

CHAPTER 3. THE MAE KLONG PILOT PROJECT

3-1. Present Situation of the Project Area

3-1-1. The Mae Klong District No.1

The Project Area is located in the Tha Maka irrigation district included in the Greater Mae Klong Project, extending in about 400 ha paddy fields along the IL-IR canal. The Area administratively belongs to Tambol Muan-Chum and Tambol Ban Mai in Amphoe Tahmuang, Changwat Kanchanaburi.

The Mae Klong river water is diverted by Vajiralongkorn weir to IR canal and pumped up at the rate of about 1.0 cu,m/s to be conveyed to IR-IL canal. In 1974, the construction works of ditches and dikes had been implemented to improve the terminal water distribution systems in the Mae Klong Area and its vicinity, including eight irrigation ditches provided in the Pilot Project Area.

In the wet season no shortage of the irrigation water takes place, but the river discharge in the dry season can meet quite insufficiently the water requirements to cover its vast irrigation areas. The Ban Chao Nen Reservoir under construction is expected to properly control the river flow when completed within a few years, and produce the good effect to irrigation water supply.

At present, most of the Area (400 ha) is cropped with paddy (355 ha) in the wet season, but the water shortage in the dry season prevents paddy cropping therein. Almost upland field (44 ha) is cropped with sugar cane.

Although seven officials including two extension officers have been assigned to the agriculture extension office in Changwat Kanchanaburi, only one officer to the Amphoe office. Since the two officers in the Changwat office serve concurrently to administrative works, only little

extension services are available at present. The extension services in the Amphoe level have been carried out in the manner to hold meetings from time to time for giving technical guidances to the farmers' groups (37 groups in the Changwat). No intensive guidances in the extension activities have been made in the Project Area to date.

3-1-2. The Mae Klong District No.2

This Area (about 500 ha) is located in the Kampeng Saen irrigation district included in the Greater Mae Klong Project, being bounded by the Tha Sarn drainage canal in the north and the west, and by the Mae Klong left bank main canal in the south.

The 3L canal, which bifurcates from the left bank main canal of the Kampeng Saen irrigation project, runs through the Area longitudinally. The irrigation in the Area, however, is carried out in the plot-to-plot method due to absence of effective terminal irrigation facilities. The present land use of 500 ha contains paddy fields of 340 ha (68%) and upland fields of 140 ha (32%) and the upland field ratio to the paddy field is higher as compared with the other cases. The most of all upland fields are cultivated with sugar cane. No specific agriculture extension services have been carried out just like in the case of the District No.1.

3-2. Approaches

3-2-1. The Scope of the Study

The scope of this study will be limited to the basic plan formulation for the Mae Klong District Irrigated Agriculture Development Project, and the detailed study with final design shall be made by another study team that is scheduled to follow this team.

Agricultural infrastructure consolidation

As the main irrigation and drainage canals are fully provided in the both districts of the Mae Klong No.1 and 2, the study for land consolidation works was taken up in this program.

It may be required, however, to conduct further survey for suitability of function of the existing irrigation and drainage facilities for the irrigated agriculture development program to be proposed.

The deliberate consultation between the Government of Thailand and Japan has concluded that the intensive land consolidation will be applied to the District No.1 and the extensive land consolidation to the District No.2

The so-called intensive land consolidation is made in the same method applied to the Chao Phya Pilot Farm Project that will provide not only the water distribution system to the terminal plots, but also land consolidation to meet the requirement for improvement of farming techniques and of their practical application in the near future. Such intensive way for land consolidation will allow to execute effective water management, to alleviate heavy burden of farming labor and to facilitate the introduction of the farm mechanization.

Contrarily, the extensive land consolidation is made mainly by improvement of terminal water utilization facilities and providing the farm road networks; however, the extensive way of land consolidation is to be designed to be able to turn to the intensive method, if necessity arises in the future.

The construction machineries, which shall be used in the works of the District No.1, are planned to be converted to implementation of the District No.2.

Agriculture supporting services

In the District No.1, the trial farm and model farms will be provided and the experts in various fields will station in the job site to give technical guidances to the farmers. The farmers, who will crop in the District No.2, will be able to learn and apply the results obtained in the trial farm in the District No.1 to improve the farming

works in their own fields, and also the farmers will be able to receive the guidance by the experts servicing in the trial farm in the District No.1 from time to time.

3-2-2. The Mae Klong District No.1

a. Proposed Farming Scheme

Implementation of land consolidation will enable to complete the terminal irrigation facilities which will enable to make an effective water utilization and increase in cropping acreage in the dry season.

The Project aims to increase in unit yields and in a land use ratio for expansion of the agricultural productivity. The varieties of paddy, the main crop to be introduced in the Area will be those which have high response to fertilizers, short stalk, non-photosensitivity and short maturing period. In order to realize the proposed yield with new varieties, it is required to employ the improved cropping pattern and to dose the fertilizers and agri-chemicals reasonably.

In the proposed land use, the paddy will be centered in the program in consideration of the present land use in the Area. The proposed cropping pattern was designed as following four types:

- 1) Paddy double cropping
- 2) Paddy cropping in the wet season and upland cropping in the dry season
- 3) Sugar cane cropping
- 4) Upland cropping all the year round

In most of the paddy fields, the paddy double cropping (type 1) will be introduced, but in about 10 percent of the paddy fields, and type 2 will be introduced to meet the requirement for crop diversification. The pulse will be cropped as the secondary crop to promote

the soil fertility. For the year-round upland cropping, rotational multi-cropping will be carried out with vegetables (cucumbers and so forth), including the pulse. The upland irrigation will function effectively for the dry season cropping.

Proposed Land Use (ha)

<u>Land Category</u>	<u>Without Project</u>	<u>With Project</u>
Paddy fields	355.0	332.0
Upland fields	45.0	43.0
Sugarcane	(44.0)	(42.0)
Vegetables	(1.0)	(1.0)
Sub-total	400.0	375.0
Plots for facilities	-	3.6
Public lands	-	21.4
Sub-total	-	25.0
Total	<u>400.0</u>	<u>400.0</u>

b. Land Consolidation Scheme

The intensive land consolidation will be executed and the detailed design will be made by the another study team as mentioned in 3-2-1.

Being the case as such, this study will formulate the basic plan of the land consolidation in the District on the basis of the results obtained from the study in the Chao Phya Pilot Farm Project. Size of plot (160m x 50m), unit farm land (19.2 ha), layout of farm roads and ditches that are designed in the Chao Phya case will be all applicable to this scheme as the fundamental plan.

The different topographical condition of the Districts from the Chao Phya Project Area is that the area along the IR canal elevates higher in gradient toward east at 1/2,000 slope on an average, although the Chao Phya Project extends almost flat. Under such conditions, the diversion from the lateral canals to the ditches will be available only in one direction which will require to provide more lateral canals for

irrigation and drainage as compared with the Chap Phya case, while in the Chao Phya area the diversion in both direction is possible. Another different point from the Chao Phya case is that there have already existed the water sources in the upper reach of the Mae Klong Area.

For a consideration of the topographical conditions of the District No.1, the plot-layout was made as shown in FIGURE III-1. At present, the diversion works are provided at 300 m interval along the IR canal; however, the existing diversion works shall be integrated into two for concentrated water-intake control available.

c. Agriculture Supporting Services

The trial farm and model farms will be constructed and the necessary experts will station in the job site for rendering agriculture supporting services as well as in the Chao Phya case. The trial farm will be available to execute application tests of improved farming techniques in the Suphan Buri Experiment Station. And also the extension officers and selected farmers will be trained in the Suphan Buri Training Center.

The experimental studies in the trial farm will be the application test of the improved techniques to local conditions for paddy double cropping and others; mainly 1) farming practices of paddy transplanting and upland crops, 2) plant protection from damages by birds, animals, insects and diseases, 3) water control, and 4) farm mechanization.

Among the trained farmers in the Center, three farmers, who will be qualified to do the improved farming, shall be selected to manage the model farms which will be given conveniences in supply of necessary fertilizers, agri-chemicals, and farming equipments for facilitating the execution of the new farming practices. The experts assigned in the job site will be in a position to give guidance for preparation of cropping schedule and management upon request of the farmers.

The following farmers' organizations will be necessary for effective execution of the improved farming in the District where the land consolidation is to be implemented. The intensified guidance will be given to the related farmers by the staff of organization concerned and experts for the purpose.

- Promotion of land consolidation
- Strengthening the extension services and farmers training
- Rationalization of water management and farm management
- Supply of agricultural inputs
- Collection, storage, processing and marketing of the farm products
- Establishment of crediting system and promotion of accumulation of owned capital by farmers

3-2-3. The Mae Klong District No.2

a. Farming Scheme and Agriculture Supporting Services

The main crops in the District No.2 are paddy and sugar cane. The land use will remain unchanged as what it is; paddy fields (322 ha) and upland fields (153 ha). The three types of cropping will be expected in the future; that is, 1) paddy double cropping, 2) paddy cropping in the wet season and upland cropping in the dry season, and 3) sugar cane cropping.

Most of the paddy fields will be cultivated with paddy in double cropping (type 1), and the type 2 will be introduced into about 10 percent of the paddy fields with pulse growing as main secondary crop, and other upland crops. The irrigation in the dry season will produce good effect to yield increase.

The current technical cooperation program includes no plan to provide the trial farm and the model farm in the District No.2. Then, the farmers in this District shall utilize the related facilities to be provided in the District No.1. The Thai extension officials, therefore,

should play an important role in the agricultural supporting services for the farmers in the District, and also the experts stationing in the District No.1 will be in a position to render services to the farmers in this District upon their request.

b. Land Consolidation Scheme

The extensive land consolidation to be implemented in this District will aim at the followings;

- To facilitate the exchange and consolidation of farm lands
- For every farm plot to face the farm roads
- To provide irrigation and drainage ditches with every farm plot
- To make the water control possibly simplified and easy
- To arrange the farm plots and roads suitable for partially mechanized farming and animal power farming
- To eliminate the surface water

The following studies were made for successful accomplishment of the purpose.

Dimensions of the farm plot

The width of plot was suitably determined by 50 m, the same length of that in the Chao Phya case, owing to little restriction by topography. The effect of the length of run, which affect the land consolidation works and farming practices, will be conceptionally defined as follows; (In the extensive approach the width of plot, 80 m, is equivalent to the half of the length of run, 160 m, in the intensive approach.)

Effect by Variance of Plot Dimensions

<u>Plot Dimensions (m)</u>	<u>200 x 50</u>	<u>160 x 50</u>	<u>100 x 50</u>	<u>80 x 50</u>
Volume of Land Grading	Large	← Medium	→	Small
Public Use Land	Small	← Medium	→	Large
Water Management	Difficult	←	→	Easy
Efficiency of Farming Machines	High	←	→	Low
Levelling Works	Difficult	←	→	Easy

When the land consolidation is executed based on the existing farm plots, exchange of farm lands may be comparatively facile; however, some problems as below will be pointed out in the case.

- 1) The different dimensions of plots will be a bottleneck for efficient water control.
- 2) So far as the sample area, 170 ha, is concerned, the length of run of many plots runs in the same direction as the topographical inclination. This will make it difficult to keep evenly the depth of the water in one unit farm plot.

Farm ditches

There are two ways of laying out for the farm ditches; the one is to provide the ditches on both sides of the farm roads, and the other is to construct one ditch on one side of the farm road and the diversion works installed to convey waters across the roads to the opposite plot. The comparative study on the construction costs for the both cases revealed that the cost for the former case was roughly estimated not lower than that in the latter.

The one-sided ditch system will be employed in the Project in taking account the easiness of road maintenance and convenience in farming works.

Access road to the farm plots

Access roads to farm plots from the farm roads, crossing the ditches, will facilitate to move the farming machineries.

Since, however, the extensive land consolidation, employing small size farming machineries provides no specific access road, the farmers should use wooden plotes for bridging over the ditches as temporary facilities.

Pavement of community roads

No pavement of the branch roads will be required for the traffics by small-size farming machineries animal-drive equipments, etc.

General idea on the extensive land consolidation

The extensive approach to the land consolidation, which will cost economically and allow the efficient water control available, is summarized as follows.

In this case, the land grading works should be applied to the farm plots only that may be difficult in water intake under the designed irrigation system and plot-reparcelling.

Dimensions of plot :	160 m x 50 m (0,8 ha)
Farm road :	width 3.0 m, height 0.4 m
Community road :	width 4.0 m, height 0.6 m

3-2-4. Buildings and Facilities

In implementation of the Technical Cooperation for the Irrigated Agriculture Development Project in the Mae Klong District No.1, the temporary field office, lodging accommodation for the experts staying in the site, the trial farm will be provided in the same way as planned in the Chao Phya case.

a. Temporary Facilities

i) Location

A part of the accommodation that has been provided for the construction works of Vajiralongkorn Dam, will be available for the temporary field office for this Technical Cooperation Project. The relevant accommodation is equipped with the complete supply and disposal systems with considerably vast plot of ground provided for further buildings constructions. The proposed lodging accommodation for experts will be constructed in the said plot for their convenience, accordingly.

ii) Transportation and communication

The means of transportation and communication in the District is well provided, so that the transportation between the office and the job-site can be made by land, and the smooth communication will be available with present facilities.

iii) Supply and disposal systems

As previously mentioned, the supply and disposal systems are completely equipped in the plot of the existing facilities, and the lodging accommodation should be constructed in appropriate location in consideration of the present arrangement of the systems.

iv) Architecture

Temporary field office

The part of existing office building as mentioned above, will be used for the temporary field office with some interior modeling.

Lodging accommodation for experts

The experts to be assigned to the Project, who will have residences in Bangkok as those to the Chao Phya Project, should make services in the job site for the week-days, and the lodging accommodation in job site should be provided for the purpose. If, however, some of the accommodation, which is under construction (completion in 1977) by

the Thai Government in the Vajiralongkorn Dam site for the officials assigned thereto, will be able to be offered to the experts of the Mae Klong Project. There will be no need to provide the new lodgings specially for the Project accordingly.

b. Trial Farm

i) Location

The trial farm, the location of which is suitably selected at the north-west corner of the District No.1 along the IR-II canal, will be constructed. In the trial farm lot, about ten hectares for facilities will be selected along the IR-II canal in the viewpoint of a accessibility from roads.

ii) Supply and disposal systems

Water supply

An artesian well will be provided as a water source to utilize the ground water.

Power supply

High voltage power is distributed to the existing pumping station about six kilometer northwest from the proposed Project site. If the existing supply line have surplus capacity of about 100 KVA, the power source of the Project facilities in the trial farm will be able to rely on these existing supply source. The necessary construction cost to provide the distribution line (about 6 km) was estimated roughly at one million Baht, which will be nearly the same amount, about 1.1 million Baht to cost for construction of the new generating plant with capacity of 100 KVA. As the new generating plant will be uneconomical in taking into account the running cost of equipment, the power supply shall advantageously rely on the existing distribution system under the condition of its surplus power available.

iii) Buildings

The functions and scale of the trial farm shall be almost the same as the Chao Phya case; and then, the necessary buildings and the related facilities will be the same as those in the Chao Phya as well.

FIGURE III-1.

PLANNING MAP OF MAEKLONG NO.1 PILOT PROJECT AREA
S=1:16,000

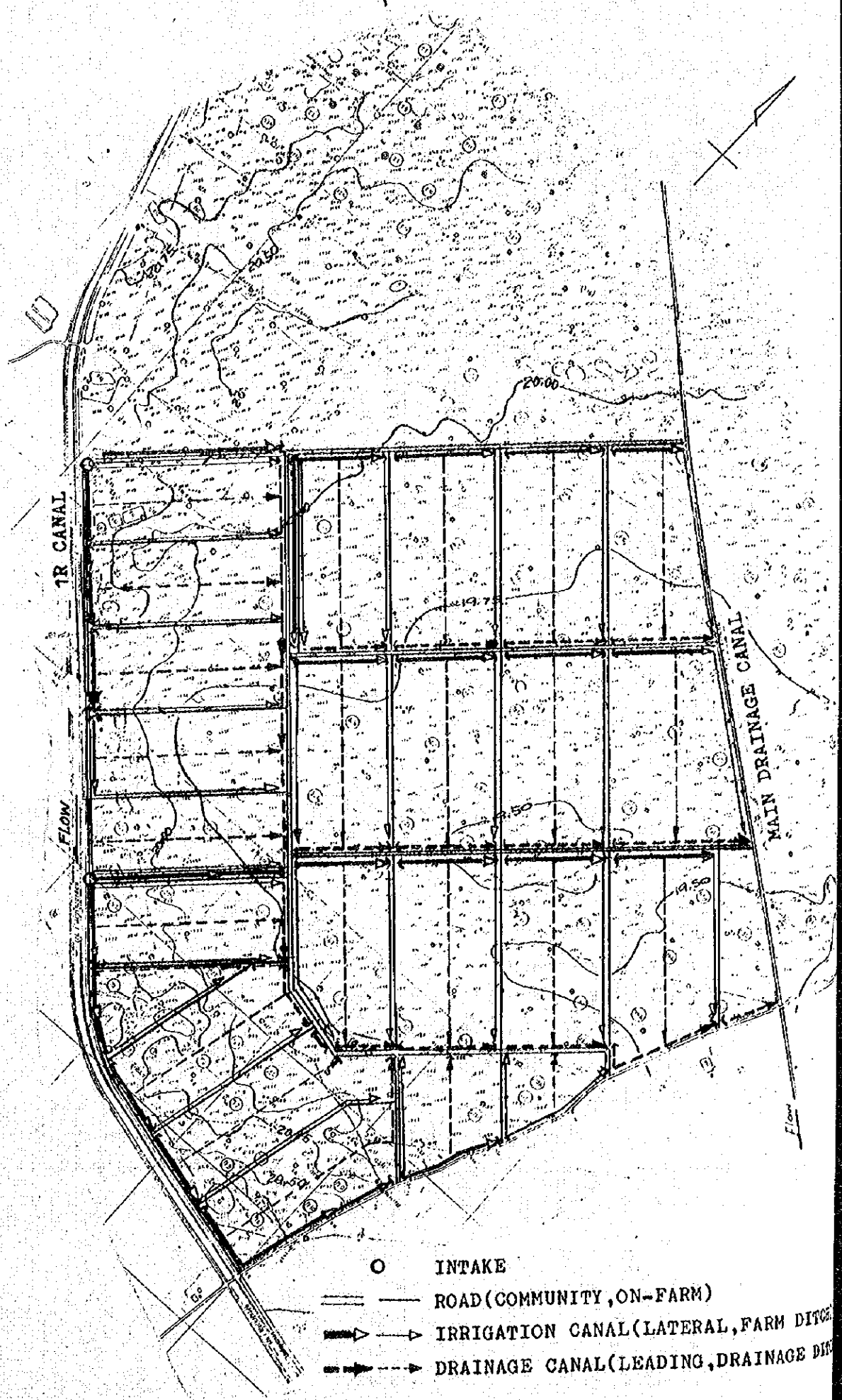
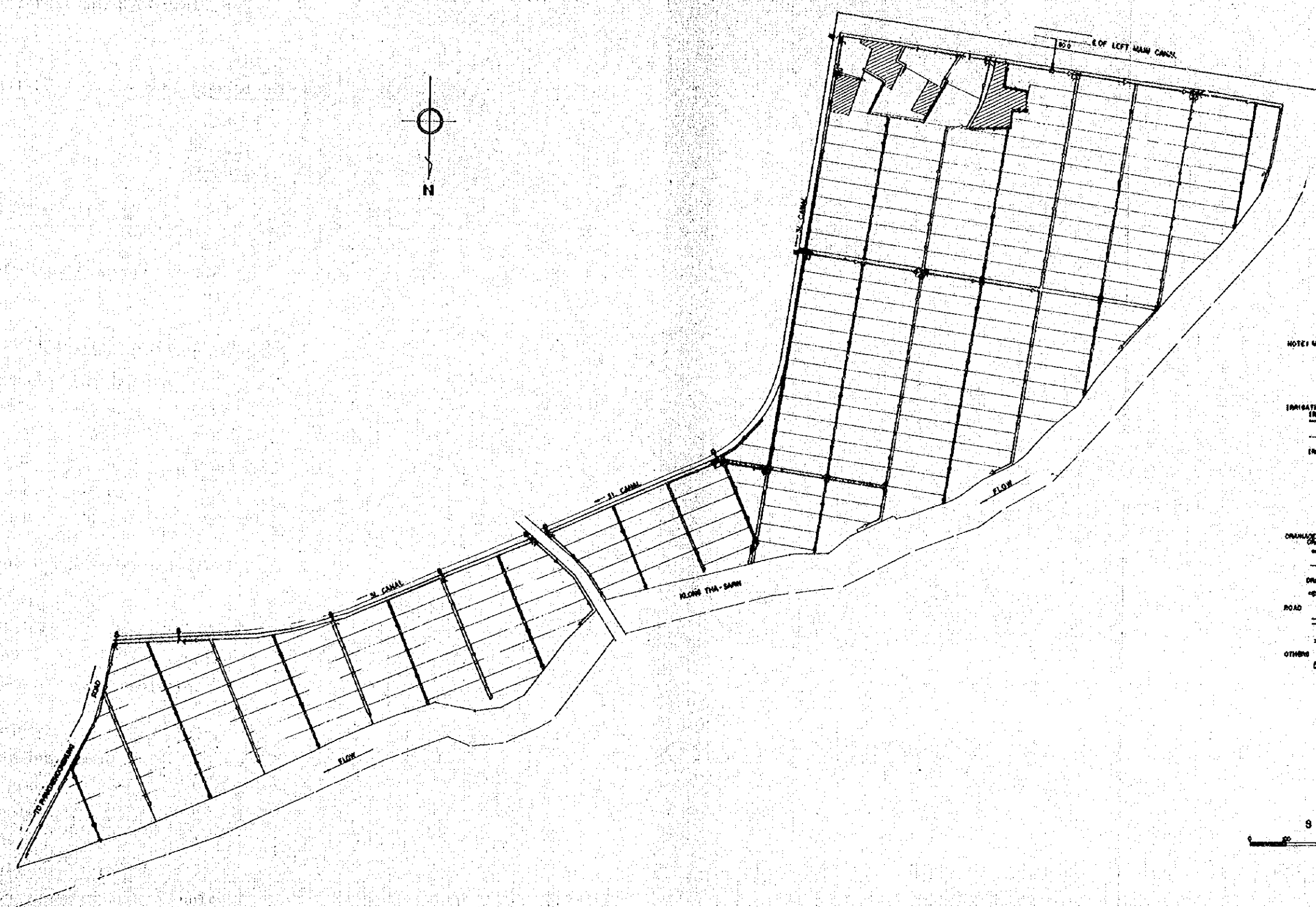


FIGURE III-2.

PLAN OF MAE KLONG NO2 PILOT PROJECT

8 = 12,000



NOTE: MAP SHOWS SAMPLE AREA (1/7TH)

LEGENDS

- IRRIGATION
 - IRRIGATION CANAL
 - LATERAL CANAL
 - FARM DITCH
- IRRIGATION FACILITIES
 - TURN OUT
 - INLET
 - CROSS CULVERT
 - CONTROL WEIR
- DRAINAGE
 - DRAINAGE CANAL
 - LEADING DRAINAGE
 - DRAINAGE DITCH
- DRAINAGE FACILITIES
 - DRAINAGE CULVERT
- ROAD
 - COMMUNITY ROAD
 - ON-FARM ROAD
- OTHERS
 - HOMESTEAD

SCALE

8 = 1:12,000



3-3. Machineries and Equipments

TABLE III-1. Provisional List of Machineries and Equipment

Items	Total Quantity	Fiscal Year (Japan)				
		1977	1978	1979	1980	1981
<u>1. Project Administration</u>						
Vehicles	unit 2		2			
Meteorological recorder	L.S. 1			1		
Stationaries	" 1		1			
<u>2. Agricultural Infrastructure Development</u>						
<u>2-1. Construction Machineries</u>						
Bulldozer	140 PS unit 6		2	2	2	
Backhoe	60 PS " 2		1	-	1	
Scrapedozer	6.4 cu.m " 2			1	1	
Motor grader	125 PS " 1			1		
Water truck	6 ton " 1			1		
<u>3. Agricultural Supporting Services</u>						
<u>3-1. Trial Farm</u>						
<u>(Indoor Training)</u>						
Calculator	unit 5		3	1	1	
8mm movie camera and projector	" 1			1		
Slide projector	" 1			1		
Blue print instrument	" 1		1			
Cylinder press	" 1		1			
Tape recorder	" 1			1		
Microphone	" 1			1		
<u>(Indoor Trial)</u>						
Microscope	unit 2			1	1	
Binocular microscope	" 2			1	1	
Thermo-controll equipment	" 3			3		

Item	Total Quantity	Fiscal Year (Japan)				
		1977	1978	1979	1980	1981
Refrigerator	unit 2		1		1	
Balance	" 4		2	2		
Moisture meter	" 2		1	1		
Air conditioner (Seed storage)	" 2		2			
Humidifier (Seed storage)	" 2		2			
(Field Trial and Training)						
Trucktor 30HP	unit 2			1	1	
Trucktor attachments	L.S. 3			1	1	1
Power tiller	unit 2			2		
Power attachments	L.S. 3			1	1	1
Rice planter	unit 5			3	1	1
Combine harvester	" 5			1	2	2
Pest control equipment	" 5			2	2	1
Winnowing	" 1			1		
Thresher	" 1			1		
Rice mill equipment	" 2			1	1	
Pump for irrigation	" 5			2	2	
Cargo truck	" 2				1	1
Cargo truck with crane	" 1				1	
Workshop equipment	L.S. 1				1	
Fertilizer	t 20.4			5.1	7.7	7.6
Agri-chemicals	100kg			4.7	6.8	6.9
(Public Utility)						
Pump	unit 3			3		
3-2. Model farm						
Trucktor 30 PS	unit 3				1	2
Power tiller	" 3				1	2
Fertilizer	t 2.8					2.8
Agri-chemicals	kg 200					200

3-4. Estimated Project Cost

TABLE III-2. Project Cost

(unit: 1,000¥)

Items	Total Cost	Fiscal Year				
		1977	1978	1979	1980	1981
<u>The District No.1</u>						
1. Land Consolidation	4,050	-	540	1,620	1,890	-
2. Construction Machinery	(15,274)	-	(3,230)	(6,511)	(5,533)	-
	19,091	-	4,037	8,138	6,916	-
3. Agricultural Supporting Services						
<u>Trial farm</u>						
Civil and architecture	6,000	-	3,000	3,000	-	-
Equipemnt	(5,108)	-	(15)	(1,361)	(2,632)	(1,100)
	5,673	-	16	1,526	2,905	1,226
Model farm	(684)	-	-	-	(437)	(247)
	752	-	-	-	480	272
	(5,792)	-	(15)	(1,361)	(3,069)	(1,347)
Sub-total	12,425	-	3,016	4,526	3,385	1,498
4. Project Administration						
Temporary facilities	600	-	600	-	-	-
Materials and equipment	(533)	-	(400)	(133)	-	-
	641	-	481	160	-	-
Managerial expense	11,093	-	1,131	3,383	3,637	2,942
	(533)	-	(400)	(133)	-	-
Sub-total	12,334	-	2,212	3,543	3,637	2,942
	(21,599)	-	(3,645)	(8,005)	(8,602)	(1,347)
Total	47,900	-	9,805	17,827	15,828	4,440
<u>The District No.2</u>						
1. Land Consolidation	1,830	-	-	-	730	1,100
2. Project Administration	570	-	-	-	230	340
Total	2,400	-	-	-	960	1,440
	(21,599)	-	(3,645)	(8,005)	(8,602)	(1,347)
Grand total	50,300	-	9,805	17,827	16,788	5,880

Note: Figures in parentheses show the foreign currency component and are included in the total figures.

CHAPTER 4. SUPHAN BURI TRAINING CENTER AND PROJECT CENTER

4-1. Suphan Buri Training Schedule

The purpose of the Suphan Buri Training Center Program is to train the related government officials to the irrigated agriculture development projects in the effective utilization of the facilities of the Suphan Buri Rice Experiment Station and the study results accumulated thereby.

Since 1973, the Suphan Buri Rice Experiment Station has conducted the study on the intensive utilization of land and water in paddy cropping under the closest cooperation with Japanese experts, as a nucleus of the research on rice cultivation.

