plant which receives 22 kV from supply line. The source of power is fed by the regional electric company/authority. In the both power sub-stations, emergency generator units are installed. The generator units provides 50 % power of Maximum operation, when an emergent power stops.

(9) AUTHORIZATION OF DESIGN CONCEPT AND CRITERIA BY EGYPTIAN TECHNICAL COMMITTEE

All design works herein were discussed are accepted by the National Organization of Potable Water and Sanitary Drain (NOPWASD) and Suez Canal Authority (SCA) on behalf of the Ministry of Development, New Communities Housing and Public Utilities (MODANC).

3.7.2 DESIGN CONDITIONS

(1)	Service Area	See Figure 3.7-2
(2)	Average Daily Water Consumption	See Table 3.7-1
(3)	Design Water Demand	See Table 3.7-2
(4)	Design Raw Water Quality	See Table 3.7-3 and 3.7-4

3.7.3 DESIGN CRITERIA AND SPECIFICATIONS OF WATER SUPPLY FACILITIES

3.7.3.1 INTAKE FACILITIES

(See Figure 3.7-3)

(1)	Plant composition	Intake mouth, Screen, Pump sump, Pumping station, Operation Bldg, Power sub-station, Workshop, Guard house	
(2)	Capacity	100,000 m^3/day.	
(3)	Intake pump	Total head:	120 m
		Pumping rate:	18.3 m^3/day.
		Type:	Multi stage double suction centrifugal pump with slip-ring motor
		Configuration:	500 kW x 6 unit (one for stand-by)
(4)	Operation	Semi-automatic system relating to water level of the raw water reservoir	

3.7.3.2 AQUEDUCT

(1)	Total length	19..5 km
(2)	Type of pipe	Ductile cast iron pipe with mortar inner coating and epoxy outer coating
(3)	Diameter	1,100 mm

3.7.3.3 WATER TREATMENT PLANT

(see Fig. 3.7-4)

(1) Production capacity: 100,000 m³/day.

(2) Treatment series: 250,000 m³/day x 4 series

(3) System composition:

(Treatment facilities) Raw water reservoir, Mixing and coagulation basin, Rapid filter, Filter washing water basin, Chemical Bldg.

(Sludge treatment) Draw-off water reservoir, Sludge drying beds

(Operation and Maintenance) Administration Bldg., Workshop, Guard house

(Power facilities) Electric sub-station including emergency generator sets

(4) Retention time:

Raw water reservoir	240 minutes
Mixing and Coagulation Basin	158 minutes
Treated water reservoir	240 minutes
total	638 minutes = 10.6 hours

(5) Disinfection

Pre-Chlorination	Max.10 mg/l	Min. 4 mg/l
Post-Chlorination	Max. 3 mg/l	Min. 2 mgl

(6) Operation and Maintenance:

(Dosing control) Automatic operation

(Filter washing) Semi-automatic operation at the local control panels

(Emergency power) Automatic changing-over to the emergency generators

(Inspection of process) Central inspection at the central control room of the administration Bldg.

3.7.3.4 DISTRIBUTION PIPELINE

(1) Total length of the distribution pipeline: 35.5 km

(2) Total length of the draw-off water pipeline: 43.1 km

(3) Type of pipes (Distribution pipes) over 350 mm Dia. Ductile cast iron pipe less than 300 mm Dia. PVC

(Draw-off water pipes) PVC

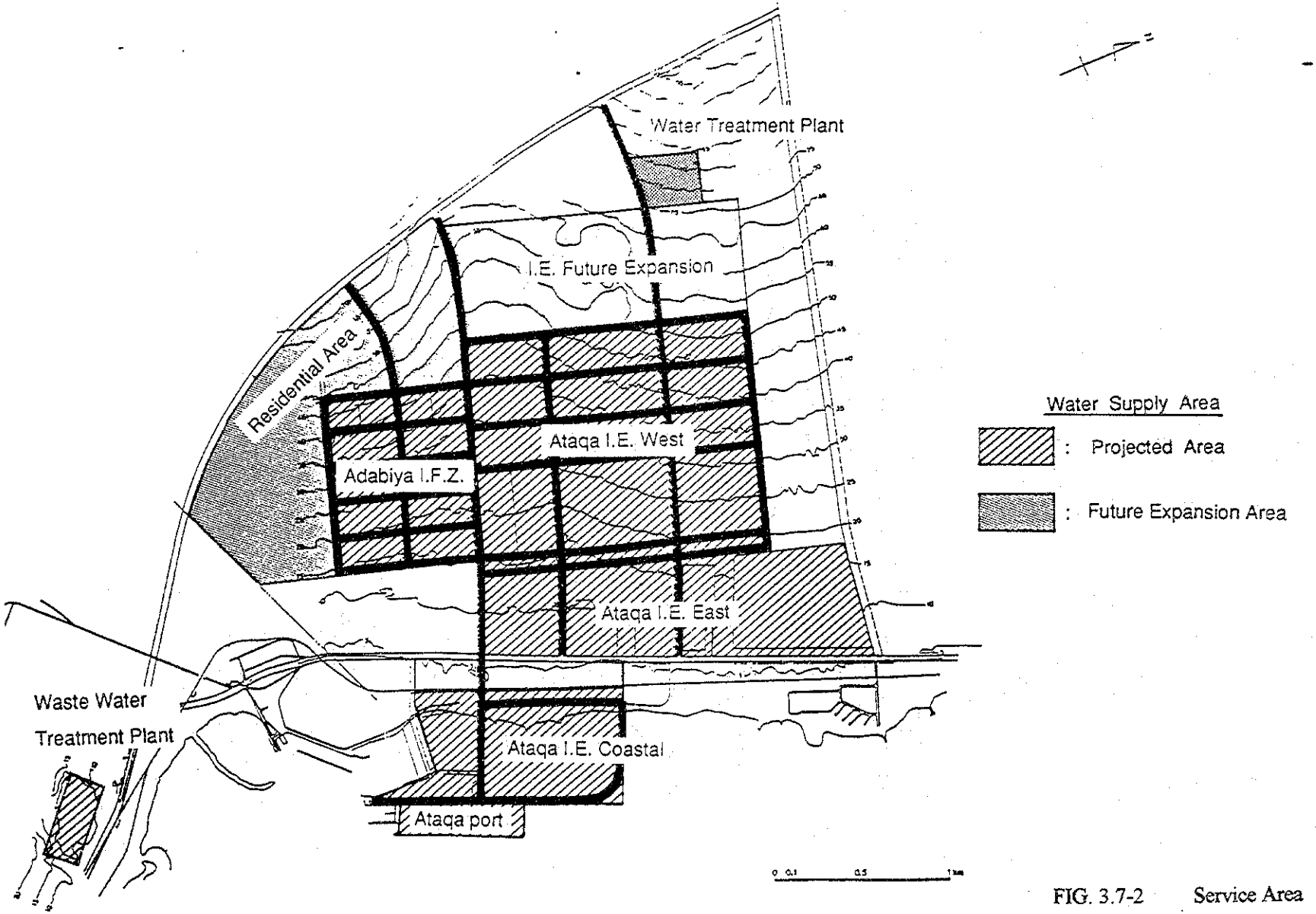
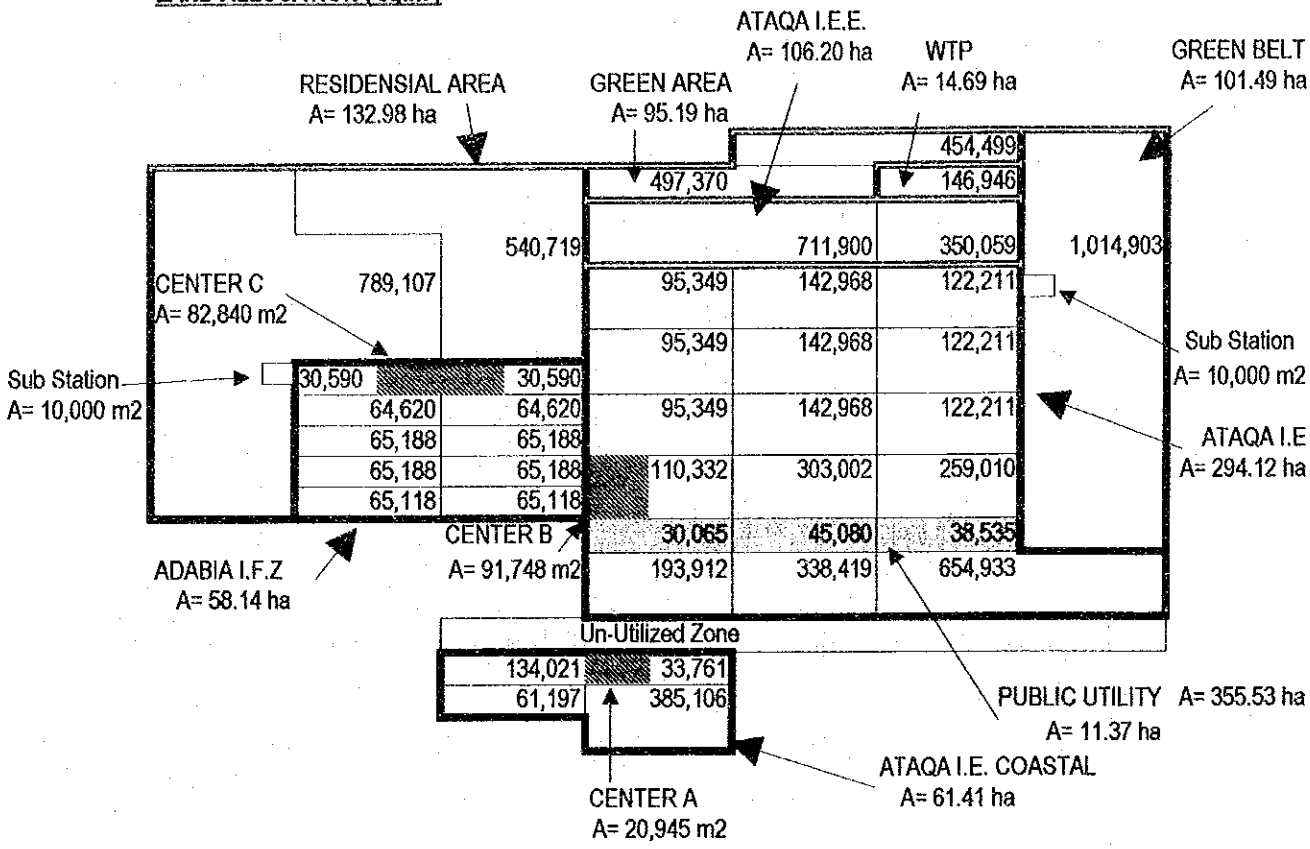


FIG. 3.7-2 Service Area

TABLE 3.7-1 Average Daily Consumption

LAND ALLOCATION (sq.m)



WATER CONSUMPTION AND DEMAND

a. Water Consumption (Average Day Demand)

Category	Quantities (unit)	Unit Demand cu.m / unit / day	Consumption cu.m / day
(Domestic Use)			
Residential Use	35,000 capita	0.190	6,650
Commercial and Public Use			
Center A	110 capita	0.285	31
Center B	253 capita	0.285	72
Center C	225 capita	0.285	64
Grain Terminal	155 capita	0.285	44
W.W.T.P	1 lot		400
Sum. of Domestic Use			7,262
(Industrial Use)			
Ataqa I.E.	294 ha	107	31,471
Ataqa I.E.C.	61 ha	107	6,571
Ataqa I.E.E.	106 ha	107	11,363
Adabiya I.F.Z.	58 ha	107	6,221
Ataqa Port	1 lot		1,580
Sum. of Industrial Use			57,205
Total of Average Day Consumption			**64,467**

