

No. 5

BASIC DESIGN STUDY REPORT
ON
THE INDUSTRIAL REHABILITATION CENTER
IN
THE KINGDOM OF THAILAND

OCTOBER 1983

JAPAN INTERNATIONAL COOPERATION AGENCY

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No. 13744

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国際協力事業団	
受入 用日 584,19.25	122
登録No. 09987	94.7
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PREFACE

In response to the request of the Government of the Kingdom of Thailand, the Government of Japan decided to conduct a basic design study on the Establishment Project for the Industrial Rehabilitation Center and entrusted the study to the Japan International Cooperation Agency (JICA). The JICA sent to Thailand a study team headed by Mr. Shoji SHIGA, Vocational Training Bureau, Ministry of Labour from May 23 to June 11, 1983.

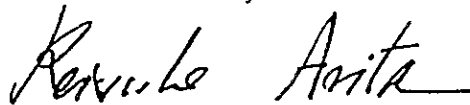
The team had discussions with the officials concerned of the Government of Thailand and conducted a field survey in Bangpoo, Phatum-Thanani Province.

After the team returned to Japan, further studies were made and the present report has been prepared.

I hope that this report will serve for the development of the Project and contribute to the promotion of friendly relations between our two countries.

I wish to express my deep appreciation to the officials concerned of the Government of the Kingdom of Thailand for their close cooperation extended to the team.

October, 1983

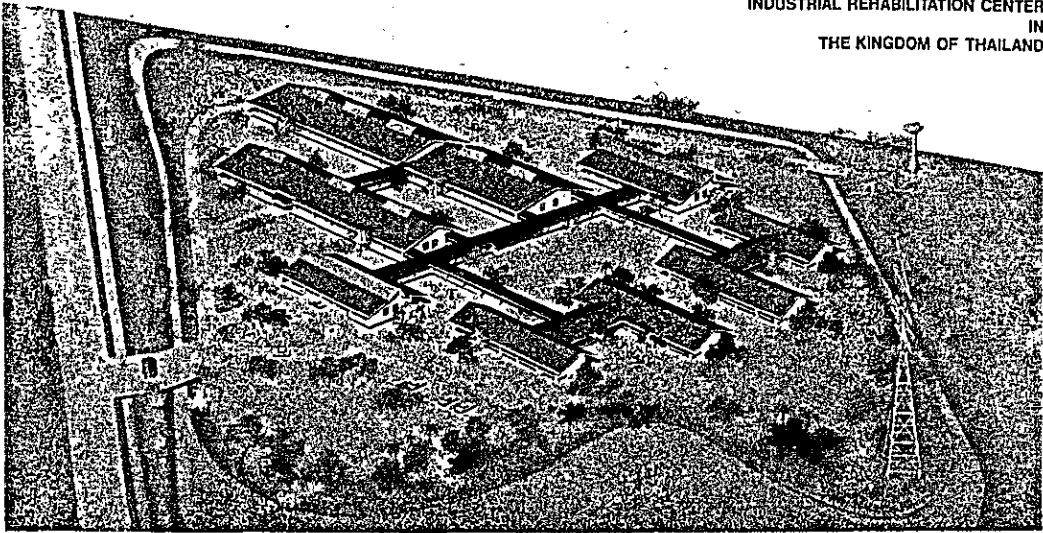


Keisuke Arita

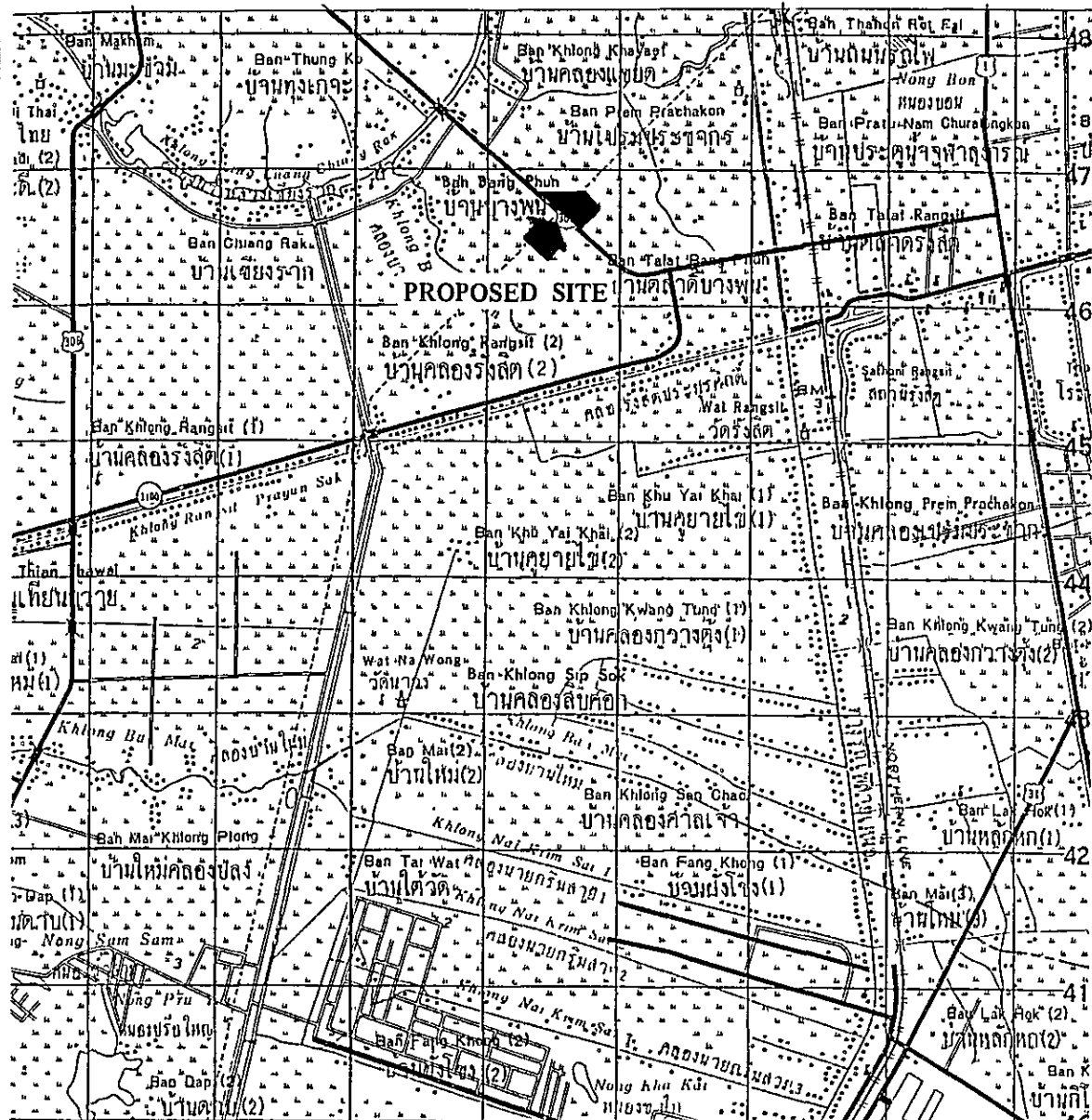
President

Japan International Cooperation Agency

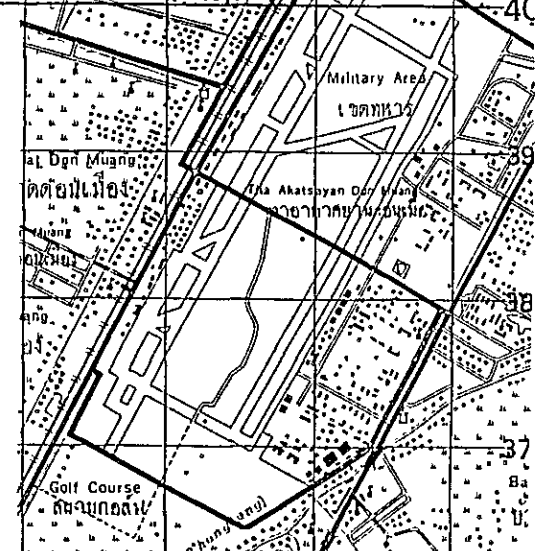
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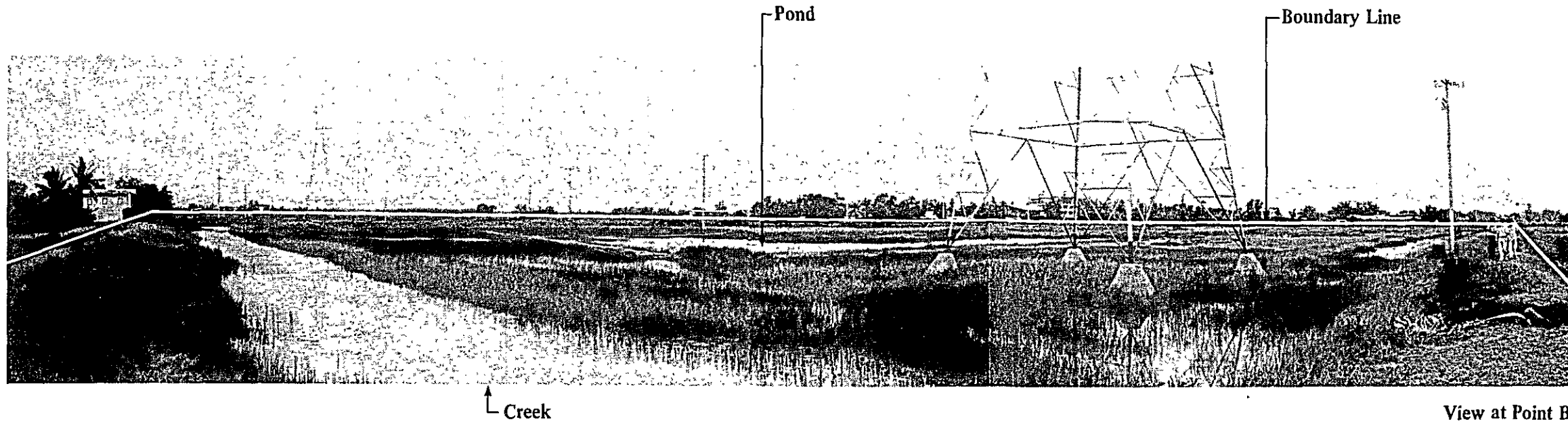
LOCATION MAP



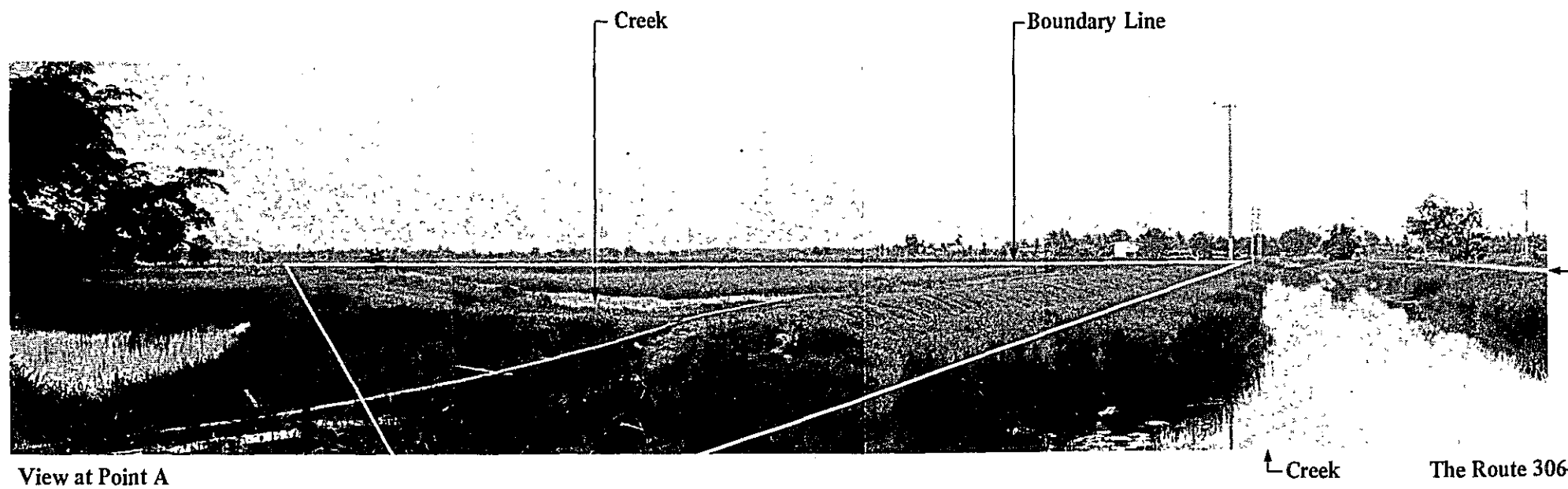
BANGPOON, PATHUM THANI PROVINCE



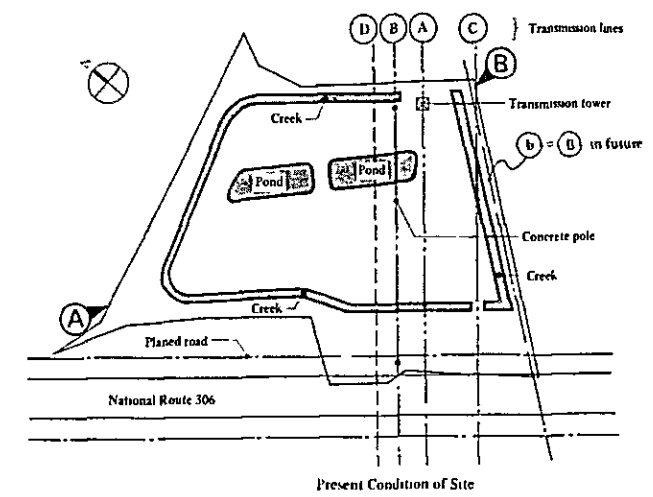
VIEW OF PROPOSED SITE



View at Point B



View at Point A



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SUMMARY

Under the auspices of its Fifth National Economic and Social Development Five-Year Plan (1981-1985), the Kingdom of Thailand is striving to convert itself from an agricultural to a semi-industrialized country with a strong manufacturing industry.

In line with this industrialization policy, however, there has been an increase in labor accidents. This situation has prompted the Government of Thailand to seek measures aimed at preventing such accidents, as well as those which will enable workers disabled as a result of industrial accidents to return to work as soon as possible. Thailand is pushing ahead with these measures in order to improve worker welfare and ensure it has a sufficient supply of skilled labour.

In 1979, the Government of Thailand established the Workmen's Compensation Fund as one of its measures aimed at helping disabled workers. This fund has been used to provide medical and disability compensation benefits to workers disabled through industrial accidents. However, to date Thailand has not had the facilities necessary to assist persons physically handicapped by labour accidents to restore their occupational abilities and to quickly return to the workplace.

The purpose for constructing this Industrial Rehabilitation Center (IRC), then, is to provide Thailand's disabled workers with occupational rehabilitation and the training necessary to restore their abilities to perform work (medical rehabilitation). It is also designed to encourage workers disabled as a result of industrial accidents to become self-supporting, as well as to improve employment opportunities for the disabled and overall worker welfare.

