ANNEX IX STUDY ON OVERHEAD TANK CAPACITY

ANNEX IX Study on Overhead Tank Capacity

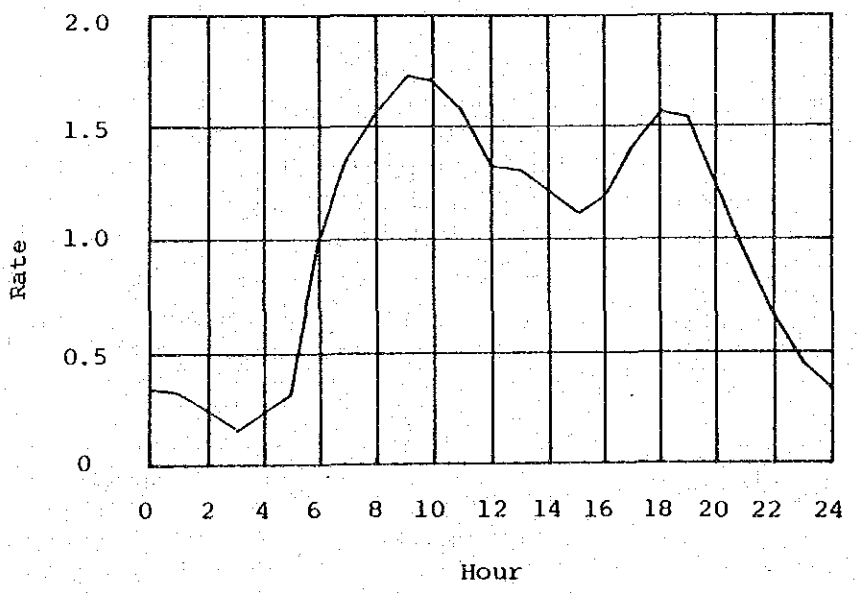
1. Hourly Change in Water Delivery

Since no data on hourly change in water delivery in Bangladesh are available, Data for Japan were used as a base for estimation.

(a) Hourly change in water supply to house connection

Data for Japan cannot be used as they are since the living environment and customs in Bangladesh are different from those in Japan. Major differences in the living environment are the use of electric washing machine, flush toilet, hot bath, etc. In order to adjust for these differences, data for the year around 1955, when the diffusion rates of these facilities were still low, will be used. The following figure presents the hourly changes in water consumption when the daily mean water consumption is set at 1.0.

Fig. A-9-1 Hourly Rate of Water Supply to House Connection (Rate, mean = 1.0)



(b) Hourly change in water supply to public post

As no data are available on the public posts because although they did exist at one time immediately after the World War II, they no longer exist today. The following therefore is an estimate.

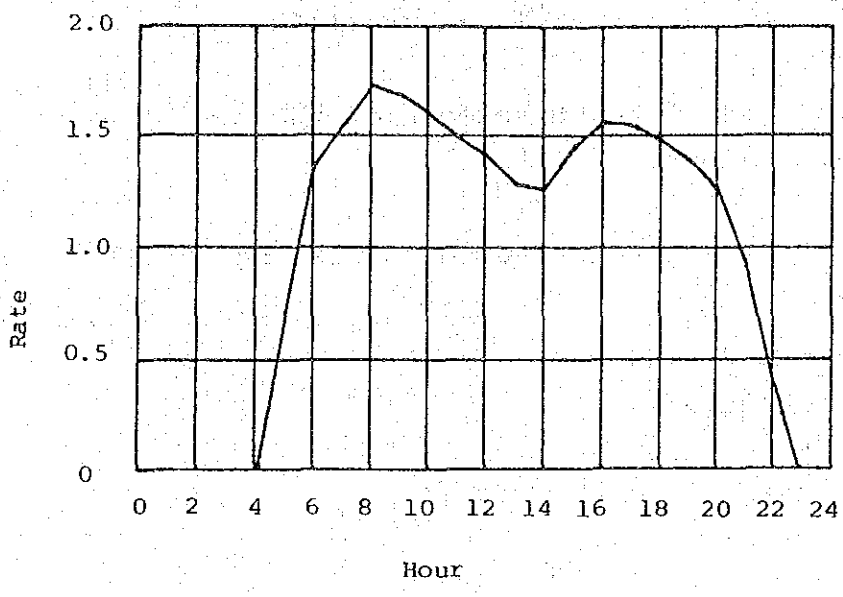
An example of the breakdown of the use of water would be as follows:

Drinking, cooking, dish washing, house cleaning	10.5 ℓ/man-day
Laundering	5.0
Ablutions	17.5
Head flush	2.5
Others	4.0
Total	39.5

Of these, laundering would be done at the place of water tap but for other uses, water would probably be carried into each house. Also, water for meal and dish washing would probably be filled into vessels one or two hours before meal. Accordingly, the morning peak consumption would be smaller and the morning and evening peak hours earlier by one or two hours than in the case of house connections. During night, the water filled in vessels would be used while tap water would hardly be used. In order to be on the safe side, the maximum hourly ratios in the morning and evening were assumed to be the same as in the case of house connections.

Fig. A-9-2 Hourly Rate of Water Supply to Public Post

(Rate, mean = 1.0)



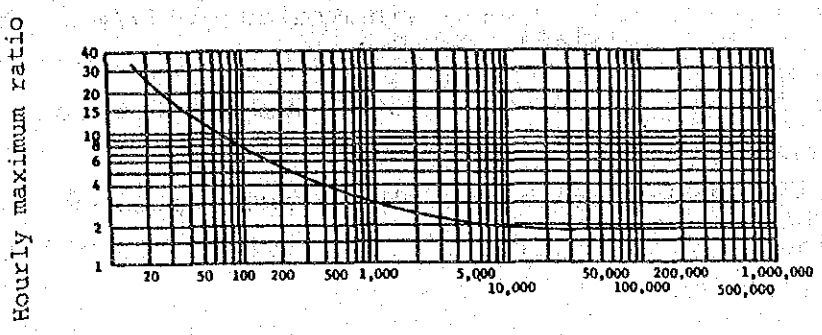
2. Ratio of Hourly Maximum Water Consumption to Daily Maximum Water Consumption

Since no data are available on the hourly maximum ratio in Bangladesh, the following is our best estimate based on the data for Japan.

(a) House connection

The relationship between the population supplied and the hourly maximum ratio would be as illustrated below.

Fig. A-9-3 Relationship Between Population Supplied and the Hourly Maximum Ratio



The hourly maximum ratio (α) is obtained as follows.

1) The hourly maximum water consumption is calculated for α obtained from Fig. A-9-3.

$$Q_H = \alpha \times \frac{q_o}{24} \times p$$

2) Simultaneous tap opening water volume (Q_1) is calculated.

$$Q_1 = q_1 \times N^{0.475}$$

3) a If $Q_H < Q_1$, then Q_H is the hourly maximum water consumption.

b If $Q_H > Q_1$, then Q_1 is the hourly maximum water consumption.

In the above, p : Estimated population supplied (in persons)

q_o: Maximum water consumption per head per day (ℓ/man-day)

q_1: Volume of water used per tap (in ℓ/min. 17 ℓ/min. for a ϕ13 mm tap)

N : Total number of taps

The following is the hourly maximum water consumption calculated for Narayanganj Town which has the Largest population.

1) a = 1.7 as per Fig. A-9-3.

Q_H = 1.7 x 113.7 ℓ/man-day x 470,000 men x 0.5
= 31.544 ℓ/min.

2) Q_1 = 17 ℓ/min. x = 1,938 ℓ/min.

Since Q_H Q_1, Q_1 would be the hourly maximum water consumption, but the difference between Q_H and Q_1 is far too large. This is judged to indicate that the instance in Japan is not applicable to Bangladesh where the family size is large at 11 on average and where there is only one tap for each house connection.

In view of the foregoing, it would be better to obtain Q_H from the hourly maximum ratio.

(b) Public post

For public post, Q_H shall be obtained from the hourly maximum ratio, too.

(c) Hourly maximum ratio for the total volume of water supply

When the hourly maximum ratio for the total volume of water supply is obtained from the hourly changes in water delivery, the results was $\alpha' = 1.71$ as per Table A-9-1. Since this is quite close to $\alpha' = 1.7$ obtained from Fig. A-9-3, it was decided to adopt the distribution of water delivery in (1) above.

Table A-9-1 Hourly Maximum Ratio for the Total Volume of Water Supply

(per person)

Hour	House connection		Public post		Total
	Ratio	Water Volume (x 90 ℓ)	Ratio	Water Volume (x 34 ℓ)	
0	0.33	37.5	0	0	37.5
1	0.24	27.3	0	0	27.3
2	0.19	21.6	0	0	21.6
3	0.14	15.9	0	0	15.9
4	0.12	13.6	0	0	13.6
5	0.31	35.2	0.70	23.80	59.0
6	0.98	111.4	1.33	45.22	156.6
7	1.33	151.2	1.54	52.36	203.6
8	1.57	178.5	1.72	58.48	237.0
9	1.72	195.5	1.68	57.12	252.6
10	1.69	192.2	1.60	54.40	246.6
11	1.56	177.4	1.49	50.66	228.1
12	1.34	152.4	1.40	47.60	200.0
13	1.29	146.7	1.28	43.52	190.2
14	1.22	138.7	1.26	42.84	181.5
15	1.10	125.1	1.45	49.30	174.4
16	1.17	133.0	1.56	53.04	186.0
17	1.39	158.0	1.54	52.36	210.4
18	1.56	177.4	1.50	51.00	228.4
19	1.54	175.1	1.40	47.60	222.7
20	1.25	142.1	1.25	42.50	184.6
21	0.91	103.5	0.91	30.94	134.4
22	0.62	70.5	0.39	13.26	83.8
23	0.43	48.9	0	0	48.9
Average	1.00	113.7	1.00	34.00	147.7

$$\text{Hourly maximum ratio } \alpha' = \frac{211.92}{124.00} = 1.71$$

3. Review on the Capacity of Overhead Tank

On the basis of numerical values obtained up to the preceding paragraph, studies were made on whether around the clock water supply is possible with the capacity equivalent to 20% of the daily maximum consumption on two cases, one for the target year of 1990 and the other for the scheduled year of completion of 1989.

For the target year of 1990, two cases of operating hours of pump were assumed, one of which is between 7:00 and 22:00 and the other between 6:00 and 21:00; and for 1989, between 7:00 and 22:00. In every case, pump will be operated 15 hours a day.

The calculated results (Tables A-9-3 through A-9-5) are summarized as tabulated below.

Table A-9-2 Summary of Results

Conditions	Findings
1990 : Overhead tank capacity 20 % (of daily maximum water consumption), 15 hours a day operation (between 7:00 and 22:00)	Water supply will be cut off. Prior to starting operation at 7 a.m., the quantity of water stored will become slightly short (equivalent to 0.4 minute of thruput)
Overhead tank capacity 20%, operating hours 15 hours a day (between 6:00 and 21:00 6:00 and 21:00)	Water supply will not be cut off. Although small, water will still be left in the tank prior to start operating at 6 a.m. (equivalent to 0.2 minute of thruput)
1989 : Overhead tank capacity 20%, 15 hours a day operation (between 7:00 and 22:00)	Water supply will not be cut off. Remaining water in storage will be equivalent to 6.7 minutes of thruput)

4. Determination of the Capacity of Overhead Tank

As a result of the foregoing study in which the overhead tank capacity was assumed to be equivalent to 20 % of the daily maximum water consumption and the pump to be operated 15 hours a day, around the clock water supply is believed to be perfectly possible in 1989 and almost possible in the target year of 1990. As for 1991 and later years, around the clock water supply is possible by extending the operating hours of pump.

Accordingly, the overhead tank capacity shall be 20% of the daily maximum water consumption.

Table A-9-3 Calculation Table

NAME OF CITY: Narayanganj
POPULATION SUPPLIED: 1990
RESERVOIR QUANTITY: 20%
OPERATION HOUR FROM: 7 TO 22

HR	RATIO	HOUSE	RATIO	PUBLIC	UNKNOWN	TOTAL	SUPPLY	TANK	
0	0.33	37.5	0.00	0	63.3	100.8	0	652.7	
1	0.24	27.5	0.00	0	63.3	90.6	0	562.1	
2	0.19	21.6	0.00	0	63.3	84.9	0	477.2	
3	0.14	15.9	0.00	0	63.3	79.2	0	398.0	
4	0.12	13.6	0.00	0	63.3	76.9	0	321.1	
5	0.31	35.2	0.70	23.8	63.3	122.3	0	198.8	
6	0.98	111.4	1.33	45.2	63.3	219.9	0	-21.1	(0.4 minute)
7	1.33	151.2	1.54	52.4	63.3	266.9	337.6	70.7	
8	1.57	178.5	1.72	58.5	63.3	300.3	337.6	108.0	
9	1.72	195.5	1.68	57.1	63.3	315.9	337.6	129.7	
10	1.69	192.2	1.60	54.4	63.3	309.9	337.6	157.4	
11	1.56	177.4	1.49	50.7	63.3	291.4	337.6	203.6	
12	1.36	152.4	1.40	47.6	63.3	263.3	337.6	277.9	
13	1.29	146.7	1.28	43.5	63.3	253.5	337.6	362.0	
14	1.22	138.7	1.26	42.8	63.3	244.8	337.6	454.8	
15	1.10	125.1	1.45	49.3	63.3	237.7	337.6	554.7	
16	1.17	133.0	1.56	53.0	63.3	249.3	337.6	643.0	
17	1.39	158.0	1.54	52.4	63.3	273.7	337.6	706.9	
18	1.56	177.4	1.50	51.0	63.3	271.7	337.6	772.8	
19	1.54	175.1	1.40	47.6	63.3	286.0	337.6	824.4	
20	1.25	142.1	1.25	42.5	63.3	247.9	337.6	914.1	
21	0.91	103.5	0.91	30.9	63.3	197.7	337.6	1,054.0	→1,012.8
22	0.62	70.5	0.39	13.3	63.3	147.1	0	865.7	
23	0.43	48.9	0.00	0	63.3	112.2	0	753.5	
TOTAL	24.00	2,728.8	24.00	816.0	1,519.2	5,064.0			

Table A-9-4 Calculation Table

NAME OF CITY: Narayanganj
POPULATION SUPPLIED: 1990
RESERVOIR QUANTITY: 20%
OPERATION HOUR FROM: 6 TO 21

HR	RATIO	HOUSE	RATIO	PUBLIC	UNKNOWN	TOTAL	SUPPLY	TANK
0	0.33	37.5	0.00	0	63.3	100.8	0	455.0
1	0.24	27.5	0.00	0	63.3	90.6	0	364.4
2	0.19	21.6	0.00	0	63.3	84.9	0	279.5
3	0.14	15.9	0.00	0	63.3	79.2	0	200.3
4	0.12	13.6	0.00	0	63.3	76.9	0	123.4
5	0.31	35.2	0.70	23.8	63.3	122.3	0	1.1 (0.2 minute)
6	0.98	111.4	1.33	45.2	63.3	219.9	337.6	117.7
7	1.33	151.2	1.54	52.4	63.3	266.9	337.6	188.4
8	1.57	178.5	1.72	58.5	63.3	300.3	337.6	225.7
9	1.72	195.5	1.68	57.1	63.3	315.9	337.6	247.4
10	1.69	192.2	1.60	54.4	63.3	309.9	337.6	275.1
11	1.56	177.4	1.49	50.7	63.3	291.4	337.6	321.3
12	1.34	152.4	1.40	47.6	63.3	263.3	337.6	395.6
13	1.29	146.7	1.28	43.5	63.3	253.5	337.6	479.7
14	1.22	138.7	1.26	42.8	63.3	244.8	337.6	572.5
15	1.10	125.1	1.45	49.3	63.3	237.7	337.6	672.4
16	1.17	133.0	1.56	53.0	63.3	249.3	337.6	760.7
17	1.39	158.0	1.54	52.4	63.3	273.7	337.6	824.6
18	1.56	177.4	1.50	51.0	63.3	271.7	337.6	890.5
19	1.54	175.1	1.40	47.6	63.3	286.0	337.6	942.1
20	1.25	142.1	1.25	42.5	63.3	247.9	337.6	1,031.8 →1,012.8
21	0.91	103.5	0.91	30.9	63.3	197.7	0	815.1
22	0.62	70.5	0.39	13.3	63.3	147.1	0	668.0
23	0.43	48.9	0.00	0	63.3	112.2	0	555.8
TOTAL	24.00	2,728.8	24.00	816.0	1,519.2			

Table A-9-5 Calculation Table

NAME OF CITY: Narayanganj
POPULATION SUPPLIED: 1989 (1990 x 94.3%)
RESERVOIR QUANTITY: 20%
OPERATION HOUR FROM: 7 TO 22

HR	RATIO	HOUSE	RATIO	PUBLIC	UNKNOWN	TOTAL	SUPPLY	TANK (1,012.8)
0	0.33		0.00	0		95.1	0	673.2
1	0.24		0.00	0		85.4	0	587.8
2	0.19		0.00	0		80.1	0	507.7
3	0.14		0.00	0		74.7	0	433.0
4	0.12		0.00	0		72.5	0	360.5
5	0.31		0.70			115.3	0	245.2
6	0.98		1.33			207.4	0	37.8 (6.7 minutes)
7	1.33		1.54			251.7	337.6	
8	1.57		1.72			283.2	337.6	
9	1.72		1.68			297.9	337.6	
10	1.69		1.60			292.2	337.6	
11	1.56		1.49			274.8	337.6	
12	1.34		1.40			248.3	337.6	
13	1.29		1.28			239.1	337.6	
14	1.22		1.26			230.8	337.6	
15	1.10		1.45			224.1	337.6	
16	1.17		1.56			235.1	337.6	
17	1.39		1.54			258.1	337.6	
18	1.56		1.50			256.2	337.6	
19	1.54		1.40			269.7	337.6	
20	1.25		1.25			233.8	337.6	
21	0.91		0.91			186.4	337.6	→1,012.8
22	0.62		0.39			138.7	0	874.1
23	0.43		0.00			105.8	0	768.3
TOTAL	24.00		24.00					

DRAWINGS

No.1 Production Well

No.4 Overhead Tank 300 m^3

No.3 Overhead Tank
2,000 m^3x 2 Nos.

