

CHAPTER V. IMPLEMENTATION AND OPERATION & MAINTENANCE PLANS

V-1. Implementation Plan

V-1-1. Project Implementation Body

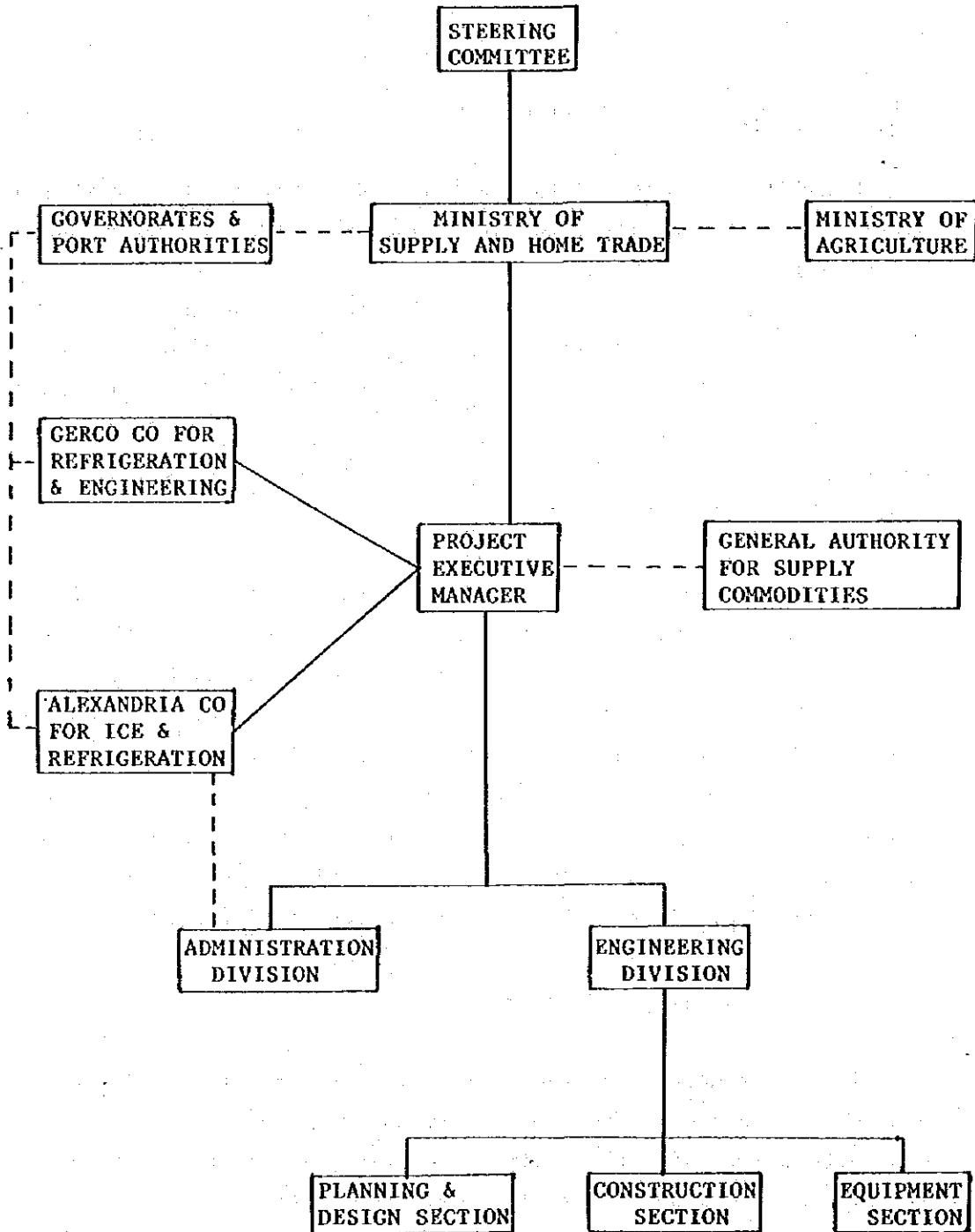
GERCO Co. and Alexandria Co. are responsible to the Ministry of Supply, and Home Trade for the distribution of imported cold foods in the public sector from ports to consumption areas, and inclusive of the management and operation of cold storages and the other related facilities, and will jointly organize the implementation body for the Project. Under the Project Executive Manager assigned by these organizations, the administrative and engineering departments will be established to carry out necessary works for the Project implementation.

Cold storages and meat processing plants render services to the public. To coordinate the interdisciplinary efforts of the Ministry of Supply and Home Trade, Ministry of Agriculture, related governorates, and Port Authority for securing foods, it is proposed that the Ministry of Supply and Home Trade will organize the Coordinating Committee for the Project implementation in which the representatives of the above-mentioned governmental organizations will take part to render advice and cooperation to the implementing body. The proposed organization chart is shown in Figure-11.

V-1-2. Implementation Schedule

The manufacturing of the equipment to be imported shall commence immediately after the conclusion of a contract with contractors for which the equipment drawings shall be checked and approved beforehand. In parallel with the manufacturing of equipment, the site preparation, earth works and foundation works shall be carried out at the proposed sites. Before the completion

Figure-11. Proposed Organization Chart for Project Implementation



of concrete works for floors, structural steel and precast architectural concrete to be imported (by the first shipping) shall be available at the sites. Immediately after its arrival, field work to erect structural steel will start, and the roofing and setting of precast concrete shall follow.

Prefabricated synthetic panels, electrical and mechanical equipment inclusive of those for cooling/freezing and meat processing, and architectural materials to be imported (by the second shipping) shall arrive at the sites before the completion of the roofing work. The setting of prefabricated panels will start immediately after erecting electrical and mechanical equipment. Upon the completion of panel setting, work for damp-proofing and heat isolation, concrete placing for finishing floors, and electrical, mechanical and architectural works will be carried out.

After the completion of structural works, the test run, adjustment and fitting, and guidance in operation of equipment will be conducted over a two-month period.

The proposed implementation schedule is shown below (see Figure-12).

Figure -- 12. Implementation Schedule for the Project

Items	1983			1984			1985			1986								
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1. Feasibility Study																		
2. Implementation Program																		
3. Appraisal E/N etc.																		
4. Detail Design																		
5. Procurement																		
- Tender																		
- Evaluation																		
- Manufacturing																		
- Shipping																		
6. Construction																		
- Temporary Works																		
- Foundation																		
- Structure																		
- Roofing & Siding																		
- Insulation Panel																		
- Finishing Works																		
- Electrical Works																		
- Mechanical Works																		
- Outside Works																		
7. Caring & Test																		
8. Consulting Services																		
- Detail Design																		
- Supervision																		
9. Training Program																		

V-2. Operation and Maintenance Plan

V-2-1. Operation and Maintenance of Cold Storages

The operation and maintenance of cold storages shall be carried out based on the following concepts;

(1) Quality Control

It is desirable to maintain the quality of foods in cold storages at the state at which they were brought. Actually, however, foods cannot be protected from being deteriorated and spoiled by any means, and accordingly the primary purpose of the hygiene and quality control of foods is to possibly prevent them from being degraded and damaged. Strict quality control, therefore, should be compulsorily carried out, and it is essential to prepare a manual for the successful execution of quality control as well as to give adequate training and education to persons in charge of handling and storage of foods.

The temperature control of a cold storage is one of the most important factors to maintain the stored foods in good quality.

The temperature of the cold storage, which shall be determined according to the principle of TTT mentioned below, and kept in a range within the minimum fluctuation.

Although cold foods are less affected by fluctuation in temperature than fresh foods and fruits, the cold products will be sometimes damaged or their quality changed by excessive dryness. The proposed cold storages will be so designed as to allow temperature to fluctuate in a range between 0°C and -30°C.

Under the situation, some stored foods like fish may give off an odor when the temperature rises, and such odor given off from easily-spoiled foods will pollute other foods like butter, etc., so to speak, those foods vulnerable to malodor.

On the other hand, a great care should be exercised for effective ventilation and cleaning of the cold rooms lest malodor affect other stored products. Deodorizing cold rooms may be one of the most effective ways to prevent odor pollution to the products as well as always keeping the rooms sanitary.

Furthermore, careful attention should be paid to the fact that two cold rooms in juxtaposition, one of which is kept high in temperature as compared with that of another, will affect each other in terms of their room temperature through the insulated wall. And particular care should be taken of the case where one room is flanked by rooms with lower storage temperature than that of the former one, because the lower temperature of the flanking rooms will considerably reduce the temperature of the room in between.

(2) Basic concept of TTT

All persons in charge, including supervisors and workers, should have sufficient knowledge of relationships among Time, Temperature, and Tolerance. These three factors are the basis of the so-called concept of TTT, each T of which stands for the longest duration of storage Time, the lowest limit of Temperature to be maintained, and the limit of Tolerance to be assured.

Based on this concept, the store rooms should be so designed as to keep the standard temperature at -25°C or below for frozen meat, fish, and poultry, and 0°C for cheese and butter.

Packages of frozen poultry should be carefully inspected to prevent the package from being broken due to its vulnerability to dryness and freeze burn.

The tolerance of poultry for freezing at -18°C is only about six weeks. The standard freezing temperature of 0°C can be applied only to well-packed butter which is processed in good hygienic conditions, and a temperature of -25°C should be applied to butter to be stored more than six months.

Cheese, specified into about 500 types by degree of maturity, requires a wide range of temperature control for its storage to meet the respective maturity stages, and the optimum temperature for storage of cheese in various stages will be applied according to recommendation by producers. Refrigeration tolerance ranges from six months to one year for processed cheese, while about one month for natural cheese under refrigeration temperature of about 5°C in good packing conditions.

Accordingly, all persons concerned with refrigeration should have a thorough knowledge of the basic concept of TTT to cover a wide variety and types of food.

(3) Manual for hygienic control of plant

Successful control of plant essentially requires the preparation of manual for hygienic operation and maintenance of the facilities. The manual should refer at least to the following items.

- a) Anyone who suffers from or is exposed to infectious diseases shall be prohibited from entering processing plant, cold storages and meat handling areas.
- b) No visitors shall be permitted to enter processing plants, cold storages, and meat handling areas without permission. Visitors who are permitted to enter shall observe the said manual while they are in the facilities.

- c) The employees working in processing plants and cold storages shall wear working clothes and working boots which are always kept clean. Soon after the work is finished, the clothes and boots shall be put back to the designated lockers. In particular, the boots shall be washed by flowing water provided for the exclusive use of this purpose every time when work is over.
- d) The employees working in the plants shall wash their hands with soap and dry them by hot air, when beginning work, leaving their positions, and returning thereto on duty, and whenever they have touched unhygienic objects.
- e) Persons shall refrain from smoking and chewing gum in the storage and meat handling areas.

(4) Manual for processing

It is essential to observe the following rules for hygienically successful operation and maintenance of the equipment and facilities.

- a) The working floors, tables, tools, and equipment shall be washed and sterilized immediately after the work is completed.
- b) Washing shall be made with clean water, and with neutral cleanser for greased tools and so on.
- c) The aforesaid tools and equipment shall be sterilized with hypochlorite (NaHCl_2) after washing.
- d) Large equipment that cannot be dipped into washing tubs shall be washed with sprayed water.

(5) Manual for receiving and forwarding of products

The work flow of receiving and forwarding of the products is illustrated as follows:

Receiving

Unloading ----- Checking products ----- Loading onto
pallets ----- Designating locations of products to be stored
----- Hauling into storage ----- Final Checking of
Products.

Forwarding

Checking stocks ----- Hauling out of storages -----
Checking products ----- Loading onto vehicles ----- Hauling out
----- Delivery order ----- Forwarding

All the aforesaid works should be carried out following the operation manual shown below so that orderly and smooth flows of the products can be secured.

- (a) When handling cold products, loading and unloading should be made as quickly as possible for sorting the products and putting in and out of pallets. In this connection, the staff and workers concerned should always be in a position ready to work anytime when the products are received and/or forwarded.
- (b) The products shall not be left long time on the platform and kept in the temperature of 2°C at maximum.
- (c) Every flow of the products should be checked through recording the weight, quantities and types of the products.

- d) A careful check should always be made for damages of the packing and spoilage of products. Partially defrozed products should be recorded and the temperature of the spoiled products should be taken from time to time so as to keep other products from being adversely affected.
- e) The insulating doors of the cold rooms should be operated carefully whenever anyone comes in and out of the rooms. Time for the doors to be left open should be minimized to keep the room temperature at the designated one.
- f) The pallet yard and the passages of forklift should be clearly shown by marking on the floor so that the forklifts can be operated smoothly and efficiently.
- g) Forwarding should be made from the products stored for longer period, and those stored longer should be relocated closely to the doors so as to be taken out easily.
- h) The products should be classified and stored on the storing period basis, and the products stored long time should be placed separately from those to be hauled in lately.
- i) In principle, the products should be stored by placing them on pallets. When the circumstances do not allow to do so, an exceptional case the products should be placed on duck-boards to avoid direct laying on the floors with two pieces of wood logs with at least 100 mm thickness. The products can be laid in two layers and such product-loaded duck-boards should be placed at 600 mm intervals and at least 300 mm distance from walls. Bone meat should be placed with great care to avoid overloading on the duck-boards, and placed with the aforesaid wood logs placed at the right angle to the products in each layer.

- j) The products should be stored by categories in order to make possible quick finding of the classified products. Tags should be put on each pallet to indicate the location of the products. The location of the products should be recorded for reference by the staff concerned.

(6) Office works for cold storages

The office works involved in the operation and maintenance of cold storages are roughly divided into the office management centering around the booking of unloaded, stored, and loaded cold foods at each cold storage as well as billing, accounting, reporting to higher organizations, bonding, desk works for operation and maintenance of equipment, and personal affairs of employees.

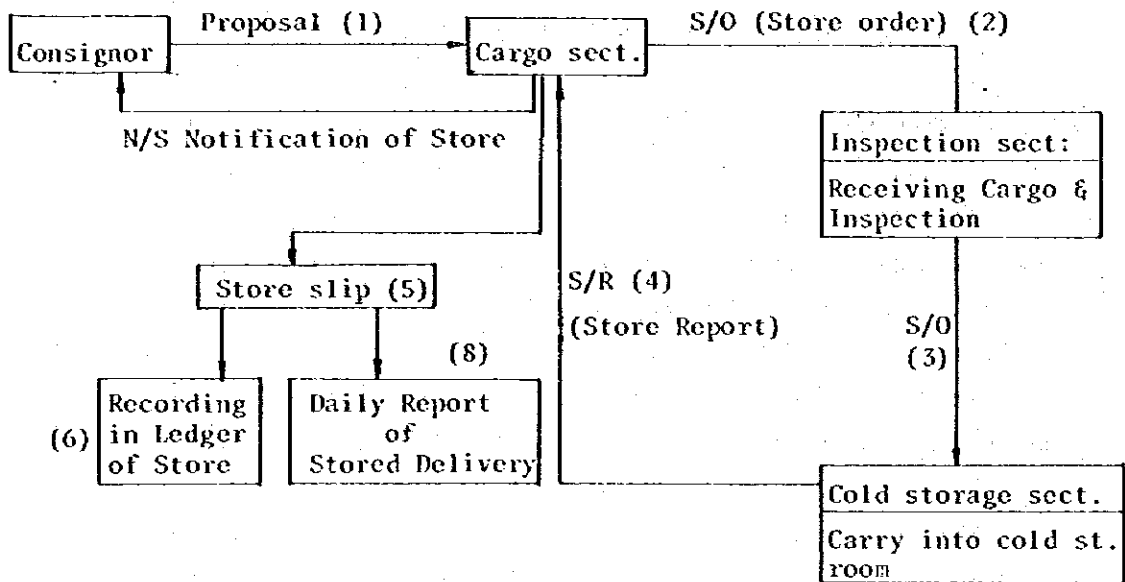
The storage of cold foods starts from unloading and ends at loading of them for forwarding or distribution. In addition to the utmost efforts for careful storage of cold foods, it is essential to take a series of due and accurate recording steps for which the storage ledger is the most important. The orderly storage ledger keeping is essential. The flow chart of office works is shown in Figure-13.