The proposed site for the construction of this Industrial Rehabilitation Center is located in the Bangpoo district of Phatum-Thani Province approximately 30 kilometers north of Bangkok. The facilities scheduled to be constructed will consist of the Administration Building, the Evaluation/Functional Training Building, and the Work Preparation/Training Building, the Canteen/Auditorium Building and the Dormitories for resident clients. As for the scale of this Project, all buildings will be single-story of reinforced concrete structures, the total floor area of which

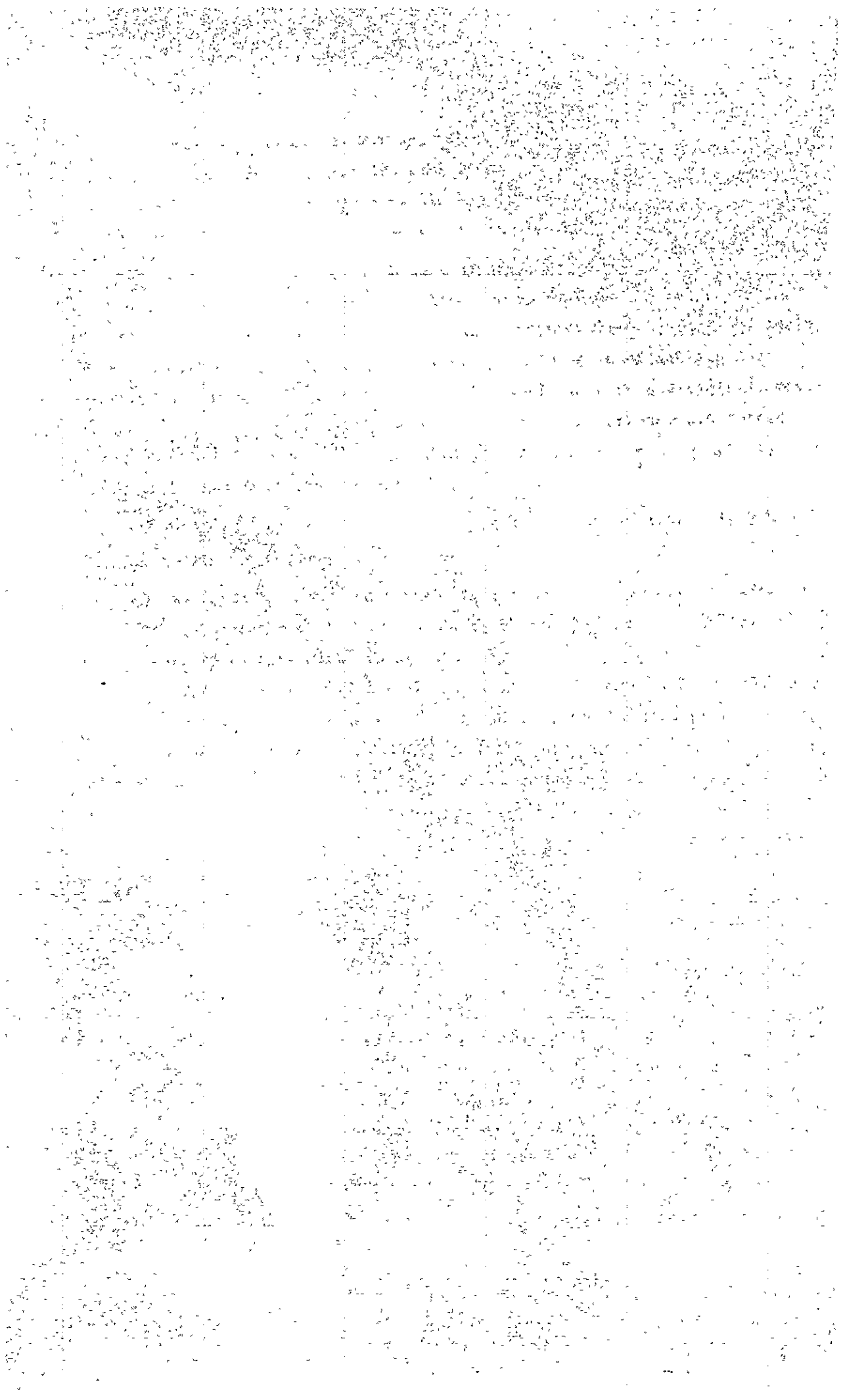
will come to 6,632 square meters. The construction period will be 12 months long. The construction work involved in this Project will be carried out on the authority of the Department of Labour, the Ministry of Interior.

This Project should prove very significant for Thailand's disabled workers in that it will provide them with facilities constructed under the Grant-Aid Agreement which will enable them to make the most of their remaining abilities to return to society in the role of workers and self-supporting businessmen. This will result in a considerable improvement over the present situation wherein these same persons are forced to give up any hopes of ever being able to return to society as active, working members of that society.

The following proposals are put forth in order to make this Project even more effective:

- 1) The funds necessary to run the Center should be secured in advance;
- 2) The selection of clients to undergo rehabilitation at the Center should be done with utmost care; and
- 3) Since these facilities will be the first of their kind in Thailand, consideration should be given to securing technical assistance from Japan to see that they are managed properly.

CHAPTER 1 PREFACE



CHAPTER 1 PREFACE

The Kingdom of Thailand has been promoting industrialization especially in the manufacturing industry as the key policy to improve its economic foundation. However, one unavoidable aspect of industrialization, unfortunately, is an increase in industrial accidents. Along with growing employment, the number of handicapped persons disabled by industrial accidents is also increasing. In view of this situation, creation of an industrial accidents prevention policy and measures designed to restore disabled workers and enable them to return to their work places as early as possible has become a big issue. In fact, this has become one of the most important labour policies in Thailand today.

One measure concerning disabled workers which is currently in effect in Thailand is the Workmen's Compensation Fund established by the Department of Labour, Ministry of the Interior in 1974. This fund makes grants of money available to persons disabled as a result of industrial accidents to cover medical costs and as compensation for their injuries. But there are no industrial rehabilitation facilities in existence to motivate these physically handicapped persons to restore their vocational skills and enable them to return to work quickly.

The Government of Thailand, therefore, under the Fifth National Economic and Social Development Five-Year Plan (1982-1986) is planning to establish the Industrial Rehabilitation Center (IRC) making use of the Workmen's Compensation Fund. In order to realize this plan, the Government of Thailand requested the cooperation of the Japanese Government in the form of Grant Aid.

Responding to the request, the Japanese Government decided to conduct the Basic Design Study. Japan International Cooperation Agency, on behalf of the Japanese Government, dispatched the Basic Design Study Team to Thailand from May 23 to June 11, 1983, headed by Mr. Shoji SHIGA, a member of the Vocational Training Bureau, Ministry of Labour.

Surveys were made on the following aspects, taking into account the results of two preliminary studies carried out in the past; one on the Industrial Rehabilitation Center Scheme in November, 1982, and the other on technical cooperation related to the IRC Scheme in March, 1983.

- 1) Confirmation of Thai Government Requests;
- 2) Collection of data necessary to decide the scale and functions necessary for the construction of the IRC, as well as to study the appropriateness of the Project;
 - a. Investigations related to the planned construction site
 - b. Infrastructure situation
 - c. Construction conditions.
 - d. Gathering data on the Thai construction system and budget to use as material for Project planning

The fundamental points of agreement concerning this Project were reached at a meeting held between representatives of the Government of Thailand and the Japanese Study Team, while the latter was in Thailand conducting the survey for this Project. These points have been compiled in the form of minutes, and both parties have signed copies of these minutes.

The Japanese Study Team analyzed and studied the results of the surveys they conducted in Thailand and drew up a basic set of plans for the carrying out of the Project. A draft of the Basic Design were explained to representatives of the Government of Thailand in Thailand between August 16, 1983 and August 25, 1983. Also, the contents of these plans were transformed into basic design specifications to fulfill the information requirements for the Grant-Aid Agreement with Japan.

See Appendix I-1 for Basic Design Study.
(Members of Team, Diary, Minutes Copies)

See Appendix I-2 for Confirmation of Basic Design Study.
(Members of Team, Diary, Minutes Copies)

CHAPTER 2 PROJECT BACKGROUND

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is crucial for ensuring transparency and accountability in the organization's operations.

2. The second part of the document outlines the specific procedures and protocols that must be followed to ensure the integrity and security of the data.

3. The third part of the document provides a detailed overview of the various systems and tools used to manage and analyze the data, highlighting their strengths and limitations.

4. The fourth part of the document discusses the role of the data in decision-making and the importance of using it to drive strategic initiatives and improve organizational performance.

5. The fifth part of the document addresses the challenges and risks associated with data management and provides strategies to mitigate these risks and ensure the long-term success of the organization.

6. The sixth part of the document concludes by summarizing the key findings and recommendations, and emphasizes the need for ongoing monitoring and evaluation to ensure the continued effectiveness of the data management strategy.

7. The seventh part of the document provides a list of references and resources used in the research and analysis, and includes contact information for the authors and the organization.

8. The eighth part of the document is a glossary of terms and definitions used throughout the document, providing clarity and consistency in the language used.

9. The ninth part of the document is an appendix containing additional information and data that supports the main findings and conclusions of the document.

10. The tenth part of the document is a final section that provides a summary of the document and its key findings, and includes a call to action for the organization to implement the recommendations and improve its data management practices.

CHAPTER 2 PROJECT BACKGROUND

2-1 Labour Conditions in Thailand

2-1-1 Industrialization and Employment Situation

According to a Labour Force Survey conducted in 1980, the employment structure of Thailand consists of a work force (over 11 years old) of 22.73 million (this is 48% of the total population). Of these potential workers, 22.52 million are engaged in work of some kind, while 210 thousand are jobless. The unemployment rate is therefore around 0.9%.

Employment by industry breaks down to 70% of the work force being engaged in agriculture, forestry and/or fisheries related work. Following this, about 8% of the remaining work force are engaged in jobs in commerce, service-related and/or manufacturing industries. The manufacturing industry in particular has shown a drastic increase in workers, rising at a rate of 10.1% a year during the 1970's in line with the Thai Government's promotion of industrialization. Jobs in the fields of construction, electricity, gas and water are also increasing in number, while agriculture, forestry and fisheries, mining and quarry work are beginning to show a slight decrease (see Appendix II-1-1 Employment Trends by Industry 1960-1980).

The ratio of male to female workers indicates that dependence on female labour is quite high (47-48% of all workers during the past 20 years have been women).

Since most of the work force are engaged in agriculture, forestry and/or fishing, the status of employment in Thailand is primarily self-managed businesses and family-run concerns. However, the number of employed workers are steadily increasing. By 1980, this number had reached 4.9 million (22% of all workers). In addition, employed workers are concentrated in either Bangkok or other cities, and most of them (81%) are unskilled workers with only a 4th grade education.

According to statistics, the unemployment rate is only 0.9%, but this is because part-time workers were included in the calculations (short working hours, extremely low wages, not engaged in suitable jobs).

The labour force in agricultural villages and those workers who came to the cities from farming villages fall under this category. Statistics for 1980 alone indicate that there are 4.55 million part-time workers in Thailand.

According to the Fifth National Economic and Social Development Five-Year Plan, the Thai work force is estimated to increase an average of 2.7% a year between 1982-1986. This implies that if between 600 to 700 thousand new job opportunities are not created every year, the country will not even be able to maintain its present level of employment. Furthermore, the current economic slump which has been going on for some time now, is closing the labour market to new graduates (especially from universities and colleges) and accelerating dismissals which will push up the total unemployment rate.

This kind of employment situation is also driving more and more workers to try to find jobs outside of the country; in the Middle East, Singapore or other nearby countries. As of 1982, the number of workers abroad was reported to be between 160-180 thousand. The Government has been encouraging this trend to find jobs outside of the country in order to increase its acquisition of foreign currencies.

2-1-2 Working Conditions of Employed Workers

(1) Wages

Since there is limited demand for employees in modern industrial sectors, and since the supply of unskilled workers is so great compared to the few skilled workers available, wages are always pushed to the minimum level. According to a survey on the wages of unskilled workers conducted by the Thai Central Bank in 1980, the national average income is 1,277 baht per month, and in Bangkok is 1,349 baht per month. This indicates that actual wages were lower than the Minimum Wage Requirements of 54 baht per day in Bangkok and 47 baht per day in outlying regions. Furthermore, according to a survey conducted by the National Wages Committee in 1981 on the family budget of unskilled workers, every family surveyed showed a monthly deficit averaging around 16 baht.

Thus, it is quite clear that the level of wages in Thailand is still very low. However, since 1973, the rising cost of living, democratization and organization of the labour unions have combined to energize the labour offensive in Thailand resulting in the Minimum Wage Standard. This Standard has helped raise wages in modern industries, improving wage conditions significantly.

Individual worker's wages are decided based on one's educational background, employment history and skill levels. Especially in modern industries, educational background is a big factor in deciding a workers basic wage rate. For example, the basic wage of a civil servant who graduated from senior high school is 1,255 baht, plus living allowance of 270 baht. Civil servants with university degrees (bachelor degrees) get 2,765 baht, plus a living allowance of 200 baht.

In addition to monthly wages, raises are generally received once a year and a one or two month year-end bonus is paid. As for fringe benefits, meal subsidies, medical treatment, work uniforms and a bus for commuting to and from work are commonly made available by manufacturing industries in particular.

Laws and regulations in effect regarding wages are mainly concerned with Minimum Wages, discharge allowances and overtime wages. All of these laws and regulations fall under the provisions set forth by the Ministry of Interior in "Announcement No.103 of the National Executive Council".

The basic wage stipulated in the Minimum Wage Standard adopted in Feb., 1973, was 12 baht per day for workers in the Bangkok area. This was amended in Sept., 1982 to 61 baht per day for workers in the Bangkok area and 52 baht per day for those in other areas. This rate is still in effect today.

The Minimum Wage Standard applies to all workers except civil servants and workers who are still working at a company on a trial basis (2 months of employment). In reality, however, small- and medium-sized industries in outlying areas can hardly afford to conform to this standard (it is said that more than 50% of all companies with more than 20 employees are not able to follow this

standard.). Each time the Government has tried to enforce these minimum wage regulations legally, the companies dismiss the workers and/or shut down their factories, thus creating increasing unemployment. Therefore, nothing can be done about this situation at the moment. Since there are no up-to-date statistics on average workers wages in Thailand (there are no average workers), the Minimum Wage Standard can be applied as an effective index of what the level of wages should be. The Minimum Wage is decided by the National Wage Committee, composed of representatives from the Government, labour and management, who meet every year and base their decision on basic data on price fluctuations and surveys on the household expenses of workers.

(2) Working Hours

Working hours are specified by law to be 48 hours a week or less with at least one day off (commerce workers must put in 54 hours a week, while those engaged in dangerous and/or lethal work are legally limited to 42 hours a week and/or 7 hours a day). However, working hour are actually much longer. Many small industries and shops take no holidays. On the other hand, government offices, schools, banks and foreign capital industries take two days off a week. Working hours at government offices are from 8:30 to 12:00 and 13:00 to 16:30, 35 hours a week.

Concerning holidays, workers get more than 13 national holidays a year. Moreover, workers have the right to take up to 30 days sick-leave annually. Both holidays and sick-leave are counted as paid holidays for permanent workers.

2-2 Conditions and Policies Concerning Disabled Workers in Thailand

2-2-1 Conditions of Disabled Workers

Industrialization is no doubt a big factor in promoting economic growth in Thailand. It has also helped increase job opportunities for industrial workers. However, at the same time, industrialization has resulted in more and more work-related accidents, especially in those plants and factories where safety measures and controls were not applied to machine operation and working methods.

In view of this situation, in 1974, the Workmen's Compensation Fund was established to help persons disabled as a result of work-related accidents to recover. The Fund provides both medical and economical compensation. The present status of disabled workers in Thailand can be grasped from the number of requests for compensation submitted to the Fund. The following is a summary of findings in this area (See Appendix II-1-2 Numbers of Disabled Workers 1974-1982).

