REPORT ON BASIC DESIGN

CAIRO UNIVERSITY PAEDIATRIC HOSPITAL

IN

ARAB REPUBLIC OF EGYPT

FEBRUARY 1980

JAPAN INTERNATIONAL COOPERATION AGENCY

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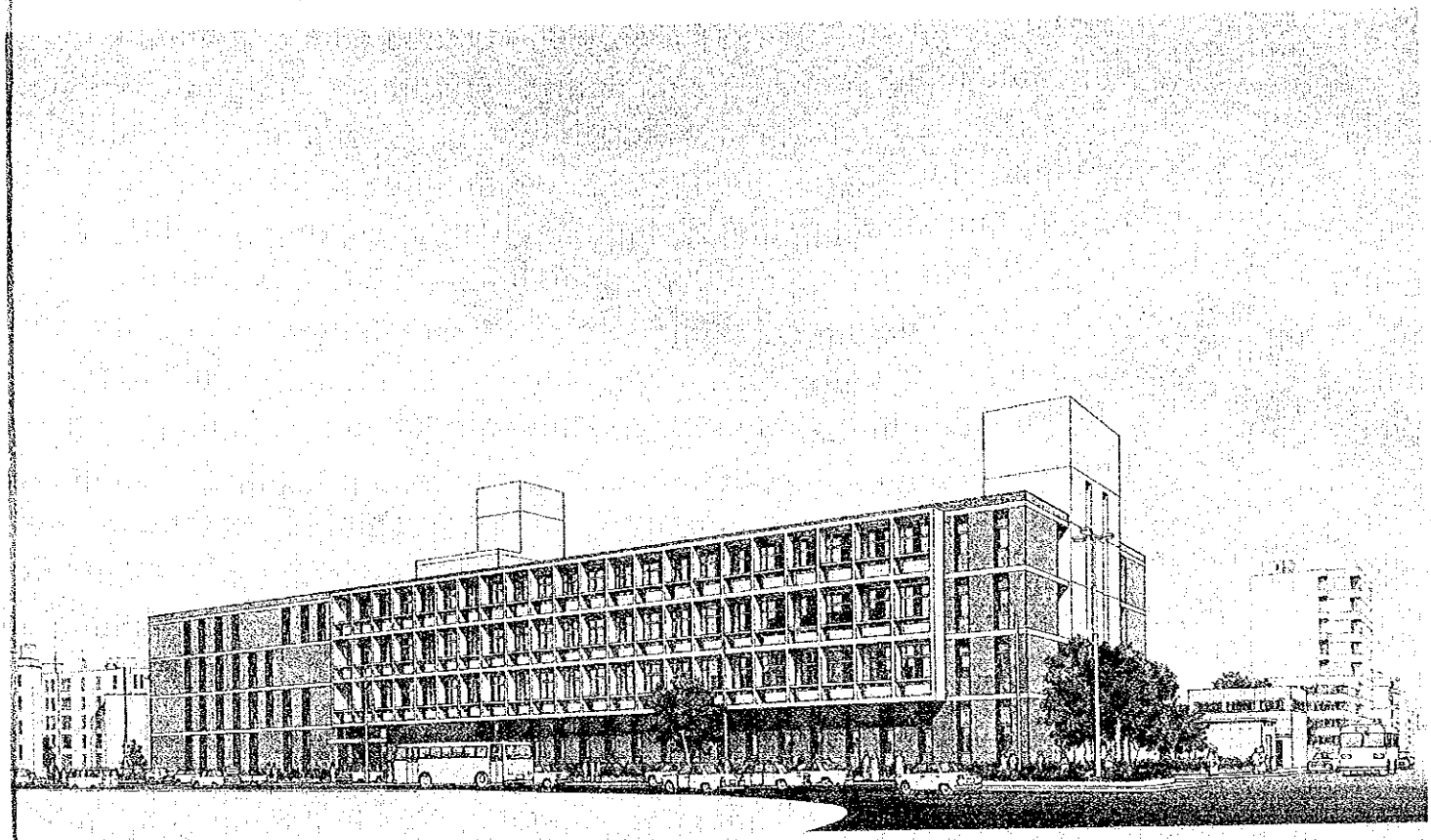


CAIRO UNIVERSITY PAEDIATRIC HOSPITAL

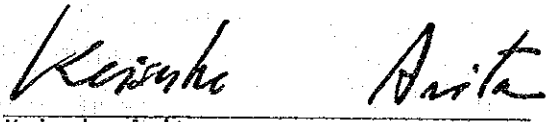
PREFACE

In response to the request of the Government of the Arab Republic of Egypt, the Government of Japan decided to take up a survey on the Project for reconstructing Cairo University Pediatric Hospital as part of the general project in New Kasr Ei-Aini, and the Japan International Cooperation Agency (JICA) was entrusted with the survey.

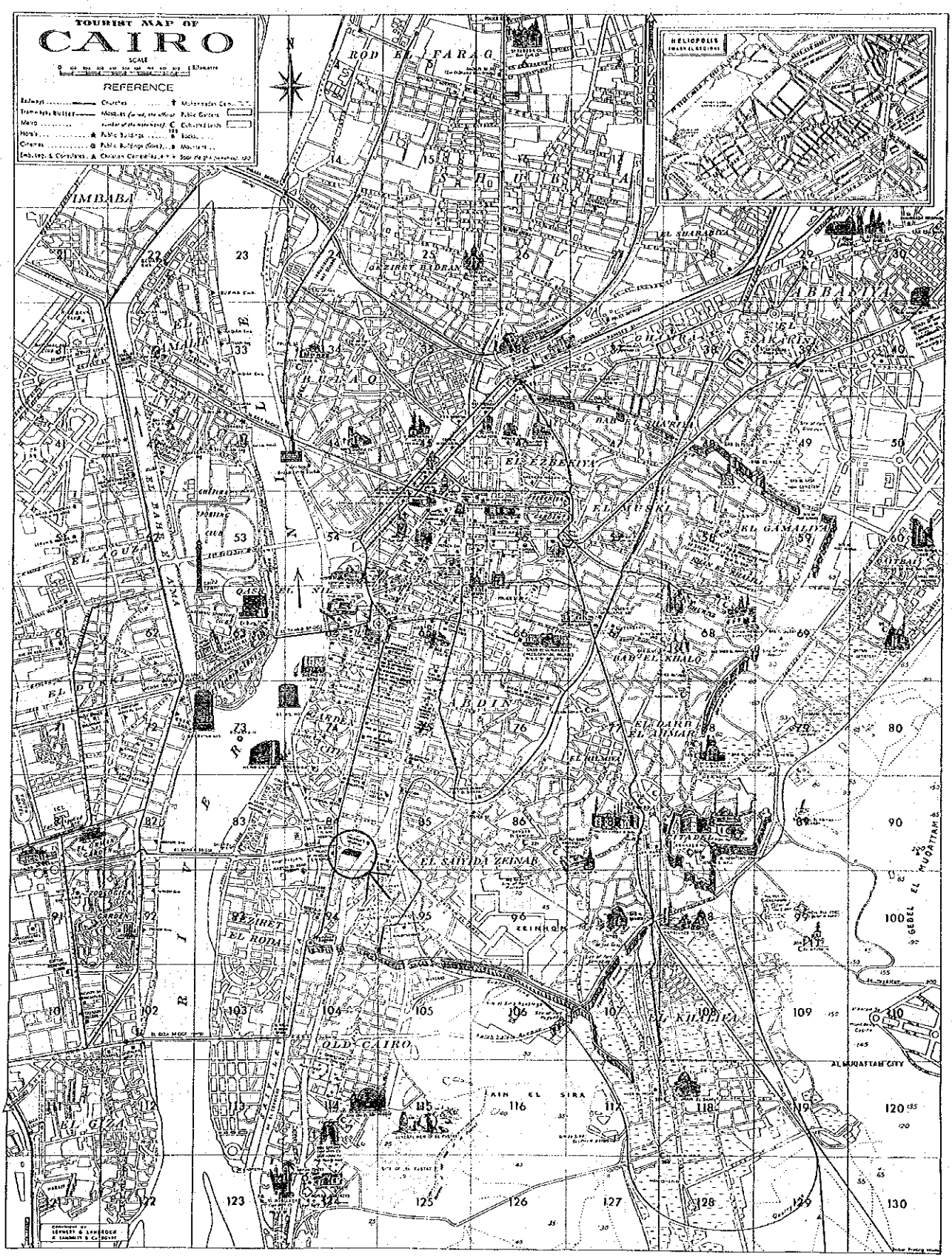
Recognizing that this Project will contribute greatly to the promotion of children's health and welfare and to the stability of people's livelihood in Egypt, JICA dispatched a survey team to Egypt from November 7th to 28th, 1979 to collect necessary data and information on the basic designing of the Project as well as to consult with the competent authorities of the Arab Republic of Egypt. The survey was conducted smoothly in cooperation with the authorities of Egypt. Upon its return to Japan, the team made further studies and has completed the present report.

I hope this report will be found useful for the development of the Project and will serve to the promotion of friendly relations between our two countries. I wish to express my sincere appreciation to the officers and people concerned of the Arab Republic of Egypt for their close cooperation extended to our survey team.

