

第9章 技術協力

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タイにおいては保健医療、公衆衛生に対する援助は特に重要な役割をになうものである。日本、アメリカをはじめとする多くの先進諸国及びWHO等の国際機関がこの分野に対して多大な援助を行ってきている。日本政府は国際協力事業団を通して技術協力による援助を行いタイのこの分野に対し、多大な貢献をしてきた。今まで、ウイルス研究所（S 36～S 41；各種ウイルス性疾病の解明のための研究）、薬品研究所（S 42～S 48；生薬の研究開発）、がんセンター（S 42～S 51；がんの早期発見のための診断及び治療技術のレベルアップ）、タイ家族計画（S 49～S 54；家族計画の啓蒙・啓発・普及）等の技術協力が実施された。特に1976年より実施されている「地域保健向上計画」プロジェクトは、保健衛生にかかわる広い分野における技術協力であり、地方における公衆衛生活動推進の効果的方法の確立、疾病対策、衛生研究活動、監視機構の強化において多くの成果をあげた。このプロジェクトを通して、チョンブリ、チャントブリのモデル地域においてタイ政府は、疾病の予防・治療の為に組織的研究を促進させる計画を立案するに至った。その結果高度な研究を行いその結果を地方に広めていくためには、中央における衛生研究機関の設立が必要不可欠で、かつ効果的であることが強く認識され、本計画の要請となったのである。

タイの研究者の中には欧米、日本等で教育研修を受け高度な専門的知識を身につけている人達もあるが、一般的には衛生研究者のレベルはまだ高いとは言えない。従って本計画を突り多しものにするためには基礎的技術の指導と高度な技術の導入により、全体の研究水準のレベルアップを図り、専門知識と技術の蓄積及びその普及を図るための技術協力の意義は大きいと言える。

本計画は、タイの保健医療の上で重要かつ緊急を要する疾病対策にかかわる基礎的研究に重点を置いているので、これと整合する感染症を中心とする分野に技術協力が行われるなら、著しい効果が期待できると思われる。

第10章 結論と提言

第10章 結論と提言

WHO憲章(1948年)の前文には「健康とは、身体的・精神的そして社会的に完全に良好な状態にあることであって、単に病気がなく虚弱でないということではない」という健康の定義がある。しかしタイ国の現状では「単に病気がなく虚弱でない」という状況をつくりだすにはまだまだ多大な努力が払われなければならない、タイ国政府は国家保健計画を策定し、国の重要課題として疾病予防、保健の向上に真剣に取り組んでいる。

国立衛生研究所設立計画は、基礎的衛生研究に重点を置き、特に感染症及びその他重要な疾病治療に貢献することを目的としたプロジェクトであり、長年にわたりタイ政府が日本の援助を大いに期待していたものである。

基本設計調査を通じて、本計画の背景、計画の目的及び活動をすすめる上での研究体制、運営・維持管理体制及びタイ側のプロジェクト実施準備、努力等を検討した結果、本計画は日本政府が無償資金協力として実施するに十分な妥当性をそなえており、その援助効果が広くタイ国民の保健向上に貢献し、日・タイ両国の友効親善に大きく寄与すると考えられる。日本政府が本件協力を強力に推進する措置を講ぜられることを強く希望する次第である。

最後に本計画が実施された場合、施設及び機材が本計画通り機能し、研究の成果が充分発揮出来るようタイ国側に次のことを提言する。

国立衛生研究所を設立するに当たっては、既存医科学局の機構の改革、組織の改編等がタイ側により進められると思われるが、本研究所が当初の計画通り効率的に運営されるよう、医科学局内の部門間との業務の連携、分担を明確にし組織を整備する必要がある。また、施設及び機材を維持管理し、研究活動を促進していく上で、タイ国政府は予算の確保について十分な配慮を行うことが不可欠であり、同時に、研究の本質は人であるとの基本的認識に立って研究者の増強、質的レベルの向上を常に心掛け、研究体制をより充実させていく必要がある。

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(1) 基本設計現地調査

1) 調査団の編成

団 長	村 田 良 介	国立予防衛生研究所名誉所員
公衆衛生	深 井 孝之助	大阪大学微生物病研究所名誉教授
業務調整	小野田 勝 次	国際協力事業団 無償資金協力部基本設計課
建築計画	田 中 正 美	(株)日建設計
建築設計	久 野 秀 晴	(株)日建設計
設備（電気）設計	吉 宮 弘 志	(株)日建設計
設備（機械）設計	増 田 弘 一	(株)日建設計
機材計画	伊 沢 恭 一	(株)日建設計