The Suphan Buri Training Center shall function as the integrated training center of the officials of the related government organization to the irrigated agriculture development, such as Department of Agriculture Extension, Department of Agriculture, Royal Irrigation Department, Agricultural Land Reform Office, Central Land Consolidation Office, Department of Land Development, and Office of Acceleration of Rural Development, and aims to give training to about 700 officials during five years. In 1977, the building construction, the introduction of necessary machines and equipments for training will be completed, so that the establishment of general training schedule may be realized. The training will be started in 1978 to last five years up to 1982.

The operation and management of the Center will be executed by Technical Division of Department of Agriculture under the cooperation of Rice Division and other divisions concerned. Staffing for the training center was planned to place 27 officers including 14 existing staff and 13 expected new appointees.

The outline of the training will be as follows:

The first year

The training will be given to those officials dispatched from Department of Agriculture, Royal Irrigation Department, Department of Agriculture Extension, Agricultural Land Reform Office, and Office of Acceleration of Rural Development for upbringing of lectures to educate farmers on effective diffusion of farming techniques. The major subjects will be 1) Irrigation and water management, 2) Growing crops, 3) Crop protection, 5) Meteorology, 6) Social study, etc.

The training will have two sessions in a year, one session lasting five months, and the participants (30 persons for the session) should be the university or college graduates.

The second through the third year

The training will be given to the extension officers (Department of Agriculture Extension), and farmers' foremen. The major subjects will be almost the same as those in the First Year, but be more practical and applicable. The qualification of the participants should be restricted to those who have graduated from vocational schools. One training course should last five months and two courses will be available in a year. In each course, 45 persons will be participated and 180 persons will be trained through for two years.

The fourth through fifth year

The trainings shall be classified into two; the in-service training and the short term training. The participants of the in-service training, the extension officers and farmers' foremen, will be trained on irrigation and water control, multiple cropping, and rice cultivation. The five-month training course will be held two times in a year. In each course, 45 persons will be participated and 180 persons will be trained through for two years.

The short-term training will be held for zonemen (Royal Irrigation Department) and those farmers who positively engage themselves in farming works. The subjects will be such practical ones as plowing, puddling, water control, O & M of farming machines and crop protection. The training will be given intensively for two weeks and 45 persons will be participated in respective course and 270 persons will be trained through for one year.

4-2. Project Center

The project center will be established in Bangkok as the headquarters to conduct managerial and coordinating works in order to promote smooth and effective implementation of three sub-projects, Chao Phya Pilot Project, Mae Klong Pilot Project and Suphan Buri Training Project.

4-3. Materials and Equipment

TABLE IV-1. Provisional List of Materials and Equipment
(Suphan Buri Center)

<u>Items</u>	<u>Total</u> <u>Quantity</u>	<u>Fiscal Year (Japan)</u>				
		<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
<u>1. Project Administration</u>						
Vehicles	unit 1		1			
Stationeries	L.S. 1		1			
<u>2. Agricultural Supporting Services</u>						
<u>2-1. Indoor Training</u>						
Dry Oven with Ventilator	unit 4		2	1		1
Balance	" 16		8	8		
Moisture meter	" 1		1			
Photography equipment	L.S. 1			1		
Calculator	unit 5		3	2		
8mm movies camera and projector	L.S. 1			1		
Tape recorder	unit 1			1		
Draft chamber	" 1					1
Thermo control equipment	" 1			1		
Microscope	L.S. 3		1	2		
Binocular microscope	" 3		1	2		
Microphone	" 1		1			

Items	Total Quantity	Fiscal Year (Japan)				
		1977	1978	1979	1980	1981
2-2. Outdoor Training						
Insect collect equipment	L.S. 2		1	1		
Soil hardness meter	unit 2		1	1		
Handy microphone	" 4		2	2		
Microbus	" 1					1
Jeep type car	" 1					1
Generator	" 4			2	2	
2-3. Field Training						
Trucktor	unit 2		1			1
Trucktor attachment	L.S. 2		1			1
Power tiller	unit 2		1	1		
Power attachment	L.S. 1		1	1		
Rice planter	unit 4		2	2		
Combine harvester	" 2		1			1
Pest control equipment	unit 4		2	2		
Irrigation pump	" 4		2	2		

TABLE IV-2. Provisional List of Materials and Equipment
(Project Center)

Items	Total Quantity	Fiscal Year (Japan)				
		1977	1978	1979	1980	1981
Project Administration						
Vehicles	unit 2	2				
Stationeries	L.S. 1	1				

4-4. Estimated Project Cost

TABLE IV-3. Project Cost for Suphan Buri Training Center

Item	Total Cost	(unit: 1,000฿)				
		Fiscal Year				
		1977	1978	1979	1980	1981
1. Material and Equipment	(492)		(171)	(265)	(56)	
Indoor training	544	-	189	293	62	-
Outdoor training	(455)		(52)	(52)	(351)	
Field training	528	-	59	59	410	-
Total	(1,348)		(674)	(203)	(471)	
Total	1,550	-	770	240	540	-
Total	(2,295)		(897)	(520)	(878)	
Total	<u>2,622</u>	-	<u>1,018</u>	<u>592</u>	<u>1,012</u>	-
2. Project Administration	(230)		(230)			
Material and equipment	253	-	253	-	-	-
Manegetrial expense	4,325	-	-	1,442	1,442	1,441
Total	(230)		(230)			
Total	<u>4,578</u>	-	<u>253</u>	<u>1,442</u>	<u>1,442</u>	<u>1,441</u>
Total	(2,525)		(1,127)	(520)	(878)	
Grand Total	<u>7,200</u>	-	<u>1,271</u>	<u>2,034</u>	<u>2,454</u>	<u>1,441</u>

Note: Figures in parentheses show the foreign currency component and are included in the total figures.

TABLE IV-4. Project Cost for Project Center

Item	Total Cost	(unit: 1,000฿)				
		Fiscal Year				
		1977	1978	1979	1980	1981
1. Material and Equipment	(400)	(400)				
Total	441	441	-	-	-	-
2. Administration	3,659	226	579	618	618	618
Total	(400)	(400)				
Total	<u>3,100</u>	<u>667</u>	<u>579</u>	<u>618</u>	<u>618</u>	<u>618</u>

Note: Figures in parentheses show the foreign currency component and are included in the total figures.

CHAPTER 5. PLAN OF TECHNICAL COOPERATION

The plan of technical cooperation for irrigated agriculture development in Thailand will be realized along with the guideline confirmed in the mutually signed Record of Discussions on April 8, 1977, and the draft implementation schedule was shown in 5-2,

5-1. Record of Discussions

ON THE RECORD OF DISCUSSIONS BETWEEN THE JAPANESE AGRICULTURAL SURVEY TEAM AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THAILAND CONCERNING TECHNICAL CO-OPERATION PROJECT ON THE IRRIGATED AGRICULTURE DEVELOPMENT IN THAILAND

The Japanese Agricultural Survey Team, organized by the Japan International Cooperation Agency and headed by Michio Nakahara, visited Thailand from February 13 to April 13, 1977, for the purpose of formulating concrete co-operation plans for the Technical Co-operation Project on the Irrigated Agriculture Development which will be carried out with the Chao Phya Pilot Project, the Mae Klong Pilot Project and the Suphan Buri Rice Experiment Station and Training Center for the Irrigated Agriculture Development as its cores.

During its stay in Thailand, the Team exchanged views with the authorities concerned of the Government of Thailand on the necessary measures to be taken by both Governments to successfully implement the Technical Co-operation Project on the Irrigated Agriculture Development in Thailand. The Team also conducted necessary survey for the implementation of the Project.

As a result of the exchange of views and survey, both parties agreed to recommend to their respective Governments to carry out the matters referred to in the Record of Discussions.

Bangkok, April 8, 1977

Mr. Michio Nakahara
Head of the Japanese Agricultural
Survey Team
Japan International Cooperation Agency

Mr. Prida Karnasut
Under-Secretary of State
Ministry of Agriculture and
Cooperatives

in the presence of

Mr. Xujati Pramoolpol
Director-General
Department of Technical
and Economic Cooperation

RECORD OF DISCUSSIONS

- I. (1) Both Governments will co-operate with each other in implementing the Technical Co-operation Project on the Irrigated Agriculture Development in Thailand (hereinafter referred to as "the Project") with the Chao Phya Pilot Project, the Mae Klong Pilot Project and the Suphan Buri Rice Experiment Station and Training Center for the Irrigated Agriculture Development (hereinafter referred to as "the Suphan Buri Station") as its cores. The Project aims at contributing to the promotion of land consolidation, the improvement and extension of agricultural production technology, the development and strengthening of farmers' organization and other related activities which will be necessary for increase of rice yield and expansion of multi-cropping area.
 - (2) The Project will be implemented in accordance with the Master Plan as stipulated in Annex I.
 - (3) The Project will be implemented under the supervision and direction of the Project Director referred to in VIII.
 - (4) The Project will be implemented in accordance with the annual operational work plan to be formulated annually by the Joint Committee referred to in X. The annual plan will be submitted to the authorities concerned of both Governments for their approval.
- II. (1) In accordance with laws and regulations in force in Japan, the Japanese authorities concerned will take necessary measures to provide at their own expense the services of the Japanese experts as listed in Annex II through the normal procedures under the Colombo Plan Technical Co-operation Scheme.
 - (2) The Japanese experts referred to in (1) above and their

families will be granted in Thailand the privileges, exemptions and benefits no less favourable than those accorded to experts of third countries working in Thailand under the Colombo Plan Technical Co-operation Scheme.

III. (1) In accordance with laws and regulations in force in Japan, the Japanese authorities concerned will take necessary measures to provide at their own expense such equipment, machinery, implements, vehicles, tools, spare parts and other materials required for the implementation of the Project as listed in Annex III through the normal procedures under the Colombo Plan Technical Co-operation Scheme.

(2) The articles referred to in (1) above will become the property of the Government of Thailand upon being delivered c.i.f. to the Thai authorities concerned at the ports of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese Team Leader referred to in Annex II.

IV. (1) A part of the goods referred to in III (1) may be rented at reasonable rates to farmers in areas to be decided after mutual consultations between the authorities concerned of both Governments and a part of consumable items such as fertilizer, agricultural chemicals, etc. may also be transferred at reasonable prices to the farmers in the above-mentioned areas.

(2) The proceeds from such rentals or transfers will be used exclusively for the implementation of the Project in accordance with laws and regulations in force in Thailand.

(3) The provisions of (1) and (2) above will be applied in accordance with the annual operational work plan referred to in I (4) above, and there will be close consultations between the

Japanese Team Leader referred to in Annex II and the Thai Project Director referred to in Annex IV as regards their application.

V. (1) In accordance with laws and regulations in force in Japan, the Japanese authorities concerned will take necessary measures to receive the Thai personnel engaged in the Project for technical training or study tour in Japan through the normal procedures under the Colombo Plan Technical Co-operation Scheme.

(2) The Government of Thailand will take necessary measures to ensure that the knowledge and experience acquired by the Thai personnel mentioned in (1) above through technical training and study tour in Japan may be utilized effectively for the implementation of the Project.

VI. The Government of Thailand will take necessary measures to provide at its own expense:

(1) the services of the Thai counterparts and other personnel as listed in Annex IV;

(2) land and buildings as listed in Annex V as well as incidental facilities;

(3) supply or replacement of equipment, machinery, implements, vehicles, tools, and spare parts, and any other materials necessary for the implementation of the Project other than those provided by the Japanese authorities concerned under III (1);

(4) suitably furnished housing accommodations for the Japanese experts and their families;

(5) transportation facilities and the grant of the travel allowance for the Japanese experts for the official travel within Thailand.

VII. The Government of Thailand will take necessary measures to meet:

(1) expenses necessary for transportation within Thailand of the articles mentioned in III (1) as well as for the installation, operation and maintenance thereof;

(2) all running expenses necessary for the implementation of the Project;

(3) customs duties, internal taxes and any other charges, imposed in Thailand in respect of the articles referred to in III (1).

VIII. The Government of Thailand will appoint the Project Director who will be responsible for the administration and implementation of the Project, and the Japanese experts will provide primarily technical guidance and advice for the implementation of the Project.

IX. The Government of Thailand shall undertake to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with, the discharge of their official functions in Thailand, except for those claims arising from willful misconduct or gross negligence of the Japanese experts.

X. There will be close consultation between the Japanese experts and the officials concerned of the Government of Thailand for the smooth promotion and effective implementation of the Project. For this purpose, a Joint Committee will be established as specified in Annex VI. The joint Committee will meet at least once a year.

XI. For the successful implementation of the Project, both Governments will consult with each other when deemed necessary.

XII. The period of the technical co-operation mentioned in this Record of Discussions will be five (5) years: from the date of signature and co-operation thereafter will further be consulted between the authorities concerned of both Governments.

Annex I. Master Plan of the Project

The Project consists of the Project Center and three sub-projects, namely Chao Phya Pilot Project, Mae Klong Pilot Project and Experiment and Training Project, in order to promote the Irrigated Agriculture Development Plan in an integrated and effective manner.

1. The Project Center

The Project Center will be established in Bangkok and will function as the headquarter.

The activities of the Center are as follows:

- (1) To give necessary technical advices for planning and implementation of the Irrigated Agriculture Development Plan in the Lower Greater Chao Phya Basin and the Greater Mae Klong Basin, centering around the pilot areas in respective Basins;
- (2) To conduct managerial and coordinating works in order to promote smooth and effective implementation of three sub-projects.

2. The Chao Phya Pilot Project

The Chao Phya Pilot Project of about 500 ha for agricultural development of the flood irrigation area will be set up in Tambol Phraya Banlu, Amphoe Lat Bua Luang, Changwat Ayutthaya.

3. The Mae Klong Pilot Project

The Mae Klong Pilot Project (No. 1) of about 400 ha and the Mae Klong Pilot Project (No. 2) of about 500 ha will be set up in Tambol Maungchum and Banmai, Ampoe Tha Muang, Changwat Kanchanaburi and in Tambol Taklamen, Amphoe Tha Maka, Changwat Kanchanaburi respectively

for agricultural development by means of multi-cropping.

The activities of the Pilot Projects mentioned in 2 and 3 above are as follows:

- (1) To plan and execute the improvement works of the agricultural physical infrastructure, such as field rearrangement, farm roads, irrigation and drainage facilities and empoldering dikes (as required in Chao Phya), in each pilot area;
- (2) To advise on technical matters to farmers in the pilot areas and staff concerned for effective water management;
- (3) To conduct trials with improved agricultural techniques of rice cultivation mainly at the trial farm of about 10 ha;
- (4) To provide training and guidance to farmers in the pilot areas and their vicinities on improved agricultural techniques;
- (5) To introduce and demonstrate improved agricultural techniques at a few model farms which will be selected in the pilot areas;
- (6) To foster and strengthen farmers' organizations for water management, joint co-operative activities for distribution of agricultural materials, collection and forwarding of agricultural products and other activities necessary in the pilot areas including their vicinities when necessity arises.

The implementation of the Mae Klong Pilot Project (No. 2) will be of extensive method.

4. Experiment and Training Project

The activities of the Suphan Buri Station located in Tambol Rua Yai, Amphoe Muang, Changwat Suphan Buri are as follows:

To conduct experiments and training on improved agricultural techniques for the successful implementation of the Irrigated Agriculture Development in the pilot areas and their vicinities.

The experiment mentioned above will be primarily carried out by the Government of Thailand and the trainees will be agriculture officers and staff concerned.

Annex II. List of Japanese Experts

<u>Category</u>	<u>Field</u>
1. Team Leader	
2. Experts and associated experts	Irrigation and Drainage Land Consolidation Agricultural Economy Agricultural Machinery Agronomy Extension Water Management
3. Liaison Officer	

- Note:
1. Team Leader, a land consolidation expert, an agricultural economy expert and a liaison officer will be attached to the Project Center.
 2. A sub-leader will be nominated from among experts in each sub-project.
 3. The number of long term experts including a few associated experts to be dispatched concurrently will not exceed 20 persons in total.
 4. Some additional short term experts in the fields mentioned above as well as others may also be dispatched when necessity arises.

Annex III. Articles to be provided by the Government of Japan

1. Construction machinery and equipment, including pumps and their accessories, and their spare parts.
2. Agricultural machinery and implements and their spare parts.
3. Fertilizer and agricultural chemicals.
4. Machines and tools for repair work.
5. Equipment, instruments, tools, their spare parts and other materials for experiment.
6. Equipment and materials for public utilities.
7. Vehicles and motor boats.
8. Teaching materials including audio-visual aids.
9. Other necessary equipment, tools, and materials to be mutually agreed upon for the effective implementation of the Project.

Annex IV. List of Thai Counterpart Officials and Other Personnel

<u>Category</u>	<u>Field</u>
1. Project Director	
2. Counterpart Officials	Irrigation and Drainage Land Consolidation Agricultural Economy Agricultural Machinery Agronomy Extension Water Management
3. Clerical and Service Employees	
4. Laborers	

Note: Thai experts will be posted as counterparts to Japanese experts.

Annex V. Land and Buildings

1. Project Center

Buildings

- a. Project Director's room
- b. Team Leader's room
- c. Office room
- d. Working room
- e. Store room
- f. Meeting room
- g. Garage
- h. Others

2. Each Pilot Project

(1) Land

- a. Land for trial farm
- b. Land for buildings

(2) Buildings

- a. Offices including lecture room and meeting room
- b. Sheds for machinery and equipment
- c. Storehouses for farming materials
- d. Fuel storage
- e. Workshop
- f. Garage
- g. Management office for trial farm
- h. Housing for staff
- i. Guest house
- j. Others

3. Experiment and Training Project

Buildings, farms and other facilities attached to the Suphan Buri Station.

5-2. Implementation Schedule (Draft)

The Implementation Schedule of the Project will be materialized in details through the procedures of the Japan-Thai Joint Committee, and the present schedule in draft was shown below.

5-2-1. Project Organization (Refer to FIGURE V-1)

5-2-2. Implementation Schedule

Chao Phya Pilot Project

- | | |
|---|---------------------------------------|
| 1. Field office building and trial farm | Start: 1977
Completion: 1979 |
| 2. Polder dikes | Start: Early 1978
Completion: 1979 |
| 3. Pumping stations | |
| Main pumping station | 1979 - 1980 |
| Irrigation pumping stations | 1979 - 1982 |
| 4. Land consolidation | 1980 - 1982 |

Mae Klong Pilot Project

- | | |
|---|---------------------------------------|
| 1. Field office building and trial farm | Start: 1978
Completion: Early 1979 |
| 2. Land consolidation | Start: Early 1979
Completion: 1982 |

5-2-3. Assignment Schedule of Experts (Refer to TABLE V-1)

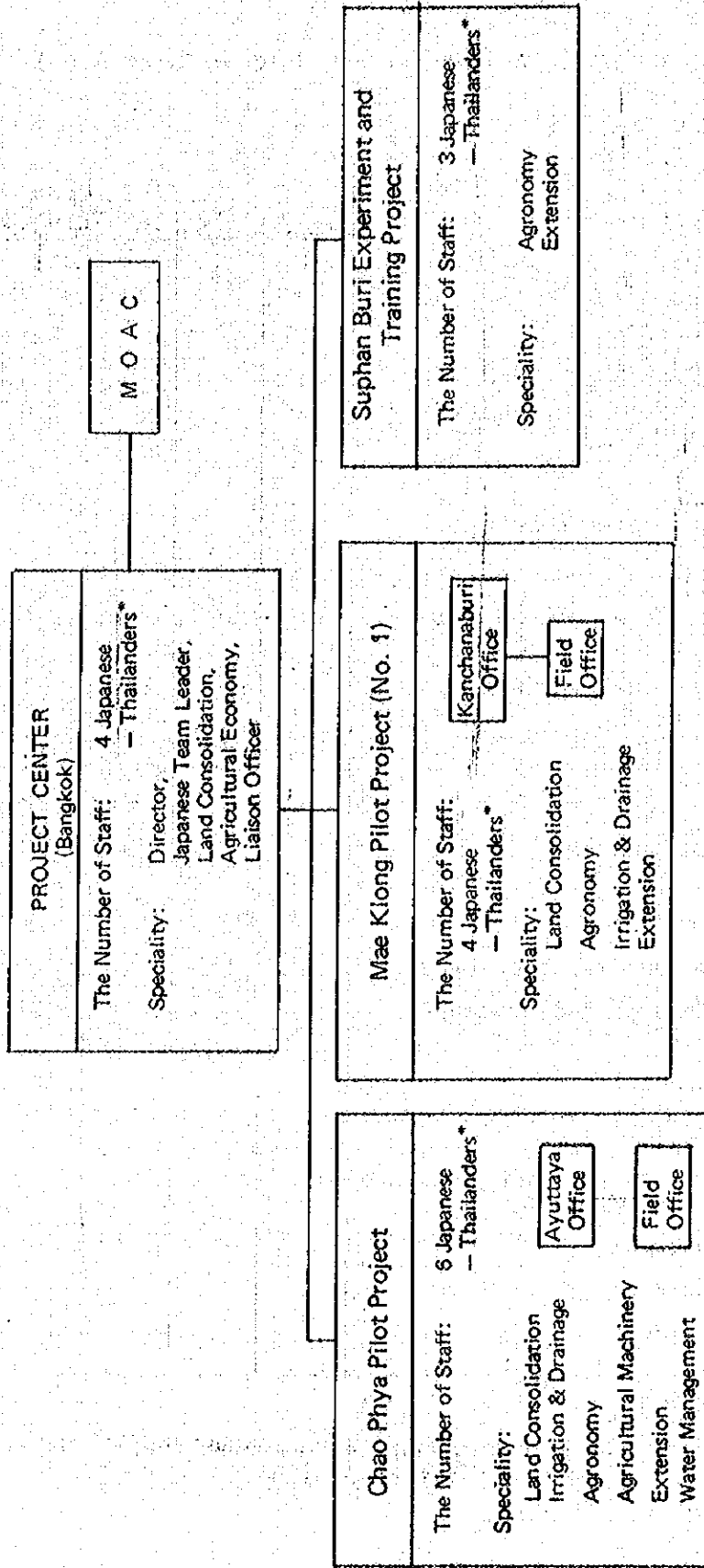
5-2-4. Training Schedule (Refer to TABLE V-2)

5-2-5. Provisional List of Machineries and Equipment (Refer to TABLE V-3)

5-2-6. Total Project Costs (For references)

The total project costs for the technical cooperation are tabulated as TABLE V-4 and V-5.

FIGURE V-1. Organization Chart of the Project



Note: * To be nominated by Thai authorities

TABLE V-1. Assignment Schedule of Experts (*)

Speciality	Fiscal Year					
	1977	1978	1979	1980	1981	1982
1. Project Center						
a. Team Leader						
b. Agricultural Economist						
c. Land Consolidation Expert						
d. Liaison Officer						
2. Chao Phya Pilot Project						
a. Land Consolidation Expert						
b. Irrigation and Drainage Expert						
c. Agricultural Machinery Expert						
d. Agronomist						
e. Extension						
f. Water Management						
3. Mae Klong Pilot Project						
a. Land Consolidation Expert						
b. Irrigation and Drainage Expert						
c. Agronomist						
d. Extension						
4. Suphan Buri Station						
a. Agronomist						
b. Agronomist						
c. Extension						

Note: * Subject to change in accordance with the progress of Project implementation.

TABLE V-2. Training and Study Tour in Japan (*)

	(Unit: person)				
	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>
1. Study Tour (about 2 weeks)	2	1	1	1	1
2. Training (about 1 to 5 months)					
Irrigation and Drainage		1	1		
Land Consolidation		1	1	1	
Agricultural Machinery			1		1
Agronomy				1	
Agricultural Extension		1		1	1
Water Management		1			
Agricultural Economy			1		
Others	1**			1	2
Total	<u>3</u>	<u>5</u>	<u>5</u>	<u>5</u>	<u>5</u>

Note: (*) This training program is subject to changes in accordance with the progress of project and annual country allotment of trainees.

(**) Water Resources for Agriculture

TABLE V-3. Provisional List of Machinery and Equipment

<u>Items</u>	<u>Unit</u>	<u>Quantity</u>
<u>A. Chao Phya Project</u>		
<u>A-1. Project Administration</u>		
Vehicles	unit	1
High speed boats with engines	"	2
Meteorological recording instruments	L.S	1
Pumps and engines	unit	1
Office necessities	L.S	1
<u>A-2. Agricultural Infrastructure Development Works</u>		
i) Construction machinery		
Bulldozers 140 PS class	unit	5
Swamp type bulldozers, 140 PS class	"	2
Bulldozers, 200 PS class	"	1
Back Hoe, 0.3 cu.m	"	2
Back Hoe, 0.6 cu.m	"	2
Tired rollers, 10 ton	"	2
Scrape dozer, 6.4 cu.m	"	2
Diesel hammer, 1.3 ton	"	1
Dump trucks, 8 ton	"	3
Motor grader, 125 PS	"	1
Water truck, 6 ton	"	1
ii) Pump and engine		
Pumps, $\phi 700$ mm	unit	2
Diesel engines, 60 PS	"	2
Attachment	L.S	1
Diesel generator	unit	1
Vertical pumps	"	6

<u>Items</u>	<u>Unit</u>	<u>Quantity</u>
<u>A-3. Agricultural Supporting Service</u>		
i) Trial farm		
(Indoor training)		
Calculators	unit	5
Blue print instrument	"	1
Others	L.S	1
(Indoor trial)		
Thermo-controllers	unit	3
Refrigerators	"	2
Humidifiers for seed storage	"	2
Microscopes	"	2
Binocular microscopes	"	2
Others	L.S	1
(Field trial and Training)		
Trucktors, 30 HP	unit	2
Combine harvesters	"	5
Rice planters	"	5
Work shop	L.S	1
Cargo trucks	unit	2
Cargo truck with crane	"	1
Other machineries and equipments	L.S	1
Fertilizer	ton	28
Agricultural chemicals	ton	2.5
ii) Model farm		
Tructors, 30 PS	unit	3
Power tillers	"	3
Fertilizer	ton	5
Agricultural chemicals	ton	0.4

<u>Items:</u>	<u>Unit</u>	<u>Quantity</u>
<u>B. Mae Klong Project</u>		
<u>B-1. Project Administration</u>		
Vehicles	unit	2
Meteorological recording instruments	L.S	1
Office necessities	"	1
<u>B-2. Agricultural Infrastructure Development Works</u>		
Bulldozers, 140 PS class	unit	6
Back hoe, 0.3 cu.m	"	2
Scrape dozers, 6.4 cu.m	"	2
Motor grader, 125 PS	"	1
Water truck, 6 ton	"	1
<u>B-3. Agricultural Supporting Service</u>		
-- Same as the Chao Phya Project --		
<u>C. Suphan Buri Station</u>		
<u>C-1. Project Administration</u>		
Vehicle	unit	1
Office necessities	L.S	1
<u>C-2. Agricultural Supporting Service</u>		
(Indoor training)		
Dry ovens with ventilator	unit	4
Others	L.S.	1
(Outdoor training)		
Micro bus	unit	1
Vehicle	"	1
Others	L.S	1

<u>Items</u>	<u>Unit</u>	<u>Quantity</u>
(Field training)		
Tractors	unit	2
Combine harvesters	"	2
Rice planters	"	4
Others	L.S.	1

D. Project Center

Vehicles	unit	2
Office necessities	L.S.	1

TABLE V-4. Total Project Costs for Technical Cooperation Project

Items	(Unit: 1,000฿)		
	<u>L.C.</u>	<u>F.C.</u>	<u>Total</u>
<u>A. Chao Phya Pilot Project</u>			
1. Infrastructure Development	13,184	5,948	19,132
2. Construction Machineries	6,355	25,428	31,783
3. Supporting Services	7,672	6,169	13,841
4. Project Administration	18,558	1,286	19,844
Total	<u>45,769</u>	<u>38,831</u>	<u>84,600</u>
<u>B. Mae Klong Pilot Project</u>			
B.1. No.1 District			
1. Land Consolidation	4,050	-	4,050
2. Construction Machineries	3,817	15,274	19,091
3. Supporting Services	6,633	5,792	12,425
4. Project Administration	11,801	533	12,334
Sub-total	26,301	21,599	47,900
B.2. No.2 District			
1. Land Consolidation	1,830	-	1,830
2. Project Administration	570	-	570
Sub-total	2,400	-	2,400
Total	<u>28,701</u>	<u>21,599</u>	<u>50,300</u>
<u>C. Suphan Buri Station</u>	<u>4,675</u>	<u>2,525</u>	<u>7,200</u>
<u>D. Project Center</u>	<u>2,700</u>	<u>400</u>	<u>3,100</u>
Total (A+B+C+D)	<u>81,845</u>	<u>63,355</u>	<u>145,200</u>
<u>E. Expenditure for Technical Cooperation</u>			
1. Japanese Experts	-	40,076	40,076
2. Survey Team	-	6,349	6,349
3. Training in Japan	-	1,775	1,775
Total	-	<u>48,200</u>	<u>48,200</u>
<u>F. GRAND TOTAL</u>	<u>81,845</u>	<u>111,555</u>	<u>193,400</u>

