5–9 PROJECT COST

The total project cost for the Japanese portion is estimated as follows:

This estimation is based on the price rate in April, 1984 and the exchange rate is 1 US$ = 7.79 kyats = Japanese Yen 235.

Building	1,134,520,000	Japanese Yen
Equipment	339,190,000	"
Experimental Field	544,670,000	"
Consultant's Service	171,620,000	"
Total	2,190,000,000	Japanese Yen

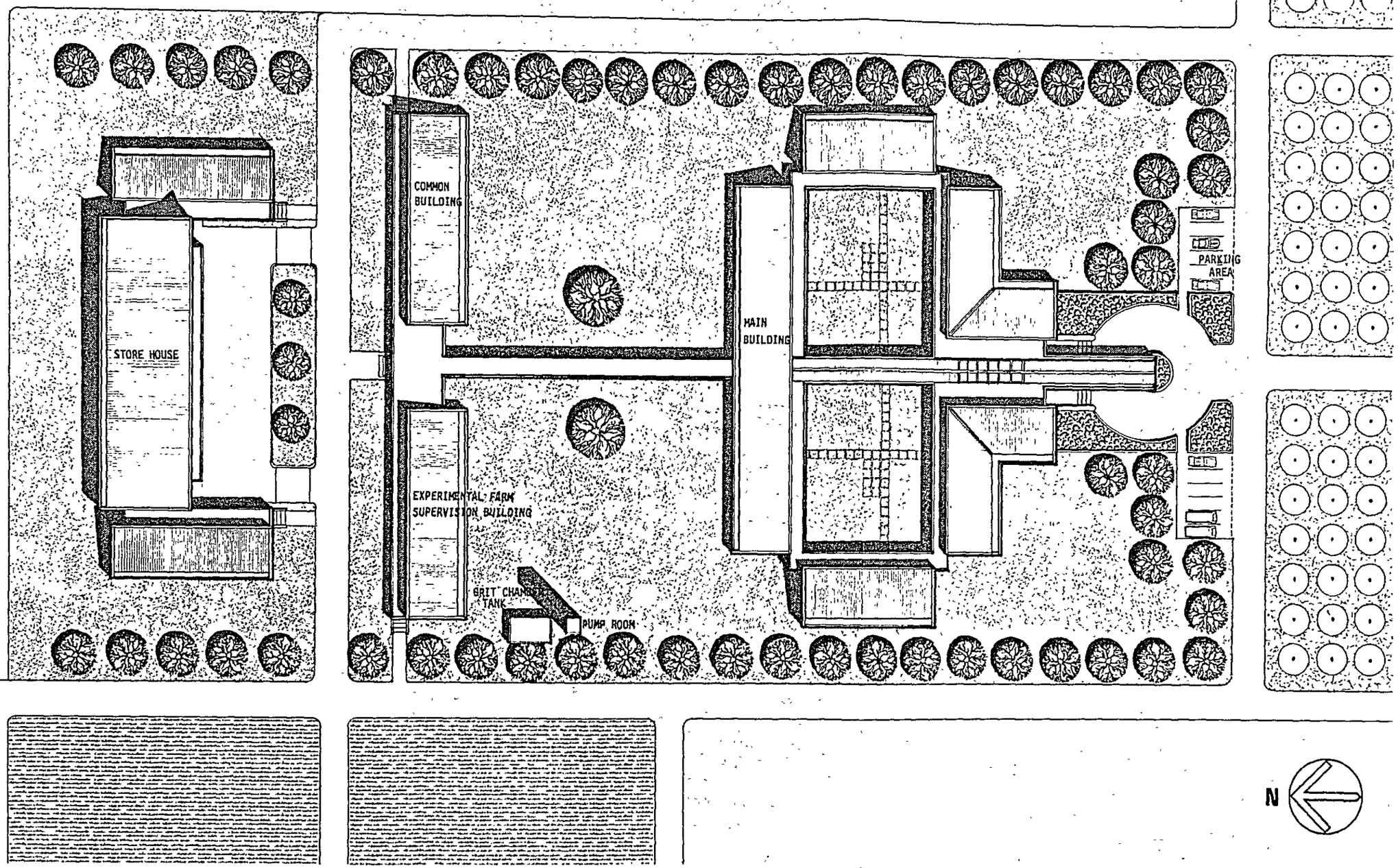
5–10 BASIC DESIGN

5–10–1 Basic Design Drawings

5–10–2 Experimental Field

5–10–3 Equipment List

BASIC DESIGN DRAWINGS

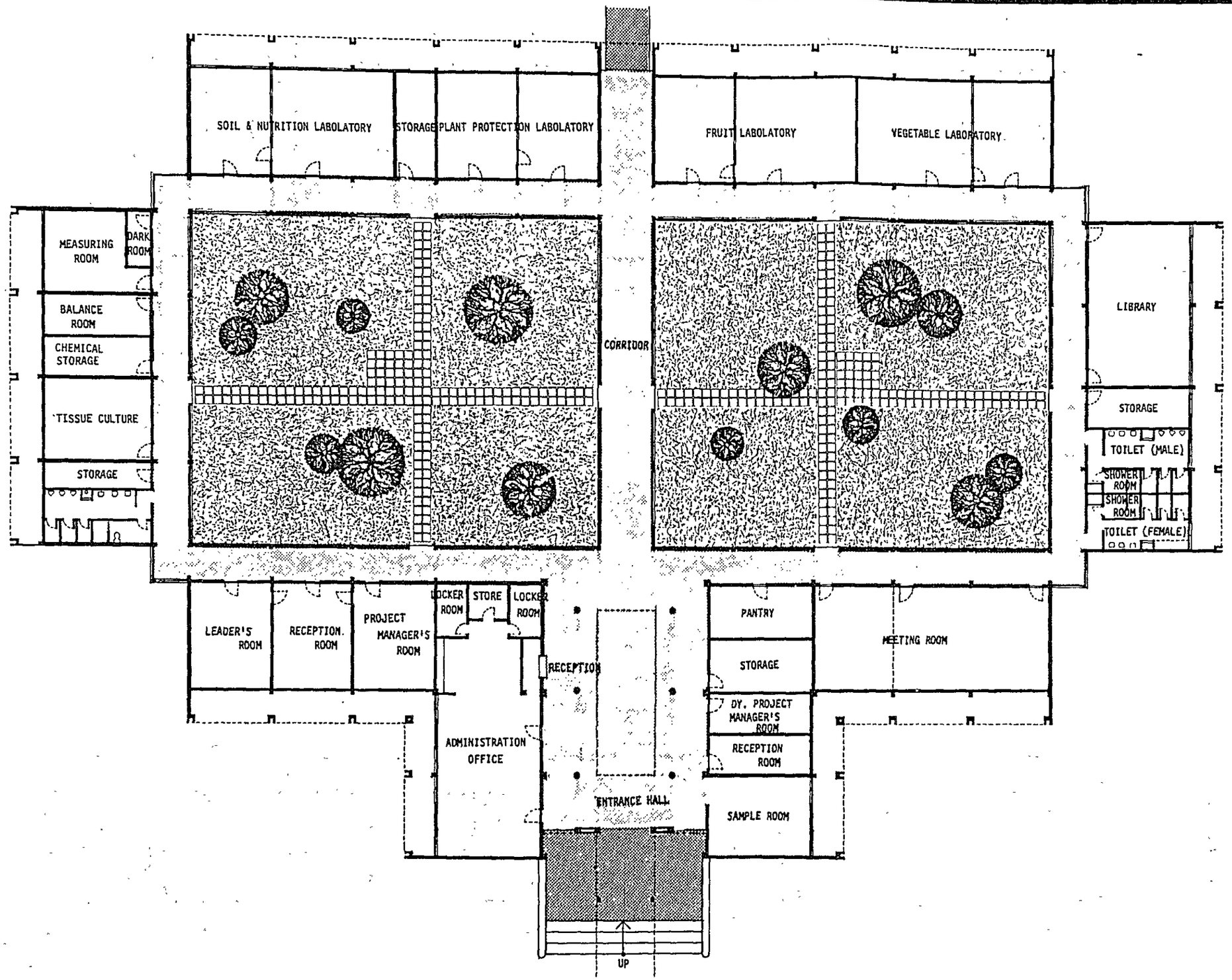


THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

SITE PLAN

SCALE (meters) 0 2 4 8 15 30

01

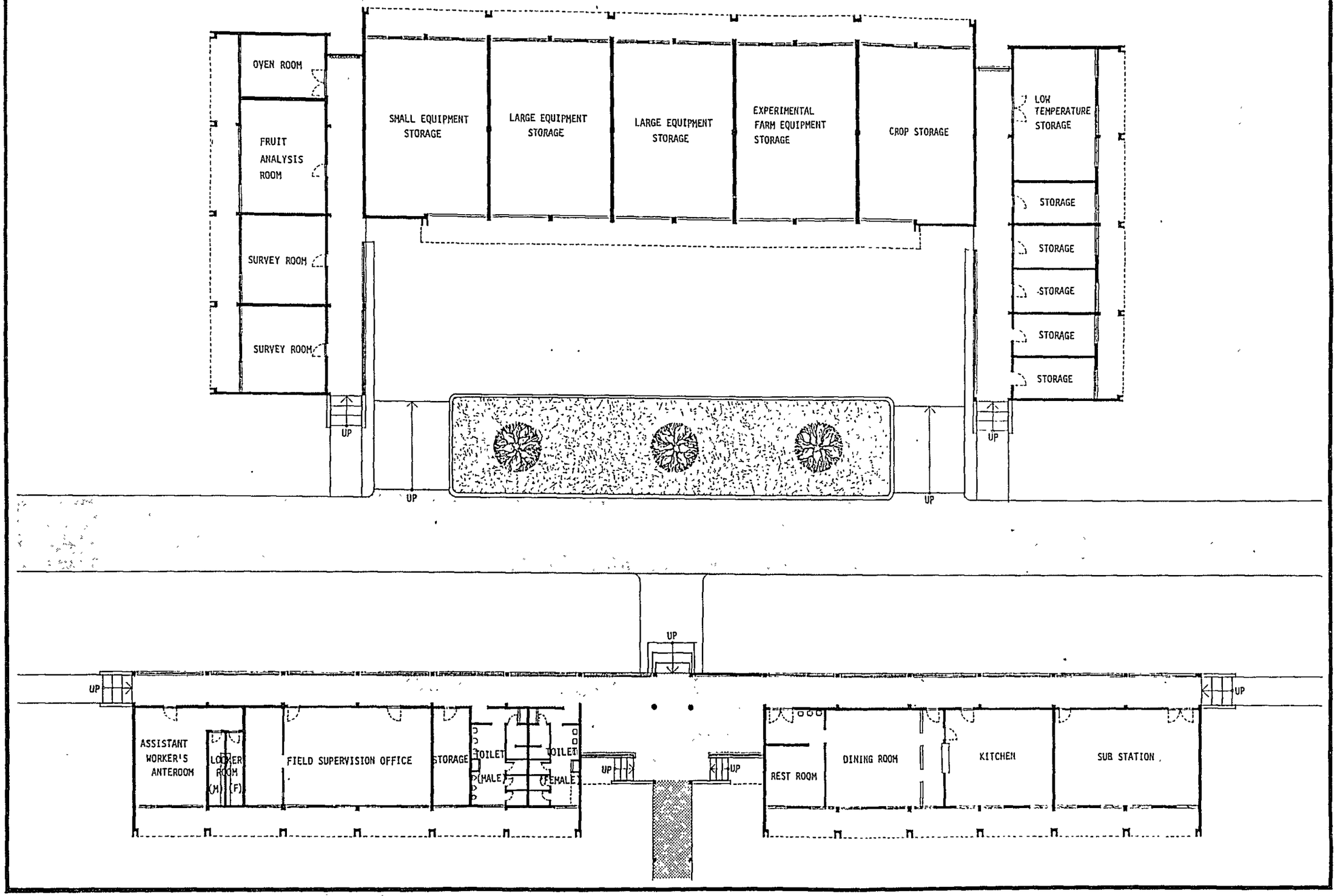


THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

PLAN

SCALE (meters)
0 1 2 3 6 12

02

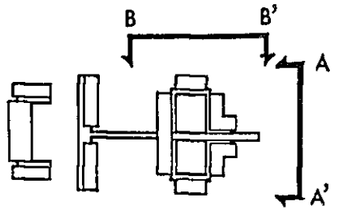


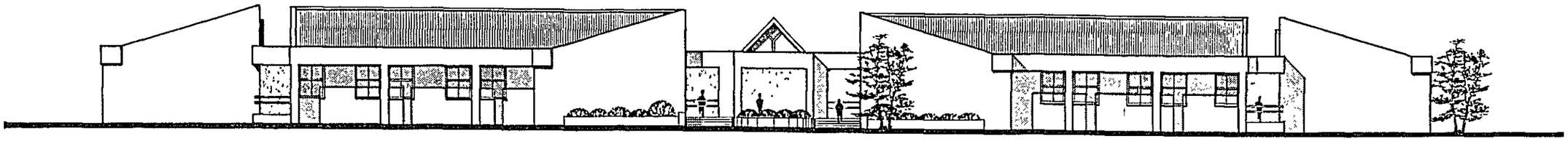
THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

PLAN

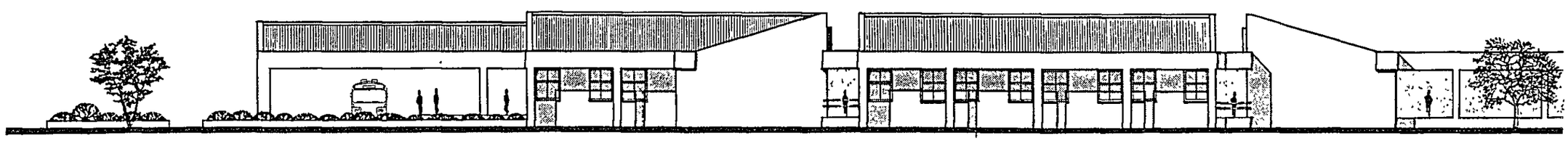
SCALE (meters)
0 1 2 3 6 12

03





A—A ELEVATION



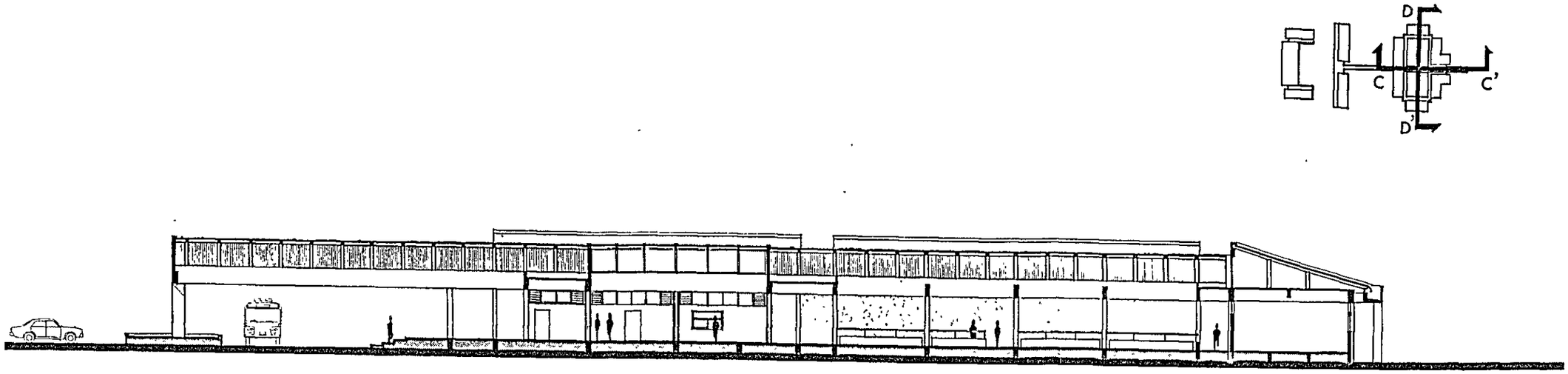
B—B ELEVATION

THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

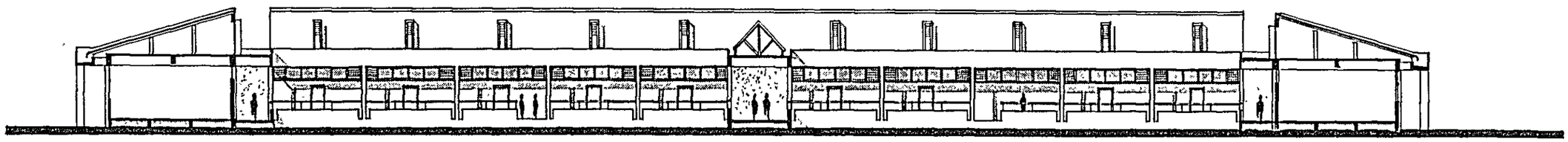
ELEVATION

SCALE (meters)
0 1 2 3 6 12

04



C–C SECTION



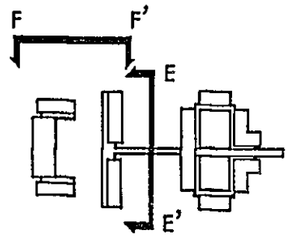
D–D SECTION

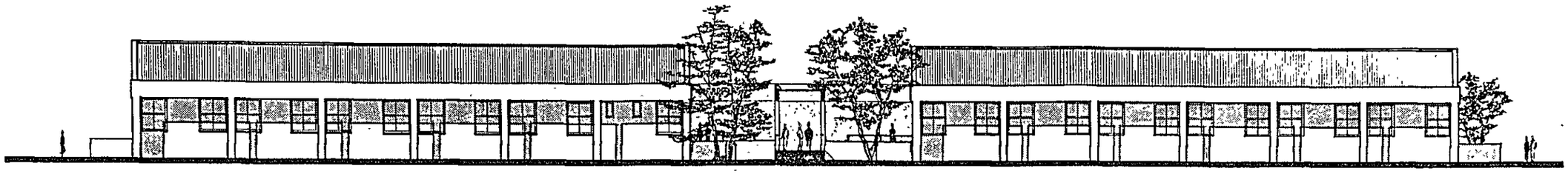
THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

