イラク電機産業訓練センター

# 実施調査団報告書

昭和51年3月

国際協力事業団

イラク電機産業訓練センター

# 実施調査団報告書



昭和51年3月



国際協力事業団

# はしがき

日本国政府は，イラク共和国に対する技術協力の一環として同国に電機産業訓練センターを設置することとなり，当事業団はその委託をうけて，昭和４９年１１月２４日から同１２月10日まで事前調査を実施し，さらに今般これをうけて，社団法人日本エレベータ協会 酒井正巳を団長とする５名の実施調査団を現地に派遣した。実施調査団は昭和５０年８月２３日本邦を出発，１６日間イラク共和国に滞在し，センター設置および運営の具体的方法等について，イラク政府ならびに関係者との話し合いを行なうとともに，設置に必要な技術的事項について調査を行なった。本書はその報告である。

この調査ならびに打合せの結果，その重要事項は「合意議事録」として調査団長とイラク政府工業・鉱物省工業開発局長との間で署名を了することができた。

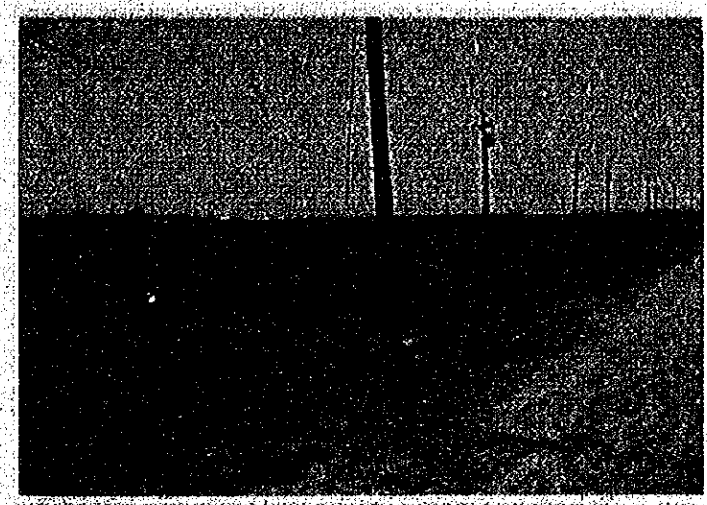
ここに，本調査団の派遣に御協力いただいた関係機関の方々に対し，この機会をかりて深甚の意を表する次第である。

昭和５１年　３　月

国際協力事業団

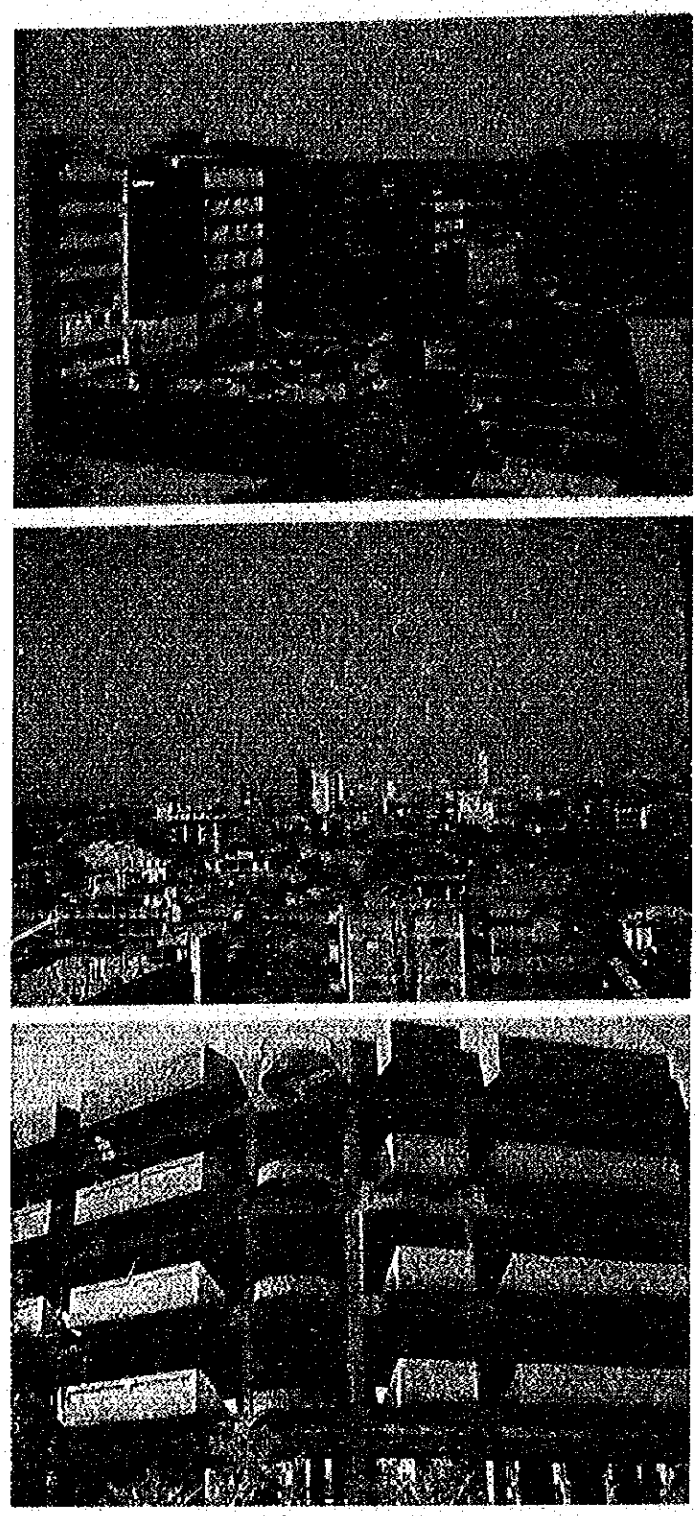
総裁　法眼晋作

イラク電機産業訓練センター建設予定地

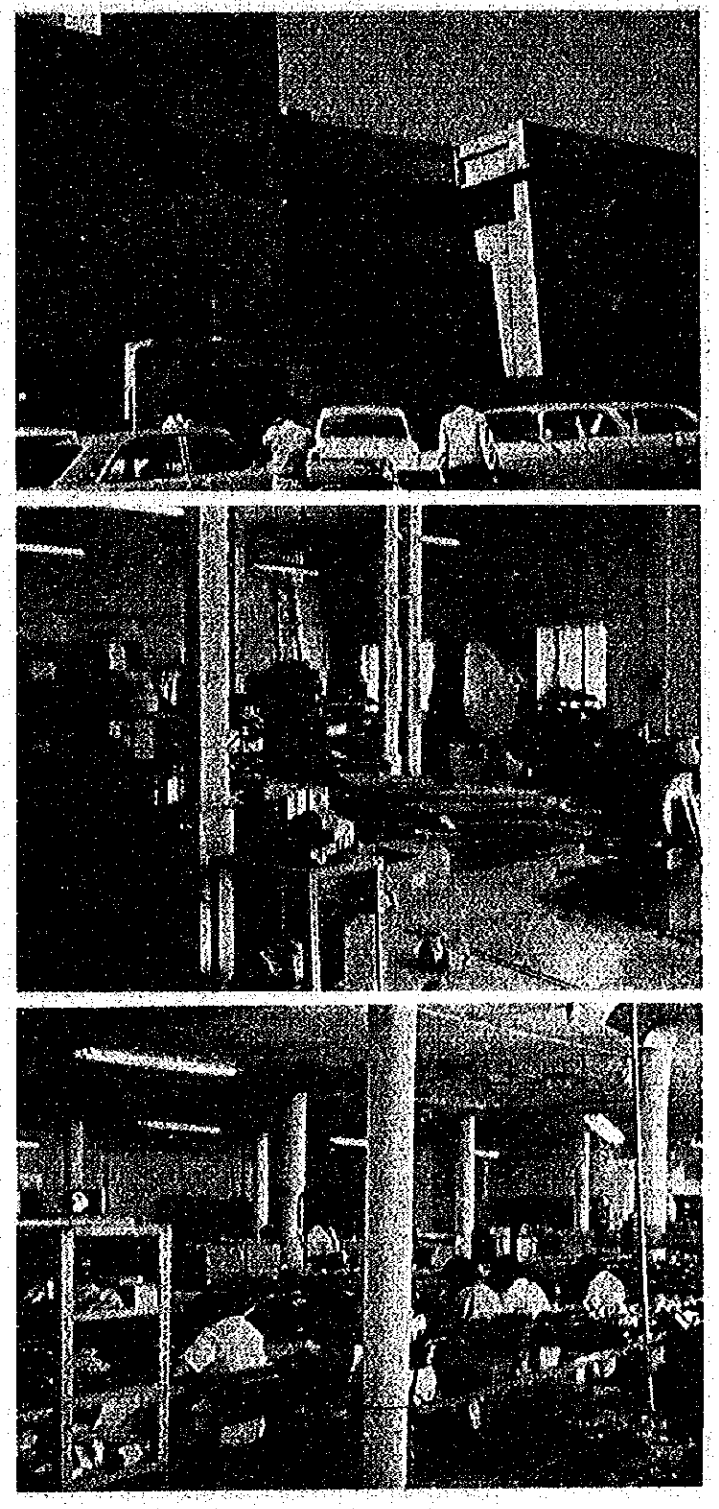


ZAFARANIAセンター設置場所の検討

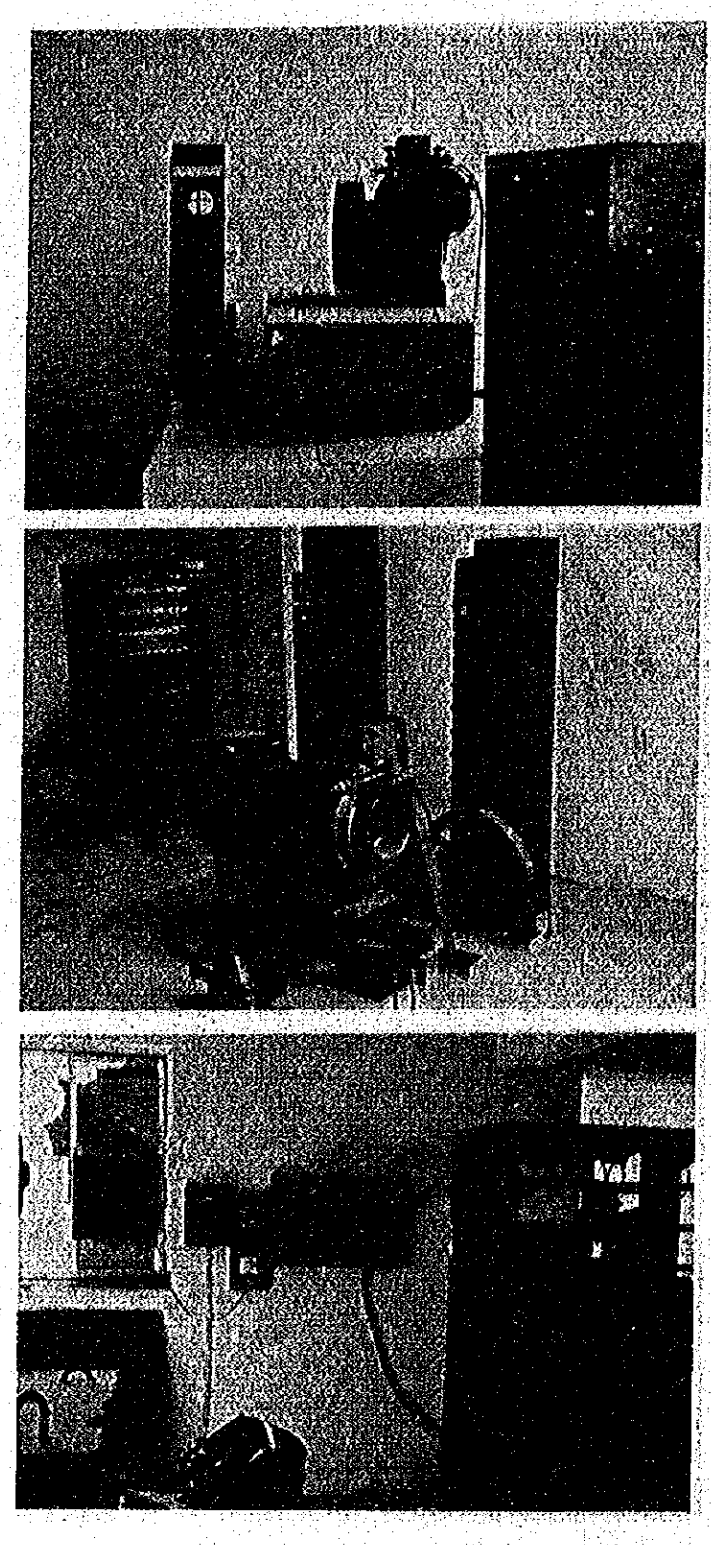
バグダット市街



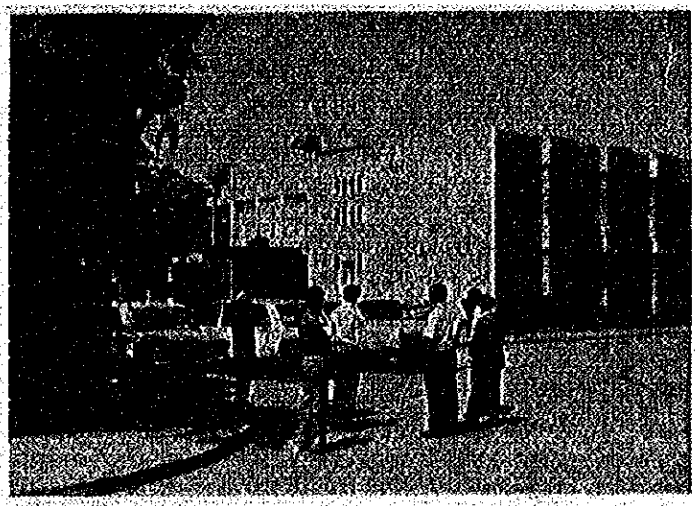
バグダード市街建築状況

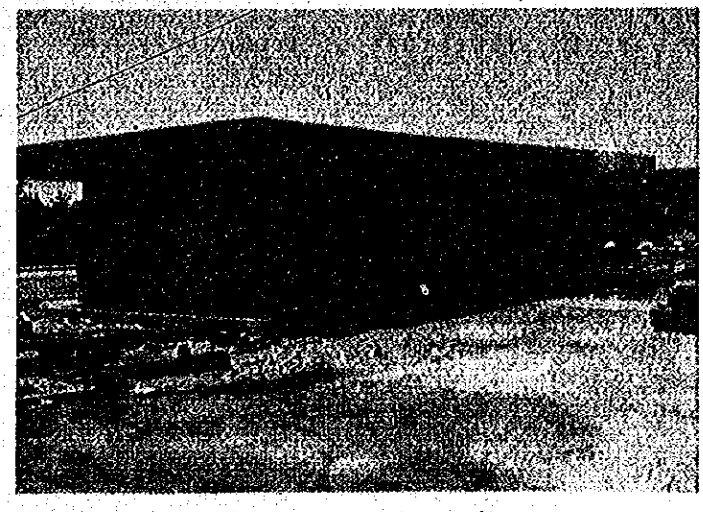


TV第2工場　上より　前景　1階工作場　2階組立場

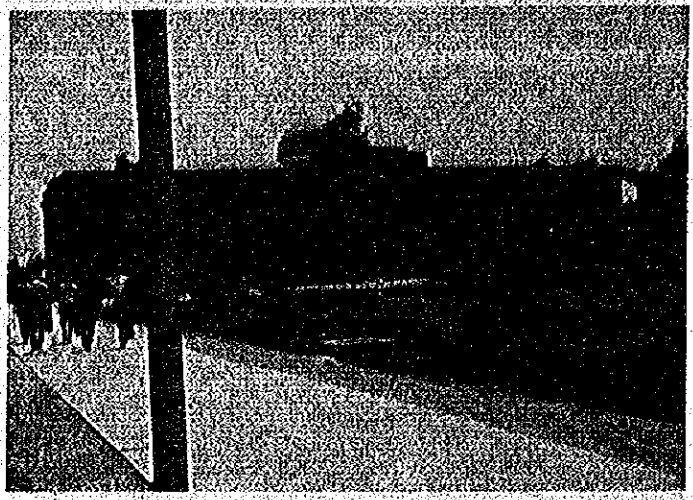


S.O.I.D. 設置　4人乗・6人乗リフトの機械室





石油産業訓練センター
- 本　館
- 電機教室
- 石油レクチャールーム



上　段　鉄骨プレハブ構造（西独製）

下　段　Institute of technology 本館

# 目　　次


Ⅰ　調査団員名簿 …… 1

Ⅱ　調査団の行程 …… 2

Ⅲ　派遣目的 …… 3

Ⅳ　交渉経過 …… 3

Ⅴ　合意議事録（英文） …… 6

Ⅵ　合意議事録（訳文） …… 13

参考資料

（調査団持参資料）

# Ⅰ 調 査 団 名 簿

| | | | |
|---|---|---|---|
| 団　長 | 酒井正巳 | 総括兼エレベータ部門担当 | 社団法人日本エレベータ協会 |
| 副団長 | 佐野美則 | 業務調整兼研修教育担当 | 国際協力事業団<br>鉱工業開発協力部参事 |
| 団　員 | 喜多久雄 | 冷凍空調機器部門担当 | 社団法人日本冷凍空調工業会 |
| 〃 | 安室辰夫 | 施設および行政部門担当 | 建設省大臣官房営繕計画課<br>課長補佐 |
| 〃 | 小林一美 | 一般用電子機器部門担当 | 社団法人日本電子機械工業会 |

## Ⅱ　調査団の行程

| 月 | 日 | 曜日 | 行程 |
|---|---|---|---|
| 8 | 23 | 土 | 東京発・ボンベイ着。 |
| | 24 | 日 | ボンベイ発・バクダッド着。 |
| | 25 | 月 | 在イラク大使館表敬と打合せ。<br>工業・鉱物省工業開発局にてイラク側代表（Dr. F. Jalal 以下4名）と打合せ。 |
| | 26 | 火 | テレビ工場およびセンター設置予定地（Zafarania）視察。 |
| | 27 | 水 | Tsaining Centen for Oil Industsy 視察。<br>State Organigation of Industrial Design and Construction（S. O. I. D. A. C.）との打合せ。 |
| | 28 | 木 | 工業開発局にてイラク側代表と討議。 |
| | 29 | 金 | バビロン地区視察。 |
| | 30 | 土 | 計画省にて関係者と討議。<br>大林組（バクダットにて架橋工事請負中）と懇談，建築事情につき聴取。 |
| | 31 | 日 | S. O. I. D. A. Cにて関係者と建物関係につき討議。 |
| 9 | 1 | 月 | Institute of Technology 視察。 |
| | 2 | 火 | S. O. I. D. A. Cにて関係者と建物関係につき討議。<br>工業開発にてイラク側代表と討議。 |
| | 3 | 水 | University of Technology およびHilal Industrial Co., S. A. 視察。 |
| | 4 | 木 | 調査結果とりまとめ。 |
| | 5 | 金 | Light Industry Co., S. A. 視察。<br>African Iraq Trading Co.,よりエレベータ事情につき聴取。 |
| | 6 | 土 | 工業開発局にてイラク側代表と最終打合せ。 |
| | 7 | 日 | 工業開発局にて合意議事録に署名。 |
| | 8 | 月 | バクダッド発・テヘラン着<br>在イラン大使館表敬，中近東における建築資材入手事情につき聴取。 |
| | 9 | 火 | テヘラン発。 |
| | 10 | 水 | 東京着 |

## Ⅲ　派遣目的

１９７４年１１月より１２月にいたる間の事前調査団の結論にもとづき，本実施調査団は，バクダット郊外Zafaraniа 地区に設置するイラク電機産業訓練センターの開設までの建設段階を具体化する目的をもって，１９７５年8月２３日より9月１０日の間イラク共和国に派遣された。

## Ⅳ　交渉経過

上記目的をもって，日本案であるエレベータ，冷凍空調機器および一般用電子機器の３訓練コースについて，次に示すAおよびBの２プランをもって資料を準備し，イラク側代表と交渉を重ねた。

| | PIan Aによる<br>訓練生数／年 | PIan Bによる<br>訓練生数／年 |
|---|---|---|
| エレベータ・コース | ３０　名 | １８　名 |
| 冷凍空調機器・コース | ３０　名 | １８　名 |
| 一般用電子機器・コース<br>（ラジオ，T.V.，電卓） | ６０　名 | ３０　名 |
| 合　　計 | １２０　名 | ６６　名 |

現地到着の翌日，本センターの当局であるイラク共和国工業・鉱物省工業開発局の局長，Dr. F. JaIaI に本調査団の目的を説明し，準備した下記資料（持参資料）を提示し検討を依頼，本調査の結論として討議議事録をまとめ，それに署名することとした。

資料内容

- 各訓練コースの訓練目的
- カリキュラム項目および訓練期間３年間の時間割
- 必要教官数と日本に受入れ予定の研修員の人数の関係
- 必要訓練機材・工具・測定器具の詳細一覧表
- 運営組織図
- エレベータ訓練搭のレイアウト図

○ 開校までの建築，派遣専門家，受入研修員，機材等のスケジュールおよび建築レイアウトプラン図

イラク側で資料の検討期間中，イラク共和国の訓練センター，学校，工場等の現状視察を行ったが，これにより日本側持参の計画案の前提条件と内容に関して，イラク側と討議する際には基本的に計画案通り進行し得るとの確信を得た。なお，資料についてイラク側より各国製で且つ多岐にわたる機種に対応し得る技能者の養成と，部品不足による保守上の問題点の解決の要請があった。これに対して，訓練用基本機種機材の厳選とこれ等の保守技術のマスターによる広い応用技能の訓練および必要スペア部品の準備と管理技術の習得の必要性を痛感した。

議事録に関してはイラク側は時間と予算の節約を理由に規模縮小案に同意し，コースは3訓練コースでPlanBを基本とすることとした。主要討議事項は下記のとおりである。

1） 機材に関する日本政府の対外援助基本方針の説明

日本政府方針としては，発展途上国援助のうち，資源保有国に対してはソフトウェアを中心とし，ハードウェアは有償を原則とする旨を説明し，保有国であるイラク側の資材費用負担に関する協力を要請した。

これに対しイラク側は発注仕様書作成に要する多大の労力，時間および機材購入の経費負担のために，日本に対して機材の全額負担を要求してきたが，結局，日本側にて仕様詳細を示す機材の各カタログを準備することで了解に達した。さらに日本側負担分を金額又は必要全金額の負担比率で表示することを要求してきたがこれを拒否した。イラク側は執拗に日本側負担分の増額を迫ったが，日本側より(1)市場より容易に入手可能な機材（工具機具類），(2)訓練用エレベータのごとき据付をともない且つ建物の一部を構成するものはイラク側負担とすることを了解させ，最終的にAnnex Vに日本側負担の機材名一覧表を各コースごとに明記することとした。ただし，表現はincluding these provided in Annex Vとし，日本側供与機材の追加に対する多少の余地を残した。

2） 議事録の有効期間について

3年間又は建設完了の時までとし，これを当方持参の原案の本文より前文に移した。イラク側は開校後における日本側の協力の保証に関する文言の記載を強く要望してきたが，これは本調査団の任務外のことはあったが，イラク側の要望を入れソフトウェア（日本人専門家の派遣とイラク研修員受入れを意味する）の一部として日本人専門家が開校後の運営に協力することを約した。

また，本議事録の発効は，イラク側では本件について予算措置を講ずる必要があるため，関係当局の承認を要するとのことだったので，承認完了の際には，その旨の文書を日本政府に発信することとし，その日付をもって発効することとした。

3） 開校時期について

本件はイラク側責任分野のセンター建設の完了時期により左右されるものであり，１９７８年の可能な限り早い時期とした。

4） 研修員について

渡航費を日本側負担とする旨の記載と人数（１０名以上）の明示の要求があったが，渡航費は日本側負担であることを口頭にて説明した。人数については，現時点で確定することはさけ，必要数ということを記載することで了解に達した。

5） 日本人専門家の特権等について

日本人専門家の日常生活必需品全般にわたる輸入税免除の項については，イラク側の異議を認め，イラク側から議事録の4.(1).dのa fully furnished comfortable accommodationには，必需品全般を備えるとの説明があったので，今回は自動車のみについて記載することとした。

○ 建築レイアウトプランについて下記のような結論を得た。

1） 夏季を考慮し出入口，建屋は北向きとする。

2） 訓練生用宿舎は不要とする。

3） ダイニングルームを設ける。

4） 日本人専門家宿舎はフェンスを設ける。

5） 実習棟は鉄骨構造とし管理棟，エレベータ実習塔は R. C. とする。

6） 国道１７号側は空地とし，将来の増設は反対側を使用する。

7） 日本側は基本設計に参画，工業・鉱物省のState Organization of Industrial Design and Construction（S．O．I．D．A．C.）が建築の設計・施工・監理を行う。

8） S．O．I．D．A．C.には建築技術者および設備（給排水，電気，空調等）の技術は，十分存在するとのことであったので，有償派遣を前提として日本側から提案した日本人技術者の協力は必要でない。

# V　合意議事録（英文）

## ON THE RECORD OF DISCUSSIONS BETWEEN THE JAPANESE IMPLEMENTATION SURVEY TEAM AND THE MINISTRY OF INDUSTRY AND MINERALS STATE ORGANIZATION OF INDUSTRIAL DEVELOPMENT OF THE GOVERNMENT OF THE REPUBLIC OF IRAQ

The Japanese Implementation Survey Team (hereinafter referred to as 'the Team') organized by the Japan International Cooperation Agency, headed by Mr. Masami Sakai, the Japan Elevators Association, visited the Republic of Iraq from August 24th, to September 8th, 1975 for the purpose of working out details of the Project for the establishment of the Iraq Training Center for Electrical and Electronic Industries (hereinafter referred to as 'the Project').

