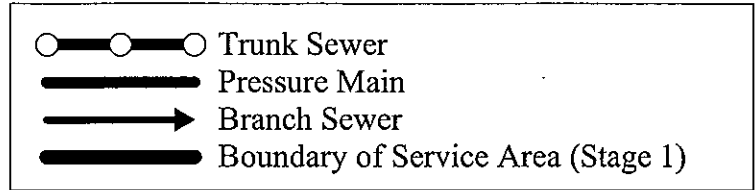
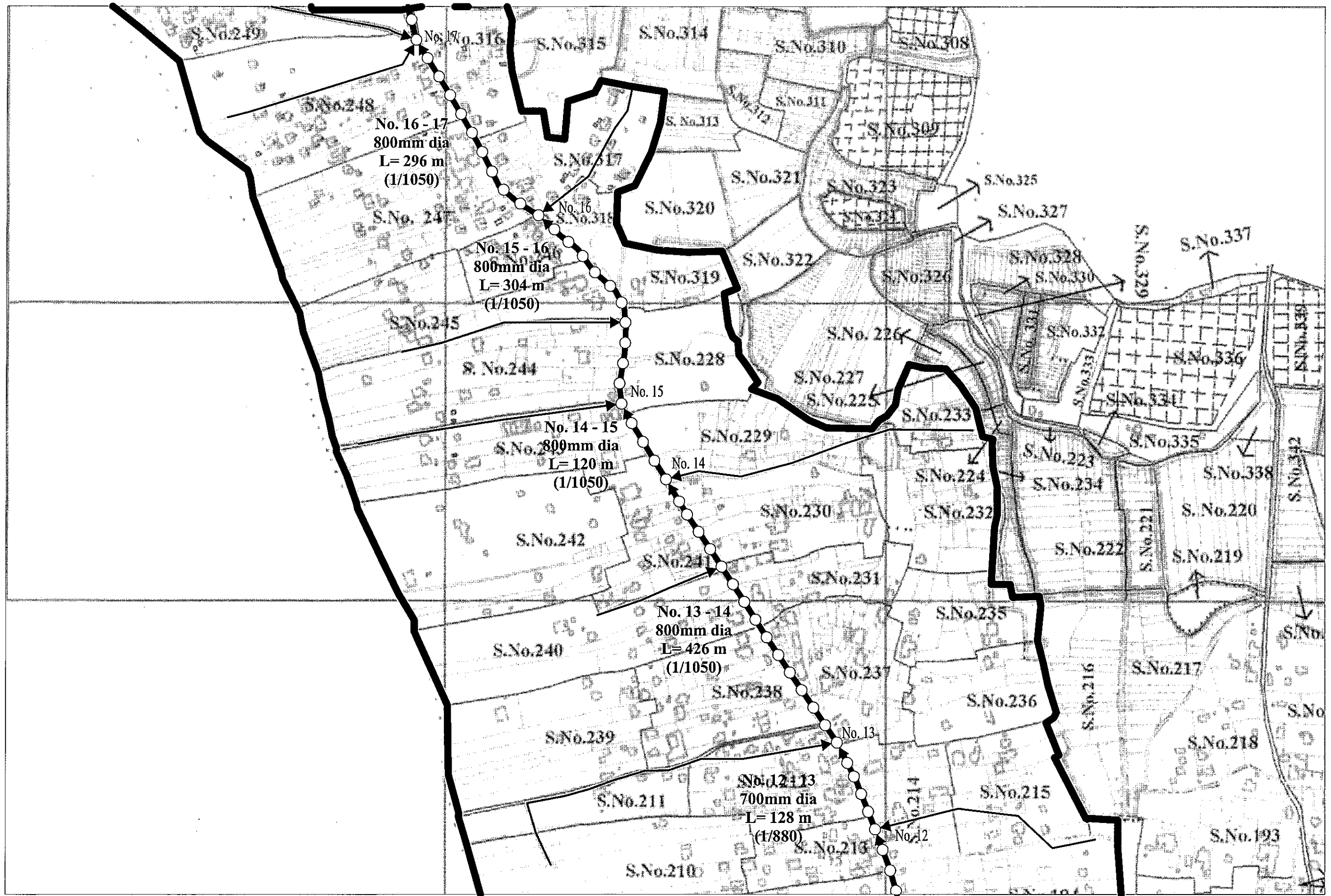


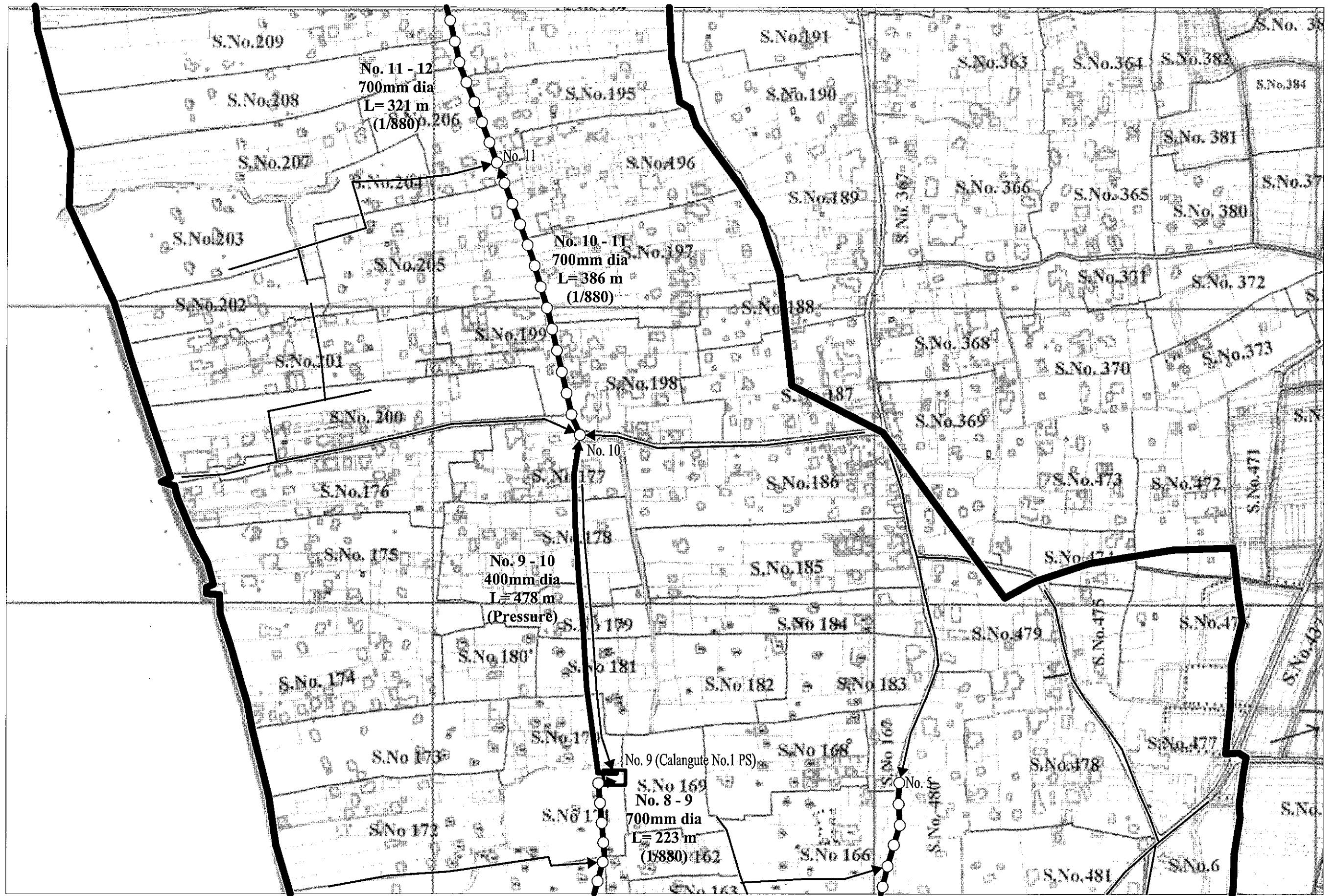
Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Plan for Sewer Network (F/S) North Coastal Belt (1/5)	Scale: 1:5,000
	No.: S-29



Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Plan for Sewer Network (F/S) North Coastal Belt (2/5)	Scale: 1:5,000
	No.: S-30

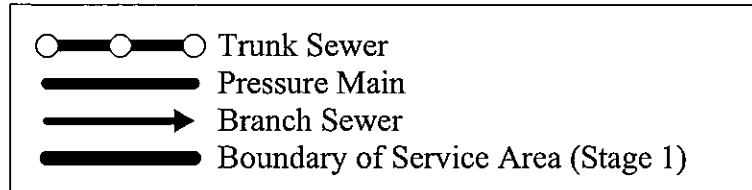
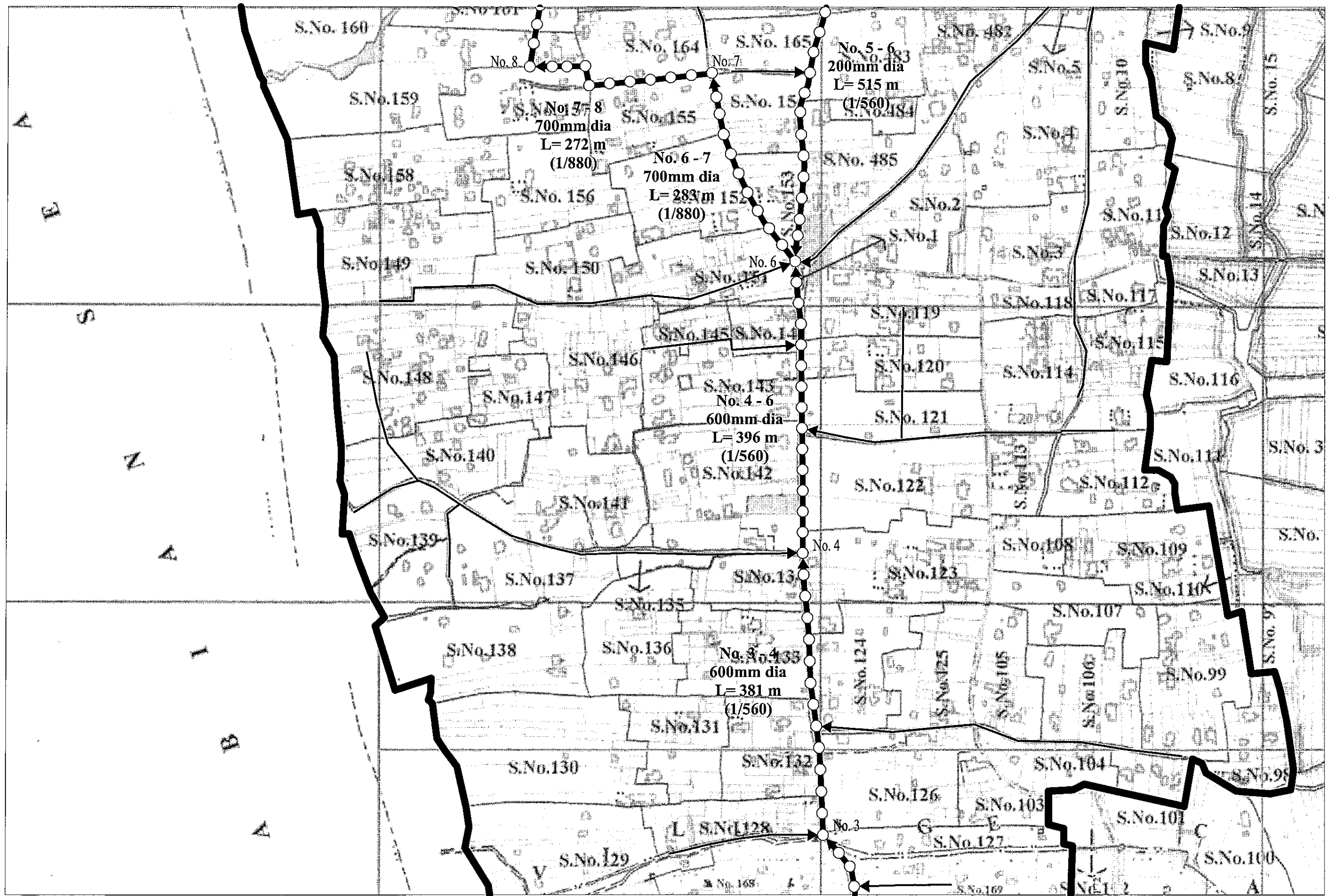


- Trunk Sewer
- ▬ Pressure Main
- ▬ Branch Sewer
- ▬ Boundary of Service Area (Stage 1)

Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Plan for Sewer Network (F/S)
North Coastal Belt (3/5)

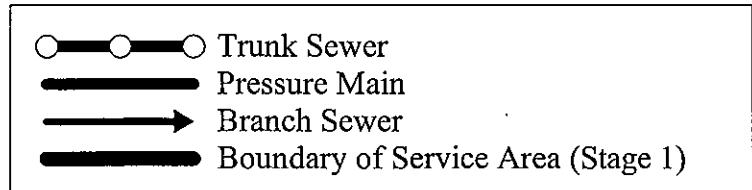
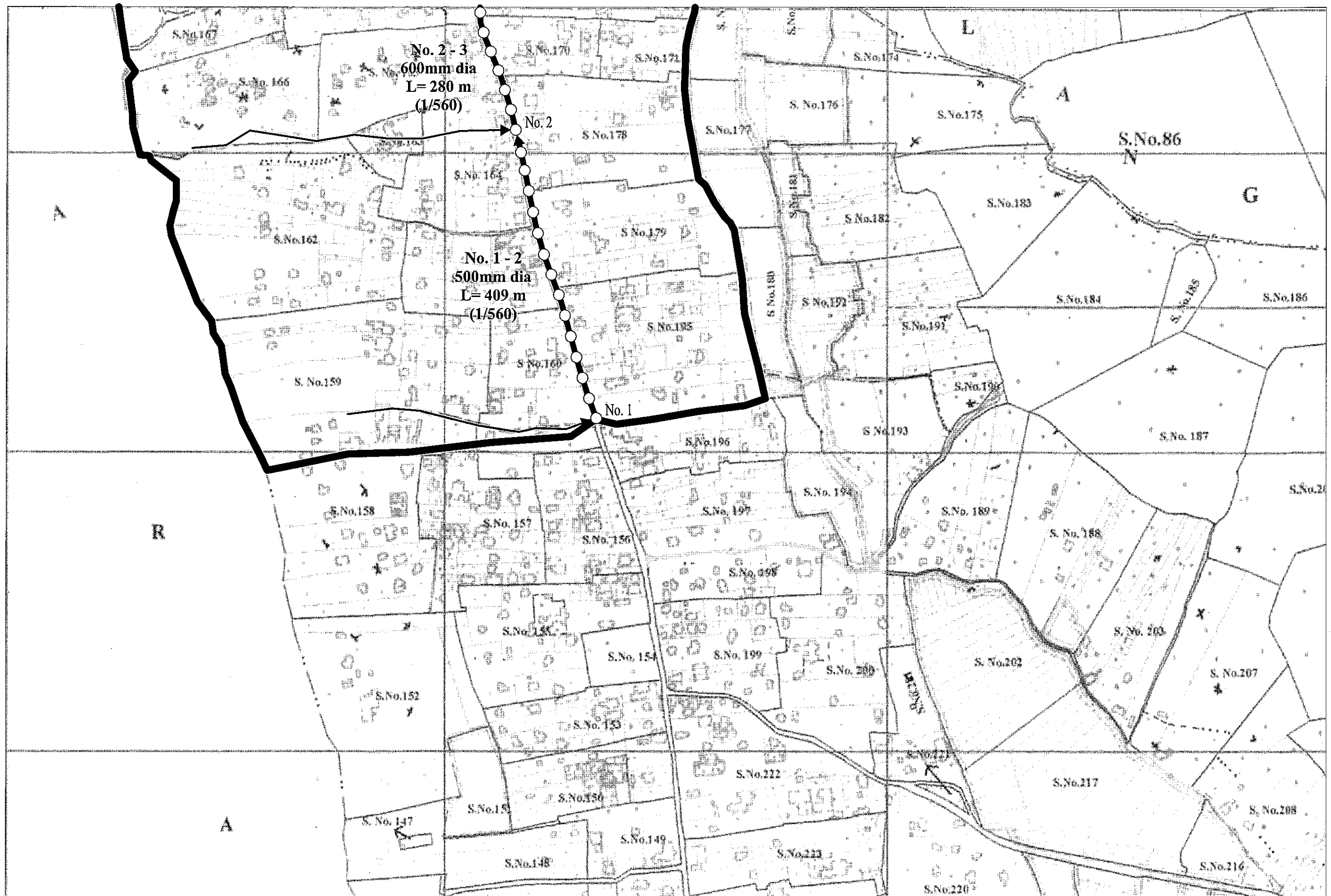
Scale: 1:5,000
No.: S-31



Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Plan for Sewer Network (F/S)
North Coastal Belt (4/5)

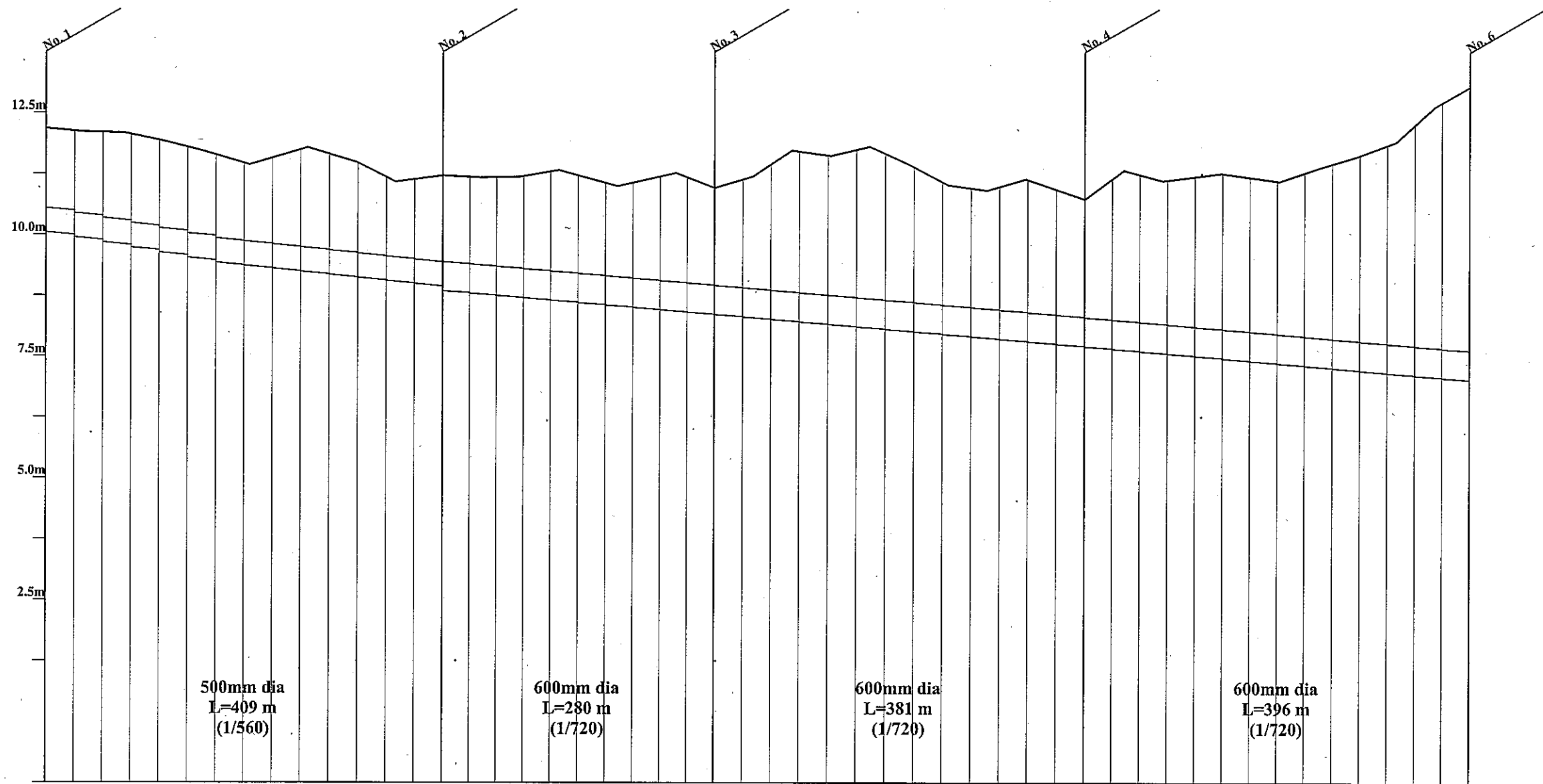
Scale: 1:5,000
No.: S-32



Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Plan for Sewer Network (F/S)
North Coastal Belt (5/5)

Scale: 1:5,000
No.: S-33

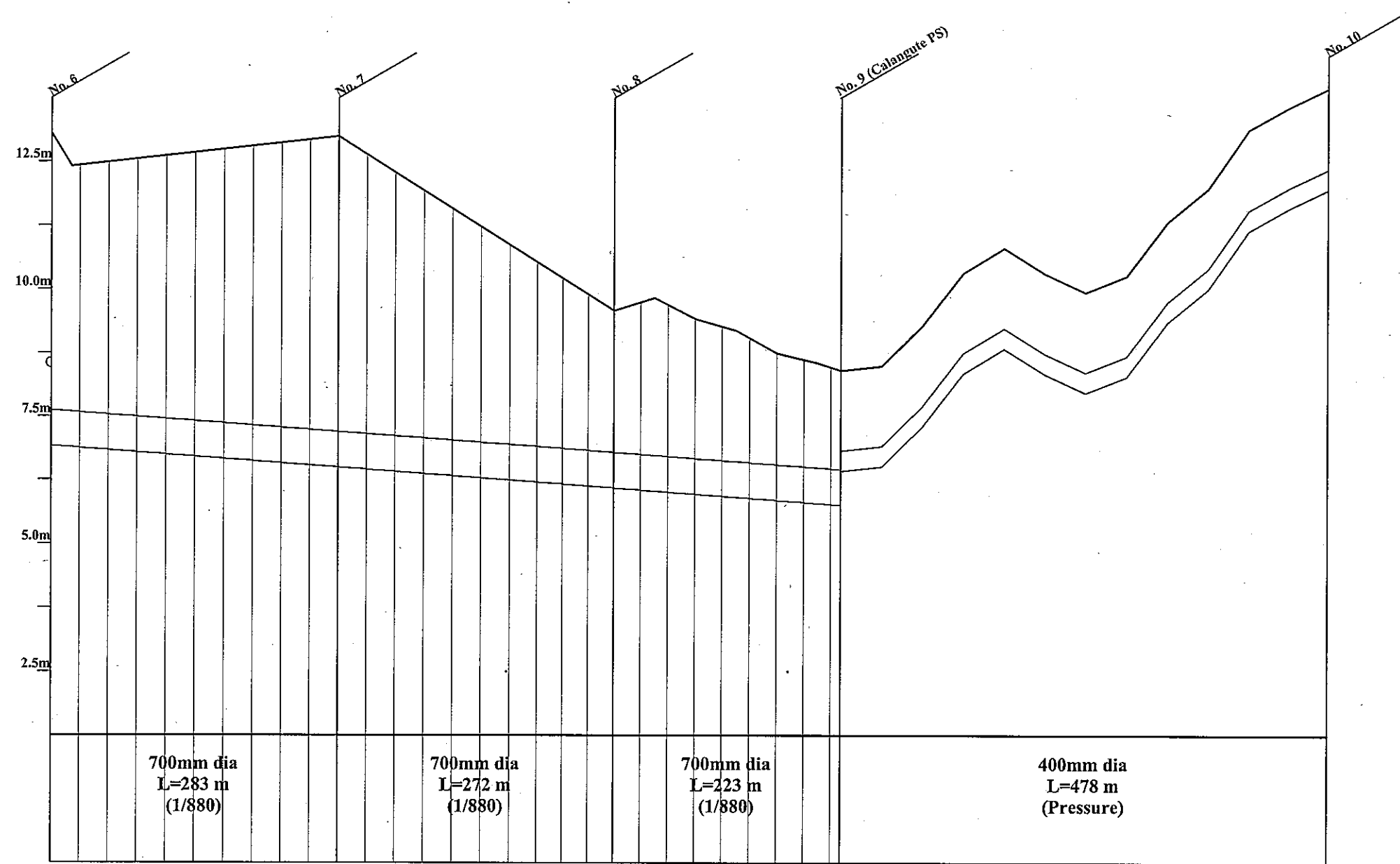


Ground Level (m)	12.18	12.11	12.09	11.93	11.73	11.44	11.79	11.49	11.09	11.22	11.18	11.19	11.33	11.10	11.27	10.96	11.20	11.73	11.62	11.81	11.44	11.02	10.91	11.14	10.73	11.32	11.11	11.24	11.27	11.16	11.11	11.37	11.61	11.91	12.63	13.05		
Invert Level (m)	10.049						8.845			8.845						8.366									7.897											7.016		
Covering (m)	1.55						1.70			1.70						1.91									2.35												5.25	
Chainage (m)	0						409			689						1070									1466													

Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Longitudinal Profile of Trunk Line (F/S)
North Coastal Belt (1/5)

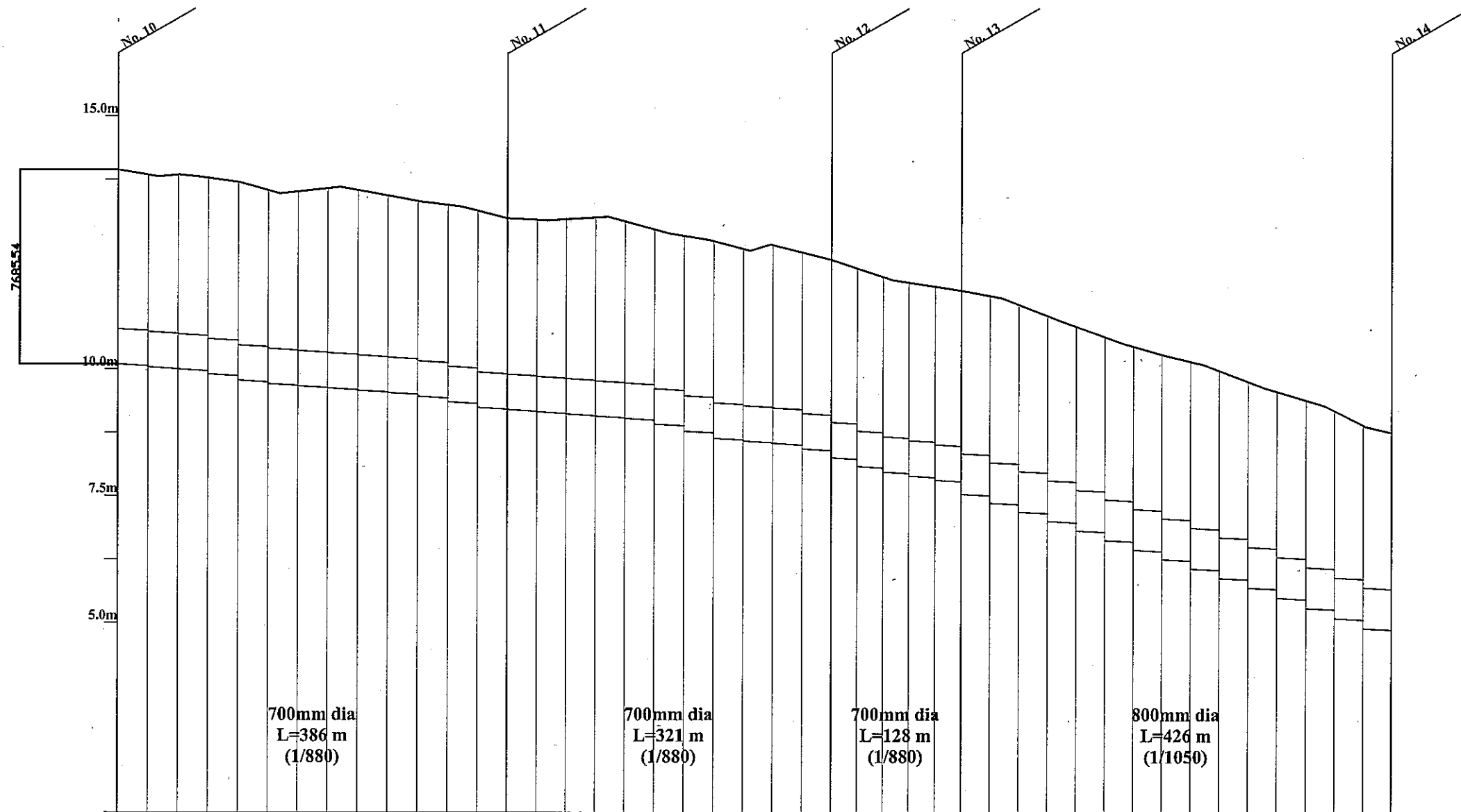
Scale: (H)1:100, (V)1:5,000
No.: S-34



Ground Level (m)	13.05	12.41	13.00	9.58	9.83	9.42	9.19	8.74	8.55	8.40	8.49	9.28	10.32	10.81	10.31	9.94	10.26	11.33	11.98	13.13	13.58	13.94	
Invert Level (m)	6.916	6.585	6.585	6.088	6.088	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725	5.725
Covering (m)	5.35	5.73	5.73	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71	2.71
Chainage (m)	1.466	1.749	1.749	2.021	2.021	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244	2.244

Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Longitudinal Profile of Trunk Line (F/S) North Coastal Belt (2/5)	Scale: (H)1:100, (V)1:5,000
	No.: S-35

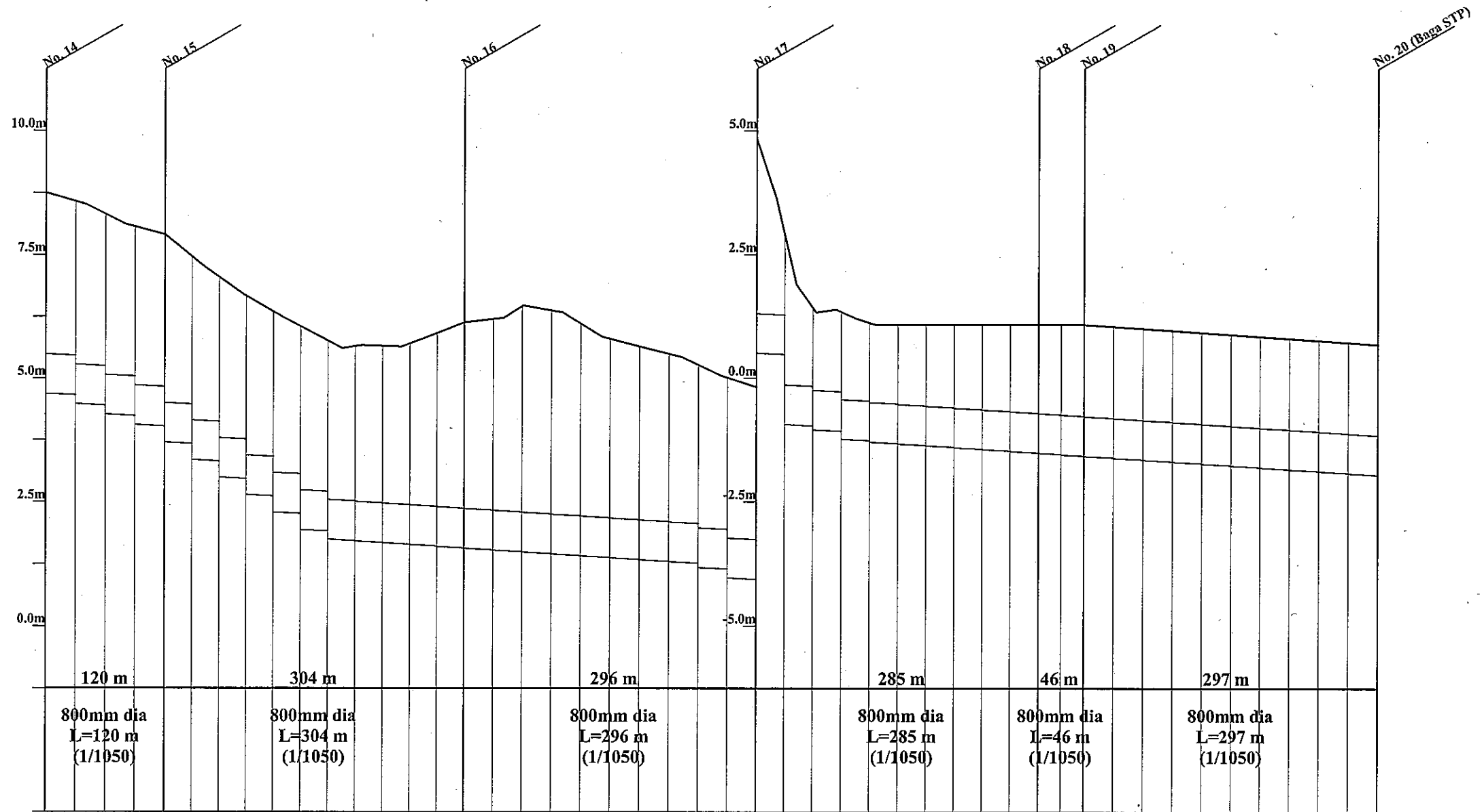


Ground Level (m)	13.94	13.82	13.85	13.81	13.70	13.48	13.61	13.46	13.32	13.22	12.99	12.95	13.02	12.69	12.56	12.35	12.47	12.17	11.86	11.56	11.41	10.94	10.51	10.28	10.09	9.63	9.27	8.87	8.75
Invert Level (m)	10.097										9.210							8.290			7.581								4.870
Covering (m)	3.06										3.81							3.19			3.19								3.00
Chainage (m)	2.722										3.108							3.429			3.557								3.983

Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Longitudinal Profile of Trunk Line (F/S)
North Coastal Belt (3/5)

Scale: (H)1:100, (V)1:5,000
No.: S-36

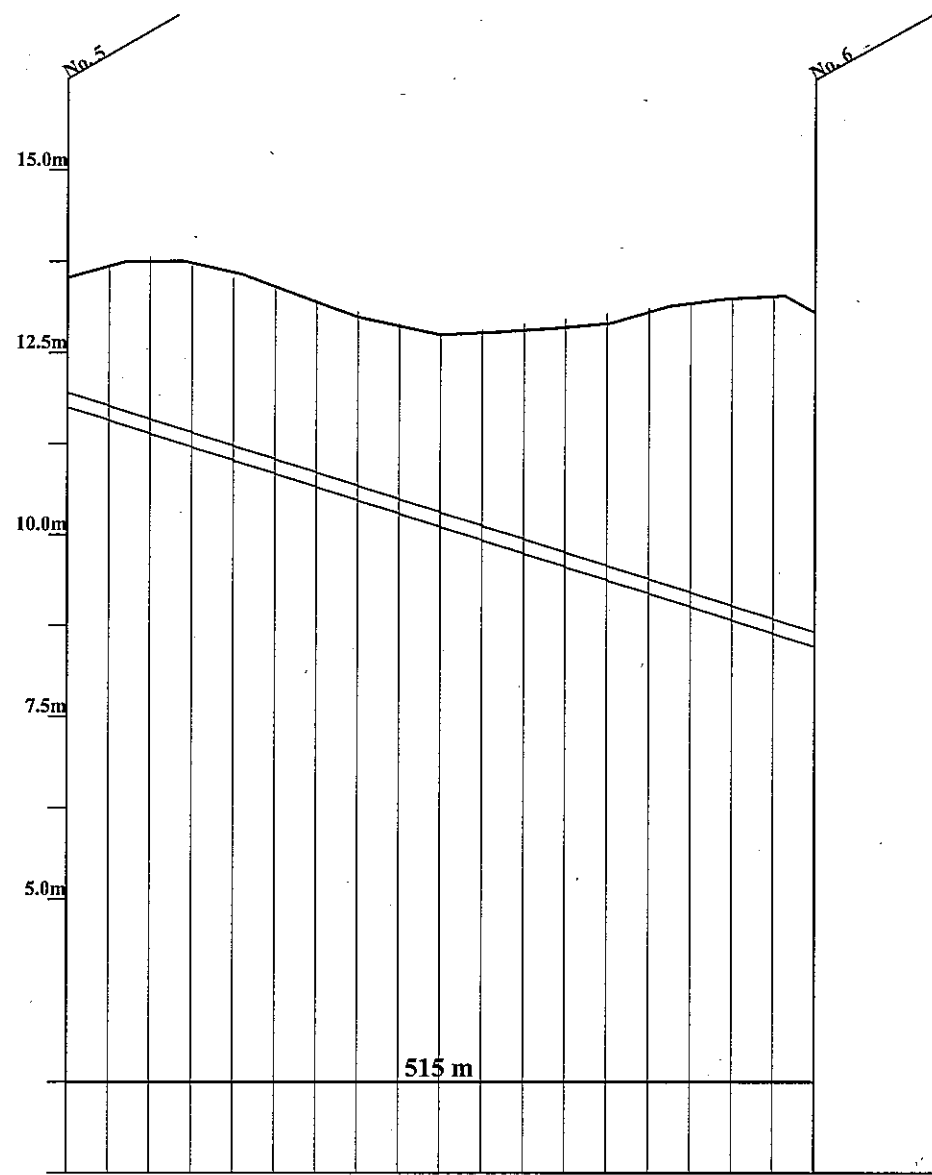


Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Longitudinal Profile of Trunk Line (F/S)
North Coastal Belt (4/5)

Scale: (H)1:100, (V)1:5,000

No.: S-37

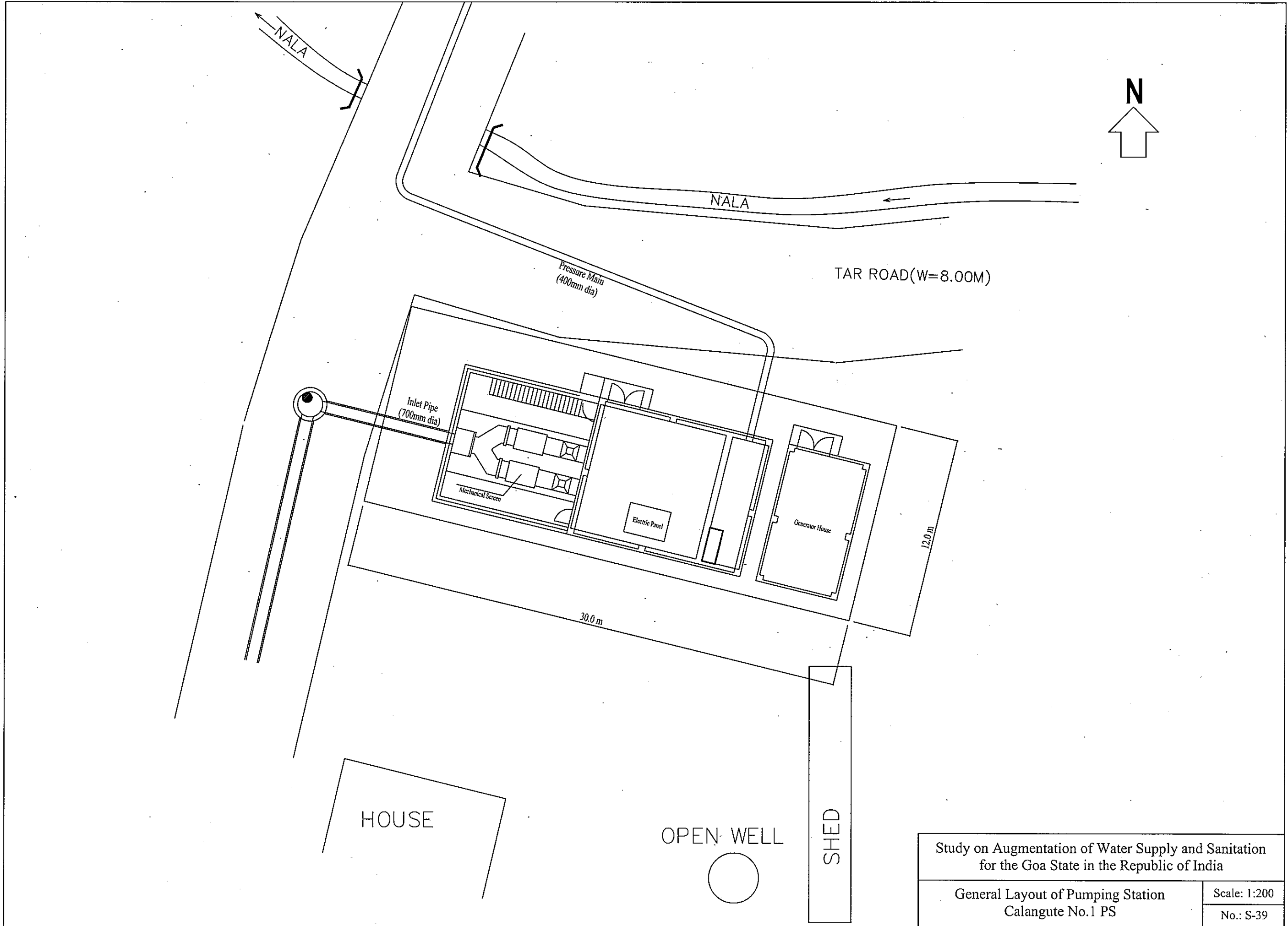


Ground Level (m)	13.53	13.75	13.76	13.58	13.28	12.99	12.75	12.79	12.84	12.91	13.14	13.24	13.12	13.05
Invert Level (m)	11.750													8.450
Covering (m)	1.50													4.31
Chainage (m)	0													515

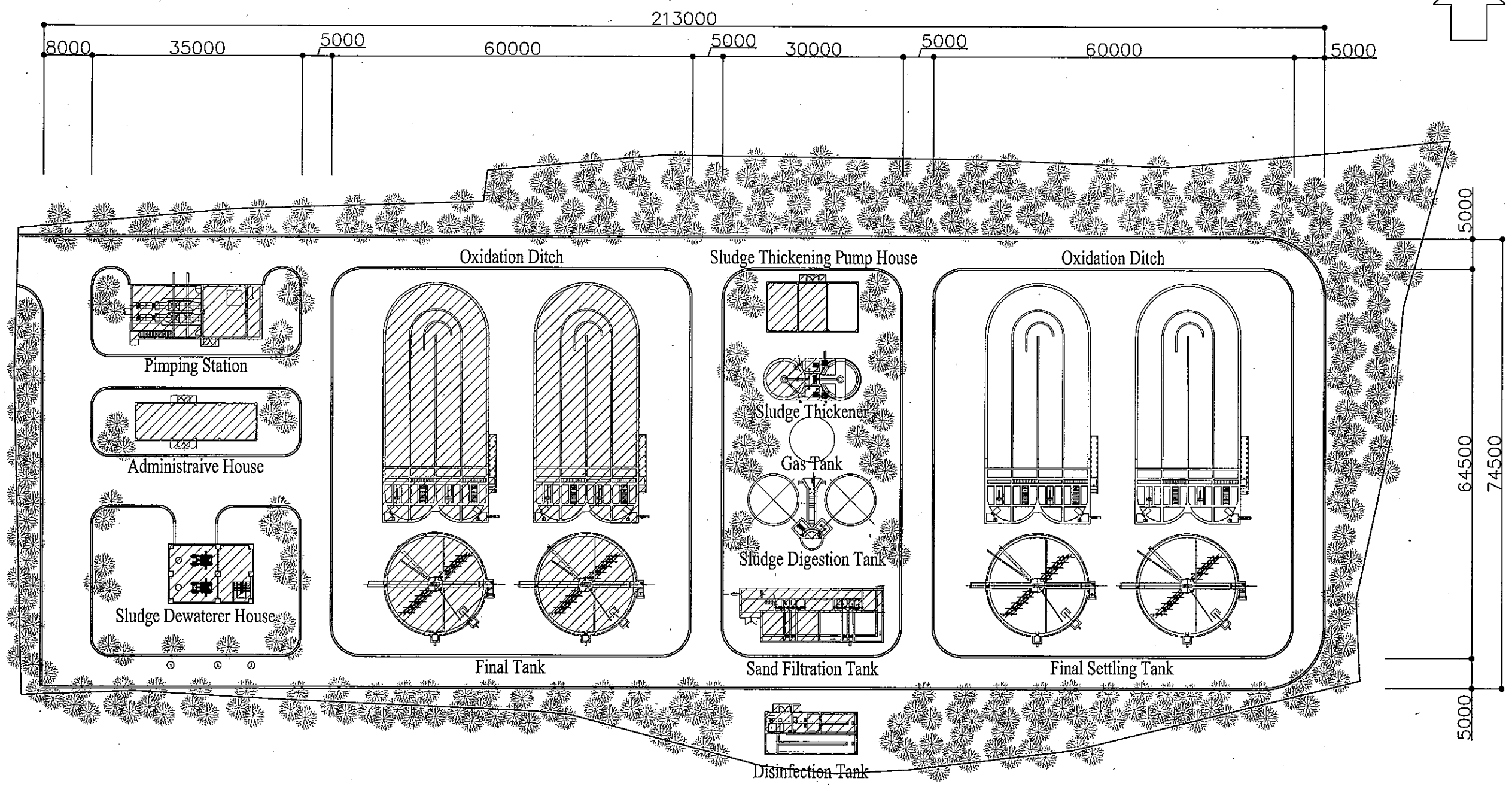
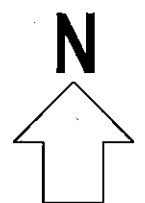
Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Longitudinal Profile of Trunk Line (F/S)
North Coastal Belt (5/5)

Scale: (H)1:100, (V)1:5,000
No.: S-38



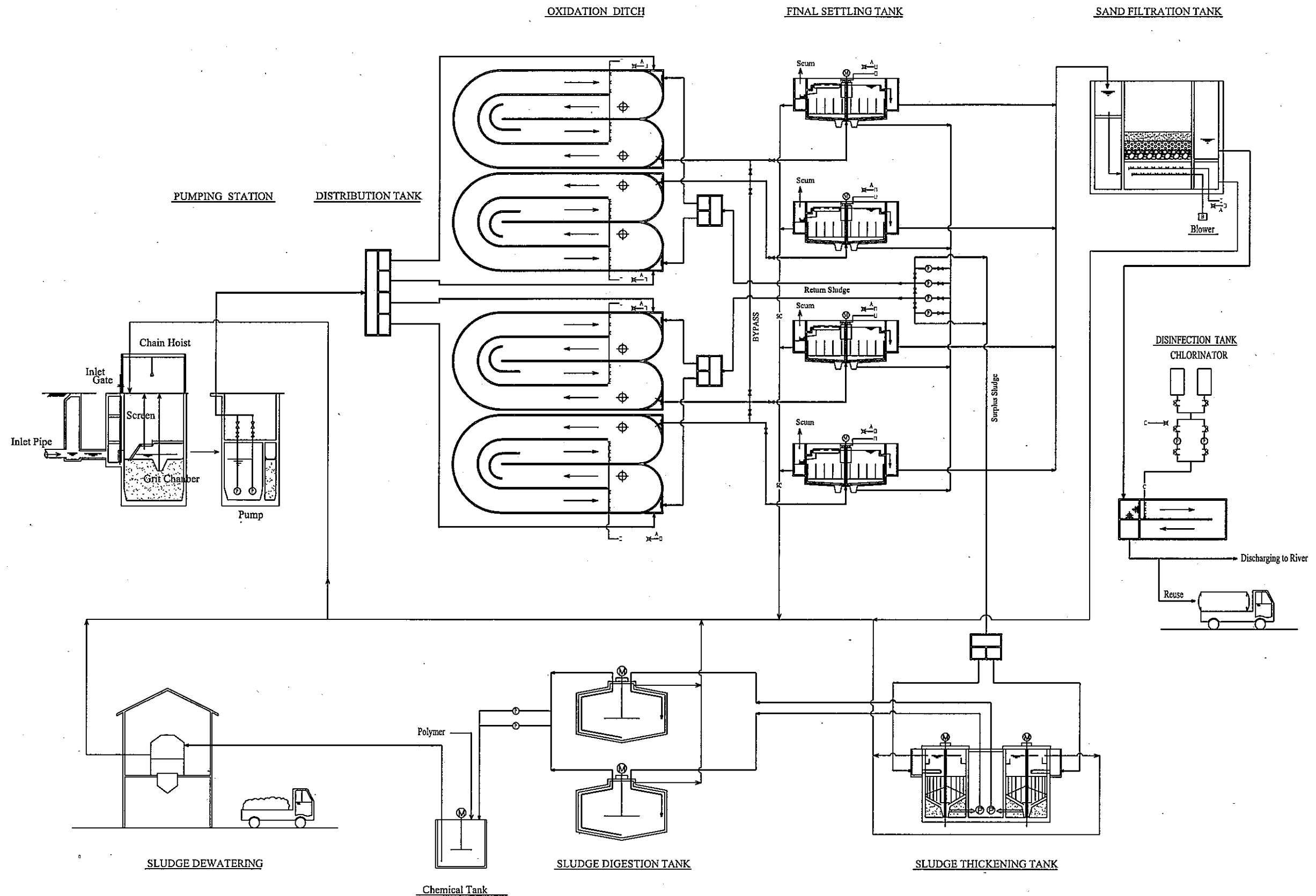
Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India	
General Layout of Pumping Station Calangute No.1 PS	Scale: 1:200
	No.: S-39



 Stage 1

Design Capacity:	5.6 MLD (Stage 1) 5.6 + 5.6 = 11.2 MLD (Stage 2)
Land Area:	2.07 ha

