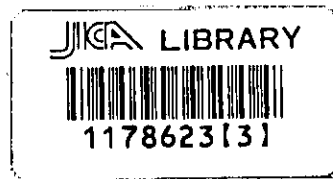


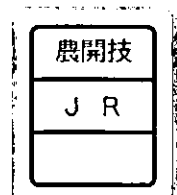
タイ国 農業協同組合振興計画  
モデルインフラ整備事業施工管理業務

報 告 書

昭和61年9月



国際協力事業団



タイ国農業協同組合振興計画  
モデルインフラ整備事業施工管理業務

報 告 書

昭和61年 9月

国際協力事業団



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## はじめに

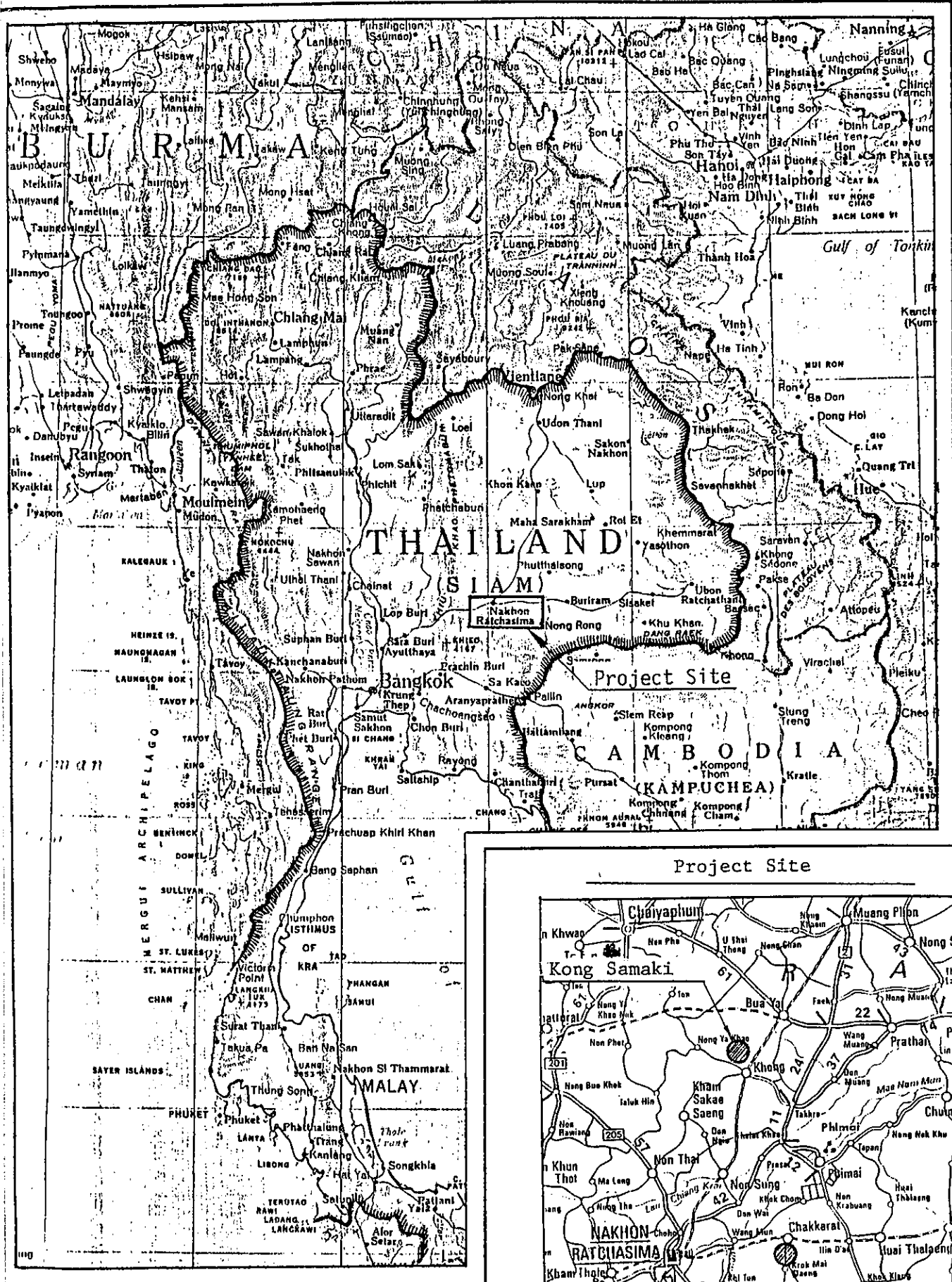
タイ国農業協同組合振興計画に基づき、現在その活動の拠点としている東北タイナコンラチャシマ県にある5農協のうち、同プロジェクト活動の一環としてのモデルインフラ整備工事の導入をコン農協、チャカラ農協において実施した。

コン農協、チャカラ農協の2農協におけるモデルインフラ整備工事に関しては、1985年10月中旬から11月中旬にかけて、タイ側関係者及び日本人専門家との間で詳細な協議が行われ、その内容は「タイ国農業協同組合振興計画モデルインフラ整備事業実施設計調査報告書 1986年1月 国際協力事業団」にとりまとめられている。

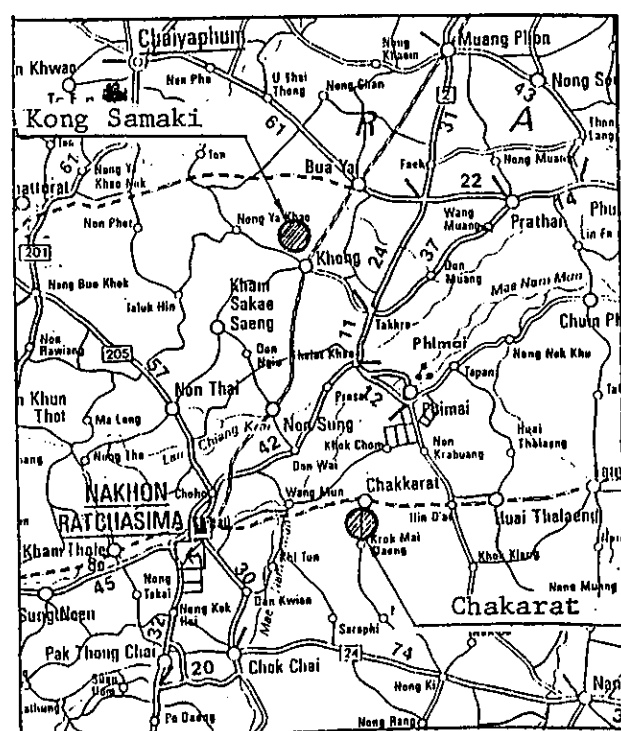
モデルインフラ整備事業の導入は、本プロジェクトの目的とする農民の共同意識の高揚、組織化による農民の経済的、社会的な生活基盤の安定を図るに際し、農業経営、営農指導、また、農産物の安定確保、治水・利水整備等の面から非常に有効な手段であることより、1つのモデルケースとしてそのすみやかな実施が望まれていたが、このたび国際協力事業団により実施の運びとなったものである。

本報告書は、「上記タイ国農業協同組合振興計画モデルインフラ整備事業実施設計調査報告書」に示される調査・設計を基にしたモデルインフラ整備工事の、工事契約から工事施工完了に至るまでの諸手続及び工事施工管理記録をとりまとめたものである。

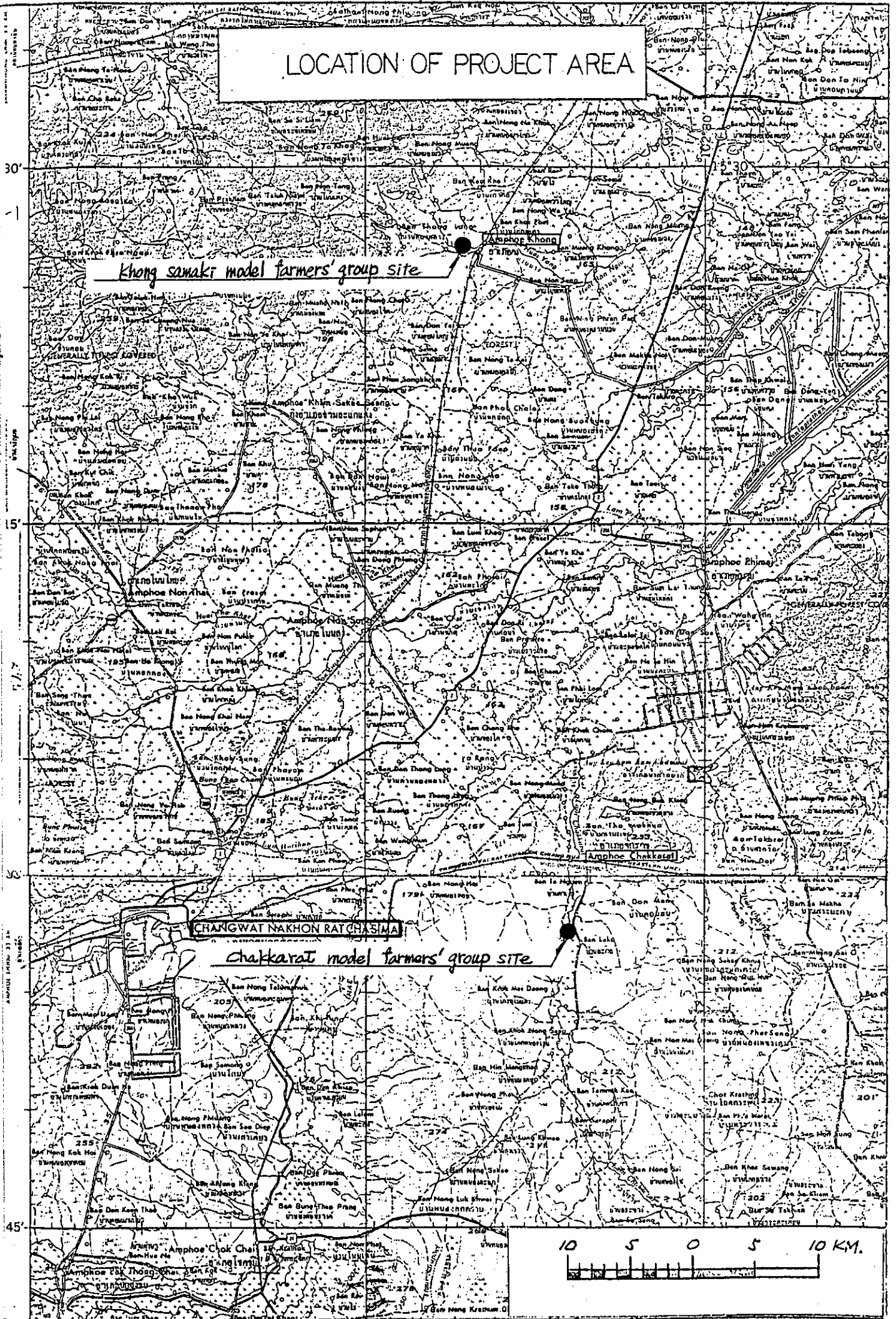
LOCATION MAP



Project Site



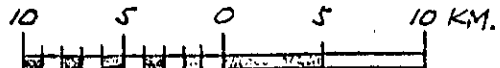
# LOCATION OF PROJECT AREA



Khong samaki model farmers' group site

CHANGWAT NAKHON RATCHASIMA

Chakkarat model farmers' group site



# 目 次

はじめに	
第1章 概 要	1
第2章 モデルインフラ整備事業申請に至るまでの関係文書	4
2-1 追記R/D	5
2-2 口上書	6
2-3 A1フォーム	7
2-4 A4フォーム	10
2-5 プロジェクト基盤整備費申請書	12
第3章 工事請負契約について	15
第4章 機材供与について	19
第5章 施工管理について	43
第6章 資料編	51
6-1 予定価格調書・予定価格下調書及び内訳書	52
6-2 工事請負業者選定に関する資料	66
6-2-1 CPDによって選定された地元業者一覧表	67
6-2-2 地元業者の資産・保有重機及び施工経歴資料	68
6-2-3 地元業者・施工能力判定試験出席者一覧表	80
及び試験問題・解答	
6-2-4 地元業者選定結果一覧表	106
6-3 現場説明会資料	107
6-3-1 Invitation Letter	108
6-3-2 現場説明会出席者一覧表	114
6-3-3 入札保証	115

6-4	入札結果に関する資料	119
6-4-1	プロポーザル	120
6-4-2	入札金額比較表	189
6-4-3	入札結果の通知書	190
6-5	契約書類	194
6-5-1	Terms and Conditions of the Coustruction	195
6-5-2	Contract	200
6-5-3	Technical Specification	216
6-5-4	Performance Bond	241
6-5-5	タイ側への契約に至るまでの経過報告	242
6-6	機材供与	250
6-6-1	見積書	251
6-6-2	契約書	255
6-7	施工管理	263
6-7-1	Inspection Committeeへの参加要請レター	264
6-7-2	工事着手前の諸手続	267
6-7-3	追加工事算定資料	276
6-7-4	工事実施状況報告書	293
6-7-5	Data for Quality Control	323
第7章	検査資料	378
7-1	中間検査資料	378
7-2	竣工検査資料	382
7-3	竣工図面	388
第8章	工事完了に係るタイ側への提出レポート	415
工事施工写真		444



## 第 1 章 概 要

## 第1章 概要

本報告書は「タイ国農業協同組合振興計画」の一環として、プロジェクトの活動拠点である東北タイ、ナコンラチャシマ県の5つの営農集団のうちチャカラ及びコンサマキの2つのモデル営農集団の農地において、かんがい用水源確保のため、堰、溜池等のかんがい施設をモデルインフラ整備事業として実施した際の施工管理業務をとりまとめたものである。

### 1. 事業の背景及び経緯

タイ国政府は貧困地域である東北地方の開発推進のため、農業の振興に大きな役割を果たす農協組織の活動の拡大強化を目的とした技術協力を日本政府に要請してきた。これを受けて、農業協同組合振興プロジェクトに関するR/Dの署名交換が1984年7月6日に行われ、5年間の協力が実施されている。現在、プロジェクト発足2年を経過し、ナコンラチャシマ県の5つの営農集団に対し、6名の専門家が派遣され、農協経営、営農指導、販売・購買事業、信用事業及び訓練・研修等に対する指導及び助言を行っている。

本事業は、恵まれない土地及び気象条件のため大部分の水稻栽培が天水依存で極めて不安定な営農を続けている東北タイにおいて、必要とされるかんがい用水施設等を整備する目的で実施された。工事实施に当たり次の専門家及び調査団が報告を行っている。

短期専門家派遣	2名	1985年5月1日～5月31日
調査団派遣		1985年8月11日～8月21日
短期専門家派遣	2名	1985年10月16日～11月14日

### 2. 工事概要

#### (1) 実施設計図書及び図面

「タイ国農業協同組合振興計画モデルインフラ整備事業実施設計調査業務報告書 1986年1月」に基づいた。

#### (2) 工事实施場所

タイ国ナコンラチャシマ県チャカラ地区及びコンサマキ地区

#### (3) 工事实施期間

1986年3月18日～8月24日(160日間)

(4) 主要工事

チャカラ地区

- ・ 放水工工事 ..... 1ヶ所
- ・ 取水工工事 ..... 1ヶ所
- ・ ゲート工事 (スルースゲート $1.50m \times 1.50m$ ) ..... 4基

コンサマキ地区

・ 小規模溜池群建設

タイプ：A	$26m \times 26m \times 5m$ , 1,810 $m^3$	.....	2ヶ所
B-1	$30m \times 30m \times 5m$ , 2,630 $m^3$	.....	2ヶ所
B-2	$33m \times 33m \times 5m$ , 3,350 $m^3$	.....	3ヶ所
C	$40m \times 40m \times 5m$ , 5,380 $m^3$	.....	4ヶ所
計	40,450 $m^3$		11ヶ所

(5) 工事請負業者

業者名 Thai Takenaka International Ltd.  
住所 138 Silom Road, Bangkok  
代表者 Taketsugu Nunose  
契約日 1986年 3月18日  
契約額 3,050,000 バーツ

3. 機材供与

本工事を実施するに当り、スルースゲート ( $1.50m \times 1.50m$ , 4基) を供与機材として現地購入を行った。

4. 専門家派遣 (施工管理)

- ・ 野添浩彦 (日本技研株式会社), 1986年 2月10日 ~ 5月10日
- ・ 加藤孝宏 (日本技研株式会社), 1986年 2月10日 ~ 9月7日

## 第2章 モデルインフラ整備事業申請 に至るまでの関係文書

SUPPLEMENTARY NOTE  
TO THE RECORD OF DISCUSSIONS

ON

THE JAPANESE TECHNICAL COOPERATION

FOR

THE AGRICULTURAL COOPERATIVE PROMOTION PROJECT

\* 追記 R/D

Mr. Michimoto GOTO, the Resident Representative of Japan International Cooperation Agency (hereinafter referred to as "JICA") in the Kingdom of Thailand had a series of discussions with the authorities concerned of the Government of the Kingdom of Thailand on the provision of special measures by the Government of Japan concerning the Japanese Technical Cooperation for the Agricultural Cooperative Promotion Project (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed to recommend the following to their respective Governments:

In order to enhance the smooth implementation of the Project, the Government of Japan will, in accordance with the laws and regulations in force in Japan, take necessary measures through JICA to supplement a portion of the local cost expenditure on construction of the "Model Infrastructure" (repair of weir intake, digging ponds and canals)

Bangkok, February , 1986



Michimoto GOTO  
Resident Representative  
Japan International  
Cooperation Agency  
Japan



Chern Bamrungwong  
Director-General  
Cooperatives Promotion Department  
The Kingdom of Thailand

Mr. Mitoma

大使	主 管 官
公 使	W. H. E. A. S. A.
参 事 官	
技 術 官	
技 術 官	
技 術 官	
技 術 官	JICA

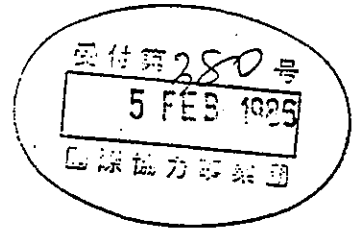
口上書

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION

Krung Kasem Road, Bangkok, Thailand

Cable: DTEC.  
TEL. 817555

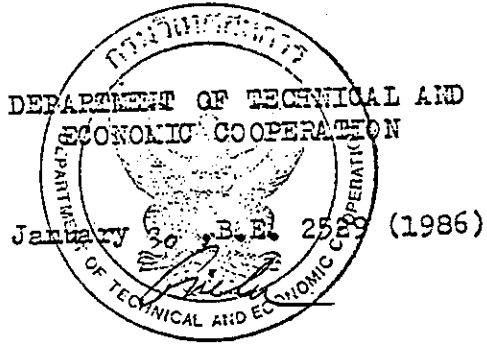
No. 1702.3/2604



The Department of Technical and Economic Cooperation presents its compliments to the Embassy of Japan and, with reference to the Record of Discussions dated July 6, 1984, and the Summary Report of Japanese Consultation Survey Team for the Agricultural Cooperatives Promotion Project in Thailand dated August 20, 1985, has the honour to request, on behalf of the Cooperatives Promotion Department, Services of two (2) short-term experts ~~and the construction of model-infrastructure~~ under the Technical Cooperation Scheme of the Colombo Plan.

The detailed information on the request is enclosed herewith for the Embassy's consideration.

The Department of Technical and Economic Cooperation avails itself of this opportunity to renew to the Embassy the assurances of its highest consideration.



Encls.

The Embassy of Japan,  
Bangkok.

DEC-I/Japan Sub-Division  
Tel. 2812747



THE COLOMBO PLAN  
COUNCIL FOR TECHNICAL CO-OPERATION IN ASIA AND THE PACIFIC

APPLICATION FOR EXPERT

By the Government of the Kingdom of Thailand to the Government of Japan  
for an expert in the Agricultural Cooperative Promotion Project in Thailand

Notes.—(a) This form has been devised for the general guidance of co-operating countries in order to facilitate the supply of relevant information and data necessary to afford an adequate appreciation of the nature of the technical assistance required. Full and accurate completion of this application form will avoid much reference back and lead to speedier action.

(b) The requisite number of copies of the Form A I, including a copy for the Colombo Plan Bureau, duly endorsed by the appropriate Foreign Aid Department of the requesting government should be forwarded to the donor government concerned through the appropriate channels.

1. Background Information

This section should show as precisely as possible the general nature of the project for which the expert is required, stating whether it comes within the Government's development programme. It is important to indicate whether the project is a new enterprise or whether it was started previously. In the latter case, any assistance received under other technical co-operation programmes (e.g. under United Nations auspices) should be stated. With regard to industrial enterprises, some impression of the size is important and the output and number of workers to be employed are useful indications. The type of process, make and age of industrial or scientific equipment with which the expert will be concerned should be specified. In the case of academic establishments, it is an advantage to know the number of annual intake of students, their level of attainment, numbers and status of existing staff and details of any research facilities and the level of research being undertaken. (Copies of brochures, annual reports, financial statements, calendars, syllabus of instruction, etc. should be attached where applicable).

This request is made to the Government of Japan in accordance with item II-1 of the Attached Document in accompanying with the item II note (1) of the Annex to the Record of Discussions between the Japanese Implementation Survey Team and the Authorities Concerned of the Government of the Kingdom of Thailand on the Japanese Technical Cooperation for the Agricultural Cooperative Promotion Project in Thailand dated July 16, 1984. At this stage a number of short-term experts required has been discussed with the Japanese Experts of the Project and was recommended by them.

2. Specification for the post :\*

- (a) post title
- (b) duties for which the expert will be responsible. These should preferably be listed, and it is important to give as much detail as possible
- (c) authority to whom expert will be responsible
- (d) qualification and experience required and approximate age limits
- (e) number of personnel required

Civil Engineer (2)

The short-term experts will be responsible for implementing of the Model Infrastructure Construction work in farm model groups of Kong Samakki Agricultural Cooperative Ltd. and Chak Raj Agricultural Cooperative Ltd.

Director-General of the Cooperatives Promotion Department

The fields of specialisation required are as mentioned in 2 (b) and approximate age limits 35-55 years old.

Two

3. In the case of continuous projects, give name and particulars of understudy or counterpart who is to work with the expert

4. Terms and conditions of appointment :

- (a) duration
- (b) actual place of employment, nearest town and post office
- (c) if living accommodation to be provided, state whether furnished or unfurnished, and whether suitable for married man with family :
  - (i) daily allowance for food if accommodation only provided
  - (ii) daily rate for accommodation and food if neither are provided in kind

seven months (February-August 1986)

Cooperatives Promotion Department and the Project areas in Nakorn Ratchasima Province.

In Accordance with the Provisions of Agreement on Technical Cooperation between the Government of Japan and the Government of Thailand

\* It is essential that full particulars should be given. If the space provided is inadequate, particulars should be given on a separate sheet.

4. Terms and conditions of appointment—(contd).

- (d) daily and nightly rates of subsistence payable when away from base on duty
- (e) are costs of internal travel paid or car provided ?
- (f) what leave arrangements are suggested ?
- (g) extent to which free hospital and medical treatment is to be provided for the expert and his accompanying dependants, if any
- (h) is expert free from income tax ?
- (i) will personal effects imported on first arrival be cleared free of custom duty ?
- (j) does host government undertake to indemnify expert in respect of damages awarded against him for actions performed in the course of his official duties ?
- (k) approximate date on which the expert is required to arrive in receiving country
- (l) any other information

In Accordance with the Provisions of Agreement on  
 Technical Cooperation between the Government  
 of Japan and the Government of Thailand

5. Proposals for apportionment of costs of salary and allowance and passages

Under the Colombo Plan Technical Cooperation Scheme.

6. Previous steps, if any, to fill the post :

If any previous attempt has been made to fill the post under the Colombo Plan (including ICA) or from any external source (UN, Specialised Agency or other) please indicate :

- (a) to whom application was addressed, with date
- (b) result or present stage of negotiations
- (c) are other experts working in this area in associated projects or have there been experts working in this field previously ? If so, are any reports by these experts available ?

7. Correspondence :

Name, postal and telegraphic address of official to whom correspondence regarding this application should be forwarded

Director-General  
 Department of Technical and Economic Cooperation  
 Krung Kasem Road,  
 Bangkok, Thailand.

Signed C. Dammongkol  
 for Counterpart Agent

Signed Pracha Chaowasilp

on behalf of the Government of Thailand (Mr. Pracha Chaowasilp)  
 Deputy Director-General

Date: January 21, 1986

30 JAN 1986

For use only by Donor Government

Application accepted/rejected/withdrawn

on behalf of the Department of \_\_\_\_\_

Date: \_\_\_\_\_



大 使	三 官 經 済
公 使	NAC-1/A
総 務 参 事 官	
参 事 官/1	JICA

DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION

Krung Kasem Road, Bangkok, Thailand

Cable: DTEC.

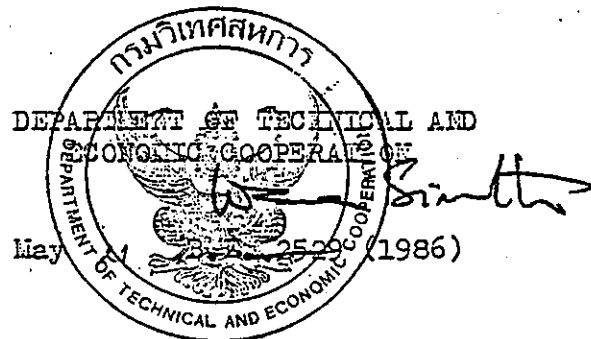
TEL. 817555

No. 1702.3/12495

The Department of Technical and Economic Cooperation presents its compliments to the Embassy of Japan and, with reference to the Record of Discussions dated July 6, 1984, has the honour to request, on behalf of the Cooperatives Promotion Department, Ministry of Agriculture and Cooperatives, equipment for the Agricultural Cooperative Promotion Project in Thailand, under the Technical Cooperation Scheme of the Colombo Plan.

Enclosed herewith are 8 copies of Form A4 for the Embassy's consideration.

The Department of Technical and Economic Cooperation avails itself of this opportunity to renew to the Embassy the assurances of its highest consideration.



Encls.

The Embassy of Japan,  
Bangkok.

DEC-I/Japan Sub-Division  
Tel. 2812747



THE COLOMBO PLAN  
COUNCIL FOR TECHNICAL CO-OPERATION IN ASIA AND THE PACIFIC  
Equipment for Training or Research Institutes and for Equipment accompanying Experts

**APPLICATION**  
The Kingdom of Thailand.

By the Government of \_\_\_\_\_  
from The Government of Japan \_\_\_\_\_  
(Country)

- Notes.—(a) This Form has been devised for the general guidance of co-operating countries in order to facilitate the supply of relevant information and data necessary to afford an adequate appreciation of the nature of the technical co-operation required. The careful completion of this application form will avoid much reference back and lead to speedier action. Separate forms A 4 should be used for requests for equipment for each individual institute or project.
- (b) The requisite number of copies of the Form A4, including a copy for the Colombo Plan Bureau, duly endorsed by the appropriate Foreign Aid Department of the requesting government should be forwarded to the donor government concerned through the appropriate channels.

1. Background Information

Please describe as concisely as possible the general outlines of the project for which the equipment is required, indicating whether the latter is (a) for use by an expert in the performance of his duties (b) for a training scheme or institution or (c) for a research institution. If either (b) or (c) please say whether the equipment is for the establishment of a new institution or the expansion or re-organisation of an existing one (e.g., by the provision of a new department, &c.). The name and exact location of the institution, its approximate cost and the authority responsible for it should be stated. Where appropriate, details should be given of the availability of any services required for the operation of the equipment. This would include operation by electricity (i.e. type of current, periodicity, voltage and any variations, phases, frequency, etc. and if D.C. is the only current available please give full details), water reticulation or steam, gas, etc. Details of similar equipment already in use should be given.

This request is made to the Government of Japan in accordance with the matter referred to the item III-1 of the Attached Document with accompanying the item III of Annex to the Record of Discussions between the Japanese Implementation Survey Team and the Authorities Concerned of the Government of the Kingdom of Thailand on the Japanese Technical Cooperation for the Agricultural Cooperative Promotion Project in Thailand, dated July 6, 1984 and the Supplementary Note to the Record of Discussions, dated February 4, 1986. At this stage, a number of equipment and materials are required for conducting the construction works of water development system for model farming groups of the Project.

2. Description of Equipment Required

Please give a full description of each item and general specifications where possible. The manufacturer and estimated cost of each item if known together with details of the proposed end use of item should be given. Where applicable, give details of any special packing or tropic proofing required and indicate whether handbooks or instruction data supplied in English will suffice. If appropriate, please indicate any required priorities or phasing of deliveries and advise whether adequate facilities exist for maintenance and servicing of the type of equipment requested. (If lengthy, detailed lists should be annexed, it would be convenient to have separate annexures for (a) films, (b) books and (c) other equipment).

The list of additional equipment and materials required in 1986 are as follows :

1. Steel sluice gate
2. Hand operated valve gear
3. Steel ladder and hand rail
4. Epoxy resin paint
5. Accessories of sluice gate

3. Has this equipment request already been directed to any other Agency or Colombo Plan country and if so to whom was it addressed and with what result?

4. Has the list of equipment already been discussed with representatives of the supplying country/ies? If so, please indicate what stage the discussions have reached.

Yes, the list of additional equipment and materials required in 1986 has been discussed with the Expert team leader and Short term Experts of the Project and was recommended by them.

5. Furnish full particulars in respect of—

- (a) Consignee;
- (b) Official to receive documents and enquiries; and
- (c) Clearing agent at port of entry.

- a. Director-General of the Cooperatives Promotion Department.
- b. The Cooperatives Promotion Department.
- c. The Cooperatives Promotion Department.

6. Where equipment is required for use by an expert Please indicate—

- (a) The country or agency from which the expert has been requested or obtained
- (b) His duties and length of secondment (a reference to the relative Form A1 will suffice when the expert is being provided by the country to which the equipment request is addressed)

The equipment and materials are required for use by the Japanese experts in construction works of water development system under the Project

References :

- I. R/D, dated July 6, 1984 and Supplementary Note to the R/D dated February 4, 1986.
- II. The short-term Japanese experts of the Agricultural Cooperative Promotion Project in Thailand (Form A1)

(c) What use is proposed for the equipment when the expert's period of secondment terminates?

It will be retained by the Cooperatives Promotion Department for the use in the Agricultural Cooperative Promotion Project in Thailand.

(d) By what date is the equipment required?

in May 1986.

7. Where equipment is required for Training or Research Institutions

Please indicate--

(a) Nature and standard of training or research to be undertaken

(b) Total number of students to be accommodated from within the country or from elsewhere in the Region, the qualifications for admission, the duration of courses, and the annual output of trainees

(c) Whether there is already a similar institute(s) in existence in the country. If so, please give details.

(d) Whether buildings are already available, if not, has construction started and when is it expected to be completed?

(e) Whether qualified staff to handle the equipment has been recruited or is proposed to be recruited locally.

If not, is it proposed:

(i) to recruit foreigners under aid programmes?

(ii) to train locally recruited personnel abroad in handling equipment?

(The reference numbers of any Forms A1 or A2 relating to such requests should be quoted)

(f) Taking into account the answers to (d) and (e) above, what is the date by which the equipment is required and the date on which training or research work is to commence

(g) Whether any assistance in drawing up the scheme has been obtained from outside experts? (Any specialist reports or Government surveys (e.g. Educational Committee Reports, &c.), bearing on the request should be provided if possible)

8. Correspondence

Name, Postal and Telegraphic Address of official to whom correspondence regarding this application is to be forwarded

Director-General  
Department of Technical and Economic Cooperation  
94 Kasem Road  
Bangkok, Thailand

Signed C. Bamrungwong  
for Counterpart Agency  
Chern Bamrungwong

Director General

Signed Wanchai Sirirattna

on behalf of the Government of (Mr. Wanchai Sirirattna)  
Director - General

Date 2 May, 1986

20 MAY 1986

For use only by Donor Government

Application accepted/rejected/withdrawn

on behalf of the Department of

Date

7 FEB 1960

1194 2/2

様式-1

プロジェクト基盤整備費申請書

昭和61年2月6日

国際協力事業団

総務 有田 圭輔 殿

事務所長

氏名 国際協力事業団  
バンコック事務所  
所長 後藤 敬

下記によりモデルインフラ整備費・パイロットインフラ整備費の支給を申請する。

記

- (1) プロジェクト名 7ヶ国 農業協同組合振興計画
- (2) 工事名 モデルインフラ整備事業
- (3) 概算工事費 2,800,000円
- (4) 工事内容

A) 工事概要

- 1) ため池整備工
- 2) 河川堤整備工(改修)  
下流導水施設

B) 主要工事数量

- 3) 分水工(改修)
- 1) 12ヶ所
- 2) 各1ヶ所
- 3) 1ヶ所

C) 工期

昭和61年2月20日~昭和61年9月31日

(5) 申請の事由

(実施要綱第3条の要件及び工事の目的等を記載すること)

別添12紙

# タイ国農業協同組合振興計画プロジェクトインフラ 整備費申請書

## 申請の事由

本プロジェクトはタイ国の農業生産の向上、流通の合理化等による農協組織の育成・強化を図るため、日本の農協の蓄積としていく経験、知識の導入を通じてタイ国の農協振興を進めることと目的として昭和59年7月6日から5ヶ月の協力の実施としていく。

プロジェクト活動は東支タイプロジェクトチャレア県の5つのプロジェクト農協の区域内で実施としていく。プロジェクト管理集団を拠点として進められていくが、この管理集団は天水依存の不安定な環境用水源に依存していくため、管理指導、農協経営指導等プロジェクトの基本的活動に大きな障害となっている。

この状況を早急でタイ側予算で改善することは困難であるため、5つのプロジェクト管理集団のうち、コスマキ、チャカローの2プロジェクト管理集団において、プロジェクトインフラ整備事業により地域の環境、即ち天水の環境用水源開発工事の実施を申請するものである。

February 6th, 1986

Mr. Michimoto GOTOH  
Director, Bangkok Office  
Japan International  
Cooperation Agency  
c/o Embassy of Japan

Subject: Request for Cooperation in the  
Construction of Model Infrastructure

Dear Mr. Gotoh,

In accordance with the Record of Discussions pertaining to the Agricultural Cooperative Promotion Project, we would like to inform you that the works of the project are now proceeding smoothly under the technical cooperation of the Japanese experts assigned to the Project and that it is a mutual concensus of our staff members and the Japanese experts that construction of model infrastructure in the project sites as an integral part of the improvement works is of vital importance for effective implementation of the Project.

We would like, therefore, to submit to JICA our request for the necessary assistance in the construction of the said infrastructure.

Hoping for your kind consideration, I remain.

Sincerely yours,

Mr. Chern Bamrungwong  
Director-General  
Cooperatives Promotion Department  
Ministry of Agriculture &  
Cooperatives

### 第3章 工事請負契約について

### 第3章 工事請負契約について

#### 1. 工事費の積算

工事数量についてJICA専門家、CPDスタッフと協議を行い、単価の再検討に基づき工事費の積算を行った。この「予定価格下調書」をもってJICAバンコク所長の決裁を仰いだところ、「予定価格調書」のとおり、3,085,000 バーツが決定された。(P. 53 参照)

#### 2. 工事請負業者の選定

本プロジェクトの目的から地元への経済効果を高める配慮より、CPDによってP. 67 に示す地元業者6社が選定された。

これら6社による競争入札は、

- i) 業者の技術力、資本力、実績等について十分な選択が不可能である。
- ii) 主任技術者の英語能力が不十分な場合、施工管理業務が困難である。

等の問題があるため、上記の点についての資料提出及び面接等を行った結果、6社のうち以下に示す2社のみが、ある程度の能力があるものと判断された。選定結果をP.106に示す。

- Chok Chai Construction Co., Ltd.  
address : Hua-tha-lay Commune, Muang District,  
Nakhornratchasima Province  
tel. : 044 - 242125
- Thai Silp Co., Ltd.  
address : 3596/5-7 Suranaree Road, Muang District,  
Nakhornratchasima Province  
tel. : 044 - 242529

この2社だけの指名競争入札では、同じ地元業者であることから、2社の間で入札に際して事前協議による価格調整が懸念されたため、適正な価格競争をさせるために同等以上の能力を持つ企業を入札に参加させることを決定し、次の2社を選定した。



- Thai Takenaka International Ltd.  
address : Boonmitr Bldg., 138 Silom Road, Bangkok  
tel. : 233 - 3246
- Thai Konoike Construction Co., Ltd.  
address : Regent House, 183 Rajdamri Road, Bangkok  
tel. : 251 - 3138

以上の経過をふまえ、2月28日 J I C A バンコク所長名により指名通知を行った。(P.108)

### 3. 現場説明会

3月3日午前11時日本大使館1階会議室において前記4社の代理人出席のうえ、三苦 ( JICA BANGKOK OFFICE ) , 野添, 加藤 (ともに JICA EXPERT ) により、入札心得, 契約条件, 契約約款, 工事仕様書, 図面等について説明を行った。また、3月4日午前12時よりコンサマキ, チャカラの現場を業者と視察し、疑問点等に返答を行った。(P.114)

入札日時は3月10日午前11時とし、同時刻までにプロポーザルを提出させることとした。

### 4. 入札開封並びにプロポーザルの受理

3月10日 J I C A 2階所長室において前記4社代理人出席のもと、プロポーザルの提出がなされた。官側の出席者は鈴木 ( JICA バンコク次長 ) , 三苦 ( 前述 ) , 野添 ( 前述 ) 。1位指名業者の決定に当っては入札金額及びプロポーザルの内容を熟読する必要があることより、後日各社へ通知することとし、散会した。

プロポーザル受理後直ちに各社の入札金額及びプロポーザルの照会作業に入った。入札参加4社の入札金額及びプロポーザルをP.120に示す。J I C A 事務所側で協議した結果、入札金額では THAI TAKENAKA INTERNATIONAL LTD. が最低額、かつ予定価格範囲内であり、また、プロポーザル内容もP.169に示すとおり本プロジェクトの主旨に沿うものであることより、THAI TAKENAKA INTERNATIONAL LTD. を1位指名業者とし、該社との契約を進めることとした。

## 5. 契約

### (1) 契約日 昭和61年 3月18日

JICAバンコク事務所所長室において、後藤JICA所長及びTHAI TAKENAKA INTERNATIONAL LTD.側から布瀬取締役、大竹氏、石丸氏が列席し、契約書に署名し、契約が成立した。なお、連署人として 三苦（JICA補佐）、佐藤（専門家チームリーダー）の両名がそれぞれ署名した。契約書類をP.194に示す。

### (2) 工期

自 昭和61年 3月18日  
至 昭和61年 8月24日 (160日間)

### (3) Performance Bond

契約と同時にTHAI TAKENAKA INTERNATIONAL LTD.側より契約額の5%に当る完成保証書（銀行証明）が提出された。(P.241)

なお、契約に至るまでの経過について、短期専門家よりタイ側に報告をした。(P.243)

## 第4章 機材供与について

## 第4章 機材供与について

### 1. 現地調達機材

現地調達機材として、下記のものを購入した。購入方法は、見積りを徴し、最低価格者より購入した。(P.251)

品名	スルースゲート
仕様	鋼鉄製(SS41), 1.50m×1.50m 手動巻上装置, 操作用Ladder及びHand rail 付 水密ゴム装着, エポキシレジン塗装
数量	4基
購入先	THAI TAKENAKA INTERNATIONAL LTD.
購入金額	1,150,000 バーツ

### 2. 日本からの供与機材

本モデルインフラ整備工事での使用及び将来タイ側の施工能力をより強化する目的で、以下に示す建設用重機が日本より供与された。

供与機材名	数量	* 現地到着日	備考
1. Bulldozer D41P-3	1	5月16日	
2. - do - D31P-17A	1	5月16日	
3. Back hoe assembly (D31P-17A装着)	1	5月16日	
4. Back hoe PC 150LC-3	1	5月30日	
5. Dump truck CWA53HD	1	7月11日	
6. - do - CKA21	1	7月11日	
7. Pump EBARA80ES	4	7月11日	
8. Generator NES25BN	1	7月11日	

注) \* 現地到着日：コラート第3エンジニアリングセンターに機材の到着日

上表1～4の供与機材については、現地コラート第3エンジニアリングセンター到着後直ちに、コマツエンジニアによる組立て及びCPD第3エンジニアリングセンター職員への運転・操作方法、重機の点検修理方法等の講習が行われた。

なお、Bulldozer D31P-17A、コラート第3エンジニアリングセンター到着時においてエンジンオイルパンの内に多量(1～2ℓ)の水の混入が見られ、走行不可能な状態であった。これより、同ブルドーザーエンジンオイルによる洗浄を2回行い、その修理を行った。また、同様にエアフィルターも浸水により使用不可能であったことよりその交換を行った。上記エンジン

内への水の浸入はブルドーザー運搬中（日本からコラートまで）において雨水がエンジン吸気管よりエンジン中へ入ったと考えられるが、運搬のどの過程でその雨水浸入があったかは判明しなかった。エンジン修理等の作業はコマツエンジニア、CPD第3エンジニアリングセンター職員により行われ、修理費用はJICAバンコク事務所、プロジェクト専門家、CPD側との協議の上CPDの負担となった。（修理費についてはP. 36 参照）

本モデルインフラ整備工事で使用した重機及び使用工種・期間等を以下に示す。

供与機材名	使用工事現場	使用工種	使用期間
1. Bulldozer D41P-3	Kong	溜池表土まき出し 仮設道路復旧	5月30日～ 7月13日
2. Bulldozer D31P-17A (3. Back hoe assembly )	Chakkarat	水路掘削 (Outlet, Deversion, works )	5月31日～ 6月15日
	Kong	仮設道路復旧	6月16日～ 7月 6日
4. Back hoe PC 150LC-3	Kong	溜池盛土法面整形	7月 6日～ 7月 9日
	Chakkarat	水路掘削（追加工事）	7月10日～ 7月13日

5. , 6. Dump truck (CWA53HD, CKA21) については重機のコラート到着以前にKongでの掘削、盛土工事が終了したこと及びChakkarat においてはダンプトラックによる土砂運搬等の工事がなかったことにより、本工事では使用しなかった。

7. 水中ポンプ (EBARA80ES) , 8. Generator (NES25BN) についても工事期間中降雨等による工事区域内の排水の必要がなかったことより、その使用はなかった。

1. Bulldozer D41P-3, 2. Bulldozer D31P-17A (3. Back hoe assembly) , 4. Back hoePC 150LC-3は工事使用後コマツエンジニアによる点検を行い、CPD第3エンジニアリングセンターに返却した。(P.26)

なお、Bulldozer D31P-17Aの工事使用中においてキャリアローラー（キャタピラーの上部をささえるローラー）の偏摩耗が見られたことによりその交換を施工業者（THAI TAKENAKA INTERNATIONAL LTD.）による費用負担により行った。キャリアローラーの偏摩耗の原因はコマツのコメントではキャリアローラーのまわりについた土砂によりローラーの回転が妨げられ、ローラーとキャタピラーの接触摩擦によりローラーが偏摩耗したということである。キャリアローラーは左右に1pcずつ装備されているが、今回の交換は左右両方の2pcs に及んだ。(P.37)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

COPY

No. 444/61

April 25, 1986

Mr. Chern Bamrungwong  
Director-General  
Cooperatives Promotion Department

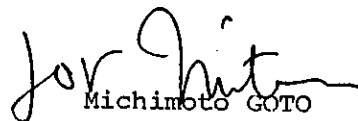
Dear Sir,

We would like to inform that the construction equipment provided by the Government of Japan already arrived at Bangkok Port, at 14th April. This construction equipment listed in attached paper is, for the time being, required to use for additional construction works of Model Infrastructure on Agricultural Cooperative Promotion Project in Thailand.

We would like to request prompt action for necessary procedures, for example customs clearance, registration and transportation to Engineering Center No. 3 at Korat.

Your kind cooperation will be kindly appreciated.

Sincerely yours,



Michimoto GOTO  
Resident Representative,  
JICA Bangkok Office

No. 541/61

March 25, 1986

Mr. Chern Bamrungwong  
Director General  
Cooperatives Promotion Department

Dear Sir,

The equipment provided by the Government of Japan is required for the effective and successful construction works of Model Infrastructure on the Agricultural Cooperative Promotion Project in accordance with R/D (Record and Discussions).

JICA would like to borrow the equipment for the additional works, and the equipment will be used by the Contractor under the responsibility of JICA.

Items and/or specifications are listed in attached paper.

Your kind cooperation will be highly appreciated.

Sincerely yours,

  
Michimoto GOTO

Resident Representative, Bangkok Office  
Japan International Cooperation Agency

c.c Mr. T. KATO  
Supervisor, Construction Works  
for Model Infrastructure in  
the Agricultural Cooperative Promotion Project

LIST OF EQUIPMENT

Kinds of Equipment	Model	Quantities
1. Bull-dozer	D41 P-3	1
2. Bull-dozer	D31 P-17	1
3. Power-shovel	PC 150LC-3	1
4. Back-hoe assembly	D31 P3	1
5. Dump truck	CWA 53HD	1
6. Dump truck	CKA 21	1
7. Drainage Pump	80ES	4
8. Generator	NES 20BN	1



แบบบันทึกการยืมเครื่องมือและอุปกรณ์ของโครงการส่งเสริมสหกรณ์การเกษตรในประเทศไทย

ระหว่างหน่วยราชการในกรมส่งเสริมสหกรณ์หรือคนผู้เช่ารายอื่น

เขียนที่ ..... วันที่ 3 ตุลาคม 2529

วันที่ 30 เดือน พฤษภาคม พ.ศ. 2529

ข้าพเจ้า มีชื่อ ทักษิณ ชัยกุล ..... ตำแหน่ง วิศวกร วิทยาลัยการเกษตร ( วิชา )

มีความประสงค์ขอยืมเครื่องมือและอุปกรณ์ของโครงการส่งเสริมสหกรณ์การเกษตรในประเทศไทย

จาก ศูนย์ฯ ที่ 3 จ. นครราชสีมา

เป็นระยะเวลา 3 เดือน ตั้งแต่วันที่ 30 เดือน พฤษภาคม พ.ศ. 2529

ถึงวันที่ 31 เดือน สิงหาคม พ.ศ. 2529

ถึงรายการต่อไปนี้

1. KOMATSU D 31 P-17 A SWAMP BULLDOZER & BACK HOE 1 UNIT
2. KOMATSU D 41 P-3 SWAMP BULLDOZER 1 UNIT
3. ....
4. ....
5. ....

ทั้งนี้ เพื่อใช้ในราชการภายใต้โครงการส่งเสริมสหกรณ์การเกษตรในประเทศไทย

ลงชื่อ ..... ( มีชื่อ ทักษิณ ชัยกุล )

ข้าพเจ้าได้รับสิ่งของตามรายการข้างบนนี้

ไปถูกต้องแล้ว

ลงชื่อ ..... ( มีชื่อ ทักษิณ ชัยกุล )

ลงชื่อ ..... ( นายสุภา ธรรมดี )

หัวหน้าศูนย์ฯ ที่ 3

วันที่ 30 เดือน พฤษภาคม พ.ศ. 2529

- COPY -

18th August, 1986

Mr. Chern Bamrungwong  
Director General  
Cooperatives Promotion Department

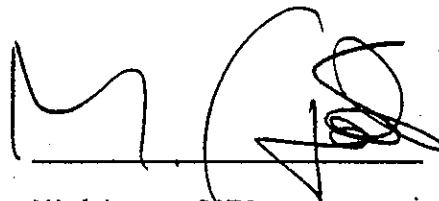
Dear Sir:

This is to inform you that the equipment mentioned below have been made good use for the construction works for Model Infrastructure on the Agricultural Cooperative Promotion Project and returned to Cooperatives Promotion Department after the maintenance and inspection in the presence of Inspection Committee.

1. Bulldozer - D41P - 3
2. Bulldozer - D31P - 17A
3. Backhoe - PC150 LC - 3

We would like to express our sincere appreciation to your cooperation.

Sincerely yours,



Michimoto GOTO

Resident Representative, Bangkok office  
Japan International Cooperation Agency

CC : Mr. T. KATO

Supervisor, Construction Works  
for Model Infrastructure on  
the Agricultural Cooperative Promotion Project

機材返却文書

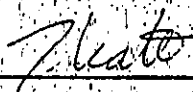
วันที่ ๑๕ สิงหาคม พ.ศ. ๒๕๒๕

เรียน คุณโยชิยา พรหมดี  
หัวหน้าศูนย์ช่างที่ ๓ กรมส่งเสริมสหกรณ์  
เรื่อง ขอส่งมอบเครื่องจักรคืน

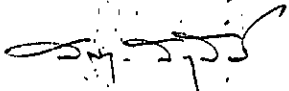
เนื่องจากทาง JICA ได้นำเครื่องจักรจากศูนย์ช่างที่ ๓.๑ ไปดำเนินการก่อสร้างสระเก็บน้ำที่อำเภอคงและประตูเก็บกักน้ำที่อำเภอจตุรพักตรพิมาน จังหวัดร้อยเอ็ด และบัดนี้ ทาง JICA จึงขอส่งมอบเครื่องจักรคืนให้แก่ศูนย์ช่างที่ ๓.๑ ทั้งหมด หลังจากได้รับการตรวจซ่อมโดยนายช่างของผู้แทนเจ้าหน้าที่ในประเทศไทย ดังรายการต่อไปนี้

- 1. BULLDOZER " KOMATSU " D41 P - 3
- 2. BULLDOZER " " D31 P - 17A
- 3. BACK HOE " " PC150 LC - 3

จึงขอขอบคุณ กรมส่งเสริมสหกรณ์และศูนย์ช่างที่ ๓ เป็นอย่างสูง

  
TAKAHIRO KATO  
JICA, EXPERT

ได้รับแจ้งเรื่องดังกล่าว จีไอเอขอแจ้งคืนของเครื่องจักร และเงินค่ามัดจำคืน  
130830๕๕๖

  
(นายสมชาย สรรณามุสรณ์)  
หัวหน้าหมวดเครื่องกล

Somchai Saranamusorn  
Chief Engineer  
Engineering Centre

REPORT ON EQUIPMENT AND MATERIALS RECEIVED

Ref. \_\_\_\_\_

Date: 4<sup>th</sup> June 1986

To: Japan International Cooperation Agency

From: Cooperatives Promotion Department

Subject: **Agricultural Cooperative Promotion Project**

(Title of Project)

This is to inform you that the cargo mentioned below have been duly examined and received.

1. Name of Vessel or Aircraft	<u>PIPOB SAMUT</u>
2. Unloading Date and Port	<u>14<sup>th</sup> Apr 1986 Bangkok port</u>
3. Cargo's Arrival Date at Project Site	<u>16<sup>th</sup> May 1986</u>
4. Bill of Lading No.	<u>Y - 75</u>
5. Invoice No. total items	_____
6. Packing List Package No.	<u>K1 - K9</u>
7. Insurance Policy No.	_____
8. Main Equipment worth CIF.	_____
9. Date of Examining Goods	<u>19<sup>th</sup> May 1986</u>
10. Place of Examining Goods	<u>CPD, Engineering Center No 3 Nakhon-ratchasima</u>
11. Conditions of Goods	<u>Good</u>

Examining Officer

Paya Promdee

Expert in charge

J. Lato

Date:

# JAPAN INTERNATIONAL COOPERATION AGENCY

P.O. Box 216, Mitsui Bldg., Shinjuku-ku, Tokyo, Japan.

## PACKING LIST

Consigned to : DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION, No : .....

KRONG KASEM ROAD, BANGKOK, THAILAND. Date : MAR. 31, 1986  
 (FOR THE AGRICULTURE COOPERATIVE PROMOTION PROJECT)  
 Shipped per "PIPOB SAMUT"

Shipping Mark :

from YOKOHAMA, JAPAN  
 to BANGKOK  
 via .....  
 on MAR. 31, 1986

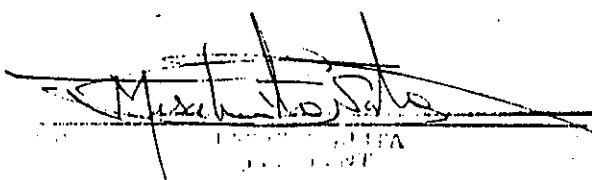
ACP

### SIDE MARK



TECHNICAL COOPERATION  
 BY THE GOVERNMENT OF JAPAN

DTEC/BANGKOK  
 C/No. K1 - K9  
 MADE IN JAPAN

C/Nos.	Description of Goods	Quantity	Weight		Measure-ment
			net	gross	
K1-K9	EQUIPMENTS FOR TECHNICAL COOPERATION OF JICA. - DETAILS ARE AS PER ATTACHED SHEET - TOTAL: 9 PACKAGES =====	2 UNITS & 1 SET =====		20,440 KGS	69.953 M3 =====
JAPAN INTERNATIONAL COOPERATION AGENCY JAPAN INTERNATIONAL COOPERATION AGENCY  DIRECTOR GENERAL JICA					

E. & O. E

INTERNATIONAL COOPERATION AGENCY

Box 216, Mitsui Bldg., Shinjuku-ku, Tokyo, Japan.

( )

C/Nos.	Description of Goods	Quantity	Weight		Measure- ment
			net (KG)	Gross (KG)	
EQUIPMENTS FOR TECHNICAL COOPERATION OF JICA.					
K1	1 UNIT (2) KOMATSU D31P-17A SWAMP BULLDOZER MAIN BODY.	1 UNIT		6,840	22.753
K2	1 CRATE (2) CANOPY FOR KOMATSU D31P-17A SWAMP BULLDOZER.	(1 )		110	0.989
K3	1 CASE (2) STANDARD PARTS AND TOOLS FOR KOMATSU D31P-17A SWAMP BULLDOZER	(1 )		50	0.255
K4	1 CRATE (3) KOMATSU BACK HOE FOR KOMATSU D31P-17A SWAMP BULLDOZER.	1 SET		2,540	22.050
K5	1 UNIT (1) KOMATSU D41P-3 SWAMP BULLDOZER MAIN BODY.	1 UNIT		9,530	19.912
K6	1 CRATE (1) CANOPY FOR KOMATSU D41P-3 SWAMP BULLDOZER.	(1 )		110	0.989
K7	1 CASE (1) STANDARD PARTS AND TOOLS FOR KOMATSU D41P-3 SWAMP BULLDOZER.	(1 )		260	0.476
K8	1 SKID (1) I FRAME FOR KOMATSU D41P-3 SWAMP BULLDOZER.	(1 )		300	0.564
K9	1 SKID (1) ANGLE BLADE FOR KOMATSU D41P-3 SWAMP BULLDOZER.	(1 )		700	1.965
TOTAL: 9 PACKAGES =====		2 UNITS & 1 SET =====		20,440 KGS =====	69.953 M3 =====
Confirmation of equipment approval.					
<p style="text-align: right;"> <i>Pamela Dromed</i>  <i>W. Chikuy</i>  <i>J. Kato</i> </p>					

REPORT ON EQUIPMENT AND MATERIALS RECEIVED

Ref. \_\_\_\_\_

Date: 4<sup>th</sup> June 1986

To: Japan International Cooperation Agency

From: **Cooperatives Promotion Department**

Subject: **Agricultural Cooperative Promotion Project**

(Title of Project)

This is to inform you that the cargo mentioned below have been duly examined and received.

1. Name of Vessel or Aircraft	<u>HAI Lee</u>
2. Unloading Date and Port	<u>6<sup>th</sup> May 1986 Bangkok Port</u>
3. Cargo's Arrival Date at Project Site	<u>30<sup>th</sup> May 1986</u>
4. Bill of Lading No.	<u>YB - 25</u>
5. Invoice No. total items	_____
6. Packing List Package No.	<u>K10 - K13</u>
7. Insurance Policy No.	_____
8. Main Equipment worth CIF. _____	_____
9. Date of Examining Goods	<u>4<sup>th</sup> June 1986</u>
10. Place of Examining Goods	<u>CPD, Engineering Center No 3 Nakhonrat</u> <u>chasima</u>
11. Conditions of Goods	<u>Good</u>

Examining Officer

Pany Poomdee

Expert in charge

[Signature]

Date:

# JAPAN INTERNATIONAL COOPERATION AGENCY

P.O. Box 216, Mitsui Bldg., Shinjuku-ku, Tokyo, Japan.

## PACKING LIST

Consigned to : DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION, No : .....  
 KRONG KASEM ROAD, BANGKOK, THAILAND. Date : APRIL 21, 1986  
 (FOR THE AGRICULTURE COOPERATIVE PROMOTION PROJECT) Shipped per "HAI LEE"

Shipping Mark : ACP from YOKOHAMA, JAPAN  
 SIDE MARK to BANGKOK  
 TECHNICAL COOPERATION BY THE GOVERNMENT OF JAPAN via .....  
 on APRIL 21, 1986  
 DTEC/BANGKOK  
 C/No. K10-K13  
 MADE IN JAPAN



C/Nos.	Description of Goods	Quantity	Weight		Measurement
			net	gross	
C/NO.K10-K13	EQUIPMENTS FOR TECHNICAL COOPERATION OF JICA. - DETAILS ARE AS PER ATTACHED SHEET - TOTAL: 4 PACKAGES	1 UNIT & 3 LOTS		16,480 KGS	48.138 M3
JAPAN INTERNATIONAL COOPERATION AGENCY 					

E. & O. E



JAPAN INTERNATIONAL COOPERATION AGENCY

P.O. Box 216, Mitsui Bldg., Shinjuku-ku, Tokyo, Japan.

( 1 )

C/Nos.	Description of Goods	Quantity	Weight		Measurement
			net	gross	
	EQUIPMENTS FOR TECHNICAL COOPERATION OF JICA.			(KG)	(M3)
K10 (UNIT)	KOMATSU PC150LC-3 EXCAVATOR MAIN BODY.	1 UNIT		12,320	31.973
K11 (CRATE)	KOMATSU PC150LC-3 EXCAVATOR BOOM AND ARM	( 1 )		2,450	11.746
K12 (BARE)	KOMATSU PC150LC-3 EXCAVATOR BUCKET	( 1 )		460	1.517
K13 (CASE)	SPARE PARTS FOR KOMATSU PC150LC-3 EXCAVATOR.	1 LOT		1,250	2.902
	SPARE PARTS FOR KOMATSU D41P-3 SWAMP BULLDOZER.	1 LOT			
	SPARE PARTS FOR KOMATSU D31P-17A SWAMP BULLDOZER.	1 LOT			
	TOTAL: 4 PACKAGES -----	1 UNIT & 3 LOTS -----		16,480 KGS -----	48.138 M3 -----

*Forza Promolec*  
*Shate*

# JAPAN INTERNATIONAL COOPERATION AGENCY

INTERNATIONAL COOPERATION AGENCY  
16, Mitsui Bldg., Sh. Q. Box 216, Mitsui Bldg., Shinjuku-ku, Tokyo, Japan.

NO. 1

( 1 )

## INVOICE

Quantity      Unit Price      Amount

MOTOR VEHICLES AND SPARE PARTS

Consigned to: "NISSAN" Diesel Dump Truck 3 Ton, Model: CKA21EDN with 3 Ton Capacity, Drop Gate, Standard Test, REGIS: 00018 TECHNICAL COOPERATION BY THE GOVERNMENT OF JAPAN  
 PROJECT, C/O DEPARTMENT OF TECHNICAL AND ECONOMIC COOPERATION, KRONG KASEM ROAD, BANGKOK, THAILAND.  
 Date: May 12, 1986

Spare Parts for Model: CKA21EDN (10% of vehicle value) - details are as per attached sheets.  
 Shipping Mark: "NISSAN" Diesel Dump Truck 3 Ton, Model: CKA21EDN with 3 Ton Capacity, Drop Gate, Standard Test, REGIS: 00018 TECHNICAL COOPERATION BY THE GOVERNMENT OF JAPAN  
 Spare parts for Model: CKA21EDN (DTEC/BANGKOK) Value - details are as per attached sheets.  
 C/No. II-1, III-1  
 MADE IN JAPAN  
 Submersible Pump "SEARA MODEL" 80 SS 33.7

Shipped per "LAUREL NO. 1" from Yokohama, Japan to Bangkok, Thailand via Direct on May 12, 1986

Export Licence No. 4 sets ¥270,000.- ¥1,080,000.-



**SIDE MARK**

056-00088

Nos.	Description of Goods	Quantity	Unit Price	Amount
	Diesel Generator Model: NES 25BN with Standard Accessories and Tool Set	1 set		¥1,300,000.-
	<u>EQUIPMENT FOR TECHNICAL COOPERATION OF J.I.C.A.</u>			
	<u>EX-GO DOWN YOKOHAMA</u>			
	<u>MOTOR VEHICLES AND OTHERS</u>	2 units, 2 lots,		¥16,380,000.-
	TOTAL: 2 units, 2 lots, and 5 sets only. - details are as per attached sheets. -	5 sets		¥16,380,000.-
	ขอรับรองว่า เป็นภาพถ่ายจากต้นฉบับจริง  8.243			
			SHIPPING CHARGE	¥ 934,356.-
			OCEAN FREIGHT (US\$8,706.92 x @¥165.20)	¥ 1,438,383.-
			INSURANCE PREMIUM (90 days...0.4925 %)	¥ 92,817.-
	TOTAL : 2 units, 2 lots, and 5 sets only.		C.I.F. BANGKOK	¥18,845,556.-
	JAPAN INTERNATIONAL COOPERATION AGENCY			
	 P.F. KATSUKE ARITA PRESIDENT 8 240			

5 8.8. 2529



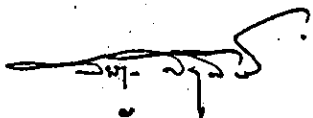
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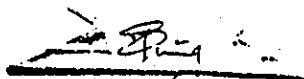
INTERNATIONAL COOPERATION AGENCY  
16, Mitsui Bldg., Shinjuku-ku, Tokyo, Japan.

( 1 )

	Description of Goods	Quantity	Unit Price	Amount
	<u>MOTOR VEHICLES AND SPARE PARTS</u>			
1.	"NISSAN" Diesel Dump Truck 12 Ton, Model:CWA53HDN with 12 Ton,8M3 Capacity, Dropside Gate,Standard Tool Kit. CHASSIS NO.: 00053 ENGINE NO.: 012895	system / 1 unit		¥7,500,000.-
2.	Spare Parts for Model:CWA53HDN (10% of Vehicle Value) - details are as per attached sheets.-	1 lot		¥ 750,000.-
3.	"NISSAN" Diesel Dump Truck 8 Ton, Model:CKA21EDN with 8 Ton,5.3M3 Capacity, Dropside Gate,Standard Tool Kit. CHASSIS NO.: 00018 ENGINE NO.: 115535	system 2 1 unit		¥5,230,000.-
4.	Spare Parts for Model:CKA21EDN (10% of Vehicle Value) - details are as per attached sheets.-	1 lot		¥ 520,000.-
	<u>MACHINERY N.O.S.</u>			
1.	Submersible Pump "EBARA MODEL" 80 ES 53.7	4 sets	¥270,000.-	¥1,080,000.-
2.	Diesel Generator Model:NES 25BN with Standard Accessories and Tool Set Serial No.: E1338-X Engine No.:SD22-399742	1 set		¥1,300,000.-
	TOTAL : 2 unit, 2 lots and 5 sets .....			¥16,380,000.-



  
 ขอรับรองว่า  
 เป็นภาพถ่ายจากต้นฉบับจริง

  
 ๓๓๖ 3

8 240



文書No	ZK86-177	発信日	S61 - 8 - 18	○ /
処理期限	- - -	発信者 (担当 内線)		
受付No				

JICA エキスパート  
加藤孝宏様

(株)小松製作所  
バンコク事務所  
前山義人

幣社製D31P湿地リドラー修理の件

前記の件、8月5日修理が完了致しました。D31P (S/N 43589)の  
故障原因等につき、ご報告致します。

記

1. 故障原因

上転輪のまわりに付着した土の除去が不十分なため、土が固まり、  
上転輪がまわらなくなったことにより、上転輪の異常摩耗が発生  
したと推定されます。

2. 依頼事項

事故の再発を防ぐため、毎日、作業終了後、足廻りに付着した  
土の除去を行って戴くようお願い致します。

以上



# บริษัท บางกอกมอเตอร์เวิร์คส์ จำกัด

## ฝ่ายบริการและโรงงาน

โทร. 511-2711

ใบสั่งงานที่: (ORDER NO.) \_\_\_\_\_

งานที่: (JOB NO.) 41164/29

วันที่ 23 กค. ๖๙  
Date

นาย ศรีรงค์ สุ่มเคี่ยม  
Mr.

เป็นช่างของบริษัท บางกอกมอเตอร์เวิร์คส์ จำกัด  
Mechanic of BANGKOK MOTOR WORKS CO., LTD.

ชื่อเจ้าของรถ ค. หงษ์สวัสดิ์  
Owner

ที่อยู่ ค. หงษ์สวัสดิ์  
Address

สถานที่ทำงาน ค. หงษ์สวัสดิ์ ค. หงษ์สวัสดิ์  
Location of Work

แบบ D 31P-17  
Me

หมายเลขเครื่องยนต์  
Engine No.

หมายเลขตัวรถ 37589  
Serial No.

เลขชั่วโมงทำงาน 181 ชั่วโมง  
Hour Meter Hrs.

ชนิดของงาน ตัวเดิน  
Type of Work

สภาพและสาเหตุการชำรุดเสียหายโดยละเอียด  
Condition & Assumed Cause

การแก้ไข  
Repairs

TOP CARRIER ROLLER รั่วซึม

การแก้ไข

TOP CARRIER ROLLER รั่วซึม  
เพราะเกิดจากดินเข้าไปอุดตันที่ ROLLER  
ในสกรูของท่อน้ำ  
เพราะใช้หัวฉีด หัวฉีด 2 หัว  
สกรูท่อน้ำไม่ปกติ.

\* ไม่พบว่า CONTROL LEVER รั่วซึม +  
\* เบ้าหัว BACK HOE รั่วซึม \*

ตามรายการต่างๆข้างบนนี้ ช่างได้ทำการซ่อมเสร็จ

งานได้เสร็จเมื่อวันที่ ๒3 กค. ๖๙ เวลา \_\_\_\_\_ น.  
Works Finished on Time

เรียบร้อยแล้วเป็นที่พอใจข้าพเจ้าทุกประการ

อนึ่ง ถ้าหากเกิดเหตุขัดข้องภายหลัง ข้าพเจ้าจะ

แจ้งให้บริษัททราบภายใน 5 วัน หลังจากวันส่งมอบ

All above repairs have been satisfactorily carried out by  
your mechanics. Should any problem be found hereafter,  
you will be notified within 5 days after date of delivery.

ลงนามผู้สั่งซื้อ  
Works Ordered by. Takahir KATO

ลงนาม  
Sig. of Mech. [Signature] ช่างผู้ตรวจซ่อม



# บริษัท บางกอกมอเตอร์เวิร์คส์ จำกัด ฝ่ายบริการและโรงงาน

โทร. 511-2711

ใบสั่งงานที่: (ORDER NO.) 4207/310029

งานที่: (JOB NO.) \_\_\_\_\_

วันที่ 5 มี.ค. ๕๙  
Date

ชื่อช่าง  
Mr. ประพนธ์ 11 ส.ค. ๕๘

เป็นช่างของบริษัท บางกอกมอเตอร์เวิร์คส์ จำกัด  
Mechanic of BANGKOK MOTOR WORKS CO., LTD.

ชื่อเจ้าของรถ สุพันธ์ รัตติ 3  
Owner

ที่อยู่ อ. เมือง น. นครราชสีมา  
Address

สถานที่ทำงาน สุพันธ์ รัตติ 3  
Location of Work

แบบ 1100 cc D 31 P  
Model

หมายเลขตัวรถ 34589  
Serial No.

เลขชั่วโมงทำงาน 183.5 ชั่วโมง  
Hour Meter Hrs.

ชนิดของงาน \_\_\_\_\_  
Type of Work

### สภาพและสาเหตุการชำรุดเสียหายโดยละเอียด Condition & Assumed Cause

1. หัวฉีดสกปรก 500 cc หัวฉีด - ยาว มีดิว  
2. ระเบิด 500 cc หัวฉีด

### การแก้ไข Repairs

1. เปลี่ยน หัวฉีด 500 cc หัวฉีด - ยาว  
2. เปลี่ยน หัวฉีด 500 cc หัวฉีด - ยาว  
3. ทดสอบด้วยหัวฉีด หัวฉีด 500 cc  
4. ใส่น้ำมันเครื่องใหม่  
5. อัดจารบี 150 cc หัวฉีด หัวฉีด 500 cc  
6. ใส่น้ำมันเครื่องใหม่

ตามรายการต่างๆข้างบนนี้ ช่างได้ทำการซ่อมเสร็จ  
เรียบร้อยแล้วเป็นที่พอใจข้าพเจ้าทุกประการ  
อนึ่ง ถ้าหากเกิดเหตุขัดข้องภายหลัง ข้าพเจ้าจะ  
แจ้งให้บริษัททราบภายใน 5 วัน หลังจากวันส่งมอบ

งานได้เสร็จเมื่อวันที่ 5 มี.ค. ๕๙ เวลา \_\_\_\_\_  
Works Finished on \_\_\_\_\_ Time

All works have done with satisfactory, you are-  
expected to notify us of any complaint within 5 days after  
delivery date

ชื่อคนสั่งซื้อซ่อม \_\_\_\_\_  
Works Ordered by.

ลงนาม \_\_\_\_\_ ช่างผู้ตรวจซ่อม  
Sig. of Mech.

ลูกค้า

เลขที่ 6595

เขียนที่

วันที่

เรียน ผู้จัดการฝ่ายบริการ ฯ บริษัท บางกอกมอเตอร์เวย์ออส จำกัด

ตามที่ท่านได้จัดส่งนาย

ข้างของบริษัท ฯ ไปตรวจซ่อมรถ

แบบ ..... หมายเลขรถ

หมายเลขเครื่อง

ตั้งแต่วันที่ ..... ถึงวันที่

ตามงาน เลขที่

มีค่าน้ำมันที่ข้าพเจ้าส่งซ่อมสำเร็จเรียบร้อยแล้ว ตามรายการอะไหล่ - ค่าแรง - ค่าพาหนะ - ค่าที่พัก และค่าใช้จ่าย

อื่น ๆ ดังรายการที่รวบรวมได้ในขั้นต้นดังต่อไปนี้

- 1. ค่าอะไหล่ 6,096 บาท
  - 2. ค่าแรง 2000 บาท
  - 3. ค่าพาหนะข้าง
  - 4. ค่าที่พักข้าง
  - 5. ค่าอื่น ๆ
- รวม 8506 บาท

(แปดพัน หกร้อย หกบาทถ้วน)

ข้าพเจ้าตกลงจ่ายเงินให้แก่บริษัท ..... ตามจำนวนที่ปรากฏในขั้นต้นข้างบนนี้ในทันทีที่งานเสร็จเรียบร้อยแล้ว และข้าพเจ้ายินดีชำระเพิ่มเติมให้แก่บริษัท ฯ เมื่อบริษัท ฯ แจ้งและคิดราคา ออกใบส่งของเป็นการแน่นอนแล้ว และปรากฏว่าราคางานตาม ใบส่งของสูงกว่าจำนวนที่ข้าพเจ้าชำระไว้ในครั้งนี้

ลายเซ็น

Signature

ผู้ส่งซ่อมหรือผู้แทน

( Medoob Ungkri ) ตัวบรรจง

งานเลขที่

ดี/โอเลขที่

วันที่

บันทึกการรับชำระเงินค่าซ่อมจากลูกค้า

ค่าซ่อมครั้งนี้ข้าพเจ้า นาย ..... ข้างบริษัท ฯ

ได้รับชำระค่าซ่อมซึ่งจ่ายโดย นาย ..... เป็น

จำนวนเงิน ..... บาท ( )

เพื่อส่งมอบให้บริษัท ฯ ไว้แล้ว

ลงชื่อผู้รับเงิน

( )

ตำแหน่ง

หมายเหตุ 1. ลูกหนี้มิได้รับ Credit จาก บริษัทฯ จะต้องชำระด้วยเงินสดไม่รับชำระด้วยเช็ค  
2. ผู้แทนหรือผู้ส่งซ่อมที่มีได้เป็นเจ้าของรถจะต้องมีใบมอบอำนาจจากเจ้าของรถให้ทั่วถาวรลงนามส่งซ่อมได้ แนบเป็นหลักฐานด้วย



表リ30-5 修理費明細書

**BANGKOK MOTOR WORKS CO., LTD.**

SERVICE DEPARTMENT



Name: **Thai Takenaka International Ltd. Job. 41207/29**  
 (JICA) No. 138 Silem, Bangkok  
 Address: *Thai Takenaka International*

NO. \_\_\_\_\_  
 Date: **August 4, 1986**  
 Cash \_\_\_\_\_  
 Credit \_\_\_\_\_

**REPAIR PART**

ITEM.	QUANTITY	PART NO.	DESCRIPTION	UNIT PRICE	AMOUNT
<b>D31P-17 CARRIER ROLLER REPAIRING COST</b>					
1	2Pcs	144-30-00040	Floating seal	820.-	1,640.-
2	2"	111-30-11411	Roller	2,450.-	4,900.-
3	2"	07000-03065	O'Ring	33.-	66.-
<b>Total Parts</b>					<b>6,606.-</b>
<b>Labour charged and transportation</b>					<b>2,000.-</b>
<b>Total</b>					<b>8,606.-</b>
(Total Bht. Eight Thousand Six Hundred and Six Only)					
WHEN WORK COMPLETED, PAYMENT CASH OR CREDIT					
LIST OF REPAIR PARTS (REPLACE)					
TRANSPORTATION CHARGES					
TOTAL					

Requisition No. \_\_\_\_\_ Delivery Note No. \_\_\_\_\_  
 Engine No. \_\_\_\_\_ Serial No. **D31P-17** Job No. **41207/29**  
 Received by: *[Signature]* customer Authorised by: *[Signature]*

ลูกค้า

ใบสั่งซ่อม

เลขที่  
NO.

