

5-10. Electrical System

1) Power Receiving System

a) Power distribution

Power will be received from the distribution line of WAPDA which runs along the Peshawar road in front of the project site. The low-voltage distribution line presently across the site will be transferred by the Pakistan side.

Receiving power rating: 3 ϕ , 3W, 11KV, 50Hz

b) Power receiving and transformation

The transformation equipment will be installed in the WAPDA's substation provided inside of the main building using the high-voltage, 3 phse, 3 wire, 11 KV, by underground cable. The transformer will be accommodated in the electricity room for power supply to each load through the distribution panel. The transformer will be estimated a capacity of 630 KVA. Power will be supplied to meet the following loads including reserve load. Power supply for 20 Staff Houses should be separately prepared because of avoiding voltage-descent.

(a) Lighting and receptacles.	100 KVA
(b) Air-conditioning and ventilation system.	100 KVA
(c) Sanitary equipment.	30 KVA
(d) Practical training machinery and equipment.	400 KVA

2) Power Circuit System

A power supply system leading to building equipment as well as to training machinery will be planned. Distribution voltage will be as shown below.

a) Lighting and receptacles load.	3-phase, 4-wire, 400/230V
b) General power load.	3-phase, 3-wire, 400V
c) Training machinery power load.	3-phase, 4-wire, 400/230V

3) Lighting System

a) Light source and fixtures

Fluorescent lamps will be mainly used to cut down the running cost, and direct fix type will be selected for most rooms. Main light sources as shown below.

Fuorescent lamp	Workshops, classrooms, test rooms, office rooms
Incandescent lamp	Lecture hall, walk ways, etc.
Mercury lamp	Outdoor lamps

These lamps will be turned on and off in each room to save power consumption.

b) Design illumination

Office, classrooms	350 - 400 lx.
Workshops	300 - 350 lx.
Lecture Hall	100 - 150 lx.
Walk ways, WCs	50 - 100 lx.

4) Telephone System

a) Telephone line receiving

About five telephone lines will be installed into the site. For the telephone incoming, a service pole is built in the site and a terminal box is installed on the post by T & T. The wiring after the terminal box to MDF (Main Distribution Frame) in the building switchboard is underground.

b) Telephone outlet

The cable conduit line is led from the MDF through the PBX board to each wall outlet.

Outlet boxes are to be of wall-mounted type.

c) Telephone exchange system

Telephone exchange system is of cross bar type, and planning is made to install about 40 extension telephone lines.

5) Public Address System

An amplifier will be installed in the administrative room for announcement of class beginning and closing hours and for liaison between all buildings.

6) Fire System

Emergency alarm bells and push switches will be installed to provide against an emergency including fire, with a display panel set up in the administrative room to indicate the whereabouts of accidents.

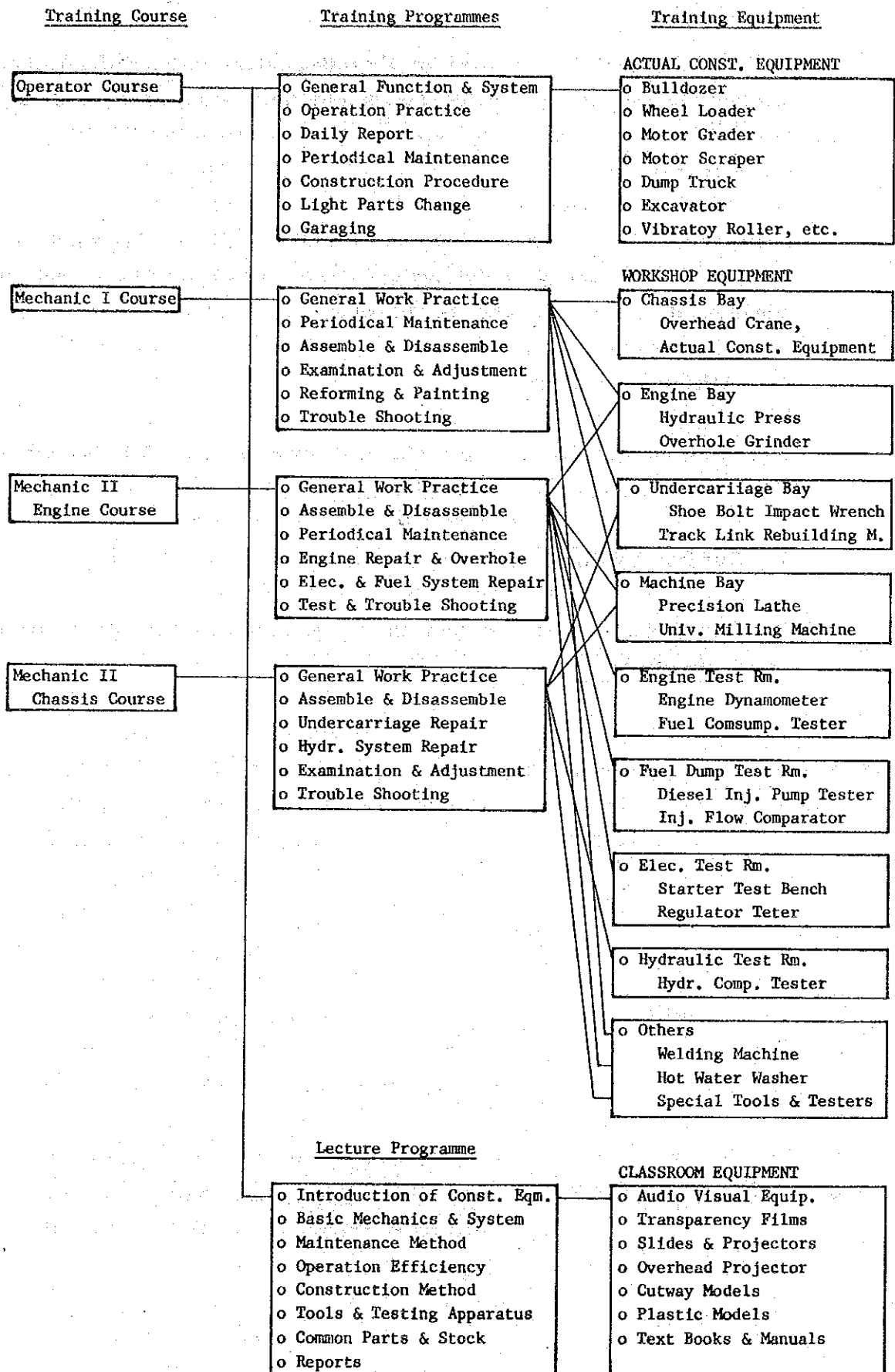
7) Lightning Arrester

Lightning conductors will be installed to protect the CMTC facilities against the damage of lightning discharge.

8) Outdoor lighting

Outdoor lamps will be installed along the roads in the CMCT for nighttime crime prevention.

■ Training Programmes and Equipment



5-11. Training Equipment Planning

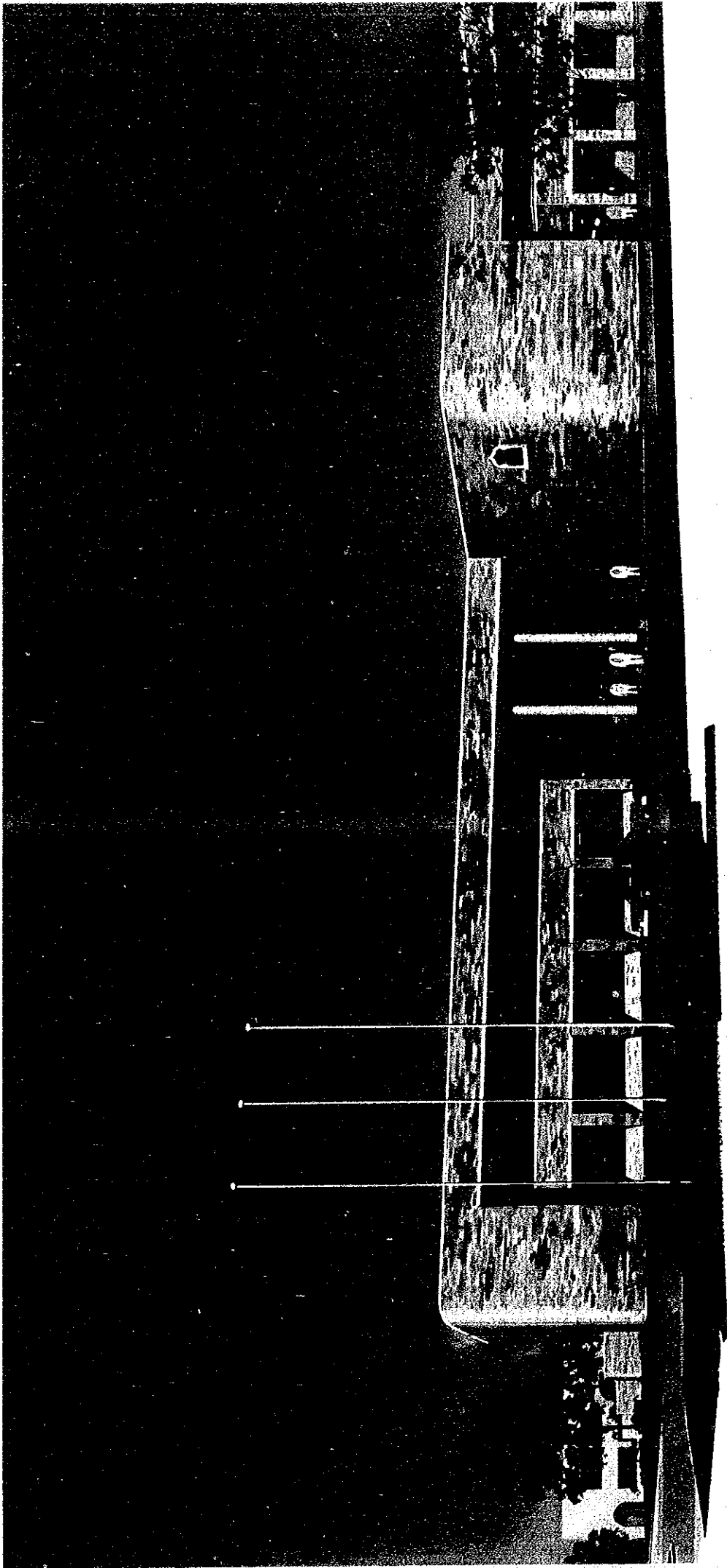
The List on Appendix is showing the training equipment required for the CMTC operations. In selecting these equipment, attention should be given to the following points.

- 1) Select the equipment that can produce high training effects in a systematic manner, with the focal point on the improvement of trainees' technical level.
- 2) Select those equipment, actually used at similar training institutions or workshops should be checked and in selecting those types of equipment which will enable trainees to exhibit the acquired technical capabilities after graduation of the course.
- 3) Select those equipment which are easy to use and require the minimum maintenance service.
- 4) The quantity and layout of the equipment should be determined after a careful study of the contents/method of training to assure their efficient operation.
- 5) Construction machinery for operator training should be selected to provide a well-balanced combination which will actually be used in the civil engineering work such as road construction, land reclamation, irrigation facilities construction, etc.

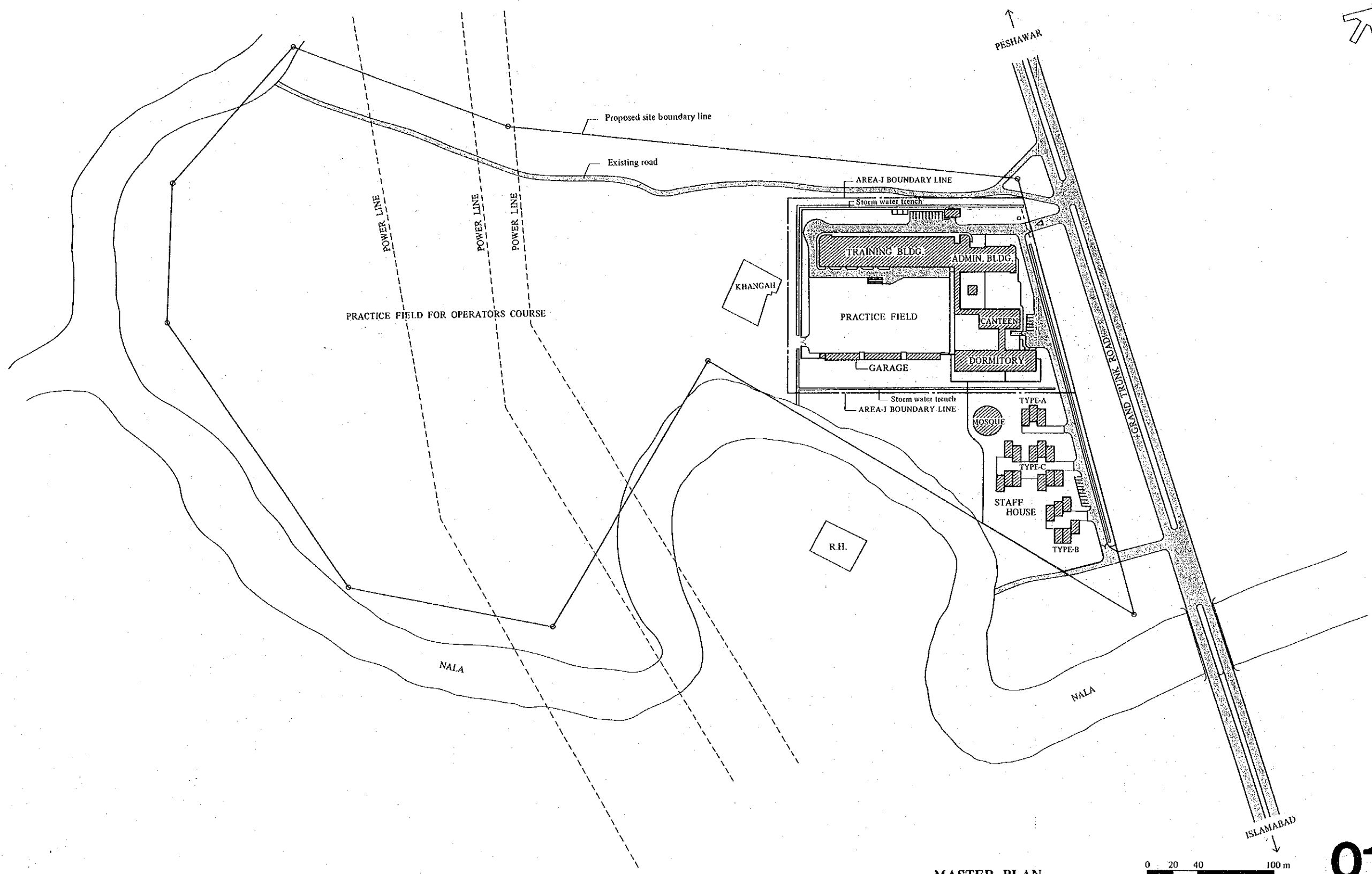
In order to enable the training by these equipment efficiently as planned at the outset, it should be acquired the necessary operating/maintenance capability in a short training period. For this purpose, training in operating techniques should be given in a well-planned, systematic manner and spare parts should be supplied smoothly by maintaining close contact with the Japanese experts assigned by the Project-based Technical Cooperation and by securing the services of their Pakistan instructors.

BASIC DESIGN DRAWINGS

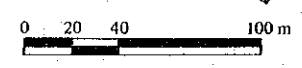
1. MASTER PLAN
2. FLOOR PLAN (LEVEL-1)
3. FLOOR PLAN (LEVEL-2)
4. ROOF PLAN
5. ELEVATIONS
6. SECTIONS
7. WATER SUPPLY SYSTEM
8. DRAINAGE SYSTEM
9. GAS SUPPLY SYSTEM
10. ELECTRICAL SYSTEM
11. TELEPHONE SYSTEM
12. EQUIPMENT LAYOUT-1
13. EQUIPMENT LAYOUT-2



