

MINUTE OF DISCUSSIONS
ON
BASIC DESIGN STUDY ON THE PROJECT
FOR
GROUNDWATER DEVELOPMENT
IN
VIENTIANE PROVINCE
IN
LAO PEOPLE'S DEMOCRATIC REPUBLIC

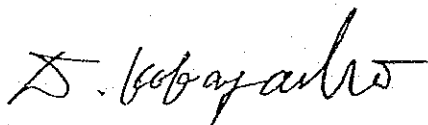
Based on the results of the preliminary study, the Japan International Cooperation Agency (JICA) decided to conduct a Basic Design Study on the Groundwater Development in Vientiane Province (hereinafter referred to as "the Project").

JICA sent to Lao People's Democratic Republic (the Lao PDR) a study team (hereinafter referred to as "the Team") headed by Mr. Shigeki KOBAYASHI, Grant Aid Division, Bureau of Economic Cooperation, Ministry of Foreign Affairs. The Team is scheduled to stay in the Lao PDR from 23th May to 24th June, 1993.

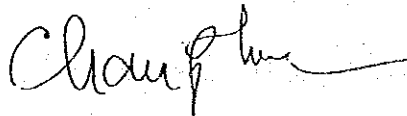
The Team held discussions with the officials concerned of the Government of Lao PDR (the Lao Government) and conducted a field survey at the study area.

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. The Team still proceed to further works and prepare a report of the Basic Design Study.

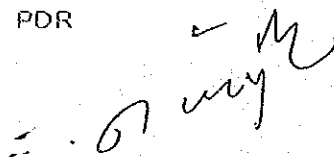
Vientiane, May 28th, 1993



Mr. Shigeki, KOBAYASHI
Leader
Basic Design Study Team
JICA



Dr. Champhone MONGKHONVILAY
Deputy Chief of Cabinet of
Ministry of Public Health,
Lao PDR



Mr. Mounekeo ORABOUNE
Governor,
Vientiane Province,
Lao PDR

ATTACHMENT

1. OBJECTIVE

The objective of the Project is to provide the people in Vientiane Province with adequate quantities of safe and easily accessible drinking/domestic water from wells, in order to promote public health and to improve living standards of inhabitants.

2. PROJECT AREAS

The Project areas are some villages in Phonhong, Thoulakhom and Keo-Oudom Districts in Vientiane Province.

3. EXECUTING AGENCY

Ministry of Public Health and the Vientiane Province are responsible for the administration and execution of the Project.

4. ITEM REQUESTED BY THE GOVERNMENT OF LAO PDR

After discussions with the Basic Design Team, the following item was finally requested by the Laotian side.

To provide villages with deep wells around 50m depth with necessary equipment such as pumps, spare parts and tools.

5. DISCUSSION FROM THE JAPANESE SIDE

The followings are pointed out by the Japanese side.

(1) The villages to be covered by Japan's Grant Aid, if any, would be selected taking the priority put by the Lao side and urgent needs for water in each village into consideration.

The urgency would be determined based on the present quality and quantity of water in dry seasons.

(2) Project management capability of the Lao side should also be taken into consideration when villages to be covered by Japan's Grant Aid are finally determined.

(3) System to supply water in each village would be selected among, but not limited to, the followings,

(a) To provide a village with deep well(s) with handpump(s).

(b) To provide a village with a deep well with an electric pump, and distribute water through an elevated tank to public faucets in several places.

6. JAPAN'S GRANT AID SYSTEM

- (1) The Government of Lao PDR has understood the system of Japanese Grant Aid explained by the Team.
- (2) The Government of Lao PDR will take the necessary measures, described in Annex I for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

7. SCHEDULE OF THE STUDY

- (1) The consultants will proceed to further studies in Lao PDR until 24th June, 1993.
- (2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around August, 1993.
- (3) In case that the contents of the report is accepted in principle by the Lao side, JICA will complete the final report and send it to the Government of Lao PDR by October, 1993.

8. OTHER RELEVANT ISSUES

- (1) On condition that Japan's Grant Aid is extended to the Project, the Government of Lao PDR will set a necessary organization and allocate necessary budget for operation and maintenance.
- (2) The Lao side expressed that they would organize a technical staff group in the Project implementation stage, in order to upgrade its technical level concerning planning, implementation, operation and maintenance of groundwater development.