บริษัท บางกอกมอเตอร์เวอคส์ จำกัด

1200 ถนนพหลโยธิน บางเขน กรุงเทพฯ

ฝ่ายบริการและโรงงาน

โทร. 5112711-9

Thai Takemura International Ltd

วันที่ DATE 29 กรกฎาคม 2559

คำสั่งงานเลขที่  
OUR JOB NO.

ชื่อลูกค้า (TICA)  
CUSTOMER

ที่อยู่ 138 Silom Bangkok  
ADDRESS

ยี่ห้อ  
MAKE

1 มอเตอร์

ชนิดรถ 031P-14

หมายเลขตัวรถ

หมายเลขเครื่องยนต์  
ENGINE NO.

โทร. ที่ทำงาน โทร. ที่บ้าน  
OFFICE TEL. RES. TEL.

บันทึกข้อความส่งซ่อมมาขอใบรับรถจากคุณวิระชัย

ลำดับที่ ITEM	รายการซ่อม	INSTRUCTIONS	ราคา
1	140-30-00010 Floating seal 2 (ชุด)	เปลี่ยนซีลและลูกสูบ	1,645.-
2	111-34-11111 Roller 2 ชุด	เปลี่ยนลูกกลิ้ง	1,900.-
3	07000-03065 O-Ring 2 "	เปลี่ยนโอริง	66.-
			6,606.-
	Labour charges and Transportation		2,000.-
	Customer Field		8,606.-

เมื่องานซ่อมเสร็จเรียบร้อยแล้วจะจ่ายเงินสด / WHEN WORK COMPLETED, PAID BY CASH  หรือเครดิต / OR CREDIT

ประมาณการค่าซ่อมส่วนข้างรถตามรายการข้างบน ESTIMATED COST OF REPAIR FOR THE ABOVE ITEMS	เป็นเงิน	บาท
1. ค่าอะไหล่ที่จะใช้ซ่อม SPARE PARTS	.....	.....
2. ค่าใช้จ่ายเบ็ดเตล็ด MISCELLANEOUS EXPENSES	.....	.....
3. ค่าซ่อมเชื่อมและกढ़บขพินเครื่องล่าง UNDERCARRIAGES REBUILDING	.....	.....
4. ค่าขนส่ง TRANSPORTATION CHARGES	.....	.....
5. ค่าใช้จ่ายเดินทางของช่าง TRAVELLING EXPENSES	.....	.....
6. ค่าแรงงานในการซ่อม LABOUR CHARGES	.....	.....
รวมประมาณค่าซ่อมเป็นเงิน TOTAL ESTIMATED	.....	.....

ประมาณค่าซ่อมไม่ถือว่าเป็นยอดเงินค่าซ่อมที่แน่นอน. บริษัทฯ จะคิดค่าซ่อมตาม ความเป็นจริง ซึ่งอาจจะสูงหรือต่ำกว่านี้ก็ได้

ข้าพเจ้าพร้อมทราบบันทึกข้อตกลงการส่งซ่อมตามรายละเอียดข้างต้น ไปส่งซ่อมฉบับนี้แล้ว.

ลงชื่อ (ชื่อลูกค้า) \_\_\_\_\_  
หน้าชื่อ

อนุมัติให้ดำเนินการได้

ผู้จัดการฝ่ายบริการและโรงงาน  
SERVICE MANAGER

## 第5章 施工管理について

## 第5章 施工管理

### 1. Inspection Committee

工事請負契約書に基づき下記の者がInspection Committee のメンバーとしてJICAバンコク所長より任を受けた。(P.265)

Mr. Eitaro Mitoma	Assistant Resident Representative, JICA Bangkok office
Mr. Sizuo Sato	Team Leader, Agricultural Cooperative Promotion Project
Mrs. Wannee Ratanawaraha	Chief, Project Management Office, CPD
Mr. Panya Promdee	Chief, Engineering Center No.3, CPD
Mr. Hirohiko Nozoe	JICA expert
Mr. Takahiro Kato	- do -

### 2. 施工管理

#### (1) 施工前の手続

コンサマキ地区での11ヶ所の小規模溜池群はすべて営農集団の私有地に建設したため、工事期間中の地元住民の協力要請等についてや個々の溜池の位置、規模あるいは溜池への流入工の位置については、事前にletterあるいは同意書を作成し、工事期間中あるいは施工後の施設使用に際してトラブルのないように配慮した。

また、チャカラ地区での河川構造物建設にあっても河川管理者等への事前了承を得るための手続をコンサマキ地区と同様に行った。

#### (2) 工程管理

工程管理は本モデルインフラ整備工事調査実施設計書(昭和61年1月)を基本とし、契約書類 (Terms and Conditions of the Contract Section 2. 2-1 Work schedule) に基づき施工業者から提出された工事実施工程表に沿って行われた。また、工事工程を詳細にわたり確認するため Inspection Committee と施工業者の間でWeekly Report 及び Request for Approval をとりかわし、工事状況の把握に努めた。

本モデルインフラ工事はKong, Chakkarat の2地区からなり、両地区の距離も100 Kmと大きく離れている。インフラ工事はKong地区での溜池工事、Chakkarat 地区での河川改修工事からなるが、Kong, Chakkarat 両地区ともに、その工事現場は水田内にあり、資材運搬等のための仮設道路はすべて水田を通る必要があった。このことより、以下の諸問題をふまえて工事に着手する必要があった。

## 1) Kong地区

- 仮設道路は極めて排水条件の悪い水田を通るため、1降雨により3～4日の工事ストップの可能性がある。主要道路より地区内最遠溜池までの仮設道路延長は1.2 kmに達する。
- 地区の稲作は天水依存のため、稲作（なわ代，田植え）時期は確定されておらず、降雨が十分にあれば本工事工期中期にあたる7月においても稲作を行うということより、主要道路から溜池建設位置までの仮設道路路線については比較的排水条件がよく、早期の稲作に影響を与えず、また、地区内には溜池建設とは無関係（非受益者）は農民の水田が多く存在するため、その農民の工事に対する合意を得ること等を考慮し、地元農民と慎重に協議し、決定する必要がある。
- 溜池，仮設道路に湛水がある場合（降雨，地下水等）、すみやかに排水する必要がある。
- 人夫として地元農民を雇用することがプロジェクトの主旨に沿うものであるが、工事が農繁期と重なることが十分考えられる。その場合において工事に支障をきたさないだけの人夫を確保することが可能か。

## 2) Chakkarat 地区

- Kong地区と同様に、仮設道路は極めて排水条件の悪い水田を通るため、降雨による現場への資機材搬入の遅れが懸念される。
- 河川内構造物の建設であるため、洪水等の発生による構造物への被害、また、河川流域面積が800 km<sup>2</sup>と非常に大きいことより1降雨による河川流出時間の工期に及ぼす影響が心配される。
- 降雨，河川水等により河川内に湛水がある場合はすみやかに排水する必要がある。

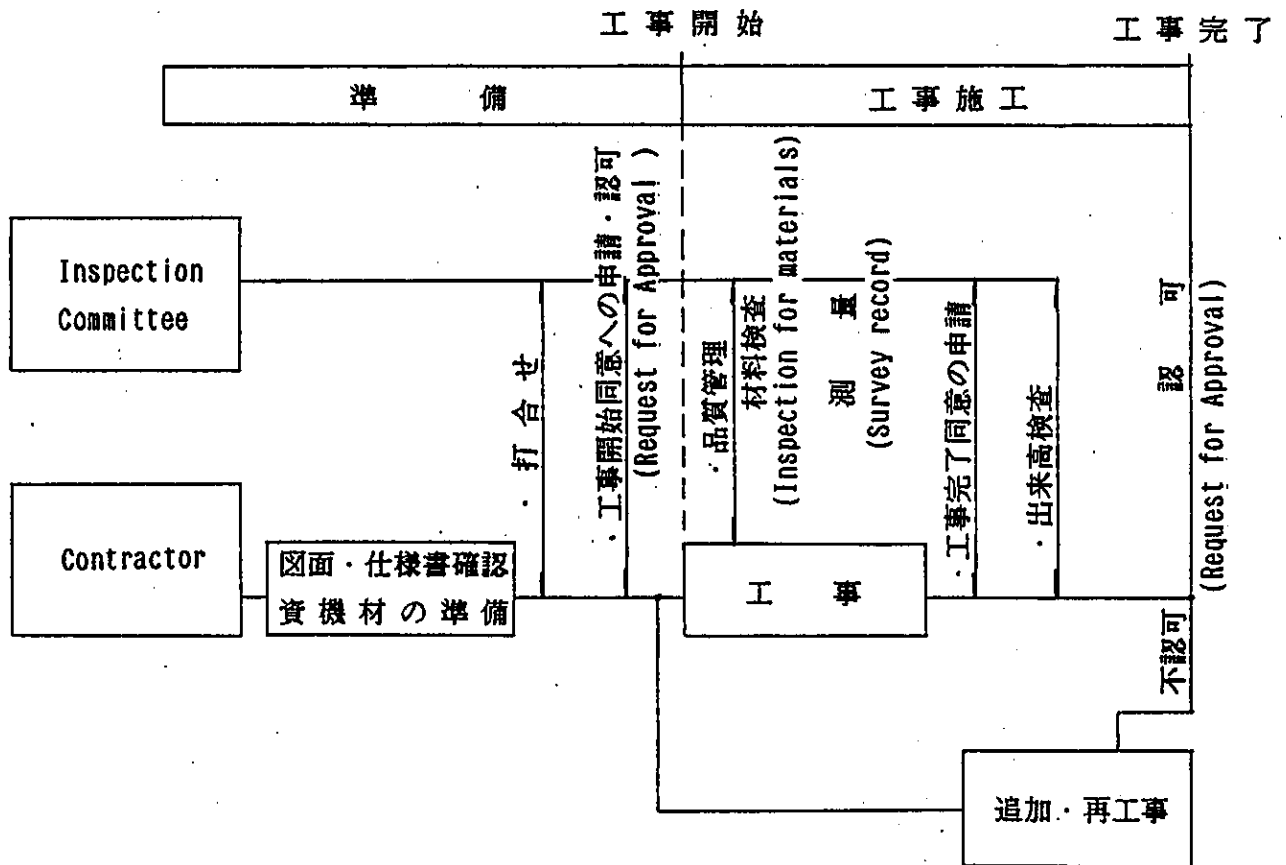
上記諸問題を考慮し、本工事工程はKong地区での溜池掘削工事，Chakkarat 地区での河川改修工事におけるコンクリート打設工事を乾期である5月中旬終了を目標とし、Chakkarat 地区コンクリート工事終了次第、Kong地区の取水工（Inlet），斜面保護工（Slope protection）工事を開始するように計画した。また、仮設道路の復旧は田植え時期等を考慮し、効率よくその復旧を行えるようにその路線を計画した。

実際の工事にあたっては、仮設道路通行不能日数は20日間程度であったが工事工程に大きく影響を与えることはなく、無事工期内工事完了をすることができた。

中間検査は5月29日，竣工検査は8月27，28日に実施された。これらの資料及び工事実施状況報告書をP.293より示す。

### (3) 品質管理

施工業者が設計内容、設計図面を十分理解し、工事を円滑に進めることができるように以下に示す事務手続をとった。



#### 1) 構造物の位置、寸法、標高の確認

##### • Kong地区溜池工事

溜池は農協組合員の水田内に建設されるため、盛土等が非組合員の水田に入らないように十分留意すると同時に、溜池の建設位置は複数農民の水田の境界となることより溜池建設用地面積が各受益者所有の土地において均等となるようにその位置を受益者立会いのもと決定した。また、溜池掘削量、掘削深及び掘削形状の的確な把握が最重要とされることより施工前、施工途中、施工後における測量を行い、そのために必要な測量技術者の常駐を義務づけた。

##### • Chakkarat 地区河川改修工事

水路工事、ゲート据付工事、河川堤防掘削、法面ライニング工事等各工事で構造物の位置、寸法及び標高を確認するため測量技術者を配置し、工事進行に従い随時測量を行い、確認を行った。

## 2) 土工事

### ・ 溜池工事 (Kong)

溜池掘削量は表土掘削を含めて45,000 m<sup>3</sup>に達する。表土掘削は溜池盛土面の畑地としての利用を考慮し、“表土扱い”実施したものである。

以下に溜池施工順序・施工機械を示す。

溜池施工順序	ブルドーザー	バックホウ	クラムシェル	ローラー	ダンプトラック	人 力
1. 表土掘削	○	○				
2. 表土仮置き		○			○	
3. 溜池掘削		○	○			
4. 盛土	○	○	○			
5. 盛土転圧				○		
6. 表土盛土, 転圧	○	○				○
7. 法面整形		○				○

1. 表土掘削 は当初ブルドーザのみを計画していたが、水田耕土部が堅固で作業効率が非常に悪いためバックホウとダンプトラックを併用し、その掘削を行った。5. 盛土転圧 はローラーを用い、含水比が不足する場合にはタンク車により散水を行った。6. 表土盛土, 転圧 は溜池盛土の畑地としての利用を考慮し、ブルドーザによる敷均し, 転圧を行った。

#### a) 土質試験

盛土材（現場掘削土）の力学的性質を把握し、盛土の施工管理基準を設定するため、次に示す土質試験を行った。

なお、同土質試験は“ロー・ポー・チョー”（ナコンラチャシマ）に依頼した。

- ・ 土粒子の比重試験 (ASTM D854)
- ・ 土の粒度試験 (ASTM D422)
- ・ 土の液塑性限界試験 (ASTM D423, 424)
- ・ 突固めによる締固め試験 (ASTM D698 Method A)

各試験結果をP.323より示す。

土質試験結果より、現場掘削土は日本統一土質分類において上層1.5 ~ 2 mにおいては砂粒土に分類される“SC”であり、それ以下(3~5m)では細粒土に分類される“CL”若しくは“ML”である。

土の粒度試験より、上層1.5 ~2 mでは粒度のバラツキが少なく粒度分布がよいと考えるが、下層3 ~5 mでは粒度のバラツキが大きくなっている。また、締固め試験からもわかるように含水比の少しの変化で土の性質が大きく変化する。これらの土の性質から判断し、実際の施工では以下の点に留意した。

- 盛土の締固め管理基準としてTechnical Specificationにある必要密度は突固めによる土の締固め試験で得られた最大密度の90%とし、 $\gamma_d = 1.48 (g/cm^3)$ とした。
- 掘削土のまき出し、締固めは、溜池掘削深により土の粒度分布が大きく異なり、また、溜池深部では土の塑性指数 $I_p$ が小さく粘着性に欠け、盛土材としてあまり適さないが、溜池掘削土の盛土高は1.5 m程度と小さいことより、上層(1~2 m)の土と混合することにより盛土の安定を図ることとした。掘削、まき出しに際しては、上層と下層の掘削土がよく混合されるように留意すると同時に、転圧に際しては土の含水比が最適含水比(若しくはそれ以上)になるようにし、含水比試験を随時行いそのチェックを行った。掘削土の自然含水比はほぼ最適含水比を示したが、2~3の溜池において最適含水比を下回ったため、タンク車による散水、再度のまき出し後、転圧を行った。

### 3) コンクリート工事

Kong地区溜池Slope protectionのコンクリートフレームは工場生産とし、その他Kong地区溜池Inlet, Chakkarat 地区河川改修コンクリート工事についてはすべて現場練り(ポータブルミキサー及び人力)で行った。

コンクリートの品質管理はTechnical Specificationに基づき施工業者から提出されたMixing Designに従い投入するセメント、骨材及び水の計量に注意するとともに、コンクリートの圧縮試験等を実施した。

### (3) 安全管理

本工事は特に危険をと考えられる工事がないと判断されたため、工事関係者への安全管理等についての講習は行わなかったが、無事故で工事完了を行うことができた。



### 3. 工事派遣カウンターパートについて

CPD独自による工事発注、施工を目的として事業実施に必要な調査、設計、施工、施工管理技術者の育成を目指し、本モデルインフラ工事に対し、CPDより次頁に示すカウンターパートの派遣受入れ要請があった。しかし、実際の工事に際してのカウンターパート派遣人数は2人とどまり、派遣の延日数も20日間程度と非常に少なく、全体工事を通しての技術者育成に対しては満足いくものではなかった。

カウンターパート派遣人数、日数の少なかった理由を以下に示す。

1. カウンターパートは個々にCPDにおける業務を持っており、本インフラ工事にあたる時間的余裕に欠けていた。
2. 各カウンターパートの専門分野が限定されており、160日間に及ぶ工事の一貫した調査、設計、施工の中においても適材適所にカウンターパートを配置することは困難であった。
3. 本モデルインフラ工事に精通したカウンターパートが少なかった。

	<u>Name of Counterpart</u>	<u>Position</u>	<u>Tel.</u>
	<u>รายชื่อผู้ร่วมงาน</u>	<u>ตำแหน่ง</u>	<u>โทร.</u>
1.	Mr. Chuchad Losakul นายชูชาติ โล่ห์สกุล	Survey engineer	2828725
2.	Mr. Apiwat Wongsomboon นายอภิวัฒน์ วงศ์สมบูรณ์	Engine engineer	2821226
3.	Mr. Panya Promdee นายปัญญา พรหมดี	Chief, Engineering Center 3	243010
4.	Mr. Anan Songchai นายอนันต์ แสงชัย	Civil engineer	243010
5.	Mr. Somchai sarananusorn นายสมชาย สรรณานุสรณ์	Engine engineer	243010
6.	Mr. Chusak Losagulpong นายชูศักดิ์ โล่ห์กุลพงษ์	Engineer	2828725

## 第 6 章 資料編

6-1 予定価格調書、予定価格下調書及び内訳書。

予 定 価 格 調 書

金 3,085,000 パーツ

件 名 農協振興計画モーターの整備事業費

上記のとおり決定する。

昭和61年2月26日

国 際 協 力 事 業 団

契約担当役

バンコック事務所

所長

後藤 敬 基

予 定 価 格 下 調 書

金 3085,000      パーツ

件 名 曲 農協 堰 興 計 画  
モデル 工 場 整 備 事 業 費 に 関 し て

上記のとおり積算しました。

内訳は、別紙予定価格下調内訳書のとおりです。

昭和 61 年 2 月 26 日

国 際 協 力 事 業 団

バンコック海外事務所

担当

工務課長



CONSTRUCTION COST

A. Direct

Cost

Kong Samaki

- |                               |                    |
|-------------------------------|--------------------|
| 1. Construction of Farm ponds | <u>1,745,000</u> ₱ |
| 2. Appertenant structure      | <u>445,000</u> ₱   |

Chakarat

- |                          |                  |
|--------------------------|------------------|
| 3. Outlet works          | <u>147,000</u> ₱ |
| 4. Appertenant structure | <u>25,000</u> ₱  |
| 5. Diversion works       | <u>184,000</u> ₱ |
| 6. Appertenant structure | <u>25,000</u> ₱  |

<u>Sub-Total</u>	<u>2,571,000</u> ₱
------------------	--------------------

B. Indirect

- |             |                  |
|-------------|------------------|
| 1. Overhead |                  |
| 2. Profit   |                  |
| 3. Tax      | <u>514,000</u> ₱ |

<u>Sub-Total</u>	<u>514,000</u> ₱
------------------	------------------

<u>Total</u>	<u>3,085,000</u> ₱
--------------	--------------------

<u>Round off</u>	<u>(-)</u> ₱
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<u>Construction cost</u>	<u>3,085,000</u> ₱
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B I L L O F Q U A N T I T I E S

No. 1

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
Kong Samaki Area						
1. Construction of farm pond						
1-1. Farm pond Type A (estimated 2 places)						
101	Excavation (top soil)	cum	1,080	14.6	15,768	Back Hoe (0.35m <sup>3</sup> ) Dull Dozer (11Ton)
102	Excavation	cum	740	14.6	10,804	
103	Excavation	cum	2,600	32.3	83,980	
104	Spreading (Top soil)	cum	1,080	9.1	9,828	
105	Compaction	cum	4,420	6.8	30,056	
106	Smoothing face of excavated and filled up	sqm	2,460	1.4	3,444	
107	Sub-Total				153,880	(A)
1-2. Farm pond Type B-1 (estimated 2 places)						
108	Excavation (top soil)	cum	1,440	14.6	21,024	
109	Excavation	cum	1,100	14.6	16,060	
110	Excavation	cum	3,800	32.3	122,740	
111	Spreading	cum	1,440	9.1	13,104	
112	Compaction	cum	6,340	6.8	43,112	
113	Smoothing face of excavated and filled up	sqm	2,920	1.4	4,088	
114	Sub-Total				220,128	(B)



B I L L   O F   Q U A N T I T I E S

No. 2

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
1-3.	Farm pond Type B-2 (estimated 3 places)					
115	Excavation (top soil)	cum	2,700	14.6	39,420	
116	Excavation	cum	2,040	14.6	29,784	
117	Excavation	cum	7,350	32.3	237,405	
118	Spreading	cum	2,700	9.1	24,570	
119	Compaction	cum	12,090	6.8	82,212	
120	Smoothing face of excavated and filled up	sqm	4,920	1.4	6,888	
121	Sub-Total				420,279	(C)

B I L L   O F   Q U A N T I T I E S

No. 3

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-4	Farm pond Type C (estimated 4 places)			(B)	(B)	
122	Excavation (top soil)	cum	4, 520	14.6	65, 992	
123	Excavation	cum	4, 240	14.6	61, 904	
124	Excavation	cum	16, 000	32.3	516, 800	
125	Spreading	cum	4, 520	9.1	41, 132	
126	Compaction	cum	24, 760	6.8	168, 368	
127	Smoothering face of excavated and filled up sqm	sqm	9, 680	1.4	13, 552	
128	Sub-Total				867, 748	(D)
1-5	Miscellaneous Construction	LS	/		83, 101	(E)
	Total				1, 745, 136	(A)+(B)+(C)+(D)+(E)
				round off	1, 745, 000	

B I L L O F Q U A N T I T I E S

No. 4

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2. Appertenant structure						
2-1. Diversion canal of Type A (estimated 4 places)						
201	Excavation	cum	104	16.6	1,726	
202	Smoothing face of excavated	sqm	130	1.4	182	
203	Lining concrete	cum	20.4	1,119.6	22,839	
204	Plain concrete	cum	1.6	997.8	1,596	
205	Wooden form	sqm	13.6	326.0	4,433	
206	Slope protection	sqm	200.0	147.4	29,480	
207	Sub-total				60,256	(A)
2-2. Diversion canal of Type B (estimated 4 places)						
208	Excavation	cum	122	16.6	2,025	
209	Smoothing face of excavated	sqm	153	1.4	214	
210	Lining concrete	cum	24.0	1,119.6	26,870	
211	Plain concrete	cum	1.6	997.8	1,596	
212	Wooden form	sqm	3.4	326.0	1,108	
213	Slope protection	sqm	200	147.4	29,480	
214	Sub-total				61,293	(B)

B I L L O F Q U A N T I T I E S

No. 5

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-3.	Diversion canal of Type B-2	(estimated	6 places)	(B)	(B)	
215	Excavation	cum	209	16.6	3,469	
216	Smoothing face of excavated	sqm	263	1.4	368	
217	Lining concrete	cum	41.4	1,119.6	46,351	
218	Plain concrete	cum	2.4	997.8	2,394	
219	Wooden form	sqm	20.4	326.0	6,650	
220	Slope protection	sqm	300.0	147.4	44,220	
221	Sub-total				103,452	(C)

B I L L O F Q U A N T I T I E S

No. 6

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-4	Diversion canal of Type C (estimated 11 places)			(B)	(B)	
222	Excavation	cum	705	16.6	11,703	
223	Smoothering face of excavated	sqm	757	1.4	1,059	
224	Lining concrete	cum	79.2	1,119.6	88,672	
225	Plain concrete	cum	4.4	997.8	4,390	
226	Wooden form	sqm	37.4	326.0	12,192	
227	Slope protection	sqm	650	147.4	81,070	(D)
228	Sub-Total				199,086	
2-5	Miscellaneous construction	LS	/		21,204	(E)
	Total				445,291	(A)+(B)+(C)+(D)+(E)
				round off	445,000	

B I L L O F Q U A N T I T I E S

No. 7

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
Chakarat				(B)	(B)	
3. Outlet works						
3-1. Repair of existing bank						
301	Excavation (top soil)	cum	110	28.0	3,080	
302	Excavation	cum	50	28.0	1,400	
303	Hauling	cum	110	15.4	1,694	
304	Hauling	cum	50	15.4	770	
305	Compaction	cum	340	14.8	5,032	
306	Smoothing face of filled up	sqm	240	1.4	336	
307	Sub-total				12,312	(A)
3-2. Outlet works						
308	Excavation (top soil)	cum	190	28.0	5,320	
309	Excavation	cum	610	28.0	17,080	
310	Hauling	cum	290	28.0	8,120	
311	Hauling	cum	100	15.4	1,540	
312	Hauling	cum	520	15.4	8,008	
313	Compaction	cum	100	14.8	1,480	
314	Smoothing face of excavated and filled up	sqm	350	1.4	490	

B I L L O F Q U A N T I T I E S

No. 8

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
315	Reinforced concrete	cum	16.7	1,080.8 (B)	18,049 (B)	
316	Reinforcing steel bar	t	0.5	12,041.0	6,020	
317	Lining concrete	cum	43.0	1,119.6	48,142	
318	Wooden form	sqm	30-1	326.0	9,812	
319	Sub-total				124,061 (B)	
3-3.	Miscellaneous construction works	Ls.	/		10,909 (C)	(8%)
	Total				147,282 (A)+(B)+(C)	
4.	Appertenant Structure	Ls.	/	round off	147,000	
					25,000	Gate setting and test

B I L L O F Q U A N T I T I E S

No. 9

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
5.	Division works					
5-1.	Repair of existing bank					
501	Excavation (top soil)	cum	180	28.0	5,040	
502	Excavation	cum	200	28.0	5,600	
503	Compaction	cum	200	14.8	2,960	
504	Hauling	cum	180	15.4	2,772	
505	Hauling	cum	200	15.4	3,080	
506	Smoothing face of excavated and filled up	sqm	480	1.4	672	
507	Sub-total				20,124	(A)
5-2.	Division works					
508	Excavation (top soil)	cum	90	28.0	2,520	
509	Excavation	cum	140	28.0	3,920	
510	Compaction	cum	160	14.8	2,368	
511	Hauling	cum	70	15.4	1,078	
512	Hauling	cum	160	15.4	2,464	
513	Smoothing face of embankment and filled up	sqm	120	1.4	168	
514	Reinforced concrete	cum	41.6	1,080.8	44,961	
515	Lining concrete	cum	47.8	1,119.6	53,516	



B I L L O F Q U A N T I T I E S

No.10

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
516	Wooden form	sqm	90.5	326.0	29,503	(B)
517	Reinforcing steel bar	t	1.2	12,041.0	14,449	(B)
518	Sub-total				154,947	(B)
5-3.	Miscellaneous construction works	Ls.	/		9,628	(C) (5.5%)
	Total				187,699	(A)+(B)+(C)
				round off	187,000	
6.	Appertenant Structure	Ls.	/		25,000	Gate setting and test

6-2 工事請負業者選定に関する資料.

6-2-1 コラト地元業者一覧表 (CPD 提示)

CONTRACTORS' NAMES FOR ACP:

1. Thai Silp Co., Ltd.

3596/5-7 Suranaree Road,  
Muang District,  
Nakhonratchasima Province.

2. Haeng Thavee Company

87 Mitr-tha-parp Road,  
Poo-Yai Commune,  
Muang District,  
Nakhornratchasima Province.

3. Chai-Chareon Furniture Ratchasima Co., Ltd.

50-52 Mook-ka-montri Road,  
Muang District,  
Nakhornratchasima Province.

4. Sang-chai Co., Ltd.

523-524/1 Nakhonratchasima -Chokchai Road,  
Huatha-lay Commune, Muang District,  
Nakhornratchasima Province. tel: 044-245805

5. Chok-chai Construction Co., Ltd.

Hua-tha-lay Commune, Muang District,  
Nakhornratchasima Province. tel: 044-2465-02

✓ 6. Say-lee-pharn Co., Ltd.

Muang District,  
Nakhornratchasima Province. tel: 044-241307

ส่วนที่ 1 ทรัพย์สิน

1. (社名) ชื่อบริษัท Chai Charoon Furniture Rajasima company limited part .....
2. (住所) ที่ตั้งของบริษัท 50-52 mukkamonte road.. Tambal.. Naimuang... Amphur-  
Meang... Korat Thailand ..... หมายเลขโทรศัพท์ 242931, 244114
3. (資本金) มูลค่าทุนจดทะเบียน 1,000,000 bath .....
4. (登録日) วันจดทะเบียน September 15, 1980 .....
5. (固定資産) ทรัพย์สินถาวร (เช่น ที่ดิน อาคาร) 0 .....

รายการ	จำนวน	ราคาประเมิน (บาท)
building reinforce concrete	2 room	2,500,000
land 1136 m <sup>2</sup>	1 plot of land	4,000,000
land 2012 m <sup>2</sup>	1 plot of land	1,500,000
land 160 m <sup>2</sup>	10 plot of land	400,000

7. (流動資産) ทรัพย์สิน 株  
ทรัพย์สินหมุนเวียน (เช่น เงินฝาก, พัน)

รายการ	จำนวน	ราคาประเมิน (บาท)
Deposit Receipt	3 account	500,000
Checking Account	2 account	1-1,500,000

8. (工事受注金額) ประวัติการจ้างงาน (แบบโครงการรับรองถาวร)

ชื่อโครงการ	ชื่อเจ้าของโครงการ	ราคางาน	ระยะเวลาก่อสร้าง	สถานที่ก่อสร้าง	รายละเอียด
Barack	Portion army	3,164,000	180 day	Suranaree Army	Building Reinforce-concrete
Soldier building	Portion army	2,857,070	150 day	Suranaree Army	"
Shop building	Jarakachin School	750,000	120 day	Kormburi	"
Drain	Town Municipality	1,562,500	180 day	Amphur Meang Boundary	"
Study building	College Teacher	3,440,000	210 day	Amphur Meang Boundary	"
Government Service- resthouse	Korat Court	3,207,700	210 day	Amphur Meang Boundary	"

(技師姓名及資格)

9. จำนวนวิศวกรของบริษัท

ชื่อ	สาขาวิชา	การศึกษา ระดับ	ปีที่ จบ	ทำงานมา แล้ว (ปี)	ใบอนุญาต เลขที่	ความสามารถ ด้านภาษา	รายละเอียด
1. Mr. Somchai	degree	degree	7	2258	Thai-English	Civil Engineering Branch	
2. Mr. Vitaya	degree	degree	8	2185	Thai-English	"	"
✓ 3. Mr. Vichai	degree	degree	5	2948	Thai-English	"	"
.....							
.....							
.....							

10. จำนวนเครื่องจักรกลหนัก (保有重機)

ประเภท (ชนิด)	(容量) กำลังผลิต	(台数) จำนวน	(使用年数) อายุใช้งาน (ปี)
Cutter piltan		1	5
Tractor		1	4
Tractor		1	6
Dump		4	3-5
Back Hoelositacht		1	3
.....			
.....			

รายละเอียดทรัพย์สิน

- (ชื่อ)  
 1. บริษัท ชอกชัย ซิวิล ลิมิเต็ด พาร์ทเนอร์ชิพ  
 (住所)  
 2. เลขที่ 276 Rajsima - Chokchai Road T.Huathalae A.Muang  
 . Nakornrajsima, Thailand..... หมายเลขโทรศัพท์ . 044 - 242125, 243438  
 (資本金)  
 3. มูลค่าหุ้นจดทะเบียน... 40,000,000.- Baht  
 (登録日)  
 4. วันที่จดทะเบียน... February 21 RD, 1980  
 (固定資産)  
 5. ทรัพย์สินถาวร (เช่น ที่ดิน อาคาร)

รายการ	จำนวน	ราคาประเมิน (บาท)
..... Land.....	2 Acres	8,000,000.- Baht
..... Building.....	1 Unit	3,000,000.- Baht
.....	.....	.....
.....	.....	.....
.....	.....	.....
..... (流動資産) : ทรัพย์สิน	.....	.....

7. ทรัพย์สินหมุนเวียน (เช่น เงินฝาก, หุ้น)

รายการ	จำนวน	ราคาประเมิน (บาท)
..... Common Stock.....	1,000 Shares	225,000.- Baht
..... Bank Deposit.....	6 Books	7,946,000.- Baht
..... Letter Of Credit.....	1 Copy	38,000,000.- Baht
.....	.....	.....
.....	.....	.....

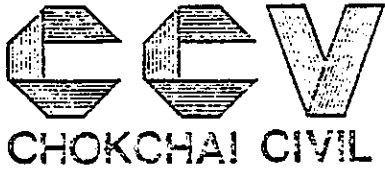
8. ทรัพย์สินทางการเงิน (เช่น เอกสารรับรอง)

ชื่อโครงการ   ชื่อเจ้าของโครงการ   ภาคงาน   ระยะเวลาก่อสร้าง   สถานที่ก่อสร้าง   รายละเอียด

.....  
 .....  
 .....

(นายองอาจ ตั้งศักดิ์ชัย)

หุ้นส่วนผู้จัดการ



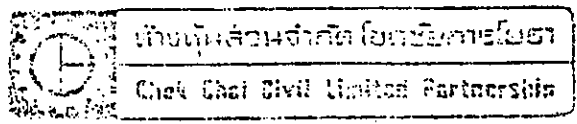
ห้างหุ้นส่วนจำกัด โชคชัยโยธา  
CHOK CHAI CIVIL LIMITED PARTNERSHIP  
เลขที่ 276 หมู่ 2 ถนนราชสีมา-โชคชัย ต. หัวทะเล อ. เมือง จ. นครราชสีมา

平衡工事受注一覧表  
บัญชีแสดงรายละเอียดต่างๆของทางฯ

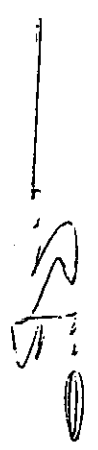
- ๑. ทะเบียนการค้าเลขที่ ๓๐ ๓๒ ๑๘๘๓ เลขประจำตัวผู้เสียภาษี ๓ ๓๐ ๒ ๐๐๘๓๑ ๘
- ๒. จกทะเบียนห้างหุ้นส่วนจำกัด ณ.พาณิชย์จังหวัดนครราชสีมา เมื่อวันที่ ๒๑ กุมภาพันธ์ ๒๕๒๓ เลขทะเบียน นพ.๓๓๓
- ๓. ทุนจดทะเบียน ๘๐.๐๐๐,๐๐๐,บาท(สี่สิบล้านบาท)
- ๔. ชื่อผู้มีอำนาจทำการแทนทางฯ นายองอาจ ทั้งศิริชัย หุ้นส่วนผู้จัดการ
- ๕. ทรัพย์สินถาวร อาคารสำนักงานและที่ดิน ๕.ไร่ ราคาประมาณ ๑๐ ล้านบาท
- ๖. เงินทุนหมุนเวียน
  - ๑. เงินฝากประจำปรากฏตามสำเนาใบรับเงินฝากประจำธนาคารนครธน สาขานครราชสีมาไม่ฝากแนบมาจำนวนเงิน ๓,๘๘๖,๐๐๐.( ใช้หลักฐานเอกสารสนับสนุน)๒. เกร็ดธนาคารนครธน สาขานครราชสีมาปรากฏตามหนังสือรับจำนวนเงิน ๓๘.๐๐๐.๐๐๐.บาท(สามสิบล้านแปดแสนบาท)
- ๗. ประวัติและผลงาน
 


๑.ปี ๒๕๒๓ (1980)	รวมเป็นเงิน ๑๕,๘๘๑,๖๕๒.บาท	14,441,000 \$
๒.ปี ๒๕๒๔ (1981)	๑๘,๓๓๕,๓๘๘.บาท	14,335,000 \$
๓.ปี ๒๕๒๕ (1982)	๑๕,๘๕๓,๖๕๒.บาท	15,883,000 \$
๔.ปี ๒๕๒๖ (1983)	๔๗,๓๓๓,๘๓๓.บาท	47,373,000 \$
๕.ปี ๒๕๒๗ (1984)	๒๐,๖๘๕,๕๘๕.บาท	20,695,000 \$
๖.ปี ๒๕๒๘ (1985)	๓๘,๗๔๕,๓๘๖.บาท (ทางฝ่ายขายขอ.จกรวาท-ขายแสดง เงินกู้ IBRD)	38,745,000 \$
๗.ปี ๒๕๒๙ (1986)	งานที่กล่าวถึงดำเนินการก่อสร้างรวมประมาณ ๑๕,๐๐๐,๐๐๐.บาท	14,000,000 \$
- ๘. ชื่อวิศวกรประจำทางฯ
  - ๑. นายวิเศษ พิเศษจรรยาอุทก ปรินญาโทวิศวกรรมโยธา
  - ๒. นายประสิทธิ์ จรุงกล ปรินญาตรีวิศวกรรมโยธา
  - ๓. นายทรงชัย แผลเจริญ วิศวกรวุฒิวิศวกรโยธา
  - ๔. นายสังศักดิ์ วัฒนานเป็น วิศวกรเครื่องกล
  - ๕. นายรัชต์ - มะเร็งสิทธิ์ ปวส.ช่างก่อสร้าง
  - ๖. นายประเสริฐ สกุลสืบเรศสีมา ปวส.ช่างก่อสร้าง
- ๙. ชื่อผู้จัดการโครงการ
  - ๑. นายองอาจ ทั้งศิริชัย
  - ๒. นายสุชาติ วัฒนเวชรรัตน์
- ๑๐. รายการแสดงเครื่องจักรกลหนักปรากฏตามบัญชีแนบท้ายนี้
- ๑๑. จำนวนและชนิดของเครื่องมือ

(นายองอาจ ทั้งศิริชัย)  
หุ้นส่วนผู้จัดการ



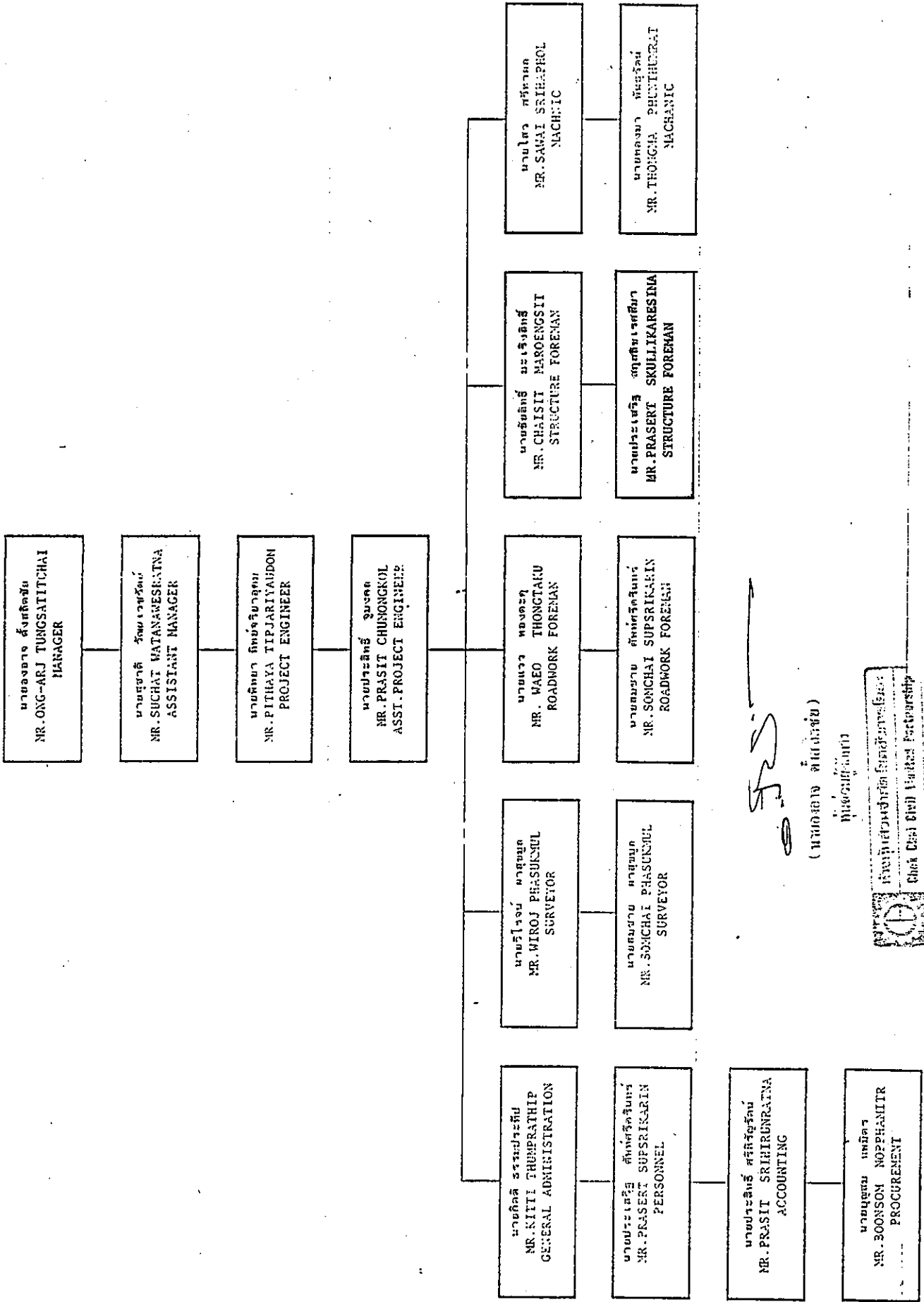
List of Engineer

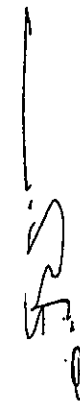
Name	Speciality	Final Educational Background and Graduate year	Professional Records	License	Language Proficiency	Remarks
1. Mr. Pithaya Tipjarinya - udom	Civil Engineer	B.S. Civil Engineering, 1973 M.S. Management Engineering, 1977	See Document No.1	S.Y.2752	English	Resident
2. Mr. Prasit Jumongkol	Civil Engineer	B.S. Civil Engineering, 1979	See Document No.2	P.Y.6131	English	Resident
3. Mr. Songchai Paechoen	Civil Engineer	B.S. Civil Engineering, 1968   (นายองอาจ ตั้งศักดิ์ชัย) หุ้นส่วนผู้จัดการ	See Document No.3	W.Y.694	English	Consultant

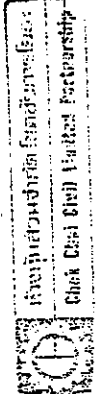

 ห้างหุ้นส่วนจำกัด โชคชัยการโยธา  
 Chok Chai Civil Limited Partnership



ORGANIZATION CHART  
CHOKCHAI CIVIL LIMITED PARTNERSHIP




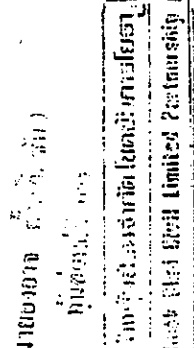
  
 (นายองอาจ ตึงตังชัย)  
 ผู้จัดการทั่วไป  
 (General Manager)



Professional Records

Project Name	Owner	Contract Price	Construction Period	Place	Contents
1, Provincial Road A. Dankoontod A. Bamnetnarong Contract no IBRE/LN 2035-TH	Department Of Highways	37,547,258.80 Bt	480 Days	A. Dankoontod-A. Bamnet -narong Chaiyapoom	-Contract No 59/24 Dated Dec.30, 1981
2, Water Reservoir Ban Choraka	Provincial Govern- -or Nakornrajsima	3,000,000.00Bt	180 Days	Ban Choraka, T. WangPo A. Ban Liem Nakornrajsima	Letter of Certification Dated March 17, 1983
3, Laterite Surface Road A. Nongbuadang-Ban Wang Yai SECT.3	Provincial Govern- -nor Chaiyapoom	7,300,000.00Bt	240 Days	Ban Wang Yai-A. Nong- -buadang Chaiyapoom	Letter Of Certification AT. CY.31/3287 Dated Feb.1, 1983
4, Excavation Of The Wells Talaee See-Dor	Provincial Govern- -nor Chaiyapoom	720,000.00Bt	90 Days	T. Huatalae A. Bamnet- -narong Chaiyapoom	Letter Of Certification AT. CY.0029/14 Dated Feb.20, 1984
5, Excavation Of The Wells	Provincial Govern- -or Nakornrajsima	1,724,081.00Bt	180 Days	Nakornrajsima	Letter Of Certification AT. NM.5103/267 Dated Feb.22, 1984

Professional Records

Project Name	Owner	Contract Price	Construction Period	Place	Contents
6, Dam Huai Yang Ba	Provincial Governor Chaiyapoom	3,180,000.00Bt	240 Days	Ban Koke Soong T.Roab Muang Chaiyapoom	Letter Of Certification AT. 675/2527 DATED Aug.29,1984
7, Excavation Of The Wells	Provincial Governor Nakornrajsima	2,991,500.00Bt	180 Days	T Pood Sa. A. Muang Nakornrajsima	Letter Of Certification AT. 0015/0729 DATED Mar.19,1985
8, Provincial Road A.Chakarat-A.Huai Talaeng -A.Lamplaimat (SECT. 1) Contract No. IBRD/LN2035-TH(1)	Department Of Highways	38,745,346.70Bt	20 Months	A. Chakarat-A. Huaite- laeng-A. Lamplaimat Nakornrajsima	Letter AT CH.1/0451/86 DATED Jan.16,1986   

10. HEAVY EQUIPMENT

NO.	NAME (TYPE)		CAPACITY	UNIT	MADE IN YEAR
1.	CATTERPILLAR	Crawler Tractor Bulldozer			
2.	"	"	180 H.P.	1	4
3.	"	"	180	1	4
4.	KOMATSU	"	145	1	3
5.	CATTERPILLAR	"	140	2	3
6.	"	"	93	1	3
7.	"	"	90	1	3
8.	KONATSU	Wheel Type Loader	100, 81	1	3
9.	"	Crawler "	" (1.25M <sup>3</sup> )	2	5
10.	"	Moter Grader	145	2	3
11.	CATTERPILLAR	"	140	1	5
12.	INGERSOILRAND	"	145	2	3,4
13.	WATANABE	Vibrating Roller	145	1	1
14.	SAKAI	Rubber Tire Roller	84	2	2½
15.	"	"	90	1	4
16.	WATANABE	Steel Roller	120	2	3½
17.	KOMATSU	"	120	1	2½
18.	YUTANI	Back Hoe	78	1	3
19.	KOMATSU	"	140	1	4
20.	ISUZU, REO	"	168	2	2½
21.	NISSAN	Water Truck	145	1	1
22.	HINO	Drump Truck	180, 120	5	3
23.	NISSAN	Truck Trailer	260, 185	2	2½
			168, 191	6 (หมายถึง ดึงรถขุด)	2, 3
			280, 300	2	1½

มีแผนผังแนบมา



กรมทรัพยากรธรรมชาติและสิ่งแวดล้อม  
 ราชบัณฑิตยสถาน  
 กรุงเทพมหานคร

รายละเอียดของ

1. (社名) RATCHNAKORN ~~INC~~ ENGINEERING LTD.
2. (住所) 159/3 SUBSIDI RD. AMPURE KANG NAKORN PA-  
CHSIMA ..... หมายเลขโทรศัพท์ 044 245406  
246753
3. (資本金) มูลค่าของจดทะเบียน 1,000,000 BATH
4. (登録日) วันจดทะเบียน 24 JAN 1952
5. (固定資産) ทรัพย์สินถาวร (เช่น ที่ดิน อาคาร)

รายการ	จำนวน	ราคาประเมิน (บาท)
OFFIC	1	2,000,000 B
TORC DUMP	4	3,000,000 B
BACK HOLD	1	1,600,000 B

7. (流動資産) ทรัพย์สินหมุนเวียน (เช่น เงินฝาก, หุ้น) 預貯金 株

รายการ	จำนวน	ราคาประเมิน (บาท)
DEPOSIT RECET	3 ACCOUNT	6,300,000 B

8. ประวัติการทำงาน (แนบเอกสารรับรองถ้ามี)

ชื่อโครงการ ชื่อเจ้าของโครงการ ราคางาน ระยะเวลาก่อสร้าง สถานที่ก่อสร้าง รายละเอียด

(技術者氏名 及 資格)

9. จำนวนวิศวกรของบริษัท

ชื่อ	ตำแหน่ง	การศึกษา ระดับ	ปีที่ จบ	ทำงานมา แล้ว (ปี)	ใบอนุญาต เลขที่	ความสามารถ ด้านภาษา	รายละเอียด
------	---------	-------------------	-------------	----------------------	--------------------	------------------------	------------

.....  
 MR. A. OPAS ..... BSCE 1952 S. 83074 THAI  
 OPAS  
 ADAMSON UNIVERSITY  
 .....

10. จำนวนเครื่องจักรกลหนัก (保有重機)

เครื่องจักร (名稱) รายการ (ชนิด)	(容量) กำลังผลิต	(台数) จำนวน	(使用年数) อายุใช้งาน (ปี)
--------------------------------------	-------------------	---------------	---------------------------

.....  
 TURK DUMP ..... 4 ..... 2  
 TRACTOR P. 4 ..... 1 ..... 2  
 BACK HOLD ..... 1 ..... 2  
 .....

(技術者氏名及び資格)

9. จำนวนเครื่องจักร (จำนวนเครื่องจักร)

ชื่อเครื่องจักร (ชื่อเครื่องจักร)	กำลังม้า (กำลังม้า)	จำนวน (จำนวน)	ปี (ปี)	รวม (รวม)	หมายเหตุ (หมายเหตุ)
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Mr. Bumpen Panturatanaesara, A civil Engineer, B.E., 1976, 10 years, sy. 1506 Satisfactory.

Mr. Chaiyong Khomkao, A civil Engineer, B.E., 1981, 5 years, py. 2002, Satisfactory.

Mr. SAHARD KWANCHAI... CIVIL ENGINEER... B.E. 1978... 8 YEARS SY. 3398

10. จำนวนเครื่องจักร (保有重機)

ชื่อเครื่องจักร (ชื่อเครื่องจักร) รุ่น (รุ่น)	กำลังม้า (กำลังม้า) H.P.	จำนวน (จำนวน) ตัว (ตัว)	ใช้กี่ปี (ใช้กี่ปี) ปี (ปี)
KOMUTSU PC200	140 H.P.	1	2 Years
KOMUTSU 20MT	140 H.P.	1	4 Years
KOMUTSU D6Ca	140 H.P.	1	5 Years
KOMUTSU J63	140 H.P.	1	2 Years
CATERPILLAR D4	100 H.P.	1	4 Years
CATERPILLAR 955L	135 H.P.	1	4 Years
CATERPILLAR 920	130 H.P.	1	5 Years
10 WHEELS TRUCK	160 H.P.	8	3 Years
6 WHEELS TRUCK	120 H.P.	8	8 Years

4-2-3 施工能力判定試験出席者一覧表 及び 試験問題、解答

List of Attendants

for

on






The Agricultural Cooperative

in

Thailand

Promotion Project

Date : 12th Feb. 1986

Name of company	Name of Attendant	Status	Signature
วิ.อ.น.   8000	สุพัส งามวิมล	87 มุมเมือง อ.เมือง อ.เมือง	
นาง เสกขมาภรณ์/พ.อ.สุวิมล	เสกขมาภรณ์	50-52 หมู่ 4 อ.เมือง อ.เมือง	
นาง นเรศวร	นเรศวร	12-196 ม.เมือง อ.เมือง	
นาง. นพรัตน์	นพรัตน์ งามวิมล	529-4/1 ม.เมือง-10 อ.เมือง	
นาง. ใจเบญจมาภรณ์	ใจเบญจมาภรณ์	276 หมู่ 2 อ.เมือง อ.เมือง	



List of Attendants  
for

on  
The Agricultural Cooperative Promotion Project  
in  
Thailand

Date : 12th Feb. 1986

Name of company	Name of Attendant	Status	Signature
HENGTHAVEE CO, Ltd	Angul Prasadokpinyaj	Manager	
CHAICHAROENFURNITURE CO, Ltd.	Vichai Asavajiravit	Manager	
THAISILP CO, Ltd.	Yu Vinitthanakit	Manager	
PONGSONG CHAI CO, Ltd	Sompong Petchasart	Manager	
CHOKCHAI KARNYOTHA CO, Ltd.	Suchart Vatanavitchanon	Representative	

業者施工能力判定試験問題 (1986年2月18日)

1. Give answer to the method of quality control about earth works, using following words.

(optimum moisture content, D90, in dry season, back-fill at the back of the concrete structure, soil test)

2. Give answer to the method of quality control about concrete works, using following words.

(slump test, vibrator, construction joint, curing, mixing design of concrete)

3. Calculate the number of working days in accordance with following condition. Other necessary condition for calculating shall be assumed respectively.

Construction	; Concrete works of canal (except earth works)
Working time	; 8 hours/day
Portable concrete mixer	; 0.35 cum, / piece
Time required for hauling	; 10 minutes

Standard section, length are shown in Fig-1

4. Select the kind of construction equipment, and calculate the number of working days in accordance with following condition. Other necessary condition for calculating shall be assumed respectively.

Construction	; Excavation, Embankment
Working time	; 8 hours/day
rate per unit natural ground's volume	
	excavate compact
soil	1.1 : 0.9
gravel	1.2 : 1.1

Standard section, soil condition are shown in Fig - 2.

5. State the measure of water drainage form the earth foundation for placing concrete, using following words.

(geology, the amount of gushed water, artesian condition of ground water)

6. As to earth works, state the special attention of following items (see Fig - 3).

- Slope stability of embankment and excavated under construction.
- Top soil treatment for cropping.
- The distinction of soil compaction between dry season and rainy season.

7. State the temporary works for construction works across the river (Ex. weir, head works, and so on).

Fig - 1

Canal length; 100.0 m  
Interval of construction joint  
; 5.0 m

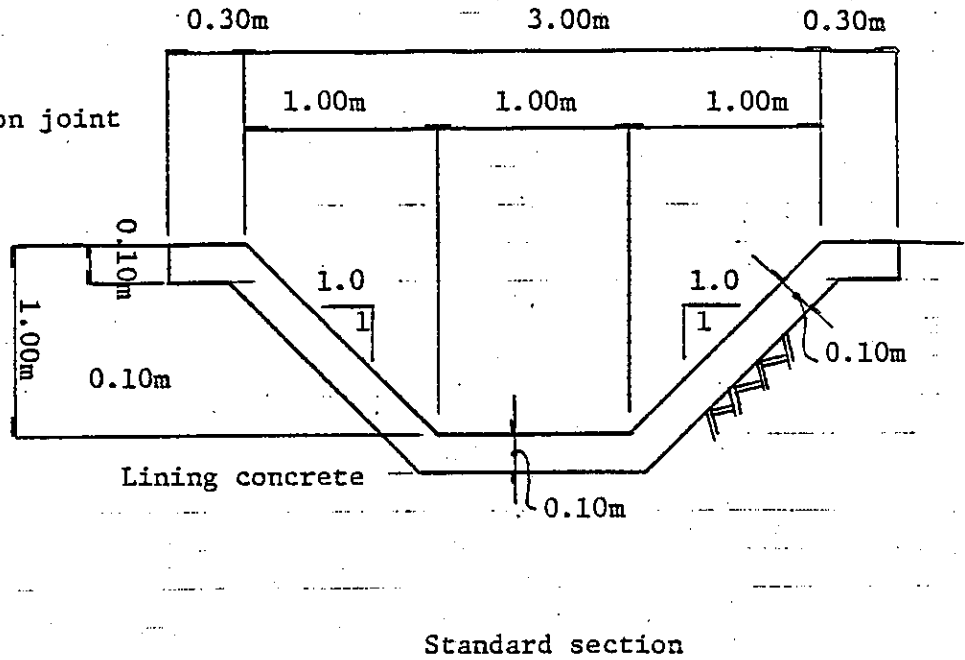


Fig - 3

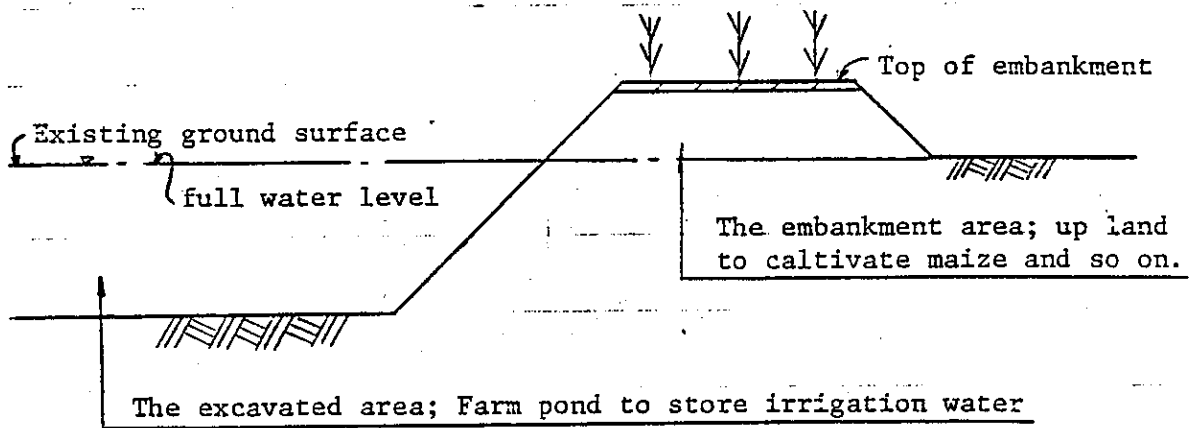
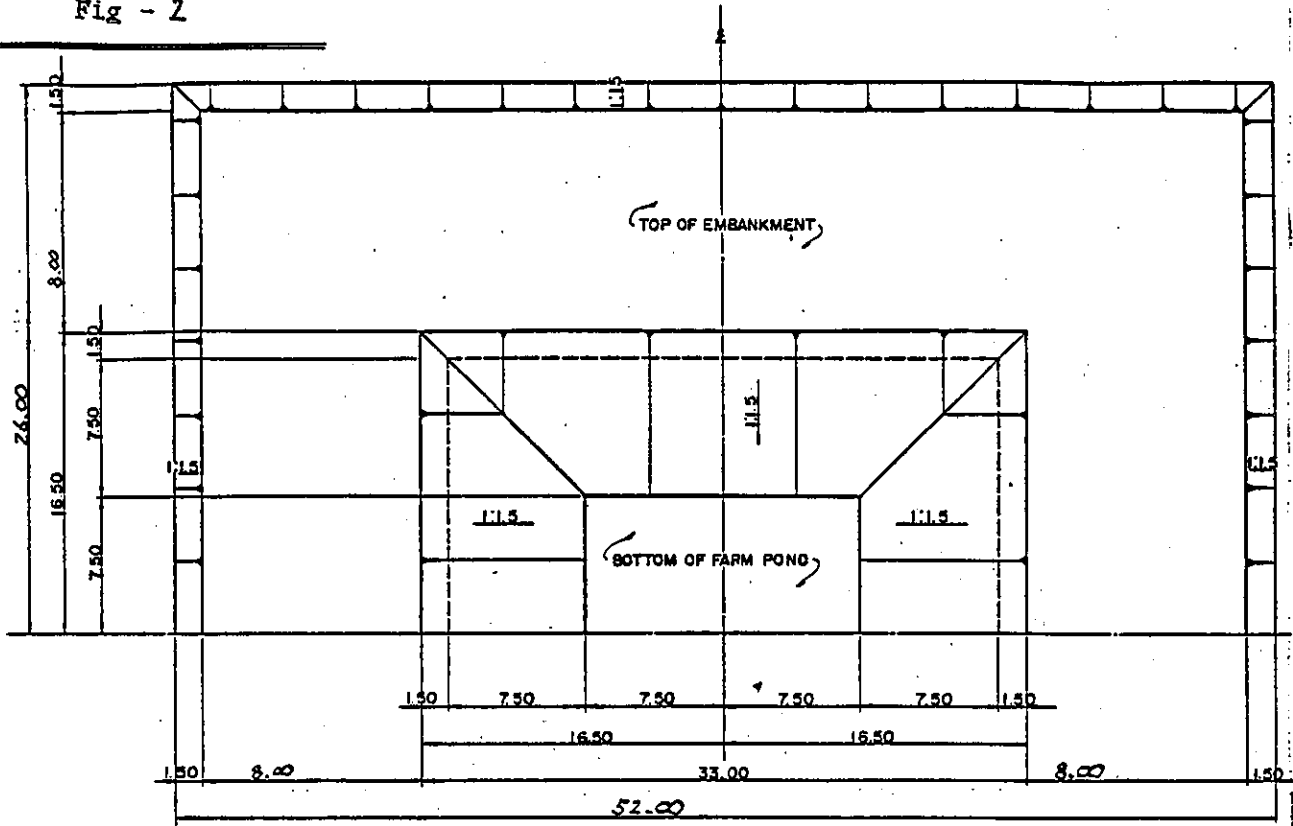
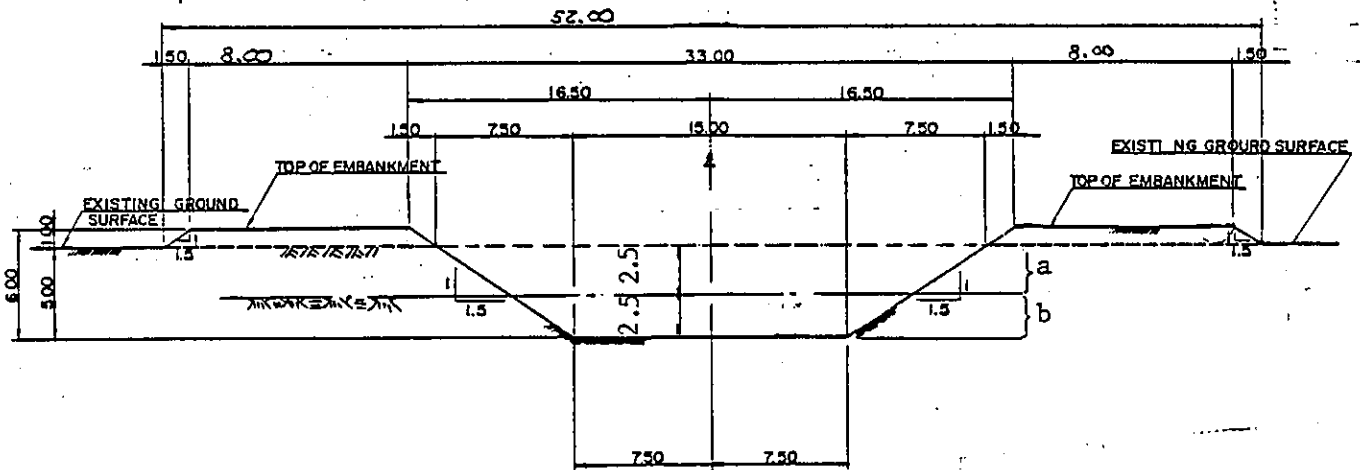


Fig - 2



PLANE OF FARM POND



STANDARD SECTION OF FARM POND

a ; Common soil  
 b ; Gravel (N value=30) } Core Index = 5-7

COMPANY NAME

THAI SILP

ADDRESS

TEL: (24) 2529 NAKORN RATJAS

ENGINEER NAME

Samud Kavanchari

NR

1. The method of quality Control about earth works by all the given words can be explained as shown below:

- 1.1 Optimum moisture Content is defined as a criteria to control the moisture in materials (soil) which was used in the project and as we know this value is different in different type of soil so it will be very important to find out what is the Optimum moisture Content of the soil we are using because it relate with the maximum density (or degree of compaction) which required in construction procedure on job site such as how much water needed to mix in our materials.
- 1.2  $D_{90}$  is defined as a criteria to decide the gradation of soils (or materials) by its size or dimension of its particles. As we know that we classified the mechanism quality of soil by its size and the different kind of soils will compose of different gradation.  $D_{90}$  is a value used in gradation testing in laboratory to show that more than 90% of all soil sample used have the bigger size than the remainder.
- 1.3 In dry season it's also very importance to consider about the weather or climate of the season during construction period because this is one of many factors to control the quality of works especially for earth works. The physical property of feature in the same kind of soil will be different in the different season it also relate to the construction procedure such as moisture control.
- 1.4 Back-fill at the back of the concrete structure. This is the condition shall be done in case that to protect that concrete structure still remain in good condition after pouring. The back fill material can resist and distribute load or pressure occurred on top of its surface.
- 1.5 Soil test this is the most important ~~first~~ step needed to perform prior to other things in earth work because we can ~~collect~~ know all properties of soil by testing in laboratory such as chemical property, physical property, mechanical property and biological property after soil test, we can determined how to perform those soil step by step until it's attain the best quality as required.

2. The method of quality Control about Concrete works.

2.1 Slump test is one of the method to show the degree of liquidity of the mixed Concrete used on site we use this value to Control the amount of water in the using Concrete and it can be vary according to the Construction Condition such as pouring Condition, weather Condition.

2.2. Vibrator. is the instrument we use during pouring concrete ~~to~~ to make the concrete which we pour shake or vibrate the mass of pouring Concrete has the max density which no void in interior.

2.3. Construction joint is the joint we must make in the Concrete structure because we can not complete all part of the structure simultaneously so it is essential to leave the joint on the finished part of structure before we continue the beyond part.

2.4. Curing is the step to Control the quality of poured Concrete still in the good moisture content This is made to protect the quick evaporation of water from the surface of Concrete.

2.5. Mixing design of Concrete is the computation method to design and defines the mixture of concrete we need in each job. The design will base on the strength of the concrete required in the job we will design and try to select the mixture which give us the suitable strength.

3. Calculate the number of working days.

$$\text{Concrete Vol.} \approx 0.443 \times 100 = 44.30 \text{ m}^3$$

$$\text{Concrete Vol./joint} = 0.443 \times 5 = 2.215 \text{ m}^3$$

$$\text{Mixer} = 0.35 \text{ m}^3/\text{hr.}$$

$$\text{Time required for hauling} = 10 \text{ min.}$$

$$\begin{aligned} \text{assumed time to complete one mixer} &= \text{provide concrete} + \text{hauling} + \text{pouring} \\ &= 3 + 10 + 20 = 15 \text{ min.} \end{aligned}$$

assume we have 4 mixer.

$$\therefore \text{So Vol. poured/day} = 4 \times 3.5 \times 8 \times 4 = 44.80 \text{ m}^3$$

$$\therefore \text{number of working day} = 1 \text{ day, let say } 1\frac{1}{4} \text{ day}$$


---

\* 4.

Items	Kind of soil	Equipment	Capacity	Reason
Excavation	Common soil 860 m <sup>3</sup>	drag line	230 m <sup>3</sup> /day = 2 day.	
	Gravel 440 m <sup>3</sup>	Digger	150 m <sup>3</sup> /day = 3 day.	
Embankment	Common soil 980 m <sup>3</sup>			
	Gravel	NO.		

Total Vol. of Soil excavation  $\approx 26.25 \times 13.125 \times 2.5 = 861.50 \text{ m}^3$

Gravel excavation  $\approx 18.75 \times 9.375 \times 2.5 = 439.50 \text{ m}^3$

Soil embankment  $\approx (9.5 \times 26.75 \times 2) + (30 \times 9.5 \times) = 508 + 285 = 793 \text{ m}^3$

working time = 8 hours/day

Total working day = 2 + 3 + Spare 1 day = 6 day.



5. geology & to inspect the Condition of the surrounding soil on the area. And also the bottom soil to learn about the geological property of its surface this shall be done for the safety problem. before and after drainage.

the amount of gushed water: to estimate or evaluate the pressure reduce & or increase which apply on the structure and also for calculate the Capacity and time for work.

artesian Condition of ground water: to inspect that after drainage ~~Drainage need to~~ ~~Drain~~ one will face the problem about under ground water or not and to prepare the good Condition in Concrete placing.

6. a.) Slope stability of embankment and excavated under construction is the most special attention we shall have, because it relate to the safety conditions during construction time. In case that the slope stability is not in the good condition it can cause the great destruction by sliding.

b.) Top soil treatment for cropping

This is a process to improve or adjust the top soil quality to change its original condition or property in case it is not suitable for any cropping.

c.) Distinction of soil compaction between dry season and rainy season.

Between dry and rainy season the distinction in compaction is the amount of water in natural soil which cause a lot of trouble and problem.

7. the temporary work for construction works across the river.

the temporary work in this kind of construction (across river)  
we need any type of Cofferdam to construct <sup>around</sup> the area of  
the structure that will make us can do the job easily and properly

---

COMPANY NAME  
CHAIGAREYN CON.

ADDRESS 188 GAMHAMSONGKAM. KOYAT  
TEL: ( )

ENGINEER NAME

VICHAI VIPHATGASEMSUK

1. Optimum moisture content is control moisture of soil maximum.
2. Back-fill at the back of concrete structure have sand, rock, concrete 1:3:5.
3. D90. is kind of Tractor. use for compaction soil and dig soil for channel.
4. In dry season in the soil with water moisture content
5. Soil test. is Method test soil have  
Shrinkage analysis, Atterberg limit, compaction  
and C.B.R.

2.

Slump test is control about concrete because concrete have settlement if have water very much; and if soil is have many water, concrete is settle down.

Vibrator: use for about concrete compaction.

Cement.

Construction joint use for prevent Transverse concrete.

Curing use for concrete have high strength.

Mixing design of concrete use for control concrete ordinary 1:2:4 for.

Beam, footing use one cement two sand, four aggregate with by weight or volume.

3.

$$\text{Volume of concrete} = 44.2 \text{ cum.}$$
$$\text{Portable concrete Mixer} = \frac{44.2}{.35} = 126 \text{ piece.}$$

$$\text{Time required for heating} = 126 \times 10 =$$
$$= 1260 \text{ minutes}$$
$$= 21 \text{ hours.}$$

$$\therefore \text{Working day} = \frac{21}{8} = 3 \text{ day.}$$

4.

Items	Kind of soil	Equipment	Capacity	Reason
Excavation	Common soil	<i>Tractor.</i>		
	Gravel			
Embankment	Common soil			
	Gravel			

Volume Area of soil =  $\frac{1}{2} \times (15 + 22.5) \times 7.5 = \frac{140 \text{ cu ft}}{15 \times 7.5}$

Volume Area of gravel =  $\frac{1}{2} \times (22.5 + 33) \times 7.5 = 208 \text{ cu ft.}$

if have compaction. use

Volume of soil = 150 cu ft. — ①

Volume of gravel = 229 cu ft. — ②

Total Volume ① + ② = 379 cu ft. for pond.

V. of soil for hour = 750 hours.

V. of gravel for hour = 1603 "

Total = 2353 hour.

Working day =  $\frac{2353}{8} = 294 \text{ day}$

5. ① Geology is effect for foundation because water absorb to soil if water very much under the foundation, the foundation is settlement.

② Artesian condition of groundwater is natural water is effect to the footing very much because if under the footing no rock is effect the footing settlement. and with effect pumping under footing if level water on. the footing is name groundwater.

③ The amount of gushed water effect to structure because in the design structure relative bearing capacity of a soil. if very much water in the soil in the design. must pile foundation.



6. (c). The distinction of soil compaction between dry<sup>season</sup> and rainy season. as.

Soil compaction in the dry season with fill water to limit ~~Moisture~~ ~~on~~ Maximum optimum moisture content. with by sericified soil to with water to optimum moisture content.

a) Slope stability of embankment. effect to structure slope very good to 1:1 and with tree on slope.

b). Top soil Treatment for Cropping. is necessary to compaction if use for Traffic<sub>road</sub> to compactor 95% Modified AASU.

COMPANY NAME CHAIJO REYN.

7.

CHOK CHAI CIVIL LIMITED PART		276 RAJSIMA - CHODHAI ROAD
COMPANY NAME		ADDRESS T. HUATALAF A. MUANG MAKORNRAJSIMA TEL: (044) 242125 242438
ENGINEER NAME	1	MR. PITHAYA TIRIYAUOM
	2	MR. PRASIT JUMONGKOL
	3	MR. SONGCHAI PACHAROEN.

1. QUALITY CONTROL OF EARTH WORKS:

THE MOST IMPORTANT FACTOR OF EARTH WORK IS THE WATER CONTENT DURING THE CONSTRUCTION PROCESS. THE WATER CONTENT MUST BE KEPT VERY CLOSE TO THE OPTIMUM MOISTURE CONTENT FOR THE BETTER COMPACTION EFFORT. THE COMPACTION OF EARTH WORK SHALL BE CONTROLLED BY THE METHOD OF SOIL TEST, ESPECIALLY COMPACTION TEST. COMPACTION CAN BE MADE TO 90% OF STANDARD PROCTOR. SPECIAL CASE OF EARTH WORK WHICH MUST BE PAID MORE ATTENTION IS THE CONSTRUCTION IN DRY SEASON, BECAUSE THAT THE CONTROL OF WATER CONTENT TO OMC, WILL BE DIFFICULT

IN THE CASE OF EARTH WORKS CONSTRUCTION, BACK-FILL AT THE BACK OF CONCRETE STRUCTURE, PERIODS MATERIAL SOME TIME NECESSARY FOR DRAINAGE OF WATER. CONSTRUCTION MUST BE VERY CAREFUL IN ORDER TO AVOID THE DAMAGE THE STRUCTURE.