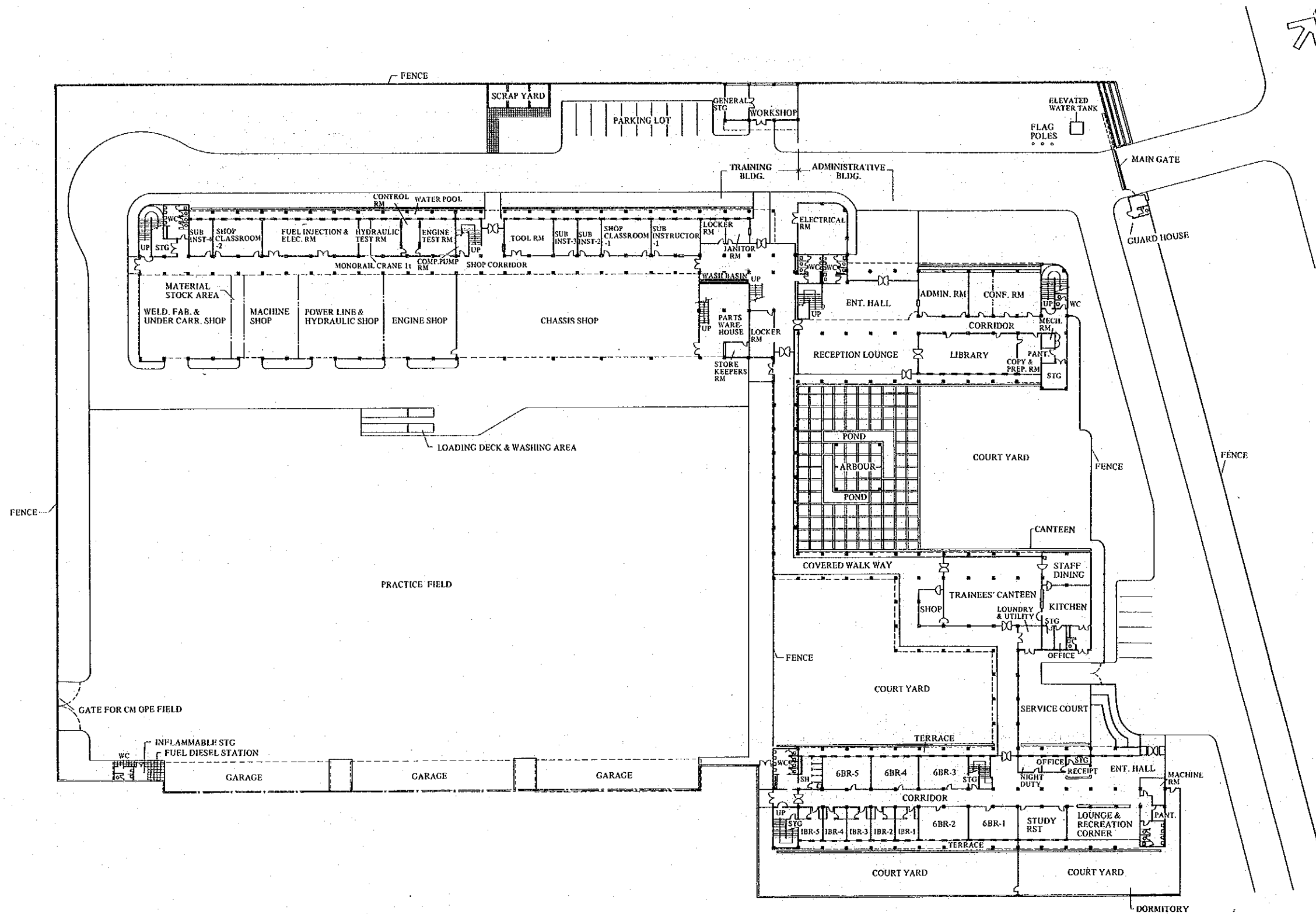
CONSTRUCTION MACHINERY TRAINING CENTER
JUNE 20, 1984



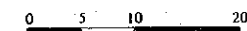
MASTER PLAN



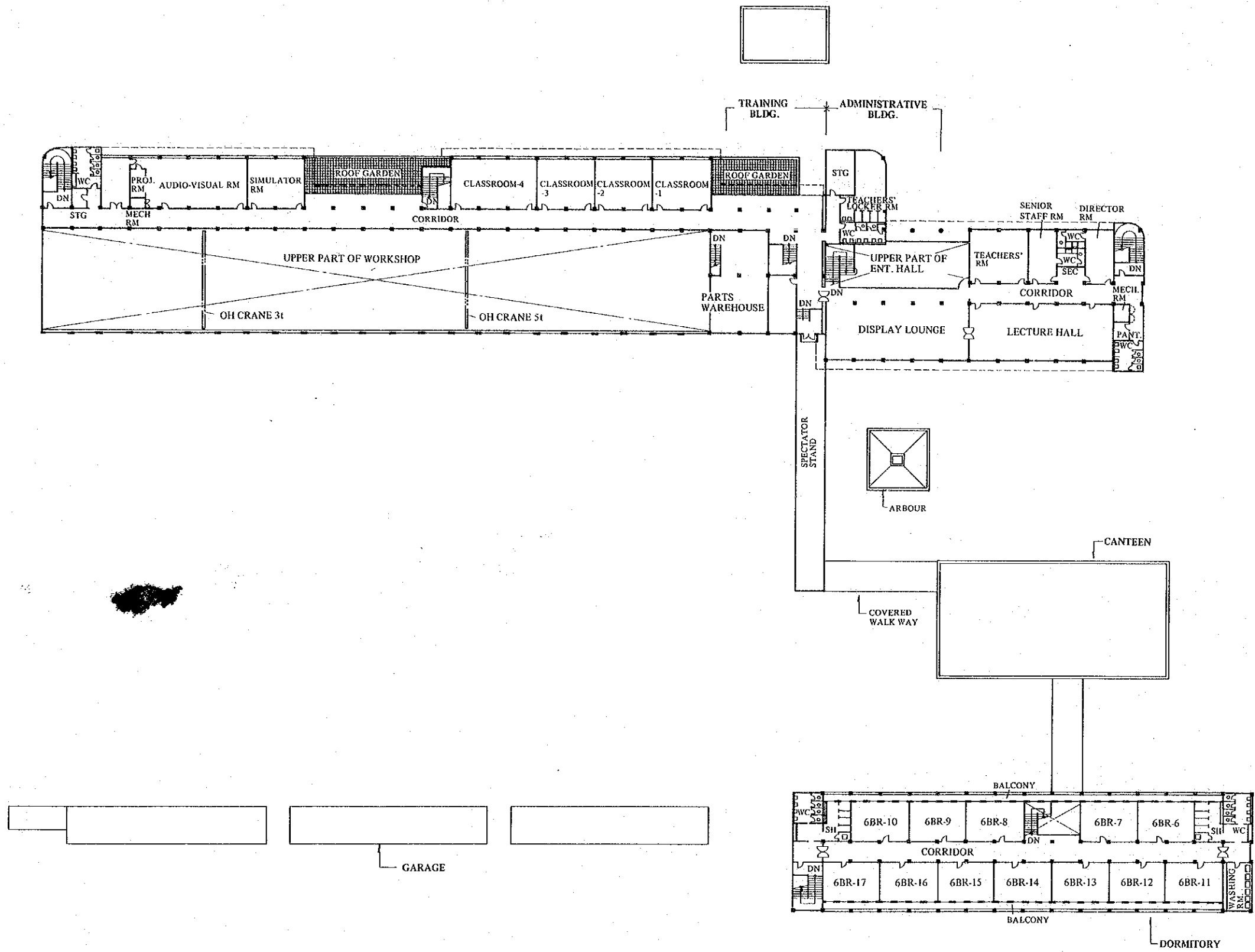
01



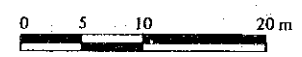
LEVEL-1 FLOOR PLAN



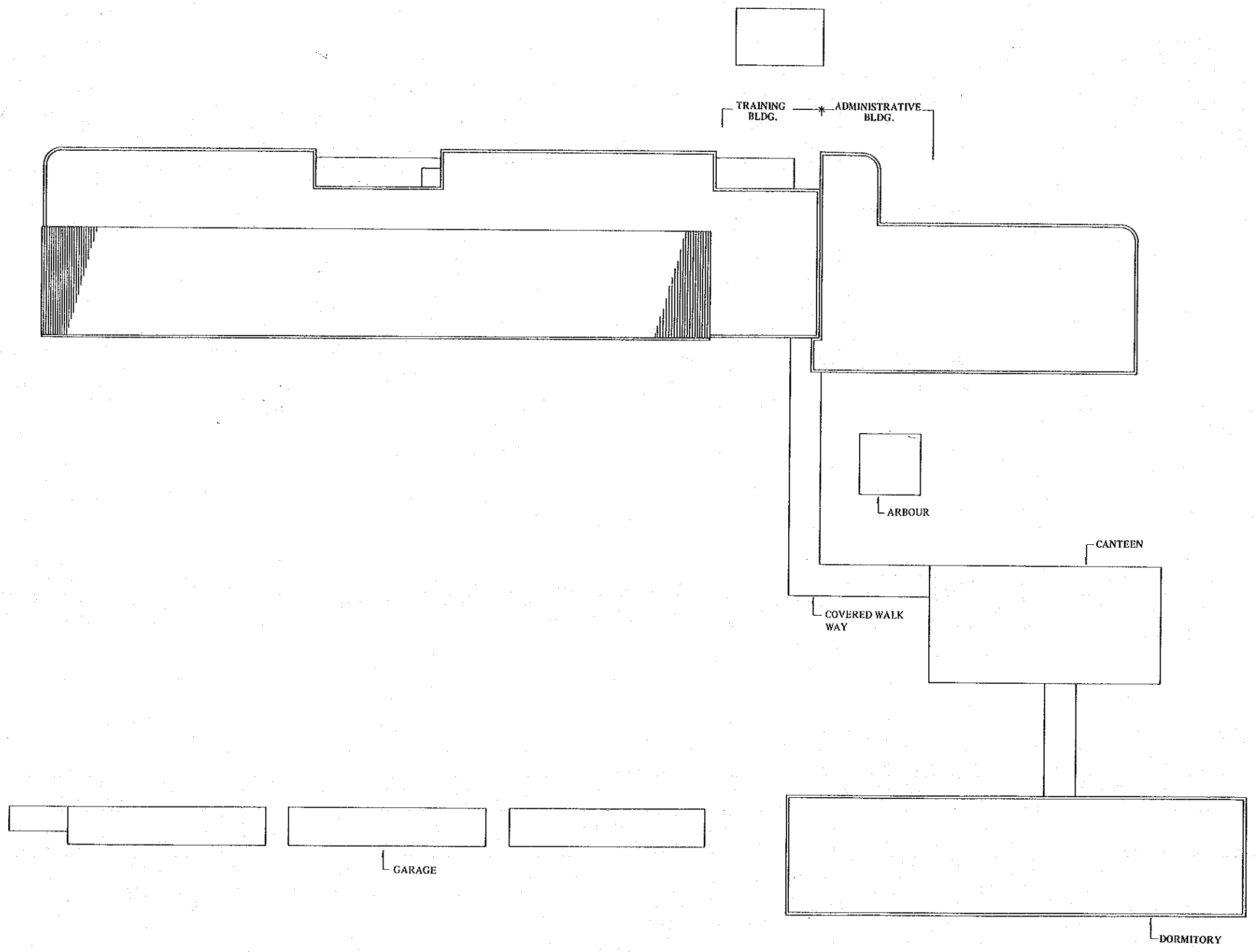
02



LEVEL-2 FLOOR PLAN

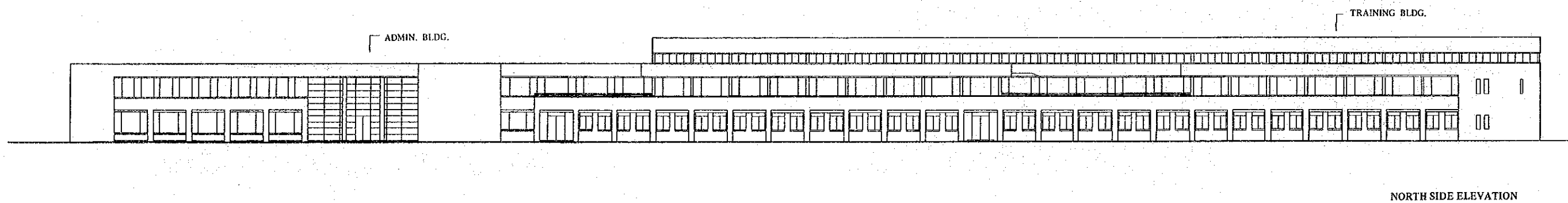
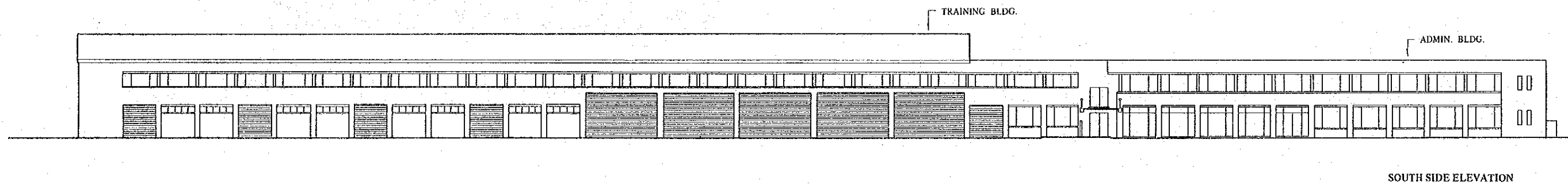
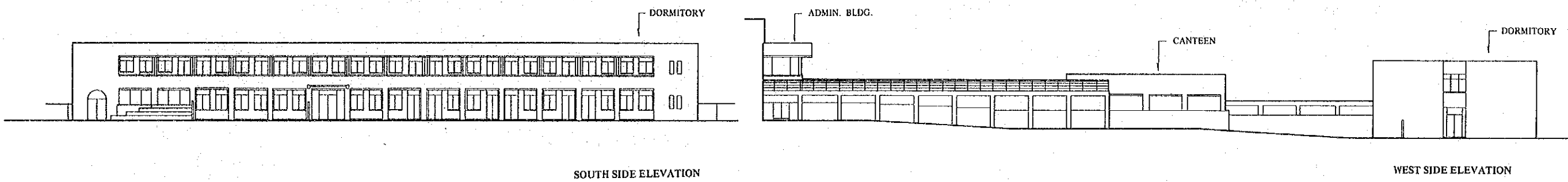
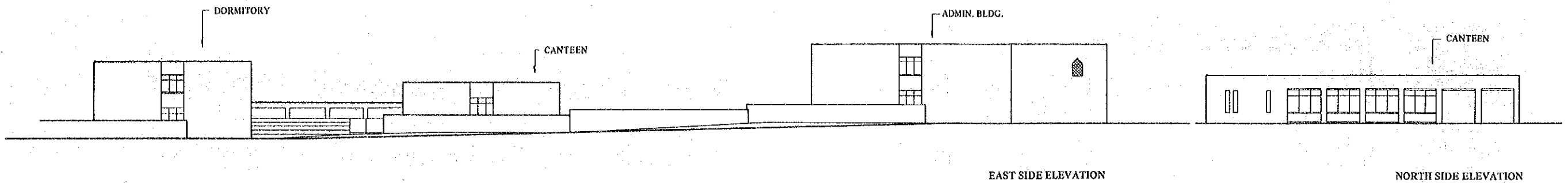


