

APPENDIX 4

MINUTES OF DISCUSSIONS

**MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY
IN
THE ARAB REPUBLIC OF EGYPT**

In response to the request of the Government of the Arab Republic of Egypt, and based on the results of the preliminary study for the Project of the Water Supply and Sewer System Upgrading in Monib, Giza City (hereinafter referred to as "the Project"), Japan International Cooperation Agency (JICA) decided to implement a basic design study and sent the study team headed by Mr. Haruo IWAHORI, Team Leader, JICA to the Arab Republic of Egypt from November 24 to December 25, 1991.

The team had a series of discussions with the authorities concerned of the Government of the Arab Republic of Egypt and conducted a field survey in the Project site.

As a result of the discussions and the field survey, both parties have agreed to recommend to their respective Governments the main items described on the attached sheets.

The team will proceed to the works and prepare the Basic Design Study Report.

Giza, December 15, 1991

岩 堀 春 雄

Mr. Haruo IWAHORI
Leader
Basic Design Study Team
JICA

Fouad

Mr. Fouad KHALIL
Mayor of Giza City

Witnessed by:

M. Mohamed Sadek

Mr. Mohamed Sadek
Director of Japan Department
Ministry of International Cooperation

ATTACHMENT

1. Objective

The objective of the Project is to upgrade the present conditions of both water supply and sewer system in Monib, Giza City in order to improve the living standards of the low income group of inhabitants in the area.

2. Project Site

The Project site is Monib, Giza City, Giza Governorate, the location of which is shown in Annex-I.

3. Responsible and Executing Organization

- Responsible and Coordinating Organization for the Project:
Giza Governorate

- Executing Organization of the Project:
Giza City

4. The Project Components

The following items were requested by the Government of the Arab Republic of Egypt. However, final items will be decided after further studies.

- (1) Construction of sewer main line
 - Dia 1,600 mm to 2,000 mm : Approx. 1.8 km
- (2) Material provision of sewer branch line
 - Dia less than 300 mm : Approx. 20 km
 - Dia 300 mm to 600 mm : Approx. 4.5 km

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- (3) Material provision of water supply branch line
- Dia less than 300 mm : Approx. 20 km
- Dia 300 mm to 500 mm : Approx. 4.7 km
(Construction for railway crossing point will be implemented by Japanese side.)

5. Japan's Grant Aid System

- (1) Giza Governorate has acknowledged the system of Japan's Grant Aid explained by the team.
- (2) The Government of the Arab Republic of Egypt will take the necessary measures described in Annex-II for smooth implementation of the Project, on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

6. Schedule of the Study

- (1) JICA will prepare draft report in English and despatch a mission to the Arab Republic of Egypt in order to explain its contents in April, 1992.
- (2) In case that the contents of the report are accepted in principle by the Government of the Arab Republic of Egypt, JICA will complete a final report and send it to Egypt by July, 1992.

7. Required Assistance from Giza Governorate in case Japan's Grant is executed:

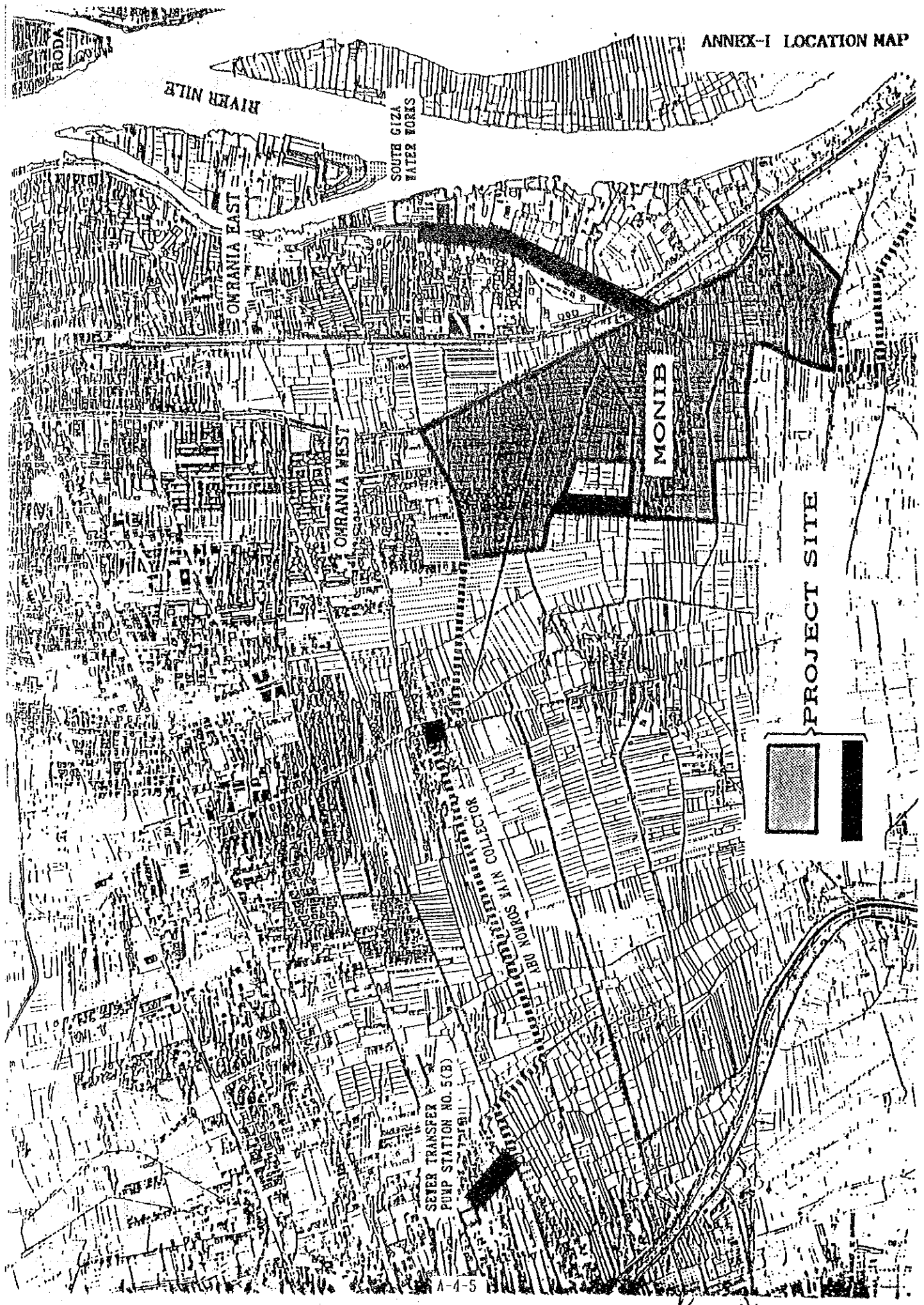
- (1) to secure land for water supply and sewer system and other related facilities.
- (2) to provide temporary land for a construction liaison office, warehouse, stockyard, jacking pit plant, etc., during the construction period.
- (3) to provide necessary data and information for detailed design.

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These data and information are not eligible to be delivered to third parties or brought to their notice unless there is a written consent by Giza Governorate.

- (4) to give permission required for test pitting to check underground services at the time of detailed design, if necessary.
- (5) to take necessary actions to expedite the approval for executions of the Project by Giza Governorate.
- (6) to give permission required for all the works related to the Project, e.g., opening of manholes, entering into railway and canal lot, surveying on the road, etc.
- (7) to witness and confirm by the authorities concerned when test pitting and, protection and relocation of services are carried out.
- (8) to take necessary measures for inhabitant's cooperation and traffic control.
- (9) to take necessary measures for historical remains which may be encountered during the construction period, if any.
- (10) to provide disposal places of the water including silt, clay, etc., discharged during the construction period.
- (11) to secure suspension of water supply during the connection works of the proposed water supply trunk line and the existing line.
- (12) to form a steering committee in Giza City to expedite the Project.

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ANNEX-II Recommendations for Undertakings by the Government of the Arab Republic of Egypt in case Japan's Grant is executed:

1. to undertake incidental outdoor works such as gardening, fencing, gates and exterior lighting in and around the site.
2. to construct the access road to the site prior to the commencement of the construction.
3. to provide facilities for distribution of electricity, water supply, telephone, drainage and other incidental facilities to the Project site.
4. to ensure prompt unloading and customs clearance at ports of disembarkation in the Arab Republic of Egypt and internal transportation therein of the products purchased under the Grant.
5. to secure, with respect to the supply of the products and services under the verified contracts that Japanese nationals shall not be subject 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 services under the verified contract such facilities as may be necessary for their entry into 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 maintain and use properly and effectively the facilities constructed and equipment under the Grant.
8. to bear all the expenses other than those to be borne by the Grant, necessary for the execution of the Project.

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY ON THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB,
GIZA CITY
IN
THE ARAB REPUBLIC OF EGYPT
(CONSULTATION ON DRAFT REPORT)

In November 1991, Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for the Water Supply and Sewer System Upgrading in Monib, Giza City (hereinafter referred to as "the Project"), to the Arab Republic of Egypt, and through discussions, field survey, and technical examination of the results in Japan, has prepared the draft report of the study.

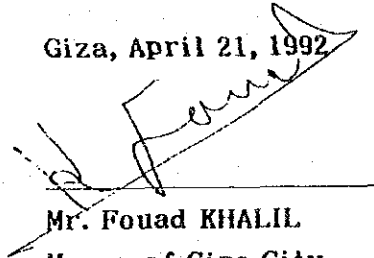
In order to explain and to consult the Egyptian side on the components of the draft report, JICA sent to Egypt a Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Haruo IWAHORI, development specialist of JICA, and is scheduled to stay in the country from April 15 to 23, 1992.

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

岩堀嘉雄

Mr. Haruo IWAHORI
Leader
Draft Report Explanation Team
JICA

Giza, April 21, 1992


Mr. Fouad KHALIL
Mayor of Giza City

ATTACHMENT

1. Components of Draft Report

Giza Governorate has acknowledged and accepted in principle the components of the Draft Report proposed by the Team as stated in "MEMORANDUM ON DRAFT REPORT" signed on the same day.

2. Japan's Grant Aid system

Giza Governorate has acknowledged the system of Japanese Grant Aid explained by the Team.

3. Further schedule

The Team will make the Final Report in accordance with the confirmed items, and send it to Giza Governorate by the end of June 1992.

4. Recommendations for undertakings by Giza Governorate in case Japan's Grant Aid is executed

Giza Governorate agreed to request the related authorities to take the following measures for successfully accomplishing the objectives of the Project and for maximizing the positive effects of the Project.

Prior to project implementation

- (1) To ascertain the will of beneficiaries to pay a water charge after completion of the Project in order to secure a continuous revenue flow to cover the operation and maintenance expenses of the new facilities.
- (2) To obtain the agreement of local inhabitants not to dispose of vinyl objects, cloth, paper, etc., into the sewer facilities through enlightenment to local inhabitants, to maintain their proper functioning and to reduce the operation and maintenance expenses.

- (3) To conduct public relations activities in order to secure cooperation for the construction work, especially 24 hours/day working, possible traffic jams and construction noise, etc.
- (4) To secure the necessary budget for the work to be undertaken by Giza Governorate.
- (5) To establish the Project Steering Committee in order to secure the smooth implementation.
- (6) To obtain the official permission for the sewer trunk line, water supply and sewer branch lines (diameter 300-600mm) which will be buried under the existing road.
- (7) To take necessary measures to the "feedback of evaluation results" as stated in 3-4-3-(8) of the Draft Report.

During project implementation

- (8) To appoint several full-time engineers at the initial stage of Project implementation with a view to improving their expertise which will enable them to be responsible for the plan, construction, operation and maintenance of water supply and sewer facilities, to learn the technical aspects of the Project for the maintenance work in the future.
- (9) To ensure that the materials provided by the Japanese side are used for their original purposes.