SECTION

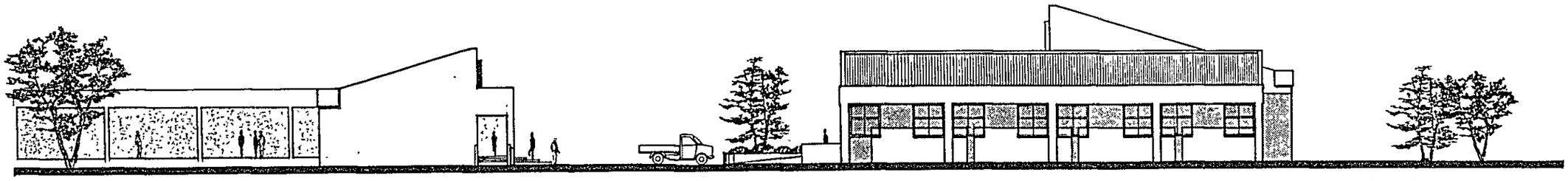
SCALE (meters)
0 1 2 3 6 12

05





E-E ELEVATION



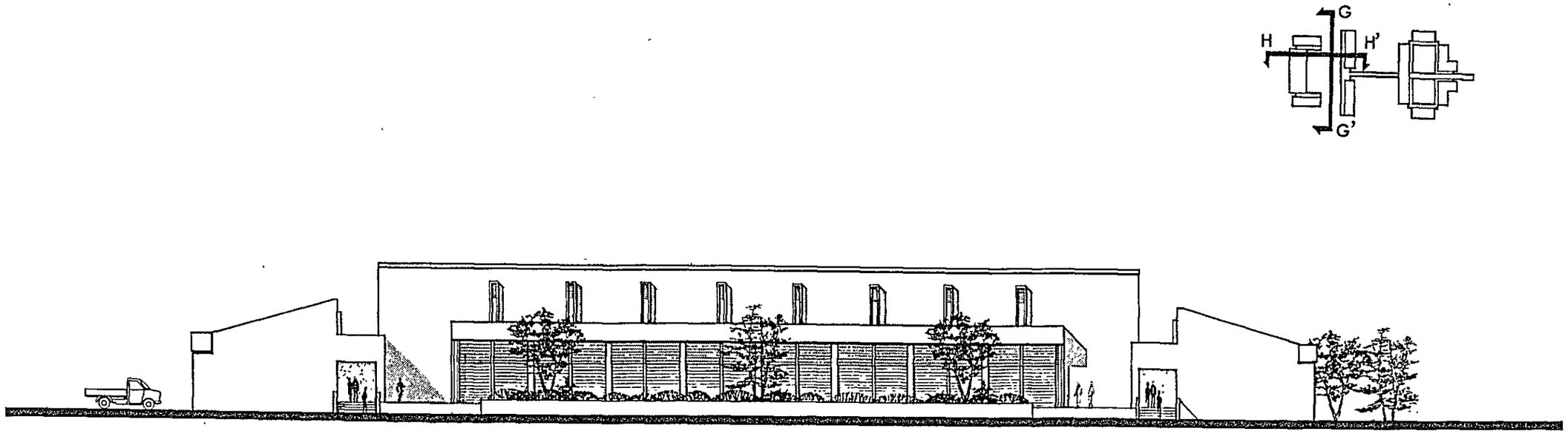
F-F ELEVATION

THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

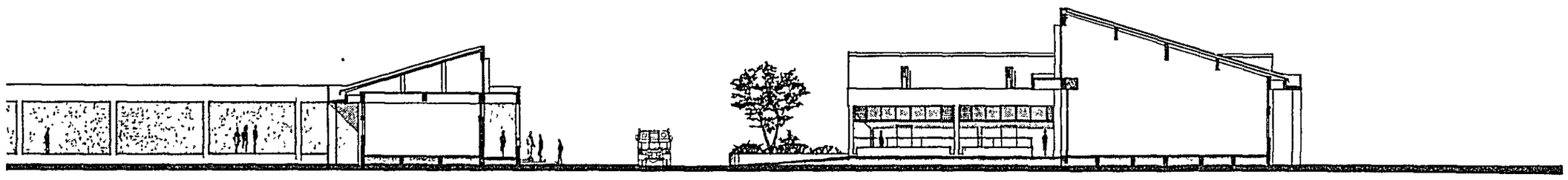
ELEVATION

SCALE (meters)
0 1 2 3 6 12

06



G–G ELEVATION



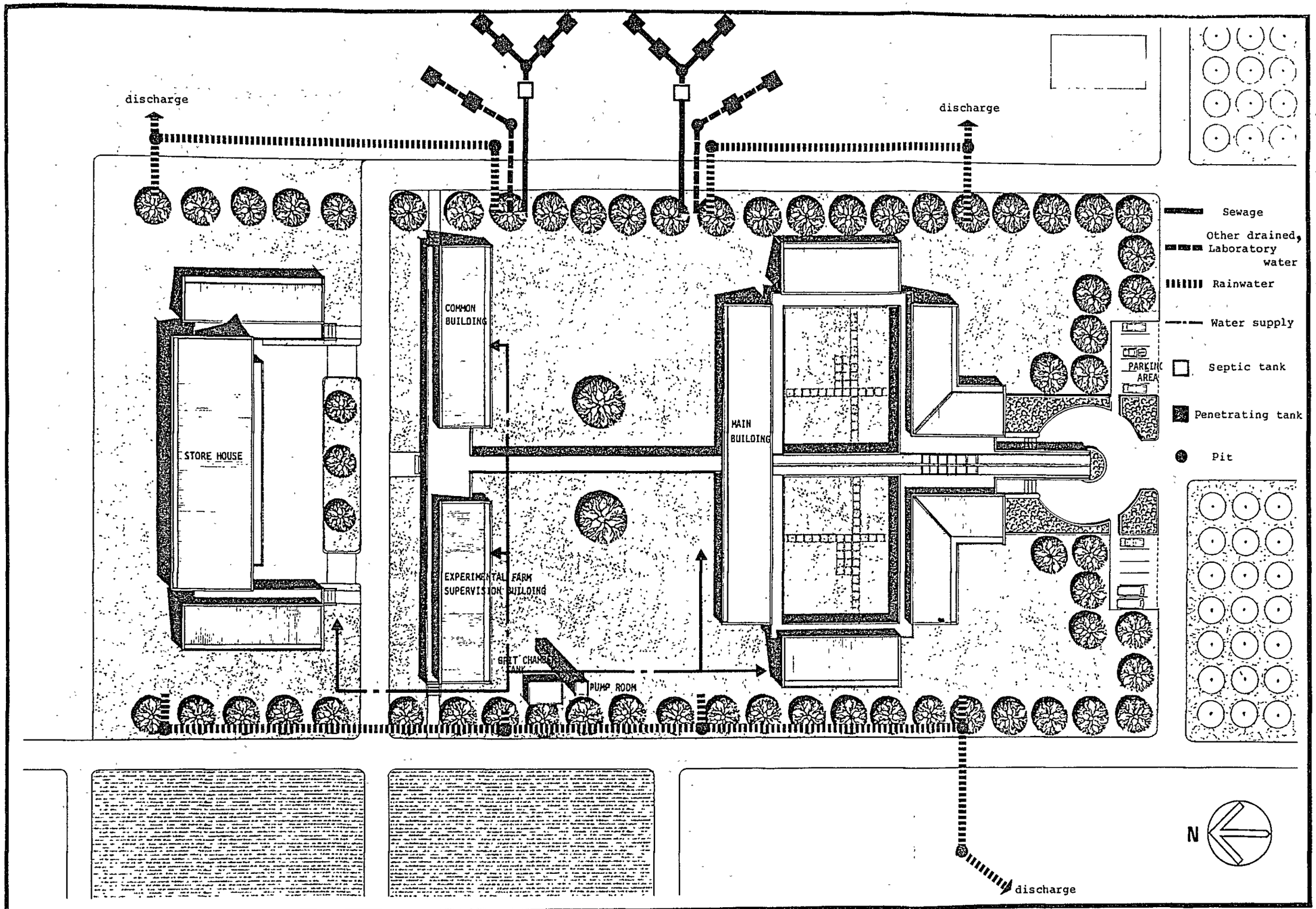
H–H SECTION

THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

ELEVATION & SECTION

SCALE (meters)
0 1 2 3 6 12

07

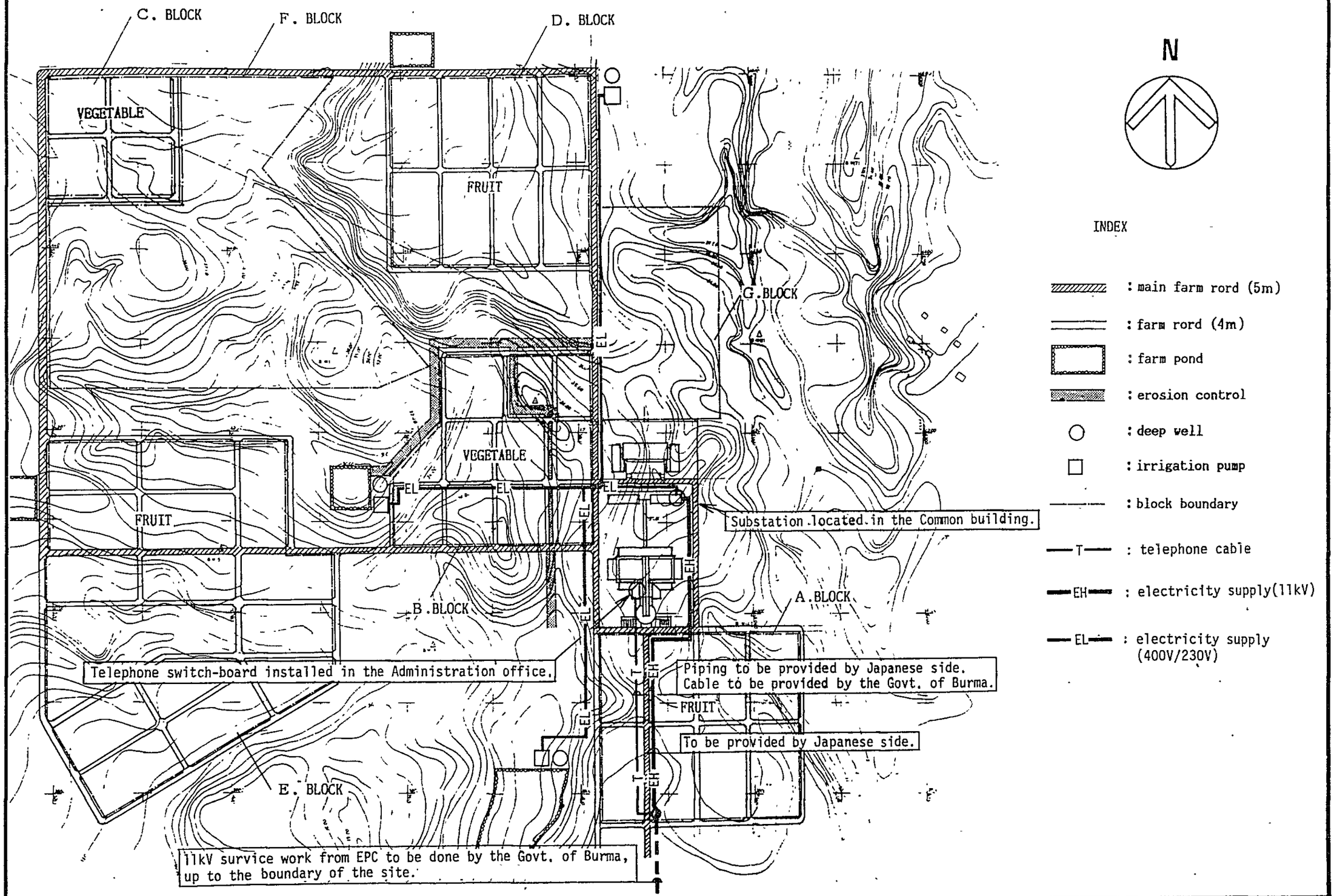


THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

WATER SUPPLY & DRAINAGE

SCALE (meters) 0 2 4 8 15 30

08



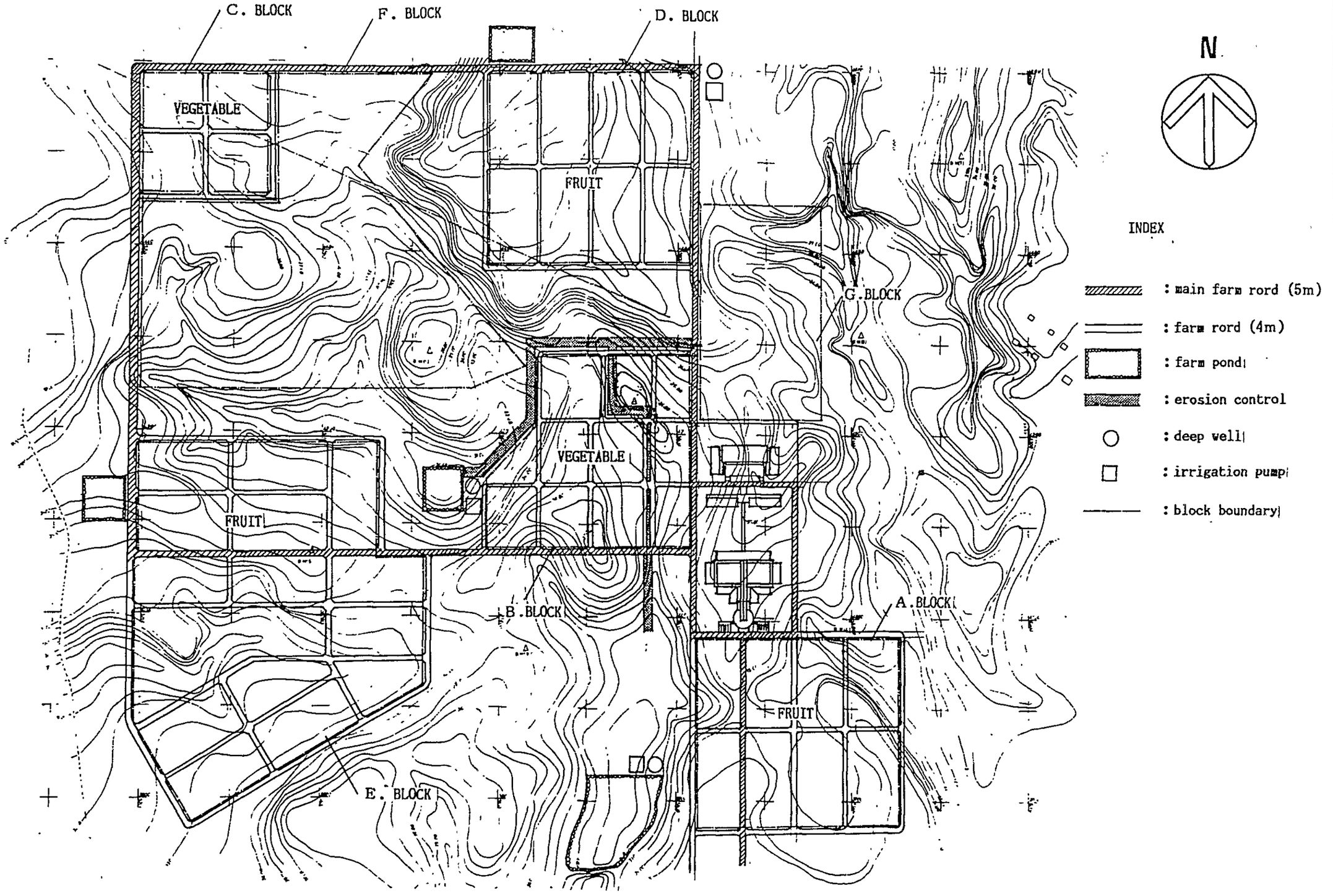
THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

EXTERNAL PLAN OF ELECTRICAL SERVICE (Electricity Supply / Telephone)

SCALE (meter) 0 16 40 80 160

09

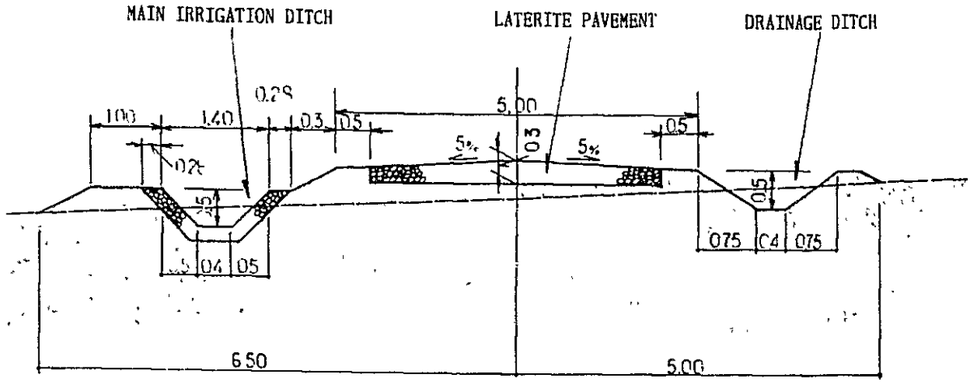
EXPERIMENTAL FIELD



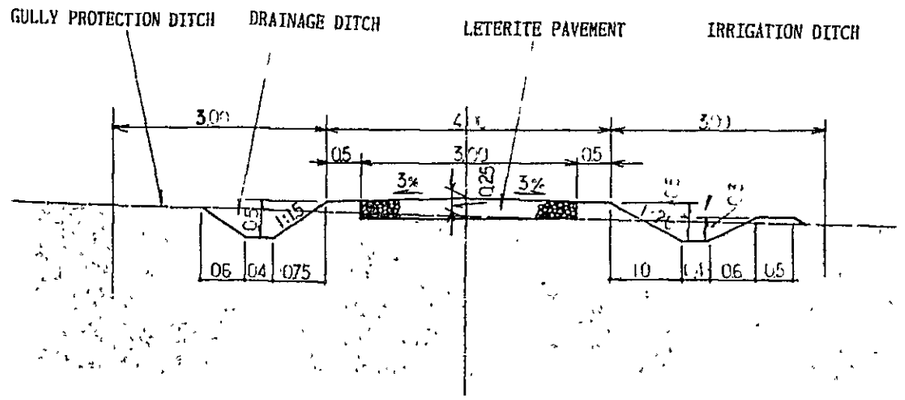
THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

Experimental Field

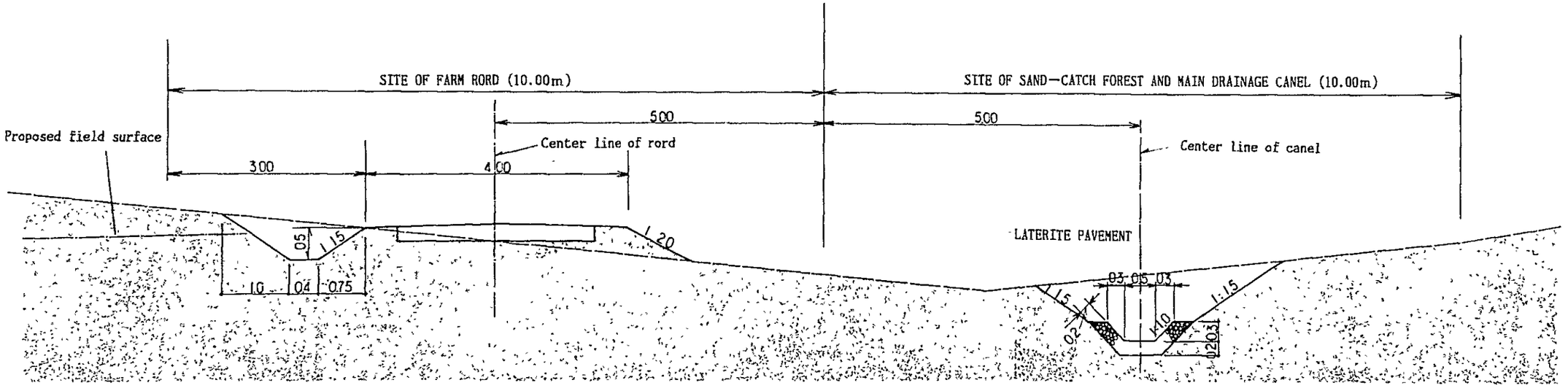
10



TYPICAL SECTION OF MAIN FARM RORD WITH IRRIGATION AND DRAINAGE DITCH
SCALE,1 : 80



TYPICAL SECTION OF FARM RORD WITH IRRIGATION AND DRAINAGE DITCH
SCALE,1 : 80



MAIN DRAINAGE CANEL AND SAND—CATCH FOREST SECTION
SCALE,1 : 65

THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

Section of Farm Road

11

EQUIPMENT LIST

PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
A. COMMON USE					
1. Biological microscope, research	A	1	1	5	7
2. Stereo microscope	A	1	1		2
3. Microscope, phasecontrast	A	1			1
4. Photomicropgraphic equipment, automatic	A	1			1
5. Biological microscope, fluoresence	B	1			1
6. Camera with accessories	A	2	1	5	8
7. Microtome	A	1			1
8. Paraffin spreading warmer	A	1			1
9. Paraffin embeding oven	A	1			1
10. Forced convection drying oven	A	4	1		5
11. Constant temp./humidity, chamber	A	2	1		3
12. Constant temp./water bath	A	1	1		2
13. Water bath, 4-opening	A	3			3
14. Water bath, 6-opening	A	1			1
15. Air compressor	A	3			3
16. Vacuum pump	A	3			3
17. Handy aspitator	A	2			2
18. Magnetic stirrer	A	4			4
19. Homogenizer	B	1			1
20. Wiley's pulverizer	A	1			1
21. Centrifuge	A	2			2
22. Water still	A	2			2
23. Ion exchange resin generator	A	1	1		2
24. Balance (double beam)	A	5	1	5	11
25. Balance (automatic top pan)	A	1	1		2
26. Balance (analytical, dinect reading)	A	2			2

PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
27. Electric calculator	A	5	2	5	12
28. Transformer (230v-100v)	A		1		1
29. Illuminometer, photoelectric cell	A	1	0		1
30. Freezer, quick	A	1			1
31. Ice maker	B	1			1
32. Refregerator	A	5	1		6
33. Balance table	A	2	0		2
34. Microscope table	A	5	0	0	5
35. Stop watch	A	2	1	5	8
36. Slide projector with screan	A	1	1		2
37. Overhead projector	A	1			1
38. Plain paper copier	A	2			2
39. Stencil duplicator	B	1	0		1
40. Electric typewriter (English)	A	1			1
41. Storage cabinet	A	4	1		5
42. Filling cabinet	A	5	1		6
43. Book cabinet	C	5	1		6
44. Locker	C	5	1		6
45. Filask heating mantle	A	2			2
46. Hot plate	A	5	1		6
47. Gas plant	A	5			5
48. Test tube mixer	A	1			1
49. Dry hangerstand	A	5	1		6
50. Lift had cart	A	1			1
51. Top board type cart	A	2			2
52. Specific gravitymeter set	A	1			1
53. Dissecting set	A	1	1		2
54. Laboratory tool kits	A	2	1		3
55. Impulse sealer	A	1			1
56. Illuminator (stereo microscope)	A	1	1		2

PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
57. Practice table	A	11	1	5	17
58. Side sink	A	6	1		7
59. Laboratory timer	A	4			4
60. Film development tool set	A	1			1
61. Video Projector	C	1			1
62. Video Camera	C	1			1
63. Color Video Tape	C	50			50
B. VEGETABLE & FRUIT RESEARCH					
1. Refractometer, Abbe	A	1	1		2
2. Hand refractometer	A	4	2	5	11
3. Leaf punch	A	4	2	10	16
4. Caliper	A	2	1	5	8
5. Planimeter for leaf	A	1	1		2
6. Fruit hardness tester	A	4	2	10	16
7. Pruning toll set (scissors, knife, saw)	A	10	5	25	40
8. Crossing instruments set	A	2	1		3
9. Fruit testing squeezer	A	2	1	5	8
10. Fruit juce acid tester	A	1	1		2
11. Germinator	A	2	1		3
12. Laboratory seed sorter	A	1			1
13. Seed motsture meter	A	1			1
14. Biological microscope, tissue culture	A	1			1
15. Mist generator set	A	1			1
16. Growth cabinet	A	2			2
17. Clean bench	A	1			1
18. Tissue culture incubator	A	1			1
19. Cold storage cabinet	A	1			1
20. Center table	A	5	1		6
21. Inverted microscope	A	1			1
22. Dissecting microscope	B	1			1

PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
23. Juce mixer	A	1	1		2
24. Drycabinet for glass wares	B	1			1
25. Dispenser with 2 spare needles	A	1			1
26. Daylight thermostats	A	1			1
27. Reciprocating shaker	A	1			1
C. SOIL & PLANT NUTRITION RESEARCH					
1. Boring stick, core type	A	1	1	5	7
2. Soil sampler with joint stick	A	1			2
3. Sampling tube set	A	10			10
4. Soil sieve set with shaker	A	1			1
5. Soil actual volumenometer	A	1			1
6. Exchange capacity detemination apparatus	A	1			1
7. Soil tension meter unit	A	2			2
8. Auger for tension meter	A	1			1
9. Soil hardness tester	A	1			1
10. Potable PH meter	A	2	1	5	8
11. Portable EC meter	A	1	1	2	4
12. Quick test kit	A	1	1		2
13. L-tube earth thermometer set	A	5	2	5	12
14. Soil moisture tester	A	1	1	5	7
15. Soil mixer	A	1			1
16. Soil sterilizer	A	1			1
17. Soil sampling trowel set	A	2	1	5	8
18. Plant nutrient test kit	A	1	1	5	7
19. Center table	A	2			2
20. Tintration table	A	1			1

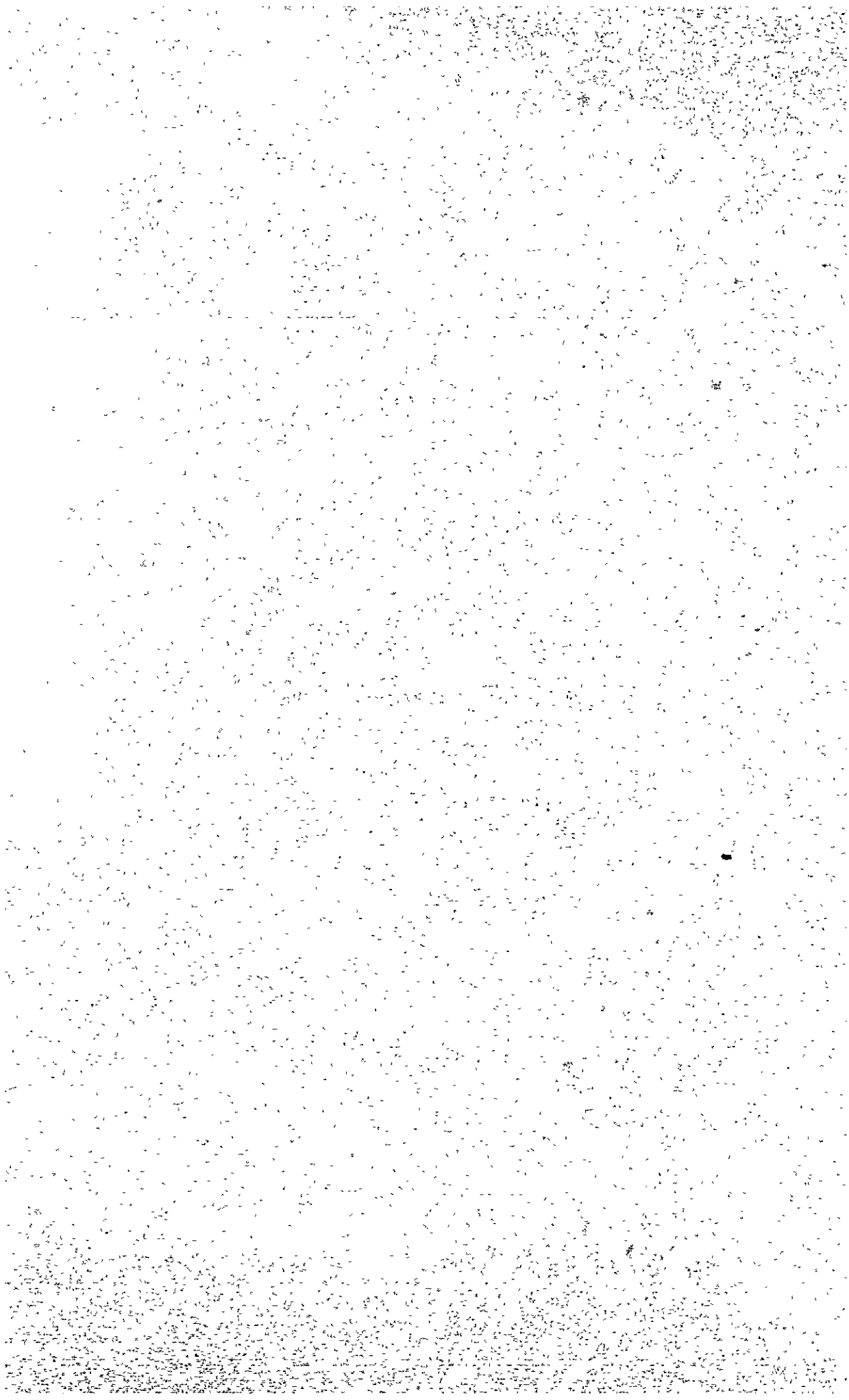
PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
D. PLANT PROTECTION RESEARCH					
1. Auto clave	A	2	1		3
2. Constant temp. shaker	B	1			1
3. Sterilizing instrument	A	2	1		3
4. Sterilizing lamp, UV.	A	4	2		6
5. Air cleaner	B	1			1
6. Aseptic box	A	1	1		2
7. Incubator, low temperature	A	1	1		2
8. Insect reaing incubator	A	1			1
9. Drycabinet for glass ware	B	1	1		2
10. Spore collector	A				
11. Suction catcher	A	2	1		3
12. Lupe	A	6	3	10	12
13. Handy tolly counter	A	2			2
14. Center table	A	2			2
E. ANALYSIS & MEASUREMENT					
1. Atomic absorption spectrophotometer	A	1			1
2. Flame photometer	A	1			1
3. Recording titrater	A	1			1
4. Dubasseq's colorimeter	A	1			1
5. Muffle furnace	A	1			1
6. Paper chromatography assembly	A	1			1
7. Gas chromatography assembly	B	1			1
8. PH meter with spare electrode	A	1			1
9. EC meter with spare electrode	A	1			1
10. Nitrogen digesting apparatus	A	1			1
11. Nitrogen distillation apparatus	A	1			1

PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
12. Center table	A	1			1
13. Rotary evaporator set	A	1			1
14. Stirrer	A	2			2
15. Fume hood	A	1			1
16. Extraction apparatus, soxhlet	A	2			2
F. FARM OPERATION					
1. Tractor (40ps) with	A	1	1		2
Disk plan	A	1	1		2
Bottom plan	A	1	1		2
Disk harrow	A	1	1		2
Rotary harrow	A	1	1		2
Ridger	A	1	1		2
Cultivater	A	1	1		2
Lime sower	A	1	1		2
Manure spreader	A	1	1		2
Dump trailer	A	1	1		2
Rotary cutter	A	1	1		2
Front loader	A	1	1		2
2. Power sprayer	A	1	1	5	7
3. Wheel backhoe	B	1			1
4. Power tiller (7-10ps) with	A	2	1	5	8
Ridger	A	2	1	5	8
Cultivater	A	2	1	5	8
Rotary mower	A	1	1	5	7
Trailer	A	2	1	5	8
5. Speed sprayer	A	1			1
6. Shoulder type sprayer	A	4	2	10	16
7. Hand mower	A	3	2	5	10
8. Tensionmeter	B	2			2
9. Duster	A	1	1	5	7
10. Scale (5,50,100kg)set	A	2	1	5	8
11. Measuring tape (steel, nylon 50m)	A	6	3	10	19
12. Nursery shed equipment unit	A	1	1		2
13. Water pump unit	A		1		1

PARTICULARS	PRIORITY	MAIN CENTER	SUB-CENTER	5-REF	TOTAL
G. METEOGOLOGICAL EQUIPMENT					
1. Hygrothermograph, weekly recording	A	5	1	5	11
2 Thermograph, dayly recording	A	1	1	5	7
3. Anemoscope & anemometer	A	1	1	5	7
4. Sunshine gauge	A	1	1	5	7
5. Rain gauge	A	1	1	5	7
6. Evaporation pan	A	1	1	5	7
7. Actinograph	A	1	1	5	7
8. Soil thermometer	A	1	1	5	7
9. Weather instrument screen	A	1	1	5	7
H. GLASS AND PLASTIC WARES				1 Lot	
I. LABORATORY IMPLEMENT				1 Lot	
J. NECESSITIES OF POT EXPERIMENT INCLUDING MATERIALS; AGRI-CHEMICALS AND FERTILIZERS				1 Lot	
K. CHEMICALS				1 Lot	
L. OTHERS					

	Item	Quantity
1.	Black Board	2
2.	Mobile Chalkboard	2
3.	Book Shelf	66
4.	Reading Table w/chair	4
5.	Card Case	2
6.	Meeting Table	26
7.	Meeting Chair	78
8.	Mini-Bus	1
9.	4WD Long-whell-base Mortorcar	2

CHAPTER 6
PROJECT EXECUTION SYSTEM



CHAPTER 6 PROJECT EXECUTION SYSTEM

6–1 AUTHORITY IN CHARGE OF EXECUTION OF THE PROJECT

This project will be operated by the Agriculture Corporation, which will be responsible for the execution of the project, under the supervision of the Ministry of Agriculture and Forests. The Agriculture Corporation will be the agent in charge of this project directly, and representing for the Government of Burma, so that it will be for the Japanese Government representing it in all matters regarding the project execution. The Agriculture Corporation through its construction committee staff will be in charge with receiving approval, in advance, from the following authorities and committees for all practical affairs regarding execution of this project. There are in addition the following bodies shall promote the works to be done by the Government of Burma. The Agriculture Corporation will be responsible for making the initial application to the committee and for making certain that the works shall be completed successfully.