February, 1980



Keisuke Arita
President
Japan International Cooperation Agency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SCALE
REFERENCE
HELIOPOLIS
ROD EL FARAG
IMBABA
ABBASIA
EZBEKIYA
ABDIN
EL SAYIDA ZEINAB
OLD CAIRO
AIN EL SIRA
AL MUQATTAM CITY
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EL GIZA
NILE


6th October Bridge
ZAMALEK
QASR EL NIL
cairo tower
NATIONAL SPORTING CLUB
El Burg Hotel
EL TAHRIR BRIDGE
EGYPTIAN AGRICULTURE SOCIETY
EL TAHRIR GARDEN
EGYPTIAN MUSEUM
NILE HILTON HOTEL
MIN. OF WAQFS
SH. HUDA SHARAWI
EL BUSTAN
MARKET
CHAMBER OF COMMERCE
BANQUE MISR
POLICE ST.
AMERICAN UNIVERSITY
EWART MEMORIAL HALL
BAB EL LUG STATION
MIN. OF INTERIOR
MIN. OF JUSTICE
PARLIAMENT
SHARI MAGLIS
MIN. OF PUBLIC HEALTH
MIN. OF SUPPLIES
MIN. OF COMMERCE & INDUSTRY
MIN. OF EDUCATION
EL MUNIRA HOSPITAL
ABDIN
SHEPHEARD'S HOTEL
AMERICAN Emb.
BRITISH Emb.
SUEZ CANAL Co.
BELGIAN Emb.
EL NIL HOTEL
GARDEN CITY
SHERATON HOT.
U.S.S.R. Emb.
FOUNTAIN
MERIDIEN Hotel
INDONESIAN Emb.
JAPANESE Leg.
ITALIAN Emb.
CAIRO UNIVERSITY HOSPITAL
R.E. MEDICAL ASSOC.
HIGHER INSTITUTE OF EDUCATION
FRENCH INSTITUTE
NAPOLEONIC MUSEUM
EL MANYAL
EL QASR EL AINI HOSPITAL
CHILDREN'S HOSPITAL
FACULTY OF MEDICINE & PHARMACY
POST OFFICE
EL SAIYIDA ZEINA
SANGAR EL-GAWLI
LEBANESE Emb.
SALAH EL DIN M.
EL GAMA'A BRIDGE
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MANYAL EL RODA MUSEUM
AMIRABIC INSTITUTE
RESEARCH INSTITUTE
TURKISH Emb.
CH Emb
GEZIRET EL RODA
EL RODA
Aqueduct Saqyas
Armenian
Capt. Orth
CHRISTIAN CEMETERIES
R.C.
Pr.
Roman Cath
POLICE OUTPOST
SLAUGHTERHOUSE
SH. IBN YAZID
SH. BEIRAM EL TUNSI
BAB TULUN
Site of Fort Muireur
TANNERIES
Aqueduct
Quarry line
Ain el Sira Hous
GIZA BRIDGE (Swing)
EL MALIK EL SALIH BRIDGE
Subway
OLD CAIRO
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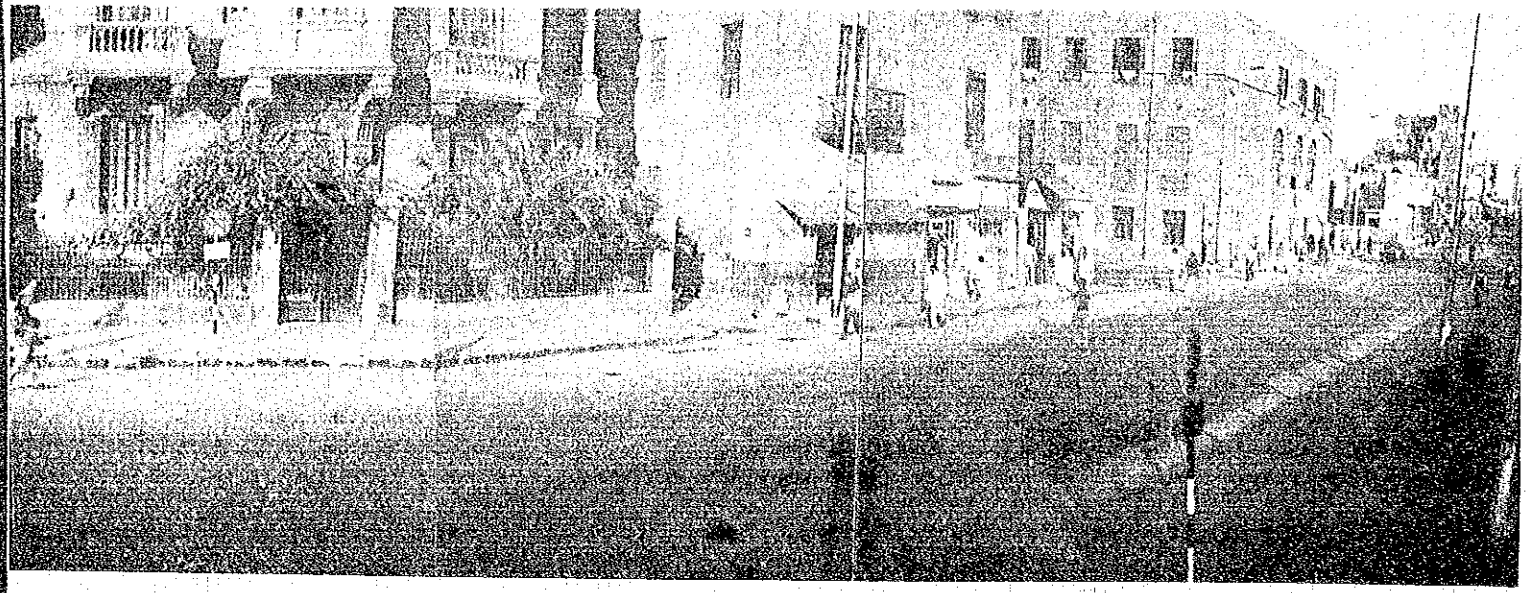
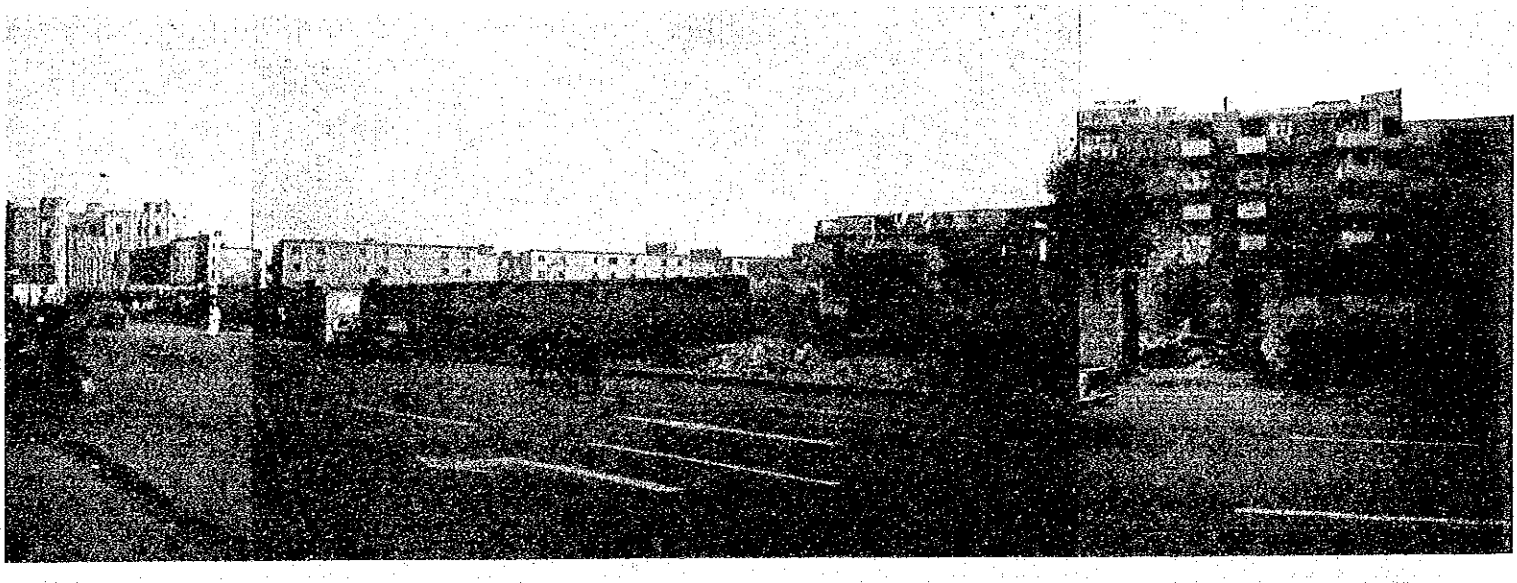


EXISTING PAEDIATRIC HOSPITAL



PROPOSED SITE

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CHAPTER 1 : SUMMARY

CHAPTER I : SUMMARY

1-1 Since the year of 1979 was the United Nation's Year of Children, all over the world, the governmental children's programs were revised and also attracted public attention on the children's welfare.

In Egypt too, many programs related to the children's health and welfare had been promoted under the powerful guidance of the Government. They were also revised at this occasion and the construction of the new children's hospital was found as the pivot to these programs because more modernized medical services and more advanced training of medical and health staff in quality and quantity are keys to carry out these programs.

