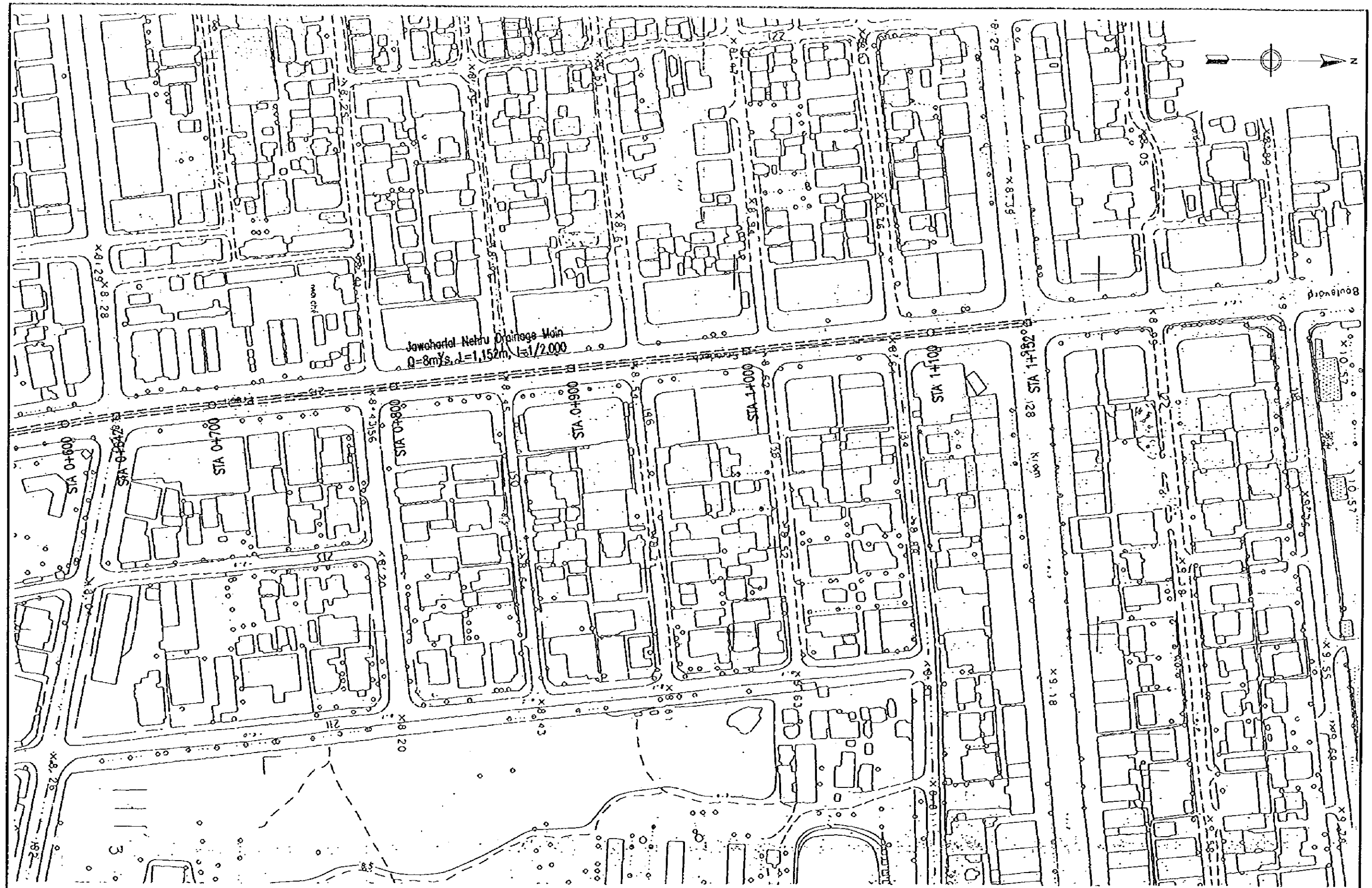




The Study on Drainage Improvement and Flood Control
 in the Municipality of Phnom Penh
 JICA-CTIE International Co., Ltd.-Nippon Koei Co., Ltd.

Figure II-4-14
 Plan of Jawaharlal Nehru Drainage Main (1/2)



The Study on Drainage Improvement and Flood Control
 in the Municipality of Phnom Penh
 JICA-CTIE International Co., Ltd.-Nippon Koei Co., Ltd.

Figure II-4-14
 Plan of Jawaharlal Nehru Drainage Main (2/2)