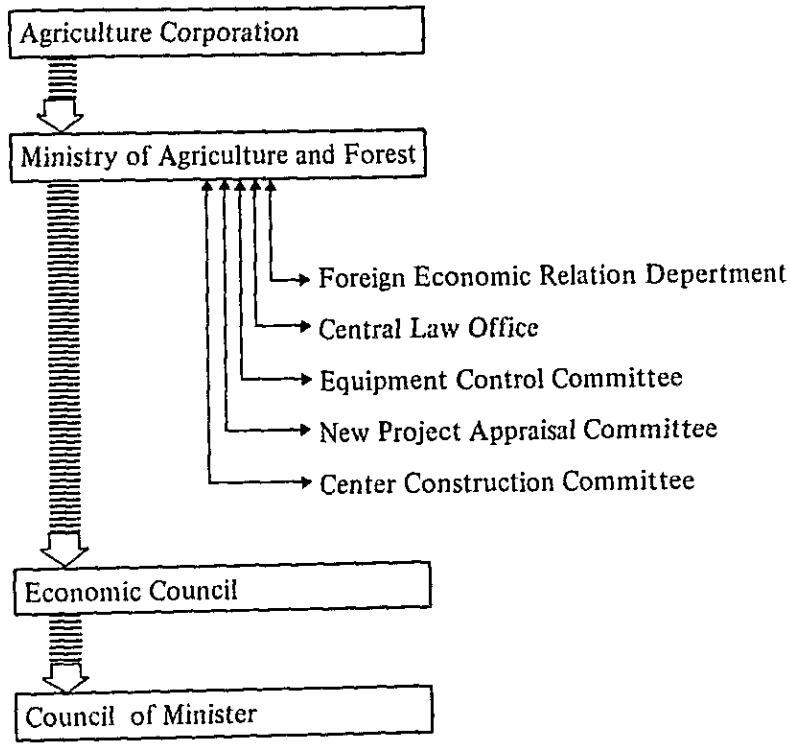


Fig. 38 Authorities Concerned and Committee

Construction Corporation

It shall promote the construction works in collaboration with a Japanese Contractor. In addition, it will also execute a part of the works to be done by the Government of Burma.

Irrigation Department

It will construct the experimental fields in collaboration with a Japanese Contractor. This department is especially engaged in farm construction works and possesses the machinery required for doing such works.

Electric Power Corporation

It will lead in an electric power line from the high votage line running along the Rangoon-Mandalay Road. Presently, they are facing to a shortage of construction materials e.g. wires, transformers, etc.

Post and Telecommunication Corporation

It will be in charge of installing the telephone lines.

Myanma Foreign Trade Bank

It will be a coordinating and corresponding bank with regard to the various services to be provided by the bank, such as Banking Arrangement and Authorization to Pay.

It is expected that the project will be implemented smoothly and appropriately, since the Agriculture Corporation has experience in completing a Japanese grant-aid project. They are well-informed of the necessary procedures for the grant-aid project.

6–2 CONSTRUCTION PROGRAM

6–2–1 Execution System

The project will come to implementation on the basis of the guide lines of the Japanese grant-aid project in 1984. According to the guide lines, after approval on the execution of the project by the grant-aid system, and the subsequent conclusion of the Exchange of Note (E/N) between the Government of Burma and the Government of Japan, the project will start officially. At the same time the Government of Burma enters into a contract with a domestic foreign exchange bank on authorization to pay regarding the execution of the project and also selects a Japanese Consultant for designing and supervising services. And then, the Government of Burma will make a contract with a Japanese Contractor by a public tender for carrying out the construction.

6–2–2 Construction Planning

The construction works must be completed by March 1986, based on the guide lines of the grant-aid project from Japan 1984. And the construction schedule must be made so that the construction works are completed on schedule without fail. In Burma, as stated before, the rainy season starts in May and runs until October. The great amount of rainwater will significantly affect the soil conditions and will disturb the progress of the works. Therefore, the schedule must be planned so that the earth works and foundation works are completed before the rainy season. Considering the total volume of construction works and the local capacity of labour and other conditions, the construction works should be started by the end of January 1985. And the earth works should be started as soon as possible. In other works, all necessary office works should be done completely by the end of January, 1985. Prior to the commencement of construction, site clearance and the construction of an access road of 2 km length must be completed, by the Government of Burma. Without this it is impossible to start the construction works. Therefore, above works should be carefully discussed and designed during the detail design period so that the date of commencement and the construction method of these works are decided not to interfere the main construction schedule.

In the construction schedule, following points should be considered for the determination of the periods for each phase of construction.

(1) Local climatic condition must be carefully observed to set the commencement date of construction.

(2) Duration of each work phase must be accurately comprehended based on the local work productivity mainly with the local construction methods.

(3) Material procurement plan in comformity with the construction progress must be assumed in consideration with the requested period.

The commencement date of the construction shall be set on the end of January, 1985 in order to achieve this project on schedule. Therefore it is significant to reduce the period for

miscelleneous formalities such as signing consultant agreement, tender and selecting contractor.

6–2–3 Supervising Schedule

Upon the start of the project, a consultant contract between the Agriculture Corporation and the Japanese consultant should be made on the basis of the guide lines of the Japanese grant-aid project. The consultant services may be classified in three stages: basic design, detail design and supervision. Among them, the specifications of supervision services are as follows:

a. Procedures for conclusion of the construction contract

The consultant will decide the form of tender. And then, the consultant will also prepare the tender documents including draft of construction contract, then a construction company will be nominated though tender. Then after attending the negotiations for the contruction contract, the consultant will examine the cost breakdown and also assist in setting the contents of the contract and concluding the contract.

b. Dispatch a resident engineer

After the commencement of the construction works, a supervising expert will be dispatched immedately. He is responsible for examination of the construction process, technical instruction on construction, making reports on progress of the works, and operation with office routine and so on.

c. Approval and inspection of shop drawings and materials

The consultant shall examine and approve the shop drawings, materials and equipment submitted by the contractor. A resident supervising expert shall perform this work keeping in touch with the experts dispatched by the consultant company in Japan.

d. Inspection

During the period of construction, inspection, approval and instruction should be carried out, whenever necessary, by experts properly dispatched from Japan.

e. Cooperation regarding office routine

As the work progressed, the consultant shall cooperate with the office routine such as making documents for payment, compliling basic data on customs clearance, making reports to the Government of Burma, etc. The consultant shall comfirm the completion of the construction and fulfillment of conditions of the construction contract. Also, the consultant shall have the resposibility for implementation the whole project and reporting of necessary affairs to Japanese authorities concerned.

6–3 SCOPE OF WORK

This project is not a Turn-Key-Project. The project is carried out by bilateral cooporation between the Government of Burma and the Government of Japan.

6–3–1 By Japan

a. Buildings

(1) main building
(2) experimental farm supervision building
(3) storehouse
(4) common building
(5) machinery room, corridor

b. Basic facilities for buildings

(1) water supply facilities (deep wells, water tanks, water towers)
(2) drainage facilities (rain, soiled water)
(3) electricity (wire for buildings, equipment furnished in the sub-station)
(4) telecommunication (cable installed in the buildings)
(5) lightning rod

c. Facilitirs alongside buildings

(1) paving of main roads and parking areas
(2) drainage alongside buildings
(3) installation of lights alongside of buildings

d. Experimental Field

(1) irrigation system (deep wells, irrigation ponds, sprinklers)
(2) drainage (drain ditches)
(3) farm roads
(4) field reclamation (top soil clearance, ground reformation)

Japanese responsibility in regard with the experimental field is to prepare it in a suitable scale and form for the each purpose so that the field can be immediately used as experimental field after completion of construction.

e. Equipment

(1) for research and farm in the Main Center
(2) for field experiment in the Sub-Center
(3) for field preparation in five (5) regional experimental farms
(4) consumption goods for the above-mentioned equipment

6–3–2 by Burma

a. provision of respective data and information required for the construction

b. provision of the site and site clearance

c. provision of data of boring test and water tests

d. construction of an access road (by the end of Jan. 1985)

e. installation of electric power to the site

f. installation of telephone cable

g. tax exemption of construction machinery and materials to be imported and customs clearance of them. Inland transportation is to be included as the resposibility of Japan.

h. exemption of Japanese nations concerned from customs duties, internal taxes and other fiscal levies which may be imposed in Burma.

i. budget arrangement and expenditure for maintenance of facilities and materials.

j. Other works

(1) Building Works

- Staff Quarters
- Labours' Quarters
- Laboratories for the Sub-Center and 5 Regional Experimental Farms
- Guest House
- Covered Way (Road)

(2) Outdoor Works

- Site preparation and landscaping
- Fencing and gate
- Sports field
- Outdoor lighting
- Exterior drainage

(3) Infrastructure Works

- Septic tank and sewer
- Water supply

(4) Furniture and Fixture

6–4 CONSTRUCTION SCHEDULE

The schedule of the project after conclusion of the Exchange of Note is as follows:

6–4–1 From Conclusion of E/N to Tenders

Shortly after conclusion of the E/N, the consultant contract shall be concluded between the Agriculture Corporation and the Japanese consultant. After that the consultant shall prepare detail drawings and tender documents, based on the basic design drawings, which should be approved by the Government of Burma, and start preparation of tenders. This will take approximately three months.

6–4–2 Tenders

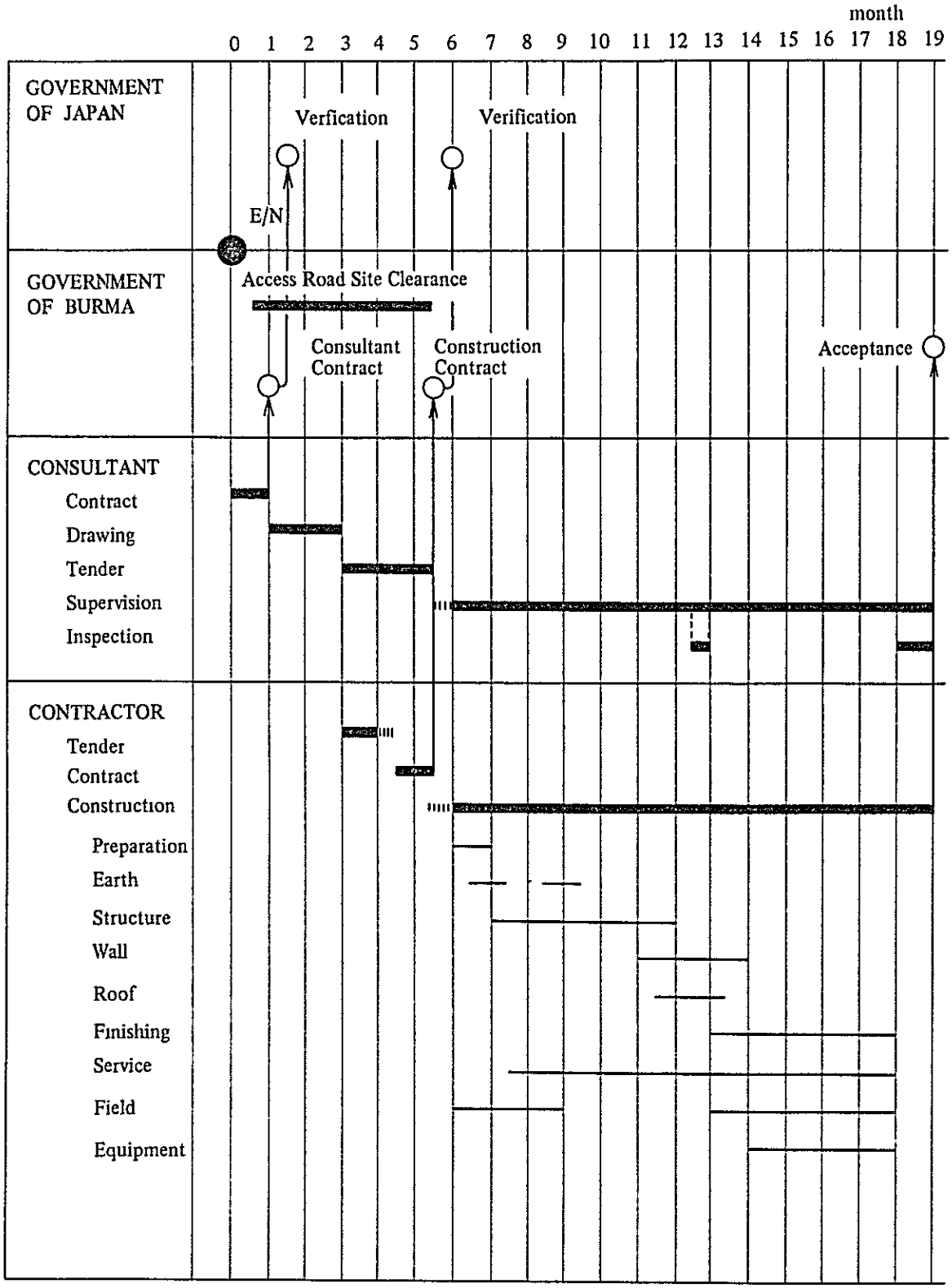
After the approval of the tender documents, the tender shall be officially announced in writing in Japan, and its procedures such as tender description, tender opening, estimation of the price, nomination of a contractor, conclusion of the construction contract and others, shall be completed in about two months.

6–4–3 Construction

The construction work shall be started immediately after the conclusion of the construction contract. With regard to the scale and scope of this project, the total construction period is assumed to be thirteen (13) months if construction commences three (3) months prior to the rainy season. Thus the project shall be completed by the end of March in 1986.

Accordingly, execution of this project shall require approximately eighteen (18) months from the conclusion of E/N to completion of the construction works.

Fig. 39 Construction Schedule



6–5 PROCUREMENT

Upon the compiling material procurement schedule, adoption of technology standard and material in comformity with the local construction situation is fundamental, however, it is necessary to assume that the procurement of materials both from Japan and the third countries is needed in view of cost and supply capacity of local material and equipment and the entire construction schedule. Procurement of the material and equipment in the third countries shall be determined thoroughly basing on performance of the material and equipment, cost and the means of transportation. Possible candidates are Singapore, Thailand and Malaysia.

Labor force supply is greatly depending on the Construction Corporation. But despatch of Japanese specialist is seemed necessary for five (5) to seven (7) construction firlds to secure job quality judged by the preceding work. Also the common workers can be easily collected so the construction schedule can include approximately two hundred (200) to three hundred (300) workers per day.

Outline for the procurement plan of the construction material are as follows:

A. Local procurement materials

(1) Cement and structure material
(2) Brick (machine made and hand made)
(3) Corrugated Asbestos Cement Board (roof material)
(4) Lumber – foundation and flooring block
(5) Glass – by 4 m/m
(6) Terrazzo Block

B. Materials and Equipment to be imported

(1) Steel bar and light weight steel
(2) Paint
(3) Aluminum frames, steel door
(4) Pipes (PVC pipe, steel pipe)
(5) Electrical installation material (lighting equipment, socket outlet, ceiling fan, cable and power transformer)
(6) Utility equipment (sanitary equipment, pump and air conditioner)
(7) Construction equipment
(8) Temporary facility material (generator, scafolding, tools and plywood plates)
(9) Experimentary equipment (experiment, farm)
(10) Farm maintenance equipment (sprinklers, pumps)

It is signifficant to judge accurately with the information regarding to the supply capacity on each material and required period and formalities from placing order to the arrival of the goods at the construction site, basing on the accurate observation of scheduled quantity and period in order to determin the time of placing procurement order. Since the construction period in this project is considerably short, procurement schedule must be accurately set in the fine detail. Thus any delay on the construction work due to the procurement imperfection shall be avoided in order to complete this project within the schedule.

6-6 MAINTENANCE AND ADMINISTRATIVE SCHEDULE

Maintenance and administrative expenses, operation expenses, and consumable expenses, etc. will be allocated from the budget of the Agriculture Corporation of the Government of Burma. However, although the annual budget of the Agriculture Corporation has been formed at about 1.7 billion kyats, the operation expenses for this facility have not been budgeted yet. The following is a rough estimate of the annual expenses for maintenance and administration for this project, based on the local survey and the reference data.

Overhead	756,000 kyats
Facility's Operational Utilities	330,000 "
Equipment and Material Consumables	300,000 "
Facility Maintenance Expenses	250,000 "
Miscellaneous	194,000 "
Total	1,830,000 kyats

(each figure will be changed in accordance with the actual budget.)

Estimate of the Power Consumable

The facility's operational utilities is composed of electricity, telephone, etc.. However, the estimate presented herein refers to the electricity charge being as it is the dominate factor of the utility expenses. The expenses for water can be excluded, since the facility will depend on the deep-tube well at the site as the water source.

(1) Quantity of Electricity Consumed (kWH)

Load Item	Load Capacity (kW)	Hours (h/day)	Days (day/M)	Demand Rate (%)	Power Consumable (kWH)
1. Socket Outlet (Including fan & Air-con.)	150	8	25	70	21,000
2. Power (Buildings)	18.5	3	25	100	1,387.5
3. Research Experiment	160	24 (25%) 8 (75%)	30 25	30 30	8,640 7,200
4. Deep-Tube Well Pumps (experimental fields)	41	24	30	65	19,188
5. Sprinkler Water Pumps (experimental field)	18.5	10	30	65	3,607.5
Total					61,023 kWH

(2) Electricity Charge

The following is the electricity charge rate in Burma:

Initial 500 kWH:	0.54 KV/kWH
Additional 500 kWH:	0.44 KV/kWH

Therefore the electricity charge for this facility will be:

Monthly Charge = 500 kWH x 0.54 KV + (61,023kWH – 500kWH) x 0.44KV
= 26,900 KV/month

Annual Charge = 26,900 KV/month x 12months = 322,800 KV/year

Hence the annual electricity charge will be 322,800 KV.

6–7 PROBLEMS

A. To complete the construction of the access road awarded by the Government of Burma by the end of January, 1985.

The construction site locates itself at the distance of approximately 2 kilometers from the Rangoon-Mandaly Road, amid the shrubbery and surrounded by rice paddy and rubber plantation, and this location unables any access by vehicles to the site.

Therefore, unless the access road connecting the distance of some 2 kilometers between the site and the Rangoon-Mandalay Road is constructed by the Government of Burma, commencement of the construction works of the Main Center is impossible and even tender itself cannot be carried out as of now. This is a very important factor in determing whether or not the project should be executed. However, the following were clarified as to the construction of the access road.

a. Considering the location of the site, it is necessary to negotiate with the local farmers in order to gain a sufficient area of land on which an access road can be constructed.

b. Considering the height of the Rangoon-Mandalay Road and the water level of the paddy fields in the rainy season, the access road should be at least 2.5–3.0 m higher than the present surface of the paddy fields. Its construction is not technically easy.

c. Starting construction of the access road is not approved before the budget bill for the project passes, which comes after conclusion of the E/N.

The construction period of the access road will be overwhelmingly short if it starts after the approval for the budget bill. These problems must be solved before conclusion of the E/N in order to start construction of the main center as scheduled.

B. To shorten the time required for obtaining approvals prior to concluding the execution contract.

In order to complete this project within the designated dead-line, it is required to complete the foundation work within the three (3) months before the rainy season. In other words, to commence the project by the end of January, 1985 by shortening the time required for the processes necessitated during the period from the conclusion of the E/N onto the commencement of the construction works, is essential. The major approvals to be obtained during this period as follow:

(1) consultant contract
(2) approval of basic design drawing
(3) approval of tender documents and its procedure
(4) construction contract

CHAPTER 7
PROJECT EVALUATION

CHAPTER 7 PROJECT EVALUATION

7–1 SOCIAL AND ECONOMIC EVALUATION

Burma is fundamentally an agricultural country where agriculture plays an important role as the basis for the economy of Burma. As can also be seen in its economic development projects, the economy of Burma is not greatly inclined to industrialization. Rather, it is implementing a balanced development policy with a long-range goal to shift to an industrialized country with agricultural basis, in which the policy is motivated by the increase of agricultural production. Under such circumstances, rice, which has the largest share in its export, and other agricultural products such as pules, sugar cane, wheat, and maize are satisfactorily increasing in production. However, these agricultural products are influenced by the decline in international commodity prices. Therefore, there is a need for not only a production increase policy, but a new policy which takes into consideration the future stable growth of economy of Burma.

With the above given situation and with the climate and geographic conditions of Burma, this project which focuses on the vegetable and fruit research and development is being set forth as a means for deversifying the agricultural production. The following are the goals of the project.

(1) Collection and selection of qualified plants, research and development of cultivation and management method with regard to these plants.

(2) Investigation of actual conditions of damage by disease and noxious insects, research and development of plant protection.

(3) Spreading of the above technology in qualified areas, and increasing the vegetable and fruit production.

(4) Promotion of domestic demand through the production increase of vegetables and fruits to stimulate the economic activities of the farmers.

(5) Promotion of vegetable and fruit export to acquire foreign currencies.

When the above goals of the project are reached, the following social and economic effects may be expected.

(1) Diversification of agricultural products and increasing production would increase the consumption of each individual. Furthermore, the consumption of fruits and vegetables would raise the people's health level.

(2) The vegetable and fruit market which at present is totally dependent on local consumption would grow with the improvement of the domestic distribution system. This would stimulate the farmers' economic activities, providing them with chances to earn cash income.

(3) Stimulation of the farmers' economic activities through the production of vegetables and fruits would contribute to the development of the rural area which do not have sufficient means of cash income. Therefore, it would help to abolish earning differentials between rural and urban areas.

(4) Exporting surplus products would promote acquisition of foreign currencies.

(5) Possibilities for agricultural diversification and modernization would be increased by implementing food processing technology to merchandize the vegetables and fruits.

In this way, research and development of vegetables and fruits would be very influential and beneficial. Since there has been only limited research and development of vegatables and fruits in Burma thus far, the realization of this project at the earliest convenience is highly recommended.

7–2 EXPERTISE EVALUATION

Vegetable and fruit research and development in Burma today is at a level in which the researchers of a few regional experimental farms only breed and grow the plants and seedling. Under such circumstances, this project has been planned to establish the first organized research institution in Burma for the purposes of researching and developing vegetables and fruits. The institution is to be equipped with various basic experimental facilities along with experimental fields. The research and development personnel of this institution is now planned to be chosen from the graduates of various educational institutions in Burma, from among those who had studied abroad, or from among those who now belong to the Extension Division of the Agriculture Corporation. However, they have not been exposed to an institution which possess highly technical equipment. Therefore, it may be presumed that technical cooperation arranged by the Government of Japan would be effective at the beginning to help direct the course of research and development.

In this way, the establishment of this institution would also be an establishment of the system of vegetable and fruit research and development which has not existed before in Burma. It would also be significant from the view of research and development of technology in this field, and of training the researchers. As for the accomplishment of the researches, a system is planned in such way that the accomplishments and results of the researches should be well conveyed to the farmers in all districts in Burma through the neighboring CADTC by its trainees who number 800 each year, and this would enable conveyance of the relevant results from research and development. Therefore, the results of the research are to be definitely diffused as far as the local and district level. It would directly contribute to the diversification and the production increase of the agricultural products in Burma. As a result, this project can be evaluated as an effective project.

7–3 FINANCIAL EVALUATION

7–3–1 organization expenses

The scope of the works of the Government of Burma is as mentioned before. The total expenses necessary are approximately 19,100,000 kyats. These expenses are to be appropriated in the budget of the fiscal year of the Agriculture Corporation which is responsible for this project so that the scope of the work to be done by the Government of Burma will be executed. However, these expenses have not been budgeted yet. The budget will be formed when this project is officially agreed upon when the "Exchange of Note" is signed between the Government of Burma and the Government of Japan. Since this project is an important project which was determined at the Cabinet Meeting in Burma, and since the organization expenses would be only a small share in the annual budget of approximately 1,700 million kyats of the Agriculture Corporation, the budgeting should be no problem.

