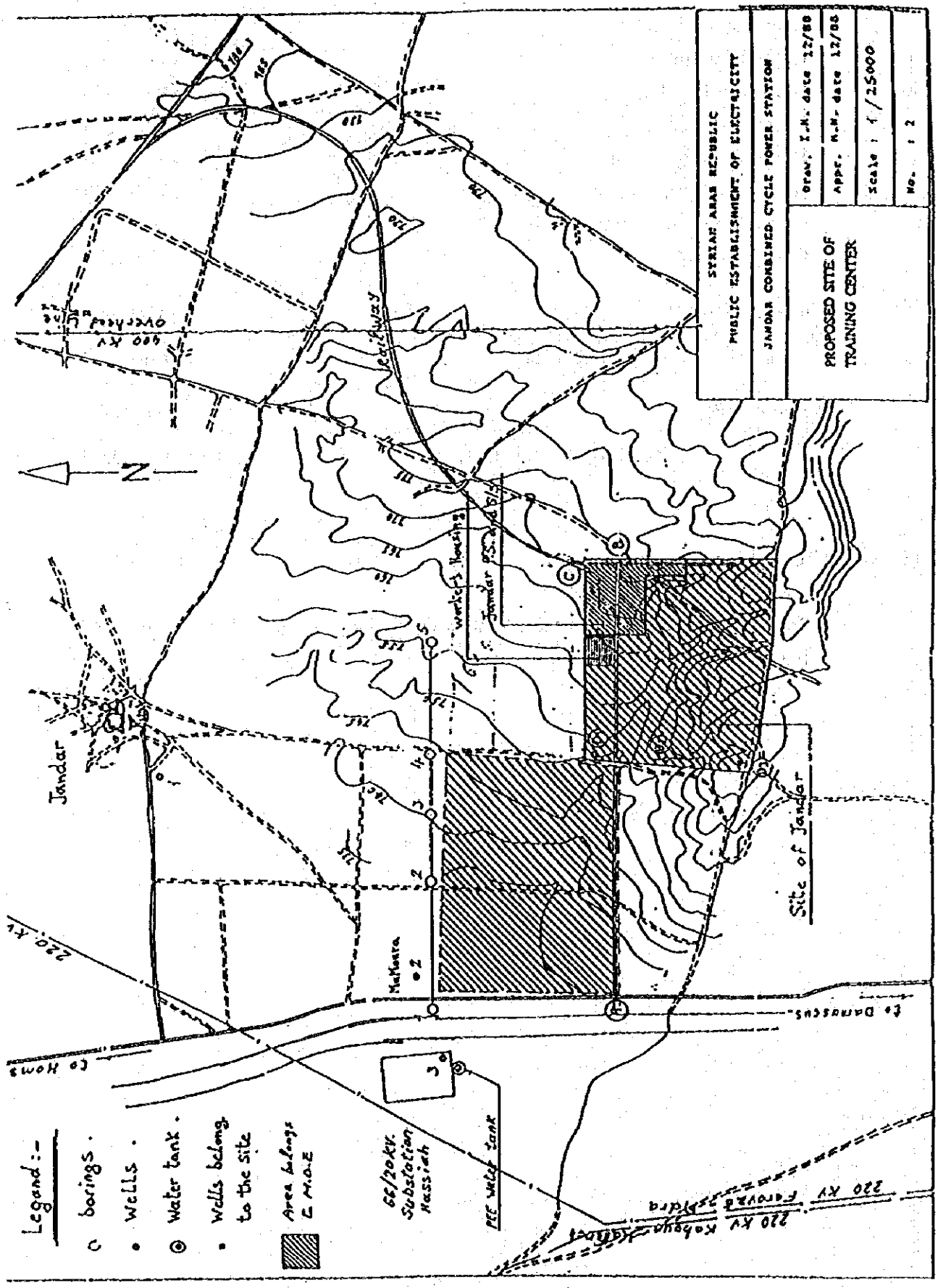
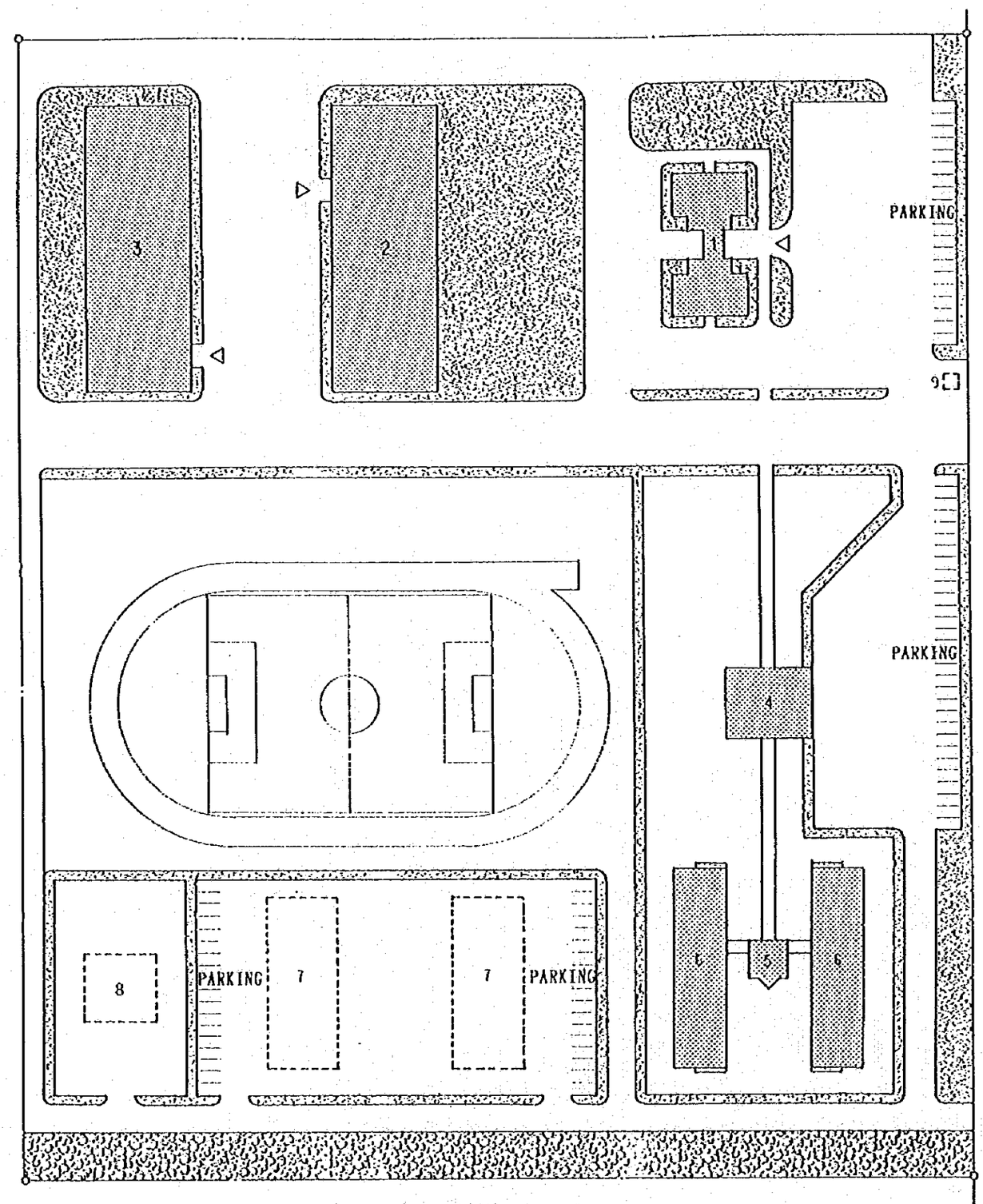
1)	Buildings	
	- Administration Building	k¥140,000
	- Laboratory Building	k¥240,000
	- Workshop Building	k¥240,000
	- Canteen	k¥60,000
	- Dormitory for Students	k¥260,000
	- Apartment for Instructors	k¥540,000
	- General Director's House	k¥25,000
	- Gate House	k¥2,000
2)	Outdoor facilities	k¥100,000
	Sub Total	k¥1,607,000
3)	Contingency	k¥73,000
	Total construction Cost	k¥1,680,000

(3) Grand Total (1) + (2) k¥2,780,000

Note: Taxes and duties which may imposed by the Syrian Government are not included in the cost estimation above.

DWG-NO.5.2.4-1 Proposed Site Location (Jandar C/C/ Site)



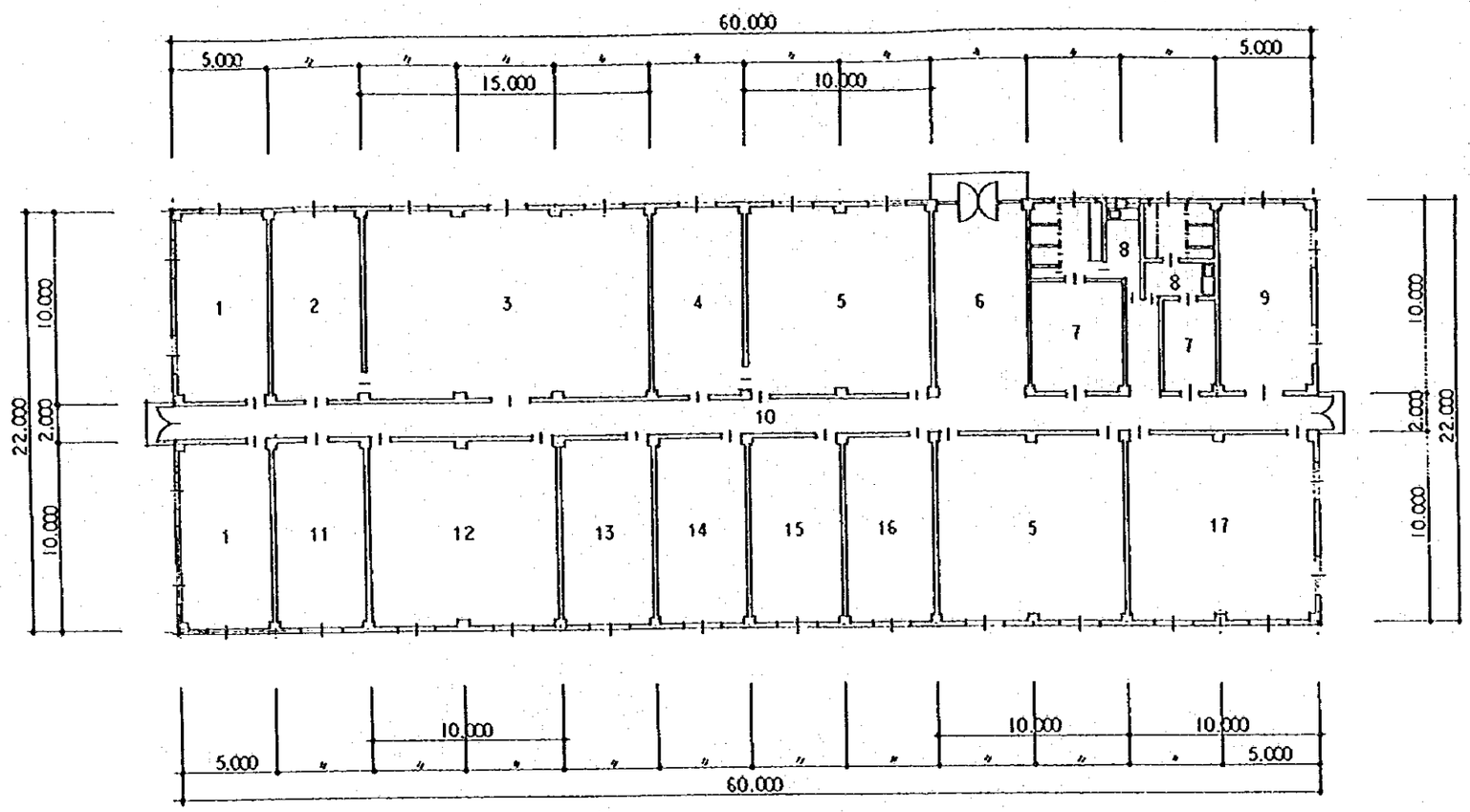


SITE PLAN 1 : 1000

1 ADMINISTRATION BUILDING
2 LABORATORY BUILDING
3 WORKSHOP BUILDING
4 CANTEEN
5 DORMITORY OFFICE
6 DORMITORY
7 APARTMENTS FOR STAFFS
8 DIRECTOR'S RESIDENCE
9 GATEHOUSE

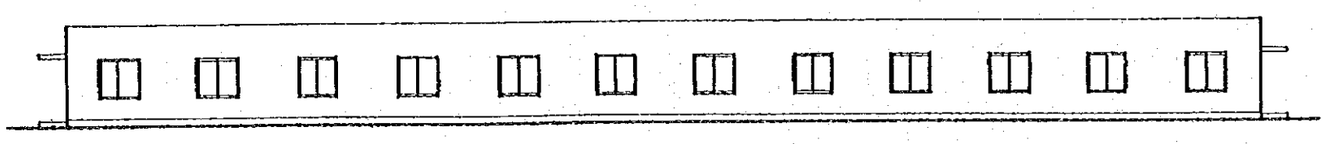
1. Administration Building	706.80 m2
2. Laboratory Building	1,320.00 m2
3. Workshop Building	1,320.00 m2
4. Canteen	270.00 m2
5. Dormitory office	66.25 m2
6. Dormitories for Students	1,296.00 m2
Total Floor Area	4,979.05 m2

DWG-NO.5.2.4-2 Facility Layout Plan

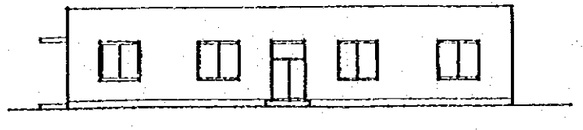


LABORATORY PLAN 1 : 300

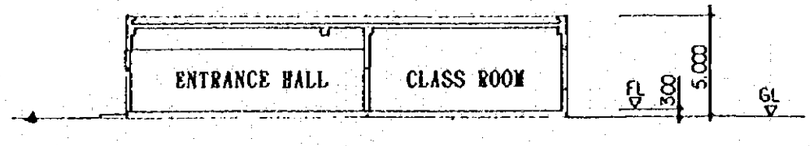
1 INSTRUCTOR'S ROOM
2 COMPUTER ROOM
3 SIMULATER ROOM
4 PREPARATION ROOM
5 CLASS ROOM
6 ENTRANCE HALL
7 LOCKER ROOM
8 TOILET & WASHROOM & PANTRY
9 ELECTRICAL ROOM
10 CORRIDOR
11 ADVANCED CONTROL LABORATORY
12 ADVANCED ELECTRICAL LABORATORY
13 ADVANCED MECHANICAL LABORATORY
14 GENERAL CONTROL LABORATORY
15 GENERAL ELECTRICAL LABORATORY
16 GENERAL MECHANICAL LABORATORY
17 NDT TESTING ROOM