TABLE V-5. Project Costs for Technical Cooperation Project

Items	Total Costs	(Unit: 1,000฿)				
		Fiscal Year				
		1977	1978	1979	1980	1981
<u>A. Chao Phya Pilot Project</u>						
1. Infrastructure Development	19,132	1,037	11,072	3,193	2,082	1,748
2. Construction Machineries	31,783	12,037	8,842	8,137	2,767	-
3. Supporting Services	13,841	1,656	7,095	2,023	1,606	1,461
4. Project Administration	19,884	2,768	3,624	4,483	4,793	4,176
Total	<u>84,600</u>	<u>17,498</u>	<u>30,633</u>	<u>17,836</u>	<u>11,248</u>	<u>7,385</u>
<u>B. Mae Klong Pilot Project</u>						
<u>B.1. No.1 District</u>						
1. Land Consolidation	4,050	-	540	1,620	1,890	-
2. Construction Machineries	19,091	-	4,037	8,138	6,916	-
3. Supporting Services	12,425	-	3,016	4,526	3,385	1,498
4. Project Administration	12,334	-	2,212	3,543	3,637	2,942
Sub-total	<u>47,900</u>	-	<u>9,805</u>	<u>17,827</u>	<u>15,828</u>	<u>4,440</u>
<u>B.2. No.2 District</u>						
1. Land Consolidation	1,830	-	-	-	730	1,100
2. Project Administration	570	-	-	-	230	340
Sub-total	<u>2,400</u>	-	-	-	<u>960</u>	<u>1,440</u>
Total	<u>50,300</u>	-	<u>9,805</u>	<u>17,827</u>	<u>16,788</u>	<u>5,880</u>
<u>C. Suphan Buri Station</u>	<u>7,200</u>	-	<u>1,271</u>	<u>2,034</u>	<u>2,454</u>	<u>1,441</u>
<u>D. Project Center</u>	<u>3,100</u>	<u>667</u>	<u>579</u>	<u>618</u>	<u>618</u>	<u>618</u>
Total (A+B+C+D)	<u>145,200</u>	<u>18,165</u>	<u>42,288</u>	<u>38,315</u>	<u>31,108</u>	<u>15,324</u>
<u>E. Expenditure for Technical Cooperation</u>						
1. Japanese Experts	40,076	1,543	5,596	9,880	11,765	11,292
2. Survey Team	6,349	4,573	444	444	444	444
3. Training in Japan	1,775	187	397	397	397	397
Total	<u>48,200</u>	<u>6,303</u>	<u>6,437</u>	<u>10,721</u>	<u>12,606</u>	<u>12,133</u>
<u>F. GRAND TOTAL</u>	<u>193,400</u>	<u>24,468</u>	<u>48,725</u>	<u>49,036</u>	<u>43,714</u>	<u>27,457</u>

LIST OF DRAWINGS ON CHAO PHYA PILOT PROJECT

<u>PROJECT AREA</u>		<u>DRAWING NO.</u>	
PLAN	PLAN OF CHAO PHYA PILOT PROJECT	C- 1	
	POLDER DIKE	PROPOSED POLDER DIKE	C- 2
	MAIN PUMPING STATION	PLAN OF MAIN PUMPING STATION	C- 3
		PROFILE OF MAIN PUMPING STATION	C- 4
		TYPICAL SECTIONS OF MAIN PUMPING STATION	C- 5
	SECONDARY PUMPING STATION	CONSTRUCTION PLAN OF MAIN PUMPING STATION	C- 6
		SECONDARY PUMPING STATION	C- 7
	BRIDGE	BRIDGE	C- 8
	ON-FARM STRUCTURES	ROAD AND CANAL	C- 9
		MISCELLANEOUS STRUCTURES	C-10
<u>TRIAL FARM</u>			
PLAN	PLAN OF TRIAL FARM	C-11	
	PLAN OF BUILDING LOT	C-12	
	CONSTRUCTION PLAN OF TRIAL FARM	C-13	
CIVIL WORKS	IRRIGATION PUMPING STATION	C-14	
	DRAINAGE PUMPING STATION	C-15	
	ROAD AND CANAL	C-16	
	MISCELLANEOUS STRUCTURES	C-17	
ARCHITECTURES	WATER SUPPLY, SEWAGE DISPOSAL AND POWER SUPPLY	C-18	
	MANAGEMENT OFFICE	C-19	
	GENERAL WORKSHOP AND WAREHOUSES	C-20	
	REPAIRSHOP, WORKSHOPS AND GENERATOR HOUSE	C-21	
	OIL & FUEL STORAGE, SHOWER-W.C. AND CANTEEN	C-22	
	AGRICULTURAL MACHINERY SHED AND GARAGE	C-23	
	SPECIFICATIONS	C-24	
	EXPERTS' LODGING	C-25	

PLAN OF CHAO PHYA PILOT PROJECT



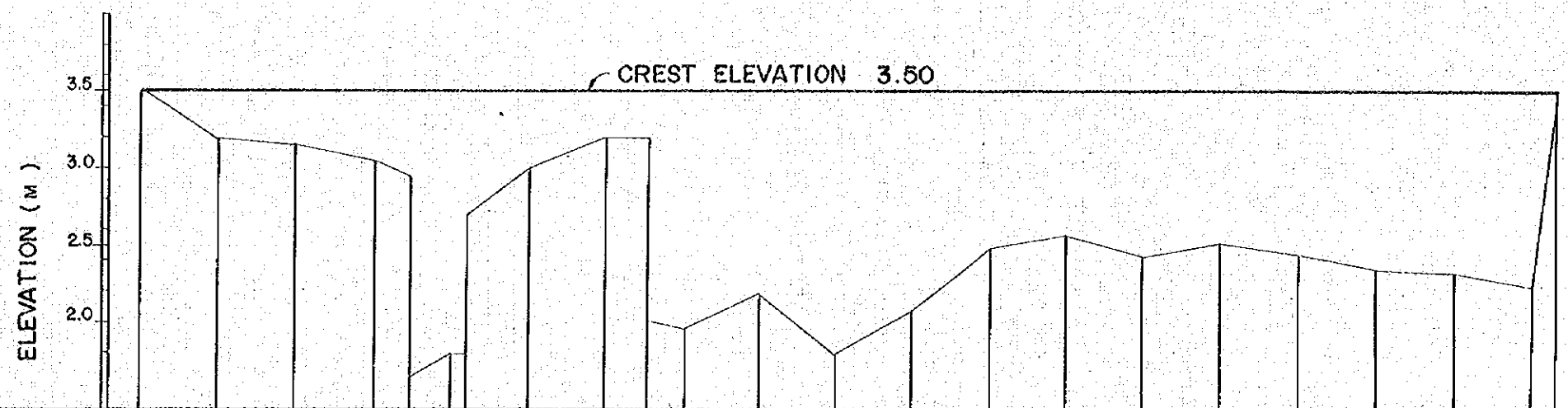
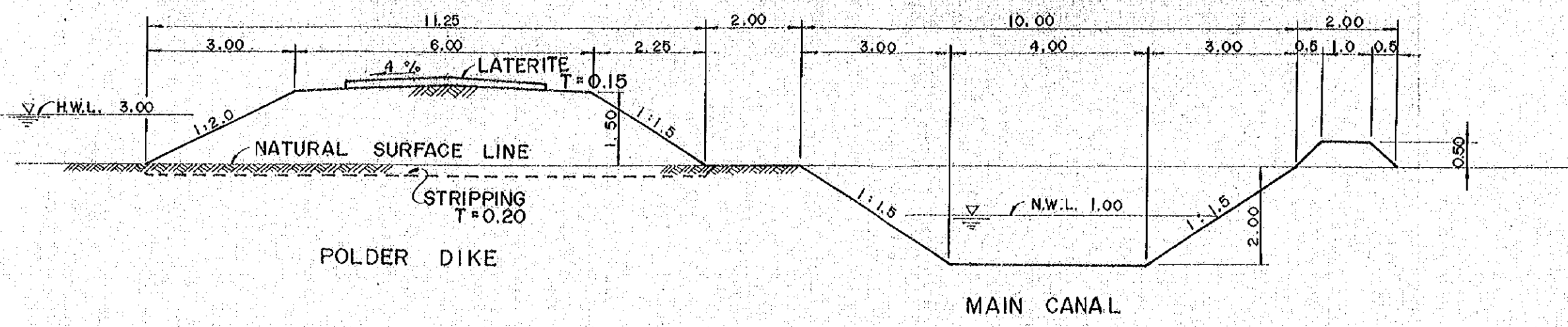
- IRRIGATION
- IRRIGATION CANAL
- LATERAL CANAL
- FARM DITCH
- IRRIGATION FACILITIES
- TURN OUT
- INLET
- FARM INLET
- CROSS CULVERT
- WASTE WAY (W-1)
- WASTE WAY (W-2)
- CONTROL WEIR
- DRAINAGE
- DRAINAGE CANAL
- LEADING DRAINAGE
- DRAINAGE DITCH
- DRAINAGE FACILITIES
- DRAINAGE CULVERT
- ROAD
- COMMUNITY ROAD
- ON-FARM ROAD
- VEHICLE TURN
- PUMP
- PUMPING STATION
- OTINDS
- HOMESTEAD
- ORCHARD
- UPLAND
- SCALE 1:12,000

CHAO PHYA PILOT PROJECT
IADP IN THAILAND

PLAN
OF
CHAO PHYA PILOT PROJECT

DATE	JULY 1977	D. W. G	C - 1
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JAPAN INTERNATIONAL COOPERATION AGENCY



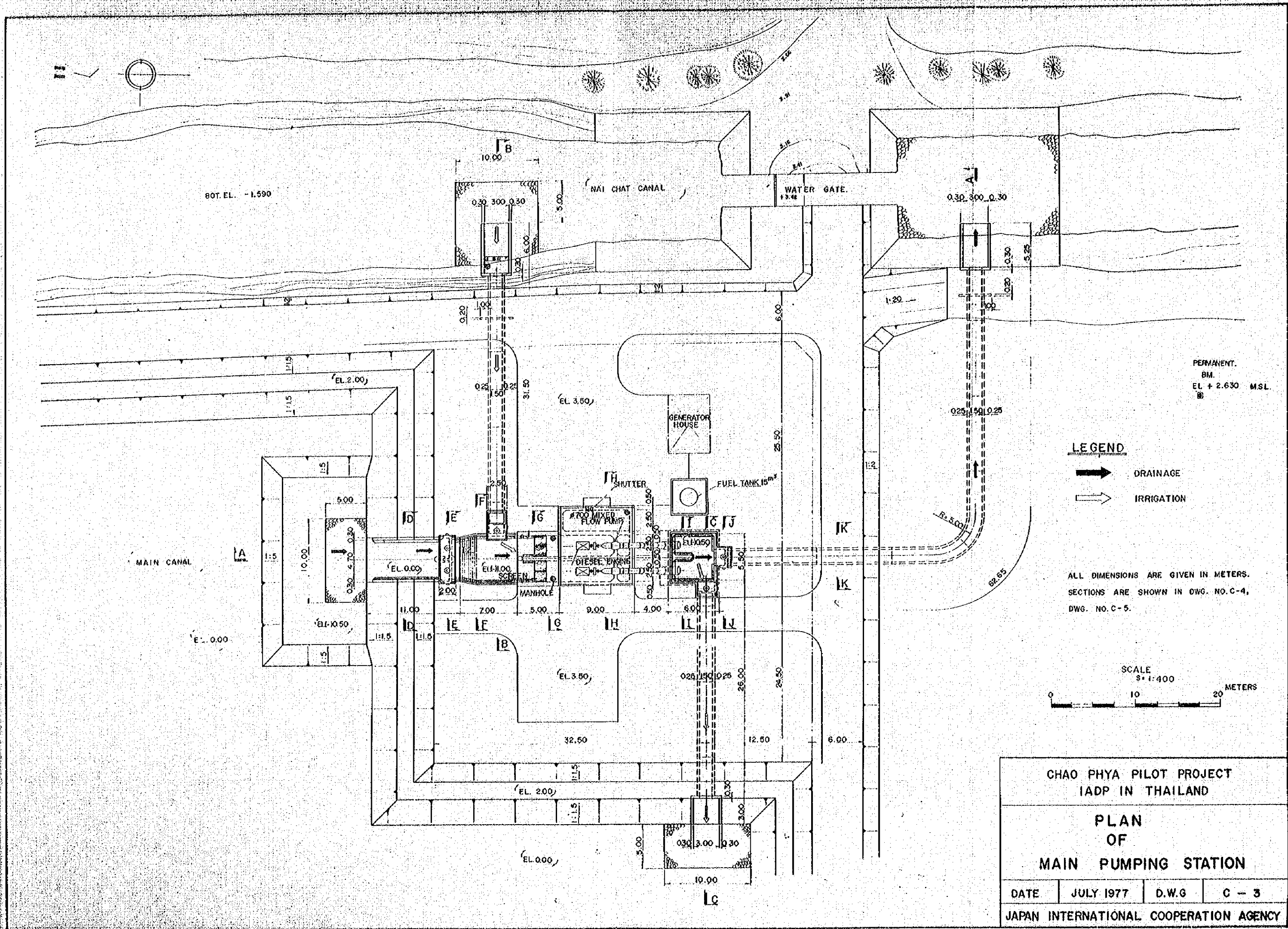
	(M)	(M)	(E.I.M.) (E.I.M.) (M)	(M)	(M)	(M)																	
BANK HEIGHT	0	0.30	0.35	0.45	0.55 (1.85)	1.70 (0.80)	0.50	0.30	0.30 (1.50)	1.53	1.30	1.69	1.42	1.00	0.93	1.07	0.98	1.05	1.16	1.18	1.27	0	
CREST ELEVATION	EL. 3.50																						
GROUND ELEVATION	3.50	3.20	3.15	3.05	2.95 (1.65)	1.80 (2.70)	3.00	3.20	3.20 (2.00)	1.97	2.20	1.81	2.08	2.50	2.57	2.43	2.52	2.45	2.34	2.32	2.23	3.50	
ACCUM. DISTANCE	0	500	1 000	1 500	1 740	2 000	2 500	3 000	3 250	3 500	4 000	4 500	5 000	5 500	6 000	6 500	7 000	7 500	8 000	8 500	9 000	160	
DISTANCE	0	500	1 000	1 500	240	260	500	500	250	250	500	500	500	500	500	500	500	500	500	500	500	160	
SATION NO.	-NO.0	-NO.0+500	-NO.1	-NO.1+500	-NO.1+740	-NO.2	-NO.2+500	-NO.3	-NO.3+250	-NO.3+500	-NO.4	-NO.4+500	-NO.5	-NO.5+500	-NO.6	-NO.6+500	-NO.7	-NO.7+500	-NO.8	-NO.8+500	-NO.9	-NO.9+160	

ALL DIMENSIONS ARE GIVEN METERS.
SCALE
S=1 100
0 5 METERS

CHAO PHYA PILOT PROJECT
IADP IN THAILAND



PROPOSED POLDER DIKE

DATE | JULY 1977 | D.W.G | C-2
JAPAN INTERNATIONAL COOPERATION AGENCY

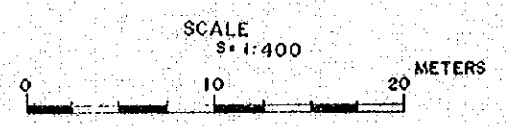


PERMANENT.
BM.
EL. + 2.630 M.S.L.
⑧

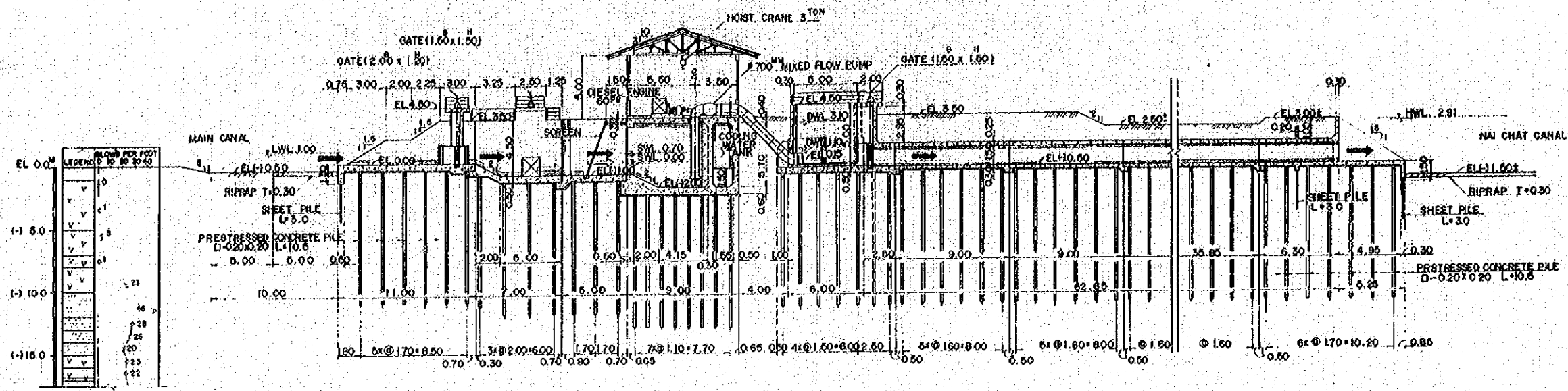
LEGEND

-  DRAINAGE
-  IRRIGATION

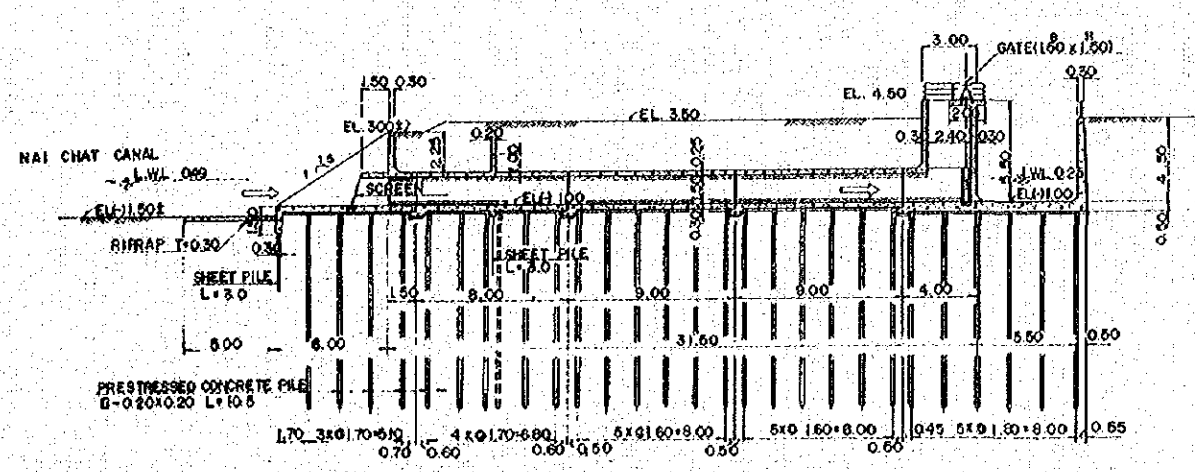
ALL DIMENSIONS ARE GIVEN IN METERS.
SECTIONS ARE SHOWN IN DWG. NO. C-4,
DWG. NO. C-5.



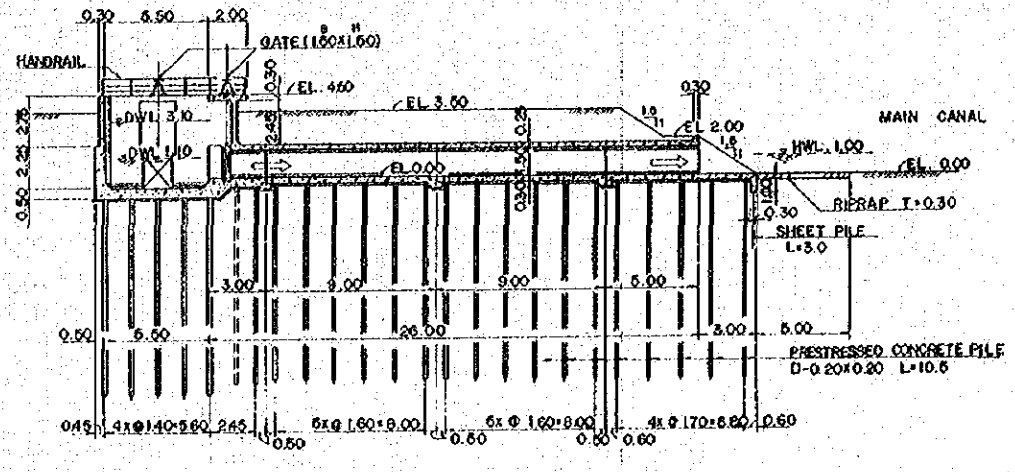
CHAO PHYA PILOT PROJECT IADP IN THAILAND			
PLAN OF MAIN PUMPING STATION			
DATE	JULY 1977	D.W.G	C - 3
JAPAN INTERNATIONAL COOPERATION AGENCY			



SECTION A-A



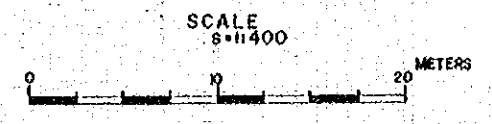
SECTION B-B



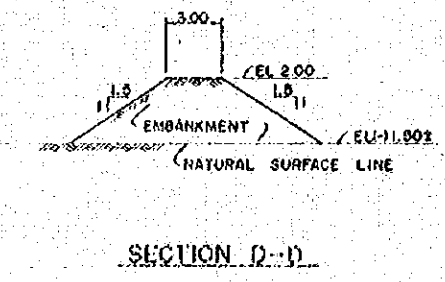
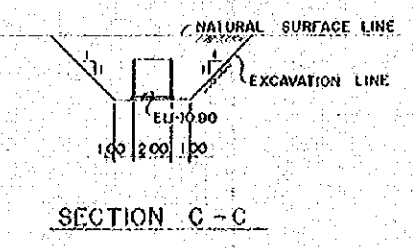
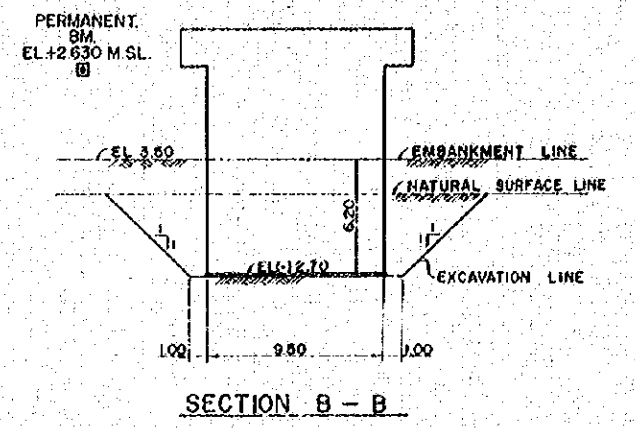
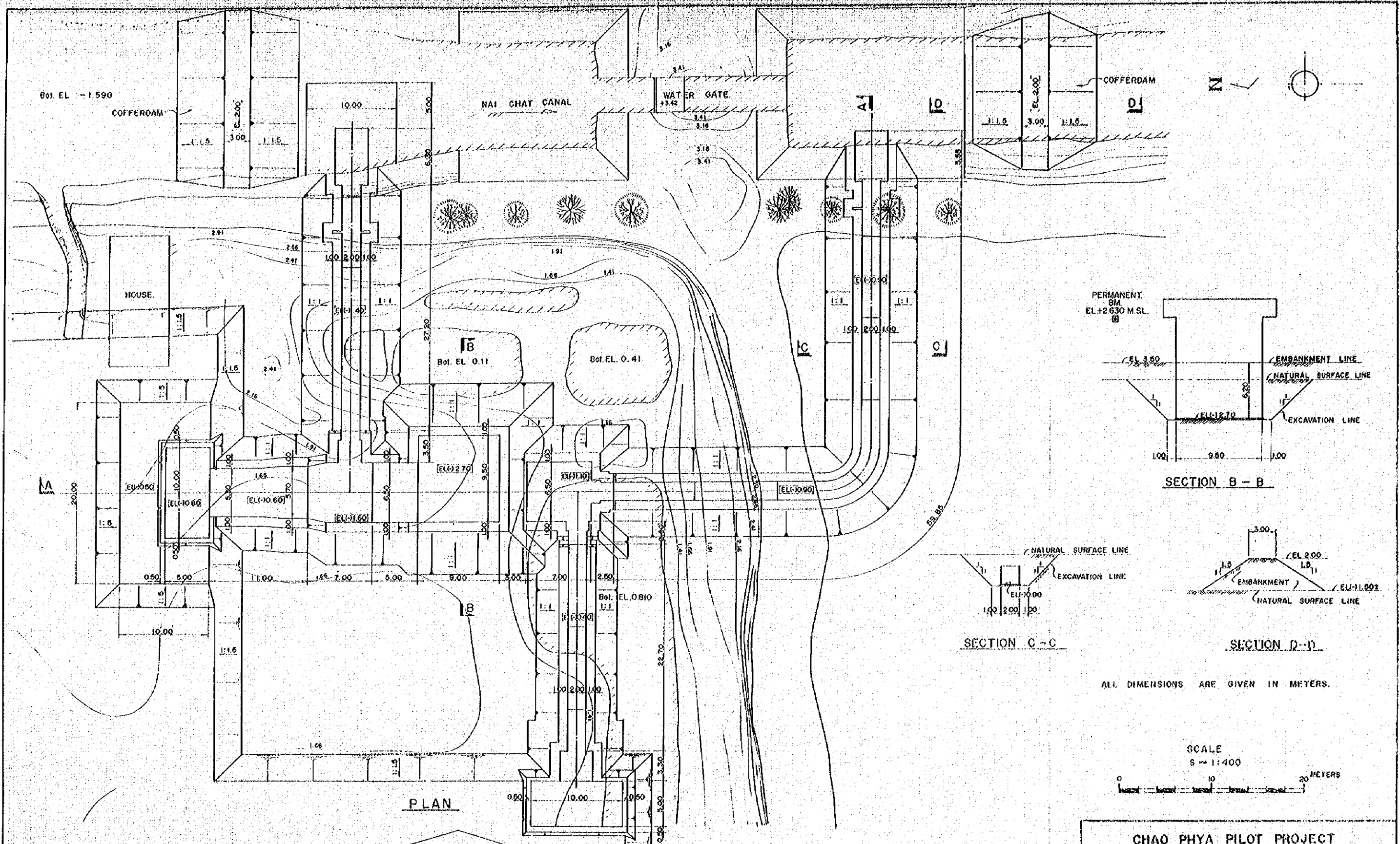
SECTION C-C

- LEGEND**
- DRAINAGE
 - IRRIGATION
 - SWL SUCTION WATER LEVEL
 - DWL DELIVERY WATER LEVEL

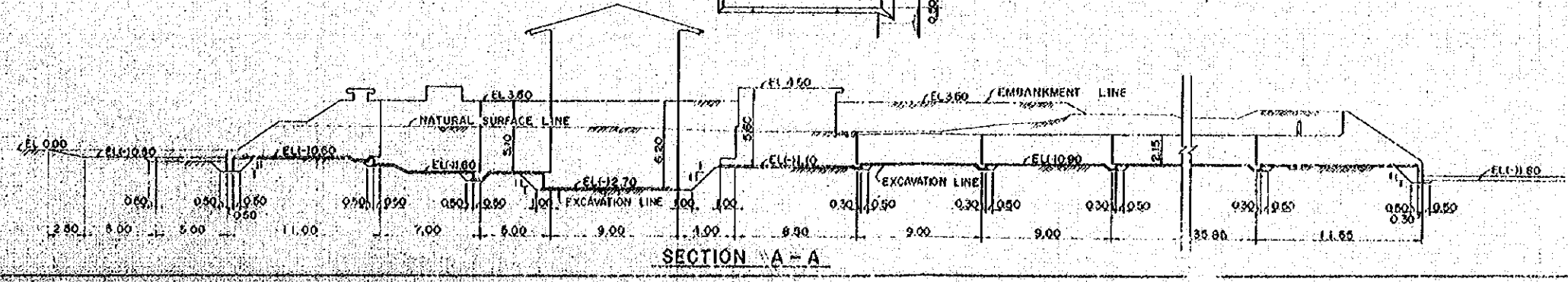
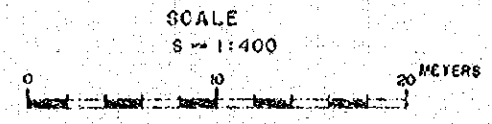
ALL DIMENSIONS ARE GIVEN IN METERS
 LOCATION OF SECTION IS SHOWN IN
 DWG. NO. C-3.



