OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

RESTRICTED

08941

DP/ID/SER.A/187
11 October 1978
English

(R) PLANNING AND DESIGNING OF NEW ABATTOIRS AND OPTIMUM UTILIZATION OF BY-PRODUCTS*,
SI/CYP/77/802,
CYPRUS.

Technical report: Appraisal, planning and designing of abattoirs

Prepared for the Government of Cyprus by the
United Nations Industrial Development Organisation,
executing agency for the United Nations Development Programme

000039

Based on the work of Dimitrije A. Popovic,
expert in abattoir appraisal, planning and designing

United Nations Industrial Development Organisation
Vienna

26 JUN 1979

*This document has been reproduced without formal editing.

id. 78-6977

Mention of firm names and commercial products does not imply the endorsement of the United Nations Industrial Development Organization (UNIDO).

CONTENTS

List of tables

List of drawings

SUMMARY

Following the mission of an expert of the Food and Agricultural Organization (FAO) on hides and skins improvement and animal by-products utilization in 1973, the Government of Cyprus requested the United Nations Development Programme (UNDP) for technical assistance in the appraisal and the design of slaughterhouse facilities and animal by-product utilization. UNDP assistance was approved (project SI/CYP/74/004) with FAO as the executing agency. Due to the events of 1974 the implementation of the project had to be deferred.

When the Government renewed its request in 1977, a new project "Planning and designing of new abattoirs and optimum utilization of by-products" (SI/CYP/77/802) was approved in June 1977, this time with the United Nations Industrial Development Organization (UNIDO) as the executing agency. Two experts, one in animal by-products utilization and another in abattoir appraisal, planning and designing were scheduled for three months each. The execution of this project was again somewhat postponed, pending the availability of the report of an FAO mission to Cyprus financed under the International Meat Development Scheme.

The expert in abattoir appraisal, planning and designing took up his assignment on 26 April and concluded his mission on 23 August 1978, after an extension by one month.

This Report contains technological bases and solutions for:

a. A Central Slaughterhouse for the districts of Nicosia, Larnaca and Limassol.

b. A Slaughterhouse in Paphos.

c. The Proposal of Waste Water Treatment for the Central Slaughterhouse and By-products Plant was not worked out because this plant will be a matter of future development, based on proposals by Mr. Crawford, UNIDO expert in animal by-products utilization, as indicated in his technical report DP/ID/SER. A/163. For this work a specialist will be engaged in due course.

d. The already purchased equipment for a planned Slaughter-house in Nicosia was inspected by the Consultant and comprised into equipment specification for the new Central Slaughterhouse.

e. A Report on the surveyed equipment is herewith attached.

The site plan for the Central Slaughterhouse with By-products Plant in the vicinity of Kophinou town was elaborated by the expert in co-operation with the Consultant for By-products Plant, who fully agreed with the suggestion as exposed in the latter's report under conclusions and recommendations.

Technological plans contain the analysis of raw materials, on the basis of which the appraisal was made of the capacities of all the needed departments, rooms and equipment in the Slaughter-house, as well as the standards for the treatment of the inside surfaces of the rooms.

These technological plans represent the bases, i.e. the work programmes for the elaboration of the main plans (static, architectonic, thermodynamics, and for the installations for water, steam, electricity, etc.).

In the further design of Plant and the elaboration of detailed plans, as well as in supervising the installation of the equipment and the start of the operating process, additional technical assistance may be required.

2. INTRODUCTION

2.1. The need for the construction of slaughterhouses in some larger cities of Cyprus, arose many years ago, as a result of inconvenient conditions for slaughter and the inadequate capacities of the existing slaughterhouses.

2.2. Following the mission of Mr. R. Milson, Livestock and Meat Processing Officer , in August 1977, the Government requested through the UNDP Resident Representative for a short-term consultative mission to provide technical expertise in the field of appraisal, planning and design of modern abattoir and better utilization of slaughterhouse by-products (Project Symbol: SI/CYP/77/802).

2.3. The consultancy has been carried out by Mr. D. Popović, from 26 April to 25 August 1978. The Terms of Reference were given as follows:

a. Assist in the drawing up of plans and blueprints for the construction of a central slaughterhouse for the three districts of Nicosia, Larnaca and Limassol, to be located at an already chosen site near Kophinou. The capacity of the slaughterhouse should be 5 - 8 heads of cattle, 100 - 120 pigs and 125 - 150 small ruminats per hour on three different slaughterlines; it should be taken into consideration that a by-products processing plant will be built on the same site.

b. Advise on equipment for the plant, taking into consideration the use of the equipment already purchased for a slaughterhouse in Nicosia and also the arrangement and equipping of the pig slaughterline in such a way that not only scalding but also dehiding may be carried out if required.

c. Advise on layout and design of a waste water treatment plant for the slaughterhouse and the by-products processing plant.

d. Advise on plans already prepared with regard to a slaughterhouse in Paphos; the slaughterhouse should have a daily capacity of 3 - 10 heads of cattle, 80 pigs and 150 small ruminants on two lines.

2.4. The Consultant elaborated on the quoted tasks, and the Report consists of two parts:

I. Technological plans and Design for the Central Slaughterhouse in Kophinou.

II. Technological plans and Design for a Slaughterhouse in Paphos.

3. [illegible]

3.1. The Slaughterhouse Complex with the By-products Plant is to be constructed on the site ca. one hundred meters from and on the left of the road, in the direction of Nicosia-Limassol, and ca. 3 miles away from Kophinou.

.2. The site for the whole compound of the Slaughterhouse with the By-products Plant occupies an area of ca. 9 hectares. The compound has two entrances: a, for animals and waste products of slaughter and b, for meat transportation. The electric current supply is to be taken from the main electrical duct crossing over the very place, and water supply is to be through water-pipe from Kophinou, which is abundant with water wells. A dry riverbed near the place will help the solution of waste waters in a relatively cheap way.

3.3. The [illegible] area is about 2,400 m² and the slaughterhouse building in [illegible] area of 1,400 m² and it is to be built in the shape of two squares of [illegible]:

a. The smaller one contains slaughtering departments in the ground floor, and by-products receiving departments in the basement;

b. the larger square contains meat coolers and the necessary utility rooms, as well as meat loading ramp. This block takes up the ground floor only.

3.4. The building construction is made of reinforced concrete, and the finalization of the inside areas corresponds to the regulations according to the propositions of the "New Meat Hygiene Law" (MHL), and to the demands of the foreign market.

3.5. Machines and facilities enable a more rapid flow of raw material through technological process, excluding thus hard physical work, and the arrangement of the rooms facilitates the inner transport.

General conception and the arrangements of buildings divide the site plan into two parts:

a. "Dirty" part with a lairage area and by-products plant with waste water treatment system, and

b. "Clean" part with coolers and ramp. On the same basis the main slaughterhouse building is also divided, so that the meat lines moving never cross the by-product lines.

3.6. Water consumption is on the average ca 175 m³/day. Total electricity consumption is on the average of 1,057 kw/day.

3.7. The slaughterhouse will employ ca 140 workers and clerks.

3.8. The slaughterhouse is to serve on the basis of services to butchers and others responsible for meat supply for the cities of Nicosia, Larnaca and Limassol, as well as to persons and organizations engaged in the export of meat to foreign markets.

4. RECOMMENDATIONS

4.1. Following the events of 1974, the population in these towns and districts almost doubled as a result of the arrival of displaced persons. This aggravated the already difficult situation in the existing slaughterhouses without adequate technical facilities and having insufficient capacities, now fell into an even worse situation. A special problem is also the handling of by-products, the large quantity of which requires great removing costs and greatly increases the danger for the expansion of contagious and invasive diseases. For this reason, it is recommended:

- that the Government urgently introduces measures in order to realize the construction of both plants, slaughterhouse and by-products plant.
- to find the capital to finance the construction and the purchase of the needed equipment.
- to form a team and engage experts for making detailed plans and drawings, specification and tender documents, as well as all installations, which will also put the plants into operation.
- to adopt the proposed "New Meat Hygiene Law".
- to introduce standards for meat and skins.

I. CENTRAL SLAUGHTERHOUSE IN KOPHINOU FOR THE DISTRICTS OF [illegible] LARNACA AND LIMASSOL

Since the new municipal slaughterhouse is to work on the basis of providing services for slaughter to butchers and other persons responsible for the supply of meat to the above mentioned districts, it was necessary to collect data and information on the existing methods and organization of work, so that the new slaughterhouse would be able to satisfy completely the users of its service. In addition, these data and information are needed for the appraisal of capacities, not only of slaughtering lines, but also the programme of work in the slaughterhouse, and therefore, capacities of all the other departments and facilities.

1. PRESENT STATE

1.1. **Lairage area:**

- The transportation of animals is done by private trucks, engaged by individual butchers, and the animals are transported for groups of butchers.
- The animals are housed in pens, either for one of them or for more than one, in which case the animals are marked.

1.2. The slaughter of animals is done by workers who are licenced by the slaughterhouse authorities, and who have to undergo medical examinations. Butchers set the work with the workers and the latter work either individually or in teams, for several owners. They are paid by the piece, in money or sometimes in meat or offals (often done in Larnaca and Limassol districts).

.3. Skinning of the sheep and goats is done with "closed skin", because this is the way the brokers want it.

Dehiding of cattle is done mainly on the floor, and the final hide separating in hanging position of the carcass (hand hoist).

Skinning of hogs is not practised in either of the slaughterhouses because the butchers are not materially interested, although most hog skins are not used.

Comments:

There are no facilities whatsoever for hog skinning. The quality of other skins is also very bad, because neither the butchers nor the workers care for the quality of the work, as brokers take the skins by weight and kind, regardless of the quality.

Recommendations:

The consultant is of the opinion that the facilities themselves cannot improve the quality. It is necessary to introduce standards for skins and to start from the beginning, this must be done on the basis of grading, in which case the workers would be paid for the skins of the first class.

1.4. Slaughter fee is paid on the basis of carcass weight, but weighing differs from district to district, also depending on the kind of animal. (See Table 1)

Comments:

Though complicated and inaccurate, this method of slaughter fee payment will be possible also in the new slaughterhouse, but it will be made difficult by the amount of work, and by lack of time and space.

Recommendations:

It is therefore recommended that slaughter fee payment should be done on the basis of live weight. For this purpose there will be an automatic scale with recording devices for the date, weight, kind of animal and the licence number of the owner.

1.5. The account between a butcher and a farmer is done on the basis of carcass weight and on the ground of the certificate issued by the slaughterhouse.

With regard to cattle, the weight of the head and liver are not included, and with small ruminants the skin. With regard to pigs if a farmer does not possess his own scale, a certificate on the weight of the carcass with an addition of 16-17% (slaughter losses) is issued by the slaughterhouse.

It is recommended that this settlement should also be done on the basis of live weight, for which the owner would get a copy of the recording scale.

The amount of slaughter fee would be adapted on the basis of the percentage of losses on slaughter for each kind of animal.

1.6. The practice is that a certain number of "great butchers" supply with meat (particularly of small ruminants) smaller meat shops. Also, two or more butchers share a cattle carcass.
In that case, an automatic scale would only speed up the work and it would be done with better accuracy.

1.7. By-products treatment is the utmost problem in all the slaughterhouses. Apart from condemned material, a great amount of other material, that should be used in a more economical way, is also discarded. Not rarely, the parts usable for human nutrition (hog's head, the liver, etc.) are also discarded owing to the shortage of workshops for processing and to the shortage of markets.

In Nicosia and Larnaca districts, a certain amount of these by-products is used for the nutrition of pigs. The most difficult situation is at Limassol where such material is burried, and due to the lack of land, there are open pits, full of not yet mineralized material. It is of course needless to say what danger this is for the surroundings.

1.8. The transport of meat is included in the slaughter fee, and it is done by slaughterhouse vehicles. The practice established is that the meat is loaded into meat vans by a pre-determined schedule, depending on the location of meat shops.
Due to the lack of space for manipulation and particularly of coolers, these vehicles serve also as reception storehouses for meat. As the number of these vehicles is not sufficient, the butchers often use their own cars and trucks for the transportation of meat (Larnaca, Limassol).

For the preparation, weighing and loading of meat into vans, the new slaughterhouse will provide sufficient space for simultaneous manipulation for all the three districts.

1.9. Meat cutting (particularly pork) into commercial cuts is done by some butchers, for the purpose of providing smaller meat shops, processing stations, hotels, supermarkets and restaurants with meat.

Also some butchers do the deboning of meat (pork), to provide smaller restaurants which make"kobab". The remaining bones represent a loss and are a problem for removing.

In most cases, and especially by the application of the "New Meat Hygiene Law", these shops will not be permitted to do this work.

For this reason, the new slaughterhouse will have a department for meat cutting and deboning. This will:
a. Enable the butchers to continue to use these services under proper hygienic conditions,
b. Enable the collection of a large amount of bones, hog's skin and fat for by-products, and
c. Speed up the manipulation with these products.

1.10. Working hours are in all the slaughterhouses during the night, due to the high temperatures and lack of coolers. Since the capacity of slaughter varies in quantities from several heads to several hundreds of heads (hogs and small ruminants) the beginning of working hours is adjusted, depending on the capacity from evening hours until midnight. The basic thing is that the work is finished until early in the morning, so as to enable the delivery of the meat to the butcher shops.

1.11. Labourers

Because of very hard physical work during the night and inconvenient conditions (dampness, pollution), older and experienced workers leave the job, and young ones are not easily persuaded to accept the job. If they do, it is only for very high wages. In such a situation, poorly trained workers without experience reduce the already small daily output.

Recommendation:

It is recommended that in the new slaughterhouse the work should be done with permanently employed workers, paid by the slaughterhouse. The reasons for this are:

a. Line work requires equally well trained workers in full number on the line.

b. The distance of the slaughterhouse from the settlements is bound to create a problem regarding the transportation, however this can be solved by the use of slaughterhouse buses.

c. Good working conditions, modern equipment, a flexible capacity of slaughter lines and sufficient capacity of coolers, will provide conditions for a regular daily work and for work with a relatively fixed capacity.

However, if this is not possible to be done, the work in the slaughterhouse will have to continue with the present system.

1.12. Numeral data of the existing situation in the slaughterhouse (See Table 2).

1.13. The capacity of slaughter in the existing slaughterhouses is varying greatly by days, kinds of animals, months and seasons. Table 3 shows the data on the average and maximal amounts of the daily slaughtered animals in the three existing slaughterhouses.

2. PURPOSE AND PRODUCTION PROGRAMME OF NEW CENTRAL SLAUGHTERHOUSE

2.1. The new Central Slaughterhouse is going to work on the basis of giving services to butchers and other persons and organizations responsible for the supply of meat to the local market, as well as to those engaged in the export of meat to foreign markets (particularly pork).

2.2. The Slaughterhouse, together with the By-products Plant will represent a complex unit.

2.3. With its facilities and equipment, it will make possible the processing and finalization of the following products:

1. Chilled pork carcasses
2. Chilled carcasses of small ruminants
3. Beef chilled in sides and cut in quarters
4. Eatable organs and beef stomach (tripe), chilled

2.4. All the other parts of the animal carcass will be collected and delivered to the By-products Plant for further treatment and processing, i.e.:

1. Blood
2. Hoofs and horns
3. Hides and skins
4. Stomachs and intestines
5. Confiscates and other parts
6. Cadavers of dead animals within the lairage area

Comments: The amounts of these parts are presented in Table 9.
The programme of work of the By-products Plant is the subject of a separate technical report (Dr/D/Tom.I/16).

3. BASES OF WORK ORGANIZATION AND TECHNOLOGICAL CONCEPTIONS

3.1. According to the existing regulations, all the animals must have an 18-hour rest before slaughter.

3.2. On arrival at the slaughterhouse, the animals undergo an ante-mortem inspection and weighing.

3.3. The users of the slaughterhouse will have a licence number.

3.4. On arrival at the slaughterhouse, all the animals will be marked with numbers, i.e.:

- Pigs with hot brand

- cattle and small ruminants with ear tags. These tags remain on the skin after skinning, and the meat is stamped in dye with the same number (i.e. licence number of the butcher).

3.5. Slaughter and treatment of all kinds of animals is to be done in hanging position of the carcass.

3.6. Three lines will be established for slaughter, separately for each kind of animals, i.e.:
- The line for hogs will be in a separate room.
- Separate lines for the slaughter of cattle and small ruminants will be in the same room.

Comments: Considering the amounts and possible religious requests (connected with export of meat), hogs and small ruminants cannot be slaughtered on the same line. It would not be convenient to use a line for cattle to slaughter small ruminants, because it is high, and any accommodation would be expensive due to numerous platforms; it would also be small in capacity regarding the capacity of slaughter during the days of maximal slaughter.

3.7. The hog line will have a by-pass, which will make possible the skinning as needed.

3.8. For the hog line the already purchased equipment will be used. If necessary, other equipment (especially overhead railway) will be accommodated to this equipment.

3.9. The whole quantity of meat must be cooled in coolers in accordance with the Meat Hygiene Law.

3.10. For cooling of viscera there will be a special cooler.

3.11. All by-products will be collected by kinds, in separate rooms, and will be taken to the by-products plant in special containers. The blood will be removed by a pneumatic device.

3.12. The slaughterhouse will have a separate room for meat cutting and deboning with a connected cooler for the meat cuts.

3.13. Meat transportation will be done by slaughterhouse vehicles according to the Meat Hygiene Law regulations. If a butcher does possess a vehicle of such a standard i.e. abiding to these regulations, transportation may be made by himself.

3.14. The By-products Plant will be also in the slaughterhouse compound but it will be separated by a special fence.
The slaughterhouse and the By-products Plant will share:

- A water tank with facilities
- A steam boiler station
- Electricity transformer station
- Mechanic and electricity workshop
- Maintaining workshop for vehicles, with a plateau and facilities for washing and disinfection of vehicles
- Waste water treatment system.

Comments: An electro-generator, as a reserve in case of power failure, has not been planned because:

a. There is almost never a power failure
b. If there is one it lasts for a short time only
c. The amount of meat in relation to the dynamic of consumption does not represent a risk for loss.

4. CAPACITIES OF SLAUGHTER LINES AND OTHER DEPARTMENTS IN THE NEW CENTRAL SLAUGHTERHOUSE

4.1. Lairage Area

The number of pens, their location and dimensions are of great importance for the proper organization of the work, having in mind sypplying all slaughter lines by animals in due time.
As is evident in Table 2, existing pens in all the three slaughterhouses have an area of about 1,093 m^2. The pens in the new slaughterhouse will have an area of 2,400 m^2. The 144 pens with 8 m^2 and 16 m^2 will be satisfactory and will have a very large elasticity in animal [illegible].

4.2. As already said, capacities of daily slaughter vary considerably. The slaughterhouse must, by all means, satisfy maximal daily needs in slaughter, and its dimensions will also correspond to the needs.
In order to correctly appraise these needs, a comparative review was made of:

a. Daily slaughter in 1975
b. Present average and maximal slaughter
c. Anticipated needs in 1986. (See Table 4)

The table shows that the proposed capacities can satisfy both the present maximal needs and the planned ones in 1986, and therefore the lines will have the following capacities per hour.

4.3.
- Line for slaughter of sheep and goats 150/hour
- Line for slaughter of cattle 8/hour
- Line for slaughter of hogs 100/hour

Comments: The line for slaughter of hogs is determined by the already purchased equipment, enabling slaughter of 100 heads/hour. But if the need arises, overtime work will compensate for the existing capacity.
The by-pass for hog skinning will make possible the operation on 40 heads/hour.

4.4. Capacity of Coolers

Coolers represent a "bottle neck" in the total volume of slaughterhouse work. In order to make a correct appraisal of the capacities of coolers and their load, an appraisal of the average weight of all kinds of animals was made (see Table 5), and in order to make other departments with correct dimensions, an analysis of carcass yield by the kind of animal, was made (see Tables 6,7,8).
On the basis of these data were determined the capacities of the cooling unit, i. .:

- The capacity of coolers should satisfy the accommodation and cooling of the meat obtained during the 8-hour work, on all the lines of slaughter.
- The storeroom for the cooled meat is 50% of the capacity of coolers.

4.5. - The meat cutting department should make possible the cutting of 10 tons of meat.
- The storeroom for the cut meat is of a 10-ton capacity.

Comments: If the need arises for the enlargement of coolers the cooling [illegible] is constructed in such a way that it makes a functional entirety with any future enlargement.

4.6. - The capacity of the department for the preparation and loading of meat onto the vehicles, is 30 tons of meat in carcasses.

4.7. - Meat loading ramp can receive a simultaneous loading onto six vehicles.

5. GENERAL DESCRIPTION OF CENTRAL SLAUGHTERHOUSE

The slaughterhouse complex is to be divided into "clean" and "dirty" parts. The "clean" part will be used for the entrance of staff and the transport of the prepared meat, while the "dirty" part for convenience of animals and the transport of non-eatable finished products, and waste. Within this latter part the By-products Plant is placed and it is separated by means of a fence.

The following buildings are included within the compound:

1. Lairage for all kinds of animals.
2. Slaughterhouse Main Building.
3. Office Building.
4. Water Station.
5. Fence and Door-keeper Lodge.
6. By-products Plant with separate compound, including:
   - By-products Plant Main Building.
   - Steam Boiler Station.
   - Mechanical Workshop.
   - Sewage System and Waste-water Treatment.

5.1. Lairage Area

This area serves for keeping the animals before slaughtering. It consists of:

- Unloading ramp (a simultaneous unloading of three trucks capacity). It is made of concrete.
- Three reception pens, 16 m^2 each.
- Live animal scale, with offices for the "scaleman" and the Veterinary Inspector.
- One isolation pen for suspect animals.
- Pens for animal of 8 and 16 m^2 (144 pcs) fenced by tubular construction and with double-wing door.

  All pens are connected by passages and the lairage area is connected with the slaughterhouse by a corridor.

5.2. Slaughterhouse Main Building

This is constructed of a ground elevation of 2,707 m^2 and a basement elevation of 450 m^2. The walls are of concrete brick between the reinforced concrete pillars, which support the flat roof and the construction of overhead tubular railway.

The walls, ceilings and floors in all the cold store are thermoisolated, and also protected against humidity by a hydroisolation layer.
The floors are drained to the swallow channels and the drains.
The height of the slaughtering hall is 7 metres in the part with elevators and hoists and over the bleeding areas and the transfering platform. The height of the cold store is 4 metres.
Slaughtering halls have windows of 50 cm height and 150 cm width and are placed below the ceiling.
All processes are "on line" which means that the animals are slaughtered in vertical position, hanged on the railway and continuously passed through various dressing operations to emerge as fully dressed carcasses which will be transported by rail system to the chilling rooms and after chilling to the meat preparing hall for loading onto the refrigeration truck.
The non-eatable offal, blood, intestines and all condemned parts will be transported by means of chuts to the basement floor in various receiving rooms, and later on the By-products Plant.

5.3. <u>Office Building</u>

This is a separate building connected with the slaughterhouse by means of a passage. This building is divided in three parts:

- The administrative part which includes offices for the managing personnel, the accountant and telephone operator.
- The second part includes wardrobes, w.c. and lavatories. Within this part is the laundry with store for dresses.
- The third part is the canteen with coffee/tea kitchen.

5.4. <u>Water station</u>

This is common for both the plants i.e. for the slaughterhouse and the by-products plant. This station consists of water tank hydrophor (if necessary), chlorinating station and necessary pumps and installations.
The water supply will be provided by pipe from bore holes in the vicinity of Kophinou, in the water tank which will synchronize water consumption during the high consumption hours.
Cold water needed in the slaughterhouse has a pressure of about 2.5 atm., except for the hose station for cleaning the various areas in the slaughterhouse which has 37 kgs/cm^2. This pressure will be produced by a high pressure pump.

Hot water of 83° C will be provided by a boiler placed in the basement floor and working the steam produced within the by-products plant.

5.5. Fence and Door-keeper Lodge

To protect the slaughterhouse yard from unwanted visitors and especially dogs and other animals, a combined fence of wall and wiremesh will be constructed all around the complex.
Near the entrance doors of the "Clean" and "Dirty" parts of the slaughterhouse complex a door keeper lodge will be built, supplied with telephone and a writing table. The door-keeper will be responsible for controlling the entrance and for providing evidence of the animals entering in the lairage area, as well as evidence of the transportation of meat.

All roads and platforms within the yard will be of concrete or asphalt and other areas will be covered with grass, in order to avoid the dust. Near the fence a green belt of about 10 m will be planted.

5.6. By-products Plant Compound

This is explained separately in the technical report prepared by Lewis L. Crawford, (DP/ID/SER.A/163).

6. DESCRIPTION OF SLAUGHTERHOUSE OPERATIONS

The technological process of the work in the slaughterhouse ensures a continuous work beginning with receiving live animals and finishing with delivering chilled meat. This process is carried out in the following way:

6.1. Receiving, inspecting, weighing and marking of animals

The animals will come to the slaughterhouse mainly by trucks and partially on foot (from the animal market, in future). After arrival and veterinary inspection, the animals will be marked as follows:

a. Pigs by electric brander
b. Sheep and goats by paint sticks
c. Cattle by ear tags

The animals will then pass over the automatic scale, where the owner will receive a copy of the recording.

Suspected animals will be taken into an isolation pen and healthy ones will be put into pens within the lairage for resting till the following day. The animals will be selected by kind and disposed in pens under certain arrangements. The programme of arrangement will be settled and prepared in accordance with the meat transportation arrangement of meat distribution to the various butcher shops in various towns. The slaughtering programme will follow the same arrangement.

6.2. Pig Slaughtering

The pigs are driven in groups of about 30 animals into the waiting room. They will be stunned by means of an electric stunning device, tied with chain of bleeding chaculeS on a hind leg and lifted on the bleeding rail, where they are slaughtered and held about 5 minutes until complete bleeding is performed.

6.2.2. The dressing operations could be made in two different ways:

a. Scalding, dehairing and cleaning:
   - To begin with, the carcass is dropped into the scalding tank by means of a hydraulic dropper.
   - After about four minutes the carcass will authomatically be taken out and put into the dehairing machine, where the main quantity of bristles will be removed and the carcass thrown onto the gambreling table.
   - On the gambreling table the cleaning of the carcass will be continued by hand using a singeing nozzle, knife and economy shower.

- Then the carcass will be elevated by means of an electric elevator on the rail, where they will finally be cleaned and washed with a shower.

b. <u>De-skinning method, performed as follows:</u>

- The animal will be dropped on a dressing table by means of an electric hoist.
- On the dressing table all the skinning operations will be finished consisting of ripping the hind and fore legs, ripping the belly and breast, skinning the whole carcass except for the head. The head is cut off and after passing from the scalding tank, it is cleaned on the gambreling table.

6.2.3. Cleaned and washed carcasses will be transported to the evisceration area, where the abdomen will be opened and all viscera taken out and placed on the viscera inspection table.

6.2.4. The conveyor moves the carcasses parallel with the viscera inspection table so as to enable the inspection of carcasses and all viscera at the same time.

6.2.5. Eatable offals will be cleaned and washed, placed on a truck with stainless steel containers and transported to the offal chilling room.

6.2.6. Condemned parts will be collected in a special container and dropped down by means of a chute in the condemned parts collecting room on the basement floor.

6.2.7. Stomach and intestines will also be dropped down, but by means of another chute, adjacent to the previous one, which transferred the viscera into the stomach and intestine collecting room.

6.2.8. After meat inspection, the carcass will be cut in halves by means of a pneumatic saw, washed with shower and transported to the chilling room.

6.3. <u>Sheep and goats slaughtering</u>

6.3.1. Sheep and goats are driven into groups of about 20-30 animals, from the lairage area into the waiting room. The small ruminants are tied by a chain of bleeding chackle on a hind leg and lifted on the bleeding rail one by one, where they are held for about 4-5 minutes until complete bleeding is performed. The dressing operation is then carried out.

6.3.2. The animals are pushed along the concrete platform for dressing the legs. At first, the whole skin is inflated by means of compressed air, after which a worker strips the skin from the free leg, and another worker hangs the dressed leg on the lower rail and then strips the skin from the other hind leg.

6.3.3. After these operations on the platform are finished, the horns will be cut off by means of a pneumatically-operated knife arms, and then the following other skinning operations will continue while moving the carcasses on the rail by means of a conveyor. The various operations of skinning the whole carcass by the method of "close skin" consist of: ripping the fore and hind legs, stripping off the skin from the belly, back, shoulder, neck and head; this will be completed within about 15 minutes time because the length of the conveyor is 21 metres and the speed is 2.5 cm/second. The skin will be dropped down to the hides and skins collecting room on the basement floor by means of a chute. The markerman will mark each carcass with the same number that is on the skin.

6.3.4. The skinless carcass will reach the end of the converyor rail, and then the abdomen will be opened to enable evisceration. First, the small intestine will be separated by pulling out and second, the stomach and other intestines will be taken out and put onto the receiving table. After meat inspection, all these viscera will be dropped by chute into the intestines collecting room on the basement floor.

6.3.5. The red organs (heart, lungs and liver) will remain attached to the carcass; only condemned parts will be collected by the meat inspectors in a separate meat container and dropped down in the condemned parts collecting room, by means of a separate chute.

6.3.6. The carcasses will be transferred from the gambrels to the multi-hook çarriers and transported into the sheep and goats chilling rooms.

6.4. <u>Slaughtering the Cattle</u>

A line system for slaughtering the cattle is accepted. In this system, the working process is divided into several operations, so that a greater number of workers operate at one time as a whole, where each worker performs always the same definite operations. The slaughtering process develops as follows:

6.4.1. The animals are driven into the stunning box, where they are stunned with a bolt pistol, after which they are thrown on the floor.

6.4.2. A chacule rubber chain is tied round the hind leg above the knee; then the animals are lifted and loaded on the bleeding rail by means of an electric hoist. (The height of the bleeding rail is about 520 cm). On the bleeding rail the animals are held for about 6-8 minutes until the bleeding is completed and then they are transported by pushing (a gentile slope of 1.5 cm/metre is provided on the rail system), to the next working place, where the fore legs and horns are cut off with a pneumatic cutter and dropped into a hoofs and horns chute, from which they are collected in a container in the basement floor.

4.3. The head is then cut off, cleaned in a washing cabinet and placed on a truck for inspection and transportation to the chilling room.