After completion of project

- (10) To secure adequate budget of operation and maintenance for the facilities by surely collecting the water service charge based on (1) above.
- (11) To take the necessary measures to transfer the property of the new facilities to GCWSA and GOSD.
- (12) To ensure that GCWSA and GOSD conduct the operation and maintenance of the transferred facilities in a responsible manner.
- (13) To maintain regular contact with the Fire Department to ensure the proper functioning of fire hydrants in order to create an urban environment in which the lives and assets of local inhabitants are protected.

MEMORANDUM ON DRAFT REPORT
BASIC DESIGN STUDY ON THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB,
GIZA CITY
IN
THE ARAB REPUBLIC OF EGYPT

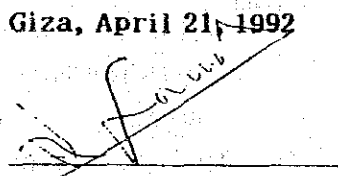
With regard to the Project for the Water Supply and Sewer System Upgrading in Monib, Giza City (the Project), the Draft Report Explanation Team of JICA (the Team) has explained and consulted the Egyptian side on the components of the draft report of the Project. As a result of the explanation by the Team and discussions with the related authorities, the Egyptian side has acknowledged and accepted in principle the components of the draft report.

The Egyptian side and the Team confirmed that the report of the Basic Design Study of the Project will be finalized in Japan taking into account the items attached in the Annex and the final report will be submitted officially to the Egyptian side by the end of June, 1992.

Giza, April 21, 1992

岩堀春雄

Mr. Haruo IWAHORI
Leader
Draft Report Explanation Team
JICA


Mr. Fouad KHALIL
Mayor of Giza City

Annex : Confirmation and Modification on Draft Report

1. Confirmation on Draft Report

The Egyptian side and the Team have discussed the draft report and the Egyptian side has accepted the components of the draft report as stated in the letters, attached herewith, from the related authorities (Greater Cairo Water Supply Authority and Greater Cairo General Organization for Sanitary Drainage) to Giza City.

2. Modification on Draft Report

Following revisions are taken into account for the finalization of the Basic Design Study Report.

2.1 Page 71 in Draft Report, 4-3-5-(1)

In the sub-section 4-3-5 "Operation and Maintenance Plan", item (1) "Securing Operation and Maintenance Cost Through Water Charge System" will be substituted by the following.

(1) Securing Operation and Maintenance Cost through Water Charge System

The Government of Egypt is required to urgently improve the poor living and sanitation conditions in the Project Site to meet the expectations of local inhabitants and to conduct appropriate operation and maintenance of the new facilities to ensure their long, undistrupted service. It will be essential to continuously secure the necessary cost for such operation and maintenance and the collection of an appropriate water charge with the full understanding of local inhabitants of the necessity for such collection will be necessary.

In this connection, the Government of Egypt is required to take the following actions.

- 1) As described earlier in 2-2-2-3), GCWSA will be required to make efforts to improve the financial situation by implementing the water tariff readjustment plan through the examination of the water tariff that more nearly reflect the costs of producing and distributing the potable water.
- 2) GCWSA will be required to make efforts to collect the water tariff from each household and public facility without fail as well as to promote the installation of water meter on each household and public facility through investigating whether the meters are adequately provided.

- 3) GOSD will be required to have a consultation with GCWSA for "improvement of water metering system to establish the wastewater quantities to be paid for" as recommended in the draft of SYSTEM MANAGEMENT PLAN for GOSD (October, 1989) and thereby reconsider the surcharge on the water tariff which is assessed for wastewater service and used for the maintenance and operation work of the wastewater system.

2.2 Pages A-7-1 and A-7-2 in Draft Report, APPENDIX 7

The estimated cost for the work to be undertaken by the Egyptian side shown in APPENDIX 7 will be calculated in the Egyptian pound (LE) which is now expressed in US dollar (US\$).

2.3 Pages 141 to 145 in Draft Report

Drawing No. EMU-S-04

Invert levels of the sewer trunk line shown in the drawing No. EMU-S-04 shall be as follows.

- ROUTE 2 : to be revised from 21.65m to 11.65m at Manhole No.5
- ROUTE 3 : to be revised from 13.33m to 13.35m at Manhole No.14

Drawing Nos. EMU-S-05 and S-06

- Two openings shall be provided on the top slab of each manhole and inner diameter of the openings shall be 60cm and 76cm.
- The depth of the riser for opening shall not be more than 50cm.

(نوفج ٢٠٢٢ م)

بسم الله الرحمن الرحيم

”وجعلنا من الماء كل شيء حي“

مدن الله العظيم

الهيئة العامة
لمرفق مياه القاهرة الكبرى

مكتب رئيس مجلس الإدارة



الامر في ١٢/٤/١٩٩٢

رقم

١٩٩٢

السيد الامتاذ / رئيس مدينة الجيزة

محافظة الجيزة

مكتب وكيل اول الوزارة - رئيس المدينة

تحية طيبة وبعد

بالاشارة الي كتابكم بتاريخ ١٩٩٢/٤/٨ والمرفق معه مسودة التقرير المبدئي الخاص
بالدراسات والتصميمات لمشروع شبكة التوزيع بالمياه وشبكة الصرف الصحي لمحافظة
المنيا بمدينة الجيزة .

تأسل الاحاطه بأنه قد تمت مراجعة التقرير المرفق والهيئة ليس لديها أية ملاحظات
من النواحي الفنية بخمسة عشر من شهر يونيو حيث سبق التنسيق مع فريق البحث الياباني
اتناء اعداد هذا التقرير .

وتفضلوا بقبول افسر الاحترام .

رئيس مجلس الإدارة

مهندس محمد الدين محمد حسن الديب

أ.ح

GREATER CAIRO WATER SUPPLY AUTHORITY

Giza Mayor

Dear sir,

With reference to your letter dated 8/4/1992 to which the Draft Report on the Basic Design on the Project for the Water Supply and Sewer System Upgrading in Monib in Giza City. We would like to inform you that this report has been studied and the Authority has no technical comments on the water project as the authority had organized the work with the Japanese side during the preparation of the report.

Best regards.

Chairman,

Eng. Saad El-din Mohamed Hassan El-Dieb



القيود : ٧١٠٤٥

التاريخ : ١٩٩٢ / ٤ / ١٨

المرفقات :

السيد الاستاذ / رئيس مدينة الجيزة

تحية طيبة .. وبعد

ردا على خطاب سيادتكم رقم (بدون) بتاريخ ٩٢/٤/٨ والمرفق به التقرير المبدئي الخاص بمشروع شبكة الصرف الصحي لمنطقة العنيب وبعض اجزاء مجمع ابو النعس التي سيتم تنفيذها بالانفاق . وبناء على الخطاب المقدم للهيئة العامة لمرفق الصرف الصحي للقاهرة الكبرى من مندوب البعثة اليابانية بتاريخ ١٩٩٢/٤/١٨ .

رجاء التفضل بالاحاطه بأن الهيئة توافق على التقرير المبدئي المقدم على أن نوافي برسومات تفصيلية للمشروع للمراجعة والاعتماد مع موافقتنا ببيعاد التنفيذ للمشروع لتحديد جهاز الاشراف من الهيئة كذا فإن الهيئة ستأخذ في اعتبارها ما جاء من ملاحظات بالتقرير المرفق بخصوص أعمال الصيانة لمحطة الصداقه اليابانية . ونفضلوا بقبول فائق الاحترام ...

التوقيع :
٤١٩

مهندس / احمد عبدالمقصود السيد

رئيس مجلس الإدارة

آمال ...

GENERAL ORGANIZATION CAIRO SANITARY DRAINAGE UTILITY

No. 1045

Date : 20/4/1992

Giza Mayor

Dear sir,

With reference to your letter dated 8/4/1992 to which the Draft Report on the Basic Design on the Project for the Water Supply and Sewer System Upgrading in Monib in Giza City, and with reference to the letter from the Japanese mission to Cairo Sanitary Drainage Organization dated 18/4/1992. We would like to inform you the authority approves the said report provided that we can be supplied with detailed drawings of the project for revision and verification and to inform us of the execution date to designate supervising staff from the authority, in addition to that the authority will consider the comments in the report regarding maintenance work of the Japanese Friendship Station.

Best regards.

Eng. Ahmed Abdel Maksoud
Chairman

APPENDIX 5

FIELD REPORT



JAPAN INTERNATIONAL COOPERATION AGENCY
THE BASIC DESIGN STUDY TEAM OF THE PROJECT FOR THE
WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB,
GIZA CITY IN THE ARAB REPUBLIC OF EGYPT

THE BASIC DESIGN STUDY
ON

THE PROJECT FOR

THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY

IN

THE REPUBLIC OF EGYPT

December 24, 1991

Mr. Fouad Khalil
Mayor
Giza City

Re : The Project for the Water Supply and Sewer System Upgrading in
Monib, Giza City

Sub: Submission of Field Report

FIELD REPORT

Dear Sir,

With regard to the captioned project, in accordance with the inception report prepared by the basic design study team, we, as the consultant team of the basic design, submit herewith three (3) copies of the field report which shows the basic technical concept of the Project.

As mentioned in the field report, we have already submitted and explained relative section in the report to the authorities concerned with your official.

Therefore, you are kindly requested to inform us of your comment by the beginning of January, 1992, if any.

We thank you for your kindness and deepest cooperation extended to us during our stay in Egypt.

Yours very truly,

Kyosuke Teranishi
Leader of Consultant Team of
JICA Basic Design Study Team

CONSULTANT TEAM OF BASIC DESIGN STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

DECEMBER, 1991

TABLE OF CONTENTS

1. Introduction

This report has been prepared unofficially by the consultant team of basic design study (hereinafter referred to as "the consultant team") for the Project for the Water Supply and Sewer System Upgrading in Monib, Giza City in the Arab Republic of Egypt (herein after referred to as "the Project"), based on the field survey and discussions with authority concerned of the Government of Egypt, in order to build mutual understanding and to prevent misunderstanding of the Project.

However, all the items in the basic concept are subject to the approval of the Japanese Government, and some items in this report may be modified based on the result of the further study in Japan.

2. Required Conditions for Construction Work

For the construction work, the following items shall be required in order to make smooth implementation of the Project.

2.1 Temporary construction work

(1) Provision of temporary land owned by Giza Governorate for construction with the following space:

- For temporary yard including site office, warehouse, etc. : Approx. 2,500m² (1 place)

- For stock yard : Approx. 3,600m² (1 place)

(2) Provision of disposal places of the water including salt, clay, etc., discharged during the construction period.

The transportation distance from the Project site to the disposal places shall be as follows:

1. Introduction

2. Required Conditions for Construction Work

3. Materials of Branch Lines

4. Field Report submitted to the authorities concerned

4.1 Conceptual Plan of Water Supply Pipeline

4.2 Conceptual Plan of Aqueduct over El Zomor Canal for Water Supply Pipe Line

4.3 Conceptual Plan of Jacking Method at the State's Railway Crossing for Water Supply Pipe Line

4.4 Conceptual Plan of Sewer Pipe Line

4.5 Preliminary Plan of the expansion of Giza South Waterworks

- For dumping yard for the disposal of surplus soil from excavation work : Approx. 15km
- For disposal place of the removal of groundwater from excavation work : within the project site (Canal)

2.2 Origin of the materials to be used for the Project

We are planning to use, for the most part, the construction materials and equipment available in the Greater Cairo region.

However, some construction materials and equipment are not available by the following reasons:

- They are not in Greater Cairo region.
- It is very difficult to get them in Greater Cairo region.
- It is doubtful to maintain the desired safety and quality of facilities to be constructed and/or the construction schedule.

Therefore, the following materials and equipment shall be transported from Japan.

To avoid any trouble and/or delay for the Project, necessary measures on the import and transportation of the materials and equipment into Egypt shall be taken by Giza City for Japanese Contractor.