CHAO PHYA PILOT PROJECT IADP IN THAILAND			
PROFILE OF MAIN PUMPING STATION			
DATE	JULY 1977	D.W.G	C - 4
JAPAN INTERNATIONAL COOPERATION AGENCY			



ALL DIMENSIONS ARE GIVEN IN METERS.



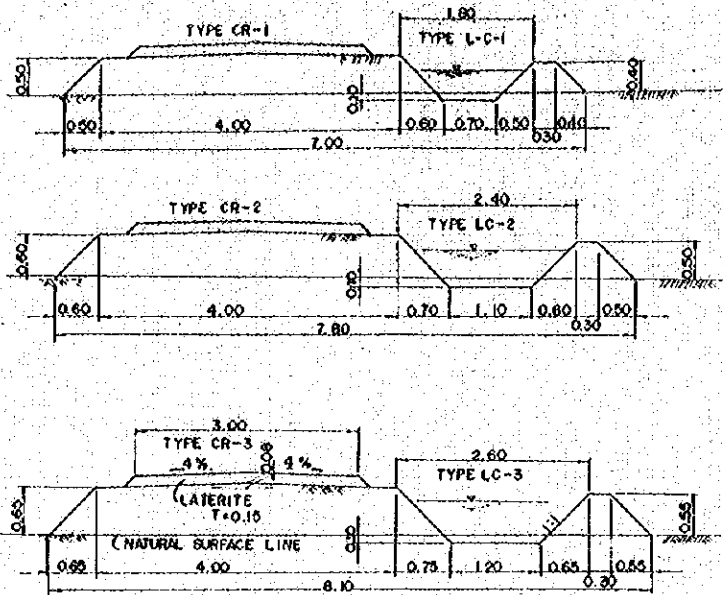
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

CONSTRUCTION PLAN
OF
MAIN PUMPING STATION

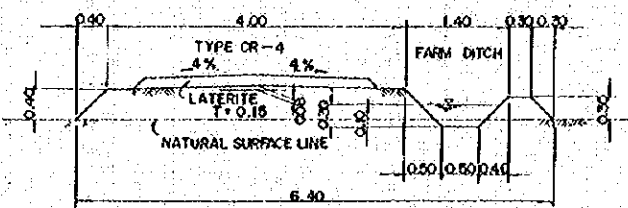
DATE:	JULY 1977	D.W.G.	C - 6
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JAPAN INTERNATIONAL COOPERATION AGENCY

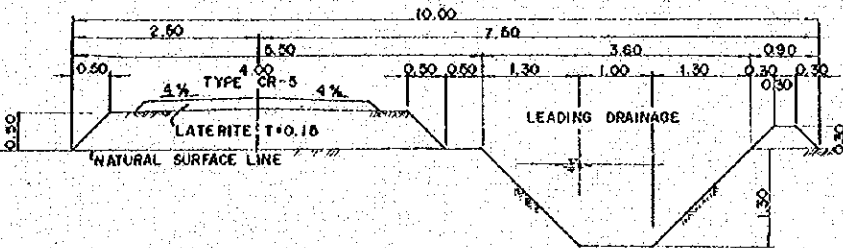
COMMUNITY ROAD WITH LATERAL CANAL



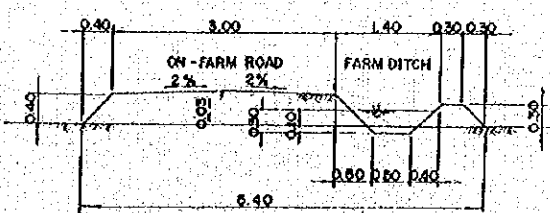
COMMUNITY ROAD WITH FARM DITCH



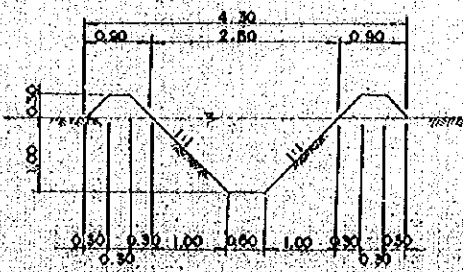
COMMUNITY ROAD WITH LEADING DRAINAGE



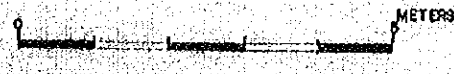
ON-FARM ROAD WITH FARM DITCH



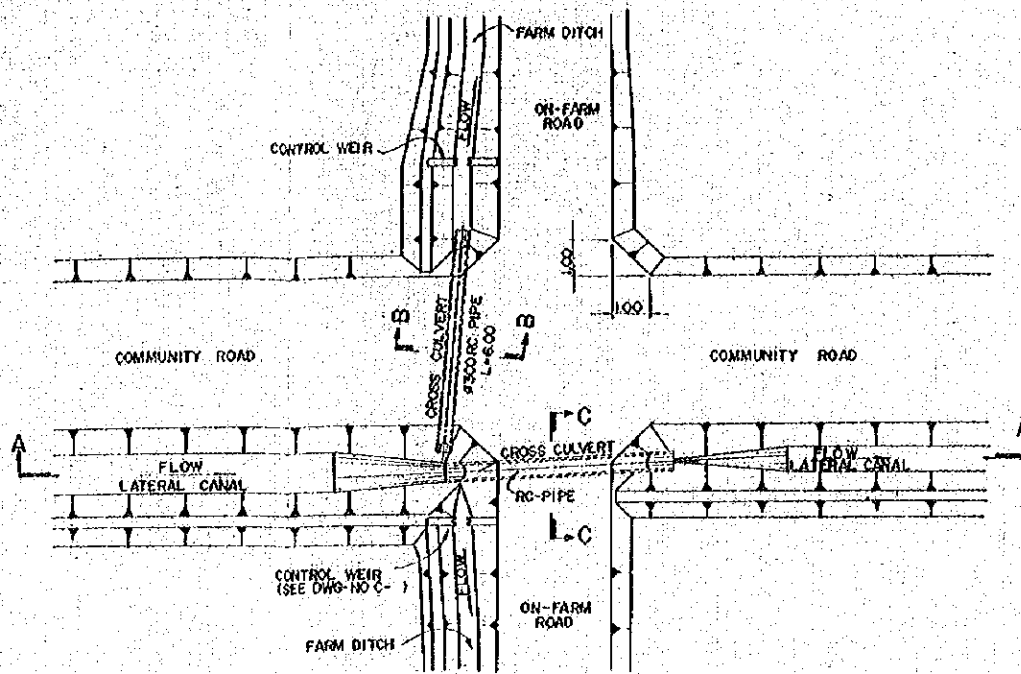
DRAINAGE DITCH



SCALE 9:1100



TURN OUT



PLAN

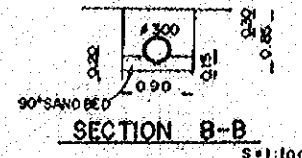
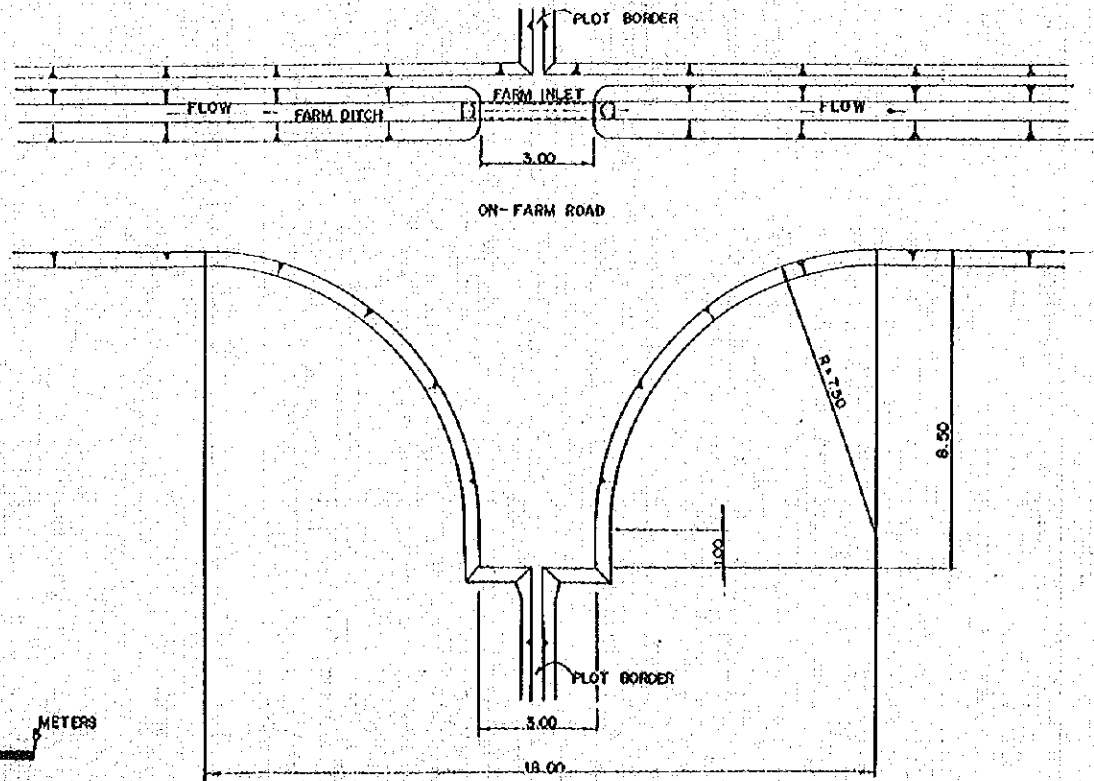
9:11200

SECTION A-A

9:11200

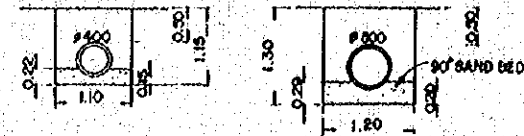
VEHICLE TURN

9:11200



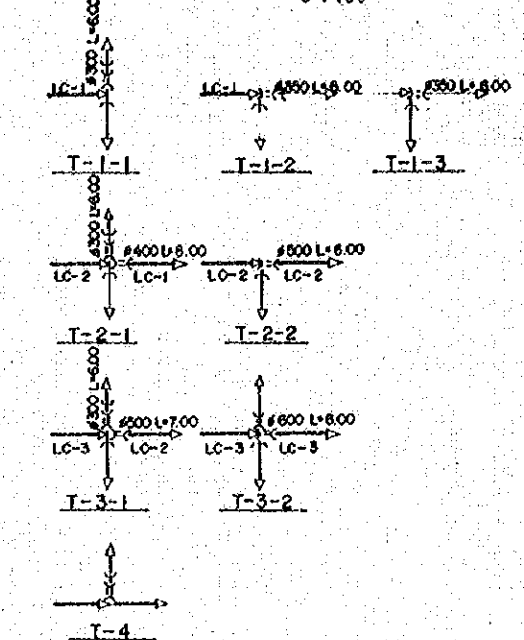
SECTION B-B

9:11100



SECTION C-C

9:11100



ALL DIMENSIONS ARE GIVEN IN METERS.

LEGEND

- LATERAL CANAL
- - - FARM DITCH
- - - CROSS CULVERT
- () CONTROL WEIR

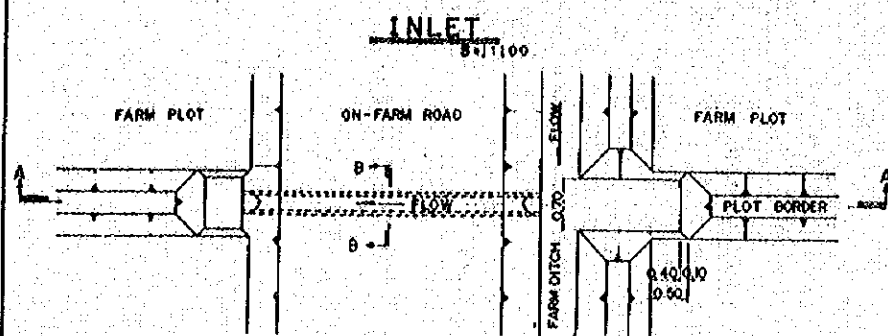
SCALE 9:11200



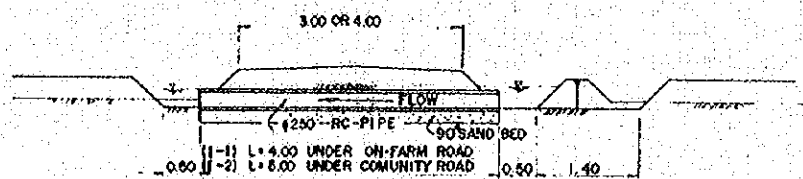
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

ROAD AND CANAL

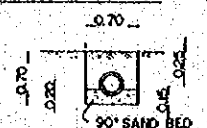
DATE	JULY 1977	D.W.G	C - 9
JAPAN INTERNATIONAL COOPERATION AGENCY			



PLAN

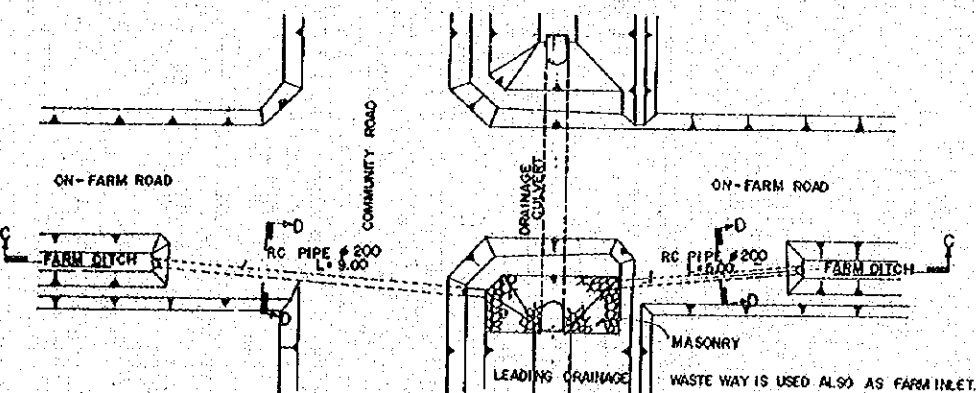


SECTION A-A

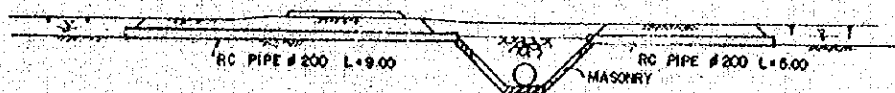


SECTION B-B

WASTE WAY
5:1:200



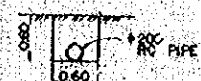
PLAN



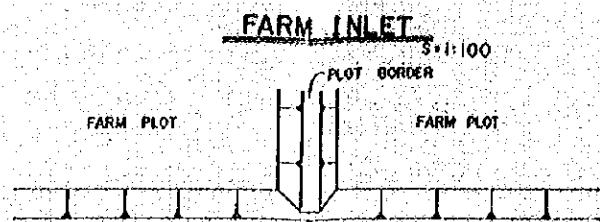
TYPE W-2

TYPE W-1

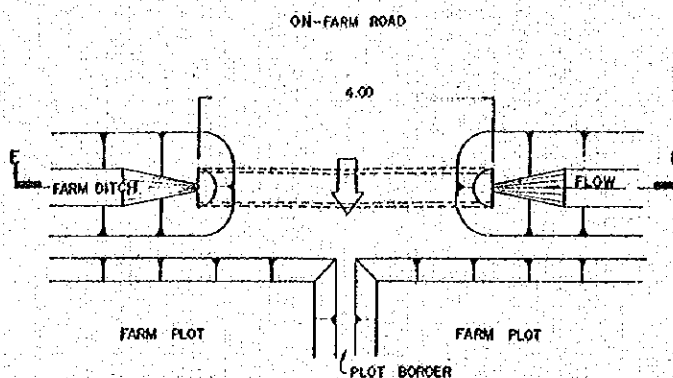
SECTION C-C



SECTION D-D

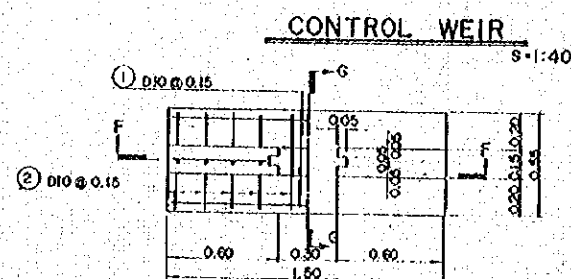


FARM INLET
5:1:100



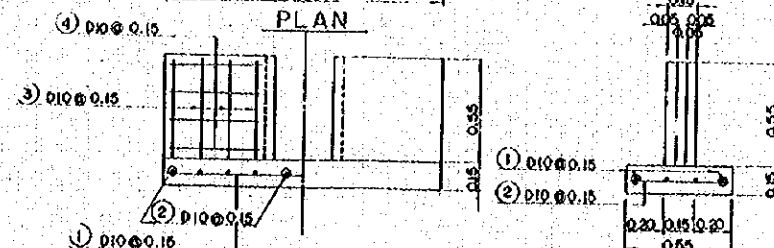
PLAN

SECTION E-E



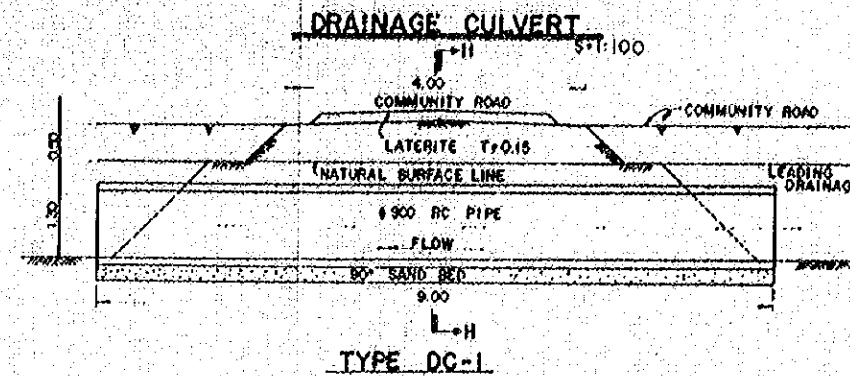
CONTROL WEIR
5:1:40

PLAN

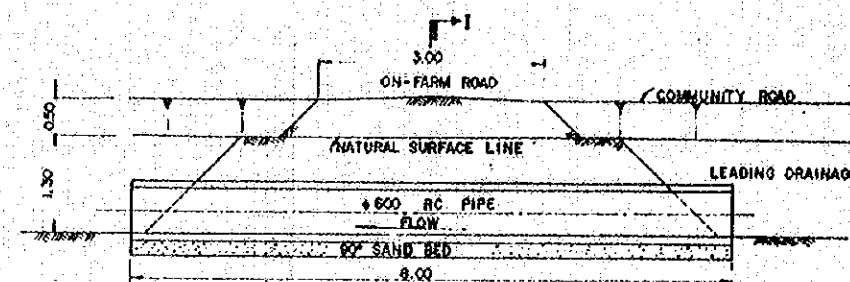


SECTION F-F

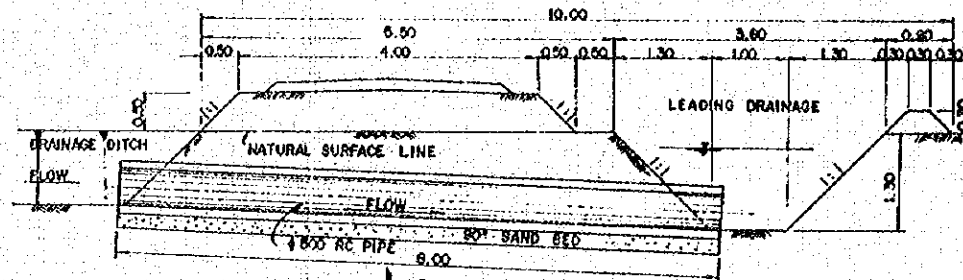
SECTION G-G



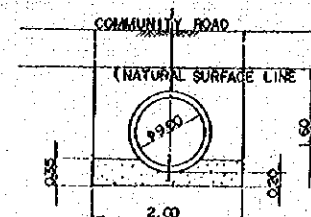
TYPE DC-1



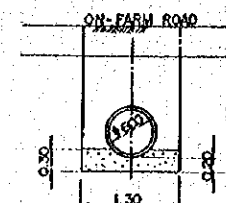
TYPE DC-2



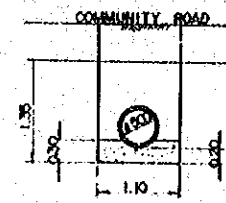
TYPE DC-3



SECTION H-H



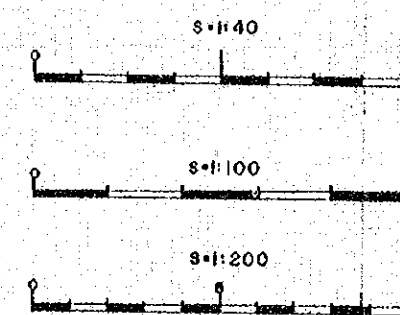
SECTION I-I



SECTION J-J

ALL DIMENSIONS ARE GIVEN IN METERS.

SCALE



CHAO PHYA PILOT PROJECT
IADP IN THAILAND

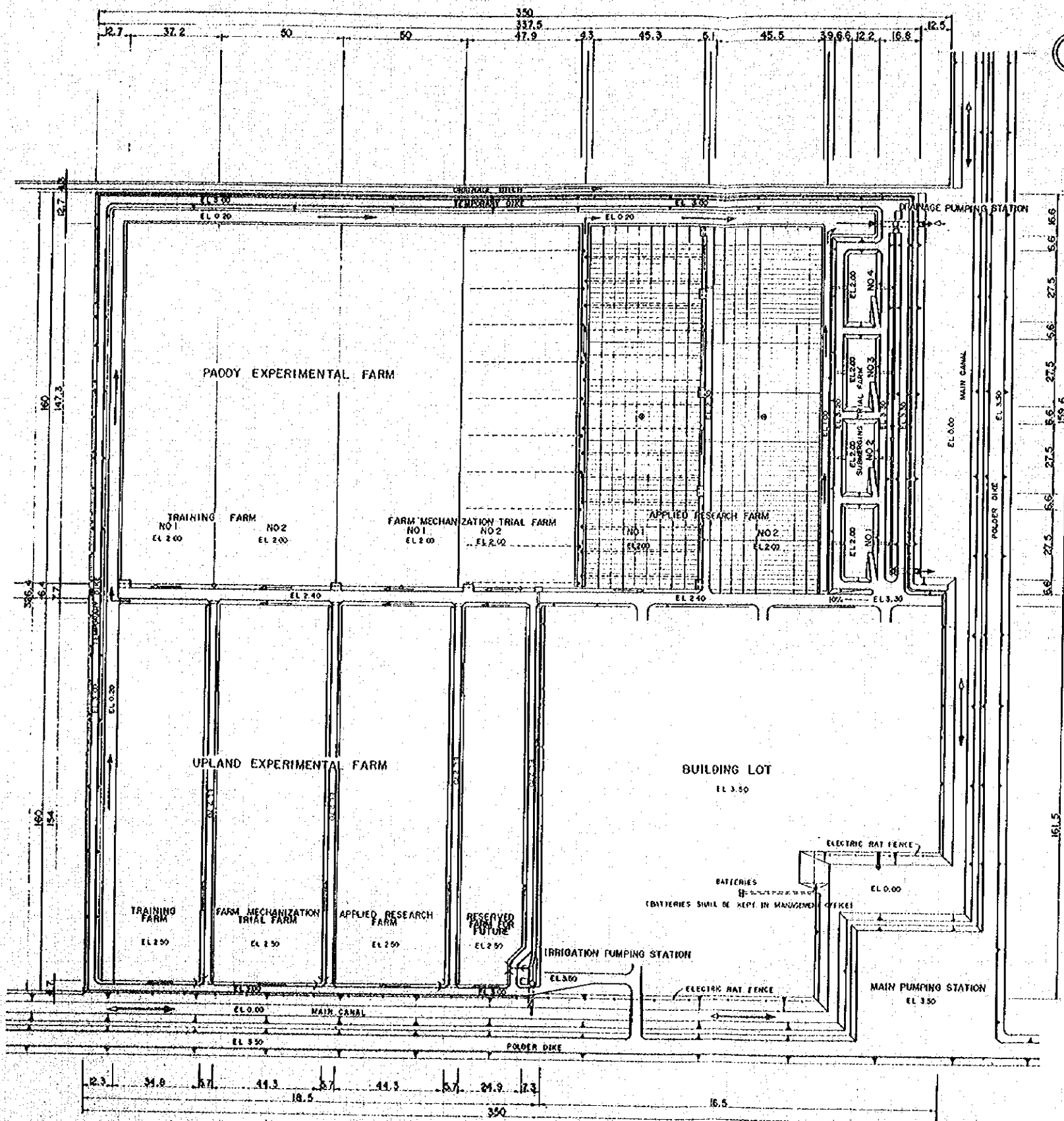
MISCELLANEOUS STRUCTURES

DATE JULY 1977 D.W.G C-10

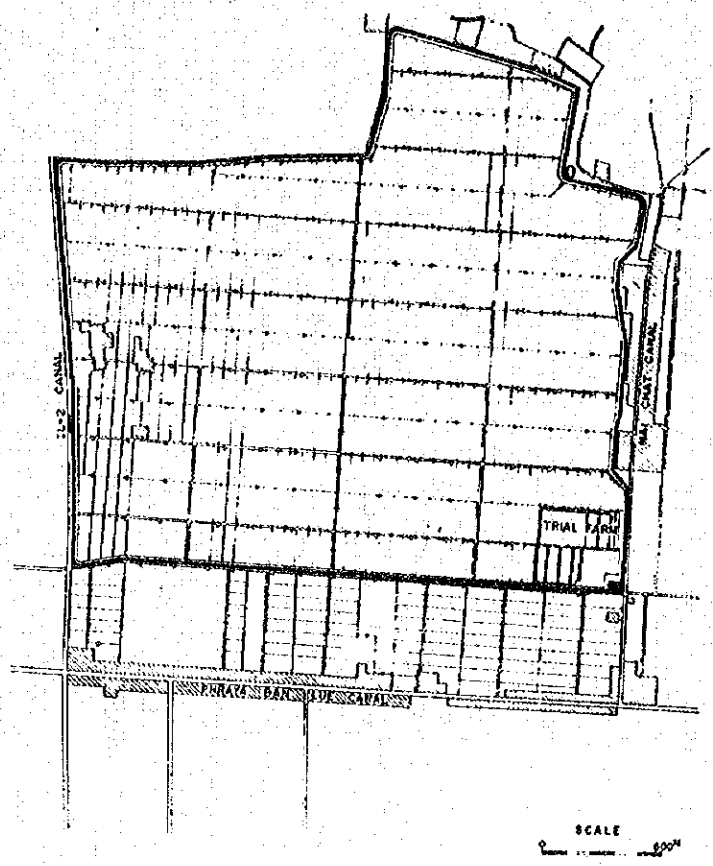
JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN OF TRIAL FARM

S = 1:2,000

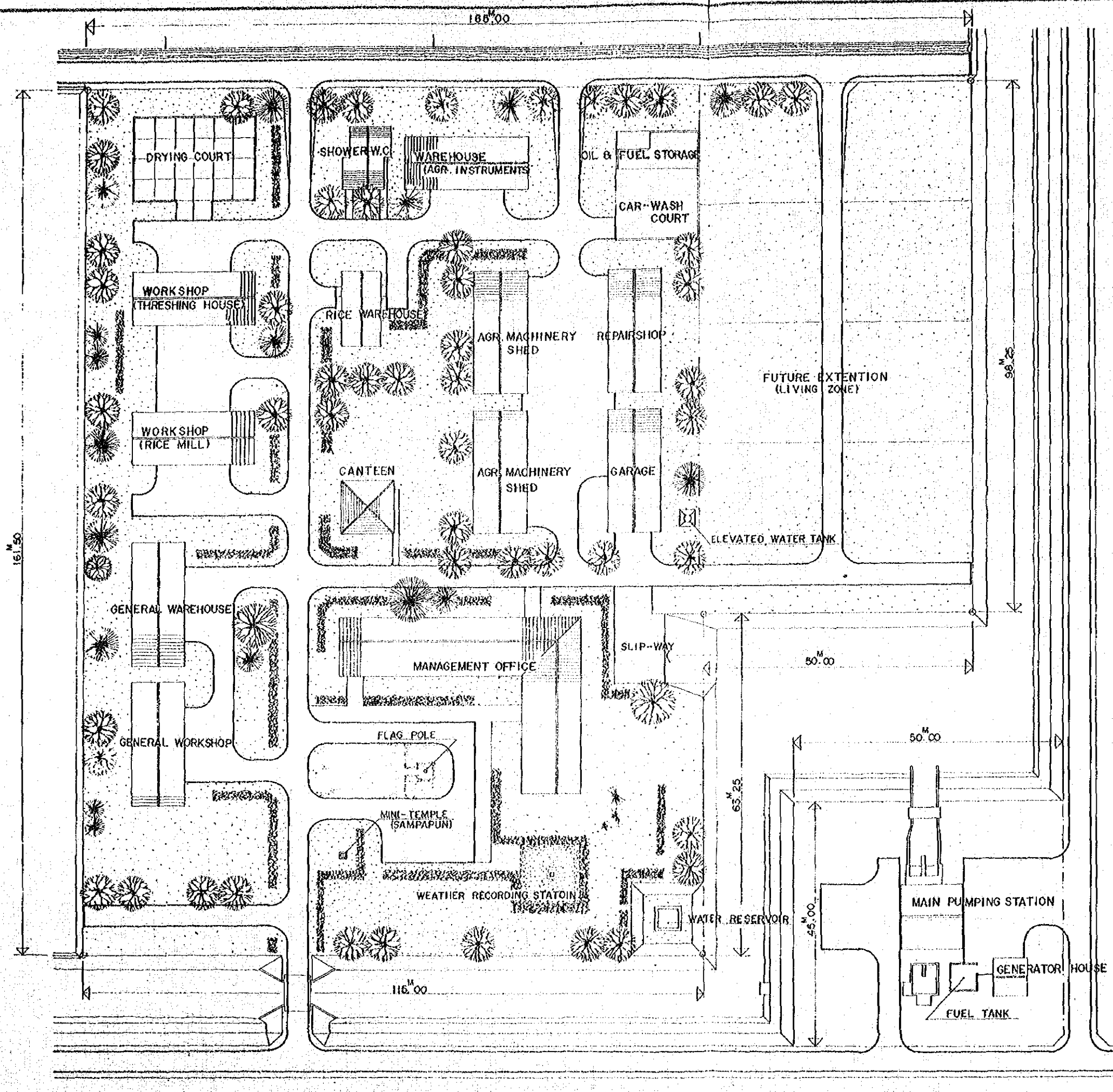


LOCATION MAP



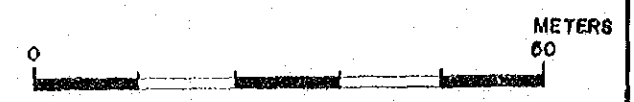
- LEGEND**
- FARM DITCH
 - DRAINAGE DITCH AND FARM DRAIN
 - LEADING DRAINAGE
 - MAIN CANAL
 - UNDER DRAIN
 - ⌋ CONTROL WEIR
 - INLET
 - ⊕ ELECTRIC RAT FENCE
 - ⊙ AUTOMATIC WATER GAGE
- SCALE 1:2,000
0 50 100 METERS

CHAO PHYA PILOT PROJECT			
IADP IN THAILAND			
P L A N O F T R I A L F A R M			
DATE	JULY 1977	D.W.G	C - 11
JAPAN INTERNATIONAL COOPERATION AGENCY			



ALL DIMENSIONS ARE GIVEN IN METERS.