Annex I

Necessary measures to be taken by the Government of Lao People's Democratic Republic in case Japan's Grant Aid is executed.

1. To secure the sites for the Project.
2. To clear, level and reclaim the sites prior to commencement of the construction.
3. To undertake incidental outdoor works such as gardening, fencing and gate in and around the sites.
4. To construct access roads to the sites including test boring sites prior to commencement of the construction.
5. To provide facilities for distribution of electricity, drainage and other incidental facilities to the Project sites.
6. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
7. To exempt taxes and to take necessary measures for customs clearance of disembarkation.
8. To accord Japanese Nationals whose services may be required in connection with the supply of products and the services under the verified contract such facilities as may be necessary for their entry into Lao PDR and stay therein for the performance of their work.
9. To maintain and use properly and effectively that the facilities constructed and equipment purchased under the Grant.

10: To bear all the expenses, other than those to be borne by the Grant, necessary for the implementation of the Project:

調査日程表 (1/2)

月日	曜日	業務・調査内容	
団員氏名		小林・下村・高柳・加地・渡部	
5/22	土	東京⇄バンコック(下村・高柳・加地・渡部団員)	
5/23	日	バンコック ⇄ビエンチャン到着 (同上) 今月19日に到着済の小林団長と合流	
5/24	月	ビエンチャン市	日本大使館表敬訪問、保健省訪問及びインセプション・レポート説明
		ビエンチャン県	ビエンチャン県訪問及びインセプション・レポート説明
5/25	火	ビエンチャン県	ビエンチャン県内サイト視察・調査
5/26	水	ビエンチャン県	同上
5/27	木	ビエンチャン市	ミニッツ案協議、市内浄水施設視察
5/28	金	ビエンチャン市	ミニッツ案協議、署名、大使館報告
団員氏名		小林・下村	高柳・加地・渡部
5/29	土	ビエンチャン⇄バンコック	ビエンチャン県 37・ホーリング用サイト決定 (全員)
5/30	日	バンコック⇄東京	ビエンチャン市 団内協議
5/31	月		ビエンチャン県 37・ホーリング用サイト視察 (高柳)
			ビエンチャン市 資料収集 (加地・渡部)
6/1	火		ビエンチャン県 Project Area内80村Interview (加地・渡部)
			ビエンチャン市 資料収集 (高柳)
6/2	水		ビエンチャン県 Project Area内80村Interview(全員)
6/3	木		ビエンチャン市 資料収集・整理 (全員)
6/4	金		ビエンチャン市 資料収集・整理 (全員)
6/5	土		ビエンチャン県 既存深井戸調査 (高柳・渡部)
			ビエンチャン県 主要サイト概略地図作成 (加地)
6/6	日		ビエンチャン市 団内協議
6/7	月		ビエンチャン県 既存深井戸調査 (高柳・渡部)
			ビエンチャン県 主要サイト概略地図作成 (加地)
6/8	火		ビエンチャン県 既存深井戸調査、 ホーリング 調査業務監理 (高柳・渡部)
			ビエンチャン県 主要サイト概略地図作成 (加地)
6/9	水		ビエンチャン市 資料収集・整理 (高柳・渡部)
			ビエンチャン県 主要サイト概略地図作成 (加地)
6/10	木		ビエンチャン県 Private Well調査、 (公共深井戸がない地区で個人用深井戸 が掘削されている例がないかを調査) 揚水試験 (高柳・渡部)
			ビエンチャン市 資料収集・整理 (加地)

調査日程表 (2/2)