Plan of the materials and equipment to be imported from Japan

- (1) Jacking machine and ancillary equipment
- (2) Vibro hammer of vibration free
- (3) Centrifugal reinforced concrete pipes for intermediate jacking
- (4) Ancillary materials of reinforced concrete pipes, e.g., connection materials and rubber materials for jacking method

- (5) Ductile cast iron with flanges in the part of state's railway crossing
- (6) All fittings of ductile cast iron pipes, e.g., bend and valves for water supply pipe lines
- (7) Sheet piles and ancillary steel materials for jacking method
- (8) Liner plate and ancillary steel materials for jacking method
- (9) Grouting materials and machine for soil stabilization and so on

2.3 Working hour for the construction work

In order to keep the construction schedule which is very tight, the jacking work for the piping installation shall be executed for about 24 hours per day by conducting two or three shift system, if necessary.

To avoid any trouble and/or delay for the Project, necessary measures on the work shall be taken by Giza City for Japanese Contractor.

3. Materials of Branch Lines

The piping materials of branch lines for water supply and sewer drainage shall be supplied by Japanese side under this Project provided that Giza City installs all the materials.

The following materials shall be adopted for this purpose:

- (1) Water supply branch lines
 - For pipeline with diameter 300 to 600mm : Ductile cast iron pipe
 - (2) Sewer branch lines
 - For pipeline with diameter less than 300mm : Asbestos cement pipe
- For all the branch lines : Vitrified clay pipes

[FIELD REPORT]

THE BASIC DESIGN STUDY
ON
THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY
IN
THE REPUBLIC OF EGYPT

4. Field Report submitted to the authority concerned

As described in the previous Section 1 "Introduction", in order to build mutual understanding and to prevent misunderstanding of the Project, we have submitted the field report to the authority concerned.

The list of the authority concerned which we have submitted the report is given below. The reports submitted to the authority are attached herewith.

<u>Sec. No.</u>	<u>Title of Report</u>	<u>Name of Authority</u> (Received official)	<u>Date of Submission</u>
4.1	Conceptual Plan of Water Supply Pipe Line	GCWSA (Secretary of Chairman)	December 22, 1991
4.2	Conceptual Plan of Aqueduct over El Zomor Canal for Water Supply Pipe Line	Giza Irrigation Authority (Mr. Mostafa Nada General Manager)	December 22, 1991
4.3	Conceptual Plan of Jacking Method at State's Railway supply pipeline	GCWSA (ditto) Egyptian State Railway (Mr. Mohamed Marei General Manager of Railway Engineering Department) GCWSA (ditto)	December 22, 1991
4.4	Conceptual Plan of Sewer Pipeline	GOSD (Secretary of Chairman) CWO (Secretary of Vice Chairman)	December 23, 1991 December 22, 1991
4.5	Preliminary Plan of the Expansion of Giza Waterworks	GCWSA (Ditto)	December 22, 1991

CONCEPTUAL PLAN
OF
WATER SUPPLY PIPELINES

DECEMBER, 1991

CONSULTANT TEAM OF BASIC DESIGN STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

Conceptual Plan of Water Supply Pipelines

1. General

1.1 General conditions

Following general conditions of basic design have been confirmed through the data and information obtained by Giza city, The Greater Cairo Water Supply Authority (GCWSA) and other related authorities during the field survey as well as the discussion with GCWSA.

(1) Project area	: Monib , Giza City
(2) Served area	: 185 ha
(3) Population	
-at 2010	: 247,000
-at present	: 133,000
(4) Average water demand	: 140 lit/day/cap.

1.2 Route plan

The route, diameter and connection points of water supply pipelines for this project shall be compiled with the master plan, "STUDY OF WATER SUPPLY FOR CITY OF GIZA", prepared by GKW in 1987.

The route and diameters of water supply pipelines are shown on the attached Fig.WS-1.

2. Scope of work

Pipeline materials are to be provided by the Japanese side and the pipe laying work shall be done by the Egyptian side except the railway crossing part constructed by Japanese side. Please refer to Part B, "CONCEPTUAL PLAN OF JACKING METHOD AT THE STATE'S RAILWAY CROSSING FOR WATER SUPPLY PIPELINE".

3. Material

3.1 Straight pipe

Material of straight pipe for water supply pipelines shall be ductile cast iron pipes made in Egypt except all fitting, valves and accessories.

3.2 Fitting, valves and Accessories

All fittings, valves and accessories will be transported from Japan.

4. Major basic design conditions of ancillary equipment and pipes for water supply pipelines

Major basic design conditions of ancillary equipment and pipes for water supply pipelines as follows:

4.1 Joints of Pipe

Pipes shall be connected by T-shape joints(push - on joint) except the following cases.

- Pieces inside the water stop valve chambers which shall be connected by flange joints.

- Pieces between jacking pit and receiving pit in the railway crossing part which shall be connected by flange joints.

Valves shall be connected by flange joints.

4.2 Standard earth covering

Standard earth covering shall be approx. 1.2 m.

4.3 Water stop valves

(1) Butterfly valve shall be installed on pipes of not less than 400 mm in diameter.
Please refer to Fig.WS-2.

- (2) Sluice valve will be installed on those of less than 400 mm in diameter.
Please refer to Fig.WS-3.
- (3) Water stop valves shall be installed at the aqueduct,railroad crossing ,washout pipes and the connecting points of pipelines.
- (4) Ductile cast pipes with paddle installed through the walls shall be used.
- (5) Flexible joints before and after valve chamber shall be used.
- (6) An expansion joint shall be used for valve maintenance works in the chamber.

4.4 Washout facilities

- (1) Washout facilities shall be installed at certain lower parts in the water supply pipelines and located near canal.
- (2) The diameters of washout pipes shall be of 150 mm or 100 mm.
- (3) When the water surface of outflow at discharge places is higher than the bottom of the pipe, drainage chamber should be provided.
Please refer to Fig.WS-4.

4.5 Air Valve

- (1) Air valves shall be installed at certain convex parts in water supply pipelines such as aqueduct.
- (2) Dual mouthed air valves shall be installed on water supply pipelines of not less than 400 mm in diameter.
Please refer to Fig.WS-5.

- (3) Single mouthed air valves shall be installed on water supply pipelines of less than 400 mm in diameter.
Please refer to Fig.WS-6.

4.6 Fire Hydrant

- (1) Fire hydrants shall be installed at the intervals of Approx.150 meters as shown on Fig.SW-1 and/or be installed at some points where fire fighting activities is convenient.
- (2) Single jet hydrant shall be installed on header pipeline of not less than 150 mm and less than 300 mm in diameter.
Dual jet hydrant shall be installed on header pipeline of not less than 300 mm in diameter.
- (3) Typical plans of Fire hydrants are shown on Fig.SW-7 and Fig.SW-8.

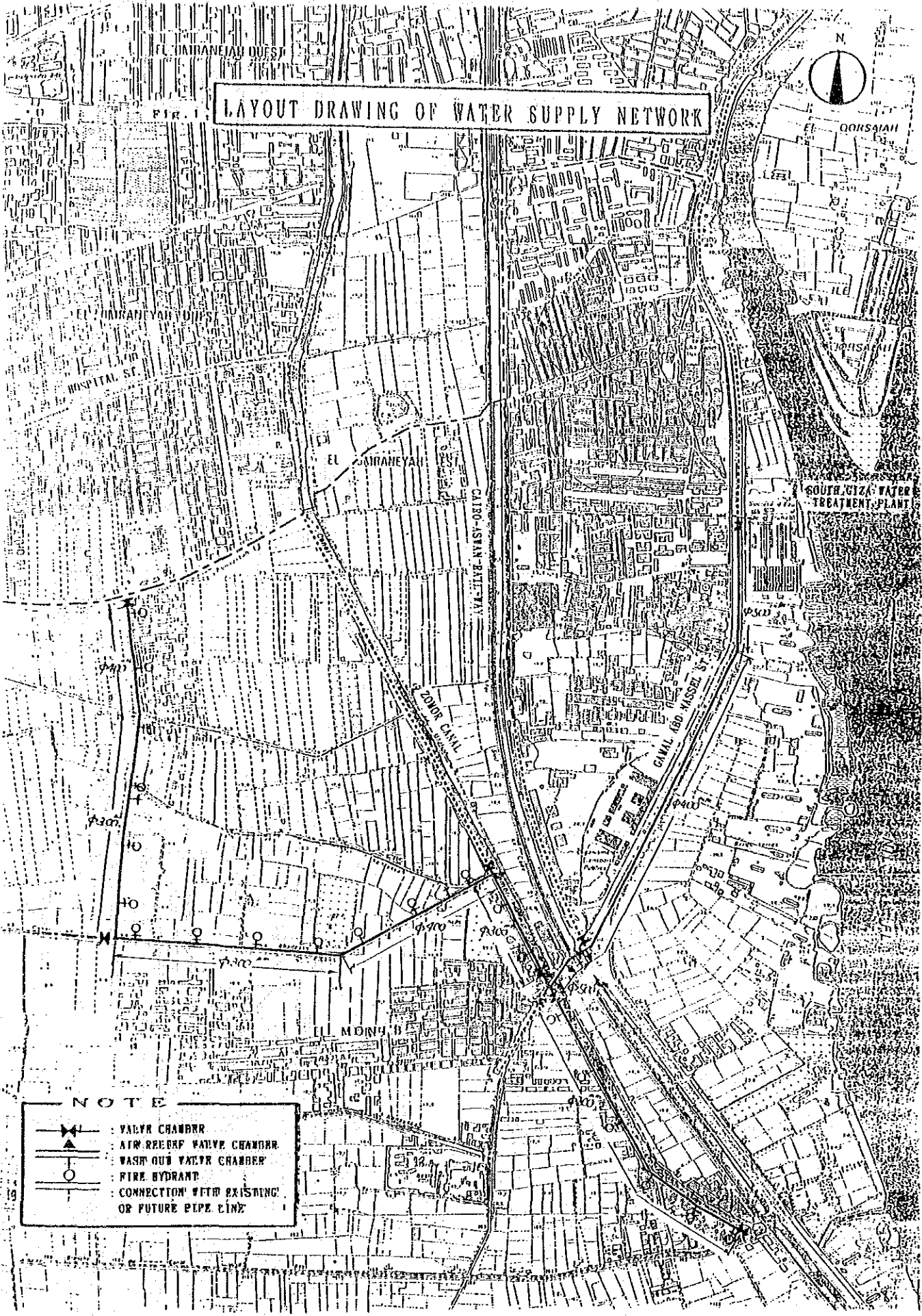
In case that roads have no walkway, fire hydrants shall be installed at the public road of approx. 1.0 m from boundary between private land and public road.
- (5) The type of screw and the outside diameter of mouth of fire hydrants shall be complied with the technical recommendation of Giza Fire Authority.

4.7 Support of pipe

Pipe shall be supported by the concreted anchor block.
Standards of anchor block are shown on Fig.WS-9






5. Conceptual plans

please refer to Fig. SW - 1 TO SW - 9.