SCALE
S = 1:750

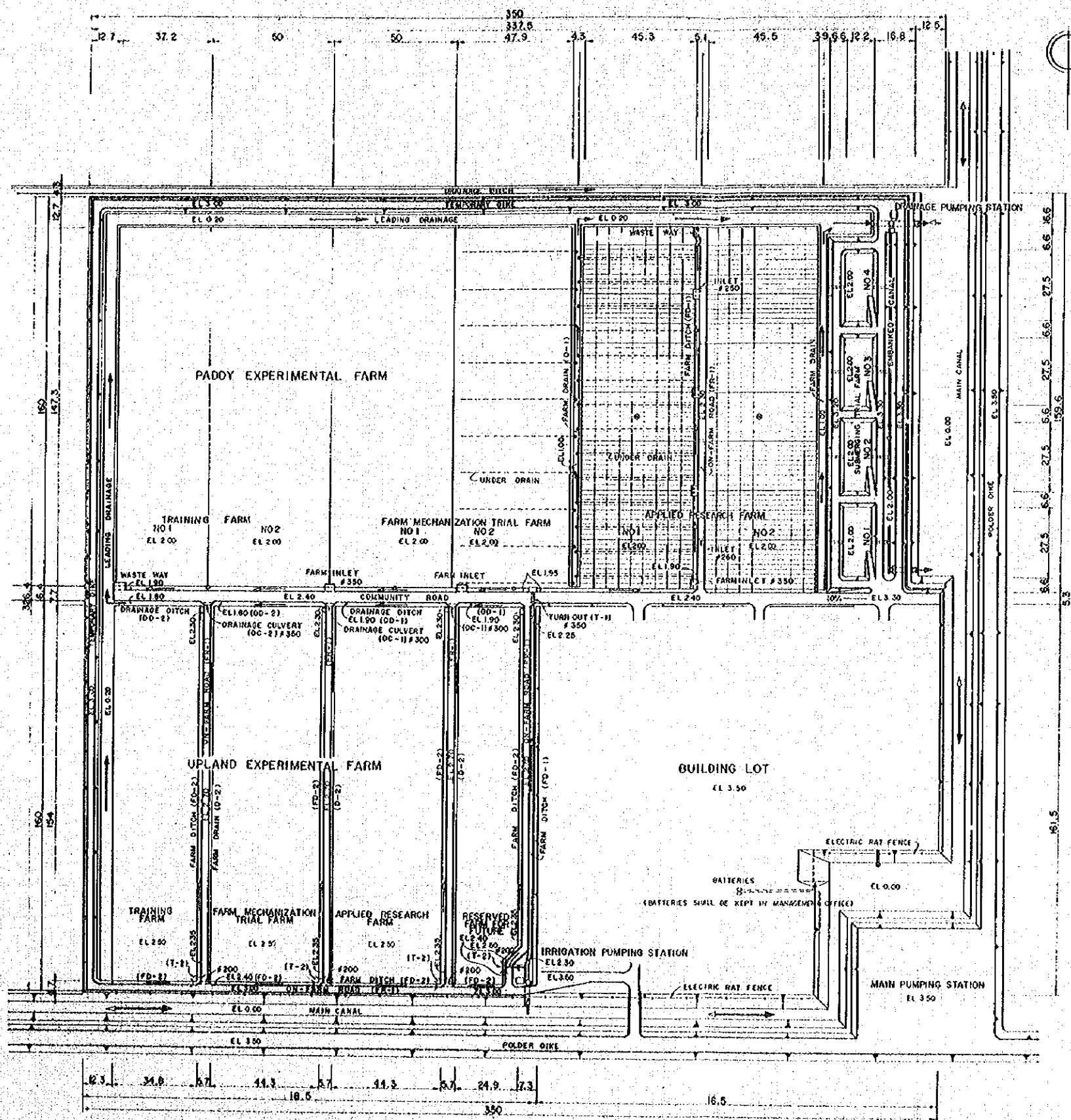


CHAO PHYA PILOT PROJECT			
IADP IN THAILAND			
PLAN OF BUILDING LOT			
DATE	JULY 1977	D.W.G	C - 12
JAPAN INTERNATIONAL COOPERATION AGENCY			

CONSTRUCTION PLAN OF TRIAL FARM

S = 1:2,000

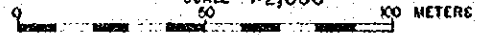
N



LEGEND

- FARM DITCH
- ▶— DRAINAGE DITCH AND FARM DRAIN
- ▶— LEADING DRAINAGE
- ▶— MAIN CANAL
- UNDER DRAIN
- C — CONTROL WEIR
- INLET
- ELECTRIC RAT FENCE
- ⊗ AUTOMATIC WATER GAGE

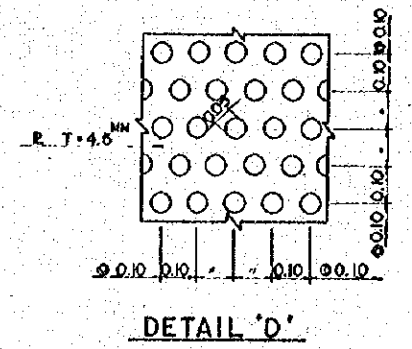
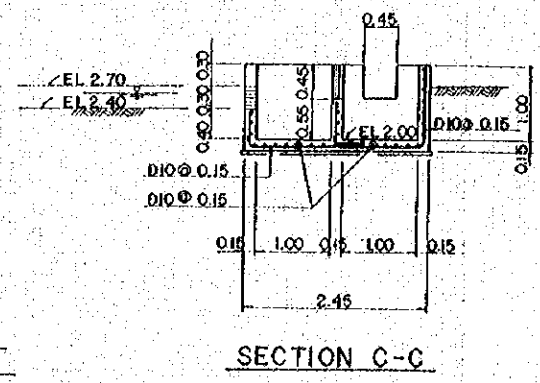
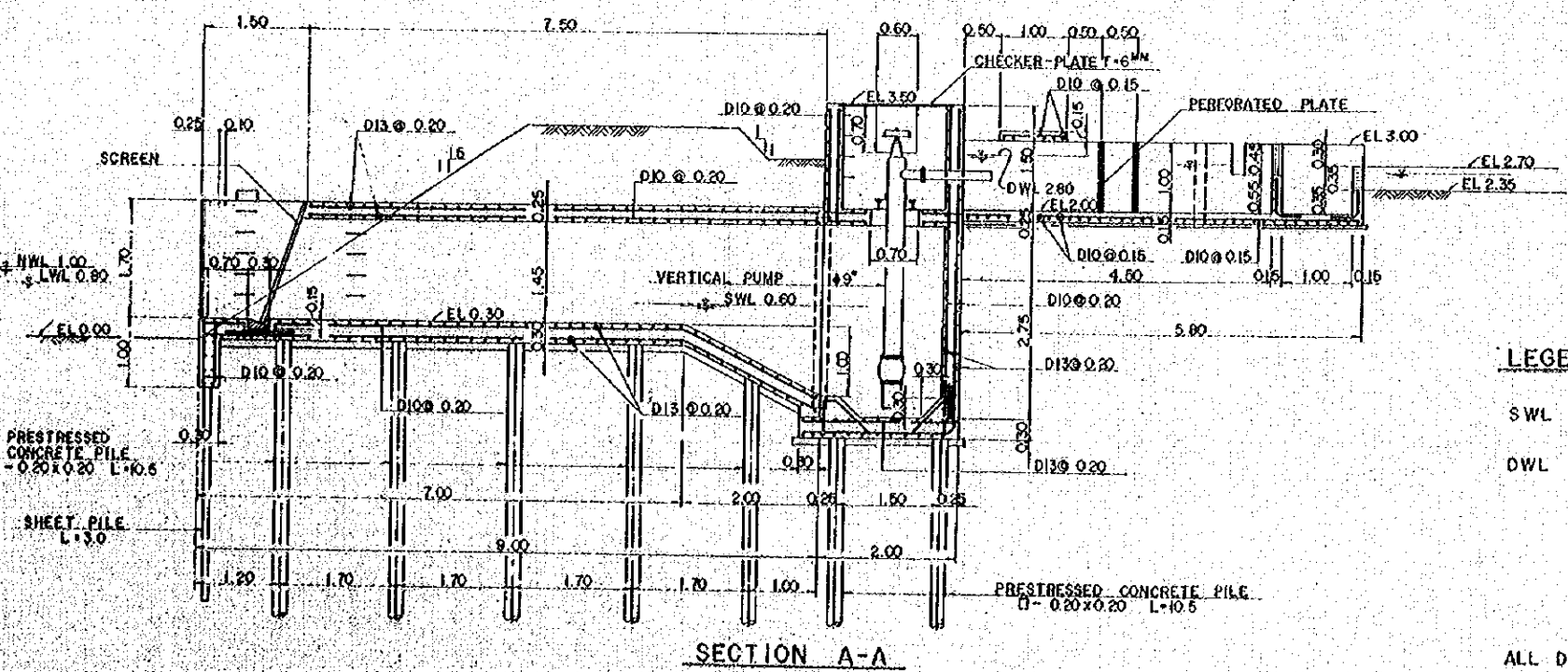
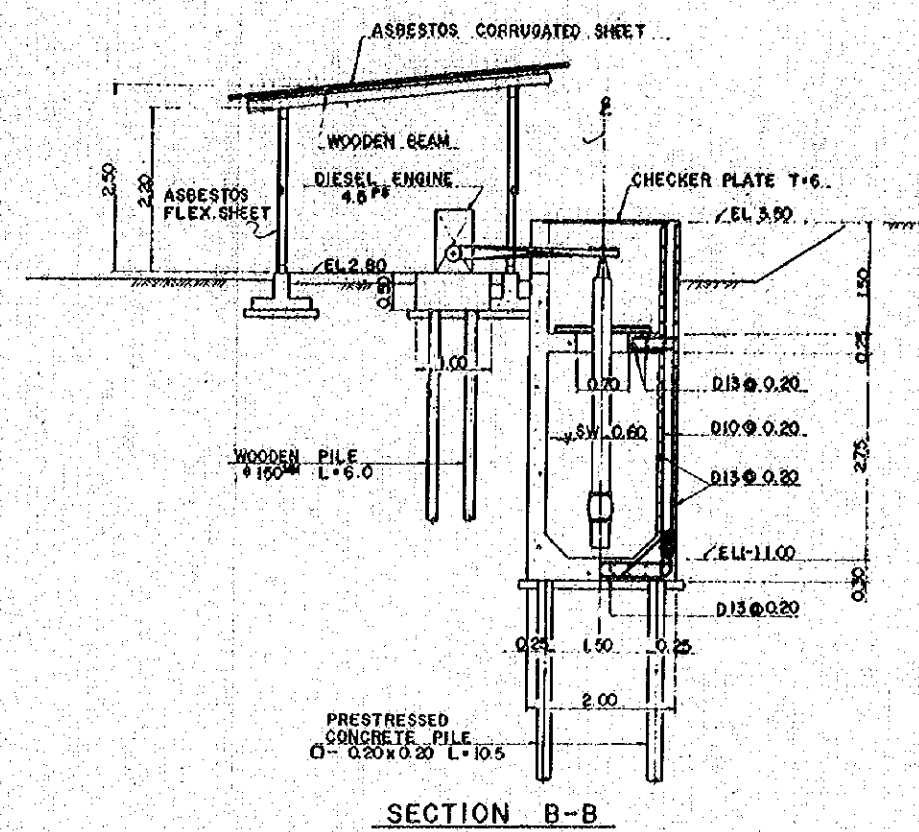
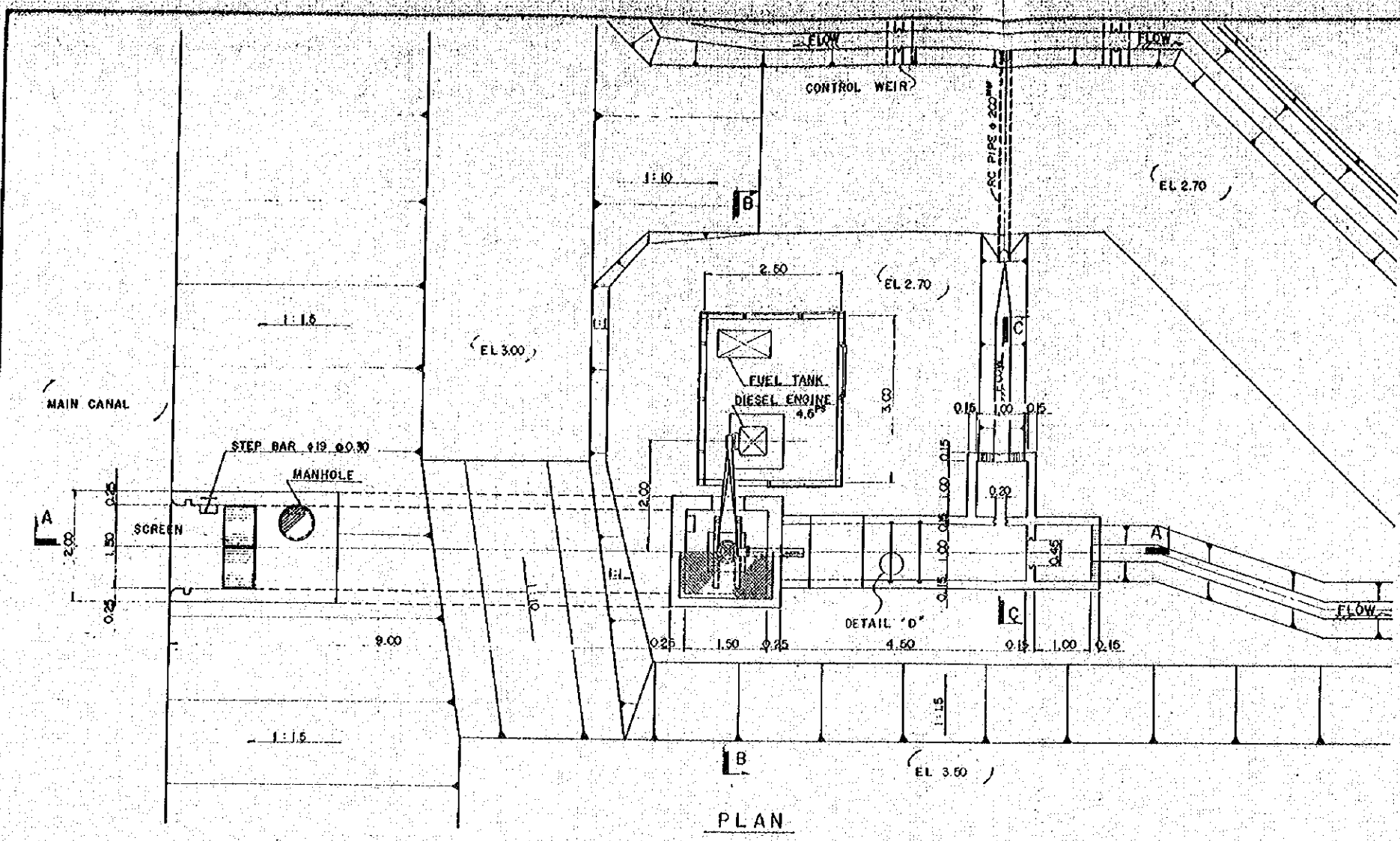
SCALE 1:2,000



CHAO PHYA PILOT PROJECT
IADP IN THAILAND

CONSTRUCTION PLAN OF TRIAL FARM

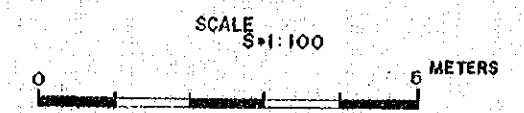
DATE	JULY 1977	D.W.G	C - 13
JAPAN INTERNATIONAL COOPERATION AGENCY			



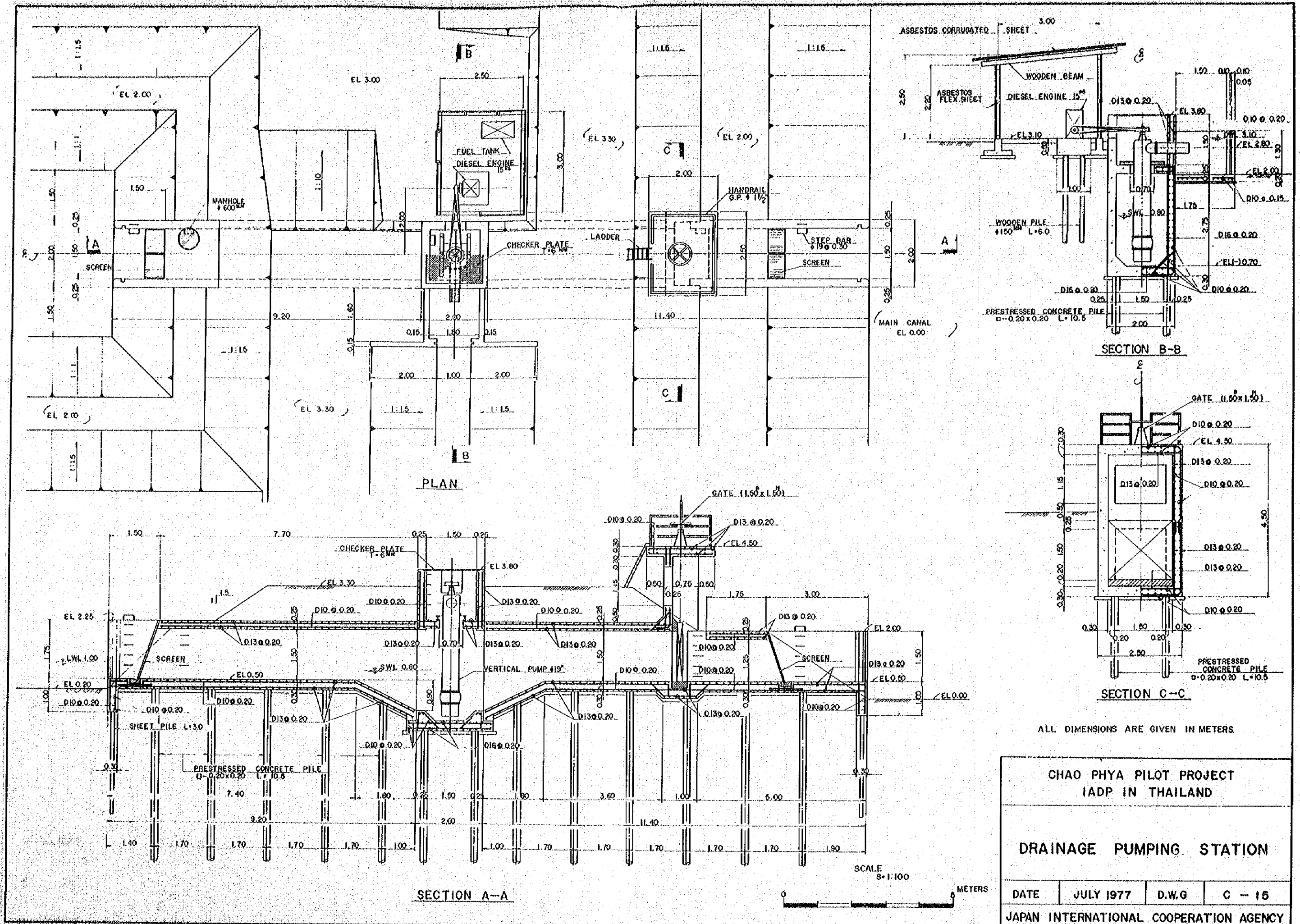
LEGEND

- SWL SUCTION WATER LEVEL
- DWL DELIVERY WATER LEVEL

ALL DIMENSIONS ARE GIVEN IN METERS.



CHAO PHYA PILOT PROJECT			
IADP IN THAILAND			
IRRIGATION PUMPING STATION			
DATE	JULY 1977	D.W.G	C - 14
JAPAN INTERNATIONAL COOPERATION AGENCY			



