

5-3-6 Equipment Plan

(1) Equipment Plan

As to the selection of equipment, thorough examinations have been made on their functions and roles together with the purpose of the Project with Chiang Mai University. The principal policies formulated under the discussions will be as follows : -

1) To select only such equipment which will be used for training purposes, taking into consideration the technical level and number of trainees, cost of operation and maintenance, and the degree of technology for smooth operation, and to eliminate the equipment which will require higher operation cost.

2) Considering the electric condition at the Center, where shall be operated by generating set, to select the Model requiring smaller consumption of electricity without any interference to the purpose of utilization. In case of workshop building, one set of low capacity generator shall be installed independently due to heavy frequency of load depending on the kind of work and to reduce fuel cost. Farm machinery shall be manual or engine mounted models as well as possible for extension engine because trainees are hilltribe farmers who can not be expected to utilize electricity.

3) Considering that the Center is located at remote and secluded place in the mountains, to select trouble-free equipment, of which spare parts can be easily obtained for maintenance and to provide maintenance, inspection and repair workshop tools for enabling to process and repair small scaled equipment including building

facilities and to extend services such as periodical inspection, maintenance and replace of parts for small, medium and large equipment for smooth execution of training plan.

4) As to audio-visual equipment, which was surveyed to be more popular and to be utilized more effective than expected near around here, minimal number of equipment shall be provided for effective management of the Center.

5) It is needed to improve and to maintain the access road between Chiang Mai City and the Center. It is very difficult to manage road by farm machinery because of the past experiences and so agreed to provide specific road maintenance machines for securing traffic of trainees all year round despite dry and rainy season for execution of training program.

6) As to the equipment for highland agricultural development, to minimize the item and number and to provide essential equipment required for meteorology, soil conservation and plant protection training.

7) To provide the type and number of transportation vehicles suitable for the training activities.

(2) Contents of Equipment

According to the training plan including course, curriculum, trainee, duration, etc., practical and definite discussions were held with Thai side. It is concluded to provide the equipment listed as follows:

(Details can be referred to Appendix 6-10)

Table 5-3 (1) List of Equipment to be Provided for Highland
Agricultural Development and Training Center

Name of Equipment	Quantity	Standard
1) Equipment for Training		
① Audio Visual Equipment		
a. Outdoor Video Production Equipment		
Video Camera	1 unit	with Microphone & Tripod
Video Cassette Recorder	1 unit	
Video Monitor	1 unit	9" & Color
Lighting Kit	1 unit	Battery-driven
Others	1 lot	
b. Indoor Video Production Equipment		
Video Monitor	1 lot	9", 12" & 21"
Editing Control Unit	1 unit	
Video Cassette Editing Recorder	1 unit	
Power Amplifier	1 unit	
Audio Mixer	1 unit	
Cassette Tape Recorder	1 unit	
CD Player	1 unit	
Others	1 lot	
c. Video Editing Equipment		
Video Cassette Editing Recorder	1 unit	
Editing Control Unit	1 unit	
Video Monitor	1 unit	14" & Color
Others	1 lot	

Table 5-3 (2) List of Equipment to be Provided for Highland Agricultural Development and Training Center

Name of Equipment	Quantity	Standard
d. Video Duplication Equipment		
Video Cassette Player	2 units	U-Matic & S-VHS/VHS
VTR Dubbing Controller	1 unit	
Video Audio Distributor	1 unit	
Video Recorder Player	2 units	
Others	1 lot	
e. Video Display Equipment		
Video Cassette Player	1 unit	
Video Projector	1 unit	Movable type
Audio Mixer	2 units	
Power Amplifier	2 units	
Speaker	2 pairs	
Screen	2 units	
Others	1 lot	
f. Mobile Training Equipment		
Video Cassette Player	1 unit	
Display	1 unit	27"
Engine Generator	1 unit	1KVA
Automatic Voltage Regulator	1 unit	
② Training Support Equipment		
Manual Typewriter	2 units	Thai
Electric Typewriter	2 units	Thai/English
Computer Set	1 lot	16 bits
Plain Paper Copy Machine	1 unit	B5-A3, 21 copies/min-A4
Printing Machine	1 lot	Stencil Cutter, Auto Printer, Cutter, Book Binder, & Paper Drill
Electric Calculator	2 units	10 digits

Table 5-3 (3) List of Equipment to be Provided for Highland
Agricultural Development and Training Center

Name of Equipment	Quantity	Standard
Wireless Radio Set	1 lot	Base Station 2 units, Automobile 3 units & Handy Carry 6 units
Fax	1 unit	
Steel Shelves	4 units	
File Cabinet	5 units	
Slide Door Locker	5 units	
Camera Set	3 sets	35mm
Slide Projector	3 sets	
Overhead Projector	3 units	
Opaque Projector	1 unit	
16mm Movie Projector	1 unit	
Screen	1 lot	Floor Stand Type 3 units & Wall Type 1 unit
Handy Speaker	5 units	Battery driven
2) Equipment for Demonstration Farm		
① Farm Machinery & Implement		
Hand Tractor Set	2 sets	7 Hp, Diesel with Rotary, Disc Plow, Ridger, Cage Wheel & Trailer
4 Wheel Tractor Set	1 set	Diesel, 70 Hp, with Rotary, Disc Plow, Disc Harrow, Ridger, Front Blade, Cage Wheel & Trailer
Sprayer Set	1 lot	Power Sprayer 2 units, Hand Sprayer 5 units & Preparation Tank 6 units
Bush Cutter	5 units	2 Hp
Sprinkler Head	50 units	
Corn Sheller	3 units	Manual

Table 5-3 (4) List of Equipment to be Provided for Highland
Agricultural Development and Training Center

Name of Equipment	Quantity	Standard
Rice Thresher	1 unit	Engine driven
Winnowing	2 units	Manual
② Workshop Tools		
Gage Jack	1 unit	3 ton
Battery Charger	1 unit	6-12V 30A, 18~24V 15A
Hand Tachometer	1 unit	5 Digits, Digital
Air Compressor	1 unit	9.9 kg/cm ²
Blacksmith Tool Set	1 lot	Iron Anvil, Hammer, Tong Firing & etc.
Carpenter's Tool Kit	1 lot	Nail Extractor, Portable Circular Saw, Power Plane & etc.
Work Bench	1 unit	
Others	1 lot	
3) Equipment for Road Maintenance		
Bulldozer	1 unit	70 Hp. Diesel
Dump Truck	1 unit	2 ton, 4WD, Diesel
Hydraulic Excavator	1 unit	15 Hp, Diesel, Crawler Type, Bucket Capacity 0.04m ³
4) Equipment for Transportation Vehicle		
Station Wagon	3 units	
Pickup Truck	1 unit	
Microbus	1 unit	
Motor Cycle	5 units	
5) Equipment for Highland Agricultural Development		
① Equipment for Land and Soil Conservation		
Electronic Balance	2 units	0~6, 100g/0.01g

Table 5-3 (5) List of Equipment to be Provided for Highland
Agricultural Development and Training Center

Name of Equipment	Quantity	Standard
Mechanical Balance Set	6 sets	5kg & 12kg
Spring Scale	6 units	10kg
Platform Scale	6 units	50kg
Rule	6 units	1,000mm
Sketchboard	14 units	
Drying Oven	1 unit	150l
Meteorological Instrument	1 unit	2 units each of Evaporation Pan, Sunshine Autograph, Rain Gauge, Precipitation Recorder, Thermohygrograph, Anemometer & Assman Aspiration Psychrometer
Automatic Weather Station	1 lot	Installed at site. Connected to Computer. Consisting of Temperature, Soil Temperature, Humidity, Rain, Insolation, Sunshine, Evaporation, Barometric Pressure & Anemometer Sensor
Clinometer	14 units	Optical & Portable
Compass	14 units	Loupe Type
Altimeter	14 units	Digital
Runoff Plots Set	1 lot	
Global Positioning System	2 units	Digital, Accuracy 2-3m
Soil Moisture Meter	2 units	Digital
pH Meter	2 units	Digital
Soil Sampler	2 units	Sampling Depth 1m
Soil Analysis Sieve Set	2 sets	12 pieces/set
② Equipment for Plant Protection		
Stereomicroscope	14 units	Max.30X, with Illuminator
Compound Microscope	13 units	Max.1,000X, with Illuminator

Table 5-3 (6) List of Equipment to be Provided for Highland Agricultural Development and Training Center

Name of Equipment	Quantity	Standard
Compound Microscope with Camera and Display	1 unit	Max.1,000X, with Illuminator
Glassware for Microscope	1 lot	with Mortar and Pestle, Slide Glass, Cover Glass, Peti Dish & Tweezers
Loupe	26 units	10X
Alcohol Lamp	26 units	
Plate Reader Set	1 set	Micro Plate Reader, Plate Mixer, Plate Washer & ELISA Plate
Incubator	1 unit	150l
Autoclave	1 unit	40l
Oven	1 unit	150l
Water Bath	1 unit	40l
Dark Box	1 unit	6W × 2 pieces, with Ultra Violet Lamp
Grain Moisture Meter	1 unit	Digital, 6~40%

(3) Electric Power Required

Electric power required for the planned equipment is summarized in the following table ; 3.055 KW for the equipment continuous supply, 2.0 KW for the training equipment to be utilized in the lecture room during training, 4.18 KW for the experimental equipment in the practice room and 7.834 KW for the equipment to be utilized at an unspecified time. (Details can be referred to Appendix 6-11 attached herewith)

Table 5-4 Electric Power Requirement for the Planned Equipment

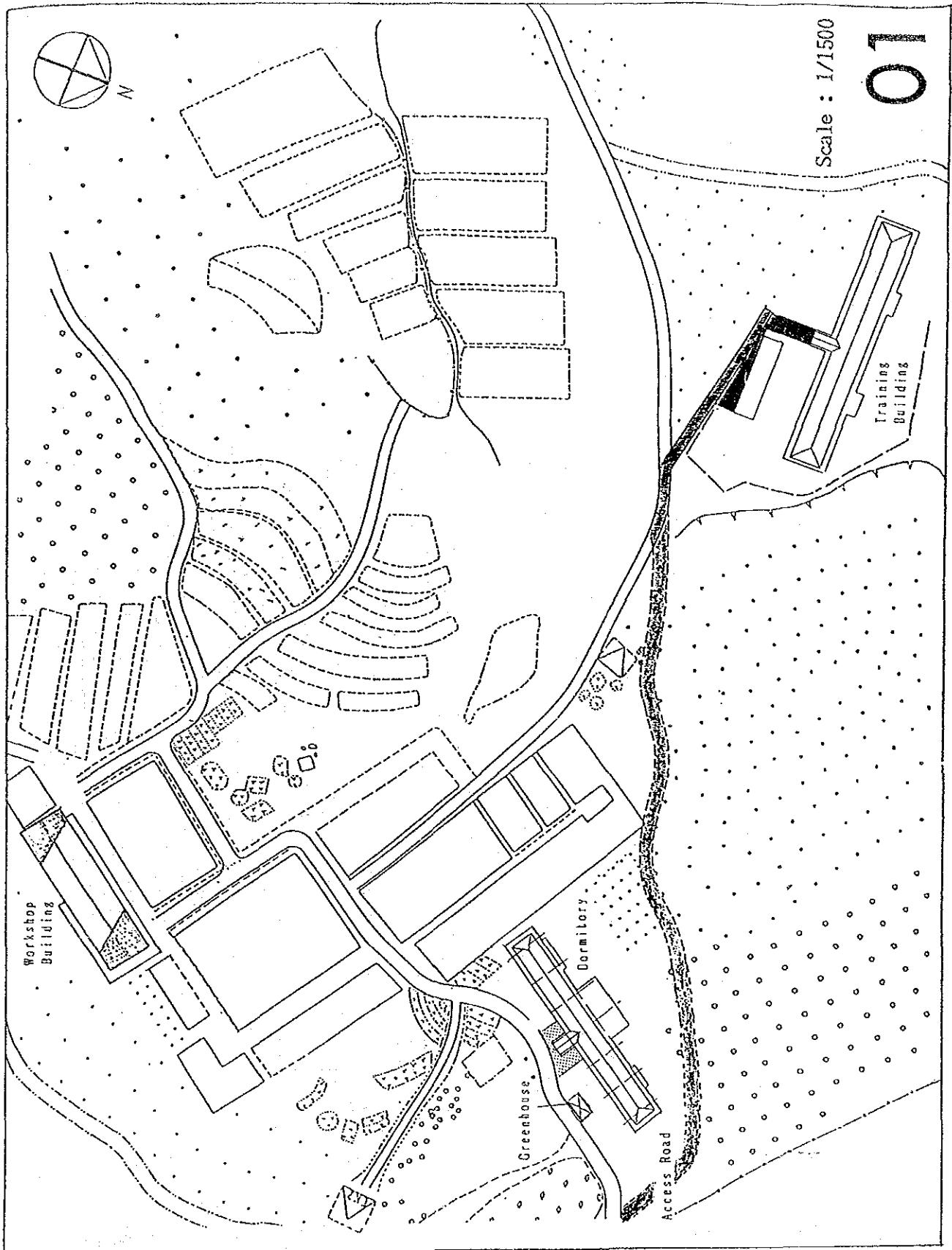
Name of Equipment	Form of Utilization				Remarks
	Continuous Use	When Training		Unspecified Use	
		Lecture Room	Practice Room		
1. Equipment for Training	2.038	2.0	-	5.009	
2. Equipment for Demonstration Farm	-	-	-	2.38	Almost engine-driven
3. Equipment for Road Maintenance	-	-	-	-	Engine-driven
4. Equipment for Transportation Vehicle	-	-	-	-	Engine-driven
5. Equipment for Highland Agricultural Development	1.017	-	4.18	0.445	
Total	3.055	2.0	4.18	7.834	

5-3-7 Basic Design Drawings

The necessary drawings for training building, dormitory, workshop, greenhouse and access road designed under the basic design study are listed as follows : -

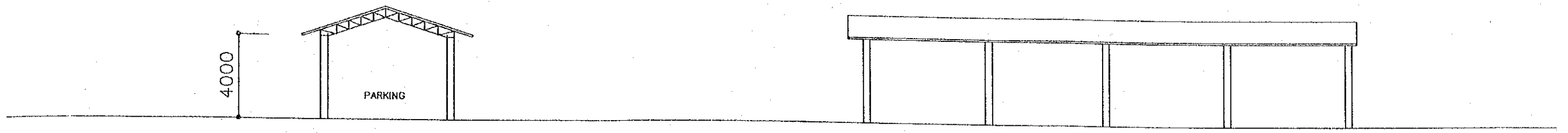
No. of Drawings	Title	Page
01	Facility Plot Plan	104
02	Plot Plant for Training Building and Parking Plan	105
03	Floor and Roof Plan for Training Building	106
04	Elevation and Section for Training Building	107
05	Plot Plan for Dormitory	108
06	Floor and Roof Plan for Dormitory	109
07	Elevation and Section Plan for Dormitory	110
08	Plot Plan for Workshop Building	111
09	Floor and Roof Plan for Workshop Building	112
10	Elevation and Section for Workshop Building	113

FACILITY PLOT PLAN



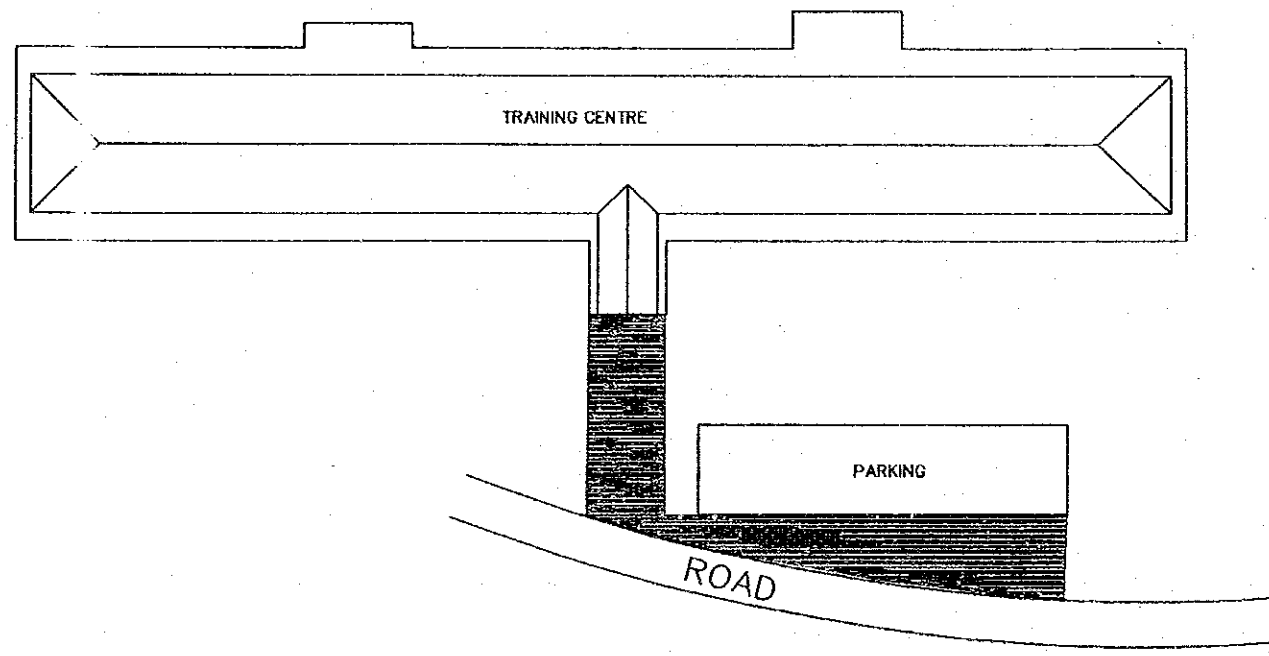
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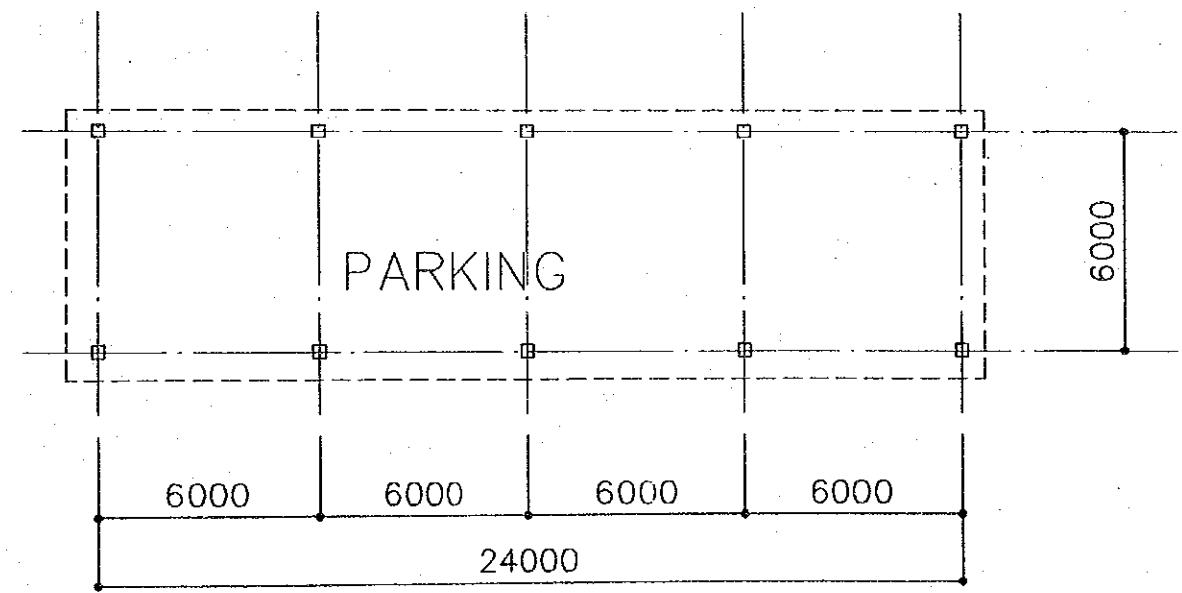