TABLE 3.7-2 Design Water Demand

b. Maximum Day Demand

Category	Ave. Day Cons. cu.m / day	Ave. / Max.	Max. Day Demand cu.m / day
(Domestic Use)			
Residential Use	6,650	1.30	8,645
Commercial and Public Use			
Center A	31	1.30	41
Center B	72	1.30	94
Center C	64	1.30	83
Grain Terminal	44	1.30	57
W.W.T.P	400	1.30	520
Sum. of Domestic Use			9,440
(Industrial Use)			
Ataqa I.E.	31,471	1.20	37,765
Ataqa I.E.C.	6,571	1.20	7,885
Ataqa I.E.E.	11,363	1.20	13,636
Adabiya I.F.Z.	6,221	1.20	7,465
Ataqa Port	1,580	1.20	1,896
Sum. of Industrial Use			68,647
Total of Maximum Day Demand			78,087

c. Peak Hour Demand

Category	Ave. Day Demand cu.m / day	Peak Factor	Peak Day Demand cu.m / hour
(Domestic Use)			
Residential Use	6,650	2.00	554
Commercial and Public Use			
Center A	31	2.00	3
Center B	72	2.00	6
Center C	64	2.00	5
Grain Terminal	44	2.00	4
W.W.T.P	400	2.00	33
Sum. of Domestic Use			605
(Industrial Use)			
Ataqa I.E.	31,471	2.00	2,623
Ataqa I.E.C.	6,571	2.00	548
Ataqa I.E.E.	11,363	2.00	947
Adabiya I.F.Z.	6,221	2.00	518
Ataqa Port	1,580	2.00	132
Sum. of Industrial Use			4,767
Total of Peak Hour Demand			5,372

d. Maximum Day Demand by Areas

Order	(Area)	Domestic Use	Industrial Use	Leakage	Process W.	**Total**	**Accum.**
1	Ataqa I.E.	94	37,765	5,679	3,786	**47,323**	47,323
2	W.W.T.P (1)	260		39	26	**325**	47,648
3	Adabiya I.F.Z.	83	7,465	1,132	755	**9,436**	57,084
4	W.W.T.P (2)	260		39	26	**325**	57,409
5	Ataqa Port	98	1,896	299	199	**2,493**	59,902
6	Ataqa I.E.C.		7,885	1,183	788	**9,856**	69,758
7	Residential Area	8,645		1,297	865	**10,806**	80,564
8	Ataqa I.E.E.		13,636	2,045	1,364	**17,044**	97,609
Total		**9,440**	**68,647**	**11,713**	**7,809**	**97,609**	

TABLE 3.7-3 Raw Water Quality

Items	Unit	Design Max.	Design Min.
Color	degree	3	2
Turbidity	NTU	18	15
Total Hardness as CaCO3	mg/l	224	-
Total Dissolved Solid	mg/l	733 (900) *	-
Total Alkalinity	mg/l	174	-
Ammonium-N	mg/l	0.2	0.1
Nitrate	mg/l	0.05	nil
pH		8.27	8
Cyanide	mg/l	trace	nil
Mercury	mg/l	trace	nil
Arsenic	mg/l	trace	nil
Iron	mg/l	nil	nil
Manganese	mg/l	nil	nil
Potassium	mg/l	59	-
Magnesium	mg/l	21	-
Chloride	mg/l	500	172
Phenol	mg/l	nil	nil
Calcium	mg/l	160	-

* Total Dissolved Solid : 773 mg/l is data of May 2 1992. 900 mg/l is the past maximum value in the record of SCA/NOPWASD.

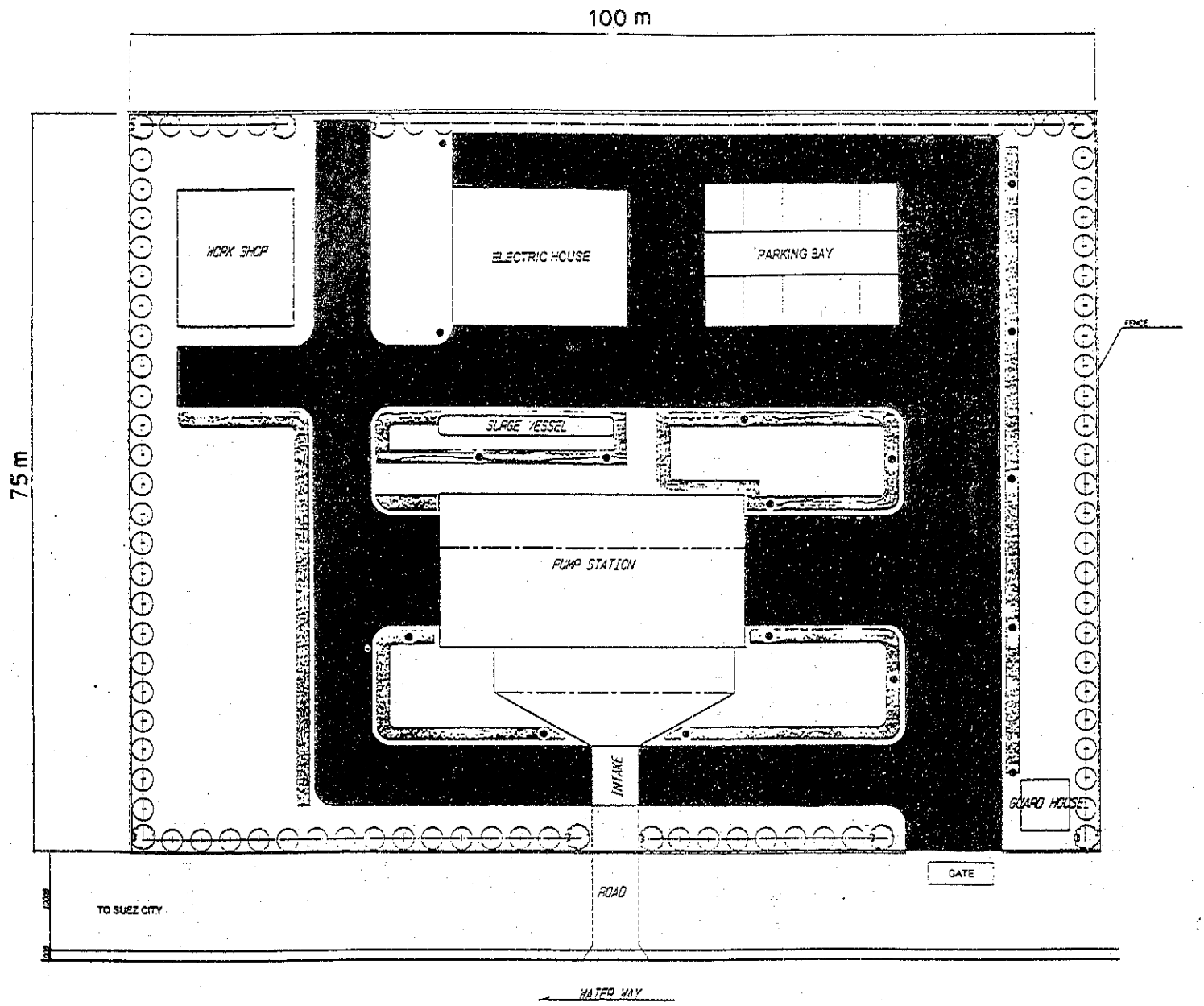
TABLE 3.7-4 Treated Water Quality

(Unit : mg/l except for pH and where noted.)

Item	Limitation	Item	Limitation
Color (Platinum-Cobalt units)	50	Manganese	0.50
Turbidity (NTU)	5	Copper	1.50
Taste	shall be acceptable	Zinc	15
Odor	shall be acceptable	Calcium	200
Lead	0.10	Magnesium	150
Arsenic	0.05	Total Hardness as CaCO3	500
Cyanide	0.05	Chloride	600
Cadmium	0.01	Sulfate	400
Selenium	0.01	Phenol	0.002
Mercury	0.001	pH	6.5 - 9.2
Barium	shall not be included	Mineral Oil	shall not be included
Chromium	shall not be included	Hydrogen Sulfide	shall not be included
Fluoride	0.80	Anionic Detergents/Forming Agents	shall not be included
Nitrite	45	Gross alpha activity (pCi/l)	3
Total Dissolved Solids	1500 [1] 500 [2]	Gross beta activity (pCi/l)	30
Iron	1.00		

1 Egyptian Standard for Drinking Water.

2 Recommendation of NOPWASD



GENERAL NOTES

LEGEND

TREE

COVER SOIL

OUTDOOR LIGHTING

Asphalt Pavement

Fence

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	

NO.	DATE	DESCRIPTIONS	BY	APPD
REVISIONS				

ARAB REPUBLIC OF EGYPT

MINISTRY OF DEVELOPMENT, NEW COMMUNITIES, HOUSING AND PUBLIC UTILITIES

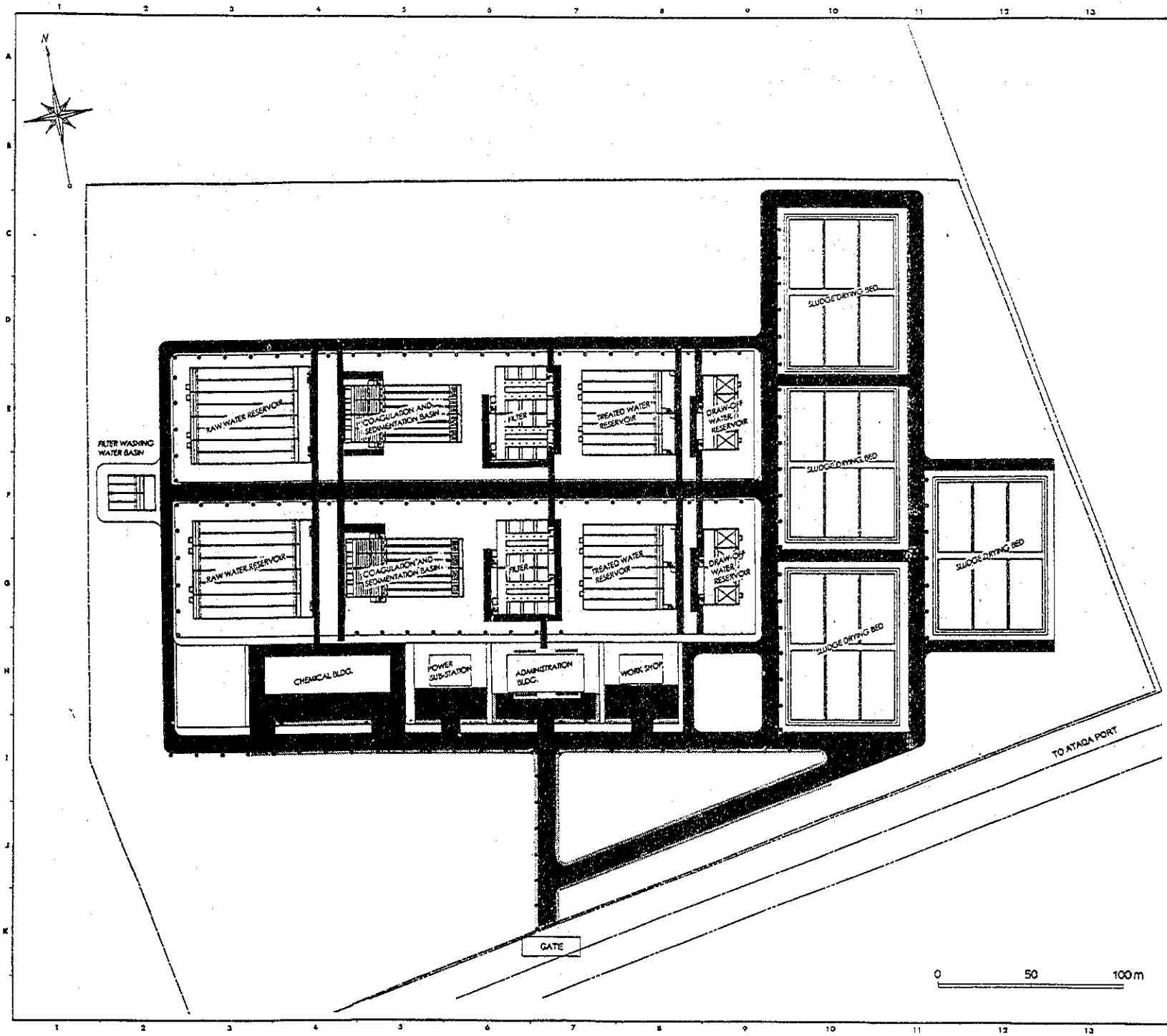
THE DETAILED DESIGN ON THE URGENT DEVELOPMENT PLAN OF THE SUEZ SAT COASTAL AREA DEVELOPMENT