PLAN

SECTION A-A

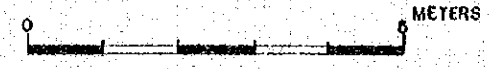
SECTION B-B

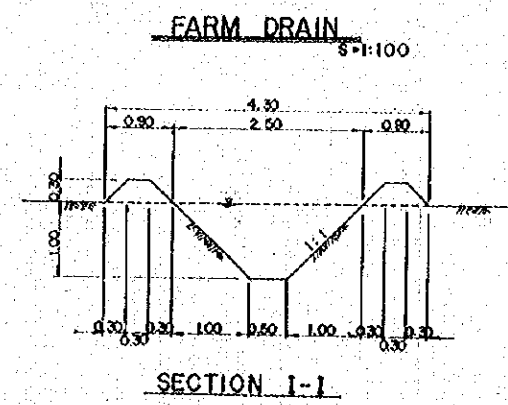
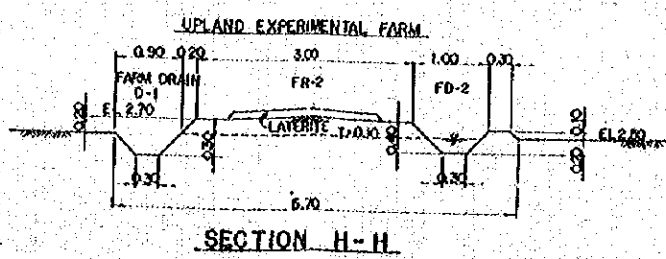
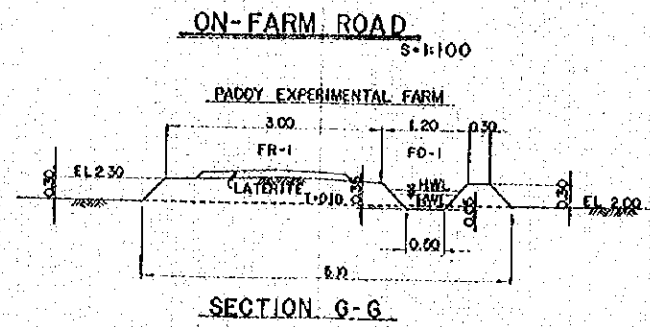
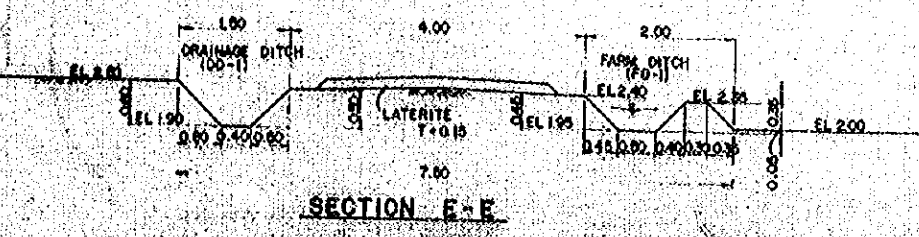
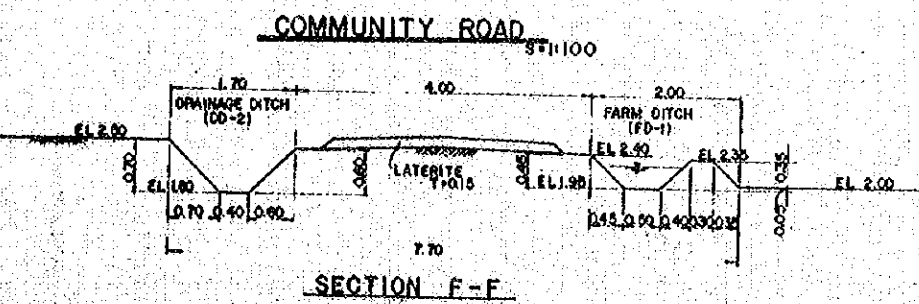
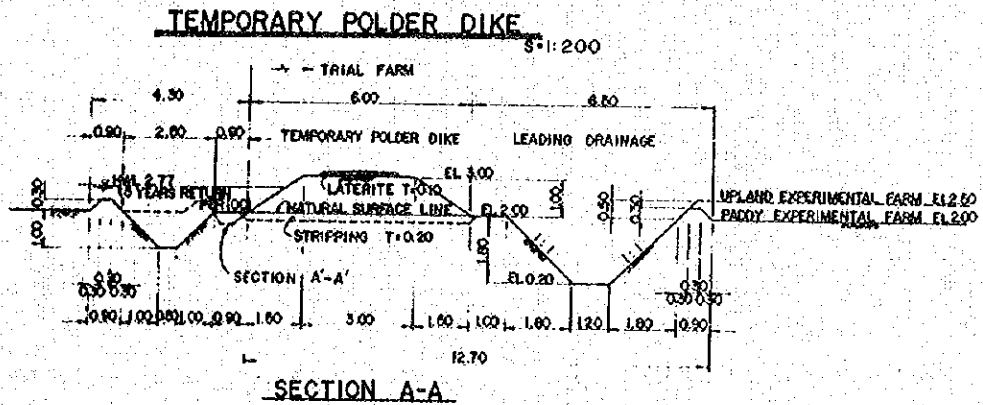
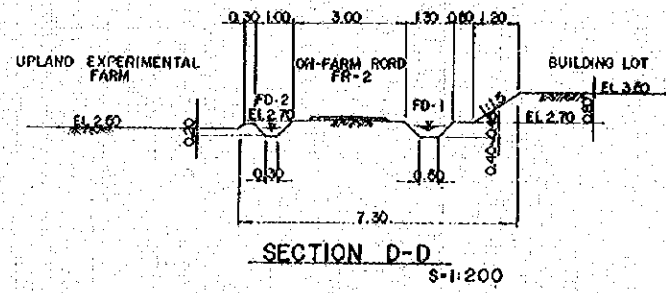
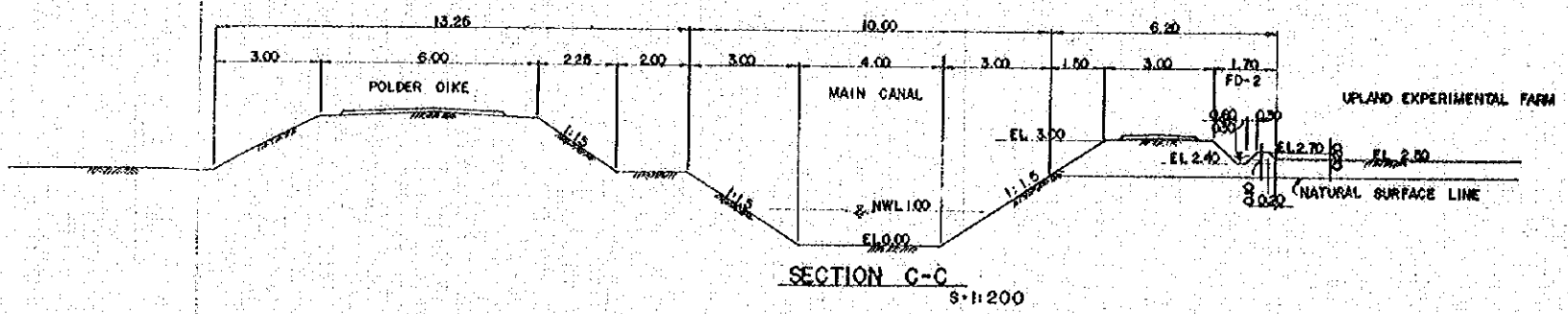
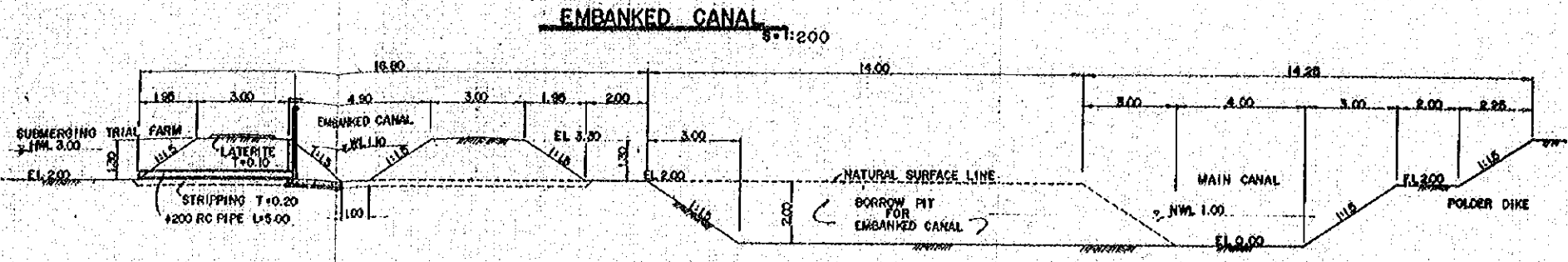
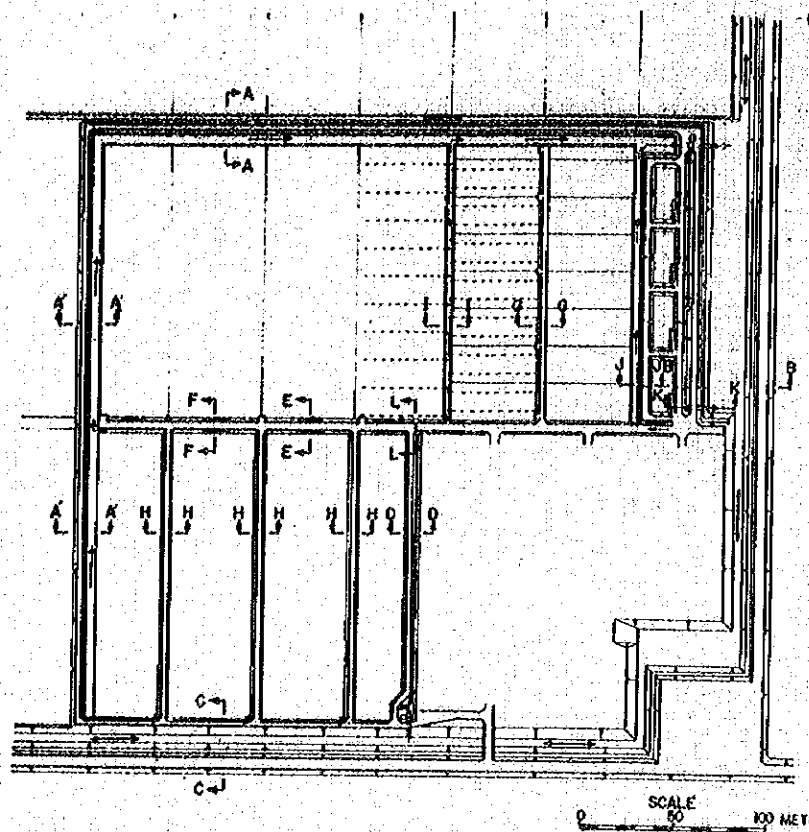
SECTION C-C

ALL DIMENSIONS ARE GIVEN IN METERS

CHAO PHYA PILOT PROJECT IADP IN THAILAND			
DRAINAGE PUMPING STATION			
DATE	JULY 1977	D.W.G	C - 15
JAPAN INTERNATIONAL COOPERATION AGENCY			

SCALE 5:1:100



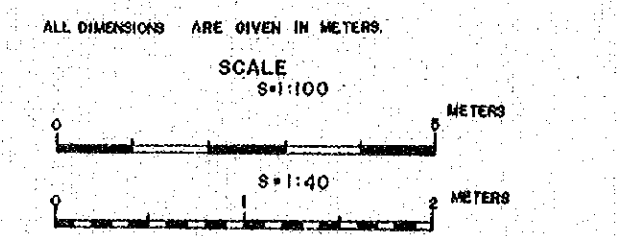
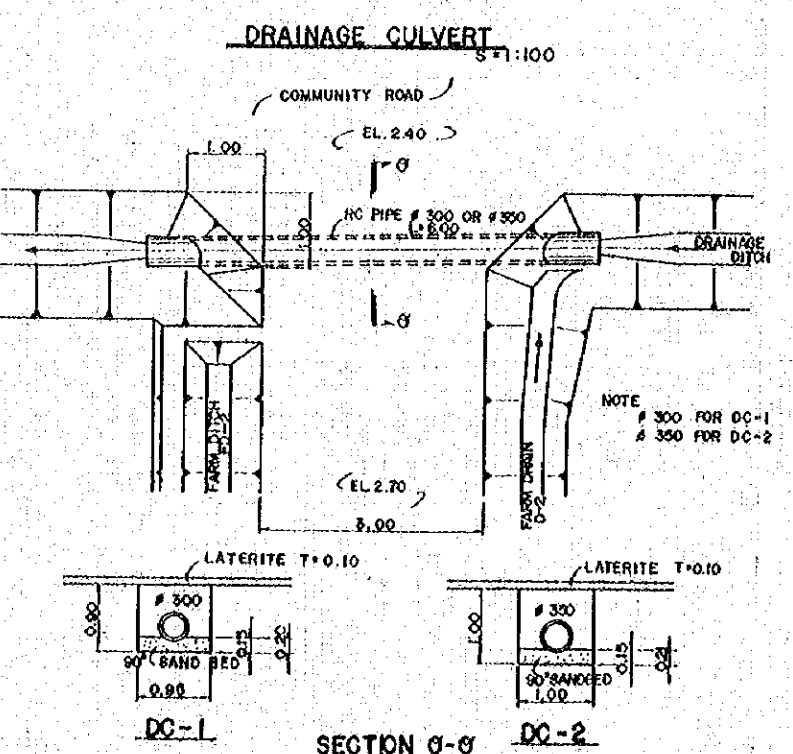
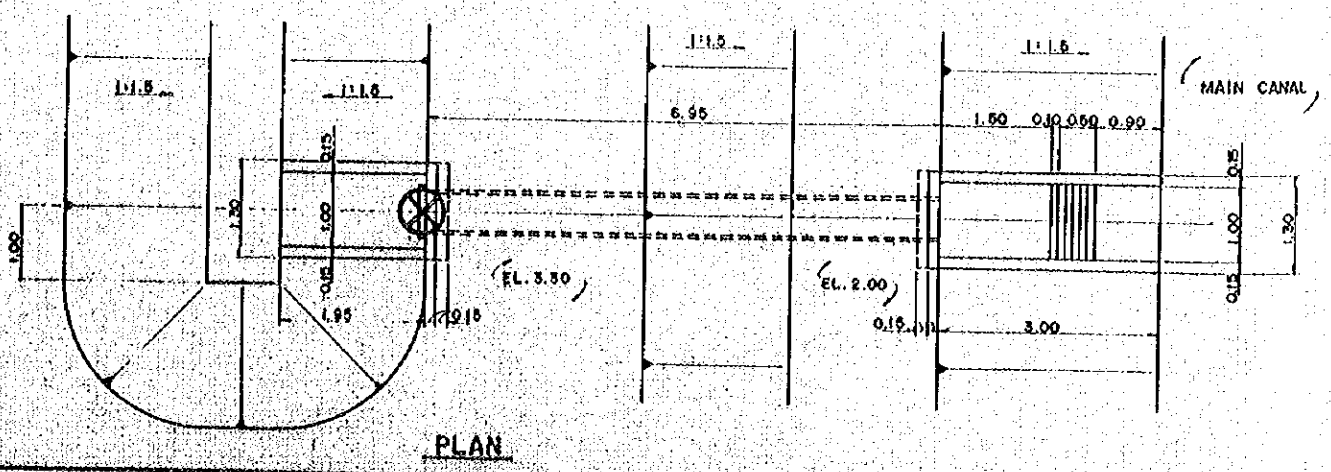
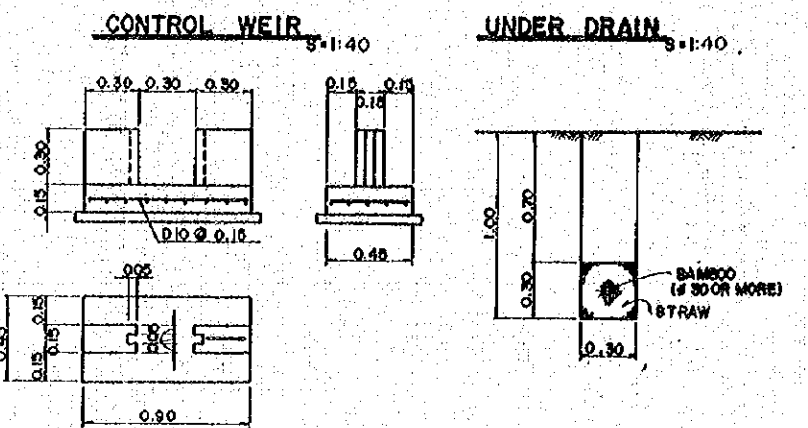
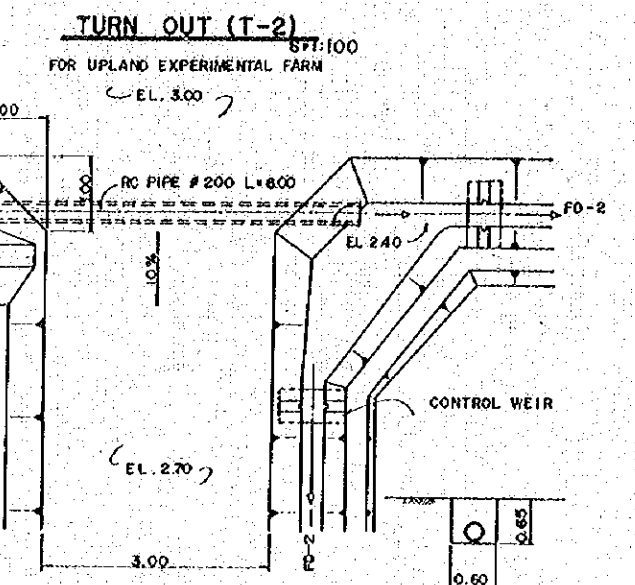
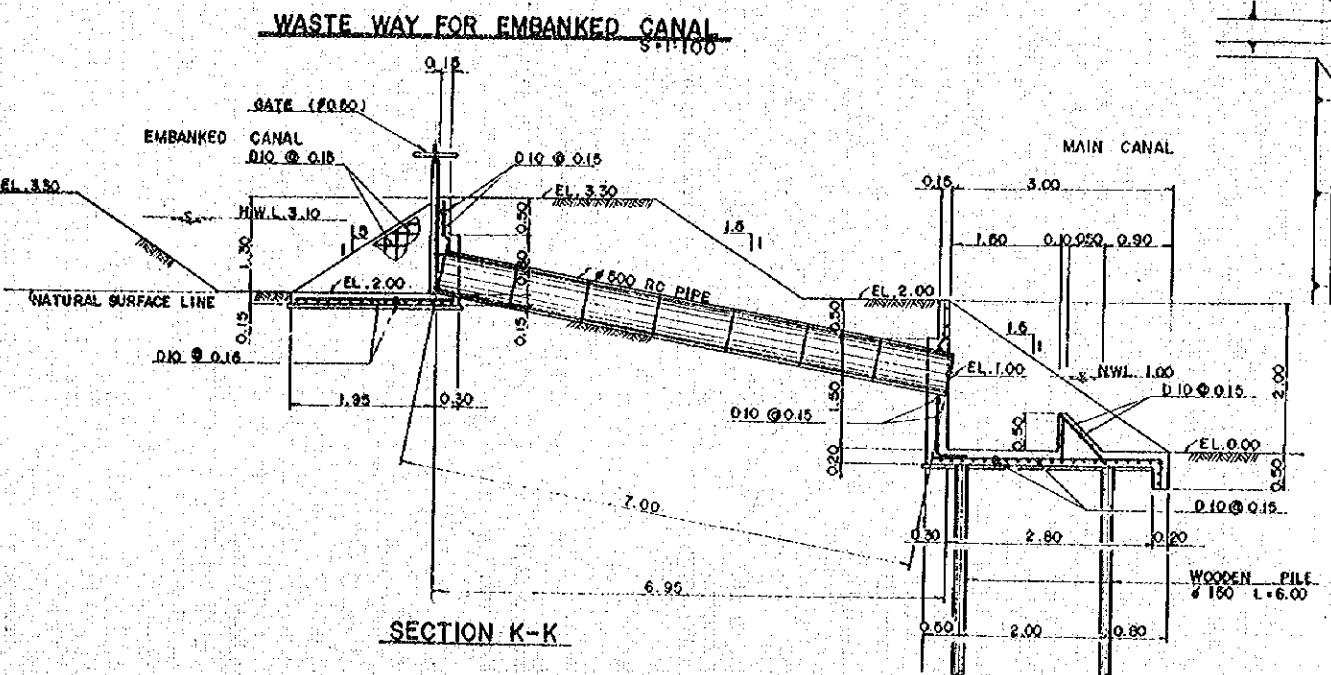
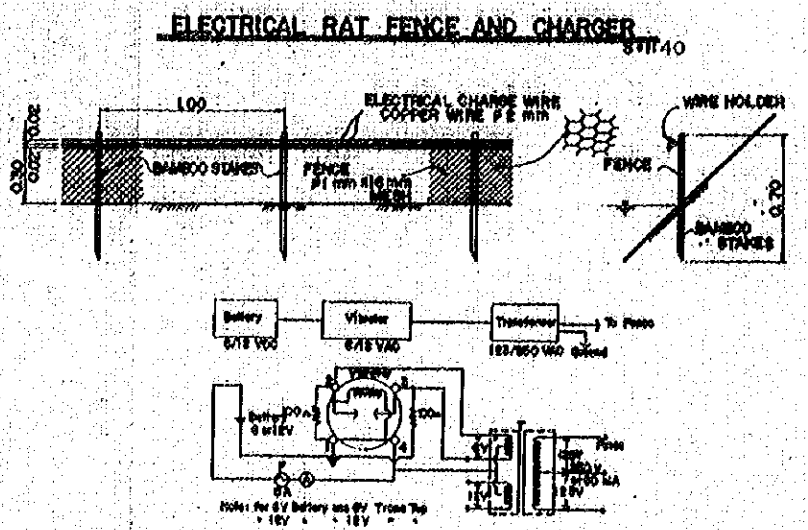
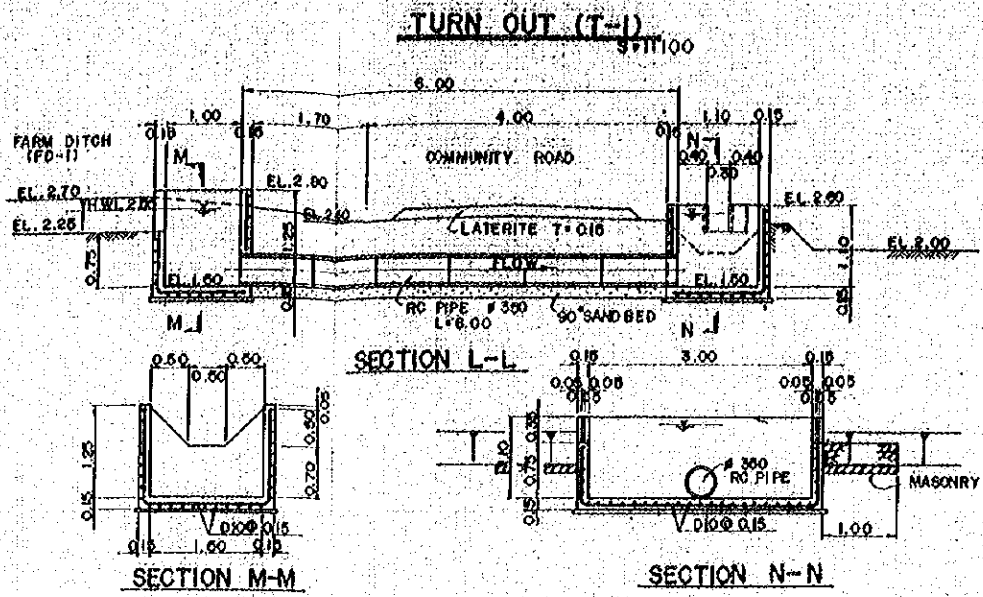
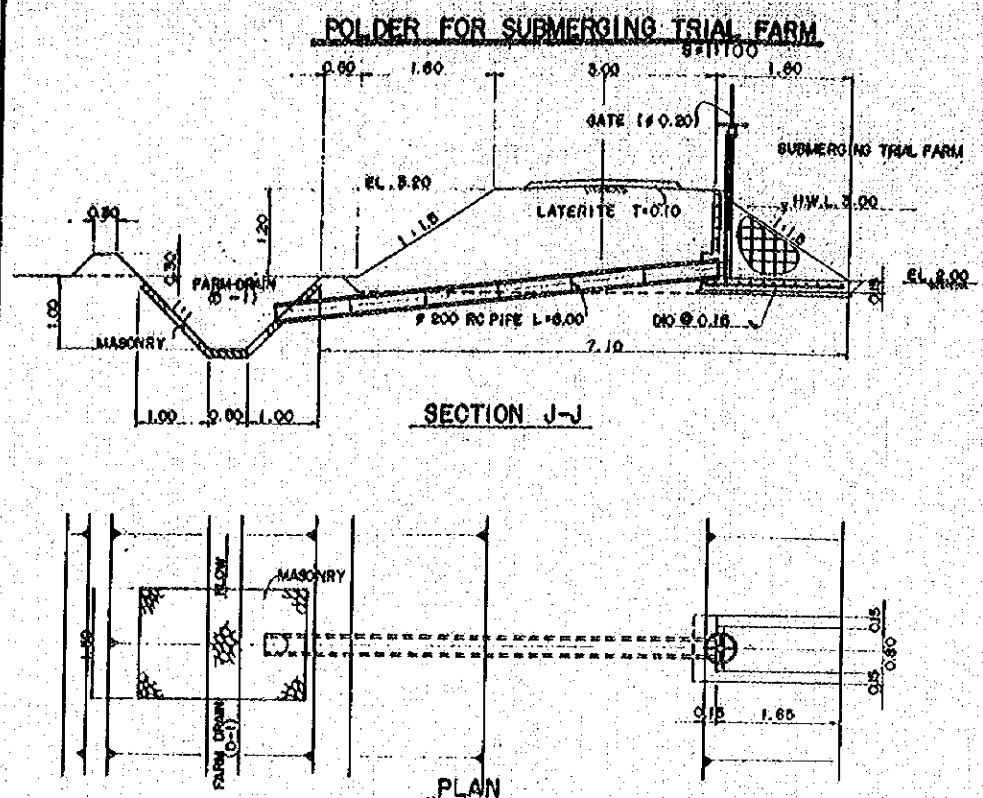


ALL DIMENSIONS ARE GIVEN IN METERS.
SECTIONS (J-J TO L-L) ARE SHOWN IN DWG. NO. C-17.

SCALE
S=1:200
METERS

S=1:100
METERS

CHAO PHYA PILOT PROJECT IADP IN THAILAND			
ROAD AND CANAL			
DATE	JULY 1977	D.W.G	C-16
JAPAN INTERNATIONAL COOPERATION AGENCY			



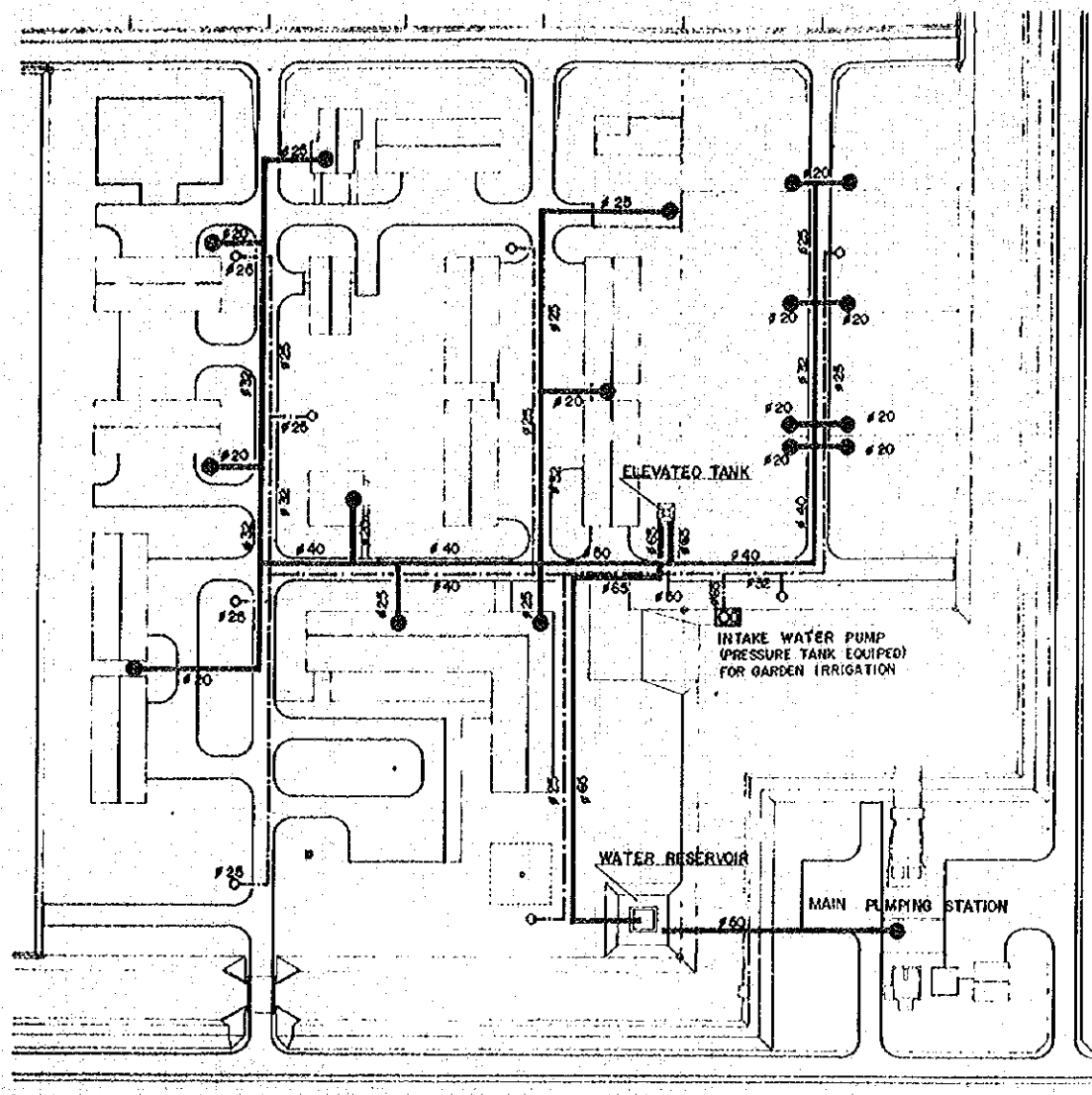
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

