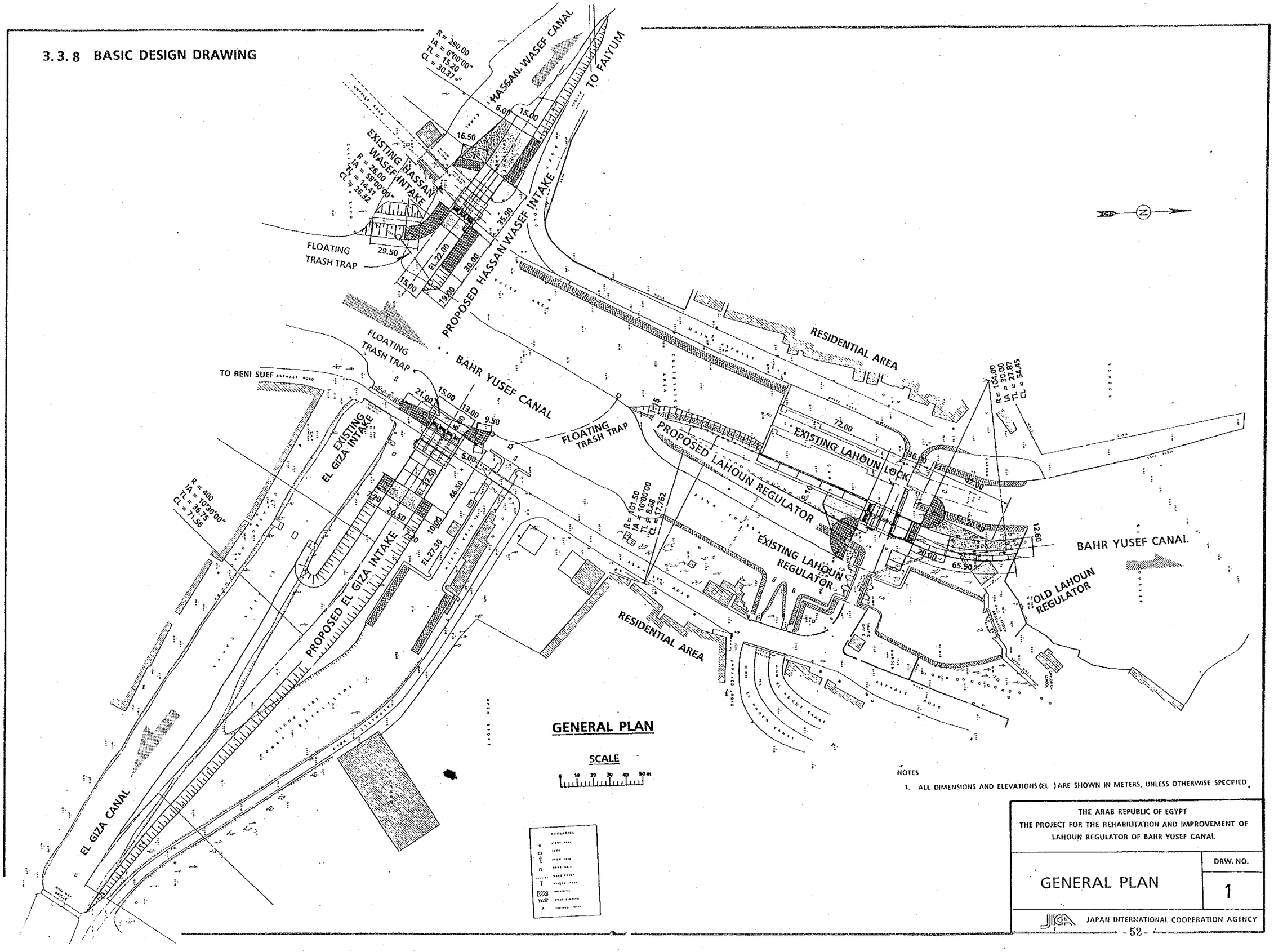
3.3.8 BASIC DESIGN DRAWING



GENERAL PLAN

SCALE

0 10 20 30 40 50 m

NOTES

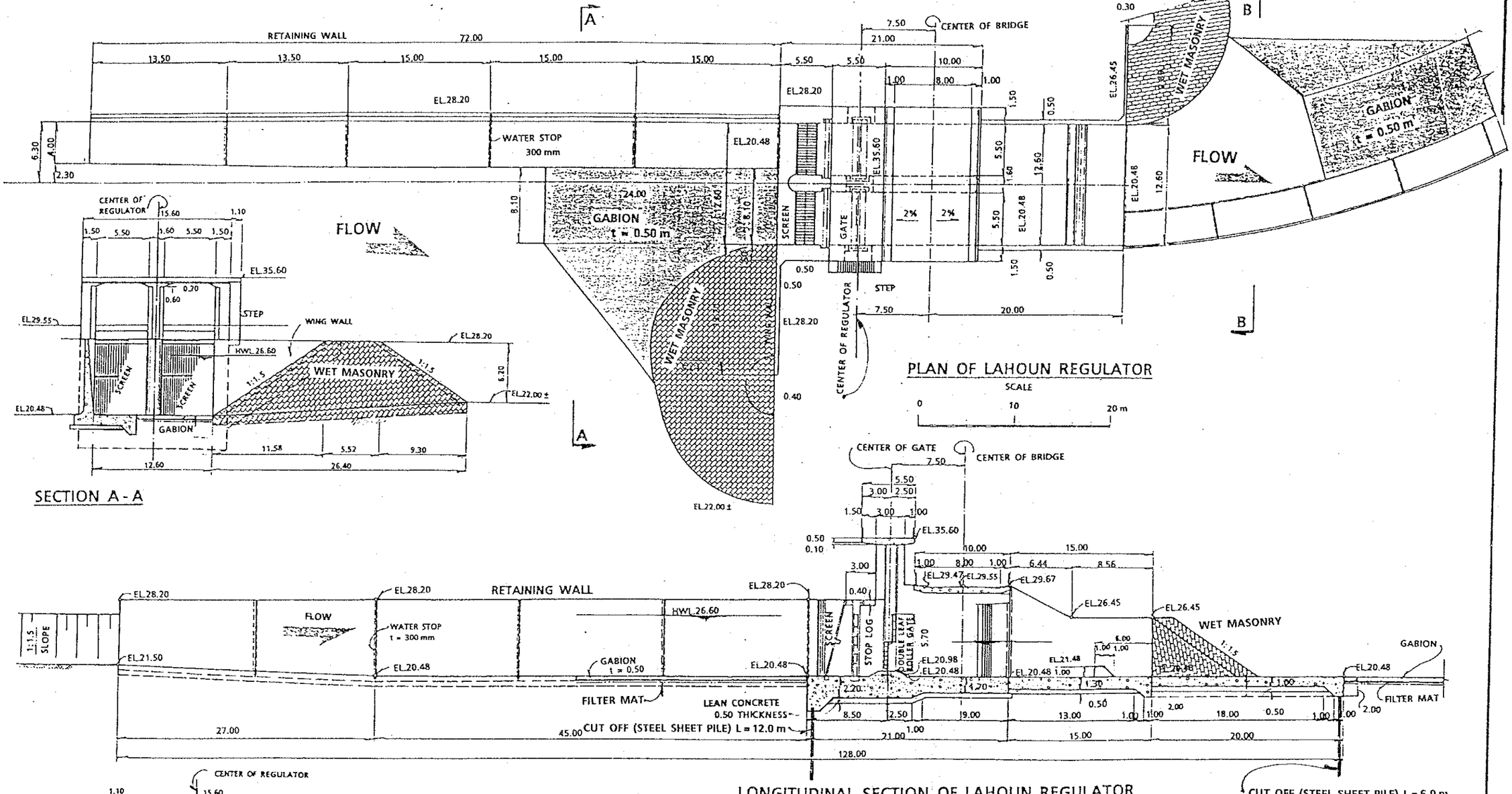
1. ALL DIMENSIONS AND ELEVATIONS (EL) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

GENERAL PLAN	DRW. NO. 1

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

SECTION A - A

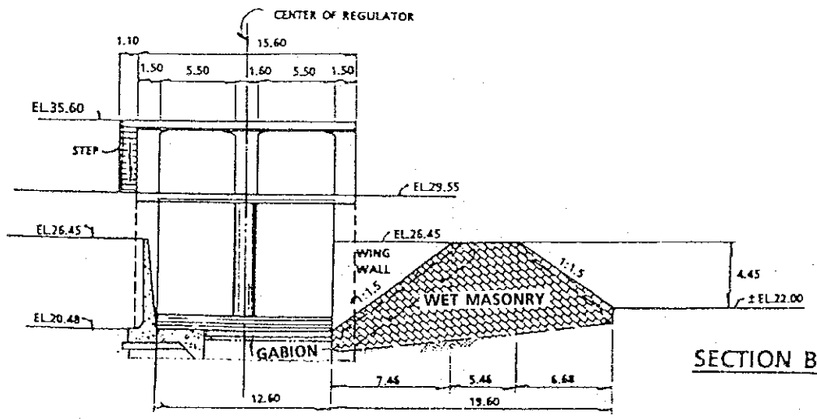


PLAN OF LAHOUN REGULATOR

SCALE

0 10 20 m

LONGITUDINAL SECTION OF LAHOUN REGULATOR



SECTION B - B

NOTES

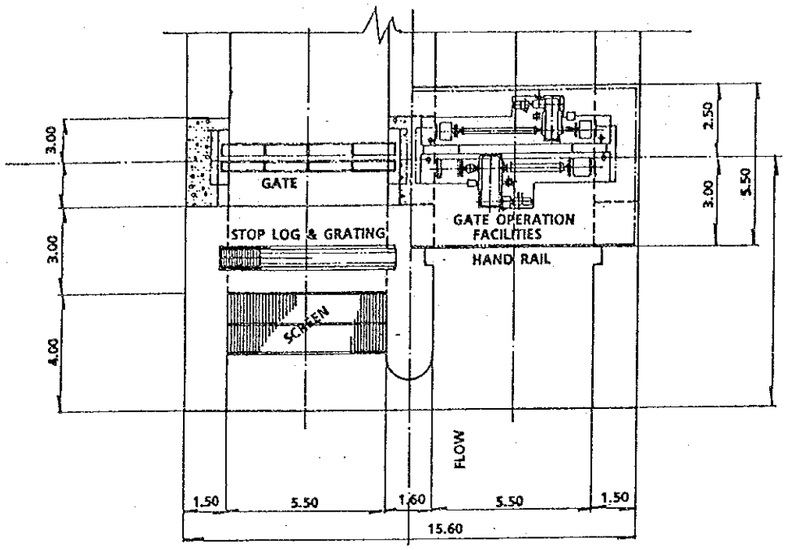
1. ALL DIMENSIONS AND ELEVATIONS (EL. HWL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.
2. HAND RAIL, WATER STAFF GAGE AND ETC. ARE NOT SHOWN IN THE DRAWING.
3. SIDE CUTOFF IS NOT SHOWN IN THE DRAWING.

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

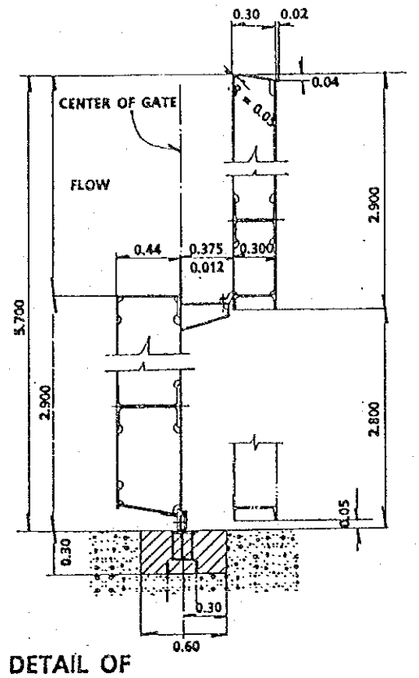
LAHOUN REGULATOR
- STRUCTURE -

DRW. NO. 2

JICA JAPAN INTERNATIONAL COOPERATION AGENCY



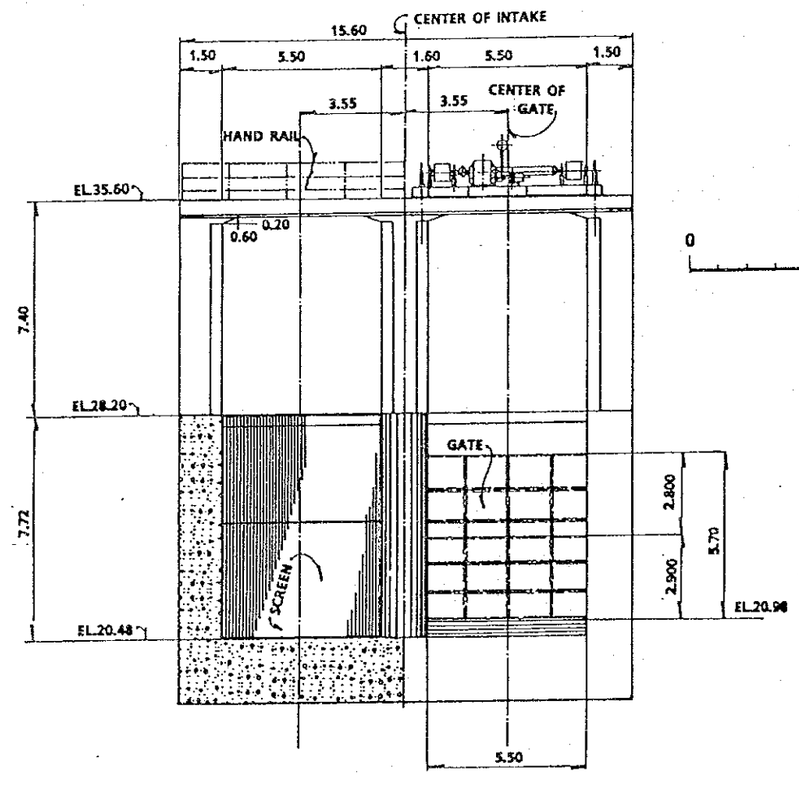
PLAN



DETAIL OF GATE SECTION

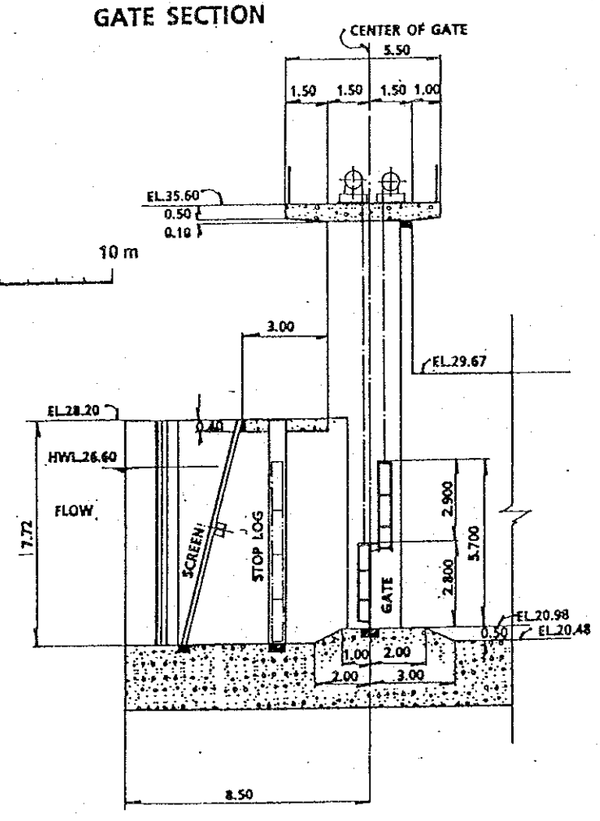
NAME OF GATE	LAHOUN REGULATOR
TYPE	STEEL DOUBLE LEAF ROLLER GATE
NUMBER OF GATE	2 UNITS
CLEAR SPAN	5.50 M
GATE HEIGHT	5.70 M
DESIGN WATER LEVEL	HWL.26.60 TO 20.98
WATER LEVEL IN OPERATION	HWL.26.60 TO 20.98
SILLING ELEVATION	EL.20.98
WATER PROOFING	RUBBER WATER STOPPING
OPERATION METHOD	WIRE ROPE MECHANISM BY MOTOR OR MAN POWER
OPERATING SPEED	0.3 M/MIN BY MOTOR
LIFTING	6.620 M
OPERATION METHOD	REMOTE CONTROL/MANUAL
MATERIALS	GATE : SS400, A283 (JIS) GUIDE: SUS 304, A167 (JIS) LEFT : SM400, A284 (JIS)

NOTES
1. ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.



ELEVATION

SCALE
0 5 10 m



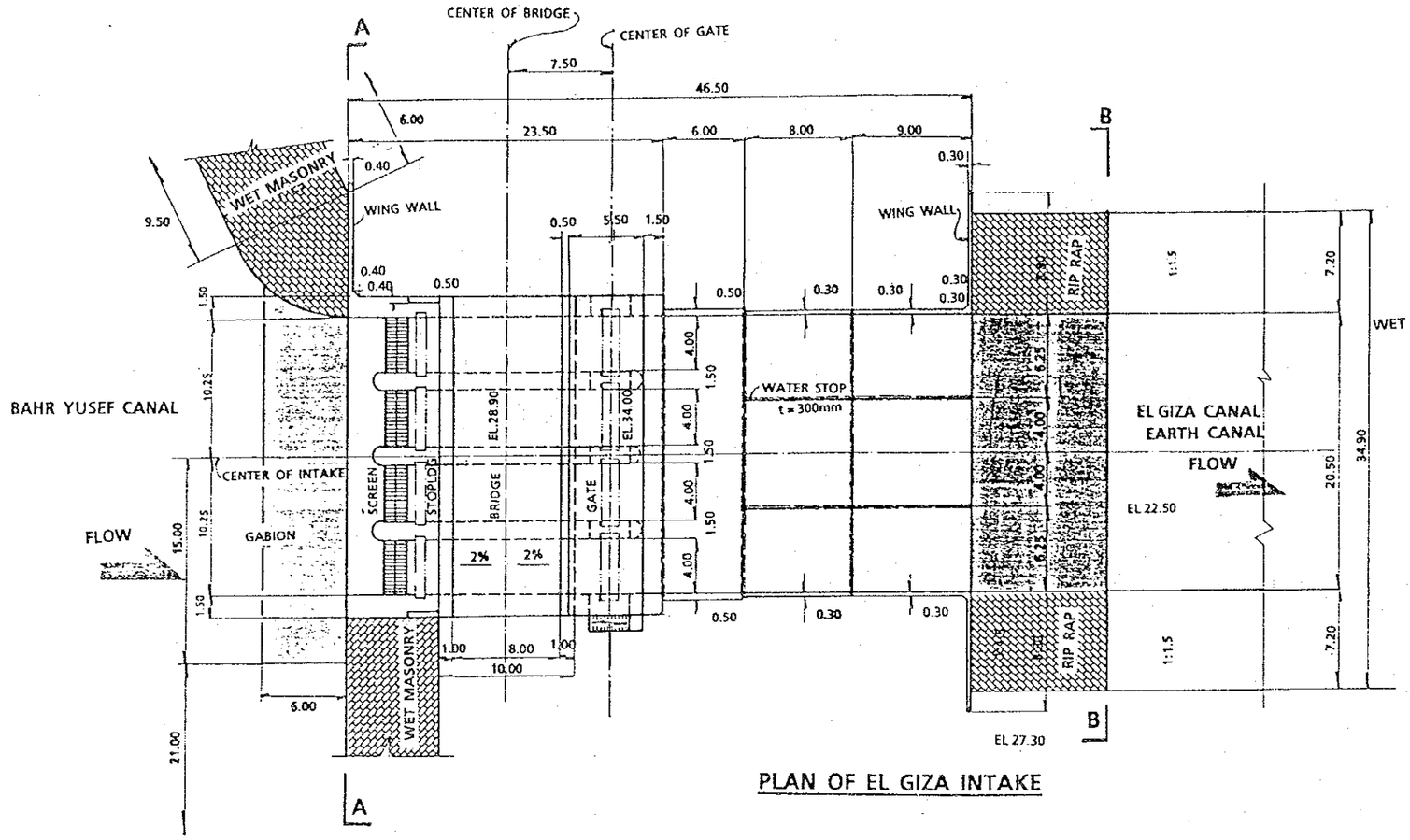
PROFILE

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

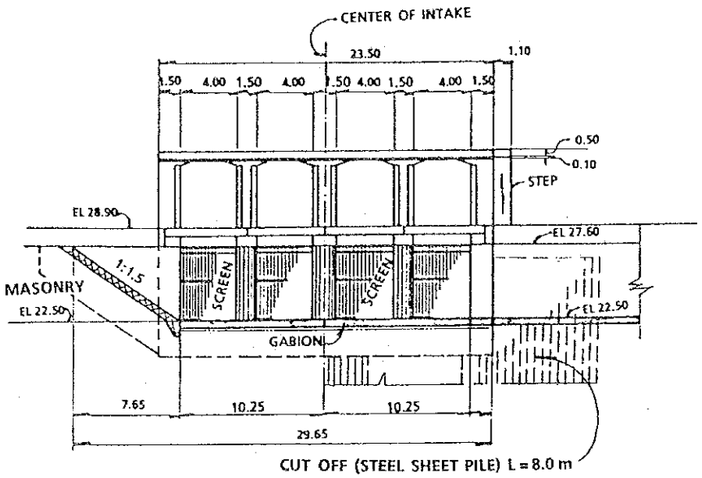
LAHOUN REGULATOR
- GATE FACILITIES -

DRW. NO. 3

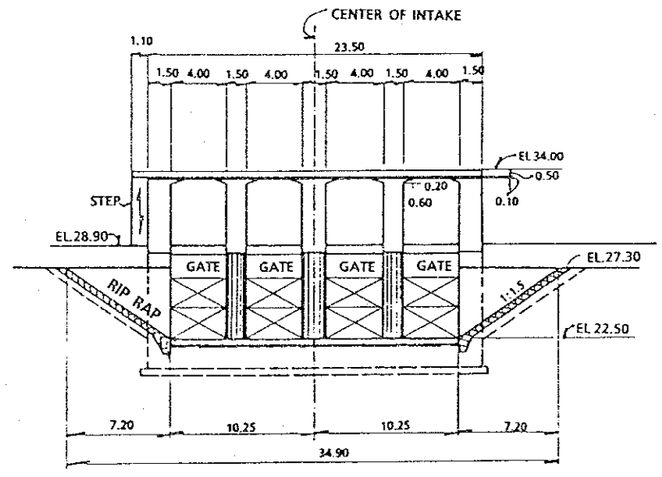
JICA JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN OF EL GIZA INTAKE

