Land area:

Existing land	:	Approximately 5.0 ha
New land to be developed	:	Approximately 4.5 ha (including the ice making plant area, utility facility installation area and repair yard)

Sea Area:

New reclamation area	:	Approximately 3.2 ha (including landing quay, fish handling area and parking lot)
T O T A L A R E A	:	12.7 ha

Since the existing quay and the new quay will be used continuously, the present slipway and repair yard that will separate them will be relocated at the southern end of the existing quay.

To use existing port facilities effectively, private facilities, such as the stores and fish boxing yard that exist behind the south quay, should be relocated to an area behind the north quay. The vacated area behind the south quay should then be used as a public space for drying fishing nets.

5.3.2 Determination of Facility Size

(1) Determination of Fishing Port Size

1) Determination of Landing Quay Length

The necessary landing quay length $\Sigma (N/r) \cdot L$ was calculated by taking into account the number of boats coming in daily during the peak fishing season "N" (Σ n/D boats/day), the necessary berth length "L" (m/boat), and the berth operating cycle "r" (cycles/day).

The length of the boats used for each fishing method (see Table 4-3-1) plus a 15% allowance was adopted for the necesary berth length "L". The berth operating cycle "r"

was calculated by taking into account the fish landing capability of 6.0 tons/hr after completing Project construction and the preparation time of 0.5 hr/boat as shown in item III of Table 5-3-1.

The new quay's operable time was assumed to be 6 hours, and is the same as the one presently in effect -- 2:00 PM is the latest time for the fish to depart the port area to arrive at the major market place, Cairo, by evening time. Fish for Suez is landed during the 6-hour period.

The necessary berth length was calculated as being 240 m as shown in Table 5-3-1.

Table 5-3-1 Necessary Landing Quay Length

	Type of Fishing Boat				TOTAL
	Trawling	Purse Seining	Trawling outside of Suez Bay	Long Lining	
I. Obtain necessary length per boat "L"					
Average boat length "L" for each fishing method (m/boat)	24.9	24.2	25.6	14.0	
Plus 15%	28.6	27.8	29.4	16.1	
II. Daily incoming boats "N" from Table 4-3-6:					
N= n/ D (boats/day)	7.9	27.7	1.7	4.2	41.5
III. Berth operating cycles from field survey result:					
·Quay usable time:	t_1 = 6.0 hrs (8:00 to 14:00) to deliver to Cairo				
·Average fish catch per boat during peak fishing season qa (ton/boat):	2.9	5.1	3.4	2.1	178.2 (ton/day)
·Landing volume qc (ton/hr)	6.0	6.0	6.0	6.0	
·Landing time t_2=qa/qc (hr/boat)	0.48	0.90	0.57	0.37	
·Preparation time t_3 (hr/boat)	0.5 hr per boat (docking and undocking 0.25 hr + work preparation 0.25 hr)				
·Berth operating cycle "r" $r=t_1/(t_2+t_3)$ (cycle/day)	6.12	4.30	5.66	7.06	
IV. Number of necessary berths N/r:	1.29	6.50	0.30	0.59	
V. Necessary quay length (N/r) · L	36.9	180.7	8.8	9.5	235.9
				Rounded:	240 m

2) Preparation Quay

The preparation quay length was calculated based on the number of daily incoming fishing boats (the number of incoming boats and outgoing boats are equal) to the port. It was assumed that a fishing boat receives fuel, water, ice, and food supplies simultaneously.

The berth operating cycle "r" was calculated by obtaining each supply operation time based on the per hour supply capacity which was verified by the field survey as shown in items III and IV of Table 5-3-2.

An assumption was made that the existing 20-ton/hr capacity fuel and water supply pumps would be used and that they would be operated 8 hours a day, from 8:00 to 16:00.

The necessary length of the preparation quay was calculated as being 120m (see Table 5-3-2).

Table 5-3-2 Necessary Preparation Quay Length

	Type of Fishing Boats				TOTAL
	Trawling	Purse Seining	Trawling Outside of Suez Bay	Long Lining	
I. Necessary berth length per boat "L" (m/boat)	28.6	27.8	29.4	16.1	
II. Daily imcoming boats "N" (boats/day)	7.9	27.7	1.7	4.2	41.5
III. Required item					
a. Fuel (ton/boat)	9.12	1.81	27.29	3.15	181.8 (tons/day)
Fueling capacity	20 tons/hr/each + preparation time 0.17 hr				
Fueling time (hr/boat)	0.62	0.26	1.53	0.33	
b. Water supply (ton/boat)	4.0	4.0	10.0	1.0	163.6 (tons/day)
Supply capacity					
Supply capacity (ton/boat)	20 tons/hr/each + preparation time 0.17 hr				
Supply time (hr/boat)	0.37	0.37	0.67	0.22	
c.Ice supply (ton/boat)	3.0	2.0	3.5	2.4	95.1 (tons/day)
Supply capacity (ton/hr)	6.0 tons/hr + preparation time 0.17 hr				
Necessary time (hr/boat)	0.67	0.50	0.75	0.57	
Food Supply (ton/hr)	0.48	0.24	2.07	0.34	15.4 (tons/day)
Supply capacity (ton/hr)	2.0 tons/hr + preparation time 0.17 hr				
Necessary time (hr/boat)	0.41	0.29	1.21	0.34	
IV. Berth operating cycle "r"	Based on 8 hrs/day operation: Longest necessary time of III a. to b. plus docking and undocking time 0.25 hr:				
"r" (cycle/day)	8.70	10.67	4.49	9.76	
V. Number of necessary berth N/r	0.91	2.60	0.39	0.43	
VI. Necessary quay length (N/r)·L	26.0	72.3	11.2	6.9	116.4
				Rounded:	120 m

Table 5-3-3 Fuel Consumption by Fishing Method

	Type of Fishing Boats			
	Trawling	Purse Seining	Trawling Outside of Suez Bay	Long Lining
I. Boat engine power (weighted average) H (PS)	297	269	309	98
II. Converted operating time				
Moving time t_1 (hr)	48.0	24.0	168.0	48.0
Output coefficient C_1	0.8	0.8	0.8	0.8
Converted time $t_1 C_1$ (hr)	38.4	19.2	134.4	96.0
Operating time t_2 (hr)	144.0	24.0	384.0	216.0
Output coefficient C_2	0.8	0.6	0.8	0.3
Converted time $t_2 \cdot C_2$ (hr)	115.2	14.4	307.2	64.8
Total converted operating time $\Sigma t \cdot C$ (hr)	153.6	33.6	441.6	160.8
III. Fuel consumption	Based on fuel consumption rate of 0.2 kg/PS·hr,			
$H \times \Sigma t \cdot c \times 0.2$ (ℓ/sail)	9,123.8	1,807.7	27,290.9	3,151.7

Table 5-3-4 Food Supply Volume

	Type of Fishing Boats			
	Trawling	Purse Seining	Trawling Outside of Suez Bay	Long Lining
I. Number of crew Nc (person)	20	40	30	8
II. Number of days for one sail $D_1 + D_2$ (day/sail)	8	2	23	14
III. Food supply volume (kg/sail)	Based on 3 kg/person/day 480	240	2,070	336

3) Idle Berthing Quay

The necessary length of the idle berthing quay for the peak fishing season (November through December), inclement weather, and the season prohibited for conducting purse seining and trawling (June - October) was examined.

The previous section provided information concerning the fishing boats entering port daily. The fishing boat operating cycle times during the prohibited seasons vary as shown in Table 5-3-5.

Table 5-3-5 Fishing Boat Operating Cycle Times (during the Prohibited Season for Purse Seining and Trawling)

Item / Fishing Boat Type	Moving and fishing days D1 + 2 (days/sail)	Resting after fish landing D3 (days/sail)	Total days per sail D1 - 3 (days/sail)	No. of cycles a month $\frac{30}{D1 - 3}$ (sail/month)
Trawling boat	-	-	-	-
Purse seining boat	-	-	-	-
Trawler outside of Suez Bay	32	10	42	0.71
Long lining boat	24	3	27	1.11

Based on Table 5-3-5, the number of incoming boats daily during the prohibited season was estimated as shown in Table 5-3-6.

Table 5-3-6 Number of Daily Incoming Boats (during the Prohibited Season for Purse Seining and Trawling)

Item / Fishing Boat Type	Number of operating boats *1	Monthly incoming boats *2	Daily incoming boats
	Σn (boats)	$\Sigma n \cdot \frac{30}{D1 - 3}$ (boats)	$\frac{\Sigma n}{D1 - 3}$ (boats)
Trawling boats	*3 (72)	-	0
Purse seining boats	*3 (76)	-	0
Trawling boat outside of Suez Bay	48	34	1.14
Long lining boats	60	67	2.22
TOTAL	108	101	3.36

Notes *1 Necessary days for repair on slipway=23 days/year; slipway available days=274 days/year (Ramadan days excluded); shutdown rate=8.4%

*2 Based on the field survey results shown in Table 4-3-3.

*3 Half of the boats are idle at Ataqa Port. The other half operate in the Mediterranean Sea.

The sections usable for idle berthing are: the existing 490m quay (except for a 40m-long section between it and the new preparation quay that will be used for slipway relocation); the 40m-long connecting portion of the breakwater that exists on the east side of the new landing quay. Fenders and mooring posts that will be used for idle berthing will be installed at these sections.

The number of idling boats during each season and during inclement weather was estimated based on the number of daily incoming fishing boats and the boat operating cycle time (see Table 5-3-7). The number of rows of idle berthing boats was calculated as shown in Table 5-3-8.

During storms when all boats take shelter in port, unloading equipment must be shut down temporarily and the entire quay length must accommodate about 8 rows of berthing boats.

During peak fishing seasons and other seasons, about 5 rows of boats at most will berth. During these times, even if the boats berth in front of the existing quay where the harbour basin width is 70m wide, a channel width equivalent to a boat length can be maintained.

Table 5-3-7 Number of Idle Berthing Boats for Each Case*1

Upper figure: Number of boats
Figure in parentheses is total berthing length (m).

Case / Fishing Boat type	Peak Fishing Season	Storm Day *2	Prohibited Season for Trawling and Purse Seining *3
Trawling Boat (28.6 m/boat)	23.7 (677.8)	79.0 (2259.4)	36.0 (1,029.6)
Purse seining boat (27..8 m/boat)	55.4 (1,540.1)	83.0 (2,307.4)	38.0 (1,056.4)
Trawling boat outside of Suez (29.4 m/boat)	13.6 (399.8)	52.0 (1,528.8)	12.5 (367.5)
Long lining boat (16.1 m/boat)	12.6 (202.9	66.0 (1,062.6)	8.9 (143.3)
Total	105.3 (2,820.6)	280.0 (7,158.2)	95.4 (2,596.8)

Notes: *1 Number of boats includes the boats entering port each day.
*2 All idle boats condition. Number of boats operating during peak fishing season.
*3 Half of the purse seining and trawling boats operate in the Mediterranean Sea.

Table 5-3-8 Available Idle Berthing Quay Length and Number of Berthing Boat Rows for Each Case

Case / Use Condition	Peak Fishing Season	Inclement Weather	Prohibited Season for Trawling and Purse Seining
Entire landing quay length	930 m	Landing quay 240 m Preparation quay 120 m Connection sections 80 m Existing quay 490 m	
Landing quay length	240 m	0 m	46 m One berth is required for each trawler operated outside the Suez Bay. Remaining quay length is for idle berthing.
Preparation quay length	120 m	0 m	46 m
Available idle berthing length	570 m	930 m	838 m
Boat mooring rows*	4.9 rows	7.7 rows	3.1 rows

*: One row each at landing and preparation quays.
Parallel rows at idle berthing quays.

4) Slipway

A slipway exists at the north end of the existing Ataqa Fishing Port. The slipway consists of a two-lane ramp, a 1.3 ha repair yard, boat racks, and a 200 hp diesel-powered winch facility for pulling boats. The slipway location would be at the midpoint of the existing quay and new quay locations; hence it would hinder boat operations and the functional operations of the quay at the Project port. Therefore, the slipway will be relocated to a northern section where the existing quay is removed.

Features of the major fishing boats utilizing the slipway are listed in Table 5-3-9.

According to the past record; it is considered that small boats will effect repairs at the nearby beach, and that boats longer than 30 m will be repaired on a large-sized slipway in Suez. Also, it is considered that more than one half of the trawlers and purse seiners will undergo repairs at the shipyards along the Mediterranean Sea because they operate in that area during the prohibited fishing season in the Suez Bay.

Based on the number of licensed fishing boats shown in Table 4-3-1, it was estimated that 120 fishing boats will use the slipway each year. This figure agrees with the one obtained during the field survey period. For this reason, the new slipway is planned to have the same capacity as the present one.

Slipway Size and Related Facilities:

- Repair yard size : 1.3 ha
- Slipway : with rack, two-lane ramp (21m wide)
  Deepest point : DL -2.7 m
- Winch : 1 unit
- Annual operating days : 274 days
  365 x (10/12) (except for a two-month period of the peak fishing season)
  minus 30 days (Ramadan holidays)
- Necessary days for repair : Bottom hull repair, 3 days/time (once a year).

Bottom hull repair Wooden boat seam repair Replacement of deteriorated portions Machinery repair & adjustment	20 days/time (once a year)

- Standard number of boats to be repaired:

$$\frac{274 \text{ days/year}}{(20 + 3) \text{ days}} \times 10 \text{ boats/time}$$

$$= 119 \text{ boats/year}$$

Table 5-3-9 Features of Major Fishing boats

Boat Type	Overall length ℓ (m)	Draft d (m)	Deck height above water hd (m)	Bridge height ht (m)	Beam b (m)	Structure
Purse seining boat I	26.0	2.6	1.0	3.0	6.8	Wood
II	20.0	1.8	0.8	2.6	5.8	Wood
Trawling boat I	28.0	2.7	1.2	3.5	7.0	Wood
II	24.0	2.5	0.8	2.8	6.0	Steel

5) Determination of Breakwater Size

i) New Breakwater

Since the Ataqa Fishing Port is located behind a cape in Adabiya that is to the south, it is well protected from waves coming from a southerly direction. However, when the wind blows from an easterly or a south easterly direction, waves reach heights of from 1.1 to 1.3m (refer to Appendix 8).

Under normal weather conditions, the port is protected from waves and calm water is maintained in the harbour, making normal port operations possible. During storm conditions, breakwaters are also required to protect sheltered boats.

The allowable maximum wave heights for loading, unloading, preparation and mooring work are shown in Table 5-2-2.

Against the design offing waves (1.3 m during storm conditions and 1.1 m during normal weather conditions) that reach the Ataqa Fishing Port, various cases of breakwater arrangements having different lengths were examined to determine if they could maintain the satisfactory harbour calmness that is shown in Table 5-2-2. As a result, the following necessary breakwater lengths were obtained (the results of the harbour

calmness analysis for determining the breakwater lengths are listed as data in Appendix 9):

New breakwater at the north side: 355m
Extension to the existing south-side breakwater: 45 m

ii) Rehabilitation of the Existing Breakwater

The crown height of the 350m-long existing breakwater is low, at only DL +2.5m. Part of the breakwater body is damaged; therefore, the breakwater must be rehabilitated and have a crown height of DL +3.5m.

6) Determination of Dredging Elevation

The dredging depth for the new channel in the harbour was decided based upon the maximum draft of fishing boats under full-load conditions and on the clearance between the boat's bottom and the seabed as follows:

Maximum draft under full load :	3.7m
Clearance between boat's bottom and seabed :	0.3m
Depth of channel and harbour :	4.0m

(2) Determination of Facility Size

1) Ice Making Plant

During the peak fishing season, a 96 tons/day supply of ice for fishing boats and a 76 tons/day supply for trucks transporting fish to Cairo are required at the Ataqa Fishing Port. To satisfy this requirement, 50 tons of ice from the Suez ice making plant and 128 tons from Cairo are delivered daily to the port.

To use the new preparation quay efficiently ice must be delivered to the quay without delay. Unfortunately, the delivery of ice from Cairo is occasionally delayed and the outgoing fishing boats are unable to receive a timely supply. Furthermore, the ice delivered by trucks from Cairo melts easily and is not suitable for fishing boat use. Thus, fishing boats are subjected to ice shortages. For these reasons, a 50-tons/day capacity ice making

plant is to be constructed in the Ataqa Fishing Port to supplement the ice supplied to the fishing boats daily, eliminating the need for the boats to needlessly spend extra time in port waiting for ice supplies.

The ice required for use in transporting landed fish should be brought in from Cairo by trucks.

2) Oil Supply Facility

The piping installation will be done from new oil tanks to the proposed preparation quay. Since oil will be supplied by a private company, the installation of oil tanks, an oil pump and a pump operating house were eliminated from the Project.

The location of the oil tank installation was assigned to an area where oil delivery tank trucks can have easy access. About 2,500 m^2 (about 50m square) of land is to be secured for the tank installation area.

The daily oil supply amount of fishing boats is 163.6 tons/day, so the actual land size is sufficient for installing two 200 kilolitre oil tanks that can hold an amount of oil equivalent to the daily demand (see Figure 5-3-2).

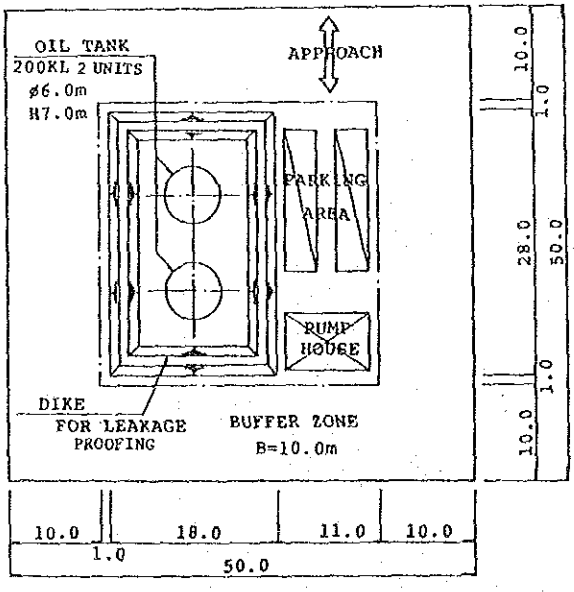


Figure 5-3-2 Oil Tank Arrangement Plan

3) Water Supply Facility

In order to provide a stable water supply to the Ataqa Fishing Port, a reservoir will be installed. Reservoir water will be delivered through an elevated water tank. The reservoir was designed to have four reinforced concrete chambers and to have a daily supply capability of 300 tons. The elevated water tank was designed to have a 30 ton capacity. Water from the elevated tank will be delivered through the existing 100mm diameter pipe that extends to the entrance of the present port.

The amount of water required daily is as follows:

Table 5-3-10 The Amount of Water Required Daily

Purpose	Quantity
50 ton capacity ice making plant:	120.0 tons/day
Fishing boat supply:	163.6 tons/day
Port use (1,200 persons x 20 litres/day):	24.0 tons/day
Total	307.6 tons/day

Even if one chamber of the reservoir is being cleaned, the other three chambers must supply a sufficient amount of the daily water demand. Thus, the reservoir's capacity was decided upon as being 400 tons as follows:

307.6 tons/day x (4 x 3) = 410 tons (say 400 tons)

4) Supply of Saltwater for Cleaning Purposes

The fish handling sheds next to the landing quay and the floor of the fish sorting area for Suez markets must be kept clean at all times. Thus, a saltwater pump and piping system must be provided so that these areas can be cleaned whenever required.

Cleaning must be conducted within one or two hours after finishing fish handling work.

By assuming that 20 litres of cleaning water is required per square meter, and that the required cleaning time is one hour, the necessary saltwater supply pump capacity was decided upon as follows:

Necessary cleaning water:

20 litres/m^2 x 864m^2 = 17.28 tons/hr

Pump capacity : 17.28 tons/hr/60 min = 0.3 ton/min

To prevent corrosion by saltwater, the saltwater pump and compression tank must be made of stainless steel. The saltwater supply outlets must be so arranged to permit all fish handling and fish sorting areas to be cleaned.

5) Drainage Facilities

Wastewater and sewage will be drained by two flow systems as shown in Fig. 5-3-3.

After removing sludge by a trap, the wastewater will be treated in an infiltration tank. Sewage will be processed by a septic tank and then treated in an infiltration tank.

The saltwater used for cleaning the fish handling and fish sorting areas will be discharged directly into the sea after waste materials have been removed by screens.

As the annual rainfall in the Project area is small (27mm), no special drainage was designed to handle it. Roads and the parking lot are designed to have slopes for draining rainwater.

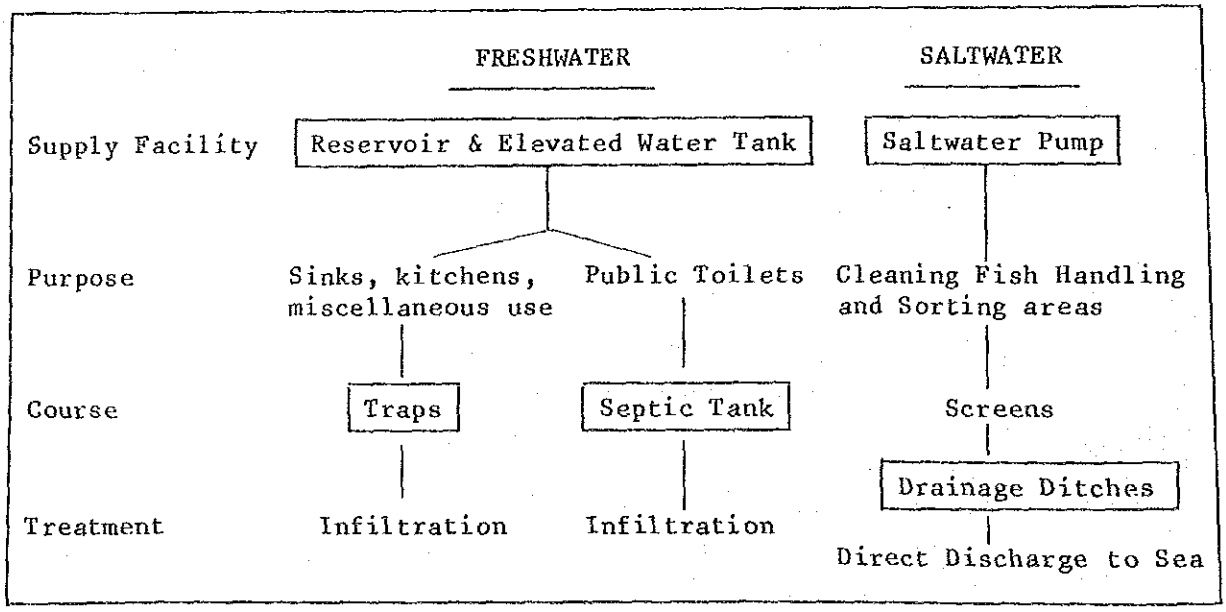


Fig. 5-3-3 Drainage System Diagram

(3) Buildings, Roads and Parking Area

1) Administration

After construction of Project facilities construction is completed, the management of the Port will be undertaken by a management organization consisting of the General Egyptian Authority of Fish Resources of the Ministry of Agriculture, the Suez Governorate and the Red Sea Port Authority of the Ministry of Maritimes Transport.

