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THESIS

TOWN PLANNING SCHEME

OF

A RESIDENTIAL QUARTER

OF

THE VILLA TYPE .

by

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For The B . Sc . in C.E.

Under The Tutorship
Of

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INTRODUCTION

It is a plain fact that town planning is playing nowadays one of the most important roles in ^{the} development of cities and countries and their progress from the economic, hygienic, and aesthetics points of view. Most of the modern civilized nations have given this problem due attention. All well-organized municipalities have taken rules and have drawn up plans governing the development of the cities they are representing. Everywhere in modern countries, deep studies of the subject, statistics, informations are carried on by engineers and authorities; and as a result of that economic and health conditions of the people are greatly improved, and the cities became beautiful and well organized.

Looking at my home town, Irbid, I found that the situation there is totally different. The town lies in the midst of a very wide plain which gives it a good opportunity to develop according to the most modern rules of city planning. On the other hand its economic strategic position, being near the frontiers of Syria and Palestine, and lying on the Haifa-Baghdad highway, ensures for it a vast future

development. But instead of taking advantage of its position and developing as it should, the city is developing in a haphazard way which seems ugly and crooked. There is no master plan for the town, and streets are planned under the influence of notable personalities or families. There is no adequate drainage, no playgrounds, no recreational facilities or, in short, nothing of what modern town planning asks for.

Looking at this situation, I feel that it is my duty to take care of it and to try to remedy it by all means possible. That is why I have chosen "Town planning" as a topic for my thesis, in order to develop my knowledge of that subject as much as possible, so that I will be able to help the town in a useful and efficient way.

Another reason for my choosing of this topic is that I am going to start my work with actual town planning of another city near that of my home town. And I think that my work there will be a laboratory for what I have collected from the works on this thesis.

In studying up the problem I have referred to :

1. City Planning by Molen
2. Design of Residential Areas by Adams
3. Form - February, 1945
4. Lectures and conferences with Professor N. Manassah, for whom I owe a lot in preparing the thesis and whose advice was the prominent one all through my work.

Thanking Prof. N. Manassah for his cooperation and advice I hope that I have fulfilled the right treatment of the problem.

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A.U.B.

Beirut, May 25, 1945.

CHAPTER I

CITY PLANNING

City planning is the attempt to exert a well-considered control on behalf of the people of a city over the development of their physical environment as a whole.

City planning stands not only for a longer look ahead in planning municipal improvements than has been customary in the past, but especially for a broader and more penetrating vision of the interrelations between apparently distinct lines of planning in cities and regions and of the profound influence which activities carried on in one part of the field and with a view to one set of purposes may have upon conditions in another part of the field. It takes account of the influence of the street plans and depths of blocks upon the prevailing type of building and thus upon the amount of light and air and privacy in the people's dwellings; of the effect of railroad location on the distribution of factories and on the congestion of population and character of housing; of the economic interrelation between water-supply lands and park lands; of the social and economic values to be secured by grouping educational and recreational functions

which have ordinarily been separated; and of other combinations innumerable.

City planning may conveniently be considered under three main divisions: The first concerns the means of circulation -- the distribution and treatment of the spaces devoted to streets, railways, waterways, and all means of transportation and communication. The second concerns the distribution and treatment of the spaces devoted to all other public purposes. The third concerns the remaining of private lands and the character of development thereon, in so far as it is practicable for the community to control such development.

Facility of communication is the very basis for the existence of cities; improved methods of general transportation are at the root of modern phenomenon of rapid city growth; and the success of the city is more dependant upon good means of circulation than upon any other physical factor under its control.

Moreover, the area devoted to streets in most cities (excluding those undeveloped) amounts to between 20 and 40 percent of the whole and the improvement and use of all the

remainder of the city area, both in public and in private hands, is so largely controlled by the network of subdividing and communicating streets that the street plan has always been regarded as the foundation of all city planning.