EAST ELEVATION 1 : 300



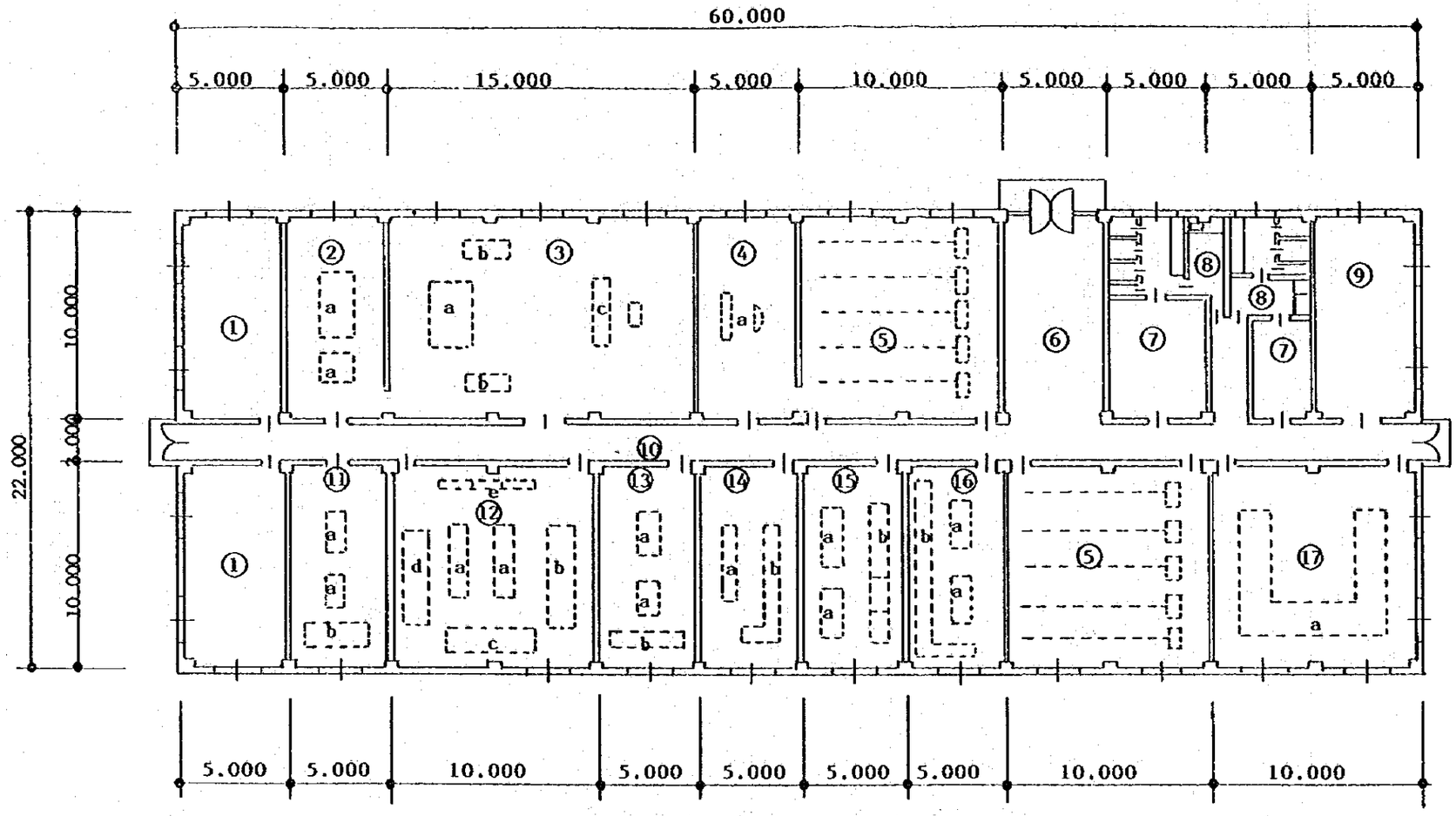
SOUTH ELEVATION 1 : 300



SECTION 1 : 300

1320.0 m²

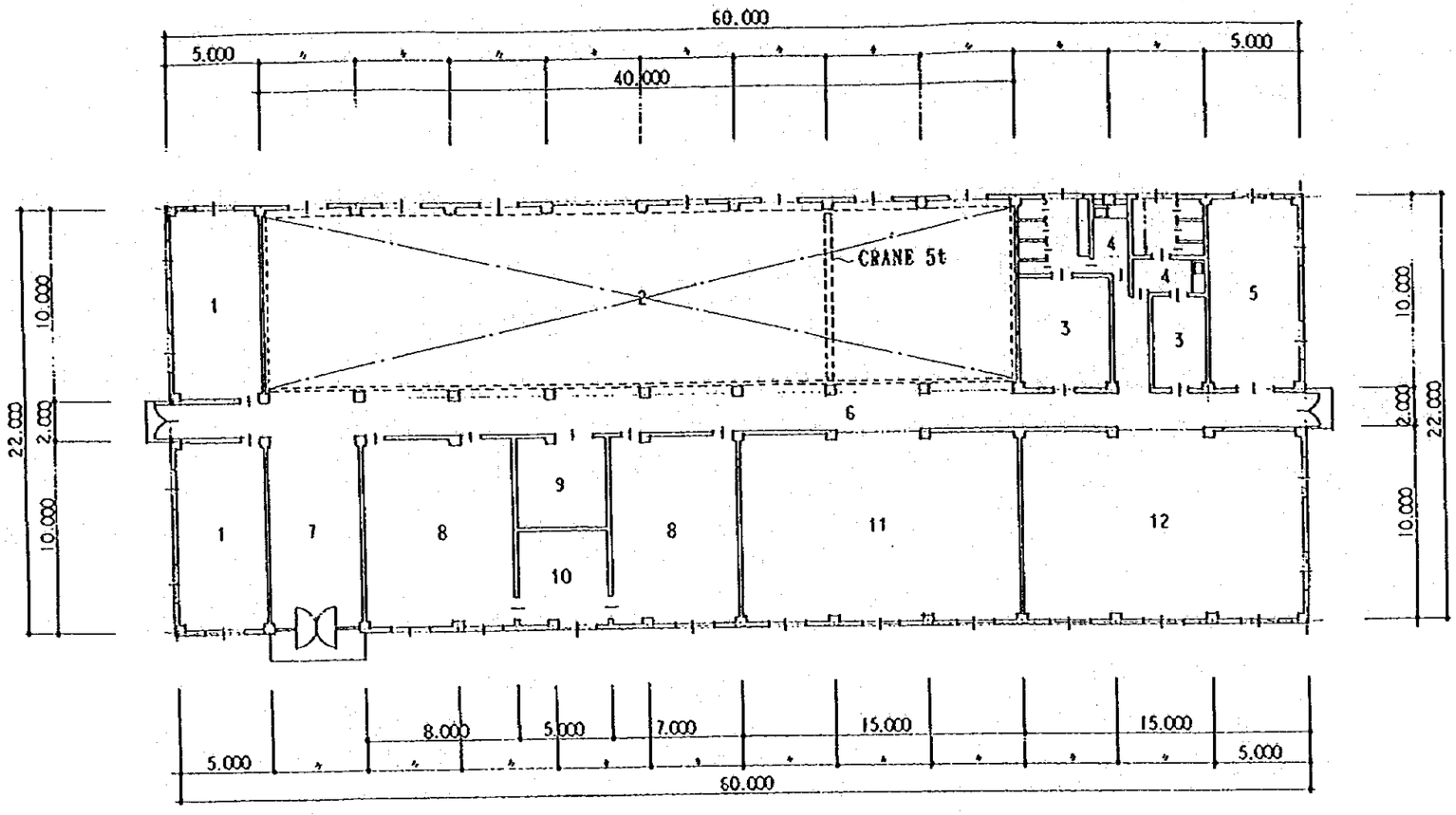
DWG-NO.5.2.4-3 Laboratory Bldg., (Plan Section, Elevations)



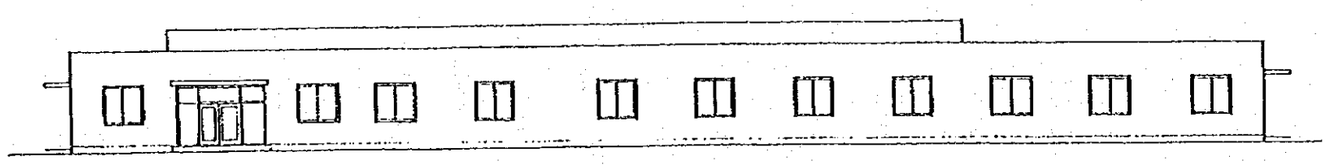
LABORATORY BUILDING PLAN 1: 250

No.	Room	Main Training Equipment to be Installed
①	Instructor's Room	-
②	Computer Room	a: Computer for Simulator
③	Simulator Room	a: Boiler-Turbine-Generator Panel b: Auxiliary Panel c: Shift-chief's Desk
④	Instruction Room	a: Instructor's Bench
⑤	Class Room	-
⑥	Entrance Hall	-
⑦	Locker Room	-
⑧	Toilet,Washroom,Pantry	-
⑨	Electrical Room	-
⑩	Corridor	-
⑪	Advanced Control Laboratory	a: Work Benche b: Sensor & Valves, etc
⑫	Advanced Electrical Laboratory	a: Work Bench b: GCB-VCB-ACB Panels c: AVR-Frequency-Relay Panels d: Relay Panel e: Measuring Instruments, Tool Rack, etc
⑬	Advanced Mechanical Laboratory	a: Work Bench b: Valves
⑭	General Control Laboratory	a: Work Bench b: Pressure Switches, Recorders Chemical Instruments
⑮	General Electrical Laboratory	a: Work Bench b: Sequence Practice Panel, Protection Panel Plastic Model (Rotor etc)
⑯	General Mechanical Laboratory	a: Work Bench b: Valves, Plastic Model(Boiler etc)
⑰	NDT Testing Room	a: Work Bench, Various Testing Devices

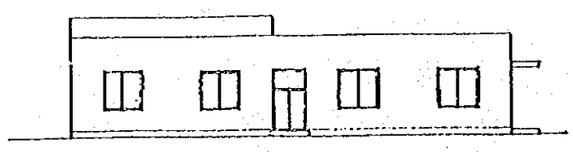
DWG-NO 5244
Main Equipment Layout Plan
(Laboratory)



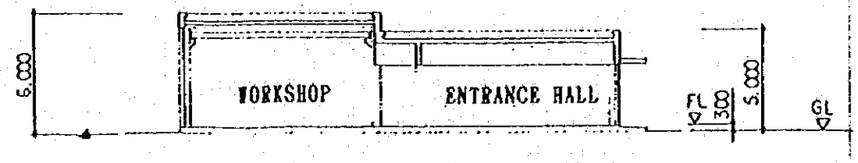
WORKSHOP PLAN 1 : 300



EAST ELEVATION 1 : 300



SOUTH ELEVATION 1 : 300

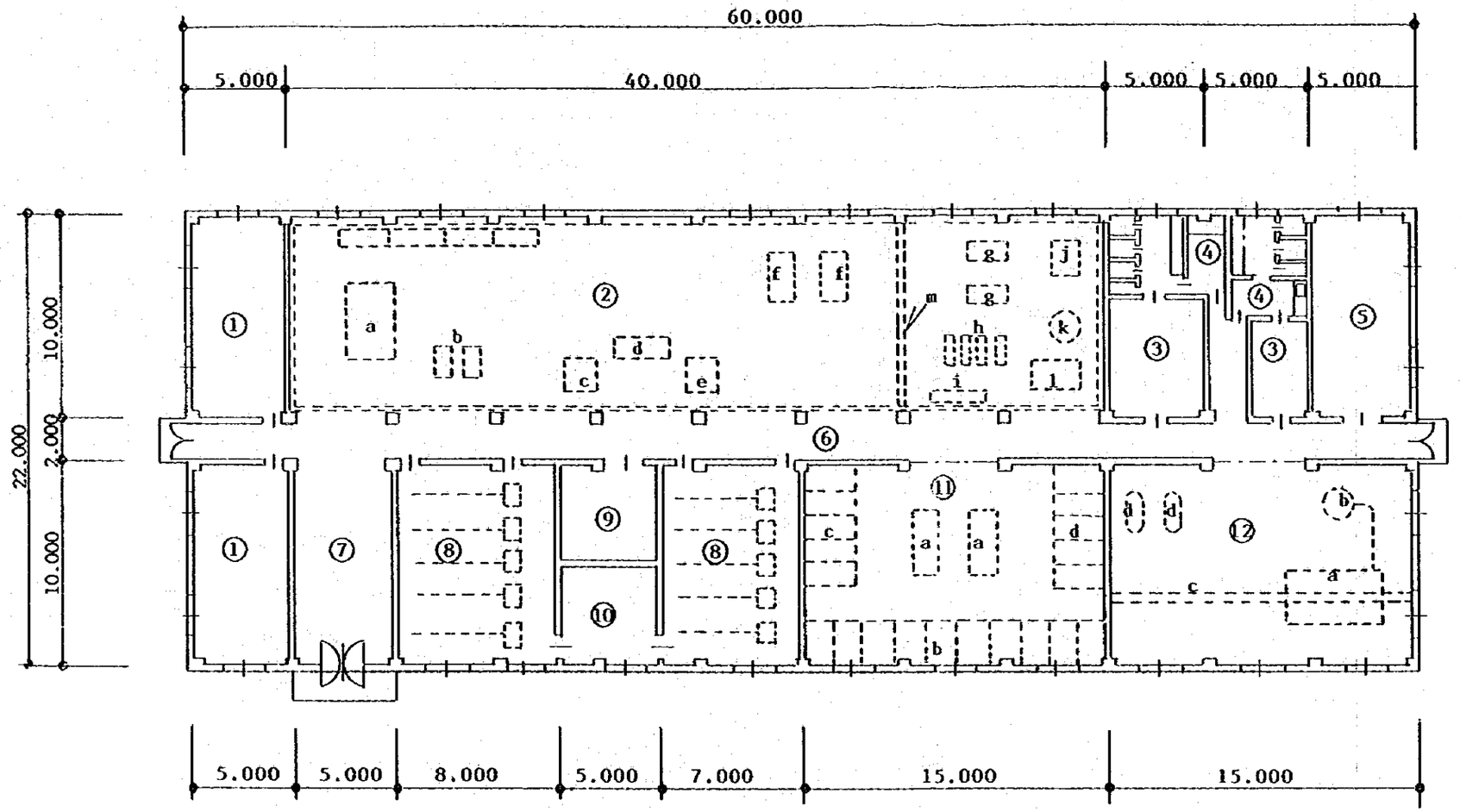


SECTION 1 : 300

1 INSTRUCTOR ROOM
2 WORKSHOP
3 LOCKER ROOM
4 TOILET & WASHROOM & PANTRY
5 ELECTRICAL ROOM
6 CORRIDOR
7 ENTRANCE HALL
8 CLASS ROOM
9 TOOL ROOM
10 PREPARATION ROOM
11 WELDING LABORATORY
12 COMPRESSOR ROOM

1320.0 ㎡

DWG-NO.5.2.4-5 Workshop Bldg., (Plan, Section, Elevations)



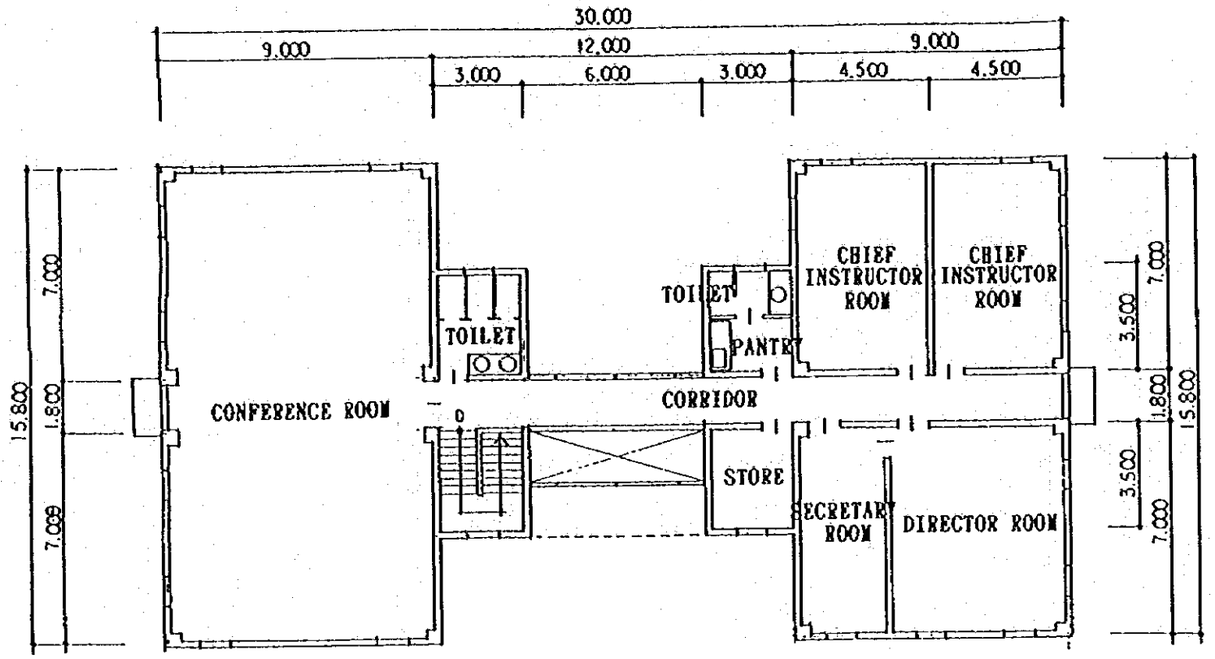
WORKSHOP BUILDING PLAN 1 : 250

No.	Room	Main Training Equipment to be Installed
①	Instructor's Room	
②	Workshop	a: Ventilator b: Control Drive c: Governor d: Control Valve e: Main Stop Valve f: Large Motor g: Horizontal Pump(Large) h: Horizontal Pump(Small) i: Control Panel j: Head-tank k: Vertical Tank l: Water Tank(Underground) Vertical Pump m: Over Head Crane(5 ton)

