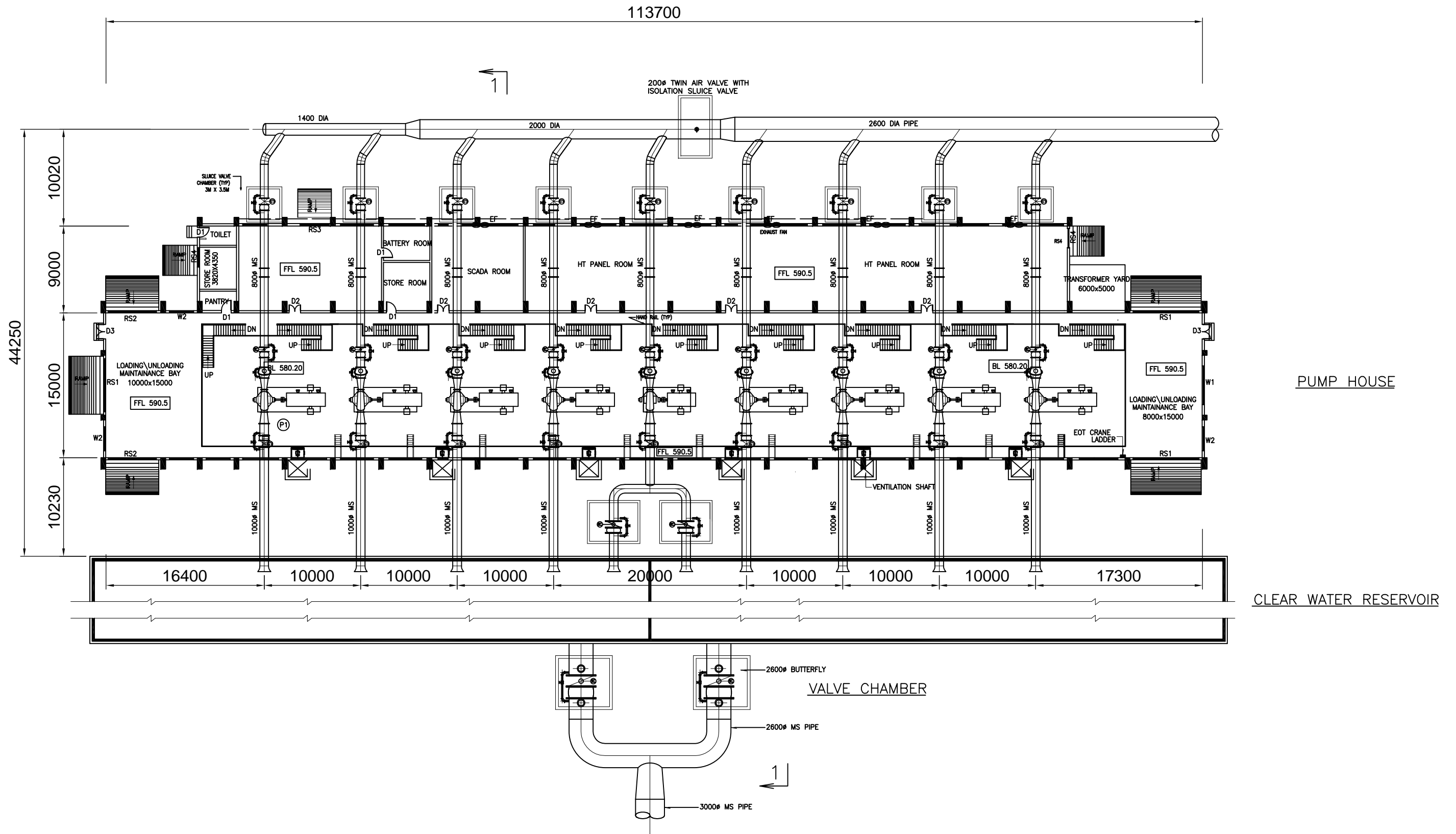


SECTION 2-2



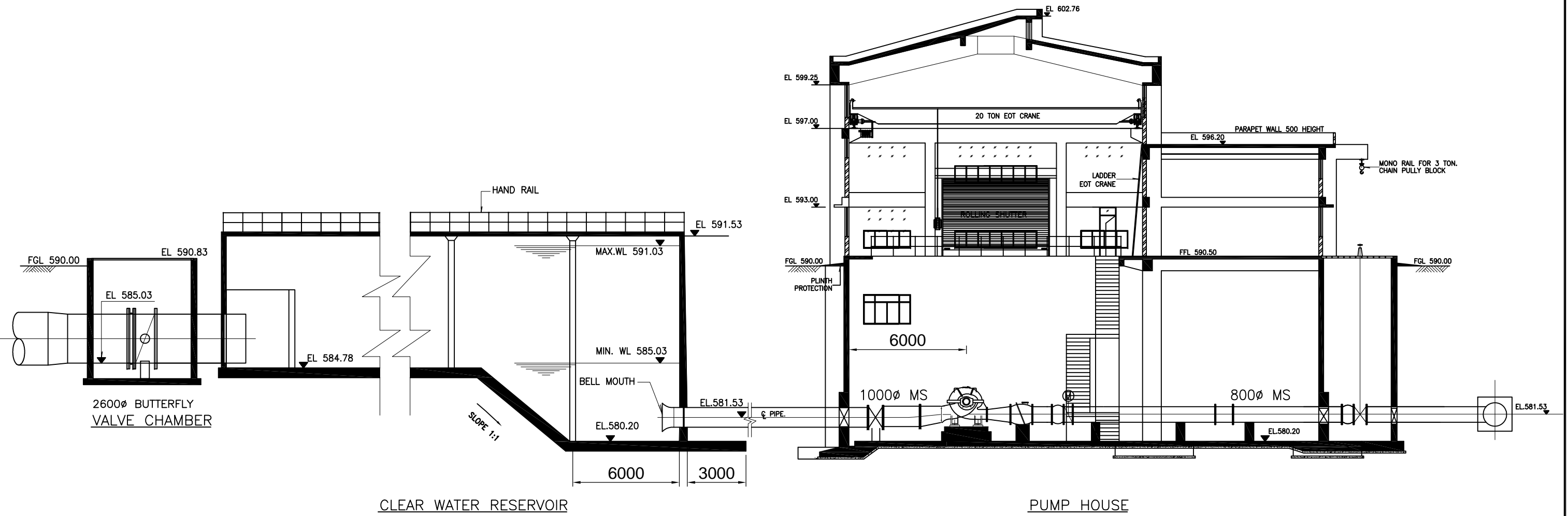
SECTION 1-1

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
SECTION OF CLEAR WATER RESERVOIR FOR STAGE V AT TK HALLI	1:100
DRAWING NO.	
W-031	



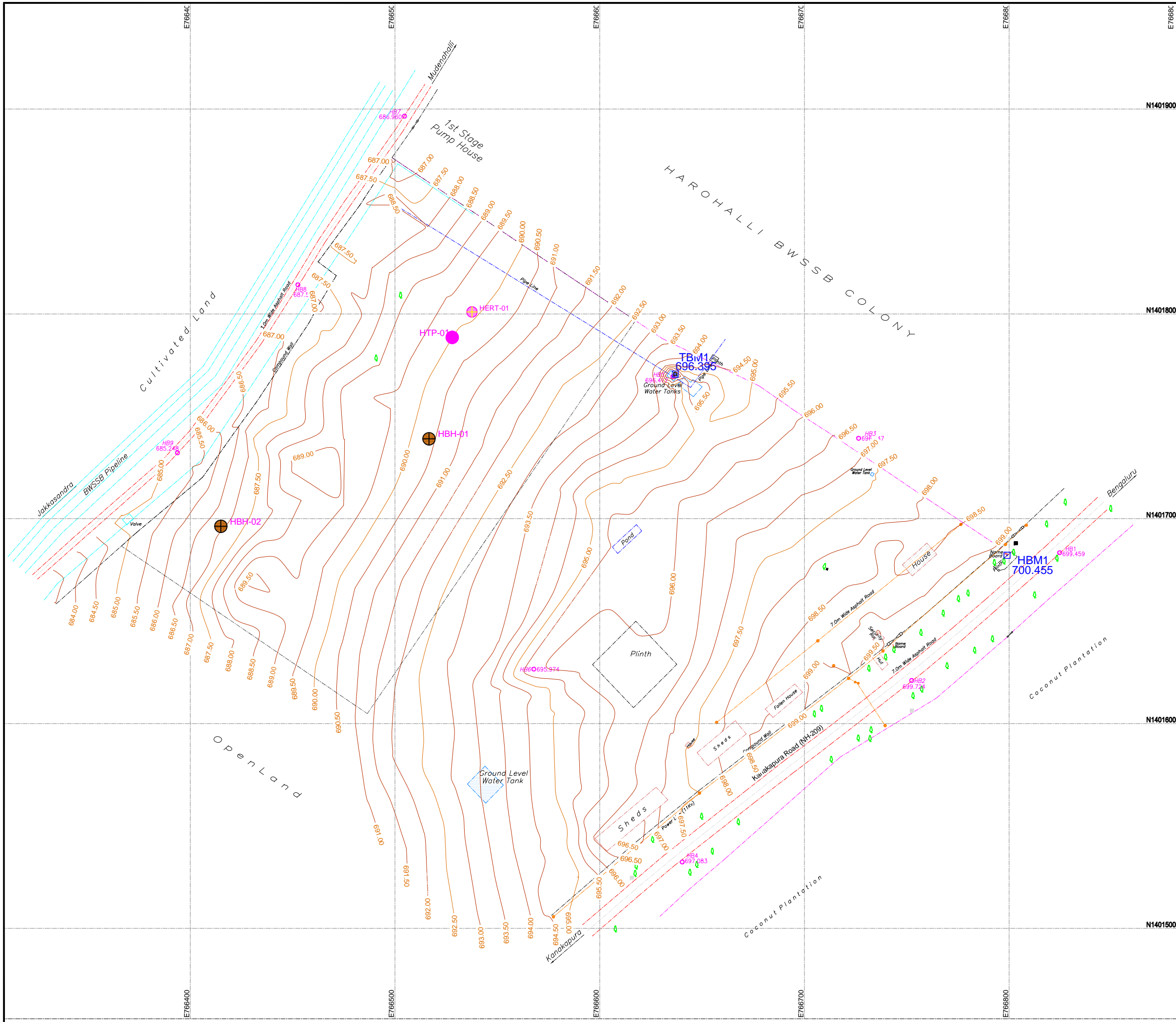
PLAN OF PUMPING STATION

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE PLAN OF PUMPING STATION FOR STAGE V AT TK HALLI	SCALE 1:400 DRAWING NO. W-032



SECTION 1-1

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
SECTION OF PUMPING STATION FOR STAGE V AT TKHALLI	1:200
DRAWING NO.	
W-033	



LEGEND :

1. ASPHALT ROAD,	- - - - -
2. DRAIN, BUILDING, CULVERT, FENCE.	- - - - -
3. COMPOUND WALL WITH GATE, TREE.	- - - - -
4. TRANSFORMER, POWER LINE WITH POLE, OFC.	- - - - -
5. BORE WELL, HAND PUMP, NAME BOARD,	- - - - -
6. TRAVERSE POINTS, BENCH MARKS	- B13 O 599.199 B14 O 700.455
7. CONTOUR WITH TEXT, SPOT LEVELS.	- - - - -
8. BORE HOLE, TRAIL PIT, ELECTRICAL RESISTIVITY TEST	- - - - -

- NOTES :**
1. ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS NOTED.
 2. TOTAL AREA OF PROPOSED LAYOUT = 8.00 Acres
 3. TOTAL ROAD LENGTH INSIDE STAGE-V PUMPING STATION = 920M
 4. TBM1 IS MARKED ON TOP OF WATER TANK.i.e RL:696.395.
 5. HBM1 IS MARKED ON TOP OF PLINTH ON KANAKAPURA ROAD.i.e RL:700.455.