6.4.4. The carcasses are transported to the transferring platform, where the free hind leg can be dehided and cut off and a runner hook inserted in the sinew.
Next, the runner hook with the dehided hind leg is placed on the transferring hoist and transferred to the lower dressing rail (with about 330 cm height). The other hind leg is released in the same way and placed on the dressing rail by means of a transferring hoist.

6.4.5. From the transferring platform the dressing operations begin, with dehiding the inner part of the hind legs, cutting the aichbone and tail, ripping and dehiding the stomach, breast and fore legs, after which the dehiding with rumping starts.(See Table 18).

6.4.6. On the dressing rail the carcasses are transported to the dehiding area where the whole hide will be separated from the carcass and transported by means of a flat truck to the chute for hides and skins where the hide will be dropped.
The ear tag remains on the hides, and the markerman puts the same number on the carcass with a special ink.

6.4.7. The dehided carcasses are transported to the breast opener saw and after cutting the breastbone, they are pushed to the eviscerating area, where the carcasses are spread with a built-in pneumatic spreader, so as to secure the right spreading of the hind legs to facilitate the evisceration.

6.4.8. After opening the belly, the stomach and intestines are placed on a table, where they are inspected and then transported by means of a channel made of stainless steel to the stomach emptying and cleaning area. The pluck - sets are placed on a table supplied with hooks, where they are inspected and washed and then transported to the offals chilling room.
By this method, the meat inspector is able to inspect the carcass, the viscera and the head at the same time.

6.4.9. After evisceration, the carcasses are tranported to the splitting platform of the pneumatic elevating type. A pneumatic built-in spreader is placed on the overhead rail, so as to ensure the spreading of the hind legs while splitting the carcass.
The splitting of the carcasses is operated by means of an electric saw.

6.4.10. Then, the dressing line is equipped with a washing platform, including washing facilities.
The carcasses are transported to the chilling room on the rail of the same height(330 cm). After chilling the carcass half is cut into quarters and delivered.

Comments: The cattle slaughtering line has a capacity of 8-10 heads of cattle per hour. So, for each of the mentioned operations remains an interval of 6 to 7.5 minutes. (See Table 18).

6.5. Cattle stomach cleaning

After meat inspection, the stomach and intestines will be transported to the stomach cleaning area, where all viscera will be received on a table. The intestines will be separated and dropped into the viscera collecting room in the basement floor, by means of a chute.

6.5.1. The stomach will be opened over a grate through which all contents will be dropped down to the basement floor by means of chute and collected into a transportation truck.

6.5.2. After emptying, the stomach is put on a revolving cone, on which it is carefully washed by hand and by an economy shower. It is then scalded in scalding basin and inserted in a stomach cleaning machine, in which the viscera should be coagulated separated and thrown out.

6.5.3. The cleaned stomach will be additionally prepared on a working table, pre-chilled in a basin with cold water and transported to the offal chilling room.

Comments: In case that the stomach should not be cleaned, it will be dropped after emptying, in the same chute as the intestines.

6.6. Manipulation with By-products

All non-eatable offals and by-products will be transported to the basement floor by means of many chutes and collected into various rooms.

6.6.1. The blood of all slaughtered animals will be collected in a special cylindric vessel and transported pneumatically to the by-products plant.

6.6.2. Other offals and by-products as pigs bristles, skins, hides, hoofs and horns, stomach and intestines, contents of beef stomachs and condemned parts will be collected into various rooms, separated by kind and transported to the by-products plant by means of various containers, trucks and wheel barrows, every hour or from time to time as necessary.
The slaughterhouse will be connected with the by-products plant with a good concrete paved passage, so as to enable easy cleaning and disinfecting.

6.7. Meat chilling

- All carcasses and edible parts of all animals are to be chilled in various chilling rooms which will be placed in a separate cool-block.
- The rooms are connected by a large passage, so as to enable all manupulation with meat and empty hooks carriers. Within this passage, the cutting of beef halves into quarters will also be carried out.
- All rooms are supplied with overhead rail-way of the following heights:
  - room for beef chilling, on 320 cm, in order to enable the chilling of the whole beef halves so that the meat will be disposed on the skeleton properly. After chilling, the halves will be cut in quarters, to enable easy manipulation and transport.
  - All other chill rooms have a rail-way of a height of 220 cm. Such a solution will enable storing meat of all kinds of animals such as pork, muton as well as the beef quarters. There will therefore be a large flexibility in using of the chilling capacity.

- The very large oscillations in slaughtering capacities require several chilling units, so as to enable economical exploitation of the cooling block. When the number of slaughtered animals is small, the same room will be used only, depending on the kind of animals (in any case, pork must be chilled separately, and other kinds of meat may be chilled together). For higher slaughtering capacity, more rooms will be used, and these rooms may also be used for storing chilled meat for many days.

- For the same reason, the capacity of unit coolers is calculated to be able to satisfy meat chilling or storing in a large weighty scale, by means of a special regulating valve.

6.8. **Meat Cutting and Deboning**

- A separate room, air-conditioned and supplied with working tables and other facilities will be provided for these operations.
  The room will be rented to various butchers on a time or quantity (kg) basis.
- The "cuts" and other parts or manufactured meat could be stored in separate chilling store.

6.9. Before loading, the carcasses will be loaded (by request of the owner) and distributed on various rail-ways, according to pre-arrangement and meat transportation programme for each district and each group of butchers.

Such organisation will enable a quicker loading and transportation of meat, so that the butcher shops may be supplied with meat in due time.

METHOD OF WEIGHING AND ESTIMATING THE WEIGHT ON WHICH THE SLAUGHTERHOUSE FEES ARE PAID

TABLE I.

TOWN	CATTLE	PIGS	SHEEP AND GOATS	
			Young	Old
Nicosia	carcass +: 10% of carcass weight for head and liver	carcass +: -Head -Feet -Eatable offals	carcass +: -Head -Feet -Eatable offals -Skin	The same as in column 4
Larnaca	The same as in Nicosia	carcass +: -eatable offals	The same as in Nicosia	carcass without head
Limassol	The same as in Nicosia	carcass only	The same as in Nicosia	carcass +: eatable offals

SOURCE: Data collected from meat inspectors in charge of slaughterhouse Manager in Nicosia, Larnaca and Limassol.

NUMERICAL PRESENTATION OF EXISTING SITUATION IN SLAUGHTERHOUSES OF NICOSIA, LARNACA AND LIMASSOL.

TABLE: 2.

ITEM	DESCRIPTION	NICOSIA		LARNACA		LIMASSOL	
1.	POPULATION(APPROX).	150.000		50.000		100.000	
2.	BUTCHERS	67		30		94	
3.	DAILY SLAUGHTER CAPACITY:	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM	AVERAGE	MAXIMUM
	I PIGS	160-180	250	150	200	100	215
	2 SHEEP AND GOATS	221	520	80-90	130	215	600
	3 CATTLE	9	20	4-5	10	5	30
4.	DAYS OF MAXIMUM SLAUGHTER	SUNDAY/MONDAY		MONDAY		THURSDAY/FRIDAY	
5.	MEAT TRANSPORTATION:						
	I. MEAT VAN	6		2		2	
	2. DRIVERS	6		1		2	
6.	LAIRAGE AREA(m^2-approx)	BOXES/pen	CCA m^2	BOXES/pen	CCA m^2	BOXES/pen	CCA m^2
	I. FOR PIGS	29		19	62	17	204
	2. FOR SHEEP AND GOATS	48	582	20	65	13	90
	3. FOR CATTLE			3	10	18	80
	TOTAL:	77	582	42	137	48	374
7.	STAFF AND LABOURERS					TOTAL	
	1. MEAT INSPECTORS	3	1	2		6	
	2. EMPLOYED WORKERS	18	3	6		27	
	3. LICENCED WORKERS (CHANGABLE)	CCA 50	CCA 18	CCA 25-70		CCA 93-108	

SOURCE: Meat Inspectors in charge of slaughterhouse Managers in Nicosia, Larnaca and Limassol.

REMARK: Dimensions and area of Lairage (item 6) was estimated by Consultant.

AV. RAGE DAILY SLAUGHTERING IN THE EXISTING SLAUGHTERHOUSES

TABLE 3

	NICOSIA		LARNACA		LIMASSOL		TOTAL	
Daily capacity	Aver.	Max.	Aver.	Max.	Aver.	Max.	Aver.	Max.
Pigs	180	250	150	200	100	216	430	665
Sheep & Goats	226	520	85	130	215	600	526	1,250
Cattle	9	20	5	10	5	30	19	60
Higher working days:	Sunday Monday		Monday		Thursday Friday			

SOURCE: Approximate estimation by Consultant, based on statistical data of the Municipal Councils of Nicosia, Larnaca and Limassol for the period January to March 1978.

Comments: These data and some other piece of information were discussed with the representatives of all the three municipalities, in order to determine the capacities of the slaughterhouse and the accompanying departments.

COMPARISON BETWEEN PROPOSED CAPACITY OF SLAUGHTERING LINES AND TIME NEEDED FOR SLAUGHTERING:

a) QUANTITY OF ANIMALS SLAUGHTERED IN 1975 YEAR.
b) EXISTING AVERAGE AND MAXIMUM DAILY SLAUGHTERING
c) PROJECTED SLAUGHTERING FOR 1986 YEAR. (For districts of: Nicosia, Larnaca and Limassol).

TABLE 4.

ITEM	DESCRIPTION	SHEEP AND GOATS		PIGS		CATTLE	
I.	a. Slaughtered animal in 1975 Total pos.	164.479		113.011		5.023	
1.2	Average per day; basis 250 working day/year	657		452		20	
1.3	Hour's capacity; based on 8 working hours/day	82		56		2-3	
1.4	Needed time for slaughtering based on proposed lives capacity for:						
	-Sheep and goats-150/h in minutes	33					
	-Pigs =100/h " "			34			
	-Cattle = 8/h " "					22	
2.	b. Quantity of slaughtered animal in January - March 1978:	AVR.	MAX.	AVR.	MAX.	AVR.	MAX.
2.1	Daily capacity:average/maximum	526	1250	430	665	19	60
2.2	Hour's capacity:based 8 working hour/day	66	156	54	83	2°3	7°5
2.3	Needed time for slaughtering;based on proposed capacity; in hours.	3°5	8°3	4°3	6°7	2°3	7°5
3.	c. Projected quantity of slaughtered animal for 1986 year.Total per Year:pos.	312.180		237.888		8,152	
3.1	Average per day;based on 250 working days/year	1.248		951		33	
3.2	Hour's capacity;based on 8 working hours/day	156		118		4°5	
3.3	Needed time (hours) for slaughtering based on proposed lines capacities	8°3		7°9		4°2	

SOURCE AND A: Report on the proposal for the construction of a Central Slaughterhouse and by-products utilisation plant. Proposed by: Committee for the study on the construction of New Slaughterhouses and By-Products Plant.

B: Average and maximum daily capacity are estimated by Consultant, based on Municipal Corporation statistics data for slaughtered animal for Nicosia, Larnaca and Limassol.

ESTIMATION OF CARCASS WEIGHT
ESTIMATION WAS MADE BY USING STATISTICS DATA OF SLAUGHTERED ANIMAL FOR 1977 YEAR

TABLE 5.

	TOWNS	PIGS			SHEEP AND GOATS			CATTLE		
		Slaughtered animal in pcs.	Total weight in kgs.	Average weight per pc/kgs.	Slaughtered animal in pcs.	Total weight in pcs.	Average weight pc/kgs.	Slaughtered animal in pcs.	Total weight in kgs.	Average weight pc/kgs.
1.	NICOSIA	42.268	3,319.371	78.53	61.486	990.144	16.10	1,746	517.021	296.1
2.	LARNACA	25.824	2,030.151	78.61	13.563	192.865	14.21	656	169.862	258.9
3.	LIMASSOL	23.631	1,320.000	55.85	42.601	490.300	11.05	1.406	322.200	229.1
	TOTAL: 1-3	91.723	6,669.522	72.71	117.650	1,673.309	14.22	3.808	1,009.083	265

SOURCE: Statistics data of daily slaughtering issued by Municipal Corporation of: Nicosia, Larnaca and Limassol.

REMARK: For Larnaca: Data for slaughtered animal was taken on account only for these months in which they used the scale, because during the other period of year the slaughterhouse fees were paid by estimation of carcasses weight.

CARCASS YIELD ANALYSIS: SHEEP AND GOATS AVERAGE

LIVE WEIGHT: 25kgs.

TABLE: 6

		PER PC. %	PER PC. Kgs.	TOTAL PER 526 pcs kgs.	MATERIALS FLOW THROUGH PRODUCTION: CHILLING: CARCASS	CHILLING: OFFAL	IN BY-PROD PLANT	OTHER	COMMENTS
I	2	3	4	5	6	7	8	9	10
1.	BLOOD	3.30	0.82	431.32			431		
2.	FEET	1.60	0.40	210.40			210		
3.	SKIN	12.40	3.10	1630.60				1.630	SALTING.
4.	HORNS	1.20	0.30	157.80				157	DRYING.
5.	STOMACH & LARGE INTS.	12.95	3.23	1698.90			1.698		
6.	SMALL INTESTINES	2.08	0.52	273.52				273	PROCESSING
7.	CONDEMNED PARTS	5.60	1.40	736.40			736		
8.	LOSS BY SLAUGHTERING	2.80	0.70	368.20					
	TOTAL: I - 8	41.93	10.48	5512.48			3.075	2.060	
9.	LUNGS	1.40	0.35	184.10		184.1			
10.	HEART	0.45	0.11	57.86		57.8			
11.	LIVER	0.70	0.17	89.42		89.4			
12.	SPLEEN	0.10	0.03	15.78		15.8			
13.	TALLOW (OMENTUM)	0.60	0.15	78.90		78.9			
14.	HEAD	3.70	0.92	483.92		484			
15.	CARCASS (HOT)	51.12	12.78	6722.28	6.722	910			
	TOTAL: 9 - 15	58.07	14.51	7632.26	7.632				

SOURCE: Average carcass weight ie carcass + head + all eatable offals (9-15), is based on official report made by Municipal Corporation of Nicosia, Larnaca and Limassol. (See table 5).

Live weight and the weight of all other parts of animal body is made by Consultant by implementing mentioned%. The average live weight is rounded to 25 kgs. per head.

CARCASS YIELD ANALYSIS: PIGS

(LIVE WEIGHT: 91 kg)

TABLE 7.

		PER PC		TOTAL PER 430 pcs. kgs.	MATERIALS FLOW THROUGH PRODUCTION				
		%	Kgs.		CHILLING CARCASS	CHILLING OFFAL	IN BY-PROD PLANT	OTHER	COMMENTS.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	BLOOD	2.70	2.45	1.056.5			1.056		
2.	BRISTLES	0.20	0.18	78.2				78[x]	DRYING
3.	HOOTS	0.40	0.36	156.5				156[x]	"
4.	STOMACH AND LARGE INTESTINES	2.30	2.09	900.0			900		
5.	SMALL INDESTINES	1.40	1.27	547.8				547[x]	PROCESSING
6.	CONTAIN OF STOMACH	4.0	3.64	1,565.2				1565	FERTILIZER
7.	CONDEMNED PARTS	4.20	3.82	1,673.4			1.673		
8.	LOSS BY SLAUGHTER	2.29	2.08	896.0					
	TOTAL: 1-8	17.49	15.91	6.843.8			3.599	2346	
9.	LUNGS	0.72	0.65	281.7		281			
10.	HEART	0.25	0.22	97.8		97			
11.	LIVER	1.00	0.91	391.3		391			
12.	KIDNEY	0.22	0.20	86.1		86			
13.	SPLEEN	0.15	0.13	58.6		58			
14.	BRAIN	0.06	0.05	23.4		23			
15.	TONGUE	0.17	0.15	66.5		66			
	TOTAL: 9 - 15	2.57	2.33	1,005.6		1.002			
16.	CARCASS (HOT)	80.00	72.8	31.304	31.304				

SOURCE: Average carcass weight is estimated based on Official Report made by Municipal Corporation of Nicosia, Larnaca and Limassol. (See table 5).

Live weight is estimated by Consultant, implementing above mentioned %.

The average live weight is rounded to 91 kgs. per head.

CARCASS YIELD ANALYSIS: CATTLE

(LIVE WEIGHT: 491 kgs.)

TABLE 8.

		PER %	PC Kgs.	TOTAL PER 20 pcs. kgs.	MATERIALS FLOW THROUGH PRODUCTION				
					CHILLING		IN BY-PROD PLANT	OTHER	COMMENTS
					CARCASS	OFFAL			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1.	BLOOD	3.20	15.71	314.24			314		
2.	HORNS AND HOOFS	0.26	1.27	25.53				25[x]	DRYING
3.	HIDE	7.97	39.13	782.65				782[x]	SALTING
4.	FEET	1.75	8.59	171.8		70[x]	100		EATABLE
5.	STOMACH - EMPTY	1.8	8.83	176.6		50[x]	126		EATABLE
6.	INTESTINES SET -U-	3.9	19.14	382.8				382[x]	SALTING
7.	CONTAIN OF STOMACH	6.2	30.44	608.8				608[x]	FERTILIZER
8.	TESTS OF UDDERS	0.10	0.49	9.8		4[x]	5		EATABLE
9.	CONDEMNED PARTS	2.85	13.99	279.8			279		
10.	LOSS BY SLAUGHTER	9.89	48.55	971.2					
	TOTAL: 1 - 10	37.92	186.18	3.723.74				1.797	
11.	HEAD	2.68	13.15	263.17		263			
12.	LUNGS	0.75	3.68	73.65		73			
13.	HEART	0.30	1.47	29.46		29			
14.	LIVER	1.05	5.15	103.00		103			
15.	SPLEEN	0.15	0.73	14.73		14			
16.	KIDNEY	0.20	0.98	19.64		19			
17.	TILE	0.25	1.22	24.55		24			
18.	TALOW	2.60	12.76	255.32			255		
19.	TONGUE	0.20	0.98	19.64		19			
	TOTAL: 11 - 19	8.18	40.16	803.27		368	1.079		
20.	CARCASS HOT	53.90	264.64	5.292.98	5.292				

SOURCE: Average carcass weight is estimated based on Official Report of Municipal Corporation in Nicosia, Larnaca and Limassol.

The live weight is estimated by Consultant, implementing above % on carcass weight. Live weight is rounded to 491 kgs. per head.

COMPARISON IN CAPACITIES AND MATERIALS FLOW THROUGH PRODUCTION RELATING TO:

EXISTING AVERAGE AND MAXIMUM DAILY SLAUGHTERING AND PROJECTED SLAUGHTER IN 1986 YEAR

TABLE: 9.

	Kgs. per pc.	EXISTING AVERAGE				EXISTING MAXIMUM				PROJECTED SLAUGHT. CAPCT.			
		CHILLING		IN BY-PR.PLANT KGS.	SALTING KGS.	CHILLING		IN BY-PR.PLANT KGS.	SALTING KGS.	CHILLING		IN BY-PROD. PLANT	SALTING KGS.
		PCS.	KGS.			PCS.	KGS.			PCS.	KGS.		
SHEEP & GOATS:													
CARCASS	14.51	526	7.632			1.250	18.137			1248	18.108		
SKINS	3.10				1.630				3.875				3.868
BY-PRODUCTS	5.81			3.075				7.300				7.288	
PIGS:													
CARCASS	72.8	430	31.304			665	48.412			951	69.232		
OFFALS	2.33		1.002				1.549				2.215		
BY-PRODUCTS	8.37			3.599				5.566				7.959	
CATTLE:													
CARCASS	267.64	20	5.292			60	15.878			33	8.733		
OFFAL	33.4		668				2.004				1.102		
HIDES	39.13				782				2.347				1.291
BY-PRODUCTS	53.95			1.079				3.237				1.780	
TOTAL:			45.898	7.753	2.412		85.980	16.103	6.222		99.390	17.027	5.159

SPECIFICATION OF ROOMS AND DEPARTMENTS.
DIMENSIONS AND STANDARDS OF INTERNAL FINISHINGS

TABLE: 10.
(cont'd.)

ITEM	DESCRIPTION OF THE ROOMS AND DEPARTMENTS	DIMENSIONS C.M.	AREA M^2	HIGHT OF CEILING	STANDARDS OF INTERNAL FINISHINGS		
					FLOOR	WALLS	SEE TABLE NO.
1.	2.	3.	4.	5.	6.	7.	8.
	I. LAIRAGE AREA:						
1.	Unloading ramp for animal with 3 receiving plus 4x4m. Hight of ramp is 110cm.	12x4	48	—	1	—	
2.	Pens for ante-mortem inspection: 3 pens 4 x 4m.	12x4	48	—	1	—	
3.	Pens for resting the animal during caranten period:						
	a. Pens dimensions 4x4m=36 pcs.		576	—	1	—	
	b. Pens dimensions 2x4m=108pcs.		864	—	1	—	
	c. Passages within lairage area, width 150 cms.	447x1.5	670	—	1	—	
	d. Passage to the slaughterhouse devided in 3 channels. Total width 300 cms.	50x3	150	—	1	—	
	e. Total length of fence within the lairage area.	1.265cm.	—	—	—	—	
	f. Two sides swinging doors 180pcs. dimensions 1.5 x 1.2 cms.	270cm.	—	—	—	—	
4.	Weighing area and two offices	8x5	40	3	4	5	
	T O T A L I:		2.396				
	II. SLAUGHTERING AREA-GROUND FLOOR						
5.	Waiting room for cattle	2.3x6	13.8	7	2	1	
6.	Stunning and sleeding	3.2x6	19.2	-"-	2	1	
.	Dressing area: Cattle - Shoop		245.4	-"-	2	1	
8.	Tripe cleaning room		29.5	-"-	2	1	
9.	Sterilisation room	3.6x2.5	9.0	-"-	2	1	
10.	Waiting room for sheep-goats	5x5	25.0	-"-	2	1	
11.	Steps	6x1	6.0	—	1	3	
12.	Markerman Room	3x2	6.0	—	4	5	
13.	Waiting room for pigs	5x7	35.0	7	2	1	
1..	Scalding - Dehiding room	13.2x8	105.6	-"-	2	1	
15.	Evisceration Room		77.5	-"-	2	1	
16.	Meat detention room	2.7x6.5	17.5	4	3	1	
17.	Meat inspectors laboratory	6.5x3.4	22.1	4	4	5	
18.	Passage	24x3	103.2	7	2	2	
19.	Compressor Room	8.8x6	52.8	7	4	3	
	T O T A L: II.		767.5				

SPECIFICATION OF ROOMS AND DEPARTMENTS
DIMENSIONS AND STANDARDS OF INTERNAL FINISHINGS

TABLE: 10.
(cont'd)

ITEM	DESCRIPTION OF THE ROOMS AND DEPARTMENTS	DIMENSIONS C.M.	AREA M^2	HIGHT OF CEALING	STANDARDS OF INTERNAL FINISHINGS		
					FLOOR	WALLS	SEE TABLE NO.
1.	2.	3.	4.	5.	6.	7.	8.
20.	Store for spare parts	3.3x6	19.8	4	4	3	
21.	Toilets	4x3.5	14	4	4	2	
22.	Chill room for offals	5x5	25	4	3	4	
23.	Passage	30x5	150	4	2	2	
24.	Chill room for beef	12x6	72	4	3	4	
25.	" " " sheep & goats	12x12	144	3.8	3	4	
26.	" " " all kind of meat	12x6	72	-"-	3	4	
27.	" " " " " " "	12x6	72	-"-	3	4	
28.	" " " pork	12x12	144	-"-	3	4	
29.	" " " all kind of meat	12x6	72	-"-	3	4	
30.	" " " " " " "	12x6	72	-"-	3	4	
31.	Meat cutting room	12x12	144	-"-	2	2	
32.	Chilled store for "Cuts"	12x6	72	-"-	3	2	
33.	Meat preparing room	23x12	267	-"-	2	2	
34.	Scale office	3x3	9	-"-	4	5	
35.	Loading ramp	35x3	105	-"-	4	2	
36.	Toilet	3.5x2.2	7.7	-"-	4	1	
37.	First Aid Room	3.8x3.5	13.3	-"-	4	5	
38.	Passage	6x2.5	15	-"-	4	5	
	T O T A L		1.489.8				
	III. SLAUGHTERHOUSE-BASEMENT FLOOR						
39.	Sanitary slaughtering room	5x6.5	32.5	3.2	2	1	
40.	Steps	8.5x1	8.5	-"-	1	3	
41.	Toilet	3.5x4	14	-"-	4	1	
42.	Passage	10x4	36.3	-"-	1	3	
43.	Gas tank store	2.5x1.5	3.7	-"-	1	3	
44.	Blood collecting room	5x4.5	22.5	-"-	2	1	
45.	Air compressor and boyler	5x6.5	32.5	-"-	1	3	
46.	Hide & Skins receiving room	7.5x15	112.5	-"-	2	1	
47.	Condemned parts receiving room	4.5x15	67.5	-"-	2	1	
48.	Stomach & Intestines " "	8x15	113.4	-"-	2	1	
49.	Stomach contents " "	2.2x3	6.6	-"-	4	3	
	TOTAL: III		450				
	G R A N D T O T A L: II + III		2.707.3				

STANDARDS OF INTERNAL FINISHING OF THE VARIOUS ROOMS AND DEPARTMENT

TABLE: 11.

DESCRIPTION	STANDARDS SYMBOL.
I. FLOOR:	
1. - Concrete floor, screed finished, sloped to the channels.	
- The channels towards drains are fitted with traps and gratings.	1.
2. - Waterproof flooring which is easy to clean and desinfect, rot-proof and fitted up in such a way so as to facilitate the draining of water and easy passage of truck and wheelbarrows.	
- The swallow channels towards drains are fitted with traps and gratings.	
- (Proposed materials: "Kisserling", or ceramick hard non-slip tiles).	2.
3. - Thermoisolated floor, waterproof, rot-proof and sloped to the door, made of concrete non-slip finished or of strength asphalt.	
- The threshold is made under slope, so as to facilitate easy passage of truck and wheelbarrows.	3.
4. - Sloping floor made of artificial tiles.	4.
COMMENT: Except for the chilling rooms, there are no threshholds.	
II. WALLS:	
1. - Smooth walls with light coloured washable tiles up to height of 3 meters.	
- All corners are protected with non rust angle steel.	
- All angles between walls and walls and floors must be rounded (curved)	1.
2. - Smooth walls with light coloured washable tiles up to hight of 2 meters.	
- A concrete parapet height 0.5 meters thickness 10 cms. placed on corner between walls and floor for protecting the walls against the trucks and wheelbarrows.	
- With rounded angle and protected corners.	2.
3. - Smooth walls made of cement finished to the "Black Shine", up to height of 3 meters.	3.
4. - The walls with thermoisolation, waterproof and protected with tiles (or cement finished to the "Black Shine") to the height of 3 meters.	4.
5. - Smooth walls with light coloured washable paint.	5.
III. CEILINGS: - All ceilings are lime coloured and finished.	
IV. **WINDOWS:** - All windows must be screened. The down inside part of windows has to be made with a slope of 45°.	

STANDARDS OF INTERNAL FINISHING OF THE VARIOUS ROOMS AND DEPARTMENTS

TABLE: 11.
(cont'd)

DESCRIPTION	STANDARDS SYMBOL.
L. DOORS:	
1. - The cold store doors must cover (flash) the whole clear dimensions and must be completely air-tight.	
- The upper frame for rail passage, must be supplied with rubber curtains.	
- The down side of the door is made with an angle, supplied with rubber hose which lean completely to the sloped threshhold.	
2. - All other doors which are not mentioned in the equipment specifiction, are made of iron steel on a stabile frame and protected against rusting.	

ESTIMATION OF IMPOSED LOAD WITHIN SLAUGHTERHOUSE

TABLE 12

	DESCRIPTION	LOADING - KG		Total in the room Tons
		Per 1 meter of rail	per m^2	
1.	Cattle slaughtering line	500		-
2.	Sheep and goat line	100		-
3.	Pigs line	250		-
4.	The electric hoists on the cattle slaughtering line (item 63,73)	1,000		
5.	Scalding tank for pigs, dimensions 6 x 1.6 x 0.8 m (Item 16) Total		8,000	
7.	Dehairing machine (Item 17) has vibration, total:		5,000	
8.	All other equipment		500	
9.	Loading of all overhead rail, except slaughtering lines, in continuity	250		
	The total loading of the chilling rooms is:			
	a. Chilling room No. 25 & 28			20
	b. Chilling room No. 32		300	
	c. All other chilling rooms, each			10
10.	The loading of floor in all rooms within the slaughterhouse, except chilling rooms No. 24 - 30, will be used for passing the trucks in total weight of 500 kgs		500	

SPECIFICATION OF EQUIPMENT
FOR CENTRAL SLAUCHTERHOUSE IN CYPRUS

TABLE 13

	Description	Quantity		Comment
		Existing	New	
1.	2	3	4	5
	I. LAIRAGE			
1.	Automatic scale for living stock with round dial in kg. and oke, provided with an electric weight recorder. (One oke = 400 drams; 1 oke = 1.27 kg.). The basis of scale is constructed in a closed frame. The platform is slitter proofed. On the narrow part of the grating construction are 2 swinging doors. The dial head, weighing cabinet, the basis and the grating construction are rust proofed. Weighing capacity .. .. 1000 kg Chart graduation .. .. 1000 grms. Size of platform .. .. 2.5X1.25m. The scale is provided with locking device.		1	
2.	"Pic-up" apparatus for live stock, run by battery.		6	
3.	Wheel-barrow for trasporting manure		6	
4.	High pressure washer, mobile, petrol powered, capacity about 10 l/min., with pressure about 35kg/cm. Provided with tank for disinfectants or detergent.		1	
5.	Electric brander for pigs marking, with 3 sets of numbers, complete.		2	
	II. SLAUGHTERHOUSE			
	(a) Pigs Line			
6.	Electrical stunning device, complete with stunning tongue, connector, rubber cables, on-off switch and transformer.	1		
7.	Blood and water drain, with interchangeable cast plug and cast grating. Channel open is ø 11cm. Total dimensions are 16X50cm. Construction is to be built within the floor.		3pcs.	
8.	Bleeding chackles, with slide hooks for run on 2" piperail, with steel chain and hook.	50		
9.	Sticking hoist, for raising the Pigs to the bleeding rail. The hoist is driven by an electromotor, connected by roller-chain to a reductor. Automatic inlet.	1		

TABLE 13
(cont'd)

1.	2	3	4	5
10.	Bleeding rail, made from 3" gaspipe, inclusive two curves, bolts and nuts and bolted hangers, provided with two stops. Raillength about 18m.	13m.	5m.	
11.	Hydraulic dropper, for lowering the pigs from bleeding rail into the scolding tank, made of a heavy steel construction.	1		
12.	Returnrail for chackles, made from 1½" gaspipe. Length about 4m.	4m.		
13.	Rail for deskinning the pigs, made from 2" gaspipe, with all necessary bolts, nuts and hanger, with two switches. Total length about 17m.		17m.	
14.	Electric hoist, for lowering and lifting the pigs to and from the dressing table, with hand operated switch, capacity 250kg. lifting height 4 m.		1	
15.	Pigs dressing table, with table plate made of two parts. Each of them made of hot-dip galvanized steel plate, dimension 30X100m. fixed under angle of 30° on a trastle construction made of pipe with two wheels. Total height 70cm.		6	
16.	Scalding tank, dimension inside 6X1.6X0.8m constructed of stainless steel plate 3mm. thick. The tank is provided with 2 steam-heaters, water inlet valve, overflow and water drain, thermostat and heatcontrol and with a diping device.	1		
17.	Dehairing machine with 3 cylinders. Capacity is about 100 pigs per hour. The machine work automatically.	1		
18.	Chute for pigs skins and bristles, inside made of galvanised steel plate, on iron frame. Dimensions are 70X70X20 cm. Tube ø 30cm.		1	
19.	Pig singeing nozzle, automatic one-hand torch, with hand grip valve for flame shoats out and shoats off. For manufactured gas.		4	
20.	Gambrelling table, for cleaning the pigs. Top of the table is made of pipe hot-dip galvanized, dimension of working plate is 300X160cm. The top of table is slightly arched to both longsides and fixed on a pipe foot. All parts are hot-dip galvanized. Total height is 70 cm.		1	

TABLE 1
(cont'd.