On the basis of the results of the prelimianry survey in November and December 1974, the Team conducted a survey and exchanged views with the Ministry of Industry and Minerals of the Government of the Republic of Iraq.

The Record of Discussions includes construction stage which is a 3-year period or until the end of construction, to be followed by a subsequent operation stage for which the Japanese Government will take the necessary measures to prepare the required experts in order to operate the Center efficiently and immediately after inauguration, as part of the software plan. (Technical assistance in the form of sending Japanese experts to Iraq and accepting Iraqi trainee's in Japan at the expense of the Japanese Government.)

The Japanese Team agreed to recommend to its own Government the matters referred to in the Record of Discussions attached herewith. The Iraqi Delegation, on the other hand, will prepare a report indicating the cost and other details concerning the Center to the Iraqi Authorities concerned for approval and financial allocations.

Therefore, this Record of Discussions will be in force from the date of the letter of approval submitted by the Iraqi Authorities concerned to the Government of Japan.

Written in duplicate in English at Baghdad, on September 7, 1975.

| | |
|---|---|
| For the Japan International Cooperation Agency. | For the Ministry of Industry & Minerals, State Organization of Industrial Development. |
| Masami Sakai, Leader of the Team | Dr. Ferhang Jalal, President |

## RECORD OF DISCUSSIONS

1. Desiring to assist the self-sustaining development of manpower in the Republic of Iraq and the industrial development of the country, the Government of Japan will cooperate with the Government of the Republic of Iraq in the field of electrical and electronic industries at the Center to be located in Zafarania.

2. The outline of the Project:

   (1) The Project will be carried out in the three courses as listed in Annex I. These courses comprise respectively two (2) stages: the first is the basic course and the second is the advanced course.

   (2) The duration of each training course will be thirty six (36) months including the period of eighteen (18) months to the basic course and that of eighteen (18) months to the advanced course, respectively.

   (3) The trainees to be admitted to the Center must have nine years' schooling. The number of trainees is listed in Annex I.

   (4) The Center will be inaugurated at the earliest possible date in 1978.

3. The measures to be taken by the Government of Japan:

   (1) In accordance with laws and regulations in force in Japan, the Government of Japan will take necessary measures to provide at its own expense the requisite services of Japanese experts for the purpose of advancing the objectives of the Center and further promoting cooperation in preparation for establishing the Center as listed in Annex II.

   (2) The Japanese experts will carry out the duties as listed in Annex III.

   (3) a. In accordance with laws and regulations in force in Japan, the Government of Japan will take necessary measures to provide at its own expense equipment, machinery, instruments and other materials required for the establishment of the Center.

   b. The goods referred to above will become the property of the Government of the Republic of Iraq upon being delivered C.I.F. at the port of disembarkation to the Authorities concerned of the Republic of Iraq.

   c. The goods referred to above will be utilized exclusively for the implementation of the Project upon the advice of the Japanese Chief Advisor.

d. The goods referred to above will be subject to close consultation between Japanese and Iraqi sides for the purpose of successful transportation to and installation at the Center.

(4) In accordance with laws and regulation in force in Japan, the Government of Japan will take necessary measures to receive at its own expense the Iraqi counterpart personnel associated with the Project for technical training in Japan up to the necessary number required for the Center.

4. The measures to be taken by the Government of the Republic of Iraq:

(1) In accordance with laws and regulations in force in the Republic of Iraq, the Government of the Republic of Iraq will take necessary measures to provide at its own expense:

a. The services of the Iraqi counterpart personnel for the preparation of inauguration of the Center as listed in Annex IV.

b. Requisite land and all the necessary buildings for the Center.

c. Equipment, machinery, instruments and other materials necessary for the establishment of the Center except for those provided by the Government of Japan at its own expense including those listed in Annex V.

d. A fully furnished comfortable accommodation for each Japanese expert and his family.

(2) In accordance with laws and regulations in force in the Republic of Iraq, the Government of the Republic of Iraq will take necessary measure to meet:

a. Expense necessary for construction works of the Center.

b. Expense necessary for the transportation of the goods provided by the Government of Japan as well as for their installation, operation and maintenance.

c. Customs duties and any other charges, if any, as may be imposed upon the goods provided by the Government of Japan to the Republic of Iraq.

d. Expense for the internal travel in Iraq of the Japanese experts on duty.

e. Expense for vehicle with driver for the Japanese experts during working hours including transportation from and to house.

5. The Japanese experts will be granted in the Republic of Iraq, the privileges, exemptions and benefits as listed in Annex VI no less favorable than those granted to the experts of any third country under similar circumstances.

6. The Government of the Republic of Iraq undertakes to bear claims, if any arises, against the Japanese experts resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Iraq, except for those claims arising from the willful misconduct or gross negligence of the Japanese experts.

7. The Government of the Republic of Iraq will take necessary measures to ensure that the knowledge and experiences acquired through the Iraqi counterpart personnel will be utilized effectively for the implementation of the Project.

8. (1) President of the State Organization of Industrial Development, the Government of the Republic of Iraq will have the overall responsibility for the implementation of the Project.

(2) The Director of the Center will be responsible for the construction and operation of the Center, while the Japanese Chief Advisor will be responsible primarily for technical matters and give advice to the Director of the Center on other matters whenever so requested by the latter.

9. There will be mutual consultation between the two Governments on any matter arising from the implementation of the Project.

## ANNEX I.
## THE COURSES AND THE NUMBER OF TRAINEES

| Training Course | Number of Trainees |
|---|---|
| a) Electric lift course | 18 |
| b) Air-conditioning and refrigeration equipment course | 18 |
| c) Radio, T.V. and electronic calculating machines course | 30 |

## ANNEX II.
## JAPANESE EXPERTS

(1) Chief advisor

(2) Expert on:

a) Electric lift
b) Air-conditioning and refrigeration equipments
c) Radio, T.V. and electronic calculating machines
d) Building

## ANNEX III.
## DUTIES OF THE JAPANESE EXPERTS

(1) Duties of the Japanese Chief Advisor

a) Overall advice on the preparation of a basic plan for the establishment of the Center.
b) Overall advice on training programme and training activities in each training course.
c) Overall advice on the preparation of the curricula including, if required, dispatch of Japanese experts for this purpose as well as on technical training in Japan of officials of the Republic of Iraq associated with the activities of the Center.
d) Overall advice on the preparation of the list of equipment and machinery necessary for the operation of the Center.
e) Overall advice and cooperation pertaining to preparatory stage of the establishment of the Center including transportation, installation, test run and maintenance of goods to be provided by the Government of Japan.
f) Overall advice and cooperation pertaining to the construction of the Center.
g) Overall advice and cooperation concerning the selection and training of the Iraqi counterparts.
h) Other instruction activities.

(2) Duties of the Japanese Experts:

a) Advice on the preparation of a basic plan for the establishment of the Center.
b) Planning of training programme and conducting training activities in each training course.
c) Advice on the preparation of the list of equipment and machinery necessary for the operation of the Center.
d) Advice and cooperation to the technical matters including curricula, pertaining to each training course.
e) Advice and cooperation to the technical matters on transportation, installation, test run and maintenance of goods and machinery to be provided by the Government of Japan.
f) Other duties directed by the Japanese Chief Advisor.

## ANNEX IV.
## IRAQI STAFF

(1) Director of the Center

(2) Administrative Staff:
Employees including typists, clerks and drivers.

## ANNEX V.

1. Electric Lift Course

(1) Traction Machine Assembly
(2) Governor Sets
(3) Car, Platform Sets
(4) Safety Assembly
(5) Selector Assembly
(6) Door Engine Assembly
(7) Consumptive Parts or Devices

2. Air-Conditioning and Refrigeration Course

(1) Training Unit
(2) Refrigeration System Pannel Board
(3) Psychrometric Test Instrument
(4) Open Type Compressor
(5) Semi Hermatic Compressor

(6) Hermatic Compressor
(7) HMC Compressor
(8) Assorted Cutway Model
(9) Assorted Jigs and Tools for Compressor
(10) Packaged Air-Conditioner
(11) Water Chiller
(12) Fan Coil Unit
(13) Room Air-Conditioner
(14) Condensing Unit
(15) Cooling Unit
(16) Display Case
(17) Cooling Tower
(18) Ice Machine
(19) Water Cooler
(20) Walk in Storage Room

3. General Electronic Apparatus Course

(1) Color Television
(2) Parts Kit of Color Television
(3) Black & White Television
(4) Parts Kit of Black & White Television
(5) Signal Injector
(6) Shield Room
(7) Radio
(8) Radio Kit Part
(9) Electronic Calculators
(10) Electronic Calculator for Engineering

## ANNEX VI.
## PRIVILEGES, EXEMPTIONS AND BENEFITS

(1) Exemptions from income tax.

(2) Automobile import privileges will be granted to the Japanese experts during their stay in Iraq for works connected with the Center in accordance with laws, rules, regulations and their ammendments of the Iraqi Government.

(3) Free medical services and facilities.

# VI　合意議事録（訳文）

## 日本国実施調査団とイラク共和国政府工業・鉱物省工業開発局との討議議事録

国際協力事業団により編成された実施調査団（以下調査団と称す）は，酒井正巳（日本エレベータ協会）を団長とし，１９７５年８月２４日より９月８日までの間，イラク電機産業訓練センターの設立プロジェクト（以下本プロジェクトと称す）の細目を策定する目的をもってイラク共和国を訪問した。

本調査団は，１９７４年１１月より１２月の間に派遣された事前調査の成果にもとづき，イラク共和国政府の工業鉱物省とともに調査を実施し，意見の交換を行った。

本議事録はセンター建設段階の３年間または建設終了までの協力に関する討議をまとめたもので，引きつづき次の運営段階において，日本政府はセンター開設後有効且つ迅速にセンターを運営するため，ソフトウエアプランの一部（日本人専門家のイラク派遣とイラク研修員の日本受入を日本政府負担にて実施する技術協力を称す）として，必要な数の専門家の派遣に対し必要な措置を講ずることとする。

本調査団は，ここに添付する本議事録に掲げる諸事項を日本政府に提言することに同意するものであり，一方イラク代表はイラク当局の承認と予算措置を講ずるため，センターの経費とその他の細目を示す報告書を準備するものとする。

従って，本議事録は日本政府に対するイラク当局からの承認した旨の書簡の日付をもって発効するものとする。

１９７５年９月７日，英文にて２部作成した。

| | |
|---|---|
| 日本側：　国際協力事業団を代表して | イラク側：　工業・鉱物省工業開発局を代表して |
| 調査団長　酒　井　正　巳 | 局　長　フェルハング　ジャラール |

# 討　議　議　事　録

1. 日本国政府は，イラク共和国の人材の養成と，同国の工業開発を援助することを切望しつつ，イラク共和国政府に対しザファラニヤに設置予定のセンターに対し電気および電子産業の分野において協力を行うこととする。

2. 本プロジェクトの概要

(1) 本プロジェクトはAnnex Ⅰに示すコースを実施することとする。本コースは最初の基礎コースと，それにつづく上級コースから構成される。

(2) 各コースの期間は３６カ月とし，基礎コースは１８カ月，また上級コースは１８カ月とする。

(3) センター入所の訓練生は，９年教育修了者であり，その定員はAnnexⅡ．に示すとおりである。

(4) センターは１９７８年の可能な限り早期に開設されるものとする。

3. 日本国政府の執るべき措置

(1) 日本国政府は，自国において施行されている法令に従って，自己の負担においてAnnex Ⅱに示すセンター設立準備に対して協力を進めるため，これに必要な日本人専門家を派遣することとする。

(2) 日本人専門家はAnnex Ⅲに示す任務を遂行することとする。

(3) a．日本国政府は，自国において施行されている法令に従って，自己の負担においてセンター設立に必要な設備，機械，器具およびその他必要な物品を供与することとする。

b．上記機材はＣＩＦだてで降し港においてイラク共和国の財産となるものとする。

c．上記機材は，本プロジェクト遂行の目的に専ら使用され，日本人チーフ・アドバイザーの助言にもとづいて利用されるものとする。

d．上記機械のセンターへの輸送および据付けを円滑に行うため，日本・イラク両国は緊密に協議するものとする。

(4) 日本国政府は，自国で施行されている法令にもとづき，本プロジェクトの推進に必要なイラク側研修員を技術訓練のため必要数日本に受入れることに対し，必要な措置を講ずることとする。

4. イラク共和国政府の執るべき措置

(1) イラク共和国政府は，自国で施行されている法令に従って，自己の負担において次の諸

事項の実施に対して必要な措置を講ずることとする。

a. センターの開設準備に必要なイラク側要員の役務提供

b. センターに必要な土地・建物の提供

c. 日本国政府負担にて供与されるAnnex Ⅴ. に示す機材以外の必要な設備，機械，器具およびその他の物品の提供

d. 日本人専門家とその家族に対し，完全に家具つきで且つ快適な住居の提供

(2) イラク共和国政府は，自国で施行されている法令に従って，次の諸事項に対して必要な措置を講ずることとする。

a. センター建設作業に必要な経費

b. 日本国政府供与の機材の輸送と，その設置，運転および保守に必要な経費

c. 日本国政府がイラク共和国に供与する機材に対し，関税を要する場合はその負担

d. 日本人専門家の業務上の国内旅費

e. 日本人専門家に対する通勤のための住居往復を含み，職務遂行中における運転手付き自動車

5. イラク共和国政府は，日本人専門家に対し，同一の条件において同政府が第三国専門家に対して供与するのと同等のAnnex Ⅵ. に示す特権，免除，便宜を供与すること。

6. イラク共和国政府は，日本人専門家のイラク共和国における職務の遂行に起因し，その遂行中に発生し，または，その遂行に関連して発生する，日本人専門家に関する請求が生じた場合には，その請求に対する責任を負うことを確約する。但し，日本人専門家の故意または重大な過失から生ずる責任についてはこの限りではない。

7. イラク共和国政府は，イラク側カウンターパート研修員が得た知識と経験が本プロジェクト遂行上有効に活用されるよう，必要な措置を講ずることとする。

8.(1) イラク共和国政府工業開発局長は，本プロジェクト遂行上の全責任を有することとする。

(2) センターの所長はセンター設立運営上の責任を有し，日本人チーフ・アドバイザーは主として技術的事項とセンター所長よりの要望によるその他の事項に対し，助言を行う責任を有することとする。

9. 本プロジェクト遂行上発生するいかなる事項に関しても両国政府は緊密に協議を行うこととする。

## ANNEX Ⅰ

### コースと訓練生の数

| コース名 | 訓練生数 |
|---|---|
| a　エレベータ・コース | 18名 |
| b　冷凍空調機器・コース | 18名 |
| c　ラジオ・T。V.・電卓コース | 30名 |

## ANNEX Ⅱ

### 日本人専門家

(1)　チーフ・アドバイザー

(2)　下記の専門家

a　エレベータ

b　冷凍空調機器

c　ラジオ，T。V.，電卓

d　建築

## ANNEX Ⅲ

### 日本人専門家の任務

(1)　日本人チーフ・アドバイザーの任務

a　センター設立のための基本計画の準備に対する助言　全般

b　各コースの訓練計画および訓練活動に対する助言　全般

c　カリキュラムの準備，必要があればその目的のために日本人専門家の派遣ならびにセンターの活動に関係するイラク共和国公務員の日本における技術訓練に関する助言　全般

d　センター運営上必要な設備，機械，器具のリストの準備に関

する助言全般

e　日本国政府供与の機材の輸送，設置，試運転，維持管理を含むセンター設立の準備段階に関する協力事項の助言全般

f　センター建設に関する協力事項の助言全般

g　イラク側カウンターパートの選考，訓練に関する協力事項の助言全般

h　その他の助言活動

(2)　日本人専門家の任務

a　センター設立のための基本計画の準備に関する助言

b　各コースの訓練計画立案と訓練活動の実施

c　センターの運営上必要な設備，機械のリストの準備に関する助言

d　各コースのカリキュラムを含む技術的協力事項に関する助言

e　日本国政府供与の機材の輸送，設置，試運転，維持管理に関する技術的協力事項の助言

f　その他日本人チーフ・アドバイザーの指示する事項

## ANNEX Ⅳ

イラク共和国スタッフ

(1)　センター所長

(2)　管理要員：タイピスト，事務員，運転手を含む要員

## ANNEX Ⅴ

1.　エレベータ・コース

(1)　トラクションマシン組立品

(2)　ガバナーセット

(3)　かご組立品

(4) 非常止め組立品

(5) セレクター組立品

(6) ドア機構

(7) 消耗部品

2. 冷凍空調機器・コース

(1) 訓練ユニット

(2) 冷凍システムパネルボード

(3) サイクロメトリック試験機

(4) オープンタイプコンプレッサー

(5) セミハーマティックコンプレッサー

(6) ハーマティックコンプレッサー

(7) HMCコンプレッサー

(8) カットアウエイモデル組立品

(9) コンプレッサー用シグ工具組立品

(10) パッケージ形エアコン

(11) ウォーターチラー

(12) ファンコイルユニット

(13) ルームエアコン

(14) コンデンスユニット

(15) クーリングユニット

(16) ディスプレイケース

(17) クーリングタワー

(18) アイスマシン

(19) ウォータークーラー

(20) 冷蔵庫用組品

3. 電子コース

(1) カラーT。V.

(2) カラーT。V.部品キット

(3) 白黒T。V。

(4) 白黒T。V。部品キット

(5) シグナルインジェクター

(6) ジールドルーム

(7) ラジオセット

(8) ラジオキット

(9) 電卓

(10) 工業用電卓

## ANNEX Ⅵ

### 特権免除および便宜

(1) 所得税免除

(2) 自動車輸入特権をセンター関連業務のためイラク滞在中の日本人専門家に対し，イラク共和国政府の法令およびその改正法令に従い供与すること。

(3) 医療設備サービスの無償供与

# 参考資料

（調査団持参資料）

# THE JAPANESE IMPLEMENTATION STUDY TEAM

# FOR

# THE ESTABLISHMENT OF THE IRAQ ELECTRICAL and ELECTRONIC INDUSTRIES TRAINING CENTER

August, 1975

Japan International Cooperation Agency

CONTENTS

List of Members of the Japanese Implementation Study Team..... 1

Objective & Substance of Each Training Course..... 2

Curriculum of Training Course for Electric Lift..... 4

Curriculum of Training Course for Airconditioning & Refrigeration Equipment..... 6

Curriculum of Training Course for General Electronic Apparatus..... 8

Areas of Studies for Electric Lift Training Course (Technics)..... 11

Areas of Studies for Airconditioning & Refrigeration Equipment Training Course (Technics)..... 16

Areas of Studies for General Electronic Apparatus Training Course (Technics)..... 22

Schedule of Training Course for Airconditioning & Refrigeration Equipment..... 35

Schedule of Training Course for General Electronic Apparatus..... 37

Required Number of Teachers, Instructors & Assistants..... 40

Iraqi Teachers & Instructors Training Schedule for Electric Lift..... 41

Iraqi Teachers & Instructors Training Schedule for Airconditioning & Refrigeration Equipment..... 42

Iraqi Teachers & Instructors Training Schedule for General Electronic Apparatus..... 44

Aids & Materials for Electric Lift Training Course..... 45

- Specification of Training Lifts..... 46
- Training Equipments..... 48
- Instruments for Measuring & Testing..... 49
- General Hand Tools for Traineees..... 51
- Common Tools..... 53

Aids & Materials for Airconditioning & Refrigeration Equipment Training Course..... 57

- Measuring..... 59
- Drawing..... 61

Refrigerating Engineering..... 62

Airconditioning Engineering..... 63

Installation Design..... 64

Piping..... 65

Welding..... 66

Wiring..... 67

Refrigerant Piping..... 69

Ducting..... 70

Assembly & Disassembly..... 72

Construction..... 74

Other Practices..... 76

Office Appliances..... 79

Aids & Materials for General Electronic Apparatus Training Course..... 80

Equipments for Technical Subject..... 81

Equipments for Television Course..... 83

Equipments for Radio Course..... 85

Equipments for Electronic Calculator..... 87

Iraqi Electrical & Electronic Industries Training Center Pilot Plan Buildings List..... 89

Organization..... 90

Rough Dimension of Electric Lift..... 91

Tentative Schedule for Establishing Iraq Electrical & Electronic Industries Training Center ..... 94

Appendix 1

LIST OF MEMBERS OF THE JAPANESE IMPLEMENTATION STUDY TEAM FOR THE ESTABLISHMENT OF THE IRAQ ELECTRICAL AND ELECTRONIC INDUSTRIES TRAINING CENTER

| | | |
|---|---|---|
| MR. MASAMI SAKAI | Leader | Japan Elevator Association (Hitachi, Ltd.) |
| DR. MINORI SANO | Sub-Leader | Technical Cooperation Division, Mining & Industrial Development Cooperation Department, Japan International Cooperation Agency (JICA) |
| Mr. HISAO KITA | | Refrigeration & Airconditioning Industries Association of Japan (Hitachi, Ltd.) |
| MR. TATSUO YASUMURO | | Government Buildings Department, Ministry of Construction |
| MR. KAZUMI KOBAYASHI | | Electronic Industries Association of Japan (Tokyo Shibaura Electric Co., Ltd.) |

# Objective & Substance of Each Training Course

## Electric Lift Training Course

(1) Objective

This course is to have the purpose of providing workers with technical knowledge and skills required for preventive maintenance services and minor repair concerning electric lifts, mainly AC and GD type.

