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TERMS OF REFERENCE
FOR
THE STUDY ON
INTEGRATED URBAN DRAINAGE IMPROVEMENT
FOR
THE CITIES OF MELAKA AND SUNGAI PETANI
IN MALAYSIA

KL 14307-13

1. Background

The Malaysian economy has gone through rapid structural changes since independence in 1957. From a basic primary producing economy with rubber, tin, palm oil, etc., as its staple products and exports, Malaysia is now emerging as an industrializing economy with 27% of its GDP and 60% of total exports from the manufacturing sector. The average growth rate was high at 6.7% per annum for 1970-1990 and it was 8.2% in 1996.

The urban growth is dynamic in accordance with the rapid economic growth and industrialization. The urban population growth rates are 4.3% in Peninsular, 6.1% in Sabah and 4.3% in Sarawak (as of 1994). In Peninsular Malaysia, the urban population in 1994 is about 6.5 million (44.1% of the total), and it is expected to grow to 10.7 million in the year 2000, an increase of almost 65%. The infrastructure has been strained by rapid urban growth, and there are high needs of improvement of amenities, e.g., water supply, electricity, transportation, environment and drainage.

Of these, the urban drainage is an essential component in the urban development, since inundation caused by a poor drainage system gives direct damage to urban assets and it also hampers economic development by secondary damage through suspension of transportation, etc. At the same time, preservation of water quality in urban areas is an important aspect of the urban drainage planning to sustain better living standards in the urban areas.

In 1971, Malaysia suffered serious damage over the whole country, and the importance of effective urban drainage was strongly recognized. The Government of Malaysia gave the Department of Irrigation and Drainage (DID) the task of planning and implementation of urban drainage works as a part of the overall flood mitigation program. DID, in collaboration with the other government agencies, has increasingly given greater importance to matter related to urban floods and water quality deterioration. These include the implementation of flood mitigation projects, the formulation of master drainage plans for major towns, and the establishment of institutional arrangements and procedures to manage the various aspects of urban drainage.

The flood mitigation projects and master drainage plans are generally formulated based on the projected development by year 2000 to 2010. However, it is anticipated the further development of these urban areas will take place beyond the period projected and the proposed measures in these flood mitigation projects and master plans become inadequate.

In addition, the increasing costs for construction and maintenance of the urban drainage system obviously can never be sufficient because of the continuous fast urban development in the country. It should be noted that urbanization has been giving cities some change in land utilization which raised runoff peaks on a hydrological viewpoint and accumulates property in flood area on an economic viewpoint.

2. Necessity of the Study

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In order to solve the problem, an integrated urban drainage system should be studied and proposed. The Integrated urban drainage system should be an optimum combination of (i) improvement of drainage capacity, e.g., drainage channel improvement, and (ii) measures to reduce runoff, e.g., rainfall infiltration facilities, utilization of storage capacity in the basin. The system should also consider institutional measures and the riverine environment to provide better water quality in the urban areas. In this study, measures for solid waste and waste water entering into drainage systems and river channels should be considered because they are major sources of river pollution. Although the most effective way of pollution control is through control of the source that will require another study.

Since the objective of the study is essentially to improve urban drainage systems in major cities in the country, two cities which have serious urban drainage problems and different characteristics should be selected as target areas to enable the study results to be used later as models for other cities seems most appropriate for the study areas. Melaka, one of the oldest cities with historical value, has a drainage deficiency because the existing system is too old to work for full service. Improvement of the system is accordingly required. Sungai Petani, as one of keystone cities for industrialization in the country, has no sufficient drainage system and requires new construction of drainage infrastructure to support industrial development.

Furthermore, preparation of a standard manual for integrated urban drainage planning is urgently needed to assist in widespread use of the practice in the country.

3. Necessity of Technical Cooperation of Japan

As identified above, the necessity of implementing the study is needed. However, the procedure for integrated urban drainage improvement is under-developed in this country.

In Japan, rapid urbanization and dense land use hamper the smooth realization of drainage system improvement especially with the conventional measures such as widening and deepening of open drainage channels and provision of underground closed drainage channel. A new concept for drainage system has been developed, namely, improvement considering the full utilization of storage capability and filtration of the urban area as a retarding function, and several regulation as institutional countermeasures have been introduced to control land development. Much effort also has been carried out to improve water quality in rivers.

These experiences and know-how in Japan would be helpful for DID to cope with the problem of realization of an integrated drainage system improvement.

4. Objectives of the study

The objectives of the study are:

- (1) to formulate a master plan of integrated urban drainage improvement for the two cities of Melaka and Sungai Petani;
- (2) to conduct a feasibility study on priority projects identified in the master plan study;

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- (3) to prepare a guideline for integrated urban drainage improvement; and,
 - (4) to transfer knowledge of the method and management of integrated urban drainage improvement to counterpart personnel in the course of the study.
5. **Policy of Implementation of the Study**

The policy of implementation of the study is as follows:

(1) **Master Plan Study**

The two objective cities, Melaka and Sungai Petani has been selected as representatives of the present cities in Malaysia. Melaka is an old city with drainage deficiency because the system is too old to work for full service. On the other hand, Sungai Petani is a newly developing city and requires the introduction of new drainage facilities.

One of the notable aspects of the urban drainage is increasing runoff with shortened peak concentration time due to rapid urbanization of the city. For the reduction of flood/inundation, not only the improvement of drainage capacity but also measures to reduce runoff should be considered. Measures to reduce runoff include regulation ponds, infiltration of rainfall, storage in house yards, land use control, etc.

Integrated urban drainage planning should consider riverine environmental aspects as well. Thus, the Master Plan shall identify measures to control solid waste and waste water entering into rivers to improve river water quality. Use of the river and drainage channels as an amenity for urban areas should also be considered.

(2) **Feasibility Study**

Feasibility study will be conducted for priority projects that will give quick effect for the integrated urban drainage improvement. The feasibility study should also include detail design of several facilities whose technology has not been introduced in the country yet, such as storm water infiltration facilities.

(3) **Preparation of Guideline**

A guideline for the integrated urban drainage improvement for cities of the country will be prepared referring to the results of the master plan study as well as the survey to be conducted at five major cities in the country. The guideline will cover planning, survey, design, environmental study, construction, operation and management, and institutional arrangement. The guideline should include two separate items. One is a guideline for the introduction of a new urban drainage system and another is for the improvement of existing ones.

6. **Scope of Work**

The scope of work of the Study is described as follows:

6.1 Master Plan Study (Phase I)

Master plan studies for integrated urban drainage improvement shall be conducted for the cities of Melaka and Sungai Petani.

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A. Basic Study

- (1) Collection, review and analysis of related data and information
 - (a) Natural conditions including meteorological, hydrological, soil/geological data and aerial photos
 - (b) Institutional aspects, e.g, laws, regulation, organizations
 - (c) Existing policies and standards for drainage improvement
 - (d) Social and economic conditions
 - (e) Master drainage plans
 - (f) Existing drainage, flood/inundation control plans and facilities
 - (g) Ongoing and proposed projects relevant to the study, e.g., urban development plans.
 - (h) Environmental aspect
 - (i) Other relevant data and information
- (2) Field reconnaissance and survey
 - (a) Hydrological observation
 - (b) Topographical survey
 - (c) Geological and hydrogeological survey to grasp surface geological condition, permeability of the ground surface, groundwater condition, etc.
 - (d) Existing drainage and flood/inundation control facilities
 - (e) Water quality analysis and present condition related to solid waste
 - (f) Flood/inundation water level and flood/inundation damage
 - (g) Land use and urban housing
 - (h) Environmental survey, including water quality and other environmental analysis for relevant rivers and drainage channels, survey for pollution and solid waste source.
 - (i) Others.

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- (3) Examination of the results of basic study and hydrological analysis
- (a) Examination on improvement in drainage capacity
The study shall identify and evaluate problems in existing drainage facilities and river channels with regard to planning, survey, design, environmental aspects, implementation and maintenance, and identify improvement measures for drainage capacity such as improvement/introduction of drains and river channels in both quantity and quality.
 - (b) Examination on measures to reduce runoff
The study shall examine and evaluate adaptability/validity of various measures to reduce runoff, such as retention ponds, storage and infiltration facilities, storage in house yards and land use control.
 - (c) Hydrological analysis

B. Formulation of a Master Plan

- (1) Confirmation of planning framework
- (a) Target year
 - (b) Target area
 - (c) Population projection
 - (d) Land use plan
 - (e) Economic growth
 - (f) Design discharge
- (2) Formulation of Master Plan
- (a) Establishment of alternatives and selection of the appropriate plans and their combination considering (i) improvement in drainage capacity and (ii) measures to reduce runoff, considering the aspect of riverine environment, e.g., urban environment, river environment, scenic condition.
 - (b) Measures to prevent waste and pollution entering into rivers and drainage channels.
 - (c) Preliminary design of facilities
 - (d) Non-structural measures
 - (e) Operation and maintenance plan
 - (f) Management and institutional plan
 - (g) Cost estimate and financial plan

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- (3) Formulation of implementation program considering staged implementation and realization of early effect
- (4) Initial environmental examination (IEE)
- (5) Evaluation of the Master Plan
 - (a) Economic evaluation
 - (b) Financial evaluation
 - (c) Technical evaluation
 - (d) Social evaluation
- (6) Selection of priority projects
- 6.2 Feasibility Study (Phase II)
 - (1) Supplement data collection and analysis
 - (2) Topographic survey and soil survey for the proposed structure sites
 - (3) Confirmation of planning framework
 - (4) Formulation of plans for priority projects
 - (a) Preliminary design
 - (b) Non-structural measures
 - (c) Cost estimate, construction planning and financial plan
 - (d) Operation and maintenance plan
 - (e) Management and institutional plan
 - (5) Detail design for several facilities
 - (a) Facilities whose technology has not yet been introduced in the country such as storage and infiltration facilities.
 - (b) Facilities to prevent solid waste and wastewater entering into drains and river channels.
 - (c) Typical drains and river channel improvements taking into consideration and landscape.
 - (d) Other characteristic facilities.
 - (6) Execution of preliminary Environmental Impact Assessment in accordance with Environmental Impact Assessment Ordinance 1987.

- (7) Project evaluation
 - (a) Economic evaluation
 - (b) Financial evaluation
 - (c) Technical evaluation
 - (d) Social evaluation

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6.3 Preparation of Guideline (Phase III)

A. Basic Study

- (1) Review of present system

Data and information regarding planning, design, environmental study, construction, operation and maintenance, and institutional arrangement for the urban drainage improvement will be collected through interview survey. Significant issues will be identified accordingly.

- (2) Survey on status of drainage improvement works

The existing urban drainage improvement systems in the five (5) major cities will be surveyed and problems identified. Similar standards in other countries will also be studied.

B. Preparation of Guideline

The guideline will be the basis for implementation of the integrated urban drainage improvement in the country. It should include both drainage improvement works and measures to reduce runoff. It should be broadly divided into two: (i) improvement of the existing urban drainage facilities and (ii) construction of new drainage facilities. Conditional characteristics in Malaysia, topography, geology, rainfall pattern, etc., should be considered.

- (1) Planning
 - (a) Determination of policy, target area, design scale, etc.
 - (b) Determination of design discharge
 - (c) Combination of drainage improvement works and measures to reduce runoff
 - (d) Preparation of a master plan
 - (e) Phased implementation plan
 - (f) Others

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- (2) Survey
 - (a) Items and methodology of necessary survey for the preparation of a master plan
 - (b) Items and methodology of necessary survey for the designing of structures for integrated urban drainage improvement
 - (c) Others
 - (3) Design
 - (a) Application limit for various structures of integrated urban drainage improvement

For example for the storage cum infiltration facilities, topography, geology and soil condition (permeability), especially those found in Malaysia and applicability for reworked soil in land development sites
 - (b) Design manual for various structures of integrated urban drainage improvement
 - (c) Standard design for various structures of integrated urban drainage improvement
 - (4) Environmental consideration
 - (a) Items and methodology for the environmental consideration on urban environment and scenic aspect.
 - (b) Items and methodology for the prevention of solid waste and wastewater inflow
 - (c) Necessary items and methodology for the environmental impact assessment
 - (d) Others
 - (5) Construction
 - (a) Construction manual for various structures of integrated urban drainage improvement
 - (b) Typical case of construction for various structures of integrated urban drainage improvement
 - (c) Others
 - (6) Operation and Maintenance
 - (a) Necessary items and sample of operation and maintenance for various structures of integrated urban drainage improvement

7. Study Schedule

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The study shall be carried out in accordance with the tentative schedule shown in Figure 1.