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.












DRAWING TITLE	SCALE
TOPOGRAPHICAL SURVEY FOR PROPOSED PUMPING STATION FOR STAGE V AT HAROHALLI	1:1800
DRAWING NO.	W-034



1st Stage Pump House

MAIN ENTRY

LEGEND :

-  BWSSB BOUNDARY
-  STAGE WISE BOUNDARY
-  INCOMING CLEAR WATER LINE
-  OUTGOING CLEAR WATER LINE
-  EXISTING ROAD
-  PROPOSED ROAD
-  PROPOSED PUMPING STATION UNITS
-  EXISTING DETAILS
-  TRAIL PIT
-  BORE HOLE
-  ELECTRICAL RESISTIVITY TEST

NOTES :

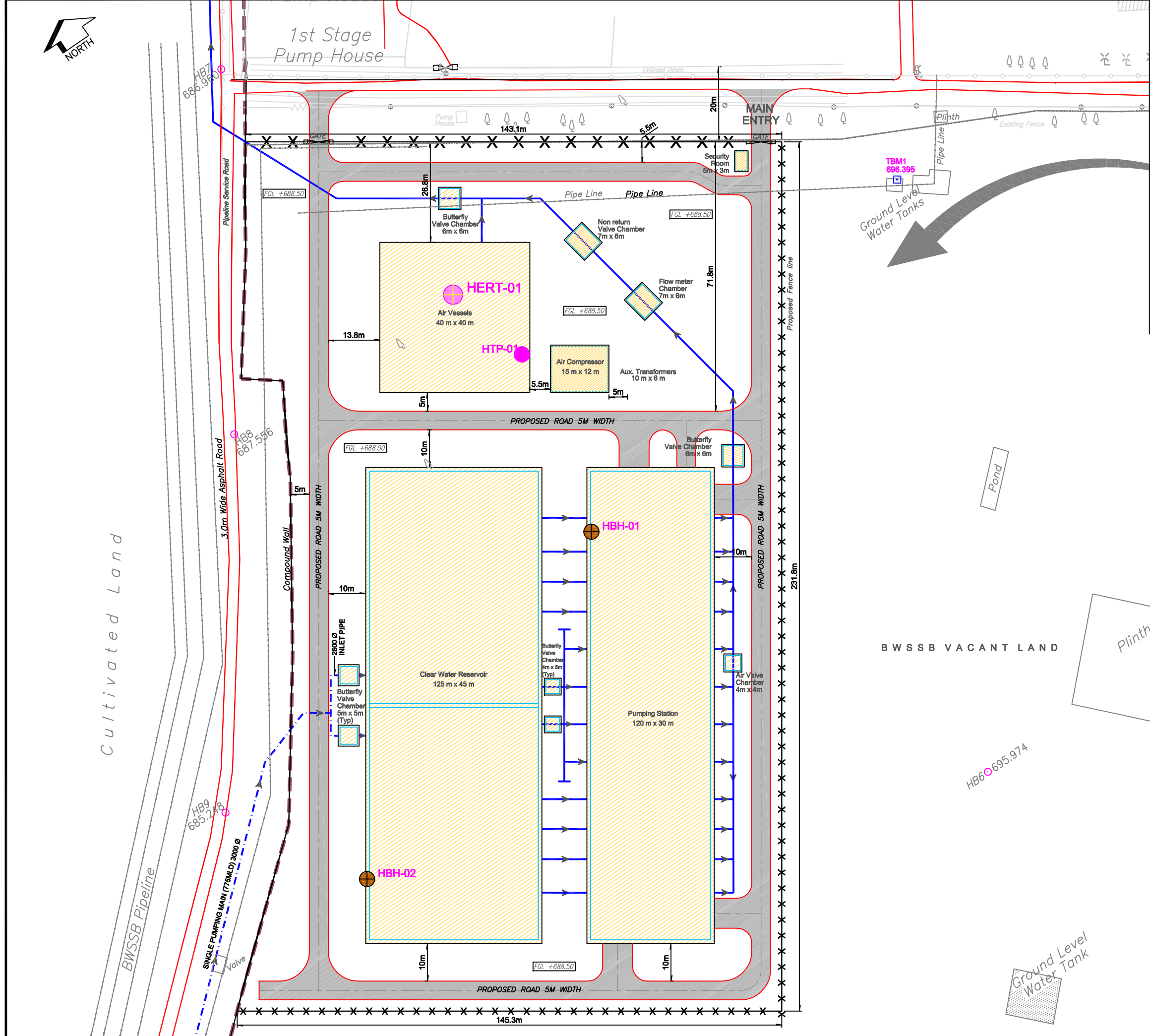
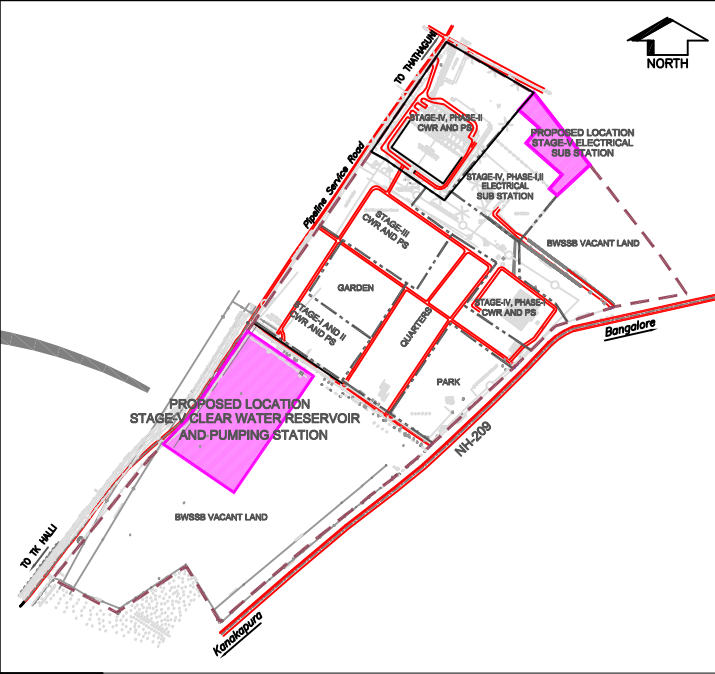
1. ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS NOTED.
2. TOTAL AREA OF PROPOSED LAYOUT = 8.00 Acres
3. TOTAL ROAD LENGTH INSIDE STAGE-V PUMPING STATION = 920M

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

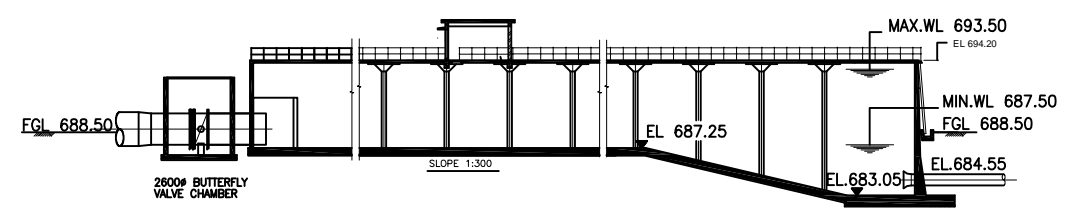
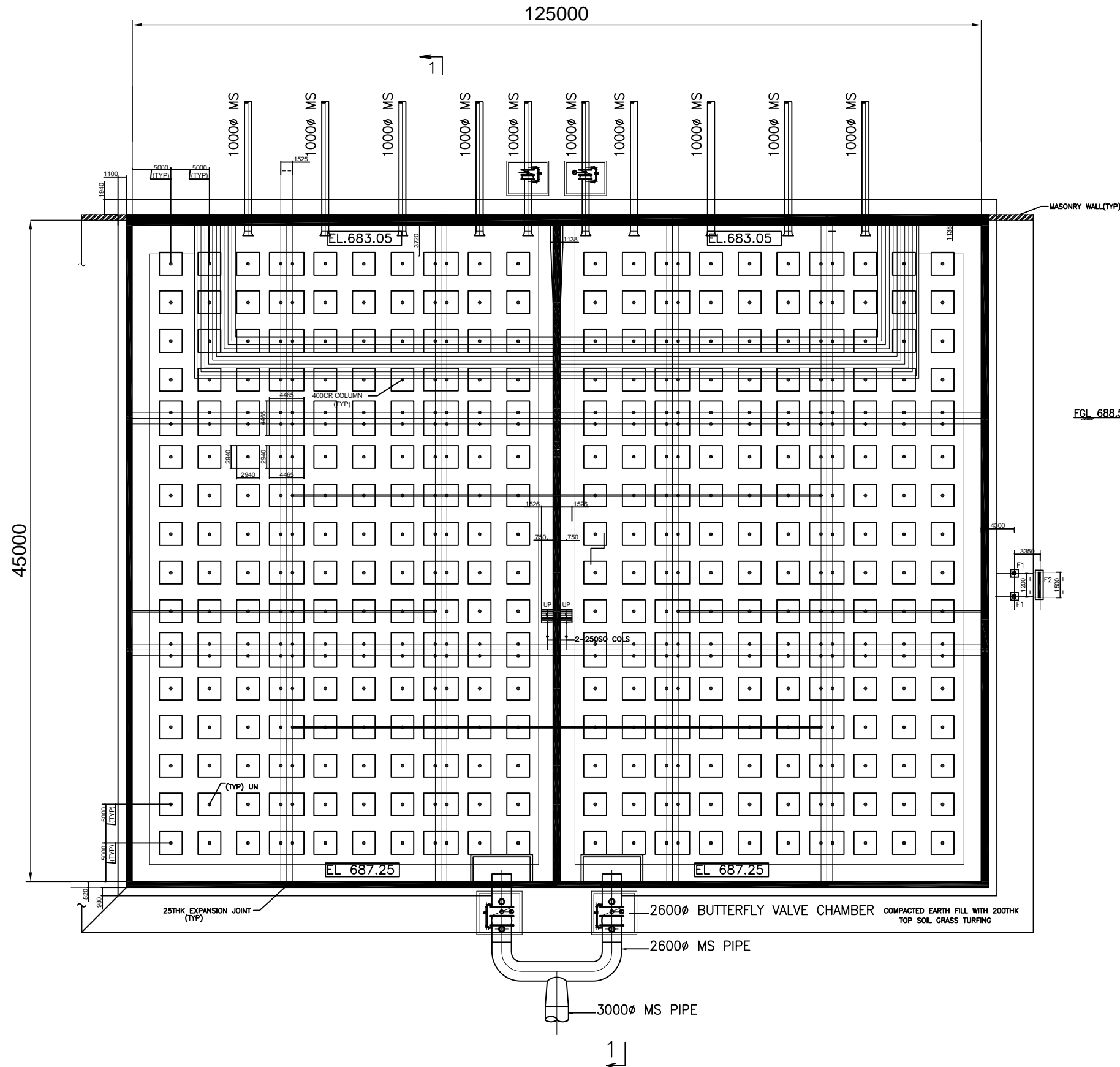
DRAWING TITLE GENERAL LAYOUT PLAN OF PUMPING STATION FOR STAGE V AT HAROHALLI	SCALE 1:1000
DRAWING NO. W-035	