V-2-2. Organization

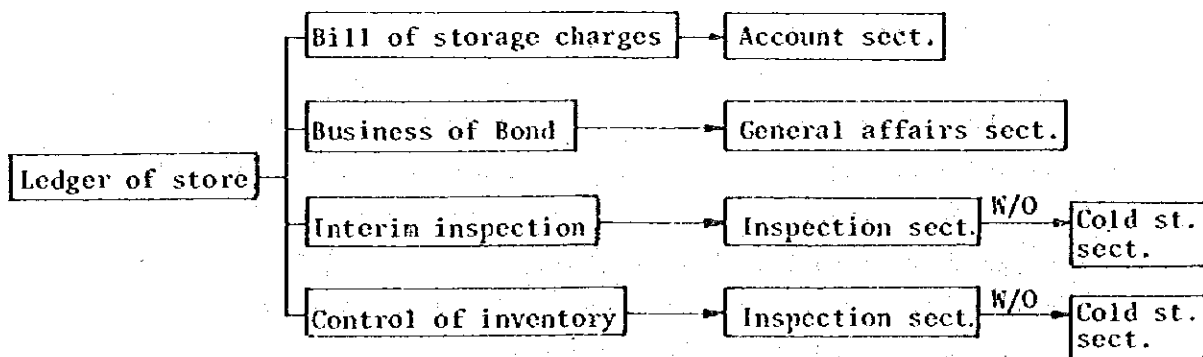
The systematic organization is the most important for successful operation of each section and department of the plant. The following figures show the proposed organization of cold storages. Besides the above organization, several task force teams should be formed to cope with emergencies such as fire, explosion of ammonia, etc., and those who are assigned to the task force should be trained at least once a year to prepare for such accidents.

Figure -13. Flow Chart of Business of Cold Storage

(1) STORE IN



(2) STORAGE PERIOD



W/O : Work order

(3) DELIVERY

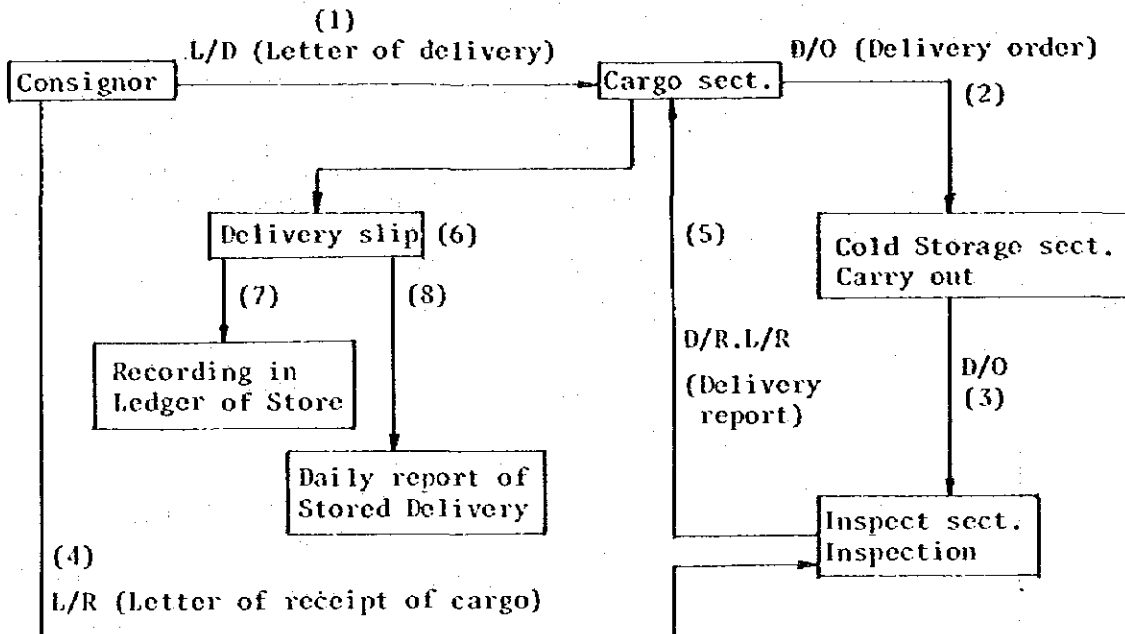
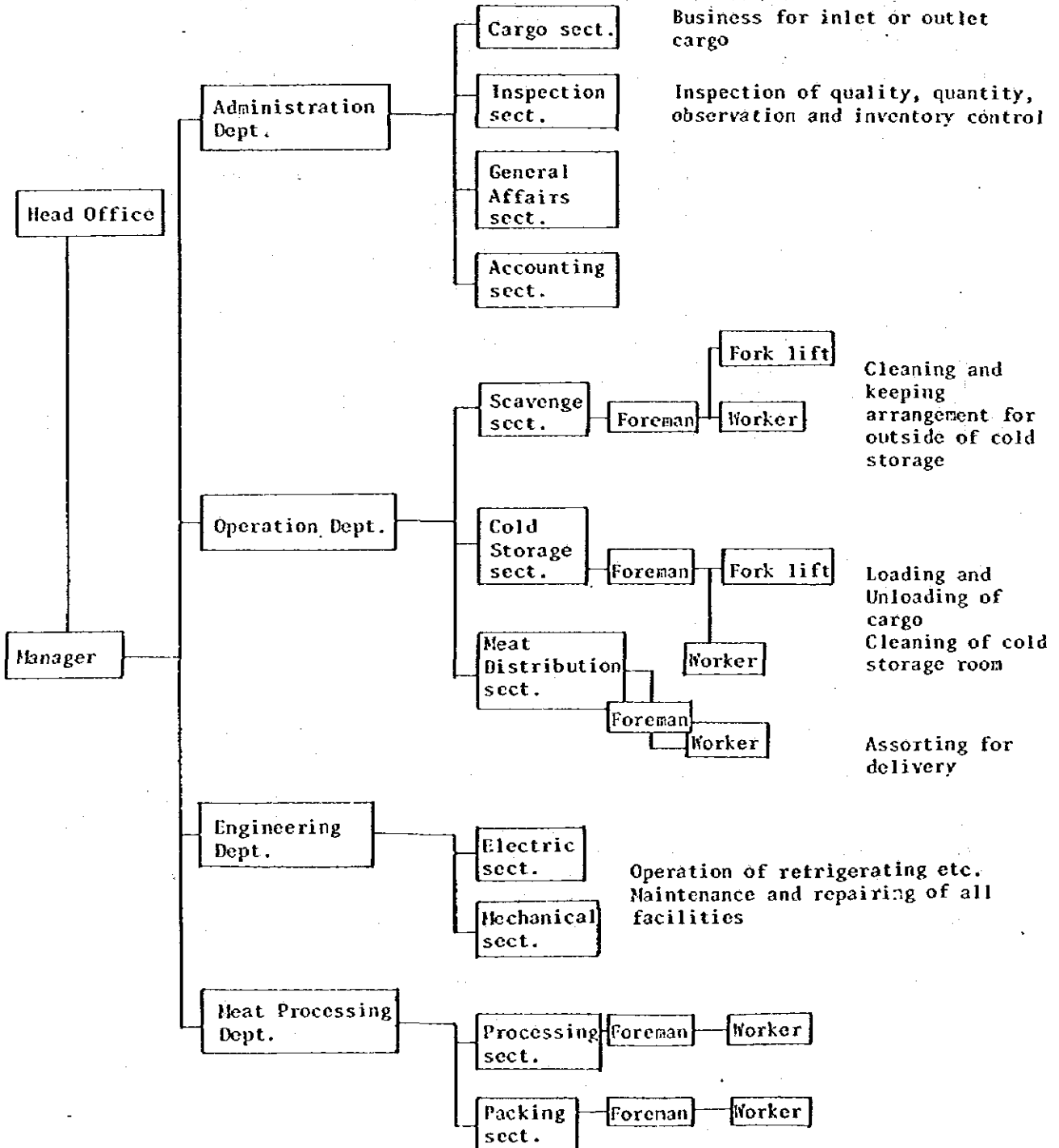


Figure -14. Organization Diagram

(1) COLD STORAGE AND MEAT PROCESSING PLANT



(2) ICE PLANT

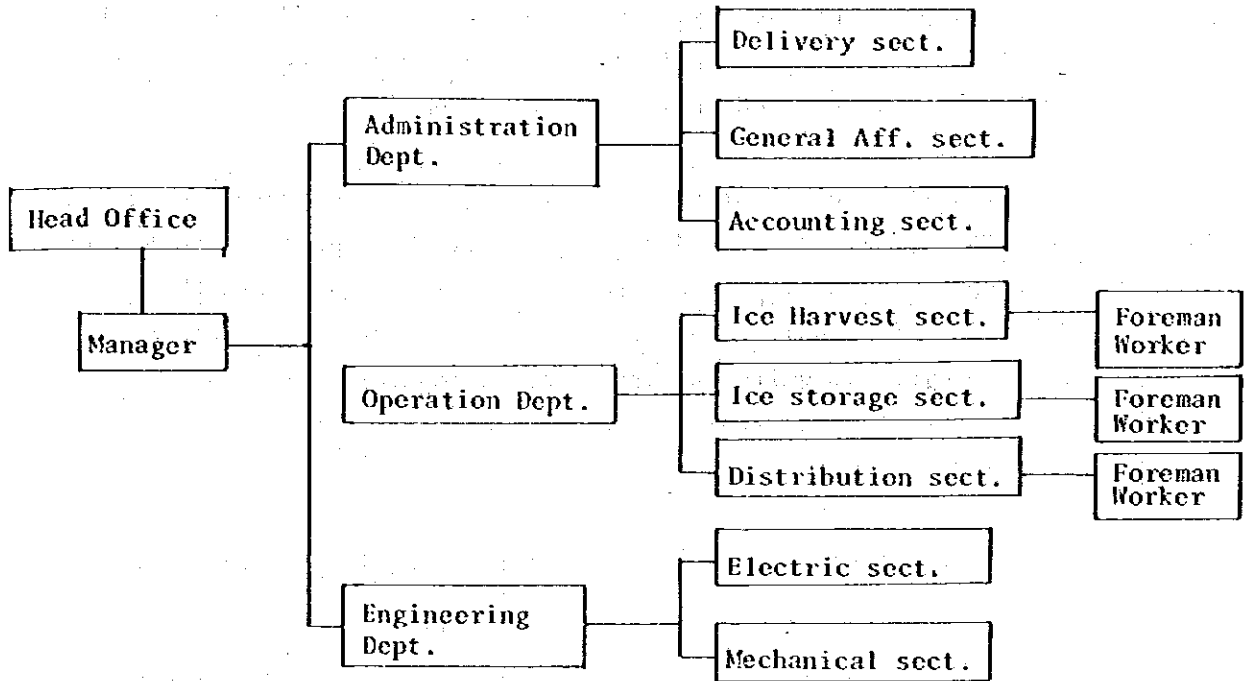


Figure-14 is a proposed staffing plan based on the organization chart prepared previously. The said staffing plan does not include any employment of extra workers on the assumption that the whole works shall be covered only by permanent employees.

The work volume of cold storages usually fluctuates throughout the year as well as in a day. Therefore, the staffing plan should be prepared to meet such fluctuating requirements across the divisions in organization. In this regard, intensive training of the employees is quite essential for successful operation and management of cold storage through close cooperation among divisions and workers concerned.

Staffing at Cold Storages, Meat Processing Plants, and Ice Plant

<u>Facility</u>	<u>Manager</u>	<u>Administ- ration Division</u>	<u>Operation Division</u>	<u>Engineer- ing Division</u>	<u>Process- ing Division</u>	<u>Others</u>	<u>Total</u>
Alexandria	1	7	38	8	74	6	134
-El Dekihla							
Port Side	1	7	13	8	-	6	35
-Sherif							
Port Side	1	7	10	8	-	6	32
-Abbas							
Suez	1	7	13	8	-	6	35
-Suez							
Cairo	1	7	23	8	-	6	45
-Ghamra							
Cairo	1	7	38	8	74	6	134
-Ramada							
Alexandria (Ice Plant)	1	4	20	8	-	-	33

The details of staffing plan appear in Appendix C-1.

V-2-3. Operation and Maintenance of Facilities

(1) Operation and Maintenance of refrigeration facilities

The operation and maintenance of the facilities shall be carried out mainly by the Mechanical Section of Engineering Department. Employees with high engineering qualifications should be assigned to this department in a three-shift system per day because the works of this department is dangerous and involves the handling of toxic chemicals and high pressure ammonia.

(2) Standards for operation and maintenance of facilities

Major items of standards for O & M are as follows:

- a) To maintain facilities so as to operate them to their capacity;
- b) To realize the efficient operation with the minimum losses of electric power, water and fuel, etc;
- c) To secure the safe working environment;
- d) To try utmost to avoid accidents lest operation should be interrupted;
- e) To render successful maintenance services for making the desirable life of facilities possibly longer; and,
- f) To give regular inspection and check of the facilities for well-balanced storage under the O & M program.

(3) Preparation of maintenance program

The following records and drawings should be kept neatly to make quick reference possible for the successful implementation of the above maintenance program.

- a) Design drawings of facilities,
- b) Records of maintenance services, including repairing, accidents and troubles, that describe occurrences and resolutions,
- c) Details of parts of facilities based on manufacturers' specifications, number and types and dimensions of the related parts, and
- d) Records of consumption of supplies including electricity, water, and oil, etc.

In addition, successful maintenance works require a maintenance manual and the cumulative knowledge thereof to be used for the education of newcomers.

(4) Contents of maintenance manual

The following items should be recorded in each stage of maintenance works rendered according to the manual.

- a) Types of maintenance work and the date, month, and year of the works done;
- b) Items and process of the work;
- c) Tools and supplies used;
- d) The number of workers engaged and time consumed; and,
- e) Points checked carefully, including items prohibited and safety measures.

(5) Specific maintenance works

Maintenance work should be performed along with the following schedules but not limited thereto.

a) Daily inspection

- i. Checking the daily records of operation of refrigeration facilities to see whether there are any troubles and to supplement any supplies if necessary.
- ii. Checking meat processing plant and equipment.
- iii. Checking should be performed for the forklifts, insulating doors, electric system, washing, disinfecting equipment, and thawing machines.

b) Monthly Inspection

- i. Adjusting belts and checking pulleys;
- ii. Confirming the working of high pressure switches for compressor and other safety devices;
- iii. Checking electric insulation of equipment;
- iv. Cleaning water portion side of the condenser and water tanks, (only in the sand-storm season from March to May); and,
- v. Defrosting coolers of storage room.

c) Yearly Inspection

- i. Renewing the worn-out belts;
- ii. Overhauling of compressor; (Inspection shall be carried out in accordance with the instructions given in the manual prepared by manufacturers)
- iii. Cleaning refrigerant filters; and,
- iv. Examining and repairing if necessary, all facilities (building, insulation, etc.).

Daily check of equipment should be made by operators so as to locate any troubles and take necessary and appropriate counter-actions for smooth running.

(6) Record of operation

All operators at each shift should record the following items at every two hours in the record books and keep them neatly.

- a) Compressor discharge pressure, Compressor suction pressure, and Compressor oil pressure
- b) Pump discharge pressure
- c) Compressor suction gas temperature, Compressor discharge gas temperature, and Compressor oil temperature;
- d) Motor(voltage and ampere);
- e) Water temperature, outdoor air temperature, cold storage room temperature, meat processing room temperature;
- f) Purifying level of lubricating oil;
- g) Defrosting conditions;
- h) Frosting condition by coolers; and
- i) Running noise and others.

(7) Work of scavenge section

Scavenge section shall perform the following works.

- a) Housing of used pallets and preparation for receiving the products;
- b) Repairing and painting of damaged pallets;
- c) Cleaning platform and handling room by washing (every day, especially during sand-storm season); and,
- d) Cleaning outside of the plants.

V-2-4. Operation and Maintenance Cost

The estimated operation and maintenance costs required by each factory are shown in (4) of this clause.

(1) The plant capacity and the necessary number of workers are as per V-2-2 "Organization".

(2) The unit cost is calculated as follows:

- a) Personnel expenses : Based on the existing average wage level of each plant of GERCO plus 20 percent increase as welfare benefit.
- b) Electric charges : Based on the price indicated by GERCO plus LE 0.05/KWH as basic charge.
- c) Water charges : The flat rate of LE 0.05/m³ shall be added to the basic price indicated by GERCO.
- d) Oil charges : As fuel for boiler, based on the unit price at the beginning of 1982.
- e) Price of vinyl bag : Based on the unit price for two kilogram contents, currently used for block meat by GERCO.
- f) Maintenance and repairing charges:
The cost was estimated on the assumption of the proposed new level of O & M services because the current O & M works have been unsatisfactory.
- g) Miscellaneous expenses:
Three percent of the above total, including those costs of office stationeries, telephone, mail charges, and so forth.

(3) The quantitative basis for calculation is as follows:

- a) Personnel expenses : Full time working is the base for estimation according to "Staffing" of "Organization Diagram".

- b) Electric charges : Power consumption by motors for various uses with respect to calculated load factors and movable factors is shown below:

	<u>Ref.Comp.</u>	<u>Ref.Equip.</u>	<u>Air Cond.</u>	<u>Meat Processing Equip.</u>	<u>Room Cooler</u>	<u>Ice Making</u>
Load factor	0.8	0.7	0.8	0.8	0.8	0.9
Movable factor	0.8	0.7	0.5	0.5	0.2	0.9

- c) Water charges : Theoretical consumption plus loss.
d) Oil : On the assumption that boilers are operated during the meat processing works.
e) Vinyl Bag : Based on the maximum volume of meat processed.