FIG. 3.7-3 General Layout of Intake Pump Station

JAPAN INTERNATIONAL COOPERATION AGENCY

SUBMITTED	APPROVED	SCALE	REV. NO.
		1:200	

DATE October, 1993 | DWG. NO. A2-2,1-1-4



GENERAL NOTES

LEGEND

- Asphalt Pavement
- Cover Soil and Planting
- Out-door Lighting
- Fence

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	

NO.	DATE	DESCRIPTIONS	BY	APP'D
REVISIONS				

ARAB REPUBLIC OF EGYPT

MINISTRY OF DEVELOPMENT, NEW COMMUNITIES, HOUSING AND PUBLIC UTILITIES

THE DETAILED DESIGN ON THE URGENT DEVELOPMENT PLAN OF THE SUEZ BAY COASTAL AREA DEVELOPMENT

FIG. 3.7-4
General Layout of Water Treatment Plant

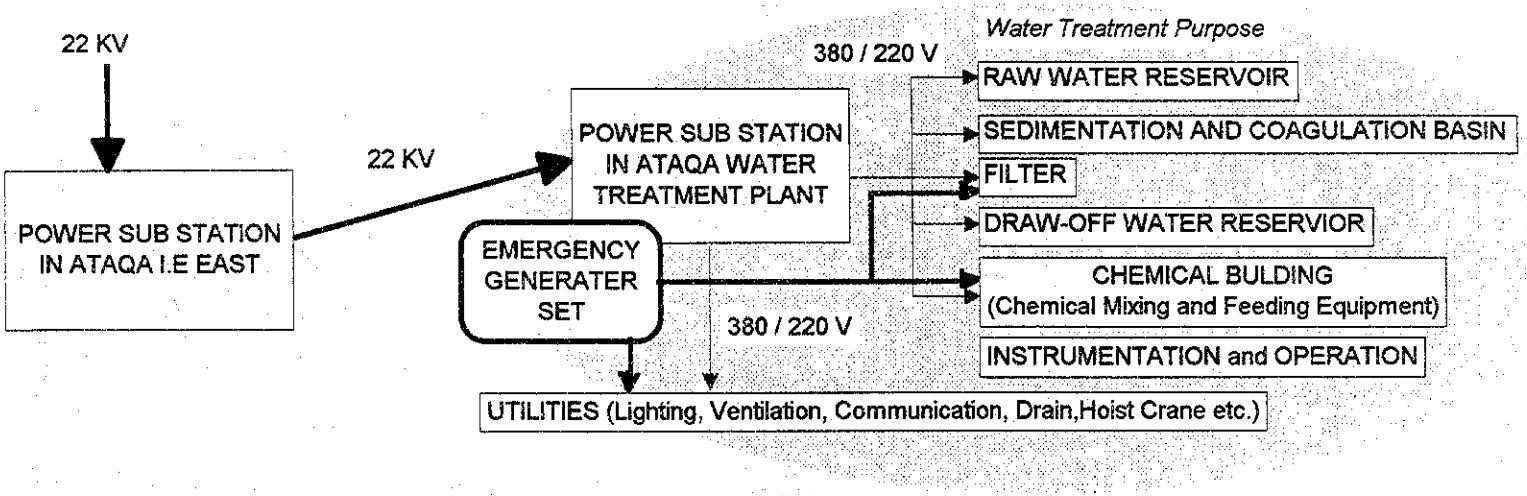
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

SUBMITTED	APPROVED	SCALE	REV. NO.

DATE OCT. 1993 | DWG. NO. A2-2 3-1-1 (2)

FIG. 3.7-5 Power Supply Diagram

(1) WATER TREATMENT PLANT



(2) RAW WATER INTAKE FACILITIES

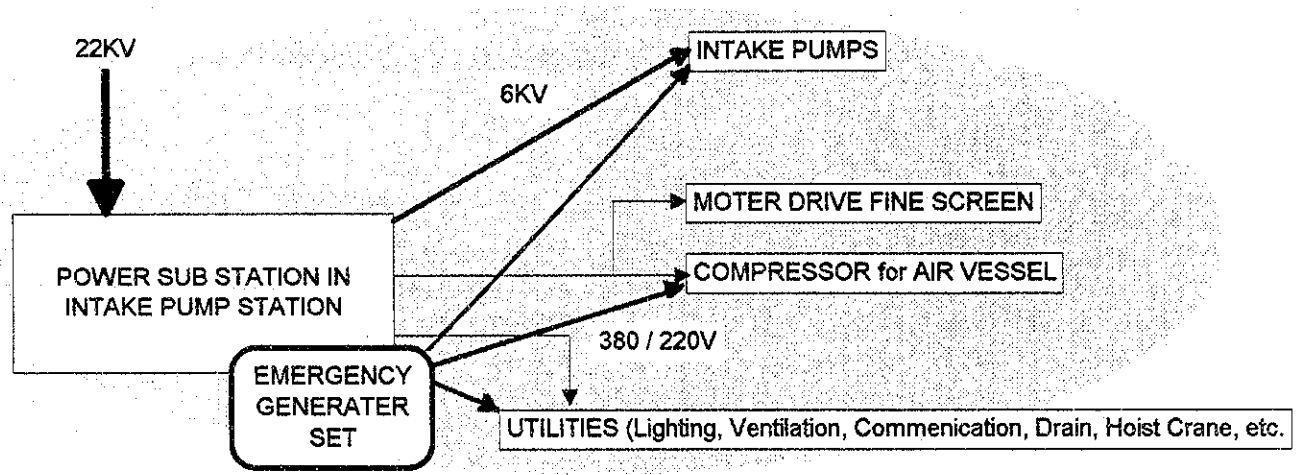
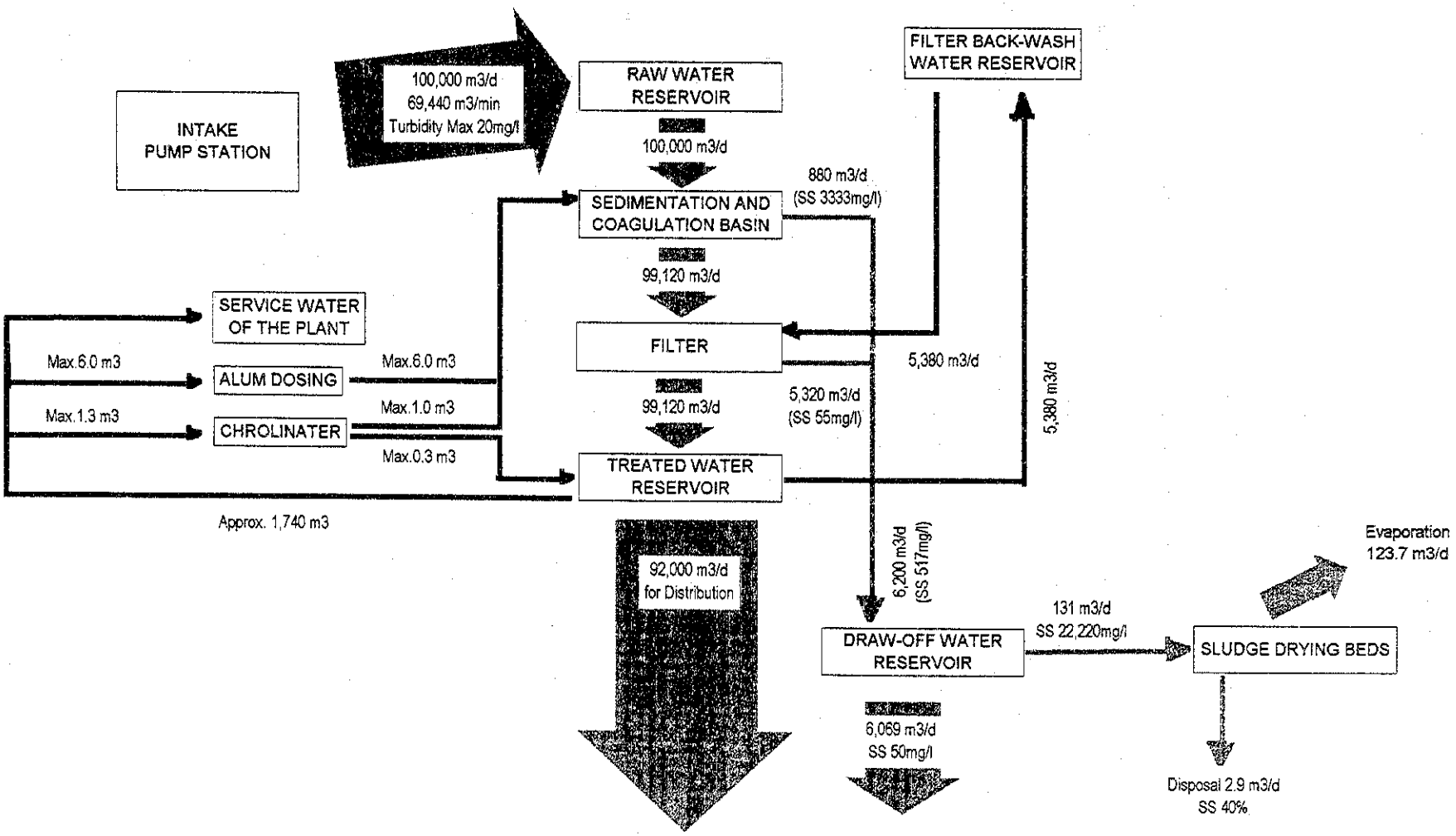


FIG. 3.7-6 Water Mass Balance Diagram



3.8 SEWERAGE SYSTEM

3.8.1 DESIGN CONCEPT

(1) PURPOSE OF SEWERAGE SYSTEM

The purpose of sewerage system construction in this Project Area are conceived as follows.

(a) The water quality preservation of the public water area (Suez Bay).

The sewerage systems is recommended as the technically sound measure for managing wastewater thus water environment from pollution can be protected.

(b) To develop clean and safe sanitary condition of the living and working environment.

(c) To establish effective and economical wastewater management system.

By adopting the sewerage system, where all wastewater are collected and conveyed to the single treatment plant, which is a centralized system. Wastewater could be handled more effectively and economically as compared with a decentralized system (each factory treats it's own wastewater individually in accordance with the Egyptian Law No. 93 for 1962-1989).

(2) MAIN FACILITIES OF SEWERAGE SYSTEM

The recommended sewerage system consists of a network of the sewers, three relay pumping stations (two are for industrial wastewater collection system and one is for domestic swages which are conveyed to the USAID plant) and a wastewater treatment plant (hereinafter referred to as "WWTP").

(3) SERVICE AREA

The area to be covered by the sewerage system including industrial and residential areas are as follows.

Project Area			
Ataqa I.E. West and East	:	294	ha
Ataqa I.E. Coastal	:	61	ha
Adabiya I.F.Z.	:	58	ha
Wastewater Treatment Plant	:	4.5	ha
Center A	:	2.1	ha
Center B	:	9.2	ha
Center C	:	8.3	ha
Future Expansion Area			
Residential Area	:	132	ha
Expansion Area of Ataqa I.E.	:	106	ha
Total Service Area		**675.1**	**ha**

3.8.2 DESIGN CONDITIONS

(1) WASTEWATER CHARACTERISTICS

Tables 3.8-1 and 3.8-2 show the quantity and quality of industrial wastewater and domestic sewage.

The design quantity of the wastewater is determined on the basis of the design criteria (NOPWASD) stating that the average wastewater capacity is to be 80 % of the average water consumption.

The design quality of the industrial wastewater is estimated on the bases of data accumulated in Japan which are shown in "Guidebook for Comprehensive Basin - Wide Planning of Sewerage System".

Table 3.8-1 Wastewater Quantities

Item / Kind of Wastewater	Industrial Wastewater	Domestic Sewage
1. Average Daily	46,500 (m^3/d)	5,400 (m^3/d)
2. Maximum Daily	55,800 (m^3/d)	7,020 (m^3/d)
3. Peak Hourly	3,875 (m^3/hr)	450 (m^3/hr)

Table 3.8-2 Wastewater Qualities

Item / Kind of Wastewater	Industrial Wastewater	Domestic Sewage
1. PH	6 to 10	6 to 9
2. BOD	330 mg/l	280 mg/l
3. COD	280 mg/l*-1	580 mg/l*-2
4. SS	380 mg/l	400 mg/l

*-1 COD measured using potassium permanganate method.
*-2 COD measured using dichromate method.