SECTION 1/200

ELEVATION

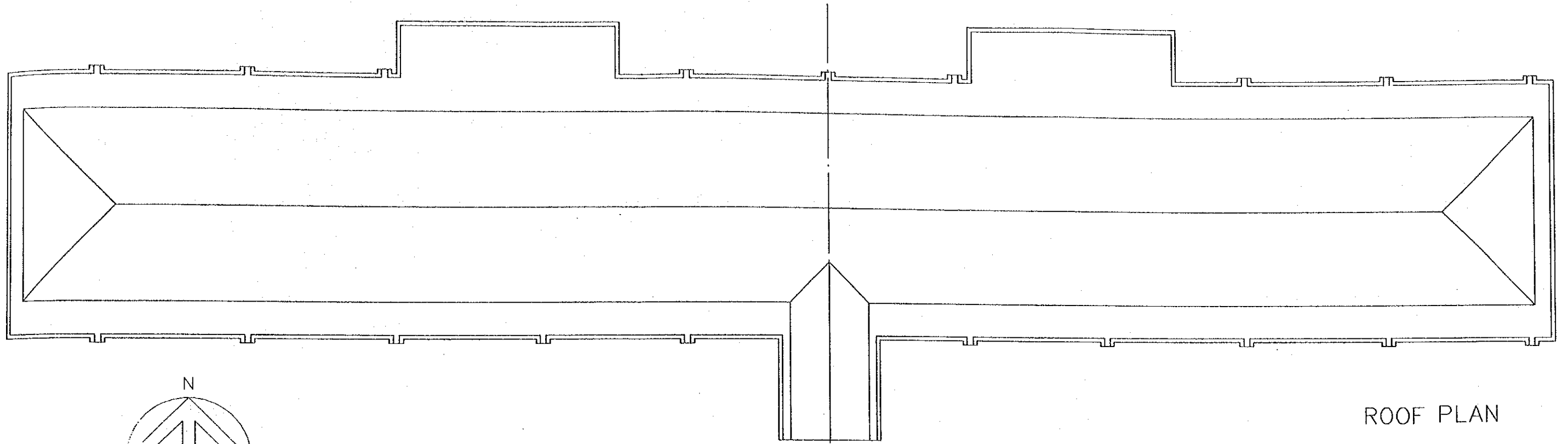


SITEPLAN 1/500

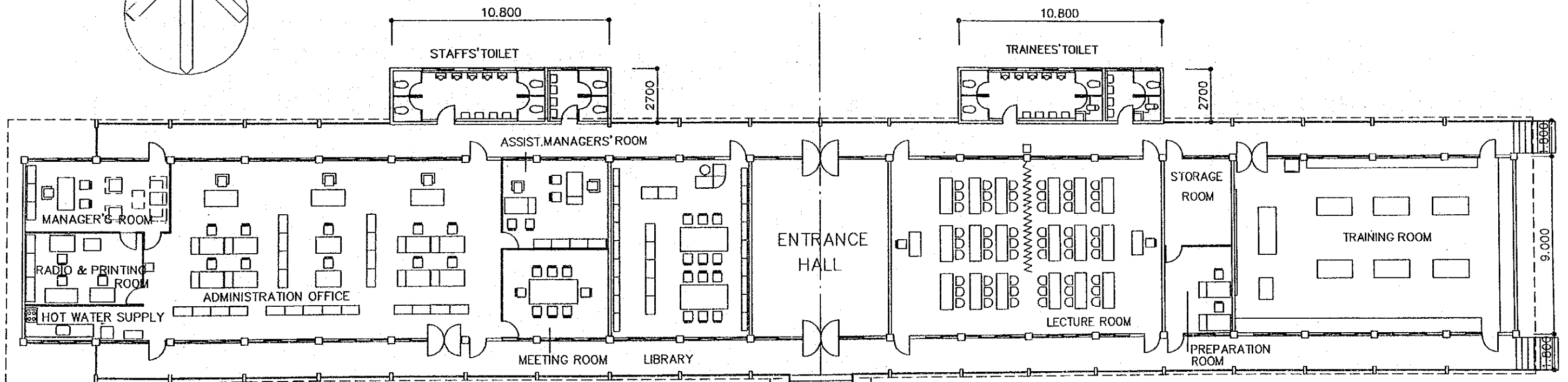
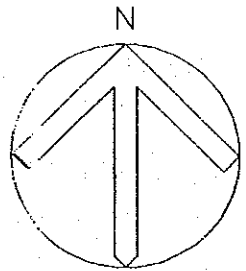


PLAN 1/200

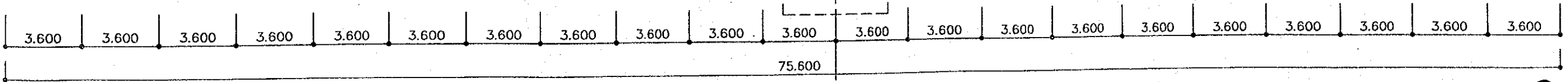
TRAINING CENTER SITEPLAN 1/500 02



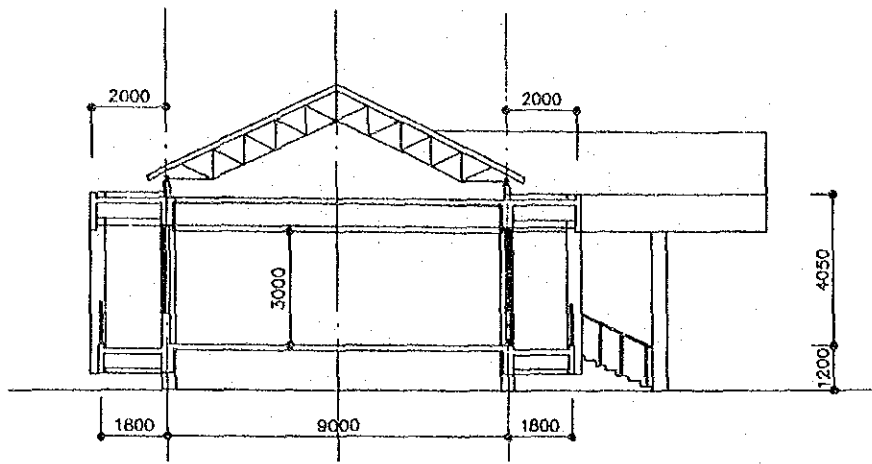
ROOF PLAN



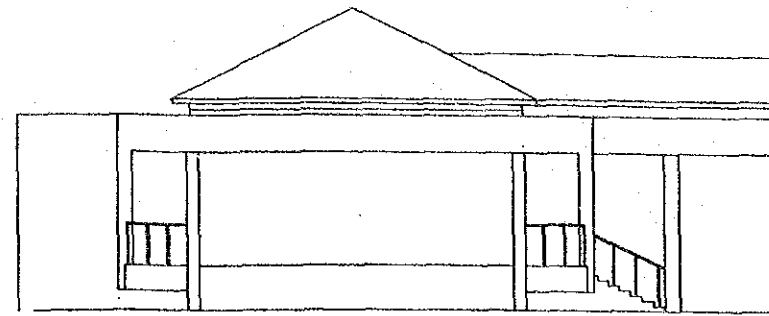
1ST FLOOR PLAN



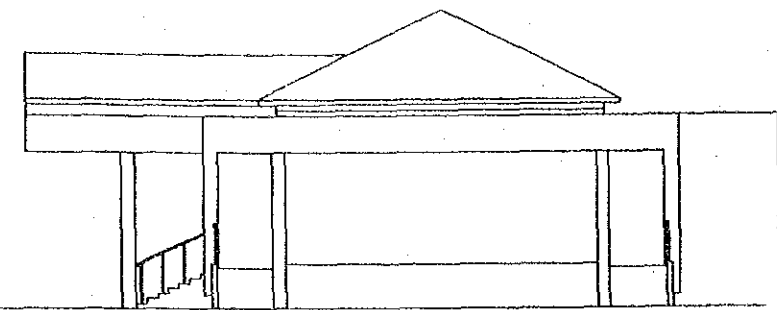
TRAINING CENTRE 1/200 03



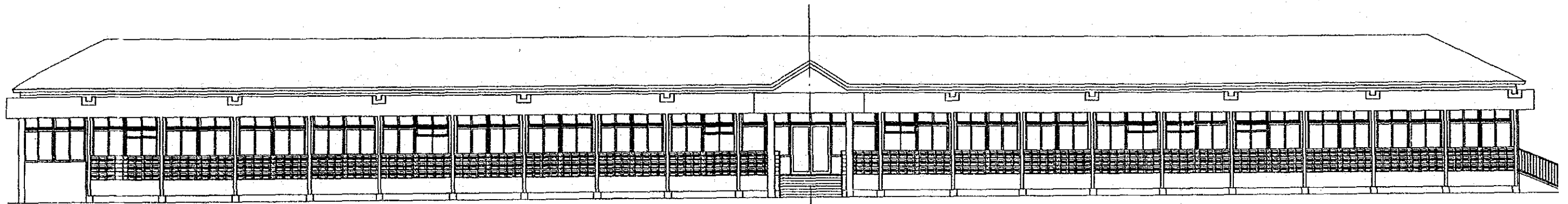
SECTION



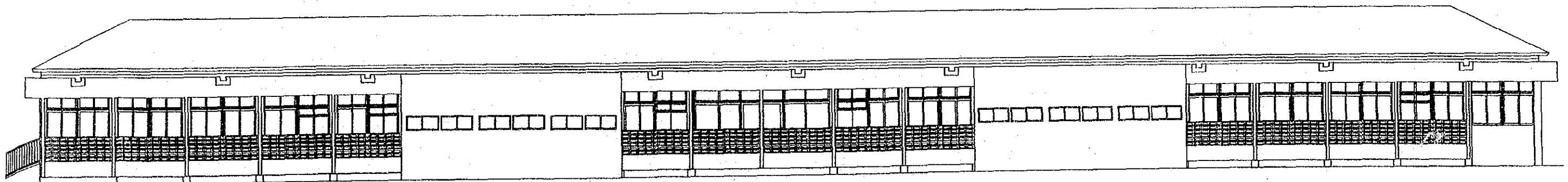
WEST SIDE ELEVATION



EAST SIDE ELEVATION

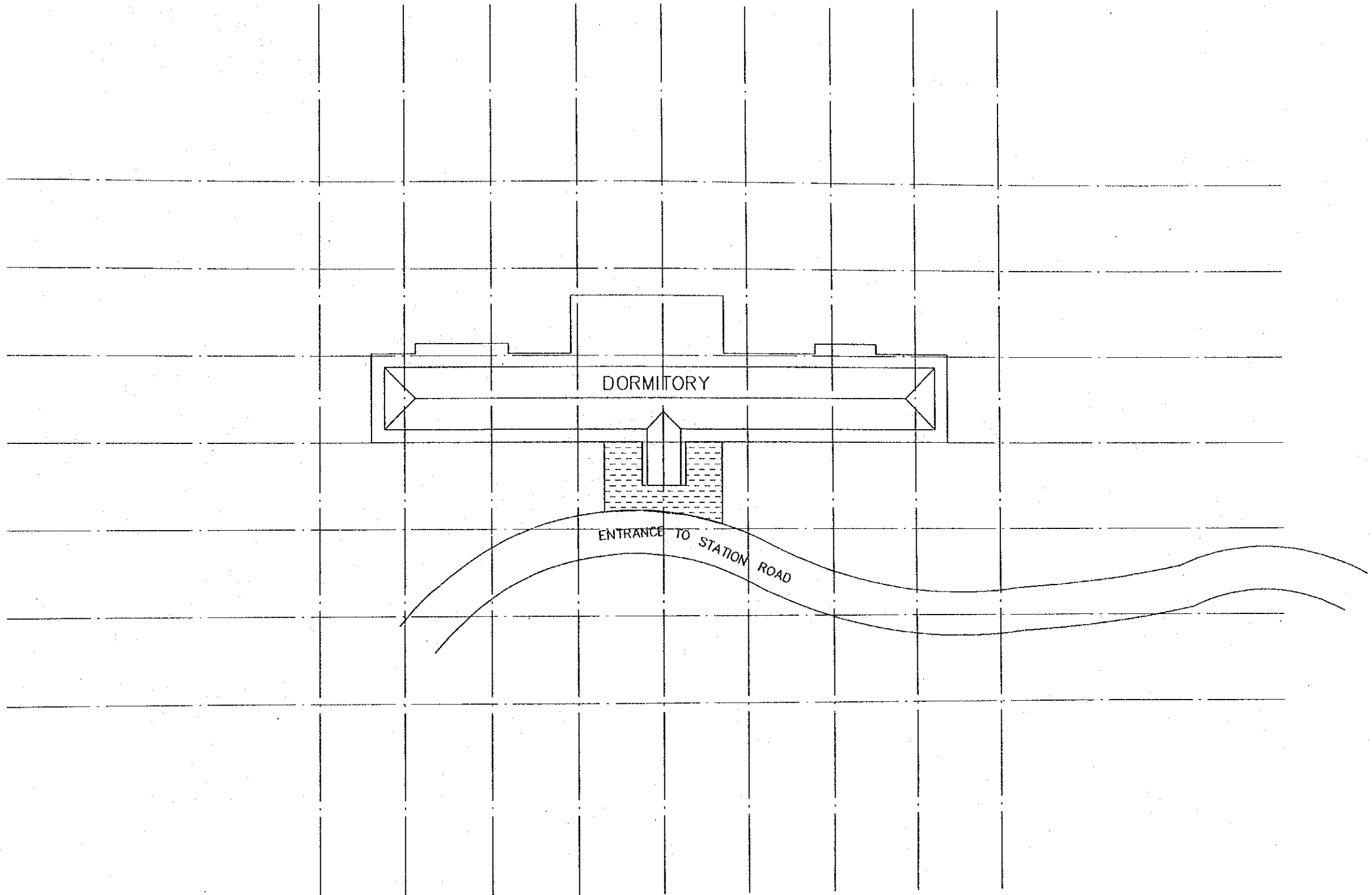


SOUTH SIDE ELEVATION

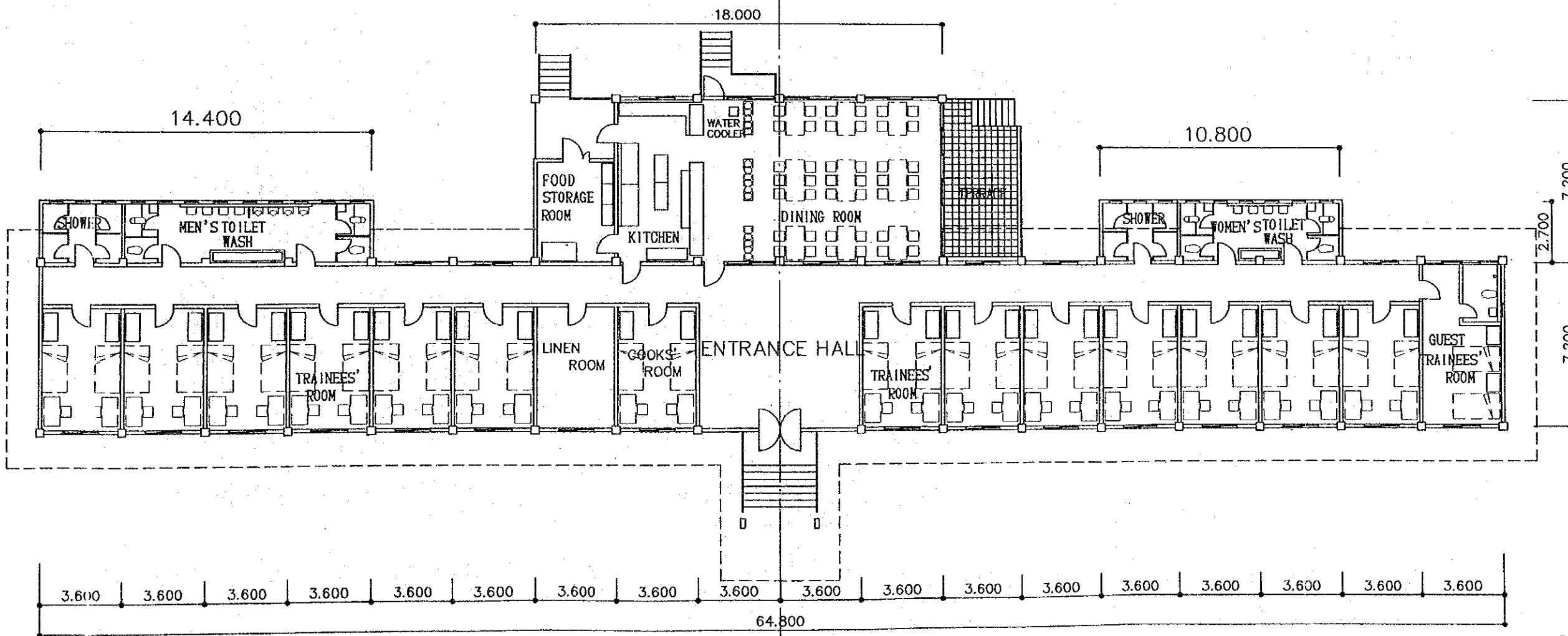
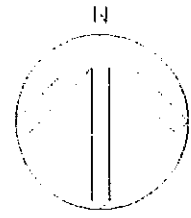
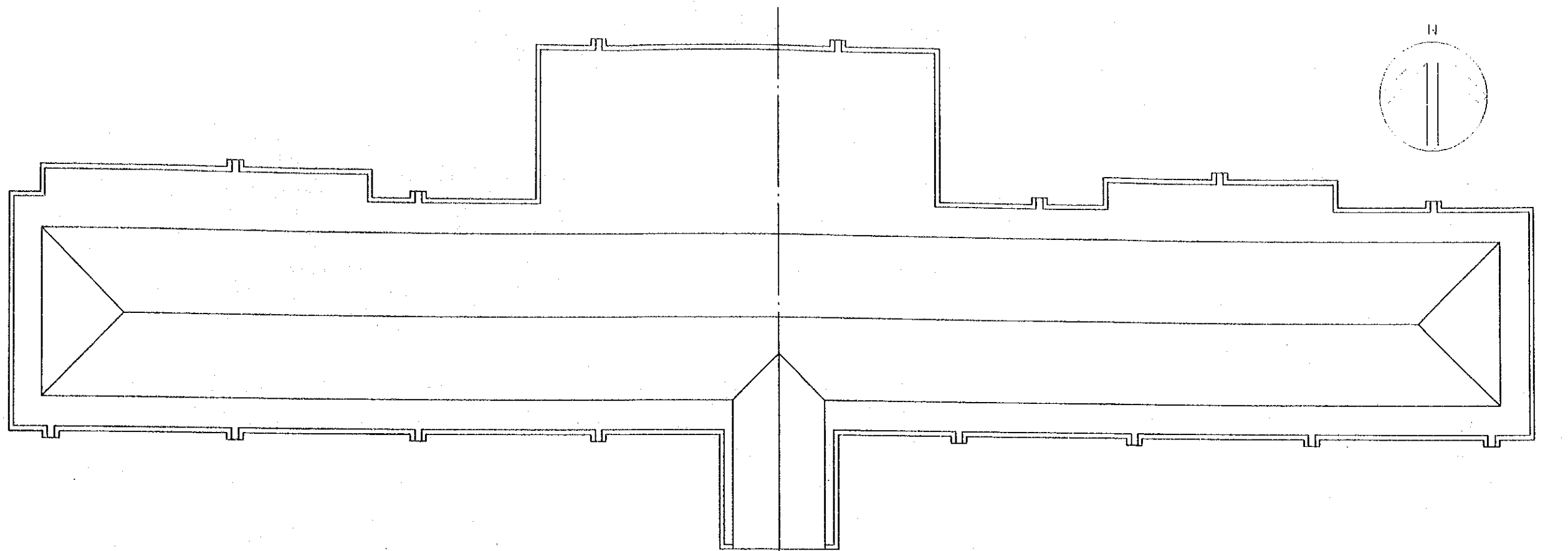


NORTH SIDE ELEVATION

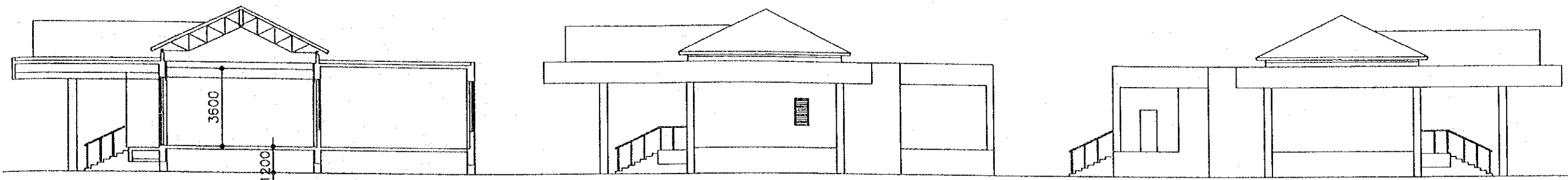
TRAINING CENTRE 1/200 04



DORMITORY SITEPLAN 1/500 05



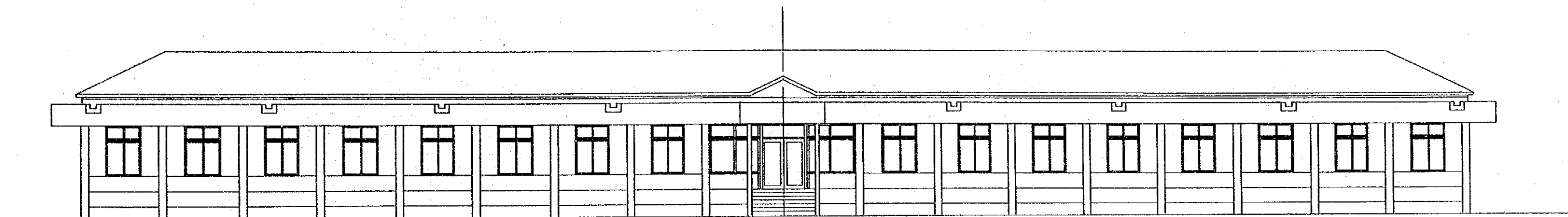
DORMITORY 1/200 06



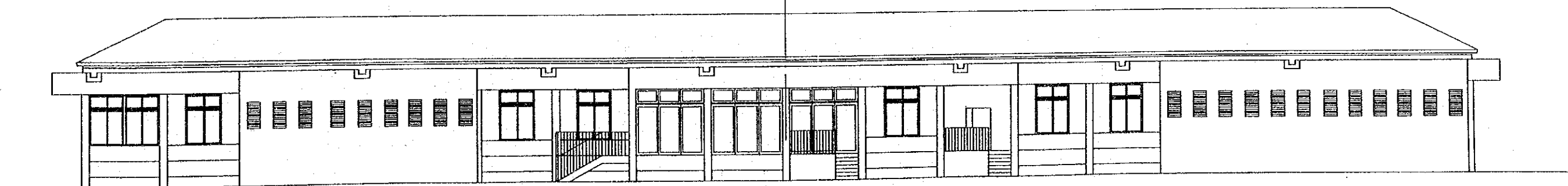
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EAST SIDE ELEVATION