1.	2	3	4	5
21.	Gambrels in black execution, designed for 2" diameter pipe, dimension 450X225mm. gambrels the same constuction as item 21 but with part which comes in touch with meat, made of stainless steel.	200	500	
22.	Gambreling hoist (Type "GEJERSTRUP") equipped with gearmotor.	1		
23.	Transportation system, length about 50m. inclusive all the necessary bends, hangers, bolts and nuts, swithces and supporting construction.	50m.		
24.	Dressing conveyor, length about 11m. completed with chain, drive and take-up wheels, variator, transmission and drop fingers.	1		
25.	Table for receiving the intestines is made from stainless steel with heightened ends (5cm), framework is metalised.	1		
26.	Table for inspecting the red organs, with 6 removable stainless steel perforated containers dimension 60X40X5cm on a stainless steel frame, supported on framework metalised. Total length is 2500cm high 900 cm.		1	
27.	Air operated saw for pigs carcasses spliting.		1	
28.	Economy shower 3/4" with 3m. long rubber pipe for high pressure.		9	
29.	Standard meat truck 220 litres, made of stainless steel, with 2 fixed and 1 revolving wheels.		10	
30.	Work table for washing eatable offals the top is made of stainless steel plate with heightened sides, dimension 150X80X900cm on framework metalised.		1	
31.	Truck with 8 stainless steel pans, for transporting the eatable offals.		10	
32.	Hand washing lavatory, with knife steriliser, steam heated, with disinfecting container, all of stainless steel, foot operated.		3	
33.	Chute for intestines, inside made of stainless steel, with a hot galvanized frame. Receiving box dimension 60X60X70cm. The tube passing throuth the floor is Ø 40cm. length about 350cm. supplied with self-closing cover on down opening.	1		

TABLE 13
(cont'd.)

1	2	3	4	5
34.	Chute for condemned parts. Receiving box dimension 100X60X70cm (situated in the middle of seperation wall) has two self-closed doors with hinge on the upper side. The tube ∅ 40cm length 300cm. All made of hot galvanized steel plate.		1	
	(b) Slaughtering Line for small ruminants			
35.	Bleeding chackle with slide hook for run on 2" piperail, with steel chain and hook. Total length of chackle is about 75cm.		25	
36.	Sticking hoist for diagonal elevation of animal to the bleeding rail. The hoist is constructed with a hot galvanised frame and provided with chain and drop fingers, spaced about 750mm. Capacity is 150 sheep/hour. The hoist is driven by an electromotor, connected by rollerchain to a reductor. Automatic inlet.		1	
37.	Air pressure needle with valve and handle, all made of stainless steel, for air blowing under the sheep and goats skin. The unit is provided by a rubber pipe for high air pressure, length about 4 meters Complete.		2	
38.	Skid hooks for sheep, metalized, total length 30cm adapted for moving by conveyor. Part that comes in touch with meat is made of stainless steel.		80	
39.	Gambrels for sheep, made of stainless steel (triangular) with solid bar.		80	
40.	Sheep de-horner knife arms, operated by a compressed air cylinder. De-horner is supplied with a wire rope and counter balancer, air high pressure pipe and a filter lubricator/regulator.			
41.	Bleeding rail, made of 2" gaspipe, including bolts and nuts, hangers, provided with 3 staps. Raillength is about 16 meters.		16m	
42.	Sheep dressing rail, made of 2" gaspipe with all necessary bolts, units, hangers, switches and supporting construction. Part of rail is adapted for conveyor system. Total length of the rail is about 65 meters.		65m.	
43.	Conveyor for sheep dressing 2" tubular rail line, capacity 150 sheep/hour, run by an electromotor, completed with all necessary construction, supplied with speeds variator (to 200 sheep/hour), total useful length is about 21m. with 4 curves. Complete conveyor unit.		1pc.	

TABLE 13
(cont'd.)

1	2	3	4	5
44.	Sheep brisked shear, pneumatically operated supplied with spring balancer, air high pressure pipe and combined filter lubricator/regulator. Complete unit.		1	
45.	Chute for hide and skins, made of hot galvanized steel plate. Receiving part (lying on the floor) dimension 70X70X20cm is covered by a solid lid with hinge at one side. The tube Ø 50cm is curved passing the floor, length of tube is about 300cm. The tube is supplied with a self-closing lid on the down opening. Complete unit with frame.		1	
46.	Table for receiving and inspecting the stomach and intestines, made of stainless steel. The top of the table with hightened sites (5cm) dim. 300X60cm, is supported on a tubular framework hot dip galvanized, total hight is 90cm.		1	
47.	Inspection table made of stainless steel with hightened sides and drained to the center, dim. 150X50cm is supported on a tubular framework hot dip galvanized total height is 90cm. The table is supplied with a metalized frame with stainless steel hooks.		1	
48.	Shute for stomachs and intestines, made of stainless steel. All construction is the same described in Item 15. Dimension for receiving pork is 60X60X20cm, and the tube is Ø 40 cm, length of tube is 300 cm.		1	
49.	Truck for condemned parts, made of stainless steel, capacity 220 litres, supplied by 4 wheels and cover.		3	
50.	Multi-hooks carriers for transporting sheep carcasses, made of hot dip galvanized steel. The frame dimension is 70X25cm and it is supplied with 8 hooks made of stainless steel which are placed 3 pcs. on each long side and one hook on each short side. The frame construction hang on skid hook.		150	
51.	Economy shower 3/4" with 3 metres long rubber hose for high pressure.		3	
52.	Hand washing lavatory, with knife sterilizer steam heated, all of stainless steel; foot operated.		4	
53.	Platform for transferring the carcasses from dressing rail to the transportation frame with hooks, dimensions 150X70X40cm. The platform is of non-slip flooring.			

TABLE 13
(cont'd.)

1	2	3	4	5
	(c) Cattle Slaughtering Line			
60.	Stunning pen made of concrete, dimensions 245X90cm is supplied with frame, revolving door and a guillotine-gate.		1	
61.	Bolt stunner with 5,000 stunning cartridges for cattle, complete set.		2	
62.	Cattle bleeding roller shackle, for tubular rail 2" with chain and hook, long overall 120cm.		6	
63.	Electric hoist for stunned cattle, lifting capacity 1 ton, up and down movement of hook 7 meters. The hoist is supplied with facility for putting the bleeding hook on the bleeding tubular rail, upper stop and push-button.		1	
64.	Cattle bleeding rail made of 2" gaspipe, including bolts, nuts, hangers, 3stops and supporting construction. Raillength is about 12 meters.		12m.	
65.	Bleeding hooks return rail, long about 3 meter.		3m	
66.	Horns and front legs cutter, pneumatically operating, completed with high pressure air pipe, overhead balancer, filter lubrificator/regulator.		1pc	
67.	Head washing cabinet made of stainless steel, dim. 70X70X170cm. supplied with a hook. Floor of cabinet is drained to the center.		1pc.	
68.	Head inspection truck, with 6 head supporters made of stainless steel: framework is made of hot dip galvanized pipe.		1	
69.	Truck for offals transporting, with 60 stainless steel hooks. The base frame is made of mild steel and is fitted with a steel drip tray. All framework is galvanized and supplied with 4 wheels. The hooks are provided with number plates (Dimensions 150X80X130cm approximately).		2	

TABLE 15
(cont'd.)

1	2	3	4	5
70.	Chute for horns and hoofs, made of galvanized steel plate, the same construction as Item 45. Dimension of receiving part is 60X60cm, and the tube ⌀ 35cm.		1	
71.	Beef dressing platform, with non-slip flooring and steps on galvanized framework with adjustable legs. Platform is supplied with galvanized protective rail, with stainless steel wash-hand basin with knife sterilizer, dimensions of platforms: 180X80cm height:			
	(a) 200cm		1	
	(b) 180cm		1	
	(c) 100cm		1	
72.	Cattle dressing roller for 2" rail, hook touching the meat is made of stainless steel.		120	
73.	Electric hoist for transferring beef carcasse from the bleeding to the dressing rail. Capacity one ton. The hoist is completed with a hoak for taking over the carcasse from the bleeding rail and it is supplied with push-button and upper stop. Complete unit.		1	
74.	Air operated beef dehiders completed with high pressure rubber pipe and combined filter lubricator/regulator.			
	(a) Round cutting blade		2	
	(b) Long cutting blade		2	
75.	Flat truck, for transporting hides, platform dimensions are 60X100cm, with two movable and two fixed wheels.		1	
76.	Air operated beef breastbone opener saw with overhead balancer, high pressure rubber pipe, filter lubrificator/regulator, complete unit.		1	
77.	Working platform, serving evisceration table the same type as described in Item 71(c). Dimensions of platform are 100X80cm.			

TABLE 13
(cont'd.)

1	2	3	4	5
78.	Beef panch and intestine receiving table. Top of the table is made of stainless steel with hightened sides, framework galvanized with aljustable legs. Dim. are 180X90X110cm.		1	
79.	Panch and intestines transportation channal, made of stainless steel: with hightened sides, dimension 800X80cm on galvanized framework with adjustable legs.		1	
80.	Chute for beef panch and intestines, made of stainless steel with galvanized frame. Dimensions of receiving part are 90X90X20cm. The tube is Ø 60cm. Construction is the same as described in Item 33.		1	
81.	Beef hind legs spreader, air operated, adapted to the overhead 2" pipe rail.		2	
82.	Hydraulically operated platform, for serving the cattle back bone cutting saw. The platform is completed with motor and hydraulics, with foot control valve, nonslip flooring and protection fence, mounted on substantial underframe.		1	
	Saw steriliser, steam heated, made of stainless steel.		1	
83.	Beef spliter saw, run by water-proofed electromotor. The saw is supplied with electric cable and overhead balancer. Complete unit.		1	
84.	Protection screen behind the spliter saw, made of stainless steel in a galvanized frame, dimensions 200X220cm.		1	
85.	Hand washer and saw sterilizer unit, made of stainless steel, steam heater.		1	
86.	Economy shower 4" with 4 meter high pressure rubber pipe.		5	
87.	Working platform, dimensions 100X80 high 100cm. The same construction as described in Item 71.		1	
88.	Inspection table, the same construction as in Item 17.		1	

TABLE 1
(Cont'd.)

1	2	3	4	5
89.	Truck for condemned parts the same as in Item 19.		2	
90.	Rail system made of 2" gaspipe, complete with bolts, nuts, hangers, 3 switches and supporting construction, total length about 42 meters, and 5 stops.		42	
	(d) By Products Manipulation and Other Equipment			
95.	Cattle stomach receiving and empting table, top is made of stainless steel with hightened the largest sides, dimensions 190X90 cm on galvanized framework high 90cm.		1	
96.	Grate for empting stomach contents, made of galvanized iron, dimension 75X75cm with grate opens 10X10cm. The grate is placed in a frame of angle iron fixed in a concrete box dimension 80X80X85cm.		1	
97.	Chute for stomach contents, made of galvanized steel sheet, tube is ø 18cm long 250cm.	1		
98.	Conical stomach (Tripe) washer, made of stainless steel ø 100cm. Revolve cone is placed in a galvanized steel basin ø 120cm on a galvanized pipe framework. Basin is drained to the cannal open ø 10cm.		1	
99.	Tripe-scalder, made of stainless steel capacity 250 litres, steam heated, completed with steam heater and all necessary valves.		1	
100.	Stomach cleaning machine (Type Stohrer Universal) with parts that get in touch with products, made of stainless steel, and metalized construction. Complete with valves and all accessories.		1	
101.	Working table, top is made of stainless steel with plastic cutting board on one side, framework is metalized. Dimensions of the table are 150X90X90cm.		1	

TABLE 13
(cont'd.)

1	2	3	4	5
102.	Standard meat truck, made of stainless steel, capacity 220 litres.		2	
103.	Truck with 6 stainless steel pans. The pans are numerated.		2	
104.	Jet belt knife sharpening machine, driven by electromotor water proofed.		2	
105.	Grate and steam valve foot operated, for sterlizing the pans, made of galvanized steel. Grate dimension 100X100cm placed in a concrete basin high 30cm.		1	
106.	Economy showers ½" with rubber pipe for high pressure, long 4 meter.		4	
107.	Set of meat markers: (a) indelible meat creyon (b) round aluminium tags with number 1-200 (c) tags fasteners		3 3 2	
108.	Blood pneumatic transportation system, made of steel, consist of: cylindric pressure vessel capacity about 200 litres, with receiving valve pneumatically operated air pressure valve and transfer pipe long about 60 meter. The unit is hand operated. Complete unit.		1	
109.	Compressed air system to drive all pneumatical equipment in the slaughterhouse, consist of: 2 air compressors, one air tank and all pipes, valves and necessary armatures. Complete set.		1	
110.	Gas station with gas tanks and all necessary piping valves and armatures for supplying the singeing nozzles on pigs gambreling table. Complete set.		1	
111.	Stomach content transportation truck, capacity 500 litres tank, with receiving inlet and discharge open, made of steel sheet, on iron framework with 4 wheels with bearings.		2	

TABLE 13
(cont'd.)

1	2	3	4	5
112.	Offal bin, for transportation various offal to the By-products plant, made of mild steel plate reinforced around the top and fitted with trunions and handles. Adapted for moving with two wheels carrier.		40	
113.	The carriers for transporting the offal bin is formed of mild steel tubes electrically welded, and is fitted with roller bearing, pneumatic tyred wheels ø 50 cm. The whole is galvanized except running gear.		10	
114.	Hose station for keeping the hose with spray nozzle for cleaning the surface in slaughterhouse rooms. Consist of: stainless hose rack, hot and cold water mixing valve, control valve and check valve. Hose with spray nozzle is long about 10 meters.		20	
115.	Boiler station for hot water, steam heated to 85 °C, capacity 500 lit/hour, with all necessary valves and piping and water softner. Complete.		1	
116.	Water pressure machine, for high pressure about 30kg/ cm^2. Completed with all necessary piping and accessories, complete set.			
	(a) for cold water, capacity 50 litres/minute		1	
	(b) for hot water, capacity 50 litres/minute		1	
	(c) <u>Cooling Department</u>			
120.	Transport and loading rail system, complete with all necessary bolt, nuts, hangers and 80 switches and supporting construction, total length about 825 meter.		825m	
121.	Double-wing door, made of transparent plastic within a metalized frame, with divice for automatically closing and opening in both directions; with upper frame for rail passage. Dimensions are:			
	(a) 120X323cm		1pc.	
	(b) 120X233cm		8pcs	
	(c) 150X323/233		1pc.	

TABLE 13
(cont'd)

1	2	3	4	5
122.	Cold store doors:			
	1. Cold store synthetic swing door, clear dimensions 100X323cm, with upper frame for rail passage, temperature 20/0°C		1pc.	
	2. Cold store synthetic swing door, clear dimensions 100X233, with upper frame for rail passage, temperature 20/0°C.		8pcs.	
	3. Cold store synthetic swing door, clear dimensions 120X220, temperature 20/0 °C.		4pcs.	
	4. Cold store synthetic swing door, clear dimensions 120X133cm, with upper frame for rail passage, temperature 20/38°C.		5pcs.	
123.	Overhead weighing scale (Berkel type) with: dial head and cabinet, weighing capacity 200 kgs X 200 gr. with electric weight recorder. Distance between centre weighrail to the centre dial head is about 140cm.	1		
124.	Overhead weighing scale, capacity 300 kg. X 200gr. with round dial scale in kg. and oke, with all necessary construction, supplied with electric weighing recorder.		1	
125.	Platform dial scale, capacity 300 kg. dimensions of platform are 100X90cm, to be in the same flooring level. Dial for simple weight reading.		1	
126.	Meat cutting table, top dimensions are 190X120cm, made of stainless steel, with plastic boards on both long sides (30cm) framework metalized, height 90 cm.		8	
127.	Standard meat transportation truck capacity 220 lit. made of stainless steel.		8	
128.	Meat truck with 8 stainless steel pans.		8	
130.	Complete cooling equipment provided for the following performances:-			

TABLE 13
(cont'd.)

1	2	3	4	5
	(1) Meat detention room dimensions 2.5X6m., high 4m. air temperature - 10°C, capacity 2000kg., chilled from 38°C to - 5°C.			
	(2) Edible offal chilling room, dimensions 5.5X5.5m. high 4m. air temperature ± 0°C, capacity 4 tons.			
	(3) Beef chilling room, dimensions 11.7X5.7m., high 4m. capacity 15 tons, being chilled from 38°C to +4°C during 24 hours.			
	(4) Pork or sheep 2 chilling room, dimensions 11.7X11.7m high 3.8m Capacity 20tons, being chilled from 37°C to 4°C during 24 hours.			
	(5) Pork or sheep 4 chilling rooms, dimensions 5.7X11.7m., high 3.8m., capacity 10 tons, being chilled from 37°C to 4°C during 24 hours.			
	(6) Meat deboning room, dimensions 11.7X11.7m., high 3.8m. Passage of meat 1 ton/hour with temperature 7°C in presence of 25 workers. Temperature in the room should be 12°C.			
	(f) Transportation Facilities			
131	**Refrigeration truck, capacity 3 tons for meat transporting to the local markets:**			
	(a) for butchers in Nicosia		4	
	(b) for butchers in Larnaca		5	
	(c) for butchers in Limassol		9	
	Total new trucks:		18	
	Remark: See the analysis of needed truck in Table No. 14			

ESTIMATION OF NEEDED MEAT REFRIGERATION TRUCKS.

TABLE: 14.

	PIGS		SHEEP & GOATS		CATTLE		NEEDS FOR NEW TRUCKS.
	AVER.	MAX.	AVER.	MAX.	AVER.	MAX.	
1.	2.	3.	4.	5.	6.	7.	8.
NICOSIA							
1. SLAUGHTERED ANIMAL/DAY	170	250	221	520	9	20	
2. AVER. CARCASS WEIGHT KGS.	72.8	72.8	14	14	264	264	
3. TOTAL WEIGHT TONS	12.3	18.2	3	7.2	2.3	5.3	
4. NEEDED TRUCKS-3 TONS CAPACITY	4	6	1	2	1	2	
5. EXISTING TRUCKS			6				
6. NEEDED NEW TRUCK			1	2	1	2	4
LARNACA							
1. SLAUGHTERED ANIMAL/DAY	150	200	90	130	5	10	
2. AVER. WEIGHT OF CARCASS	72.8	72.8	14	14	264	264	
3. TOTAL WEIGHT TONS	10.9	14.5	1.2	1.8	1.3	2.6	
4. NEEDED TRUCK	4	5	0.5	1	0.5	1	
5. EXISTING TRUCK			2				
6. NEEDED NEW TRUCKS	2	3	1	1		1	5
LIMASSOL							
1. SLAUGHTERED ANIMAL/DAY	100	215	215	600	5	30	
2. AVER. CARCASS WEIGHT KGS.	72.8	72.8	14	14	264	264	
3. TOTAL WEIGHT TONS	7.2	15.6	2	8.4	1.3	8	
4. NEEDED TRUCKS	2.5	5	1	3	0.5	3	
5. EXISTING TRUCKS			2				
6. NEEDED NEW TRUCKS		3	1	3		3	9

COMMENTS: THE FOLLOWING CRITERIA WAS TAKEN INTO ACCOUNT:

1. THE THREE TONS CAPACITY REFRIGERATION TRUCK IS THE MOST CONVENIENT TYPE FOR PASSING THROUGH THE EXISTING STREETS IN THE TOWNS OF NICOSIA, LARNACA, AND LIMASSOL.
2. THE NECESSARY TIME FOR ONE CHARGE, INCLUDING: A. LOADING THE MEAT; B. TRANSPORT TIME, ROUND TRIP, C. DISTRIBUTION OF MEAT TO THE BUTCHERS SHOP; ARE ESTIMATED FOR: NICOSIA 4 HOURS
   LARNACA 3 "
   LIMASSOL 4.5 HOURS.
3. THE NUMBER OF NEW TRUCKS IS ESTIMATLD ON THE BASIS OF MAXIMUM DAILY SLAUGHTERING.

NECESSITIES OF WATER AND STEAM
(APPROXIMATELY)

TABLE: 15.

	CONSUMERS	KIND OF UNIT.	CONSUMPTION LITRES/H	CONSUMPTION PER DAY M^3
	I. WATER CONSUMERS			
1.	LAIRAGE:			
	-FOR CATTLE 60 HEAD	50 lit/head		3
	-FOR SHEEP & GOATS 1,250 "	15 "		18.7
	-FOR PIGS 665 "	25 "		16.6
	TOTAL:			38.3
2.	SLAUGHTLRHOUSE:			
	-FOR CATTLE 60 HEAD	200	1,715	12
	-FOR SHEEP & GOATS 1,250 "	20	3,125	25
	-FOR PIGS 665 "	100	9,500	66.5
	TOTAL:		14,340	103.5
3.	COOL BLOCK		1,500	30
4.	SANITARY NECESSITIES FOR 60 PERSONS.	50 lit/person		3
	GRAND TOTAL:		30,180	174.8
	II. STEAM CONSUMERS			
1.	FOR HEATING SCALDING TANK 6m^3 WATER/H FROM + 15°C TO + 75°C. (ITEM NO. 16)			
2.	TRIPE SCALDER 250 lit. WATLR, FROM 15°C TO 75°C (ITEM NO. 99)			
3.	GRATE FOR STERILIZING THE PENS STEAM REDUCING VALVE TO 0.5 ATM			
4.	BOILER STATION 500 LIT. WATER/H FROM + 15°C TO + 85°C.			

REMARKS: The exact hour consumption will be estimated after receiving the technical data from the supplier of equipment.

SPECIFICATION OF ELECTRICITY CONSUMERS.
APPROXIMATELY

TABLE: 16.

ITEM IN EQUIP. SPECIF.	DESCRIPTION	INSTALLED KW.	EFFECTIVE WORKING HOURS	MAXIMUM DEMAND. %	MAXIMUM DEMAND. KW.	DAILY CONSUMPTION KW.
	I. L A I R A G E.					
4.	High pressure washer	3.0				
9.	Sticking hoist	2.8				
14.	Electric Hoist	2.8				
17.	Dehairing machine	4.5				
	Gambreling hoist	2.8				
2[illegible].	Dressing Conveyer	1.3				
36.	Sticking hoist	2.8				
[illegible]3.	Conveyer for sheep dressing	1.5				
63.	Electric hoist for cattle	2.8				
73.	Electric hoist for transfering	2.8				
83.	Beef spliter saw.	2.3				
100.	Stomach cleaning machine	3.0				
104.	Knife sharpening machine	0.3				
[illegible]09.	Air compressor	8.0				
116.	Water pressure machine	6.0				
	Lighting installation	12.0				
	T O T A L:	40.7	4	60	24.42	97.68
130	Complete cooling equipment	80	20	60	48	960
	G R A N D T O T A L:	111.6				1,057.68

R E M A R K S: All calculations are based on maximum daily slaughtering capacity.

The exact calculation can only be made after receiving technical information from the supplier of equipment.

SPECIFICATION OF AIR PRESSURE CONSUMER AND HYDRAULICS

TABLE 17

Item in Spec. Equ.	D E S C R I P T I O N	Consumption per shift	Consumption per hour
11.	Hydraulic droper		
27.	Air operated saw for pigs		
37.	Air pressure needle		
40.	Air-operated sheep dehorner		
44.	Air operated sheep brisket shear		
66.	Pneumatically-operated horns and legs cutter		
74.	Air-operated beef dehiders (4 pcs)		
76.	Air-operated beef breast bone saw		
81.	Air operated beef hind legs spreader (2 pcs)		
82.	Hydraulic operated platform		
108.	Blood pneumatic transportation system		

REMARK: The estimation of air-pressure necessities will be made after receiving the technical data from the equipment supplier

NECESSARY LABOURERS AT CENTRAL SLAUGHTERHOUSE
(ESTIMATION IS MADE ON MAXIMUM DAILY SLAUGHTERING)

TABLE: 16

ITEM	OPERATIONS	QUALIFICATION				ON DUTY IN II&III SHIFTS	TOTAL
		WOR...	...ENT	QU.	TOTAL		
1.	2.	3.	4.	5.	6.	7.	8.
	I. [illegible]						
1.	MANIPULATION WITH ANIMAL WITHIN THE PENS	4			4	2	6
2.	MARKING & WEIGHING		1		1	1	2
3.	TO PUSH ON THE ANIMAL TO SLAUGHTERING	2			2		2
	TOTAL I:	6	1		7		10
	II. CATTLE SLAUGHTERING						
1.	STUNNING, BLEEDING, HANGING	1		1	2		2
2.	HORN CUTTING HEAD PREPARING			1	1		1
3.	FORE LEGS RIPPING & FLAYING			1	1		1
4.	HIND LEGS RIPPING, FLAYING AND TRANSFERING TO THE LOWER RAIL		1	1	2		2
5.	RIPPING FLAYING THE BELLY & BREAST			1	1		1
6.	RIPPING, FLAYING THE SHOULDERS			1	1		1
7.	FLAYING THE BACK AND NECK			1	1		1
8.	BREST BONE CUTTING & EVISCERATING			1	1		1
9.	CLEANING & PREPARING THE EATABLE OFFALS		1		1		1
10.	CUTTING THE CARCASS IN HALVES		1		1		1
11.	INTERNAL TRANSPORTATION	3			3		3
	TOTAL II:	4	3	8	15		15
	III SHEEP & GOATS SLAUGHTERING						
1.	STUNNING, HANGING & BLEEDING	1		1	2		2
2.	AIR INFLATE UNDER THE SKIN		1		1		1
3.	RIPPING & CUTTING LEFT HIND LEG		2		2		2
4.	" " " RIGHT LEG HANGING ON GAMBREL & TRANSFERING ON LOWER RAIL	1	2		3		3
5.	RIPPING, FLAYING & CUTTING THE FORE LEGS	1	2		3		3
6.	FLAYING THE HIND LEGS & TAIL		2		2		2
7.	HORN CUTTING		1		1		1
8.	FLAYING THE BELLY			2	2		2
9.	FLAYING THE SHOULDERS			2	2		2
10.	FLAYING THE FORE LEGS & NECK			2	2		2
11.	FLAYING THE HEAD & MARKING			3	3		3
12.	OPENING THE BELLY			1	1		1
13.	SMALL INTESTINES SEPARATING		2		2		2
14.	EVISCERATING ABDOMINAL CAVITY			1	1		1

NECESSARY LABOURERS AT CENTRAL SLAUGHTERHOUSE
(ESTIMATION IS MADE ON MAXIMUM DAILY SLAUGHTERING)

TABLE 18
(cont'd.)

ITEM	OPERATIONS	QUALIFICATION				ON DUTY IN II&III SHIFTS	TOTAL
		NOM 2m	SEMY 2m	QU.	TOTAL		
1.	2.	3.	4.	5.	6.	7.	8.
15.	SEPARATING THE THORACIC CAVITY			1	1		1
16.	EATABLE OFFALS PREPARING	1		1	2		2
17.	INTERNAL TRANSPORT & CLEANERS	2			2		2
18.	TRANSFERING CARCASSES TO CARCASSES HOLDER.	1			1		1
	TOTAL III.	7	12	14			34
	IV PIGS SLAUGHTERING (a)						
1.	STUNNING, HANGING & BLEEDING	2	1	1	4		4
2.	SCALDING		2		2		2
3.	DEHAIRING MACHINE OPERATOR		1		1		1
4.	SINGEING HOZZLE OPERATORS		2		2		2
5.	GAMBRELING TABLE CLEANING			4	4		4
6.	GAMBRELING HOIST OPERATOR			1	1		1
7.	CLEANING CARCASSES BY SHOWER		2		2		2
8.	OPENING THE BELLY & BREAST BONE			1	1		1
9.	EVISCERATING ABDOMINAL CAVITY			1	1		1
10.	" THORACIC "			1	1		1
11.	EATABLE OFFALS CLEANING & PREPARING		1	1	2		2
12.	CARCASSES CUTTING IN HALF			1	1		1
13.	CARCASSES WASHING BY SHOWER		1		1		1
14.	INTERNAL TRANSPORT, CLEANING	3			3		3
	TOTAL IV	5	10	11	26		26
	IN CASE OF PIGS DEHIDING (b)						
	HOIST OPERATOR		1				
	RIPPING THE BELLY & LEGS (1,4)		4				
	FLAYING THE PIGS (5,6)			5			
	GAMBRELING & CARCASS WASHING		2				

COMMENT: PIGS DEHIDING OPERATIONS WILL BE DONE BY THE SAME WORKERS MENTIONED IN ITEM 2 - 7.