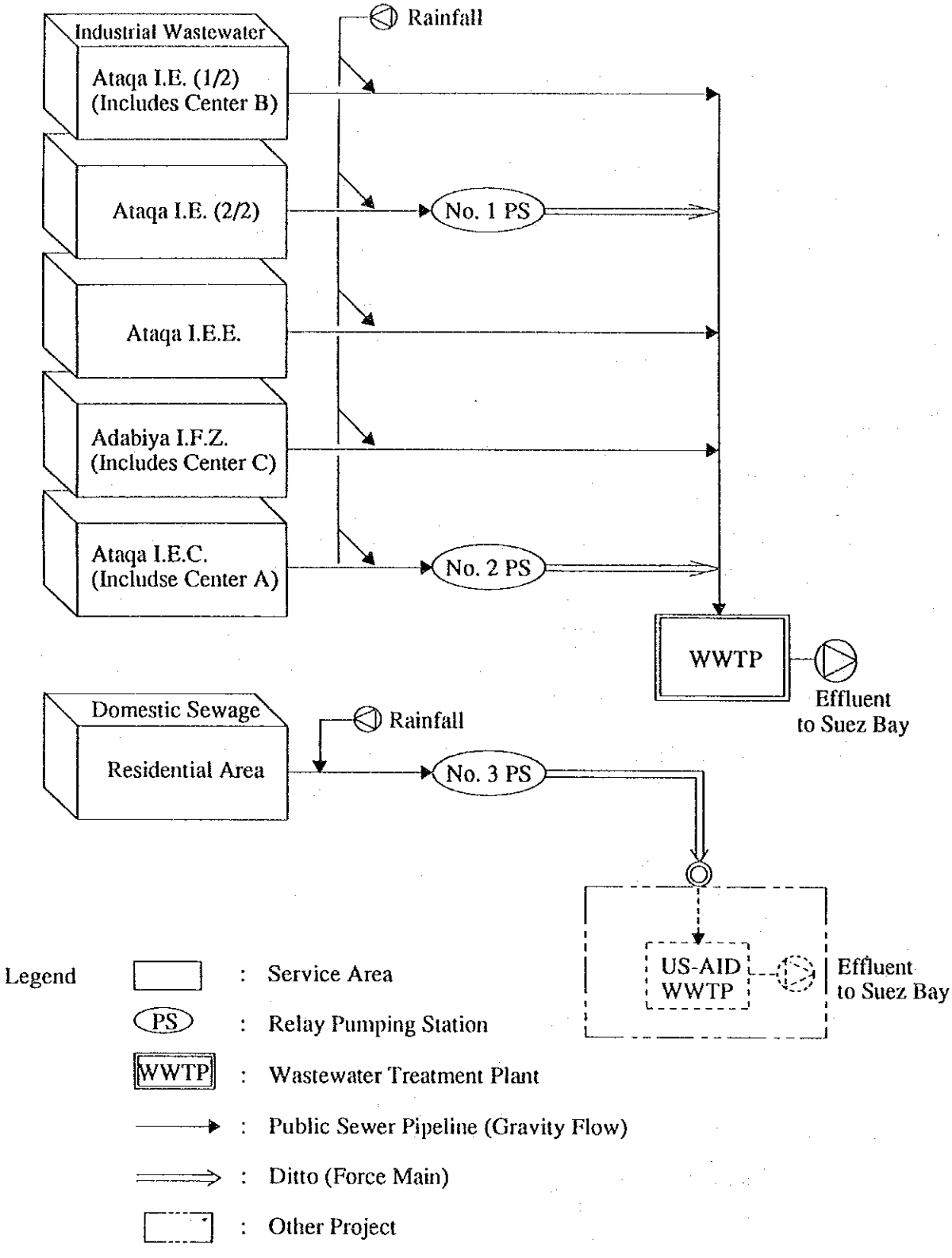


FIG. 3.8-1 Sewerage System Diagram

3.8.3 OUTLINE OF DETAILED DESIGN

(1) WASTEWATER TREATMENT PLANT

(a) Treatment Facility Unit

The capacity of the treatment plant is 55,800 m³/day (Maximum Daily). The plant is divided into four parallel trains. Each train has a capacity of 55,800/4 = 13,950 m³/d and can be operated independently each other. Due to this separation, the stage construction of the train is also possible if necessary.

(b) Industrial Wastewater Treatment Process

The treatment process for the industrial wastewater is composed of neutralization, coagulation, and sedimentation as the primary treatment process.

The conventional activated sludge system is proposed as the secondary treatment process applied for this sewerage project through the comparative study on alternative treatment processes.

The alternative processes include Stabilization Pond, Aerated Lagoon, Oxidation Ditch, Rotating Bio-disk, Trickling Filter and Conventional Activated Sludge.

The stabilization pond and the aerated lagoon are not suitable for this area because the processes require a large scale of site which is not available in the vicinity. The rotating bio-disk has few practices for a treatment plant with the capacity more than 20,000 m³/day, thus is eliminated from the process applicable here.

The trickling filter likely causes a higher level of odor released from the biofilters and microbial film in biofilters is used as a breeding ground by various flies and midges, which can cause severe nuisance especially in hot climates. It is apparent that the process is not applicable.

The initial and maintenance cost of the conventional activated sludge process (hereinafter referred to as CAS) was compared with that of the oxidation ditch (hereinafter referred to as OD) process and it became clear that CAS is less expense.

On the basis of the feature the conventional activated sludge method is considered preferable for the treatment process in this project.

Process diagram and layout of WWTP are shown in Figure 3.8-2 and 3.8-3.

(c) Sludge Treatment Facility

Based on the result of a comparative study of the two treatment facilities (Mechanical type and Drying Bed), the drying bed method was selected from view points of economy, energy saving and maintainability.

The volume of sludge from both primary and final sedimentation tanks is reduced in the sludge thickener. The thickened sludges are dewatered at the drying beds and produced sludge cakes are transported and dumped to a designated site.

(d) Reuse of Treatment Industrial Wastewater

Because the Project Area is a new industrial estate, the type of industry can only be estimated with a "likely or maybe" version, as well as the quality of the industrial wastewaters. Under such situation, it is rather impossible to judge the feasibility of reusing treated effluents. Consequently the feasibility of reuse of treated wastewater effluent could be studied only after the inflow rate of the treatment plant has reached the design level and the treated effluent quality, which is the basic data concerned to reuse, could be analyzed and determined to a reasonable degree.

Therefore, reuse of treated wastewater effluent is left for future consideration. In this Project it is considered as follows:

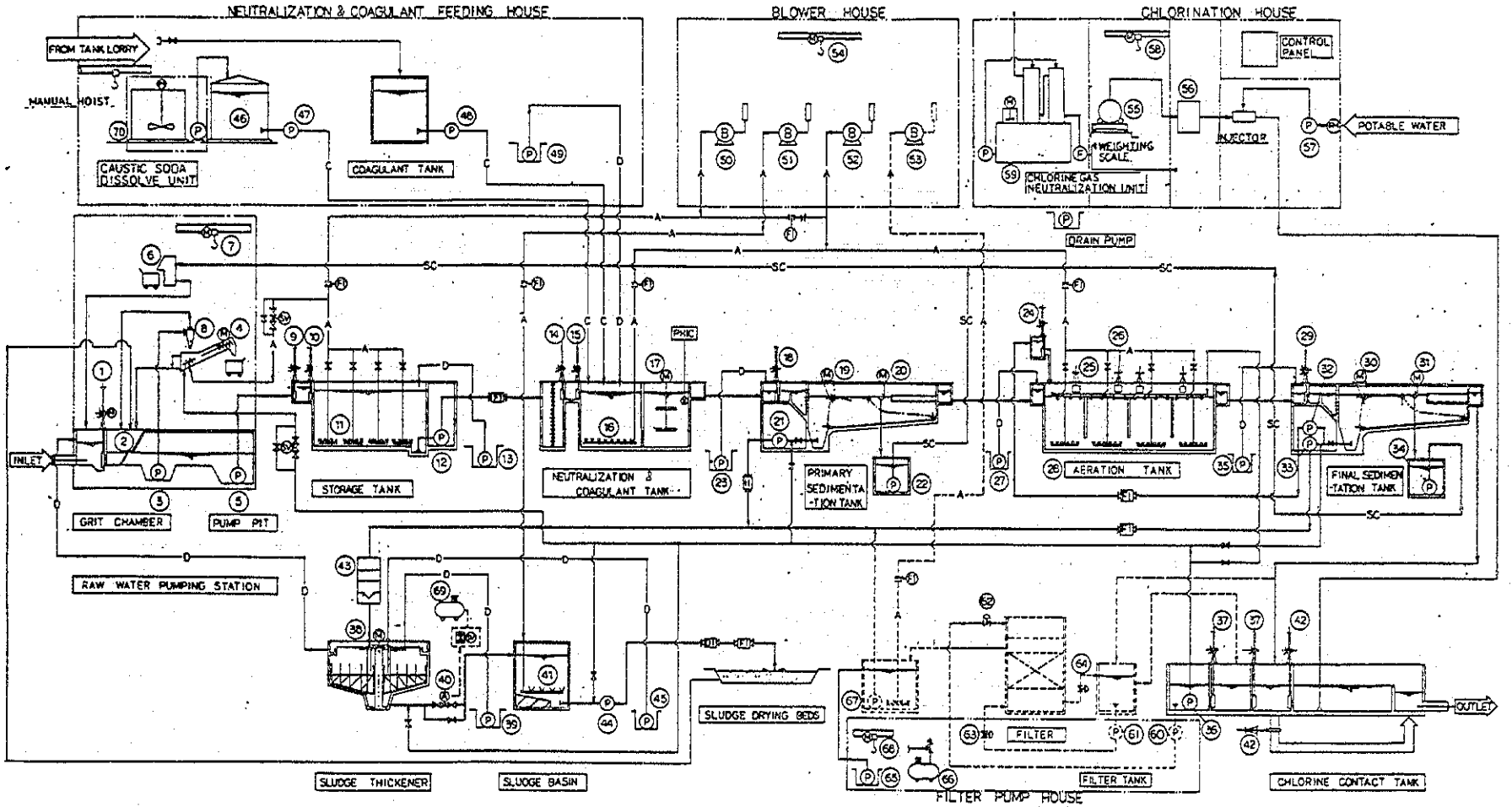
If the reuse of treated effluents or the improvement of effluents quality becomes necessary, filter equipment can be installed.

An area for the sand filter process has been set aside and the water levels of related processes have been planned taking into consideration possible future connection to the filter.

(2) SEWER PIPELINE

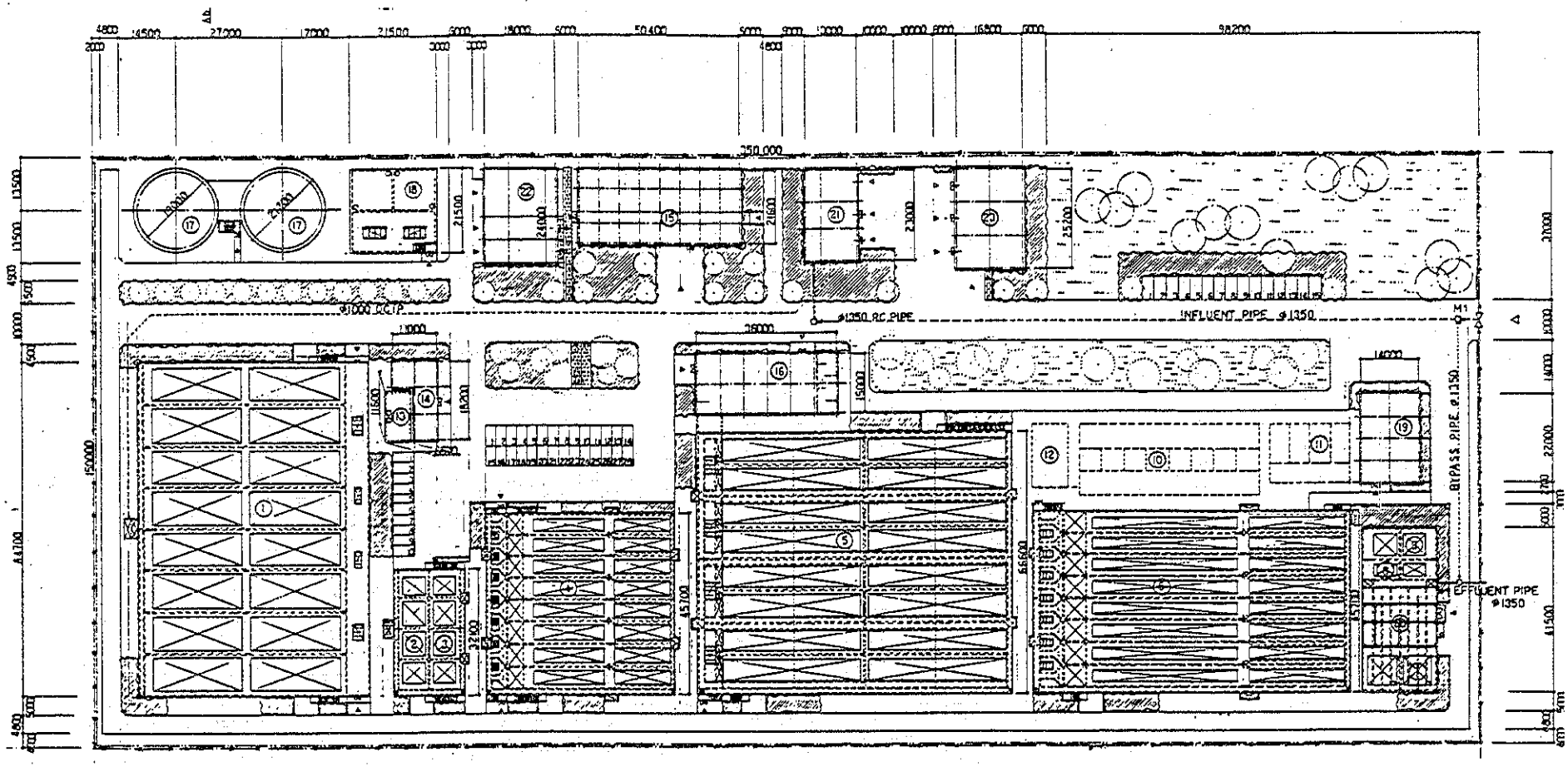
(a) Main Sewer Routes

Routes for main sewers have to be planned with the objective function to minimize the initial cost under the following constrains: minimum cover, shortest path, and least number of crossing with other utilities or structures. Main sewer routes selected taking into consideration of the above mentioned requirement are shown in Figure 3.8-4.