Details of the organization's management, operation and maintenance were determined by taking into consideration the duties of each section for the Ataqa Fishing Port's operation.

As shown in Fig. 4-3-4, the administration office space was decided upon by taking into account five sections, and other spacies such as offices, telephone and radio room, meeting room, dining room, etc. The space area decided upon is shown below.

The administration office was designed to have an adequate space, and it was designed to be of the same structure type as the shed area so that the fish landing operation will not be hindered.

	Number of Personnel	Basic Floor Space Calculation	Designed Floor Space
Port Master's Office	1		20m^2
Sub-Port Master's Office	1		14m^2
Chief Officers' Office (separate offices)	5	5 x 9m^2 = 45m^2	45m^2
·Marketing & Transport			
·Licensing & Statistics			
·Accounting			
·Facility Management			
·Administration			
General Affairs Office	9	9 x 6m^2 = 54m^2	48m^2
Duties of the personnel in the above sections are shown in Fig. 4-3-4			
Meeting Room	16	16 x 1.5m^2 = 24m^2	24m^2
Dining Room	16	16 x 1.5m^2 = 24m^2	24m^2
Storage			20m^2
Bathroom			21m^2
Common space, such as hallways, stairways, etc.			162m^2
Transit space			162m^2
T O T A L			540m^2

2) Fish Handling Sheds and Sorting Areas

In order for the fish landing operation to be conducted efficiently and to prevent the fish from losing their freshness under direct sunlight, roofed transit sheds were planned at the rear of the landing quay.

The space for the fish handling area was decided upon as being 78m^2 per berth by assuming a case whereby 172 boxes of fish (an average landing of one fishing boat) will be stacked three boxes high, and then, after the boxes are filled with crushed ice, be loaded on trucks.

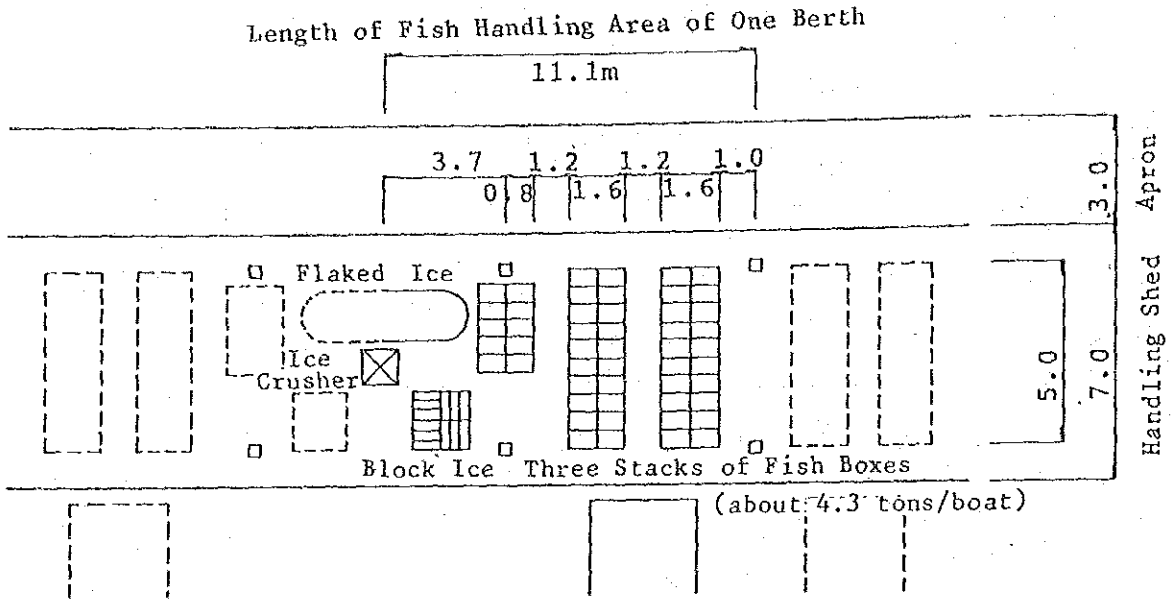
As part of the fish landed at the Ataqa Fishing Port is transported to the Suez Governorate at government controlled prices, fish in the wooden boxes belonging to the fishing boats is repacked in plastic boxes. The amount of such fish is 15% (26.7 tons/day) of the total landing volume.

As shown in Fig. 5-3-4, if the fish boxes are stacked four or five high and there are three operating cycles per day, the necessary floor area will be 188m^2. This figure is practically the same as that of the existing floor space (180m^2) that is used for sorting fish to the Suez area.

The required floor spaces and the amount of fish handled per unit of floor space are shown in Table 5-3-11.

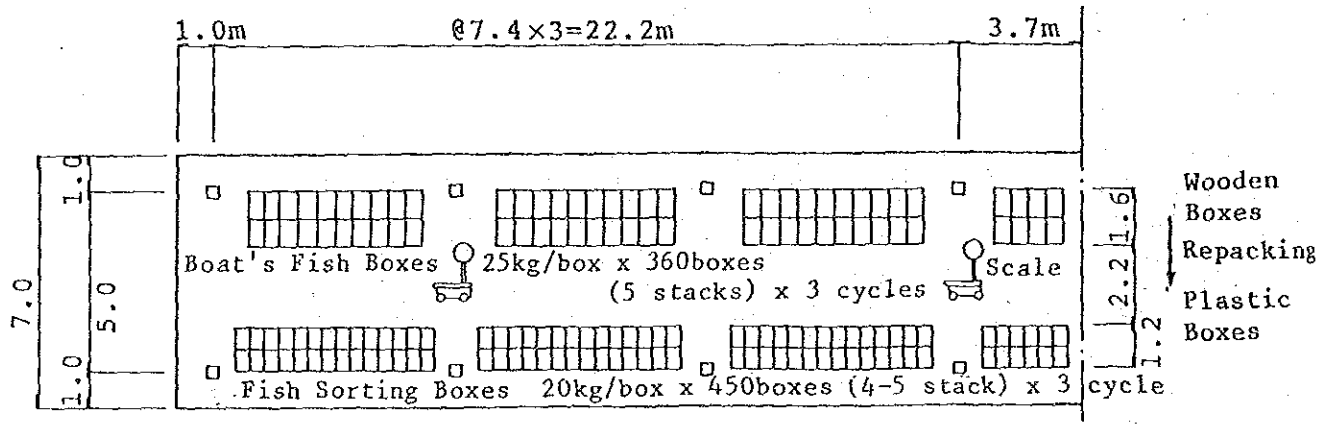
Table 5-3-11 Floor Space Required

Purpose	Conditions	Required	Fish handled per unit of floor space
Landing	Handling Volume; 178.2 tons/day Number of Vessels; 41.5 ships	676.0m^2	264 kg/m^2
for Suez	Handling Volume; 26.7 tons/day (15% of above)	188.0m^2	142 kg/m^2
	Total	864m^2	-



Fish Handling Facility Arrangement

77.7 M² /BERTH



Fish Sorting Facility Arrangement

188.0 m²

Fig 5-3-4 Fish Handling and Sorting Areas

3) Guard House

A guard house was planned; it will be located at the side of the new road entrance. It was estimated that the guard house would have 15m^2 of floor space.

4) Public Toilet

Excluding fishing boat crews, the number of people using the Project port is about 1,200 a day; 5% are women. Based on these figures, the number of toilet bowls and urinals to be installed were decided upon as shown in Table 5-3-12. The toilet bowls and urinals were arranged in four toilets located about 200m apart.

Table 5-3-12 Number of Toilet Bowls and Urinals

	For Men		For Women	
	Necessary Number	Designed Number	Necessary Number	Designed Number
Sinks	8	8	3	4
Toilet Bowls	8	8	2	4
Urinals	14	16	-	-

5) Garbage Accumulation Areas

Four garbage accumulation areas were planned for temporary garbage storage at the Ataqa Fishing Port. Each area was designed to be 24m^2 (6m by 4m).

An incinerator will be installed in one of the garbage accumulation areas.

6) Trunk Road

The width of the trunk road in the Ataqa Fishing Port was designed based on the standard concept of necessary driveway width and parking strip width. In the area where a parking area exists nearby, a parking strip was not designed. Sidewalks and a center strip were planned where required.

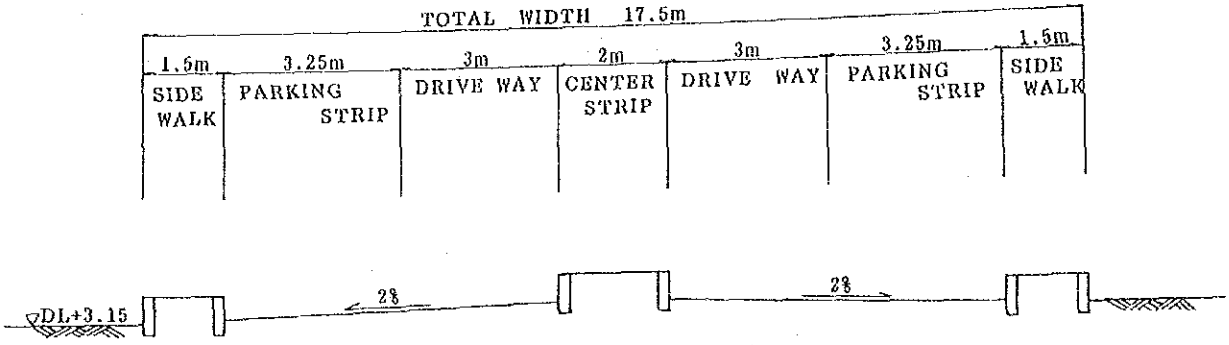


Fig. 5-3-5 Typical Cross Section of Trunk Road in the Fishing Port

7) Roads Behind the Transit Shed

During the short period of time when fish landing operations are being conducted at the landing quay, the roads behind the transit shed become congested with fish-loading trucks, trucks delivering ice, and waiting vehicles. Thus, sufficiently wide roads and parking areas were planned. A typical cross section of the roads is shown in Fig. 5-3-6.

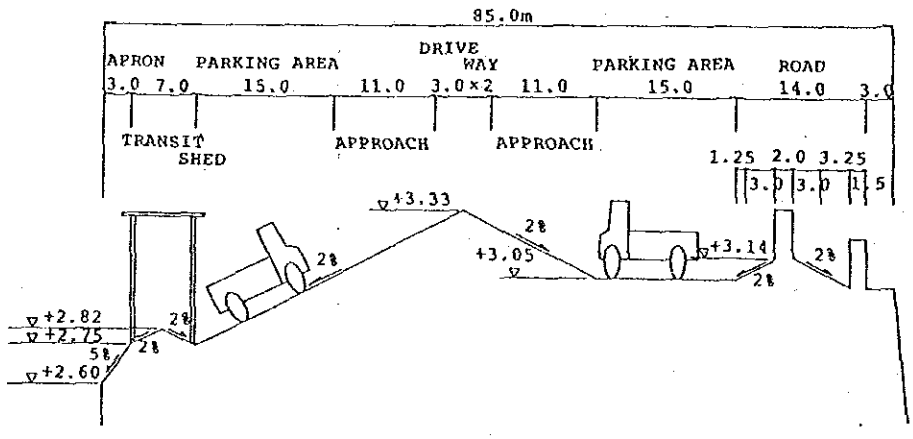


Fig. 5-3-6 Typical Cross Section of Roads Behind Transit Shed

8) Parking Areas

About 600 vehicles enter the Ataqa Fishing Port daily during the peak fishing season. By assuming that each vehicle's waiting time at the port is two hours, and that there are three parking cycle times during the period of from 8:00 to 14:00 -- the most congested period -- the necessary parking space was decided upon as being 6,000m^2 based on the calculation shown in Table 5-3-13.

Table 5-3-13 Parking Space Calculation

No. of Vehicles	No. of Each Class		Parking Space
(600/day) 200/cycle x 3 cycle/day	Small	70	13m^2 x 70 = 910m^2
	Large	120	43m^2 x 120 = 5,160m^2
	Extra large	10	60m^2 x 10 = 600m^2
TOTAL		200	6,670m^2

Table 5-3-14 Number of Parked Vehicles at Ataqa Fishing Port

Vehicle Class		Parked Vehicle Number (daily)	Percentage of Vehicle Class
Small	Sedan Small trucks	20 28	35%
Large	Microbus Trucks	5 76	60%
Extra Large	Trailers	7	5%
TOTAL		136	100%

Note : Surveyed on Dec. 6, 1989 and learned from fishermen

5.3.3 Basic Design

(1) Fishing Port's Civil Works Structure Design

1) Quay Design

The crown heights of the new landing quay and preparation quay were decided upon as being DL +2.60m by taking into account tide conditions and fishing boat quay usage conditions as shown in Fig. 5-3-7. A 60m section of the quay that will be used by small boats will have a crown height of DL +2.20m.

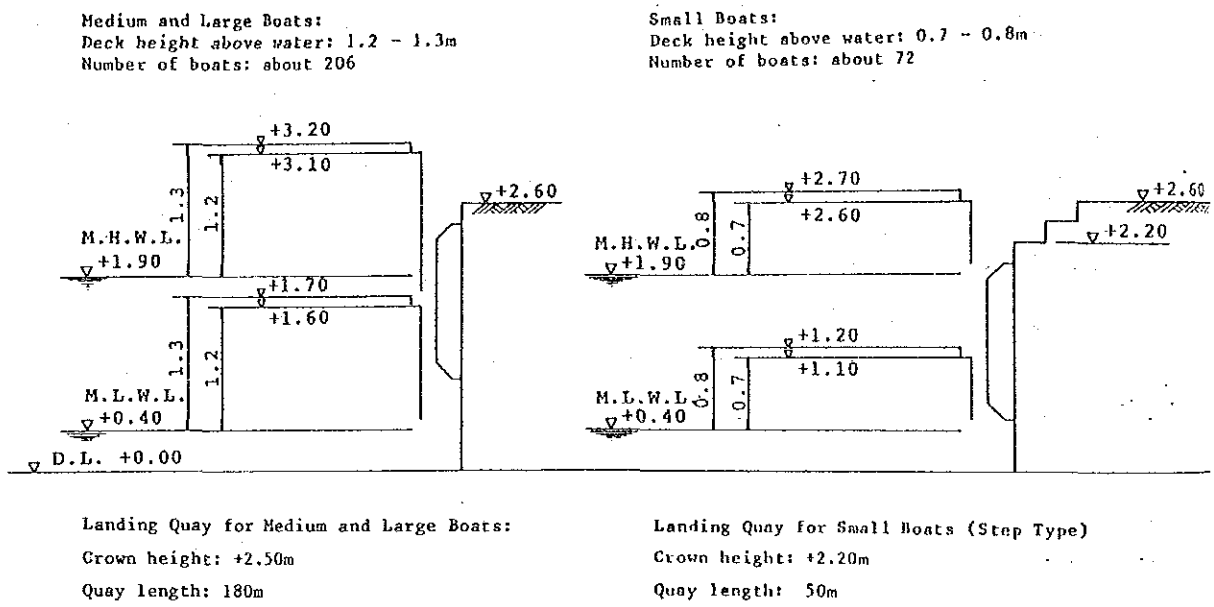


Fig. 5-3-7 Quay Crown Height

For the quay's structure type, the concrete block type, concrete cellular block type, steel pile pier type, and the steel sheet-pile type were examined and compared. As a result, it was determined that the gravity concrete block type would be suitable for the structure type based on the following reasons:

(1) The ground at the Project site consists mainly of good sand. No ground settlement is expected.

(2) In view of the level of local workers' skill and the construction material availability, the gravity concrete block type is the most appropriate structure type.

(3) As the construction process for this type of structure is simple, the arrangement of land fill work at the rear of the quay would be easier than the same work with other quay structure types.

(4) This type of structure is economical to build.

(5) Leveling the rubble and fill material is easier to accomplish with this type of structure than with the cellular block type structure.

Each quay, including the existing idle berthing quay, will be equipped with fenders and mooring posts.

Berthing Speed:

Large deep sea trawling boat (31m long): 25 cm/sec

Purse seining boat (30m long) : 30 cm/sec

Berthing Energy: 1.52 ton·m (for both types of boats)

Thus, the V-250 H type fender is adopted.

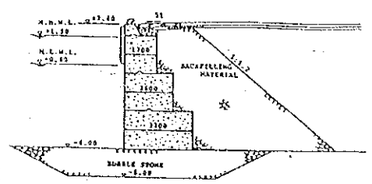
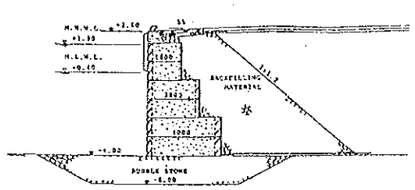
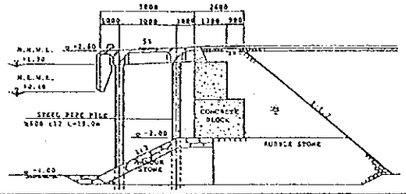
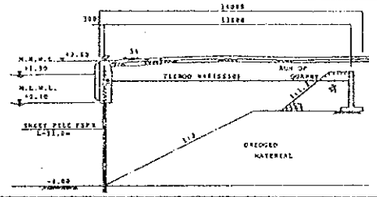
Table 5-3-15 lists the major dimensions of the fender and mooring posts.

Table 5-3-15 Major Dimensions of Fender Material and Mooring Posts

	Dimensions	Installation Intervals
Fender Material	V-250 H, 1500 L	5 m
Mooring Post	Bitt 10 tons	7.5 m

The work to clean the accumulated debris from in front of the existing quay and repair the crown of the existing quay shall be conducted together with the construction of new quays.

Table 5-3-16 Summary of Each Structure Type

Structure Type / Items to be examined			Concrete Block Type	Concrete Cellular Block Type	Steel Pile Parallel Pier Type	Steel-Sheet Pile type
Outline of Structure						
Features	Merits		·Volume of concrete in site is small. ·Construction procedure is simple and the work is easy. ·Most construction materials are available locally.	·Volume of concrete in site is small. ·A relatively small number of concrete blocks are required in comparison with the concrete block type.	·This type has many merits when used at deep water sites where the bearing ground is located in a deep layer.	·Backfilled material is not affected by scouring action
	Demerits		·This type requires more concrete block than does the concrete cellular block type.	·This type requires the use of many construction procedures. It also requires a long construction period. ·This type requires accurate work to level the filled rubble material in the cells.	· It is difficult to procure steel piles locally. · As this type requires a pile structure and retaining structure, construction costs become high. · It requires a long construction period.	·It is difficult to procure steel piles locally. ·As retaining wall construction is required, it is difficult to prepare a construction schedule.
Quantities	Concrete	Precast, plain	320.0m³	-	172.0m³	-
		Plain, in site	8.4	8.4m³	8.4	-
		Reinforced	-	95.5	82.5	126.4m³
		TOTAL	328.4m³	103.9m³	262.9m³	126.4m³
	Stone Materials	Rubble mound, Backfill	1,082.2m³	1,088.2m³	844.0m³	96.6m³
		Fill-in	-	284.0	79.0	-
		Reclamation	1,170.0	1,210.0	594.0	2,007.0
		TOTAL	2,252.2m³	2,582.2m³	1,517.0m³	2,103.6m³
	Excavation & Dredging		428.0m³	434.0m²	160.0m³	-
	Concrete paving		60.0m²	60.0m²	-	60.0m²
	Asphalt paving		260.0m²	260.0	220.0m²	260.0m²
	Other materials		Scour protection sheets: 170.0m² Sand protection boards: 90.0m²	Scour protection sheets: 340.0m² Sand protection boards: 65.0m²	Steel piles, ϕ = 600mm, t = 12mm: 190.0m Scour protection sheets: 220.0m² Sand protection boards: 70.0m²	Steel sheet piles, Type III: 550.0m Wale: 540.0kg Tie rods, ϕ = SS50:12.5 each
Estimated Cost Ratio			1.00	1.01	1.50	1.11
EVALUATION			RECOMMENDED TYPE			

2) Slipway Design

Features of the slipway are as follows:

Width	:	21.0m
Installation depth	:	DL -2.7m
Winch capacity	:	10 tons
Repair yard space	:	1.3 ha

Winch capacity was calculated to pull up a wooden boat:

Boat weight "W"

= coefficient x length x beam x light load draft

= 0.7 x 28m x 7.0m x 1.6m = 220 tons

Required pull force "P"

= apparent weight + friction force

= 220 tons x Sin 9.5° + 220 tons x Cos 9.5° x 0.2

= 78.3 tons

By using a six-folded wire arrangement, the necessary winch capacity will be:

$78.3 \div 2^3 = 9.8$ tons

3) Breakwater Design

Based on the results of the harbour calmness examination (see Section 5.3.2), the arrangement of a new breakwater and the length of the existing breakwater extension were decided upon as follows:

Northside new breakwater	:	355m
Southside existing breakwater extension	:	45m

Required breakwater crown height is:

Design sea level (M.H.W.L.) + Design wave height x 1.25

= (DL + 1.9) + (1.3 x 1.25)

= DL = 3.5m

The breakwater will be a sloped rubble-mound type made of the abundant amount of limestone available at the quarry behind the Ataqa Fishing Port. For the portion of the breakwater that connects to the landing quay (100m long), a vertical wall type was adopted to allow easy, safe fishing boat maneuvering.

The weight of an armor rock to be used for the rubble-mound type sloped breakwater was calculated by using the Hudson equation as follows:

Necessary weight (at the top of breakwater)

$$= \frac{\text{(Unit weight of material in air)} \times \text{(design wave height)}^3}{K_D \times (\text{material's specific gravity} - 1)^3 \times \cot\alpha}$$

where, K_D : stability coefficient,

$K_D = 2.0$, at the top of breakwater
($K_D = 3.5$, at the general part of breakwater)

α: slope of rubble mound, $\cot\alpha = 2.0$

Thus,

$$\text{Weight} = \frac{2.6 \times 1.3^3}{2.0 \times (2.5 - 1)^3 \times 2.0}$$

$$= 0.42 \text{ ton/each}$$

As a result of the above calculation, the breakwater slopes shall be protected by armor rocks that are 500kg per piece or heavier, at the top of breakwater. Similarly, it is calculated to apply 300 kg per piece or heavier at the general part of breakwater.

(2) Ice Making Plant Design

It is planned to install a 50 tons/day capacity ice making plant (24 hr operation, 2,000 pieces of 25 kg block ice per day).