Year by year, the number of disabled workers is increasing in Thailand. The first year following the establishment of the Fund, the number of disabled workers was 3,200. However, by 1982, the number had increased to 29,510, a nine-fold increase in nine years. (Partly as a result of the expansion of geographical coverage) The number of persons who became partially disabled in 1974 was 2,704, and by 1982, this figure had risen to 28,115 persons. This is more than a ten-fold increase.

The rate of increase in the number of permanent partial disability and permanent total disability fluctuates year to year. In 1982, permanent partial disabilities numbered 1,094. In comparison to the previous year's figure of 1,275 persons, this was a decrease of 181 persons. Permanent total disabilities numbered 13 in 1982, an increase of three over the previous year. Since the Workmen's Compensation Fund was first promulgated in 1974, a total of 8,996 disabled workers have submitted requests for compensation during the nine years up to 1982, of whom permanent total disabilities for 63.

Workers covered by the Workmen's Compensation Fund as of 1982 were limited to those workers in companies with more than 20 employees in 33 of Thailand's 73 provinces (companies with total 841,000 workers). These figures would indicate that there are more disabled workers nationwide than are currently being covered by the Fund.

Industrial Accidents by Industry (1981) are listed below.

Food, drink and tobacco manufacturing industries	4,490 persons
Metal products and machine manufacturing industries	4,485 "
Construction industry	2,759 "
Textile and clothing manufacturing industries	2,545 "
Transportation machinery manufacturing and repair industries	2,541 "

The number of disabled workers (Permanent partial disabilities and permanent total disabilities) in 1981 was 1,285. The causes and the disabled portions of the body are listed below.

1) Cause		
	machines	883 (69%)
	pressure	115 (9%)
	falling objects	92 (7%)
	others	195 (15%)
	<hr/>	
	Total	1,285 (100%)
2) Disabled portion of the body		
	hand & fingers	1,054 (84%)
	feet & toes	73 (6%)
	multiple injuries	40 (3%)
	eyes	35 (3%)
	others	83 (6%)
	<hr/>	
	Total	1,285 (100%)

According to a sample survey (number of samples 400) conducted by the Workmen's Compensation Fund Division of the Department of Labour on those people receiving compensation, the disabled persons situation in Thailand can be described as follows.

(1) Degree of Disabilities and Types of Injuries

Of the disabled workers sampled in this survey, 29% had slight injuries, 40% had suffered medium injuries and 31% were seriously injured in work-related accidents. Most of the injuries involved the workers' hands, fingers or arms (upper limbs), accounting for 84% of total disabilities. This was followed by injuries of feet or legs (lower limbs) 7%, then eyes 5% and others 4%. Further, 71% of all upper limb disabilities were functional disorders (the remained 29% being amputees). (See Appendix II-1-3 Degree of Disabilities and Types of Injuries)

(2) Age of Disabled Workers

The majority of those persons disabled due to industrial accidents are in their twenties. If we compare the number of disabled workers under 30 years of age with the total number of workers in the same age bracket, we see that 77% of all disabled workers are less than 30 years old, while 51% of all workers fall in this same age group. The percentage of disabled workers over 40 years old as compared to the ratio of total workers over 40 is 11% versus 26%, respectively. This indicated that most disabled workers are of the younger generation. (See Appendix II-1-4 Ages of Disabled and General Workers)

(3) Educational Degree of Disabled Workers

As for educational degree of disabled workers, 83% of them completed primary school (4th degree), and 16% of disabled workers graduated from technical school. On the other hand, as for non-disabled workers, 79% of them completed primary school (4th degree), 12% of them are non-educated workers. Therefore, it can be said that the educational level of disabled workers is higher than non-disabled workers. (See Appendix II-1-5 Educational Degree of Disabled Workers).

(4) Disabled Workers Ability to Return to Work by Degree and Types of Injuries

Of the total number of disabled workers in Thailand, roughly 79% have been able to return to their former employment. Of the 316 disabled workers to do so, about 81% or 255 individuals were able to get back their old jobs. Only one of these disabled returnees had to change employment. This proves how difficult it is for disabled workers to find new employment in Thailand.

These statistics do not indicate the number of persons who have started their own businesses, however. According to the explanation provided by the staff members of the Workmen's Compensation Fund Division, Department of Labour, the organ which conducted the survey, those workers who managed to start their own business were included in the category of "no-job" for the purposes of this survey.

When the rate of return is observed from the standpoint of the degree of the injuries sustained, it was apparent that the more serious the injury, the harder it is to get one's old job back (slight injuries 92%, medium injuries 60%, serious injuries 41%). Therefore, the ratio of seriously disabled workers either starting their own businesses or remaining without a job is high. (See Appendix II-1-6 Disabled Workers Ability to Return to Work by Degree and Types of Injuries)

2-2-2 Conditions of Compensation to Disabled Workers

According to the "Announcement of the Ministry of Interior Concerning Protection of Workers", employers are obligated to pay industrial compensation to those workers who are disabled or to the bereaved family of those who died as a result of work-related injuries or disease. The Workmen's Compensation Fund, established in 1974, assumes most of the burden for such compensation in place of the employer. This Fund is the only social security program existing in Thailand at present. It is under the authority of the Department of Labour. The insurance rate is decided according to the type of work in which the disabled workers are not engaged (0.2 - 4.5%),

and the Minister of Interior decides the range of these payments, which shall not exceed 10/100 of a worker's total annual salary and reserves shall not exceed 25/100 of total annual insurance income.

Premium or discount insurance rate may be levied depending on the circumstances surrounding the disabled workers accident.

Compensation under this system is as follows:

- | | |
|--------------------------------|--|
| 1) Medical care expenses | max. 30,000 baht (including artificial limbs) |
| 2) Compensation for work | 60% of the worker's monthly salary (min. of 1,000 max. of 6,000 baht) for up to 52 weeks |
| 3) Compensation for disability | 60% of the worker's monthly salary for up to 10 years |
| 4) Compensation for survivors | 60% of the worker's monthly salary for up to 5 years |
| 5) Funeral costs | 3 months salary (min. 5,000, max. 10,000 baht) |

In addition, since the ceiling for medical care expenses is 30,000 baht, most of this amount is used up for medical treatment alone in the case of serious injuries, thus making rehabilitation impossible.

The Fund took in a total of 2.58 million baht during 1981, of which 1.48 million baht went for compensation. This works out to a 1.1 million baht surplus. Thus, the reserve of surplus funds by the end of fiscal 1981 had reached 3.96 million baht (2 million baht of which was accounted for by the accumulation of interest).

2-3 Conditions and Countermeasures of Preventing Industrial Accidents

Taking seriously the increasing number of industrial accidents, the Ministry of Interior, the Department of Labour has been extending efforts in strengthening the industrial safety and health measures and in the fulfillment of measures against disabled workers for the prevention of industrial accidents. Under the industrial safety and health measures, the safety standards for 7 types of work, namely, machine, electricity, construction, diving, chemical substance, working environment (noise, temperature, intensity of light) and construction-use lift, are in force at present. Guidance and supervisions are extended by the labour standards inspectors (now there are 25 inspectors in Bangkok and 20 in the local areas), however, there are problems such as 1) lack of safety and health knowledge among workers, employers and inspectors, 2) insufficient number of inspectors comparing to the number of factories in operation, 3) incompleteness of facilities at the supervisory offices, and 4) an authority to suspend the use of dangerous machineries is at the hand of the Ministry of Industry where there is not enough linkage with the Department of Labour. In this connection, the Department of Labour is under preparation for the establishment of the National Institute of Occupational Safety and Health. And ILO is extending technical cooperation with UNDP Fund for the construction of the Institute from March, 1983 for 3 years. Activities to be promoted in this Institute will be 1) efficiency improvement of the safety inspectors, 2) improvements of technologies and facilities for safety trainings, 3) survey and research, and 4) collection and offer of information concerning safety and health.

2-4 Conditions and Countermeasures of Medical Rehabilitation

2-4-1 Medical Service

(1) Medical Expenses

At present, there is no medical insurance system in Thailand except the Workmen's Compensation. Generally, those patients who are not able to pay for the medical treatment will be exempted from the payment at the public hospitals. Monetary supplementation to the public hospitals depend on either the subsidies of the government or donations of the general public. According to the statistics, it can be observed that average days of hospitalization of the patients are extremely short.

Total 30,000 baht of medical expenses are paid under the Workmen's Compensation. However, this amount is still not enough to cover the total treatment expenses for injuries caused by industrial accidents. Currently, it is said that the Department of Labour is seeking the possibilities of providing rehabilitation expenses aside from the medical expenses.

(2) Medical Facility

Roughly divided, there are national hospitals under the authority of the Department of Public Health, private hospitals and clinics in Thailand. Regarding national hospitals excluding the hospitals with special functions, there are five city hospitals in Bangkok, one regional hospital and one or two provincial hospitals in each province. All are the general hospitals. Additionally, there are four or five district hospitals in each province where the general practitioners are available. Further, there are small scale health-care centers where regular doctors are not available in some places. Aside from these, there are seven medical college-attached hospitals and five army and police-attached hospitals.

(3) Doctors

There are about 8,000 licensed medical doctors in Thailand now, however, it is assumed that about 1,500 of them live outside the country. Ratio of population to one doctor is 7,224 persons which clearly indicates the lack of doctors. 80% of the doctors are tend to concentrate in the city area (50 to 60% of them are concentrated in Bangkok or its surrounding areas).

There are seven medical colleges. Every year, there are 600 graduates, and they are obligated to work at the rural areas scarce of medical care for two years after the graduation.

(4) PT (Physical Therapist)

At present, there are about 250 licensed PTs, however, the number actually engaged in work is only about 125 and 35 of them live outside the country.

Average four to five PTs are working at the university hospitals, two to three at the regional hospitals and one to two at, not all, but some of the provincial hospitals.

There are 20 graduates from 4-years universities every year, and in 1983, three new facilities of this kind will be constructed.

(5) OT (Occupational Therapist)

The first eight OTs will graduate from Chaing Mai University in 1983.

At present, there are only one or two OTs working at the large scale hospitals or at the university attached hospitals in Bangkok.

(6) Other Paramedical Staff Members

There are educational courses conducted for case workers and psychologists in university, but there are no license systems.

2-4-2 Medical Rehabilitation

(1) Conditions of rehabilitation provided to the general disabled persons:

Currently in Thailand, there are 25 national and 21 private hospitals provided with PTs and more than 100 m² rehabilitation facilities (according to the data of the Department of Labour). And the hospitals with the physical therapy facilities are 65 provincial hospitals and only 32 of them are equipped with the rehabilitation facilities (according to the data of the Department of Medical Service).

According to the explanation of the Department of Medical Service, all the provincial hospitals are planned to be provided with the rehabilitation facilities sooner or later, however, there is no definite longterm plan set forth at the moment.

The seven hospitals visited by the Study Team in the past are all large scale central hospitals having 300 to 1,200 beds. And all are provided with the rehabilitation facilities, although not complete. Also there are average five to two PTs and one to two OTs working in some of the hospitals visited. It is explained that, at an extreme occasion, one PT had to look after more than 50 patients at a time. Most of the cases, the patients are requested to supplement training at homes after receiving short direct rehabilitation guidance at the hospital. Therefore, home programs are specially prepared for this purpose.

Moreover, there remains a problem of medical expenses. It is a deniable fact that many of the patients do not have sufficient economical capabilities to go for complete rehabilitation services. (Not only the direct medical expenses, but also the costs for transportation and accommodation to and from the hospitals are quite a burden for the patients, which will result in making them keep away from the hospital at the early stages.)

The problems of the medical rehabilitation in Thailand today are pointed out as follows by the hospitals visited.

- 1) Lack of economical capabilities of the general disabled patients and no medical insurance system existing in Thailand
- 2) Incompleteness and insufficiency of the facilities
- 3) Shorthanded of rehabilitation staff members
- 4) Patient's lack of understanding to medical rehabilitation

(2) Rehabilitation Conditions Provided to Disabled Workers:

Disabled workers are the only patients covered by a kind of medical insurance system in Thailand, however, the overall conditions are not very different from the general disabled persons as described above. According to the interview conducted with 17 disabled persons at the Department of Labour, most of them have claimed the problems of medical care and medical rehabilitation provided at present. Nine of them have not actually received an appropriate medical rehabilitation at an appropriate time and three remained problems related to remedial medicine. For example, a person who got an amputation below the femoral region was not provided with an artificial limb; a person who got an amputation of the lower limb took one year until managed to walk by oneself because, even though artificial limb was prepared, ambulation training itself was not provided; and, a person who got artificial limbs for both forearms but not being able to make use of them at all.

Causes of the problems stated above can be analysed into two reasons.

- 1) Since the ceiling of Workmen's Compensation Fund is 30,000 baht at the moment, complete medical treatment can not be covered within the provided amount in most cases. Therefore, the strain has been shifted to the stage of medical rehabilitation.
- 2) Since there is a limitation of capacity of the medical rehabilitation in the hospitals, most of the patients have to leave hospitals at early stages than required, and because of the big expenditure forced to be paid to go to the hospitals after leaving the hospitals, they will discontinue going for medical rehabilitation.

According to the sample survey conducted by the Department of Labour recently, about 60% of disabled workers are required medical rehabilitation, but actually only about 30% of the total disabled workers are receiving medical rehabilitation. However, even though they say they have undergone medical rehabilitation, as it is well aware from the interviews made to the disabled workers, services provided are not complete.

2-5 Conditions and Countermeasures of Vocational Rehabilitation

2-5-1 Vocational Rehabilitation Extended to Disabled Workers

The vocational rehabilitation services provided to disabled workers at the moment are limited to those kinds offered by the referral officers. System of the referral officers was framed in February, 1982. There are one regular and two part-time officers at work now.

Major roles of the referral officers are to assist disabled workers enable to receive medical rehabilitation, while, at the same time, work to the employers to enable those disabled workers completed medical rehabilitation to return to the same or different jobs at their previous employers.

After the establishment of this system, 260 disabled workers have received the services of the referral officers and 90% of them have successfully returned to their jobs.

2-5-2 Vocational Rehabilitation Extended to General Disabled Persons

The Department of Public Health, Ministry of Interior is the responsible authority to provide vocational rehabilitation to the general disabled persons. At present, there are two vocational rehabilitation centers (Phra Pradaeng Vocational Center established in 1968 and Khon Kaen Vocational Center established in 1973) established for the purpose of restoring mainly the physically handicapped persons (caused by polio or the deaf-mute) disabled from their babyhoods.

Trades provided and number of trainees received (as of 1982) at both vocational centers are shown in the following list.

	Pra Pradaeng Center	Khon Kaen Center
Capacity	100 persons	50 persons
Training Period	1 year	6 months
Trade & Training Staff	Dressmaking 34	Dressmaking 26
	Radio/TV repair 64	Radio/TV repair 29
	Welding 10	Barbering 9
	Electrical appliance assembly 10	Beauty culture 6
	Leather work 28	
	Total 148	Total 70

The ways the persons advanced after the completion of the courses at the centers are as follows:

	Pra Pradaeng Center	Khon Kaen Center
General employment	22%	60%
Started business	59%	30%
Sheltered employment	10%	-
Others	9%	10%
Total	100%	100%

Currently, Pra Pradaeng Vocational Center has attached a sheltered workshop in order to provide disabled persons with work. About 40 disabled persons are now engaged in dressmaking and textile weaving work there. Also, the Department of Public Health is now under the construction of a similar kind of workplace for disabled persons with the capacity of 200 persons for the time being in the suburb of Bangkok. It is supposedly complete by the middle of 1983, then the sheltered workshop at Phra Pradaeng Center will be closed and transferred to this new facility.

