

5. SCOPE OF WORK

SCOPE OF WORK
FOR
THE STUDY
ON
ROAD DISASTER PREVENTION PLAN
IN
THE KINGDOM OF THAILAND
AGREED UPON BETWEEN
MINISTRY OF TRANSPORT AND COMMUNICATIONS
DEPARTMENT OF HIGHWAYS
AND
JAPAN INTERNATIONAL COOPERATION AGENCY

BANGKOK, AUGUST 5th, 1993



Mr. Sanan Srirungrojana
Director General
Department of Highways
Ministry of Transport
and Communications



Mr. Koichi Matsumoto
Leader
Preparatory Study Team
JAPAN INTERNATIONAL
COOPERATION AGENCY

I. INTRODUCTION

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan has decided to conduct the Road Disaster Prevention Plan in the Kingdom of Thailand (hereinafter referred to as "the Study"), in accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand signed on November 5, 1981.

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

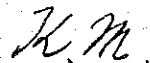
Department of Highways (hereinafter referred to as "DOH") shall act as a counterpart agency to the Japanese study team and also act as a coordinating body with other relevant organizations for smooth implementation of the Study, on behalf of the Government of the Kingdom of Thailand.

The present document sets forth the Scope of Work for the Study.

II. OBJECTIVES OF THE STUDY

1. Objectives of the Study are:

- (1) to conduct a feasibility study for the road disaster prevention plan on the selected project roads;
- (2) To recommend management and operation systems against road disasters; and



(3) to prepare a road disasters prevention manual.

Objective disasters in the Study shall be those related to roads such as slope failures, rock falls, land slides, debris flow and washing outs. And, as for countermeasures the Study shall include those which can be undertaken by DOH and shall exclude large scale Sabo works or river control works.

III. SCOPE OF THE STUDY

In order to achieve the objectives mentioned above, the Study shall cover the following items;

1. Selection of Project Roads

Based on following studies, roads with high potential in road disasters shall be selected as Project Roads.

- (1) Collection and analysis of past disaster records
- (2) Review and analysis of the existing data and information
- (3) Classification of road disasters
- (4) Assessment of road disaster potential
- (5) Selection of Project Roads for the Study

2. Feasibility Study on the Project Roads

- (1) Traffic and Socio-economic Study
 - a. Traffic survey
 - b. Socio-economic survey
 - c. Traffic demand forecast
- (2) Identification of Spots with Road Disaster Potential
 - a. Field inspection
 - b. Development of rating criteria to assess disaster potential spots
 - c. Selection of typical spots with high disaster potential for the Study



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- (3) Field survey of the selected typical spots
 - a. Topographical survey
 - b. Geological survey
 - c. Soil investigation

 - (4) Determination of Countermeasures and Preliminary Design
 - a. Study of various types of countermeasures for each type of disaster in due consideration of natural conditions
 - b. Determination of countermeasures for each identified spot
 - c. Preliminary design of countermeasures selected for each spot
 - d. Cost estimate

 - (5) Implementation program

 - (6) Evaluation
 - a. Technical feasibility
 - b. Benefit estimate and economic feasibility
 - c. Social impacts
3. Recommendation of management and operation systems against road disasters
- (1) Survey of present management and operation systems against road disasters in Thailand
 - a. Organization for disaster management
 - b. Standard operation procedure
 - c. Size and arrangement of road maintenance materials and machineries for road disasters

 - (2) Recommendation of management and operation systems against road disasters.

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4. Preparation of Road Disaster Prevention Manual

A road disaster prevention manual shall contain followings.

- Classification of road disasters
- Assessment of road disaster potential
- Field survey for design
- Prevention and restoration measures
(urgent measures, permanent measures)
- Selection of prevention and restoration measures
- Design of selected measures
- Monitoring, inspection and communication system
- Materials and equipment required for restoration

IV. STUDY SCHEDULE

The study will be carried out in accordance with the attached tentative schedule.

V. REPORTS

JICA shall prepare and submit the following reports in English to DOH.