No.2 Overhead Tank 910 m^3
(Existing)

R I V E R

West Water Purification Plant (Existing)

No.1 Overhead Tank 1,000 m^3

West Water Purification Plant (Proposed)

East Water Purification Plant
(Proposed)

No.8 Overhead Tank 1,000 m^3

GRAPHIC SCALE

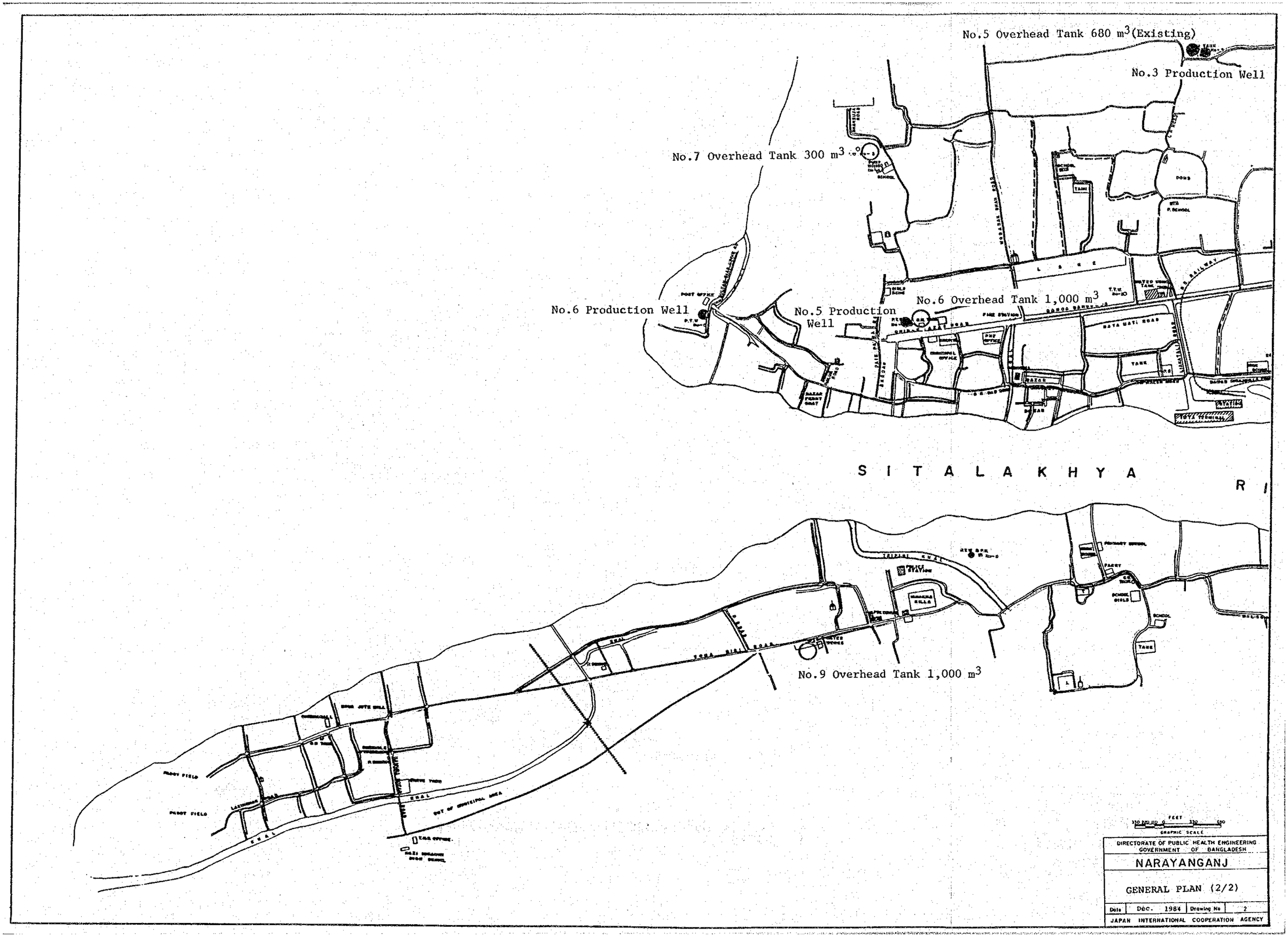
DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

NARAYANGANJ

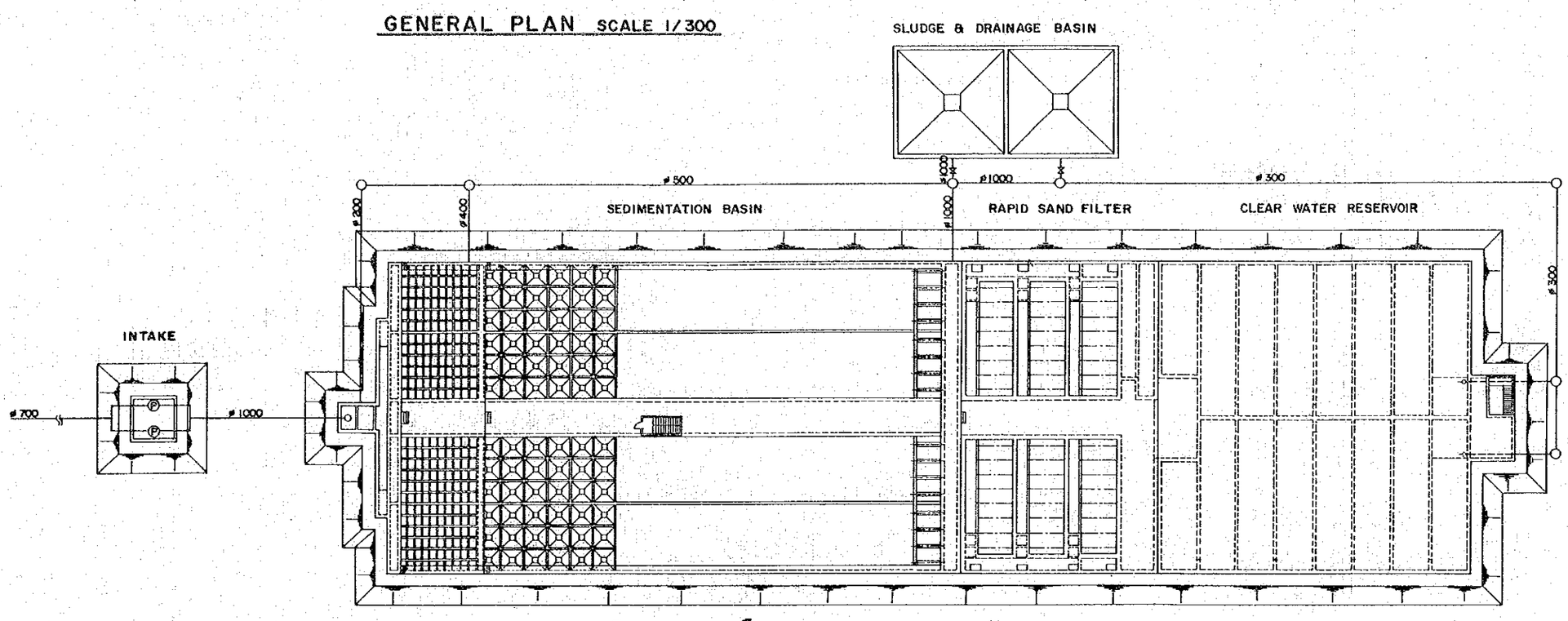
GENERAL PLAN (1/2)

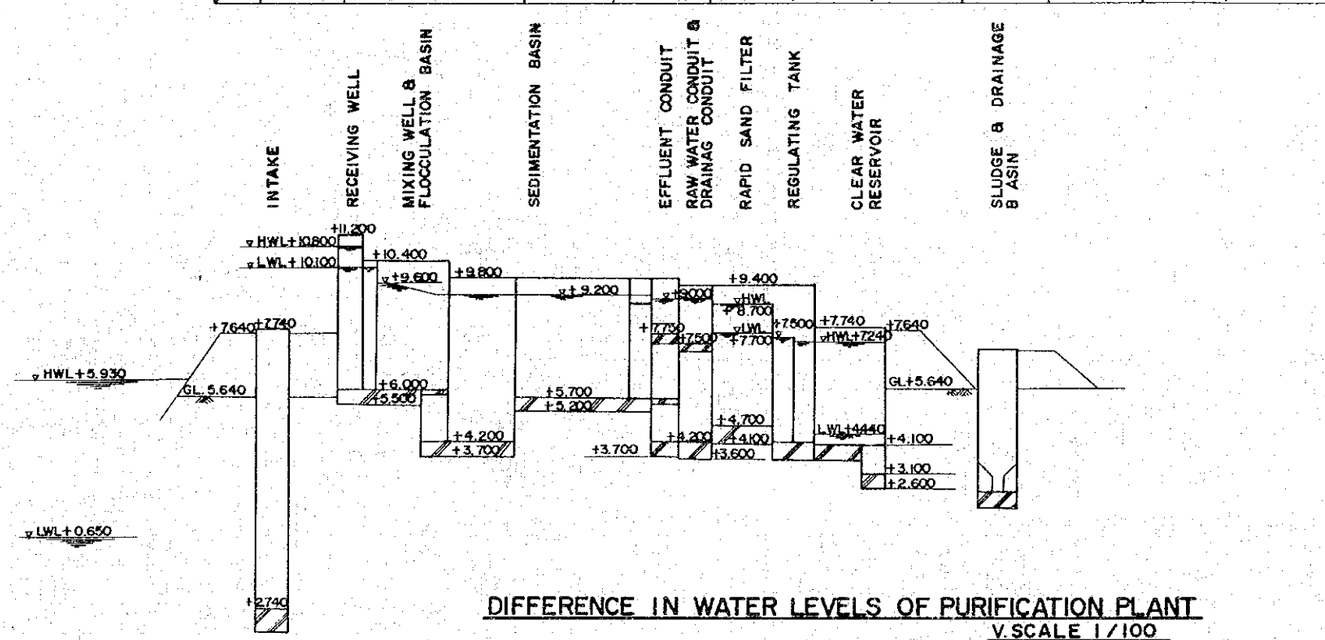
Date	Dec. 1984	Drawing No	1

JAPAN INTERNATIONAL COOPERATION AGENCY


No.5 Overhead Tank 680 m3(Existing)
No.3 Production Well
No.7 Overhead Tank 300 m3
No.6 Production Well
No.5 Production Well
No.6 Overhead Tank 1,000 m3
S I T A L A K H Y A
R I
No.9 Overhead Tank 1,000 m3
FEET
GRAPHIC SCALE
DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH
NARAYANGANJ
GENERAL PLAN (2/2)
Date Dec. 1984 Drawing No 2
JAPAN INTERNATIONAL COOPERATION AGENCY

GENERAL PLAN SCALE 1/300





DIFFERENCE IN WATER LEVELS OF PURIFICATION PLANT
V. SCALE 1/100

SCALE
0 1 2 3 4 5 (m)