MISCELLANEOUS STRUCTURES

DATE	JULY 1977	D.W.G	C-17
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JAPAN INTERNATIONAL COOPERATION AGENCY

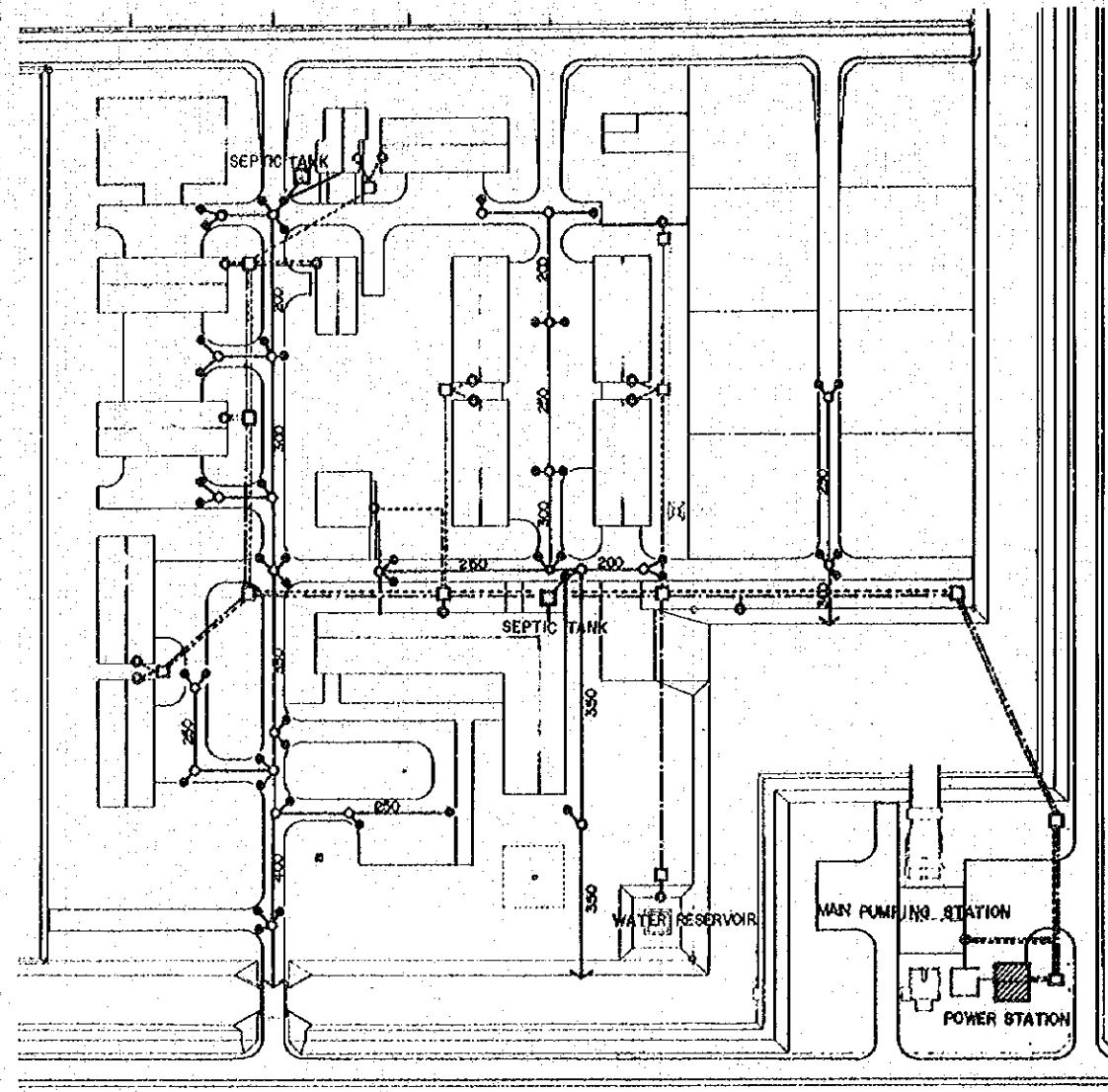
WATER SUPPLY



LEGEND

- DRINKING WATER
- GARDEN IRRIGATION WATER

SEWAGE DISPOSAL, POWER SUPPLY



LEGEND

- 220 V SINGLE PHASE
- 300 V THREE PHASES
- ELECTRIC POLE
- DRAINAGE PIPE
- CATCH BASIN
- DRAINAGE BASIN

SCALE



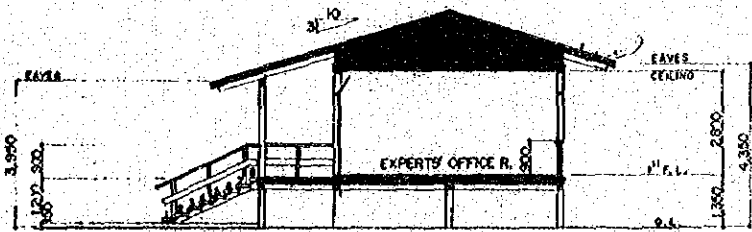
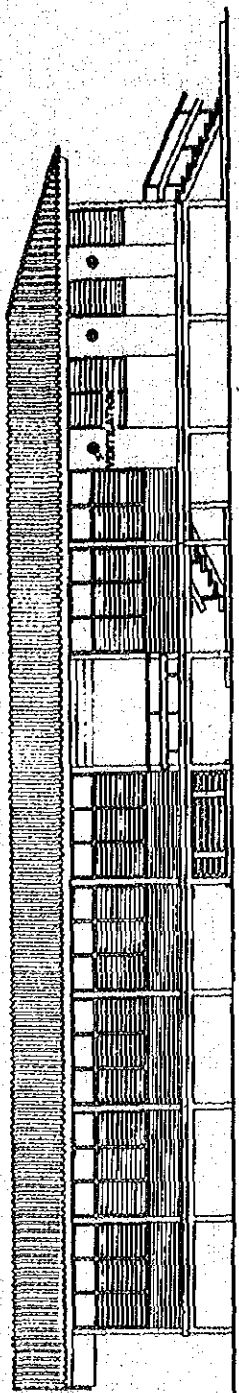
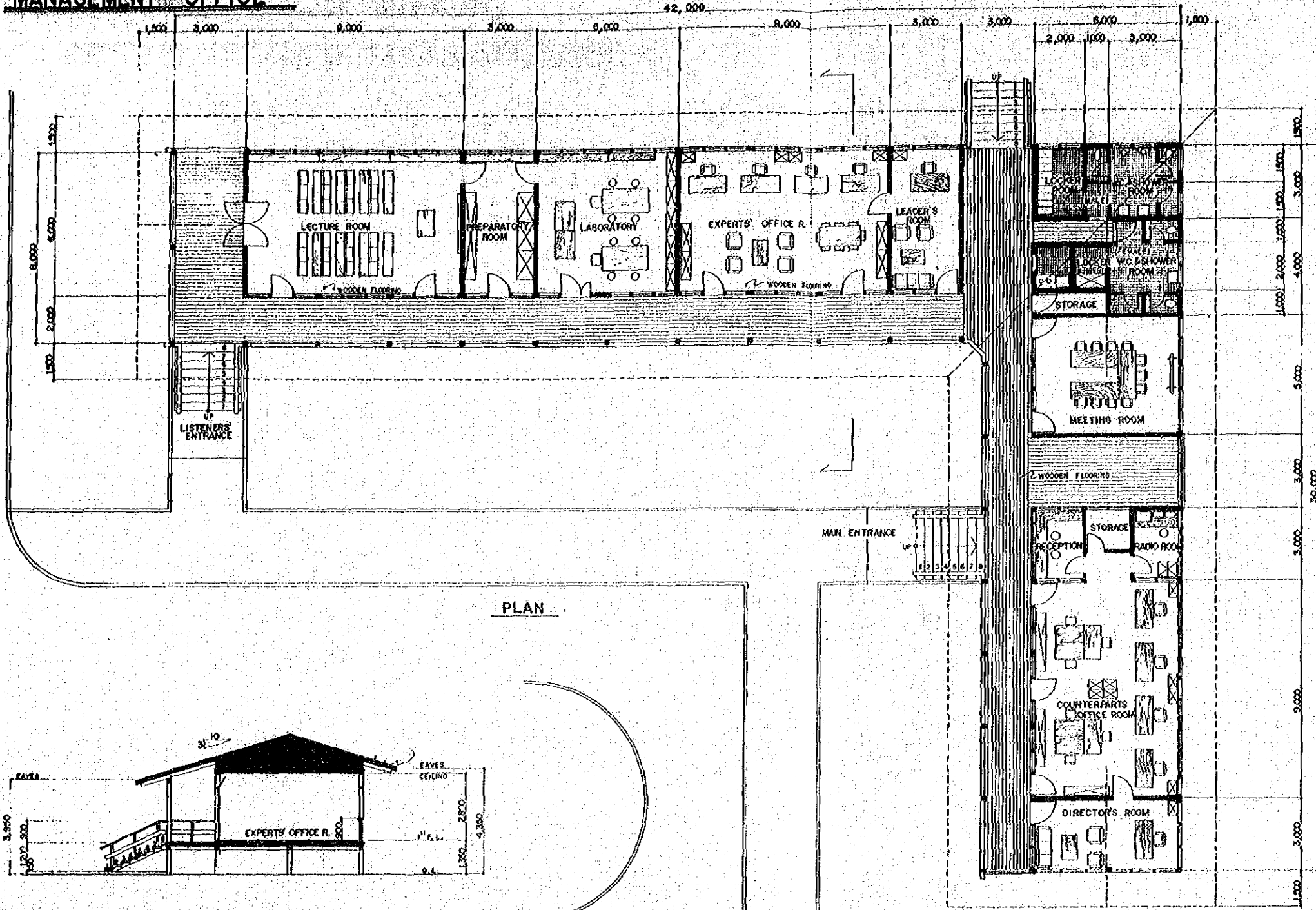
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

WATER SUPPLY,
SEWAGE DISPOSAL
AND POWER SUPPLY

DATE	JULY 1977	D.W.O	C - 18
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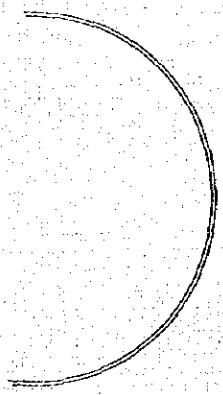
JAPAN INTERNATIONAL COOPERATION AGENCY

MANAGEMENT OFFICE

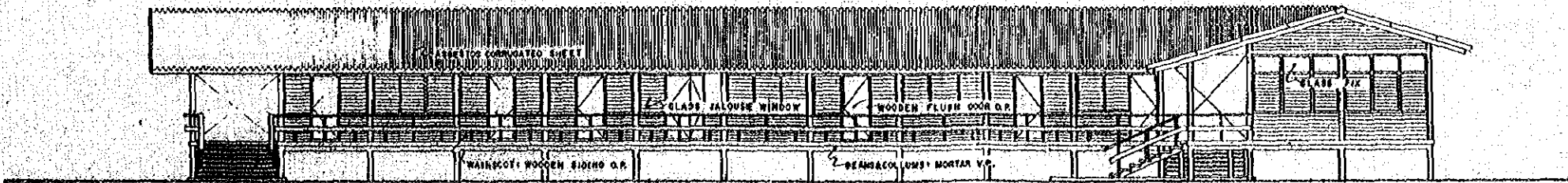


SECTION

PLAN



ALL DIMENSIONS ARE GIVEN IN MILLIMETERS.



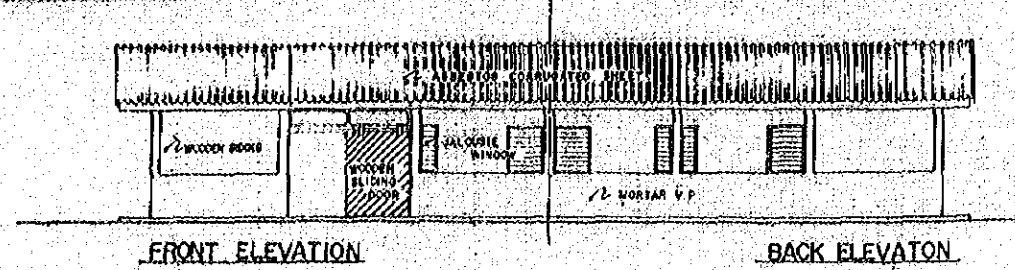
SOUTH ELEVATION

SCALE
S = 1:200



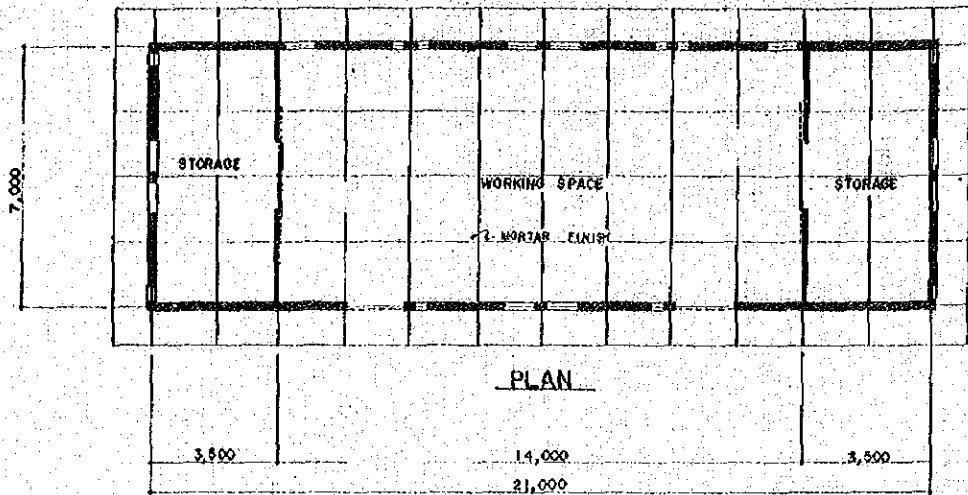
CHAO PHYA PILOT PROJECT IADP IN THAILAND			
MANAGEMENT OFFICE			
DATE	JULY 1977	D.W.G	C - 19
JAPAN INTERNATIONAL COOPERATION AGENCY			

GENERAL WORKSHOP



FRONT ELEVATION

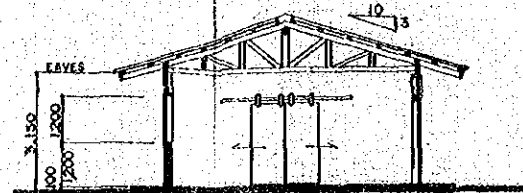
BACK ELEVATION



PLAN

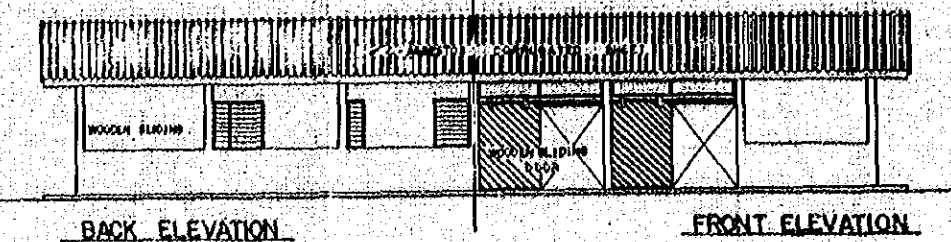


SIDE ELEVATION



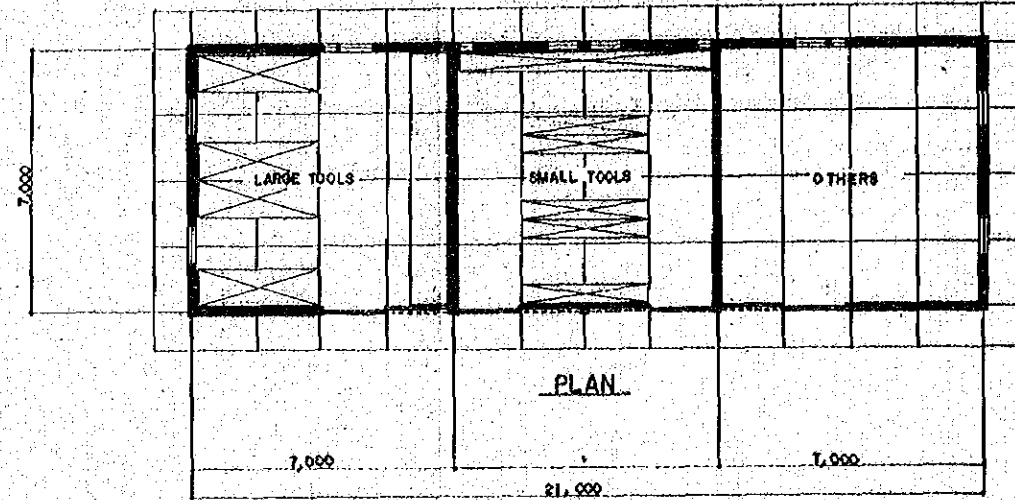
PLAN

WAREHOUSE (AGR. INSTRUMENTS)



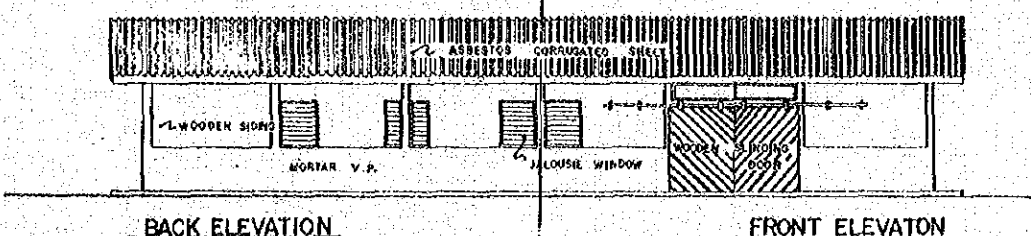
BACK ELEVATION

FRONT ELEVATION



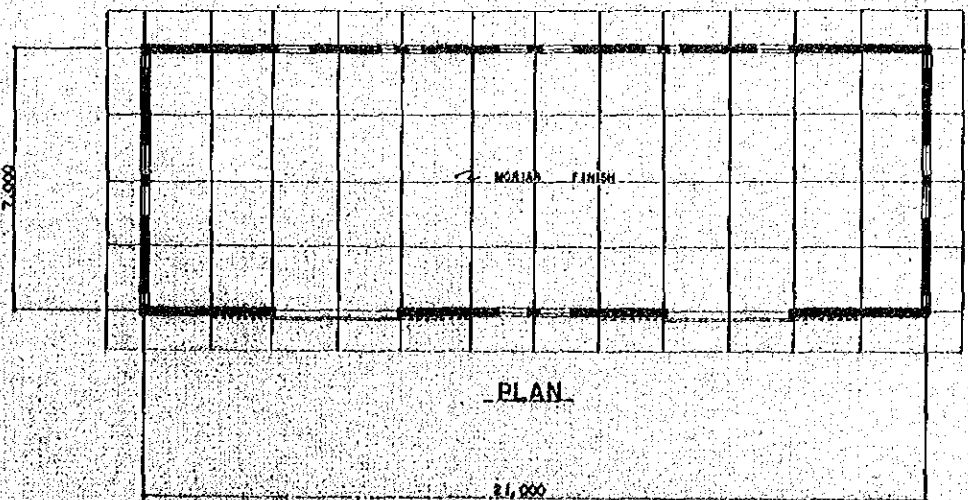
PLAN

GENERAL WAREHOUSE



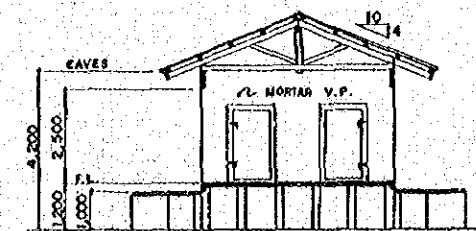
BACK ELEVATION

FRONT ELEVATION

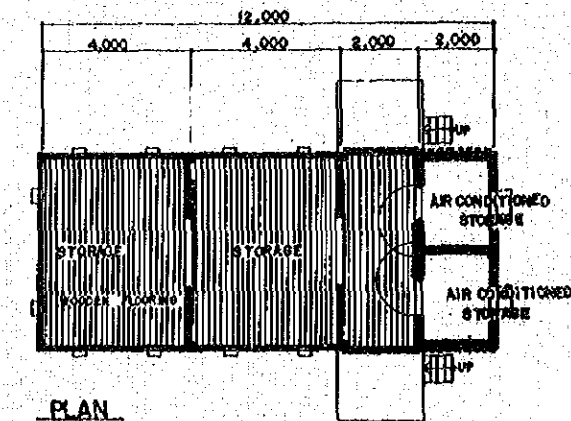


PLAN

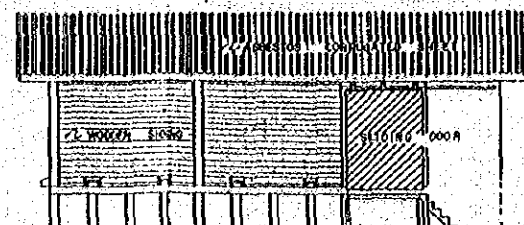
RICE WARE HOUSE



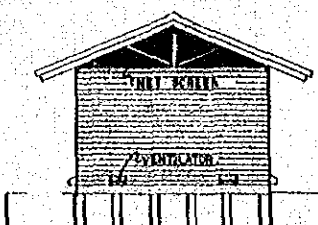
SECTION



PLAN



FRONT ELEVATION



SIDE ELEVATION

CHAO PHYA PILOT PROJECT
IADP IN THAILAND

GENERAL WORKSHOP
AND WAREHOUSES

DATE	JULY 1977	D.W.G	C - 20
JAPAN INTERNATIONAL COOPERATION AGENCY			

REPAIRSHOP

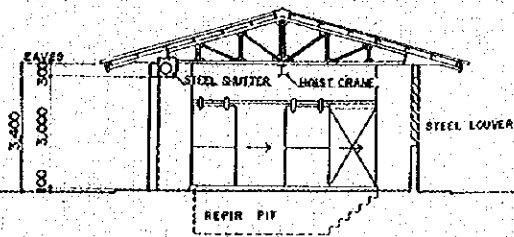


FRONT ELEVATION

BACK ELEVATION

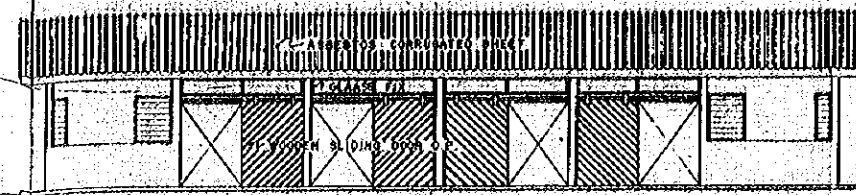


SIDE ELEVATION

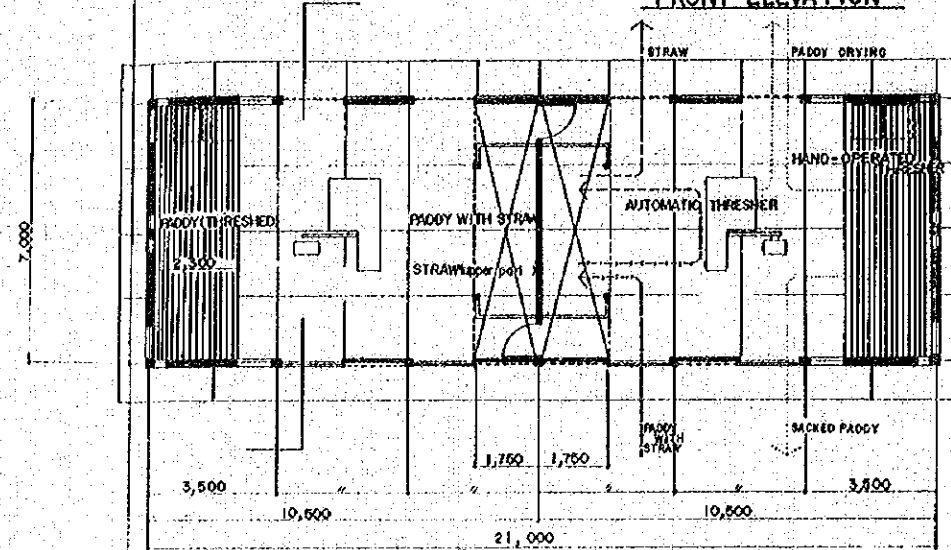


SECTION

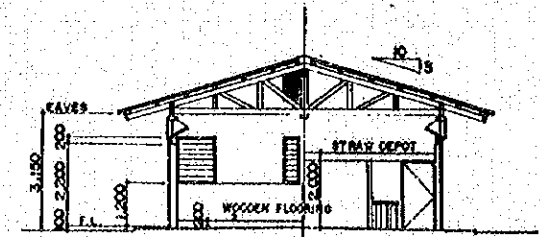
WORKSHOP (THRESHING HOUSE)



FRONT ELEVATION

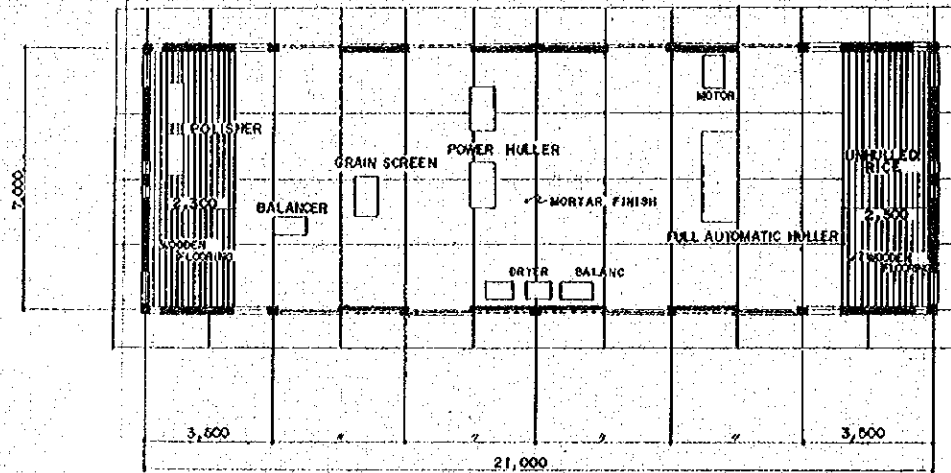


SIDE ELEVATION

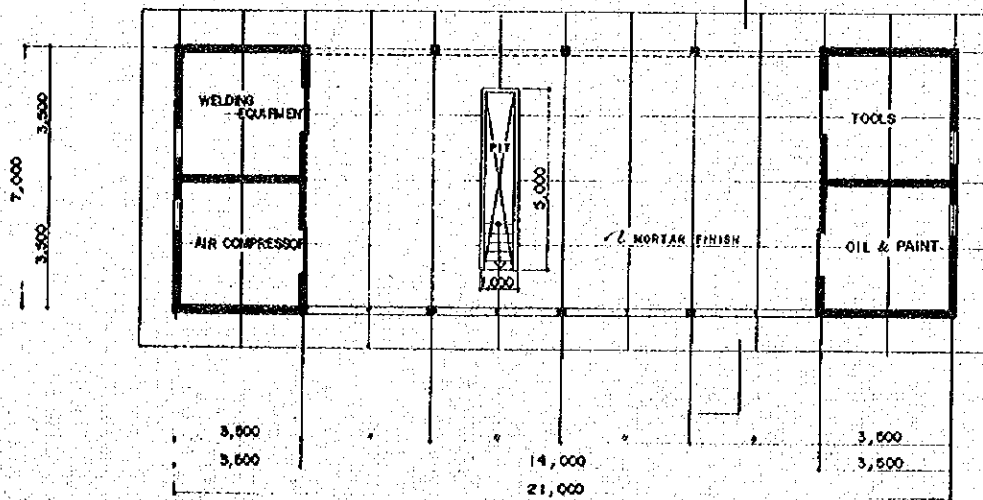


SECTION

WORKSHOP (RICE MILL)



PLAN



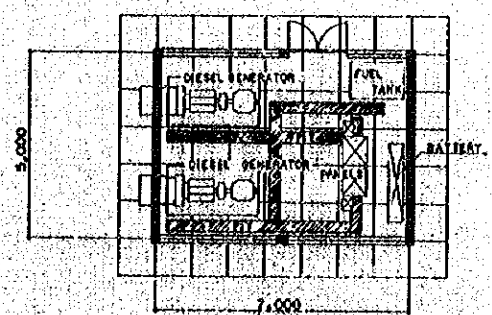
PLAN

ALL DIMENSIONS ARE GIVEN IN MILLIMETERS.