Furthermore, the Department of Public Health provides loan of maximum 5,000 baht to the disabled persons to start their own businesses. The fund of total 2 million baht framed for this purpose came from the "Disabled Rehabilitation Fund" which was formed by donations from the general public in commemoration of the International Year of Disabled Persons in 1981.

2-6 Rehabilitation as a Part of Labour Policy and Its Necessity

The Department of Labour explains the reason why rehabilitation as a part of labour policy became so important in Thailand as follows;

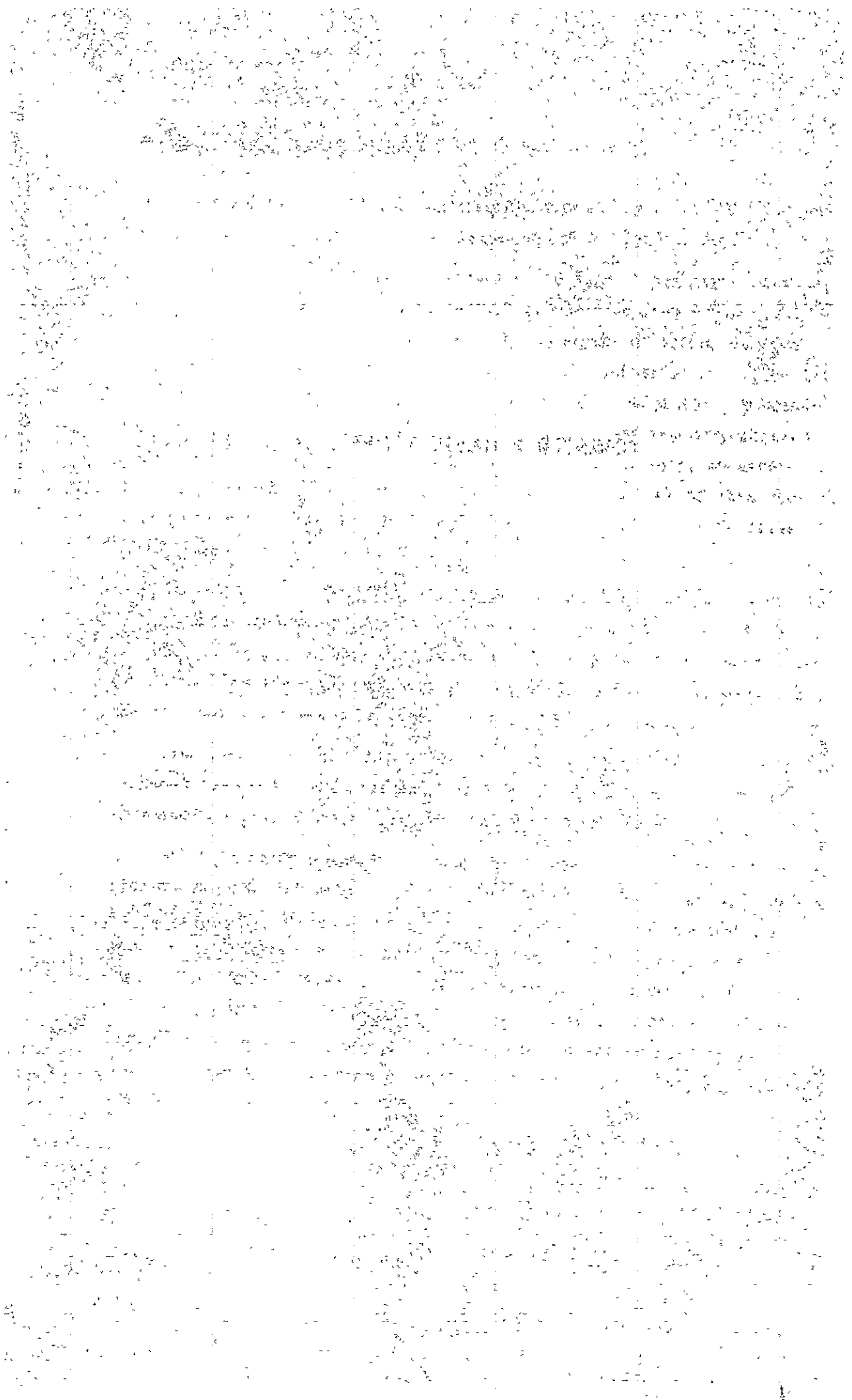
"Although strengthening activities of industrial accidents prevention has been promoted, it is impossible to eliminate total occurrence of industrial accidents. Therefore, the Department of Labour decided to establish Workmen's Compensation Fund in 1974 and it is now effectively used to restore disabled workers. Industrial accidents are increasing year by year along with the industrialization and the compensation from the Fund is being paid accordingly. However, in fact, no after-care is provided to those who have lost their jobs. Most of them usually go back to their hometowns and become the burden of the families for the rest of their lives.

The Department of Labour considered leaving those skills and experiences of the workers, even though disabled, are great loss of the national economy, therefore, as long as it is possible that disabilities of the workers are surmountable through rehabilitation, it is beneficial for the national economy to return them to their workplaces.

From such point of view, a new idea came up to utilize Workmen's Compensation Fund. The Fund will not only be used for the payment of compensation, but also be used for rehabilitation as well."

As it is clearly understood from the statement above, rehabilitation measures do not only stand in the viewpoint of improving workers' welfare, but also of maintaining enough skilled labour force for the economic development of the country. Therefore, the conception that "rehabilitation of disabled workers be strengthened as a part of labour policy and Workmen's Compensation Fund be used for its financial background" is an welcomed measure naturally for the labour unions, but also strong support has come from the employers associations as well as from all quarters of the society.

CHAPTER 3 BASIC SCHEME OF THE PROJECT



CHAPTER 3 BASIC SCHEME OF THE PROJECT

Basic scheme of the Industrial Rehabilitation Center (IRC) is settled into shape based on the survey results from the Preliminary Studies conducted twice in the past and basic Design Study conducted just recently as well as on the consultation results with the Thai Government.

3-1 Objectives and Qualifications for IRC Clients

3-1-1 Objectives

- 1) The clients to be admitted to IRC should be those who have been disabled due to work-related accidents and considered to have sufficient prospects of returning to their previous jobs or achieving vocational independence through the services offered there.
- 2) IRC should provide those clients mentioned above with mainly vocational rehabilitation services, if necessary, such medical rehabilitation services as functional training to improve and/or maintain their present physical condition.
- 3) IRC should provide employers with technical assistance and follow-up services regarding employment of disabled workers.

3-1-2 Qualifications for IRC Clients

IRC clients should meet all of the following qualifications.

- 1) Those who are disabled due to work-related accidents, and also who, as a rule, have received medical rehabilitation services at hospitals or other medical facilities.
- 2) Those who are able to manage the activities of daily living by themselves.
- 3) Those who are considered to have sufficient prospects of returning to their previous jobs or achieving vocational independence through the services at IRC.
- 4) Those who do not suffer from a contagious disease or mental illness.

3-2 Contents of the Services Offered at IRC

IRC should become the core organ to play a leading role in the field of vocational rehabilitation of disabled due to work-related accidents in Thailand. Therefore, contents of services offered at IRC will be as follows: (See Fig. 3-a Flow of the Services at IRC)

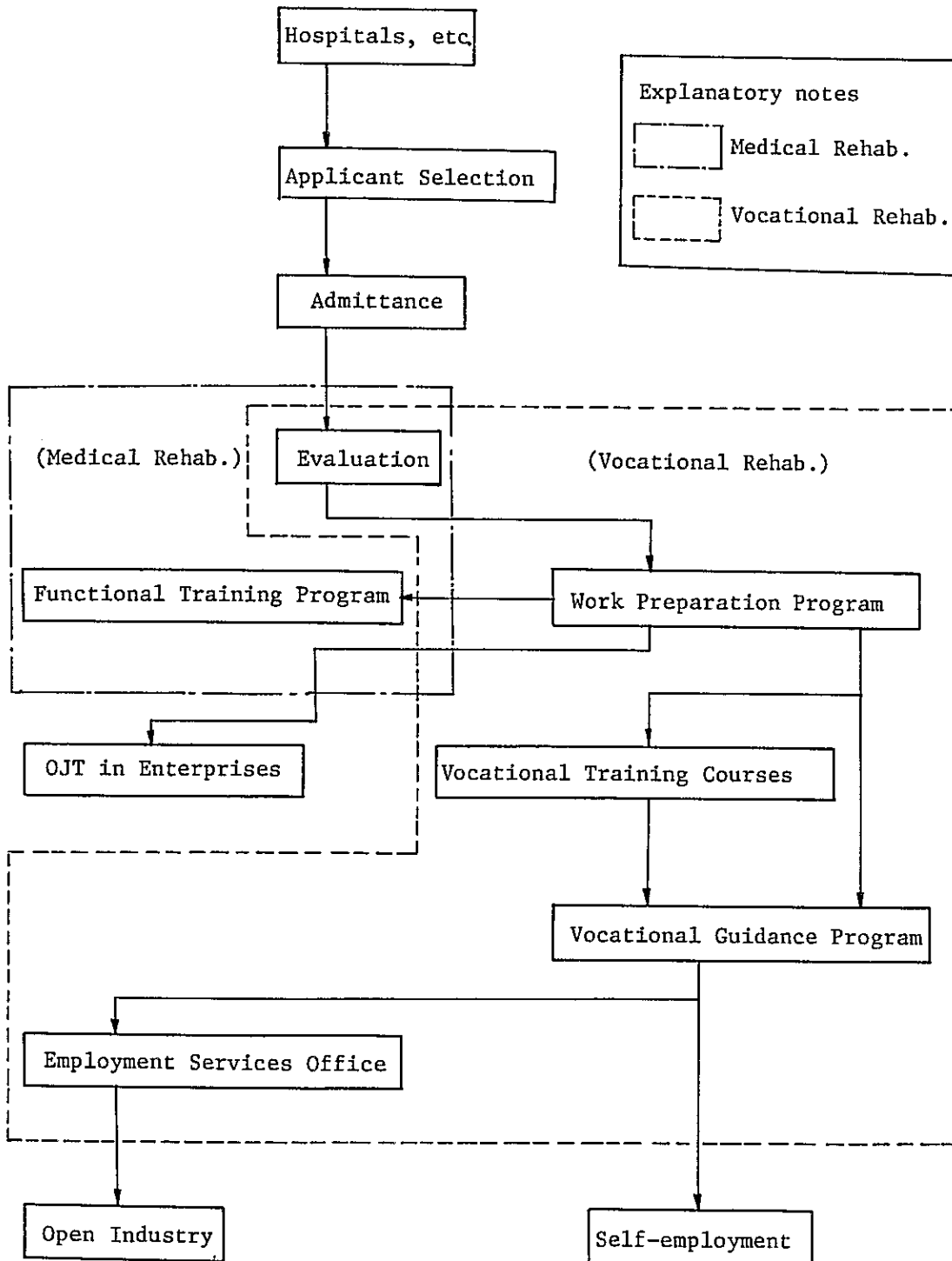
3-2-1 Clients Selection

IRC clients should be selected at case conferences, members of which consist of the specialists concerned. The criteria for the selection should be based on the information collected through application forms and, if necessary, through interviews with applicants. Those who are considered unqualified to receive IRC services should be referred to other agencies concerned, if necessary.

3-2-2 Admittance Procedures

- 1) Basic information concerning the category and the degree of client disabilities, their educational levels and psychological characteristics, and other data needed to decide subsequent rehabilitation programs, should be collected and confirmed through personal interviews and observations of client behavior.
- 2) Orientations should be given to those clients who are accepted into IRC to familiarize them with the contents of the rehabilitation services offered at IRC, and the utilization of the facilities, etc.
- 3) Admittance services should be offered jointly by staff members of both the vocational rehabilitation department and the medical rehabilitation department of IRC. (Admittance services are actually provided mainly by a social worker and rehabilitation doctor.)
- 4) The duration of admittance services should be around one or two days.

Fig. 3-a Flow of the Services at IRC



3-2-3 Evaluation Services

- 1) Evaluation of such potential vocational abilities and characteristics of clients as physical function, vocational aptitude, performance, work attitude and human relations as well as the necessity of medical rehabilitation should be carried out through the conduct of medical and psychological tests and the provision of work tasks composed of work samples.
- 2) Evaluation should be conducted by a vocational evaluator, an occupational psychologist and a rehabilitation doctor. (If necessary, a PT and an OT are also included.)
- 3) The evaluation period should fall within a client's first two weeks at IRC.

3-2-4 Vocational Guidance Program and Follow-up Services

- 1) As a final process of vocational rehabilitation, IRC should refer those clients who are ready to graduate from the work preparation program or vocational training courses to nearby employment services office or other agencies offering placement services. IRC should be able to provide those clients with information concerning job opportunities in the labour market, vocational counseling, factory visits and on-the-job training at enterprises so as to assist them in securing suitable jobs and adjusting to the work environment.
These services should be offered to the clients in close cooperation with employment services offices.
- 2) Follow-up services should be offered to facilitate the vocational adjustment of IRC graduates, as well as to evaluate the effects of IRC services. The latter will serve as feedback to improve the quality of the services at IRC.

- 3) IRC should provide employers with necessary guidance and assistance concerning improvement of facilities and equipment, development of appropriate devices to supplement the disabilities of clients and job redesign, etc.
- 4) Vocational guidance and follow-up services should be offered by vocational counselors and social workers.

3-2-5 Medical Rehabilitation (Functional Training) Services

- 1) The following medical rehabilitation services, consisting primarily of minimum level physical and occupational therapies, are offered in close cooperation with general and other hospitals which have specialized medical rehabilitation departments. These services are available to those who, as a result of the evaluation, are considered to be in need of continual functional training to improve and/or maintain their present physical condition. As a rule, it is desirable to offer medical rehabilitation services to applicable clients along with the necessary vocational rehabilitation services.
 - Functional training should be offered by a physical therapist and an occupational therapist.
 - Adjustment and repair services for orthotic and prosthetic equipment should be provided to those in need of them.
 - And simple types of prosthetics and self-help devices should be produced by IRC.
- 2) Medical rehabilitation services should be offered by a rehabilitation doctor, a physical therapist, an occupational therapist and, if necessary, an orthotic and prosthetic engineer.
- 3) The duration of medical rehabilitation services should be kept within three months. Those clients who are considered to be in need of more specialized medical rehabilitation services which will last more than three months should be referred to hospitals with specialized medical rehabilitation sections.

- 4) The maximum number clients enrolled in medical rehabilitation programs should be around 10 persons.

3-2-6 Work Preparation Courses

- 1) Work preparation courses offer services to improve the vocational adjustment abilities of clients mainly by means of making use of a variety of productive, real workshops.
Those considered appropriate for vocational training as a result of services offered through these courses should be promptly referred to the vocational training courses.
- 2) On-the-job training of clients in nearby enterprises should be utilized, if necessary, in the work preparation courses.
- 3) Staff members responsible for the work preparation courses should be workshop supervisors who work in close cooperation with vocational evaluators, an occupational psychologist and an occupational therapist.
- 4) The standard period for these courses should be approximately four months. However, the duration of services for those considered for referred to the vocational training courses should be limited to be minimum.
- 5) The maximum number of clients enrolled in the work preparation courses should be around 70 individuals.

3-2-7 Vocational Training Courses

Vocational training courses should be offered to those clients who, during the work preparation program, were considered to be in need of such training and to be capable of acquiring vocational skills. Further, in view of the actual condition in Thailand, the courses will mainly consist of trades enabling those clients to carry on their independent businesses.

