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THE ARCHITECTURAL DESIGN OF
FRONTIER CUSTOMS AND POLICE BUILDING
AT DAMYEH - PALESTINE

By

SUDKI K. A. KHADR, B.A.

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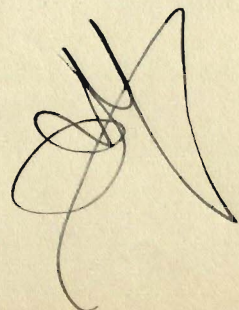
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T H E S I S
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SUDKI K. A. KHADR, B.A.

This Thesis submitted to the Civil
Engineering faculty in partial fulfilment of
the requirements for the degree of Bachelor
of Science in Civil Engineering.

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Acknowledgment

The writer wishes to express his gratitude and indebtedness to the kind help, ^{and} wise advice offered by Professor K. Yeramian in the preparation of this Thesis.

Beirut, Lebanon

May 14th, 1950

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ARTICLE I

INTRODUCTION

Damyeh: is a wide region located in the vicinity of the Jordan in Palestine 280 mts.. below sea level. It has an important strategic situation from the points of view of agriculture and trade communication. As shown in figure (1) it is 80 kilometers north east of Jerusalem and 42 kilometers east of Nablus city and is nearly in the midway between Amman (the capital of Transjordan and Haifa one of the most important harbours and commercial centres on the Mediterranean sea. Transjordan being an inland country used to import its goods via Haifa port through Jerusalem - Allenby bridge (on Jordan river) up to Amman a total distance of 270 kilometers. In 1932 the Transjordan Government commenced negotiations with the Palestine Government to construct a bridge on the Jordan river at Damyeh to shorten the way between Haifa and Amman and consequently reduce the great transportation expenditures.

Unfortunately however, the Palestine Government could not afford to construct a bridge spanning 64 mts. and a road 42 kilometers from Nablus to Damyeh. As a compromise the Palestine Government suggested to construct a short cut connecting Beisan - on north of the Jordan with Jericho - on Jerusalem Allenby Bridge - Amman road, thus saving a distance of 80 kilometers. As this road is only 4 mts. wide and is water-bound macadamized, it unfortunately did not solve the problem of transportation.

In 1939 when the second great war commenced, the British Armies in Palestine found that the existing Allenby Bridge (1)

(1) The old Allenby bridge was through highway 6" pipe truss, double screw union connection, Indian type, 2 spans each 32 mts.