SCALE
0 5 10 15 20 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

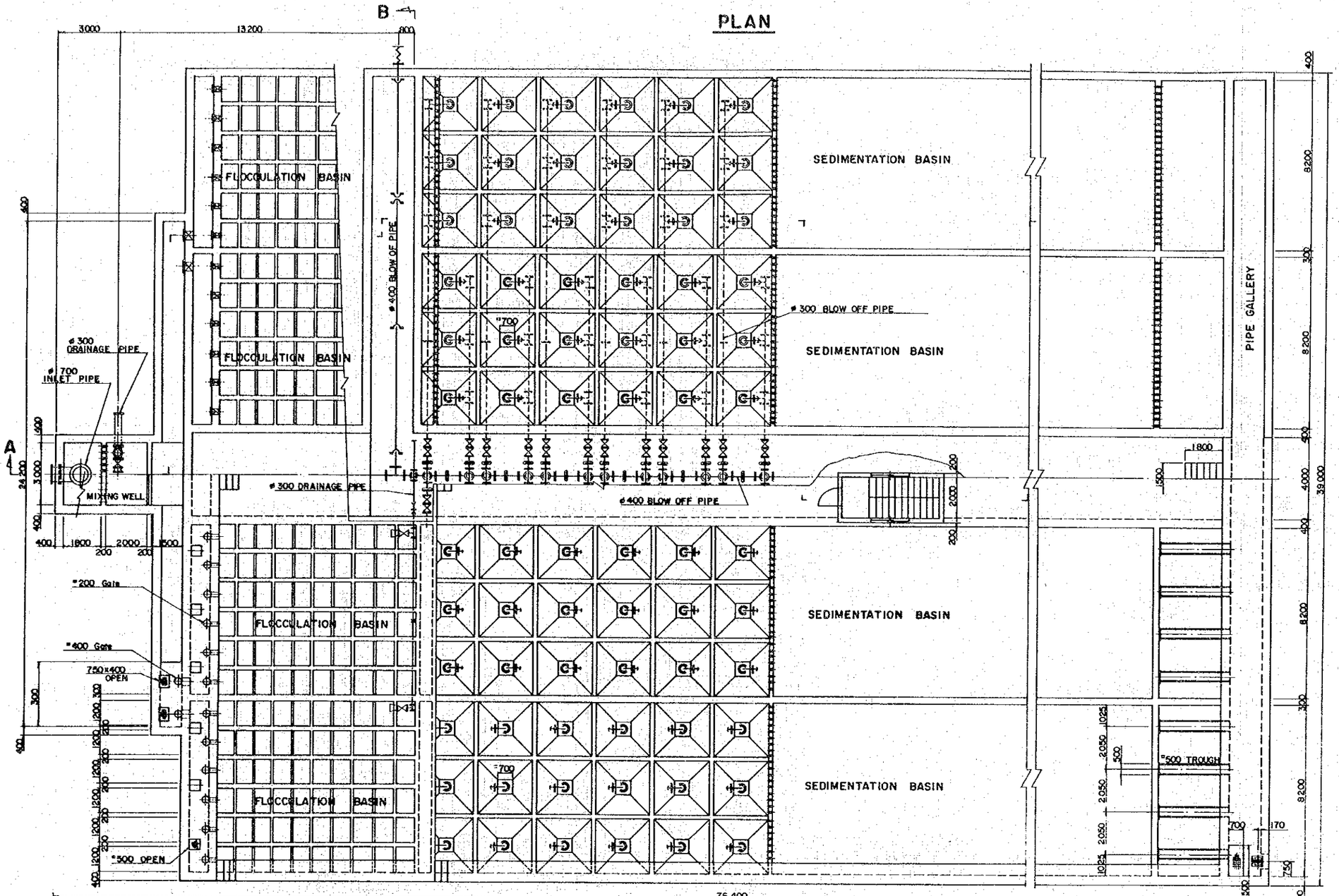
NARAYANGANJ

WEST PURIFICATION PLANT
GENERAL PLAN AND DIFFERENCE IN WATER LEVELS

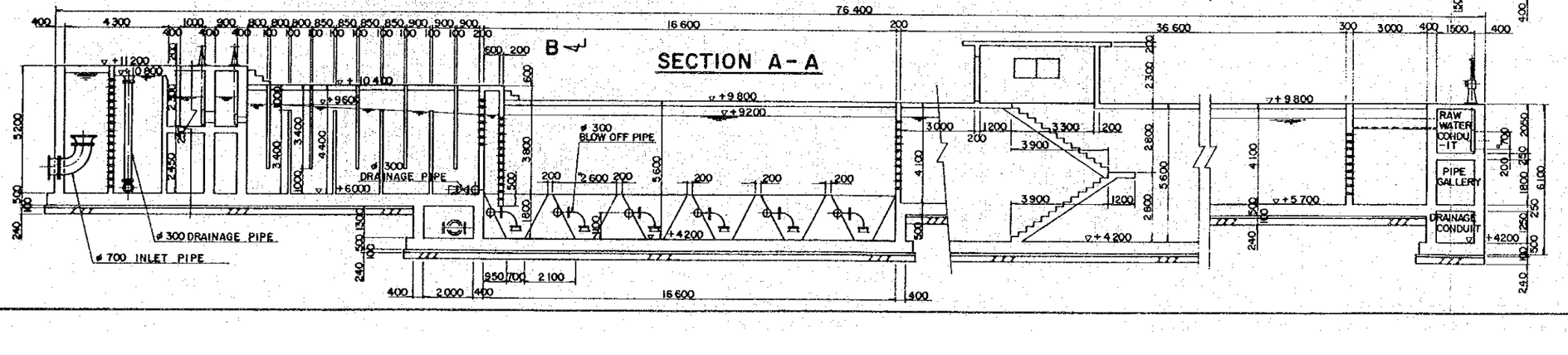
Date	Dec. 1984	Drawing No	3

JAPAN INTERNATIONAL COOPERATION AGENCY

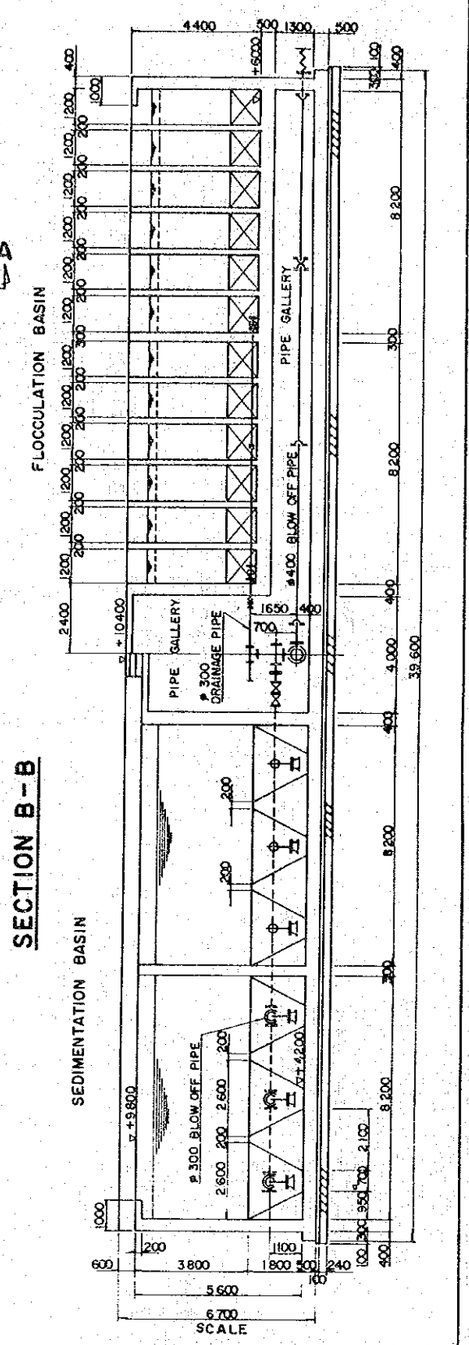
PLAN



SECTION A-A



SECTION B-B



DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

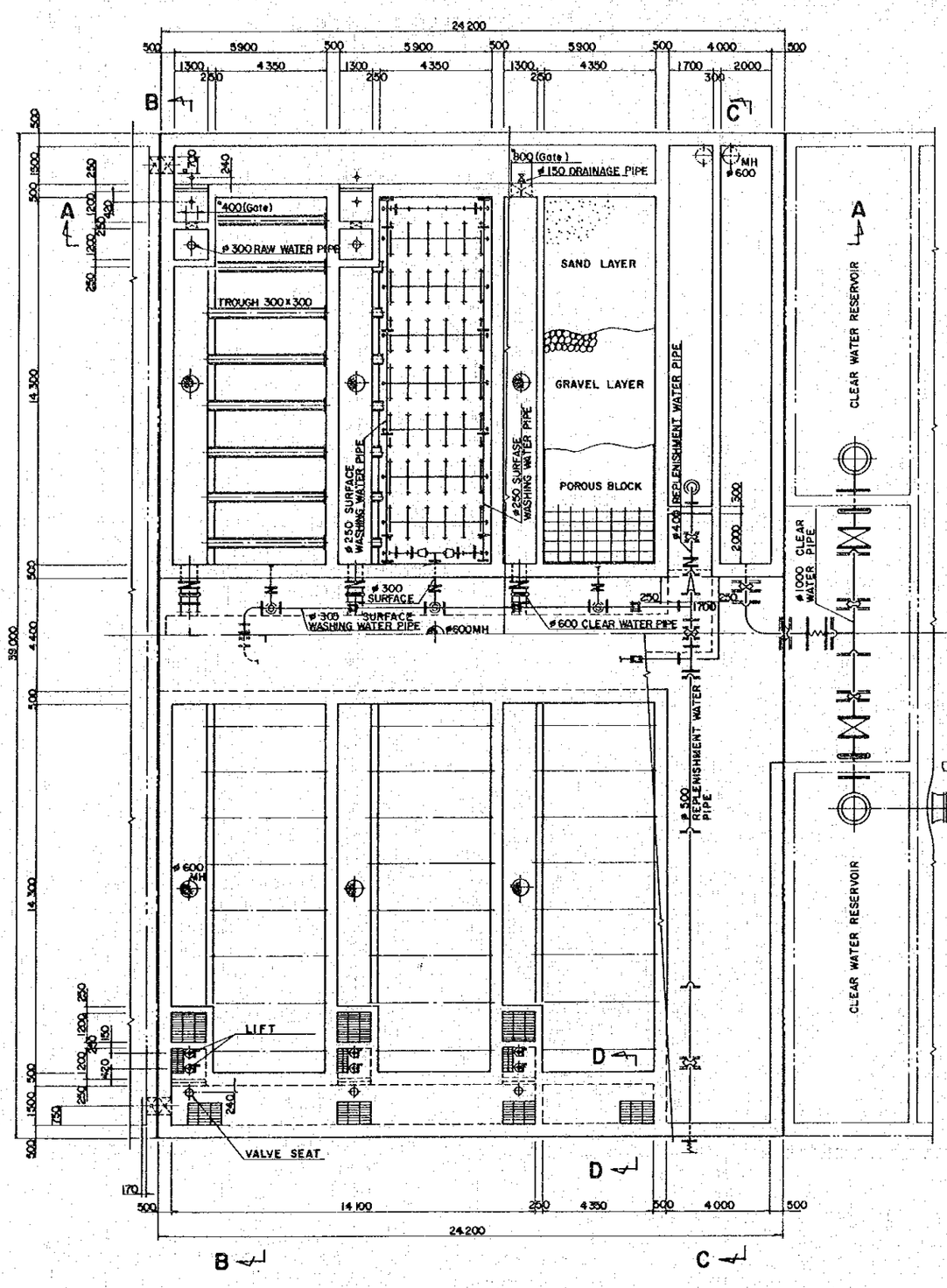
NARAYANGANJ

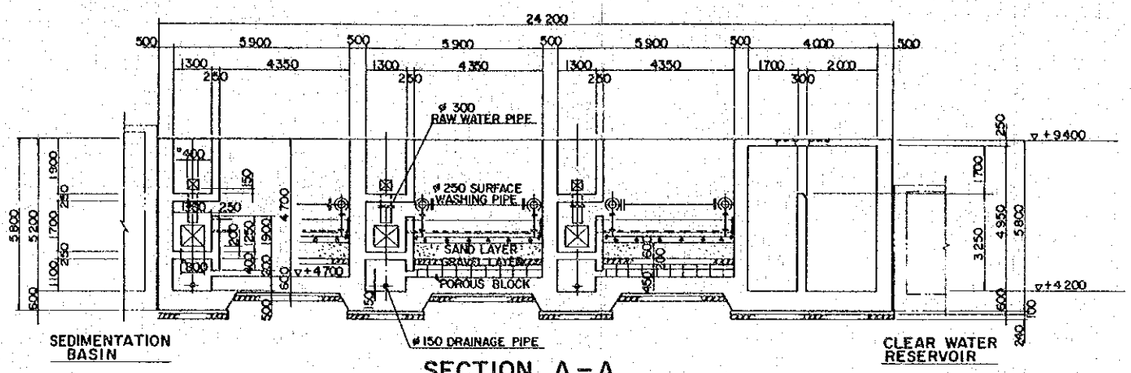
WEST PURIFICATION PLANT FLOCCULATION BASIN & SEDIMENT -ATION BASIN PLAN AND SECTIONS

Date	Dec. 1984	Drawing No	4

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN





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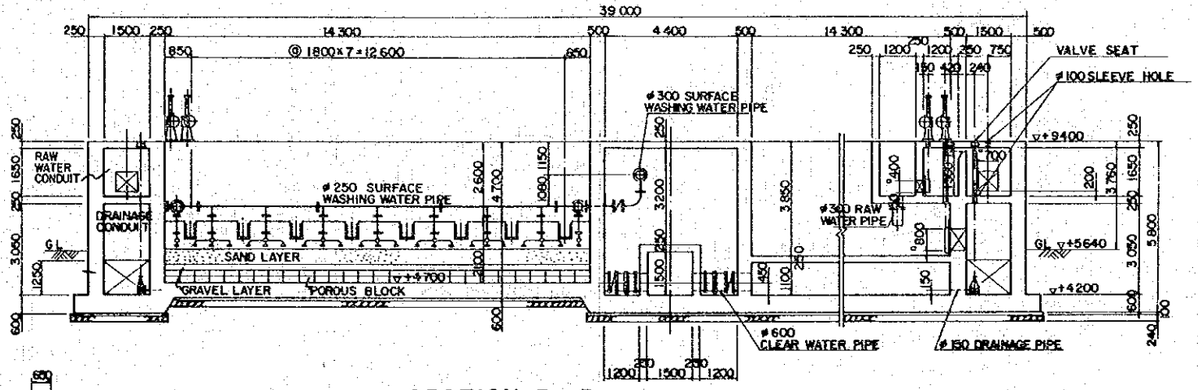

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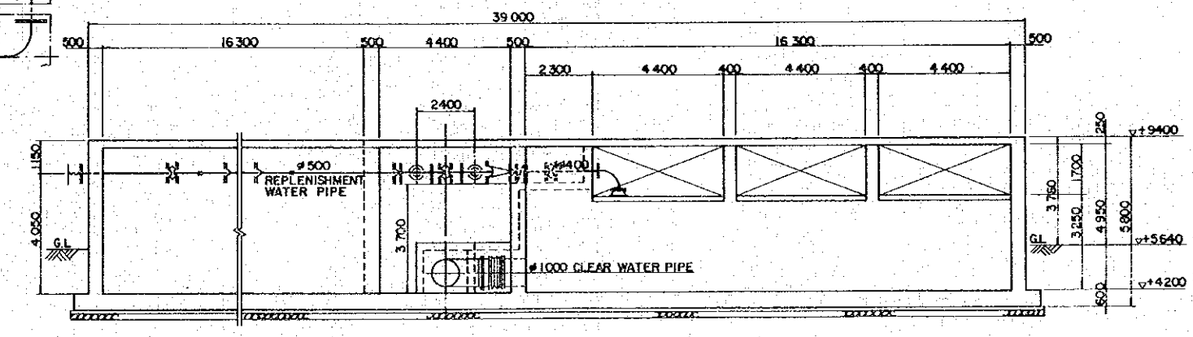
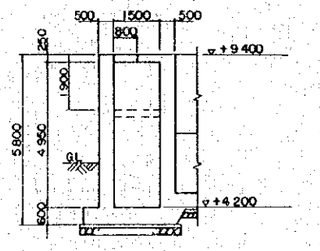


SECTION C-C



SECTION D-D

SCALE

0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

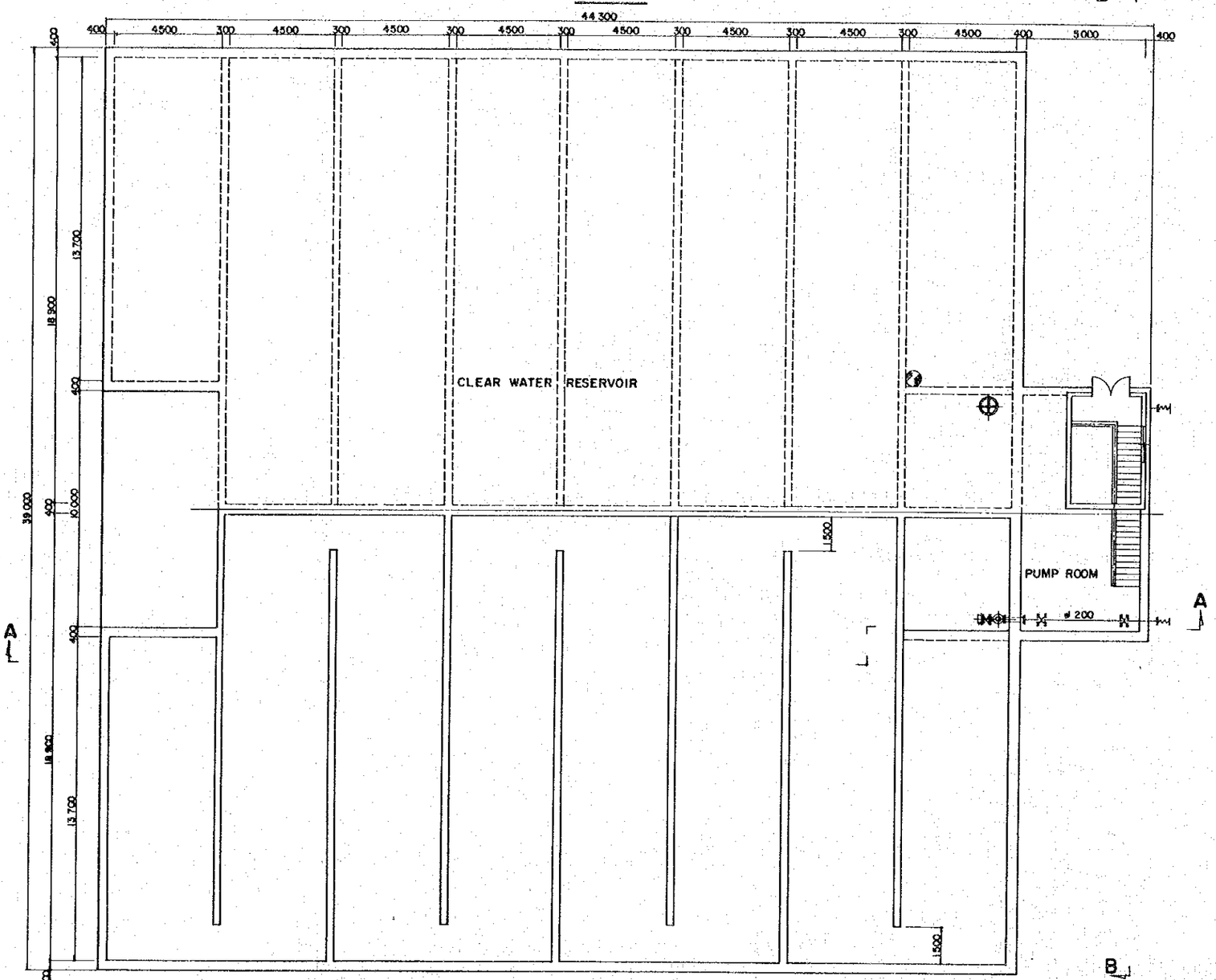
NARAYANGANJ

WEST PURIFICATION PLANT
RAPID SAND FILTER
PLAN AND SECTIONS

Date	Dec. 1984	Drawing No	5

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



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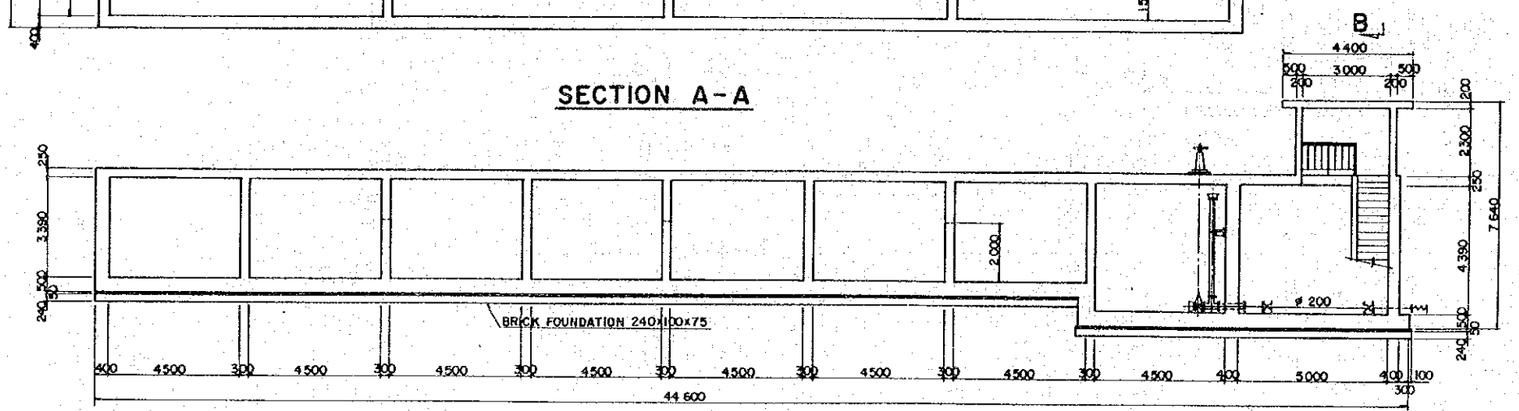

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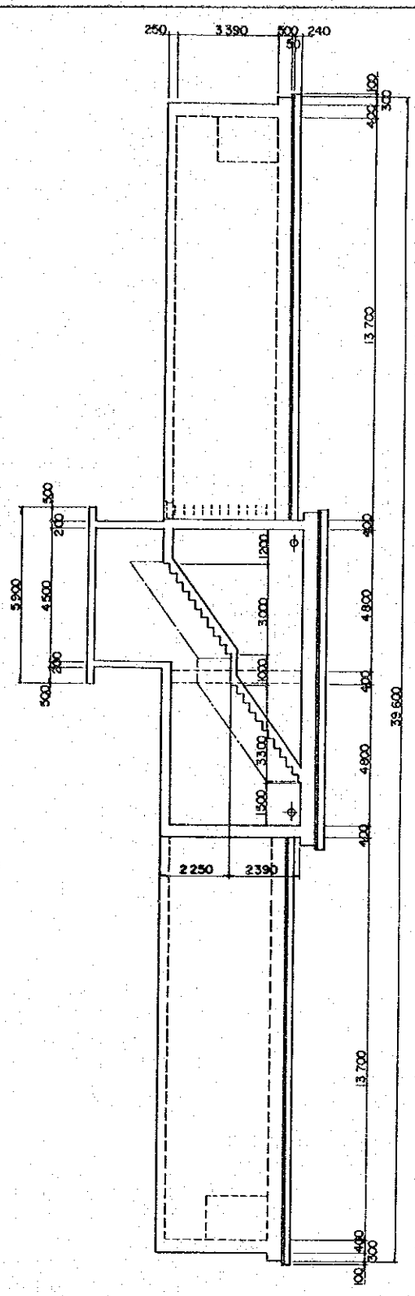