月日	曜日	業務・調査内容	
団員氏名		渡部	高柳・加地
6/11	金	ビエンチャン⇒バンコック	ビエンチャン市 資料収集・整理、揚水試験
6/12	土	バンコック⇒東京	ビエンチャン市 資料収集・整理、揚水試験
団員氏名		高柳・加地	
6/13	日	ビエンチャン市	資料収集・整理
6/14	月	ビエンチャン市	資料収集・整理、地図作成、深井戸資料の整理
6/15	火	ビエンチャン市	資料整理、深井戸資料の整理
6/16	水	ビエンチャン市	資料整理、地質調査、深井戸調査、ホーリング 調査業務監理
6/17	木	ビエンチャン県	Phon Hong 病院関連地図作成及びインタビュー、電気探査準備
6/18	金	ビエンチャン市	資料整理、カクカーパートと協議（全員）、電気探査（高柳）
6/19	土	ビエンチャン県	主要サイトの概略地図作成（加地）、電気探査（高柳）
6/20	日	ビエンチャン市	技術上の協議事項について団内協議／公共水栓水道施設建設予定サイトの決定（全員）、電気探査（高柳）
6/21	月	ビエンチャン市	技術場の協議事項について資料作成／公共水栓水道施設建設予定サイトの決定（全員）、電気探査（高柳）
6/22	火	ビエンチャン市	カクカーパートと今後の技術上の方針について協議、モラング署名、井戸関連資料収集
6/23	水	ビエンチャン市	大使館報告、資料収集・整理
6/24	木	ビエンチャン⇒バンコック	
6/25	金	バンコック⇒東京	

付属資料 A-4 相手国関係者リスト

職 位	氏 名
<p>1. Ministry of Public Health</p> <ul style="list-style-type: none"> • Vice Minister, Ministry of Public Health • Deputy Chief of Cabinet, Ministry of Public Health • Deputy Manager of National Institute of Hygiene and Epidemiology, Project Manager of Water Supply and Environmental Health, Ministry of Public Health • Deputy Manager of Water Supply and Sanitation Project, Ministry of Public Health • Head of Groundwater Section, Water Supply and Sanitation Project, Ministry of Public Health • Officer of External Relation(Bilateral and NGO's), Ministry of Public Health 	<p>Dr. Rasmy KHAMPHAY Dr. Champone MONGKHONVILAY Dr. Nouanta MANIPHOUSAY Dr. Khumvieng VILAPHAN Mr. Kongkhan MIBOON Mr. Phoukhong CHONMALA</p>
<p>2. Vientiane Province</p> <ul style="list-style-type: none"> • President of Vientiane Province • Deputy Chief of Cabinet, Vientiane Province • External Economic Relationship Bureau, <div style="text-align: right;">Vientiane Province</div> 	<p>Mr. Mounekeo ORABOUNE Mr. Ling KHAM Mr. Oudons PHONGPHAYPADITH</p>
<p>3. Embassy of Japan</p> <ul style="list-style-type: none"> • 特命全権大使 • 一等書記官 • 二等書記官 	<p>和田 雅夫 佐藤 三郎 大豆生田 清志</p>

収集資料一覧表

報告書

- (1) 北部郡上水開発計画 (TA1607-LAO, Vol I, II, III) 及び付属資料
／ADB・ラオ水道公社、1993年 3月
- (2) 1987-1991 年間に実施された開発計画におけるラオス人民民主共和国政府と国際児童基金間の協力体制に対する中期報告／ユニセフ、1990年 6月
- (3) ラオス国地方給水衛生計画・10ヶ年計画の概要(Vol I, II) /ユニセフ、1991年 8月
- (4) 第3次5ヶ年計画・1992-1996 /公衆衛生局、1992年 5月
- (5) Tha Ngon地方復旧・開発計画／農業森林省、1989年
- (6) 地下水探査開発計画・ラオス国南部郡村落給水事業／公衆衛生省、1992年
- (7) Dansavan村給水計画／ユニセフ、1993年 2月