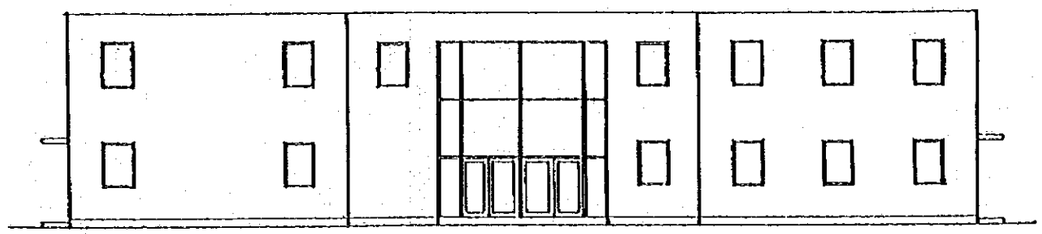
No.	Room	Main Training Equipment to be Installed
③	Locker Room	-
④	Toilet,Washroom,Pantry	-
⑤	Electrical Room	-
⑥	Corridor	-
⑦	Entrance Hall	-
⑧	Class Room	-
⑨	Tool Room	-
⑩	Preparation Room	-
⑪	Welding Laboratory	a: Work Bench b: Electric Welding machine c: TIG Welding Machine d: Gus Cutting Apparatus

No.	Room	Main Training Equipment to be Installed
⑫	Compressor Room	a: Air Compressor b: Receiver c: Geared Trolley Hoist (3 ton) d: Air Compressor (Small)

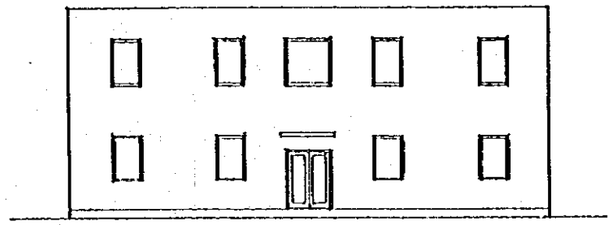
DWG-NO 5246
Main Equipment Layout Plan
(Workshop)



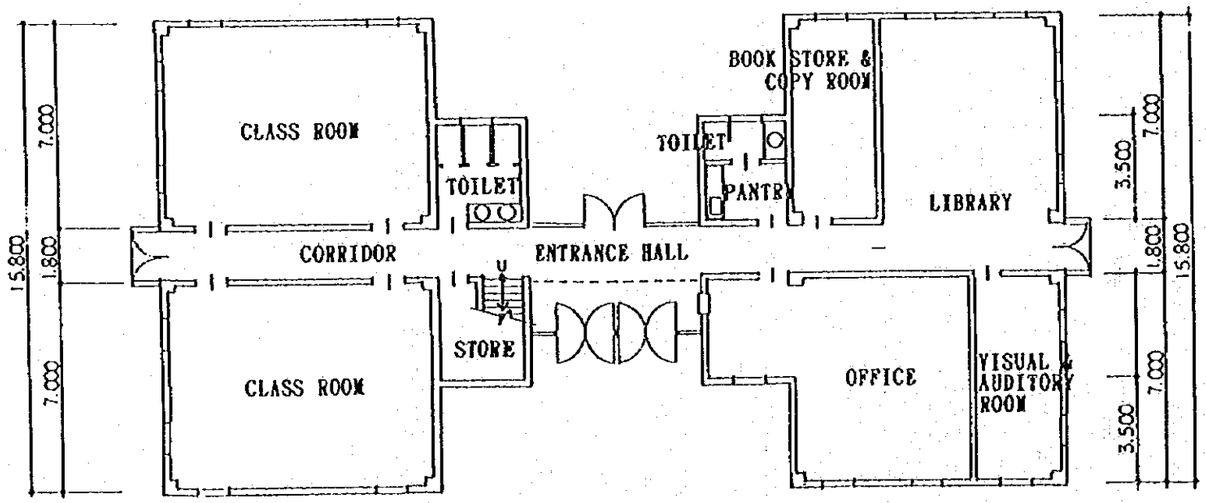
ADMINISTRATION BUILDING FIRST FLOOR PLAN 1 : 200



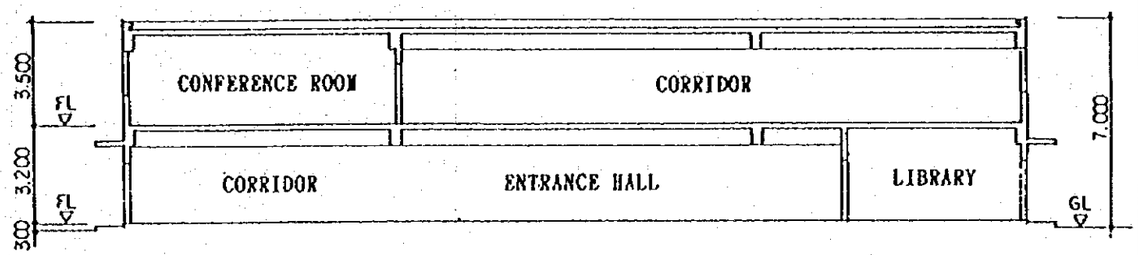
EAST ELEVATION 1 : 200



NORTH ELEVATION 1 : 200



ADMINISTRATION BUILDING GROUND FLOOR PLAN 1 : 200



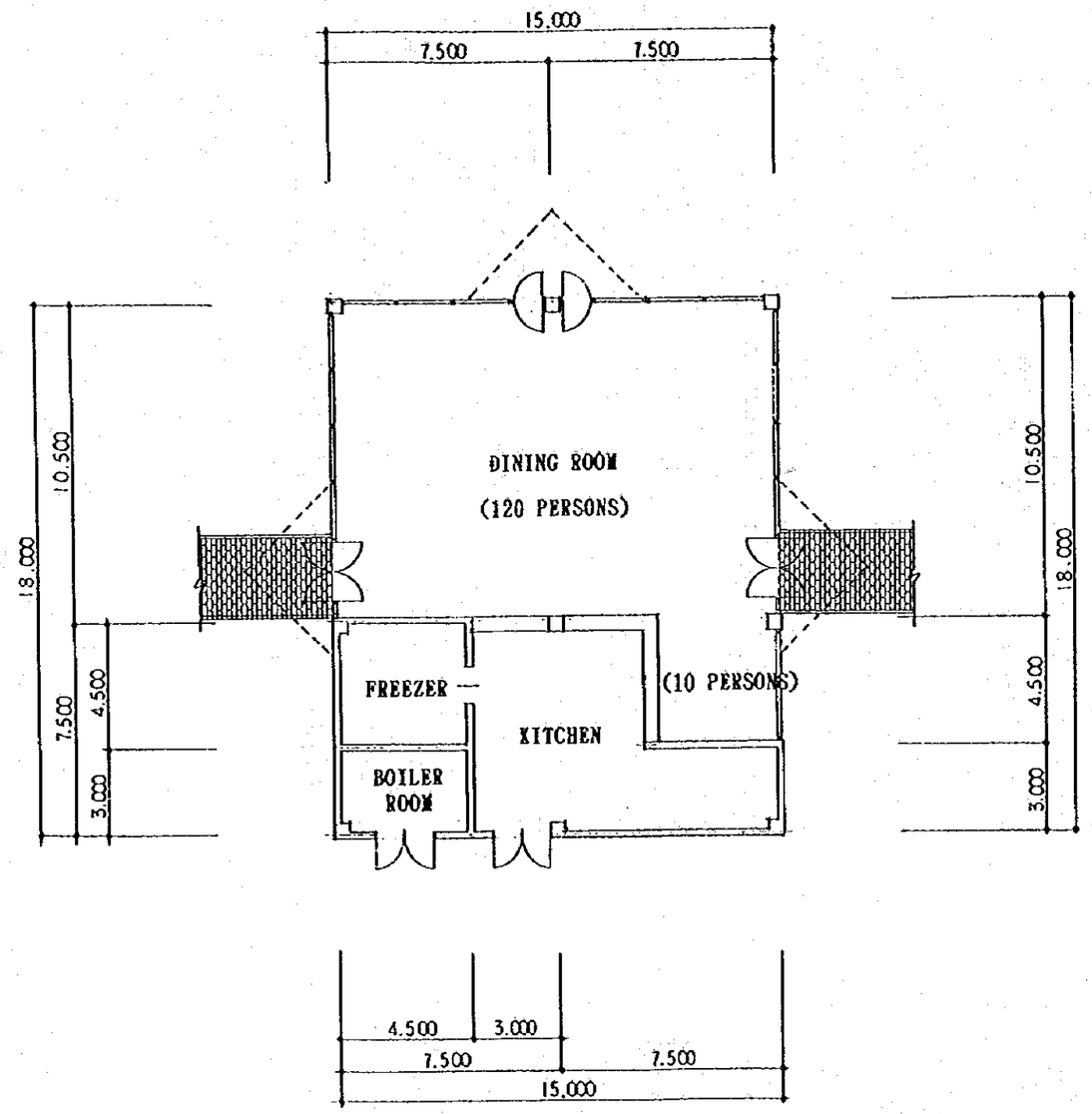
SECTION 1 : 200

GF 358.8 ㎡

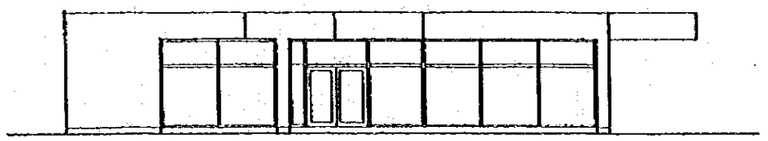
1STF 348.0 ㎡

TOTAL 706.8 ㎡

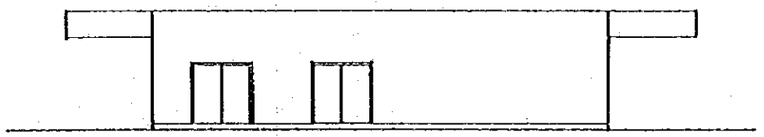
DWG-NO.5.2.4-7 Administration Bldg., (Plan, Section, Elev.)



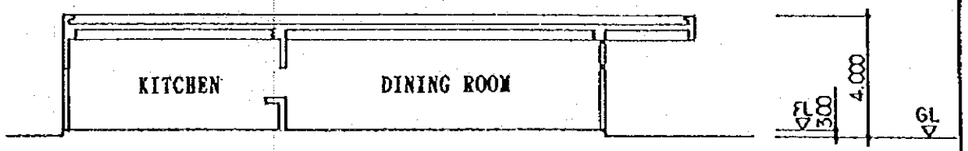
CANTEEN PLAN 1 : 200



NORTH ELEVATION 1 : 200



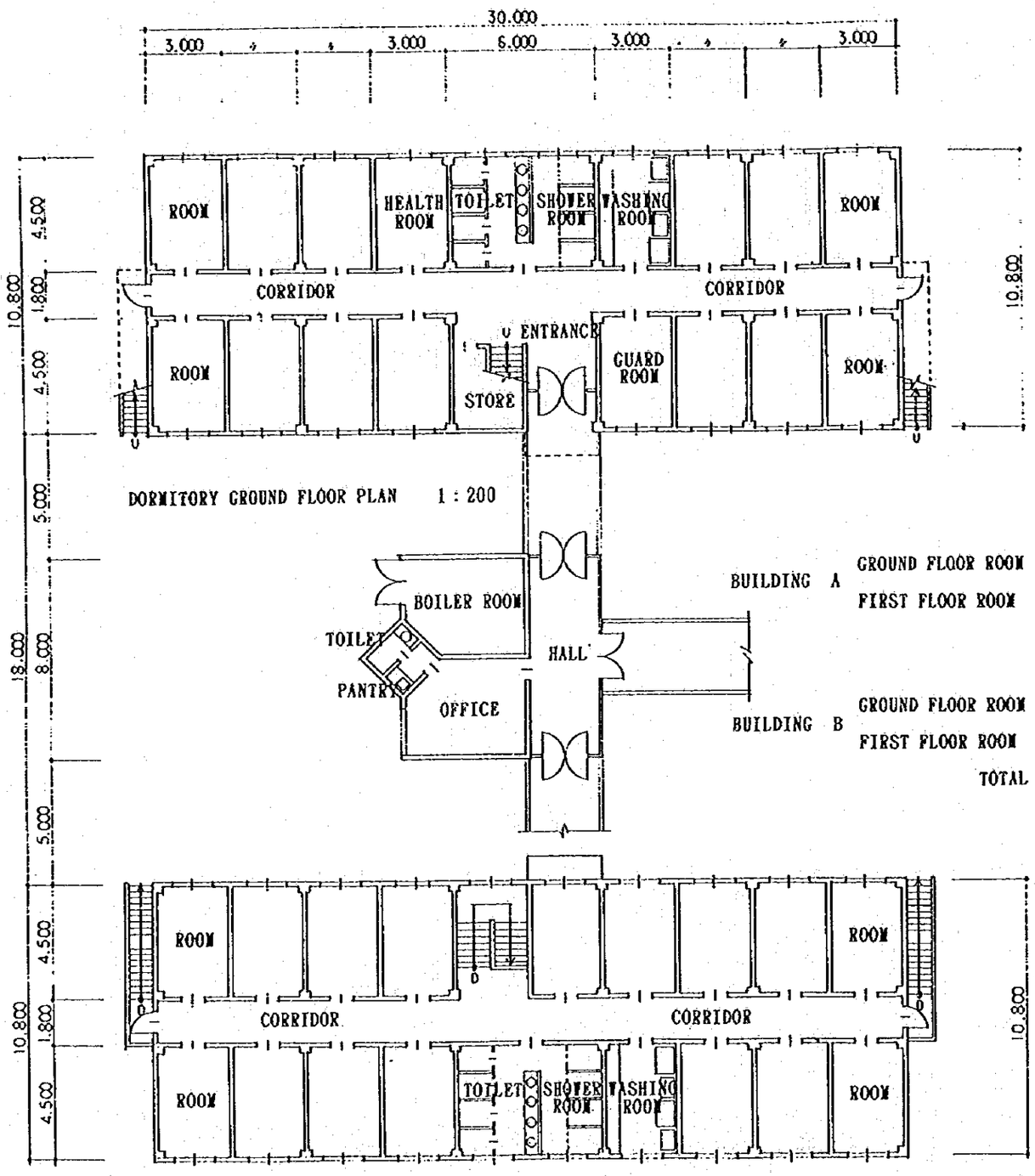
EAST ELEVATION 1 : 200



SECTION 1 : 200

270.0 ㎡

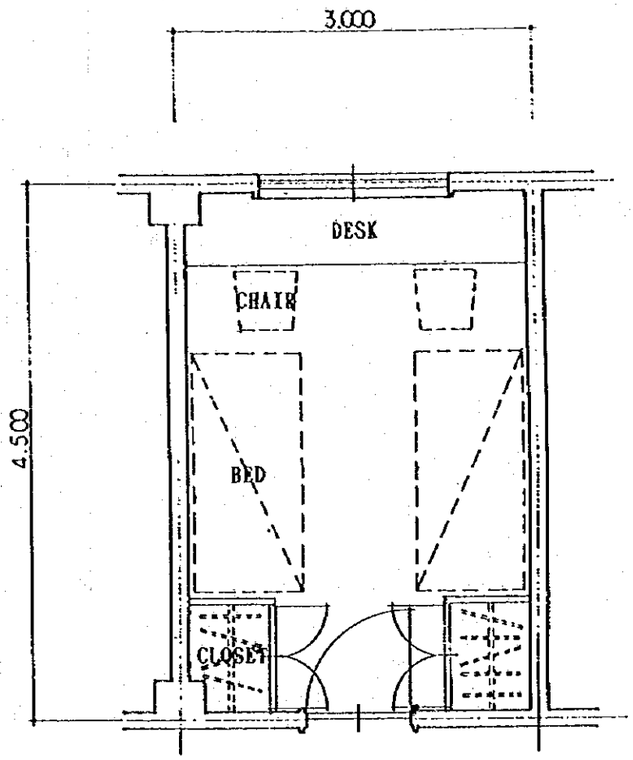
DWG-NO.5.2.4-8 Canteen (Plan, Section, Elevations)



DORMITORY GROUND FLOOR PLAN 1 : 200

DORMITORY FIRST FLOOR PLAN 1 : 200

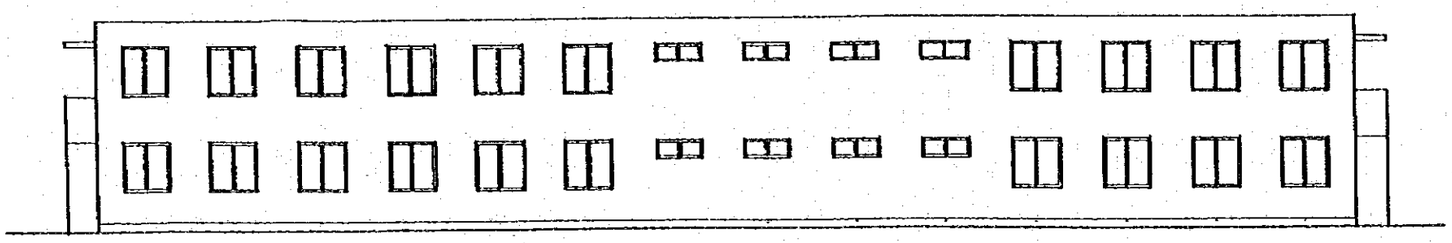
BUILDING A	GROUND FLOOR ROOM	13
	FIRST FLOOR ROOM	16
BUILDING B	GROUND FLOOR ROOM	13
	FIRST FLOOR ROOM	16
	TOTAL	58 ROOMS (116 PERSONS)