2. SLUMP TEST IS A METHOD OF SELECTING CONCRETE WHICH IS MORE CONCERNED WITH WATER RATIO.

VIBRATOR. IS THE METHOD

2. THE METHOD OF QUALITY CONTROL ABOUT THE CONCRETE WORKS BY USING THE GIVEN WORDS ARE AS FOLLOWING EXAMPLES :

BEFORE WORKING OF ANY CONCRETE WORKS, WE HAVE TO SET THE MIXING DESIGN BY USING THE PROPER GOOD MATERIALS (CEMENT, SAND & WATER & CRUSHED STONE) WITH A GOOD PROPORTION TO COME-UP WITH HIGH STRENGTH AND BEING ACCEPTED BY CERTAIN INSTITUTION. AFTER THE MIXED DESIGNED WAS SET, CONCRETE IS ALREADY BRING TO THE SITE WORK. AT THIS TIME WE HAVE TO MAKE THE SLUMP TEST WHICH IS THE VALUE SHOULD BE ACCEPTED, ABOUT 5-10 CM.

NEXT IS TO POUR THE CONCRETE, WHILE POURING THE CONCRETE WE HAVE TO USE THE VIBRATOR TO REMOVE THE AIR INSIDE THE CONCRETE OUT & TO SET CONCRETE IN THE PROPER FORM. IN CASE OF CONCRETE POURING CAN NOT FINISH WITHIN A CERTAIN PERIOD, WE HAVE TO MAKE A CONSTRUCTION JUNCTION AS DECIDED BY THE ENGINEER AT THE SITE WORK. NEXT IS TO CURE THE CONCRETE, THE DAY AFTER CONCRETE BEING POURED, WHICH IS VERY NECESSARY TO BE FORMATED, TO GIVE MORE STRENGTH OF CONCRETE, USUALLY CURING PERIOD IS ABOUT 28 DAYS.

COMPANY NAME

CHOK CHAI CIVIL LIMITED PART.

3.

THE NUMBER OF WORKING DAYS OF CONCRETE WORKS OF  
CANAL IS. 3 DAYS.

- CONCRETE      R      ~~44.28~~      CO. M
- CAPACITY OF RIVER      16.8      CO. M / DAY
- TIME REQUIRED      ≈ 2.6      DAYS      SAY      3      DAYS

COMPANY NAME

CHOK CHAI CIVIL LIMITED PART.

4.

Items	Kind of soil	Equipment	Capacity	Reason
Excavation	Common soil	BACK HOE BULLDOZER	1000 CU.M / DAY <del>2000</del>	EXCAVATED SOIL WILL BE USED FOR EMBANKMENT ( 2 WORKING DAYS )
	Gravel	BACK HOE DUMP TRUCK	- 700 CU.M / DAY - 2 @ 10 CU.M TRUCKS	EXCAVATED GRAVEL MUST BE TAKEN OUT AS THE SAME SPOIL MATERIAL ( 2 WORKING DAYS )
Embankment	Common soil	Motor Grader Rubber Tyre Roller		COMMON SOIL FROM EXCAVATION CAN BE USED FOR EMBANKMENT ( 2 WORKING DAYS )
	Gravel	—	—	GRAVEL WILL NOT BE USED FOR EMBANKMENT

WORKING DAY FOR THIS WORK WILL BE 6 DAYS

5. THE MEASURES OF WATER DRAINAGE FROM THE FOUNDATION ARE PLACING CONCRETE OF ANY PROJECT MUST CONSIDERED WITH THE GEOLOGY MATERIALS LIKE, FOR EXAMPLE, CLAY, SAND, GRAVEL ETC..
- EACH OF THIS TYPE, THESE PROPERTIES ARE VARY FROM EACH OTHER.
- AFTER THE SOIL WAS EXCAVATED FOR THE FOUNDATION, THE GROUND WATER IS FOUND WE HAVE TO PUMP THE WATER OUT & CLEAN THE BOTTOM OF FOUNDATION BEFORE PLACING THE CONCRETE.
- IN CASE OF THE WATER REACH TO ACHIEVE THE GROUND WATER WE HAVE TO USE SOME THIS REQUIREMENT.

6.

a) SLOPE STABILITY

SPECIAL ATTENTION FOR SLOPE STABILITY : -

- TYPE OF SOIL
- DRAINAGE OF GROUND WATER
- SEEPAGE OF STORAGE WATER
- DEGREE OF STEEPNESS OF SLOPE
- COMPACTION

b) GOOD SOIL

- COMPACTION
- TYPE OF SOIL (GOOD FOR CROPPING)
- EROSION PROTECTION
- DE-WATERING SYSTEM

c) THE DISTINCTION OF SOIL COMPACTIONDRY SEASON

- LESS WATER CONTENT, DIFFICULT FOR COMPACTION
- ADDITIONAL WATER REQUIRED

WET SEASON

- HIGHER WATER CONTENT DIFFICULT FOR PROCESSING
- EXCESS WATER ~~WATER~~ MUST BE DRIC OUT



7.

TEMPORARY WORKS FOR CONSTRUCTION WORK ACROSS THE RIVER

- GAREE DAM
- TEMPORARY BRIDGE OR DETOUR BRIDGE
- SITE OFFICE
- WEIR
- HEAD WORKS
- TRANSPORTATION CRANE
- CONCRETE PLANT
- DRAINAGE STRUCTURE (PUMPING STATION)

etc.

6-2-4 コラト地元業者 選定結果一覧表

業者名	Chai Chareon Furniture Co., Ltd.	Chok Chai Construction Co., Ltd.	Haeng Thavee Company	Sang-Chai Co., Ltd.	Say-lee-pharn Co., Ltd.	Thai Silp Co., Ltd.	
資本金 (Bakt)	1,000,000	40,000,000	1,800,000	—	—	未提出	
固定資産 (Bakt)	8,400,000	11,000,000	6,600,000	—	—	未提出	
流動資産 (Bakt)	12,000,000	46,171,000	6,300,000	—	—	未提出	
技術者数	3	3	1	—	—	3	
工事実績	道路工事 小規模溜池工事	道路(簡易アスファルト舗装) 小規模溜池、ダム工事	建築工事のみ、土木工事 の経験はない。	—	—	土木路 小規模溜池工事	
保有重機	Back hoe --- 3台 Dump Truck --- 4台	Bull dozer --- 6台 Back hoe --- 3台 Dump Truck --- 3台 その他多数保有	Back hoe --- 2台 Dump Truck --- 2台	—	—	Bull dozer --- 3台 Back hoe --- 4台 Dump Truck --- 2台	
技術者の能力	英語力	日常生活ができる	自由に駆使できる	辞書等が必要	—	—	自由に駆使できる
	技術力	<ul style="list-style-type: none"> <li>技術力は低い。</li> <li>全社評価 --- 10%</li> </ul>	<ul style="list-style-type: none"> <li>土木、コンクリート工事における基本的事項を理解している。</li> <li>コンクリート工事、特に土木の工程管理力はとぼしい。</li> <li>本工事の技術的ポイント(斜面浸食防止、湧水処理、河川構造物の仮設橋等)についての解答は不十分。</li> <li>全社評価 --- 50%</li> </ul>	棄権	—	—	<ul style="list-style-type: none"> <li>コンクリート工事における基本的事項を理解しているが、土木工事については、低い理解度。</li> <li>コンクリート工事の工程管理力はあるが、土木工事については、乏しい。</li> <li>全社評価 --- 30%</li> </ul>
総合評価	<ul style="list-style-type: none"> <li>技術者の英語力、技術力が他の2社に比べ低い。</li> <li>工事実績等については問題なし。</li> </ul>	<ul style="list-style-type: none"> <li>工事実績等の会社状況及び技術者能力については問題はない。</li> <li>本工事に対する熱意がうかがわれる。</li> </ul>	<ul style="list-style-type: none"> <li>土木工事の実績がなく、本工事に対する熱意も少ないため、本工事施工業者としては、不適当と判断。</li> </ul>	—	—	<ul style="list-style-type: none"> <li>工事実績は、かなり小規模なものが多いが、本工事については問題がない。</li> <li>技術者能力は若干低いと考えられるが、多少サポートを行なうことによる問題はない。</li> <li>本工事に対する熱意がうかがわれる。</li> </ul>	
	△	○	×	×	×	○	

6-3

現場説明会資料.

# JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

28th March, 1986

- COPY -

6-3-1

INVITATION TO BID

To whom it may concern,


The Japan International Cooperation Agency, Bangkok Office hereby invites sealed written bids for the Construction of Model Infrastructure on Agricultural Cooperative Promotion Project (the Project) which is situated in Kong Samaki and Chakarath, Nakorn Ratchasima Prefecture.

This Contract will include, among others, the following;

1. Terms and Conditions of this Contract
2. Pledge Agreement
3. Technical Specification
4. Bill of Quantities
5. Drawings

Bids shall be addressed to Mr. Michimoto GOTO, Resident Representative, Japan International Cooperation Agency, Bangkok Office, c/o Embassy of Japan, 1674, New Petchburi Road, Bangkok, Thailand, and marked "Sealed Proposal, Nakorn Ratchasima Model Infrastructure".

The date for the opening of bids will be held at 11:00 o'clock (a.m.), Thailand. Standard Time on March 10th, 1986 at the JICA, Bangkok Office, 1674 New Petchburi Road, Bangkok.



Mr. Michimoto GOTO  
Resident Representative of JICA  
Bangkok Office

INTRUCTION TO BIDDERS

For

Construction of Model Infrastructure

On

Agricultural Cooperative Promotion Project

in

Thailand

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY

## INSTRUCTION TO BIDDERS

### IB-01 PREPARATION OF BIDS

All bids shall be submitted in an original and three (3) copies on or before the hour and date fixed for receipt of bids, in accordance with the Invitation for Bids, and shall conform to the following requirements;

- a) One copy of proposal shall be marked "Original". The original and copies of bids shall be submitted in its entirety with all blanks in the proposal properly filled in.
- b) Bids prices shall be written in words as well as in figures. In case of discrepancy between the words and figures, the price in words shall prevail.
- c) The proposal must be signed by the Bidder with his usual signature and shall show his full business address.

### IB-02 BASIS ON WHICH BIDS ARE REQUESTED

The form of the Contract to be awarded is on fixed unit price basis of payment to the Contractor, as specifically set forth in these Contract Documents. Bids are requested on the above basis and a proposal which is on any other basis will not be considered.

Quotation of prices shall be made in Thai Baht and the Contractor shall be paid in Local Currency.

### IB-03 BID SECURITY

The original, but not the copies of each bid, shall be accompanied by a proposal bond in an amount equivalent to (10) % of the total bid price in the form of cash or certified

check, as a guarantee that the successful bidder will, within seven (7) days from March 3rd, enter into Contract with the Japan International Cooperation Agency, Bangkok Office, and complete faithful performance of the work specified in these Contract Documents. In case the successful bidder fails for any reason to execute such Contract within the stipulated time, the bid security shall be forfeited to the Japan International Cooperation Agency, Bangkok Office, as liquidated damages.

The bid securities will be returned without interest after the successful bidder has signed the Contract.

IB-04 DELIVERY OF BIDS

Bids shall be directly delivered to JICA Bangkok Office,  
to Mr. Michimoto GOTO  
-----  
at 11 o'clock a.m., Thailand Standard Time on March 10th, 1986.

IB-05 WITHDRAWAL OF BIDS

A bidder will be allowed to withdraw his bid prior to the time set for the opening of bids if he communicate his purpose in writing to the Japan International Cooperation Agency, Bangkok Office, and his bid shall be returned to him unopened. No bid can be withdrawn for any reason whatsoever after the opening of bids has been made.

IB-06 BIDDER'S RESPONSIBILITY

The Bidders shall be responsible for having taken steps to carefully examine all of the Contract Documents and also to have fully informed themselves as to all conditions, local and otherwise, affecting the carrying out of the Contract Works. Failure to do so will be at the Bidder's risk.

IB-07 DATA TO BE SUBMITTED WITH PROPOSAL

All proposal shall contain the following documents:

- a) A construction schedule showing the detailed proposal plan of operation and construction of each main item in the Bill of Quantities from start to completion of the Contract Work. The schedule shall be in a bar chart form with weeks shown as the least unit of time and each main item on a separate horizontal line. The schedule shall also show expected monthly accomplishment and financial requirements based on the Bill of Quantities.
- b) A list of equipment proposed to be used for the performance of the Contract Work. This list shall specifically enumerate the number, type and capacity.
- c) Others

IB-08 INTERPRETATION OF CONTRACT DOCUMENTS

If the prospective Bidder is in doubt as to the true meaning of any part of the Contract Documents, the Bidder may submit to the Japan International Cooperation Agency, Bangkok Office, a written request for interpretation allowing sufficient time for a reply to reach him before submission of his bid. Any interpretation of the proposed documents will be made only by a Supplemental Notice duly issued.

IB-09 PRE-BIDDING CONFERENCE

A pre-bidding conference will be scheduled on March 8th, 1986 at 1:00 o'clock p.m. at Ben Guest House. Address. 205/8-12 Soi 21 (Asoke) Sukhumvit Road, Bangkok Room No. 103 Tel: 258-0337.

Attendance for Contractors is desirable but not mandatory.



IB-10 COMPARISON OF BIDS

In making its selection, the Japan International Cooperation Agency, Bangkok Office will not be bound to award a Contract to the Bidder submitting the Bid with the lowest indicated cost, but will take into consideration the bid prices, unbalanced bids, guaranteed completion time and other relevant consideration.

IB-11 AWARD OF CONTRACT

Bids will be opened in the presence of the Bidders who may desire to attend such opening by the Japan International Cooperation Agency, Bangkok Office, at 11:00 o'clock  
a.m. Thailand Standard Time on March  
10th, 1986.

Promptly after the opening of the bids the Japan International Cooperation Agency, Bangkok Office will undertake a detailed study and appraisal of the proposal submitted. The Contract will be awarded to the Bidder whose proposal is considered to be the most advantageous to the Japan International Cooperation Agency, Bangkok Office. The Japan International Cooperation Agency, Bangkok Office reserves the right to reject any and all bids received.

IB-12 BID DOCUMENTS

Bid documents shall include the following;

- a) Invitation for Bids
- b) Instruction to Bidders
- c) Terms and Conditions of this Contract
- d) Pledge Agreement
- e) Contract
- f) Technical Specification
- g) Proposal
- h) Bill of Quantities
- i) Drawings





CC. 007506

NR 007506

Payable to the order of

THE BANGKOK BANK OF COMMERCE LTD

ธนาคารพาณิชย์ จำกัด

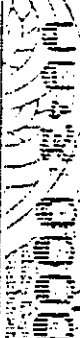
ธนาคารพาณิชย์ จำกัด

Pay to the order of

Mr. Nichimoto GOTO

Baht

SIX HUNDRED THOUSAND ONLY



๖๐๐,๐๐๐

Baht

600,000.00-BAHT.

Handwritten signature and notes in Thai script, including the name "นิชิมิโตะ โงตะ" and date "7 March 1986".

# THE BANK OF TOKYO, LTD.

Cable Address  
"TOHBANK BANGKOK"

BANGKOK OFFICE โปรดส่งคืนฉบับหนึ่งด้วย Tel. 2330790-8  
Thaniya Building 5 P.O. Box 502  
62 Silom Road, Bangkok 5 คาประกันให้ธนาคาร  
เมอหมคอาชแล้วตัว.

Date: March 6, 1986

Mr. Michimoto Goto  
Resident Representative, Japan  
International Cooperation  
Agency Bangkok Office

Gentlemen:

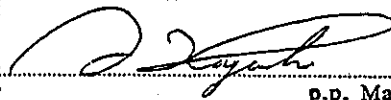
Letter of Guarantee No. BKG165-86/502  
in your favour for Baht 320,000.-  
a/c Thai Konoike Construction Co., Ltd.

We hereby guarantee Thai Konoike Construction Co., Ltd.  
to the extent of Baht 320,000.- (BAHT THREE HUNDRED TWENTY THOUSAND ONLY)  
being Tender Bond for The Construction of Model Infrastructure on Agricultural  
Cooperative Promotion Project \*\*\*\*\*

\*\*\*\*\*  
This Letter of Guarantee is effective from March 10, 1986 to March 17, 1986  
after which date this Guarantee will automatically become null and void. Any claim in this  
consequence should also be submitted to us on or before the said expiry date.

Please return this Original Letter to us at your earliest convenience upon expiration.

Yours faithfully,  
THE BANK OF TOKYO, LTD.  
Bangkok Office



p.p. Manager

A. HAYASHI



# THE BANK OF TOKYO, LTD.

Cable Address  
"TOHBANK BANGKOK"

BANGKOK OFFICE **โปรดส่งคืนต้นฉบับหนังสือ** Tel. 2330790-8  
Thaniya Building **สำนักงานให้ธนาคาร** P.O. Box 502  
62 Silom Road, Bangkok **เมื่อหมดอายุแล้วด้วย.**

Date: March 6, 1986

Japan International Cooperation Agency,  
Bangkok Office

Gentlemen:

Letter of Guarantee No. BKG165-86/501  
in your favour for Baht310,000.-  
a/c Thai Takenaka International Ltd.

We hereby guarantee Thai Takenaka International Ltd.  
to the extent of Baht310,000.- (BAHT THREE HUNDRED TEN THOUSAND ONLY)  
being Bid Bond for Construction of Model Infrastructure on Agricultural  
Cooperative Promotion Project \*\*\*\*\*

\*\*\*\*\*

This Letter of Guarantee is effective from March 10, 1986 to April 9, 1986  
after which date this Guarantee will automatically become null and void. Any claim in this  
consequence should also be submitted to us on or before the said expiry date.

Please return this Original Letter to us at your earliest convenience upon expiration.

Yours faithfully,  
THE BANK OF TOKYO, LTD.  
Bangkok Office



p.p. Manager

A. HAYASHI



23-19-25

วันที่ 7 มิถุนายน 2529

Bank of Ayudhya Limited

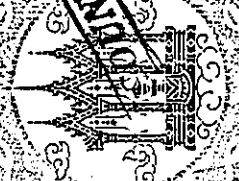
ธนาคารอยุธยา จำกัด

เลขที่ 012779

Cashier's Cheque

190/2529

Bank of Ayudhya Limited



Bank of Ayudhya Limited

Japan International Cooperation Agency, Bangkok Office of Ayudhya

เงินฝากออมทรัพย์

เงิน 650,000.00 บาท

650,000.00

เงิน 650,000.00 บาท

1646-1648 ถนนพระยาสุรเสนา

1646-1648 ถนนพระยาสุรเสนา

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1646-1648 ถนนพระยาสุรเสนา

7

6-4

入札結果に関する資料

COPY

PROPOSAL

For

Construction of Model Infrastructure

On

Agricultural Cooperative Promotion Project

in

Thailand

Chok Chai Civil Limited Partnership

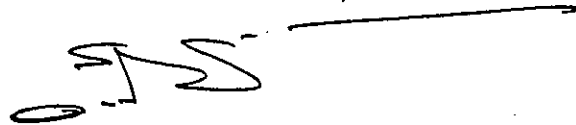


PROPOSAL Chok Chai Civil

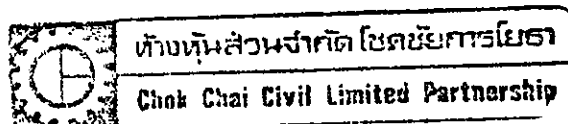
To: Mr. Michimoto GOTO  
The Resident Representative  
Japan International Cooperation Agency, Bangkok Office  
c/o Embassy of Japan  
1674, New Petchburi Road, Bangkok

P-01 BILL OF QUANTITIES AND BID PRICES

The undersigned Bidder having carefully examined in their entirely the Contract Documents for the Construction of the Model Infrastructure on the Agricultural Cooperative Promotion Project, hereby offers and proposes to perform all of the construction and services, to furnish all equipments, materials, supplies, labor and other items described in the Contract Documents, all for the unit or lump sum prices stated in words and figures in the following Quantities:



MR. ONG-ARI TUNGSATITCHAI



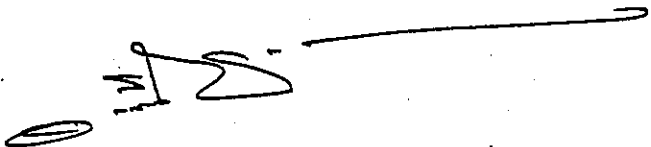
- Bill of Quantities to be attached herein -

P-02 GUARANTEE OF COMPLETION

The undersigned Bidder guarantee to effect the commencement, prosecution and completion of the Contract Works.

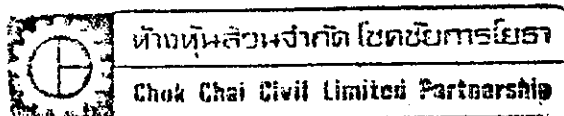
P-03 BID SECURITY

I hereby certify that all statements herein are made on behalf of CHOKCHAI CIVIL LIMITED PART.;  
Dated this 10 day of MARCH 1986.

  
MR. ONG-ARI TUNGSATITICHAI

Title CHOKCHAI CIVIL LIMITED PART.

Firm's Address 276 RAJSIMA-CHOKCHAI RI  
NAKHONRAJSIMA, THAILAND



CONSTRUCTION COST

A. Direct

Cost

Kong Samaki

1. Construction of Farm ponds
2. Appertenant structure

3,146,167.- ₪

664,762.- ₪

Chakarat

3. Outlet works
4. Appertenant structure
5. Diversion works
6. Appertenant structure

225,108.- ₪

20,000.- ₪

266,056.- ₪

20,000.- ₪

Sub-Total

4,342,093.- ₪

B. Indirect

1. Overhead
2. Profit
3. Tax

651,314.- ₪

434,209.- ₪

379,933.- ₪

Sub-Total

1,465,456.- ₪

Total

5,807,549.- ₪

Round off

(-) 7,549.- ₪

Construction cost

5,800,000.- ₪

< FIVE MILLION AND EIGHT HUNDRED THOUSAND BART ONLY

LIST OF UNIT COST

NO.	ITEM	UNIT	UNIT COST	REMARKS
1	Common labor	day	65	
2	Foreman, earth work	day	300	
3	Foreman, Concrete work	day	300	
4	Technician, form work(Carpenter)	day	200	
5	Technician, stell work	day	200	
6	Operator, Bull-Dozer	day	200	
7	Operator, Back-Hoe Shovel	day	200	
8	Excavation by Manpower	cum	60	Normal soil
9	Excavation by Bull-Dozer (11 ton)	cum	22	-do-
10	-do-	cum	25	sand
11	Excavation by Back-Hoe Shovel (0.35m)	cum	22	
12	-do-	cum	-	
13	Compacting by Manpower	cum	50	
14	Compacting by Compactor	cum	35	
15	Compacting by Vibration Roller	cum	18	
16	Reinforced concrete	kg	1.40	
17	Lining concrete	cum	1,600	
18	Plain concrete	cum	1,450	
19	Wooden form of concrete	sqm	260	
20	Processing and Assembling of Iron Bar	kg	11	
21	Loading by Tractor Shovel (1.2 cum)	cum	15	
22	Hauling by Dump Truck (8 ton)	cum	12	Normal Soil L = 150 m
23	-do-	cum	15	Normal Soil L = 500 m
24	Spreading by Bull-Dozer (11 ton)	cum	8	Normal Soil
25	Smoothing of Face Excavated or filled up	sqm	6	

B I L L O F Q U A N T I T I E S

No. 1

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
Kong Samaki Area						
1. Construction of farm pond						
1-1. Farm pond Type A (estimated 2 places)						
101	Excavation (top soil)	cum	1,622	22	35,684-	
102	Excavation	cum	4,162	25	104,050-	
103	Excavation	cum	-	-	-	
104	Spreading (Top soil)	cum	5,785	8	46,280-	
105	Compaction	cum	4,482	18	80,676-	
106	Smoothing face of excavated and filled up	sqm	5,697	6	34,182-	
107	Sub-Total				<u>300,872-</u>	(A)
1-2. Farm pond Type B-1 (estimated 2 places)						
108	Excavation (top soil)	cum	2,160	22	47,520-	
109	Excavation	cum	5,705	25	142,625-	
110	Excavation	cum	-	-	-	
111	Spreading	cum	7,865	8	62,920-	
112	Compaction	cum	6,147	18	110,646-	
113	Smoothing face of excavated and filled up	sqm	7,547	6	45,282-	
114	Sub-Total				<u>408,993-</u>	(B)

B I L L O F Q U A N T I T I E S

No. 2

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-3.	Farm pond Type B-2 (estimated 3 blades)					
115	Excavation (top soil)	cum	4,040	22	88,880 -	
116	Excavation	cum	12,003	25	300,075 -	
117	Excavation	cum	-	-	-	
118	Spreading	cum	16,043	8	128,344 -	
119	Compaction	cum	12,817	18	230,706 -	
120	Smoothing face of excavated and filled up	sqm	14,053	6	84,318 -	
121	Sub-Total				<u>832,323 -</u>	(C)

B I L L O F Q U A N T I T I E S

No. 3

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
				(B)	(B)	
1-4	Farm pond Type C (estimated 4 places)					
122	Excavation (top soil)	cum	6,750	22	148,500.-	
123	Excavation	cum	21,535	25	538,375.-	
124	Excavation	cum	-	-	-	
125	Spreading	cum	28,285	8	226,280.-	
126	Compaction	cum	27,740	18	499,320.-	
127	Smoothering face of excavated and filled up	sqm	23,584	6	141,504.-	
128	Sub-Total				<u>1,553,979.-</u>	(D)
1-5	Miscellaneous Construction	LS			<u>50,000.-</u>	(E)
	Total				<u><u>3,146,167.-</u></u>	(A)+(B)+(C)+(D)+(E)

B I L L O F Q U A N T I T I E S

No. 4

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
2.	Appertenant structure					
2-1.	Diversion canal of Type A	estimated 4 places)				
201	Excavation	cum	126	22	2,772.-	
202	Smoothing face of excavated	sqm	439	6	2,634.-	
203	Lining concrete	cum	19	1,600	30,400.-	
204	Plain concrete	cum	3	1,450	4,350.-	
205	Wooden form	sqm	433	52	22,828.-	20%
206	Slope protection	sqm	180	125	22,500.-	
207	Sub-total				<u>85,484.-</u>	(A)
2-2.	Diversion canal of Type B-	(estimated 4 places)				
208	Excavation	cum	144	22	3,168.-	
209	Smoothing face of excavated	sqm	475	6	2,850.-	
210	Lining concrete	cum	22	1,600	35,200.-	
211	Plain concrete	cum	3	1,450	4,350.-	
212	Wooden form	sqm	475	52	24,700.-	20%
213	Slope protection	sqm	180	125	22,500.-	
214	Sub-total				<u>92,768.-</u>	(B)



B I L L O F Q U A N T I T I E S

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
2-3.	Diversion canal of Type B-2 (estimated 6 places)					
215	Excavation	cum	242	22	5,324.-	
216	Smoothing face of excavated	sqm	765	6	4,590.-	
217	Lining concrete	cum	37	1,600	59,200.-	
218	Plain concrete	cum	4	1,450	5,800.-	
219	Wooden form	sqm	765	52	39,780.-	20%
220	Slope protection	sqm	270	125	33,750.-	
221	Sub-total				<u>148,444.-</u>	(C)

No. 5

B I L L O F Q U A N T I T I E S

No. 6

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
2-4	Diversion canal of Type C (estimated 11 places)					
222	Excavation	cum	647	22	14,234.-	
223	Smoothing face of excavated	sqm	1,619	6	9,714.-	
224	Lining concrete	cum	85	1,600	136,000.-	
225	Plain concrete	cum	8	1,450	11,600.-	
226	Wooden form	sqm	1,619	52	84,188.-	20%
227	Slope protection	sqm	495	125	61,875.-	(D)
228	Sub-Total				<u>317,611.-</u>	
2-5	Miscellaneous construction	LS			<u>20,455.-</u>	(E)
	Total				<u><u>664,762.-</u></u>	(A)+(B)+(C)+(D)+(E)

B I L L OF Q U A N T I T I E S

No. 7

Item No.	Description	Unit	Quantity	Unit Price (₹)	Price (₹)	Remarks
Chakarat						
3. Outlet works						
3-1. Repair of existing bank						
301	Excavation (top soil)	cum	167	22	3,674.-	
302	Excavation	cum	56	25	1,400.-	
303	Hauling	cum	427	12	5,124.-	
304	Hauling	cum	-	-	-	
305	Compaction	cum	651	18	11,718.-	
306	Smoothing face of filled up	sqm	290	6	1,740.-	
307	Sub-total				<u>23,656.-</u>	(A)
3-2. Outlet works						
308	Excavation (top soil)	cum	308	22	6,776.-	
309	Excavation	cum	718	25	17,950.-	
310	Hauling	cum	117	12	1,404.-	
311	Hauling	cum	-	-	-	
312	Hauling	cum	-	-	-	
313	Compaction	cum	1,142	18	20,556.-	
314	Smoothing face of excavated and filled up	sqm	1,096	6	6,576.-	

B I L L O F Q U A N T I T I E S

No. 6

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
315	Reinforced concrete	cum	19	1,450 (B)	27,550. -	
316	Reinforcing steel bar	t	0.6	10,000	6,000. -	
317	Lining concrete	cum	36	1,600	57,600. -	
318	Wooden form	sqm	520	52	27,040. -	20% (B)
319	Sub-total				<u>171,452. -</u>	
3-3. Miscellaneous construction works		LS.			<u>30,000. -</u>	(C)
Total					<u>225,708. -</u>	(A)+(B)+(C)
4. Appertenant Structure		LS.			<u>20,000. -</u>	Cate setting and test

B I L L O F Q U A N T I T I E S

No. 9

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
5.	Division works					
5-1.	Repair of existing bank					
501	Excavation (top soil)	cum	136	22	2,992.-	
502	Excavation	cum	175	25	4,375.-	
503	Compaction	cum	570	18	9,720.-	
504	Hauling	cum	229	12	2,748.-	
505	Hauling	cum	-	-	-	
506	Smoothing face of excavated and filled up	sqm	774	6	4,644.-	
507	Sub-total				<u>24,479.-</u>	(A)
5-2.	Division works					
508	Excavation (top soil)	cum	284	22	6,248.-	
509	Excavation	cum	189	25	4,725.-	
510	Compaction	cum	737	18	13,266.-	
511	Hauling	cum	264	12	3,168.-	
512	Hauling	cum	-	-	-	
513	Smoothing face of embankment and filled up	sqm	900	6	5,400.-	
514	Reinforced concrete	cum	43	1,450	62,350.-	
515	Lining concrete	cum	48	1,600	76,800.-	

B I L L O F Q U A N T I T I E S

No. 10

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
516	Wooden form	sqm	87	260	22,620.—	(B)
517	Reinforcing steel bar	t	1.7	10,000	17,000.—	
518	Sub-total				<u>211,577.—</u>	(B)
5-3.	Miscellaneous construction works	Ls.			<u>30,000.—</u>	(C)
	Total				<u>266,056.—</u>	(A)+(B)+(C)
6.	Appertenant Structure	Ls.			<u>20,000.—</u>	Gate setting and test

COPY

PROPOSAL

For

Construction of Model Infrastructure

On

Agricultural Cooperative Promotion Project

in

Thailand

*Thai Konoike Construction Co., Ltd*

PROPOSAL Thai Konoike

To: Mr. Michimoto GOTO  
The Resident Representative  
Japan International Cooperation Agency, Bangkok Office  
c/o Embassy of Japan  
1674, New Petchburi Road, Bangkok

P-01 BILL OF QUANTITIES AND BID PRICES

The undersigned Bidder having carefully examined in their entirety the Contract Documents for the Construction of the Model Infrastructure on the Agricultural Cooperative Promotion Project, hereby offers and proposes to perform all of the construction and services, to furnish all equipments, materials, supplies, labor and other items described in the Contract Documents, all for the unit or lump sum prices stated in words and figures in the following Quantities:

Baht Three Million One Hundred Sixty-Five  
Thousand Only  
(฿3,165,000.-)

-----  
- Bill of Quantities to be attached herein -



P-02 GUARANTEE OF COMPLETION

The undersigned Bidder guarantee to effect the commencement, prosecution and completion of the Contract Works.

P-03 BID SECURITY

I hereby certify that all statements herein are made on behalf of THAI KONOIKE CONSTRUCTION CO., LTD.;  
Dated this 10th day of March 1986.



Hikaru Ogawa  
Hikaru Ogawa

Title President

Firm's Address 12th Fl.

Regent House, 183 Rajdamri  
Road, Bangkok

CONSTRUCTION COST

<u>A. Direct</u>	<u>C o s t</u>
Kong Samaki	
1. Construction of Farm ponds	1,824,160 ₪
2. Appertenant structure	487,378 ₪
Chakarat	
3. Outlet works	160,190 ₪
4. Appertenant structure	30,000 ₪
5. Diversion works	189,772 ₪
6. Appertenant structure	30,000 ₪
<u>Sub-Total</u>	<u>2,721,500 ₪</u>
B. Indirect	
1. Overhead	163,290 ₪
2. Profit	176,897 ₪
3. Tax	107,610 ₪
<u>Sub-Total</u>	<u>447,797 ₪</u>
<u>Total</u>	<u>3,169,297 ₪</u>
<u>Round off</u>	<u>(-) 4,297 ₪</u>
<u>Construction cost</u>	<u>3,165,000 ₪</u>

LIST OF UNIT COST

NO.	ITEM	UNIT	UNIT COST	REMARKS
1	Common labor	day	70	
2	Foreman, earth work	day	180	
3	Foreman, Concrete work	day	180	
4	Technician, form work(Carpenter)	day	175	
5	Technician, stell work	day	175	
6	Operator, Bull-Dozer	day	160	
7	Operator, Back-Hoe Shovel	day	160	
8	Excavation by Manpower	cum	30	Normal soil
9	Excavation by Bull-Dozer (11 ton)	cum	18	-do-
10	-do-	cum	17	sand
11	Excavation by Back-Hoe Shovel (0.35m)	cum	20	Normal Sand
12	-do-	cum	19	Sand
13	Compacting by Manpower	cum	30	
14	Compacting by Compactor	cum	16	
15	Compacting by Vibration Roller	cum	16	
16	Reinforced concrete	kg cum	1,200	
17	Lining concrete	cum	1,150	
18	Plain concrete	cum	1,200	
19	Wooden form of concrete	sqm	250	
20	Processing and Assembling of Iron Bar	kg	12,000	
21	Loading by Tractor Shovel (1.2 cum)	cum	18	
22	Hauling by Dump Truck (8 ton)	cum	20	Normal Soil L = 150 m
23	-do-	cum	23	Normal Soil L = 500 m
24	Spreading by Bull-Dozer (11 ton)	cum	12	Normal Soil
25	Smoothing of Face Excavated or filled up	sqm	1	

B I L L O F Q U A N T I T I E S

No. 1

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
Kong Samaki Area						
1. Construction of farm pond						
1-1. Farm pond Type A (estimated 2 places)						
101	Excavation (top soil)	cum	960	18	17,280	t=0.2m
102	Excavation	cum	3,120	20	62,400	By backhoe
103	Excavation	cum	-	-	-	
104	Spreading (Top soil)	cum	960	12	11,520	
105	Compaction	cum	4,080	16	65,280	
106	Smoothing face of excavated and filled up	sqm	2,400	1	2,400	
107	Sub-Total				158,880	(A)
1-2. Farm pond Type B-I (estimated 2 places)						
108	Excavation (top soil)	cum	1,440	18	25,920	t=0.2m
109	Excavation	cum	5,340	20	106,800	By Backhoe
110	Excavation	cum	-	-	-	
111	Spreading	cum	1,440	12	17,280	
112	Compaction	cum	6,780	16	108,480	
113	Smoothing face of excavated and filled up	sqm	3,020	1	3,020	
114	Sub-Total				261,500	(B)

B I L L O F Q U A N T I T I E S

No. 2

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-3.	Farm pond Type B-2 (estimated 3 places)			(β)	(β)	
115	Excavation (top soil)	cum	2,160	18	38,880	t=0.2m
116	Excavation	cum	8,010	20	160,200	By Backhoe
117	Excavation	cum	-	-	-	
118	Spreading	cum	2,160	12	25,920	
119	Compaction	cum	10,170	16	162,720	
120	Smoothing face of excavated and filled up	sqm	4,530	1	4,530	
121	Sub-Total				392,250	(C)

B I L L O F Q U A N T I T I E S

No. 3

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-4	Farm pond Type C (estimated 4 places)				(B)	
122	Excavation (top soil)	cum	4,500	18	81,000	t=0.2m
123	Excavation	cum	20,600	20	412,000	By Backhoe
124	Excavation	cum	-	-	-	
125	Spreading	cum	4,500	12	54,000	
126	Compaction	cum	25,100	16	401,600	
127	Smoothing face of excavated and filled up sqm	sqm	9,800	1	9,800	
128	Sub-Total				958,400	(D)
1-5	Miscellaneous Construction	LS	1		53,130	(E)
	Total				1,824,160	(A)+(B)+(C)+(D)+(E)

B I L L O F Q U A N T I T I E S

No. 4

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
2.	Appertenant structure					
2-1.	Diversion canal of Type A (estimated 4 places)					
201	Excavation	cum	100	20	2,000	
202	Smoothing face of excavated	sqm	140	1	140	
203	Lining concrete	cum	19.6	1,150	22,540	
204	Plain concrete	cum	1.6	1,200	1,920	
205	Wooden form	sqm	14.4	250	3,600	
206	Slope protection	sqm	160	235	37,600	
207	Sub-total				67,800	(A)
2-2.	Diversion canal of Type B (estimated 4 places)					
208	Excavation	cum	124	20	2,480	
209	Smoothing face of excavated	sqm	160	1	160	
210	Lining concrete	cum	22.0	1,150	25,300	
211	Plain concrete	cum	1.6	1,200	1,920	
212	Wooden form	sqm	14.4	250	3,600	
213	Slope protection	sqm	160	235	37,600	
214	Sub-total				71,060	(B)

B I L L O F Q U A N T I T I E S

No. 5

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-3.	Diversion canal of Type B-2 (estimated 6 places)			(B)	(B)	
215	Excavation	cum	186	20	3,720	
216	Smoothing face of excavated	sqm	240	1	240	
217	Lining concrete	cum	33.0	1,150	37,950	
218	Plain concrete	cum	2.4	1,200	2,880	
219	Wooden form	sqm	21.6	250	5,400	
220	Slope protection	sqm	240	235	56,400	
221	Sub-total				106,590	(C)



B I L L O F Q U A N T I T I E S

No. 6

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-4	Diversion canal of Type C (estimated 11 places)					
222	Excavation	cum	737	20	14,740	(B)
223	Smoothing face of excavated	sqm	803	1	803	
224	Lining concrete	cum	81.4	1,150	93,610	
225	Plain concrete	cum	4.4	1,200	5,280	
226	Wooden form	sqm	39.6	250	9,900	
227	Slope protection	sqm	440	235	103,400	
228	Sub-Total				227,733	(D)
2-5	Miscellaneous construction	LS			14,195	(E)
	Total				487,378	(A)+(B)+(C)+(D)+(E)

B I L L O F Q U A N T I T I E S

No. 7

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
Chakarat				(B)	(B)	
3. Outlet works						
3-1. Repair of existing bank						
301	Excavation (top soil)	cum	124	30	3,720	
302	Excavation	cum	52	30	1,560	
303	Hauling	cum	124	25	3,100	
304	Hauling	cum	52	25	1,300	
305	Compaction	cum	356	30	10,680	
306	Smoothing face of filled up	sqm	230	1	230	
307	Sub-total				20,590	(A)
3-2. Outlet works						
308	Excavation (top soil)	cum	205	30	6,150	
309	Excavation	cum	638	30	19,140	
310	Hauling	cum	95	25	2,375	
311	Hauling	cum	444	25	11,100	
312	Hauling	cum	304	25	7,600	
313	Compaction	cum	95	30	2,850	
314	Smoothing face of excavated and filled up	sqm	380	1	380	

B I L L O F Q U A N T I T I E S

No. 8

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
315	Reinforced concrete	cum	16.5	1,200	19,800	(B)
316	Reinforcing steel bar	t	0.22	12,000	2,640	
317	Lining concrete	cum	48.5	1,150	55,775	
318	Wooden form	sqm	28.5	250	7,125	
319	Sub-total				134,935	(B)
3-3.	Miscellaneous construction works	Ls.	1		4,665	(C)
	Total				160,190	(A)+(B)+(C)
4.	Appertenant Structure	Ls.	1		30,000	Cate setting and test

B I L L O F Q U A N T I T I E S

No. 9

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
<b>5. Division works</b>						
5-1. Repair of existing bank				(B)	(B)	
501	Excavation (top soil)	cum	192	30	5,760	
502	Excavation	cum	165	30	4,950	
503	Compaction	cum	210	30	6,300	
504	Hauling	cum	192	25	4,800	
505	Hauling	cum	210	25	5,250	
506	Smoothing face of excavated and filled up	sqm	510	1	510	
507	Sub-total				27,570	(A)
<b>5-2. Division works</b>						
508	Excavation (top soil)	cum	95	30	2,850	
509	Excavation	cum	155	30	4,650	
510	Compaction	cum	110	30	3,300	
511	Hauling	cum	95	25	2,375	
512	Hauling	cum	155	25	3,875	
513	Smoothing face of embankment and filled up	sqm	125	1	125	
514	Reinforced concrete	cum	43.5	1,200	52,200	
515	Lining concrete	cum	50.4	1,150	57,960	

B I L L O F Q U A N T I T I E S

No. 10

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
516	Wooden form	sqm	97.2	(β) 250	(β) 24,300	
517	Reinforcing steel bar	t	0.42	12,000	5,040	
518	Sub-total				156,675	(B)
5-3.	Miscellaneous construction works	LS.	1		5,527	(C)
	Total				189,772	(A)+(B)+(C)
6.	Appertenant Structure	LS.	1		30,000	Gate setting and test

ADDITIONAL DATA

CONSTRUCTION OF MODEL INFRASTRUCTURE  
AGRICULTURAL COOPERATIVE PROMOTION PROJECT

- 1) CONSTRUCTION SHCEDULE
- 2) LIST OF EQUIPMENT
- 3) OTHERS

# Progress Chart of Works for: A.C.P. PROJECT

CONSTRUCTION TERM FROM: TO:

160 DAYS

Thai Konoike Construction Co. Ltd.

NO.	DISCRIPTION	WEEKS																							Weekly Output
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
A	PREPARATION WORKS	(KONG SAMAKI AREA)																							
B	CONSTRUCTION of FARM POND																								
1	Excavation		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	3,100m <sup>3</sup>
2	Spreading				●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	650m <sup>3</sup>
3	Compaction			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	3,100 m <sup>3</sup>
4	Smoothing Face			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	1,200 m <sup>2</sup>
C	APPERTENANT STRUCTURE																								
1	Excavation & Smoothing Face																								
2	Lining Concrete																								
3	Wooden Form & Plain Concrete																								
4	Slope Protection																								150 m <sup>2</sup>
D	CLEAR AWAY																								
		(CHAKARAT)																							
E	PREPARATION WORKS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
F	OUTLET WORKS																								
1	Excavation & Hauling	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
2	Compaction & Smoothing Face	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
3	Wooden Form, Re-Bar & Re - Concrete																								
4	Lining Concrete																								
G	DIVERSION WORKS																								
1	Excavation & Hauling	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
2	Compaction & Smoothing Face	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
3	Wooden Form, Re-Bar & Re - Concrete																								
4	Lining Concrete																								
H	CLEAR AWAY																								

List of Equipment

No.	Name	Unit	Capacity	Type
1	Bulldozer	2	12 ton / 124 ps	D50A
2	Power shovel	2	0.45m <sup>3</sup> / 85 ps	PC120
3	Dump truck	4	11 ton / 281 ps	FXZ210
4	Concrete mixer	1	0.2m <sup>3</sup> / Batch	Local Made

OFFICE

12th Floor, REGENT HOUSE, 183 Rajdamri Road, Bangkok, Thailand.  
 Telephone : 251-3138-9, 251-3243, 251-3330, Telex : 84778 KIGBKK TH



Others

In order to promote the employment of local people, labour for the work will be obtained in the area around the site.

---

OFFICE

12th Floor, REGENT HOUSE, 183 Rajdamri Road, Bangkok, Thailand.  
Telephone : 251-3138-9, 251-3243, 251-3330, Telex : 84778 KIGBKK TH

COPY

PROPOSAL

For

Construction of Model Infrastructure

On

Agricultural Cooperative Promotion Project

in

Thailand

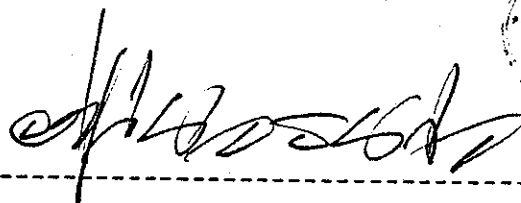
*Thai Silp Limited Partnership Co., Ltd.*

PROPOSAL Thai Silp

To: Mr. Michimoto GOTO  
The Resident Representative  
Japan International Cooperation Agency, Bangkok Office  
c/o Embassy of Japan  
1674, New Petchburi Road, Bangkok

P-01 BILL OF QUANTITIES AND BID PRICES

The undersigned Bidder having carefully examined in their entirely the Contract Documents for the Construction of the Model Infrastructure on the Agricultural Cooperative Promotion Project, hereby offers and proposes to perform all of the construction and services, to furnish all equipments, materials, supplies, labor and other items described in the Contract Documents, all for the unit or lump sum prices stated in words and figures in the following Quantities:

  
-----



- Bill of Quantities to be attached herein -

P-02 GUARANTEE OF COMPLETION

The undersigned Bidder guarantee to effect the commencement, prosecution and completion of the Contract Works.

P-03 BID SECURITY

I hereby certify that all statements herein are made on behalf of Shai Silp Limited Partnership, Co Ltd.  
Dated this 10 day of March 1986.



[Handwritten Signature]

Title \_\_\_\_\_

Firm's Address 192-196 Suranaree Road,  
T. Nai Muang A. Muang, Nakhonrajisima.

CONSTRUCTION COST

<u>A. Direct</u>	<u>Cost</u>	
Kong Samaki		
1. Construction of Farm ponds	3,312,750. —	P
2. Appertenant structure	1,284,225. —	P
Chakarat		
3. Outlet works	371,452. —	P
4. Appertenant structure	80,000. —	P
5. Diversion works	379,080. —	P
6. Appertenant structure	80,000. —	P
<u>Sub-Total</u>	<u>5,527,507. —</u>	P
B. Indirect		
1. Overhead 15%	829,126.05	P
2. Profit 5.5%	304,012.88	P
3. Tax 7.5%	414,563.02	P
<u>Sub-Total</u>	<u>1,547,701.90</u>	P
<u>Total</u>	<u>7,075,208.90</u>	P
<u>Round off</u>	(-) —	P
<u>Construction cost</u>	<u>7,075,208.90</u>	P

LIST OF UNIT COST

NO.	ITEM	UNIT	UNIT COST	REMARKS
1	Common labor	day	68	
2	Foreman, earth work	day	320	
3	Foreman, Concrete work	day	300	
4	Technician, form work(Carpenter)	day	220	
5	Technician, stell work	day	200	
6	Operator, Bull-Dozer	day	250	
7	Operator, Back-Hoe Shovel	day	250	
8	Excavation by Manpower	cum	80	Normal soil
9	Excavation by Bull-Dozer (11 ton)	cum	25	-do-
10	-do-	cum	28	sand
11	Excavation by Back-Hoe Shovel (0.35m)	cum	25	
12	-do-	cum	-	
13	Compacting by Manpower	cum	70	
14	Compacting by Compactor	cum	35	
15	Compacting by Vibration Roller	cum	22	
16	Reinforced concrete	kg	1.5	
17	Lining concrete	cum	1,500	
18	Plain concrete	cum	1,500	
19	Wooden form of concrete	sqm	250	
20	Processing and Assembling of Iron Bar	kg	10	
21	Loading by Tractor Shovel (1.2 cum)	cum	14	
22	Hauling by Dump Truck (8 ton)	cum	15	Normal Soil L = 150 m
23	-do-	cum	20	Normal Soil L = 500 m
24	Spreading by Bull-Dozer (11 ton)	cum	10	Normal Soil
25	Smoothing of Face Excavated or filled up	sqm	10	

B I L L O F Q U A N T I T I E S

No. 1

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
Kong Samaki Area						
1. Construction of farm pond						
1-1. Farm pond Type A (estimated 2 places)						
101	Excavation (top soil)	cum	1,650	25	41,250.-	
102	Excavation	cum	4,500	28	126,000.-	
103	Excavation	cum	-	-	-	
104	Spreading (Top soil)	cum	6,000	10	60,000.-	
105	Compaction	cum	4,500	22	99,000.-	
106	Smoothing face of excavated and filled up	sqm	6,000	10	60,000.-	
107	Sub-Total		-	-	386,250.-	(A)
1-2. Farm pond Type B-1 (estimated 2 places)						
108	Excavation (top soil)	cum	2,500	25	62,500.-	
109	Excavation	cum	5,000	28	140,000.-	
110	Excavation	cum	-	-	-	
111	Spreading	cum	7,800	10	78,000.-	
112	Compaction	cum	6,000	22	132,000.-	
113	Smoothing face of excavated and filled up	sqm	7,500	10	75,000.-	
114	Sub-Total		-	-	487,500.-	(B)

B I L L O F Q U A N T I T I E S

No. 2

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-3.	Farm pond Type B-2 (estimated 3 plades)				(B)	
115	Excavation (top soil)	cum	4,500	25	112,500.-	
116	Excavation	cum	10,000	28	280,000.-	
117	Excavation	cum	-	-	-	
118	Spreading	cum	17,000	10	170,000.-	
119	Compaction	cum	12,000	22	264,000.-	
120	Smoothing face of excavated and filled up	sqm	14,500	10	145,000.-	
121	Sub-Total				<u>971,500.-</u>	(C)



B I L L O F Q U A N T I T I E S

No. 3

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
1-4	Farm pond Type C (estimated 4 places)					
122	Excavation (top soil)	cum	6,700	25	167,500.-	
123	Excavation	cum	15,000	28	420,000.-	
124	Excavation	cum	-	-	-	
125	Spreading	cum	20,000	10	200,000.-	
126	Compaction	cum	20,000	22	440,000.-	
127	Smoothing face of excavated and filled up	sqm	24,000	10	240,000.-	
128	Sub-Total				<u>1,467,500.-</u>	(D)
1-5	Miscellaneous Construction	LS	-	-	-	(E)
	Total				<u>3,512,750.-</u>	(A)+(B)+(C)+(D)+(E)

B I L L O F Q U A N T I T I E S

No. 4

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2. Appurtenant structure						
2-1. Diversion canal of Type A (estimated 4 places)						
201	Excavation	cum	130	25	3,250.-	(B)
202	Soothing face of excavated	sqm	450	10	4,500.-	
203	Lining concrete	cum	20	1,500	30,000.-	
204	Plain concrete	cum	4	1,500	6,000.-	
205	Wooden form	sqm	450	250	112,500.-	
206	Slope protection	sqm	190	130	24,700.-	(A)
207	Sub-total				<u>180,950.-</u>	
2-2. Diversion canal of Type B (estimated 4 places)						
208	Excavation	cum	145	25	3,625.-	
209	Soothing face of excavated	sqm	500	10	5,000.-	
210	Lining concrete	cum	25	1,500	37,500.-	
211	Plain concrete	cum	5	1,500	7,500.-	
212	Wooden form	sqm	500	250	125,000.-	
213	Slope protection	sqm	180	130	23,400.-	(B)
214	Sub-total				<u>202,025.-</u>	

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-3.	Diversion canal of Type B-2	(estimated 6 places)		(B)	(B)	
215	Excavation	cum	250	25	6,250.-	
216	Smoothing face of excavated	sqm	700	10	7,000.-	
217	Lining concrete	cum	40	1,500	60,000.-	
218	Plain concrete	cum	4	1,500	6,000.-	
219	Wooden form	sqm	700	250	175,000.-	
220	Slope protection	sqm	250	130	32,500.-	
221	Sub-total				<u>286,750.-</u>	(C)

B I L L O F Q U A N T I T I E S

No. 6

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-4	Diversion canal of Type C (estimated 11 places)				(B)	
222	Excavation	cum	600	25	1,5000.-	
223	Soothing face of excavated	sqm	1,700	10	17,000.-	
224	Lining concrete	cum	90	1,500	1,35,000.-	
225	Plain concrete	cum	5	1,500	7,500.-	
226	Wooden form	sqm	1,500	250	375,000.-	
227	Slope protection	sqm	500	130	65,000.-	(D)
228	Sub-Total				<u>6,14,500.-</u>	(E)
2-5	Miscellaneous construction	LS	-	-		(A)+(B)+(C)+(D)+(E)
	Total				1,284,225.-	

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
Chakarat						
3. Outlet works						
3-1. Repair of existing bank						
301	Excavation (top soil)	cum	180	25	4,500.-	
302	Excavation	cum	70	28	1,960.-	
303	Hauling	cum	450	15	6,750.-	
304	Hauling	cum	-	-	-	
305	Compaction	cum	600	22	13,200.-	
306	Smoothing face of filled up	sqm	300	10	3,000.-	
307	Sub-total				<u>29,410.-</u>	(A)
3-2. Outlet works						
308	Excavation (top soil)	cum	320	25	8,000.-	
309	Excavation	cum	700	28	19,600.-	
310	Hauling	cum	120	15	1,800.-	
311	Hauling	cum	-	-	-	
312	Hauling	cum	-	-	-	
313	Compaction	cum	1,200	22	26,400.-	
314	Smoothing face of excavated and filled up	sqm	1,100	10	11,000.-	

B I L L O F Q U A N T I T I E S

No. 5

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
315	Reinforced concrete	cum	20	(B)		
316	Reinforcing steel bar	t	1	15000	30,000.-	
317	Lining concrete	cum	40	1500	60,000.-	
318	Wooden form	sqm	500	250	125,000.-	(B)
319	Sub-total				<u>296,800.-</u>	
3-3.	Miscellaneous construction works	LS.	-	-	65,242.-	(C)
	Total				391,452.-	(A)+(B)+(C)
4.	Appertenant Structure	LS.	-	-	80,000.-	Cate setting and test

B I L L O F Q U A N T I T I E S

No. 9

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
5.	Division works			(B)		
5-1.	Repair of existing bank					
501	Excavation (top soil)	cum	140	25	3,500.-	
502	Excavation	cum	175	28	4,900.-	
503	Compaction	cum	500	22	11,000.-	
504	Hauling	cum	230	15	3,450.-	
505	Hauling	cum	-	-	-	
506	Smoothing face of excavated and filled up	sqm	780	10	7,800.-	
507	Sub-total				<u>38,650.-</u>	(A)
5-2.	Division works					
508	Excavation (top soil)	cum	300	25	7,500.-	
509	Excavation	cum	200	28	5,600.-	
510	Compaction	cum	700	22	15,400.-	
511	Hauling	cum	250	15	3,750.-	
512	Hauling	cum	-	-	-	
513	Smoothing face of embankment and filled up	sqm	1,000.	10	10,000.-	
514	Reinforced concrete	cum	60	1,500	90,000.-	
515	Lining concrete	cum	65	1,500	97,500.-	

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
516	Wooden form	sqm	100	2,500	2,500.-	
517	Reinforcing steel bar	t	.3	15,000	4,500.-	
518	Sub-total				<u>277,250.-</u>	(B)
5-3.	Miscellaneous construction works	Ls.	-	-	6,3180.-	(C)
	Total				379,080.-	(A)+(B)+(C)
6.	Appertenant Structure	Ls.	-	-	80,000.-	Gate setting and test



PROPOSAL

For

Construction of Model Infrastructure

On

Agricultural Cooperative Promotion Project

in

Thailand

*Thai Takenaka International Ltd.*

To: Mr. Michimoto GOTO  
The Resident Representative  
Japan International Cooperation Agency, Bangkok Office  
c/o Embassy of Japan  
1674, New Petchburi Road, Bangkok

P-01 BILL OF QUANTITIES AND BID PRICES

The undersigned Bidder having carefully examined in their entirety the Contract Documents for the Construction of the Model Infrastructure on the Agricultural Cooperative Promotion Project, hereby offers and proposes to perform all of the construction and services, to furnish all equipments, materials, supplies, labor and other items described in the Contract Documents, all for the unit or lump sum prices stated in words and figures in the following Quantities:

BAHT THREE MILLION FIFTY THOUSAND ONLY  
(฿3,050,000.-)

- Bill of Quantities to be attached herein -

P-02 GUARANTEE OF COMPLETION

The undersigned Bidder guarantee to effect the commencement, prosecution and completion of the Contract Works.

P-03 BID SECURITY

I hereby certify that all statements herein are made on behalf of Thai Takenaka International Ltd.

Dated this 10th day of March 1986.

บริษัท ไทยทาเคเนคากา สากลก่อสร้าง จำกัด  
THAI TAKENAKA INTERNATIONAL LTD.

  
-----  
Taketsugu Nunose

-----  
Title Managing Director

-----  
Firm's Address Boonmitr Building  
5th Fl., 138 Silom Road, Bangkok.  
-----

CONSTRUCTION COST

A. Direct

C o s t

Kong Samaki

1. Construction of Farm ponds	1,753,952	₱
2. Appertenant structure	490,785	₱

Chakarat

3. Outlet works	144,525	₱
4. Appertenant structure	22,000	₱
5. Diversion works	189,544	₱
6. Appertenant structure	22,000	₱

Sub-Total 2,622,806 ₱

B. Indirect

1. Overhead	209,824	₱
2. Profit	113,670	₱
3. Tax	103,700	₱

Sub-Total 427,194 ₱

Total 3,050,000 ₱

Round off (-) - ₱

Construction cost 3,050,000 ₱

LIST OF UNIT COST

NO.	ITEM	UNIT	UNIT COST	REMARKS
1	Common labor	day	65	
2	Foreman, earth work	day	190	
3	Foreman, Concrete work	day	190	
4	Technician, form work(Carpenter)	day	170	
5	Technician, stell work	day	170	
6	Operator, Bull-Dozer	day	180	
7	Operator, Back-Hoe Shovel	day	180	
8	Excavation by Manpower	cum	26	Normal soil
9	Excavation by Bull-Dozer (11 ton)	cum	20	-do-
10	-do-	cum	18	sand
11	Excavation by Back-Hoe Shovel (0.35m)	cum	23	
12	-do-	cum	21	
13	Compacting by Manpower	cum	26	
14	Compacting by Compactor	cum	15	
15	Compacting by Vibration Roller	cum	15	
16	Reinforced concrete	kg	1,050	
17	Lining concrete	cum	1,200	
18	Plain concrete	cum	1,000	
19	Wooden form of concrete	sqm	350	
20	Processing and Assembling of Iron Bar	kg	13,300	
21	Loading by Tractor Shovel (1.2 cum)	cum	15	
22	Hauling by Dump Truck (8 ton)	cum	18	Normal Soil L = 150 m
23	-do-	cum	20	Normal Soil L = 500 m
24	Spreading by Bull-Dozer (11 ton)	cum	10	Normal Soil
25	Smoothing of Face Excavated or filled up	sqm	1.5	

B I L L O F Q U A N T I T I E S

No. 1

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
Kong Samaki Area						
1. Construction of farm pond						
1-1. Farm pond Type A (estimated 2 places)						
101	Excavation (top soil)	cum	960	20	19,200	h=0.2m
102	Excavation	cum	750	20	15,000	By Bulldozer h=0.3m
103	Excavation	cum	2,476	23	56,948	By Backhoe h=4.5m
104	Spreading (Top soil)	cum	960	10	9,600	
105	Compaction	cum	3,226	15	48,390	
106	Smoothing face of excavated and filled up	sqm		1.5	3,489	
107	Sub-Total		2,326		152,627	(A)
1-2. Farm pond Type B-I (estimated 2 places)						
108	Excavation (top soil)	cum	1,440	20	28,800	h=0.2m
109	Excavation	cum	774	20	15,480	By Bulldozer h=0.3m
110	Excavation	cum	4,124	23	94,852	By Bulldozer h=4.5m
111	Spreading	cum	1,440	10	14,400	
112	Compaction	cum	4,898	15	73,470	
113	Smoothing face of excavated and filled up	sqm	2,780	1.5	4,170	
114	Sub-Total				231,172	(B)

B I L L O F Q U A N T I T I E S

No. 2

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-3.	Farm pond Type B-2 (estimated 3 places)			(B)	(B)	
115	Excavation (top soil)	cum	2,160	20	43,200	h=0.2m
116	Excavation	cum	1,161	20	23,220	By Bulldozer h=0.3m
117	Excavation	cum	6,186	23	142,278	By Backhoe h=4.5m
118	Spreading	cum	2,160	10	21,600	
119	Compaction	cum	7,347	15	110,205	
120	Smoothing face of excavated and filled up	sqm	4,170	1.5	6,255	
121	Sub-Total				346,758	(C)

B I L L O F Q U A N T I T I E S

No. 3

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
1-4	Farm pond Type C (estimated 4 places)			(B)	(B)	
122	Excavation (top soil)	cum	4,500	20	90,000	
123	Excavation	cum	2,808	20	56,160	
124	Excavation	cum	17,392	23	400,016	
125	Spreading	cum	4,500	10	45,000	
126	Compaction	cum	20,200	15	303,000	
127	Smoothing face of excavated and filled up	sqm	9,648	1.5	14,472	
128	Sub-Total				908,648	(D)
1-5	Miscellaneous Construction	LS			114,747	(E)
	Total				1,753,952	(A)+(B)+(C)+(D)+(E)



B I L L O F Q U A N T I T I E S

No. 4

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2.	Appertenant structure					
2-1.	Diversion canal of Type A (estimated 4 places)			(B)	(B)	
201	Excavation	cum	104	23	2,392	
202	Smoothing face of excavated	sqm	204	1.5	306	
203	Lining concrete	cum	16.8	1,200	20,160	
204	Plain concrete	cum	2.0	1,000	2,000	
205	Wooden form	sqm	12.8	350	4,480	
206	Slope protection	sqm	160	220	35,200	
207	Sub-total				64,538	(A)
2-2.	Diversion canal of Type B-1 (estimated 4 places)					
208	Excavation	cum	128	23	2,944	
209	Smoothing face of excavated	sqm	256	1.5	384	
210	Lining concrete	cum	19.2	1,200	23,040	
211	Plain concrete	cum	2.0	1,000	2,000	
212	Wooden form	sqm	12.8	350	4,480	
213	Slope protection	sqm	160	220	35,200	
214	Sub-total				68,048	(B)

B I L L O F Q U A N T I T I E S

No. 5

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-3.	Diversion canal of Type B-2	(estimated 6 places)		(P)	(P)	
215	Excavation	cum	192	23	4,416	
216	Smoothing face of excavated	sqm	384	1.5	576	
217	Lining concrete	cum	28.8	1,200	34,560	
218	Plain concrete	cum	3.0	1,000	3,000	
219	Wooden form	sqm	19.2	350	6,720	
220	Slope protection	sqm	240	220	52,800	
221	Sub-total				102,072	(C)

B I L L O F Q U A N T I T I E S

No. 6

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
2-4	Diversion canal of Type C (estimated 11 places)				(B)	
222	Excavation	cum	671	23	15,433	
223	Smoothing face of excavated	sqm	1,045	1.5	1,567	
224	Lining concrete	cum	77.0	1,200	92,400	
225	Plain concrete	cum	5.5	1,000	5,500	
226	Wooden form	sqm	35.2	350	12,320	
227	Slope protection	sqm	440	220	96,800	
228	Sub-Total				224,020	(D)
2-5	Miscellaneous construction	LS			32,107	(E)
	Total				490,785	(A)+(B)+(C)+(D)+(E)

B I L L O F Q U A N T I T I E S

No.7

Item No.	Description	Unit	Quantity	Unit Price (β)	Price (β)	Remarks
Chakarat						
3. Outlet works						
3-1. Repair of existing bank						
301	Excavation (top soil)	cum	100	26	2,600	
302	Excavation	cum	45	26	1,170	use for banking
303	Hauling	cum	100	17	1,700	Top soil disposal
304	Hauling	cum	45	15	675	
305	Compaction	cum	337	26	8,762	
306	Smoothing face of filled up	sqm	243	1.5	364	
307	Sub-total				15,271	(A)
3-2. Outlet works						
308	Excavation (top soil)	cum	185	26	4,810	
309	Excavation	cum	595	26	15,470	
310	Hauling	cum	103	15	1,545	use for outlet work
311	Hauling	cum	385	17	6,545	disposal
312	Hauling	cum	292	15	4,380	transport to bank
313	Compaction	cum	103	26	2,678	
314	Smoothing face of excavated and filled up	sqm	375	1.5	562	

B I L L O F Q U A N T I T I E S

No. 8

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
315	Reinforced concrete	cum	17	1,050	17,850	
316	Reinforcing steel bar	t	0.2	13,300	2,660	
317	Lining concrete	cum	44	1,200	52,800	
318	Wooden form	sqm	30	350	10,500	
319	Sub-total				119,800	(B)
3-3.	Miscellaneous construction works	Ls.	1		9,454	(C)
	Total				144,525	(A)+(B)+(C)
4.	Appertenant Structure	Ls.	1		22,000	Gate setting and test

B I L L O F Q U A N T I T I E S

No. 9

Item No.	Description	Unit	Quantity	Unit Price (P)	Price (P)	Remarks
5.	Division works					
5-1.	Repair of existing bank					
501	Excavation (top soil)	cum	175	26	4,550	
502	Excavation	cum	150	26	3,900	
503	Compaction	cum	185	26	4,810	
504	Hauling	cum	175	17	2,975	disposal (spreading)
505	Hauling	cum	150	15	2,250	
506	Smoothing face of excavated and filled up	sqm	475	1.5	712	
507	Sub-total				19,197	(A)
5-2.	Division works					
508	Excavation (top soil)	cum	92	26	2,392	
509	Excavation	cum	162	26	4,212	
510	Compaction	cum	127	26	3,302	
511	Hauling	cum	92	17	1,564	disposal
512	Hauling	cum	162	15	2,430	transport to bank 35m <sup>3</sup>
513	Smoothing face of embankment and filled up	sqm	118	1.5	177	
514	Reinforced concrete	cum	42	1,050	44,100	
515	Lining concrete	cum	51	1,200	61,200	

B I L L O F Q U A N T I T I E S

No.10

Item No.	Description	Unit	Quantity	Unit Price	Price	Remarks
516	Wooden form	sqm	95	350	(B)	
517	Reinforcing steel bar	t	0.4	13,300		
518	Sub-total				157,947	(B)
5-3.	Miscellaneous construction works	Rs.	1		12,400	(C)
	Total				189,544	(A)+(B)+(C)
6.	Appertenant Structure	Rs.	1		22,000	Gate setting and test

DATA ATTACHED TO BID PROPOSAL

FOR

CONSTRUCTION OF MODEL INFRASTRUCTURE

ON

AGRICULTURAL COOPERATIVE PROMOTION PROJECT

THAI TAKENAKA INTERNATIONAL LTD.



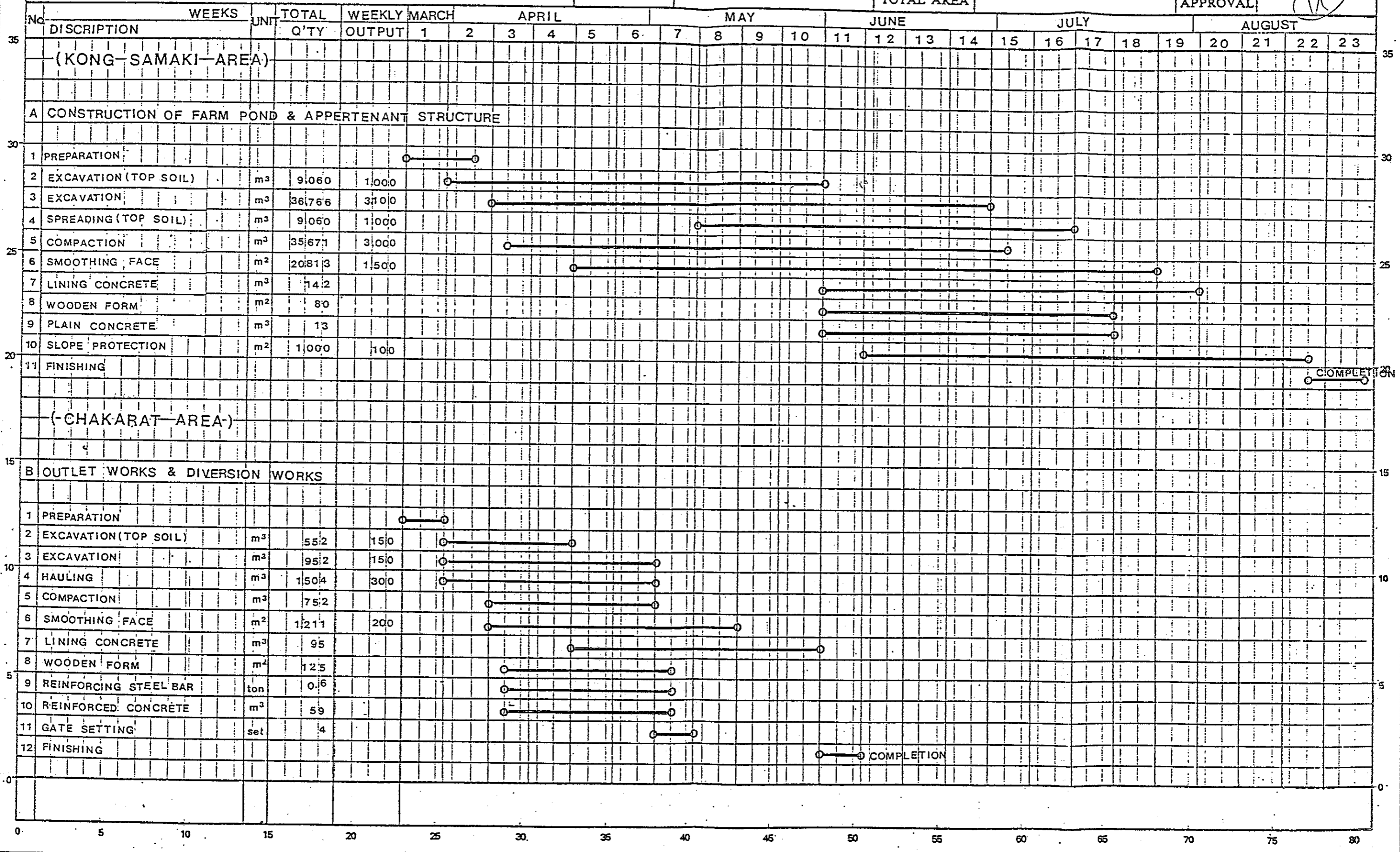
INDEX

1. Construction schedule
2. List of Equipment
3. Basic policy in the execution of  
of the Work

# CONSTRUCTION PROGRESS SCHEDULE

AGRICULTURAL COOPERATIVE PROMOTION PROJECT

CLIENT	JICA	STRUCTURE	B. F. P.	DATE	MAR. 7 '86
SITE	NAKORN RATCHASIMA	BLDG. AREA	-	ARCHITECT	
CONST.PERIOD	160 DAYS	TOTAL AREA	-	APPROVAL	



## 2. List of Equipment

No.	Kind of Equipment	Q'ty	Type	Capacity
1	Bulldozer	1	DSB	12 ton / 106 ps
2	"	1	D4ELGP	10 ton / 81 ps
3	Power shovel	1	HD550	0.55m <sup>3</sup> / 93 ps
4	"	1	MS120-B	0.45m <sup>3</sup> / 85 ps
5	Dump truck	2	KT-925	11 ton / 280 pcs
6	"	4		6 ton / 130 ps
7	Water tank truck	1		4,000L
8	Vibration plate	2	CM-10	0.3 - 1.0 ton
9	Concrete mixer	1	Portable type	0.25m <sup>3</sup> / 1 Batch

3. Basic Policy in the execution of the work

- 1) According to the purpose of the project to promote the agriculture in the district, we will try to employ the materials and manpower locally available for the construction of the Model Infrastructure as much as possible.
- 2) For the construction of farm pond, the sequence of the work and allocation of equipment shall be planned properly and efficiently, considering the volume of the work and rainy season.
- 3) During the dry season, water shall be splinkled over the embankment.
- 4) Top soil in the farm pond areas shall be cut and stocked nearby the site prior to the commencement of exsavation of the farm pond. After embankment will be completed such stocked top soil shall be placed on the embankment, so that the area can be used as a field.
- 5) The major part of outlet works and diversion work shall be completed before the rainy season starts. A temporary diversion shall be also considered during the rainy season.
- 6) For the successful completion of the project we will try to maintain friendly cooperation and smooth communication with local people and authorities concerned during the construction period.

.....