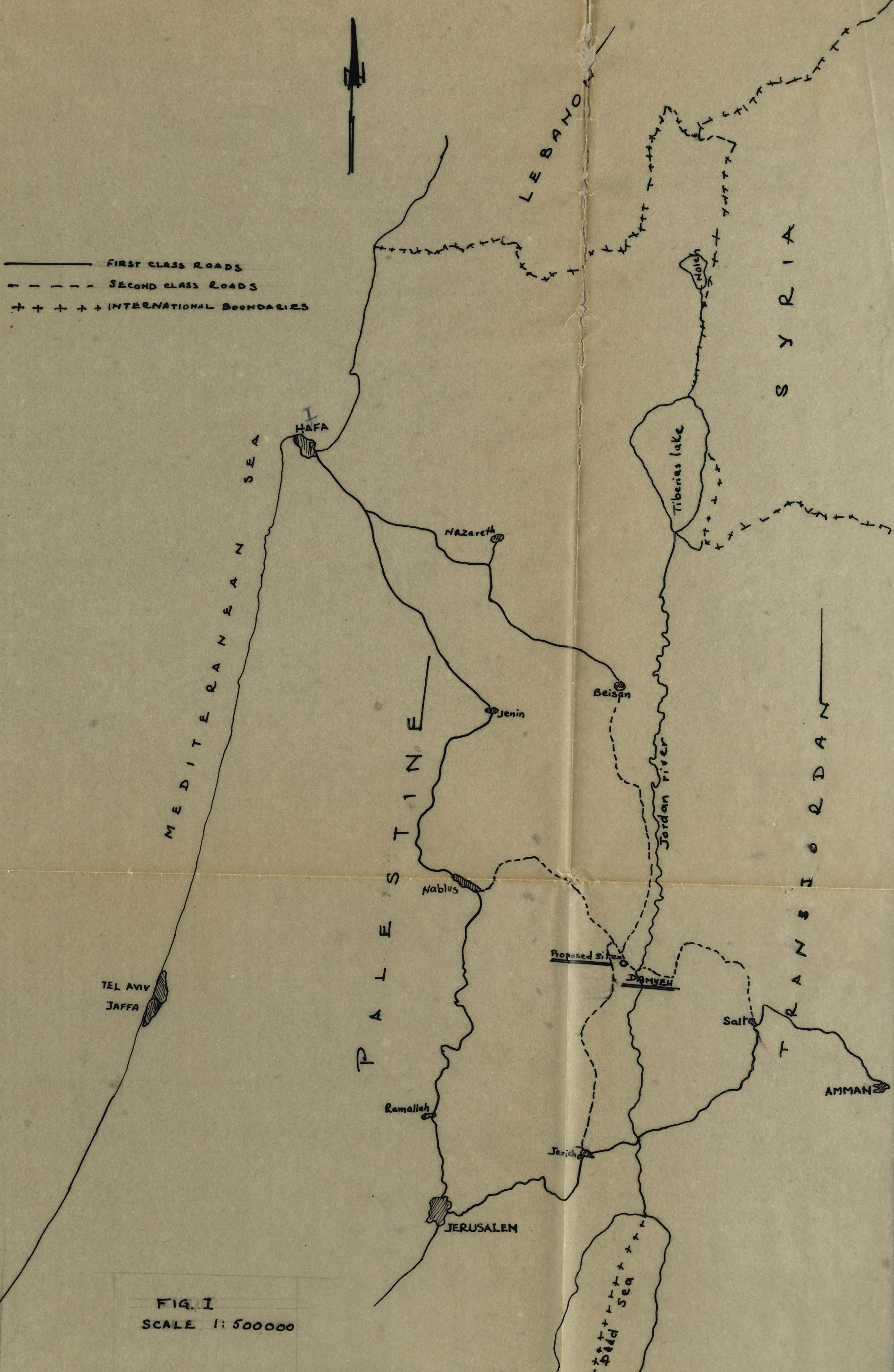


FIG. I
 SCALE 1:500000

would not fulfil the requirements for transportation of their mobile troops, so they dismantled the bridge and constructed a through steel riveted highway bridge instead. At the same time Damyeh case was raised again and finally the Palestine Government constructed that old dismantled Allenby bridge on Damyeh to serve for two main objects, the Commercial transportation and as a reserve military bridge in case of emergency. Forthwith a secondary road was constructed in 1942 between Nablus and Damyeh Bridge but unfortunately this secondary road did not serve the purpose it was made for, because the section of the road in Transjordan was not started due to financial difficulties.

On the other hand this Nablus - Damyeh road greatly increased the value of the surrounding land. Land owners started improving their agriculture by adopting modern methods in irrigation, soil improvements and plantation. There, the importance of Damyeh was realized by all people who dashed to utilize the stored fortunes in these virgin lands. Some of them settled there.

In 1945 the Transjordan Government constructed the other section of the road, thus the proposed old scheme was comparatively executed. Although this Nablus - Damyeh - Amman road was not officially open to traffic, yet few countrymen were using it to a certain extent.

During this period 1945 - 1947 large numbers of smugglers started practicing this sort of business between Transjordan and Palesting in the Damyeh region. Those smugglers formed well organized parties and became a nuisance factor on the security.

The papers as a unit asked earnestly the government to put an end to this and establish a custom station and also the people there

both the villagers and Bedwines asked to have a police building for security and defence. Palestine government gave up the idea for two reasons, one because the British administration was preparing to terminate the mandate in Palestine and secondly for political reasons concerned Transjordan and Palestine.

In 1947 - 1948 Palestine fell into a miserable and critical juncture, well known disturbances, violent fights took place which resulted in the partitioning of Palestine and a new Arab State was proposed should come into existence. There, at that instant, I realized that Damyeh will be the most convenient custom station between Palestine and Transjordan, connecting as it does the most prosperous and densely populated portion of Arab Palestine with Transjordan. Then I thought of working on a scheme comprising a custom and police building at Damyeh. This year I studied the requirements again and made the necessary plans which I hereby submit to the Engineering faculty of the American University of Beirut.

Concerning the offices, it is required to have the following:

a) A separate block located in the middle of the main road to control vehicles and goods.

b) An adjacent room on the side including a weigh.

c) Parking block for at least five vehicles.

d) Main central building common for customs and police.

The section of houses common thereto has to include the administration offices, stores, laboratory, cells, armoury, defence towers, recreation, dining, kitchen, lavatories, and servants sleeping.

ARTICLE II

REQUIREMENTS.

During the five years of employment in the public works department - Palestine, the writer has visited the custom station at Ras el Nakura, subject to an invitation by the officer in charge. As a technical man he noticed the buildings, offices. Although the offices were very small and inadequate yet he got an idea what a custom building requires. Also the writer has contacted the superintendent of police in Nablus and inquired about the number of police men required to control the security in a Danyeh region which involves about thirty thousand inhabitants, and came to the following conclusion:

The minimum number of employees required for the custom offices is, fourteen including one superintendent, 2 sergeants and others are constables, three of them assumed to be married, together with the superintendent.

Concerning the offices, it is required to have the following:

- a) A separate block located in the middle of the main road to control vehicles and goods.
- b) An adjacent room on the side including a weigh.
- c) Parking block for at least five vehicles.
- d) Main central building common for customs and police.

The section of housed customs therein has to include the administration offices, stores, laboratory, cells, armoury, defence towers, recreation, dining, kitchen, lavatories, and servants sleeping.

The minimum number of employees required for the police offices is 20 including, one superintendent, 2 sergeants, and others are constables, three of them assumed to be married together with the superintendent.

Concerning offices, it is required to have the following:

- a) A separate block located in the middle of the main road to control passports.
- b) A main central building as mentioned before common for customs and police, has to include the administration offices, stores, cells, armoury, infirmary, recreation, dining, kitchen lavatories and defence towers.

The main building includes also, engine room for generating electricity, battery room, garages, workshop, tools room, stores, stables for twenty horses, forage room, and room for saddles.

Also it must include the sleeping quarters for bachelors, library, light sports rooms as ping pong and billiard; two main reservoirs to supply the employees, married quarters and horses.

It is also required to have residential quarters for six married constables and two superintendents located a convenient distance from the main building together with an access road leading to them. All of these requirements will be tackled in details in the succeeding chapters.

Finally it is required to have on the site itself a fenced stockade to be used as a quarantine for animals, and also a tennis court.

ARTICLE III

THE SITE

The site has to be located on an elevated piece of land adjacent to the main road, it has a uniform grade northward of 1 % approximately. The land out of which the site is going to be segregated is very wide and it is a government property called Jiftlik. (1)

The writer found that an approximate area 330 M^s x 250 M^s will satisfy the requirements and has to be fenced with barbed wire and angle irons - please see the location plan drawing No. 1.