1 Influent Gate
2 Bar Screen
3 Sand Pump
4 Grit Washer
5 Sewage Pump
6 Scum Screen
7 Chain Hoist
8 Cyclone
9 Influent Gate
10 Separated Gate
11 Diffuser
12 Raw water Pump
13 Floor Drain Pump
14 Distribution Gate
15 Inlet Gate
16 Diffuser
17 Mixer
18 Inlet Gate
19 Rake
20 Scum Skimmer
21 Sludge Pump
22 Scum Pump
23 Floor Drain Pump
24 Inlet of Return sludge
25 Inlet of Aeration tank
26 Stop Gate
27 Floor Drain Pump
28 Diffuser
29 Inlet Gate
30 Rake
31 Scum Skimmer
32 Sludge Return Pump
33 Sludge Pump
34 Scum Pump
35 Floor Drain Pump
36 Spray Pump
37 Gate
38 Sludge Thickener
39 Flood Drain Pump
40 Thickened Sludge Pump
41 Diffuser
42 Inlet Gate
43 Sludge Distribution tank
44 Sludge Feed Pump
45 Drain Pump
46 Caustic Soda Tank
47 Caustic Soda Pump
48 Alum Sulfate Pump
49 Floor Drain Pump
50 Blower of Storage T.
51 Blower of Storage T.
52 Aeration Blower
53 Blower for Backwash
54 Chain Hoist
55 Chlorine Container
56 Chlorinator
57 Booster pump
58 Chain Hoist
59 Cl Gas Neutralization
60 Filter
61 Backwash Pump
62 Filter Inlet Valve
63 Backwash Valve
64 Treated Water Valve
65 Floor Drain Pump
66 Compressor
67 Transfer Pump
68 Chain Hoist
69 Compressor
70 Caustic Soda Dissolver

FIG. 3.8-2 Process Diagram of Wastewater Treatment Plant



NOTE

① Storage Tank
② Neutralization Tank
③ Coagulation Tank
④ Primary Sedimentation Tank
⑤ Aeration Tank
⑥ Final Sedimentation Tank
⑦ Chlorine Contact Tank
⑧ Treated Water Tank
⑨ Filtered Tank
⑩ Filter
⑪ Filter Tank
⑫ Backwashed Tank
⑬ Neutralization Dosing House
⑭ Coagulent Feeding House
⑮ Operation Center
⑯ Blower House
⑰ Sludge Thickener
⑱ Sludge Basin and Sludge Feeding Pump House
⑲ Filter Pump and Backwash Pump House
⑳ Chlorination House
Future Fauuties
㉑ Raw Waste Water Pumping Station
㉒ Power Sub-Station
Work Shop

FIG. 3.8-3 Detailed Layout Plan of Wastewater Treatment Plant

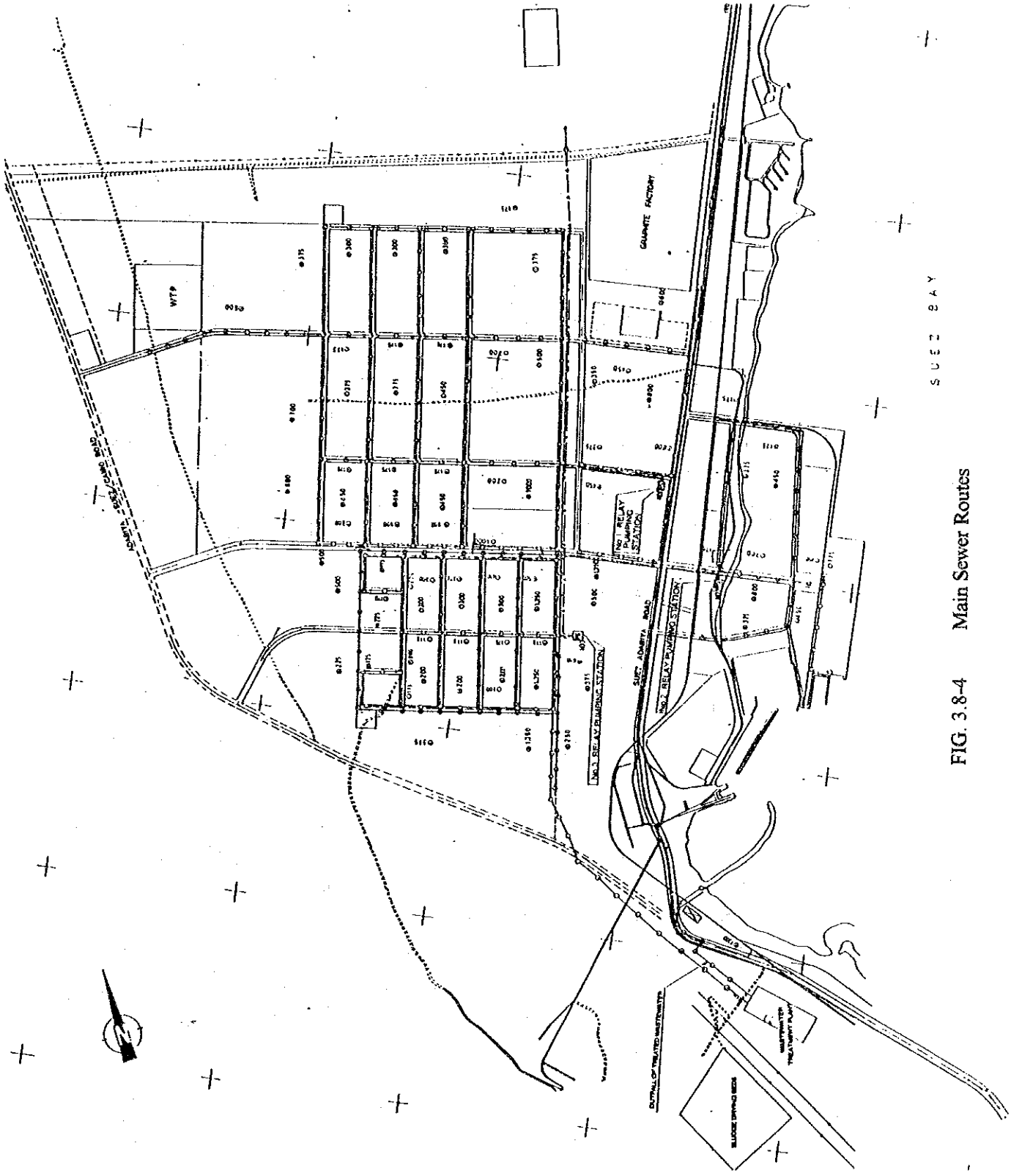


FIG. 3.8-4 Main Sewer Routes

(b) Hydraulic Calculations for Sewer

The Manning formula is most commonly used in hydraulic calculations for sewers.

Manning formula:

$$v = \frac{1}{n} \cdot R^{\frac{2}{3}} \cdot I^{\frac{1}{2}}$$

in which
- v : Flow velocity (m^3/sec.)
- R : hydraulic radius (m)
- I : hydraulic gradient
- n : roughness coefficient of the channel

(c) Pipe of Materials and Available Diameter

Based on the results of the comparative study of the four gravity sewer pipe materials, Vitrified Clay and Reinforced Concrete pipe were selected from view points of economy and acid resistance for gravity sewer pipe. The available pipe diameter of each materials are shown in Table 3.8-3.

Table 3.8-3 Pipe Materials and Diameter

Materials	Available Diameter	Remarks
Vitrified Clay "VC"	100 to 900 mm	Gravity Pipe
Reinforced Concrete "RC"	more than 1,000 mm	Gravity Pipe
Polyvinyl Chloride "PVC"	110 to 400 mm	Gravity Pipe
Ductile Iron ("DCIP")	200 to 450 mm	Force Main

(3) RELAY PUMPING STATIONS

Wastewater in Ataqa East, Ataqa Coastal, and the Residential area, which cannot be drained to the treatment plant by gravity flow, is collected in the relay pumping station in each area and pumped to the specified location by a sewage pump. The station is equipped with a coarse screen and grit chamber to protect the pump by removing screenings and sand contained in raw wastewater.

The specifications for this equipment are shown in Table 3.8-4.

Table 3.8-4 Specifications for Pumping Stations

	Description	Q'ty	Type	Capacity		
				No. 1. PS (Ataqa I.E. East)	No. 2. PS (Ataqa I.E. Coastal)	No. 3 PS (Residential)
1	Main Pump	3 (1)	Vertical Shaft	6.9 m^3/min. x 18 m	4.56 m^3/min. x 25 m	3.69 m^3/min. x 39 m
2	Coarse Screen	2	Bar Screen	60 mm Bar Pitch	60 mm Bar Pitch	60 mm Bar Pitch
3	Generator	1	Diesel Engine	150 KVA	125 KVA	150 KVA

Note : ( ) STAND-BY at PUMPING STATION

3.8.4 OPERATION AND MAINTENANCE

(1) ORGANIZATION

An organization related to the operation and maintenance of the sewerage system is shown in Figure 3.8-5.

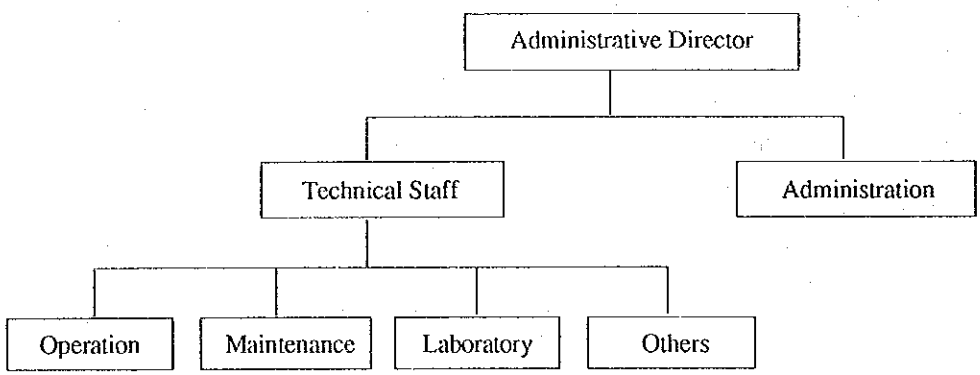


Figure 3.8-5 Organization of Sewerage System

(2) WASTEWATER TREATMENT PLANT

Operators can monitor the process operating conditions of the W.W.T.P. through a centralized supervisory panel in the operation center. However, the operation of equipment shall be basically carried out by the local control panel(s) and control device(s).

(3) SEWER PIPELINE

In order to keep the wastewater conveyance system in good condition to maintain a smooth flow and utilize its capacity fully, the following maintenance work is required:

(a) Inspection and cleaning or dredging
(b) Repair of sewer pipe breakages
(c) Countermeasures for calamities and accidents
(d) Instructions for house connections

(4) RELAY PUMPING STATIONS

Operations can supervise the process operating conditions of the Relay Pumping Station through a supervisory panel in this station. However, the operation of equipment shall be basically carried out by the local control panels.

3.9 POWER SUPPLY SYSTEM

3.9.1 POWER SUPPLY TO PROJECT SITE

The power to the Project site is to be supplied by 220 kV system from the National Unified Power Grid of Egypt. The high voltage power line currently installed in the Project site will be relocated by EEA to the west of the site.

The power transmission and distribution lines to be arranged in the industrial zone was designed to be installed underground in order to increase reliability of the power supply aiming at protecting them from external force and animals.

3.9.2 POWER CONSUMERS AND DEMAND FORECAST

Power consumers and their power demand forecast were made as follows:

(1) INDUSTRIAL LOTS

(a)	Ataqa I.E.	76,400 kVA
(b)	Adabiya I.F.Z.	14,400

(2) PUBLIC FACILITIES

Water treatment plant	1,245 kVA
Waste water treatment plant	1,913
Grain silo terminal	4,961
Bulk cargo terminal	223
Railway facilities	200
Public use small equipment	498
Center A	204
Center B	509
Center C	329
Total	10,082 kVA

(3) ROAD LIGHTING 578 kVA

(4) DORMITORIES 60,000 kVA

As the sum of power demand for individual sectors comes to 161,460 kVA, maximum power demand has been estimated to be 148 MVA taking demand factor and future increase into account.

3.9.3 POWER SUPPLY NETWORK IN PROJECT SITE

(1) POWER SUPPLY FACILITIES IN INDUSTRIES LOTS

Major power supply facilities in industrial lots and scope of design conducted for the Project are summarized below:

Table 3.9-1 Outline of Power Supply Network

Power Supply Facilities	Description for Scope of Design
220/66 kV substation* - one location	Basic design Review of dimensions of substation selection of location
Substation 66/22 kV substation* - two locations	Basic design Review of space for substation selection of location
Substation 220 kV & 66 kV transmission lines*	Review of routing of transmission lines Design of road crossing of 66 kV
Lines Substation for public facilities (local substation)	Detail Design
Unit substations** (road lighting, small power use)	Detail design
22 kV distribution lines***	Detail design
Road lighting (11 - 15 lux)	Detail design

Note: * As the design and construction of the substations and transmission lines are carried out by EEA, the design work in the above table has been undertaken.