6-4Z

X 扎金 对比 表

## CONSTRUCTION COST

Items	Estimated cost by JICA	Chok Chai Civil Limited Partner- ship	Thai Konoike Construction Co., Ltd.	Thai silp Limited Partnership Co., Ltd.	Thai Takenaka International Ltd.
A. Direct					
Kong Samaki					
1. Construction of farm ponds	1,745,000	3,146,167	1,824,160	3,312,750	1,753,952
2. Appretement Structure	445,000	664,712	487,378	1,284,225	490,785
Chakarat					
3. Outlet works	147,000	225,108	160,190	391,452	144,525
4. Appretement Structure	25,000	20,000	30,000	80,000	22,000
5. Diversion works	184,000	266,056	189,772	379,080	189,544
6. Appretement Structure	25,000	20,000	30,000	80,000	22,000
Sub-Total	2,571,000	4,342,093	2,721,500	5,527,507	2,622,806
B. Indirect					
1. Over head		651,314	163,290	829,126.05	209,824
2. Profit	514,000	434,209	176,897	304,012.88	113,670
3. Tax		379,933	107,610	414,563.02	103,700
Sub-Total	514,000	1,465,456	447,797	1,547,701.90	427,194
Total	3,085,000	5,807,549	3,169,297	7,075,208.90	3,050,000
Round off	---	7,549	4,297	---	---
Construction cost	3,085,000	5,800,000	3,165,000	7,075,208.90	3,050,000
	(100)	(188)	(103)	(229)	(99)

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

6-4-3

入札結果の通知書

COPY

No. 286/61

March 14, 1986

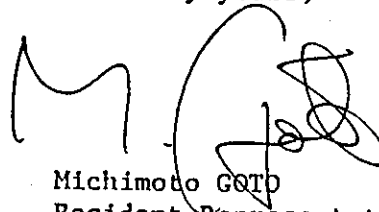
Chok-chai Construction Co., Ltd.  
Hua-tha-lay Commune,  
Muang District  
Nakhornratchasima

Dear Sir,

I am informing that your proposal for which JICA invited on 3rd of March was not regretablely adopted for the model infrastructure construction work in the Agricultural Cooperative: Promotion Project.

The next opportunity will be highly appreciated.

Sincerely yours,



Michimoto GOTO  
Resident Representative,  
JICA Bangkok Office

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

COPY

No. 287/61

March 14, 1986

Thai Konoike Construction Co., Ltd.  
12th Floor Regent House  
183 Rajdamri Rd., Patumwan,  
Bangkok 10500

Dear Sir,

I am informing that your proposal for which JICA invited on 3rd of March was not regreably adopted for the model infrastructure construction work in the Agricultural Cooperative Promotion Project.

The next opportunity will be highly appreciated.

Sincerely yours,



Michimoto GOTO  
Resident Representative,  
JICA Bangkok Office

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

COPY

No. 285/61

March 14, 1986

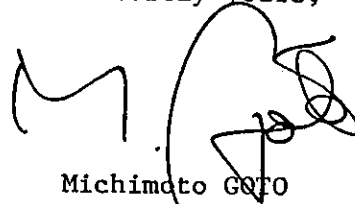
Thai Silp Co., Ltd.  
3596/5-7 Suranaree Rd.,  
Muang District,  
Nakornratchasima

Dear Sir,

I am informing that your proposal for which JICA invited on 3rd of March was not regretably adopted for the model infrastructure construction work in the Agricultural Cooperative Promotion Project.

The next opportunity will be highly appreciated.

Sincerely yours,



Michimoto GORO  
Resident Representative,  
JICA Bangkok Office



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

- COPY -

No. 288/61

March 14, 1986

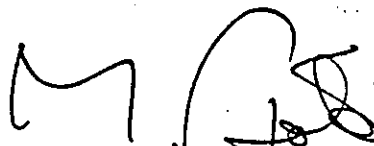
Thai Takenaka International Ltd.  
Boonmitr Bldg. 5th Fl.  
138 Silom Rd.,  
Bangkok.

Dear Sir,

It is formed that your proposal dated on 10th March for the Model Infrastructure construction work in the Agricultural Cooperative Promotion Project successfully got the first priority for the negotiation.

You will be entered into the negotiation for the bidding on 17th March, 10:00 a.m. at JICA Bangkok Office, and your attendance for the matter will be appreciated, we remain.

Sincerely yours,



Michimoto GOTO  
Resident Representative  
JICA Bangkok Office

6-5

契約書類

6-5-1

TERMS AND CONDITIONS  
OF THE CONTRACT

For

Construction of Model Infrastructure

on

Agricultural Cooperative Promotion Project

in

Thailand

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY

## TERMS AND CONDITIONS OF THE CONTRACT

### Section 1 General Information

#### 1.1 Objective

According to the Record and Discussions signed July 6, 1984, technical cooperation concerning Agricultural Cooperative Promotion Project in Thailand (the Project) will be carried out.

The objective of the works are to develop the water resource in necessary for the project for the accelate motivation of the farmers.

#### 1.2 Location of the site

The Kong Samaki job site is located at north northeast of Nakorn Ratchasima City and about 80 km off. The Chakarat job site is located at east of the City and about 40 km off.

#### 1.3 Collaboration

Accordingly the objective of technical cooperation, the counterpart agency of JICA, the Agricultural Cooperative Promotion Department, is executing several experiments around the job site. Prior to or during the course of the works, the Contractor shall make the good relation with the Agricultural Cooperative Department for the satisfactory implementation of the Works to secure full collaboration. Should it happen that the relation between the Agricultural Cooperative Promotion Department and the Contractor is disturbed, the Contractor shall inform the Inspection Committee who will conciliate the both parties.

### Section 2 Submission of Notices

#### 2.1 Work schedule

The Contractor shall submit the Work schedule in following item before the commencement of the Works at the job site. If the Contractor intends to change the Work schedule, the approval from the Inspection Committee shall be obtained prior to the modification of the schedule.

1. Preparation of facilities and transportation of equipment etc. to the job site
2. Farm pond at Kong Samaki job site
3. Appertenant structures at Kong Samaki job site
4. Outlet work at Chakarat job site
5. Division work at Chakarat job site
6. Appertenant structure at Chakarat job site
7. Appertenant structures
8. Clearing away

Also the Contractor shall submit the machineries scheme including the numbers, and kind of machineries and using period of them.

#### 2.2 Notices

The JICA and the Contractor shall submit the notices to each other, as necessary, in accordance with Article 19 in the Construction Contract Document within reasonable time except that special articles are provided in the Contract Document and Terms and Conditions of this Contract.

### Section 3 Field Test and Inspection

The field tests in accordance with the Technical specifications and the demands from the Inspection Committee shall be the responsibility for the Contractor. The charges for such field test shall be included in the total amount of the construction cost, and the Contractor is not entitled to claim any amount of the field test charges.

#### Section 4   Modification of Plan

In case the JICA estimates the cost for the modification in accordance with Article 14, and if there are two portions, one for the increase and the other for the decrease of the construction cost resulting from such modification, the JICA shall have the right to offset them in the payment and pay or claim the difference between the increase and decrease of the construction cost as the case may be.

#### Section 5   Release from the Works

After the final acceptance of the Works by the JICA, the Contractor shall remove its own temporary facilities, office, warehouses, construction roads, electric wiring, surplus material, debris and so forth which were provided by the Contractor within 10 (ten) days. Upon approval of the Inspection Committee for the removal of the above-mentioned facilities etc., the Contractor will be released from its responsibility of the Works but remains responsible under 1 (one) year guarantee of the Works as specified in Article 11 in this Contract.

#### Section 6   General Obligations of the Contractor

##### 6.1 Temporary office and residence

In case the Contractor intends to build the temporary office, residence and so forth, the Contractor shall submit the plan to the Inspection Committee for approval at least 10 (ten) days in advance of the commencement of the Works.

The Contractor is required to always keep the buildings and facilities in good condition and to make proper drainage and sanitary system. Should the Contractor build them outside of the job site, the Contractor shall arrange with the owner of such land and at its own expense.

## 6.2 Fuel storage

In area of temporary office and residence, the fuel tank capacity shall not exceed 1,000 liters and shall be far away from the housing area.

Fuel storage and transportation shall be done with care and shall have a good system of fire prevention. If storage licence is required, the Contractor shall arrange for obtaining it.

## 6.3 Other facilities

All necessary facilities for the Works and the Contractor's convenience shall be provided and maintained in good condition by the Contractor.

## Section 7 Additional Works

In case that the Government of Japan provides the Government of Kingdom of Thailand with the heavy equipment such as Bulldozer, Back-hoe shovel, and so forth for the project, the Contractor shall use the said heavy equipment for this construction works.

The Inspection Committee has the right to modify the unit costs of the item about earth work used heavy equipment, the additional works of the balance price between Construction cost written the Contract and Construction cost estimated by Inspection Committee again are ordered by the Inspection Committee.

## Section 8 General Text

The Contractor shall implement the Works in accordance with the Contract Documents in broad sense such as the Contract in narrow sense, Terms and Conditions of Construction Contract, Technical Specification and Guideline for Supervision. Should the events occur that the both parties can not reach agreement on the interpretation of the above-mentioned Contract Documents in broad sense, both parties shall negotiate with sincerity and good faith for settlement of any disagreement, failing which the decision of the JICA shall prevail.

6-5-2

CONTRACT

FOR

CONSTRUCTION OF MODEL INFRASTRUCTURE

ON

AGRICULTURAL COOPERATIVE PROMOTION PROJECT

IN THAILAND

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY



CONTRACT

For Construction of Model Infrastructure  
on Agricultural Cooperative Promotion  
Project in Thailand



1986

This Contract is executed on the 18th day of March, 1986  
at the JICA Bangkok Office between

Japan International Cooperation Agency, Bangkok Office  
by Mr. Michimoto GOTO Title Resident Representative as its  
authorized representative of the JICA Bangkok Office, hereinafter  
called "the JICA" of the one part, and Thai Takenaka  
International Ltd. whose office is situated at 138 Road  
Silom Tambon Surawongse Amphoe Bangrak  
Changwat Bangkok Tel. 234-0072 Represented by  
Taketsugu Nunose Nationality Japanese  
Title Managing Director hereinafter called "the Contractor",  
of the other part.

Both parties mutually agree under the terms of this  
Contract as follows:-

Article 1 Purpose of agreement and Contract Price

The JICA agrees to employ the Contractor and the  
Contractor agrees to perform the Works for the construction of  
Model Infrastructure on Agricultural Cooperative Promotion  
Project Located at Kong Samaki and Chakarot, Nakorn  
Ratchasima Prefecture For the total  
amount of ฿3,050,000.- (Baht Three Million Fifty  
Thousand Only ), hereinafter called "Contract Price".

The following documents shall form integral part of this Contract:-

- Terms and conditions of this contract -----
- Pledge agreement -----
- Technical specification -----
- Bill of Quantities -----
- Drawings -----

Article 2 Performance Bond

As a security for the faithful performance of the Works under this Contract, the Contractor has on the execution of this Contract deposited a performance bond with the JICA ----- Baht (-----) in cash, or in lieu thereof a Bank Guarantee issued by the Bank of Tokyo, Ltd. ----- bearing the number BKG165-86/588 ----- and dated March 18, 1986 in the amount of ~~¥152,500.-~~ ----- Baht One Hundred Fifty-two Thousand (Five Hundred Only) ----- which represents five (5) percent of the Contract Price, the name of the issuing bank and the form of the bank guarantee are to be approved by the JICA.

The JICA will return the performance Bond in cash or the Bank Guarantee to the Contractor as the case may be at the end of the twelve (12) months after final acceptance of the Works by the JICA as stipulated in Article 15 of this Contract, provided that the completed Works shall not show any defect or damage caused through the fault of the Contractor, or through the fault of any new Contractor in the case of termination of Contract by the JICA under Article 4.

Should the Contractor be in default, the JICA shall have the right to demand payment from all or any part of the performance Bond. In addition, the Contractor shall remain liable for the full loss sustained by the JICA.

Article 3 Payment

The JICA agrees to effect payments for the Works to the Contractor in the following manner:-

a. Advance Payment, to be effected upon the bringing of equipment and materials required for the Works and properly stored at the job site by the Contractor and of value estimated by the Inspection Committee. Baht Nine Hundred Fifteen Thousand Only  
(฿915,000.-)-----which corresponds to Thirty (30) percent of the Contract Price shall be paid upon signing of this Contract.

b. Interim payment, to be effected according to the progress of the Works satisfactorily executed by the Contractor and accepted by the Inspection Committee. Baht Nine Hundred Fifteen Thousand Only (฿915,000.-)-----which corresponds to Thirty (30) percent of the Contract Price shall be requested for payment at the end  
of May 1986----- . In case that value of the executed construction works estimated by Inspection Committee is less than fifty (50) percent of the Contract Price, interim payment shall be deducted by the full amount of advance payment, balance of which correspond to value of the executed construction works.

c. Final Payment, to be effected upon the satisfactory completion of the Works by the Contractor and accepted by the Inspection Committee.  
The remainder of Baht One Million Two Hundred Twenty Thousand Only (฿1,220,000.-)  
----- which corresponds to Forty (40) percent of the Contract Price, or the remaining amount of Contract Price shall be paid after the Final Certificate by the JICA for payment to the Contractor.

Payment under (b) and (c) shall be effected within ten (10)----- day after the respective acceptance of the Works by the Inspection Committee.

Taxes payable by the Contractor, if any, shall be deducted at source by the JICA on each payment.

It is expressly understood that payments by the JICA do not mean acceptance responsibilities under this Contract.

Article 4    Completion Time

The Contractor agrees to commence the Works at the site within ten (10) days from the date of signing of this Contract (commencement date) and the Contractor agrees to satisfactorily complete the Works within 160 days (completion time) after the date hereof which will become due on 24 August, 1986 (completion date).

If the Contractor fails to commence the Works by the above commencement date, or should in the course of the construction any event occur which may reasonably cause the JICA to believe that the Contractor will not be able to complete the Works on the completion date, or should the Contractor fail to complete the Works by the completion date, or should the Contractor fail to meet any of the Contract requirements, the JICA shall have the right to terminate this Contract by giving written notice to the Contractor.

However, in case that the Contractor fails to complete the Works by the completion date, or to meet any of the Contract requirements, if the Inspection Committee thinks that the Contractor has the ability for completion of the Works within reasonably extended period, the Contractor may be permitted by the JICA to continue the Works beyond the completion date but within the within time.

Article 5    Penalty

In case that the Contractor is in default as mentioned in Article 4, the Contractor agrees to be responsible to the JICA as follows:-

5.1 In case of the termination by the default of commencement for the Works, the Contractor shall pay a penalty of fifty Thousand Baht (50,000.00) Baht) per day counting from the commencement date until the new Contract is completely executed with a new Contractor for this Works, the period of which is included the time spent for finding the new Contractor and excuting the new Contract etc.

5.2 In case the JICA thinks that the Contractor will not be able to complete the Works within the completion time and thereby terminates this Contract, the Contractor shall pay a penalty of fifty Thousand Baht (50,000.00 Baht) per day counting the number of days in the same manner as prescribed in 5.1 above. However, the JICA may reduce such number of days according to the ratio between the completed Works and the total Works as may be decided by the Inspection Committee.

5.3 In case the Contractor fails to complete the Works by the completion date or to meet any Contract requirement, the Contractor shall pay a penalty of fifty Thousand Baht (50,000.00 Baht) per day counting from the date following the completion date until the Works satisfactorily completed and accepted by the Inspection Committee.

#### Article 6 Compensation

If the JICA sustains any losses as direct or indirect damages caused by the Contractor's failure, the Contractor shall compensate the JICA for such losses. The parties agree that time is essential for the completion of the Works.

Article 7    The JICA's right for default

The JICA has the sole and absolute right to decide whether to terminate the Contract, to impose only the penalty on the Contractor or to claim the compensation for the damage as stated in Article 5 or Article 6. The money due to the JICA exercising its right under this article shall be retained and deducted from any money due to the Contractor but yet unpaid, including from the performance bond. If the total amount of the loss is larger than the money above-mentioned, the Contractor agrees that the JICA has the right to retain the construction equipment, materials and supplies etc. and demand payment of the balance from such equipment etc. or proceeds of sale thereof.

Article 8    Contractor's responsibility on termination of this Contract

After the Contract has been terminated in accordance with the foregoing Article 4, the JICA shall have the right to employ another Contractor (hereinafter called the "New Contractor") to carry on the remaining parts of the Works, and the payment for the Contractor that fail to complete the work shall be made out of the necessary Contract price for the remaining Works. Should the remaining amount after payment of the advance and interim payment from the Contract price, be insufficient to effect payment to the new Contractor, the difference between such remaining amount and actual cost estimated by the JICA for the satisfactory completion Works carried out by the new Contractor, shall be deemed as direct loss sustained by the JICA, and the Contractor shall pay such difference to the JICA within ten (10) days from the date of request by the JICA, failing which interest at the rate of eighteen (18) percent per annum shall be charged thereon.

Article 9    Inspection Committee

The Inspection Committee, authorized to act on behalf of the JICA will be appointed by the JICA and the Inspection Committee is entitled to do all things that the JICA may do so. The Inspection Committee shall control and supervise the Works all the times whether it is in the preparation or implementation of the Works and the Contractor shall promptly furnish all necessary facilities for proper inspections of the Works in accordance with the Inspection Committee's request. At any moment the Inspection Committee can request the Contractor to stop the Works, if necessary and the Contractor shall have no claim on the JICA for extension of the completion time due to such suspension of the Works under this Article.

The Inspection will not be deemed as the acceptance of the Works, and the Contractor shall not be relieved from his responsibility to meet the Contract requirements by the fact that the Inspection Committee exercise their duties. Should it be found that the Works have not been satisfactorily performed in the faithful manner, the Contractor shall correct any part of the Works indicated by the Inspection Committee within the period specified by the Inspection Committee.

Article 10    Prohibition for the equipment removal

Should the Contractor fail to complete the Works during the completion time or the Inspection Committee thinks that the Contractor will not be able to satisfactorily complete the Works, any equipment and materials brought to the site for use on the Works shall not be removed without the prior approval of the Inspection Committee in writing.

Article 11    Rectification of the defective construction

For a further period of One (1) year after satisfactory completion and final acceptance of the Works by the JICA, whether completed by the Contractor or by the new Contractor in case of termination of Contract under Article 4, any damage to the Works which is caused by the Contractor's fault, either because of defective workmanship or the use of inferior materials or any other cause, shall be made good as necessary by the Contractor to the satisfaction of the JICA at no extra cost.

In case of the termination of the Contract, the JICA may decide which part of the Works should come under the Contractor's responsibility, and requests the Contractor to make good of the damaged Works. Should the Contractor fail to do so within period specified after receipt of written request to do so from the JICA, the JICA shall have the right to employ another Contractor to carry out such work and the Contractor agrees to bear all expenses incurred.

Article 12    Discrepancies among the Contract Documents

If, prior to or during the course of the Works, any discrepancies are found in the drawings and/or the Technical Specifications etc. attached to this Contract, the Contractor shall follow the ruling given by the Inspection Committee at no additional cost to the JICA.

Article 13    Construction Method and Temporary Works

The construction method including implementation schedule and plan of the temporary works such as installation of temporary facilities, offices, ware houses, construction roads, electric wiring, etc. shall be submitted by the Contractor and approved by the Inspection Committee at least 10 (ten) days in advance of the commencement of the Works.



Should the cost of the above temporary works be estimated in the unit cost of each work items of Bill of Quantities in this Contract, and the Contractor is not entitled to claim any amount of charges for the temporary works.

Article 14    Modification of Plan

If the Inspection Committee finds it necessary to make modification of construction design, quantities and/or materials and so forth during the course of construction, the JICA has the right to order the modification of the Works to the Contractor, and such order shall be made in writing from the Inspection Committee to the Contractor.

The JICA agrees to adjust upwards or downwards the necessary expense for such modification to the Contractor, which will be estimated by unit price in the bill of quantities of this Contract in case of modification of quantities of construction works. In the case of additional works which are not quoted by unit price in the bill of quantities of this Contract, the Inspection Committee will make estimation thereof and the JICA will pay to the Contractor for such additional works accordingly. But if the Contractor does not agree to such estimation, the Contractor is then entitled to negotiate with the JICA. Also the extension of the completion time due to the modification shall be given by the JICA who shall have the sole right to decide the number of days of such extension.

Article 15    Acceptance of the Works

When the entire Works have been completed, the Contractor shall submit the invoice in written form indicating the Work actually completed to the Inspection Committee. If there are compliance with drawings or Technical Specifications, the JICA shall accept the Works as the final acceptance of satisfactory completion Works within ten (10) days after the receipt of the written form and it shall be deemed that the final acceptance has been made on such date of the receipt of the written form.

On the other hand, should non-compliance with drawings or Technical specifications or defects be found in the Works executed by the Contractor, the Inspection Committee will have the right not to accept the Works and to order the rectification of the Works. If the required period for the rectification of the Works is beyond the completion date, the Contractor shall not be relieved from its responsibility to pay the penalty as stipulated under clause 5.3, and after the completion of rectification of the Works, then the final acceptance will be made in the same manner as described in the first paragraph of this Article.

During the course of construction, whether in the completion time or of extended time specified in the last paragraph of Article 4, the JICA has the right to accept a part of the Works already completed in the written form which shall be considered as a part of final acceptance. However, both parties shall negotiate with each other for the maintenance and usage of the accepted part of the Works, and the contractor is not entitled to request the extension of the completion time due to any interruption caused by the use of such accepted Works by the JICA, the Inspection Committee or the officers of Thai Government authorities, or any delay in repairing such accepted Works.

#### Article 16    Construction Engineer

The Contractor shall appoint a construction engineer at his own expense for the supervision of the Works performance, who shall be authorized to act on behalf of the Contractor, and the instructions given to him shall be deemed as given to the Contractor. Such construction engineer shall be a well English-speaking person and accepted by the JICA, who shall stay at the job site all the time and shall not leave without obtaining the prior approval of the Inspection Committee. If the Contractor replaces the construction engineer, the Contractor shall obtain the prior approval from the Inspection Committee in writing.

Article 17    Replacement of Labour, Engineer and Foreman

The Inspection Committee may request the Contractor to remove any of the Contractor's labours, foremen or engineers if it appears to the Inspection Committee that such labour, foreman or engineer is incompetent for his job or is not suitable or is not capable of handling his workmen or staff, and the Contractor shall promptly replace any such labour, foreman or engineer. No extra cost or claim for extension of time will be allowed because of such replacement.

Article 18    Sub-Contractor

The Contractor shall not sub-contract or assign any portion of the Works under this Contract without obtaining the prior approval of the JICA who has the sole right to decide which portion of the Works may be sub-contracted or assigned to the Sub-Contractor. However, the Contractor shall be fully responsible for the Works done by the Sub-Contractor.

Article 19    Notice

All Notices required by this Contract shall be effective only at the time of receipt thereof, and only when received by the parties concerned at following address:-

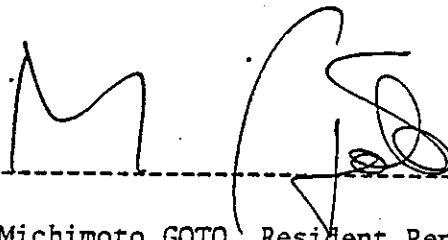
The JICA	Bangkok Office, c/o Japanese Embassy ----- 1674/1 New Petchburi Road, Bangkok. -----
The Contractor	Thai Takenaka International Ltd. ----- Boonmitr Bldg., 5th Floor ----- 138 Silom Road, Bangkok ----- -----

All Notices required by the terms of this Contract shall be made in writing in English Language, and delivered by registered mail or hand delivery.

Article 20   Dispute

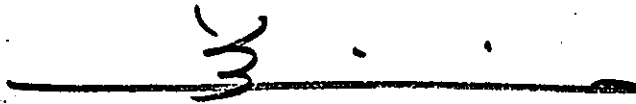
In the event of any dispute arising from the interpretation and performance of the terms of this contract, both parties agree to make the best attempt with sincerity and in good faith to negotiate and amicably settle such dispute, failing which the parties agree to refer such dispute to arbitration under Thai Commercial Arbitration Rules and Regulation, Bangkok, by 2 arbitrators, each of which is to be appointed by each party. If either party fails to appoint its arbitrator within seven (7) days or should the arbitrators fail, within fifteen (15) days after their appointment, to agree upon the decision of the dispute or no decision is reached on the appointment of an umpire, then the dispute shall be brought before the Court the Thainland for decision under the laws and procedures of the Kingdom of Thailand.

This Contract is executed in duplicate of the same tenor, one of the original copy to be kept by JICA and the other original copy to be kept by the Contractor. Both the JICA and the Contractor have set their signatures and affixed the seals thereto in the presence of the witnesses.



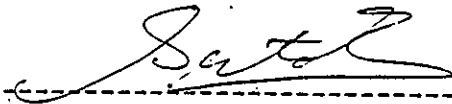
----- JICA

Mr. Michimoto GOTO, Resident Representative,  
Bangkok Office, Japan International Cooperation Agency



----- Contractor

Mr. Taketsugu Nunose  
Managing Director  
Thai Takenaka International Ltd.



----- Witness

Mr. Shizuo SATO, Team Leader,  
Agricultural Cooperative Promotion Project



----- Witness

Mr. Eitaro Mitoma,  
Assistant Resident Representative,  
Bangkok Office, Japan International Cooperation Agency

แบบ อ.ส. ๔

เลขที่ 317715

ใบสลักหลังตราสาร

วันที่ 18 / เดือน / 1959

ชื่อผู้เสียอากร M. 10000000000000000000

ที่อยู่ 138 ซ.ค. มอริท กทม.

ได้เสียอากรแสดมภ์เป็นตัวเงินสำหรับลักษณะแห่งตราสาร

ตามบัญชีตราอากรแสดมภ์ข้อ

อากรแสดมภ์ 3050 บาท

เงินเพิ่ม บาท

โดยใบเสร็จเลขที่ 30675 วันที่ 18

ลงชื่อ

ตำแหน่ง พนักงานเจ้าหน้าที่อากรแสดมภ์

ใบสลักหลังตราสารนี้จะสมบูรณ์เมื่อเจ้าหน้าที่ในฐานะพนักงานเจ้าหน้าที่อากรแสดมภ์ลงนามลงนามลงนามอากร ได้ลงชื่อและออกใบเสร็จรับเงินเรียบร้อยแล้ว

พิมพ์ที่ ร.พ. สามเจริญพานิช จำนวน 1,000 เล่ม 2522




PLEDGE AGREEMENT

To Japan International Cooperation Agency, Date March 18, 1986  
Bangkok Office.

We Thai Takenaka International Ltd., the Contractor hereby agree that all equipment, materials and supplies brought to the job site under the Construction Contract made with the JICA dated on March 18, 1986, shall be pledged by us with the JICA as security for our execution of Works, and shall not be removed at any time without prior approval of the JICA in writing.

We further agree that should there be any loss or damage to pledged equipment, materials and supplies kept at the job site, the JICA shall bear no responsibility whatsoever for such loss or damage.

  
-----  
Taketsugu Nunose  
Managing Director

6-5-3

TECHNICAL SPECIFICATIONS

FOR

CONSTRUCTION WORK OF THE MODEL INFRASTRUCTURE

ON

THE AGRICULTURAL COOPERATIVE PROMOTION PROJECT

IN

THAILAND

BANGKOK OFFICE

JAPAN INTERNATIONAL COOPERATION AGENCY



## TECHNICAL SPECIFICATIONS

### PART 1 SPECIAL PROVISION

1-01 The Contractor shall exercise utmost care so that his construction operations will not damage any existing structure except such structures as specified to be dismantled. Any damages on the such existing structure or facilities shall be made good by the Contractor at his expense.

1-02 If it is necessary in the prosecution of the work to interrupt or obstruct the drainage of the surface, the flow of artificial drains and the flow of irrigation canal, the Contractor shall provide for the same during the progress of the work in such a way that no damage shall result to either public or private interest. For any neglect to provide for either natural or artificial irrigation or drainage which he may interrupted, he shall be held liable for all damages which may result therefrom during the progress of the work.

1-03 The Contractor is expected to visit the location of the work and make his own estimate of the facilities needed for the work. In the successful execution of the contract, the Contractor is expected to familiarize himself with local conditions, availability of labour, transportation facilities, uncertainties of weather, and other contingencies. From investigations, made at site, it is believed that topographical conditions are approximatedly as shown on the drawings, but the nature of the materials and the depth of satisfactory foundations, are not guaranteed. It is expressly understood that JICA will not responsible for any deduction, interpretation, or conclusions made by the Contractor. JICA does not guarantee that other materials will not be encountered or that the proportions of the several materials will not vary from those indicated by the drawings.

1-04 Elevation referred to the datum plane are to be determined from bench marks established by JICA or the Inspection committee at the site of the work.

1-05 The Inspection Committee will establish the necessary survey monuments and bench marks at convenient points in the area covered by this contract for use of the Contractor in laying the lines and grades required for the proper conduct and execution of the work. All stakes, bench marks, etc., placed by the Inspection Committee in laying out the work shall be carefully guarded and preserved by the Contractor, and in such case stakes or marks are misplaced or rendered useless through the carelessness or negligence of the Contractor or his agents, employees or workmen, they will be replaced by the Inspection Committee at the expense of the Contractor.

1-06 The Contractor shall execute the work to the lines and grades given by the drawings and/or the Inspection Committee. The Contractor shall, at his own expense, furnish all stakes, templates, pattern, platforms and labor that may be required in setting or laying out any part of the work.

## PART 2 GENERAL CONSTRUCTION FACILITIES

### 2-01 SCOPE

This part covers the construction and/or maintenance of access roads, setting up of Contractor's camp facilities, providing camp security and the disposition of the Contractor's various facilities at the end of the contract.

### 2-02 ROADS

(a) The Contractor shall improve, repair and widen, if necessary, existing roads to satisfactorily meet his haulage requirements. He shall also construct all other roads within the construction area which he deems necessary in the prosecution of his work. The improving, widening and maintaining of existing roads and constructing and maintaining new roads shall be made without cost to JICA, and same shall be the responsibility of the Contractor during and up to the completion of all construction work under the contract.

### 2-03 CONTRACTOR'S CAMP FACILITIES

(a) If the Contractor deems necessary, he shall grade his camp site; construct his office, employees' housing, warehouses, machine and repair shops, fuel storage tanks; and provide such other facilities that the Contractor deems necessary for maintaining health, peace and order in the camp and work area.

(b) The location, construction, operation and maintenance of such camps and facilities shall be subject to the approval of the Inspection Committee. At least ten (10) calendar days to the date on which the Contractor desires to begin to work on in feature of camp construction, the Contractor shall submit for the approval of the Inspection Committee drawings and specifications, in sufficient detail to permit determination of suitability of the construction in compliance with these specification, and no camp construction of any kind shall be undertaken until such drawings and specifications have been approved by the Inspection Committee.

2-04 CAMP SECURITY

The Contractor shall provide his own security force to the extent that he deems necessary for maintaining peace and order in the camps and work areas and to safeguard materials and equipment.

2-05 DISPOSITION OF CAMP AND CONSTRUCTION FACILITIES

After the completion of the work covered by the Contract, the entire camp of the Contractor, including its water supply system, quarters, warehouses, shops and other facilities therein; and all other temporary installations at work areas shall be removed by the Contractor and the site shall be cleaned.

2-06 PAYMENT

There will be no separate payment for complying with the requirements of this part. The expenses incurred by the Contractor shall be included in the item of COMMON TEMPORARY WORKS as indicated in the PRICED BILL OF QUANTITY in the Design Report, Volume 1.

## PART 3 CARE OF WATER DURING CONSTRUCTION

### 3-01 SCOPE

In accordance with specifications contained in this part, the Contractor shall care the water during construction so that construction work can be performed in areas free from water. Care of water during construction shall include provision for drainage and pumping system for dewatering the foundation areas and the construction of temporary bulkheads necessary for the protection of construction operations from encroachment by water.

### 3-02 DRAINAGE AND PUMPING

The Contractor shall be responsible for dewatering the foundation areas so that work may be carried on in a suitably dry condition, draining and/or pumping all water during the process of construction until its completion. The Contractor shall construct drainage ditches, holes, or culverts; furnish, operate, and maintain at his own expense all necessary pumps, to keep all work areas in amply dry condition, and prior to final acceptance of the work by the Contracting Officer, the Contractor shall remove, fill or plug all temporary drainage structures and pumping equipments at his expense.

### 3-03 PAYMENT

No separate payment shall be made for the care of water during construction. But the cost of furnishing, constructing, operating, maintaining, and removal of temporary drainage structures, canals, and pumping system necessary to keep construction operations free from water shall be included in the item of COMMON TEMPORARY WORKS as indicated in the PRICED BILL OF QUANTITY in the DESIGN REPORT, VOLUME 1.

## PART 4 OPEN EXCAVATION AND FOUNDATION PREPARATION

### 4-01 SCOPE

In accordance with the Specifications, contained in this part, and as shown on the drawings, or otherwise directed by the Inspection Committee the Contractor shall perform all required open excavation and foundation preparation pertinent to the construction work.

### 4-02 OPEN EXCAVATION

#### (a) General

Open excavation under these Specifications consists of the removal, hauling, dumping, and satisfactory disposal of all materials from required excavations for farm road, irrigation and drainage canals and miscellaneous excavations for other structures included under this contract. Open excavation shall be performed to the lines and grades shown on the drawings or established by the Inspection Committee. The Inspection Committee may modify slopes of excavation to fit conditions encountered during construction. Such changes or modifications shall not be considered by the Contractor as a basis for additional compensation over and above the unit prices bid. All necessary precautions shall be taken to preserve the ground outside the specified lines and grades in the soundest possible condition.

#### (b) Foundation in Loose Material

When the surfaces of excavation upon or against which concrete or embankment fill is to be placed consist of loose materials, the said loose materials shall be removed or replaced with suitable materials and compacted in a manner satisfactory to the Inspection Committee. The cost of removing the loose materials shall be paid for under the pertinent bid items for open excavation. The cost for the replacement with suitable materials and the compaction of the same shall be paid for under the pertinent bid items for fill.

#### 4-03 DISPOSITION OF EXCAVATED MATERIALS

##### (a) Spoil Areas

The Contractor shall submit for the approval of the Inspection Committee locations, areas, drawings and other necessary specifications of spoil area which the Contractor proposes to use for the work under this Contract, and any kind of disposition shall not be undertaken before obtaining the said approval. Excavated material not suitable for fill or otherwise not needed shall be wasted in approved spoil areas. Spoil piles shall be constructed to the stable slopes of the material being wasted. Any spoil pile exceeding two (2) meters in height shall not be performed. Spoil material shall be spread and graded so that surface drainage will not be concentrated and will not create and/or accelerate undesirable erosion in spoil areas.

#### 4-04 DEMOLITION, REMOVAL, AND DISMANTLING

When specified in the drawing or the Inspection Committee, existing concrete structures, such as concrete masses, stones, etc., shall be demolished and disposed of accordingly.

#### 4-05 FOUNDATION PREPARATION

##### (a) Fill on Earth

All horizontal and sloped earth surfaces, upon which embankment material is to be placed or other foundation surfaces whose locations are specifically indicated by the Inspection Committee, shall consist of undisturbed or compacted material and shall be clean, damp, free from standing or running water and free from organic matter; and shall be suitable as a foundation for the material to be placed upon them.

##### (b) Concrete

All horizontal and sloped earth surfaces upon which concrete is to be placed shall be undisturbed or of approved compaction, clean and damp, free from standing or running water, and shall be otherwise suitable as a foundation for the concrete to be placed upon them.

#### 4-06 MEASUREMENT FOR PAYMENT

##### (a) Open Excavation

A survey of the areas to be excavated shall be made by the Contractor prior to the commencement of the work under this contract, and all measurements of excavation shall be based on this survey without regard to any change that may occur during the prosecution of the work. All such surveys shall be the subject to check and approval by the Inspection Committee. Volumes will be computed and shall be the amount between the original ground determined by the survey and the slopes, lines and grades shown on the drawings or established by the Inspection Committee.

##### (b) Foundation Preparation

No separate payment will be made for all foundation preparation specified under Paragraph 4-05, (a). The entire cost of foundation preparation for 4-05, (a), shall be included in the unit price for the pertinent item of embankment or fill in the Bill of Quantity. The cost of foundation preparation specified under Paragraph 4-05, (b) shall be paid for under the pertinent item shown in the Bill of Quantity, and the measurement shall be made by the acceptable method to the Inspection Committee.

##### (c) Demolition, Removal and Dismantling

Demolition, removal and dismantling work will be measured by the acceptable method to the Inspection Committee and paid for under the items shown in the Bill of Quantity.



## PART 5 FILL AND BACKFILL

### 5-01 SCOPE

In accordance with the specifications contained in this part and as shown in the drawings or otherwise directed by the Inspection Committee the Contractor shall furnish and place the earth fill for construction work, backfill for related structures. Any work of fill and backfill shall not be commenced without prior approval of the Inspection Committee. The slope of the embankment shall be finished to the designed gradient by providing fixed rules.

### 5-02 BACKFILL

Backfill, as used herein, is defined as refill for structures. The materials used for backfill for structures shall be free from roots, stones of more than five (5) centimeters in diameter, and other objectionable materials and subject to the approval of the Inspection Committee. Backfill materials shall be placed in layers, each layer being not more than twenty (20) centimeters thick before compaction, thoroughly compacted by means of power tampers or by other means of approved by the Inspection Committee.

### 5-03 FILL

#### (a) Lines and Grades

The fills shall be constructed to the lines, grades and cross sections indicated on the drawings, unless otherwise directed by the Inspection Committee. The Inspection Committee may increase or decrease the slopes of the fill or make such other changes in the design as may be deemed necessary to produce a stable structure. Change in quantities of materials, resulting from prescribed changes in section, shall not make cause for claims for increased unit prices. Generally, a tolerance of plus or minus 0.05 meter from the slope lines and

grades shown on the drawings will be allowed in the finished surfaces of the embankments except that the tolerances shall not be continuous over an area greater than twenty (20) square meters.

(b) Conduct of the Work

1. The Contractor shall maintain and protect the fills in a satisfactory condition at all times until final completion and acceptance of all work under the Contract. Any approved fill material which rendered unsuitable after being placed in the fills shall be replaced by the Contractor and no additional payment will be made there. The Contractor shall excavate and remove from the fills any material which the Inspection Committee considers objectionable and shall also dispose of such material and refill the excavated as directed, all at no additional cost to JICA. The Contractor may be required to remove at his own expense any fill material placed outside of prescribed slope lines.

2. When the excavation of suitable fill material from required excavation and approved borrow sources progresses at a faster rate than placement in the fills, such excavated materials may be stockpiled at approved locations until use is authorized. No separate payment will be made for stockpiling or reloading and hauling of this material to its place in the fills and all costs in connection therewith shall be included in the applicable contract unit price for the fill materials.

5-04 MATERIALS

(a) Sources

The Contractor shall submit for the approval of the Inspection Committee locations, areas, drawings and other necessary specifications of borrow areas which the Contractor proposes to use for obtaining fill material. Materials for fills shall be secured from required excavations and from the borrow areas as approved. There is no guarantee that all the materials

in/any borrow area will be suitable for use in the fills and the Contractor shall move or modify his operations to avoid unsuitable material. The Contractor shall maintain and operate sufficient excavating and hauling equipment so that an adequate amount of fill material from all sources is available as required. Operations in borrow areas shall not be on danger roads, buildings, or structures. Borrow areas shall be graded to provide drainage from all parts of the excavated areas. When operations in a borrow area have terminated, the area shall be dressed to a neat and orderly appearance, as approved by the Inspection Committee. Any additional material needed shall be obtained from sources approved by the Inspection Committee.

(b) Suitability

Materials containing brush, roots, sod or other perishable material will not be considered suitable for fills. The suitability of the materials shall be subject to the approval of the Inspection Committee.

5-05 PLACEMENT

(a) General

No fill material shall be placed on any part of the fill foundations until such areas have been inspected and approved by the Inspection Committee and until after completion of foundation preparation as specified in PART 4. The gradation and distribution of materials shall be such that the fills will be free from lense, pockets, and streaks.

(b) Earth Fill

The fill material shall be dumped and spread in horizontal layers having an uncompacted thickness of not over 20 cm. When material is spread, chunks larger than 10 cm in size shall be broken down by approved means or removed.

## 5-06 COMPACTION

### (a) General

After a layer of fill material has been dumped and spread, it shall be compacted by hand operated mechanical tampers or by other compaction machine approved by the Inspection Committee, to a density more than 85 percent of the maximum dry density of the material or to a density specified by the Inspection Committee.

### (b) Fill on or against Culverts and Concrete Structure

No fill shall be placed on or against concrete surface before a period of fourteen days has elapsed after placing the concrete. Before passage of hauling equipment over the top of culverts or other structures will be permitted, the depth of fill over the concrete shall be sufficient to permit such passage without harmful stresses or vibrations in the structure. Fill placed around and over culverts or other structures shall be compacted by hand operated mechanical tampers or by man power to a density equal to that specified for the other earth fill.

## 5-07 ADDITIONAL COMPACTION

If, in the opinion of the Inspection Committee, the desired compaction of portion of the embankment is not secured, additional compaction operation shall be made over the surface area of such designated portion until the desired compaction has been obtained, without additional cost to JICA.

## 5-08 QUALITY CONTROL

If it is required, tests, for moisture content and density, all necessary tests will be made by the Inspection Committee, and from these tests, corrections, adjustments, and modifications of methods, materials, and moisture contents may be made in order to secure satisfactory density of the fill materials. The Contractor shall provide necessary unskilled labor in obtaining and preserving samples.

5-09 MEASUREMENT FOR PAYMENT

(1) Fill

(a) Measurement

Measurement for payment of fill will be calculated on the number of cubic meters of material placed between the foundation lines as determined on the basis on drawings or a survey made after completion of the excavation and foundation preparation and the lines, grades and slopes shown on the drawings. No allowance will be made for foundation or embankment settlement.

(b) Payment

Payment shall constitute full compensation for all work in connection with the excavation from borrow areas including clearing, grubbing and stripping of borrow areas, hauling, stock-piling, rehandling, foundation preparation, placing, spreading, sprinkling, drying, breaking up, compacting, removal of objectionable material, and all other work required for the construction, protection and maintenance of the fills. No adjustment in payment will be made for substitution of materials and for additional compaction.

(2) Backfill

Measurement for payment of backfill shall be calculated on the number of cubic meters of materials placed among the original ground line, or designated line of backfill and the structure and the neat pay lines of excavation shown in the drawings. Payment will be made on the unit price bid per cubic meter of backfill.

PART 6 CONCRETE WORKS.

6-01 SCOPE

In accordance with the Specifications contained herein and as shown on the detail drawings or otherwise directed, the Contractor shall -

- (a) Furnish all materials, and manufacture, transport, place, finish, protect and cure concrete;
- (b) Furnish, construct, erect and dismantle forms;
- (c) Construct expansion and contraction joints and furnish and place waterstops, joint fillers, and sealing compound, if required; and
- (d) Prepare, clean, cut, bend and place steel reinforcement.

6-02 CEMENT

(a) General

Cement for mortar and concrete work shall be Portland Cement which conforms to the requirements of the Standard Specifications for Portland Cement (A.S.T.M. Designation C150-69).

(b) Storage

Cement shall be stored in a dry, weather tight and properly ventilated warehouse with adequate provisions for the prevention of absorption of moisture. All storage facilities shall be subject to approval and shall be such as to permit easy access for inspection and identification. Cement which has been stored for more than one month or which are suspected to be damp shall not be used unless otherwise approved by the Inspection Committee.

6-03 FINE AGGREGATE

(a) Composition

Fine aggregate shall be natural sand not including organic matter and other foreign substances.

(b) Quality

Fine aggregate shall consist of hard, tough, durable, uncoated particles. The shape of the particles shall be generally rounded or cubical and reasonably free from flat or elongated pieces. The fine aggregate shall conform to the following specific requirements:

1. Grading - Fine aggregate shall be well graded from fine to coarse and the gradation shall conform to the following requirements as delivered to the mixers:

<u>Sieve Designation</u> <u>U.S. Std. Square Mesh</u>	<u>Cumulative Percentage</u> <u>by Weight Passing</u>
No. 4	95 - 100
No. 16	60 - 75
No. 100	2 - 10

In addition to the grading limits shown above, the fineness modulus shall be in the range from 2.30 to 3.00.

(c) Storage

Fine aggregate shall be stored in such a manner as to avoid the inclusion of any foreign material in the concrete. Sufficient live storage shall be maintained at all times to permit continuous placement of concrete at the rate specified.

6-04 COARSE AGGREGATE

(a) Composition

Coarse aggregate shall consist of gravel, crushed gravel or rock, or a combination of gravel and crushed gravel or rock.

(b) Quality and Grading

1. Quality - Coarse aggregate shall consist of hard,

tough, durable, clean and uncoated particles. All foreign materials and dust shall be removed by adequate processing. The particle shape of the smallest size of crushed coarse aggregate shall be generally rounded or cubical, and the coarse aggregate shall be reasonably free from flat and elongated particles in all sizes.

2. Grading - The coarse aggregate shall be well graded from fine to coarse. The grading of the aggregate as delivered to the mixer shall be as follows:

Sieve Designation <u>U.S. Std. Sq. Mesh</u>	Per Cent by Wt. Passing Individual Sieves <u>3/4" Max.</u>
1 "	100
3/4"	90 - 100
3/8"	20 - 55

3. Size - Unless otherwise directed, the maximum sizes of coarse aggregate to be used in the various parts of the work shall be 3/4 inch.
4. Storage - Storage of coarse aggregates shall be as that specified in Paragraph 6-03 (c) for fine aggregates.

#### 6-05 AGGREGATE SAMPLES

Samples of the aggregate shall be furnished at a point designated by the Inspection Committee for his approval at least ten (10) days in advance of the time when the placing of concrete is expected to begin.



#### 6-06 WATER

Water used in mixing concrete shall be fresh, clean and free from injurious amount of oil, acid, alkali, salts, or organic matter.

#### 6-07 PROPORTIONING OF CONCRETE

(a) The Contractor shall design the mix proportion for every class of concrete placing for the approval of the Inspection Committee. The Contractor shall carry out the mix test in case being requested by the Inspection Committee. The test is to be made at the expense of the Contractor.

(b) The compressive strength of the age of 28 days shall be as follows and desirable mix proportion is also indicated.

Class	Minimum 28 days	Mixing proportion by volume
	Compressive strength	cement: fine aggregates: coarse aggregates
A (Reinforced concrete)	210 kg/cm <sup>2</sup>	1 : 2 : 3
B (Plain concrete)	160 kg/cm <sup>2</sup>	1 : 2 : 4
C (Concrete layer)	135 kg/cm <sup>2</sup>	1 : 3 : 4

Other proportions for mixed design may be indicated by the Inspection Committee at the site of work, if it is necessary.

#### 6-08 MIXING

##### (a) Equipment

Concrete shall be mixed by portable concrete mixer unless otherwise approved by the Inspection Committee.

##### (b) Measurement

The measurement of every ingredient of concrete shall be made in weight. Nevertheless, the measurement in volume is admitted subject to the approval of the Inspection Committee.

(c) Mixing Time and Method

The mixing time of concrete shall be more than two (2) minutes and less than five minutes. Over mixing, requiring the introduction of additional water to preserve the required consistency, will not be permitted. The mixer shall be completely emptied before receiving the materials for the succeeding batch and shall be kept clean and washed out after stopping work at the end of each shift.

On commencing work, the first batch shall contain sufficient excess of cement, sand and water to coat the inside of the drum to avoid the reduction of the required mortar content of the mix.

6-09 CONVEYING

(a) General

Concrete shall be conveying from mixer to forms, as rapidly as practicable, by methods which will prevent segregation or loss of ingredients. There shall be no vertical drop greater than 1.5 meters except where suitable equipment is provided to prevent segregation and where specifically authorized. Belt conveyors, chutes or other similar equipment in which the concrete is delivered to the structure in a thin, continuously exposed flow, will not be permitted except for very limited or isolated sections of the work. Such equipment shall be arranged to prevent objectionable segregation.

6-10 PLACING

(a) Approval

Approval of the Inspection Committee shall be obtained before starting any concrete pour.

(b) General

Concrete shall be worked into the corners and angles of the forms and around all reinforcement and embedded items without permitting the material to segregate. Not more than

three (3) cubic meters shall be deposited in one pile for compaction. Free water shall be collected in depressions away from the forms and removed by bailing prior to placement of additional concrete. All concrete placing equipment and methods shall be subject to approval.

(c) Cooling of Aggregates

The aggregate shall be cooled by wetting if it is drier than the condition known as saturated, surface dry.

(d) Concrete on Earth Foundation

All concrete shall be placed upon clean, damp surface free from standing or running water. Prior to placing concrete, the earth foundation shall be satisfactorily compacted in accordance with approved methods.

(e) Concrete on Other Concrete

Surface upon or against which concrete is to be placed shall be clean, free from oil, standing or running water, mud, drummy rock, objectionable coatings, debris, and loose, semi-detached or unsound fragments. To insure a firm and tight bond between fresh concrete and other concrete, concrete surfaces, where necessary, shall be chipped or roughened as directed by the Inspection Committee. All surfaces shall be wetted thoroughly to keep them in a completely moist condition before placing concrete. All approximatedly horizontal surfaces shall be covered with a layer of mortar of the same cement-sand ration as used in the concrete mix before the concrete is placed.

6-11 FORMS

(a) General

Forms shall be used, wherever necessary, to confine the concrete and shape it to the required lines, or insure against contamination of the concrete. Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall be maintained rigidly in

correct position. Forms shall be sufficiently tight to prevent loss of mortar from the concrete. Forms for exposed surfaces against which backfill is not to be placed shall be lined with a form grade plywood or sheet steel. Steel panel forms may also be used.

(b) Cleaning and Oiling of Forms

At the time concrete is placed in the forms, the surfaces of the forms shall be free from incrustations of mortar, grout, or other foreign material that would contaminate the concrete or interfere with the fulfillment of the Specifications' requirements relative to the finish of formed surfaces. Before concrete is placed, the surfaces of the forms shall be oiled with a commercial form oil that will effectively prevent sticking and will not stain the concrete surfaces.

(c) Removal of Forms

Forms shall be removed as soon as practicable in order to avoid delay in curing and to make possible earliest practicable repair of surface imperfections, but in no case shall they be removed before approval. Any needed repair or treatment shall be performed at once, and shall be followed immediately by the specified curing. Forms shall be removed with care so as to avoid injury to the concrete, and any concrete so damaged shall be repaired.

6-12 CURING AND PROTECTION

(a) General

All concrete shall be moist cured for a period of not less than seven (7) consecutive days by an approved method or combination of methods applicable to local conditions, except that the curing period may be reduced to three days for concrete made with high-early-strength cement. The Contractor shall have all equipment needed for adequate curing and protection of the concrete on hand and ready to install before actual concrete placement begins.

(b) Water Curing

Concrete shall be kept wet by covering with an approved, watersaturated material or by a system of perforated pipes or mechanical sprinklers or by any other approved method which will keep all surfaces continuously (not periodically) wet. Water for curing shall be generally clean and free from any element which might cause objectionable staining or discoloration of the concrete.

6-13 REPAIR OF CONCRETE

Repair of imperfections in formed concrete shall be completed within twenty four (24) hours after removal of forms at no additional cost to JICA. Fins shall be neatly removed from exposed surfaces. Concrete that is damaged or honeycombed must be removed to sound concrete and replaced with drypack, mortar, or concrete as hereinafter specified. Where large bulges and abrupt irregularities protrude, the protrusions shall be reduced by bush-hammering and grinding. Drypack filling shall be used for holes left by the removal of fasteners from the ends of form tie rods.

6-14 DRYPACK MORTAR

Drypack shall consist of a mixture (by dry volume or weight) of one (1) part cement to  $2\frac{1}{2}$  parts of sand conforming to Paragraph 6-03, Fine Aggregate, except that in gradation, 100% shall pass a No.16 sieve. Only enough water shall be used to produce a mortar which, when used, shall stick together on being molded into a ball by a slight pressure of the hands, and shall not extrude water but will leave the hands damp.

6-15 STEEL REINFORCEMENT

(a) General

The Contractor will furnish all steel reinforcement in accordance with the drawings and these specifications. The Contractor shall prepare, clean, cut, bend and place all

reinforcements, as shown on the detail drawings or as otherwise directed. The Contractor shall furnish all chains, supports and ties. All reinforcement shall be reasonably free from loose, flaky rust and scale, and free from oil, grease and other coating which might destroy or reduce its bond with concrete.

(b) Relationship of Reinforcement to Concrete Surfaces

The distance from the edge of the main reinforcement to the concrete surface shall be 5 cm except such portions as shown in the drawings. The concrete covering the stirrups, spacer bars, and similar secondary reinforcement may be reduced by the diameter of such bars, unless otherwise indicated.

(c) Lapping

Lapping length at joints of the reinforcing bar shall be at least thirty times of the diameter of bar and shall be bound by steel wire.

(d) Supports

All reinforcements shall be secured in place by use of metal or concrete supports, spacers or ties. Such supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operation. The supports shall be used in such a manner that they will not be exposed or contribute in any way to the discoloration or deterioration of the concrete.

6-16 MEASUREMENT FOR PAYMENT

(a) Concrete

1. Measurement for payment for plain or reinforced concrete, will be based on the volume of concrete in place within the lines and grades shown on the drawings.
2. No deduction will be made for rounded or bevelled edges, or space occupied by metal work, or embedded

items such as supports, spacers or ties. The cost of construction joint treatment with the attendant loss of material shall be included in the unit price bid per cubic meter of concrete.

3. Payment at the unit prices bid shall constitute full payment for all costs for concrete work. The costs of any dewatering required to maintain dry conditions during the pouring of concrete, furnishing materials, and installing and removing formwork, shall be included in the unit cost.

(b) Steel Reinforcement

Measurement for payment for furnishing, preparing bar cleaning, cutting, bending, and placing steel reinforcement by the Contractor will be based on the number of kilograms placed in accordance with the detail drawings or as otherwise directed. Payment will be made for steel in laps as shown on the drawings; where bars are welded, payment will be made as if they were lapped. Payment will not be made for steel in laps or used which are solely for the convenience of the Contractor. Payment will be made at the unit price bid for steel reinforcement. No separate payment will be made for steel reinforcement supports, and the cost thereof shall be included in the unit price bid.

PART 7 OTHER RELATED CONSTRUCTION WORKS

7-01 GENERAL

The land consolidation works for the construction work include under this contract construction works for appurtenant structure besides main construction works such as the construction of gate.

The said appurtenant structures comprise, diversion facilities, turn-outs, culverts, etc.

The majority of the appurtenant structures shall be concrete structure, which shall be constructed by means of the combination of earth work and concrete work. It means that the Specification indicated in the PART 4, 5 and 6 shall be adoptable for the construction of the appurtenant structure.

The constructor shall execute the work to the lines and grades given by drawing and/or the Inspection Committee.



6-5-4

Performance Bond

คำประกันให้ธนาคาร  
เมื่อหมดอายุแล้วด้วย.

# THE BANK OF TOKYO, LTD.

Cable Address  
"TOHBANK BANGKOK"

BANGKOK OFFICE  
Thaniya Building  
62 Silom Road, Bangkok 5

Tel. 2330790-8  
P.O. Box 502

- COPY -

Date: March 18, 1986

Japan International Cooperation Agency,  
Bangkok Office.

Gentlemen:

Letter of Guarantee No. BKG165-86/588  
in your favour for Baht152,500.--  
a/c Thai Takenaka International Ltd.

We hereby guarantee Thai Takenaka International Ltd.  
to the extent of Baht152,500.--(BAHT ONE HUNDRED FIFTY TWO THOUSAND FIVE HUNDRED  
ONLY)  
being Performance Bond for Construction of Model Infrastructure on  
Agricultural Cooperative Promotion Project. \*\*\*\*\*

\*\*\*\*\*

This Letter of Guarantee is effective from March 18, 1986 to August 24, 1987  
after which date this Guarantee will automatically become null and void. Any claim in this  
consequence should also be submitted to us on or before the said expiry date.

Please return this Original Letter to us at your earliest convenience upon expiration.



Yours faithfully,  
THE BANK OF TOKYO, LTD.  
Bangkok Office

p.p. Manager

A. HAYASHI

ORIGINAL  
DULY  
STAMPED  
BAHT

# AGRICULTURAL COOPERATIVE PROMOTION PROJECT

COOPERATIVES PROMOTION DEPARTMENT  
MINISTRY OF AGRICULTURE AND COOPERATIVES  
TEVEJ, BANGKOK

Ref. No. \_\_\_\_\_

17 April, 1986

Mr. Chern Bamrungwong  
Director General  
Cooperative Promotion Department

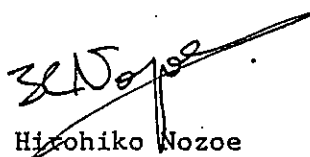
Dear Sir:

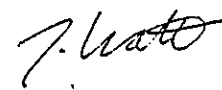
It is an honour to inform that the Contract for construction of Model Infrastructure on Agricultural Cooperative Promotion Project in Thailand is agreed between the JICA Bangkok Office and the contractor, and the progress of contract is shown in attached paper.

We expect that the Contract followed reasonable procedures will promote a better understanding of the above mentioned construction works.

Your kind cooperation will be highly appreciated.

Your faithfully,

  
Hitohiko Wozoe  
JICA Expert

  
Takahiro Kato  
JICA Expert

cc: Mr. Eitaro Mitoma  
: Sizuo Sato

L-5-5

REPORT  
ON  
MODEL INFRASTRUCTURE  
ON  
AGRICULTURAL COOPERATIVE PROMOTION PROJECT

## 1. The Construction Cost

The JICA Expert exchanged views and had a series of discussions with the CPD staff about design of the Model Infrastructure on Agricultural Cooperative Promotion Project. The construction cost was estimated for budget-making by JICA staff in accordance with the result of discussions.

As the result of cost estimation, the total amount of three million fifty thousand Baht was decided by Mr. Michimoto GOTO, Resident Representative JICA Bangkok office.

## 2. Listed Construction Company

In consideration of the economic effect at local area, the diffusion of technical level and management method to local area, the six companies at Korat were listed by CPD. But prior to commencement of competitive bid price by the above mentioned six companies, it was necessary for the company to be satisfied with following conditions.

- o the site engineer dispatched from the company should be good command of English, because JICA expert for supervising construction and site engineer can communicate on smoothly.
- o the company should have good background, for example, technical level, the capital strength, and construction experience of irrigation facilities.

In reference of these points, the data were submitted by the company. And the site engineer was interviewed and taken an examination of technical problem (see Table 1).

It was judged that two companies out of six companies had a measure of construction abilities. The company names were as follows:

- o Chok Chai Construction Co.,Ltd.
- o Thai Silp Co.,Ltd.

However, it was expected that the bid price would be adjusted by the preparatory operation between these local companies at Korat. The participation in competitive bid price of another two companies which have abilities equal to or higher than two companies at Korat, was decided for the purpose of getting a reasonable bid price. Another two companies in Bangkok which had past experiences were listed by JICA. The company names were as follows:

- o Thai Konoike Construction Co.,Ltd.
- o Thai Takenaka International Ltd.

On 28th February, invitation of bid was noticed to the above mentioned four companies as bidders by Resident Representative, JICA Bangkok office.

3. Explanation of the Construction Works

On 3rd March, at Embassy of Japan, the meeting for explanation of the construction works was held with attendance of the JICA staff and bidders. At this meeting, the outline of the project, purpose of the construction works and necessary procedures for bidding were explained by JICA staff.

The next day, the JICA staff and bidders visited a job site so as to make sure of location and questions and answers were exchanged.

The documents given by JICA were as follows.

1. Terms and conditions of the contract
2. Contract
3. Technical Specification
4. Drawing
5. Proposal, being kept blank for filling out

4. The opening of Bids

On 10th March, at the JICA Bangkok office, the proposals were submitted by the bidders to Resident Representative JICA Bangkok office. The bid was opened in the presence of the JICA staff and the bidders.

Evaluation to the proposals were as follows:

(a) Bid price (see Table 2)

The bid price estimated by Thai Takenaka International Ltd. was most inexpensive among the bidders.

The bid price estimated by companies at Korat were unexpectedly expensive that these could not even be compared with that estimated by JICA. One was about two times as much as that estimated by JICA, the other was more than two times compared with that estimated by JICA. The reason those two companies at Korat were so expensive were as follows:

- 1) Tax was about 9% of the direct cost, and the Indirect cost included Tax was more than 30% of the direct cost according to the proposal submitted by the companies at Korat. It was generally that Tax and Indirect cost were 4% and 20% of Direct cost, respectively.
- 2) The quantity of soil excavation which reflected bid price, was calculated excessively.
- 3) The construction cost of earth work was estimated in accordance with un-necessary construction step.

(b) Contents of Proposal

The proposals submitted by companies at Korat were insufficient, for example, without construction schedule and list of equipment. Therefore, it was impossible to judge the contents of proposal.

The proposal submitted by Thai Takenaka Intl. Ltd. was judged highly, because his proposal brought up the problem from a point of contractor's view. For example, it was stated that the relation between construction period and rainy season, employment of materials and labour at job site.

In case that the company at Korat was recommended as a successful bidder, there would have been many issue to be solved, for example, taking the long time in negotiating with the company at Korat because of a gap between its bid price and the original budget. Consequentially, much time which should have been shared for construction works was thought wastful. More over, in case that the contract was agreed between JICA and the company, the quantity of construction works would have been decreased and paid no attention of quality control.

As the result of discussion with JICA and CPD staff, Thai Takenaka Intl. Ltd. was recommended as a successful bidder which reserves the ritht to negotiate first of all in accordance with following reasonable procedures.

5. Contract

The contract for construction of Model Infrastructure on Agricultural Cooperative Promotion Project in Thailand was executed on 18th March at JICA Bangkok office between the Japan International Cooperation Agency and Thai Takenaka International Ltd., The attendants put signature to the contract were as follows:

JICA Bangkok Office

Mr. Michimoto GOTO  
Resident Representative, JICA Bangkok Office

Thai Takenaka Intl. Ltd.

Mr. Taketsugu NUNOSE  
Managing Director

Witness

Mr. Eitaro MITOMA  
Assistant Resident Representative,  
JICA Bangkok Office

- do -

Mr. Sizuo SATO  
Team Leader  
Agricultural Cooperative Promotion Project  
in Thailand

TABLE 1

## SUMMARY OF CONSTRUCTION ABILITY (LOCAL CONTRACTOR IN KORAT)

Name	Chai Chareon Furrinu tre Ratchasima Co., Ltd	Chok Chai Construc- tion Co., Ltd.	Haeng Thavee Company	Sang-Chai Co.,Ltd	Say-lee-pharn Co.,Ltd	Thai Silp Co.,Ltd.
Capital	1,000,000 Baht	40,000,000 Baht	1,800,000 Baht	-	-	Non-present
Fixed assets	8,400,000 Baht	11,000,000 Baht	6,600,000 Baht	-	-	Non-present
Liquid assets	12,000,000 Baht	46,171,000 Baht	6,300,000 Baht	-	-	Non-present
The number of Engineers	3	3	3	-	-	3
Construction Experience	Earth Canal Small Scale Farm- Pond	Main Road Small Scale Farm Pond Dam	Building Only	-	-	Earth Canal Small Scale Farm- Pond
Heavy Equipment Holdings	Back-Hoe 3 Dump Truck 4 Only	Bull-Dozer 6 Back-Hoe 3 Dump Truck 3 A large quantity of Other heavy equipment	Back-Hoe 2 Dump Truck 2 Only	-	-	Bull-Dozer 3 Back-Hoe 4 Dump Truck 2 Only
English ability of Engineers	Good-poor	Good	Poor	-	-	Good
Total Evaluation	Almost all of their construction experi- ence is small scale, but there is no pro- blem about the con- struction works. It is questionable about their construction supervision because of the poor expert know- ledge and English ability.	There is no problem about this Construc- tion works because of their construction experience. Company organisation is much larger and the abili- ty of engineers is too high.	Their construction experience is build- ing construction only and they are inexper- ienced in civil works They are unsuitable for this construction works.	-	-	Judging from their Construction experien- ce, there is no problem about this construction works. The ability of engineers isn't enough.



CONSTRUCTION COST

Table 2

Items	Estimated cost by JICA	Chok Chai Civil Limited Partnership	Thai Konoike Construction Co. Ltd.	Thai silp Limited Partnership Co. Ltd.	Thai Takenaka International Ltd.
A. Direct					
Kong Samaki					
1. Construction of farm ponds	1,745,000	3,146,167	1,824,160	3,312,750	1,753,952
2. Appretement Structure	445,000	664,712	487,378	1,284,225	490,785
Chakarat					
3. Outlet works	147,000	225,108	160,190	391,452	144,525
4. Appretement Structure	25,000	20,000	30,000	80,000	22,000
5. Diversion works	184,000	266,056	189,772	379,080	189,544
6. Appretement Structure	25,000	20,000	30,000	80,000	22,000
Sub-Total	2,571,000	4,342,093	2,721,500	5,527,507	2,622,806
B. Indirect					
1. Over head		651,314	163,290	829,126.05	209,824
2. Profit	514,000	434,209	176,897	304,012.88	113,670
3. Tax		379,933	107,610	414,563.02	103,700
Sub-Total	514,000	1,465,456	447,797	1,547,701.90	427,194
Total	3,085,000	5,807,549	3,169,297	7,075,208.90	3,050,000
Round off	---	7,549	4,297	---	---
Construction cost	3,085,000	5,800,000	3,165,000	7,075,208.90	3,050,000
	(100)	(188)	(103)	(229)	(99)

6-6

機材供与.

6-6-1 伐与機材見積書

บริษัท ไทยทาเคนากา สากลก่อสร้าง จำกัด  
THAI TAKENAKA INTERNATIONAL LTD.  
800NMITR BLDG., 5FL.  
138 SILOM ROAD, BANGKOK.  
TEL : 233-3246, 3637 234-0072, 4601, 5314, 8718

Our Ref. TTI/86/030

April 16, 1986

Mr. Michio Goto  
Resident-Representative  
JAPAN INTERNATIONAL COOPERATION AGENCY, BANGKOK OFFICE  
c/o Embassy of Japan  
1674, New Petchburi Road, Bangkok

Dear Sir,

Re: Quotation for Sluice Gate  
CONSTRUCTION OF THE MODEL INFRASTRUCTURE ON THE  
AGRICULTURAL COOPERATIVE PROMOTION PROJECT


It is our great pleasure to submit our quotation for the sluice gate in the amount of Baht One Million One Hundred Fifty Thousand Only (฿1,150,000.-) for your kind consideration and approval.

The breakdown of the quotation is attached hereto.

Your kind consideration and acceptance for our quotation would be highly appreciated.

Yours sincerely,

THAI TAKENAKA INTERNATIONAL LTD.

  
\_\_\_\_\_  
Taketsugu Nunose  
Managing Director

Encl: Quotation Breakdown

COST BREAKDOWN

<u>No.</u>	<u>Item Description</u>	<u>Q'ty</u>	<u>Amount (Baht)</u>
1)	Steel sluice gate w/steel frame	Ls	425,000
2)	Hand-operated devel gear w/spindle cover	Ls	300,000
3)	Steel ladder & hand rail	Ls	75,000
4)	Epoxy resin paint	Ls	90,000
5)	Misc. material	Ls	40,000
6)	Transportation	Ls	95,000
7)	Overhead expenses	Ls	87,600
8)	Business tax	Ls	37,400
	Total Amount		1,150,000

Estimation Basis

1. Place of delivery : On site at Chakkarat, Nakhon Ratchasima
2. Delivery time : Within 30 days after signing Contract
3. Terms of payment : All of Contract amount will be paid within 15 days after the delivery of the goods.



ห้างหุ้นส่วนจำกัด เบนจามิตรก่อสร้าง  
BENJAMITR CONSTRUCTION LTD.,PART.

April 16, 1986

Messrs : Japan International Cooperation Agency, Bangkok Office  
1674, New Petchburi Road, Bangkok.

Dear Sirs,

Re: : COST ESTIMATION OF SLUICE GATE WORK

In accordance with the Sluice Gate Work for the construction of the model infrastructure on the agricultural cooperative promotion project, we would like to propose our cost estimation for the said project.

BREAK DOWN

No.	Item Description	Unit/Quantity	Amount
1)	Sluice Gate & Frame	Ls	375,000
2)	Devel Gear (Hand-Operate)	"	230,000
3)	Spindle Cover	"	80,000
4)	Steel Ladder & Other	"	90,000
5)	Epoxy Resin Painting	"	120,000
6)	Misc. Work	"	50,000
7)	Transportation	"	75,000
	Sub Total		(1,020,000)
8)	O.H. & Tax	Ls	185,000
TOTAL COST			1,205,000

Thank you for your consideration.

VISANU AMORNOPAWANG (Project Manager)



ห้างหุ้นส่วนจำกัด เบนจามิตรก่อสร้าง  
Benjamitr Construction Limited Partnership



บริษัท ไชคประพันธ์ก่อสร้าง จำกัด  
CHOKE PRA PHAN CONSTRUCTION CO., LTD.

47/2 ถนนวิภาวดีรังสิต บางเขน กทม.10900 โทร.579-0209, 579-0063

April 16, 1986

TO : JAPAN INTERNATIONAL COOPERATION AGENCY,  
BANGKOK OFFICE

Dear Sir,

Re : QUOTATION FOR SLUICE GATE  
C.P.D. NAKORN RATCHASIMA PROJECT

We are glad to submit the quotation of sluice gate for the project mentioned above for your consideration, the details are as follows:-

COST BREAKDOWN

<u>No.</u>	<u>Work Item</u>	<u>Q'ty</u>	<u>Amount</u>
1	Hand-operated gear & spindle cover	Ls	340,000
2	Steel sluice gate w/frame	Ls	435,000
3	Steel ladder & misc. work	Ls	135,000
4	Epoxy resin	Ls	95,000
5	Transportation & expenses	Ls	75,000
6	Profit	Ls	157,760
7	Tax	Ls	42,240

Total Cost 1,280,000  
(Baht One Million wo Hundred Eighty Thousand Only)

Praphan Songsombat  
(Managing Director)



บริษัท ไชคประพันธ์ก่อสร้าง จำกัด  
CHOKE PRA PHAN  
CONSTRUCTION CO.,LTD.

6-6-2 CONTRACT

FOR SUPPLY AND DELIVERY OF LOCAL PROCUREMENT

This Contract is executed and delivered this 17 April, 1986 between

THAI TAKENAKA INTERNATIONAL LTD.

Boonmitr Bldg., 5th Fl., 138 Silom Rd., Bangkok

represented by Mr. Taketsugu Nunose and herein called "Seller" and

Japan International Cooperation Agency (JICA)

Bangkok Office, C/O Embassy of Japan, Bangkok

represented by Mr. Michimoto GOTO, the Resident Representative and herein called "Buyer".

The Seller and the Buyer mutually agrees as follows:

1. Contract Documents

The following documents are attached to this Contract and are incorporated and made a part of this Contract, as though fully written out and set forth herein: Seller's ESTIMATE NO. TTI/86/030 dated April 16, 1986.

2. Agreement for sale

The Seller agrees to sell, and the Buyer agrees to buy Sluice Gate as are described in the Seller's Estimate Total amount Baht 1,150,000.- (Baht One Million One Hundred Fifty Thousand Only)

3. Delivery Site Location: Chakarat, Nakorn Ratchasima Pref.

4. Time for Delivery: Not later than 30 days.

5. Payment

The payment to the Seller shall be made within 15 days after the date of acceptance.

6. Guaranty for the equipment: for 1 year.

7. Integration

The Seller and the Buyer agree that this Contract, including the Contract Document, expresses all of the agreement, understanding, Promises, and convenience of the parties, and that it integrates, combines, and supersedes all prior and contemporaneous negotiations understanding, and agreements whether written or oral, and that no modification or alteration of this Contract shall be valid or binding on either party, unless expressed in written and executed with the same formality as this Contract, except as may otherwise be specifically provided in this Contract.

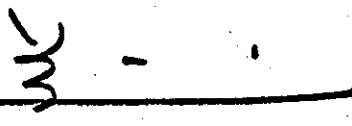
8. Jurisdiction

The proper law governing this Contract shall be the law in force in the Kingdom of Thailand.

9. Counterparts

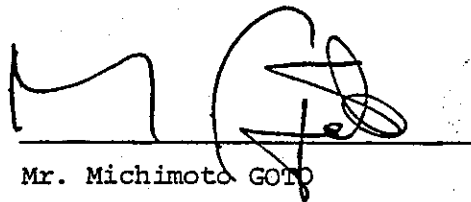
This Contract is executed in duplicate, one for the Seller and one for the Buyer. The Contract shall become effective on the date of signing the Contract.