8. Expected Major Output of the Study

The following reports in English shall be prepared and submitted:

(1) Inception Report

Thirty (30) copies shall be submitted at the commencement of the study. This report shall contain the schedule and methodology of the study.

(2) Progress Report (1)

Thirty (30) copies shall be submitted at the end of the first field study in Malaysia. This report shall present the results of data collection and analysis, results of field investigation, progress of the basic study and analysis, and the draft master plan for integrated urban drainage improvement.

(3) Interim Report

Thirty (30) copies shall be submitted at the beginning of the second field study in Malaysia. This report shall include all the results of the master plan study on integrated urban drainage improvement.

(4) Progress Report (2)

Thirty (30) copies shall be submitted at the end of the second field study in Malaysia. This report shall include the progress of the feasibility study on priority projects and of the work for the preparation of the guideline for integrated urban drainage improvement.

(5) Draft Final Report

Thirty (30) copies shall be submitted at the end of the third field study in Malaysia. The Government of Malaysia shall submit its comments within one month after the receipt of the Draft Final Report.

(6) Final Report

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

9. Implementing Agency

The Department of Irrigation and Drainage shall be the implementation agency of the study, while the Economic Planning Unit of the Prime Minister Department shall be the main monitoring and coordinating agency in relation to the participation of other relevant government and non-government bodies.

10. Transfer of Knowledge

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Technical know-how shall be transferred to the counterpart personnel during the study. This shall include:

- (1) On the job training in survey and investigation, basic study and analysis, and formulation of the plan.
- (2) Overseas training to attain a wider knowledge on modern techniques related to the objectives of the study.

11. External and Government Input

The study is envisaged to be carried out by means of technical assistance, namely through the Japan International Cooperation Agency (JICA). The Government of Malaysia through DID will provide local counterpart and support personnel as well as logistic support to the extent necessary.

11.1 External Input

(1) Engineering Services

This will include a total of 125 man-months of expert services over a period of 24 months. The list of experts with their respective fields of specialty and period of input are as shown in Table 1.

(2) Overseas Training of Counterparts

A total of four (4) man-months is required for special training in Japan for selected counterpart personnel.

(3) Equipment

The equipment required for the study are shown in Table 2.

11.2 Government Input

The Government of Malaysia is prepared to provide the following in support of the study.

- (1) Data and information relevant to the study.
- (2) Necessary counterpart personnel and office space and facilities in support of the study.
- (3) Two (2) four wheel drive vehicles including drivers, fuel and maintenance for carrying out the necessary field works.
- (4) Staff as may be required to assist the study team in administrative work.
- (5) Exemption from tax and customs duties of materials, machinery, equipment, office supplies and commodities needed in conducting the study.

Table 1: List of Expert Required

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No.	Designation	Man-month
1.	Team leader	14
2.	Flood control planner	10
3.	Drainage planner	20
4.	Hydrologist	10
5.	Geological/Soil mechanic engineer	6
6.	Land use analyst	6
7.	Structure engineer	20
8.	Construction planner/Cost estimator	10
9.	Socioeconimist	7
10.	Environmental Expert	5
11.	Geodetic Engineer	8
12.	Institutional expert	6
13.	Landscape architect	3
	Total	125

Table 2: List of Equipment Required

No.	Item	Quantity
1.	Drafting equipment	2 sets
2.	Photocopy machine	1 set
3.	Personal computer	2 sets
4.	Four-wheel drive vehicle	2 units
5.	Handy telephone	2 sets

資料2 SCOPE OF WORK

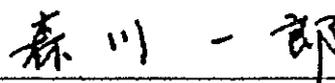
SCOPE OF WORK
FOR
THE STUDY
ON
INTEGRATED URBAN DRAINAGE IMPROVEMENT
FOR
MELAKA AND SUNGAI PETANI
IN
MALAYSIA

AGREED UPON BETWEEN
THE ECONOMIC PLANNING UNIT
OF
THE PRIME MINISTER'S DEPARTMENT
ON BEHALF OF
THE GOVERNMENT OF MALAYSIA
AND
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Kuala Lumpur, 3 September 1998



Mr. Ahmad Konchong
Director of Agriculture Section,
Economic Planning Unit (EPU),
Prime Minister's Department
on Behalf of
The Government of Malaysia



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

I. INTRODUCTION

In response to the request of the Government of Malaysia, the Government of Japan has decided to conduct the Study on Integrated Urban Drainage Improvement for Melaka and Sungai Petani in Malaysia (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 Malaysia.

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 structure plans of Integrated urban drainage improvement for Melaka and Sungai Petani
2. to conduct feasibility study(s) on priority project(s) identified in the structure plans
3. to prepare a guideline for integrated urban drainage improvement in Malaysia
4. to transfer technology to the counterpart personnel in the course of the Study.

III. STUDY AREA

The study area shall cover Melaka (approximately 240km²) and Sungai Petani (approximately 90km²).

The study area is shown in the appendix 1 and the appendix 2.

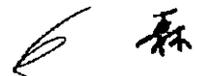
IV. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the scope of work for the Study shall cover the following items.

Phase I : Formulation of Structure Plans

[Basic Study]

1. Collection and review of related data and information
 - (1) natural conditions, including meteorological, hydrological and geological data, and topographic map
 - (2) Institutional aspects, e.g., laws, regulations and organizations
 - (3) existing policies and standards relevant to the Study
 - (4) existing drainage master plans
 - (5) existing drainage, sewerage, flood/inundation control plans and facilities
 - (6) on-going/planned projects and plans relevant to the Study, e.g., urban development plans
 - (7) social and economic conditions
 - (8) environmental aspect



- (9) other relevant data and information
2. Field reconnaissance and field survey, if necessary
 - (1) hydrological observation
 - (2) topographical and geological conditions
 - (3) water quality analysis and present conditions relevant to the Study
 - (4) land use
 - (5) present environmental conditions
 - (6) inundation condition and damages
 - (7) existing facilities relevant to the Study
 - (8) others
3. Analysis and examination of basic study

[Formulation of Structure Plans]

1. Confirmation of planning framework
 - (1) economic growth
 - (2) planned population
 - (3) target area
 - (4) land use
 - (5) design discharge
2. Establishment of alternatives and selection of the optimum plans
3. Formulation of facility plan(s)
4. Formulation of non-structural measure(s)
5. Preparation of operation and maintenance plan
6. Preparation of institutional plan
7. Selection of priority project(s)

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

1. Supplemental data collection and analysis
2. Supplemental field survey
3. Confirmation of planning framework
4. Formulation of plans for the priority project(s)
 - (1) preliminary design of facility(ies)
 - (2) non-structural measure(s)
 - (3) operation and maintenance plan
 - (4) institutional plan

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- (5) cost estimation and financial plan
5. Environmental impact assessment (EIA)
6. Project evaluation
 - (1) economic evaluation
 - (2) environmental evaluation
7. Formulation of implementation plan
8. Preparation of a guideline for integrated urban drainage improvement in Malaysia

V. STUDY SCHEDULE

The study will be conducted in accordance with the tentative schedule as attached in the Appendix 3. 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 Malaysia.

1. Inception Report:

Thirty (30) copies at the commencement of the first field survey in Malaysia. 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:

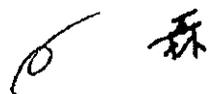
Thirty (30) copies at the end of Phase I. This report will contain the results of the Phase I study and outline of the Phase II study program.

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 Malaysia 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.

VII. UNDERTAKINGS OF THE GOVERNMENT OF MALAYSIA

To facilitate the smooth conduct of the Study, the Government of Malaysia will take the following necessary measures:

1. To inform the members of the Study Team of any existing risk in the study area and to take any measures deemed necessary to secure the safety of the Study Team.
2. To ensure the necessary entry permits for the Study Team to conduct field surveys in Malaysia and exempt them from consular fees.
3. To exempt the members of the Study Team from taxes and duties, as normally accorded under the provision of Malaysian General Circular No.1 of 1979, on equipment, machinery and other materials brought into and out of Malaysia for the conduct of the Study.
4. To exempt the members of the Study Team from Malaysia income tax on their official emoluments in respect of their period of assignment in Malaysia in connection with the conduct of the Study, but the Government of Malaysia shall retain the right to take such emoluments into account for the purpose of assessing the amount to be applied to income from other sources.
5. To provide the necessary facilities to the Study Team for remittance as well as utilization of funds introduced into Malaysia from Japan in connection with the conduct of the Study.
6. To secure permission for entry into private properties or restricted areas for the conduct of the Study.
7. To provide the Study Team with medical services when needed but the expenses will be chargeable to members of the Study Team.
8. To provide the Study Team with available data, maps and information necessary for the execution of the Study.
9. To make arrangements for the Study Team to take back to Japan the data, maps and materials connected with the Study, subject to the approval of the Government of Malaysia, in order to prepare the reports.
10. To appoint counterpart personnel to the Study Team during the study period.
11. To provide the Study Team with suitable office space with clerical service and necessary office equipment in Kuala Lumpur, Melaka and Sungai Petani.
12. To provide the Study Team with adequate means of local transport for official travel only.
13. To indemnify any member of the Study Team in respect of damages arising from any legal



action against him in relation to any act performed or omissions made in undertaking the Study except when the two Governments agree that such a member is guilty of gross negligence or willful misconduct, and

14. To nominate the Department of Irrigation and Drainage to act as a counterpart agency for the Study and the Economic Planning Unit as a main coordinating body in relation to other relevant governmental and non-governmental organizations.

VIII. UNDERTAKINGS OF JICA

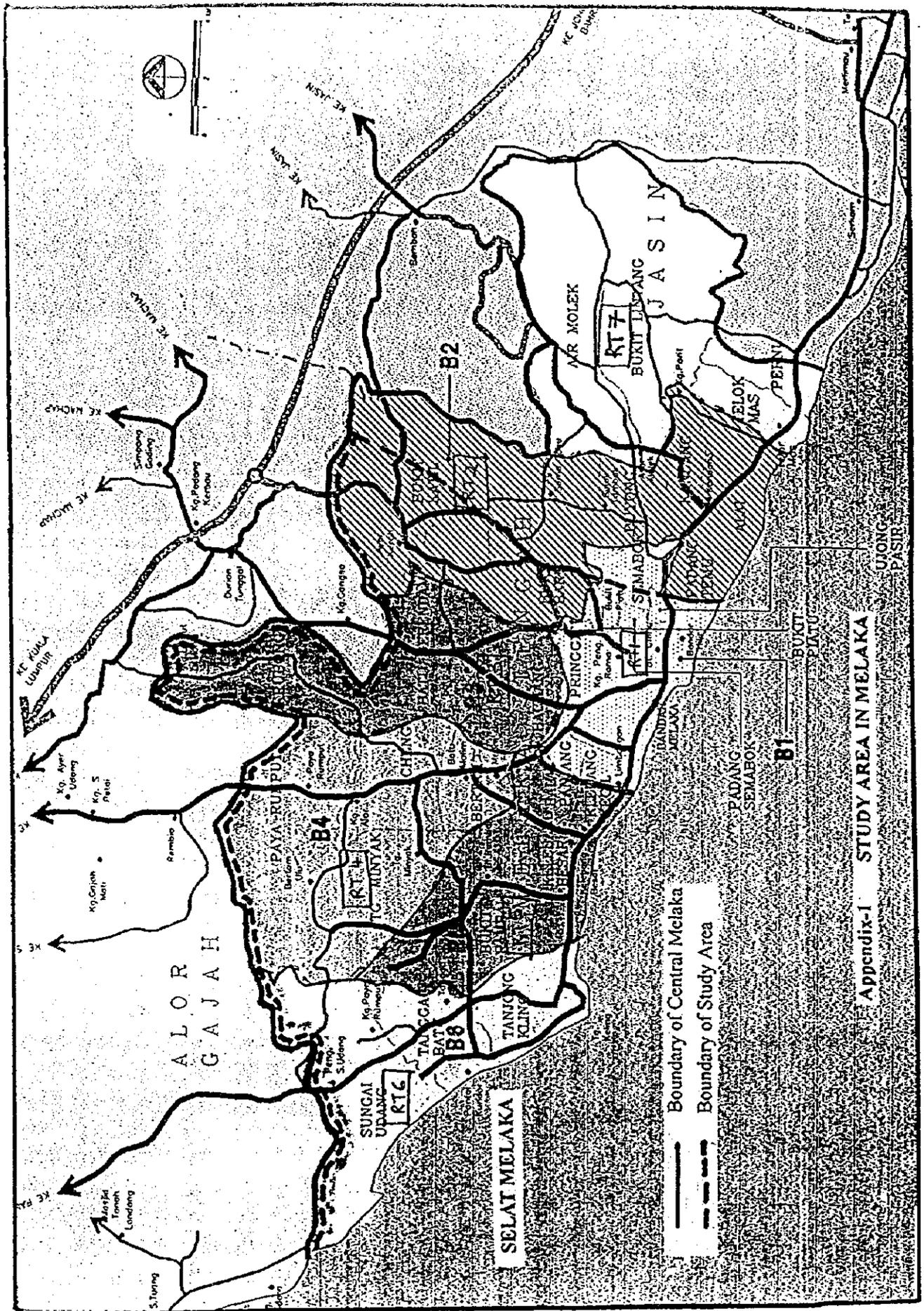
For the implementation of the Study, JICA shall take the following measures:

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

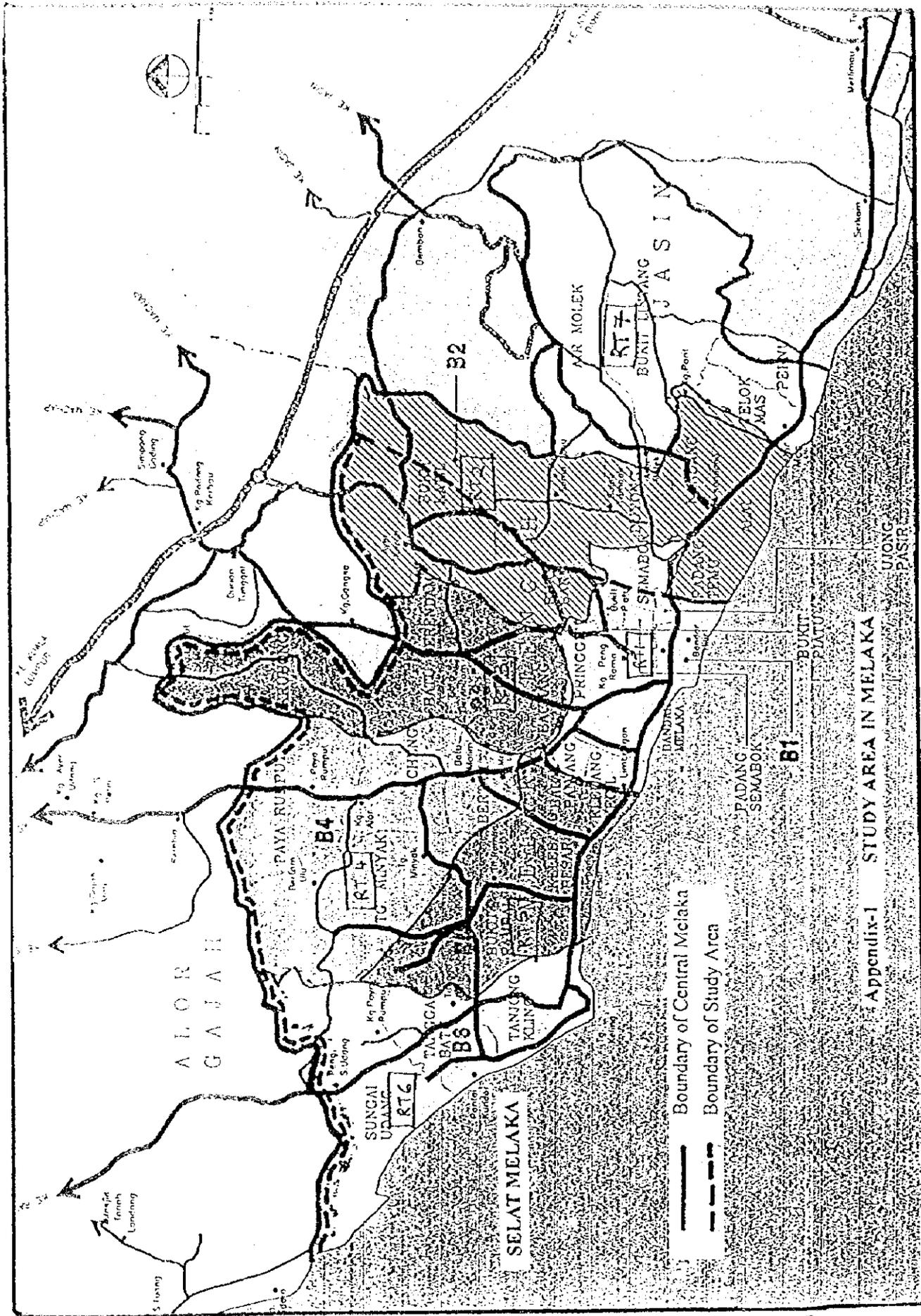
IX. CONSULTATION

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

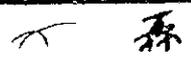


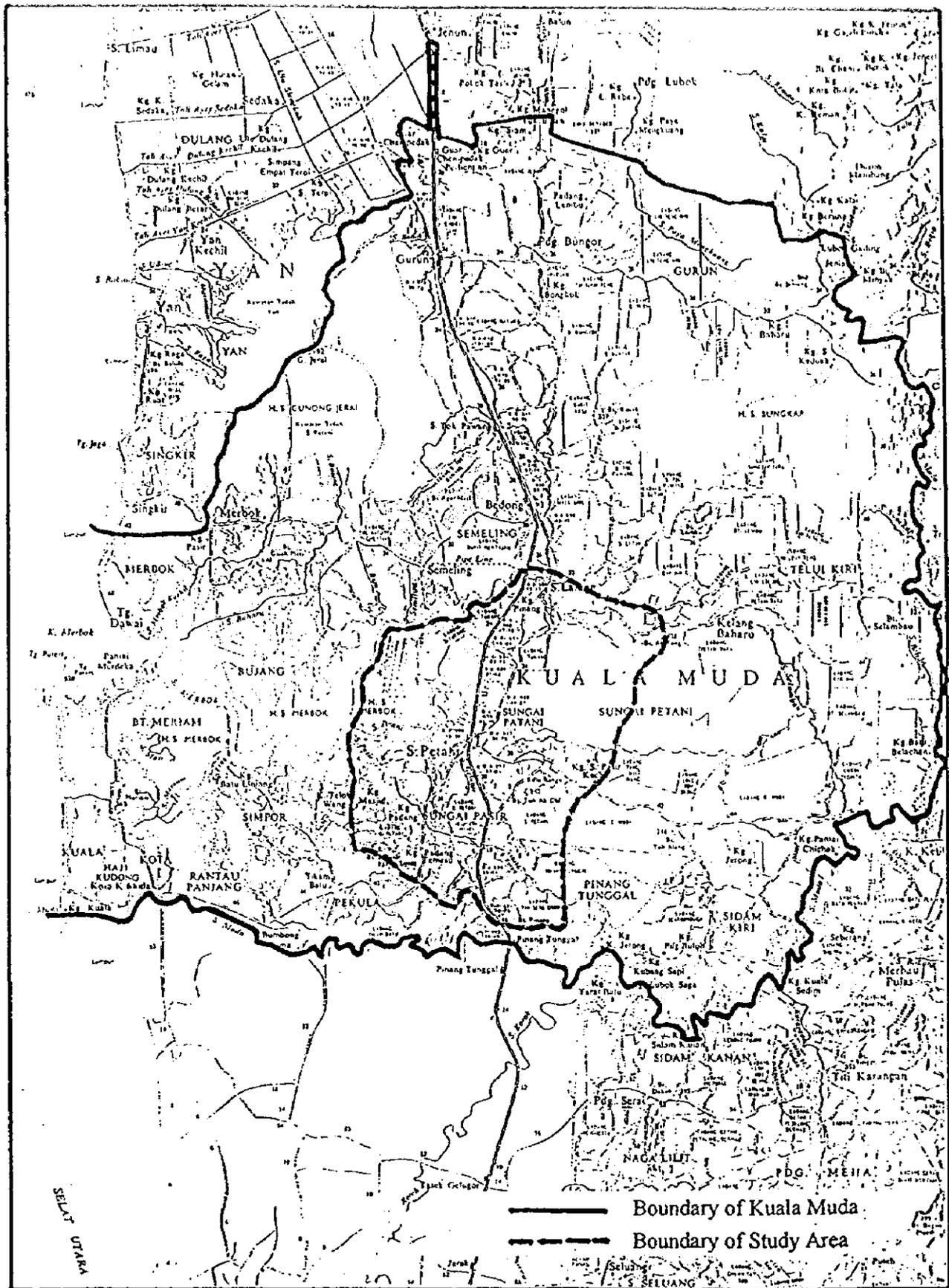


Appendix-I STUDY AREA IN MELAKA



Appendix-1 STUDY AREA IN MELAKA





Appendix-2 STUDY AREA IN SUNGAI PETANI



APPENDIX 3

TENTATIVE SCHEDULE

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
DESCRIPTION																				
WORK IN MALAYSIA (FIELD SURVEY)																				
WORK IN JAPAN																				
PHASE OF THE STUDY																				
REPORT PRESENTATION																				

▨ : JICA Study Team's Work in Malaysia

□ : JICA Study Team's Work in Japan

IC/R : Inception Report DF/R : Draft Final Report

P/R : Progress Report F/R : Final Report

IT/R : Interim Report

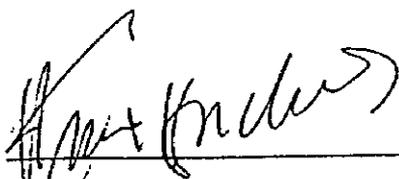
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資料3 MINUTES OF MEETINGS

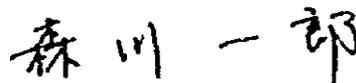
MINUTES OF MEETINGS
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Kuala Lumpur, 3 September, 1998



Mr. Ahmad Konchong
Director of Agriculture Section,
Economic Planning Unit (EPU),
Prime Minister's Department
on Behalf of
The Government of Malaysia



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

MINUTES OF MEETINGS
ON THE SCOPE OF WORK FOR THE STUDY ON INTEGRATED URBAN DRAINAGE
IMPROVEMENT FOR MELAKA AND SUNGAI PETANI IN MALAYSIA

I. BACKGROUND AND INTRODUCTION

In response to the request of the Government of Malaysia (hereinafter referred to as "GOM"), Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Preparatory Study Team (hereinafter referred to as "the Preparatory Team") headed by Mr. Ichiro Morikawa from 23 August to 10 September 1998 to discuss and determine the Scope of Work (hereinafter referred to as "S/W") for the Study on Integrated Urban Drainage Improvement for Melaka and Sungai Petani (hereinafter referred to as "the Study").

During the stay in Malaysia, the Preparatory Team visited the study area, and had a series of discussions on the draft Scope of Work prepared by the Preparatory Team with Department of Irrigation and Drainage (hereinafter referred to as "DID"). Further the joint meeting with authorities of the GOM concerned were also held. Finally, the Scope of Work was agreed upon by both side, and signed on 3 September 1998.