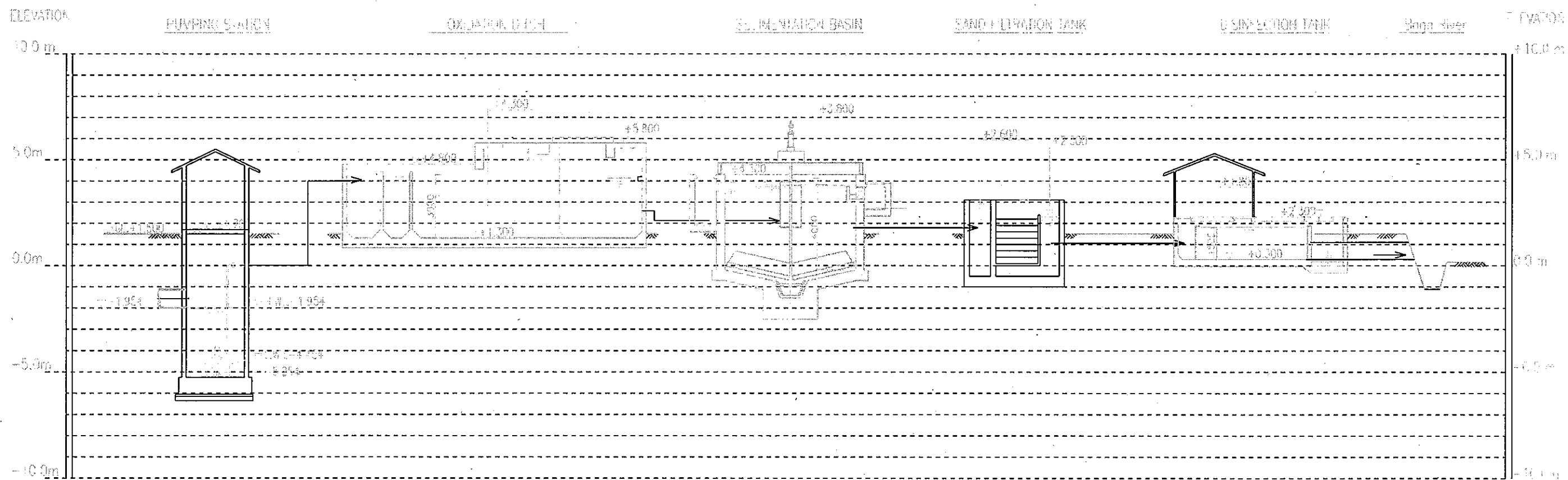
Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India	
General Layout Plan of STP Baga STP	Scale: 1:750 No.: S-40



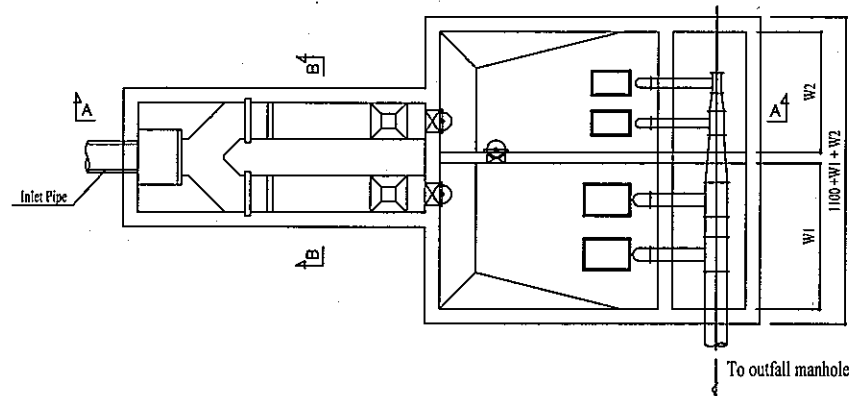
Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Process Diagram of STP
Baga STP

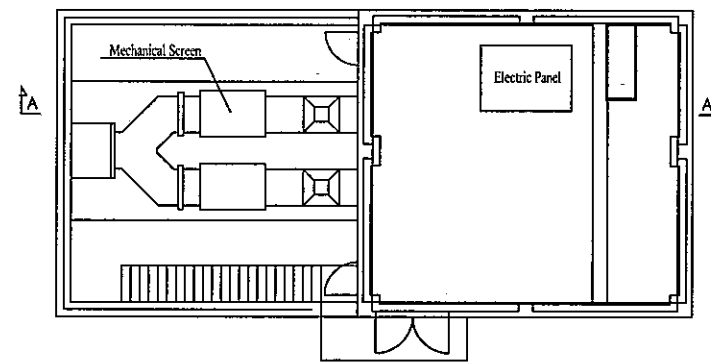
Scale:
No.: S-41



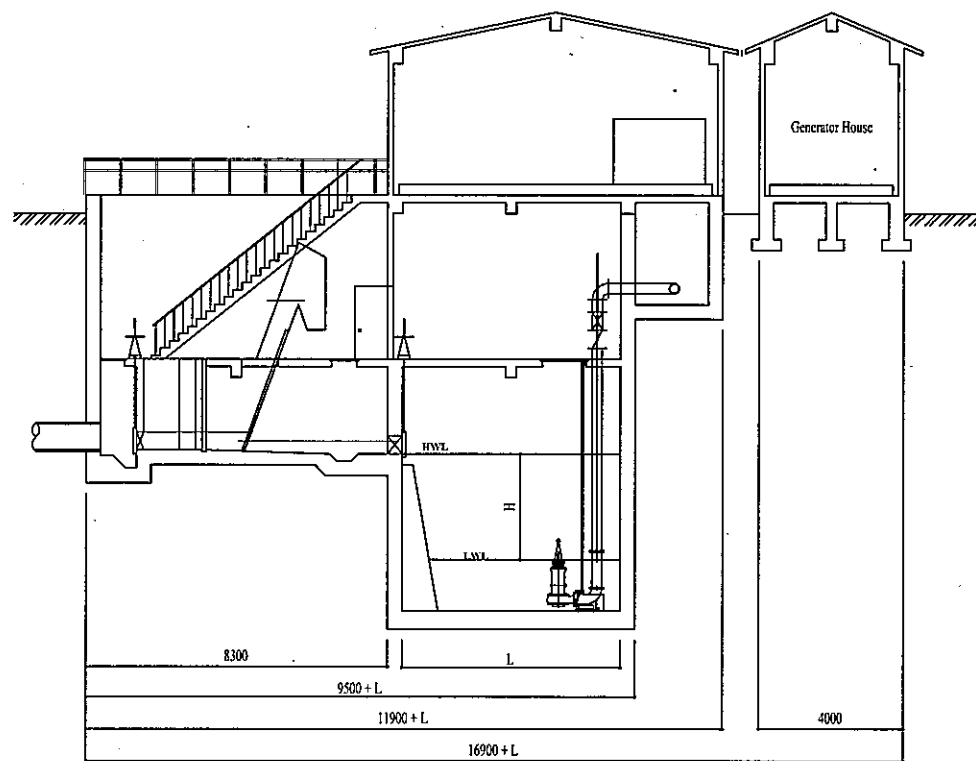
Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India	
Hydraulic Profile of STP Baga STP	Scale: 1:200
	No.: S-42



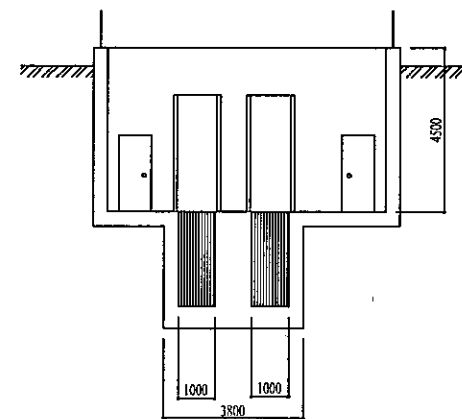
B1 FLOOR PLAN



1st FLOOR PLAN



SECTION A-A



SECTION B-B

1. Wet Well

Item	Margao PS	Calangute PS		
Width	W1 = 4.0 m, W2 = 3.3 m	W1 = 4.0 m, W2 = 3.3 m		
Length	L = 7.8 m	L = 7.5 m		
Depth	H = 3.0 m	H = 3.0 m		
Basin number	F/S	M/P	F/S	M/P
	2	2	2	2

2. Pump Equipment

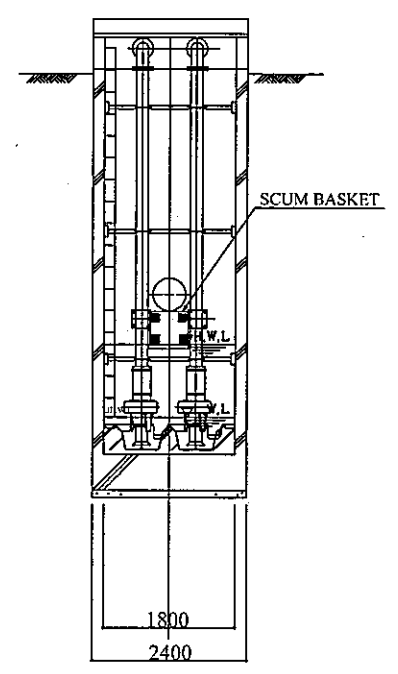
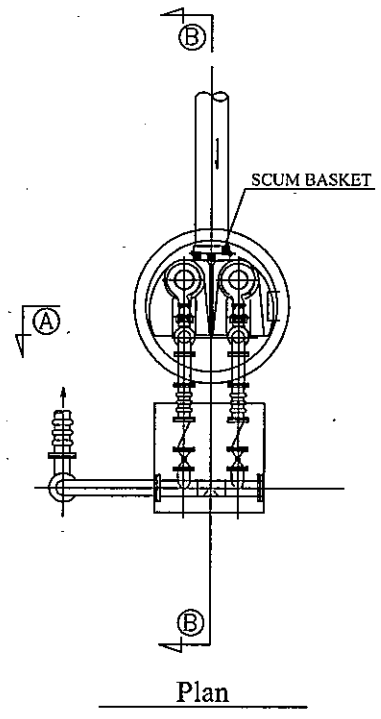
2.1. Margao PS			
Pump Specification	F/S	M/P	
150mmx3.5m3/minx15.0mHx15.0kW	1 Unit	2 Units	
250mmx7.0m3/minx15.0mHx29.0kW	2(1) Units	2(1) Units	
2.2. Calangute PS			
Pump Specification	F/S	M/P	
150mmx3.3m3/minx14.0mHx14.0kW	1 Unit	2 Units	
250mmx6.5m3/minx14.0mHx26.0kW	2(1) Units	2(1) Units	

Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

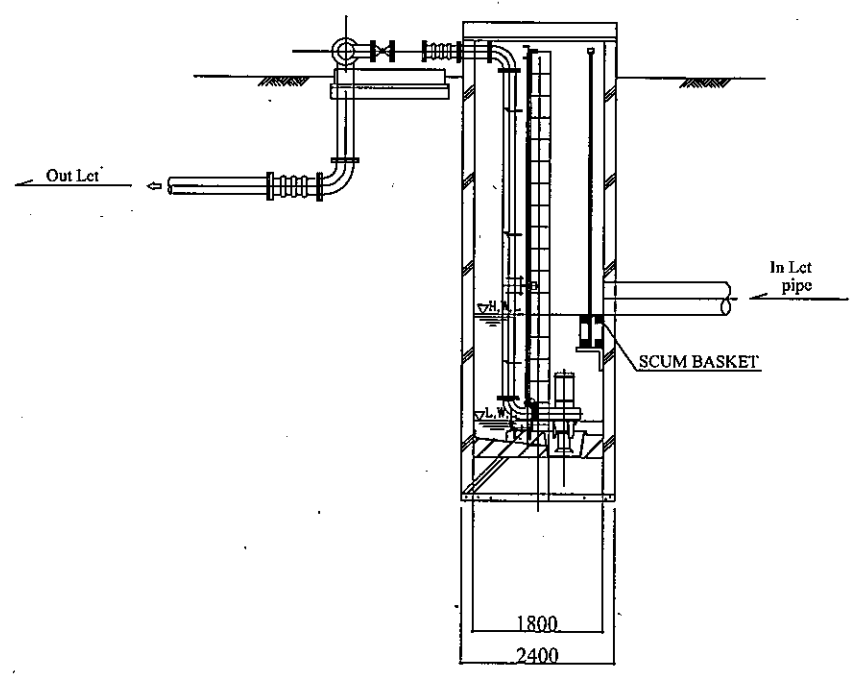
Structure of Pumping Station
Conventional Type

Scale: 1:200

No.: S-43

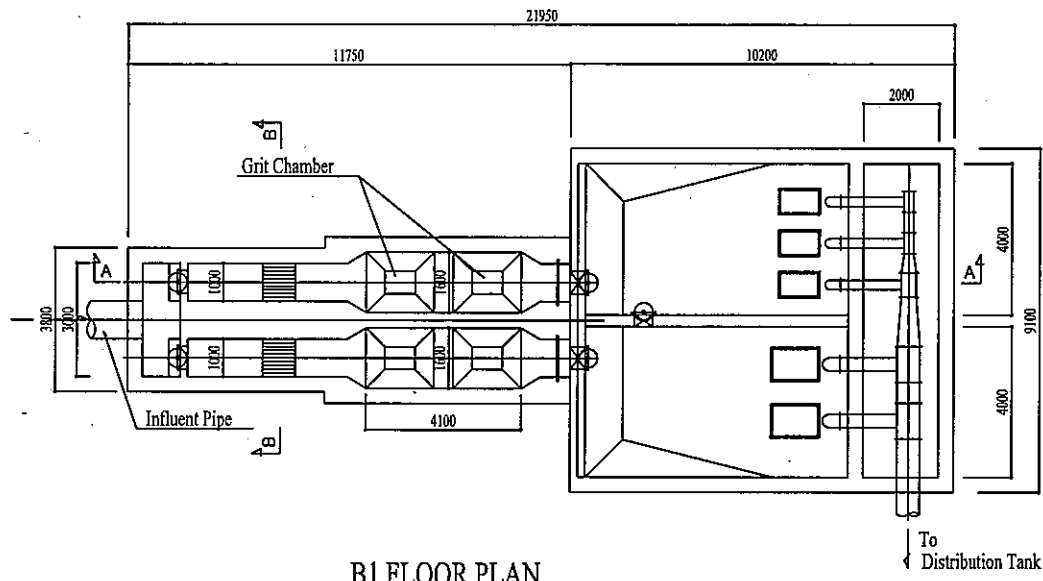


SECTION A-A

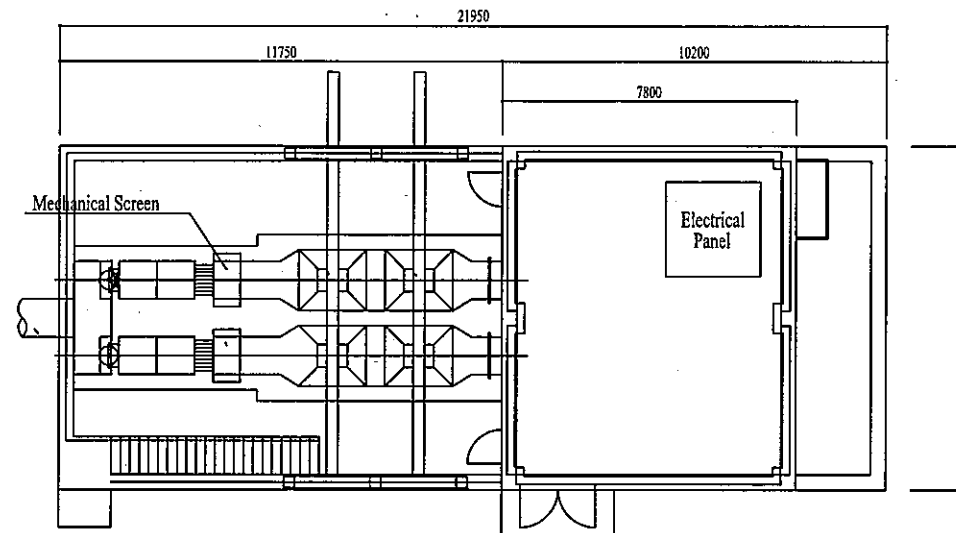


SECTION B-B

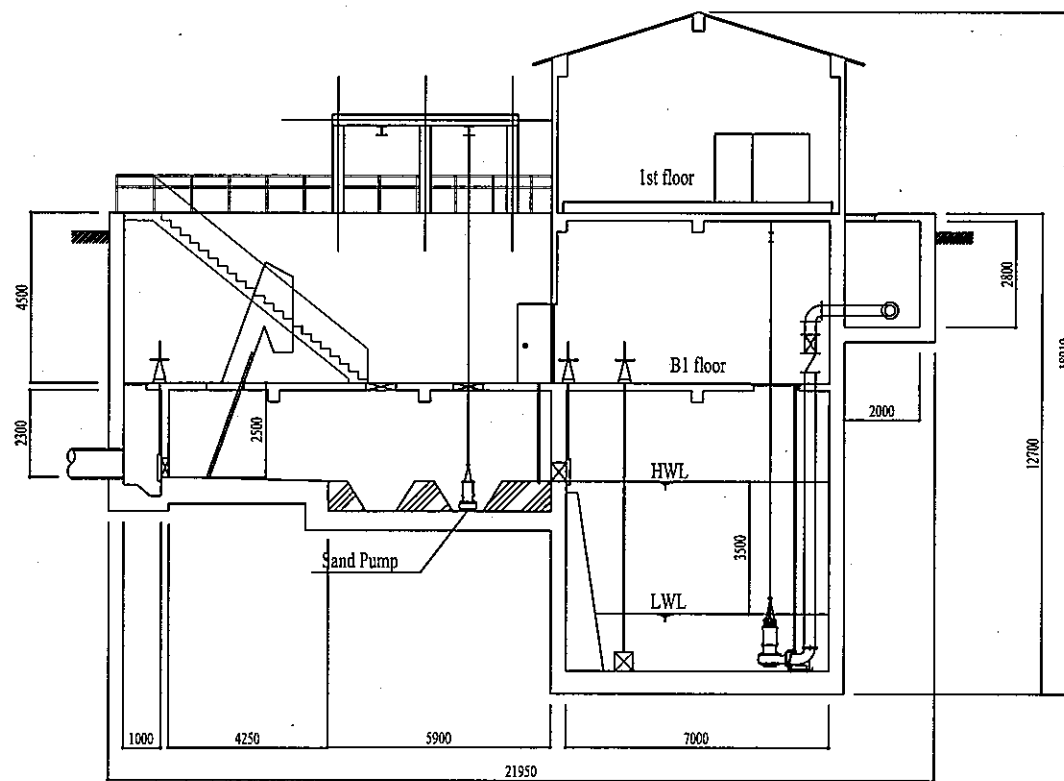
Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India	
Structure of Pumping Station Manhole Type	Scale: 1:100
	No.: S-44