(2) Substance of Training

(i) Mastering of essential technique concerning safety maintenance of electric lifts.

(ii) Understanding of the importance of cooperative work and sense of responsibility.

## Airconditioning & Refrigeration Equipment Training Course

(1) Objective

This course is to have the purpose of providing workers with technical knowledge and skills required for repair and maintenance services concerning airconditioners and refrigerators.

(2) Substance of Training

(i) Mastering of essential technique concerning repair and maintenance of airconditioners and refrigerators with a reciprocating type compressor under the inspection of well-experienced engineer.

(ii) Understanding of the importance of sense of responsibility.

Note:

1. The airconditioning and refrigeration is concerned with the science based on such as mechanical engineering, electrical engineering and so on. Students must have enough capability to learn these engineerings and enough ability to enter technical high school.

2. If the graduates receive retraining in the training center after 2~3 years' working, they will improve their ability in handling more sophisticated equipments.

3. The performance of airconditioning and refrigeration equipment is decided by the designing and installation of equipment as well as power of it. Therefore, the suppliers or engineering contractor should be responsible for the performance.

General Electronic Apparatus Training Course

(1) Objective

This course is to have the purpose of providing workers with technical knowledge and skills required for repair and adjustment services concerning television sets, radios and electronic calculators.

(2) Substance of Training

(i) Mastering of essential technique concerning assembling, wiring, repair and adjustment of television sets, radios and electronic calculators, and concerning the using method of measuring equipments.

(ii) Understanding of the importance of sense of responsibility.

Appendix 3

## Curriculum of Training Course for Electric Lift

| | | | | |
|---|---|---|---|---|
| Basic | | 1) | Mathematics | 300 hr |
| | | 2) | Physics | 300 |
| | | 3) | English | 300 |
| | | 4) | Athletics | 200 |
| Adjustment | | | Review time | 100 |
| Technics | I General | 1) | Mechanical engineering | 44* |
| | | 2) | Electrical engineering | 88* |
| | | 3) | Production control engineering | 44* |
| | | 4) | Construction engineering | 66* |
| | | 5) | Measuring | 44 |
| | | 6) | Safety | 22* |
| | II Basic Practice | 1) | Basic maintenance | 50 |
| | | 2) | Safety of work | 60 |
| | | 3) | Ordinance of regulation | 50 |
| | | 4) | Maintenance training | 100 |
| | | 5) | Adjustment of electrical circuit (1) | 250 |
| | | 6) | Adjustment of electrical circuit (2) | 350 |
| | | 7) | Mechanical assembling structure | 400 |
| | III Applied Practice | 1) | AC TYPE maintenance training | 100 |
| | | 2) | AC TYPE adjustment training | 75 |
| | | 3) | AC·GD TYPE maintenance works | 150 |
| | | 4) | GD TYPE adjustment training | 75 |
| | | 5) | Checking & repair training | 97 |
| | | 6) | Inspection training | 75 |
| | | 7) | AC·GD TYPE trouble shoot training | 50 |

Note) * are common with Airconditioning & Refrigeration Equipment Training Course.

Total Time Table 3400 hr

| Basic | Adjustment | Technics | | |
|---|---|---|---|---|
| | | General | Basic Practice | Applied Practice |
| 1100 hr | 100 hr | 308 hr | 1260 hr | 632 hr |

Appendix 4

## Curriculum of Training Course for Airconditioning & Refrigeration Equipment

| | | | | |
|---|---|---|---|---|
| Basic | | 1) Matematics | 300 | hr |
| | | 2) Physics | 300 | |
| | | 3) English | 300 | |
| | | 4) Athletics | 200 | |
| Adjustment | | Review time | 100 | |
| Technics | I. Class | | | |
| | 1. General | 1) Mechanical engineering | 44 | * |
| | | 2) Electrical engineering | 88 | * |
| | | 3) Production control engineering | 44 | * |
| | | 4) Construction engineering | 66 | * |
| | | 5) Safety | 22 | * |
| | | 6) Materials | 44 | |
| | | 7) Drawing | 88 | |
| | | 8) Rules & standards | 44 | |
| | | 9) Measurements | 44 | |
| | 2. Special | 1) Refrigerating engineering | 66 | |
| | | 2) Refrigerating machines | 66 | |
| | | 3) Airconditioning engineering | 66 | |
| | | 4) Installation engineering | 66 | |
| | | 5) Installation design | 110 | |
| | II. Practice | | | |
| | 1. General | 1) Piping | 44 | |
| | | 2) Welding | 44 | |
| | | 3) Wiring | 132 | |
| | | 4) Measuring | 44 | * |
| | | 5) Construction | 66 | |
| | 2. Applied | 1) Refrigerant piping | 44 | |
| | | 2) Ducting | 44 | |
| | | 3) Assembly & disassembly | 165 | |
| | | 4) Operating | 88 | |
| | | 5) Installation of refrigerating machine | 187 | |

| | | |
|---|---|---|
| | 6) Operating & maintenance | 264 hr |
| | 7) Trouble shooting | 220 |

Note) * are common with Electric Lift Training Course.

Total Time Table 3400 hr

| Basic | Adjustment | Technics | |
|---|---|---|---|
| | | Class | Practice |
| 1100 hr | 100 hr | 858 hr | 1342 hr |

Appendix 5

Curriculum of Training Course for General Electronic Apparatus

| | | | |
|---|---|---|---|
| Basic | | 1) Mathematics | 300 hr |
| | | 2) Physics | 300 |
| | | 3) English | 300 |
| | | 4) Athletics | 200 |
| Adjustment | | Review time | 100 |
| Technics | I. General | 1) Alternating current theory | 100 |
| | | 2) Electromagnetics | 100 |
| | | 3) Semiconductor | 50 |
| | | 4) Electrical parts | 70 |
| | | 5) General machines | 50 |
| | | 6) Transistor circuit | 100 |
| | | 7) Logic circuit | 80 |
| | | 8) Electronic measurement | 60 |
| | | 9) Drafting | 50 |
| | | 10) Regulations | 20 |
| | | 11) Safety & hygienics | 20 |
| | II. Study of Television | 1) Video sound circuit | 20 |
| | | 2) Chroma circuit | 20 |
| | | 3) Synchronization & deflection circuit | 10 |
| | | 4) Power supply circuit | 10 |
| | | 5) CRT & convergence circuit | 20 |
| | III. Practice of Television | 1) Adjustment of black & white TV | 20 |
| | | 2) Adjustment of color TV | 80 |
| | | 3) Repair of black & white TV | 50 |
| | | 4) Repair of color TV | 250 |
| | IV. Study of Radio | 1) AM Radio | 10 |
| | | 2) FM Radio | 20 |
| | | 3) Recording & rerecording | 25 |
| | | 4) Application & attached circuit | 25 |
| | | 5) Electronic parts | 20 |

| | | | | |
|---|---|---|---|---|
| Technics | V. | Practice of Radio | 1) Repair of AM 1 band radio | 20 hr |
| | | | 2) Repair of AM 2 band radio | 40 |
| | | | 3) Repair of FM/AM radio | 70 |
| | | | 4) Repair of AM/caset radio | 80 |
| | | | 5) Repair of FM stereo radio | 80 |
| | | | 6) Repair of phonograph | 80 |
| | | | 7) Repair in General | 50 |
| | VI. | Basic Theory of Electronic Calculator | 1) Summary of the electronic calculator | 5 |
| | | | 2) Operation system of the electronic calculator | 5 |
| | | | 3) Control device | 5 |
| | | | 4) Binary system | 5 |
| | | | 5) Binary system & logical circuit | 5 |
| | | | 6) Boalean algebra | 10 |
| | | | 7) Development of logical axiom from true-value table | 10 |
| | | | 8) Logical elements | 10 |
| | | | 9) Pulse circuit | 10 |
| | | | 10) Logical circuit | 10 |
| | | | 11) Flip flop | 5 |
| | | | 12) Integrated circuit for the electronic calculator | 10 |
| | VII. | Actual State of Electronic Calculator | 1) Relation between each devices and their operation | 5 |
| | | | 2) Input device | 5 |
| | | | 3) Output device | 10 |
| | | | 4) Calculation & control device | 10 |
| | | | 5) Calculation method | 10 |
| | | | 6) Calculation examples & their routine | 50 |
| | | | 7) Power supply circuit | 10 |
| | | | 8) Parallel processing system | 20 |
| | | | 9) Programming for the electronic Calculator | 40 |

| | | | |
|---|---|---|---|
| Practice VIII. | Training for Calculator Repairing & Assembling | 1) Assembly of the personel calculator | 15 hr |
| | | 2) Assembly of the business use calculator | 60 |
| | | 3) Conclusion of calculator assembly | 25 |
| | | 4) Repair for the personal calculator | 30 |
| | | 5) Repair for the business use calculator | 90 |
| | | 6) Conclusion of calculator repair | 30 |

Total Time Table 340 hr

| Baisc | Adjustment | Technics | | | | |
|---|---|---|---|---|---|---|
| | | General | Study of Television | Practice of Television | Study of Radio | Practice of Radio |
| 1100 hr | 100 hr | 700 hr | 100 hr | 400 h5 | 100 hr | 400 hr |

| Technics | | |
|---|---|---|
| Basic Theory of Electronic Calculator | Actual State of Electronic Calculator | Training for Calculator Repairing & Assembling |
| 90 hr | 160 hr | 250 hr |

Areas of Studies for Electric Lift Training Course (Technics)

I-1) Mechanical Engineering

a. Strength of materials
b. Elements of machines
c. Mechanism
d. Machinery
e. Lifts & carriers

I-2) Electrical Engineering

a. Electricity
b. Magnetic-electricity
c. Alterating electricity
d. Single-phase alternating electricity
e. Three-phase alternating electricity
f. Sequence circuit
g. Electric machines
h. Parts & materials for wirings

I-3) Production Control Engineering

a. Organization of enterprises
b. Process control
c. Quality control
d. Installation & mintenance
e. Material control
f. Cost control
g. Safe working
h. Industrial pollution

I-4) Construction Engineering

a. General introduction
b. Structure of buildings
c. Construction of buildings
d. Materials for buildings
e. Utilities

I-5) Measuring

a. Length
b. Pressure, power, work, energy
c. Heat, temperature, internal energy
d. Electric meters
e. Controllers

I-6) Safety

a. Safe working
b. First aids
c. Arrangements & preventions
d. Environmental precautions

II-1) Basic Maintenance

a. Maintenance concept
b. Teamwork training

II-2) Safety of Work

a. Safety-first principle
b. Safe working on height
c. Safe training
d. Safety equipments

II-3) Oridinance of Regulation

a. Regulation
b. Technical standard
c. Report

II-4) Maintenance Training

a. Maintenance practice
b. Field education
c. Operation training

II-5) Adjustment of Electrical Circuit (1)

a. Symbol
b. Sequence
c. Electricity in general
d. Back wiring
e. Driving system
f. Control system
g. Signal system
h. Instruments & tools
i. Adjustment of AC·GD low speed
j. Adjustment of AC·GD high speed
k. Magnetic brake
l. Door operation system

II-6) Adjustment of Electrical Circuit (2)

a. Operation
b. Power source
c. Trabeling cable
d. Selector
e. Adjustment in general
f. Contactor
g. Relay
h. Overcurrent relay & fuse

II-7) Mechanical Assembling Structure

a. Traction machine
b. AC·GD type traction motor
c. Magnetic bracke arrangement
d. Door operating mechanism
e. Safety
f. Safety device arrangements
g. Buffer
h. Governor
i. Mechanical device in hoist way

j. Wire rope (hoisting wire, governor wire)
k. Steel tape
l. Bearing
m. Plunger
n. Door interlock device
o. Coupling
p. Traction machine centering
q. Setting of machine

III-1) AC Type Maintenance Training

a. Basic maintenance
b. Safety training
c. AC type lift

III-2) AC Type Adjustment Training

a. Voltage control
b. Reactor
c. Door operating machine
d. Leveling of AC lift

III-3) AC·GD Type Maintenance Work

a. Mechanical knowledge
b. Clearing
c. Lubrication
d. Checking

III-4) GD Type Adjustment Training

a. Variable voltage geard (VVGD)
b. Motor-generator voltage
c. VVGD type speed adjustment
d. VVGD type leveling adjustment
e. Magnet-brake
f. Motor field

III-5) Checking & Repair Training

a. Exchange of parts
b. Gear oil
c. Door connecting cord
d. Safety door edge
e. Brake lining
f. Guide shoe
g. Governor wire rope
h. Hoisting wire rope
i. Bearing
j. Coupling

III-6) Inspection Training

a. Law inspection method
b. Inspection method
c. Inspection subjects
d. Safety check

III-7) AC·GD Type Trouble Shoot Training

a. Trouble working
b. Trouble shooting chart
c. Case study

## Areas of Studies for Airconditioning & Refrigeration Equipment Training Course (Technics)

1-1-1) Mechanical Engineering

a. Strength of materials
b. Elements of machines
c. Mechanics
d. Machinery
e. Lifts & carriers

1-1-2) Electrical Engineering

a. Electricity
b. Magnetic-electricity
c. Alternating electricity
d. Single phase alternating electricity
e. Three-phase alternating electricity
f. Sequence circuit
g. Electric machines
h. Parts & materials for wirings

1-1-3) Production Control Engineering

a. Organizations of enterprises
b. Process control
c. Quality control
d. Installation & maintenance
e. Material control
f. Cost control
g. Safe working
h. Industrial pollution

1-1-4) Construction Engineering

a. General introduction
b. Structure of buildings
c. Construction of buildings
d. Materials for buildings
e. Utilities

1-1-5) Safety

a. Safe working
b. First aids
c. Arrangements & preventions
d. Environmental precautions

1-1-6) Materials

a. Metals
b. Non-metals
c. Pipes

1-1-7) Drawing

a. General
b. Mechanical drawing
c. Electrical drawing
d. Constructional drawing

1-1-8) Rules and Standards

a. Refrigeration rules
b. Electrical standards
c. Constructional standards
d. Miscellaneous

1-1-9) Measurement

a. Characteristics of materials
b. Measurement theory
c. Measurement apparatus
d. Measuring methods

I-2-1) Refrigerating Engineering

a. Thermostatics
b. Thermodynamics
c. Principals of refrigeration
d. Refrigerants
e. Refrigeration systems

I-2-2) Refrigerating Machines

a. Reciprocating machines
b. Other machines
c. Auxiliary devices
d. Application
e. Treatment

I-2-3) Airconditioning Engineering

a. Principles
b. Planning
c. Systems
d. Airconditioners

I-2-4) Installation Engineering

a. Piping
b. Plates
c. Welding
d. Installation

I-2-5) Installation Design

a. Machine selection
b. Base design
c. Piping
d. Refrigerant piping
e. Auxiliary devices
f. Wiring

g. Application
h. Estimation

II-1-1) Piping

a. Pipe cutting
b. Pipe bending
c. Threading
d. Drilling
e. Jointing
f. Water piping
g. Insulation

II-1-2) Welding

a. Gas welding
b. Gas cutting
c. Soldering
d. Arc-welding

II-1-3) Wiring

a. Treatment
b. Source wiring
c. Machine wiring
d. Sequence
e. Inspection

II-1-4) Measuring

a. Length
b. Pressure, power, work, energy
c. Heat, temperature, internal energy
d. Electric meters
e. Controllers

II-1-5) Construction

a. Preparation
b. Levering
c. Concrete-placing
d. Plastering
e. Bricklaying

II-2-1) Refrigerant Piping

a. Copper-tubing
b. Piping
c. Refrigerant charging

II-2-2) Ducting

a. Plating
b. Ducting
c. Insulation

II-2-3) Assembly and Disassembly

a. Basic work
b. Compressors
c. Pumps
d. Others

II-2-4) Operating

a. Refrigerators' operation
b. Airconditioners' operation

II-2-5) Installations of Refrigerating Machines

a. Refrigerators
b. Airconditioners
c. Applicating machines

II-2-6) Operating and Maintenance

a. Refrigerators
b. Airconditioners
c. Applicating machines

II-2-7) Trouble Shooting

a. Refrigerators
b. Airconditioners
c. Applicating machines

## Areas of Studies for General Electronic Apparatus Training Course (Technics)

I-1) Alternating Current Theory

a. Alternating current
b. Linear circuit network
c. Polyphase alternating current
d. Distributed constant circuit
e. 4 Terminal network

I-2) Electromagnetics

a. Electrostatic field
b. Current
c. Magnetic field
d. Electromagnetic induction
e. Electromagnetic field
f. Magnetic

I-3) Semiconductor

a. Diode
b. Transister
c. Integrated circuit

I-4) Electrical Parts

a. Resistance
b. Capactor
c. Coil
d. Transformer

I-5) General Machines

a. Materials dynamics
b. Mechanical factor
c. Mechanism
d. General machines

I-6) Transistor Circuit

a. Circuit construction
b. Bias circuit
c. Power amplifier
d. Linear amplifier

I-7) Logic Circuit

a. Pulse circuit
b. Logic circuit

I-8) Electronic Measurement

a. Voltmeter
b. Ammeter
c. Tester
d. Vacuum tube volt meter
e. Oscilloscope
f. Sweep
g. Marker
h. Universal bridge
i. Electric field strength meters

I-9) Drawing

a. Electrical drawing

I-10) Regulations

a. Electrical regulation

I-11) Safety & Hygienics

a. Safety
b. Hygienics

II-1) Video & Sound Circuit

a. Antenna circuit
b. UHF Tuner
c. VHF Tuner
d. Connecting circuit
e. Internediate frequence amplifier
f. Video detector
g. Video amplifier
h. SIF Circuit
i. Sound amplifier

II-2) Chroma Circuit

a. Band pass circuit
b. Chroma syncronization circuit
c. Demodulate circuit
d. Attached circuit

II-3) Synchronization & Deflection Circuit

a. Sync separate circuit
b. Sync amplifier
c. AFC Circuit
d. Vergical circuit
e. Horizontal circuit
f. High Voltage circuit
g. Attached circuit

II-4) Power Supply

a. Rectifier circuit
b. Stability circuit
c. Filter circuit

II-5) CRT & Convergence Circuit

a. CRT Dirve circuit
b. Cathode ray tube
c. Attached circuit
d. Static convergence
e. Dynamic convergence

III-1) Adjustment of B/W TV

a. Adjustment
b. Measurement

III-2) Adjustment of Color TV

a. Adjustment
b. Measurement

III-3) Repair of B/W TV

a. Repair
b. Adjustment

III-4) Repair of Color TV

a. Repair
b. Adjustment

IV-1) AM Radio

a. Amplifier circuit
b. Oscillator circuit
c. Rectifier circuit
d. Modulate & demodulate circuit
e. Electromagnetic wave & antenna

IV-2) FM Radio

a. Amplifier circuit
b. Oscillator circuit
c. Rectifier circuit
d. Modulate & demodulate circuit
e. Electromagnetic wave & Antenna

IV-3) Recording & Rerecording

a. Recording
b. Rerecording

IV-4) Application & Attached Circuit

a. Tone circuit

IV-5) Electronic Parts

a. Bar-antenna
b. Variable condenser

V-1) Repair of AM1 Band Radio

a. Assembly
b. Adjustment
c. Measurement
d. Repair
e. Decomposition

V-2) Repair of AM2 Band Radio

a. Assembly
b. Adjustment
c. Measurement
d. Repair
e. Decomposition

V-3) Repair of FM/AM Radio

a. Assembly
b. Adjustment
c. Measurement
d. Repair
e. Decomposition

V-4) Repair of AM/Casot Radio

a. Assembly
b. Adjustment
c. Measurement
d. Repair
e. Decomposition

V-5) Repair of FM Stereo Radio

a. Assembly
b. Adjustment
c. Measurement
d. Repair
e. Decomposition

V-6) Repair of Phonograph

a. Assembly
b. Adjustment
c. Measurement
d. Repair
e. Decomposition

V-7) Repair in General

a. Repair of actual object
b. Research of example of damage

VI-1) Summary of Electronic Calculator

a. Basic operation & key cord
b. Numeric enter key
c. Function key
d. Switch for the constant number
e. Tabulation switch

VI-2) Operation System of the Electronic Calculator

a. Operation of the addition
b. Operation of the subtruction
c. Example of a negative and with decimal point answer
d. The three main things in calculator

VI-3) Control Service

a. Where are control devices operated?
b. When are control devices operated?
c. Purpose of the control device operation
d. Job of the control devices
e.