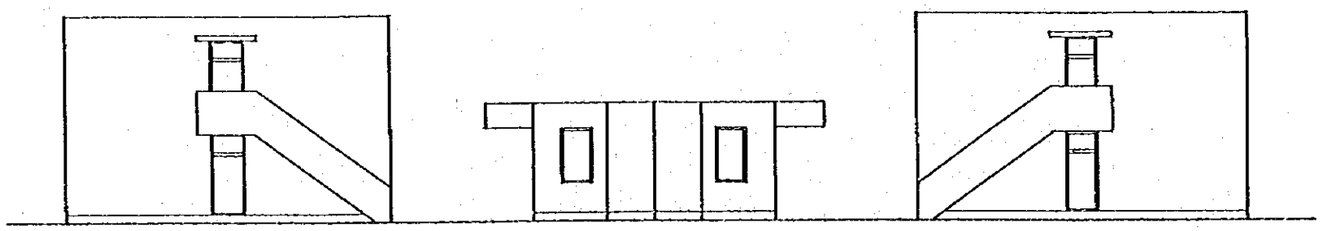
ROOM DETAIL PLAN 1 : 50

GF	714.25 ㎡
1STF	648.0 ㎡
TOTAL	1362.25 ㎡

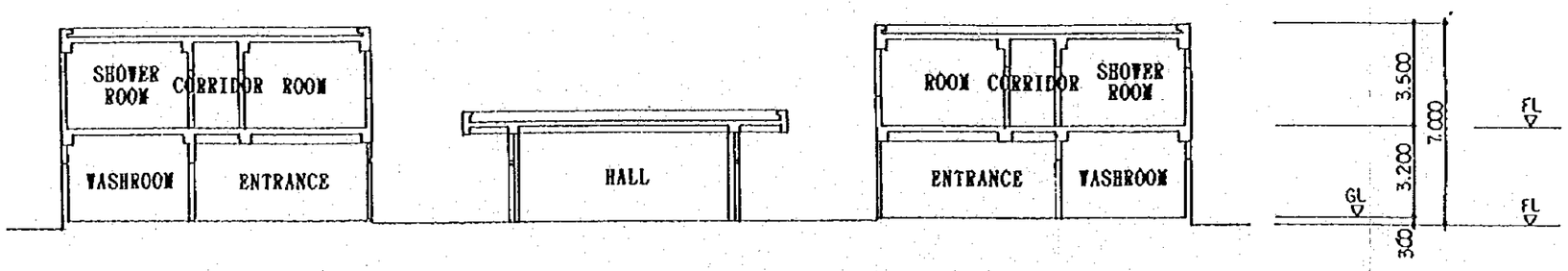
DWG-NO.5.2.4-9 Dormitory (Plan)



DORMITORY EAST ELEVATION 1 : 200



DORMITORY SOUTH ELEVATION 1 : 200



SECTION 1 : 200

DWG-NO.5.2.4-10 Dormitory (Section, Elevations)

5.3 Operation and Maintenance Costs of the New Training Center

The following shows a calculation of the annual operation and maintenance costs for the New Training Center after completion of construction and commencement of activities. The PEEGT needs to take necessary measures to ensure that the budget for such costs is obtained at the same time of completion of construction.

1) Personnel Costs

a)	General Director	US$ 800/month ×	1 ×	12 months	=	US$ 9,600
b)	Directors	500	3	12	=	18,000
c)	Instructors	400	22	12	=	105,600
d)	Asst. Instructors	300	9	12	=	32,400
e)	Section Chiefs	400	2	12	=	9,600
f)	Administrators	300	11	12	=	39,600
g)	Others (Driver, etc.)	200	14	12	=	33,600
	Total					US$ 248,400/year

Note: Various allowances have been included in the rates for personnel expenses.

2) Water, Lighting and Heating Costs

a) Electricity

- Building Load	About 7,300 m^2 × 50 w/m^2	=	365 kw
- Outdoor lighting load etc.		=	35 kw
	Load total		400 kw

- Annual power consumption:
  400 kw × 10 h/day × 300 days/year = 1,200,000 kwh/year
- Annual electricity charge:
  1,200,000 × 5 cents/kwh = US$ 60,000

Total US$ 60,000/year

b) Fuel Costs

- Fuel for vehicles:
  20 ℓ/car × 2 cars × 25 days/month × 12 months × US$ 0.5/ℓ = US $6,000
- Fuel for heating:
  200 ℓ /boiler × 30 days/month × 4 months × US$ 0.2/ℓ = US$ 4,800
- Kitchen•Shower Bath:
  200 ℓ /boiler × 30 days/month × 12 months × US$ 0.2/ℓ = US$ 14,400

Total US$ 25,200/year

3) Communications Costs

US$ 300/month × 12 months = US$ 3,600/year

4) Building and Facilities Maintenance Costs

US$ 1,000/month × 12 months = US$ 12,000/year

5) Teaching Materials and Equipment Purchase Costs

US$ 4,000/month × 12 months = US$ 48,000/year

6) Food Costs (Reference only)

(US$ 4/person × (115 + 40) × 30 days × 12 months = US$ 223,200/year)

7) Total

1) Personnel costs	=	US$	248,400-
2) Water, heating and lighting costs	=	US$	85,200-
3) Communications costs	=	US$	3,600-
4) Buildings and facilities maintenance costs	=	US$	12,000-
5) Teaching Materials and Equipment Purchase Costs	=	US$	48,000-
6) (Food costs)	=	(US$	223,200-)
Total excluding food costs		US$	397,200/year
(Including food costs		US$	620,400/year)

It is thus estimated that the PEEGT needs to prepare some US$ 400,000 each year to cover the operation and maintenance costs of the New Training Center.

However, if it is assumed that some of the staff at the New Training Center is composed of staff already employed at existing power plants and other PEEGT organizations, those personnel costs will not become an additional burden to the budget of the PEEGT because they are already incorporated into the existing one.

5.4 Financial Consideration of the Proposed Training Center

(1) Contents of the Consideration

Proposed training center will not generate any financial revenue so that common financial analysis is not suitable. In this consideration, current training budget is reviewed and capability to bear the costs for the training program is assessed.

(2) Budget Appropriation for Existing Technical Institutes

At present, MOE manages three technical institutes, and a total of SP.49.5 million is allotted as budgets for those institutes in 1994. Out of the total, SP.16.5 million is estimated as building, facility and equipment expansion, SP.10 million as staffs' salary, and SP.23 million as other recurrent expenditures including those for preparation of training materials.

(3) Capability to Bear the Cost

The proposed training center will incur a total capital cost of US$ 27.8 million (SP.311 million, even in the case that the official exchange rate is applied), US$ 11.0 million (SP.123 million in the same exchange rate) for equipment purchase, and US$ 16.8 million (SP.188 million of the same) for building construction. The center will also require annual recurrent cost of SP.16.7 million, SP.10.4 million for staffs' salary and the remaining SP.6.3 million for other operation and maintenance cost.

By 1997, the generation capacity of PEEGT is projected to be doubled as described in Chapter 3, so that operation and maintenance activities and costs will also be doubled. In the case that MOE and PEEGT would maintain the current portion of training budget to the total operation and maintenance budget, the recurrent expenditure for the proposed training center can be born by the budget for PEEGT.

As for capital investment, however, MOE or PEEGT seems not be able to bear the cost in the current budgetary conditions. The building construction and equipment purchase would preferably be financed by foreign grants.

5.5 Recommendations

5.5.1 Positioning of the New Training Center

The New Training Center aims to provide training to graduates from existing MOE-run technical institutes and to provide retraining for staff in the existing thermal power plants. Compared to the existing technical institutes, the New Training Center will therefore provide advanced and more practical training contents with the aim of nurturing staff skills that can immediately prove useful in actual plant operation and maintenance activities. The technical level of the training will be high and the Center will be treated as the central institution in the training organization of the MOE and PEEGT.

5.5.2 Securing of Instructors

The success of the New Training Center in fulfilling its designed functions and nurturing good graduates entirely depends on the securing of excellent instructors. The PEEGT must assign the instructors described in Section 5.2.1 to the Center at least six months before the completion of construction in order to provide ample time for the preparation of detailed training curriculums, time schedules and text books etc.

The PEEGT Training Department shall play the central role in securing the instructors from those currently teaching at the existing technical institutes and also from among engineers and technicians currently working at the thermal power plants. There is not currently a surplus of operation and maintenance engineers and technicians at the existing power plants and it is forecast that the plants will hesitate to dispatch their best engineers and technicians to the New Training Center. Vigorous efforts must, however, be made to obtain the cooperation of the plants as the New Training Center will make a major contribution to the improvement of operation and maintenance technical levels at the plants and, as a result, lead to the future improvement of output and thermal efficiency levels.

5.5.3 Links with Existing Technical Institutes and the Power Plants

As well as maintaining close links with the existing technical institutes, it will be necessary to encourage exchange of instructors with the existing technical institutes in order to have the consistency of training curriculums, to aid the preparation of trainee acceptance plans, and to contribute to improve the technical levels of the instructors and to nurture future instructors.

It will also be necessary to maintain close links and hold consultations with the power plants in order to establish trainee acceptance plans and a cooperation setup whereby requests for the dispatch of instructors, and to make site training plan at the plants easier, and, also, to secure work places for graduated trainees.

5.5.4 Treatment of Graduate Trainees

(1) Salaries

Concerning trainees dispatched from power plants, it will be necessary to provide them with salaries equal to what they would receive as power plant employees during the training period and also, as is the case in the existing technical institutes, exempt all trainees from paying tuition fees in order to ensure that the trainees are fully motivated to learn.

(2) Qualifications, Pay Rises and Promotions

The conferring of state-authorized or MOE-authorized technical qualifications or titles on the trainees who have finished the required courses and passed the final examinations, will provide a concrete goal for the trainees. Moreover, by raising the pay and promoting the qualifications of those trainees who return to their respective power plants having obtained the aforementioned qualifications or titles, the trainees will feel motivated to make further efforts in their studies.

APPENDICES

APPENDICES

Appendix-1

Minutes of Discussion

Appendix-1 Minutes of Discussion

1-A. Minutes of discussion signed on 14th November, 1994

MINUTES OF MEETING
FOR
MASTER PLAN STUDY
ON
REHABILITATION & MAN-POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC

Date : 30 October - 14 November, 1994

Place : SPC, MOE and PEGT office

Attendants :

SYRIAN SIDE

Mr. Ali Chabaani, Chief of Steering Committee
Mr. Soleman Geriass, Deputy Chief of Steering Committee
Mr. Walid Wafi, Member of Steering Committee
Mr. Kazem Masoud, Member of Steering Committee
Mr. Sabri Beebar, Member of Steering Committee
(All other members participated at meetings and field survey are referred to Annex-1)

JICA

Mr. T. Morimura, JICA
Mr. N. Chiba, Leader, Study Team, JICA
Mr. M. Nishikawa, Study Team,JICA
Mr. Y. Muraki, Study Team, JICA
Mr. K. Kakurai, Study Team, JICA
Mr. Y. Watanabe, Study Team,JICA
Mr. K. Nakamura, Study Team,JICA
Mr. Y. Koshimizu, Study Team, JICA
Mr. A. Ito, Study Team,JICA
Mr. K. Matsui, Study Team, JICA

The Study Team (the Team), organized by Japan International Cooperation Agency (JICA) and headed by Mr. Noritsune CHIBA, visited the Syrian Arab Republic from October 29, 1994 for the first field survey of Master Plan Study on Rehabilitation & Man-Power Training for Power Plants in The Syrian Arab Republic(the Study) in accordance with Scope of Work (S/W) agreed between MOE and JICA Preparatory Study Team on July 7th, 1994.

At the first meeting held on 30th October 1994, Mr. T. Komori, Manager of JICA Syria Office and Mr. N. Chiba, the team leader, introduced all the JICA members, and Mr. Basam Al-Sibaee, Director of Scientific and Technical Cooperation, State Planning Commission, introduced all the PEGT and other Syrian officials concerned attended at the meeting.

The Study results during from 30th Oct. to 14th Nov.1994 is summarized as follows.

1. Inception Report

The Team submitted thirty (30) copies of the Inception report to PEGT, and discussed with PEGT and Syrian officials concerned with the study procedure, schedule, Syrian side task force, seminar plan and other related subjects of the study.

2. Syrian Side Task Force

Syrian side submitted and explained to the Team the organization plan of the Syrian Side Steering committee and Task Force team in which Mr. Ali Chabaani, Director of Energy Production, PEGT, is a chief of Steering Committee and Mr. Soleman Geriass, Director of Energy Planning, PEGT, is a task force manager.

Members of both Steering committee and Task force team are attached on Annex-2.

3. Seminar Plan

The Team explained the seminar plan described in the Inception Report and requested PEGT to arrange a hall for the seminar. PEGT agreed a request made by the Team.

Seminar was successfully held on 3rd November, which titled by "Maintenance and Inspection of thermal power plants" and more than 30 Syrian engineers were attended at such Seminar.

4. Data and Information Request

The Team submitted the Data and Information Request Sheets necessary for the Study and explained PEGT its contents. PEGT agreed to collect such data and information and will submit them to the Team as soon as possible. Some of information and data were submitted to the Team as attached on Annex-3.

5. Study Schedule

The Team explained overall study schedule, in which the first field survey is conducted in November 1994 and discussion of Progress Report, Interim Report and Draft Final Report is scheduled in January 1995, March 1995 and June 1995 respectively and the study is to be completed by August 1995.

PEGT and the Team discussed the field survey schedule which drafted by the Team. Both parties agreed to conduct the field survey for Thermal Power Plants in Syria as much as possible, and to have meetings in order to select target power plants for Rehabilitation after the field survey.

First field survey was done from November 5th to 9th and the Team reported the results of such survey to PEGT and following 3 power plants were selected as subject plants to be rehabilitated by both parties. (Final selection of subject plants will be made after analysis of data and information collected at the work in Japan(1st stage) and consultation by Japanese officials concerned.)

(1) No.3, 4 and 5 units of Kattenh Power Plant including No 6 unit

(2) No.1 and 2 units of Mehardeh Power Plant

(3) No.1 and 2 units of Banias Power plant

Second field survey will be started around 19th November 1994 in order to collect more detailed information and data for selected power plant necessary for preparation of rehabilitation plans.

6. Training in Japan

Concerning with the Study(this Master Plan Study), the Team requested PEGT to determine a PEGT staff to be trained in Japan and to submit an official request form to JICA Syria office urgently through SPC. PEGT agreed to submit such form to JICA Syria office immediately.

7. Equipment for Field Survey

The Team brought the following equipment for the field survey.

- Ultrasonic Flaw Detector
- Fiber Scope
- Portable Water Quality Analyzer

The Team is ready to hand over the equipment shown above to MOE after field site survey.