統計

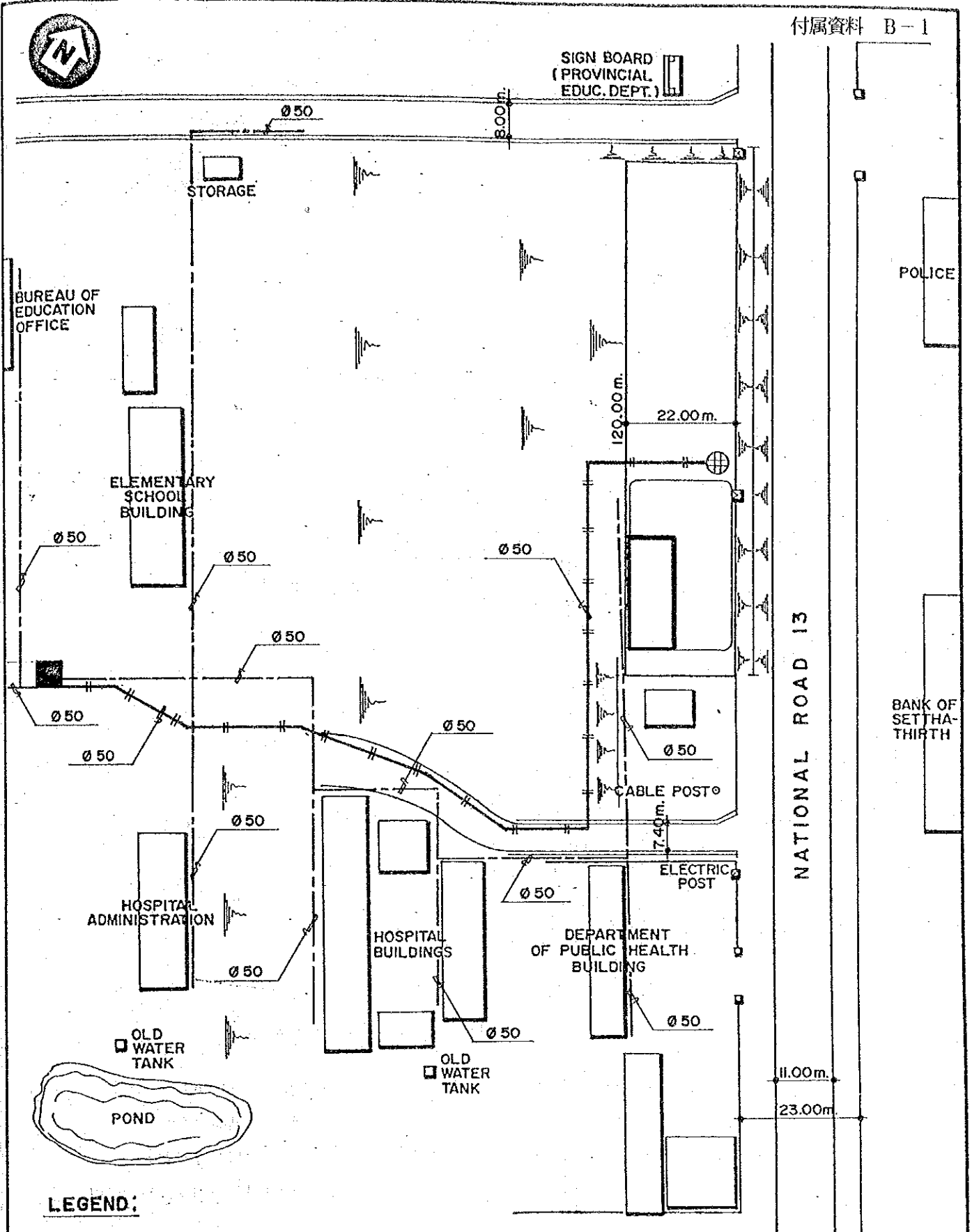
- (1) ラオス国における社会経済発展に関する基礎統計書
／企画協力委員会・中央統計センター、1991年
- (2) ラオス国における社会経済発展に関する基礎統計書
／企画協力委員会・中央統計センター、1992年

刊行書

- (1) ラオス国における投資／外国投資管理委員会・商工業会議所、1992年 6月

地図

- (1) ヴィエンチャン県地図 1/125,000 /国立地理院、1990年
- (2) ヴィエトナム-カンボディア-ラオス地質地図 1/2,000,000
／ヴィエトナム国立地理院、1971年
- (3) Thangon, Samphanna, Napho, Thinkeo村地図 1/100,000 /国立地理院、1985年・1986年