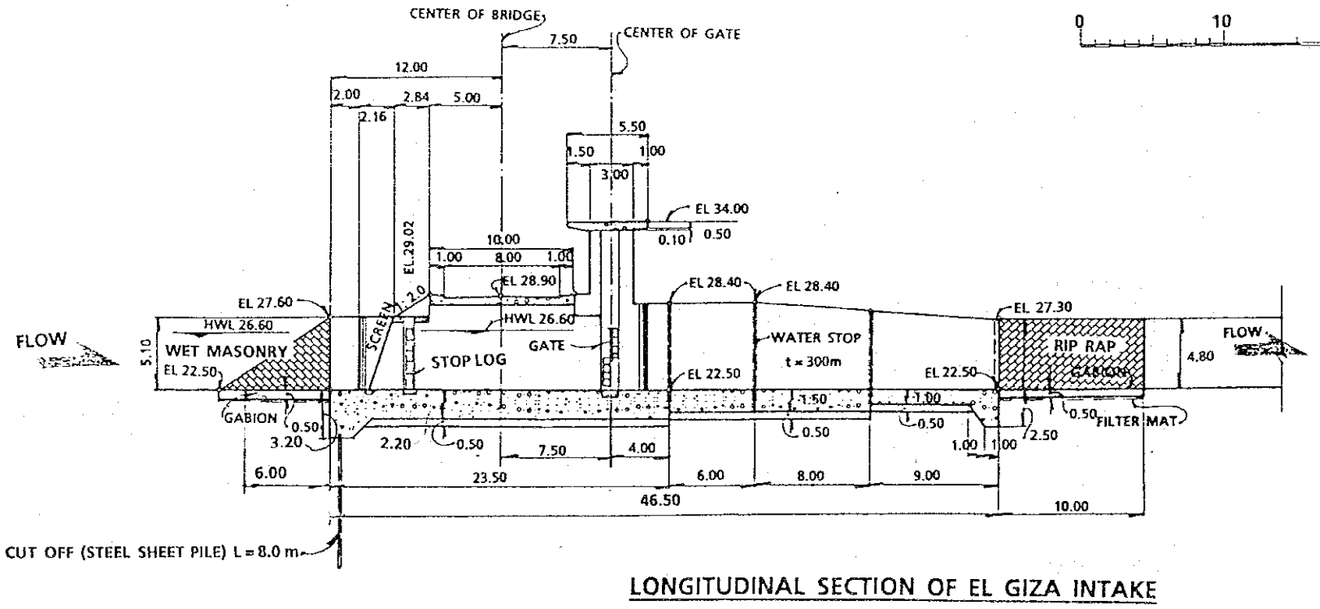


SECTION A-A



SECTION B-B

SCALE
0 10 20m



LONGITUDINAL SECTION OF EL GIZA INTAKE

NOTES
1. ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.
2. HANDRAIL, WATER STAFF GAGE AND ETC. ARE NOT SHOWN IN THE DRAWING.
3. SIDE CUTOFF IS NOT SHOWN IN THE DRAWING.

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

EL GIZA INTAKE
- STRUCTURE -

DRW. NO. 4

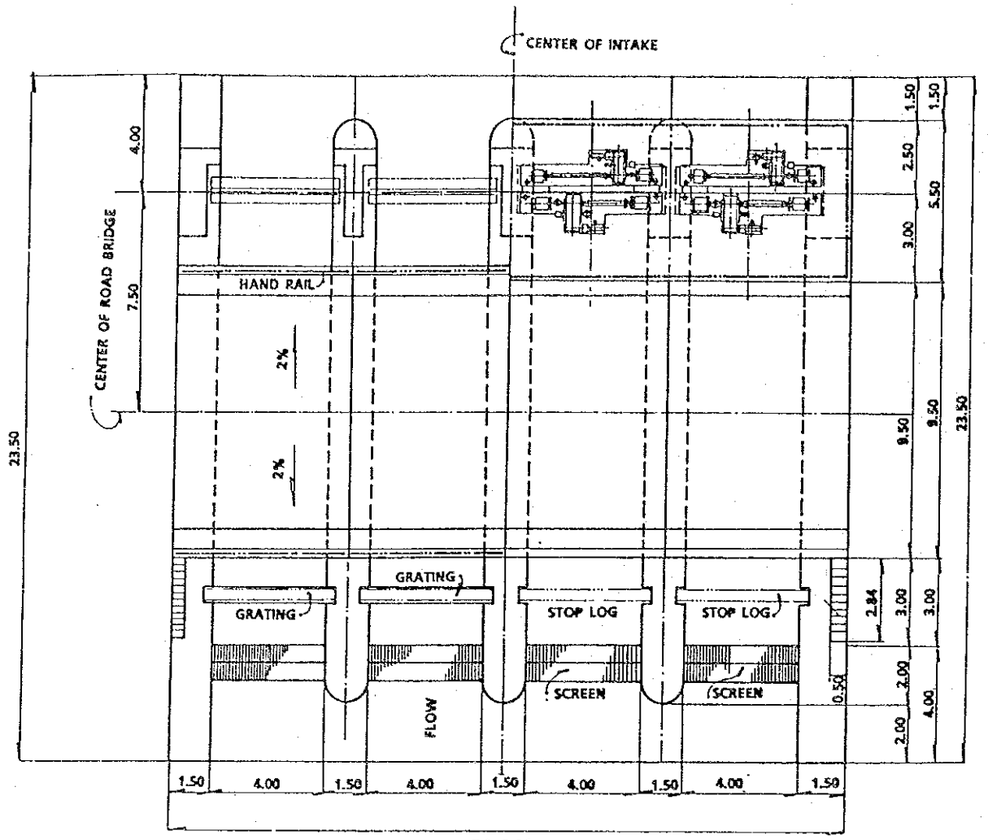
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

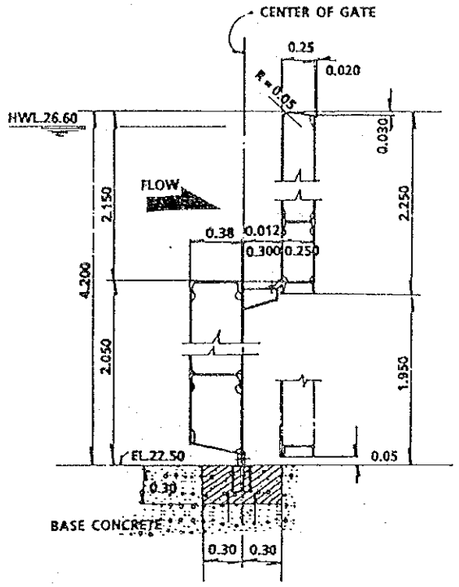
EL GIZA INTAKE - GATE FACILITIES -

DRW. NO. 5

JICA JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN



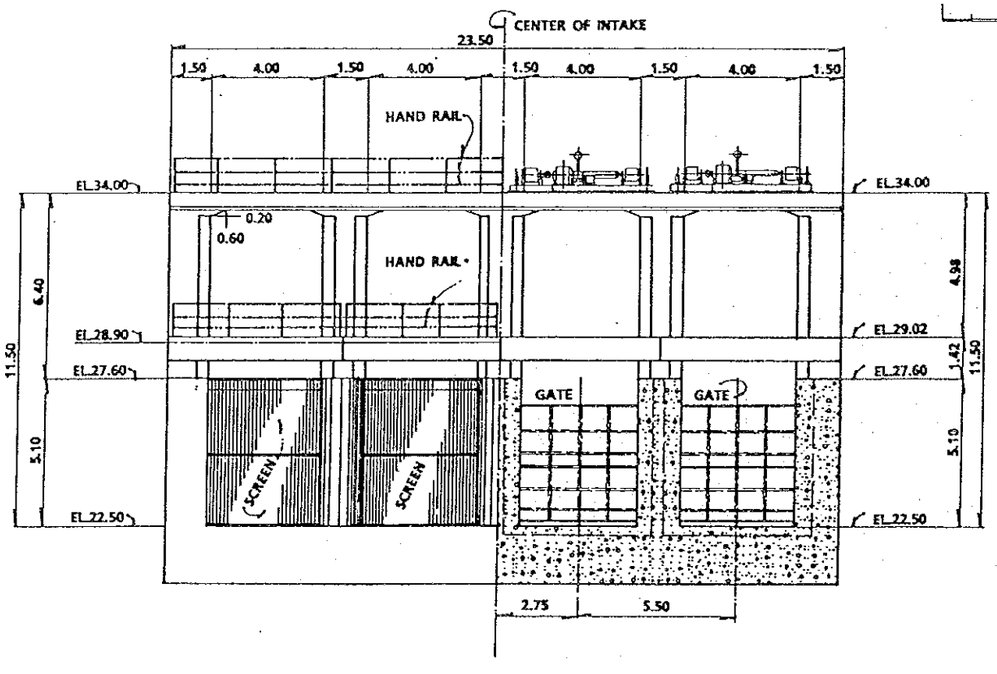
DETAILS OF GATE SECTION PROFILE

NO SCALE

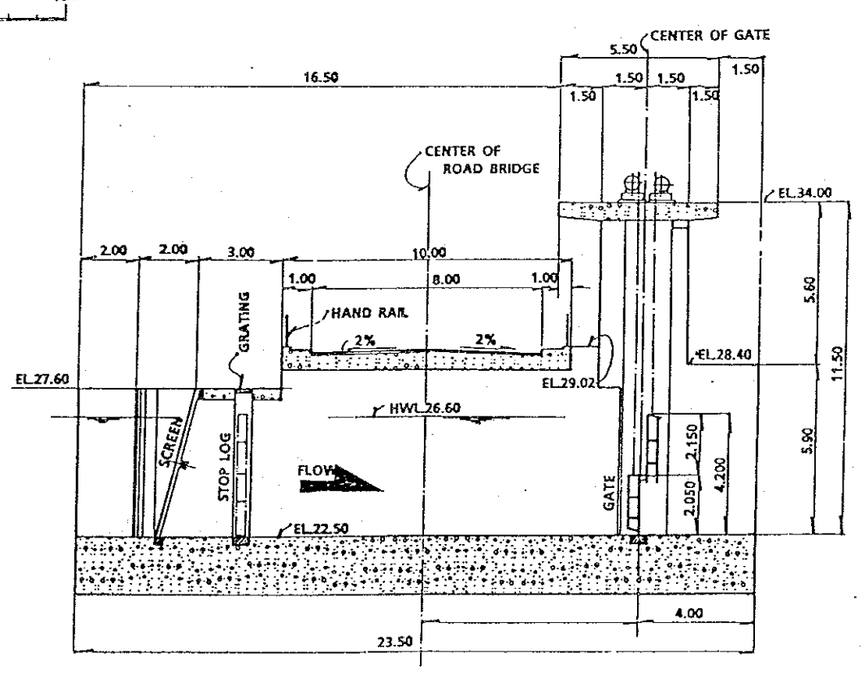
NOTES
1. ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.

NAME OF GATE	EL GIZA INTAKE
TYPE	STEEL DOUBLE LEAF ROLLER GATE
NUMBER OF GATE	4 UNITS
CLEAR SPAN	4.00 M
GATE HEIGHT	4.20 M
DESIGN WATER LEVEL	HWL.26.60 TO 22.50
WATER LEVEL IN OPERATION	HWL.26.60 TO 22.50
SILLING ELEVATION	EL.22.50
WATER PROOFING	RUBBER WATER STOP
OPERATION METHOD	WIRE ROPE MECHANISM BY MOTOR OR MAN POWER
OPERATING SPEED	0.3 m/min BY MOTOR
LIFTING	5.10 m
OPERATION METHOD	REMOTE CONTROL/MANUAL
MATERIALS	GATE : SS400, A283 (JIS) GUIDE: SUS 304, A167 (JIS) LEFT : SM400, A284 (JIS)

SCALE
0 5 10 m

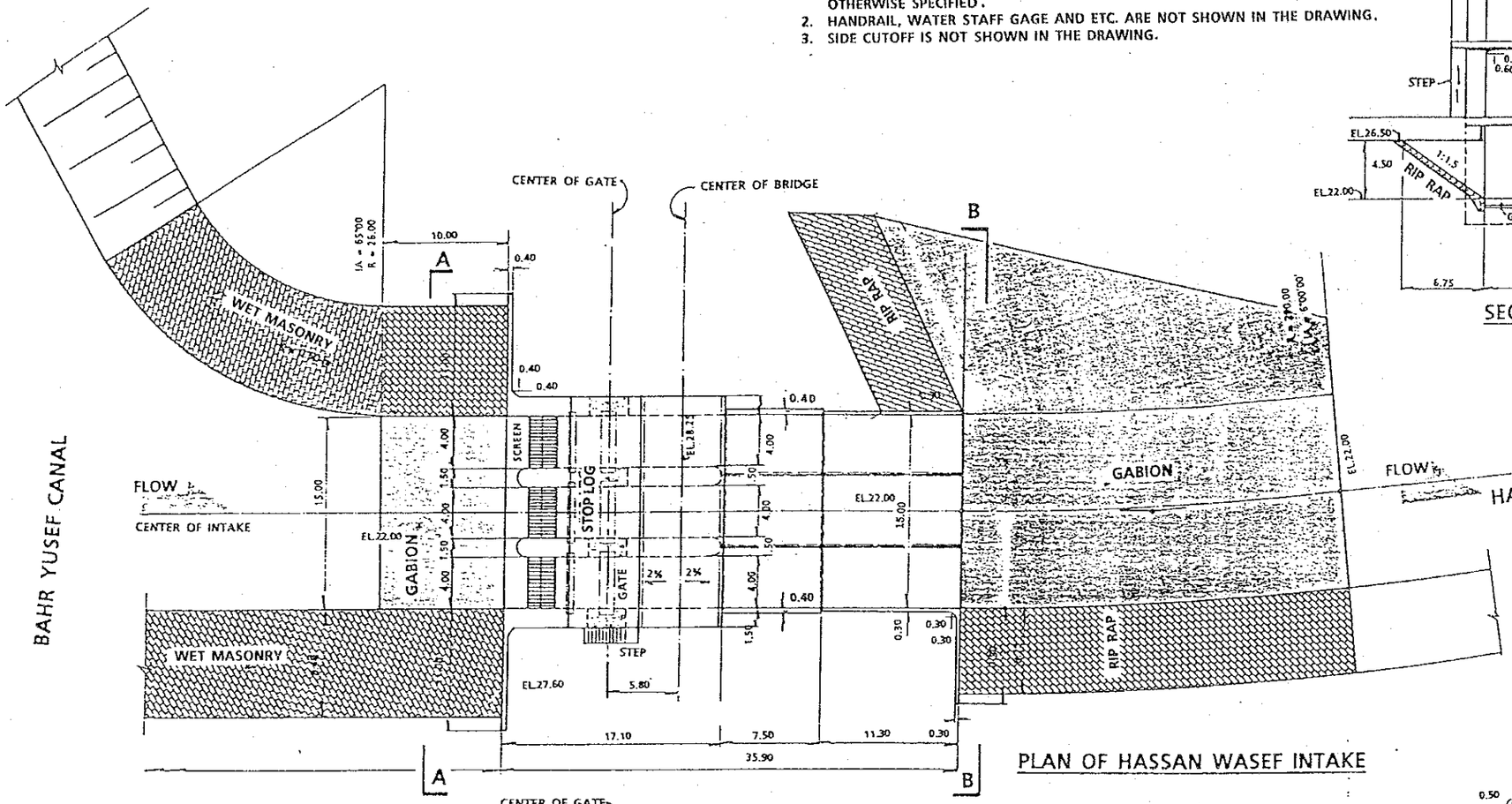


ELEVATION

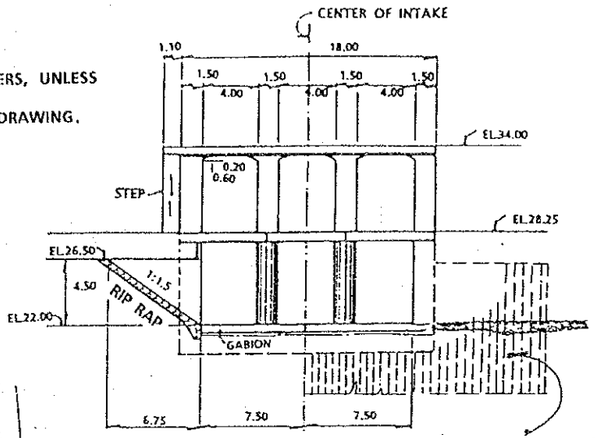


PROFILE

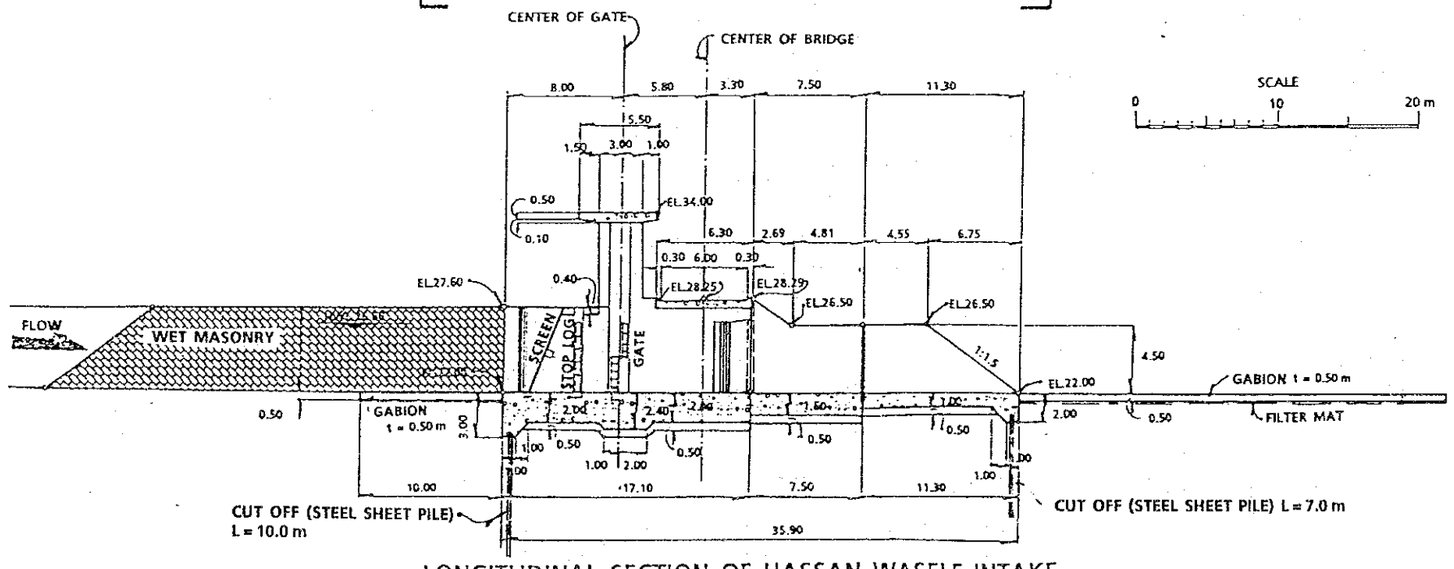
NOTES
1. ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.
2. HANDRAIL, WATER STAFF GAGE AND ETC. ARE NOT SHOWN IN THE DRAWING.
3. SIDE CUTOFF IS NOT SHOWN IN THE DRAWING.