Mr. Ali Chabaani
Chief of committee
Director of Energy Production
PEGT
14.11.94

Mr. Noritsune Chiba
Leader,
JICA Study Team

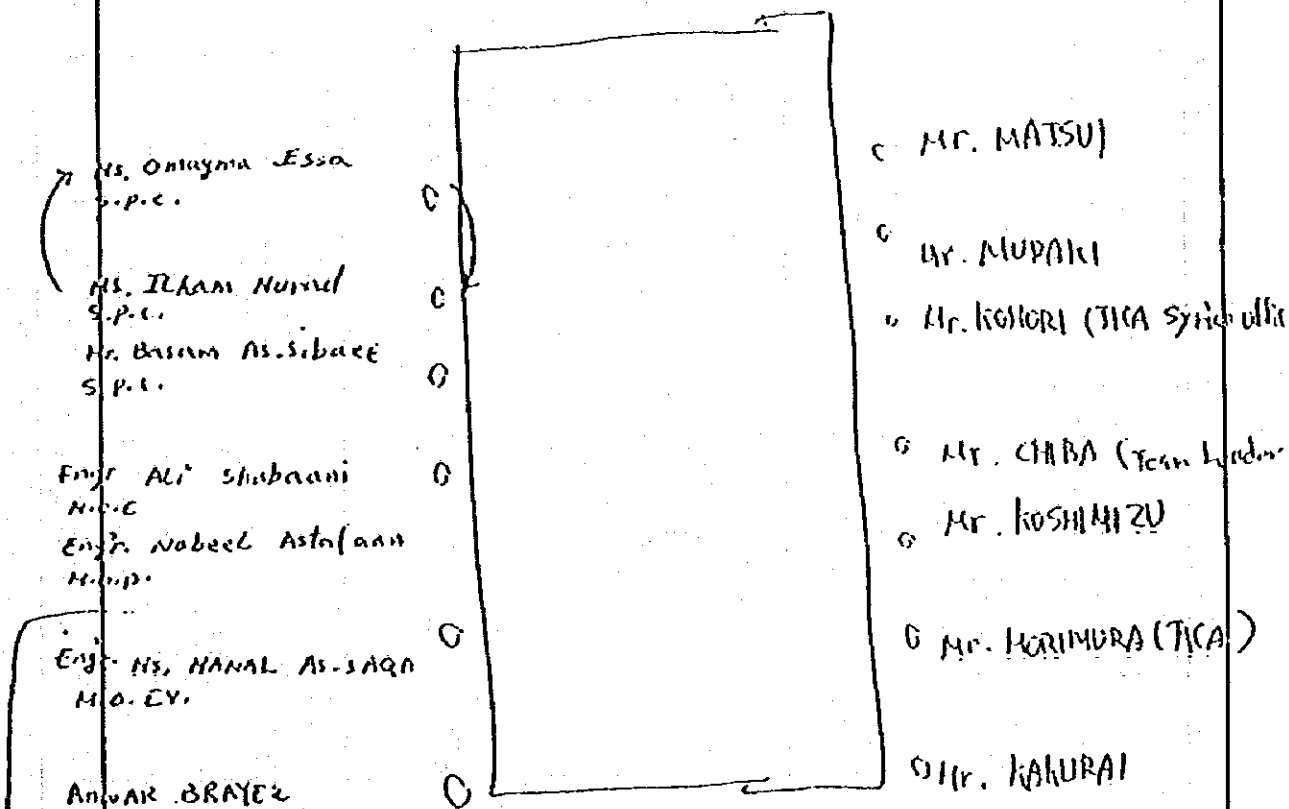
Annex-1

Attendance Lists for Meetings and Field Survey

1. Meeting from 30th Oct., to 1st Nov. 1994 at SPC and MOE offices(Inception report, Field survey schedule, etc.)
2. Field survey on 5th Nov.1994 at Tichrin Power Plant
3. Field survey on 6th Nov.1994 at the construction site of Jandar Power Plant
4. Field survey on 6th Nov.1994 at Kattineh Power Plant
5. Field survey on 7th Nov.1994 at Mehardeh Power Plant
6. Field survey on 8th Nov.1994 at Latakia Technical Institute
7. Field survey on 9th Nov.1994 at Banias Power Plant
8. Field survey on 10th Nov.1994 at National Control center
9. Field survey on 12 th Nov.1994 at Adra Technical Institute
10. Meeting on 13th Nov.1994 at MOEV(collection of data and information)
11. Meeting on 13th Nov.1994 at SPC (collection of data and information)
12. Meeting on 14th Nov.1994 at MOE(selection of subject Power Plant)

Nov-30-'14

Ms. Essa , Deputy director of energy · s.p.c.
Ms. Nuwad, Assist. of scientific and technical cooperation
Mr. As-sibaee , Director of : : : :



国際協力事業団

ATTENDANCE LIST

Place: Tichrin P/S
Date : 5 NOV. '94

Name	Status	Office
RAMADAN. MEHOD	MANEGER	operition
Michel KAZMA	Director	planing and statistical
HASHM. Mishfij	MANAGER	

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place : Jandar P/S

Date : 6/11/94

1. Mr. Alzein Kouhi — Site Manager of Jandar P/S, PEGT
2. Mr Veijo Komulainen — Project Director of EKONO ENERGY LTD.
3. Mr. Mohamed Khalil Shoki — PEGT

ATTENDANCE LIST

Place: Kattinah
Date: Nov. 6. '94

Name	Status	Office
Eng. Farhan Al Haje	General Director	Kattinah P.S. Co
Eng. A. Alyfaeli	Maintenance eng	Kattinah P.S. Co
Eng. Al Salami	Turbine	= =
Eng. S. Draubi	Spare parts dep	(H1) = =
Eng. T. Tolmi	Instrumentation Eng.	=
Eng. F. Al yafi	Electrical maintenance eng	=
Eng. N. Schoubek	instrumentation eng	
Eng. H. Gabbaha	chief for production	
Mohamed Khalil Siller	Chief department of Conserving Energy (Capacity Building)	

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center ENERGY.
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place: MEHARDE

Date : 7.11.1994

Name	Status	Office
GH. SALLOUM	P.S. MANAGER	MEHARDE
ALI HAIFA	OPERATION DEP. CHEF.	— 〃 —
KAREEAR DOUNA	Instrumentation	〃
ROMI ABDO	Instrumentation Eng	〃
Mohammed Jamari	Mech. Maint. Head.	〃
OMAR GAZAL	[illegible]	
MOHAMED KHALIL SHEKH		PEGT
[illegible]	[illegible]	[illegible]

IME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place: Institute Lattakia
Date : Nov. 8 - '91

Name	Status	Office
Mustafa Fawzi	Direction	Latakia
Fauzi Gabbour	Adminis Director	Institut
Munir Fazzi	Financing Director	
Mohamed Khalil Shehab		PEGT

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place: Baniias

Date : Nov 9 1994

Name	Status	Office
JANAL ZIOUD.	TRAINING ENG.	Banias Power Station
WEFIK MOHAMAD	OPERATION ENG.	"
[illegible]	ele. eng	"
A.R. [illegible]	general directore	"
MOHAMED KHALIL SHEIKH		PEGT

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place: Dispatching Center
Date : Nov-10-94

Name	Status	Office
MAHER Hanna	NCC, Manager	Dispatching Center
NADIR MARDINI	Maintenance Eng.	" "

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NDCC : National Dispatching Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place: ANBAR INSTITUTE

Date : Nov-12-'94

Name	Status	Office
Dr. Tahsin Mufti	Director of Instit.	Intermediate Institute for Mechanic and Electricity
Eng. Abd ALRAHMAN OMRAN	Laboratory Advisor High voltage	"
Chemical assistant Hill	chemi	

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

PLACE : SPC
Date : 13/11/1994

1. Mr. Basam As-sibace SPC.
2. Mr. Mohamed Khalil Sheki PEGT

ATTENDANCE LIST

Place: Min. of Env.

Date : Nov. 13. 1998

Name	Status	Office
Yahya Awaidah	Chief Eng.	Min. of State for Env.
[illegible]	Elec. Eng.	"
[illegible]	Env. Eng.	"
[illegible]	Env. Eng.	"
MOHAMED KHALIL	SHEIKH EL Eng	PEGT EE
[illegible]	[illegible] Eng	[illegible]
K. KAKURAI	SENIOR CHIEF ENGINEER	BK TECHNOS LTD
A. Ito	Env. Eng.	PEGTEE

MINISTRY OF STATE FOR THE ENVIRONMENTAL AFFAIRS

YAHYA AWAIDAH

[illegible]

IIME : Intermediate Institute for Mechanic and Electricity
JICA : Japan International Cooperation Agency
MOE : Ministry of Electricity
MOEV: Ministry of State for the Environment
MOP : Ministry of Petroleum and Mineral Resources
NCC : National Control Center
PEGT : Public Establishment for Generation and Transmission
SPC : State Planning Commission

ATTENDANCE LIST

Place : MOE

Date : 14/11/94

1. Mr Ali Chabaani, Committee Chief
2. Mr Soleman Geniass, Deputy Committee Head
3. Mr Kaziem Masoud, Committee Member (Steam Turbine)
4. Mr. Sabri Bechar, Committee Member (Gas Turbine)

Annex-3

Data and information collected as of 14th Nov. 1994

No,	Title	Published by	Year
01	Statistics Abstract	Offic of the Prime Minister, Central bureau of Statistics	1993
02	Climatic Atlas of Syria	Service of Military Geography	1977
03	Energy Sector Management Assistant Program	UNDP/World Bank	1988
04	Electricity Prices as from 1/1/1991	PEGT	1994
05	Load Grouth and Total Generation (1994 - 2000)	PEGT	1994
06	Capacity Demand (1995 - 2020)	PEGT	1994
07	Existing Generation Plant 1993	PEGT	1994
08	Route of Transmission Lines (230kV & 400kV)	PEGT	1994
09	Worker Plan (Mehardeh P/S, Banias P/S and Kateneh P/S)	PEGT	
10	Program of Institute	Latakia Technical Institute	1994
11	Budget Plan of Institute	Latakia Institute	1994
12	Operation Data (For turbines in Kateneh P/S only)	PEGT	1994
13	Layout and/or Arrangement Drawings (Partially)	PEGT	1994

Appendix-1 Minutes of Discussion

1-B. Memorandum signed on 29th November, 1994

MEMORANDUM
FOR
MASTER PLAN STUDY
ON
REHABILITATION & MAN-POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC

Date : 15 - 29 November, 1994

Place : MOE and PEGT office

Attendants : SYRIAN SIDE

Mr. Zaki Odeh, General Director, PEGT
Mr. Soleman Geriass, Leader of Task force Team, PEGT
Mr. Mohamed Kharil Sheki, Member of Task force Team, PEGT
Mr. Micheal Kazuma, Member of Task Force Team, PEGT
Mr. Tammam Mahmoud, Member of Task Force Team, PEGT
(All other members participated at meetings and field survey are referred to M/M dated 14 th November 1994)

JICA

Mr. M. Nishikawa, Study Team, JICA
Mr. Y. Muraki, Study Team, JICA
Mr. K. Kakurai, Study Team, JICA
Mr. Y. Watanabe, Study Team, JICA
Mr. K. Nakamura, Study Team, JICA
Mr. Y. Koshimizu, Study Team, JICA
Mr. Iio, Study Team, JICA

The Master Study Team (the Team), organized by Japan International Cooperation Agency (JICA), have continued the first field survey of Master Plan Study on Rehabilitation & Man-Power Training for Power Plants in The Syrian Arab Republic(the Study) from 15 th to 29 th November 1994 with cooperation and friendship of the Syrian Task Force Team.

The Study activities and results from 15th Nov. to 29th Nov. 1994 are summarized as follows.

1. Survey of Subject Thermal Power Plants

According to the results of the meeting held on 14th Nov. 1994 between Syrian side Steering Committee and the Team (Please refer to M/M dated 14th Nov. 1994), the Team visited and surveyed Subject Thermal Power Plants to be studied in order to collect detailed information and date necessary for the preparation of rehabilitation alternatives for each Power Plants with the following schedule.

From 19th to 20th Nov. 1994	Banias Power Plant
From 21st to 22nd Nov. 1994	Mehardeh Power Plant
From 23rd to 24th Nov. 1994	Katteneh Power Plant

Data and Information collected during above survey will be analyzed and used for the preparation of the rehabilitation alternatives during the Work in Japan(1st stage).

After consultations with officials concerned in Japan, Results of the Work in Japan will be shown in the Progress Report which will be submitted and explained to the Syrian side on middle of January 1995.

2. Manpower Training

During field survey of thermal power plants, the Team found that they do not have enough numbers of Engineers, Assistant engineers and Technicians for operation and maintenance who have sufficient capabilities and most of such personnel are old.

As same as aged equipment & machineries, lack of such personnel is causing of low operation efficiencies of existing power plants

In Addition to that, young operation and maintenance personnel are required more for new power plants such as Jandar, Aleppo and Al-Zara power plants which are under construction and will be planned to complete in a few years.

Therefore, the Team, in principle, understood the necessity of the establishment of the new training center as soon as possible.

3. Location of New Training Center

Both parties, Syrian side and the Team, agreed that the New Training Center will be established at Jandar Power Plant Construction site because it is located at the center of Syrian country and has enough area.

The Team has collected necessary data, information and drawings for preparation of the conceptual design of the new training center which will be shown in the Progress Report.

4. Data and Information Collected

Data and Information collected by the Team through the first field survey are attached

on Annex-1.

In case it is found necessities of more data and information through the Work in Japan(1st stage) for the Study, Syrian side agreed that required data and information will be sent to Tokyo head office of Yachiyo Engineering Co., Ltd. by telefax in compliance with the request of the Team.

Telefax No. are as follows

- PEGT. 963-11-2229062 Attention Mr Seleman
- YEC, 81-3-3715-1604 Attention Mr. N. CHIBA

29th November. 1994

Mr. Soleman Geriass
Depty Chief of Steering Committee
Leader of Task Force Team
PEGT

Mr. Mitsuhasa Nishikawa
Sub Leader
JICA Study Team

Annex-1

Data and Information Collected from 15 to 28 Nov. 1994

1, General Data and Information

(1) Energy Balance in Syria

(2) Efficiency in Thermal Power Plants

(3) Produced Electrical Energy and Requirement of Production with average of their consumption in Steam Generation Unit in 1992 and 1993.

(4) Organization Chart of NCC

(5) Record of Generating Power as of 19/11/94

(6) Arrangement Dwg. of Power Transmission System

2, Data and Information related to Rehabilitation of Power Plants

(1) Katteneh Power Plant

1) Operation data

	Output	Dated	Data for
Unit-3	100t/h	14-06-89	Boiler
	108		Boiler
	60	27-01-91	Boiler
Unit-5	85	27-10-92	Boiler
	65	26-06-94	Boiler
	100		Boiler
Unit-6	50MW	22-11-94	Turbine
	48	21-11-94	Boiler
	50	22-11-94	Boiler
	60	02-01-82	Boiler
	60	01-01-82	Boiler
	50	24-06-89	Boiler

2) Drawings

Dwg-No. 1501144 - 7	Layout Dwg	for Unit-3,4,5
1494597 - 7 - 8	ditto	ditto
1501144 - 7	ditto	ditto
1494594 - 4	Hot air piping	ditto
148379 - 0	Layout Dwg(Reference Dwg.)	
E-275644/2	Air Fan	
2-11 - 8500-022	ID Fan	for Unit-3
4-11-9851-029	Characteristic of Fan(FDF)	

4-11-9848-104 ditto (IDF)

3) Instrument List
4) P & I Diagram(Boiler and Turbine for Unit-4)
5) Electrical One-line Diagram
6) Organization Chart
7) General layout Drawing

(2) Mehardeh Power Plant

1) Operation and Planned Data

	Planned data	Operation data
Unit-1	150MW	110MW
Unit-2	150	130
Unit-3	165	165
Unit-4	165	125

Unit-3
Superheater steam output data(dd. 22-11-94/70MW)
Reheater steam output data(dd. 22-11-94/71MW)
154MW output data(dd. 03-04-90)
* Air/Flue Gas
* Reheater
* Surperheater
* Thermal cycle
* MW, Oil, Air, STM & DIFF Pressure, O2
* Generator output
156MW output data(dd. 03-04-90)
* Air/Flue Gas(2 kinds)
* Reheater
* Surperheater(2 kinds)
* Thermal cycle(2 kinds)
* MW, Oil, Air, STM & DIFF Pressure, O2
* Generator output

Unit-4
175MW output data(dd.11-06-89)
* Air/Flue Gas
* Reheater
* Surperheater
* Thermal cycle
* Load regulation operation

Others

2) Instrument List

3) Spare Parts list to be procured for Instrumentation

4) General Layout Drawing

(3) Banias Power Station

1) Operation Data

	Output	Dated	Data for
Unit-1	100MW	10-11-94	Boiler
	100	ditto	Turbine
	145	ditto	Boiler
	145	ditto	Turbine
Unit-2	85	15-11-94	Boiler
	85	ditto	Terbine
Unit-3	170	15-11-94	Boiler
	70	13-11-94	Boiler
	150	ditto	Boiler
Unit-4	140	12-11-94	Boiler
	100	15-11-94	Boiler
	155	ditto	Boiler

2) Records of Chemical Analysis dated ; 13-06-92, 14-06-92, 04-07-92, 05-07-92, 04-11-94, 05-11-94

3) Records of Maintenance of Air Preheater(section-3)

4) Instrument List

5) Electrical One-line Diagram

6) Program of Seminar(Apr. 16 1994)

7) Energy Audit(July 1994)

8) General Layout Drawing

9) Organization chart

(4) Hameh Power Plant

1) Operation Reports

2) Technical Proposal for Rehabilitation and Maintenance

3, Data and Information related to Manpower Training

(1) Jandar Power Plant

1) Location Map

2) General Arrangement Dwg.

3) Simulator Building Dwgs.