For the following reasons, it was designed that the ice storage capacity should be equal to the amount of ice produced by the plant

1 Ice storage is required to make the necessary adjustments to meet the variable daily ice demand. Even on once-a-week holidays, ice must be supplied to the fishing boats.

2 To continuously produce ice on a 24 hour a day basis is the most economical and efficient ice plant operation method. The ice produced at night must be stored until the following morning.

3 Whenever ice blocks are delivered directly from the ice making tubs to the customers, large quantities cannot be supplied in a short period of time. The reason for this is that if large amounts of ice are removed from the tubs at one time, tub temperature will rise temporarily lowering ice making efficiency.

4 If two or three blocks of ice are taken from a tub and sold to a customer, the remaining blocks must be picked up and stored.

The necessary floor space for ice storage was estimated as follows:

Under the assumption that ice blocks will be stacked to a height of 1.76m;

$$\text{Floor space} = \frac{(\text{Storage volume}) \times (\text{Passage allowance rate})}{(\text{Height}) \times (\text{Unit weight of ice})}$$

$$= \frac{50 \text{ tons} \times 1.2}{1.76 \times (22\text{cm} \times 8 \text{ layers}) \times 0.8 \text{ ton/m}^2}$$

$$= 42 \text{ m}^2$$

Capacities and features of the ice making plant and ice storage facility are as follows:

1) Ice Making Plant

Capacity	:	50 tons/day, 24 hr operation
Ice blocks	:	25 kg/each (22cm wide, 13cm high, 85cm long), 2,000 blocks a day

2) Ice Storage

Dimensions	:	3.6m x 12.4m x 3m, sealed coil type

3) Equipment Features

Ice making tub	:	25 tons/tub, 2 tubs
Ice lifting crane	:	Two 0.5 ton capacity units

4) Ice Making Method

Ammonia cooling system

5) Power Supply

380V, 50 Hz, 3 Phase and 200V, 50 Hz, Single Phase

6) Other Items

The spare parts that are necessary for operating and maintaining the above major equipment will be provided.

The equipment shall be of such type that will allow daily operation and maintenance to be performed at the local technical level.

(3) Building Design

1) Basic Conditions

Project buildings shall be designed based on the "Egyptian Law Relating to Orientation and Organization of Building Works," and the Japan Building Design Standards as required. The structure type shall be as follows:

- Foundation:

The direct foundation method that transmits the weight of the buildings directly to the bearing ground will be adopted.

However, the elevated water tank will be supported by a pile foundation.

- Building Structure:

The rigid frame reinforced concrete structure that is commonly used in Egypt will be adopted.

Small buildings, such as the guard house, will be built of reinforced concrete blocks.

2) Design Plan

The outline of each Project building and finishing work are as follows.

i) Administration building shall be two-storied. The ground level shall be used as a fish handling area. The building shall be arranged along the quay; column intervals were decided upon by taking into account the room arrangement and fish handling work procedures.

In the administration building, the hallway shall be arranged in a longitudinal direction. Rooms shall be arranged on both sides of the hallway so that it will be possible to provide them with natural lighting and ventilation.

The General Affairs office will be arranged on the land side. Individual offices will be arranged on the sea side of the hallway.

The overhead height of the ground level will be 4.0m. The second floor will be provided with a ceiling having a height of more than 2.5m.

ii) Transit Shed

A handling area for landed fish shall be provided parallel to the landing quay. This area will be divided into two blocks and will be arranged so that it is in balance with the entire quay length.

A shed shall be built with a roof to prevent fish from direct sunshine. The space between the shed and the landing quay will be planned to allow vehicle traffic. Sunlight shading eaves will be installed on the shed to maintain fish freshness. The columns of the shed will be arranged by taking into account the fish handling work process and the vehicle traffic between the columns.

In view of the above requirements, the column intervals were designed to have a 5.0m beam span (width) and 7.5m girder spans (longitudinal direction). The 7.5m column intervals will allow two vehicles to park between them. 1.0m long eaves are arranged to be installed on the sea side and land side of the shed. The designed height of the shed is 4.5m.

iii) Guard House

A guard house will be built at the middle of the port entrance. Its ceiling height is planned to be 2.30m.

iv) Four toilets shall be installed in the fishing port. Partitions will be installed to separate the men's and ladies' toilet facilities.

v) Garbage Accumulation Areas and Incinerator

One garbage incinerator will be installed in a garbage accumulation area in the proximity of the port administration building for the purpose of maintaining an agreeable port environment.

Type of garbage:	Fish boxes, straw used for wrapping ice blocks transported from Cairo, 10 to 15 percent water content, and combustible garbage.	
Amount:	Fish boxes:	A small amount
	Straw:	(122 tons/day of ice transported from cairo) x 8 kg/ton = 976 kg/day
	Total	1,000 kg/day (approx.)

Necessary combustion chamber volume (V):

$$V = \frac{W \cdot H \cdot Y}{250{,}000\ K}$$

Where, W = Amount of material to be burned
= 1,000 kg/day = 167 kg/hr (6 hr operation)
H = Heat generation = 5,000 Kcal/kg
Y = Incineration efficiency = 0.995
K = Incineration coefficiency = 1.0

$$V = \frac{167 \times 5{,}000 \times 0.95}{250{,}000 \times 1.0} = 3.17 m^3$$

Thus, the incinerator's comlbustion chamber shall be larger than 3.2 m^3.

The fuel cost (a large portion of the incinerator's operational cost) was estimated as follows:

Annual garbage amount:	130,000kg (approx.)
Annual operating hours:	130,000kg ÷ 167kg/hr = 778 hours
Fuel amount:	778hrs x 15liters/hr = 11.670liters
Fuel cost:	11,670 liters x 0.07 L.E./liter
	= 817 L.E./year

As a result of the above estimation, the operation and maintenance cost of the incinerator will be very minor if the person performing the incineration work also engages in other types of work.

vi) Winch House for Slipway

The winch house shall contain a machinery room and a combined office and storage room.

vii) Ice Making Plant

The building must be large enough to allow the installation of ice making tubs capable of making 50 tons of ice daily. The overhead height of the building shall be more than 7.0m to accommodate hoist cranes. A machinery room and ice storage shall be provided.

viii) *Associated Building Facilities*

The following associated facilities are to be included in the building construction:

- Air Conditioning system
  - Room air conditioner: (4,500-5,250 K·cal) 6 units
- Ventilation System
  - Ceiling mounted fan : 200D, 13 units
  - Ventilation fan (for bathroom): 1 unit
  - Ventilation fan for toilet: 3 units
- Telephone 7 units
  - Four circuit telephone: 1 unit
  - Main switchboard: 1 unit
- Saltwater Supply Facility
  - Pump: 0.3 ton/min, 1 unit
- Lighting System
  - Fluorescent lighting fixtures: Install in each room according to illumination requirements.
- Water Supply Facility
  - Water receiving tank (reservoir): 400 ton capacity
  - Elevated water tank: 30 ton capacity
- Drain Facility
  - Treatment tank: Septic tank type, 5 units
  - Infiltration tank: 5 units
- Extinguisher
  - Mobile fire extinguisher 5 units
  - Handy fire extinguisher 2 units

(4) Design of Associated Facilities

1) Power Facility

i) Estimation of Power Requirements

The power requirements for the Project's facilities were estimated as follows:

Building Name	Floor Area (m^2)	Facility Name	Floor Area x Unit Capacity x Efficiency Rate x Demand Rate	= Load
Management Building	324 (540)	Lighting fixture ·Outlets Air conditioning	324x40x0.8x0.5=	5.18 (KW)
Fish handling area 1	428.4	Lighting fixture ·Outlets	428.4x20x0.8x0.3	2.06
Fish handling area 2	437.2	Lighting fixture ·Outlets	437.2x20x0.8x0.3	2.10
Guard house	15	Lighting fixture ·Outlets	15x40x0.8x0.8	0.39
Public toilet	128	Lighting fixture	128x20x0.8x0.8	1.64
Other facilities				
Winch house				90.00
Ice making plant				300.00
Pump house				30.00
Reservoir/ Water pump				12.00
Street lights				20.00
Total				475.37KW

ii) Power Receiving Facility

- Power Connection Lines:

Power connection lines meeting the Project power requirements shall be installed to the power receiving board that shall be installed as part of the Project. The Egyptian side will be responsible for the installation of the connection lines to the power receiving board.

- Main Power Line Facility:

  Power conduits shall be installed from the low voltage power distribution board in the power house to each branch power distribution board. Conduits shall be installed underground. The distribution method shall be 3-phase 4-wire, 380/220V, 50 Hz.

iii) Lighting and Receptacle Installation

The lighting and receptacle installation shall meet Egyptian technical standards. Basically, the lighting fixtures shall be fixed types. As a basic rule, two lighting fixtures shall be installed in each room; extra units may be added if required.

Average illumination requirements shall be as shown in the following table:

Place		Average Illumination	Lighting Fixtures
Management Building	Office	300 (Lx)	Fluorescent
	Meeting room	300	"
	Dining room	150	"
	Storage	70	"
	Toilet, Hallway	50	"
Fish handling area 1		10-15	Fluorescent
Fish handling area 2		10-15	"
Guard house		150	Fluorescent
Public Toilet		50	Fluorescent
Winch house		70	Fluorescent
Ice making plant, work area		100	Fluorescent
Pump house		50	Fluorescent
Parking lot and street light		5	Mercury lamp

iv) Telephone Line Installation

Telephone lines shall be installed to the connection board in the Management Building. This installation work will be performed by the Egyptian side. Regular telephone and intercom telephone units will be installed in the Port Master's and Sub-Port Master's offices in the Management Building, and in the ice making plant, guard house, and slipway office.

Cables from the main connection board to each facility shall be installed in the underground conduits.

3) Air Conditioning System

Air conditioning systems shall be installed in the Port Master's and Sub-Port Master's offices, and in the meeting room. Other offices shall be equipped with forced ventilation systems.

4) Water Supply and Sanitation Facilities

i) Water Supply Facility

In order to supplement the pressure drop of the water supply main in the fishing port and to provide a stable water supply, a reservoir shall be installed. The reservoir water shall be distributed to each port facility through the elevated water tank that will also be installed as part of the Project.

The reservoir shall be a four-tank type having a 400 ton holding capacity. The elevated water tank shall have a 30 ton capacity. Both the reservoir and elevated water tank shall be made of reinforced concrete.

The necessary height of the elevated water tank was examined as follows (the formula was based on the estimated maximum amount of water to be used in the toilet that will be installed at the rear of the existing quay):

$$H = h_1 + h_2$$

where, h_1 = required lowest hydraulic pressure

$= 0.7\ kg/cm^2 = 7m$

h_2 = hydraulic loss (friction and fitting loss)

$$= \frac{10 \times 1.2 \times 600m}{1,000} = 7.2m$$

$H = 7.0m + 7.2m = 14.2m$, say 15m

ii) Drainage System

Drainage from each Project facility shall be separated into sewage, waste, and cleaning waste water.

The sewage shall be treated in the treatment tank and then infiltrated by the infiltration tank. Wastewater will be infiltrated directly through the infiltration tank.

The cleaning wastewater from fish handling areas will be directly discharged into the sea after removing waste materials by screens.

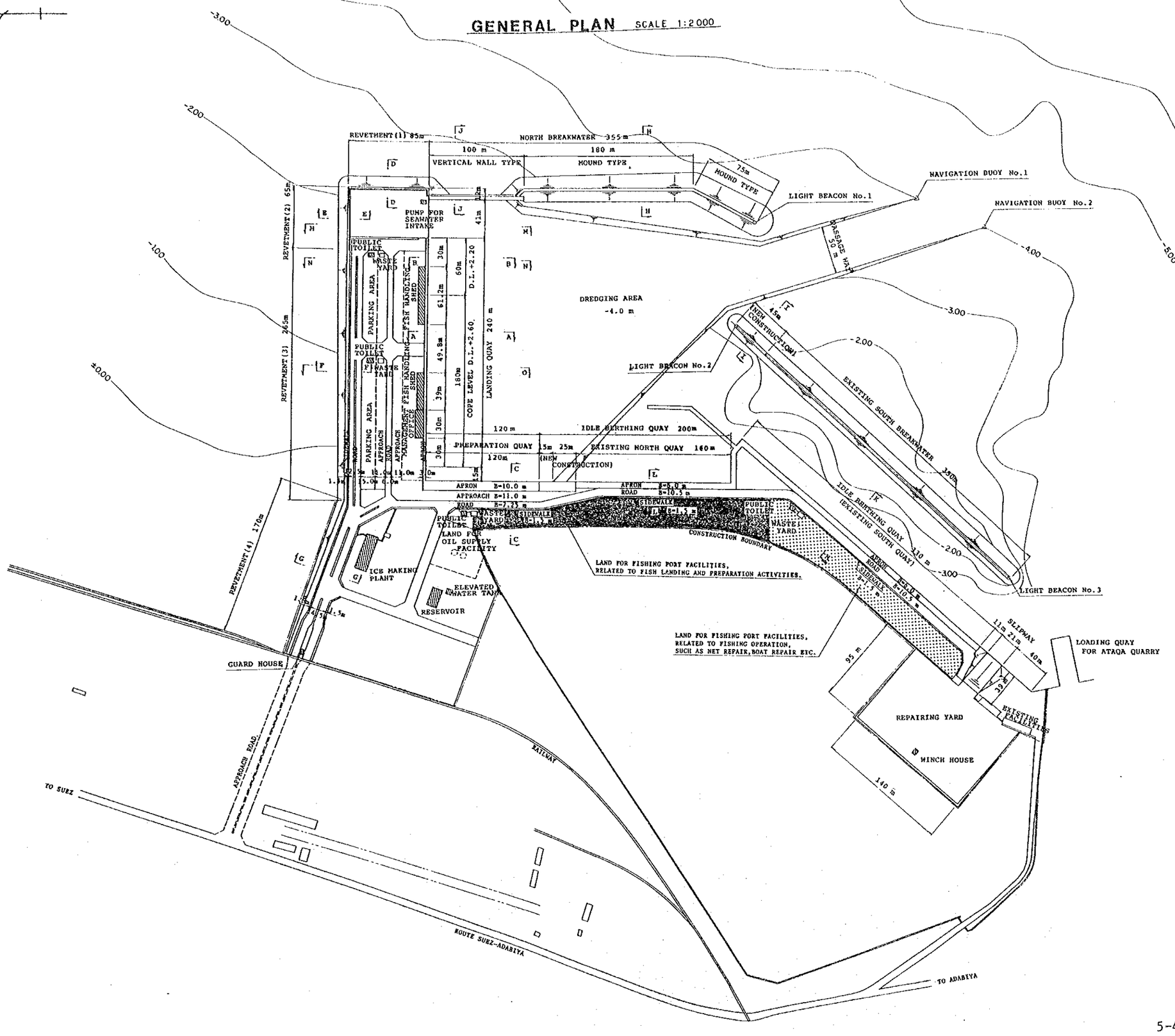
The treatment tank shall be the septic type which is most commonly used in Egypt. The sewage line shall be a gravity flow system.

5.3.4 Basic Design Drawings

Basic design drawings are attached as follows.

Dwg. No.	Title
C-1	General Plan
C-2	Cross Section of Reclaimed Area
C-3	Quay and Revetment
C-4	Improvement for Existing Quay
C-5	Slipway
C-6	North Breakwater
C-7	Improvement of Existing South Breakwater
A-1	Plan for Management Office and Fish Handling Shed
A-2	Plan for Ice Making Plant, Reservoir, etc.
U-1	Layout for Water and Oil Supply Facilities
U-2	Water Supply and Treatment Facilities
U-3	Fish Handling Shed/Plumbing, Drainage Works
E-1	Single Line Diagram for Electrical Works
E-2	Open Air Wiring Layout
E-3	Indoor Wiring Layout (1)
E-4	Indoor Wiring Layout (2)
Attachment	Exterior, Interior for Building Works

GENERAL PLAN SCALE 1:2000



GENERAL NOTES

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
◇	
◇	
◇	
◇	

NO.	DATE	DESCRIPTIONS	BY	APP'D
REVISIONS				

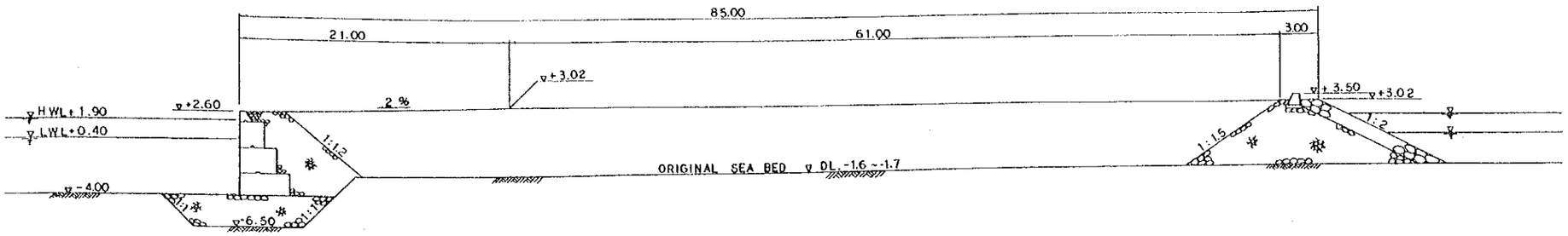
BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

GENERAL PLAN

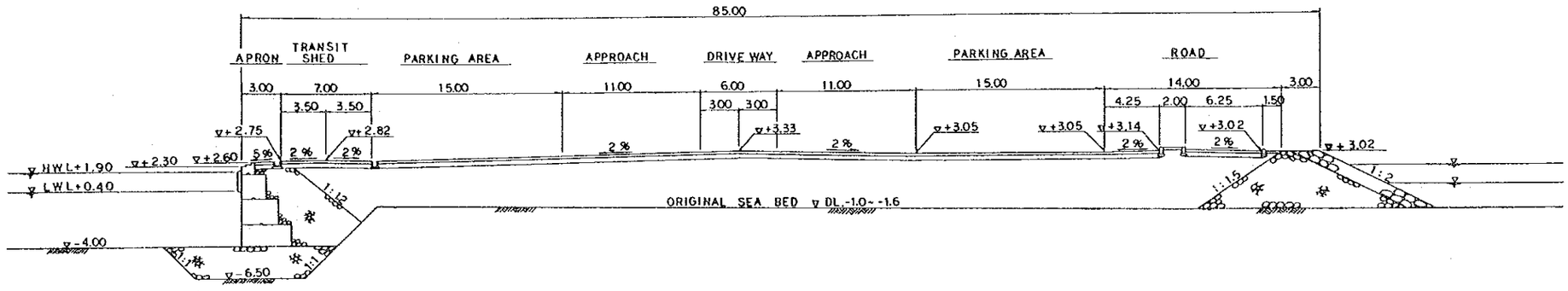
PACIFIC CONSULTANTS INTERNATIONAL

SUBMITTED	APPROVED	SCALE	REV. NO.
			◇
DATE		DWG. NO.	C – 1

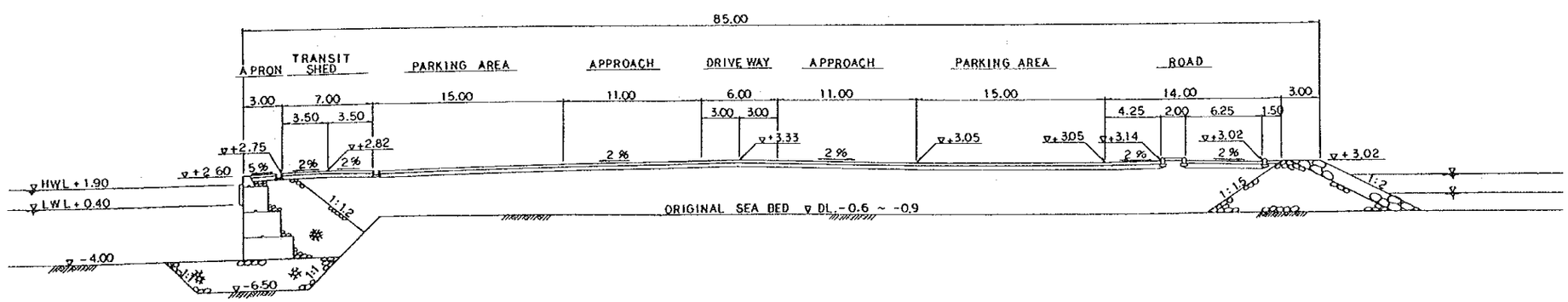
SECTION M – M



SECTION N – N



SECTION O – O



GENERAL NOTES

1. ALL DIMENTIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS ARE IN METRES.

ABBREVIATIONS

H.W.L. : HIGH WATER LEVEL
L.W.L. : LOW WATER LEVEL
DL. : DATUM LEVEL

NO.	DATE	DESCRIPTIONS	BY	APP'D

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

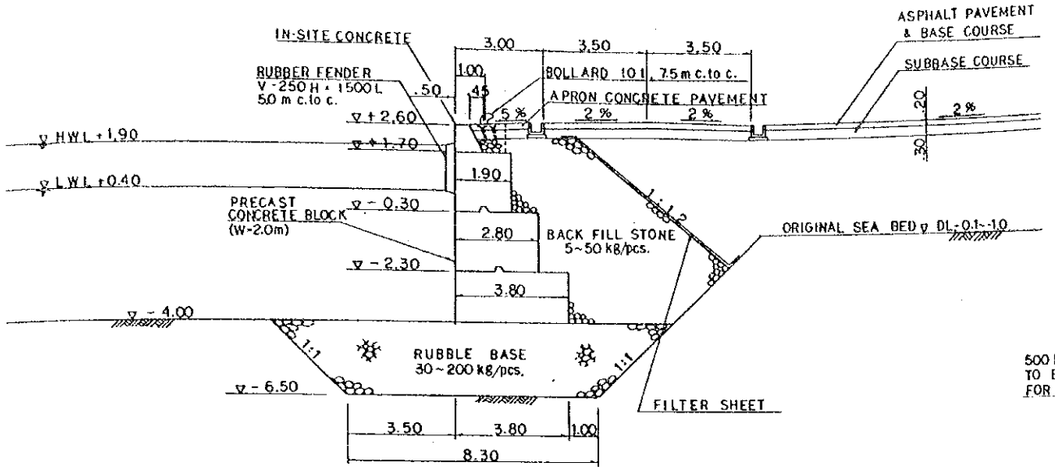
CROSS SECTION OF RECLAMATED AREA

PACIFIC CONSULTANTS INTERNATIONAL

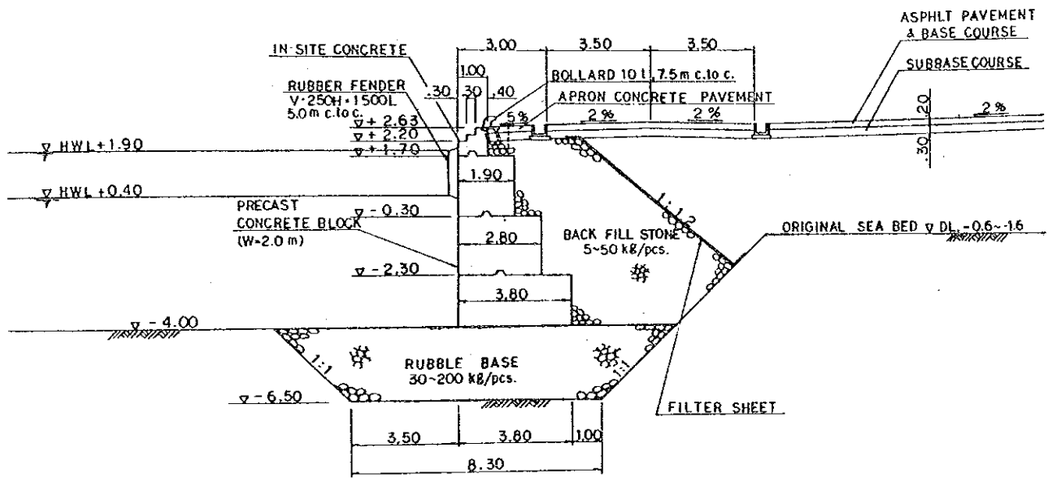
SUBMITTED	APPROVED	SCALE	REV. NO.
		1:200	◇
DATE		DWG. NO.	C – 2