The Minutes of Meetings with main points of the discussions made in the course of the preparation of S/W have been prepared for the better understanding of S/W agreed upon between Malaysian side and the Preparatory Team.

II. MINUTES OF MEETING

1. WELCOMING SPEECH BY CHAIRMAN

The Chairman welcomed and thanked all present at the meeting. This meeting was a follow-up meeting of those held on 25 August and 1 September, for finalizing the scope of work for the Study. He emphasized that the Study is important for the nationwide urban drainage, and he also expressed the importance of the guideline which would be prepared by JICA.

2. BRIEFING BY THE PREPARATORY STUDY TEAM

Mr. Ichiro Morikawa of the Preparatory Team informed that the team had several discussions with various authorities concerned during the past week and visited the study areas i.e. Melaka and Sungai Petani. He thanked all parties concerned who had cooperated with the Preparatory Team.

3. ATTENDANCE

The attendance list is shown in Appendix 1.

4. MAIN ISSUES DISCUSSED:

4.1 Study title

Both sides agreed that the title of the Study would be "the Study on Integrated Urban Drainage Improvement for Melaka and Sungai Petani in Malaysia" as described in S/W.

4.2 Signatory for Malaysian side

Both sides agreed that the Signatory for Malaysian side for the Scope of Work and Minutes of Meetings should be the Director of Agriculture Section, Economic Planning Unit (EPU), Prime Minister's Department.

4.3 Guideline for urban drainage improvement in Malaysia

DID explained that DID is planning to prepare a guideline of urban drainage for newly developed area. As the result of discussions, It was confirmed that a guideline would be prepared by JICA focusing on improvement of existing urban drainage system as well as new concept and new technology such as detention facilities, retention facilities, infiltration facilities and the others.

4.4 Study area

Malaysian side requested that the study area of Melaka should cover the basins of Melaka river, Malim river and Lereh river (approximately 240km²) in the municipality of Melaka. The Preparatory Team recognized the necessity and agreed on it.

4.5 Target year

Both sides agreed that the Study would cover the period until the year of 2020.

4.6 Coordination with Other Ministries and Organizations

Malaysian side agreed to establish a steering committee under the chairmanship of EPU and a technical committee under the chairmanship of DID for the smooth implementation of the Study. The committees would include following organizations of the GOM.

Steering committee

- (1) Economic Planning Unit (EPU), Prime Minister's Department
- (2) Ministry of Agriculture
- (3) Ministry of Housing and Local Government
- (4) State Economic Planning Unit (EPU), Melaka
- (5) State Economic Planning Unit (EPU), Kedah
- (6) Municipal Council of Melaka, Melaka
- (7) Municipal Council of Sungai Petani, Kedah
- (8) Department of Environment (DOE), Ministry of Science, Technology and Environment
- (9) Public Works Department (PWD), Ministry of Public Works
- (10) Others

Technical committee

- (1) Department of Irrigation and Drainage (DID), Ministry of Agriculture
- (2) Municipal Council of Melaka, Melaka
- (3) Municipal Council of Sungai Petani, Kedah
- (4) Department of Irrigation and Drainage (DID), Melaka
- (5) Department of Irrigation and Drainage (DID), Kedah

- (6) Department of Town and Country Planning, Ministry of Housing and Local Government
- (7) Department of Environment (DOE), Ministry of Science, Technology and Environment
- (8) Others

4.7 Assignment of appropriate number of counterpart personnel

It was confirmed that DID would assign the appropriate number of counterpart personnel to the JICA Study Team in the following fields. The numbers and fields of counterpart personnel will, however, be finalized by the DID and the JICA Study Team in discussions at the commencement of the Study.

- Supervision / Urban drainage plan
- Flood control
- Guideline for urban drainage
- Design of urban drainage facilities, including cost estimation and construction plan
- Operation and maintenance plan for urban drainage facilities
- Institutional plan, including laws, regulations and organizations
- Hydrology / Hydraulics
- Environment
- Economic / Financial analysis
- Surveying
- Coordination for the JICA Study Team
- Others

4.8 Counterpart training in Japan

EPU requested JICA to conduct counterpart training in Japan, in addition to on-the-job-training, for the purpose of the smooth transfer of technology during the Study. The Preparatory Team agreed to convey the request to JICA Headquarters for consideration.

4.9 Technology transfer seminars

EPU requested JICA to hold seminars as a part of the technology transfer in the course of the Study. The Preparatory Team agreed to convey the request to JICA Headquarters for consideration.

4.10 Study reports

JICA requested EPU to make the Study reports open to the public in order to achieve maximum use of the Study results. EPU explained that it is the GOM's policy not to make them open to the public because of present regulations and EPU requested JICA to keep them confidential. The Preparatory Team agreed to convey the request to JICA Headquarters for consideration.

4.11 River section survey

It was confirmed that DID would conduct river section survey if river sections are not available for certain reaches of rivers in the Study area. If the survey is deemed necessary, the survey would be started before the Study Team comes to Malaysia to save time for the analysis.

LIST OF ATTENDANCE

Malaysian Side

- | | | |
|-----|--------------------------|---|
| 1. | Mr. Ahmad Konchong | Economic Planning Unit
Chairman |
| 2. | Mr. Arisfadilah Sariat | Economic Planning Unit |
| 3. | Mr. Ismail Che' Hassan | Economic Planning Unit |
| 4. | Mr. Azizan Mohd Sidin | Economic Planning Unit |
| 5. | Mrs. Zarina Kadri | Economic Planning Unit |
| 6. | Mr. Hj. Ghazali Omar | Drainage and Irrigation Department (DID) |
| 7. | Ir. Hamid Kassim | Drainage and Irrigation Department (DID) |
| 8. | Mr. Mokhtar Ab. Rahim | Drainage and Irrigation Department, Malacca |
| 9. | Mr. Baharuddin A. Nasir | Drainage and Irrigation Department, Kedah |
| 10. | Mr. Abdul Mukri Abdullah | Municipality Council of Sungai Petani |
| 11. | Mr. Rafiee Hj. Mamat | Municipality Council of Malacca Historical City |
| 12. | Mrs. Suriati Samad | Municipality Council of Malacca Historical City |
| 13. | Mr. Katsunori Takagi | JICA Expert in DID |

Japanese Side

JICA Preparatory Study Team

- | | | |
|----|----------------------|-------------|
| 1. | Mr. Ichirou Morikawa | Team Leader |
| 2. | Mr. Tateo Kudo | Member |
| 3. | Mr. Katsuyoshi Saito | Member |
| 4. | Mr. Toshikatsu Imai | Member |
| 5. | Mr. Nobuyuki Okabe | Member |

JICA MALAYSIA

- | | |
|----|-------------------------|
| 1. | Mr. Yoshihide Teranishi |
| 2. | Mr. Naofumi Yamamura |



資料4 主要面会者リスト

Economic Planning Unit

Mr. Ahmad Konchong Director of Agricultural Section

DID マレーシア

Ir. Hj. Keizrul Bin Abdullah Director-General

Ir. Ahmad Fuad Bin Embi Deputy Director-General II

Ir. Ghazali Bin Omar Director of Drainage Branch

Ir. Abdul Hamid Bin Md. Kassim Assistant Director, Drainage Branch

Ir. Roslina Yusup Engineer, Drainage Branch

Ms. Kelsom Alias Senior Technical Assitant, Drainage Branch

Minicipal Council of Sungai Petani

Mr. Abdul Mokhti B Abdullah President of Majlis Perbandaran Sungai Petani Kedah

Mr. Mohd Amin Ali Majlis Perbandaran Sungai Petani Kedah

DID Sungai Petani

Ir. Radzi Zain District Engineer, Jabatan Pengairan dan Saliran, Sungai Petani

Mr. Aznul Ibrahim Jabatan Pengairan dan Saliran, Kedah

DID Malacca

Ir. Mohd Azhari Director of DID Malacca

Mr. Chua H.P.

Ir. Azman Yahya

Malacca Municipal Council

Ir. Rafiee Bin Haji Mamat Engineering Director

Ms. Suriati Binti Samad

Ms. Ong Ay Lee Town Planning Department

在マレーシア日本国大使館

長谷川朋弘 二等書記官

JICAマレーシア

西牧隆杜 所長

寺西義英 次長

山村直史 所員

JICA長期専門家

高木克則 DID 河川部

**QUESTIONNAIRE FOR DATA AVAILABILITY
FOR
THE STUDY ON INTEGRATED URBAN DRAINAGE IMPROVEMENT
FOR
MELAKA AND SUNGAI PETANI
IN
MALAYSIA**

Item	Availability (O or X)	Source	During Preparatory Study	Remarks
1. TOPOGRAPHY AND GEOLOGY				
1-1. Topographic maps covering the study area				
a. Area covered by the above maps	O	Department of Survey Mapping	☆	サンプル・コピー入手 Melaka: 購入
b. Scale	1:50,000			
c. Interval of contour line				
d. Agency and administrative office	X			
1-2. Acrophotographs (the latest photos)				
a. Area covered by the above acrophotographs				
b. Scale				
c. Photographing year				
d. Agency and administrative office				
e. Control point (location and altitude)				
f. Triangulation station				
g. Permission for the Study Team to take them out of the Malaysia to Japan				
1-3. River plan, profile and cross-section				
a. Plan, profile and cross-section of existing river	O	Department of Irrigation and Drainage (DID)	☆	サンプル・コピー入手
b. Agency and administrative office				
1-4. Geological maps covering the study area				
a. Area covered by the above maps	O	Geological Survey Department	☆	
b. Scale				
c. Agency which prepared map/administrative office				

O: Available, X: Not Available, ☆: Data to be collected

O: Available, X: Not Available, ☆: Data to be collected

Item	Availability (O or X)	Source	During Preparatory Study	Remarks
1-5. Land use maps covering the study area a. Scale b. Year of publication or investigation c. Agency and administrative office	O	Municipal Council	☆	
1-6. Satellite images covering the study area a. Scale b. Year of publication or investigation c. Agency and administrative office	X			
1-7. Spatial planning maps covering the study area	O	Municipal Council	☆	
1-8. Soil-mechanical data (boring log data) at major river structure	O	DID		
2. CLIMATIC AND HYDROLOGICAL DATA				
2-1. Location map of climatological and hydrological observatories in and around the study area a. Climatological and precipitation stations b. Hydrological gauging stations (water level and discharge) c. Tide stations	O	DID & Malaysian Meteorological Service (MMS)	☆	
2-2. List of aforementioned stations showing a. Station name b. Location/address c. Classification of observatory or code No., if any d. Observation items indicating equipment in use e. Period of observation f. Authorities concerned	O	DID & MMS	☆	
2-3. General climatic conditions in term of monthly average at major climatological stations, to be compiled in an attached <u>Form-1</u>	O	MMS	☆	

O: Available, X: Not Available, ☆: Data to be collected

Item	Availability (O or X)	Source	During Preparatory Study	Remarks
<p>2-4. Specific climatic conditions ever recorded at major stations, to be compiled in an attached <u>Form-2</u></p>	O	DID & MMS	☆	自記紙からの読み取り
<p>2-5. Hyetograph of storm which caused major historical floods in and around the study area</p> <ul style="list-style-type: none"> a. Hourly distribution of storm rainfall at major stations b. Hourly hydrograph of flood flow at major stations c. Isohyetal maps 	O	MMS		既往最大時間雨量記録有
<p>2-6. Annual maximum daily rainfall, together with the date of occurrence, recorded at major stations in recent 30 years, to be compiled in an attached <u>Form-3</u></p>	O	DID & MMS	☆	
<p>2-7. Water levels and discharges</p> <ul style="list-style-type: none"> a. Monthly average discharges at major non-tidal river gauging stations, to be compiled in an attached <u>Form-4</u> b. Annual maximum water level and discharge, together with the date of occurrence, recorded at major stations in recent 30 years, to be compiled in an attached <u>Form-5</u> c. Water level and discharge hydrographs observed during major floods in the past d. Authorized drainage areas at major points e. Equation and/or curve showing relationship between water level and discharge (for water level to discharge conversion) f. Tidal water level recorded at major tide stations, to be compiled in an attached <u>Form-6</u> 	O	DID	☆	自記紙からの読み取り
<p>2-7. Sediment observation record</p> <ul style="list-style-type: none"> a. River bed materials analysis b. Particle size distributions of bed materials c. Sediment volume of bed load and suspensions load (data obtained from observation) 	O	DID		