* Floor plan

* Elevation and Section

4) Dwg for Workers House Plan
5) Dwgs. for Dormitory
   * Floor plan
   * Elevation and Section
6) Simulator Specifications(MHI Proposal)
7) Construction Schedule for Jandar C/C Power Plant

(2) Katteneh Power Plant
1) Worker and Staffing Plan for the year of 1995

(3) Mehardeh Power Plant
1) Worker and Staffing Plan for the year of 1995

(3) Banias Power Plant
1) Worker and Staffing Plan for the year of 1995

(4) Lattakia Technical Institute
1) Study Plan of Mechanical and Electrical Institute
2) Financial Program for the year of 1994

(5) Adra Technical Institute
1) Study Plan of Mechanical and Electrical Institute

(6) Aleppo Technical Institute
1) General Layout drawing
2) Schedule of Registered Students
3) Schedule of Graduated Students

Appendix-1 Minutes of Discussion

2. Minutes of meeting signed on 4th February, 1995

SYRIA POWER PLANTS
M-M,2nd F/S

MINUTE OF MEETING
FOR
MASTER PLAN STUDY
ON
REHABILITATION & MAN-POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC

Date : 14 January - 04 February, 1995

Place : PEGT office and Subject Power Plants

Attendants : SYRIAN SIDE

Mr. Sufian Al Allow, Deputy Minister, MOE
Mr. Zaki Odeh, General Director, PEGT
Mr. Ali Chabaani, Chief of Steering Committee
Mr. Soleman Geriass, Leader of Task Force Team, PEGT
Mr. Bassam Kouider, Director of Training Department, PEGT
Mr. Walid Wafai, Director of Jandar Training Center
Mr. Kazem Masood, Vice Director of Generating Department, PEGT
Mr. Mohamed Kharil Sheki, Member of Task Force Team, PEGT
Mr. Micheal Kazuma, Member of Task Force Team, PEGT
Mr. Tammam Mahmoud, Member of Task Foece Team, PEGT
General Manager of each power plant
(The staff interviewed at subject power plants are the same as 1st survey's)

JICA

Mr. N. Chiba, Leader, Study Team, JICA
Mr. M. Nishikawa, Study Team, JICA
Mr. K. Kakurai, Study Team, JICA
Mr. Y. Watanabe, Study Team, JICA
Mr. K. Nakamura, Study Team, JICA
Mr. Y. Koshimizu, Study Team, JICA

The Master Plan Study Team for the Captioned Project (the Team), organized by Japan International Cooperation Agency (JICA), have carried out the second field survey of Master Plan study on Rehabilitation & Man-power Training for power Plants in The Syrian Arab Republic (the Study) from 14th January to 4th February 1995 with cooperation and friendship of the Syrian Task Force Team.

The Study activities and results of the second field survey are summarized as follows.

Progress Report

The Team submitted thirty(30) copies of the Progress Report to PEGT, which were prepared by the Team at the Work in Japan (first stage) based on the first field survey results. And the Team explained of and discussed on the Progress Report with MOE and PEGT officials with the Study background, Rehabilitation and Renovation Alternatives for Subject Power Plants, Conceptual design of the New Training Center and other related subjects of the Study.

2. Detailed Survey of Subject Thermal Power Plants

The Team visited and surveyed Subject Thermal Power plants to be rehabilitated in order to collect detailed information and data necessary for the preparation of rehabilitation proposal(s) for each Power Plant with the following schedule.

From 21st to 22nd Jan. 1995	Banias Power Plant
From 23rd to 24th Jan. 1995	Mehardeh Power Plant
On 25th Jan.1995	Kattineh Power Plant

Data and Information collected during above survey will be analyzed and used for the preparation of the rehabilitation Proposal(s) during the Work in Japan(2nd stage).

3. Rehabilitation Proposal

After the detailed field survey for Subject Power Plants carried out from 21st to 25th January 1995 as shown above, both PEGT and the Team agreed that the fowllowing rehabilitation proposals will be studied more detail during the Works in Japan (2nd stage) by the Team.

(1)Banias Power Plant (for Unit No.1 &2)
- 1)Cleaning, Detailed inspection and Repair
- 2)Renewal of Reheater and Superheater
- 3)Renewal of Control system,Instruments and Electrical equipment

(2)Mehardeh Power Plant (for Unit No.1 &2)
- 1)Cleaning, Detailed inspection and Repair
- 2)Renewal of Reheater and Superheater
- 3)Renewal of Control system,Instruments and Electrical equipment

(3)Kattineh Power Plant

1)For Unit No.3,4&5 — These units are too defective to restore the performance due to long years of service: no rehabilitation plan is proposed.

Note: Instead of proposing rehabilitation plan, a new installation of NG and/or HFO fired 150 - 200MW unit is proposed.

2)For Unit No.6
- 1)Cleaning, Detailed inspection and Repair
- 2)Renewal of Control system,Instruments and Electrical equipment

After consultations with the officials concerned in Japan, Results of the Work(2nd stage) will be shown in the Interim Report which will be submitted and explained to the Syrian side on the middle of March 1995.

Manpower Training

As stated in the Progress Report, both Syrian side and Team recognized the necessities of the New Training Center. Based on this understanding, both parties have made discussions for the contents of the New Training Center during the second field survey. Main results of discussions are summarized as follows.

(1) Location of the New Training Center will be proposed at Jandar C/C construction site.

(2) Training courses,Number of students for each course and Total number of students to be graduated are attached on Attachment - 1.

(3) Syrian side agreed to provide necessary Syrian instructors to the New Training Center as proposed by the Team as per the Attachment - 2.

(4) Tentative list of main training equipment to be installed in the New Training Center are attached on Attachment - 3.

(5) Expected total staff requested in the New Training Center is attached on Attachment - 4.

(6) As for the scope of the New Training Center construction, Syrian side requested to the Team to show Syrian side undertakings and scope of Japanese side supply in case the New Traiing Center will be granted by the Government of Japan.
The Team agreed to explain the Japan's Grant Aid System to Syrian side at the time of 3rd field survey scheduled on March 1995.

Results of discussions shown above will be analyzed during the Work in Japan (2nd stage) and will be reflected to the Interim Report which will be submitted and explained to the Syrian side on the middle of March 1995 after consultations with the officials concerned in Japan.

4th February,1995

Mr. Ali Chabaani
Chief of Steering Committee
Director of Energy Production
PEGT

Mr. Noritsune Chiba
Leader
JICA Study Team

Attachment - 1

Training Schedule for New Training Center

Training Courses	No. of Students per class	Training Schedule	Total No. of Students to be Graduated
(1)Maintenance Training Courses			
1)Basic Course			Note:
① Mechanical Course	20	2M	M- Month
② Electrical Course	20	2M	S - Students
③ Control & Instrumentation Course	20	2M	T - Number of annual session
2)General Course			
① Mechanical Course	20	3M	20Sx2T= 40
② Electrical Course	20	3M	20Sx2T= 40
③ Control & Instrumentation Course	20	3M	20Sx2T= 40 (120)
3)Advanced Course			
① Mechanical Course	10	5M	10Sx2T= 20
② Electrical Course	10	5M	10Sx2T= 20
③ Control & Instrumentation Course	10	5M	10Sx2T= 20
4)Welding Course	10	5M	10Sx2T= 20 (80) 200
(2)Operation Training Course			
1)Basic Course			
① Boiler Course	15	2M	
② Turbine Course	15	2M	
③ Electrical Facility Course	10	2M	
2)Advanced Course			
① Boiler Course	15	2M	15Sx4T= 60
② Turbine Course	15	2M	15Sx4T= 60
③ Electrical Facility Course	10	2M	10Sx4T= 40 (160)
		Total	360

Attachment - 2

Summary of Necessary Instructors in Accordance with Training Courses (Syrian Staff)

Courses	Division Directors	Chief Instructors	Instructors	Assistant Instructors
1)Maintenance Training Division	1			
① Mechanical Section		1		
a) Basic Course			1	1
b) Advanced Course			1	1
② Electrical Section		1		
a) Basic Course			1	1
b) Advanced Course			1	1
③ Control & Instrumentation Section		1		
a) Basic Course			1	1
b) Advanced Course			1	1
④ Welding Section			1	
a) Electric Welding				1
b) Gas Welding				1
2)Operation Training Division	1			
① Boiler Section		1		
a) Basic Course			1	
b) Advanced Course			1	
② Turbine Section		1		
a) Basic Course			1	
b) Advanced Course			1	
③ Electrical Facility Section		1		
a) Basic Course			1	
b) Advanced Course			1	
3)Planning Section			1	1
Sub-Total	2	6	14	9
Total	31			

Attachment - 3

Reference Only

List of Necessary Training Equipment & Materials for New Training Center

I . Maintenance Training Courses

(1) Basic Course (Consists of Mechanical,Electrical and Control & Instrumentation Courses)

Subjects	Equipment and Materials			Remarks
	Items	Q'ty	Unit	
1. Basics	-Audio visual equipment			
	• Video recorder with CRT	1	set	
	• Video camera	1	set	
	• OHP	3	sets	
	-Visual aid	1	lot	
(1)Boiler	-Plastic model of boiler			
	• Main body	1	pc	
	• Drum	1	pc	Common use with a basic course of operation training course.
	• Safety valve	1	pc	
	-Burner	1	pc	
(2)Turbine	-Plastic model of turbine			
	• Main body	1	pc	
	• Rotor	1	pc	
	• Governor	1	pc	
	• Condenser	1	pc	
	-Graphic panel of boiler & turbine steam water supply system	1	set	
(3)Generator	-Plastic model of rotor	1	pc	
2. Tools and measuring	-Measuring instruments	1	lot	
	-Electric operated over head crane(5ton)	1	set	Common facility

Reference Only

(2) General Courses
1)Mechanical Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Liquid penetrant testing	-Dye check kit Kit cotains: . Cleaning liquid . Penetrant liguid . Exposure liquid	1	lot	
	-Test piece	1	lot	
	-Loupe (Various scale)	1	lot	
2. Ordinary valves	-Gate valve, 4" ~ 10"	1	lot	
	-Glove valve, 4" ~ 10"	1	lot	
	-Check valve, 4"	1	lot	
	-Packing cutter set	1	lot	
	-Packing tool set	1	lot	
	-Packing: Gland packing	1	lot	
	" Sheet packing	1	lot	
	-Cut-away model(Gate Valve)	1	pc	
3. Centering (Alignment)	-Dial gauge	1	lot	
	-Magnet base	1	lot	
4. Electric operated valve	-Electric operated gate valve	1	pc	
	-Electric operated glove valve	1	pc	
5. Measuring	-Caliper	1	lot	
	-Micrometer(outer measure)	1	lot	
	-Gap gauge	1	lot	

Reference Only

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
6. Vibration	-Vibration meter - -ditto- (portable type)	2 2	sets sets	
7. Piping	-Pipe cutter -Bending tool -Flaring tool -Copper tube -Fittings	1 1 1 1 1	lot lot lot lot lot	
8. Small pump inspection	-Loop equipment for water	1	set	Common use
	-General tools *Including; Lath, Milling machine Grinder, Electric drill Machine vise, Anvil and other hand tools	1	lot	

Reference Only

2)Electrical Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Centering (Alignment)	- Dial gauge - Level instrument - Gap gauge - Adjustment liner - Horizontal pump with motor	1 1 1 1 1	lot lot lot lot set	
2. Vibration	- Vibration meter	1	set	Common use with 6.
3. Wiring	- Sequence practice panel	3	set	
4. Protection relay system	- Protection relay practice panel	1	set	
5. Switchboard auxiliary	- Sequence practice panel	-	-	
6. Small electric motor	- (Loop equipment) . Electric motor for small pump use . Small electric motor - Disassembling tools for centering	 4 4 1	 pcs pcs lot	
7.Medium voltage cable (Up to 22KV)	- Cable termination materials (Various size) - Termination tools - Dielectric test equipment - Jointing terminals	1 1 1 1	lot lot set lot	
	- Common items . Multi tester . Insulation resistance tester . Wiring tools	 1 1 1	 lot lot lot	

Reference Only

3)Control & Instrument Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Regulating valve	- Regulating valve	2	pcs	
2. Manometer & Pressure switch	- Manometer (Various pressure)	1	lot	
	- Pressure switch (Various pressure)	1	lot	
	- Pressure test equipment	2	sets	
	- Thermometer			
3. Recorder	- Temperature Recorders			
	• Chopper bar type recorder	1	set	
	• Pen type recorder	1	set	
4. Chemical instrument	- pH meter	1	pc	
	- Conductivity meter	1	pc	
	- Turbidity meter	1	pc	
	- Fuel Analizer	1	set	
5. Control drive	- Electric control drive device	1	lot	
	- Pneumatic control drive device	1	lot	
	- Disassembling tools	1	lot	
	- Common items			
	• Disassembling tools	1	lot	

Reference Only

(3) Advanced Courses

1)Mechanical Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Non-destructive testing	- Dye check kit	(1)	lot	Common materials
	- Magnetic particle inspection set	1	lot	
	- Ultrasonic testing set	1	set	
	- Radio graphic examination set	1	set	Portable type
	- Film exposure equipment	1	set	
	- Reflecting microscope	1	set	
	- Sump film	1	lot	
	- Test piece	1	lot	
2. Air compressor inspection	- Air compressor (Large)	1	pc	Reciprocating type
	- Air compressor (Small)	2	pcs	
	- Tollory chain block	1	pc	
3. Ventilator inspection	- Ventilating fan (Large)	1	pc	
	- Packing	1	lot	
	- Fan rotor supporting frame	1	pc	
4. Horizontal type pump inspection	- Horizontal pump set			
	• Double suction type	1	set	On loop equipment
	• Single suction type	1	set	
	- Packing	1	lot	
	- Shaft supporting frame	1	pc	

Reference Only

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
5. Vertical type pump	- Vertical pump set	1	set	
	- Packing	1	lot	
	- Shaft suporting frame	1	pc	
6. Turbine control valve	- Control valve	1	lot	For governor
	- Gasket & Packing	1	lot	(Hydraulic drive)
7. Main stop valve	- Main stop valve	1	lot	
	- Gasket & Packing	1	lot	
	-Common items			
	· Disassembling tools	1	lot	
	· Measuring tools	1	lot	
	· Slinging tools	1	lot	

Reference Only

2)Electrical Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Metal clud panel (MBB,VCB) Power center (ACB)	- Magnetic blowout circuit breaker (MBB)	1	set	22kV class
	- Vacuum circuit breaker (VCB)	1	set	22kV class
	- Air circuit breaker	1	set	600V class
	- Test panel	1	set	
2. Automatic voltage regulator	- Automatic voltage regulator panel	1	set	
	- Testing device	1	set	
3. Large electric motor	- Electric motor(6kV)	2	pcs	
	- Rotor supporting frame	1	pc	
4. Analog relay for generator	- Relay panel	1	lot	
	- Current relay	1	lot	
	- Voltage relay	1	lot	
	- Power relay	1	lot	
	- Differential relay	1	lot	
	- Testing device	1	set	
	- Common items			
	. Disassebling tools	1	lot	
	. Slinging tools	1	lot	
	. Measuring tools	1	lot	

Reference Only

3)Control & Instrumentation Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Local control device	- (Loop equipment)	-	-	Common use
	- Pneumatic control device	1	lot	
	- Electric control device	1	lot	
2. Turbine supervisory instrument	- Detectors (Rotation,Eccentricity, Shaft position)	1	lot	
	- Ductilometer	1	set	
	- Elongation differential meter	1	set	
	- Vibration meter (with attachments)	1	set	

Reference Only

(4) Welding Course

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
1. Arc welding	-Electric welding machine	10	sets	
	-Argon arc welding	5	sets	
	-Welding protector	1	lot	
	-Weldingrods	1	lot	
	-Welding practice materials	1	lot	
	-Disc thunder	5	pcs	
	-Cutting machine	1	pc	
	-Dye check kit	1	lot	Common use
2. Gas cutting	-Oxy-acetylene welding & cutting apparatus	5	sets	
	- Tools for cutting torch	1	lot	

Reference Only

Ⅱ . Operation Training Courses

Subjects	Equipment and Materials			Remarks
	Items	Q't y	Unit	
(Basic Course) 1. Basics	-	-	-	
2. Normal operation	-	-	-	
3. Start & shut down and emergency shut down and mal-operation	- Simulator	1	set	Basic simplified simulator
(Advanced Course) 1. Normal operation	(Simulators installed at Jandar C/C will be used.)	-	-	
2. Handling accidents	- ditto -	-	-	

Appendix

The following equipment are requested by Syrian side during the discussions in addition to the Attachment - 3.
The master plan study team will review its propriety in consulting with the officials concerned in Japan.

Courses	Requested Equipment
I .Maintenance Training Courses (1) Basic Course	• Plastic model of rotating air-heater • Practical material of turbine by-pass system • Bearing (Journal/Thrust/Ball type) • Generator visual aid
(2) General Courses 1)Mechanical Course	• Solenoid valve • Steam drain valve • Micrometer (Inner measure) • Small balancing machine with a sample of rotor
2)Control & Instrumentation Course	• Regulating valve → Pneumatic type-1 (each 1); Hydraulic type -1 (each 1) • Recorder for manometer • Transducer • O_2 analizer • Special tools for adjustment & calibration
(3) Advanced Courses 1)Mechanical Course	• Horizontal pump set → Multi stage type • Vertical pump set → Multi stage type • Intercept valve • Safety valve
3)Control & Instrumentation Course	• Practical materials for inspection of elctronic cards system
(4) Welding Course	• Pre-heating & heat treatment equipment and materials

Note: Arrow(→) indicates the requested type of equipment.

Additional request by PEGT for Training Equipment and Materials on January 31,1995

The following equipment are requested by Syrian side during the discussions in addition to the Attachment- 3.