Cairo University has a longlasting glorious history as institute in Egypt and the Middle East, and the Children's Hospital affiliated to its School of Medicine has been the center of paediatric clinic, education, training and research works to the extent that its name Avou El-Rish became a synonym of paediatrics among the people today. However, after fifty years of services, the building became quite inadequate partly because of the highly increased number of patients owing to the rapid expansion of population and partly because of defects in the building and utility services, totally it does not cope with the requirement of modern medicine and education any more.

Under these circumstances, the Government of the Arab Republic of Egypt asked for the Government of Japan in 1979 to corporate to construct the new paediatric hospital.

In response to this request, the Government of Japan through Japan International Cooperation Agency (JICA) dispatched the Preliminaly Survey Team in August 1979, the Basic Design Survey Team in November

1979 and the Confirmation Survey Team in January 1980 to the Arab Republic of Egypt to make the study on the construction of the new paediatric hospital project.

This report was prepared for the above mentioned purpose based on data and information obtained through these surveys and discussions held between the Egyptian Authorities concerned and the visiting Japanese Teams related to the proposed site conditions, scale of the building, basically needed functions and expected medical, educational and research activities.

1-2 This project is being planned as a part of the national 'Reconstruction of Kasr El-Aini' project and will be the first step of its realization when it is implemented.

The district where this project is being planned is named as Kasr El-Aini after the Castle (Kasr) El-Aini then stood here, and in around 1800 A.D. the castle was converted into a hospital. Since then, together with other medical facilities affiliated to the Cairo University, Kasr El-Aini Hospital had been the center of medical activities in Egypt and the Middle East that today Kasr Al-Aini is a synonyum of medical education of Cairo University.

From this historical point and strategical position with Kasr Al-Aini and other medical facilities of Cairo University, the proposed site could be said best suited to the project.

1-3 The existing hospital will be remodeled into the general out-patient clinic and auxilially facilities while the new hospital will be facilitated more higher medical education and survices which are quite impossible to perform in the existing hospital. The demonstration center will be faciliated for the studen's, nurse's and public health education and training.

The proposed new paediatric hospital will be of service to the children's health and welfare in a trinity with the remodeled existing hospital and the demonstration center being planned at the neighbour of this project site.

1-4 The proposed new paediatric hospital is supposed to be a four-storied, reinforced concrete framing building and its construction shall be carried out in two Phases.

1st Phase will consist of Out-Patient, Central Clinic Components and Mechanical Rooms while 2nd Phase will consist of In-Patient and Service Components. Administrative Component, Educational and Research facilities are scattered on two Phases.

CHAPTER 2 : FIELD SURVEY

CHAPTER 2 : FIELD SURVEY

2-1 OBJECTIVES AND BACKGROUND

1. Objectives

At the request of the Government of the Arab Republic of Egypt, the Government of Japan through Japan International Cooperation Agency (JICA) dispatched a survey team* to the Arab Republic of Egypt for twenty days from November 8th to November 27th, 1979 to carry out the basic design of the Cairo University Paediatric Hospital in Cairo, the Arab Republic of Egypt. The objectives of the team were to hold discussions with the Egyptian Authorities concerned regarding the implementation study of this project, and to collect the data and information necessary for the basic design of the facilities including the medical equipment.

* NIKKEN SEKKEI LTD took part in this survey.

2. Background

Japan's cooperation in the children's health care in Egypt will contribute to the improvement of the children's health and welfare and training of medical and para-medical personnel in the field of paediology, resulting in the strengthening of the foundation for social and economic development in Egypt. Matching Japan's policy to promote programs overseas to improve people's "BASIC HUMAN NEEDS", it will help further the friendly relations between the two nations. In particular, the Government of Japan considers that it is important to contribute to the systematic modernization of clinical, teaching and research works for paediatology and to the future prosperity of mankind. Accordingly a Preliminary Survey Team was dispatched to Egypt in August 1979 to establish the position of such work in the economic cooperation program.

The Preliminary Survey Team headed by Prof. Dr. Kasuga was dispatched to Egypt for 13 days from August 1st, 1979 in response to the request given by the Arab Republic of Egypt. The Team began preliminary discussions with the Egyptian Counterparts on the future activities and the function of the hospital. As a result of the discussions, the following was confirmed: the hospital shall substitute for the existing paediatric hospital which will be modified to a sorting clinic, and shall be an affiliated hospital to the Cairo University. Maintenance and operation will be the responsibility of the Cairo University.

Following the report made by the Preliminary Survey Team for the construction program of the new paediatric hospital, the Government of Japan dispatched a basic design survey team led by Prof. Dr. Kimura to investigate in more detail the possibility for setting up a cooperation program.

2-2 BASIC DESIGN SURVEY

1 Meeting with the Egyptian Authorities

The team visited Prof. Dr. Ibrahim Badran, Rector of Cairo University, Prof. Dr. Mamdouh Gabr, Minister of Health, and other Egyptian Authorities concerned at the Cairo University and gave them a detailed explanation of the objectives of the survey, Japanese regulations concerning Grant Aid, expected procedure and the system of the Japanese fiscal year. These were fully understood by all officials concerned.

2 Discussions with the Egyptian Authorities

The mission held a series of discussions concerned with the facilities of the hospital, number of beds, required rooms for practice of clinical, teaching and research activities and their space, system of operation and maintenance including catering and sterilization services, to obtain the necessary data and information for the basic design.

3 Investigation of Site

Accompanied by the counterparts of the Authorities concerned, the survey team inspected the proposed site to carry out a site survey, paid visits to the various local Authority offices and held discussions with local Authorities concerned during which the following points were investigated.

a. Location

i. Coordination with city planning
ii. Relationship with neighbouring facilities and sites
iii. Existing obstacles
iv. Approach to the site

b. Site Formation and Environment

i. Size of site for this project and future proposed projects
ii. Possible location of buildings in the site
iii. Street scenery and sunshine
iv. Noise, odor and air pollution

c. Status of Utility Supply

i. City water supply
ii. Sewage and drainage
iii. Supply of electricity (service line and emergency generator)
iv. Telephone line
v. City gas supply

d. Soil Conditions

i. Soil and geological conditions
ii. Level of subterranean water
iii. Necessity for, and problems with, building foundations

e. Rights and Restraints

i. Ownership of the site
ii. Restraints concerning the future expansion of streets
iii. Building codes

f. Estimation of Required Infrastructural Scale

i. Site preparation
ii. Neighbouring public utility facility
iii. Utility services (electricity, city water, sewage, telephone and city gas)

4. Result of the Site Investigation

After the site investigations, both parties confirmed the suitability of the site for the construction of the paediatric hospital, provided the sewage pump station next to this site receives some improvements.

The site is located at the corner of Aly Basha Ibrahim Street and Kasr El-Aini Street, just opposite the existing paediatric hospital, also very near to Kasr El-Aini Hospital, Faculty of Medicine and Pharmacy and within walking distance from the Cairo University Hospital, thus almost forming part of the hospital compound of Cairo University.

The district where the site is, though not the center of Cairo City, is highly densed and seems convenient for the patients to visit.

In addition to these investigations and discussions, the team carried out research into construction materials, the price, availability, standards, law and code on the design and construction of buildings in the Arab Republic of Egypt.

2-3 RECORD OF DISCUSSIONS

The Team held a series of discussions with the Egyptian Authorities concerned on matters related to the future implementation of this project when the budget was allocated by the Government of Japan.

The major points of discussions are as follows:

1. Schedule

It was estimated that about 16 months will be required for the construction of the building at each stage taking the similar cases in Egypt into consideration.

Grant projects usually require about 10 months before their construction start after their budgets are allocated.

Whereupon the Team presented a tentative schedule for this project which shows these procedures required and their period of time.

The Egyptian Authorities concerned showed their deep concern and suggested that they will take necessary measures to carry out their part of procedure with exceptional promptness.

2. Budget

The Team explained the procedure of Japanese Grant Aid and the fiscal system of the Government of Japan.

The Egyptian Authorities concerned showed their full understandings on these matters and further they stated

that the Government of the Arab Republic of Egypt is considering this project very important, and they wished the Government of Japan would give a special consideration to this project.

3. Sewage Pumping Station

There exists a sewage pumping station at the west side of the site facing Kasr El-Aini Street, which is a key pumping station of the Cairo City sewage system and consists of a pump house, transformer room and others. A meeting was held in the presence of the sewage authority on this existing pumping station. The Committee and the sewage authority asked if it would be possible to plan the new hospital leaving the pumping station as it is now because it is essential to the total sewage net work, and to remodel or to demolish would cause many difficulties.

The Team made a study plan and concluded that the new hospital could be planned leaving the pumping station as it is now provided some improvement to the facilities were made.

The Committee and the sewage authority promised the following:

a. The septic tank shall be completely covered to prevent the breeding of flies and other insects. Covers shall be opened only for inspection and maintenance purposes.

b. The sewage pumping station shall be completely installed underground when Aly Basha Ibrahim Street is expanded in the future.

c. The lavatory in the station shall be improved.

4. Piling Works

A soil survey by the boring test was urgently requested as the piling works, whether they should be necessary or not, will

affect the budget, work schedule and even the scale of the building to be planned. For that the Team took a Sweden Sounding Tool from Japan to carry out such a survey by themselves. The Committee also understood the importance of a soil survey, and carried out boring and soil tests. The result of these soil tests are as shown on the Graph attached hereto.