1. Inception Report

Thirty (30) copies will be submitted at the commencement of the Study.

2. Interim Report (1)

Thirty (30) copies will be submitted within five (5) months after the commencement of the study.

3. Progress Report

Thirty (30) copies will be submitted within eight (8) months after the commencement of the study.



4. Interim Report (2)

Thirty (30) copies will be submitted within eleven (11) months after the commencement of the study.

5. Draft Final Report

Thirty (30) copies will be submitted within fourteen (14) months after the commencement of the study.

DOH shall provide JICA with its comments within one (1) month after the submission of Draft Final Report.

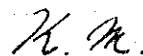
6. Final Report

Sixty (60) copies will be submitted within two (2) months after receipt of the comments.

VI. UNDERTAKING OF THE GOVERNMENT OF THAILAND

1. In accordance with the Agreement on Technical Cooperation between the Government of Japan and the Government of Thailand dated November 5, 1981, the Government of Thailand shall accord benefits to the Team as follows:

- (1) to permit the members of the Team to enter, leave and sojourn in Thailand for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees;
- (2) to exempt the members of the Team from taxes, duties and any other charge on equipment, machinery and other materials brought into Thailand for the conduct of the Study;



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

(4) to 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 members of the Team;

2. To facilitate smooth conduct of the Study, DOH shall take necessary measures in cooperation with other relevant organizations:

(1) to secure permission for entry into private properties or restricted areas for the conduct of the Study;

(2) to secure permission for the Team to take all necessary data and document related to the Study out of Thailand to Japan;

(3) to provide the medical services as needed (Its expenses will be chargeable on members of the Team);


(4) to ensure the safety of the members of the Team when and as it is required in the course of the Study.

3. DOH shall, at its own expenses, provide the Team with the followings:

(1) Available data and information related to the Study;

(2) Counterpart personnel;

(3) Credentials or identification cards;



- (4) To secure permission for aerial photograph surveying, if necessary.

VII. UNDERTAKING OF JICA

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

1. To dispatch, at its own expense, the Study Team to Thailand;
2. To pursue technology transfer to Thai counterpart personnel in the course of the Study.

VIII. CONSULTATION

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



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TENTATIVE SCHEDULE
for
The Study
on
Road Disaster Prevention Plan in Thailand

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Work in Thailand	=====															
Work in Japan	==															==
Report	△				△			△			△			△		△
	IC/R				IT/R(1)			P/R			IT/R(2)			DF/R		F/R

IC/R : Inception Report
 IT/R(1&2) : Interim Report
 P/R : Progress Report
 DF/R : Draft Final Report
 F/R : Final Report

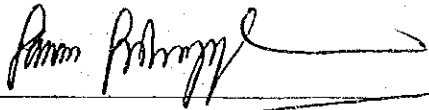
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6. MINUTES OF MEETING

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ON
THE SCOPE OF WORK
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The Japanese Preparatory Study Team (hereinafter referred to as "the Team"), organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Koichi Matsumoto visited Thailand from July 25 to August 6, 1993, in connection with the Study on Road Disaster Prevention Plan (hereinafter referred to as "the Study").

The Team had a series of discussion with the Department of Highways (hereinafter referred to as "DOH") which is a counterpart agency of the Government of Thailand and carried out field surveys along the roads in the disaster prone areas.

The final meeting was held on August 5th, 1993, with attendants attached in Annex.

Main items discussed are as follows:

1. DOH had requested that the study should include countermeasures for the road damage by flood. Then, the Team proposed that the countermeasures of the Study should be limited to those undertaken by DOH.
2. Both sides agreed that the amendments of Scope of Works (draft) related mentioned above was acceptable.
3. Both sides agreed that the areas of the feasibility study shall be selected within the southern and northern regions of Thailand.
4. Project Roads shall be basically selected among existing roads. Roads under construction, however, could be included in the Study, if damages to the roads are expected to occur in near future.