SCALE

0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

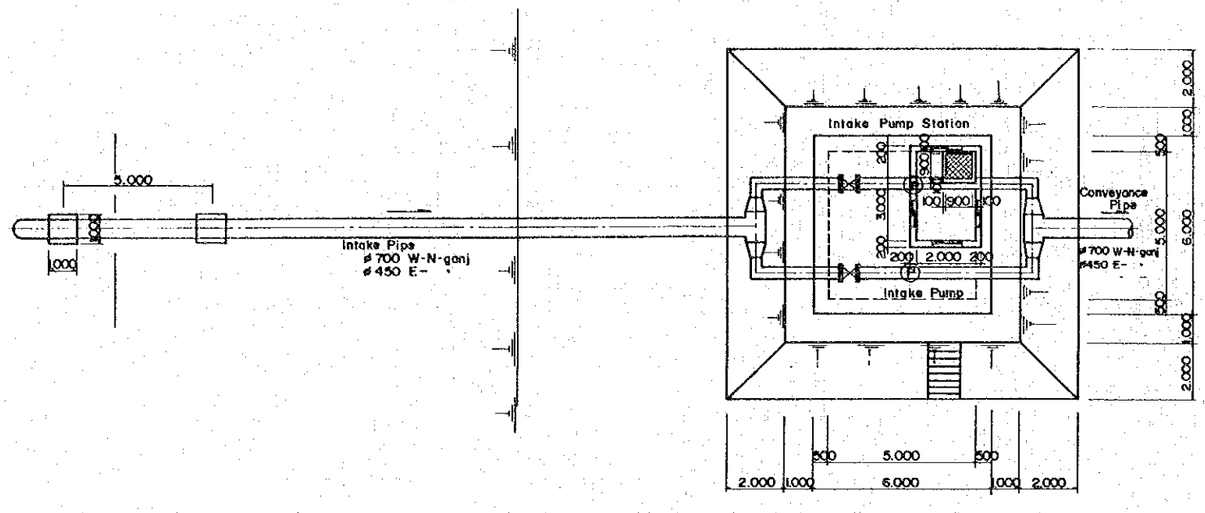
NARAYANGANJ

WEST PURIFICATION PLANT
CLEAR WATER RESERVOIR
PLAN AND SECTIONS

Date	Dec. 1984	Drawing No	6

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



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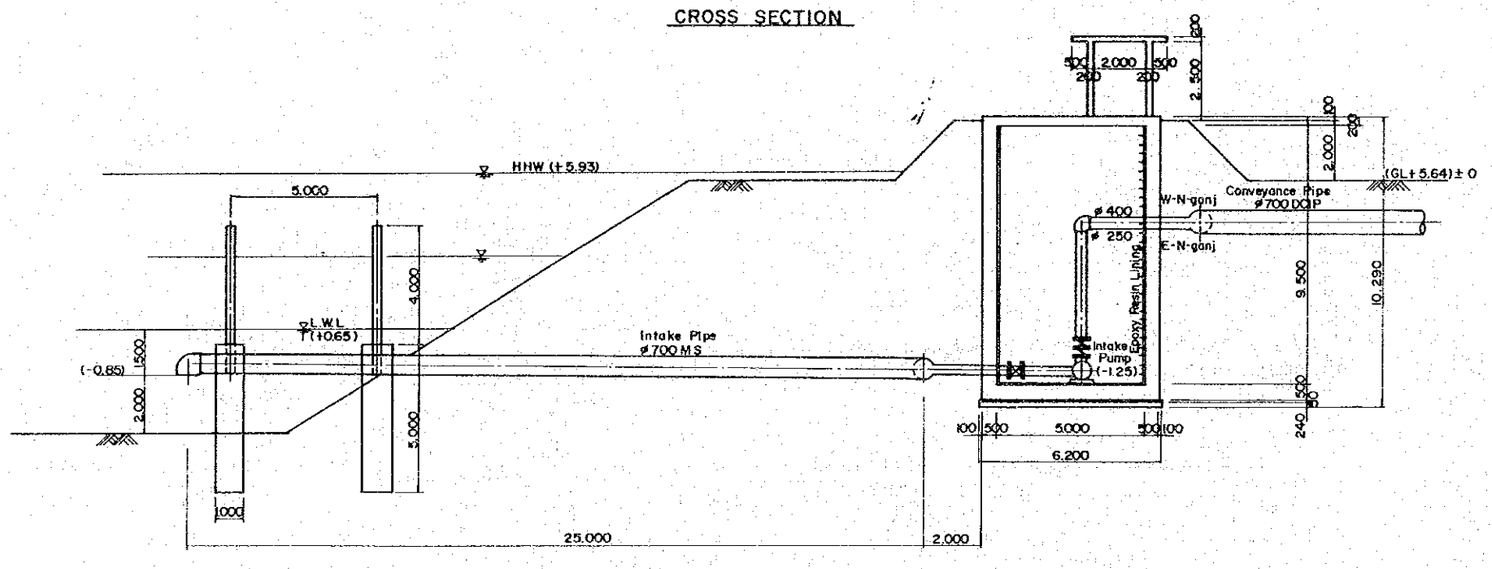


SCALE

0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

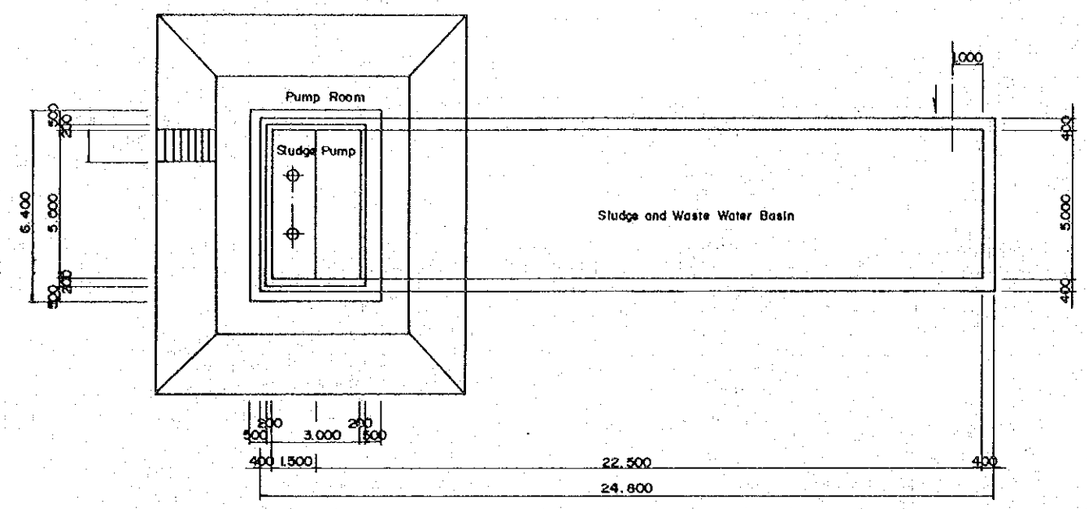
NARAYANGANJ

WEST & EAST PURIFICATION PLANT
INTAKE FACILITIES

Date	Dec. 1984	Drawing No.	7 , 13

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



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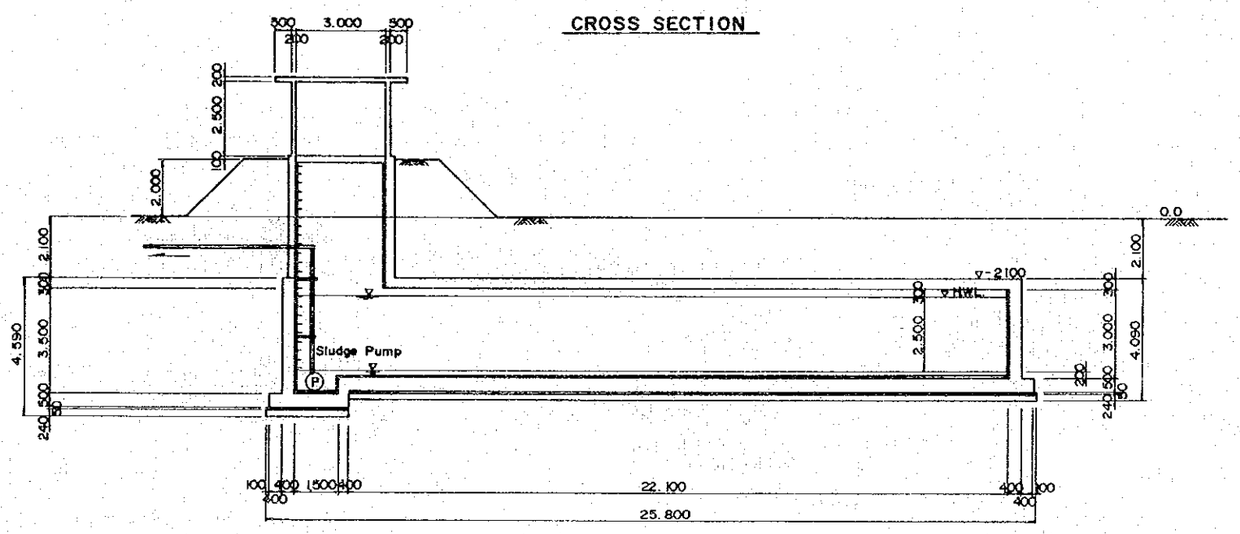


SCALE

0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

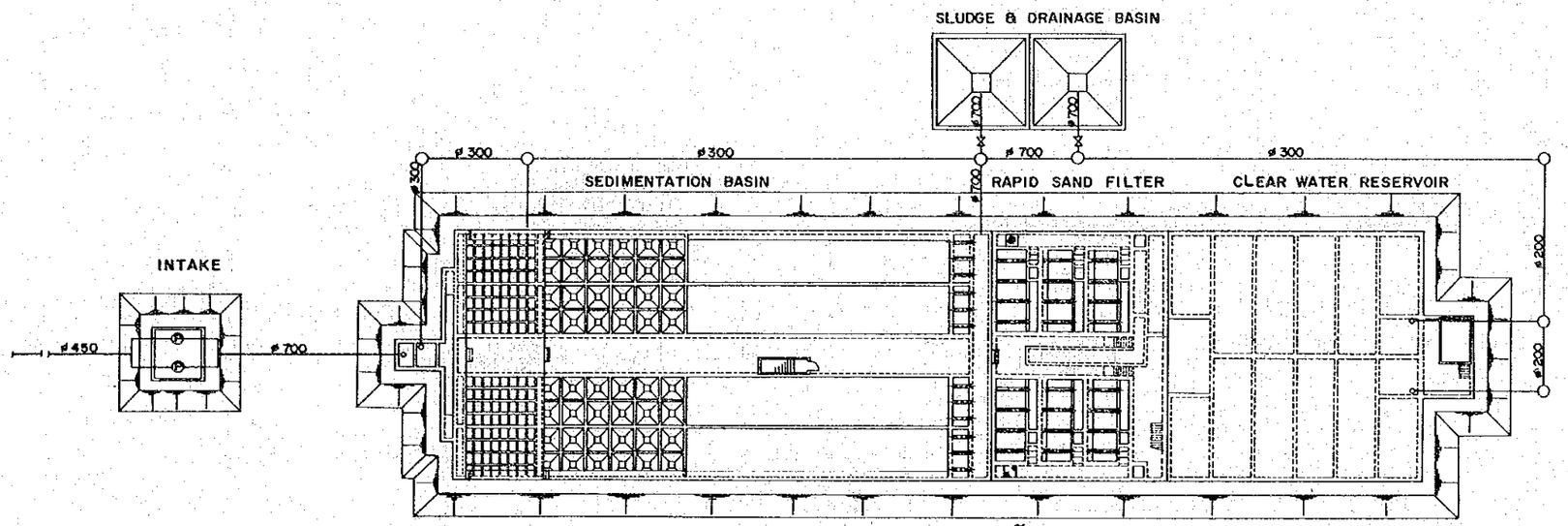
NARAYANGANJ

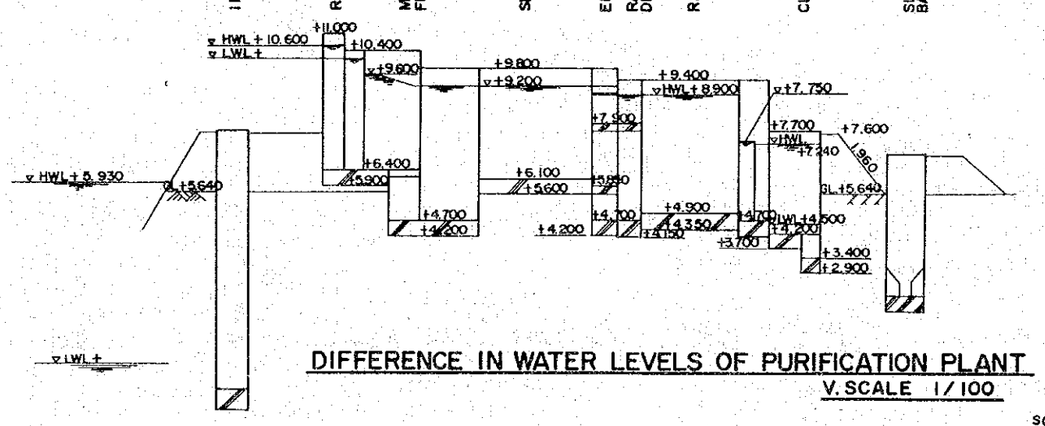
WEST PURIFICATION PLANT
SLUDGE AND WASHING WATER BASIN

Date	Dec. 1984	Drawing No.	8

JAPAN INTERNATIONAL COOPERATION AGENCY

GENERAL PLAN SCALE 1/300





DIFFERENCE IN WATER LEVELS OF PURIFICATION PLANT

V. SCALE 1/100

SCALE

0 1 2 3 4 5 (m)