As a result of this survey and tests, the Team and the Egyptian authority agreed upon the necessity of piling works for the foundations.

5. Scale, Arrangement and Plan of the Hospital

The Team submitted to the Committee its schematic plans of the new hospital which were prepared in Japan to obtain more precise planning opinions and the understanding of the Egyptian authorities concerned.

During the discussions on the schematic plans the Team prepared five alternative plans as a result of their suggestions and also explained the Team's understanding, and finally both sides reached an agreement on the final schematic plan.

Major opinions of the Committee concerned the scale, arrangement and planning are as follows:

a. First stage of the construction should take place at the east side of the site because of the close relationship between the existing and new hospitals.

b. Main approach to the hospital, visiting patient access and services should be from the south, Ismail Sabry Street, to avoid heavy traffic on Aly Basha Ibrahim Street from which only house staff and emergency patient access will be allowed.

c. To give consideration to the Demonstration Center which will be built to the east of this building and shall be an component of the Child Health Complex.

d. 10 lecture rooms are requested in addition to one lecture room in the Out-Patient Department.

e. To provide a Central Supply where all instruments except those for the Surgical Suite will be sterilized and delivered to all departments in the hospital.

f. After some discussions the number of three Operating Theaters was agreed upon.

g. To provide a Medical Photography Room, Endoscopy Room (Central Clinical Component), Recovery Room for the Out-Patients and a Medical Equipment Maintenance Room.

h. To provide a Milk-room on each floor of the ward. If it is decided to share with the Pantry, a separate kitchenette should be provided.

i. A separate Clean and oil Corridor should be provided in the Surgical Suite.

j. Clean Utilities and Soil Utilities should be clearly separated.

k. At the beginning 8 beds and 2 Incubators shall be provided in ICU. The future remodeling of the Neonatology Room into an ICU should be taken into consideration.

l. The planned Central Laboratory, Library, Storage and Clinical Office seem to need more area for adequate functioning.

m. The Kitchen appears too small for a central catering system.

n. The route from wards to the mortuary should be planned not to be obvious to the public.

o. The Emergency facilities should follow the agreed national plan.

p. To provide space for the children to play and watch TV.

q. To provide a service yard for the kitchen.

r. To give consideration to the waiting space in the Out-Patient Facility so it could be used for the practice of health education using Video-Taperecorder, etc.

s. To provide a physical Therapy and Rehabilitation Room.

t. To Provide a small Pharmacy on each floor, but it will not be needed if a similar facility could be provided in the Nurse's Station or Treatment Room.

u. A research facility was requested but the Team explained that such activities should be carried out in the Central Laboratory and the Egyptian side agreed to this point.

v. A Students' Lounge was requested on each floor.

w. An X-ray Room and a small laboratory were requested but the Team explained that these examinations should be carried out in the Central Clinical Facility, and that explanation was agreed by the Egyptian side.

x. The number of beds was agreed upon as 240.

6. Medical Equipment

The Team submitted a tentative list of medical equipment which could be provided under this Grant Aid, and hoped to discuss it in detail. However, the Committee decided to give the information of the activities which are proposed to take place in the new hospital to the Team later and let the Team decide what medical equipment is to be selected.

7. Building Materials

Whenever possible it is desirable to use locally producted materials in this project. However, some important materials like cement are under the control of the Government and very hard to obtain in the open market. Therefore the Team asked to the Committee if it would be possible for the Government to give special priority to this project in supplying these governmentally controlled materials and the Committee agreed.

8. Scope of Works

The Team and the Committee agreed to the scope of works to be borne by the respective Governments, as prescribed in the 'Minutes of the Meeting' attached hereto.

9. Licence Permission, etc.

A registration and licence is required in Egypt to act as a consultant or to perform a contractor business. The Team requested to the Committee to take all necessary measures so that the Japanese nationals engaged in this project shall be furnished with licences or permissions to perform their parts.

2-4 EXCHANGE OF MINUTES

At the completion of the site investigation, the findings and the discussions held were summarized in the Minutes. In the Minutes signed by Prof. Dr. Ibrahim Badran (Rector of Cairo University), Prof. Dr. Mostafa Kamel Helmy (Minister of Education), Prof. Dr. Mamdouh Gabr (Minister of Health) and Prof. Dr. Mikio Kimura (Leader of the Japanese Survey Team), the following were agreed: the name of the hospital, location, the Buildings and facilities to be provided by the Government of Japan and works to be done by the Government of the Arab Republic of Egypt at its own expense. The full text of the Minutes is shown on APPENDIX I.

2-5 CONFIRMATION SURVEY

1. Objectives

On the basis of the survey resu;ts described in Section 2-2, a basic design was worked out in Japan and compiled in a report titled "Report on Basic Design - draft - Cairo University Paediatric Hospital in the Arab Republic of Egypt".

The Japan International Cooperation Agency dispatched a survey team led by Prof. Dr. H.Kasuga, Scool of Medicine, Tokai University to Egypt from January 10 to January 19, 1980 to submit and explain the Report and to conduct further investigation necessary for finalizing the basic design.

2. Consultation

The Team made a presentation of the basic design and discussed it with the Egyptian Authorities concerned. The Egyptian side in principle agreed all matters described in the Report regarding the design of the buildings and facilities except points described below.

a. Live loads as descibed 250kg/m and 300 kg/m shall be 300 kg/m and 350 kg/m following to the Egyptian regulations.

b. The kitchen area seems a little too narrow.

c. Cental Sterilization shall be divided into Sterilization and Laundry.

d. Electrical supply voltage will be regulated as 11 kv in future and to provide devices for 11 kv intake.

The Team promised to revise the Report on these matters.

The Egyptian Authorities confirmed that

1. They already took necessary financial measures to undertake works to be borne by the Egyptian Government described in the "Minutes of the Meeting" dated November 25, 1979. (Ref. to Appendix I)
2. The site will be ready for the construction works to be commenced by April 1, 1980.

The Egyptian Authorities and the Team has exchanged letters to this effect signed by Prof. Dr. Ibrahim Badran, Rector of Cairo University and Prof. Dr. Hitoshi Kasuga, Leader of Japanese Confirmation Survey Team.

CHAPTER 3 : BRIEF DESCRIPTION OF HOSPITAL

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3-1 OUTLINE OF THE HOSPITAL

It is clearly demonstrated in the health statistics of Egypt that some diseases such as diarrhea and communicable diseases are still prevalent and present a serious health hazard for the children in Egypt and its neighbours.

Infant mortality is especially high, being approximately one-third of the total motality rate. The infant motality ratio is still about 100 per one thousand live births. The causes of death in infant and childhood mortality cases in Egypt are mainly digestive diseases especially diarrhea diseases showing approximately 46% of all mortality causes in 0-5 age group. The second major causes of death among infants and pre-school age group are infectious and parasitic diseases. The rate is high for infants by 29% of the cases but it shows on alarmingly high level for the pre-school age group in 42% of the causes of death.

Most of these death causes of infants and children are preventable, however, these diseases are actually difficult to control without an improvement in nutrition and popularization of sanitary education in the society.

The Government of the Arab Republic of Egypt has been making efforts to improve the health and welfare situation by arranging a medical net-work system throught the country providing maternal and child health clinics for primary care, preventive medicine and maintenance of health. Through these health services by the Ministry of Health, the Government realized that the success of primary health care is dependent upon the quality of personnel and services rendered as well as the level of community participation in such services. Thus the need for improvement and re-orientation in medical education to meet the present and future community health becomes mandatory.

The survey team of JICA held a series of discussions and exchanged views with the Egyptian authorities concerned on the proposed hospital. The following points were agreed upon by both parties:

1. The new hospital will serve for education, training, research and health services as a component of the paediatric health complex together with Premature Center, Demonstration Center for Child Health and the existing child hospital.

2. The existing hospital will be remodeled and serve for the following:
   a. General outpatients with the required sorting rooms and supporting facilities
   b. Isolation wards for infectious diseases
   c. Physical medicine unit
   d. Day care clinic
   e. Others

Based on the agreement the survey team drew up a plan for the building and a list of the equipment to be supplied.

3-2 EFFECT OF THE NEW HOSPITAL

With infants and children forming 45% of the Egyptian population and 55% of the utilizers of health service facilities, the establishment of a paediatric hospital for education, training, research and health services has a high priority in Egypt.
The existing Maunira Paediatric Hospital performed excellent services in this field for 50 years. However, at the present time the Hospital is serving on the daily average more than 2,000 infants and children in the morning and 1,000 cases in the afternoon in spite of being originally planned for 400 cases per day.

The impact of the new Paediatric Hospital will be interpreted into objectives related to education, training, research and health services. The present group of top quality personnel in all paediatric specialities and other staff resources together with the unique reputation that the existing hospital has earned will ensure the achievement of these objectives.

1. Education

As part of Cairo University Medical School, the Paediatric Department has the following educational duties:

a. On the undergraduate level about 1,000 students have to get intensive compulsory training for two months in the field of paediatrics.

b. Upon graduation from the Faculty of Medicine, the students are required to do one year internship. Around 100 of them work as interns in the hospital on a rotational basis.

c. After completion of the internship, twenty of the graduates stay for 3 years to work as residents.

d. Eighty master and doctorate students have to do their studies and thesis work in area related to paediatrics.