WEST SIDE ELEVATION

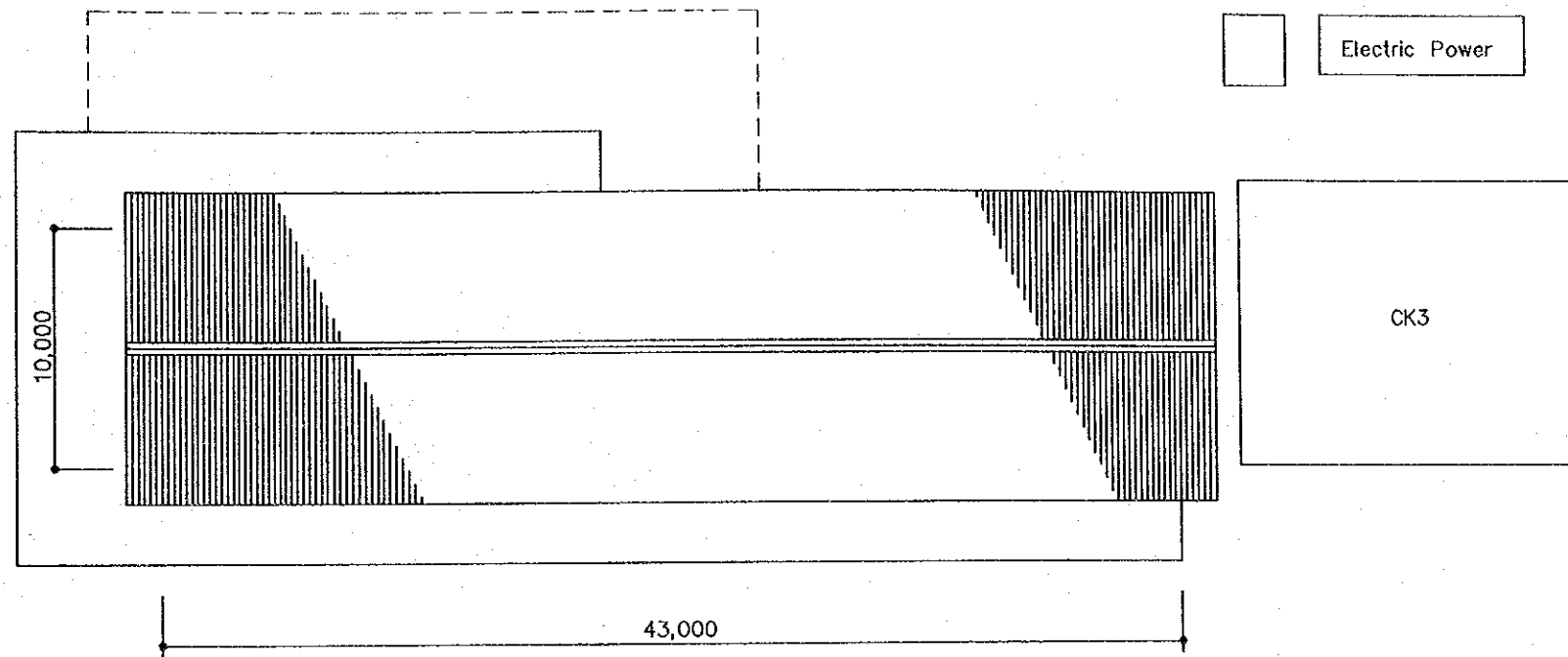


SOUTH SIDE ELEVATION



NORTH SIDE ELEVATION

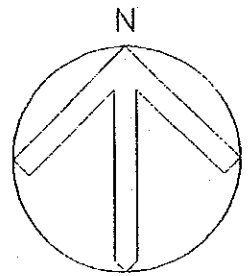
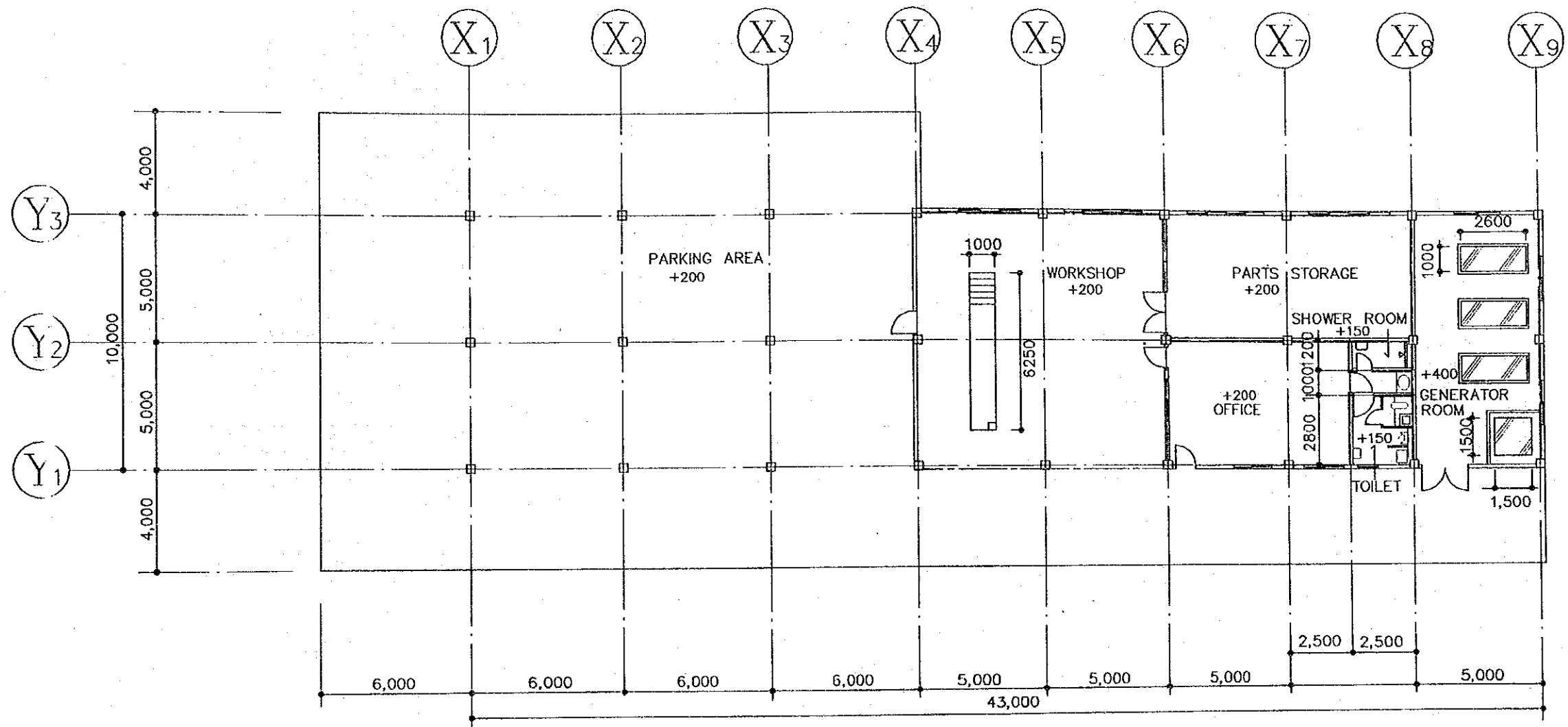
DORMITORY 1/200 07



SITE PLAN

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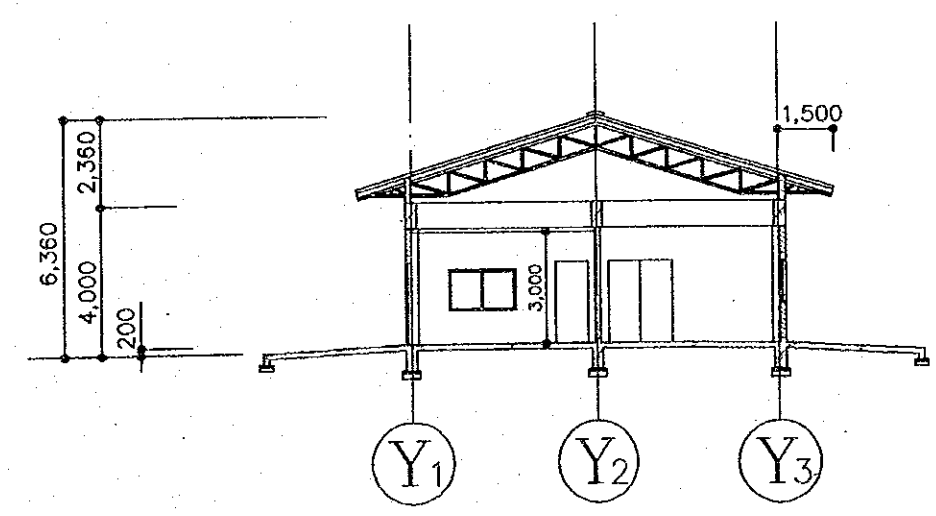
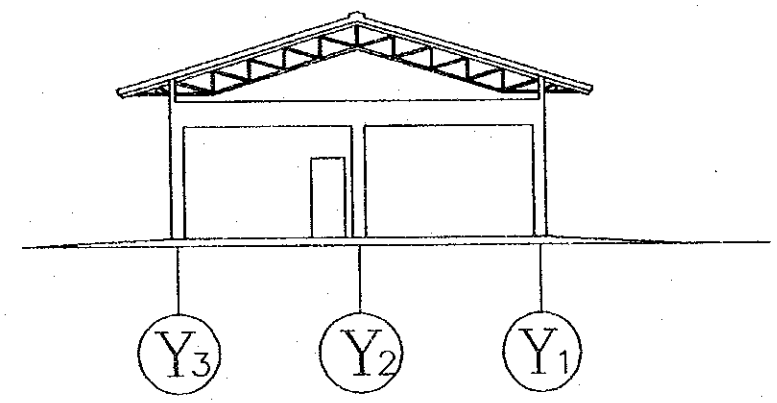
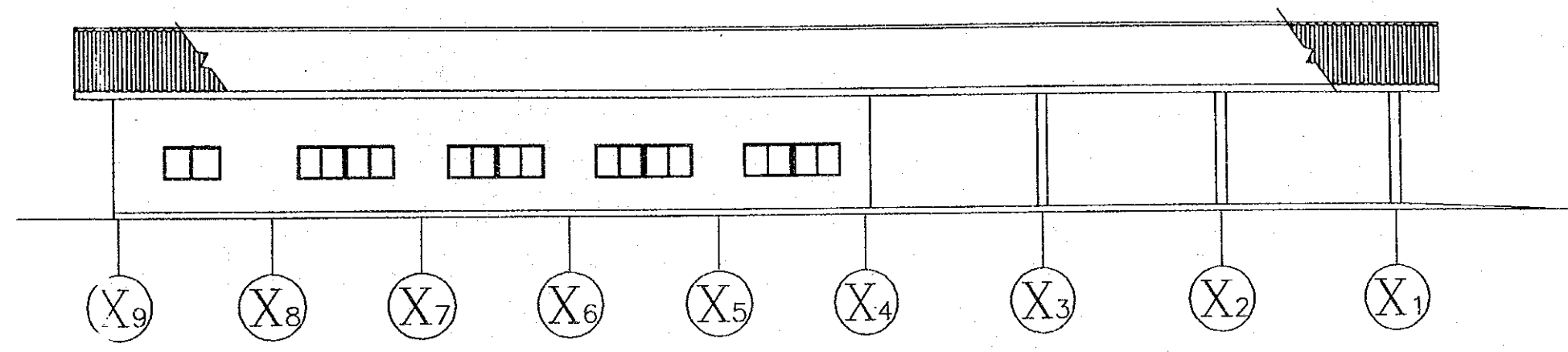
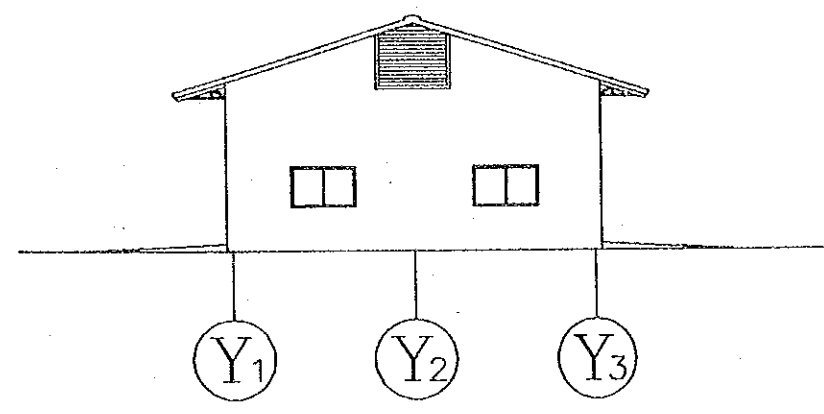
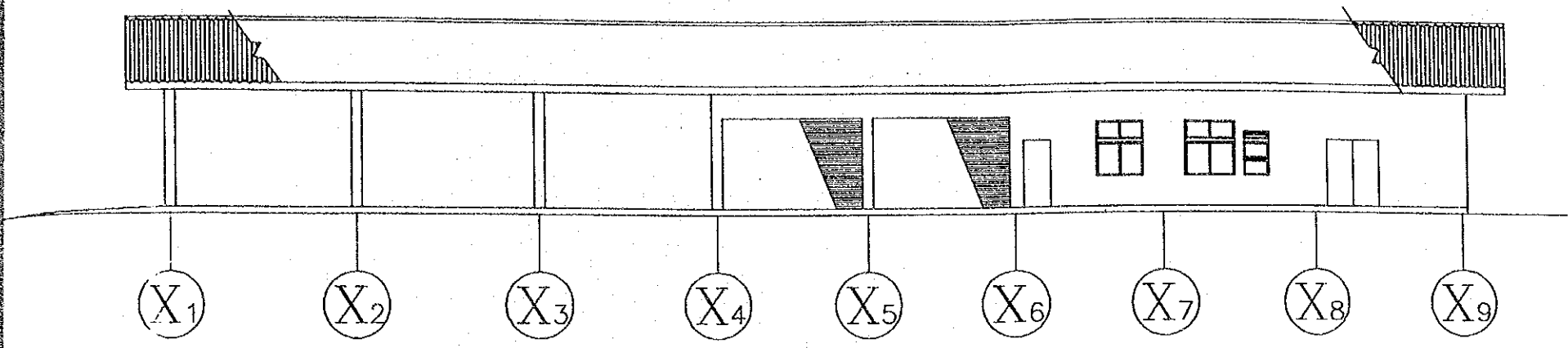
WORK SHOP 08



WORK SHOP 1st FLOOR PLAN

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WORK SHOP 09



SCALE=1:200 WORK SHOP 10

5-4 Implementation Plan

5-4-1 Implementation Policy

This Project must be completed within 12 months after the signing of the construction contract for the Project owing to Japanese budgetary system for grant aid cooperation. In the implementation plan, therefore, it is necessary to establish an implementation system which will enable, with a minimum of staff from Japan, and a maximum of local materials, equipment and labor, completion by the specified time to achieve the specified construction quality, and take into consideration the financial aspects including appropriation of temporary fixtures and equipment.

The authorities and the consultant will keep in close connection with each other through the detail design stage and the construction period to remove obstacles appearing in the way of the work.

The authorities concerned in Thailand are requested to repair caved-in parts of the road from the intersection to the site, and to complete discharge procedures before the beginning of the construction work to facilitate the work.

5-4-2 Construction Condition and Special Matters considered for Construction

Attention will be paid to 2 items. One is the construction period. Since 1/3 of the road to the site is earth with curving and rolling, which becomes a muddy road in the rainy season, the construction period is governed by which work meets rainy season expanded over 6 months. It is recommended therefore that the

construction work should at the latest start by the end of November. That is the first month of the dry season; and that roofing work should be completed by the beginning of the rainy season; and that exterior finish and external works should be executed during the following dry season.

The other is the quality of building materials and equipment, and of the workmanship. To save maintenance cost of the buildings, durable and reliable materials and equipment will be used and the quality of workmanship of skilled labor will be required simultaneously.

5-4-3 Implementation and Management Plan

Consultants' detail design and preparation stage for making out tender documents will take 3 months after making a consultant agreement with the authority in accordance with the conclusion of the Exchange of Notes between both Governments.

Then, as soon as the contractor is decided by the tender held at the end of October or the beginning of November, 1992, preparation work will be started. Construction work in the site will begin by the end of November or the beginning of December, 1992. Last month and a half will be required for final inspection, repair work and final procedures, and therefore 12 months will be requested as sum total for the construction period.

One supervisor will be sent to Thailand by the consultant throughout the construction period and the mechanical engineer will visit the site at the time of installing and inspecting equipment for 1 month for provisional takeover. One project manager of the work will be resident upto the completion of the work and, moreover, Japanese

mechanical and electrical engineers shall visit the site each for 3 months (2persons×3months=6man-month) to check and expedite the works.

5-4-4 Procurement Plan of Construction Materials and Equipment

(1) Construction Materials

The ordinary construction materials are domestically produced or constantly imported in Thailand. Even in Chiang Mai City most near to construction site for the Project, it is easy to procure. Through the delivery period and quantity are satisfactory as planned, the procurement plan shall be carefully studied in advance.

(2) Equipment

It will be recommended to procure administration equipment such as computer system with related facility, typewriter and etc. locally due to competitive price and after-sales service network. Furthermore, farm machinery like as axial-flow thresher, which is most popular and traditional in Thai farming and not manufactured in Japan, shall also be better to procure locally. However, other equipment will be expected to purchase in Japan since of unstable delivery date, quality and maintenance.

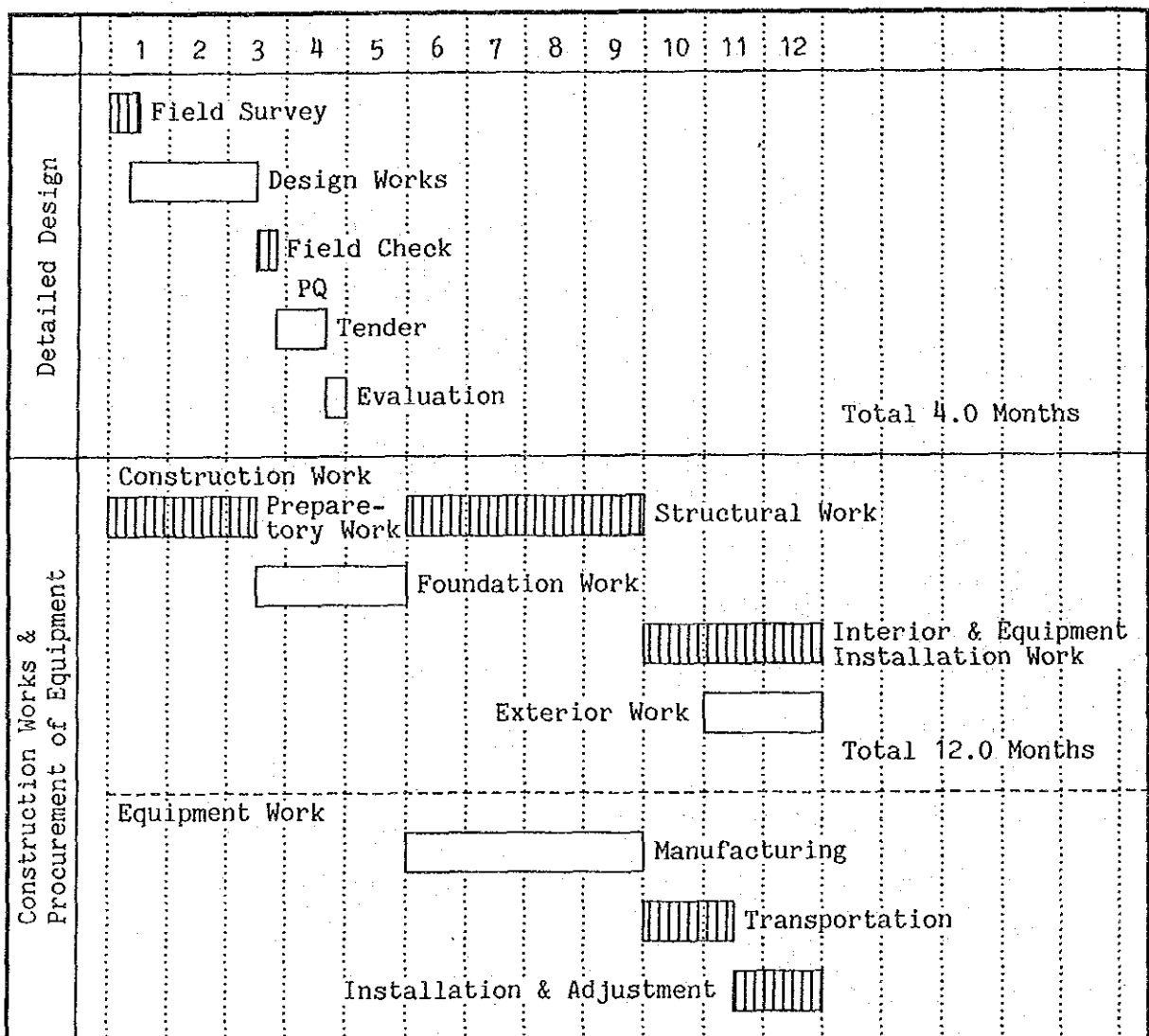
(3) Inland Transportation

The equipment excluding local-procured ones will be unloaded at Bangkok port after ocean transportation and then transported to Chiang Mai City by large trucks through inland road. Then after, the cargo shall be transshipped into smaller trucks and transported to the site because of bad road condition between Chiang Mai City and the site for the Project.