, * The number of substations and 22 kV distribution lines depends on actual power requirements for prospective consumers, and therefore shall be reviewed at the time of application for power receiving by such consumers. Moreover, distribution lines from unit substations will be constructed by CEDC and are excluded from the scope of detail design.

*** The distribution lines to waste water treatment plant and water intake pump station will be designed by CEDC and therefore are excluded from the scope of detail design.

(2) LOCATION OF 220/66 KV SUBSTATION AND 66/22 KV SUBSTATION

220/66 kV substation shall be located to the west of the Project site, where the substation lies close to the high voltage line of the National Unified Power Grid and far away from the seashore, thus leading to decrease in a possibility of salt contamination. Similarly 66/22 kV substations need to be located in the northwest and southwest of the industrial zone for the same reasons.

(3) SUBSTATION FOR PUBLIC FACILITIES (LOCAL SUBSTATION)

The local substations are intended for public facilities where power in excess of 200 kW is needed. Emergency diesel engine generators need to be provided for the following facilities where critical equipment must be in operation in the event of power failure.

Table 3.9-2 Provision of Emergency Generators

Public facilities with local substations	Provision of emergency generators
Water treatment plant	O
Waste water treatment plant	O
Grain silo terminal	O
Bulk cargo terminal	X
Center A	O
Center B	O
Center C	O

Note: Emergency generators need to be provided

3.9.4 TELEPHONE CONDUIT SYSTEM

(1) ESTIMATION FOR TELEPHONE DEMAND

1) Public Facilities

The telephone demand of each public facility is estimated by the scale and type of the facility as follows:

220/66 kV Substation	10 lines
66/22 kV Substation-A	10
66/22 kV Substation-B	10
Water treatment plant	20
Waste water treatment plant	20
grain silo terminal	20
Bulk cargo terminal	10
Railway facilities	20
Center A	20
Center B	20
Center C	20
Total	180 lines

2) Industrial Lots

The telephone demand density of each industrial lots is estimated by the site area and unit demand per area.

Ataqa I.E.	4,120 lines
Adabiya I.F.Z.	920
Ataqa I.E. Coastal	1,050
Total	6,090 lines

3) Residential Area

Telephone demand density of residential area is estimated by the site area and unit demand per area.

Total	2,600 lines

4) Future Extension

Total	2,000 lines

5) Total of Telephone Lines

Sum of 1) thru 4)	10,870 lines

(2) LOCATION OF TELEPHONE EXCHANGE STATION

Telephone exchange station to be located in the area of Center B.

(3) TELEPHONE MAIN LINES

The main lines will be installed from existing Ataqa exchange station located about 7 km far from the project site by the Arento, and therefore are excluded from the scope of design.

3.10 GRAIN HANDLING FACILITIES

3.10.1 GRAINS TO BE HANDLED

The facilities will handle the following grains.

(1) KIND OF GRAINS

Wheat (corn, soybean, etc. will also be able to be handled).

(2) HANDLING QUANTITY

1,300,000 t/year (in 2000)
1,800,000 t/year (in 2010)

3.10.2 OUTLINE OF THE FACILITIES

The facilities will consist of the following equipment.

(1) UNLOADING EQUIPMENT

Mechanical continuous unloaders.

(2) RECEIVING EQUIPMENT

(a) Vertical Conveying

Bucket elevators.

(b) Horizontal or Inclined Conveying

Belt conveyors.

(3) STORAGE EQUIPMENT

Silos.

(4) DELIVERY AND RECYCLING EQUIPMENT

(a) Vertical Conveying

Bucket elevators.

(b) Horizontal or Inclined Conveying

Chain conveyors.

(5) LOADING EQUIPMENT

(a) For Railway Wagon

Chutes for bulk (70 % of the handling volume).

(b) For Road Truck

Chutes for bulk (24 % in 2000, 30 % in 2010)
Bagging device (6 % in 2000, 0 % in 2010)

(6) OTHER RELATED FACILITIES

Machinery tower, administration building, workers rest house, bagged material storage house, maintenance building, warehouses, etc.

Note: Space for future ship loading facilities for wheat and rice of 1,000,000 t/year has been prepared.

3.10.3 WORKING CONDITIONS

(1) WEATHER

Temperature:	lowest 5 - highest 60 degrees C. Humidity: max. 95 %
Wind velocity:	In service 16 m/sec, resting 25 m/sec, anchored 35 m/sec.

(2) WORKING HOURS

Working days:	295 days per year.	
Working houres:	For ship unloading: 24 hours a day.	
	For loading to railway wagons:	24 hours a day.
	For loading to road wagons:	12 hours a day in summer, 8 hours a day in winter.

3.10.4 OUTLINE OF EQUIPMENT

The above equipment will consist of the following devices.

(1) UNLOADING EQUIPMENT

(a) Type: Mechanical continuous unloader

(b) Quantity: Two (2) units

(c) Capacity: 630 t/h each

(d) Outreach: 24.5 m

(e) Equiped with foreign material removal device:
Magnetic separator (for iron or steel pieces), one per each unit

(f) Equiped with dust collecting device:
Bag filter type, one per each unit,

(g) Electric source: 380 v, 50Hz, 3 Ph

(h) Max. wheel loads:

	Sea-Side	Land-side
At working	35 t	17.5 t
At resting	30 t	30 t

(i) Ships to be unloaded: Max. 80,000 DWT, Min. 30,000 DWT

(j) Berth: length: 300 m, water depth: C.D. -15 m, quay height: C.D. +3.6 m, tidal range: 1.5 m

Note: The initial cost of the mechanical continuous unloader will be 10 % to 20 % higher than that of a pneumatic unloader, however, running cost will be much less than that of a pneumatic unloader because the electric power consumption of the mechanical continuous unloader will be less than 60 to 70 % than that of a pneumatic unloader.

(2) RECEIVING EQUIPMENT

(a) Berth Conveyors (installed parallel to the runway rails of the unloader)

Type: Belt conveyor

Quantity: 2 lines

Capacity: 700 t/h each

(b) No. 1 Inclined Conveyors (installed perpendicular to the berth conveyors)

Type: Belt conveyor

Quantity: 2 lines

Capacity: 700 t/h each

Inclination angle: max. 9 degrees

(c) No. 2 Inclined Conveyors (installed perpendicular to the No. 1 inclined conveyors)

Type:	Belt conveyor
Quantity:	2 lines
Capacity:	700 t/h each
Inclination angle:	max. 9 degrees

(d) Vertical Conveyor

Type:	Belt conveyor
Quantity:	2 lines
Capacity:	700 t/h each

(3) STORAGE EQUIPMENT

(a) Silos

Type:	Cylindrical
Construction	Reinforced concrete construction, on concrete pile foundations.
No. of silo bin:	56 bins
Silo bin capacity:	1,870 t/bin, total 100,000 t
Diameter of silo bin:	11 m
Height of silo bin:	27 m
Earthquake load:	0.05 g

(b) Foreign Material Removal Devices

Type:	Magnetic separators:	For removing iron or steel pieces
	and	
	Net separators:	For larger size materials.
Position:	At each receiving line.	

(c) Fumigation Devices

Type:	Tablet systems:	2 sets, tablet feeders are installed on the receiving lines
	and	
	Gas systems:	6 sets, consist of blowers, gas vaporizers, gas distributors, installed in the fumigation device room.

(d) Weighing Devices

Receiving side	700 t/h hopper scales for each receiving line, in the machinery tower.
Hopper bin:	Four (4) 700 t/h hopper scales at the delivery line of hopper bins for controlling each hopper bin.
Delivery side:	Bulk material Two (2) truck scales, installed at the gate of the terminal. One (1) wagon scale, installed at the loading site. Bagged material Weighed during bagging operation.

(e) Sampling Device

Automatic type.
Installed at each receiving line in the machinery tower.

(f) Dust Collecting Device

Nine (9) sets of dust collecting devices are installed for the purpose of preventing air pollution and dust explosion.

(4) DELIVERY AND RECYCLING EQUIPMENT

(a) Conveyors

Type:	Chain conveyor
Quantity:	3 systems x 2 lines
Capacity:	300 t/h each

(b) Vertical Conveyors

Type:	Backet conveyor
Quantity:	3 systems x 2 lines
Capacity:	300 t/h each

(5) LOADING EQUIPMENT

(a) For railway Wagons (bulk)

Type:	Chute
Quantity:	3
Capacity:	200 t/h each

(b) For Road Trucks (bulk)

Type:	Chute
Quantity:	2
Capacity:	200 t/h each

(c) Bagged Material

Type:	Automatic bagging device
Quantity:	4
Capacity:	250 baggs/h each

3.10.5 MACHINERY TOWER

(1) LOCATION

Center of the silo groups.

(2) PURPOSE

Containing receiving equipment, delivery equipment, related equipment central control room, etc.

(3) CONSTRUCTION

Reinforced concrete construction, eight (8) floors, total floor area of approx. 4,700 sq.m.

3.10.6 OPERATION SYSTEM

Whole operations of the facilities except the followings will be carried out in the central control room.

(1) Ship unloaders
(2) Railway wagon loading
(3) Road truck loading

Note: The above operations will be carried out at the site under the instructions from the central control room.

3.10.7 SAFETY MEANS

(1) Explosion prevention device: Static electricity absorber.
(2) Explosion releasing device: Pressure openning panels.

3.10.8 ANCILLARY EQUIPMENT

(1)	Smaller size bulldozer:	For ship hold clean up.
(2)	Wheel loader:	For gathering scattered material.
(3)	Separator:	For separating stones/pebbles mixed in the gathered material.

3.11 STORM WATER DRAINAGE

There are two major rivers (wadi) in the project area. They are the Wadi Alabar and the Wadi Abu-Sayalah as shown in Figure 3.11-1. The Wadi Alabar crosses the north-west corner of the project area and flows down along the boundary line between the project area and the wastewater treatment plant area of US-AID. The Wadi Abu-Sayalah crosses the central part of the industrial estate.

Although the project area belongs to a semiarid zone, storm rainfall occurs at every several years. The ground and the rivers remain usually dry mostly in a year, but rainfall runoff occurs during the storm rainfall. Furthermore, as there are almost no plants and trees in the mountains and as the ground is covered by silty sand with relatively low permeability, the hydrograph of the rainfall runoff seems to be sharp with high peak discharge.

In order to protect the project area from flooding by the rivers as well as the rainfall runoff from other sub catchment areas, it is necessary to provide storm water drainage facility around the proposed industrial estate and the wastewater treatment plant.

The drainage for catchment area of Wadi Alabar is located within premises of the US-AID project. It was concluded that the US-AID project will construct the drainage channel since the US-AID project is scheduled to start earlier than the industrial estate development of MODANC. Therefore, the drainage facilities for this catchment area was excluded in the detail design. A training dike or wall must be considered in the US-AID design, to prevent the Wadi Alabar runoff from entering into the project area.

Design storm rainfall is selected to be 23.4 mm/day with 30-year return period. The duration of the design storm period is estimated to be 90 minutes. Therefore, the design storm intensity is to be 15.6 mm/hour.

The layout of drainage channels and other related facilities are proposed as shown in Figure 3.11-2.

A trapezoidal channel section is adopted for the proposed drainage channels in principle. Since gradients of the original ground surface along the proposed drainage channels are measured to be quite steep, ranging from 1/500 to 1/30, while the allowable maximum gradient of the channel is calculated to be about 1/50, it is proposed to provide drop structures to stabilize the flow in the channels.

In addition to the trapezoidal channel, seven (7) concrete box culverts will be constructed at the crossing of new-Adabiya-Suez/Cairo Road, existing Suez-Adabiya Coastal Road, existing railway, and under ground pipelines.

The estimated linear length of channel is approximately 9 km including the total length of the seven concrete box culverts.