O: Available, X: Not Available, ☆: Data to be collected

Item	Availability (O or X)	Source	During Preparatory Study	Remarks
3. URBAN DRAINAGE IMPROVEMENT AND RELEVANT INFORMATION				
3-1. Record or information on the past flood damage in the study area	O	Municipal Council	☆	Sungai Melaka
a. occurrence year				
b. Cause				
c. Inundation area and damage on the land and property.				
d. Damage on the urban drainage facilities and other infrastructure facilities such as bridges, roads and irrigation weirs				
c. Extent of damage				
3-2. Present conditions of existing urban drainage facilities in the study area	O	Municipal Council & DID		Sungai Melaka
3-3. Water use in the study area	O			Sungai Melaka
a. present water rights and future water use plans				
b. past records of water withdrawal				
c. water transportation				
d. fishery				
3-4. Information regarding the completed/on-going/proposed urban drainage improvement projects in and around the study area covering project name, title and contents of project reports	O	DID	☆	
3-5. Existing flood warning/evacuation system in the study area	O	DID		Sungai Melaka
3-6. Land conservation of the study area	O	Department of Forestry		
a. Forestation				
b. Erosion control				
c. Record of landslides				
3-7. Design and Standard which is being applied to urban drainage improvement project	O	DID	☆	

O: Available, X: Not Available, ☆: Data to be collected

Item	Availability (O or X)	Source	During Preparatory Study	Remarks
<p>4. ENVIRONMENT 4-1. Legislation a. Do you have the law/guidelines on environmental impact assessment? Please attach the detail, e.g. responsible ministry or agency, procedure, if any. b. Do you have the environmental quality standard(s)? Please attach the detail, e.g. values, penalties, if any.</p>	O	Department of Environment (DOE)	☆	
<p>4-2. International Conventions on Environmental Conservation Have you affiliated to bilateral or multilateral convention(s) concerning environmental conservation, e.g. Ramsar Convention, Washington Convention? Give the name(s) of the convention(s) affiliated and the date of affiliation, if any.</p>	O	DOE	☆	
<p>4-3. Present situation of the proposed project site a. Socio-economic Environment - Number of people to be resettled and plan of resettlement or compensation - Experience of resettlement in previous projects, if any - Number and distribution of schools, hospitals, religious facilities - Location of the community which will be split by the project, if any - Cultural property or archaeological sites, if any - Use of spring/river/lake/sea water, i.e. domestic, industrial and agricultural - Existence of common land - Solid waste collection and disposal system b. Natural Environment - Availability of vegetation map - History of natural disaster such as landslide, high tide, earthquake and flood - Change of water level of rivers and lakes in recent years - Location of environmentally vulnerable areas such as mangrove forest, coral reef, wet land, tideland, if any - Availability of oceanological data such as littoral drift, oceanological map - Species of valuable animals and plants in the area, if any</p>	O	Municipal Council & DID		
	O	DOE & DID		

O: Available, X: Not Available, ☆: Data to be collected

Item	Availability (O or X)	Source	During Preparatory Study	Remarks
<ul style="list-style-type: none"> - Location of particular areas officially protected such as national parks and natural parks - Distribution of important landscape or scenery for tourism or religion <p>c. Environmental Pollution</p> <ul style="list-style-type: none"> - Present water quality - Regulation on effluent - Present conditions of noise and vibration - Regulation for prevention of noise and vibration 	O	DOE & DID		
<p>5. OTHERS</p> <p>5-1. List of Consultant Firms in Malaysia which specialize in Survey, Water quality analysis, Flood control and Environmental assessment</p> <ul style="list-style-type: none"> a. Survey b. geology c. acrophotograph d. Water quality e. Hydrology and hydraulics f. Environmental assessment 	O	DID & DOE	☆	
<p>5-2. Unit price and wages of focal consultants, technical and supporting staff, typist, driver and workers</p>	O	DID	☆	

6. 収集資料リスト

No.	タイトル	発行年	発行元	種別	備考
1.	上位計画				
1-1	Rancangan Struktur Majlis Perbandaran Sungai Petani 1990 - 2010	-	Majlis Perbandaran Sungai Petani	印刷物	スンガイブタニ市 総合開発計画
1-2	Draf Rancangan Tempatan Sungai Petani 1996 - 2010	-	Majlis Perbandaran Sungai Petani Kedah Darul Aman	印刷物	スンガイブタニ市 総合開発計画
1-3	Annual Report 1996		Majlis Perbandaran Melaka Bandaraya Bersejarah	印刷物	
1-4	Rancangan Struktur	1993	Majlis Perbandaran Melaka Bandaraya Bersejarah	印刷物	マラッカ市総合開 発計画報告書
1-5	Laporan Pemeriksaan Rancangan Struktur Majlis Perbandaran Melaka 1987 - 2010	-	Jabatan Perancang Bandar dan Desa Semananjung Malaysia	印刷物	マラッカ市総合開 発計画報告書
2.	水文・水理関係				
2-1	気温、相対湿度、降雨量、蒸発量、日照時間、風向風 速等 (Melaka, Alor Setar)	-	Malaysian Meteorological Service	コピー	
2-2	降雨量等 (Sungai Petani)	-	Malaysian Meteorological Service	コピー	
2-3	SISTEM AMARAN BANJIR, NEGERI MELAKA (マラッカの 気象及び水位・流量観測所位置図)	-	Department of Irrigation And Drainage Malaysia	コピー	
2-4	HYDROLOGICAL STATIONS INVENTORY (RAINFALL STATIONS AND RIVER STAGE AND DISCHARGE STATIONS)	-	Department of Irrigation And Drainage Malaysia	コピー	
2-5	年最大雨量 (BKT. SEBUKUR at MELAKA)	-	Department of Irrigation And Drainage Malaysia	707ピット・データ	
2-6	年最大雨量 (JAB. PENJARA SG. PETANI at KEDAH)	-	Department of Irrigation And Drainage Malaysia	707ピット・データ	
2-7	年最大及び最小の水位と流量及び、月平均流量 (SG. MELAKA at PANTAI BELIMBANG)	-	Department of Irrigation And Drainage Malaysia	707ピット・データ	
2-8	年最大及び最小の水位と流量及び、月平均流量 (SG. DURIAN TUNGGAL at B.11 AIR RESAM, MELAKA)	-	Department of Irrigation And Drainage Malaysia	707ピット・データ	
2-9	Flood Prone Area (Melaka)	-	Melaka Municipal Council	コピー	

2-10	河川測量成果のサンプル (Sg. Melaka (1997), Sg. Putat (1996), Sg. Malim (1989), Sg. Ayer Salak (1997))	-	Department of Irrigation And Drainage Malaysia	コピー	
3.	現況土地利用				
3-1	LANDUSE IN THE CENTRAL BUSINESS DISTRICT	-	Melaka Municipal Council	コピー	
3-2	CONSERVATION AREA (Town And Planning Department, Melaka (1985))	--	Melaka Municipal Council	コピー	
3-3	DENSITY CONTROL/UNDER THE LOCAL PLAN	-	Melaka Municipal Council	コピー	
4.	環境関係				
4-1	A HANDBOOK OF ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINES (Second Edition)	1995	Department of Environment	印刷物	
4-2	ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINES Volume V DRAINAGE AND/OR IRRIGATION Draft Final Report	1995	Department of Environment	コピー	
4-3	ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINES FOR DRAINAGE AND/OR IRRIGATION	1995	Department of Environment	コピー	
4-4	MALYASIA ENVIRONMENTAL QUALITY REPORT	1997	Department of Environment	印刷物	
4-5	Historical and Cultural Conservation Area (Melaka)	-	Melaka Municipal Council	コピー	
4-6	Forest Reserve (Melaka)	-	Melaka Municipal Council	コピー	
5.	既往報告書				
5-1	KAJIAN PELAN INDUK SALIRAN BANDAR DAN REKABENTUK TERPERINCI SUNGAI PETANI, KEDAH DARUL AMAN EXECUTIVE SUMMARY AND FINAL REPORT (VOLUME D)	1997	PB Perunding Bakti	印刷物	ス ン ガ イ ブ タ ニ 排 水 マ ス タ ー ブ ラ ン 検 討 報 告 書
5-2	KAJIAN PELAN INDUK SALIRAN BANDAR DAN REKABENTUK TERPERINCI SUNGAI PETANI, KEDAH DARUL AMAN PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT	1997	PB Perunding Bakti	印刷物	ス ン ガ イ ブ タ ニ 排 水 マ ス タ ー ブ ラ ン 検 討 報 告 書

5-3	KAJIAN PELAN INDUK SALIRAN BANDAR DAN REKABENTUK TERPERINCI SUNGAI PETANI, KEDAH DARUL AMAN FIGURES (VOLUME III)	1997	PB Perunding Bakti	印刷物	ス ン ガ イ ブ タ ニ 排 水 マ ス タ ー ブ ラ ン 校 討 報 告 書
5-4	KAJIAN PELAN INDUK SALIRAN BANDAR DAN REKABENTUK TERPERINCI SUNGAI PETANI, KEDAH DARUL AMAN TABLES (VOLUME IV)	1997	PB Perunding Bakti	印刷物	ス ン ガ イ ブ タ ニ 排 水 マ ス タ ー ブ ラ ン 校 討 報 告 書
5-5	MEKALA RIVER REHABILITATION PROJECT (Progress Report) Melaka River Water Quality Modelling	1997	Department of Irrigation And Drainage Malaysia	コピー	
5-6	MEKALA RIVER REHABILITATION PROJECT (Progress Report) Hydrodynamic Modelling of Melaka RIVER REHABILITATION PROJECT, MELAKA (PROJECT COMPLETION REPORT: DRAFT)	1997	Department of Irrigation And Drainage Malaysia	コピー	
5-7	JANUARY 1996 - APRIL 1998.	1998	Department of Irrigation And Drainage Malaysia	コピー	
5-8	RIVER REHABILITATION PROJECT, MELAKA (PROJECT COMPLETION REPORT) JANUARY 1996 - APRIL 1998	1998	Department of Irrigation And Drainage Malaysia	印刷物	
5-9	MELAKA SEWERAGE AND URBAN DRAINAGE STUDY VOLUME 5 ADDENDUM TO VOLUME 4		Yunit Perancang Ekonomi Jabatan Perdana Menteri	コピー	図 面 、 表 等
5-10	MELAKA SEWERAGE AND URBAN DRAINAGE STUDY VOLUME 5 ADDENDUM TO VOLUME 4		Yunit Perancang Ekonomi Jabatan Perdana Menteri	コピー	図 面 、 表 等
6.	統計資料				
6-1	POPULATION REPORT FOR ADMINISTRATIVE DISTRICT (Population and Housing Census of Malaysia)	1995	Department of Statistics Malaysia	印刷物	
6-2	POPULATION REPORT FOR MUKIM (Population and Housing Census of Malaysia 1991)	1995	Department of Statistics Malaysia	印刷物	
6-3	CONSUMER PRICE INDEX (1994 = 100) JULAI 1998	1998	Department of Statistics Malaysia	印刷物	
6-4	STATICS HANDBOOK 1998	1998	Department of Statistics Malaysia	印刷物	
7.	地質関係				
7-1	GEOLOGY AND MINERAL RESOURCES OF THE GUNONG JERAI AREA, KEDAH	1972	Geological Survey Headquarters	印刷物	ク ダ 州 地 質 図 説
7-2	(マラッカ州一般地質図)		Department of Geology Malaysia	コピー	