5-4-5 Project Implementation Schedule

After the verification of consultant contract by the Government of Japan, which will be contracted after the signing of the exchange of notes between the Government of Japan and the Royal Thai Government, it will take 4 months for detail design works, preparation of tender documents and approval of tender results, and 12 months for the construction works.

Fig. 5-2 Tentative Implementation Schedule



5-4-6 Detail Design and Construction Supervision

The consultant will execute the following works after the conclusion of the exchange of notes (E/N) between the Government of Japan and the Government of the Kingdom of Thailand. The resident supervisor will coordinate between the agencies of Japan and Thailand. At final stage of the Project, the equipment engineer will provide spot supervision.

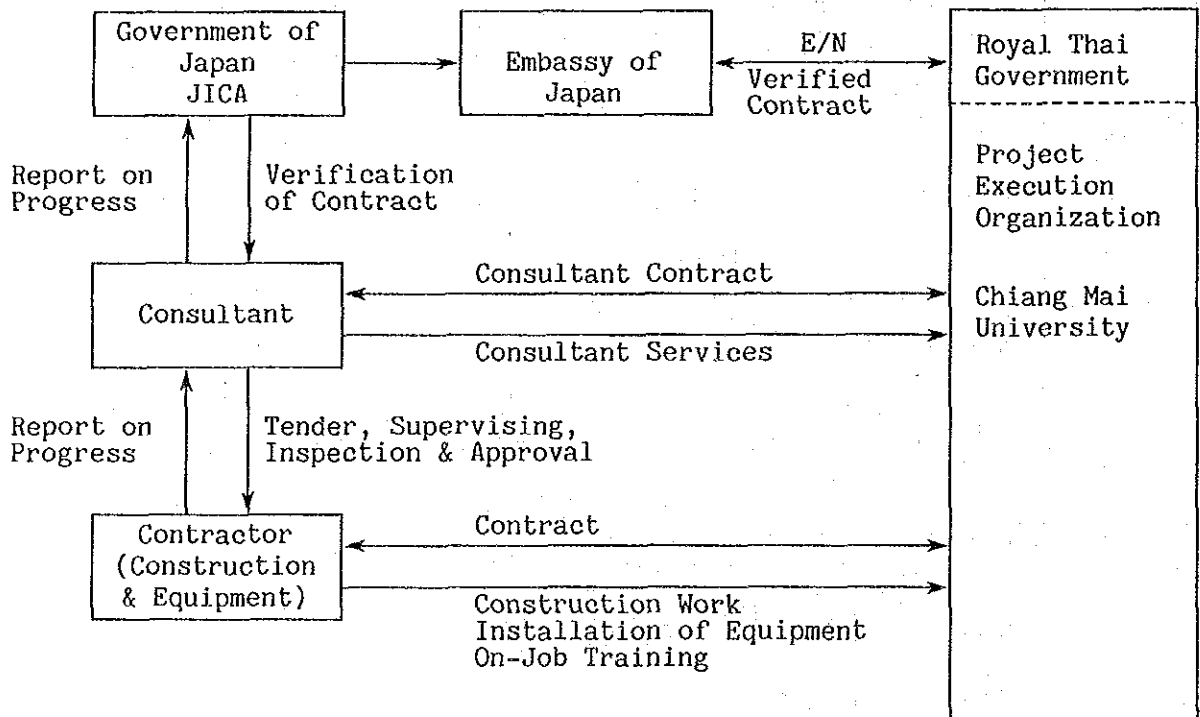
(1) Detail Design Schedule

- a. Signing the consultant agreement with an organization representing Thailand
- b. Taking necessary procedures for the verification of the consultant agreement by the Japanese Government
- c. Holding on-the-site discussions regarding the design
- d. Preparing the detail design documents
- e. Obtaining approval of the design documents from Thailand
- f. Publicly announcing of the tender offer in Japan and checking qualifications of contractors
- g. Managing the tendering procedures on behalf of the client
- h. Evaluating tendering amount
- i. Discussing the contractors and construction amounts with the Royal Thai Government
- j. Witnessing the signing of the construction contract

(2) Construction Supervision Schedule

- a. Dispatching resident supervisor
- b. Discussing the construction plan with the Royal Thai Government and contractors during the preparation period
- c. Dispatching equipment engineer when necessary
- d. Submitting monthly construction progress report
- e. Supervising the construction work and approving the completion of each stage
- f. Supervising the contractors' explanation of how to use the facilities and witnessing the provisional take-over.

Fig. 5-3 Organization for Project Execution



5-4-7 Cost Estimate

(1) Scope of Work

The construction of the facilities consists of the work to be undertaken by the Government of Japan and the government of Thailand as follows:-

1) Work to be undertaken by Japan

- a. To construct the main facilities
- b. To construct the incidental facilities
- c. To install access road with drain canal in the site
- d. To install power and water supply in the site
- e. To provide materials and equipment as specified

2) Work to be undertaken by Thailand

- a. To secure land for Project site
- b. To improve access road between Chiang Mai City and the site
- c. To plant in the site if necessary
- d. To provide facilities like as general furnitures and fixtures required for managing, maintaining and administrating the center
- e. To ensure prompt unloading, import tax exemption, customs clearance at Bangkok port, local tax exemption and prompt

internal transportation of the materials and equipment purchased under the Grand Aid

- f. To establish organization and budget for maintaining and utilizing properly and effectively the facilities
- g. To exempt Japanese nationals involved in the Project from custom duties, internal taxes and other fiscal levies which may be imposed in the Kingdom of Thailand with respect to the supply of the products and services under the verified contracts
- h. To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such facilities as may be necessary for their entry into the Kingdom of Thailand and stay therein for the performance of their works
- i. To secure permission and/or approval required for the internal tax exemption, and application and approval based on internal regulations for Japanese nationals involved in the execution of the Project
- j. To ensure effective reception of Japanese nationals for construction and equipment installation works, and on-job training
- k. To provide temporary depository for equipment both on the premises of the Project site and Chiang Mai University and temporary managing the equipment deposited there.

- l. To bear the advising commission of Authorization to Pay and payment commission to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement and issue the Authorization to Pay (the A/P)
- m. To bear all the expenses other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment

(2) Cost Estimate

The Royal Thai Government shall bear an amount of 135,000 Bahts excluding taxes classified as below :

1) Royal Improvement Cost	96,000 Bahts
	(estimated on the basis of 8,000 Bahts per kilometer)
2) Banking Arrangement Cost	39,000 Bahts
<u>Total</u>	<u>135,000 Bahts</u>

CHAPTER 6 PROJECT EFFECTS AND CONCLUSION

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6-1 Effects of Project Implementation

6-1-1 Direct Effects

A total of 1,342 trainees including 328 persons in crop production course, 204 persons in discipline course, 160 persons in other course and 650 farmers in mobile training would be able to complete the training at the end of 1994, one year after the completion of this Project.

All courses are inter-related and have their own purposes and functions. The "discipline course", consisting of highland farming system course, plant protection course, soil conservation course and environmental course, is designed mainly to enhance technical know-how to the extension officers. The "crop production course" will be supported by discipline course. While the "other course" is designed to make a policy on the development and extension in the highland agriculture. Lastly, the crop production course consisting of vegetable, fruits, upland rice, field crop and flower course, is designed to acquire technology transfer directly to the highland farmers. In this course, there are 246 persons as agricultural extension officers in Thailand and 49 officers in neighboring countries and 33 as advanced farmers, a total of 328 persons, who will be trained in the first year (1994). Farmers are generally used to cultivate upland rice, corn and wheat as staple food, and additional one or two crops of fruits, flowers and vegetables as cash crop, a total of 3 ~ 4 kinds of crops. Consequently, every farmer will be trained by 3 ~ 4 agricultural extension officers. Therefore, assuming that a farmer

will require average 3.5 agricultural extension officers and a agricultural extension officer, who completed the course, will transfer technology to 300 farmers, total number of extension officers and total number of farmers to be trained would become 295 officers (246 officers in Thailand and 49 in neighboring countries) and 25,286 farmers respectively in 1995 as follows:

$$295 \text{ officers} + 3.5 \text{ officers} \times 300 \text{ farmers} = 25,286 \text{ farmers}$$

While the advanced farmers to be trained in the Center will assist agricultural extension officers.

Finally, including 650 farmers to be trained through mobile activities and 33 advanced farmers who completed the course, a total of 25,969 farmers would be transferred new technology in 1995.

Eventually, total number of farmers to be transferred new technology from 1996 to 1999 would become as follows :

1996	55,900 persons
1997	88,285 persons
1998	124,103 persons
1999	163,355 persons

Table 6-1 Extension Effects to General Farmers

Unit : Persons

Trainees	Year	1995	1996	1997	1998	1999
1st year trainees		25,286	25,286	25,286	25,286	25,286
Ext.W. 295 persons		33	33	33	33	33
Farmers 33 persons		650	650	650	650	650
Mobile F. 650 persons						
2nd year trainees		-	29,143	29,143	29,143	29,143
Ext.W. 340 persons			38	38	38	38
Farmers 38 persons			750	750	750	750
Mobile F. 750 persons						
3rd year trainees		-	-	31,543	31,543	31,543
Ext.W. 368 persons				42	42	42
Farmers 42 persons				800	800	800
Mobile F. 800 persons						
4th year trainees		-	-	-	34,971	34,971
Ext.W. 408 persons					47	47
Farmers 47 persons					800	800
Mobile F. 800 persons						
5th year trainees		-	-	-	-	38,400
Ext.W. 448 persons						52
Farmers 52 persons						800
Mobile F. 800 persons						
Total		25,969	55,900	88,285	124,103	163,355

Note : Ext. W. = Extension Officer

Mobile F. = Farmer to be trained by Mobile Training

6-1-2 Indirect Effects

It is expected that the agricultural economics of hilltribes villagers in highland area will be improved and stabilized, and the new living structure in highland village will be constructed without depending on poppy cultivation by introduction of the new farming technology under this project. Furthermore, it is concluded that a campaign for enlightenment to protect forestry destruction would be

Table 6-2 Effects and Improvement Level of Existing Situation by the Implementation of the Project

Status and Problems	Countermeasures by the Project	Effects and Improvement Level by the Project
<p>1. Many hilltribes people cultivates poppy, of which only products can bring cash income.</p>	<p>1. The research and experimentation on the substitutes of poppy have been progressed in the Faculty of Agriculture, Chiang Mai University, royal projects and the related agencies and the replaced crops have been selected.</p>	<p>It is expected that the general farmers can start their training and the effects can be obtained from 1995. According to the before mentioned table "Extension Effects to General Farmers", a total of 25,969 farmers in 1995 and 163,355 farmers in 1999 will be transferred with the new technology and their production will be increased and livelihood will be stabilized. Farmers in neighboring countries can enjoy the similar benefits. Consequently, decrease of poppy cultivation will be expected.</p>
<p>2. The related Governmental agencies plan to stabilize the management of hilltribes farming by the replacement crops of poppy, however, there is no sufficient extension officers to promote the plans.</p>	<p>2. According to the 5-years training plan, extension officers and advanced farmers will be trained, 452 persons in 1994, 521 persons in 1995, 565 persons in 1996, 604 persons in 1997 and 648 persons in 1998. They will be dispatched to those 6 provinces as Chiang Mai, Chiang Rai, Mae Hong Son, Phayao, Nan and Tak in due course.</p>	
<p>3. No training centers for agricultural extension officers</p>		

accelerated smoothly through technology transferring activities from the traditional farming like as shifting cultivation to the new farming.

6-2 Conclusion

The Faculty of Agriculture, Chiang Mai University, which is the executing agency for this Project, has played a significant role in the field of studying, development and extension of the highland agricultural technology in Thailand together with other Faculties.

The Faculty employs many researchers and engineers for the field of highland agriculture, and their technical levels are higher with the support of their sufficient experiences as shown in the successful cultivation of replaced crops of poppy such as coffee, fruits, flowers, vegetables, etc. under the Royal Projects.

The Faculty has contributed significantly in the improvement of agricultural technology, income and living standard as well as in the stabilization of livelihood for hilltribe people who mostly live in the depressed highland areas of the northern Thailand.

Also, the Faculty contributed greatly to the preservation of forestry resources and protection of environmental destruction, which are the major important targets under the 7th National Economic and Social Development Plan (1992~1996).

These activities are extended not only to Thailand but also to neighboring countries such as Myanmar, Cambodia, Vietnam, China, etc. as resulted in the training of Laotian officers, where they live under similar geographical condition and living environment. However, the expected capability can not be sufficiently demonstrated due to poor

provisions of existing facilities. The scale of the facilities and equipment, and contents of activities planned under this Project has proved practical and reasonable in meeting with the level of technology and economy in Thailand. In view of these facts, facilities under this Project would be fully operated, maintained and managed by the Chiang Mai University.

Development, training and extension activities for the highland agriculture will be completed if the technical cooperation will be implemented by the Government of Japan.

The development of this Project has been accorded the highest priority by the Government of the Kingdom of Thailand. Chiang Mai University is now trying to make vigorously such budgetary measures as are necessary for the Project implementation and to prepare the system and the organization required for operation, maintenance and management of the Project in cooperation with the ONCB. The management expenses are feasible to be provided for in the budget.

Upon completion of the construction, the Project will surely contribute not only to the improvement of living standard and the stabilization of livelihood of the hilltribe people living in Thailand and the neighboring countries such as Myanmar, Laos, Vietnam, China, etc., also to the promotion of the friendly relations among the countries of Japan, Thailand and its neighbors.

Under the above conditions, the Project is therefore considered suitable for a grant-aid from the Japanese Government.

APPENDIX

APPENDIX 1 Minutes of Discussions

1-1 Basic Design Study

1-2 Explanation of Draft Final Report

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY ON THE PROJECT
FOR
THE IMPROVEMENT OF FACILITIES AND EQUIPMENT
FOR
THE HIGHLAND AGRICULTURAL DEVELOPMENT AND TRAINING CENTER
IN
THE KINGDOM OF THAILAND

In response to the request made by the Government of the Kingdom of Thailand, the Government of Japan decided to conduct a Basic Design Study on the Project for the Improvement of Facilities and Equipment for the Highland Agricultural Development and Training Center (hereinafter referred to as "the Project"), and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to the Kingdom of Thailand a study team, which is headed by Mr. Masashi Kono, Deputy Director, Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, from January 27 to February 20.

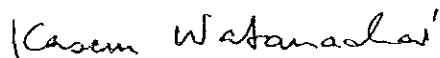
The team had a series of discussions with the officials concerned of the Government of the Kingdom of Thailand and conducted a field survey at the study area.

As a result of discussions and field survey, both sides have confirmed the main items described in the attached sheets. The team will proceed to further works and prepare the Basic Design Study Report.

Chiang Mai, February 5, 1992



Mr. Masashi Kono
Leader
Basic Design Study Team
JICA



Prof. Kasem Watanachai M.D.
President
of
Chiang Mai University

ATTACHMENT

1. Title of the Project

The title of the Project is the Improvement of Facilities and Equipment for the Highland Agricultural Development and Training Center.

2. Objective

The objective of the Project is to contribute to the Highland Agricultural Development by improving the Highland Agricultural Development and Training Center.

3. Project Site

The Project site is located at Chang Khian, as shown in Annex I.

4. Coordinating and Executing agencies

Office of the Narcotics Control Board(ONCB),Office of the Prime Minister,will coordinate and give necessary assistances to the Project.

Chiang Mai University is responsible for the administration and execution of the Project.

5. Necessary items for the realization of the Project requested by the Government of the Kingdom of Thailand

After discussions,both sides have confirmed that the following items would be necessary for the realization of the Project.

(1) Construction of the facilities for the Chang Khain Highland Agricultural Development and Training Center

- 1) Training room
- 2) Library
- 3) Dining room
- 4) Exhibition room
- 5) Office and Administration room
- 6) Dormitory
- 7) Warehouse and Workshop

(2) Provision of equipment related to the Project

- 1) Equipment for training
- 2) Equipment for demonstration farm
- 3) Equipment for road maintenance
- 4) Equipment for transportation vehicles
- 5) Equipment for highland agricultural development

However, the final components of the Project may differ from the above items, if it is so judged after further studies in Japan.

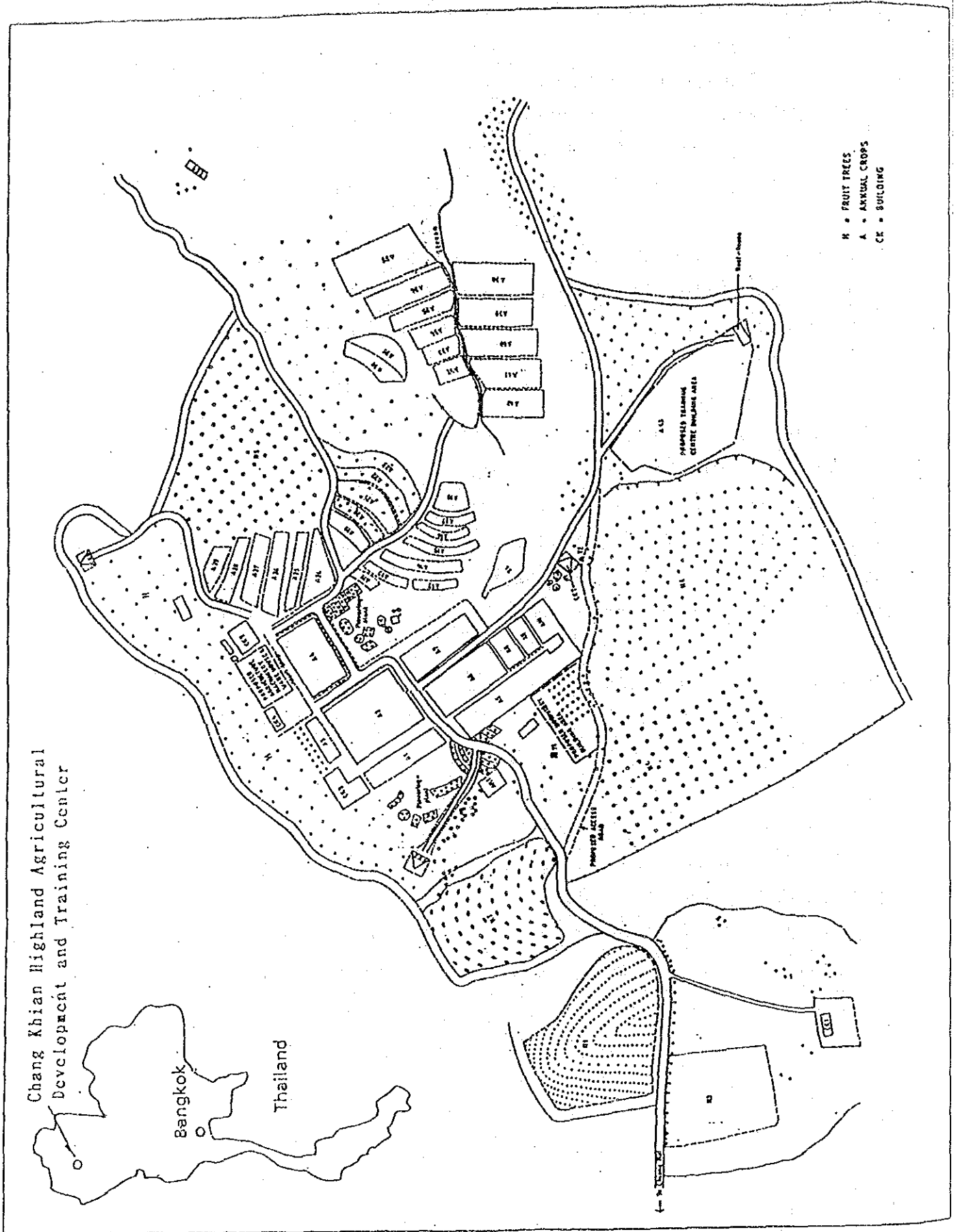
6. Japan's Grant Aid system

- (1) The Thai side understood the system of Japan's Grant Aid as explained by the team.
- (2) The Thai side will take necessary measures, as described in Annex II for the smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

7. Schedule of the Study

- (1) The consultants will proceed to further studies in Thailand until February 20.
- (2) Based on the Minutes of Discussions and the results of the study, JICA will prepare a draft report and dispatch a mission in order to explain its contents in May, 1992.
- (3) Upon approval of the said draft report by the Thai side, JICA will complete the final report and send it to the Government of the Kingdom of Thailand around July 1992.