However, it is necessary to note that the construction of an access road is included in the scope of the works of the Government of Burma. It is absolutely necessary to finish construction by end of January of 1985 in order to accomplish this project. If the budgeting of this construction work is to be done after the Exchange of Note and if the necessary office procedure for this work in the Government of Burma takes an excess of time, the completion of the access road might be delayed. In order to avoid such a situation it may be necessary to take a special measure such as taking the expenses for the construction of the access road out of this year's budget. Other works which need to be budgeted immediately are the land clearance of the site and the electric power supply works.

7–3–2 Working expenses

The design for this institution has been prepared with a view to reduction of working expenses. For instance, the use of local materials will facilitate maintenance and management, and also, the employment of a design which adapts to the natural environment will reduce the light and fuel expenses. The consumption materials for the experiment and research equipment are supplied on the assumption that they will be immediately used.

While the annual expenses for maintenance and management after the completion of the construction, are calculated to total approximately 1,830,000 kyats, as has been previously mentioned, the annual working expenses of the institution have not yet been determined. The working expenses are to be budgeted from the annual budgetary allocation of the Agriculture Corporation of 1,700 million kyats. Judging from the size of the budget, the allocation for this institution also from the annual budget of the Agriculture Corporation is concluded to be feasible.

7–4 ADMINISTRATIVE EVALUATION

This institution is administrated at the same level as the other ten (10) projects (e.g. CADTC, Plant Protection Project, etc.) under the control of the General Manager of the Agriculture Corporation. Since this institution is ranked highly within the Agriculture Corporation, it can be assumed that the Government of Burma is expecting much from this project.

The institution consists of six (6) sections: four (4) research sections, experimental field section, and administration section. A Sub-Center along with five (5) Regional Experimental Farms are attached to this institution. This organization of the institution corresponds with the function of this project. In relation to the other divisions of the Agriculture Corporation, too, the organization and ranking could be evaluated as appropriate.

It is planned that the personnel of this institution will be chosen mainly from the personnel of the Agriculture Corporation. The researchers and the staff members will be chosen from the graduates of universities and junior colleges in Burma, the researchers who have studied abroad, and the experienced staff of the Agriculture Corporation. Although they have not had the opportunity to do full-scale experimental research in this field before, most of them have studied at research institutions and are deeply interested in the research and development works. Therefore, there should be no obstacle in carrying out the research. The number of people of this institution is to be 80 at the Main Center, 25 at the Sub-Center, and 50 at the five regional experimental farms (10 workers per farm). These numbers could be evaluated as appropriate for the management of this institution. The personnel expenses of the first fiscal year are estimated to be 756,000 kyats.

CHAPTER 8
CONCLUSION

CHAPTER 8 CONCLUSION

8–1 CONCLUSION

Judging from the request by the Government of Burma, the result of the Basic Design Study, and subsequent analysis in Japan, it can be concluded that the society of Burma will derive great benefit from this project. Therefore, the demand for the implementation of this project is significant.

The scope of the research and the contents of equipment and facilities proposed in this report should be regarded as fully appropriate and effective, considering the status quo regarding production and research, the degree of its necessity, and the present number of researchers. It can also be concluded that the projected site is suitable for the proposed facilities in terms of the site area, configuration, soil conditions and the suitability of the surrounding area.

Therefore, when this project is carried out under the grant-aid from the Government of Japan, it will be very rewarding and will contribute to social development, economic progress and the creation of experts in the agricultural field of Burma.

8–2 SUGGESTIONS

For smooth implementation of this project and subsequent effective use of the facilities, the following are to be suggested:

8–2–1 Suggestions concerning the smooth implementation of the construction works

(1) Cooperation to expedite permission to proceed on each stage of the project

The time necessary for the various permission procedures on each stage of the project should be minimezed for smooth implementation of the project. Expedition of permission procedures prior to commencement of construction is very important. It is not too much to say that the suceess of this project is totally dependent on efficient processing of these permission procedures during the initial stage of the project.

(2) Smooth implementation of the works that is to be done by the Government of Burma

The works to be done by the Government of Burma should be finished within the time required by the construction schedule. It is especially necessary by any means that the access road leading to the site should be completed before the construction contract is signed. Any vehicles would not be able to enter the site and the construction work could not be started unless the access road is completed. Due to the limited construction period, the completion of the access road before the commencement of the construction work is an indispensable condition of the project.

(3) Cooperation to complete the construction on schedule

Efficient cooperation from the Government of Burma, during the construction period, is necessary in order to expedite the construction on schedule. This includes; negotiations with authorities concerned other than the Agriculture Corporation, procurement of construction materials, arrangement for smooth customs clearance and related transportation, and necessary arrangements for Japanese nations concerned.

8–2–2 Suggestions concerning vegetable and fruit research and development in Burma

(1) The scope of research subjects and varieties of vegetables and fruits to be studied.

It has been concluded that it is very difficult to carry out all of the research items proposed by the Government of Burma in this project.

The reasons for this conclusion are as follows:

a. The items required by the Government of Burma cover a great number of research subjects.

b. This facility is the first institute of its kind in Burma.

c. The present level of research is in the primary stage.

Therefore, the research subjects which directly improve the present production of vegetables and fruits in Burma are selected. Further research subjects should be gradually added and expanded corresponding with the progress of the research. Selection of research subjects to be added should be based on the proposed research subjects.

Regarding specifically the variety of vegetables and fruits to be studied, it may be concluded that the same method should be applied as is used for the selection of research subjects; the scope of the variety should not be too broad but should be limited within necessary and appropriate areas.

(2) Staffing of researchers

The number of the researchers in this project is less than one third of that proposed by Burma. The reasons for this are that the research should be started from most important subjects in the field at the present situation, and that through this stage, the quality and quantity of the researchers should be improved to enable to introduce higher level research methods.

The number of researchers has been decided upon according to the present manpower in this research field and the research subjects to be done at present by Burma. The number of researchers should be increased, along with the enlargement of the research field, in accordance with the progress of the fundamental or important research.

(3) Improvement of sub-center and regional experimental farms

Information on the Sub-Center and five Regional Experimental Farms, where research equipment is planned to be supplied, was obtained from the drawings and on-the -spot inspection. According to the information, the research activity in these farms is mainly at the stage of plantation management and breeding and growing. Moreover, they are insufficiently equipped with research equipment, experimental fields and buildings. In particular, the electricity is not available in most of the farms. Therefore, it is of urgent necessity to improve the quality of the experimental fields with equipment to be supplied in this project. It will be suggested that the Sub-Center and five (5) Regional Experimental Farms should fulfill the function of experimental farms for the application of the research results from the Main Center, and also as the regional core for the diffusion of the results.

(4) Establishment of a research system which can cope with future expansion

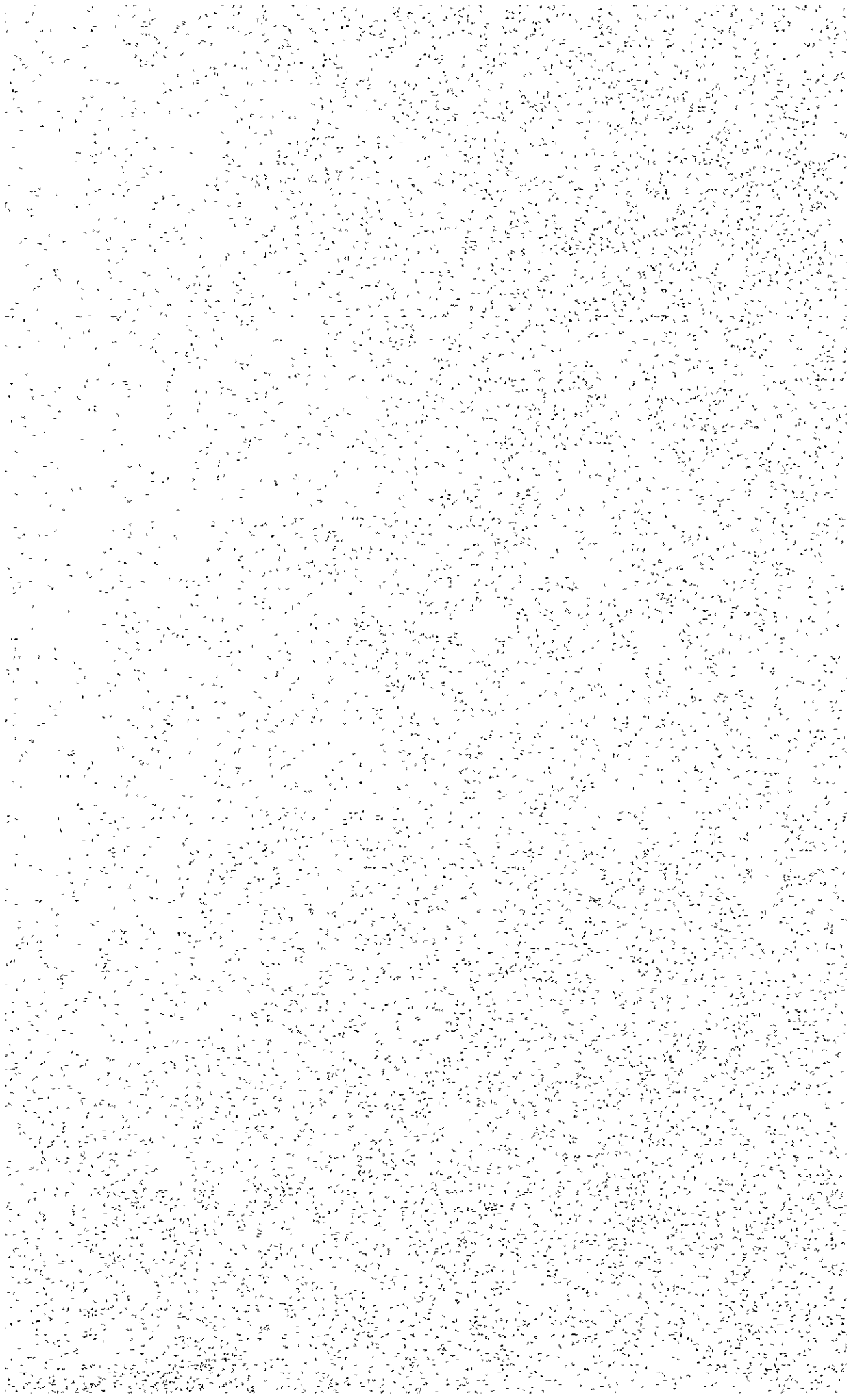
The society of Burma will profit enormously once the results of the research on vegetables and fruits are applied to the agricultural field in Burma. Their production will increase and they will be consumed in and out of the country in both processed and unprocessed forms. It can be predicted with high probability that the farmer's income will increase and more foreign currency will be obtained. It can also be expected that these favorable results of the project will prove to have a continuing influence. Reconfirming the aims of this project and its future prospects as its blue-print, and hence, anticipating the social needs of the con-

veyance and application of the research results, it is necessary to establish a research system which is able to accommodate the expanding scope in the future.

8–2–3 Development towards technological cooperation

The Vegetable and Fruit Research and Development Center is the first research institute in Burma exclusively of vegetables and fruits, therefore, the researchers who will join to this project are not necessarily well experienced in this field. We believe that, in order to effectively execute research covering on area which ranges from the basic research of vegetables and fruits to the establishment of conveyable technologies and to make the grant-aid most fruitful, the technical cooperation of Japan is necessary.

APPENDIX I



1. MEMBERS OF THE STUDY TEAM

1–1 Basic Design Study Team (April 1 ∿ April 21, 1984)

Team Leader	Dr. Isao IWAGAKI	Research Horticulturist, Okitsu Branch, Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries
Specialist	Dr. Takehiro NAKASHIMA	Research Horticulturist, Vegetable and Ornamental Crops Research Station, Ministry of Agriculture, Forestry and Fisheries
Project Coordinator	Mr. Mikio NAKAMURA	Deputy Chief, Basic Design Division, Grant Aid Department, Japan International Cooperation Agency (JICA)
Project Architect	Mr. Kanji SHIBATA	Director, Chief Architect, Yamashita Architects & Engineers, Inc.
Architect	Mr. Takanori TANAKA	Architect, Yamashita Architects & Engineers, Inc.
Specialist (Equipment)	Mr. Norio KOIWA	Agrominist, Sanyu Consultants Inc.
Specialist	Mr. Hideo HIRATSUKA	Councilor, Sanyu Consultants Inc.

1–2 Basic Design Study Team

(Explanation of Draft Final Report, July 6 ∿ July 15, 1984)

Team Leader	Dr. Isao IWAGAKI	Research Horticulturist, Okitsu Branch, Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries
Project Coordinator	Mr. Tatsuo SUZUKI	Grant Aid Department, Japan International Cooperation Agency
Project Architect	Mr. Kanji SHIBATA	Director, Chief Architect, Yamashita Architects & Engineers, Inc.
Architect	Mr. Takanori TANAKA	Architect, Yamashita Architects & Engineers, Inc.

2. SURVEY SCHEDULE

2–1 Survey Schedule (Apr. 1 ∿ Apr. 21, 1984)

Date	Details of Study
1st day April 1 (Sun)	Lv. Narita (TG 601)
2nd 2 (Mon)	Ar. at Rangoon via Bangkok (TG 305) Study Schedule Meeting
3rd 3 (Tue)	Courtesy Call on the Japanese Embassy Discussion with the Agriculture Corporation Explanation of Inseption Report
4th 4 (Wed)	Investigation of the Project site Visit the Central Agriculture Development Training Center Discussion with the Construction Corporation (Q & A)
5th 5 (Thu)	Discussion with the Agriculture Corporation Survey of general construction conditions in the city
6th 6 (Fri)	Report of mid-survey result to the Japanese Embassy Discussion with the Agriculture Corporation Received the answer to the questionnaire
7th 7 (Sat)	Data collection and adjustment Survey of a city construction site
8th 8 (Sun)	Dr. Iwagaki Dr. Nakashima Mr. Nakamura arrived at Rangoon Discussion with the Team Members (Mr. Motosugi, First Secretary, Mr. Takashima, member of JICA joined the discussion)
9th 9 (Mon)	Discussion with the head office of the Agriculture Corporation
10th 10 (Tue)	Discussion with the Agriculture Corporation on Minutes of Discussion Discussion with the team members
11th 11 (Wed)	Joint session with related organizations Discussion with Rangoon Industry University (about the Site Map)

Data		Details of Study
12th day April	12 (Thu)	Survey of Mandalay Experimental Farm Survey of the project site Discussion with the Construction Corporation (about construction unit prices)
13th	13 (Fri)	Survey of Maymyo Sub-Center Data collection and adjustment (Completed the drawing of the Site Location)
14th	14 (Sat)	Survey of the surroundings of the Maymyo Experimental Farm Discussion with the team members (about the Site Plan)
15th	15 (Sun)	Discussion with the team members (about the Equipment Plan) Survey of a city construction site
16th	16 (Mon)	Report of mid-survey result to the Japanese Embassy (to Mr. Motosugi) Data collection and adjustment
17th	17 (Tue)	Exchange signature on the Minutes of Discussion (Dr. Iwagaki, Dr. Nakashima, Mr. Nakamura Lv. Rangoon for Japan)
18th	18 (Wed)	Discussion with the Agriculture Corporation (about the project schedule) Joint session with the related organization and re-investigation of the project site
19th	19 (Thu)	Survey of the project site with the Construction Corporation Discussion with the Agriculture Corporation (Received the Site Map)
20th	20 (Fri)	Farewell Call to the Agriculture Corporation, the Japanese Embassy, JICA Office Lv. Rangoon (UB 221)
21th	21 (Sat)	Ar. at Tokyo via Bangkok (JAL 466)

2–2 Survey Schedule (July 6 ∿ July 15)

Date			Survey Schedule
1st day	July	6 (Fri)	Lv. Narita (TG 741)
2nd	"	7 (Sat)	Ar. at Rangoon via Bangkok (TG 305) Schedule Meeting
3rd	"	8 (Sun)	Investigation of the project site Discussion with the Team Members.
4th	"	9 (Mon)	Courtesy Call on the Japanese Embassy and JICA Discussion with the Agriculture Corporation (about Draft Final Report)
5th	"	10 (Tue)	Discussion with the Agriculture Corporation (explanation of Draft Final Report, acquisition of Soil Data)
6th	"	11 (Wed)	Joint Session with related organizations (approval on the Draft Final Report)
7th	"	12 (Thu)	(National Holiday)
8th	"	13 (Fri)	Exchange signature on the Minutes of Discussion Discussion with Construction Corporation and with Electric Power Corporation
9th	"	14 (Sat)	Lv. Rangoon (TG 306)
10th	"	15 (Sun)	Ar. at Tokyo via Bangkok (TG 740)

3. MEMBERS OF THE COUNTERPARTS

AGRICULTURE CORPORATION

1.	U Khin Win	Managing Director	
2.	U Hla Myint Oo	General Manager	(Planning Division)
3.	U Tin Hlaing	General Manager	(Extension Division)
4.	U Soe Myint	Deputy G/M	(do)
5.	U Kyin	Deputy G/M	(do)
6.	U Aye Kyaw	Deputy G/M	(Accounts Division)
7.	U Sein Hla Bo	Asstt. G/M	(Extension Division)
8.	U Htay Aung	Junior Officer	(do)
9.	Daw Hla Kay Khyine	Desk Officer	(Planning Division)
10.	kaw Nu Nu San	Desk Officer	(do)

CONSTRUCTION CORPORATION

1.	U Win Kyu	Staff Officer I	(Design)
2.	U Shwe Win	Staff Officer II	(Design)
3.	U Tin Aung	Staff Officer II	(Architect)
4.	U Nawe Tun	Staff Officer I	(Water Supply)
5.	U San Tin	Staff Officer II	(Electrical Work)
6.	U Shwe Tun Mg	Staff Officer II	(Soil Testing)

MINISTRY OF AGRICULTURE AND FORESTS

1.	U Hia Moe	Director	(Planning Division)

CENTRAL LAW OFFICE

1.	U Tun Naing	Law Officer I

FOREIGN ECONOMIC RELATIONS DEPARTMENT

1.	U Than Myint	Office-in-charge

MYAMA FOREIGN TRADE BANK

1.	U Tin Mg Aye	Manager

ELECTRIC POWER CORPORATION

1.	U Kyu Sein	Junior Officer

POST AND TELECOMMUNICATION CORPORATION

1.	U Tin Tun	Engineer II

SUB–CENTER (MAYMYO), REGIONAL EXPERIMENTAL FARM

1.	U Than Myint	Deputy Division Manager
2.	U Kyaw Than	Farm Manager, Maymyo Farms
3.	U San Hla Baw	Farm Manager, Maymyo Sericulture Farm
4.	U Myint Than	Deputy F/M, Madaya Farm
5.	U Myo Win	Deputy F/M, Dokwin Farm
6.	U Hla Maung	Township Manager, Maymyo
7.	U Maung Aung	Deputy F/M, Maymyo
8.	U Su	Adviser

4. MINUTES OF DISCUSSION

4--1 *Minutes of Discussion 1*

MINUTES OF DISCUSSION

ON

THE VEGETABLE AND FRUIT

RESEARCH AND DEVELOPMENT PROJECT

IN

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

APRIL, 1984

Minutes of Discussion

on

the Vegetable and Fruit Research and Development Project

in

the Socialist Republic of the Union of Burma

In response to the request made by the Government of the Socialist Republic of the Union of Burma (GOB) for the Grant Aid Assistance for the Vegetable and Fruit Research and Development Project (hereinafter referred to as "the Project"), the Government of Japan (GOJ) has sent a Mission through the Japan International Co-operation Agency (JICA), headed by Dr. Isao Iwagaki (Research Horticulturist, Fruit Tree Research Station, Ministry of Agriculture, Forestry and Fisheries) to conduct basic design study on the Project from April 1st of 1984.

The Mission visited the Project site and held a series of discussions with the Agriculture Corporation (AC) and other officials concerned of the authorities of GOB related to the Project.

As a result of the field survey and discussions both parties have agreed to recommend to their respective Governments and authorities concerned to examine the major points of understanding reached between them as attached herewith towards the realization of the Project.

April 30th. 1984
Rangoon

(KHIN [illegible])
Managing Director
Agriculture Corporation

(ISAO IWAGAKI)
Leader
Basic Design Study Team

Major Points of Understanding

I. Outline of the Project

1. The Objective of the Project is to undertake research and improve vegetables and fruits by establishing the Vegetable and Fruit Research and Development Center (hereinafter referred to as " the VFRDC ") and experimental farms, and to contribute to horticultural development through extension of improved and advanced technology.

2. To achieve the above objective, the VFRDC will play a role as the Main Center of the Project mainly for the research activities in Breeding, Cultivation and Management, Soil and Nutrition and Plant Protection, together with the Sub-Center in Maymyo and five Regional Experimental Farms (REF) in Shan State, Chin State, Mandalay Division, Irrawaddy Division and Mon State.

3. The Project will be established under the direct control of the Managing Director of the AC and staffed by about 155 personnel mainly recruited from the AC itself.

The proposed organization chart of the Project is attached in ANNEX I.

II. Project Site

The proposed site of the VFRDC located at Hlegu Township of Rangoon Division which is approximately 100 hectares of land area, will be acquired by AC.

The site plan for VFRDC is attached in ANNEX II and the map showing the location of VFRDC, Sub-Center and REFs is attached in ANNEX III.

III. Executing Agency

The AC will be the executing agency for the Project responsible for the implementation of the preparatory works and construction works of the VFRDC. The AC will establish a Project Management Office in the Extension Division of AC Headquarters and Liaison Office at the Project site and appoint a well qualified project manager and adequate staff for the proper implementation of the Project, from the beginning of the construction works of the VFRDC.

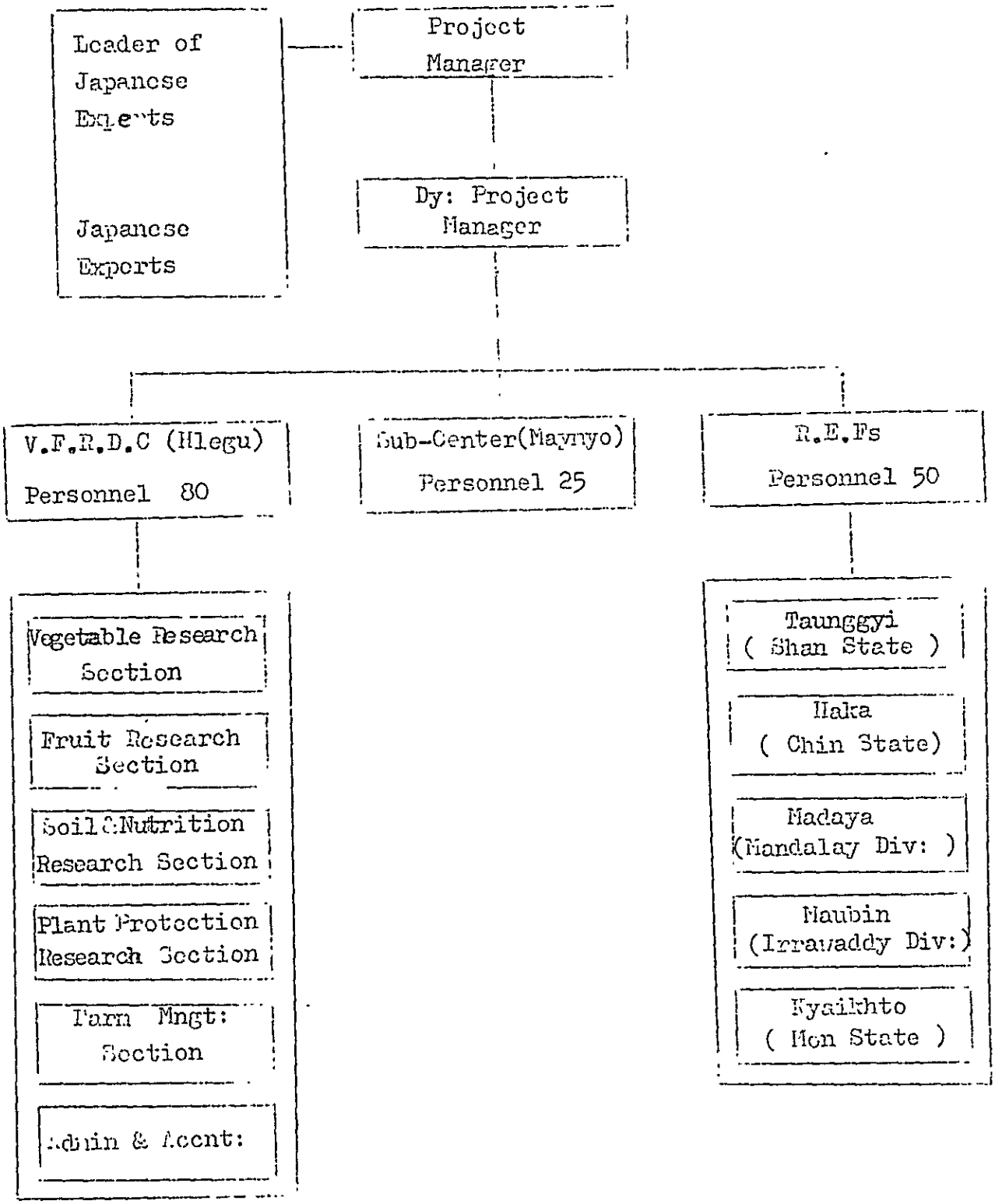
IV. GOJ's Contribution Requested

The Mission will convey the desire of the GOB to the GOJ that the latter will take necessary measures to co-operate in implementing the Project and will provide the building and other items as listed in ANNEX IV within the scope of Japanese economic cooperation in grant form.