03

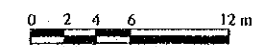


ROOF PLAN 0 5 10 20 m

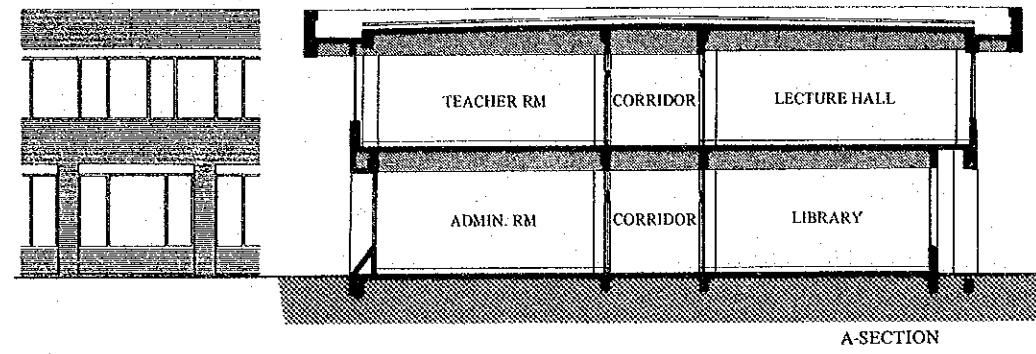
04



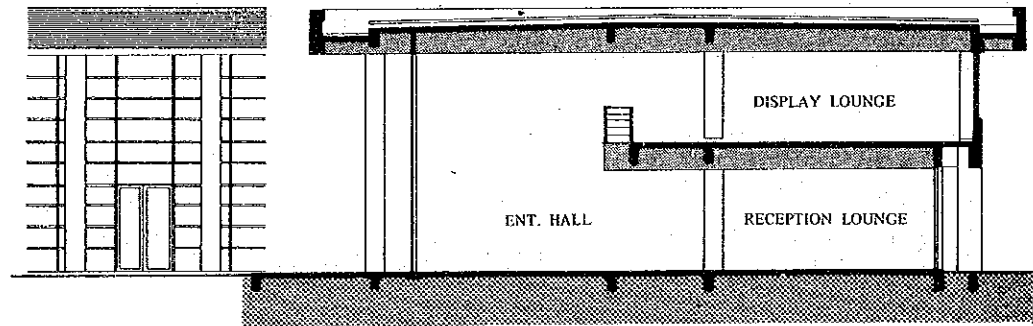
ELEVATION



05

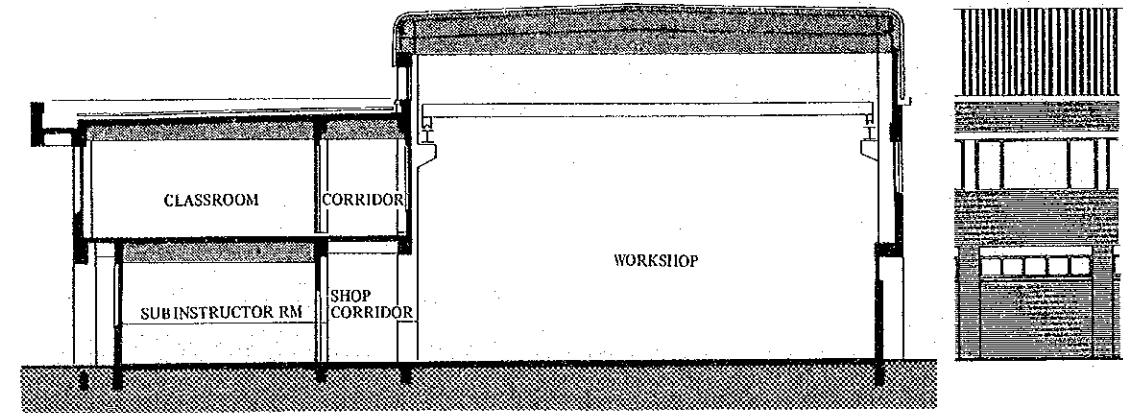


A-SECTION

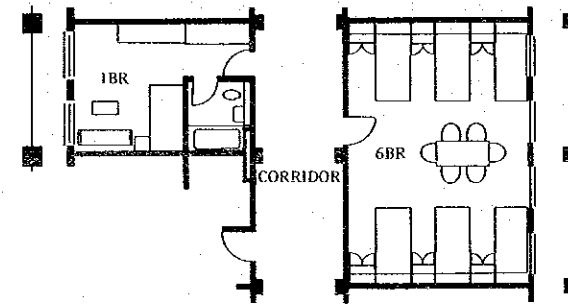


B-SECTION

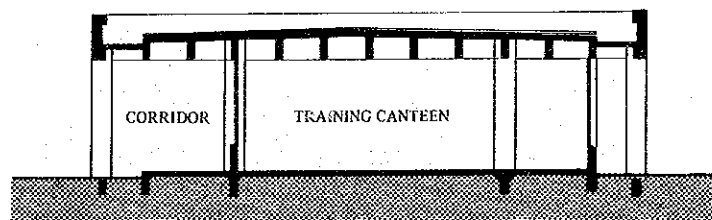
ADMINISTRATIVE BLDG. SECTION



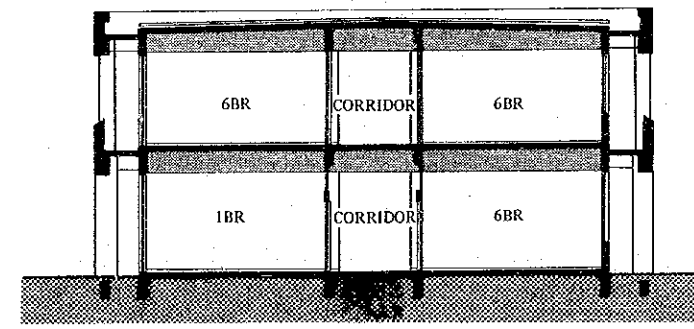
TRAINING BLDG. SECTION



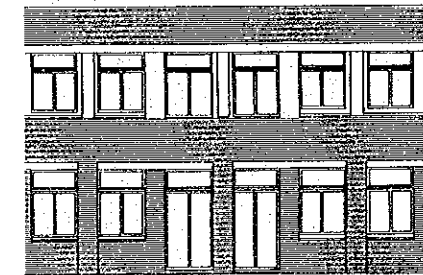
DORMITORY BED ROOM PLAN



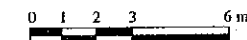
CANTEEN SECTION



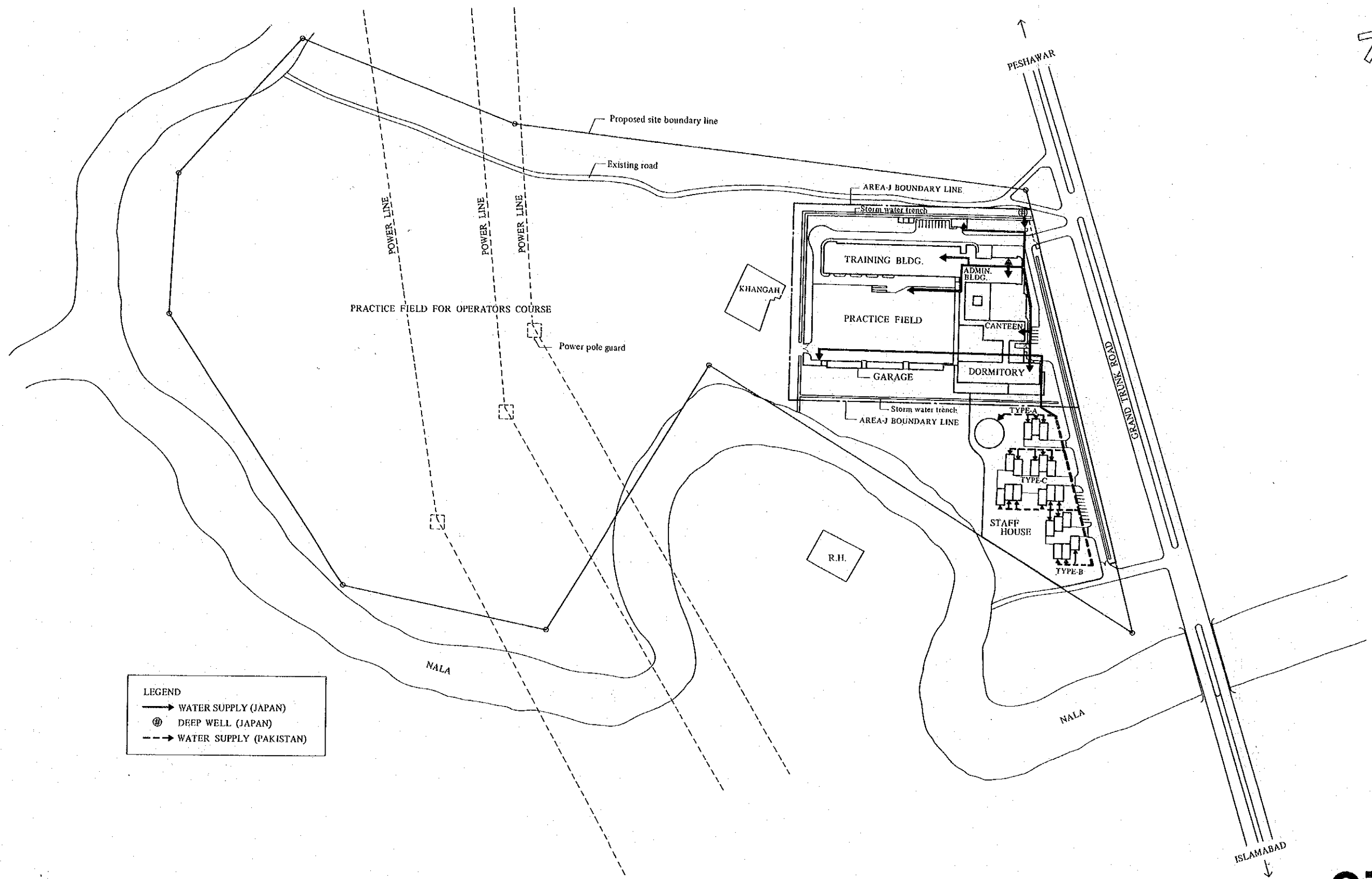
DORMITORY SECTION



SECTION

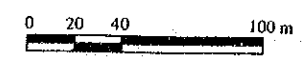


06

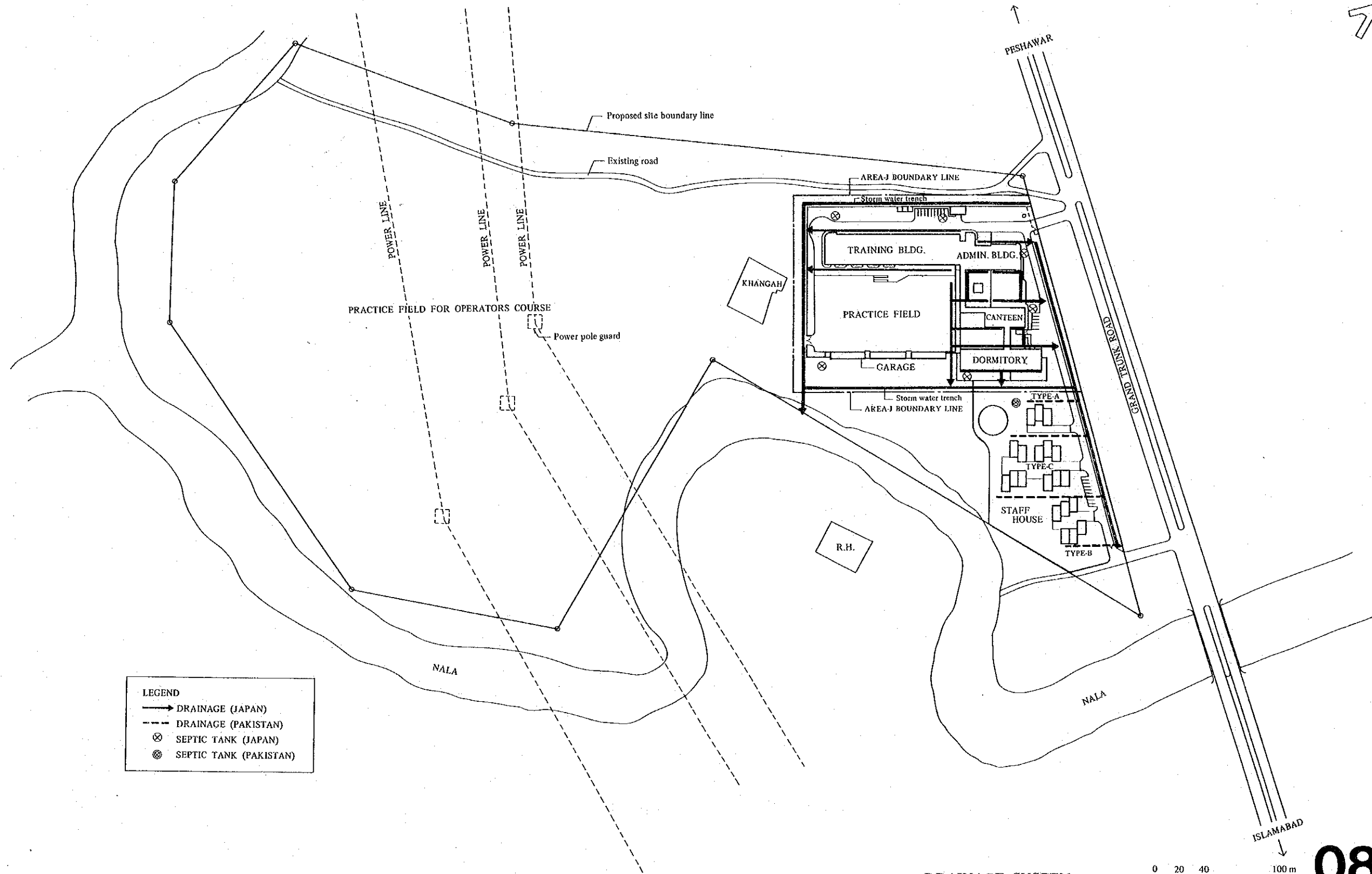


LEGEND
 —→ WATER SUPPLY (JAPAN)
 ⊕ DEEP WELL (JAPAN)
 - - - - WATER SUPPLY (PAKISTAN)

WATER SUPPLY

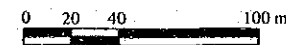


07

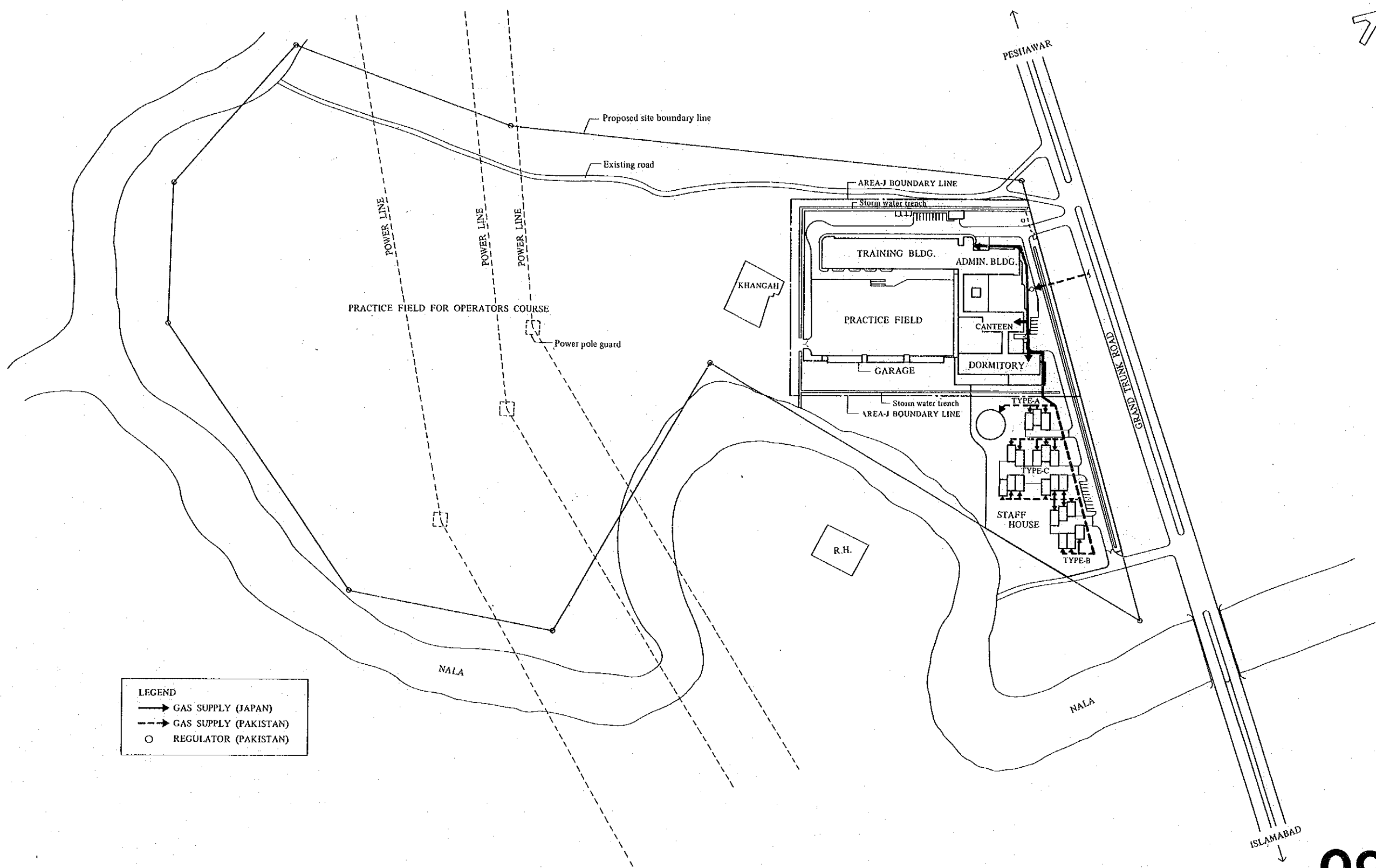


LEGEND	
→	DRAINAGE (JAPAN)
- - -	DRAINAGE (PAKISTAN)
⊗	SEPTIC TANK (JAPAN)
⊙	SEPTIC TANK (PAKISTAN)

DRAINAGE SYSTEM

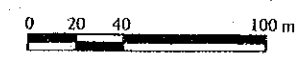


08



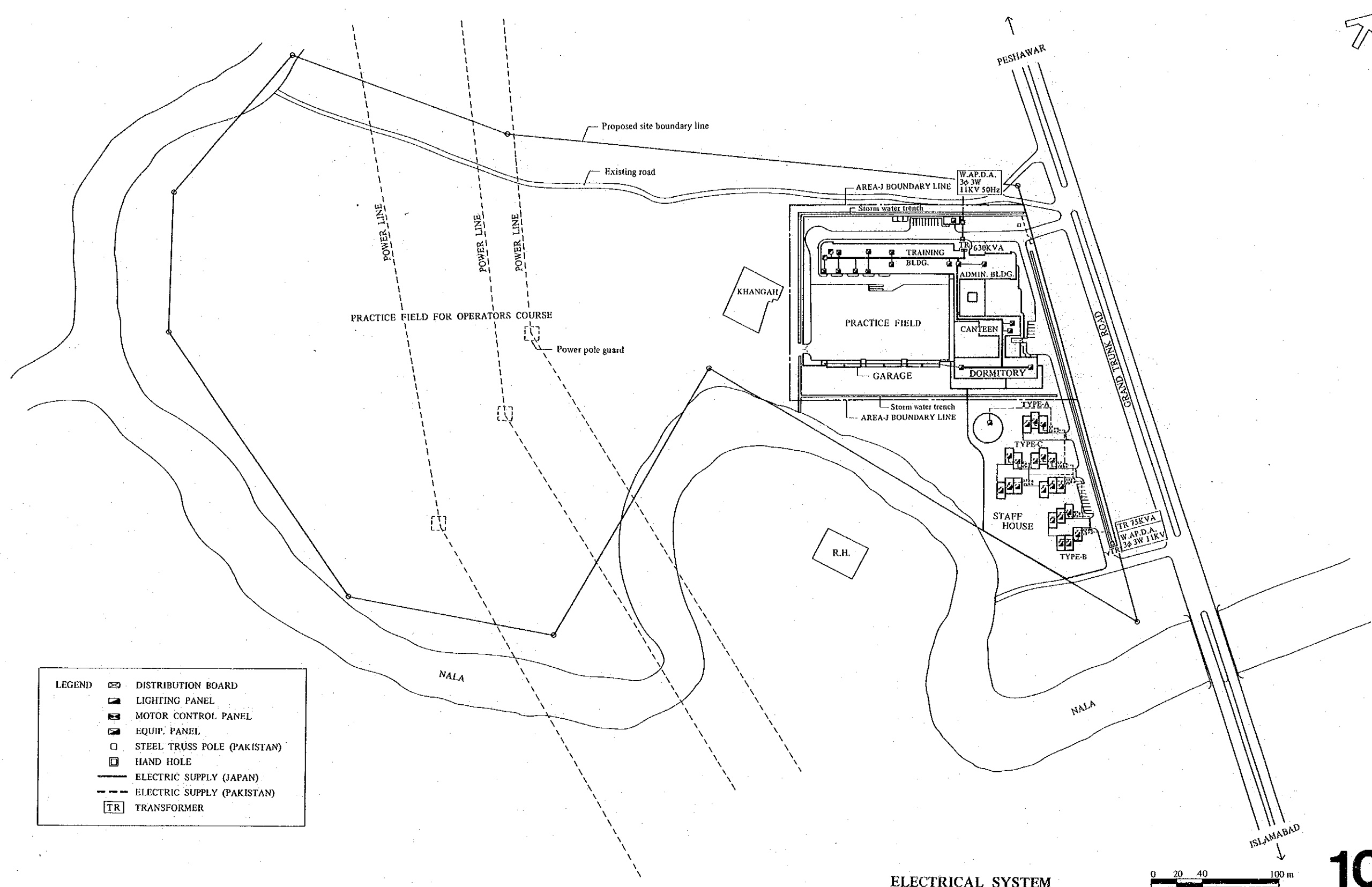
LEGEND
 —→ GAS SUPPLY (JAPAN)
 - - - → GAS SUPPLY (PAKISTAN)
 ○ REGULATOR (PAKISTAN)

GAS SUPPLY SYSTEM



09



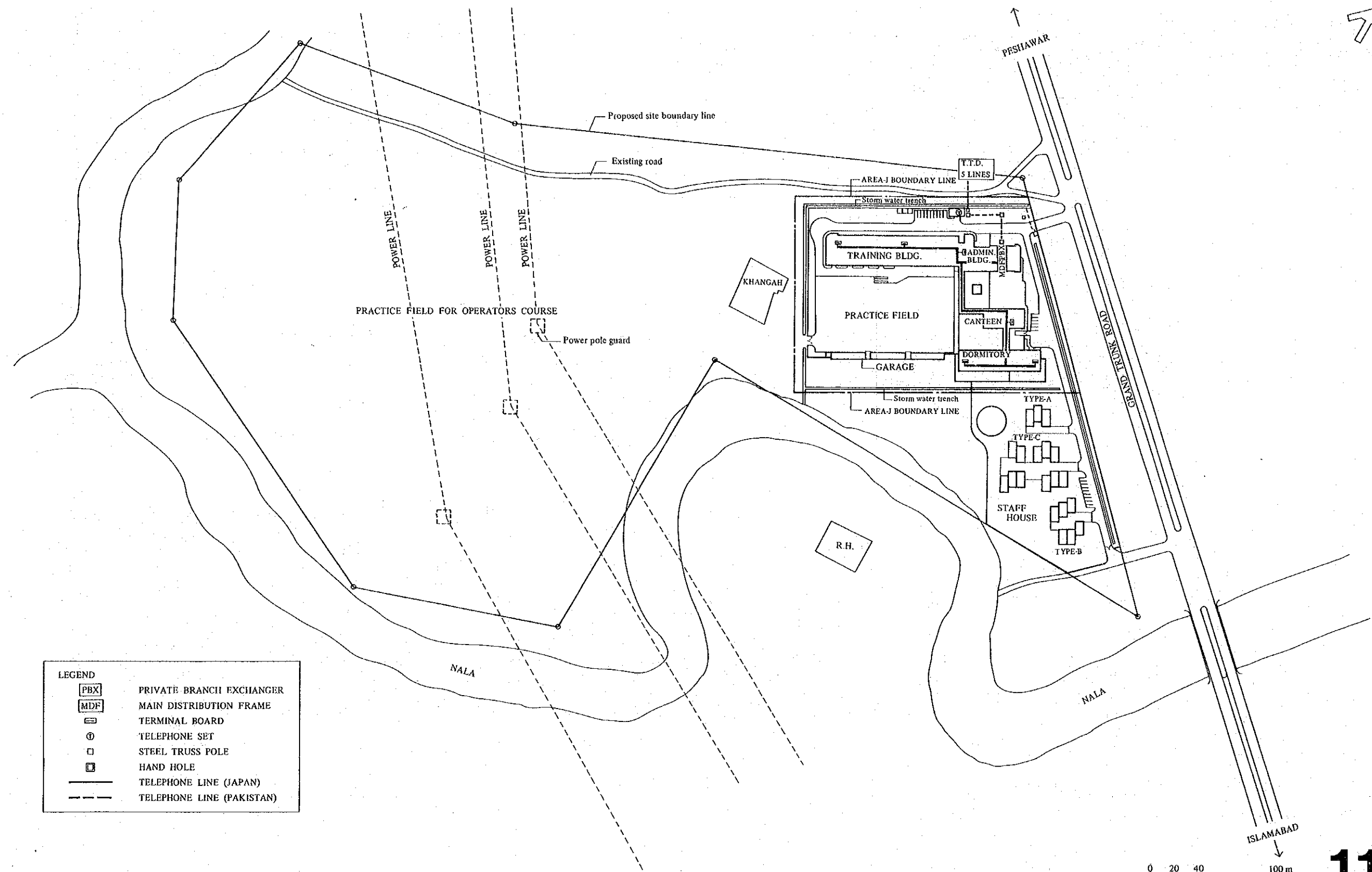


LEGEND	
	DISTRIBUTION BOARD
	LIGHTING PANEL
	MOTOR CONTROL PANEL
	EQUIP. PANEL
	STEEL TRUSS POLE (PAKISTAN)
	HAND HOLE
	ELECTRIC SUPPLY (JAPAN)
	ELECTRIC SUPPLY (PAKISTAN)
	TRANSFORMER