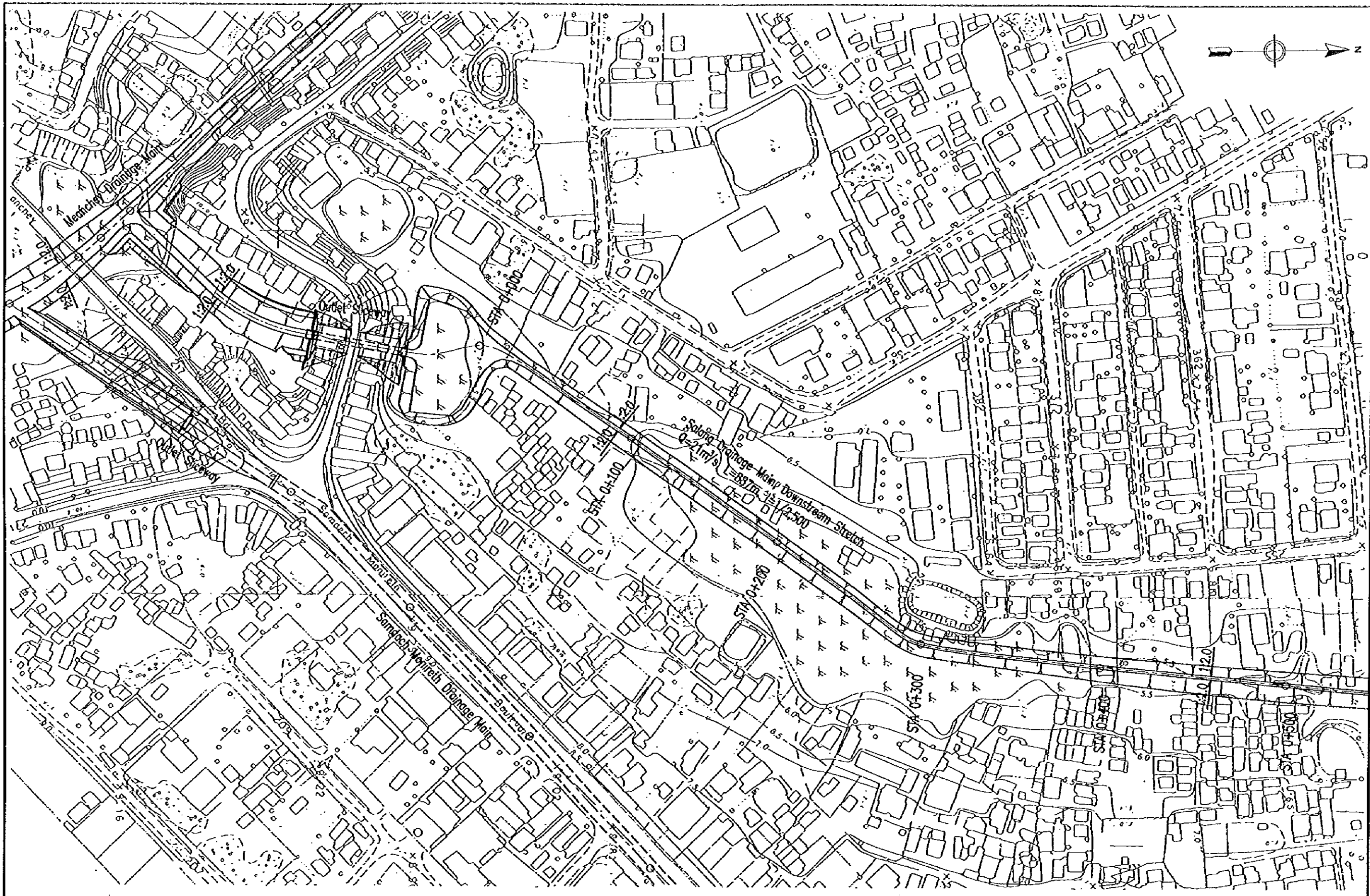
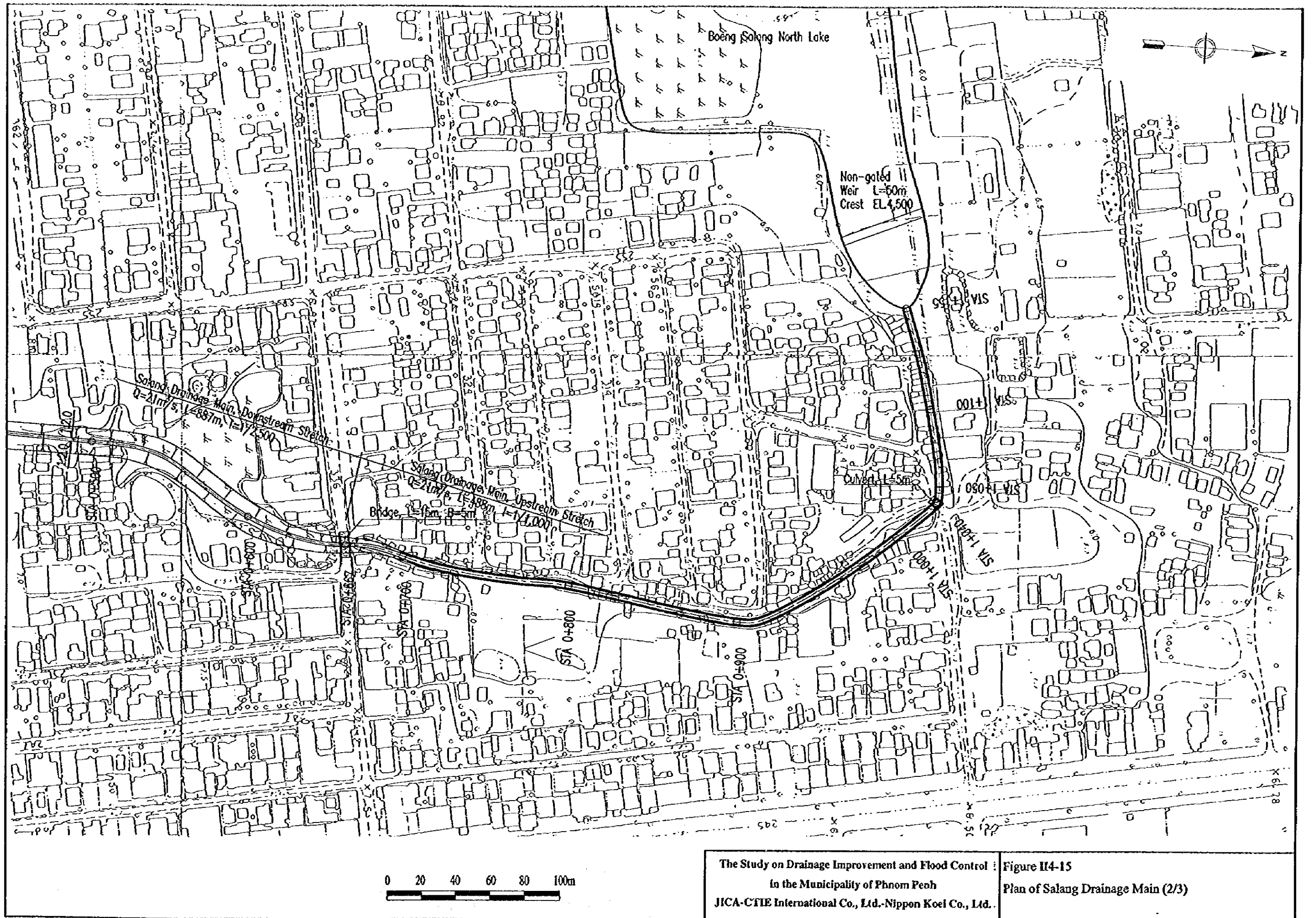
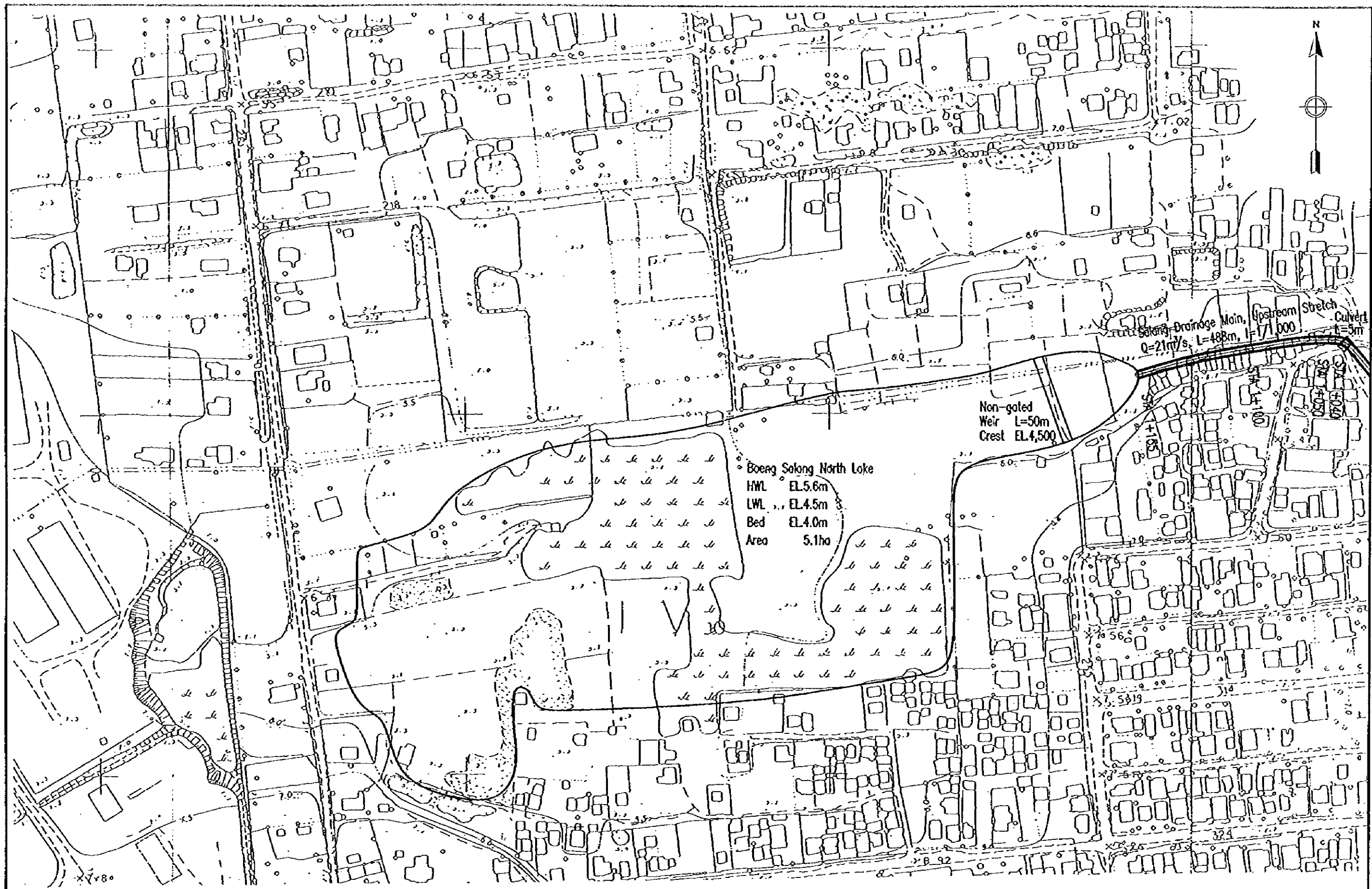