SCALE

0 5 10 15 20 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

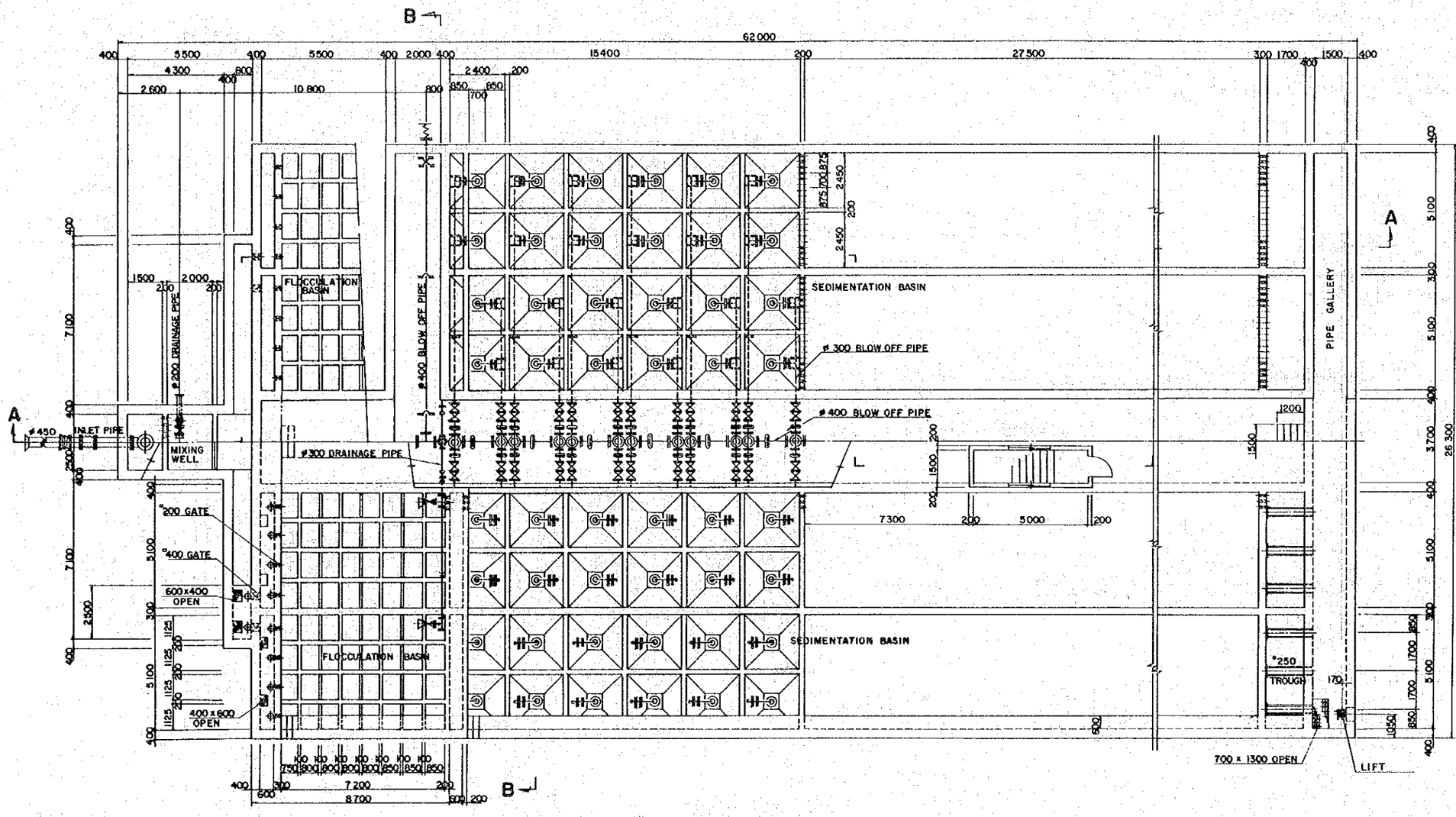
NARAYANGANJ

EAST PURIFICATION PLANT
GENERAL PLAN AND DIFFERENCE IN WATER LEVELS

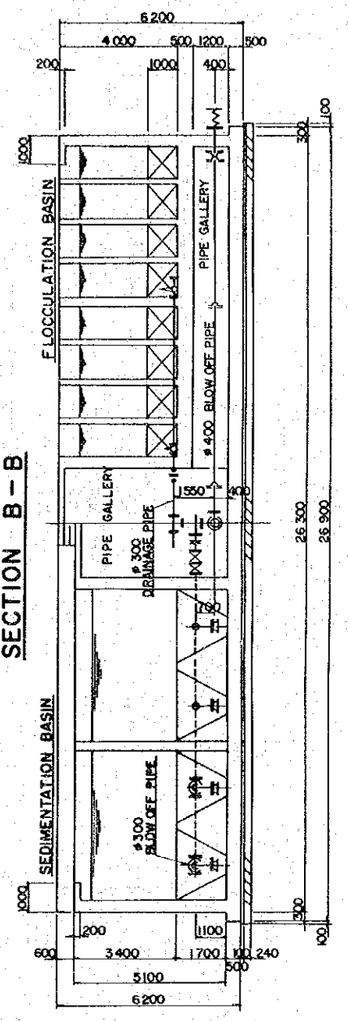
Date	Dec. 1984	Drawing No	9

JAPAN INTERNATIONAL COOPERATION AGENCY

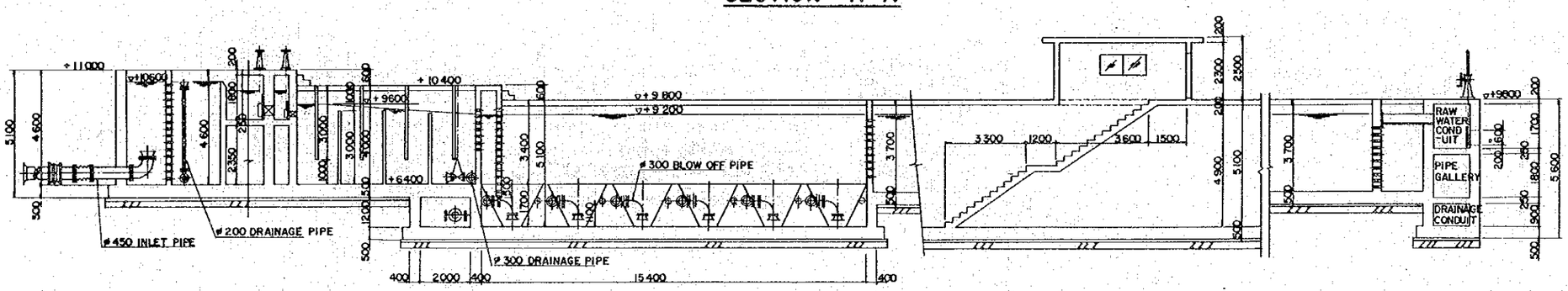
PLAN



SECTION B-B



SECTION A-A



SCALE 0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

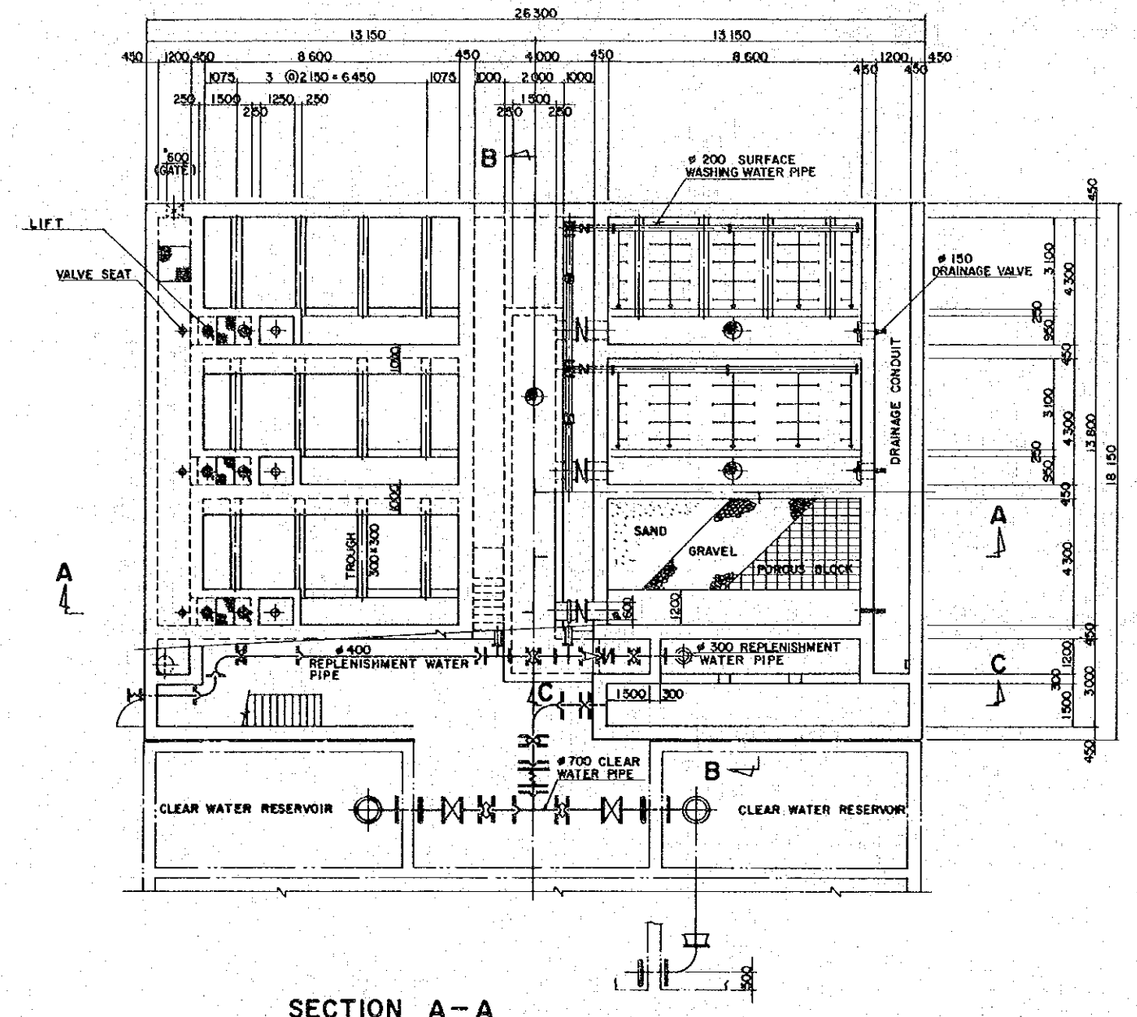
NARAYANGANJ

EAST PURIFICATION PLANT FLOCCULATION BASIN & SEDIME -NTATION BASIN PLAN & SECTIONS

Date	Dec. 1984	Drawing No	10

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



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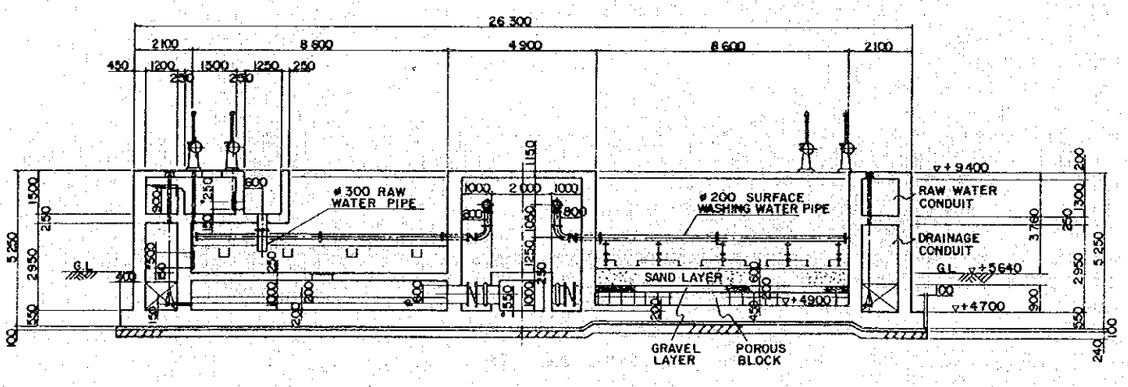
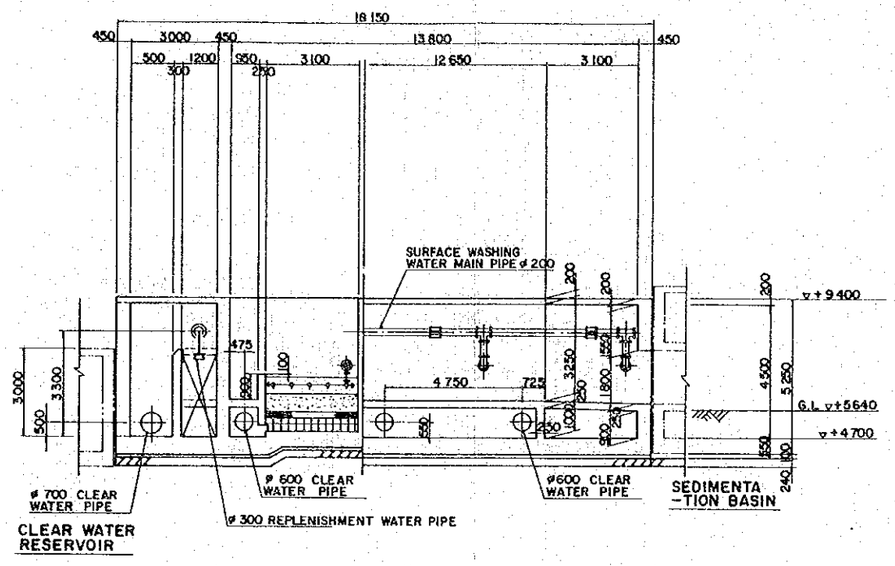
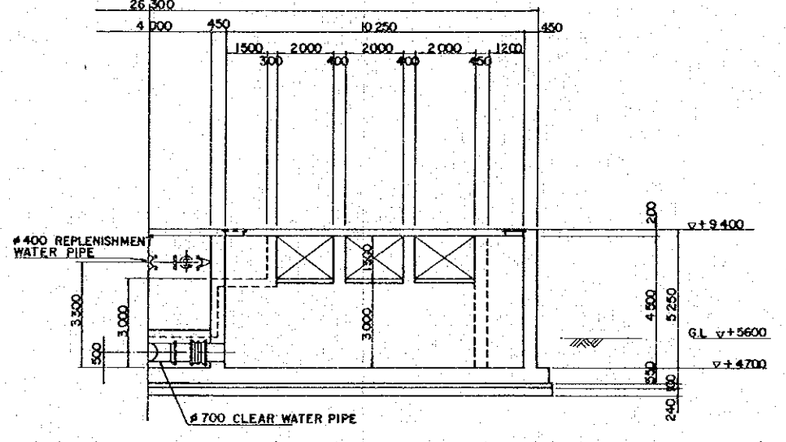


SECTION B–B

S = 1/100



SECTION C–C



SCALE

0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

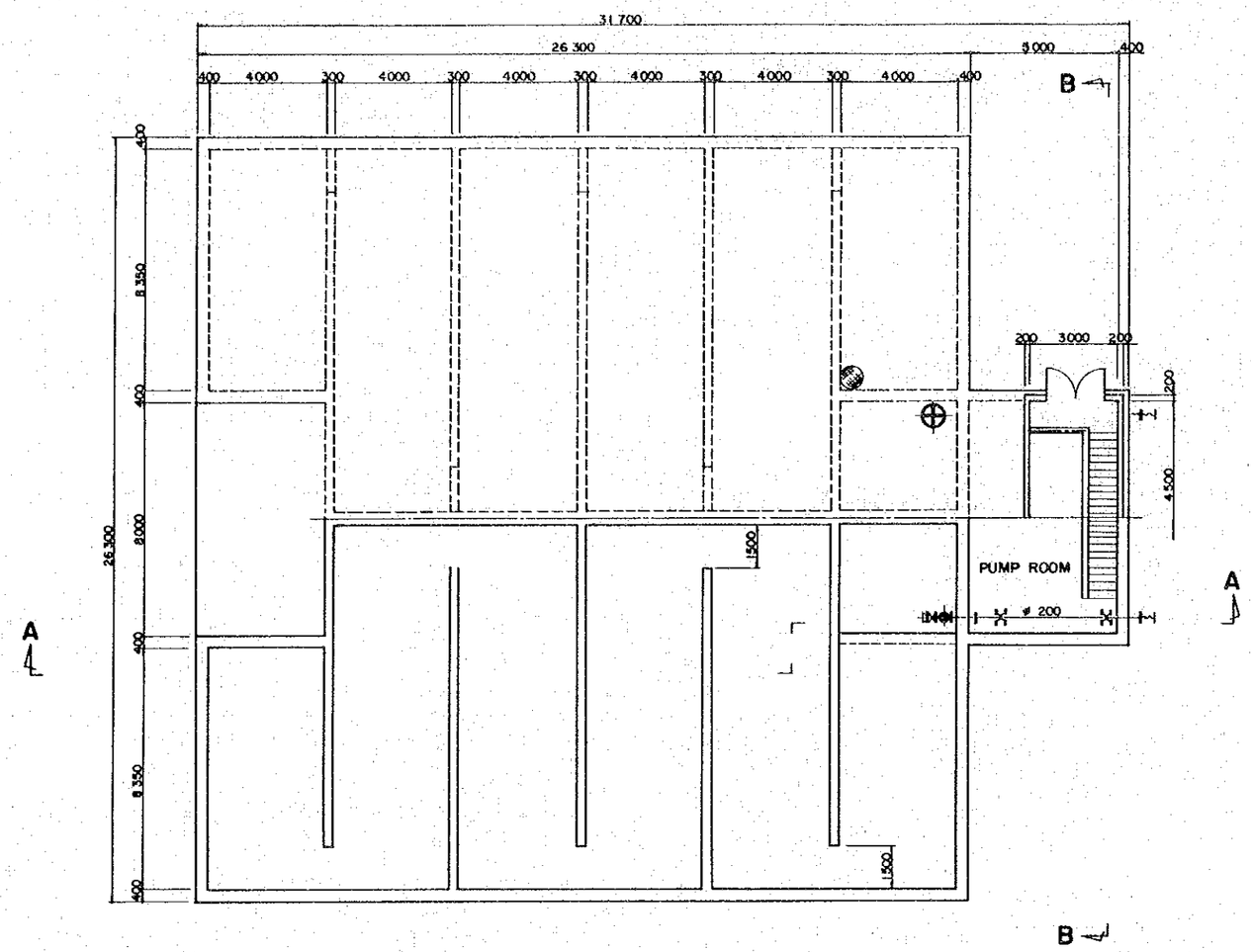
NARAYANGANJ

EAST PURIFICATION PLANT
RAPID SAND FILTER
PLAN AND SECTIONS

Date	Dec. 1984	Drawing No	11

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



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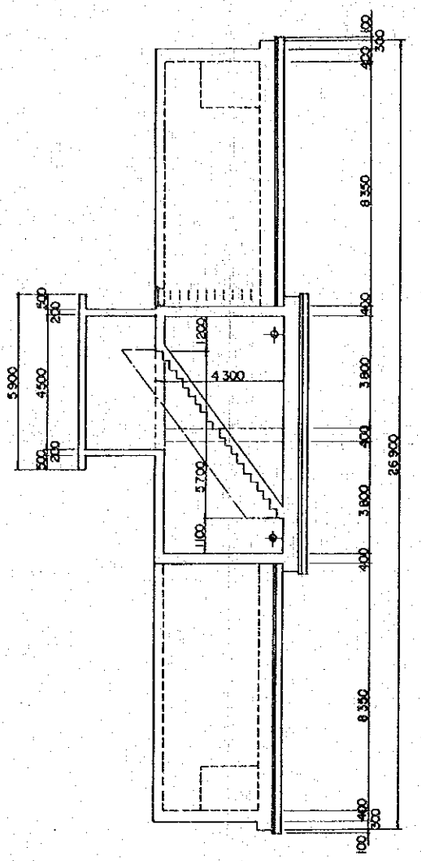
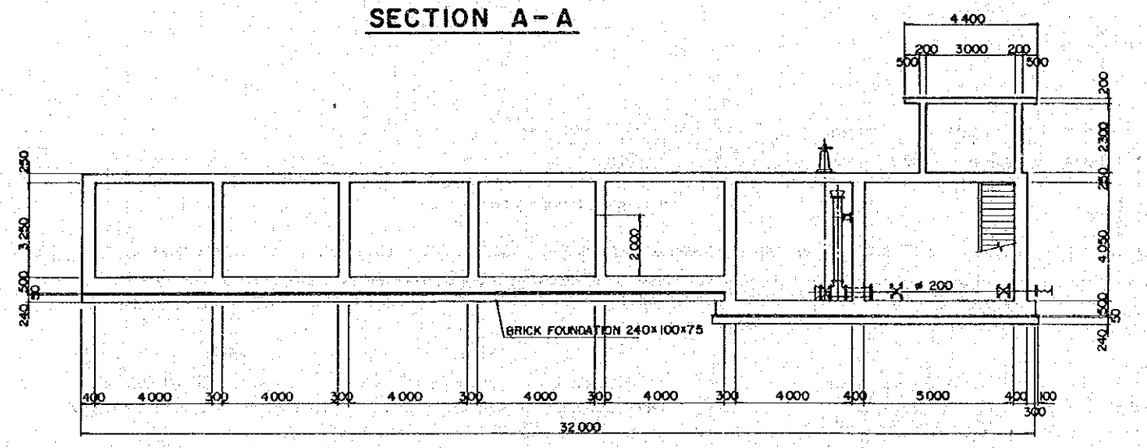