NECESSARY LABOURERS AT CENTRAL SLAUGHTERHOUSE

(ESTIMATION IS MADE ON MAXIMUM DAILY SLAUGHTERING)

TABLE: 18

(cont'd.)

ITEM	OPERATIONS	QUALIFICATION				ON DUTY IN II&III SHIFTS	TOTAL
		NOM 2m	SEMY 2m	QU.	TOTAL		
1.	2.	3.	4.	5.	6.	7.	8.
	V. BY-PRODUCTS RECEIVING DEPT.						
1.	BLOOD & AIR PRESSURE SYSTEM OPERATOR			1	1		1
	HIDE & SKINS GRADING INSPECTION	1		1	2		2
3.	CONDEMNED PART COLLECTING		1		1		1
4.	STOMACH & [illegible] COLLECTING	1	1		2		2
5.	TRIPE EMPTYING & CLEANING		2	1	3		3
	TOTAL V.	2	4	3	9		9
	VI. MANIPULATION WITHIN COOLED STORE						
1.	FOREMAN ORGANIZING MEAT TRANSPORT			1	1		1
2.	MEAT LOADING CLEANING THE STORE	6			6		6
3.	SCALEMAN			1	1		1
4.	DRIVERS			20	20		20
5.	COMPRESSOR - MECHANIC (24^h)			1	1	2	3
6.	ELECTRIC - MECHANIC (24^h)			1	1	2	3
7.	MECHANIC - WORKER		1	2	3		3
	TOTAL VI	6	1	26	33	4	37
	VII. ADMINISTRATION	a.	b.	c.			
1.	MANAGER			1			
2.	TECHNICAL MANAGER			1			
3.	FEES COLLECTOR, ACCOUNTANT			4			
4.	TELEPHONE OPERATOR, MESSENGER	1	1				
5.	DOOR KEEPER	6					
	TOTAL VII.	7	1	6	14		14
	GRAND TOTAL:						136

REMARKS: 1. MEAT INSPECTION WILL BE ORGANISED BY MIN. OF AGRICULTURE, VETERINARY INSPECTION.

2. WATER AND ELECTRIC INSTALATION, WORK SHOPS AND OTHER WORK CONNECTED WITH MAINTENANCE WILL BE ORGANISED IN BY-PRODUCTS PLANT.

NECESSARY LABOURERS AT CENTRAL SLAUGHTERHOUSE
(ESTIMATION IS MADE ON MAXIMUM DAILY SLAUGHTERING)

TABLE: 18
(cont'd.)

COMMENTS: NUMBER OF WORKERS FOR SLAUGHTERING LINES ARE CALCULATED AS FOLLOWS:

1. FOR CATTLE LINE, FOR AN INTERVAL OF 6 MINUTES FOR EACH OPERATION.
2. FOR SHEEP AND GOATS, FOR AN INTERVAL OF 30 SECONDS FOR EACH OPERATION REQUIRED FROM ENTERING THE CARCASSES TO THE DRESSING LINE.
3. FOR PIGS, FOR AN INTERVAL OF 36 SECONDS FOR EACH OPERATION REQUIRED FROM ENTERING THE CARCASSES TO THE DRESSING LINE.

II. MUNICIPAL SLAUGHTERHOUSE IN PAPHOS

1. **INTRODUCTION**

1.1. The Municipality of Paphos has a layout plan for the slaughterhouse which is now adapted to the estimated capacity and produotion programme.

1.2. The previously chosen site is fully acceptable. The site is situated about 5 km from the town on the left site of the road going from Paphos to Limassol. The main asphalted road, the main water pipe line and the electric line for the town, are all adjacent to the Slaughterhouse Compound. The site covers an area of about two hectares with a gentle slope to the dry river bed.

2. **EXISTING STATE**

The way of animal transporting, and receiving, organisation of work within the lairage area, time of slaughtering, way of flaying, manipulation of eatable offals and slaughterhouse fees, are all the same as in Chapter I (1) for the Central Slaughterhouse.

2.1. Within the pig slaughtering area, there are no scalding tanks, so that the pigs are scalded laying on the concrete floor and are poured with hot water heated in a kettle.

2.2. The by-products are collected and burried in many very deep pits within the Slaughterhouse yard. The depth of these pits is about 10 metres.

2.3. The existing slaughterhouse building is made partially of brick, wood and congated iron steel. The floor is made of concrete with deep channeling. There are three separate departments for slaughtering pigs, small ruminants and cattle, all with individual working place.

All these accommodations have a very low roof, are without ventilation and have inadequate lighting.

The capacity of all these departments is not sufficient for the existing slaughtering capacity.

The pens within the lairage area are small, fenced with walls, roofed and without sufficient ventilation.

2.4. The numerical data are as follows:

- There are 7 butchers who are slaughtering and selling only pork, and 11 butchers who are slaughtering and selling other kinds of animals.
- The butchers are mainly themselves working in the slaughterhouse and they engage about 5 licenced workers.
- The lairage area is about 200 m^2 with pens of different dimensions.
- There are two vans for meat transportation and drivers are engaged by the Municipality.
- Three Meat inspectors are on duty in the town and at the same time they are working in the Slaughterhouse.

  One of them is in charge as Slaughterhouse Manager.

3. CAPACITY AND PRODUCTION PROGRAMME

3.1. The capacity of the new Slaughterhouse is estimated by the Municipality of Paphos, based on the analysis of the Projected Rate of Growth in 1985, as follows:

PROJECTED QUANTITY OF LIVESTOCK SLAUGHTERHOUSE — TABLE: 19

A.	TOWN		DISTRICT	
	Per Year	Per Day	Per Year	Per Day
	PHASE I		PHASE II	
Cattle	636	2.5	776	3.1
Sheep & Goats	25,602	102.4	45,674	182.7
Pigs	12,596	50.3	15.058	60.2
	+ 50%	+ 50%	+ 50%	+ 50%
Cattle	954	3.8	1.164	4.6
Sheep & Goats	38,403	153.6	68,511	274.0
Pigs	18,894	75.5	22.587	90.3

Based on the above, the following daily slaughtering was estimated: PHASE I

B.	Average	Per hour (6 hours)	Interval/ minutes
Cattle	4	0.6	90
Sheep and Goats	150	25.0	2.4
Pigs	75	12.5	4.8

COMMENTS: The operations interval (Table I, part B) has been estimated on 6 working hours, by engaging a team of three workers for each slaughtering line. Such organisation of work is not economical, because it requires a higher number of workers working at the same time. Also the consumption of water, steam and electricity is higher than necessary (top consumption) and internal transportation connected with evidence of ownership of each butcher's carcasses is more complicated.

Therefore, on the Consultant's suggestion the operation intervals are diminished by 50% so that one team of about 18 workers is able to finish all the mentioned daily slaughtering within 7 working hours (see Table 2). The results are as follows:

- For slaughtering 4 - 5 cattle within 1 hour, it takes an operation interval of 12 minutes.
- For slaughtering 150 sheep and goats within 3 hours, it takes an operation interval of 1.2 minutes or 72 seconds.
- For slaughtering 80 pigs within 3 hours, it takes an operation interval of 3.2 minutes or 140 seconds.

The reasons for accepting such a solution are:

- The New Slaughterhouse must follow all the hygiene requirements prescribed in the "New Meat Hygiene Law" (N.H.L)
- In the New Slaughterhouse, hard physical work should be avoided and the operations facilitated by using the mechanised equipment at a reasonable degree.
- The slaughtering operations have to be carried out according to a line system and not on the basis of individual working places.
- To fulfill these basic technological concepts and in connection with estimated capacities of the slaughtering lines, certain equipment and space are accepted.

Therefore, if the technical level of this accommodation allows such an economical organisation of work, why not accept it!

Such a solution will provide great flexibility for future expansion of capacities (PHASE II).

3.2. Capacity of the Cooling Block

The new Meat Hygiene Law requires meat chilling of all kinds of slaughtered animals.

Therefore, the chilling capacity is estimated at full capacity of daily slaughtering, plus one third of the total daily capacity as reserve for meat manipulation. The reason for this reserve is in fact so that slaughtering could start before emptying all chilling rooms. In such a case, an empty chilling room should be available for receiving the hot meat.

The results of daily slaughtering, based on carcass yield exposed in Tables 24, 25 and 26 for the Central Slaughterhouse are as follows:

CAPACITY OF THE MEAT [illegible] TABLE: 26

	TO CHILLING ROOM				TO BY-PRODUCTS PLANT				
	Slaught per day	Carcass Weight kg/pc	Total kg	Edible offal kg	Blood	Soft part	Bones	Talow	TOTAL
Pigs	80	72.8	5.824	186	196	472.8	-		668.8
Sheep & Goats	150	14.51	2.176	-	123	694.5	60		877.5
Cattle	5	264.64	1.323	137	78.3	116.5	44.1	63.8	303
TOTAL			9.323	323	397.5	1,283.8	104.1	63.8	1849.3

The total daily meat production is 9,323 kgs, say 10 tons. The chilling capacity is 15 tons, in three rooms.

The total quantity of by-products which could be processed in the by-products plant are 1,849 kgs i.e. 1.5 tons (taking into account about 50% loss by blood coagulation. The chilling store capacity for by-products is estimated at 3 tons, in order to enable transportation of the by-products every second day, which will cut down the transportation costs.

3.3. Production Programme

The slaughterhouse will not have its own production, as it will operate as an institution providing service. It will be equipped in such a way as to enable the slaughtering process, and the meat and by-products manipulation to be carried out in a proper way, and under hygienic conditions.

The final products which could be made, are:

3.3.1. - Chilled carcasses in total (muton) cut in halves (pork), or in quarters (beef).

3.3.2. - Chilled eatable offals.

3.3.3. - Hides and skins, collected and given to the owners after grading.

3.3.4. - All organic materials (by-products) which could be processed in the by-products plant, such as blood (after coagulation and chilling), hoofs and horns, stomach and intestines (which are not cleaned and prepared for human consumption), condemned parts, bones and fat. These materials will be collected and after separation will be transported to the by-products plant.

3.3.4. - The stomach contents and manure from the lairage area, collected in a concrete hole for using as fertiliser.

4. GENERAL DESCRIPTION OF THE SLAUGHTERHOUSE

The slaughterhouse compound is divided into "clean" and "dirty" parts, but with the same entrance.

The "clean" part is used for the entrance of workers and the transportation of meat, while the "dirty" part for admittance of animals, trucks and lorries washing and cleaning and for treatment of waste water and garbage.

The following buildings are included in the slaughterhouse compound:

1. Fence and door-keeper lodge.
2. Offices, workers dressing department and canteen.
3. Main slaughterhouse building.
4. Steam boiler station.
5. Lairage area with unloading ramp, scale for live animals and facilities for ante mortem inspection.
6. Garage and lorry washing area.
7. Waste-water treatment area.

4.1. Fence and door-keeper lodge

This will be constructed partly of wall and partly of wire mesh, with the aim of keeping the animals within the compound and protecting the compound from undesired visitors.

The door keeper will control the entrance of animals and will also record evidence of meat transportation.

4.2. Office building

This consists of offices for the Manager and the Accountant, wardrobes and lavatories for the workers and a canteen. This building will be connected with the main slaughterhouse building by means of a passage.

4.3. Slaughterhouse Main Building

The main building will consist of all necessary operation departments such as: cattle and small ruminants killing and dressing area, a separate area for pigs killing and dressing, carcasses chilling rooms, meat preparing and loading department and by-products receiving and storing departments, a total of 1,037 m^2.

The by-products departments are found in the basement floor, and all other departments are on the ground floor. This position arrangement of the departments will enable an easier and more speedy internal transportation.

In the basement floor, there is a separate room for emergency slaughtering (See Table 21).

4.4. Water and Steam Boiler Station

This is a separate small building in which a boiler will produce steam for heating the pigs scalding tank, sterilisers, and the hot water calorifer supplies hot water to the stomach and intestines cleaning machines, the showers and the high pressure washer for the slaughtering and the other areas.
Near the building is a water tank of a capacity of about 20 m^3 which will synchronise the necessary quantity of water during top consumption hours. The water supply will be provided from the main water pipe-line for the Paphos town, which is passing near the compound.

4.5. Lairage Area

This serves for keeping the animals before killing and it is connected with the slaughterhouse by means of a corridor. The lairage is divided into many pens of 8 and 16 m^2 capacity. The fence of pens is made of metallic grate to enable sufficient air circulation and ventilation for accumulated animals. The floor is made of concrete with a slope to the open channels placed on both sides of the passages. The lairage is ruffed.
There is an unloading ramp, a scale for live animals, a separate pen for ante mortem inspection and marking of the animals and an isolation room for suspect animals. The total lairage area is about 670 m^2.

4.6. Garage and Washing Area

This serves for maintenance and lubrification of the trucks and meat vans. There is a sloped concrete platform for washing and disinfection of the meat vans by means of a movable high pressure water machine.

4.7. Waste-water treatment - Sewage System

All waste water from the slaughterhouse passes through a cleaning system before entering in lagune or in the dry river bed. Provision for effluent treatment will be a future development which will be provided by a specialist.

4.8. All roads and platforms within the slaughterhouse compound are paved or asphalted to avoid the dust.

5. GENERAL DESCRIPTION OF SLAUGHTERHOUSE OPERATIONS

These operations are almost the same as for the Central Slaughterhouse as explained in chapter I (6). The differences are:

- The sheep and goats slaughtering line does not have a conveyor. Instead of a conveyor, the length of the rail is adapted for more working space within five parallel lines.
- The cutting of the beef carcass in halves is done by using seven dawn steps, instead of the pneumatic platform, because of the small capacity of this line.

SPECIFICATION OF THE ROOMS AND DEPARTMENTS.

TABLE: 21

ITEM	DESCRIPTION	DIMENSION	m^2	h	FLOOR	STANDARD WALL	ROOF CEILING
1.	2.	3.	4.		5.	6.	7.
1.	I. LAIRAGE AREA: TOTAL		669				
	-Small pens 2x4m=pcs.						
	-Big " 4x4m= "						
	-Passage width 1,5m cca 19c lm						
	-Unloading ramp		45				
	Scale office & Inspector	8x4	32				
	II. SLAUGHTERHOUSE-GROUND FLOOR.						
3.	Weighing room for pigs	4,2x5,2	21,8		7		
	Scalding area	8,7x5,2	42,2		7		
5.	Dressing area		63,2		7		
6.	Meat Inspectors room	4x3	12		4		
7.	Detention room	5,3x2,6	13,7		4		
8.	Weighing room for sheep	5x3	15		7		
9.	Weighing & Bleeding room for beef		25		7		
10.	Dressing room for sheep & cattle		113		7		
11.	Sterilisation room	3,5x2,5	8,7		7		
	W.C.	3x2,5	7,5		4		
13.	Passage	3,6x17,2	62		7		
14.	Compressor room	5x6,2	31		7		
15.	Passage	10x4	40		4		
16.	Chill room for pigs	9x5	45		3,8		
17.	Chill room for beef	9x5	45		4		
	" " " sheep	9x5	45		3,8		
19.	" " " "	9x5	45		3,8		
20	" " " offals	4,5x3,6	16,2		3,8		
1.	Weighing scale room	2x2	4		3,8		
22.	Meat preparing room	13x6	78		3,8		
23.	Passage	2,1x6	12,6		3,8		
24.	Office	3x6	18		3,8		
25	Office	3x6	18		3,8		
26.	Loading ramp	22x2	44		4		
	TOTAL GROUND FLOOR		825,9				
	BASEMENT FLOOR						
27.	Emergency room	3,5x3	10,5		3,2		
28.	Blood collecting room	4,5x3	13,5		"		

SPECIFICATION OF THE ROOMS AND DEPARTMENTS

TABLE: 21
(cont'd.)

ITEM	DESCRIPTION	DIMENSION	m^2	h	FLOOR	STANDARD WALL	ROOF CEILING
1.	2.	3.	4.		5.	6.	7.
	BASEMENT FLOOR						
29.	Air compressor room	4x3	12	3,2			
30.	Gas installation room	3x3	9	"			
31.	Hide, skins, hoof & horn collecting room	9x3	18	"			
32.	Condemned meat receiving	3,6x6	21,6				
33.	Cooled store for eatable offals	3,6	21,6	"			
34.	Stomach & Intestines receiving & Preparing room		70,4	"			
35.	Cooled store for salted casing	3,3x3,5	11,5	"			
36.	Stomach content receiving	3,2x2	6,4	"			
37.	W.C.	2,5x3	7,5				
	TOTAL BASEMENT FLOOR		211				
	G R A N D T O T A L:		1.036,9				

COMMENT:

1. The standards of internal finishing of the various rooms and departments are the same as for the Central Slaughterhouse as described in Table 11 of Section I.

2. The estimation of imposed loading of floors and walls is described in Table 12 of Section I (For Central Slaughterhouse)

SLAUGHTERHOUSE IN PAPHOS.

SPECIFICATION OF EQUIPMENT.

TABLE: 2

ITEM	DESCRIPTION	QUANTITY pc./l.m.
	I. L A I R A G E	
1.	Total length of fences for pens boxes ramp and passages	466 l.m.
	(The fence is made of angle or hollow beams, hight 1,2 m).	62 pcs.
3.	Scale for live animal, capacity 1 ton, with swingdoor on each narrow sides of the scale platform.	1
4.	Electric heated marker with 3 sets of numbers.	1
5.	Water high pressure machine for cleaning the lairage area (movable type)	1
	II. SLAUGHTERING DEPARTMENT - PIGS SLAUGHTERING LINE.	
11.	Electric stunning device, tongue type complete with transformator, pan, and overhead balancer.	1
12.	Bleeding chackles with chain for 2" tubular rail system	101.m.
13.	Stunning hoist, diagonal type, with electric motor, construction and chain with dropfingers	1 pc.
14.	Bleeding rail 2 pipe, with dawn curved droper length abaut	11 l.m.
15.	Pig receiving board fixed on the scalding tank, dimensions 140 x 60 cms, made of steel plate.	1 pc.
16.	Scalding tank made of steel plate, with steam inlet valve, overflow output, dimensions 200 x 160 x 80 cms.	1
17.	Dehairing machine, capacity 60 pcs/hour	1
18.	Gambreling table, made of galvanised 2" pipe on the framework made of angle iron, dimensions 250 x 160 x 70 cms.	1
19.	Singeing nozzle with hand grip forflame shoot, for manufactured gas, completed with gas tanks.	2
20.	Gambreling hoist for lifting the pigs from the table on the dressing rail, run by electric motor capacity 250 kgs. with stop on the highest point.	1
21.	Gambrels for pigs, width 45 cms. Skid hook made of mild steel and gambrel made of stainless steel.	120 pcs.
22.	Transport rail system (height 240 cms.) completed with bolts, nuts, hungers and all necessary conswitches.	401.m. 10pcs.
23.	Inspection table, top is made of stainless steel, on galvanized frame-work. Over the table is a frame supporting the hooks of stainless steel.	1 pc.
24.	Eatable offals washing table, the same construction as item 16. but, without frame & hooks.	1 pc.
25.	Shoute for stomach & intestines, inside made of stainless steel on iron frame. Dimensions 70 x 70 cms. tube ∅ 35 cms.	1
26.	Shoute for condemned parts, made of galvanized iron sheet, dimension of the receivings box 120 x 60 x 70 cms. Box is placed in the middle of the wall and is supplied with two self-closing hanging doors, tube ∅ 40 cms.	1

SPECIFICATION OF EQUIPMENT

TABLE: 22
(cont'd.)

ITEM	DESCRIPTION	QUANTITY pc./l.m.
27.	Standard meat truck, made of stainless steel, capacity: 220 lit.	4
28.	Truck with 8 pans made of stainless steel, for transporting the eatable offals.	4
29.	Air operated saw for splitting the pig carcass in halfs.	1
	III. SHEEP & GOATS SLAUGHTERING LINE.	
30.	Electric stunning device for sheep, complete	1 pc.
31.	Bleeding chackles with chain, for sheep, addapted to the rail ∅ 2" .	20 pcs.
32.	Stunning hoist capacity 60 sheep/hour run by electromotor, complete.	1 pc.
33.	Bleeding rail made of tubular pipe ∅ 2" with bolts, nuts, hangers and all necessary construction, length abaut.	14 l.m.
34.	"S2 hooks made of ½" round steel, length 30 cms. for rail 2".	20 pcs.
35.	Gambrels for sheep, for transport on the 2" rail.	60 pcs.
36.	Transport rail system the same as item 33	
	Length abaut Switches	50 l.m. 10 pcs.
37.	Shoute for skins and hides, made of galvanized iron, on frame fixed on the floor. Dimensions 80 x 80 x 20 cms. the tube is ∅ 55 cms. with self closing cover on the down open.	1 pc.
38.	Stomach & Intestines inspection table, top is made of stainless steel with hightened sides, dimensions: 150 x 60 cms. on the frame work made of pipe with adjustable legs.	1 pc.
39.	Table for washing the eatable offals, the same construction as item 16.	1
40.	Shoute for stomach and intestines, the same construction as item 18, tube ∅ 40 cms.	1
41.	Truck with 8 stainless steel pans.	2
42.	Standard meat truck, made of stainless steel, capacity 220 lit.	2
43.	Frame with 8 stainless steel hooks for transporting the carcasses of small ruminats in chilling rooms. Frame is made of maild steel Dimensions 60 x 20 cms. total hight with skid hook is about 45cm.	40 pcs.
44.	Meat transfering platform, top is made of non slip flooring on tubular frame work with adjustable legs.	1 pc.
	IV. CATTLE SLAUGHTERING LINE	
50.	Bolt stunner with 5000 cartiges, for cattle complete set.	1 pc.

SPECIFICATION OF EQUIPMENT.

TABLE 22
(cont'd.)

ITEM	DESCRIPTION	QUANTITY pc./lm.
	IV. CATTLE SLAUGHTERING LINE	
51.	Stunning box made of concrete with one revolving door and one gilletine door, complete.	1 pc.
52.	Bleeding chackles for beef.	4 pcs.
53.	Electric hoist, capacity 1 ton, with device for easily putting the chackle on the bleeding rail 2" pipe, hand operating switch on and stop on the highest point, complete.	1 pc.
54.	Bleeding rail, made of 2" pipe with bolts, nuts, hangers and all supporting construction, total length abaut.	10 l.m.
55.	Working platform, top is made of non-slip flooring, supplied with protection fence on two sides with hand washer and tools sterilizer, on frame work with steps and adjustable legs. Dimensions of top are 180 x 80 cms. hight:	
	a. 200 cms.	1 pc.
	b. 120 cms.	1
	c. 50 cms.	1
56.	Electric hoist for transfering the carcass from the bleeding rail to the dressing rail. Construction is the same as in item 53.	1 pc.
57.	Transporting rail system (Hight 330 cms.) the same construction as in item 54. Total length abaut.	30 l.m.
58.	Head washing cabinet, made of stainless steel, dimensions 70 x 70 140 cms.	1 pc.
59.	Head inspection truck with 6 head hangers	2 pcs.
60.	Air operated dehider knife, with filter regulator lubrificator, complete	
	a. With round bladers	2
	b. With long bladers	2
61.	Pneumatical spreader for beef hind legs, complete with filter regulator, lubrificator	2
62.	Hooks for beef carcasses halves, with pin bearings. Meat hook is made of stainless steel, other parts metalised.	40 pcs.
63.	Stomach and intestines receiving table, top is made of stainless steel with hightened sides, dimensions: 190x90cms. framework of tubular construction with adjustable legs, hight 110 cms.	1 pc.
64.	Shute for beef stomach and intestines, made of stainless steel in metalised frame, dimensions 90 x 90 x 20 cms. Tube ∅ 60 cms. length 3 m.	1 pc.
65.	Working platform, the same construction as in item 55.	1 pc.
66.	Beef carcass spliter saw, electric operated, with overhead balance complete.	1 pc.
67.	Sawing dawn steps, with non slide flooring steps high to 120 cms. with protection fence tubular framework with adjustable legs.	1

SPECIFICATION OF EQUIPMENT.

TABLE: 22
(cont'd.)

ITEM	DESCRIPTION	QUANTITY pc/lm.
68.	Viscera inspection table, top is made of stainless steel in a hot galvanized angle iron frame, supporting 3 pans of stainless steel dimensions 50x60x5 cms. The top is drained to the center. Over the table top is a frame supporting stainless steel hooks. The framework is made of pipes with adjustable legs.	1.
69.	Truck supporting 50 stainless steel hooks, for transport beef eatable offals.	1.
70.	Hand washing lavatory with knife sterilizer, made of stainless steel, feet operated.	7 pcs.
71.	Stand meat truck, made of stainless steel, capacity 220 litres.	2.
72.	Economy shower 3/4" with 3 meter long rubber hose for high pressure.	17 pcs.
73.	High pressure machine for cleaning of the plant, capacity about 15 litres, pressure about 34 kgs/cms^2. Complete.	1 pc.
74.	Wet belt sharpening machine, complete.	1
75.	Air compressor with air tank, paping and all necessary valves and accessories, capacity for running all mentioned air operated facilities. Complete set.	1
76.	Blood and water drain, with interchangable cost plug and cost grating. Opens ø 10 cms.	3
	V. BY-PRODUCTS RECEIVING DEPARTMENT.	
80.	Blood collecting and coagulating tank, capacity 500 lit. with steam inlet valve, overflow valve and inlet. Tank is made of stainless steel, framework metalised.	1
81.	Blood pans ø 50 cms. high 10 cms, made ofgalvanized iron sheet with two handles.	20 pcs.
82.	Floor scale, capacity 300 kgs.	1 pc.
83.	Portable offal bin, made of mild steel plate, with handle for transporting by two wheels barrow. capacity 250 litres.	10 pcs.
84.	Wheelbarrow with two wheels for transporting offal bin (Item 83).	3 pcs.
85.	Receiving table for stomach and intestines, top is made of stainless steel, dimensions 190x90 cms. with hightened sides, framework metalized, hight 90 cms. with adjustable legs.	1 pc.
86.	Grate for stomach omptying, made of galvanized iron, dimensions 70 x 70 x 5 cms. in frame of angle iron fixed in a concrete box.	1 pc.
87.	Dome for washing cattle stomach (tripe) dimensions ø 100 cms. conical part in touch with products made of stainless steel, other parts metalized.	1 pc.
88.	Tripe scalder made of stainless steel, capacity 250 litres.	1.

SPECIFICATION OF EQUIPMENT.

TABLE: 2
(cont'd.)

ITEM	DESCRIPTION	QUANTITY pc./lm.
	V. BY-PRODUCTS RECEIVING DEPARTMENT.	
89.	Stomach cleaning machine (Tube stohrer) with parts getting in touch with products, made of stainless steel, construction metalized, complete.	1.
90.	Work table, top is made of stainless steel, with hightened sides, frame work metalized. Dimensions 150 x 90 x 90 cms.	1.
91.	Intestines receiving table, the same construction as item 90. Dimensions 190 x 90 x 90 cms.	2 pcs.
92.	Gut cleaning machine, capacity 60 sets/hour, complete.	1 pc.
93.	Stand meat truck, made of stainless steel, capacity 220 litres.	4 pcs.
94.	Dump truck for transporting the stomach content, capacity 500 litres.	2 pcs.
95.	Hot water boiler, capacity 250 litres/hour, heated by steam to 85° C.	2 pcs.
	VI. COOLING DEPARTMENT.	
100.	Cooling equipment, completed for providing the following performances:	
	a. 3 Chilling rooms, dimensions 8,5x7,7x3,8 cms, each loaded by 5 tons meat in carcasses, room temperature +0°C. The meat has to be chilled to about 7°C. within 24 hours.	
	b. One offals chilling room, dimensions 4 x 3,5 x 3,8 m. loaded with 2 tons eatable offals. Room temperature 1/1°C, the products entering temperature are about 30°C. has been chilled to 2°C. within 16 hours.	
	c. One detention room dimensions 2,2 x 5 x 4 m. loaded by 1,5 tons meat in carcasses. Meat entering temperature is 38°C., which should be chilled to -5°C. within 48 hours.	
	d. One condemned offals chilling room, dimensions 3.5x5x3.2 m.	
101.	Cold store synthetic swing door, clear dimensions 100x323 cms. for temperature 20/0°C, with upper frame for rail passage.	1 pc.
102.	Cool store swing door, clear dimensions 100 x 233 cms. for temperature 20/0°C, with upper frame for rail passage.	6 pcs.
103.	Cold store swing door, clear dimensions 120 x 220 cms. for temperature 25/-1°C.	2 pcs.
	Insulation of the rooms has to be carried out in order to reach a coefficient of heat transmission k= 0,3 ocal $m^2/h/C^0$.	
	Outer walls temperature is about 38°C.	
104.	Overhead rail scale, with dial in kgs/oke, capacity 200 kgs. 200grs. Completed with all necessary construction.	1 pc.
105.	Transport rail 2" pipe system as in item 54. Total length about	243 l.m.

WATER AND STEAM CONSUMPTION (APPROXIMATELY)

TABLE: 23

	CONSUMERS	KIND OF UNIT	CONSUMPTION LITRES/HOUR	CONSUMPTION PER DAY M^3
	A. WATER CONSUMERS:			
1.	LAIRAGE AREA:			
	1. PIGS - 80 PCS.	30 lit/pc.		2.4
	2. SHEEP & GOATS 150 PCS.	20 lit/pc.		3.0
	3. CATTLE 5 HEAD	50 lit/head		0.25
	TOTAL:			5.65
2.	SLAUGHTERHOUSE:			
	1. PIG SLAUGHTERING LINE	150 lit/pc.	4000	12.0
	2. SHEEP " "	80 lit/pc.	4000	12.0
	3. CATTLE " "	300 lit/pc.	750	1.5
	TOTAL:		8750	25.5
	GRAND TOTAL:			31.15
	B. STEAM CONSUMERS:			
1.	Scalding tank (sp. oq. 16)			
2.	BLOOD COAGULATING TANK (S.E.80)			
3.	TRIPE SCALDER (S.E.88)			
4.	HOT WATER BOYLER (S.E.95)			

COMMENTS:

1. Mentioned quantity of water consumption includes: Watering of animals and cleaning.

2. Quantity of water includes: Necessary quantity for processing and treatment of the plant.

3. Necessary quantity of steam and steam boiler capacity will be estimated after receiving the technical data from Suppliers.