Cultivated Land

BWSSB VACANT LAND

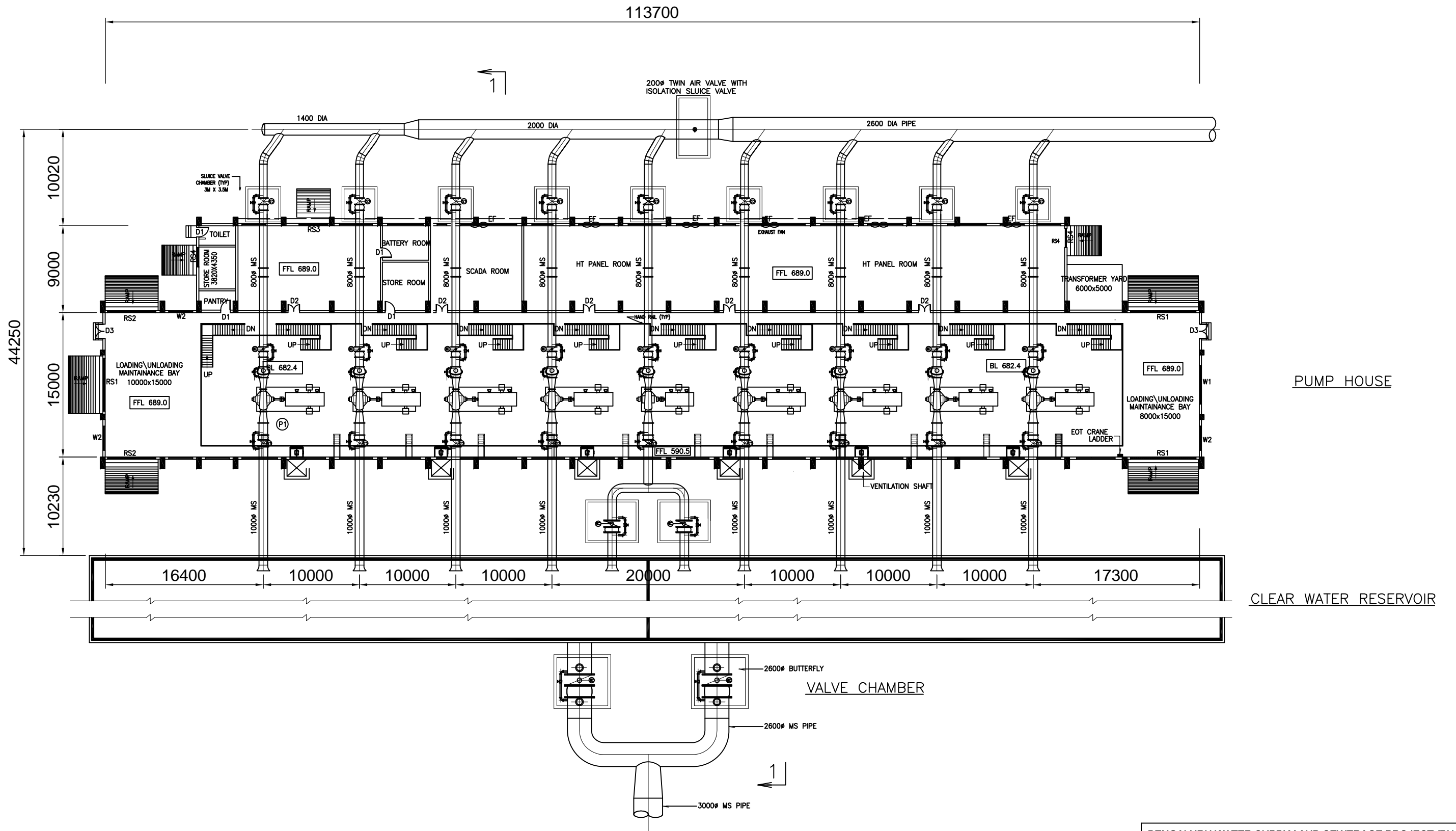
Ground Level Water Tank



SECTION 1-1

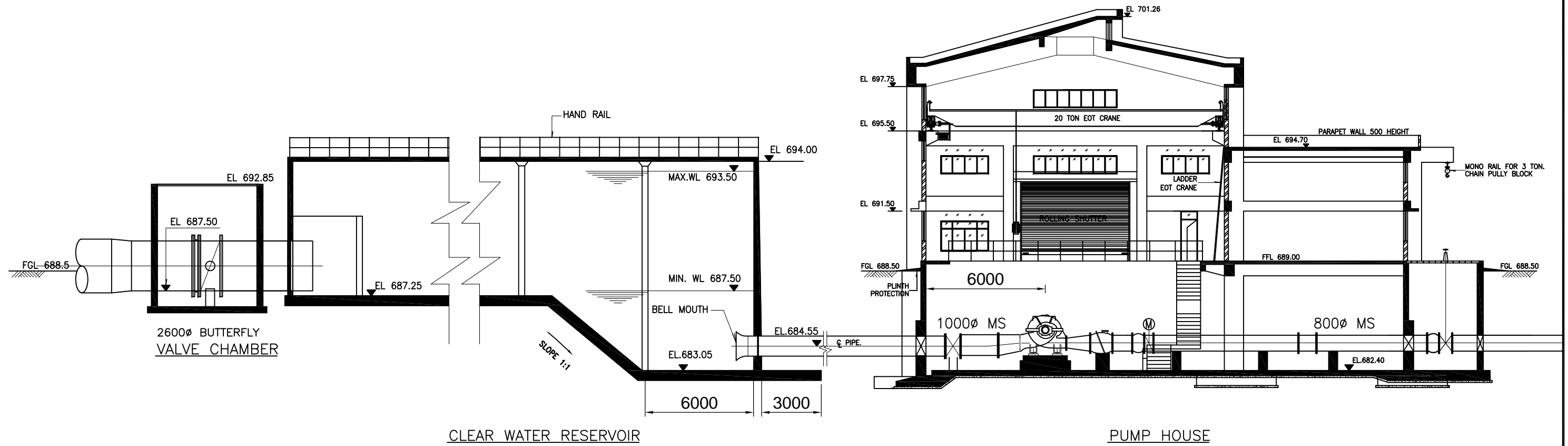
PLAN AT BASE SLAB TOP LEVEL

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE PLAN AND SECTION OF CLEAR WATER RESERVOIR FOR STAGE V AT HAROHALLI	SCALE 1:600 DRAWING NO. W-036



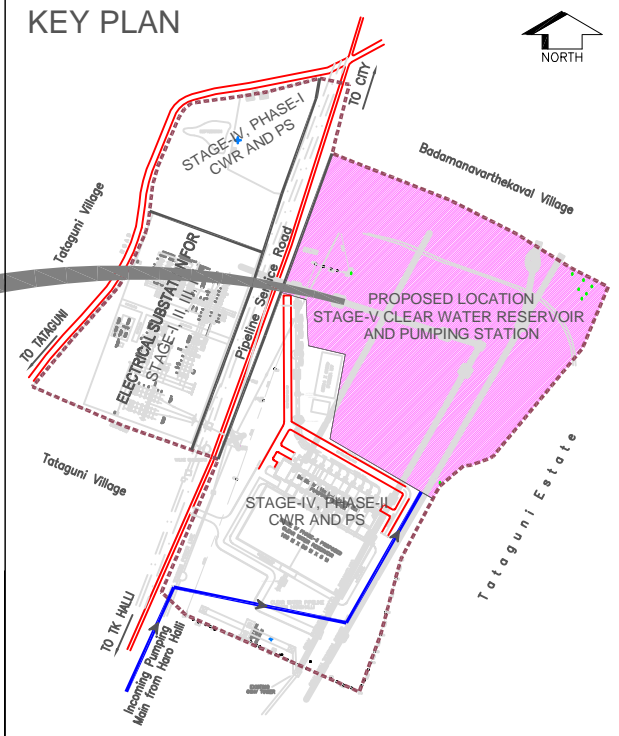
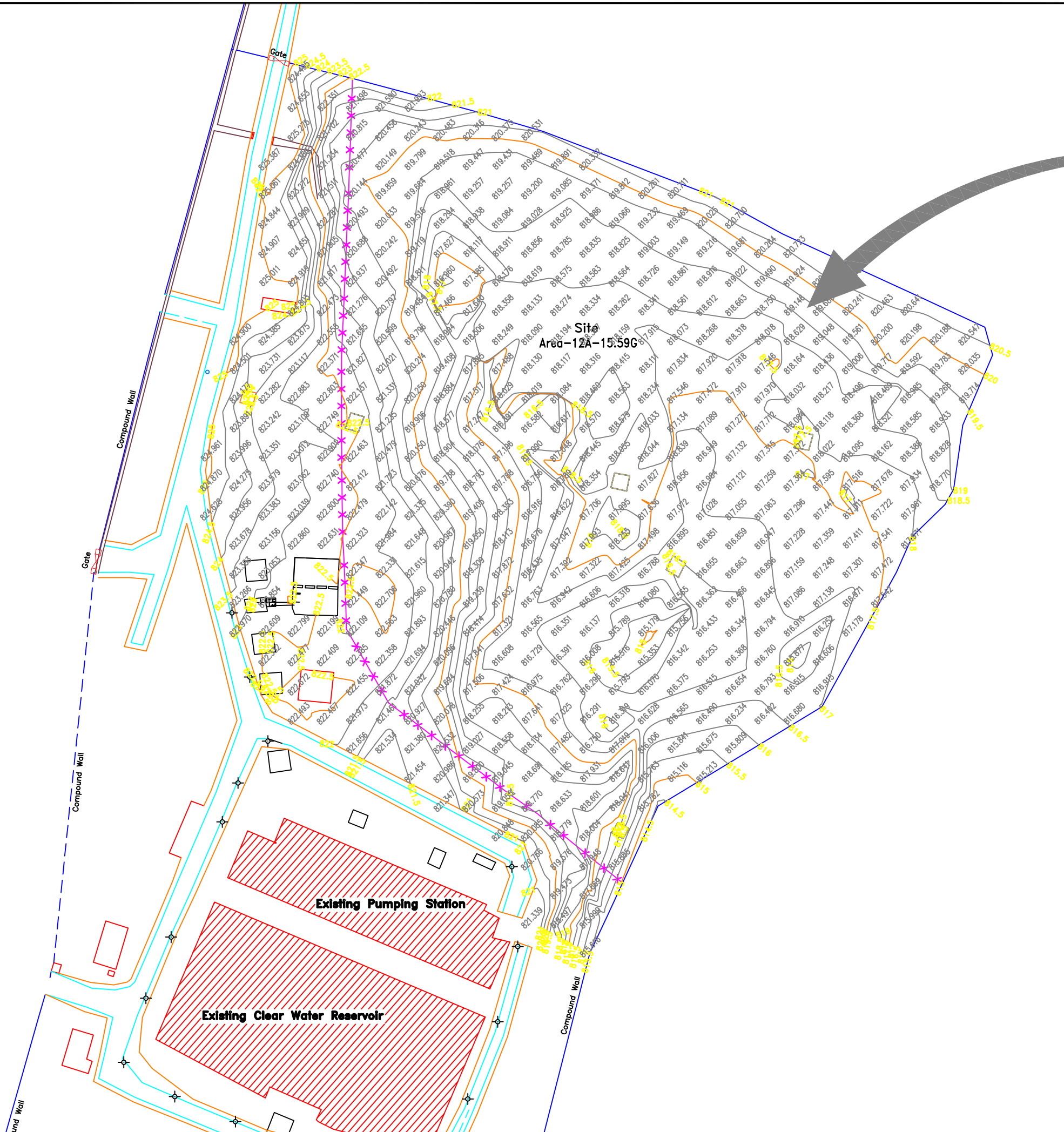
PLAN OF PUMPING STATION