LAYOUT DRAWING OF WATER SUPPLY NETWORK

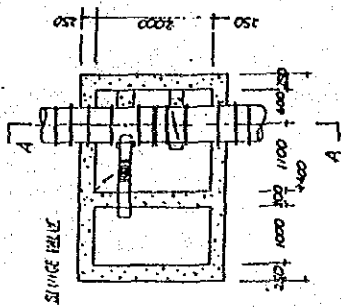


- NOTE
-  VALVE CHAMBER
 -  AIR RELEASE VALVE CHAMBER
 -  WASH OUT VALVE CHAMBER
 -  FIRE HYDRANT
 -  CONNECTION WITH EXISTING OR FUTURE PIPE LINE

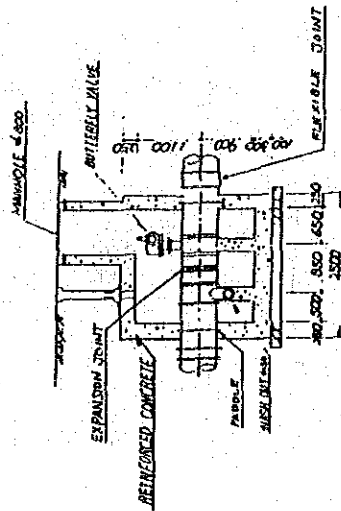
EX WS-2 VALVE CHAMBER (VERTICAL TYPE)
(BUTTERFLY VALVE $\phi 600 \sim \phi 800$)

NON SCALE
UNIT: mm

HORIZONTAL SECTION

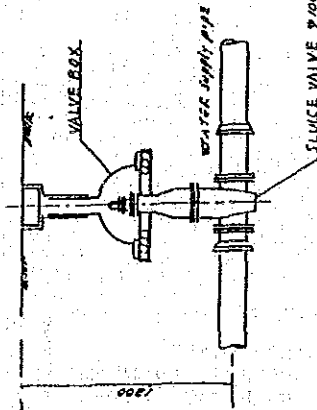


SECTION A-A



EX WS-3 VALVE PROTECTION FOR VALVE $\phi 100 \sim \phi 500$

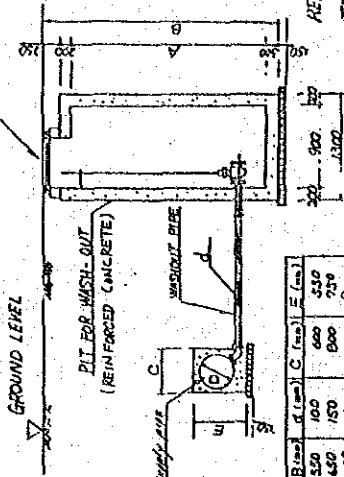
$S = 1/20$
UNIT: mm



EX WS-4 TYPICAL SECTION OF WASH-OUT

NON SCALE
UNIT: mm

$\phi 300 \times \phi 100$
MANHOLE COVER (M50)



Diap. (mm)	Alto (mm)	B (mm)	d (mm)	C (mm)	E (mm)
300	1800	1320	100	600	530
400	1900	1420	150	800	730
500	2000	1520	150	1000	900
600	2100	1620	150	1200	1020

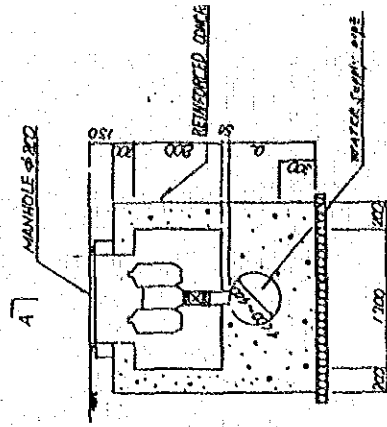
REMARKS:

WATER DISCHARGED IN PIT FOR WASH-OUT SHALL BE DEWATERED BY PORTABLE PUMP EQUIPMENTS.

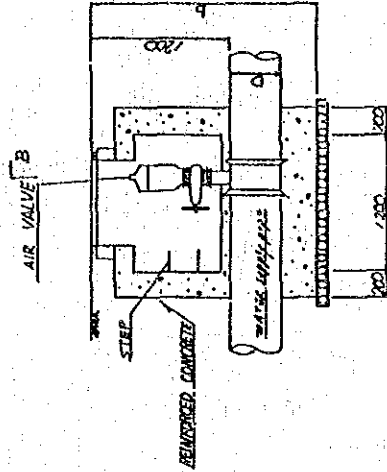
EX WS-5 AIR VALVE CHAMBER ($\phi 400$ TO $\phi 600$)

NON SCALE
UNIT: mm

SECTION B-B



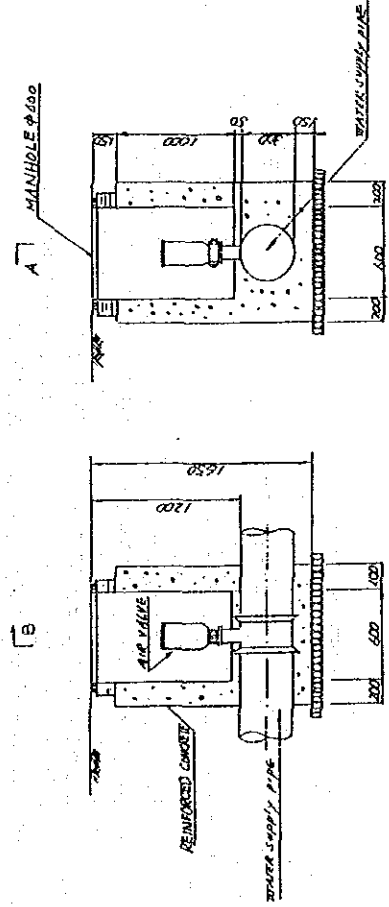
SECTION A-A



Diap. (mm)	a (mm)	b (mm)
400	1000	2000
500	1100	2000
600	1200	2000

Fig. WS-6 AIR VALVE CHAMBER (P. 200)
(SINGLE MOUTHED AIR VALVE)
NON SCALE
UNIT: 1/8" = 1'-0"

SECTION A-A



SECTION B-B

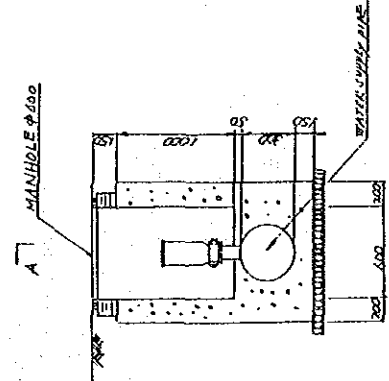
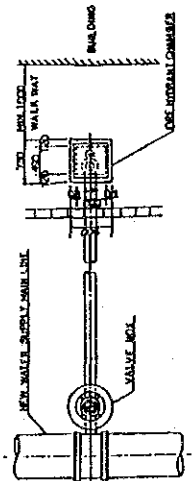


Fig. WS-7
FIRE HYDRANT CHAMBER TYPE-2 (S-1-3)
(IN CASE OF WIDE WALKWAY)

PLAN



SECTION

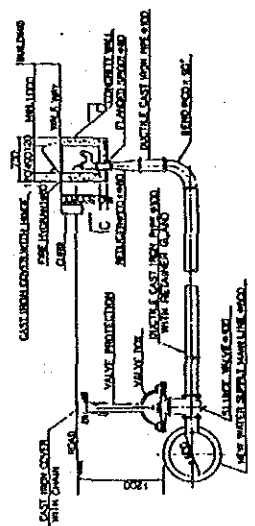
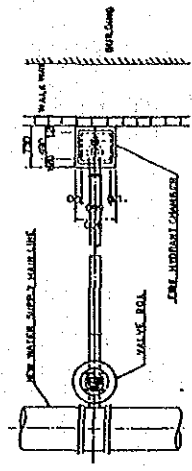


Fig. WS-8
FIRE HYDRANT CHAMBER TYPE-1 (S-1-3)
(IN CASE OF NARROW WALKWAY)

PLAN



SECTION

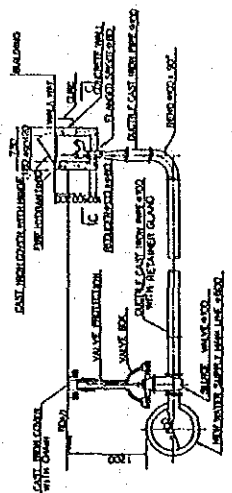
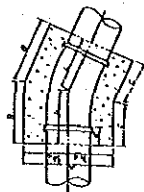


Fig. WS-9 ANCHOR BOLT STANDARDS FOR WATER SUPPLY PIPELINE
UNIT: 1/8" = 1'-0"

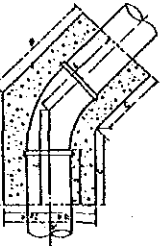
IN CASE OF 2 1/2" SEND

PLAN



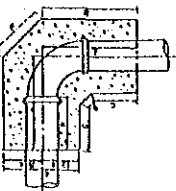
IN CASE OF 4" SEND

PLAN



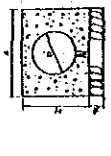
IN CASE OF 6" SEND

PLAN

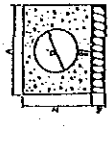


D	A	B	C	E	H	K	L
300	620	670	760	—	520	1570	1970
400	760	810	900	300	600	2000	2400
500	900	950	1040	370	700	2100	2500
600	1040	1090	1180	440	800	2200	2600

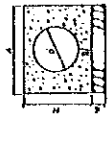
SECTION



SECTION



SECTION



D	A	B	C	E	H	K	L
300	620	670	760	—	520	1570	1970
400	760	810	900	300	600	2000	2400
500	900	950	1040	370	700	2100	2500
600	1040	1090	1180	440	800	2200	2600

D	A	B	C	E	F	G	H	K	L
300	620	670	760	4.70	1.70	2.70	700	2.00	1.70
400	760	810	900	5.00	2.00	3.00	800	2.00	1.70
500	900	950	1040	5.30	2.30	3.30	900	2.00	1.70
600	1040	1090	1180	5.60	2.60	3.60	1000	2.00	1.70

Conceptual Plan of Aqueduct over El Zomor Canal for Water supply Pipeline

1 Major conditions of basic design
Major conditions of basic design for aqueduct are as follows:

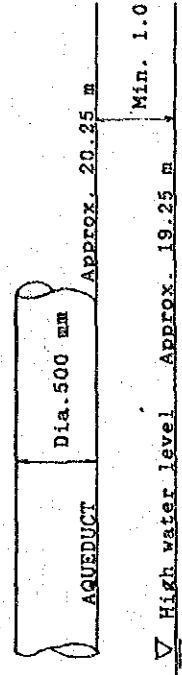
1.1 Location of the aqueduct
Location of the aqueduct is as shown on Fig.AQ-1.

1.2 Typical section of canal
Typical section of El Zomor canal is as shown on Fig.AQ-1 and AQ-2.

- Width of canal : Approx.16.9 m
- High water level : Approx.19.25 m above mean sea water level
- Side slope of canal : 1:1(=45°)
- Distance from standard point :Approx.5.0 km

1.3 Diameter of Aqueduct : 500 mm

1.4 Minimum clearance between the bottom level of the aqueduct and high water level:Min.1.0 m



1.5 Rehabilitation and/or expansion of the canal :Nil

1.6 Pipe materials of the aqueduct :Structure steel (with paint)

THE BASIC DESIGN STUDY
ON
THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY
IN
THE REPUBLIC OF EGYPT

CONCEPTUAL PLAN
OF
AQUEDUCT
OVER
EL ZOMOR CANAL
FOR
WATER SUPPLY PIPELINE

DECEMBER, 1991

CONSULTANT TEAM OF BASIC DESIGN STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

[FIELD REPORT]

- 1.7 Auxiliary equipment
The air valve shall be installed on the top of higher point of the pipe.
The expansion joints shall be installed adjacent to the ring supports on the both sides of support.
The flexible couplings shall be installed on the both sides of buried pipes.
(Please refer to Fig.AQ-2)

2. Conceptual plan
Conceptual Plan is shown on Fig.AQ-1 and AQ-2.

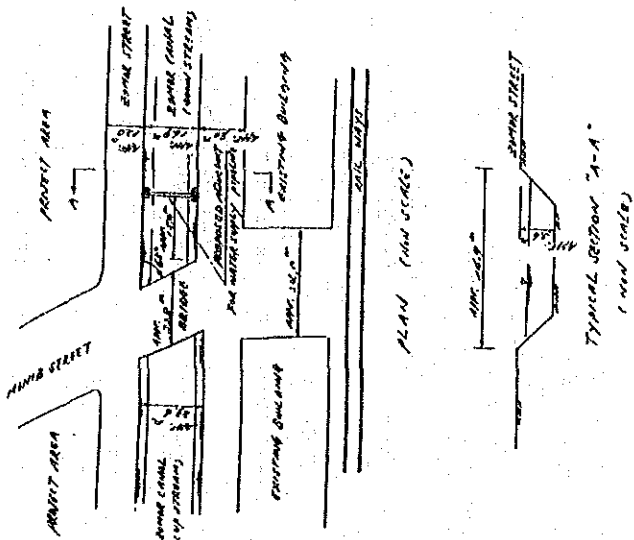


Fig. AQ-1 plan also typical section

TYPICAL SECTION OF AQUEDUCT OVER CANAL

(New scale)