SPECIFICATION OF ELECTRIC CONSUMERS

(APPROXIMATELY)

T A B L E: 24

NO. OF SP.EQ.	C O N S U M E R S	INSTALLED KW.	EFFECTIVE WORKING HOURS	MAX. DEMAND %	MAX. DEMAND KW.	DAILY CONSUMPTION KW.
	II. PIGS SLAUGHTERING LINE					
13.	Stunning Hoist	2.25				
17.	Dehairing Machine	4.5				
20.	Gambreling Hoist	2.25				
	T O T A L: II.	9.0	3	60	5.4	16.2
	III. SHEEP SLAUGHTERING LINE					
32.	Stunning Hoist	1.0	3	80	0.8	2.4
	T O T A L: III.					
	IV. CATTLE SLAUGHTERING LINE					
53.	Electric Hoist	2.8				
56.	El. Transfering Hoist	2.8				
66.	Beef splitter saw	2.25				
73.	High pressure machine	1.75				
74.	Wet belt sharpening machine	0.3				
75.	Air Compressor	7.0				
89.	Stomach cleaning machine	4.5				
92.	Gut cleaning machine	1.2				
	T O T A L: IV.	22.60	2	50	11.30	22.60
	VI. COOLING DEPARTMENT.					
100.	Cooling set	50.0	20	80	40.0	800.0
	Lighting	8.0	4	60	4.8	19.2
	G R A N D T O T A L:	90.60				860.4

SPECIFICATION OF PNEUMATIC AND AIR PRESSURE CONSUMERS.

T A B L E: 25

	DESCRIPTION	ITEM IN SPECIFICATION OF EQUIPMENT.
1.	SAW FOR SPLITTING THE PIGS	29.
2.	AIR OPERATED DEHIDER KNIVES (4 PCS.)	60.
3.	PNEUMATICAL SPREADER (2PCS.)	61.

C O M M E N T: CAPACITY OF AIR-PRESSURE COMPRESSOR AND AIR TANK, WILL BE ESTIMATED AFTER RECEIVING THE TECHNICAL DATA FROM SUPPLIER.

SPECIFICATION OF NECESSARY LABOURERS AND STAFF.

(Estimation is made based on estimated full daily capacity.)

T A B L E: 26

	DESCRIPTION	QUALIFICATION NON SK.	SEMI SK.	SKILLED	TOTAL I. SHIFT.	II-III SHIFT QUALIFICATION NON SK.	SEMI SK.	SKILLED	GRAND TOTAL
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	I. LAIRAGE AREA:								
1.	Live animals manipulating	4					1		
2.	Weighing live animal			1					
3.	Marking		1						
	T O T A L:	4	1	1	6		1		7
	II. PIGS SLAUGHTERING								
4.	Stunning, housing, killing	1	1	1	3				
5.	Scalding - Combreling	2		4	6				
6.	Cleaning & Carcass washing		1	1	1				
7.	Eviscerating, cutting in half		1	2	1				
8.	Eatable offals cleaning			2	2				
9.	Internal Transport	2			2				
	T O T A L:	5	3	10	18				18
	III. SHEEP SLAUGHTERING LINE								
10.	Stunning, hoisting killing		1	1	2				
11.	Air blowing under the skin		1		1				
12.	Horn cutting			1	1				
13.	Ripping & Cutting 1st hind leg			1	1				
14.	" " " 2nd " "			1	1				
15.	Transfering to the lower rail		1		1				
16.	Flaying hind legs & Tail			3	3				
17.	" the belly		2		2				
18.	" " shoulders & fore legs		2		2				
19.	Flaying the head			1	1				
20.	Eviscerating			1	1				
21.	Internal transport	2			2				
	T O T A L:	2	7	9	18				18

SPECIFICATION OF NECESSARY LABOURERS AND STAFF.

(Estimation is made based on estimated full daily capacity).

TABLE: 26
(cont'd.)

DESCRIPTION		QUALIFICATION			TOTAL I. SHIFT	II-III SHIFT QUALIFICATION			GRAND TOTAL
		NON SK.	SEMI SK.	SKILLED		NON SK.	SEMI SK.	SKILLED	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	IV. CATTLE SLAUGHTERING LINE								
22.	Stunning, lifting, killing		1	1					
23.	Horn Cutting		1						
24.	Head cutting & preparing			1					
25.	Fore legs cutting & ripping		1						
26.	1st hind leg ripping & cutting			1					
27.	2nd " " " " "			1					
28.	Transforing to lower rail		1		1				
29.	Flaying the hind legs & tail			1	1				
30.	" " Belly			1	1				
31.	" " Shoulder & fore legs.			1	1				
32.	Cutting the breast bone		1		1				
33.	Eviscerating		1	1	2				
34.	Washing the eatable offals		1		1				
35.	Carcass cutting in halves			1	11				
	interval transport	2							
	TOTAL:	2	7	9	18				18
	V. COLD BLOCK								
37.	Meat loading & cleaners	3			3				3
38.	Compressor Mechanics			1	1			2	3
39.	Electricians			1	1			2	3
40.	Drivers			2	2		1		3
	TOTAL:	3	1	2	7				12
	VI. ADMINISTRATIVE STAFF								
41.	Manager			1	1				
42.	Technical Manager			1	1				
43.	Accountant			1	1				
44.	Scale man		1		1				
45.	Messenger		1		1				
46.	Guard man		1		1		1		
	TOTAL:		3	3	6		2		8
	GRAND TOTAL:								45

SPECIFICATION OF NECESSARY LABOURERS AND STAFF.

(Estimation is made based on estimated full daily capacity).

T A B L E: (cont'd.)

C O M M E N T S:

1. In connection with daily capacity, the following calculation was made:
   - For 80 pigs - 3 working hours, with an interval of 3.2 minutes or 140 seconds for each operation.
   - For 150 sheep and goats - 3 working hours, with an interval of 1.2 minutes, or 72 seconds for each operation.
   - For 5 cattle 1 working hour, with an interval of 12 minutes for each operation.

2. Based on such organisation and lives capacities, only one team of 18 workers is provided.

   One hour is provided for cleaning and maintenance of the slaughterhouse's accomodations.

6. RECOMMENDATIONS

6.1. Undoubtedly the change from the individual working place where all slaughtering operations are carried out, to the line system of work will creat a lot of difficulties in the slaughterhouses.
It is, therefore recommended:

- To send two young and skilled workers from each Municipality, for training at a slaughterhouse where such or a similar line system of work exists, in order to prepare them as foremen who will be able to organise the work on the lines. One of them for the pig slaughtering line and the other one for the sheep and cattle slaughtering lines. The training should be organised by the supplier of equipment.
- Another possibility is to make a contract with the equipment supplier, with the condition that the supplier be obliged and responsible for the training of the workers and the organisation of the work on the lines.
- The same recommendations are made in connection with mechanics who will be responsible for the maintenance and proper running of all machines, especially for compressors and cooling set.

6.2. A lot of the equipment could be supplied locally. The Consultant has visited local work shops and estimated them as being very capable and convenient (if they could be competitive).
In any case, to make the detailed drawings of these equipment, than in building design and structure, installations details, equipment ordered and their installation, the local architects and engineers will need help for the elaboration of these specific works. Supervision during the beginning and trial work will also be necessary.
It is therefore recommended to hire an Expert or Company with adequate experience in this job. UNIDO could be of great help in solving these problems.

Annex I

REPORT ON THE EXISTING EQUIPMENT PURCHASED BY NICOSIA MUNICIPALITY FOR A PIG SLAUGHTERING LINE

The survey was carried out on the 19th July 1978 in the presence of:

1. Mr. C. Constantinou, Municipal Engineer, Nicosia Municipality
2. Mr. D. Popovic, Consultant in Abattoir Planning and Design (UNIDO Expert)

GENERAL INFORMATION

The equipment are placed in a Municipal Store at Ayios Andreas, Nicosia.

They were packed in cases, which are in a relatively good condition, closed, without any serious damages.

The cases were opened on the upper side only due to the inability of manouvring and limited space available in the store room.

The aim of the survey was to identify the various equipment and to estimate the possibility of them being used on the pigs slaughtering line in the proposed New Central Slaughterhouse in Cyprus.

The surveyors had the following documentation, as a basis for surveying and comparison:

1. Specification of equipment issued from the Firm "SEFFELAR AND LOOYEN N.V." dated 17th December 1970 (Municipal Fair, symbol Γ.(G)4/63/II and No. 1/63/12).
2. Packing lists, for grate Nos: 15, 16, 17, 18, 19 and 20, with description of item, quantity of parts consisting in each grate. The lists were issued from "SEFFELAR AND LOOYEN N.V." dated 28 August 1972
3. Lay-out plan of the pigs line, No. 9-1056-7, dated 18.2.1972.

The detailed layout Plans mentioned by the suppliers could not be found on the files.

FINDINGS

Using the suppliers list and specifications the following equipment were identified:

Item	Description	Comments
1.	Electrical Stunning Device	Not identified
2.	Sticking hoist	Identified
3.	Bleeding chackles	"
4.	Bleeding rail	"
5.	Hydraulic dropper	"

Item	Description	Comments
6.	Return rail for empty chackles	Identified
7.	Scalding tank	"
8.	3-Cylinders dehairing machine	"
9.	Gambreling table	Not identified
10.	Gambrels in black execution	Identified but entirely roten
11.	Gambreling hoist	Identified
11.a	Accumulating conveyor	"
12.	Hand operated Singeing furnace	"
13.	Blackscraping Machine	"
14.	Inclined conveyor	"
15.	Transport rail system	"
16.	Dressing conveyor	"
17.	Chute for intestines	Not identified
19.	Tables for livers	"
20.	Inspection rail	Identified
21.	Overhead Weighing scale	"

REMARK

Although some of the equipment mentioned in the suppliers list were not identified, it cannot be concluded that the supplier did not send them. The surveyors were unable to inspect all the contents in the cases.

CONCLUSIONS

1. In relation to condition, all equipment are useful.
2. The gambrels (Item 10) are entirely roten, but after cleaning their usefulness should be reestimated, because the intensity and degree of damage by rust was not possible to be estimated at this stage.

3. All equipment in connection with size and types, could be used for the pigs slaughtering line in the Central Slaughterhouse except Items 9, 11a, 12, and 13, which are not necessary.

   In any case, these equipment must be cleaned and assembled before installation.

RECOMMENDATIONS

1. The Municipality of Nicosia should clean and assemble all equipment in order to identify the usefulness of each of them.

2. The Municipality of Nicosia should form a team of professionals; mechanics, electricians and slaughterhouse expert, who should provide a quantitative survey using detail plans and specifications with the aim of completing each unit and estimating their running conditions.

   Separate care has to be taken regarding: electromotors and sensitive instruments and accessories as are: thermostats, thermometers, valves, starters, switches, etc.

3. These equipment should be preserved, packed by units and stocked in proper condition until their installation.

   Those equipment which will not be used in the new Central Slaughterhouse, could be sold.

Annex 11

OFFICIAL VISITS

1. Government Planning Bureau of Cyprus
2. Municipality of Nicosia
3. Municipality of Larnaca
4. Municipality of Limassol
5. Municipal Planning Bureau in all three cities
6. Municipal Slaughterhouse in Nicosia
7. Municipal Slaughterhouse in Larnaca
8. Municipal Slaughterhouse in Limassol
9. Municipality of Paphos
10. Municipal Slaughterhouse in Paphos
11. Municipal Planning Bureau in Paphos
12. Ministry of Agriculture - Veterinary Department
13. Veterinary Laboratory in Athalassa
14. Nicosia old market and supermarkets (3)
15. Larnaca old market and butcher shops
16. Limassol old market and butcher shops
17. Paphos old market and butcher shops
18. Ministry of Commerce and Industry
19. Government Water Development Department
20. Sausage Plant - Larnaca
21. Larnca Meat and Sausage Workshop
22. METALCO LTD - Nicosia
23. AIR CONDITIONING AND DUCTING - Nicosia
24. New Plant site in vicinity of Kophinou

+ Multiple visits not mentioned

A C K N O W L E D G E M E N T

The Consultant wishes to record his thanks to all those who assisted him in the elaboration of his work.

Special thanks are extended to Mr. John Hadjiantonas and Mr. Constantinos Constantinou from the Technical Department of the Municipality of Nicosia, and also to Mr. Andreas Christodoulides, from the Technical Department of the Municipality of Paphos, for their great help, advice and cooperation.

Separately, thanks are extended to Mr. Pavlou, Meat Inspector in charge of the Slaughterhouse in Nicosia, who greatly facilitated the Consultant in understanding the existing situation in meat preparation and manipulation with all its characteristic peculiarities.

I also wish to thank Mr. L. Crawford, UNIDO Project Expert for his willingness, help and cooperation.

ID/IO/SER.A/187/Add.1
11 October 1978
English

RESTRICTED

with
08941

PLANNING AND DESIGNING OF NEW ABATTOIRS AND OPTIMUM UTILIZATION OF BY-PRODUCTS*

SI/CYP/77/802
CYPRUS

Addendum

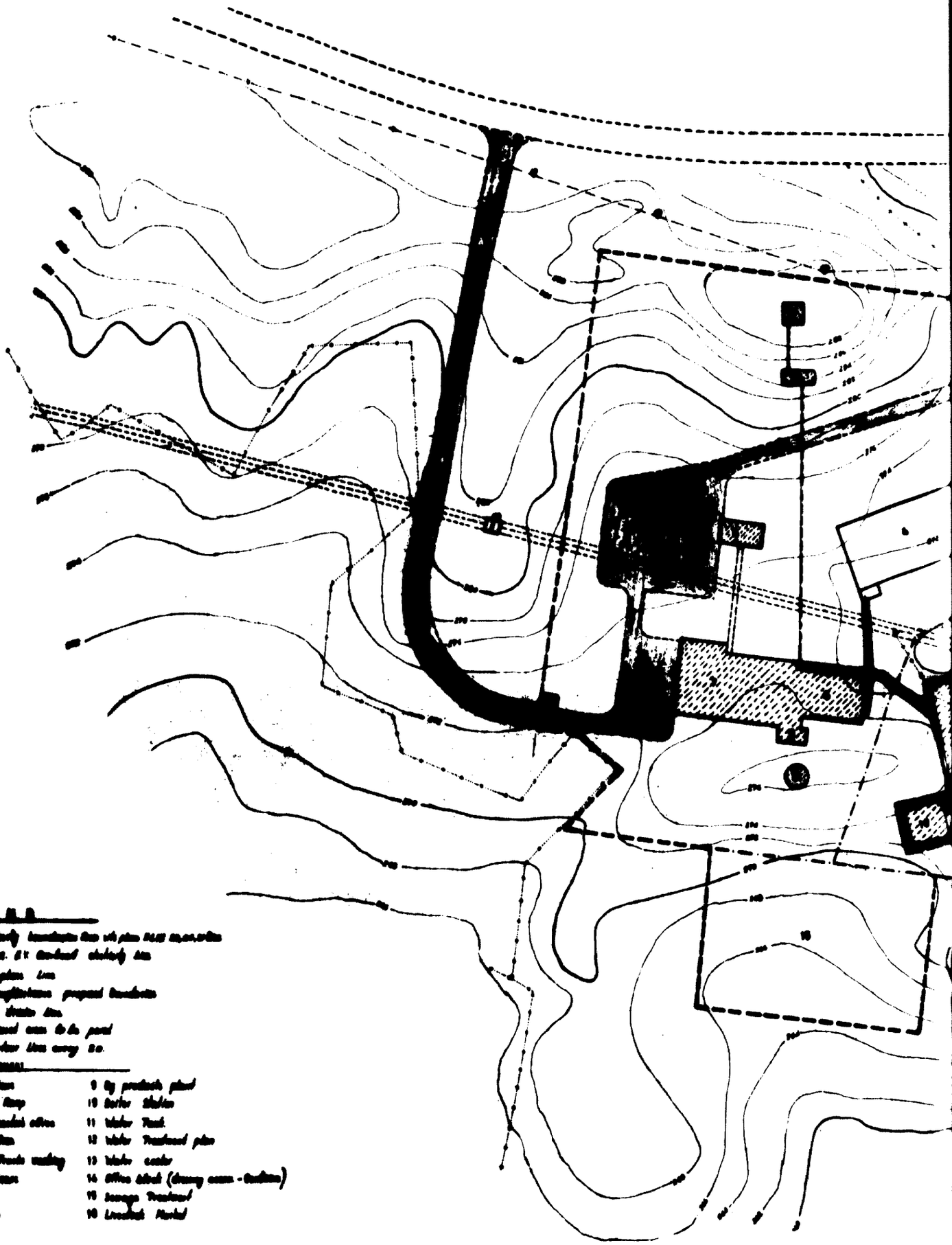
Technical report: Appraisal, planning and designing of abattoirs

Prepared for the Government of Cyprus by the
United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of Dimitrije A. Popovic,
expert in abattoir appraisal, planning and designing

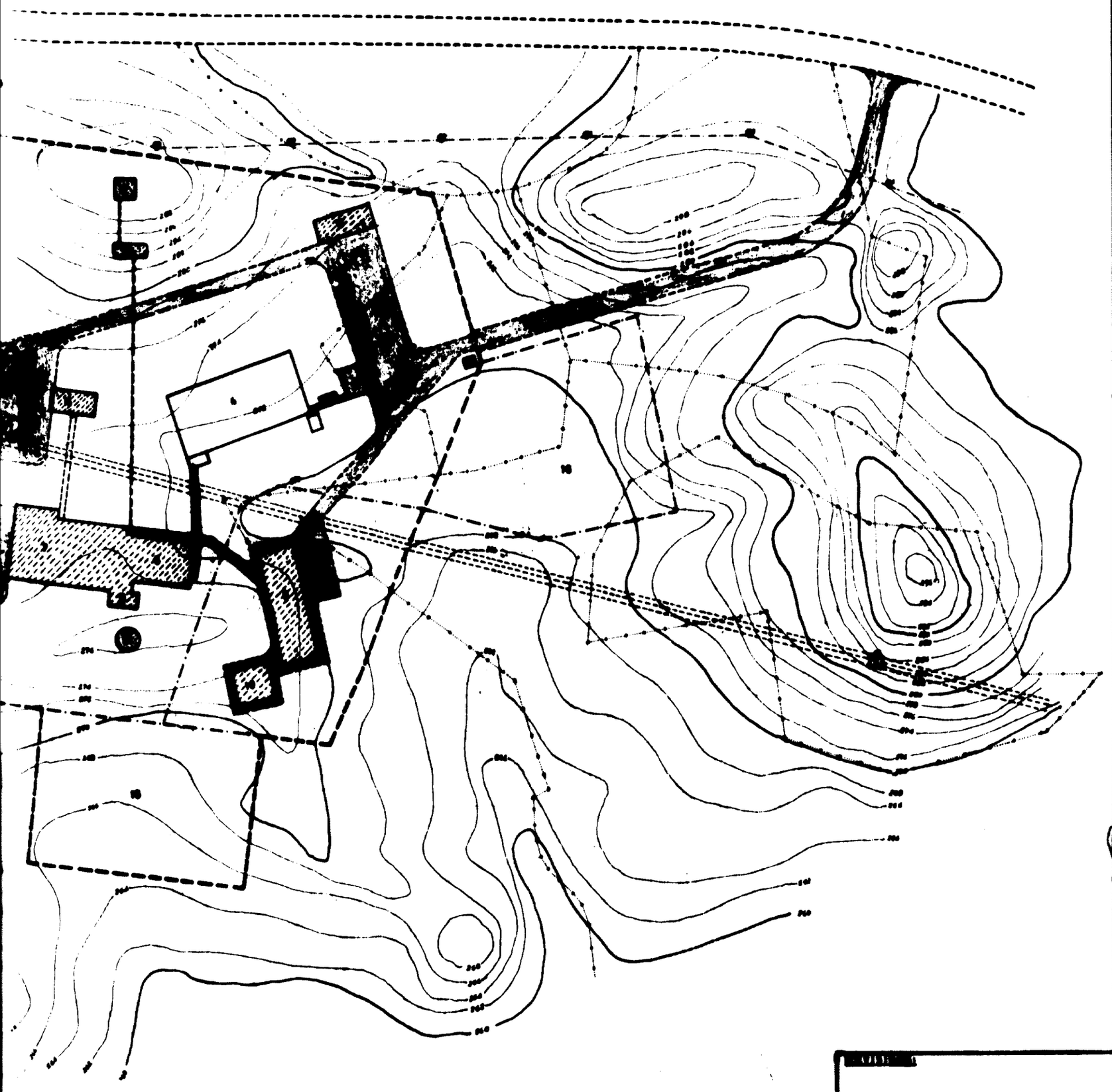
United Nations Industrial Development Organization
Vienna

* This document has been reproduced without formal editing.



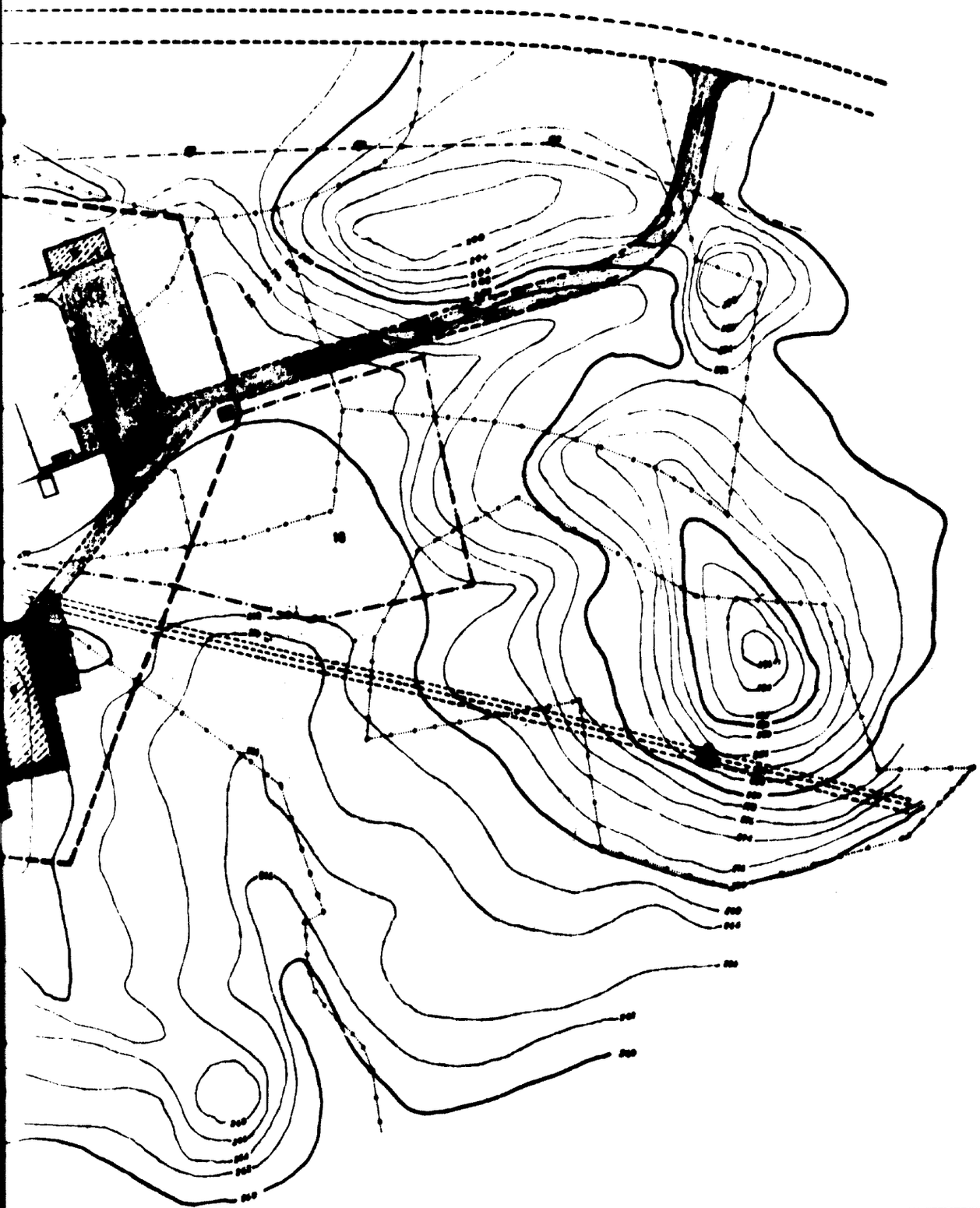
CYPRUS CENTRAL SLAUGHTERHOUSE	D. POPOVIC	

SECTION 1



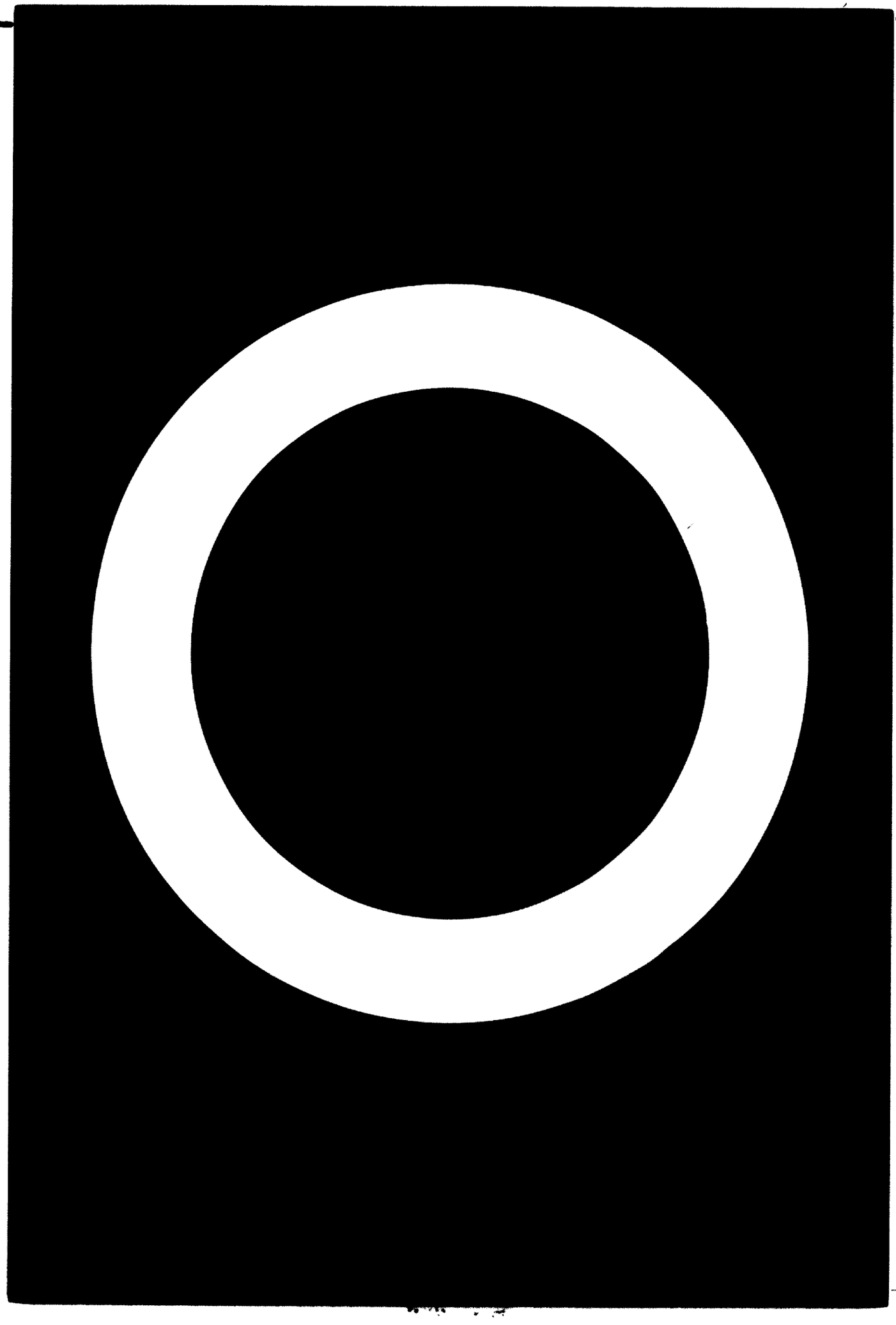
DESIGNED BY:	DRAWN BY:	DATE:	SCALE:	DRAWING TITLE:
D. POPOVIC	P. TELEVANTOS	JULY 1970	1:2.000	SITE PLAN POSITION OF BUILDINGS