The limited space and facilities of the existing hospital are the major obstacles to the performance of these duties at a high standard resulting in a lot of frustration to both students and staff.
It is a major objective of this new hospital to provide the space and facilities for a high standard of education on both the graduate and postgraduate levels.

2. Training

The training activities in the new hospital will cover the following:

a. Physicians: To train the trainers in the field of paediatrics.
b. Nurses: To solve an existing deficiency in the number of qualified nurses.
c. Administrators: To give a training program in hospital administration on a highly scientific basis.

3. Research

The proposed paediatric hospital will contribute to have all the resources needed to conduct applied research in the field of paediatrics. These resources include the following:

a. A group of the highest qualified personnel in this field in the country.
b. Well equipped research component with up-to-date research facilities.
c. A large variety of cases which cover almost all types of diseases and which lend themselves to investigation and analysis.

This impetus to applied research in the field of paediatrics is expected to have a great impact on the continueing efforts by the existing staff.

4. Health Service

The new paediatric hospital will increase the accessibility of the community, especially the urban poor, to a high quality ambulatory service which they badly need at the present time.

The linking of existing basic health services with the paediatric hospital will increase the effective utilization of both levels as well as the quality of services to the public.

The improvement of health services will give the following solution:

a. Referral clinic after sorting will enable the doctors to examine patients much more intensively.
b. Increase in number of beds will optimize the potential capacity of existing staff.
c. Modern and sufficient supporting facilities will enable the staff to carry out diagnosis, treatment and nursing in a better way.

CHAPTER 4 : BASIC DESIGN

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4-1 GENERAL DESCRIPTION

The two surveys directly concerned with this project were carried out in August and November 1979. The first was to investigate the general conditions of the project and the second was to make more detailed proposals for the implementation of the project and it is from these two surveys that this basic design has been developed.

A variety of medical and building requirements were furnished to the survey team by the members of the Egyptian authorities concerned for the Cairo University Paediatric Hospital. These requirements were incorporated into the design concept described in this report with advice on medical and architectural aspects given by the Egyptian and Japanese experts concerned to this project.

In designing the layout, structure and room conditions of the facilities and electrical and mechanical systems to be installed, the following were taken into account: the climatic conditions, the nature of the proposed facility, soil conditions, the state of the local building industry and other local conditions.

The Government of Arab Republic of Egypt will have to carry out some works in relation to this construction project. Such works, however, are described briefly in this report where they are related to the function and construction of the proposed facilities.

Cost estimates and a time schedule for the construction of the facilities have also been prepared. These have been based on the investigated costs of materials and labour, and construction time for similar projects in Egypt. Consideration was also given to the method of transportation of materials and equipment from Japan.

4-2 DESIGN PRINCIPLES

1. The intention and requirements of the Egyptian people who will occupy and utilize the facility and the comfort of the patients should be fully taken into consideration.

2. The facility should be practical and easy to maintain.

3. The buildings should be able to respond to future changes or developments. Also relations with another facilities which will compose the paediatric health complex shall be taken into consideration.

4. Local conditions such as natural environment and climatic conditions should be taken into consideration.

5. The design of the facility should take into consideration to local customs, construction methods, building trade practices, etc.

6. Local materials should be used as much as possible for the construction of the facility to minimize imported materials.

7. The design should be carried out to conform to the applicable Egyptian regulations and standards and satisfy all local statutory requirements.

8. To construct the building in two phases if necessary from the financial aspect, and each phase has to be activated independently when completed.

4-3 SUMMARY OF PROJECT

1. General

The Cairo University Paediatric Hospital is composed of the following components.

a. Administrative Component

This component will control the whole hospital and also serve as a pivot for all paediatric medical activities.

b. Out-Patient and Emergency Component

Patients who need to be examined intensively will be sent here from the sorting clinic in the old hospital or the urban health clinics.
The emergency component shall be designed according to the national plan for emergency treatment and shall be a center for paediatrics emergencies.

c. In-Patient Component

Patients will be housed here for treatment or examination, for the very young children, mothers will be allowed to stay in with the patient and mothers'rooms will be provided.

d. Central Clinical Component

This component consists of; operating suite, X-rays, laboratory, pharmacy, physical therapy etc., which is given highest priority in the proposed hospital.

e. Service's Component

This component is to run the hospital properly. Kitchen,

supply center, mechanical and electricity rooms will be provided.

f. Teaching and Research Component

All research works for paediatrics and children's health care and training for medical and para-medical personnel including physicians, graduate and post-graduate students will be carried out in this department.

2. Structure

The buildings are reinforced concrete frame structure four storied high with pile foundation.

4-4 SITE CONDITIONS

1. Site Description

Cairo is the capital of the Arab Republic of Egypt, about 180 km from the Mediterranean coast and its approximate location is at 30 00'N. Lat. and 31 15'E Long.

The site proposed by the Government of Egypt for this project is almost rectangular with a cut at the corner of Aly Basha Ibrahim and Kasr El-Aini Street. At the south-west corner there is a Sewage Pumping Station. To the east of the site Demonstration Center is being scheduled by USAID.

The area of the site is 4,457 square meters.

There were five buildings at the project site. They are being demolished by the Government of Egypt including the foundations two meters deep from the ground surface. It is proposed that the site will be left excavated to two meters deep by the authorities concerned.

The Sewage Pumping Station serves as a transmitting station for the sewage net work of this district. As it presents some problems to this project, a meeting was held with the presence of the Sewage Authorities. After discussions, it was decided to leave it as it is with some improvement to be made.

2. Site Surroundings

The site is almost at the center of Cairo City with a high density population. Aly Basha Ibrahim Street and Kasr El-Aini Street to the North and West of the site are among the busiest street in the City. These Streets are planned to be widened in the future.

To the north opposite to Aly Basha Ibrahin Street, to its East there is the exisitng Paediatric Hospital which shall remain as a part of the Paediatric Health Complex and staff and material circulation should be taken into consideration. Some existing apartment houses are adjacent to the existing hospital.

To the East, at the remaining part of the site, a Paediatric Demonstration Center is expected to be built by USAID, but no information is available at this moment. There lies a railway adjacent to the site for Demonstration Center, which tends to be affected by noise nuisance.

To the South, there is a street named Ismail Sabry, this street is expected to be the main approach to the site avoiding the heavy traffic of Aly Basha Ibrahim Street. Opposite are a school and apartment houses.

To the West, half of the site border faces to the Sewage Pumping Station and the other half is open to Kasr El-Aini Street.

The faculty of Medicine and Pharmacy of Cairo University could be described as just opposite to the Kasr El-Aini Street and New Kasr El-Aini Hospital is being planned very near to this site.

3. Climatic Conditions

The climatic records of Cairo are shown on the next page.

In Spring a wind called 'Hamshiin' blows from the West, carrying fine sand from the Sahara Desert. The velocity of the wind is a mederate one, but the fine sand penetrates into the building even through the narrowest slit.

1947 - 1970

			Month
Mean Air temperature (c°)	Max.	27.8	Jul.
	Min.	13.7	Jan.
Max. Air temperature (c°)	Max.	35.0	Jul.
	Min.	8.8	Jan.
Diference between Max. and Min. Air temp. (c°)	Max.	14.8	May
	Min.	10.3	Jan.,Dec.
Mean Relative Humidity in one month (%)	Max.	60	Dec.
	Min.	43	May
Mean Amount of rain in one month (mm)	Max.	6.7	Dec.
	Min.	0	Jul.
Mean Amount of rain in one day (mm)	Max.	50	Dec.
	Min.	0	Jul.
Mean Surface Wind Speed (m/s)	Max.	17	May
	Min.	6.4	Aug.
Surface Wind Speed (m/s)		1 - 10	May - Sep.
		10 - 15	Jan.- Apr.
Surface Wind Directions	Prevailing Wind : from North West - North East		
	Dusty Wind Feb. - Apr.: from North East Jan.: from South West-South East		