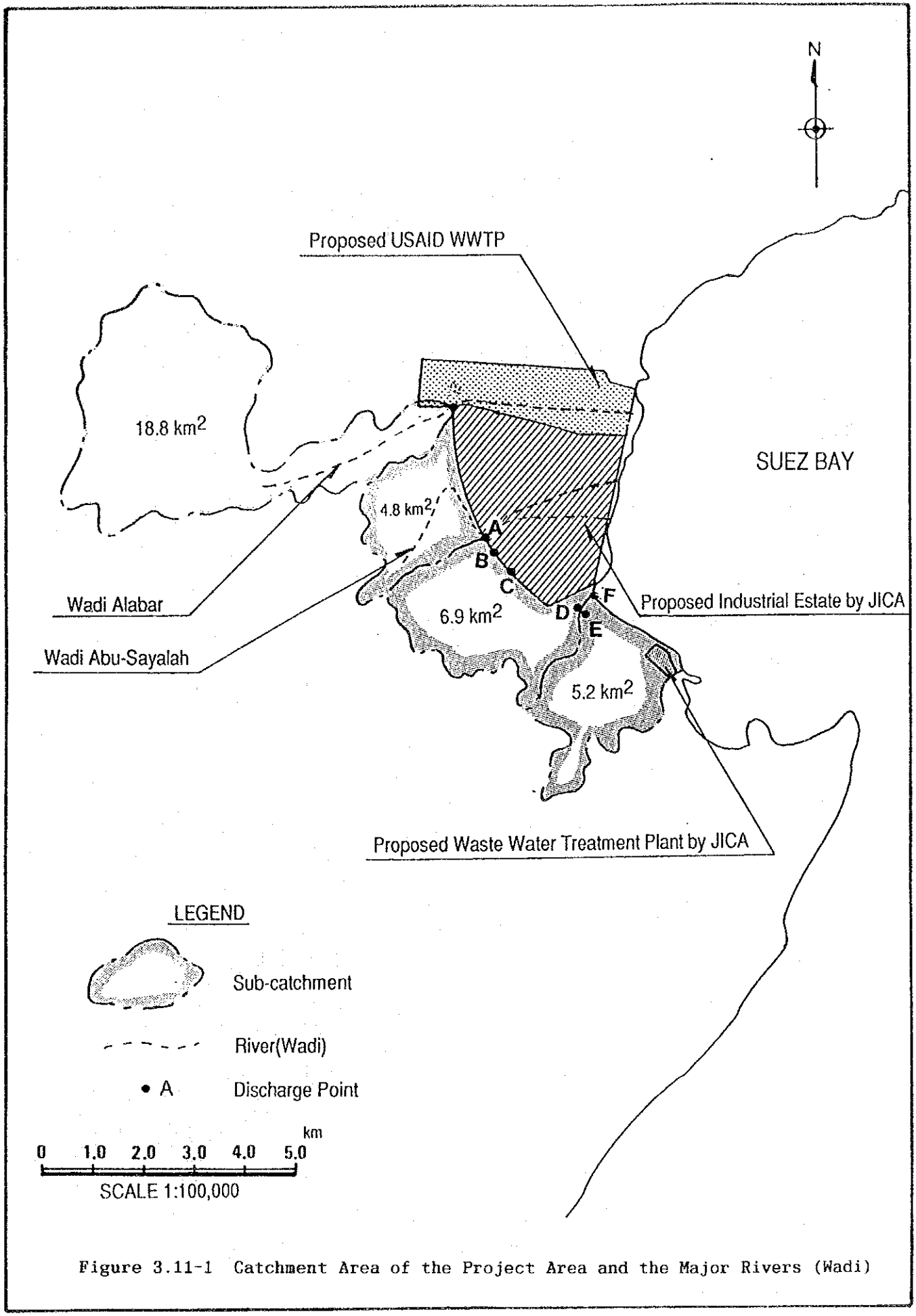


Figure 3.11-1 Catchment Area of the Project Area and the Major Rivers (Wadi)

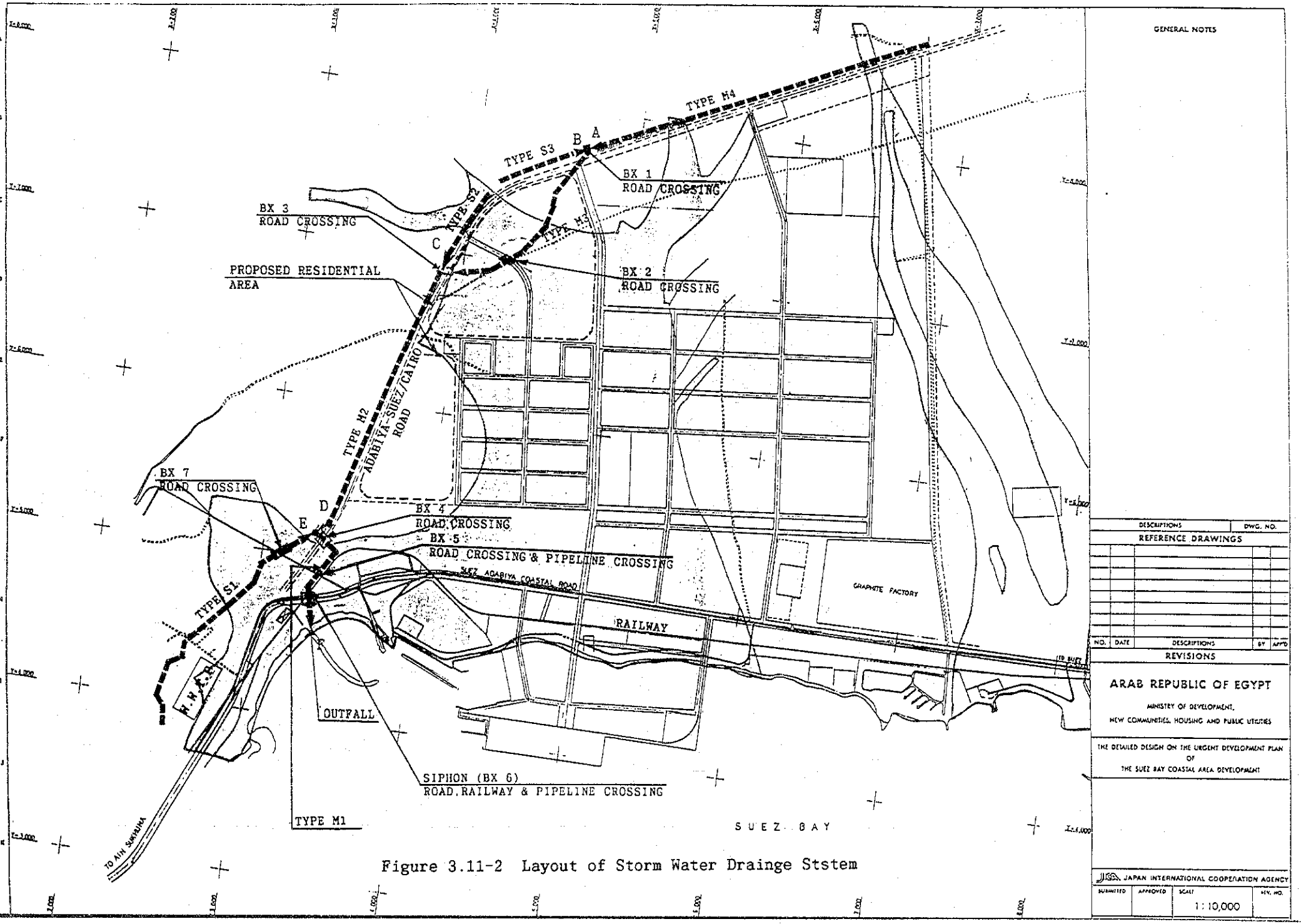


Figure 3.11-2 Layout of Storm Water Drainge Ststem

3.12 ENVIRONMENTAL IMPACT ANALYSIS

The Suez Bay Coastal Area Development would involve the introduction of new industries into the Ataqa and Adabiya area, which would, in turn, affect the aquatic and the atmospheric environment of the area. The impacts which are likely to be caused by the implementation of the Development have been classified into two main items as follows:

- The impacts on the sea water quality caused by the proposed waste water treatment plant
- The impacts on the ambient air quality caused by the proposed industrial complex

The study has been conducted to evaluate the expected impacts of the Development . The study is composed of two major parts; i.e., understanding of the present state of the sea water quality and the ambient air quality, and prediction and evaluation of the impacts caused by the Development.

3.12.1 SEA WATER QUALITY

A survey covering the sea area adjacent to the proposed site of the Development was carried out to obtain the data on sea water characteristics in the area. In the survey, three stations have been selected to understand the present state of sea water movement. During the ebb tide, the southeasterly current was the most dominant direction with average velocity of 3.8 cm/sec, 3.2 cm/sec and 3.2 cm/sec at the three sites respectively. While during the rising tide, the southeasterly and the northwesterly current with an average speed of 5.2, 7.8 and 3.9 cm/sec at the three sites respectively. Additionally seven stations have been selected to understand the present state of sea water quality. The area is receiving organic wastes from different sources, therefore concentrations of COD are comparatively high.

The results of the prediction for COD using mathematical model are shown in Figure 3.12-1. Judging from the results, the contribution of the effluent to the sea water quality never spread over seriously. Once the distance from the discharging point exceeds approximately 150 meters, the increased concentration of COD reduces the level below 0.1 mg/l, namely, below 1 ~ 2 % of the present concentration of the sea water. In general, the effect on the sea water caused by the effluent of the proposed waste water treatment plant is expected to be very limited.

The industrial waste water shall be primarily treated by each industry before discharging to the public sewer pipe according to the law/regulation. Therefore, hazardous or highly organically polluted waste water is never to flow to the proposed waste water treatment plant nor to discharge into the sea. However, it is recommended to conduct the water quality monitoring. Because, once the plant or the sea is contaminated, it will be quite difficult to recover.

3.12.2 AMBIENT AIR QUALITY

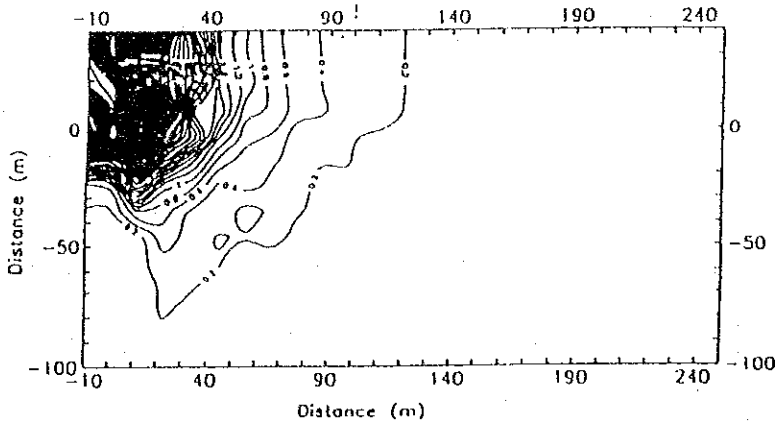
The results of analysis of air samples collected from three stations show that the air in the proposed site has much higher concentration of SO_2 that is considered to be caused by a down wind from the existing industries located in the north direction. All of the obtained concentrations of SO_2 for three stations exceed the Egyptian environmental standard (200 μg ≈ 0.07 ppm). Accordingly, sulphate concentration in the suspended matter of air in the area is at least twice as that in Alexandria during January. On the other hand, all of the obtained concentration of NO_X for three stations are quite lower then the Egyptian standard (200 μg ≈ 0.10 ppm).

The results of the prediction for So_2 and NO_X using mathematical model are shown in Figure 3.12-2. Judging from the results, higher effect would be found in the south of the proposed industrial complex.

In other directions except for south, south-south-east and south-south-west, the predicted effect of So_2 rarely exceed 0.01 ppm (=10ppb). Fortunately very few houses are located in the south direction, therefore, the emitted gas from the industries which are expected to be established in the proposed industrial complex would not have serious effects on the existing residences. Only proposed residential area next to and located south of the industrial complex would suffer the deterioration of air quality as for So_2 to some extent. Therefore, it is recommended that newly planned industries shall use the natural gas as fuel. Because, sulphur content of natural gas is generally considerably lower than that of fuel oil and is expected to reduce the effect of So_2.

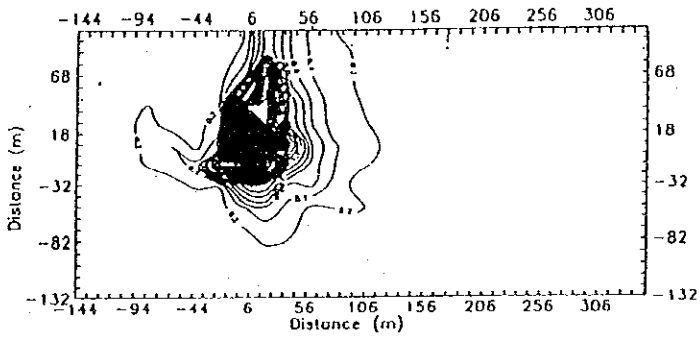
As for NO_X, the deterioration of the air quality would be minimum and of a very limited extent. The concentration of NO_X would be lower than several air quality standards (40 ~ 100 ppb for 24 hrs maximum, 20 ~ 60 ppb for annual mean) including Egyptian one.