VI-4) Binary System

a. Pure binary system
b. Converted of P coded
c. Binary coded decimal system
d. Addition & subtruction of the binary coded system

VI-5) Binary System & Logical Circuit

a. Logical OR gate circuit
b. Logical AND gate circuit
c. Logical NOT circuit
d. MIL graphic symbol

VI-6) Boalean Algebra

a. Outline of Boalean algebra
b. AND & OR gate according to
c. Theorem of the Boalean algebra
d. Value of the Benn diagram
e. Veith diagram
f. Veith diagram of one variable (two, three, four)

VI-7) Development of Logical Axiom from True-Value Table

a. Simplification of logical axiom
b. Redundancy
c. Redundancy of binary coded system

VI-8) Logical Element

a. The principle of diode
b. The principle of transistor
c. Earthing system of transistor
d. Static characteristic carve of transistor
e. Current amplification factor & current transmission of transistor
f. Endurance voltage of collector of transistor
g. Collector cut off current
h. Principle of a field effect transistor (F.E.T)
i. Kinds of MOS FET
j. Advantages of MOS FET
k. Basic circuit of MOS FET
l. Characteristics of ferrite core magnetization
m. Coincidence current system of a core memory element

VI-9) Pules Circuit

a. Explanation of pules
b. Pules moduration
c. C.R Differentiation circuit
d. C.R Integrating circuit

e. Switching circuit
f. Switching characteristics & circuit operation of transistor
g. Switching time of transistor
h. Pules amplifier circuit of inverter
i. Pules amplifier circuit of emitter follower
j. Driver circuit for the display
k. Multivibrator circuit
l. Biatable multivibrator circuit

VI-10) Logical Circuit

a. OR gate circuit (logical sum)
b. AND gate circuit (logical product)
c. Logical NOT circuit
d. Logical exclusive OR current
e. Logical NAND circuit
f. Logical NOR circuit
g. Metal oxide semiconductor (MOS) OR gate circuit
h. M.O.S. AND gate circuit
i. Two AND gate -two OR gate circuit

VI-11) Flip Flop

a. Explanation of flip flop
b. Temporary memory circuit
c. Type of flip flop (RSS, D, JK)

VI-12) Integrated Circuit for the Electronic Calculator

a. Relation between each component and electronic calculator
b. Classification of integrated circuit
c. Metal oxide semiconductor IC
d. Explanation of integrated circuit for the practice calculator

VII-1) Relation between Each Devices and their Operation

a. Explanation of after turning on the power
b. Pules generating circuit and their operations
c. Bits time counter
d. Digits time counter
e. P Generation during calculation
f. P Generation when numeric key is depressed
g. P Generation when function key is depressed
h. P Generation circuit
i. Relation between each devices & their operate

VII-2) Input Device

a. Explanating of key board
b. Read switch
c. Double depress protection of the numeric keys
d. Tabulation dial (slide) switch
e. Constant switch

VII-3) Output Device

a. Organization of electronic flourescent tube & their operation
b. Driving method of display tube
c. Decimal point display
d. Decording circuit
e. Plate segment decording circuit & their driving circuit
f. Driving circuit for cold cathod-discharge tube

VII-4) Calculation Device & their Control Device

a. Addition of pure binary system
b. Subtruction of pure binary system
c. Pure binary subtruction & addition device
d. Binary coded decimal addition & their complement (+6)
e. Binary coded decimal subtruction and their complement (-6)
f. Addition & subtruction device of binary coded decimal

g. Explanation of flow chart
h. Addition & subtruction flow chart
i. Multiplication flow chart
j. Division flow chart
k. Program chart
l. Program matrix
m. Microorders Gob
n. Addrus & branch
o. No addrus operation
p. Addrus transfer from No to Nn
q. Control clack pules
r. Memory function & their operation

VII-5) Calculation Method

a. P cycle operation
b. Operation of when C key is depressed
c. Operation of when CE key is depressed
d. Operation of when function key is depressed (x÷-=(+))

VII-6) Calculation Examples & their Routine

a. Addition & subtruction
b. Multiplication
c. Division
d. Constant calculation
e. Memory calculation
f. Different between memory add & memory sub

VII-7) Power Supply Circuit

a. Rectification
b. Relation between rectification circuit and their load
c. Half wave rectification circuit and their load
d. Full wave rectification circuit and their load
e. Constant voltage circuit
f. Constant voltage diode (Zener diode)

g. Constant voltage characteristics
h. Basic constant voltage circuit
i. Constant voltage circuit by Zener diode
j. Constant voltage circuit by transistor
k. Prasell connected type of constant voltage circuit
l. Srial connected type of constant voltage circuit

VII-8) Parallel Processing System - 4

a. Outline of parasell processing system
b. Clock pules generator device
c. Input output device
d. Random access memory device
e. Read only memory device
f. Central processing unit device

VII-9) Programming for the Electronic Calculator

a. Four arithmetic calculations instruction (Add Sub Mult. Div.)
b. Input & output instruction
c. Transfer instruction
d. Operation instruction
e. Judging & branching instruction
f. Other instruction
g. Programming procedure
h. Storage of program (PROG)
i. Tracing of program (TRAC)
j. Dumpinng of program (DUMP)
k. Listing of program (LIST)
l. Loading of program (LOAD)
m. Verify of program (VERI)

VIII) Training for Calculator Repairing and Assembling

a. Input device (key)

b. Output device (display, printer)

c. Calculation device

d. Power circuit

e. Program unit

Schedule of Training Course for Airconditioning & Refrigeration Equipment

| Division | | No | Subject | Hour | 1st Year | | | 2nd Year | | | 3rd Year | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic | | 1) | Mathematics | 300 | 66 | 66 | 55 | 55 | 55 | | | | |
| | | 2) | Physics | 300 | 55 | 55 | 66 | 66 | 55 | | | | |
| | | 3) | English | 300 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| | | 4) | Athletics | 200 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| Adjustment | | | Review time | 100 | | | | | | | | | |
| Technics | I. Class | | | | | | | | | | | | |
| | 1. General | 1) | Mechanical engineering | 44 | 33 | 11 | | | | | | | |
| | | 2) | Electrical engineering | 88 | | 44 | 44 | | | | | | |
| | | 3) | Production control engineering | 44 | 44 | | | | | | | | |
| | | 4) | Construction engineering | 66 | 33 | 33 | | | | | | | |
| | | 5) | Safety | 22 | | 22 | | | | | | | |
| | | 6) | Materials | 44 | 44 | | | | | | | | |
| | | 7) | Drawing | 88 | | | | | | | | | |
| | | 8) | Rules & standards | 44 | | | | | | | 44 | | |
| | | 9) | Measurements | 44 | | | | | | | | | |
| | 2. Special | 1) | Refrigerating engineering | 66 | | | | | | | | | |
| | | 2) | Refrigerating machines | 66 | | | 44 | 22 | | | | | |
| | | 3) | Airconditioning engineering | 66 | | | | | 44 | 22 | | | |
| | | 4) | Installation engineering | 66 | | | | | 44 | 22 | | | |
| | | 5) | Installation design | 110 | | | | | | | 55 | 55 | |

| Division | | No | Subject | Hour | 1st Year | | 2nd Year | | | 3rd Year | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Technics | II. Practice | | | | | | | | | | | |
| | 1. General | 1) | Piping | 44 | 44 | | | | | | | |
| | | 2) | Welding | 44 | | 44 | | | | | | |
| | | 3) | Wiring | 132 | | 33 | 33 | 22 | 22 | 22 | | |
| | | 4) | Measuring | 44 | | 33 | 11 | | | | | |
| | | 5) | Construction | 66 | | | | | 66 | | | |
| | 2. Applied | 1) | Refrigerant piping | 44 | | | | | | 22 | 22 | |
| | | 2) | Ducting | 44 | | | | | | 22 | 22 | |
| | | 3) | Assembly & disassembly | 165 | | | | | | 44 | 44 | 77 |
| | | 4) | Operating | 88 | | | | 22 | 22 | 22 | 22 | |
| | | 5) | Installation of refrigerating machine | 187 | | | | | 44 | 44 | 44 | 55 |
| | | 6) | Operating and maintenance | 264 | | | 44 | 44 | 44 | 44 | 44 | 44 |
| | | 7) | Trouble shooting | 220 | | | 22 | 22 | 44 | 44 | 44 | 44 |

Appendix 10

## Schedule of Training Course for General Electronic Apparatus

| Division | | No | Subject | Hour | 1st Year | | | 2nd Year | | | 3rd Year | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Basic | | 1 | Mathematics | 300H | 66 | 66 | 55 | 55 | 55 | | | | |
| | | 2 | Physics | 300 | 55 | 55 | 66 | 66 | 55 | | | | |
| | | 3 | English | 300 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |
| | | 4 | Athletics | 200 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| Adjustment | | | Review time | 100 | | | | | | | | | |
| Technics | I. General | 1 | Alternating current theory | 100 | 50 | 50 | | | | | | | |
| | | 2 | Electramagnetics | 100 | 50 | 50 | | | | | | | |
| | | 3 | Semiconductor | 50 | 50 | | | | | | | | |
| | | 4 | Electrical parts | 70 | 25 | 25 | 20 | | | | | | |
| | | 5 | General machines | 50 | 25 | 25 | | | | | | | |
| | | 6 | Transistor circuit | 100 | | 50 | 50 | | | | | | |
| | | 7 | Logic circuit | 80 | | | 50 | 30 | | | | | |
| | | 8 | Electronic measurement | 60 | | | 30 | 30 | | | | | |
| | | 9 | Drafting | 50 | | | 30 | 20 | | | | | |
| | | 10 | Regulations | 20 | | | 20 | | | | | | |
| | | 11 | Safety hygienics | 20 | | | | 20 | | | | | |
| | II. Study of Television | 1 | Video & sound circuit | 20 | | | | 20 | | | | | |
| | | 2 | Chroma circuit | 20 | | | | 10 | 10 | | | | |
| | | 3 | Synchronization & deflection circuit | | | | | | | | | | |
| | | 4 | Power supply circuit | 10 | | | | | 10 | | | | |
| | | 5 | CRT & Convergence circuit | | | | | | 20 | | | | |
| | III. Practice of Television | 1 | Adjustment of black & white TV | 20 | | | | | | 20 | | | |
| | | 2 | Adjustment of color TV | 80 | | | | | | 80 | | | |
| | | 3 | Repair of black & white TV | 50 | | | | | | | 50 | | |
| | | 4 | Repair of color TV | 250 | | | | | | | 50 | 100 | 100 |

| Division | | No | Subject | Hour | 1st Year | 2nd Year | 3rd Year |
|---|---|---|---|---|---|---|---|
| Technics | IV. Study of Radio | 1 | AM Radio | 10 | | 10 | |
| | | 2 | FM Radio | | | | |
| | | 3 | Recording & rerecording | 25 | | 10 15 | |
| | | 4 | Application & attached circuit | 25 | | 25 | |
| | | 5 | Electronic parts | 20 | | 20 | |
| | V. Practice of Radio | 1 | Repair of AM 1 band radio | 20 | | 20 | |
| | | 2 | Repair of AM 2 band radio | 40 | | 40 | |
| | | 3 | Repair of FM/AM radio | 70 | | 50 | 20 |
| | | 4 | Repair of AM/caset radio | 80 | | | 80 |
| | | 5 | Repair of FM stereo radio | 80 | | | 80 |
| | | 6 | Repair of phonograph | 80 | | | 20 40 |
| | | 7 | Repair in General | 50 | | | 50 |
| | VI. Basic Theory of Electronic calculator | 1 | Summary of the electronics calculator | 20 | | 20 | |
| | | 2 | Binary system and logical circuit | 30 | | 30 | |
| | | 3 | Pules and logical circuit | 30 | | 30 | |
| | | 4 | Integrated circuit for the electronics calculator | 10 | | 10 | |
| | VII. Actual State of Electronic Calculator | 1 | Each device in the electronics calculator | 20 | | 20 | |
| | | 2 | Calculation and control devices | 20 | | 20 | |
| | | 3 | Example of calculation | 60 | | 60 | |
| | | 4 | Parasell processing system | 20 | | | 20 |
| | | 5 | Programing for the electronics calculator | 40 | | | 40 |

| | | | No | Subject | Hour | 1st Year | 2nd Year | 3rd Year | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Technics | VIII. | Training for Calculator Repairing & Assembling | 1 | Assembly of the personal calculator | 15 | | | 15 | | |
| | | | 2 | Assembly of the business use calculator | 60 | | | 35 | 25 | |
| | | | 3 | Conclusion of the calculator assembly | 25 | | | | 25 | |
| | | | 4 | Repair of the personal calculator | 30 | | | | 30 | |
| | | | 5 | Repair of the business use calculator | 90 | | | | 20 | 70 |
| | | | 6 | Conculusion of the calculator repair | 30 | | | | | 30 |

Required Number of Teachers, Instructors & Assistants — Appendix 11

| Course | Basic | | | | General + Adjustment | | | | Technics - (General +Adjustment) | | | | Japanese Experts |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hour | Teacher | Instructor | Assistant | Hour | Teacher | Instructor | Assistant | Hour | Teacher | Instructor | Assistant | |
| Electric Lift (30 x 1 class) | 1100 | | | | 308 +100 | | | | 1892 | 5 | 3 | 7 | 2 |
| | | | | | | 2 | 2 | | | | | | |
| Airconditioning & Refrigeration Equipment (30 x 1 class) | 1100 | 4 | | | About 800 +100 | | | | About 1400 | 2 | 8 | | 1 |
| General Electronic Apparatus (30 x 2 classes) | 1100 x 2 | | | | (700 +100) x 2 | 2 | | | 500x2 (TV) | 2 | 4 | | 1 |
| | | | | | | | | | 500x2 (Radio) | 2 | 4 | | 1 |
| | | | | | | | | | 500x2 (Calculator) | 2 | 4 | | 1 |
| | | 4 (Math. Phys. Athl. Eng.) | | | | 4 | 2 | | | 13 | 23 | 7 | 6 |
| | | | | | | | | | | | | Team leader | 1 |
| | | | | | | | | | | Total | 53 | | Total 7 |

Iraqi Teachers & Instructors Training Schedule for Electric Lift

1) Teachers

Qualification desired; University graduate, majoring in mechanics or electricity

Place and term ;

| | |
|---|---|
| A (name) | Practice in Japan Sep. 76 - Aug. 77 (HITACHI & MITSUBISHI) |
| B (name) | Practice in Japan Sep. 76 - Aug. 77 (HITACHI & MITSUBISHI) |
| C (name) | Training in Iraq (instructed by A, B and a Japanese) |
| D (name) | |
| D (name) | |

2) Instructors

Qualification desired; Junior college graduate or more, majoring in mechanics or electricity

Place and term ;

| | |
|---|---|
| a (name) | Practice in Japan Sep. 76 - Aug. 77 (HITACHI & MITSUBISHI) |
| b (name) | Practice in Japan Sep. 76 - Aug. 77 (HITACHI & MITSUBISHI) |
| c (name) | Training in Iraq (instructed by a, b and a Japanese) |
| d (name) | |
| e (name) | |

Iraqu Teachors & Instructors Training Schedule
for Airconditioning & Refrigeration Equipment

I. Refrigeration and Airconditioning Course

1) Teachers

Qualification desired; University graduate, majoring in mechanical engineering

Places and terms ;

| | | |
|---|---|---|
| A (name) | Practice in Japan (HITACHI) | Mar. 76 - Feb. 77 |
| B (name) | | |
| B (name) | Training in Iraq (Instructed by A) | Apr. 78 - |

2) Instructors

Qualification desired; Junior college graduate or more, majoring in mechanics or electricity

Places and terms ;

| | | |
|---|---|---|
| a (name) | Practice in Japan (HITACHI) | Mar. 76 - Feb. 77 |
| b (name) | | |
| c (name) | | |
| d (name) | Training in Iraq (instructed by a, b and a Japanese) | Apr. 78 - |
| e (name) | | |
| f (name) | | |

II. Machining Course

1) Teacher C (name)

Qualification desired; University graduate, majoring in mechanical engineering

Place ; Iraq

2) Instructor G (name)

Qualification desired; Junior college graduates or more, majoring in mechanics

Place and term ; Practice in Japan Sep. 76 - Aug. 77

III. Architecture Course

1) Teacher D (name)

Qualification desired; University graduate, majoring in architecture

Place ; Iraq

2) Instructor h (name)

Qualification desired; Junior college graduate or more, majoring in architecture

Place ; Iraq

* University graduate in this paper means a 4 years system university or college study. While junior collge, 2 years system study after a high school.

## Iraqi Teachers & Instructors Training Schedule for General Electronic Apparatus

1) Teachers (A, B, C, D, E, F)

Qualification desired; University graduate, majoring in electricity

Place ; Iraq (Study by oneself)

2) Instructors

Qualification desired; Junior college graduate or more, majoring in electricity

Place ;

| | | |
|---|---|---|
| a (name) | Practice in Japan (Mainly at Toshiba) | Mar. 76 - Feb. 77 |
| b (name) | Practice in Japan (Mainly at Matsushita) | Mar. 76 - Feb. 77 |
| c (name) | Practice in Japan (Mainly at Sharp) | Mar. 76 - Feb. 77 |
| d (name) | | |
| e (name) | | |
| f (name) | Training in Iraq (instructed by a, b, c and a Japanese) | |
| g (name) | | |
| h (name) | | |
| i (name) | | |

Aids & Materials for Electric Lift Training Course

| No | Name | Notes |
|---|---|---|
| 1 | AC Electric Lift P2-6-C045 as described in Appendix 16 | |
| 2 | GD Electric Lift P2-8-C090 as described in Appendix 16 | |
| 3 | Training Equipments as described in Appendix 17 | |
| 4 | Instruments for Measuring & Testing as described in Appendix 18 | |
| 5 | General Hand Tools for Trainees as described in Appendix 19 | |
| 6 | Common Tools as described in Appendix 20 | |
| 7 | Installation Work Equipments | Unnecessary if prepared in Iraq. |
| 8 | Installation Expenses (4 Japanese engineers, 2 months) | |

## Specification of Training Lifts
(Two Complete Sets)

Type P2-6-C045 Passenger Lift

| | |
|---|---|
| Land | 400kg (6 persons) |
| Speed | 45 m/min |
| Operation | A.C. Two-speed Collective control or 2 B.C. operation with Attendant service |
| Landings | 4 stops with same number of entrances |
| Travel | 12m = 5m + 3.5m + 3.5m |
| Total-height | 19m = pit depth 2m + travel 12m + overhead 5m |
| Suspension Ropes | 12 mmϕ x 3 wires (1:1 Roping) |
| Traction Moter | AC 3 phases 380V50Hz 5.5KW with double cage roter |
| Safety | Instantaneous |
| Governor | Disk type |
| Buffer | Spring |
| Door Type | 2 panels-center-opening |
| Door Operation | Automatic open and close type |
| Rails | 8k-Rail for Car and Counterweight |
| Signal | Car position indicator |
| Alarm | Bell |
| Indicator | Vertical flash light with up-down lamp and Hall button |
| Sill | Hard Alminum |
| Jamb Type | S-type 50~60 mm depth painted steel jamb |
| Cage | Painted steel plate |
| Machine Room | Top of the Histway (by constructor) |
| Power Source | 3 phases AC 380V 50Hz<br>Receiving Box with N.F.B. and pilot lamp (by constructor) in machine room |

Type P2-8-C090 Passenger Lift

| | |
|---|---|
| Land | 550 Kg (8 persons) |
| Speed | 9.0 m/min |
| Operation | D.C. Geared Collective control or 2 B.C. operation with Attendant service |
| Landings | 4 steps with some number of entrances |
| Travel | 12m = 5m + 3.5m + 3.5m |
| Total Heights | 19m = pit depth 2m + travel 12m + overhead 5m |
| Suspension Rope | 12mmø x 3 wires |
| Traction Machine | 7.5kw D.C. Motor with Motor Generator |
| Safety | Flexible gradual clamp |
| Governor | Disk type |
| Buffer | Oil buffer |
| Door Type | 2 panels center opening |
| Door Operation | Automatic open and close type |
| Rails | 8k-Rail for Can and Counterweight |
| Signal | Car position indicator |
| Alarm | Bell |
| Indicator | Vertical flash lifht with Up-Down lamps and Hall button |
| Sill | Hard Alminum |
| Jamb Type | S-type 50~60mm depth painted steel jamb |
| Cage | Rainted steel plate |
| Machine Room | Top of Hoistway (by constructor) |
| Power Source | 3 phases A.C. 380V 50Hz<br>Receiving Box with N.F.B. and pilot lamp in machine room (by constructor) |

Training Equipments

1. Traction Machine Assembly (with Motor, Brake, Sheave and Base)

| | |
|---|---|
| 5.5 KW for AC Two speed machine (each of 2 types) | 2 sets |
| 7.5 KW for DC Geared machine (each of 2 types) | 2 sets |
| DC Gearless machine | 2 sets |

2. Governor

| | |
|---|---|
| Disk type for 60 m/min (each of 2 types) | 2 sets |
| Disk type for 90 m/min (each of 2 types) | 2 sets |
| Ball type | 1 set |

3. Car, Platform Set with Car Door Operation System, Car Door, Hall Door, Car Sling, Safety Mechanism and Car Enclosure for Gearless Collective Operation (each of 2 types) — 2 sets

4. Safety Assembly

| | |
|---|---|
| Instantaneous (connected in plank or beam with rail pieces) | 1 set |
| Flexible gradual clamp (connected in plank with rail pieces) | 1 set |

5. Selector Assembly

| | |
|---|---|
| VS-DB type Floor-controller | 1 set |
| VT type Floor-controller | 1 set |
| Type KN Selector | 1 set |
| Mechanical landing switch type | 1 set |

6. Door Engine Assembly

| | |
|---|---|
| Standard type | 1 set |
| Type E-2 | 1 set |

Consumptive Parts or Devices

1. Contactors, Relays, Timers, Switches, Door locking devices, Rectifiers, Guide slides and rollers, Rope sockets, Door shoes, and Indicator Relays

2. Sample of Ropes, Cables and Oil-Grease

## Instruments for Measuring & Testing

| No | Name | Specification | 30 Trainnes/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | STOP WATCH | 30 Sec | 12 | |
| 2 | A.C. VOLTMETER | A.C. 300/600V single swing accuracy 0.5% | 6 | YEW-N02013-18 |
| 3 | D.C. VOLTMETER | D.C. ±150/300V double swing accuracy 0.5% | 6 | |
| 4 | A.C. AMMETER | A.C. 10/20/50/100A single swing accuracy 0.5% | 6 | YEW N02013-14 |
| 5 | A.C. AMMETER | A.C. 250/500A single swing accuracy 0.5% with shunt | 6 | YEW N02013-20 N02241 |
| 6 | A.C. CLAMP METER | A.C. 150/300/600 V.A. | 6 | KYORITSU KEW SNAP-8 |
| 7 | D.C. AMMETER | D.C. ±0.3/1/3/10A double swing accuracy 0.5% terminal type | 6 | YEW N02051-15 |
| 8 | D.C. AMMETER | D.C. ±5~15 mA double swing accuracy 0.5% with shunt | 6 | YEW N02011-04 |
| 9 | D.C. AMMETER | D.C. ±150A double swing accuracy 0.5% with shunt | 6 | YEW N02215-14 150A |
| | | D.C. ±300A ditto | 6 | YEW N02215-16 300A |
| 10 | D.C. AMMETER | D.C. ±15/30A | 6 | YEW N02011-99 |
| 11 | MEGGER | 500V 100MΩ with spare dry cell | 12 | YEW N03213 |
| 12 | INSULATION METER FOR SEMICONDUCTOR | 15V 20MΩ with spare dry cell | 6 | YEW |
| 13 | EARTH DIRECTING METER | 0-10-100-1000Ω logarithm scale with accessories | 2 | YEW 3235 |
| 14 | DIGITAL TESTOR | AC 2~500V DC 2~100V with spare cell 200Ω 20MΩ 100MΩ A.C., D.C. 200uA 2000mA adapter for A.C. 220V A.C. 220V | 3 | IWASAKI VOAC 77 |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 15 | PRECISE CIRCUIT TESTOR | 1MP 10MΩ/V D.C. with spare parts, A.C., D.C. 0.3~600V adapte for A.C. 220V | 3 | |
| 16 | WHEATSTON BRIDGE | 1Ω~10MΩ | 6 | YEW NO2755 |
| 17 | HAND TACHOMETER | 100~400 300~1200 1000-4000 RPM with each pullies and accessories | 12 | |
| 18 | ELECTRIC DYNAMO TYPE TACHOMETER | 100, 200, 300, 600 m/min with dynamo, pulley, and accessories | 3 | YEW NO2601 |
| 19 | LUX METER | 0.1~1000 Lux | 2 | TOKO SP1-5 |
| 20 | SOUND LEVEL METER | 30~150 dB | 3 | YEW NO3282 |
| 21 | ACCELERATION METER | 0.01g 0.03g 0.1g 0.3g 1g | 2 | DENSOKU V-34J |
| 22 | THERMOMETER | 100°C Alcoholic type<br>300°C Mercury type | 12<br>12 | |
| 23 | MINI WRITER | 20H 25~10mV 25~50 mm/sec with pilot generator accessories and adapter for 220V A.C. | 2 | |
| 24 | OSCILLO-SCOPE | | 1 | |
| *25 | GOVERNOR TESTING MACHINE | Mitsubishi electric co. | 6 | Special instruments |
| 26 | SOUND-SCOPE | | 4 | |
| 27 | FREQUENCY METER | 45~65 Hz Dial meter type | 4 | |
| 28 | SPRING BALANCE | 200 g<br>2 kg<br>10 kg | 6<br>6<br>6 | |