(4) Operation and Maintenance Cost by Cities

- i) El Dekihia at Alexandria (6,000-ton cold storage and meat processing)
462,000 LE/year
- ii) Sherif of Port Said (3,000-ton cold storage)
102,500 LE/year
- iii) Abbas at Port Said (2,000-ton cold storage)
87,400 LE/year
- iv) Suez (3,000-ton cold storage)
102,500 LE/year
- v) Ghamra at Cairo (3,000-ton cold storage)
109,200 LE/year
- vi) Kawada at Cairo (3,000-ton cold storage and meat processing)
389,000 LE/year
- vii) Alexandria (Ice making and ice storage, 100 tons/day)
151,000 LE/year

The bases upon which the staffing plan of each cold storage was formulated, and the operation and maintenance cost estimated are shown in Appendix C-2.

V-3. Consulting Services

- ° A six-month period will be necessary for the detailed design and operation of tender documents. The tendering, evaluation of tender documents, and contract signing will be completed in a four-month period. The consulting services equivalent to 136 man-months will be required as tabulated below (see Figure-15);

- ° In the construction stage, the engineering services for site supervision, check of the drawings of imported materials and equipment, and inspection of them at site and at the time of export will be necessary. One resident engineer will be stationed at Cairo and Alexandria each (both for the cold storage and ice making plant), one covering Port Said and Suez. The consulting services of 114 man-months will be required in this stage as tabulated below (see Figure-15);

Figure - 15. Proposed Schedule for Consulting Services

Designation	No. of Consultant	1985												1986												Man-Month	No. of Trip
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12		
A. Detail Design																											
A-1. Team Leader	1																								6	1	
A-2. Civil Engineer	2																								8	2	
A-3. Senior Architect	1																								6	1	
A-4. Architect	7																								42	7	
A-5. Structural Engineer	4																								18	4	
A-6. Electrical Engineer	2																								9	2	
A-7. Mechanical Engineer	4																								20	4	
A-8. Specification Writer	1																								5	1	
A-9. Cost Estimator	7																								14	7	
A-10. Handling/Transport Expert	1																								3	1	
A-11. Managerial Specialist	1																								2	1	
A-12. Economist/Financial Analyst	1																								3	1	
Sub-total																									136	32	
B. Supervision																											
B-1. Team Leader	1																								18	1	
B-2. Civil Engineer	2																								12	2	
B-3. Senior Architect	1																								9	1	
B-4. Architect	3																								21	3	
B-5. Structural Engineer	4																								24	4	
B-6. Electrical Engineer	2																								8	2	
B-7. Mechanical Engineer	4																								16	4	
B-8. Managerial Specialist	1																								3	1	
B-9. Financial Analyst	1																								3	1	
Sub-total																									114	19	

V-4. Training Program

It is essential that the trainees selected in accordance with the following standard should be educated along with the training program in parallel with the commencement of factory construction (See Appendix C-9 for the detailed Training Program):

V-4-1. Selection Criteria:

- (1) Those who have graduated from university/college or have the same basic knowledge and understanding as these college graduates.
- (2) Those young trainees who have experience in the similar field.
- (3) Those trained persons who can take full responsibility for educating other workers in Egypt for long period thereafter. It is not advisable to select those who may leave their positions soon after training.

V-4-2. Training Program

- (1) For cold storage

The number of trainees and time required are as follows:

	Man	Month
Non-experts/Administration Officers	5	3
Mechanics*	5	4

- * The mechanics shall have on-the-job training at the sites until the completion of plant after the ordinary training is over.

Major items:

Non-experts and Administration Officer

- Study & practice on temperature control,
(for understanding TTT concept)
- Study & practice on hygienic control and its execution.
- Efficient cargo handling and mobilization of staff and workers.
- Office management and budget compilation.

Mechanics:

- Study & practice on operation of refrigeration and other equipment, and their daily check-up,
- Study & practice on maintenance and repair of refrigeration and other equipment,
- Study and practice on maintenance and repair of facilities such as insulating panels, insulating doors, concrete floors, and so on.
- Study on the maintenance manual and its application.
- Field practice after training at proposed sites on refrigerant pipeline networks, valves, joints, and fabrication of facilities, machineries, buildings, and trial operation and adjustment of automatically working devices.

The training will be held:

for non-experts and Administration Officers

- At two cold storages constructed after 1975, with capacity of 3,000 tons and over.

for Mechanics

- At two cold storages constructed after 1975 with a capacity of 3,000 tons and over, using central and two-staged compression system.
- At respective machine manufacturers' plants.

(2) For meat processing

The training in processing control will be given for three trainees for three months

Major items:

- Study and practice on quality control,
- Study and practice on hygienic control and its execution, and
- Study and practice on various processing, packing, sorting works, and handling machines.

Training will be held at the meat processing plant constructed after 1975.

(3) For ice plant

The number of trainees for mechanics is three and the time required is three months. The trainer shall have on-the-job training at the construction site after training until the plant completion.

Major items:

- Study and practice on hygienic control and its application

- Study and practice on efficient operation of refrigerators and various ice making machines and their daily check-up.
- Study and practice on maintenance and repair and of various machines.
- Study and practice on maintenance and repair of facilities.
- Study and practice on preparation of maintenance manual and its application.
- On-the-job training at construction site in Refrigerant pipeline networks, valves, joints, and installation of facilities, machineries, fabrication of buildings, and trial operation and adjustment of automatic working devices.

Training will be held at block ice plant using herringbone coils constructed after 1960.

CHAPTER VI. PROJECT EVALUATION

VI-1. General

1) Objective of the Project

In view of ever expanding import of cold foods in Egypt, the major objective of the Project is to keep quality control and ensure stable supply of imported cold foods through provision of new cold storages, installation of meat processing plant at storages in consumption area, and introduction of fork lifts at all new cold storages to help ease loading and unloading works as well as of insulated trucks as a means of transporting imported cold foods from the cold storage at port to that of consumption area.

The Project has been formulated, though constrained by some data availability, to develop a cold storage chain system with cold storages of designed capacity of 20,000 ton and an ice making plant of 100 ton per day for fresh fish. The closed system is proposed for distribution network between the port of import and the consumption area.

2) The Project Components

Brief outline of the Project components is as follows:

	<u>Unit</u>	<u>Capacity</u>
Cold Storage at Port	4	14,000 ton
Cold Storage at Consumption Area	2	6,000 ton
Meat Processing Facility	2	(25 ton/8 hrs)
Insulated Truck	16	(10 ton/truck)
Fork Lift	37	
Ice Making Plant	1	100 ton/day

VI-2. Economic Evaluation

VI-2-1. Method of Evaluation

The Project is evaluated using EIRR with the following assumptions:

1. Project life of 30 years
2. In order to determine the economic price of input and output of the Project, standard conversion factor is estimated in the following manner:

$$SCF = (I_m + I_x) / (I_m + I_x + TI_m + TI_x - SE_x)$$

where SCF : Standard Conversion Factor
I : Total Value of Import (c.i.f. price)
I^m : Total Value of Export (f.o.b. price)
TI^x : Total Import Tax
TI^m : Total Export Tax
SE^x : Total Subsidy for Export

Standard conversion factor derived from the trade statistics of the past four years turns out to be 0.8 (refer to Table-26).

VI-2-2. Economic Benefits

Economic benefits to be generated from the Project are discussed below.

1) Cold Storage

- a. Reduction of qualitative and quantitative loss in imported cold foods
- b. Large-scale importation of cold foods when the market prices are low

- c. Stable supply of imported cold foods to general consumers.
- d. Reduction of demurrage because there is no more need from the viewpoint of quality control, to make use of refrigerator ship as a cold storage while it is moored at port.

Since some data constraint would not allow quantitative assessment of the items a, b, and c above, this report is primarily concerned with the benefit from the item d.

- Reduction of Demurrage -

	<u>Port Said</u>	<u>Suez</u>	<u>Alexandria</u>	<u>Total</u>
Total overstay (day) ^{/1}	233	243	171	647
Demurrage (L.E/day/day)	10,000	10,000	10,000	10,000
Total demurrage (L.E 1,000)	2,330	2,430	1,710	6,470

/1 -- See Table-27.

2) Meat Processing

- a. Part of meat processing works is saved at the retail stage.
- b. Loss in quality of imported cold meat is reduced because meat can be processed without thawing and preserved for a long period.
- c. In case meat is imported in bags of 2-3 kg instead of the current practice of importing in boxes of 30 kg, expansion of the storage capacity is necessary. Reduction of increased cost of the expansion is regarded as benefit.
- d. Value added to the final products through meat processing.

The price mechanism of imported cold foods in Egypt is characterized by what is called "backspread" or selling at the price lower than that purchased, however, the data are hardly obtainable on the rate of government subsidy for imported cold foods. It is also quite difficult to quantify the items a, b, and c above. This study attempts to enumerate the project benefit assuming the cost of meat processing equal to the value added.

Considering the annual cost of meat processing as benefit, additional cost is estimated as follows:

- Additional Cost of Meat Processing -

(Unit: L.E 1,000)

	<u>Total Cost</u>	<u>Annual Cost</u>
Initial Cost ^{/1}		
F/C	3,881	129
L/C	851	28
Sub-total	<u>4,732</u>	157
O & M Cost ^{/2}	-	635
Total	-	<u>792</u>

Note: ^{/1} -- See Table-28.

^{/2} -- See Table-29.

3) Ice-Making Plant

Preserving fresh fish in good quality is the probable benefit derived from an ice-making plant. This benefit, though not readily estimated due to the insufficient data, is calculated by multiplying the retail price of ice and the annual volume of production as follows:

- Incremental Production of Ice -

Capacity (ton/day)	100
Annual Operation (day)	300
Annual Production (ton)	30,000
Unit Price (L.E/ton)	10
Production Value (L.E/year)	300,000

Project benefits are summarized as below:

<u>Source</u>	<u>Benefit</u> (L.E 1,000/year)
Cold Storage	6,470
Meat Processing Facility	792
Ice-making Plant	300
Total	<u>7,562</u>

VI-2-3. Economic Cost

Initial economic cost of investment is estimated by multiplying the local currency portion of the initial financial cost of investment by the standard conversion factor.

- Initial Investment Cost -

(Unit: L.E 1,000)

	<u>Initial Financial Cost</u> (less price contingency)		<u>Initial Economic Cost</u>
F/C	26,915	x 1.00	26,915
L/C	15,053	x 0.80 (SCF)	12,042
Total	<u>41,968</u>	-	<u>38,957</u>

The annual operation and maintenance cost for the Project is estimated at L.E 1,441,600 as given in Table-30.

For some facilities and equipment which have lesser durable life than the project analysis period of 30 years, the following replacement costs are taken into account in the calculation of E.I.R.R.:

<u>Item</u>	<u>Cost/*</u> (L.E 1,000)	<u>Durable Life</u> (Year)	<u>Counted Time</u>
Insulated Truck & Forklift	1,417	10	2
Pallet	1,016	10	2
Meat Processing Facility	2,325	15	1
Cooling Equipment	6,091	20	1

Note: /* ... In terms of economic cost.

VI-2-4. Economic Internal Rate of Return

EIRR is calculated based on the economic benefit and cost estimated as above for the project life of 30 years. Both streams of cost and benefit over 30 years are shown in Table 32. EIRR is also estimated for the both cases without an ice-making plant at Alexandria and without an ice-making plant and cold storage at Alexandria. The summary is given below.

<u>Case</u>	<u>EIRR(%)</u>
- All Facilities Constructed	14.0
- Without Ice Making Plant	14.5
- Without Ice Making Plant and Cold Storage at Alexandria	15.3

VI-2-5. Sensitivity Analysis

The sensitivity analysis is conducted for the case where all the facilities are constructed. The results are shown below:

<u>Case</u>	<u>EIRR(%)</u>
- 10% increase in Project Cost	12.4
- 10% decrease in Project Benefit	12.3
- Delay of 1 year in Construction Period	12.9

Table - 26 Calculation of Standard Conversion Factors

(Unit : LE 1,000)

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>Average</u>
1. Import (c.i.f., total)	2,632,191	2,686,213	3,402,000	6,187,497	3,726,975
2. Export (f.o.b., total)	679,754	1,287,813	2,132,178	2,262,982	1,590,682
3. Import Duties and Taxes	1,009,505	961,844	1,153,958	2,175,256	1,325,141
4. Export Duties and Taxes	2,142	1,119	1,030	1,182	1,368
5. Export Subsidy	-	-	-	-	-
6. (1 + 2)	3,311,945	3,974,026	5,534,178	8,450,479	5,317,657
7. (1 + 2 + 3 + 4 - 5)	4,323,592	4,936,989	6,689,166	10,626,917	6,644,166
8. SCF (6 + 7)	0.766	0.805	0.827	0.795	0.800

Table - 27

Calculation of Demurrage

	Port Said	Suez	Alexandria	Total
Total Import Amount (ton)	25,000	15,000	50,000	70,000
- Red Meat (35%)	8,750	5,250	10,500	24,500
- Chicken (35%)	8,750	5,250	10,500	24,500
- Fish (30%)	7,500	4,500	9,000	21,000

Port Said	Cargo Amount	No. of Ships	Without Project		With Project		No. days of Overstay
			Daily Transport	Mooring day	Port Handling	Mooring day	
Meat	3,000 t	5	83.3 t	36 x 5	370 t/day	8 x 5	28 x 5 = 140
"	2,500 t	1	"	30 x 1	"	7 x 1	23 x 1 = 23
Fish	3,000 t	2	"	36 x 2	400 t/day	8 x 2	28 x 2 = 56
"	1,500 t	1	"	18 x 1	"	4 x 1	14 x 1 = 14
Suez:							
Meat	3,000 t	3	50 t	60 x 3	240 t/day	13 x 3	47 x 3 = 141
"	1,500 t	1	"	30 x 1	"	6 x 1	24 x 1 = 24
Fish	3,000 t	1	"	60 x 1	400 t/day	8 x 1	52 x 1 = 52
"	1,500 t	1	"	30 x 1	"	4 x 1	26 x 1 = 26
Alexandria							
Meat	3,000 t	7	100 t	30 x 7	200 t/day	15 x 7	15 x 7 = 105
Fish	3,000 t	3	"	30 x 3	375 t/day	8 x 3	22 x 3 = 66

Total 647/year

1/ P.S. 25,000/500 = 83.5, Suez 15,000/500 = 50, Alex. 30,000/500 = 100

Table- 28. Additional Cost of Meat Processing
(Initial Investment)

(Unit : ¥ 1,000)

	With Meat Processing		Without Meat Processing		Additional Cost	
	F/C	L/C	F/C	L/C	F/C	L/C
<u>I. Ramada</u>						
- Foundation	-	215,625	-	158,269	-	57,356
- Building	815,577	199,495	597,166	146,429	216,411	53,066
- Cooling Equipment	285,645	29,166	208,096	25,051	77,549	4,115
- Meat Processing	506,000	54,000	-	-	306,000	54,000
- Total	1,405,222	498,286	805,262	329,749	599,960	168,537
<u>II. El Dekihla</u>						
- Foundation	-	348,267	-	299,161	-	49,106
- Building	1,199,853	301,561	1,030,674	258,869	167,179	42,492
- Cooling Equipment	328,815	36,628	239,546	31,460	89,269	5,168
- Meat Processing	506,000	54,000	-	-	306,000	54,000
- Total	1,834,668	740,256	1,270,220	589,490	564,448	150,766
<u>II. Total</u>						
	3,239,890	1,238,542	2,075,482	919,239	1,164,408	319,303
	(LE 10,800)	(LE 4,128)	(LE 6,919)	(LE 3,064)	(LE 5,881)	(LE 1,064)

Table - 29. Additional Cost of Meat Processing
(O & M Cost)

(Unit: LE/year)

	With Meat Processing		Without Meat Processing		Additional Cost
	Ramada	El Dekihla Total	Ramada	El Dekihla Total	
1. Personnel Expenses					
Permanent Staff	24,480	24,480	19,380	19,380	10,200
Workers	66,000	66,000	15,600	15,600	100,800
Sub-total	<u>90,480</u>	<u>90,480</u>	<u>34,980</u>	<u>34,980</u>	<u>111,000</u>
2. Electricity Charges	108,920	125,020	52,815	68,915	112,210
3. Water Charges	945	1,050	225	330	1,440
4. Oil (for M.P.)	10,800	10,800	-	-	20,160
5. Vinyl Bags (for M.P.)	150,000	150,000	-	-	300,000
6. Repair & Maintenance					
Cold Storage	18,000	36,000	18,000	36,000	0
Meat Processing	36,000	36,000	-	-	72,000
Sub-total	<u>54,000</u>	<u>72,000</u>	<u>18,000</u>	<u>36,000</u>	<u>72,000</u>
7. Miscellaneous	12,575	13,370	3,180	4,275	16,490
8. Total	<u>427,000</u>	<u>462,000</u>	<u>109,200</u>	<u>144,500</u>	<u>655,300</u>

Table - 30. Operation and Maintenance Cost

(Unit: LE/year)

	<u>Abbas</u>	<u>Sherif</u>	<u>Suez</u>	<u>Chamra</u>	<u>Ramada</u>	<u>El Dekihla</u>	<u>Ice</u>	<u>Total</u>
1. Personnel Expenses								
Permanent Staff	18,360	18,360	18,360	19,580	24,480	24,480	1,190	124,610
Workers	8,400	10,200	10,200	15,600	66,000	66,000	950	177,550
<u>Sub-total</u>	<u>26,760</u>	<u>28,560</u>	<u>28,560</u>	<u>34,980</u>	<u>90,480</u>	<u>90,480</u>	<u>2,140</u>	<u>301,960</u>
2. Electricity Charges	43,400	52,815	52,815	52,815	108,920	125,020	117,530	553,315
3. Water Charges	185	225	225	225	945	1,050	1,650	4,505
4. Oil (for Meat Processing)	-	-	-	-	10,080	10,080	-	20,160
5. Vinyl Bags (for Meat Processing)	-	-	-	-	150,000	150,000	-	500,000
6. Repair and Maintenance								
Cold Storage	14,500	18,000	18,000	18,000	18,000	36,000	-	122,500
Meat Processing	-	-	-	-	36,000	36,000	-	72,000
Ice Plant	-	-	-	-	-	-	25,000	25,000
<u>Sub-total</u>	<u>14,500</u>	<u>18,000</u>	<u>18,000</u>	<u>18,000</u>	<u>54,000</u>	<u>72,000</u>	<u>25,000</u>	<u>219,500</u>
7. Miscellaneous	2,555	2,900	2,900	3,180	12,575	13,370	4,680	42,160
8. <u>Total</u>	<u>87,400</u>	<u>102,500</u>	<u>102,500</u>	<u>109,200</u>	<u>427,000</u>	<u>462,000</u>	<u>151,000</u>	<u>1,441,600</u>

Table - 31.