Location Map of the Project Site



Handwritten signature and initials: MIB
KW

Annex II

Necessary measures to be taken by the Government of the Kingdom of Thailand on condition that Japan's Grant Aid is extended:

1. To secure the site for the Project.
2. To clear, level and reclaim the site prior to commencement of the construction.
3. To undertake incidental outdoor works such as gardening, fencing, gates and exterior lighting within and around the site.
4. To improve the access road to the site prior to commencement of the construction.
5. To provide facilities for water supply, and other incidental facilities including general furniture.
6. To arrange exemption of customs duties and other taxes on the materials and products imported or procured locally in Thailand for the Project, and to take the necessary measures for customs clearance at the port of disembarkation.
7. To arrange exemption of Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the Kingdom of Thailand with respect to the supply of the products and services under the verified contracts.

8. To arrange entry and stay of Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts, and extend such facilities as may be necessary for their entry into the Kingdom of Thailand and stay therein for the performance of their works.
9. To use and maintain properly and effectively the facilities constructed and the equipment purchased under the Grant.
10. To arrange to bear all the expenses other than those to be covered by the Grant, necessary for the execution of the Project.

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON THE PROJECT FOR
THE IMPROVEMENT OF FACILITIES AND EQUIPMENT FOR
THE HIGHLAND AGRICULTURAL DEVELOPMENT AND TRAINING CENTER
IN THE KINGDOM OF THAILAND
(CONSULTATION ON DRAFT REPORT)

From January 27 to February 20, 1992, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team on the Project for the Improvement of Facilities and Equipment for the Highland Agricultural Development and Training Center (hereinafter referred to as "the Project") to the technical examination of the result in Japan, the team has prepared the draft report of the study.

In order to explain and to consult with the Thai side on the components of the draft report, JICA sent to the Kingdom of Thailand a study team, which is headed by Mr. Teruaki Kamada, Assistant Director Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs, and is scheduled to stay in the country from June 7 to June 13, 1992.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Chiang Mai, June 11, 1992

J. Kamada

Mr. Teruaki Kamada

Leader

Draft Report Explanation Team

JICA

Kasem Watanachai

Prof. Kasem Watanachai M.D.

President

of

Chiang Mai University

ATTACHMENT

1. Components of Draft Report

The Government of the Kingdom of Thailand has agreed and accepted in principle the components of the Draft Report proposed by the team.

2. Japan's Grant Aid System

(1) The Government of the Kingdom of Thailand has understood the system of Japanese Grant Aid explained by the team.

(2) The Government of the Kingdom of Thailand will take the necessary measures, described in Annex 1, for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

3. Further Schedule

The team will make the Final Report in accordance with the confirmed items, and send it to the Kingdom of Thailand by the end of July, 1992.

4. Staff Allocation

The Thai side has confirmed all the staff mentioned in the Draft Report shall be allocated three months before the completion of the construction work, on condition that the Grant assistance by the Government of Japan is extended to the Project.

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5. Operation and Maintenance Cost for the Centre

Also the Thai side has confirmed the yearly operation and maintenance cost estimated in the Draft Report shall be taken budgetary measures three months before the completion of the construction work, on condition that the Grant assistance by the Government of Japan is extended to the Project.

6. Technical Cooperation

1. Thai side requested the short term Agricultural Expert in the field of Post harvest, Meteorology and Plant Protection for supporting the training programme. The team stated to convey the above mentioned request to the agencies concerned, while the team explained the difficult execution of the request under the present situation.
2. Thai side requested the acceptance of Thai lecturers assigned in the Center to be trained in Japan.

Annex 1 : Necessary measures to be taken by the Government of the Kingdom of Thailand on condition that Japan's Grant Aid is extended :

1. To secure the site for the Project.
2. To undertake incidental outdoor works such as gardening, fencing, gates and exterior lighting within and around the site.
3. To improve the access road to the site prior to commencement of the construction.
4. To provide facilities for water supply, and other incidental facilities including general furniture.
5. To arrange exemption of customs duties and other taxes on the materials and products imported or procured locally in Thailand for the Project, and to take the necessary measures for customs clearance at the port of disembarkation.
6. To arrange exemption of Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the Kingdom of Thailand with respect to the supply of the products and services under the verified contracts.

7. To arrange entry and stay of Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contracts, and extend such facilities as may be necessary for their entry into the Kingdom of Thailand and stay therein for the performance of their works.

8. To use and maintain properly and effectively the facilities constructed and the equipment purchased under the Grant.

9. To arrange to bear all the expenses other than those to be covered by the Grant, necessary for the execution of the Project.

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APPENDIX 2 Member List of Study Team

2-1 Basic Design Study Team

2-2 Explanation Team of Draft Final Report

2-1 Basic Design Study Team

Mr. Masashi KONO	Team Leader Deputy Director Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Mr. Yasuyuki SAKAI	Agronomist Senior Technical Official International Cooperation Division, Economic Bureau, Ministry of Agriculture, Forestry and Fisheries
Mr. Eiji INUI	Project Coordinator Staff First Basic Design Study Division, Grant Aid Study & Design Department, Japan International Cooperation Agency (JICA)
Mr. Hirokazu KOURIKI	Farming Technology and Extension Planner Sanyu Consultants Inc.
Mr. Masatoshi SOGAWA	Facilities Designer Idec Limited
Mr. Sakae TAMURA	Equipment Planner Sanyu Consultants Inc.

2-2 Explanation Team of Draft Final Report

Mr. Teruaki KAMADA	Team Leader Assistant Director Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Mr. Hirokazu KOURIKI	Farming Technology and Extension Planner Sanyu Consultants Inc.
Mr. Sakae TAMURA	Equipment Planner Sanyu Consultants Inc.

APPENDIX 3 Itinerary of Study Team

3-1 Basic Design Study Team

3-2 Explanation Team of Draft Final Report

3-1 Basic Design Study Team (January 27 ~ February 20, 1992)

Serial No.	Date	Movement	Accommodation	Activities
1	Jan.27(Mon)	Tokyo→Bangkok	Bangkok	JL717 13:00→17:35
2	Jan.28(Tue)		Bangkok	Courtesy call on JICA and DTEC and explanation of Inception and study procedures
3	Jan.29(Wed)		Bangkok	Courtesy call on UNDCP & USAID, and discussion
4	Jan.30(Thu)	Bangkok→Chiang Mai	Chiang Mai	TG104 12:00→13:05 Courtesy call on Chiang Mai University, explanation of Inception & discussion on Itinerary
5	Jan.31(Fri)		Chiang Mai	Discussion with CMU, observation of Faculty of Agriculture CMU, visit Hilltribe Welfare Field Office, survey Bang Fuey Tahd in Thai-Australian Project Area
6	Feb.01(Sat)		Chiang Mai	Survey Chang Khian site & Doi Non Thanong Royal Project
7	Feb.02(Sun)		Chiang Mai	Arrangement of data & documents, Team's inner meeting
8	Feb.03(Mon)		Chiang Mai	Courtesy call on President of CMU, discussion with CMU
9	Feb.04(Tue)		Chiang Mai	Discussion with CMU, submission of draft minutes of discussions

Serial No.	Date	Movement	Accommodation	Activities
10	Feb.05(Wed)	Chiang Mai →Bangkok	Officials in Bangkok Consultants in Chiang Mai	Signing minutes of discussions, TG119 12:50→14:00, leave of Mr. Kono, Mr. Sakai & Mr. Inui, Reporting to ONCB. discussion with CMU on facility scale & equipment
11	Feb.06(Thu)		Officials in Bangkok Consultants in Chiang Mai	Reporting to Embassy of Japan & JICA. Survey Chang Khian Site, visit Royal Project Office & Northern Agricultural Development Office.
12	Feb.07(Fri)	Bangkok→Tokyo	Consultants in Chiang Mai	Leave of Mr. Kono, Mr. Sakai & Mr. Inui, TG640 11:00→19:00. Discussion with CMU.
13	Feb.08(Sat)		Chiang Mai	Arrangement of data & documents, Team's inner meeting
14	Feb.09(Sun)		Chiang Mai	Arrangement of data & documents, Team's inner meeting
15	Feb.10(Mon)		Chiang Mai	Discussion with CMU on training plan, facility & Equipment, receipt of answer to questionnaire
16	Feb.11(Tue)		Chiang Mai	Survey Non Hoi Training Center, discussion with CMU on answer to questionnaire

Serial No.	Date	Movement	Accommodation	Activities
17	Feb.12(Wed)		Chiang Mai	Courtesy call on JICA Expert Mr. Y. Kobayashi in Faculty of Science of CMU, Japanese Consulate, Repair Section of CMU, ONCB/Chiang Mai & UNDCB Project Cooperative Office, Investigation of construction materials & equipment suppliers.
18	Feb.13(Thu)		Chiang Mai	Discussion with CMU
19	Feb.14(Fri)	Chiang Mai →Bangkok	Bangkok	Discussion with CMU, TG105 14:00→15:00
20	Feb.15(Sat)		Bangkok	Team's inner meeting
21	Feb.16(Sun)		Bangkok	Arrangement of data & documents, Team's inner meeting
22	Feb.17(Mon)		Bangkok	Reporting to EOJ & JICA, Investigation of agricultural, construction & manufacturing condition
23	Feb.18(Tue)		Bangkok	Arrangement of data & documents, Team's inner meeting
24	Feb.19(Wed)		Bangkok	Investigation of agriculture, construction material & transportation condition
25	Feb.20(Thu)	Bangkok→Tokyo		Leave of Consultants' team, TG640 11:00→19:00

3-2 EXPLANATION TEAM OF DRAFT FINAL REPORT (June 7 ~ June 13, 1992)

Serial No.	Date	Movement	Accomodation	Activities
1	June 07(Mon)	Tokyo→B.K.K.	Bangkok	TG641 11:00→15:30
2	June 08(Mon)		Bangkok	Courtesy call on JICA, EOJ, DTEC & ONCB and explanation of final draft report
3	June 09(Tue)	B.K.K.→C.M.	Chiang Mai	TG114 9:50→10:55 Courtesy call on CMU and explanation of final draft report
4	June 10(Wed)		Chiang Mai	Discussion with CMU and submission of draft minutes of discussions, Survey Project Site.
5	June 11(Thu)		Chiang Mai	Signing minutes of discussions, courtesy call on Japanese Consulate
6	June 12(Fri)	C.M.→B.K.K.	Bangkok	TG-111 7:45→8:50 Reporting to JICA & ONCB
7	June 13(Sat)	B.K.K.→Tokyo		TG-640 11:00→18:50

APPENDIX 4 Cooperated Officials in the Study

4-1 Basic Design Study

4-2 Explanation of the Final Draft Report

4-1 Basic Design Study

1. Office of Narcotics Control Board (ONCB)

Police General Chavalit Yodmani	Secretary General, Narcotics Control Board
Mr. Sorasit Saengrasert	Director, Narcotics Crop Control Division
Mr. Siree Bonnag	Director, Technical and Planning Division
Mrs. Runathai Singlalvany	Chief, Foreign Affairs Sub-Division
Mr. Yupana Chitkaroon	Foreign Relations Officer
Mr. Yong Youth Boonsirivibul	Foreign Relations Officer
Mr. Chutima Hanpachern	Policy and Plan Analyst, Narcotics Crop Control Division
Mrs. Arparporn Vimooktalop	Policy and Plan Analyst, Narcotics Crop Control Division

2. Department of Technical and Economic Cooperation (DTEC)

Mr. Apinan Patiyanon	Director External Cooperation Division 3
Mrs. Tipsuda Nopmongcol	Chief, Japan-Sub-Division
Mr. Banchong Amornchewin	Program Officer, Japan Sub-Division
Mr. Tomikazu Inagaki	JICA Expert, Technical Cooperation Coordination

3. United Nations International Drug Control Programme (UNDCP)

Mr. Willian F. Beachner	Director, Regional Centre
Mr. Odd A. Halhjem	Field Adviser
Ms. Narumi Yamada	Deputy Field Adviser

4. U.S. Agency for International Development (USAID/Thailand)

Mr. Mintra(Min) Silawatshananai	Chief Engineer
Mr. Kamol Chantanumate	
Mr. Thongkorn Hiranraks	

5. Department of Public Welfare (DPW)

Mr. Elawat Chandraprasert	Director, Hill Tribe Welfare Division
Mrs. Pannipa Woodtikarn	Chief, Hill Tribe Development Section
Mr. Supachai Satheerasilpin	Hill Tribe Researcher
Mrs. Suntaree Puaves	Public Welfare Officer

6. Chiang Mai University (CMU)

Dr. Kasem Wattanachai	President
Dr. Luechai Chulasai	Vice President, Foreign Relations and Special Affairs
Dr. Chote Theetranont	Vice President
Mr. Nakorn Na Lampang	Dean, Faculty of Agriculture
Dr. Pongsak Anghasith	Project Coordinator, Training and Audio Visual Laboratory Incharge
Dr. Methi Ekasing	Research Incharge, Land-Use Planning Laboratory
Dr. Bantoone Warrit	Assistant Manager of the Coffee Project, Plant Physiology Laboratory, Faculty of Agriculture
Dr. Vichian Hengawat	Post-Harvest Laboratory
Dr. Boonloom Cheewaisarakul	Analytical Laboratory
Dr. Prasartporn Samiyamarn	Bio-Technology Laboratory
Dr. Rumpaipun Aprichartpongchai	Secretary
Mr. Angsana Charukitphiphat	Foreign Relations Officer, Foreign Affairs Section
Mrs. Areerat Sukkasem	Foreign Relations Officer, Foreign Affairs Section
Mr. Dittagorn Fantapa	Acting Chief of the Training Stations
Dr. Boonlom Chivaisrakul	Department of Animal Husbandry Faculty of Agriculture
Mr. Puja Methakounvudhi	Architect, Design & Construction, Welfare Section, Office of President
Dr. Yoshio Kobayashi	JICA Expert in Polymer Technology, Department of Chemistry, Faculty of Science

7. Royal Project Office & Northern Agricultural Development Center (NADC)

Mr. Suthat Pleumpanya Office Manager

8. ONCB & UNDCP Projects Coordination Office

Dr. Gary Suwannrat Senior Adviser

9. Embassy of Japan

Mr. Koichi Takahashi Counsellor

Mr. Hiromori Kuroki 1st Secretary

Mr. Toshiaki Nagato 1st Secretary

Mr. Koichi Noguchi

10. Japan International Cooperation Agency, Thailand Office

Mr. Nobuji Abe Resident Representative

Mr. Takafumi Ito Assistant Resident Representative

Mr. Athorn Charoenlai Manger

4-2 Explanation of the Final Draft Report

1. Office of Narcotics Control Board (ONCB)

Police General Chavalit Yodmani	Secretary General, Narcotics Control Board
Mr. Sorasit Saengrasert	Director, Narcotics Crop Control Division
Mr. Siree Bonnag	Director, Technical and Planning Division
Mr. Saman Dolnok	Narcotics Crop Control Division
Ms. Chutima Hanpachern	Policy and Plan Analyst, Narcotics Crop Control Division
Ms. Runathai Singlalvany	Chief, Foreign Affairs Sub-Division

2. Department of Technical and Economic Cooperation (DTEC)

Mr. Apinan Patiyanon	Director of the External Cooperation, Division III
Ms. Tipsuda Nopmongcol	Chief of Japan Sub-Division
Mr. Banchong AMornchewin	Program Officer, Japan Sub-Division
Ms. Kanokwan Pringruksa	Program Officer, Japan Sub-Division
Ms. Sutisa Shoonharaungdej	Program Officer, Japan Sub-Division
Mr. Tomikazu Inagaki	JICA Expert, Technical Cooperation Coordination

3. Chiang Mai University (CMU)

Dr. Kasem Watanachai	President
Dr. Luechai Chulasai	Vice President, Foreign Relations and Special Affairs
Mr. Nakorn Na Lampang	Dean, Faculty of Agriculture
Dr. Pongsak Anghasith	Project Coordinator
Dr. Methi Ekasing	Research Incharge, Land-Use Planning Laboratory

Dr. Bantoone Warrit Assistant Manager of the Coffee Project,
Plant Physiology Laboratory, Faculty of
Agriculture

Dr. Boonloom Cheewaisarakul Analytical Laboratory

Ms. Areerat Sukkasem Foreign Relations Officer,
Foreign Affairs Section/

Mr. Dittagorn Pantapa Acting Chief of the Training Stations

Dr. Boonlom Chivaisrakul Department of Animal Husbandry, Faculty
of Agriculture

4. Embassy of Japan

Mr. Koichi Noguchi

5. Japanese Consular Post at Chiang Mai

Mr. Isamu Yamada Consul

6. Japan International Cooperation Agency (JICA), Thailand Office

Mr. Yoshio Tanikawa Deputy Resident Representative

Mr. Takabumi Ito Assistant Resident Representative

APPENDIX 5 Items of Supplementary Data

- | | |
|---|---|
| 1. Outline of Thai Economics
(1990~1991) | Japanese Chamber of Commerce,
Bangkok |
| 2. The Seventh Five Year National
Economic and Social Development
Plan (1992~1996) - Agricultural
Development Guide Line | International Agricultural Affairs
Division, Permanent Secretary
Office, Ministry of Agriculture and
Agricultural Cooperatives |
| 3. Labor Law and Related Regulations
of Ministry of Interior | Japanese Chamber of Commerce,
Bangkok |
| 4. Explanation of Laborer Protection
Law and Laborer Protection Law | Japanese Chamber of Commerce,
Bangkok |
| 5. Agricultural Statistics of
Thailand Crop Year 1989/90 | Center for Agricultural Statistics,
Office of Agricultural Economics,
Ministry of Agriculture &
Co-operatives |
| 6. Agricultural Statistics in Brief
Crop Year 1990/91 | Center for Agricultural Statistics,
Office of Agricultural Economics,
Ministry of Agriculture &
Co-operatives |
| 7. Thai-German Highland Development
Programme | TG-HDP |
| 8. Thai-Australia Highland
Agricultural and Social
Development Project | TA-HASD |
| 9. The Royal Project | Royal Project Office |
| 10. Highland Agricultural Development | Chiang Mai University |
| 11. From Opium Poppy To Coffee | Chiang Mai University |
| 12. Thailand Narcotics Annual Report
1990 | ONCB |
| 13. Technology of Arabica Coffee | Chiang Mai University |
| 14. International Seminar on Coffee
Technology | Chiang Mai University |
| 15. Faculty of Agriculture | Chiang Mai University |
| 16. Annual Report 1990 | Highland Coffee Research and
Development Center |
| 17. Training for Lao 1990 | Highland Coffee Research and
Development Center |

- | | |
|--|---|
| 18. Insecticide and Pesticide Training | Highland Coffee Research and Development Center |
| 19. Report on the Results at Chang Khian
Highland Agricultural Research and Training Center | Highland Coffee Research and Development Center |
| 20. UN/THAI PROGRAMME FOR DRUG ABUSE CONTROL IN THAILAND | United Nations Fund for Drug Abuse Control |
| 21. Annual Report | Department of Public Welfare |
| 22. Office of the Narcotics Control Board | ONCB |
| 23. Thailand's Efforts in Drug Control | ONCB |
| 24. Price List for Construction Materials | Chiang Mai University |
| 25. Project Completion Report Mae Chaem Watershed Development Project AID Project No. 493-0294 | USAID/Thailand |
| 26. Short-Term Consultancy on Roasting and Cupping of Arabia Coffee at the Highland Coffee Research and Development Centre, Chiang Mai, Thailand, February 12th-28th, 1991 | Jacob Boot Mission |
| 27. Profile of Chiang Mai University 1992, Chiang Mai, Thailand | CMU |
| 28. Highland Coffee Research and Development Centre | HCRDC |

APPENDIX 6 Back Data

- 6-1 Meteorological Condition
 - 6-1-1 Meteorological Condition (Chiang Mai, 1989-1991)
 - 6-1-2 Meteorological Condition (Chiang khian, 1989-1991)
- 6-2 Highland Agricultural Development Plan
 - 6-2-1 HASD (Highland Agricultural and Social Development) Zone
 - 6-2-2 Completed Projects for Highland Agricultural and Social Development under Assistance of Foreign Countries
 - 6-2-3 On-going Projects for Highland Agricultural and Social Development under Assistance of Foreign Countries
 - 6-2-4 MAP Showing Highland Development Projects in Northern Thailand
- 6-3 Hilltribe Population Data
- 6-4 Agricultural Land Use at 5 Provinces in Northern Thailand
- 6-5 Major Agricultural Commodities produced at 5 Provinces in Northern Thailand
- 6-6 Major Livestock raised at 5 Provinces in Northern Thailand
- 6-7 Chang Khian Highland Agricultural Development and Training Center, Land Use Map

- 6-8 Chang Khian Highland Agricultural Development and Training Center,
Cropping Calendar
- 6-9 Training Plan
- 6-9-1 Summary of 5-year Training Plan (1994-1998)
- 6-9-2 Training Plan, 1994
- 6-9-3 Training Plan, 1995
- 6-9-4 Training Plan, 1996
- 6-9-5 Training Plan, 1997
- 6-9-6 Training Plan, 1998
- 6-10 List of Equipment
- 6-11 Electric Power required for Main Equipment

6-1-1 Meteorological Condition (Chiang Mai, 1989-1991)