- 1) Vocational training should aim at equipping clients with specialized knowledge and vocational skills mainly through practical training.
- 2) On-the-job training at nearby enterprises, if necessary and appropriate, might be offered to clients as a part of their vocational training.
- 3) The following training courses should be offered to the clients;
 - Home Electric Appliances Repair Course (Radio, TV, etc.)
 - Dressmaking course (Cutting, sewing and finishing)
- 4) Vocational training should be offered by vocational instructors.
- 5) The standard period of vocational training courses will be one year, and if necessary supplemental two to three months extension should be possible. This training period should be kept flexible to allow it to be shortened or lengthened according to trainee's performance.
- 6) The maximum number of clients admitted to vocational training courses annually should be around 30 individuals (Home electric appliances repair 20 and dressmaking 10).

3-3 Duration and Number of Clients Admitted to the Training Courses

3-3-1 Duration and Training Courses

Duration and Training Courses of IRC are as follows:

	Clients	Duration	Contents of Services
1. Work Preparation Course	Those disabled persons who will be able to return to their previous jobs	Approx. 4 months	Work Preparation Program, and Vocational Guidance Program
2. Vocational Training Course	Mainly those disabled persons who plan to secure self-employment.	Approx. 1 year	Work Preparation Program Vocational Training Course and Vocational Guidance Program

3-3-2 Number of Clients

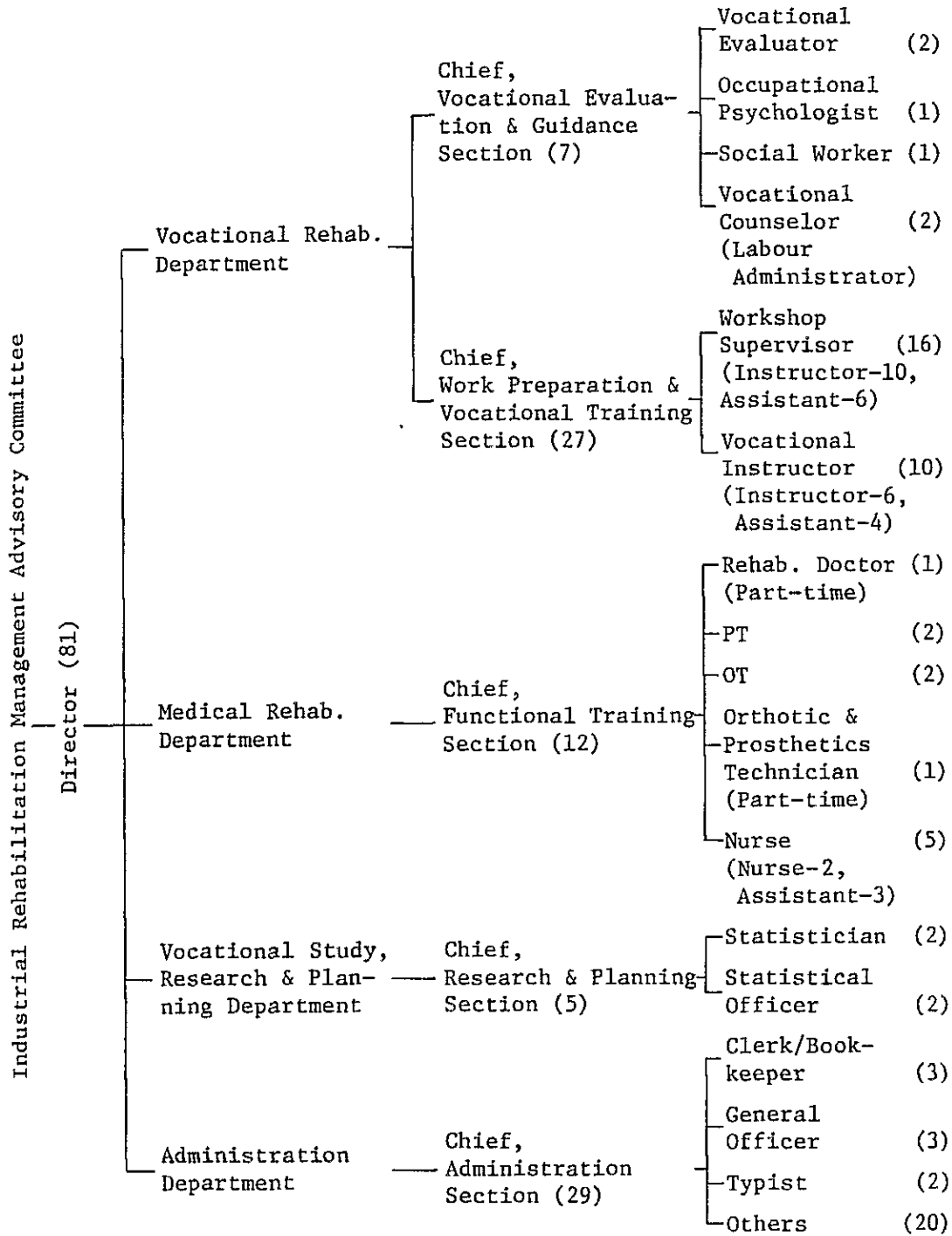
The net capacity of IRC, for the time being, should be limited to around 100 disabled persons, and the total capacity per year will be approximately 260.

	Net Capacity
1. Work Preparation Course Approx. 4 months	70
2. Medical Rehabilitation Service	(10)
3. Vocational Training Course Approx. 1 year	30

3-4 Organization and Allocation of Personnel to Each Section

Organization chart and number of personnel allocated to each section are shown in Fig. 3-b.

Fig. 3-b Organization Chart of IRC



3-5 Departmentizing of Organization and Facilities

The following departments will be required to enable the Industrial Rehabilitation Center (IRC) to function effectively.

3-5-1 Administrative Department

The administrative department comprises the core of IRC, and is essential for the efficient management and control of its facilities.

3-5-2 Research & Planning Department

This department will deal with the collection and analysis of statistics and reference materials concerning rehabilitation. It will also carry out applicable research regarding vocational rehabilitation, trainings for related organ staff members, medium- and long-term plans for IRC, as well as public relations activities.

3-5-3 Vocational Evaluation & Guidance Department

The main function of this department will be to provide comprehensive evaluations of individual client's work-oriented abilities through various productive and practical tasks set for them at the workshops. In addition, it will also provide guidance and vocational placement services as well as follow-up guidance for those disabled workers who actually return to the workplace.

3-5-4 Medical Rehabilitation Department

The medical rehabilitation department will provide functional training together with the execution of vocational rehabilitation programs. Further, constant attention will be paid to the physical conditions of the trainees in attempt to obtain greater rehabilitation effects.

3-5-5 Work Preparation and Vocational Training Department

Work preparation workshops are meant to provide clients with the chance to return to their previous jobs by up-grading their vocational adjustment abilities. Therefore, work preparation workshop will be set up as follows:

- 1) Machine Workshop : Operation of various machine tools for grinding, punching and drilling
- 2) Assembly Workshop : Mainly sedentary work using such hand tools as pinches, nippers, screwdrivers and soldering irons
- 3) Metal Workshop : The work tasks will involve mainly the use of hand tools, but small machines will also be utilized.
- 4) Wood Workshop : Same as the metal workshop
- 5) Clerical Workshop : Mainly general clerical work, and simple accounting

Vocational training will also be aimed at providing assistance to those clients not capable of returning to their previous employers to gain sufficient new skills to start their own businesses or switch over to a different vocation. For the time being, the following vocational training programs will be set up temporarily:

- 1) Home Electric Appliances Repair Workshop (Radio, TV, etc.)
- 2) Dressmaking workshop

The reasons for selecting the aforementioned five work preparation training workshops are as follows:

- 1) Since metal work, wood work and machine work are closely related to those types of industries which have the highest incidents of work-related accidents in Thailand, it will be necessary to provide clients with vocational rehabilitation services that improve their vocational adjustment abilities, thus helping them return to their previous jobs.

- 2) Assembly and clerical work are the most suitable for the evaluation of work performance. Therefore, practical workshops will be established in these fields at IRC.

The selection of home electric appliances repair work and dress-making as vocational training programs was made based on the training programs practiced at vocational rehabilitation centers managed by the Ministry of Interior, Department of Public Welfare. These two types of work are the most popular trades among trainees at the moment; the former by male workers and the latter by female workers. At the same time, both trades have a higher potential for starting one's own business. Interviews conducted with disabled workers by the Preliminary Study Team indicated that most of them wished to undergo training in these two trades.

3-5-6 Other Facilities

An outline of the other principal facilities at the IRC is as follows;

- 1) Canteen/Auditorium

Sufficient space for sports, recreation and/or meetings should be allocated in the canteen/auditorium.

- 2) a. IRC should be able to provide living accommodations for around 100 clients.
b. The ratio of male to female clients should be 3:1.

3-5-7 Concept Concerning the Design of the Buildings:

It goes without saying that the design of the Center's facilities should be oriented toward the physically handicapped as much as possible. However, since a major objective of IRC will be to try to return its clients to everyday living in their respective communities, it will also be very important to accustom clients to life in the real world. Therefore, buildings should be equipped with only the most indispensable features for the physically handicapped. However, for these persons confined to wheel chairs, every basic requirements will be fully taken into consideration.

3-6 Technical Cooperation

Needless to say, the executive body of the Industrial Rehabilitation Center (IRC) will be the Government of Thailand. And only when smooth management and control of the Center would have been realized, the hoped-for objectives can be successfully achieved. However, the IRC Project is the first of its kind in this field in Thailand, and technical cooperation should be provided in parallel with actual construction work.

3-6-1 Training of Counterparts

(1) Staff Members

Thai counterparts expected to serve as staff members at the Center initially will be those individual currently engaged in vocational fields in Thailand, who will then be trained to provide them with specialized knowledge and skills necessary in addition to their own acquired work experience and knowledge. However, the number of vocational evaluator and OT currently available in Thailand is unknown yet. Therefore, it may be necessary to train new graduates as counterparts as well.

- 1) Vocational Evaluators : Those with degrees in psychology or production engineering. No previous experience required.
- 2) Vocational Counsellors : Those with experience in employment services or personnel management in industry. Degrees in psychology, education or some related academic field would be preferable.
- 3) Social Workers : Individuals who majored in social science, social welfare or psychology. Three years previous experience as a social worker is desirable.

- 4) Workshop Supervisors : Individuals with work experience at a level higher than foreman in the manufacturing industry.
- 5) Vocational Training Instructors : Persons with experience as instructors at vocational training facilities or other deemed appropriate.
- 6) PT : Persons with PT licenses and more than three years work experience.
- 7) OT : Persons with OT licenses (the first eight students are expected to graduate from the university in 1983)

Among the above professions, those for which training in Japan is deemed most necessary and effective are Workshop Supervisors, Vocational Evaluators PT and OT. Applicants for the remaining professions should be trained locally by Japanese experts dispatched for that purpose.

The training period in Japan will of course differ for each field, but all will be approximately three to six months. Training will concentrate on providing counterparts with the necessary knowledge and technical skills to enable them to make up manuals outlining duties in each field prior to the opening of the IRC after returning to their native country. Trainees will be attached to rehabilitation hospitals and vocational rehabilitation facilities in Japan.

(2) Administrative Staff Members

It will be beneficial to provide administrative staff members with courses and training on related legal systems and the flow of work based on those systems in order to enable them to grasp the concept of vocational rehabilitation. Especially since the IRC Project is not only under labour administration but also requires the cooperation of organizations and individuals in the fields as well, it will be most important to provide training concerning the overall administration system, laying stress on the vocational rehabilitation aspects.

- 1) Administration of legal systems related to vocational rehabilitation as well as management of related organs and facilities
- 2) Procedures prior to clients arriving at vocational rehabilitation facilities and service systems from admittance to employment
- 3) Professional services from medical rehabilitation, vocational evaluation, guidance and training to placement

Between two and four administrative officers who are assigned to the Project from Workmen's Compensation Fund will be required to undergo the above training course for the execution of this Project. The training period will be about three months and should be given at a relatively early stage.

3-6-2 Dispatch of Japanese Experts

Japanese experts should be dispatched to Thailand during the preparation stage of the Project to provide comprehensive advice and instructions. As previously mentioned, vocational rehabilitation is a new field for Thailand, so that detailed guidance will be indispensable right from the preparation stage. These experts should probably be dispatched after Thai counterparts have finished their training in Japan, and also their arrival in Thailand should be in time for the installation of training equipment and allocation of tools and materials at the latest. Experts will be required in the following fields:

- 1) Overall Project Guidance Experts (These individuals should be dispatched as soon as possible.)
 - 2) Vocational Evaluation
 - 3) Vocational Councelling
 - 4) Social Work
 - 5) OT
 - 6) Work Preparation Training Instruction
- } People who can cover both fields

There will be no difficulty finding competent manpower to serve as Thai counterparts. Therefore, Japanese experts should concentrate on providing follow-up training to Thai counterparts upon their return from training in Japan, plus pass on the philosophy of vocational rehabilitation via on-the-job training in each profession.

CHAPTER 4 OUTLINE OF THE PROPOSED SITE

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CHAPTER 4 OUTLINE OF THE PROPOSED SITE

4-1 Selection of the Proposed Site

The Japanese Study Team has been studying six sites proposed by the Thai Government for the construction of the IRC: 1) Samut Prakan, 2) Sala Ya, 3) Klong Luang, 4) Thunyaburi, 5) Swang Kanyvas and 6) Bangpoon. (See Fig. 4-a) These studies consisted of two Preliminary Studies conducted in the past and Basic Design Study carried out just recently.

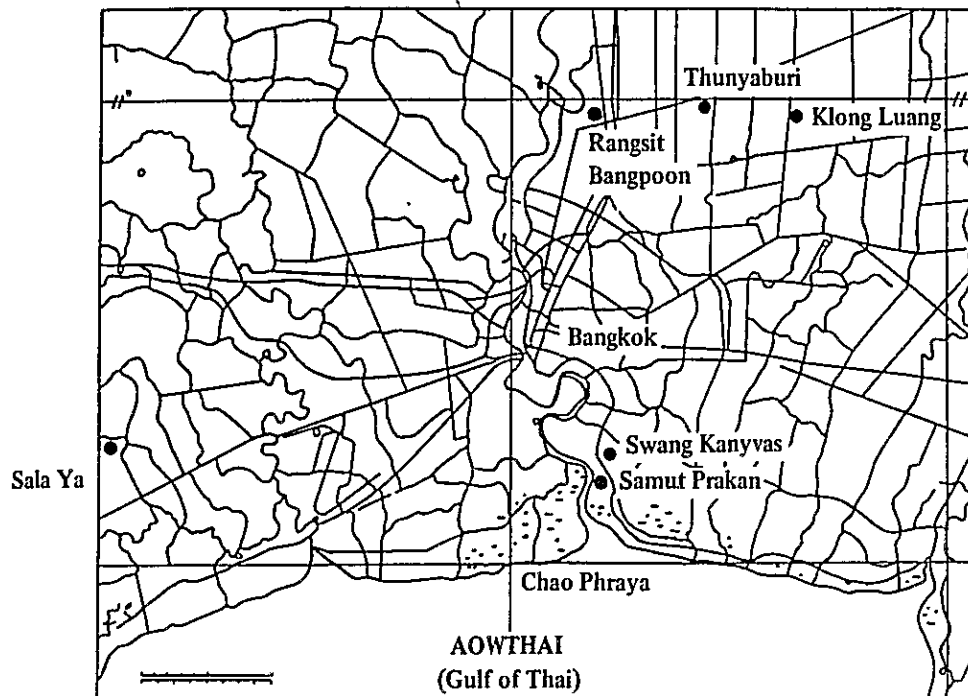


Fig. 4-a Proposed Sites by Thai Government

The results of the studies conducted at the six sites are as follows:

(1) Samut Prakan

The land is the property of the Department of Labour. The merits of this site are that it is easily accessible and close to

the industrial area. However, the total area only covers 7 rai (1 rai = 1,600 m²) which is considered too small for the Project.