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
PLAN OF PUMPING STATION FOR STAGE V AT HAROHALLI	1:400
DRAWING NO.	
W-037	



SECTION 1-1

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
SECTION OF PUMPING STATION FOR STAGE V AT HAROHALLI	1:200
DRAWING NO.	
W-038	



LEGEND :

ROADS	— — — — —	— — — — —
NALA	— — — — —	— — — — —
PROPERTY BOUNDARY	— — — — —	— — — — —
CHAINAGE	— — — — —	0+000
LS LEVEL	— — — — —	160.372
LONGITUDINAL SECTION NO.	— — — — —	1
NALA FLOW DIRECTION	— — — — —	→
FENCE	— — — — —	× × × × ×
TREES	— — — — —	🌳 🌳
MAN HOLES	— — — — —	OMH

NOTES :

- ALL LEVELS ARE IN METERS, UNLESS OTHERWISE MENTIONED.
- ALL LEVELS ARE CARRIED FROM GTS BM:K-5/13 ENGRAVED ON TOP OF CENTER OF NW. PARAPET OF CULVERT ON BANGALORE TO DINDIGUL ROAD, ABOUT 180M SW. OF KM STONE NO.440 NEAR TEMPLE AT HAROHALLI, 0.60M ABOVE GROUND.i.e RL:699.075.

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガール上下水道整備事業(フェーズ3)

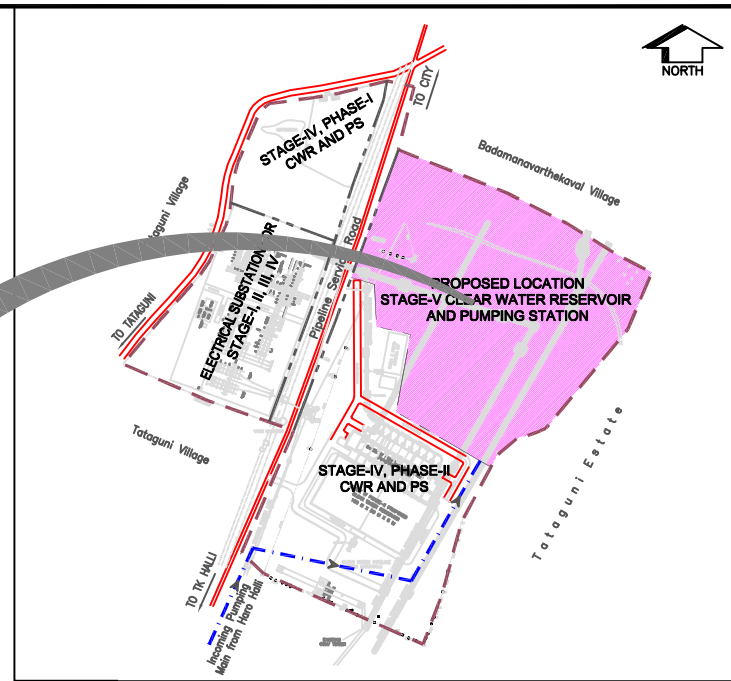
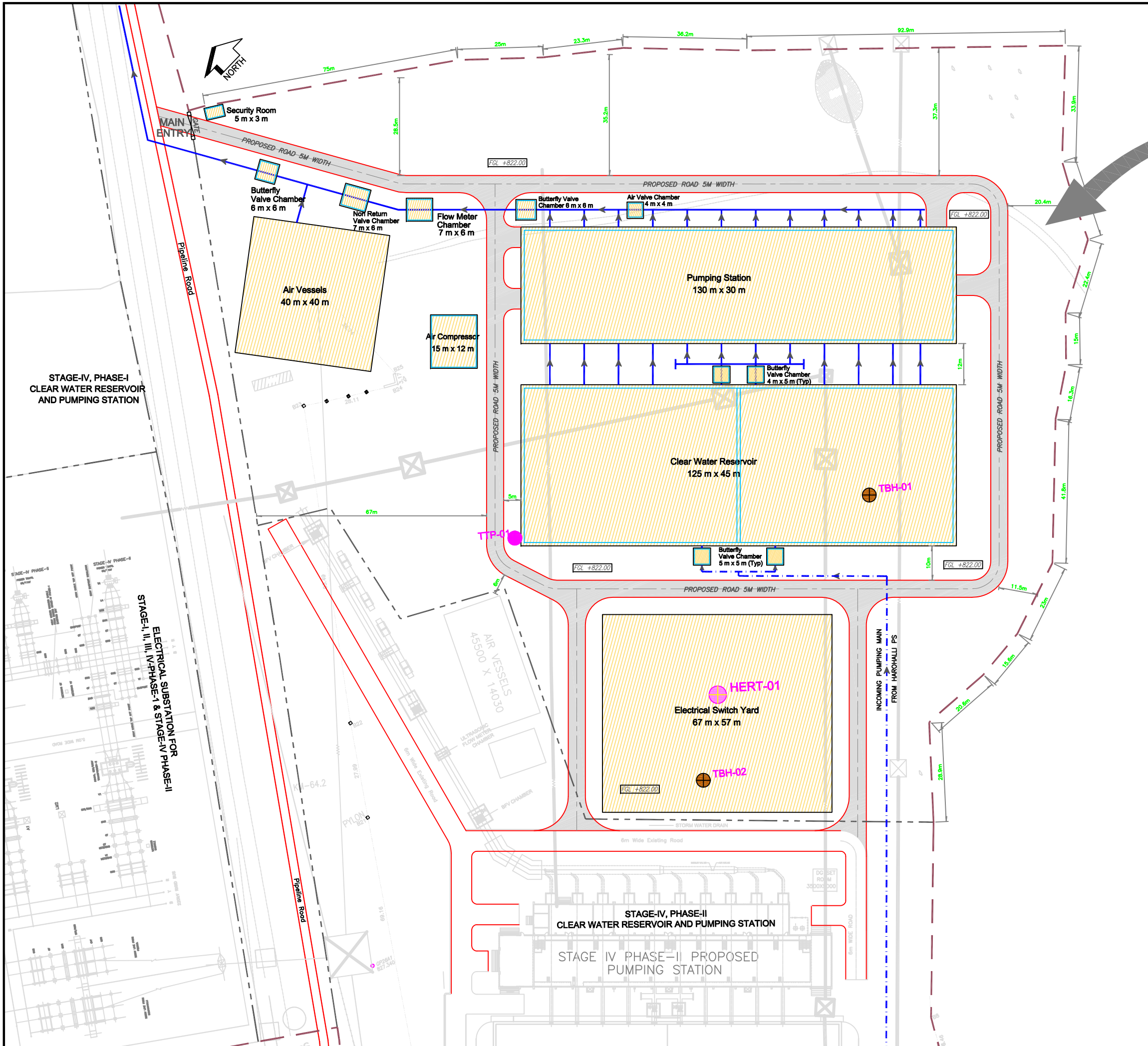
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE: **TOPOGRAPHICAL SURVEY FOR PROPOSED CLEAR WATER RESERVOIR AND PUMPING STATION FOR STAGE V AT TATAGUNI**

SCALE: **1:1400**

DRAWING NO.: **W-039**



- LEGEND :**
- BWSSB BOUNDARY
 - STAGE WISE BOUNDARY
 - INCOMING CLEAR WATER LINE
 - OUTGOING CLEAR WATER LINE
 - EXISTING ROAD
 - PROPOSED ROAD
 - PROPOSED PUMPING STATION UNITS
 - EXISTING DETAILS
 - TRAIL PIT
 - ⊕ BORE HOLE
 - ⊕ ELECTRICAL RESISTIVITY TEST

- NOTES :**
1. ALL DIMENSIONS AND LEVELS ARE IN METRES UNLESS NOTED.
 2. TOTAL AREA OF PROPOSED LAYOUT = 8.00 Acres
 3. TOTAL ROAD LENGTH INSIDE STAGE-V PUMPING STATION = 920M