SECTION A-A



SCALE

0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

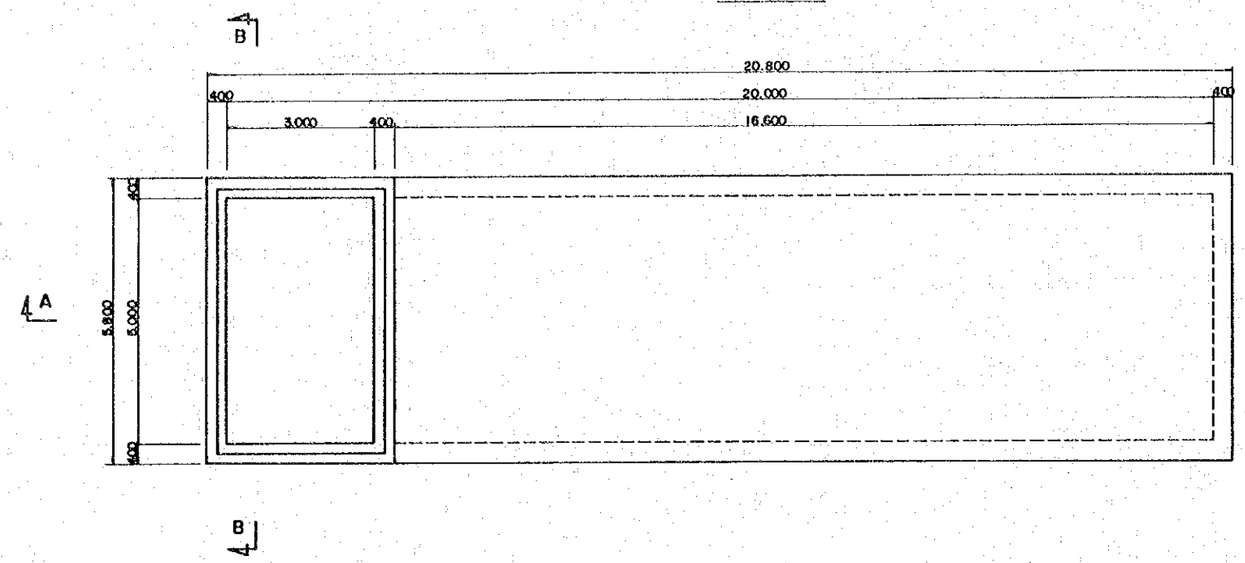
NARAYANGANJ

EAST PURIFICATION PLANT
CLEAR WATER RESERVOIR
PLAN AND SECTIONS

Date	Dec. 1984	Drawing No	12

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



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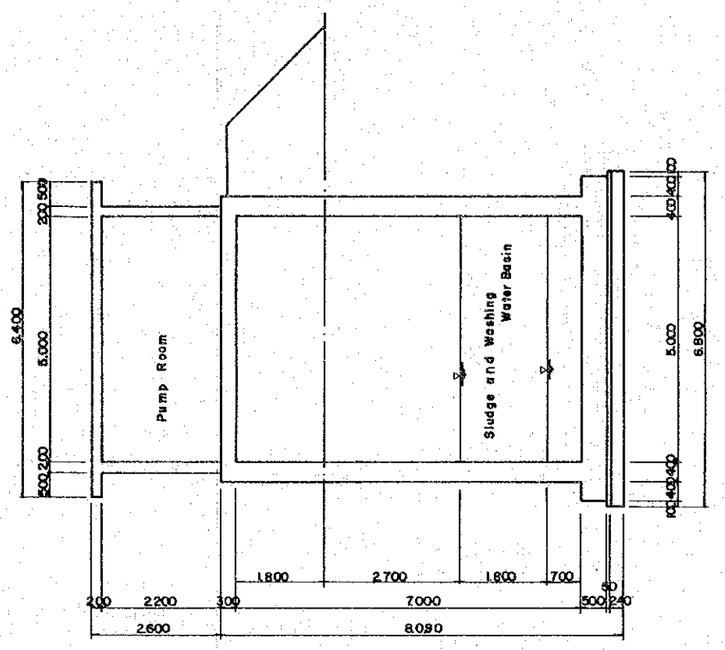
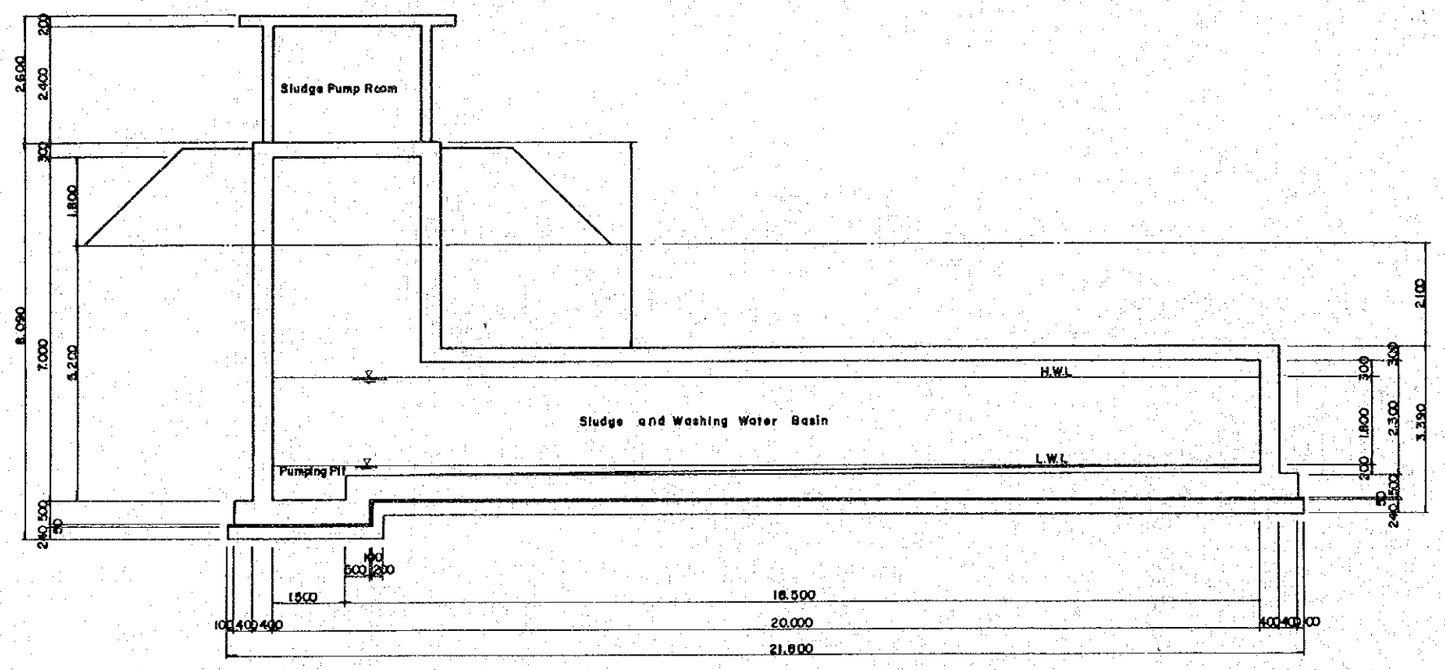


CROSS SECTION A - A



SCALE
0 1 2 3 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

NARAYANGANJ

EAST PURIFICATION PLANT
SLUDGE, WASHING WATER BASIN

Date	Dec. 1984	Drawing No.	14

JAPAN INTERNATIONAL COOPERATION AGENCY

S 1:4000

No 3 Overhead Tank
V = 2000 m3 x 2

No 2 Overhead Tank (Existing)
V = 910 m3

ø700 DCIP L=2540.0
ø400 MSP L=1680.0

Proposed Transmission Pipe ø700 mm

No 1 Overhead Tank
V = 1,000 m3

Existing Water Purification Plant

Existing Transmission Pipe ø400 mm

Proposed Water Purification Plant (West)

Existing Intake

Proposed Transmission Pipe ø450 DCIP L=650.0

Proposed Intake

Proposed Water Purification Plant (East)

SITALAKHYA RIVER

SCALE
0 100 200 300 (m)

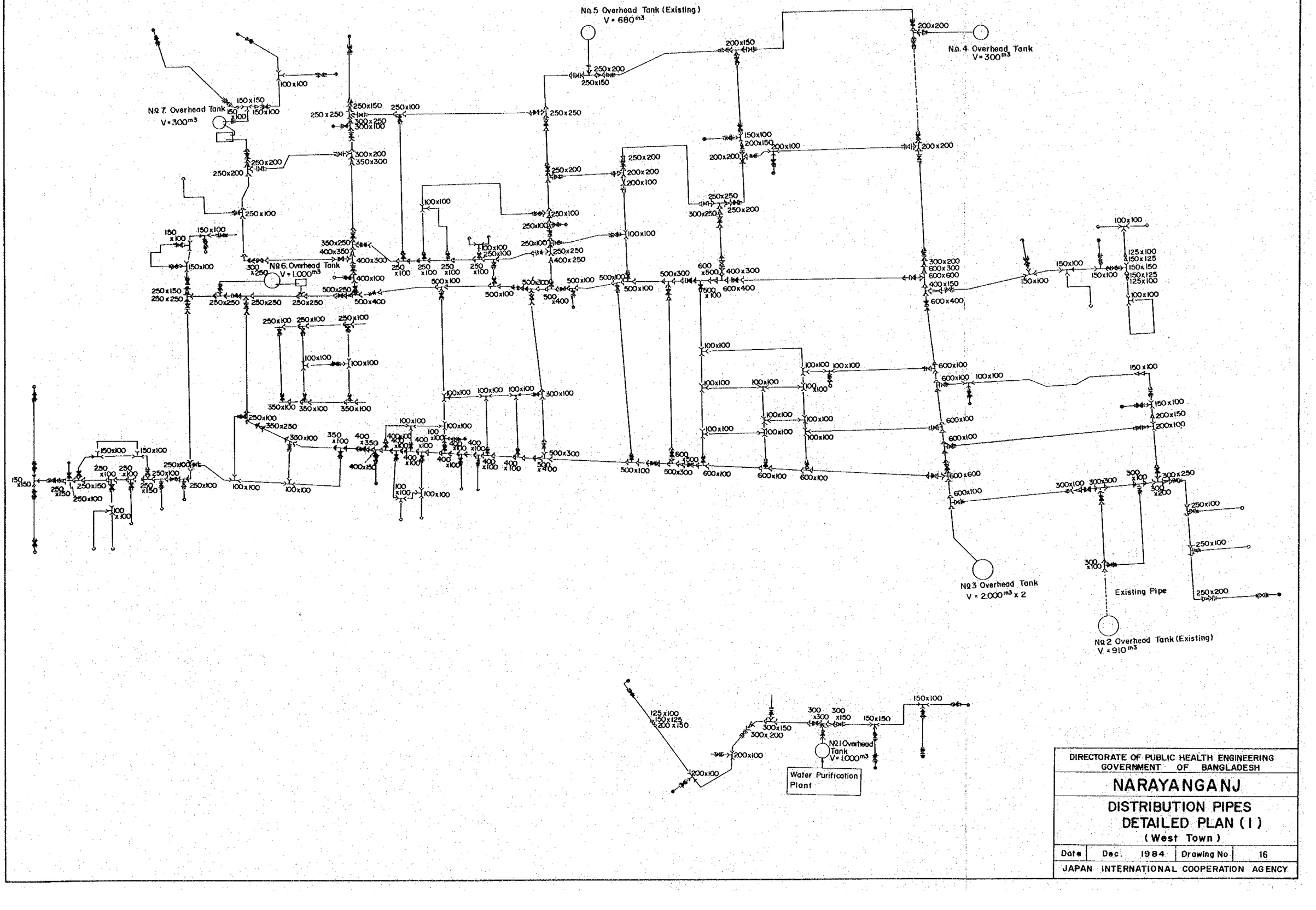
DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

NARAYANGANJ

TRANSMISSION PIPES PLAN

Date	Dec. 1984	Drawing No	15

JAPAN INTERNATIONAL COOPERATION AGENCY



DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

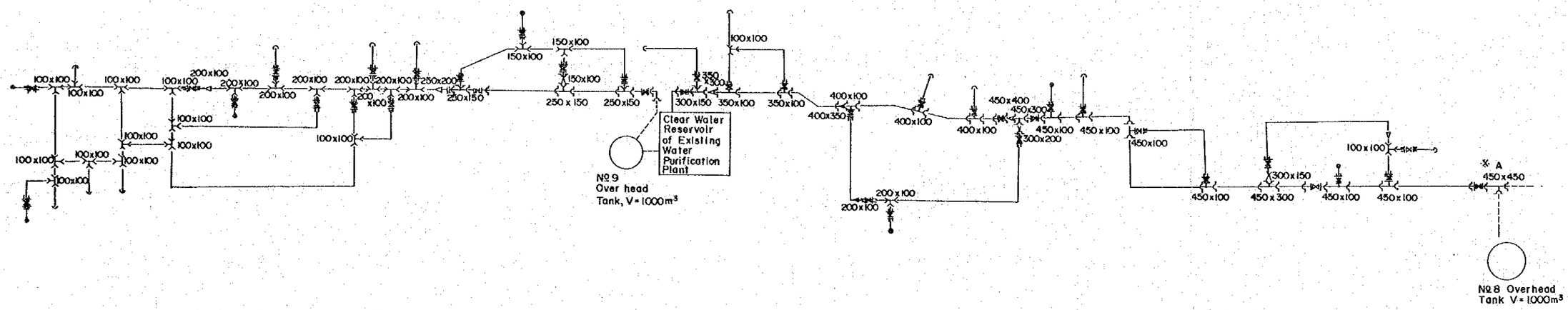
NARAYANGANJ

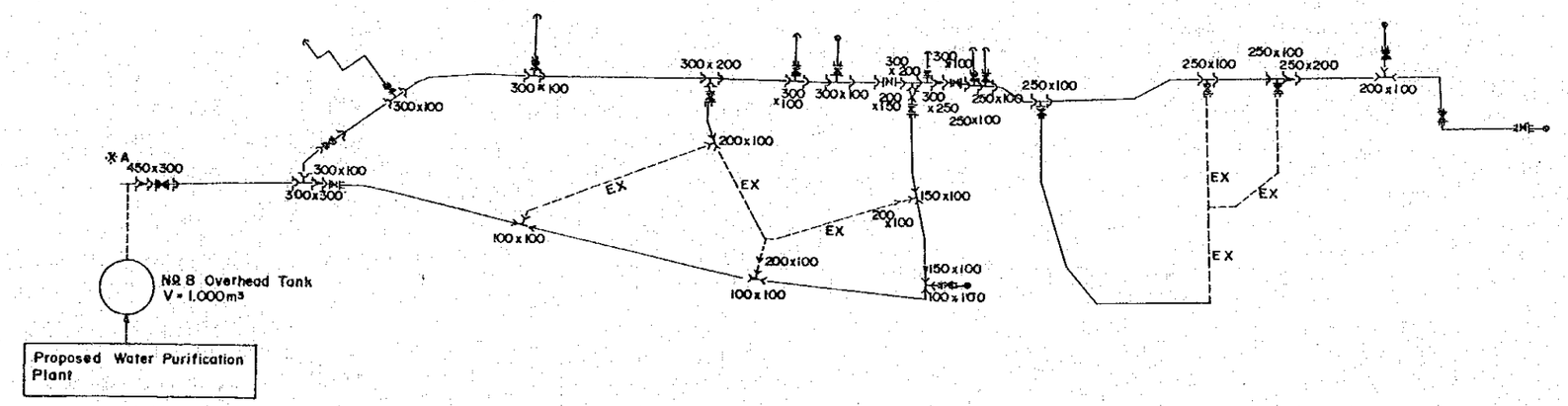
DISTRIBUTION PIPES DETAILED PLAN (I)

(West Town)

Date	Dec. 1984	Drawing No	16

JAPAN INTERNATIONAL COOPERATION AGENCY





DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

NARAYANGANJ

DISTRIBUTION PIPES DETAILED PLAN (2)

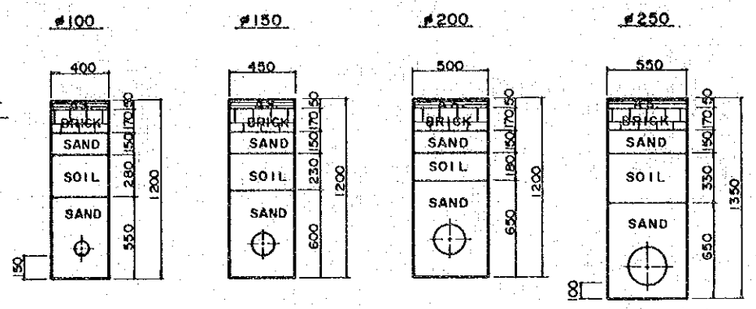
(West Town)