8.	地形図								
8-1	MELAKA, Edition 2-PPNM (Scale: 1/75,000)		1986	National Mapping, Malaysia	コピー	マラッカ州地図			
8-2	BANDAR MELAKA DAN AYER KEROH (Scale: 1/10,000, Sheet No. Mk.1)		1995	National Mapping, Malaysia	コピー	マラッカ中心部の地形図			
8-3	マラッカのコンター100m毎の5万分の1地形図 (PORT DICKSON:143, GEMENCHEN:145, PASIR PANJANG:152, MELAKA:153, JASIN:154, ケダ州南部の地図 (RAMPAJAN 50)		1996	National Mapping, Malaysia	印刷物				
8-4	SUNGAI PETANI (Scale: 1/50,000, Sheet No. 3366)		1969	National Mapping, Malaysia	コピー				
8-5			1985	National Mapping, Malaysia	コピー				
9.	ローカルコンサルタント一般								
9-1	DID登録コンサルタント会社リスト (SENARAI PERUNDING BERDAFTAR, MEGIKKUT ABJAD)		1998	Department of Irrigation And Drainage Malaysia	コピー				
9-2	List of Consultants Firms for Land Survey		-	Department of Irrigation And Drainage Malaysia	コピー				
9-3	DOE登録 (EIA調査) コンサルタント会社リスト		1997	Department of Environment	コピー				
9-4	Unit Price and Wages of Local Consultant (KAJIAN PENYEDIAAN PELAN INDUK SALIRAN BANDAR IPOH, PERAK プロジェクトの例)		-	Department of Irrigation And Drainage Malaysia	コピー				
10.	その他								
10-1	OFFICIAL SECRETS ACT		1997	MDC Penerbit Pencetak Sdn Bhd	印刷物	(政府関係秘密保持法)			
10-2	Terms of Reference Drainage Master Plan Study for Sg. Davong, Sg. Punggor, Sg. Umbai, and Pt. Cina Areas, Penyusupan, Pengalaman di Negara Jepun (日本における雨水浸透貯留施設の実施例を紹介するパンフレットのマレー語翻訳版)		1998	Department of Irrigation And Drainage Malaysia	コピー				
10-3	Urban Drainage Design Standards and Procedures for Peninsular Malaysia		-	Department of Irrigation And Drainage Malaysia	印刷物				
10-4			1975	Department of Irrigation And Drainage Malaysia	コピー				

資料7 コーカルコンサルタントリスト

DID登録コンサルタント会社リスト(土木一般)

No.	Company Name	Address	Registration		Field
			No.	Period	
1		Sabah, Tawau	T/808(A)/7/91	181195-171197	Civil Engineering
2	Aktif FA Konsult Sdn. Bhd.	Sabah, Kota Kinabalu	T/02911/7/95	281196-271198	Civil Engineering
3	Angkasa GHD Engineers Sdn. Bhd.	Selangor, Subang Jaya	K.KEW/K&B/D/02/494/465-000118	051097-041099	Civil Engineering
4	Antara Jurutera Perunding Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/128/5/86	281096-271098	Civil Engineering, Elect. & Mech.
5	BW Perunding Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/67/4/86	030596-020598	Civil Engineering
6	C & H Eng. Cons. Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/869(A)/8/91	200296-280298	Civil Engineering, Structure
7	Dr. Nik & Associates	Wil Persekutuan, K. Lumpur	T/2202/2/95	230797-220799	Civil Engineering
8	Endeavour Consult Sdn. Bhd.	Wil Persekutuan, K. Lumpur	K.KEW/K&B/D/02/494/465-001168	271197-261199	Civil Engineering
9	"	N. Sembilan, Seremban	"	"	"
10	Erinco Sdn. Bhd.	N. Sembilan, Seremban	T/544/87	141196-131198	Civil Engineering
11	"	Selangor, Petaling Jaya	"	"	"
12	HLA Associates Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/1917/3/94	220696-210698	Civil Engineering
13	"	Kedah, Sungai Petani	"	"	"
14	Bran-GEA Engineers Sdn. Bhd.	Selangor, Subang Jaya	T/447/1/87	270995-260997	Civil Engineering (Geo. & Environ)
15	IR Perunding Sdn. Bhd.	Selangor, Subang Jaya	T/02122/1/95	250397-240399	Civil Engineering
16	Juruperunding Delima	Wil Persekutuan, K. Lumpur	T/02115/1/95	190996-180998	Civil Engineering & Mechanical
17	Jurutera Consultant (Sen.) Sdn. Bhd.	Wil Persekutuan, K. Lumpur	K.KEW/K&B/D/02/494/465-001166	030298-02022000	Civil Engineering
18	"	Johor, J. Bharu	"	"	"
19	"	P. Pinang	"	"	"
20	Jurutera Perunding Bersama Sdn. Bhd.	Wil Persekutuan, K. Lumpur	K.KEW/K&B/D/02/494/465-000022	100797-120799	Civil Engineering
21	Jurutera Perunding Pelangi Sdn. Bhd.	P. Pinang, Gelugor	T/03084/4/97	050597-040599	Civil Engineering & Electrical
22	KL Prima Consult Sdn. Bhd.	Kedah, Alor Setar	T/02791/6/96	090996-080998	Civil Engineering
23	"	Wil Persekutuan, K. Lumpur	"	"	"
24	KTA Tenaga Sdn. Bhd.	Selangor, Petaling Jaya	T/1555(A)/7/93	050897-040899	Civil Engineering, Elect. & Mech.

No.	Company Name	Address	Registration		Field
			No.	Period	
25	Malata Eng. Consultants Sdn. Bhd.	Wil Persekutuan, K. Lumpur	K.KEW/K&B/D/02/494/465-000148	090298-08022000	Civil Engineering & Electrical
26	Minconsult Sdn. Bhd.	Selangor, Petaling Jaya	K.KEW/K&B/D/02/494/465-001118	010997-310899	Civil Engineering
27	O & L Jurutera Perunding	Melaka, Bukit Baru	T/1364(A)1/93	160295-150297	Civil Engineering
28	Pakatan Runding Yusoff	Wil Persekutuan, K. Lumpur	T/1444/6/86	180197-170199	Civil Engineering
29	Perunding Aziz Sehu Sdn. Bhd.	Wil Persekutuan, K. Lumpur	1/55/3/86	080696-070698	Civil Engineering
30	"	Sabah, Kota Kinabalu	"	"	"
31	Perunding Bersatu	Perak, Ipoh	T/46/3/86	140696-130698	Civil Engineering & Mechanical
32	"	Selangor, Petaling Jaya	"	"	"
33	"	P. Pinang, Pitt Street	"	"	"
34	"	Kedah, Alor Setar	"	"	"
35	Perunding CM	Wil Persekutuan, K. Lumpur	T/02625/3/96	030596-020598	Civil Engineering
36	Perunding Hashim & Neh Sdn. Bhd.	Selangor, Petaling Jaya	T/60/3/86	080794-070796	Civil Engineering, Elect. & Mech.
37	Perunding Pertama	Sabah, Kota Kinabalu	K.KEW/K&B/D/02/494/465-000125	100997-110999	Civil Engineering
38	Perunding Timur Sdn. Bhd.		T/487/3/87	160796-150798	Civil Engineering, Elect. & Mech.
39	Perunding ZAR Sdn. Bhd.	Selangor, Shah Alam	T/02890/7/96	131196-121198	Civil Engineering
40	Perunding ZKR Sdn. Bhd.	Selangor, Petaling Jaya	T/02691/4/96	030796-020798	Civil Engineering
41	Perwira Al-Shura Con. Eng. Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/1293(A)/9/92	090397-080399	Civil Engineering, Elect. & Mech.
42	PU Engineering Sdn. Bhd.	Sabah, Kota Kinabalu	K.KEW/K&B/D/02/494/465-000224	201297-191299	Civil Engineering
43	"	Sarawak, Kuching	"	"	"
44	Putra Konsult	Perak, Ipoh	K.KEW/K&B/D/02/494/465-000230	071297-061299	Civil Engineering
45	"	Selangor, Ampang	"	"	"
46	"	P. Pinang, Bayan Lepas	"	"	"
47	PY Konsep Perunding Sdn. Bhd.	Sabah, Kota Kinabalu	T/370(A)/E2/90	110794-100796	Civil Engineering
48	Rahulan Zain Associates	Wil Persekutuan, K. Lumpur	T/818/2/88	040797-030799	Civil Engineering

No.	Company Name	Address	Registration		Field
			No.	Period	
49	Sepakat Setia Perunding Sdn. Bhd.	Sabah, Kota Kinabalu	T/85/4/86	210396-200398	Civil Engineering, Elect. & Mech.
50	"	Selangor, Seri Kembangan	"	"	"
51	Sri Perunding	Johor, Segamat	T/428/3/87	060497-050499	Civil Engineering
52	"	Selangor, Subang Jaya	"	"	"
53	"	Melaka, Bukit Baru	"	"	"
54	Struktur Sejagat Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/115(A)/6/92	210297-200299	Civil Engineering
55	Utama Jurutera Perunding	Sabah, Kota Kinabalu			
56	Vast Consultant Sdn. Bhd.	Pahang, Jengka Pusat	T/6/9(A)/1/91	230996-220998	Civil Engineering, Geotechnical
57	"	Selangor, Batu Caves	"	"	"
58	WV Consult	Wil Persekutuan, K. Lumpur	T/952(A)/2/92	230392-220394	Civil Engineering
59	W. D. Lee & Associates	Sabah, Kota Kinabalu	T/02961/1/97	230197-220197	Civil Engineering
60	Zaidun-Leeng Sdn. Bhd.	Wil Persekutuan, K. Lumpur	T/152/3/86	220796-190798	Civil Engineering, Elect. & Mech.

DID 登録コンサルタント会社リスト (測量)

No.	Company Name	Address	Registration		Branch Office
			No.	Period	
1.	Awal Surveyors and Mappers	Kuala Terengganu	T/1618(A)/9/93	210195-261097	Kuantan
2.	Ahamad Daud & Rakan-rakan	Kuala Lumpur		1000396-090398	Nil
3.	Bornmap Surveys Sdn. Bhd.	Kuching	T/113/5/86	110596-100598	Bintulu
4.	Dhlas Land Services	Kuala Lumpur	T/02568/2/96	260396-250398	
5.	Jalal Johari Consultants	Kuala Lumpur	T/02128/1/95	170295-160297	Ipoh
6.	Kumpulan Ukur Petanah	Kuala Lumpur	T/733/2/88	270594-260596	Semabok
7.	K. T. Wah & Rakan	Pulau Pinang	T/004(A)/1/89	260495-250497	Kota Kinabalu Ipoh
8.	Jurukur Bakti	Kuala Lumpur	T/23/1/86	160896-150898	Kangar Kuantan Johor Bahru
9.	Jurukur Berjasa	Kota Bahru	T/167/2/86	160696-150698	Kuala Lumpur
10.	Jurukur Bersatu	Johor Bahru	T/189/7/86	240894-230896	Kuantan
11.	Jurukur Budiman	Kuala Lumpur	T/536/6/87	281195-271197	Kuala Terengganu Kuantan Ipoh
12.	Jurukur Bani Raya	Petaling Jaya	T/35/1/86	240396-230398	Sungai Petani
13.	Jurukur Cergas	Seremban	/02641/3/96	080596-070598	Nil
14.	Jurukur Chai & Rakan-rakan	Alor Setar	T/967(A)/2/92	310396-300398	Butterworth Pulau Pinang
15.	Jurukur Esa Sdn. Bhd.	Kuala Lumpur	T/176/1/86	050296-040298	Kangar Ipoh Pulau Pinang
16.	Jurukur Jalil Yunus	Ampang	T/327/1/86	180994-170996	Kota Bharu Melaka
17.	Jurukur Kemuncak	Kuala Lumpur			Kuantan Pulau Pinang
18.	Jurukur Maju	Kota Bharu, Kelantan	T/105/5/86	201094-191096	Kuantan, Pahang
19.	Jurukur Makmur	Johor Bahru	T/141(A)/1/90	100196-090198	Kuala Lumpur
20.	Jurukur Perpaduan	Kuala Lumpur	T/874/6/88	270596-260598	Alor Setar
21.	Jurukur Rakyat	Johor Bahru	T/276(A)/E1/90	020994-010996	Ipoh