Seller:



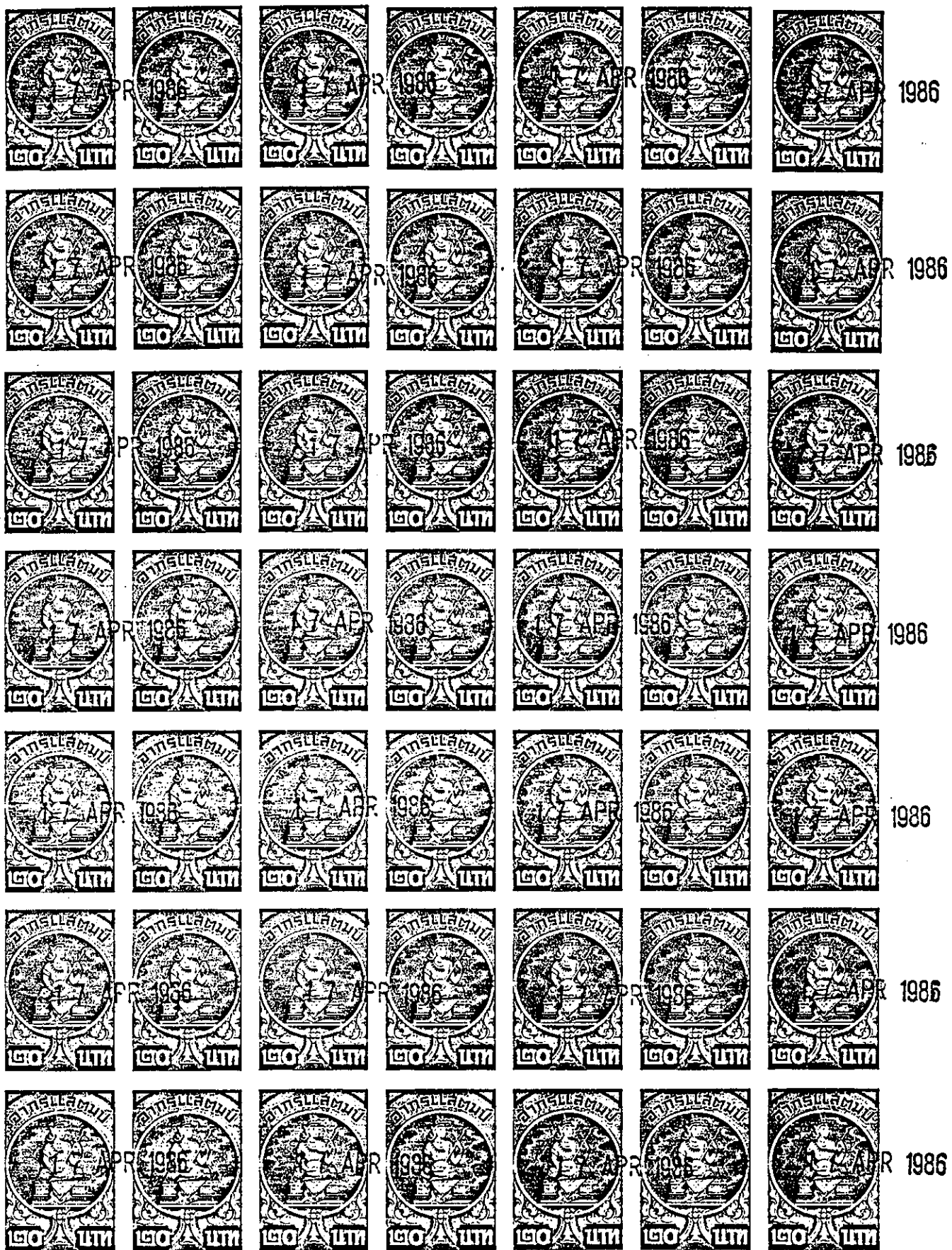
Mr. Taketsugu NUNOSE  
Thai Takenaka International Ltd.

Buyer:



Mr. Michimoto GOTO  
JICA Resident Representative





Stamp Duties in respect of Contract Document of Sluice Gate Work for Japan International Cooperation Agency.



Stamp Duties in respect of Contract Document of Sluice Gate Work  
for Japan International Cooperation Agency.

บริษัท ไทยทาเคนาคา สากลก่อสร้าง จำกัด  
THAI TAKENAKA INTERNATIONAL LTD.

BOONMITR BLDG., 5FL.  
138 SILOM ROAD, BANGKOK.  
TEL : 233-3246, 3837 234-0072, 4801, 8314, 8718

B-206/86

- COPY -

May 24, 1986

Japan International Cooperation Agency,  
Bangkok Office

Dear Sirs,

B I L L  
Sluice Gate Work

In accordance with our Contract, we respectfully request that you make payment for the amount of ฿1,150,000.- (Baht One Million One Hundred Fifty Thousand Only) for the subject work.

Your early payment of the above stated amount will be highly appreciated.

Yours sincerely,

THAI TAKENAKA INTERNATIONAL LTD.

.....  
Taketsugu Nunose  
Managing Director

Encl: Photo of Sluice Gate

# 繰越 529

## 支出負担行為書兼支出返納書

件名 農協復興計画モデルインフラ整備事業に係る 水門用鉄板の現地調達について			
上記のことについて 別添のように 支出してよろしいか伺います。			
起案年月日	昭和61年4月16日	決裁年月日	昭和61年4月17日
支出負担行為金額	¥1,150,000	支出・返納内容	取水ゲート
年度 区分	支出 返納 科目	(款) 農林業協会の (項) 農林業協会の (目) 材料費 (節) 材料費 (事項名)	支出 返納 相方
	繰越予算		THAI TAKENAKA INTERNATIONAL LTD
実施計画差引簿記入年月日(支出負担済額確認)		昭和61年4月28日	
上記について下記のとおり支出・返納してよろしいか。			
支出・返納金額	¥1,150,000	支出・返納種別	現金払・現金送金・小切手払・銀行口座
実施計画差引簿記入年月日(支出決定済確認)		昭和61年4月28日	
物品管理簿記入年月日	昭和 年 月 日	物品出納簿記入年月日	昭和 年 月 日
契約担当役	出納命令役	係	起案者
渡藤			Watanabe 三吉菜太郎

- (注) 1. 本書は、国内旅費、交通費を除く海外事務所の支出の原因となる契約その他の行為について使用する。  
2. 支出依頼は支出負担行為の承認後、請求書・納品書その他の証憑書を添付して行うこと。

○ 支出負担行為付属書

契約方法	<input checked="" type="checkbox"/> 会計規程第49条第1項第 号による随意契約
	<input checked="" type="checkbox"/> 2 会計規程第50条第1項による見積書取敢
	3. 会計規程第50条第2項による見積書取敢省略
	4. 会計規程第52条第1項第 号による契約書作成省略
	5. 会計規程第51条第1項ただし書による単価契約
目的	モデルハウスの整備事業用として
品目・数量	別添の通り
納入期日	昭和 61年 5月 15日
納入場所	エーサマキーの工事現場
送付期別	空送、海送、 <input checked="" type="checkbox"/> 陸送
送付期日	昭和 年 月 日
備 考	

(注) 本書は、契約を行なう場合の支出負担行為付属書として使用のこと。

昭和61年5月29日

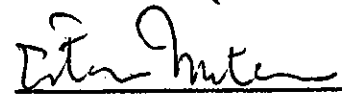
検査調書

契約担当役

JICA BANGKOK OFFICE  
所長 後藤 敏 殿

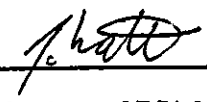
検査職員

三苫 英太郎



(JICA BANGKOK OFFICE)

加藤 孝宏 (監)



(CONSTRUCTION SUPERVISER)

検査件名	外国農業協同組合振興計画モリン万整備事業に於ける供与機材
契約金額	1,150,000 Baht
契約の相手方	THAI TAKENAKA INTERNATIONAL LTD.
納入場所	Chakkarat Agricultural Cooperative, Nakhon Ratchasima
契約期間	1986.4.18 — 5.18
納入を受作日	1986.5.18
検査年月日	1986.5.29
既着年月日	—
部分払の限度額	—
備考	

6-7 施工管理.

6-7-1 Inspection Committee の追加申請 Letter



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

BANGKOK OFFICE

No. 401/61

April 16, 1986

Mr. Chern Bamrungwong  
Director-General  
Department of Cooperatives Promotion

Dear Sir,

It is an honour to inform that the construction works of Model Infrastructure on Agricultural Cooperative Promotion Project in Thailand is carried out on schedule.

In accordance with The Contract, the Inspection Committee will be established with the function and composition as referred to the attached paper. For the effective and successful implementation of the construction works, the Inspection Committee will bear overall responsibility for supervising and controlling of the construction works.

Your kind cooperation will be highly appreciated.

Sincerely yours,



Michimoto GOTO  
Resident Representative  
JICA Bangkok Office

Member's List  
of  
Inspection Committee

Name	Present Position
Mr. Eitaro Mitoma	Assistant Resident Representative JICA Bangkok Office
Mr. Sizuo Sato	Team Leader Agricultural Cooperative Promotion Project in Thailand
Mrs. Wannee Ratanawaraha	Chief, Project Management Office Cooperative Promotion Department
Mr. Panya Promdee	Chief, Engineering Center No.3 Cooperative Promotion Department
Mr. Hirohiko Nozoe	JICA Expert
Mr. Takahiro Kato	-do-

6-7-2 工事着手前の諸手続

March 3 , 1986

Mr. Chern Bamrungwong  
Director-General  
Cooperative Promotion Department

Subject : Construction of Model Infrastructure  
on Agricultural Cooperative Promotion Project

Dear Sir,

Prior to the commencement of construction works, it is respectfully suggested that prompt action mentioned below be taken by the Cooperatives Promotion Department for the effective and successful construction works.

- (1) To confirm the farmers approval about reduction of field area for construction of farm pond, and the suspension of farming, the land for rent without compensation which may happen during the construction period.
- (2) To take necessary measures on construction of the weir from the authorities concerned in the light of the laws and regulations in force.

We would like to hear from you at an early date.

Your kind cooperation will be highly appreciated.

  
Sincerely Yours,

Shizuo SATO  
Team Leader  
Agricultural Cooperative Promotion  
Project in Thailand



March 31, 1986

Mr. Sangchai Pavaboonsiriwongse  
Provincial Cooperative Officer

Dear Sir,

I would like to borrow some survey instruments shown in attached paper, for the purpose of effective and successful implementation of the Construction of Model Infrastructure.

Your kind cooperation will be highly appreciated.

Sincerely Yours,



Hirohiko NOZOE  
JICA Expert

LIST OF SURVEY INSTRUMENTS

Instrument	Quantity
1 Digital Theodolite TM 6 No 54312	Sokkisha 1 set
2 Automatic Level B2C No 70358	Sokkisha 1 set
3 Plane survey set including Tripod	1 set
4 Staff gage No 90511 70730	Taihei sangyo 2 pcs
5 Pole	6 pcs
6 Esion tape 100 m	Sekisuijushi 2 pcs
7 Esion rope 100 m 100 LN	Sekisui jushi 2 pcs
8 Enoculars 7 50 CF HP	Nikon 1 pc

- COPY -

August 15, 1986

Mr. Sangchai Pavaboonsiriwongse  
Provincial Cooperative Officer

Dear Sir,

This is to inform that the survey instruments shown in attached paper have been made good use for the construction works for Model Infrastructure on the Agricultural Cooperative Promotion Project and returned to Cooperatives Promotion Department.

I would like to express my sincere thanks to your cooperation.

Sincerely yours,



Takahiro KATO

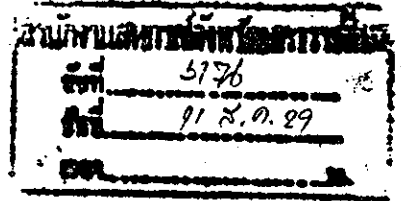
JICA Expert

Sangchai P.  
August 11, 1986.



August 15, 1986

Mr. Sangchai Pavaboonsiriwongse  
Provincial Cooperative Officer




Dear Sir,

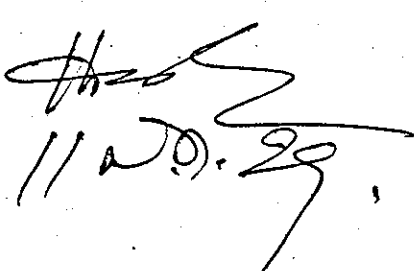
This is to inform that the survey instruments shown in attached paper have been made good use for the construction works for Model Infrastructure on the Agricultural Cooperative Promotion Project and returned to Cooperatives Promotion Department.

I would like to express my sincere thanks to your cooperation.

Sincerely yours,

Handwritten Thai text, likely a signature or note, written in cursive script.

  
Takahiro KATO  
JICA Expert

  
11 20. 29



๒๘๒  
บันทึกข้อความ

ส่วนราชการ สำนักงานสหกรณ์จังหวัดนครราชสีมา โทร. 044 - 242091, 244526

ที่ นม 0011/3849 วันที่ 14 สิงหาคม 2529

เรื่อง ขอส่งมอบวัสดุอุปกรณ์เครื่องมือสำรวจ

เรียน หัวหน้าศูนย์ช่างที่ 3 นครราชสีมา

พร้อมบันทึกนี้ ขอส่งมอบวัสดุอุปกรณ์เครื่องมือสำรวจของโครงการส่งเสริมสหกรณ์  
การเกษตรในประเทศไทย จำนวน 8 รายการ ดังรายการที่แนบมาพร้อมนี้

จึงเรียนมาเพื่อโปรดทราบและดำเนินการรับวัสดุอุปกรณ์เครื่องมือสำรวจ  
ไปเก็บรักษาไว้ที่ศูนย์ช่างที่ 3 ต่อไป

(นายแสงชัย ปาบบุญศิริวงศ์)  
สหกรณ์จังหวัดนครราชสีมา

ได้รับมอบ เครื่องมือวัด ที่เลข ๑๓๗๑๙ เลขที่ 118๒๙๓ 11๘๒

ตาม

(นาย สมชาย สุวณิช)

นายช่างสำรวจ 3.

พรทิพย์ พิมพ์/ทาน

ตรวจ

13 ส.ค. 29

LIST OF SURVEY INSTRUMENTS

Instrument	Quantities
✓ 1. Digital Theodolite TM 6 No.54312 Sökkisha	1 set
✓ 2. Automatic Level B2C Sökkisha	1 set
/ 3. Plane survey set including Tripod	1 set
✓ 4. Staff gauge No.90511,70730 Taihei sangyo	2 pcs
/ 5. Pole	6 set
/ 6. Eslon tape 100m Sekisui jushi	2 pcs
/ 7. Eslon tape 100m 100LN Sekisui jushi	2 pcs
/ 8. Binoculars 7x 50 CF HP Nikon	1 pc

6-7-3 追加工事算定資料



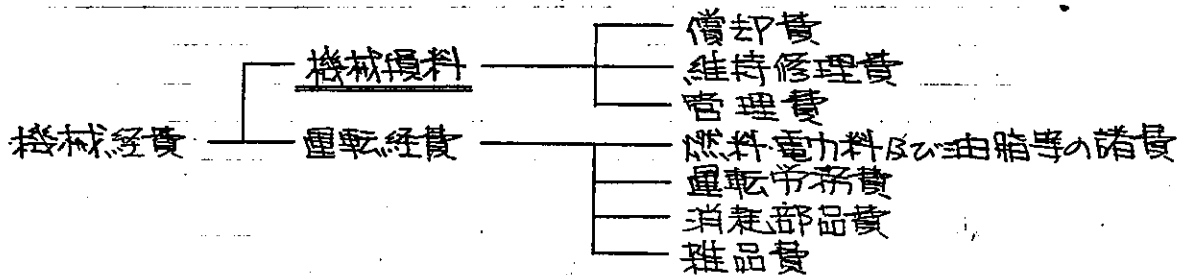
・ Backhoe (PC150LC-3)  
コナマキ地区溜池掘削に使用。ニ山より本工事使用終了日は  
6月25日(工程表より)、貸与日数15日とする  
NO.12

## 2. 追加工事量算出

追加工事量は、ニ山に示す 貸与機材(Ⓜ41P-3, Ⓜ31P-17A, PC150LC-3)  
の本工事での稼働量(工事費)と計算し、その工事費をもとに、ニ山と算出する。

### 2-1. 追加工事対象工事費

貸与機材の本工事(追加工事と含まない)に占める工事費は電機1日当りの  
機械経費(下図参照)のうち、機械損料の項目において、貸与機材(2台国  
外)である場合と、そうでない場合と別途、機械経費を計算し、  
その差額に、重機貸与日数と乗じ、算出する。重機貸与日数は、「1-3、  
本工事使用終了日及び貸与日数」に示す通りである。



#### i) Bulldozer (11ton 相当を算出)

$$\begin{aligned}
 \text{追加工事対象工事費} &= \text{機械経費総額} \times \text{貸与日数} \times \text{稼働率} \times \text{台数} \\
 &= (4542.1 - 2806.1) \text{ 円} \times 30 \text{ 日} \times (21/30) \times 2 \text{ 台} \\
 &= 72,912 \text{ 円}
 \end{aligned}$$

(No. 4 参照)

#### ii) Backhoe (0.5m<sup>3</sup>相当を算出)

$$\begin{aligned}
 \text{追加工事対象工事費} &= (4535.2 - 2883.2) \text{ 円} \times 15 \text{ 日} \times (21/30) \times 1 \text{ 台} \\
 &= 17,346 \text{ 円}
 \end{aligned}$$

(No. 6 参照)

ニ山より追加工事対象工事費は、上記 i), ii) を合計し 90,000 円とする。

- |          |          |            |
|----------|----------|------------|
| 1. 直接工事費 | 70,000   | (No. 9 参照) |
| 2. 間接工事費 | 20,000   | (上記の30%)   |
| 3. 全体工事費 | 90,000 円 |            |

## 11 ton Bulldozer

基礎價格	耐用年數	運轉時間	運轉日數	使用日數	維持修理費率	管理費率
2,840,000 \$	15	1,000	150	220	0.75	0.07

◦ 運轉1時間當量損耗 = 基礎價格 ×  $\frac{\frac{1}{2} \text{ 償却費率} + \text{維持修理費率}}{\text{年面標準運轉時間} \times \text{耐用年數}}$

$$= 2,840,000 \times \frac{0.5 \times 0.9 + 0.75}{1,000 \times 15}$$

$$= 227$$

◦ 使用日當量損耗 = 基礎價格 ×  $\frac{\frac{1}{2} \text{ 償却費率} + \text{年面管理費率} \times \text{耐用年數}}{\text{年面標準使用日數} \times \text{耐用年數}}$

$$= 2,840,000 \times \frac{0.5 \times 0.9 + 0.07 \times 15}{220 \times 15}$$

$$= 1,290.9$$

$$\approx 1,291$$

◦ 運轉1時間當量換算值 = 227 + 1,291 ×  $\frac{220}{1,000}$

$$= 511 \text{ $}$$

◦ 運轉1時間當量維持修理費 = 基礎價格 ×  $\frac{\text{維持修理費率}}{\text{年面標準運轉時間} \times \text{耐用年數}}$

$$= 2,840,000 \times \frac{0.75}{1,000 \times 15}$$

$$= 142$$

◦ 使用日當量機械管理費 = 基礎價格 ×  $\frac{\text{年面管理費率}}{360}$

$$= 2,840,000 \times \frac{0.07}{360}$$

$$\approx 552$$

◦ 運轉1時間當量換算值 = 142 + 552 ×  $\frac{220}{1,000}$

$$= 263 \text{ $}$$

No. OP-1		OPERATION COST OF			Remarks	Explanation
11 ton Bull-dozer		Quantity	Unit	Unit Cost		
(Calculated by per day)						
<u>₹ 4,542.1/day</u>						
1. Labour Cost						
Operator	1.0	md	180	180		
Assistant operator	0.5	md	70	35		
Sub-Total				215		
2. Fuel and Others						
Fuel	59.5	liter	6.9	410.6	8.5 x 7	
Lubricant and others	30	%		123.2		
Sub-Total				533.8		
3. Depreciation Cost	7	hr.	511	3,577	7 <sup>hr</sup> x 263 = 1,841	
Total				4,325.8		2,589.8
4. Temporary Work and others	5	%		216.3		216.3
Total				<u>4,542.1</u>		<u>2,806.1</u> (無償貸与)



0.5 m<sup>3</sup> Backhoe Shovel

基礎價格	耐用年數	運轉時間	運轉日數	使用日數	維持修理費率	年管理費率
3,960,000	15	1300	195	270	0.65	0.07

◦ 運轉1時間當量攤料 = 基礎價格 ×  $\frac{\frac{1}{2} \text{償却費率} + \text{維持修理費率}}{\text{年標準運轉時間} \times \text{耐用年數}}$

$$= 3,960,000 \times \frac{0.5 \times 0.9 + 0.65}{1300 \times 15}$$

$$= 223$$

◦ 使用日當量攤料 = 基礎價格 ×  $\frac{\frac{1}{2} \text{償却費率} + \text{年管理費率} \times \text{耐用年數}}{\text{年標準使用日數} \times \text{耐用年數}}$

$$= 3,960,000 \times \frac{0.5 \times 0.9 + 0.07 \times 15}{270 \times 15}$$

$$= 1466.7$$

$$\approx 1467$$

◦ 運轉1時間當量換算值 = 223 + 1467 ×  $\frac{270}{1300}$

$$= 528 \text{ 円}$$

◦ 運轉1時間當量維持修理費 = 基礎價格 ×  $\frac{\text{維持修理費率}}{\text{年標準運轉時間} \times \text{耐用年數}}$

$$= 3,960,000 \times \frac{0.65}{1300 \times 15}$$

$$= 132$$

◦ 使用日當量機械管理費 = 基礎價格 ×  $\frac{\text{年管理費率}}{360}$

$$= 3,960,000 \times \frac{0.07}{360}$$

$$\approx 770$$

◦ 運轉1時間當量換算值 = 132 + 770 ×  $\frac{270}{1300}$

$$= 292 \text{ 円}$$

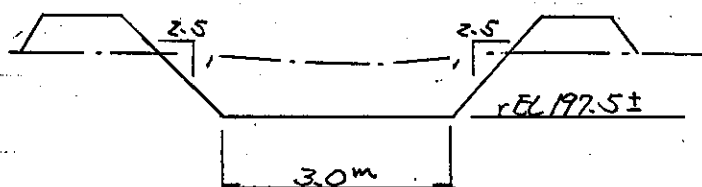
No.	OPERATION COST OF		(Calculated by per day)				Explanation
	Quantity	Unit	Unit Cost	Cost	Remarks		
	<p style="text-align: center;">0.5 m<sup>3</sup> Back-hoe Shovel</p> <p style="text-align: center;">₱ 4,535.2/day</p>						
1. Labour Cost							
Operator	1.0	md	180	180			
Assistant operator	0.5	md	70	35			
Sub-Total				215			
2. Fuel and Others							
Fuel	45.5	liter	6.9	314.0	6.5 x 7		
Lubricants and others	30	%		94.2			
Sub-Total				408.2			
3. Depreciation Cost							
Total	7	hr.	528	3,696	7 <sup>hr</sup> x 292 = 2,044		
4. Temporary Works and Others							
Total	5	%		4,319.2		2,667.2	
				216.0		216.0	
				<u>4,535.2</u>		<u>2,883.2</u>	(要領費)

Z-2 追加工事地区

追加工事地区は千代田地区 Diversion works 右岸分水工下流  
に付ける現況河川改修工事とする。位置図をNo. 8 に示す。

Z-3 追加工事

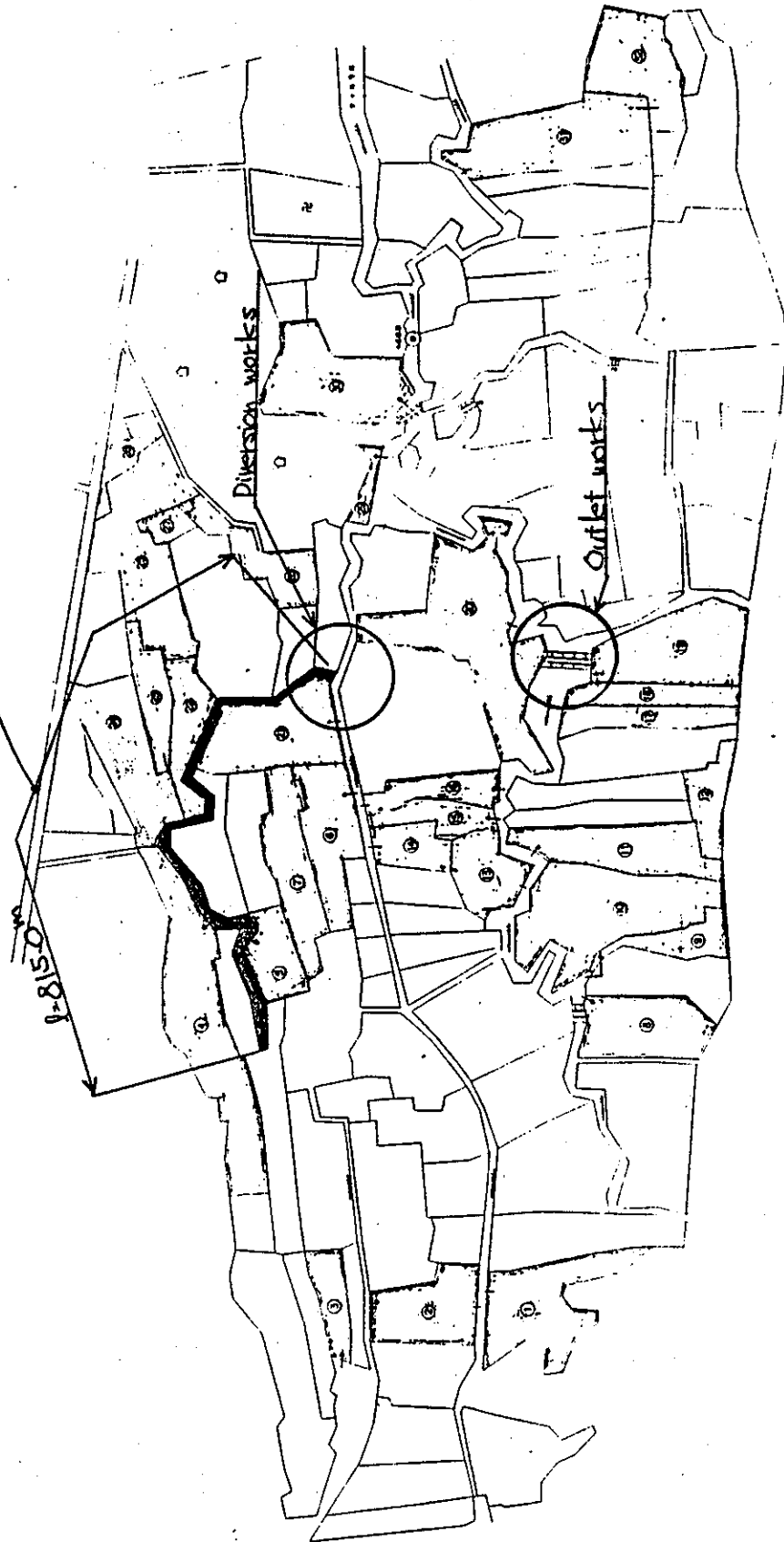
- ・ フロドゲイによる掘削、締固め 及び掘削・盛土法面整形
- ・ 標準断面



- ・ 工事図面 (別添)

CHAK RAJ MODEL GROUP 1:11,400

Additional works (Canal - Repair)



B I L L O F Q U A N T I T I E S

No.

(No. 9)

Item No.	Description	Unit	Quantity	Unit Price (B)	Price (B)	Remarks
7	Repair of existing irrigation canal					
7-1	Repair of existing irrigation canal					
701	Excavation	cum	1,990	20	39,800	
702	Compaction	cum	1,990	10	19,900	
703	Smoothing face	sgm	4,730	1.5	7,095	
704	Sub-total				66,795	(A)
7-Z	Miscellaneous Construction	LS	/		3,339	(B) ; (A) x 0.05
	Total				70,134	(A)+(B)
				round off	70,000	

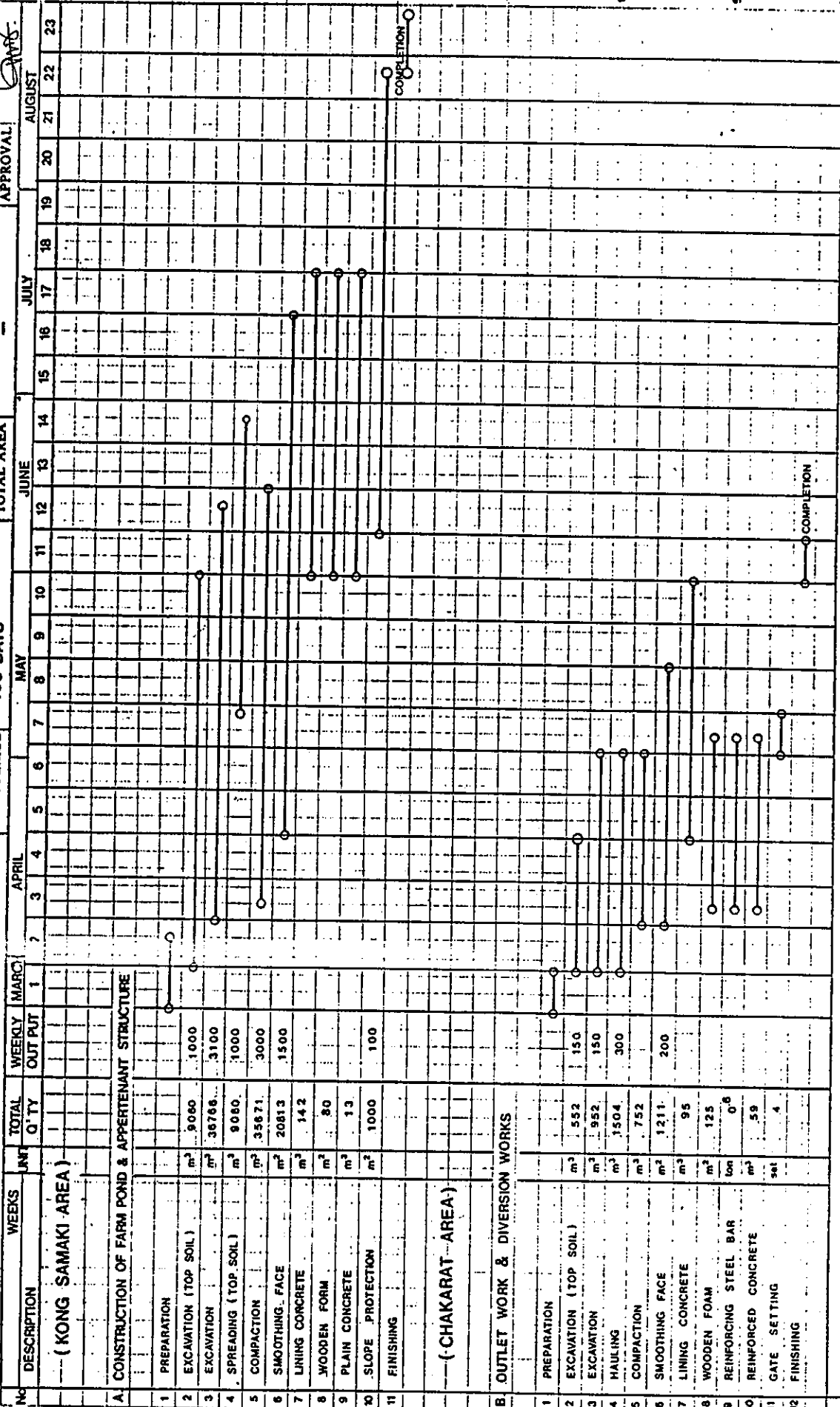
Station	Excavation . Compaction				Smoothing face			Remarks
	Interval m	Area m <sup>2</sup>	Ave. Area m <sup>2</sup>	Volume m <sup>3</sup>	Length m	Ave. length m	Area m <sup>2</sup>	
+ 14.0		5.5			10.0			
+ 50.0	36.0	0.3	2.9	104.4	1.3	5.7	205.2	
+ 100.0	50.0	4.7	2.5	125.0	9.3	5.3	265.0	
+ 120.46	20.46	0.3	2.5	51.2	2.5	5.9	120.7	
+ 150.0	29.54	2.8	1.6	47.3	6.0	4.3	127.0	
+ 182.61	32.61	2.3	2.6	35.2	6.5	6.3	205.4	
+ 200.0	17.39	2.1	2.2	38.3	5.8	6.2	107.8	
+ 249.29	49.29	3.9	3.0	52.3	6.5	6.2	305.6	
+ 300.0	50.71	4.7	4.3	218.1	12.2	9.4	476.7	
+ 305.21	5.21	4.1	4.4	22.9	11.8	12.0	62.5	
+ 340.35	35.14	4.0	4.1	144.1	8.0	9.9	347.9	
+ 350.0	9.65	4.6	4.3	41.5	12.0	10.0	96.5	
+ 400.0	50.0	3.3	4.0	200.0	9.0	10.5	525.0	
+ 450.0	50.0	4.7	4.0	200.0	11.0	10.0	500.0	*
+ 462.53	12.53	2.7	3.7	46.4	5.0	8.0	100.2	
+ 500.0	37.47	2.1	2.4	89.9	1.5	3.3	123.7	
+ 508.67	8.67	2.1	2.1	18.2	1.5	1.5	13.0	
+ 550.0	41.33	2.1	2.1	86.8	1.5	1.5	62.0	
+ 600.0	50.00	3.2	2.7	135.0	5.5	3.5	175.0	
+ 611.5	11.5	3.8	3.5	40.3	8.5	7.0	80.5	
+ 650.0	38.5	1.0	2.4	92.4	4.2	6.4	246.4	
+ 657.15	7.15	2.1	1.6	11.4	6.0	5.1	36.5	
+ 700.0	42.85	0.5	1.3	55.7	1.0	3.5	150.0	
+ 730.42	30.42	0.5	0.5	15.2	1.8	1.4	42.6	
+ 750.0	19.58	1.4	1.0	19.6	6.0	3.9	76.4	
+ 800.0	50.00	2.0	1.7	85.0	3.8	4.9	245.0	
+ 815.22	15.22	0.0	1.0	15.2	0.0	1.9	28.9	
Total				1,991.4 <sup>m<sup>3</sup></sup> = 1,990 <sup>m<sup>3</sup></sup>			4,725.5 = 4,730 <sup>m<sup>2</sup></sup>	

LIST OF EQUIPMENT

No. 11

Kinds of Equipment	Model	Quantities
1. Bull-dozer	D41 P-3	1
2. Bull-dozer	D31 P-17A	1
3. Power-shovel	PC 150LC-3	1
4. Back-hoe assembly	D31 P3	1
5. Dump truck	CWA 53HD	1
6. Dump truck	CKA 21	1
7. Drainage Pump	80ES	4
8. Generator	NES 20BN	1

**CONSTRUCTION PROGRESS SCHEDULE  
AGRICULTURAL COOPERATIVE PROMOTION PROJECT  
-- ADJUSTMENT SCHEDULE --**





MINUTE OF DISCUSSION

( NO. 1 )

SUBJECT:	REF. NO.	
	DATE	
	PLACE	
INSPECTION COMMITTEE		
CONTRACTOR		
<p>CONTENTS:    <u>The Lease of Heavy Equipment</u></p> <p>According to Section 7 of TERMS AND CONDITIONS OF THE PROJECT, the heavy equipment owned by the Government of Kingdom of Thailand shall be used in accordance with the following conditions.</p> <ol style="list-style-type: none"> <li>1.    General             <ol style="list-style-type: none"> <li>1-1    The name of heavy equipment    : see attached paper (No.3)</li> <li>1-2    The lease period                    : see attached paper (No.3)</li> <li>1-3    Delivery site location                : Kong, Chakkarat    Nakhon Ratchasima</li> </ol> </li> <li>2.    Lease Conditions             <ol style="list-style-type: none"> <li>2-1    The heavy equipment is required to always keep in good conditions. The Contractor shall be responsible to protect the heavy equipment against rough handling, damage, loss and pilfering during lease period.</li> <li>2-2    The Contractor shall be at his own expense in all respects of the transportation for the delivery and so on.</li> <li>2-3    In case of the trouble occurrence about the heavy equipment, the Contractor shall submit the report to the Inspection Committee and follow the ruling given by the Inspection Committee.</li> <li>2-4    The Contractor shall return the heavy equipment as following condition.                     <ol style="list-style-type: none"> <li>(a)    In case that the Cooperative Promotion Department is necessary to use the heavy equipment though unavoidable circumstance.</li> <li>(b)    In case that the Inspection Committee judge that the Contractor is inadequate to lease the heavy equipment.</li> </ol> </li> <li>2-5    In the event of the Contractor:-                     <ol style="list-style-type: none"> <li>(a)    The heavy equipment is used except the purpose of this construction works.</li> <li>(b)    The heavy equipment is transferred to the outsider, and/or put in pledge.</li> <li>(c)    The heavy equipment is lost and/or broken up, which is caused by the Contractor's fault.</li> </ol> </li> </ol> </li> </ol>		

(d) The Inspection Committee judge that the Contractor is in default as mentioned in Minute of Discussion herein.

The Inspection Committee reserves the right to claim for any suitable compensation under the Contractor's responsibility.

3. Additional Works

In accordance with Article 14 of CONTRACT, the Inspection Committee order the following additional works to the Contractor, provided that the construction period is not modified.

1. Location Chakkarat, Nakhon Ratchasima
2. Construction Repair for existing irrigation canal  
( see attached paper No. 4 )

canal length : 815 m

LIST OF EQUIPMENT

( No. 3 )

Kinds of Equipment	M o d e l	Quantities
1. Bull-dozer	D41 P-3	1
2. Bull-dozer	D31 P-17A	1
3. Power-shovel	PC 150LC-3	1
4. Back-hoe assembly	D31 P3 . .	1
5. Dump truck	CWA 53HD	1
6. Dump truck	CKA 21	1
7. Drainage Pump	80ES	4
8. Generator	NES 20BN	1

. The arrival date at Engineering Center No.3

- |                            |          |
|----------------------------|----------|
| 1. Bull-dozer D41P-3       | 16th May |
| 2. Bull-dozer D31P-17A     | 16th May |
| 3. Back-hoe assemble D31P3 | 16th May |

The arrival date of the others is unfixed.

. The lease period

- |                            |                            |
|----------------------------|----------------------------|
| 1. Bull-dozer D41P-3       | from 27th May to 25th June |
| 2. Bull-dozer D31P-17A     | -do-                       |
| 4. Back-hoe assemble D31P3 | -do-                       |
| 3. Power-shovel PC150LC-3  | to 25th June               |



6-7-4 工事実施状況報告書

工事実施状況報告書 (物1)

(昭和86年3月18日～3月22日)

月日(曜日)	18(水)	19(木)	20(金)	21(土)	22(日)
天気	晴	晴	晴	晴	晴

作業記事 監督事項		備考
仮設工事	Kong samaki	
	Chakkarat	
	<ul style="list-style-type: none"> <li>準備 (測量機材搬入)</li> <li>工事図面の説明</li> <li>測量手順の打合せ (既設エカト杭の位置確認)</li> </ul>	

工事実施状況報告書 (物2)

(昭和86年3月23日～3月29日)

月日(曜日)	23(日)	24(月)	25(火)	26(水)	27(木)	28(金)	29(土)
天気	晴	晴	晴	晴	晴	晴	晴

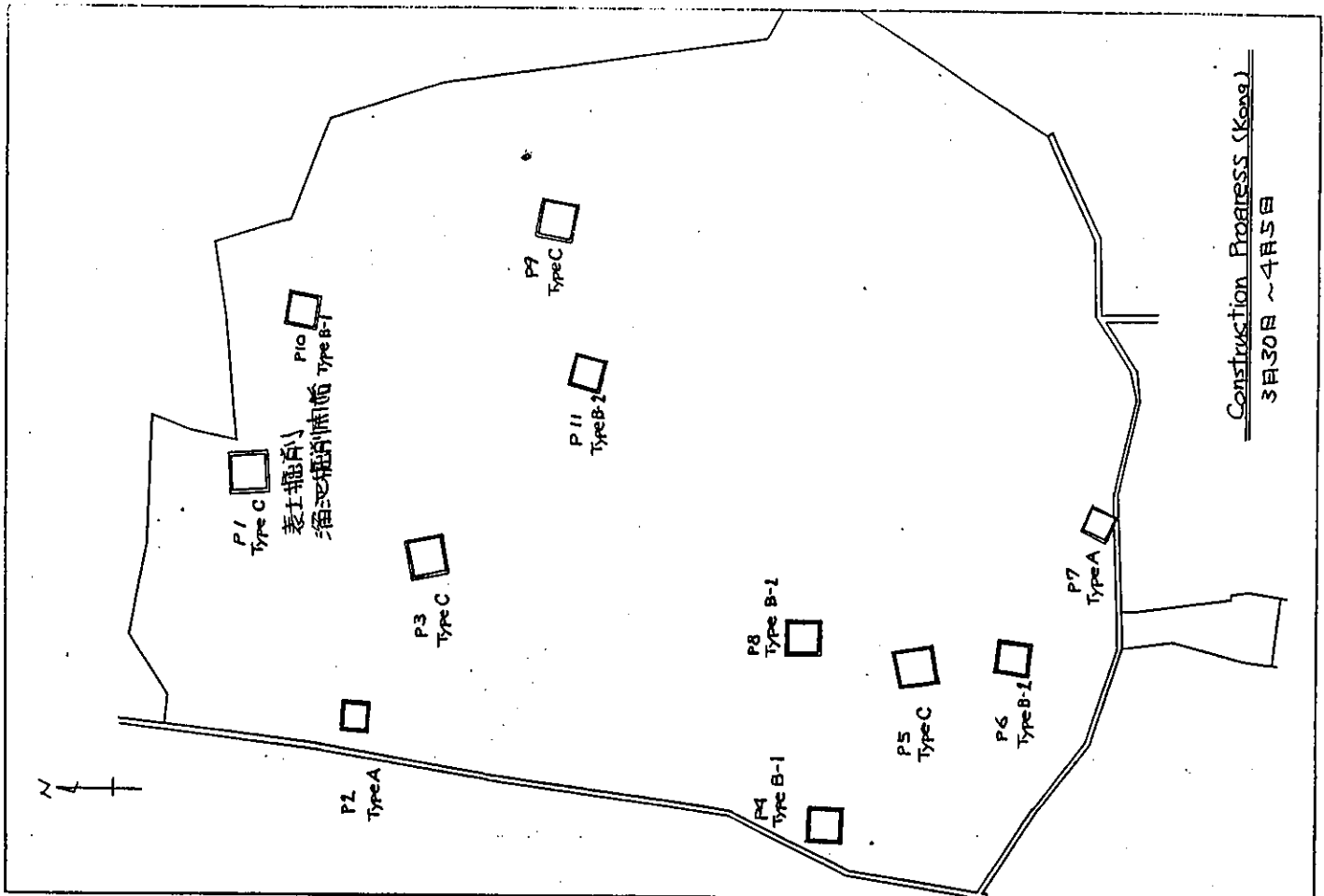
作業記事 監督事項		備考
仮設工事	Kong samaki	A point = Out let works
	Chakkarat	
	<ul style="list-style-type: none"> <li>準備 (測量機材の搬入)</li> <li>現場踏査 (既設杭のチェック)</li> <li>P1, P2, P3, P10 涵池中心杭を設置した後、当該設置者立会いによる最終的涵池位置の確認と完了。</li> <li>P1, P2, P3, P10 涵池の仮設控杭 (盛土工法より外側へ5mm) 取囲)の設置</li> </ul>	

工事実施状況報告書 (巻3)

(昭和26年3月30日～4月5日)

月日(曜日)	30(日)	31(月)	1(火)	2(水)	3(木)	4(金)	5(土)
天気	晴	晴	晴	晴	晴	晴	晴
	晴	晴	晴	晴	晴	晴	晴

作業記事 監督事項		備考
Kong samaki	Chakkarat	B point = Diversion works
<ul style="list-style-type: none"> <li>° P1 1-1の表土掘削 (20~30cm) 開始 (by Bulldozer)</li> <li>表土は非常に堅固であるため、フルド-ザ-による表土掘削の能力は悪い。</li> <li>° P1 表土掘削終了後、70cmシールによる溜池掘削開始</li> <li>同時にフルド-ザ-による掘削工の持出し (20cm厚)</li> <li>° P.4 ~ 9, P11 溜池中心杭設置後、当該要箇者による立会い、最終位置の確認。</li> </ul>	<ul style="list-style-type: none"> <li>° B point 現況河川中心線測量及び河川縦横断面測量</li> <li>縦断面測量 No.1 ~ No.10+5.0; 延長 95m</li> <li>横断面測量 No.1 ~ No.10+5.0; 21断面</li> </ul>	
現場投入機械	Bulldozer D-5 1台 (3/30着) Clamp shell (11-B Komatsu-Bugurus 0.7m <sup>2</sup> ) 1台 (4/3着)	Bulldozer D-5 1台 (3/30着)

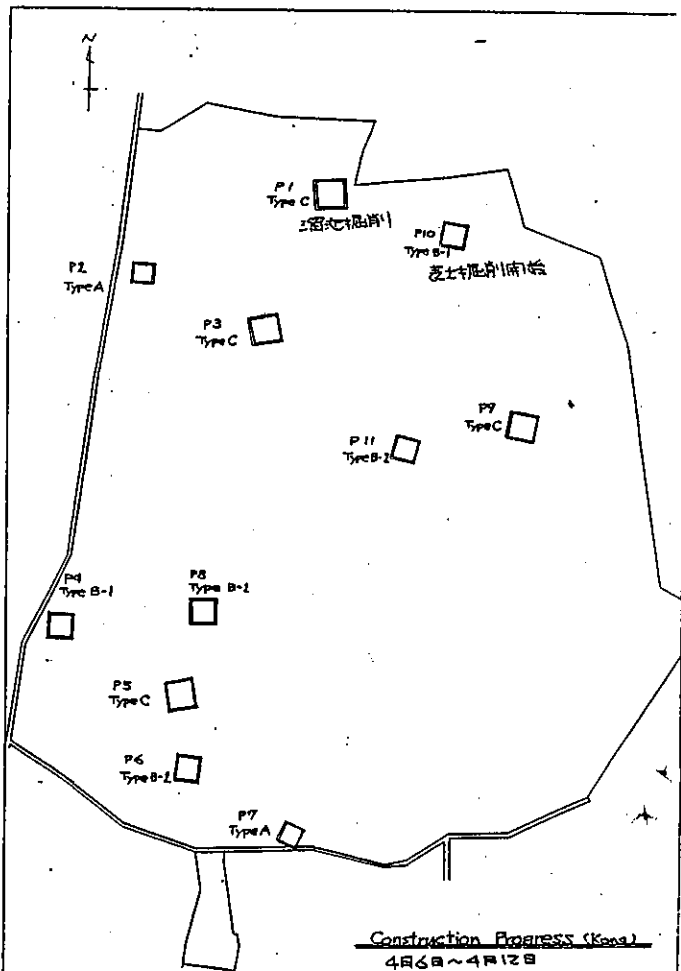
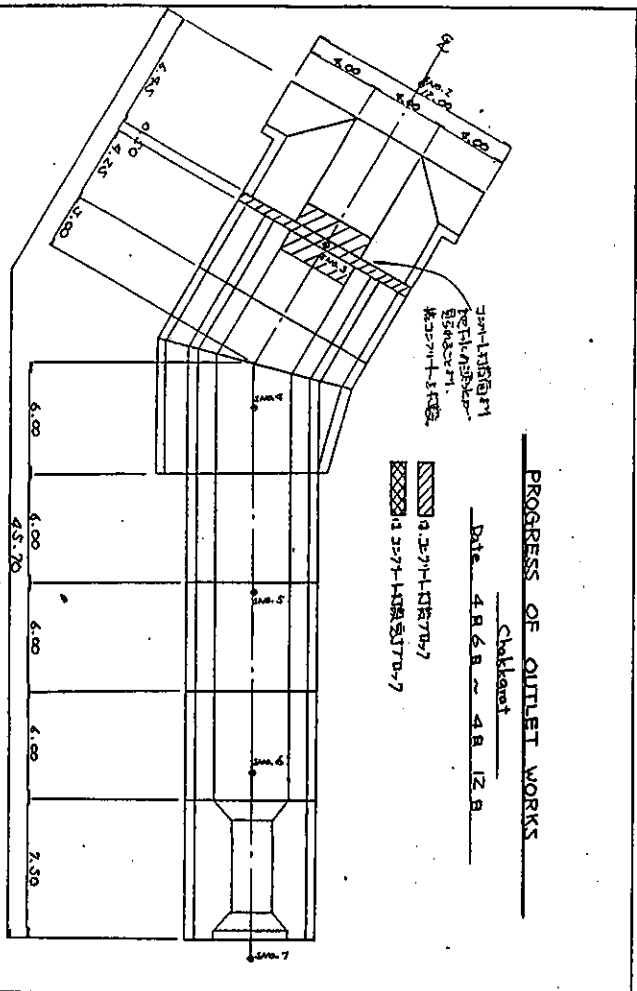


工事実施状況報告書 (巻4)

(昭和56年4月6日～4月12日)

月日(曜日)	6(日)	7(月)	8(火)	9(水)	10(木)	11(金)	12(土)
天候	晴	晴	晴	晴	晴	晴	晴/雨
風向	晴	晴	晴	晴	晴	晴	晴

作業記事 及び 監督事項		備考
Kong samaki	Chakkarat	
<ul style="list-style-type: none"> <li>○P1-7%シロシ.パイプ用土による掘削完了。掘削後 底面P10に於て 80% (4,400㎡) 掘削完了</li> <li>○深さ5m (設計深さ5m) に於て 岩(軟岩)が露頭。これは底面面積の30%に相当する。パイプ用土による掘削は不可能な状態である。(露頭深さは5m以下であることより、掘削の必要はない)</li> <li>○P10に於て表土掘削開始(30%完了)</li> <li>○P4~9, P11 仮設用地杭設置</li> </ul>	<ul style="list-style-type: none"> <li>○Apoint 表土18%完了</li> <li>○P1設置部(ONO.2+5.8~5NO3+1.5)の掘削完了。掘削後 底面P10に於て水切りシロシを敷設(5cm) 掘削コンクリート(5cm)を施工(4/10)</li> <li>○P10部の 鉄筋加工 組立(4/11)</li> <li>○P10部 コンクリート打設 (cc197.20~cc198.00) (4/12完了)</li> </ul>	<p>鉄筋コンクリートの配合は 配合設計に基づき 1:3:12 水は1バケツに4杯とす</p>
現場投入機材		
<ul style="list-style-type: none"> <li>Bulldozer D-5 1台</li> <li>Clamp shell (0.7m<sup>3</sup>) 1台</li> <li>Back hoe (ISHI, Komatsu) 1台 (4/6着)</li> <li>Roller (15', Motarabe) 1台 (4/6着)</li> <li>Dump truck 2台 (4/6着)</li> <li>Water tank truck 1台 (4/6着)</li> </ul>	<ul style="list-style-type: none"> <li>Bulldozer D-5 1台</li> <li>Concrete Mixer (0.15m<sup>3</sup>) 1台 (4/6着)</li> <li>Generator 1台 (4/6着)</li> </ul>	





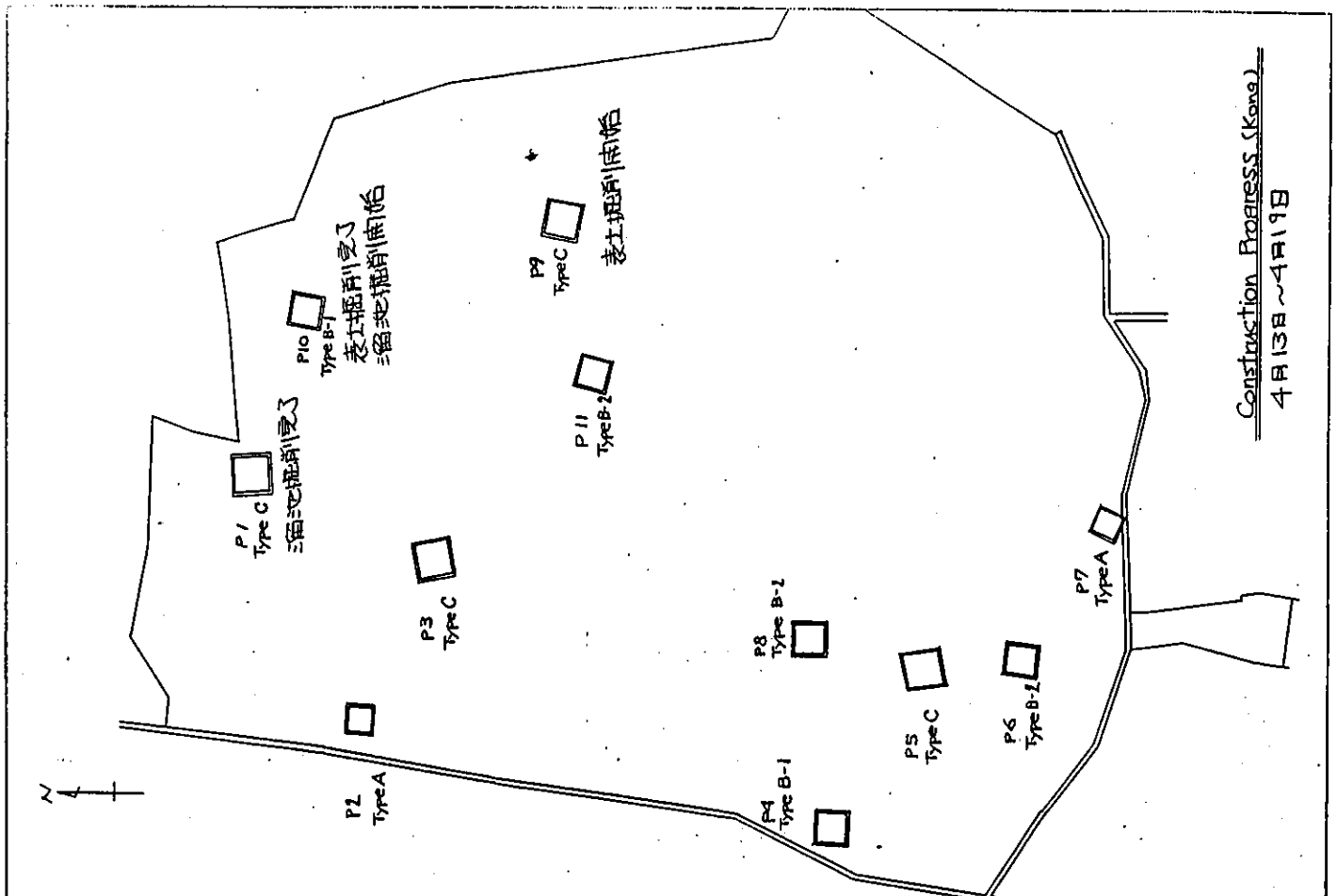
工事実施状況報告書 (巻5)

(昭和28年4月13日～4月19日)

月日(曜日)	13(日)	14(月)	15(火)	16(水)	17(木)	18(金)	19(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong Samaki

作業記事及び発着事項	備考
<p>掘削・盛土</p> <ul style="list-style-type: none"> <li>○14～17日 野赤・加藤 Bangkokへ出張</li> <li>○P1 掘削及び盛土(表土と陸く)完了</li> <li>○P10 表土掘削完了。溜池掘削開始</li> <li>P10においては 現況地盤上の深度4.5mにおいて軟岩が部分的に露頭したが、バックホウでの掘削は可能であった。</li> <li>○P9 表土掘削開始</li> <li>P1においては表土掘削はフロッパーによる掘削・押しを用いたが、乾燥のため表土が堅固であることより P9, P10においてはバックホウによる掘削・荷込、ジャンプクレーンによる運搬とした。</li> <li>○P1 盛土の締固め状態は D値90以上であることを確認 (rd<math>\geq</math>1.5%)</li> </ul>	<ul style="list-style-type: none"> <li>○13, 14日は70%の為に休日</li> <li>○溜池掘削合計 7,400<sup>m<sup>3</sup></sup></li> <li>現場搬入機械</li> <li>○Bulldozer D-5 /</li> <li>○Clampshell 0.7m<sup>3</sup> /</li> <li>○Back hoe PC200 /</li> <li>                  " 15HT /</li> <li>○Bulldozer D-4 /</li> <li>○Roller 8<sup>t</sup> /</li> <li>○Water tank truck /</li> <li>○Dump truck 3</li> </ul>



工事実施状況報告書 (巻5)

(昭和36年4月13日～4月19日)

月日(曜日)	13(日)	14(月)	15(火)	16(水)	17(木)	18(金)	19(土)
天候	晴	晴	晴	晴	晴	晴	晴

Chakkarat

作業記事及び監督事項	備考
<p>○14～17日 野添・加藤 Bangkokへ出張</p> <p>○A point 下地基礎設置。下地部(EL198.00～EL199.80)の鉄筋加工・組立及び型枠の建込み</p>	<p>13, 14日はY-773-1の為休日</p> <p>現場搬入機材</p> <ul style="list-style-type: none"> <li>○Bulldozer D-5  </li> <li>○Concrete Mixer 0.15m<sup>3</sup>  </li> <li>○Welding generator  </li> <li>○Machine vibrator  </li> </ul>

工事実施状況報告書 (巻6)

(昭和36年4月20日～4月26日)

月日(曜日)	20(日)	21(月)	22(火)	23(水)	24(木)	25(金)	26(土)
天候	晴	晴	晴/雨	晴	晴/雨	晴	晴/曇

Kong Samaki

作業記事及び監督事項	備考
<p>○P10 溜池掘削完了</p> <p>○P9 表土掘削 (バックホウ掘削・積込 - タンクロー) 履搬)</p> <p>” 溜池掘削開始 (Back hoe PC200 BTR clampshell)</p> <p>P9 においては 軟岩の露頭は見られない。</p> <p>○P11 表土掘削 (バックホウ HTIS 掘削・積込、タンクロー履搬)</p> <p>P11 において 受植地境界線が調査・測量時より 変更となったため、溜池盛土形状を変更した。B-2 95°(P11) 設計盛土形状; 67m x 67m = 4500m<sup>2</sup> 変更後 52m x 90m = 4700m<sup>2</sup> (同積車に於て、受植者は承認済み。)</p>	<p>現場搬入機材</p> <ul style="list-style-type: none"> <li>○Bulldozer D-5  </li> <li>” D-4  </li> <li>○Clamshell 0.7m<sup>3</sup>  </li> <li>○Back hoe PC200  </li> <li>” 15HT  </li> <li>○Roller 8t  </li> <li>○Water tank truck  </li> <li>○Dump truck 3</li> </ul>

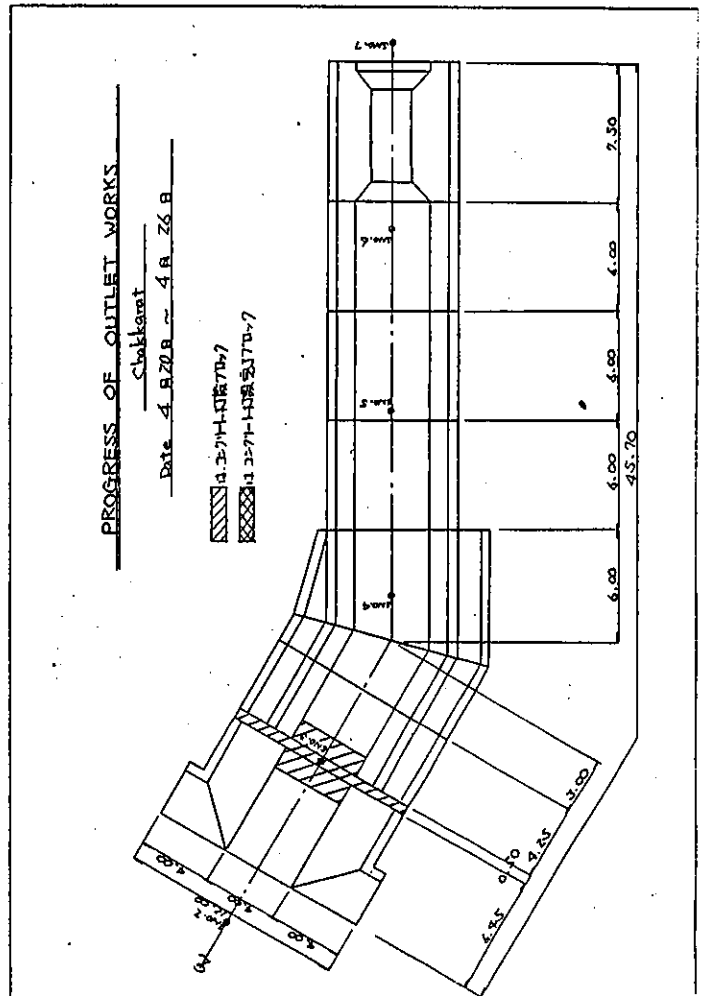
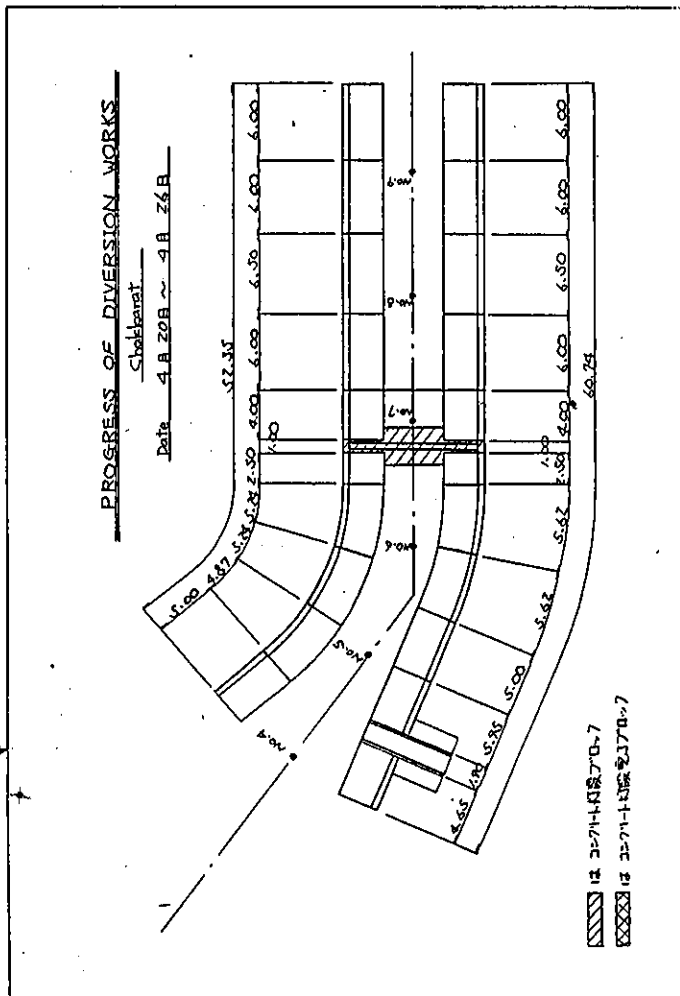
工事実施状況報告書 (巻6)

(昭和28年4月20日～4月26日)

月日(曜日)	20(日)	21(月)	22(火)	23(水)	24(木)	25(金)	26(土)
天候	晴	晴	晴/雨	晴	晴/雨	晴	晴/曇

Chakkanat

作業記事 及び 監督事項		備考																				
<p>• A-point ゲート部コンクリート打設 (EC 198.00 ~ EC 199.80) コンクリート配合は以下の通り。</p> <table border="1"> <thead> <tr> <th></th> <th>Cement</th> <th>Water</th> <th>Sand</th> <th>Aggregate</th> </tr> </thead> <tbody> <tr> <td>重量(kg)</td> <td>50.0</td> <td>27.7</td> <td>126.3</td> <td>200.3</td> </tr> <tr> <td>容積(m³)</td> <td>0.016</td> <td>0.028</td> <td>0.049</td> <td>0.073</td> </tr> <tr> <td>容積比</td> <td>1</td> <td>1.8</td> <td>3.1</td> <td>4.6</td> </tr> </tbody> </table> <p>水・セメント比 w/c = 0.55 コンクリート打込機に際してはバイブレーターを使用。</p> <p>• B-point 現況河川放流ゲート部床掘り完了後、鉄筋加工組立 BW EC 197.20 ~ EC 198.00 のコンクリート打設。配合設計は 上記と同一。コンクリート打設前に降雨あり、同位置に20cm程度の湛水が ありため、人力BWポンプによる排水を指示した後、勾配面を確保す その後、打設面を乾燥とせり。基礎として地耐力が確認後、コン クリート打設。</p> <p>• 放流ゲート下流 (No. 7 ~ No. 8 + 5.00) の河川断面の整形</p>			Cement	Water	Sand	Aggregate	重量(kg)	50.0	27.7	126.3	200.3	容積(m³)	0.016	0.028	0.049	0.073	容積比	1	1.8	3.1	4.6	<p>現場搬入機材</p> <ul style="list-style-type: none"> <li>• Bulldozer D-5 1</li> <li>• Concrete Mixer 0.15m³ 1</li> <li>• Welding generator 1</li> <li>• Machine vibrator 1</li> </ul>
	Cement	Water	Sand	Aggregate																		
重量(kg)	50.0	27.7	126.3	200.3																		
容積(m³)	0.016	0.028	0.049	0.073																		
容積比	1	1.8	3.1	4.6																		



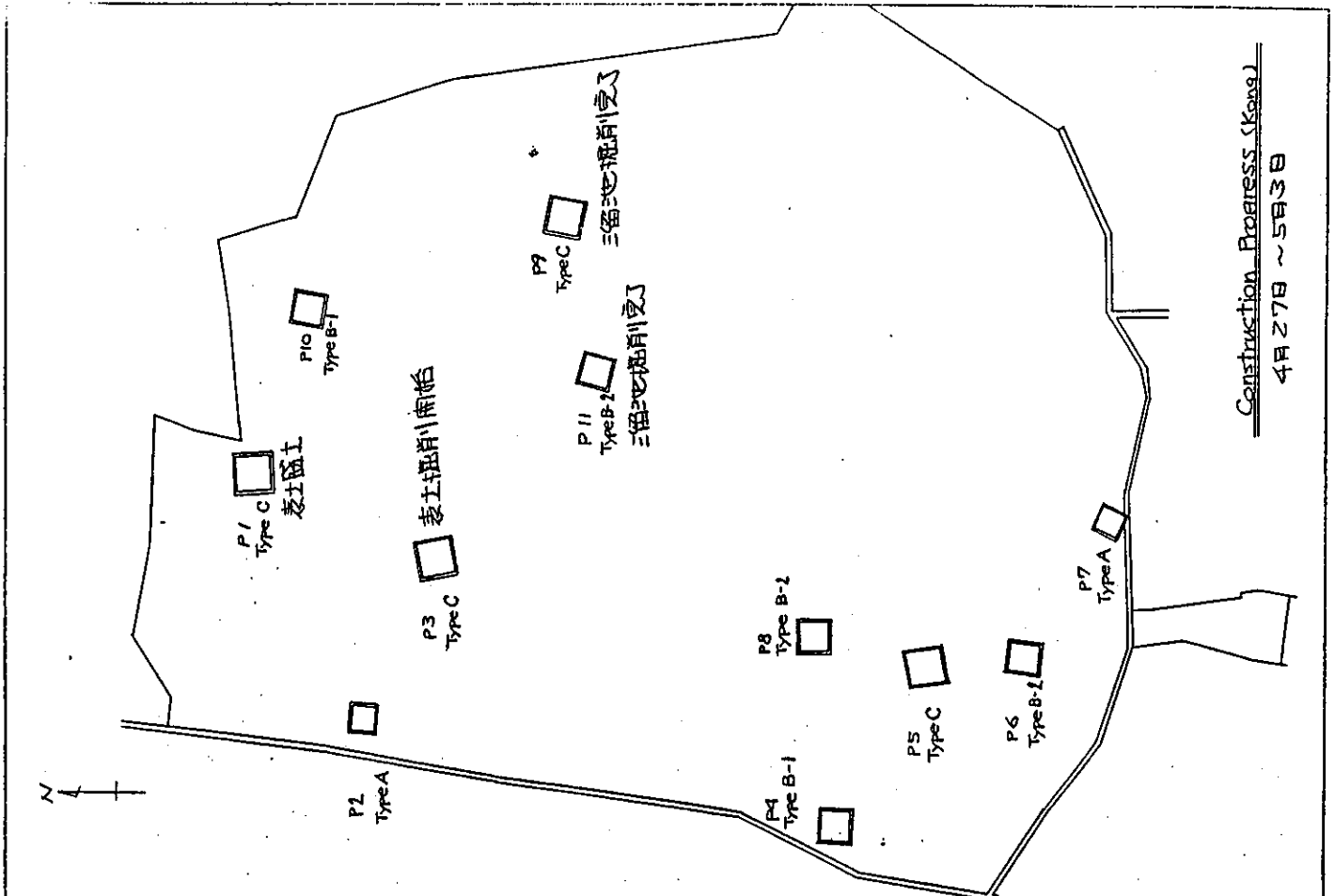
工事実施状況報告書 (巻7)

(昭和28年4月27日～5月3日)

月日(曜日)	27(日)	28(月)	29(火)	30(水)	31(木)	2(金)	3(土)
天候	晴	晴	晴	晴	晴	晴/雨	晴

Kong Samaki

作業記事 及び 監督事項	備考
<ul style="list-style-type: none"> <li>・P9 溜池掘削完了</li> <li>・P11 溜池掘削完了</li> <p>P11、盛土締固めにおいて掘削は含水量比(自然含水量比)が低いことから、7-7車により散水し、締固めを行った。含水量比は20%を目安とした。締固め工の巾値は90%以上となる。</p> <li>・P3 表土掘削開始</li> <li>・P1 表土盛土</li> <li>・P1, P10, P9 流入位置の確認と当該段礫者立合の元、ニシエを行った。</li> </ul>	<ul style="list-style-type: none"> <li>・現場搬入機材</li> <li>・Bulldozer 4-5</li> <li>   "      4</li> <li>・Clamshell 0.7m<sup>3</sup></li> <li>・Backhoe PC200</li> <li>   "      15HT</li> <li>・Roller 8t</li> <li>・Water tank truck</li> <li>・Dump truck 6t</li> </ul>



工事実施状況報告書 (巻7)

(昭和28年4月27日～5月3日)

月日(曜日)	27(日)	28(月)	29(火)	30(水)	31(木)	2(金)	3(土)
天候	晴	晴	晴	晴	晴	晴/曇	晴

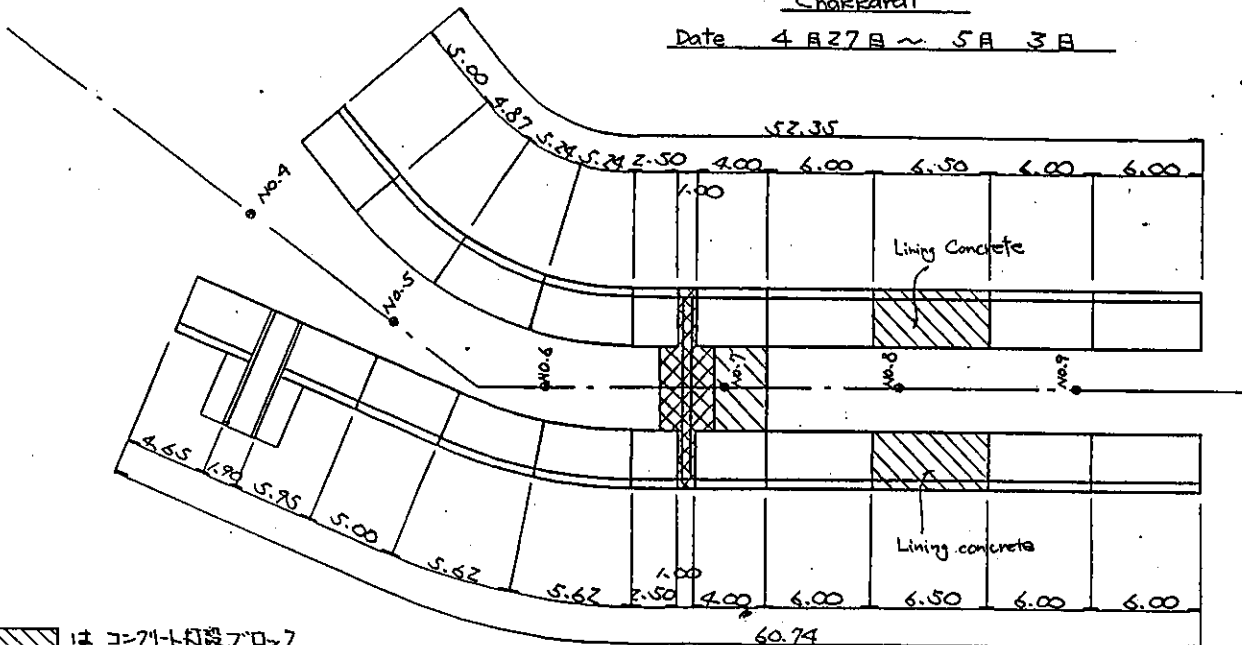
Chakkarat

作業記事及び監督事項	備考
<ul style="list-style-type: none"> <li>・A-point トレ部型枠解体後、L型による養生を引続き行う。</li> <li>・B-point 117mm厚 (+30cm) コンクリート打設 コンクリート厚が30cmと薄いため、バイブレーターによる打込みは行わず、鉄筋による打込みを行う。</li> <li>・ラインアコンクリート打設。(No. 7+8.5 ~ No. 8+5.00) ラインコンクリート伸縮JOINTは厚さ1cmの板をコンクリート面にはさむこととし、収縮JOINTは油性ハイシ塗布と同時に1cm x 1cmの盲目地を施工するよう指示。</li> <li>・放流部トレ部型枠の加工、組立 (EC198.00 ~ EC197.80)</li> <li>・右岸分水工部の掘削を行う。EC192.50付近で湧水が見えることより、敷砂利を敷き、格コンクリートを打つことに指示。</li> </ul>	<p>現場搬入機材</p> <ul style="list-style-type: none"> <li>・Dumper D-5</li> <li>・Concrete mixer 0.15m<sup>3</sup></li> <li>・Welding generator</li> <li>・Machine vibrator</li> </ul>