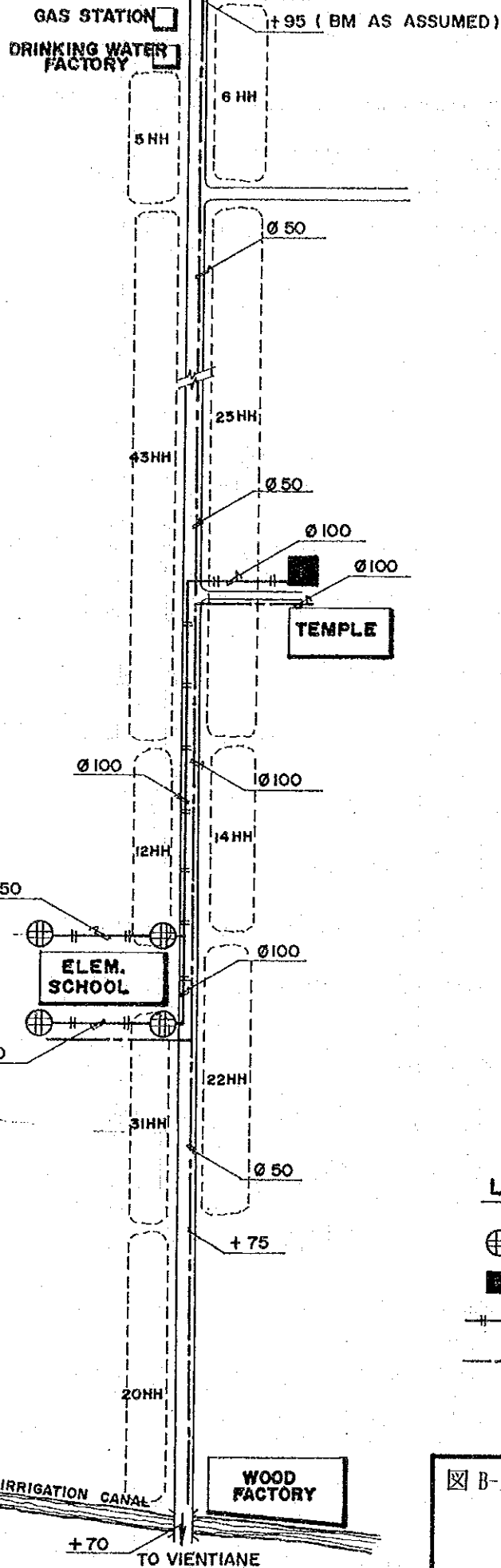
LEGEND:

- ⊕ DEEPWELL
- RESERVOIR
- == MAIN RISING
- MAIN DISTRIBUTION

☒ B-1-1

公共水栓式給水施設例
(Phon Hong 病院)

1700 m



LEGEND:

- DEEPWELL**
- RESERVOIR**
- RISING MAIN**
- DISTRIBUTION MAIN**

図 B-1-2

公共水栓式給水施設例

(Mail : #36)