***** CALCULATION OF INTERNAL RATE OF RETURN *****

(UNIT: LE 1,000)

DISCOUNT RATE	***** PRESENT WORTH BENEFIT	***** COST	B/C RATIO
5.00 %	102200.	55961.	1.83
7.50 %	75742.	49784.	1.52
10.00 %	58170.	45364.	1.28
12.50 %	46039.	42042.	1.10
15.00 %	37363.	39432.	0.95
17.50 %	30960.	37306.	0.83
20.00 %	26101.	35521.	0.73
22.50 %	22323.	33986.	0.66
25.00 %	19324.	32639.	0.59
27.50 %	16899.	31439.	0.54

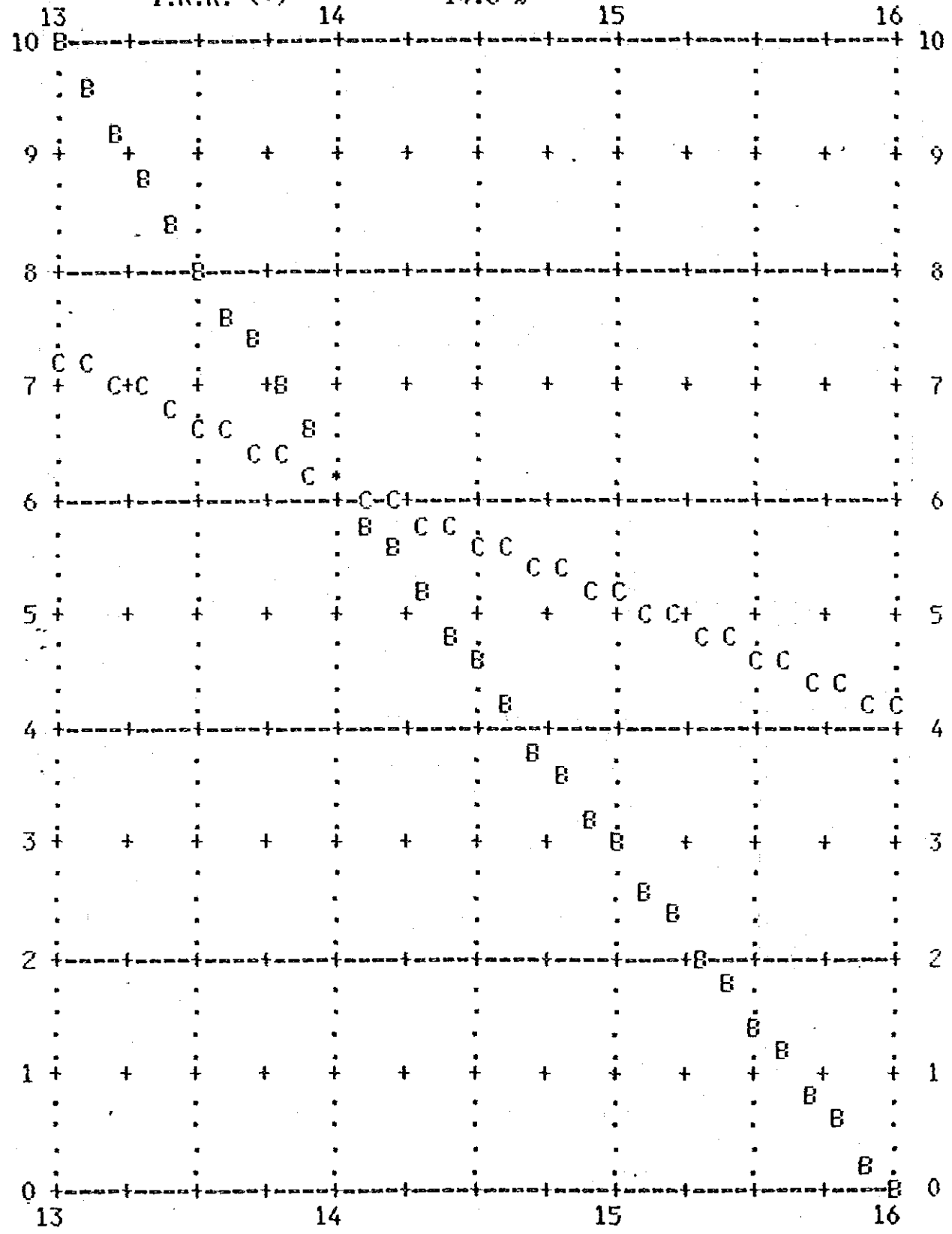
INTERNAL RATE OF RETURN ----- 14.0 %

Table - 32. STREAMS OF PROJECT COST AND BENEFIT

(Unit: LE 1,000)

Project Year	Project Cost			Project Benefit	Net Benefit
	Initial Cost	Replace Cost	O & M Cost		
			Total		
1	25,137	-	25,137	-	- 25,137
2	13,821	-	13,821	-	- 13,821
3	-	-	1,442	7,562	6,120
4	-	-	1,442	7,562	6,120
5	-	-	1,442	7,562	6,120
6	-	-	1,442	7,562	6,120
7	-	-	1,442	7,562	6,120
8	-	-	1,442	7,562	6,120
9	-	-	1,442	7,562	6,120
10	-	-	1,442	7,562	6,120
11	-	-	1,442	7,562	6,120
12	-	2,433	3,875	7,562	3,687
13	-	-	1,442	7,562	6,120
14	-	-	1,442	7,562	6,120
15	-	-	1,442	7,562	6,120
16	-	-	1,442	7,562	6,120
17	-	2,325	3,767	7,562	3,795
18	-	-	1,442	7,562	6,120
19	-	-	1,442	7,562	6,120
20	-	-	1,442	7,562	6,120
21	-	-	1,442	7,562	6,120
22	-	8,524	9,966	7,562	-
23	-	-	1,442	7,562	2,404
24	-	-	1,442	7,562	6,120
25	-	-	1,442	7,562	6,120
26	-	-	1,442	7,562	6,120
27	-	-	1,442	7,562	6,120
28	-	-	1,442	7,562	6,120
29	-	-	1,442	7,562	6,120
30	-	-	1,442	7,562	6,120

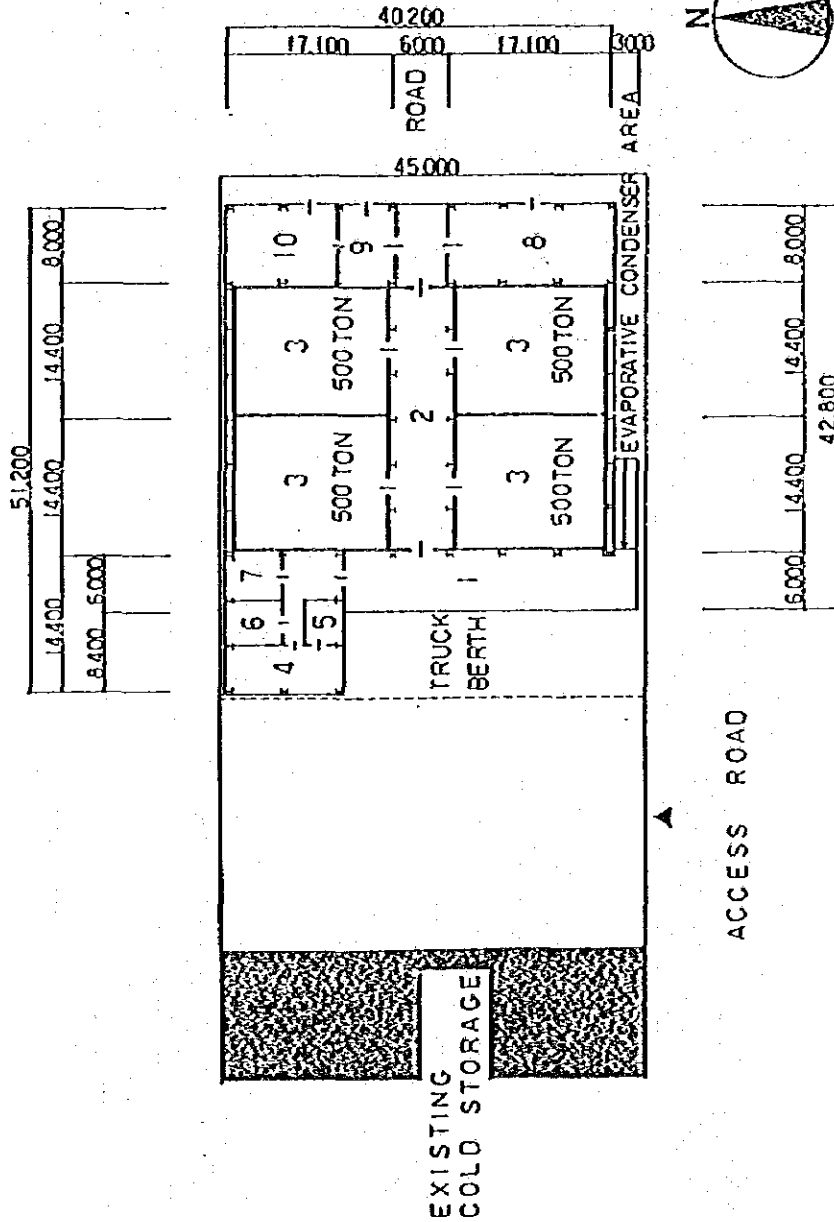
Figure - 16.
 *** PLOT OF PW OF BENEFIT AND COST ***
 Y AXIS : PRESENT WORTH VALUE
 X AXIS : DISCOUNT RATE (%)
 I.R.R. (*) ----- 14.0 %



LIST OF DRAWINGS

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5.	" - SECTIONS AND ELEVATIONS	XXX
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7.	" - FLOOR PLAN	XXXII
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13.	CAIRO (RAMADA) - SITE PLAN	XXXVIII
14.	" - FLOOR PLAN	XXXIX
15.	" - SECTIONS AND ELEVATIONS	XXXX
16.	" - MAP OF BUILDING LOT	XXXXI
17.	ALEXANDRIA - SITE PLAN	XXXXII
18.	" - FLOOR PLAN	XXXXIII
19.	" - SECTIONS	XXXXIV
20.	" - ELEVATIONS	XXXXV

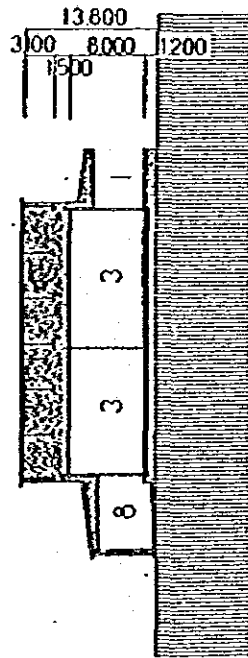
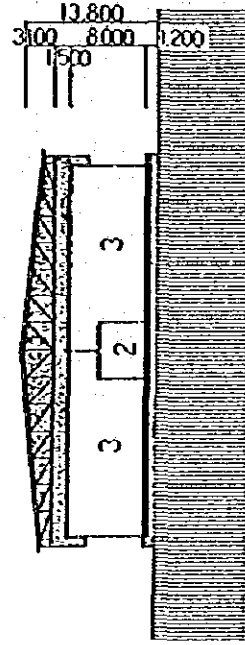
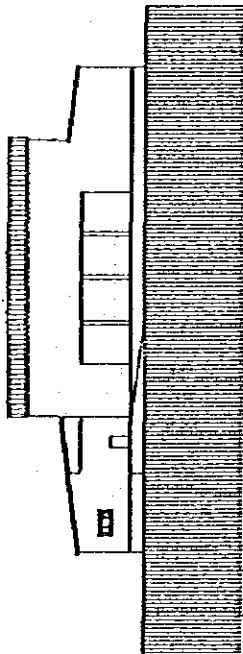
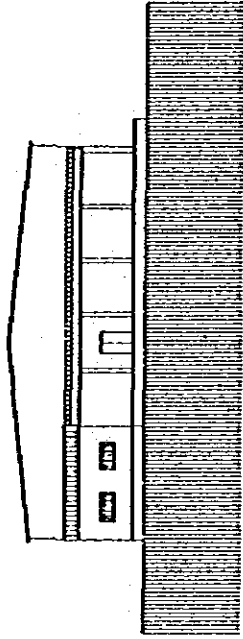
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 2. ANTE ROOM
 3. COLD ROOM
 4. OFFICE
 5. HEAD OFFICER'S ROOM
 6. TOILET
 7. LOCKER ROOM
 8. MACHINE ROOM
 9. CONTROL ROOM
 10. ELECTRICAL ROOM



FLOOR AREA
1864 M²

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SITE AND FLOOR PLAN OF ABBAS COLD STORAGE (PORT SAID)	
DATE	DWG. NO.
JAPAN INTERNATIONAL COOPERATION AGENCY	

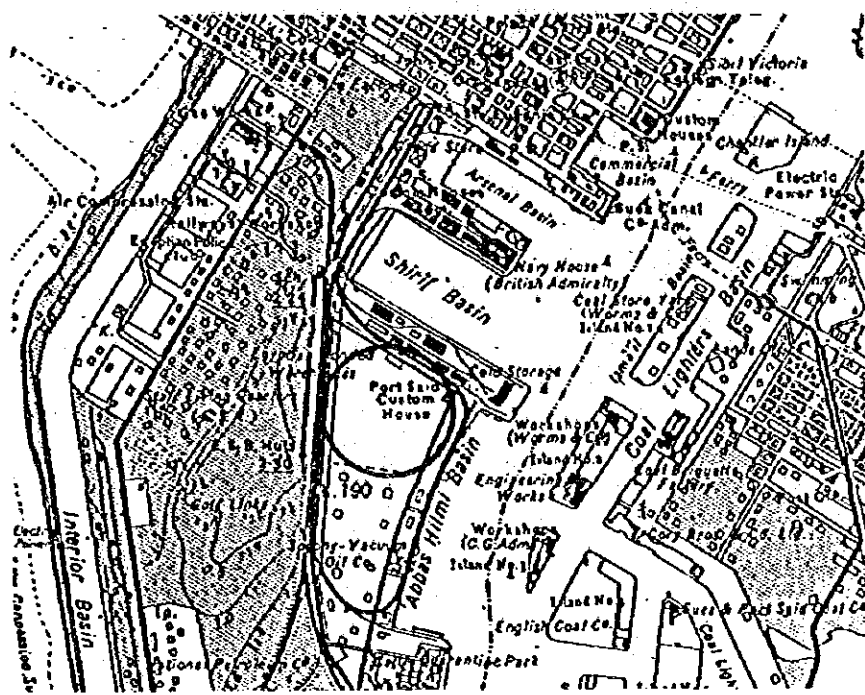
ELEVATIONS



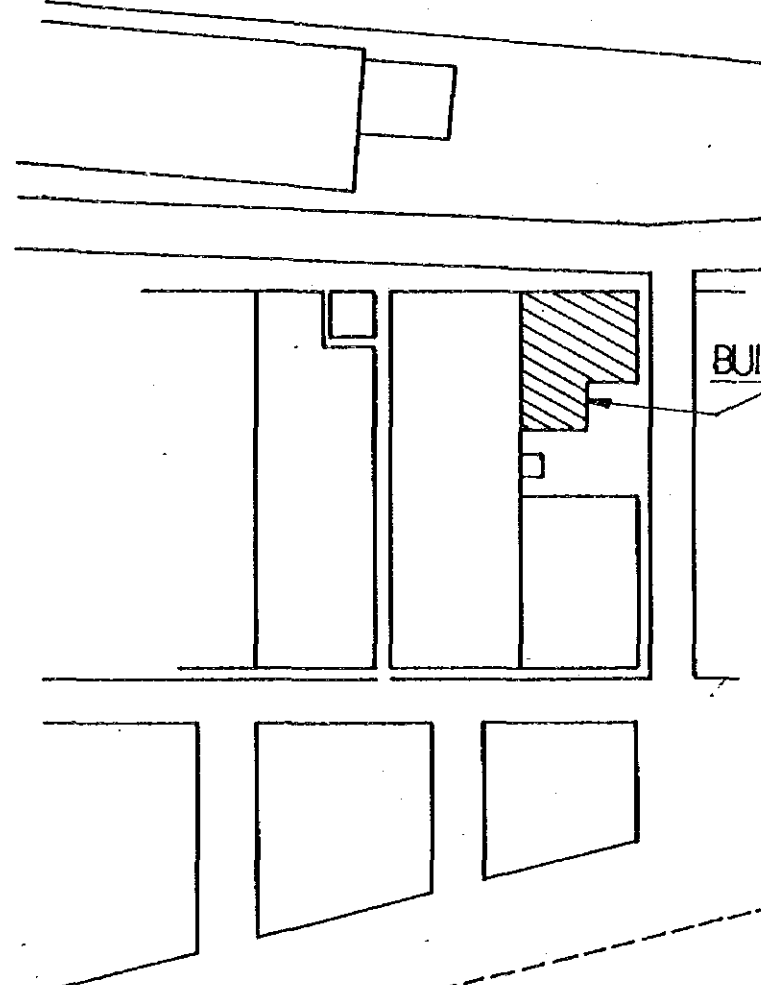
SECTIONS

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SECTIONS AND ELEVATIONS OF ABBAS COLD STORAGE (PORT SAID)	
DATE	DWG NO. 2
JAPAN INTERNATIONAL COOPERATION AGENCY	