2) 調査日程

1983年

- 11月15日(木) ・バンコック着
・スケジュール打合
- 11月16日(水) ・大使館・JICA打合せ
・DTEC表敬
・ナデイラ医科学局長と面談、インセプションレポートを提示し、調査の内容・スケジュールを説明
- 11月17日(木) ・医科学局と第1回打合
インセプションレポートをもとに、調査の目的・手法を説明、無償資金協力のシステムの説明、インセプションレポート質問事項により資料の準備を要請
・敷地調査(第1回)
- 11月18日(金) ・保健省アモーン次官を表敬
・医科学局と第2回打合
プロジェクトの背景、新NIHの活動計画と医科学局との関係、プライマリ・ヘルスケア、地域保健活動向上計画などとの関係などを聴取
- 11月19日(土) ・団内会議
聴取事項の検討
- 11月20日(日) ・団内会議
受領資料の整理、次回以降の打合の内容検討

- 11月21日(月) ・医科学局と第3回打合
N I Hの各研究部門の活動内容を聴取、意見交換
- 11月22日(火) ・医科学局と第4回打合
N I Hの各研究部門の活動内容を聴取、意見交換
施設規模について協議
- ・団内打合
- 11月23日(水) ・医科学局と第5回打合
N I Hの活動の重点目標、技協の必要な分野について協議、施設規模協議
- ・団内作業及打合(研究機材)
- 11月24日(木) ・医科学局と第6回打合
ミニッツ協議、施設規模と部門別面積配分協議
- 11月25日(金) ・ミニッツ署名交換
- ・既存施設調査
- 11月26日(土) ・チョンブリ地域衛生試験所調査
- 11月27日(日) ・チャンタブリ県衛生試験所調査
- 11月28日(月) ・大使館・J I C A ・D T E Cに報告
- ・マヒドン大学実験動物センター調査
- ・水道局と給水について打合
- 11月29日(火) ・村田団長、深井団員、小野田団員帰国
- ・医科学局と第7回打合
アクセス道路、敷地造成レベル、マスタープラン構想、地盤調査、基準ラボの形と設備、給水、電気、排水などについて協議
- ・環境衛生部と排水規準打合
- ・電力公社と給電打合
- 11月30日(水) ・医科学局と第8回打合
各部門別所要室、設備、機材
- ・既存施設調査
- 12月1日(木) ・医科学局と第9回打合
各部門別所要室、設備、機材

- 12月 2日(金) ・既存生物学的製剤研究部門(GPO内)調査
・医科学局と第10回打合
各部門別所要室、設備、機材
- 12月 3日(土) ・伊沢団員帰国
・敷地及アクセス道路調査(第2回)
- 12月 4日(日) ・団内作業 打合事項まとめ
- 12月 5日(月) ・団内作業 打合事項まとめ
- 12月 6日(火) ・医科学局と第11回打合
協議事項の確認
・大使館、JICA報告
- 12月 7日(水) ・田中団員、久野団員、吉宮団員、増田団員帰国

3) Minutes of Discussion



MINUTES OF DISCUSSION
ON
THE ESTABLISHMENT PROJECT OF THE NATIONAL INSTITUTE OF HEALTH
IN THE KINGDOM OF THAILAND
BETWEEN
THE JAPANESE BASIC DESIGN SURVEY TEAM
AND
THE AUTHORITIES CONCERNED OF THE ROYAL GOVERNMENT OF THAILAND

In response to the request made by the Royal Government of Thailand for a grant aid of the Establishment Project of the National Institute of Health in Thailand (hereinafter referred to as "The Project"), the Government of Japan, through Japan International Cooperation Agency (JICA), has dispatched a survey team headed by Dr. Ryosuke MURATA, Honorary Member of the National Institute of Health in Japan (hereinafter referred to as "The Team") to conduct the basic design study on the Project from November 15 to December 7, 1983.

The Team has carried out a field survey, had a series of discussions and exchanged views with the Thai authorities concerned of the Project.

As a result of the survey and discussions, the Team and the Thai authorities concerned have agreed to recommend to their respective Governments that the results of the discussions attached herewith should be examined toward the realization of the Project.