V. GOB's Contribution

The Mission explained the system of the Japanese Grant Aid including the use of Japanese consultant and contractor, and Burmese side understood it and GOB will take necessary measures as listed in ANNEX V on condition that the Grant Aid Assistance would be extended to the Project.

Proposed Organization Chart of the Project

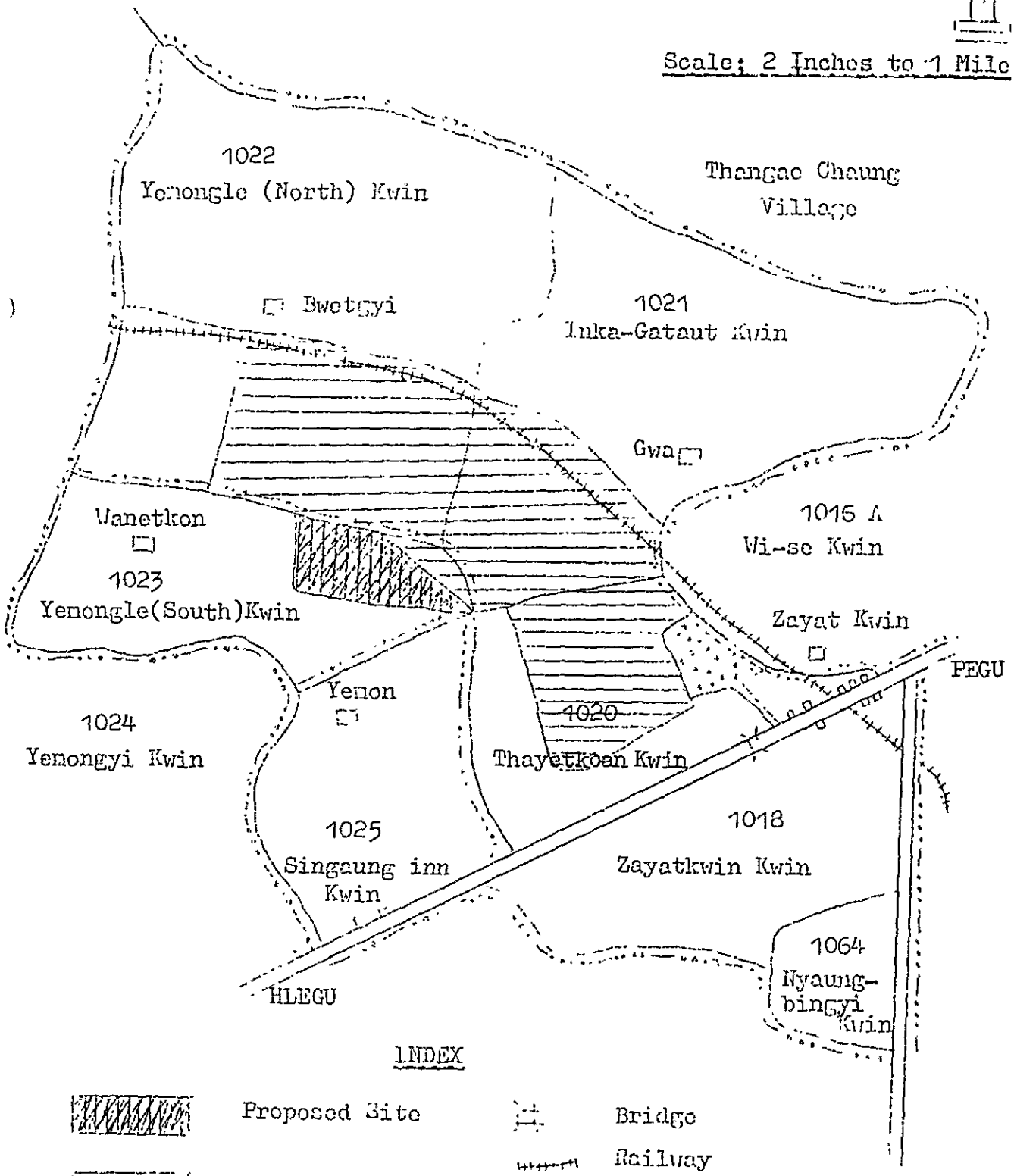


ANNEX II

Proposed Site Plan for VFRDC

(Hlegu Township, Rangoon Division)

Scale: 2 Inches to 1 Mile

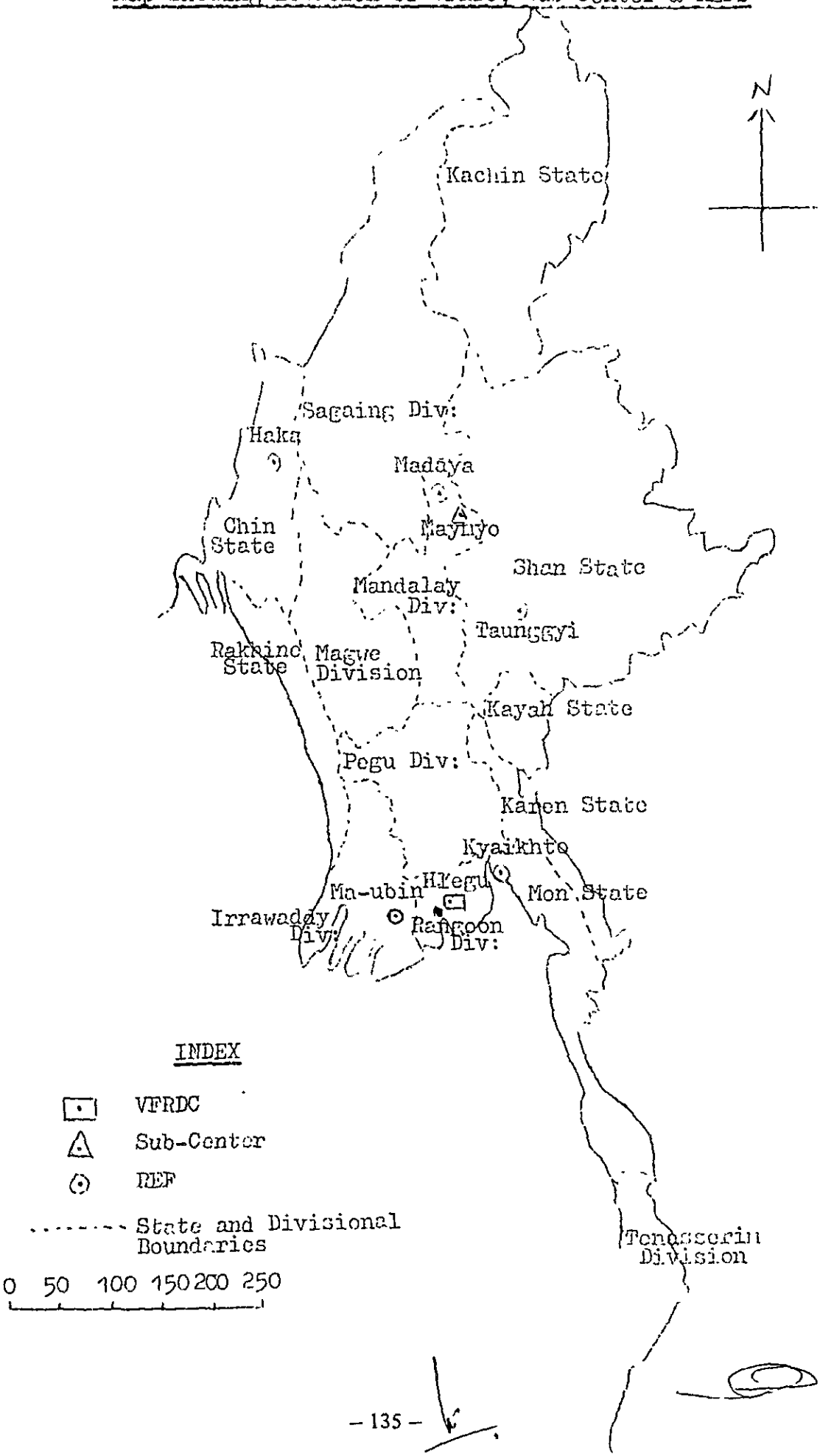


INDEX

- Proposed Site
- CADTC
- Rubber Plantation Estate
- Bridge
- Railway
- Road
- Boundary of Kwins
- Boundary of Villages
- Village

ANNEX III

Map showing location of VFRDC, Sub-Center & REFs



Items requested by the GOB the cost of which will be borneby the GOJ, are as follows:

1. Buildings (Main Center)

   a. Main Building

      Vegetable Research Laboratory

      Fruit Research Laboratory

      Soil and Nutrition Research Laboratory

      Plant Protection Research Laboratory

      Administration Room, etc.

   b. Experimental Farm Supervising Building

   c. Store House (Storage, preparation, examination etc.)

   d. Glass House, Net House, Shade House etc.

2. Experimental Farm (Main Center)

   41 hactares(Vegetable - 6 ha, Fruit - 35 ha) with irrigation facilities and soil improvement in necessary plot.

3. Equipments

   Necessary equipments and materials for the research activities in the Main Center, Sub-Center and 5 Regional Experimental Farms.

ANNEX V

Following arrangements are required to be undertaken by the GOB:-

1. to provide respective data and information to Japanese consultant and contractor necessary for the detailed engineering services and construction;
2. to acquire the land necessary for the construction of the facilities of the VFRDC, and to clear the site for the Main Center;
3. to construct access road;
4. to execute groundwater survey including water lifting test and core boring including penetration test;
5. to provide facilities for distribution of electricity, telephone and other incidental facilities outside the site;
6. to provide space necessary for such construction on temporary office, working area, stock yard and others;
7. to construct the gate and fence in and around the site;
8. to ensure prompt unloading and custom clearance at the port of disembarkation in the GOB;
9. to exempt Japanese nationals concerned from custom duties, internal taxes and other fiscal levies which may be imposed in Burma with respect to the supply of materials and services for construction;

Kywe*

10. to provide and accord necessary permission, licences and other authorization required for the execution of the Project;

11. to provide furniture, and other office utilities as necessary; and;

12. to ensure budget arrangement and expenditure of maintenance and operating cost and expenses.

April 17, 1984

4–2 Letter

Dear Sir,

As the result of discussions between Agricultural Corporation and Basic Design Study Team for the Vegetable and Fruit Research and Development Project from April 3 to 17, 1984, I would like to ask your co-operation to undertake the following points, mentioned in ANNEX "A", in order to commence the construction works as scheduled.

In addition, I would like to enclose the following documents for your consideration and I wish your response to them before the team's departure.

1) layout plan of buildings and experimental research farm for Main Centre
2) questionnaire for Sub-Centre and Regional Experimental Farms

Thanking you,

Yours faithfully,

Isao Iwagaki
Team Leader
Basic Design Study Team.

U Hla Myint Oo
General Manager
Planning and Projects
Agriculture Corporation.

Annex "A"

(1) Total Schedule up to the commencement of the construction works, as shown on the attached sheet, should be followed.

(2) Site Clearance should be done by the Government of Burma (GOB) by the end of January 1985.

(3) Access Road, connected between the site and Mandalay Road, should be constructed by GOB by the end of January 1985. And the route of the access road from Mandalay Road to the connecting point at the site, indicated in the "Site Layout Plan", should be informed within one month.

(4) Electrical Power should be led in the site by GOB by the end of January 1985. The following loads are to be requested to Electrical Power Corporation.

750 kVA for permanent

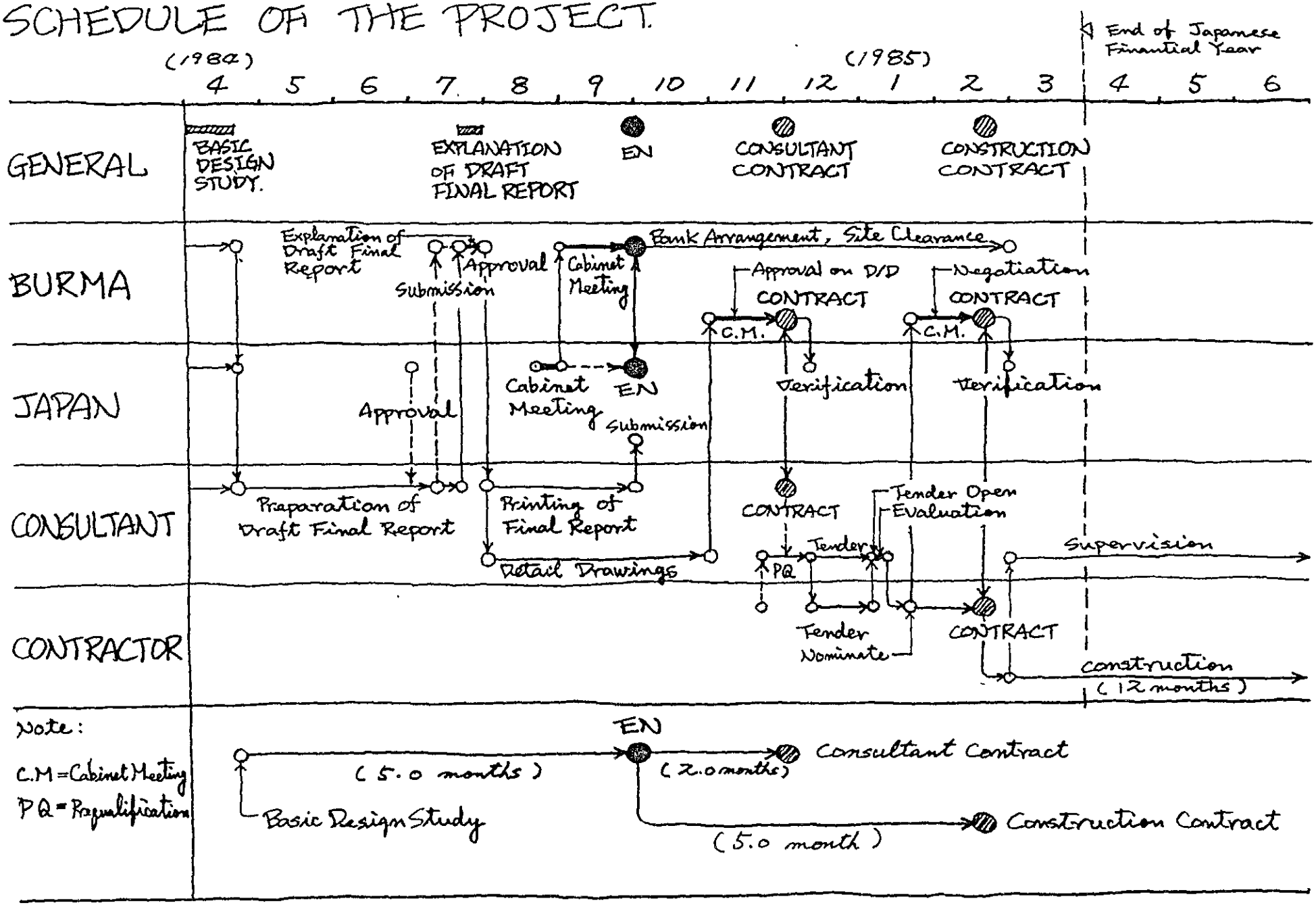
200 kVA for temporary (for construction)

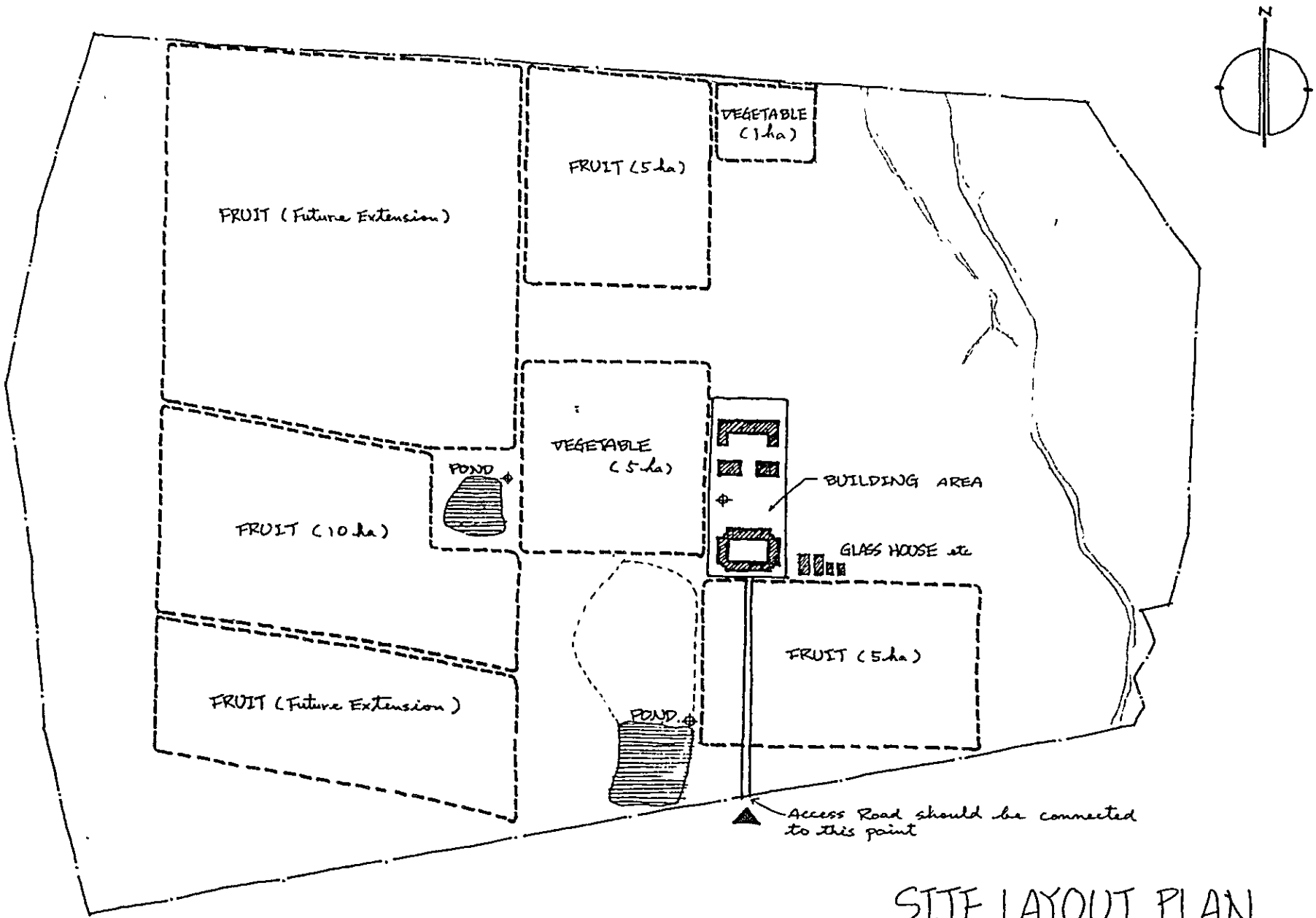
(5) Boring Test and Water Test should be done by GOB and the data should be provided for the Japanese Team through Embassy of Japan in Burma within one month.

30m depth 4 points - for boring test

100m depth 2 points - for water test

SCHEDULE OF THE PROJECT.





SITE LAYOUT PLAN

SCALE 1 : 4000

Questionnaire for Sub-Centre and 5 Regional Expreimental Farms

I would like to request you to provide the following data concerning Sub-Centre and 5 Regional Experimental Farms.

1) Site Maps indicated following items: a) Present Situation
   * layout plan
   * vegetable and fruit farm with acreage
   * buildings (w/grade)
   * irrigation facilities, if any
   b) Future Plan

2) Water source for irrigation

3) Situations of electricity

4) Expected implementation schedule for site development on Sub-Centre and Regional Experimental Farms

Year	Preparation of Farm (ha)	Plantation of Crop & Tree (ha)	Buildings (m^2)	Electricity	Water Source
1984					

MINUTES OF DISCUSSIONS
ON
THE DRAFT REPORT OF THE BASIC DESIGN STUDY
ON
THE VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT
IN
THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

The Government of Japan has sent, through the Japan International Cooperation Agency, a Basic Design Study Team to Burma from 6th July to 15th July, 1984 for the purpose of submitting and explaining of the Basic Design Study Draft Report (the Report) on the Vegetable and Fruit Research and Development Project (the Project).

The Team held meetings with the Agriculture Corporation and other authorities concerned of the Government of Burma to explain and discuss on the Report. As a result of the discussions, both parties have agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined toward the realization of the Project.

Rangoon, July 13th 1984.

KHIN WIN
Managing Director
Agriculture Corporation

ISAO IWAGAKI
Leader
Basic Design Study Team

Kywe*

Major Points of Understanding

1. Burmese side principally has agreed to the contents of the Report.

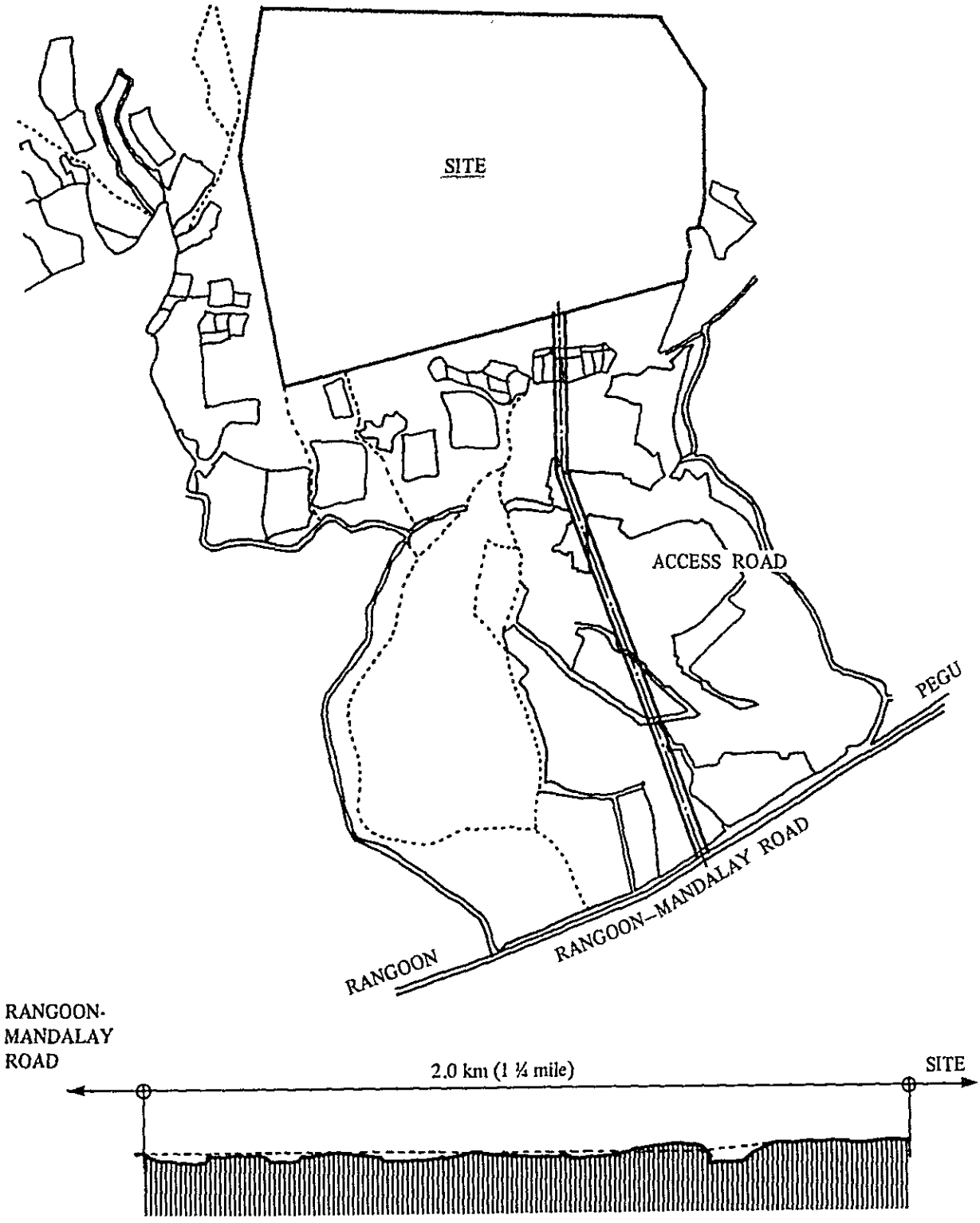
2. Burmese side indicated that the experimental field Block C (Vegetable) (an area of 2 ha) should be reconsidered to move to west side of Block D, in actual implementation.

3. In addition, Burmese side requested that the final report should be submitted as soon as possible after the completion of modification based on the discussions held between both parties and that the cost of the project should be described in the above mentioned Report in order to proceed the preparation of the Burmese side budget for the Project.

Soe/13784.