The master plan study team will review its propriety in consulting with the officials concerned in Japan.

Mechanical Repair and measurment Tools

GAUGE BLOCK,

KNIFE FOR THREAD CONTROL, I

SURFACE GAUGE WITH GRADUATED ROD,

STEEL CALIPER WITH I ,

STEEL INTERNAL CALIPER,

STEEL EXTERNAL CALIPER,

UNIVERSAL ANGLE PROTRACTOR,

SLIDING CALIPER CALIBRATED IN FIFTIETHS

SLIDING DEPTH CALIPER

SET OF EXTERNAL MICROMETERS,

MICROMETRIC TIPS FOR INSIDE MEASUREMENTS

BORE MEASURING INSTRUMENT

- 10 MM CENTESIMAL COMPARATOR
- 50 MM CENTESIMAL COMPARATOR
- COMPARATOR HOLDER WITH MAGNETIC BASE
- SUPPORT FOR MICROMETERS
- MOBILE SET OF DRAWERS WITH 4 DRAWERS
- SET OF DOUBLE FORK WRENCHES
- SET OF PIN EXTRACTORS (2-3-4-5-6-8)
- BURIN
- FLAT CHISEL
- FLAT CHISEL
- CROSS-CUT CHISEL
- SET OF MALE ALLEN WRENCHES
- ADJUSTABLE MONKEY WRENCH
- FLAT JAW PINCERS
- PINCERS FOR CIRCLIPS
  for holes, with curved jaw
- PINCERS FOR CIRCLIPS
  for shafts, with curved jaw
- 250 MM SELF-LOCKING PINCERS
  concave jaws
- DIAGONAL NIPPERS

UNIVERSAL PINCERS

STRAIGHT-BLADED SHEARS

SET OF FLAT TIP SCREWDRIVERS

SET OF PHILLIPS TIP SCREWDRIVERS

HAMMER S

PLASTIC HEAD HAMMERS

HACKSAW

SET OF SECOND-CUT FILES (5 PCS)

SLIDING CALIPER CALIBRATED IN TWENTIETHS

FLEXOMETER

SCRIBER

BLADE PRECISION THICKNESS GAUGE

WHITE SAFETY GOGGLES

WORKSHOP EQUIPMENT

SET OF DOUBLE-ENDED WRENCHES,

SET OF PERCUSSION FORK WRENCHES

SET OF PERCUSSION BOX WRENCHES

SET OF MALE ALLEN WRENCHES

RIBBED CHISEL,

ADJUSTABLE MONKEY WRENCH

FLAT JAW PINCERS

PINCERS FOR CIRCLIPS
for holes, with curved jaw

PINCERS FOR CIRCLIPS
for shafts, with curved jaw

SELF-LOCKING PINCERS
concave jaws

DIAGONAL NIPPERS

UNIVERSAL PINCERS

STRAIGHT-BLADED SHEARS

SET OF FLAT TIP SCREWDRIVERS

SET OF PHILLIPS TIP SCREWDRIVERS

SET OF UNIVERSAL EXTRACTORS

SET OF SECOND-CUT FILES

SET OF SOCKET WRENCHES,
complete with accessories

SET OF DOUBLE BOX WRENCHES

SET OF T-WRENCHES,

SET OF UNIVERSAL T-WRENCHES, [illegible]M

SET OF SPIRAL DRILL BITS, [illegible]M

[illegible]

SET OF DRILL BIT ADAPTORS

SET OF SCREW TAPS AND THREADING DIES

VARIOUS TOOLS
(hacksaw, oilers, scribers etc.)

PORTABLE ELECTRIC DRILL

TOOL CABINETS

OVERHEAD PROJECTOR

MAGNETIC BOARD

PEARL PROJECTION SCREEN 1

[illegible] 1

[illegible] 1

Electrical Repair & Measurements Tools

1. PORTABLE ELECTRODYNAMIC AMMETER
2. PORTABLE ELECTRODYNAMIC AMMETER
3. PORTABLE ELECTRODYNAMIC AMMETER
4. PORTABLE ELECTRODYNAMIC VOLTMETER
5. SINGLE-PHASE PORTABLE WATTMETER
6. SNAP-ON AMMETER
7. INSULATION RESISTANCE METER
8. INSULATION RESISTANCE METER
9. PORTABLE EARTH RESISTANCE METER
10. PORTABLE SINGLE-PHASE VOLTAGE CONVERTER
11. PORTABLE THREE-PHASE VOLTAGE CONVERTER
12. PHASE INDUCTION CONVERTER
13. PORTABLE INDEX FREQUENCY METER
14. PORTABLE ELECTRODYNAMIC PHASEMETER
15. WHEATSTONE BRIDGE
    box with built-in galvanometer to measure resistance.
16. BOX-TYPE MAXWELL BRIDGE
    to measure inductance up to 100 H

BOX-TYPE DE SAUTY BRIDGE
to measure capacity

STABILISED POWER SUPPLY

MANUAL DIGITAL TACHOMETER

VARIABLE CAPACITOR

VARIABLE RESISTOR

VARIABLE INDUCTOR

RATIO METER
to measure the turns ratio of 1/1000 transformers

ELECTRIC MAGNET GALVANOMETER

DECADE-TYPE UNIVERSAL REDUCTION UNIT

INDICATOR OF THE CYCLE DIRECTION

PORTABLE THREE-CURRENT RATING SHUNT

LINEAR SLIDER RHEOSTATS
- 10 Ohm/10 A
- 50 Ohm/5 A
- 100 Ohm/2.5 A
- 500 Ohm/1 A
- 1000 Ohm/1 A
- 10000 Ohm/1 A

SPARK GAP STRENGTH METER

PORTABLE AMPEROMETRIC TRANSFORMER

PORTABLE VOLTAGE TRANSFORMER

UNIVERSAL TEST METER

PORTABLE DIGITAL MULTIMETER

PORTABLE RELAY TESTER

5. SET OF INSULATED CABLES
with cable terminal and plug, of the following lengths:
- 0.5 m.
- 0.75 m.
- 1 m.
- 1.5 m.

i. SET OF KEYS FOR CIRCUIT MEASUREMENT
- simple key
- double key
- reversal key

. ELECTRICAL LABORATORY BENCH
double-seated bench in channelled steel, with 1500x1000 mm. rubber covered top, with toolbox. Supplied with two drawers to store the tools.

WINDING MACHINE FOR SMALL TRANSFORMER WINDINGS

WINDING MACHINE FOR MOTOR WINDINGS

PILLAR DRILL

TIMER

FAULT-FINDING BOX

COMPUTERISED TEACHING SIMULATOR
for practise on electrical machines, electric systems and applied electrotechnics

COMPUTERISED WORKSTATION
composed of:
personal computer
printer
data display

SINGLE-PHASE METER

SWITCH HOOK FOR TEACHING PURPOSES

OSCILLOSCOPE

8. PRACTISE PANEL
size mm 1600x800
complete with motor, inverter, contactors, switches, temperature relays, terminals and all the necessary elements for cabling practise

9. PRACTISE PANEL
size mm 1600x800
complete with motorised valve, contactors, switches, temperature relays, limit switches, terminals and all the necessary elements for cabling practise

1. OVERHEAD PROJECTOR

. MAGNETIC BOARD

. PEARL PROJECTION SCREEN

. ELECTRIC OVEN

TUB FOR INSULATING VARNISH

COMPLETE KIT
cables, fuses, cable terminals, etc.

CABINETS, TABLES, CHAIRS

WORKBENCH
size mm 2000x1000
wooden counter, two drawers and two vices

PORTABLE ELECTRIC DRILL

SET OF DRILL BITS

AIR COMPRESSOR L. 50

SET OF SCREW TAPS AND THREADING DIES
complete with accessories

VARIOUS TOOLS 1
(hacksaw, oiler, chisels, etc.)

SET OF DOUBLE ENDED WRENCHES 1
6-32 mm

11 - 9 - 92

1.	SET OF MALE ALLEN WRENCHES	
.	SET OF FLAT TIP SCREWDRIVERS	
.	SET OF PHILLIPS TIP SCREWDRIVERS	
.	SLIDING GAUGE 1/50	
	EXTERNAL MICROMETER 0-25	
	SET OF ROUND, FLAT AND HALF-ROUND FILES	
	SET OF SOCKET WRENCHES	
	ENAMELLED WIRE FOR WINDINGS	7
	TOOL CABINETS	6
		1

Electrical

- Protections
- Elec. Motors 5.5 kV
- U.P.S Unit Power Supply
- Extiation system.
- SF6 S.B
- Inverters
- Sample Transformer (cross section)

Mechanical

- soot blowers
- Balancing machine
- heat exchangers.
- hydraulic couplings.

Instrument & Control.

Subjects	Equipment and Materials			Remarks
	ITEMS	Q'ty	Unit	
1. pressure Controller	- Pneumatic Controller. - Dp. Controller.	1 1	set. set	
2- Temperature Measurment & maintenance.	- Temperature Source 0÷80 °C - Kinds of Sensor & probes. - temperature Transducer - Temperature switch. - adjustment THE Themperature Controller.	1 1 1 1 1	pcs. set. set. pcs set	
3- volume & flow Counters (Fuel, light Fuel, Demi water, Gas..)	- Fuel oil Counter oval with tools & Calibration Circuits.	1	Set	فك وتركيب ومعايرة لعدادات الفيول. ١٩٩٥/١/٢٠ محمد منصور

Attachment - 4

Reference Only

Expected Total Staff Including Instructors in New Training Center
(Syrian Staff)

Personnel	No.	Qualifications/Experience	Salary Estimated
1)-General Director	1	-	
-Secretary	1	-	
2)Maintenance Training Division			
-Director	1	Engineer / 15years or more	
(Mechanical Section)			
-Chief Instructor	1	Engineer/ 10years or more	
-Instructor (Basic Course)	1	Assistant Engineer/ 5years or more	
-Instructor (Advanced Course)	1	Assistant Engineer/ 5years or more	
-Assistant Instructor	2	5years or more in the technical field	
(Electrical Section)			
-Chief Instructor	1	Engineer/ 10years or more	
-Instructor (Basic Course)	1	Assistant Engineer/ 5years or more	
-Instructor (Advanced Course)	1	Assistant Engineer/ 5years or more	
-Assistant Instructor	2	5years or more in the technical field	
(Control & Instrument Section)			
-Chief Instructor	1	Engineer/ 10years or more	
-Instructor (Basic Course)	1	Assistant Engineer/ 5years or more	
-Instructor (Advanced Course)	1	Assistant Engineer/ 5years or more	
-Assistant Instructor	2	5years or more in the technical field	
(Welding Section)			
-Instructor	1	Assistant Engineer/ 5years or more	
-Assistant Instructor (Electric & Gas Welding)	2	Skilled in the field	
3)Operation Training Division			
-Director	1	Engineer / 15years or more	
-Chief Instructor (Boiler)	1	Engineer/ 10years or more	
-Instructor (Boiler, Basic)	1	Assistant Engineer/ 5years or more	
-Instructor (Boiler, Advance)	1	Assistant Engineer/ 5years or more	
-Chief Instructor (Turbine)	1	Engineer/ 10years or more	
-Instructor (Turbine, Basic)	1	Assistant Engineer/ 5years or more	
-Instructor (Turbine, Advance)	1	Assistant Engineer/ 5years or more	
-Chief Instructor (Electrical Facilities)	1	Engineer/ 10years or more	
-Instructor (Electrical, Basic)	1	Assistant Engineer/ 5years or more	
-Instructor (Electrical, Advance)	1	Assistant Engineer/ 5years or more	

Cont'd ···

Personnel	No.	Qualifications	Salary Estimated (US$)
4)Planning Section			
-Planner	1	Assistant Engineer/ 5years or more	
-Assistant Planner	1	5years or more in the technical field	
5)Administration Division			
-Director	1	-	
(Accounting Section)			
-Section Chief	1	-	
-Purchasing	1	-	
-Clerk	1	-	
-Typist	1	-	
(General Affairs Section)			
-Section Chief	1	-	
-Personnel Affairs	1	-	
-Clerk	1	-	
-Typist	1	-	
-Receptionist	1	-	
-Driver	2	-	
-Store keeper	1	-	
-Janitor (for facility maintenance)	1	-	
-Security Guard	2	-	
-House Cleaner	2	-	
(Dormitory):Subordinate section of General Affairs			
-Manager	1	-	
-Janitor	2	-	
(Canteen): -ditto-			
-Manager	1	-	
-Chief Cook	1	-	
-Cook Helper	4	-	
Total	60		

Note: Division directors and chief instructors shall be equipped with an english language ability both writing and speaking.

Appendix-1 Minutes of Discussion

3. Minutes of meeting signed on 20th March, 1995

MINUTES OF MEETING
FOR
MASTER PLAN STUDY
ON
REHABILITATION & MAN-POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC

Date : 11 March - 21 March, 1995

Place : MOE office and PEEGT office

Attendants : SYRIAN SIDE
Mr. Sufian Al Allow, Deputy Minister, MOE
Mr. Zaki Odeh, General Director, PEEGT
Mr. Ali Chabaani, Chief of Steering Committee
Mr. Sofeiman Geriass, Deputy Chief of Steering Committee
Mr. Bassam Kouider, Director of Training Department, PEEGT
Mr. Walid Wafai, Member of Steering Committee
Mr. Kaziem Masoud, Member of Steering Committee
Mr. Sabri Bechar, Member of Steering Committee
Mr. Mohamed Khalil Sheki, Member of Task Force Team, PEEGT
JICA Study Team
Mr. N. Chiba, Leader, Study Team, JICA
Mr. M. Nishikawa, Study Team, JICA
Mr. Y. Muraki, Study Team, JICA
Mr. K. Kakurai, Study Team, JICA
Mr. K. Nakamura, Study Team, JICA

The Study Team (the Team), organized by Japan International Cooperation Agency (JICA) and headed by Mr. Noritsune CHIBA, visited the Syrian Arab Republic from March 11th, 1995 for the third field survey of Master Plan Study on Rehabilitation & Man-Power Training for Power Plants in The Syrian Arab Republic(the Study) in accordance with Scope of Work (S/W) agreed between MOE and JICA Preparatory Study Team on July 7th, 1994.

During the third field survey in Syria, the Team has submitted and explained the Interim Report which are showing the results of the Work in Japan(2nd stage) to the Syrian side and has held a seminar on 16th March 1995.

The Study results during the third field survey from 11th to 21st March 1995 are summarized as follows;

1. Interim Report

The Team submitted thirty (30) copies of the Interim Report to the Syrian side, and explained and discussed with PEEGT and Syrian officials concerned.

2. Rehabilitation Proposals

Syrian side has understood and has principally agreed to the rehabilitation proposals shown in the Interim Report. The concepts of the rehabilitation proposals and the Syrian side comments are shown as follows;

2.1 Rehabilitation Proposals for Subject Power Plants

Plant Name and Units	Boiler	Turbine & Generator	Control & Instruments
Banias Unit-1&2	1. Detailed inspection, Cleaning and Repair. 2. Renewal of Reheater and Superheater	1. Detailed inspection and Repair	1. Renewal of Control System (From Pneumatic to Electric) 2. Renewal of Instruments and Electrical equipment
Mehardeh Unit-1&2	1. Detailed inspection, Cleaning and Repair. 2. Renewal of Reheater and Superheater	1. Detailed inspection and Repair	1. Renewal of Control System (From Pneumatic to Electric) 2. Renewal of Instruments and Electrical equipment
Kattineh Unit-6	1. Detailed inspection, Cleaning and repair	1. Detailed inspection and Repair	1. Renewal of Control System (From Pneumatic to Electric) 2. Renewal of Instruments and Electrical equipment
Kattineh Unit-3,4&5	These units are too defective to restore the performance. Therefore, no rehabilitation alternatives are proposed. Instead, a new installation of NG and/or HFO fired 200MW unit is proposed.		

2.2 Available installed capacity

The Syrian side has requested the Team to revise a Table and Graphs of the Available installed capacity (Table 1.2.3-1 and Fig 1.2.3-1 & 2 in the Interim Report) according to the latest information given by the Syrian side.

The Team agreed to revise the Table and Graphs at the time of preparing the Draft Final Report.

2.3 Cooling Water at Kattineh Power Plant

For the New Installation Proposal of 200MW at Kattineh Power Plant, the Syrian Side suggested to provide a cooling tower for the condenser cooling, taking the environmental effect(discharged water temperature) into consideration.

3. Manpower Training

The Syrian side has agreed to the Conceptual Design of the New Training Center such as Training Programs, Training Curriculum, Organization, Management system, Training Equipment and Materials, Facilities Plans which were prepared by the Team through the Work in Japan(2nd stage) and proposed in the Interim Report .

As for the operation cost for the New Training Center, an average amount of salary for operating stuff including fringe benefit will be revised in accordance with the latest information obtained from the PEEGT.