(2) Sala Ya

This area is 24 rai in size, and is located 6 to 7 km away from Mahidol University, but access roads and the infrastructure, including water and power supplies are not complete. Therefore, due to the extra costs that would be entailed in constructing the installation here, it has deemed unsuitable.

(3) Klong Luang

The area of this site is about 20 rai but the Department of Fisheries occupies most of the land. The remaining area consists of rather complicated topography which makes this site unsuitable as well.

(4) Thunyaburi

National property. At present, the Department of Public Health utilizing the land as a relocation site for the poverty stricken (Begger's House). The total area covers more than 100 rai. Although the site was considered appropriate for the Project, since no agreement could be reached between the Department of Public Health and the Department of Labour, utilization will be impossible.

(5) Swang Kanyvas

This site offers good surroundings (it is located next to the Physically Handicapped Rehabilitation Hospital managed by the Red Cross), but acquiring it for the Project would have been very difficult since the Department of Labour seemed reluctant to concede to requests along these lines. The Study Team also agreed not to insist.

(6) Bangpoo

This site is located 30 km north of Bangkok and covers an area of about 27 rai (45,600 m²). There are some undesirable

points such as the level of the land being very low, the existence of ponds and a creek, and special high voltage transmission lines cutting across the area. However, compared to the other five sites, it is still quite favorable. The Study Team, therefore, requested the Department of Labour to acquire Bangpoon for the IRC construction site. Following the Study Team's request, this land was officially transferred to the Department of Labour from the Accelerated Rural Development Office, Ministry of Interior.

4-2 General Conditions of the Proposed Site

The conditions of the proposed construction site, as confirmed by the field survey are explained below.

4-2-1 Location and Environment

The proposed site for the IRC is situated in the Bangpooon district of Phatum-Thani Province which is about 30 km north of central Bangkok. The site faces National Route No.306, about 3 km west of National Route No.1 which leads to Northern Thailand from Bangkok. (See Fig. 4-b) The surrounding area is still rather rural, and there are only a few factories and private houses scattered among the fields (See Fig. 4-c). But since National Route No.306 is the bus route to and from downtown Bangkok, which is only about 2 km away from the site, there are some shops and housing complex along this road. The Liaison of Employment Services Division and War Veteran's Hospital are also located nearby, the former being about 2 km from the site, and the latter about 2.5 km away. The Air Force Hospital is open to the general public and currently has 200 beds and rehabilitation facilities (the number of beds will be increased

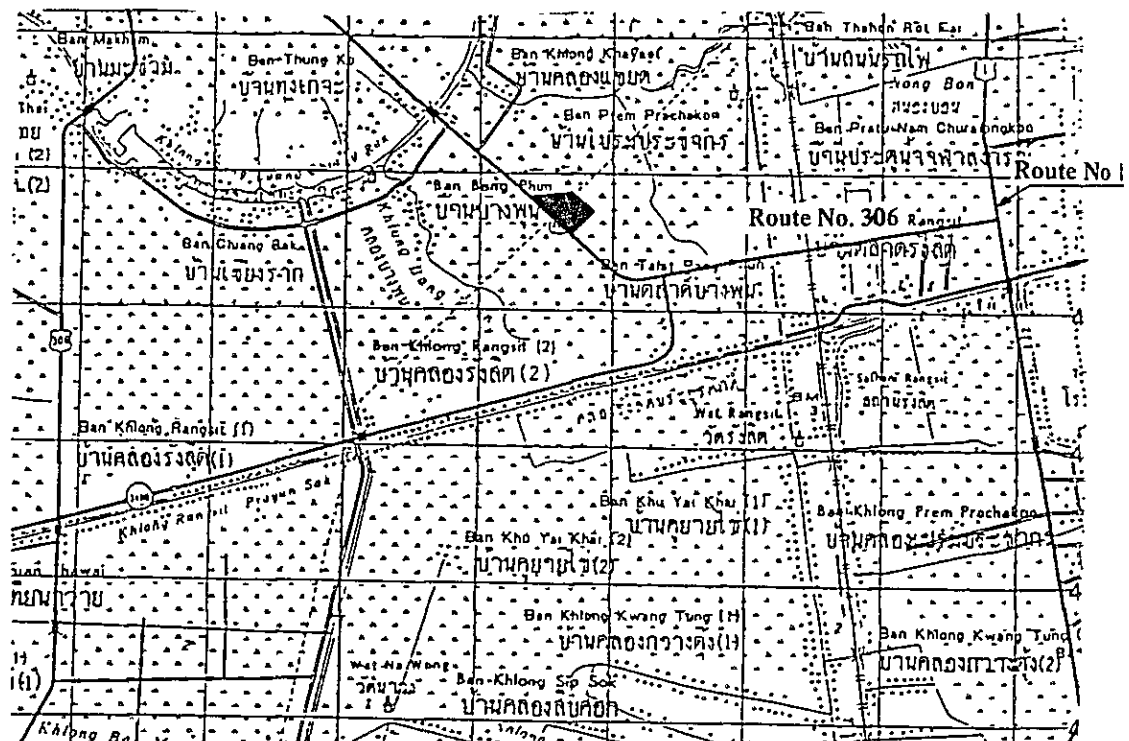


Fig. 4-b Location Map

to 700 in future). Tie ups with these facilities will also be possible. All of these factors make the location of this site quite favorable.



Fig. 4-c

1. Phatum Thani Provincial Labour Office (Rangsit Branch)
2. Shop Building
3. Thai Stand Steel Factory
4. Construction Material Supplier
5. Drinking Water Manufacturing
6. Construction Material Supplier
7. Udon Patana Saw Mill Co. Ltd.
8. Thai-German Training Center (Ministry of Education)
9. Training Center for Male Retarded
10. Rural Accelerated Training Center
11. Mechanical Center (Office Land Reformation)
12. Automobile Light Manufacturing Co. Ltd.
13. Phatum Thani Technical College
14. Construction Material Supplier
15. Concrete Block Factory
16. Artificial Marble Manufacturing
17. Marble Manufacturing
18. Cotton and Kapok Factory
19. Thai-Netherland Artificial Insemination Center
20. Factory
21. Marboonkrong Silo
22. Marboonkrong Marble Manufacturing
23. Marboonkrong Plant Saturated Factory

24. Wood Product Manufacturing
25. Brick Factory
26. ICE Manufacturing
27. Army Automobile Maintenance and Repairment
28. Phatum Thani Highway Branch
29. Rangsit Electricity Generating Authority Sub-Station
30. Gasoline Station
31. Car Repairing Shop
32. Umbrella Factory
33. Construction Material Supplier
34. Housing Complex.

4-2-2 Present Conditions of the Proposed Site

The area of the proposed construction site is about 27 rai (about 45,600 m²). The condition of the land is as shown in Fig. 4-d. South side of the site faces National Route No.306 (The width of this road is currently about 7 m, but it will be widened in future.), and the site is flat but sunken, being about 1.5 m lower than the level of the adjacent road. A creek, about 7 m wide and 1 m deep, flows around the inner fringe of the site, and there are two ponds, about 20 m x 75 m in size and roughly 6 m deep, in the center of the site.

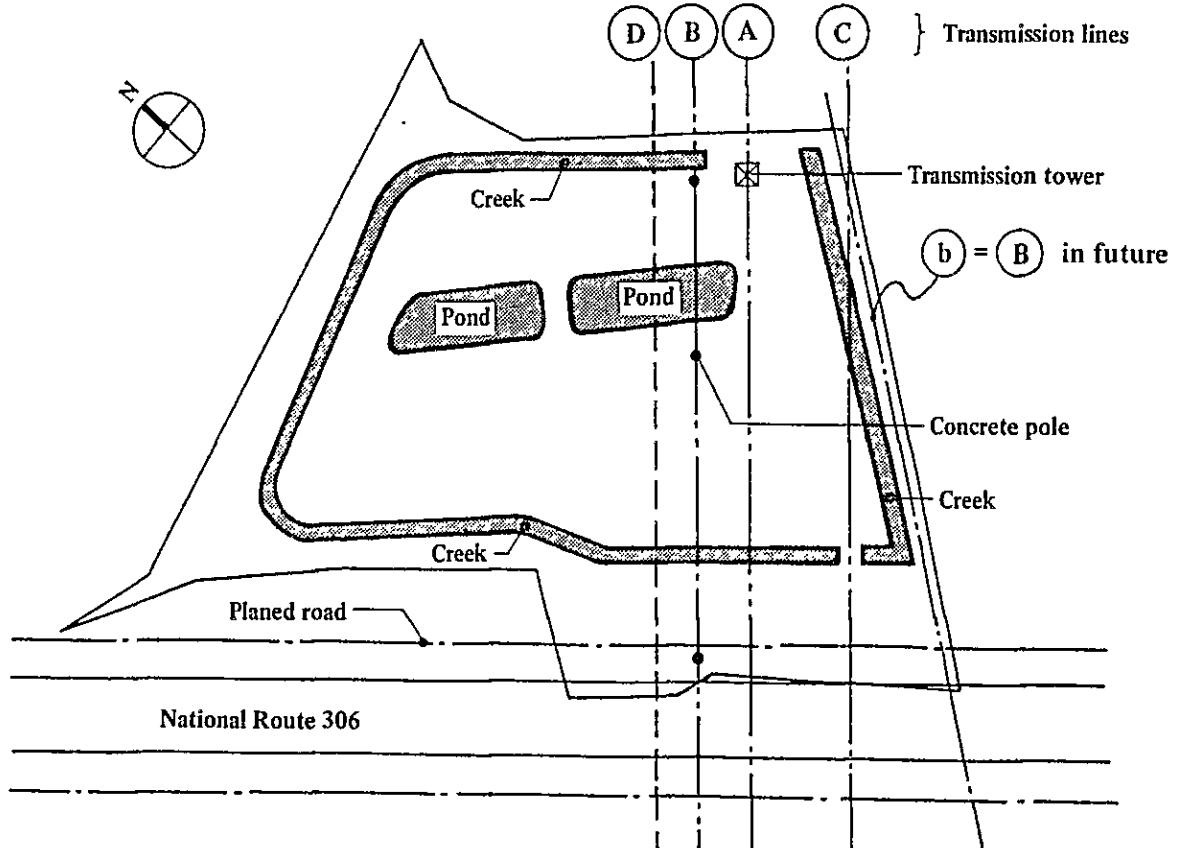


Fig. 4-d Present Condition of Site

Moreover, special high-voltage transmission lines (230 KV), plus ordinary high-voltage transmission lines (22 KV) run across the eastern portion of the site, and there are plans to install two more special high-voltage transmission lines (230 KV each) in the near future. These transmission lines are shown in Figure 4-d, and marked (A), (B), (C) and (D), respectively. The special high-voltage transmission lines (A), are already being used commercially which prevents it from being re-located. However, the ordinary lines, (B), even though already in commercial use, can be moved since they are installed on concrete poles and are not special high-voltage transmission lines. (Study Team has already required DOL to ask for the appropriate authorities to have these lines moved.) Although the special high-voltage lines indicated by (C) and (D) have yet to be installed, plans for the installation of (C) this year can not be changed, and installation plans for (D) have yet to be decided by the Thai Power Generation Agency. (Study Team has already required DOL to ask for the proper authorities for the right to consult with the offices concerned to avoid having these lines run across the site.)

Thai regulations specify that no buildings may be constructed within 40 m of special high-voltage transmission lines, and 10 m of ordinary high-voltage transmission lines. Therefore, a careful study will have to be made concerning land use planning for the Project.

4-3 Natural Conditions

4-3-1 Weather Conditions

Bangkok falls within the tropical monsoon zone according to meteorological classifications. Maximum average of temperature in the daytime is between 31°C to 36°C the year round. The seasons are classified as either the rainy season (May through October) or the dry season (November to April). During the rainy season, squalls occur everyday and last for between one to two hours. Naturally, humidity during the rainy season is extremely high.

The direction of the wind is also seasonal, the summer monsoon coming from the southwest during the rainy season, and the winter monsoon from the northeast during the dry season. Wind velocity is not strong, though.

4-3-2 Topographical Conditions

The Project site is bordered on the east by the Korat plateau, on the north by a mountainous region and on the west by the Tanosri mountains. To the south of the site is the Chao Phraya plain facing the Gulf of Thailand. The site itself is located on this plain. The land is very flat here, and rises only 1.5 m above sea level. The soil is alluvial, having accumulated here from the upper reaches of the Chao Phraya river which runs through central Thailand. This soil is generally composed of an alternating strata of loose, fine sand, sandy clay, clay and silt. The geological conditions of the construction site are as shown in the results of the soil investigation (See Appendix III-1). From the surface of the ground down to the -15 m level is the soft layer consisting of silt clay, fine sand and sandy clay.

4-3-3 Natural Disasters

Since Bangkok and its surrounding areas are located on low ground, drainage is not efficient. During the rainy season, local downpours

often lead to houses and roads being flooded. Also, lightening strikes this area quite frequently during the rainy season, causing fatalities and power failures.

Fortunately, Thailand is outside of the Alps-Himalayan earthquake belt as well as the circum-pan-Pacific earthquake belt, making earthquakes very rare. There have been cases of slight earthquake tremors in the past, but no disasters were ever recorded.

4-4 Infrastructure Situation

4-4-1 Water Supply Facilities

There is no main water supply pipe coming into the Project site. However, about 2.5 km away from the site, there is a 200 mm main water pipe. It would be extremely difficult to extend a water pipe to the site because it would have to be laid across the Railway Line. Also, due to the limited amount of construction time scheduled, water supply to the IRC will have to be managed in the form of rain water and well water. However, water samples taken from a deep well near the site showed that the quality of the water is not fit for drinking (See Appendix III-2). Factory workers and residents near the site use pump-up water from the creek, but it is limited to non-drinking uses. For drinking water, local inhabitants depend on bottled water purchased from Bangkok. In any case, the quality of the water even in Bangkok is not generally fit for drinking directly from the tap.

4-4-2 Drainage and Sewage Facilities

There are no main drainage and sewage line installed on or around the Project site. The only apparent means of draining rain water and waste water are the creek that runs along the adjacent road. There are no BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand) or SS (Suspended Solid) discharge restrictions concerning drainage in general, but there are such restrictions concerning creek for irrigation. Sewage is either disposed of by vacuum trucks or treated in Thai made individual FRP septic tanks (90 ppm). For reference purposes, Japanese law stipulates that sewage can only be discharged after being treated in the community treatment plant for up to 30 to 60 ppm. Recently in Thailand, too, Thai made septic tanks are being installed in newly constructed buildings.

4-4-3 Gas Facilities

Propane gas is used more widely in Thailand than city gas. Therefore, propane gas will be used at the IRC facilities subject to the provision of municipal regulation.

4-4-4 Electricity

Electricity service in Thailand is provided at the national level. Total power supply, from power generation to distribution, is managed by national organs such as EGAT (Electricity Generating Authority of Thailand), MEA (Metropolitan Electricity Authority) and PEA (Provincial Electricity Authority). EGAT is responsible for power generation, while MEA and PEA mainly control distribution to customers. EGAT belongs to the Ministry of Development; MEA and PEA to the Ministry of Interior.