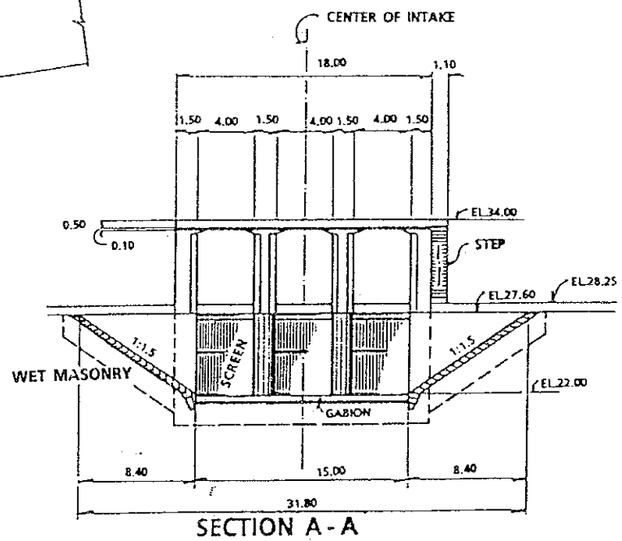
PLAN OF HASSAN WASEF INTAKE



SECTION B - B CUT OFF (STEEL SHEET PILE) L = 10.0 m



LONGITUDINAL SECTION OF HASSAN WASELF INTAKE



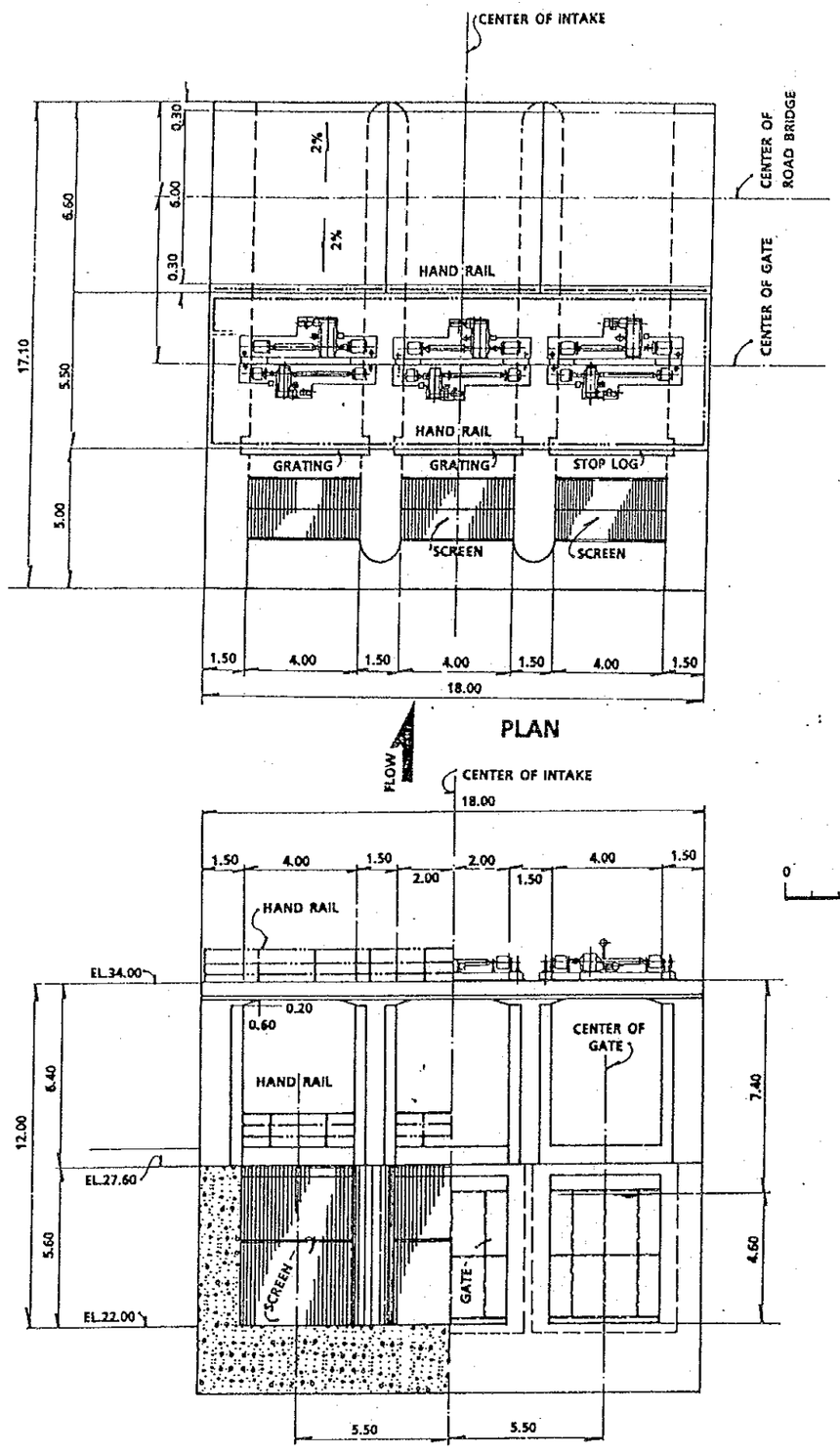
SECTION A - A

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

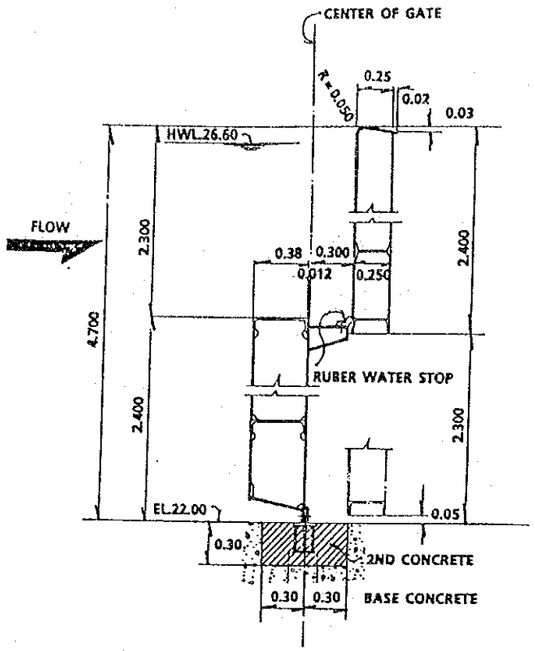
HASSAN WASEF INTAKE - STRUCTURE -

DRW. NO. 6

JICA JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN



DETAIL OF GATE SECTION

NO SCALE

NAME OF GATE	HASSAN WASEF INTAKE
TYPE	STEEL DOUBLE LEAF ROLLER GATE
NUMBER OF GATE	3 UNITS
CLEAR SPAN	4.00 M
GATE HEIGHT	4.70 M
DESIGN WATER LEVEL	HWL.26.60 TO 22.00
WATER LEVEL IN OPERATION	HWL.26.60 TO 22.00
SILLING ELEVATION	EL.22.00
WATER PROOFING	RUBBER WATER STOP
OPERATION METHOD	WIRE ROPE MECHANISM BY MOTOR OR MAN POWER
OPERATING SPEED	0.3 M/MIN BY MOTOR
LIFTING	6.620 M
OPERATION METHOD	REMOTE CONTROL/MANUAL
MATERIALS	GATE : SS400, A283 (JIS) GUIDE: SUS 304, A167 (JIS) LEFT : SM400, A284 (JIS)

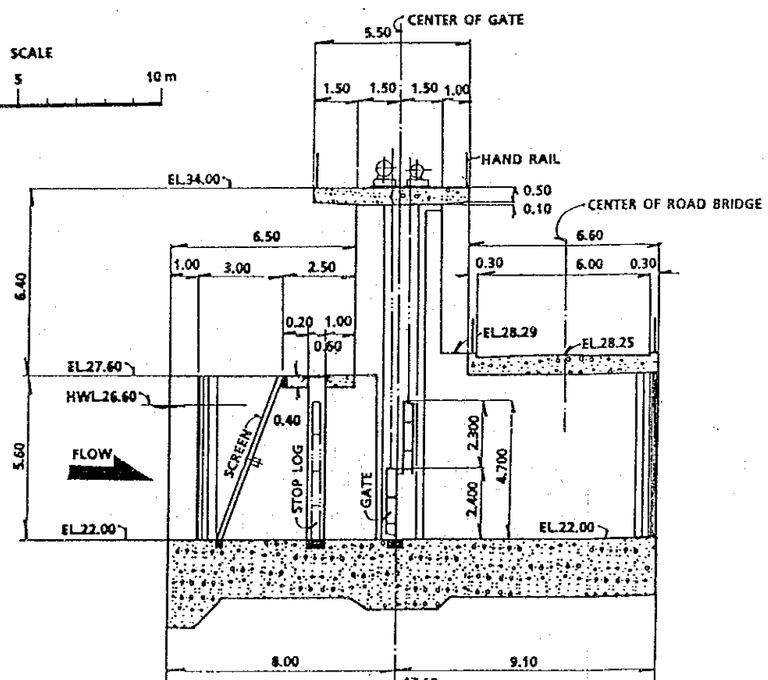
NOTES

ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.

ELEVATION

SCALE

0 5 10 m



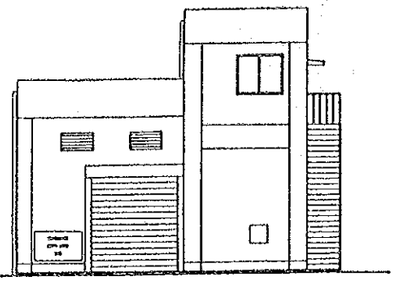
PROFILE

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

HASSAN WASEF INTAKE
- GATE FACILITIES -

DRW. NO. 7

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

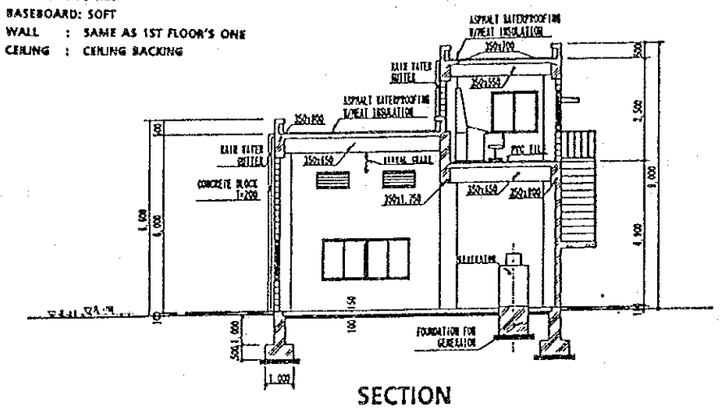


ELEVATION

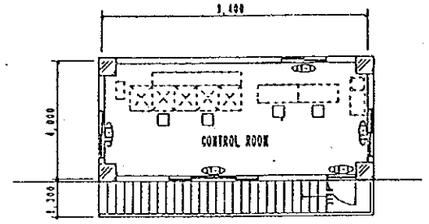
FINISH SCHEDULE

1ST FLOOR
- FLOOR : MORTAR FINISH
- WALL : TROWEL FINISHED MORTAR AND VINYL PAINT
- CEILING : EXPOSED CONCRETE AND EMULSION PAINT
- OUTSIDE WALL: MORTAR AND SPRAYING

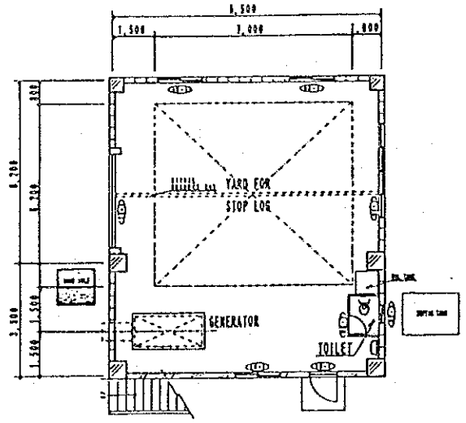
2ND FLOOR
- FLOOR : PVC TILE
- BASEBOARD: SOFT
- WALL : SAME AS 1ST FLOOR'S ONE
- CEILING : CEILING BACKING