CROSS SECTION OF QUAY AND REVETMENT

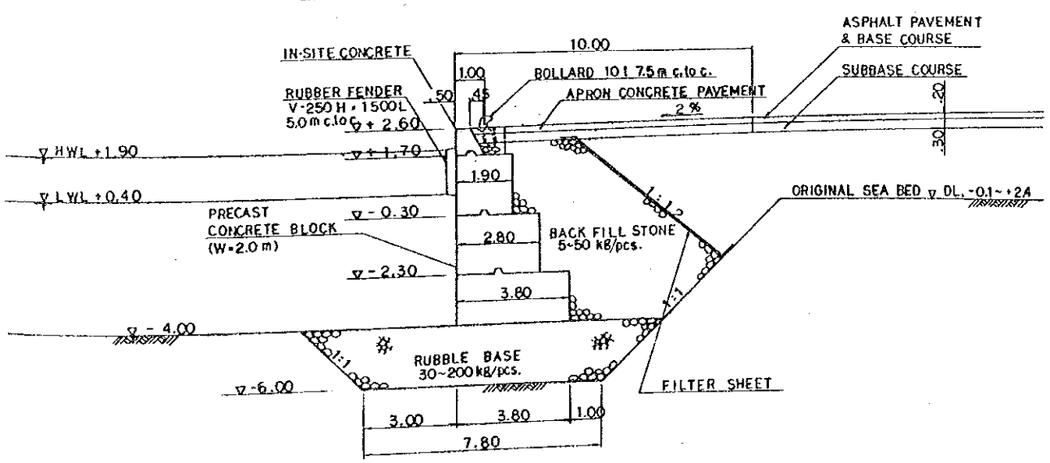
SECTION A - A



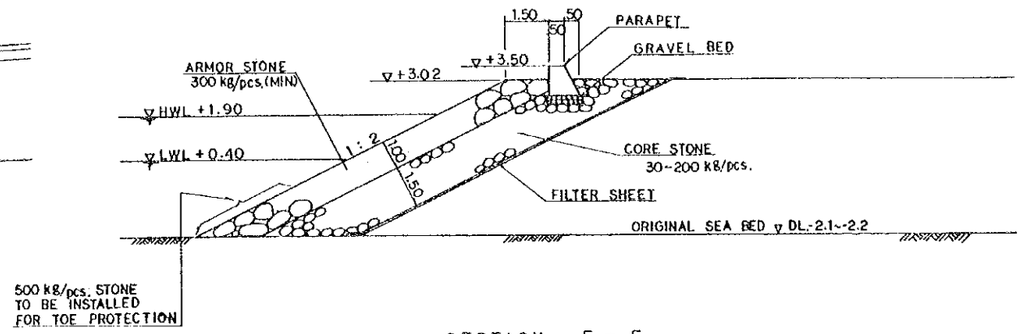
SECTION B - B



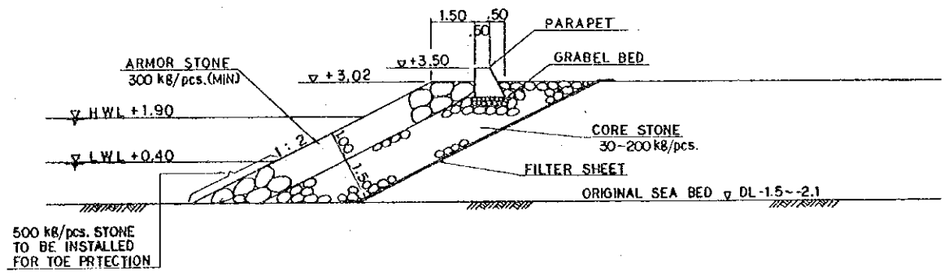
SECTION C - C



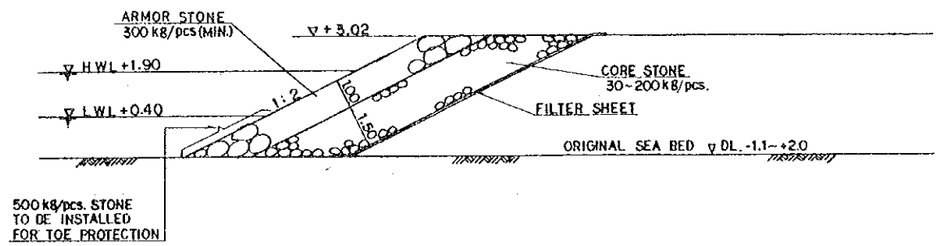
SECTION D - D



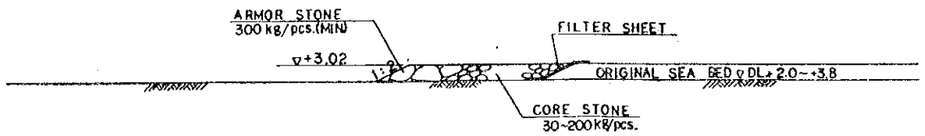
SECTION E - E



SECTION F - F



SECTION G - G



GENERAL NOTES

1. ALL DIMENTIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS ARE IN METRES.

ABBREVIATIONS

H.W.L.	: HIGH WATER LEVEL
L.W.L.	: LOW WATER LEVEL
DL.	: DATUM LEVEL
▽	: WIDTH OF CONCRETE BLOCK
c.to.c.	: CENTER TO CENTER
MIN.	: MINIMUM

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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◇	

NO.	DATE	DESCRIPTIONS	BY	APP'D

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

QUAY AND REVETMENT

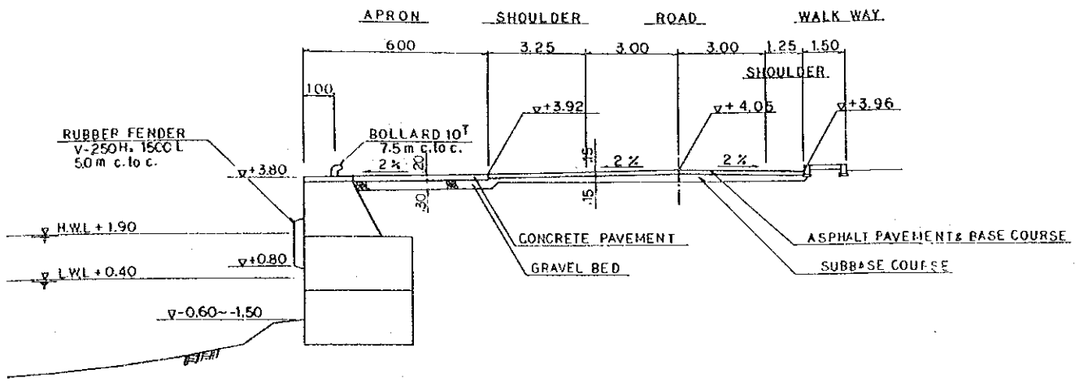
PACIFIC CONSULTANTS INTERNATIONAL

SUBMITTED	APPROVED	SCALE	REV. NO.
		1:100	◇
DATE		DWG. NO.	C - 3

REPAIR OF EXISTING QUAY

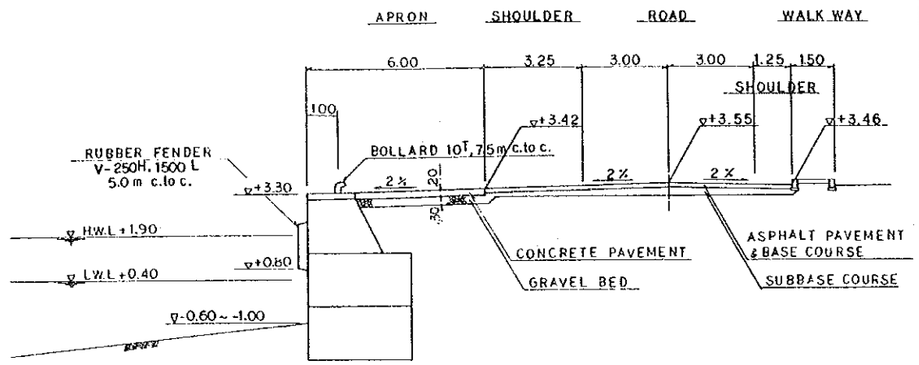
SECTION K - K SCALE=1:100

EXISTING SOUTH QUAY

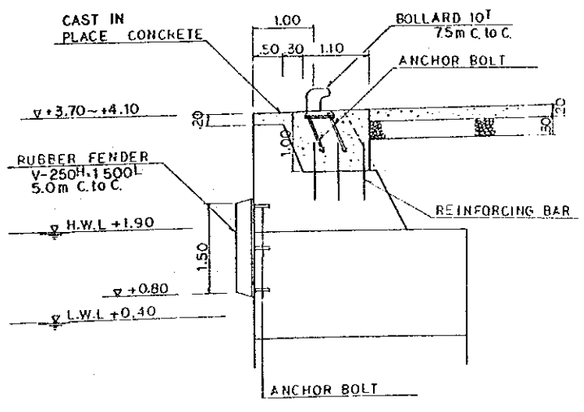


SECTION L - L SCALE=1:100

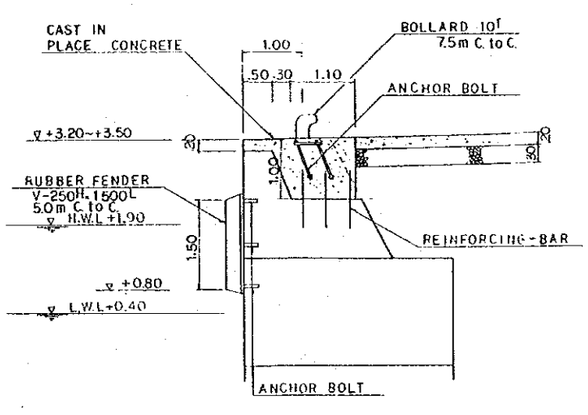
EXISTING NORTH QUAY



DETAIL OF BOLLARD AND FENDER SCALE=1:50



DETAIL OF BOLLARD AND FENDER SCALE=1:50



GENERAL NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS ARE IN METERS.

ABBREVIATIONS

H.W.L.	:	HIGH WATER LEVEL
L.W.L.	:	LOW WATER LEVEL
DL.	:	DATUM LEVEL
W	:	WIDTH OF CONCRETE BLOCK
c. to c.	:	CENTER TO CENTER
MIN.	:	MINIMUM

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D

REVISIONS

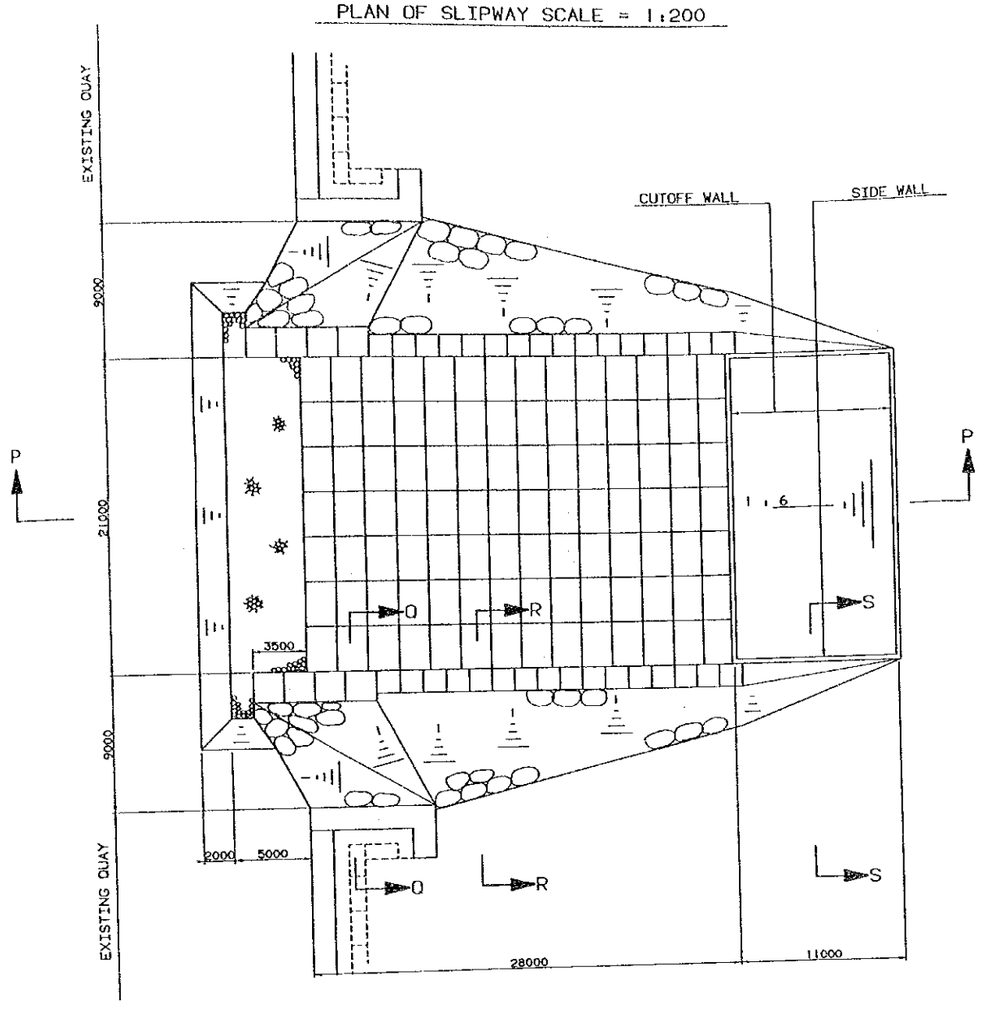
BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

IMPROVEMENT FOR EXISTING QUAY

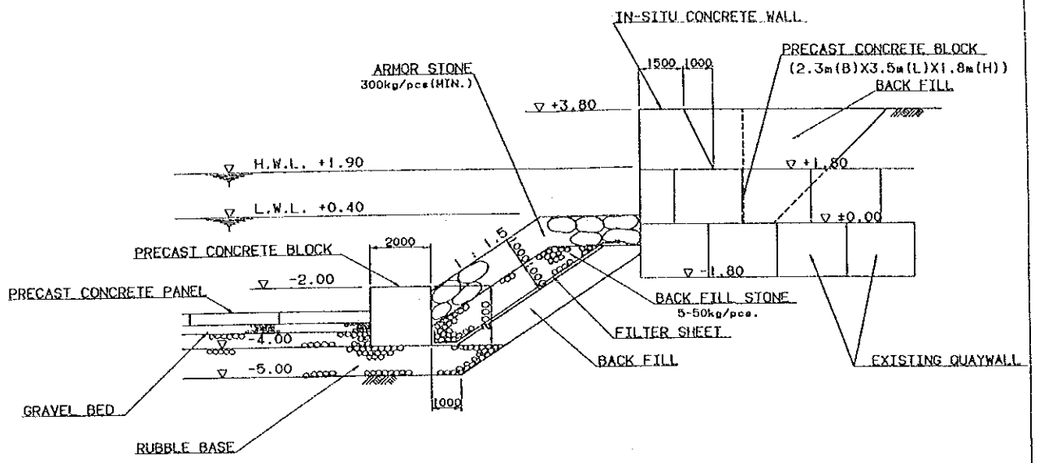
PACIFIC CONSULTANTS INTERNATIONAL

SUBMITTED	APPROVED	SCALE	REV. NO.
		AS NOTED	◇
DATE		DWG. NO.	C - 4

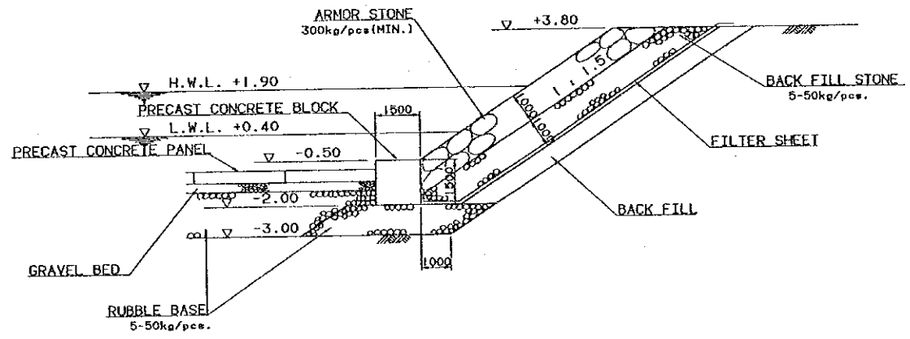
PLAN OF SLIPWAY SCALE = 1:200



SECTION Q - Q SCALE = 1 : 100



SECTION R - R SCALE = 1 : 100



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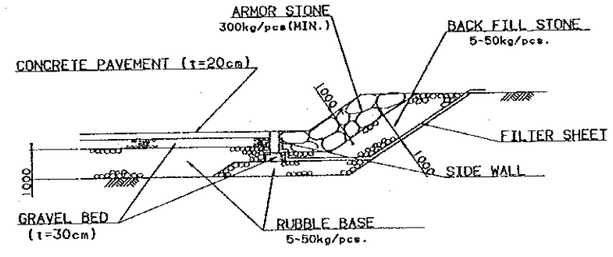
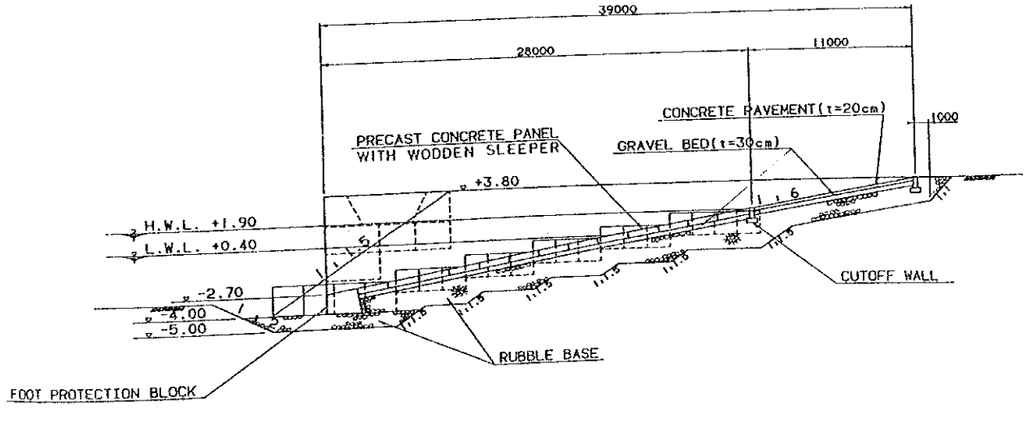
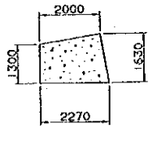


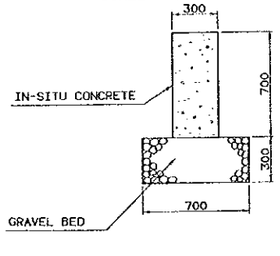
SECTION P - P SCALE =1:200



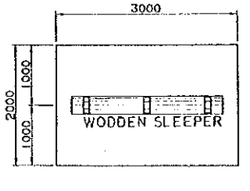
FOOT PROTECTION BLOCK SCALE = 1 : 100

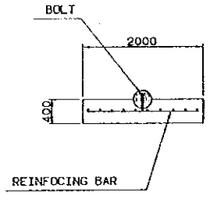


CUTOFF WALL & SIDE WALL SCALE = 1:20



PRECAST CONCRETE PANEL SCALE = 1:50





GENERAL NOTES

1. ALL DIMENTIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. ALL ELEVATIONS ARE IN METRES.

ABBREVIATIONS

H.W.L.	:	HIGH WATER LEVEL
L.W.L.	:	LOW WATER LEVEL
DL.	:	DATUM LEVEL
(B)	:	WIDTH OF CONCRETE BLOCK
(L)	:	LENGTH OF CONCRETE BLOCK
(H)	:	HIGHT OF CONCRETE BLOCK
MIN.	:	MINIMUM

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APPD

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

SLIPWAY

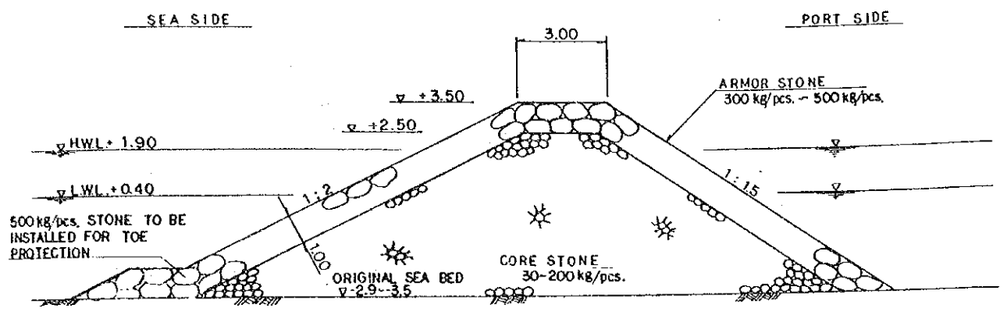
PACIFIC CONSULTANTS INTERNATIONAL

SUBMITTED	APPROVED	SCALE	REV. NO
		AS NOTED	◇
DATE		DWG. NO.	C — 5

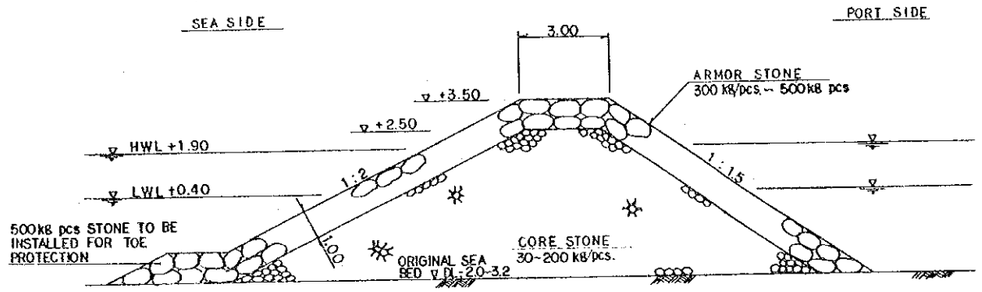
5-50

CROSS SECTION OF BREAKWATER (NEWLY CONSTRACTED)