APPENDIX II

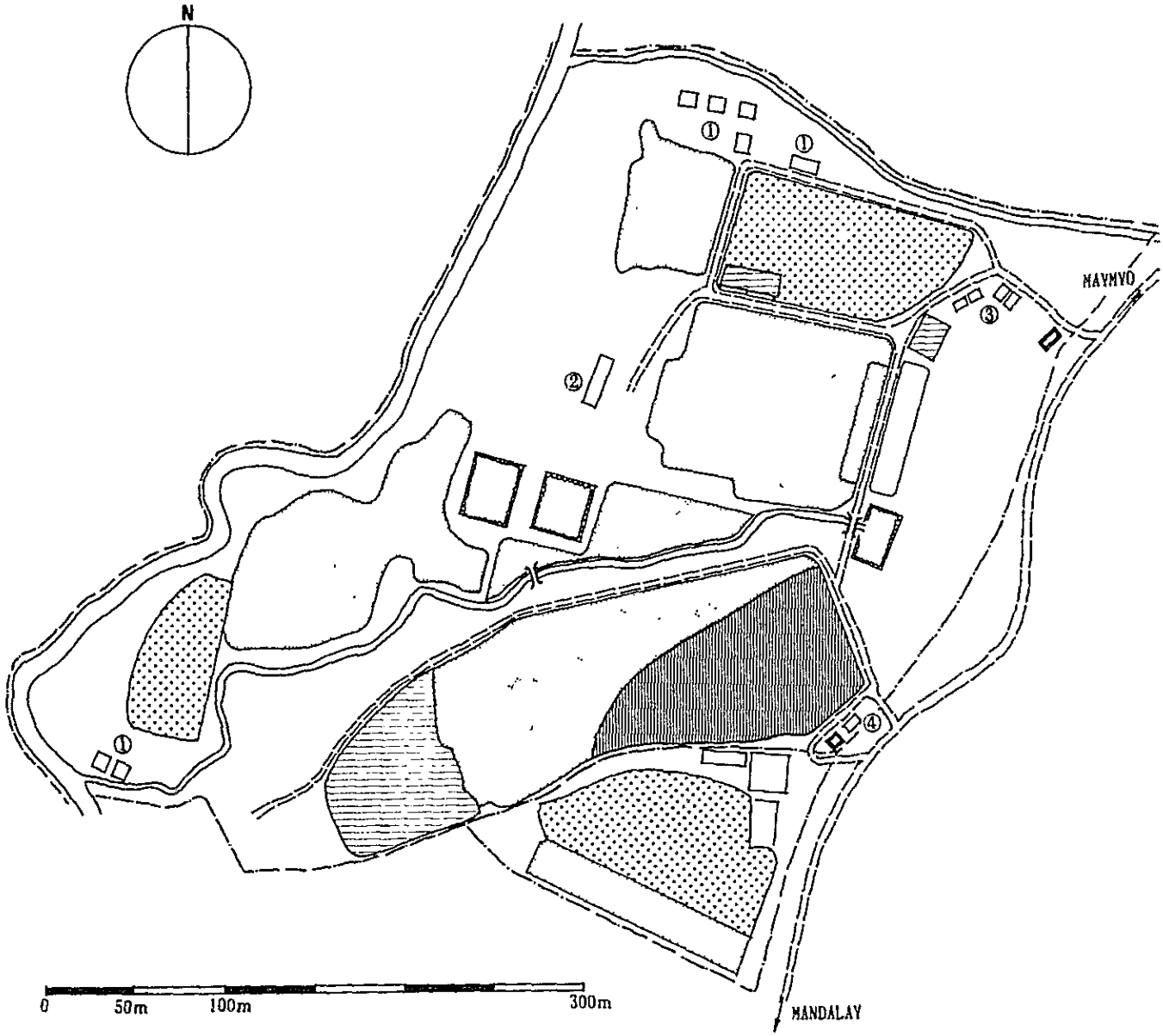
ACCESS ROAD


SITE
ACCESS ROAD
PEGU
RANGOON
RANGOON–MANDALAY ROAD
RANGOON-
MANDALAY
ROAD
2.0 km (1 ¼ mile)
SITE

SUB – CENTER

REGIONAL EXPERIMENTAL FARM

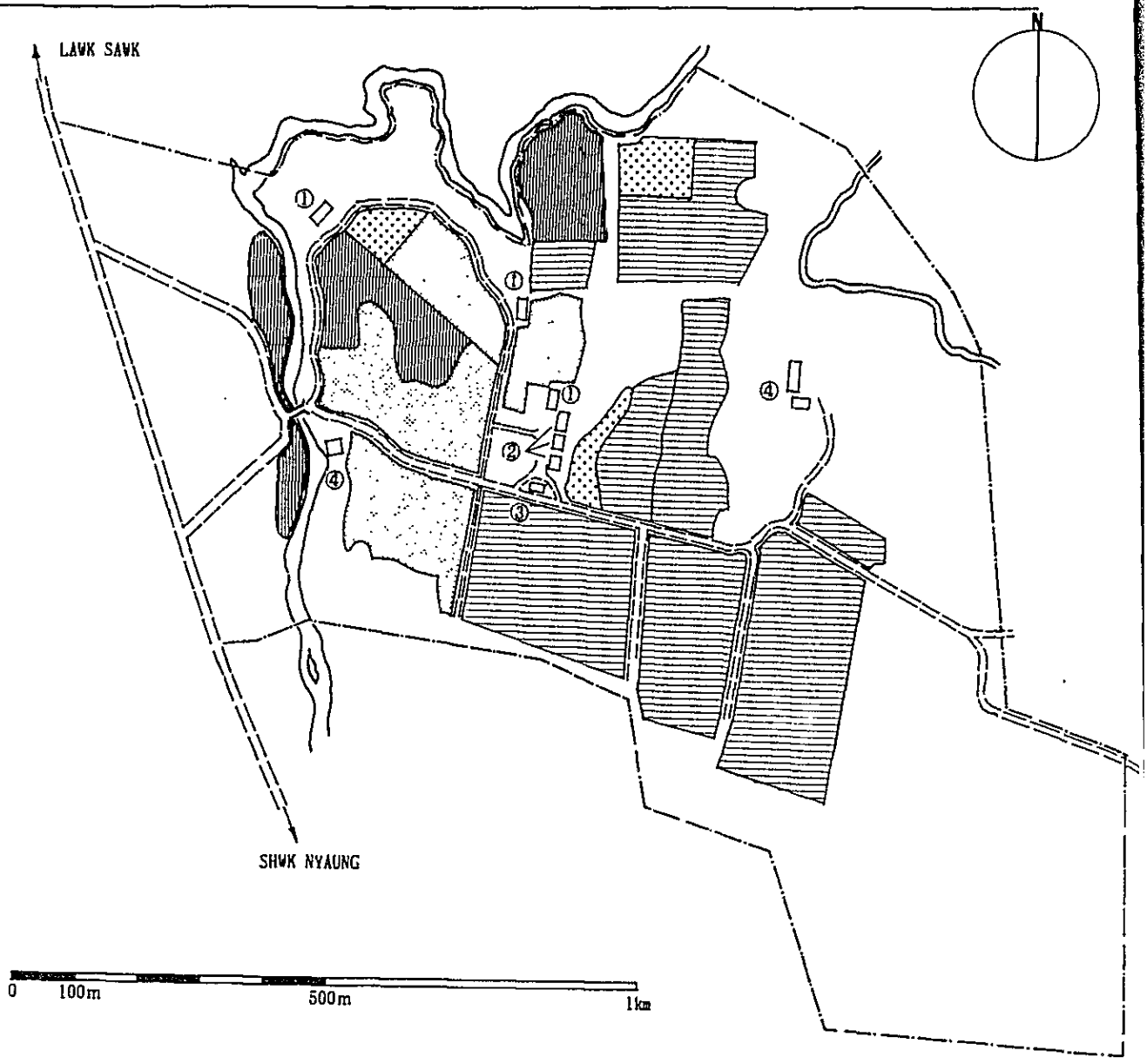
MAYMYO FARM (SOB-CENTER)



INDEX

- : FARM BOUNDARY
- : PROPOSED PROJECT AREA (Vegetable)
- : PROPOSED PROJECT AREA (Fruit)
- : AREA UNDER CULTIVATION (Citrus)
- : AREA UNDER CULTIVATION (Coffee)
- : ROAD
- : STREAM
- : BUILDING
  - ① : Staff Quarter
  - ② : Training Hall
  - ③ : Storage
  - ④ : Office
- : POND

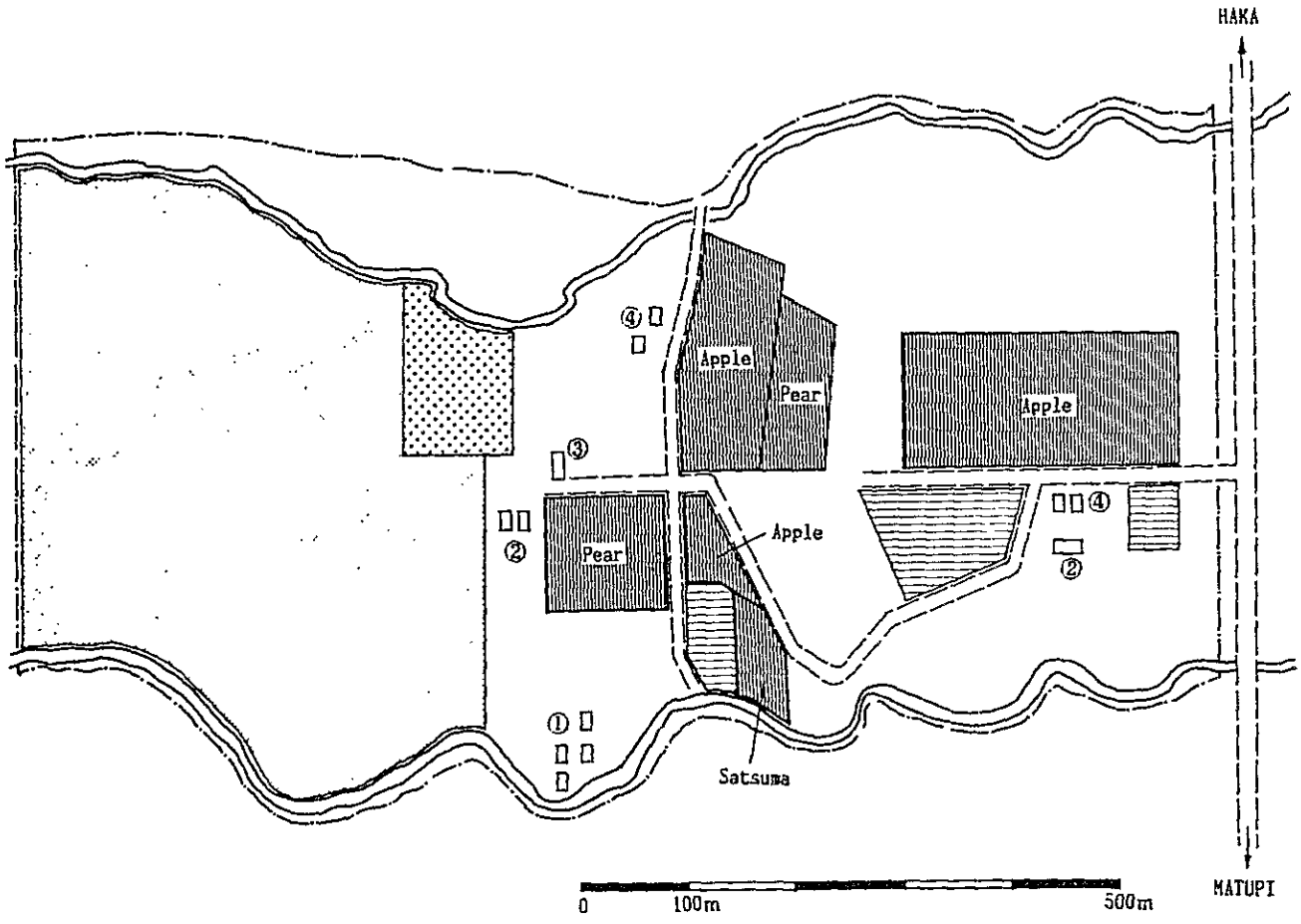
MAMLAT FARM (TAUNGGYI TOUNSHIP)



INDEX

- : FARM BOUNDARY
- : PROPOSED PROJECT AREA (Vegetable)
- : PROPOSED PROJECT AREA (Fruit)
- : AREA UNDER CULTIVATION (Orange)
- : AREA UNDER CULTIVATION (Annual Crops)
- : ROAD
- : STREAM
- : BUILDING
  - ① : Staff Quarter
  - ② : Storage
  - ③ : Office
  - ④ : Nursery & Sheds

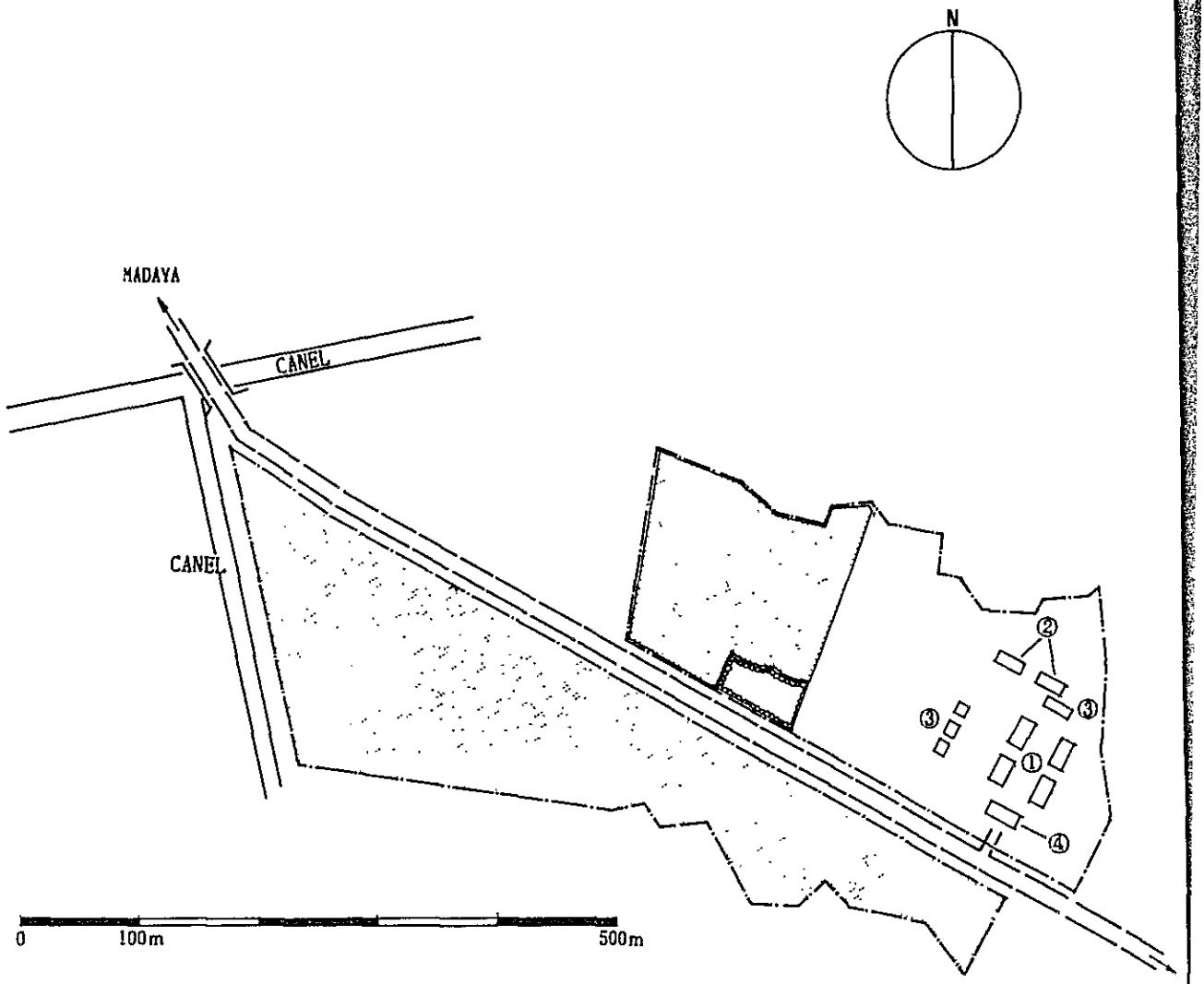
CAWBUK FARM (HAKA TOWNSHIP)



INDEX

- : FARM BOUNDARY
- : PROPOSED PROJECT AREA (Vegetable)
- : PROPOSED PROJECT AREA (Fruit)
- : AREA UNDER CULTIVATION (Vegetable)
- : AREA UNDER CULTIVATION (Fruit)
- : ROAD
- : STREAM
- : BUILDING
  - ① : Staff Quarter
  - ② : Storage
  - ③ : Office
  - ④ : Staff QTRS

MADAYA FARM (MADAYA TOWNSHIP)



INDEX

: FARM BOUNDARY

: PROPOSED PROJECT AREA

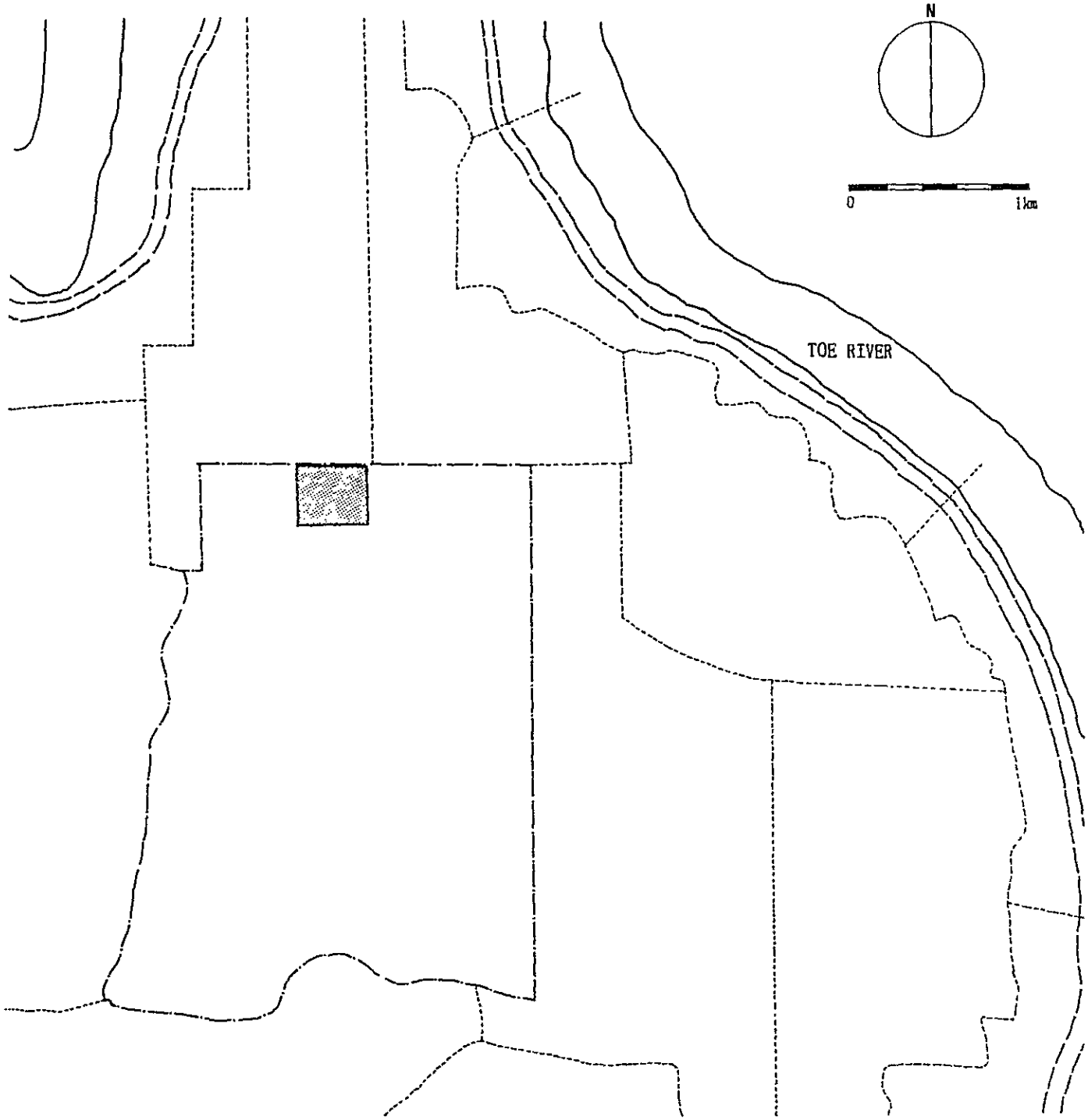
: ROAD

: BUILDING

① : Staff QTRS
② : Storage
③ : Office
④ : Tank

: POND

MA_UBIN FARM (MA_UBIN TOWNSHIP)



INDEX

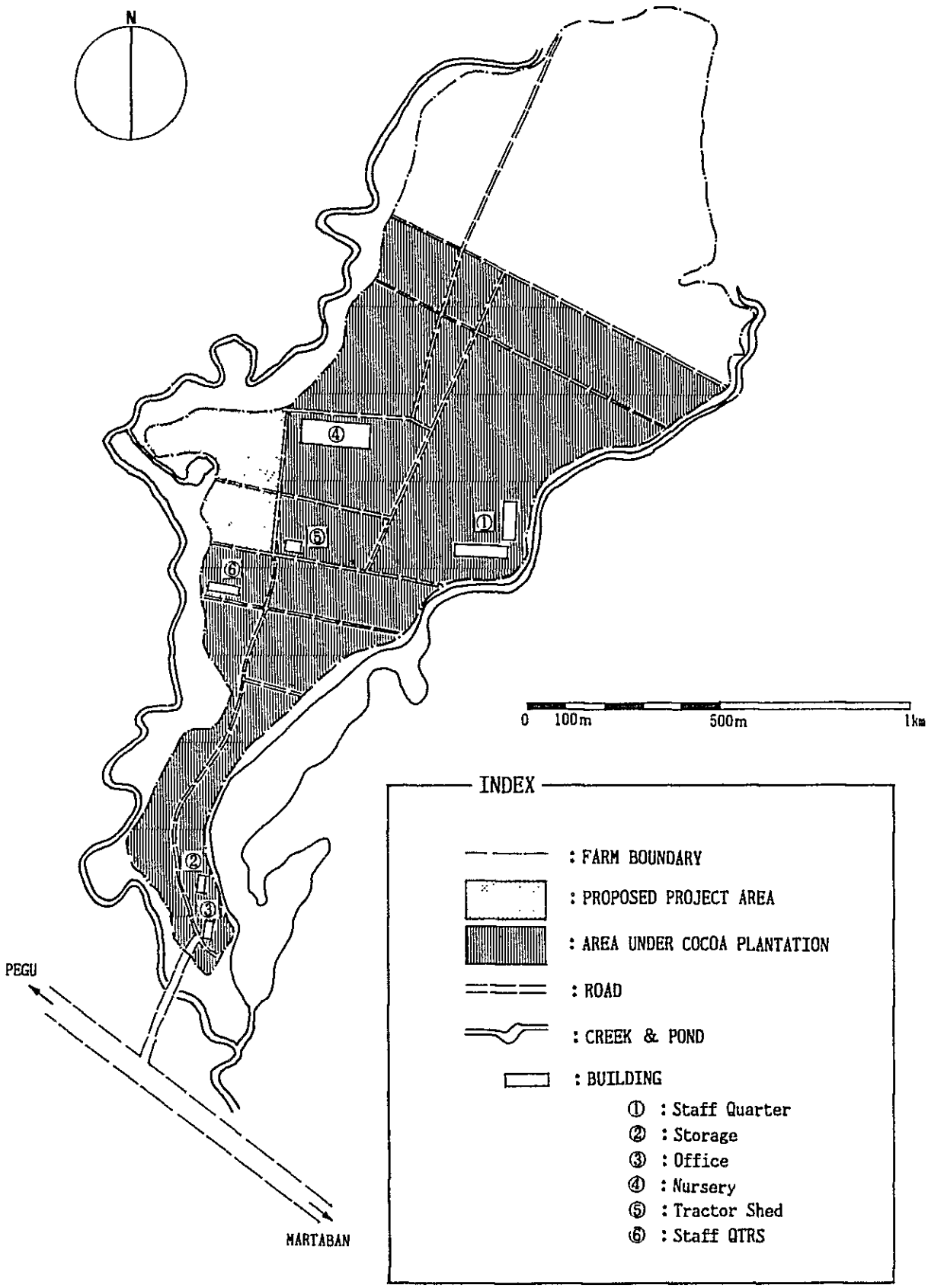
: FARM BOUNDARY

: PROPOSED PROJECT EREA

: ROAD

: STREAM

INGABO FARM (KYAIKHTO TOWNSHIP)



SUBSURFACE INVESTIGATION

ပြည်ထောင်စု ဆိုရှယ်လစ်သမ္မတ မြန်မာနိုင်ငံတော်

ဆောက်လုပ်ရေးကော်ပိုရေးရှင်း

REPORT ON SUBSURFACE INVESTIGATION AT VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT SITE INDAING, RANGOON

သုတေသနနှင့်မြေအောက်စမ်းသပ်ရေးဓါတ်ခွဲခန်းမှ

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CONSTRUCTION CORPORATION
RESEARCH & SOIL TESTING LABORATORIES
KAMAYUT ROAD, THUWUNNA

SUBSURFACE INVESTIGATION AT VEGETABLE AND FRUIT RESEARCH AND DEVELOPMENT PROJECT SITE, INDAING, RANGOON

1.0 INTRODUCTION

1.1 Authority

Letter number thapha/02 (286) 84-85, dated the 7th May, 1984 of the General Manager (Extension) of the Agricultural Corporation, Rangoon.