No.	Company Name	Address	Registration		Branch Office
			No.	Period	
22.	Jurukur Perunding Services	Kuala Lumpur	T/5/1/86	050296-040298	Alor Setar Pulau Pinang Melaka Kota Bharu Kuala Terengganu Ipoh
23.	Jurukur Sejati	Klang	T/1678(A)/1/94	030296-020298	Johor Bahru
24.	Jurukur Setia	Kuala Lumpur	T/360/13/86	201194-191196	Melaka
25.	Jurukur Selatan	Johor Bahru	T/34/2/86	070894-060896	Ipoh, Perak
26.	Jura Ukur Sentosa	Petaling Jaya, Selangor	T/535/6/87	251195-241197	Kuala Terengganu, Terengganu
27.	Jurukur Timur	Kota Bharu	T/101/5/86	080496-070498	Kuala Terengganu
28.	Jurukur Tempatan Sdn. Bhd.	Kota Kinabaru	T/636(A)/2/91	101194-091196	Kuala Lumpur
29.	Jurukuru Siu & Rakan-rakan	Gelugor			Nil
30.	Jurukur Wilayah	Kuala Lumpur	T/358/13/86	151194-141196	Kota Bharu Pulau Pinang
31.	Mega Ukur Consultant	Kota Bharu	T/1007(A)/3/92	070596-060598	Sungai Petani
32.	Mahabob & Co	Johor Bahru, Johor	T/132(A)/5/89	221295-211297	Petaling Jaya, Selangor Kuantan, Pahang Alor Setar, Kedah
33.	Nadi Ukur Consultant	Petaling Jaya	T/02139/1/95	010395-280297	Kuala Terengganu
34.	Perunding Ukur Tekun	Kuala Lumpur	T/02134/1/95	200295-190297	Ipoh
35.	Roadland Survey Consultants	Kuala Lumpur	T/1474(A)/5/93	270595-260597	Kuantan
36.	Syarikat Abdul Wahab	Seremban	T/349/12/86	091094-081096	Kuala Lumpur
37.	Syarikat Ayob bin Saud	Pulau Pinang		310196-300198	Kota Bharu Johor Bahru
38.	Syarikat Jurukur Konsultant	Kuala Lumpur	T/21/2/86	081094-071096	Kulim Kuantan
39.	Syarikat Jurukur Malinja	Petaling Jaya	T/395/1/87	270195-260197	Nil

No.	Company Name	Address	Registration		Branch Office
			No.	Period	
40.	Syarikat Jurukur Malaysia	Kuala Lumpur	T/87/4/86	140696-130698	Johor Bahru Butterworth Taiping Kota Bharu Kuala Terengganu Kuantan
41.	Syarikat Loh Kam Lak	Ipoh, Perak	T/82/3/86	130296-120298	
42.	Syarikat Sow Tung Low	Taiping	T/375/13/86	011294-301196	Ipoh
43.	Syarikat Ukur Aman	Kuantan	T/25/2/86	121295-111297	Kuala Terengganu
44.	Syed Hussein & Saharuddin	Kuala Lumpur	T/63/A/86	150396-140398	Kuantan Seremban Melaka
45.	Tan Peng Seng dan Rakan-rakan	Pulau Pinang	T/2/2/86	240294-230296	Kuala Lumpur Alor Setar
46.	Tan, Yap & Associates	Ipoh	T/364/13/86	241194-231196	Nil
47.	Urus Ukur Consultant	Batu Caves, Selangor	T/17/1/86	050495-949497	Johor Bharu, Johor
48.	Wira Ukur Consultant	Kota Bharu	T/526(A)/5/90	160495-150497	Kuala Lumpur
49.	Yap Sze Pin	Ipoh, Perak			Petaling Jaya, Selangor

DOE 登録コンサルタント会社リスト (EIA 調査)

(1997年9月)

No.	会社名	分野	所在地	Number	Status	登録No.
Bil.	Nama	Pidang Keahlian	Alamat	Tel/Fax	Perkhidmatan	Perkhidmatan
1	ACRIS Sdn. Bhd.	SAINS ALAM SEKTOR [EKONOMI SOSIAL] [TEKNOLOGI INKLUSIF]	[NO. 9-2, JALAN 10/12SD, [UMAH DESA PEDLING [57100 KUALA LUMPUR	[03-9589766 [03-9589759	[Tulis] [Tulis]	[F00009 [F00009
2	ALARA RISK MANAGEMENT SERVICES Sdn. Bhd.	[ANALISA RISIKO [KEJURUTERAAN	[19th. Floor, bangunan [Sate Bank [4, Jln. Sultan Sulaiman [50000 K. LUMPUR.	[03-2625533 [63-2625534 [2522817	[Tulis] [Tulis]	[F00052 [F00052
3	ARORA QHD ENGINEERS Sdn. Bhd.	[EIA HIDROLOGIS	[NO.49, JALAN USJ 10/1A [JEP. SELANG JAYA [47600 PEDLING JAYA	[03-7328899 [03-7328833	[Tulis] [Tulis]	[F00039 [F00039
4	ASIA PACIFIC ENVIRONMENTAL CONSULTANTS	[SAINS ALAM SEKTOR	[30-2 JALAN 9/12SD [UMAH DESA PEDLING [57100 KUALA LUMPUR	[03-9574392 [03-9573943	[Tulis] [Tulis]	[F00003 [F00003
5	ASSOCIATED POLLUTION CONSULTANTS	[KEJURUTERAAN ALAM SEKTOR [ALAM SEKTOR EIA [ALAM SEKTOR PENGULIHAN SILA	[15A, JALAN LIM SENG CHEM, [IPOH [30250 PERAK DARUL KEDAHN.	[05-538069 [05-534900	[Tulis] [Tulis]	[F00031 [F00031
6	BIRO REKONGSIAN DAN KEMAMPUAN UTM	[ALAM SEKTOR EIA [SAINS & SAINS ULAMAAN FIZIK	[UNIVERSITI KEBANGSAAN MALAYSIA [BANGI [43600 SELANGOR	[03-8250552 [03-8252469	[Tulis] [Tulis]	[F00042 [F00042
7	CBM CENSI Sdn. Bhd.	[EKOLOGI [ALAM SEKTOR EIA [PERANGKAP BENDAR & DESA	[NO.29-2, JALAN 109-E [DM. DESA BUSINESS PARK, JLN. WANG LINA [58100 KUALA LUMPUR	[03-7840560 [03-7840561	[Tulis] [Tulis]	[F00060 [F00060
8	CHESAIN CONSULTANT Sdn. Bhd.	[SAINS & SAINS ULAMAAN KIMIA [SAINS & SAINS ULAMAAN BIOLOGI	[37, 39 & 41 WISMA 10-PERAGA [JALAN SENG TEE [91350 KUCHING, SARAWAK	[082-422736 [082-415506	[Tulis] [Tulis]	[F00043 [F00043
9	CITIC, UNQMS	[KEJURUTERAAN ALAM SEKTOR [SAINS & SAINS ULAMAAN BIOLOGI	[UNIVERSITI MALAYSIA SARAWAK [KOTA SEMPAPAN [54300 SARAWAK	[08-2672302 [08-2672303	[Tulis] [Tulis]	[F00047 [F00047
10	DMES AND MOPE M Sdn. Bhd.	[SAINS ALAM SEKTOR [KEJURUTERAAN ALAM SEKTOR	[10TH FLOOR, WISMA DAS [JALAN MELAYU [50100 KUALA LUMPUR	[03-2327416 [03-2321580	[Tulis] [Tulis]	[F00036 [F00036
11	DET NORSE VERITAS INDUSTRY Sdn. Bhd.	[SAINS ALAM SEKTOR [RISIKO	[5TH FLOOR, MENARA AIX HIA [ORANGKAT RAJA OULAN [50200 KUALA LUMPUR	[03-2386614 [03-2386617	[Tulis] [Tulis]	[F00005 [F00005
12	EDDINE MANAGEMENT Sdn. Bhd.	[ALAM SEKTOR EIA [ALAM SEKTOR KUALITI AIR [ALAM SEKTOR KUALITI UDARA	[12th, JALAN SS 21/35 [DAMPARAN UDARA [47400 PEDLING JAYA, SELANGOR	[03-7664640 [03-7664650 [03-7664650	[Tulis] [Tulis] [Tulis]	[F00063 [F00063 [F00063

47301 PETALING JAYA

Bil.	Nama	Bidang Pekerjaan	Alamat	Nomor Tel/Fax	Status Pendaftaran	Nomor Pendaftaran
13	RUTAH ASSOCIATES S.N. B.D.	SAINS ALAM SEKTOR	123-L, KUSMA LISTER GREEN 3RD FLOOR, JALAN PRONLISTER 10000 RUMAH PINTU	04-2295906 04-2289410	(Lulus)	F00016
14	ENG. & ENV. CONSULTING S.N. B.D.	KEKURUBAHAN AUM AUM SEKTOR HIRUKIRI PENCILAHAN SILA	31, LORONG RAHM HATAI 13 DEMAN TAN ER. ISMAIL 60000 KUALA LUMPUR	03-7188705 03-7173164	(Lulus)	F00008
15	BAMTAB S.N. B.D.	SAINS ALAM SEKTOR	388, JALAN PADANG, DEMAN PELANGI 80000 JOHOR BAHRU	07-3326277 07-3319357	(Lulus)	F00038
16	ENVIRONMENTAL & RISK MANAGEMENT S.N. B.D.	SAINS ALAM SEKTOR EIA RISESO	SUNTE 6.04, LEVEL 6, KUSMA INDI 281, JALAN TAN KAZAK 50000 KUALA LUMPUR	03-2446037 03-2449777	(Lulus)	F00013
17	ENVIRONMENTAL RESEARCH ASSOCIATES	PERANCING BAYAR & LESA	19FAS 31, (TGT 1) MERRA KOMER 10000 RUMAH PINTU	04-628278 04-628275	(Lulus)	F00053
18	ENVIRONMENTAL SCIENCE M. S.N. B.D.	SAINS ALAM SEKTOR KEKURUBAHAN AUM SEKTOR	NO.38, JALAN TEMAGA SD 5/24 BAYAR SRI DAMAIKRA 50000 KUALA LUMPUR	03-6336016 03-6359325	(Lulus)	F00017
19	EEI KONG S.N. B.D.	AUM SEKTOR EIA PENCILAHAN SILA PEJAL	NO.120, 2/D. FLOOR LOT 176 SESENO 12, JALAN HUI THA 93000 KUCHING, SARAWAK	082-246734 082-246744	(Lulus)	F00061
20	EPE CONSULT S.N. B.D.	AUM SEKTOR EIA AUM SEKTOR METEOROLOGI KEKURUBAHAN AUM SEKTOR	23-2 & 23-3, JALAN USJ 9/SN DEP SELANG JAYA 47000 PEJALING JAYA	03-7242287 03-7242300	(Lulus)	F00035
21	EBECO S.N. B.D.	KEKURUBAHAN AUM KEKURUBAHAN AUM SEKTOR	3B & 3C, JALAN 19/29 PEJALING JAYA 46300 SELANGOR D.E.	03-7557023 03-7557027	(Lulus)	F00027
22	ELITESSA ENGINEERING SERVICES S.N. B.D.	AUM SEKTOR EIA AUM SEKTOR PENCILAHAN SILA	36D, JALAN PEJALING UDARA 9 PEJALING UDARA 46000 PEJALING JAYA	03-7933639 06-7943200	(Lulus)	F00054
23	EM ENVIRO CONSULTING	AUM SEKTOR EIA AUM SEKTOR EIA	12-8 (TINGKAT 1), JALAN KODA LAMA 20300 KUALA TERENGGANU, TERENGGANU.	09-6237018 09-6237019	(Lulus)	F00048
24	FUJO GEOTECHNICS M. S.N. B.D.	SAINS ALAM SEKTOR GEOLOGI PERANCING	NO.15, JALAN RIS 11/14 BAYAR SUNGAY 46150 PEJALING JAYA, SELANGOR	03-7341802 03-7341876	(Lulus)	F00025