ELECTRICAL SYSTEM

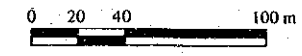


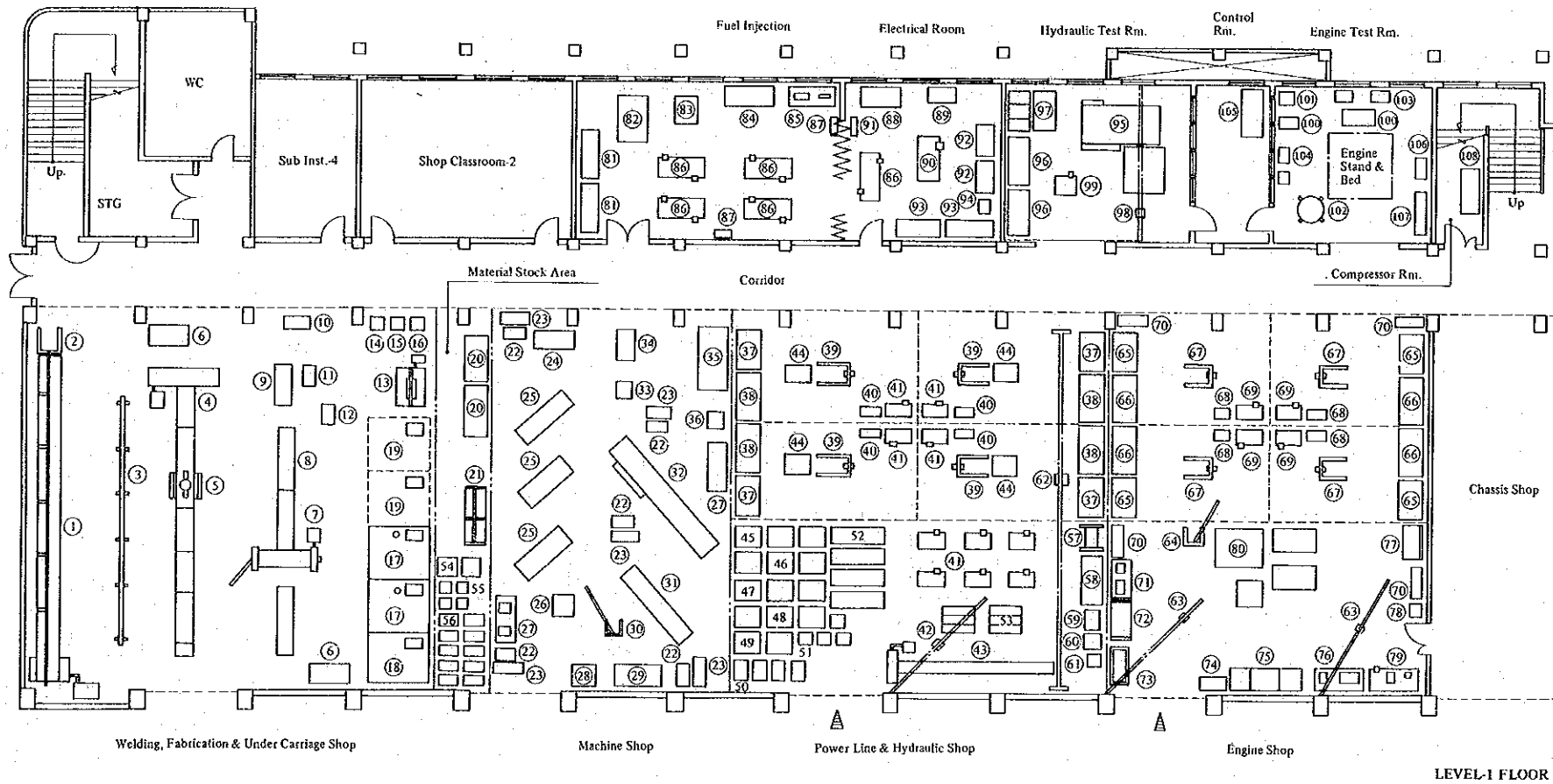
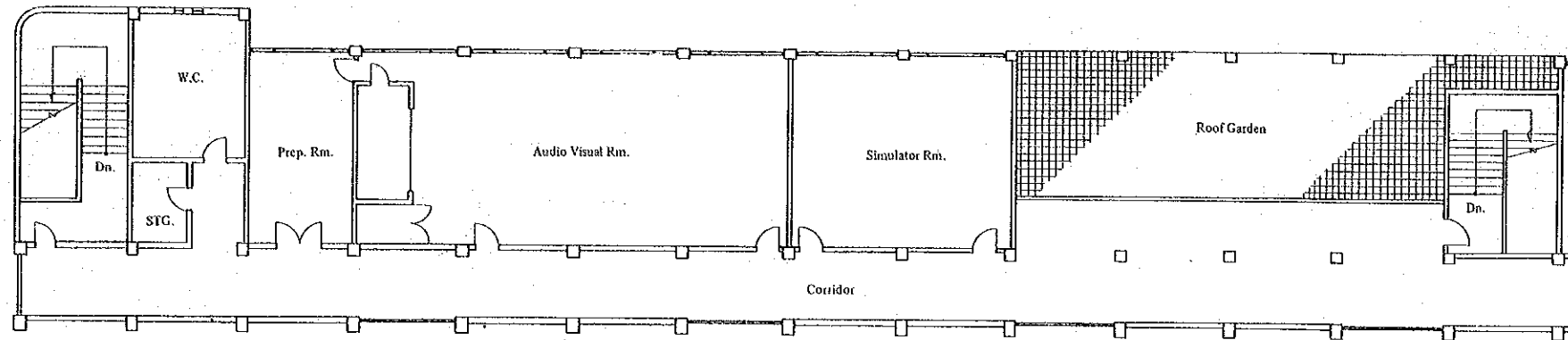
10



LEGEND	
	PRIVATE BRANCH EXCHANGER
	MAIN DISTRIBUTION FRAME
	TERMINAL BOARD
	TELEPHONE SET
	STEEL TRUSS POLE
	HAND HOLE
	TELEPHONE LINE (JAPAN)
	TELEPHONE LINE (PAKISTAN)

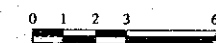
TELEPHONE SYSTEM



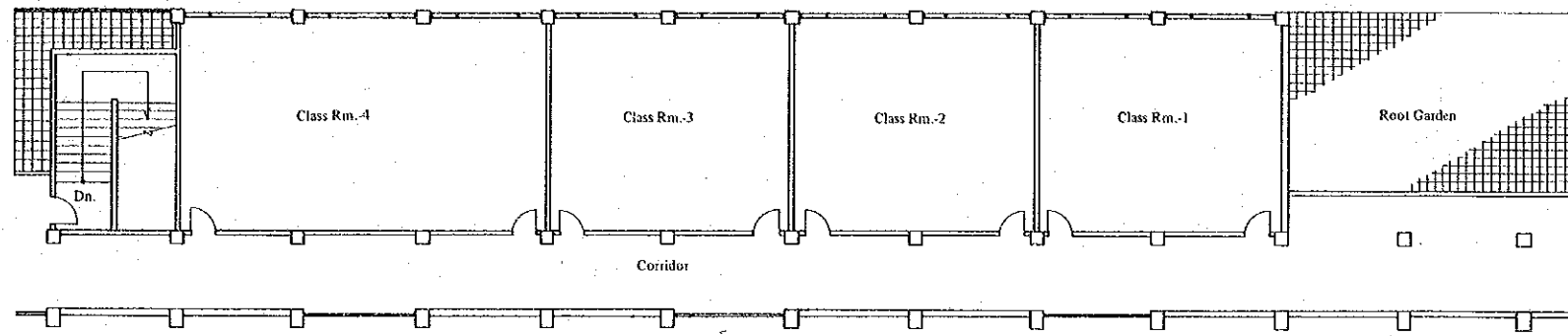


No.	Item No.	Description	Q'ty	Phase	Cap.	Remark
1	A-8-5	Track Link Rebuilding M.	1	3	55 kVA (50 kW)	8-16 (Welding Bed)
2	A-8-17	Roller Idler Attachment	1	1	0.2 kW	
3	A-8-20	Track Link Hanger	1			
4	A-8-12	Track Press	1	3	11.0 kW	
5	A-8-13	Shoe Bolt Impact Wrench	1	3	2.2 kW	8-14 (Conv. Stand)
6	A-8-19	Parts Wagon	2			
7	A-8-10	Roller Idler Press	1	3	6.3 kW	
8	A-8-11	Conveyor Stand	1			
9	A-2-30	Crankshaft Rebuilding M.	1	3	30.0 kW	
10	A-8-18	Electric Grinder	1	3	0.75 kW	
11	A-8-21	Tool Cabinet	1			
12	A-8-7	High Speed Cutter	1	3	2.2 kW	
13	A-8-22	Hydraulic Press (100 ton)	1	3	3.75 kW	
14	A-8-5	Iron Anvil, Cast Iron	1			
15	A-8-6	Cast Iron Swage Block	1			
16	A-8-9	Hand Lever Shear	1			
17	A-8-1	AC Arc Welder	2	1	24.0 kVA (13.0 kW)	
	A-8-2	Electrode Drier	2	1	0.33 kW	
18	A-8-3	CO ₂ -Gas Shield Arc Welder	1	3	18.1 kVA	
	A-8-8	Partition	10			
19	A-8-4	Gas Welder Set	4			
20	A-7-10	Parts Rack	2			
21	A-7-12	Bar Rack	1			
22	A-7-13	Tool Locker & Cabinet	5			
23	A-7-9	Parts Locker	5			
24	A-7-4	Universal Milling Machine	1	3	3.7 kW	
25	A-7-1	Precision Lathe	3	3	7.5 kW	
26	A-7-5	Shaping Machine	1	3	1.5 kW	
27	A-7-8	Work Bench	2			
	A-7-7	Bench Electric Grinder	1	3	0.75 kW	
	A-7-3	Bench Drill Press	1	3	0.4 kW	
28	A-7-6	Track Sawing Machine	1	3	1.5 kW	
29	A-2-28	Honing Machine	1	3	5.7 kW	
30	A-7-11	Mobil Floor Crane (2 ton)	1			
31	A-2-27	Main Line Boring Machine	1	3	1.1 kW	
32	A-2-29	Crankshaft Grinder	1	3	7.55 kW	
33	A-7-2	Upright Drilling Machine	1	3	1.5 kW	
34	A-2-24	Connecting Rod Boring M.	1	3	1.5 kW	
35	A-2-25	Surface Grinder	1	3	4.81 kW	
36	A-2-26	Cylinder Boring Machine	1	3	0.5 kW	
37	A-6-6	Parts Wagon	4			
38	A-6-5	Parts Rack	4			
39	A-6-1	Unit Repair Stand	4			
40	A-6-2-3	Mechanic Tool Set & Cabinet	4			
41	A-6-4	Mobil Work Bench & Vise	10			
42	A-6-8	Jib Crane (1 ton)	1	3	0.8 kW	
43	A-6-7	Hydraulic Cylinder Service Stand (component)	1	1	0.7 kW	(Hyd. Pump)
44	C-2-1	Torque Converter Ass'y	4			
45	C-2-2	Torqflow Transmission	4			
46	C-2-3	Transmission for Loader	2			
47	C-2-4	Transmission	4			
48	C-4-5	Hyd. Pump & Regulator (Ex)	2			
49	C-4-6	Hyd. Motor for Excavator	2			
50	C-4-4	Steering Control Valve Ass'y	4			
51	C-4-2	Pump Ass'y for Transmission	4			
52	C-6-1	Differential Ass'y	4			
53	C-4-7	Hyd. Cylinder Ass'y	6			
54	C-6-2	Dump Transmission	2			
55	C-4-3	Hyd. Control Valve	4			
56	C-4-1	Hyd. Pump Ass'y	10			

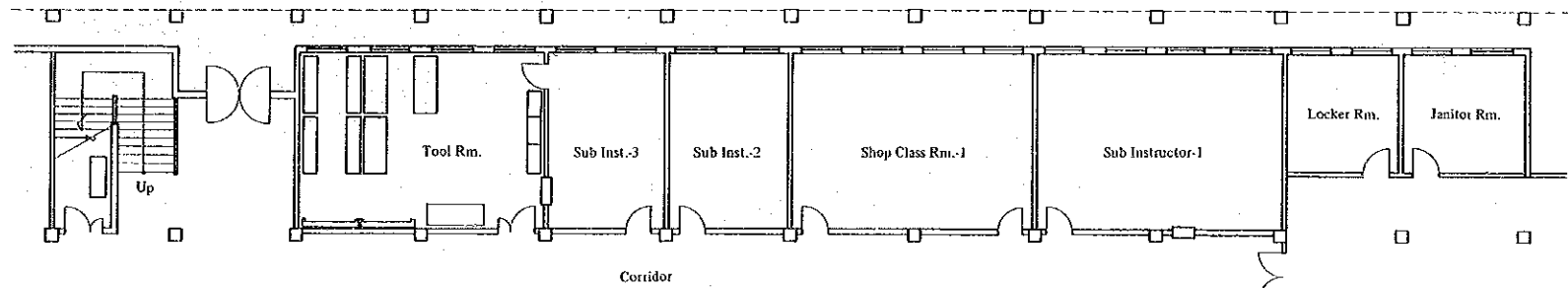
TRAINING EQUIPMENT LAYOUT PLAN 1



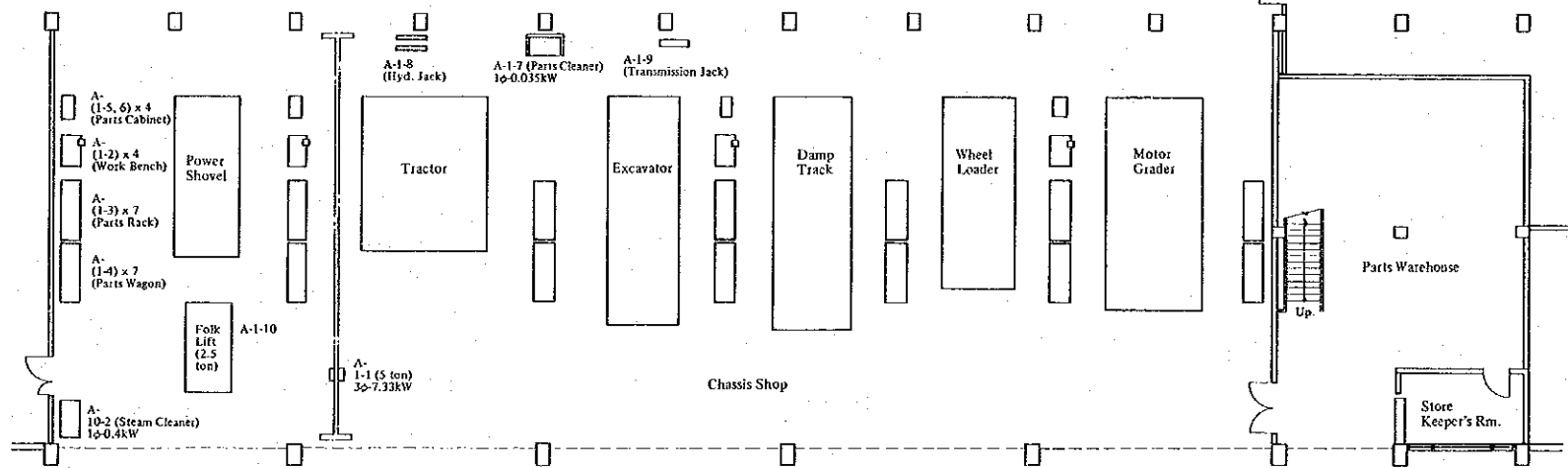
12



LEVEL-2 FLOOR

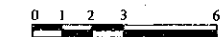


LEVEL-1 FLOOR



No.	Item No.	Description	Q'ty	Phase	Cap.	Remark
57	A-2-4	Hyd. Press (35 ton)	1			
58	A-6-11	Work Bench	1			
59	A-6-12	Tool Cabinet	1			
60	A-6-9	Hyd. Tire Removing Tool	1			
61	A-6-10	Tire Spotter	1	1	1.0 kW	
62	A-2-1	Over Head Crane (3 ton)	1	3	3.79 kW	
63	A-2-2	Jib Crane (1 ton)	2	3	0.8 kW	
64	A-2-3	Mobil Floor Crane (2 ton)	1			
65	A-2-10	Parts Wagon	4			
66	A-2-9	Parts Rack	4			
67	A-2-8	Engine Stand	4			
68	A-2-17,18	Tool Cabinet	4			
69	A-2-21	Mobil Work Bench & Vice	4			
70	A-2-22	Tool Locker	4			
71	A-2-5	Work Bench	3			
	A-2-6	Bench Electric Grinder	1	3	0.75 kW	
	A-2-7	Bench Drill Press	1	1	0.2 kW	
72	A-2-23	Parts Cleaner	1	3	6.75 kW	
73	A-2-20	Steam Cleaner	1	1	0.4 kW	
74	A-2-19	Cylinder Head Hyd. Stand	1			
75	A-2-11	Cylinder Head Work Bench	1			
76	A-2-31	Valve Seat Grinder	1	1	0.18 kW	(2-5)
	A-2-13	Valve Refacer	1	1	0.44 kW	(2-5)
77	A-2-12	Parts Cleaner	1	1	0.055 kW	
78	A-2-15	Piston Heater	1	1	3.0 kW	
79	A-2-32	Machinists Vice	1			(2-5)
	A-2-14	Valve Spring Tester	1			(2-5)
	A-2-16	Connecting Rod Aligner (Component)	1			(2-5)
80	C-1-1	Engine Ass'y	2			
	C-1-2	Engine Ass'y w. Turbo, Clutch	4			
	C-1-3	Gasoline Engine Ass'y	2			
81	A-5-10	Parts Rack	2			
82	A-5-1	D.F. Injector Pump Tester	1	3	7.26 kW	
83	A-5-2	Pump Test Stand	1	3	5.7 kW	
84	A-5-9	Parts Cleaner	1	1	0.07 kW	
85	A-5-3	Injector Flow Comparator	1	1	0.55 kW	
	A-5-4	Nozzle Tester	1			
	A-5-5	Work Bench	1			
86	A-5-5	Work Bench	5			
	A-5-6	Engineer's Vice	10			
87	A-5-8	Tool Cabinet	2			
88	A-5-11	Starter Generator Test B	1	3	3.7 kW	
89	A-5-18	Water Purifier	1			
90	A-5-13,14	Work Bench Vice	1			
91	A-5-15	Tool Cabinet	1			
92	C-5-1~4	System Board	4			
93	A-5-17	Parts Rack	2			
94	A-5-16	Silicon Quick Charger	1	3	6.5 kVA	
95	A-4-1	Hyd. Component Univ. Tester	1	3	93.1 kW	
96	A-4-2	Parts Rack	2			
97	A-4-3	Mechanic Tool Set	6			
98	A-4-4	Elec. Chain Block, Gear Trolley	1	3	0.8 kW	
99	A-4-5	Mobil Work Bench Vice	1			
100	A-3-1,2	Engine Dynamometer, Panel	1	3	0.4 kW	
101	A-3-3	Fuel Tank	1			
102	A-3-4	Cooling Water Tank	1			
103	A-3-5	Water Supply Pump	2	3	2.2 kW	
104	A-3-6	Fuel Consumption Meter	1			
105	A-3-7	Work Bench	1			
106	A-3-9	Tool Cabinet	1			
107	A-3-8	Parts Rack	1			
108	A-9-1	Air Compressor	1	3	7.5 kW	

TRAINING EQUIPMENT LAYOUT PLAN-2

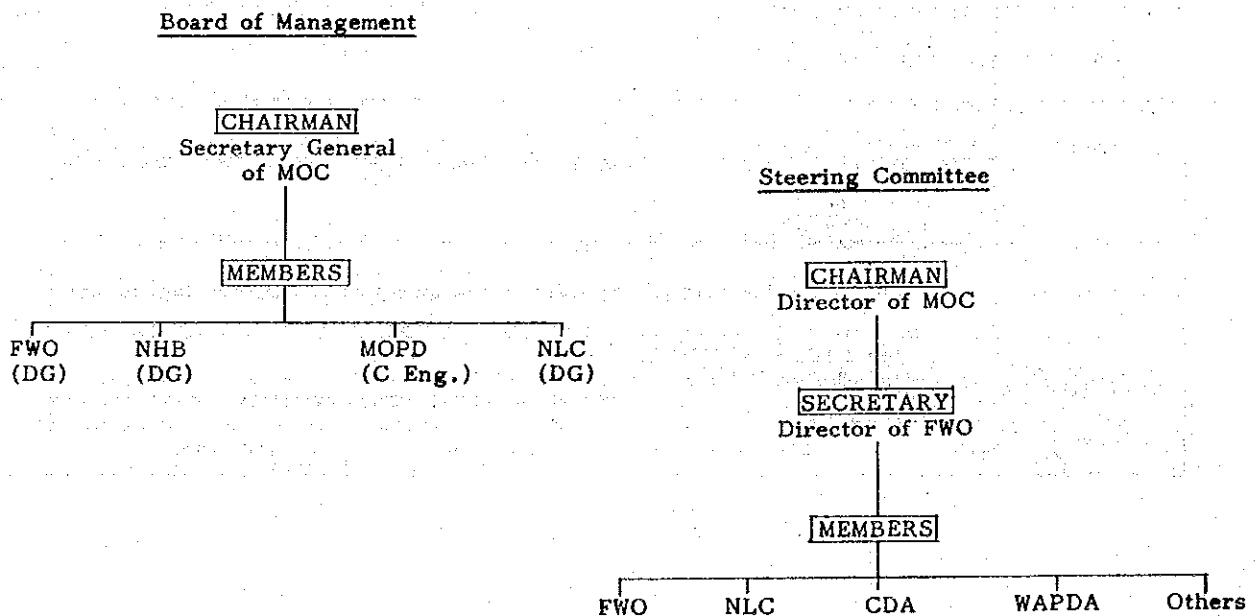


CHAPTER 6. PROJECT IMPLEMENTATION PLAN

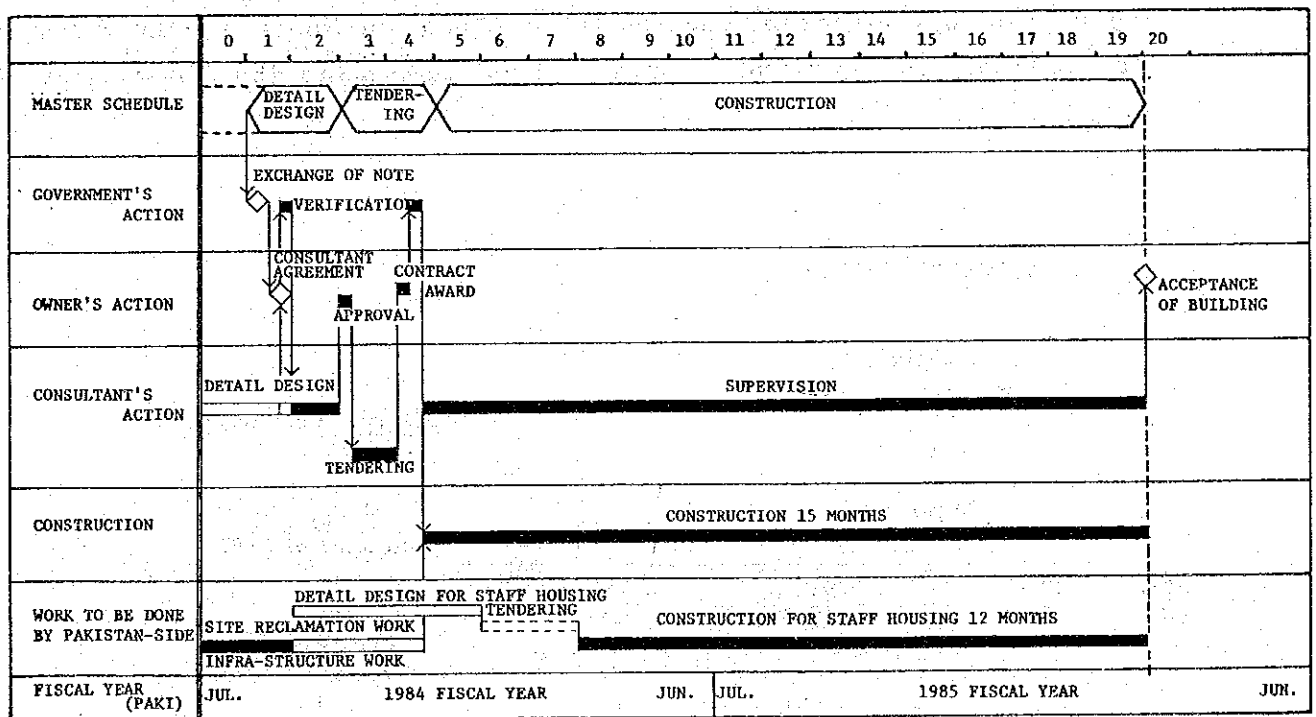
6-1. Project Execution System

The MOC is the Pakistan-side execution body of the project. The project implementation will be controlled by the Board of Management headed by Secretary General of the MOC and comprised of Director Generals of other government agencies such as the FWO, NHB, MOPD and NLC. Under this Board of Management, the Steering Committee organized by the officials in charge of the relevant government agencies. The Steering Committee is an organization formed for practical level negotiations with the Japanese side. The Economic Affairs Division of the Pakistani Ministry of Finance and Economic Affairs, which is responsible for matters related to foreign aids offered to Pakistan, undertakes the services required for conclusion of bilateral aid agreements.