1.2 Scope of Work

This report pertains to the field and laboratory study of the subsurface on (4) boreholes, Comprising of the determination of the penetration resistance and of the underground water table at the subject site and also analysis of the basic engineering properties of the soil samples at the Central Laboratory.

2.0 S I T E

The subject site is situated at Indaing, Hlegu Township, Rangoon Division.

The terrain at the site is almost flat.

The natural drainage condition is reasonably good.

The subsurface soil appears to be of SILT & CLAY, mixed with a trace or some Sand.

The positions of the borehole located by the client on the ground, are shown in fig.1.

3.0 FIELD INVESTIGATION

The field operation, covering a total footage of (296) feet of boreholes was carried out in early May, 1984, during the dry season.

The Construction Corporation Standard Method of Subsurface Investigation Designation Nos CCS 001-03:1983 and CCS 001-04:1983 were adopted.

The penetration resistance in terms of 'N' values were recorded during the field operation.

The ground water table was generally encountered at(18) feet depth from the surface during the operation period.

The field data are illustrated in fig.2.1 and 2.2.

The subsurface soil samples were duly collected, preserved and sent to the Central Laboratory for further analysis.

4.0 LABORATORY TEST

Altogether (86) soil samples were received and tested at the Central Laboratory, Construction Corporation.

The Testing Methods BS.1377 (1967) was adopted in analysing the engineering properties of soil samples.

The following tests were carried out:-

- natural moisture content, wet and dry densities and unconfined compressive strength tests, ,
- grain size analysis and Atterberg limits test,
- direct shear test and
- consolidation test.

The laboratory test results are presented in table 1,2,3,4 and also in fig. 2,3,4,5.

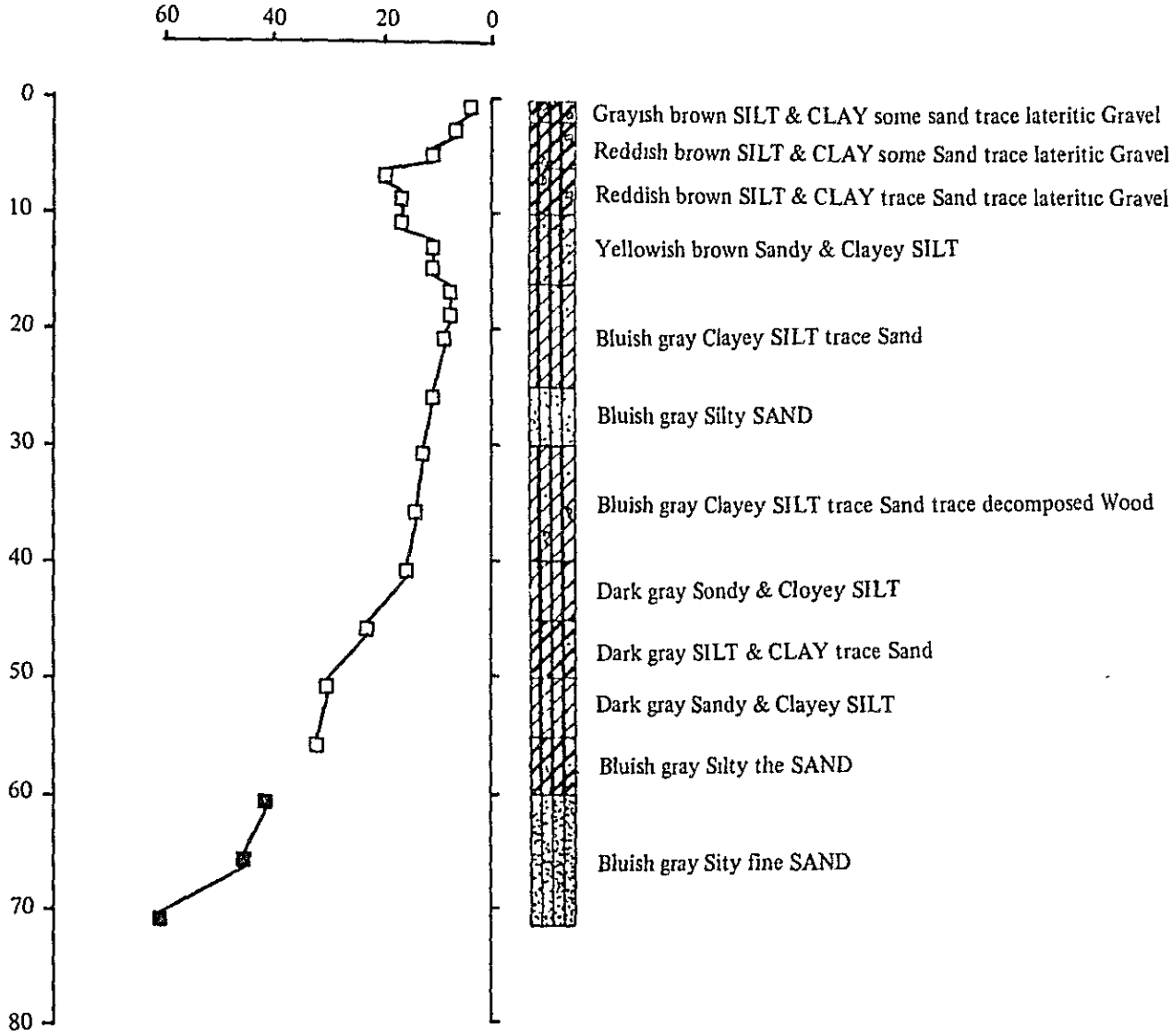
5.0 C O N C L U S I O N

The subsurface materials in the zone extending from the surface to a depth (63 ± 2) feet, is predominantly SILT and CLAY, except at sporadic places where some thin layers of SAND exist. The region at (10 ± 2)feet depth appears to be relatively stiffer judging from the SPT 'N' values.

The underlying zone until the ends of borings is of SAND or SAND and SILT mixed with a trace of Clay. In this zone the SPT 'N' values generally exceed (30).

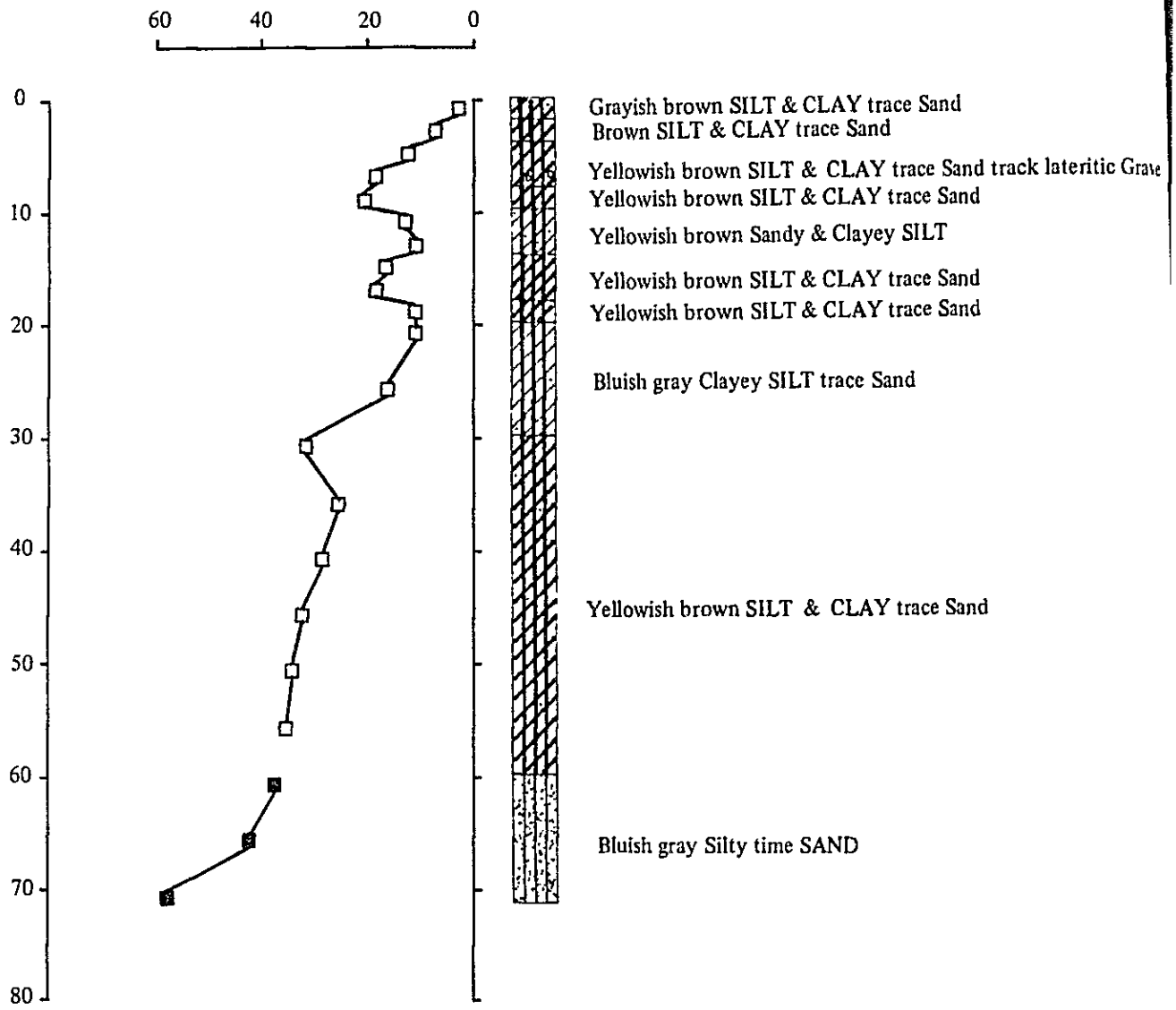
for (SHWE TUN MAUNG)
STAFF OFFICER II
RESEARCH & SOIL TESTING (LABS:)
CONSTRUCTION CORPORATION

AM/10-7-84



□ THE WALL STEEL SAMPLER DRIVEN WITH 140 LBS HAMMER, DROP 30"

■ STANDARD SPLIT – SPOON SAMPLER DRIVEN WITH 140 LBS HAMMER, DROP 30"



□ THE WALL STEEL SAMPLER DRIVEN WITH 140 LBS HAMMER, DROP 30"

■ STANDARD SPLIT – SPOON SAMPLER DRIVEN WITH 140 LBS HAMMER, DROP 30"

SOIL SURVEY

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA

MINISTRY OF AGRICULTURE AND FORESTS

AGRICULTURE CORPORATION

(LAND USE)

2/84

REPORT ON THE SOIL SURVEY, OF THE FARM OF HORTICULTURE & VEGETABLE RESEARCH DEVELOPMENT PROJECT ZAYAT KWIN, HLEGU TOWNSHIP.

RANGOON, MAY, 1984

INTRODUCTION

The soil survey was carried out by the Land Use Division as requested by the General Manager, (Extension), Agricultural Corporation vide Memo Thama/02/83–84 (260) dated the 22nd March, 1984, to investigate and supply soil data and soil maps for the centre for Horticulture and Vegetable Project to be constructed with Japanese Government Aid, at Zayat Kwin, Hlegu Township.

U Hla Aye Deputy General Manager, Land Use Division, and three assistants, viz. U Mya Tin, U Khin Aung, U Kyaw Shwe carried out the soil investigations in March, 1984.

The area surveyed is about 280 acres in area and is situated on the edge of the upland (Kwin No. 1023 – Yemongale South) adjoining the paddy lowland plain.

Traverses were made, soils were examined at 42 sites out of which 8 were 60" pits, 8 were 30" pits, and 36 were 18" pits. Soil samples from 38 sites and water from 4 wells were chemically analysed. Twelve soil mapping units were distinguished, soil maps topographic maps were drawn on a 16" = 1 M scale together with drawings of geomorphic profiles and soil profiles.

Relevant climatic geological floral farm management and other data were collected and the final findings are herewith presented in the form of a report by U Hla Aye, leader of the team.

TABLE S–2/1

Sheet No. 1

CHEMICAL PROPERTIES
AGRICULTURE CORPORATION (LAND USE)
PROJECT ZAYAT KWIN VEGETABLE AND FRUIT RESEARCH FARM

Division – RANGOON
Township –HLEGU (ZAYAT KWIN)

Soil Name and Numbers	Profile No.	Horizon	Depth in Inchies	Moisture %	pH		Texture %			Orbanic carbon %	Humus %	C.E.C. me/ 100gm	Cations						Available Nutrient mg/100gm		
					H_2O	CKl	Sand	Silt	Clay				Ca^{++}	Mg^{++}	K^{+}	Na^{+}	H^{+}	Al^{+++}	N_2	P_2O_5	K_2O
1.	2	3.	4.	5.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
YBF I	VKA-4	A	0– 7	0.5	4.9	4.3	55.0	25.3	19.0	0.75	1.30	–	2.91	1.66	–	–	–	–			
		A/B	7–17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3.8	0.9	2.9
		B	17–26	1.3	4.7	4.2	37.2	34.1	28.9	0.42	0.73	10.88	0.83	2.08	–	–	–	–	3.8	0.6	2.8
LYBF	VKS-9	A	0– 3	0.4	5.5	4.3	38.1	35.6	22.8	0.15	0.26	–	1.25	0.41	–	–	–	–	3.5	2.7	5.5
(FC-15″)		B	3–14	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
II		C	14–18	1.1	5.3	3.6	39.9	32.2	24.2	0.15	0.26	4.25	0.83	1.65	–	–	–	–	2.8	1.1	3.4
GBF	VKA-6	A	0– 5	0.3	5.0	4.2	59.4	20.2	16.6	0.90	1.56	5.83	1.67	0.83	–	–	–	–	3.6	1.5	3.3
		A/B	4–16	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		B	16–24	0.3	4.5	3.2	61.8	16.7	19.7	0.36	0.62	3.88	1.25	1.66					3.4	0.5	2.2
LYBF	VKS7	A	0– 7	0.8	5.3	3.6	29.1	52.0	18.7	0.15	0.26	–	1.25	2.91	–	–	–	–	3.6	1.45	–
(L-20″)		B_I	7–17	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		B_{II}	17–28	0.7	4.7	3.5	52.6	26.1	17.7	0.45	0.78	–	0.42	2.50	–	–	–	–	2.5	2.7	–
LYBF	VKS13	A	0– 8	0.3	4.8	4.0	35.2	43.0	19.8	0.30	0.52	–	0.83	1.67					2.5	0.7	1.7
(L-30″)		B	8–36	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IV		B/C	36–40	0.8	4.8	3.6	47.1	30.0	18.9	0.09	0.15	–	0.83	1.25	–	–	–	–	2.5	0.9	2.2
LYBF	VKS-5	A	0– 8	0.7	4.8	3.5	16.3	44.2	37.2	0.39	0.67	–	1.25	Trace	–	–	–	–	3.06	–	1.05
(FC-15″)		B_I	8–28	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
		B_{II}	28–35	1.5	5.1	3.4	31.1	42.4	24.1	0.09	0.15	–	0.21	3.12	–	–	–	–	2.48	–	0.65
LYBF	VKS-15	A	0– 8	0.3	5.2	3.4	31.1	42.4	24.1	0.93	1.61	–	1.67	2.08	–	–	–	–	–	–	–
(BC-40″)		B_I	8–21	0.6	5.0	4.5	22.8	42.9	33.6	0.45	0.78	–	0.42	1.64	–	–	–	–	–	–	–
		B_{II}	21–37	0.8	4.0	3.2	21.1	34.2	41.6	–	–	–	0.50	2.50	–	–	–	–	–	–	–
		B/C	37–45	1.3	6.2	4.5	34.1	45.2	17.1	–	–	–	Trace	4.99	–	–	–	–	–	–	–
LYBF	VM-9	A	0– 7	0.7	4.2	3.6	12.5	–	21.1	0.45	0.78	–	Trace	2.08	–	–	–	–	3.4	0 6	2.4
(L-20″)		A/B	7–16	1.1	4.0	3.4	10.8	–	27.1	0.48	0.83	–	Trace	2.08	–	–	–	–	–	–	–
III		B_I	16–20	0.6	4.2	3.6	12.2	–	22.7	–	–	–	0.42	2.08	–	0.134	–	–	–	–	–
		B_{II}	30–50	0.8	5.0	4.8	24.6	–	24.5	–	–	–	0.42	2.08	–	0.134	–	–	–	–	–
LGBF	VM-11	A	0– 7	0.9	4.7	3.2	9.4	–	26.9	0.36	0.62	4.38	0 42	2.08	–	0.186	–	–	2.8	0.6	2.2
(FC-30″)		A/B	7–20	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
VII		B_I	20–32	0.8	4.1	3.2	15.6	–	26.0	0.06	0.10	3.75	Trace	2.50	–	0.143	–	–	3.6	0.5	1.5

PHYSICAL AND WATER PHYSICAL PROPERTIES OF SOILS

S. No. Pit No.	Name of Soil	Texture	Layer in inches	* Specific gravity	o Volumetric weight gm/cm^3	+ Porosity % by Volume	Moisture Contents at (% by wt)		Permeability mm/hr. (K)	
							Maximum water holding capacity	The time of Sampling (December)	For each layer	For the whole profile of soil
1.	Light Yellow Brown	Sicl	0– 8	2.60	1.42	45	22.6	15.6	10.2	
	Forest Soils (Lateritic)	Sicl	8–22	2.60	1.42	45	21.1	16.0	25.5	25.26
	(HVRDP–3, 4)	cl	22–40	2.65	1.67	37	20.7	11.7	76.5	
2.	Shallow Yellow Brown	Sil	0– 9	2.60	1.49	43	18.9	16.6	1.70	
	Forest Soils	Sicl	9–16	2.60	1.38	47	24.5	13.7	33.30	
	(Lateritic)	Sicl	16–36	2 65	1.52	43	19.5	15.5	57.1	6.96
	(HVRDP–2, 3)	Sicl	36–46	2.65	1.57	41	20.1	18.5	–	
3.	Light Grey Brown	Sicl	0– 8	2.65	1.53	42	15.5	9.4	62.90	
	Meadow Soils	Sicl	8–18	2.65	1.52	43	25.2	24.6	6.94	.8.56
		Sicl	18–40	2.67	1.66	20	20.5	20.5	0.50	

* Particle density
o Bulk Density
\+ Pore - Space

READILY ACCESSIBLE WATER FOR THE SOILS OF CADTC PROJECT AREA

Sr. No.	Name of Soils	Depth of Layer in ins.	Physical Clay %	Moisture F.C.	Content W.P.	Accessible Water (inches)		Remarks
						For each layer	For 48 of soils	
1.	Light Yellow Brown Forest (Lateritic) Soils	0– 8	62.4	32.09	9.23	1.83		* Physical Clay is Physically active Particles, is < 0.01 mm
		8–22	65.7	29.96	9.23	2.90	10.97	
		22–48	54.2	33.74	9.78	6.24		
2.	Shallow Yellow Brown Forest (Lateritic) Soils	0– 9	57.7	28.16	8.34	1.78		The Moisture Stock is Calculated for 48 inches of soils layer.
		9–16	52.4	33.81	8.56	1.77	10.49	
		16–36	57.8	29.64	8.66	4.20		
3.	Light Gray Brown Meadow	0– 8	30.0	23.72	6.43	1.38		WP =Wilting Coefficient (Obtained from previously determined soils phsical data of similar soil Type) F.C.= Maximum Water Holding Capacity.
		8–18	45.3	38.30	7.90	3.04	11.44	
		18–48	40.9	34.03	8.63	7.02		

TUBE–WELL LOG

Telex : Agrico BM 2033
Cable : AGRICORP
Telephones : —
General Manager 80355
Dy: General Manage 80356
Office 80353
80354

THE SOCIALIST REPUBLIC OF THE UNION OF BURMA
MINISTRY OF AGRICULTURE AND FORESTS
Agriculture Corporation (Extension)
NO. 74, SHWEDAGON PAGODA ROAD.
RANGOON, BURMA.

No...540/Ka(6)84/.1081....

Dated the,.....25th June 84.....

To,

MR.A Motosugi,
First Secretary,
Embassy of Japan,
Rangoon.

Subject: Vegetable & Fruit Research and Development Project

Dear MR. Motosugi,

We wish to refer the relevent letter despatched under letter No.540/Ka (6)84/999 dated 12th: June Concerning the Captioned subject.

In this connection, pleased to enclose herewith a copy of the tube-well log received from the Construction Corporation in respect of water supply of the said project. We shall be much appreciated if you will kindly transmit the same to Ms.Yamashita Architects and Engineers Inc: Tokyo, at your earliest convenience.

With best regards,

Yours sincerely,

25/6/84

for General Manager (Extension)
(MG KYIN, DEPUTY GENERAL MANAGER)

CC:Director General,Planning and
Statistics Department,M.A.F.

Soe/28684.

CONSTRUCTION CORPORATION, RANGOON DIVISION.

WATER SUPPLY & SANITATION SECTION, TUBE WELL LOG.

NAME OF WORK. Yemon V.F.R.D.C Project

4" ф gravel packed Test TUBE WELL No. (1)

LOCALITY

TOWNSHIP [illegible] (HLEGU TOWNSHIP)

VILLAGE [illegible] (YEMON VILLAGE)

SITE V.F.R.D.C site

DRILLING METHOD Manual Drilling

TYPE OF DRILL Reverse Circulation

DRILLER NAME U Saw Kying & Party

DATE OF COMMENCED 25.5.84

DATE OF COMPLETED 6.6.84

BORE HOLE SIZE 15" Inch

ADVANCED BORING 8" Ft

STEP OF BORING 8" to 13" Inch

DEPTH OF DRILLED 245' Ft

CASING PIPE(a)SIZE 4ф Inch

(b)LENGTH 158' Ft

SCREEN PIPE, size 4 Inch, LENGTH 30 Ft

SLOTTED SIZE Local Slotted

TYPE OF STRAINER -

CLAY SEAL DEPTH 0-0 to 130-0 = 130 Ft

DEPTH OF GRAVEL 130-0 to 200-0 = 70 Ft

BLANK PIPE AT 185-0 to 195-0 = 10 Ft

SCREEN PIPE AT 155-0 to 185-0 = 30 Ft

WATER LEVEL(Measure from Ground Level)

(a)STATIC 19-0 Ft

(b)DYNAMIC Ft

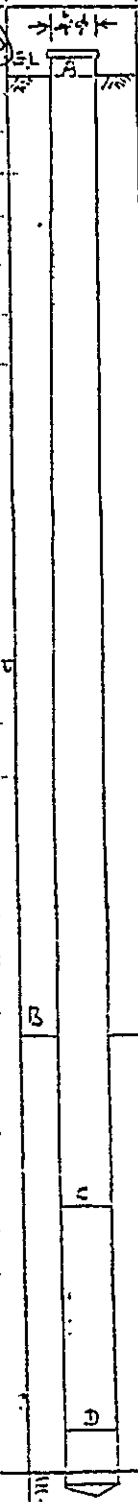
YIELD 3600 gall: Gal per hr

WATER STRUCK AT Ft

STARTING PRESSURE p.s.i

PUMPING PRESSURE p.s.i

CASING



THICK (FT)	DEPTH (FT)	DESCRIPTION ⊙
		0 N.G.L
		1 [illegible] (a)
	20-0	2
		[illegible] (b)
	30-0	3
		4 [illegible] (c)
	50-0	5
		[illegible] (d)
	60-0	6
		[illegible] (d) + [illegible] (x)
	70-0	7
		8
		(a) [illegible] +
		9 [illegible] (x)
		10
	105-0	11 [illegible] (P)
	115-0	12 [illegible] (q)
	130-0	13 [illegible] (x)
		14 [illegible] (n)
	145-0	15
		[illegible] (s)
	160-0	16
		17 [illegible] (P)
	175-0	18 [illegible] (q)
	195-0	19 [illegible] (q)
195'	245'	[illegible] (a)

Data Collected by .... Logged by .... Approved by [illegible]

Remarks: - Explanation for ⊙ (Description) attached .....

Explanation

1. (a) Lateritic Soil (ဂုံမြေ)
2. (b) Yellowish Mud (ခွံတီဇဝ:)
3. (c) Yellowish fine sand (သဲတိန့်)
4. (d) Yellowish Coarse sand (သဲတိုက်ဒ:)
5. (x) Gravel (ကျောက်စရစ်)
6. (p) Whitish fine sand (သဲဖြူန့်)
7. (q) Whitish Coarse sand (သဲဖြူကြိဒ:)
8. (n) Bluish fine sand (ကြဝ်သဲပြာန့်)
9. (s) Bluish Coarse sand (သဲပြာကြိဒ:)
10. (m) Bluish Mud ကြဝ်ပြာဇဝ:)

WATER ANALYSIS

(Hygiest) From No. 2.

THE NATIONAL HEALTH LABORATORY, BURMA

Bacteriological Report on Water Sample

No. 8924/13 P 1 Dated Rangoon, the 26-6- 1984.

Laboratory No. W-254/ 84. Identification mark or No.