5. The Team requested DOH to facilitate to issue entry visas for members of the full-scale study team. DOH accepted the request mentioned above.
6. DOH agreed to try to make their best efforts to provide the full-scale study team with all existing data including the most recent traffic and socio-economic data.
7. DOH earnestly requested to the Team the followings:
 - (1) To accept at least three (3) Thai counterparts to Japan for facilitating technical transfer in the course of the Study.
 - (2) To let at least four (4) DOH personnels participate in on-the-job training in Thailand in the course of the full-scale Study.
 - (3) To take consideration to transfer of technology by providing necessary equipments, such as a few personal computers for conducting the Study.

The Team promised to convey the above requests to the Japanese authorities concerned.

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Annex

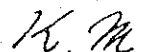
Attendants List

Thai Side

Mr. Sanan Srirungrojana : Director General of DOH
Mr. Songsawasdi Duangratana : Deputy Director General for
Engineering of DOH
Mr. Likhit Khaodhiar : Director, 4th Construction
Division
Mr. Chinchai Mahasaen : Director, Maintenance
Division
Dr. Teeracharti Ruenkrairergsa : Director, Road Research and
Development Center, DOH
Mr. Vichai Ruangsawasdi : Chief, Evaluation Section
Planning division
Mr. Solos Temiyabutra : Expert Engineer
Maintenance Division
Mr. Suwate Chalanunt : Senior Engineer,
4th Construction Division
Mr. Isamu Bito : JICA Expert to DOH

Japanese Side

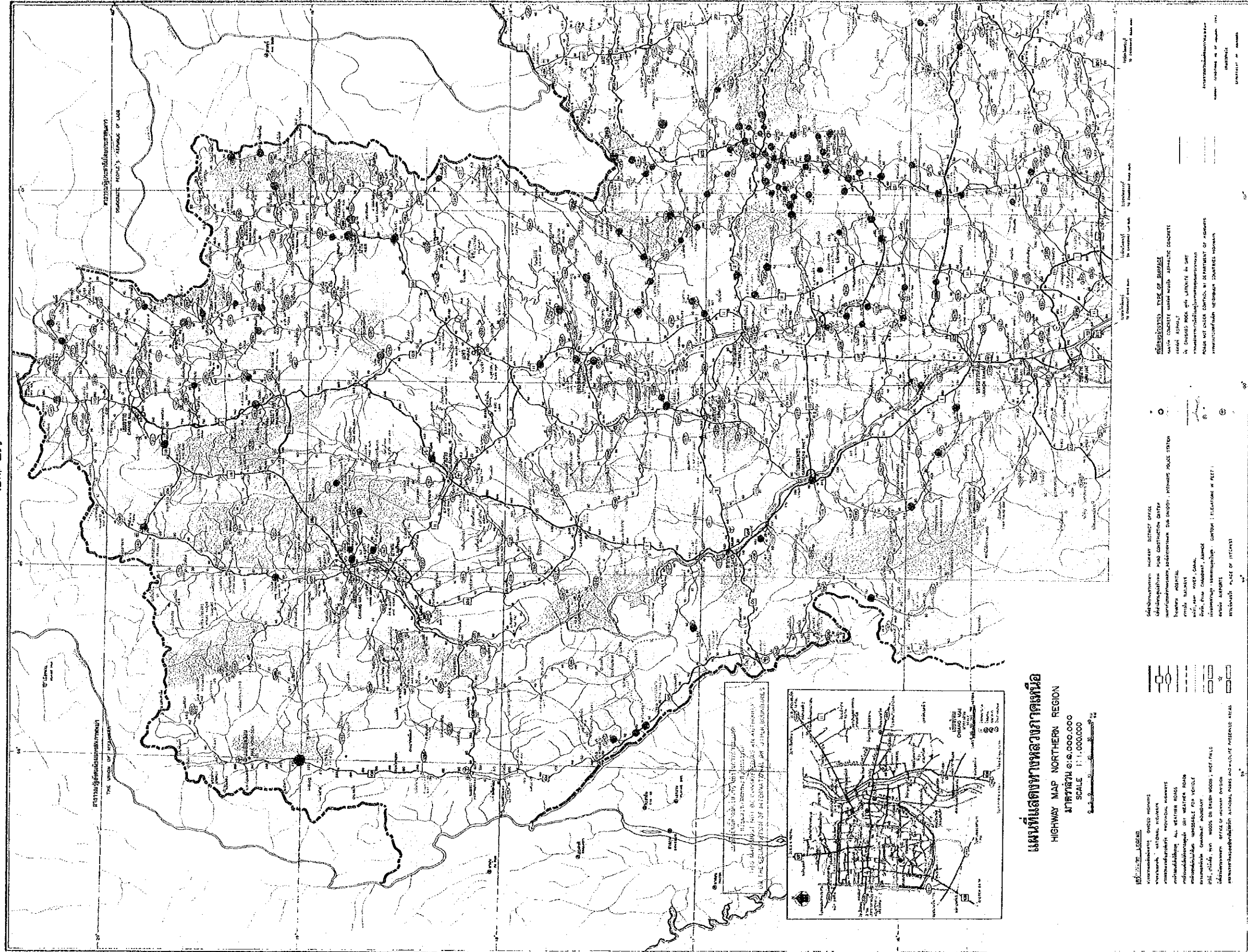
Mr. Koichi Matsumoto : Leader of Preparatory Study Team
Mr. Hidetoshi Kohashi : Member of Preparatory Study Team
Mr. Hironobu Ito : Member of Preparatory Study Team
Mr. Hiroo Takeda : Member of Preparatory Study Team
Mr. Kazumasa Suzuki : Member of Preparatory Study Team
Mr. Yoshiharu Yoneyama : Staff of JICA Thailand Office