The detailed design, supervising service and construction contract procedures for the project implementation are approved by the Board of Management through the Steering Committee, and the MOC services as the Pakistan-side party for the contract. As regards procedures for concluding a grant aid agreement such as the Exchange of Notes and the Banking Arrangement, the Economic Affairs Division represents the Government of Pakistan.



■ Execution Schedule



6-2. Construction Execution Planning

6-2-1. Execution Plan

After exchange of the official documents attesting to the bilateral agreement on the execution of the project construction, the Steering Committee is required to discuss the details and adjust the opinions concerning the detail design, tender procedure and conclusion of the construction contract.

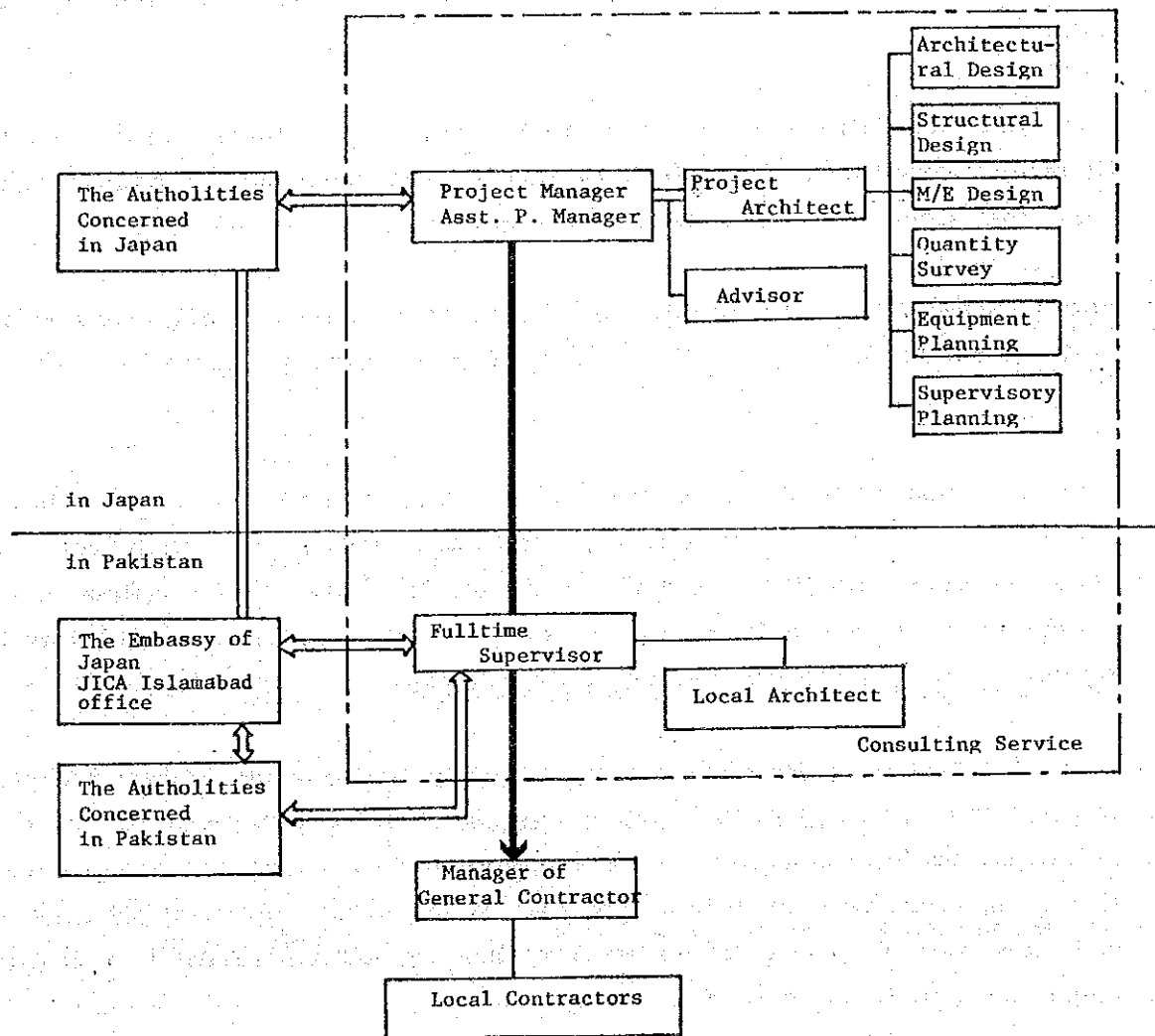
As regards the construction of the CMTTC, the filling and grading work at the proposed construction site should be completed without delay by the Pakistan side before the commencement of the construction. Furthermore, test boring needs to be conducted at site to drill a deep well that can be used as the clean water supply source on early stage by the Japanese side.

For the formulation of the execution plan, the Japanese side and the Steering Committee are required to examine the execution schedule, determine the scope of operations of both governments as well as a study for procurement, transportation and site installation of construction equipment and materials, and arrange for the presence of Pakistan engineers at the test operation and adjustment of training equipment before delivery of facilities.

The execution plan should preferably be formulated according to the climatic condition in Pakistan. Specifically, the earth work, foundation work and skeleton work should be completed during the dry season (December - June) so as to be able to carry out the wall construction and interior finishing work in the wet season (July - January).

It is also necessary to eliminate any time gap between the arrival timing of the imported equipment from Japan and the construction work or the most suitable time for dispatching skilled professional workers and the proposed timing of construction work, so that a balanced input of equipment, materials and manpower free from any time lag will be realized during the scheduled construction period.

■ Supervisory System



6-2-2. Supervising Planning

The consultant is required to organize a Project Execution Team which will offer services for preparing detailed drawings as well as supervising services and also adjust the opinions of all parties concerned for smooth completion of the project in conformity to the policies of the Japanese Grant Aids system and in compliance with the basic design policies.

At the stage of execution supervision, the consultant should send supervisors with ample technical capabilities who will be stationed at the construction site to provide supervisory services during the construction period and offer liaison services. The consultant should also send capable professional engineers to the site for a short time for spot inspection, attendance of test and direction of special services according to the progress of the construction work.

(1) Policies for Supervision Service

- Maintain close contact with the agencies and officials concerned of the both Governments for smooth completion according to the execution schedule.
- Provide adequate and timely advice and guidance to the contractor to ensure that all facilities will be built according to the detail drawings.
- Make best efforts to use locally available materials and adopt local construction methods to upgrade the level of building production in Pakistan.
- Make consistent efforts of technology transfer for upgrading the local construction techniques and methods to assure that the project will produce the maximum effects as the Grant Aid.
- Offer adequate advice and guidance to the Pakistan officials in charge of maintenance and management after delivery of the facilities to the Pakistani side.

(2) Contents of Supervising Services

a) Cooperation on contract agreement

Selection of construction companies, Preparation of contract documents, Assistance in letting construction contracts, Examination of cost breakdown for construction, Attendance on contract agreement.

b) Check and confirmation of shop drawings

Examination of shop drawings, materials, finish samples, and equipment submitted from contractor during construction.

c) Instruction of construction

Study of construction planning and schedule, Instruction to staffs of contractor, Presentation of supervision report for construction progress.

d) Cooperation of authorization to pay

Examination of contents of payment requests during and after construction and cooperation of payment procedure.

e) Inspection of construction

Inspections of construction on each empleted amount of work during the construction term from commencement to completion.

The consultant will confirm the completion of construction and fulfillment of conditions of contract agreement. By the attendance on the delivery and acceptance of the Project, the consultant will complete its supervision services. Moreover, the Project will be reported its necessary and essential matters to the Government of Japan through consultant such as construction progress, payment procedure, and completion and delivery, etc.

6-3. Demarcation of Construction

The scope of works for the project implementation will be divided as described below between the both Governments.

6-3-1. Items to be borne by the Government of Japan

1) Facilities

- a) Administrative buildings
- b) Training building
- c) Canteen
- d) Dormitory
- e) Construction machinery garage
- f) Washing yard and fuel storage
- g) Gate house
- h) Maintenance workshop

2) Infrastructure Work

- a) Elevated water tank
- b) Water supply system
- c) Well drilling work
- d) Hydrant and fire pump
- e) Power receiving and transformer
- f) Telephone exchange

3) External Work within the Site

- a) Roads and parking pavement
- b) Drainage system
- c) Outdoor lighting
- d) Effluent treatment and Soak pits
- e) Front fence and gate
- f) Flag poles

4) Training Equipment as specified in Appendix

5) General Furniture

6-3-2. Items to be borne by the Government of Pakistan

1) Construction Works

- a) Acquisition of land area for the CMTC
- b) Site area leveling before the commencement of the construction work
- c) Connecting road construction
- d) Construction of Staff Houses and related infrastructural improvement including road construction
- e) Infrastructural work
 - Relocation of existing low-voltage transmission lines
 - Power distribution line laying (700 KVA)
 - Gas supply pipe laying (35 m³/hr)
 - Telephone line laying (5 lines)
- f) Furniture and fittings
 - Furniture, fittings, curtains, etc. not covered by the Japanese side
 - Landscaping and tree planting
 - Sports facility

2) Services and Undertakings

- a) Supply of technical information necessary for the project implementation
- b) Bearing of the following commissions
 - Expenses for the Banking Agreement
 - Expenses for laying power, gas and telephone lines
 - Expenses for obtain the building permit
 - Expenses for finalizing the tax exemption formalities
- c) Expenses for maintenance of the facilities and equipment
- d) Services for quick customs clearance and inland transportation
- e) Services for exempting Japanese personnel participating in the project under the verified contract from the customs duty, domestic taxes and surcharge on property imposed in Pakistan;
- f) Providing and accord necessary permission, licenses and other authorization required to carry out the project;
- g) Assignment of capable personnel required for the project operation and maintenance on the basis of a careful staff allocation.

6-4. Execution Schedule

The preparation of working drawings for the CMTC under the grant aid cooperation by the Government of Japan will start following the conclusion of the Exchange of Notes between the Government of Pakistan and the Japanese Government.

The Schedule consists of three phases, detail design, tendering and construction;

Detail Design

About two months will be required for the Project. The tender documents will be prepared based on the Basic Design Report. During this phase confirmations will be made to the Pakistan side in three stages, preliminary, intermediary and final stage.

Tendering

About two months will be required for the tendering including the pre-qualification of tenderers, tendering and evaluation of the tenders and recommendation of contractors to the Government of Pakistan.

Construction

The construction work will be started after the awarded contract is verified by the Japanese Government. Judging from the scale of facilities of the CMTC, it is estimated that a period of about 15 months will be required to complete the project construction, provided that the supply of construction equipment and materials goes on smoothly and the Pakistan side preparation work such as land leveling is completed on schedule.

6-5. Procurement of Construction Materials

In the market research conducted during the Basic Design Study for the project, it was found that building materials are available in Pakistan but many of them are imported products. Examination of their cost, quality and available quantities, it was concluded that the following local materials would be used for the project. However, a further detailed survey must be conducted on these materials.

As for the equipment to be installed at the CMTC, it was felt that local equipment were not acceptable in terms of cost and grade of quality, but a detailed survey should also be conducted on these local equipment before the project implementation.

1) Equipment and Materials to be procured in Pakistan

- Building work
 - Aggregate, cement, bricks, stones, tiles, terazzo blocks, paints, glass and timber.
- Air-conditioning work
 - Ceiling fans.
- Plumbing work
 - Concrete pipes, clarification tanks, sanitary fixture (local type).
- Electrical work
 - Some wires, cables and receptacles, electric bulbs and tubes.

2) Equipment and Materials Planned to be Procured in Japan and Third Countries

- Building work
 - Steel frames and bars, waterproof agents, aluminum and steel fittings, wooden fittings, building iron ware.
- Air-conditioning system
 - Air-conditioning equipment, ventilating fans, steel pipes and plates, dampers.
- Water supply/drainage and sanitary facilities
 - Sanitary fixture, valves and pipings, pumps.
- Electrical work
 - Transformers, distributing panels, telephone exchanges, lighting equipment, light electrical appliances.

CHAPTER 7. OPERATION AND MAINTENANCE

The true effect of grant aid assistance will never give full play without smooth operation of the delivered facilities by self-reliant efforts on the beneficiary side and strenuous exertion to support the objective scheme. It is essential, therefore, to establish a suitable operation management and maintenance system of this center for effective promotion of the technician training project under MOC.

7-1. Administration System

Many governmental offices and bureaus like FWO, NHB, NLC, WAPDA, etc. take part in this project under the leading promotion of the MOC. So, it is necessary to establish a solid management system as well as to adjust the mutual opinions among the organizations concerned. Judging from the facility scale and the training programme, the center will require such a managerial scheme with 65 staffs as illustrated below.

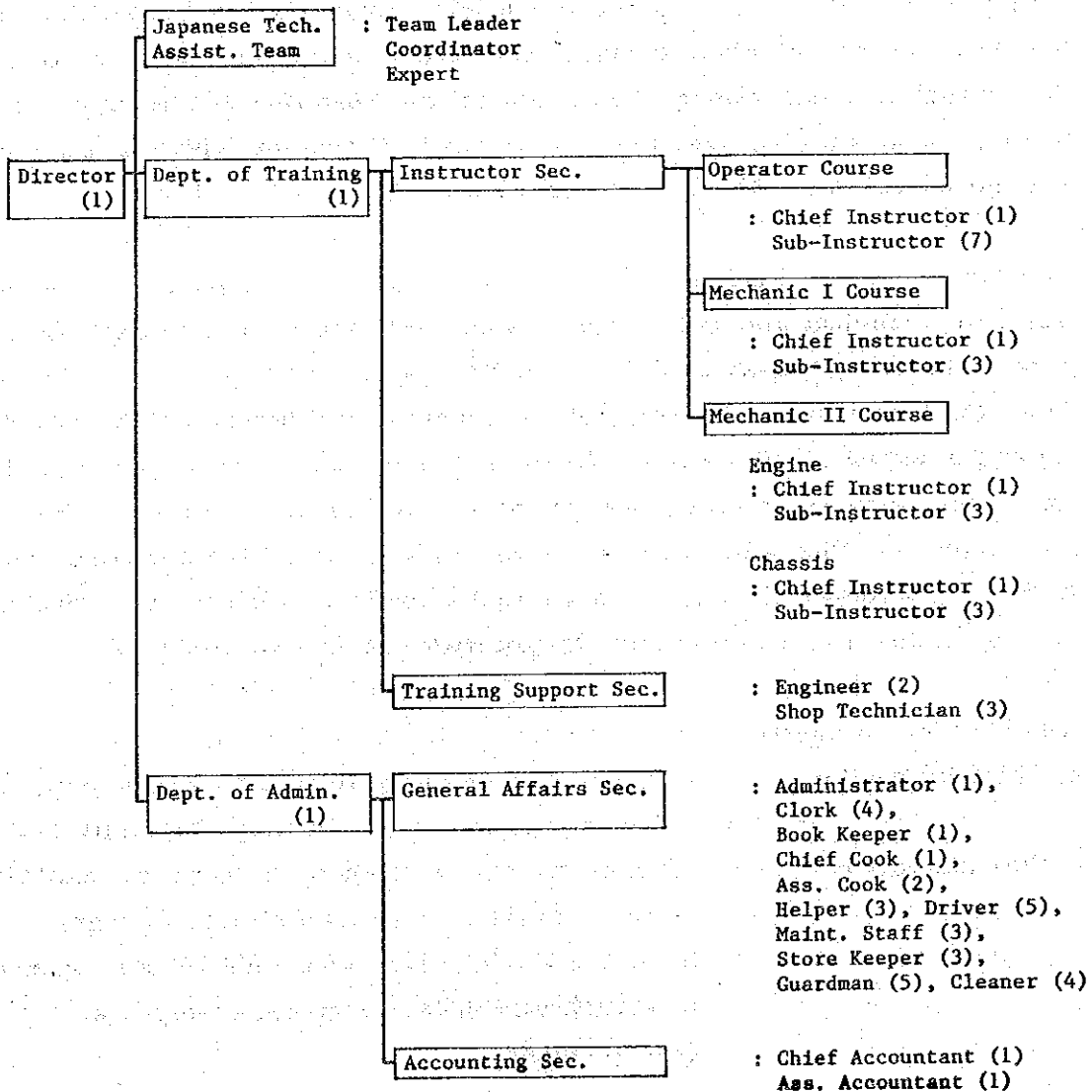
The Leader of the Technical Cooperation Team to be dispatched from Japan will give technical and managerial advice while the expert in each field will give technical guidance to Pakistan instructors.

The effect of training at this center depends not merely on the efforts of Japanese experts but also on the potential capability of Pakistan instructors who serve as direct receiver of the technical devolution. So, each instructor of this center must have high personal ability like enough leadership, cooperativeness, intellectual appetite, spirit of self-discipline, etc. in addition to the technical qualification as follows.

Qualification of Instructors

- o Chief instructor Persons having more than one year's experience after acquirement of B.Sc. Eng. or equivalent.
- o Sub-instructor Persons having more than three years' experience after graduation from Intermediate College.
Or those having more than one year's experience in actual work after reception of diploma.
Or equivalent.

■ Staff Allocation for the Centre



7-2. Maintenance Planning

The Center shall be so designed as to assure easy maintenance and management. The operation and maintenance control method of the buildings, facilities, equipment, training materials, etc. shall be explained in detail at the time of delivery. Namely, the actual method of maintenance and control shall be instructed and demonstrated to the Pakistan side managerial staff and maintenance engineers of each division according to the prepared operation and maintenance manuals of the facilities, machinery, equipment, etc. and as to the managerial control of the buildings and facilities, the standard method of operation, cleaning, and maintenance shall be duly instructed together with the handling method, optimum operation time, and maintenance inspection of the facilities, machinery, equipment, etc. In the CMTC site, the Maintenance Workshop will be planned for such maintenance works and staff.