1989

MONTH	Air temperature, °C			Air Humidity, %			Rain mm	E-pan mm/day	Wind km/day	Sunshine(hrs)		Solar rad. *		PET mm/day
	max	min	mean	8.00	15.00	mean				act.	poss.	act.	poss.	
Jan)	31.2	14.0	21.4	88.4	45.5	67.0	0.0	4.5	76.7	8.8	11.0	7.2	11.4	2.7
Feb	33.0	13.9	22.1	81.0	31.1	56.1	0.0	5.3	75.2	9.6	11.4	8.2	12.8	3.3
Mar	34.5	19.6	25.9	73.3	38.4	55.9	3.5	6.2	97.1	7.2	11.9	7.9	14.5	4.3
Apr	38.0	20.9	28.2	66.4	31.8	49.1	25.9	7.6	102.5	8.9	12.4	9.3	15.7	5.2
May	35.2	23.4	28.4	79.0	55.5	67.3	226.4	7.1	109.0	6.9	12.9	8.3	16.2	4.9
Jun	32.9	23.3	27.4	84.6	64.9	74.7	155.5	5.1	88.9	4.4	13.1	7.0	16.2	4.1
Jul	32.8	23.4	27.4	88.1	67.8	77.9	233.5	4.7	82.7	3.7	13.0	6.6	16.2	3.9
Aug	32.4	23.2	27.1	88.5	69.6	79.0	212.5	4.9	80.2	4.2	12.7	6.8	15.9	3.9
Sep	32.1	22.9	26.8	89.7	70.8	80.2	154.5	4.4	66.6	3.7	12.1	6.2	14.9	3.5
Oct	31.5	22.0	26.1	91.8	67.5	79.6	146.5	4.5	66.5	5.1	11.6	6.3	13.4	3.3
Nov	30.6	18.4	23.6	89.6	52.7	71.2	9.0	4.2	61.4	7.2	11.1	6.6	11.7	2.9
Dec	28.6	12.6	19.4	90.6	47.2	69.0	0.0	3.7	48.1	8.7	10.6	6.8	10.9	2.2
Total							1167.4							
Mean	33.1	20.4	25.9	83.7	54.1	68.9	106.1	5.3	82.5	6.3	12.1	7.3	14.4	3.8

1990

MONTH	Air temperature, °C			Air Humidity, %			Rain mm	E-pan mm/day	Wind km/day	Sunshine(hrs)		Solar rad. *		PET mm/day
	max	min	mean	8.00	15.00	mean				act.	poss.	act.	poss.	
Jan	31.0	14.0	21.3	89.8	41.5	65.7	4.1	3.9	52.5	8.7	11.0	7.1	11.4	2.6
Feb	32.3	15.6	22.8	81.6	39.1	60.3	28.7	4.7	65.6	8.1	11.4	7.6	12.8	3.3
Mar	34.7	18.7	25.5	74.6	34.4	54.5	46.0	6.5	92.3	8.4	11.9	8.5	14.5	4.3
Apr	36.8	21.8	28.2	69.6	35.3	51.1	35.1	7.2	109.1	7.3	12.4	8.5	15.7	5.1
May	33.3	22.7	27.2	86.3	61.1	73.5	268.1	5.8	90.6	5.3	12.9	7.5	16.2	4.2
Jun	32.8	23.6	27.5	84.1	65.8	75.1	63.0	5.1	87.7	3.9	13.1	6.7	16.2	4.0
Jul	31.7	23.4	26.9	85.4	67.8	76.6	93.7	3.7	98.0	1.8	13.0	5.7	16.2	3.6
Aug	33.1	23.3	27.5	87.7	64.8	75.9	213.5	4.3	76.1	5.1	12.7	7.3	15.9	4.2
Sep	32.4	22.6	26.8	88.1	68.3	77.5	133.0	3.9	71.1	4.7	12.1	6.8	14.9	3.8
Oct	32.3	21.8	26.3	89.0	64.0	76.5	132.8	4.6	73.1	5.9	11.6	6.7	13.4	3.5
Nov	31.4	19.2	24.4	89.5	53.8	71.7	135.1	4.3	72.8	7.1	11.1	6.6	11.7	3.0
Dec	29.4	15.0	21.2	90.6	47.5	69.2	0.0	3.8	65.9	8.4	10.9	6.7	10.9	2.5
Total							1152.9							
Mean	32.6	20.1	25.5	84.7	53.6	69.0	96.1	4.8	79.6	6.3	12.0	7.1	14.2	3.7

1991

MONTH	Air temperature, °C			Air Humidity, %			Rain mm	E-pan mm/day	Wind km/day	Sunshine(hrs)		Solar rad. *		PET mm/day
	max	min	mean	8.00	15.00	mean				act.	poss.	act.	poss.	
Jan	31.4	13.5	21.1	90.0	40.1	65.3	6.1	4.1	60.0	8.9	11.0	7.2	11.3	
Feb	33.2	15.2	22.9	84.1	33.9	59.6	0.0	5.0	68.6	9.2	11.4	8.1	12.8	
Mar	36.3	19.9	26.9	73.5	32.4	53.2	3.0	6.3	87.2	8.2	11.9	8.4	14.5	
Apr	37.1	22.8	29.0	71.7	39.8	56.3	78.0	6.8	101.8	8.0	12.4	8.8	15.7	
May	36.6	23.9	29.4	73.0	44.0	58.6	89.7	6.4	107.3	8.5	12.9	9.2	16.2	
Jun	32.8	23.7	27.6	85.6	71.2	78.7	117.8	4.6	105.6	3.1	13.1	6.1	16.2	
Jul	32.4	23.5	27.3	87.5	65.4	76.4	123.8	4.3	90.1	2.9	13.0	6.0	16.2	
Aug	31.7	23.1	26.8	91.3	74.7	82.9	336.1	3.3	79.9	2.9	12.7	6.2	15.9	
Sep	32.4	23.4	27.2	91.6	70.1	80.9	179.4	4.3	70.0	4.3	12.1	6.6	14.9	
Oct	32.0	22.1	26.3	92.7	67.1	79.8	55.5	3.8	69.0	5.8	11.6	6.7	13.4	
Nov	30.2	18.0	23.2	92.4	51.5	71.9	34.1	4.0	62.9	7.3	11.1	6.6	11.7	
Dec	29.0	15.2	21.1	90.8	47.9	69.4	26.9	3.7	69.1	6.7	10.9	6.0	10.9	
Total							1050.5							
Mean	32.9	20.4	25.7	85.4	53.2	69.4		4.7	81.0	6.3	12.0	7.2	14.1	

6-1-2 Meteorological Condition (Chang Khian, 1989-1991)

1989

MONTH	Air temperature, °C			Air Humidity, %			Rain	E-pan	Wind	Sunshine(hrs)		Solar rad. *		PET
	max	min	mean	8.00	15.00	mean	mm	mm/day	km/day	act.	poss.	act.	poss.	mm/day
Jan	22.1	10.3	15.3	82.6	43.7	63.2	0.0	4.3	129.9	7.5	11.0	6.6	11.4	2.4
Feb	23.4	10.4	16.0	70.0	41.3	55.7	0.0	5.0	113.7	8.8	11.4	7.9	12.8	2.8
Mar	26.6	13.9	19.3	84.7	50.7	67.7	14.1	4.5	107.1	6.7	11.9	7.7	14.5	3.5
Apr	29.4	16.8	22.2	81.9	49.6	65.8	14.1	7.3	110.5	9.0	12.4	8.9	15.7	4.2
May	27.1	18.7	22.3	95.6	58.9	77.3	358.4	4.1	95.4	5.3	12.9	7.5	16.2	3.7
Jun	25.1	18.8	21.5	97.8	69.0	83.4	326.1	2.9	89.8	2.9	13.1	6.1	16.2	3.2
Jul	25.5	19.0	21.8	97.6	66.9	82.3	378.3	3.0	105.9	2.7	13.0	6.1	16.1	3.1
Aug	25.0	18.7	21.4	98.8	69.2	84.0	330.3	2.5	68.8	2.9	12.7	6.1	15.9	3.1
Sep	25.0	18.7	21.4	99.7	69.8	84.7	230.3	2.6	61.0	2.9	12.1	5.8	15.0	2.8
Oct	23.5	18.2	20.5	96.9	63.8	80.4	330.2	3.3	70.7	3.3	11.6	5.5	13.4	2.6
Nov	22.7	15.3	18.4	84.8	43.1	64.0	2.7	2.1	50.4	4.8	11.1	5.6	11.8	2.4
Dec	20.8	10.7	15.1	84.6	74.8	79.7	0.0	2.5	51.7	6.8	10.9	6.1	11.0	1.8
Total							1884.5							
Mean	24.7	15.8	19.6	89.6	58.4	74.0		3.7	87.9	5.3	12.0	6.7	14.2	3.0

1990

MONTH	Air temperature, °C			Air Humidity, %			Rain	E-pan	Wind	Sunshine(hrs)		Solar rad. *		PET
	max	min	mean	8.00	15.00	mean	mm	mm/day	km/day	act.	poss.	act.	poss.	mm/day
Jan	23.8	12.8	17.5	70.9	29.9	50.4	0.0	3.7	81.8	7.8	11.0	6.7	11.4	
Feb	25.1	14.2	18.9	63.4	29.4	46.4	0.0	4.1	94.3	7.7	11.4	7.3	12.8	
Mar	26.5	16.1	20.6	64.6	28.5	46.6	49.9	5.8	104.3	7.7	11.9	8.2	14.5	
Apr	28.8	18.5	22.9	67.2	31.2	49.2	37.4	6.3	115.1	7.4	12.4	8.5	15.7	
May	25.6	18.9	21.8	81.3	47.8	64.5	339.6	3.6	81.2	3.9	12.9	6.8	16.2	
Jun	25.0	19.9	22.0	96.5	80.2	88.4	299.7	4.1	100.8	3.3	13.1	6.4	16.2	
Jul	24.5	19.5	21.6	97.2	81.2	89.2	401.7	3.6	95.3	1.8	13.0	5.6	16.2	
Aug	25.8	19.4	22.1	97.7	81.1	89.4	496.9	3.8	80.8	3.6	12.7	6.5	15.9	
Sep	25.0	19.0	21.6	97.6	82.9	90.2	226.5	2.9	53.7	3.2	12.1	6.0	14.9	
Oct	24.2	18.4	20.8	99.4	83.6	91.5	216.5	2.6	51.5	4.8	11.6	6.2	13.4	
Nov	23.8	15.6	19.1	98.7	70.4	84.6	220.0	2.9	49.3	5.3	11.1	5.7	11.7	
Dec	21.3	12.6	16.3	99.2	78.6	88.9	0.0	2.4	59.6	5.5	10.9	5.3	10.9	
Total							2288.4							
Mean	25.3	17.5	20.8	86.1	60.4	73.3		3.8	80.6	5.2	12.0	6.6	14.1	

1991

MONTH	Air temperature, °C			Air Humidity, %			Rain	E-pan	Wind	Sunshine(hrs)		Solar rad. *		PET
	max	min	mean	8.00	15.00	mean	mm	mm/day	km/day	act.	poss.	act.	poss.	mm/day
Jan	24.3	12.7	17.7	93.3	57.1	75.2	30.7	4.1	82.7	7.9	11.0	6.7	11.3	2.2
Feb	25.7	14.6	19.4	93.6	60.6	77.1	0.0	4.7	92.0	8.8	11.4	7.8	12.8	2.8
Mar	29.2	18.5	23.1	90.6	56.7	73.6	0.0	6.0	92.4	8.3	11.9	8.4	14.5	3.8
Apr	28.9	19.4	23.5	96.1	65.4	80.8	109.4	5.0	96.7	7.3	12.4	8.3	15.7	4.0
May	28.1	19.8	23.4	97.8	68.2	83.0	159.7	4.7	80.0	6.9	12.9	8.3	16.2	3.9
Jun	25.7	19.8	22.4	98.7	83.1	90.9	377.2	4.0	104.2	2.7	13.1	6.0	16.2	3.1
Jul	25.2	19.5	21.9	100.0	81.9	90.9	236.9	3.4	89.3	2.2	13.0	5.8	16.2	2.9
Aug	24.4	19.2	21.4	100.0	85.1	92.5	792.7	2.8	80.6	2.0	12.7	5.6	15.9	2.8
Sep	25.1	18.9	21.6	100.0	79.1	89.6	414.6	2.6	53.9	2.8	12.1	5.8	14.9	2.8
Oct	24.2	17.9	20.6	97.8	77.0	87.4	213.4	2.2	56.5	4.0	11.6	5.8	13.4	2.5
Nov	22.5	14.5	18.0	97.0	67.1	82.1	88.5	2.6	64.1	5.6	11.1	5.9	11.7	2.1
Dec	20.7	11.7	15.5	95.3	59.0	77.1	4.7	2.6	56.2	4.5	10.9	5.1	10.9	1.8
Total							2427.8							
Mean	25.4	17.2	20.7	96.7	70.0	83.4		3.7	79.1	5.3	12.0	6.6	14.1	2.9

6-2-1 HASD (Highland Agricultural and Social Development) Zone

Zone	Province
1. Hua Mae Kum Zone	Chiang Rai
2. Huay Nam Yen Zone	Chiang Rai
3. Huay Lu Zone	Chiang Rai
4. Tung Chang Zone	Nan
5. Nam Luk Zone	Nan
6. Mae Mee Zone	Lampang
7. Mae Gar Zone	Lampang
8. Huay Dua Zone	Chiang Mai
9. Pong Pad Zone	Chiang Mai
10. Tung Loy Zone	Chiang Mai
11. Huay Pueng Zone	Mae Hong Son
12. Mai Rid Pa Gae Zone	Mae Hong Son
13. Huay Mung Zone	Mae Hong Son
14. Thung Hua Chang Zone	Lamphun

6-2-2 Completed Projects for Highland Agricultural and
Social Development under Assistance of Foreign Countries

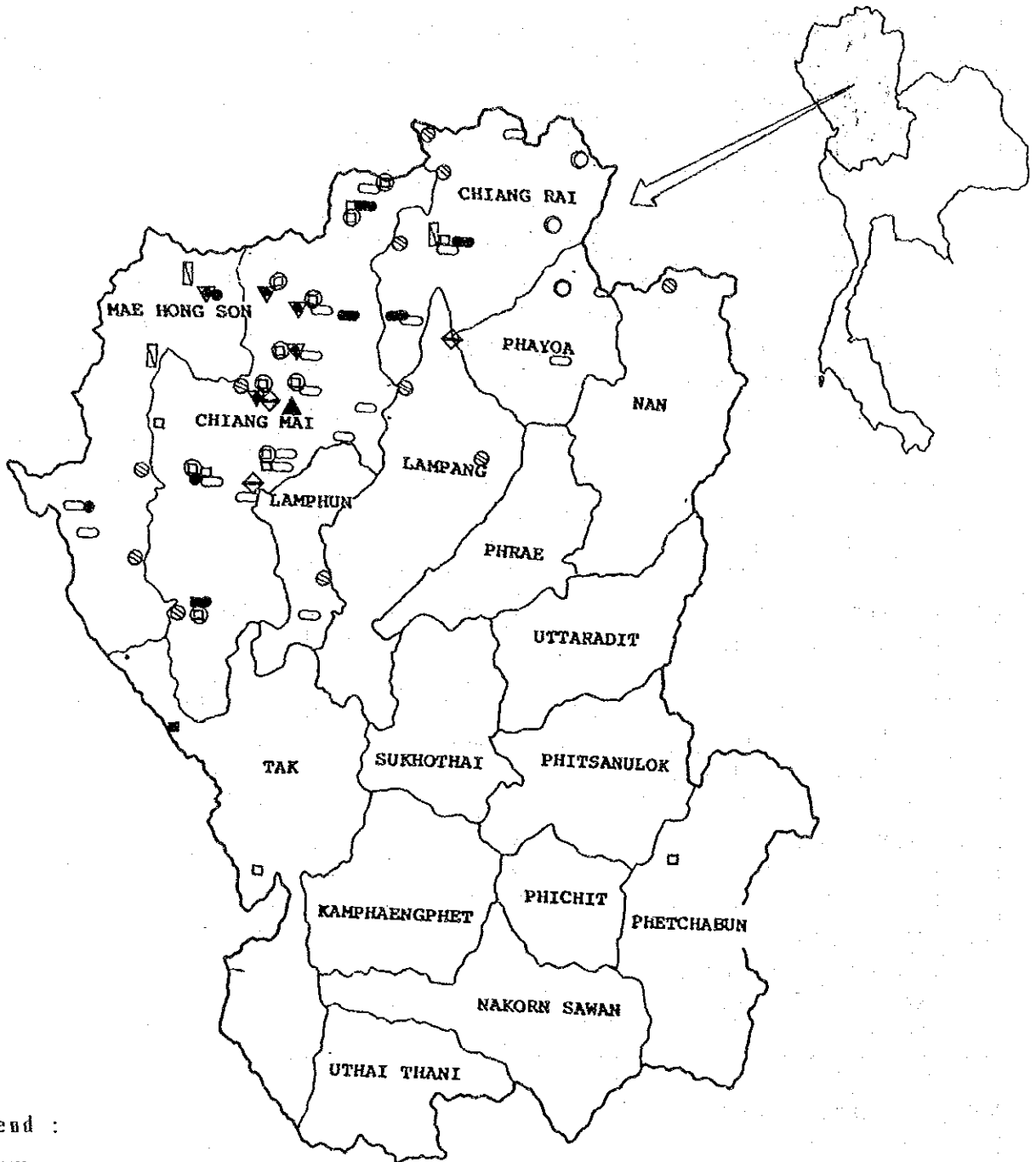
Project	Project Site	Duration	Budget
1. Royal Project	Chiang Mai, Mae Hong Son Lumphun, Chiang Rai, Payao Nan	1973~83	\$ 3.6 M
2. The Establishment of highland community & Environmental Development and Narcotic Control Plan for Tak Province	Tak	2 years	B 12.17 M
3. Doi Muser Opium Cultivation Control Project	Tak	1987~90	B 1,010,280
4. The Highland Agricultural Marketing and Project Project (HAMP)	Chiang Mai, Lampang	1980~84	\$ 9.5 M
5. Mae Chaem Watershed Development Project	Chiang Mai	1981~87	\$ 22.07
6. The Thai-Australian Highland Agronomy Project (TA-HAP)	Chiang Mai	1972~80	\$ 148,000
7. Thai Payap Development Project	Nan		B 1.95 M
8. The Upper Mae-La-Noi Highland Agricultural Development Project	Mae Hong Son	1980~84	\$ 2.5 M
9. The establishment of the Tribal Research Center (1965)	Chiang Mai	1969	assistance included vehicles, foreign experts, materials and equipment
10. Provision of Community Rice storage village water supply Rice Bank Support to the HASD Project	Chiang Mai	1973~83	B 54,800 \$ 0.74 M

6-2-3 On-going Projects for Highland Agricultural and
Social Development under Assistance of Foreign Countries

Project	Project Site	Duration	Budget
1. The Thai-Australian Highland Agricultural and Social Development Project (TA-HASD)	Phase I Chiang Mai, Mae Hong Son, Chaing Rai, Lampang, Nan	1980~88	B 349 M
	Phase II 5 province+Lumpoon	1989~93	B 367 M
2. Thai-Norwegian Highland Development Project (TN-HDP)	Chiang Mai, Chiang Rai, Lumpang, Payao	1990~93	B 169 M
3. Thai-German Highland Development Programme (TG-HDP)	Chiang Mai Mae Hong Son	1982~91~	B 132 M
4. Pae-Por Highland Development Project (PP-HDP)	Tak, Chiang Mai	1987~92	B 82 M
5. Doi Yao Pha Mon Highland Development Project	Chiang Mai Payao	1988~92	\$ 3 M
6. Sam Mun Highland Development Project	Chiang Mai Mae Hong Son		\$ 2.5 M
7. Opium Dependence Treatment and Drug Abuse Centro in Hilltribe Communities	The Project is now being worked out in details		\$ 5 M

Note : B= Thai Bahts
M= Million
\$= US Dollar

6-2-4 Map Showing Highland Development Projects in Northern Thailand



Legend :

- ▲ CMU
- DOA
- ⊙ Dept. of Public Welfare
- ⊙ DoiYao-Pha Mon HDP
- IPAD
- Pae-Pur HDP
- ⊙ TA-HDP
- ⊎ TG-HDP
- ⊕ TN-HDP
- Royal Project
- ▼ Sam-Muen HDP
- Wiang-Pha HDP

6-3 Hilltribe Population Data

(1) General

Total number of Hilltribe families	75,808
Provinces	20
Districts	88
Sub-districts	11
Villages	3,474
Population	554,172

(2) By Province

Northern region

1. Chiangmai	139,965
2. Chiangrai	98,105
3. Maehongson	82,967
4. Tak	68,745
5. Nan	55,147
6. Lamphun	21,259
7. Payao	10,913
8. Lampang	9,573
9. Petchabun	8,446
10. Kamphangphet	8,622
11. Phrae	8,397
12. Pitsanulok	5,086
13. Sukotai	2,734
14. Utaithani	2,827
15. Oaei	501

Central region

16. Kanchanaburi	19,690
17. Supanburi	1,396
18. Ratchaburi	5,953
19. Petchaburi	3,088
20. Prachaubkirikan	758

Source : Hilltribe Population Data, 1988
National Statistical Office

6-4 Agricultural Land Use at 5 Provinces in Northern Thailand

Unit : ha

Province	Total	Housing Area	Paddy Land	Under Field Crops	Orchard Tree Crops	Vegetable Flower	Livestock Farm Area	Idle Land	Other Land
Tak	153,807	4,672	47,968	64,792	10,448	2,311	19,481	3,744	391
Nan	174,589	7,858	49,204	83,757	17,200	2,988	195	12,822	565
Chiang Mai	260,404	12,411	146,102	38,131	28,542	8,052	11,628	10,455	5,083
Chiang Rai	413,797	14,142	268,112	84,605	18,041	8,959	1,448	14,843	3,647
Mae Hong Son	36,446	1,844	19,415	6,991	3,699	1,359	641	1,622	875

Source : Agricultural Statistics of Thailand Crop Year 1989/90.