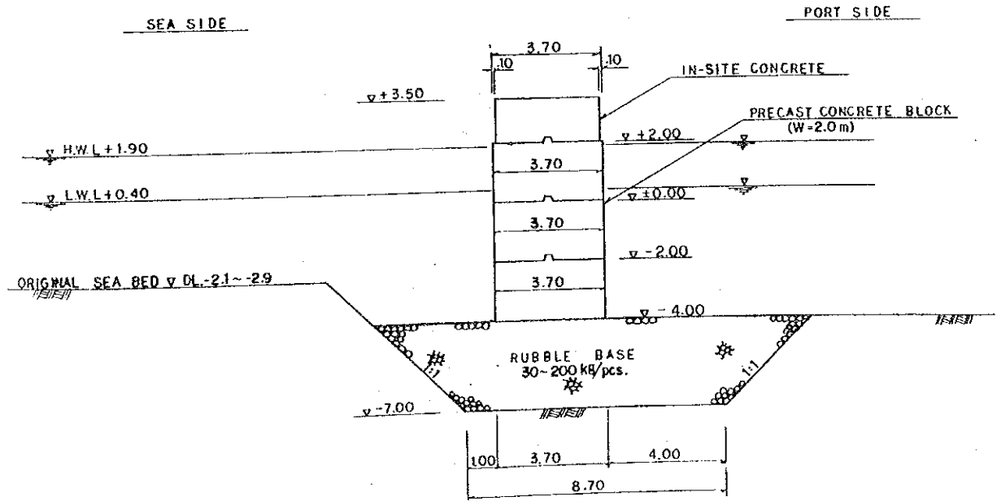
SECTION H – H SCALE=1:100



SECTION I-I SCALE=1:100



SECTION J-J SCALE=1:100



GENERAL NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
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ABBREVIATIONS

H.W.L.	: HIGH WATER LEVEL
L.W.L.	: LOW WATER LEVEL
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MIN.	: MINIMUM

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D
REVISIONS				

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF AYAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

NORTH BREAKWATER

PACIFIC CONSULTANTS INTERNATIONAL

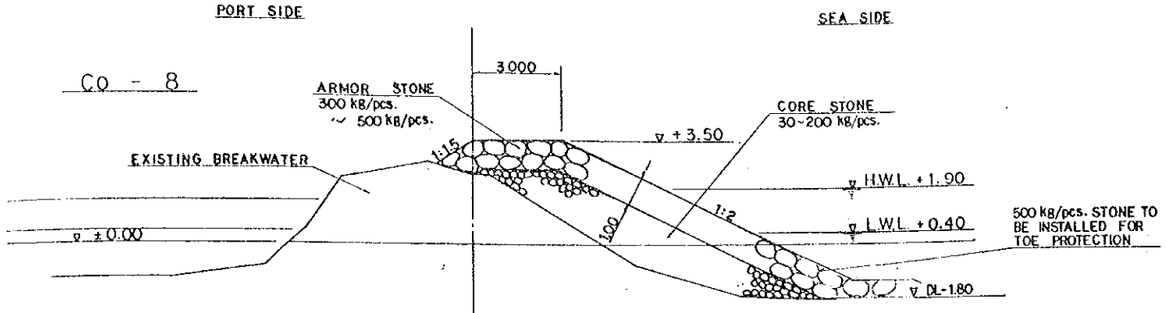
SUBMITTED	APPROVED	SCALE	REV. NO.
		AS NOTED	◇
DATE		DWG. NO.	C – 6

REINFORCEMENT OF EXISTING BREAKWATER SCALE = 1:100

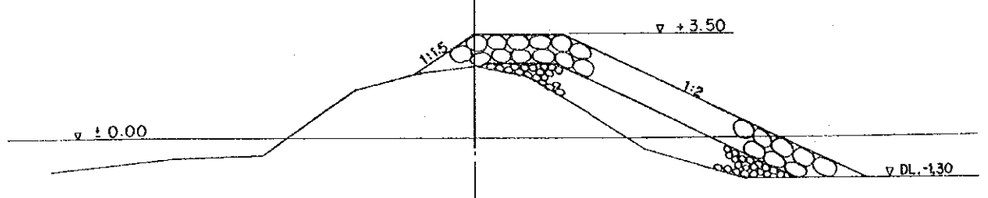
PORT SIDE

SEA SIDE

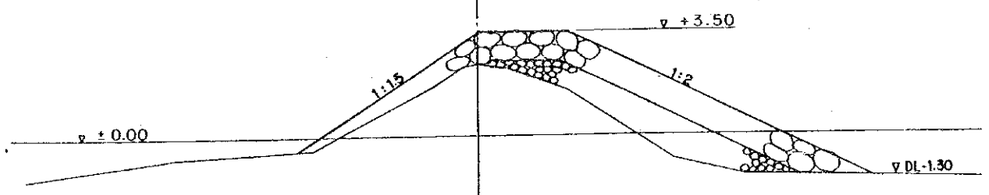
Co - 8



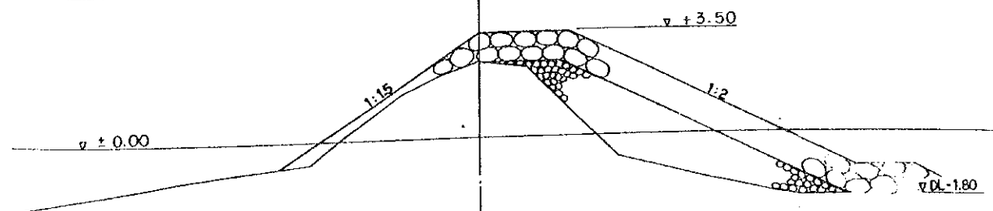
Co - 7



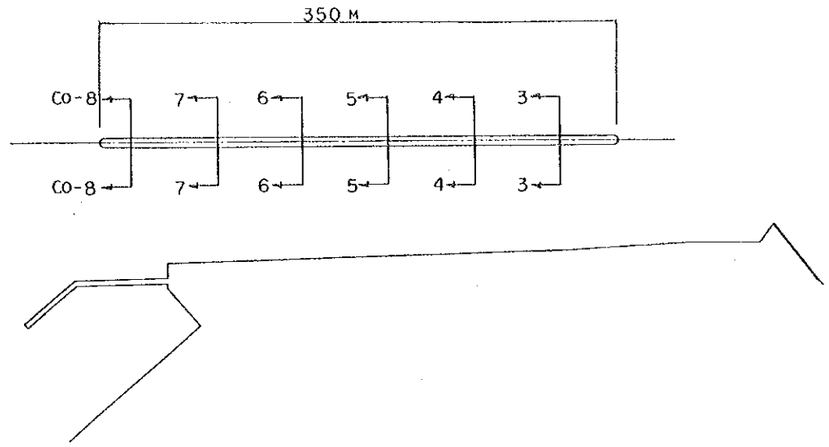
Co - 6



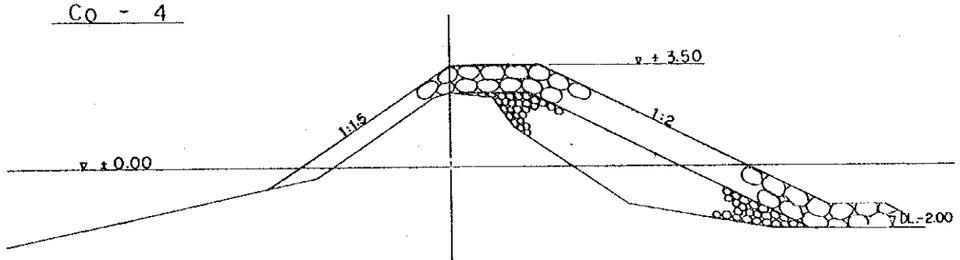
Co - 5



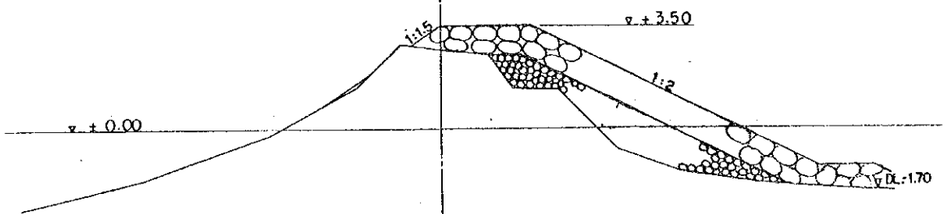
P L A N SCALE=1:200



Co - 4



Co - 3



GENERAL NOTES

1. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
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ABBREVIATIONS

H.W.L. : HIGH WATER LEVEL
L.W.L. : LOW WATER LEVEL
DL. : DATUM LEVEL
MIN. : MINIMUM

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

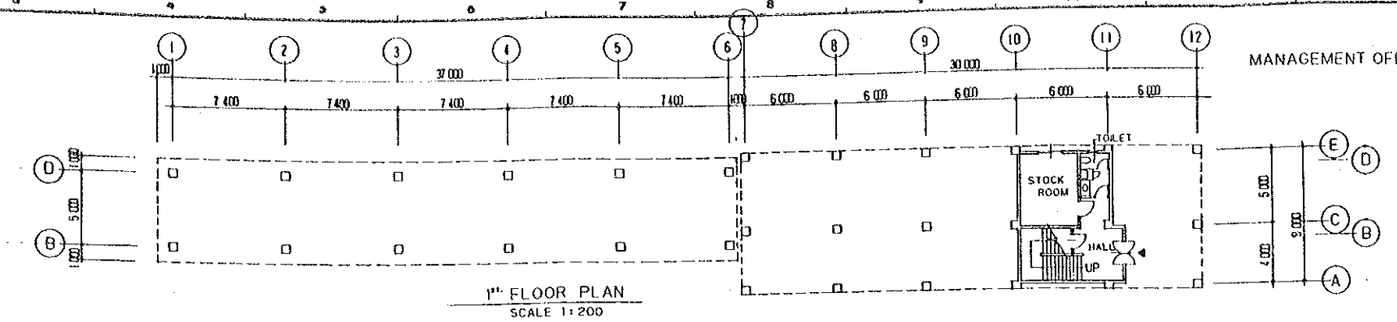
IMPROVEMENT OF EXISTING SOUTH BREAKWATER

PACIFIC CONSULTANTS INTERNATIONAL

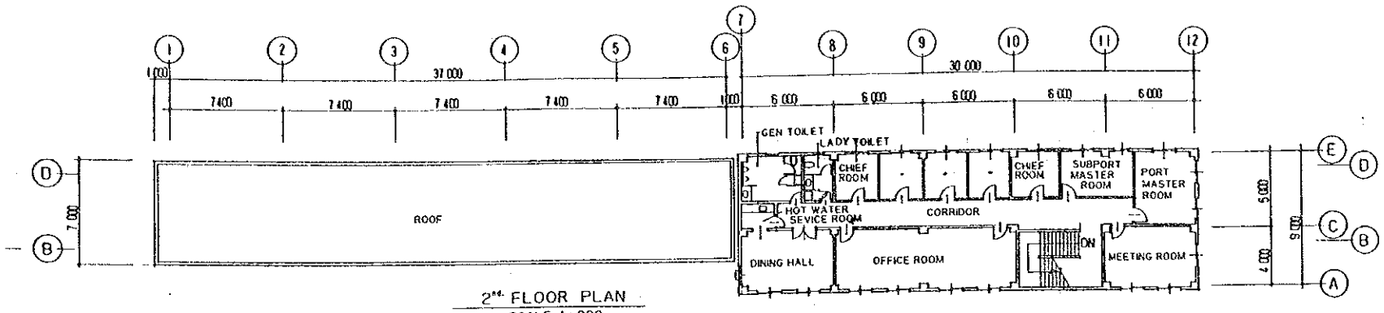
SUBMITTED	APPROVED	SCALE	REV. NO.
		AS NOTED	◇
DATE		DWG. NO.	C – 7

5-52

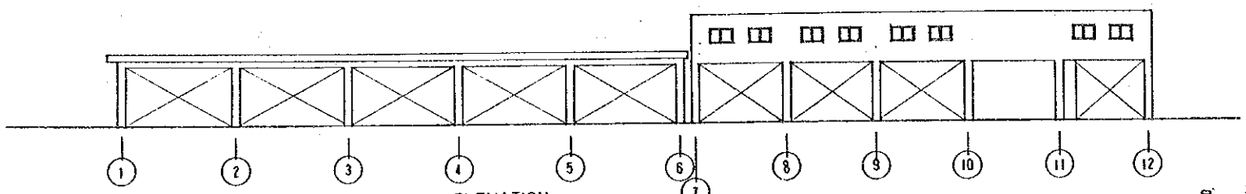
MANAGEMENT OFFICE & FISH HANDLING SHED



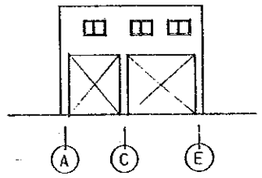
1ST. FLOOR PLAN
SCALE 1:200



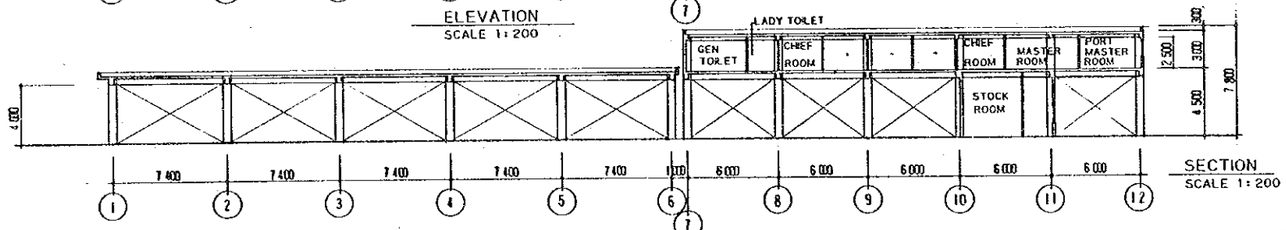
2ND. FLOOR PLAN
SCALE 1:200



ELEVATION
SCALE 1:200

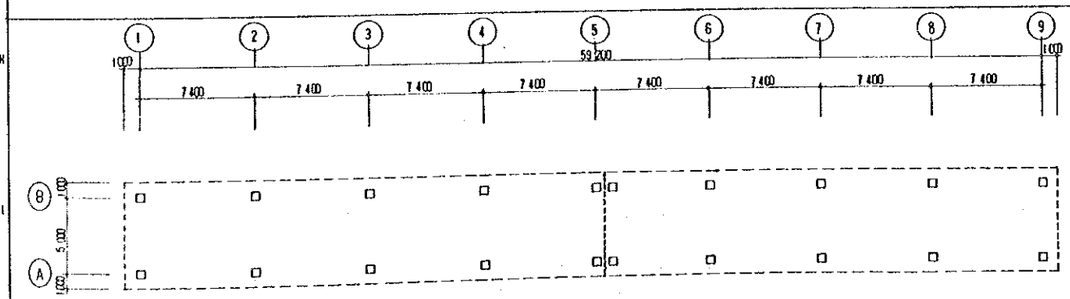


ELEVATION
SCALE 1:200

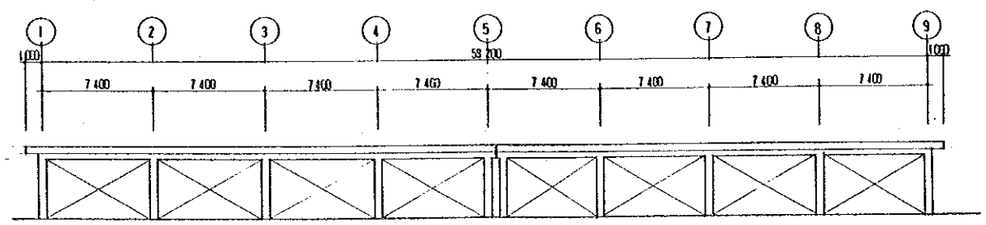


SECTION
SCALE 1:200

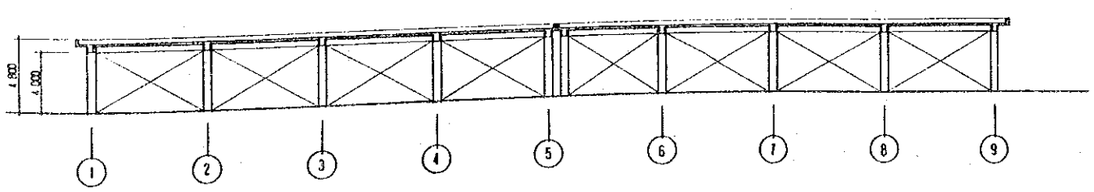
FISH HANDLING SHED



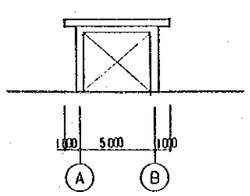
1ST. FLOOR PLAN
SCALE 1:200



ELEVATION
SCALE 1:200



SECTION
SCALE 1:200



ELEVATION
SCALE 1:200

GENERAL NOTES

FOUNDATION
— WALL FOOTING

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D
REVISIONS				

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

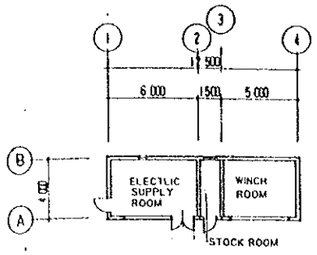
PLAN FOR
MANAGEMENT OFFICE
AND
FISH HANDLING SHED

PACIFIC CONSULTANTS INTERNATIONAL

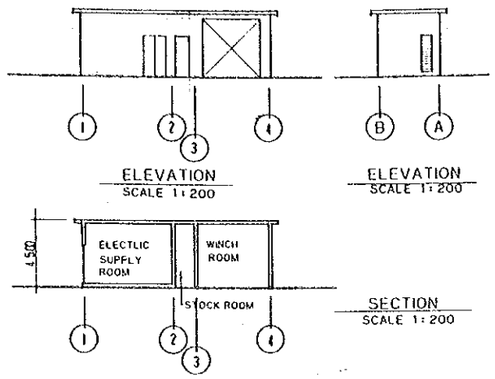
SUBMITTED	APPROVED	SCALE	REV. NO.
		1/200	◇
DATE		DWG. NO.	A – 1

5-53

WINCH HOUSE



1st. PLAN
SCALE 1:200

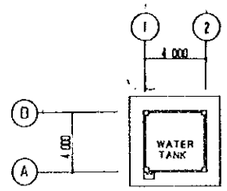


ELEVATION
SCALE 1:200

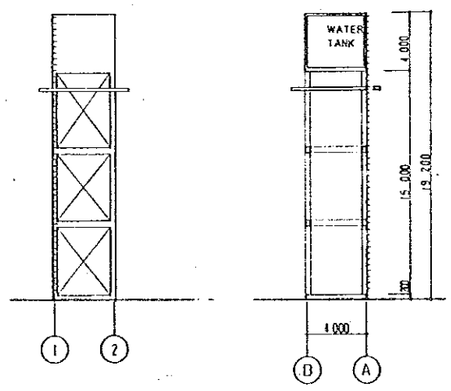
ELEVATION
SCALE 1:200

SECTION
SCALE 1:200

ELEVATED WATER TANK (RC)



PLAN
SCALE 1:200

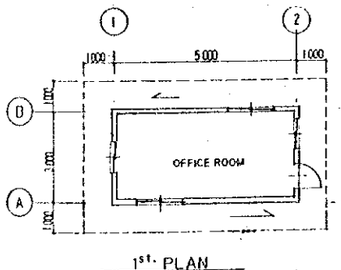


ELEVATION
SCALE 1:200

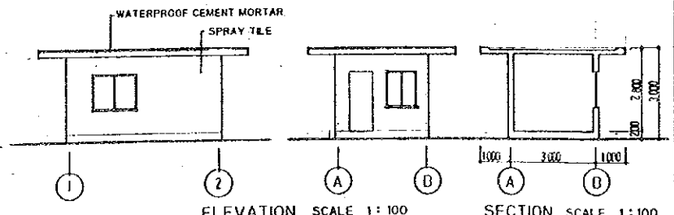
SECTION
SCALE 1:200

FOUNDATION
STRUCTURAL STEEL PILE FOUNDATION
L=15 m

GUARD HOUSE



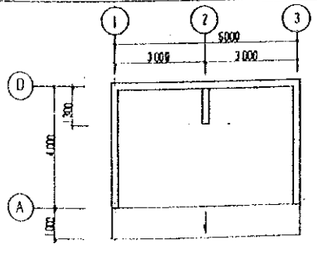
1st. PLAN
SCALE 1:100



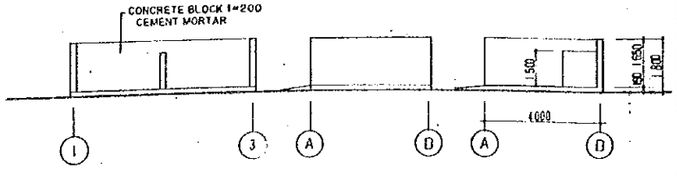
ELEVATION SCALE 1:100

SECTION SCALE 1:100

WASTE YARD

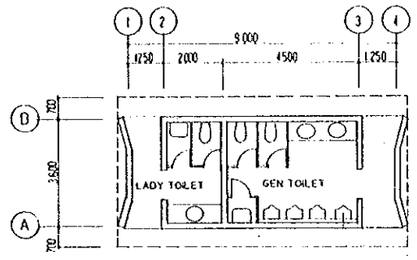


1st. PLAN
SCALE 1:100



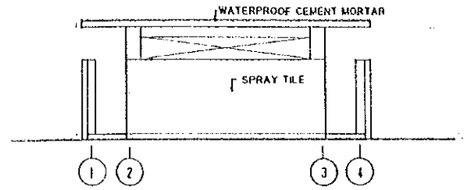
ELEVATION SCALE 1:100

SECTION SCALE 1:100

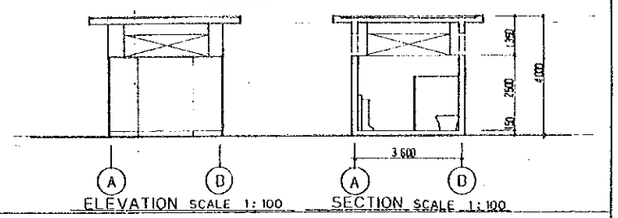


1st. PLAN
SCALE 1:100

PUBLIC TOILET



ELEVATION SCALE 1:100



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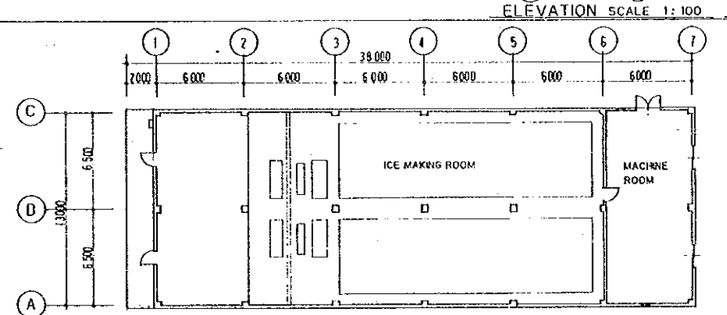
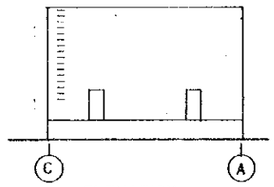
SECTION SCALE 1:100