The following characteristics were considered in selecting the site.

a) Location: The site is located on the main road and is 2 kilometers eastward of Danyeh bridge.

b) Physical features of the land: The soil texture consists of hard compact clay on the upper surface, and hard pan layer below at a depth of 60 - 80 cms.

c) There is a small pure water spring 250 mts. away from the main building from which it has to be supplied with water

d) The site being higher than the surrounding areas enables the officers to defend it easily in case of attack. Also from the architectural point of view, the structure will look as a monumental fort.

(1) Jiftlik: is a Turkish name stands for the lands of the King of Ottoman Turkey - Sultan - when the first great war was over, Palestine government possessed this land as it was an ennemy property.

ARTICLE IV

BUILDING MATERIALS

The writer suggested that the building should be constructed of masonry and cement lime mortar. He based his designs on the following factors.

a) All building in the vicinity of the site are built of masonry, therefore these proposed buildings should conform with the surrounding environment.

b) The quarry out of which the stones are to be cut is about 3 kilometers away from the site. This diminishes the costs of transportation.

c) Cement in Arab Palestine is very dear, many a time it would be unavailable in the markets. It is imported from abroad.

d) That region is famous in its excellent experts in stone work such as dressers, stones builders, sculptors, and the labour work is very cheap.

e) The foundations being of hard pan 80 cms. deep made it cheap to have stone foundation and bearing walls.

f) In such a hot country it is preferable to live in a stone masonry building.

g) From the architectural point of view a stone building with defence towers and semicircular arches will have a magnificent appearance.

Quality of Stones

All stones are to be hard - Mizzi - type free from holes, vents, impurities, structural weakness and earth veins and to be of even colour and texture throughout.

All courses are to be 25 cms. high, and the length of each stone shall be at least $1\frac{1}{2}$ times its height, but no stone shall be less than 35 cms.

The general face of the building to be rough dressed with hammer - Tobje Shaff - and 10 cms. along its depth to be roughly dressed. See figure No. 2. The main entrance, jambs, reveals, soffits of lintols and arches, top of sills, set-backs, recesses, openings, face work sunk behind the general wall face and coping stones to be fine dressed with the bouchard. The inside face of walls to be roughly dressed with the dresser's chissel to form a good binding with the plaster.

Mortar to be of cement lime and consists of 1 cement to 6 sand, plus 1 slaked lime.

Foundations are to be continuous 80 cms. thick walls made of Debsh with lime mortar and a reinforced concrete foundation belt 45 x 25 cms. - See plan No. 4 -

Partitions between rooms to be of 10 cms. hollow stoneware bricks well burnt to serve as sound and temperature proof.

Beams, Columns and roofs to be of reinforced concrete 1:2:4, but the roof of the 1st floor to be ribbed hollow brick reinforced concrete (see ^{fig.} page 2).

X Debsh - Rubble masonry

ARTICLE V

THE BUILDINGS.a - The Main Central Building.

This building as it has been mentioned in article II is supposed to be built of stones. The foundation walls below the finished floor level of the ground floor are to be 45 cms. thick. It consists of to floors.

1 - Ground floor:

The surface of the ground has a grade northward of 1 %, therefore the finished floor level has to be raised one meter above the ground at the main entrance. This is obviously seen in Drawing No. 2 and 4.

The main entrance consists of 5 external wide stairs on three sides, each one is 40 cms. wide by 20 cms. high. The main gates are three, the middle one is 2 mts. wide and the side gates are 1.20 mts. The three gates are separated from one another by 2 masonry columns every one is 75 x 50 cms. each one is straight from inside and semicircular from outside - detail of steel gates is shown in fig. No.34.

The ground floor consists of:

1. Special section for customs
2. Special section for police
3. Common section for both

Customs section consists of:

Officer in charge room

Superintendent room

Assistant superintendent room

Registry room
 Laboratory for testing and analyzing materials
 Stores to preserve arrested goods
 Reserve officer room
 Armoury room
 cell room
 lavatory for the cell room
 Lavatories for employees
 Defence post
 Staircase room
 Canteen
 Recreation room
 Dining room
 Kitchen room
 Servants sleeping
 Servants lavatories

2) Police Section consists of:

Officer in charge room
 Investigation room
 Registry room
 Assistant superintendent room
 Superintendent room
 Infirmary room
 Reserve officers room
 Store
 Armoury
 Cells and lavatories
 Lavatories for employees
 Signal's room

Stair case room

Canteen

Recreation room

Kitchen room

Servants room

and Defence post

3) The Common Section for both consists of

Workshop

Tools

Fuel stores

Stables for 20 horses

Forage for stables

Saddles room

Four garages

Engine room for electricity

Battery room

and two gardens one is 20.00 x 20.00 mts. and the other is 28.00 x 11.00 mts. and are 35 cms below floor level.

Dimensions of each room together with numbers and dimensions of doors and windows are shown on drawing No. 2 & 4, they are self-explanatory.

Height of ceiling is 4:30 mts. above finished floor level. Sills of windows are 90 cms. above floor and height is 1.70 mts.

2 - First floor

This floor is shown in Drawing No. 3. It comes above the offices of customs and police only. It is meant to be sleeping quarters for bachelors of both sections.

It consists of:

3 dormitories include 16 beds. Each constable requires a bed, night table and cupboard.

3 semi private rooms include 9 beds.

1 private room includes 2 beds.

1 private room includes 1 bed.

The total number of beds is 28 beds. Referring to article II, the number of employees required for customs was 14 and for police was 22 the total is 36. Eight of them assumed to be married there remains 28 as said before.

The first floor also includes ping pong room, billiard hall, library, baths, lavatories and spare rooms in the towers.