SECTION A-A

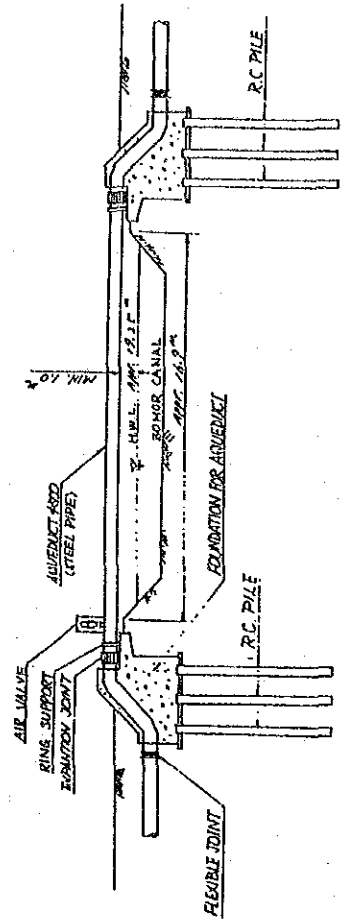


Fig. AQ-2

THE BASIC DESIGN STUDY
ON
THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY
IN
THE REPUBLIC OF EGYPT

Conceptual Plan of Jacking Method at the State's Railway Crossing
for Water Supply Pipeline

1. Major conditions of basic design
Major conditions of Basic design for water supply pipeline at
the crossing of the railway are as follows:

1.1 The route of water supply pipeline is crossing right angle
as shown Fig.RW-1.

1.2 Diameters of pipe are as follows(Please refer to Fig.RW-2):
(1) Water supply pipe : 500 mm
(2) Sleeve pipe : 1800 or 2000 mm

1.3 Materials of pipe are as follows:
1) Water supply pipe : Ductile cast iron
2) Sleeve pipe : Reinforced concrete

1.4 The construction method shall be jacking method to keep the
safety and transportation of railway.

1.5 The jacking pit near Taxi parking Area shall be applied the
sheet pile to keep the safety of pit from the jacking
force.(Please refer to Fig.RW-1 and RW-2)

1.6 Receiving pit near the ZOMOR CANAL street with heavy
traffic condition and lots of open markets shall be applied
the liner plate to minimize the space of the pit and keep
the safety of one.(Please refer to Fig.RW-1 and RW-2)

1.7 The height between surface of ballast and top of jacking
sleeve pipe shall keep not less than 3.5 m.

1.8 Distance between the nearest side of jacking pit and the
nearest rail shall keep not less than 10 meters.

CONCEPTUAL PLAN
OF
JACKING METHOD
AT
THE STATE'S RAILWAY CROSSING
FOR
WATER SUPPLY PIPELINE

DECEMBER, 1991

CONSULTANT TEAM OF BASIC DESIGN STUDY
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

[FIELD REPORT]

1.9 Distance between the nearest side of receiving pit and the nearest rail shall keep not less than 10 meters.

1.10 The soil improvement made by cement milk and so on will be applied to keep the safety of sheathing and prevent the leakage of underground water into the pit.

1.11 The pipes installed between the jacking pit and receiving pit shall be fixed by flanges and bolts & nuts.

1.12 The following auxiliary equipment at the chamber installed in the jacking and receiving pit.

- 1) Air valves
- 2) Butterfly valves
- 3) Wash out valves

2 Conceptual plan
Conceptual plan is shown on Fig.RW-1 and RW-2.

Fig. RW-1
LOCATION OF PITS FOR JACKING WORKS
S=1:500

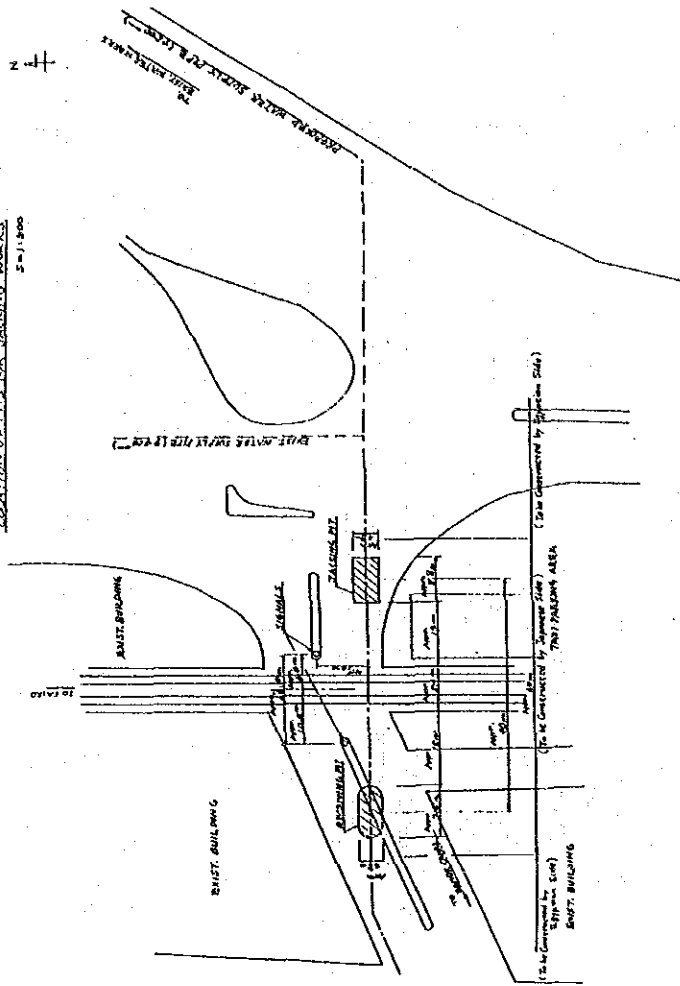
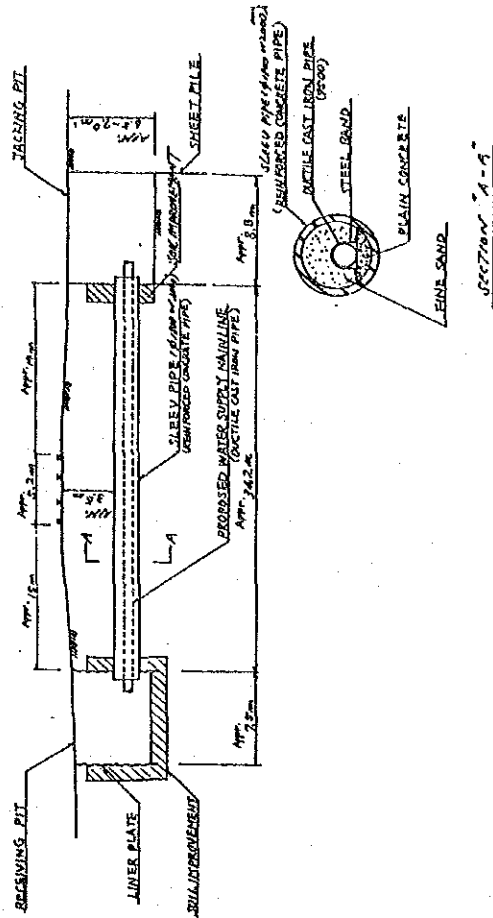


Fig. RW-2
LONGITUDINAL SECTION AT RAILWAY CROSSING
(NON-SCALE)



THE BASIC DESIGN STUDY
ON
THE PROJECT FOR
THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY
IN
THE REPUBLIC OF EGYPT

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(4) Reducing invert level of jacking pipe	4
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(1) Construction method	4
(2) Manholes	4

CONCEPTIONAL PLAN OF SEWER PIPELINE

DECEMBER, 1991

CONSULTANT TEAM OF BASIC DESIGN STUDY

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

1. General

1.1 Design Conditions

Following design conditions have been confirmed through the data and information obtained by Giza City, GOSD and other related authorities as well as the discussions with GOSD during the field survey.

- (1) Project area : Monib, Giza City
- (2) Served area : 185ha
- (3) Target year : 2010
- (4) Population
 - at 2010 : 247,000
 - at present : 133,000
- (5) Average discharge : 140lit/day/cap.
- (6) Maximum discharge : 190lit/day/cap. (at peak, including ground-water)
- (7) Velocity of flow
 - Minimum : 0.6m/sec
 - Maximum : 1.5m/sec

1.2 Materials

- (1) Pipes for sewer trunk line
 - 1) Standard pipe
Egyptian-made reinforced concrete pipe for jacking method shall be used. It shall be manufactured in accordance with the Japanese standard JSWAS A-2 (1991).
 - 2) Pipe for intermediate jacking
Since intermediate jacking pipes have special features and it is not available in Egypt, it shall be procured from Japan.

(2) Pipes for branch line

All pipes shall be of Egyptian-made vitrified clay pipe.

2. Scope of Work

- (1) Sewer trunk line
Material supply and construction of the proposed sewer trunk line will be done by the Japanese side. The basic design study for the trunk line shall be made for determining the optimum facilities for the sewer system upgrading.
- (2) Sewer branch line
Piping materials for the sewer branch line will be provided by the Japanese side and the pipe laying work including construction of manholes shall be executed by the Egyptian side. The basic design study for the branch line shall be made for determining the appropriate diameter and length based on the surveying map prepared through the field survey.

3. Proposed Sewer Pipeline

3.1 Route Plan

(1) Sewer trunk line

The proposed sewer trunk lines are the part of Abu Nomros Main Collector which are being constructed by GOSD and divided into three sections as shown on Fig-1. The approximate length of each section is as follows:

- Section-1 (Kordy st.) : 355m
- Section-2 (crossing Osman Moharam st.) : 80m
- Section-3 (El Kasabagy st.) : 1,360m

- (2) Sewer branch line
Sewer branch lines to be connected with the trunk line along El Kasabugy st. (or Zomor canal), whose diameters are expected from 300mm to 600mm, shall be planned on the secondary roads as shown on Fig-1.

The route of other sewer branch lines, whose expected diameters are less than 300mm, shall be determined after the detailed study of surveying map in Japan.

3.2 Sewer trunk line

(1) Construction method

The construction of Abu Nomros Main Collector are being carried out using open-cut method by GOSD. However, the sections which the Egyptian Government requested to the Japanese Government for the execution under Japan's Grant Aid have many difficulties to be executed as mentioned below.

- Many existing underground services are expected.
- Traffic (cars and pedestrians) is heavy.
- Roads are narrow.
- Residential buildings stand close to the narrow street.
- Depth of the proposed pipes is deep.

For these reasons, pipe jacking method shall be applied to all the proposed trunk lines. The locations of jacking and receiving pits for each section and the terminal points between GOSD and the Japanese side are shown on Fig-2, 3 and 4 respectively. The relation of Section-1 and planned screw pump station (hereinafter referred to as "No.5(B) PS") is shown on Fig-5.

(2) Alternatives of Jacking Pipe diameters

The required diameter of pipes for the proposed sewer trunk line ranges 1,600mm to 2,000mm according to GOSD's design. However, taking into account the expected allowable construction period (about 12 month) and

economical aspect under Japan's Grant Aid scheme, some alternatives of using different diameters have been raised and discussed with GOSD. The alternatives approved by GOSD are attached as Table-1. One of the alternatives shall be applied through further study in Japan.

(3) Lining methods

In case that 2000mm diameter pipe is applied instead of the designed diameter 1600mm, internal lining shall be applied to keep the desirable inner diameter. The lining methods recommended by GOSD are shown on Table-2. One of the alternatives shall be applied through further study in Japan.

(4) Manholes

Manholes shall be of reinforced concrete with blue brick lining on the internal surface of walls. Size of manholes shall be determined taking into account the Egyptian practice as well as the Japanese standard.