General Hand Tools for Trainees

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | PROTECTING WEAR | | | |
| | CAP | | 40 | |
| | UNIFORM | | 40 | |
| | SAFETY BELT | | 40 | |
| | SAFETY BOOTS | | 40 | |
| | HELMET | Hard head made of plastic | 40 | |
| 2 | BAG FOR TOOLS | | 40 | |
| 3 | LINE-MANS PLIER | 150mm Length<br>Side cutting jaw<br>Plastic coated handles | 40 | |
| 4 | LONG CHAIN-NOSE PLIER | 150mm Length<br>Side cutting jaw<br>Plastic coated handles | 40 | |
| 5 | ADJUSTABLE MONKEY WRENCH | 150mm Length | 40 | |
| 6 | OPEN-END WRENCH | 6 x 7 mm | 40 | |
| | | 8 x 9 mm | 40 | |
| | | 10 x 13 mm | 40 | |
| | | 14 x 17 mm | 40 | |
| | | 19 x 21 mm | 40 | |
| | | 19 x 24 mm | 40 | |
| | | 26 x 32 mm | 40 | |
| | | ISO 13 x 17 mm | 40 | |
| | | ISO 17 x 19 mm | 40 | |
| | | ISO 24 x 30 mm | 40 | |
| 7 | MECHANICS WATER PUMP PLIER | 250 mm Length | 40 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 8 | SLIP JOINT PLIER | 150 mm Length | 40 | |
| 9 | DRIVER | - 150 mm Length<br>+ 150 mm Length Phillips type | 40<br>40 | |
| 10 | 9-PIECES CONBINATION DRIVER SET | Spark tester screw-driver (normal & Phillips) and box-driver (hollow shaft hexagonal) | 40 | |
| 11 | FILES SET BESTERD | Flat round square in case | 40 | |
| 12 | HAMMER | 1/2 Pound | 40 | |
| 13 | CONVEX RULES | 2 meters Rule and tape measure | 40 | |
| 14 | THICKNESS GAUGE | 150mm Length with 5 blades 0.1t 0.3t 0.5t 1.0t mm | 40 | |
| 15 | FLASH LIGHT | 2 Dry-cells with spare cell | 40 | |
| 16 | ELECTRICIANS KNIFE | | 40 | |
| 17 | TESTING CORD WITH CLIPS | Shall be made at training center with electric wire and clips | 40 | |
| 18 | ELECTRIC TESTOR | A.C., D.C. 10 50 250 500 1000 V (2kΩ/V)<br>D.C. 0.5 25 100 mA<br>Ohm 10kΩ 1MΩ<br>dB -20 ~ +62<br>with case | 40 | |

## Common Tools

| No | Name | Specifcation | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | ELECTRIC ARC WELDER 65~150 Amp | Primary A.C. single phase 220V 50Hz<br>Capacity 6kw (8.0 kva)<br>Secondary noload voltage 45V<br>rating current 120A<br>Rating 20%<br>Electric shock proof type<br>with; electrode holder<br>ground clamp<br>gloves with five fingers<br>full faced welders helmet<br>primary cable 22mm$^2$ 40M<br>secondary cable 22mm$^2$ 20M<br>with plug and receptable<br>Electrode 3.2mmø 10kg | 3 | TOYO KT-WD 220V |
| 2 | DIAL INDICATOR | Up to 5mm 0-50-0 double scale calib rated<br>0.01mm increments<br>with magnetic chack | 6 | |
| 3 | GEAR-PULLER | Dia 75mmø<br>150mmø<br>250mmø<br>with c type clamp plier | 6<br>6<br>6<br>6 | |
| 4 | HEXAGONAL WRENCH SET | 0.05" and 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10 mm (10 pieces) | 6 | |
| 5 | PIPE WRENCH | 450mm Length opening 65mm | 6 | |
| 6 | RACHET SPANNER UNIVERSAL TYPE | With universal joint, socket adapter and 16 pieces (12~32mm) sockets | 6 | |
| 7 | ENGINEERS IRON STEEL LEVEL | 300mm Length accuracy 0.5mm/meter | 6 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 8 | PLUMB BOB | 190 gr, with fishing gut #8 (10m for each bob) | 20 | |
| 9 | TORQE WRENCH | Dial meter type (read clockwise) sockets are commonly used with rachet spanner measures 200~1800 kg-cm range in both directions | 6 | |
| *10 | TOOLS FOR THRUST | Hitachi ltd. | 6 | Special tools |
| 11 | BALL PEIN HAMMER | 3 LB with handle | 6 | |
| 12 | WOODEN OR RUBBER HAMMER | 60mmø x 150mm length | 6 | |
| 13 | HAND GREESE GUN | 100 cc Capacity | 6 | KH-120 |
| 14 | RAIL FINISHING FILE | 14" Length with holder | 3 | |
| 15 | STEEL MEASURE | 30m Reel type (nylon coated) | 3 | |
| 16 | HACK SAW FRAME AND BALDES | (250mm~300mm Universal with 1 gross tungsten steel blades)900mm length) | 12 | |
| 17 | BAR | 900mm Length | 6 | |
| *18 | INSERTING TOOL FOR ELECTRIC TERMINAL OF RELAYS | Hitachi ltd.<br>Mitsubishi electric co. | 12<br>12 | Special tools<br>Special tools |
| 19 | WIRE STRIPPER | For wire size 0.75mm$^2$ 1.25mm$^2$ 2mm$^2$ 3 kinds | 6x3 | |
| 20 | FASTENER PLIER | For 1.25mm$^2$~8mm$^2$ wires terminals<br>Ditto sleave type | 6<br>6 | |
| 21 | ELECTRIC SOLDERING IRON | 150 Watt for 220VA,C<br>60 Watt Ditto | 20<br>20 | |
| 22 | HAND SPOT-LIGHT | With 6 pc of batteries and sapre batteries | 20 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 23 | TESTING WEIGHT | 20kg | 100 | |
| *24 | ADJUSTING TOOLS FOR RELAYS | Hitachi ltd.<br>Mitsubishi electric co., ltd. (MELCO) | 6<br>6 | Special tools |
| 25 | HYDRAURIC CUTTER | For rope size up to 16mmø<br>For Terminal size 8~60mm$^2$ | 2 | |
| 26 | WIRE CUTTER | For rope size up to 12mmø | 3 | |
| 27 | STANDARD STREIGHT EDGES | 1 Meter x 60 mm W x 12 mmt | 6 | |
| 28 | TORCH LAMP | Gasoline 1L<br>Kerosene 1.2L | 6<br>6 | |
| 29 | ELECTRIC HAND DRILL | AC 220V 50Hz<br>6.5 mmø<br>10 mmø<br>13 mmø<br>with 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5, 12, 12.5 13 mmø bits 25 pieces, set | <br>6<br>6<br>6<br>30 | |
| 30 | BENCH GRINDER | AC 220V 50Hz with disk (6" dia x 1/2"t x 6 pc) and with cable | 3 | |
| 31 | ELECTRIC BLOWERS | AC 220V 50Hz | 6 | |
| 32 | PORTABLE ELECTRIC DISK GRINDER | AC, DC 220V 50Hz 500W<br>with(100ø disk sander 10 pc<br>(sand paper 10 pc<br>(rubber buff 1 pc | | |
| 33 | CHAIN BLOCK | With 3 pc of rope slings (5/8" x 4m, 1/2" x 2m and hooks for each<br>3 ton 3m raising<br>1 ton 2.5m raising<br>0.5 ton 2.5m raising | <br>1<br>3<br>5 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 34 | SCISSORS FOR METAL SHEET | With straight edges | 6 | |
| 35 | SOCKET WRENCH | With 9mm~32mm socket | 3 | NO260M |
| 36 | ELECTRIC VACUUM CLEANER | AC 220V 50Hz 600W | 3 | |
| 37 | ELECTRIC SPRAYER COMPRESSOR | AC single phase 220V 50Hz 400W<br>Pressure 4~5 kg/cm$^2$<br>Strange tank capacity 36L<br>With:<br>(1) Spray gun (nozzle dia 1.3mmø) x 1 with cup<br>(2) Air duster (nozzle dia 1.7mmø) x 1<br>(3) Air hose 40m x 1<br>(4) Electric cable (cable/2.5mm$^2$x3C 10m x 1)<br>(5) Safety valve, pressure gauge, over load protector, spare belt and other accessories | 3 | |
| 38 | VERINER CALIPER | 150mm Length granduation of 0.05mm | 20 | |
| 39 | FLAT AND CAPE CHIESEL SET | Brade width 16mm flat<br>Cape 100mm length | 20<br>20 | |
| 40 | CENTER PUNCH | 100mm length | 20 | |
| 41 | HAND TAP WITH TAP HOLDER SET | 3, 4, 5, 6, 8, 10, 12, 16 mm TAP | 20 | |
| 42 | CARPENTERS CLAMP | Crosby clamp opening 75mm | 20 | |
| 43 | NEEDLE SET | | 20 | |
| 44 | WIRE BRUSH | | 20 | |
| 45 | SLIDE TRANSFORMER | AC 220 V 10Amp | 10 | |
| 46 | HYDRAURIC JACK | 3 ton | 2 | |

Aids & Materials for Airconditioning & Refrigeration Equipment Training Course

| No | Name | Notes |
|---|---|---|
| 1 | Measuring | |
| 2 | Drawing | |
| 3 | Refrigerating engineering | |
| 4 | Airconditioning engineering | |
| 5 | Installation design | |
| 6 | Piping | |
| 7 | Welding | |
| 8 | Wiring | |
| 9 | Refrigerant piping | |
| 10 | Ducting | |
| 11 | Assembly & disassembly | |
| 12 | Construction | |
| 13 | Other practices | |
| 1 | Sending expenditure of 3 installing leaders/month | |
| 2 | Installing expenditure | |
| 3 | Teaching materials | |
| 4 | Office appliances | |

Notes: This Gross Sum Total does not include the following charges.

1. Building construction and electric facilities.
2. Classrooms' facilities. (3 classrooms, 1 audio-visual room)
3. Rooms' equipments (manager's room, reception room, conference room, aids-material room)

4. Airconditioning equipments for people

5. Practice rooms' facilities

   1) Temperature and humidity control equipments for water and air, and its installation and construction. (but temperature control test-room)

   2) Main power source and power supply wiring.

   3) Water piping and pits installation

   4) Airconditioners and refrigerators (for practice) installation.

## Measuring

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Dial gages | 0.01m/m, 0~10m/m | 15 | |
| 2 | Micro-meter gages | 0~25 m/m | 15 | |
| 3 | Slide calipers | 200 m/m | 15 | |
| 4 | Marking-out implements | Scriber, center punch, compasses | 15 | |
| 5 | Marking-out plates | 500x400x90m/m | 8 | |
| 6 | Blocks | 150 m/m | 8 | |
| 7 | Dial balances | 10 kg, min. 50g | 10 | |
| 8 | Scales | 250 kg | 5 | |
| 9 | Stop watches | 1/10 sec | 15 | |
| 10 | Cylincer gages | 50~150 m/m | 15 | |
| 11 | Thermometers (alcohol) | -30~50°C | 30 | |
| 12 | Thermometers (alcohol) | 0~150°C | 30 | |
| 13 | Thermometers (mercury) | -50~50°C | 30 | |
| 14 | Thermometers (mercury) | 0~300°C | 20 | |
| 15 | Thermometers (thermistor) | -25~60/60~150°C | 10 | |
| 16 | Electronic humidistats | 30~90% 10~40°C | 5 | |
| 17 | Wattmeters | AC 50/300V 0.5 ton | 15 | |
| 18 | Ammeters | AC 5/25 A 0.5 lev. | 15 | |
| 19 | Wheatstone bridges | 0.001~106r | 10 | |
| 20 | Meggars | 500V | 10 | |
| 21 | Electric testers | V.A.R. | 20 | |

| No | Name | Specification | 30 Traineers/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 22 | Hardness testers | Shore-type | 5 | |
| 23 | Pressure gages | 150 ϕ | 30 | |
| 24 | Tachometers (handy type) | Hosler type H/L | 15 | |
| 25 | Anemometers | Temp. static press, air-velocity | 5 | |
| 26 | Roots type flowmeters | Roots-type 100 L/min | 5 | |

## Drawing

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Drawing boards with drawing machines | Scale; 400 x 250 mm<br>Board; 0~75" | 30 | |
| 2 | Chairs | | 30 | |
| 3 | Pocket type electronic calculators | | 30 | |

## Refrigerating Engineering

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Training units | 1 hp | 5 | |
| 2 | Automatic thermographs | -502150 C, 12 pieces | 5 | |
| 3 | Watt-hour-meters | 120/240V, 5/25A | 5 | |
| 4 | Voltmeters | 150/300V | 5 | |
| 5 | Ammeters | 5/25A | 5 | |
| 6 | Refrigeration system pannel board | (With automatic controllers' models) | 1 | |

Airconditioning Engineering

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Psychrometric test instruments | (Heater, humidifier cooler equipped) | 1 | |

Installation Design

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Fluiddynamic test instruments | 900 x 900 x 900 mm pump pressure gauge fluid meter | 2 | |

## Piping

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Pipe threading machines | Apollo 100A 1/2"~4" | 5 | |
| 2 | Pipe wrenches | 300 mm (10232mm) | 15 | |
| 3 | Pipe wrenches | 450 mm (26~52mm) | 15 | |
| 4 | Pipe wrenches | 900 mm (50~95mm) | 15 | |
| 5 | Monkey wrenches | 250 mm | 15 | |
| 6 | Monkey wrenches | 450 mm | 15 | |
| 7 | Pipe vices | VL1 1/8B~2 1/2B | 5 | |
| 8 | Hack saws | 250mm pistol-shaped | 5 | |
| 9 | Scrapers | 3/16 ~ 1 1/2 | 10 | |
| 10 | Torch lamps | 1 L | 5 | |
| 11 | Bench type drilling machines | 3ø ~ 25ø | 3 | |
| 12 | Hand type | Max. 16mm | 3 | |
| 13 | Pumps | Handy 10 kg/cm$^2$ | 2 | |
| 14 | Pit | 4m x 2m x 2m | 1 | |

## Welding

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Autogenous welders | (Cylinder, blow-pipe hose, lighter) | 10 | |
| 2 | Electric arc welders | 100/200 V with auxiliary | 5 | |
| 3 | Chisels | 20mm x 200mm | 15 | |
| 4 | Files | 5 giles/set | 20 | |
| 5 | Hammers | 1 1/2 lb | 15 | |
| 6 | Pumps for pressure test | 20 $kg/cm^2$ | 2 | |
| 7 | Work benches | 1100mm x 1800mm x 758mm | 5 | |
| 8 | Vices | 130 mm | 15 | |
| 9 | Tongs | 390 mm | 15 | |
| 10 | Flaring tools | 1/8 ~ 3/4", 9 types | 15 | |
| 11 | Welders' gloves | | 15 | |
| 12 | Backets | | 15 | |
| 13 | Hand shields | | 15 | |
| 14 | Welders' goggles | | 15 | |
| 15 | Shoe-covers | | 15 | |

## Wiring

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Wire strippers | For 1.0~3.2mm wires | 15 | |
| 2 | Wire knives | Synthetic plastics | 15 | |
| 3 | Pliers | 175 mm | 15 | |
| 4 | Nippers | 125 mm | 15 | |
| 5 | Soldering irons | 50/100/200 W | 15 | |
| 6 | Cable joint pliers (handy type) | 5ϕ (1.25~8ϕ) | 15 | |
| 7 | Cable joint pliers (oil pressure type) | With knock-out punch | 3 | |
| 8 | Files (round, flat) | | 15 | |
| 9 | Handy type drills | Elective | 15 | |
| 10 | Pipe benders | 15, 19, 25, 31 | 5 | |
| 11 | Hole-saws | | 15 | |
| 12 | Gimlets | 4 m/m or 5 m/m | 15 | |
| 13 | Taps | 4~5 m/m | 15 | |
| 14 | Gas torches | | 15 | |
| 15 | Electric pannel models | For 5 hp packaged airconditioners (VACT) | 10 | |
| 16 | Electricians' tool sets (drivers, wrenches, etc) | | 15 | |
| 17 | Models' boards | Controllers | 20 | |
| 18 | Electric testers | SP-6 + SP-10p with case | 20 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 19 | Meggars | 500 V | 5 | |
| 20 | Electric meter sets (volt-, ammeter, pressure gages, etc.) | | 10 | |
| 21 | Galvanometers | 600 V (max.) | 30 | |
| 22 | Movable tables | | 10 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Tube-benders | Oil pressure type | 5 | |
| 2 | Flare-tools | | 15 | |
| 3 | Cutting tools | | 15 | |
| 4 | Tube expanders | | 3 | |
| 5 | Acid bath | 1m x 1m x 1m x 3 | 1 | |
| 6 | Steam-boilers for piping | 50kg/$m^3$ | 1 | |
| 7 | Aircompressor | Air-cooled, 11 kw middle-press | 1 | |
| 8 | Shell-tube condensers for training | | 15 | |

## Ducting

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| k | Home-plating tools | 138mm x 93mm x 16mm | 10 | |
| 2 | Plate shears | 390mm (for thick plates) | 10 | |
| 3 | Curved shears | 300mm | 10 | |
| 4 | Angle shears | 3mm x 450mm | 10 | |
| 5 | Wooden mallets | Rectangle 360mm | 10 | |
| 6 | Compasses | 200 mm | 10 | |
| 7 | Fold ebnders | | 10 | |
| 8 | Hooked tongs | 255mm normal | 10 | |
| 9 | Scribers | | 10 | |
| 10 | Carpenters' pencils | 210 mm | 10 | |
| 11 | Chisels | (10mm x 140mm, 22mm x 200mm) | 10 | |
| 12 | Electric soldering irons | 200 W, 16 x 125mm | 10 | |
| 13 | Iron squares | 500mm (stainless) | 10 | |
| 14 | Convex rules | 5m (white) | 10 | |
| 15 | Scales | 1,000mm | 10 | |
| 16 | Tool boxes | 450mm(L) x 200mm(W) x 190mm(H) | 10 | |
| 17 | Threading machines | 13mm = max | 2 | |
| 18 | Joint fold benders | #20 = max | 2 | |
| 19 | Fold benders | #20 = max | 2 | |
| 20 | Frame benders with puncher | #20~26 | 2 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 21 | Hand shears | 2,000m thick 1.2mm | 2 | |
| 22 | Rebetters | 4.5m oil press | 2 | |
| 23 | Assorted sheet metal fittings, grilles and registers | | 2 | |

Assembly & Disassembly

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Open type compressors (with parts) | 62FV2LB 3hp | 0 | |
| 2 | Open type compressors (with parts) | 90 FVV 4A | 5 | |
| 3 | Semi hermetic compressors (with parts) | 15011FSVW6-T | 5 | |
| 4 | Semi hermetic compressors (with parts) | 3000 S6 | 2 | |
| 5 | Hermetic compressors (with parts) | 502FM2~T | 5 | |
| 6 | H.M.C. (with parts) | 75 F6R | 5 | |
| 7 | H.M.C. (with parts) | 105 F6R | 0 | |
| 8 | Pumps | 1 hp | 5 | |
| 9 | Others devices | (Exp. v. solenoid v. dryer, strainer, pillow-block) | 1 | |
| 10 | Assorted cutaway models (compressors, heat-exchangers, controllers) | (Comp, room-aircon. pump, detector) | 1 | |
| 11 | Tool boxes | 470 m/m | 20 | |
| 12 | Socket sets | (Socket wrenches 5~41 m/m) | 20 | |
| 13 | Spanner sets | 3/8~1" | 20 | |
| 14 | Torque wrenches | 50 cmpg/portion | 20 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 15 | Monkey wrenches | 300 m/m | 20 | |
| 16 | Screw drivers | 100/300 m/m, 1 set | 20 | |
| 17 | Pully removers | | 10 | |
| 18 | Valve wrenches | 3/8" ratchet | 20 | |
| 19 | Pliers | 17.5 m/m | 20 | |
| 20 | Work tables | | 10 | |
| 21 | Surface plates | For bellows | 15 | |
| 22 | Oil pans | | 10 | |
| 23 | Lamps | | 10 | |
| 24 | Ironbars | | 10 | |
| 25 | Tools panels | | 5 | |
| 26 | Assorted jixs and tools | For disassembly | 1 | |
| 27 | Lifts | 500 kg | 2 | |
| 28 | Consumption articles (refrigerants and coils) | | 1 | |