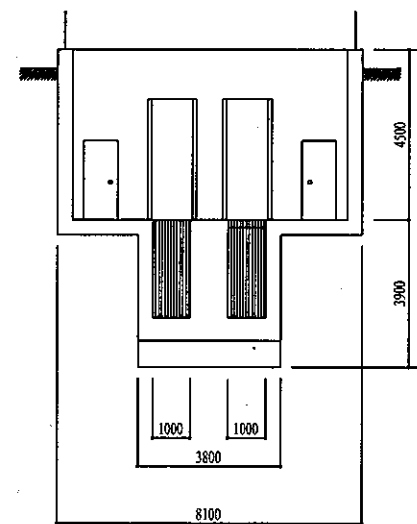
B1 FLOOR PLAN



1st FLOOR PLAN



SECTION A-A



SECTION B-B

1. Grit Chamber

Item	Mapusa STP	Baga STP		
Width	W = 1.50 m	W = 1.60 m		
Length	L = 4.20 m	L = 4.10 m		
Depth	H = 0.35 m	H = 0.35 m		
Basin number	F/S	M/P	F/S	M/P
	1	2	1	2

2. Wet Well

Item	Mapusa STP	Baga STP		
Width	W = 5.0 m	W = 5.0 m		
Length	L = 7.0 m	L = 7.0 m		
Depth	H = 2.5 m	H = 2.5 m		
Basin number	F/S	M/P	F/S	M/P
	1	2	1	2

3. Pump Equipment

3.1 Margao STP (Only new additional equipment)

Pump Specification	F/S	M/P
200mmx3.27m ³ /minx12.0mHx13.0KW	-	2 Units
250mmx6.53m ³ /minx12.0mHx25.0KW	2(1) Units	2 Units
350mmx13.06m ³ /minx12.0mHx49.0KW	-	2(1) Units

3.2 Mapusa STP

Pump Specification	F/S	M/P
150mmx2.11m ³ /minx12.0mHx8.0KW	1 Unit	2 Units
200mmx4.22m ³ /minx12.0mHx16.0KW	-	1 Unit
300mmx8.44m ³ /minx12.0mHx32.6KW	2(1) Units	2(1) Units

3.3 Baga STP

Pump Specification	F/S	M/P
150mmx2.43m ³ /minx12.0mHx10.0KW	2 Units	2 Units
200mmx4.86m ³ /minx12.0mHx19.0KW	1 Unit	1 Unit
300mmx9.72m ³ /minx12.0mHx37.0KW	1(1) Unit	2(1) Units

Note: (1) = including 1 stand-by unit

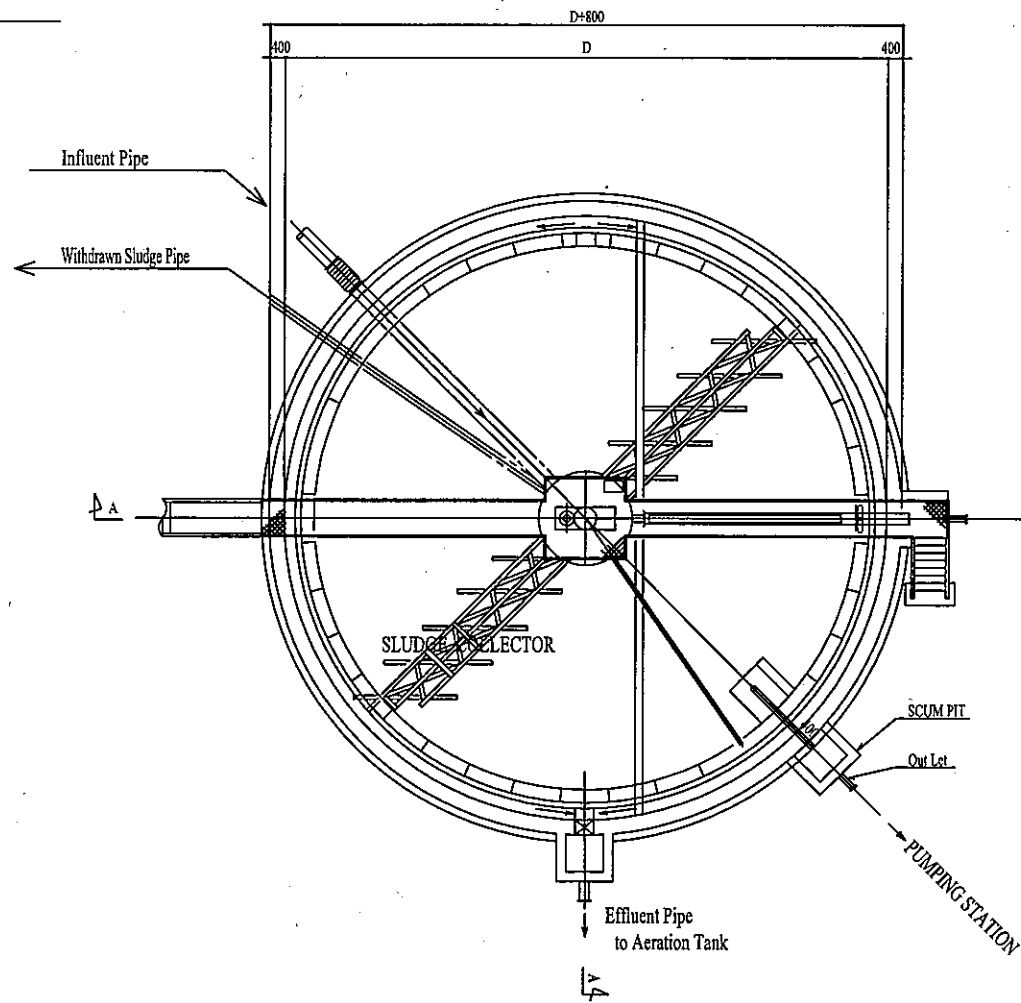
Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India

Structure of STP Facilities
Grit Chamber and Pump Facilities

Scale: 1:200

No.: S-45

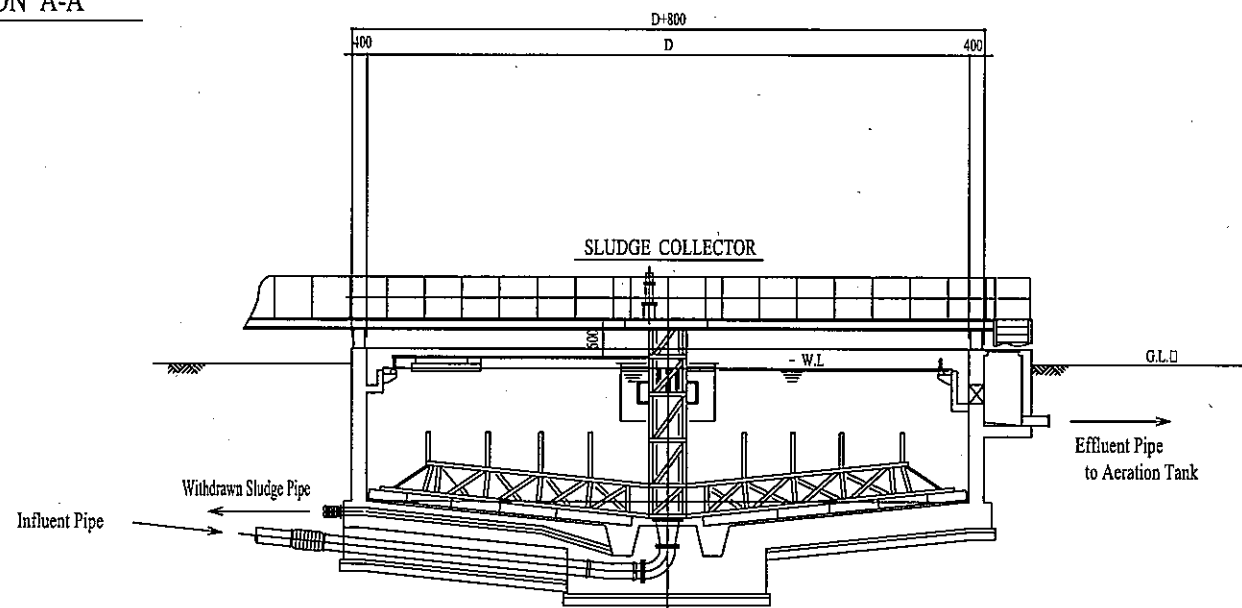
PLAN



Dimension of Primary Settling Tank

1. Margao STP		
Item	F/S Stage	M/P Stage
Type	Radial flow circular type	
Diameter	D = 12.0 m	D = 12.0 m
Depth	H = 3.0 m	H = 3.0 m
Basin number	1	2

SECTION A-A

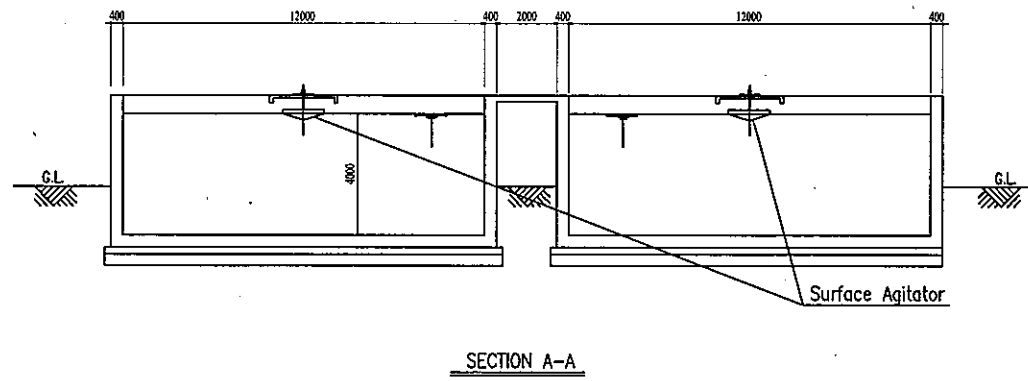
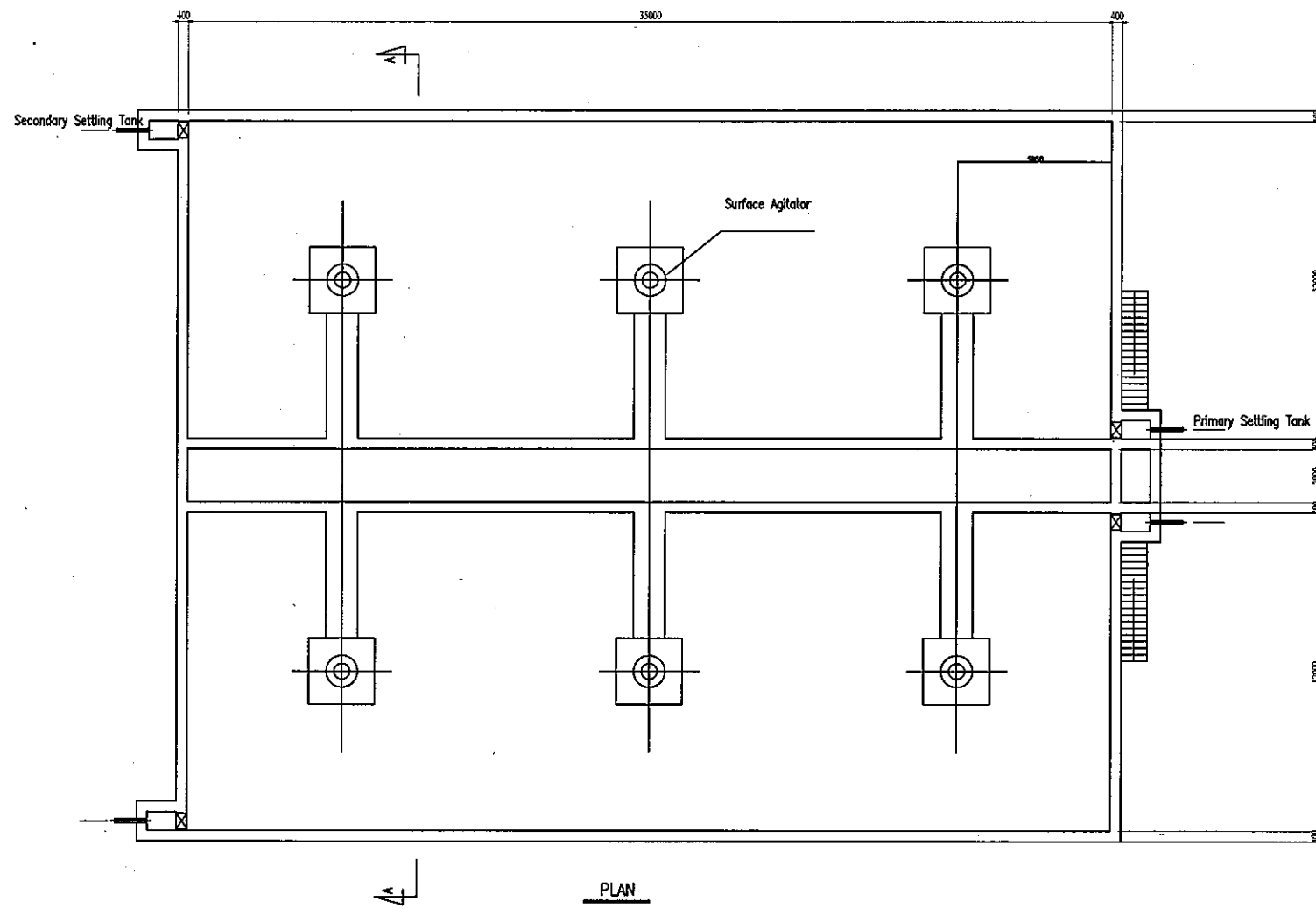


Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India

Structure of STP Facilities
Primary Settling Tank

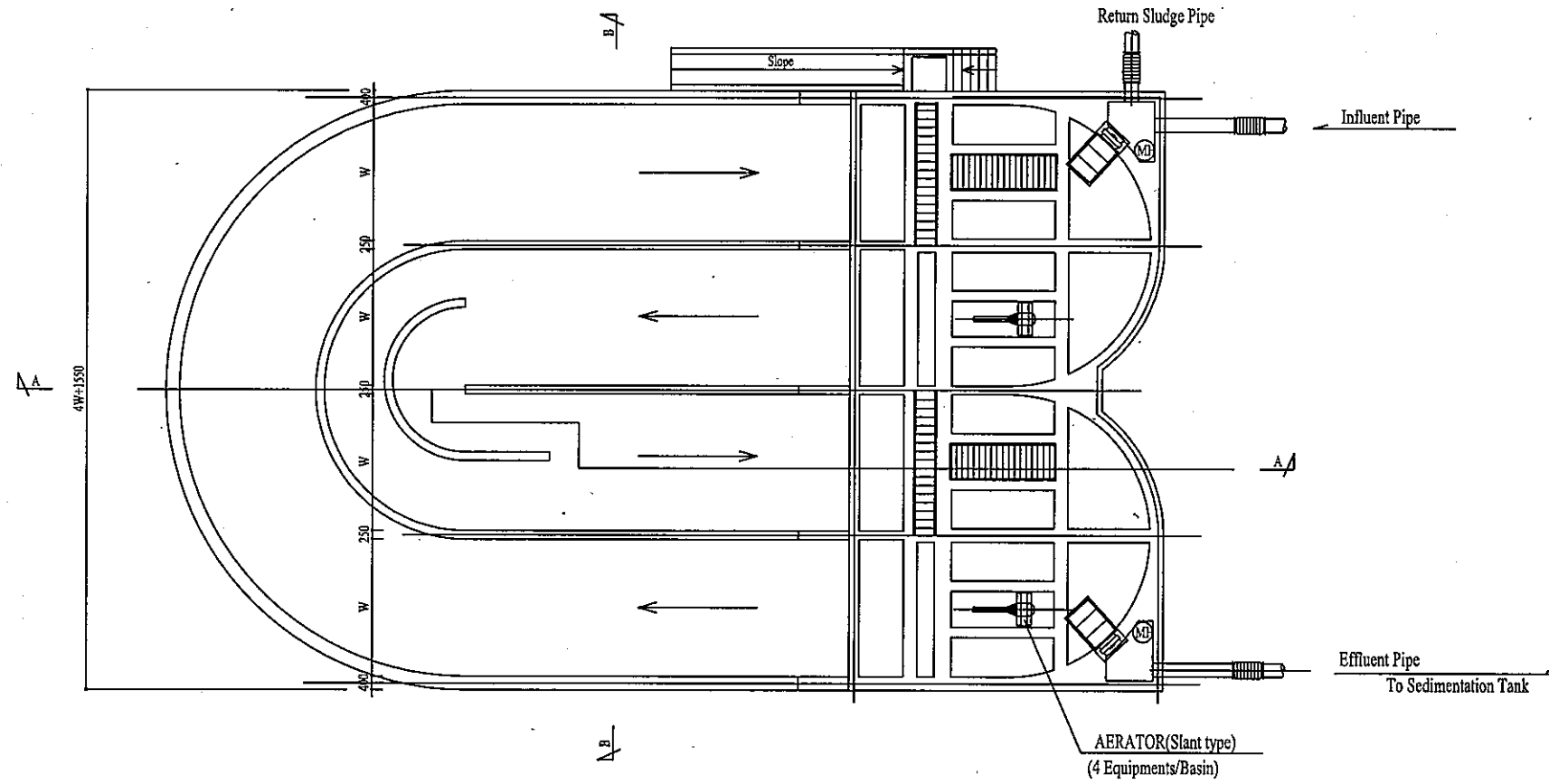
Scale: 1:200

No.: S-46



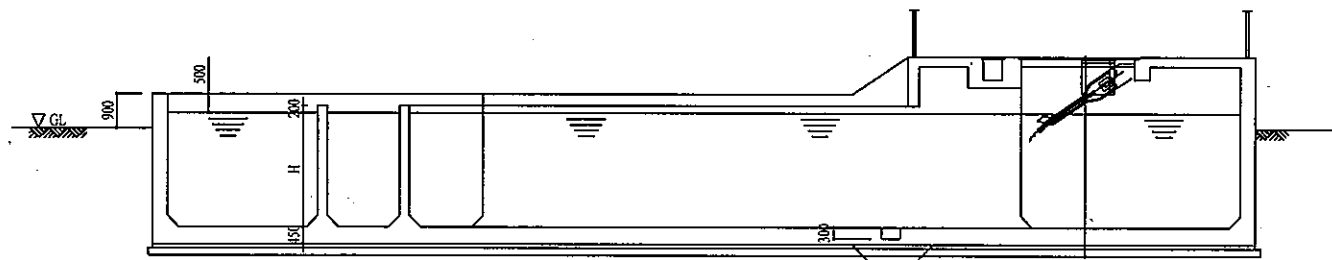
Study on Augmentation of Water Supply and Sanitation for the Goa State in the Republic of India	
Structure of STP Facilities Aeration Tank	Scale: 1:250
	No.: S-47

PLAN

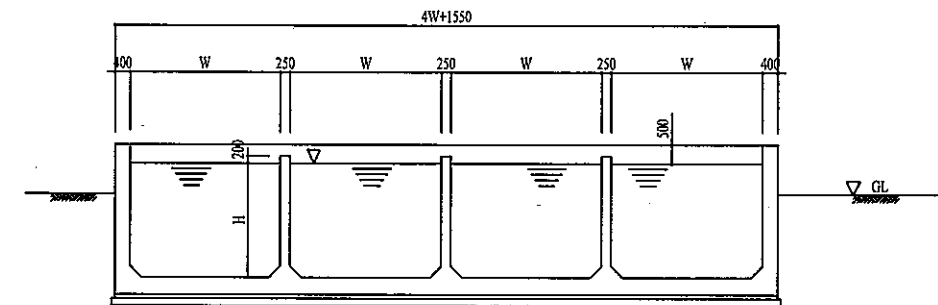


Item	Mapusa STP	Baga STP		
Type	Endless oval ditch flow type			
Width	W = 4.0 m	W = 4.0 m		
Depth	H = 3.0 m	H = 3.0 m		
Total Length	L = 141.0 m	L = 146.0 m		
Basin number	F/S	M/P	F/S	M/P
	2	4	2	4

SECTION A-A



SECTION B-B



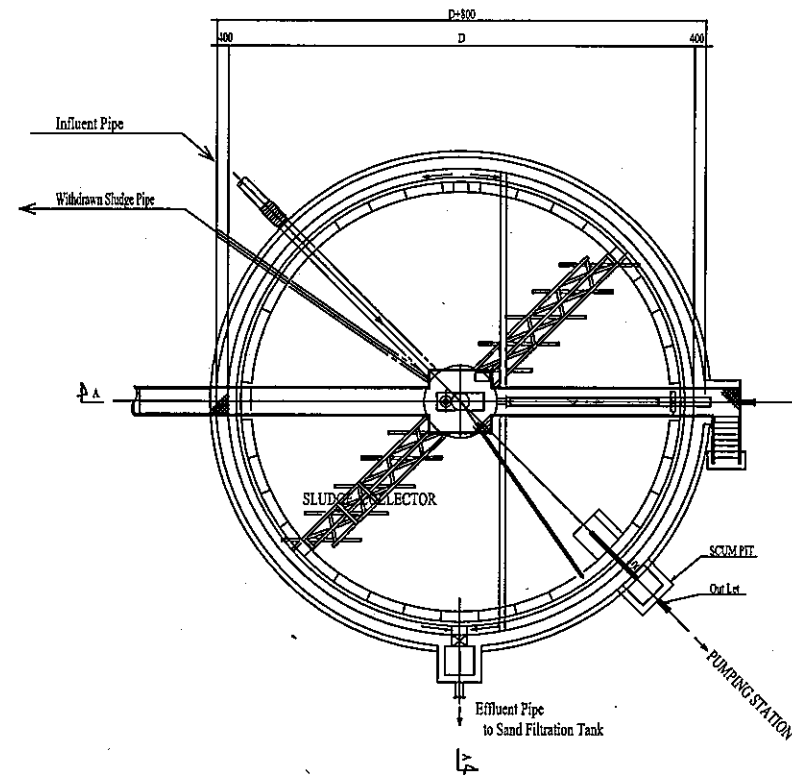
Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Structure of STP Facilities
Oxidation Ditch

Scale: 1:200

No.: S-48

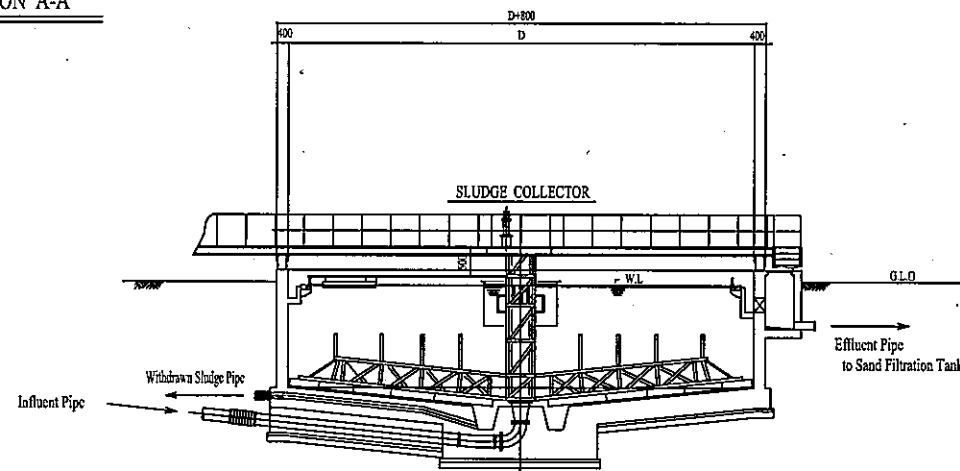
PLAN



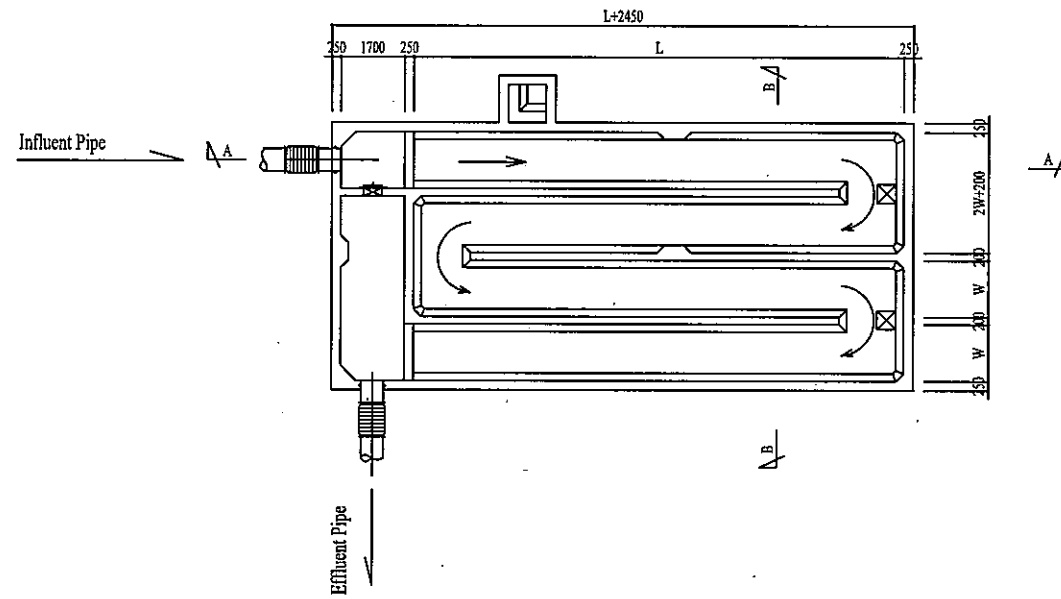
Item	Margao STP *1	Mapusa STP	Baga STP			
Type	Radial flow circular type					
Diameter	D = 18.0 m	D = 15.5 m	D = 16.0 m			
Depth	H = 4.0 m		H = 4.0 m		H = 4.0 m	
Basin number	F/S	M/P	F/S	M/P	F/S	M/P
	1	2	2	4	2	4

*1 : Only new additional facilities

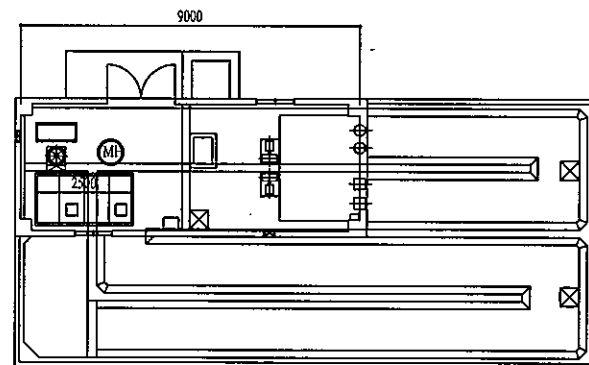
SECTION A-A



PLOT PLAN BASEMENT

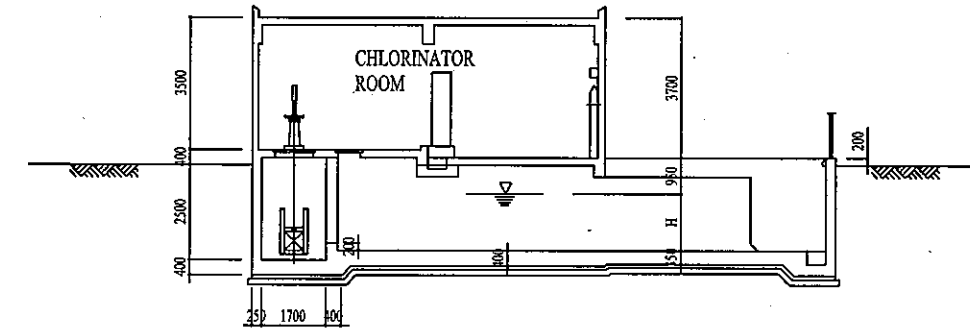


PLOT PLAN GROUND LEVEL

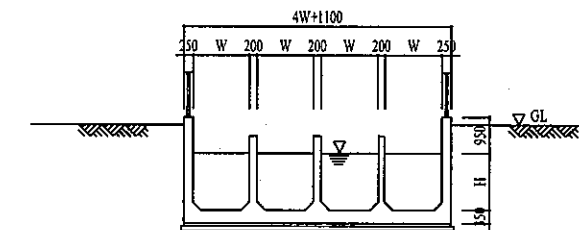


Item	Margao STP	Mapusa STP	Baga STP			
Type	Hypochlorite type					
Width	W=1.5 m	W=1.5 m	W=1.5 m			
Depth	H=1.5 m	H=1.5 m	H=1.5 m			
Length	L=12.5 m	L=12.5 m	L=13.0 m			
Pass number	F/S	M/P	F/S	M/P	F/S	M/P
	6	8	2	4	2	4