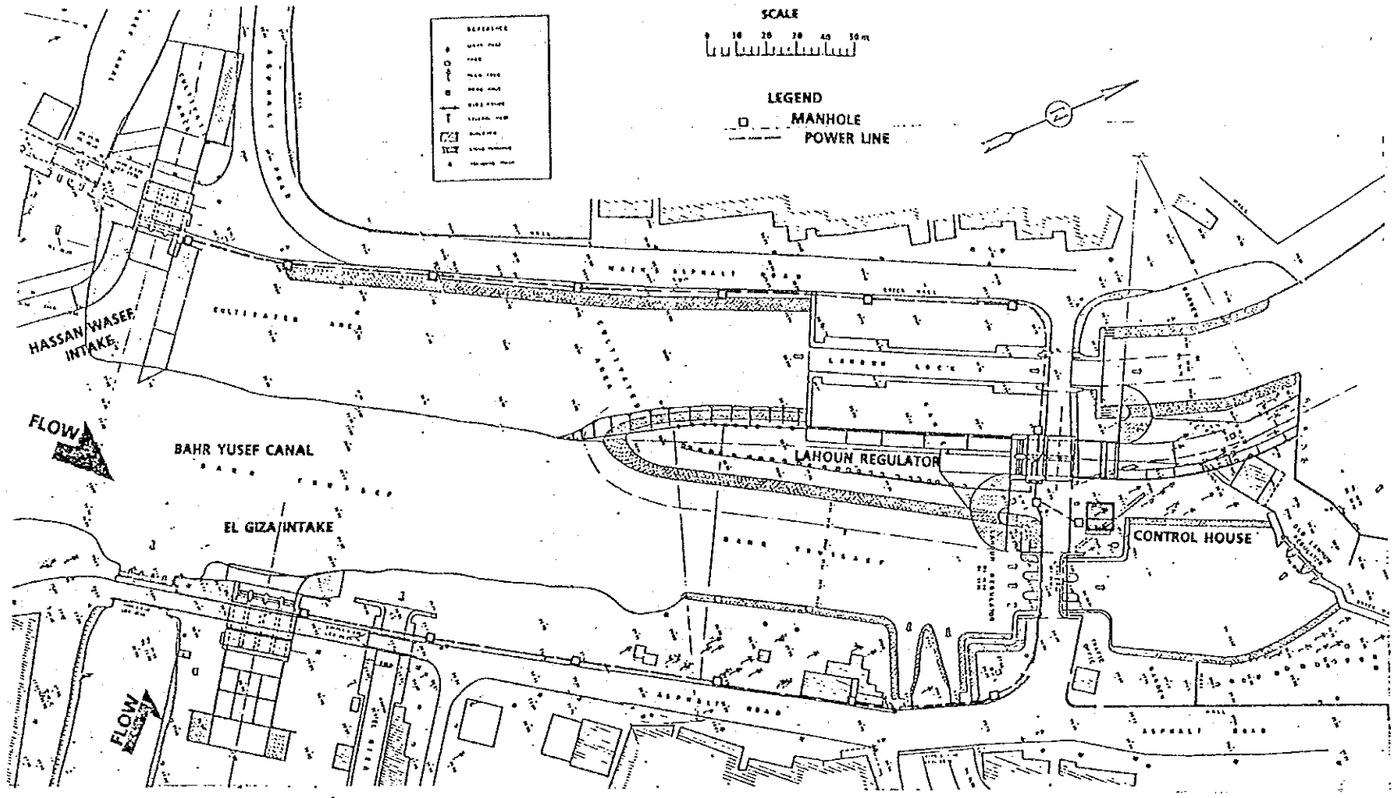
SECTION



2ND FLOOR PLAN OF CONTROL HOUSE



1ST FLOOR PLAN OF CONTROL HOUSE



LOCATION OF POWER LINE FROM CONTROL HOUSE

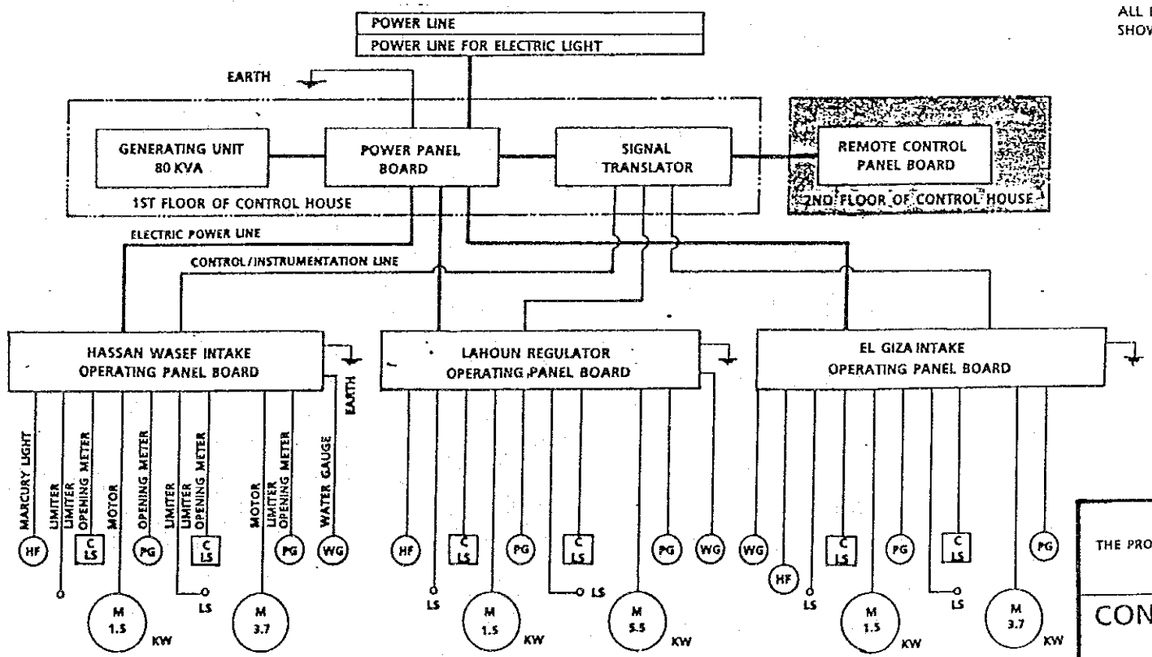


DIAGRAM CHART OF ELECTRICAL SYSTEM

NOTES

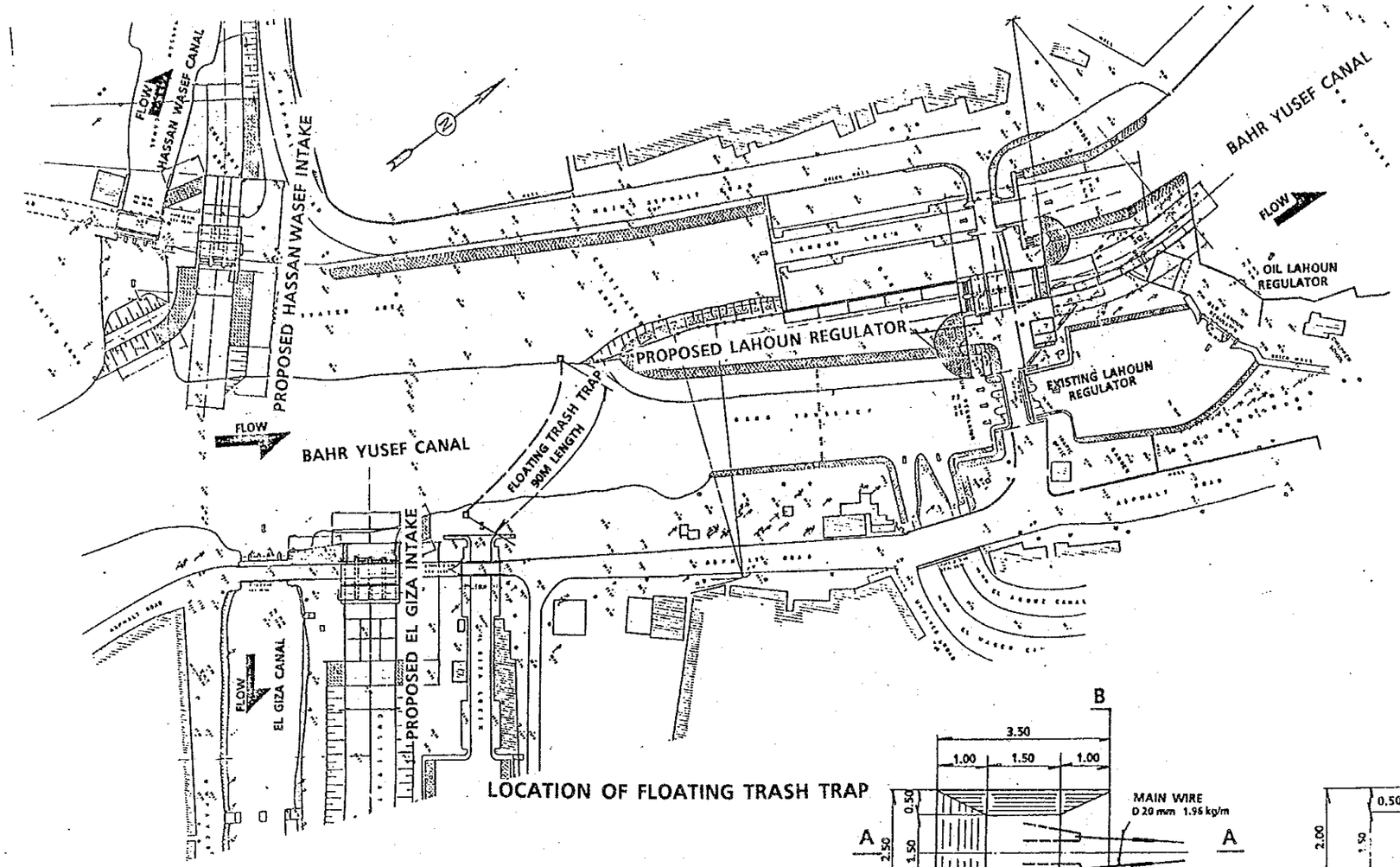
ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

CONTROL HOUSE AND ELECTRICAL SYSTEM DIAGRAM

DRW. NO. 8

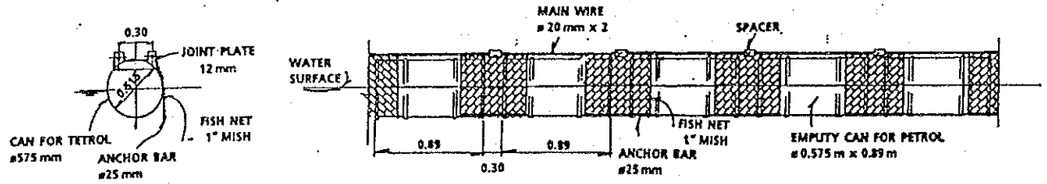
JICA JAPAN INTERNATIONAL COOPERATION AGENCY



LOCATION OF FLOATING TRASH TRAP

SCALE

0 10 20 30 40 50m

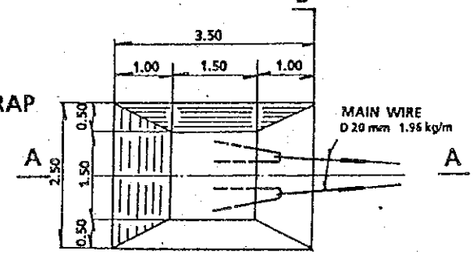


SECTION

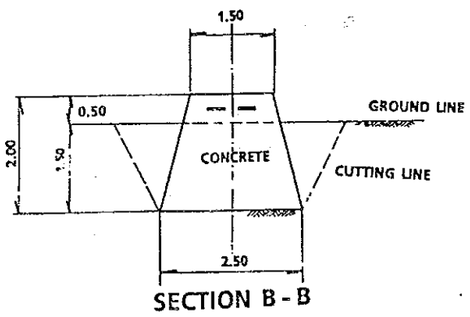
PROFILE

PLAN

DETAILS OF FLOATING

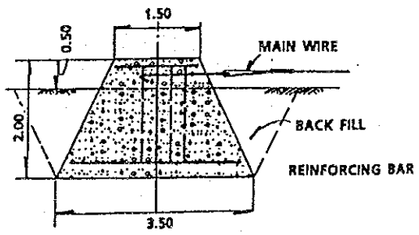


PLAN



SECTION B - B

ANCHOR BLOCK OF FLOATING TRASH TRAP



SECTION A - A

NOTES

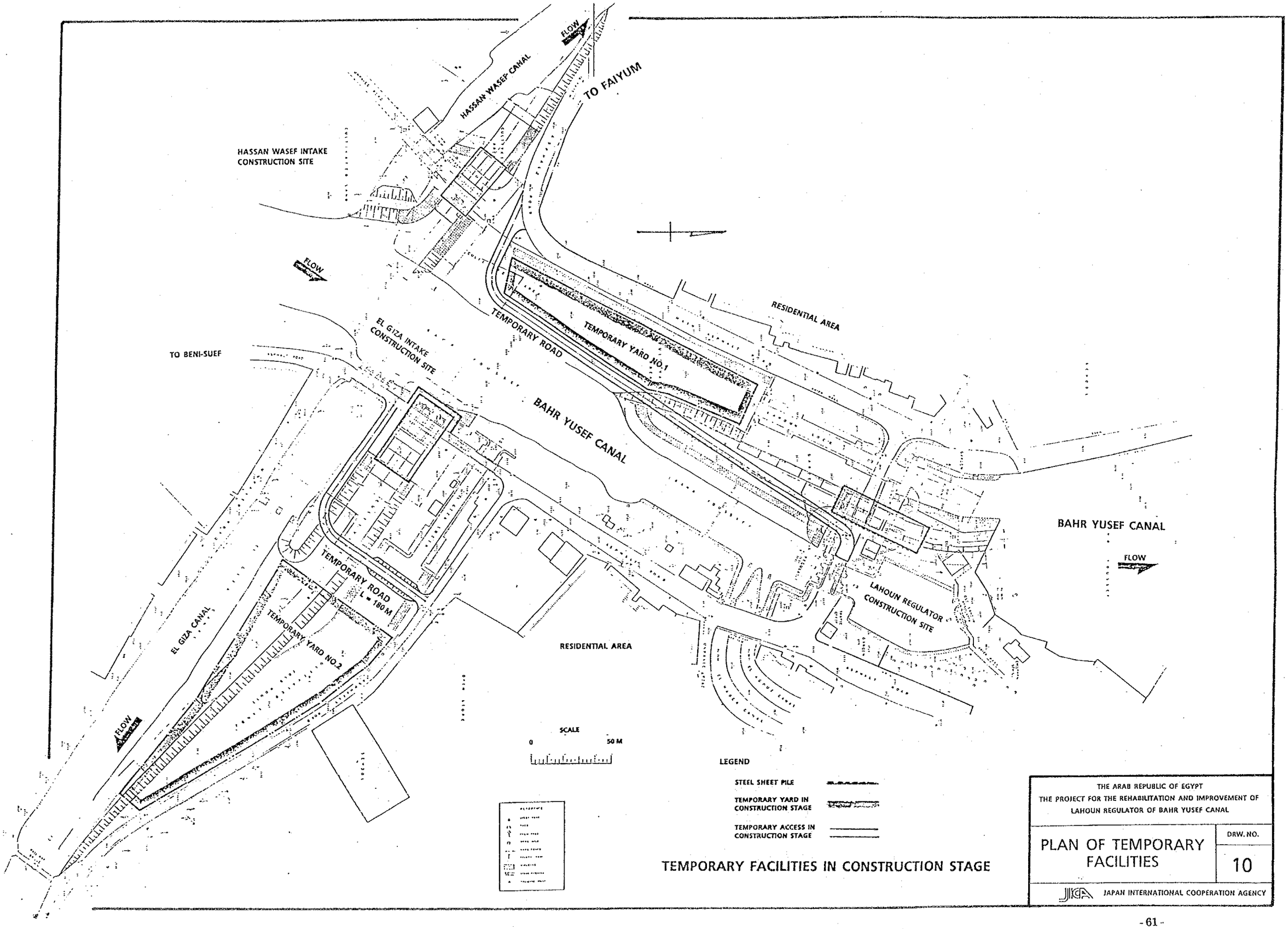
ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

LAHOUN REGULATOR
- FLOATING TRASH TRAP -

DRW. NO. 9

JICA JAPAN INTERNATIONAL COOPERATION AGENCY



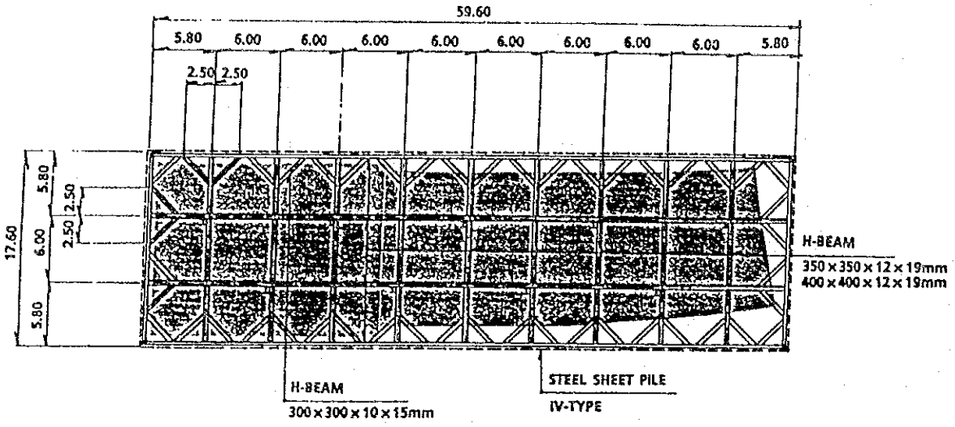
TEMPORARY FACILITIES IN CONSTRUCTION STAGE

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

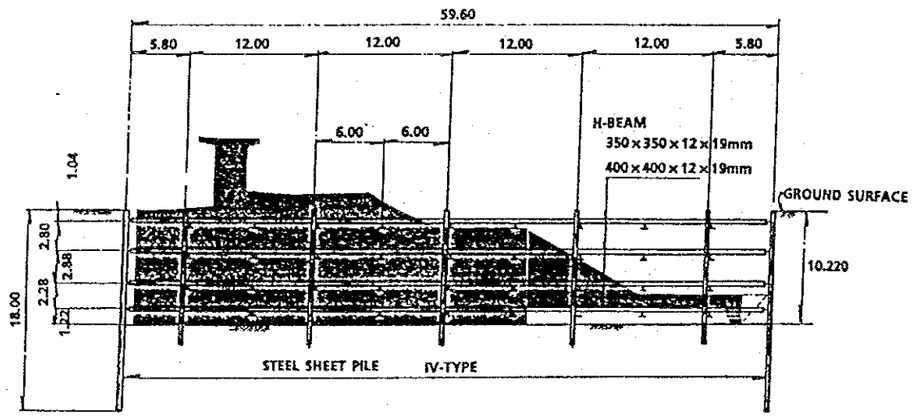
PLAN OF TEMPORARY FACILITIES

DRW. NO. 10

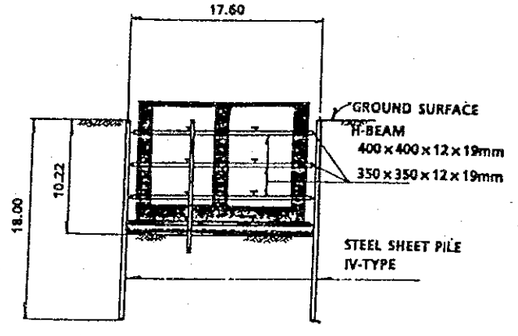
JAPAN INTERNATIONAL COOPERATION AGENCY



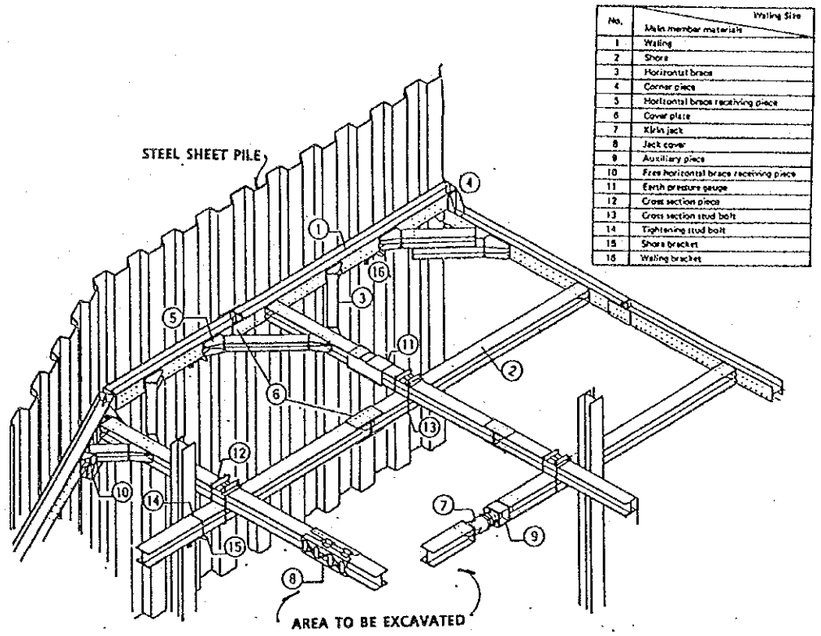
PLAN OF LAHOUN REGULATOR



PROFILE OF LAHOUN REGULATOR

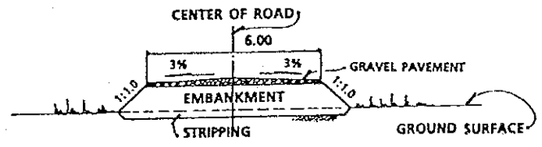


SECTION OF LAHOUN REGULATOR
EARTH HOLDING METHOD



No.	Main member materials \ Waling Shre
1	Waling
2	Shore
3	Horizontal brace
4	Corner piece
5	Horizontal brace receiving piece
6	Cover plate
7	Klrin jack
8	Jack cover
9	Auxiliary piece
10	Free horizontal brace receiving piece
11	Earth pressure gauge
12	Cross section piece
13	Cross section stud bolt
14	Tightening stud bolt
15	Shore bracket
16	Waling bracket

ENGINEERING SKETCH OF EARTH HOLDING METHOD
(HORIZONTAL SHORE METHOD)



SECTION OF TEMPORARY ROAD

NOTES
ALL DIMENSIONS AND ELEVATIONS (EL.) ARE SHOWN IN METERS, UNLESS OTHERWISE SPECIFIED.

THE ARAB REPUBLIC OF EGYPT
THE PROJECT FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR OF BAHR YUSEF CANAL

STEEL SHEET PILE DETAILS OF TEMPORARY FACILITIES

DRW. NO. 11

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

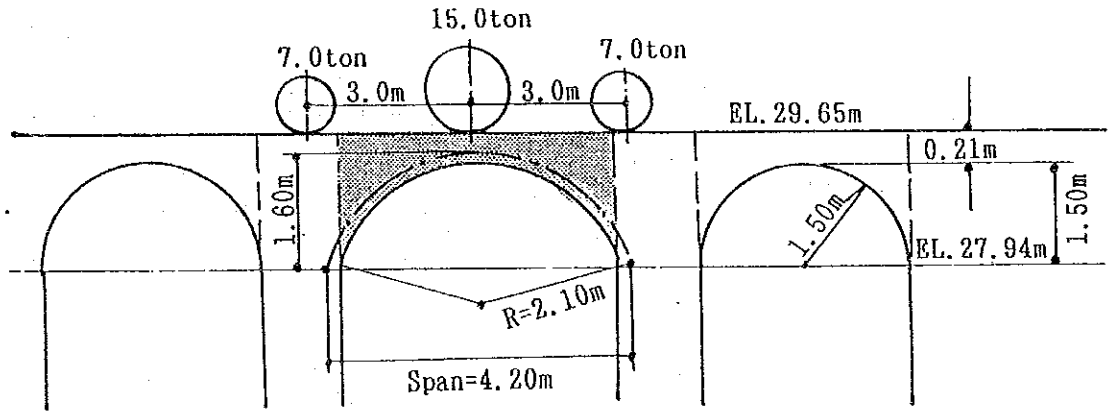
3. 3. 9 Study on Strength of the Existing Bridge

1) Bridge on the Lahoun Regulator

The existing bridge is of a symmetric, triple arch ramen structure. A Boring survey and grouting reinforcement were carried out on the piers in 1988. The boring log for the above works reveals that the weir body is constructed with bricks, except for arch and crown parts.

The study on strength of members against live load of 70 tons roller is only made on the arch and crown parts of the bridge, since the bearing capacity on the pier is judged fully safe due to its sufficient thickness and the reinforcement by grouting in 1988.