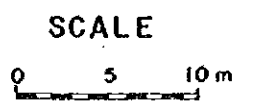
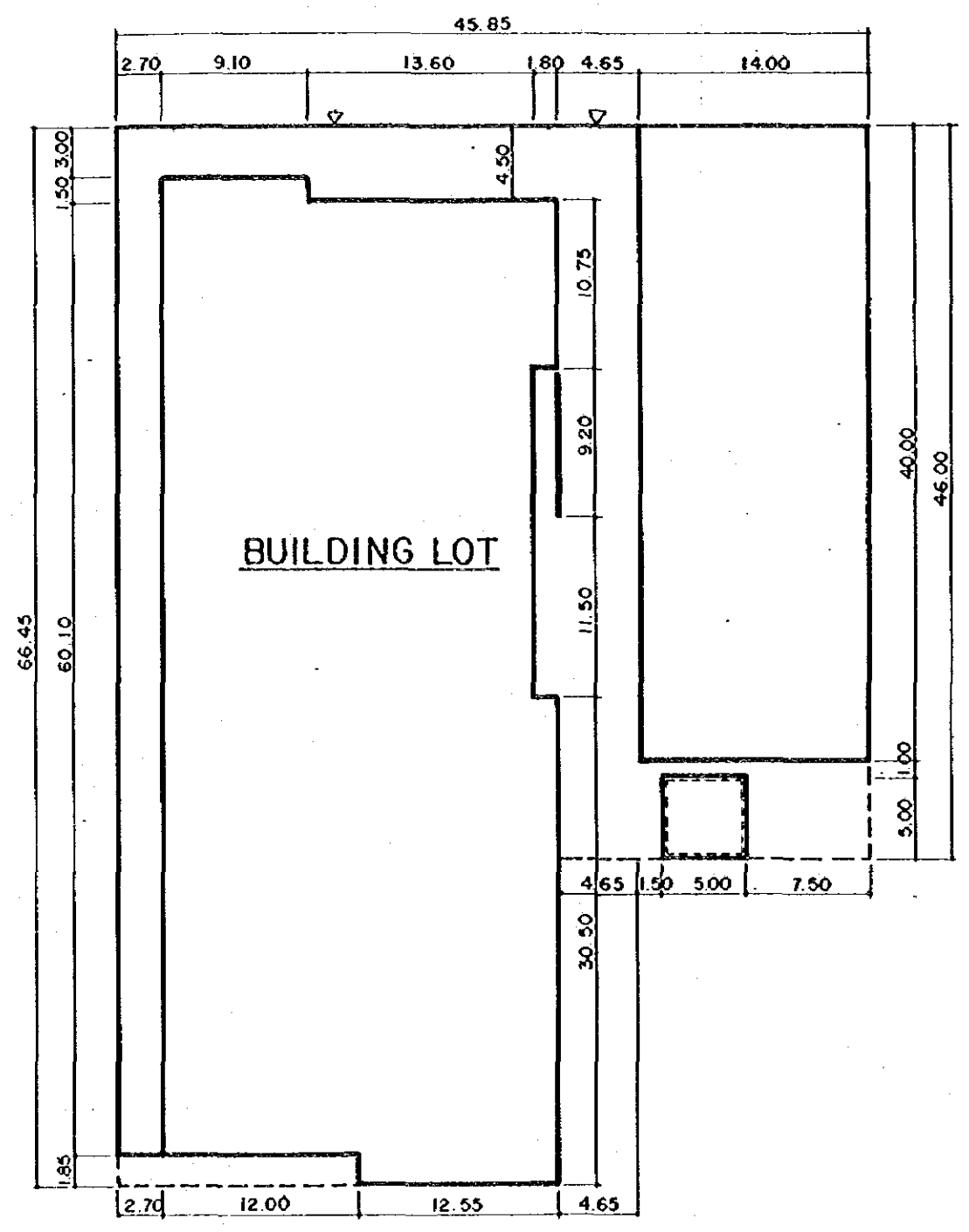


KEY MAP



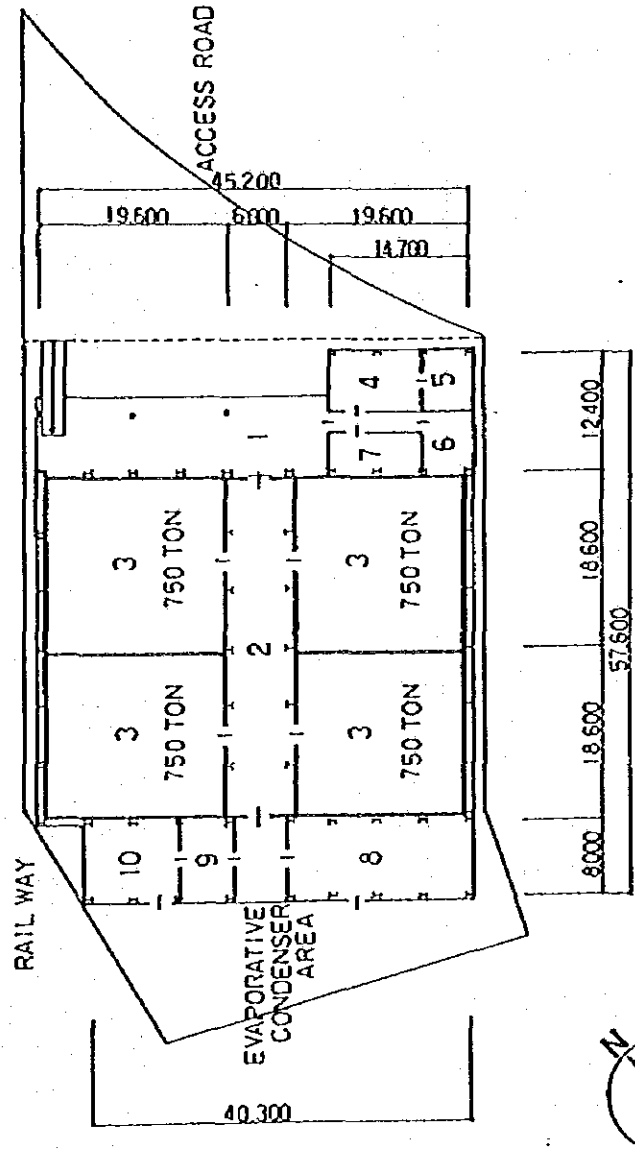
LOCATION MAP

XXVIII



THE ARAB REPUBLIC OF EGYPT			
MINISTRY OF SUPPLY AND HOME TRADE			
COLD STORAGE CHAIN DEVELOPMENT PROJECT			
MAP OF BUILDING LOT (PORT SAID - ABBAS)			
DATE		DWG NO.	3
JAPAN INTERNATIONAL COOPERATION AGENCY			

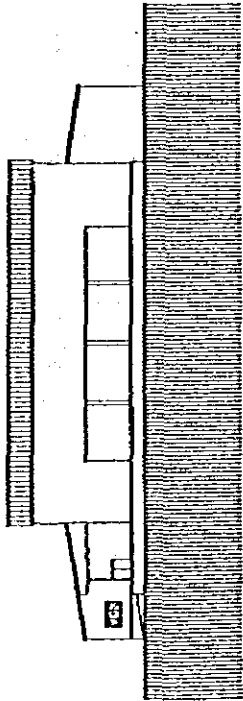
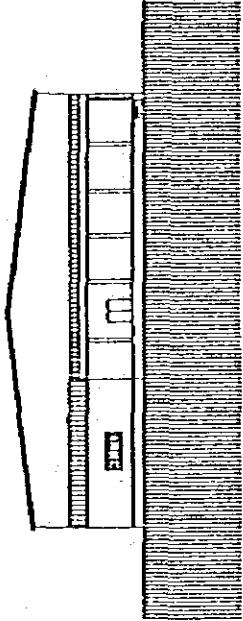
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- 2. ANTE ROOM
- 3. COLD ROOM
- 4. OFFICE
- 5. HEAD OFFICER'S ROOM
- 6. TOILET
- 7. LOCKER ROOM
- 8. MACHINE ROOM
- 9. CONTROL ROOM
- 10. ELECTRICAL ROOM



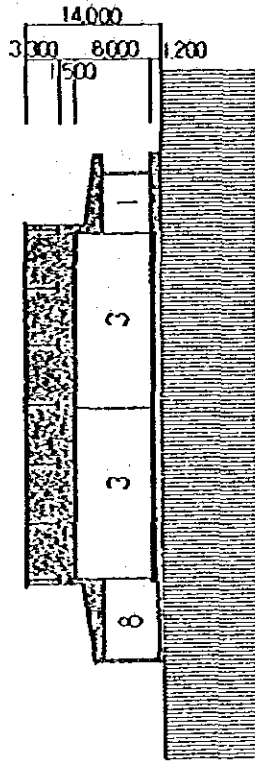
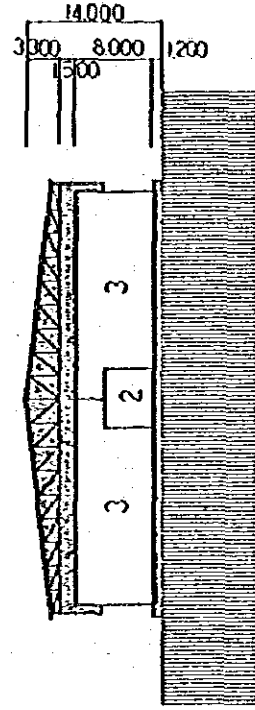
FLOOR AREA
2444 M²



THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SITE AND FLOOR PLAN OF SIERIEP COLD STORAGE (PORT SAID)	
DATE	DWG NO. 4
JAPAN INTERNATIONAL COOPERATION AGENCY	



ELEVATIONS

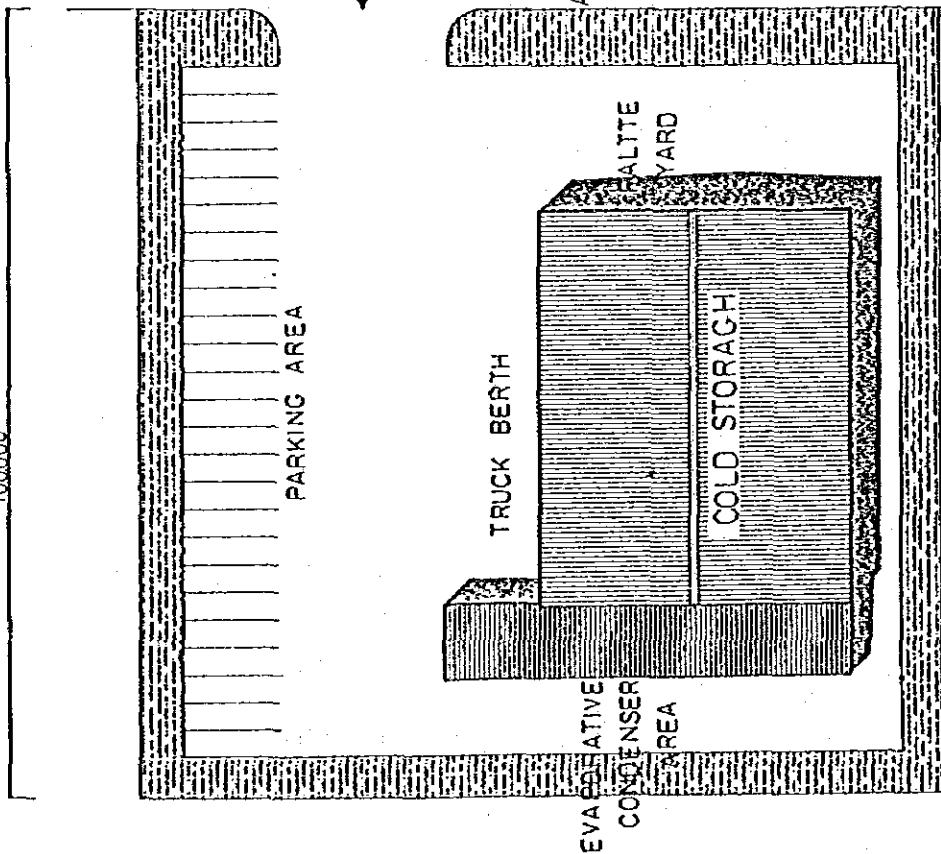


SECTIONS

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SECTIONS AND ELEVATIONS OF SHERIEF COLD STORAGE (POST SAID)	
DATE	DWG NO. 5
JAPAN INTERNATIONAL COOPERATION AGENCY	



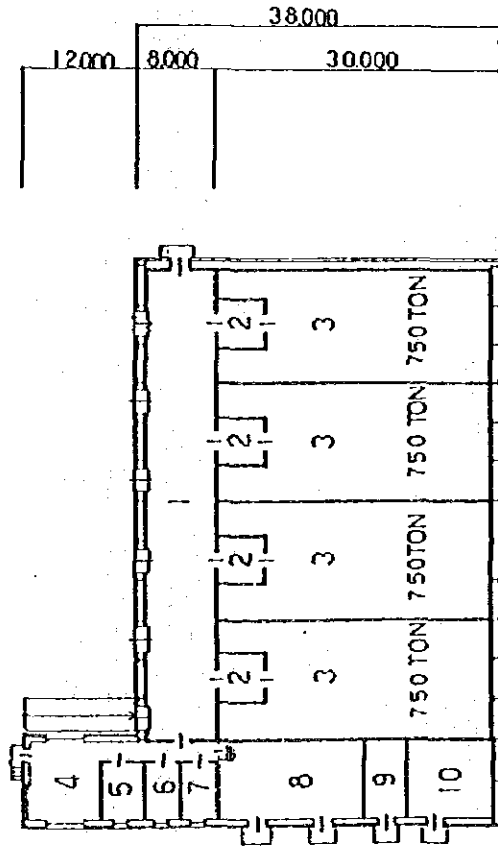
100,000



100,000

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SITE PLAN OF SUEZ COLD STORAGE (SUZE)	
DATE	DWG NO. 6
JAPAN INTERNATIONAL COOPERATION AGENCY	