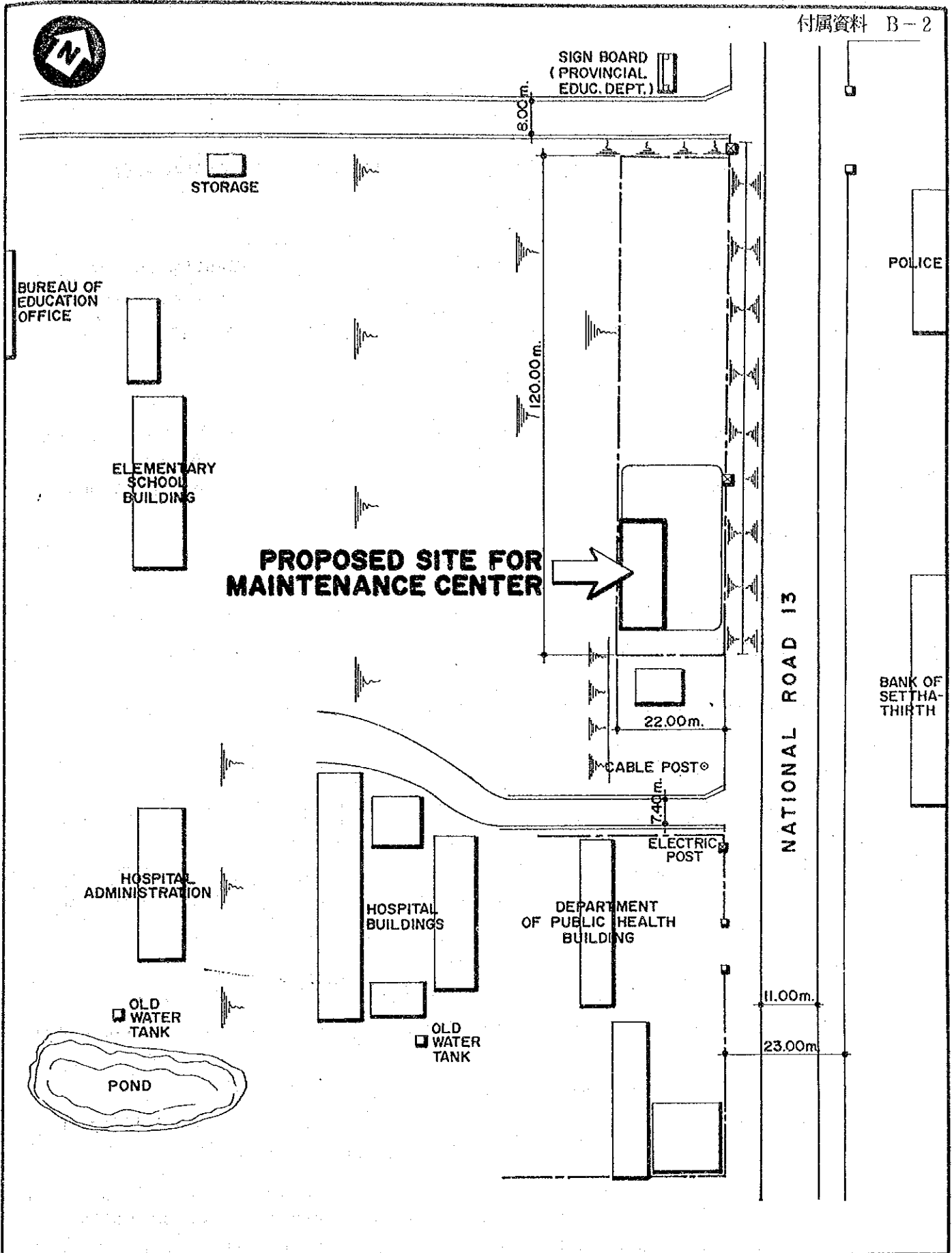


図 B-2
維持管理センター候補地位置図

APPLICATION FOR PUBLIC WATER SUPPLY FACILITY (CONTRACT)

We, household heads of the village _____
in the District of _____, in Vientian Province,
seek the construction of public wells under the assistance of Vientian
Province and the Ministry of Public Health in collablation with Japanese
Grant-Aid.

Since we understand the rule mentioned below which is enacted to build
sustainable operation and maintenance, we for apply the right to use the
public water supply system and we take an oath to observe the rules men-
tioned below.

- (1) We, the users, shall willingly take part in our responsibility to
operate and maintain the public water supply facilities (hereinafter
called the System).
- (2) To ensure the construction, smooth operation and proper maintenance of
the System, we shall bind ourselves to the following:
 - 1) That we will secure a suitable site for the project.
 - 2) That we shall pay a monthly contribution of _____ kip (hereinaf-
ter called the user's charge) to raise amount needed to maintain
the System.
 - 3) We shall support and cooperate our village chief, the inspector in
charge (hereinafter called the Inspector) and maintenance fee
collector (hereinafter called the Collector).
- (4) Operation and maintenance of the System shall be the responsibility of
villagers headed by the chief of the village.
- (5) The chief of the village shall appoint the Inspector and the Collec-
tor. The chief of the village shall get of the approval of these
appointments from a village assembly/committee.