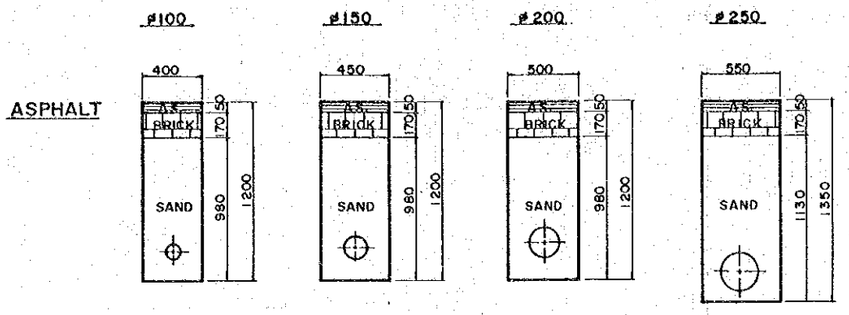
Date	Dec. 1984	Drawing No	17

JAPAN INTERNATIONAL COOPERATION AGENCY

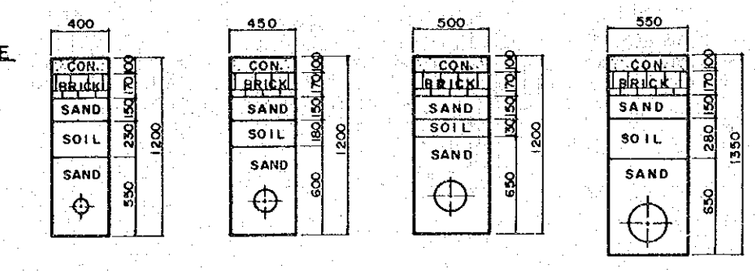
ROAD CROSSING

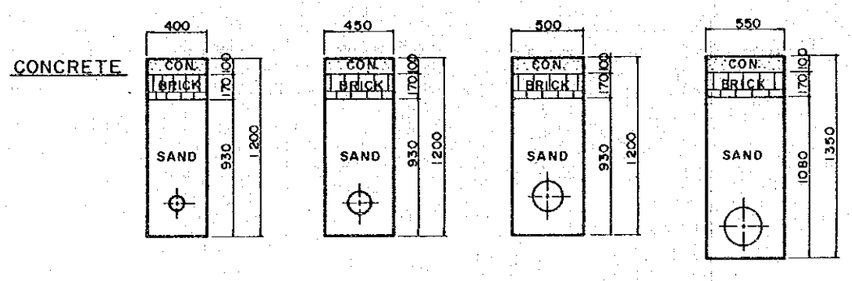
ASPHALT



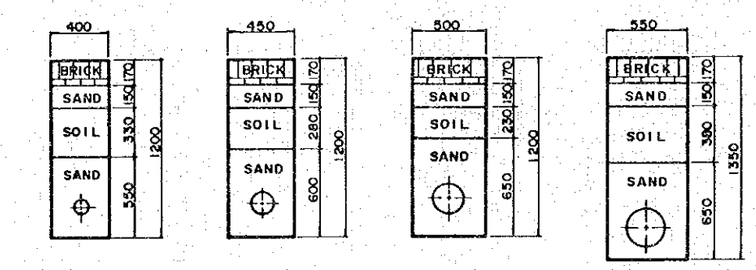


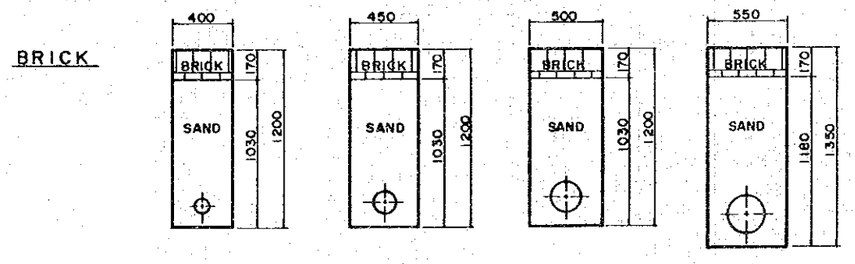
CONCRETE



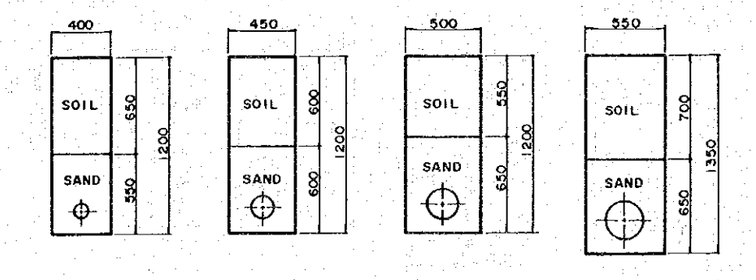


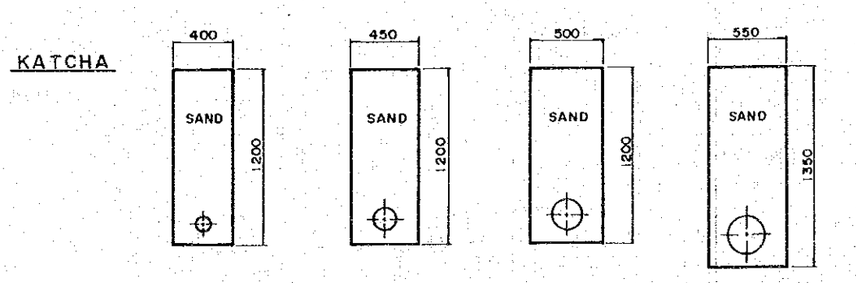
BRICK





KATCHA





S = 1:20

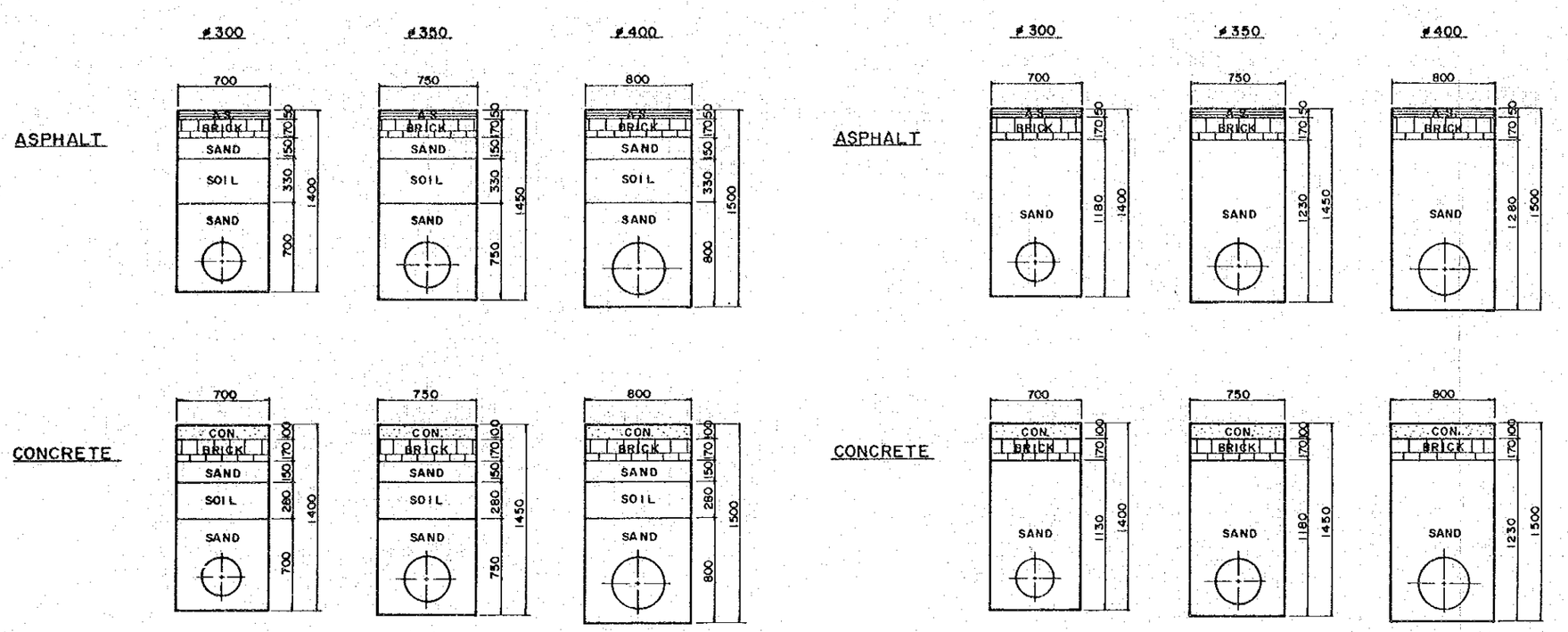
0 0.5 1.0 1.5m

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

LAYING DISTRIBUTION PIPE (1/3)
EXCAVATION AND REFILLING

Date	Dec. 1984	Drawing No.	18

JAPAN INTERNATIONAL COOPERATION AGENCY

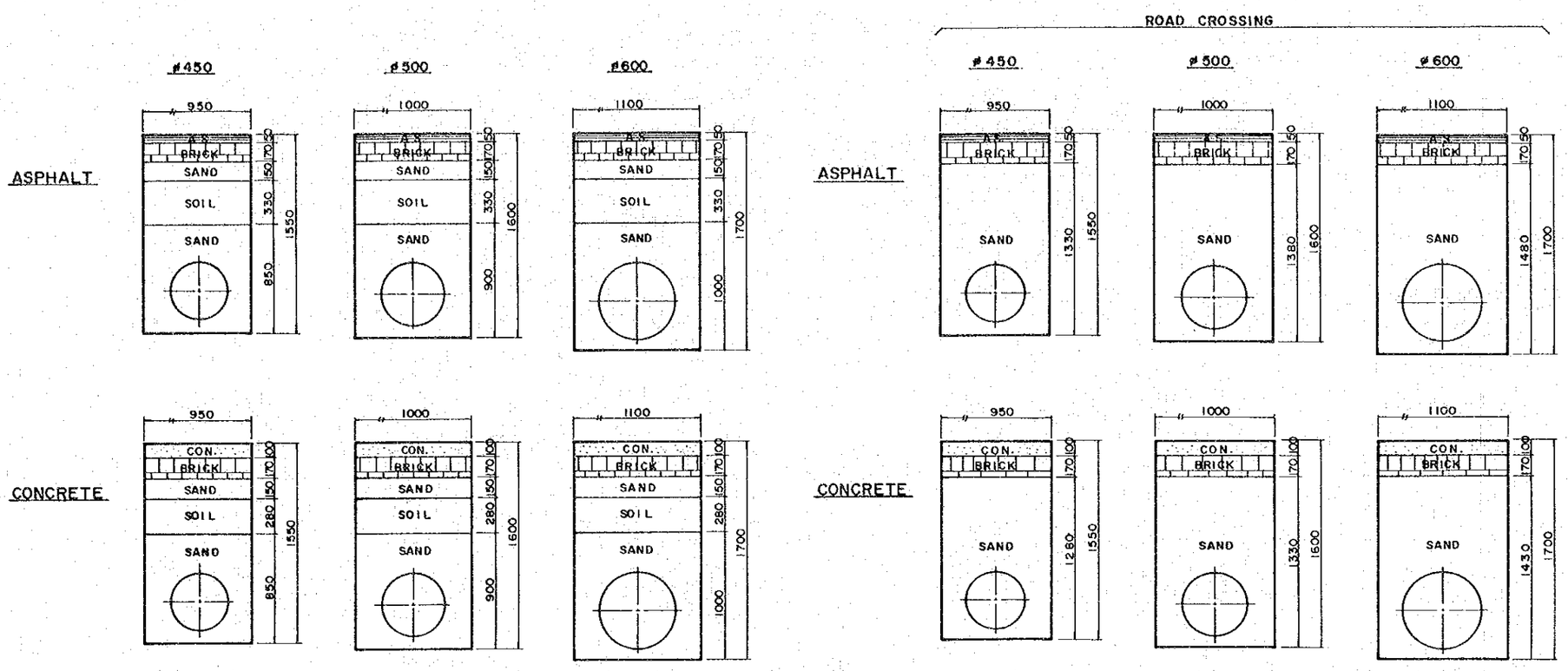


DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

LAYING DISTRIBUTION PIPE (2/3) EXCAVATION AND REFILLING

Date	Dec. 1984	Drawing No.	19

JAPAN INTERNATIONAL COOPERATION AGENCY

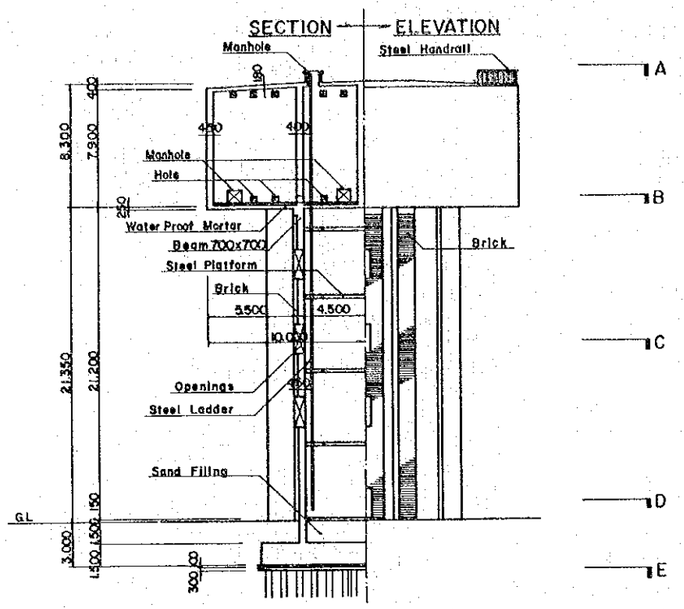


DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

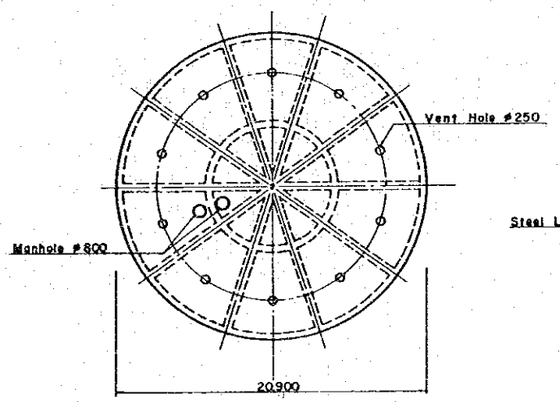
LAYING DISTRIBUTION PIPE (3/3) EXCAVATION AND REFILLING

Date	Dec. 1984	Drawing No.	20

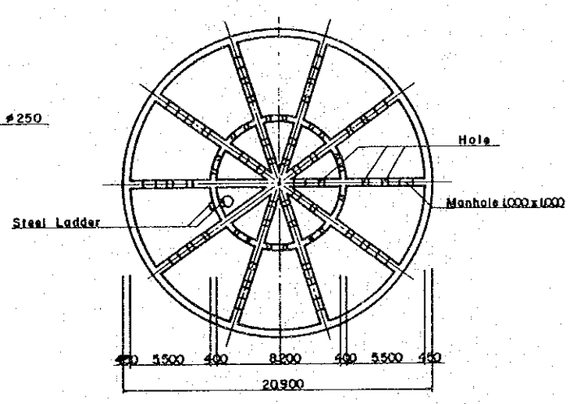
JAPAN INTERNATIONAL COOPERATION AGENCY



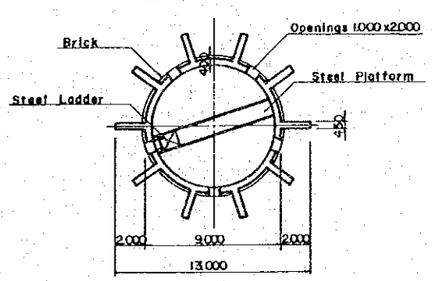
A - SECTION



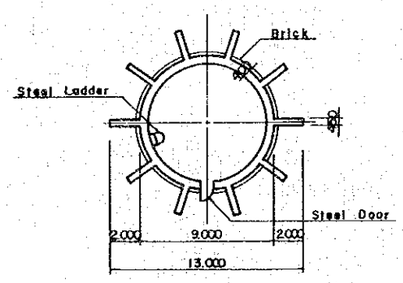
B - SECTION



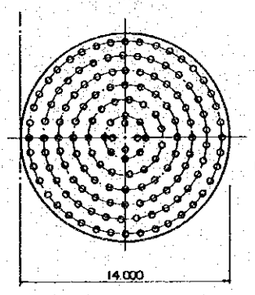
C - SECTION



D - SECTION



E - SECTION



Pile 148Nos.- 400ϕ(40T/P)
L=16.000 m

S = 1 : 200

0 5 10 15m

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

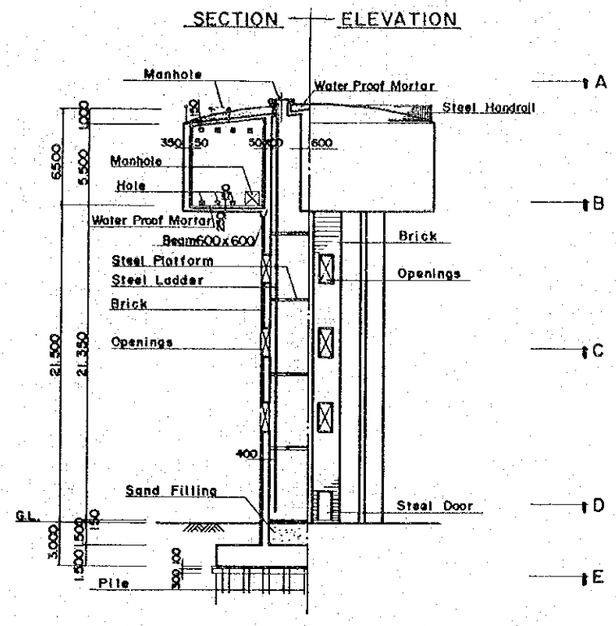
NARAYANGANJ

OVERHEAD TANK (2,000m3)
SECTION AND ELEVATION

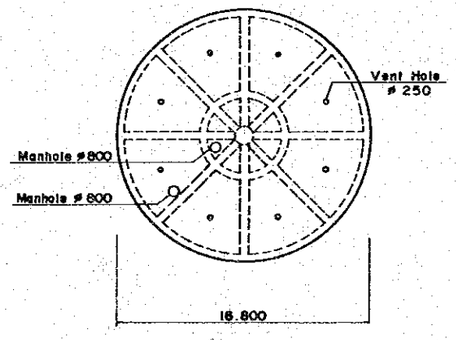
Date	Dec. 1984	Drawing No.	21

JAPAN INTERNATIONAL COOPERATION AGENCY

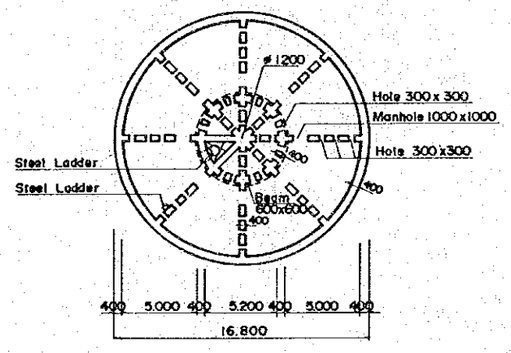
SECTION — ELEVATION



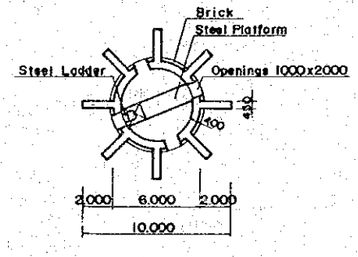
A-SECTION



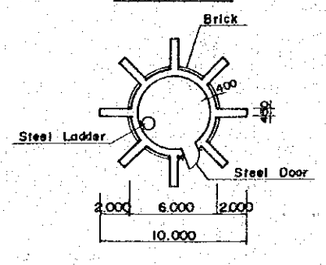
B-SECTION



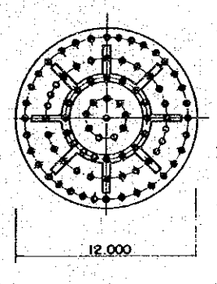
C-SECTION



D-SECTION



E-SECTION



Pile: 91Nos.- 400 ø (40T/P)
L = 16.000

S = 1 : 200

0 5 10 15m

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

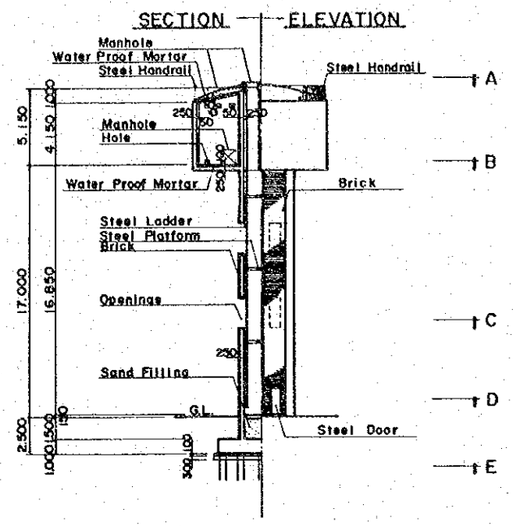
NARAYANGANJ

OVERHEAD TANK (1,000m3)
SECTION AND ELEVATION

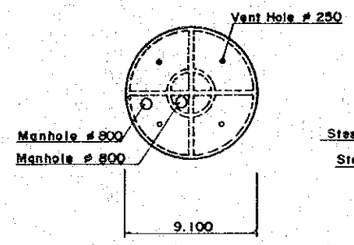
Date	Dec. 1984	Drawing No.	22

JAPAN INTERNATIONAL COOPERATION AGENCY

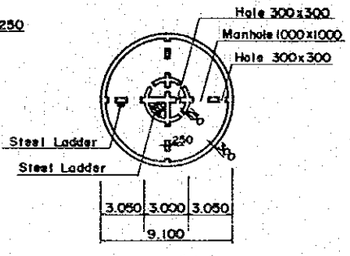
200m³ OVERHEAD TANK



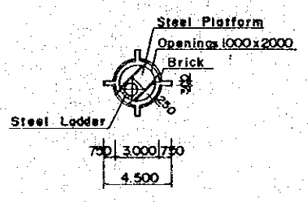
A-SECTION