Figure II-4-15
 Plan of Salang Drainage Main (1/3)



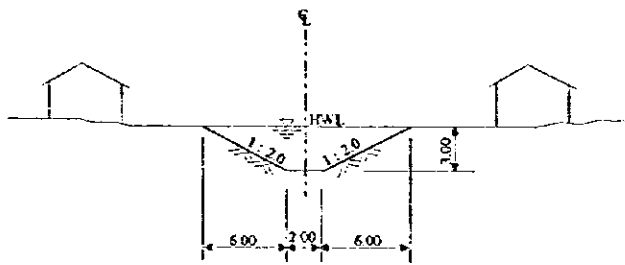
The Study on Drainage Improvement and Flood Control
 in the Municipality of Phnom Penh
 JICA-CTIE International Co., Ltd.-Nippon Koei Co., Ltd.

Figure II-4-15
 Plan of Salang Drainage Main (2/3)

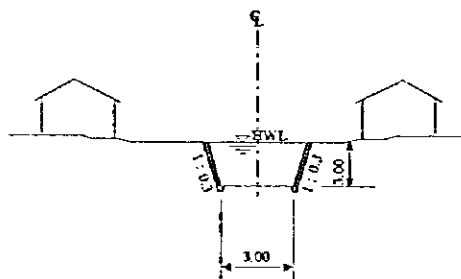


The Study on Drainage Improvement and Flood Control
 in the Municipality of Phnom Penh
 JICA-CTIE International Co., Ltd.-Nippon Koei Co., Ltd.