4. Seminar

The Seminar has successfully been held on 16th March 1995, which titled as "Rehabilitation and Maintenance Proposals for selected thermal power plants" and some 20 Syrian engineers were attended at the Seminar.

5. Draft Final Report

The draft Final Report will be submitted and be explained to the Syrian side on the middle of June 1995.

6. Counterpart Training in Japan

Related to the Study(this Master Plan Study), the Team suggested the PEEGT to determine a PEEGT staff to be trained in Japan and to submit an Official Request Form (Form A2A3) to JICA Syria office immediately through SPC as suggested during the first field survey on November 1994. PEEGT agreed to submit such Request Form to JICA Syria office urgently.

As for the Number of trainee, the PEEGT strongly hope to dispatch two(2) trainees to Japan, one for Rehabilitation and the other for Manpower training.

Mr. Ali Chabaani	Mr. Noritsune Chiba
Chief of Steering Committee	Leader,
Director of Energy Production	JICA Study Team
PEEGT	

4. **Minutes of meeting signed on 15th June, 1995**

MINUTES OF MEETING
FOR
MASTER PLAN STUDY
ON
REHABILITATION & MAN-POWER TRAINING FOR POWER PLANTS
IN
THE SYRIAN ARAB REPUBLIC

Date : 08 June - 15 June, 1995

Place : MOE and PEEGT office

Attendants : SYRIAN SIDE

Mr. Ali Chabaani, Chief of Steering Committee
Mr. Soleman Geriass, Deputy Chief of Steering Committee
Mr. Kaziem Masoud, Member of Steering Committee
Mr. Sabri Bechar, Member of Steering Committee
Mr. Mohamed Khalil Sheki, Member of Task force Team

JICA STUDY TEAM

Mr. T. Morimura, JICA
Mr. N. Chiba, Leader, Study Team, JICA
Mr. M. Nishikawa, Study Team, JICA
Mr. K. Kakurai, Study Team, JICA
Mr. K. Nakamura, Study Team, JICA

The Study Team (the Team), organized by Japan International Cooperation Agency (JICA) and headed by Mr. Noritsune CHIBA, visited the Syrian Arab Republic from June 7, to June 17, 1995 for the Fourth Field Survey of Master Plan Study on Rehabilitation & Man-Power Training for Power Plants in The Syrian Arab Republic(the Study) in accordance with Scope of Work agreed between MOE and JICA Preparatory Study Team on July 7th, 1994. Main Subject of Fourth Field Survey of the Study are explanation on and discussion of the Draft Final Report with Syrian side.

The Study results during the period from 8th June to 15th June1995 are summarized as follows.

1. Draft Final Report

The Team submitted thirty (30) copies of the Draft Final Report(the Report) to MOE and PEEGT, and discussed with MOE, PEEGT and Syrian officials concerned for the study results and other related subjects of the study.

2. Rehabilitation Proposals

Syrian side has basically agreed to the contents of the Rehabilitation Proposals shown on the Draft Final Report. Based on the results of discussion, the Team has agreed that the following items will be re-studied and be reflected to the Final Report by the Study Team.

(1) Fig. 4.3-1 Rehabilitation Master Schedule

The Team will prepare an alternative schedule based on the following conditions and it will be attached to the Final Report

1) Two(2) units in the same power station will not be stopped simultaneously for the overhaul.

2) Three(3) units will not be stopped at the same time.

(2) Current Environmental Protection

Syrian side pointed out that some of Environmental Protection Facilities such as Neutralizer and Oil Separator for Waste Water, etc., are already provided to all thermal power plants in Syria and requested to reflect this fact to the Final Report. The Team agreed to the Syrian side request.

(3) Economic Analysis

Based on the Syrian side comment(s) such as the discounted ratio(from 12 % to 9-10%) for the cost streams, etc., the Team agreed to review the Economic Analysis and reflect such results to the Final report. The Team requested Syrian side to inform their further comments, if any, as soon as possible.

(4) Table 3.2-1 Existing Power Generation Plants as of 1993

Table of Existing Power Generation Plants as of 1993 will be revised in accordance with the latest information as of 1994, which will be informed to the Team as soon as possible by PEEGT.

3. New Training Center Construction Proposal

Syrian side has basically agreed to the contents of the New Training Center Construction Proposal shown on the Draft Final Report. Based on the results of discussion, the Team has agreed that the following items will be re-studied and be reflected to the Final Report.

(1) The Number of Operation and Maintenance staff that require training and education

The Team agreed to revise Number of Operation and Maintenance staff that require training and education in accordance with to the latest information from Syrian side.

(2) Plastic Model of Gas-turbine

A Plastic model of Gas-turbine is added to the list of Necessary Training Equipment & Materials(Common Subject of Basic & General for Maintenance Training Course in Table 5.2.3-1)

4. Comments from Syrian side

All the Comments on the Draft Final Report from Syrian side, if any, will be informed to JICA before the end of June 1995 to reflect those in its finalization.

5. Final Report

Fifty(50) copies of the Final Report will be submitted to Syrian side through JICA Syria office by the end of August 1995 after reflecting the comments of Syrian side through consultations with the Japanese officials concerned.

6. Equipment for the Study

Syrian side strongly requested to transfer the following equipment and instrument which had been used for the Study in Syria.

- Ultrasonic Flaw Detector 1 set
- Fiber Scope 1 set
- Portable Water Quality Analyzer 1 set

Mr. Ali Chabaani
Chief of Steering Committee
Director of Energy Production
PEEGT

15.6.95

Mr. Noritsune Chiba
Leader,
JICA Study Team

Appendix-2

List of Persons Interviewed

Appendix-2 List of Persons Interviewed

1. SPC Office

Eng. Nabeel Astafaan	Syrian Petroleum Co., MOP
Eng. Manal As-Saga	Ministry of Environment
Mr. Bassam Al-Sibaee	Director of Scientific and Technical Cooperation, SPC
Ms. Ilhaam Murad	Assistant, SPC
Ms. Omaya Essa	Deputy Director of Energy, SPC

2. MOE Minister's Office

Eng. Moneeb Sayem-Adaher	Minister, MOE
Eng. Sufyaan Al Alow	Deputy Minister, MOE
Eng. Nazeh Yanes	Technical Advisor, MOE

3. PEEGT Office

Mr. Zaki Odeh	General Director, PEEGT
Mr. Ali Chabaani	Chief of Steering Committee, PEEGT
Mr. Soleman Geriass	Deputy Chief of Steering Committee and Chief of Task Force Team, PEEGT
Mr. Bassam Kouider	Director of Training Department, PEEGT
Mr. Walid Wafai	Director of Jandar Training Center
Eng. Kaziem Masoud	Committee Member in charge of Steam Turbine Power Plants
Eng. Sabri Bechar	Committee Member in charge of Gas Turbine Power Plants
Eng. Mohamed Khalil Sheki	Member of Task Force Team, PEEGT
Eng. Micheal Kazuma	Member of Task Force Team, PEEGT

	Eng. Tammam Mahmoud	Member of Task Force Team, PEEGT
4.	**Tishreen Power Station**	
	Eng. Hashim Mishfig	General Director, Tishreen Power Station
	Eng. Ramadan Mchop	Operation Manager, Tishreen Power Station
5.	**Jandar Power Station**	
	Eng. Alzein Rouhi	Site Manager of Jandar Power Station, PEEGT
	Eng. Veijo Komulainen	Project Director of Ekono Energy Ltd.
6.	**Katteneh Power Station**	
	Eng. Farhan Al Haji	General Director, Katteneh Power Station
	Eng. Abdra Latif Wali	Boiler Maintenance Engineer, Katteneh Power Station
	Eng. M. Salomi	Turbine Maintenance Engineer, Katteneh Power Station
	Eng. J.D. Droubi	Spare Parts Department, Katteneh Power Station
	Eng. I. Toumi	Instrumentation & Control Chief Engineer, Katteneh Power Station
	Eng. F. Al Yafi	Electrical Maintenance Engineer, Katteneh Power Station
	Eng. A. Scharbek	Instrumentation Engineer, Katteneh Power Station
	Eng. M. Bahboha	Chief Engineer for Production, Katteneh Power Station
	Eng. Mohamad Mahmoud	Electrical Engineer for Production, Katteneh Power Station
7.	**Mehardeh Power Station**	
	Eng. Ghassan Salloum	General Director, Mehardeh Power Station
	Eng. Ali Haifa	Chief of Operation Department, Mehardeh Power Station

Eng. Kareem Douna	Instrumentation Engineer, Mehardeh Power Station
Eng. Rami Abdo	Instrumentation Engineer, Mehardeh Power Station
Eng. Mohammad Jarari	Head of Mechanical Maintenance, Mehardeh Power Station
Eng. Omar Ganis	Mechanical Engineer, Mehardeh Power Station
Eng. Akram Ashmeh	Chief of Electrical Service, Mehardeh Power Station
Eng. Abdo Rajab	Operation Engineer, Mehardeh Power Station
Eng. Youcef Kaourmd	Chief of Spare Parts Department, Mehardeh Power Station

8. Banias Power Station

Eng. Abd Al Rrazak Yossef	General Director, Banias Power Station
Eng. Jaafar Daqud	Training Engineer, Banias Power Station
Eng. Wafik Mohamad	Operation Engineer, Banias Power Station
Eng. Hyaim Amar Ali	Electrical Engineer, Banias Power Station
Eng. Ahmad Hasan Ali	Electrical Engineer, Banias Power Station
Eng. Mohammad Mansour	Instrumentation and Control Maintenance Engineer, Banias Power Station

9. Zamarka Power Station

Eng. Id Abbara	PEEDE (in charge of Frame 5 Gas Turbines)
Eng. Ismail Sabek	Site Manager of Zamarka Power Station, PEEDE

10. Hame Power Station

Eng. Bassam Breaghle	General Director, Hame Power Station
Eng. Zaid Kinari	Assistant Engineer, Hame Power Station

11. NCC

Eng. Maher Mtanos	Director, NCC
Eng. Naja Maalouf	Maintenance Engineer, NCC

12. Latakia Technical Institute

Mr. Mustafa Farusi	Director, Latakia Technical Institute
Mr. Fauzi Gabbur	Administration Director, Latakia Technical Institute
Mr. Muniv Fatch	Financial Director, Latakia Technical Institute

13. Adra Technical Institute

Dr. Tansin Musfi	Director, Adra Technical Institute
Eng. Abdal Rahman Oarraznly	H.V. Laboratory, Adra Technical Institute
Chem. Moustafa Altal	Chemical Laboratory, Adra Technical Institute

14. Aleppo Technical Institute

Eng. Fysal Shikh Ahmed	Director, Aleppo Technical Institute

15. MOEV Office

Eng. Yahya Awaidah	Chief Engineer, MOEV
Eng. Khaled Kallaly	Mechanical Engineer, MOEV
Eng. Abir Zeno	Environmental Engineer, MOEV
Eng. Mamal Al Sakka	Environmental Engineer, MOEV

Abbreviations:

MOE:	Ministry of Electricity
MOEV:	MInistry of State for the Environment
MOP:	Ministry of Petrolcum and Mineral Resources
NCC:	National Control Center
PEEDE:	Public Establishment of Electricity for Distribution and Exploitation
PEEGT:	Public Establishment of Electricity for Generation and Transmission
SPC:	State Planning Commission

Appendix-3

List of Data Collected During Field Survey

Appendix-3
List of Data Collected During Field Survey

1. Data Collected During First Field Survey

1.1 General

(1) Energy Sector Management Assistance Program Activity Completion Report (Joint UNDP/World Bank)

(2) Statistics

(3) Geographical Data

(4) Program of Seminar (General Training Seminar)

(5) Development of the Peak of Electric Power Production (1964 – 2005)

(6) Capacity Demand 1995 – 2020

(7) Load Growth and Total Generation 1994/2000

(8) Energy Balance in Syrian Arab Republic –1993–

(9) Work Plans, 1995 (Banias, Mehardeh and Katteneh Power Stations)

(10) Electrical Energy Produced from Generation Utilities Related to PEE and Euphrates Dam and Consumed from General Sector with Shedding Energy and Peak of Production also demanded Energy during the Year of 1992

(11) Produced Electrical Energy and the Used Requirement of Production with their Average in Steam Generation Units during the Year of 1992

(12) Produced Electrical Energy and the Used Requirement of Production with their Average of their Consumption in the Operation of Production also the Rate of Production and Reability during the Year of 1992

(13) Electrical Energy Produced from Generation Utilities Related to PEE and Euphrates Dam and Consumed from General Sector with Shedding Energy and Peak of Production also demanded Energy during the Year of 1993

(14) Produced Electrical Energy and the Used Requirement of Production with their Average in Steam Generation Units during the Year of 1993

(15) Produced Electrical Energy and the Used Requirement of Production with their Average of their Consumption in the Operation of Production also the Rate of Production and Reability during the Year of 1993

(16) Efficiency in Thermal Power Plants

(17) Existing Generation Plants 1993
/ Power Plant Expansion Program during 1994-1997

(18) Electricity Prices as from 1/January/1991 (S.P./kWH)

(19) 230 - 400kV O.H.L Network (Map)

(20) 400kV Network (Schematics)

(21) 230 - 400kV O.H.L Network (Schematics)

(22) Location of Substations

(23) Report and Recommendations of Second Working Circular for General Advising to Specify the Environmental Effects on Different Industries in the Arab World (Cairo: 27-29/6/1994)

(24) The Environment Protection Act (Draft)

(25) Syrian Project for Industrial Waste water Range

(26) Syrian Standards Project for Component Gazes of Air

(27) Commission for Environmental Affairs Organogram

(28) List of Committees Particate in the Ministry of Environment

(29) Policy to Establish National Institute

1.2 **Banias Power Station**

(1) Tubes Diagram - Lower Part Longitudinal Section

(2) Tubes Diagram - Upper Part Longitudinal Section

(3) Single Line Diagram

(4) Instrument List

(5) List of Production and Consumption of Power in Oct. '94

(6) Organization Chart of the P.S.

1.3 Katteneh Power Station

(1) General Layout

(2) General Layout (ABB's Offer)

(3) Layout Plan (Boiler #4)

(4) Single Line Diagram

(5) Instrument List (Boiler #4)

(6) P & I D (Boiler #4)

(7) P & I D (Turbine #4)

(8) Fuel-Air Ratio Control (Boiler #4)

(9) P & I D (Boiler #5)

(10) Organization Chart

1.4 Mehardeh Power Station

(1) Brochure of Mehardeh Power Station

(2) General Layout

(3) Boiler Arrangement Drawing

(4) Boiler Bottom/Furnace

(5) Overhaul Schedule (Boiler)

(6) Overhaul Schedule (Turbine)

(7) Overhaul Schedule (Instruments)

(8) Instrument List for Process System

(9) Spare Parts List to be Purchased (17/11/'94)

1.5 Hame Power Station

(1) Bill of Production and Consumption in Sept. '94

(2) Letter to PEGT from Hame Power Station

1.6 Zamalka Power Station

(1) Data Sheet

1.7 Jandar Power Station

(1) Jandar Layout

(2) Erection Schedule

(3) Site Plotting Plan

(4) Ware House

(5) Simulator Building

(6) Training Simulator

(7) Soil Investigation Report

1.8 National Control Center

(1) 230kV, HV Network

(2) Organization Chart

(3) Table of Instantaneous Loads for Generation Units in Syria on 19.11.'94

1.9 Electrical and Mechanical Institute

(1) Study Plan -1

(2) Study Plan -2

(3) Schedule of the Registered Students

(4) Schedule of the Graduated Students

(5) Arrangement Drawing(Aleppo)

2. Data Collected During Second Field Survey

2.1 General

(1) Thermal Power Plant Periodical Inspection and Rehabilitation Plan

(2) Revised Forecast of Available Installed Capacity of All Power Plants up to 2020 year

(3) Revised Power Balance Forecast up to 2020

2.2 Banias Power Station

(1) Unit No.2 Boiler Inspection report prepared by the Industrial Testing and Research Center

(2) Expected Overhaul or Detailed inspection schedule

(3) Daily Operation Report

(4) Work Request Card

(5) Spear Parts Requirement

(6) Instrument & Control Report

(7) Dimensional and Project Features of the Main Boiler Parts

(8) Boiler Tube Arrangement Table which indicates specifications and heating surface of tubes for superheaters, reheaters and economizer

2.3 Katteneh Power Station

(1) Heavy Fuel Oil(HFO)Specification

(2) Expected Overhaul or Detailed Inspection schedule

(3) Work Request Card

2.4 Mehardeh Power Station

(1) Expected Overhaul or Detailed Inspection schedule

(2) Schedule of Instrumentation department work during shut down of unit Nos.1 & 2

(3) Inspection and Repair Work Schedule of Boiler Unit No.1

(4) Work Order Sheet

(5) Report for Spear Parts Order System

(6) Drawings related to Boilers of Unit Nos.1 & 2
(Total 15 sheets)