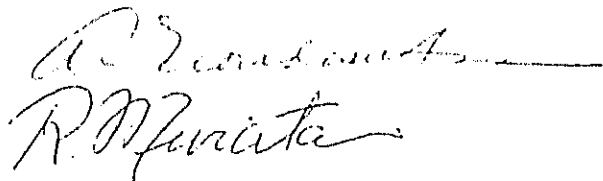
Bangkok, November 25, 1983

Dr. Ryosuke MURATA
Team Leader
Japanese Survey Team

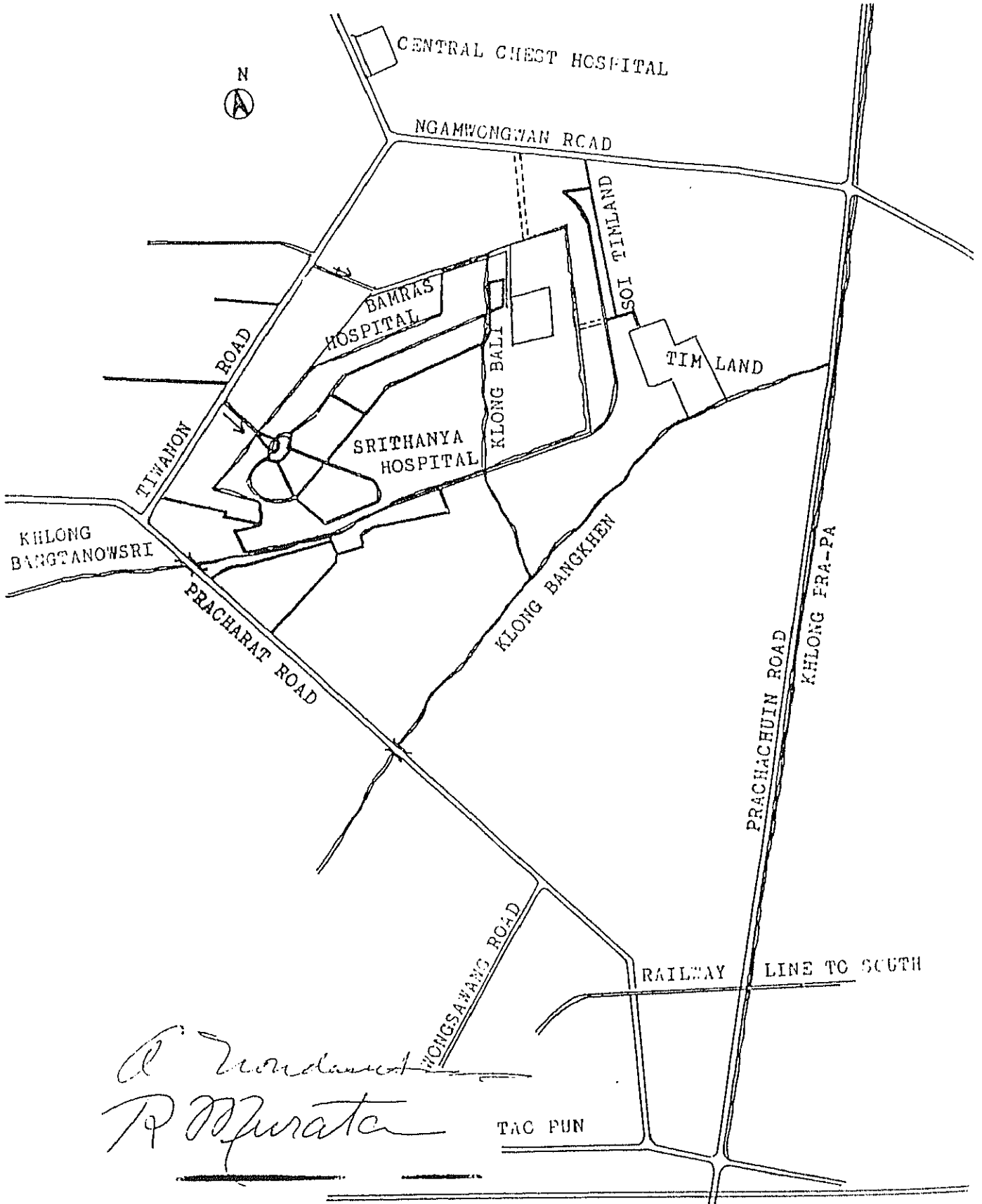
Dr. Amorn NONDASUTA
Permanent Secretary
Ministry of Public Health
The Royal Government of Thailand

ATTACHMENT

1. The objective of the Project is to provide necessary buildings, facilities and equipment for establishment of the National Institute of Health in Thailand (hereinafter referred to as "the NIH").
2. The proposed site of the Project under the authority of the Thai Ministry of Public Health is located at the area of Sri-thanya Mental Hospital, Tiwanon Road, Nonthaburi Province as attached in Annex I, II.
3. NIH is a new research organization in the Department of Medical Sciences, Ministry of Public Health, responsible for research in national important health problems.
4. Activities of NIH are shown in Annex III
5. The implementation body of the Project in Thai side is the Department of Medical Sciences, Ministry of Public Health.
6. The Team will convey the need of the Royal Government of Thailand to the Government of Japan that the technical cooperation programme is needed to be implemented in view of more effective and smooth operation.
7. The Team will convey the desire of the Royal Government of Thailand to the Government of Japan that the Japanese Government will take necessary measures to cooperate in implementing the Project by extending grant aid for construction of buildings and other items as listed in Annex IV, with priority within the scope of Japan's Economic Cooperation Programme in grant form.
8. The Thai authorities concerned have understood and confirmed Japan's Grant Aid system explained by the Team which includes a principle of use of a Japanese consultant firm and a Japanese general contractor for implementation of the Project.
9. The Thai authorities concerned have confirmed the Royal Government of Thailand will take necessary measures as listed in Annex V on condition that grant aid by the Government of Japan is extended to the Project.