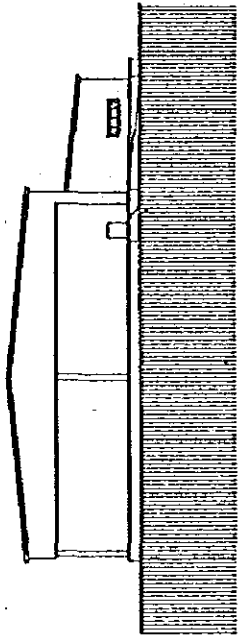
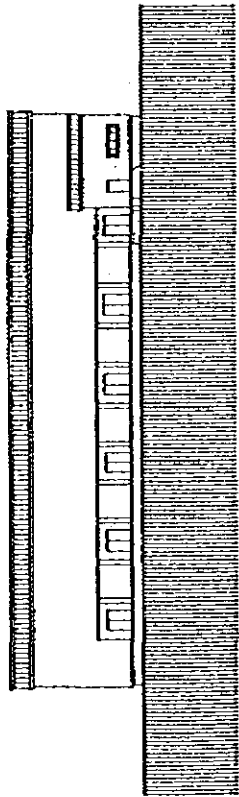
- | No. | ROOM NAME |
|-----|---------------------|
| 1. | HANDLING ROOM |
| 2. | ANTE ROOM |
| 3. | COLD ROOM |
| 4. | OFFICE |
| 5. | HEAD OFFICER'S ROOM |
| 6. | TOILET |
| 7. | LOCKER ROOM |
| 8. | MACHINE ROOM |
| 9. | CONTROL ROOM |
| 10. | ELECTRICAL ROOM |



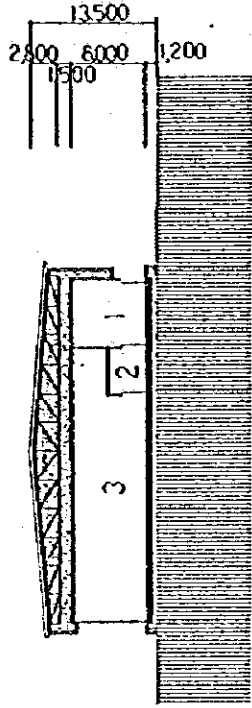
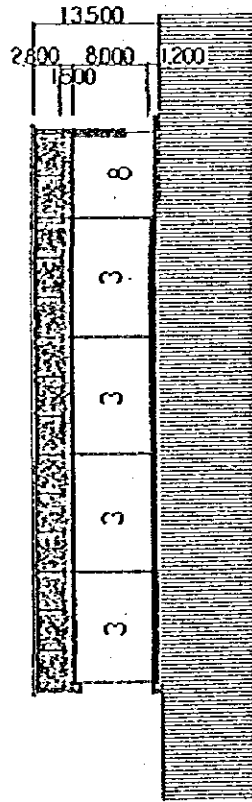
9000	12500	12500	12500	12500	12500
59,000					

FLOOR AREA
2350 M²

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
FLOOR PLAN OF SUEZ COLD STORAGE (SUEZ)	
DATE	DWG NO. 7
JAPAN INTERNATIONAL COOPERATION AGENCY	



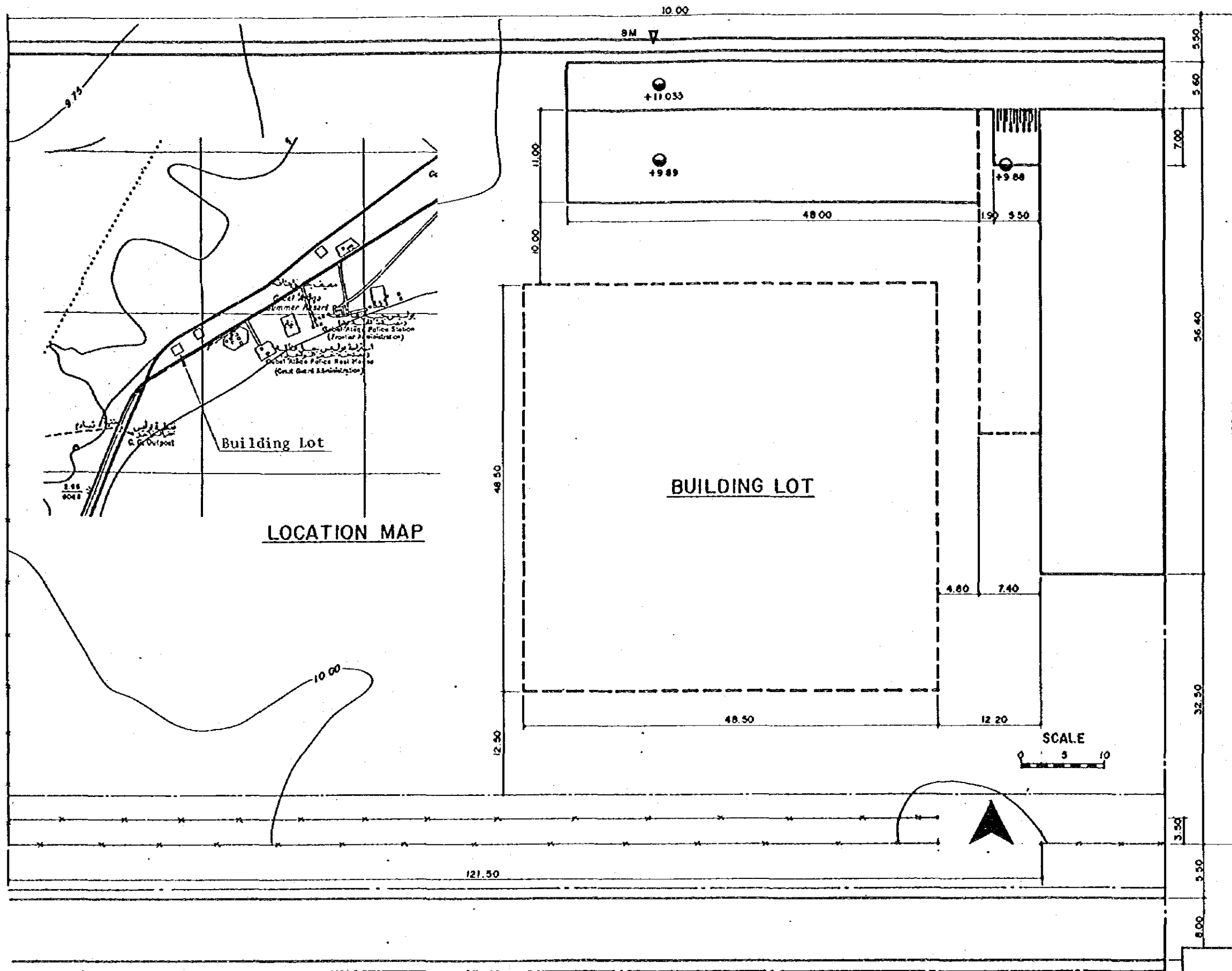
ELEVATIONS



SECTIONS

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SECTIONS AND ELEVATIONS OF SUEZ COLD STORAGE (SUEZ)	
DATE	DWG NO. 8
JAPAN INTERNATIONAL COOPERATION AGENCY	





LOCATION MAP

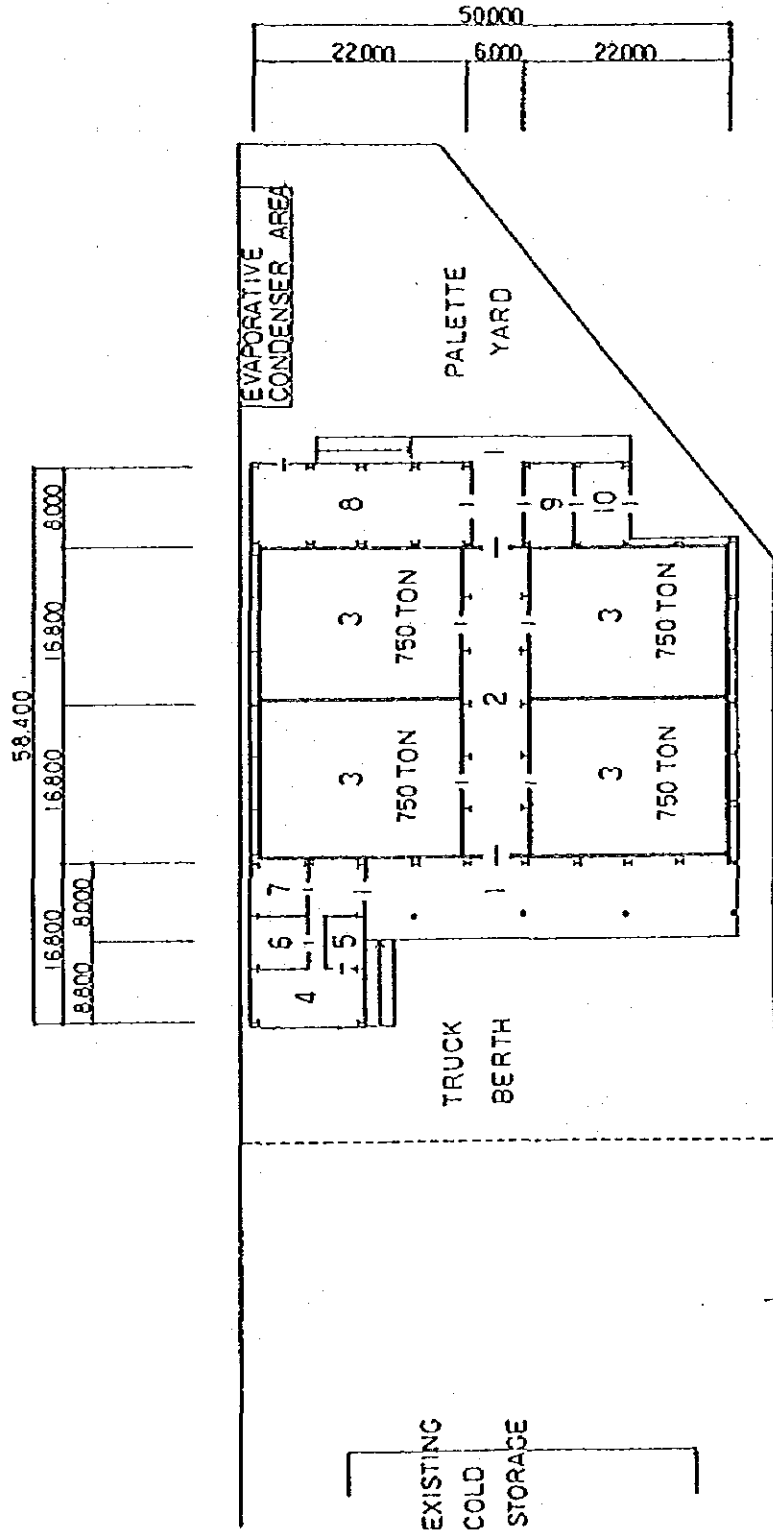
BUILDING LOT

SCALE



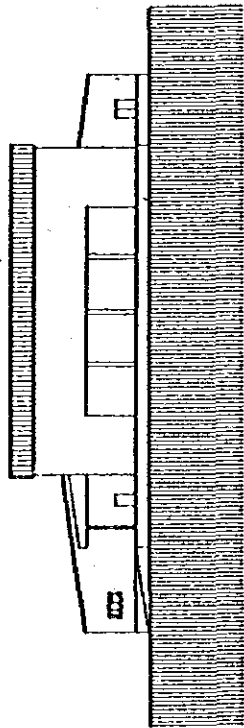
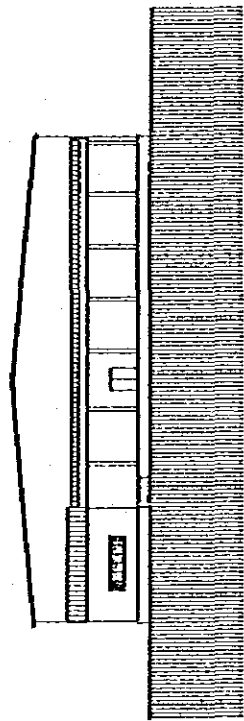
THE ARAB REPUBLIC OF EGYPT			
MINISTRY OF SUPPLY AND HOME TRADES			
COLD STORAGE CHAIN DEVELOPMENT PROJECT			
MAP OF BUILDING LOT (SUEZ)			
DATE		ONG NO.	9
JAPAN INTERNATIONAL COOPERATION AGENCY			

- | | |
|-----|---------------------|
| No. | ROOM NAME |
| 1. | PLATFORM |
| 2. | ANTE ROOM |
| 3. | COLD ROOM |
| 4. | OFFICE |
| 5. | HEAD OFFICER'S ROOM |
| 6. | TOILET |
| 7. | LOCKER ROOM |
| 8. | MACHINE ROOM |
| 9. | CONTROL ROOM |
| 10. | ELECTRICAL ROOM |

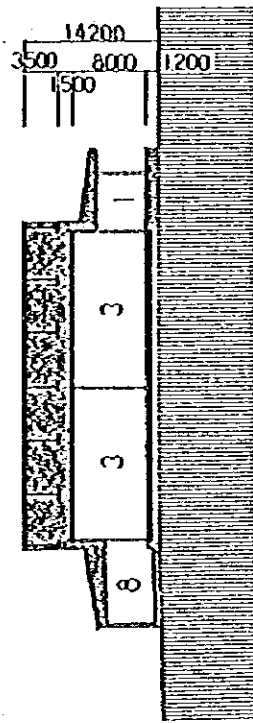
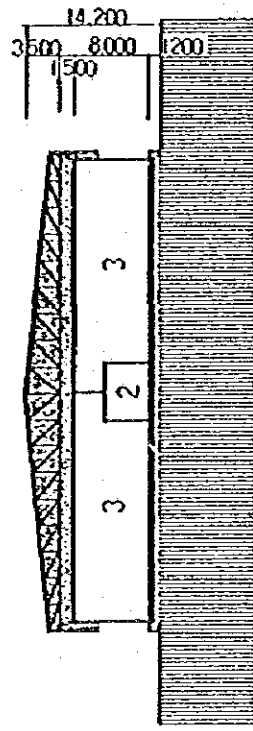


FLOOR AREA 2605M²

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SITE AND FLOOR PLAN OF GHARA COLD STORAGE (CAIRO)	
DATE	DWG NO. 10
JAPAN INTERNATIONAL COOPERATION AGENCY	



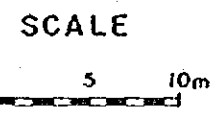
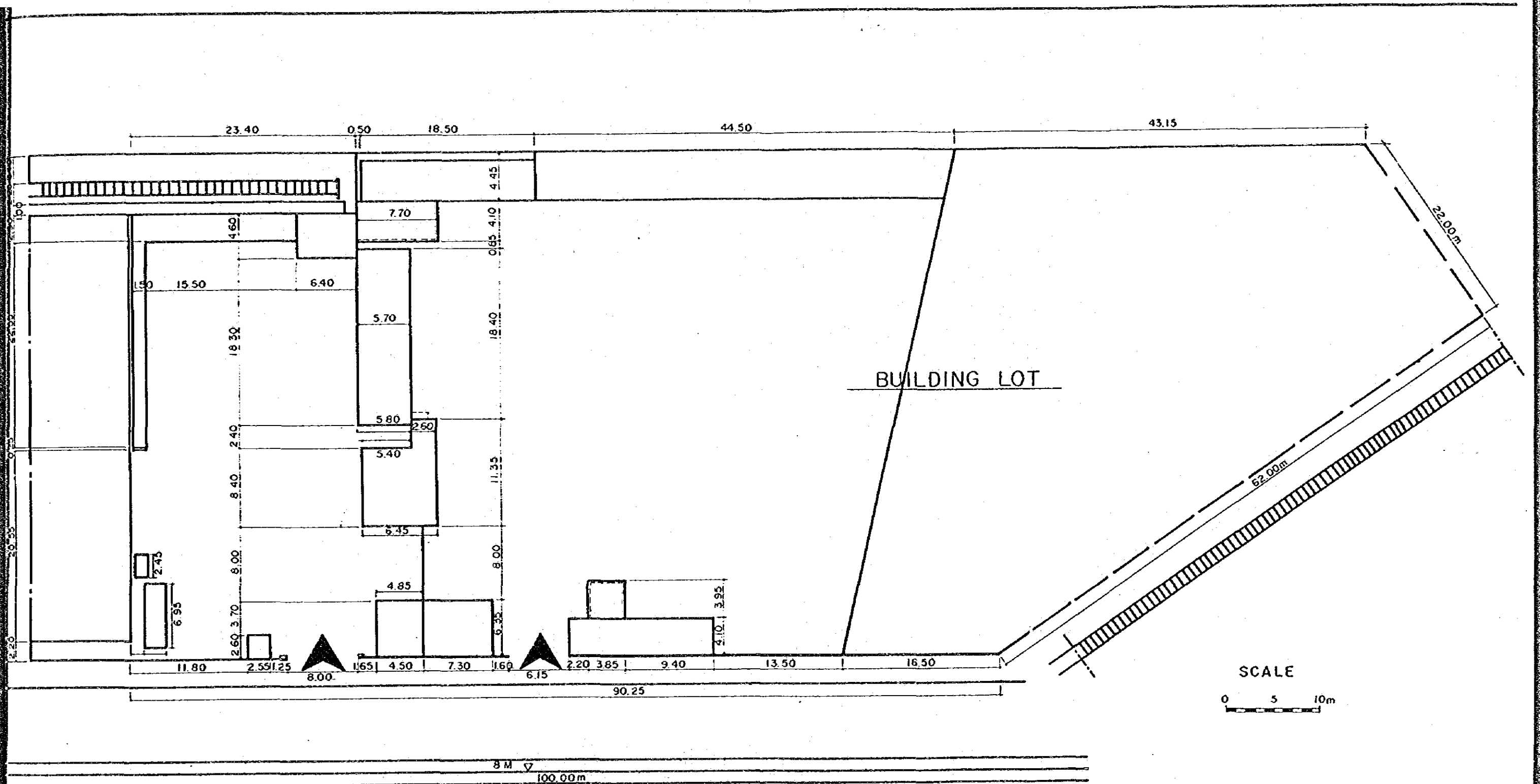
ELEVATIONS