PROGRESS OF DIVERSION WORKS

Chakkarat

Date 4月27日 ~ 5月3日



- ▨ は コンクリート打設アロー7
- ▩ は コンクリート打設完了アロー7

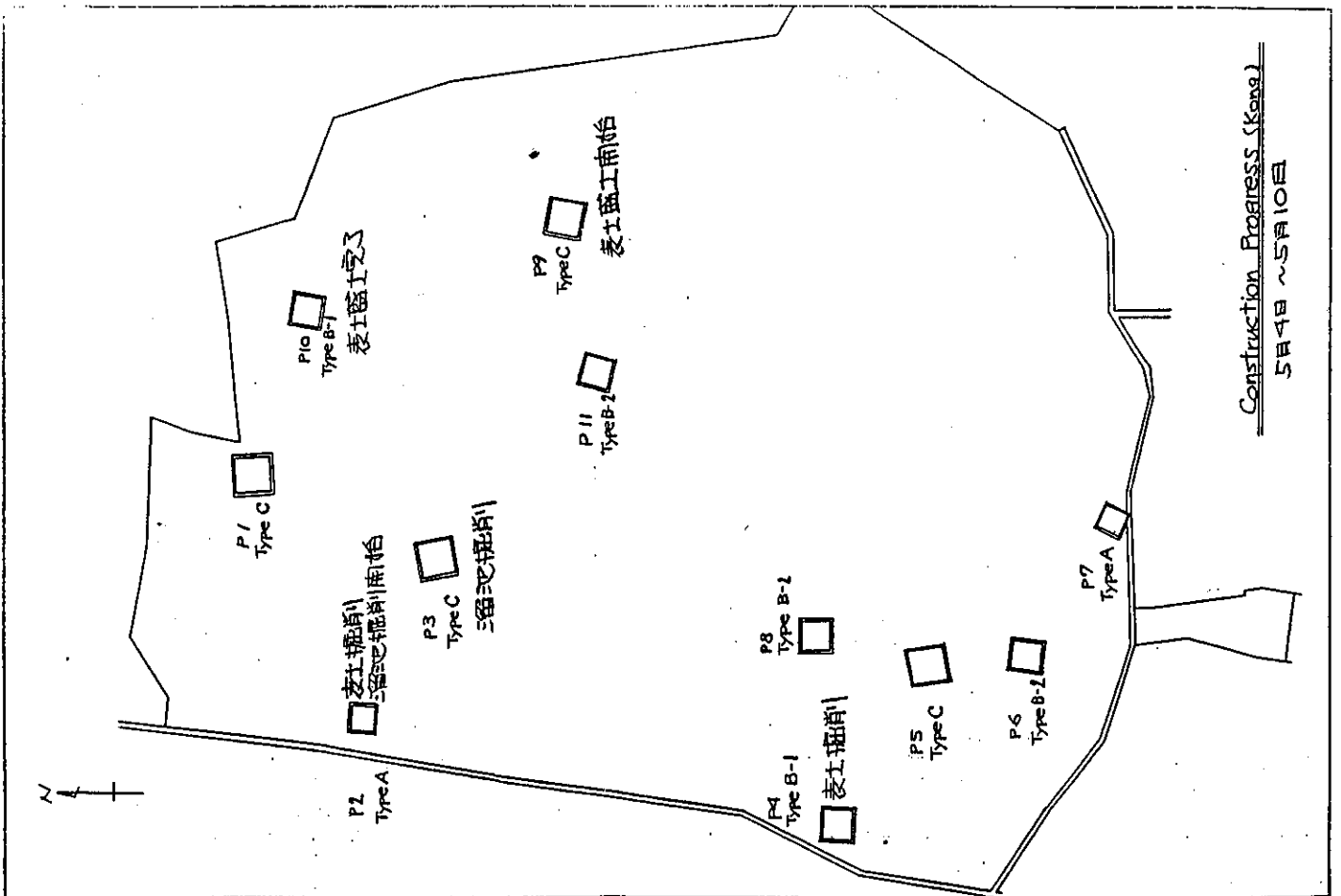
工事実施状況報告書 (表8)

(昭和8年5月4日~5月10日)

月日(曜日)	4 (日)	5 (月)	6 (火)	7 (水)	8 (木)	9 (金)	10 (土)
天候	晴	晴	晴	晴	雨	雨	雨

Kong

作業記事及監督事項	備考
<ul style="list-style-type: none"> <li>○P2 表土掘削 及び 溜池掘削開始</li> <li>○P3 溜池掘削</li> <li>○P4 表土掘削</li> <li>○P9 表土盛土開始</li> <li>○P10 表土盛土完了</li> </ul>	<p>現場搬入機材</p> <ul style="list-style-type: none"> <li>○Bulldozer D-5 1ea</li> <li>" D-4 1ea</li> <li>○Backhoe PC200 1ea</li> <li>" 15HT 1ea</li> <li>○Clam shell 0.7m<sup>3</sup> 1ea</li> <li>○Roller 8t 1ea</li> <li>○water tank truck 1ea</li> <li>○Dump truck 6t 3ea</li> </ul>



工事実施状況報告書 (巻8)

(昭和8年5月4日~5月10日)

月日(曜日)	4(日)	5(月)	6(火)	7(水)	8(木)	9(金)	10(土)
天候	晴	晴	晴	晴	雨	雨	雨

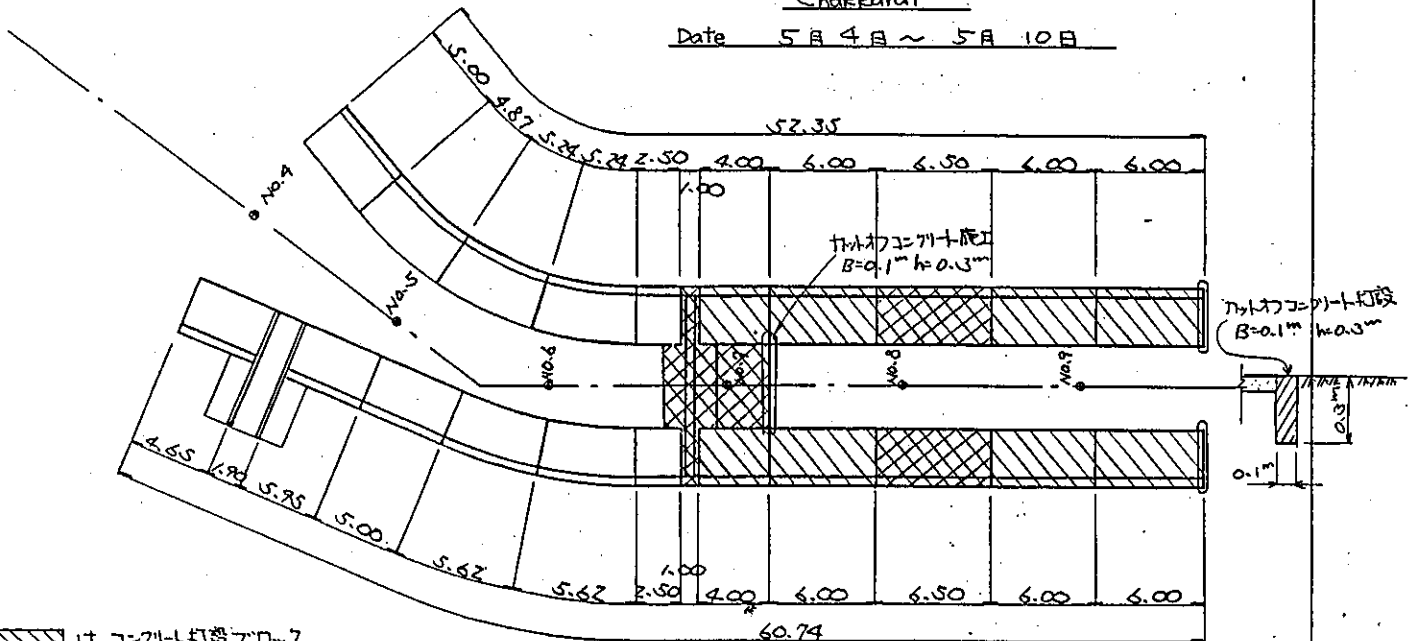
Chakkarat

作業記事及び監督事項	備考								
<p>A-point 水取水路中心線より左右5mに設計掘削標高より50cm上までの盛土と転圧を指示。非排水地或勢地の現況土質の除去を指示。</p> <p>B-point 水路ライン工コンクリート打設。打設面を乾燥し2m3ニとし。打設面への散水を指示。                  ライン工コンクリート打設範囲 (No.6+9.50~No.9+8.00)                  ライン工コンクリート打設幅 (No.9+8.00) に、幅5~10cm高さ100cmのカットオフコンクリート打設を指示。                  No.9+8.00 の5 現況水路への"ズリ付"はその延長を5mとし、ライン工水路断面の5の滑らかな掘削整形を行った。</p>	<p>現場搬入機材</p> <table border="0"> <tr> <td>Bulldozer D-5</td> <td>1ea</td> </tr> <tr> <td>Mixer 0.15m<sup>3</sup></td> <td>1ea</td> </tr> <tr> <td>Machine vibrator</td> <td>1ea</td> </tr> <tr> <td>Machine welder set</td> <td>1ea</td> </tr> </table>	Bulldozer D-5	1ea	Mixer 0.15m <sup>3</sup>	1ea	Machine vibrator	1ea	Machine welder set	1ea
Bulldozer D-5	1ea								
Mixer 0.15m <sup>3</sup>	1ea								
Machine vibrator	1ea								
Machine welder set	1ea								

PROGRESS OF DIVERSION WORKS

Chakkarat

Date 5月4日~5月10日



- は コンクリート打設アローフ
- は コンクリート打設受アローフ

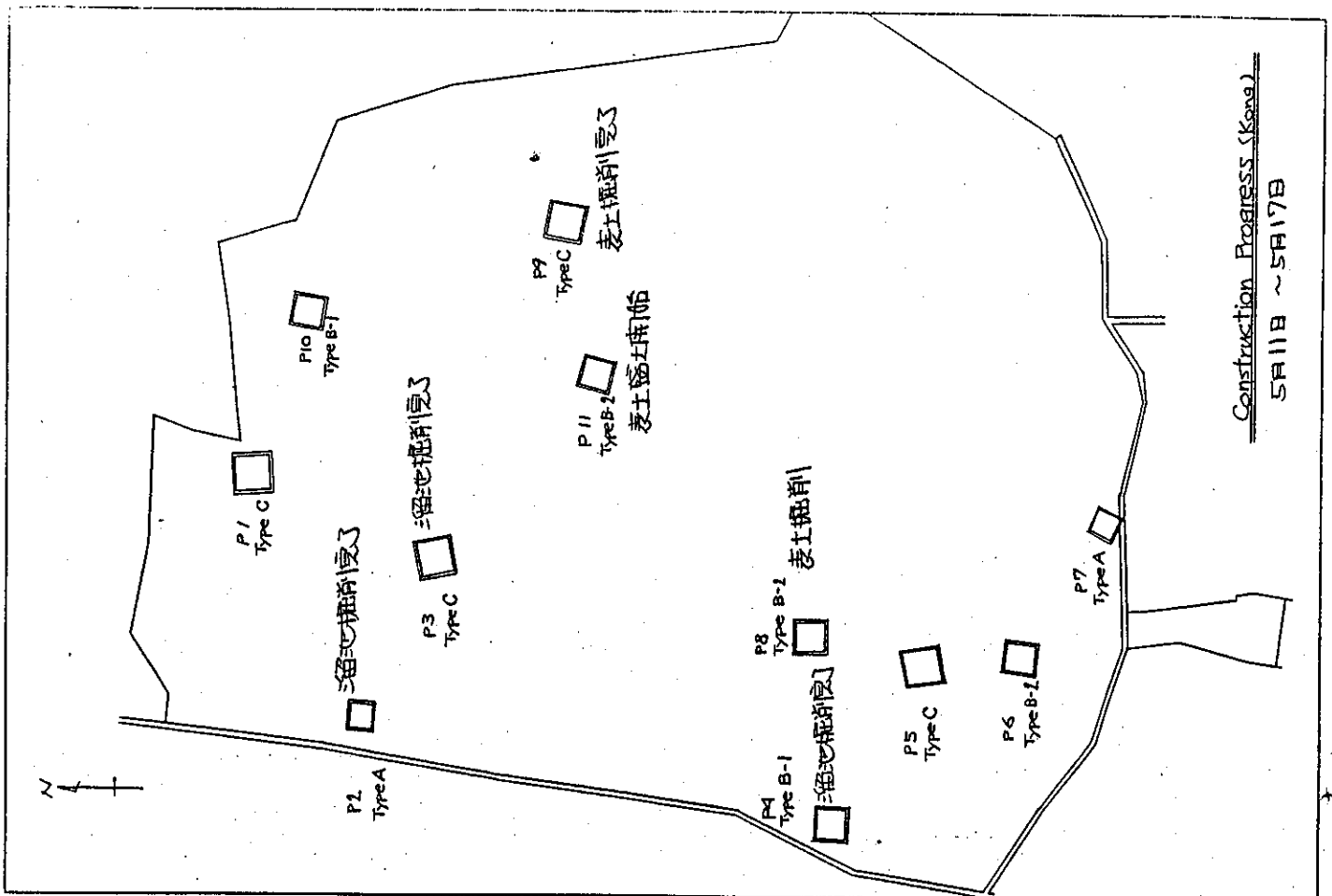
工事実施状況報告書 (巻9)

(昭和38年5月11日~5月17日)

月日(曜日)	11(日)	12(月)	13(火)	14(水)	15(木)	16(金)	17(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事 及び 監督事項	備考
<ul style="list-style-type: none"> <li>・P2 溜池掘削完了</li> <li>・P3 溜池掘削完了</li> <li>・P4 溜池掘削完了</li> <li>・P8 表土掘削</li> <li>・P9 表土留土完了</li> <li>・P11 表土留土開始</li> </ul>	<p>現場投入機材</p> <ul style="list-style-type: none"> <li>・Bulldozer D-5 1台</li> <li>・" D-4 1台</li> <li>・Backhoe PC200 1台</li> <li>・" 15HT 1台</li> <li>・Clamshell 0.2m<sup>3</sup> 1台</li> <li>・Roller 8t 1台</li> <li>・Water tank truck 1台</li> <li>・Dump truck 6t 3台</li> </ul>



Construction Progress (Kong)  
5A11B ~ 5A17B



工事実施状況報告書 (巻9)

(昭和8年5月11日~5月17日)

月日(曜日)	11(日)	12(月)	13(火)	14(水)	15(木)	16(金)	17(土)
天候	晴	晴	晴	晴	晴	晴	晴

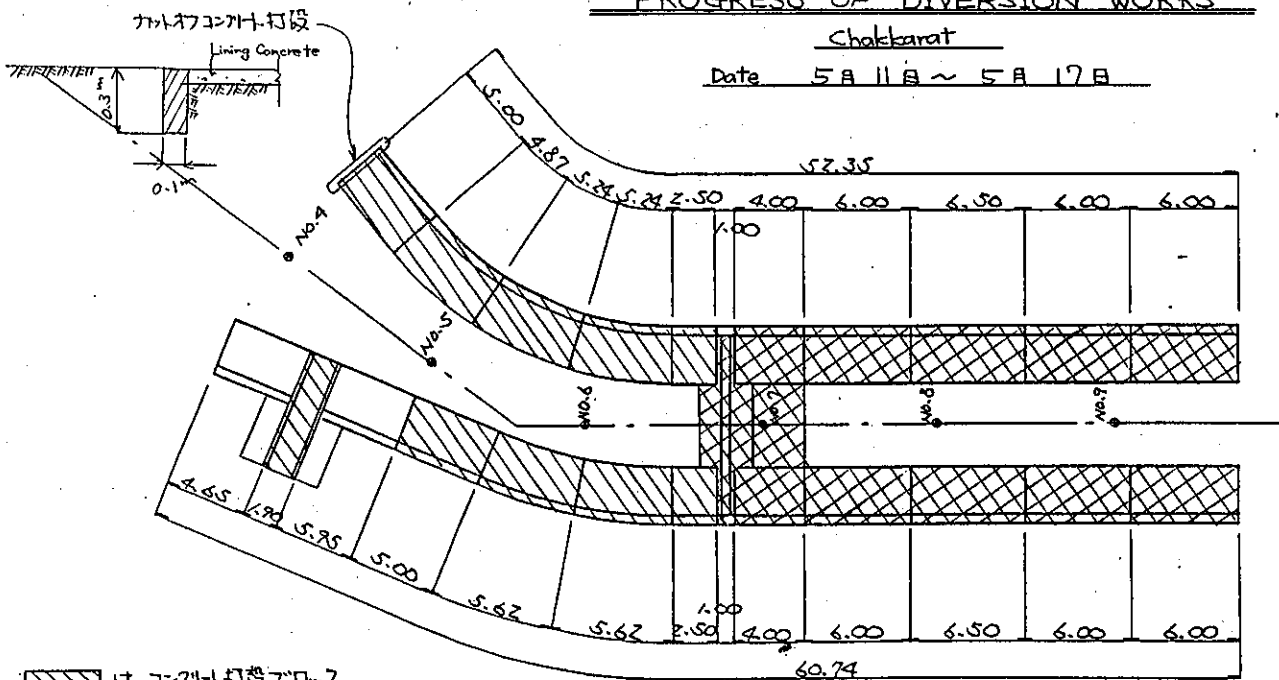
Chakkarat

作業記事 監査事項	備考
<p>B point</p> <ul style="list-style-type: none"> <li>○ ラインアコンクリート打設 (No. 4 ~ No. 6 + 8.0.)</li> <li>○ 右岸分水工部 プラム水路コンクリート打設。同底版打設部に湧水が見えることより、敷砂利を5~10cm入し、その上部に白コンクリート打設</li> <li>○ プラム水路背面の埋戻しは 30cm 幅のストップドに 現況地盤を掘削し、転圧を付す</li> </ul>	<p>5/16</p> <p>7U-11 D41P-3 " D31P-17A No.3EC に到着</p> <p>現場借入機材</p> <p>Bulldozer D-5 1ea Concrete mixer 1ea Machine vibrator 1ea Machine welder set 1ea</p>

PROGRESS OF DIVERSION WORKS

Chakkarat

Date 5月11日~5月17日



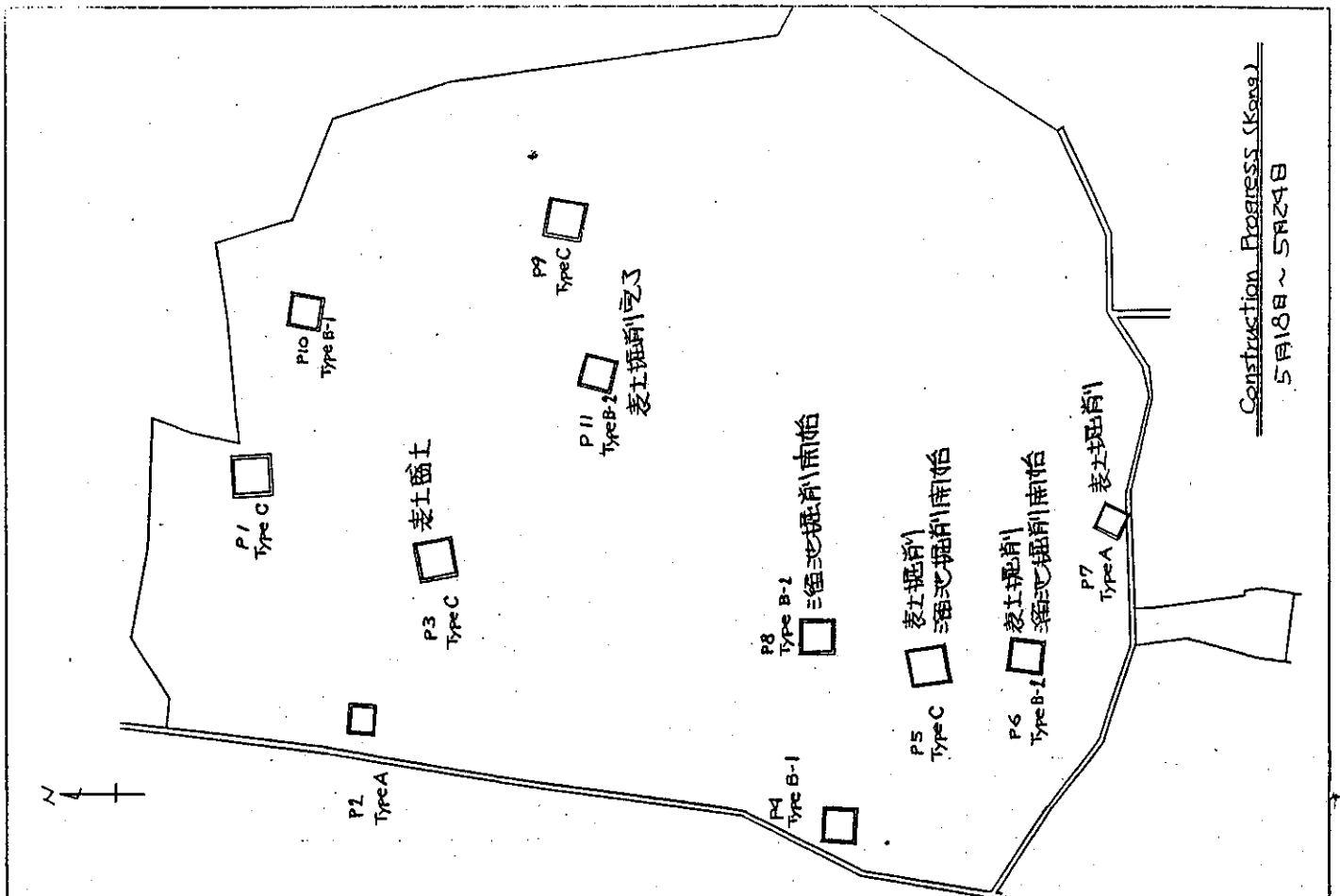
工事実施状況報告書 (物10)

(昭和38年5月18日~5月24日)

月日(曜日)	18(日)	19(月)	20(火)	21(水)	22(木)	23(金)	24(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事及び監督事項	備考
<ul style="list-style-type: none"> <li>○P3 表土盛土</li> <li>○P5 表土掘削、溜池掘削開始</li> <li>○P6 表土掘削、溜池掘削開始</li> <li>○P7 表土掘削</li> <li>○P8 溜池掘削開始</li> <li>○P11 表土掘削完了</li> </ul> <p>P6 溜池には掘削深4~5mに及ぶが地下水は観測されない。地盤は堅固な砂質土である。このため溜池の掘削は他の溜池掘削で用いた75cmのソールの使用を止め、バックホウAMによる掘削を行うと同時に掘削土の盛土、締固めは散水と併せて(含水量20%を確保)行い、約1日間放置した後締固めを行う様に指示。</p>	<p>現場搬入機材</p> <ul style="list-style-type: none"> <li>○Bulldozer D-5 1ea</li> <li>" D-4 1ea</li> <li>○Backhoe PC200 1ea</li> <li>" 15HT 1ea</li> <li>○Clam shell 0.7m<sup>2</sup> 1ea</li> <li>○Roller 8t 1ea</li> <li>○Water tank truck 1ea</li> <li>○Dump truck 6t 3ea</li> </ul>



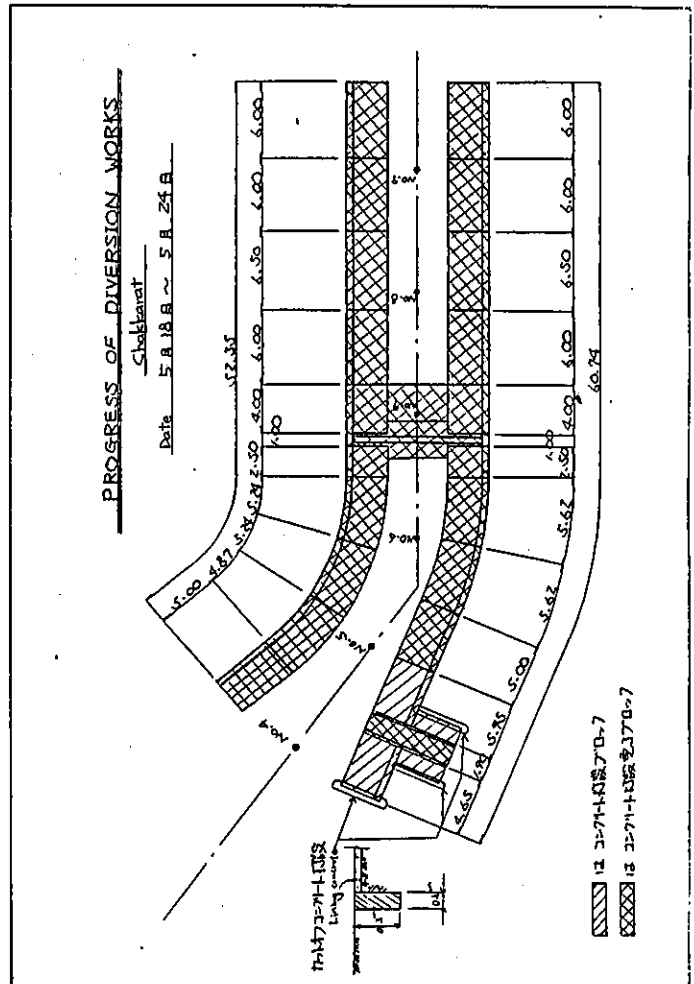
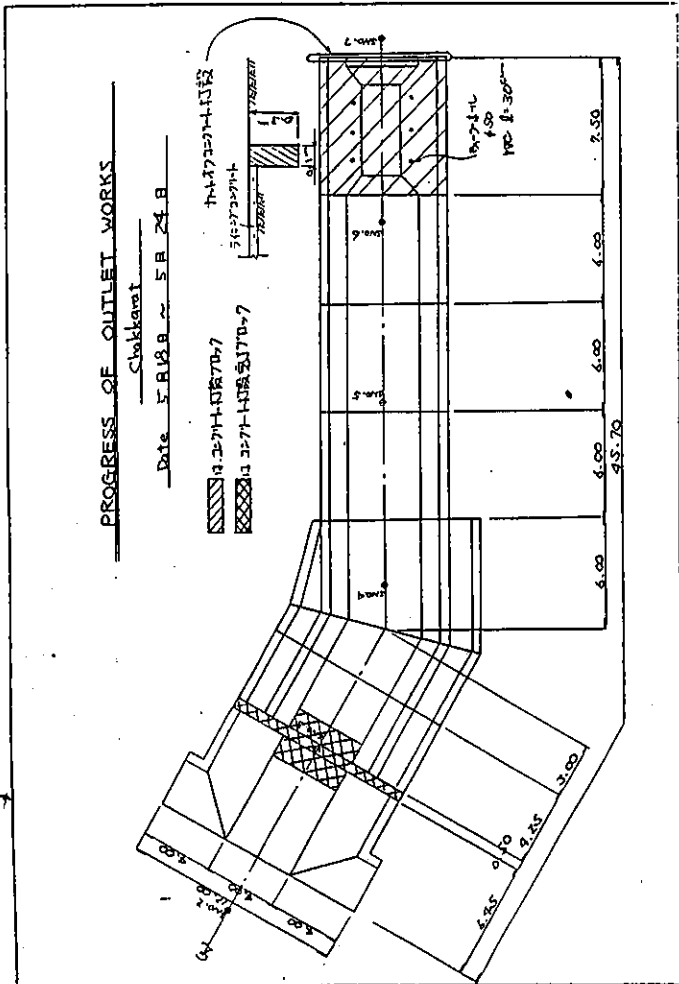
工事実施状況報告書 (巻10)

(昭和38年5月18日～5月24日)

月日(曜日)	18(日)	19(月)	20(火)	21(水)	22(木)	23(金)	24(土)
天候	晴	晴	晴	晴	晴	晴	晴

Chakkarat

作業記事 及び 監督事項	備考
<p>A-point                      ・洗水吐水路掘削工事 (No.6+1.5 ~ No.6+9.0 )                      ・洗水吐水路ライニングコンクリート工事                      (No.6+1.5 ~ No.6+9.0 )                      洗水吐下流端減勢池においてスラップホールの施工</p> <p>B-point                      ・水路ライニングコンクリート打設 (No.4~No.5 )                      同ライニングコンクリート始端にカットオフコンクリート施工                      カットオフコンクリートは幅10m、高さ30cmとした。エッジ打設                      面には散水することと指示。                      ・右岸の水工面下流減勢池掘削</p>	<p>5/19、20                      D41P-3 B2、D31P-17A                      A組並作業</p> <p>5/21                      D41P-3、D31P-17Aの                      No.3 EC Operator の                      講習指導。</p> <p>現場搬入機械                      Bulldozer D-5 1ea                      Concrete mixer 1ea                      Machine vibrator 1ea                      Machine welder set 1ea</p>



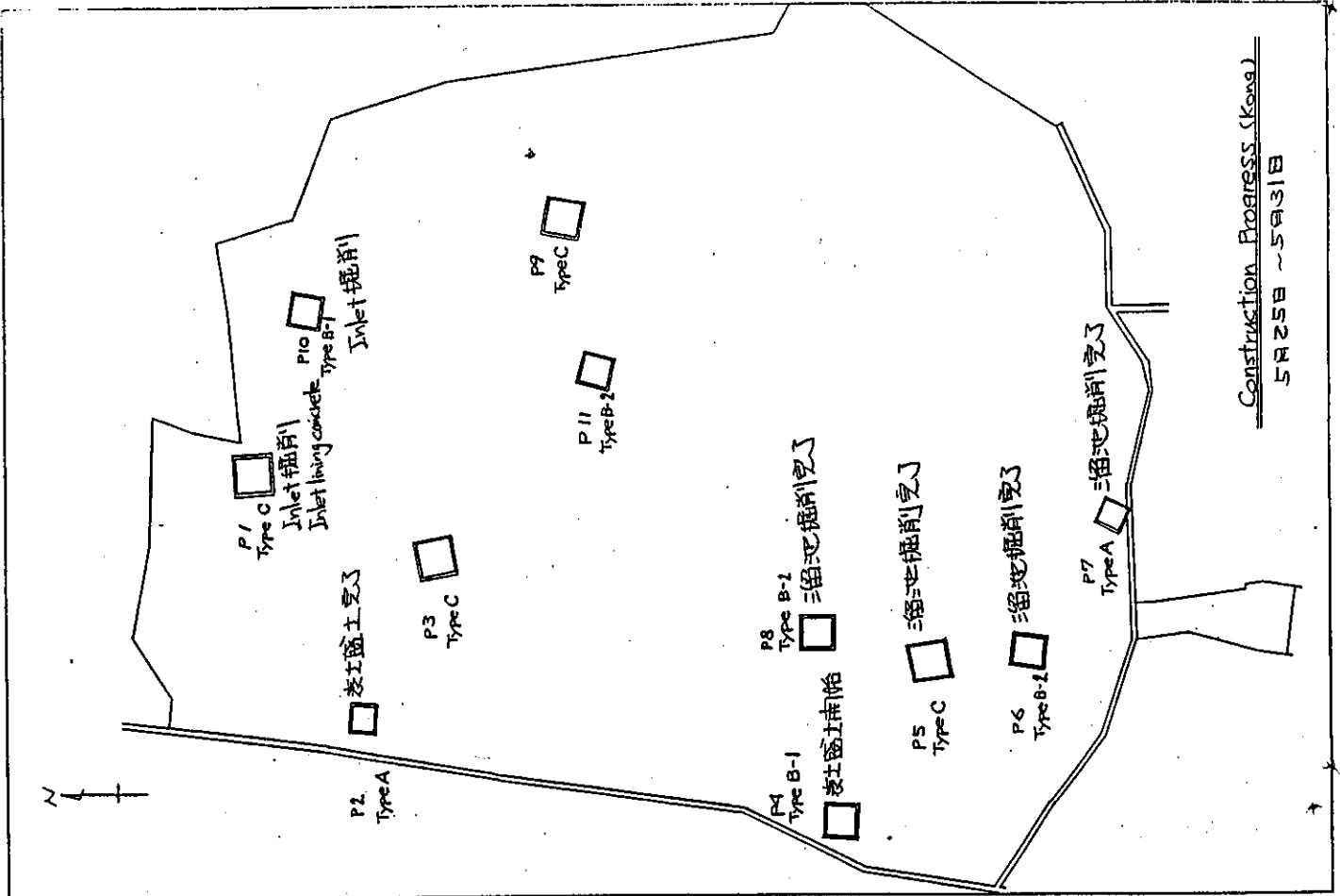
工事実施状況報告書 (物11)

(昭和8年5月25日～5月31日)

月日(曜日)	25(日)	26(月)	27(火)	28(水)	29(木)	30(金)	31(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事 及び 監督事項	備考
<ul style="list-style-type: none"> <li>○P1 インレット掘削 5m ライニアコンクリート打設</li> <li>○P2 表土盛土完了</li> <li>○P4 表土盛土開始</li> <li>○P5 溜池掘削完了</li> <li>○P6 溜池掘削完了</li> <li>○P7 溜池掘削完了</li> <li>○P8 溜池掘削完了</li> <li>○P10 インレット掘削工事</li> </ul> <p>インレットライニアコンクリート打設は当たってはコンクリート打設面に散水し、直ちにコンクリート打設仕様は指示。</p>	<p>5/29 中間検査</p> <p>5/30 DIP-32 Kongに搬入</p> <p>現場搬入機材</p> <ul style="list-style-type: none"> <li>• Bulkhoer D-5 1ea</li> <li>• " D-4 1ea</li> <li>• Backhoe R200 1ea</li> <li>• " 15HT 1ea</li> <li>• Clam shell 0.7m<sup>2</sup> 1ea</li> <li>• Roller 8t 1ea</li> <li>• Water tank truck 1ea</li> <li>• Dump truck 6t 3ea</li> <li>• Concrete mixer 0.5m<sup>3</sup> 1ea</li> </ul>



工事実施状況報告書 (巻11)

(昭和38年5月25日～5月31日)

月日(曜日)	25(日)	26(月)	27(火)	28(水)	29(木)	30(金)	31(土)
天候	晴	晴	晴	晴	晴	晴	晴

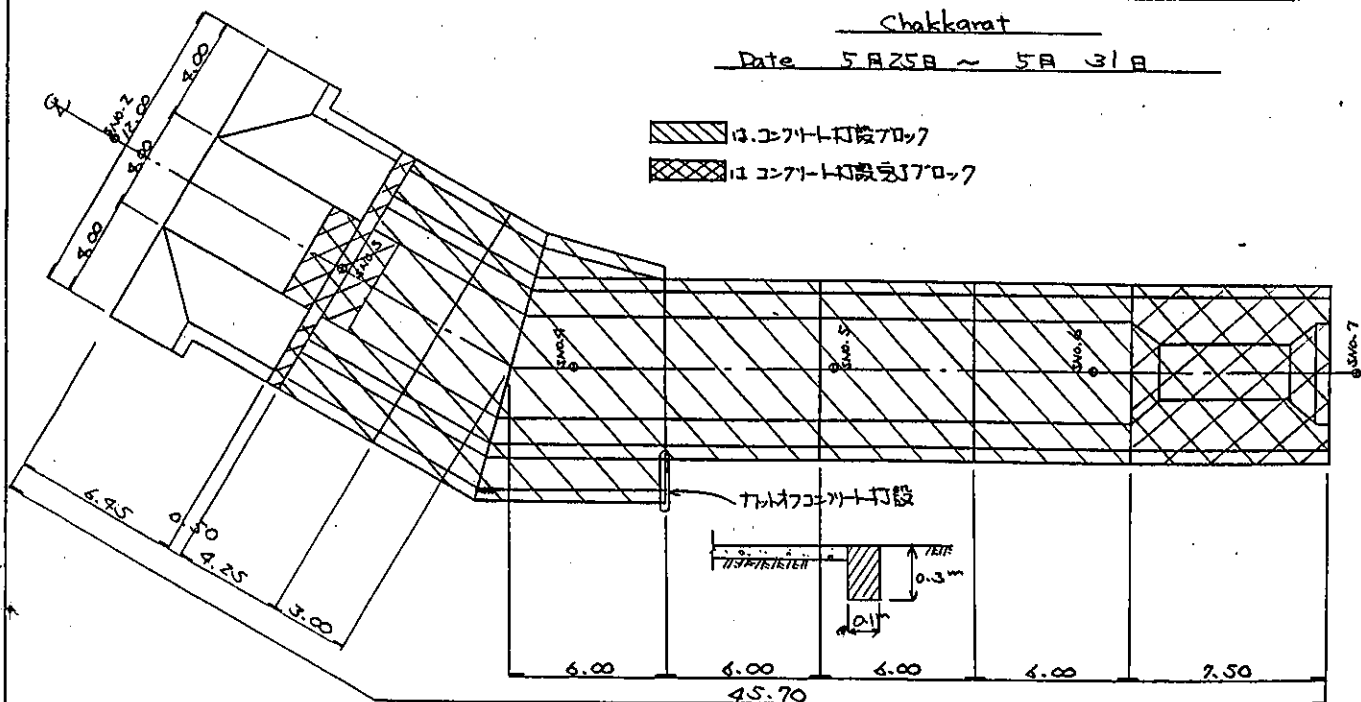
Chakkarat

作業記事 及び 監督事項	備考
<p>A-point ・ 茨水吐ラインアコンクリート打設 (S140.13 ~ S140.61+15)</p>	<p>5/29 中雨検査実施</p> <p>5/31 031P-17A Chakkaratへ搬入</p>
<p>B-point ・ 水路掘削土の整形 及び 現況水路のBank部の整形</p>	
<p>・ 放流ポート 及び 右岸分水ポートの組立</p>	<p>現場搬入機械</p> <p>Bulldozer D-5      1ea</p> <p>Concrete mixer      1ea</p> <p>Machine vibrator    1ea</p> <p>Machine welder set   1ea</p>

PROGRESS OF OUTLET WORKS

Chakkarat

Date 5月25日 ~ 5月31日



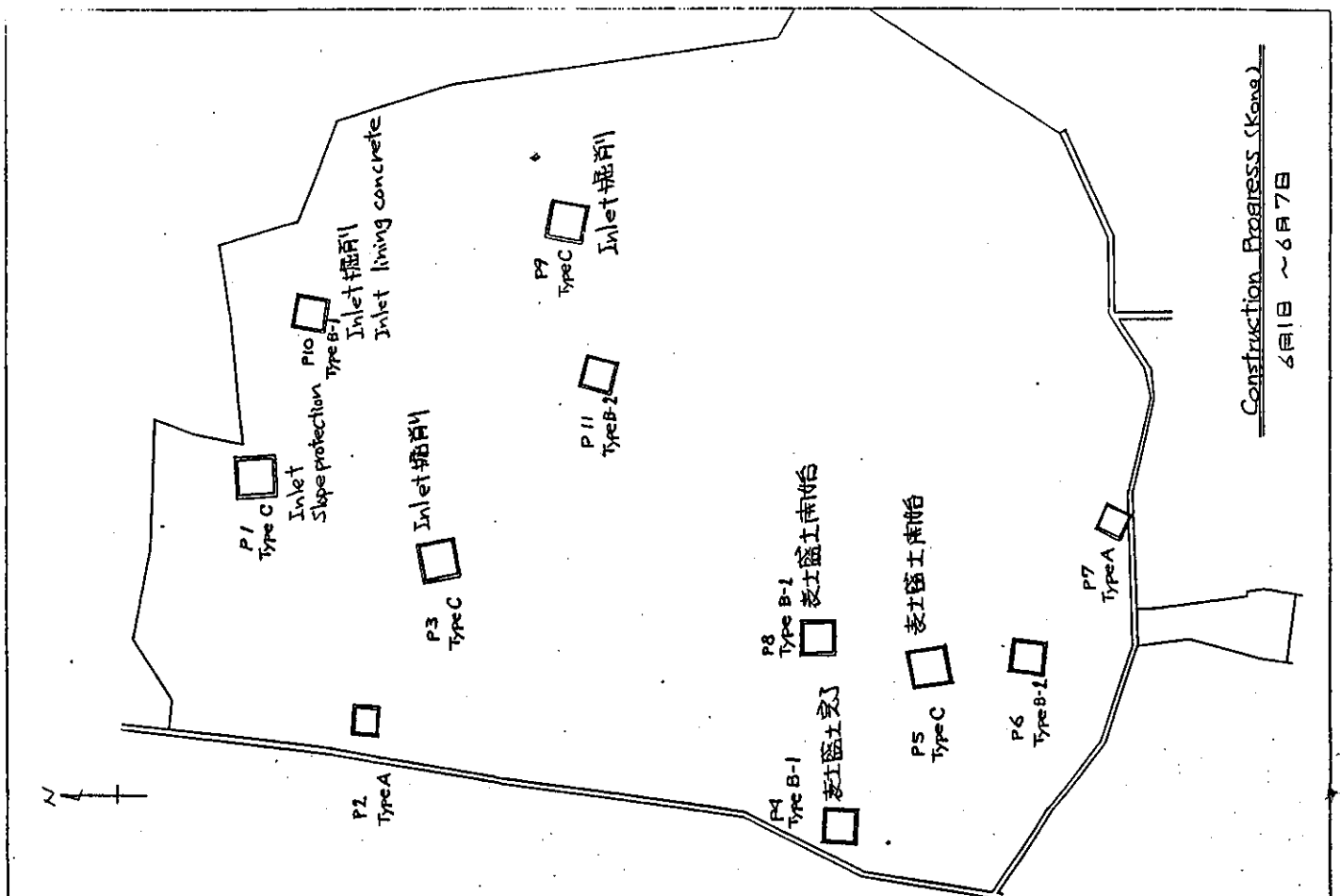
工事実施状況報告書 (物12)

(昭和8年6月1日～6月7日)

月日(曜日)	1(日)	2(月)	3(水)	4(木)	5(金)	6(土)	7(日)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事 及び 監督事項	備考
<ul style="list-style-type: none"> <li>○P1 インレット工事 及び スロープロテクション工事開始</li> <li>○P3 インレット掘削</li> <li>○P4 表土箇土完了</li> <li>○P5 表土箇土開始</li> <li>○P8 表土箇土開始</li> <li>○P9 インレット掘削工事</li> <li>○P10 インレット掘削工事 及び ライニングコンクリート工事</li> </ul> <p>P1 スロープロテクション施工に際し、エアーポートフレームの中詰材である碎石の粒度を 20mm, 20~40mm, 40mm, 40~70mm の範囲で試験した結果、40~70mm の碎石において斜面(勾配 1/1.5)での安定性が高いと判断されることより、中詰材の碎石は 40~70mm (最大)とした。</p>	<p>現場搬入機材</p> <ul style="list-style-type: none"> <li>○Bulldozer D-5 1ea</li> <li>○ " D-4 1ea</li> <li>○ D4R-3 1ea</li> <li>○Clam shell 0.7m<sup>2</sup> 1ea</li> <li>○Back hoe K200 1ea</li> <li>○ 15HT 1ea</li> <li>○Roller 8t 1ea</li> <li>○Water tank truck 1ea</li> <li>○Concrete mixer 215<sup>2</sup> 1ea</li> </ul>



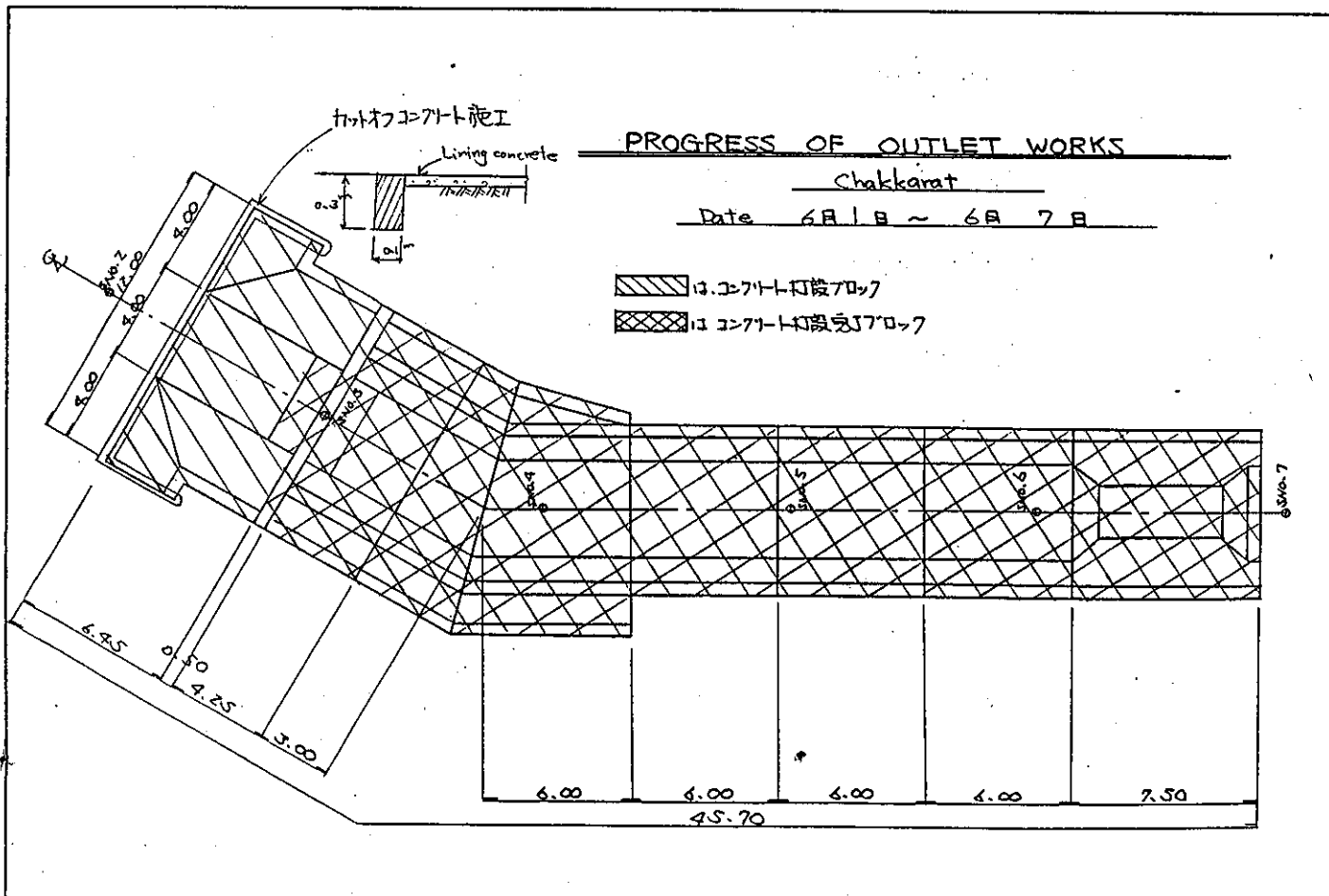
工事実施状況報告書 (巻12)

(昭和28年6月1日~6月7日)

月日(曜日)	1(日)	2(月)	3(水)	4(木)	5(金)	6(土)	7(日)
天候	晴	晴	晴	晴	晴/雨	晴	晴

Chakkarat

作業記事 及び 監督事項	備考
<p>A-point : 右岸上流部掘削及びライニングコンクリート施工。</p> <p>右岸上流部掘削の掘削部が完了。</p> <p>掘削と同時に、同下流部下流の水田(現況は荒地)のレベルアップを行う。レベルアップ面積は約500m<sup>2</sup></p> <p>A-point 掘削2内の設置及び塗装工事完了。</p> <p>B-point : 右岸下水下流掘削工事開始。</p> <p>当初フルードD-5に掘削機を盛せたが、E1925以下で湧水が大量にあることより、D31P-17Aのバックホウアタッチメントの掘削機に変更。湧水量は葦水深にして10cmとす。</p>	<p>現場搬入機械</p> <p>Bulldozer D31P-17A, D-5</p> <p>Concrete mixer 0.5m<sup>3</sup> 1ea</p>

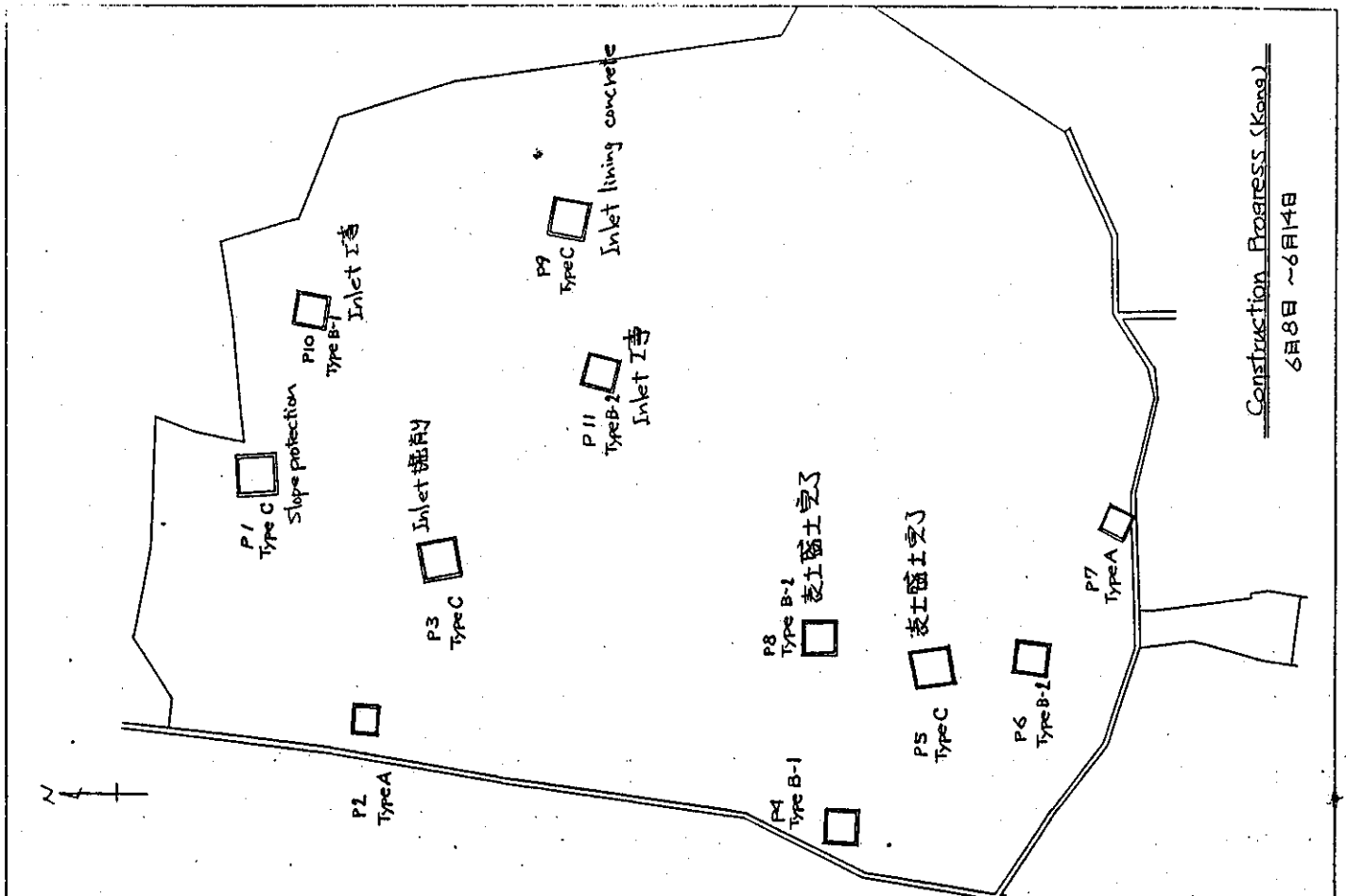


工事実施状況報告書 (物13)

(昭和8年6月8日~6月14日)

月日(曜日)	8 (日)	9 (月)	10 (火)	11 (水)	12 (木)	13 (金)	14 (土)
天候	晴	晴	晴	晴	晴	晴	晴/雨

作業記事 及び 監督事項		備考
Kong	<ul style="list-style-type: none"> <li>・P1 ... ゾロア プロテション工事</li> <li>・P3 ... インレット掘削工事</li> <li>・P5 ... 表土盛土完了</li> <li>・P8 ... 表土盛土完了</li> <li>・P9 ... インレット ライニングエカート工事</li> <li>・P10 ... インレット 工事</li> <li>・P11 ... インレット 工事</li> </ul>	現場搬入機材 Bulldozer D-5 1ea " D-4 1ea " D4P3 1ea Backhoes 15HT 1ea Roller 8+ 1ea Water tank truck 1ea Concrete Mixer 0.15 <sup>cu</sup> 2ea





工事実施状況報告書 (巻13)

(昭和8年6月8日~6月4日)

月日(曜日)	8(日)	9(月)	10(火)	11(水)	12(木)	13(金)	14(土)
天候	晴	晴	晴	晴/雨	晴/雨	晴/雨	晴/雨

Chakkant

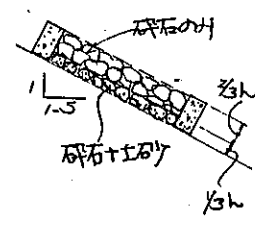
作業記事及び監督事項		備考
<p>A-point ポット上流部掘削工事</p> <p>ポット右岸現況箇土部の箇土及び整形</p> <p>B-point 現況水路堤防の整形</p> <p>追加工事 追加工事(B-point分水に隣接する現況水路の拡張整形)の測量及び掘削工事開始</p>	<p>現場搬入機材</p> <p>Bulldozer D31P-17A</p>	

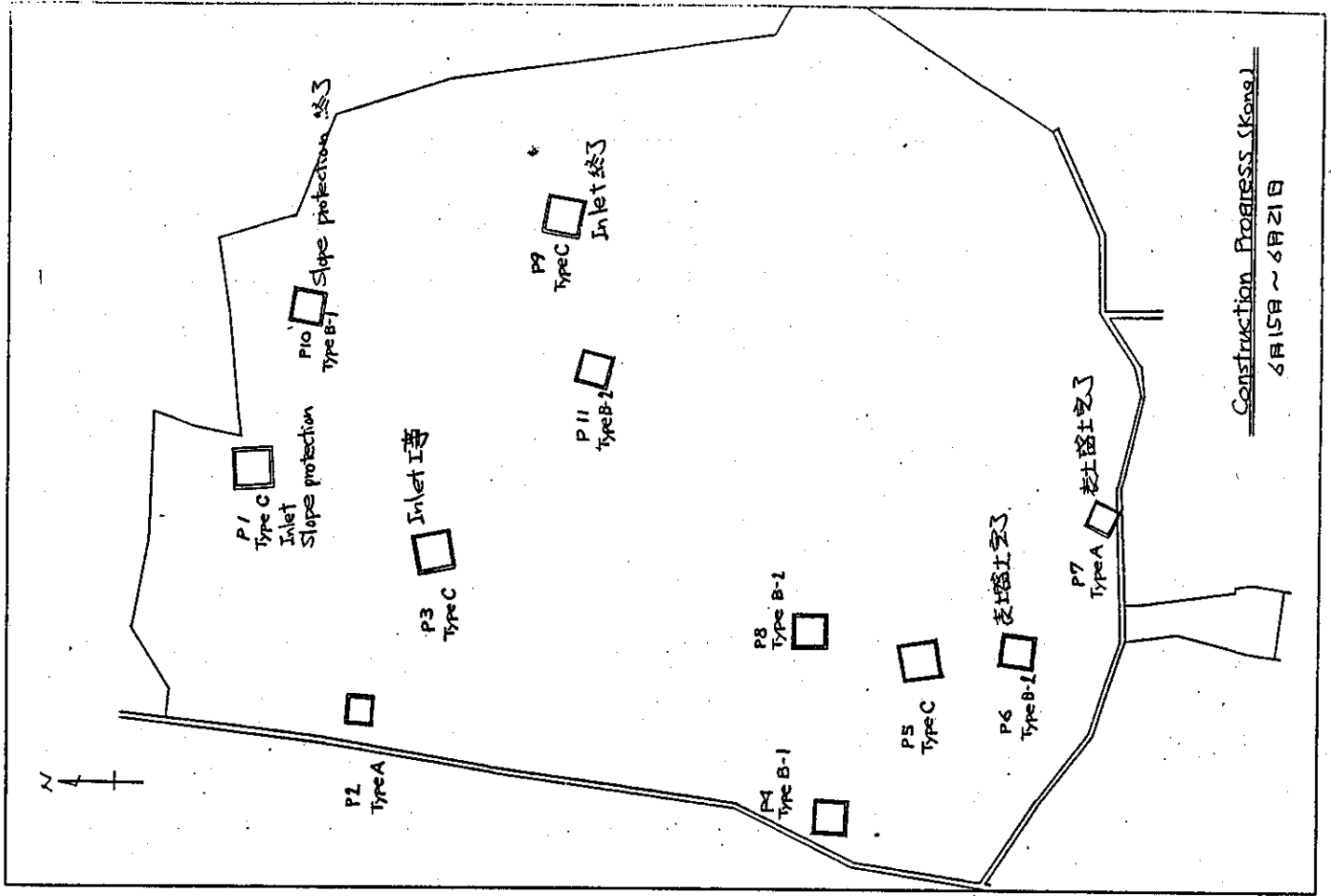
工事実施状況報告書 (巻14)

(昭和8年6月15日~6月21日)

月日(曜日)	15(日)	16(月)	17(火)	18(水)	19(木)	20(金)	21(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事及び監督事項		備考
<p>P1 Inlet工事及び Slope protection工事</p> <p>6/14日の降雨により P1 Slope protection 30%破損。</p> <p>原因は Slope protection の5.5mコンクリートの施工後の降雨により、表面の土が剥離、コンクリートの破損を生じた。特に池底から5~1.5mの範囲では表面土の20cm以下が岩(風化岩)から成ることにより、降雨が、岩の表面を流下することにより、その被害を大きくしたと推定。このため Slope protection は再び1日で終了することと指示。また、中流部別の施工は、1/3の高さに碎石と土砂を混合し Compaction し、残り 2/3 は碎石のみ中詰めし、入土に Compaction することとした。</p> <p>P.10 Slope protection 終了。排水水位計設置終了</p> <p>P.9 Inlet 工事終了</p> <p>P.11 溜池内水の排水(6/14の降雨が原因)3m排水 Inlet の5の流入水の影響が顕著あること、Inlet の5の流入が原因として土留堀を施工するように指示。排水には72時間要す。</p> <p>P.3 Inlet 工事</p> <p>P.6.7 表土箇土完了</p>	<p>Slope protection 中詰め碎石の施工図</p>  <p>現場搬入機材</p> <p>D41P-3 (Bulldozer)</p> <p>D31P-17A (Bulldozer)</p> <p>Concrete mixer (1.5m) 2台</p>	



Construction Progress (Keng)  
6月15日 ~ 6月21日

工事実施状況報告書 (物14)

(昭和8年6月15日 ~ 6月21日)

月日(曜日)	15(日)	16(月)	17(火)	18(水)	19(木)	20(金)	21(土)
天候	晴	雨/晴	晴	晴	晴	晴	晴

Chakkarat

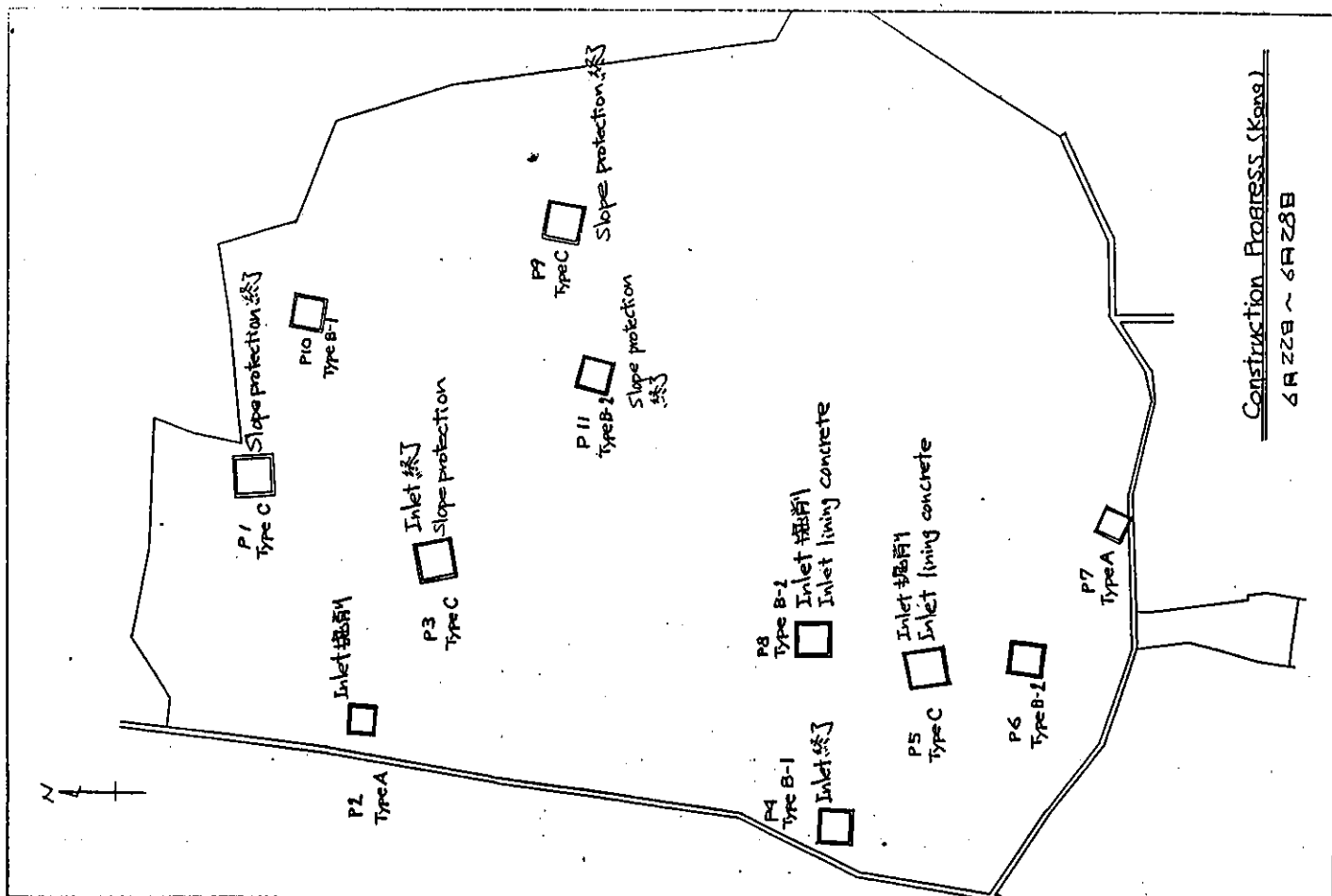
作業記事及監督事項	備考
<ul style="list-style-type: none"> <li>追加工事掘削工事終了</li> <li>尚、追加工事水路 No.0+700 ~ No.0+815 における水路掘削斜面の Smoothing が不十分と判断した事より、再度 Smoothing 工事を指示。</li> <li>追加工事完了に伴う測量を開始。</li> </ul>	<p>現場搬入機械 D31P17-A 1ea.</p>

工事実施状況報告書 (巻15)

(昭和8年6月22日～6月28日)

月日(曜日)	22(日)	23(月)	24(火)	25(水)	26(木)	27(金)	28(土)
天候	晴	晴	晴	晴	晴	晴	晴

作業記事 監督事項		備考
Kong	<ul style="list-style-type: none"> <li>○P1 Slope protection 終了. 水位計設置</li> <li>○P2 Inlet 掘削工事</li> <li>○P3 Inlet工事終了 及び Slope protection 工事</li> <li>○P4 Inlet 工事終了</li> <li>○P5 Inlet 工事掘削 及び ライニアコンクリート工事</li> <li>○P8 Inlet 工事掘削 及び ライニアコンクリート工事</li> <li>○P9 Slope protection 工事終了</li> <li>○P11 Slope protection 工事終了</li> </ul>	現場備入機材 Bulldozer D41P-3 1ea Bulldozer D31P-12A 1ea Backhoe 15HT 1ea Concrete Mixer 2ea
Chukkarat	追加工事測量 → 水路掘削箇所 E.L. 192.5m に達していない箇所があったため、再度掘削工事を行う様に指示。	



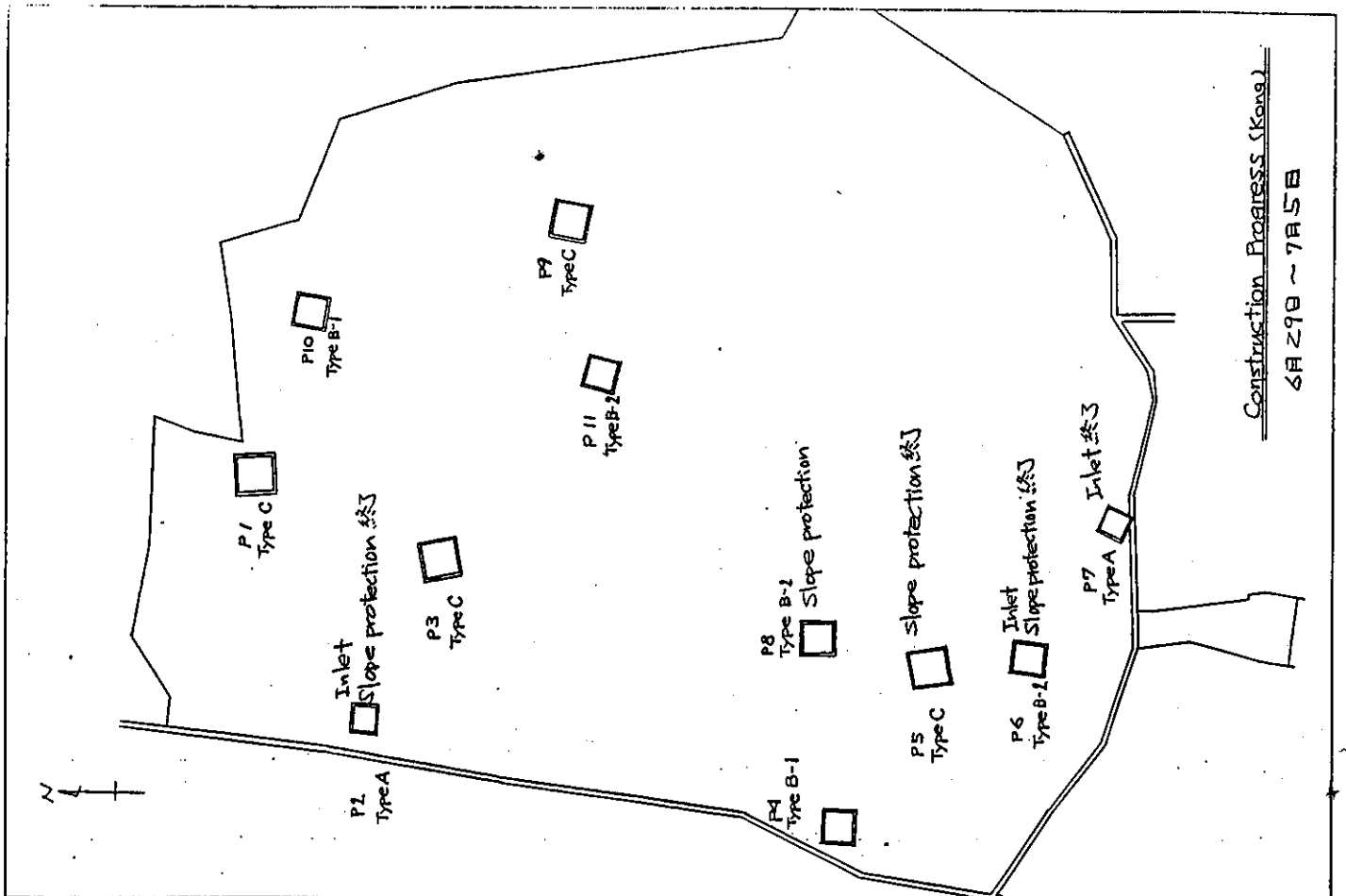
工事実施状況報告書 (物16)

(明08年6月29日～7月5日)

月日(曜日)	29(日)	30(月)	1(火)	2(水)	3(木)	4(金)	5(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事 及び 監督事項	備考
<ul style="list-style-type: none"> <li>• P2 Inlet B1 Slope protection I 等終了</li> <li>• P5 Slope protection I 等終了</li> <li>• P6 Inlet I 等 B1 Slope protection I 等終了</li> <li>• P7 Inlet I 等終了</li> <li>• P8 Slope protection I 等終了</li> </ul>	<p>現場搬入機械</p> <p>Bulldozer D41P-3 1台                      Bulldozer D31P-17A 1台                      Backhoe 15HT 1台                      Concrete Mixer 2台</p>

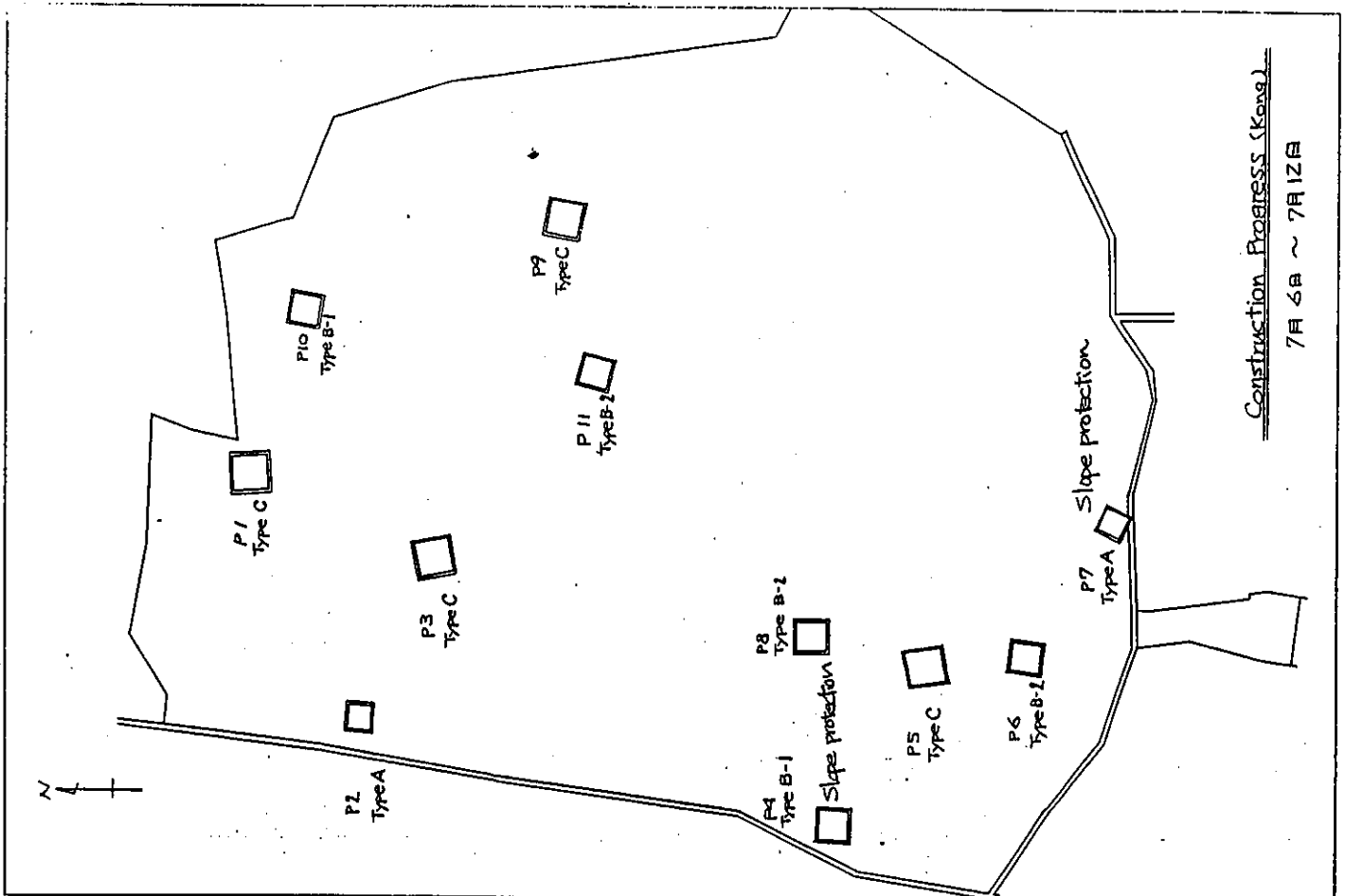


工事実施状況報告書 (物17)

(昭和8年7月6日~7月12日)

月日(曜日)	6(日)	7(月)	8(火)	9(水)	10(木)	11(金)	12(土)
天候	晴	晴	晴	晴	晴	晴	晴

作業記事 監督事項		備考
Kong	<ul style="list-style-type: none"> <li>○ P4 Slope protection 工事 及び 盛土工法高・盛土の整形</li> <li>○ P7 Slope protection 工事 及び 盛土工法高盛土の整形</li> <li>○ P5, P6, P8 盛土工法高・盛土の整形</li> </ul>	現場投入機材 Bulldozer D41P-3 1ea Bulldozer D31P-17A 1ea Back hoe 15HT 1ea Concrete mixer 2ea Backhoe PC15DLC-3
Chakkarat	<ul style="list-style-type: none"> <li>○ 追加工事(水路掘削)</li> <li>水路へ掘削工事。掘削と同時にレベル測量を行う様指示。</li> </ul>	現場投入機材 Back hoe - PC15DLC-3



工事実施状況報告書 (巻18)

(昭和61年7月13日～7月19日)

月日(曜日)	13(日)	14(月)	15(火)	16(水)	17(木)	18(金)	19(土)
天候	晴	晴	晴	晴	曇/雨	曇/雨	雨

作業記事 及び 監督事項		備考
Kong	P1, P2, P3, P9, P10, P11 の盛土後、筋工の締固め、整形	
		現地搬入機材 Roller-D-41P-3
Chakkarat	点加工等 (水路掘削工事)	現地搬入機材
	掘削面を前面整形完了。水路掘削標高(FC192.50 <sup>m</sup> ) 及び水路底掘削幅(B=2.0 <sup>m</sup> )の測量を指示。	Backhoe-PC150LC-3