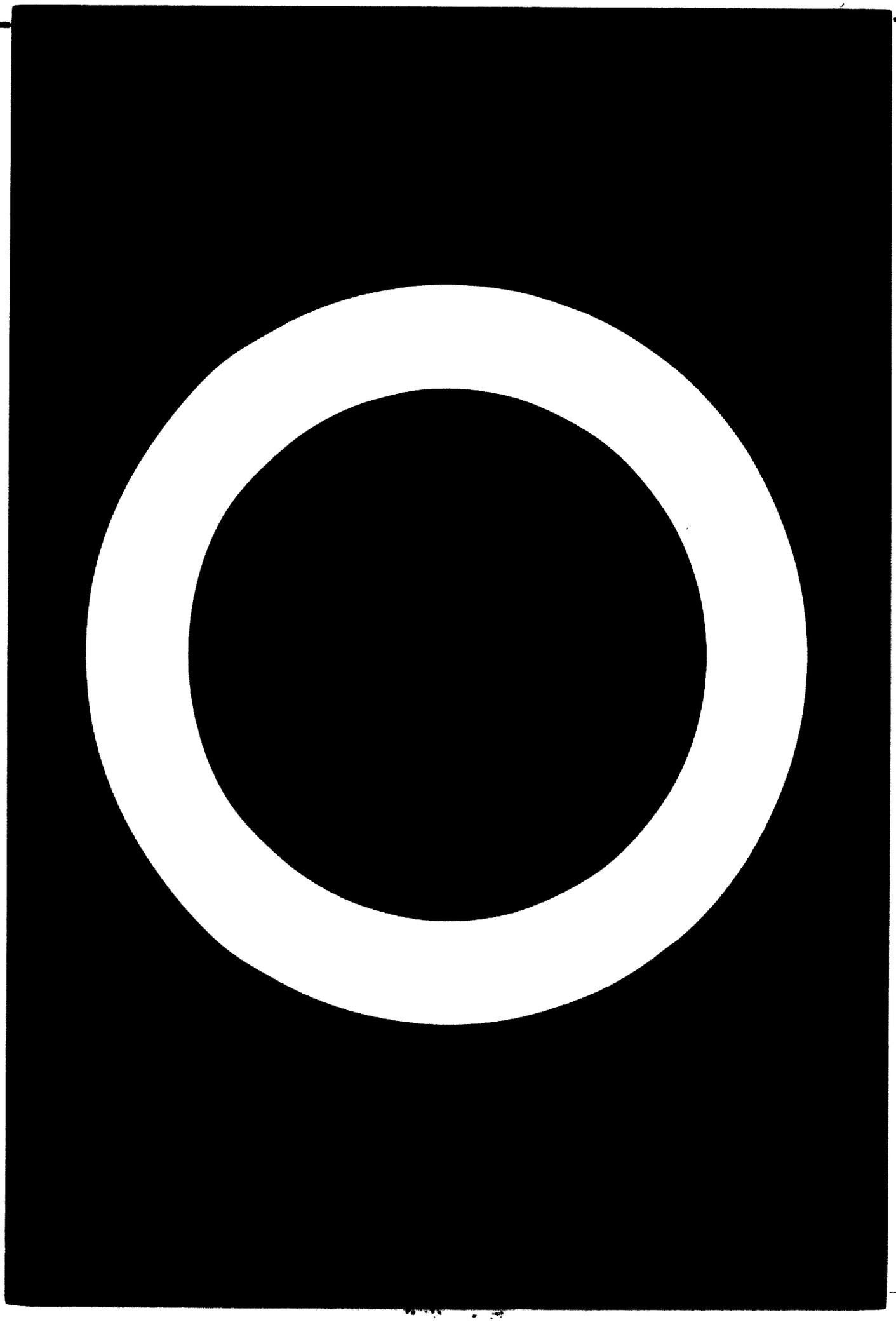
SECTION 2



BY: ELEVANTOS	DATE: JULY 1970	SCALE: 1:2.000	SITE PLAN POSITION OF BUILDINGS	1

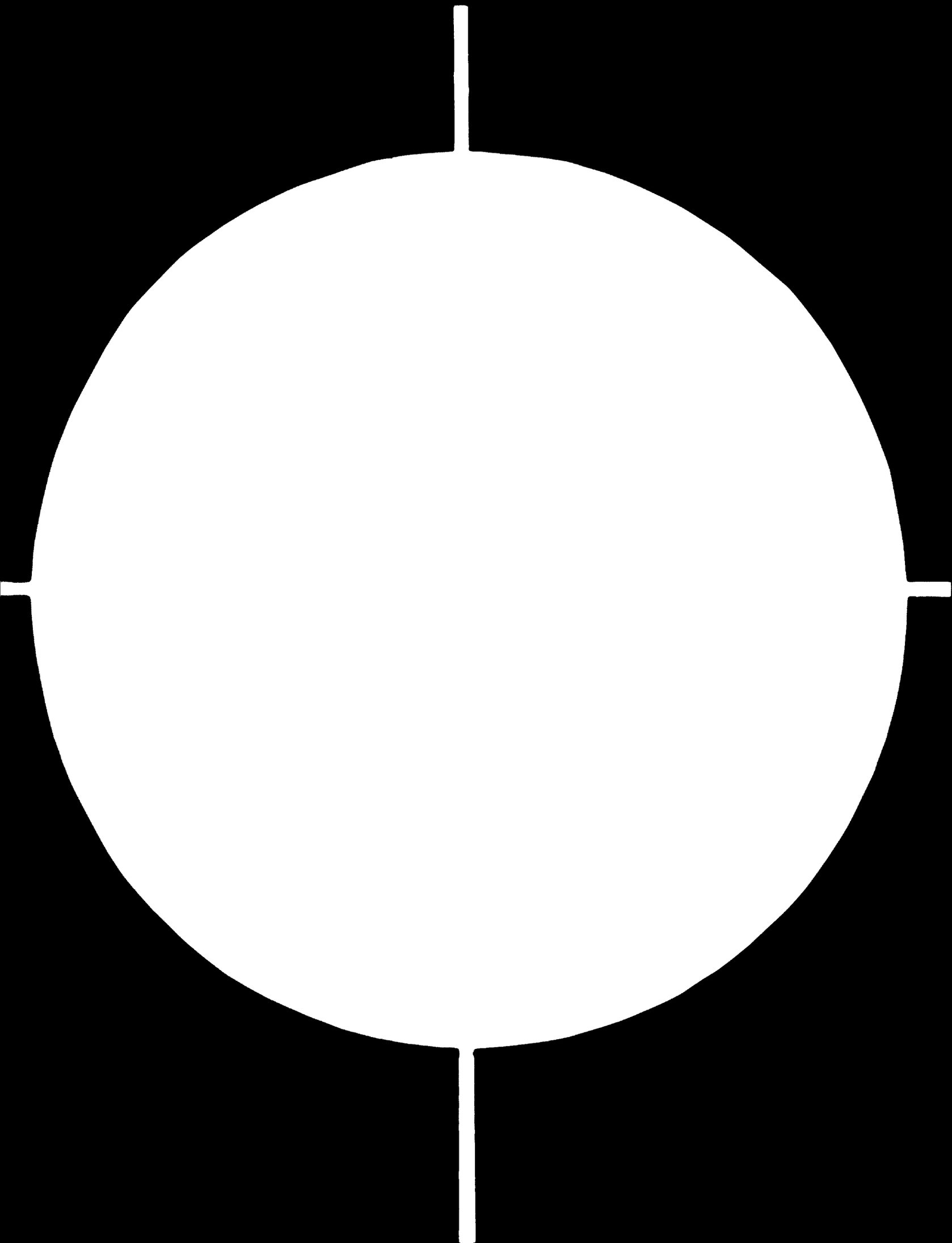
SECTION 3

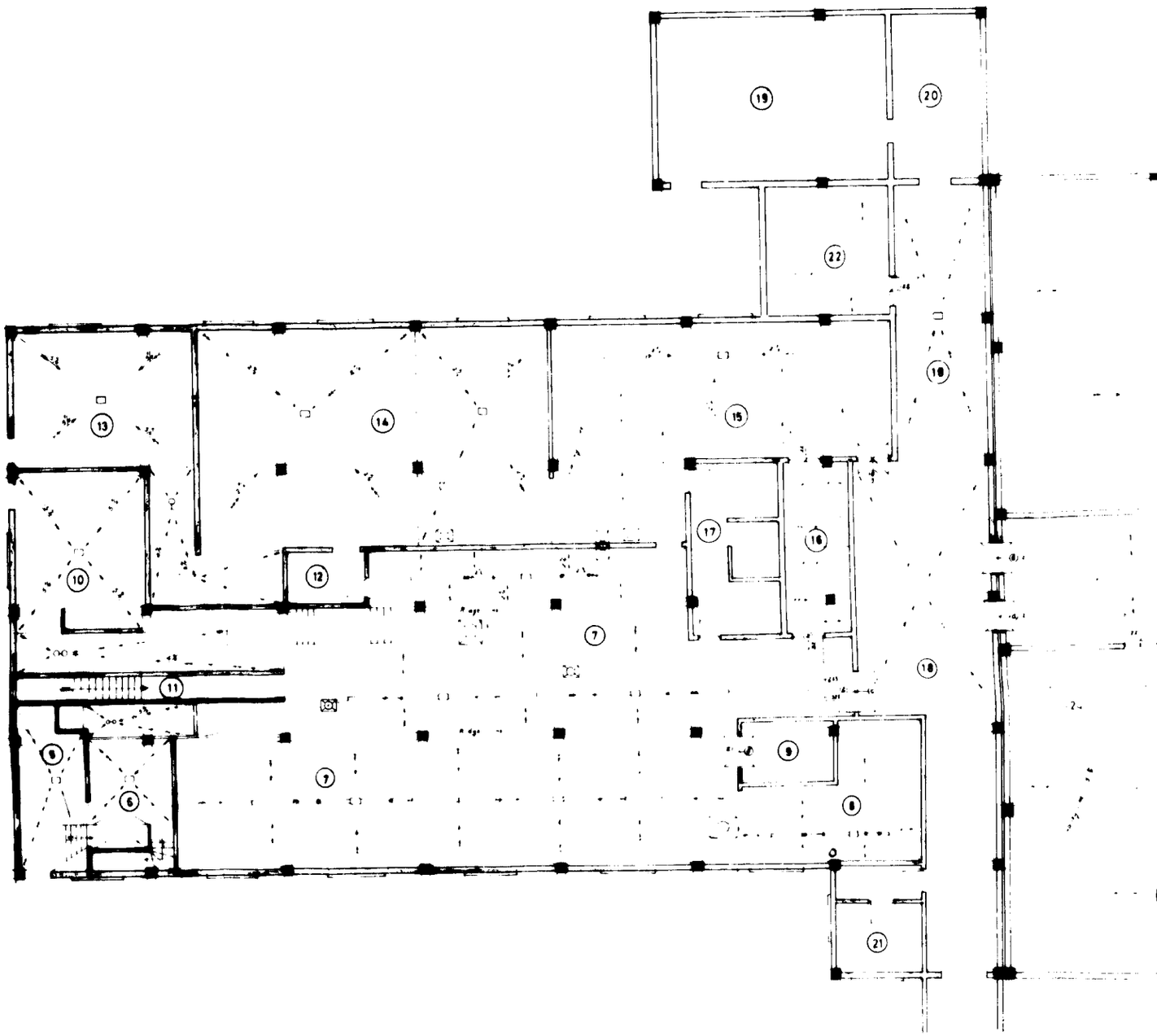




B-499

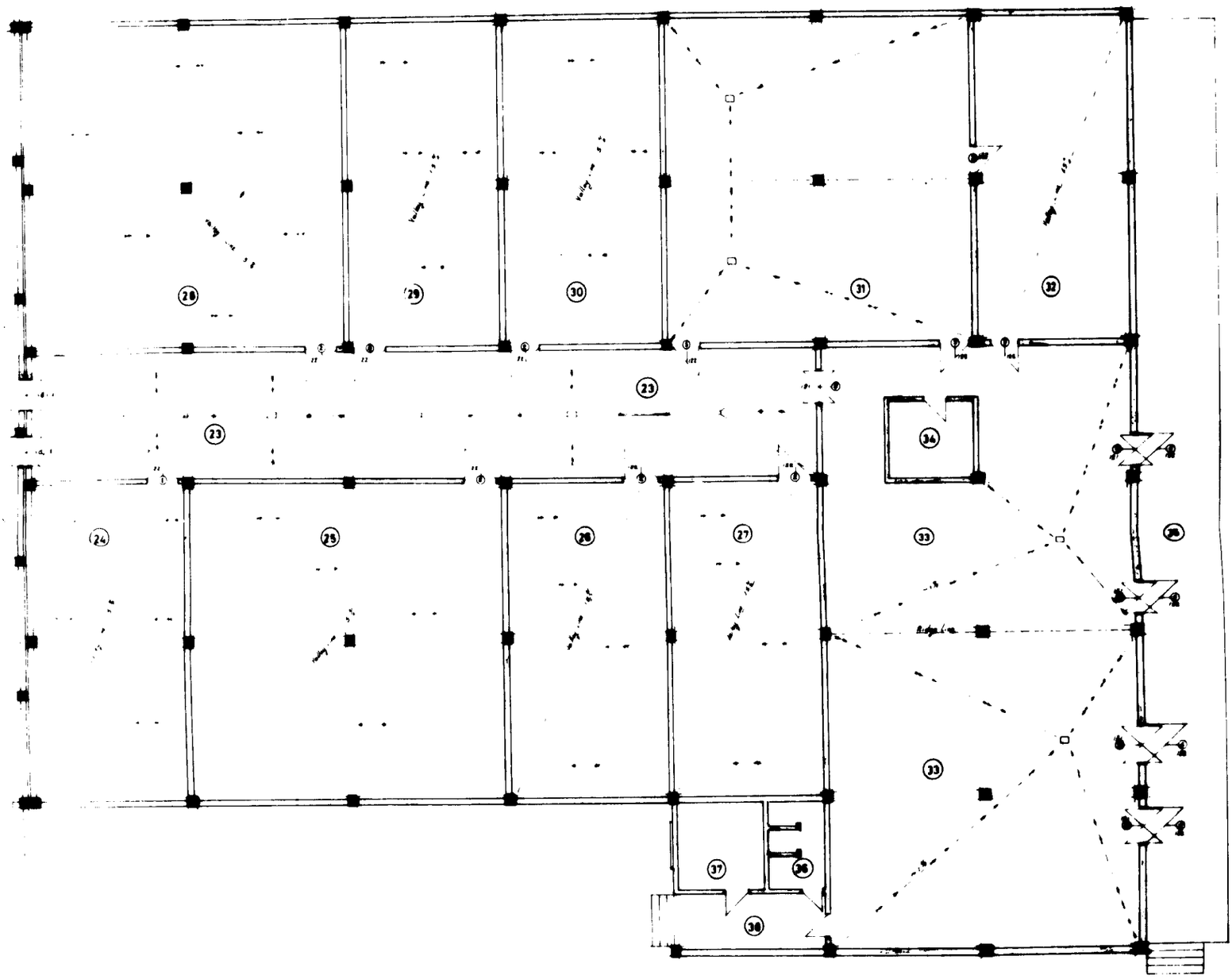
81.05.27





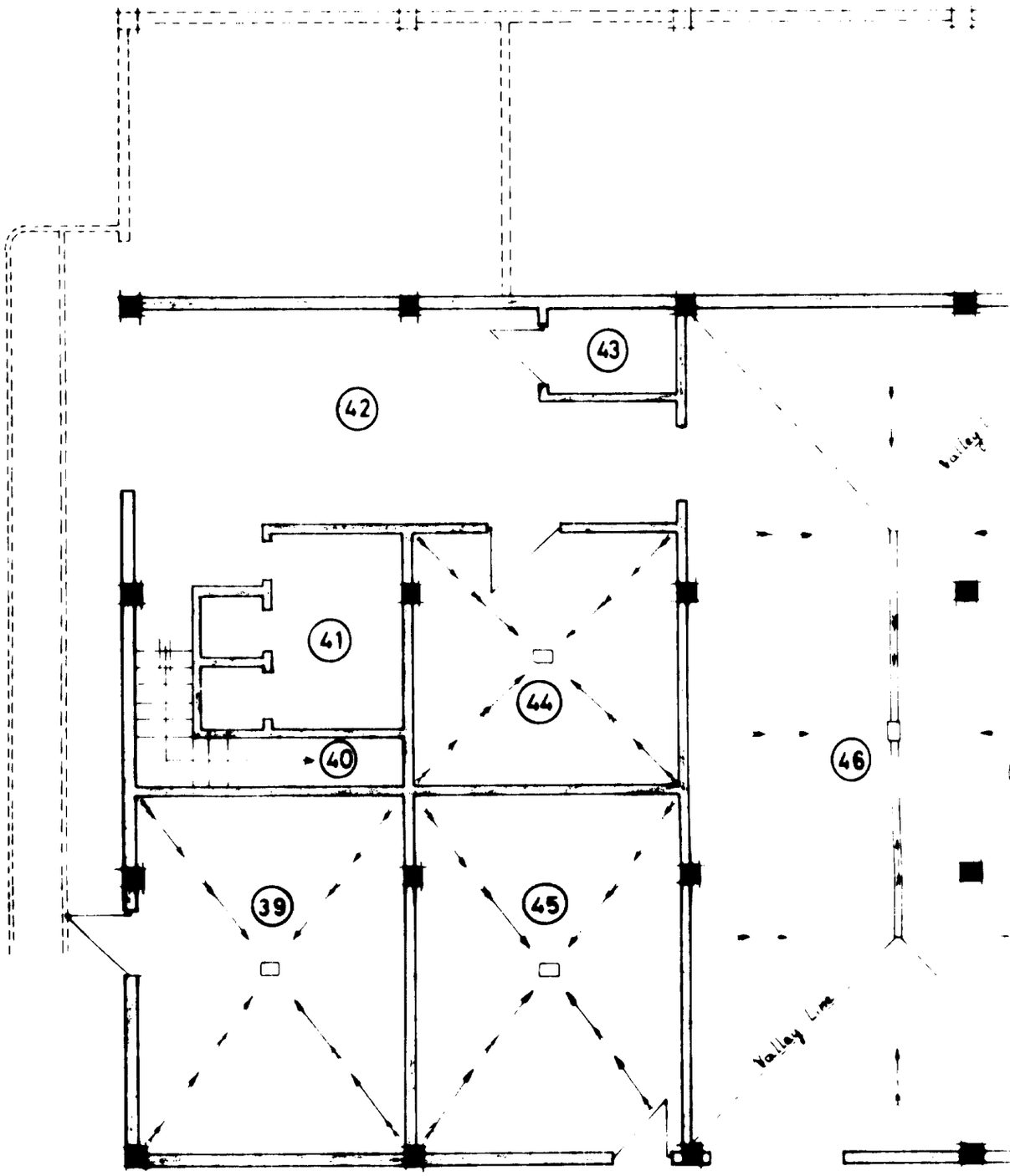
SECTION 1

JOB TITLE	DESIGNED BY	DRAWN BY
CYPRUS CENTRAL SLAUGHTERHOUSE	D POPOVIC	P

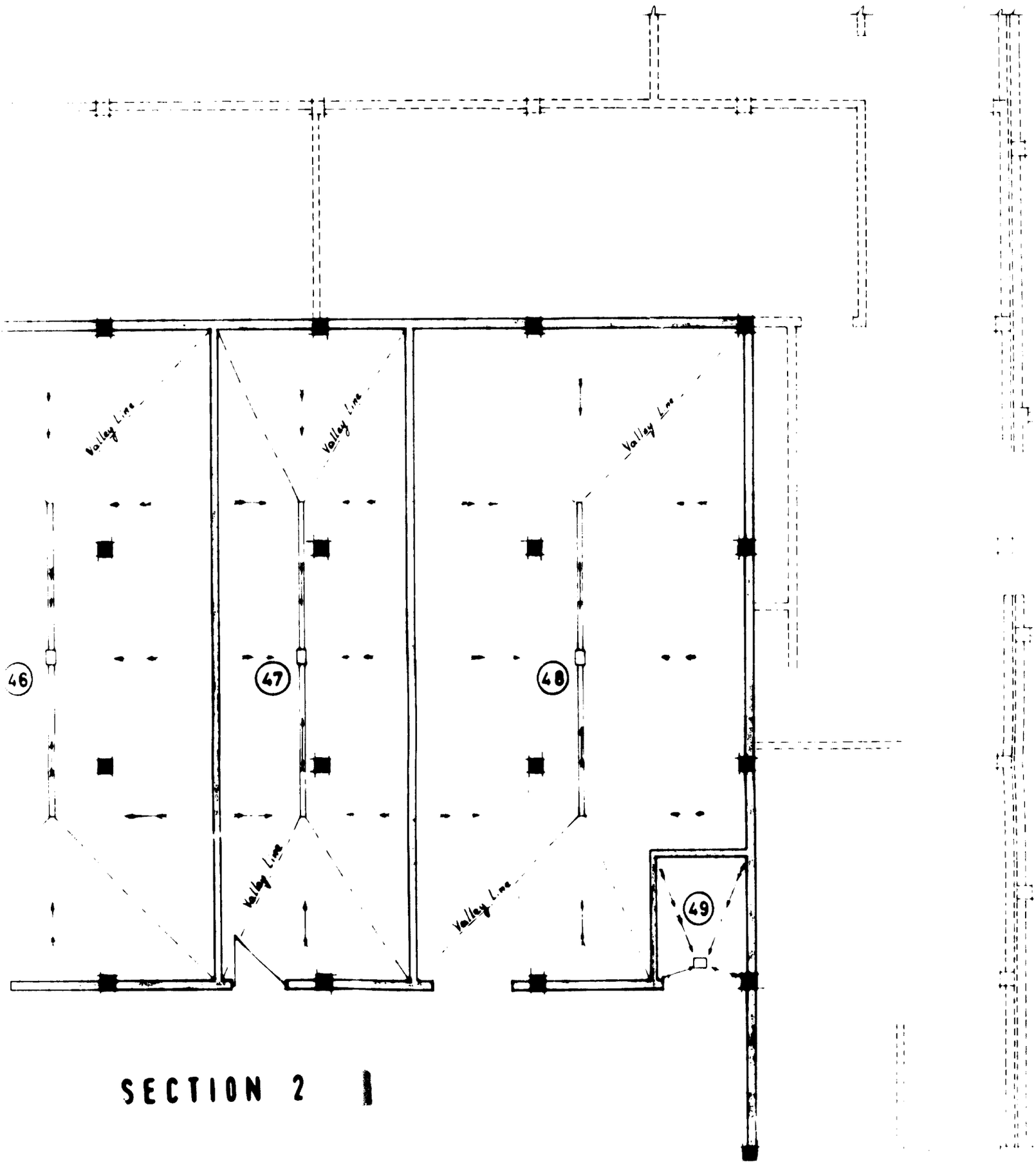


	DRAWN BY P TELEVANTOS	DATE JULY 1978	SCALE 1:200	REVISIONS DRAWING TITLE FLOOR & SLOPES OPENINGS REFERENDUM	DRG Nº 2

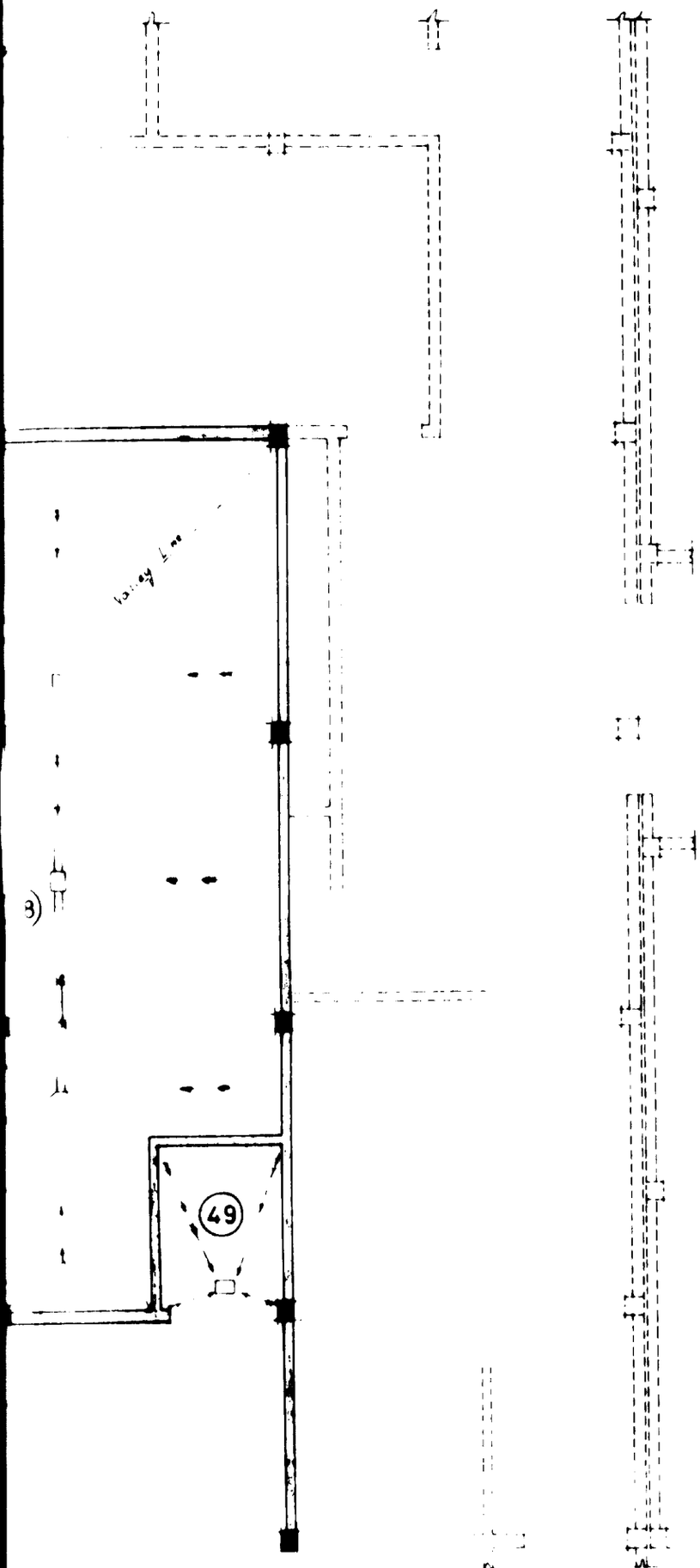
SECTION 2



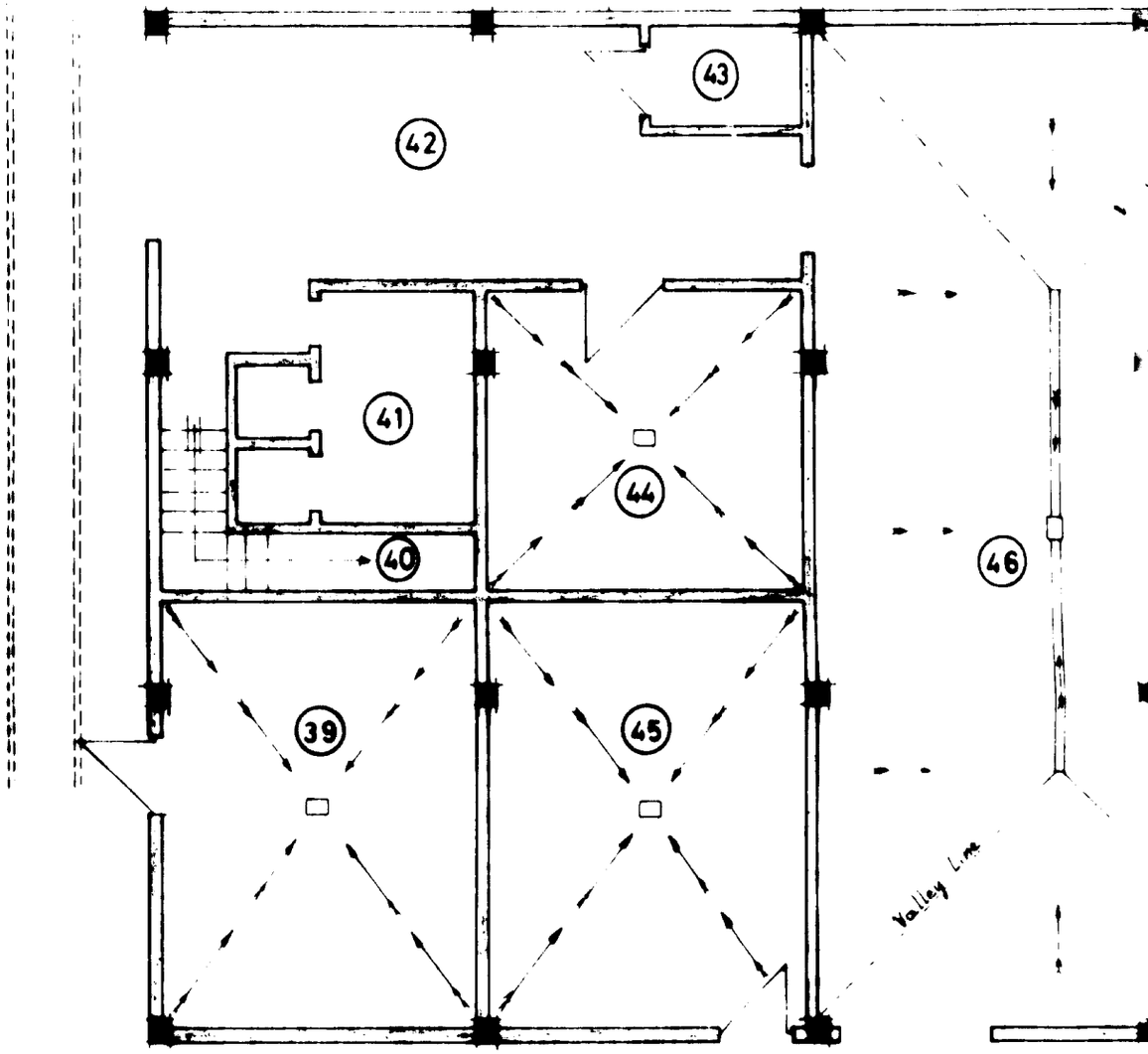
SECTION 1


Valley Line
Valley Line
Valley Line
Valley Line
Valley Line
46
47
48
49

SECTION 2



SECTION 3



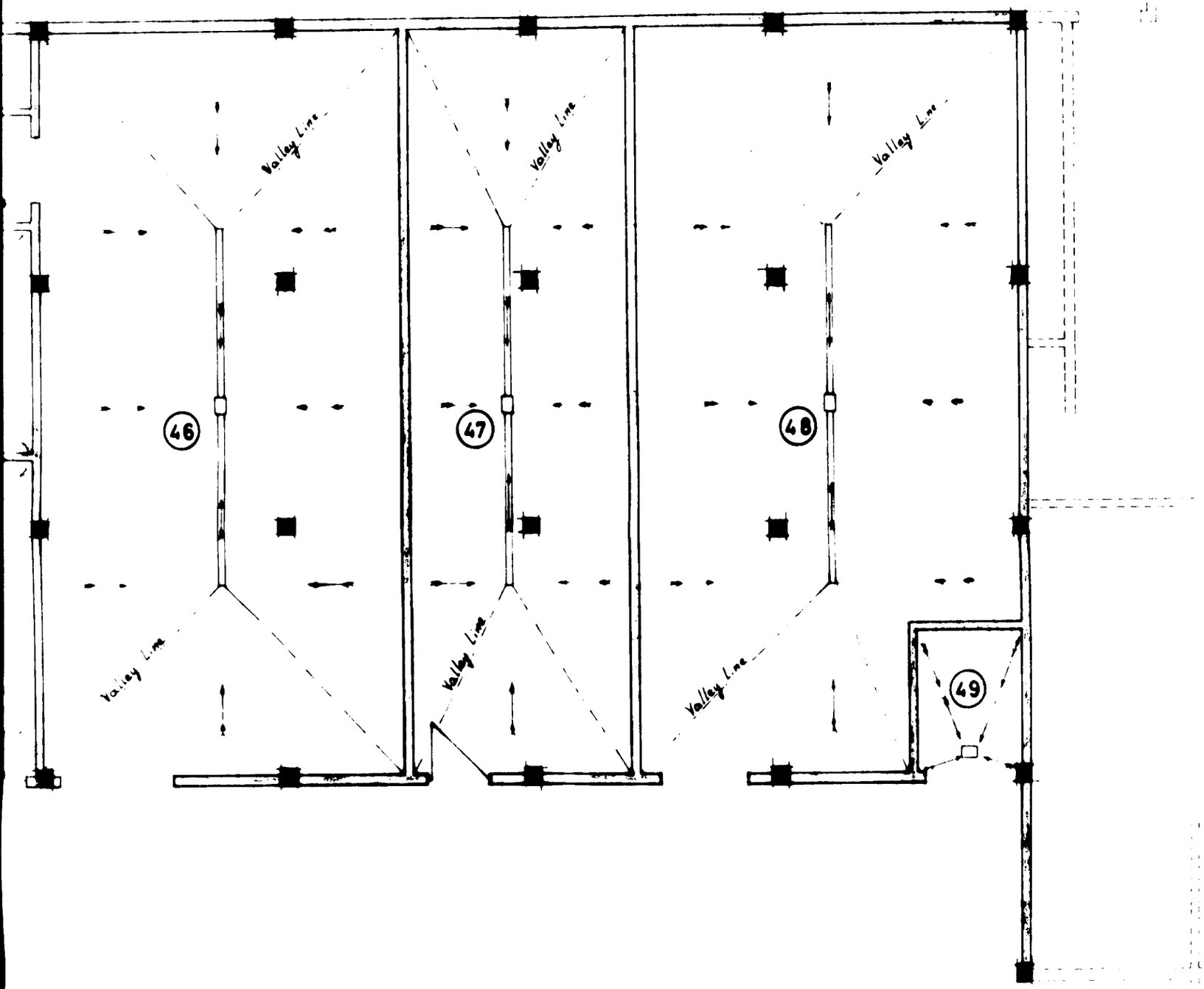
BASEMEN

SECTION 4

JOB TITLE:

CYPRUS CENTRAL SLAUGHTERHOUSE

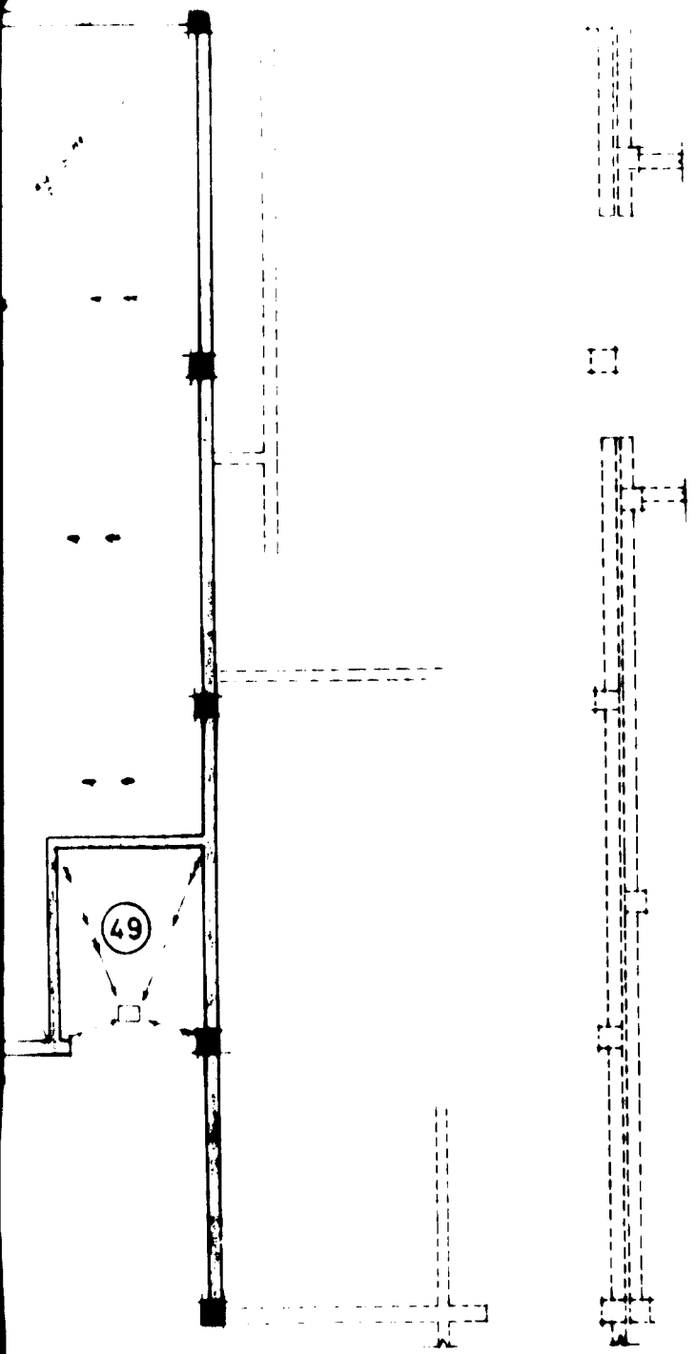
D·



BASEMENT FLOOR PLAN

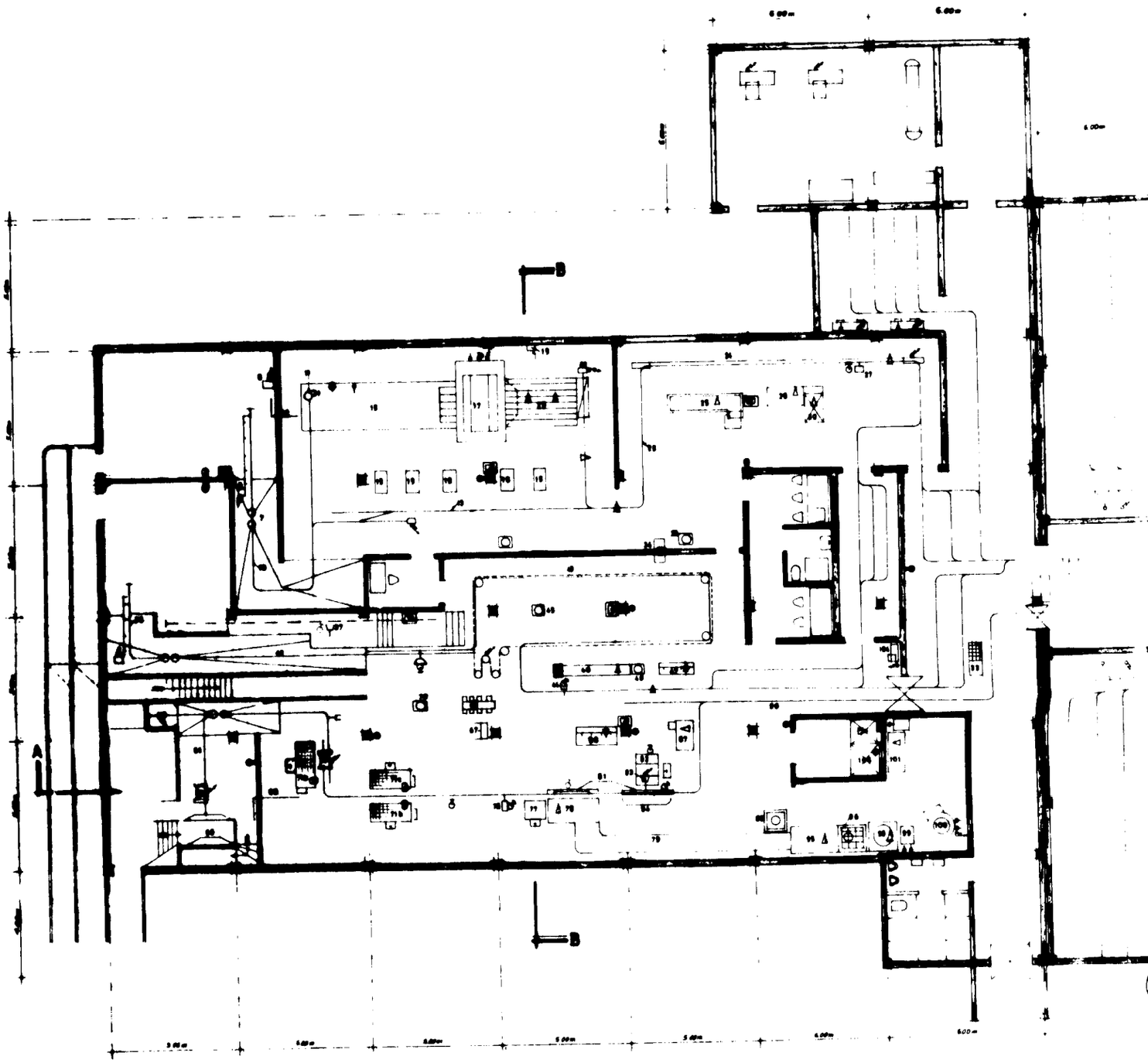
SECTION 5

R HOUSE	DESIGNED BY: D. POPOVIC	DRAWN BY: P. TELEVANTOS	DATE: JULY 1978	SCALE: 1 : 10



SECTION 6

REVISIONS:			
JULY 1978	SCALE: 1 : 100	DRAWING TITLE: FLOOR SLOPES & OPENINGS REFERENDUM	DRG. N°: 3

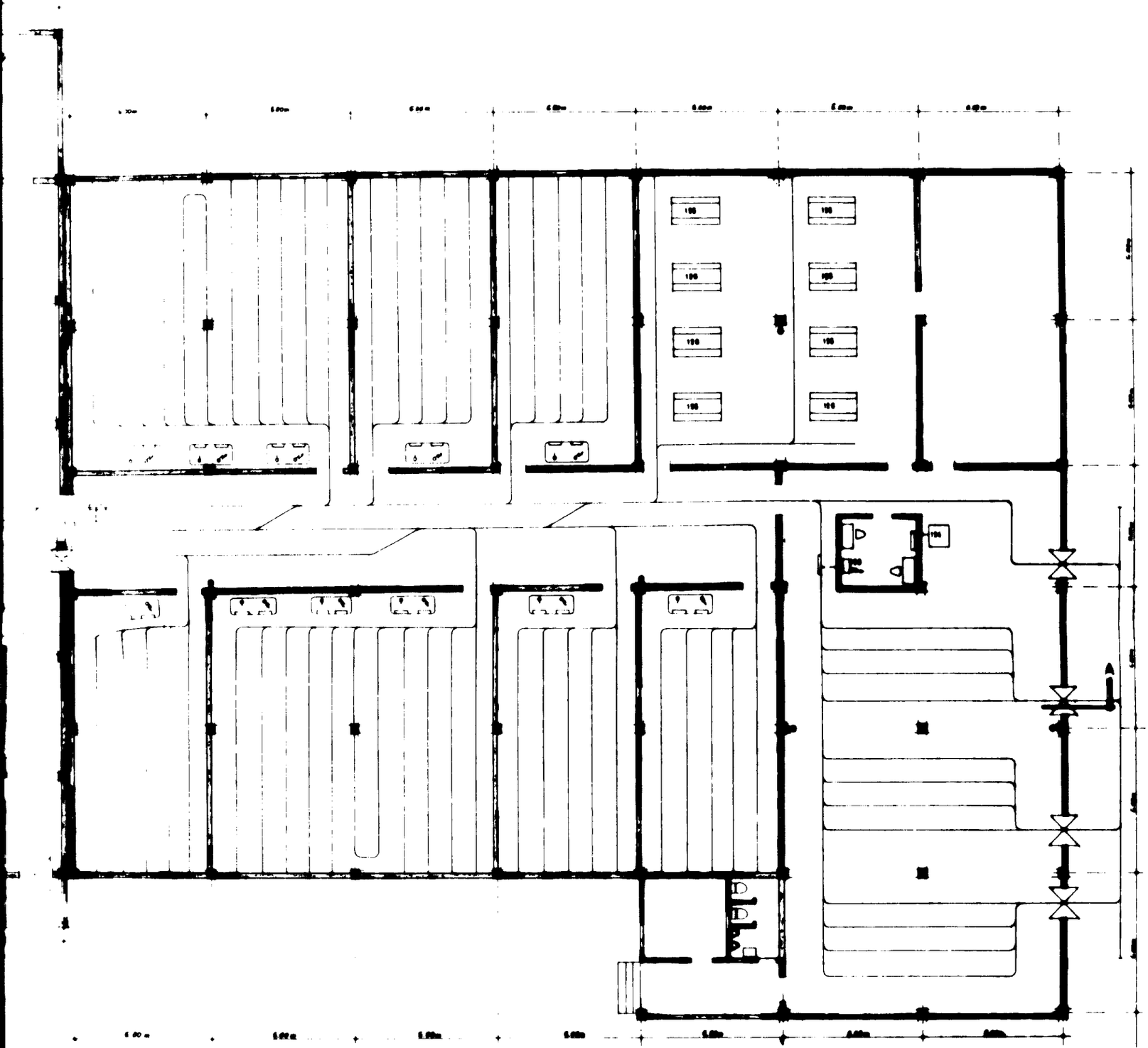


LEGEND

- Δ Economy shower (item 96)
- Hose station with hot/cold water (item 94)
- Hand washer unit (item 98)
- Cold water consumer
- Hot water consumer
- Electric consumer
- Air pressure consumer
- Steam consumer

JOB TITLE	DESIGNED BY	DRAW
CYPRUS CENTRAL SLAUGHTERHOUSE	D POPOVIC	

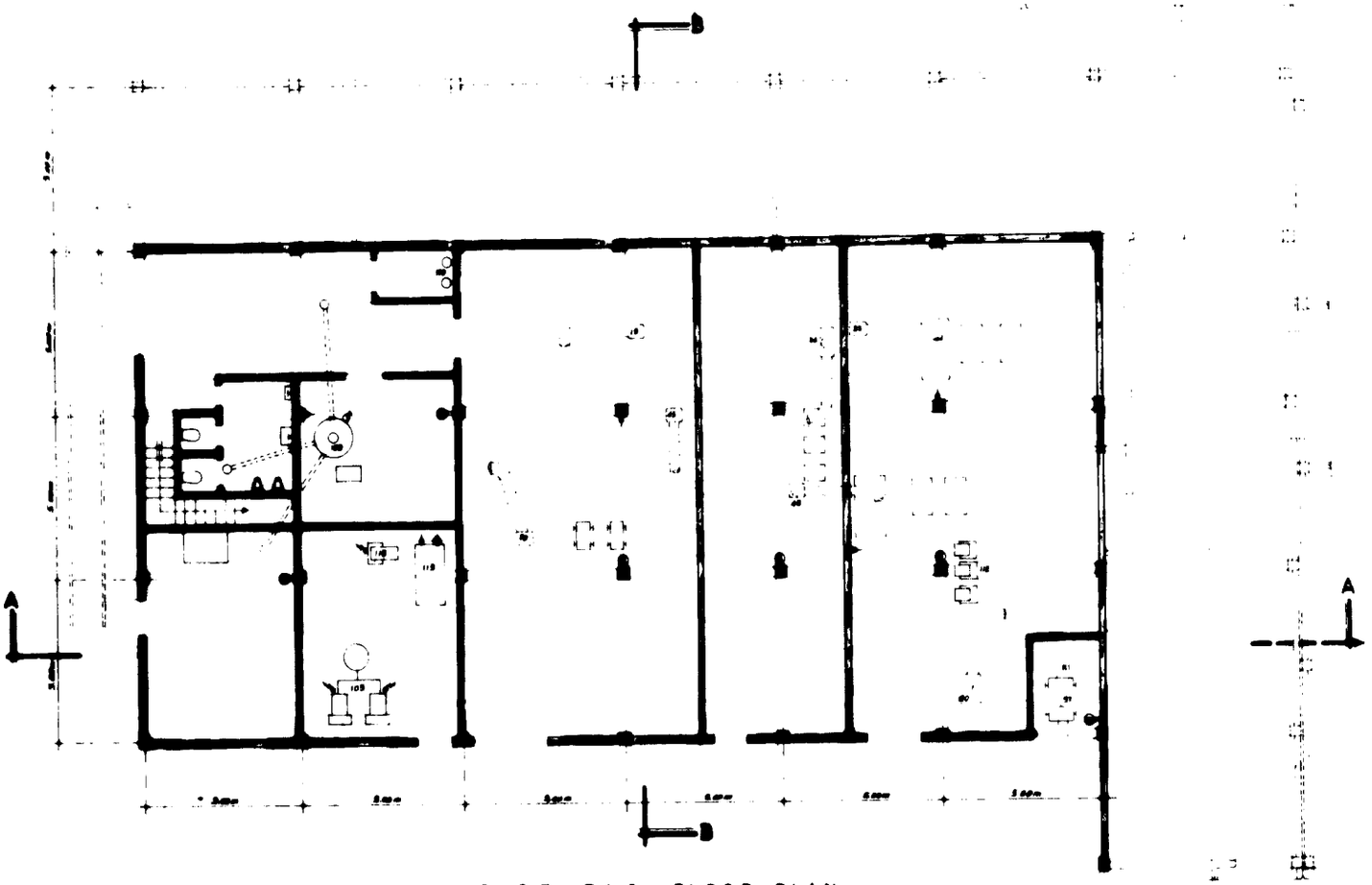
SECTION 1



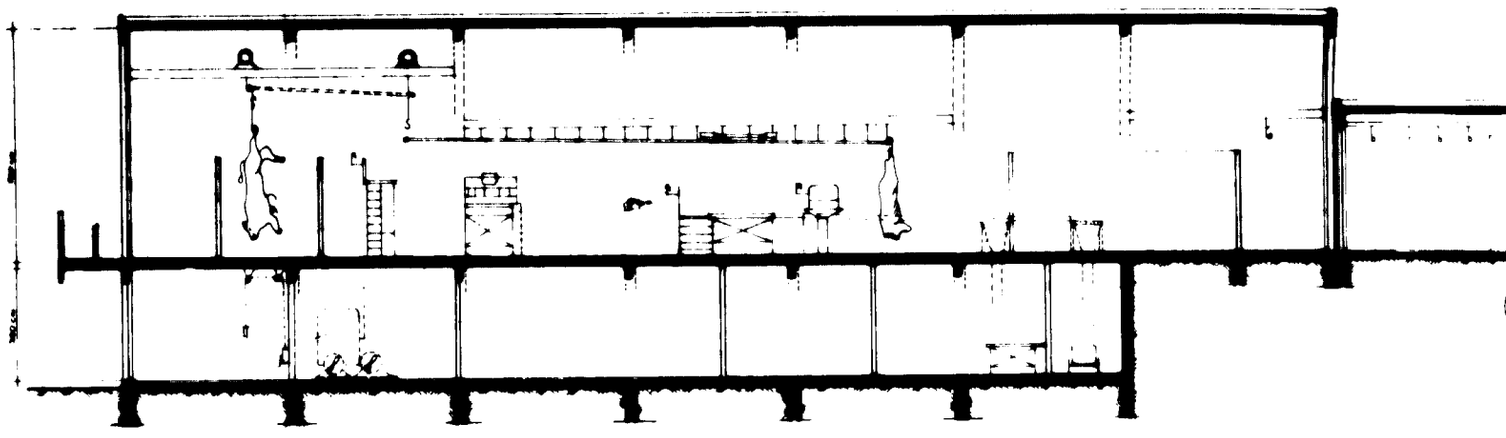
REVISIONS

	DRAWN BY	DATE	SCALE	DRAWING TITLE	DRG. Nº
	P TELEVANTOS	JULY 1978	1:200	TECHNOLOGICAL GROUND FLOOR PLAN	4

SECTION 2



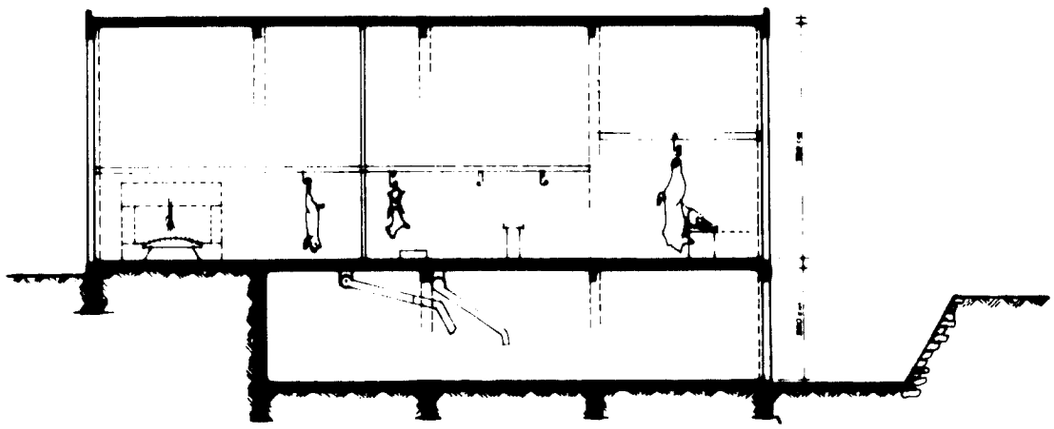
BASEMENT FLOOR PLAN



SECTION A-A

SECTION 1

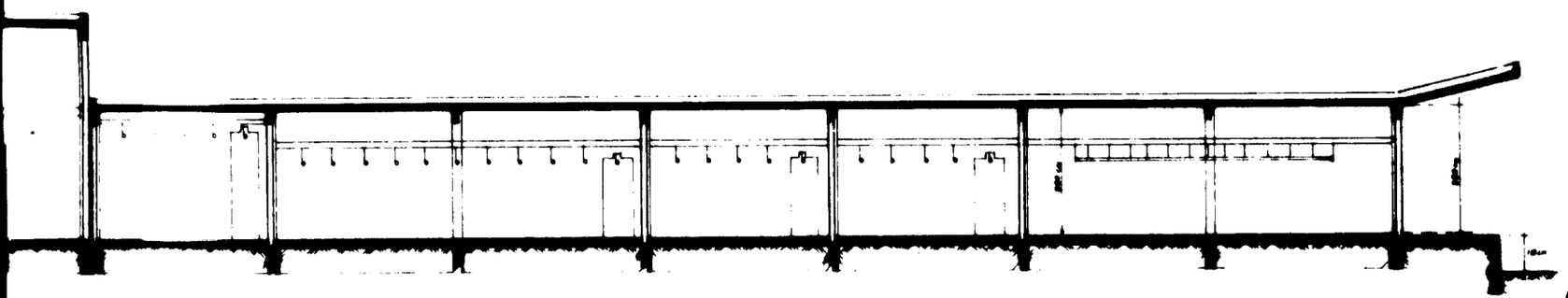
JOB TITLE	DESIGNED BY	DRAWN B
CYPRUS CENTRAL SLAUGHTERHOUSE	D POPOVIC	P T



SECTION B-B

LEGEND TO PLAN

- Economy shower (item 2a)
- Hose station with hot/cold water (item 4a)
- Hand washer unit (item 2a)
- Cold water consumer
- Hot water consumer
- Electric consumer
- Air pressure consumer
- Steam consumer



A-A

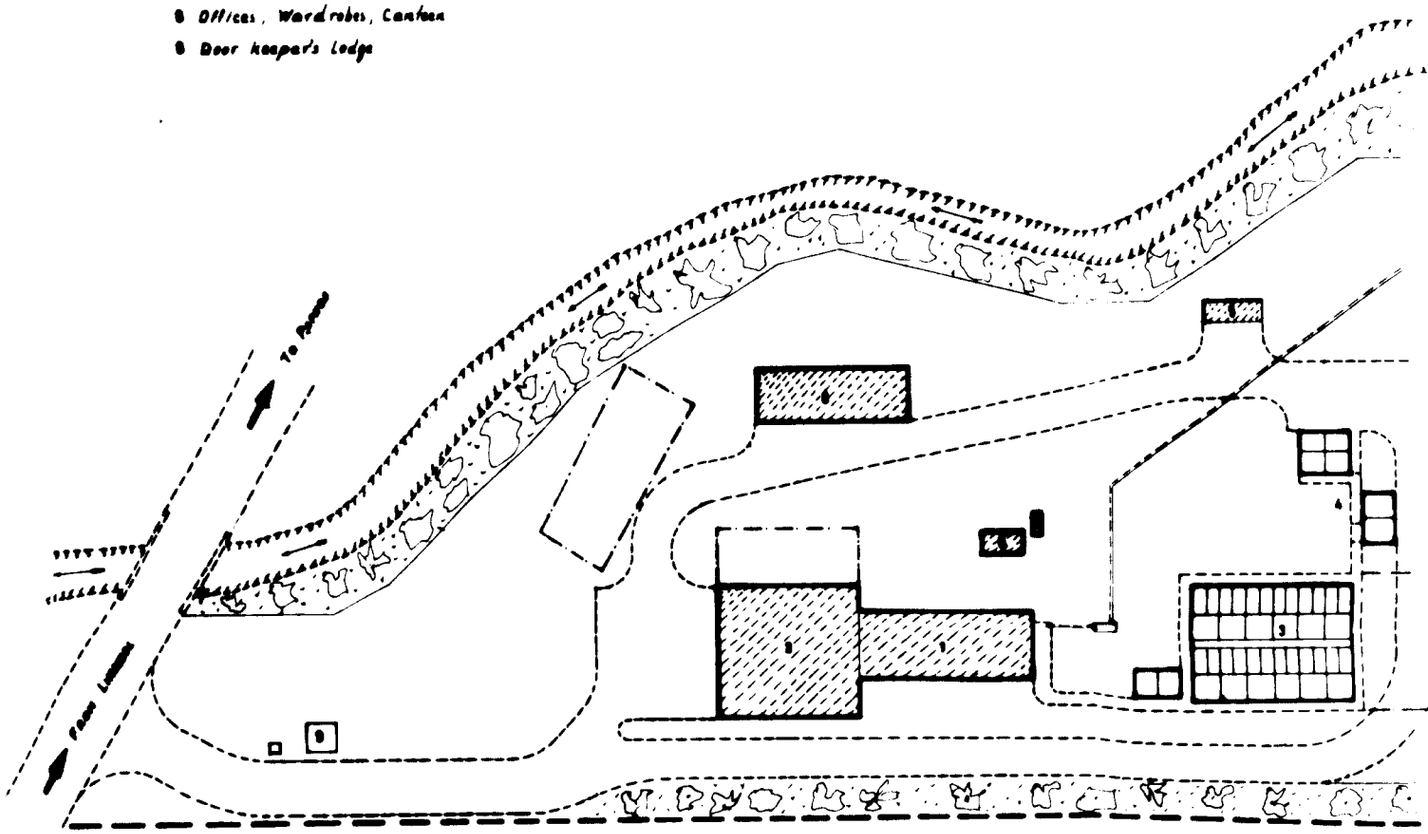
SECTION 2

	DRAWN BY: P TELEVANTOS	DATE: JULY 1978	SCALE: 1:200	DRAWING TITLE: TECHNOLOGICAL BASEMENT FLOOR PLAN & PLAN SECTIONS	DRNG Nº 5

REVISIONS

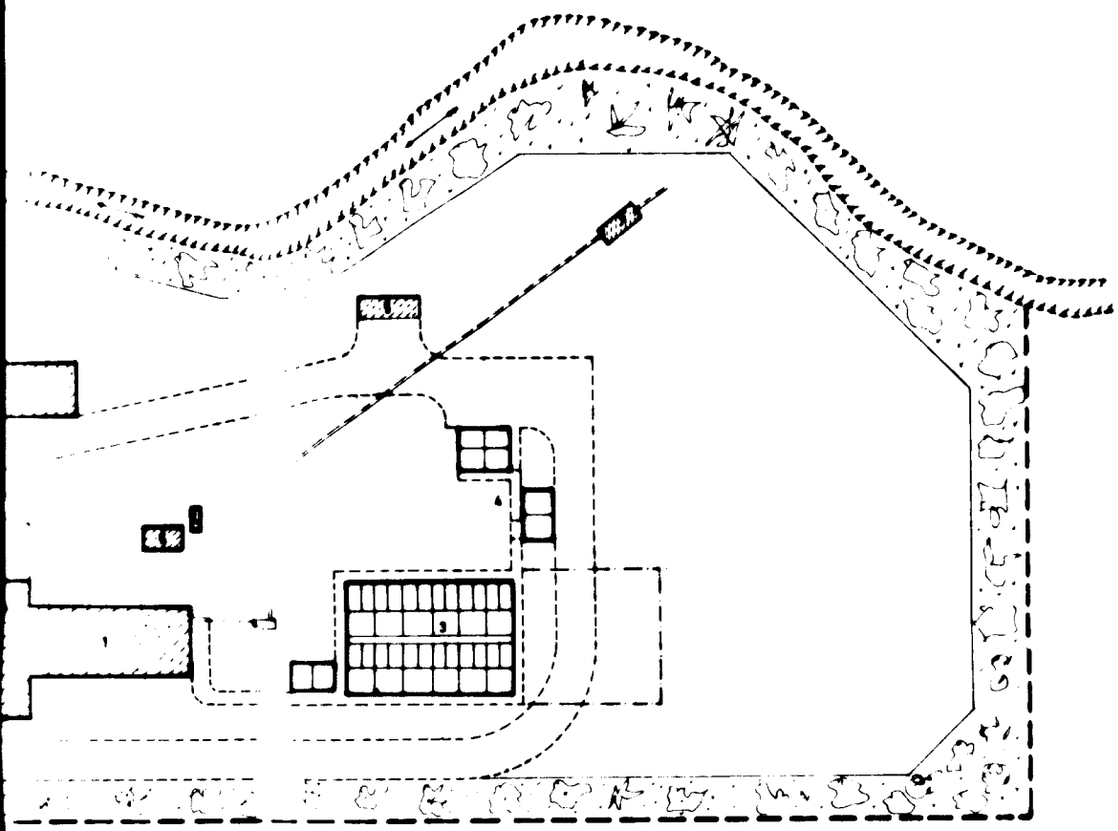
LEGEND

1 Slaughterhouse
2 Cold Block
3 Lairage Area (Quarantead Area)
4 Unloading & Inspection Ramp
5 Lorry washing Area
6 Steam Boiler Station
7 Sewage System
8 Offices, Wardrobes, Canteen
9 Door keeper's Lodge