Table 4-4-i

CAIRO A.P.		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Period
Mean Air temperature	(c°)	13.7	14.9	17.5	20.9	24.6	27.2	27.8	27.7	25.8	23.4	19.3	15.3	1947-70
Mean Max. Air temp.	(c°)	19.1	20.6	23.9	28.3	32.2	34.8	35.0	34.6	32.4	29.8	25.2	20.7	1947-70
Mean Min. Air temp.	(c°)	8.8	9.4	11.5	14.1	17.4	20.2	21.5	21.8	20.0	17.8	13.9	10.4	1947-70
Mean Relative Humidity	(%)	58	54	49	45	43	46	54	57	58	57	61	60	1947-70
Mean Total Amount of rainfall	(mm)	5.2	3.9	2.4	0.9	0.7	0.2	0.0	Trace	Trace	1.2	3.2	6.7	1947-70
Max. Amount of rain in one day	(mm)	9.6	10.4	10.0	3.8	6.0	3.6	0.0	Trace	0.1	13.8	18.5	50.0	1947-70
Mean Evaporation Piche	(mm)	7.6	9.0	11.5	14.3	16.4	17.2	14.2	13.0	12.2	11.1	8.2	7.5	1947-70
Mean Surface Wind Speed	(Knots)	8.0	8.1	8.7	8.7	8.8	8.1	6.7	6.4	6.6	7.1	6.5	7.6	1947-70
Frequency of Wind Blowing by Direction	(%)													
Calm		6.2	5.8	4.6	4.3	3.5	5.1	6.0	6.8	8.8	6.7	10.2	6.7	
Variable		1.6	1.3	1.1	1.3	1.2	1.0	0.8	1.2	1.3	2.1	1.1	3.1	
from 345° to 014°		2.5	4.8	5.8	8.8	11.6	17.0	20.5	20.6	17.7	8.9	7.2	2.6	
" 015 " 1044		5.4	8.7	9.7	15.7	20.8	22.3	15.7	18.8	26.8	21.9	15.8	6.8	
" 045 " 074		7.8	10.0	12.6	15.4	21.1	13.0	5.6	6.7	14.0	21.4	16.1	9.3	
" 075 " 104		5.1	7.2	7.0	8.1	8.7	5.1	1.6	2.1	5.1	10.3	9.0	7.6	
" 105 " 134		5.2	6.2	5.1	4.9	4.2	2.4	0.7	0.9	2.0	3.8	5.3	6.1	
" 135 " 164		5.5	4.8	3.3	2.9	1.6	0.9	0.2	0.2	0.5	1.0	2.1	4.2	
" 165 " 194		11.5	6.6	4.4	2.2	0.9	0.2	0.1	0.1	0.2	1.3	3.7	9.6	
" 195 " 224		19.2	11.4	7.8	5.3	1.2	0.9	0.2	0.3	0.3	2.5	6.9	18.4	
" 225 " 254		11.5	10.4	7.9	4.6	2.2	1.2	0.8	0.8	0.6	3.0	6.0	9.5	
" 255 " 284		7.8	7.3	9.1	5.6	3.7	2.9	4.2	2.8	1.7	2.5	4.2	6.4	
" 285 " 314		5.7	8.4	11.4	9.1	6.6	8.9	13.6	12.3	5.4	5.2	5.2	5.2	
" 315° " 344°		5.0	7.1	10.2	13.6	12.7	19.1	30.0	26.4	15.6	9.4	7.2	4.5	
Frequency of Wind Blowing by Speed	(%)													
from 1 to 3 Knots		16.7	19.3	16.2	14.3	14.0	17.2	24.3	24.7	22.0	20.0	19.1	21.4	
" 4 " 6 "		21.9	21.0	20.7	19.9	20.4	20.5	24.9	24.6	22.5	22.8	24.3	22.4	
" 7 " 10 "		25.7	25.0	25.9	28.1	30.0	28.7	27.8	29.4	29.3	29.5	27.4	24.6	
" 11 " 16 "		21.9	20.7	23.6	26.6	26.7	24.5	16.3	14.0	16.4	18.9	16.9	18.4	
" 17 " 21 "		5.6	5.3	6.3	5.3	4.4	3.7	0.7	0.4	0.9	1.9	1.6	4.6	
" 22 " 27 "		1.6	2.1	2.1	1.4	0.9	0.3	0.0	0.0	0.1	0.2	0.5	1.6	
" 28 " 33 "		0.3	0.7	0.3	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.3	
more than 34 "		0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

Table 4-4-ii Meteorological Data

4. Geological Conditions

a. Geological Outline of Cairo

The City of Cairo has developed along the basin of the River Nile which was formed during the Pliocene era. Today's Nile Delta is a built-up product of sand, silt and clay layers over this basin. This geological composition is exposed near the Pyramids at Giza. According to the change of climate in the historical span of time, the stream of the Nile has also been changed. The graph shows that there used to exist many waterways, lakes and swamps around the central area of Cairo City about 1,000 years ago. Sand, silt and clay were deposited due to repeated flood and reclamation from time to time with broken bricks etc. have changed these waterways, lakes and swamps into a city.

b. Geological Conditions of the Site

As shown in Fig. 3-4-i, the proposed site was presumably amidst the stream of the Nile and in the 13th or 14th Century, it could be found about 300 meters away from the bank.

Two boring tests at the site were conducted and results of N-value of standard penetration test are shown in Fig. 3-4-4-ii.

Some considerations were given as follows together with the geological test of the neighbouring site; 2-4m from the ground surface is a filling layer and 2-5m under this layer is a silty sand. Then deeper, the more predominant the sand layer becomes with lense-shaped silt layers at places.

The particles of these sands are not uniform in size

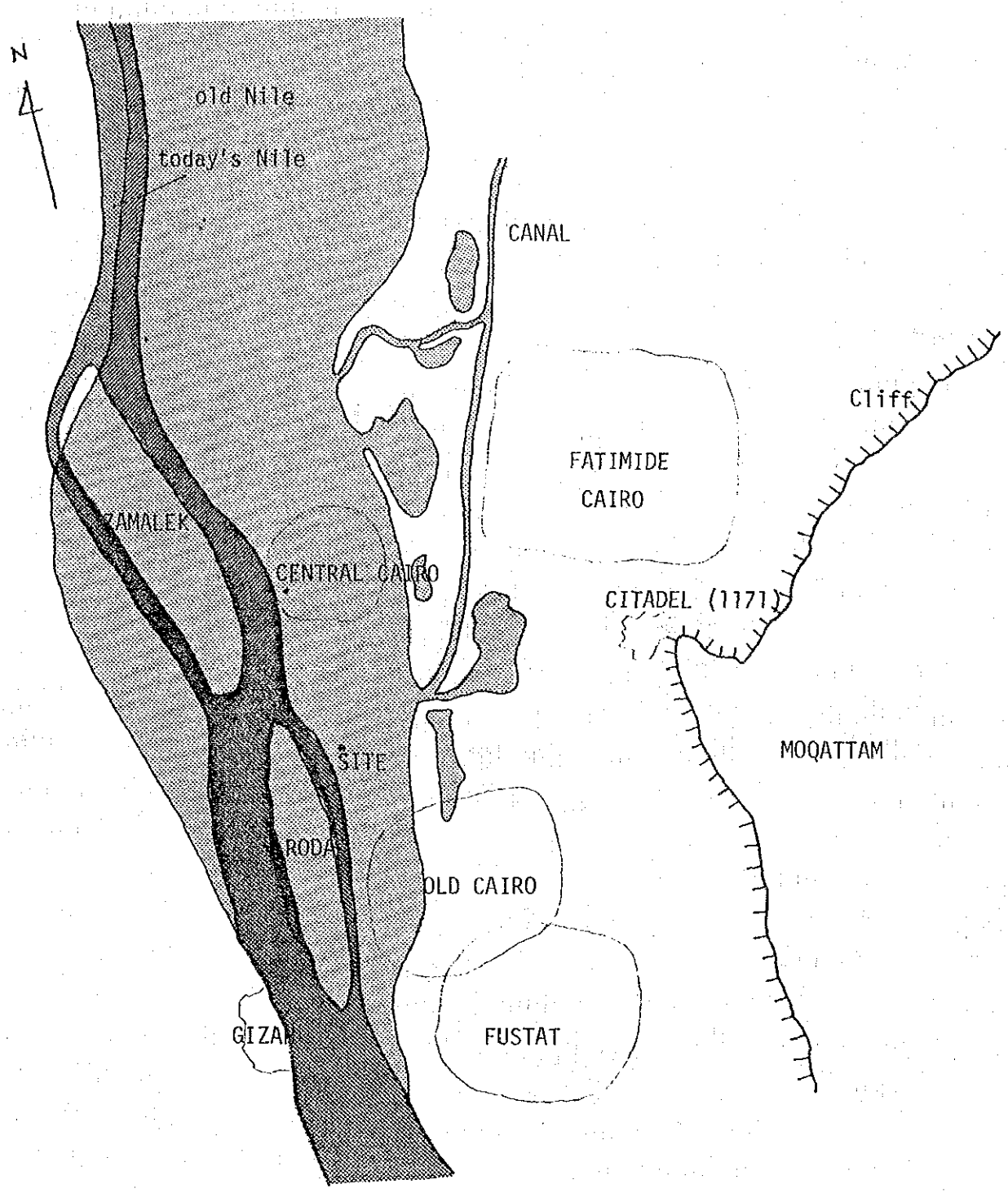
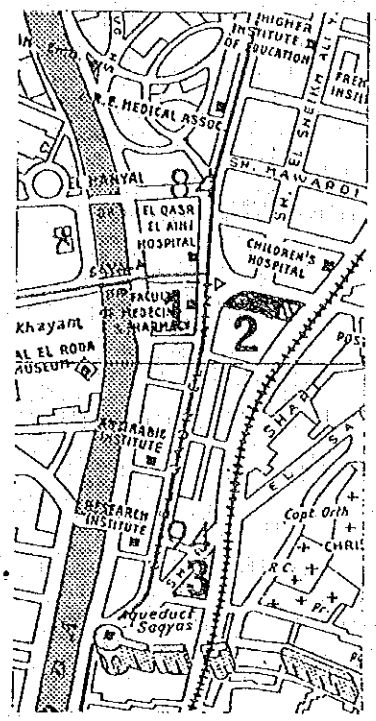
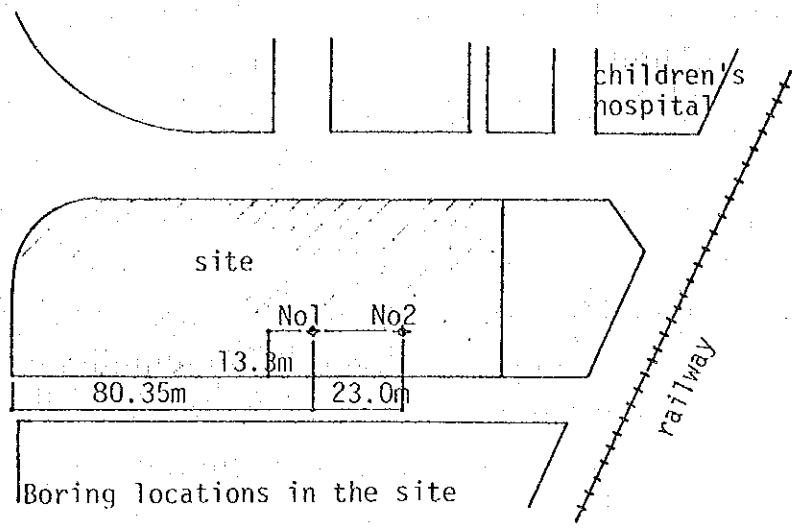
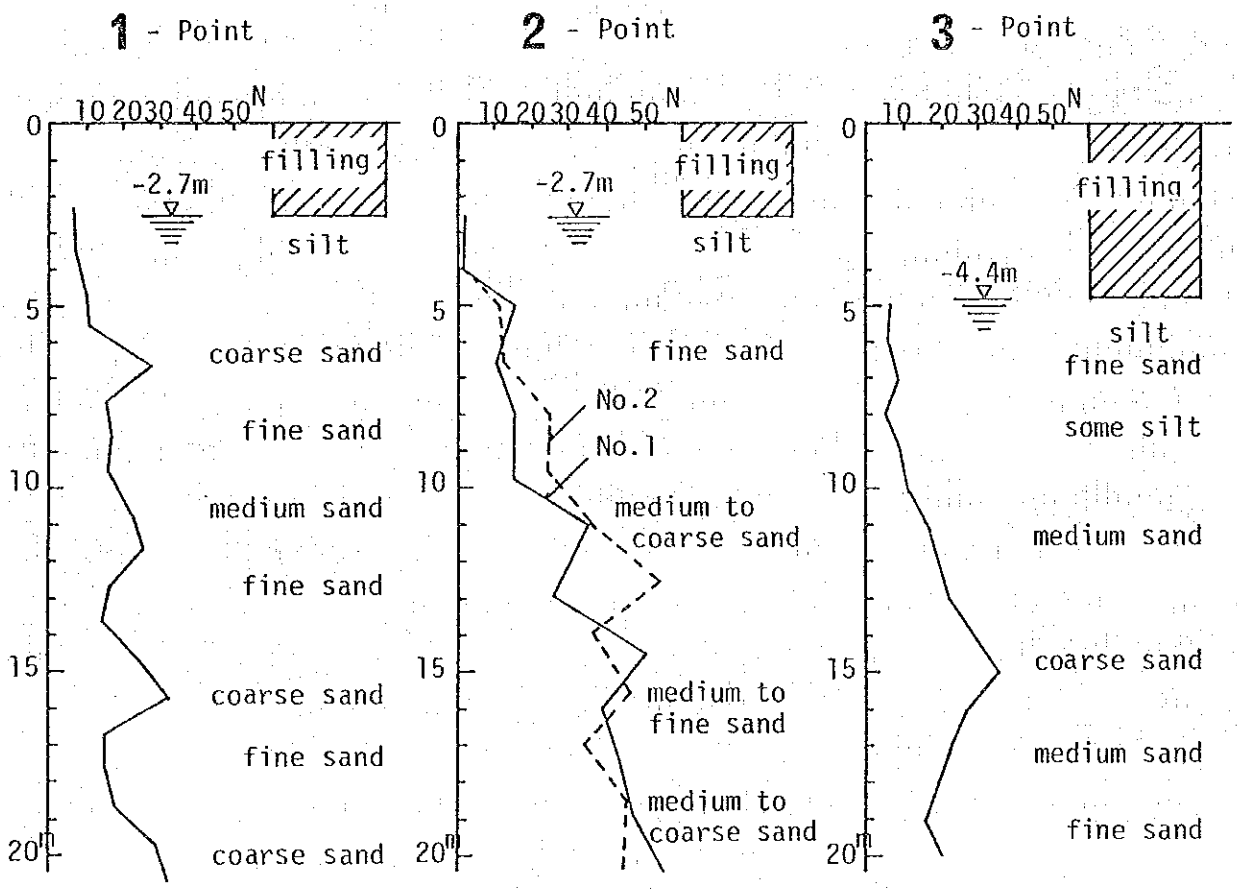