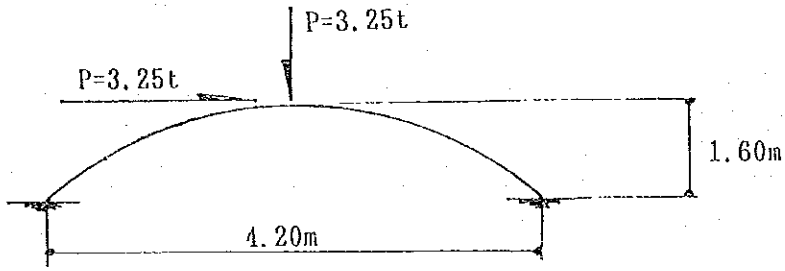
(1) Virtual Dimensions of Crown Section



(2) Load distribution, Moment and Share

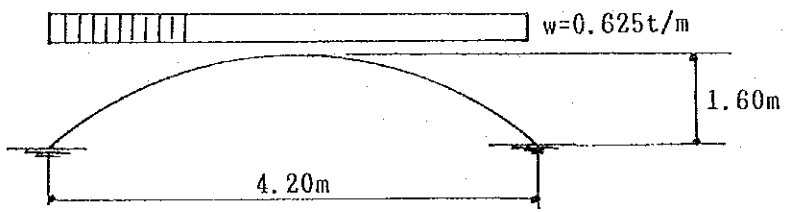
i) 70 ton Roller Load

15ton/6.00m=2.50ton/m , 2.50ton(1+0.3)=3.25ton/m



ii) Distribution Load

Wb	=0.21m x 2.50ton/cum=0.525	tom/m
Wq	=0.100 ton/sqm =0.100	ton/m
計	0.625	ton/m

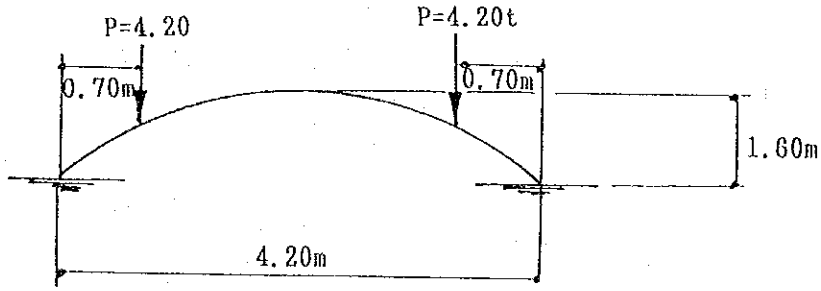


Note Wb: Dead Load by member's material
Wq: Uniform Load on the bridge

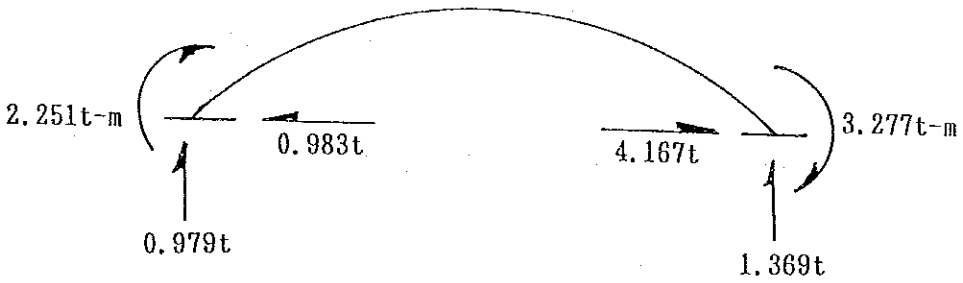
iii) Concentrated Load on the Arch

1/2 x 1.60mx2.10mx2.50t=4.20 ton/m

a=1/3x 2.10m=0.70m



iv) Moment and Share



(3) Study on Strength

The materials composing the arches are assumed to be late alluvial rocks which are considered to have strength in a range from 20 to 80 kg per square centimeter with single axial compression test.

The assumed compressive strength was calculated to be around 44 kg per square centimeter, and the allowable compressive strength of the materials of members cannot be assumed to be sufficient, in view of safety. It is recommended that small pieces, similar to the members, should be picked up to carry out the compression tests.

When the compression tests are found difficult to be executed due to inability to pick up test pieces, frequent schmit hammer tests can be applied instead.

(4) Reinforcement Method

There are two reinforcement methods considered as follows:

- reinforcement of arches by chemical grouting, and
- plugging the lower parts of the arches with lean concrete.

Since chemical grouting, however, requires support works for the arches, the construction cost becomes higher. Lean concrete plugging is more recommendable. This is the method whereby the arches are plugged with lean concrete and cavities of the crown are filled by low pressure grouting on the bridge surface.

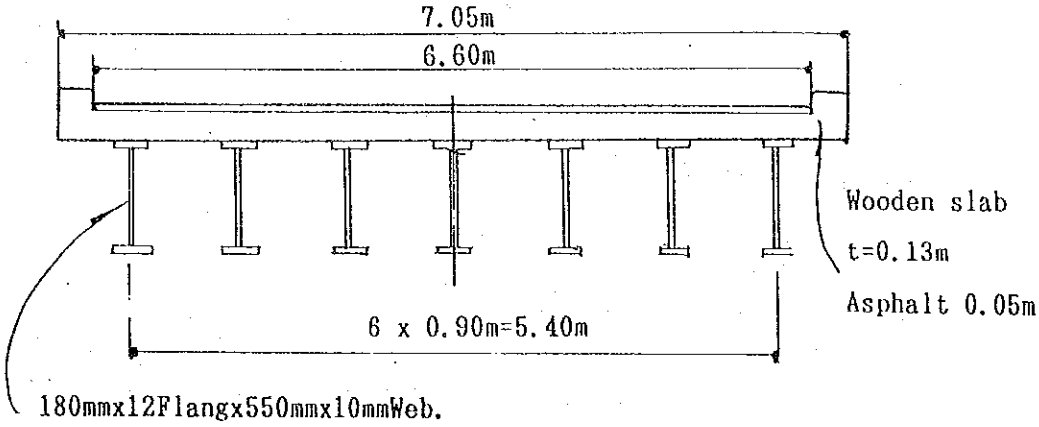
2) Draw Bridge on the Lahoun Navigation Lock

The existing draw bridge is designed to be provided on the navigation lock so as to expand space for navigation, but has not been used for navigation in the last 10 years or so. The bridge has not been utilized as a draw bridge, having additional pavement on the surface together with laying of an aqueduct along the bridge beam.

1) Cross-section and Bride Length

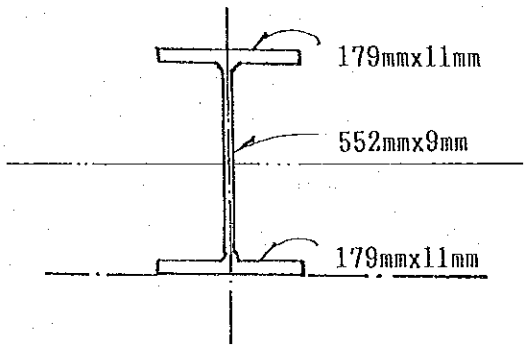
The effective width of the bridge is 6.60m and the net span length is 8.60m. The bridge is composed of main simple steel beam with floor plates of 5 inch-square woods and asphalt pavement.

Judging from appearance of the structure the design load of the bridge is considered to be less than the 70 ton roller load, as the existing Egyptian Standards applicable for major road-bridges state.



(2) Cross-sectional Strength of Main Beam

The present cross-section of the main beam is shown as follows.



The section modulus of the main beam section except corrosion margin of 1.0 mm is:

$$Z = 31,562/28.7 = 1,099.7\ cm^3$$

When the span of the existing main beam, including safety margin, is assumed as 10 meters, calculation of bending moment with 70 ton roller load becomes 13 t-m. As learned from the above, the tensile stress strength is:

$\sigma s = 1,303,800/1,099.7 = 1,185 \text{ kg/cm}^2$

The yielding point of the steel materials used is deemed as (20-25 kg/cm^2), and as a result it is considered to be short in safety for the section.

3.4 IMPLEMENTATION PLAN

3.4.1 Construction Condition

The Project aim is to repair and improve the time-worn and old-fashioned irrigation and water distribution facilities provided along the irrigation canal. Since, in Egypt, little rainfall is expected throughout the year, irrigation water is indispensable for farming. Under the conditions, as the irrigation services cannot be interrupted even during the construction period, it is considered most economical that the proposed new facilities are constructed near the existing facilities in operation, and after completion of the new facilities, service shall be restored by switching from the old facilities.

The sheet pile method, however, as retaining wall for leakage and collapse of earthworks should be adopted for the construction work in taking into consideration that wide spare space cannot be reserved for temporary work because the construction work site is located near the residential area.

Total interruption of the irrigation services through the Bahr Yusef Canal is only three weeks in January, when the inspection and repair works are carried out for the irrigation facilities, although water conveyance fluctuates seasonally to some extent. The implementation plan of the construction should be prepared for switching work of the canals from the old one to the new one in consideration of the aforesaid interruption period.

Since construction work for both the Lahoun Regulator and Giza Intake has to be carried out in crossing the national highway, a temporary detour will be necessary. Due to limited space for construction work of the new facilities and deep excavation required, it will be difficult to keep sheet piles upright and anchoring is also difficult because of facing the canal at the outside, and the supporting method with H shape steel beam should be taken for supporting beam.

About 3.0 hectares of the temporary working lots are available at the ID's land located between the Giza Intake and Navigation Lock and the river side lot upstream the Lahoun Regulator. It is the enough area to provide a site office, lodging accommodations, materials stock yard, and manufacturing yard for form works or steel bars, etc. As these sites are surrounded by residential areas, electricity can be supplied sufficiently for the temporary work site, but such a power supply will not be sufficient for the construction work because the construction sites are located sporadically at three places. This will bring considerably higher costs in view of the distribution line arrangement and so forth compared to adopting diesel generators. In the case, therefore, portable generators shall be prepared.

In Egypt, there have been such large scale construction works implemented as high rise buildings, subways, bridges, water works, highways, etc., and many Egyptian contractors have been working under supervision of foreign enterprises. These contractors are comparatively high in their technical level. Regrettably, however, most of these reputable contractors are Cairo based organizations, and local contractors cannot be evaluated as highly as those in Cairo.

From such a point of view, the engineers shall be assigned to the major construction sites throughout the working period. On the other hand, at the work sites of sheet piles, gate installation, etc. as special difficult works are executed periodically, experts in the line shall be assigned spottedly.

Engineers and Technicians assigned for this Project are shown in Table 3-4, Table 3-5.

TABLE 3 - 4 RESIDENT JAPANESE STAFF AT THE SITE OFFICE

Title	Work Description	Number
Manager	Project Direct or, Responsible Project.	1
Civil Engineer (Asst. Manager)	Supervise quality, safety, schedule and direct engineering	1
Civil Engineer	Guide engineering and schedule, supervise labour, make as built drawings	2
Architect	Guide construction of building and schedule, supervise labour, make as built drawings	1
Facilities Engineer	Guide facilities, mechanical and electrical works and supervise schedule, labour, make as built drawings	1
Administrator	Administration works of the site office	1
Total		7

TABLE 3 - 5 SPOTTEDLY ASSIGNED STAFF

Title	Work Description	Number
Sheet pile driving Engineer	Supervise for technical works for sheet pile driving and removal. (Two teams)	4
Retaining support Engineer	Supervise for placing and replacing of retaining support	1
Gate Engineer	Installation of gates and arrangement of facilities	2
Electrical Engineer	Installation of distribution line for electricity	1
Gate Operation Engineer	Guide and lecture to MPWWR staff operation and maintenance works of gates	1
Technicians	Guide and assist form work, reinforcement installation, and concrete placement	2
Total		11

The Egyptian responsibility party for the Project is the Ministry of Public Works and Water Resources, and ID, one of the infrastructural organization of which, is an executing body of the works through IIP, under its horizontal development section.

ID provides several local offices, and the ID Minia Office (Middle Egypt) is fully responsible for the Project, but actually the Beni Suef District Office will carry out the Project work in the field.

Under the circumstances, the horizontal development section of ID will be in charge of confirmation and agreement of the final design of the Project and its deviation, while the Beni Suef District Office will be responsible for implementation of the construction work at the sites.

3.4.2 Implementation Method

As mentioned above, there are many reputable contractors in Egypt, who have their own construction equipment and machinery. Although there are also those firms who rent or lease machinery, they have been mainly handling the machinery for general earth moving equipment and carriers only, and not handling some special types of machinery like sheet pile drivers, etc.

The ancient Lahoun Regulator at the down-stream of the existing one is the historical remains to be preserved. This ancient regulator is a brick made structure, and since it is considerably time-worn, careful attention should be paid to the regulator which shall be sufficiently protected from damage given by the adverse effect of vibration, etc. during the construction work.

In this respect, vibrationless pile drivers shall be used for the work, especially, as pile driving will cause vibration. However, vibrationless drivers, which cannot be leased in Egypt, should be leased in Japan to be brought into the sites.

Since the construction aim is to provide facilities for irrigation canals used at present, the interruption of irrigation services is limited to as short as three weeks or so in January. In such a condition, the implementation plan shall be prepared so that construction works on the related canal facilities and a part of the canal bed protection work shall be carried out during this period.

The temporary road should be prepared for implementation of the Lahoun Regulator which crosses over the national highway. The local traffic survey revealed that there is traffic of about 2,000 vehicles crossing the

Regulator in a day, and it is necessary to request the Egyptian Authorities concerned to issue a guidance for taking a detour from the Lahoun site in any peak time of the construction works, particularly with large size vehicles, excepting for vehicles running between Beni Suef and Faiyum.

Together with the above consideration, attention should be paid to possibly shortening a period to use the temporary road by efficient construction work to make the construction period as short as possible.

3. 4. 3 Construction and Supervisory Plan

The major duties of construction supervision by Consultants are as follows.

① Supervision on work progress and quality of the work carried out,

② Guidance to the Contractors,

③ Discussion and meeting to give advice to the Egyptian executing body,

④ Inspection on the detailed design drawings, as built drawings, modified design drawings, etc., and

⑤ Inspection on completion and at the middle term inspection, etc.

The Consultants should discharge the above duties in place of the Egyptian counterparts, although the Contractors shall be fully responsible to implement all the construction work.

The resident supervisor of the Consultants shall be only one engineer in the field so as to reduce the cost of the construction supervision, and a general supervisor of the Consultants shall visit the field whenever necessity requires in the process of construction work, so as to give inspection and adequate guidance and advice to the Contractors.

The construction work shall be carried out so as not to interrupt the irrigation services as the objective facilities are the major structures of regulator and intakes. And for such works, some extremely difficult work such as water protection work, retaining walls, etc. must be implemented. Under

the circumstances, the resident supervisor of the Consultants, shall be well qualified with sufficient knowledge and experience of design and construction of canal structures as well as hydraulics and canal management. The resident supervisor shall also be the engineer to take necessary and appropriate judgment and countermeasures against any accidents in the course of the construction work.

Furthermore, the Consultants shall have a efficient and adequate back-up system/organization in the Head Office which should give timely and proper response to the issues given by the resident supervisor on unsolved problems at site, or accidents, through the general supervisor together with full support of the Consultants. The following table shows the consultant site staff plan under the full support system by Head Office.

TABLE 3- 6 CONSULTANT SUPERVISORY STAFF PLAN

Title	Work Description
General Manager	Responsible engineer for the Project, spottedly assigned at the beginning, intermediate and final inspection etc.
Resident Supervisor	Supervise work progress, quality, guide and advice for the Project through construction works at site, meeting and inspection of drawings necessary for the construction.
Gate Engineer (Spot)	Guide and advice for the installation and operation of gates, and inspection of installation drawings, etc.
Electrical Engineer (Spot)	Guide and advice for the installation of the electrical facilities and equipment, and inspection of as built drawings and installation, etc.

3. 4. 4 Procurement Plan

A Total of nine (9) gates shall be procured for the Project. These gates have to be manufactured to particular specifications, and since there are no local factories available for manufacturing such specially specified gates and the delivery must be made in a limited short period, the gates shall be procured from Japan judging from such specially specified specification and limitedly short delivery period.

Although some of the materials attached to the gates are available in the Egyptian market, the design for the gates shall be made with Japanese materials in considering specific differences in the local materials and difficulty in local knockdown procedures, excepting some items to be locally assembled.

The construction shall be carried out without any interruption of the local irrigation services through the related canals and in the site with considerable high groundwater table. Sheet piles must be used for temporary closing works due to execution in the narrow sites.

Sheet piles used for the Project works, which will be larger in size due to deeper excavation, are not sold and leased in the local market in view of both quantity and quality. As a result, the necessary sheet piles and related materials shall be supplied from Japan.

General construction equipment, which is available in Egypt, shall be procured or leased from the local market. As for the pile drivers, vibrationless drivers shall be adopted in consideration of that the construction sites are adjacent to the historical remains or residential areas and adverse effects by vibration causing drivers must be avoided. Since, however, this type of driver is not available nor leasable in the local market or European market, either due to difference in size or other specifications, this equipment shall be leased in Japan to be brought into Egypt.

Such special equipment, devices, tools, etc. unobtainable in the Egyptian market shall be brought into the sites from Japan, such as generators, submerged pumps, tools, security equipment and materials, butcher plants, etc.

TABLE 3 - 7 EQUIPMENT AND MATERIALS PROCURED IN EGYPT

Item	Description
Materials for Civil Works	Cement, Aggregate, Sand, Reinforcement bar, Form, etc.
Construction Equipment	Crane, Bulldozer, Backhoe, Vehicles, etc.
Others	Fuel, Oil, etc.

TABLE 3 - 8 EQUIPMENT AND MATERIALS PROCURED IN JAPAN

Item	Description
Gates and Attachment	Gate, Lifting Device, Motor, Screen, Electric Panel Meter, Operating Panel, Emergency Generator, etc.
Materials for Civil Works	Sheet piles, H shape steel beam, etc.
Construction Equipment	Silent Sheet Piler (Vibration-less), Diesel generator, Submerged pump, Construction tools, Security equipment, Bucher plant, etc.

The equipment and materials procured in Japan shall be transported from Japan to Alexandria by regular ocean freighter in taking about 50 days for one trip, and the land transportation between Alexandria and the sites (abt. 350 km) shall be made by trucks, etc. in taking about 10 days including customs clearance. Therefore, the total numbers of the days for transportation between Japan and the sites is estimated at 60 days.

3. 4. 5 Implementation Schedule

The Project aim is primarily to construct the regulator and intakes and the contract of the Project shall be made in one package. The Government of Egypt should be responsible for making the Project ready for commencement in completion of land acquisition, land leveling, power supply system, etc.

The Contractors for the construction work of the irrigation facilities shall be selected from the qualified Japanese bidders. The successful bidders shall be evaluated with the details of the bid and conclude the Contract with the Employer (Government of Egypt) after having confirmation of reasonability of the bid. The construction shall be started with confirmation of the contract given by the Government of Japan.

The key to successful implementation of the Project work will depend on how the successful Japanese Contractors can make a joint venture with local well experienced and qualified sub-contractors. The Contractors must organize a well functioning organization by taking into consideration the effective management based on the reasonable division of roles and staffing between two parties.

The Project construction works shall be commenced with a 'Letter of Proceed' issued by the Government of Egypt which concludes the Exchange of Notes with the Government of Japan regarding the Grant Aid Agreement of the Project between two Governments, and the works shall be planned to be completed for coinciding with the end of the fiscal year of the Government of Japan.

The construction supervision shall be carried out by Japanese Consultants in close cooperation through frequent discussion meetings with ID of the Egyptian executing body from the design stage through the actual construction work.

The geneal implementation plan is illustrated in Figure 3-1.