R. Narita

SITE FOR NIH, DEPARTMENT OF MEDICAL SCIENCES
MINISTRY OF PUBLIC HEALTH



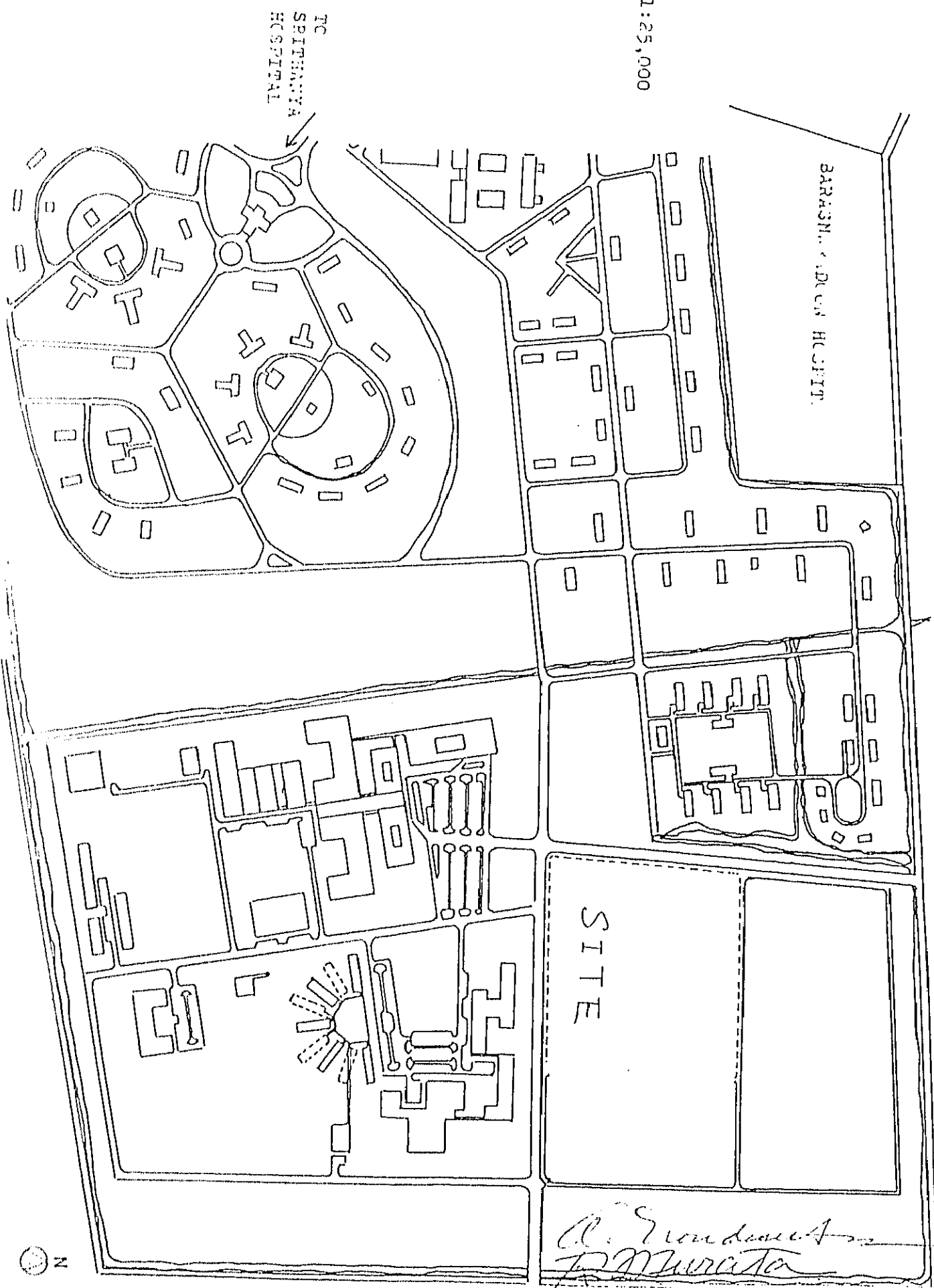
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TC
SPITHAWYA
HOSPITAL

BARASHN. & DEON HOSPITAL

SITE

A. S. ...
P. M. ...



Annex III

The priority of the NIH's activities are as follows :-

Virology

Bacteriology

Mycology

Parasitology

Immunology

Biological Products Control

Medical Entomology

Medicinal Plant Research

Environmental Chemistry

Biomedical Research in Food

Pharmaceutical Science

C. C. Mondal
R. Murata

Annex IV

Items required by the Royal Government of Thailand
whose cost will be borne by the Government of Japan :-

A. Buildings with necessary facilities for

- (1) Research Laboratories
- (2) Scientific Equipment Center
- (3) Experimental Animal Center
- (4) Training and Administration
- (5) Others

B. Equipment for

- (1) Research Laboratories
- (2) Scientific Equipment Center
- (3) Experimental Animal Center
- (4) Training
- (5) Others