SECTIONS

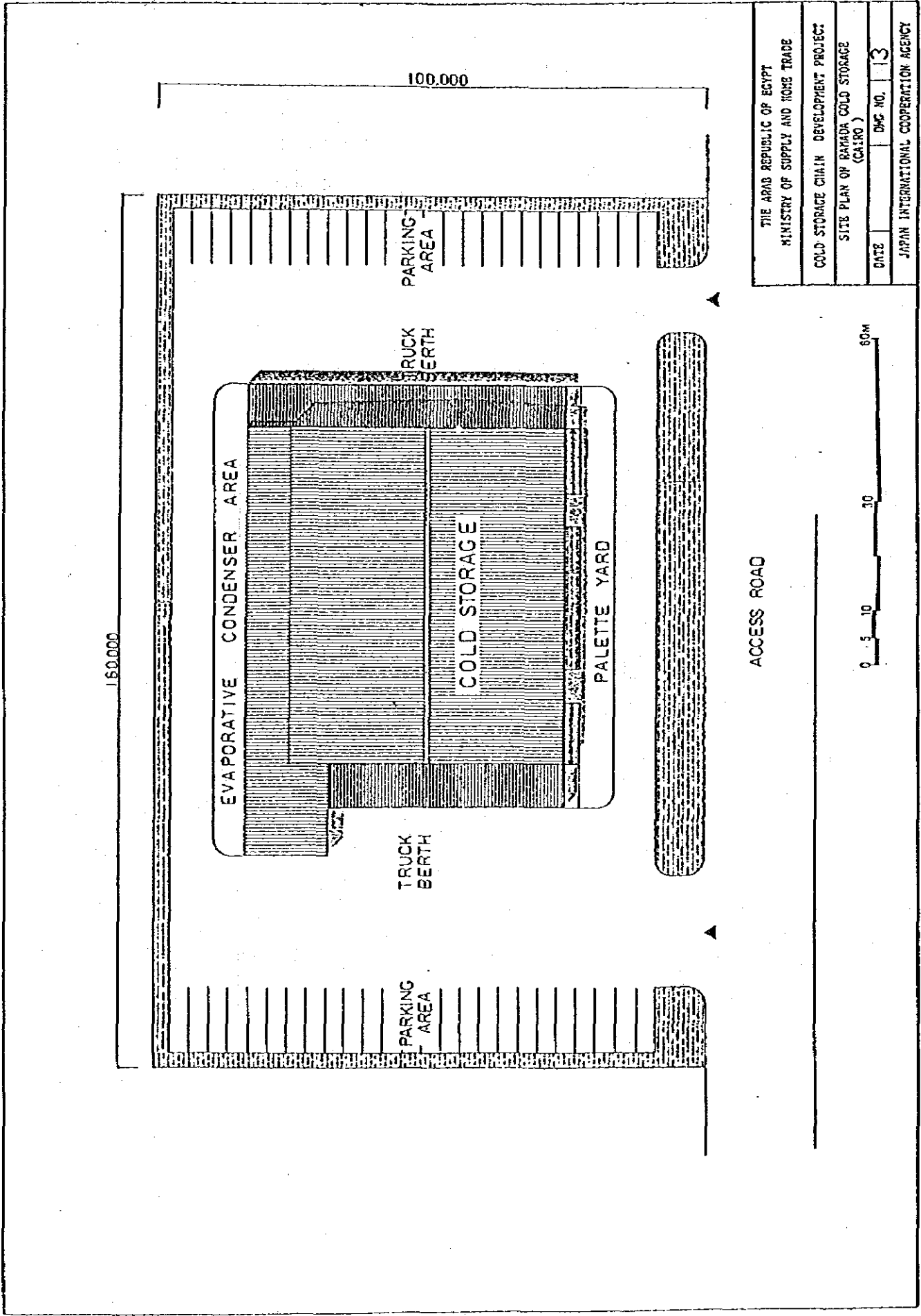


THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SECTIONS AND ELEVATIONS OF GHARRA	
COLD STORAGE (CAIRO)	
DATE	DWG NO.
JAPAN INTERNATIONAL COOPERATION AGENCY	



XXXVII

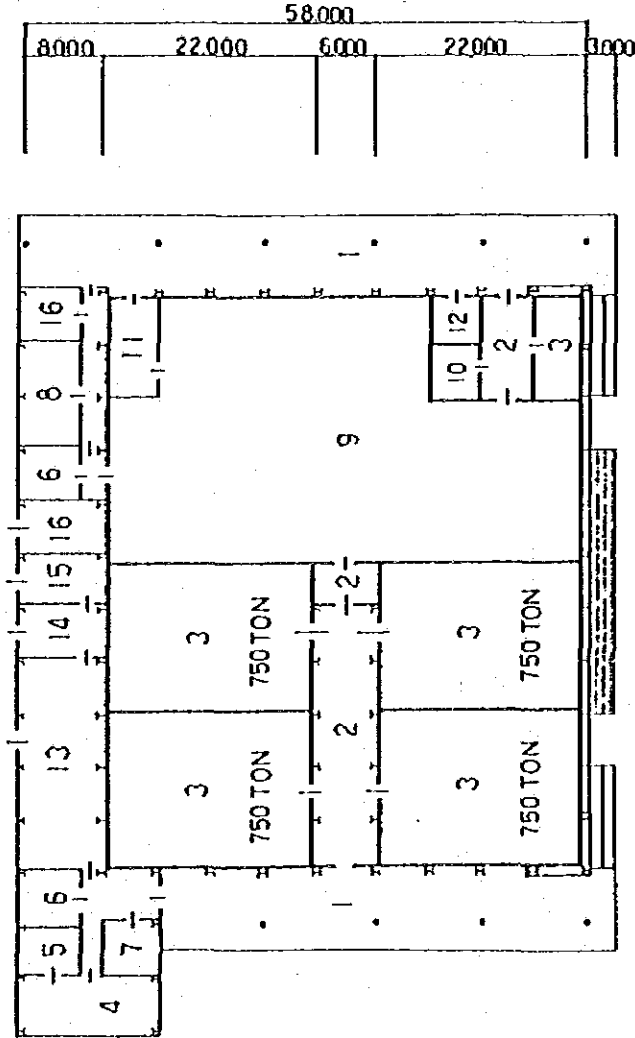
THE ARAB REPUBLIC OF EGYPT			
MINISTRY OF SUPPLY AND HOME TRADE			
COLD STORAGE CHAIN DEVELOPMENT PROJECT			
MAP OF BUILDING LOT (CAIRO - GHAMRA)			
DATE		DWG NO.	12
JAPAN INTERNATIONAL COOPERATION AGENCY			



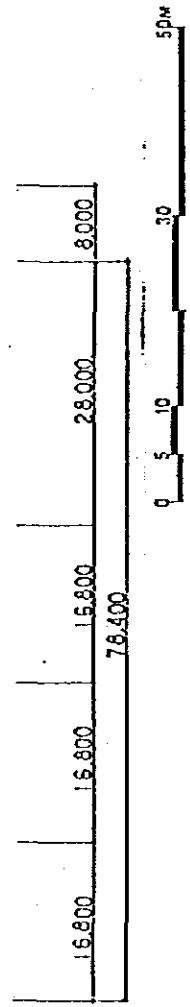
THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND FOREIGN TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SITE PLAN OF BAHADA COLD STORAGE (CAIRO)	
DATE	DWG. NO. 13
JAPAN INTERNATIONAL COOPERATION AGENCY	

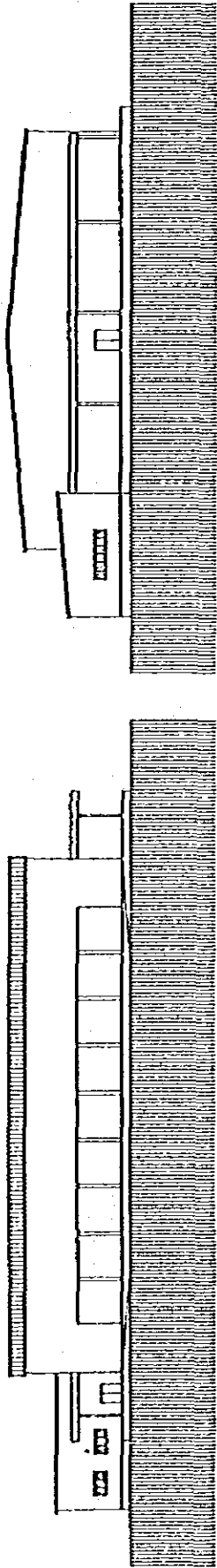
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|-----|---------------------------------------|
| No. | ROOM NAME |
| 1. | PLATFORM |
| 2. | ANTE ROOM |
| 3. | COLD ROOM |
| 4. | OFFICE |
| 5. | HEAD OFFICER'S ROOM |
| 6. | TOILET |
| 7. | LOOKER ROOM FOR COLD STORAGE DEPT. |
| 8. | LOOKER ROOM FOR MEAT PROCESSING DEPT. |
| 9. | MEAT PROCESSING ROOM |
| 10. | FREEZING ROOM |
| 11. | BONE STORAGE |
| 12. | CASE WASHER |
| 13. | MACHINE ROOM |
| 14. | CONTROL ROOM |
| 15. | ELECTRICAL ROOM |
| 16. | STORAGE |

FLOOR AREA
4741 M²

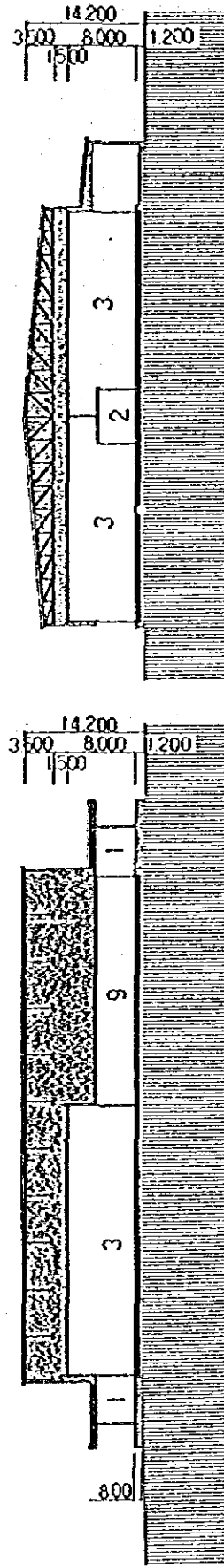


THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
FLOOR PLAN OF RAMADA COLD STORAGE (CAIRO)	
DATE	DWG NO. 14
JAPAN INTERNATIONAL COOPERATION AGENCY	





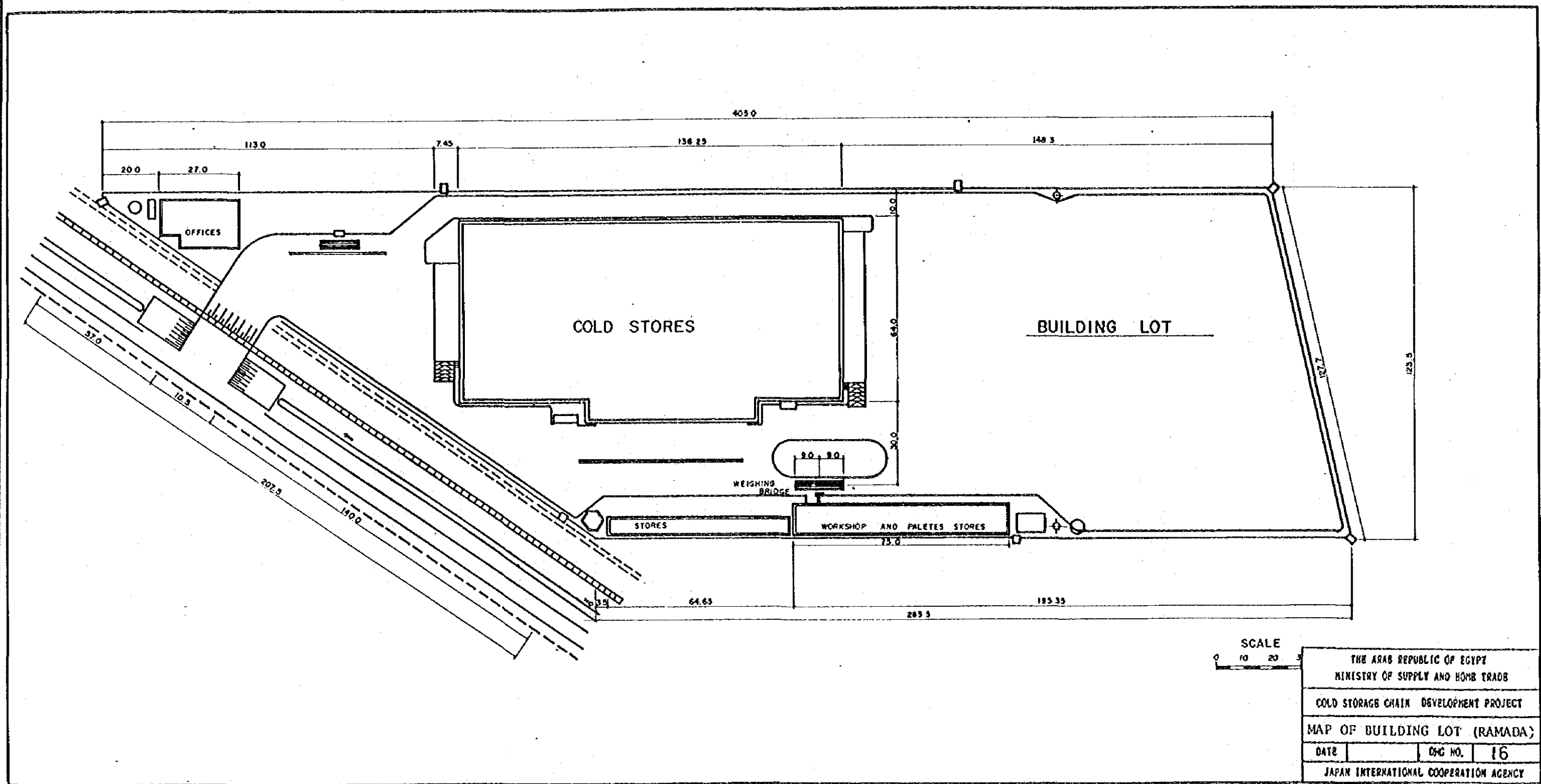
ELEVATIONS



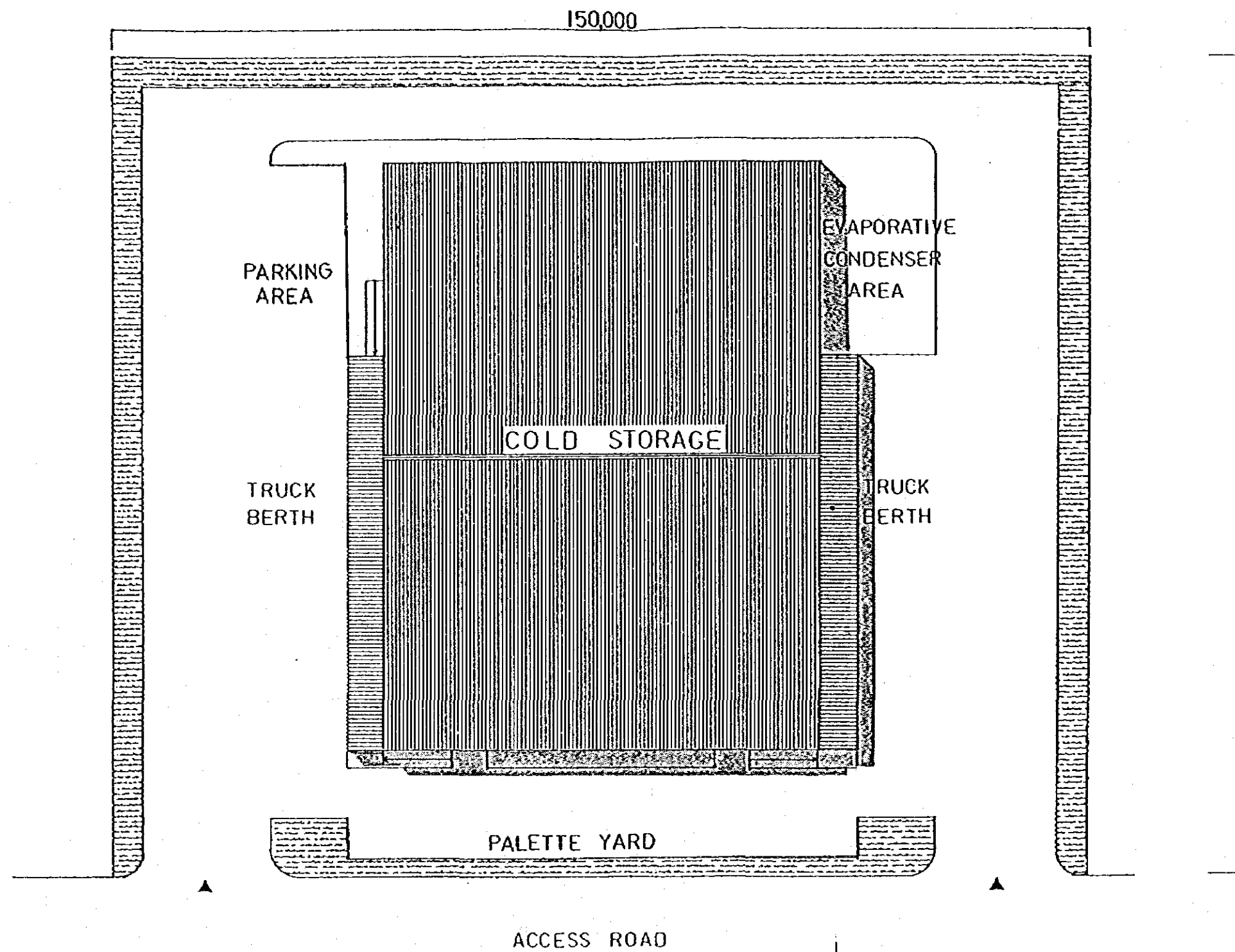
SECTIONS

THE ARAB REPUBLIC OF EGYPT	
MINISTRY OF SUPPLY AND HOME TRADE	
COLD STORAGE CHAIN DEVELOPMENT PROJECT	
SECTIONS AND ELEVATIONS OF RIMHADA COLD STORAGE (CAIRO)	
DATE	DWG NO. 15
JAPAN INTERNATIONAL COOPERATION AGENCY	