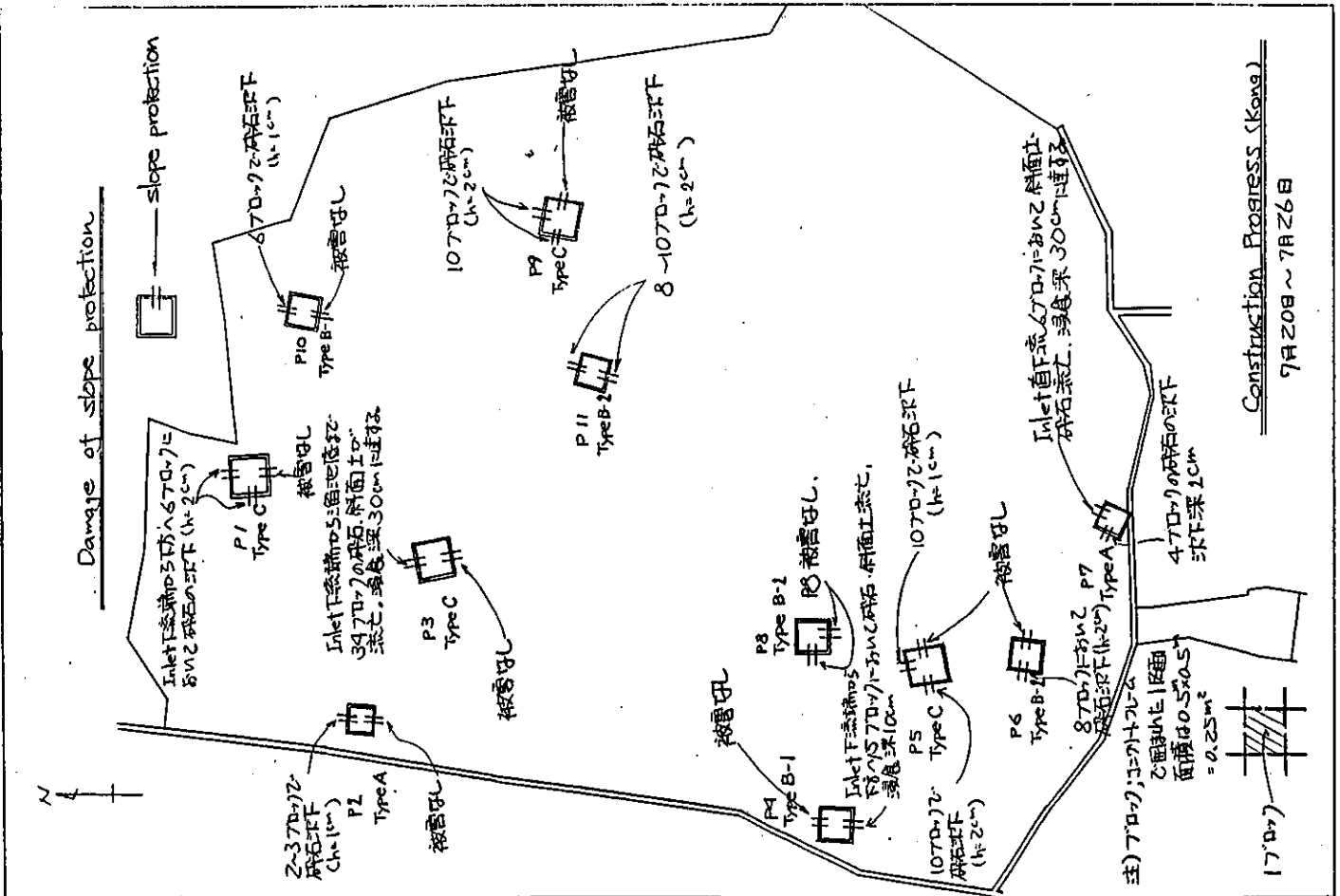
工事実施状況報告書 (巻19)

(昭和61年7月20日～7月26日)

月日(曜日)	20(日)	21(月)	22(火)	23(水)	24(木)	25(金)	26(土)
天候	雨	雨	雨	曇雨	曇	晴雨	晴雨

Kong

作業記事 監督事項	備考
<p>○7/17～7/22の降雨により、Slope protection基礎斜面土が剥離し、その結果 Slope protection 中詰め砕石が同様に剥離し、被害状況は Slope protection 2.5m幅の5.10m幅において砕石剥離率20%、5.10m幅において砕石の剥離率5%、10.4m幅は被害なし。上記砕石は基礎斜面土の剥離幅は1～1.5mに達する。</p> <p>砕石及び基礎斜面土の剥離は、溢池排水工(Inlet)より雨水の集中落下による斜面侵食であるため、Slope protectionの中央にコンクリート水路(1.0×0.5m)を施工し、Inletより雨水の流入を防止し、水路に雨水を溜め込み、流入させる様に計画。また、Inletよりコンクリート水路への導水は、Inlet上流部からコンクリート水路まで1.0m深(h=2.0m)を施工するために業者へ指示。</p> <p>溜池には1.5m雨水の溜水しているため、ポンプ排水等と別に工事工程日数の決定と指示。</p>	



工事実施状況報告書 (巻20)

(昭和61年7月27日～8月2日)

月日(曜日)	27(日)	28(月)	29(火)	30(水)	31(木)	8/1(金)	2(土)
天候	晴	晴	晴	晴	晴	晴	晴

Kong

作業記事 及び 監督事項	備考
7/30. F1 Slope protection 補修開始. ポンプによる排水と2ヶ所自稼動ポンプによる排水.	
P2, P3, P1 において ライニング水路工事. Slope protection 補修 完了. セメント骨材の現場への搬入は既に取水田において 田植え準備が済んでいる状態のため、予定人力に割りこみを行った。	
P2 7/31. ライニング水路完了	
P3 8/1	
P1 8/2	
Slope protection 補修工事は2区のみ完了。備忘に付記した 1. ポンプによる排水と2ヶ所自稼動ポンプによる排水 2. セメント骨材の搬入 3. ライニング水路打設後の降雨による Slope protection の補修 4. ライニング水路打設. セメント 5. 砕石層コンクリート打設	

工事実施状況報告書 (巻21)

(昭和61年8月3日～8月9日)

月日(曜日)	3(日)	4(月)	5(火)	6(水)	7(木)	8(金)	9(土)
天候	晴	晴	晴	晴雨	晴雨	晴雨	晴

Kong

作業記事 及び 監督事項	備考
● Slope protection 補修作業	
P10 8/3 ライニング水路 コンクリート打設完了	
P9 8/4 "	
P11 8/5 "	
P8 8/6 " { 8/6のコンクリート打設直後の降雨によるコンクリート表面 の再仕上げを指示 (P8)	
P5 8/7 " { 8/7のコンクリート打設直後の降雨によるコンクリート表面 の再仕上げを指示 (P7)	
P6 8/8 "	
P7 8/8 " { 8/8のコンクリート打設直後の降雨によるコンクリート表面 の再仕上げを指示 (P7)	
P4 8/9 "	
P1, P2, P3, P10, P9の砕石層コンクリート打設完了	
● 沼地説明用の看板を現場に搬入 (コート→コン)	



工事実施状況報告書 (巻の22)

(昭和三十八年8月10日～8月16日)

月日(曜日)	10(日)	11(月)	12(水)	13(木)	14(金)	15(土)	16(日)
天候	晴/雨	晴	晴	晴	晴	晴	晴

作業記事 及び 監督事項		備考
Kong	・ P11, P4, P5, P6, P7, P8 のコンクリート打設完了	
	・ P1~P11 の Slope protection 仕上り 及び 溜池切筋土斜面の整形を指示。特に Inlet コンクリート Slope protection コンクリートと切筋土との境界面の土留め留め、築固めを確実に行うように指示。	
	・ P1~P11 に看板 (Pond number 表示) を設置。設置後、再塗装を行うように指示。	
	・ 溜池 Inlet 部 角落しシート (50° x 100%) の設置 及び Inlet 角落しシートより水田側に堆積した土砂の除去を行った。	
Chakkarat	・ A-point "Outlet works" 及び B-point "Diversion works" 構造物に在りては、指示した Signboard (銅製) の設置を行った。	
	また、ラインコンクリート筋道におよぶ雨水による浸食の防止を目的として土留め及び植生工を行った。	

工事実施状況報告書 (巻の23)

(昭和三十八年8月17日～8月23日)

月日(曜日)	17(日)	18(月)	19(火)	20(水)	21(木)	22(金)	23(土)
天候	晴	晴	晴	晴	晴	晴	晴

作業記事 及び 監督事項		備考
Kong	・ 溜池法面の整形 及び 流入土 堆積土砂等の除去を指示。	
	・ 工事に使回した型枠等の撤去の指示。	
Chakkarat	・ 陸上法面の整形等を指示。	

工事実施状況報告書 (2024)

(2024年8月29日 ~ 月 日)

月日(曜日)	24(日)	(月)	(火)	(水)	(木)	(金)	(土)
天候	晴						

作業記事 B2 監督事項		備考
Kong	・竣工検査作業の最終手配	8月29日 工事完了日
Chakkarat	・竣工検査作業の最終手配	

6-7-5 Data for Quality Control



ศูนย์ช่าง ๓ นครราชสีมา  
โทร. ๒๔๓๓๑๓

# ในรายการมอบเงินสมทบทุน

ที่ กษ๑๑๑๐(ส๓)/48/ เรียน ผู้อำนวยการศูนย์เร่ร่อนพัฒนาชนบทภาคตะวันออกเฉียงเหนือ  
ศูนย์เร่ร่อนพัฒนาชนบทภาคตะวันออกเฉียงเหนือ

อ.เมือง

จ.นครราชสีมา (30,000)

(นางวิภาวรรณ พงษ์ทองเจริญ)  
เจ้าหน้าที่ธุรการ ๒



8 เมษายน 2529

เรื่อง ขอบทดสอบคุณภาพและความหนาแน่นในการรับน้ำหนักของดิน

เรียน ผู้อำนวยการศูนย์ เร่งรัดพัฒนาชนบทภาคตะวันออกเฉียงเหนือ

เนื่องจากคณะผู้เชี่ยวชาญญี่ปุ่นได้เข้ามาช่วยเหลือการส่งเสริมสหกรณ์การเกษตร  
ในภาคตะวันออกเฉียงเหนือ และได้จัดกลุ่มตัวอย่างดินที่สหกรณ์การเกษตร เมือง ปักธงชัย พินาย -  
คง และจักราช รวม 5 สหกรณ์ โดยจัดโครงการพัฒนาแหล่งน้ำ เช่น ขุดบ่อ สร้างฝาย เขื่อน  
ฝาย ตามโครงการต่าง ๆ ที่กล่าวมาแล้ว ซึ่งทางเจ้าหน้าที่ผู้เชี่ยวชาญญี่ปุ่น (JICA) ต้องการที่จะ  
ทราบความหนาแน่นในการรับน้ำหนักของดิน ในการที่จะสร้างสระเก็บน้ำ และอาคารต่าง ๆ ประกอบ  
ในการก่อสร้าง เนื่องจากทางศูนย์ช่างที่ 3 ไม่มีเครื่องมือและเจ้าหน้าที่ผู้ชำนาญงานในการทดสอบ  
จึงขอความอนุเคราะห์ให้ทางศูนย์ ฯ ช่วยตรวจสอบคุณภาพและความหนาแน่นของดิน ของโครงการ  
นี้ทั้งโครงการ ซึ่งจะมีการทดสอบเป็นระยะ ๆ ไป ทั้งรายการต่อไปนี้

1. Specific gravity test (ASTM D 854)
2. Liquid Limit test (ASTM D 423)
3. Plastic Limit test (ASTM D 424)
4. Grain Size analysis (ASTM D 422)
5. Standard compaction test (ASTM D 698 method A)
6. Water content

ส่วนค่าใช้จ่ายต่าง ๆ คณะผู้เชี่ยวชาญญี่ปุ่น (JICA) จะเป็นผู้ออกให้ทั้งหมดและ  
ศูนย์ ฯ หวังว่าคงจะได้รับความอนุเคราะห์เป็นอย่างดี

จึงเรียนมา เพื่อพิจารณาดำเนินการต่อไป.

(นายปัญญา พรหมดี)  
หัวหน้าศูนย์ช่างที่ 3



๒๘ เมษายน 2529

เรื่อง ขอตทดสอบคุณภาพและความหนาแน่นในการรับน้ำหนักของดิน

เรียน ผู้อำนวยการศูนย์เร่งรัดพัฒนาชนบทภาคตะวันออกเฉียงเหนือ

เนื่องจากคณะผู้เชี่ยวชาญญี่ปุ่นได้เข้ามาช่วยเหลือการส่งเสริมสหกรณ์การเกษตรใน  
 ภาคตะวันออกเฉียงเหนือ และได้จัดกลุ่มตัวอย่างพื้นที่สหกรณ์การเกษตรเมือง ปักธงชัย ทิมาชัย กง และจักราช  
 รวม 5 สหกรณ์ โดยจัดโครงการพัฒนาแหล่งน้ำ เช่น ขุดบ่อ สร้างทำนบ เขื่อนฝาย ตามโครงการต่าง ๆ  
 ...ผ่านมาแล้ว ซึ่งทางเจ้าหน้าที่ผู้เชี่ยวชาญญี่ปุ่น ( JICA ) ต้องการที่จะทราบความหนาแน่นในการรับน้ำหนัก  
 ของดินในการที่จะสร้างสระเก็บน้ำ และอาคารต่าง ๆ ประกอบในการก่อสร้าง เนื่องจากทางศูนย์ช่างที่ 3  
 ไม่มีเครื่องมือและเจ้าหน้าที่ผู้ชำนาญงานในการทดสอบ จึงขอความอนุเคราะห์ให้ทางศูนย์ ฯ ช่วยตรวจสอบ  
 คุณภาพและความหนาแน่นของดิน ของโครงการทั้งโครงการ ซึ่งจะมีการทดสอบเป็นระยะ ๆ ไป ดังรายการ  
 ต่อไปนี้

1. Compression Test (concrete)
2. Tension Test (Steel bar)
3. Grain size test (Aggregate : fine, Coarse) (ASTM D 322)  
(Fineness modulus value (F.M.))
4. Specific gravity test (Aggregate, fine, Coarse) (ASTM D 854)

ส่วนค่าใช้จ่ายต่างๆ คณะผู้เชี่ยวชาญญี่ปุ่น ( JICA ) จะเป็นผู้ออกให้ทั้งหมดและ  
 ศูนย์ ฯ หวังว่าคงจะได้รับความอนุเคราะห์เป็นอย่างดี

จึงเรียนมาเพื่อพิจารณาดำเนินการต่อไป

ขอแสดงความนับถือ

(นายสมชาย สวณานสรณ์)

นายช่างเครื่องกล อ

แทนหัวหน้าศูนย์ช่างที่ ๓

ผลการทดสอบวัสดุ

โครงการ ..... หน้าแหล่งน้ำ ศูนย์ส่งเสริมศิลปวัฒนธรรม เกษตร

วันที่ .....

ตัวอย่างที่	เปอร์เซ็นต์ผ่านตะแกรงโดยน้ำหนัก					LL. %	PI. %	ประเภท ของ วัสดุ	ความแน่น สูงสุด เมื่อแห้ง กัม/ลบ.ซม.	ความชื้น สูงสุด %	Specific Gravity ที่ความแน่น 100%—	Gravity %การตกหกร เมื่อเครื่อง หมุน 500 รอบ	การรวมตัว %
	2"	1"	3/8"	No.4	No.10								
ดูรัง	100	92.25	84.56	74.53	55.89	50.57	36.80	9.20	ML	21.00	2.348	Standard Proctor Test	

*[Handwritten signature]*  
๗๐๕๕๗

ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
ลงชื่อ *[Signature]* หัวหน้าฝ่าย

ชนิดของวัสดุ ดินเหนียว ตัวอย่างที่ .....

โครงการ สำรวจดินเหนียวภาคตะวันออกเฉียงเหนือ วันที่ทดสอบ 10 มี.ค. 29

สถานที่ อ. นครราชสีมา

ขนาดตะแกรง	ขนาดตะแกรง มม.	นน. ค้างตะแกรง กรัม	นน. ผ่านตะแกรง กรัม	% ผ่านตะแกรง
3 นิ้ว	76.2			
2 1/1 นิ้ว	63.5			
2 นิ้ว	50.8			
1 1/2 นิ้ว	38.1			
1 นิ้ว	25.4	—	1000	100.00
3/4 นิ้ว	19.1	30.40	969.30	96.93
1/2 นิ้ว	12.7	11.30	958.00	95.80
3/8 นิ้ว	9.52	35.50	922.50	92.25
เบอร์ 4	4.76	46.90	845.60	84.56
เบอร์ 10	2.00	100.30	745.30	74.53
เบอร์ 20	0.84	136.50	608.80	60.88
เบอร์ 40	0.42	49.90	558.90	55.89
เบอร์ 60	0.25	21.30	537.60	53.76
เบอร์ 100	0.149	16.50	521.10	52.11
เบอร์ 200	0.074	15.40	505.40	50.54
ถาดรอง		—	—	—

นน. ของตัวอย่างก่อนล้าง	(1) .....	1000	.....	กรัม
นน. ของตัวอย่างหลังจากล้าง	(2) .....	494.50	.....	กรัม
นน. ของตัวอย่างที่สูญหาย (๑)-(๒)	(3) .....	505.50	.....	กรัม
นน. ของตัวอย่างที่ค้างตะแกรง	(4) .....	494.30	.....	กรัม
นน. รวมของตัวอย่าง (๓)+(๔)	(5) .....	999.80	.....	กรัม
เปอร์เซ็นต์ความผิดพลาด $\frac{(๑)-(๕)}{(๑)} + ๑๐๐$	.....	0.02	.....	%

..... ผู้ทดสอบ

..... วิศวกร/นายช่างผู้ควบคุม

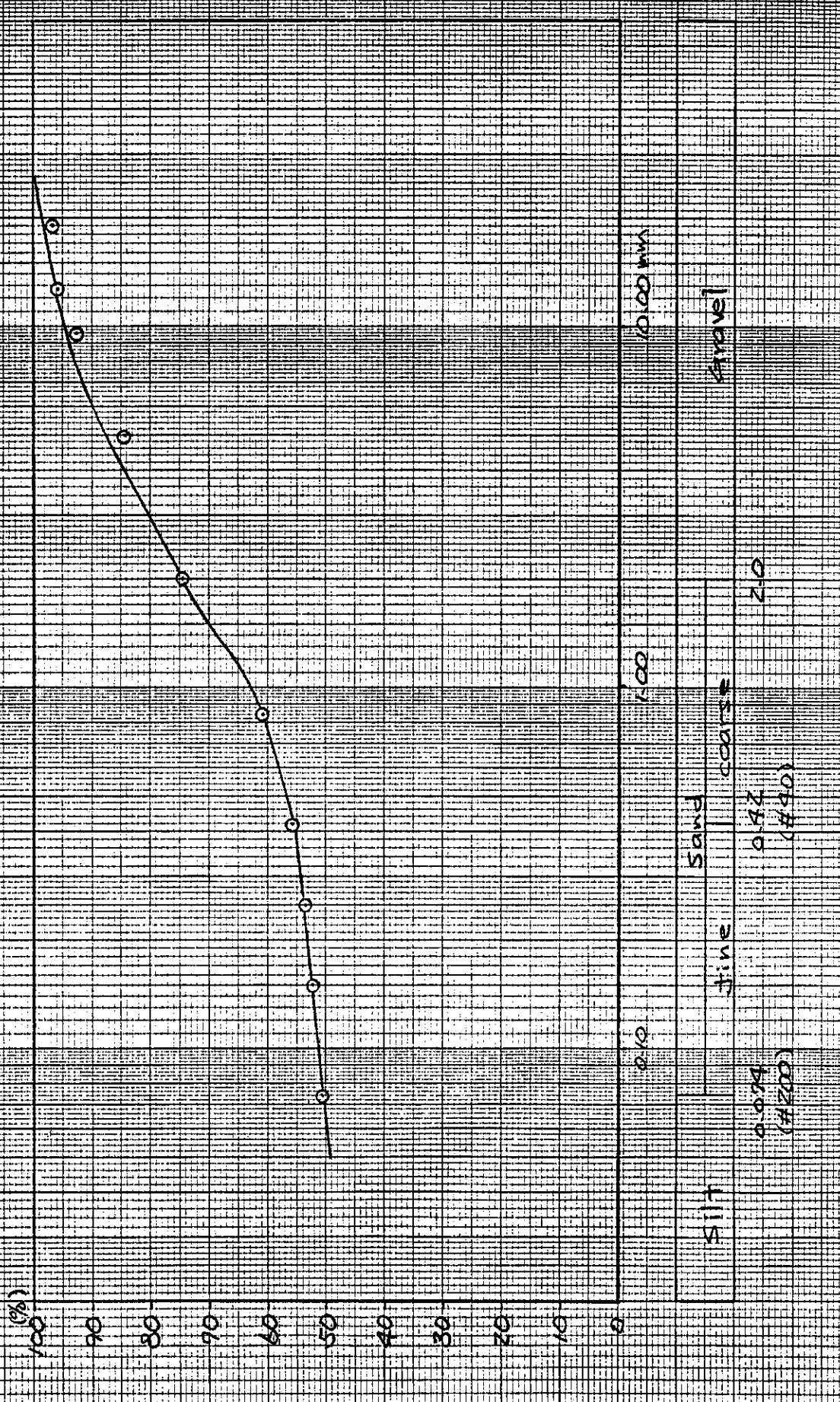
101 Ave. 1/29 ..... แบบฟอร์ม วส. ๘

งานวิเคราะห์ห้วยฯ ฝ่ายสำรวจและออกแบบ ศูนย์ ร.พ.ช.

328



粒徑加積曲線 (Grain Size Accumulation Curve)



silt  
 0.075 (#200)  
 fine sand coarse sand  
 0.15 (#100) 2.0  
 0.3 (#60)  
 0.6 (#30)  
 1.2 (#20)  
 2.5 (#10)  
 5 (#30)  
 10 (#20)  
 20 (#10)  
 40 (#40)  
 75 (#20)

**การทดสอบ ATTERBERG LIMITS**

ตัวอย่างที่ ดกข

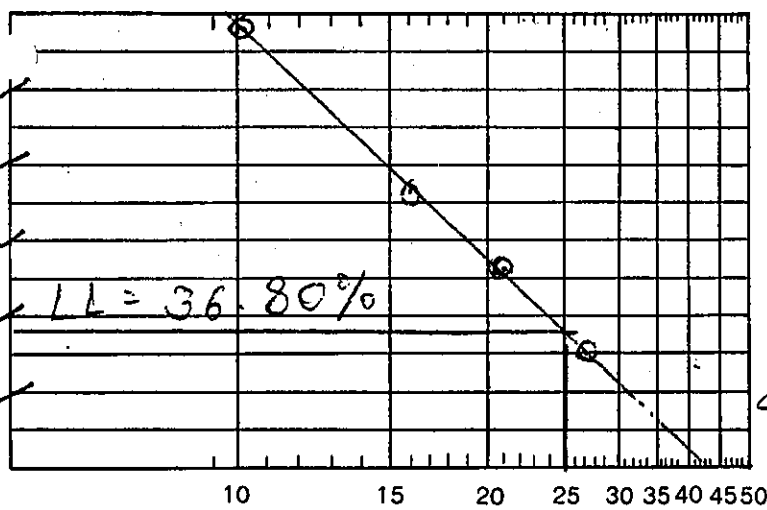
โครงการ ทางหลวงพิเศษภาคตะวันออก

ชนิดของวัสดุ กึ่งดินเหนียว

วันที่ทดสอบ 10 พ.ค. 29

PLASTIC LIMIT (P.L)						
ทดสอบครั้งที่		1	2	3	4	5
หมายเลขภาชนะ		016	117	119		
น.น. ดินขึ้น + ภาชนะ	กรัม	37.78	33.35	36.67		
น.น. ดินแห้ง + ภาชนะ	กรัม	34.97	31.10	34.15		
น.น. น้ำ	กรัม	2.81	1.95	2.52		
น.น. ภาชนะ	กรัม	21.91	20.11	25.15		
น.น. ดินแห้ง	กรัม	10.06	9.26	9.00		
เปอร์เซ็นต์ความชื้น (P.L)	%	27.93	26.86	28.00		
เปอร์เซ็นต์ความชื้นเฉลี่ย	%		27.60			

LIQUID LIMIT (L.L)						
หมายเลขภาชนะ		30	96	119	099	
น.น. ดินขึ้น + ภาชนะ	กรัม	19.18	19.11	16.47	15.37	
น.น. ดินแห้ง + ภาชนะ	กรัม	12.11	10.11	10.51	9.73	
น.น. น้ำ	กรัม	7.07	7.03	5.96	5.64	
น.น. ภาชนะ	กรัม	21.81	21.20	21.67	21.31	
น.น. ดินแห้ง	กรัม	17.27	18.21	15.84	15.42	
เปอร์เซ็นต์ความชื้น	%	40.94	38.60	37.63	36.57	
จำนวนที่เคาะ		10	16	21	27	



LL = 36.80 %  
 PL = 27.60 %  
 PI = 9.20 %

[Signature] ผู้ทดสอบ  
[Signature] วิศวกร/นายช่างผู้ควบคุม  
[Signature] หัวหน้างานวิเคราะห์  
 10, 10, 29

จำนวนครั้งที่เคาะ  
 ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
 ลงชื่อ [Signature] หัวหน้าฝ่ายฯ

แบบฟอร์ม วส. 12  
 ฝ่ายสำรวจและออกแบบ  
 ศูนย์ปฏิบัติการ รพช. นครราชสีมา

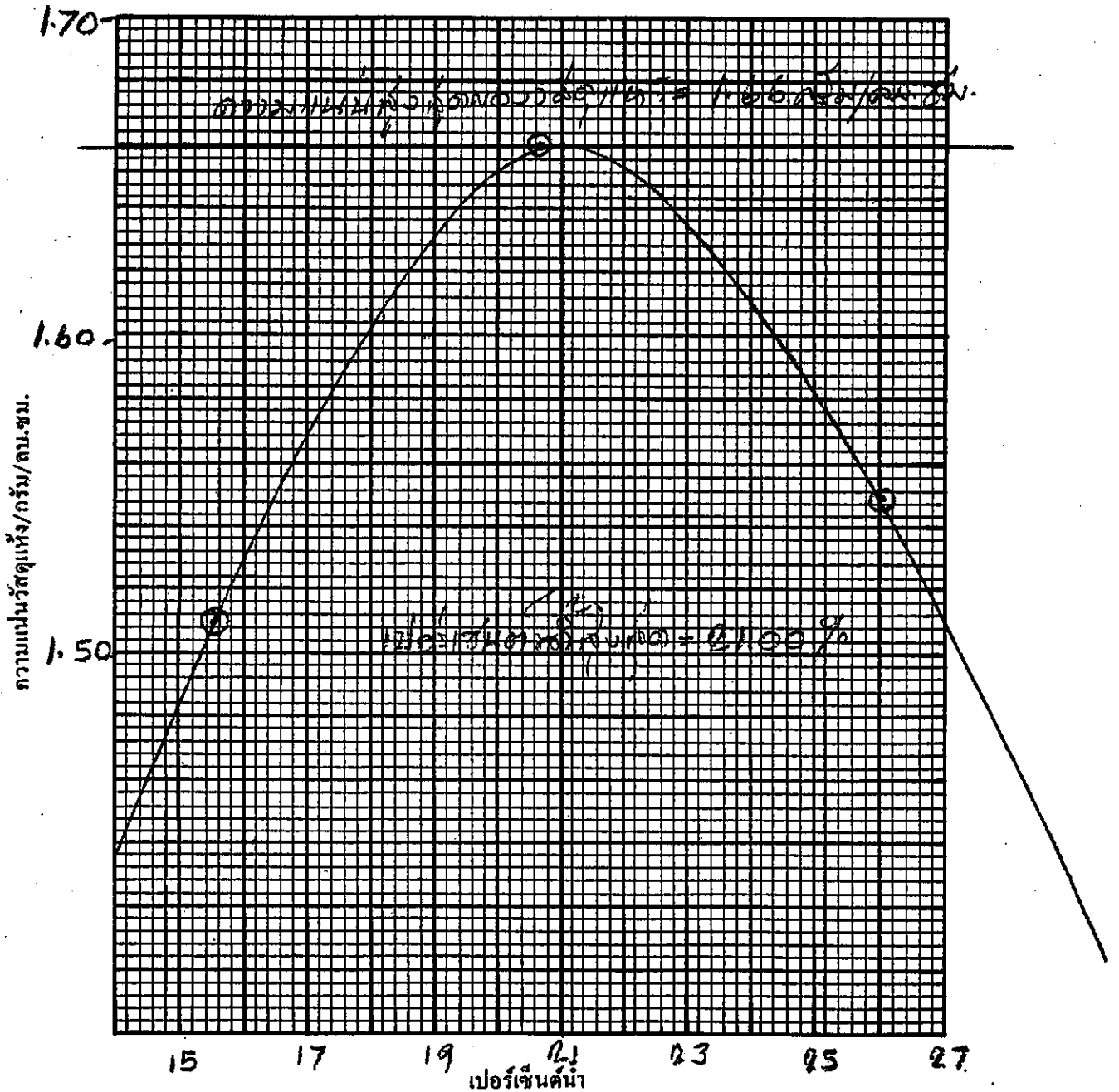


โครงการ ส่งเสริมหลักอาหาร การเกษตรและสหกรณ์ ๑ หน้า ๑๕/๗๗

ตัวอย่างที่ \_\_\_\_\_ ความแน่นสูงสุดของวัสดุแห้ง \_\_\_\_\_ 1.66 กรัม/ลบ.ซม.

ชนิดของการทดสอบ Standard Proctor เปอร์เซ็นต์น้ำสูงสุด \_\_\_\_\_ 21.00 %

ชนิดของวัสดุ ดิน ทราย ปริมาตร ของตัวอย่าง \_\_\_\_\_ 943 ซม.³



หมายเหตุ \_\_\_\_\_

[Signature] ผู้ทดสอบ

[Signature] วิศวกร/นายช่างผู้ควบคุม

[Signature] หัวหน้างานวิเคราะห์  
lowery

แบบฟอร์ม วส.14

งานวิเคราะห์ ฝ่ายสำรวจและออกแบบ ศูนย์ฯ รพช. นครราชสีมา



ชนิดของวัสดุ..... กว้าง..... ตัวอย่างที่.....  
 โครงการ..... ส่งเสริมสหกรณ์การเกษตรในภาคตะวันออกเฉียงเหนือ..... วันที่ทดสอบ..... 19 พ.ค. 29  
 สถานที่..... กอศ. บางเขน กรุงเทพมหานคร โดย JICA.....

ขนาดตะแกรง	ขนาดตะแกรง มม.	นน. ค้างตะแกรง กรัม	นน. ผ่านตะแกรง กรัม	% ผ่านตะแกรง
3 นิ้ว	76.2			
2 1/1 นิ้ว	63.5			
2 นิ้ว	50.8			
1 1/2 นิ้ว	38.1	-	2000	100.00
1 นิ้ว	25.4	85.40	1914.60	95.73
3/4 นิ้ว	19.1	24.40	1890.20	94.51
1/2 นิ้ว	12.7	37.40	1852.80	92.64
3/8 นิ้ว	9.52	28.90	1823.90	91.20
เบอร์ 4	4.76	54.60	1769.30	88.67
เบอร์ 10	2.00	100.00	1669.30	83.47
เบอร์ 20	0.84	199.50	1469.80	73.49
เบอร์ 40	0.42	76.40	1393.40	69.67
เบอร์ 60	0.25	33.40	1360.00	68.00
เบอร์ 100	0.149	24.30	1335.70	66.79
เบอร์ 200	0.074	11.00	1324.70	66.24
ถาดรอง		-	-	-

นน. ของตัวอย่างก่อนล้าง (1)..... 2000.00..... กรัม  
 นน. ของตัวอย่างหลังจากล้าง (2)..... 675.70..... กรัม  
 นน. ของตัวอย่างที่สูญหาย (๑)-(๒) (3)..... 1324.30..... กรัม  
 นน. ของตัวอย่างที่ค้างตะแกรง (4)..... 675.30..... กรัม  
 นน. รวมของตัวอย่าง (๓)+(๔) (5)..... 1999.60..... กรัม  
 เปอร์เซ็นต์ความผิดพลาด  $\frac{(๑)-(๕)}{(๑)} + ๑๐๐$ ..... ๑.๐2..... %

..... ผู้ทดสอบ  
 ..... วิศวกร/นายช่างผู้ควบคุม  
 ..... / น.อ. / ๒๑ ..... แบบฟอร์ม วส. ๘  
 งานวิเคราะห์วิจัย ฝ่ายสำรวจและออกแบบ ศูนย์ ร.พ.ช.

粒徑加積曲線 (Grain Size Accumulation Curve)

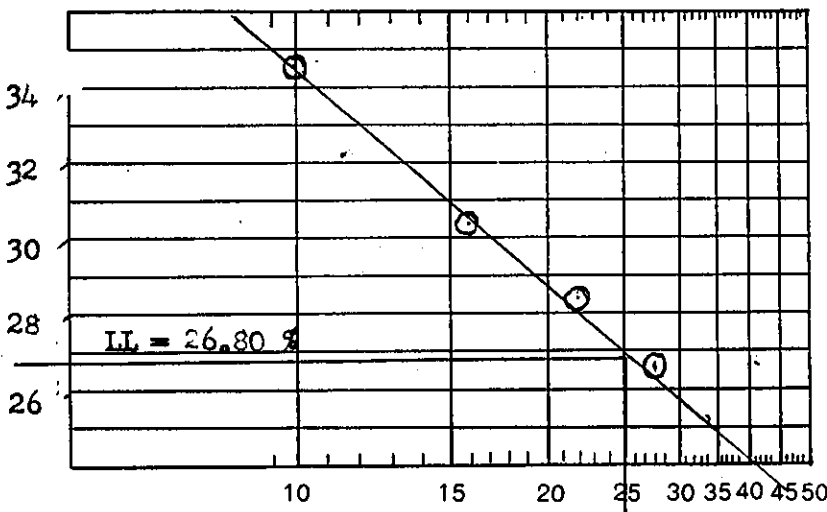


การทดสอบ ATTERBERG LIMITS

ตัวอย่างที่ อุกรัง ก่อสร้างอาคารพัฒนาหนองน้ำ โครงการ ส่งเสริมสหกรณ์การเกษตรในภาคตะวันออกเฉียงเหนือ  
ชนิดของวัสดุ อุกรัง JICA วันที่ทดสอบ ๑๔ พค. ๖๕

		PLASTIC LIMIT (P.L)				
ทดสอบครั้งที่		1	2	3	4	5
หมายเลขภาชนะ		A 22	181	013		
น.น. ดินชั้น + ภาชนะ	กรัม	41.21	36.88	38.45		
น.น. ดินแห้ง + ภาชนะ	กรัม	38.75	35.08	36.53		
น.น. น้ำ	กรัม	2.46	1.80	1.92		
น.น. ภาชนะ	กรัม	24.27	24.77	24.64		
น.น. ดินแห้ง	กรัม	14.48	10.31	11.89		
เปอร์เซ็นต์ความชื้น (P.L)	%	16.99	17.46	16.15		
เปอร์เซ็นต์ความชื้นเฉลี่ย	%	-	16.87	-		

		LIQUID LIMIT (L.L)				
หมายเลขภาชนะ		075	094	130	117	
น.น. ดินชั้น + ภาชนะ	กรัม	65.25	58.09	52.42	56.52	
น.น. ดินแห้ง + ภาชนะ	กรัม	54.92	50.34	46.32	49.72	
น.น. น้ำ	กรัม	10.33	7.75	6.10	6.80	
น.น. ภาชนะ	กรัม	25.06	24.71	24.79	24.14	
น.น. ดินแห้ง	กรัม	29.86	25.63	21.53	25.58	
เปอร์เซ็นต์ความชื้น	%	34.59	30.24	28.38	26.58	
จำนวนที่เคาะ		10	16	22	28	



LL = 26.80 %  
PL = 16.87 %  
PI = 9.93 %

*H. Seidel* ผู้ทดสอบ  
*[Signature]* วิศวกร/นายช่างผู้ควบคุม  
*[Signature]* หัวหน้างานวิเคราะห์  
๑๖, พค., ๖๕

จำนวนครั้งที่เคาะ

แบบฟอร์ม วส. 12

ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
ลงชื่อ *[Signature]* หัวหน้าฝ่ายฯ

ฝ่ายสำรวจและออกแบบ  
ศูนย์ปฏิบัติการ รพช. นครราชสีมา







การทดสอบความด่างจำเพาะและการดูดซึ่มของวัสดุละเอียด

ชนิดของวัสดุ หินลูกรัง  
 แหล่งที่เก็บวัสดุ พัฒนาแหล่งน้ำโดย JICA สงเสริมสหกรณ์การเกษตรในภาคตะวันออกเฉียงเหนือ  
 โครงการที่ก่อสร้าง พัฒนาแหล่งน้ำโดย JICA สงเสริมสหกรณ์การเกษตรในภาคตะวันออกเฉียงเหนือ  
 ทดสอบเมื่อ 19 / พค. / 29

ลำดับที่	ลำดับการทดสอบ	สัญลักษณ์	หน่วย	ตัวอย่าง 1	ตัวอย่าง 2
1	น้ำหนักขวด 500 ซม. <sup>3</sup>	WB	กรัม	164.10	160.00
2	น้ำหนักของวัสดุที่อิมตัวผิวแห้ง	WS	กรัม	450	450
3	น้ำหนักขวด + น้ำหนักน้ำถึงขีด + น้ำหนักวัสดุ	W <sub>1</sub>	กรัม	921.20	915.50
4	น้ำหนักน้ำ	W = W <sub>1</sub> - W <sub>B</sub> = W <sub>S</sub>	กรัม	307.10	305.50
5	ความด่างจำเพาะของวัสดุที่อิมตัวผิวแห้ง	$G = \frac{W_S}{500 - W}$	-	2.333	2.314
6	ผลต่างความด่างจำเพาะของวัสดุ 2 ครั้ง	G <sub>1</sub> - G <sub>2</sub>	-	0.019	< 0.02
7	ค่าเฉลี่ยความด่างจำเพาะของวัสดุเมื่ออิมตัวผิวแห้ง	G	-	2.323	
8	น้ำหนักของวัสดุที่อบแห้ง	W <sub>2</sub>	กรัม	445.00	445.20
9	ความจุในการดูดซึ่ม	$A = \frac{W_3 - W_2}{W_2} \times 100$	%	1.123	1.073
10	ผลต่างความจุในการดูดซึ่มของวัสดุ 2 ครั้ง	A <sub>1</sub> - A <sub>2</sub>	%	0.045	< 0.05
11	ค่าเฉลี่ยความจุในการดูดซึ่มของวัสดุ	A <sub>A</sub>	%	1.100	

หมายเหตุ 1. ขวดที่ใช้ทดสอบที่ความจุ = 500 ซม.<sup>3</sup>

ผู้ทดสอบ [Signature]  
 วิศวกร/นายช่างผู้ควบคุม [Signature]  
 หัวหน้างานวิเคราะห์วิจัย 11กน [Signature]  
26 / พค. / 29

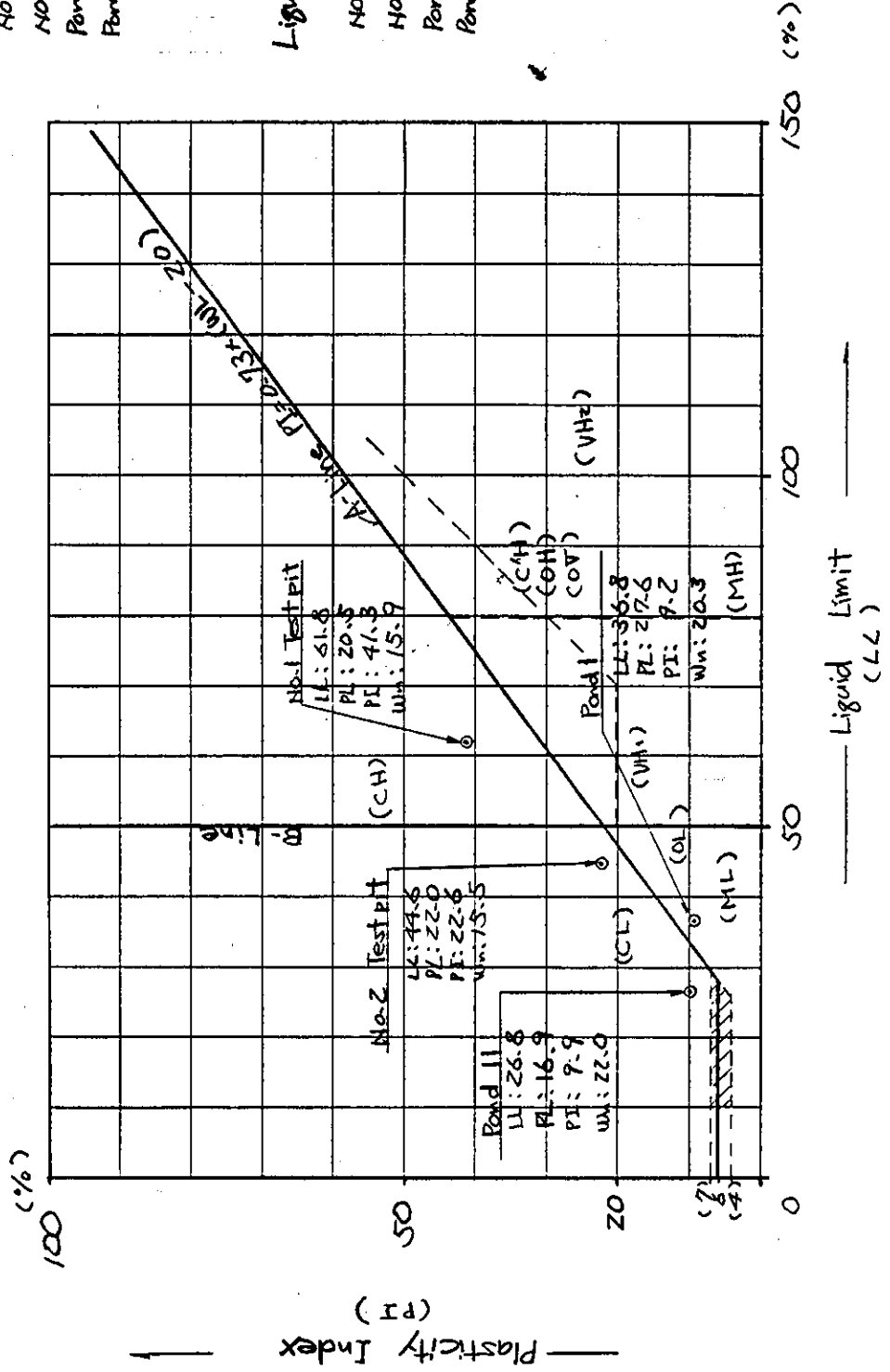
ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
 ลงชื่อ [Signature] หัวหน้าฝ่ายฯ

แบบฟอร์ม วส. 43  
 ฝ่ายสำรวจและออกแบบ  
 ศูนย์ปฏิบัติการ รพช. นครราชสีมา

# CONSISTENCY LIMITS

Consistency Index  
 No.1 IC = 1.1  
 No.2 IC = 1.3  
 Pond.1 IC = 1.8  
 Pond.11 IC = 0.5

Liquidity Index  
 No.1 IL = -0.1  
 No.2 IL = -0.3  
 Pond.1 IL = -0.8  
 Pond.11 IL = 0.5



# COMPACTION TEST

Soil sample \_\_\_\_\_ Test No. 1  
 Date. 30<sup>th</sup> OCTOBER 1985

Location KONG. ; RACHASRIMA Tested by MR. SUTHER TANOMGITNORUK  
 Type Test Dry preparation and repetitive method

Boring No. 2 Mold : volume 956.42 cm<sup>3</sup>  
 Sample No. \_\_\_\_\_ : weight 2029.20 gm.

Specific gravity,  $G_s =$  2.60 RAMMER WEIGHT 5.5 lbs  
 NUMBER OF LAYER 3

DENSITY NUMBER OF TAMPING PER EACH LAYER 25

Determination No.		1	2	3	4	5	6
Weight mold + compacted soil	g	3905.00	3835.00	3969	4007	3915	3875
Weight mold	g	2029.20	2029.20	2029.20	2029.20	2027.10	2029.20
Weight compacted soil	g	1677.80	1807.80	1941.80	1979.80	1887.80	1847.80
Wet density	g/cc	1.754	1.890	2.030	2.070	1.972	1.932
Dry density, $\gamma_d$	g/cc	1.653	1.738	1.812	1.993	1.623	1.560
Void ratio $e$		0.57	0.50	0.43	0.45	0.60	0.67
Porosity $n$	%	36	33	30	31	38	40

WATER CONTENT

Determination No.						
Container No.		N03-1	N03-2	N04-1	N04-1	N04-2
Weight container + wet soil	g	85.64	81.25	73.01	62.09	94.10
Weight container + dry soil	g	81.45	75.99	66.80	55.30	80.00
Weight water, $W_w$	g	4.19	5.26	6.21	6.79	14.10
Weight container	g	10.59	15.68	15.25	11.35	14.20
Weight dry soil, $W_s$	g	68.86	60.31	51.55	43.95	65.30
Water content, $w$	%	6.085	8.722	12.047	15.449	21.593

REMARKS:-

$$e = \frac{W_w}{\gamma_d} G_s - 1$$

$$\gamma_d = \frac{\gamma_w}{\frac{1}{G_s} + \frac{w}{S_r}}$$

$$n = \frac{e}{1+e} \times 100 (\%)$$

Location KONG., RACHASRIMA.

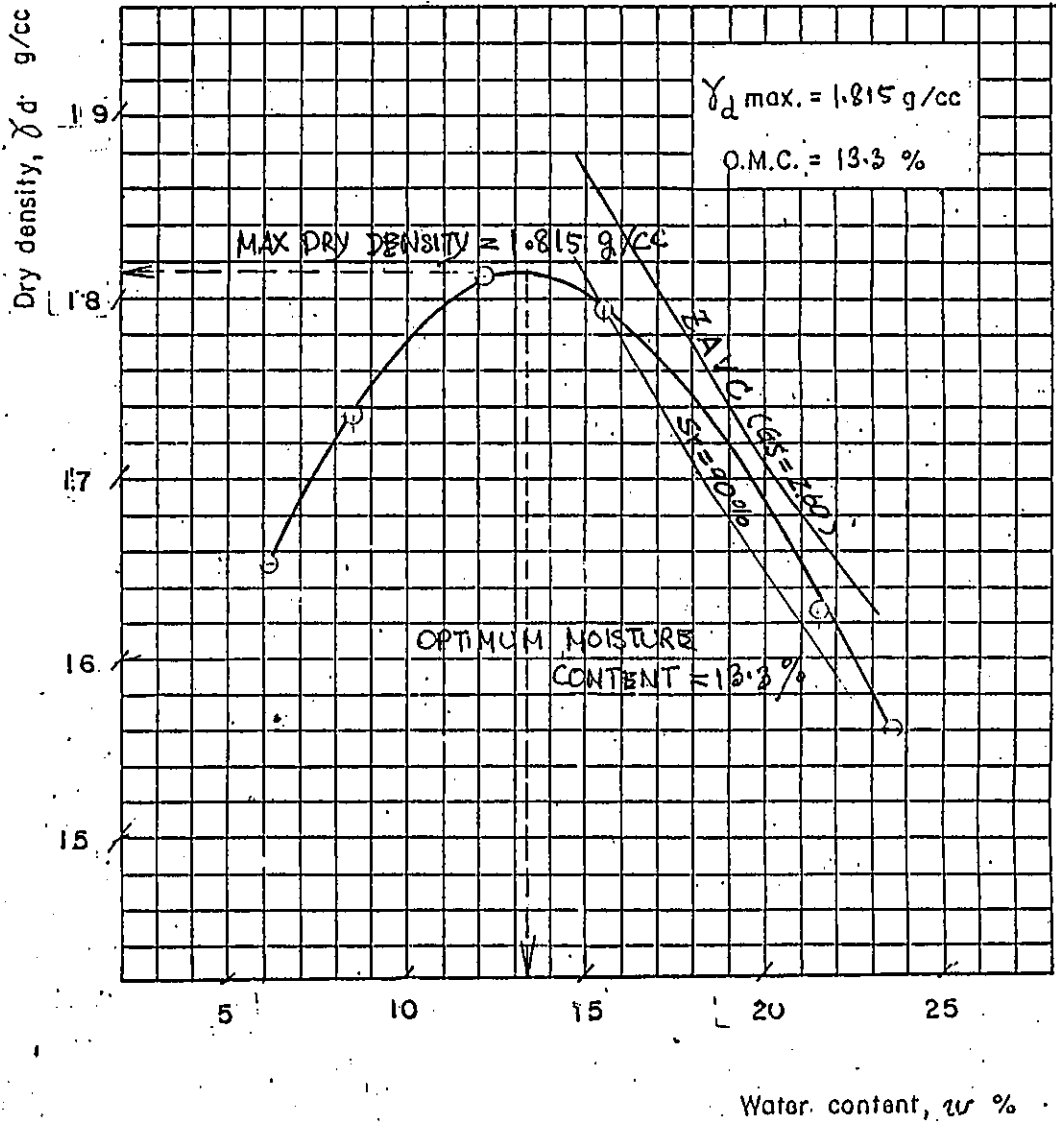
Date. 30<sup>th</sup> OCTOBER 1985

Boring No. 2.

Test No. 1.

Type Test STANDARD COMPACTION

Tested by NR. SUTHEP TANOMGITNURUK.  
MR. SIVAN PROSITKOR



- continue -

SOIL MECHANICS LABORATORY

DEPARTMENT OF COOPERATIVE PROMOTION, ENGINEERING DIVISION

COMPACTION TEST

Soil sample \_\_\_\_\_ Test No. 1  
 Date. 1<sup>st</sup> NOVEMBER 1985  
 Tasted by MR. SUTHER TANONGITAWURUK  
 Location \_\_\_\_\_ Type Test Dry preparation and repetitive method  
 Boring No. 1 Mold : volume 956.42 cm<sup>3</sup>  
 Sample No. \_\_\_\_\_ weight 2027.29 gm.  
 Specific gravity,  $G_s = 2.57$  Rammer : weight 5.5 lbs.  
 NUMBER OF LAYER 3  
 DENSITY NUMBER OF TAMPING PER EACH LAYER 25

Determination No.	1	2	3	4	5	6
Weight mold + compacted soil g	3722.00	3826.00	3865	3968	3601	
Weight mold g	2027.29	2027.29	2027.29	2027.29	2027.29	
Weight compacted soil W g	1694.71	1798.71	1837.71	1740.71	1603.71	
Wet density $\gamma_t$ g/cc	1.772	1.881	1.922	1.820	1.677	
Dry density, $\gamma_d$ g/cc	1.593	1.634	1.603	1.420	1.306	
Void ratio e	0.63	0.57	0.62	0.76	0.98	
Porosity n	39	37	38	43	49	

WATER CONTENT

Determination No.					
Container No.	NO <sub>3-2</sub>	NO <sub>4-1</sub>	NO <sub>2-1</sub>	NO <sub>1-2</sub>	NO <sub>4-2</sub>
Weight container + wet soil g	65.31	79.61	67.92	66.00	60.00
Weight container + dry soil g	60.30	70.61	59.00	56.09	49.00
Weight water, W <sub>w</sub> g	5.01	9.00	8.92	9.91	11.00
Weight container g	15.69	11.01	14.20	14.45	10.30
Weight dry soil, W <sub>s</sub> g	44.61	59.60	44.80	41.64	38.70
Water content, w <sub>r</sub> %	11.23	15.10	19.91	23.80	28.42

REMARKS:-

$$e = \frac{W_w \cdot G_s}{\gamma_d} - 1$$

$$\gamma_d = \frac{\gamma_w}{\frac{1}{G_s} + \frac{w}{S_r}}$$

$$n = \frac{e}{1+e} \times 100 (\%)$$

Compaction Test

Location \_\_\_\_\_

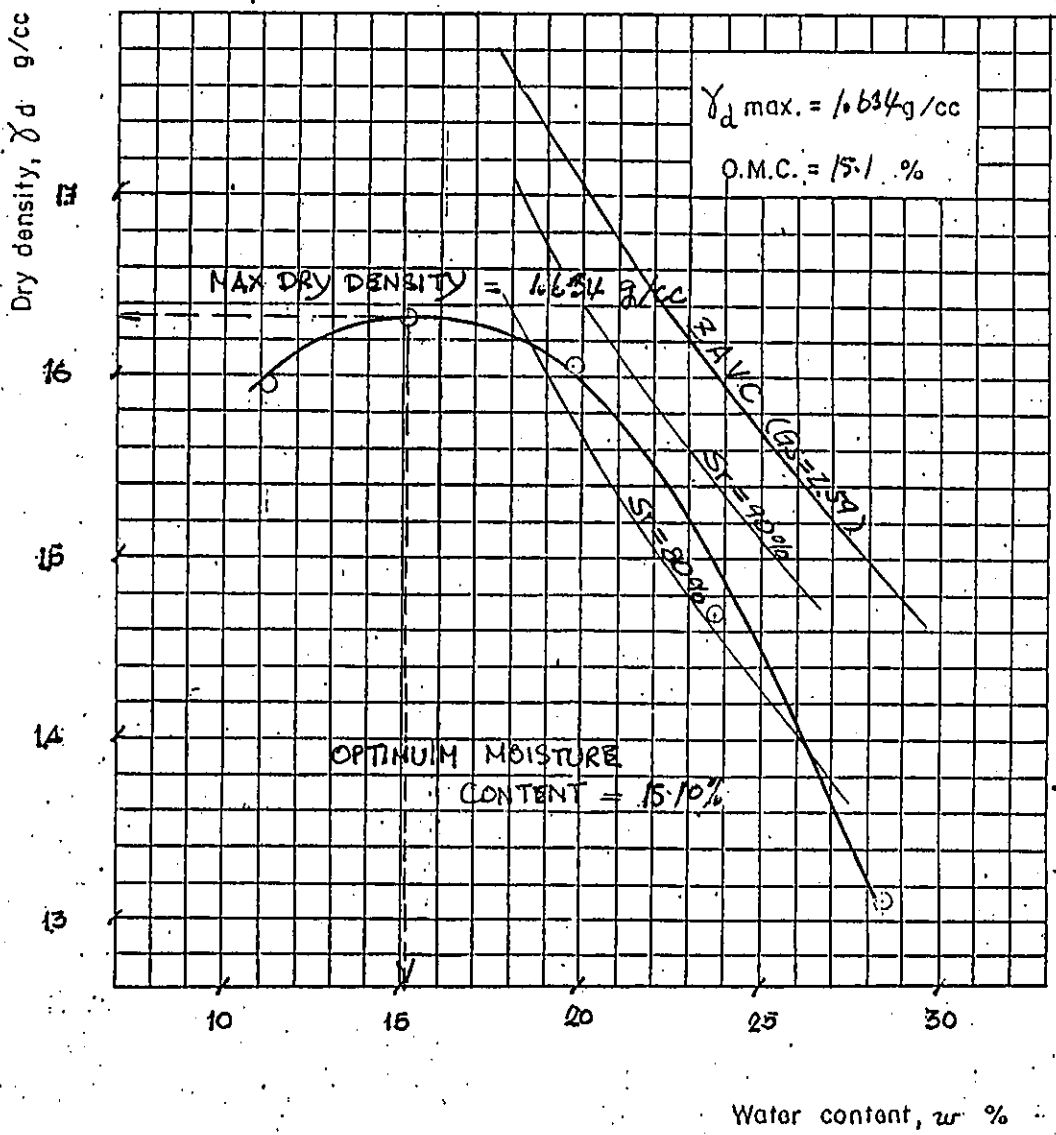
Date. 1<sup>ST</sup> NOVEMBER 1985.

Boring No. 1.

Test No. 1.

Type Test STANDARD COMPACTION.

Tested by HR. SUTHER TANONGITANURUK.  
*MU. FIMM. PHOENHONG SRI.*



- continue -



Table      SIEVE ANALYSIS

Soil sample : \_\_\_\_\_ Test No. 1

Soil sample weight : \_\_\_\_\_

Container No. \_\_\_\_\_

Wt. Container + Dry soil in g 1294.88 gm Date 31. OCTOBER 1985

Location : KONG. RACHASRIMA.

Wt. Container in g 294.88 gm

Boring No. 1 Tested by MR. SUTHEP TANONG/TNURUK.

Sample No. \_\_\_\_\_ KU. 2000. 1102/1043015

Wt. Dry soil Wts, in g. 1000.00 gm

Specific Gravity, Gs, \_\_\_\_\_

Sieve No.	Sieve opening in mm.	Wt. sieve in g.	Wt. sieve + soil in g.	Wt. soil returned in g	Percent Retained	Cumulative Percent Retained	Percent Finer
3/4	19.00 mm	507.45	507.45	—	—	—	100.00
3/8	9.50 mm	479.70	493.90	14.20	1.42	1.42	98.58
4	4.75 mm	466.20	677.40	211.20	21.16	22.58	77.42
8	2.36	423.90	723.20	299.30	29.99	52.57	47.43
10	2.00	418.05	472.20	54.15	5.45	58.02	41.98
16	1.18	412.20	528.80	116.60	11.68	69.70	30.30
30	0.60	352.00	435.20	83.20	8.94	78.64	21.36
40	0.425	347.95	397.20	29.25	2.95	81.59	18.41
50	0.30	340.00	344.50	4.50	2.45	84.04	15.96
100	0.150	309.85	372.49	62.64	6.33	90.37	9.63
200	0.075	302.50	356.00	53.50	5.36	95.73	4.27
PAN.	—	194.88	343.20	48.32	4.89	100.00	0.00

Σ 998.06  
 ERROR = 1.94 gm



Table      SIEVE ANALYSIS

Soil sample : \_\_\_\_\_      Soil sample weight. \_\_\_\_\_      Test No. 2

Container No. \_\_\_\_\_

Wt. Container + Dry soil in g 1094.95 gm      Date 1<sup>ST</sup> NOVEMBER 1985

Location : KONG, RACHASRIMA.      Wt. Container in g 294.95 gm.

Boring No. 1.      Wt. Dry soil Wts, in g. 1000 gm.      Tested by MR. JUTHER. TANOMGITTINORUK.  
AN. STIN. Dhanuboj Jno.

Sample No. \_\_\_\_\_      Specific Gravity, Gs, \_\_\_\_\_

Sieve No.	Sieve opening in mm.	Wt. sieve in g.	Wt. sieve + soil in g.	Wt. soil returned in g	Percent Retained	Cumulative Percent Retained	Percent Finer
3/4"	19.00 mm	507.45	—	—	—	—	100.00 /
3/8"	9.50 mm	479.60	486.09	6.49	0.65	0.65	99.35 /
4	4.75	466.80	696.70	210.40	21.09	21.72	78.28 /
8	2.86	449.80	699.69	249.89	22.63	49.35	50.65 /
10	2.00	418.00	471.88	53.88	5.40	57.95	45.25 /
16	1.18	412.50	521.58	109.08	10.92	65.67	34.33 /
30	0.60	351.85	441.30	89.45	8.96	74.63	25.37 /
40	0.425	347.80	382.35	34.55	3.46	78.09	21.91 /
50	0.300	300.00	347.90	27.90	2.77	80.86	19.14 /
100	0.150	309.50	389.40	77.90	7.80	88.66	11.34 /
200	0.075	302.90	358.45	55.55	5.56	94.22	5.78 /
PAN.	—	294.95	352.50	57.95	5.78	100.00	0.00 /

Σ 998.64 gm

ERROR 1.36 gm



Table      SIEVE ANALYSIS

Soil sample : \_\_\_\_\_      Soil sample weight. \_\_\_\_\_      Test No. 1.

Container No. \_\_\_\_\_

WT. Container + Dry soil in g. 1894.70 gm      Date 17th OCTOBER 1985

Location : KONG, RACHASRIMA.

WT. Container. in g. 294.70 gm

Boring No. 2.      WT. Dry soil Ws, in g. 1000 gm.      Tested by MR. SUWEEB. TANONGATYAPRAT

Sample No. 2.      Specific Gravity, Gs, \_\_\_\_\_      MR. SUWEEB. TANONGATYAPRAT  
NO. 57mm. DI. 0.0. 28.

Sieve No.	Sieve opening in mm.	Wt. sieve in g.	Wt. sieve + soil in g.	Wt. soil returned in g	Percent Retained	Cumulative Percent Retained	Percent Finer
3/4"	19.00	506.80	506.80	—	—	—	100.00
3/8"	9.50	447.30	565.35	86.05	8.61	8.61	91.39
4	4.75	466.15	763.20	297.05	29.72	38.33	69.00
8	2.36	423.70	684.52	260.82	26.10	64.43	35.57
10	2.00	414.90	466.70	148.80	14.88	69.31	30.69
16	1.18	412.20	511.89	99.69	9.98	79.29	20.71
30	0.60	357.40	420.15	68.75	6.88	86.17	13.83
40	0.425	344.60	390.82	25.22	2.32	88.49	11.51
50	0.30	319.90	326.30	16.40	1.64	90.13	9.87
100	0.15	309.20	328.35	39.15	3.92	94.05	5.95
200	0.075	302.70	330.70	28.00	2.80	96.85	3.15
PAN.	—	294.70	326.18	31.48	3.15	100.00	0.00

Σ 999.41  
 ERROR 0.57 gm

Boring No. d. Date 19<sup>th</sup> October 1985 Tested by MR SUTHER. TANONGTRUY RUK  
 Test No. 1 Location: KONG - RACHASRIMA No. 100

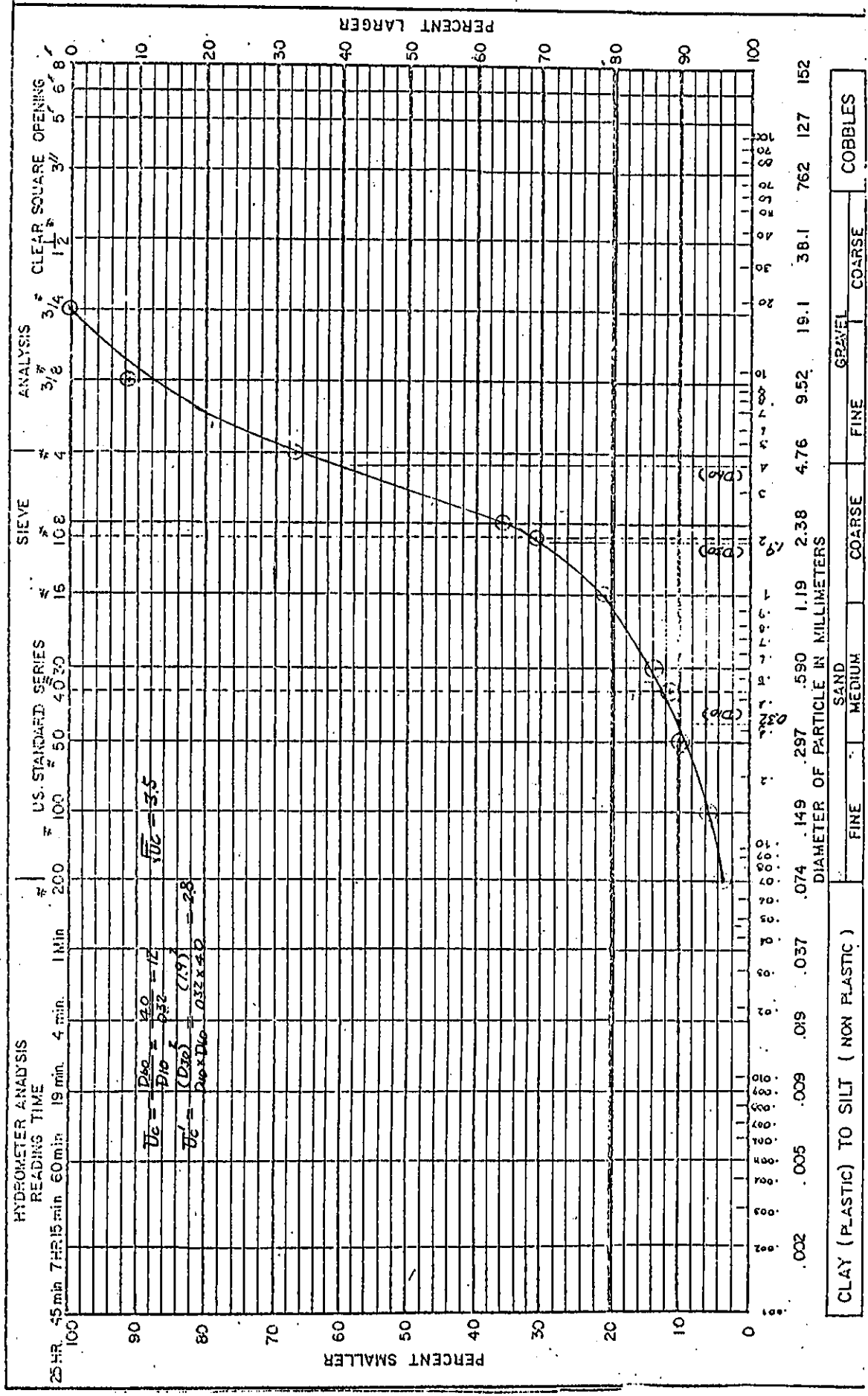


Table      SIEVE ANALYSIS

Soil sample : \_\_\_\_\_      Soil sample weight. \_\_\_\_\_      Test No. 2.

\_\_\_\_\_      Container No. \_\_\_\_\_

\_\_\_\_\_      Wt. Container + Dry soil in g 1294.90 gm      Date \_\_\_\_\_

Location : KONG, RACHASRIKA.      Wt. Container in g 294.90 gm.

Boring No. 2      Wt. Dry soil Ws, in g. \_\_\_\_\_      Tested by MR. SUPHEE TANOMCHITTAUREK  
MR. PIMM DUMNOYSHOL

Sample No 2      Specific Gravity, Gs, \_\_\_\_\_

Sieve No.	Sieve opening in mm.	Wt. sieve in g.	Wt. sieve + soil in g.	Wt. soil returned in g	Percent Retained	Cumulative Percent Retained	Percent Finer
3/4"	19.00	507.10	—	—	—	—	100.00
2"	9.20	479.69	535.00	55.51	5.56	5.56	94.44
4	4.75	466.10	757.57	291.49	29.20	34.76	65.24
8	2.36	423.72	687.36	263.64	26.42	61.18	38.82
10	1.90	418.00	474.70	56.90	5.68	66.86	33.14
16	1.18	412.20	587.40	115.20	11.54	78.40	21.60
30	0.60	352.20	429.51	77.31	7.95	86.35	13.65
40	0.425	349.82	371.81	21.99	2.40	88.75	11.25
50	0.30	320.20	337.00	16.80	1.68	90.43	9.57
100	0.15	309.82	348.05	38.23	3.83	94.26	5.74
200	0.075	302.60	330.80	28.20	2.83	97.09	2.91
PAN.	—	294.70	305.75	31.05	3.11	100.00	0.00

Σ 998.10 gm  
ERROR 1.9 gm







# JALAPRATHAN CONCRETE PRODUCTS CO., LTD.

Jalapathan Cement Bldg., 2974 Petchaburi Road, Bangkok 10, Thailand.  
Tel. 3147451-59, 3140061-64 Ext. 201,203,261

M 468/29

## CONCRETE MIX DESIGN

Contractor บริษัท ไทยทาเอนาอะลาคกลก่อสร้าง จำกัด Date 18 เมษายน 2529  
Type of construction Place

## SPECIFICATIONS

No.	Min. compressive strength (kg./cm. <sup>2</sup> )	Min. cement (kg./m. <sup>3</sup> )	Type of cement	Max.W/C	Max.size agg. (in.)	Slump (cm.)
1	180 KSC, CYL. STRENGTH AT 28 DAYS	-	I	-	1½	7.5 <sup>±</sup> 2.5
2	210 KSC, CYL. STRENGTH AT 28 DAYS	-	I	-	1½	7.5 <sup>±</sup> 2.5
3					(40mm)	
4						
5						

## MIX DESIGN

No.	Materials: kg./cu.m. concrete				W/C	Slump (cm.)	S/A	Agg.No.1/ Agg.No.2	Admixture
	Cement	Water	Sand	Aggregate					
1	300	180	743	1179	0.60	7.5 <sup>±</sup> 2.5	0.40	60/40	-
2	300	166	758	1202	0.55	7.5 <sup>±</sup> 2.5	0.40	60/40	VITACRETE RD.
3									
4									
5									

## MATERIALS USED IN DESIGN

Cement		Sand		Aggregate		Admixture
Sp. gr.	3.15	Sp. gr.	2.6	Sp. gr.	2.75	VITACRETE RD.
Type	I	Unit wt.	-	Unit wt.	-	DOSAGE: 200cc/100kg.
Brand	GREEN NAGA	Moisture	-	Moisture	-	OF CEMENT WT.
		F.M.	2.6-3.0	Max.size	1½"	

ENGINEER 

RECEIVER (นายมานิช กุลประเสริฐรัตน์)

DATE \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_



# JALAPRATHAN CONCRETE PRODUCTS CO., LTD.

Jalapathan Cement Bldg., 2974 Petchaburi Road, Bangkok 10, Thailand.

Tel. 3147451-59, 3140061-64 Ext. 201,203,261

M 465/29

## CONCRETE MIX DESIGN

Contractor บริษัท โยคประพันธ์ก่อสร้าง จำกัด Date 10 เมษายน 2529  
 Type of construction โครงการ ส่งเสริมการเกษตร Place อ.จักราช จ.นครราชสีมา  
 แห่งประเทศไทย

## SPECIFICATIONS

No.	Min. compressive strength (kg./cm. <sup>2</sup> )	Min. cement (kg./m. <sup>3</sup> )	Type of cement	Max.W/C	Max.size agg. (in.)	Slump (cm.)
1	180 KSC, CYL. STRENGTH AT 28 DAYS	-	I	-	3/4	7.5 <sup>+</sup> -2.5
2	210 KSC, CYL. STRENGTH AT 28 DAYS	-	I	-	3/4	7.5 <sup>+</sup> -2.5
3					(20 <sup>mm</sup> )	
4						
5						

## MIX DESIGN

No.	Materials: kg./cu.m. concrete				W/C	Slump (cm.)	S/A	Agg.No.1/ Agg.No.2	Admixture
	Cement	Water	Sand	Aggregate					
1	300	184	770	1125	0.61	7.5 <sup>+</sup> -2.5	0.42	-	-
2	300	169	790	1150	0.56	7.5 <sup>+</sup> -2.5	0.42	-	VITACRETE RD.
3									
4									
5									

## MATERIALS USED IN DESIGN

Cement		Sand		Aggregate		Admixture
Sp. gr.	3.15	Sp. gr.	2.6	Sp. gr.	2.75	VITACRETE RD.
Type	I	Unit wt.	-	Unit wt.	-	DOSAGE: 200cc/100kg.
Brand	-	Moisture	-	Moisture	-	OF CEMENT WT.
		F.M.	2.6-3.0	Max.size	3/4"	

ENGINEER

*นายฉัตร นานะพันธ์*  
(นายฉัตร นานะพันธ์)

RECEIVER

DATE

354



○ 鉄筋コンクリート 28日強度 について

セメントの短期強度からの28日強度の推定式

セメントの種類	7日強度( $K_7$ )から 28日強度( $K_{28}$ )を 推定する場合	3日強度( $K_3$ )および 7日強度( $K_7$ )から 28日強度( $K_{28}$ )を 推定する場合
早強ポルトランドセメント	$K_{28} = 0.4K_7 + 290$	$K_{28} = 0.25K_3 + 0.2K_7 + 300$
普通ポルトランドセメント 中層熱ポルトランドセメント 高炉セメント・シリカセメント	$K_{28} = 0.8K_7 + 170$	$K_{28} = 1.1K_7 - 0.5K_3 + 175$

$$K_{28} = 0.8 K_7 + 170$$

3.	$0.8 \times 146$	$+ 170$	$= 286.8$	}	Average $282.8 \text{ kg/cm}^2$ ( $K_{28}$ ) — OK,
4.	$0.8 \times 136$	$+ 170$	$= 278.8$		

$$K_{28} = 1.1 K_7 - 0.5 K_3 + 175$$

3, 4,  $K_7 = (146 + 136) / 2 = 141 \text{ kg/cm}^2$  ( $K_7$ の平均値)

1, 2,  $K_3 = (121 + 128) / 2 = 124.5 \text{ kg/cm}^2$  ( $K_3$ の平均値)

$$K_{28} = 1.1 \times 141 - 0.5 \times 124.5 + 175 = 267.9 \text{ kg/cm}^2$$

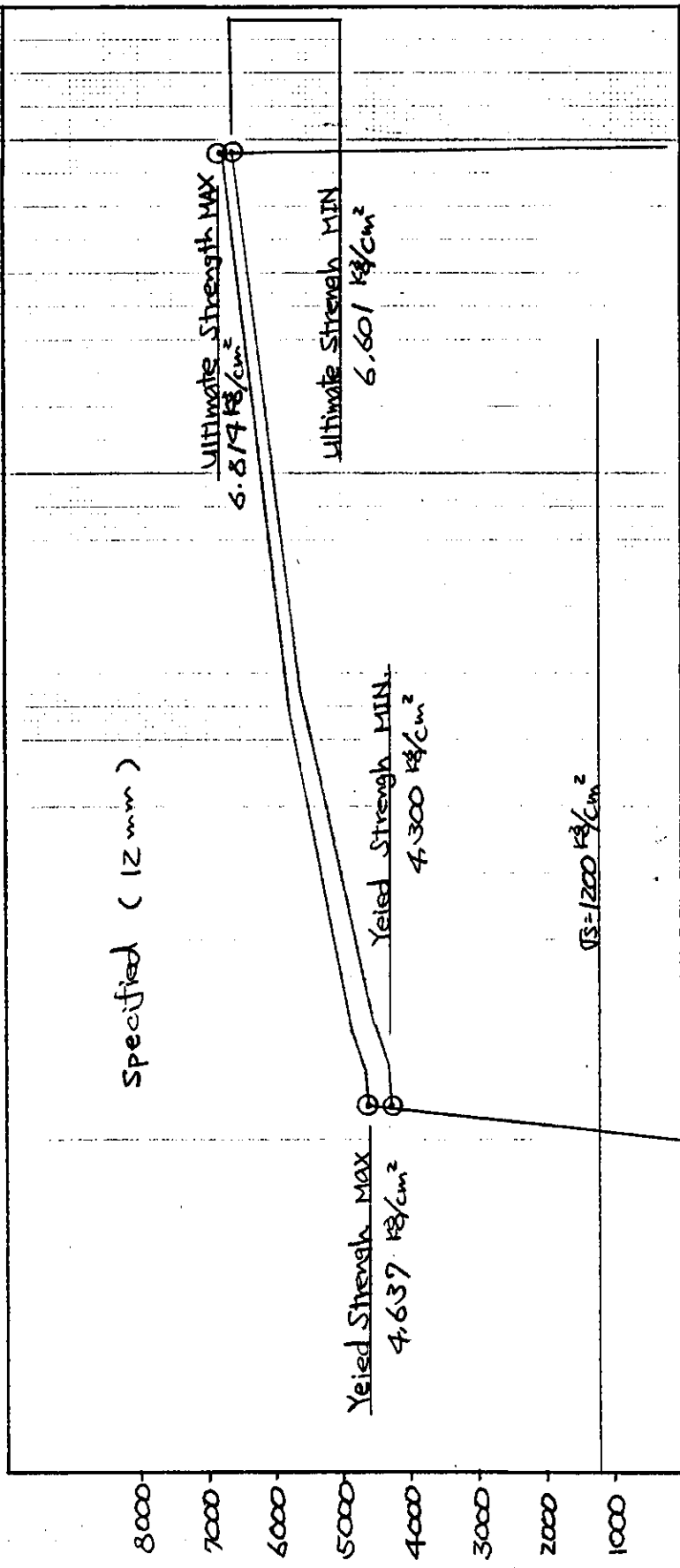
( $K_{28}$ )  
— OK,

○ ライニングコンクリート 28日強度

5.	$167 \text{ kg/cm}^2$	}	$> 160 \text{ kg/cm}^2$ ( $K_{28}$ )	— OK,
6.	$182 \text{ kg/cm}^2$			
7.	$180 \text{ kg/cm}^2$			



Tension Test for steel  
(BSI SD-30)



การทดสอบการเรียงเมล็ดของวัสดุหยาบ

Grain Size Test (aggregate; fine)

ชนิดวัสดุ  ทราย  หิน  กรวด

แหล่งที่มาของวัสดุ ..... ทดสอบเมื่อ .....