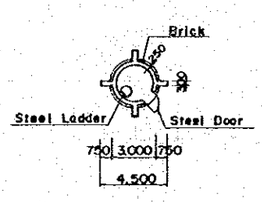
B-SECTION



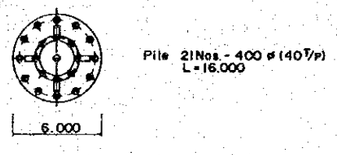
C-SECTION



D-SECTION

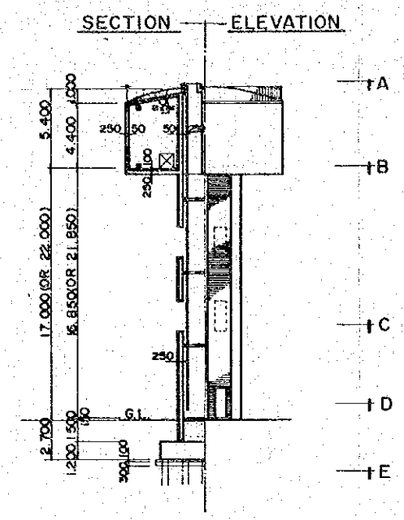


E-SECTION

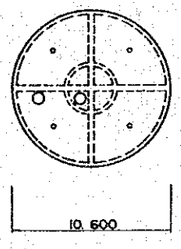


Pile 21Nos.- 400 ϕ (40T/P)
L=16.000

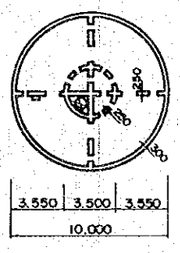
300m³ OVERHEAD TANK



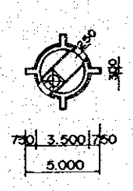
A-SECTION



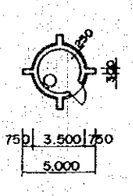
B-SECTION



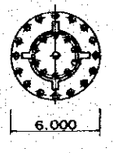
C-SECTION



D-SECTION



E-SECTION



Pile 27Nos.- 400 ϕ (40T/P)
L=16.000

S = 1 : 200

0 5 10 15m

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

OVERHEAD TANK (200m³, 300m³)
SECTION AND ELEVATION

Date	Dec. 1984	Drawing No.	23

JAPAN INTERNATIONAL COOPERATION AGENCY

S 1 : 2000

N

ø 100 PVC

ø 100 PVC

ø 150 PVC

№ 7 Overhead Tank V=300m³

Reservoir

PUMP HOUSE (Existing)

SCHOOL

ø 200 PVC

ø 200 PVC

ø 200

ø 300

ø 350

ø 300

SCHOOL

TANK

ø 250

LAKE

ø 250

GIRLS SCHOOL

ø 150 PVC

ø 400

BANGA BANDU ROAD

ø 500 DCIP

PUMP HOUSE (Existing)

№ 6 Overhead Tank V=1,000m³

Reservor

ø 250 PVC

ø 250 PVC

HOSPITAL

PHE OFFICE

KHAL

ø 250 PVC

ø 150 PVC

PUMP HOUSE (Existing)

ø 150 PVC

ø 250 PVC

SCALE

0 50 100 150 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

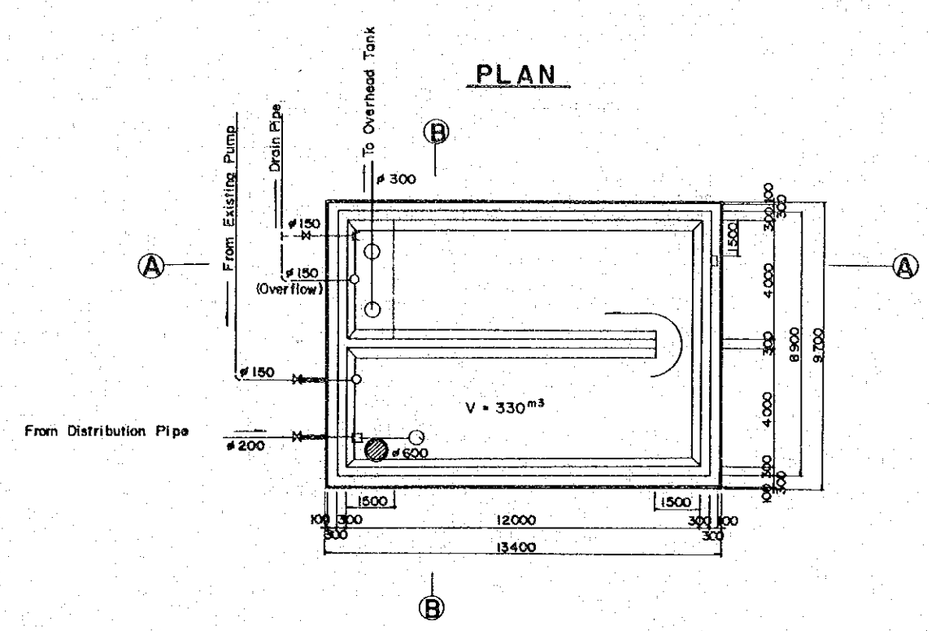
NARAYANGANJ

RESERVOIRS OF №6 & №7 OVERHEAD TANK LOCATION

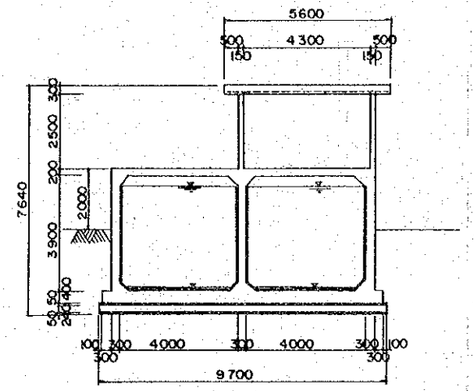
Date	Dec. 1984	Drawing No	24

JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN



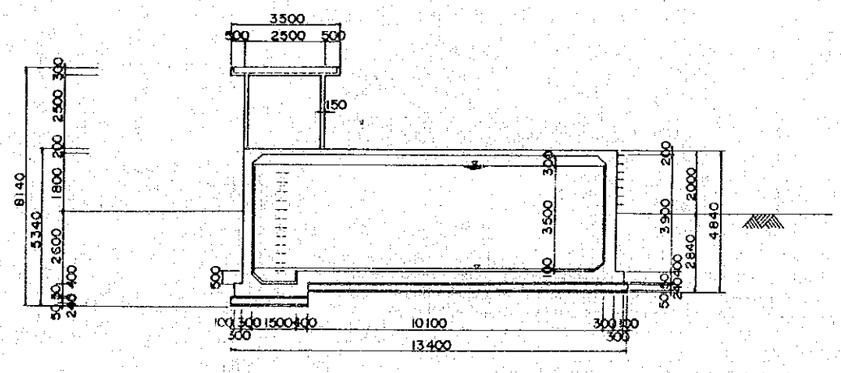
SECTION B - B

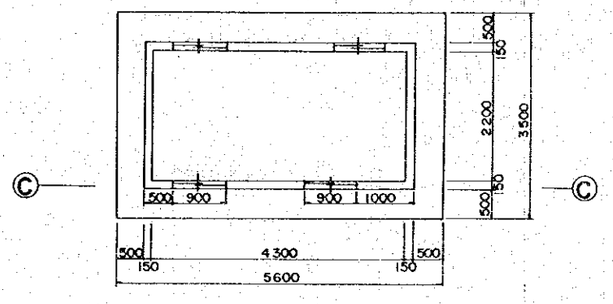


PLAN OF PUMP HOUSE

SCALE 0 0.5 1.0 1.5 (m)

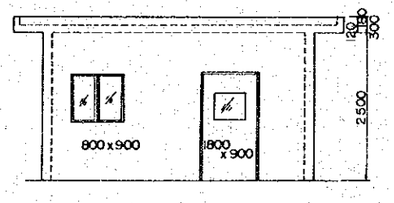
SECTION A - A





SECTION C - C

SCALE 0 0.5 1.0 1.5 (m)



SCALE 0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

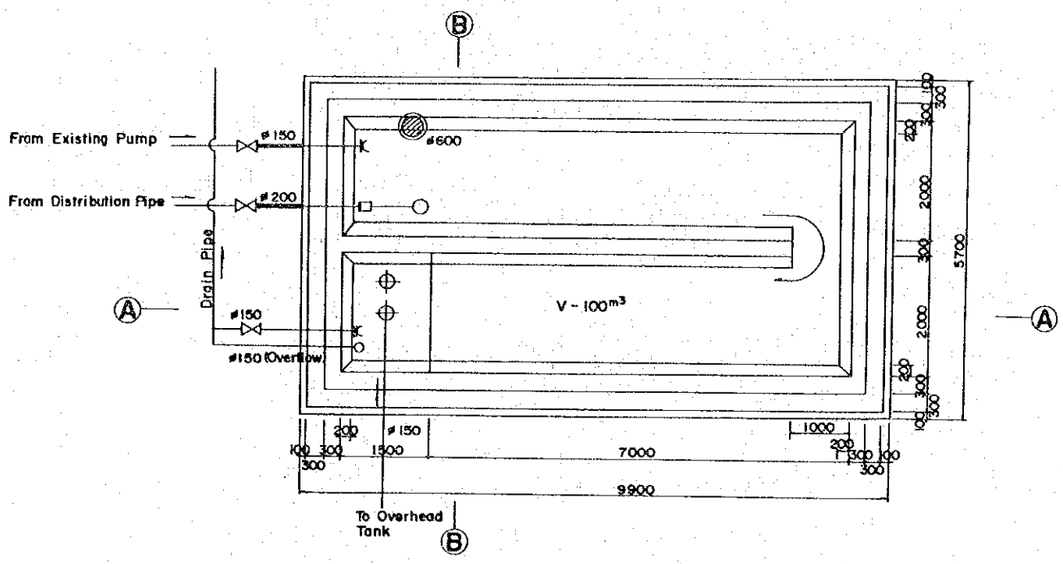
NARAYANGANJ

RESERVOIR OF NO 6 OVERHEAD TANK PLAN AND SECTIONS

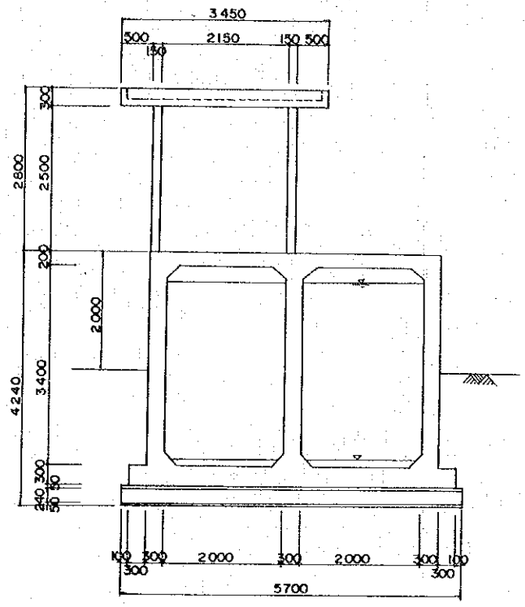
Date	Dec. 1984	Drawing No	25

JAPAN INTERNATIONAL COOPERATION AGENCY

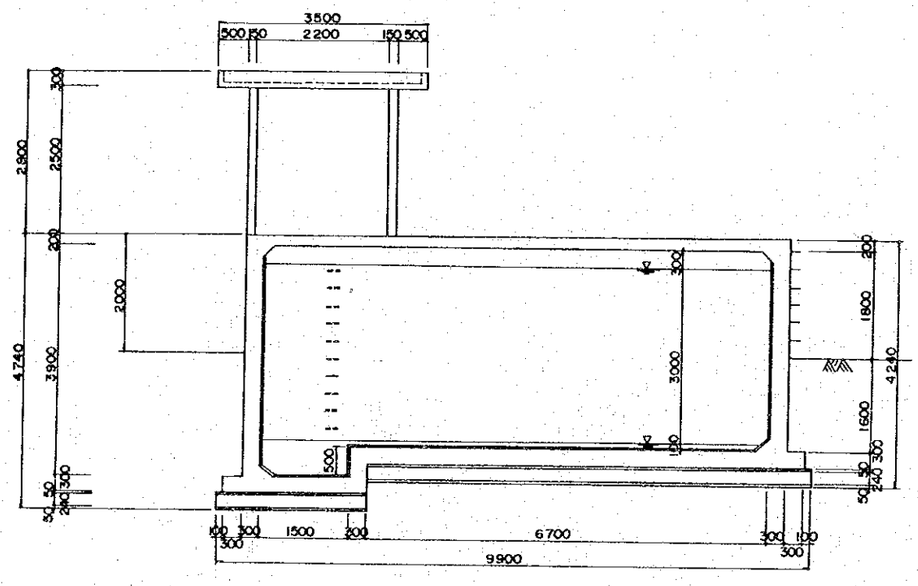
PLAN



SECTION B – B



SECTION A – A

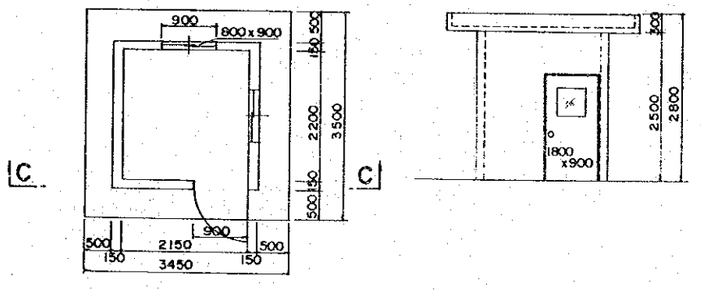


PLAN OF PUMP HOUSE

SCALE 0 0.5 1.0 1.5 (m)

SECTION C – C

SCALE 0 0.5 1.0 1.5 (m)



SCALE 0 1 2 3 4 5 (m)

DIRECTORATE OF PUBLIC HEALTH ENGINEERING
GOVERNMENT OF BANGLADESH

NARAYANGANJ

RESERVOIR OF No 7 OVERHEAD TANK PLAN AND SECTIONS

Date	Dec. 1984	Drawing No	26

JAPAN INTERNATIONAL COOPERATION AGENCY