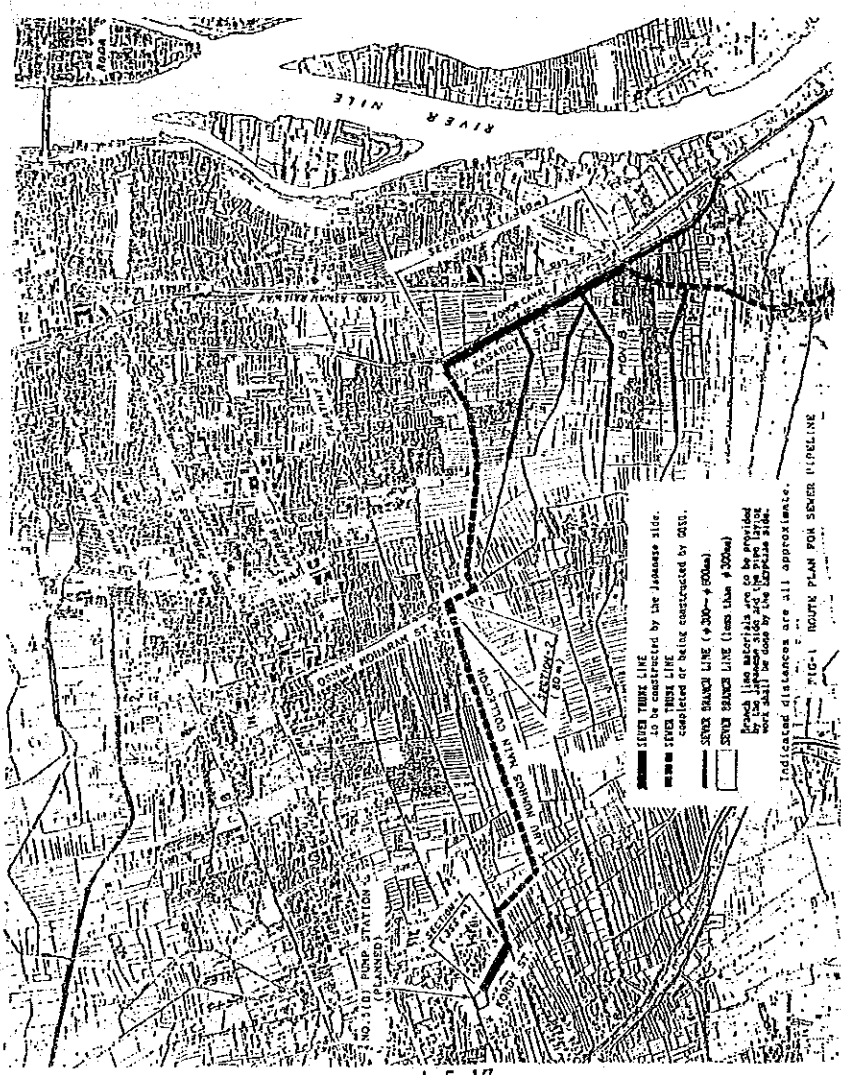
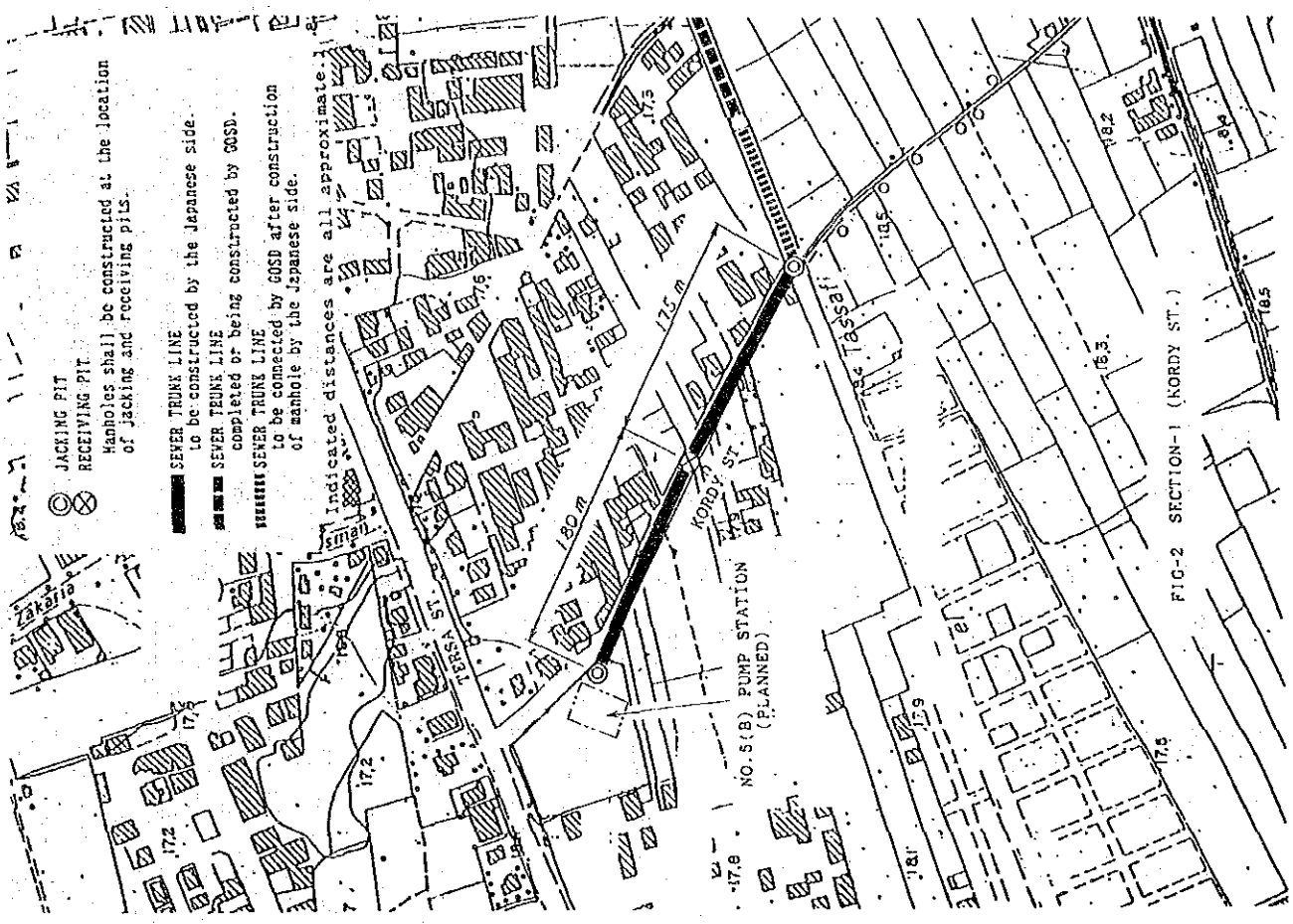
3.3 Sewer Branch Line

(1) Construction methods

Piping materials for the sewer branch line will be provided by the Japanese side in this project and the pipe laying work will be done with open-cut method by the Egyptian side.

(2) Manholes

Manholes for the sewer branch line shall be constructed by the Egyptian side.



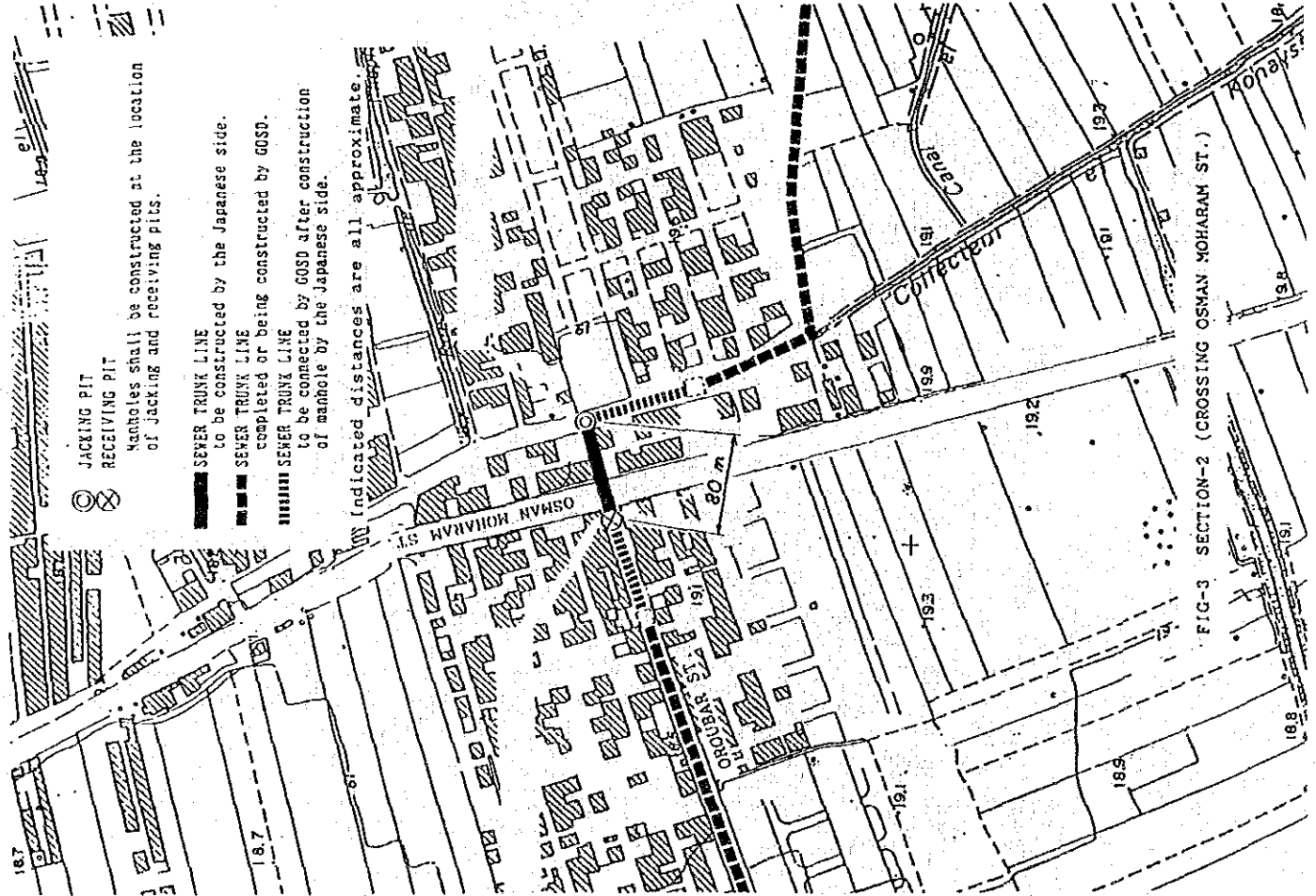


FIG-3 SECTION-2 (CROSSING OSMAN MOHARAM ST.)