Dimensions of each room, together with numbers and dimensions of doors and windows are shown on drawing No. 3 which is self-explanatory. Height of ceiling is 4.30 mts. above floor. Thickness of the walls is 35 cms.

b - Control offices block:

This block is shown in drawing number 5.

It consists of two main identical offices, one for control of passports and the other for control of vehicles and goods. Each one is 8 x 4 mts. with one edge straight and the other semicircular. Also it has 4 front circular windows every one 1.00 x 1.70 and 6 hatches each three on one side of the road and every one is 1.00 x 0.80 mts. with a smooth concrete slab sill.

These two control offices are connected with a covered passage 2.40 mts. wide. This passage takes the shape of a pargula, having 3 concrete square columns on each side. Two concrete reinforced concrete slabs each 1.30 mts. wide and 90 cms. high are laid

on the sides of this covered passage, to serve as a table for fetching baggages (please see Drawing No. 5) thickness of walls and stones are similar to those of the main building.

c - Vehicle Parking block:

As showing in Drawing No. 5 it is a rectangular block 8 mts. north of the control block on the other side of the road. It consists of a cafe and restaurant 7.70 x 6.00 mts. 2 lavatories, one for men and the other for ladies, and a parking place for five vehicles having 5 corrugated zinc doors 3 mts. each and 5 doors each 2.00 x 1.20. The roof is designed to be of hard eternite sloping to the back of the block. Height of roof is $\frac{4.70}{5}$ mts. in the front and $\frac{3.70}{4}$ mts. at the back.

Foundations, thickness of walls and stones are similar to those of the main building.

d - Residential Quarters for married officers:

These quarters are located 13 mts. to the south of the nearest point in the main central building, (please see Drawing No. 1) They are of a U shape, the main frontage is directed to the south so that the rooms will have an ample period of exposure to sunlight. The West side is along the continuation of the longest west edge of the main building.

The quarters were designed to consist of 2 floors; as shown in Drawing No. 5. The ground floor consists of six flats, The 4 flats at the wings of the \cup are all identical. The middle two are nearly equal to the other 4 except they have no stores, instead, each flat has 2 built-in cupboards and a stair case at the middle.

Every flat has got an area of 96 M^2 , it consists of:

1 hall and dining room	3.50 x 4.50 mts.
1 salon	3.50 x 4.20 "
1 Bedroom	3.50 x 4.20 "
1 Kitchen	3.50 x 4.20 "
1 Bath and W.C.	2.30 x 2.30 "
1 Store	2.30 x 2.10 "

In case one sleeping room will not be sufficient, the existing salon will be converted to a bed room and the hall to be used as a reception salon.

The finished level floor of this block is raised 85 cms. above ground surface. Height of ceiling is 4.10 cms. above floor.

The front floor is designed above the middle part of the residential block and consists of two flats each one has got the following rooms:

1 salon	4.10 x 3.80 mts.
1 Dining room	4.40 x 3.80 "
1 Bed room	4.40 x 3.70 "
1 Bed room	3.50 x 4.10 "
1 Kitchen	3.40 x 3.70 "
1 Bath and W.C.	2.20 x 2.30 "

The height of this floor is 4.10 mts. above floor and thickness of the walls is 35 cms.

e - Weigh room

It is a very simple room 3.00 x 4.00 mts. located 16 mts. away from the center of the road (see layout plan, Drawing No.1) and has a steel weigh platform 3.00 x 6.00 mts. Walls are 40 cms. thick height of room 3.75 mts. above finished floor level.

ARTICLE VI

LAYOUT

This article comprises a brief explanation of layout plan drawing No. 1.

The fence around the boundaries of the site consists of barbed wire 2.00 mts high fixed on angle irons 4 cms. x 4 cms. x 0.4 cms. spaced 2 mts. center to center. Each angle iron is 2.5 mts long, 50 cms. are anchored into a concrete base 40 x 40 cms. x 40 cms. deep. The fence is of a rectangular shape 330 x 250 mts, a total length of 1160 mts.

2 entrance steel gates 2 mts. wide are located at the middle of the main road. 2, 4" steel pipe barriers are located each 5 mts. to the front of the main gate, it is 6 mts. long used to control the traffic motion, and it is of the type which moves vertically.

The portion of the main road inside the fence is a double lane each lane is 10 mts wide and has a central longitudinal space 4.80 mts. wide.

Control block is located at the middle space between the two lanes. Restaurant and parking block are located on the north edge of the road.

The nearest building line of the main central building is 30 mts. to the south of the center of the main road. The building is parallel to the road, and the main frontage faces the main road also.

In front of the main entrance there is a beautiful asphalted yard having 3 traffic islands (shown in drawing No. 1)