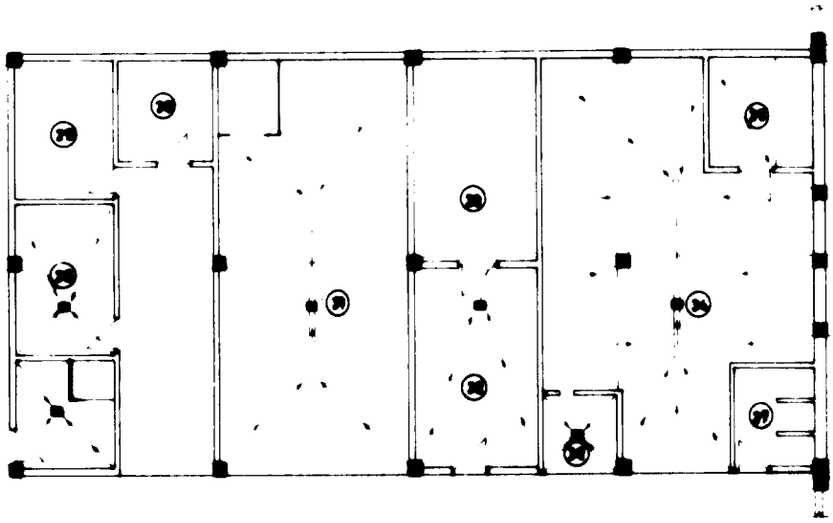
JOB TITLE	DESIGNED BY	DRAWN BY	DATE
PAPHOS MUNICIPAL SLAUGHTERHOUSE	D. POPOVIC	P. TELEVANTOS	JU

SECTION 1

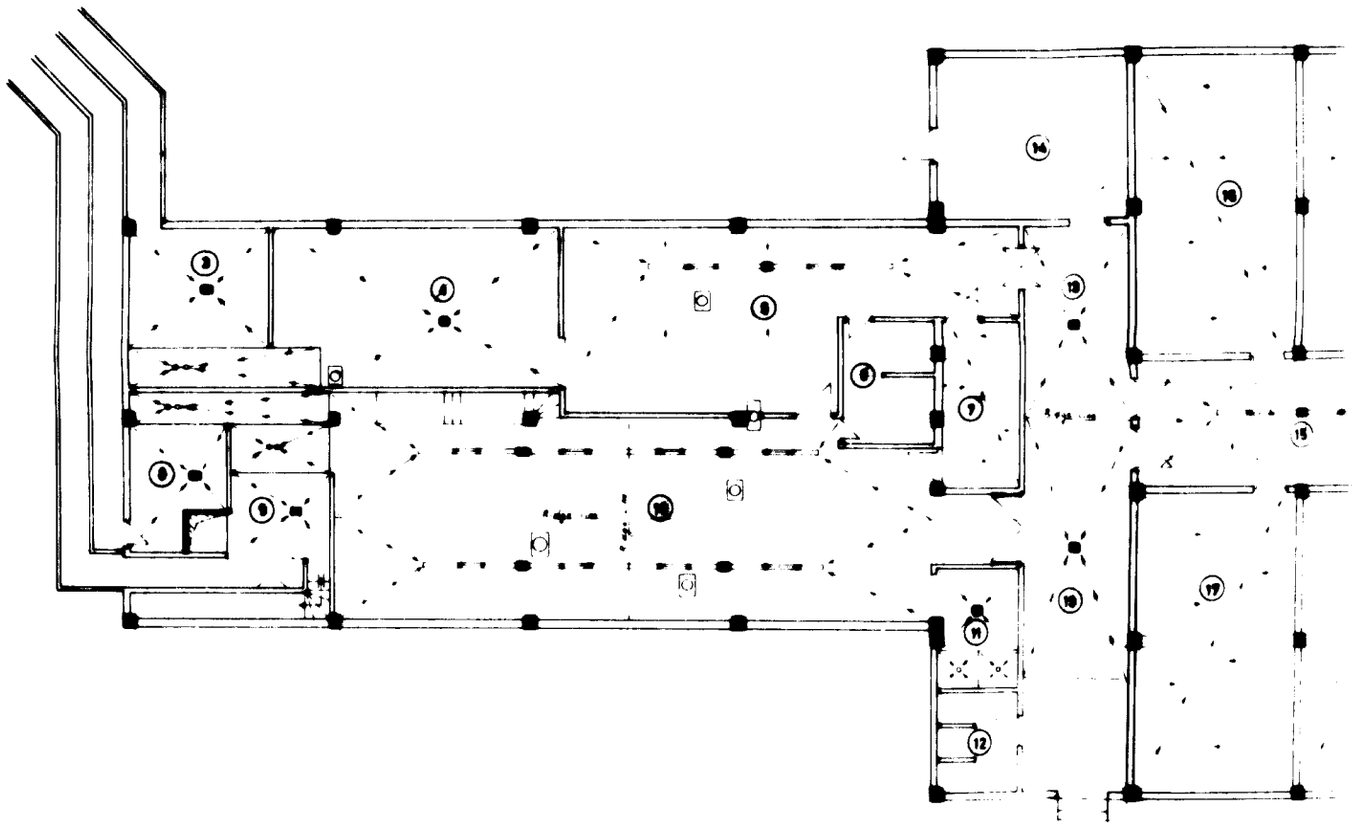


REVISIONS					
ED BY	DRAWN BY	DATE	SCALE	DRAWING TITLE	DWG. No.
POPOVIC	P TELEVANTOS	JULY 1978	1:1.000	SITE PLAN POSITION OF BUILDINGS	6

SECTION 2



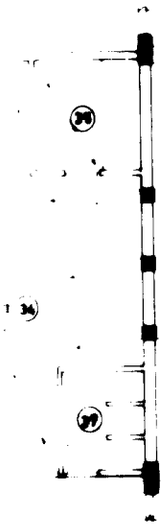
BASEMENT FLOOR PLAN

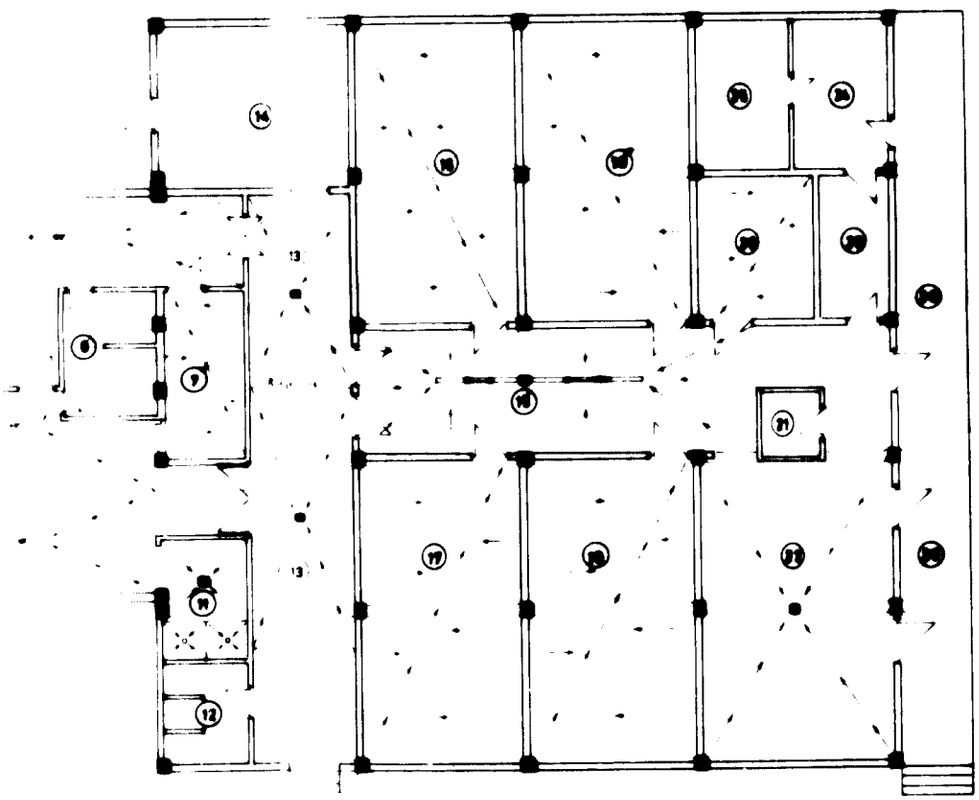


GROUND FLOOR PLAN

JOB TITLE	DESIGNED BY	DRAWN BY	DATE
PAPHOS MUNICIPAL SLAUGHTERHOUSE	D POPOVIC	TELEVANTOS	JUL

SECTION 1



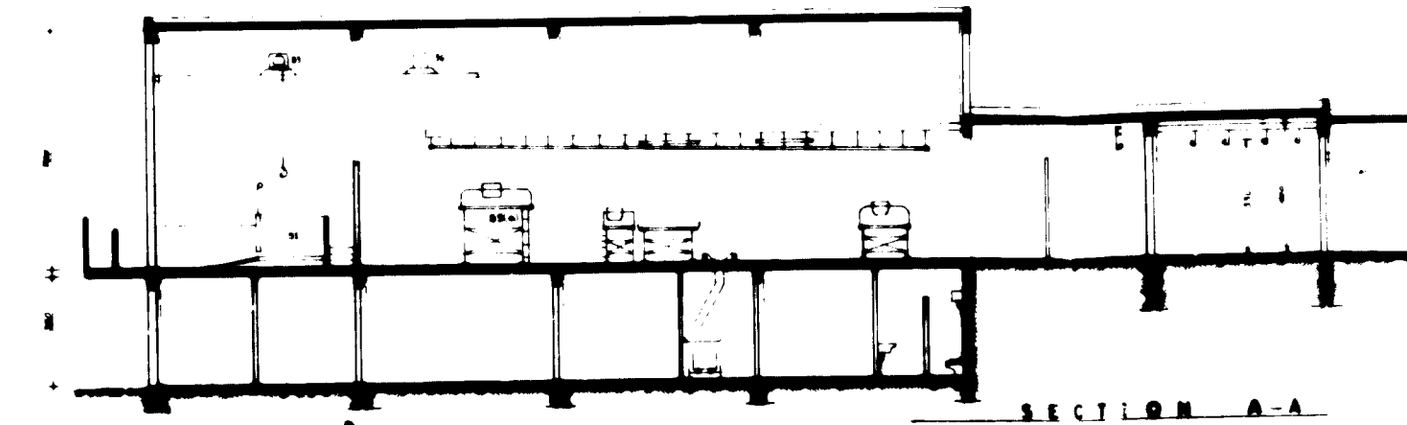


FLOOR PLAN

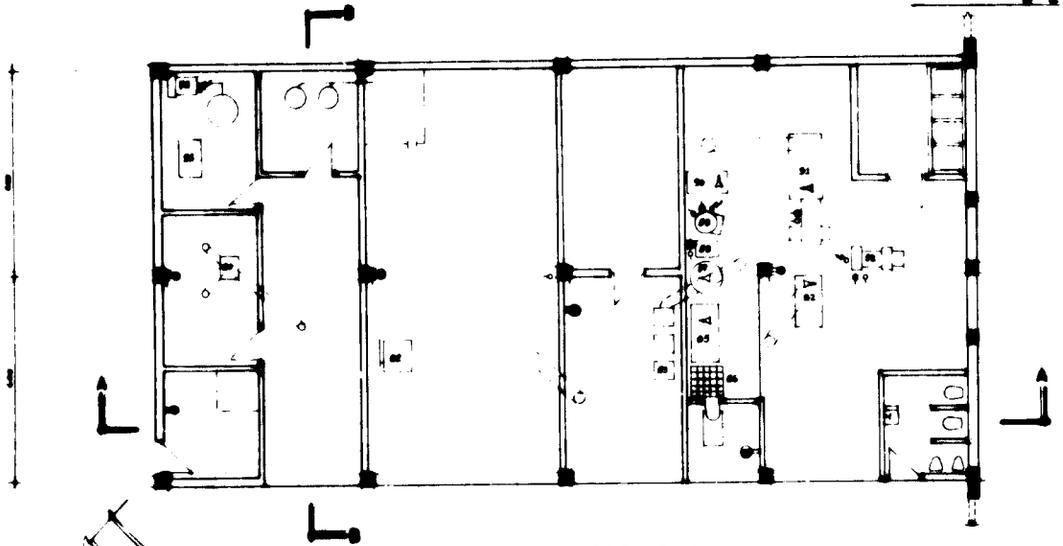
SECTION 2

SIGNED BY: D. POPOVIC	DRAWN BY: P. TELEVANTOS	DATE: JULY 1978	SCALE: 1:200	DRAWING TITLE: FLOOR SLOPES PLAN	DRG No: 7

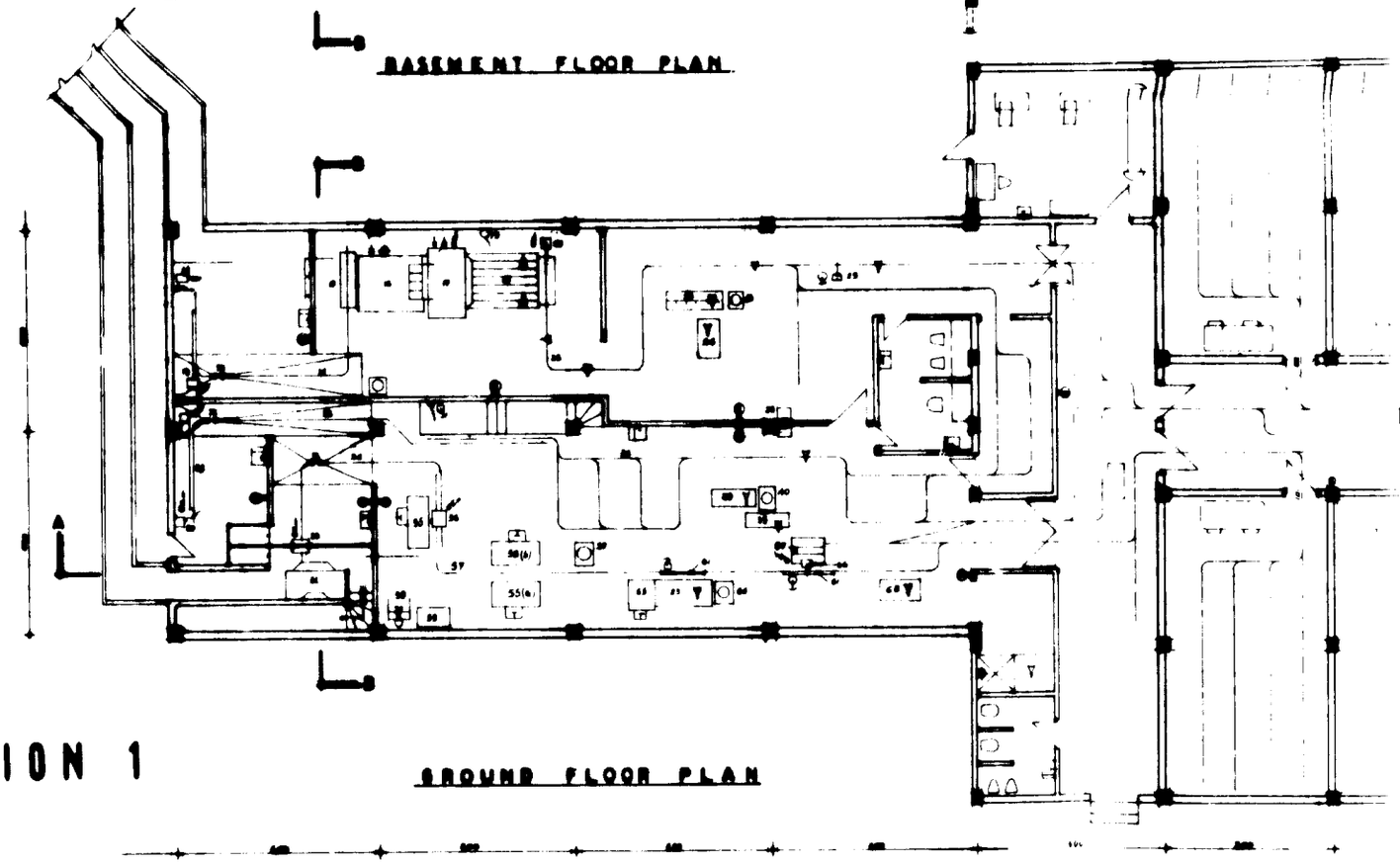
REVISIONS:



SECTION A-A



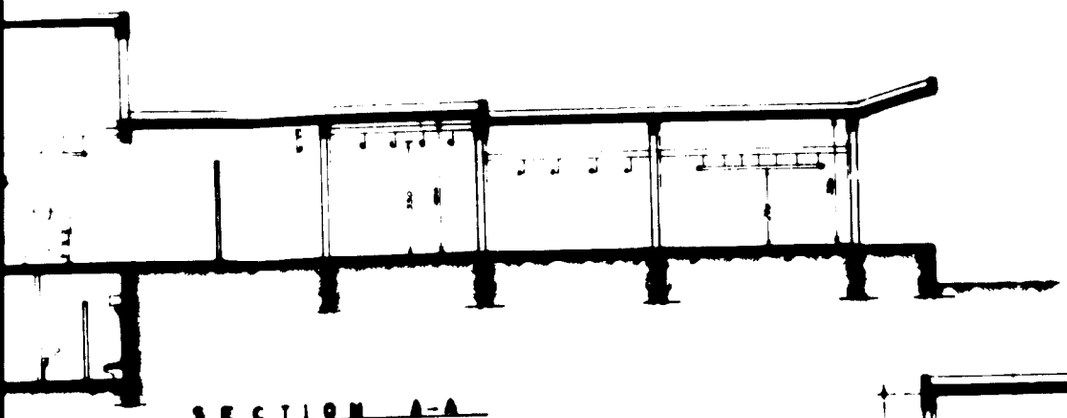
BASEMENT FLOOR PLAN



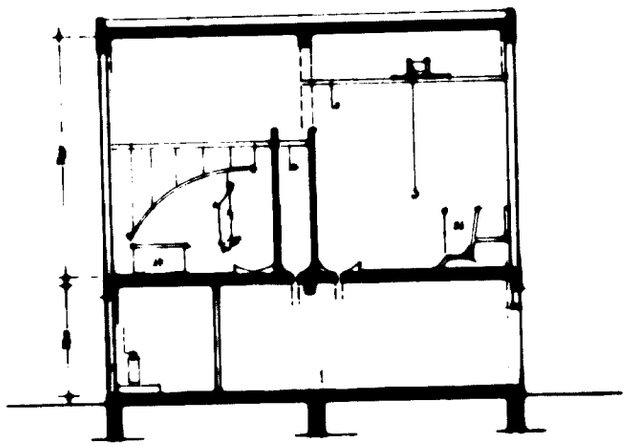
GROUND FLOOR PLAN

SECTION 1

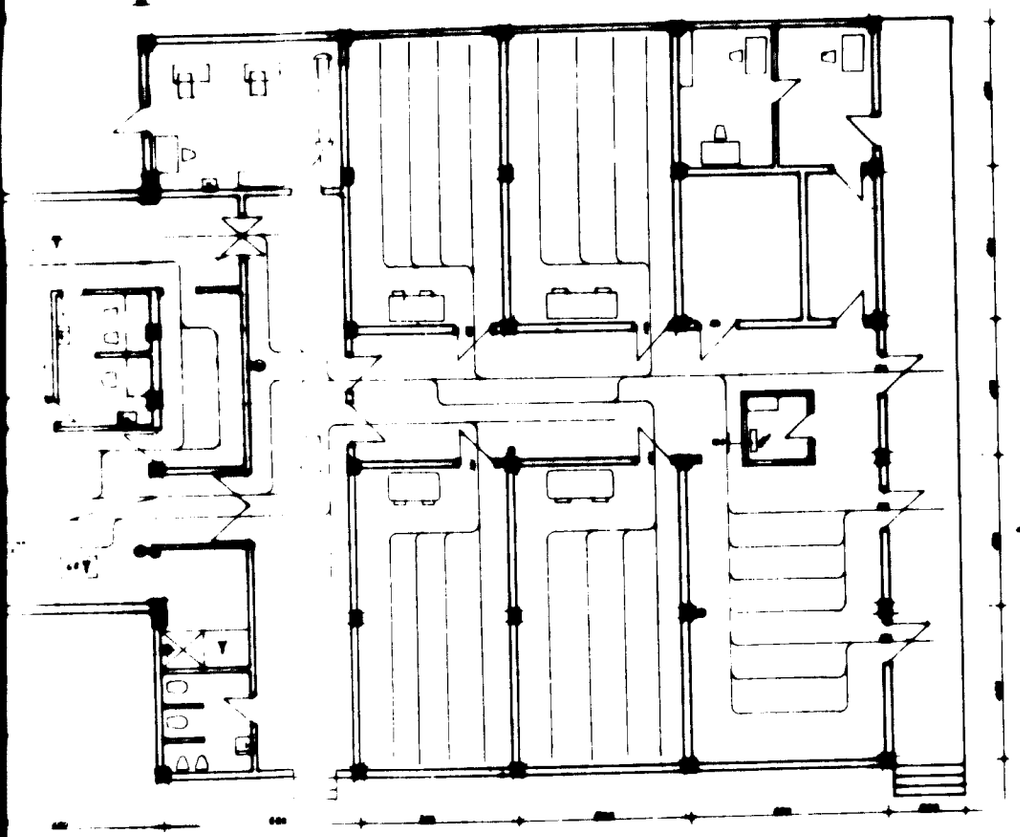
JOB TITLE	DESIGNED BY	DRAWN BY	DATE
PAPHOS MUNICIPAL SLAUGHTERHOUSE	D POPOVIC	P TELEVANTOS	JULY



SECTION A-A



SECTION B-B

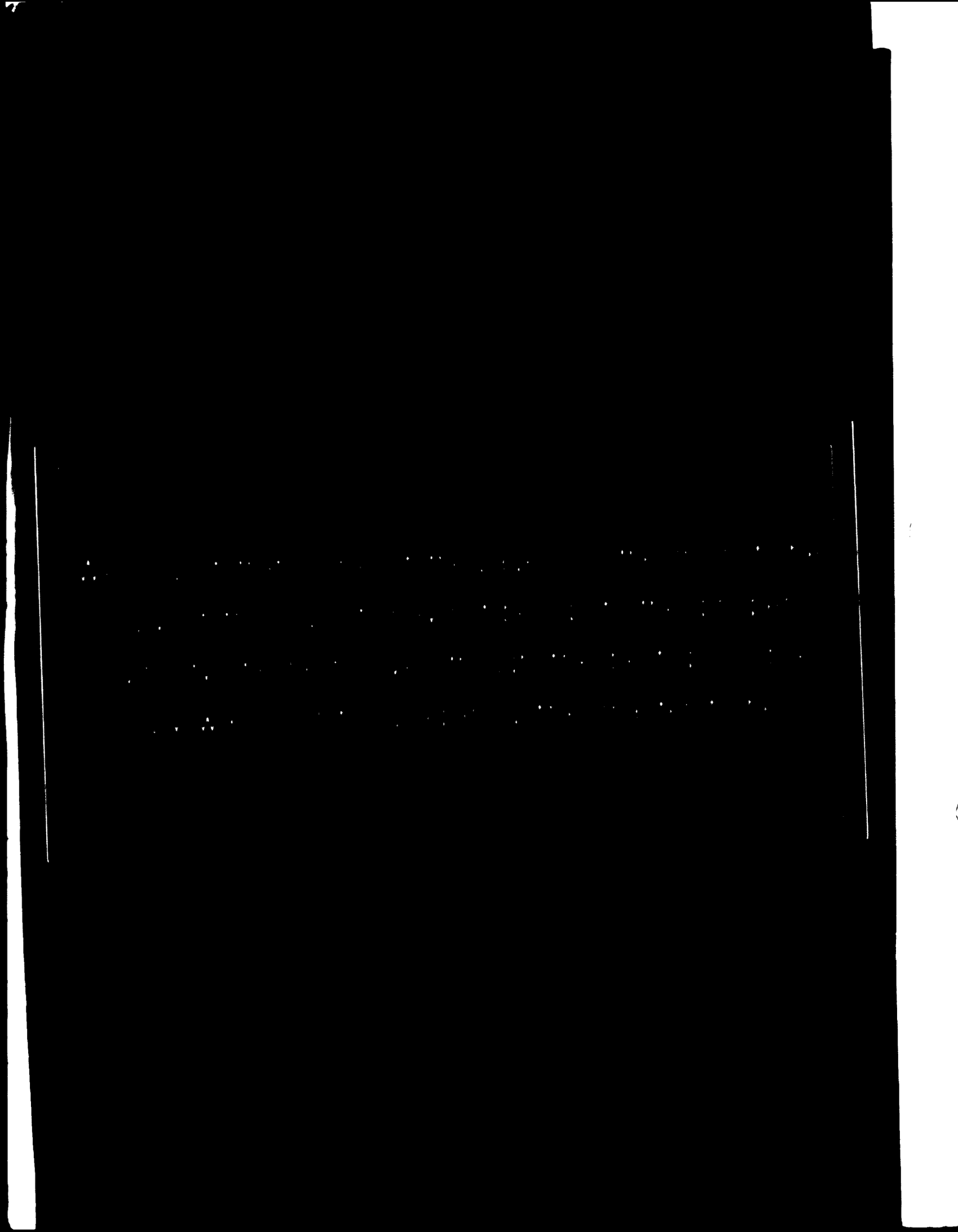


LEGEND TO PLAN

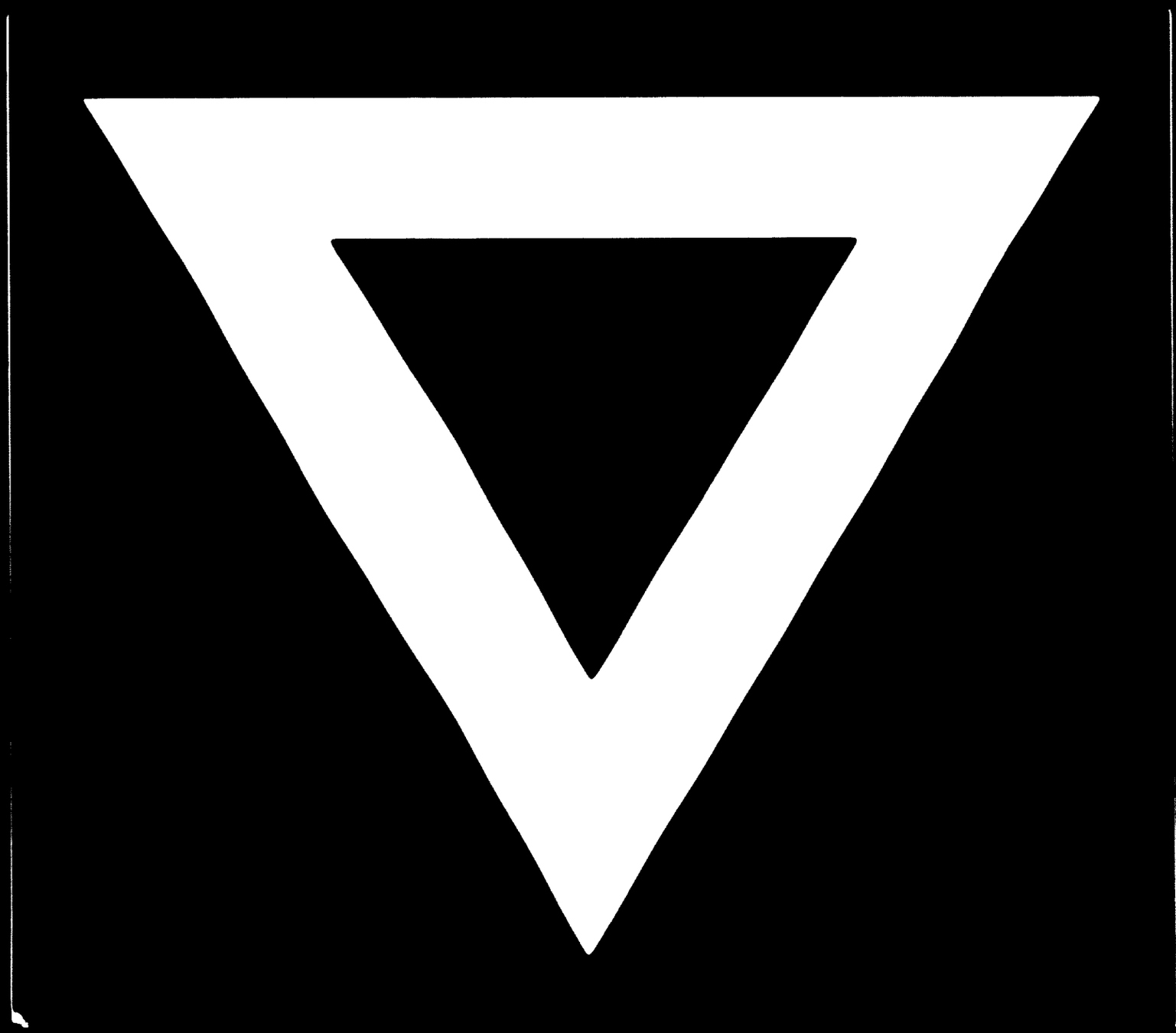
- A Shower
- Hose station with hot/cold water
- Cold water connector
- Hot water connector
- Air pressure connector
- Electric connector
- Steam connector
- Hand washer unit

SECTION 2

REVISIONS					
ED BY	DRAWN BY	DATE	SCALE	DRAWING TITLE	DWG NO
POPOVIC	P TELEVANTOS	JULY 1970	1:200	TECHNOLOGICAL PLAN & PLAN SECTIONS	8



I-499



81.05.27