Source (Description) Tube well.

Location V.F.R.D.C Project, ~~Hlaing~~ Hlegu.

Submitted by Engineer III(W/S), Construction(12), Construction Corporation, Rangoon.

Collected at 12 noon. on 14-6-84. and received in the

Laboratory 11:30AM. on 15-6-84. ~~Packed~~ not Packed in ice

Bottle not sealed.

with the letter No. , dated

RESULT OF ANALYSIS

It yielded the following reactions:-

(a) Colonies on Ager at 37° after 24 hours 300

(b) Coli form Organism in M.P.N. 161

(c) E. Coli in M.P.N. Nil

Remarks

Unsatisfactory

Director,
NATIONAL HEALTH LABORATORY,
RANGOON.

To,

Engineer III(W/S), Construction(12),
Construction Corporation,
Rangoon.

REPORT OF THE WATER ANALYSIS

No. 319/84.

Source	Physical Character				Chemical Tests										
					Quantitative (Parts Per Million)										
	Appearance	True Colour (Pt. Co. Scale)	Smell	Sediment	Sulphate (as SO_4)	Nitrates N.	Nitrites N.	Ignition	Total Solid	Chloride (as SO_4)	Total hardness	Permanent hardness (as $CaCO_3$)	Saline ammonia	Albuminoid ammonia	Iron (as Fe)
Tubo well (200'), No.1 V.B.R.D.C Project, Alegu.	Clear	6 Units	Nil	Slight	4.0	0.50	0.004	Slight charring	230.0	6.0	66.0	10.0	0.176	0.004	1.14
					Manganese (as Mn)				=	0.82	ppm.				
					Copper (as Cu)				=	Nil					
					Zinc (as Zn)				=	Nil					
					Oxygen absorbed from permanganate at 37°C for 3 hours				=	Trace					
					Total alkalinity as $CaCO_3$				=	106.0	ppm.				
					pH.				=	7.4					

Remarks:— Slightly high iron content.

DAW KHIN KHIN SOE,
M. B., B. S., D. P. H.
Asst. Director, H. E. I.

STAFF REQUIREMENT AND PAYMENT

STAFF REQUIREMENT AND ESTIMATED PAYMENT

VEGETABLE & FRUIT RESEARCH AND DEVELOPMENT PROJECT

Description	Pay Scale	Nos of staff	month	year	Minimum Qualification
1	2	3	4	5	6
PROJECT MANAGER'S OFFICE					
Project manager	1,800	1	1,300	15,600	B. Ag. with PG training and 10 years experiance
Dy. Project manager	1,000-50-1,200	1	1,200	14,400	"
Junior Officer	320-15- 440	1	440	5,280	B.Ag./Dip. Ag.
U.D.C	185-15- 305	1	305	3,660	BEHS + experinace
L.D.C	150-10- 220	2	440	5,280	"
TOTAL		6	3,685	44,220	
ADMIN & ACCOUNT SECTION					
Admin Officer	450-25- 700	1	700	8,400	B. Ag/Dip. Ag with experiance
Account Officer	450-25- 700	1	700	8,400	B. Com/B. E con with experiance
	400-20- 520	1	520	6,240	BEHS + experiance
Junior Officer	320-15- 440	1	440	5,280	B. Ag/Dip. Ag
Auditor	320-15- 440	1	440	5,280	B. Com/B. Econ with experiance
Librarian	320-15- 440	1	440	5,280	B. Ag. with Dip (Ltb)
B.C	300-15- 420	1	420	5,040	BEHS + experiance
Store keeper	300-15- 420	1	420	5,040	"
V.T.M	210-15- 330	2	660	7,900	B. Ag/Dip. Ag
Asst. Auditor	210-15- 330	1	330	3,960	BEHS + experiance
Br. Typist	210-15- 330	1	330	3,960	"
U.D.C	185-15- 305	1	305	3,660	"
Record keeper	150-10- 220	1	220	2,640	BEHS
Projectionist	185-15- 305	1	305	3,660	BEHS/THS + experiance
Electricien	185-15- 305	1	305	3,660	"
V.M	180-10- 220	1	220	2,640	B. Ag/Dip. Ag
Jr. Auditor	150-10- 220	1	220	2,640	BEHS + experiance
Jr. Typist	150-10- 220	1	220	2,640	BEHS
L.D.C	150-10- 220	1	220	2,640	"
Driver	130-10- 200	2	400	9,800	–
Watch man	100- 2- 110	2	220	2,640	–
TOTAL		24	8,035	96,420	
VEGETABLE SECTION					
Research Officer (1)	800-40-1,000	1	1,000	12,000	B. Ag. with PG training and 10 years experiance
Research Officer (2)	500-30- 800	1	800	9,600	B. Ag. with PG training and 7 years experiance
Research Officer (3)	450-25- 700	2	1,400	16,800	B. Ag. with PG training and 5 years experiance
Junior Research Officer	320-15- 440	4	1,760	21,120	B. Ag.
V.T.M	310-15- 330	0	–	–	B. Ag/Dip. Ag.
V.M	150-10- 220	0	–	–	"
TOTAL		8	4,960	59,620	

Description	Pay Scale	Nos of Staff	month	year	Minimum Qualification
1	2	3	4	5	6
FRUIT RESEARCH SECTION					
Research Officer (1)	800-40-1,000	1	1,000	12,000	B. Ag. with PG training and 10 years experiance
Research Officer (2)	500-30- 800	1	800	9,600	B. Ag. with PG training and 7 years experiance
Research Officer (3)	450-25- 700	2	1,400	16,800	B. Ag. with PG training and 5 years experiance
Junior Research Officer	320-15- 440	4	1,760	21,120	B. Ag.
V.T.M	210-15- 380	0	—	—	B. Ag/Dip. Ag.
V.M	150-10- 220	0	—	—	"
TOTAL		8	4,960	59,520	
SOIL & NUTRITION SECTION					
Research Officer (2)	500-30- 800	1	800	7,600	B. Ag. with PG training and 7 years experiance
Research Officer (3)	450-25- 300	2	1,400	16,800	B. Ag. with PG training and 5 years experiance
Junior Research Officer	320-15- 440	4	1,760	21,120	B. Ag.
V.T.M	210-15- 330	0	—	—	B. Ag/Dip. Ag
V.M	150-10- 220	0	—	—	"
TOTAL		7	3,960	47,520	
PLANT PROTECTION SECTION					
Research Officer (2)	500-30- 800	1	800	9,600	B. Ag. with PG training and 7 years experiance
Research Officer (3)	450-25- 300	2	1,400	16,800	B. Ag. with PG training and 5 years experiance
Junior Research Officer	380-15- 440	4	1,760	21,120	B. Ag.
V.T.M	210-15- 330	0	—	—	B. Ag/Dip. Ag
V.M	150-10- 220	0	—	—	"
TOTAL		7	3,960	47,520	
FARM SECTION					
Farm manager	500-30- 800	1	800	9,600	B. Ag. with PG training and 7 years experiance
Dy. Farm manager (Vege.)	450-25- 700	1	700	8,400	B. Ag./Dip. Ag. with experiance
Dy. Farm manager (Fruit)	450-25- 700	1	700	8,400	"
Irrigation Engineer	450-25- 700	1	700	8,400	B.E. with 5 years experiance
Agri. machinery Engineer	320-15- 440	2	880	10,660	B. Ag./Dip. Ag
Asst. Irrigation Engineer	320-15- 440	1	440	5,280	A.G.J.I.
Fore man	320-15- 440	1	440	5,280	"
V.T.M	210-15- 330	3	990	11,880	B. Ag./Dip. Ag
Mechanic (1)	150-10- 220	2	660	7,900	A.G.J.I.

Description	Pay Scale	Nos of Staff	month	year	Minimum Qualification
1	2	3	4	5	6
V.M	150-10- 220	3	660	7,920	B. Ag./Dip. Ag
Mechanic (2)	150-10- 220	3	660	7,920	"
TOTAL		20	8,330	99,960	
SUB TOTAL		80	37,890	454,680	
SUB CENTRE					
Research Officer (1)	800-40-1,000	1	1,000	12,000	B. Ag. with PG training and 10 years experiance
Research Officer (2)	500-50- 800	1	800	9,600	B. Ag. with PG training and 7 years experiance
Research Officer (3)	450-25- 700	2	1,400	16,800	B. Ag. with PG training and 5 years experiance
Junior Research Officer	320-15- 940	4	1,960	21,120	B. Ag.
Dy. Farm manager	450-25- 700	1	700	8,400	"
V.T.M	210-15- 330	4	1,320	15,840	B. Ag./Dip. Ag
U.D.C	185-15- 305	1	305	3,660	BEHS + experiance
V.M	150-10- 220	4	880	10,860	B. Ag./Dip. Ag
Jr. Typist	150-10- 220	2	440	3,280	BEHS
L.D.C	150-10- 220	2	440	5,280	BEHS
Driver	130-10- 200	1	200	2,400	–
watch man	100- 2- 110	2	220	2,640	–
SUB TOTAL		25	9,465	113,580	
REAS					
Dy. Farm manager	480-25- 700	5	3,500	42,000	B. Ag.
Asst. Farm manager	320-15- 440	5	2,200	26,400	B. Ag./Dip. Ag
V.T.M	210-15- 830	10	3,200	39,600	"
V.M	150-10- 220	20	4,400	52,800	"
Jr. Typist	150-10- 220	5	1,100	13,200	BEHS
L.D.C	150-10- 220	5	1,100	13,200	"
SUB TOTAL		50	15,600	187,200	
GRAND TOTAL					
MAIN CENTRE		80	37,890	454,680	
SUB CENTRE		25	9,465	113,580	
REAS		50	15,600	187,200	
		155	32,955	755,460	

Data of Vegetable and Fruit

Ammount of Production of Vegetable (1982 – 1983)

UNIT: ton

State and Division \ Production	Cabbage	Cauli-flower	Carrot	Mustard	Lettuce	Radish	Bottle gourd	Water melon	Tomato	Aspara-gus	Other	Onion	Garlic	Chilli	TOTAL
1. Kachin State	1,386	567	174	3,153	71	482	247	317	913	–	9,840	78	337	230	17,795
2. Kayah State	163	94	–	867	19	17	333	–	273	–	2,633	14	235	43	4,691
3. Karen State	52	35	–	34	27	227	287	814	1,465	15	–	2	–	501	3,459
4. Chin State	350	21	–	461	203	–	–	–	97	–	–	296	238	1,019	2,685
5. Sagaing State	12,771	2,055	8		424	2,001	3,735	40,399	–	–	47,069	14,076	1,758	1,240	129,849
6. Tenasserim Division	52	207	–	–	7	112	219	279	148	–	2,723	–	–	173	3,920
7. Pegu Division	5,622	4,879	–	20	39	2,082	2,965	17,213	21,117	13	45,973	1,978	3	3,768	105,667
8. Magwe Division	5,142	3,441	19	552	227	164	772	642	22,878	–	3,489	40,780	941	3,750	82,797
9. Mandalay Division	4,102	3,649	939	1,593	49	1,481	1,137	1,815	75,831	–	16,602	69,040	2,048	16,034	194,320
10. Mon State	377	480	712	53	72	2,418	2,563	957	2,300	–	17,268	–	–	1,408	28,608
11 Rakhine State	798	403	28	19	31	944	558	1,032	972	–	10,497	892	86	4,241	30,501
12. Rangoon Division	1,932	3,483	–	181	189	5,104	1,369	3,646	1,785	5	12,464	55	–	256	30,469
13. Shan State	37,307	10,241	619	12,490	903	806	977	158	40,153	–	12,809	5,702	20,751	2,482	145,398
14. Irrawaddy Division	8,174	3,280	127	271	538	7,716	7,122	4,621	25,214	427	2,076	6,408	–	8,384	74,361
TOTAL	78,228	32,830	2,626	23,796	2,586	21,977	20,550	35,229	233,545	460	183,443	139,321	26,397	43,532	844,526

Amount of Production of Fruit (1982 – 1983)

State and Division	Coconut (Fruit)	Orange (Ton)	Litchi Fruit)	Plum (Ton)	Shaddock (Fruit)	Apple (Ton)	Mango (Fruit)	Grapd (Ton)	Banana (Bundle)	Durian (Fruit)	Lime (Fruit)	Pear (Ton)
1. Kachin State	454,950	5,871	24,235,600	112	278,750	14	7,684,100	0.8	1,299,701	–	1,175,200	321
2. Kayah State	134,600	–	27,900	–	3,800	–	1,255,000	–	260,026	–	80,000	–
3. Karen State	1,187,440	–	315,200	119	8,523,603	–	16,674,540	–	800,404	3,467,000	19,351,877	–
4. Chin State	49,000	351	–	–	–	189	2,775,685	41	691,464	–	743,300	128
5. Sayaing State	3,775,783	113	568,800	8,457	890,000	–	62,318,057	–	4,641,588	–	22,581,800	–
6. Tenasserim Division	18,918,358	–	–	13	11,542,250	–	14,874,000	–	1,644,839	12,436,800	3,632,434	–
7. Pegu Division	7,059,498	5	–	1,087	3,853,338	–	246,616,436	–	2,886,458	218,880	32,053,337	–
8. Magwe Division	576,733	–	–	2,374	8,300	–	13,091,600	40	514,426	–	949,000	–
9. Mandalay Division	1,530,834	48	2,130,000	28,606	860,000	4	50,366,725	2,388	5,005,299	–	34,412,500	241
10. Mon State	13,072,222	–	–	154	4,427,734	–	35,860,950	–	1,460,463	7,342,270	42,108,130	–
11. Rakhine State	10,445,313	135	497,000	431	7,145,990	–	104,335,630	–	798,057	–	63,821,150	–
12. Rangoon Division	2,465,520	5	–	84	446,200	–	78,079,020	–	1,580,346	–	20,574,500	–
13. Shan State	333,586	19,900	3,120,600	45	9,348,325	47	4,626,160	17	2,430,253	–	6,724,860	4,253
14. Irrawaddy Division	56,615,004	48	–	458	510,000	0.6	248,022,750	–		–	5,019,482	–
TOTAL	116,618,841	26,476	30,895,100	41,940	48,412,990	254.6	886,580,653	2,486.8	41,301,247	23,964,950	224,384,570	4,943

The Distribution Chart of Producing Districts of Vegetable (1982 – 1983)

UNIT: ha

Production / State and Division	Cabbage	Cauli-flower	Carrot	Musterd	Lettuce	Radish	Bottle gourd	Water melon	Tomato	Aspara-gus	Other	Onion	Garlic	Chilli	TOTAL
1. Kachin State	181	113	25	609	13	94	38	32	191	–	1,947	25	92	274	3,634
2. Kayah State	34	23	–	130	5	6	45	–	93	–	763	40	73	159	1,371
3. Karen State	11	10	–	10	7	77	66	235	582	6	2,380	6	–	733	4,123
4. Chin State	157	16	–	239	82	–	6	–	23	–	2,571	59	100	8,404	11,657
5. Sagaing State	1,074	443	2	1,155	66	92	343	491	8,043	–	7,977	2,228	548	2,229	24,691
6. Tenasserim Division	6	34	–	–	1	16	25	32	21	–	602	–	–	172	909
7. Pegu Division	566	693	–	8	32	307	517	2,413	2,888	4	4,047	296	1	4,064	15,836
8. Magwe Division	190	130	6	82	38	26	120	87	4,154	–	1,049	5,122	308	6,402	17,714
9. Mandalay Division	496	572	91	416	35	168	201	168	24,193	–	5,526	10,558	632	28,639	71,685
10. Mon State	57	90	100	29	24	332	179	157	295	–	4,177	–	–	1,421	6,861
11. Rakhine State	79	56	5	12	10	244	137	208	198	–	2,682	144	53	4,502	8,330
12. Rangoon Division	74	122	–	63	61	800	238	821	375	1	3,278	9	1	254	6,096
13. Shan State	2,549	1,443	318	4,089	429	449	153	21	6,909	–	5,464	917	6,263	1,296	30,300
14. Irrawaddy Division	532	438	43	52	179	729	403	432	1,346	45	2,980	800	–	11,053	19,030
TOTAL	6,006	4,183	590	6,894	980	3,340	2,471	5,097	49,311	56	45,443	20,204	8,070	69,592	222,237

The Distribution Chart of Producing Districts of Fruit (1982 – 1983)

Unit: ha

Production / State and Division	Coconut	Orange	Litchi	Plum	Shaddock	Apple	Mango	Grape	Banana	Durian	Lime	Pear	Other Fruit	Total
1. Kachin State	89	526	240	74	25	4	147	0.4	1,159	–	31	23	1,965.6	4,284
2. Kayah State	20	36	3	0.4	2	–	13	–	314	–	0.8	–	48.8	438
3. Karen State	391	68	10	70	200	–	873	–	998	441	517	–	3,670	7,238
4. Chin State	14	524	–	55	83	272	246	14	1,210	–	227	71	610	3,326
5. Sagaing State	1,108	8	23	874	20	–	1,211	–	5,168	–	241	–	1,383	10,036
6. Tenasserim Division	3,887	–	–	15	156	–	245	–	1,728	2,584	75	–	24,727	33,417
7. Pegu Division	984	4	–	282	395	–	6,976	–	2,506	34	1,284	–	23,858	36,323
8. Magwe Division	100	–	–	315	9	–	710	15	715	–	73	–	518	2,455
9. Mandalay Division	467	40	29	1,347	35	13	2,556	376	4,527	–	668	96	2,694	12,848
10. Mon State	2,282	5	–	12	450	–	1,628	–	1,082	1,942	837	–	18,970	27,208
11. Rakhine State	2,697	21	4	111	217	–	2,366	–	1,128	–	471	–	4,146	11,261
12. Rangoon Division	862	0.4	–	77	51	–	4,225	–	1,790	–	556	–	7,097.6	14,659
13. Shan State	80	2,728	64	5	1,368	20	147	15	2,681	–	234	687	3,017	11,046
14. Irrawaddy Division	12,693	13	–	151	55	0.4	7,185	–	16,066	–	533	–	15,160.6	61,855
TOTAL	25,674	3,973.4	373	3,388.4	3,066	309.4	28,526	420.4	41,172	5,001	5,747.8	877	117,865.6	236,394

Utilization of Chemical Fertilizers

NO.	Crops	1978/79	1979/80	1980/81	1981/82 (Provisional actual)	1982/83 (Provisional)
1	Paddy	161,618	173,904	105,330	224,175	262,379
2	Wheat	841	1,331	6,767	7,213	8,187
3	Maize	1,209	1,803	2,890	3,996	5,000
4	Millet			147	442	500
5	Pulses	690	1,509	1,537	2,125	2,073
6	Ground nut	5,532	8,937	9,356	10,647	12,744
7	Sesamum		26	608	3,182	4,000
8	Sunflower	605	995	857	1,636	2,000
9	Palm oil	1,282	709	120	804	953
10	Cotton	3,412	5,449	5,640	5,610	5,700
11	Jute	9,912	7,343	4,528	2,685	5,088
12	Rubber	518	301	841	1,279	2,920
13	Sugareane	3,910	4,769	5,163	5,800	6,277
14	Mulberry	77	97	55	9	13
15	Potatoes	371	352	1,227	1,400	1,600
16	Vegetables	268	331	35	188	200
17	Others	1,976	1,116	1,438	4,519	4,654
	TOTAL	192,221	208,972	246,539	27,910	324,288

(unit: ton)

Utilization of Insecticides

upper row : lbs
lower row : gallons

NO.	Crops	1978/79	1979/80	1980/81	1981/82 (Provisional actual)	1982/83 (Provisional)
1	Paddy, Wheat, Maize	296,636	512,347	367,375	357,303	154,270
		40,057	24,854	34,624	35,036	30,731
2	Millet			17,360	12,047	
3	Pulses	13,884	40,845	4,001	141,463	2,840
		151	1,572	981	2,428	
4	Ground nut	426,095	280,400	578,184	1,032,519	476,178
		5,406	4,579	7,377	14,695	5,061
5	Sesamum	1,422	1,317	4,407	36,835	38,558
		226	225	2,088	6,489	475
6	Sunflower			4,469	27,835	2,325
				209	116	100
7	Cotton	34,547	180,931	175,449	153,146	319,803
		85,672	46,038	40,937	44,239	60,234
8	Jute	1,543	6,935	10,906	4,404	1,264
		1,952	2,300	1,574	2,068	497
9	Sugareane	17,940	60,343	69,773	49,502	66,965
		19	177	108	118	141
10	Potates	2,050	1,500	4,020	2,050	39,500
		18	30	245	1,120	60
11	Vegetables	1,388				1,970
		179	60	235	598	62
12	Others	27,310	45,399	80,628	70,932	48,311
		790	1,614	8,034	3,547	2,143
	TOTAL	822,815	1,130,017	1,116,572	1,888,036	1,161,984
		134,443	81,449	96,349	110,454	99,504

Research Workers of the Horticultural Experimental Farms (Extension Division) No. 1

No.	State & Division	Township	Farms	A G M		F M		D F M		V T M		V M		D V M		Apprentice	
				Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification
1	KACHIN	PUTAO	Malikhu			1	B. Ag.			1	Trained	7	B. Ag 1 + SAHS 3 + Trained 3				
2	KAREN	THANDAUNG	Pathichaung							1	Dip. Ag.						
		THANDAUNG	Thahtaygone					1	Dip. Ag.					1	Trained	1	Dip. Ag.
		THANDAUNG	Nagale									1	Dip. Ag.	1	Trained		
3	CHIN	MINDAT	Bawklwe					1	Dip. Ag.	1	Dip. Ag.	1	Trained			1	Dip. Ag.
		FALAM	Wayluwun							1	Trained						
		FALAM	Lunppi							1	Trained	1	Trained				
		HAKA	Heaithelan			1	Malaysia Trained					2	Trained				
		HAKA	Cawbuk									2	Trained				
4	TENASERRIM	YEBYU	Ayecani							1	Dip. Ag.	2	Dip. Ag				
5	MAGWE	YENANGYAUNG	Pinchaung					1	Dip. Ag.	1	Dip Ag.	4	Trained				
6	MANDALAY	KYAUKPAKAUNG S	Sehank	1	B. Sc (Agri.)	1	B. Ag.	1	B. Ag.	1	Trained	8	Dip. Ag 2+ Trained 6				
		KYAUKPAKAUNG	Popa					1	Trained			5	Trained				
		NYAUNG-U	Nyaung-U					1	B. Ag.	1	Trained	4	Dip. Ag 1+ Trained 3				
		MAYMYO	Dokwin			1	M. Sc (Hortt)	2	B. Ag.	1	Trained	2	Trained			1	B. Ag.
		MAYMYO	Phaungtaw									1	Trained				
		MAYMYO	Paytaung					1	Dip. Ag.	1	B. Ag.	1	Trained				
		MAYMYO	Kyundaing														
		PATHEINGYI	Htonbo					1	B. Ag.			3	Trained				
		NYITTHA	Kinda														
		MAKAYA	*Sedawgyi														

Research Workers of the Horticultural Experimental Farms (Extension Division) No. 2

No.	State & Division	Township	Farms	A G M		F M		D F M		V T M		V M		D V M		Apprentice	
				Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification	Nos	Qualification
7	MON	PAUNG	Kyonka					1	B. Ag.	1	Trained	4	Dip. Ag 2+ Trained 2				
		MUDON	Kangalay					1	B. Ag.			1	Dip. Ag.			4	B. Ag 2+ SAHS 2
		KYAIKHTO	Inkabo					1	Dip. Ag.	1	Trained	3					
8	RANGOON	MINGALADON	Shwenatha					3	B. Ag 1+ Dip. Ag 2	1	Dip. Ag.	5	B. Ag 1+ B. Sc (Bot) 2+ Tr. 1+ SAHS 1			8	B. Ag 2+ Dip. Ag 4+ SAHS 2
		BAHAN	Myay-Pa-day-tha					1	Dip. Ag.			3	B. Sc (Bot) 1+ Trained 2				
		MINGALA–	Kandawgale			1	Dip. Ag					4	B. Sc (Bot) 2+				
		TAUNGNYUNT											Trained 2				
		TAIKKYI	Kanthaya					1	B. Ag.	1	Trained	1	B. Ag.			1	B. Ag.
9	SHAN	TAUNGYI	Namlat			1	Foreign Trained	1	Dip. Ag.			2	Dip. Ag 1+ Trained 1				
		NAUNGCHO	Naungcho					1	Dip. Ag.			2	Trained				
		HSIPAW	Hsipaw						B. Ag.			2	B. Ag1+ Tr. 1				
		KUTKAI	Kutkai							1	B. Ag.	2	Trained				
10	IRRAWADDY	LAPUTTA	Laputta									2	Trained				
		HANZADA	Chinkwin									1	Dip. Ag.				
		MA–UBIN	*Ma-ubin														
11	MANDALAY	MOGOK	*Kyintheyatwek														
	TOTAL			2		6		23		15		76		2		16	

Note: A.G.M. = Assistant General Manager
F.M. = Farm Manager
D.F.M. = Deputy Farm Manager
V.T.M. = Village Tract Manager
V.M. = Village Manager
D.V.M. = Deputy Village Manager
SAHS = Sate Agricultural High School Graduate
* = New Farms to be established
B. Ag = Bachelor of Agriculture
Dip. Ag = Diploma of Agriculture
B. Sc (Bot) = Bachelor of Science (Botany)
M. Sc (Horti) = Master of Science (Horticulture)

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