[Ebb Tide]



Currents Model (Station 1)

[Rising Tide]



Currents Model (Station 1)

Figure 3.12–1 Predicted Distribution Patterns of COD Concentration (unit: mg/ℓ) from the Effluent of the Proposed Waste Water Treatment Plant

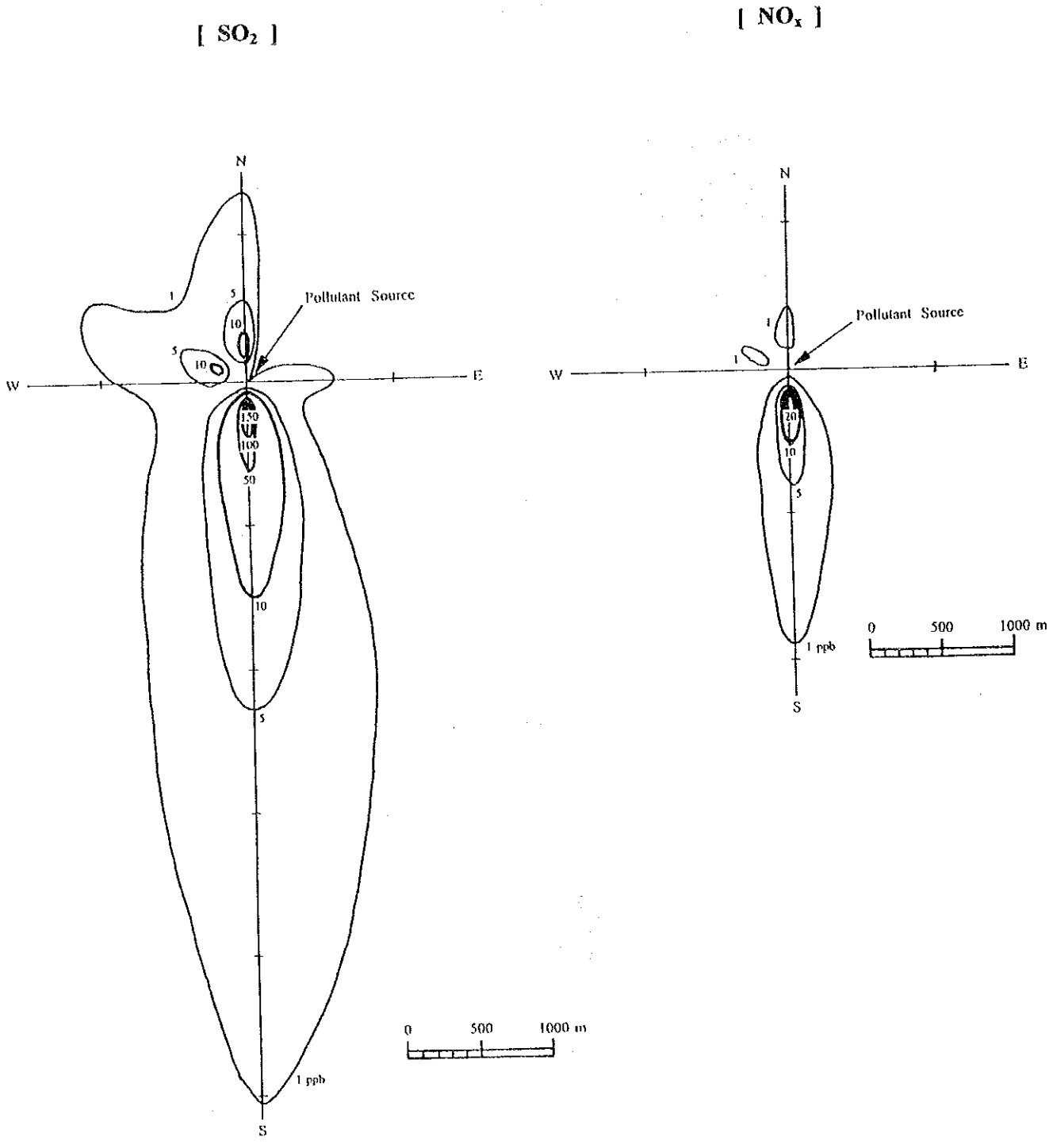


Figure 3.12–2 Predicted Distribution Patterns of SO_2 and NO_x Concentration (unit: ppb) from the Proposed Industrial Complex

Chapter 4 Contract Packages and Tender Documents

CHAPTER 4 CONTRACT PACKAGES AND TENDER DOCUMENTS

4.1 CONTRACT SOLICITATION PACKAGES

MODANC and the Study Team agreed to implement the project by dividing it into eleven (11) contract packages (hereinafter called Components) consisting of several work items (Subcomponents). The tenders will be sought on each Component to implement the work in an orderly sequence in lieu of implementing the whole Components at one time. These Components are numbered from A1 through A11, and in addition, the project includes Procurement Contracts for Grain Unloaders, Tugboats and Radar System as listed in the following:

Project Components/Sub-Components
for
Arrangement of Tender Documents

Components	Sub-components
A. Civil Work Contracts	
A1. Ataqa I.E. & Adabiya I.F.Z.	
	1.1 Roads
	1.2 Green Belt on the Boundary with US-AID Project
	1.3 Water Supply Distribution Pipelines
	1.4 Wastewater Collection Pipelines
	1.5 Power Supply Network
	1.6 Road Lighting
	1.7 Telephone Conduit Network
A2. Water Treatment Works	
	2.1 Intake Pump Station
	- Structural Works
	- Mechanical & Electrical Works
	- Power Supply
	- Buildings
	- Utilities
	- Gates & Fence
	- Pavement & Outdoor Lighting
	2.2 Aquapipeline

2.3 Water Treatment Plant

- Structural Works
- Mechanical & Electrical Works
- Power Supply
- Buildings
- Utilities
- Gates & Fences
- Pavement & Outdoor Lighting

A3. Wastewater Treatment Works

3.1 Wastewater Treatment Plant

- Structural Works
- Mechanical & Electrical Works
- Power Supply
- Buildings
- Utilities
- Gates & Fences
- Pavement & Outdoor Lighting
- Drying Bed

3.2 Two Sewer Relay Pump Stations

- Structural Works
- Power Supply
- Mechanical and Electrical Works
- Buildings
- Utilities
- Gates and fences
- Pavement & Outdoor Lighting

3.3 Disposal Pipeline & Outfall

A4. Dredging and Reclamation/Quaywall

4.1 Dredging and Reclamation

4.2 Revetment and Slope Protection

4.3 Concrete Caisson Quaywall for Grain and Bulk

- Cargo Berths

4.4 Small Boat Basin

- Concrete Block Quaywall
- Breakwater

4.5 Navigation Aid

4.6 PVC Pipes for Radar

A5. Grain Silo Terminal

5.1 Silos
5.2 Mechanical, Electrical Works and Machinery Tower
5.3 Power Supply
5.4 Buildings
5.5 Yard and Road Pavement
5.6 Water Supply Pipeline
5.7 Sewer Collection Pipeline
5.8 Telephone Conduit (Deleted)
5.9 Outdoor Lighting
5.10 Fence
5.11 PVC Pipes for Radar

A6. Bulk-Cargo Terminal

6.1 Yard and Road Pavement
6.2 Buildings & Watching Tower
6.3 Power Supply
6.4 Telephone Conduit (Deleted)
6.5 Gate & Fence
6.6 Incinerator
6.7 Outdoor Lighting
6.8 Low Tension Feeder and PVC Pipe for Radar

A7. Railway

7.1 Railway Works incl. Signaling System and Telecommunications
7.2 Buildings
7.3 Pavement
7.4 Power Supply
7.5 Water Supply Pipeline
7.6 Outdoor Lighting

A8. Center Areas

8.1 Center A
- Buildings
- External Work
- Power Supply

8.2 Center B
- Buildings
- External Work
- Power Supply

8.3 Center C

- Buildings
- External Work
- Power Supply
- Gate and Fence

A9. Ataqa I.E. Coastal

9.1 Road

9.2 Water Supply Distribution Network

9.3 Wastewater Collection Network

9.4 Power Supply Network

9.5 Telephone Conduit Network

9.6 One Sewer Relay Pump Station

- Structural Works
- Mechanical and Electrical Works
- Power Supply
- Buildings
- Utilities
- Gate and Fence
- Pavement & Outdoor Lighting

9.7 Road Lighting

A10. Coastal Road

10.1 Road Works

10.2 Draw-off Water Supply Pipeline

10.3 Box/Pipe Culverts

10.4 Lighting

A11. Storm Water Drainage

11.1 Open Drainage Ditch

11.2 Box Culverts/Siphon/Outfall

B. Procurement Contracts

B1. Grain Unloaders

B2. Tugboats

B3. Radar System

Note: I.E. = Industrial Estate

I.F.Z. = Industrial Free-Zone

4.2 SUMMARY OF TENDER DOCUMENTS FOR INTERNATIONAL TENDERINGS

The following is a list of the tender documents prepared:

(1)	Vol. I	Instructions to Tenderers
(2)	Vol. II	General Conditions of Contract
(3)	Vol. III	Technical Specifications (A1 through A11)
(4)	Vol. IV A	General Technical Specifications (Civil Works)
(5)	Vol IV B	General Technical Specifications (Building Works)
(6)	Vol. V	Bill of Quantities (A1 through A11)
(7)	Vol. VI	Drawings (A0: General)
(8)	Vol. VI	Drawings (A1 through A11)
(9)		General Conditions of Contract for Component A5, Subsomponent 5.2 "Mechanical, Electrical Works and Machinery Tower"
(10)		Procurement Contract Documents for Grain Unloaders, comprising 1) Instructions to Tenderers 2) General Conditions of Contract 3) Technical Specifications 4) Drawings.
(11)		Procurement Contract Documents for Tugboats, comprising 1) Instructions to Tenderers 2) General Conditions of Contract 3) Technical Specifications.
(12)		Procurement Contract Documents for Radar System, comprising 1) Instructions to Tenderers 2) General Conditions of Contract 3) Technical Specifications 4) Drawings.

Chapter 5 Project Cost and Implementation Programs

CHAPTER 5 PROJECT COST AND IMPLEMENTATION PROGRAMS

5.1 PROJECT COST

(1) CONDITION OF COST ESTIMATION

The Cost Estimation was carried out based on the following conditions.

- Prices of Local and Foreign Currency are expressed in Egyptian pounds (L.E.) and US Dollar (US$) respectively, based on market prices in June, 1993.
- The exchange rate set forth as US$1 = L.E.3.30
- Customs duties for the imported equipment and materials are excluded from the cost estimation.
- Price escalation and physical contingency are not considered.

(2) ESTIMATED PROJECT COST

Project cost was calculated based on the conditions set forth in 5.1. The summary of total project cost is shown in Table 5.1 and estimated project cost of each component is shown in Table 5.2.

Table 5.1 Summary of Project Cost

Unit: million L.E.&US$

Items	Foreign Currency Portion (US$)	Local Currency Portion (L.E.)
Civil Work Contract A1 - A11	188.4	477.9
Procurement Contract B1 - B2	27.4	5.0
Total	215.8	482.9

Project cost was calculated based on the market price in 1993.

Table 5.2 Project Cost

Unit: million L.E. & U.S$

Item	Foreign Currency Portion (US$)	Local Currency Portion (L.E.)
A1	5.2	126.2
A2	63.6	59.6
A3	49.1	60.9
A4	22.6	69.3
A5	41.2	65.9
A6	0.4	10.6
A7	4.5	12.2
A8	-	17.2
A9	0.7	22.6
A10	0.1	26.2
A11	-	7.2
Sub total	188.4	477.9
B1	12.9	4.0
B2	12.2	0.3
B3	2.3	0.7
Sub total	27.4	5.0
Total	215.8	482.9

Note: Project cost was calculated based on the market price in 1993

5.2 IMPLEMENTATION PROGRAMS

The implementation period of the project, "The Urgent Development Project", is considered to require 7 years as discussed with MODANC.

For the preparation of the implementation schedule, it is assumed that the project will be commenced at the beginning of fiscal year 1994/1995. Tender procedure will need for one year. The construction will be started at the beginning of fiscal year 1995/1996.

The implementation schedule has been prepared as shown in Figure 5.1.

Annual disbursement schedule of construction costs are shown in Table 5.3.

Fiscal Year	94-95	95-96	96-97	97-98	98-99	99-00	00-01	Remarks
Project Calendar Year	1	2	3	4	5	6	7	
Items								
Tendering								
A1 Ataqa I.E. and Adabiya I.F.Z.								
A2 Water Treatment Works								
A3 Wastewater Treatment Works								
A4 Dredging and Reclamation/ Quaywall								
A5 Grain Silo Terminal								
A6 Bulk-Cargo Terminal								
A7 Railway								
A8 Center Areas (Buildings)								
A9 Ataqa I.E. Coastal								
A10 Coastal Road								
A11 Storm Water Drainage								
B1 Grainage Unloaders								
B2 Tugboats								
B3 Radar System								

Figure 5.1 Implementation Schedule of the Project

Table 5.3 Disbursement Schedule

million LE/US$

Fiscal Year	'94-95	'95-96	'96-97	'97-98	'98-99	'99-00	'00-01	Total
Project calendar year	1	2	3	4	5	6	7	
Foreign currency portion (US$)		31.70	54.00	65.70	34.35	30.00	0.05	215.80
Local currency portion (LE)		114.80	146.00	99.20	60.80	49.00	13.10	482.90

Note: Project cost was calculated based on the market price in 1993.