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

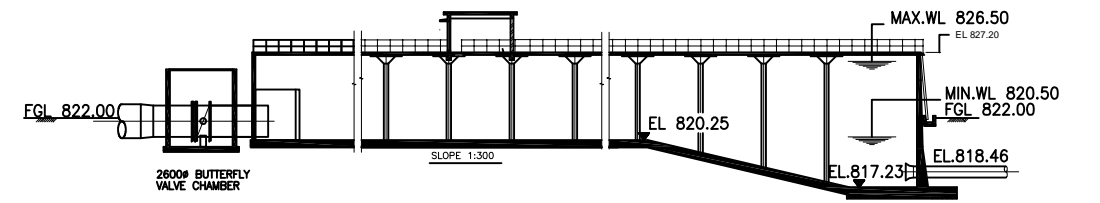
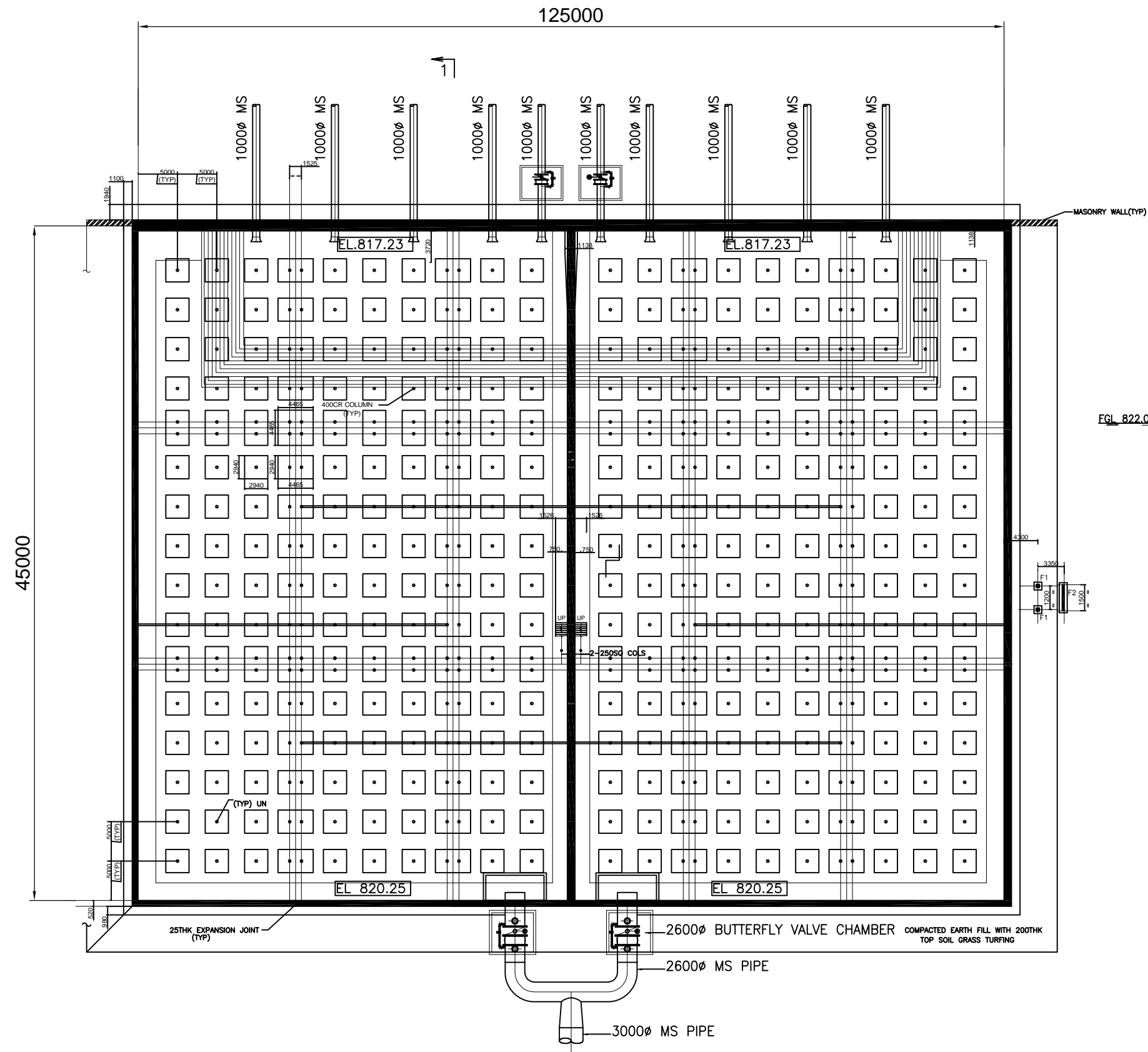
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE: **GENERAL LAYOUT PLAN OF PUMPING STATION FOR STAGE V AT TATAGUNI**

SCALE: **1:1100**

DRAWING NO.: **W-040**

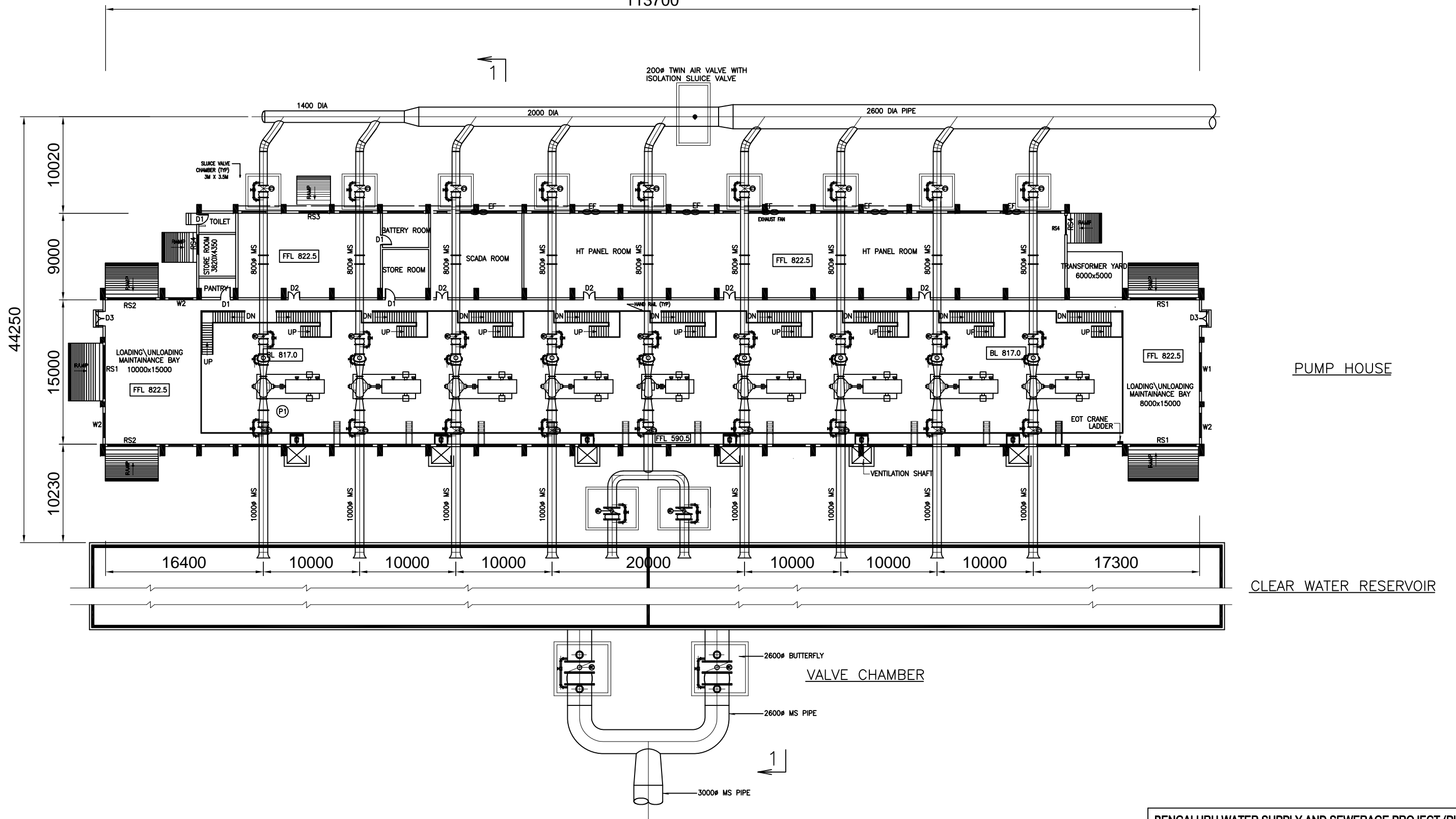


SECTION 1-1

PLAN AT BASE SLAB TOP LEVEL

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE PLAN AND SECTION OF CLEAR WATER RESERVOIR FOR STAGE V AT TATAGUNI	SCALE 1:600
DRAWING NO. W-041	

113700



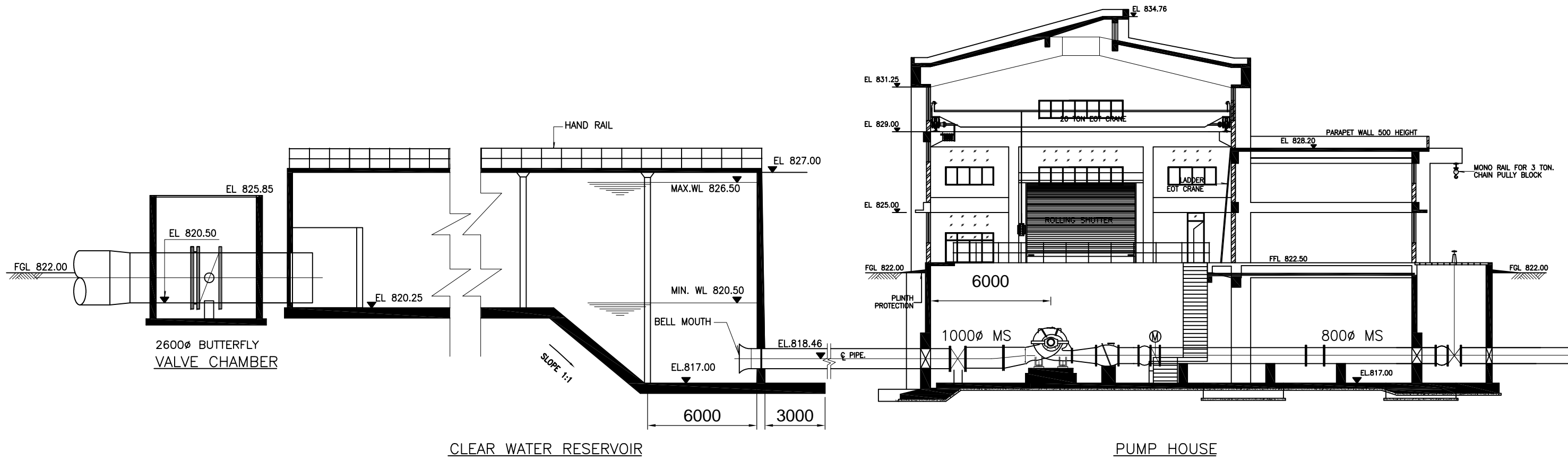
PUMP HOUSE

CLEAR WATER RESERVOIR



VALVE CHAMBER

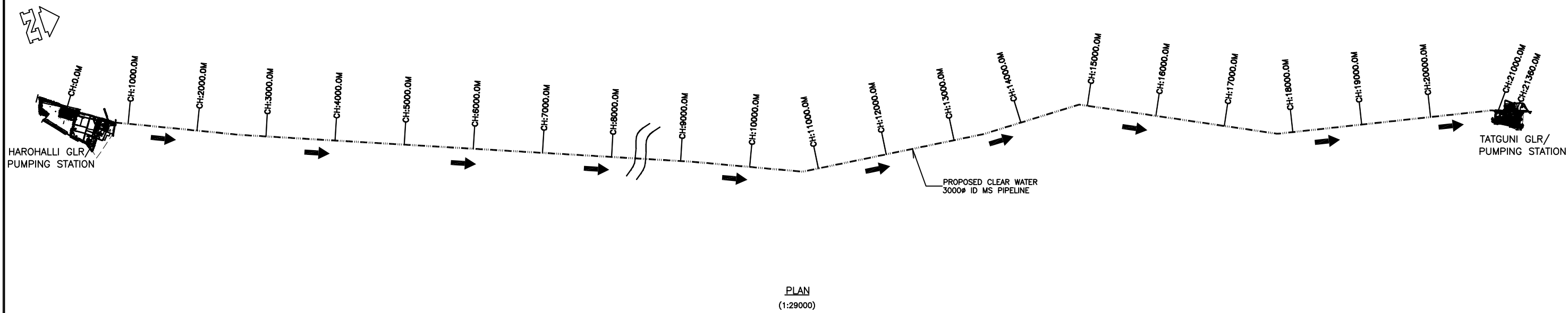
PLAN OF PUMPING STATION

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
jica JAPAN INTERNATIONAL COOPERATION AGENCY	
njs NJS CONSULTANTS CO., LTD.	
DRAWING TITLE PLAN OF PUMPING STATION FOR STAGE V AT TATAGUNI	SCALE 1:400 DRAWING NO. W-042