Fig. 4-4-i Cairo of one thousand years ago
(Fatimide Period)





Map of the site



Boring Data

Fig. 4-4-ii

according to the velocity of the flow of the Nile. Fine and coarse sand layers seems being deposited alternatively. Naturally the coarser the particle of sand is, the bigger N-Value is.

Of the sites 1 through 3, the proposed site seems to be of the best of geological conditions.
Subteranean water level is expected to be 3 or 4 meters below the ground surface.

5. Earthquake and Others

We consider that there is necessity to consider the horizontal load for a low-raised building since there was no sensible earthquake from the historical era and the wind velocity is not so high even in the Hamshiin season in Cairo. However, there is a regulation concerning to the horizontal load to be applied to a 6 storied or higher building.
Subterranean water level is expected to be stable as since the completion of Aswan High Dam, the flow of the Nile which used to flood became static.

6. Electricity

As shown in Fig. 4-4-iii, two 11 kv super high tension circuits are laid under Aly Bash Ibrahim Street coming from Saiida Substation. The electricity is distributed to the neighbouring consumers after transformed into 3 phase 380 v, single phase 220 v. The electrical load of the proposed hospital is estimated to be approximately 1,400 kvA.

The electric authority is planning to lay 2 new electric circuits exclusively for the Hospital.

In Egypt they are supplying electricity in 3 kv and 11 kv, we

told the authority we are expecting to be supplied by two 3 kv circuits.

In the hospital design, it is most common to have two electric circuits for the normal use, one main and one stand-by, and provide a stand-by generator for the emergency. Also a device to supply stable electricity for medical equipment should be provided since some fractuation in power voltage is expected.

7. Telephone

There are 1,200 trunk lines in 4 cables under Aly Basha Ibrahim Street and 100 trunk lines under Ismail Sabri Street coming from Roda Central Telephone Exchange.

The exchange system of the Roda Central Telephone Exchange is an automatic cross-bar type made by Ericson, Sweden.

8. Communication

As a communication facility other than telephone, Cairo has two channels color TV net-works and a radio broadcasting.

9. City Water

As shown in Fig. 4-4-iii, there are 100mm diameter mains in Aly Basha Ibrahim Street and Ismail Sabri Street while another 400mm and 200mm diameter mains are laid in Kasr El-Aini Street.

The supply pressure of the water is 2.0 kg/cm^2 in day time and 3.2 kg/cm^2 at night time.

The quality of drinking water and Standards for liquid wastes disposed in municipal sewers are as shown on Table 4-5-i and Table 4-5-ii.

10. Drainage

As shown on Fig. 4-4-iii, there are 30" and 12" public sewage mains under the Aly Basha Ibrahim Street and 7" main under the Ismail Sabri street.

At the west of the site, facing to the Kasr El-Aini Street there is a Sewage Pumping Station servicing for the district.

11. City Gas

City gas supply mains are laid under the Aly Basha Ibrahim Street with 100mm diameter and under the Kasr El-Aini Street with 300mm diameter.

The city gas is butane gas having a supply pressure of 80mm Aq. Gas cylinders are easy to obtain.