Where to make contact with the managerial supervisor in charge, concerned workers, relative agents, and so forth will also be made clear in consideration of the possible necessity for repair or mending of the facilities and equipment and further supply of the parts or materials at the time of delivery.

For effective operation and maintenance of the center, annual recasting of the budget and also maintenance staff allocation seem very essential.

7-3. Operation and Maintenance Costs

The necessary costs for managerial operation of this center, maintenance and control of the facilities, operation of the machinery and equipments, etc. are scheduled to be covered by the budget of MOC.

Based on the survey and collected data, the annual expenditures of the center for the first year are tentatively calculated as follows.

Personnel expenses (salaries and wages)	1,368,000 RS
Indirect expenses (30% of the above)	411,000 RS
Operation Expenses (average operation rate 60%)	592,000 RS
Training Expenses	1,646,000 RS
Consumables and Miscellaneous (5%)	209,000 RS
<hr/>	
Total	4,226,000 RS

The training expenses is calculated from operation costs of the construction machinery and training text/materials costs of 30 RS per trainee day. Expenses of electricity, gas, etc. for 20 units of staff house is not included here.

Tentative Calculation of Electrical Power Consumption

- 1) Conditions of calculation
 - (1) The calculation shall be based on the estimated monthly consumption of electric power.
 - (2) The operation time of each machinery or equipment shall be 8 hours/day and 25 days/month.

2) Load capacity			
	Lighting source	General power	Machinery power
a. Ad. bldg.	39 kw	40 kw	-
b. Training bldg.	55 kw	35 kw	350 kw
c. Canteen	7 kw	5 kw	-
d. Dormitory	25 kw	13 kw	-
e. Walk ways, garage, etc.	6 kw	-	-
f. Outdoor facilities	4 kw	13 kw	-
<hr/>			
Total	136 kw	106 kw	350 kw

Grand total: 592 kw

3) Electric power consumption (per month)

$$\begin{aligned} & (136\text{kw} \times 0.6 + 106\text{kw} \times 0.6 + 350\text{kw} \times 0.6) \times 8 \text{ hours} \times 25 \text{ days} \\ & = 355 \text{ kw} \times 8 \text{ hours} \times 25 \text{ days} = 71,000 \text{ kWh/month} \\ & \qquad \qquad \qquad = 85,200 \text{ kVA/month} \end{aligned}$$

4) Power rates

Calculation by monthly power rates of WAPDA (TARIFF C-1)

Transformer capacity 630KkVA 11kV/400V/220V 50Hz

Contract demand 630kVA $\times 1/2 = 300\text{kVA}$

$$\begin{aligned} \text{Monthly rates} &= \text{Standing charge} + \text{Consumption charge} \\ &= (58 \text{ RP/kVA} \times \text{Contract demand}) + (0.35 \text{ RP/kWH} \times \\ & \quad \text{Power consumption}) \\ &= (58 \text{ RP/kVA} \times 300\text{kVA}) + (0.35 \text{ RP/kWH} \times \\ & \quad 85,200\text{kWH}) \\ &= 17,400 \text{ RP} + 29,820 \text{ RP} \\ &= 47,220 \text{ RP/month} \end{aligned}$$

Total: 48,000 RP/month

5) Power rates of staff houses

In case the electric power is distributed from the center, the increment of power rates is estimated as follows.

Load capacity	Lighting source	20 kw
	General power	20 kw

Total increment 40 kw

$$\begin{aligned} \text{Power consumption (per month)} &= 40\text{kw} \times 8 \text{ hours} \times 25 \text{ days} \\ &= 8,000\text{kWH/month} \end{aligned}$$

$$\begin{aligned} \text{Increment of consumption charge} &= 0.35 \text{ RP/kWH} \times 8,000 \text{ kWh/month} \\ &= 2,800 \text{ RP/month} \end{aligned}$$

Calculation of Gas Rates

When calculated at the present rates of SUI-NORTHERN GAS Co., Ltd. the annual charges of gas to be consumed for the cookery, hot-water supply, and heating for dormitory are estimated as follows.

1) Gas consumption (per year)

Cookery	$450 \text{ meals/day} \times 25 \text{ days/month} \times 12 \text{ months}$ $\times 600 \text{ Kcal/meal} \div 8,700 \text{ Kcal/m}^3 \times$ $0.75 \text{ RS/m}^3 = 6,983 = \underline{7,000 \text{ RS/year}}$
Hot-water supply	$108 \text{ persons} \times 30 \text{ L./persons day} \times 25 \text{ days} \div$ $8,700 \text{ Kcal/m}^3 \div 0.8 \times 365 \text{ days/year} \times$ $0.75 \text{ RS/m}^3 = 3,186 = \underline{3,200 \text{ RS/year}}$
Heating (dormitory)	$138,000 \text{ Kcal/H} \div 8,700 \text{ Kcal/m}^3 \times 200 \text{ H/year} \times$ $0.75 \text{ RS/m}^3 = 2,380 = \underline{2,400 \text{ RS/year}}$
	<u>Total: 12,600 RS/year</u>

2) Gas consumption per hour

Cookery	$450 \text{ meals/day} \times 600 \text{ Kcal/meal} \div 10\text{H/day} \times 4 \div$ $8,700 \text{ Kcal/m}^3$ $= \underline{12.5 \text{ m}^3/\text{H}}$
Hot-water supply	$108 \text{ persons} \times 50 \text{ L./persons . day} \times 40 \text{ days} \div$ $10 \text{ H/day} \times 2 \div 8,700 \text{ Kcal/m}^3 \div 0.8$ $= \underline{3.8 \text{ m}^3/\text{H}}$
Heating (dormitory)	$138,000 \text{ Kcal/H} \div 8,700 \text{ Kcal/m}^3$ $= \underline{15.9 \text{ m}^3/\text{H}}$
	<u>Sub-Total: 32.3 m³/H</u>
Staff Houses	(Gas water heater + Cooker + Heating stove x 3) $\times 20 \text{ units} = \underline{50 \text{ m}^3/\text{H}}$
	<u>Total: 82 m³/H</u>

Operation Cost of Construction Machinery

The fuel consumption of the construction machinery for operator training has been tentatively calculated as stated in the separate table on the assumption under the normal operating condition. The scope of calculation has been confined to those machines mentioned in the Minutes of Basic Design Survey, and the cost of lubricating oil and others has been estimated at 20% of the diesel oil cost.

Specified below is the annual operation cost calculated in the said conditions.

$$\begin{aligned}\text{Annual operation cost} &= \text{Fuel cost/hour} \times \text{Hours/day} \times \text{Number of training} \\ &\quad \text{days} \times \text{Simultaneous working rate} \times 4 \text{ times/year} \\ &= 1,933 \text{ RS/H} \times 5 \text{ H/day} \times 44 \text{ days} \times 0.5 \times 4 \\ &= 850,520 = 851,000 \text{ RS/Year}\end{aligned}$$

Fig. 7.3.1 Fuel Consumption of Training Machinery

Description	Specification (Approx)	Qty for Ope.	Fuel Comsump. (1/h.)	Unit Ope. Cost (Rs/h.)*
Bull Dozer	320 ps	1	41.9	210.-
	220 ps	1	28.5	143.-
	160 ps.	1	18.0	90.-
	140 ps	1	15.9	80.-
Dozer Shovel	160 ps	1	19.7	99.-
	110 ps	1	15.9	80.-
Wheel Loader	200 ps	1	24.9	125.-
	100 ps	1	12.8	64.-
Motor Grader	145 ps	1	17.2	86.-
	110 ps	1	13.9	70.-
Dump Truck	18 t (off highway)	1	15.1	76.-
	10 t (highway)	1	9.5	48.-
Road Stabilizer	360 ps	1	28.1	141.-
Truck Crane	10 t	1	8.6	43.-
Hydraulic Excavator	0.9 m ³	1	14.7	74.-
	0.5 m ³	1	10.3	52.-
Motor Scraper	16 m ³	1	53.0	265.-
Vibratory Roller	8 t	2	17.4	87.-
Pneumatic Roller	15 t	1	5.6	28.-
Compressor w/Attachment	2.5 m ³ /min.	1	8.7	44.-
Diesel Generator	9.5 Kw	1	3.0	15.-
Asphalt Distributor		1	2.6	13.-
		Total	385.3 L./h	1,933 Rs/h

* including cost of lubricating oil & others about 20% of fuel cost (diesel oil).

$$\text{fuel cost} = 4.7\text{Rs/L.} \times 1.2 = 4.92 = 5.0\text{Rs/L.}$$

CHAPTER 8. TECHNICAL COOPERATION

8-1. Necessity of Technical Cooperation

As described above, the rapid mechanization of construction work has aggravated the shortage of operators and mechanics in Pakistan. This is because these operators and mechanics were given only short-term training at the site of each development project. As things stand now, it is difficult to keep the construction machinery in perfect operational/maintenance condition for infrastructural and rural development works included in the Sixth Plan. It is therefore urgently required to conduct intensive technical training to increase the number of operators and mechanics and upgrade the technical level of construction mechanization.

From this point of view, the CMTC will be operated for training of 300 operators and mechanics each year. The facilities and equipment of this project will be provided as an arena for technology transfer in hard aspects. On the other hand, for active technology transfer in soft aspects, it seems somehow difficult in technical because shortage of instructors and also little adoptability to modern technology. Therefore, technical cooperation must be offered to the extent that the Pakistan side is enabled conduct training on its own, using the CMTC's facilities and equipment, to secure a sufficient number of capable operators and mechanics.

Considering the present technical level and the training programme of the CMTC, the following basic items for Technical Cooperation seems to be highly necessary.

1) Guidance in CMTC Operation and Management

As the CMTC will be the only institution in Pakistan intended specifically for training in construction machinery, it is necessary to provide guidance in its efficient operation and management to secure the maximum training effects in a short period.

2) Training of Pakistani Instructors

Pakistani instructors who are to be charged with the training of operators and mechanics will be the direct recipients of actual technology transfer services. The success of the CMTC operations will depend largely on the improvement of their technical capabilities and introduction of advanced, highly effective training methods. To nurture these instructors, they should be given technical training in Japan besides the guidance offered in Pakistan.

3) Preparation of Training Programme

The contents of training to be offered at the CMTC are highly intensive as compared with the present level of training in Pakistan. To attain the expected training effects, it is necessary to prepare an elaborate, carefully thought-out training programme. For this reason, guidance service should be provided to help prepare a programme meeting the needs in Pakistan by referring to the programmes carried out in Japan.

The facilities and equipment to be supplied to the CMTC will exhibit their functions to the full only if the technical guidance mentioned above is offered continuously by the donor country until the CMTC is operated on its own by the strained self-help efforts of Pakistan side.

8-2. Method of Technical Cooperation

For the establishment of the CMTTC, the Pakistani Government requested Japan's Project-based Technical Cooperation. Acceding to this request, the Japanese Government sent a Technical Cooperation Implementation Survey Team in April 1984 through the JICA before dispatching the Basic Design Team. The following are the items of technical cooperation listed in the Record of Discussions which covered the contents and objectives of training, enrolment, etc. and was exchanged between the Japanese Survey Team and the Pakistani Authorities concerned.

1) Dispatch of Japanese Experts

Three to four Japanese experts including a Chief Advisor will be sent to Pakistan to provide Pakistani Instructors with technical guidance and advice.

2) Acceptance of Counterpart Instructors for Training

Several number of Pakistani Instructors, who will serve as counterparts of Japanese experts, will be accepted for training in Japan for a suitable period during which they will be given opportunities to acquire the latest knowledge/technologies relating to construction machinery.

3) Supply of Training Equipment and Materials

The training equipment and materials required at the CMTTC will be provided by the Japanese Government under its Grant Aid Scheme. Some additional training equipment/materials will also be provided for the purpose of technical training after a consultation between the Japanese Experts and the Pakistani Authorities concerned.

The details and execution schedule of Technical Cooperation will be discussed at a Meeting scheduled for the end of 1984, and will be presented in a Record of Discussions.

CHAPTER 9. PROJECT EVALUATION

The implementation for the establishment of the CMTC project will be evaluated as follows from the social and economic points of view.

1) Social and Economic Evaluation

For the Islamic Republic of Pakistan aiming at economic development under the hard financial condition, it is chiefly important how to make investments in what fields of industry in order to produce excellent results. Consolidation of social infrastructure whose level is relatively lower than those of most developing countries seems quite significant not only for stabilization of the social welfare but also for improvement of the industrial productivity and the investment efficiency. In the Sixth Five Year Plan (1983-1988), the promotion of this consolidation of the social infrastructure has been considered as one of the main themes. So, the project for advancement of the technical level essential to effective consolidation of the social infrastructure is very important for Pakistan.

On the other hand, the working population of Pakistan, is steadily increasing year after year, and the number of the underemployed has exceeded 20% of the total working population. Especially the number of unskilled workers has rapidly increased and they have been placed under unstable conditions partly relying on emigration to the Gulf and Middle East. For the Pakistan aiming at economic development by promotion of industries with modern technology, the enlargement of skilled workers will be inevitable. So, the project aiming at the cultivation of skilled workers through technical education and vocational training is quite valuable.

When evaluated from these points of view, this project is a well-balanced and contributable to the economic development of Pakistan because it is a manpower development project primarily purposed to foster the technical workers in operation and maintenance of construction machinery which is indispensable for rational promotion of the said consolidation of the social infrastructure.

The proposed project site for the CMTC is located in the Islamabad Capital Development Area, and the locational condition is excellent for recruitment

of the trainees and staff. The location of the site also seems suitable for effective demonstration of the construction machines which are by no means familiar to the local community. Also for the growing Islamabad, the execution of this project will contribute to the development of adjacent areas as it will produce spread-out effects.

2) Financial Evaluation

The construction cost and the operation expenses of this center will be evaluated as follows.

Construction cost

The facilities of this center will be sufficient for fulfillment of the original functions, though the scale does not seem to be large enough for the activities and the number of trainees scheduled for the future. Compared with similar facilities in Pakistan, the facility grade of this centre is moderate. The whole project has been so planned as to ensure the possible reduction of the construction cost through positive introduction of the construction methods, machines, equipments, materials, and labour which are locally available, and to foster the local construction industries in the adjacent area.

According to the estimation of the Basic Design Study, the cost of the construction work to be left in charge of the government of Pakistan as previously specified is roughly estimated at Rs. _____. This development cost is reasonable, and seeing that the amount has already been appropriated in the budget for the fiscal year 1984, it does not seem to involve any financial problem.

Managerial operation cost

The facility plan of this center has been mapped out in due consideration of the natural condition of the construction site, and the expenses for operation will be reducible to some extent through effective operation control. The annual operation and maintenance cost of this center is approximately R. 4,226,000 in total as already specified in Chapter 7. Of the said expenses, the maintenance and management cost of the equipment, materials, spare parts, etc. will be further reducible with future inforcement of the Technical Cooperation of the project based. The estimated managerial operation cost does not seem to involve any problem either.

3) Operational and Institution Evaluation

As previously stated, the operational administration system of this center is organized from the department of training and the department of administration so as to meet the purpose and functions of the whole institute. For smooth and effective promotion of the training activities, the Japanese experts who technically guide and support the training program will be further incorporated in the managerial organization.

About 65 number of Pakistan staffs will be required for this center, and about 20 instructors must be well versed in the construction machinery. If early implementation of the Project-based Technical Cooperation is realized, the previous training of the necessary staffs in Japan prior to the opening time of the center will become possible. In any case, the technical and managerial knowledge required for sound and effective operation of this centre will be imparted by the experts dispatched from Japan.

CHAPTER 10. CONCLUSIONS AND RECOMMENDATIONS

1) Conclusions

As described in the foregoing, the parallel promotion of many large-scale development projects under the Fifth Plan necessitated the import of large quantities of investment goods including construction machinery, and this brought about a diversity of problems to the economy of Pakistan. Under the Sixth Plan, therefore, the priority order of these projects was determined according to the economic efficiency, and infrastructural improvements focused on the expansion and repairs of existing ones and rural development in order to rectify regional differences.

Introduction of construction machinery, promoted at a rapid pace under the Fifth Plan, failed to yield the expected results owing to the shortage of operators and mechanics. For this reason, the Government promoted a positive manpower development policy under the Sixth Plan, giving specific importance to the training of such operators and mechanics to improve their technical level and construction efficiency, while at the same time determining to make efforts to widen employment opportunities. It is probable that the shortage of skilled operators and mechanics will gain greater severity in the future when the decentralization of construction machinery will proceed with the progress of rural development.

Considering the situation mentioned above, the Government's plan for training 300 construction machinery operators and mechanics each year under the CMTTC project is quite opportune. It can be said in conclusion that the project will produce the dual effect of not only solving the current shortage of skilled operators and mechanics but also contributing greatly to the country's economic growth by improving the technical level and production efficiency.

Equipment supplied to Pakistan under the Japanese aid scheme are valued at a cumulative total of Yens10 billion for construction machinery alone. For training operators and mechanics of such machinery, the implementation of this project by Japanese Grant Aid will produce very great cooperation effects.

2) Recommendations

In order for Pakistan to be able to promote its socio-economic development scheme smoothly at a steady pace, it roles very important part to introduce construction machinery for mechanizing various development works, and the training of operators and mechanics for such machinery seems an urgent necessity. Therefore, the CMTC will be established with the Japanese Grant Aid, and operated as an arena of technology transfer with Japan's Project-based Technical Cooperation. To obtain maximum training effects from the implementation of this project, the Pakistan side is urged to make intensive self-help efforts, as enumerated below.

(1) Establishment of Management System

The CMTC is expected to be managed by relevant government agencies headed by the MOC. For the purpose of its efficient operation and management, it is recommended that a powerful management system should be established for smooth adjustment of opinions of all agencies concerned. The system should be capable of consistent management from the design stage through the construction, delivery and operation of the CMTC after the project completion.

(2) Staff Allocation

It is estimated that a minimum of 65 staff will be required for the operation/management of the CMTC. A careful and prompt staffing needs to be formulated in order to assure that each staff will be assigned to his post and become fully acquainted with all facilities and equipment before the CMTC is delivered, so that the training programme can be put in operation immediately. It is necessary to recruit instructors and sub-instructors at an early stage because they will be required to be given short-term training in Japan and will develop textbooks and training programme with dispatched Japanese experts before the CMTC is opened.

(3) Budget Appropriation

Securing a budget appropriation for the Pakistan-side works of the project and the CMTC operating expenses after its completion is an essential prerequisite to the project implementation. While an annual estimated amount of Rs. 4.3 million is considered essential for the CMTC's operation and maintenance, it is expected that practical

training in machine operation using actual construction machinery and repair practices using consumable parts will incur a large amount of expenses. It is therefore considerable for collecting part of the training expenses from the trainees or offering charged repair services of construction Machineries to outside organizations.

(4) Maintenance of Facilities and Equipment

Technical staff in charge of building maintenance, equipment operation and furniture repairs need to be appointed before completion of the CMTC to provide them with opportunities for getting well versed in the building maintenance method and equipment operation/inspection procedure during the construction period.

(5) Pakistan-side Works

For the purpose of smooth project implementation, it is very important to be completed the basic infrastructural work and site leveling work at any early stage because the CMTC construction schedule will be greatly influenced by the progress of these preparatory works by Pakistan side. The construction schedule will also be affected by the customs clearance procedures and inland transportation of equipment as well as the stability of supply of local materials. It is therefore hoped that the Government of Pakistan will provide practical convenience for expediting the said matters.

(6) Job Training

In order to enable the trainees improve their technical capabilities steadily and reach the level required in the actual maintenance shops or construction sites, it will be necessary to conduct on the job training in a positive manner besides providing opportunities for site inspection. In the practical training in maintenance and repair services, it is strongly recommended that flexible approaches be made by using actually broken machines and by fabricating training materials from the parts of such broken machines.

(7) Intensive Training

In obtaining the expected training effects during the short period, it will be highly effective to extend the daily training hours as seen in the curriculum of the NLC's Karachi training center or provide intensive training by requiring all trainees to live in the dormitory. A

special operational/management system will be required for the execution, and establishment strongly hoped for.

Sustained efforts of the Pakistan side covering many aspects are thus indispensable for the successful operation of the CMTC, and equally important is the technical cooperation of the Government of Japan.