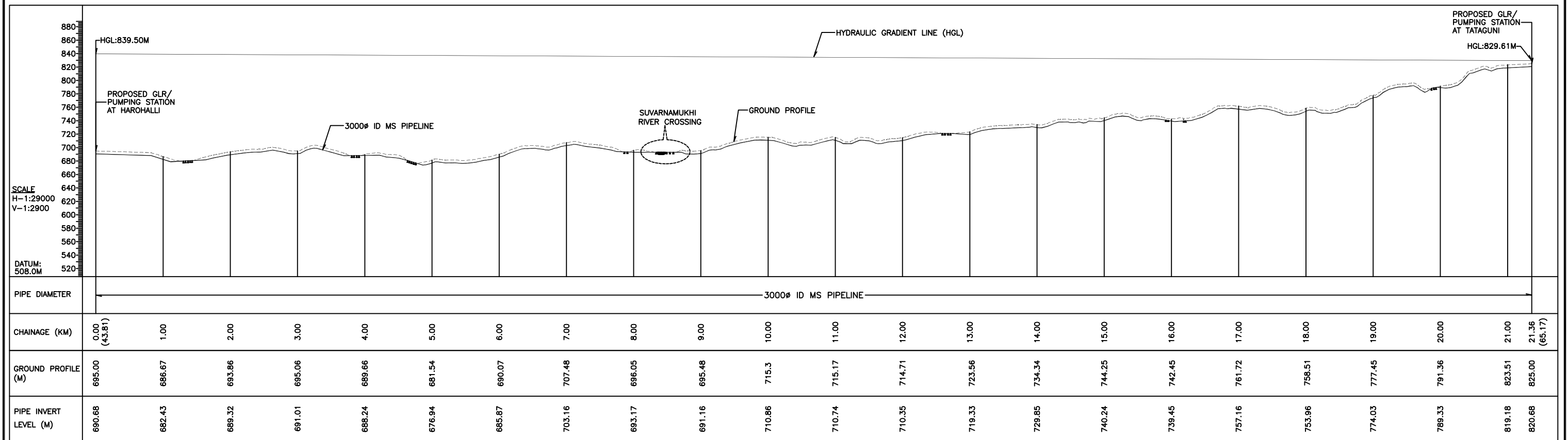


SECTION 1-1

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3) ベンガルール上下水道整備事業(フェーズ3)	
 JAPAN INTERNATIONAL COOPERATION AGENCY	
 NJS CONSULTANTS CO., LTD.	
DRAWING TITLE	SCALE
SECTION OF PUMPING STATION FOR STAGE V AT TATAGUNI	1:200
DRAWING NO.	
W-043	



PLAN
(1:29000)



LONGITUDINAL SECTION

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガールール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

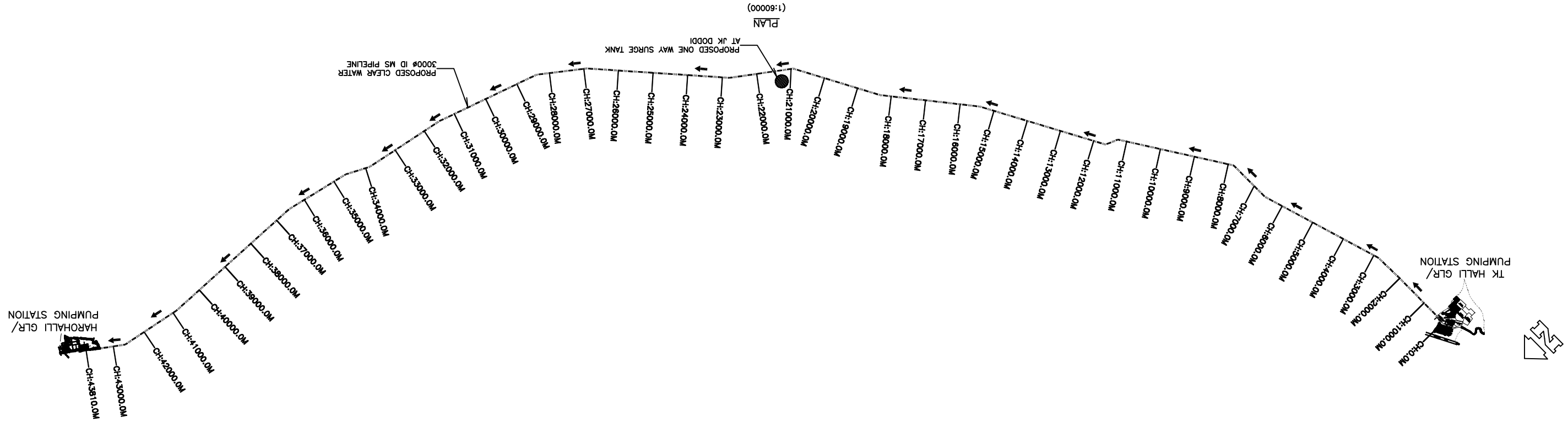
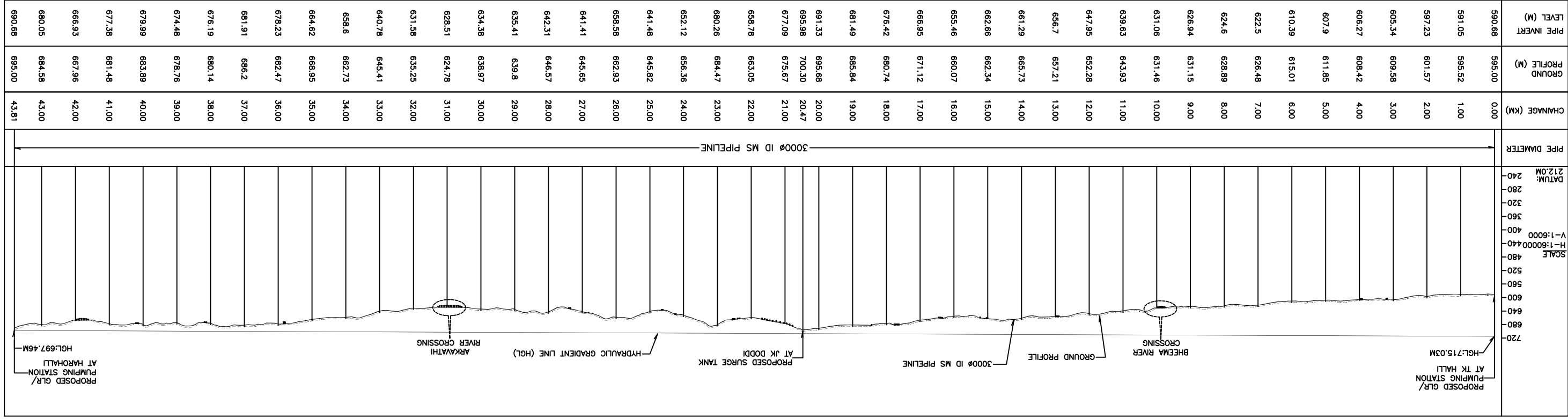
NJS NJS CONSULTANTS CO., LTD.