A. C. Goussard
P. Murata

Annex V

Following arrangement are to be taken by the Royal Government of Thailand

1. To carry out the Project Site preparation such as clearing, leveling and making access road before commencement of construction works.
2. To undertake incidental civil works such as gates, fencing, guard house, garage, gardening and exterior lighting if needed.
3. To construct the road outside the Project Site.
4. To provide facilities for distribution of electricity, water supply, drainage and telephone system as follows.
 - a. The distributing line of electricity to the Project Site.
 - b. The city water distribution main to the Project Site.
 - c. The drainage city main (for storm, sewer and others) to Project Site.
 - d. The telephone trunk line to the main distribution frame/ panel (MDF) of the building concerning of the Project.
5. To provide general furnitures such as table, chair, curtain and others.
6. To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
 - a. Advising Commission of Authorization to Pay
 - b. Payment Commission
7. To ensure unloading, customs clearance, bounded warehouse charge and tax exemption of the product at the port of disembarkation in Thailand.
8. To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Thailand with respect to the supply of the products and services under the verified contracts.
9. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their into Thailand and stay therein for the performance of their work.
10. To bear all the expense other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and the installation of the equipment.

R. Murata *A. Sordana*

11. To maintain and use properly and effectively that the facilities constructed and equipment purchased under the Grant.
12. To provide counter-parts both technical and administrative, in sufficient numbers and at appropriate levels.

A. R. ...
R. Murata

(2) 基本設計確認調査

1) 調査団の編成

団 長	村 田 良 介	国立予防衛生研究所名誉所員
公衆衛生	深 井 孝之助	大阪大学微生物病研究所名誉教授
業務調整	小野田 勝 次	国際協力事業団 無償資金協力部基本設計課
建築計画	田 中 正 美	㈱日建設計
建築設計	久 野 秀 晴	㈱日建設計
機材計画	伊 沢 恭 一	㈱日建設計

2) 調査日程

1984年

- 2月27日(月) ・田中団員、久野団員、伊沢団員バンコック着
- 2月28日(火) ・医科学局に予備説明(深井団員参加)
- 2月29日(水) ・医科学局及び施設部に予備説明・打合
・村田団長、小野田団員バンコック着
- 3月 1日(木) ・大使館・JICA訪問、報告・打合
・医科学局にドラフトファイナルレポート説明・打合
- 3月 2日(金) ・医科学局にドラフトファイナルレポート説明・打合
- 3月 3日(土) ・団内打合
- 3月 4日(日) ・団内作業
- 3月 6日(月) ・医科学と打合
・午後ミニッツ署名交換
- 3月 6日(火) ・DTECに報告
・施設部と技術打合
- 3月 7日(水) 帰 国

3) Minutes of Discussions

MINUTES OF DISCUSSIONS

The Draft Report of the Basic Design Study on the Establishment Project of the National Institute of Health in the Kingdom of Thailand

At the request of the Government of the Kingdom of Thailand for grant aid for the Establishment Project of the National Institute of Health, the Government of Japan dispatched a Mission to carry out the Basic Design Study (hereinafter referred to as "the Study") on the Establishment Project of the National Institute of Health (hereinafter referred to as "the Project") through Japan International Cooperation Agency (JICA) from November 15th to December 7th, 1983.

The Mission carried out a field survey and had a series of discussions with the authorities concerned of the Government of the Kingdom of Thailand.

As a result of these survey and discussions, JICA prepared and submitted a Draft Final Report on the Study (hereinafter referred to as "the Report") and dispatched a Mission to explain and discuss on the Report starting from February 28th to March 7th, 1984.

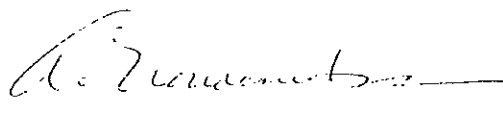
Both parties had a series of discussions on the Report and have agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined toward the realization of the Project.

March 5th, 1984

Bangkok



Dr. Ryosuke MURATA
Leader of Japanese Survey
Team



Dr. Amorn NONDASUTA
Permanent Secretary
Ministry of Public Health
The Government of the Kingdom
of Thailand

MAJOR POINT OF UNDERSTANDING

BASIC DESIGN

1. The Thai side principally has agreed to the basic design proposed in Draft Final Report.
2. The Final Report (10 copies in English) on the Project will be submitted to the Thai side by the end of April 1984.
3. Major undertakings to be taken by both Governments for the implementation of the Project are shown in Annex I.