(8) Japanese Technical Cooperation

For the purpose of smooth operation of the project, it is expected that the Government of Japan will offer project-based technical cooperation in parallel with the progress of construction work. It is necessary to formulate an elaborate plan under which Pakistan instructors will be sent to Japan at a suitable time for short-term training and Japanese experts will also be recruited and dispatched to Pakistan at a suitable time to help complete all necessary preparations such as the formulation of the training programme, preparation of textbooks, guidance of instructors before the CMTC is opened.

In order for the CMTC project to exhibit its functions successfully by providing 300 skilled machinery operators and mechanics annually and thereby serve them as a powerful incentive to Pakistan's socio-economic development, it is essential that three fundamental conditions be fully satisfied; the CMTC construction under the Japanese Grant Aid Programme, the Project-based Japanese Technical Cooperation, and the strenuous Self-help Efforts to be exerted by the Pakistan-side to make this technology transfer truly fruitful.

APPENDIX

1. Dispatch of the Survey Team
2. Minutes of Discussions
3. Conditions of the Site
4. Related Information for the CMTC
5. Equipment List

APPENDIX 1. Dispatch of the Survey Team

For the planning and design of the CMTIC concerned, survey teams have been dispatched.

1). Members of the Survey Team

● Basic Design Survey Team (March 23 - April 11, 1984)

Team Leader	Mr. Yoshifusa SHIKAMA Basic Design Division Grant Aid Department, JICA
Training Programme	Mr. Tadahiro HONGO Japan Construction Machinery Association
Architectural Planning	Mr. Ryoji HIRANO Kume Architects-Engineers
Architectural Design	Mr. Makoto NAGADOMI Kume Architects-Engineers
Mechanical Planning	Mr. Mikio KURISHIRO Kume Architects-Engineers
Equipment Planning	Mr. Kiyoshi YOSHIDA Kume Architects-Engineers

● Final Study Team (June 22 - July 1 1984)

Team Leader	Mr. Seikou FUKUDA Economic Cooperation Division Ministry of Foreign Affairs
Technical Cooperation	Mr. Tetsuya KAWABATA Construction Machinery Division, Ministry of Construction
Training Programme	Mr. Tadahiro HONGO Japan Construction Machinery Association
Project Coordinator	Mr. Yoshifusa SHIKAMA Basic Design Division, Grant Aid Department, JICA
Architectural Planning	Mr. Ryoji HIRANO Kume Architects-Engineers
Architectural Design	Mr. Makoto NAGADOMI Kume Architects-Engineers
Equipment Planning	Mr. Kiyoshi YOSHIDA Kume Architects-Engineers

2). Cooperative Officials in the Survey

● Pakistani Authorities Concerned

○ EAD (Economic Affairs Division)

Mr. Syed Ghulam Ahmed : Joint Secretary
Mr. Asif Sheik : Section Officer
Mr. Osman Sher : Section Chief
Mr. F.I. Malik : Joint Secretary
Mr. M. Faheem : Deputy Secretary
Mr. Anwarul Haq : Section Officer

○ MOC (Ministry of Communications)

Mr. F.K. Bandial : Secretary
Mr. Abdul Hameed : Joint Secretary (Transport)
Mr. M.A. Iqubal : Director, Roads & Road Transport
Mr. Leo M. Khyne : Equipment Consultant

○ PDD (Ministry of Planning & Development)

Mr. Malik Khan : Chief, Transport

○ FWO (Frontier Works Organization)

Gen. M. Aslam : Director General
Col. Rashid Khalid : Director
Col. Younath : Director
Lt. Col. M. Toseef : Acting Director

○ NHB (National Highway Board)

Brig. Khalid Mukammad Amin : Director General
Mr. Thai : Consultant
Mr. Aurangzeb Khan : Section Officer

○ NLC (National Logistic Cell)

Col. Shabeer : Director, Gujranwala Depot.
Col. Nadir Shar : Director, Karachi Depot.

○ Engineer-in-Chief (Directorate Design and Consultancy)

Col. Saeed : Director
Mr. Amjed Khan : Structure Engineer
Mr. Ain Rohilla : Architect

● Japanese Officials Concerned in Pakistan

o Embassy of Japan in Pakistan

H.E. Shinichi YANAI : Ambassador Extraordinary
and Plenipotentiary
Mr. Akira SUGINO : Counselor
Mr. Noriyoshi KONZO : First Secretary
Mr. Satoshi TAGUCHI : First Secretary
Mr. Yoshinari OSHIMA : Third Secretary

o Consulate General of Japan in Karachi

H.E. Kiichi ITABASHI : Consulate General
Mr. Ihei MAKITA : Consul
Mr. Teruhiko KADOHIRA : Vice Consul

o JICA Islamabad Office

Mr. Kinjiro WADA : Director

APPENDIX 2. Minutes of Discussions

Minutes-1 on the Basic Design Survey (April 1, 1984 Signed)
Minutes-2 on the Final Draft Survey (June 27, 1984 Signed)
for reference on the Implementation Survey (March 26, 1984 Signed)

Minutes of Discussion

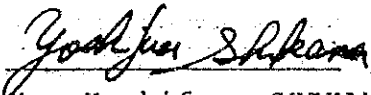
on

The Construction Project for
The Construction Machinery Training Centre
In the Islamic Republic of Pakistan

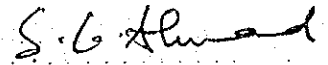
In response to the request made by the Government of the Islamic Republic of Pakistan for the Construction Project of the Construction Machinery Training Centre (hereinafter referred to as "the Project"), the Government of Japan has sent, through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), a team headed by Mr. Yoshifusa SHIKAMA, Basic Design Division of Grant Aid Department, JICA, to conduct a basic design study from March 23rd to April 1st, 1984. The team has carried out a field survey, held a series of discussions and exchanged views with the authorities concerned of the Project.

As the result of the study and discussions, both parties have agreed to recommend to their respective Governments to examine the results of the survey attached herewith towards the realization of the Project.

April 1st, 1984



Mr. Yoshifusa SHIKAMA
Team Leader
Basic Design Study Team
JICA



Syed Ghulam Ahmed
Joint Secretary
Technical Assistance &
International Economic
Relation,
Economic Affairs Division
Government of Pakistan.

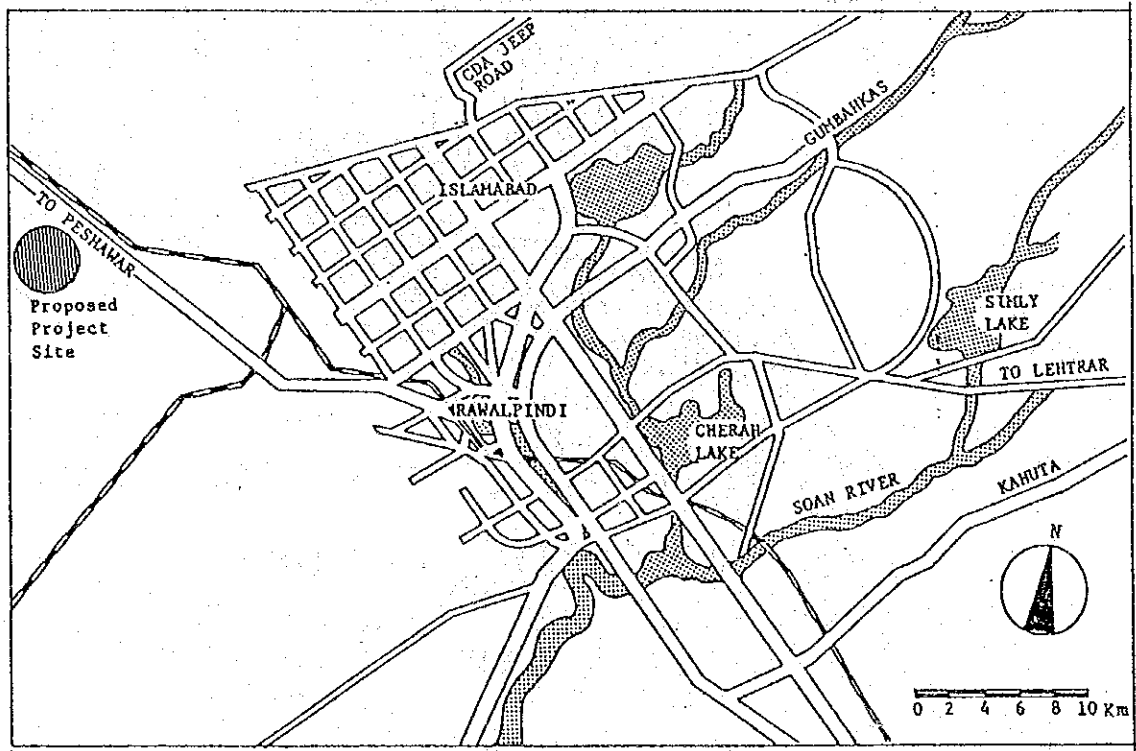
ATTACHMENT

1. The objective of the Construction Machinery Training Centre Project is to provide skilled mechanics and operators with necessary knowledge, techniques and practice to the agencies concerned to preserve construction machineries in good condition, and thus contributing to the development of social infra-structure and man-power development of Pakistan.
2. The purpose of the Construction Project is to provide necessary building, facilities and equipment for the Construction Machinery Training Centre (hereinafter referred to as "the Center").
3. The proposed site of the Project is located at Sangjani the land acquired by Pakistan side (hereinafter referred to as "the Project Site"). The Project Site location is shown in Annex I.
4. The Japanese Survey Team will convey to the Government of Japan the desire of Pakistan side that the former takes necessary measures to co-operate in implementing the Project and provides the building and other items listed in Annex II within the scope of Japanese economic cooperation programme in grant form.
5. The Government of Pakistan has understood Japan's grant aid system explained by the Team which includes a principle of use of a Japanese Consultant Firm and a Japanese General Contractor for implementation of the Project.
6. The Government of Pakistan will take necessary measures listed in Annex III on condition that the grant assistance by the Government of Japan is extended to the Project.

P. 5

ANNEX I - A

Location Map

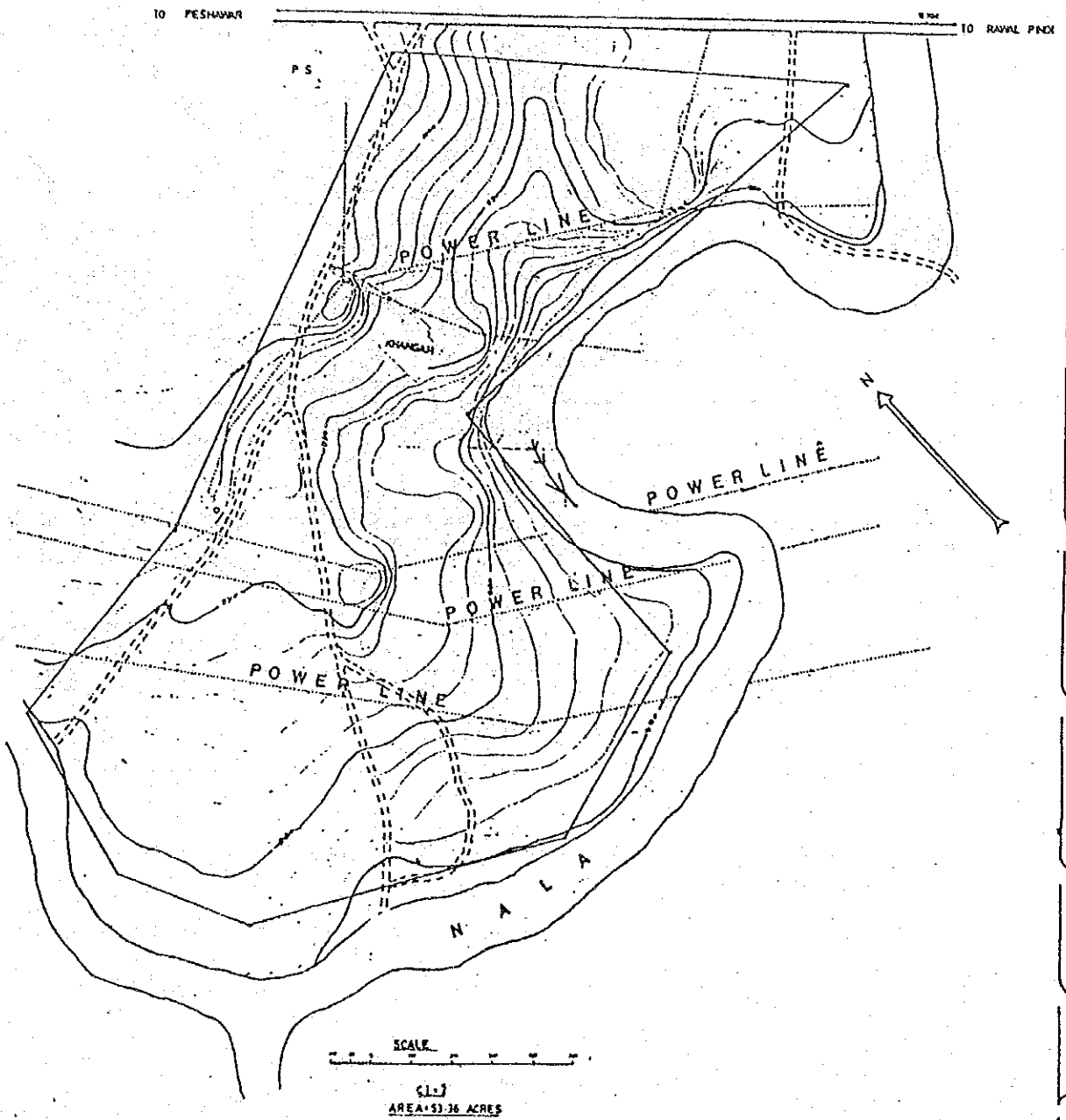


P.S

ANNEX I - B

Project Site Map

PROPOSED SITE FOR CONSTRUCTION MACHINERY
TRAINING CENTRE SANGJANI



P. 5

4

ANNEX II

Items requested for the Construction Project by the Government of Pakistan.

1. Facilities

1) Administrative Section

- Administrative Room
- Director Office
- Senior Staff Room
- Teacher's Room
- Conference Room
- Locker Room
- Shower Room
- Reception Room

2) Educational Section

- Classroom
- Lecture Hall
- Library
- Audio Visual Room

3) Training Workshop Section

- Instructors and Sub Instructors Room
- Classis Shop
- Welding, Fabrication & Undercarriage Shop
- Machine Shop
- Power-line & Hydraulic Shop
- Engine Shop
- Parts Warehouse
- Fuel Injection Pump Room
- Engine Test Room
- Electrical Room
- Hydraulic Test Room
- Tool Room
- Shop Classroom
- Waterpool for Engine - dynamo
- Generator Room

P.S

W

4) Welfare Facility

- Canteen
- Kitchen
- Storage
- Recreation Room

5) Outdoor Facility

- Garage for Construction Equipment
- Washing Area (concrete floor)
- Fuel Station with Tank
- Parking Lot
- Practice Field for Operators Course
- Guard House
- Gate and Fence

6) Accommodative Facility

- Hostel for Trainees (Max capacity 100 persons)
- Residential House for Pakistani Instructors

Note 1: With the regards to the residential accomodation for Pakistani Instructor and staff, the Government of Pakistan strongly recommends and requests the Government of Japan that this accomodation should be also constructed under the Grant Aid Scheme.

2. With the regard to the provision of furniture in the Center, the Government of Pakistan strongly recommends and requests the Government of Japan to consider furnishing of Pakistani Instructors office and residential accomodation.

2 Equipment

1) Description	Specification (Approx)	Qty for Ope.	Qty for Mech.	Total
Bull. Dozer	320 ps	1		1
	220 ps	1		1
	160 ps	1		1
	140 ps	1	1	2
Dozer Shovel	160 ps	1		1
	110 ps	1	1	2
Wheel Loader	200 ps	1		1
	100 ps	1	1	2
Motor Grader	145 ps	1		1
	110 ps	1	1	2
Dump Truck	18 t (off highway)	1		1
	10 t (highway)	1	1	2
Road Stabilizer	360 ps	1		1
Truck Crane	10 t	1		1
Hydraulic Excavator	1.2 m ³	1		1
	0.9 m ³	1		1
	0.5 m ³		1	1
Motor Scraper	23 m ³	1		1
	16 m ³	1		1
Vibratory Roller	8 t	2		2
Pneumatic Roller	15 t	1		1
Compressor W/ Attachment	2.5 m ³ /min	1	1	2
Diesel Generator	9.5. Kw	1	1	2
Asphalt Distributor		1		1

2. Service Workshop Equipment

3. Cutway Model.

Y. P

Note 1 : Additional equipment are requested by Pakistan side as follows.

Priority	Description	Specification(Approx)	Qty for Ope.	Qty for Mech.	Total Qty.
1.	Asphalt Finisher		1		1
2.	Concrete Paver		1		1
3.	Pavement Cutter		1		1
4.	Milling Machine		1		1
5.	Slurry Seal Machine		1		1
6.	Jumbo Drill		1		1
7.	Dump Truck	18 t	1		1
		10 t	1		1
8.	Truck Crane	10 t	1		1
9.	Motor Scraper	16 m ³		1	1

Note 2 : Pakistan side requested to include spare parts for the Center at least for 2 years.

Y.S

V

ANNEX III

Following arrangements are required to be taken by the Government of Pakistan.

1. To secure a lot of land necessary for the construction of facilities and to clear, fill and level the site as needed before the start of the construction.
2. To provide necessary data and information for basis design.
3. To provide facilities for distribution of electricity, telephone, water supply, gas and other incidental facilities to the proposed Project Site.
4. To ensure prompt unloading, tax exemption, customs clearance at ports of disembarkation in Pakistan, and prompt internal transportation therein of the products purchased under the grant.
5. To maintain and use properly and effectively that the facilities constructed and equipment purchased under the grant.
6. To undertake incidental civil works such as gardening, fencing, gates and exterior lighting, if needed.

P. 15

MINUTES OF DISCUSSION
ON
THE DRAFT REPORT OF BASIC DESIGN STUDY
ON
THE CONSTRUCTION OF
THE CONSTRUCTION MACHINERY TRAINING CENTRE
IN
THE ISLAMIC REPUBLIC OF PAKISTAN

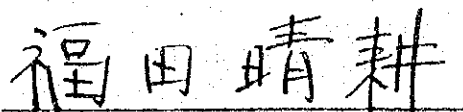
With the view to assist the Government of the Islamic Republic of Pakistan with the grant aid project for the Construction of the Construction Machinery Training Centre (hereinafter referred to as "the Project"), the Government of Japan dispatched a Mission to carry out the Basic Design Study (hereinafter referred to as "the Study") on the Construction of the Project through Japan International Cooperation Agency (JICA) from March 23rd to April 11th, 1984.

The Mission carried out a field survey and had a series of discussions with the authorities concerned of the Government of Pakistan.

As a result of these survey and discussions, JICA prepared and submitted a Draft Final Report on the Study and dispatched a Mission to explain and discuss on this Report starting from June 22rd to July 1st, 1984.

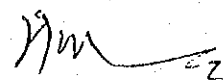
Both parties had a series of discussions on the Report and have agreed to recommend to their respective Governments that the major points of understanding reached between them, attached herewith, should be examined toward the realization of the Project.