7. 1990年～1992年の3ヶ年の災害発生地点図

(DOH作成)

1990年~1992年の災害発生地点図 (DOH作成)
 <北部地方>



8. 収集資料リスト

資料リスト (収集資料)

平成 年 月 日作成

主管部長	課長	主任	課長	技術情報

地域	東南アジア	調査団員名又は 専門家氏名	タイ国道路防災対策調査	調査の種類又は 指導科目	事前調査S/W協議	作成部課	社会開発第1課
国名	タイ	配属機関名		現地調査期間 又は派遣期間	1993年7月26日 ~ 同年8月11日	担当者氏名	伊藤 博彦

番号	資料の名称	形態	版型	ページ数	オリジナル コピーの別	部数	収買先名称又は 発行機関	寄附・購入 (価格)の別	取扱区分	利川表示	利川者所属氏名	納入 予定日	納入 確認欄
①	Highways in Thailand 1992	書物	A4	76	オリジナル	1	道路局	寄贈					
②	REPORT OF THE HIGHWAY DISASTER CAUSED BY THE FLOOD DURING 21-23 NOVEMBER 1988. (注) JICA THAIにて邦文に翻訳	報告書	変形A4	18	コピー	1	道路局	寄贈					
③	THE CONSTRUCTION OF HIGHWAY 4233, HAT RAWAI-HAT SURIN (surrounded Phuket Island). (注) JICA THAIにて邦文に翻訳	報告書	A4	15	コピー	1	道路局	寄贈					
④	THE CONSTRUCTION PROJECT, KUAY KAI-PHATAT DOITUNG (注) JICAにて邦文に翻訳	パンフ	折り込み	7	オリジナル	1	道路局	寄贈					
⑤	THE CONSTRUCTION PROJECT, BAAH HUAI KAAI-DOITUNG PACOTA (注) JICA THAIにて邦文に翻訳	パンフ	折り込み	9	オリジナル	1	道路局	寄贈					
⑥	ESCAP TECHNICAL ASSISTANCE TO THE FLOOD AFFECTED AREAS IN SOUTHERN THAILAND	報告書	A4	55	コピー	1	ESCAP	道路局専門家 経田で寄贈					
⑦	EFFECTS OF FLOODS OF NOVEMBER 18-23, 1988 IN SOUTHERN THAILAND ON HIGHWAY BRIDGES AND LARGE DAMS REPORT OF TWO MISSIONS OF DECEMBER 11-14, 1988 AND OF FEBRUARY 15-21, 1989 FOR SWISS DISASTER RELIEF UNIT	報告書	A4	55	コピー	1	AIT	道路局専門家 経田で寄贈					
⑧	STANDARD DRAWINGS FOR HIGHWAY CONSTRUCTION, April 1991	図版	A3	161	オリジナル	1	道路局	寄贈					