SECTION A-A



SECTION B-B

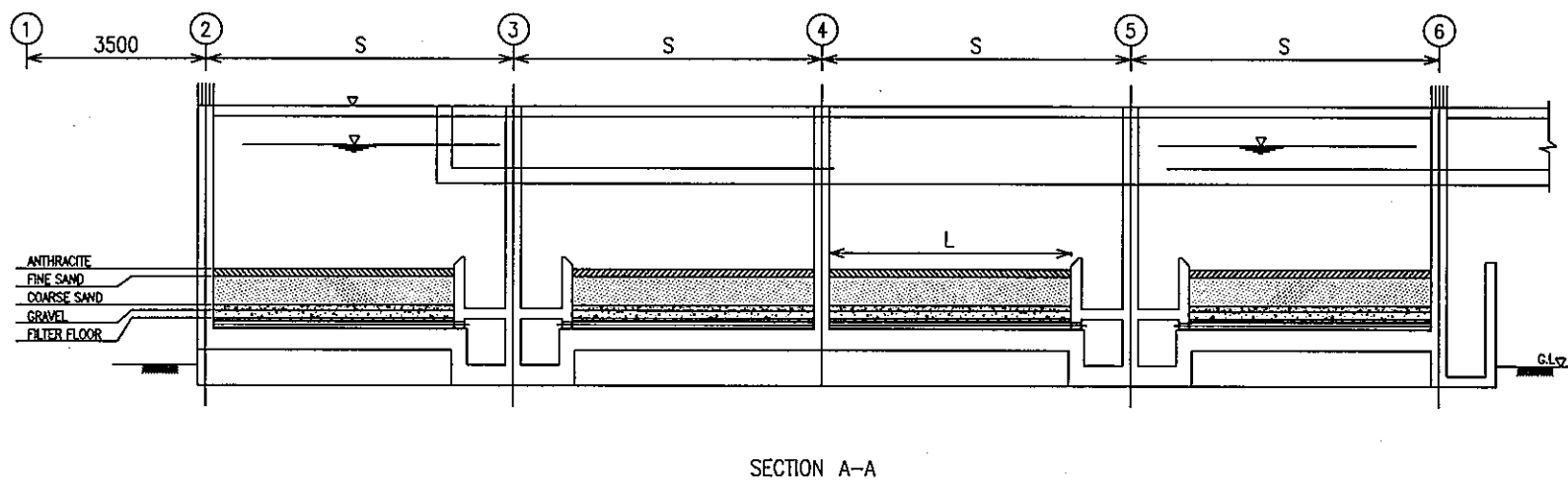
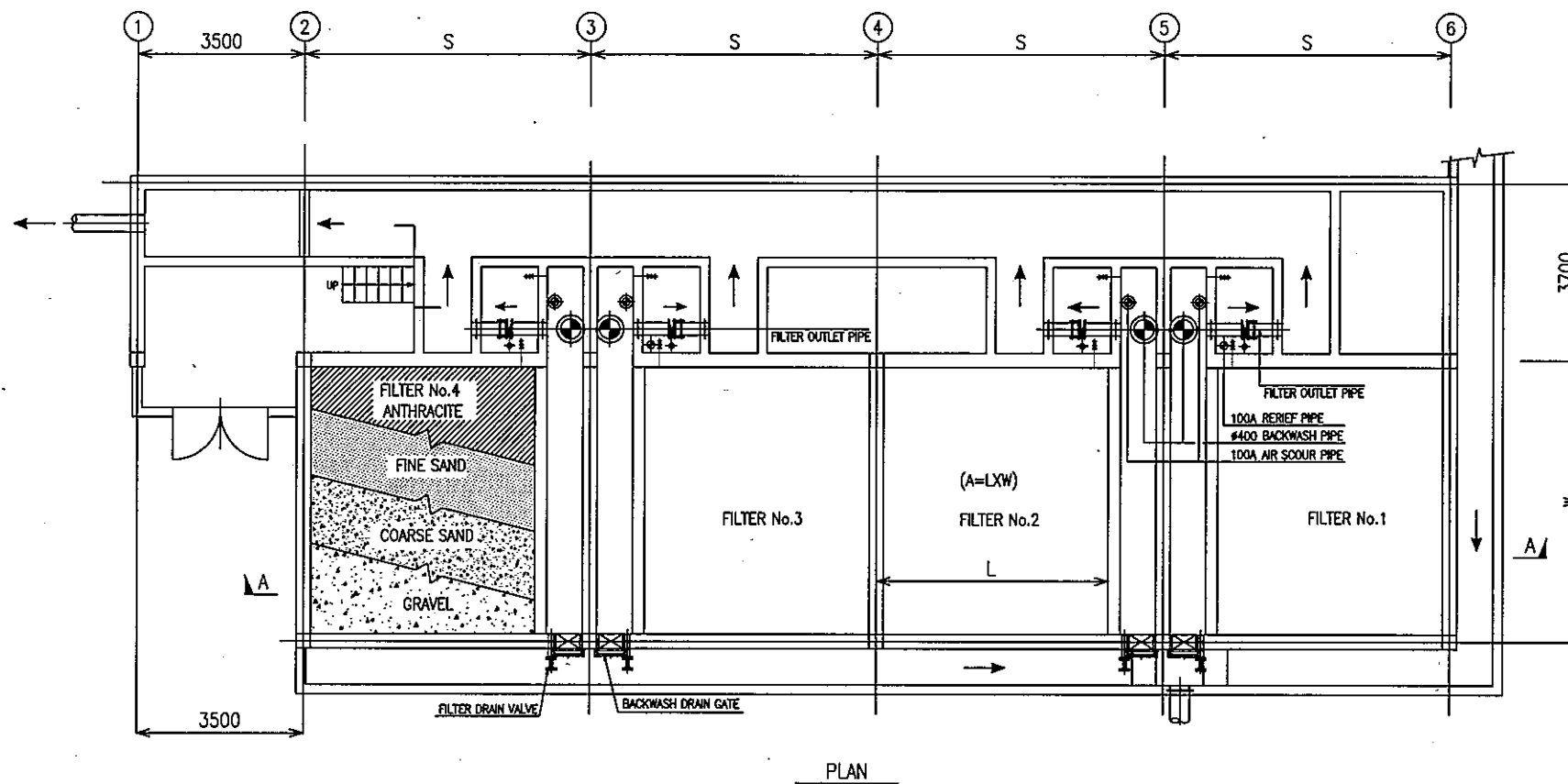


Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Structure of STP Facilities
Disinfection Tank

Scale: 1:200

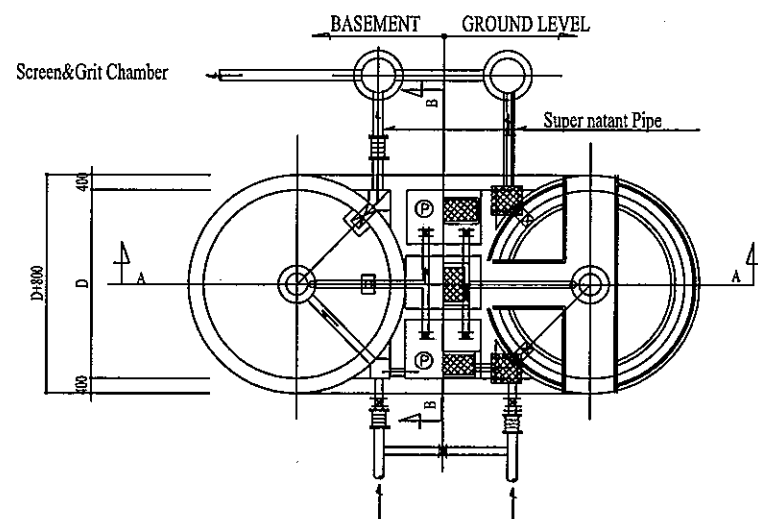
No.: S-50



Dimension of Sand Filtration Tank

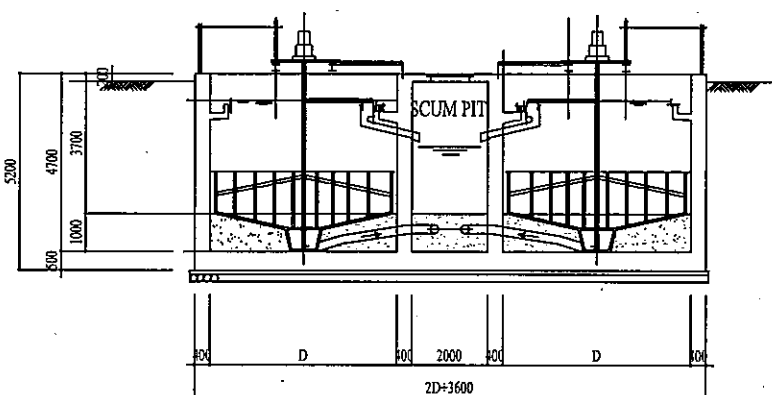
1. Margao STP		
Item	F/S Stage	M/P Stage
Type	Gravity upflow filter	
Width	W = 5.5m	W = 5.5m
Length	L = 5.0m	L = 5.0m
Basin Number	3	4
2. Mapusa STP		
Item	F/S Stage	M/P Stage
Type	Gravity upflow filter	
Width	W = 4.0m	W = 4.0m
Length	L = 3.5m	L = 3.5m
Basin Number	2	4
3. Baga STP		
Item	F/S Stage	M/P Stage
Type	Gravity upflow filter	
Width	W = 4.0m	W = 4.0m
Length	L = 3.5m	L = 3.5m
Basin Number	2	4

PLOT PLAN

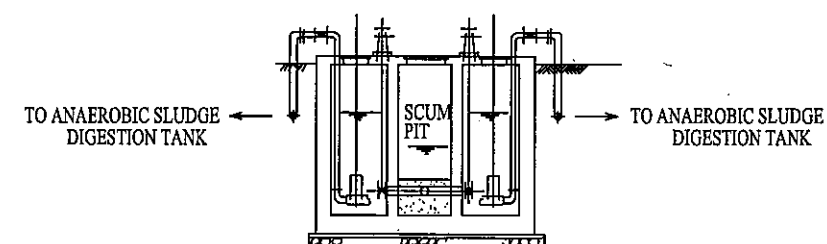


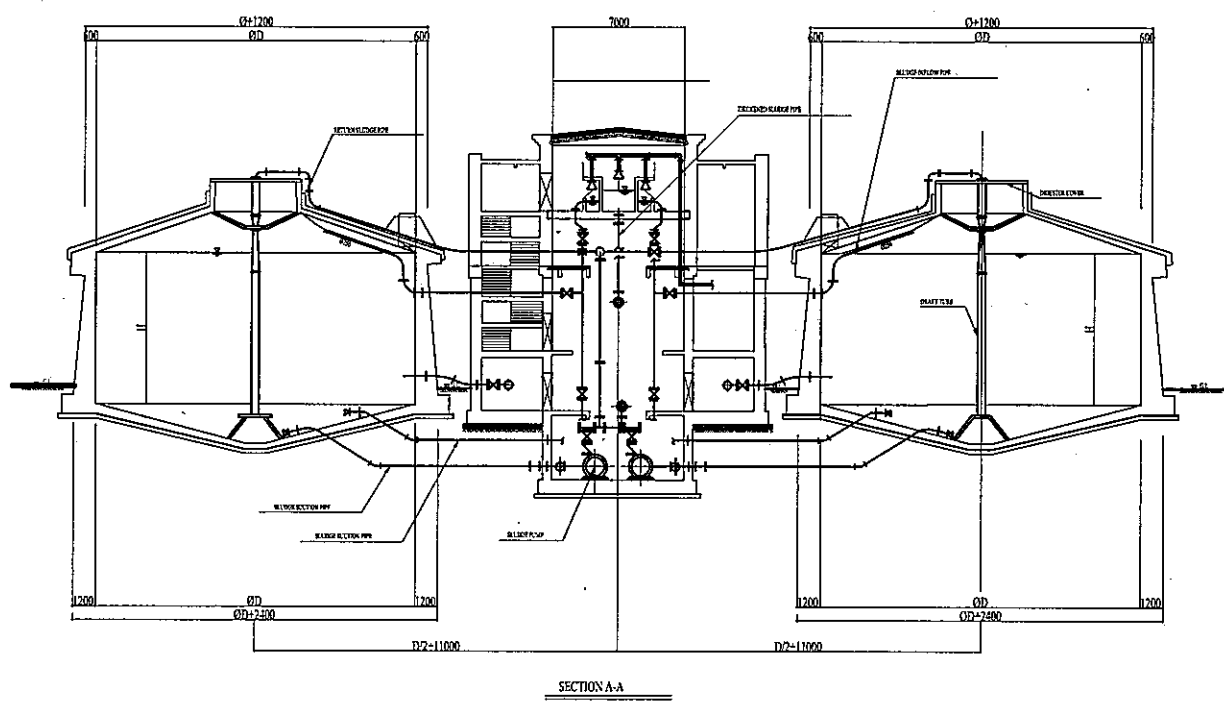
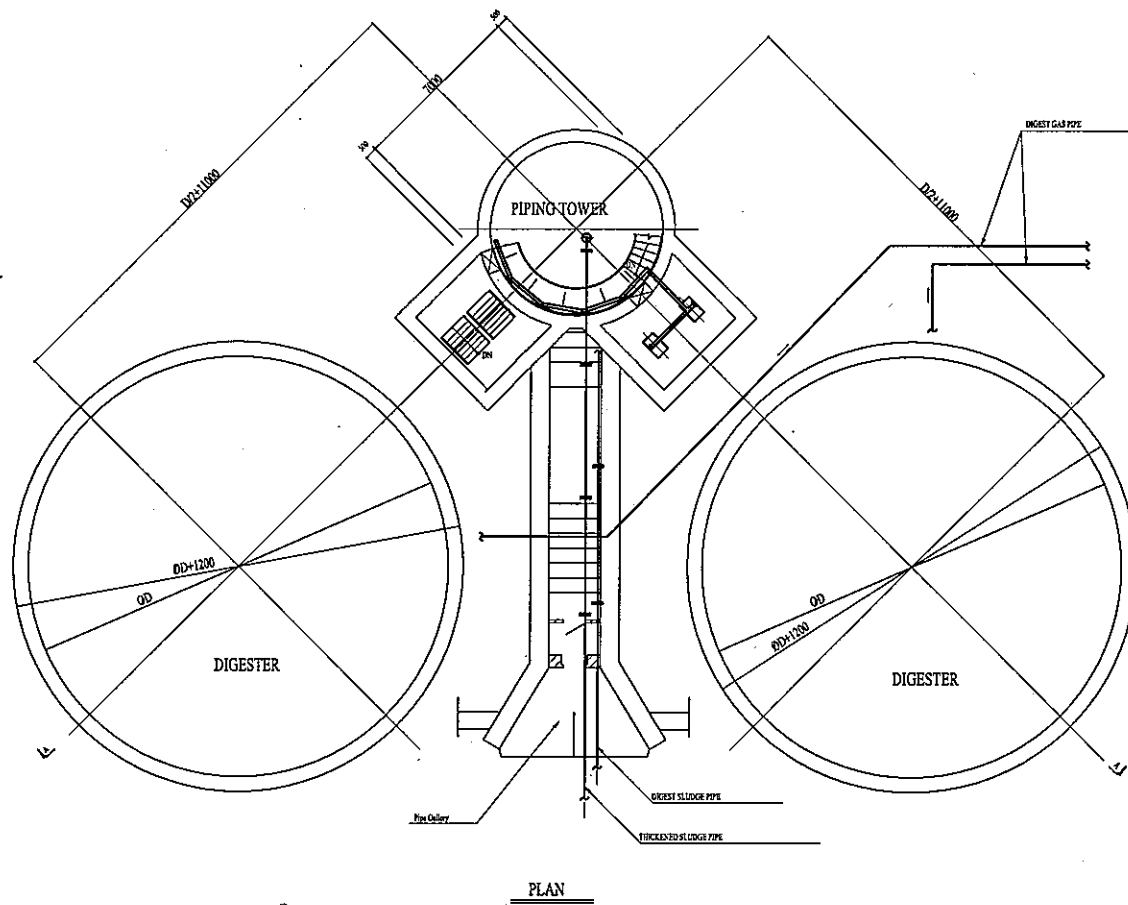
Item	Margao STP	Mapusa STP	Baga STP			
Type	Radial flow circular type					
Diameter	D = 9.5 m	D = 7.0 m	D = 6.0 m			
Depth	H = 3.0 m		H = 3.0 m		H = 3.0 m	
Basin number	F/S	M/P	F/S	M/P	F/S	M/P
	2	2	1	2	1	2