## Construction

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Chisels | | 20 | |
| 2 | Hammers | | 20 | |
| 3 | Electric hammers | | 5 | |
| 4 | Assorted pneumatic hammers | (Braker, blocker, chipper, airhase (2m)) | 5 | |
| 5 | Assorted penumatic compressors | | 1 | |
| 6 | Compactors | | 5 | |
| 7 | Rolers | 8~10t | 3 | |
| 8 | Shovels | | 15 | |
| 9 | Wheel barrows | | 10 | |
| 10 | Pickaxes | | 10 | |
| 11 | Shears for round iron bar | | 10 | |
| 12 | Assorted carpenters' tools | | 10 | |
| 13 | Mortar pans | | 10 | |
| 14 | Shovesls | (Small) for molding | 20 | |
| 15 | Backets | | 15 | |
| 16 | Wooden trowels | | 15 | |
| 17 | Mortar receivers | | 15 | |
| 18 | Vibrators | | 15 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 19 | Assorted metal trowels | | 15 | |
| 20 | Plumb lines | | 30 | |
| 21 | Levels | | 30 | |
| 22 | Trowels for blocking | Triangle, sets | 15 | |
| 23 | Electric carpenters' tools | Saw, planer, hammer | 1 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Packaged airconditioners and parts | RP-511AX, 5hp airconded. | 6 | |
| 2 | Water chillers | PCU-503AX 5hp air-conded | 5 | |
| 3 | Fan coil units | RF-800F | 10 | |
| 4 | Room air-conditioners (for installation) | RA-2201, 1hp window-type | 3 | |
| 5 | Room air-conditioners (for installation) | RAS-3501Y, 1.5hp split-type | 3 | |
| 6 | Room air-conditioners (for installation) | RAS-359F 1.5hp for R-charging | 5 | |
| 7 | Room air-conditioners (for trouble shooting) | RA-456T 1.5hp | 3 | |
| 8 | Room air-conditioners (trouble shooting) | RAS-3501Y 2hp | 3 | |
| 9 | Condensing units | 152B-FWX | 5 | |
| 10 | Cooling units | | 2 | |
| 11 | Display cases | | 2 | |
| 12 | Cooling towers | | 5 | |
| 13 | Ice machines | RI-185C | 2 | |
| 14 | Water coolers | RW-1000p | 2 | |
| 15 | Walk-in storage room | Refrigerating room | 1 | |
| 16 | Test-benches | With electric maters | 6 | |
| 17 | Voltage controllers | Movable | 6 | |
| 18 | Electric leak detectors | For gas-leakage | 10 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 19 | Air velocity meters | | 10 | |
| 20 | Stack thermometers | | 20 | |
| 21 | Assmann psychrometers | | 20 | |
| 22 | Electric testers | | 20 | |
| 23 | Meggars | 500V | 10 | |
| 24 | Wheat stone bridges | | 10 | |
| 25 | Pressure gages | Compound | 30 | |
| 26 | Roots fluidmeters | | 10 | |
| 27 | Automatic thermographs | -50~150°C 12 points | 5 | |
| 28 | Tachometers | Photoelectric counter | 10 | |
| 29 | Noise level meters | Handy | 5 | |
| 30 | Vibrometers | | 5 | |
| 31 | Stop watches | | 20 | |
| 32 | Measuring cylinders | | 10 | |
| 33 | Pilot tubes | | 10 | |
| 34 | Inclined manometers | | 10 | |
| 35 | Earthing resistors | | 5 | |
| 36 | Balances | | 10 | |
| 37 | Vacuum pumps | | 5 | |
| 38 | Manifold valves | | 30 | |
| 39 | Charging cylinders | | 30 | |
| 40 | Charging hoses | | 30 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 41 | Balances | | 15 | |
| 42 | Assorted tools (drivers, wrenches, etc.) | | 30 | |
| 43 | Vibrating tools | (For room aircond. installation) | 6 | |
| 44 | Hole saws | (For room aircond. installation) | 6 | |
| 45 | Assorted carpenters' tools | (Saws torque wrench etc.) | 6 | |

| No | Name | Specification | 30 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Electronic copying machine | 775 x 390 x 530 (W) (D) (M) | k | |
| 2 | Choppers | 397(W) x 484(H) | 1 | |
| 3 | Electric typewriters | 240 x 682x 450 | 2 | |
| 4 | Steel-made cabinets | 1790(H) x 880(W) x 380(D) | 5 | |
| 5 | Records cabinets | 1062 x 1000 x 350 | 1 | |
| 6 | Lockers | 1790(H) x 900(W) x 515(D) | 5 | |
| 7 | Lockers | 1790 x 955 x 515 | 3 | |
| 8 | Filing cabinets | A4 3 stories | 5 | |
| 9 | Roll front cabinets | 418 x 1375 x 981 | 1 | |
| 10 | Roll front cabinets supporters | | 1 | |
| 11 | Miscellaneous | Staples, numberer, puncher | | |
| 12 | Thermo-fax copying machine | MT-45 | 1 | |

Appendix 36

Aids & Materials for General Electronic Apparatus Training Course

| No | Name | Notes |
|---|---|---|
| 1 | Equipments for technical subject | |
| 2 | Equipments for television course | |
| 3 | Equipments for radio course | |
| 4 | Equipments for electronic calculator | |

Equipments for Technical Subject

| No | Name | Specification | 60 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | DC Ammeter | 10, 30, 100, 300 mA | 15 | |
| 2 | DC Ammeter | 1, 3, 10, 30 mA | 15 | |
| 3 | DC Ammeter | 10, 30, 100, 300 mA | 15 | |
| 4 | DC Ammeter | 1, 3, 10, 30 A | 15 | |
| 5 | DC Voltmeter | 0.3, 1, 3, 10 V | 15 | |
| 6 | DC Voltmeter | 3, 10, 30, 100 V | 15 | |
| 7 | DC Voltmeter | 30, 100, 300, 1000 V | 15 | |
| 8 | DC Ampere & volt meter | 17 Range | 15 | |
| 9 | AC Ammeter | 20, 100 mA | 15 | |
| 10 | AC Ammeter | 50, 250 mA | 15 | |
| 11 | AC Ammeter | 100, 500 mA | 15 | |
| 12 | AC Voltmeter | 150, 300 V | 15 | |
| 13 | AC Ampere & volt meter | 13 Range | 15 | |
| 14 | Wattmeter | 0, 2, 1 A | 10 | |
| 15 | Wattmeter | 1, 5 A | 10 | |
| 16 | Slide resistor | 4.8 kΩ | 10 | |
| 17 | Slide resistor | 1.4 kΩ | 10 | |
| 18 | Slide resistor | 600 Ω | 10 | |
| 19 | Slide resistor | 170 Ω | 10 | |
| 20 | Slide resistor | 39 Ω | 10 | |

| No | Name | Specification | 60 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 21 | Slide resistor | 10 Ω | 10 | |
| 22 | Slide resistor | 4.7 Ω | 10 | |
| 23 | Universal bridge | | 6 | |
| 24 | Curve tracer | | 1 | |

Equipments for Television Course

| No | N a m e | Specification | 60 Trainees/ Yr. Quantity | N o t e s |
|---|---|---|---|---|
| 1 | Color-dot-bar generator | | 30 | |
| 2 | Oscilloscope | | 30 | |
| 3 | Syncroscope | | 15 | |
| 4 | Sweep | | 30 | |
| 5 | RF Marker | | 30 | |
| 6 | PIF Marker | | 30 | |
| 7 | FM-AM Standard single generator | | 30 | |
| 8 | Wide range Oscillator | | 30 | |
| 9 | Frequency counter | | 3 | |
| 10 | DC Power source | 15V, 0.5A | 30 | |
| 11 | DC Power source | 30V 0.5A | 30 | |
| 12 | DC Power source | 300V | 15 | |
| 13 | Vacuum tube volt meter | | 30 | |
| 14 | Tester | | 30 | |
| 15 | High volt meter | 10, 20 KV | 2 | |
| 16 | High volt meter | 25, 50 KV | 2 | |
| 17 | AC Volt meter | 150, 300 V | 30 | |
| 18 | Field strength meter | | 2 | |
| 19 | Slidac | | 30 | |
| 20 | Shield room | | 1 | |

| No | Name | Specification | 60 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 21 | Tool set | | 60 | |
| 22 | Current proke | | 2 | |
| 23 | Color television | | 30 | |
| 24 | Parts kit of color tele-vision | | 15 | |
| 25 | Black & white television | | 30 | |
| 26 | Parts kit of black & white television | | 15 | |

Equipments for Radio Course

| No | N a m e | Specification | 60 Trainees/ Yr. Quantity | N o t e s |
|---|---|---|---|---|
| 1 | Oscilloscope | | 30 | |
| 2 | Oscilloscope | | 1 | |
| 3 | Electric counter | | 1 | |
| 4 | Electric counter | | 30 | |
| 5 | AM Test Oscillator | | 30 | |
| 6 | AM Signal generator | | 1 | |
| 7 | FM Signal generator | | 30 | |
| 8 | FM Signal generator | | 1 | |
| 9 | AM/FM Sweep | | 1 | |
| 10 | Stereo modulater | | 1 | |
| 11 | AC Milivolt meter | | 1 | |
| 12 | Distortion meter | | 1 | |
| 13 | Won flotter meter | | 1 | |
| 14 | Q Meter | | 1 | |
| 15 | Tester | | 60 | |
| 16 | Attenator | | 1 | |
| 17 | RC Oscillator | | 1 | |
| 18 | RC Oscillator | | 30 | |
| 19 | Signal injector | | 30 | |
| 20 | DC Power source | 0~25 V 1A | 31 | |
| 21 | Test speaker box | | 62 | |

| No | Name | Specification | 60 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 22 | Tool set | | 61 | |
| 23 | Slidac | | 31 | |
| 24 | Shield room | | 1 | |
| 25 | Radio | | 360 | |
| 26 | Radio kit part | | 30 | |

Equipments for Electronic Calculator

| No | Name | Specification | 60 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 1 | Tool set | | 60 | |
| 2 | Common tool set | | 12 | |
| 3 | Digital multimeter | | 12 | |
| 4 | Soldering pot | Sharp original | 12 | |
| 5 | AC Ammeter | 20, 100 mA | 12 | |
| 6 | AC Ammeter | | 12 | |
| 7 | DC Ammeter | | 12 | |
| 8 | DC Ammeter | | 12 | |
| 9 | DC Power source | 0~12V 3A | 12 | |
| 10 | DC Power source | 0~24V 3A | 12 | |
| 11 | DC Power source | 50~200V 3A | 12 | |
| 12 | Puncture tester | | 12 | |
| 13 | High resistance meter | | 12 | |
| 14 | Wattmeter | | 12 | |
| 15 | Syncroscope | | 12 | |
| 16 | Memory scope | | 12 | |
| 17 | Logic Analyzer | | 12 | |
| 18 | Slidac | 5A | 12 | |
| 19 | Training material | | 180 | |
| 20 | Printing indicator | | 120 | |
| 21 | Programing indicator | | 60 | |

| No | Name | Specification | 60 Trainees/ Yr. Quantity | Notes |
|---|---|---|---|---|
| 22 | Electronic calculators | | 60 | |
| 23 | Electronic calculator for engineering | | 30 | |
| 24 | Electronic calculator for business | | 30 | |

IRAQI ELECTRICAL & ELECTRONIC INDUSTRIES TRAINING CENTER
PILOT PLAN BUILDINGS LIST

| BUILDINGS | STRUCTURE | FLOOR | TOTAL FLOOR AREA | N O T E S |
|---|---|---|---|---|
| ADMINISTRATION & COMMON CLASSROOM | RC | 2 | 2,560($M^2$) | |
| GYMNASIUM | S | 1 | 750 | |
| LECTURE HALL | S | 1 | 500 | |
| ENERGY CENTRE | RC | 2 | 1,700 | |
| GUARD HOUSE | S | 1 | 20 | |
| GARAGE | S | 1 | 150 | |
| RADIO TV & ELECTRONIC CALCULATOR | S | 2 | 4,600 | TRAINEES 60x3 = 180 |
| ELECTRIC LIFTS | S | 3 | 3,600 | TRAINEES 30x3 = 90 |
| AIR CONDITIONING & REFRIGERATION EQUIPMENT | S | 2 | 4,650 | TRAINEES 30x3 = 90 |
| MACHINE WORKSHOP | S | 1 | 300 | |
| DINING | S | 1 | 890 | |
| DORMITORY | RC | 2 | 4,760 | 1,190$m^2$x4 (TRINEES 360) |
| GUEST HOUSE | RC | 2 | 1,400 | 350$m^2$x4(HOUSE HOLD 8) FOR JAPANESE EXPERTS |
| TOTAL | | | 25,880 | |
| (FUTURE) | | | | |
| (TRAINING HOUSE) | (S) | (2) | (12,000) | |
| (DORMITORY) | (RC) | (2) | (3,570) | 1,190$m^2$x3 (TRAINEES 270) |
| (GUEST HOUSE) | (RC) | (2) | (700) | 350$m^2$x2(HOUSE HOLD 4) |
| (TOTAL) | | | (16,270) | (GRAND TOTAL 41,850 $M^2$) |

IRAQI ELECTRICAL & ELECTRONIC INDUSTRIES TRAINING CENTER

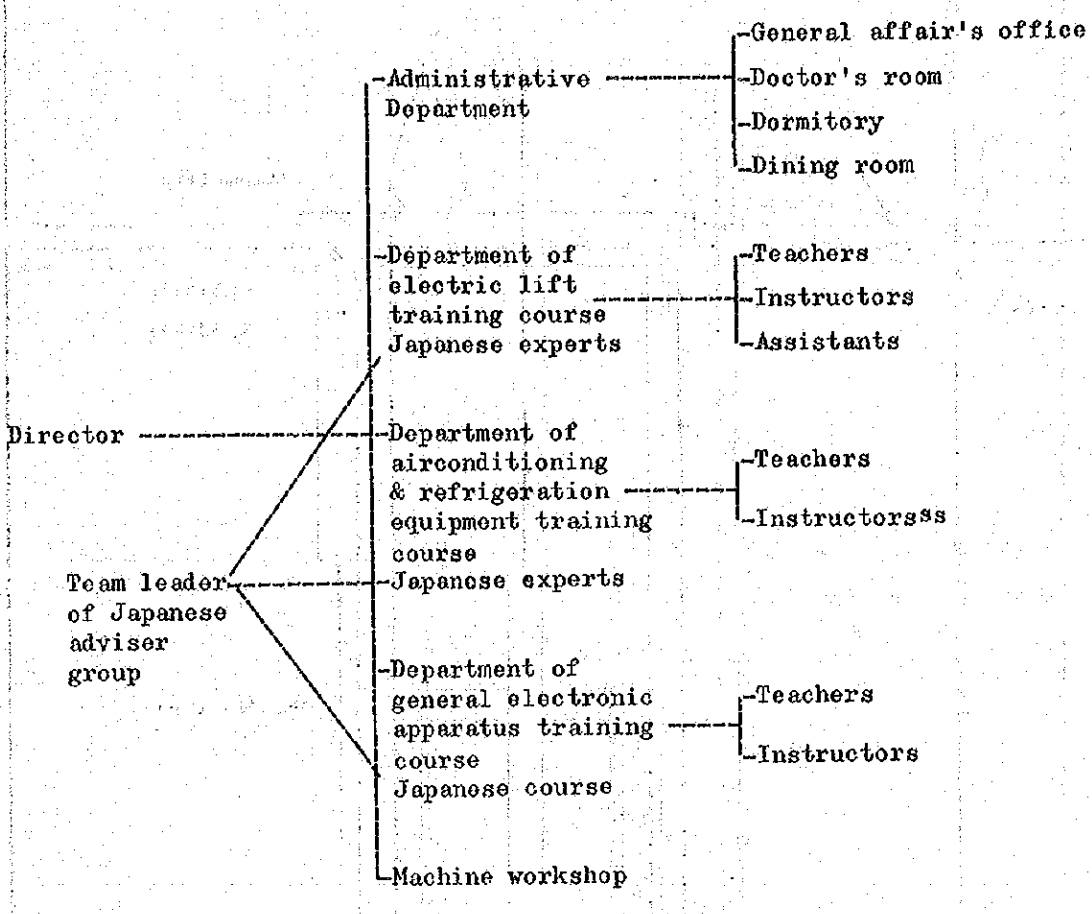
PILOT PLAN BUILDINGS LIST (B PLAN)

| BUILDINGS | STRUCTURE | FLOOR | TOTAL FLOOR AREA | N O T E S |
|---|---|---|---|---|
| ADMINISTRATION & COMMON CLASSROOM | RC | 2 | 1,920 (M2) | |
| GYMNASIUM | S | 1 | 560 | |
| LECTURE HALL | S | 1 | 380 | |
| ENERGY CENTRE | RC | 2 | 1,300 | |
| GUARD HOUSE | S | 1 | 20 | |
| GARAGE | S | 1 | 150 | |
| RADIO TV & ELECT - RONIC CALCULATOR | S | 2 | 3,450 | TRAINEES 30x3=90 |
| ELECTRIC LIFTS | S | 3 | 2,700 | TRAINEES 18x3=54 |
| AIR CONDITIONING & REFRIGERATION EQUIPMENT | S | 2 | 3,350 | TRAINEES 18x3=54 |
| MACHINE WORKSHOP | S | 1 | 300 | |
| DINING | S | 1 | 670 | |
| DORMITORY | RC | 2 | 2,600 | 1,300m2 x 2 (TRAINEES 198) |
| GUEST HOUSE | RC | 2 | 1,400 | 350m2 x 4 (HOUSE HOLD 8) FOR JAPANESE EXPERTS |
| TOTAL | | | 18,800 | |

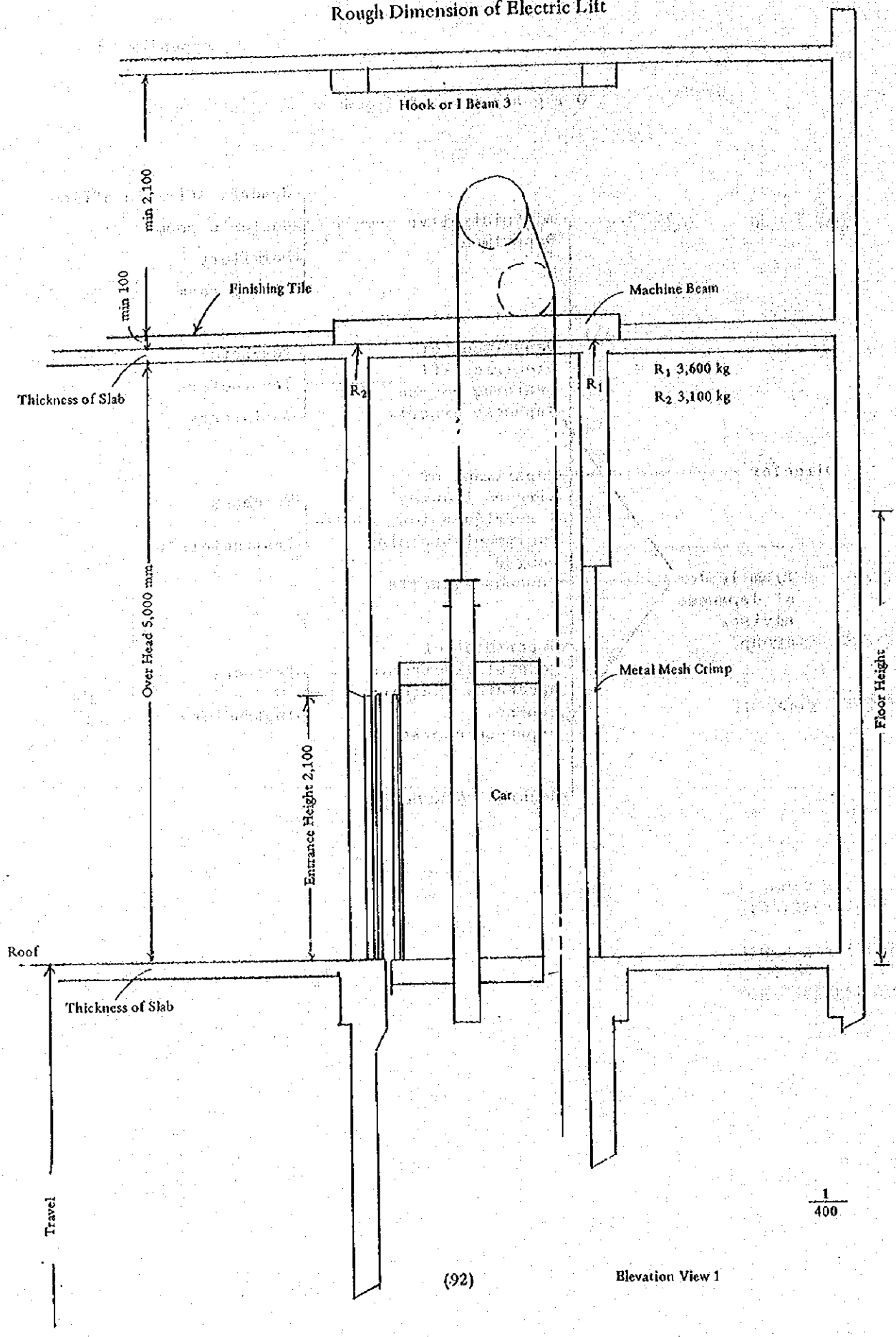
( RC; Reinforced Concrete )
( S; Steel )