ANNEX I

Major undertakings to be taken by both Governments

		Japanese side	Thai side
1.	To secure a lot of land		0
2.	To clear, level and reclaim the site when needed		0
3.	To construct the gate and fence in and around the site		0
4.	To construct the parking lot	0	
5.	To develop the landscape in the site		0
6.	To construct the road		
	1) Within the site	0	
	2) Outside the site		0
7.	To construct the building	0	
8.	To provide facilities for distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. Distributing line to the site		0
	b. Drop wiring and internal wiring within the site	0	
	c. Main circuit breaker	0	
	d. Transformer		0

	Japanese side	Thai side
2) Water Supply		
a. City water distribution main to the site		0
b. Supply system within the site (receiving and elevate tanks)	0	
3) Drainage		
a. Drainage city main (for storm, sewer and others) to the site		0
b. Drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	0	
4) Telephone System		
a. Telephone trunk line to the main distribution frame/panel (MDF) of the building		0
b. MDF and the extension after the frame/panel	0	
5) Furniture and Equipment		
a. Furniture for general office		0
b. Project equipment and furniture for research and training	0	

		Japanese side	Thai side
9.	To bear the following commissions to the Japanese foreign exchange bank for the banking services based upon the B/A		
	1) Advising commission of A/P		0
	2) Payment commission		0
10	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	0	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		0
	3) Internal transportation from the port of disembarkation to the project site	0	
11	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such necessities as may be required for their entry into recipient country and stay therein for the performance of their work		0
12	To maintain and use properly and effectively that the facilities constructed and equipment purchased under the Grant		0
13	To bear all the expenses other than those to be borne by the Grant		0

(3) タイ国政府関係者リスト

Thai Government Officials Concerned

1) DEPARTMENT OF TECHNICAL & ECONOMIC COOPERATION (DTEC)

Mr. Kasem Unahasuvan	Deputy Director General
Mr. Pracha Chaowasilp	Director, Division II of External Cooperation
Mr. Sutin Susila	Colombo Plan Sub-Division
Mr. Surayuth Kungsadan	Colombo Plan Sub-Division

2) DEPARTMENT OF MEDICAL SCIENCES (DMS), MINISTRY OF PUBLIC HEALTH

Dr. Nadhirat Sangkawibha	Director General
Dr. Preeya Kashemsant	Deputy Director General
Dr. Panchitta Ekachampaka	Deputy Director General
Miss Panida Kanchanapee	Director, Division of Medical Research
Dr. Boonluan Phanthumachinda	Director, Division of Medical Entomology
Dr. Kanai Chatiyononda	Director, Virus Research Institute
Mr. Alan Idsavas	Director, Division of Toxicology

Dr. M.L. Ratanasuda Phanurai	Director, Division of Clinical Pathology
Dr. Chaweevon Halilaminan	Director, Division of Food Analysis
Miss Boonlarp Kitisin	Director, Division of Drug Analysis
Miss Amnueyphorn Tantivejakul	Director, Office of Secretary
Dr. Somkiat Wangkobkiat	chief Scientist, Scientific Instrument Center
Mr. Smarn Pongpairoj	Senior Scientist, Biological Products Control
Dr. Nongluck Asawachinda	Senior Scientist, Virus Research Institute
Mrs. Boosun Suntainun	Senior Scientist, Div. of Food Analysis
Miss Amara Vongputiak	Senior Scientist, Div. of Food Analysis
Dr. Nuanta Muangnoicharoen	senior Scientist, Div. of Drug Analysis
Mrs. Sangthong Sawasdiphab	Senior Scientist, Div. of Drug Analysis
Miss Wiyada Charoensiriwatana	Scientist, Div. of Drug Analysis
Dr. Paiboon Sa-Ngobwarcha	Director, Div. of Radiation Protection Services
Dr. Tutchai Mungskandee	Principal Medical Officer, Office of Permanent Secretary

3) DIVISION OF CONSTRUCTION & DESIGN, MINISTRY OF PUBLIC HEALTH

Mrs. Kaisri Tunsiri	Director
Mr. Kriang Eksuwan	Architect
Mr. Wicha Sutasininond	Structural Engineer
Mr. Somsak Rungrojwanich	Electrical Engineer
Mr. Surasak Sirivoravith	Sanitary Engineer

4) OTHERS

Dr. Pradon Chatikavanij	Director, National Laboratory Animal Center, Mahidol University
Dr. Megumi Hasegawa	Team Leader, JICA Experts
Mr. Takeo Miyazaki	JICA Expert
Mr. Osamu Yasuda	JICA Expert in Economic Planning National Economic and Social Development Board (NESDB)

(4) 供給設備所轄官庁リスト

Thai Authorities Concerning Utility Services

1) Electric Power Supply

Metropolitan Electricity Authority (M.E.A.)

2) Telephone

Telephone Authority of Thailand (T.A.T.)

3) Water Supply

Metropolitan Water Work Authority (M.W.W.A.)