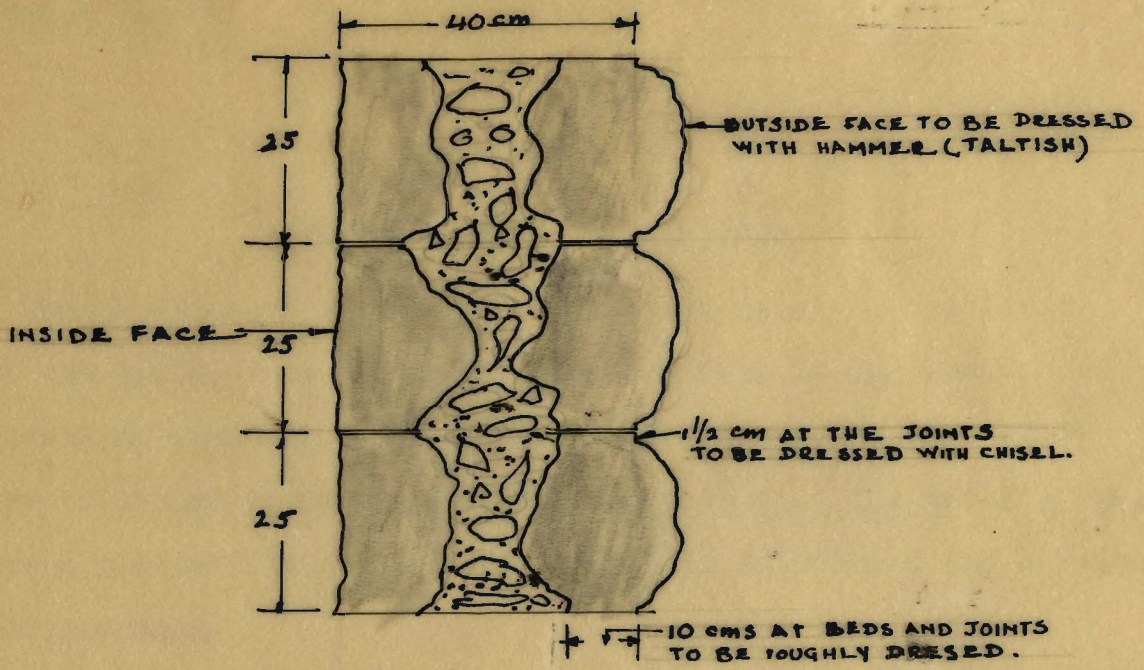
The weigh as mentioned in article V is 16 mts. south of the centre of the road.

An access road 4 mts. wide branches from the main road leading to the garages inside the main building and to the residential quarters.

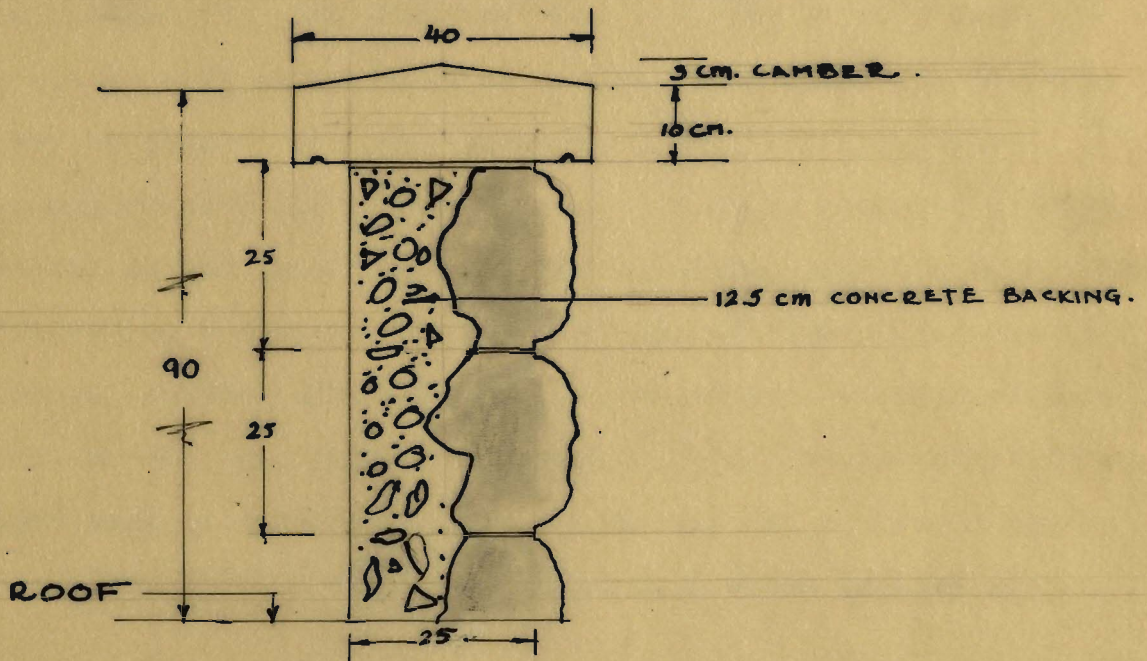
Residential quarters, are shown on the drawing and are 13 mts. to the south of the main central building.

Moreover there is a tennis court 50.0 mts. east of the main building and 70.0 mts. southward from the center of the main road.

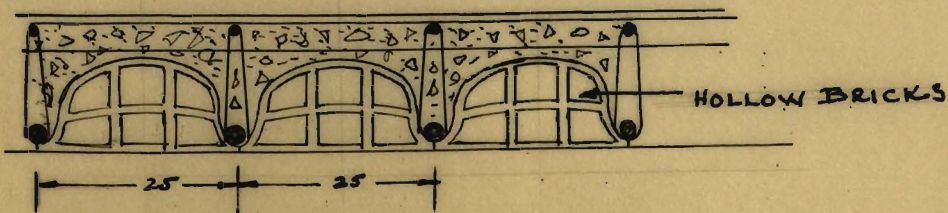
Also a stockade is located at the extreme south east corner.