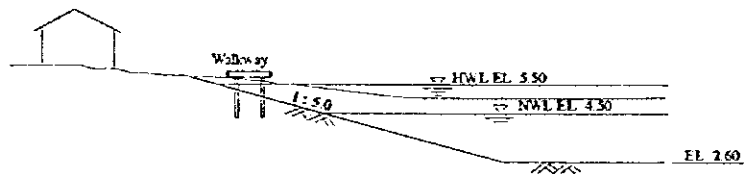
Figure II-4-15
 Plan of Salang Drainage Main (3/3)



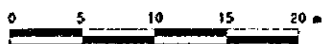
Downstream Stretch, Meanchey Confluence to Sta. 8+070



Upstream Stretch, Sta. 8+070 to Sta. 13+075



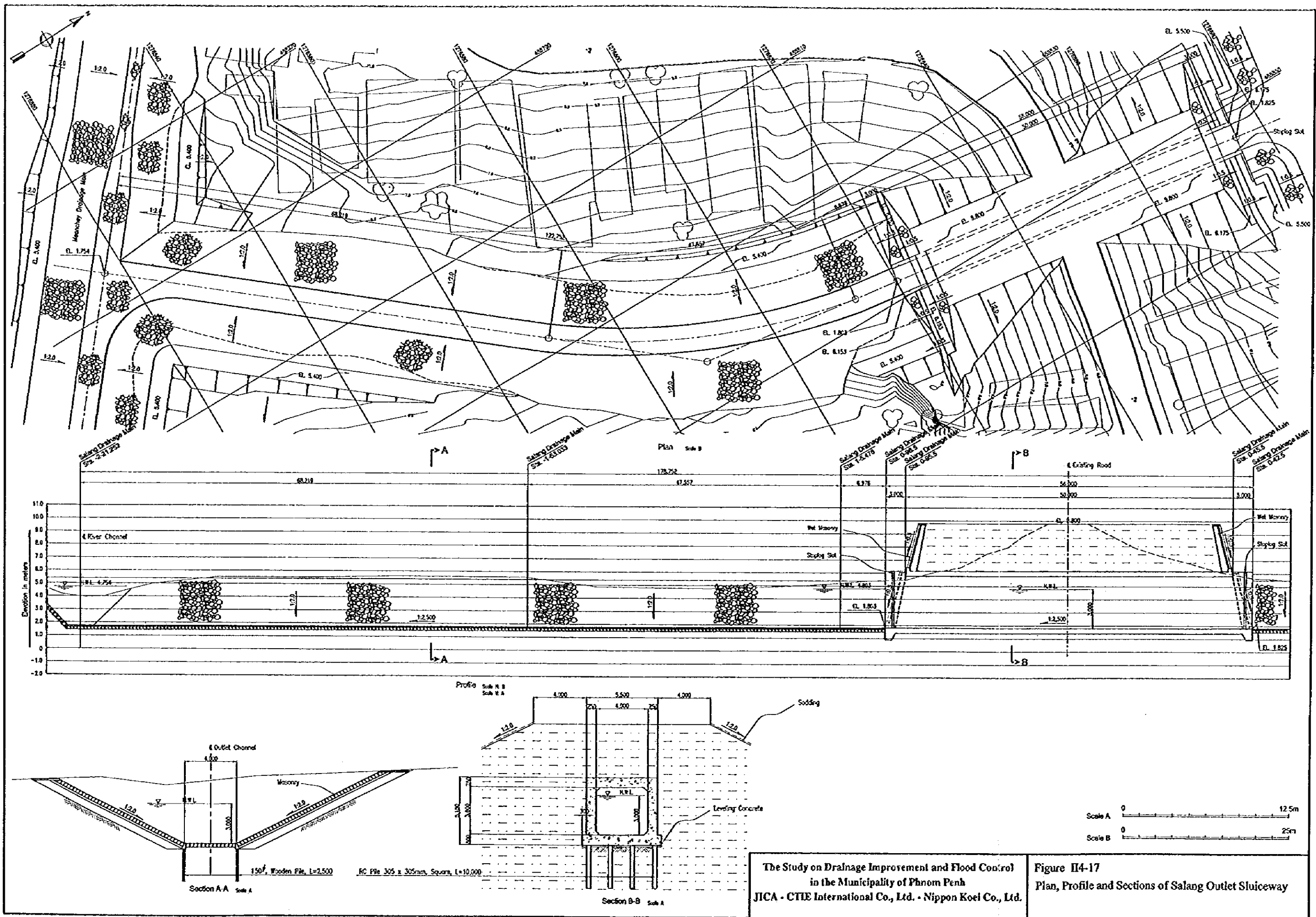
North Lake of Boeng Salang



The Study on Drainage Improvement and Flood Control
in the Municipality of Phnom Penh
JICA - CTIE International Co., Ltd. - Nippon Koei Co., Ltd.

Figure II-16
Standard Cross-sections of Salang Drainage Main





ANNEXES

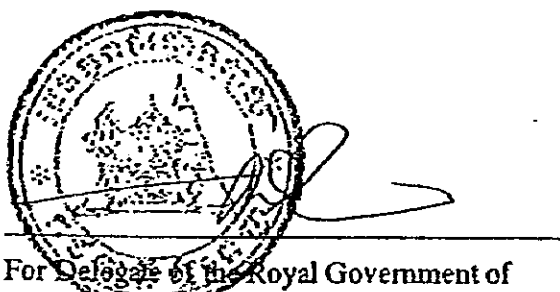
ANNEXES

	<u>Page</u>
Annex 1	
Scope of Work for the Study on Drainage Improvement and Flood Control in the Municipality of Phnom Penh in the Kingdom of Cambodia, March 18, 1997	A - 1
Annex 2	
Minutes of Meeting on Scope of Work for the Study on Drainage Improvement and Flood Control in the Municipality of Phnom Penh in the Kingdom of Cambodia, March 18, 1997	A - 9
Annex 3	
List of Members of Steering Committee, JICA Advisory Committee and Study Team	A - 15