June 27, 1984



Mr. Seikou Fukuda
Team Leader

Draft Report of Basic Design Study Team
JICA



Mr. F. I. Malik
Joint Secretary to the
Government of Pakistan
Economic Affairs Division
ISLAMABAD

MAJOR POINTS OF UNDERSTANDING

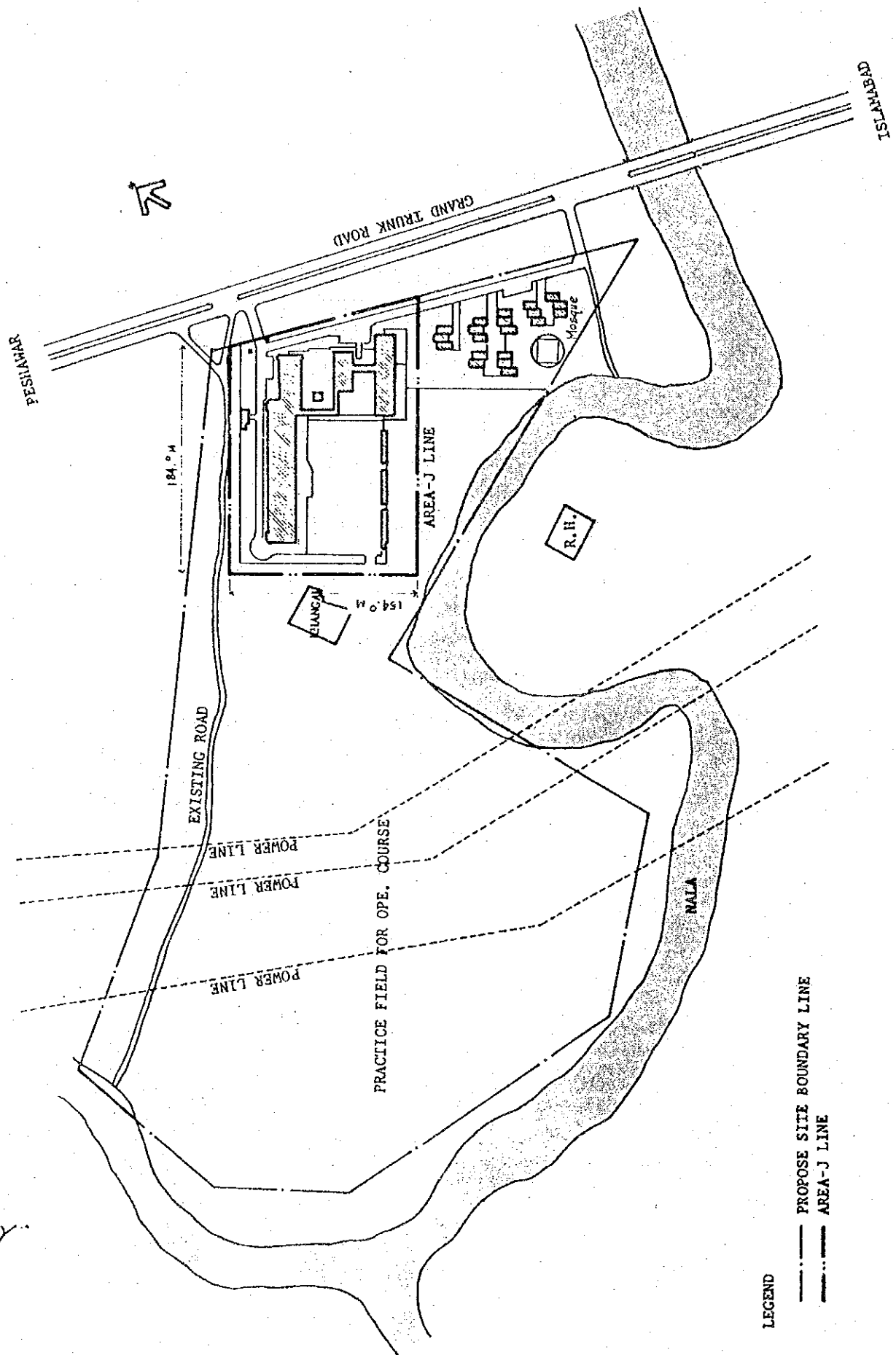
BASIC DESIGN

1. The Pakistani side has principally agreed to the basic design proposed in the Draft Final Report.
2. The Final Report (10 copies in English) on the Project will be submitted to the Pakistani side by the end of August, 1984.
3. The Pakistani side understood the system of Japan's Grant Aid Programme and the major undertakings to be taken by both Governments for realization of the Project as shown in ANNEX I & II.

Handwritten marks: a vertical line and a stylized signature or symbol.

Major undertakings to be done by both Governments.

		Japanese side	Pakistani side
1.	To secure a lot of land		●
2.	To clear, level and reclaim the site		●
3.	To construct the gate and fence in and around the site		●
4.	To construct the parking lot of the Area-J	●	
	Develop the landscape in the site		●
5.	To construct the road		
	1). Within the Area-J	●	
	2). Outside of the Area-J		●
6.	To construct the building within the Area-J	●	
7.	To provide facilities for distribution on electricity, drainage and other incidental facilities		
	1). Electricity		
	a. Distributing line		●
	b. Internal wiring after Transformer	●	
	2). Drilling tubewell and water supply	●	
	3). Drainage		
	a. Storm water drainage outside of the Area-J		●
	b. Drainage system (for toilet sewer, ordinary waster, storm drainage and others) and soak pits within the Area-J	●	
	4). Telephone System		
	a. Telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. MDF and the extension after the frame/panel	●	
	5) Furniture and Equipment		
	a. General furniture		●
	b. Training equipment for the Project	●	



MASTER PLAN

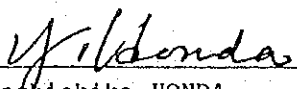
LEGEND
 ——— PROPOSE SITE BOUNDARY LINE
 - - - - - AREA-J LINE

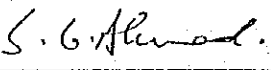
Minutes of the Meeting

The Japanese Implementation Survey Team for the Construction Machinery Training Centre Project in Rawalpindi (hereinafter referred to C.M.T.C.) which is organised by Japan International Cooperation Agency and headed by Mr. Yoshichika HONDA, had a series of discussion on the Technical Cooperation Scheme with the Pakistan Steering Committee from March 18, 1984 to March 26, 1984.

As a result of the discussion, the Japanese Implementation Survey Team (hereinafter referred to as the Team) and Pakistani Authority concerned has reached at the agreement mentioned in the Annex, to recommend their respective government for the Implementation of C.M.T.C. Project.

March 27, 1984


Yoshichika HONDA
The Leader of Japanese
Implementation Survey
Team, JICA


Syed Ghulam Ahmed
Joint Secretary
Technical Assistance &
International Economic
Relation,
Economic Affairs Division
Government of Pakistan

Annex

(Contents of the Annex)

Master Plan of the C.M.T.C. Project

- I. Goal and purpose of the CMTC Project
 - II. Scope of Training
 - III. Measures undertaken by the Government of Pakistan.
 - IV. Measures undertaken by the Japanese Government.
 - V. Administrative Organizations.
 - VI. Further details concerning to the CMTC's Implementation.
- 6

Annex

Master Plan of the C.M.T.C. Project

I. Goal and purpose of the C.M.T.C. Project.

In accordance with the 6th Five Year Economic Development Plan ('83-88), The Government of Pakistan has placed emphasis on the development of social infra-structure such as road net-work, dam, irrigation system and land recalamation and also on man-power development of un-skilled labour.

The Government of Pakistan is now introducing a large number of construction machinery in order to execute these various public works effectively and smoothly.

In this context, the purpose of the C.M.T.C Project is to provide skilled mechanics and operators with necessary knowledge, technique and practice to the agencies concerned to preserve construction machinery in good condition, and thus contributing to the development of social infra-structure and man-power development of Pakistan.

II. Scope of Training

This training is carried out so as to train the trainees to be skilled operators, Mechanic I, Mechanic II at the completion of each course. Accordingly, the three courses are prepared as follows:

1. Training Courses

- 1) Operator course
- 2) Mechanic I course
- 3) Mechanic II course

2. Training period

Operator course	----	3 months
Mechanic I course	----	3 months
Mechanic II course (Engine	----	5 months
(Chassis	----	5 months

3. Entry of qualification of trainee.

1) Operator course

Experience is not necessary.

Minimum graduation : Secondary School or equivalent

Minimum age : 18 years old, should understand written English.

2) Mechanic I course

Experience is not necessary

Minimum graduation : Secondary School or equivalent

Minimum age : 18 years old, should understand written English.

3) Mechanic II course

Minimum graduation & experience : Secondary school & practical experience for 3 years as an assistant mechanic, or Intermediate College & practical experience for one year as an assistant mechanic. should understand written English.

Minimum age : ²⁰18 years old,

4. Numbers of trainees

- 1) Operator course : 40 enrolments
- 2) Mechanic I course : 20 enrolments
- 3) Mechanic II course : 20 enrolments
- Engine : 20 enrolments
- Chassis : 20 enrolments

5. Total number of trainees to be trained in one year.

I. Operator course	-----Max 160
II. Mechanic I course	-----Max 60
III. Mechanic II course	
Engine	-----Max 40
Chassis	-----Max 40
	<hr/>
	300

6. Major items of each course
Referred in "TRAINING CURICULUM"

7. Major Training Equipments and Materials listed below will be required and provided by the Govt. of Japan and used for each training course, however, the list of equipments and materials will be designated by the Basic Design Team (Grant Aid Scheme) at an appropriate state of its study.

1. Equipments	2. Materials
Buldozer	Text book
Motor scraper	Slide film
Motor garder	Wall chart
Compactor	Transparencies
Hydraulic excavator	Cutway models
Dump truck	Mini plastic models
Dozer shovel	etc.
Wheel loader	
Road stabilizer	
Asphalt distributor	
Truck crane	
Compressor	
Generator etc.	

Note:- The Govt. of Pakistan has strongly recommended the inclusion of following equipment which would be required at CMTC in addition to the equipment listed above.

- a. Asphalt Paver b. Pavement cutter c. Milling Machine
d. Slurry seal Machine e. Concrete Paver f. Jambo drill

8. Training Programme

1) Outline of training programme

A. Operator course

a. Objectives

It intends to train the trainees to have enough theoretical machine knowledge, and operation and maintenance knowledge. As a result they can build roads, dam irrigation and reclamation without any difficulties.

b. Outline of programme

i) This programme has training subjects, time to be spent and training materials and equipment used when lecturing.

An instructor will give brief explanation of tools, measuring devices and structure and function of machines. As a result, the trainees can carry out machine operation, drive machines, maintenance.

ii) This programme will be broken down as follows:

- i) Explanation of common tools, lifting tools and measuring tools.
- ii) Introduction of construction machines
 - a) Crawler type (Bulldozer, Dozer shovel & power shovel).
 - b) Wheel type (Dump truck, Motor grader Motor scraper, etc).
- iii) Explanation of engineering components
- iv) Operation practice in training centre
- v) Construction procedure
- vi) Importance of maintenance

B. Mechanic I Course

a. Objectives

It intends to train the trainees to have enough theoretical machine knowledge required for maintenance disassembly and assembly of components. As a result, they can assemble and disassemble components, and undertake minor repairs.

b. Outline of programme

i) Contents of programme.

This programme has training subjects, time to be spent and training materials and equipment used when lecturing and practicing.

An instructor will give full explanation of tools, Measuring devices and structure and function of machines.

As a result, the trainees can carry out minor repairs.

ii) This programme will be broken down as follows:

- . Full explanation of common tools lifting tools and measuring tools.
- . Introduction of construction machines
- . General information for practice.
- . Maintenance of bulldozer, dump truck.
- . Maintenance of Motor grader, loader and power shovel.
- . Shop practice programme of engine.
- . Shop practice programme of each system of machine.

C. Mechanic II course

a. Objectives

It intends to train the trainees to have enough theoretical machine knowledge required for disassembly and assembly of components.

As a result, they can assemble and disassemble components, carry out major repairs, solve major trouble and confirm the rebuilt units.

b. Outline of programme

i) Contents of programme

This programme has training subjects, time to be spent and training materials and equipment used when lecturing and practicing.

An instructor will give full explanation of tools, measuring devices and structure and function of machines.

As a result, the trainees can carry out major repairs, overhauling, trouble shooting and test.

ii) This programme will be broken down as follows:

- . Full explanation of common tools, lifting tools and measuring tools.
- . Full explanation of engineering components
- . Shop practice programme of each course
 1. Engine
 2. Chassis
(Power train, hydraulic brake, tyre and undercarriage, etc).
- . Testing of each system.
- . Major trouble shooting
- . Machining and welding techniques.

9. TRAINING CURRICULUM (Tentative)

1) Operator Course

3 months training A 20 Persons) x 4 times
B 20 Persons)

Total Personnel to be trained

160 persons/year

Curriculum

1st month

Lecture

(Introduction of construction machines
Function of components, Importance of
preventive maintenance, operation procedures.
Construction procedure, Explanation of
common tools).

A & B Groups

2nd month

3rd month

A Group

B Group

(Operation practice

- (1st week Bulldozer 4 Groups
- (2nd week Motor scraper & Bulldozer 4 Groups
- (3rd week Motor grader & Compactor 4 Groups
- (4th week Hydraulic Excavator & Dump truck. 4 Groups

B Group

A Group

(Operation Practice

- (1st week Dozer shovel & Wheel loader 4 Groups
- (2nd week Road stabilizer & Asphalt distributor 2 Groups
- (3rd week Truck crane, Compressor & Generator. 4 Groups
- (4th week Review and test

24

Total persons to be trained

60 persons/year

2) Mechanic I Course
 1st month
 3 months
 20 persons x 3 times

Lecture
 (Explanation of tools and equipment,
 Introduction of construction machine,
 General of engine, Bulldozer, Power shovel,
 wheel loader, elector circuit and
 Hydraulic circuit).

2nd month
 Lecture & Practice
 (Importance of preventive maintenance,
 General information for practice,
 minor disassembly and assembly of
 components).

3rd month
 Practice on engine, valve clearance, Injector adjustment
 Basic trouble shooting
 Basic Gas cutting and welding technic.

3

3) Mechanic II Course
 5 months training
 (Engine) 20 persons x 2 times = 40
 5 months training
 (Chassis) 20 persons x 2 times = 40
 80 persons/year

8

ENGINE

1st Month
Lecture (Explanation of tools and Equipment.
General of engine, electric circuit & Fuel system,
Kinds of engine, Function of engine components).

2nd Month
Lecture & Practice (Procedure of engine overhauling,
General information of practice,
Engine disassembling, cleaning,
measuring and assembling, parts
reconditioning).

3rd Month
Practice (another engine overhauling, Electric component
repair and test).

4th Month
Practice (Fuel injection pump and injection nozzle repair
and test, Turbocharger disassembling and assembling).

5th Month
Practice (Engine dynamometer test, adjustment, trouble shooting).

CHASSIS

1st Month
Lecture (Explanation of tools and Equipment, General of construction
machine, Function of each component such as clutch, Targue
converter, transmission).

2nd Month
Lecture & Practice (Steering system, final drive, differential gear, Brake system).

3rd Month
Lecture & Practice (Hydraulic component such as pump, motor control valve,
Cylinder, Plunger type pump and motor).

4th Month
Test of Hydraulic Component
Lecture (Under-carriage component and repair).
Practice (Under-carriage rebuilding).
Lecture (Tyre)
Practice (Tyre disassembling and assembling)
trouble shooting of component

5th Month
Practice (Machining, gas cutting and welding).

10. Table on Training Programme

<u>Description</u>	<u>Period of training</u>	<u>Numbers of trainees</u>	<u>Times of training to be held per year</u>	<u>Total numbers to trainees per year</u>	<u>Numbers of counter parts to be required</u>	
					<u>Chief</u>	<u>Sub</u>
Course						
1). Operator course Crawler type (Bulldozer, dozer shovel, power shovel Wheel type Dump truck, Motor grader, roller etc).	3 months	A 20 B 20	4	160	1	3+4
2). Mechanic I course Maintenance and repair	3 months	20	3	60	1	3
3). Mechanic II course Engine	5 months	20	2	40	1	3
Chassis	5 months	20	2	40	1	3
<u>Total</u>				<u>300</u>	<u>4</u>	<u>16</u>

gh

III. Measures undertaken by the Government of Pakistan.

1. Staffing

Pakistani Authority concerned will assign the Director of GMTG and Head of Training and Administrative Wings, and other necessary staffs shown in the table below, at latest before six (6) months of the opening of training courses:

(Table)

Description	Number	Qualifications		
<u>Training Wing</u>				
1) Operator Course	(Chief Instructor)	1	B.Sc Engineering and one year experience or equivalent.	
	(Sub Instructor)	7	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent.	
2) Mechanic I Course	(Chief	1	B.Sc Engineering and one year experience or equivalent.	
	Sub	3	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent.	
3) Mechanic II Course	Engine	Chief	1	B.Sc Engineering and one year experience or equivalent.
		Sub	3	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent
	Chassis	Chief	1	B.Sc Engineering and one year experience or equivalent.
		Sub	3	Graduated from Intermediate College and three years practical experience or Diploma plus one year experience or equivalent.

(Administrative Wing)

Director
Accountants
Chauffers
Steno Typists
Clerk etc.

2. Budget

As a running expenses for C.M.T.C. Project, following items operating the project shall be budgeted by Pakistani Authority concerned.

- A. Personnel expenses according to staffing plan mentioned above.
- B. Expenses for electricity, water supply, fuel, oil.
- C. Expenses for supply of training materials, maintenance charges of facility and equipment.
- D. Expenses for Custom Clearance and domestic transportation of training equipment.

3. Training Facility and Accommodation.

For the implementation of GMTG Project, following accommodation facilities listed below shall be required.

Accommodation Facilities

1). Office & Teaching Room

- a. Director room
- b. Senior Staff room
- c. Teacher's Room (for Japanese Experts)
- d. Conference room
- e. Administration room
- f. Library
- g. Class room
- h. Audio Visual room
- j. Locker room
- k. Canteen
- l. Kitchen
- m. Toilet
- n. Storage
- o. Reception room

2). Workshop

- a. Instructors and Sub Instructors room.
- b. Chassis shop
- c. Welding, fabrication & undercarriage shop
- d. Machine shop
- e. Power line & Hydraulic shop

Accommodation Facilities (Continued)

- f. Engine shop
 - g. Parts ware house
 - h. Fuel Injection pump room
 - j. Engine test room
 - k. Electrical room
 - l. Hydraulic test room
 - m. Tool room
 - n. Shop Class room
 - o. Toilet
 - p. Water pool for engine dynamo
 - q. Generator
-
- 3) Garage for construction equipments
 - 4) Washing area (concrete floor)
 - 5) Fuel station with tank
 - 6) Hostel for trainees (Max.capacity 100 persons)
 - 7) Recreation room
 - 8) Residential houses for Pakistani Instructors
 - 9) Parking lot for experts, instructors and guests
 - 10) Guard house
 - 11) Gate and fence
 - 12) Practice Field for operator course

Note: Regarding to the residential accommodation (item 8) for Pakistani Instructor and staff, the Government of Pakistan strongly recommends and requests the Government of Japan that this accommodation should be also constructed under the Grant Aid Scheme.

IV Measures undertaken by the Japanese Government.

The team will recommend the Japanese Government to undertake following measures for the implementation of CMTC Project, in terms of despatch of experts, receiving trainees and provision of equipments as technical cooperation.

The Japanese Government will take necessary action after accepting the formal request of Pakistani Government, in the procedure of Japanese Technical Cooperation Scheme.

1. Despatch of Japanese Experts.
In order to provide the Pakistani Instructors with necessary advice, competent three or four (4) Japanese experts including Chief Technical Adviser will be assigned to CMTC Project by the expense of Japanese Government.
2. Training of Pakistani Instructors in Japan.
For the purpose of providing Pakistani Instructors with up-dated knowledge and technique concerning to construction machinery, several Pakistani Instructors, as counterparts of experts in CMTC will be trained in the suitable training facility in Japan for certain period.
3. Provision of supplementary training equipments.
The main training equipments will be provided by the Japanese Grant Aid Scheme, limited supplementary training equipments will be provided after the mutual consultation between the Japanese experts and Pakistani Authority concerned. All of the training equipments and machinery shall be used only for training purpose of CMTC.

✓

Yh

V. Administrative Organizations.

The CMTC shall be operated under the supervision of the following related organizations, as a result of the Minutes signed by Japanese Contact Mission and E.A.D on November 24, 1983.

1. Responsible Agency in Pakistani Government

Ministry of Communications.

2. "The Managing Board of the CMTC".

Headed by Secretary of MOC (Ministry of Communications), The Managing Board of the CMTC has responsibility for supervising the activities and basic policy of the CMTC.

The board is supreme body of decision making in Pakistani side, and consists of Secretary of MOC (Chairman). Joint Secretary of MOC, Director General of FWO, Director General of NHB, Chief (Transport & Communications) Ministry of Planning & Development, Chief Engineer of NLC, Japanese experts, and representatives of Japanese Embassy and JICA Islamabad office as observers.

3. "The Steering Committee of the CMTC".

Under the supervision of the Managing Board, the steering committee has responsibility for technical matters in the CMTC.

The Committee consists of Japanese experts, engineers and representatives from FWO, NLC, CDA, WAPDA and other related organizations.

VI. Further details concerning to the CMTC's Implementation.

The team will recommend JICA to despatch a consultation team for finalizing the technical cooperation scheme, in close coordination with the grant aid scheme.