SECTION A-A



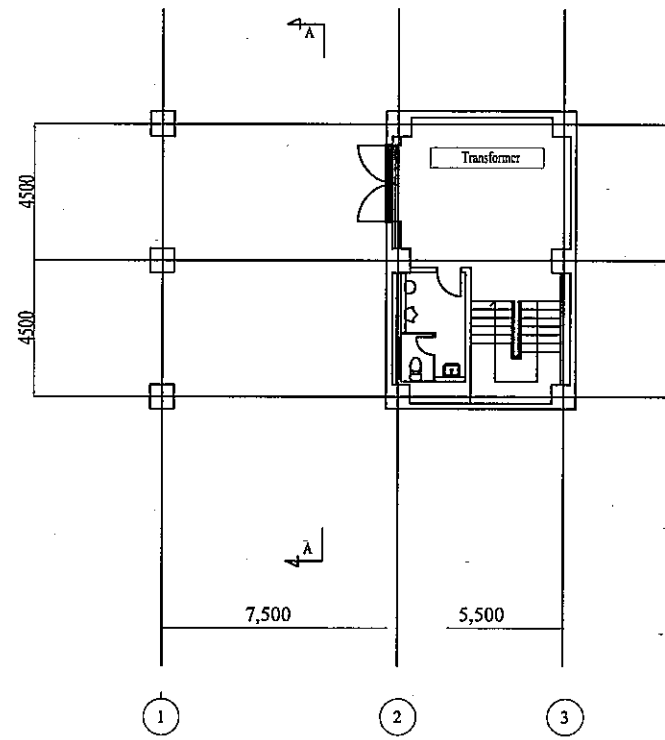
SECTION B-B



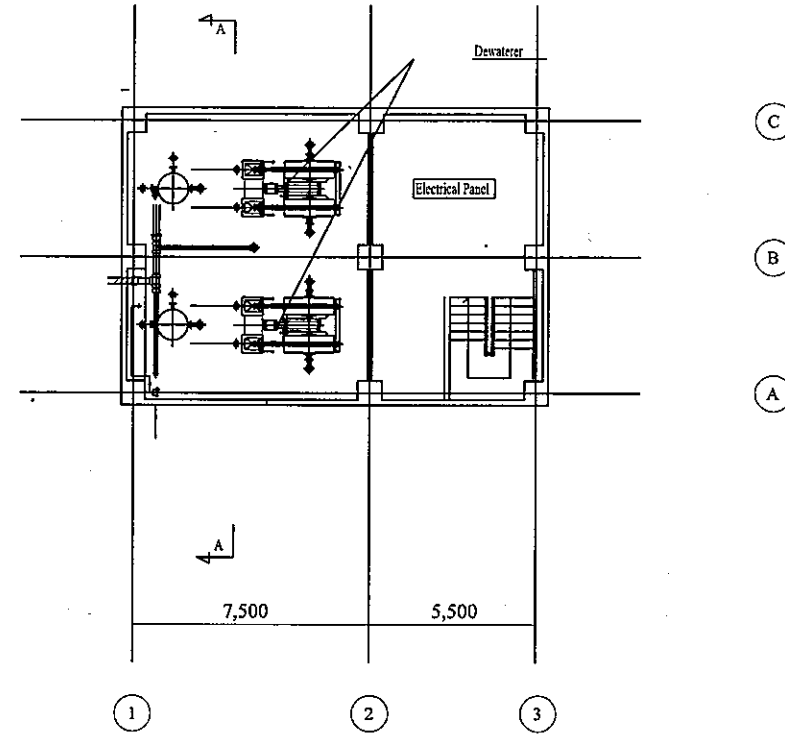


Dimension of Digestion Tank

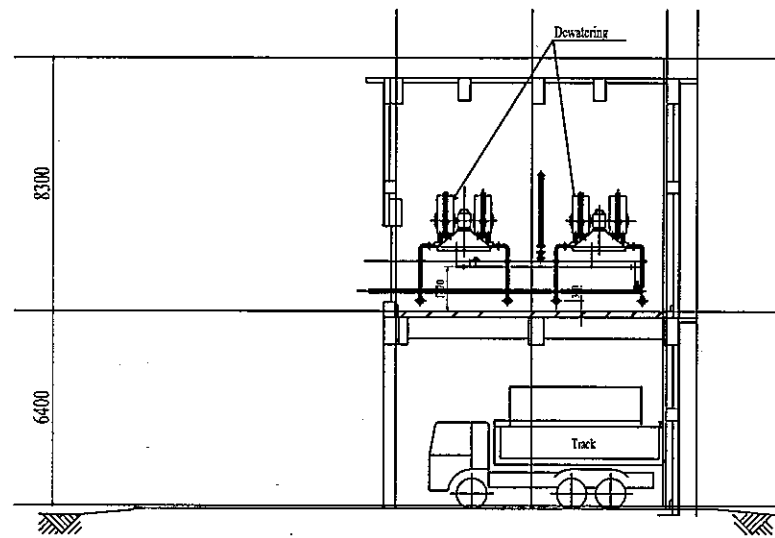
1. Margao STP		
Adoption of existing tank		
2. Mapusa STP		
Item	F/S Stage	M/P Stage
Type	-	Anaerobic digestion
Diameter	-	D = 9.0m
Depth	-	H = 8.0m
Basin Number	-	2
3. Baga STP		
Item	F/S Stage	M/P Stage
Type	-	Anaerobic digestion
Diameter	-	D = 8.0m
Depth	-	H = 8.0m
Basin Number	-	2



FIRST FLOOR PLAN



SECOND FLOOR PLAN



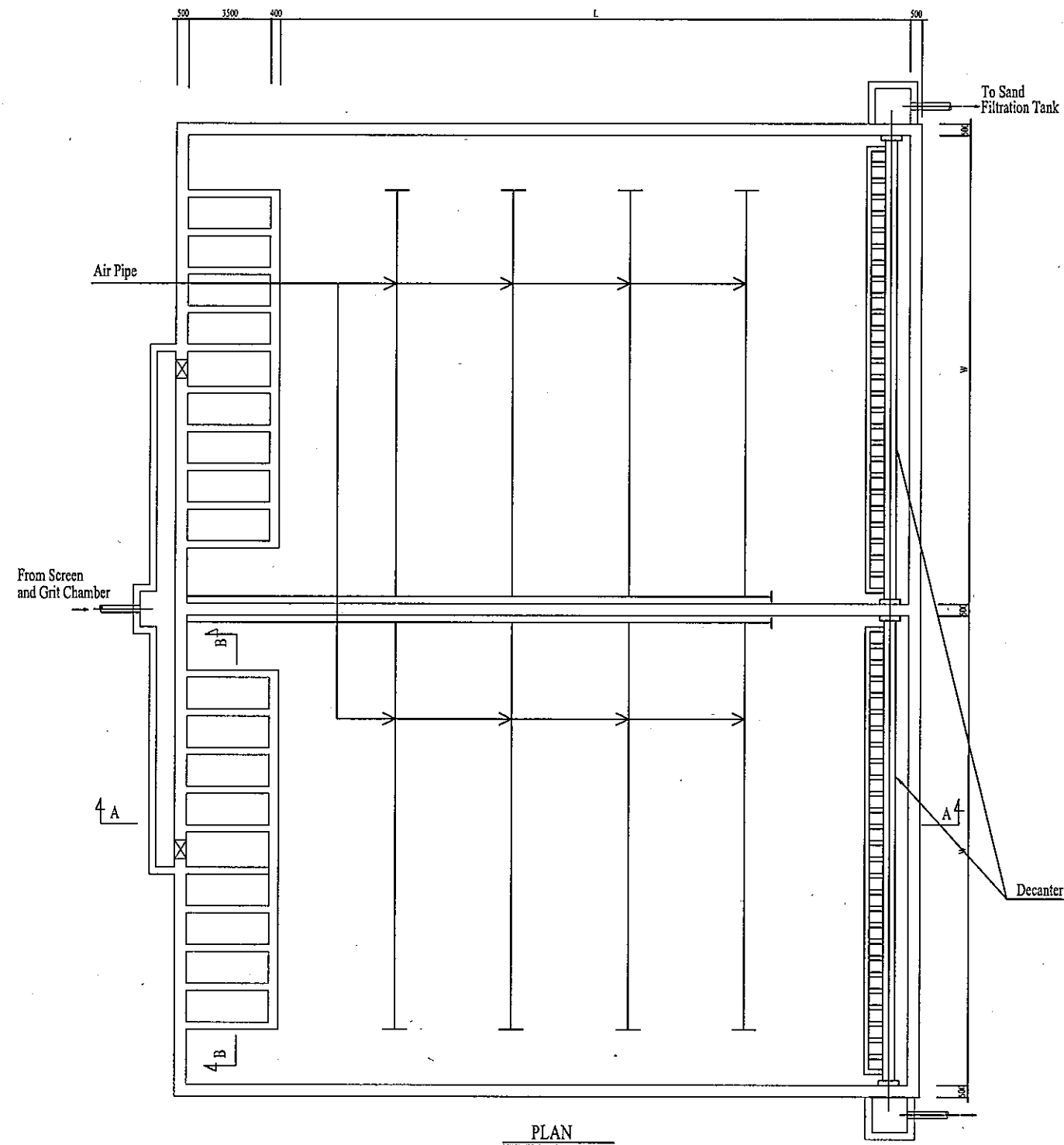
SECTION A-A

Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Structure of STP Facilities
Sludge Dewaterer

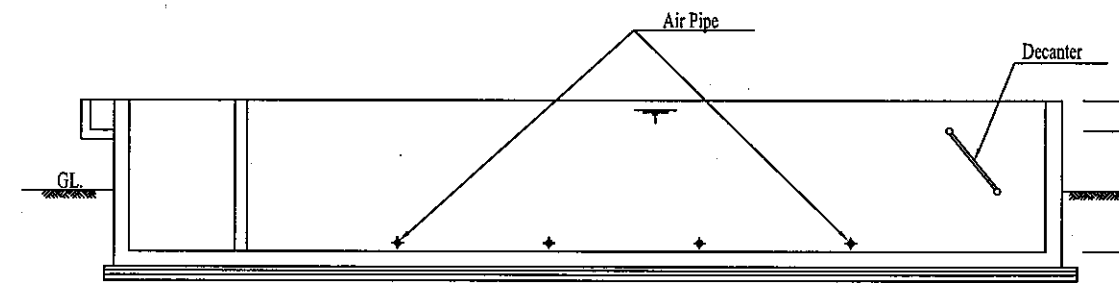
Scale: 1:250

No.: S-54

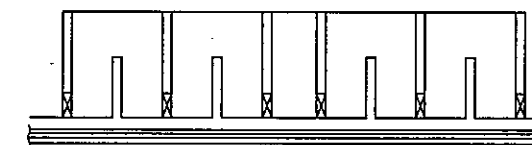


Dimension of SBR Tank

Item	Mapusa STP	Baga STP		
Type	Sequencing Batch Reactor			
Width	W = 20.0 m	W = 20.0 m		
Length	L = 26.0 m	L = 27.0 m		
Depth	H = 4.0 m	H = 4.0 m		
Basin number	F/S	M/P	F/S	M/P
	2	4	2	4



SECTION A-A



SECTION B-B

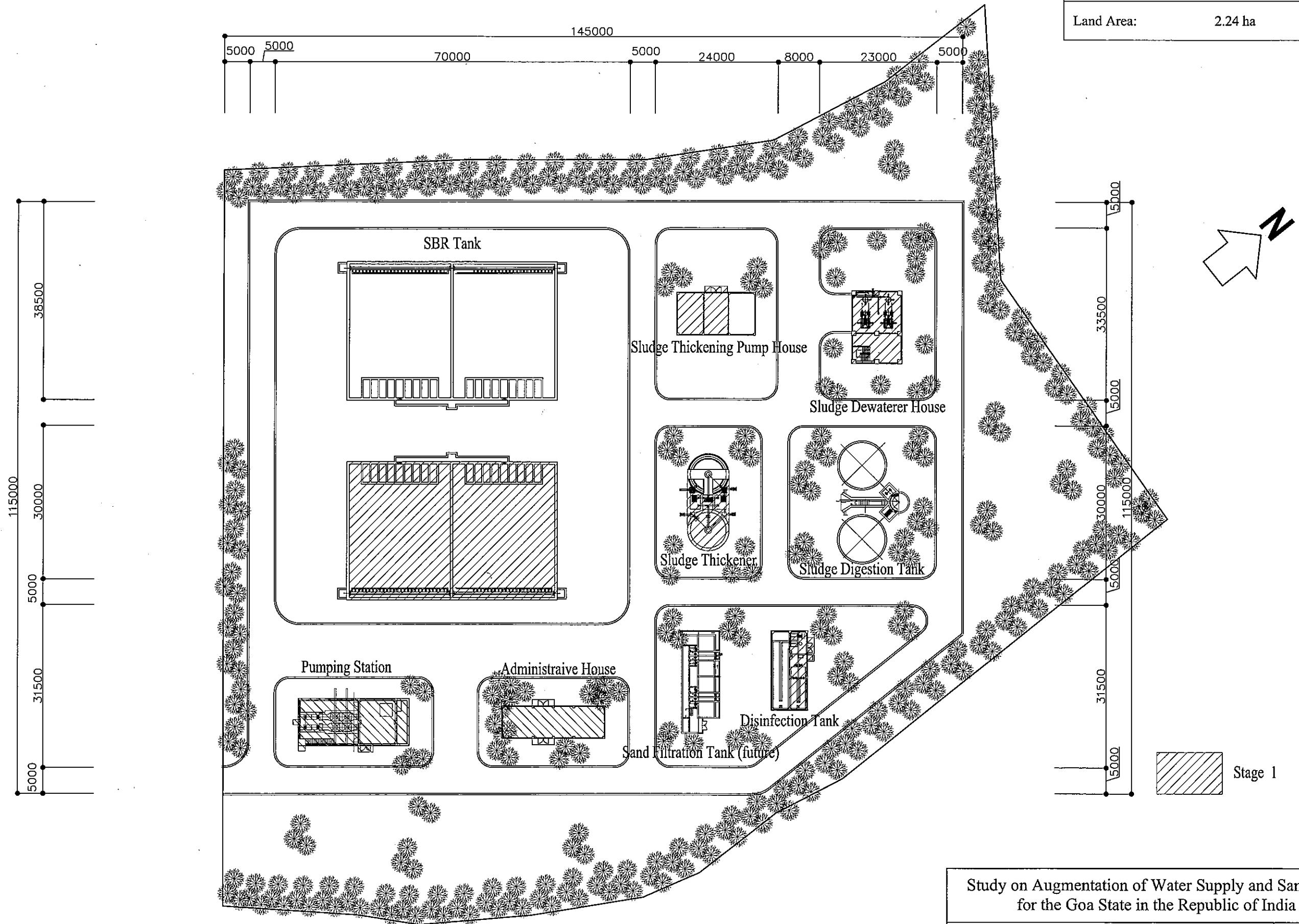
Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Structure of STP Facilities
SBR Tank

Scale: 1:250

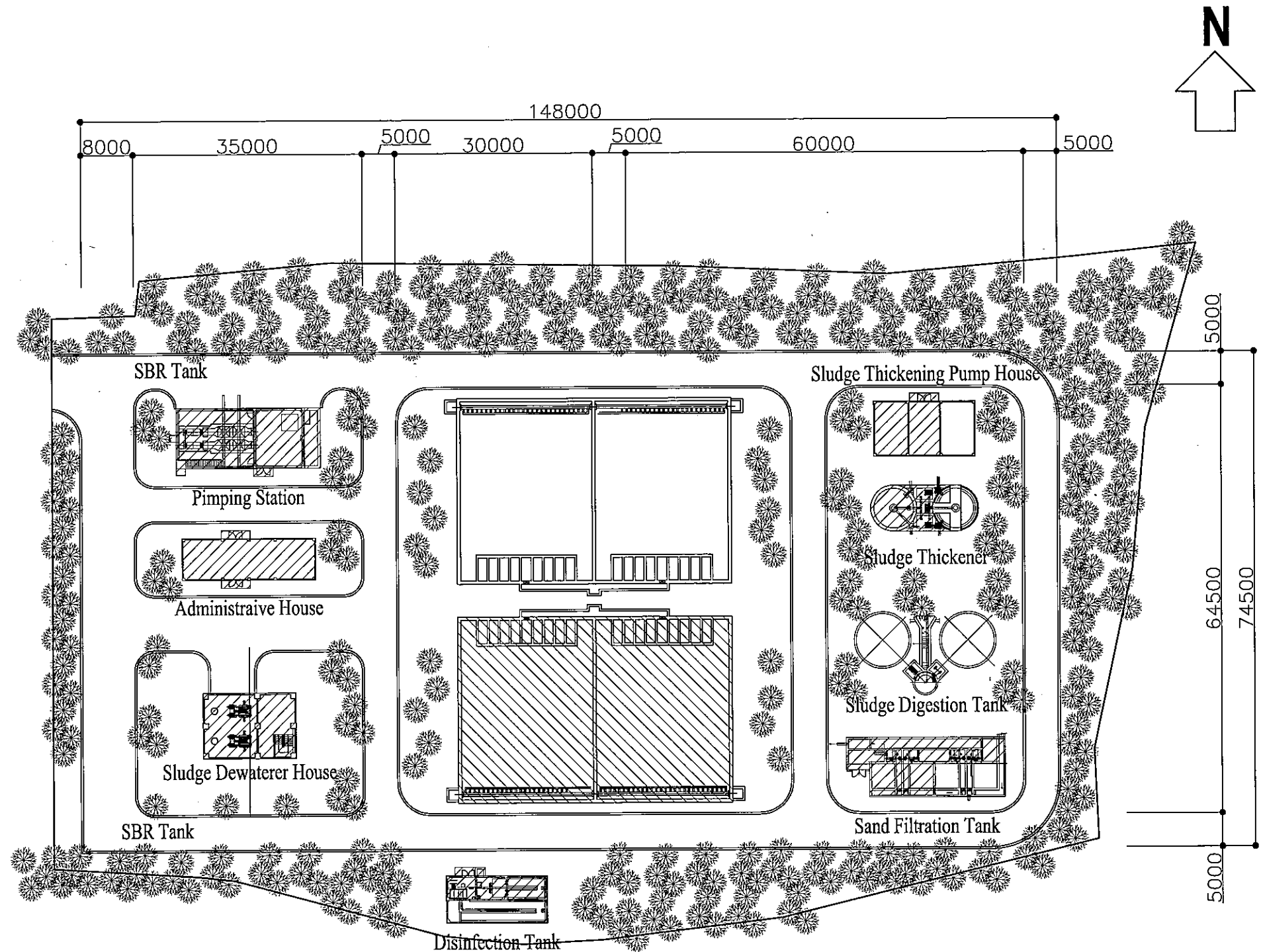
No.: S-55

Design Capacity: 5.4 MLD (Stage 1)
10.8 MLD (Stage 1 + 2)
Land Area: 2.24 ha



Study on Augmentation of Water Supply and Sanitation
for the Goa State in the Republic of India

Reference: General Layout Plan of STP Mapusa STP for SBR	Scale: 1:750 No.: S-56
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 Stage 1

Design Capacity:	5.6 MLD (Stage 1) 11.2 MLD (Stage 1+2)
Land Area:	1.55 ha

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Reference: General Layout Plan of STP Baga STP for SBR	Scale: 1:750 No.: S-57