เพื่อก่อสร้าง ..... โครงการพัฒนาแหล่งน้ำ โดย JICA

โครงการ ..... การส่งเสริมสหกรณ์เกษตรกรในภาคตะวันออกเฉียงเหนือ

ขนาดตะแกรง	ขนาดตะแกรง มม.	น้ำหนัก ค้างตะแกรง กรัม	เปอร์เซ็นต์ ค้างตะแกรง	เปอร์เซ็นต์ค้าง ตะแกรงสะสม	เปอร์เซ็นต์ผ่าน ตะแกรงสะสม
3	76.20				
2	63.50				
1 1/2"	50.80			#	
1 "	38.10				
3/4 "	19.10			#	
1/2 "	12.70				
3/8 "	9.52			#	
เบอร์ 4	4.760	5.00	0.50	# 0.50	99.50
เบอร์ 8	2.380	6.00	0.60	# 1.10	98.90
เบอร์ 16	1.190	7.00	0.70	# 1.80	98.20
เบอร์ 30	0.595	39.50	3.95	# 5.75	94.25
เบอร์ 50	0.297	278.70	39.87	# 43.62	56.38
เบอร์ 100	0.149	523.90	52.39	# 96.01	3.99
ถาดรอง	-	39.90	3.99	# 100	-

ขนาดมวลโตสุด 3/8" นน.รวม = 1000 กรัม      โมดูลัสความละเอียด = 1.4878

หมายเหตุ ผ่านตะแกรงเบอร์ 200 = 39.9 กรัม 3.99%

ผู้ทดสอบ

วิศวกร/นายช่างผู้ควบคุม

หัวหน้างานวิเคราะห์

db / ทด. / ๒

ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
ลงชื่อ: หัวหน้าฝ่ายฯ

แบบฟอร์ม วส. 36

ฝ่ายสำรวจและออกแบบ

ศูนย์ฯ ปฏิบัติการ รพช. นครราชสีมา

การทดสอบความด่างจำเพาะและการดูดซึมของวัสดุละเอียด

Specific gravity Test for Aggregate ; fine

ชนิดของวัสดุ.....ทราย

แหล่งที่เก็บวัสดุ.....

โครงการที่ก่อสร้าง.....โครงการพัฒนาแหล่งน้ำโดย JICA สงเสริมสหกรณ์การเกษตรในภาคตะวันออกเฉียงเหนือ

ทดสอบเมื่อ 19 / พค. / 29

ลำดับที่	ลำดับการทดสอบ	สัญลักษณ์	หน่วย	ตัวอย่าง 1	ตัวอย่าง 2
1	น้ำหนักขวด 500 ซม. <sup>3</sup>	WB	กรัม	164.10	160.00
2	น้ำหนักของวัสดุที่อิมด้วยผิวแห้ง	WS	กรัม	450	450
3	น้ำหนักขวด + น้ำหนักน้ำถึงขีด + น้ำหนักวัสดุ	W <sub>1</sub>	กรัม	940.20	936.50
4	น้ำหนักน้ำ	W = W <sub>1</sub> - W <sub>B</sub> = W <sub>S</sub>	กรัม	326.10	326.50
5	ความด่างจำเพาะของวัสดุที่อิมด้วยผิวแห้ง	$G = \frac{W_S}{500 - W}$	-	2.588	2.594
6	ผลต่างความด่างจำเพาะของวัสดุ 2 ครั้ง	G <sub>1</sub> - G <sub>2</sub>	-	0.006	< 0.02
7	ค่าเฉลี่ยความด่างจำเพาะของวัสดุเมื่ออิมด้วยผิวแห้ง	G	-	2.591	
8	น้ำหนักของวัสดุที่อบแห้ง	W <sub>2</sub>	กรัม	445.80	445.90
9	ความจุในการดูดซึม	$A = \frac{W_s - W_2}{W_2} \times 100$	%	0.942	0.919
10	ผลต่างความจุในการดูดซึมของวัสดุ 2 ครั้ง	A <sub>1</sub> - A <sub>2</sub>	%	0.023	< 0.05
11	ค่าเฉลี่ยความจุในการดูดซึมของวัสดุ	A <sub>A</sub>	%	0.930	

หมายเหตุ 1. ขนาดที่ใช้ทดสอบที่ความจุ = 500 ซม.<sup>3</sup>

ผู้ทดสอบ.....  
 วิศวกร/นายช่างผู้ควบคุม.....  
 หัวหน้างานวิเคราะห์วิจัย.....  
 26 / พค. / 29

ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
 ลงชื่อ..... หัวหน้าฝ่ายฯ

แบบฟอร์ม วส. 43  
 ฝ่ายสำรวจและออกแบบ  
 ศูนย์ปฏิบัติการ รพช. นครราชสีมา



การทดสอบการเรียงเมล็ดของวัสดุหยาบ

Grain Size Test (Aggregate, coarse)

ชนิดวัสดุ  ทราย  หิน  กรวด  หิน 1 1/2"

แหล่งที่มาของวัสดุ..... ทอสอบเมื่อ..... / .....

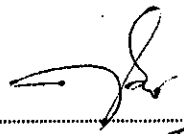
เพื่อก่อสร้าง..... โครงการพัฒนาแหล่งน้ำ ไทย JICA

โครงการ..... การส่งเสริมสหกรณ์การเกษตรในภาคตะวันออกเฉียงเหนือ

ขนาดตะแกรง	ขนาดตะแกรง มม.	น้ำหนัก ค้างตะแกรง กรัม	เปอร์เซ็นต์ ค้างตะแกรง	เปอร์เซ็นต์ค้าง ตะแกรงสะสม	เปอร์เซ็นต์ผ่าน ตะแกรงสะสม
3	76.20				
2	63.50				
1 1/2"	50.80			#	100.00
1"	38.10	4898.00	52.03	52.03	47.97
3/4"	19.10	4372.00	46.45	# 98.48	1.52
1/2"	12.70	140.00	1.49	99.96	0.04
3/8"	9.52	-	-	# -	-
เบอร์ 4	4.760	-	-	# -	-
เบอร์ 8	2.380	-	-	# -	-
เบอร์ 16	1.190	-	-	# -	-
เบอร์ 30	0.595	-	-	# -	-
เบอร์ 50	0.297	-	-	# -	-
เบอร์ 100	0.149	-	-	# -	-
ถาดรอง	-	3.00	0.03	# 100	-

ขนาดมวลโตสุด 1 1/2" นน.รวม = 9413 โมดูลัสความละเอียด = -

หมายเหตุ.....



ผู้ทดสอบ  
วิศวกร/นายช่างผู้ควบคุม  
หัวหน้างานวิเคราะห์

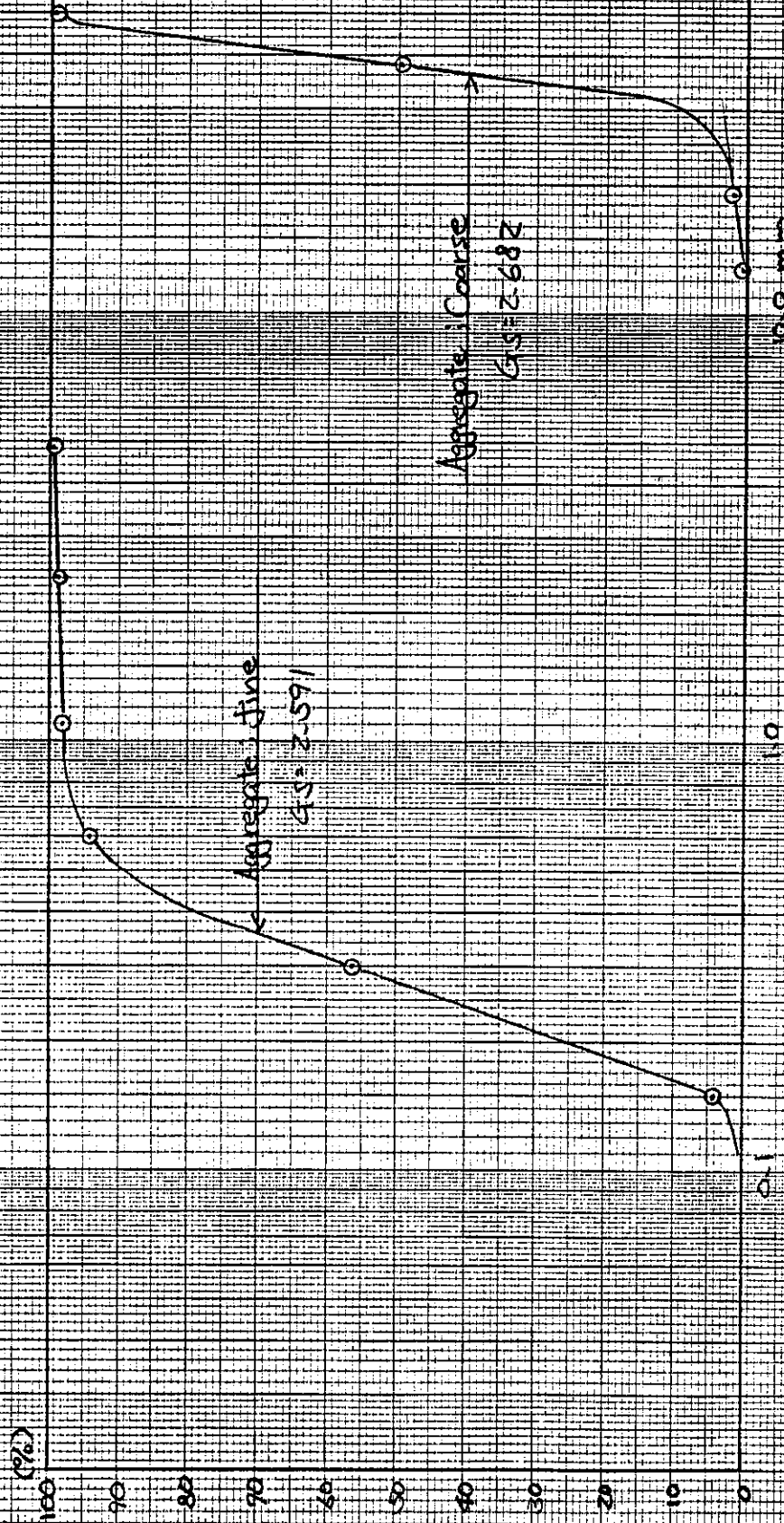
๑๖/๓๐/๖๓

ได้ชำระเงินค่าทดสอบวัสดุครบถ้วนถูกต้องแล้ว  
ลงชื่อ..... หัวหน้าฝ่ายฯ

แบบฟอร์ม วส. 36  
ฝ่ายสำรวจและออกแบบ  
ศูนย์ฯ ปฏิบัติการ รพช. นครราชสีมา

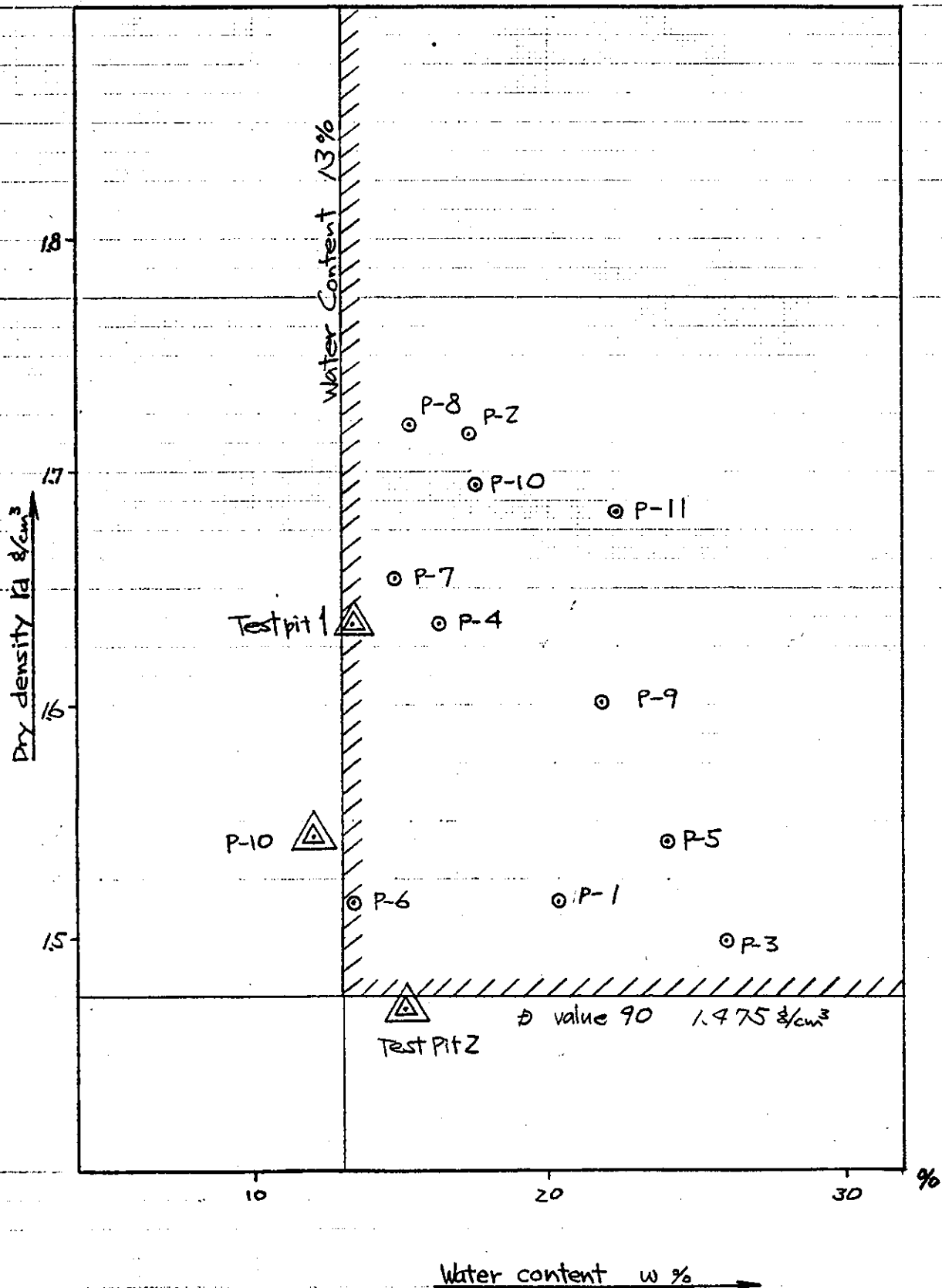


粒径加積曲線 (Grain Size Accumulation Curve)



# Field Density Test

(Compaction)



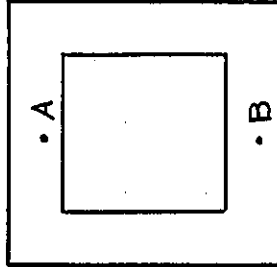
- △ 土質試験値 (D value 90%) by Compaction test
- 各溜池での試験値

FIELD DENSITY TEST

date 25 Apr

Pond No. P - 1

N ↑



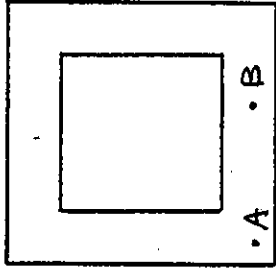
Location \_\_\_\_\_

		A	B
Specimen	Weight g	1,220	625
	Volume cm <sup>3</sup>	671	342
Wet density g/cm <sup>3</sup>		1.818	1.827
Water contents	wet	135	152
	dry	114	125
	Water contents	$\frac{135-114}{114} = 0.18$	$\frac{152-125}{125} = 0.22$
Average		17.5 %	23.0 %
Dry density g/cm <sup>3</sup>		1.547	1.485
Ave		20.3	1-5/6

FIELD DENSITY TEST

date 31th May

Pond No. P - Z



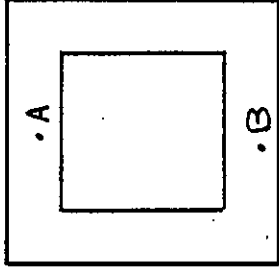
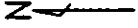
Location \_\_\_\_\_

		A	B
Specimen	Weight g	506	711
	Volume cm <sup>3</sup>	252.7	351.4
Wet density g/cm <sup>3</sup>		2.002	2.023
Water contents	wet g	160	143
	dry g	136	121
	Water contents	$\frac{160-136}{136} = 0.18$	$\frac{143-121}{121} = 0.18$
Average		17.0 %	17.5 %
Dry density g/cm <sup>3</sup>		1.711	1.722
			Ave 17.3
			1.717

FIELD DENSITY TEST

date 16th May

Pond No. P - 3



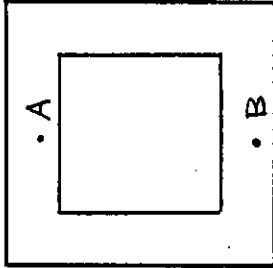
Location \_\_\_\_\_

		A	B
Specimen	Weight g	510	550
	Volume cm <sup>3</sup>	258.9	304.8
Wet density g/cm <sup>3</sup>		1.970	1.804
Water contents	wet g	140	156
	dry g	111	126
	Water contents	$\frac{140-111}{111} = 0.26$	$\frac{156-126}{126} = 0.24$
Average		27.5 %	24.5 %
Dry density g/cm <sup>3</sup>		1.545	1.449
		Ave	26.0
			1.497

FIELD DENSITY TEST

date 31th May

N ↑



Location

Pond No. P-4

		A	B
Specimen	Weight g	415	414
	Volume cm <sup>3</sup>	207.5	229.5
Wet density		2.000	1.803
Water contents	wet g	115	119
	dry g	99	102
	Water contents	$\frac{115-99}{99} = 0.16$	$\frac{119-102}{102} = 0.17$
Average		16.5 %	16.0 %
Dry density		1.717	1.554
			Ave 16.3
			1.636

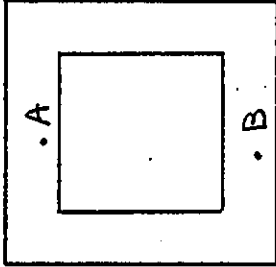


FIELD DENSITY TEST

date 5th Jan

Pond No. P-5

N



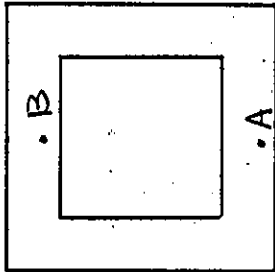
Location \_\_\_\_\_

		A	B
Specimen	Weight g	400	360
	Volume cm <sup>3</sup>	219.9	179.5
Wet density		1.819	2.006
Water contents	wet g	110	122
	dry g	91	97
Water contents		$\frac{110-91}{91} = 0.21$	$\frac{122-97}{97} = 0.26$
Average		22.0 %	26.0 %
Dry density		1.491	1.592
			Ave 24%

FIELD DENSITY TEST

date 16th Jun

N



Location

Pond No. P - 6

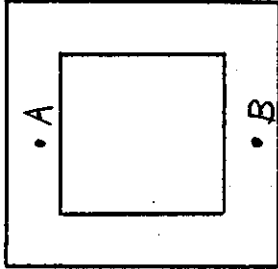
		A	B
Specimen	Weight g	315	304
	Volume cm <sup>3</sup>	183.5	177.9
Wet density	g/cm <sup>3</sup>	1.717	1.709
Water contents	wet g	117	84
	dry g	102	75
	Water contents	$\frac{117-102}{102} = 0.15$	$\frac{84-75}{75} = 0.12$
Average	%	14.0	12.5
Dry density	g/cm <sup>3</sup>	1.506	1.519
	Ave		13.3%
			1.513

FIELD DENSITY TEST

date 16th June

Pond No. P - 7

N

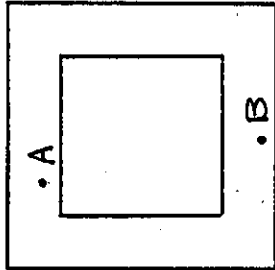


Location \_\_\_\_\_

	A		B	
Specimen	Weight	g	379	393
	Volume	cm <sup>3</sup>	204.1	202.7
Wet density	g/cm <sup>3</sup>		1.857	
	wet	g	119	140
	dry	g	106	120
Water contents	%		$\frac{119-106}{106} = 0.12$	$\frac{140-120}{120} = 0.17$
	Average		12.5 %	17.0 %
Dry density	g/cm <sup>3</sup>		1.651	
	Ave		14.8%	
			1.657	

FIELD DENSITY TEST

date 5th Jun



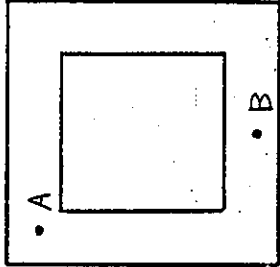
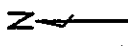
Location

Pond No. P - 8

		A	B
Specimen	Weight g	431	404
	Volume cm <sup>3</sup>	213.0	208.2
Wet density	g/cm <sup>3</sup>	2.023	
Water contents	wet g	125	138
	dry g	108	120
	Water contents	$\frac{125-108}{108}=0.16$	$\frac{138-120}{120}=0.15$
Average	%	$\frac{16.0 + 14.5}{2} = 15.3$	
Dry density	g/cm <sup>3</sup>	1.744	1.694

FIELD DENSITY TEST

date 27th Apr



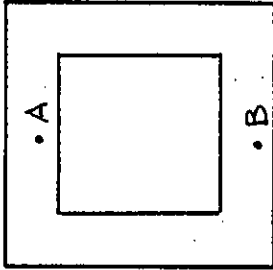
Location

Pond No. P - 9

		A	B
Specimen	Weight g	555	432
	Volume cm <sup>3</sup>	283	223
Wet density g/cm <sup>3</sup>		1.961	1.937
Water contents	wet g	124	113
	dry g	105	92
	Water contents	$\frac{124-105}{105} = 0.18$	$\frac{113-92}{92} = 0.23$
Average		19.5 %	24.0 %
Dry density g/cm <sup>3</sup>		1.641	1.562
			Ave 21.8
			1.602

FIELD DENSITY TEST

date 27th Apr



Location

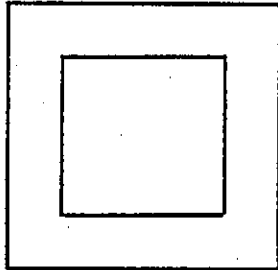
Pond No. P-10

		A	B
Specimen	Weight g	475	555
	Volume cm <sup>3</sup>	240	277
Wet density g/cm <sup>3</sup>		1.979	2.004
Water contents	wet g	179	127
	dry g	154	109
	Water contents	$\frac{179-154}{154} = 0.16$	$\frac{127-109}{109} = 0.17$
Average		16.5 %	18.5 %
Dry density g/cm <sup>3</sup>		1.699	1.695

FIELD DENSITY TEST

date 16th May

N



Location \_\_\_\_\_

Pond No. P-11

		A	B
Specimen	Weight g	556	557
	Volume cm <sup>3</sup>	272.6	268.5
Wet density g/cm <sup>3</sup>		2.040	2.074
Water contents	wet	181	159
	dry	149	130
	Water contents	$\frac{181-149}{149} = 0.21$	$\frac{159-130}{130} = 0.22$
Average		22.0 %	22.5 %
Dry density g/cm <sup>3</sup>		1.672	1.683
Ave		22.3	22.3



# บริษัท โกชู โคซัน จำกัด

## GOSHU KOHSAN CO., LTD.

1091/49 ซอยจากรูรัศน์ ถนนเพชรบุรีตัดใหม่ พญาไท กรุงเทพฯ 10400  
1091/49 Soi Charurat, New Petchburi Road, Bangkok 10400 Thailand.

โทร. 2532339, 2535581, 2537898  
Tel.

Messrs. THAI TAKENAKA INTER. LTD.

Date June 12, 1986.

No. PD-06001

### WATER ANALYSIS REPORT

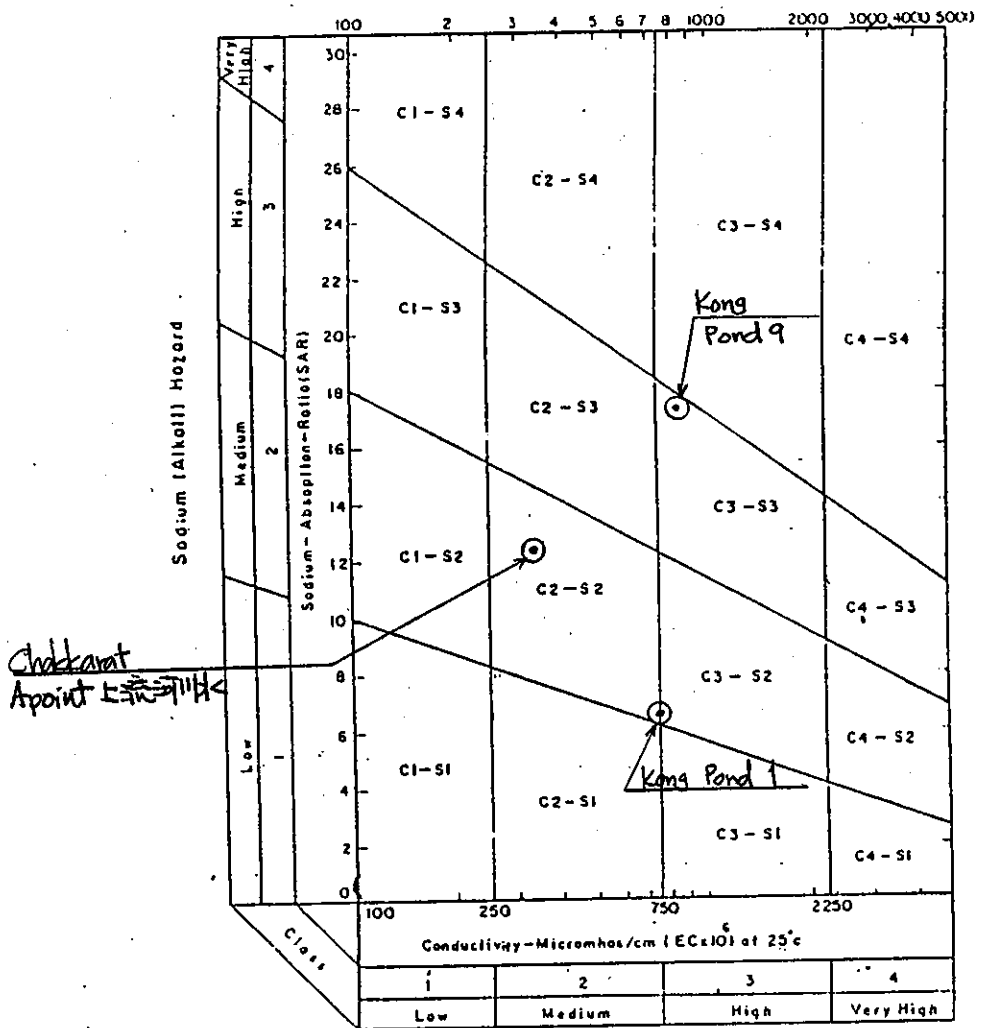
Item	Sample Name	Chakaratt Apoint	Kong P.9 Ground water	Kong P.1 Ground water (with out rainfall)
Sampling Date		22-4-86		20-4-86
Appearance				
Turbidity				
Color				
pH		6.96	7.70	7.54
• Electric Conductivity (micro S/cm)		330	870	745
Total Solid (ppm. as NaCl)		231	609	522
Total Hardness (ppm. as CaCO <sub>3</sub> )		68.3	232.0	207.0
Calcium Hardness (ppm. as CaCO <sub>3</sub> )		39.0	91.0	191.0
Total Iron (ppm. as Fe)		29.82	0.17	1.50
M-Alkalinity (ppm. as CaCO <sub>3</sub> )		68.5	438.0	290.0
P-Alkalinity (ppm. as CaCO <sub>3</sub> )				
Chloride Ion (ppm. as Cl)		39.8	5.0	28.8
Sulfate Ion (ppm. as SO <sub>4</sub> <sup>2-</sup> )		10.3	3.5	3.9
Silica (ppm. as SiO <sub>2</sub> )		9.2	58.9	59.4
Phosphate Ion (ppm. as PO <sub>4</sub> <sup>3-</sup> )				
Chemical Oxygen Demand				
Manganese (ppm. as Mn)				
	Na <sup>+</sup>	41.2	103.7	41.2
	Ca <sup>+2</sup>	15.6	36.4	76.4
Remark	Mg <sup>+2</sup>	7.15	34.4	3.9
	• S.A.R.	12.23	17.43	6.50

Manager \_\_\_\_\_

Representative \_\_\_\_\_



# WATER QUALITY CLASSIFICATION



$S_1$	<p>Low sodium water can be used for irrigation in almost all soils with little danger of the development of harmful levels of exchangeable sodium. However, sodium sensitive crops such as stonefruit trees and avocados may accumulate injurious concentrations of sodium.</p>	$C_1$	<p>Low salinity water can be used for irrigation with most crops on most soils with little likelihood, that soil salinity will develop. Some leaching is required but this occurs under normal irrigation practices, except in soils of extremely low permeability.</p>
$S_2$	<p>Medium water will present an appreciable sodium hazard in fine textured soils having high cation exchange capacity, especially under low leaching conditions unless gypsum is present in the soil. This water may be used on coarse textured or organic soils with good permeability.</p>	$C_2$	<p>Medium salinity water can be used if a moderate amount of leaching occurs. Plants with moderate salt tolerance can be grown in most cases without special practices for salinity control.</p>
$S_3$	<p>High sodium water may produce harmful levels of exchangeable sodium in most soils, and will require special soils management; good drainage, high leaching, and organic matter conditions. Gypsiferous soils may not develop harmful levels of exchangeable sodium from such waters. Chemical amendments may be required for replacement of exchangeable sodium, except that amendments may not be feasible in the case of waters of very high salinity.</p>	$C_3$	<p>High salinity water cannot be used on soils with restricted drainage, even with adequate drainage, special treatment for salinity control may be required, and plants with good salt tolerance should be selected.</p>
$S_4$	<p>Very high sodium water is generally unsatisfactory for irrigation purposes, except at low and perhaps medium salinity where the solution of calcium from the soil or used of gypsum or other amendments may make the use of these waters feasible.</p>	$C_4$	<p>Very high salinity water is not suitable for irrigation under ordinary conditions, but may be used occasionally under very special circumstances. The soils must be permeable, drainage condition must be adequate, irrigation water must be applied in excess to provide considerable leaching and very salt-tolerance crops should be selected.</p>

## 第7章 検査資料

### 7-1 中間検査資料

บริษัท ไทยทาเคนาคา สากลก่อสร้าง จำกัด  
THAI TAKENAKA INTERNATIONAL LTD.

BOONMITR BLDG., 5FL.  
138 SILOM ROAD, BANGKOK.  
TEL : 233-3246, 3837 234-0072, 4801, 5314, 8718

- COPY -

Our Ref. TTI/86/033

May 23, 1986

Mr. Michimoto Goto  
Resident Representative,  
JAPAN INTERNATIONAL COOPERATIVE AGENCY  
1674/1, New Petchburi Road,  
Bangkok

Dear Sir,


Re: Request for Interim Inspection  
MODEL INFRASTRUCTURE ON AGRICULTURAL COOPERATIVE PROMOTION PROJECT

As we have completed more than 50 percent of the above-mentioned work, we would like to request you to kindly make interim inspection to the work on 29 May 1986.

Your kind attention to the above would be highly appreciated.

Yours sincerely,

THAI TAKENAKA INTERNATIONAL LTD.

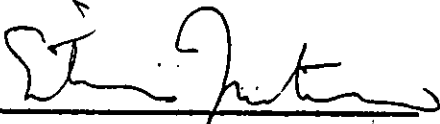


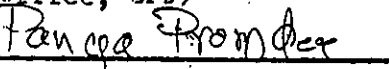
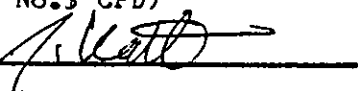
  
.....  
Taketsugu Nunose  
Managing Director

Mr. Michimoto GOTO  
 Resident Representative  
 Bangkok Office  
 Janpan International Cooperation Agency

Interim Inspection Record

As the result of Interim Inspection with regard to the following, please be informed that the construction works was executed in conformity for contract, Technical Specifications and Drawings.

SUBJECT	Construction of model Infrastructure on Agricultural Cooperative Promotion Project in Thailand
Total amount of Construction	3,050,000 Baht
Contractor	Thai Takenaka International Ltd.
Construction Period	From 18th March, 1986 to 24th August, 1986
Date of supply	23th May, 1986
Date of Interim Inspection	29th May, 1986
Date of Advance payment	21th April, 1986 (30 % of total amount of- Construction )
Total amount of Interim paymint	915,000 Baht (30 % of total amount of- Construction )

Inspector  
 Mr. Eitaro Mitoma   
 (JICA Bangkok Office)  
 Mr. Shizuo Sato   
 (Project leader of A.C.P.P)  
 Mrs. Wannee Ratanawaraha   
 (Chief, Project Manager Office, CPD)  
 Mr. Panya Promdee   
 (Chief, Engineering Center No.3 CPD)  
 Mr. Takahiro Kato   
 (Construction Superviser)

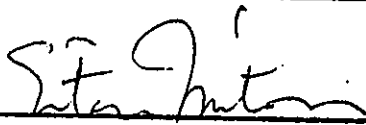
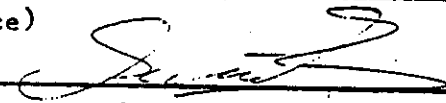

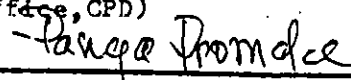

Mr. Michimoto GOTO  
 Resident Representative  
 Bangkok Office  
 Japan International Cooperation Agency

Subject; CONSTRUCTION OF MODEL INFRASTRUCTURE  
 ON  
 AGRICULTURAL COOPERATIVE PROMOTION PROJECT  
 IN THAILAND  
 INTERIM INSPECTION

In respect of the above-mentioned, Interim Inspection was held on 29th May, 1986 by the request for Interim Inspection of Thai Takenaka International Ltd. on 23th May, 1986.

The completed amount of Construction is as follows.

Kong Samaki		
1. Construction of Farm ponds	_____	80.4 %
2. Appertenant structure	_____	2.4
Chiakkarat		
3. Outlet works	_____	62.2
4. Appertenant structure	_____	0.0
5. Diversion works	_____	88.7
6. Appertenant structure	_____	50.0
Total evaluation	_____	64.5 %

Inspector  
 Mr. Eitaro Mitoma   
 (JICA Bangkok Office)  
 Mr. Shizuo Sato   
 (Project leader of A.C.P.P.)  
 Mrs. Wannee Ratanawaraha   
 (Chief, Project Manager Office, CPD)  
 Mr. Panya Promdee   
 (Chief, Engineering Center No. 3, CPD)  
 Mr. Takahiro Kato   
 (Construction Supervisor)

7-2 竣工検査資料

- COPY -

บริษัท ไทยทาเคนาคา สาขาลก่อสร้าง จำกัด  
THAI TAKENAKA INTERNATIONAL LTD.  
BOONMITR BLDG., 5FL.  
138 SILOM ROAD, BANGKOK.  
TEL : 293-3246, 3837 234-0072, 4801, 5314, 8718

Our Ref.TTI/86/040

August 18, 1986

Mr. Michimoto Goto  
Resident Representative,  
JAPAN INTERNATIONAL COOPERATIVE AGENCY  
1674/1, New Petchburi Road,  
Bangkok

Dear Sir,


Re: Request for Final Inspection  
MODEL INFRASTRUCTURE ON AGRICULTURAL COOPERATIVE PROMOTION PROJECT

As we have completed the whole work of the above-mentioned work,  
we would like to request you to kindly make final inspection to  
the work.

Your kind attention to the above would be highly appreciated.

Yours sincerely,

THAI TAKENAKA INTERNATIONAL LTD.

  
.....  
Taketsugu Nunose  
Managing Director

○検査調書

(図第Ⅲ-29)

昭和 61 年 9 月 5 日

契約担当役

殿

検査職員

所属氏名

*Shinshiro*  
三苜菜太郎

検査調書

下記について調査した結果、契約書及び仕様書並びに設計書に基づいて履行されたものであることを確認します。

記

検査件名	農協振興計画モデルハウスの整備事業		
契約金額	3,050,000 円 (数量 単価)		
契約の相手方	THAI TAKENAKA INTERNATIONAL LTD		
納入場所	COOPERATIVES PROMOTION DEPARTMENT		
契約期間	自昭和 61 年 3 月 18 日 至昭和 61 年 8 月 24 日		
納入を受けたる日	昭和 61 年 8 月 28 日		
調査年月日	昭和 61 年 8 月 27 日		
検査立会人	監督職員	——	契約の相手方
	契約担当職員	三苜菜太郎	柳沢 宝男
既済納年月日	昭和 61 年 月 日		
部分払の限度額	40% (第3回目)		
備考	別添「追加工事量」		

(注) 1. 本調書は、契約の種類に応じ該当欄を記載し作成すること。

2. 既済、既納年月日欄及び部分払の限度額欄については、給付の完了前に代価の一部を支払う必要のある契約に係るものの検査についてのみ記載すること。

3. 備考欄には、出来栄、その他検査職員が当該検査に対する所見を記載すること。

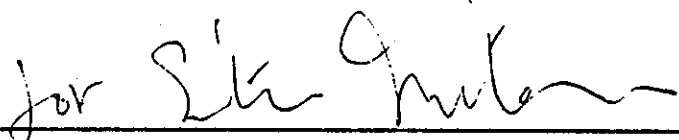


CERTIFICATE OF ACCEPTANCE  
THE CONSTRUCTION OF MODEL INFRASTRUCTURE  
ON  
AGRICULTURAL COOPERATIVE PROMOTION PROJECT

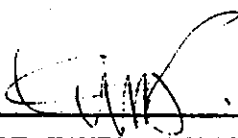
The Japan International Cooperation Agency, Bangkok Office (hereinafter referred to as "JICA"),

and Thai Takenaka International Ltd. (hereinafter referred to as "CONTRACTOR") hereby agree that the Construction works of Model Infrastructure on Agricultural Cooperative Promotion Project has been duly completed by the Contractor and delivered to JICA.


28th August, 1986

  
"JICA"


MR. MICHIMOTO GOTO, Resident Representative  
Bangkok Office, Japan International Cooperation  
Agency

  
"CONTRACTOR"

MR. TAKETSUGU NUNOSE /      MR. KANEKO YANAGISAWA  
Managing director              Manager  
Thai Takenaka International Ltd.

  
WITNESS

MRS. WANNEE RATANAWARAHA  
Chief, Project Management Office, Cooperatives Promotion  
Department

  
WITNESS

MR. SHIZUO SATO, Project Leader  
Agricultural Cooperative Promotion Project

Mr. Michimoto GOTO  
Resident Representative  
Bangkok Office  
Japan International Cooperation Agency

## Final Inspection Record

As the result of Final Inspection with regard to the following, it is to inform that the construction works was executed in conformity for contract, Technical Specifications and Drawings.

SUBJECT	Construction of model Infrastructure on Agricultural Cooperative Promotion Project in Thailand
Total amount of Construction	3,050,000 Baht
Contractor	Thai Takenaka International Ltd.
Construction Period	From 18th March, 1986 to 24th August, 1986
Date of supply	18th August, 1986
Date of Final Inspection	27th, 28th August, 1986
Date of Advance payment	21th April, 1986 (60% of total amount of Construction)
Date of Interim payment	11th June, 1986
Total amount of Final payment	1,220,000 Baht (40% of total amount of Construction)

Inspector

Mr. Eitaro Mitoma .....

(JICA Bangkok Office)

Mr. Shizuo Sato .....

(Project leader of A.C.P.P.)

Mrs. Wannee Ratanawaraha .....

(Chief, Project Manager Office, CPD)

Mr. Panya Promdee .....

(Chief, Engineering Center No.3 CPD)

Mr. Takahiro Kato .....

(Construction Supervisor)

Mr. Michimoto GOTO  
 Resident Representative  
 Bangkok Office  
 Japan International Cooperation Agency

Subject : CONSTRUCTION OF MODEL INFRASTRUCTURE  
 ON  
 AGRICULTURAL COOPERATIVE PROMOTION PROJECT  
 IN THAILAND

FINAL INSPECTION

In respect of the above-mentioned, Final Inspection was held on 27th, 28th August, 1986 by the request for Final Inspection of Thai Takenaka International Ltd. on 18th August, 1986.

The completed amount of Construction is as follows.

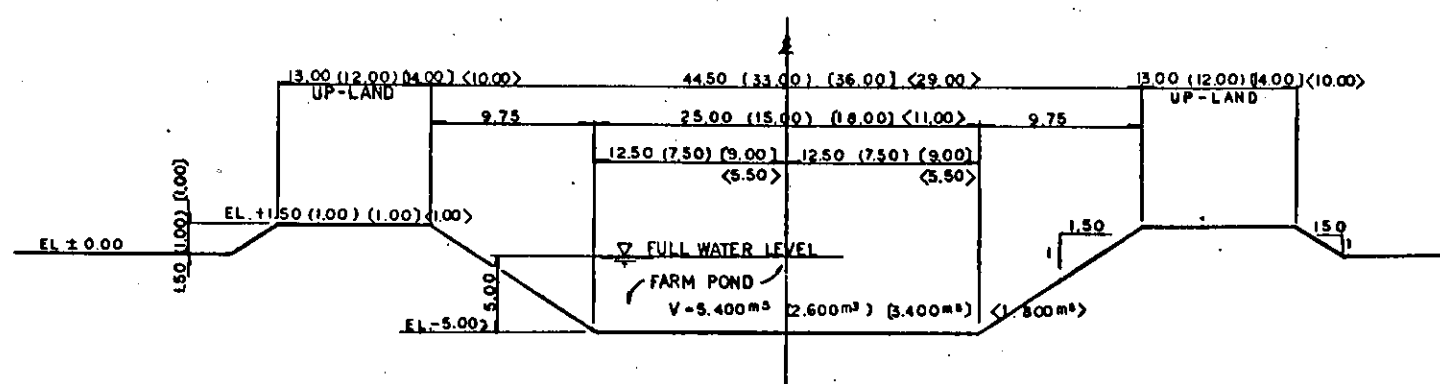
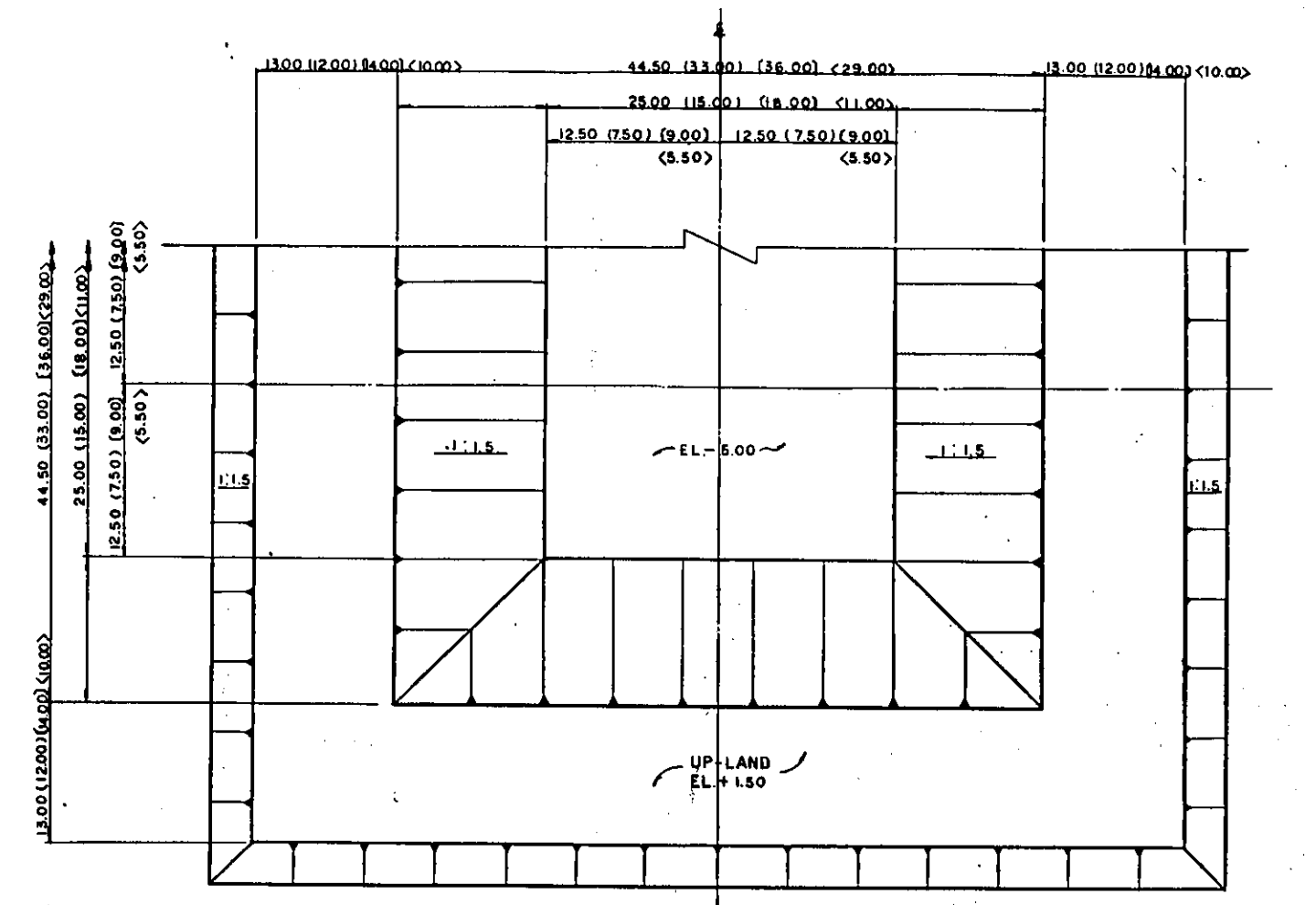
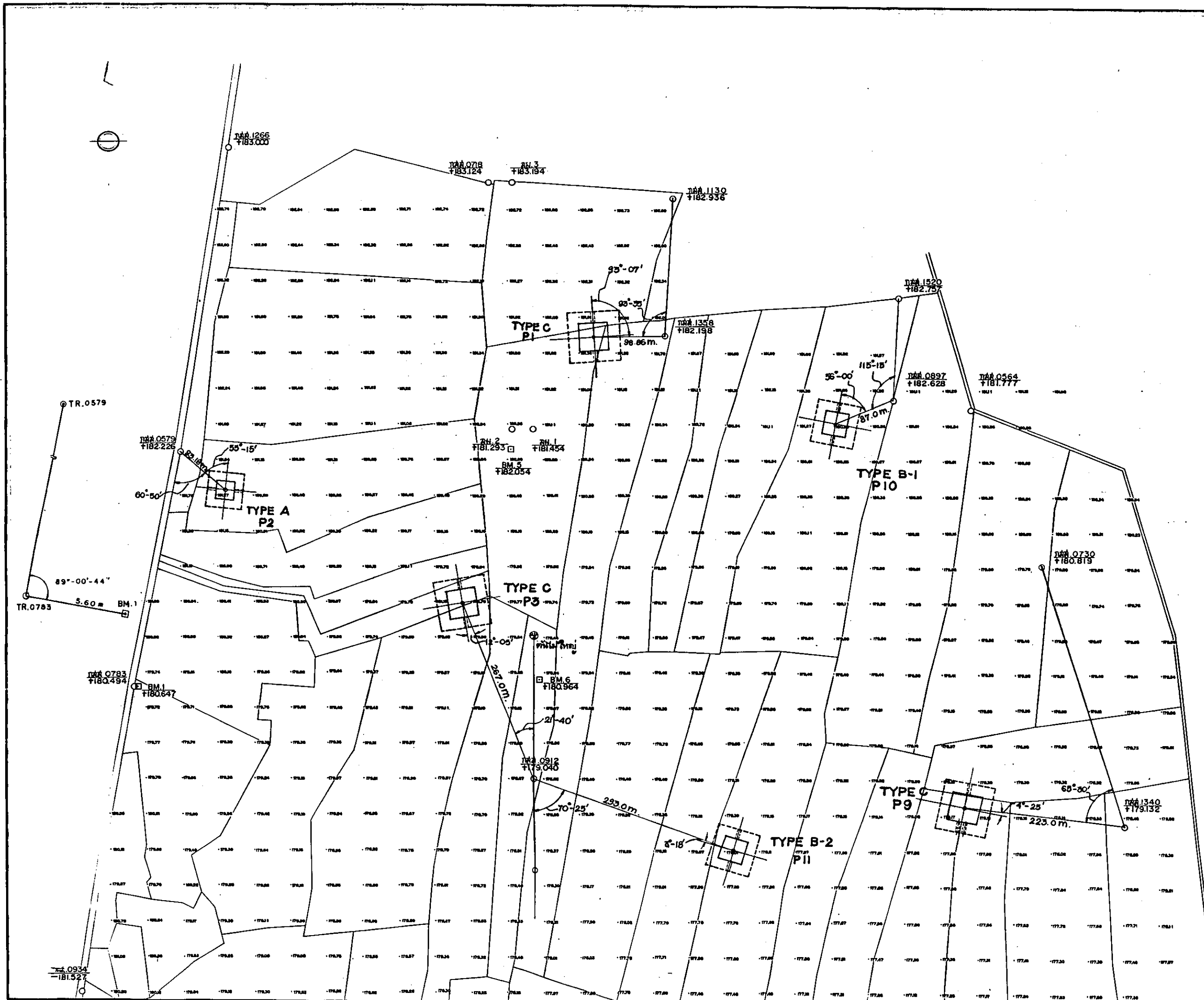
Kong Samaki	
1. Construction of Farm ponds .....	100.0 %
2. Appertenant structure .....	100.0
Chakkarat	
3. Outlet works .....	100.0
4. Appertenant structure .....	100.0
5. Diversion works .....	100.0
6. Appertenant structure .....	100.0
7. Canal works (Additional work) .....	100.0
<b>Total evaluation .....</b>	<b>100.0 %</b>

Inspector  
 Mr. Eitaro Mitoma ..... *Eitaro Mitoma*  
 (JICA Bangkok Office)  
 Mr. Shizuo Sato ..... *Shizuo Sato*  
 (Project leader of A.C.P.P.)  
 Mrs. Wannee Ratanawaraha ..... *Wannee Ratanawaraha*  
 (Chief, Project Manager Office, CPD)  
 Mr. Panya Promdee ..... *Panya Promdee*  
 (Chief, Engineering Center No.3 CPD)  
 Mr. Takahiro Kato ..... *Takahiro Kato*  
 (Construction Supervisor)

7-3 竣工図面

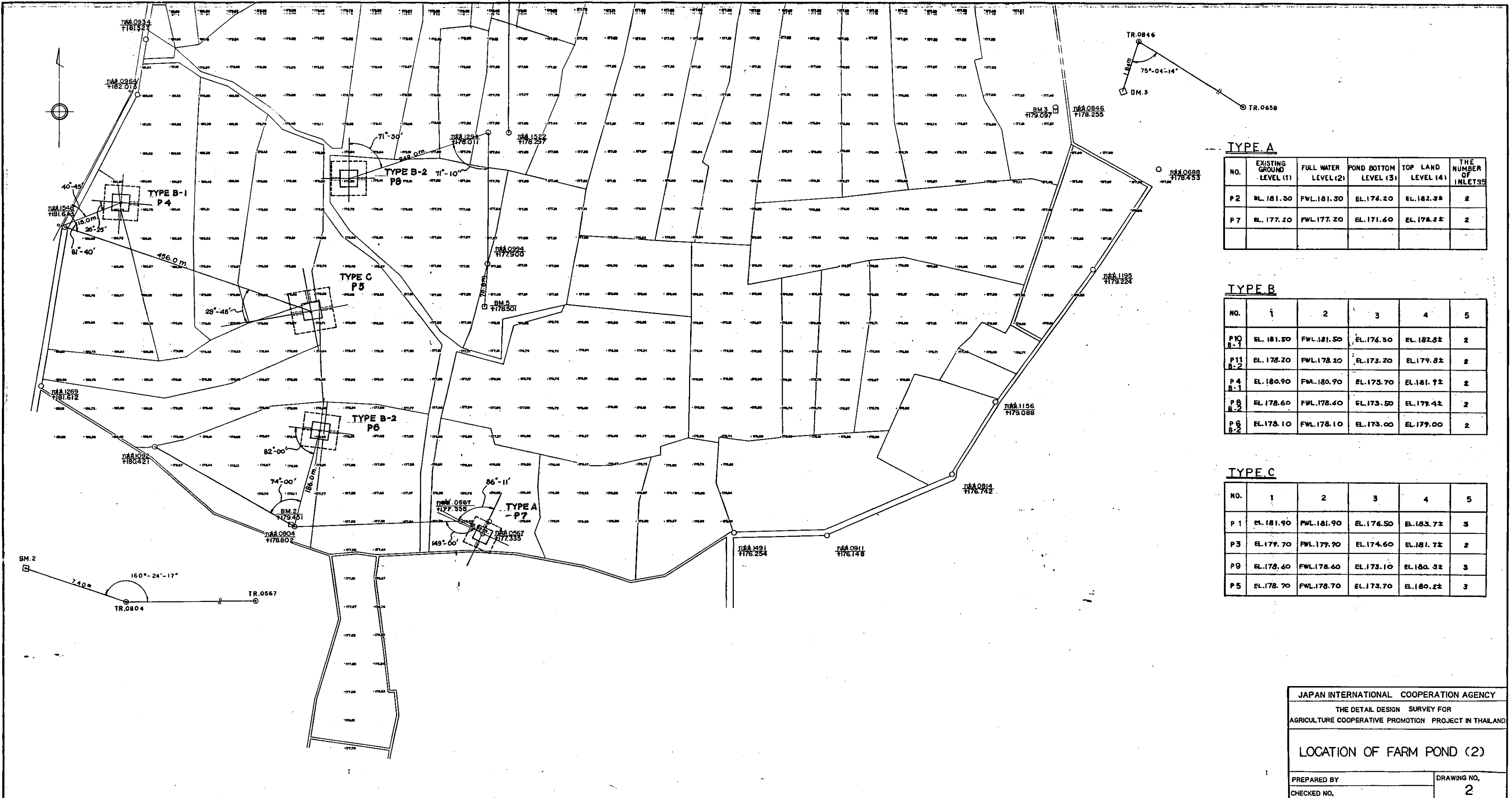
THE LIST OF DRAWINGS

1.	LOCATION OF FARM POND	( 1 )
2.	LOCATION OF FARM POND	( 2 )
3.	PLAN OF FARM POND	( 1 )
4.	PLAN OF FARM POND	( 2 )
5.	PLAN OF INLET	
6.	GENERAL PLAN OF OUTLET WORKS	
7.	PLAN OF OUTLET WORKS	( 1 )
8.	PLAN OF OUTLET WORKS	( 2 )
9.	CROSS SECTION	( 1 )
10.	CROSS SECTION	( 2 )
11.	GENERAL PLAN OF DIVERSION WORKS	
12.	PLAN OF DIVISION WORKS	( 1 )
13.	PLAN OF DIVISION WORKS	( 2 )
14.	PLAN OF REINFORCEMENT	
15.	CROSS SECTION	( 1 )
16.	CROSS SECTION	( 2 )
17.	DETAIL OF SLUICE GATE	( 1 )
18.	DETAIL OF SLUICE GATE	( 2 )
19.	CANAL WORKS	( 1 )
20.	CANAL WORKS	( 2 )
21.	CANAL WORKS	( 3 )
22.	CANAL WORKS	( 4 )
23.	CANAL WORKS	( 5 )
24.	CANAL WORKS	( 6 )
25.	CANAL WORKS	( 7 )



**STANDARD SECTION (TYPE C)**  
 SCALE 1:250  
 THE VALUE OF ( ) IS SHOWN TYPE-B-1  
 THE VALUE OF ( ) IS SHOWN TYPE-B-2  
 THE VALUE OF < > IS SHOWN TYPE-A

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
LOCATION OF FARM POND (1)	
PREPARED BY	DRAWING NO.
CHECKED NO.	1



**TYPE A**

NO.	EXISTING GROUND LEVEL (1)	FULL WATER LEVEL (2)	POND BOTTOM LEVEL (3)	TOP LAND LEVEL (4)	THE NUMBER OF INLETS
P2	EL. 181.30	FWL. 181.30	EL. 176.20	EL. 182.3±	2
P7	EL. 177.20	FWL. 177.20	EL. 171.60	EL. 178.2±	2

**TYPE B**

NO.	1	2	3	4	5
P10 B-1	EL. 181.50	FWL. 181.50	EL. 176.50	EL. 182.8±	2
P11 B-2	EL. 178.20	FWL. 178.20	EL. 173.20	EL. 179.8±	2
P4 B-1	EL. 180.90	FWL. 180.90	EL. 175.70	EL. 181.9±	2
P8 B-2	EL. 178.60	FWL. 178.60	EL. 173.50	EL. 179.4±	2
P6 B-2	EL. 178.10	FWL. 178.10	EL. 173.00	EL. 179.00	2

**TYPE C**

NO.	1	2	3	4	5
P1	EL. 181.90	FWL. 181.90	EL. 176.50	EL. 183.7±	3
P3	EL. 179.70	FWL. 179.70	EL. 174.60	EL. 181.7±	2
P9	EL. 178.40	FWL. 178.40	EL. 173.10	EL. 180.3±	3
P5	EL. 178.70	FWL. 178.70	EL. 173.70	EL. 180.2±	3

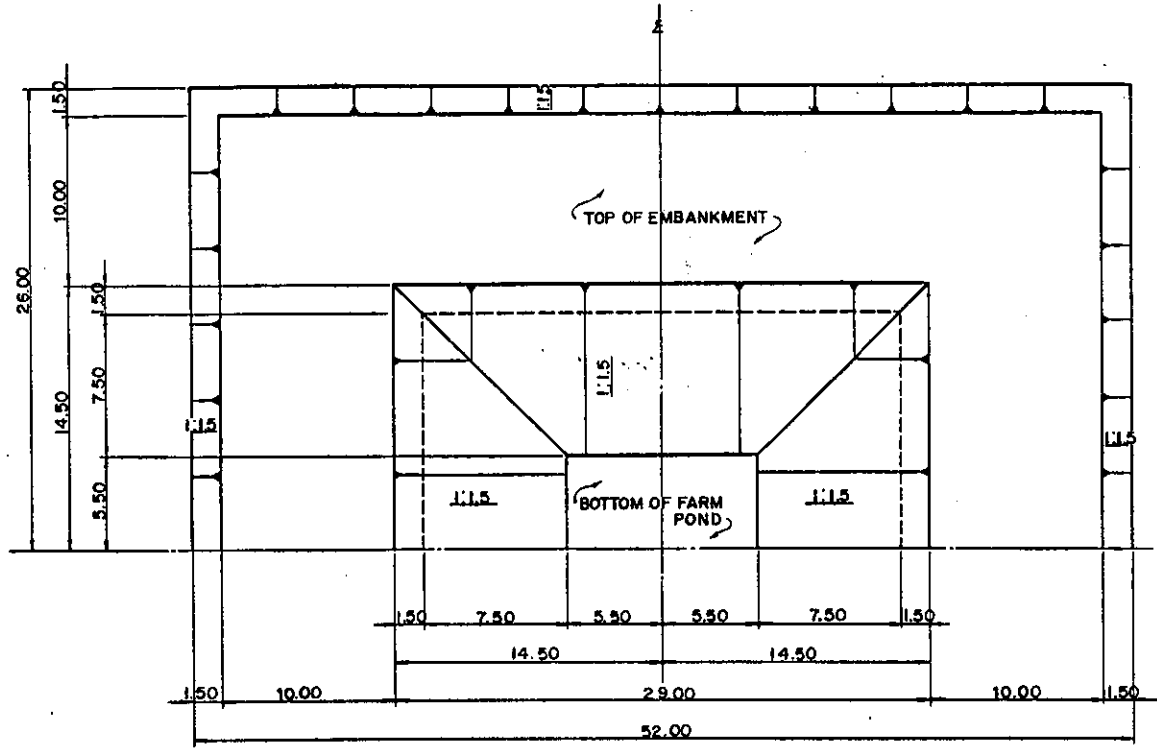
JAPAN INTERNATIONAL COOPERATION AGENCY  
 THE DETAIL DESIGN SURVEY FOR  
 AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND

**LOCATION OF FARM POND (2)**

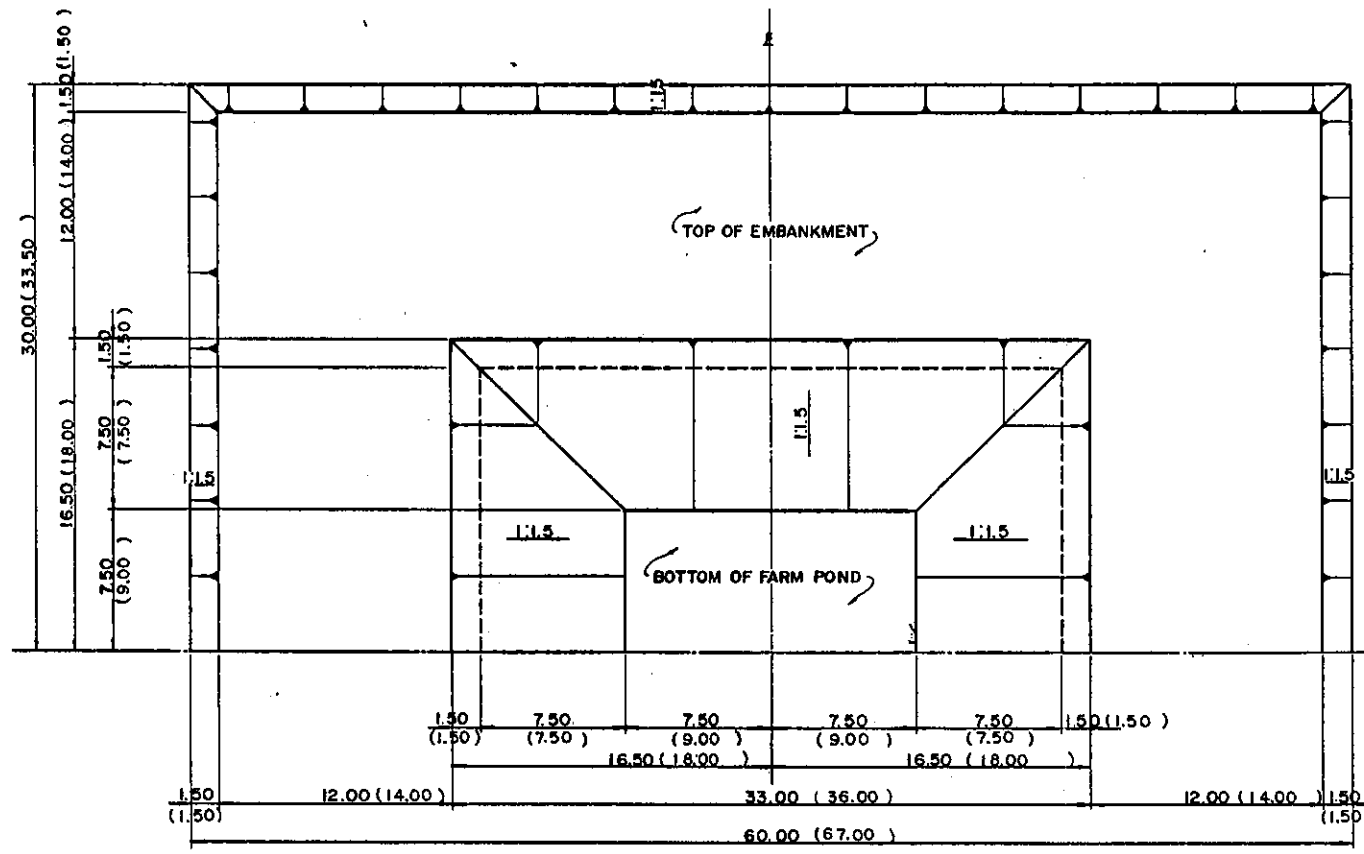
PREPARED BY \_\_\_\_\_ DRAWING NO. 2  
 CHECKED NO. \_\_\_\_\_

NOTE.

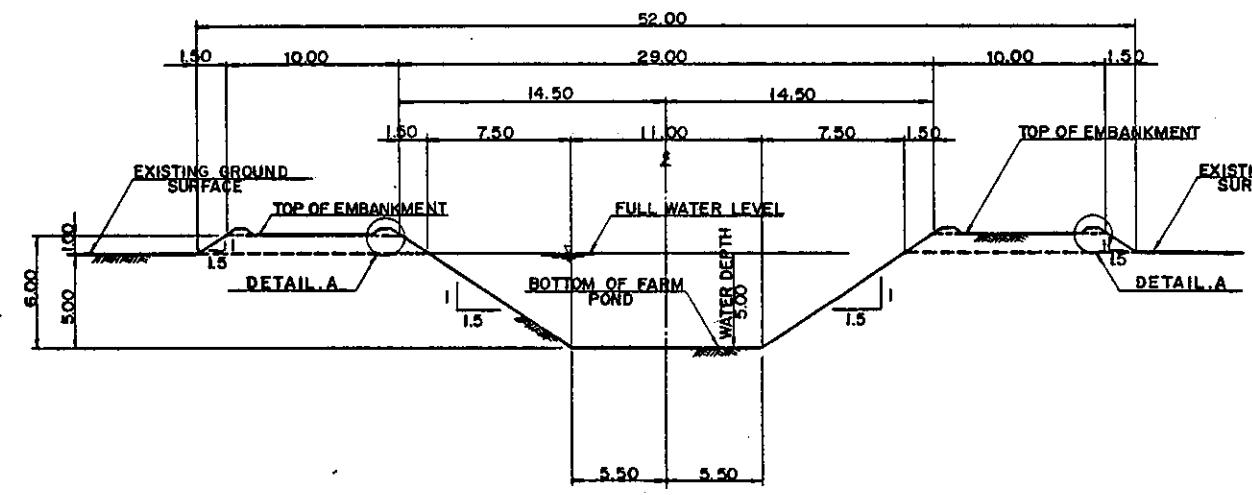
1. BEFORE THE COURSE OF COMPACTION THE CONTRACTOR SHALL TEST THE STANDARD COMPACTION TEST ACCORDING TO ASTM D-698-66T METHOD A OR JIS A 1210-1970.
2. THE SAMPLING PLACES FOR THE STANDARD COMPACTION TEST ARE INDICATED BY THE INSPECTION COMMITTEE. AND THE CONTRACTOR SHALL TAKE MORE THAN 3 (THREE) SAMPLES FOR STANDARD COMPACTION TEST AT ANY PLACE INDICATED BY THE INSPECTION COMMITTEE.
3. THE CONTRACTOR SHALL SUBMIT THE RESULTS OF THE STANDARD COMPACTION TEST TO THE INSPECTION COMMITTEE. ACCORDING TO WHICH, THE INSPECTION COMMITTEE WILL DECIDE THE WORKABLE RANGE OF MOISTURE CONTENT FOR THE COMPACTION.
4. THE CONTRACTOR SHALL COMPACT EARTH IN CASE ACTUAL MOISTURE CONTENT IS OUT OF THE WORKABLE RANGE. SHOULD THE CONTRACTOR TO COMPACT EARTH IN THE ABOVE MENTIONED STATE, THE CONTRACTOR OBTAIN THE PRIOR PERMISSION OF THE INSPECTION COMMITTEE.
5. DETAIL. A IS SHOWN IN DRAWING NO.4
6. EMBANKMENT (DETAIL.A) IS OMITTED IN PLANE OF FARM POND.



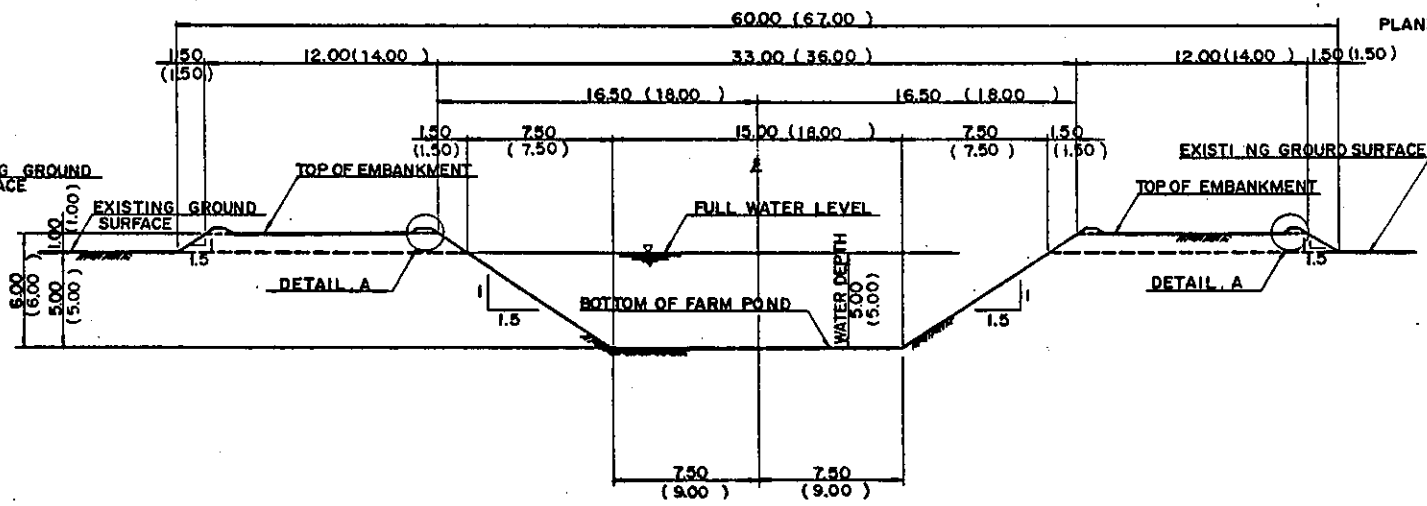
**PLANE OF FARM POND TYPE. A**  
SCALE 1:200



**PLANE OF FARM POND TYPE. B-1**  
SCALE 1:200



**STANDARD SECTION OF FARM POND TYPE. A**  
SCALE 1:200



**STANDARD SECTION OF FARM POND TYPE. B-1**  
SCALE 1:200

THE VALUE OF ( ) IS SHOWN TYPE B-2

JAPAN INTERNATIONAL COOPERATION AGENCY	
THE DETAIL DESIGN SURVEY FOR	
AGRICULTURE COOPERATIVE PROMOTION PROJECT IN THAILAND	
<b>PLAN OF FARM POND (1)</b>	
PREPARED BY	DRAWING NO.
CHECKED BY <i>[Signature]</i>	3