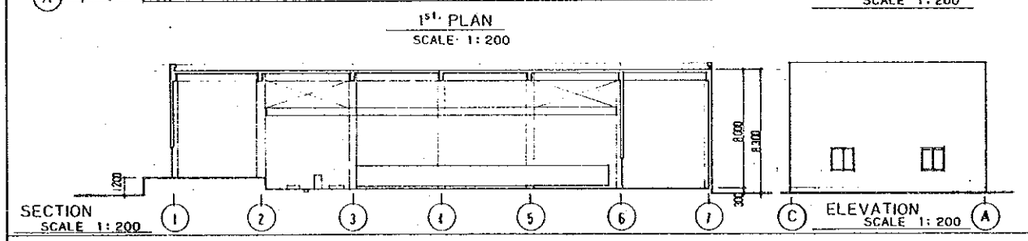


1st. PLAN
SCALE 1:200

ICE MAKING PLANT



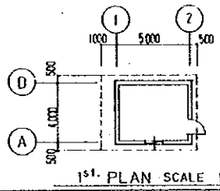
ELEVATION
SCALE 1:200



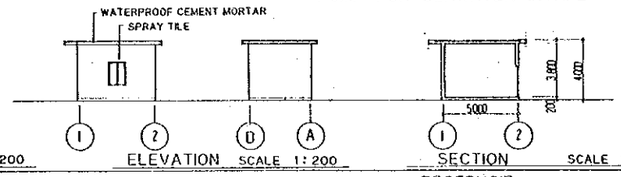
SECTION SCALE 1:200

ELEVATION SCALE 1:200

PUMP FOR SEAWATER INTAKE



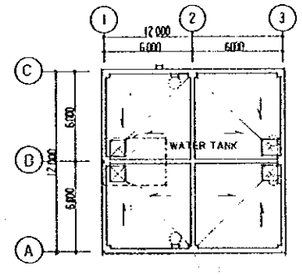
1st. PLAN SCALE 1:200



ELEVATION SCALE 1:200

SECTION SCALE 1:200

RESERVOIR



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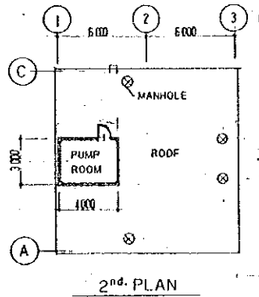
SCALE 1:200



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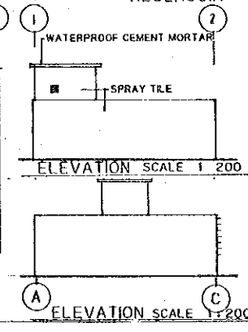

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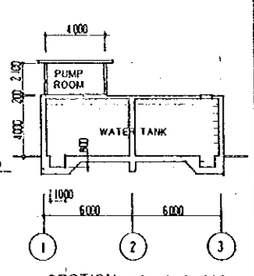
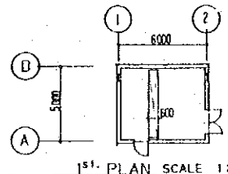


SECTION SCALE 1:200

ELECTRIC SUPPLY HOUSE



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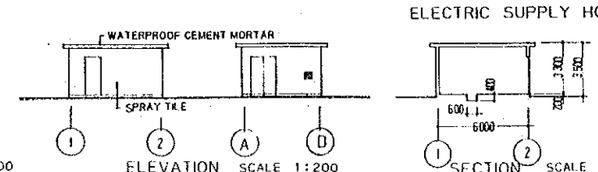

ELEVATION SCALE 1:200

SECTION SCALE 1:200

GENERAL NOTES

FOUNDATION
- WALL FOOTING
- RAFT FOUNDATION
- STRUCTURAL STEEL PILE FOUNDATION
  Elevated water tank - L 15m

DESCRIPTIONS	DWG. NO.

REFERENCE DRAWINGS

NO.	DATE	DESCRIPTIONS	BY	APP'D
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REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

PLAN FOR ICE MAKING PLANT, RESERVOIR etc.

PACIFIC CONSULTANTS INTERNATIONAL

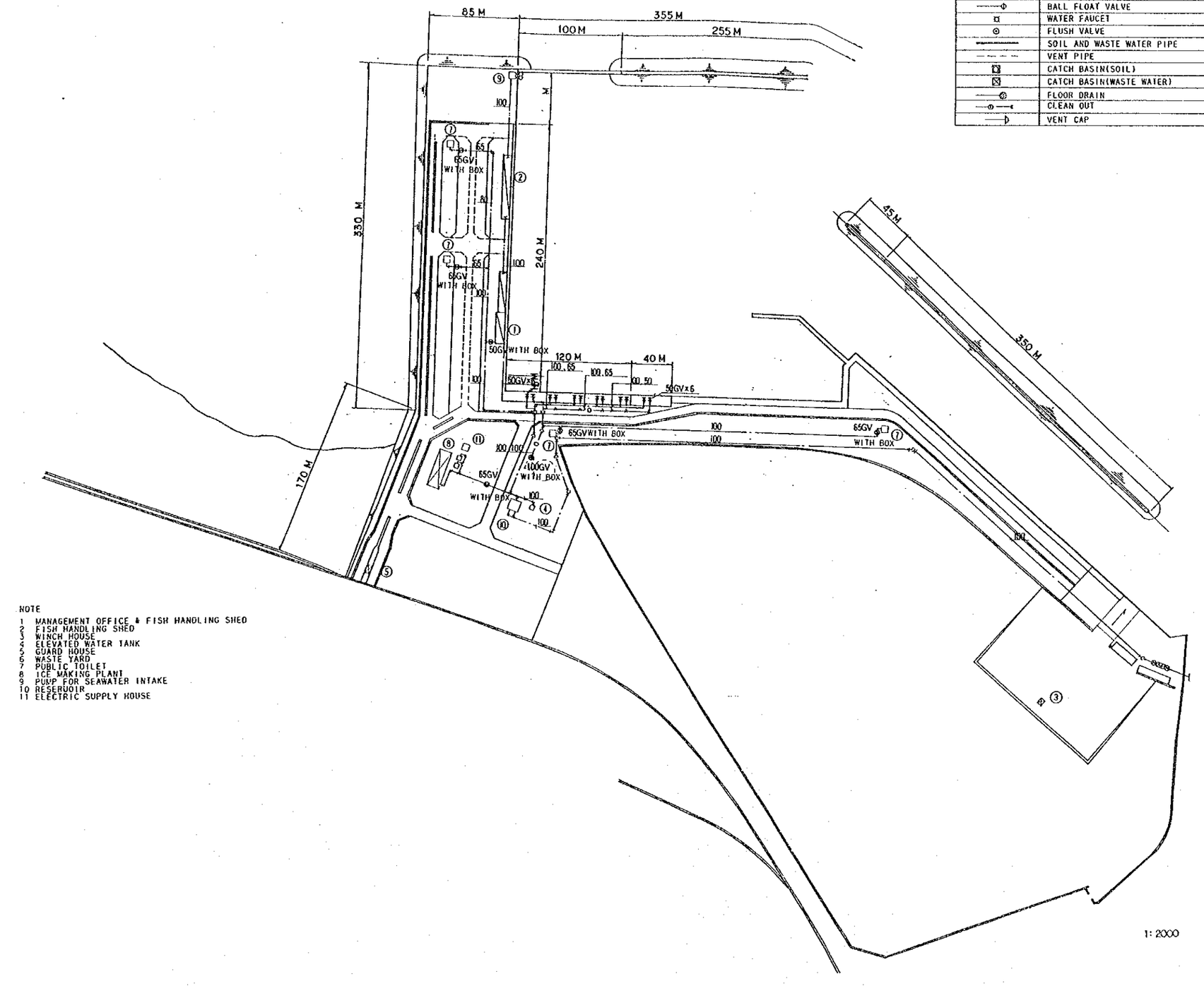
SUBMITTED	APPROVED	SCALE	REV. NO.
		1/100 . 1/200	◇
DATE		DWG. NO.	A – 2

5-54

S = 1:2000
0 50 100m

SYMBOL LIST

SYMBOL	NAME	REMARKS
	WATER SUPPLY PIPE	
	SEA WATER SUPPLY PIPE	
	OIL SUPLLY PIPE	
	GATE VALVE	
	WATER METER	
	BALL VALVE	
	CHECK VALVE	
	FLEXIBLE JOINT	
	BALL FLOAT VALVE	
	WATER FAUCET	
	FLUSH VALVE	
	SOIL AND WASTE WATER PIPE	
	VENT PIPE	
	CATCH BASIN(SOIL)	
	CATCH BASIN(WASTE WATER)	
	FLOOR DRAIN	
	CLEAN OUT	
	VENT CAP	



NOTE
1 MANAGEMENT OFFICE & FISH HANDLING SHED
2 FISH HANDLING SHED
3 WINCH HOUSE
4 ELEVATED WATER TANK
5 GUARD HOUSE
6 WASTE YARD
7 PUBLIC TOILET
8 ICE MAKING PLANT
9 PUMP FOR SEAWATER INTAKE
10 RESERVOIR
11 ELECTRIC SUPPLY HOUSE

5-55

GENERAL NOTES

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APPD
REVISIONS				

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

LAYOUT FOR WATER AND OIL SUPPLY FACILITIES

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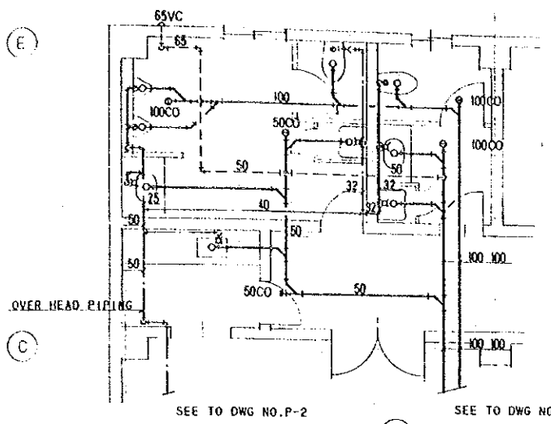
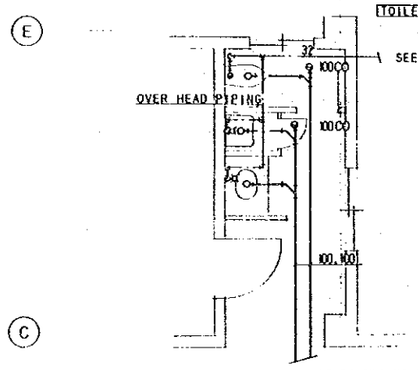
SUBMITTED	APPROVED	SCALE	REV. NO.
		1/2000	◇
DATE		DWG. NO.	U – 1

GENERAL NOTES

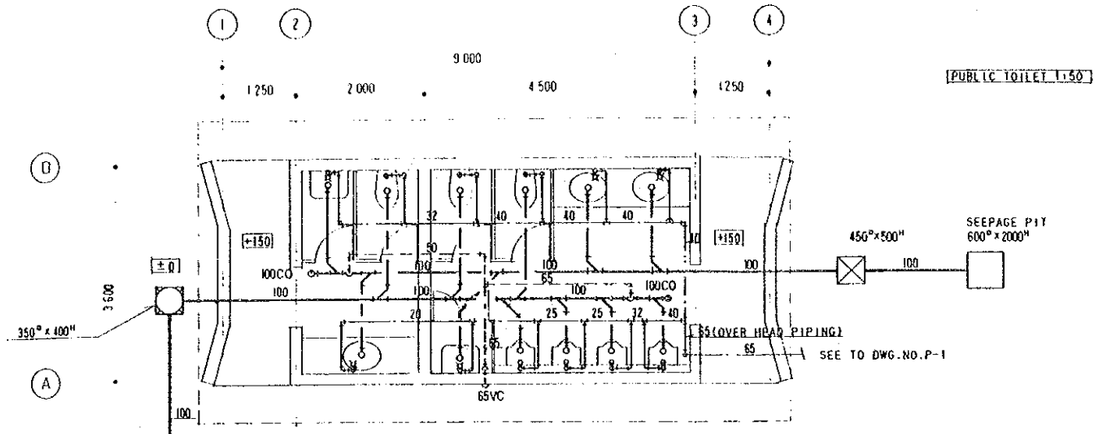
TOILET OF MANAGEMENT OFFICE 1:50



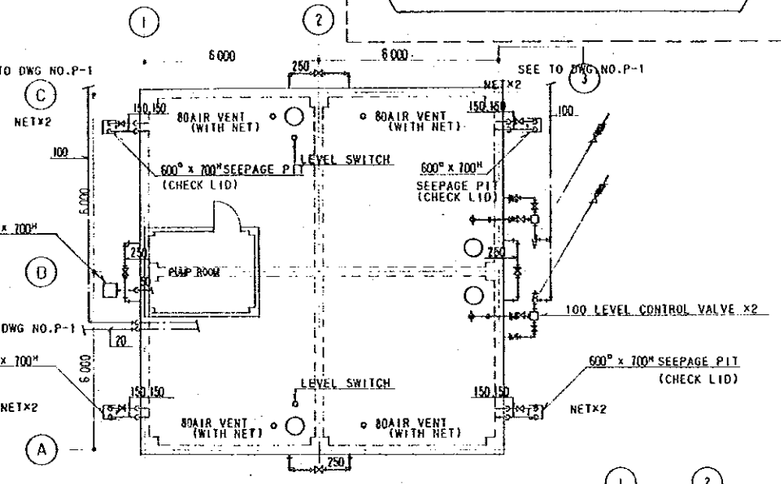
TOILET OF FISH HANDLING SHED 1:50



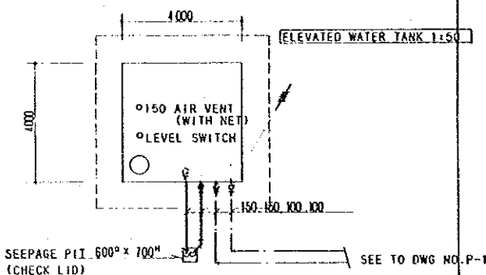
PUBLIC TOILET 1:50

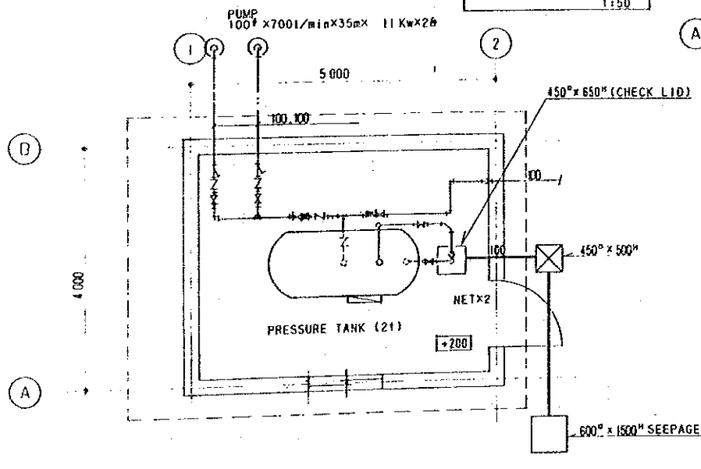


RESERVOIR 1:100

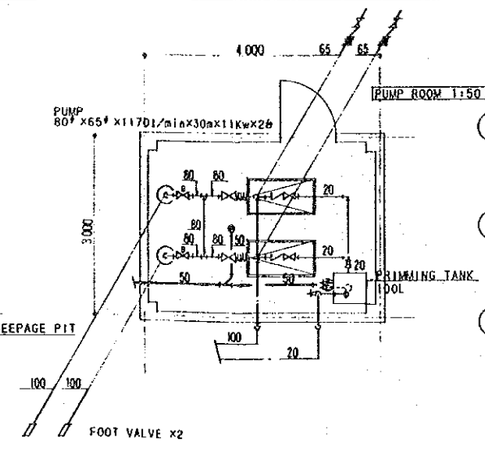


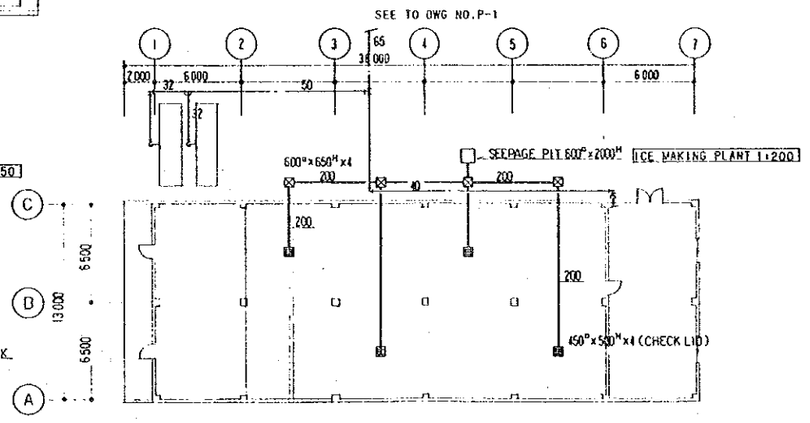
ELEVATED WATER TANK 1:50





WATER TANK HOUSE 1:100





INSTRUCTIONS
1.ALL THE LID OF PITS IS HEAVY DUTY

5-56

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D
REVISIONS				

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

WATER SUPPLY AND TREATMENT FACILITIES

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SUBMITTED	APPROVED	SCALE	REV. NO.
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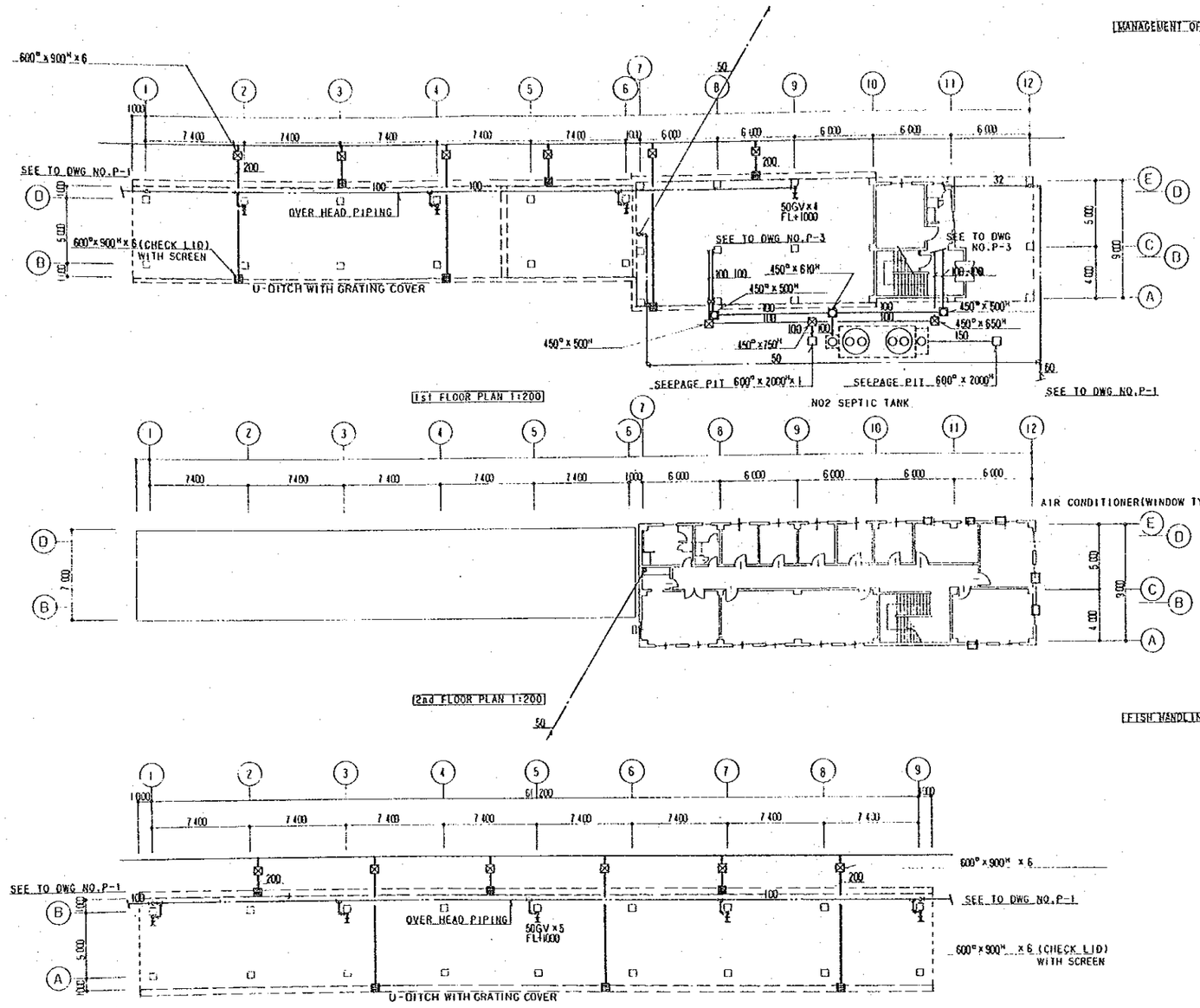
DATE		DWG. NO. U – 2	