3.4.6 Scope of Work

Out of the total Project work, those responsible by the government of Japan in the area of its Grant Aid Agreement and those responsible by the Government of Egypt are shown in Table 3-9.

FIGURE 3 - 1 IMPLEMENTATION SCHEDULE FOR THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR

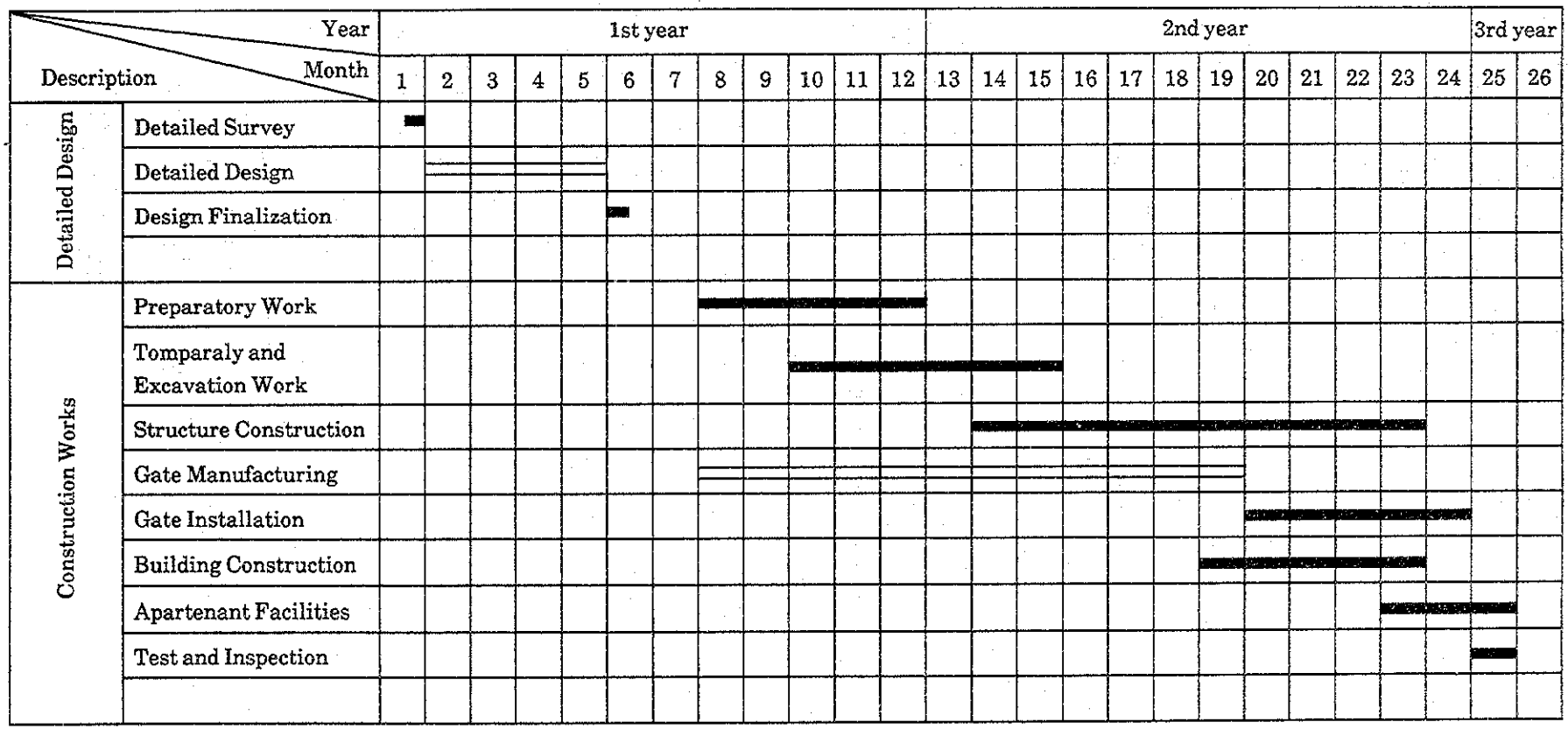


TABLE 3 - 9 SCOPE OF WORK

Scope of Work by Japanese Government	Scope of Work by Egyptian Government
1. Civil Work Temporally closure, Main structure, Canal bottom and dike protection, Diversion canal. 2. Building Work Building of control house. 3. Mechanical Facilities Work Installation of gates, Installation of emergency generator. 4. Building Construction Work 4.1 Electrical Facilities Work Installation of transformer, motor, distribution line, lighting, telephone, fire alarm, etc. 4.2 Plumbing and Ventilation Work Supply water and plumbing equipment, Ventilation equipment. 4.3 Outside Facilities Outside light.	1. Land Acquisition. 2. Land Leveling Cutting of trees, Removing of root, Land leveling. 3. Delivery of Infrastructure Delivery of electricity, Delivery of supply water. 4. Outside Facilities Garden, Planting, Gate and Fence. 5. Facilities and Instrument Curtain, Blind, Furniture. 6. Others Confirmation request procedure, survey work, Custom clearance procedure, Tax free procedure. 7. Future Operation and Maintenance.

CHAPTER 4 PROJECT EVALUATION AND CONCLUSION

CHAPTER 4. PROJECT EVALUATION AND CONCLUSION

4. 1 PROJECT BENEFIT AND IMPACT

The benefited area is estimated at about 70 percent of that commanded by the Bahr Yusef Canal which covers about 770 thousand feddans (320 thousand has) equivalent to 13 percent of the national total farm land of 6.12 million feddans (2.57 million has).

The irrigation facilities included in the Lahoun Regulator group are one of the major irrigation systems to command about 8 percent of the national total arable land. Those facilities, however, are heavily time worn and so inoperative as not to meet the requirement from the beneficiaries.

The Project aims to repair and improve the facilities of the Lahoun Regulator, Giza and Hassan Wasef Intakes as the major facilities of the group, and the rehabilitation of these facilities will bring about the following results and benefits.

- About 530 thousand feddans (223 thousand has equivalent to 8 % of the national total arable land) of the beneficial area and 215 thousand farm households can be efficiently irrigated and directly benefited.
- Efficient irrigation will benefit to about 4 million of agricultural population in the provinces of Beni Suef, Faiyum and Giza through expansion of arable land (horizontal development) and unit yield increase (vertical development).
- The Project can contribute to food production increase of the Country and to development of the national economy.

And the following effects will be contributed on the long term basis.

- Establishment of the water management system.
- Improvement of the water management technology such as gate operation by introducing remote control.
- Improvement of the road function of the attached bridge.

Table 4-1 illustrates the Project impacts and the improvement extent resulting from the Project.

TABLE 4-1 IMPROVEMENT AND BENEFIT BY THE PROJECT

Present Condition and Problem	Countermeasure by the Project	Rehabilitation and Benefit by the Project
1. Facilities are heavily time-worn and possibility of destruction.	· Reconstruction of time worn main facilities.	· Safety of facilities will be ensured.
2. Gates are of obsolete design and inoperative so as to not meet requests from beneficiaries.	· Install a slide gate with new technology with furnished electric operating system. · Emergency generator is procured. Control building, which controls 3 facilities will be provided.	· Easy to meet the requests from beneficiaries due to electrical operating system. · Ability to timely distribute to the beneficiaries. New areas can be developed by using excessive water. · Production development will also be undertaken due to ease of gate operation.
3. Bridges furnished on the weirs are time worn and designed on old criteria, so have probability of failure.	· New bridges are designed on new criteria. · Width of bridges for National road are 8.0 meters.	· Heavy vehicles can pass without problem due to new criteria provisions.
4. Existing gate cannot under go repair during irrigation period.	· Stop log type gate for operation is furnished.	· Maintenance work of gate is undertaken by using stop log.
5. Elimination of weeds, trash and sediment is insufficient to stop blockage of correct water delivery.	· Floating trash trap is furnished.	· Elimination of weeds is necessary.
6. Unstable operation causes instability in a farmers life.	· Establish a operation rule.	· Appropriate operation rule and stable water distribution make a farmer's life stable and result is National economical development.

4. 2 VERIFICATION FOR FEASIBILITY OF THE PROJECT

The beneficiaries of the Project are the farmers in the three provinces of Beni Suef, Faiyum and Giza, the numbers of the beneficial farm households of which are 20,100 households, 125,850 households and 68,300 households, respectively in estimation.

Learned from the above, the average land holding is about 2.5 feddan per farm household, but actually, those farmers who own land of less than 1.0 feddan occupy about 50 percent, 1.0 to 5.0 feddans occupy about 45 percent, and so about 95 percent of the total is included in these two classes. The farmers having farm land are about 50 to 60 percent of the total farmers. Each family is composed of 5.0 members in leading a rather hard life.

The Project aims to contribute to the stabilization and improvement of the local farmer's life whose farming depends totally upon the Nile water. The project also is a link of the chains of the long term irrigation development plans. In Egypt, however, as it takes quite long time to realize such projects by the Egyptian Government itself, due to financial difficulty, the financial aid and assistance by western developed countries like America, European countries, and Japan are indispensable.

The existing facilities are heavily time worn and so inoperative as not to distribute irrigation water timely and efficiently. Accordingly, immediate rehabilitation for those facilities is requested. Depending on the insufficient budget of the Egyptian Government, the financial and technical aid from the other countries as mentioned the above. However, as there is no plan to assist the rehabilitation for the Project, it is quite reasonable to rehabilitate the distribution facilities by the Japanese Grant Aid program.

For O and M services of the Project after completion, ID of MPWWR will take responsibility for carrying out the work with sufficient manpower, technology, and enough budget for the purpose. When the improvement of the deteriorated facilities is realized, the environment in the area will be up graded.

MPWWR, as the executing body, has been undertaking several projects under the financial aid on a grant basis by the government of Japan

and has sufficient knowledge of the necessary procedures and rules of the Japanese grant aid. Under this situation, it is considered reasonable and no problem for MPWWR to carry out the Project.

4. 3 RECOMMENDATIONS

As mentioned above, the Project is expected to develop the related area significantly and contribute toward raising the living standard of the local farmers. From these points of view, it is confirmed that the Project can be realized by the Japanese grant aid. Furthermore, the O and M of the Project after its completion can be carried out by MPWWR with their qualified staffs and sufficient budget and materials.

With the opportunity for the rehabilitation and improvement of the facilities of the Lahoun Regulator group, the following improvement will contribute not only to the improvement of the subject facilities of the Project, but also the total irrigation system of the Bahr Yusef, or even further, the national irrigation system.

1) An efficient water management plan shall be created. Then, the organizational application of the said water management will result in the more effective use of irrigation water. For successful realization, ID should give appropriate guidance to the local farmers in close cooperation with the Ministry of Agriculture.

2) Rehabilitation and improvement works should be executed for the heavily deteriorated Mazoura and Sakoula Regulators in the upstream of the canal following the Lahoun Regulator.

3) As part of the resident staff for the control building of the Lahoun Regulator, an engineer with sufficient knowledge and well experienced in water management should be assigned to show a model operation of modern irrigation facilities.

4) The total water control system and facilities maintenance plan shall be established, thus the rehabilitation and improvement of the facilities in the Bahr Yusef Canal shall be executed for the purpose of consistent

water management. Then the effective use of water resources will be achieved.

Furthermore, for the purpose of adequate distribution and efficient use of the irrigation water, the followings are recommended.

- Promotion of water management engineers
- Establishment of a water management manual
- Reinforcement of the water management cooperative

APPENDIX

APPENDIX 1. MEMBER LIST OF SURVEY TEAM

MEMBERS OF THE BASIC DESIGN STUDY TEAM

1.	Kazuhiro YOSHII	Leader / Agricultural Development Development Specialist, JICA
2.	Yukio MIYAISHI	Irrigation Facilities / Water Gate Planner Agricultural Civil Engineering Specialist. Design Division, Construction Dept. Tokai Administration Office, Ministry of Agriculture, Forestry and Fisheries.
3.	Akira NAKAMURA	Project Coordinator / Planning Management First Basic Design Study Division Grant Aid Study and Design Dept. JICA
4.	Yasuo TERAMURA	Chief Consultant Sanyu Consultants Inc.
5.	Kosaku CHICHIBU	Facilities Planner Sanyu Consultants Inc.
6.	Jiro YABE	Construction / Material & Equipment Planner Tokyo Office, Sanyu Consultants Inc.
7.	Shinichi ARAI	Equipment Planner Tokyo Office, Sanyu Consultants Inc.

MEMBERS OF THE BASIC DESIGN STUDY TEAM FOR DRAFT FINAL REPORT EXPLANATION

1.	Kazuhiro YOSHII	Leader / Agricultural Development Development Specialist, JICA
2.	Tetsuhiro UENO	Project Coordinator / Planning Management Second Project Management Division, Grant Aid Project Management, JICA
3.	Yasuo TERAMURA	Chief Consultant Sanyu Consultants Inc.
4.	Kosaku CHICHIBU	Facilities Planner Sanyu Consultants Inc.

APPENDIX 2. SURVEY SCHEDULE

OVERALL PROCESS AND SCHEDULE OF THE BASIC STUDY

Description	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.
Preparation of the study in Japan							
Field survey in Egypt							
Preparation of draft report							
Explanation of draft report							
Preparation and submission of final report							

FIELD SURVEY SCHEDULE OF BASIC STUDY TEAM

Date	Movement	Activities
May 26 (Thu.)	Arrive at Cairo	
27 (Fri.)		Internal meeting
28 (Sat.)		Site survey in Beni Suef
29 (Sun.)		Courtesy call on the Ministry of Public Works and Water Resources (MPWWR) Explanation of contents and tentative schedule of the study.
30 (Mon.)		Discussion with MPWWR
31 (Tue.)		Discussion with MPWWR
June 1 (Wed.)		Discussion with MPWWR
2 (Thr.)		Signing of the Minutes of Discussion
3 (Fri.)	Leave Cairo (3 members only)	Technical studies by the consultants
~26 (Sun.)	Leave Cairo	

SCHEDULE OF DRAFT FINAL REPORT EXPLANATION TEAM FOR BASIC STUDY

Date	Movement	Activities
Oct. 1 (Sat.)	Arrive at Cairo	
2 (Sun.)		Courtesy call on the Ministry of Public Works and Water Resources (MPWWR)
3 (Mon.)		Courtesy call on the Ministry of International Cooperation, Discussion with MPWWR
4 (Tue.)		Discussion with MPWWR
5 (Wed.)		Discussion with MPWWR, Signing of the Minutes of Discussing
6 (Thr.)		Survey trip to the Project site and the similar project site
7 (Fri.)		Data collection
8 (Mon.)		Survey trip to the similar Project site
9 (Tue.)		Report to Japanese Embassy and JICA Cairo Office
10 (Wed.)	Leave Cairo	

APPENDIX 3. LIST OF PERSONNEL CONTACTED BY THE STUDY TEAM

Ministry of International Cooperation

Mr. Wahif El Miniawey	Former Ambassador, Advisor for the Minister of Foreign Affairs
Mr. Fadid Mohamed Ari	General Director
Ms. Zahia M. Abu Zeid	General Director
Mr. Mohsin M. Sadek	Director of Japan Department
Ms. Mona Sarim	Economic Researcher
Mr. Ashrof Atia Nafal	Economic Researcher
Mr. Heshau Yehia El Metuing	
Ms. Samiha Barakat	

Ministry of Public Works and Water Resources, Irrigation Department

Eng. Gamil El Sayed Mahmoud	First Undersecretary Chairman of Planning Department
Eng. Ali Abu El Seouel	First Undersecretary Chairman of Planning Department
Eng. Ahmed El Sawaf	First Undersecretary Chairman of Irrigation Department
Eng. El Sayed Hasan	First Undersecretary Horizontal Expansion and Improvement Project
Eng. Yehia Abu del Aziz	Undersecretary, Project Director Irrigation Improvement Project
Eng. Adel Hashen Saleh	General Director, Design Division Irrigation Improvement Project
Eng. Camelia Aziz Basta	Director of planning Division Irrigation Improvement Project
Eng. Abu Bak Sekkina	Irrigation Inspector Director of Construction Divission Irrigation Improvement Project
Eng. Nadia Aziz Welson	Director of Works, Design Division, Irrigaiton Improvement Project
Eng. Alaa Ismail Ali Hamouda	Deputy Director of Construction D. Irrigaiton Improvement Project
Eng. Kahlid Hassein	Deputy Director of Construction D. Irrigaiton Improvement Project

Eng. George Fouad	Design Division, Irrigaiton Improvement Project
Eng. Hassan Shouman	Consultant, Irrigation Improvement Project
Eng. Hiroshi Egami	Technical Advisor, MPWWR

Beni Suef Irrigation Directorate (BSID)

Eng. Zeheri	Undersecretary Beni Suef Irrigation Directorate
Eng. Ibrahim Melek Tanas	General Director BSID
Eng. Ramzy Abudel Malik Ghali	General Director Horizontal Expansion, BSID
Eng. Manshad Moshady	Inspector, BSID
Eng. Mohmeck Camel	BSID

Minia Irrigation Directorate (MID)

Eng. Mohamed Fathi Seoudy	First Undersecretary
Eng. Nabil Fawzi Nashid	Undersecretary

Aswan High Dam

Eng. Hassan Osman	General Director of Hydrology
Mr. Elsyed Monsy	Specialist of Public Relation

Esna Barrage

Eng. Abdelhamid Elsadok	First Undersecretary Head of Irrigation Directrate Upper Egypt
Eng. Mohamed Hassan	Manager of Esna Barrage Irrigation Improvement Project
Eng. Nasser Abdel Sattar Farrag	Director of Works New Esna Barrage

ISAWIP (Integrated Soil and Water Improvement Project)

Eng. Ahmed Hussien	General Director, ISAWIP
Eng. Mohammed El Beky	Director, ISAWIP

Embassy of Japan (EOJ)

Amb. Taizo Watanabe	Ambassador
Mr. Akihiko Yahiro	First Secretary
Mr. Tokutaro Nakai	First Secretary
Eng. Takeshi Minagawa	First Secretary

Japan International Cooperation Agency (JICA) in Cairo

Mr. Tadashe Shinoura	Resident Representative
Mr. Kazuhide Nagasawa	Deputy Resident Representative
Mr. Hidetoshi Ishioka	Assistant Resident Representative
Mr. Mostafa Hussin	Public Relation

APPENDIX 4. MINUTES OF DISCUSSION

1) Basic Design Study Mission

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY
ON
THE PROJECT
FOR
THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR
OF
BAHR YUSEF CANAL
IN
THE ARAB REPUBLIC OF EGYPT

In response to a request from the Government of the Arab Republic of Egypt, the Government of Japan decided to conduct a Basic Design Study on the Project for the Rehabilitation and Improvement of Lahoun Regulator of Bahr Yusef Canal (hereinafter referred as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Arab Republic of Egypt a study team, headed by Dr. Kazuhiro Yoshii, Development Specialist, JICA, from May 26 to June 26,1994.

The team held a series of discussions with the officials concerned of the Government of the Arab Republic of Egypt and conducted a field survey in the study area.

During the course of discussions and the field survey, both parties confirmed the main items described in attachment. The team will proceed to further surveys and will prepare the Basic Design Study report.

Cairo, June 2, 1994

Dr. Kazuhiro Yoshii
Leader
Basic Design Study Team
JICA

Mr. Ahmed Helmy Elsawaf
Chairman
Irrigation Department,
Ministry of Public Works and
Water Resources

Witnessed by:

Amb. Wahib El Miniawy
Advisor for the State Minister,
Ministry of International Cooperation

ATTACHMENT

1. Objective

The objective of the Project is to rehabilitate and improve irrigation facilities of Bahr Yusef Canal.

2. Project Site

The Project site is located at Lahoun Regulator's group on Bahr Yusef Canal in Beni Suef and Faiyum Governorates.

(Refer to Annex I .)

3. Responsible Ministry and Implementing Organization

1) *Responsible and Coordinating Organization for the Project* is the Ministry of Public Works and Water Resources(MPWWR).