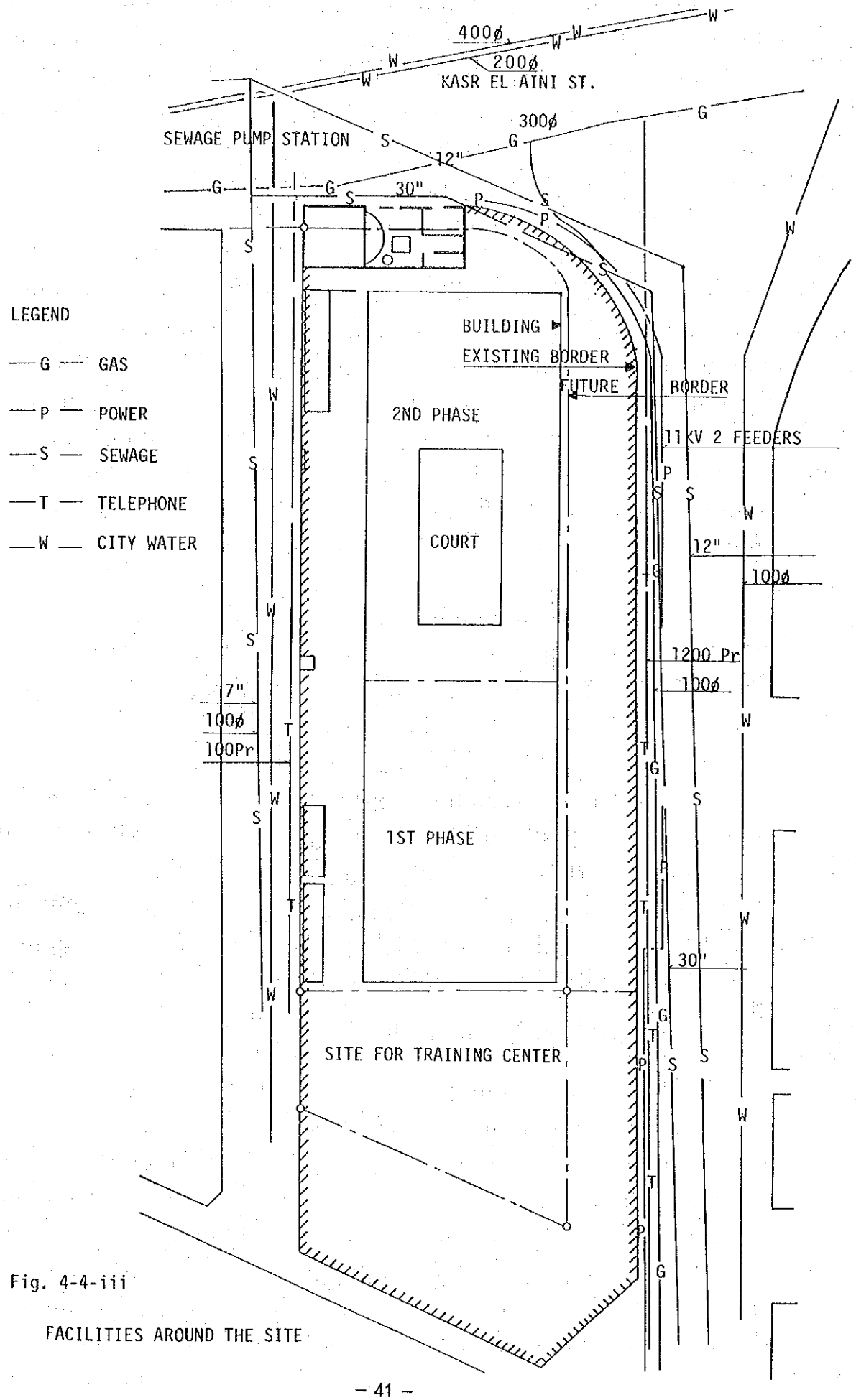


Fig. 4-4-iii

FACILITIES AROUND THE SITE

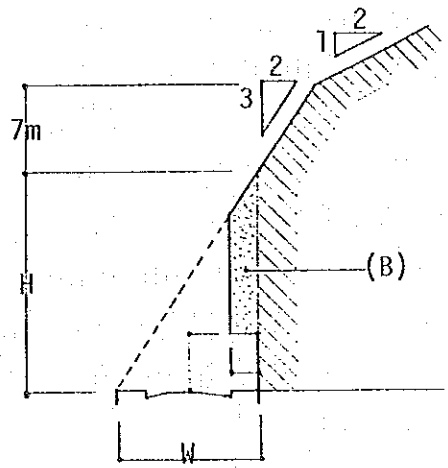
4-5 LAWS AND REGULATIONS

Of the building laws, regulations and code in Egypt, the followings are these to be taken into consideration for the proposed project.

1. Architectural

a. Building Height

Fig. 4-5-i shows the limit of the building height related to the adjacent street width.



where W:width of road facing the bldg.

H ≤ 3/2W or less than 35m

Fig. 4-5-i

Note 1: Of the area (B);
Balcony or Canopy ..... full length
Room ..... one half
of the total projected length of the building to the street to be permitted.

Note 2: The height will be measured from the top of the curbstone.

Note 3: Projections above the roof slub such as parapet, lift machine room, chimney shall not be counted in the building height.

b. Ceiling Height

i. Living Unit ..... 2.7m or more

ii. Rooms ..... 2.3m or more
(Corridor, storage, machine room etc.)

c. Natural Light and Ventilation

i. Total of effective window area for natural lighting ..... 30% or more of each room's floor area

ii. Total of effective opening area for natural ventilation ..... 15% or more of each room's floor area

iii. Above will not be applied to the room equipped with mechanical ventilation system or air-conditioner

d. Number and Width of Staircases

Minimum one main staircase and one escape staircase, by total 2 staircases are requested.

The width should be as follows;

i. Main Staircase ..... 1.2m or more

ii. Escape Staircase ..... 0.8m or more

e. Corridor Width

Corridor width in public building should be 1.2m or more.

f. Escape Distance

Escape distance from each part in the building to one of Staircases should be less than 50 meters. The distance should be a practical measurement.

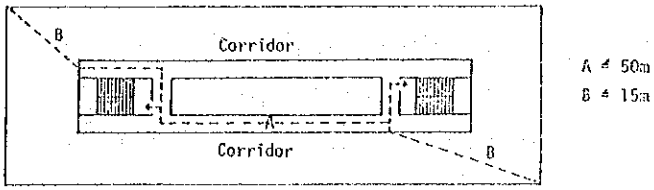


Fig. 4-5-ii

g. Court

The court is under a regulation stated below;

i) When enclosed by living units ..... Fig. 4-5-iii
ii) When enclosed by rooms ..... Fig. 4-5-iv

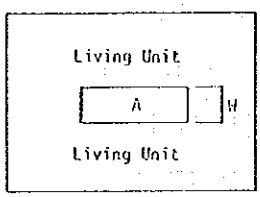
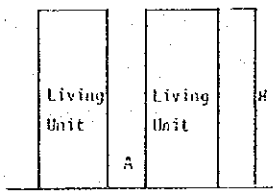


Fig. 4-5-iii



$(A) \geq (\frac{2}{5})^2 \times H$

$W \geq 1/4 \times H$

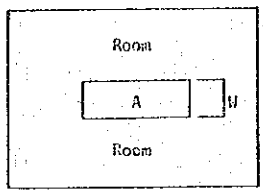
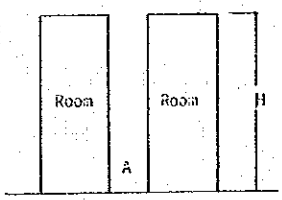


Fig. 4-5-iv



$(A) \geq 12.5m^2$

$W \geq 2.5m$

h. Height of Handrail and Window-Sill

A handrail and window sill should be higher than as stated below from the floor adjacent to it.

i) Hand rail 1.05m
ii) Window sill 0.85m

j. Miscellaneous

i) Derivation of floor area: Based on the outside measurement of structural walls

ii) Derivation of room's area: Based on inside measurement

2. Structural

" Code of Practice for the Use of Reinforced Concrete in Building " issued by the Building Research Center,Ministry of Science and Research governs the reinforced concrete structural design in Egypt. However, as the result of discussions held between the Survey Team and the Egyptian Authorities concerned, it has been agreed that the structural design of the proposed building could be made according to ACI-318 by Concrete Structural Code, U.S.A. and the above mentioned Egyptian Code will be referred to an extent of information.

3. Mechanical and Electrical

In Egypt, other than the Drinking Water Standard (Table 4-5-i) and Standards for liquid wastes disposed in municipal sewers (Table 4-5-ii), there are no laws, codes and regulations related to electricity, telephone, fire prevention and anti-pollution.

As the result of discussions held between the Survey Team and the Egyptian Authorities concerned, it was agreed that the electrical and mechanical design and works shall be performed applying related Japanese Regulations with considerations given to the local conditions.

UNIT : PPM

	ANALYSIS VALUE	STANDARD VALUE
1. PHYSICAL		
COLOR	LESS THAN 5	
TURBIDITY	LESS THAN 5	LESS THAN 5
TASTE		ACCEPTABLE
SMELL		NIL
2. CHEMICAL		
Pb	-	LESS THAN 0.1
As	-	LESS THAN 0.05
Cr^6	-	LESS THAN 0.05
CN	-	LESS THAN 0.01
F	0.5	LESS THAN 0.8
N	NIL	" 45 (NO_3)
TOTAL DISOLVED SOLIDS	180	LESS THAN 1500
Fe	0.1	LESS THAN 1.0
Mn	0.1	LESS THAN 0.5
Cu	-	LESS THAN 1.5
Zn	-	LESS THAN 15
Mg	13.2	LESS THAN 150
Ca	26	LESS THAN 200
$CaCO_3$	120	LESS THAN 500
SO_4	10	LESS THAN 400
Cl	18	LESS THAN 600
PHENOL	-	LESS THAN 0.002
PH	7.4	6.5 -9.2
ANIONIC DETERGENT	-	
Cd	-	
Hg	-	0.001
3. BIOLOGICAL		
CALIFORM GROUP	M.P.N 0	M.P.N LESS THAN 10/100 ml
BACTERIAL COUNT	-	0

Table 4-5-i Quality of drinking water

No.	Description
1	Temperatures must not exceed 40°c
2	pH must be not less than 6.0 and not more than 10.0
3	Settleable solids must not exceed 5 cm^3/litre after 10 minutes 10 cm^3/litre after 30 minutes
4	The waste should not contain particles of more than 1.5 cm diameter
5	Hydrogen sulphite (as $S^{"}$) must not exceed 1 mg/l
6	Oils, greases and resinous materials must not exceed 100 mg/l
7	The waste shouldnot contain any toxic substances in concentrations hazzardous to fish life and other living organizms
8	The waste should not contain substances that would give rise or evolve combustible gases or those of flash point 85°c or lower

Table 4-5-ii Standards for liquid wastes disposed in municipal sewers