国際協力事業団

9. ローカルコンサルタントリスト

タイローカロンコンサルタンツ

会社名	項目	創立年	資本金 1,000BATH	売上高 1990 1,000BATH	職員数	土質/地質						測量			水質	気象	海象		交通	環境調査
						ボーリング	室内試験	液状試験	凍結試験	海上ボーリング	音波探査	系	地形	路線			深	橋		
ACT CONSULTANTS CO., LTD		1980	3,860	111,400	289	○	○					○							○	
ASIAN ENGINEERING CONSULTANTS		1977	3,000	132,700	332	○	○					○							○	
A & R CONSULTANTS CO., LTD		1982	1,000	9,897	30															
CONSULTANTS OF TECHNOLOGY CO., LTD		1983	4,400	60,000	196	○	○					○							○	
EXPIRE CONSULTING ENGINEERS CO., LTD		1973	1,000	—	7															
ENVIRONMENTAL ENGINEERING CONSULTANTS CO., LTD		1976	1,000	75,000	138															○
ENVIRTECH CONSULTANTS COMPANY, LTD		1987	5,000	90,000	68	○						○							○	○
K. ENGINEERING CONSULTANTS CO., LTD		1985	—	35,400	207	○	○					○							○	○
KETRIC CO., LTD		1972	1,000	68,650	67															○
NATIONAL ENGINEERING CONSULTANTS CO., LTD		1978	1,000	22,200	102	○						○							○	○
PARYA CONSULTANTS CO., LTD		1990	5,000	25,000	53	○						○							○	○
PLANTING & RESEARCH CONSULTANTS CO., LTD		1986	4,000	20,000	87							○								○
PRO-EX CONSULTANT & MANAGEMENT CO., LTD		1989	5,000	20,000	55	○														○
SINOHU PULSITWONG CONSULTANTS		1966	1,000	117,000	165															○
SINOHU PINE KAUSSELL LTD		1991	3,000	0	6															○
SOUTHEAST ASIA TECHNOLOGY CO., LTD		1989	10,000	114,600	390							○							○	○
TEAY CONSULTING ENGINEERS CO., LTD		1978	12,000	(US)3,940,000	291	○	○					○							○	○
TESCO LTD		1977	(US) 200,000	(US)2,150,000	138							○							○	○
THAI DCI COMPANY LIMITED		1974	1,000	72,000	119	○						○							○	○
THAI ENGINEERING CONSULTANTS CO., LTD		1961	4,000	87,800	235	○	○					○							○	○
THAI PROFESSIONAL ENGINEERING CONSULTANTS CO., LTD		1976	2,000	—	81	○	○					○								○
UNIVERSAL ENGINEERING CONSULTANTS CO., LTD		1982	(US) 40,000	2,541	88	○	○					○							○	○
WATER & ENVIRONMENT CONSULTANT CORP., LTD		1987	1,000	2,500	22															○