TYPICAL SECTION OF THE WALL
1:10



TYPICAL SECTION OF PARAPET WALL AND COPING 1:10



DETAIL FOR THE ROOF OF 1ST FLOOR 1:10

FIG. 2

ARTICLE VII

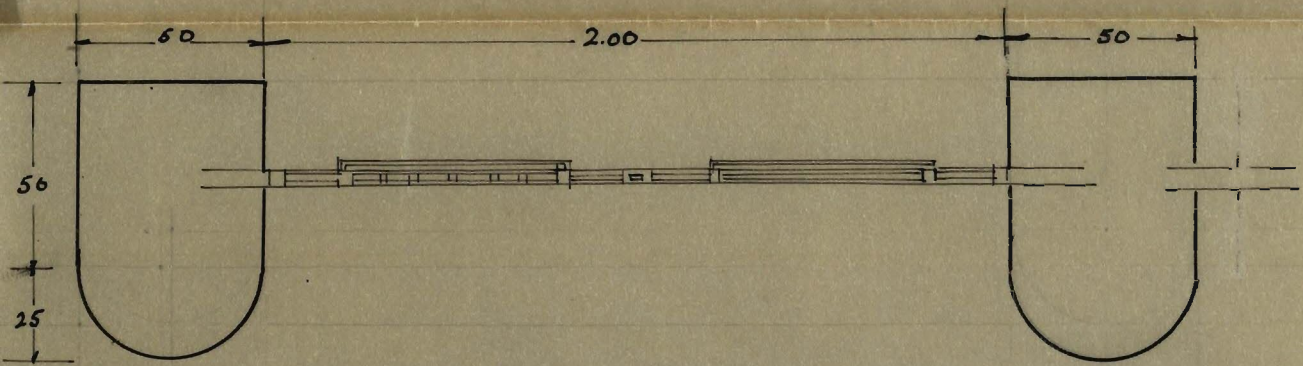
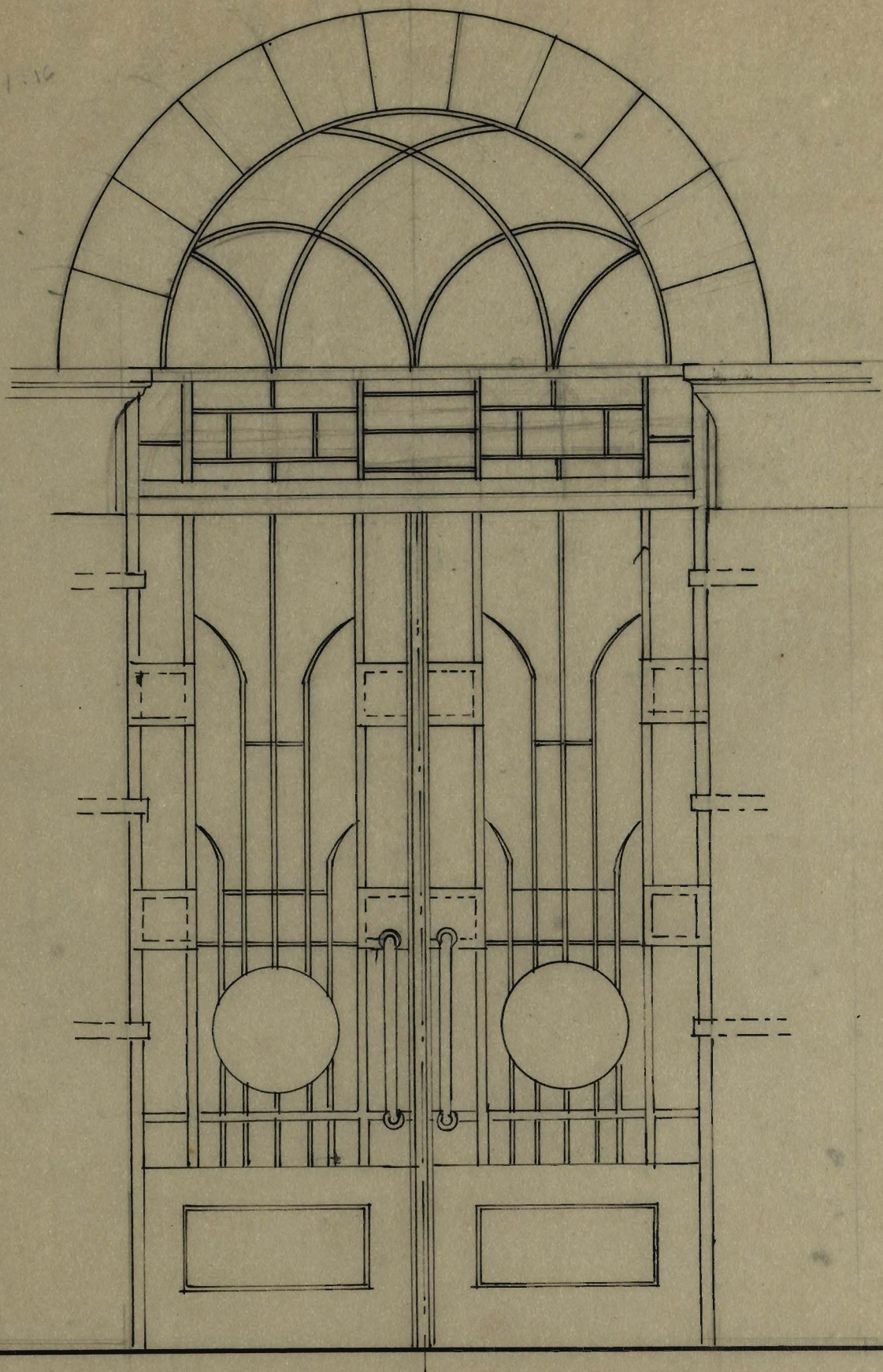
ARCHITECTURAL CONSIDERATIONS

Though the main building is neither a palace nor a luxury resort the designer meant to give the building an impressive Architectural characteristics. He is of the opinion that stone masonry buildings render a real sense of beauty. The building has to have a pleasant appearance together with smoothness and simplicity of planning.