Power supply to the Project site will be via a three-phase, three-wire system carrying 22 KV at 50 Hz through PEA lines from the Rangsit Sub-station which falls under the authority of EGAT. Voltage is supplied via a three-phase, four-wire trunk line system, with 380 V for power and 220 V for lamp.

4-4-5 Telephone

Telephone service will be furnished by the Rangsit Telephone Office, which belong to TOT (Telephone Organization of Thailand). At the moment, there are no telephone lines installed in the area of the Project site. The Study Team has received confirmation from TOT, however, that telephone lines will be installed as soon as a service order arrives from a government-related facility.

Domestic telephone service in Thailand is concentrated in the capital city due to the fact that central political and economic organizations are gathered there.

TOT has been carrying out a domestic telephone service expansion plan under guidelines set forth in the National Economy & Social Development Plan since 1967. Cooperation from Japan in the form of financial support (Grant Aid) has helped promote the modernization of switching equipment, especially on the capital. By 1975, 100% direct-dial telephone calls have been realized in Bangkok.

Current efforts are aimed at upgrading existing services, while at the same time, expanding the use of electronic switching equipment. Telephone service in Thailand should get much better before too long.

4-4-6 Television

There are four television stations in Bangkok: channels 3, 5, 7 and 9. Channel 7 starts broadcasting at noon but the others do not broadcast until the evening. All four channels go off the air at 11 pm. Only on holidays all program broadcast starting in the morning and going until around 11 pm. All stations air in color and receiving conditions near the Project site are relatively good. Management of the four stations is as follows:

	Channel	Output	Number of relay stations
1) Bangkok Entertainment Co., Ltd.	3	20 kW	11
2) Royal Thai Army TV Station (Chan.5)	5	20	3
3) Bangkok Broadcasting & TV Co., Ltd. (Royal Thai Army TV Station (Chan.7))	7	50	10
4) Masscommunication Organization of Thailand	9	50	0

4-4-7 Radio

There are many AM and FM radio stations located around Bangkok. Receiving of these broadcastings will be possible at the Project site without antenna. However, problems of interference sometimes arise due to the low output levels of stations and many broadcastings.

The available frequency zone for radio sets being sold in the Thai market is as follows:

A.M.	525 ~ 1600 kHz
F.M.	88 ~ 108 MHz

4-5 Construction Conditions

4-5-1 General Construction Conditions

(1) Construction Materials

Supply of construction materials in Thailand is relatively good. A portion of the raw materials used in structural and finishing materials for construction use are imported, but most other materials are capable of being produced and supplied within Thailand. There should be no special quality problems using indigenously produced materials except for some special items. However, when it comes to other materials and equipment besides those for use in construction work, the production capabilities of the country are still low and quality is not reliable. Therefore, most of these should be imported. Thailand places restrictions on the import/export of certain items to protect and promote domestic industries. As for construction materials concerned, reinforcing bars, wooden materials, stone materials, ceramic tile and sanitary ware are among those items so restricted. However, if these items form a portion of Japan's grant aid program, then there will be no problem.

(2) Labour Conditions

The number of construction companies registered with the Ministry of Commerce in Thailand is about 800 (as of 1980). If very small scale companies are also included, the number will reach a few thousand. The total number of workers engaged in construction is about 450 thousand. The average paid-in-capital of major Thai construction companies is between 10 to 30 million baht.

Compared to neighboring countries, the level of construction technology is rather high in Thailand. Unfortunately, skilled workers in various construction fields tend to look for jobs outside of the country. Thus the country is suffering from a lack of skilled labour. In light of this fact, selection of workers for the Project must be done very carefully. Labour wages are very low compared to those in Japan, and construction costs are slightly lower than in Japan.

(3) Transport Conditions

Direct surface transport from Japanese to Bangkok takes about seven to ten days. All goods exported to Thailand are unloaded at Kloung Toei Wharf, which is under the control of PAT (Port Authority of Thailand). Additional days are required for customs clearance and disembarkation procedures, which take at least about a week.

Regarding internal road transportation, Thai Traffic Law places restrictions on certain types of vehicles and weight loads. Within the city limits of Bangkok, heavily loaded vehicles are not permitted to run during certain hours of the day. Enough of a margin for transportation time should be allotted for the arrival of construction materials to the construction site.

4-5-2 Laws and Regulations Related to Buildings

Including the Building Control Act (1979) and the Bye-Laws of Bangkok Metropolis (1979), there are several laws and regulations concerning buildings being enforced in Thailand at present. However, these are not as detailed as Japanese ones. Also, all the standards included in the regulations are less strict than Japanese standards. Therefore, when it comes time to design the Project facilities, Thai laws and regulations will be followed, and where appropriate regulations do not exist, Japanese standards will be adhered to.

CHAPTER 5 BASIC DESIGN



CHAPTER 5 BASIC DESIGN

5-1 Basic Policy of the Project

The following items will be the basic policies adhered to when drawing up the design of the Project.

- 1) The design should be made in to ensure that Industrial Rehabilitation Center (IRC) will contribute to the vocational rehabilitation field in Thailand, functioning as the nucleus and leader in this field.
- 2) The design should be in keeping with the weather conditions, natural features (spiritual and/or cultural climate), life style and other special characteristics of Thailand.
- 3) Natural ventilation and natural lighting should be effectively utilized to minimize dependence on electric power facilities, thus reducing overall maintenance/control costs.
- 4) Consideration should be given to construction technology and materials and the labour conditions of Thailand so as to produce a design which is both simple in construction and economical.
- 5) Construction materials, etc. should be procured within Thailand as much as possible. Be sure to use standard materials that are interchangeable to facilitate maintenance/control after completion of the Project.
- 6) Construction related laws and regulations of Thailand should be adhered to as standards for the Project. When no applicable standards are apparent, then Japanese standards will be followed.
- 7) Plans for the procurement of the IRC training equipment should be drawn up after consultations with cooperating technical experts to ensure that the most appropriate equipment to Thai conditions will be installed.

5-2 Land Use Planning

5-2-1 Site Use Planning

The results of the survey described earlier indicated that there are two special high-voltage transmission lines and one, soon to be moved, ordinary high-voltage line running through the proposed site. (See Fig. 5-a) Therefore, according to Thai laws and regulations concerning construction in the vicinity of high-voltage power lines, it will not be possible to construct buildings within the shaded area in Fig. 5-a.

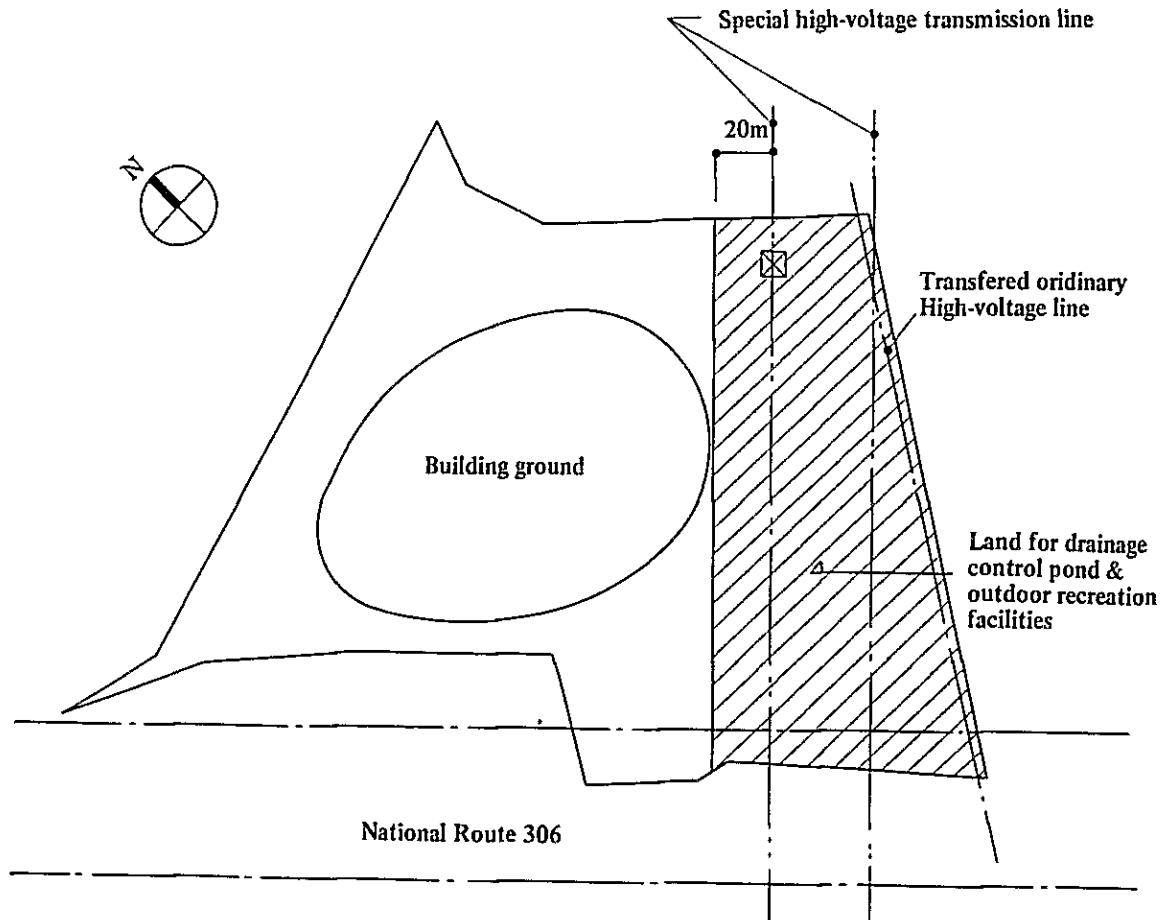


Fig. 5-a Site Use Plan

This being the case, this portion of the Proposed site will be used to construct a pond for use during the rainy season as a means of drainage control, plus outdoor recreation facilities and a parking lot. The remaining land will then be used for the construction of buildings. Effective site planning will be necessary.

5-2-2 Site Renovation Planning

As already mentioned, the Proposed site is about 1.5 m lower than the adjacent road. In addition, there are two big ponds and a creek surrounding the inner fringe of the site. For effective site planning, these ponds and creek should be reclaimed. At the same time, judging from data on past floods, the ground level of the site should be made at least 0.8 m higher than the adjacent road. Then a new creek and a drainage control pond should be constructed in preparation for the rainy season.

The cost necessary for such land renovation will be borne by the Thai Government.

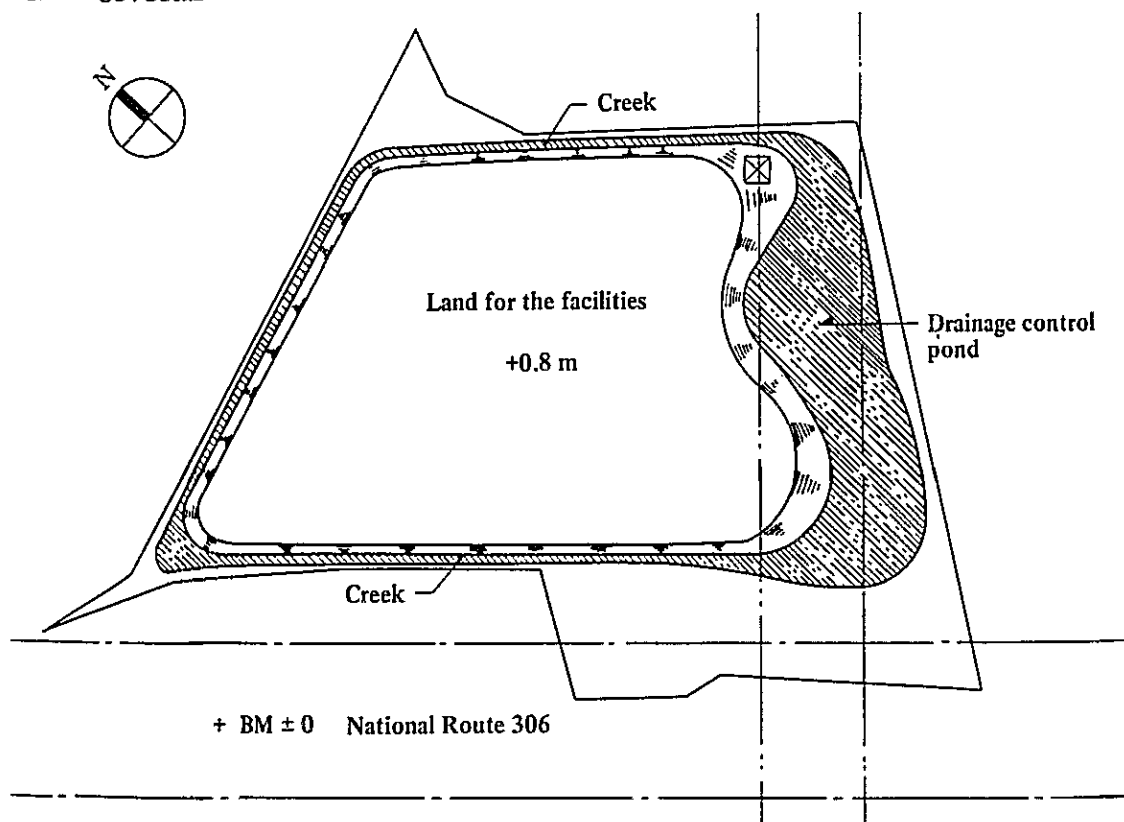


Fig. 5-b Site Renovation

5-3 Site Planning

5-3-1 Zoning

The departments of the proposed facilities can be broadly divided up by function and classified into the zones listed below.

1) Administration Dept.		}	A. Administration Zone
2) Research & Planning Dept.			
3) Medical Rehabilitation Dept.	Functional training and Prosthetics	}	B. Medical Rehabilitation Zone
4) Vocational Rehabilitation Dept.	Vocational evaluation and Guidance		
	Work preparation and Vocational training	}	C. Vocational Rehabilitation zone
5) Client Dormitory	Dormitory, Canteen and Auditorium		
6) Recreation Dept.	(Costs to be borne by the Thai Government)	}	E. Recreation Zone
7) Staff Residence	(Costs fo be borne by the Thai Government)		
		}	F. Staff Residence Zone

The functional relationships between each zone are as shown in Fig. 5-c and following items.