タイコンサルタント事務所

会社名	住所	TEL	FAX
ACT CONSULTANTS CO., LTD	10 Floor, Kanonon Building, 3354 Rama 4 Road, (Banglong, Phrakrong, Bangkok 10110, Thailand	(66-2) 249-8584	(66-2) 249-8610
ASIAN ENGINEERING CONSULTANTS	9th Floor Sathorn Thani Building, 90 North Sathorn Road Bangkok 10500, Thailand	236-6090-7	662-2366086
A & F CONSULTANTS CO., LTD	71/5 Satsiri 2 Rd. Saeconmi, Phayathai Bangkok 10400	2797576/2798164/2798610	2719367
CONSULTANTS OF TECHNOLOGY CO., LTD	33-40 Ladprao Rd. Soi 130 Bangkok Bangkok 10240	378-2380-1/377-4638/377-4504	375-1132
EMPIRE CONSULTING ENGINEERS CO., LTD	24-30 Asoke-Dinadong Rd. Huey Krang District, Bangkok 10310, Thailand	(02)246-2086-7/(02)246-2007	(662)246-2008
ENVIRONMENTAL ENGINEERING CONSULTANTS CO., LTD	12 Floor, Sintorn Building 132 Fireless Road, Bangkok 10330, Thailand	250-0340-3/250-0870-3	66 2 254 7417 / 66 2 255 7259
ENVIRTECH CONSULTANTS COMPANY LTD	288/10 Surinrongse Road, Bangkok 10500 Thailand P. O. Box 696	2346798-9/2373010-1	66-2-237-3008
K. ENGINEERING CONSULTANTS CO., LTD	136 Intamara 18, Yibhavadi Bangsit Road, Bangkok 10400	277-0149/277-9634/277-4528	662-275-7030
XETRIC CO., LTD	132 Fireless Road, 10th Floor Sintorn Bldg., Lumpini, Patuwran, Bangkok 10330, Thailand	662-250-0804 to 250-0584	662-254-4038
NATIONAL ENGINEERING CONSULTANTS CO., LTD	55/160-161 Suthisan Road, Huaei Khwang, Bangkok 10400 Thailand	275-5798/275-1795-6-277-6624	276-2654
PANYA CONSULTANTS CO., LTD	60 Intamara 40, Suthisan Road Huaei Khwang, Bangkok 10400 Thailand	277-1545/2752840	662-277-3985
PLANNING & RESEARCH CONSULTANTS CO., LTD	5th Floor Jaka Building 58 Rajararop Road, Bangkok 10400	2466464, 2471285, 2471297	2462273
PRO-EN CONSULTANT & MANAGEMENT CO., LTD	Rama Road Building #24/04, 566 Ploenchit Road, Patuwran, Bangkok 10330	291-0152, 251-7711, 252-4116	253-1386
SINBU PULSIRONG CONSULTANTS	SPC Building 1 Soi Chaeachan Sukhuvit 55, Bangkok 10110	332-8717, 332-8707	381-0857, 381-0977
SINBUH PINE VAUNSELL LTD	SPC Building 1 Soi Chaeachan Sukhuvit 55, Bangkok 10110	332-8707, 332-8717	381-0857, 381-0977
SOUTHEAST ASIA TECHNOLOGY CO., LTD	123 Sukhuvit 57, Bangkok 10110, Thailand	392-2711	(662)-3811142
TEAF CONSULTING ENGINEERS CO., LTD	31/301-5 Drive-in Center, Jod Prao Soi 130, Bangkapi, Bangkok 10240, Thailand	377-1770-1, 3773480	375-1070
TESCO LTD	217/1-14 Soi Sukhuvit 18, Bangkok 10110	2581320, 2595462-3, 2596573-7	2581313
THAI DCI COMPANY LIMITED	198/5 Rama 6 Rd., Phayathai, BKK 10400 Thailand	271-3461, 271-3403, 271-3465	66-2-271-3485
THAI ENGINEERING CONSULTANTS CO., LTD	37/1 Petchburi 15 Road Bangkok 10400, Thailand	2534573, 2534840	662-253-4283
THAI PROFESSIONAL ENGINEERING CONSULTANTS CO., LTD	2nd Floor Navcity Building, 111/253-75 Sukhuvit Road Prakanong Bangkok 10110	381-5114, 381-5870	(66-2) 381-1496
UNIVERSAL ENGINEERING CONSULTANTS CO., LTD	Ploy Xitr Building 81 Sukhuvit Soi 2 Road, Bangkok 10110, Thailand	(66-2) 252-8372, 251-0940	(66-2)255-4130
WATER & ENVIRONMENT CONSULTANT CORP., LTD	321/27 Nang Linchi Road, T. Chong Nonsi, A. Yannara, Bangkok 10120, Thailand	286-8010, 286-0112	(662)286-0114

JICA