DRAWING TITLE: **PLAN & LONGITUDINAL SECTION WITH HYDRAULIC GRADIENT LINE OF TRANSMISSION MAIN (1)**

SCALE: H=29000, V=2900

DRAWING NO.: **W-044**

LONGITUDINAL SECTION



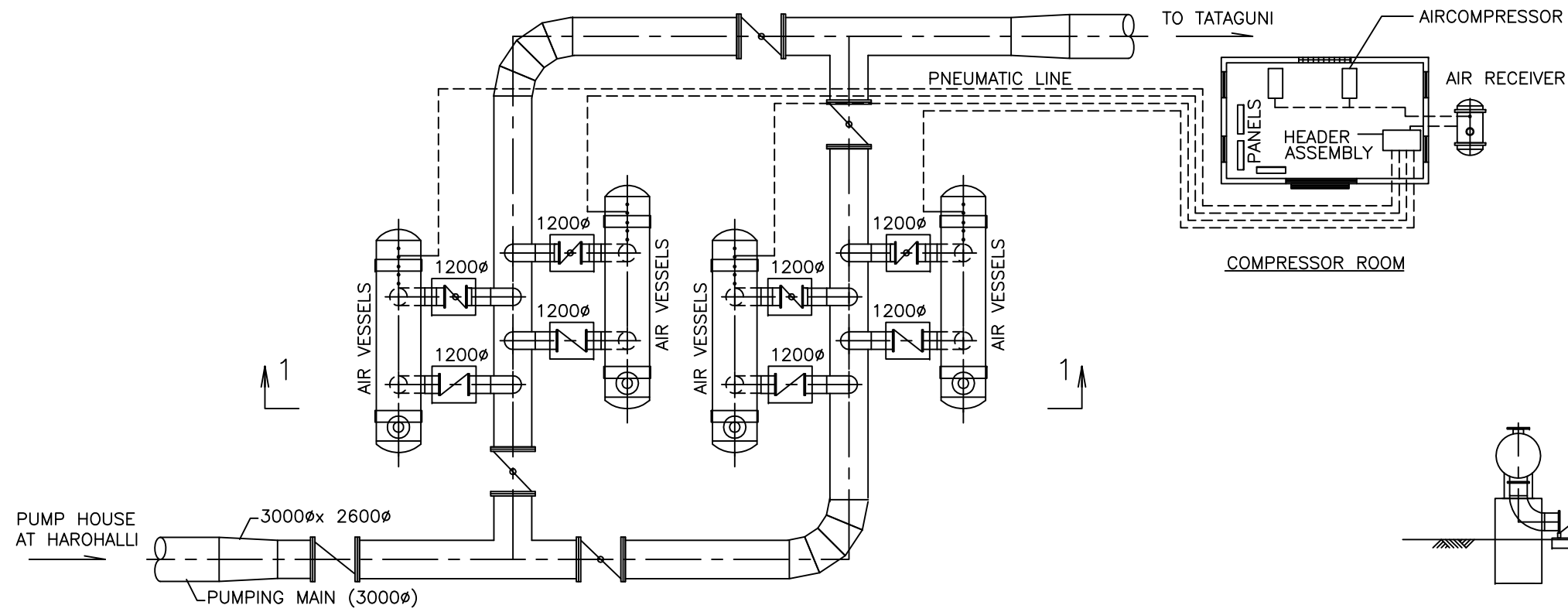
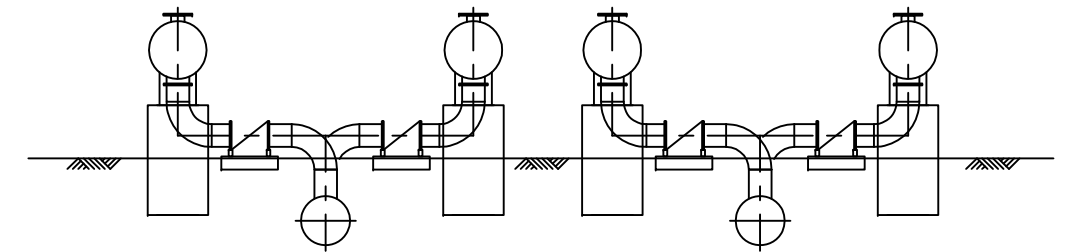
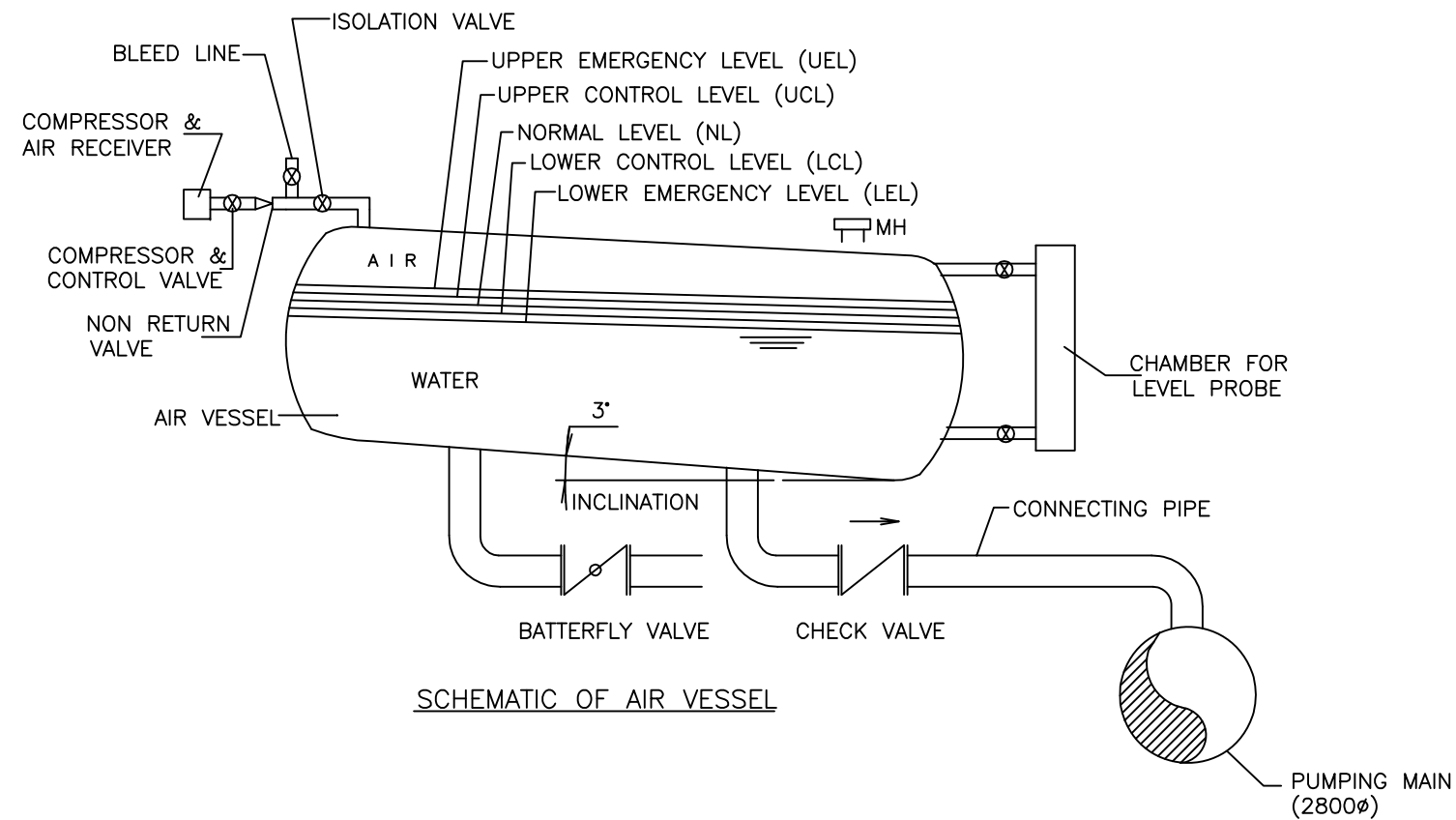


TABLE:1 DETAILS OF AIR VESSELS

PUMPING STATION	NO OF AIR VESSEL
TK HALLI	9
HAROHALLI	4
TATAGUNI	11



SECTION 1-1



SCHEMATIC OF AIR VESSEL

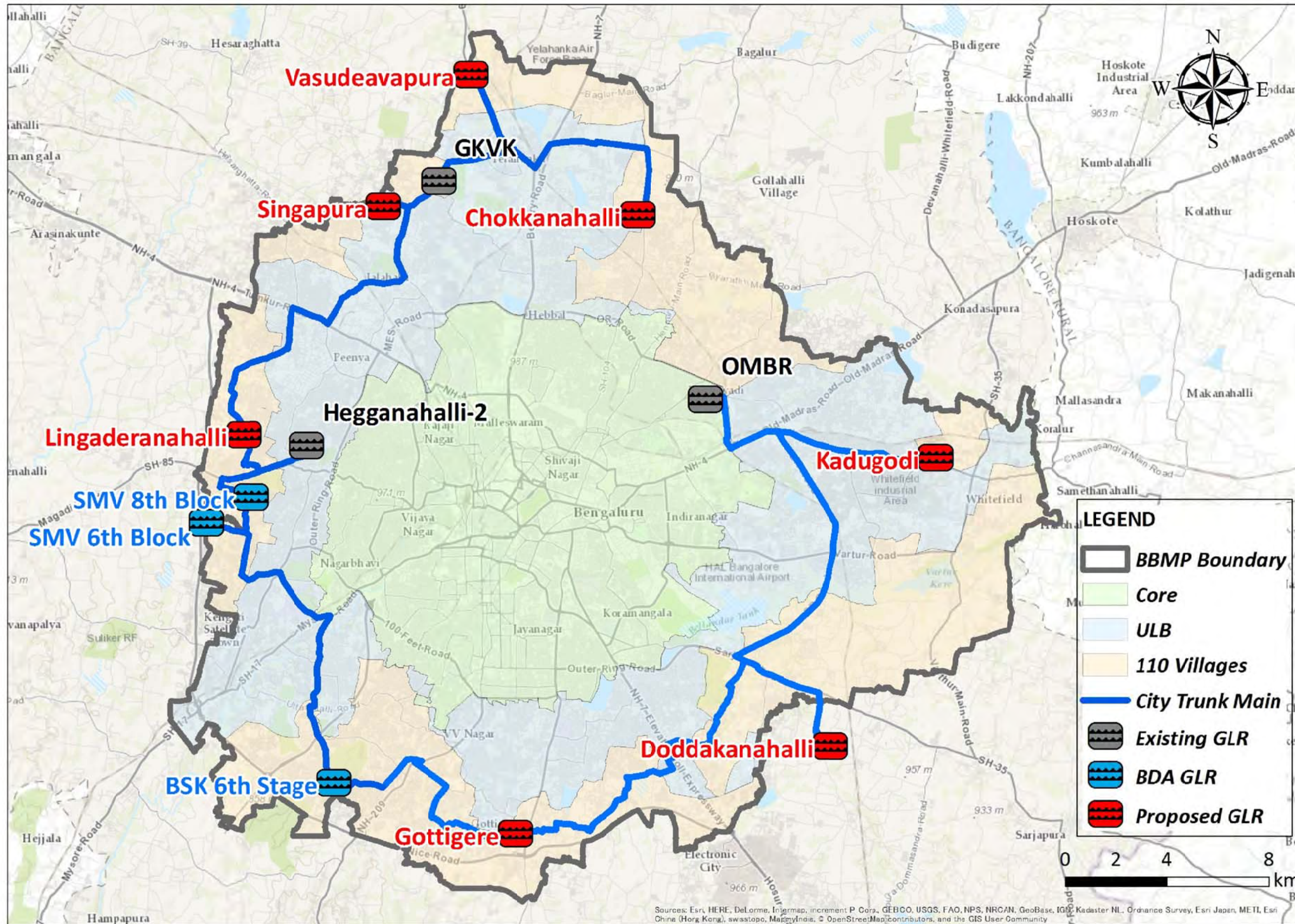
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE
**SCHEMATIC OF AIR VESSELS
 ARRANGEMENT**