SCOPE OF WORK
FOR
THE STUDY
ON
DRAINAGE IMPROVEMENT AND FLOOD CONTROL
IN
THE MUNICIPALITY OF PHNOM PENH
IN
THE KINGDOM OF CAMBODIA

AGREED UPON BETWEEN
THE MUNICIPALITY OF PHNOM PENH
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY



For Delegate of the Royal Government of
Cambodia to the Municipality of Phnom Penh
H. E. Mr. Khau Menghean
Vice-Governor of the Municipality of
Phnom Penh

Phnom Penh, March 18, 1997

青木 真

Mr. Makoto AOKI
Leader of the Preparatory Study Team,
Japan International Cooperation
Agency (JICA)

I . INTRODUCTION

In response to the request of the Government of the Kingdom of Cambodia (hereinafter referred to as "the Government of Cambodia"), the Government of Japan has decided to conduct the Study on Drainage improvement and Flood Control in the Municipality of Phnom Penh (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of technical cooperation programs of the Government of Japan, will undertake the Study, in close cooperation with the authorities concerned of the Government of Cambodia.

The present document sets forth the Scope of Work with regard to the Study.

II . OBJECTIVES OF THE STUDY

The objectives of the Study are:

- (1) to formulate a master plan of drainage improvement and flood control in the Municipality of Phnom Penh with the target year 2010
- (2) to conduct a feasibility study on drainage improvement and flood control for the priority project identified in the master plan study
- (3) to transfer knowledge of the method and management of drainage improvement and flood control to counterpart personnel to the course of the study.

III . STUDY AREA

The study area shall principally cover the urban center of the Municipality of Phnom Penh (approximately 28km²). In addition, the surrounding areas and rivers which may give an influence to the inundation in the urban center shall be also covered.

The study area is shown in the appendix 1.

IV . SCOPE OF THE STUDY

Phase I : Formulation of Master Plan Study

1. Basic Study

- (1) Collection, review and analysis of related data and information
 - a. natural conditions, including meteorological, hydrological, geological data and aerial photos
 - b. laws, regulations, policies and standards
 - c. social and economic conditions
 - d. master plan for urban development and other development plans
 - e. management and organization of drainage system and flood control
 - f. existing drainage, sewerage, flood/inundation control and sanitation facilities
 - g. drainage, sewerage, flood/inundation control and sanitary conditions

- h. on-going and planned projects relevant to the Study
- i. other relevant data and information

(2) Field reconnaissance and Field survey

- a. hydrological observation
- b. topographical and geological reconnaissance
- c. existing drainage, sewerage, flood/inundation control and sanitation facilities
- d. water quality analysis and present condition related to solid waste
- e. flood/inundation water level
- f. land use
- g. urban housing/environment
- h. others

(3) Analysis and examination of the result of basic study

2. Formulation of a Master Plan

(1) Confirmation of planning framework

- a. population projection
- b. land use plan
- c. economic growth
- d. estimation of waste water quantity
- e. flood water level and discharge

(2) Formulation of a Master Plan

- a. establishment of alternatives and selection of the appropriate plans
- b. preliminary design of facilities
- c. non-structural measures
- d. operation and maintenance plan
- e. management and institutional plan
- f. cost estimation and financial plan

(3) Formulation of implementation program

(4) Initial environmental examination(IEE)

(5) Evaluation of the master plan

- a. financial evaluation
- b. economic evaluation
- c. social evaluation

(6) Selection of priority project(s)

Phase II : Feasibility Study on the Priority project(s)

1. Supplemental data collection and analysis
2. Topographic survey and soil survey
3. Confirmation of planning framework

BY

4. Formulation of plans for the priority project(s)

- (1) design of facility(ies)
- (2) non-structural measures
- (3) cost estimation and financial plan
- (4) operation and maintenance plan
- (5) management and institutional plan

5. Environmental impact assessment(EIA)

6. Project evaluation

- (1) financial evaluation
- (2) economic evaluation
- (3) social evaluation

7. Formulation of implementation plan

V. STUDY SCHEDULE

The study will be carried out in accordance with the tentative schedule as attached in the appendix 2. The schedule is tentative and subject to be modified when both parties agree upon any necessity that arise during the course of the Study.

VI. REPORTS

JICA shall prepare and submit the following reports in English to the Government of Cambodia.

1. Inception Report:

Thirty (30) copies at the commencement of the first field survey in Cambodia. This report will contain the schedule and methodology of the Study as well as outline of the field survey.

2. Progress Report (1):

Thirty (30) copies at the end of the first field survey.

3. Interim Report:

Thirty (30) copies at the end of Phase I. This report will contain the results of the Phase I survey and outline of the Phase II study program.

4. Progress Report (2):

Thirty (30) copies at the end of the second field survey.

5. Draft Final Report:

Thirty (30) copies at the end of the third field survey. The Government of Cambodia shall submit its comments within one (1) month after the receipt of the Draft Final Report.

6. Final Report:

Sixty (60) copies within one (1) month after the receipt of the comments on the Draft Final Report.

VI. UNDERTAKINGS OF THE GOVERNMENT OF CAMBODIA

1. To facilitate the smooth conduct of the Study, the Government of Cambodia will take the following necessary measures:

(1) To secure the safety of the Japanese study team (hereinafter referred to as "the Team")

(2) To permit the members of the Team to enter, leave and sojourn in Cambodia for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees

(3) To exempt the members of the Team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into Cambodia for the conduct of the Study

(4) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study

(5) To provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into Cambodia from Japan in connection with the implementation of the Study

(6) To secure permission for the Team to enter into private properties or restricted areas for the implementation of the Study

(7) To secure permission for the Team to take all data and documents (including photographs and maps) related to the Study out of Cambodia to Japan

(8) To provide medical services as needed, expenses for which will be chargeable to the members of the Team.