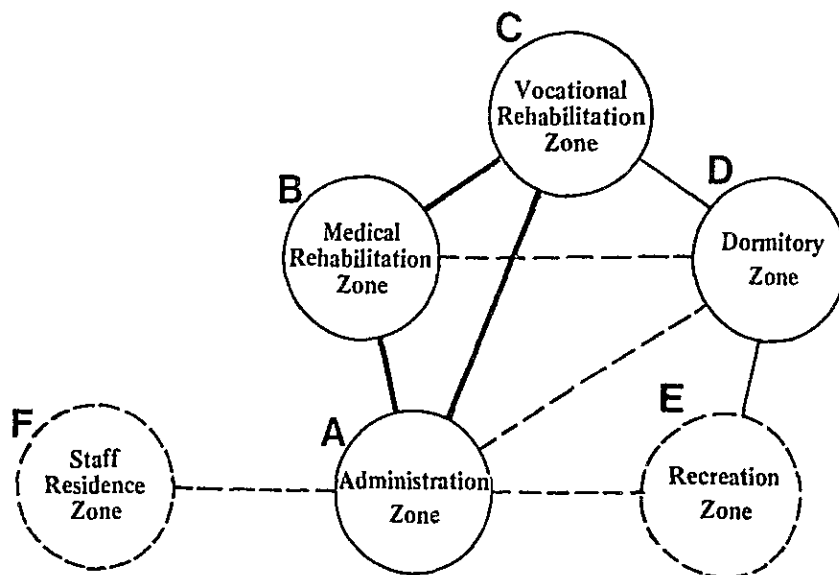


Fig. 5-c Functional Relationships

- 1) A: The Administration Zone will function as the management and service zone of the IRC facilities, while at the same time, maintaining planning and research functions as well. It will be located so as to provide visitors with easy access.
- 2) B: The Medical Rehabilitation Zone must maintain a close relations with the planning and research arms of the Administration Zone as well as with the work preparation and vocational preparation and vocational training sections of the Vocational Rehabilitation Zone. It is, therefore, situated between these two zones. The Medical Rehabilitation Zone will carry out functional training and prosthetics, as well as vocational evaluation and guidance. In this way, IRC will be better able to evaluate its clients overall medical and vocational fitness, thus providing them with comprehensive services. All these functions will be carried out in one building, to be named the Evaluation/Functional Training Building.
- 3) C: The Vocational Rehabilitation Zone is the core of the Center. In order to ensure optimum interaction with the other zones, it will be located in the most central of the buildings. Careful attention will, thus, have to be paid to make sure the noise, dirt and dust coming out of this zone doesn't adversely affect the other zones.
- 4) D: The Dormitory Zone comprises the client's living quarters. This zone will be separated from the aforementioned training facilities and situated next to the Recreation Zone to keep it as quiet and comfortable as possible. Also, since the canteen and auditorium will be located between the training facility and dormitory, a smooth path will be created for the flow of every day living.
- 5) E: The Recreation Zone will be situated on that land where buildings are not permitted to be built, but will be connected to the dormitory. This portion of the Project will be constructed at the cost of the Thai Government, and therefore only the land allocation need to be done.
- 6) F: The Staff Residence Zone will also be constructed at the cost of the Thai Government. Land for this zone has been set in the site.

5-3-2 Access Road and Walking Paths

Access for people and vehicles to the site will be from National Route No.306, which means the entrance will be at the south end of the site. Walking paths within the ground will lead directly to the central square, and then branch out to each of the surrounding buildings. The parking lot will be situated to the south of the Recreation Zone. Ordinary passenger cars will not be allowed to enter the central zone. The service approaches for transporting training equipment and other materials will be on the opposite sides of the buildings from the central square, and will be clearly separated from visitor traffic.

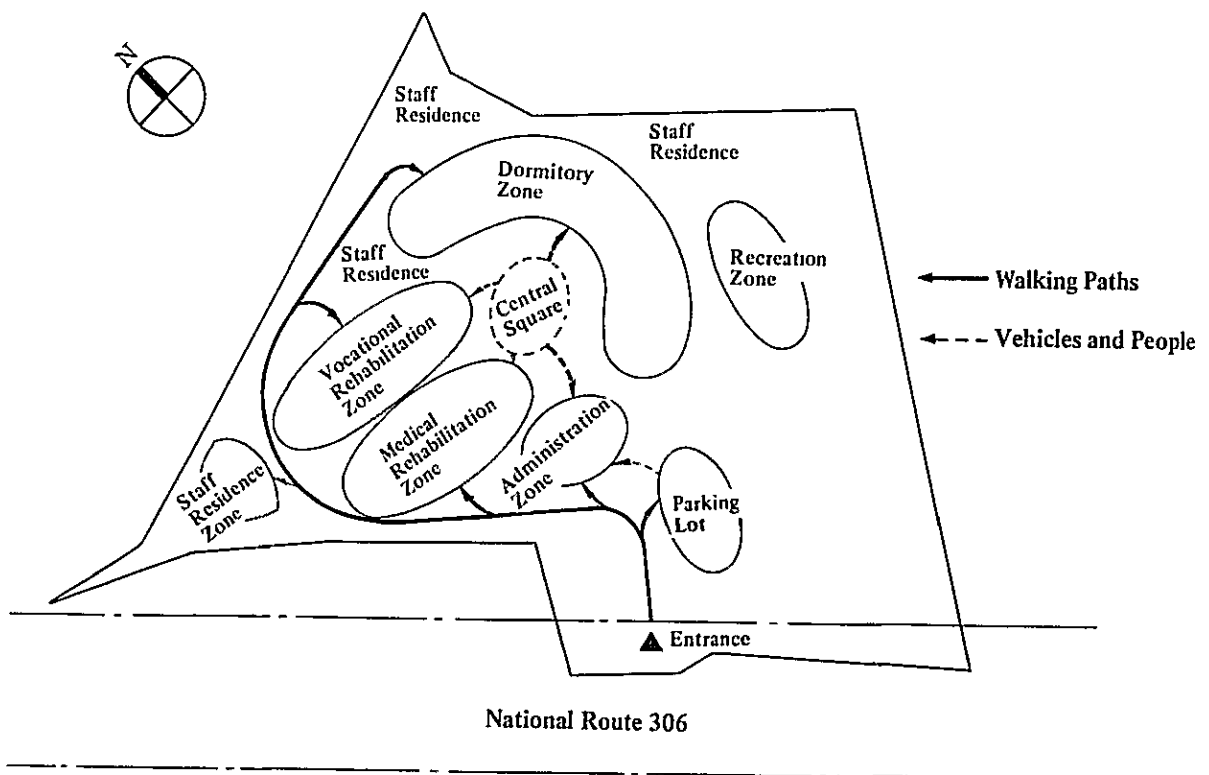


Fig. 5-d Access Road and Walking Paths

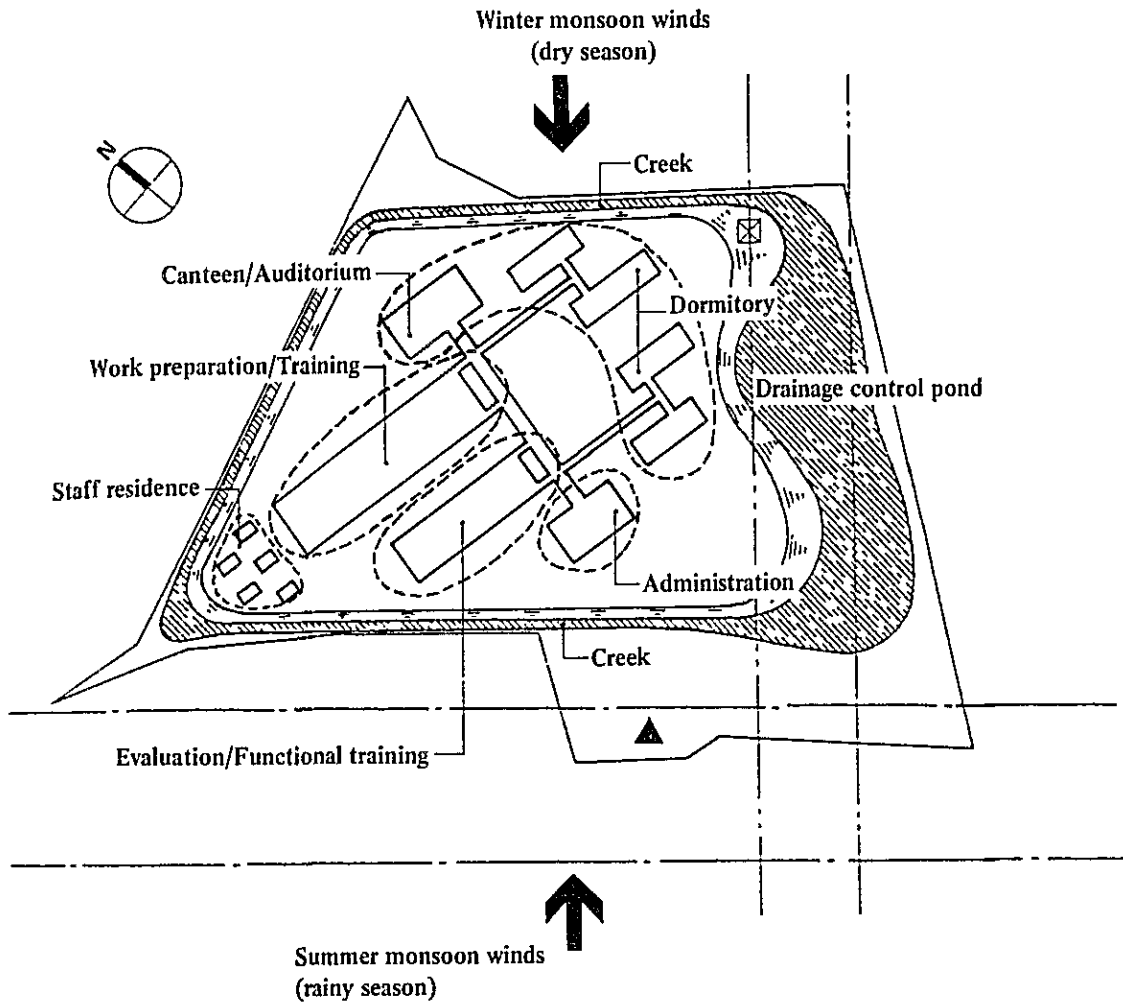


Fig. 5-e Site Plan

Each building will be located so that its longitudinal axis will run from east to west. This will allow the summer monsoon winds coming from the southwest during the rainy season, and the winter monsoon winds coming from the northeast during the dry season to blow through the buildings. Also, the buildings will be designed in shapes that prevent direct sunlight from shining into them.

5-4 Architectural Design

5-4-1 Basic Policy for the Architectural Design

(1) Floor Plans

- 1) Taking into consideration the special characteristics of the facility, buildings will all be one-story high. In principle, floors with different levels and objects that project from the walls shall be avoided. The designs should be drawn up with due consideration for physically handicapped persons.
- 2) Partitioned walls within the buildings will be avoided as much as possible, meaning most structures will be one-room types. This could be provided the flexibility needed for good ventilation and efficient machinery layouts.
- 3) Open corridors will be used as much as possible. All rooms will be designed to receive the maximum natural lighting and ventilation.

(2) Section Plans

- 1) Ceiling will be made as high as possible to get the most out of natural lighting and ventilation. Heat insulation materials will be installed into the roofs to keep out radiant heat.
- 2) The pitch of the roofs will be steep and the eaves deep. This construction will offer the best protection against local down-pours and direct sunshine.

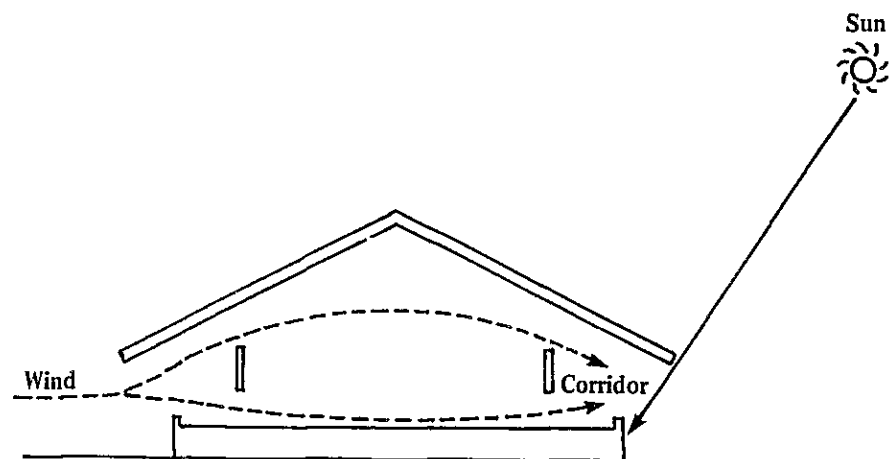


Fig. 5-f Typical Section

5-4-2 Planning of Buildings

(1) Administration Building

The Administration Building will be a one-storied building, consisting of an administration department where administration and management operations are carried out, and a planning and research department where research, information gathering and public relations activities concerning rehabilitation are performed. In the center of the building will be a multi-purpose lobby, which will make up the core of the building. Each room will lead off of this lobby.

A list of the rooms to be constructed in this building is as listed below:

- Lobby (exhibitions & public relations)
- Director's room
- Specialist's room (include Head Specialist)
- Reference room
- Conference rooms (large & small)
- General office & planning and research room
- Toilet
- Storage

(2) Evaluation/Functional Training Building

The Evaluation/Functional Training Building will be a one-stories building. This building will consist of a medical rehabilitation department and the vocational evaluation and guidance sections of the vocational rehabilitation department. Although these sections seem to be divided into different blocks in the drawings, actually, each block is connected to the other by open corridors so that even the Administration Building and the Work Preparation/Training Building are accessible. This will enable more systematic contact and cooperation between all of the zones. The rooms will be arranged in such a way that the noise and dust generating rooms will be co-located and kept separate from those requiring peace and quiet. Moreover, occupational therapy,

exercises, physical therapy and hydrotherapy will be conducted in the same big room to make it easy to keep an eye on everything as much as possible.

The major rooms to be constructed in the Evaluation/Functional Training Building are as listed below:

1) Functional Training Section

- Medical examination room
- Treatment/recovery room
- Prosthetics fitting room/work shop
- Modeling room
- Physical therapy room (for exercise and hydrotherapy)
- Occupational therapy room
- Staff room
- Storage room

2) Vocational Evaluation and Guidance Section

- Individual counselling room (Two rooms)
- Group counselling room
- Psychological testing and work sample testing room
- Case conference room
- Staff room
- File storage room
- Toilet

(3) Work Preparation/Training Building

The Work Preparation/Training Building will be used for work preparation courses (machinery, assembly, metal, wood work and clerical work) and for vocational training courses (home electric appliances repair and dressmaking). Training rooms will be separated as to the kind of work performed. For example, one room will be for wood work, another for machinery, assembly and metal work and clerical work, home electric appliances and dressmaking will be provided with individual room. Each room will be constructed in the one-room style in order to meet the future diversified needs of

the clients and changes in production technologies. In addition, this style room will be most effective from the standpoint of ventilation. Although the length of the building will be long, it will be flat, and special consideration will be given for the physically handicapped to enable them to move around easily. Also from the viewpoint of securing safety, all training rooms will be readily observable from each instructor's room.

The main rooms that will make up the Work Preparation/Training Building are as follows:

- Machinery, assembly and metal workshop
- Wood workshop
- Clerical workshop
- Home electric appliances repair workshop
- Dressmaking workshop
- Class room
- Instructor's rooms
- CCTV room
- Storage rooms
- Toilet

(4) Canteen/Auditorium

The Canteen/Auditorium provide daily meals to clients and can be used as multi-purpose hall as an auditorium for meetings and recreation. If necessary, it can be divided into two rooms of Canteen and Auditorium by movable partition. The building will be an one-storied structure with seating capacity of 50 to 60 for canteen so that meals can be served for 100 clients in two shifts and 150 seats for auditorium. The kitchen will occupy enough space to cook for 100 clients plus additional staff members.

The rooms to be constructed in the Canteen/Auditorium are as listed below:

- Canteen & Auditorium
- Kitchen
- Shop
- Storage rooms
- Toilet

(5) **Dormitories**

The Dormitories for clients will accommodate 100 persons. One building will hold 25 persons and there will be four buildings altogether. One of the four dormitories will be reserved for female clients. Rooms will be in the one-room style to prepare for increases/decreases of occupants. Also, janitor's room will be situated within the dormitory to take care of the clients.

The main rooms to be constructed in the Dormitories are as listed below:

- Living rooms
- Shower rooms
- Toilet
- Laundry space
- Janitor's room (with kitchen, toilet and shower room)