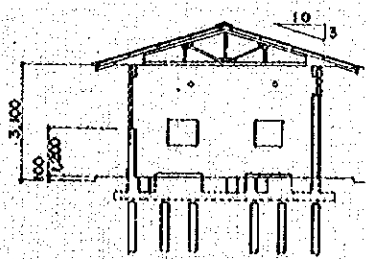
SCALE
S = 1:200



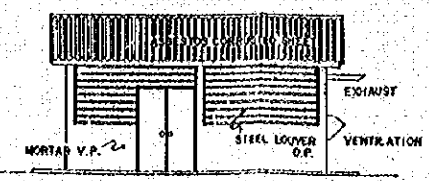
GENERATOR HOUSE



PLAN



SECTION



ELEVATION

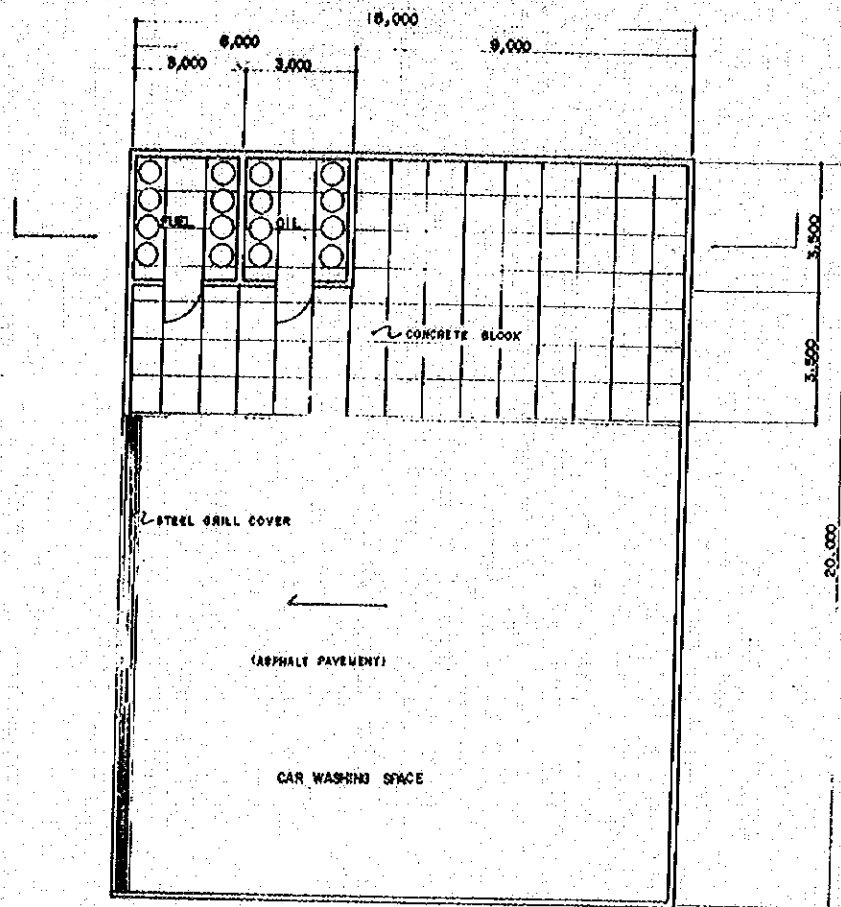
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

**REPAIRSHOP,
WORKSHOPS
AND GENERATOR HOUSE**

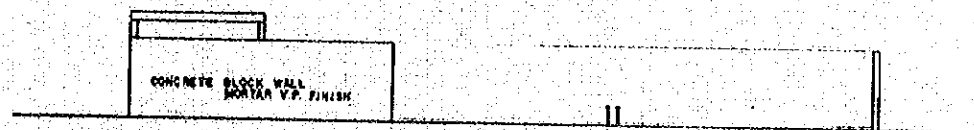
DATE	JULY 1977	D.W.G	C - 21
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JAPAN INTERNATIONAL COOPERATION AGENCY

OIL & FUEL STORAGE



PLAN

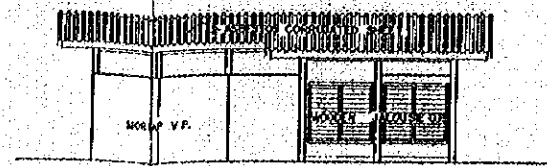


FRONT ELEVATION

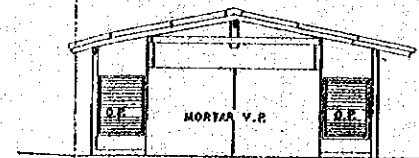


SECTION

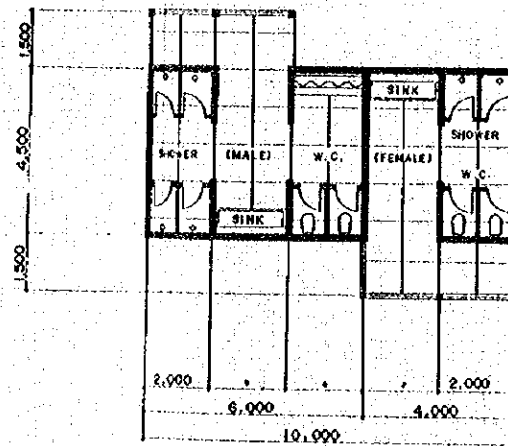
SHOWER-W.C.



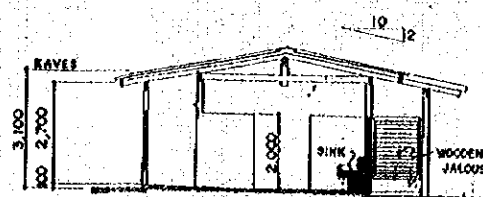
SIDE ELEVATION



FRONT ELEVATION

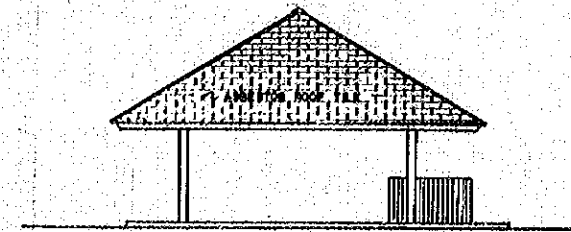


PLAN

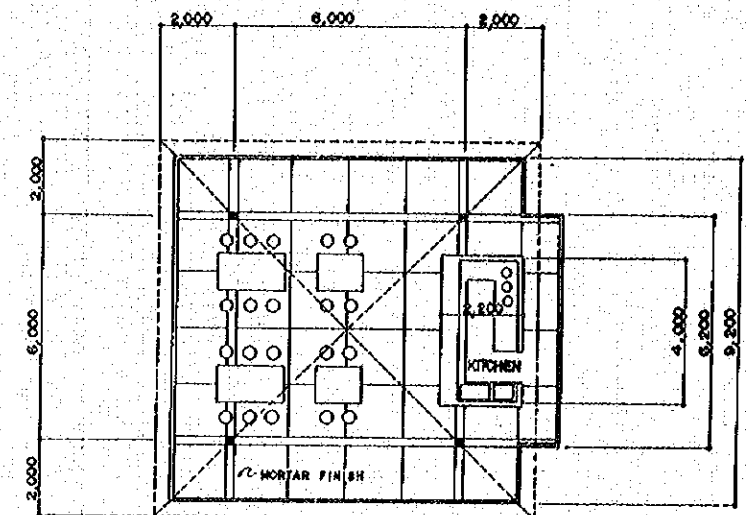


SECTION

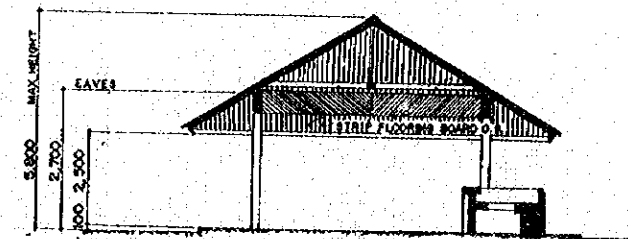
CANTEEN



ELEVATION



PLAN



SECTION

ALL DIMENSIONS ARE GIVEN IN MILLIMETERS.

SCALE S=1:200



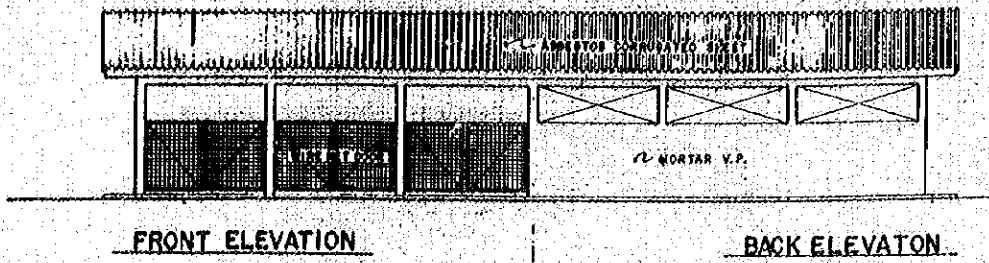
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

OIL & FUEL STORAGE,
SHOWER - W.C.
AND CANTEEN

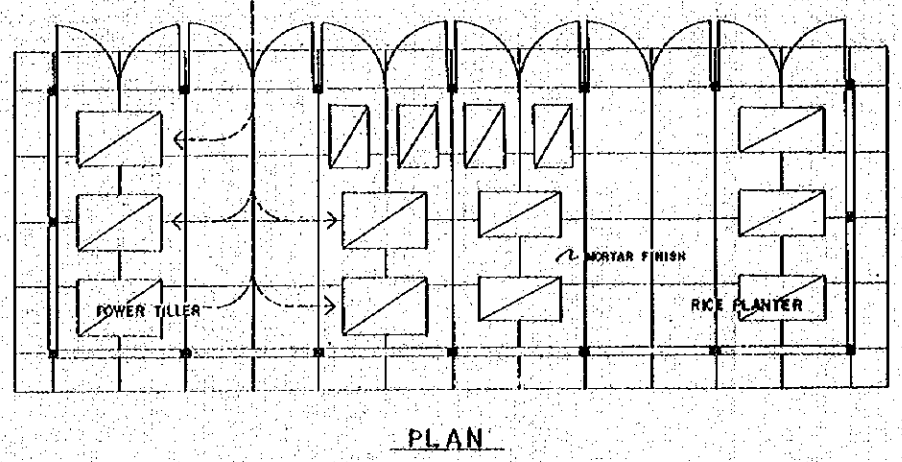
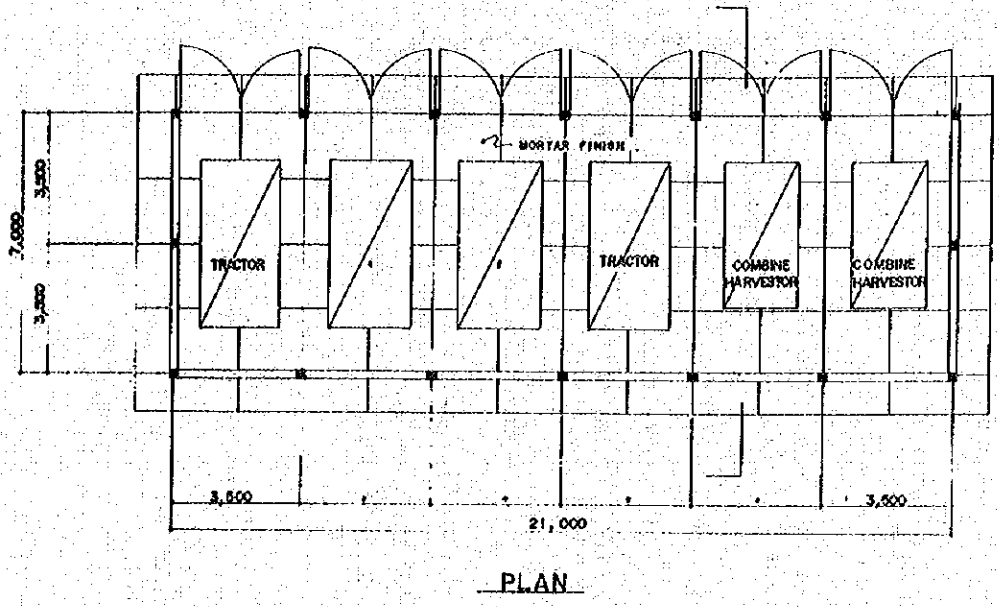
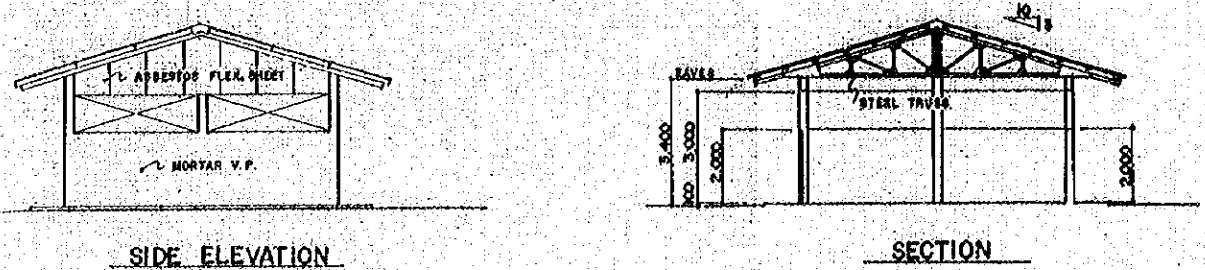
DATE JULY 1977 D.W.G C-22

JAPAN INTERNATIONAL COOPERATION AGENCY

AGR. MACHINERY SHED



AGR. MACHINERY SHED

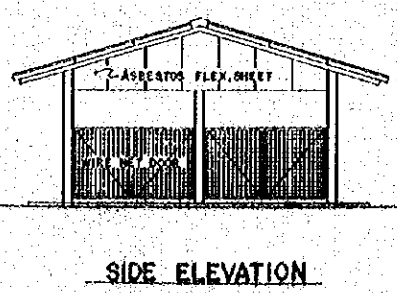
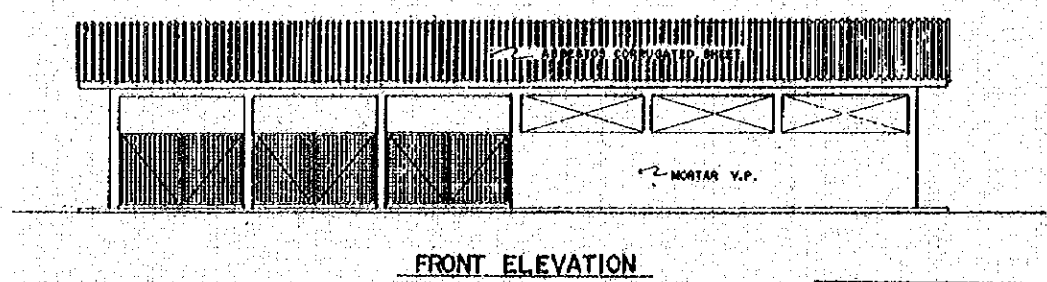
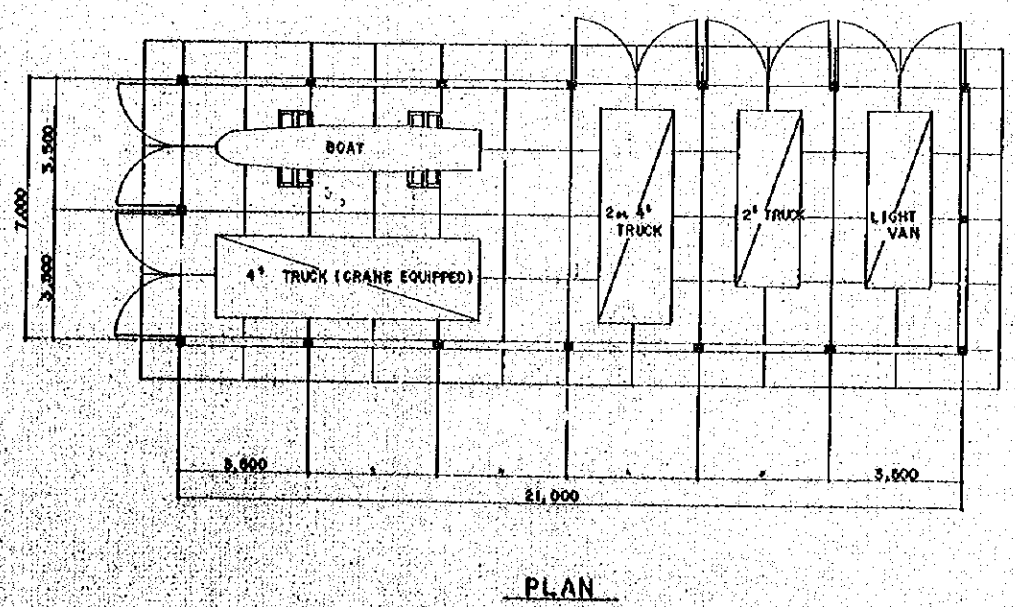


ALL DIMENSIONS ARE GIVEN IN MILLIMETERS.

SCALE
S=1:200



GARAGE



CHAO PHYA PILOT PROJECT			
IADP IN THAILAND			
AGR. MACHINERY SHED			
AND GARAGE			
DATE	JULY 1977	D.W.G	C - 23
JAPAN INTERNATIONAL COOPERATION AGENCY			

NAME OF BUILDING	ROOM	FLOOR	BASEBOARD	WALL	CEILING	FITTING	EQUIPEMENTS
MANAGEMENT OFFICE	OFFICE R.	HARD WOOD FLOORING	HARD WOOD O.P.	PLASTER V.P.	SOFT FIBER BOARD	GLASS JALOUSIE WINDOWS WOODEN FLUSH DOORS O.P.	
	EXPERTS' OFFICE R.	"	"	"	"	"	
	DIRECTOR'S R.	"	"	PLYWOOD PANELLING O.S.	FLOORING BOARD CLEAR LACQUERED	"	
	LEADER'S R.	"	"	"	"	"	
	MEETING R.	"	"	"	"	"	
	LABORATORY	PLASTIC TILE (ANTI-ACID ALKALI TYPE)	"	PLASTER V.P.	SOFT FIBER BOARD	"	
	PREPARATORY R.	"	"	"	"	"	
	LECTURE R.	HARD WOOD FLOORING	"	"	"	"	
	LAVATORY-SHOWER	TERRA 220 BLOCK	TERRA 220 BLOCK	GLAZED TILE	ASBESTOS FLEX BOARD O.P.	"	WHOLE SET OF SANITARY EQUIPMENT
LOCKER R.	"	"	PLASTER V.P.	"	"		
CORRIDOR TERRACE	HARD WOOD FLOORING	---	WOODEN SIDING O.P.	"	---		
RICE WAREHOUSE	NORMAL STORAGE	"	---	---	---	INSULATED DOOR	
	COLD STORAGE	INSULATION BACKING	---	PLASTER V.P. INSULATION BACKING	PLASTER V.P. INSULATION BACKING	WOODEN SLIDING DOOR	INSTALLATION OF COOLING UNITS INCLUDED
WORKSHOP (THRESHING HOUSE)	---	MORTAR JOINTING (PARTIALLY W.FLOORING)	MORTAR V.P.	MORTAR V.P.	---	GLASS JALOUSIE WINDOWS GLASS FIX WINDOW WOODEN SLIDING DOOR	
" (RICE MILL.)	---	"	"	"	---	"	
"	WORKING SPACE	MORTAR JOINTING	"	"	---	"	
" (GENERAL)	STORAGE	"	MORTAR JOINTING	MORTAR JOINTING	---	"	
WAREHOUSE (AGR. INSTRUMENTS)	---	"	MORTAR JOINTING	"	---	"	
" (GENERAL)	---	"	"	"	---	"	
REPAIRSHOP	WORKING SPACE	"	"	MORTAR V.P.	---	STEEL SHUTTER JALOUSIE WINDOW	HOIST CRANE REPAIR PIT
	OTHER R.	"	"	"	---	STEEL FLUSH SLIDING D.	
AGR. MACHINERY SHED	---	"	"	"	---	WIRENET STEEL PIPE FRAMED DOOR	
GARAGE	---	"	"	"	---	"	
CANTEEN	---	"	---	---	FLOORING BOARD C.L.	---	
SHOWER - W. C.	---	"	MORTAR JOINTING	MORTAR V.P.	---	WOODEN FLUSH DOOR	WHOLE SET OF SANITARY EQUIPMENTS
GENERATOR HOUSE	---	"	"	---	---	STEEL FLUSH DOOR	WIRING PIT
OIL & FUEL STORAGE	---	CONCRETE BLOCK	"	---	---	"	

NOTE

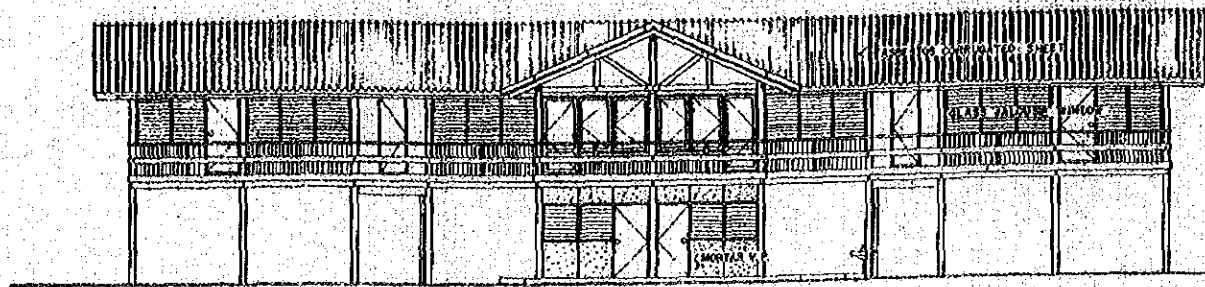
LIGHTING & WIRING WORKS ARE INCLUDED IN BUILDING WORK.

FURNITURES & FIXTURES ARE SHOWN IN THE DRAWINGS BUT NOT INCLUDED IN BUILDING WORK. UNLESS OTHERWISE MENTIONED IN THE TABLE.

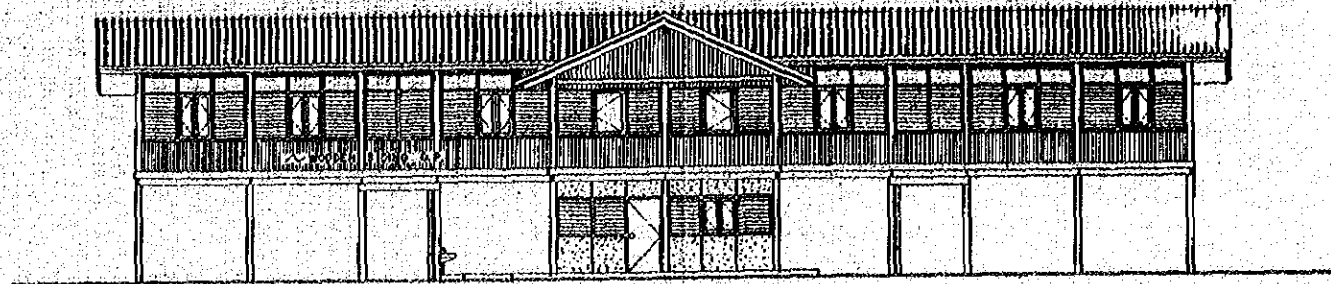
CHAO PHYA PILOT PROJECT
IADP IN THAILAND

SPECIFICATIONS

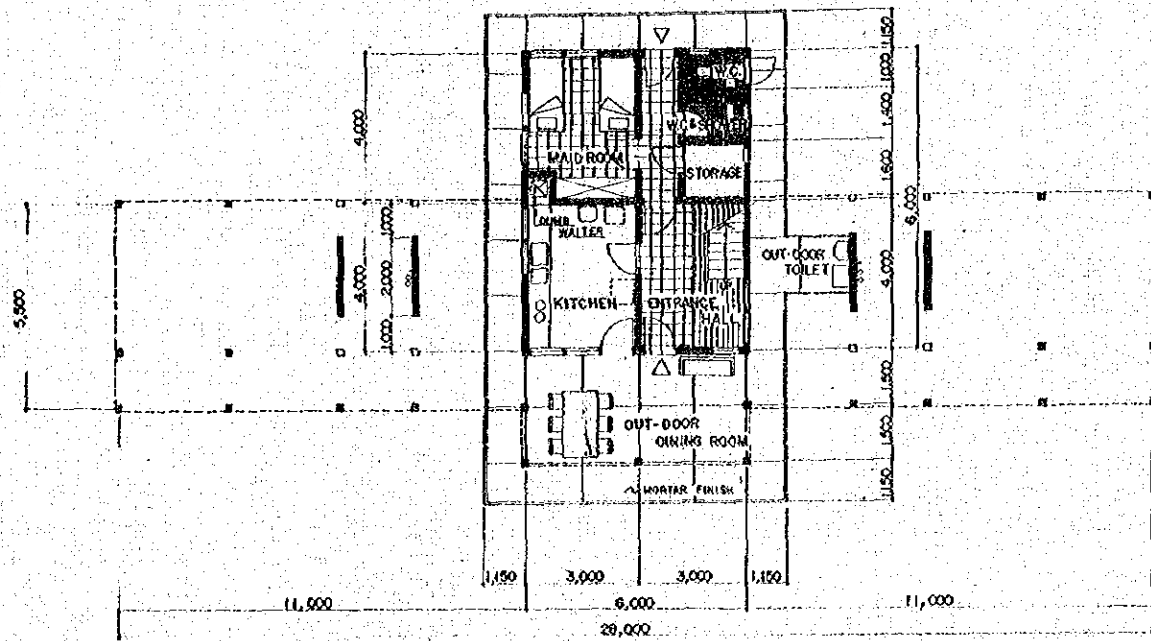
DATE	JULY 1977	D.W.G	C - 24
JAPAN INTERNATIONAL COOPERATION AGENCY			



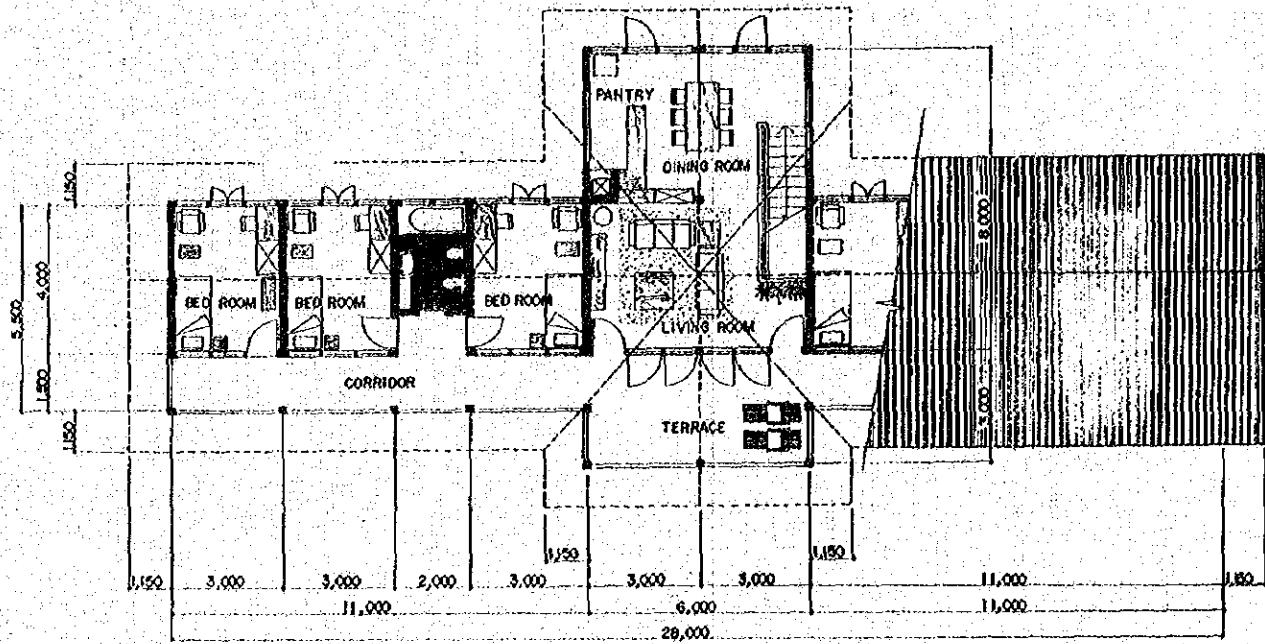
FRONT ELEVATION



BACK ELEVATION



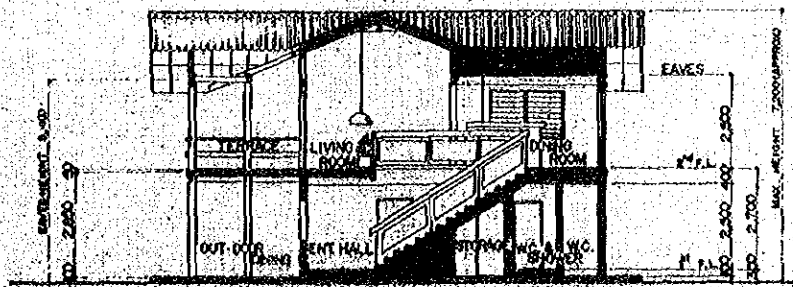
1st FLOOR



2nd FLOOR

ALL DIMENSIONS ARE GIVEN IN MILLIMETERS.

SCALE
S=1:200



SECTION

EXTERIOR FINISH	ROOF ; ASBESTOS CORRUGATED SHEET
	WALL ; WOODEN SIDING O.P. , MORTAR V.P.
	FITTING ; GLASS JALOUSIE WINDOW, WOODEN FRAME GLASS WINDOW, WOODEN FLUSH DOOR
	COLUMN ; VINYL PAINT
	CEILING ; *ASBESTOS FLEXIBLE SHEET

INTERIOR FINISH	ROOM	FLOOR	BASEBOARD	WALL	CEILING
	BED ROOM	WOODEN FLOORING	WOOD O.P.	CLOTH	WOODEN FLOORIN BOARD CLEAR LACQUER
	LIVING & DINING ROOM	41110	41110	CLOTH	41110
	MAID ROOM	TERRA 220	TERRA 220	PLASTER V.P.	PLASTER BOARD V.P.
	ENTRANCE	41110	41110	41110	41110
	KITCHEN	MORTAR	MORTAR	41110	41110

CHAO PHYA PILOT PROJECT
IADP IN THAILAND

EXPERTS' LODGING

DATE	JULY 1977	D.W.G	C - 25
JAPAN INTERNATIONAL COOPERATION AGENCY			