2) Implementing Organization for the Project is the Irrigation Improvement Project of Irrigation Department, MPWWR.

(Refer to Annex II .)

4. Items requested by the Egyptian side

After discussions with the Basic Design Study team, the following items were finally requested by MPWWR.
However, the final components of the Project will be determined by further studies.

Construction of Irrigation Facilities
- Lahoun Regulator
- Intake of Giza Branch Canal
- Intake of Hassan Wasef Branch Canal

5. Japan's Grant Aid system

1) MPWWR has understood the system of Japan's Grant Aid as explained by the team.

2) The Government of the Arab Republic of Egypt will take necessary measures, as described in AnnexIII for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

K. Y.

6. Schedule of the Study

(1)The consultants will proceed to further studies in the Arab Republic of Egypt until June 26, 1994.

(2)JICA will prepare a draft final report in English and dispatch a mission to the Arab Republic of Egypt for the purpose of presenting its content in September, 1994.

(3)In case the contents of the draft final report are acceptable in principle by MPWWR, JICA will complete the final report and send it to the Government of the Arab Republic of Egypt around November, 1994.

7. Summary of Discussions

(1)The Project will include the construction of

1)Lahoun Regulator,

2)Intake of Giza Branch Canal,

3)Intake of Hassan Wasef Branch Canal.

(2)New Lahoun Regulator will be installed between the existing one and the lock.

(3)The water flow through the existing Lahoun Regulator and the ancient one will be reduced to a minimum level.
The existing Lahoun Regulator will cease its function.

(4)MPWWR requested to put into consideration the investigation of the existing Lahoun Regulator and the existing bridge over the lock in comparison with the new regulator with respect to load capacity.

(5)A new intake will be constructed substituting the existing one or downstream of the existing one of Giza Branch Canal. Giza Lock will be available for passage of water flow during the construction of the new intake.

(6)Giza Lock may be replaced by the new intake if necessary.

K. G.

(7)A new intake may be installed between the existing Giza Intake and the lock.

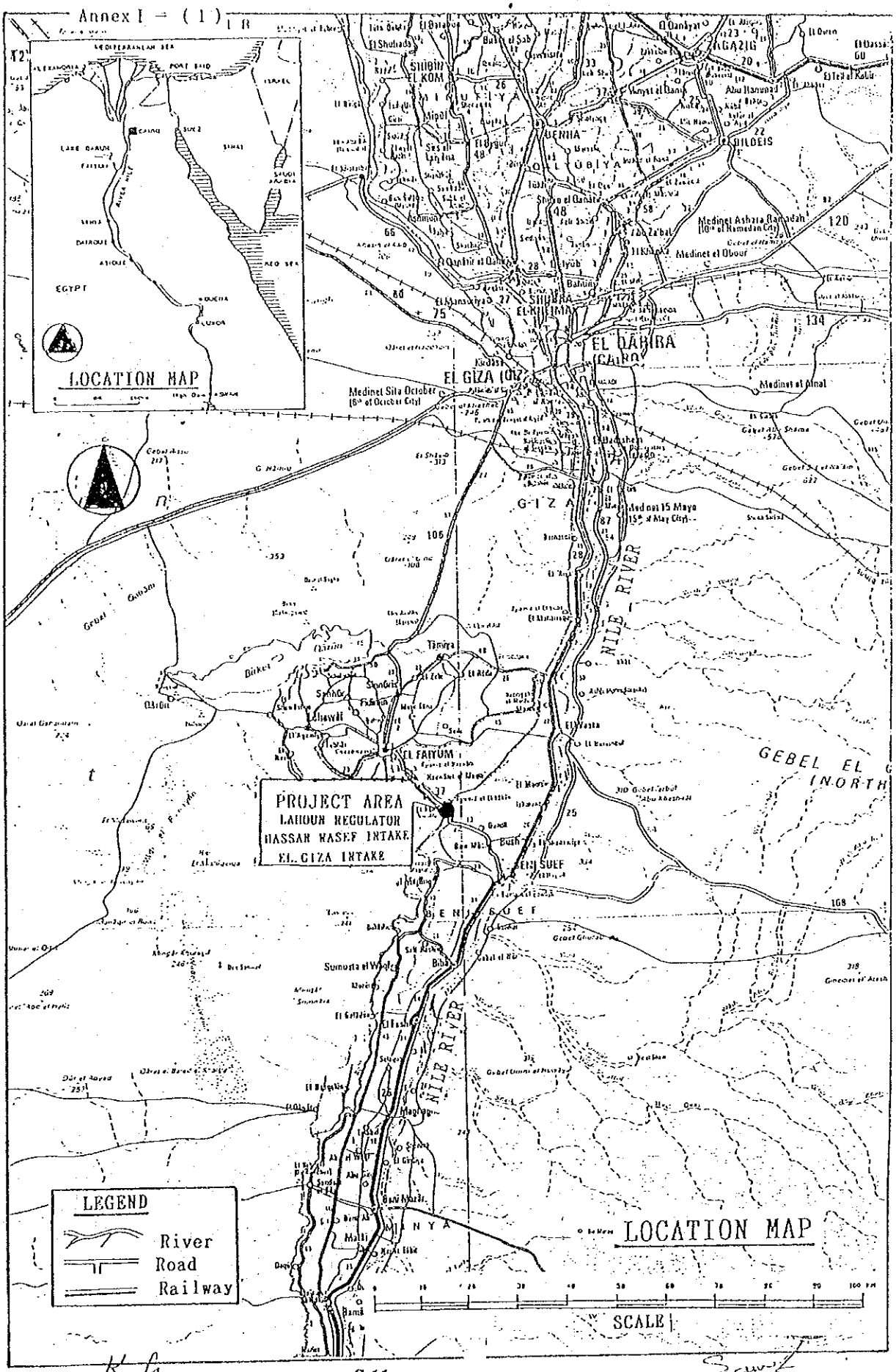
(8)On a newly opened branch canal crossing the road, a new intake will be installed on the right- or left-hand side of the existing one of Hassan Wasef Branch Canal.

(9)The area required for the construction of the facilities mentioned above will be specified in the draft final report. It will also define the area that may need to be temporarily occupied for detouring the traffic, storing construction equipment, materials, etc.

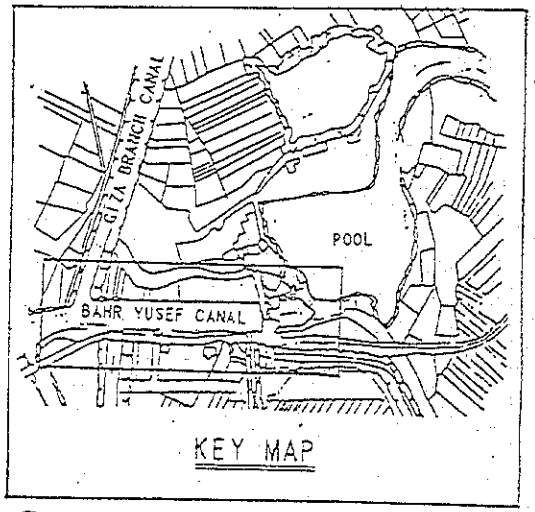
(10)The construction will preferably be made in public properties. Otherwise land acquisition of private properties for the construction shall be made by MPWWR.

(11)Within 30 days after the presentation of the Draft Final Report, MPWWR will submit to JICA a written confirmation on the availability of the area for the construction as well as that for temporary use.

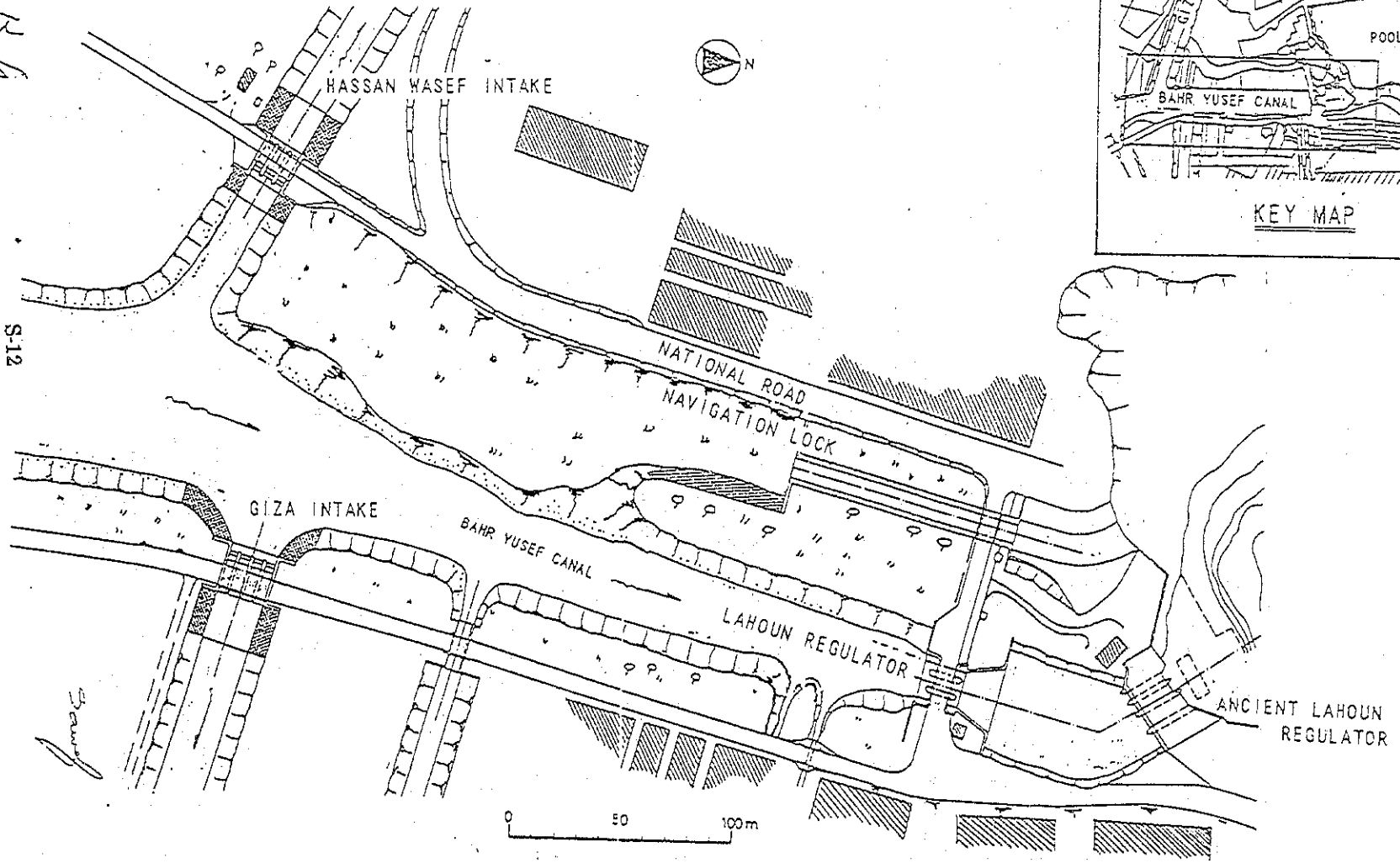
(12)MPWWR requested equipment for the maintenance of Lahoun Regulator's group of Bahr Yusef Canal.


LOCATION MAP
EGYPT
EL GIZA (GIZ)
EL FAYUM
PROJECT AREA
LAHOUN REGULATOR
HASSAN WASEF INTAKE
EL GIZA INTAKE
NILE RIVER
NILE RIVER
GEBEL EL
INORTH
LEGEND
River
Road
Railway
LOCATION MAP
SCALE

PLAN OF LAHOUN REGULATOR & INTAKES



KEY MAP



S-12

Annex I – (2)

Annex II Organization of the Project

Annex III

RECOMMENDATIONS FOR UNDERTAKINGS BY THE GOVERNMENT OF THE ARAB REPUBLIC OF EGYPT IN CASE JAPAN'S GRANT AID IS EXTENDED TO THE PROJECT:

1. To secure and clear the sites necessary for the Project prior to commencement of the construction.

2. To construct the access to the site in better condition prior to the commencement of the implementation of the Project.

3. To provide facilities for distribution of electricity, water supply, drainage and other incidental facilities necessary for the Project.

4. To ensure prompt unloading, customs clearance of the goods for the Project at the port of disembarkation in the Arab Republic of Egypt and prompt internal transportation therein of the products purchased under the Grant Aid.

5. To secure, with respect to the supply of the products and services under the verified contracts, that Japanese nationals shall not be subjected to any customs duties, internal taxes and other fiscal levies which may be imposed in the Arab Republic of Egypt.

6. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts such facilities as may be necessary for their entry into the Arab Republic of Egypt and stay therein for the performance of their work in accordance with the relevant laws and regulations of the Arab Republic of Egypt.

7. To use and maintain properly and effectively all the facilities constructed and equipment purchased under the Grant Aid.

8. To bear all the expenses other than those to be borne by the Grant Aid, necessary for the execution of the Project.

N.G.

2) Draft Explanation Mission

MINUTES OF DISCUSSIONS
B A S I C D E S I G N S T U D Y
ON
T H E P R O J E C T
FOR
THE REHABILITATION AND IMPROVEMENT OF LAHOUN REGULATOR
OF
BAHR YUSEF CANAL
IN
THE ARAB REPUBLIC OF EGYPT
(CONSULTATION ON DRAFT REPORT)

In May, 1994, the Japan International Cooperation Agency (JICA) dispatched the Basic Design Study team on the Project for the Rehabilitation and Improvement of Lahoun Regulator of Bahr Yusef Canal (hereinafter referred as "the Project") to the Arab Republic of Egypt, and through discussions, the field survey and the technical examination of the results in Japan, prepared the draft report of the study.

In order to present the draft report and to consult the Egyptian side on the components, JICA sent to the Arab Republic of Egypt a study team, headed by Dr. Kazuhiro Yoshii, Development Specialist, JICA, from October 1 to 10, 1994.

As a result of discussions, both parties have confirmed the main items described on the attached sheets.

Cairo, October 5, 1994

Dr. Kazuhiro Yoshii
Leader
Draft Report Explanation Team
JICA

Eng. Yehia Abd el Aziz
Project Director
Irrigation Improvement Project
Irrigation Department,
Ministry of Public Works and
Water Resources

Witnessed by:

Amb. Wahib El Miniawy
Advisor for the State Minister,
Ministry of International Cooperation

ATTACHMENT

1. Component of Draft Report

The Ministry of Public Works and Water Resources (MPWWR) agreed and accepted in principle the components of the Draft Report proposed by the team.

2. Japan's Grant Aid System

1) MPWWR has understood the system of Japan's Grant Aid as explained by the team.

2) The Government of the Arab Republic of Egypt will take necessary measures, as described in Annex I for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

3. Future Schedule

The team will prepare the Final Report in accordance with the confirmed items and send it to the Government of the Arab Republic of Egypt by the end of December, 1994.

4. Summary of Discussions

1) By November 4, 1994, MPWWR will submit to JICA a written confirmation of the availability of the area for construction of Lahoun Regulator, Giza and Hassan Wasef Intakes as well as that for temporary use for the construction. These areas are indicated in Drawing No.10 of the Draft Report.

2) The Japanese side requested that for the fiscal year 1995/96 MPWWR will budget the costs for land compensation, land leveling, electric power and water supplies, fencing, etc. provided that Grant Aid is extended by the Japanese Government.

K. Y.

3) The Japanese side requested that as of the fiscal year 1996/97 MPWWR will post one engineer, one mechanic, two workmen and one labor at the control building of Lahoun Regulator group. The Egyptian side indicated that MPWWR is staffed with sufficient personnel and would be able to assign operations and maintenance of the new facilities to existing employees. Thus, there will be no need to take additional budgetary measures for hiring such a new crew. The Japanese side will provide the crew with on-job training.

4) The Egyptian side requested further justification for selecting sluice vertical gate.

5) The Egyptian side requested rechecking of hydraulic bases for structures according to design criteria.

K.Y.

Annex I

RECOMMENDATIONS FOR UNDERTAKINGS BY THE GOVERNMENT OF THE ARAB REPUBLIC OF EGYPT IN CASE JAPAN'S GRANT AID IS EXTENDED TO THE PROJECT:

1. To secure and clear the sites necessary for the Project prior to commencement of the construction.

2. To construct the access to the site in better condition prior to the commencement of the implementation of the Project.

3. To provide facilities for distribution of electricity, water supply, drainage and other incidental facilities necessary for the Project.

4. To ensure prompt unloading, customs clearance of the goods for the Project at the port of disembarkation in the Arab Republic of Egypt and prompt internal transportation therein of the products purchased under the Grant Aid.

5. To secure, with respect to the supply of the products and services under the verified contracts, that Japanese nationals shall not be subjected to any customs duties, internal taxes and other fiscal levies which may be imposed in the Arab Republic of Egypt.

6. To accord Japanese nationals, whose services may be required in connection with the supply of the products and the services under the verified contracts, such facilities as may be necessary for their entry into the Arab Republic of Egypt and stay therein for the performance of their work in accordance with the relevant laws and regulations of the Arab Republic of Egypt.

7. To use and maintain properly and effectively all the facilities constructed and equipment purchased under the Grant Aid.

8. To bear all the expenses other than those to be borne by the Grant Aid, necessary for the execution of the Project.

K.Y.

APPENDIX 5. COUNTRY DATA

1994. 6.