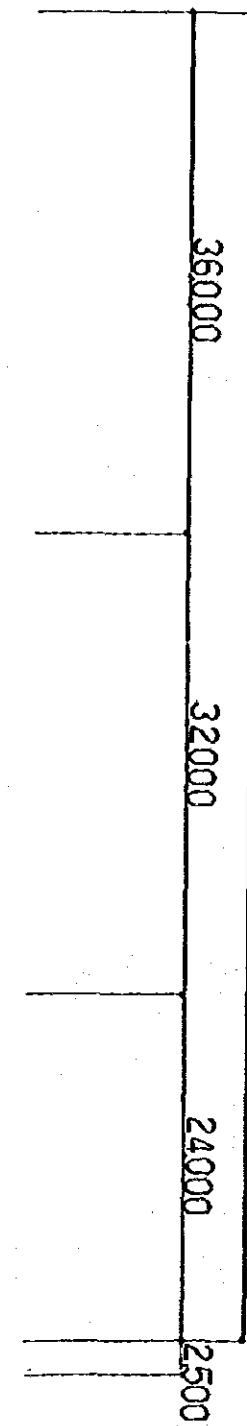
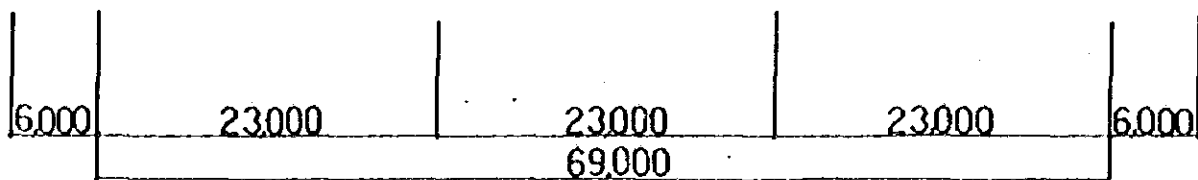
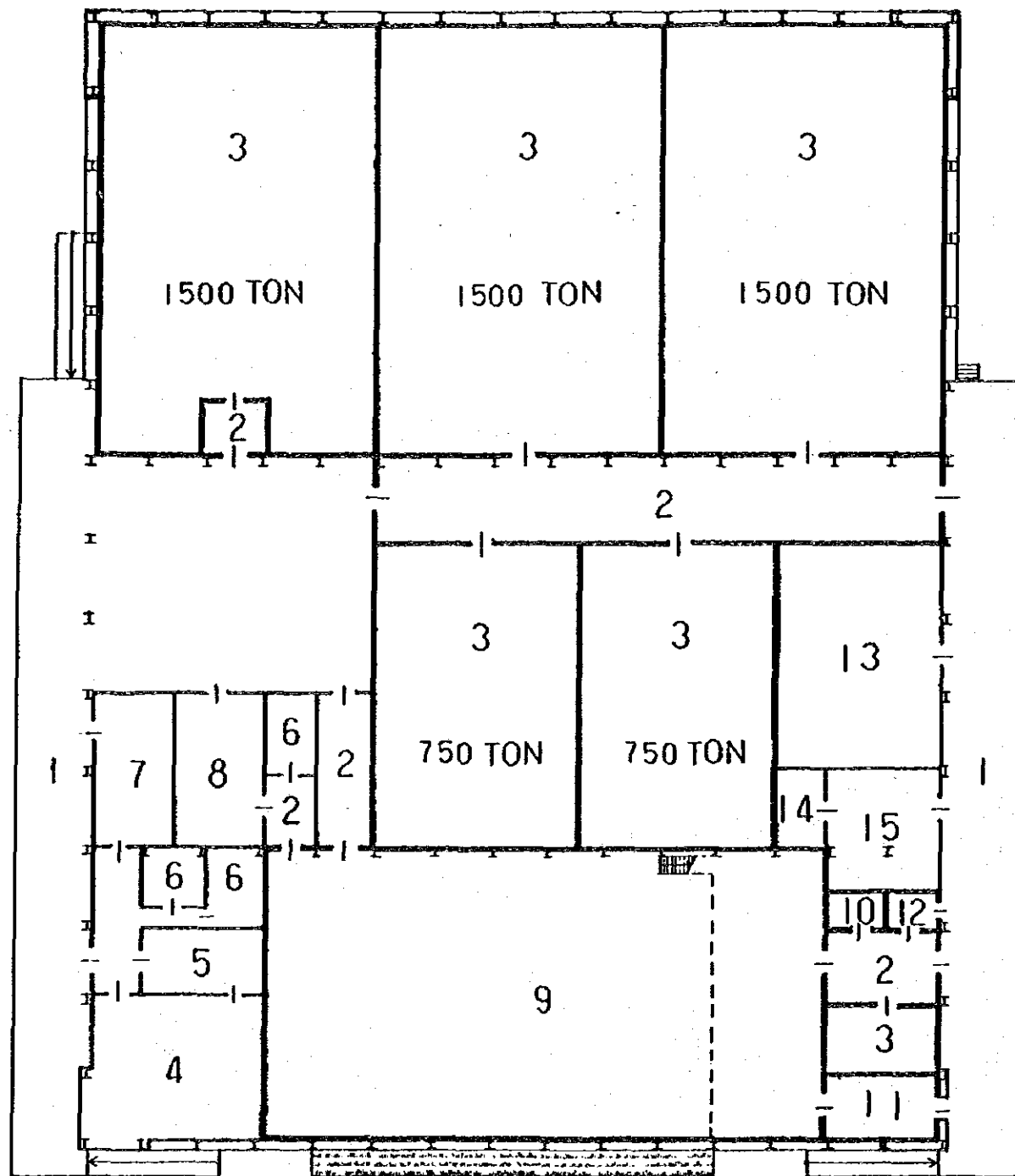
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XXXXII



THE ARAB REPUBLIC OF EGYPT		
MINISTRY OF SUPPLY AND HOME TRADE		
COLD STORAGE CHAIN DEVELOPMENT PROJECT		
SITE PLAN OF COLD STORAGE (ALEXNORTIA)		
DATE	DWG NO.	17
JAPAN INTERNATIONAL COOPERATION AGENCY		



- | No. | ROOM NAME |
|-----|---------------------------------------|
| 1. | PLATFORM |
| 2. | ANTE ROOM |
| 3. | COLD ROOM |
| 4. | OFFICE |
| 5. | HEAD OFFICER'S ROOM |
| 6. | TOILET |
| 7. | LOOKER ROOM FOR COLD STORAGE DEPT. |
| 8. | LOOKER ROOM FOR MEAT PROCESSING DEPT. |
| 9. | MEAT PROCESSING ROOM |
| 10. | FREEZING ROOM |
| 11. | BONE STORAGE |
| 12. | CASE WASHER |
| 13. | MACHINE ROOM |
| 14. | CONTROL ROOM |
| 15. | ELECTRICAL ROOM |

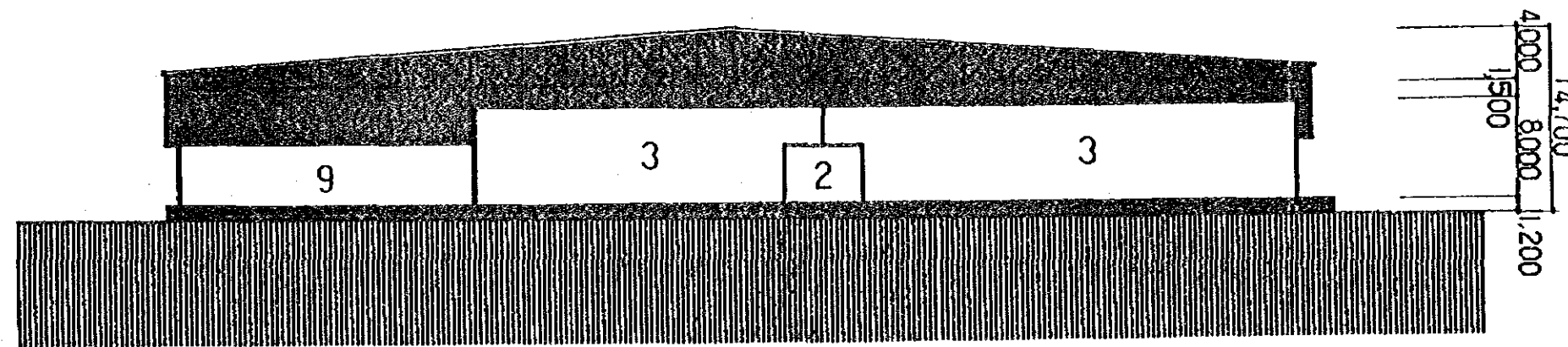
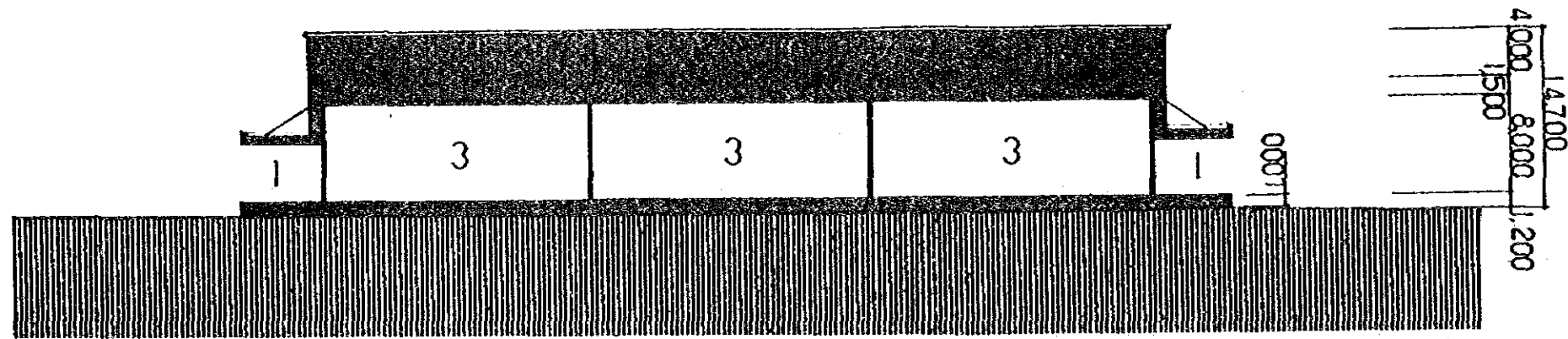
FLOOR AREA

7656 M²

XXXXIII



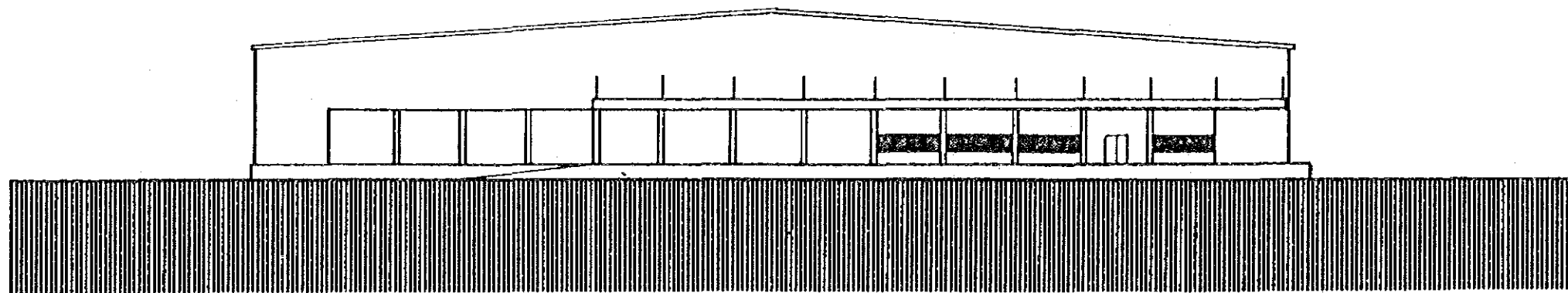
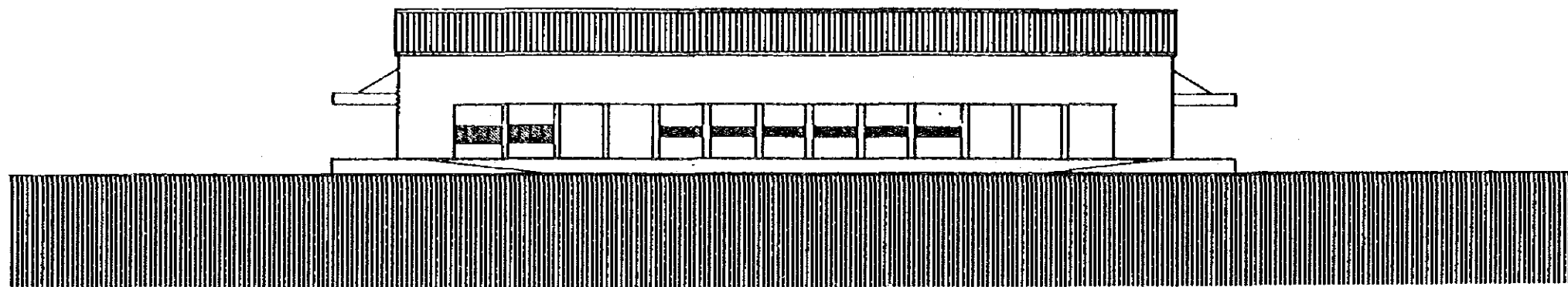
THE ARAB REPUBLIC OF EGYPT			
MINISTRY OF SUPPLY AND HOME TRADE			
COLD STORAGE CHAIN DEVELOPMENT PROJECT			
FLOOR PLAN OF COLD STORAGE (ALEXANDRIA)			
DATE		DWG NO.	18
JAPAN INTERNATIONAL COOPERATION AGENCY			



XXXXIV



THE ARAB REPUBLIC OF EGYPT			
MINISTRY OF SUPPLY AND HOME TRADE			
COLD STORAGE CHAIN DEVELOPMENT PROJECT			
SECTIONS OF COLD STORAGE (ALEXANDRIA)			
DATE		DWG NO.	19
JAPAN INTERNATIONAL COOPERATION AGENCY			



XXXXV



THE ARAB REPUBLIC OF EGYPT			
MINISTRY OF SUPPLY AND HOME TRADE			
COLD STORAGE CHAIN DEVELOPMENT PROJECT			
ELEVATIONS OF COLD STORAGE (ALEXANDRIA)			
DATE		DWG NO.	20
JAPAN INTERNATIONAL COOPERATION AGENCY			