GENERAL NOTES

INSTRUCTIONS
1.ALL THE LID OF PITS IS HEAVY DUTY

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

FISH HANDLING SHED/
PLUMBING,
DRAINAGE WORKS

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SUBMITTED	APPROVED	SCALE	REV. NO.
		1/200	◇
DATE		DWG. NO.	U - 3

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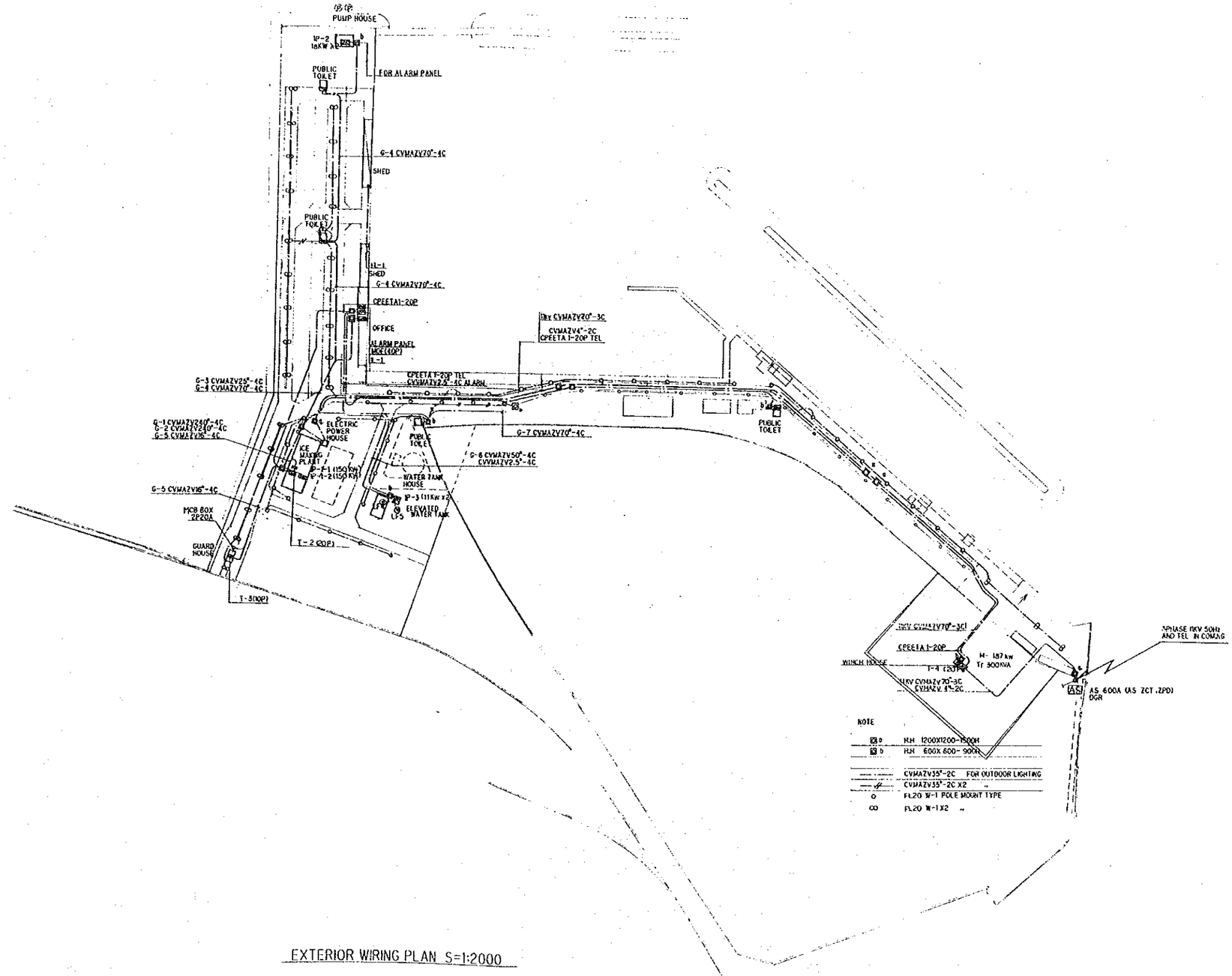
S=1:2000
0 50 100m



EXTERIOR WIRING PLAN S=1:2000

5-58

GENERAL NOTES

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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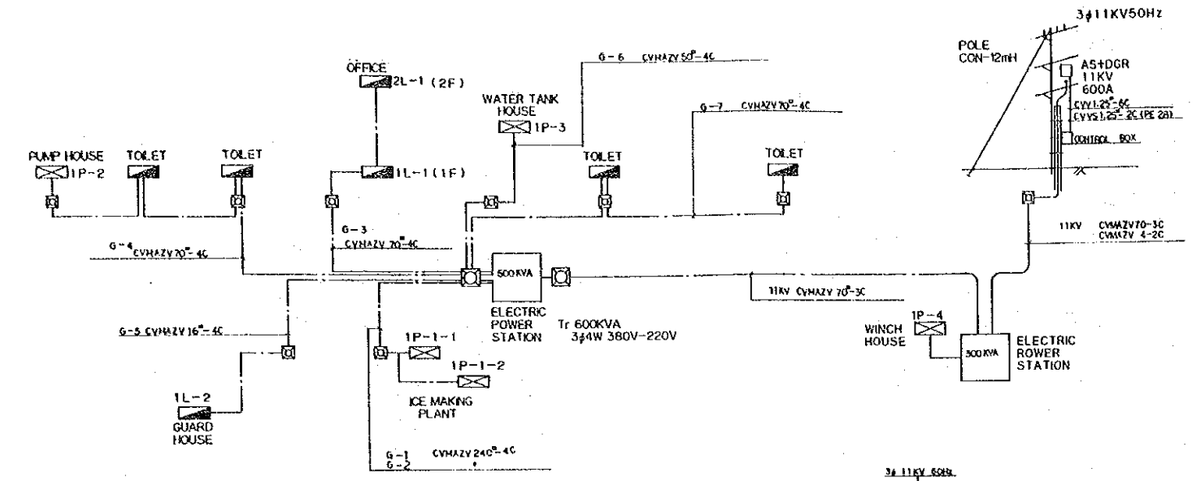
NO.	DATE	DESCRIPTIONS	BY	APP'D
REVISIONS				

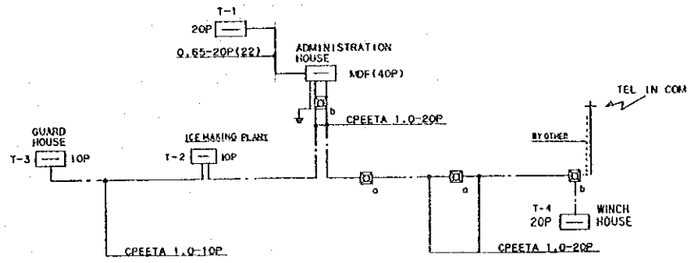
BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

OPEN AIR WIRING LAYOUT

PACIFIC CONSULTANTS INTERNATIONAL

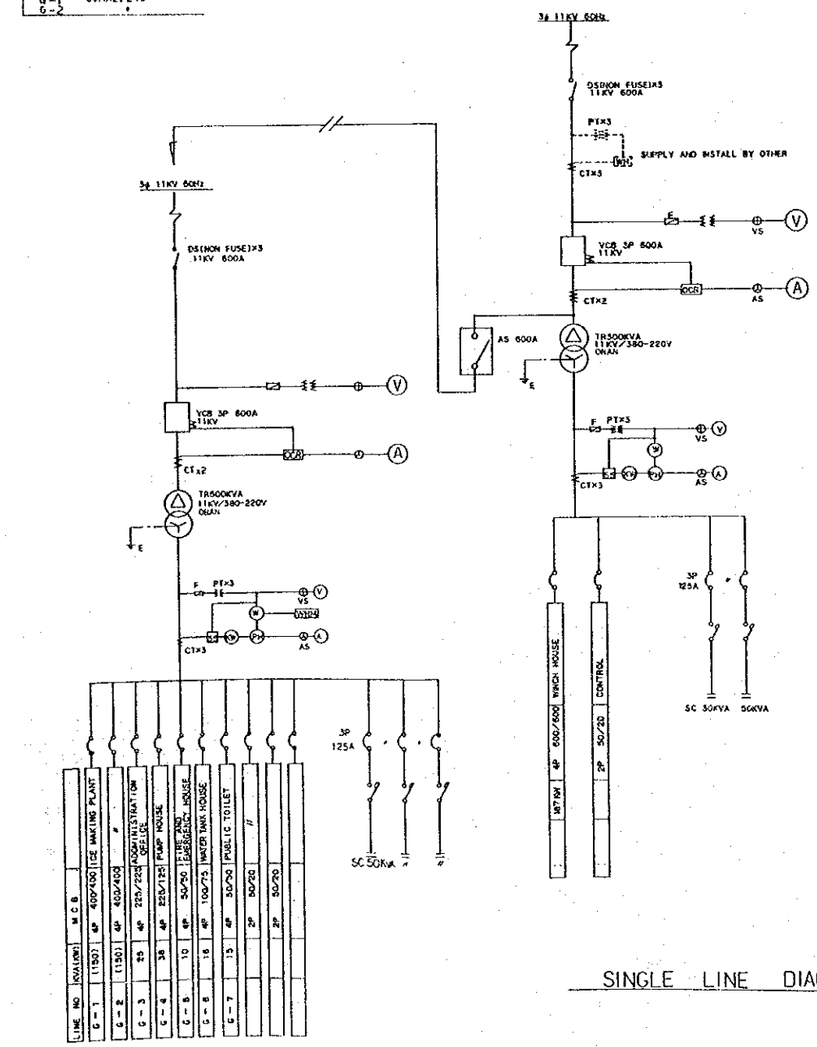
SUBMITTED	APPROVED	SCALE	REV. NO.
		1/2000	◇
DATE		DWG. NO.	E – 1



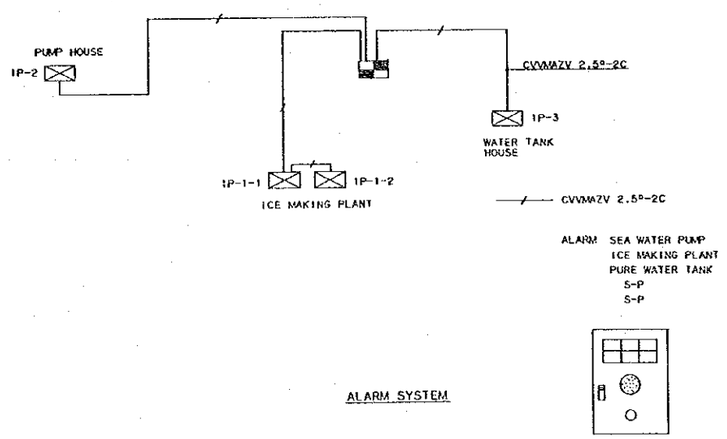


TELEPHONE SYSTEM

DESCRIPTION	
DS	DISCONNECTING SWITCH
PT	POTENTIAL TRANSFORMER
CT	CURRENT TRANSFORMER
CH	CABLE HEAD
TR	TRANSFORMER
ACB	AIR CIRCUIT BREAKER
F	FUSE
W	WATT METER
WH	WATT HOUR METER
PF	POWER FACTOR METER
AS	AMMETER SWITCH
VS	VOLTMETER SWITCH
A	AMMETER
V	VOLT METER
MCB	MOLDED CASE CIRCUIT BREAKER
MC	MAGNETIC CONTACTOR
PB	PUSH BUTTON
E	EARTH
55	AUTO POWER FACTOR RELAY



SINGLE LINE DIAGRAM



ALARM SYSTEM

GENERAL NOTES

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	

NO.	DATE	DESCRIPTIONS	BY	APP'D
		REVISIONS		

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

SINGLE LINE DIAGRAM FOR ELECTLICAL WORKS

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SUBMITTED	APPROVED	SCALE	REV. NO.
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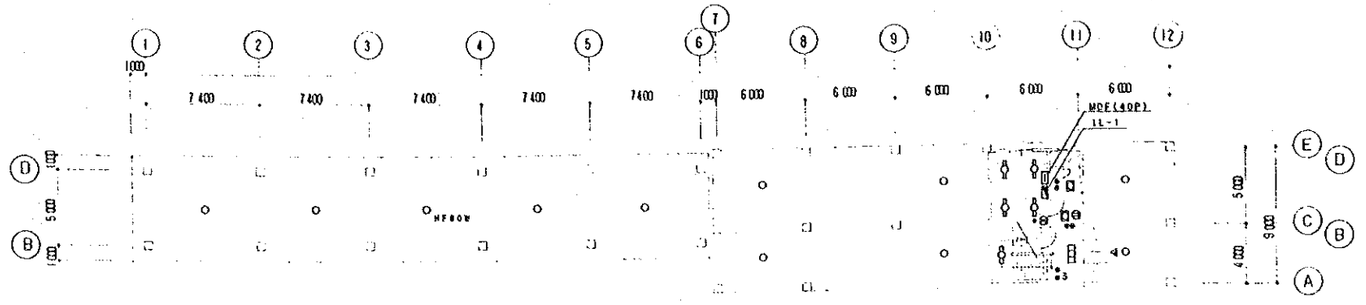
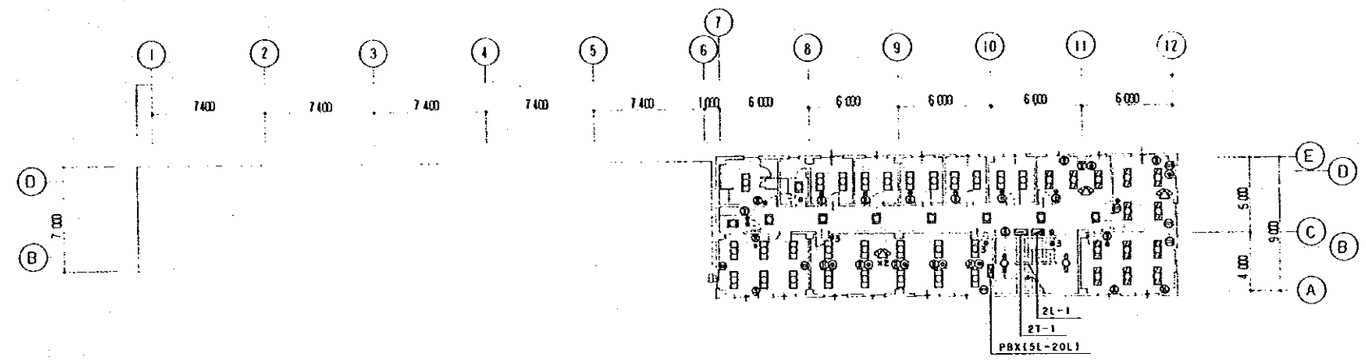
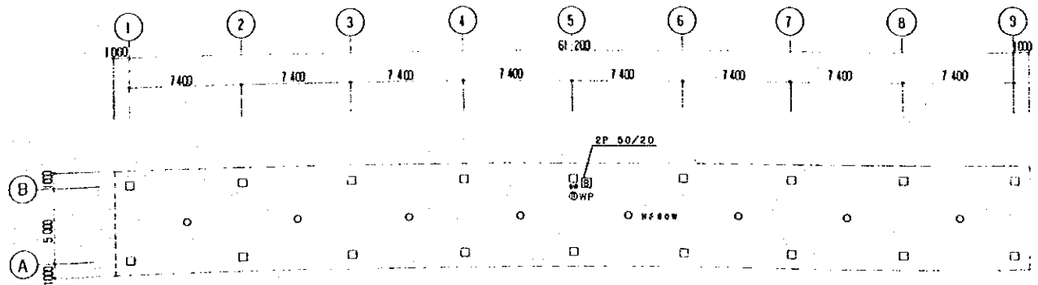
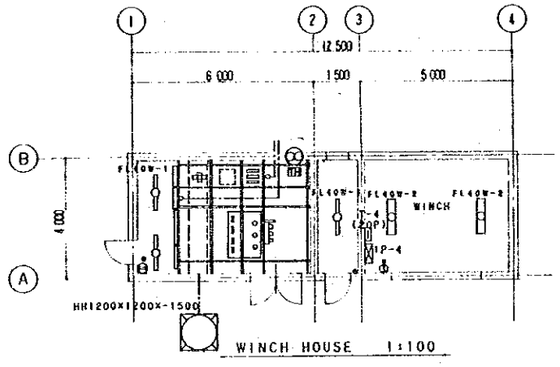


MANAGEMENT OFFICE & FISH HANDLING SHED





FISH HANDLING SHED 1:200



WINCH HOUSE 1:100

5-60

GENERAL NOTES

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	
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NO.	DATE	DESCRIPTIONS	BY	APP'D

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF ATAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

IN DOOR WIRING LAYOUT (1)

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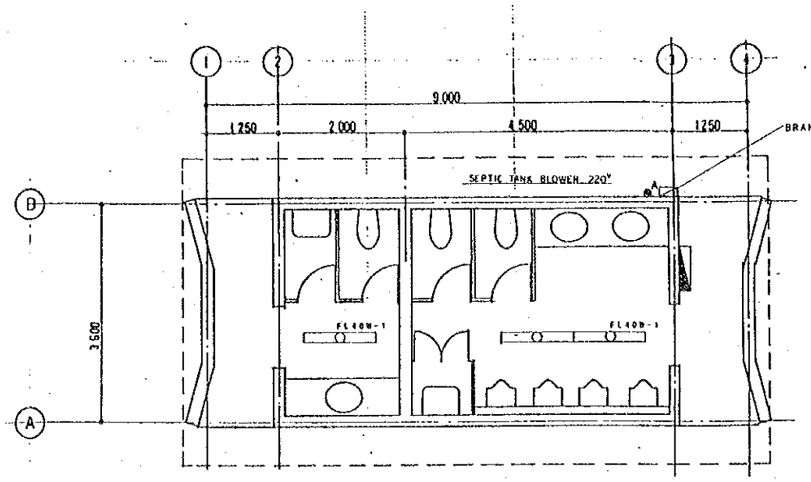
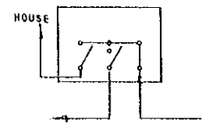
SUBMITTED	APPROVED	SCALE	REV. NO.
		1/100・1/200	◇
DATE		DWG. NO.	E – 3



PUBLIC TOILET 1:50

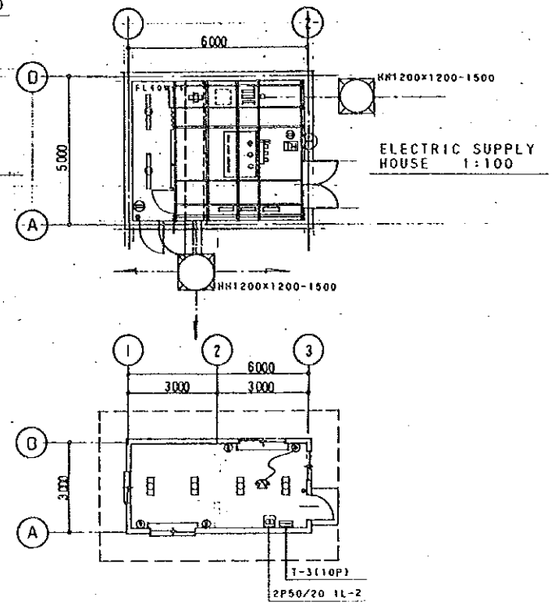


NOTE

: CEELING TYPE FL40W-2

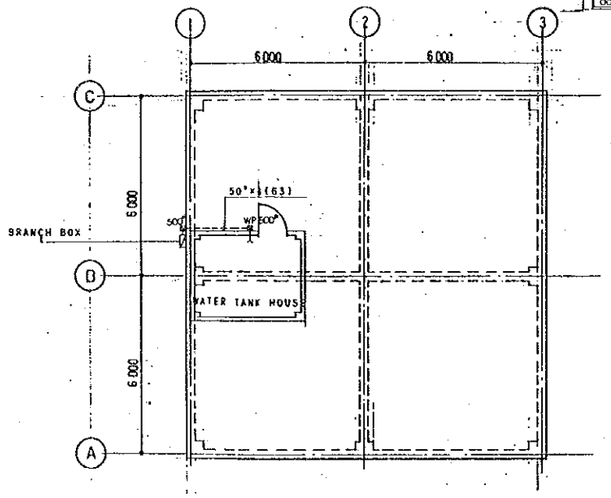
: SERFACE TYPE FL40W-2

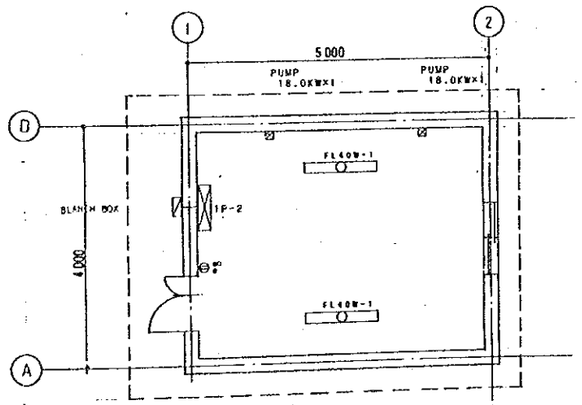
: TELEPHONE



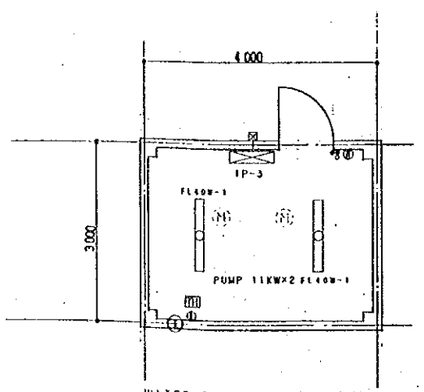
ELECTRIC SUPPLY HOUSE 1:100

GUARD HOUSE 1:100

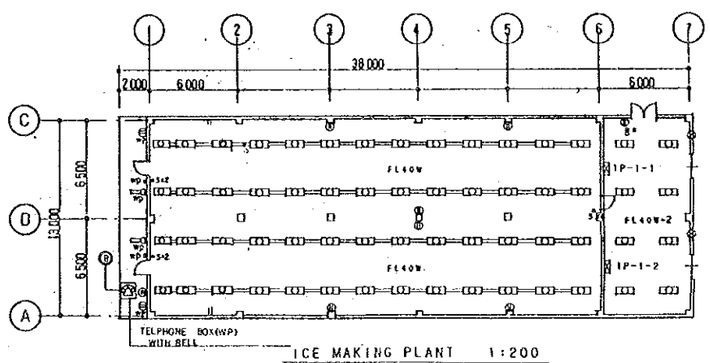




PUMP FOR SEAWATER INTAKE 1:50



WATER TANK HOUSE 1:50



ICE MAKING PLANT 1:200

GENERAL NOTES

DESCRIPTIONS	DWG. NO.
REFERENCE DRAWINGS	

NO.	DATE	DESCRIPTIONS	BY	APPD

REVISIONS

BASIC DESIGN STUDY FOR REHABILITATION AND DEVELOPMENT OF AYAQA FISHING PORT IN THE ARAB REPUBLIC OF EGYPT

IN DOOR WIRING LAYOUT (2)

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SUBMITTED	APPROVED	SCALE	REV. NO.
		1/50·100·200	◇
DATE		DWG. NO.	E – 4

Table Summary of Project Building Design (I)

Building & Room Names	Structure Type	Floor Space (m^2)	Exterior Finishing Method			Interior Finishing Method			Associated Facility
			Floor	Walls	Roof	Floor	Walls	Roof	
Port Management Building	Reinforced concrete two-storied building	540	Concrete joint cutting	Mortar spray	Asphalt Waterproof, Mortar finish				Lighting, Water supply & drain system
Port Master's Office						Long vinyl chloride sheet	Wooden board finish (CL)	Paint finish	Telephone Air conditioning
Sub-Port Master's Office							Paint finish		
Officer's Room									Ventilation
General Affairs Room									Ventilation 2 Telephones
Meeting Room									Air conditioning
Dining Room									Ventilation
Stairway, Hallway						Mortar	Paint finish		
Fish Sorting Area (ground floor)		(216)				Concrete joint cutting	Mortar spray		Saltwater supply outlets
Fish handling shed (I)	Reinforced concrete, flat	428.4	Concrete joint cutting	Mortar spray	Waterproof mortar finish				Lighting, Saltwater supply outlets
Fish handling shed (II)	Reinforced concrete, flat	173	Concrete joint cutting		Waterproof mortar finish				Lighting, Saltwater supply outlets

Table Summary of Project Building Design (II)

Building & Room Names	Structure Type	Floor Space (m^2)	Exterior Finishing Method			Interior Finishing Method			Associated Facility
			Floor	Walls	Roof	Floor	Walls	Roof	
Guard House	Concrete block, Flat	15	Mortar	Mortar spray	Waterproof mortar	Mortar	Paint finish	Paint finish	Lighting, Telephone
Public Toilet (4 places)	Reinforced concrete	32	Mortar	Mortar spray	Waterproof mortar	Tile	Paint finish partially tiled	Paint finish	Lighting, Water supply, Drainage
Ice Making Plant	Concrete block, Flat		Mortar	Mortar spray	Asphalt waterproof, Mortar finish				Lighting, Water supply, Drainage
Working Area						Mortar	Mortar	No finishing work	
Machinery Room						Mortar	Paint finish	Paint finish	Telephone
Pump House	Concrete block		Mortar	Paint finish	Waterproof mortar	Mortar	Decorative concrete block	Plain concrete	Lighting

5.4 Construction Plan

5.4.1 Construction Conditions

In Egypt, large scale marine construction work is undertaken either by the government or by foreign contractors. Building construction work is undertaken by domestic contractors. It is, therefore, possible to hire local technicians and general laborers experienced in general marine and building construction work.