2. The Government of Cambodia shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Team.

3. Department of Public Works and Transport of the Municipality of Phnom Penh (hereinafter referred to as "DPWT") shall act as a counterpart agency to the Japanese Study Team and also as a coordinating body in relation with other governmental and non-governmental organizations for the smooth implementation of the Study. DPWT shall, at its own expense, provide the Team with the followings, in cooperation with other organizations concerned:

- (1) available data and information related to the Study
- (2) counterpart personnel
- (3) suitable office space with necessary equipment in Phnom Penh
- (4) credentials or identification cards
- (5) an appropriate number of vehicles with drivers.

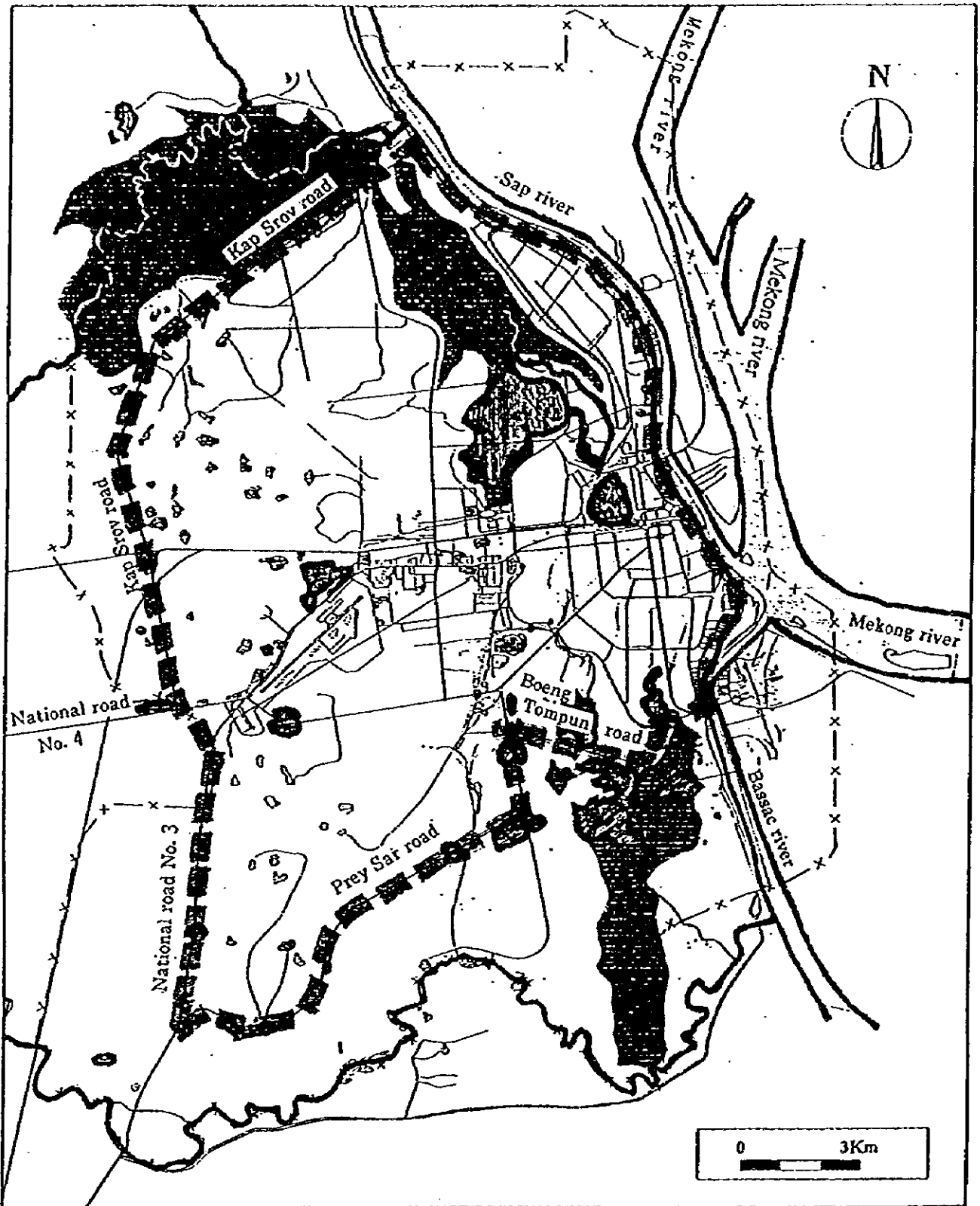
VII. UNDERTAKINGS OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, study teams to Cambodia
2. to pursue technology transfer to the counterpart personnel in the course of the Study.

IX. CONSULTATION


JICA and DPWT shall consult with each other in respect of any matter that may arise from or in connection with the Study.





LEGEND

STUDY AREA 

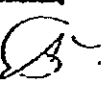
 Plan d'eau ou rivière

 Village

 Zone humide

 Limite de la commune

Avril 1995



APPENDIX 2

TENTATIVE SCHEDULE

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
DESCRIPTION																		
WORK IN CAMBODIA	▨	▨	▨	▨	▨	▨						▨				▨		
WORK IN JAPAN	□																	
PHASE OF THE STUDY	←				PHASE 1			×						PHASE 2				
REPORT PRESENTATION	▲ IC/R					▲ PR/R(1)				▲ IT/R		▲ PR/R(2)					▲ DF/R	▲ FR/R

▨ : JICA Study Team's Work in Cambodia

□ : JICA Study Team's Work in Japan

IC/R : Inception Report

PR/R : Progress Report

IT/R : Interim Report

DF/R : Draft Final Report

FR/R : Final Report

Handwritten signature or initials.