The second main division of the physical environment which city planning attempts to control is a very miscellaneous one, including all the public properties in a city not used primarily for circulation, but they may be grouped into three principal classes:

Class A may be called that of central institutions, serving the whole city and requiring for convenience a comparatively central position; such as the city hall and the head offices of public departments and services, both municipal and otherwise, the public library, museums, central educational establishments and the like.

One of the greatest needs in regard to all matters of this sort is the application of intelligent effort to the grouping of such institutions as accessible points in so-called civic centers, for the sake of convenience and of increased dignity and beauty.

Class B consists of institutions serving limited areas, and therefore needing to be repeated in many different places throughout the city. Such are schools, playgrounds, gymnasias and baths, branch libraries, fire-engine houses, district offices and yards of the department of public works and other public services, neighborhood parks and recreation grounds, and so on.

Class C of public properties consists of many special institutions not demanding a central location, but serving more than a local need, such as hospitals, charitable and penal institutions, reservoirs and their ground, parkways, cemeteries, public monuments, and the like.

The Subdivision Of Land

Broadly speaking, city land, from the point of view of land subdivisions, may be put into three main classes, namely: land for industrial use, land for retail and wholesail business, and land for residential purposes. Some of the principles underlying the subdivision of such lands may be stated as follows:

1. The plan for the subdivision of property should fit the topography, and give due consideration to natural features.

2. The use that is to be made of the land should determine its general plan and restrictions, There is no plan that is best for all places, nor for the same place for all time. Merit is largely a question of fitness for its original purpose, and its adaptability for probable future purposes.

3. Thoroughfares and other broadly related city planning features, should be located first, and within these lines, and in conformity to them, local streets, blocks and lots, should be defined in the best possible manner.

4. An increase of lots or residence sites by new land subdivisions, and of the necessary streets, should be accompanied by a corresponding increase of playgrounds, parks, and other indispensable public features required by the probable population of the area when fully built up.

5. A plan for dividing land must consider not only immediate use, but also probable subsequent use, administration, and maintenance, and must, so far as possible, forecast and provide for it.

STREETS

The great importance of the street rests in the fact that it is the natural channel of all the ordinary mediums of public circulation and public service, that it is necessary to the profitable development and use of property and that only through the opportunities it may offer can there be any broad or general expression of civic art or dignity; and only to the extent to which a comprehensive, well ordered system of main thoroughfares exists can those functions be performed efficiently and economically.

The only function performed by a street, which could not be as well, and more cheaply, provided for in other ways, is that of furnishing means of circulation in the form of either through or local travel.

Two items enter into the cost of every street - land cost and construction cost. To these, where heavy grading is done, there is often added a third item, consisting of injury to abutting property caused by deep cuts and fills.

Directness and gradient differ with the different kinds of streets. Main thoroughfares must be broad and direct, and they must have easy gradients. These are usually

expensive requirements, but, where possible, they must be fully met, whatever the cost or the damage to abutting property may be. But local streets need not be broad and direct. They may be allowed to follow the natural contours of the ground, and in many places where topographic and other conditions make it difficult or undesirable to extend a street to its intersection with another, it may be possible to designate such streets with "dead ends", called "culs de sac". The gradient also may not be as easy as that of a main throughfare. Proper consideration of the injurious effect of heave cuts or fills upon abutting property as well as of the expense involved, thereby, will frequently make it appear advisable to accept gradients as steep as 15 percent, and sometimes, for short distances, grades exceeding 15 percent can be adopted.

NEIGHBORHOOD CENTERS

The neighborhood center is the group of buildings and grounds in which provision is made for the various educational, recreational, and social functions of the city. It may fairly be considered to concern, as far as anything out

of the home can, that portion of our lives which is beyond such absolute necessities of existence as safe and convenient places to eat, sleep, and work - that is, our mental, moral, and physical upbuilding.

There are, however, limits to the effective grouping of neighborhood activities, largely due to the variation in the size of the district served. Thus, children of school age are often required to attend school from a radius of a mile or more, whereas neither the little children nor adults are likely to be attracted with any frequency to playgrounds or social centers more than a fraction of that distance away. Moreover, since certain minimum provisions must be made, the element of cost is also closely bound up in the determination of the proper size of districts to be served.