- (6) Although public wells are a public service, all villagers are not necessarily able to use the facilities. Only those villagers who have signed this a application (written oath) can use the System and shall pay the Users Charge (monthly contribution) to use the System.
- (7) When a user delays to pay the User Charge, he/she shall be prohibited from using the System at the decision of the chief of the village.
- (8) When he/she who is prohibited to use the System has paid the arrears up to the time of the prohibition, he/she can use the System after signing the application and written oath again. However, even if he/she does not submit the reapplication form, the duty of the payment for the arrears up to the time of the prohibition shall not disappear.
- (9) The chief of the village shall deposit the remaining money collected from villagers after paying electric charges and other fees to Vientiane Province. Vientian Province shall pass a certificate of deposit to the chief of the village.
- (10) Vientiane Province shall open accounts in a bank for the abovementioned money on behalf of the chiefs of the villages. Vientian Province can withdraw from the account, for spare parts charges, rental charges of maintenance tools and actual expenses of repair by the province based on the certification issued by the chiefs of the villages.
- (11) Interest borne from the account shall revert to Vientiane Province and all villagers represented by the chief of the village shall abandon the right to claim the interest.
- (12) Vientian Province shall make a fund using the spare parts charge, the rental charge for maintenance tools and the actual expenses of repair by the province. The fund shall be used to procure new spare parts and tools for maintenance. Vientiane Province shall make an accounting for the exclusive record of the transactions mentioned above.
- (13) Both Vientiane Province and the Collector in the respective villages shall make a financial record for the village and shall be responsible

for its safekeeping. When an affiliated user or a chief of the village requests to examine the bookkeeping, it shall be opened to public.

- (14) Vientiane Province shall rent its maintenance tools for the System at a charge when a villager requests to rent the tools. However, neither the province or the villagers shall not use them for any other purposes.
- (15) The User's Charge shall be classified into Level I systems (point source) and Level II systems (piped water supply with public faucets) and the charge per household shall be fixed as a flat rate system. Revision of the charges shall be done by Vientiane Province provided that the revision shall not aim at any profits. Although a public faucet is equipped with a water meter, this is not for determination of monthly contribution but for pressure adjustment in order to convey water to the pipe ends.
- (16) The System is constructed only for domestic use and is not intended for commercial or industrial users. Therefore uses for commercial and industrial purpose are strictly prohibited.
- (17) Public faucets shall not be constructed in a road area for the protection of the facilities. It shall be constructed on public land i.e. the land donated to Vientiane Province by the inhabitants of the recipient villages. The act of donating the land does not release any person from the duty to pay the user's charges.
- (18) More than one organization for the maintenance of the System in any village shall not be established.
- (19) The chief of a village shall designate an auditor in order to have him/her audit the bookkeeping, the user charge collection situation, the expenses, the remaining money and the passbook of the bank once every six months. The auditor shall open the result to the public.
- (20) If the chief of a village, a village inhabitant or the auditor suspects the Inspector or the Collector of wrong doing, they can dismiss

the Inspector or the Collector after getting a majority agreement in the village committee/assembly.

Now, therefore, we here on set our hands this _____ day of _____, 19__.

	PRINTED NAME	SIGNATURE	TIN OR RCN
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付属資料 B-4 維持管理費の概算

DETAILS OF COST ESTIMATES

(1) DEEPWELL WITH HAMDPUMPS

DESCRIPTION

Number of Villages	:	47
Number of Households	:	5,154
Number of Pump Units	:	109
Population	:	37,544

OPERATION AND MAINTENANCE COSTS

Item	Calculation	Amount
Depreciation	$554,000k \times 0.9 \times 0.066 \times 109$	= 3,587,000
Transportation	$30km \times 5times \times 6l/km / 235kip/l \times 47/11$	= 904,000
Total		4,491,000

Cost per household $\frac{4,491,000}{5,154} = 871 \text{ kip/y} = 73 \text{ kip/HH/month}$

(2) WATER SUPPLY SYSTEM WITH PUBLIC FAUCETS

DESCRIPTION

Number of Villages	:	4 villages + 1 area (M. Center)
Number of Household	:	1,069
Number of Pumps	:	18
Population	:	7,349

OPERATION AND MAINTENANCE (Submerged Motor Pump)

Item	Calculation	Amount
Depreciation	$3,090,000k \times 0.9 \times 0.066 \times 18$	= 184,000
Labor Cost	$5persons \times 2days \times 5times \times 2000kip \times 4$	= 400,000
Transportation	$30km \times 5times \times 2days \times 6l/km \times 235 \text{ kip/l} \times 4$	= 1,692,000
Electricity	$10hrs \times 2.2kw \times 25kip/kwh \times 365days \times 18$	= 3,614,000
Water Line Repair	$14,736 \text{ m} \times 0.001\% \times 5800k/m$	= 85,000
Total		5,975,000