6-5 Major Agricultural Commodities produced at 5 Provinces in Northern Thailand

Unit : t

Province	Second Rice	Major Rice	Maize	Mungbean	Soybean	Groundnuts	Garlic
Tak	5,226	79,634	128,460	3,045	20,236	2,405	2,144
Nan	3,827	83,638	67,677	11,877	4,951	9,222	954
Chiang Mai	30,935	320,087	6,617	-	55,268	14,663	38,873
Chiang Rai	20,876	544,324	92,900	307	10,718	8,885	8,568
Mae Hong Son	-	38,907	1,423	-	5,566	1,699	6,422

3 years average : 1988 - 1990

Source : Agricultural Statistics of Thailand Crop Year 1989/90.

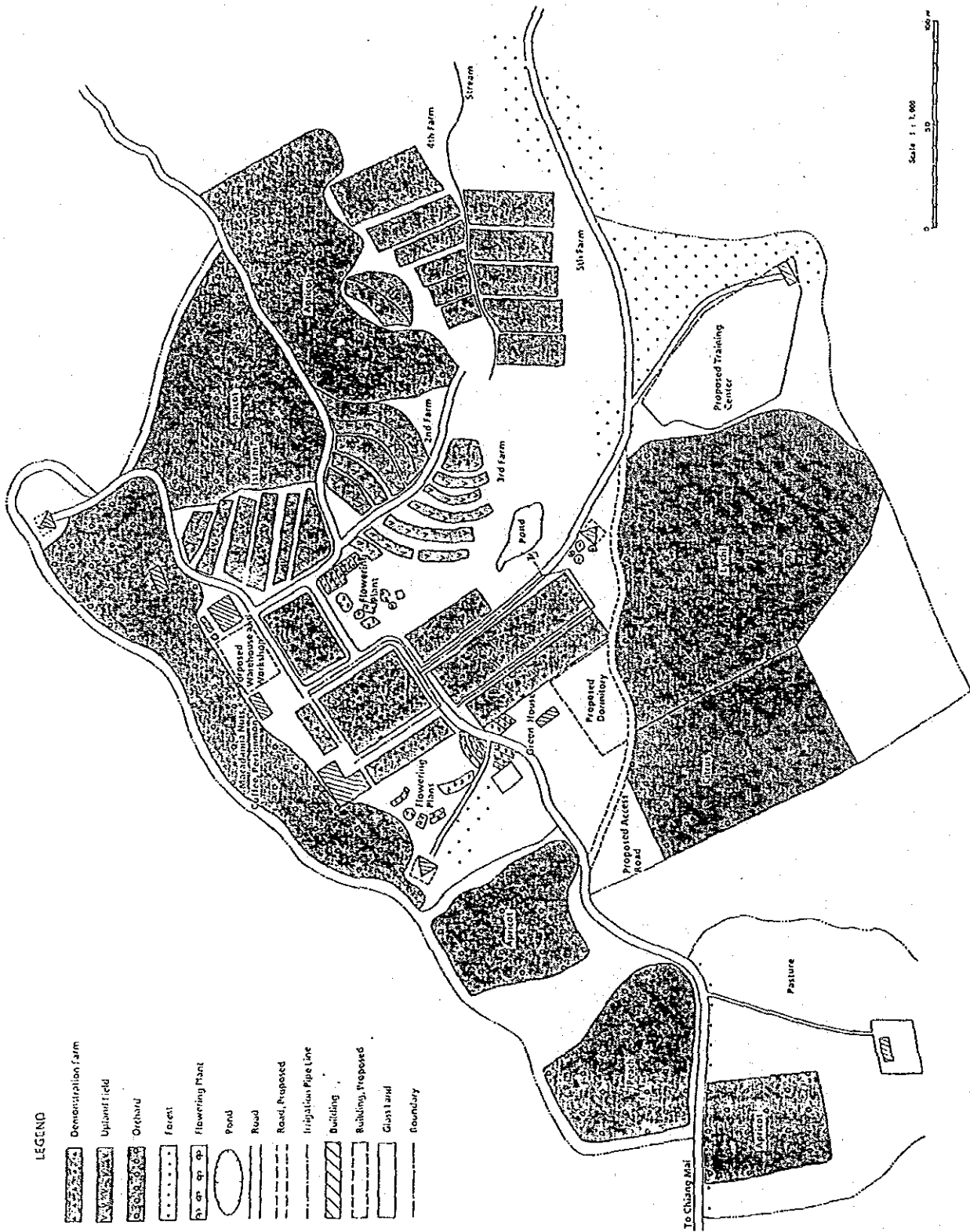
6-6 Major Livestock raised at 5 Provinces in Northern Thailand

Province	Buffaloes	Cattle	Swine	Duck	Chicken
Tak	34,242	116,461	35,558	10,435	575,047
Nan	64,184	49,574	56,846	38,671	1,462,985
Chiang Mai	109,555	119,982	168,010	170,883	3,076,657
Chiang Rai	105,924	74,978	107,629	154,806	4,766,497
Mae Hong Son	32,705	18,048	25,278	10,987	196,269

3 years average : 1987 - 1989

Source : Agricultural Statistics of Thailand Crop Year
1989/90.

6-7 CHANG KHIAN HIGHLAND AGRICULTURAL DEVELOPMENT AND TRAINING CENTER, LAND USE MAP



6-8 Chang Khian Highland Agricultural Development and Training Center Cropping Calender

Crop	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Vegetable												
Lettuce					①	②③④		⑤		⑥		
Leek			⑥						①	②③④		⑤
Sugar Pea					①②③			⑤		⑥		
Sweet Corn					①②③		⑤	⑥				
Zucchini		⑥							①②	③④		⑤
Japanese Pumpkin	⑥								①			⑤
Radish				①②③		⑤			①②③	⑤	⑥	
Baby Carrot				①②③		⑤	⑥					
Carrot		⑥							①②③		⑤	
Asparagus(7~8years)				⑤	①②③	⑥			⑤			
Tomato	⑥					①	②③④			⑤	①②③④	⑤
Seed Pepper					①	②③④		⑤		⑥		
Cucumber					①				①	②③④⑤	⑥	
Potato					①	②③		⑤		⑥		
Flower												
Straw Flower	③④	⑥		⑥					①	②	③④	⑤
Stalice	③④	⑥		⑥					①	②	③④	⑤
Carnation		④	⑤	⑥					①	②	③④	⑤
Upland Crops												
Upland Rice				①	②③			⑤			⑥	
Wheat		⑥							①	②③		⑤
Corn				①	②③	⑤		⑥				
Fruits												
Persimmon	Pr			Th	W.F.			H				Pr
Lichee	F	Th		H	Pr.W.							
Apricot	C.C.			H		W			F		Pr	
Peach		Th		F		W						Pr

- ① Land Preparation
 - ② Seeding/Seedling
 - ③ Fertilizing
 - ④ Transplanting
 - ⑤ Maintenance
Top-dressing
Plant Protecting, Weeding etc.
 - ⑥ Harvesting
- Pr : Pruning
 - Th : Thinning
 - W : Weeding
 - F : Fertilizing
 - SP : Spraying
 - C.C : Chemical Control
 - H : Harvest

6-9-1 Summary of 5-Year Training Plan (1994-1998)

Item	Training Time					Total					Agri. Extension Officer					Farmer					Neighbor Countries				
	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998	1994	1995	1996	1997	1998
1. Production Course																									
(1) Vegetable C.	4	4	4	5	5	80	92	100	125	125	60	69	75	94	94	8	9	10	13	13	12	14	15	18	18
(2) Fruits C.	4	4	4	4	4	48	56	60	80	80	36	42	45	60	60	5	6	6	8	8	7	8	9	12	12
(3) Upland Rice C.	3	3	3	3	3	60	69	75	75	75	45	52	56	56	56	6	7	8	8	8	9	10	11	11	11
(4) Field Crop C.	3	3	3	3	3	60	69	75	75	75	45	52	56	56	56	6	7	8	8	8	9	10	11	11	11
(5) Flower C.	4	4	4	4	6	80	92	100	100	145	60	69	75	75	109	8	9	10	10	15	12	14	15	15	21
Sub Total	18	18	18	19	21	328	378	410	455	500	246	284	307	341	375	33	38	42	47	52	49	56	61	67	73
2. Discipline Course																									
(1) HL Farming System C.	3	3	3	3	3	60	69	75	75	75	51	59	64	64	64	-	-	-	-	-	9	10	11	11	11
(2) Plant Protection C.	2	2	2	2	2	40	46	50	50	50	34	39	42	42	42	-	-	-	-	-	6	7	8	8	8
(3) Soil Conservation C.	1	1	1	1	1	20	23	25	25	25	17	20	21	21	21	-	-	-	-	-	3	3	4	4	4
(4) Environmental C.	1	1	1	1	1	20	23	25	25	25	17	20	21	21	21	-	-	-	-	-	3	3	4	4	4
(5) Meteorological C.	4	4	4	4	4	64	72	80	80	80	54	61	68	68	68	-	-	-	-	-	10	11	12	12	12
Sub total	11	11	11	11	11	204	233	255	255	255	173	199	216	216	216	-	-	-	-	-	31	34	39	39	39
3. Other Course																									
(1) SW on HL C.	1	1	1	1	1	32	36	40	40	40	27	31	34	34	34	-	-	-	-	-	5	5	6	6	6
(2) HL Agri. Deve. C.	1	1	1	1	1	32	36	40	40	40	27	31	34	34	34	-	-	-	-	-	5	5	6	6	6
(3) Narcotics Crop Control and Prevention Training C.	1	1	1	1	1	32	36	40	40	40	27	31	34	34	34	-	-	-	-	-	5	5	6	6	6
(4) HL Community Deve. C.	1	1	1	1	1	32	36	40	40	40	27	31	34	34	34	-	-	-	-	-	5	5	6	6	6
(5) Forestry Community Deve. C.	1	1	1	1	1	32	36	40	40	40	27	31	34	34	34	-	-	-	-	-	5	5	6	6	6
Sub total	5	5	5	5	5	160	180	200	200	200	135	155	170	170	170	-	-	-	-	-	25	25	30	30	30
4. Mobile Training	13	15	16	16	16	650	750	800	800	800	-	-	-	-	-	650	750	800	800	800	-	-	-	-	-
Total	47	49	50	51	53	1,342	1,541	1,665	1,710	1,755	554	638	693	727	761	683	788	842	847	852	105	115	130	136	142

6-9-2 Training Plan 1994

Training Course	Jan. 10/20	Feb. 10/20	Mar. 10/20	Apr. 10/20	May 10/20	Jun. 10/20	Jul. 10/20	Aug. 10/20	Sept. 10/20	Oct. 10/20	Nov. 10/20	Dec. 10/20	Total Person	Total Day
1. Production Course (10 days)														
1.1 Vegetable Course									20	20			80	40
1.2 Fruits Course					12		12		12				48	40
1.3 Upland Rice Course						20		20					60	30
1.4 Field Crop Course						20		20					60	30
1.5 Flower Course	20								20				80	40
2. Discipline Course														
2.1 Highland Farming System Course			20			20				20			60	120
2.2 Plant Protection Course			20						20				40	140
2.3 Soil Conservation Course									20				20	30
2.4 Environmental Course											20		20	30
2.5 Meteorological Course (5 days)	16						16						64	20
3. Other Course (3 days)														
3.1 Seminar/Workshop on Highland Course	32												32	3
3.2 Highland Agricultural Development Course	32												32	3
3.3 Narcotics Crop Control and Prevention Training Course	32												32	3
3.4 Highland Community Development Course												32	32	3
3.5 Forestry Community Development Course												32	32	3
Sub-Total (1. + 2. + 3.)	132/24	20/30	40/60	36/35	32/40	60/50	68/45	40/40	72/60	96/45	72/60	124/36	692	535
4. Mobile Training (50 farmers/time-3 days x 13 times/year)	150/9	150/9											650	39
Total (1. + 2. + 3. + 4.)	282/33	170/39	40/60	36/35	32/40	60/50	68/45	40/40	72/60	96/45	272/72	274/45	1,342	574

Notes : Figures in Sub-Total and Total show the total number of trainees/days.

6-9-3 Training Plan 1995

Training Course	Jan. 10/20	Feb. 10/20	Mar. 10/20	Apr. 10/20	May 10/20	Jun. 10/20	Jul. 10/20	Aug. 10/20	Sept. 10/20	Oct. 10/20	Nov. 10/20	Dec. 10/20	Total Person	Total Day
1. Production Course (10 days)														
1.1 Vegetable Course									23	23	23	23	92	40
1.2 Fruits Course					14		14				14		56	40
1.3 Upland Rice Course						23		23					69	30
1.4 Field Crop Course						23		23					69	30
1.5 Flower Course	23								23				92	40
2. Discipline Course														
2.1 Highland Farming System Course			23			23				23			69	120
2.2 Plant Protection Course			23				23						46	140
2.3 Soil Conservation Course								23					23	30
2.4 Environmental Course											23		23	30
2.5 Meteorological Course (5 days)	18			18			18						72	20
3. Other Course (3 days)														
3.1 Seminar/Workshop on Highland Course	36												36	3
3.2 Highland Agricultural Development Course	36												36	3
3.3 Narcotics Crop Control and Prevention Training Course	36												36	3
3.4 Highland Community Development Course													36	3
3.5 Forestry Community Development Course													36	3
Sub-Total (1. + 2. + 3.)	149/24	23/30	46/60	41/35	37/40	69/50	78/45	46/40	83/60	110/55	83/60	141/36	791	535
4. Mobile Training (50 farmers/time-3 days x 15 times/year)	200/12	150/9									200/12	200/12	750	45
Total (1. + 2. + 3. + 4.)	349/36	173/39	46/60	41/35	37/40	69/50	78/45	46/40	83/60	110/55	283/72	341/48	1,541	580

Notes : Figures in Sub-Total and Total show the total number of trainees/days.

6-9-4 Training Plan 1996

Training Course	Jan. 10/20	Feb. 10/20	Mar. 10/20	Apr. 10/20	May 10/20	Jun. 10/20	Jul. 10/20	Aug. 10/20	Sept. 10/20	Oct. 10/20	Nov. 10/20	Dec. 10/20	Total Person	Total Day
1. Production Course (10 days)														
1.1 Vegetable Course									25	25	25	25	100	40
1.2 Fruits Course		15					15						60	40
1.3 Upland Rice Course						25		25					75	30
1.4 Field Crop Course						25		25				25	75	30
1.5 Flower Course	25								25			25	100	40
2. Discipline Course														
2.1 Highland Farming System Course			25							25			75	120
2.2 Plant Protection Course			25					25					50	140
2.3 Soil Conservation Course									25				25	30
2.4 Environmental Course											25		25	30
2.5 Meteorological Course (5 days)	20						20						80	20
3. Other Course (3 days)														
3.1 Seminar/Workshop on Highland Course	40												40	3
3.2 Highland Agricultural Development Course	40												40	3
3.3 Narcotics Crop Control and Prevention Training Course	40												40	3
3.4 Highland Community Development Course												40	40	3
3.5 Forestry Community Development Course												40	40	3
Sub-Total (1. + 2. + 3.)	165/24	25/30	50/60	45/35	40/40	75/50	85/45	50/40	90/60	120/55	90/60	155/36	865	535
4. Mobile Training (50 farmers/time-3 days x 16 times/year)	200/12	200/12											800	48
Total (1. + 2. + 3. + 4.)	365/36	225/42	50/60	45/35	40/40	75/50	85/45	50/40	90/60	120/55	290/72	355/48	1,665	583

Notes : Figures in Sub-Total and Total show the total number of trainees/days.

6-9-5 Training Plan 1997

Training Course	Jan. 10/20	Feb. 10/20	Mar. 10/20	Apr. 10/20	May 10/20	Jun. 10/20	Jul. 10/20	Aug. 10/20	Sept. 10/20	Oct. 10/20	Nov. 10/20	Dec. 10/20	Total Person	Total Day
1. Production Course (10 days)														
1.1 Vegetable Course					25	25	25	25	25	25	25	25	125	50
1.2 Fruits Course					25	25	25	25	15				80	40
1.3 Upland Rice Course					25	25	25	25					75	30
1.4 Field Crop Course					25	25	25	25					75	30
1.5 Flower Course					25			25					100	40
2. Discipline Course														
2.1 Highland Farming System Course			25	25	25	25	25	25					75	120
2.2 Plant Protection Course			25	25	25	25	25	25					50	140
2.3 Soil Conservation Course								25					25	30
2.4 Environmental Course													25	30
2.5 Meteorological Course (5 days)					20			20					80	20
3. Other Course (3 days)														
3.1 Seminar/Workshop on Highland Course	40												40	3
3.2 Highland Agricultural Development Course	40												40	3
3.3 Narcotics Crop Control and Prevention Training Course	40												40	3
3.4 Highland Community Development Course	40												40	3
3.5 Forestry Community Development Course	40												40	3
Sub-Total (1. + 2. + 3.)	165/24	25/30	50/60	45/35	50/40	100/60	95/55	50/40	90/60	120/55	90/60	155/36	910	545
4. Mobile Training (50 farmers/time-3 days x 16 times/year)	200/12	200/12											800	48
Total (1. + 2. + 3. + 4.)	365/36	225/42	50/60	45/35	50/40	100/60	95/55	50/40	90/60	120/55	290/72	355/48	1,710	593

Notes : Figures in Sub-Total and Total show the total number of trainees/days.

6-9-6 Training Plan 1998

Training Course	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Total	
	10/20	10/20	10/20	10/20	10/20	10/20	10/20	10/20	10/20	10/20	10/20	10/20	Person	Day
1. Production Course (10 days)														
1.1 Vegetable Course						25			25	25	25	25	125	50
1.2 Fruits Course					25		25		15				80	40
1.3 Upland Rice Course						25		25		25			75	30
1.4 Field Crop Course						25			25				75	30
1.5 Flower Course					25				25				145	60
2. Discipline Course														
2.1 Highland Farming System Course			25			25				25			75	120
2.2 Plant Protection Course			25				25						50	140
2.3 Soil Conservation Course									25				25	30
2.4 Environmental Course											25		25	30
2.5 Meteorological Course (5 days)							20						80	20
3. Other Course (3 days)														
3.1 Seminar/Workshop on Highland Course	40												40	3
3.2 Highland Agricultural Development Course	40												40	3
3.3 Narcotics Crop Control and Prevention Training Course	40												40	3
3.4 Highland Community Development Course												40	40	3
3.5 Forestry Community Development Course												40	40	3
Sub-Total (1. + 2. + 3.)	165/24	45/40	50/60	70/45	50/40	100/60	95/55	50/40	90/60	120/55	90/60	155/36	955	565
4. Mobile Training (50 farmers/time-3 days x 16 times/year)	200/12	200/12											800	48
Total (1. + 2. + 3. + 4.)	365/36	245/52	50/60	70/45	50/40	100/60	95/55	50/40	95/60	120/55	290/72	355/48	1,755	613

Notes : Figures in Sub-Total and Total show the total number of trainees/days.