Edi.	Nama	Pidang Pengurusan	Alamat	Telefon / Fax	Status Pendaftaran	Notis Pendaftaran
25	HEAC ENGINEERING Sdn. Bhd.	KEJURUTERAAN MEKANIKA	267C, JALAN BAYU 12 DAMPAN MELAWATI 53100 KUALA LUMPUR	03-4066194 03-4066195	Daftar	FO0030
26	INSTITUT PENGAJIAN TEKNIK, UM	SAINS ALAM SEKTOR	INSTITUT PENGAJIAN TEKNIK UNIVERSITI MALAYA 59100 KUALA LUMPUR	03-7670000 03-7669940	Daftar	FO0015
27	JURUTERA FORMING HOCA ORDER Sdn. Bhd.		57-2 JALAN BAYU 12 BUKIT BAYU 55100 KUALA LUMPUR	03-2537252 03-2537252	Daftar	FO0049
28	KONSULTAN JURUTERA MELONG YEN	KEJURUTERAAN TEKNOLOGI	NO. 1, 4TH FLOOR JUN 2/101A, BATU 6, JALAN MELANG LAMA, 58000 KUALA LUMPUR	03-7914894 03-7928267	Daftar	FO0002
29	YEA TENGA Sdn. Bhd.	SAINS ALAM SEKTOR KEJURUTERAAN ELEKTRIK KEJURUTERAAN PETROLIUM	NO. 19 LORONG DUNDA, DAMPAN MELAWATI, 50490 KUALA LUMPUR	03-2556077 03-2556093	Daftar	FO0006
30	LAMERA M Sdn. Bhd.	KESEKUTUAN KESEKUTUAN	64 JALAN SS 21/35 DAMPAN MELAWATI 47800 BENDUNG JAYA	03-7189476 03-7189497	Daftar	FO0023
31	ENVIRONMENTAL SERVICES	SAINS ALAM SEKTOR SIA PROJEK SUSA	NO. 37A JALAN SS 15/4B SILANG JAYA 47500 SELANGOR	03-7245429 03-7351304	Daftar	FO0024
32	LIM LOOY SHEN MING CONSULTANT	MENING	NO. 145-B JALAN MHAHARAJUELA P. O. BOX 10081, 50708 KUALA LUMPUR	03-2421390 03-2495618	Daftar	FO0045
33	MAB ENVIRONMENTAL CONSULTANTS Sdn. Bhd.	SAINS ALAM SEKTOR	501, 5TH FLOOR LOYE YEN BLDG. JALAN MHAHARAJUELA 50050 KUALA LUMPUR	03-2933652 03-2933033	Daftar	FO0018
34	MUNSIAT ENVIRONMENTAL SERVICES Sdn. Bhd.	SAINS ALAM SEKTOR ALAM SEKTOR MARIN	ROOM 415, MISHA DAMPAI DAMPAN SENTOSA, JOHOR BAHRU 81250 JOHOR.	07-3349057 07-3330512	Daftar	FO0037
35	PROFF MANAGEMENT Sdn. Bhd.	SAINS ALAM SEKTOR	NO. 1, JALAN 39 DAMPAN DESA JAYA, MERDOK 52100 KUALA LUMPUR	03-6333935 03-6333935	Daftar	FO0034
36	MEDCONSULT Sdn. Bhd.	SAINS ALAM SEKTOR	NO. 14, JALAN 20/16A FRAMPOINT GREEN 45300 BENDUNG JAYA	03-7765233 03-7765676	Daftar	FO0026

No.	Nama	Bidang Penyelenggaraan	Alamat	Number	Status	Number
				Tel/Fax	Pendaftaran	Pendaftaran
37	MIRSA HIRSH M. STN. HD.	KEJURUTERAN AWM	SUITE 603, MENARA BUKIT MELURUM	07-2236210	Daftar	F00033
		ALAM SEKTOR EIA	JALAN TENDAK	07-2235901		
			8000 JOHOR BAHU.			
38	INER CONSULTANTS	KEJURUTERAN ALAM SEKTOR	LOT 210-D, TD. 2, BUKITPARI SERI KINJA	05-531127	Daftar	F00020
			JALAN SILEM IPD15 SHAH	05-531127		
			3000 IPOH, PERAK.			
39	O & L JURUTERA PERUNDING	KEJURUTERAN AWM	NO. 4410-C, JALAN MELOR	06-2820380	Daftar	F00057
			BUKIT BARU	06-2822615		
			75150 MELAKA			
40	EPAE MANAGEMENT TECHNOLOGY M. STN. HD.	ALAM SEKTOR EIA	3046A, JALAN 18/37	03-9487661	Daftar	F00041
		KEJURUTERAN AWM	DMR1 SERI SERANG	03-9481593		
			43300 SERI KEMBANGAN			
41	FUNDQ SEN. HD.	PERUNDING ALAM SEKTOR	58, JALAN MAROF	03-2820188	Daftar	F00051
			BANGAR BARU	03-2820016		
			55000 MELAKA LUMPUR			
42	PERUNDING GEA M. STN. HD.	KEJURUTERAN ALAM SEKTOR	56A & B, JALAN SS 15/4	03-7352882	Daftar	F00022
		KEJURUTERAN AWM	SERANG JAYA	03-7332277		
			47500 PEJALING JAYA			
43	PERUNDING KCI SEN. HD.	PERUNDING BANDAR & DESA	NO. 1-4, JALAN 3/82B	03-2824791	Daftar	F00050
		PERUNDING ALAM SEKTOR	BANGAR UDUK	03-2823179		
			55000 MELAKA LUMPUR			
44	PERUNDING JURANG	PERUNDING BANDAR & DESA	NO. 4, PUSKAPATI NAWADA	04-3511425	Daftar	F00054
			DMR1 TELUK AIR TAWAR	04-3511422		
			13050 BUTEBANDAH			
45	PERUNDING URAA SEN. HD.	SKINS ALAM SEKTOR	67, 2ND FLOOR, JALAN SS15/5A	03-7317158	Daftar	F00029
			SERANG JAYA	03-7311343		
			47500 PEJALING JAYA			
46	RUSTI PERAWATAN PERSEKUTUAN, UPM	KEJURUTERAN ALAM SEKTOR	REKAT PEMBANGUNAN PERSEKUTUAN	03-9488014	Daftar	F00062
		ALAM SEKTOR EIA	UNIVERSITI RUPA MALAYSIA	03-9432513		
		PERUNDING ALAM SEKTOR	43400 SERANG, SELANGOR			
47	PRATIKA BERKUALITI SEN. HD.	KEJURUTERAN ALAM SEKTOR	NO. 2-12, WISMA PRATIKA	03-4522020	Daftar	F00021
		KEJURUTERAN AWM	JALAN SETIAWAN 10, TAMAN SETIAWAN	03-4566990		
		KEJURUTERAN JETIAPA	54300 KUALA LUMPUR			
48	SBA CONSULTANTS SEN. HD.	KEJURUTERAN PERLOMONGAN	5A, MEDINI OFFICE 3	05-3136035	Daftar	F00058
		ALAM SEKTOR EIA	MEDINI OFFICE, OFF JALAN IPOH	05-3136037		
			31350 IPOH, PERAK.			

Bil.	Nama	Alamat	Alamat	Telefon	Stadium	Number
				Tel/Fax	Perkhidmatan	Perkhidmatan
49	SO MARCHMENT CONSULTANTS Sdn. Bhd.	PERAKONG ALAM SEKTOR PERDARAN	NO. 26A, JALAN SS 15/48, SUNGAI JAYA 47500 PEJALING JAYA	[03-7345361] [03-7347782]	(Tulis)	FO0012
50	SEVENET SETIA PERKONG Sdn. Bhd.	KEJURUTERAAN ALAM SEKTOR	202H FLOOR, IEB PLAZA NO. 6, JALAN KEMPA (OFF JLN TUN RAZAK) 50400 KUALA LUMPUR	[03-4417066] [03-4418267]	(Tulis)	FO0032
51	SINH CONSULTANCY	PERKONG	6A, LORONG DATUK SULAIMAN STUJ DEMAN TUN DR. ISMAIL 60000 KUALA LUMPUR	[03-7372727] [03-7321100]	(Tulis)	FO0004
52	SINOH ENVIRONMENTAL Sdn. Bhd.	SAINS ALAM SEKTOR	LOT 18, 2/D. FLOOR, BLOCK B KEMSA KOTA, LIPAS 38998 KOTA KINABALU	[088-438064] [088-437064]	(Tulis)	FO0056
53	SMB - ENVIRONMENTAL SERVICE Sdn. Bhd.	PERKONG KEJURUTERAAN ALAM SEKTOR	23, JALAN 1/76 DESA PONDOK 55100 KUALA LUMPUR	[03-9639766] [03-9639648]	(Tulis)	FO0015
54	STENTRUM SUDINA M Sdn. Bhd.	SAINS ALAM SEKTOR EIA	357C, TINGKAT 1, JALAN 5/57 DEMAN PERLING 46000 PERLING JAYA	[03-7911513] [03-793527]	(Tulis)	FO0013
55	SORDAT SAILOS Sdn. Bhd.	SAINS ALAM SEKTOR	14A, JALAN SS 25/22 DEMAN MELANG 47301 PEJALING JAYA	[03-7038511] [03-7033251]	(Tulis)	FO0001
56	T & T CONSULT Sdn. Bhd.	SAINS ALAM SEKTOR RISENO	21A, JALAN SS 22/23 DEMAN PERANGA JAYA 47400 PEJALING JAYA	[03-7196034] [03-7190771]	(Tulis)	FO0007
57	TEKNO NISIONAL RESEARCH & DEV. Sdn. Bhd.	ALAM SEKTOR EIA	LOT 3, BAHAGIAN PENGUJIAN KEJURUTERAAN INST. KEJ. TEK. TEKNO NISIONAL (INDRINO) 43009 JLN. SERONG, MANDALING	[03-8263661] [03-8263561]	(Tulis)	FO0059
58	TIL PERKONG Sdn. Bhd.	KEJURUTERAAN AWM KEJURUTERAAN ALAM SEKTOR	3C, JALAN SS 25/12, DEMAN DESA SURIA 47301 PEJALING JAYA	[03-7036335] [03-7034299]	(Tulis)	FO0040
59	UNIVERSITI TEKNOLOGI MALAYSIA	KEJURUTERAAN AWM LANSKAP PERKONG BUKIT & DESA	DEMAN BERSUDUT NO. 791 JOHOR BAHRU 80990 JOHOR	[07-5505553] [07-576904]	(Tulis)	FO0010
60	UP ENVIRONMENTAL SERVICES Sdn. Bhd.	ALAM SEKTOR EIA SAINS & SAINS CUKUPAN BIOLOGI	1ST FLOOR, LOT 8663 SEKSI 64, JALAN SENG TIGA 93300 KUCHING, SARAWAK	[082-411251] [082-248449]	(Tulis)	FO0046

Id.	Nama	Bidang Pengkhususan	Alamat	Nomor Tel./Fak	Status Perkembangan	Nomor Pendaftaran
01	UPATH RESEARCH ASSOCIATES S.N. B.D.	PERKUNG BAYAR & DESA PERKUNG LINDAP	NO. 7A, JALAN MUA (11/A) SRIH ALAM 40000 SELANCOR	[03-5509648] [03-5509461]	(ulus)	F00044
02	WIN MERRIED & HOOD S.N. B.D.	KEJURUTERAN MAM KEJURUTERAN MEKRONAL KEJURUTERAN ELEKTRIK	2B (2ND FLOOR), JALAN MESRA 1 TAMAN MESRA, BATU TERA 40000 SRIH ALAM	[03-5591855] [03-5592666]	(ulus)	F00028
03	YONGEE ENVIRONMENTAL SYSTEMS 00 S.N. B.D.	SAINS ALAM OKUTAR	4936, JALAN SIRAM DESA SIRAM 12100 BUKITBEMOH	[04-3312965] [04-3319678]	(ulus)	F00014

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