As for construction equipment, land construction equipment such as bulldozers, trucks, concrete plants, cranes, etc., are locally obtainable. Construction equipment required for general marine construction work are owned by local contractors and can be used for Project construction.

A contractor associated with the Suez Canal owns the dredgers. It is not certain that the dredgers can be obtained at the times needed for Project construction.

Construction materials such as rock, cement, and reinforcing bars are available locally.

As previously mentioned, it is possible to hire general construction workers in Egypt: however, it is necessary to dispatch engineers for ice making plant construction and supervisors of diver's work from Japan.

5.4.2 Construction Policies

Basic Policies:

The Egyptian side's responsible and executing organization for the construction of the "Project for Rehabilitation and Development of Ataqa Fishing Port" is the Ataqa Fishing Port Advisory Committee, the Ministry of Development, New Communities, Housing and Public Utilities. Japanese firms will undertake the consultant services and construction work for the Project construction --locally available equipment, materials, and workers will be utilized as much as possible.

5.4.3 Construction Management Plan

(1) Contents of Construction Management Work

In accordance with the grant aid cooperation programme procedures of the Government of Japan, the Ataqa Fishing Port Advisory Committee, Ministry of Development (the Egyptian side's Project implementation agency), and a consulting firm for the Project's implementation will make a contract agreement, and shall then obtain approval from the related Japanese government agencies.

- Detailed Design Stage

After making the contract agreement, the consultant will prepare the detailed design and tender documents for the Project based on the results of the Basic Design Study. In the event that the Basic Design has to be revised during the design period, the consultant shall obtain approval from the Egyptian side's implementation agency and the Project related agencies of the Japanese government.

- Tendering Stage

The Government of Egypt will conduct the tendering for the Project. The tender will be distributed to registered Japanese contractors.

The consultant will assist with the following items of tendering:

1) Tender announcement
2) Evaluation of tender participants
3) Explanation of the tender documents to participants and answering questions put forth by the participants
4) Tendering
5) Tender evaluation

- Construction Stage

During the Project construction period, the consultant shall dispatch one civil engineer (at least a third class engineer) to the site to represent the company and to conduct construction supervision as well as to report on construction related matters to Project-related authorities.

During the building, utility system, and ice making plant construction period, the consultant shall dispatch one architect and one utility engineer to the site to supervise the construction work.

(2) Construction Work Clarification

Summarized below are the portions of Project construction work to be borne by the Egyptian and Japanese governments:

Work to be Borne by the Japanese Side

Port Facilities:

- Landing quay construction
- Preparation quay construction
- Rehabilitation of existing quay for use as an idle berthing quay
- Breakwater construction
- Existing breakwater repair
- Ice making plant (50 tons/day capacity) construction
- Navigational aids installation
- Slipway construction

Civil Work:

- Dredging of the channel and harbour basin
- Reclamation
- Road and parking lot construction
- Water supply facility and piping system installation
- Oil supply piping installation
- Power distribution lines and street light installation

Building Work:

- Transit shed construction
- Administration building construction
- Public toilet construction, guard house construction

Work to be Borne by the Egyptian Side

- Procurement of land necessary for Project construction and access road construction
- Clearing the construction site and removal of obstructions and sunken boats
- Installation of water supply and power supply lines to the Project site and telephone lines to the master panel in the management building
- Tax exemption and customs clearance in Egypt for importing Project use equipment
- Obtaining permission and making the agreements necessary for Project construction in Egypt
- Paying commissions to a Japanese foreign exchange bank for banking services based on the Banking Agreement in accordance with standard grant procedures.
- Exempting Japanese nationals involved in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Egypt with respect to the supply of equipment and services under the verified contracts.
- According to Japanese nationals, whose services may be required in connection with the supply of products and services under the verified contracts, such facilities as may be necessary for their entry into Egypt and stay therein for the execution of the Project.
- All expenses, other than those to be borne by the grant, necessary for Project construction.

(3) Construction Period Clarification

Project construction shall be conducted in two phases, as follows:

Phase I Construction Work:

- Dredging of the channel and harbour basin
- Reclamation
- Landing quay construction
- Preparation quay construction
- Revetment work

- Breakwater construction
- Slipway relocation

Phase II Construction Work

- Rehabilitation of existing breakwater
- Existing breakwater repair
- Road and parking lot construction
- Ice making plant construction
- Navigational aids installation
- Power distribution lines and street light installation
- Transit shed construction
- Administration building construction
- Public toilet construction
- Other building construction

(4) Construction Plan

Special attention will be paid to prevent Project construction from interfering with fishing boat and fish landing operations, and fishing boat preparation work at the Ataqa Fishing Port. Thus, the new landing quay and preparation quay shall be completed during the Phase I period and the rehabilitation of the existing quay shall be completed during the Phase II period.

1) Temporary Construction Yard

A temporary construction yard will be constructed by the contractor adjacent to the planned reclamation area.

Land, about 120m by 130m in size, is required for the temporary construction yard. The following work spaces will be provided in the yard:

- Concrete block fabrication yard: 50m x 40m = 2,000m^2
- Material storage 50m x 30m = 1,500 m^2
- Rubble material storage yard: 50m x 50m = 2,500m^2
- Fabricated concrete block storage: 50m x 40m = 2,000m^2
- Repair yard: 10m x 10m = 100m^2
- Temporary site office: 10m x 20m x 2 = 400m^2
- Reinforcing bar fabrication yard: 20m x 20m = 400m^2
- Form fabrication yard: 20m x 20m = 400m^2

2) Dredging

Harbour basin and channel dredging work will be performed by an 800 hp simple cutting dredger (assembling unit type) that is able to simultaneously dredge and fill. Some sections of the dumping pipe shall be placed under water to prevent interference with passing boats. The dredger and the portion of the dumping pipe near the spoil-bank will be equipped with floaters for easy moving.

The dredging work plan is shown in Figure 5-4-1.

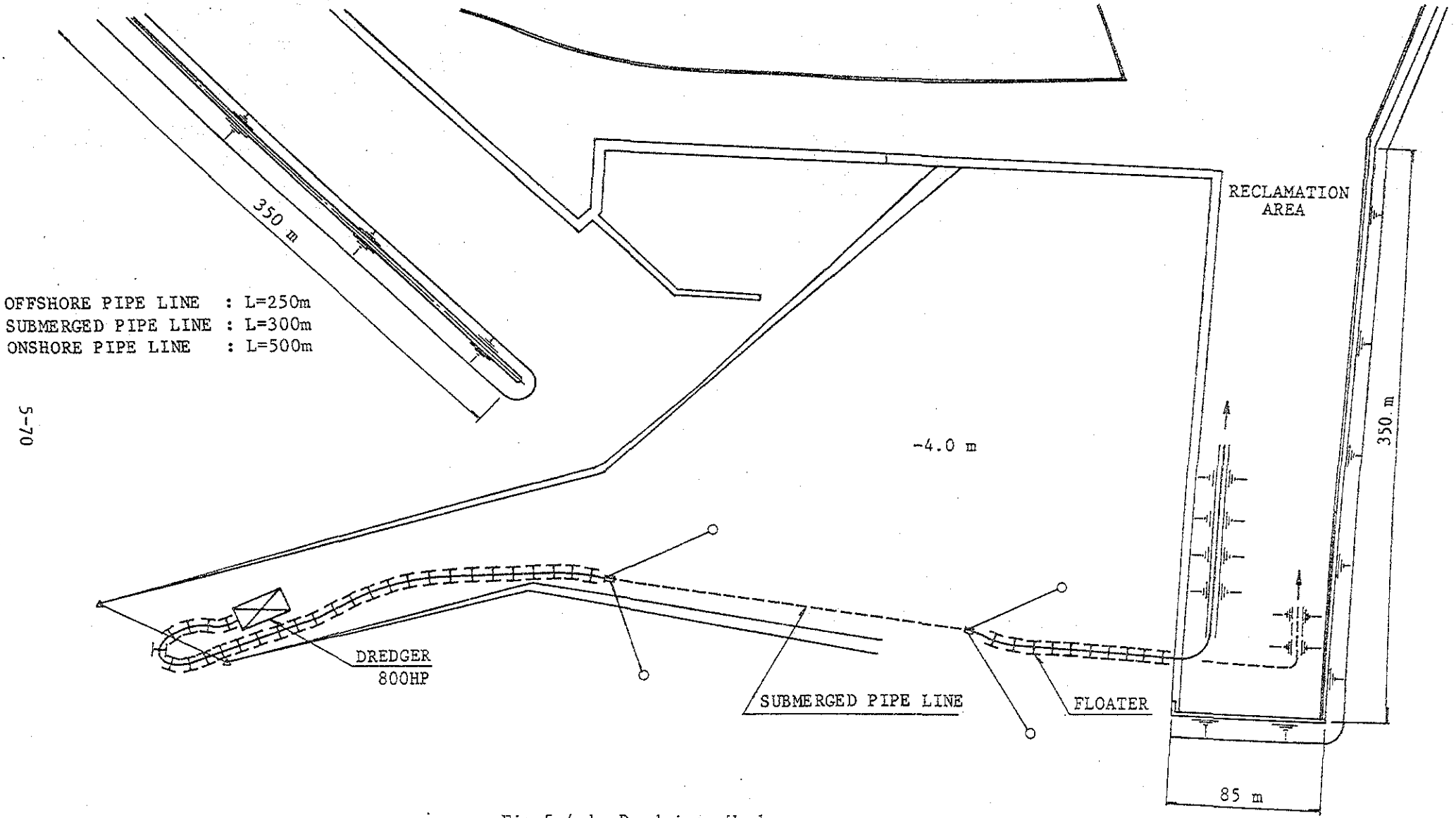


Fig.5-4-1 Dredging Works

3) Reclamation

Reclamation will be done using the dredged material. As shown in Fig. 5-4-2, an embankment shall be built and then filled with material. special attention shall be paid so that muddy water will not flow out during the reclamation work. A spillway shall be provided near the shore for controlling the muddy water flow.

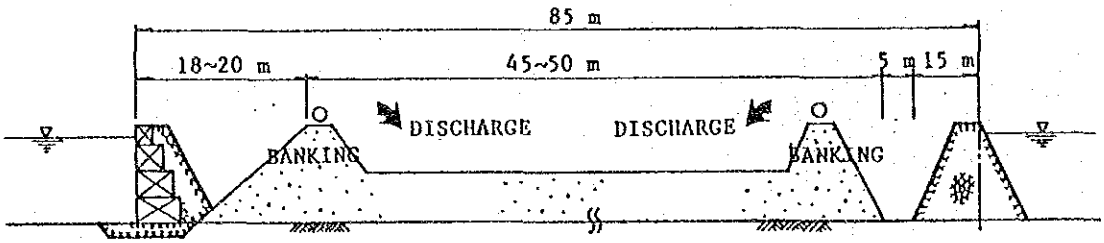


Fig. 5-4-2 Reclamation Works

4) Rubble Mound and Armor Rock

Rubble material will be dumped or placed directly on shore and reclamation areas using a $0.6m^3$ capacity clamshell.

Armor rock shall be placed by a 30-ton crawler-type crane and manually.

A portion of the existing quay will be allocated for rubble mound construction work. The rubble material will be loaded aboard a 300-ton barge by a power shovel. The barge will transport the material to the construction site where it shall be dumped under the direction of divers. Divers shall level the dumped material using a 35-ton crawler barge.

5) Concrete Block Fabrication and Placing Work

Concrete blocks will be constructed with ready-mixed concrete. A 30-ton crawler-type crane will be used to move the blocks to a temporary location. After the concrete blocks are cured they will be transported to the existing quay location by a 30-ton trailer truck where they will be placed aboard a barge by a 100-ton crawler-type crane. The loaded barge will be towed to the construction site where the concrete blocks will be placed in position.

Sheets to prevent leaking of backfilled sand will be placed on the surface slope of the rubble filling.

5.4.4 Equipment and Material Procurement Plan

Materials to be procured in Egypt:

- Cement, sand, and aggregate
- Rubble and armor rock
- Reinforcing steel bars
- Asphalt
- Acetylene and oxygen
- Fuel and oil

Equipment and materials to be procured in Japan:

- Sheets for preventing leakage of sand
- Mooring posts and fenders
- Navigational aids
- Water supply equipment
- Power supply equipment
- Ice making plant equipment
- Temporary work materials (shaped steel, steel forms, etc.)

Construction Equipment:

Locally available land-use construction equipment and marine construction equipment (except for dredger and underwater construction equipment) will be obtained in Egypt.

The dredger may be obtained by the following methods:

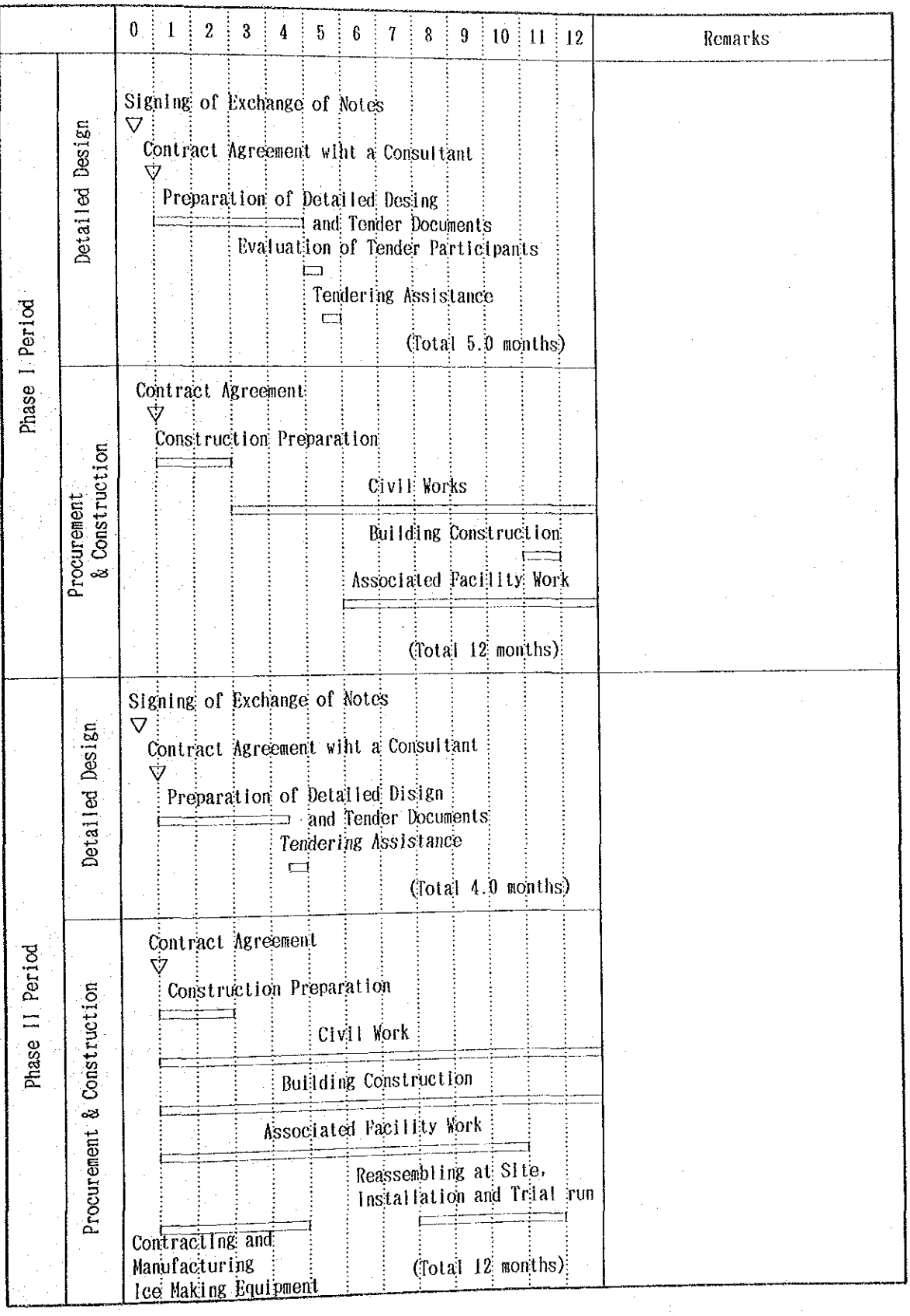
i) Towing from Singapore

ii) Shipping an assembling type unit from Japan.

As a result of examining and comparing the above two methods, it was determined that it would be more economical to ship an assembling type unit from Japan: therefore, it was decided to adopt case ii).

5.4.5 Project Implementation Schedule

Project Implementation Schedule



CHAPTER 6 PROJECT EVALUATION AND CONCLUSION

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6.1 Project Evaluation

The Ataqa Fishing Port is Egypt's central Red Sea fishery base. Upon completion of the Ataqa Fishing Port facility and infrastructure construction under the Project, the following direct and indirect effects will come about:

(1) Direct Effects:

- After constructing the landing quay it will be possible to conduct fish landing operations at a faster rate and the time fishing boats must wait to offload their fish catch will be shortened. Because of this, there will be an improvement of fish freshness and an increase in the fishing operation time for fishing boats. As a result, larger fish catches, decreased working hours for fishermen, and the improvement of fishermen's working conditions will all be achieved.
- The roofed fish handling area will eliminate the need to perform fish handling and sorting work under direct sunlight; thus, fish freshness will be retained.
- The ice making plant will make the timely supply of sufficient amounts of ice possible; thus, fish freshness will be retained bringing in higher prices at fish sales thereby increasing the incomes of the fishermen.
- Because the existing quay will be equipped with fenders and mooring posts for idle berthing use, safer boat handling will be possible thereby reducing the number of boat accidents and damages.
- The repaired breakwater and new breakwater will keep port waters calm under normal wave conditions; thus it will be possible to conduct work at the landing and preparation quays at all times. During inclement weather (storms), the fishing boats can take shelter and moor in the port.

- The expanded port facilities will allow separate uses for landing, boat preparation, and idle berthing thereby eliminating present harbour congestion. The fishing port can then be used efficiently and better services will be offered to port users.
- As effective and active fish landing will be achieved and qualitative and quantitative improvement of port services to fishing boats will be possible, new employment opportunities will be created for area residents.

As an example of the above direct effects it is estimated that a total benefit of LE 4,818,000/year will be achieved: LE 4,660,000/year because of the improved fish freshness: LE 158,000/year because of the reduced fishing boat waiting time (see appendix 11).

(2) Indirect Effects

As a result of the Project construction, the fish catch and fishermen's income will increase and the following indirect effects will be realized:

- The animal protein supply to the people will increase.
- The further development of fishery-related industries will come about.
- The living standards of the fishermen and their families will improve.
- The imports of fish products and the outflow of foreign currency will be reduced.

6.2 Recommendations

In order to obtain maximum effects from Project implementation, the following recommendations are made:

(1) For effective port operations and management, it will be necessary to establish an appropriate organizational system. Rules and regulations for port operations and management should be implemented.

(2) Separate quay use is designated for functional purposes. A system for conducting smooth port facility operations and management, such as implementing rules to control efficient quay use, should be established.

(3) Use methods and operating systems for fish handling and parking areas should be established. A fee collecting system should be set up to provide the funds for operating and maintaining the port facilities.

(4) Maintenance and repair costs for port facilities should be included in the port management's budget. Adequate measures should be taken to maintain and repair the facility. A part of the port operating revenue should be reserved for amortizing facility replacement.

(5) If the technical cooperation for the operation, management, and maintenance of the modern port that was requested by the Egyptian side is approved, greater Project effects will be realized.

As described above, Project implementation will have various effects and will promote fishery development and contribute to the improvement of the people's living standards. It was proposed, therefore, that it would be appropriate to implement the Project under the grant aid programme of the Japanese government. Furthermore, it was considered that no problems would be encountered in operating and managing Project facilities utilizing Egyptian personnel and budgetary funds once Project construction is completed.