6-10 List of Equipment

Item No.	Name of Equipment	Quantity	Standard
1.	Equipment for Training Activity	1 lot	
1.1	Audio-Visual Equipment (Outdoor Video Production Equipment)	1 lot	
1.1.1	Portable Video Camera	1 unit	with Cable, Viewfinder, Microphone & Carrying Case
1.1.2	Tripod	1 unit	with Dolly, Chest Pad & Carrying Case
1.1.3	Portable Video Cassette Recorder	1 unit	with Cable, Carrying Case, Carrying Handle, 40pcs Video Tapes .
1.1.4	Color video Monitor	1 unit	9"
1.1.5	Battery Charger	1 unit	with AC Adaptor
1.1.6	Battery Pack	10 pieces	Rechargeable, Ni-Cd
1.1.7	Portable Battery Light	1 unit	24V, 200W, with 20pcs Lamps
1.1.8	Microphone (Video Program Production Equipment)	1 unit	
1.1.9	Color Video Monitor	1 unit	21"
1.1.10	Video Monitor	2 units	9", Monochrome
1.1.11	Special Effect Generator	1 unit	
1.1.12	Headphone	1 unit	
1.1.13	Video Monitor	2 units	12", Monochrome
1.1.14	Video Cassette Editing/ Recorder	1 unit	
1.1.15	Power Amplifier	1 unit	
1.1.16	Headphone	1 unit	
1.1.17	Audio Mixer	1 unit	with Video Editor

Item No.	Name of Equipment	Quantity	Standard
1.1.18	Cassette Tape recorder	1 unit	
1.1.19	Compact Disc Player	1 unit	
1.1.20	Compact Monitor Speaker	2 units	
1.1.21	Portable Lighting Kit	1 unit	with 10pieces Lamps
1.1.22	Main Power Unit	1 unit	
1.1.23	Console (Video Editing Equipment)	1 unit	
1.1.24	Video Cassette Editing/ Recorder	1 unit	
1.1.25	Video Cassette Recorder	1 unit	with 100pcs tapes
1.1.26	Automatic Editing Control Unit	1 unit	
1.1.27	Color Video Monitor	1 unit	14"
1.1.28	Console	1 unit	
1.1.29	Main Power Unit (Video Duplication Equipment)	1 unit	
1.1.30	Video Cassette Player	1 unit	U-Matic
1.1.31	Video Cassette Player	1 unit	S-VHS/VHS
1.1.32	VTR Dubbing Controller	1 unit	
1.1.33	Color Video Monitor	2 units	14"
1.1.34	Video/Audio Distributor	1 unit	
1.1.35	VHS Recorder/Player	2 units	
1.1.36	Main Power Unit	1 unit	
1.1.37	Rack (Video Display Equipment)	1 unit	

Item No.	Name of Equipment	Quantity	Standard
1.1.38	Video Cassette Player	1 unit	
1.1.39	Color Video Monitor	1 unit	14"
1.1.40	Video Projector	1 unit	Movable
1.1.41	VP Remote Control Unit	1 unit	
1.1.42	Audio Mixer	2 units	
1.1.43	Power Amplifier	2 units	
1.1.44	Microphone	2 units	Floor Type
1.1.45	Microphone	2 units	Desk Top Type
1.1.46	Speaker	2 pairs	
1.1.47	Screen	2 units	100"
1.1.48	Main Power Unit	1 unit	
1.1.49	Console	1 unit	for Video Player, Monitor & Remote Control Unit, Movable
1.1.50	Console (Mobile Training Equipment)	2 units	for Audio Mixer & Power Amplifier, Movable
1.1.51	Video Cassette Player	1 unit	with Carrying Case
1.1.52	Display	1 unit	27", with Carrying Case
1.1.53	Engine Generator	1 unit	Gasoline
1.1.54	Automatic Voltage Regulator	1 unit	
1.2	Training Support Equipment	1 lot	
1.2.1	Typewriter Set	1 lot	
1.2.1.1	Manual Typewriter	2 units	Thai
1.2.1.2	Table	2 units	
1.2.1.3	Chair	2 units	
1.2.1.4	Electric Typewriter	2 units	Thai/English
1.2.1.5	Table	2 units	

Item No.	Name of Equipment	Quantity	Standard
1.2.1.6	Chair	2 units	
1.2.2	Personal Computer Set	1 lot	
1.2.2.1	Computer	1 unit	16bits
1.2.2.2	Keyboard	1 unit	ANSI 101keys, 12
1.2.2.3	Display	1 unit	14"
1.2.2.4	Printer	1 unit	65pcs, 10cpi
1.2.2.5	Computer Soft	1 lot	
(A)	Data Base	1 piece	
(B)	Lotus	1 piece	
(C)	MS DOS	1 piece	
1.2.2.6	Uninterrupted Power Supply (UPS)	1 unit	220V ± 15%, 1KVA
1.2.2.7	Floppy Diskette	200 pieces	3.5" DS/DD
1.2.2.8	Diskette Cabinet	1 lot	
(A)	Desk Top Type	4 units	
(B)	Common Storage	1 unit	1
1.2.2.9	Table	1 unit	
1.2.2.10	Chair	1 unit	
1.2.2.11	Data File Cabinet	1 unit	
1.2.3	Plain Paper Copy Machine	1 unit	B5~A3, 21copies/min- A4, with 12bottles toner, cleaner, cleaning & cloth
1.2.4.1	Stencil cutter	1 unit	Max. cutting area 350mm×250mm, with desk
1.2.4.2	Auto Printer	1 unit	40~130copies/min, with desk, 2year black/red/blue/yellow ink
1.2.4.3	Cutter	1 unit	Manual, Cutting Capacity 390mmL, with Stand
1.2.4.4	Book Binder	1 unit	75mmT×430mmL

Item No.	Name of Equipment	Quantity	Standard
1.2.4.5	Paper Drill	1 unit	50mm
1.2.5	Electric Calculator	2 units	10digits, Solar
1.2.6	Wireless Radio Set	1 lot	50km~100km, VHF & FM, 140MHz~150MHz
1.2.6.1	Base Station	2 units	20W
1.2.6.2	For Automobile	3 units	10W, with antenna
1.2.6.3	For Hand Carry	6 units	5W
21..7	Fax	1 unit	Original 148mm~280mm Recording 210mm(A4) x 50m, with paper
1.2.8	Steel Shelves	4 units	5shelves(Inc. Top Board), 955mmW x 634mmD x 2,400mmH 18" x 24" x 52"
1.2.9	File Cabinet	5 units	4stages,
1.2.10	Slide Door Locker	5 units	
1.2.11	Camera set	1 lot	
1.2.11.1	Camera	3 units	35mm, Single-Lens Reflex
1.2.11.2	Lens	3 lots	Standard, Wide Angle, Tele- Zoom & Close-Up
1.2.11.3	Motor Drive	3 units	
1.2.11.4	Case	3 units	
1.2.11.5	Tripod	3 units	with Case
1.2.12	Slide Projector Set	1 lot	
1.2.12.1	Slide Projector	3 units	35mm, with Zoom Lens
1.2.12.2	Slidecorder	3 units	
1.2.13	Overheard Projector	3 units	
1.2.14	Opaque Projector	1 unit	
1.2.15	16 mm Movie Projector	1 unit	
1.2.16	Screen Set	1 lot	

Item No.	Name of Equipment	Quantity	Standard
1.2.16.1	Floor Stand Type	3 units	1,800mm×1,800mm
1.2.16.2	Wall Type	1 unit	3,000mm×2,300mm
1.2.17	Handy Speaker	5 units	Battery driven, 12~18W, with spare batteries
1.2.18	Furniture	1 lot	
2.	Equipment for Demonstration Farm	1 lot	
2.1	Farm Machinery & Implement	1 lot	
2.1.1	Hand Tractor Set	1 lot	
2.1.1.1	Hand Tractor	2 units	Diesel, Max. 7.0Hp/2,400rpm
2.1.1.2	Rotary	2 units	
2.1.1.3	Disc Plow	2 units	
2.1.1.4	Ridger	2 units	
2.1.1.5	Cage Wheel	2 units	
2.1.1.6	Trailer	2 pairs	500kg
2.1.2	4 Wheel Tractor Set	1 lot	
2.1.2.1	4 Wheel tractor	1 unit	Diesel Max. 70Hp/2,400rpm
2.1.2.2	Rotary	1 unit	
2.1.2.3	Disc Plow	1 unit	
2.1.2.4	Disc Harrow	1 unit	
2.1.2.5	Ridger	1 unit	
2.1.2.6	Front Blade	1 unit	
2.1.2.7	Cage Wheel	1 pair	
2.1.2.8	Trailer	1 unit	1~2ton
2.1.3	Sprayer Set	1 lot	
2.1.3.1	Power Sprayer	2 units	Knapsack Type, Gasoline, Chemical Tank 22liter

Item No.	Name of Equipment	Quantity	Standard
2.1.3.2	Hand sprayer	5 units	Knapsack Type, 14liter Stainless Steel made Chemical Tank
2.1.3.3	Preparation Tank	6 units	Plastic made
2.1.4	Bush Cutter	5 units	Gasoline, 2Hp, 40cc
2.1.5	Sprinkler Head	50 units	Mobile, with Stand & Hose
2.1.6	Corn Sheller	3 units	Manual
2.1.7	Rice thresher	1 unit	Axial Flow, Diesel Engine driven
2.1.8	Winnower	2 units	Manual
2.2	Workshop Tools	1 lot	
2.2.1	For Engine	1 lot	
2.2.1.1	Compression Gauge	1 lot	
(A)	For Gasoline Engine	1 unit	Max Graduation 25kg/cm ² , Gauge Dia. 60mm
(B)	For Diesel Engine	1 unit	70kg/cm ²
2.2.1.2	Nozzle Tester	1 unit	with Valve, 0~500kg/cm ²
2.2.1.3	Valve Lifter & compressor	1 unit	Opening Range 50~225
2.2.1.4	Thermometer	10 pieces	~200°C
2.2.1.5	Piston Ring Tool	1 pieces	83~135mm
2.2.2	For Chassis	1 lot	
2.2.2.1	Tire Pressure Gauge	1 piece	Bar Type, Capacity, 10kg/cm ²
2.2.2.2	Garage Jack	1 unit	3ton
2.2.3	For Electric	1 lot	
2.2.3.1	Battery and Coolant Tester	1 piece	
2.2.3.2	Digital Multitester	1 unit	
2.2.3.3	Digital Clamp Meter	1 unit	

Item No.	Name of Equipment	Quantity	Standard
2.2.3.4	Battery Charger	1 unit	6~12V 30A, 18~24V 15A, 1.1KVA
2.2.3.5	Battery Tester	1 piece	12V/18~120 AH
2.2.4	For Gauge and Measurement	1 lot	
2.2.4.1	Hand Tachometer	1 unit	Non-Contact, 6~30,000rpm, 5Digits
2.2.4.2	Dial Indicator	1 unit	
2.2.4.3	Radius Gauge	1 unit	
2.2.5	For General Facility		
2.2.5.1	Steam Cleaner	1 unit	Water Consumption : 390lit/hr, Steam Pressure : 7kg/cm ²
2.2.5.2	Air Compressor	1 unit	9.9kg/cm ² , 57liter
2.2.5.3	Parts Cleaner	1 unit	Tank Capacity : 70ℓ
2.2.6	For Processing	1 lot	
2.2.6.1	Electric Drill	1 unit	10mm ϕ , with Straight Twist Shank Drill Set
2.2.6.2	Bench Drill Press	1 unit	13mm ϕ , with Drill Chuck & Handle & Straight Shank Twist Drill Set
2.2.6.3	Bench Electric Grinder	1 unit	Wheel Size : 205×19×15.88mm
2.2.6.4	Spray Gun	1 unit	Suction, 1.3mm ϕ , 1,000cc
2.2.6.5	Gas Welding & Cutting Set	1 lot	
(A)	Oxygen Container	2 pieces	40liter
(B)	Acetylene Container	2 pieces	40liter
(C)	Oxygen Pressure Regulator	1 piece	
(D)	Acetylene Pressure Regulator	1 piece	
(E)	Gas Welding Torch	1 piece	1.0~3.0mm, with 7pieces Tips

Item No.	Name of Equipment	Quantity	Standard
(F)	Manual Gas Cutting Torch	1 piece	3~30mm, with 3pieces Tips
(G)	Oxygen Hose	1 piece	6mm ϕ x 10m
(H)	Acetylene Hose	1 piece	9mm ϕ x 10m
(I)	Goggle	1 piece	
(J)	Leather Glove	2 pairs	
(K)	Spark Gas Lighter	2 pieces	
(L)	Hose Band	6 pieces	
(M)	Welding Rod	1 set	Each 25kg of 2.0mm 2.0mm ϕ x 1,000mmL, 2.6mm ϕ x 1,000mmL, 3.2mm ϕ x 1,000mmL & 6.0mm ϕ x 700mmL
(N)	Carrying Cart	1 unit	
2.2.6.6	Engine Welder Set	1 lot	
(A)	Engine Welder		50~180A, 9ps/3,600rpm
(B)	Welding Shield	1 piece	Hand Holding Type
(C)	Secondary Cord	2 pieces	22mm ϕ x 10m
(D)	Safety Holder	1 piece	150~250A
(E)	Earth Clip	1 piece	150~300A
(F)	Double-End Chipping Hammer	1 piece	
(G)	Leather Glove	1 pair	
2.2.6.7	Plating & Blacksmith Tool Set	1 lot	
(A)	Rivet Forge	1 piece	360mm ϕ x 80mmD
(B)	Iron Anvil	1 piece	Cast Steel, 30kg
(C)	Tong Firing	1 piece	Flat Nose, 450mm
(D)	Double-Face Sledge Hammer	1 set	1.8kg & 3.5kg
(E)	Cast Iron Swage Block	1 piece	300mm x 300mm x 98mm

Item No.	Name of Equipment	Quantity	Standard
2.2.7	Common Tools (For Measuring)	1 lot	
2.2.7.1	Vernier Caliper	1 piece	Digital
2.2.7.2	Measuring Tape	1 piece	Steel Made, 0~20m
2.2.7.3	Straight Rule	1 piece	0~300mm
2.2.7.4	Thickness Gauge	1 piece	25leaves
2.2.7.5	Pitch Gauge	1 piece	21leaves
2.2.7.6	Surface Gauge	1 piece	
2.2.7.7	Square (For Assembling/Dis- assembling)	1 piece	Flat Type, 150mm x 100mm
2.2.7.8	Adjustable wrench Set	1 set	3pieces/set
2.2.7.9	Open End Wrench Set	1 set	6pieces/set
2.2.7.10	Adjustable Pipe Wrench	1 piece	10~54mm
2.2.7.11	Hexagon Wrench Set	1 set	2~12mm, 9pieces/set
2.2.7.12	Double Offset Box Wrench Set	1 set	6pieces/set
2.2.7.13	1/2" Square Socket Wrench Set	1 set	22pieces/set
2.2.7.14	3/4" Square Socket Wrench	1 set	11pieces/set
2.2.7.15	Puller Set		
2.2.7.16	Screw Driver Set	1 set	
2.2.7.17	Copper Hammer Set	1 set	
2.2.7.18	Ball Peel Hammer Set	1 set	
2.2.7.19	Combination Plier	1 piece	200mm
2.2.7.20	Side Cutting Plier	1 piece	200mm
2.2.7.21	Water Pump Plier	1 piece	Spring Type, Opening 40mm x 250mmL

Item No.	Name of Equipment	Quantity	Standard
2.2.7.22	Cutting Nipper	1 piece	150mm
2.2.7.23	Radio Pencil	1 piece	150mm
2.2.7.24	1/2" Square Stud Remover (For Processing)	1 piece	19mm ϕ
2.2.7.25	Engineer's File Set	1 set	5pieces of Flat, Half-Round, Round, Square & Triangular, 250mm Medium
2.2.7.26	Needle File Set	1 set	5pieces of Flat, Half-Round, Round, Square & Triangular, 150mm Medium
2.2.7.27	Oil Stone	1 piece	
2.2.7.28	Torch Lamp	1 piece	
2.2.7.29	Screw Plate Set	1 set	Metric Size
(A)	Medium Taps	28 pieces	
(B)	Dies	26 pieces	
(C)	Tap Wrench	2 pieces	
(D)	Tap Holder	1 piece	
(E)	Die Handle	2 pieces	
2.2.7.30	Adjustable Hacksaw Frame	1 piece	250~300mm, with spare blades
2.2.7.31	Soldering Iron	1 piece	
2.2.7.32	Tinner Scissors	1 piece	Cutting Thickness : 1.2mm, Straight Cutting Direction
2.2.7.33	Punch Set	1 set	
2.2.7.34	Chisel Set	1 set	
2.2.7.35	Scraper Set (For General Use)	1 set	
2.2.7.36	Grease Gun	1 piece	300cc
2.2.7.37	Vise	1 piece	Jaw Width : 152.5mm, Opening : 200mm

Item No.	Name of Equipment	Quantity	Standard
2.2.7.38	Screw Extractor Set	1 set	5pieces in Vinyl Case
2.2.7.39	Test Hammer	1 piece	230g
2.2.7.40	Cutting Nipper	1 piece	150mm
2.2.7.41	Radio Pench	1 piece	150mm
2.2.7.42	Rigid Rack	2 pieces	3ton, 350mm~675mmH
2.2.7.43	Portable Gantry Crane	1 unit	5ton
2.2.7.44	Cleaning Pan	10pieces	450mm × 600mm × 150mm
2.2.7.45	Parts Carrier	10 pieces	590mm × 358mm × 200mm, Plastic
2.2.7.46	Tool Tray	5 pieces	415mm × 250mm × 90mm, with handle
2.2.7.47	Tool Stand	1 unit	660mm × 415mm × 830mm
2.2.7.48	Tool Cabinet	1 unit	740mm × 400mm × 1,220mm
2.2.7.49	Work Bench	1 unit	1,800W × 750mmD × 750mmH
2.2.7.50	Stool	4 units	550mmW × 550mmD × 395mm~535mmH, with Caster Wheels
2.2.8	Carpenter's Tool Kit	1 lot	
2.2.8.1	Nail Hammer Set	1 set	500g, 800g & 1,000g
2.2.8.2	Hand Saw	1 piece	500mm
2.2.8.3	Nail Extractor	1 piece	260mm
2.2.8.4	Straight Rule	1 piece	1,000mm
2.2.8.5	Tape Rule	1 piece	30m
2.2.8.6	Portable Circular Saw	1 unit	210mm ϕ
2.2.8.7	Power Plane	1 unit	82mmW
2.2.8.8	Screw Driver Set	1 set	5.5mm × 75mm, 7mm × 125mm
2.2.8.9	Try Square	1 piece	200mm
2.2.8.10	Carpenter's Drill Set	1 set	Drill Point : 2.0, 2.5, 2.8, 3.0 & 3.5mm
2.2.8.11	Wood Chisel Set	1 set	6, 9, 12, 15 & 18mm

Item No.	Name of Equipment	Quantity	Standard
2.2.8.12	Wood Marking Gauge	1 piece	
2.2.8.13	Ratchet Bit Brace and Bits Set	1 set	6, 8 & 9mm ϕ
2.2.8.14	Tool Box	1 unit	
3.	Equipment for Road Maintenance	1 lot	
3.1	Bulldozer	1 unit	70Hp
3.2	Dump Truck	1 unit	2ton, 4WD, Diesel
3.3	Hydraulic Excavator	1 unit	15Hp, Crawler Type
4.	Equipment for Transportation Vehicle	1 lot	
4.1	Station Wagon	3 units	4WD, Diesel, Long Body
4.2	Pickup Truck	1 unit	Double-Cab, 1ton, 4WD
4.3	Microbus	1 unit	12Seaters, Diesel, 4WD
4.4	Motor Cycle	5 units	Off-Road Type, 125cc, 4-Stroke
5.	Equipment for Highland Agricultural Development	1 lot	
5.1	Equipment for Land and Soil Conservation Training		
5.1.1	Electronic Balance	2 units	0~6kg, 100g/0.01g
5.1.2	Mechanical Balance Set	1 lot	
5.1.2.1	Model A	6 units	5kg
5.1.2.2	Model B	6 units	12kg
5.1.3	Spring Scale	6 units	10kg
5.1.4	Platform Scale	6 units	50kg
5.1.5	Rule	14 units	1,000mm
5.1.6	Sketchboard	14 units	

Item No.	Name of Equipment	Quantity	Standard
5.1.7	Drying Oven	1 unit	150liter, 40°C~200°C
5.1.8	Meteorological Instrument	1 lot	
5.1.8.1	Evaporation Pan	2 units	1.15m ² , with Hook Gauge Evaporimeter
5.1.8.2	Sunshine Autograph	2 units	
5.1.8.3	Rain Gauge	2 units	with 200cm ² orifice
5.1.8.4	Precipitation Recorder	2 units	
5.1.8.5	Thermohygrograph	2 units	
5.1.8.6	Anemometer	2 units	Digital
5.1.8.7	Assman Aspiration Psychrometer	2 units	Battery driven
5.1.9	Automatic Weather Station	1 set	with Computer & Printer
5.1.10	Clinometer	14 units	Digital
5.1.11	Compass	14 units	
5.1.12	Altimeter	14 units	Digital
5.1.13	Runoff Plots Set	1 set	with Water Flow Meter & Sediment Sampler
5.1.14	Global Positioning System	2 units	Digital, 2-3m Precision
5.1.15	Soil Moisture Meter	2 units	Digital, with 20pieces blocks
5.1.16	pH Meter	2 units	Analog-Digital
5.1.17	Soil Sampler	2 units	
5.1.18	Soil Analysis Sieve Set	2 sets	Brass-Made, 12pieces/set
5.2	Equipment for Plant Protection Training	1 lot	
5.2.1	Microscope Set	1 lot	
5.2.1.1	Stereomicroscope	14 units	Max. 400X, with Illuminator

Item No.	Name of Equipment	Quantity	Standard
5.2.1.2	Compound Microscope	13 units	Max. 1000X, with Illuminator
5.2.1.3	Compound Microscope with Camera & Display	1 unit	Max. 1000X, with Illuminator
5.2.2	Glassware	1 lot	
5.2.2.1	Mortar and Pestle	26 pieces	90mm ϕ
5.2.2.2	Frosted Slide Glass	1,400 pieces	0.7~0.9mm T,
5.5.5.3	Micro Cover Glass	1,400 pieces	50x40mm
5.2.2.4	Micro Slide Glass	1,400 pieces	
5.2.2.5	Petri Dish	400 pieces	90mm ϕ x 15mmH
5.2.2.6	Tweezers	26 pieces	Chrom-Plating Stainless Steel
5.2.3	Loupe	26 pieces	10X
5.2.4	Alcohol Lamp	26 pieces	
5.2.5	Plate Reader Set	1 lot	
5.2.5.1	Micro Plate Reader	1 unit	
5.2.5.2	Plate Mixer	1 unit	
5.2.5.3	Plate Washer	1 unit	
5.2.5.4	ELISA Plate	1,000 pcs	
5.2.6	Incubator	1 unit	150 liter
5.2.7	Autoclave	1 unit	40 liter
5.2.8	Oven	1 unit	150 liter
5.2.9	Water Bath	1 unit	42 liter
5.2.10	Dark Box	1 unit	
5.2.11	Grain Moisture Meter	1 unit	Digital