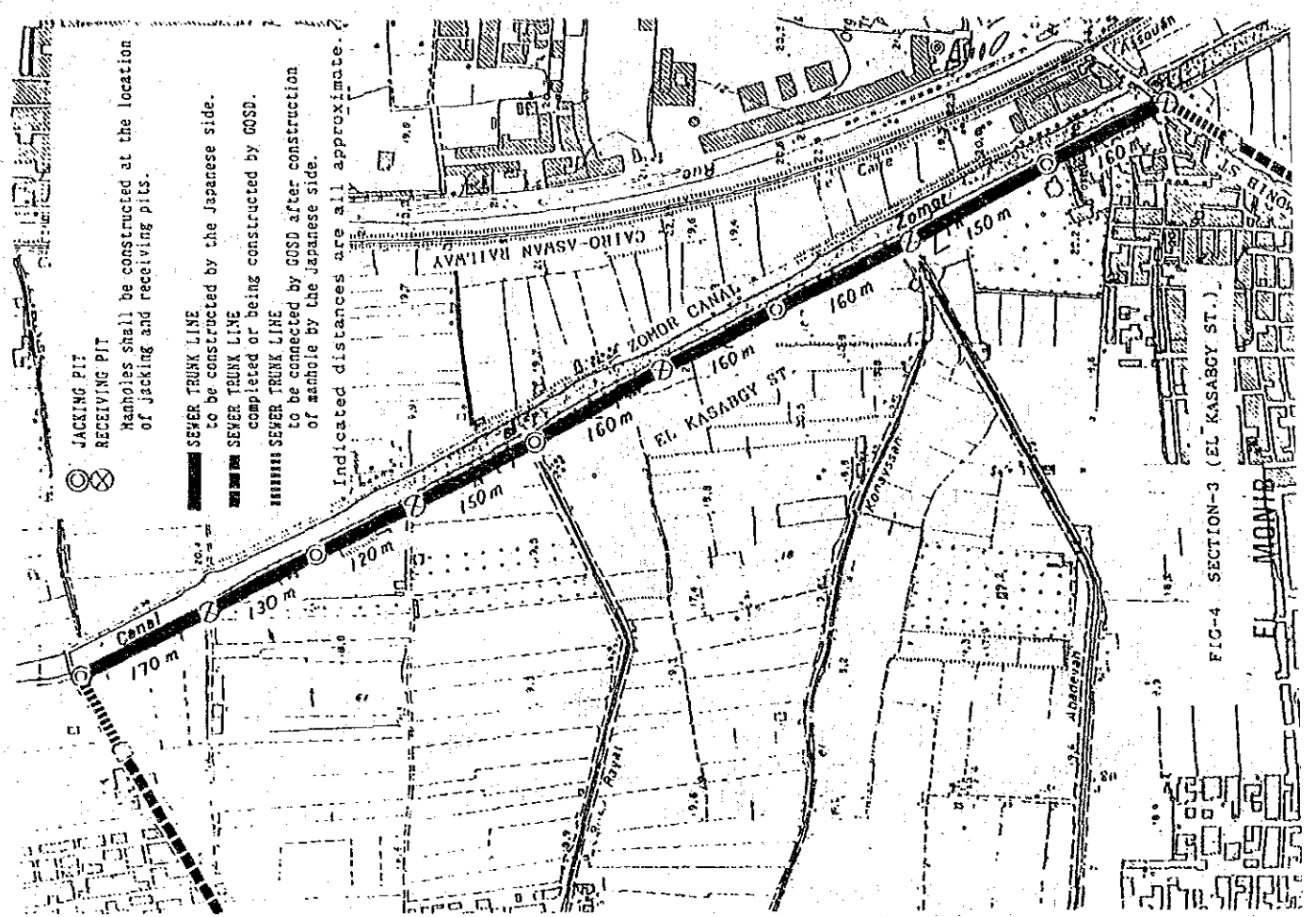
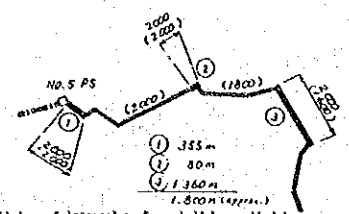
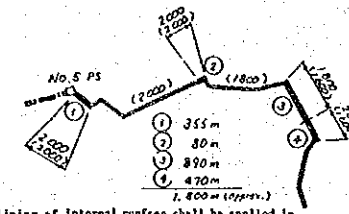
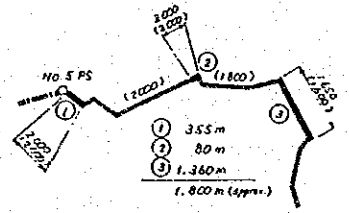


FIG-4 SECTION-3 (EL. KASABGY ST.)

TABLE-1 PROPOSAL OF JACKING PIPE DIAMETERS

Alternatives	Proposed Diameters of Jacking Pipe (mm)	Number of Jacking Machine
ALT-1	 <p>Lining of internal surface shall be applied in Section ③ (see TABLE-2).</p>	<p>φ2000mm x 2 units</p>
ALT-2	 <p>Lining of internal surface shall be applied in Section ④ (see TABLE-2).</p>	<p>φ2000mm x 1 unit φ1800mm x 1 unit</p>
ALT-3	 <p>No lining of internal surface shall be applied.</p>	<p>φ2000mm x 1 unit φ1650mm x 2 units</p>

Remarks :
 1. Figures shown in () are the diameters on the drawings of GOSD.
 2. Internal surface other than lining applied surface shall be coated by epoxy tar paint.

FIG-6 RELATION OF SECTION-1 AND PLANNED NO.5(B) PUMP STATION

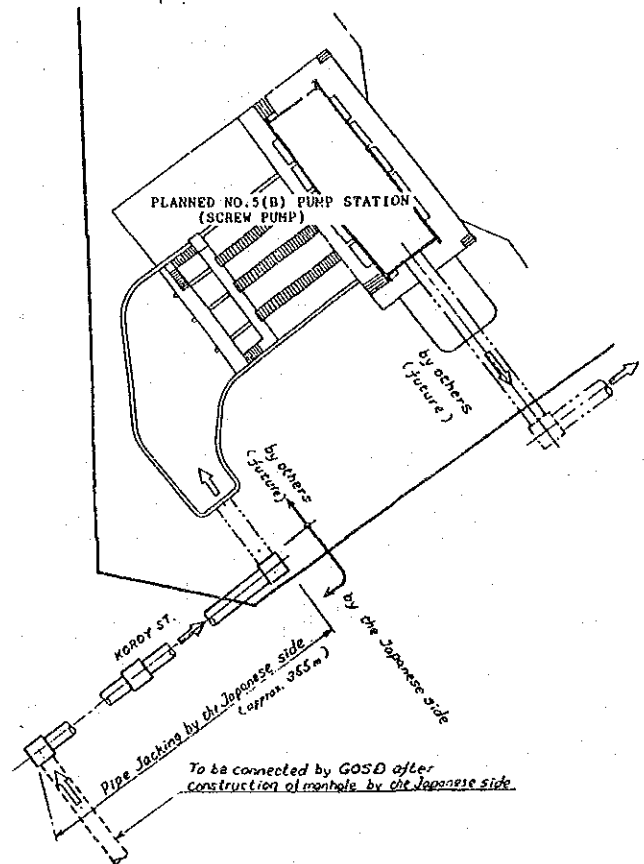
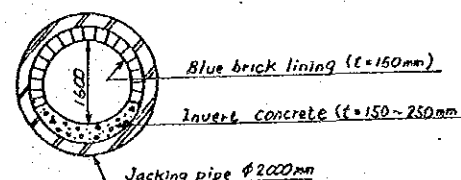
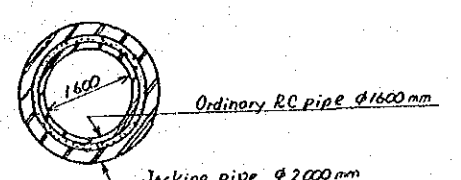


TABLE-2 LINING METHODS

One of the lining methods listed below shall be applied when Jacking Pipe of dia.2000mm is used instead of designed dia.1600mm.

TYPE	Lining Method
A	<p>120° Invert concrete + Blue brick lining</p>  <p>Blue brick lining (t=150mm) Invert concrete (t=150~250mm) Jacking pipe φ2000mm</p>
B	<p>Double piping (dia.2000mm + dia.1600mm) + Epoxy tar coating</p>  <p>Ordinary RC pipe φ1600mm Jacking pipe φ2000mm</p>

THE BASIC DESIGN STUDY
ON
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THE WATER SUPPLY AND SEWER SYSTEM UPGRADING IN MONIB, GIZA CITY

IN
THE REPUBLIC OF EGYPT

PRELIMINARY EXPANSION PLAN
OF
SOUTH GIZA WATER WORKS

Preliminary Expansion Plan of South Giza Water Works

1 Confirmation of Major Conditions of expansion treatment plant
Major conditions of expansion plan for South Giza Water Works
are as follows:

- 1.1 Total Design Capacity of expansion treatment plant.
Total design capacity of expansion treatment plant
will be 200,000 cu.m /day
- 1.2 The design capacity of the first construction stage.
The design capacity of the first construction stage
will be 25,000 cu.m /day .
This figure is included in total design
capacity(200,000 cu.m/day).
- 1.3 Expansion treatment plant
Area for the expansion treatment plant is secured
adjacent to the existing treatment plant as shown on
Fig.SG-1.
- 1.4 Concerning the intake facilities, the intake pump
equipment will be installed at the existing new raw
water pumping station and four spaces of New pump
facilities for the expansion treatment plant are
secured in above mentioned station.
- 1.5 The existing ancillary facilities such as chemical
dosing facilities, control center, laboratory, work shop
and so forth shall be used as possible as they can.
- 1.6 The flow diagram of the expansion treatment plant
shall be shown on the SG-2.

2 Preliminary plan of expansion plant

Preliminary layout of expansion treatment plant is as shown
on Fig.SG-3.

DECEMBER, 1991

CONSULTANT TEAM OF BASIC DESIGN STUDY

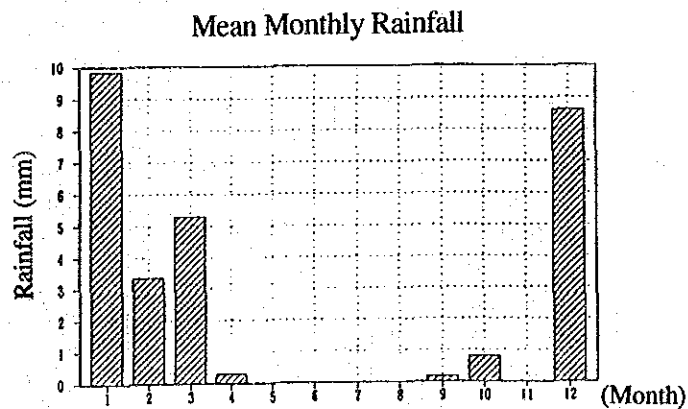
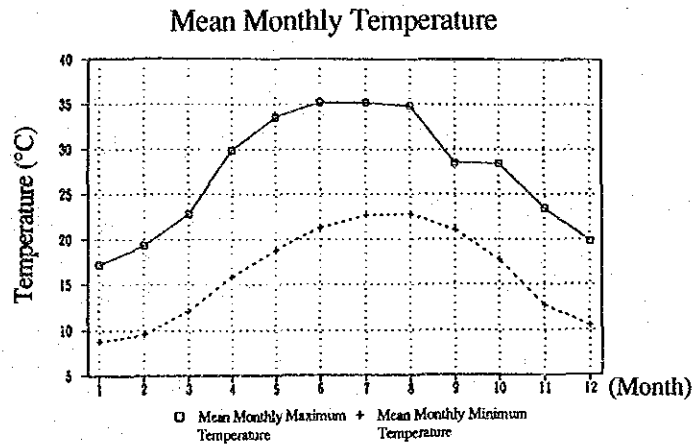
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

APPENDIX 6

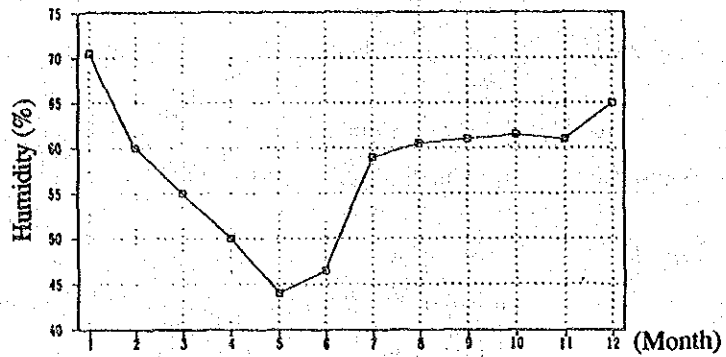
COUNTRY DATA

1. Basic Facts on the Arab Republic of Egypt

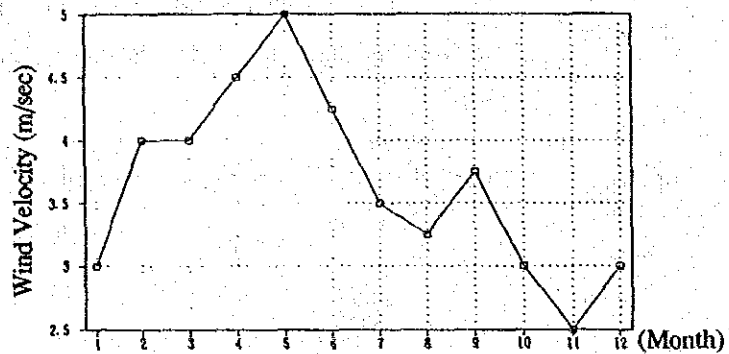
- ① Capital : Cairo
- ② Land Area : 1,001,499km²
Population : approximately 54 million (1991 estimate)
- ③ Education : Compulsory education for 6 years between the ages of 6 and 12.
School attendance ratio of school age children estimated to be approximately 78% in 1981.
- ④ Currency : Egyptian pound (LE)
1 U.S. dollar = 3.31 LE (as of January, 1992)
The floating exchange rate system has been in force since January 30, 1985.
- ⑤ Climate : Mean Monthly Temperature, Rainfall, Humidity and Wind Velocity