MINUTES OF MEETINGS
ON
SCOPE OF WORK
FOR
THE STUDY ON
DRAINAGE IMPROVEMENT AND FLOOD CONTROL
IN
THE MUNICIPALITY OF PHNOM PENH
IN
THE KINGDOM OF CAMBODIA

AGREED UPON BETWEEN
THE MUNICIPALITY OF PHNOM PENH
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Phnom Penh, March 18, 1997



For Delegate of the Royal Government of
Cambodia to the Municipality of Phnom Penh
H. E. Mr. Khau Menghean
Vice-Governor of the Municipality of
Phnom Penh

青木 真

Mr. Makoto AOKI
Leader of the Preparatory Study Team,
Japan International Cooperation
Agency (JICA)

1. Introduction

In response to the request of the Royal Government of Cambodia (hereinafter referred to as "the Government of Cambodia"), the Preparatory Study Team (hereinafter referred to as "the Team") of the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited Cambodia from March 5 to March 22, 1997 to discuss the Scope of Work (hereinafter referred to as "S/W") for the Study on Drainage Improvement and Flood Control in the Municipality of Phnom Penh (hereinafter referred to as "the Study").

The Team carried out field surveys of the study area and held a series of discussions with the authorities concerned of the Department of Public Works and Transport of the Municipality of Phnom Penh (hereinafter referred to as "DPWT") and other organizations.

The list of attendants is shown in the Appendix.

The Minutes of Meetings have been prepared for the better understanding of the S/W agreed upon between the Municipality of Phnom Penh and the Team on March 18, 1997, summarizing main points of the discussions made in the course of the preparation of the S/W.

2. JICA's Development Study Program

The Team explained JICA's Development Study Program and DPWT fully understood the Program.

3. Signer of Cambodia Side

The Team requested that the signer of Cambodia side would be Delegate of the Royal government of Cambodia to the Municipality of Phnom Penh. DPWT expressed it difficult to agree due to the several situations and the Team recognized the situations. Both sides agreed the signer would be the Vice-Governor of the Municipality of Phnom Penh who takes responsibility for Delegate of the Royal government of Cambodia to the Municipality of Phnom Penh.

4. Study Title

Both sides agreed that the title of the Study would be "the Study on Drainage Improvement and Flood Control in the Municipality of Phnom Penh" as described in the S/W.

5. Target Year

Both sides agreed that the target year for M/P would be set in the year 2010.

6. Study Area

Both sides agreed that the urban center of the Municipality of Phnom Penh consist of 4 districts which are Daun Penh, Tuol Kork, Prampi Makara and Chamkarmon. Both sides also agreed that the study shall cover the area which is nearly encircled by the following roads and rivers.

- Roads: (1) Kap Srov road
(2) National road No. 3
(3) National road No. 4
(4) Prey Sar road
(5) Boeng Tompun road
- Rivers: (1) Sap river
(2) Bassac river
(3) Mekong river

7. Counterpart Agency

DPWT shall act as the counterpart agency as described in the SAV.

8. Coordination with Other Ministries and Organizations

The Team requested DPWT to coordinate with other ministries and organizations concerned such as the Ministry of Public Works and Transport, the Ministry of Agriculture, the Ministry of Environment, BAU, ADB, WB, French Agencies to get maximum cooperation from these organizations as well as to avoid any duplicated works. The Team also suggested to establish a steering committee to achieve the above mentioned coordination. DPWT agreed to this point and promised to set up the committee, that the Chairman is the Vice-Governor of the Municipality of Phnom Penh, and invite representatives from relevant ministries and organizations for the smooth implementation of the Study.

9. Undertakings of the Government of Cambodia

- (1) It was confirmed that DPWT would secure the full support and participation of organizations concerned in the course of the Study.
- (2) It was confirmed that DPWT would assign the appropriate number of counterpart personnel to the JICA Study Team covering the following fields. A good command of English is a preferable qualification for the counterpart personnel to ensure smooth communication between the JICA Study Team and counterpart personnel. The number and fields of counterpart personnel will, however, be finalized by DPWT and the JICA Study Team in discussions at the commencement of the Study.
 - a. Supervision
 - b. Hydrology
 - c. Surveying
 - d. Drainage system and Flood Control Planning
 - e. Design of Drainage system and Flood Control Facilities, including cost estimation and construction planning
 - f. Management of Drainage system and Flood Control
 - g. Economy / Financial Analysis
 - h. Environmental Investigation
 - i. Coordination for JICA Study Team
 - j. Others

In addition, the Team suggested that the other department staff in the Municipality of Phnom Penh would be included to counterpart personnel for the effective implementation of the Study.

- (3) The Team requested that DPWT would provide suitable office space with necessary equipment in Phnom Penh, and sufficient numbers of vehicles with drivers for the Study. DPWT replied that the office space enough to work could be prepared by DPWT. DPWT, however, expressed concern that, due to budgetary constraints, it would be hard to provide office equipment and vehicles with drivers. The Team recognized the situation and promised to convey the message to JICA H.Q. for consideration.

10. Counterpart Training

DPWT requested that JICA conduct counterpart training in Japan for the purpose of the smooth transfer of technology during the Study. The Team agreed to convey it to JICA H.Q. for consideration. The training period, training field and selection of personnel shall be mutually

discussed after the Study starts.

11. Technology Transfer Seminar

DPWT requested that JICA hold a seminar as a part of the technology transfer in the course of the Study. The Team recognized the necessity and promised to convey the request to JICA H.Q. for positive consideration.

12. Equipment

DPWT requested JICA to provide with necessary equipment for the Study. The Team recognized the necessity and promised to convey the request to JICA H.Q. for positive consideration.

13. Reports

As for the Study reports, DPWT agreed to make them open to the public in order to achieve maximum use of the Study results.