Appendix 42

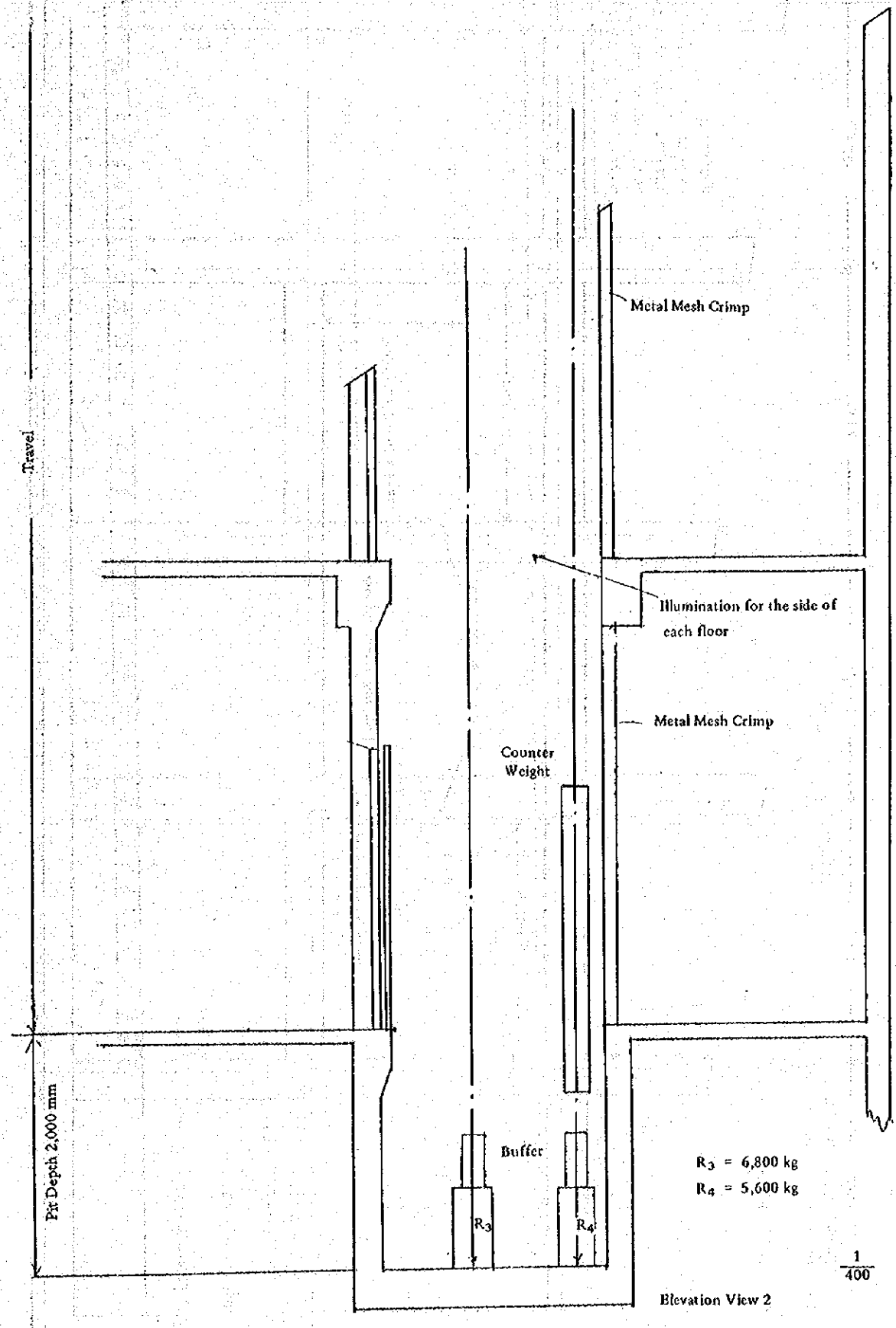
O r g a n i z a t i o n

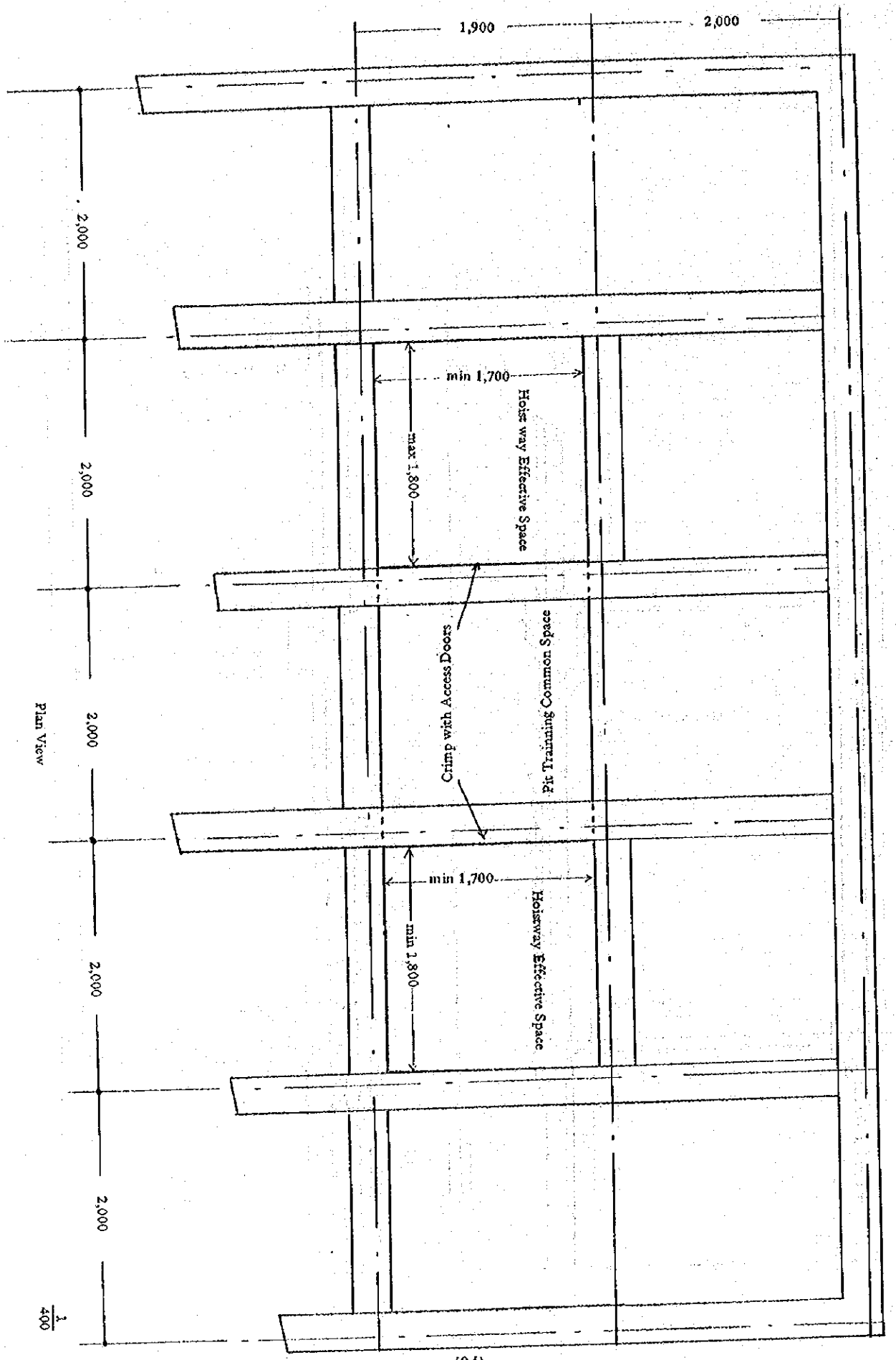


# Rough Dimension of Electric Lift



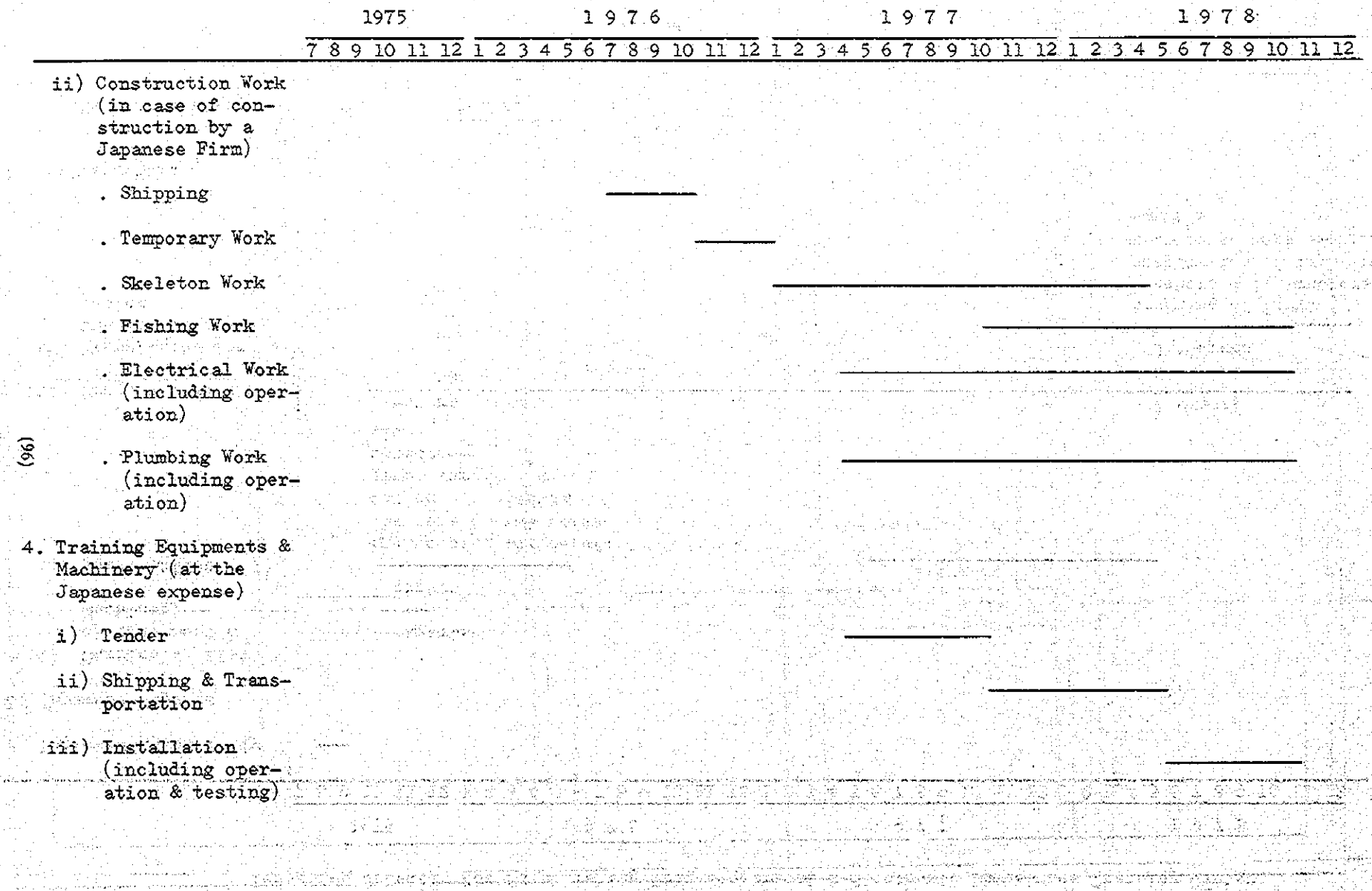

Blevation View 1


Travel
Metal Mesh Crimp
Illumination for the side of each floor
Metal Mesh Crimp
Counter Weight
Buffer
$R_3$
$R_4$
$R_3$ = 6,800 kg
$R_4$ = 5,600 kg
Pit Depth 2,000 mm
1/400
Elevation View 2


1,900
2,000
2,000
2,000
2,000
2,000
2,000
min 1,700
max 1,800
Hoist way Effective Space
Crimd with Access Doors
Pit Trimming Common Space
min 1,700
min 1,800
Hoistway Effective Space
Plan View
1/400

## Tentative Schedule for Establishing Iraq Electrical & Electronic Industries Training Center

| | 1975 | | | | | | 1976 | | | | | | | | | | | | 1977 | | | | | | | | | | | | 1978 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1. Implementation Study | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2. Japanese Experts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| i) Curricula, List of Equipment & Machinery | | | | | | | 4 experts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ii) Construction | | | | | | | 1 expert | | | | | | | | | | | | | | | | | | 1 expert | | | | | | | | | | | | | | | | | |
| | | | | | | | advice of the condition given for construction | | | | | | advice of execution design | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| iii) Project Leader | | | | | | | 1 expert | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| iv) Preparation for Opening of the Center | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 6 experts for 3 courses | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | training of Iraqi teachers & instructors, preparation of training materials, text books & manuals |
| 3. Building Work | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| i) Basic Design & Executive Design | | | | | | | | tender | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


1975
1976
1977
1978
7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12
ii) Construction Work (in case of construction by a Japanese Firm)
. Shipping
. Temporary Work
. Skeleton Work
. Fishing Work
. Electrical Work (including operation)
. Plumbing Work (including operation)
4. Training Equipments & Machinery (at the Japanese expense)
i) Tender
ii) Shipping & Transportation
iii) Installation (including operation & testing)

| | 1975 | | | | | | 1976 | | | | | | | | | | | | 1977 | | | | | | | | | | | | 1978 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 5. Additional Equipments & Machinery (at the Iraqi expense) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| i) Airconditioning Equipments (including shipping, installation & operation) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ii) Electric Lift Equipments (including shipping, installation & operation) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| iii) General Electronic Apparatus (including shipping, installation & operation) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| iv) Dispatch of Installation & Operation Engineers | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. Counterparts | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| i) Selection of Counterparts to be invited to Japan | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ii) Training | | | | | | | | | | | | | | | | | | | 2 counterparts (airconditioning & refrigeration equipment) in Japan | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 3 counterparts (T.V., radio, electronic calculator) in Japan | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 1 counterpart (airconditioning & refrigeration equipment) in Japan | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | 4 counterparts (electric lift) in Japan | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. Opening of the Center | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# TALKING PAPER

Date. August, 1975

To: The Ministry of Industry,
The Republic of Iraq

From: The Implementation Study Team sent by
the Japan International Cooperation Agency

Subject. Establishment of Iraq Electrical and Electronic
Industries Training Center

## I. Objective of the Implementation Study Team

The Implementation Study Team sent by the Japan International Cooperation Agency aims to follow up the ideas and report presented by the Preliminary Survey Team. It is expected that the Implementation Study Team will make up a concrete action program to extablish the Iraq Electrical and Electronic Industries Training Center by discussing and exchanging frank opinions on the matters of mutual concern with the officials of the authorities concerned of the Iraqi Government.

## II. Principal Themes for Discussions

The following are the themes for discussions between the Iraqi and Japanese delegations. The ideas presented under each theme are derived from careful discussions of the Japanese side, however, the Japanese team do welcome comments and suggestions from the Iraqi side on each item of the themes. Any alterations on the ideas and methods for better and smoother implementation will be made upon the mutual consent.

### 1. Training Courses

#### a. Number of courses

The Japanese side thinks that three training courses should be started at the very beginning and later the remaining three courses should be considered to be additionally started when the initial three courses have come to run successfully. The reasons why the courses are divided into two stages are largely two; (i) Budget constraint of the Japanese side which limits the range of JICA's possible collaboration in this program, and (ii) The difficult availability of Japanese experts specialized in motor, measuring instruments, and audio-visual equipment. Since both electrical and electronic technologies are largely owned by the private sector in Japan, the Government's collaboration to developing coutries need to rely on the non-profit motivated willingness of the private sector. With these two reasons the Japanese side is not able to provide the Iraqi Government with the sufficient preparation for starting the remining three courses at the beginning. The initial three courses are;

i. Electric Lifts
ii. Air-conditioning and Refrigeration Equipment
iii. Radio, T.V., and Electronic Calculators

b. Enrollment of each course

The Japanese side has made two alternative plans for the initial three courses regarding the enrollment of trainees which determines the size and cost of buildings, facilities and operational activities. Two alternative plans show the number of enrollment of trainees as follows;

| | Plan A | Plan B |
|---|---|---|
| Electric Lifts | 30 | 18 |
| Air-conditioning & Refrigeration Equip. | 30 | 18 |
| Radio, T.V. & Electronic Calculator | 60 | 30 |
| Total Number of Enrollment | 120 persons | 66 persons |

c. Curriculum of each course

Detailed curriula are attached hereto (See Appendices 3-10). Training hours are based on total 3,400 hours for three years which consist of 1,100 hours for basic training, 100 hours for adjustment, and 2,200 hours for technical training. Trainees will be divided into several groups in technical training. Curriculum of each course emphasizes the safety work in theory and practice.

d. Teachers and instructors

Required number of Iraqi teaching and training staff is 53 including 21 teachers, 25 instructors and 7 assistants. Qualification desired is shown in the attached sheet. The teachers must be university graduates, and the instructors must be selected from among the graduates of the Institute of Technology or junior college graduates.

e. Availability of Japanese experts for teaching and instruction

Total number of Japanese experts is 7, as shown in the attached sheet.

f. Identification of machines, equipment and tools required

These are shown in the attached sheet. Two alternative plans show the quantity of them, according to the number of enrollment of trainees. The unit price of each electrical and electronic instrument is subject to change because of (i) Voltage difference between the two countries, (ii) Transportation cost, and (iii) The probable inflation in the future.

g. Text books

These should be provided by the Iraqi Government. A special consideration should be paid to the language used in the books.

h. Audiovisual system

In Japanese experts' view and experience, the Iraqi teachers and instructors should master the programing method of audiovisual system while they work in the center. Therefore, it is expected that the projector and slide system will be used for the time being in the training.

i. Retraining course to upgrade the skills of graduates and workers

The retraining course should be considered later, when regular courses have come to run successfully, and the staff and facilities are sufficiently available.

2. Buildings and Facilities

Construction of the buildings and facilities should be started as early as possible since the opening of the center is largely dependent on the completion of the buildings and facilities.

a. Layout

The layout of the buildings is shown in the attached blue prints. The buildings and facilities for the plan of 3 courses cover an area of 25,880 $m^2$.

b. Detailed designing

It is suggested that the future work might go smoothly, if the detailed designing is made by Japanese architects.

c. Tender

It might be of great convenience for the future work, if a Japanese construction firm becomes a contractor to build the buildings and facilities.

d. Procurements

It is hoped that those machines, equipment and tools of the Iraqi provision are of the Japanese make as same as those of Japan's provision, since the Japanese experts who will work in Iraq are very familiar with Japanese Products, which reduces the difficulty in their training practices. In this case, the Japanese side will cooperate with the Iraqi side in making up the documents for procurement.

e. Accommodations for the Japanese experts

Accommodations for each Japanese experts' family should have a space, minimum 350 $m^2$, as seen in the blue print, and are equipped with airconditioners and furnitures.

f. Preparation of the land

Special considerations should be given toward the utilities such as power, water supply and drainage.

g. Schedule

The realistic schedule should be made up so as to expedite actions smoothly and clarify the opening time of the Center.

3. Organization and Administration

The organization of the center is shown in the attached sheet

a. Appointment of administrators and other staff

It is expected that key personnels on the Iraqi side are appointed as soon as possible.

b. Manual of jobs

It is expected that manual of the jobs regarding training and administrative staff has to be made up as clearly as possible.

c. Identification of necessary provisions

The Iraqi side will prepare necessary provisions, e.g. room, stationary, desks and chairs.

d. Cost of operation

The operational cost of the center is borne by the Iraqi Government.

4. Training of Iraqi Counterparts in Japan

The following matters should be discussed and decided.

a. Number of counterparts to be trained in Japan

The Japanese side have a plan that 4 counterparts are to be trained for the electric lift training course, 3 for the airconditioner and refrigeration equipment, and 3 for the general electronic apparatus as shown in the attached sheet.

b. Qualifications

It is no doubt that the successful running of center does depend on the ability and effort of the teachers and instructors. Therefore, the counterparts tobe trained in Japan should be strictly selected from among the excellent graduates of university or junior college, majoring in electric engineering or mechanical engineering, as shown in the attached sheet.

c. Terms

It is expected that five counterparts are to be trained in Japan from March 1976 to February 1977, and another five from September 1976 to August 1977, as shown in the attached sheet.

5. Entrance examination of trainees

Trainees to be enrolled in a regular course must have successfully passed the entrance examination which consists of aptitude and academic tests.

6. Cost Estimate

Costs of building construction, machines, equipment and tools are highly important, therefore they need to be estimated specifically.

a. Sharing of costs between the two countries

The Japanese side will provide the Iraqi Government with machines, equipment and tools required within her range of collaboration. Others are to be provided by the Iraqi Government.

7. Establishment of Necessary Institutions

Some institutions must be established. For example,

a. Regulations on electrical and construction engineerings including safety for electric lift, e.g. National Safety Code for Passengers and Attendants of Lifts, and Occupational Safety and Health Codes for Workers of Lifts.

b. Licence for qualified experts and workers trained in the center

c. Regulations for Periodical Inspections

III. Responsiblity of Each Government

Urgent disscussions and decision are required to identify the responsibility of each Government of this program.

1. Japanese Government

a. A part of machines, equipment and tools needed in the center

b. Salaries of Japanese experts

c. The flight and living costs of Iraqi counterparts to be trained in Japan.

2. Iraqi Government

a. Remaining part of machines, equipment and tools needed in the center, which are not granted by the Japanese side. In addition to this, there are (i) text books, (ii) operational cost of the center, (iii) buildings and facilities, (iv) installation costs of machines, and (v) partial cost, except that borne by the Japanese Government, which is required in teaching iraqi counterparts special matters.

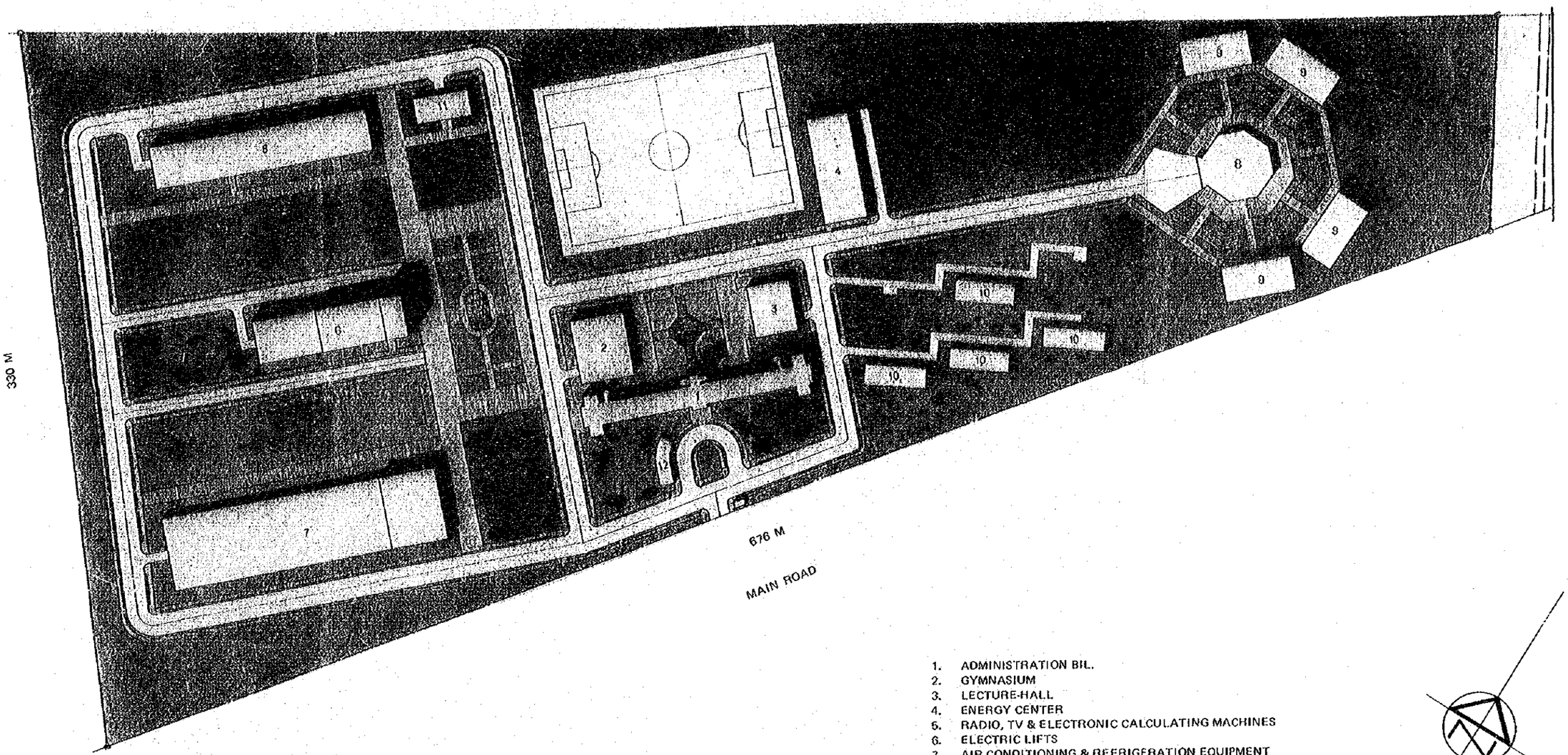
b. It is the responsibility of the Irqi Government to make a special effort to expedite quick and smooth implementation of the program regarding the administrative matters in the Republic of Iraq.