As a matter of fact these conditions can^{be} acquired by combining simple modern architecture with an Arabesque type called Saracen architecture. The designer does not like to have huge building blocks with panel walls as a monolithic piece all through, that is why he planned too many corners in the building, thus giving an opportunity for the eye to move from one block to another.

Looking at the main facade of the building, plan No. 4, a plinth projecting 3 cms. at the finished ground floor level around the building. Another dressed stone course 25 cms. is also projecting 2 cms. at the top, between the ground floor and the first floor. The parapet wall is recessed 5 cms. on the top and a dressed coping stone 40 cms. projecting 7 1/2 cms. from both sides (please see fig. 2)

It is well believed that the main entrance to a building should be the most influential part on which reflects the architectural characteristic to that building. This is why the designer planned the main entrance to consist of broad stairs ending with a wide landing 9.00 mts. x 2 mts. and 2 front dwarf columns 90 cms. high.



DETAIL OF MAIN INTERMEDIATE STEEL GATE 1:20

FIG. 3

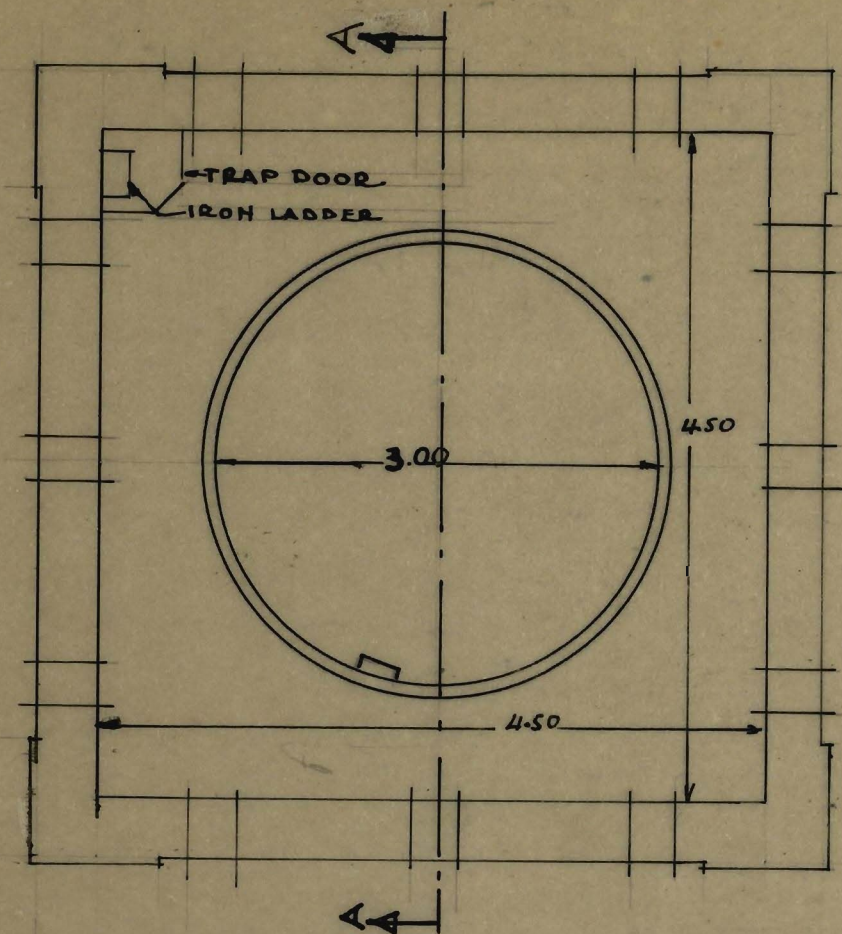
The main front panel wall 9 mts. long projects 20 cms. outside with 4 stone columns 75 x 50 cms. made of a straight edge in the back and semicircular in the front having a radius of 25 cms. (See drawing No. 2 and 6) Every column is mounted with a capital 50 cms. high, above which a semicircular arch is built (see Drawing No.4). Above these three arches the designer did not intend to adopt the same pattern in the second floor so as to break the unreasonable continuity, he used a flat arch above the columns with a projecting cornice to introduce the element of modern architecture.

The two blocks on the two sides of the main entrance are intended to give a vertical effect, to accentuate this effect the two windows were combined together with a vertical rectangular recess 5 cms. The middle entrance wall was raised 10 mts. above floor level and finished with a cornice, while the two side walls were raised 4 mts. and ended with a small recess 20 cms. deep. The high middle wall on which the clock is located was recessed 40 cms., raised 2.5 mts. above the top of the front middle wall. These 4 walls, intermingled together gave the impressive effect sought.