SCALE
 Not
 DRAWING NO.
 W-046



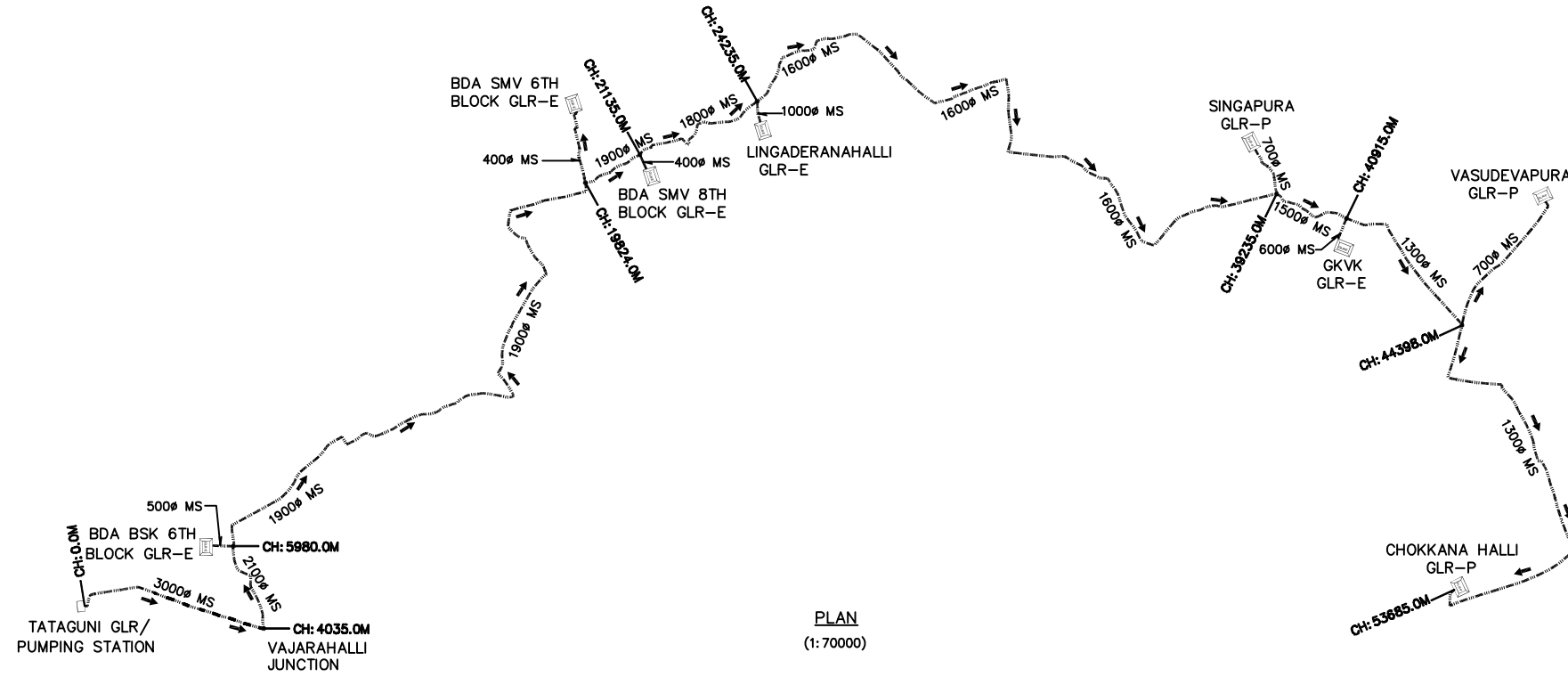
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

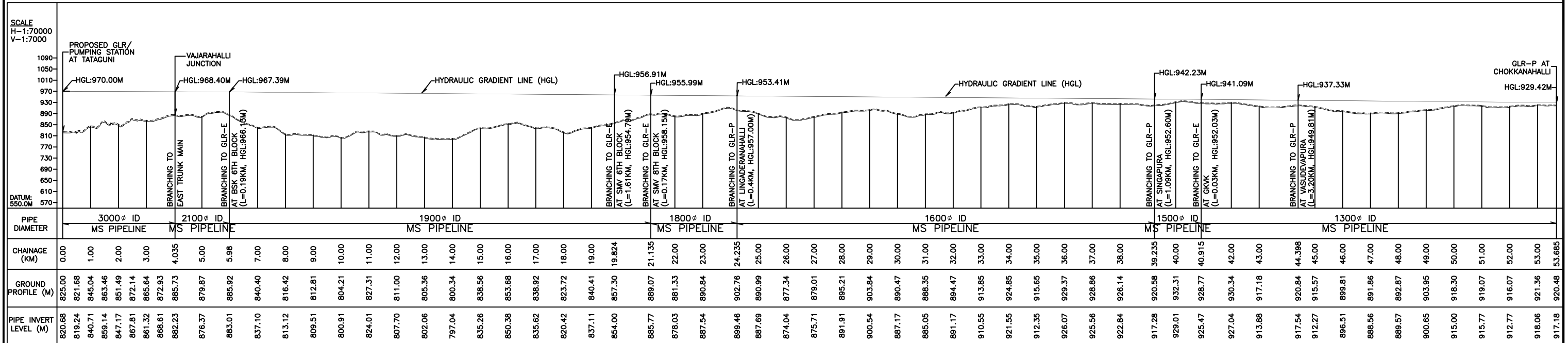
NJS CONSULTANTS CO., LTD.

DRAWING TITLE
 LOCATION OF PROPOSED CITY TRUNK MAIN AND EXISTING /
 PROPOSED GLRs FOR STAGE V

SCALE
 NTS
 DRAWING NO.
 W-047



PLAN
(1:70000)



LONGITUDINAL SECTION

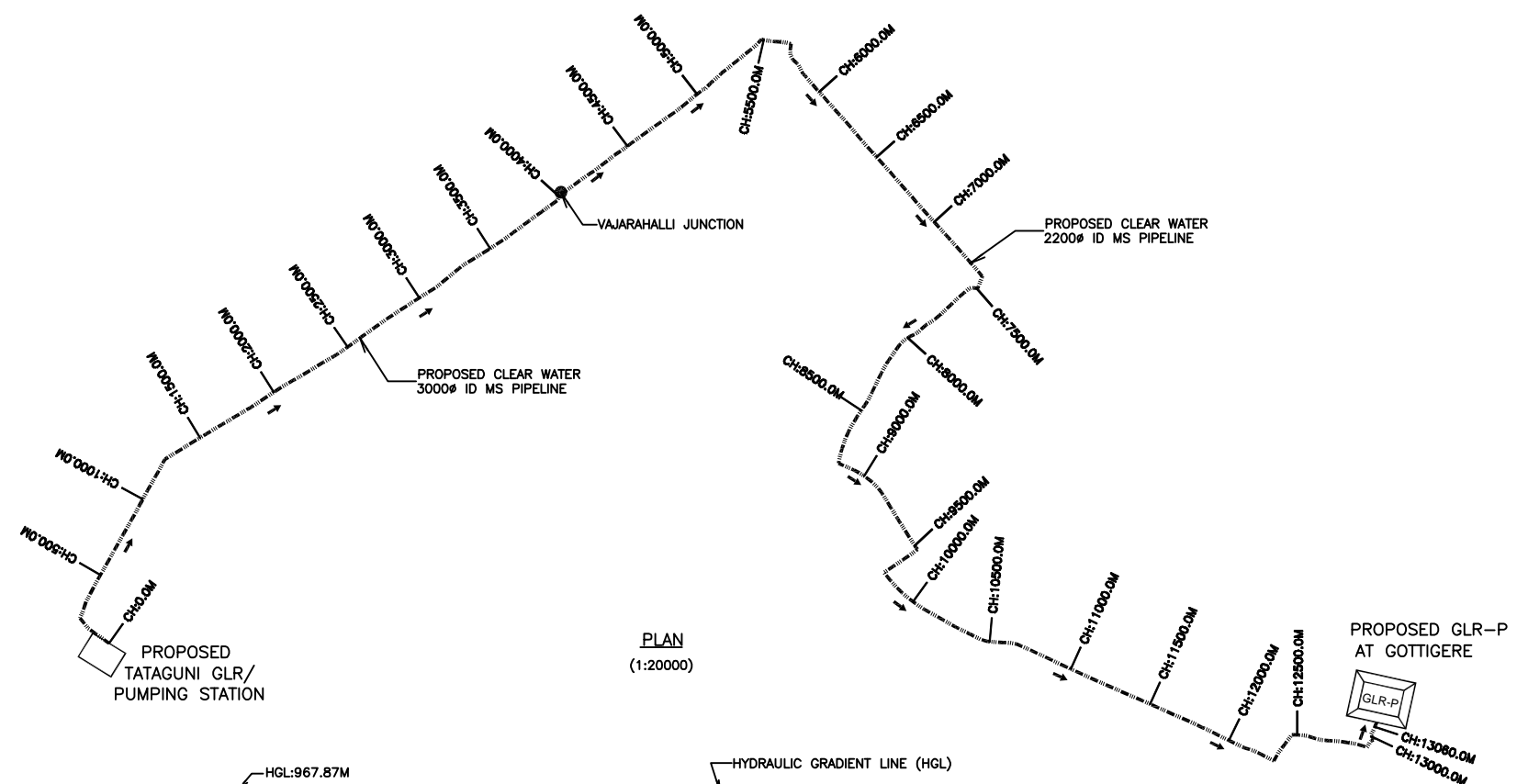
BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

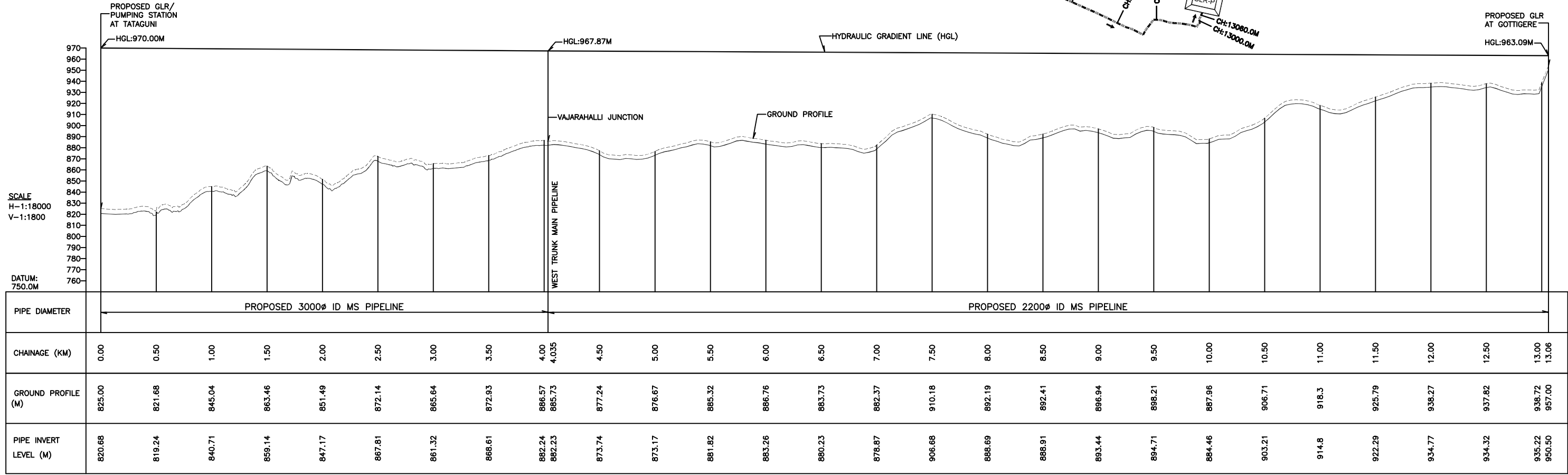
NJS CONSULTANTS CO., LTD.

DRAWING TITLE
PLAN & LONGITUDINAL SECTION WITH
HYDRAULIC GRADIENT LINE OF CITY
TRUNK MAIN (WESTERN ROUTE)

SCALE
H=70000, V=7000
DRAWING NO.
W-048



PLAN
(1:20000)



LONGITUDINAL SECTION

BENGALURU WATER SUPPLY AND SEWERAGE PROJECT (PHASE 3)
 ベンガルール上下水道整備事業(フェーズ3)

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

NJS CONSULTANTS CO., LTD.

DRAWING TITLE: PLAN & LONGITUDINAL SECTION WITH HYDRAULIC GRADIENT LINE OF CITY TRUNK MAIN (EASTERN ROUTE) 1

SCALE: H=18000, V=1800

DRAWING NO.: W-049