DPWT requested JICA to provide the following copies of reports because of coordination with other ministries and organizations concerned and JICA agreed that the following copies of reports shall be prepared and submitted for better use of the Study results.

- (1) Inception Report: Thirty(30) copies
- (2) Progress Report(1): Thirty(30) copies
- (3) Interim Report: Thirty(30) copies
- (4) Progress Report(2): Thirty(30) copies
- (5) Draft Final Report: Thirty(30) copies
- (6) Final Report: Sixty(60) copies

APPENDIX

LIST OF ATTENDANTS

(Cambodian side)

The Municipality of Phnom Penh

H. E. Mr. Khau Menghean	Vice-Governor of The Municipality of Phnom Penh
H. E. Mr. Chap Nhalyvoud	Vice-Governor of The Municipality of Phnom Penh
Mr. Kim Saysamalen	Deputy Chief of Cabinet
Mr. Keo Savin	Director, Department of Public Works and Transport
Mr. Ban Narin	Deputy Director, Department of Public Works and Transport
Mr. Moeung Sophan	Vice-Chief of Drainage and Sewerage Division, Department of Public Works and Transport
Mr. Chiep Sivorn	Director, Phnom Penh Environment Service
Mr. Ty Yao	Director, Bureau of Urban Affairs
Mr. Phat Leng	Director, Department of Agriculture
Ms. Mom Sandap	Director, Planning of Phnom Penh Municipality
Mr. Nak Tanavuth	Chief, Bureau of International Relations
Mr. Ok Frak	Deputy Director, Department of Cadastral

Council Ministers

Mr. Suong Leang Hay	Advisor
Mr. Chhoeuy Roeun	Staff Member

Ministry of Foreign Affairs and International Cooperation

Mr. Eat Lyheng	Deputy Director, Department of Asia and Pacific
Mr. Sok Chea	Staff Member, Department of Asia and Pacific

Ministry of Economy and Finance

Mr. Pao Sophan	Assistant to the Minister of Economy and Finance
Mr. Chea Sina	Staff Member

Ministry of Agriculture, Forestry and Fisheries

Mr. Veng Sakhon	Deputy Director General, General Directorate of Irrigation, Meteorology and Hydrology
-----------------	---

Ministry of Public Works and Transport

Mr. Mon Sambath	In charge of Road and Bridge, Department of Public Works and Transport
-----------------	--

UNDP

Mr. Om Paul	Technical Advisor
Mr. Teruo Jinnai	Financial Administrative Advisor to the Municipality of Phnom Penh

ADITEM

Mr. Nicolas Mouy	Technical Advisor to BAU
------------------	--------------------------

(Japanese side)

Embassy of Japan

Mr. Yoichi Kakita

Second Secretary

JICA Cambodia Office

Mr. Masatoshi Teramoto

Assistant Resident Representative

Preparatory Study Team

Mr. Makoto Aoki

Leader

Mr. Katsuyoshi Saito

Member

Mr. Kazuhisa Tomita

Member

Mr. Katsuro Soejima

Member

Mr. Yuji Hatakeyama

Member

Mr. Mineo Kai

Member

Annex 3 List of Members of Steering Committee, JICA Advisory Committee and Study Team

Members of Steering Committee

Name	Position	Designation
H.E. Chea Sophara	First Vice Governor of MPP	President
H.E. Kry Beng Hong	Vice Governor of MPP	Vice President
H.E. Chap Nhalyvoud	Vice Governor of MPP	Vice President
Mr. Mann Chocurn	Chief of Cabinet of MPP	Member
Mr. Kim Saysatalen	Deputy Chief of Cabinet of MPP	Member
Mr. Keo Savin	Director of Department of Public Works and Transport, MPP	Member
Mr. Sen Sok	Director of Department of Urbanization and Construction of MPP	Member
Mr. Chhuon Sothy	Director of Department of Cadastral of MPP	Member
Mr. Chiep Sivom	Director of Department of Environment of MPP	Member
Miss Mom Sandap	Director of Department of City Planning of MPP	Member
Mr. Nget Chaddavy	Director of Department of Economy and Finance of MPP	Member
Mr. Phat Leng	Director of Department of Agriculture of MPP	Member
Mr. Kim Savuth	Chief of General Affair Office of MPP	Member
Mr. Nak Tanavuth	Chief of International Relation Bureau of MPP	Member
Mr. Lay Pharin	Representative of Ministry of Planning	Member
Mr. Tan Bean	Representative of Ministry of Foreign Affairs and International Cooperation	Member
Mr. Yit Bunna	Representative of Ministry of Public Works and Transport	Member
Mr. Bun Hean	Representative of Ministry of Agriculture, Forestry and Fisheries	Member
Mr. UK Someth	Special Advisor to MEF & CDC	Member
Mr. Chhoeuy Roen	Representative of Cabinet of Council of Minister	Member
Mr. Nhem Saran	Staff of General Affair Office of MPP	Secretary

JICA Advisory Committee

Name	Designation
Mr. Ryosuke KIKUCHI	Chairman
Mr. Kazuhisa TOMITA	Urban Drainage Planning (until March 1998)
Mr. Masato URAKAMI	Urban Drainage Planning (April to October 1998)
Mr. Hitomi GODO	Urban Drainage Planning (from November 1998)

Study Team

Name	Designation
Mr. Keiji SASABE	Team Leader
Mr. Yasuhiko UCHIDA	Deputy Team Leader/ Drainage and Flood Control Planner
Mr. Susumu HONDA	Hydrologist
Mr. Takashi HIRUTA	Structure Planning and Designing Engineer
Mr. Yutaka NAKADA	Geodetic Engineer
Mr. Guillaume STETTEN	Urban Planner
Mr. Ravi V. SUNDARAM	Environmental Specialist
Mr. Haruo YAMANE	Economist
Mr. Takashi NAKAJIMA	Coordinator (until July 1998)
Mr. Akira SASAKI	Coordinator (from January 1999)







JICA