The following information is required by the Japanese team to make demand estimate for the future extension.

i. Construction Plan for Building and Housing
ii. Colour T.V. Broadcasting System
iii. FM Radio Broadcasting Plan

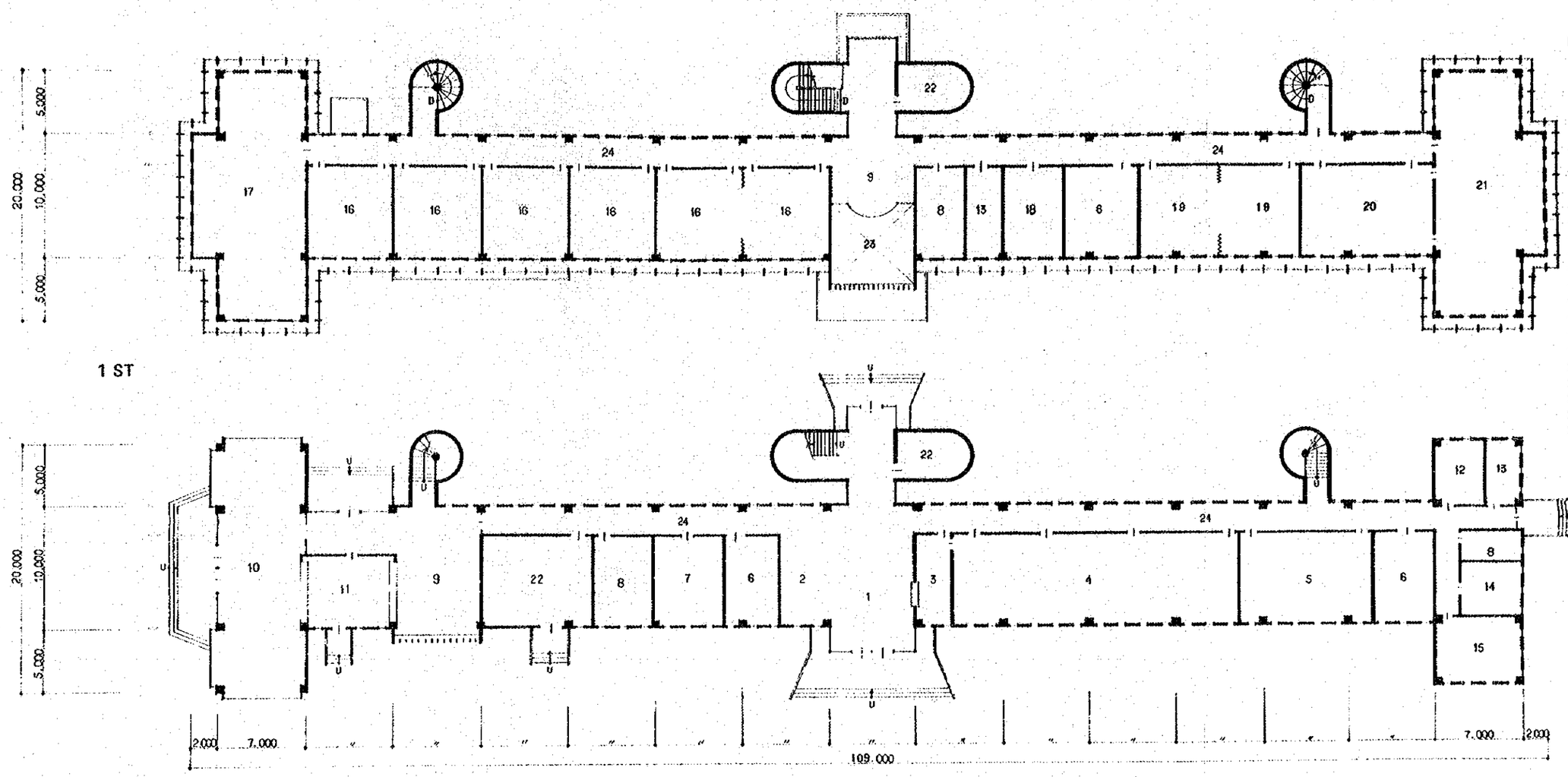
MAIN ROAD

676 M




1. ADMINISTRATION BIL.
2. GYMNASIUM
3. LECTURE-HALL
4. ENERGY CENTER
5. RADIO, TV & ELECTRONIC CALCULATING MACHINES
6. ELECTRIC LIFTS
7. AIR CONDITIONING & REFRIGERATION EQUIPMENT
8. DINING
9. DORMITORY
10. GUEST HOUSE
11. MACHINE WORKSHOP
12. GARAGE

| | | |
|---|---|---|
| ELECTRICAL INDUSTRIES TRAINING CENTRE (PILOT PLAN A) | | 1/4 |
| SITE PLAN | | |
| | S : 1 / 4,000 | |

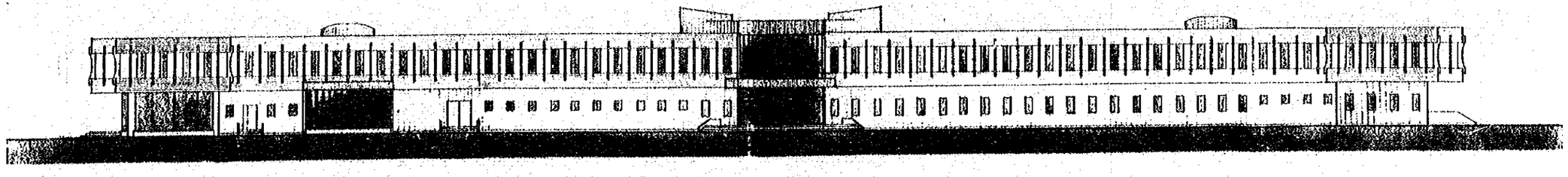



1 ST

GROUND

ROOM NAME LIST

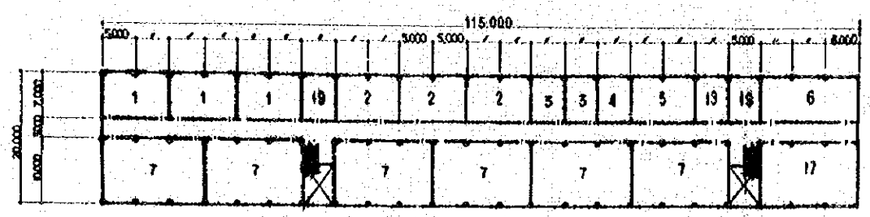
1. ENTRANCE HALL
2. EXHIBITION HALL
3. RECEPTION
4. OFFICE
5. HEADMASTER R.
6. STORAGE
7. BARBER
8. W. C.
9. LOUNGE
10. CAFETERIA
11. KITCHEN
12. COPY R.
13. HOT-WATER SERVICE R.
14. PREPARATORY R.
15. NIGHT KEEPER'S R.
16. CLASSROOM
17. LIBRARY
18. TELEPHONE R.
19. CONFERENCE R.
20. REST R.
21. DOCTOR'S R.
22. MACHINE R.
23. OPEN
24. CORRIDOR

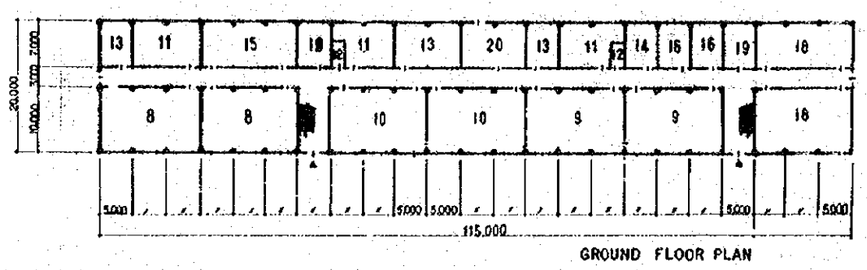


ELEVATION

| | | |
|---|---|---|
| ELECTRICAL INDUSTRIES TRAINING CENTRE (PILOT PLAN A) | | 2/4 |
| ADMINISTRATION PLAN & ELEVATION | | |
| | S : 1/800 | |

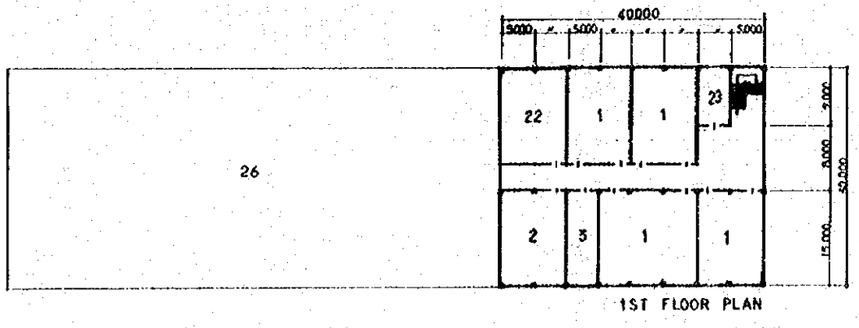
## RADIO, T.V. & ELECTRONIC CALCULATING MACHINES

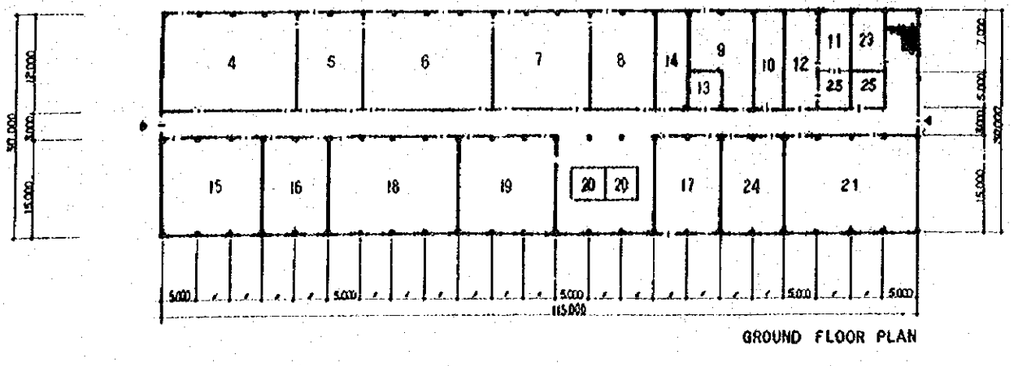



◀ ROOM NAME
1 INSTRUCTOR'S R.
2 TEACHER'S R.
3 RECEPTION R.
4 OFFICE
5 DIRECTOR'S R.
6 CONFERENCE R.
7 LECTURE R.
8 TRAINING R.( ELECTRONIC CALCULATOR )
9 TRAINING R.( RADIO )
10 TRAINING R.( T.V. )
11 PREPERATION R.
12 SHIELDED R.
13 STORAGE
14 MEASURING INSTRUMENT R.
15 AUDIO-VISUAL EQUIPMENT R.
16 DRESSING R.
17 LIBRARY
18 TRAINING R.(COMMON)
19 TOILET
20 MACHINE R.(FOR BUILDING)

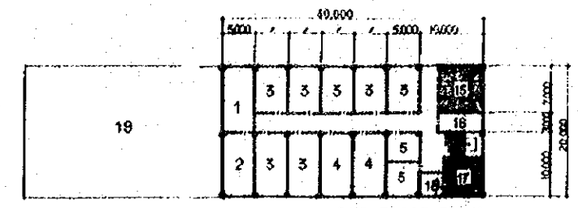
## AIR CONDITION & REFRIGERATION EQUIPMENT

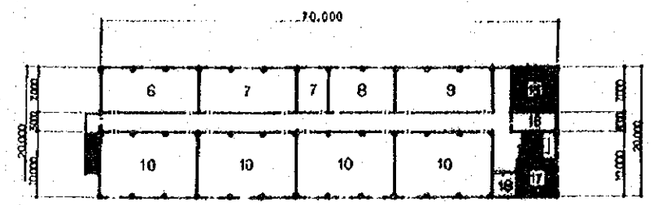


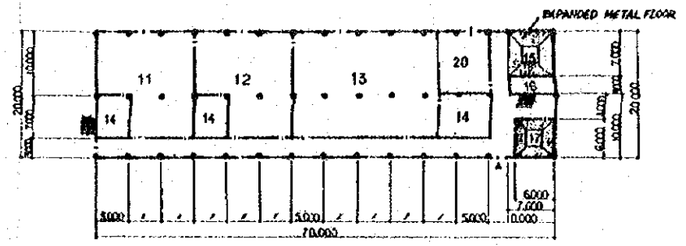




◀ ROOM NAME
1 LECTURE R.
2 LIBRARY
3 MATERIAL R.
4 ASSEMBLING & DISASSEMBLING R.
5 CONSTRUCTION TRAINING R.
6 PIPING R.
7 WELDING & DUCTING R.
8 WIRING R.
9 INSTRUCTOR'S R.
10 TEACHER'S R.
11 DIRECTOR'S R.
12 OFFICE
13 DRESSING R.
14 STORAGE
15 REFRIGERATION R.
16 MEASURING R.
17 MACHINE R.( FOR BUILDING )
18 PACKAGED UNIT, WATER CHILLER, FAN-COIL UNIT & AIR-CONDITIONER R.
19 REFRIGERATOR OPERATING R.
20 CONTROLLED TEMPERATURE & HUMIDITY TEST R.
21 DRAFTING R.
22 CONFERENCE R.
23 TOILET
24 FLOWED DYNAMIC TEST R.
25 RECEPTION R.
26 ROOF

## ELECTRIC LIFTS



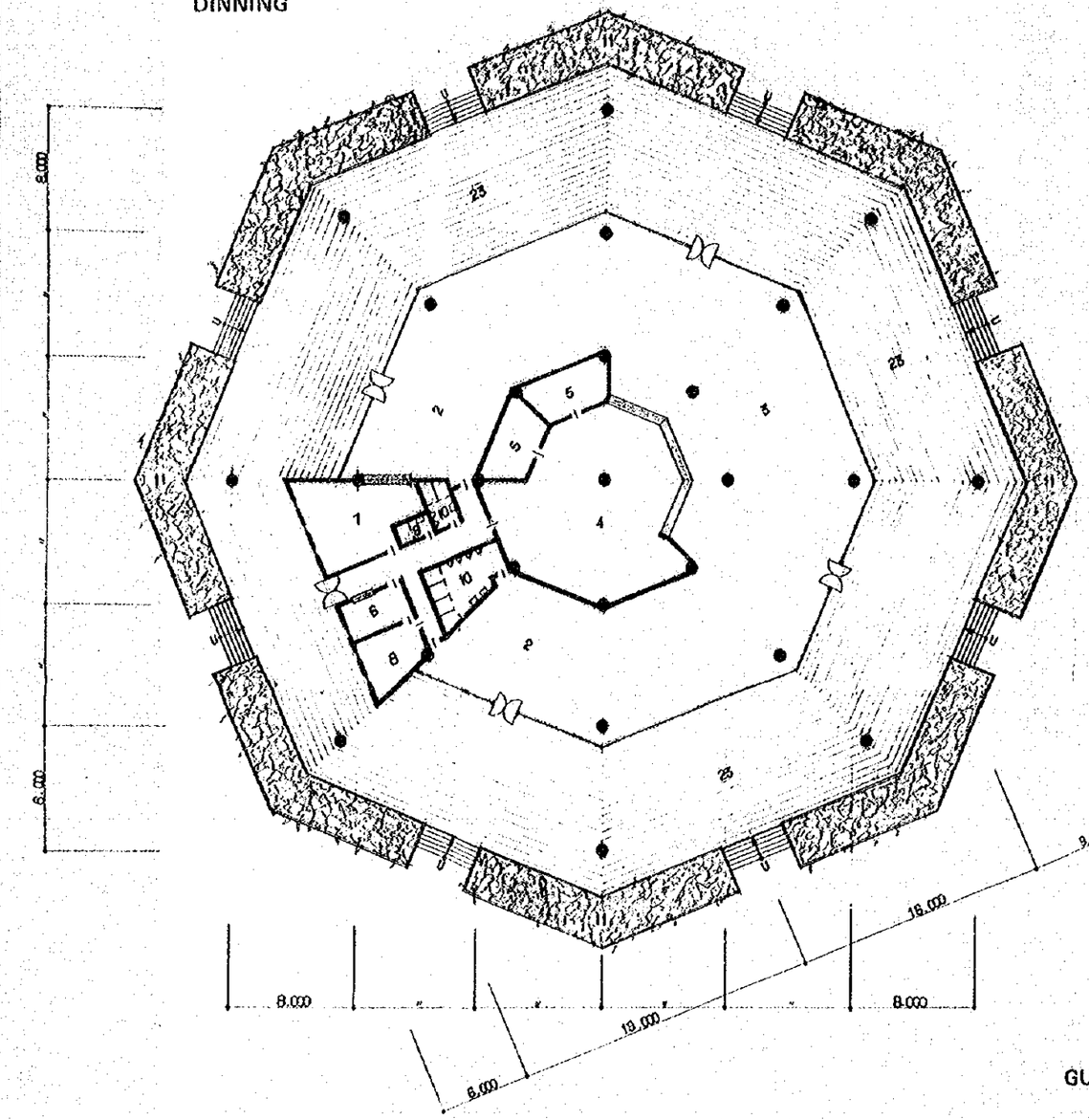




▲ ROOM NAME
1 OFFICE
2 DIRECTOR'S R.
3 TEACHER'S R.
4 CONFERENCE R.
5 RECEPTION R.
6 INSTRUCTOR'S R.
7 MATERIAL R.
8 DRESSING R.
9 ASSISTANT'S R.
10 LECTURE R.
11 ELECTRIC CIRCUIT SYSTEM R.
12 DOOR OPERATING SYSTEM R.
13 MACHINE EQUIPMENT R.
14 STORAGE
15 G.D. LIFT
16 TOILET
17 A.C. LIFT
18 D. S.
19 ROOF
20 MACHINE R.( FOR BUILDING )

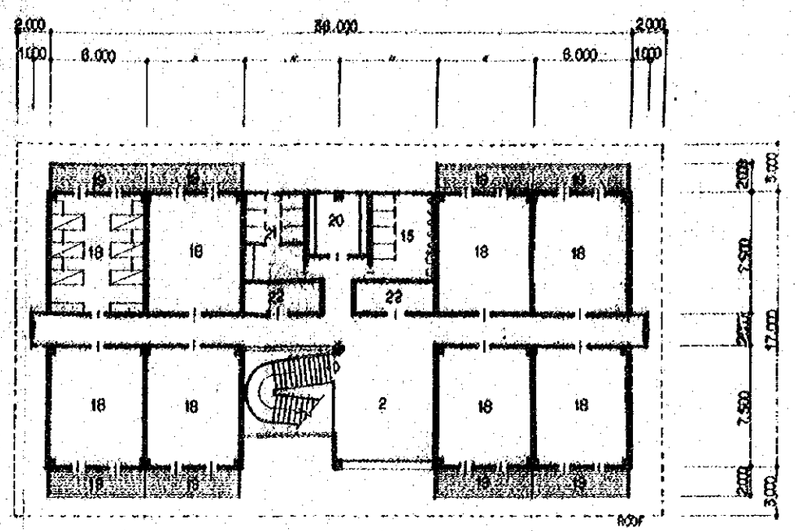
| | | |
|---|---|---|
| ELECTRICAL INDUSTRIES TRAINING CENTRE (PILOT PLAN A) | | 3/4 |
| TRAINING BUILDINGS | | |
| | S : 1/2,000 | |

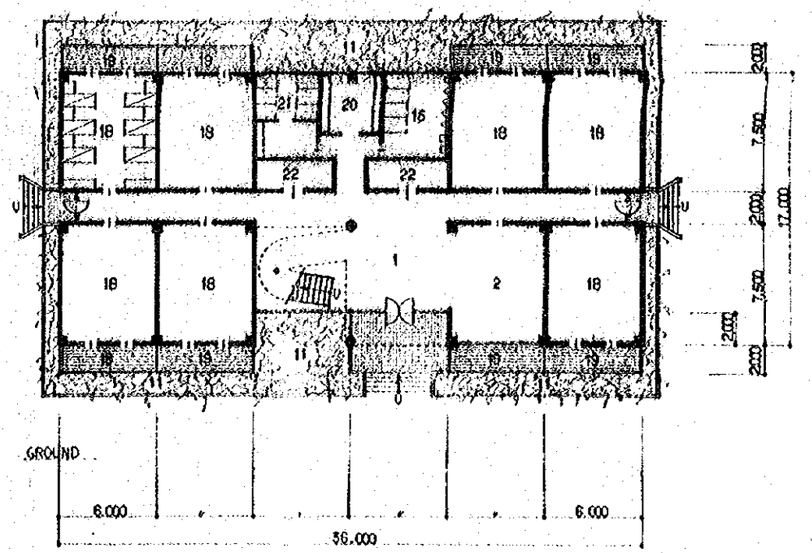
## DINNING



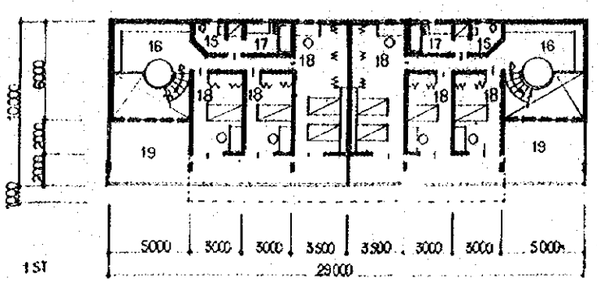

### ROOM NAME LIST

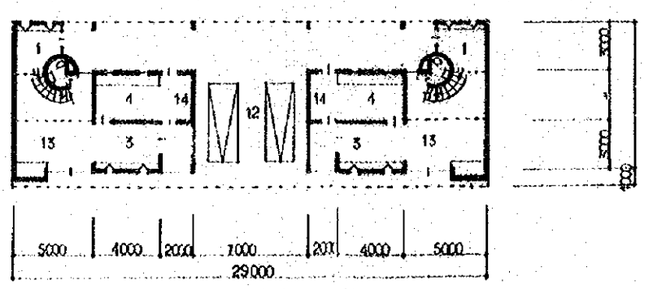
1. ENTRANCE HALL
2. LOUNGE
3. DINING R.
4. KITCHEN
5. FOOD STORAGE
6. ADMINISTRATION R.
7. LAUNDRY
8. REST R.
9. W. C. (LADY)
10. W. C. (MAN)
11. SHRUBBERY
12. PARKING
13. LIVING R.
14. UTILITY
15. W. C.
16. ALCOVE
17. BATH R.
18. BED R.
19. BALCONY
20. LAVATORY
21. SHOWER R.
22. STORAGE
23. CONCOURSE




## GUEST HOUSE




## DORMITORY

| | | |
|---|---|---|
| BLECTRICAL INDUSTRIES TRAINING CENTRE (PILOT PLAN A) | | 4/4 |
| DINING, DORMITORY & GUEST HOUSE | | |
| | S : 1 / 800 | |