4) Sewerage

Environmental Health Div., Health Dept., Ministry of
Public Health

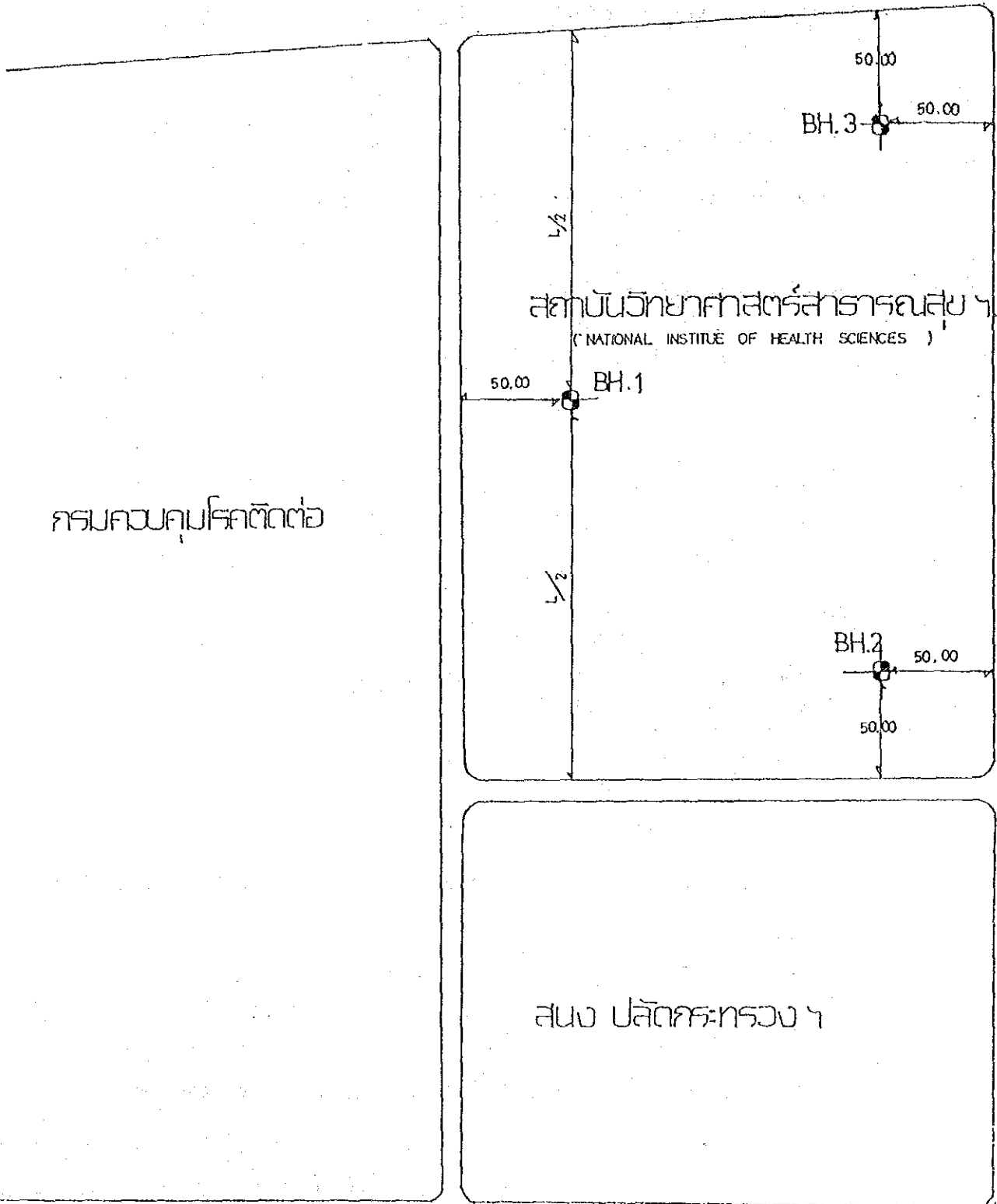
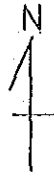
5) Garbage Disposal

Garbage Disposal Div., The Bangkok Metropolitan Administration
(B.M.A.)

6) Radioisotope

Waste Disposal Div., Office of the Atomic Energy for Peace

(5) บอริง調査データ



BORING LOCATION
NATIONAL INSTITUTE OF HEALTH SCIENCES.
NONTHABURI.

กรมศิลปากร มหาวิทยาลัยเกษตรศาสตร์

FIG. 3

GROUND WATER OBSERVATION.				W.E.C. BORING LOG	BORING NO. 1
DATE	TIME	EL. of HOLE	EL. of WATER		SURFACE ELV.
24 HR. AFTER BORING.		FLOOD #		LOCATION. อุบลราชธานี	DATE START 27.1.27
					DATE FINISH 30.1.27

SOILS DESCRIPTION	SOIL PROFILE	SAMPLE TYPE NO.	DEPTH, M.	STANDARD - PENETRATION	LIQUID LIMIT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	One half Unconfined Compressive Strength	TOTAL DENSITY
				BLOWS / FT.	%			KSC.	
GROUND LEVEL			0.00	30 - 60	20 40 60 80			1 2 3	1 2
TOP. SOILS. 1.00									
VERY SOFT DARK GREY SILTY CLAY, OCCASIONAL VERY FINE SAND, DECAYED WOOD, SHELL BITS	ST. 1								
	ST. 2								
	ST. 3								
	ST. 4								
	ST. 5								
	ST. 6								
	ST. 7								
	ST. 8								
	ST. 9								
	ST. 10								
	ST. 11								
	ST. 12								
	ST. 13								
	ST. 14								
15.25	ST. 15								
VERY STIFF GREY & BROWN VERY FINE SANDY CLAY. 16.30	SS. 16								
SS. 17									
SS. 18									
VERY DENSE TO DENSE GREYISH BROWN SILTY VERY FINE SAND. 22.50	SS. 19			49					
SS. 20				54					
SS. 21				39					
SS. 22				66					
SS. 23				49					
DENSE TO VERY DENSE GREY SILTY VERY FINE SAND. 30.45	SS. 24			62					
SS. 25				100					
SS. 26				94					
SS. 27				83					
SS. 28				91					
SS. 29				95					
END OF BORING	SS. 30		30	96					