Arab Republic of Egypt

1. General Index	
Country Name	Arab Republic of Egypt
Politic Body	Republic Government
Head of State	President Mohamed Mubarak
Date of Independent	February 28, 1922
Racial Structure	Eastern Hamitic 90%
Language	Arabic, English
Religion	Sunny Islam 94%
United Nation	Entry on October, 1945
World Bank / IMF	Entry on December, 1945
National Area	1,001,000 square kilometer
Population	59,586 thousand person (1993)
Capital City	Cairo
Main City	Cairo, Alexandria, Port Said
Labor	15 million person (1989)
Education System	
Population Density	55.0 person / km^2 (1992)
Population Growth Rate	2.3% (1993)

2. Economic Index		
Currency	Egyptian Pound (LE)	
Currency Exchange Rate	1 US$ = 3.38 LE	
Fiscal Year	July to June	
National Budget		
Annual Income	41,406 million LE (1991)	
Annual Expenditure	47,563 million LE (1991)	
Balance of International Payment	3,360 million $ (1992)	
Income from ODA	3,538 million $ (1992)	
Gross Domestic Product (GDP)	34,602 million $ (1992)	
GDP per Capita	610 $ (1991)	
GDP ratio per Industry	Agriculture	18.0%
	Manufacture and Mining	30.0%
	Service Industry	52.0%
Employment Structure	Agriculture	42.0%
	Manufacture and Mining	21.0%
	Service Industry	37.0%
Economic Growth Rate	0.3% (1992)	
International Trade		
Export	3,051 million $	
Import	8,245 million $	
Main Export Product	Crude Oil, Petrochemical Product, Cotton, Textile, Meet	
Main Import Product	Machine and Equipment, Food, Fertilizer	

Export to Japan	92 million $ (1992)
Import from Japan	584 million $ (1992)
Foreign Currency Holding	12,681 million $ (1994)
Foreign Currency Debt	40,431 million $ (1992)
Debt Return Ratio	15.4% (1992)
Inflation Ratio	19.5% (1992)

3. Meteorological Data (1937 ~ 1979, Cairo)

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec..	Mean
Maximum Temperature	18.0	21.0	24.0	28.0	33.0	35.0	36.0	35.0	32.0	30.0	26.0	20.0	28.1°C
Minimum Temperature	8.0	9.0	11.0	14.0	17.0	20.0	21.0	22.0	20.0	18.0	14.0	10.0	15.3°C
Mean Temperature	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0°C
Precipitation	5.0	5.0	5.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	3.0	5.0	29.0 mm

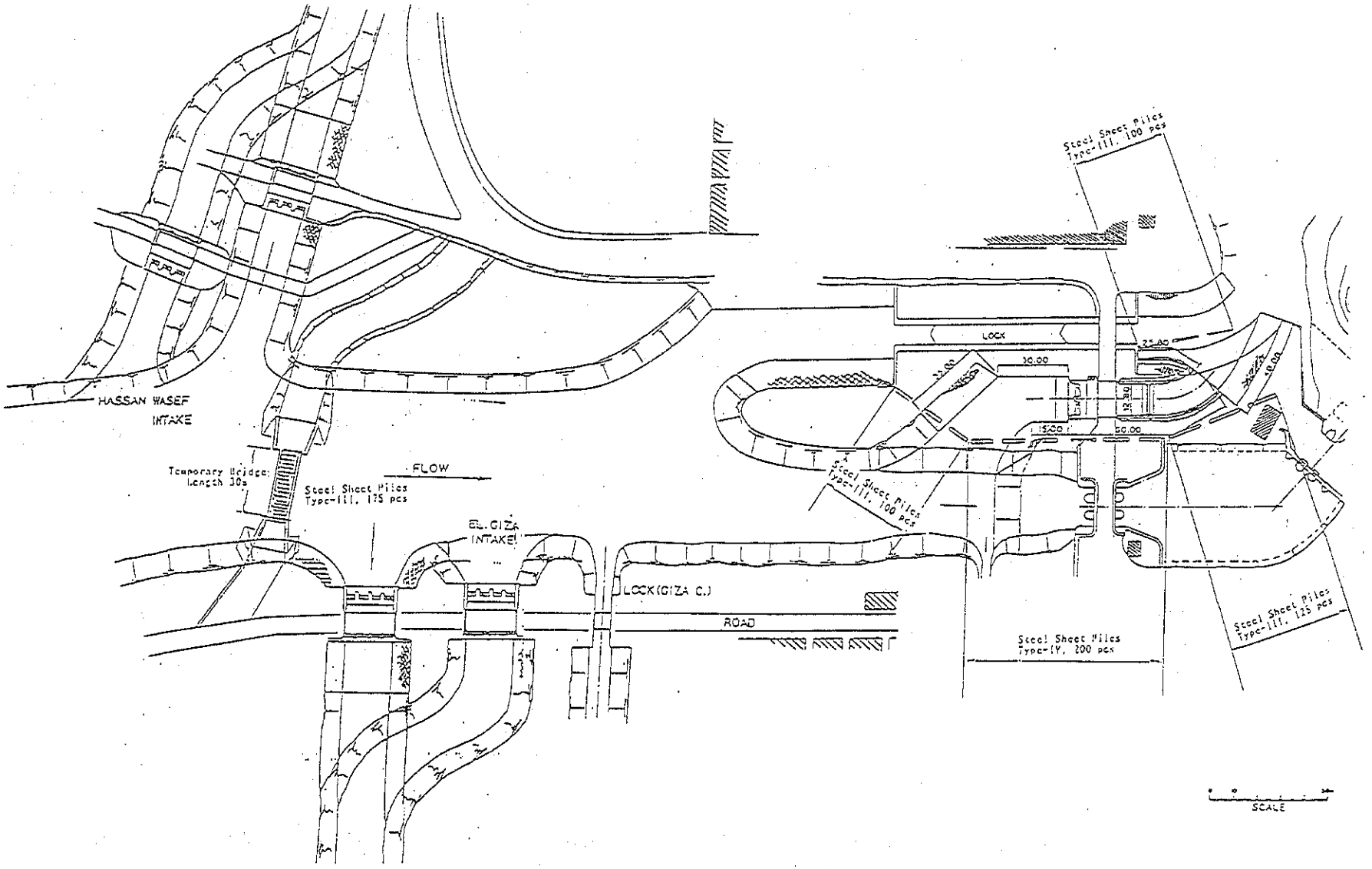
4. ODA Performance from Japan

(Unit: Million US$)

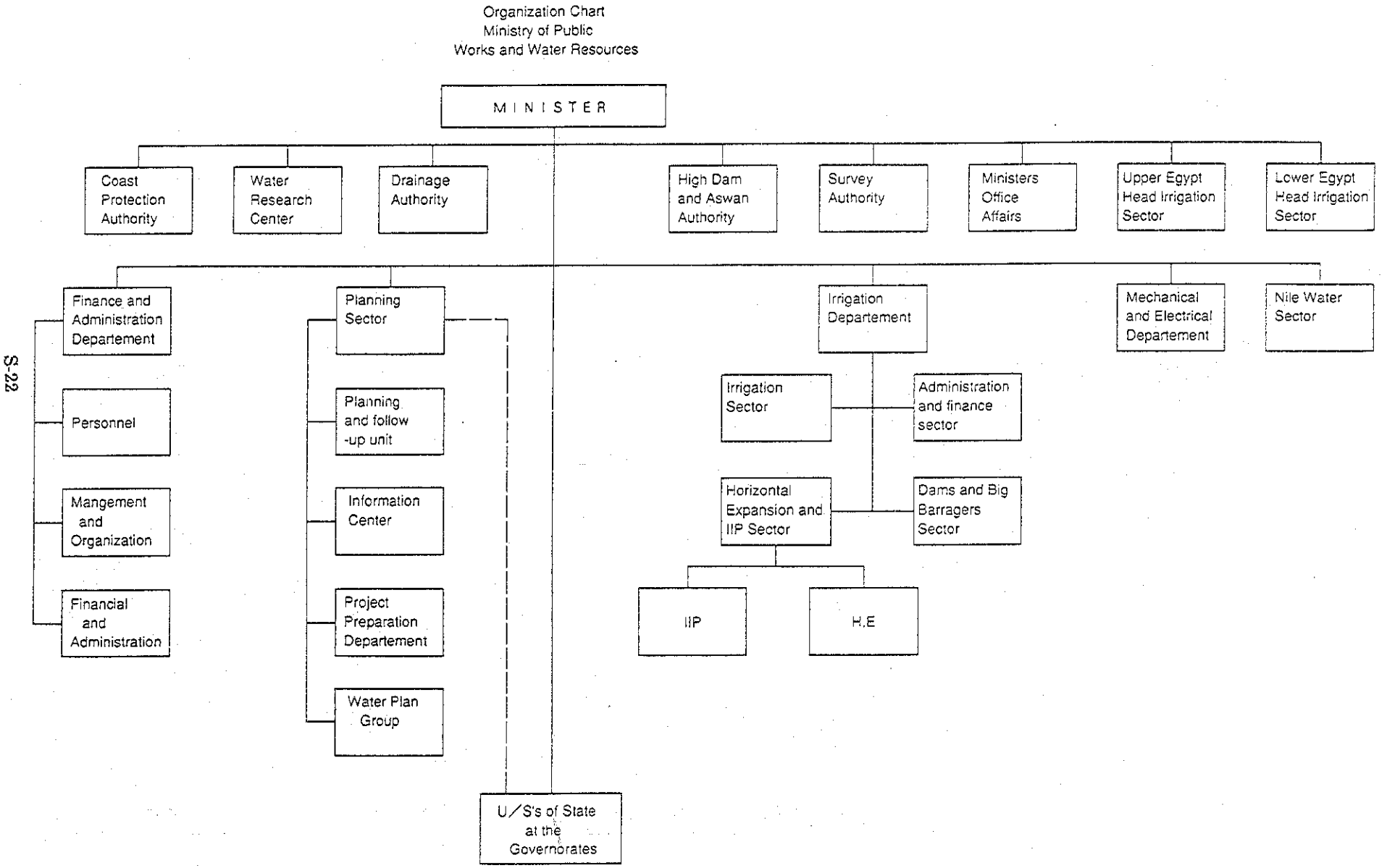
Description \ Year	1989	1990	1991	1992
Grant Aid	18.61	19.14	17.05	24.46
Technical Cooperatiion	32.99	45.28	23.99	44.16
Loan Assistance	27.05	34.44	578.53	41.97
Total	78.65	98.86	619.57	110.59

Reference: The World Factbook (C.I.A)
Human Development Report (UNDP)
International Financial Statistics (IMF)
World debt Tables (WORLD)
New World Handbook (Tokyo Publication)

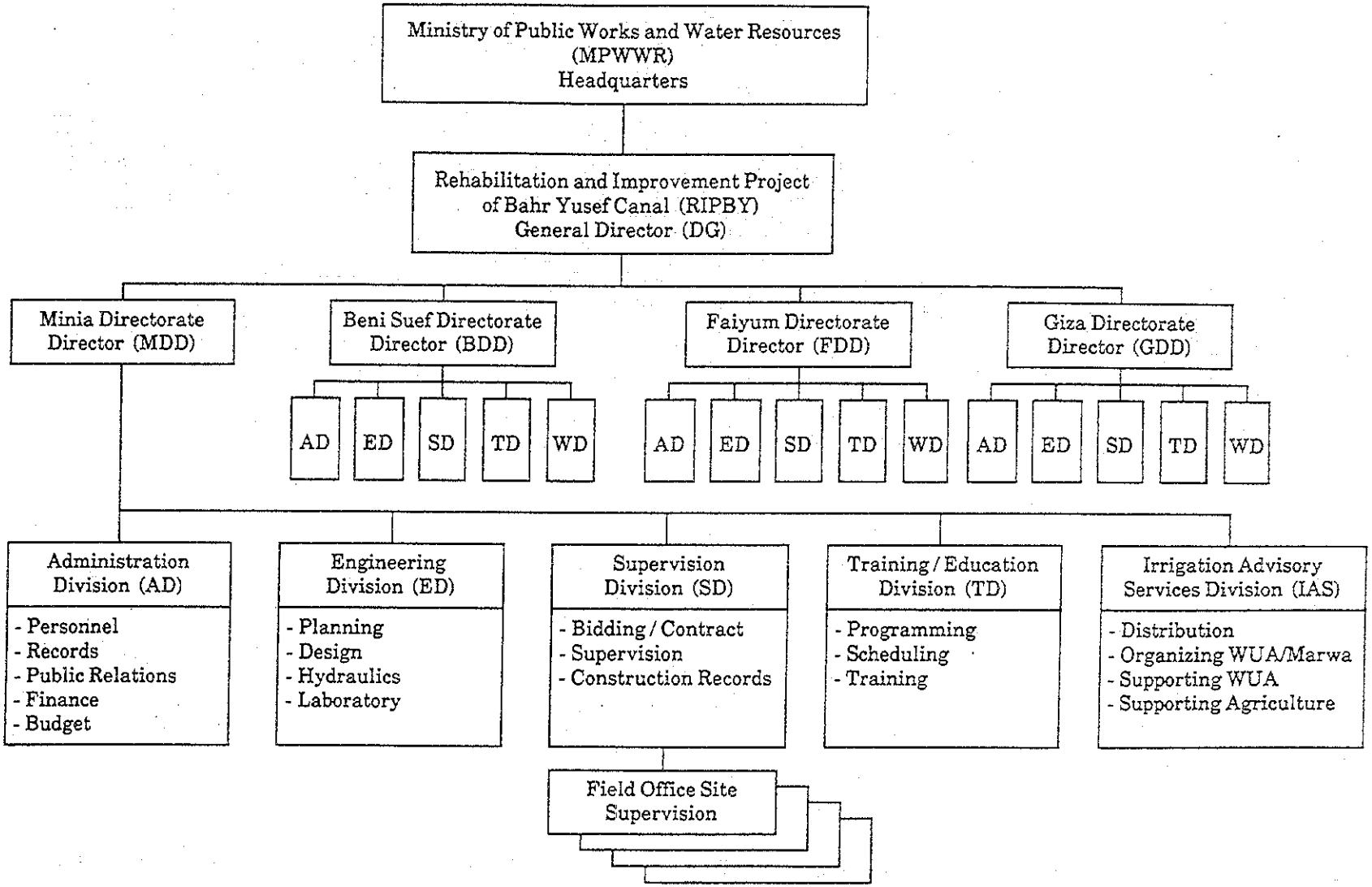
APPENDIX 6. REQUESTED LOCATION PLAN OF LAHOUN REGULATOR, HASSAN WASEF AND GIZA INTAKES



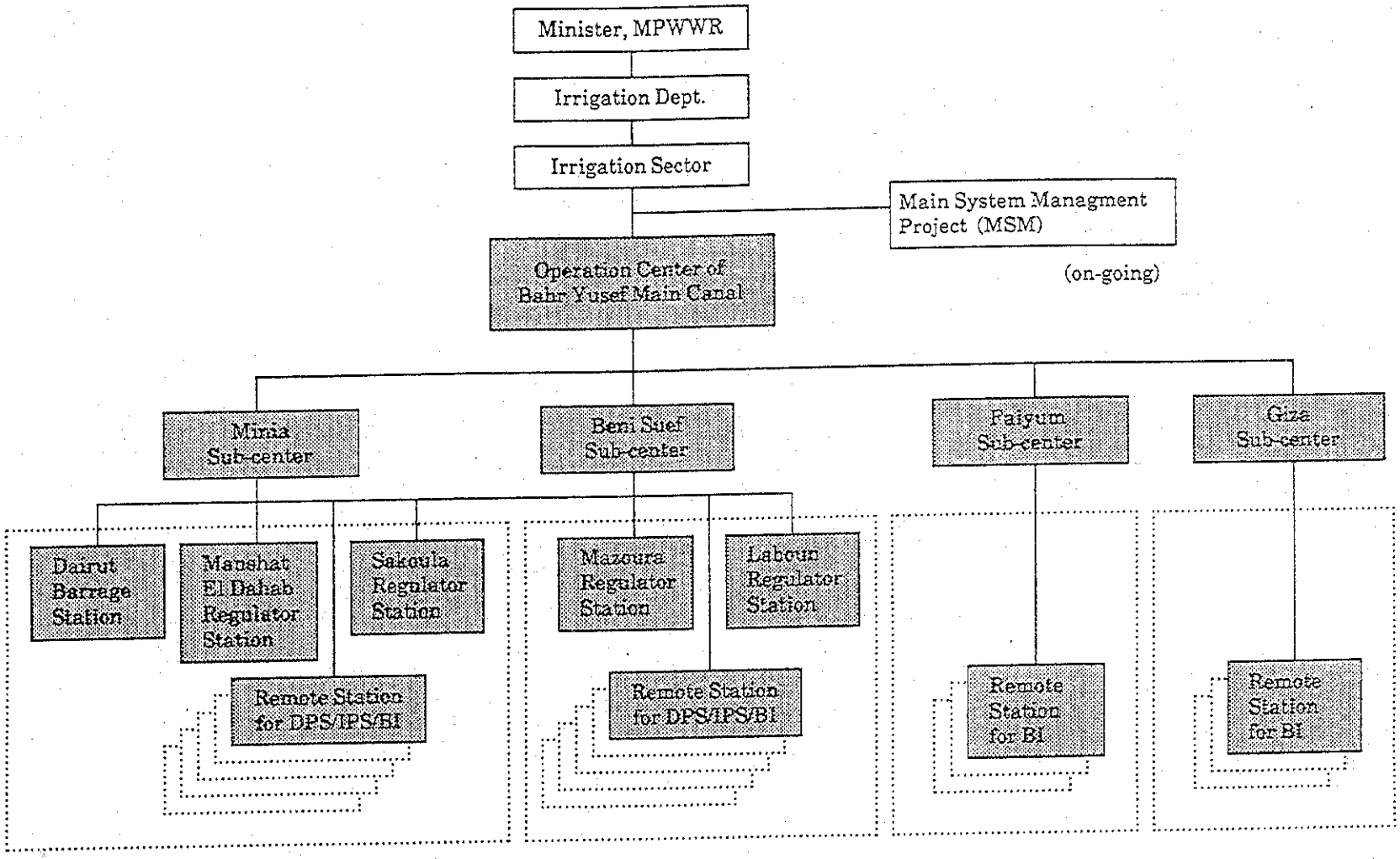
APPENDIX 7. ORGANIZATION CHART OF MINISTRY OF PUBLIC WORKS AND WATER RESOURCES



APPENDIX 8. ORGANIZATION FOR IMPLEMENTATION OF PROJECT



APPENDIX 9. PROPOSED ORGANIZATION STRUCTURE FOR OPERATION AND MAINTENANCE OF BAHR YUSEF CANAL SYSTEM



(IPS : Irrigation pump station, DPS : Drainage pump station, BI : Branch intake)

APPENDIX 10. COST ESTIMATION BONE BY THE EGYPTIAN GOVERNMENT

a) Cost of Land Compensation

- Compensation for crop	25,000 LE
- Data collection of land map & etc	7,000
- Boundary surveying	10,000
- Road signal installation for by-pass	18,000
Total	60,000 LE

b) Land Leveling

- Hassan Wasef Intake	
. Removal of existing tree & etc.	7,836 LE
. Arrangement of existing water supply pipe and electrical line	4,764
Sub-total	12,600 LE
- Lahoun regulator	
. Removal of tree and plants	16,878 LE
. Demolish of existing house and wall	23,215
. Arrangement of existing Water supply pipe and electrical line	26,967
Sub-total	67,000 LE
- EL Giza Intake	
. Land leveling	6,834 LE
. Arrangement of existing water supply pipe and electrical line	5,566
Sub-total	12,400 LE
Total	92,000 LE

c) Introducing charge of electrical & water supply line

Water supply line	7,000 LE
Electrical line	60,000
Total	67,000 LE

d) Fencing works for facilities

- Fence for control building		50,400 LE
- Gate for control building	2 units	16,000
- Fence for park area		47,400
- Entrance to park	2 units	20,000
- Exit at regulator & intakes	3 units	6,200
Total		140,000 LE

e) Accessories for control building, curtain and etc. 26,000 LE

f) Miscellaneous 3.75 % 15,000 LE

Total a) to f) 400,000 LE

APPENDIX 11. ANNUAL OPERATION AND MAINTENANCE COST

a) Staff expenses

Resident engineer	2,000LE/month×12month=	24,000	LE
Technician	600LE/month×12month=	7,200	
Gate keeper	450LE/month×12month×2=	10,800	
Office boy	300LE/month×12month×1=	3,600	
Labor (part time)	10LE/man×120man=	1,200	
Total		46,800	LE
		≒ 47,000	LE

b) Checker and repairman

Carpenter	5men×12month×25LE=	1,500	LE
Labor	15men×12month×10LE=	1,800	
Materials-paint, oil, lubricating oil, etc =		2,700	
Total		6,000	LE

c) Removal of water weeds and trash

Pick-up & ship charge	500LE×2time×12month=	12,000	LE
Labor and driver	10×40LE×12month=	4,800	
Total		16,800	LE

d) Dredging & canal cleaning

Dragline	196LE×8hr×110%×48day=	82,790	LE
Labor	10LE×2man×48day=	960	
Dump track	89LE×8hr×110%×48day=	37,593	
Total		= 121,343	LE
		≒ 122,000	LE

e) Supply of Lubricating oil and etc. for gate facilities

Technician	2man×3day×25LE=	150	LE
Materials	Lamp Sun=	4,500	
Total		4,650	LE
		≒ 5,000	LE

f) Re-painting and repair of damage parts in five years cycle.

Truck crane 16ton	105LE×7hr×2day×110%=		23,247	LE
Labor	10LE×4man×4day=		160	
Painter	25LE×2man×4day=		200	
Mechanician	35LE×1man×4day=		140	
Pick-up	300LE/day×4day×110%=		1,320	
Paint materials	22.5LE×150m^2×110%=		3,712	
Oil and others	Lamp Sum	=	2,000	
Spare parts	Lamp Sum	=	5,000	
Total			35,779	LE
		≒	36,000	LE/5 years
	36,000LE/5 years×3 facilities=		21,600	LE/year

Total of anual cost=218,400 LE/year