Mean Monthly Humidity



Mean Monthly Wind Velocity



2. Social and Economic Data

① International Balance of Payments

(Unit: million U.S.\$)

Fiscal Year	1987/88	1988/89	1989/90
Trade Balance	Δ6,567	Δ7,533	Δ7,567
Exports	3,274	2,546	3,206
(Crude Oil)	1,563	1,066	1,129
Imports	9,841	10,090	10,733
Invisible Trade Balance	1,940	1,764	1,530
Receipts	4,575	5,058	5,580
(Suez Canal)	1,269	1,307	1,472
(Tourism)	886	901	1,067
(Interest)	624	734	776
Payments	2,634	3,298	4,050
(Interest)	785	1,128	1,686
Balance of Transfer Account	4,082	4,240	4,824
(Government Transfer)	698	710	1,080
(Remittance from Abroad)	3,384	3,580	3,744
Current Balance	Δ535	Δ1,457	Δ1,214

Source: Ministry of Planning

② National Budget

(Unit: million LE)

Expenditure				Revenue			
Item	1989/90	1990/91	1991/92	Item	1989/90	1990/91	1991/92
Total	30,306	41,248	54,431	Total	25,416	32,523	45,083
General Account	18,749	27,245		General Account	20,342	27,845	39,264
Subsidies	2,061	3,579	4,520	Tax	5,730	7,915	9,085
Defence	3,711	3,133	3,742	Levies, etc.	7,520	7,980	9,547
Debt Service	3,614	8,362	14,381	Non-Tax	5,642	9,983	14,892
Wages	6,250	7,140	8,288				
Capital Expenditure	11,557	14,003	-	Capital Receipts	5,074	4,677	5,819
Investment	6,350	6,751	10,700	Investment Receipts	2,231	2,111	-
Capital Transfer	5,207	7,252	-	Transfer Receipts	2,843	2,567	-
				Deficit	4,890	8,725	9,438

Note : Exchange Rate 1 U.S.\$ = 3.24 LE (1991/92)
1 U.S.\$ = 2.00 LE (1990/91)

Source : Ministry of Planning

③ Production Target by Industry Under 2nd 5-Year Plan and Actual Result

(Unit: million LE)

Item	1987/88 (1st Year)		1988/89 (2nd Year)		1989/90 (3rd Year)	1991/92 (Final Year)	Target Growth Rate (%)
	Target	Result	Target	Result	Result	Target	
Agriculture	8,960	8,930	9,205	9,180	9,440	10,500	4.1
Mining & Manufacturing	7,446	7,435	8,069	7,979	8,564	10,397	8.4
Petroleum	1,769	1,799	1,966	1,748	1,728	1,898	2.3
Electricity	560	559	599	612	649	729	7.1
Construction	2,128	2,145	2,259	2,259	2,381	2,637	5.9
Sub-Total (Merchandise Sector)	20,863	20,868	22,098	21,778	22,762	26,221	5.8
Transport & Communications	3,928	3,996	4,211	4,368	4,678	4,819	5.1
Commerce, Finance & Insurance	10,118	10,150	10,487	10,618	11,110	12,624	5.5
Tourism	424	533	483	644	694	688	10.9
Sub-Total (Productive Service Sector)	14,470	14,679	15,181	15,630	16,482	18,111	5.6
Public Facilities & Utilities	896	898	984	1,007	1,104	1,409	11.4
Services	1,923	1,930	2,009	2,018	2,112	2,375	5.2
Government Services & Insurance	4,898	4,874	5,212	5,170	5,451	6,010	5.5
Sub-Total (Social Service Sector)	7,717	7,702	8,205	6,195	8,667	9,794	6.2
Total	43,050	43,249	45,484	45,603	47,911	54,126	5.8

Source: Ministry of Planning

④ Price Trend

Fiscal Year	1965/66	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
Price Index (1965/66=100)	100	487.8	572.1	650.2	820.9	1,044.9	1,220.3

Source: Central Statistics Bureau

⑤ GDP Trend in Last 5 Years

(Unit: 100 million LE)

Fiscal Year	1986/87	1987/88	1988/89	1989/90	1990/91
GDP	477	587	776	840	860

Sources : 1986/87 Central Statistics Bureau
 1987/88~1989/90 U.S. Embassy Estimate
 1990/91 Economist Intelligence Unit (EIU) Estimate

3. Public Holidays (1992)

Eve of 1st Bairam	April 3
1st Bairam	April 4~6
Sinai Liberation Day	April 25
Sham El-Nessim	April 27
Laborers Day	May 1
Eve of 2nd Bairam	June 10
2nd Bairam	June 11~14
Evacuation Day	June 18
Hejri New Year	July 2
Revolution Day	July 23
Prophet Mohammed's Birthday	September 10
Army Forces Day	October 6
Suez City & National Liberation Day	October 24
Victory Day	December 23

APPENDIX 7

**ESTIMATED COST FOR THE WORK
TO BE UNDERTAKE BY THE EGYPTIAN SIDE**

The construction cost to be borne by the Egyptian side is as follows;

1. Cost of Water Supply Branch Line Work

1.1 Branch Line Pipe Laying

1.1.1 Earth work

(1) Excavation	35,000 cum	×	26.5 LE = 927,500 LE
(2) Backfilling	33,000 cum	×	16.6 LE = 547,800 LE
(3) Disposal of surplus soil	2,000 cum	×	56.4 LE = 112,800 LE

1.1.2 Concrete work

(1) Concrete	300 cum	×	232.1 LE = 69,630 LE
(2) Shuttering	1,500 sqm	×	23.2 LE = 34,800 LE
(3) Reinforcing bar	30 ton	×	2,154.8 LE = 64,640 LE

1.1.3 Pipe laying

(1) Dia. 100mm (PVC)	26,370 m	×	5.0 LE = 131,850 LE
(2) Dia. 200mm (PVC)	6,440 m	×	6.6 LE = 42,500 LE
(3) Dia. 300mm (DCIP)	2,170 m	×	29.8 LE = 64,670 LE
(4) Dia. 400mm (DCIP)	1,560 m	×	33.2 LE = 51,790 LE
(5) Dia. 500mm (DCIP)	440 m	×	36.5 LE = 16,060 LE
(6) Dia. 600mm (DCIP)	20 m	×	39.8 LE = 800 LE
(7) Valve installation (Dia. 200mm and less)	570 pcs	×	6.6 LE = 3,760 LE
(8) Valve installation (Dia. 300mm and less)	12 pcs	×	215.5 LE = 2,590 LE

1.1.4 Reinstatement work

- Asphalt pavement	3,000 sqm	×	33.2 LE = 99,600 LE
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1.2 Aqueduct

1.2.1 Earth work

(1) Excavation	100 cum	×	26.5 LE = 2,650 LE
(2) Backfilling	68 cum	×	16.6 LE = 1,130 LE
(3) Disposal of surplus soil	32 cum	×	56.4 LE = 1,800 LE

1.2.2 Piling work

- Piling	72 m	×	497.3 LE = 35,810 LE
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1.2.3 Concrete work

(1) Concrete	32 cum	×	232.1 LE = 7,430 LE
(2) Shuttering	48 sqm	×	23.2 LE = 1,110 LE
(3) Reinforcing bar	3 ton	×	2,154.8 LE = 6,460 LE

1.2.4 Fabrication of aqueduct

(1) Scaffolding man	40 persons	×	26.5 LE = 1,060 LE
(2) Crane	5 days	×	994.5 LE = 4,970 LE

Sub-total 2,233,210 LE

2. Cost of Sewer Branch Line Work

2.1	Earth work				
	(1) Excavation	50,000 cum	×	33.2 LE	= 1,660,000 LE
	(2) Backfilling	48,000 cum	×	16.6 LE	= 796,800 LE
	(3) Disposal of surplus soil	2,000 cum	×	56.4 LE	= 112,800 LE
2.2	Manhole work				
	(1) Concrete	1,100 cum	×	232.1 LE	= 255,310 LE
	(2) Shuttering	6,000 sqm	×	23.2 LE	= 139,200 LE
	(3) Reinforcing bar	110 ton	×	2,154.8 LE	= 237,030 LE
	(4) Manhole covers and steps	590 pcs	×	994.5 LE	= 586,760 LE
2.3	Pipe laying				
	(1) Dia. 200mm	23,650 m	×	8.3 LE	= 196,300 LE
	(2) Dia. 225mm	840 m	×	8.3 LE	= 6,970 LE
	(3) Dia. 250mm	1,900 m	×	9.9 LE	= 18,810 LE
	(4) Dia. 300mm	630 m	×	9.9 LE	= 6,240 LE
	(5) Dia. 350mm	1,370 m	×	13.3 LE	= 18,220 LE
	(6) Dia. 375mm	700 m	×	13.3 LE	= 9,310 LE
	(7) Dia. 450mm	910 m	×	36.5 LE	= 33,220 LE
	(8) Dia. 500mm	1,240 m	×	39.8 LE	= 49,350 LE
	(9) Dia. 600mm	450 m	×	43.1 LE	= 19,400 LE
2.4	Reinstatement work				
	- Asphalt pavement	4,000 sqm	×	33.2 LE	= 132,800 LE

Sub-total 4,278,520 LE

Construction cost to be borne
by the Egyptian side (1 + 2)

Total 6,511,730 LE

For reference, the construction cost for the remaining branch lines of Block B and D in the Project Site which are not provided by the Japanese side is calculated as follows;

1. Cost of Water Supply Branch Line Work

1.1	Earth work			
	(1) Excavation	13,220 cum	×	26.5 LE = 350,330 LE
	(2) Backfilling	12,390 cum	×	16.6 LE = 205,670 LE
	(3) Disposal of surplus soil	830 cum	×	56.4 LE = 46,810 LE
1.2	Concrete work			
	(1) Concrete	110 cum	×	232.1 LE = 25,530 LE
	(2) Shuttering	570 sqm	×	23.2 LE = 13,220 LE
	(3) Reinforcing bar	12 ton	×	2,154.8 LE = 25,860 LE
1.3	Pipe laying			
	(1) Dia. 100mm (PVC)	13,920 m	×	5.0 LE = 69,600 LE
	(2) Valve installation (Dia. 100mm)	230 pcs	×	6.6 LE = 1,520 LE
1.4	Reinstatement work			
	- Asphalt pavement	1,000 sqm	×	33.2 LE = 33,200 LE
				<u>Sub-total</u> 771,740 LE

2. Cost of Sewer Branch Line Work

2.1	Earth work			
	(1) Excavation	20,700 cum	×	33.2 LE = 687,240 LE
	(2) Backfilling	19,910 cum	×	16.6 LE = 330,510 LE
	(3) Disposal of surplus soil	790 cum	×	56.4 LE = 44,560 LE
2.2	Manhole work			
	(1) Concrete	460 cum	×	232.1 LE = 106,770 LE
	(2) Shuttering	2,490 sqm	×	23.2 LE = 57,770 LE
	(3) Reinforcing bar	46 ton	×	2,154.8 LE = 99,120 LE
	(4) Manhole covers and steps	260 pcs	×	994.5 LE = 258,570 LE
2.3	Pipe laying			
	- Dia. 200mm	13,100 m	×	8.3 LE = 108,730 LE
2.4	Reinstatement work			
	- Asphalt pavement	1,650 sqm	×	33.2 LE = 54,780 LE
				<u>Sub-total</u> 1,748,050 LE

Construction cost for the remaining branch lines to be borne by the Egyptian side (1 + 2)

Total 2,519,790 LE