รายงานผลการสำรวจดินและน้ำบาดาล

FIG. 4

GROUND WATER OBSERVATION.				W. E. C. BORING LOG				BORING NO. 2							
DATE	TIME	EL. of HOLE	EL. of WATER	LOCATION. อุบลราชธานี				SURFACE ELEV.							
								DATE START 30.1.27							
24 HR. AFTER BORING.		FLOOD M.						DATE FINISH 2.2.27							
SOILS DESCRIPTION...	SOIL PROFILE	SAMPLE TYPE NO.	DEPTH, M.	STANDARD - PENETRATION.	LIQUID LIMIT.				One half Unconfined - Compressive Strength.		TOTAL DENSITY				
					PLASTIC LIMIT.				INSITU VANE SHEAR...						
					NATURAL MOISTURE CONTENT.				One half Pocket - Penetrometer Rdg.		γ_d, γ_w				
					%				KSC.						
GROUND LEVEL			0.00	30	60	20	40	60	80	1	2	3	1	2	
TOP SOILS			1.00												
VERY SOFT DARK GREY SILTY CLAY OCCASIONAL DECAYED WOOD SHELL BITS & VERY FINE SAND.	ST. 1														
	ST. 2														
	ST. 3														
	ST. 4														
	ST. 5														
	ST. 6														
	ST. 7														
	ST. 8														
	ST. 9														
	ST. 10			10											
	ST. 11														
	ST. 12														
	ST. 13		13.30												
VERY STIFF LL-GREYISH BROWN SILTY CLAY.	ST. 14														
	SS. 15		15.50		20										
MEDIUM TO VERY DENSE BROWN & GREYISH BROWN SILTY FINE SAND.	SS. 16				23										
	SS. 17														
	SS. 18				55										
	SS. 19				46										
	SS. 20			20	39										
	SS. 21				39										
	SS. 22				47										
	SS. 23		24.00		61										
	SS. 24				65										
	SS. 25				116										
VERY DENSE GREY SILTY FINE SAND.	SS. 26				74										
	SS. 27				70										
	SS. 28				59										
	SS. 29				60										
	SS. 30		30.45	30	66										
END OF BORING															

ภาคการ... สถาบันวิทยาศาสตร์การชลประทาน

FIG. 5

GROUND WATER OBSERVATION				W.E.C. BORING LOG	BORING NO. 3
DATE	TIME	EL. of HOLE	EL. of WATER		SURFACE ELV.
24 HR. AFTER BORING.		FLOOD - M.		LOCATION. บึงนาราง	DATE START 2. 2. 27
					DATE FINISH 5. 2. 27

SOILS DESCRIPTION	SOIL PROFILE	SAMPLE TYPE NO.	DEPTH, M.	STANDARD - PENETRATION. BLOWS / FT.	LIQUID LIMIT. %	PLASTIC LIMIT. %	NATURAL MOISTURE CONTENT. %	One half Unconfined Compressive Strength. KSC.			TOTAL DENSITY. T / M ³	
								1	2	3		
GROUND LEVEL			0.00									
TOP SOILS			1.20									
VERY SOFT DARK GREY SILTY CLAY. OCCASIONAL SHELL BITS, VERY FINE SAND, DECAYED WOOD.	ST. 1											
	ST. 2											
	ST. 3											
	ST. 4											
	ST. 5											
	ST. 6											
	ST. 7											
	ST. 8											
	ST. 9											
	ST. 10											
VERY STIFF GREYISH BROWN SILTY CLAY	ST. 11											
	ST. 12											
STIFF GREYISH BROWN - VERY FINE SANDY - CLAY	ST. 13		13.50									
	ST. 14		15.00									
MEDIUM TO VERY DENSE BROWN SILTY FINE SAND.	SS. 15		16.05	20								
	SS. 16			24								
	SS. 17			24								
	SS. 18			45								
	SS. 19			79								
	SS. 20			91								
	SS. 21			66								
	SS. 22			66								
	SS. 23			57								
	SS. 24			62								
MEDIUM TO VERY DENSE GREY & GREYISH BROWN SILTY FINE SAND, OCCASIONAL GRAVEL.	SS. 25		24.00	18								
	SS. 26			39								
	SS. 27			41								
	SS. 28			35								
	SS. 29			32								
END OF BORING			30.45	30								
			SS. 30									

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