Cost per Household $\frac{5,975,000}{1,069} = 5,600 \text{ kip/y} = 470 \text{ kip/month}$

事業計画の規模は、当初の計画要請80村落から次のような条件により取捨選択が行われ、51村落および1地域となった。以下に取捨選択の理由について述べる。

① 合併した村（2村減少）

- ・ Phon Hong (No. 4) と Nong' Kork (No. 6) とが合併し、Phon Hong となる（②と重複）。
- ・ Nong Nak (No. 44) と Samboun (No. 57) とが合併し、Phon Ngeunと改称。
- ・ Tao Poune (No. 59) と MOUNG Khao (No. 60) とが合併し、Pakcheng Neua と改称。

② 既に他プロジェクトの実施が決定した村（8村減少）

- ・ アジア開発銀行による計画対象地域

Phonsi Tai (No. 2), Nam Linh (No. 3), Phon Hong (No. 4), Phon Kham (No. 5)
Nong' Kork (No. 6), Phon Xay (No. 7), Phon Ngam (No. 8)

- ・ フランスの無償援助による計画対象地域

Keun (No. 66)

③ 水理地質的に地下水開発が困難と判断された村（17村減少）

- ・ Nam Tcheng (No. 1) - 野外観察（村落周辺地域に砂岩の露頭あり）
- ・ Na Xom (No. 15) - 地質図による不透水層の地質分布状況と既存井情報
（村の3本の既存手掘浅井戸の建設中約8mの深度で頁岩層に遭遇）
- ・ Kham (No. 21) - 地質図による不透水層の地質分布状況と既存井情報
（既存手掘浅井戸の建設中頁岩層に遭遇）
- ・ Gnoat (No. 22) - 地質図による不透水層の地質分布状況と既存井情報
（既存手掘浅井戸の建設中頁岩層に遭遇）
- ・ Phon Haii (No. 29) - 地質図による不透水層の地質分布状況と既存井情報
（既存手掘浅井戸の建設中頁岩層に遭遇）

- Na Thep (No. 37) - 野外観察 (村落周辺地域に砂岩の露頭あり)
- Na Lao (No. 39) - 野外観察 (村落周辺地域に頁岩層の露頭あり)
- Na Bon (No. 45) - 電気探査結果による (不透水層の地質分布)
- Phon Savang (No. 49) - コアボーリング結果による
(粘土・頁岩層が地表近くに分布)
- Phon Ngeun (No. 50) - 野外観察 (村落周辺地域に砂岩の露頭あり)
- Phon Kham (No. 51) - 電気探査結果による (不透水層の地質分布)
- Na Kang (No. 70) - 電気探査結果による (不透水層の地質分布)
- Napoune (No. 75) - コアボーリング結果による
(粘土・頁岩層が地表近くに分布)
- Thasun (No. 76) - 地質図による不透水層の地質分布状況
- Thalal (No. 77) - 地質図による不透水層の地質分布状況と野外観察
(村落周辺地域に頁岩層の露頭あり)
- Thinkeo (No. 78) - 地質図による不透水層の地質分布状況と野外観察
(村落周辺地域に頁岩層の露頭あり)
- Phoukaokham (No. 79) - 地質図による不透水層の地質分布状況

当地域に分布する砂岩、頁岩層は中生代起源の地層であって、硬く固結していて不透水層となっている。

④ 既存の井戸で給水が十分賄えると判断された村 (2村減少)

- Na Song (No. 23) - 人口も村落の規模も比較的小さく、また、7井ある手掘浅井戸の全てが乾期にも涸れず、水の濁りもなく村人が現状に満足している。
- Phon (No. 33) - USAIDによって建設された深井戸が3本もあり、全て稼働していて給水に使われている。

以上を合計すると、計画より除外された村の数は、①2村減少 (Phon Hong と Nong' Kork は②他のプロジェクトに含まれるので除外)、②8村減少、③17村減少、④2村減少で、29村落となる。よって計画対象村落は51村落となる。さらにPhon Hong 病院付近に病院の給水も含めて維持管理センターへの給水施設を建設する計画であるので、1地区が加えられる。

JICA