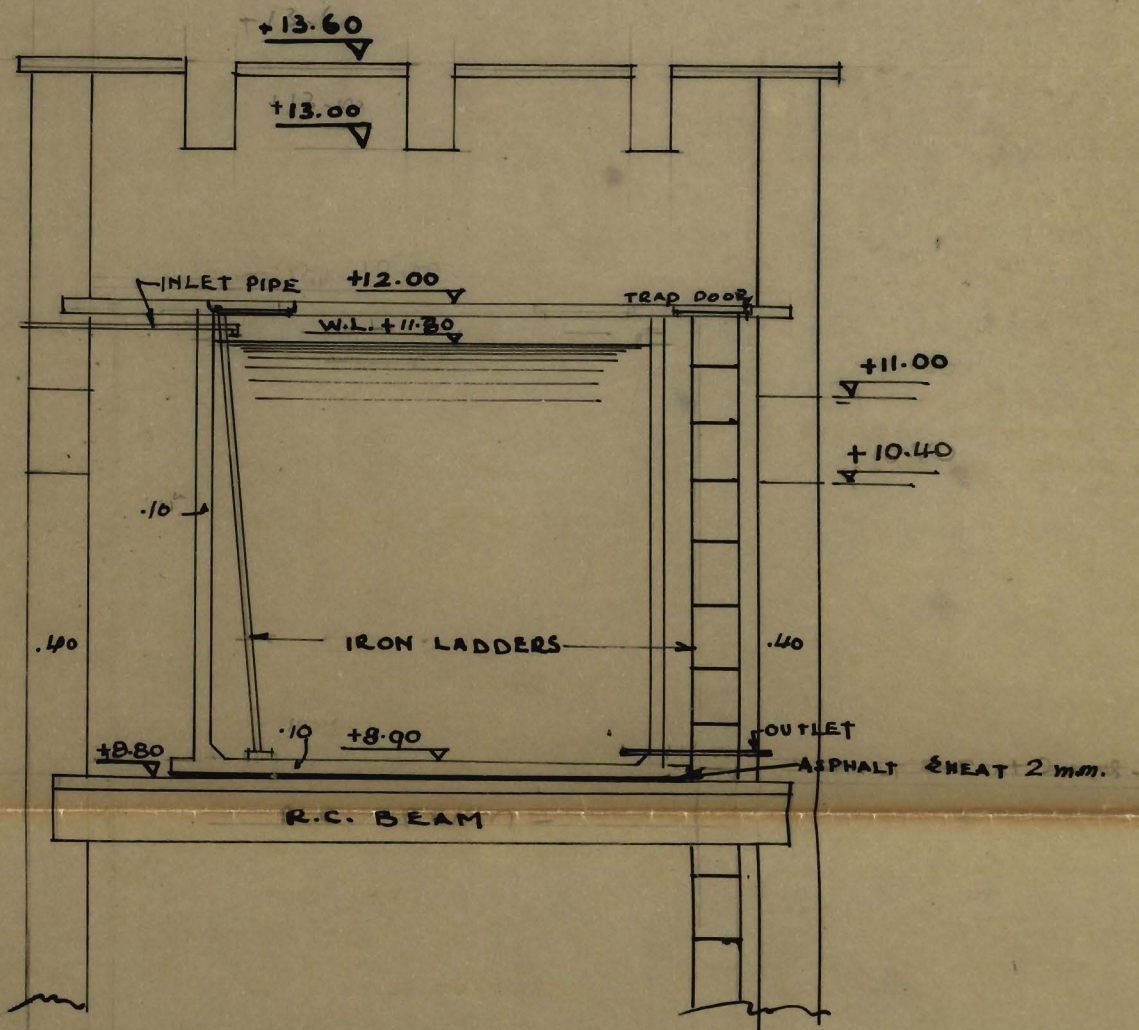
The two horizontal cornices enclosing the windows of the main offices give the horizontal sense in contrast to the vertical effect of the main entrance.

The semicircular arches of the terraces on top are intended to break the monotony and introduce a variation to the architectural treatment of the main façade.

The towers together with their projecting quoins and loop windows give a sense of stability and strength.



PLAN OF SECOND FLOOR OF TOWER 1:50



SECTION A-A 1:50

N.B: ELEVATIONS SHOWN ARE REFERED TO FLOOR LEVEL OF GROUND FLOOR

FIG. 4

ARTICLE VIII

MISCELLANEOUS

All window sills are to be ninety cms. above flour level and 170cms. high. All doors to be 250 cms. high, the door itself is 210cms. and a fan light of 40cms. Doors and windows are to be made of Katrani timber, and of the filled type with a timber architrave.

Towers: Each tower is 4.5. square and 13.6 m. above finish flour level. Each ⁰flour has 12 loop holes 30X60 cms. The second ⁰flour contains a reinforced concrete water tank having an inside diameter of 3m. and a ^eheight of 3m. The depth of water is 2.80 m., the capacity 20M. ³Manhole door is in the roof of the first ⁰flour-see figure 4-. The north west tank is supposed to supply the offices and the south west to supply stables and the residential quarters.

Expansion Joints: The main building has been divided into six blocks for the sake of expansion and contraction as shown in drawing No.3.

Stables: As shown in drawing No.2 every bay is 3m.X1.80m., partitions are of concrete blocks 10cms. having a trapezoidal shape, its parallel sides are 2m. and 1m. ⁰Flour to be concrete with grooves. The manger is of quadrant shape, the radius of which is 60cm. All window are 50cm.x 80cm.

Water trough: Is to be made of reinforced concrete 60cm.x3.20m., the height is 70cm. above ground level.

ARTICLE IX

DRAWINGS

Estimate of Cost:

Built up area(ground flour)....	3336M ²	at 60L.L.	-	200160
" " " (first flour)	1070M ²	at 55L.L.	-	58850
Roads and yards	8300M ²	at 15L.L.	-	124500
Fence	1300MR	at 7L.L.	-	9100
Contingencies 10%			-	41390
Total				L.L. 454000

000

-
- 3: Plan and elevation of the main quarters, plan elevation and section of central and parking blocks scale 1:100
 - 4: Elevation and section of the main building scale 1:100
 - 5: Perspective view for the main building scale 1:100

ARTICLE IX

DRAWINGS

The drawing attache in a separate case are the following:

Drawing No.1: Lay out plan, scale 1:500

- " " 2: Plan of the main central building scale 1:100
- " " 3: Plan of the first flour of the central building scale 1:100
- " " 4: Elevation and section of the main building scale 1:100
- " " 5: Plan and elevation of the married quarters, plan elevation and section of control and parking blocks scale 1:100
- " " 6: Perspective view for the main building scale 1:100