Centers may comprise the following types:

1. The playground of the small child, age two to five or six.
2. The combined school and recreation plant for older children, age five or six to twelve or fourteen.
3. The combined school, vocational school (and college), and recreational facilities for youth, age twelve or fourteen to sixteen or twenty.

4. The combined social and recreational centers for adults.

Two practical difficulties at once arise in attempting to combine all these buildings and grounds in a single plant. Boys and men require large areas for outdoor games; small children will not walk habitually more than a quarter of a mile to a playground. Fortunately, boys and men will go some distance, a mile or more, to find a ball field, so that a few large athletic fields, preferably in connection with certain of the recreation centers, will meet their demands.

The needs of the small child will appear to be most adequately met by the so-called "block-playgrounds," an open space reserved in the interior of every block, where it is to be noted land is actually comparatively cheap, and an open space is already needed for light and air. These block playgrounds should have nor regularly open access to the street except through abutting property, so that a mother can let her child out into it with the assurance that he will not wander out upon the street.

The ideal location of centers is controled by three factors: First, the frequency, that is, the extent of

territory each center can serve; second, access; and third, relation to its immediate surroundings, such as streets and thoroughfares.

The first point of consideration is distance, that is, how far from home people will customarily go, or, as in the case of schools where attendance is compulsory, how far they should be expected to reach the center. Broadly speaking, a half mile is found to be close to the limit of effective service of most recreational and social facilities.

A second element is density of population within the area served. Except in very densely populated districts, however, this factor will seldom control the frequency of centers, as it is more economical to enlarge the capacity of the various units than to repeat them in additional centers.

The effect of physical conditions is closely connected with the factor of access. Barriers, such as topographical features, may be absolute as in the case of wide rivers, extensive railroad yards without crossings, cliffs and even steep hills and valleys to be crossed, extensive areas of industrial

or business property, grade crossings, and, for children at least, heavy traffic thoroughfares. Centers should be located so as to avoid, as far as possible, these hindrances to free access from within their districts.

More immediate approaches are of equal importance, as the relation of the center to its surroundings depends largely upon their arrangement. The center should be located near one or more thoroughfares, but not directly upon them, primarily on account of noise from traffic and danger to the users of the center, particularly children.

From the thoroughfares, however, adequate approaches should lead directly to the main entrance which should be plainly visible - for example, at the end of a short street - so as to be readily found. One other topographical condition is of vital importance: the ground must be level or at least capable of being graded into a few broad terraces.

This is a very brief and general word about the subject with which my thesis is concerned.

Treatment of the Problem

A plot of land about 450 x 400 m. the topography of which is shown by the contours, is to be developed into a first-class residential suburb of the villa type according to the following conditions:

1. Subdivision Plan.- Scale 1:1000 or larger showing the proposed town planning scheme with all streets, lots, public spaces, etc.
2. Profiles and Cross-Sections.- Horizontal scale 1:1000, vertical scale 1:200 or larger but in the same proportion.
3. Streets in the Suburb.- To conform to the general street plan of the locality, but reduce the connections to a maximum of 3 streets :• Two connecting the lower part of the suburb with the down-town district and one connecting one of the sides with the adjacent area.
4. The Suburb.- Is to be bounded by a protection green belt 10-15 meters wide which serves as a fence against dust storms, and accommodate a comfortable fresh air in the environment.
5. Streets.- Should be adjusted to the contour of the ground, so as to produce usable lots, and streets of reasonable gradient without excessive cuts and fills.
6. Park and Places.- Dedicated for public use should be indicated. Their area together with the area of the streets should be between 30-35% of the area of the suburb.
7. The main features of such public spaces should combine a model primary school and a community center with enough playgrounds for the students and to accommodate the inhabitants of the suburb.

8. Lot sizes should be between 600-800 sq. meters with a width of 15 - 20 m. a maximum. As far as possible the sides of the lots should be perpendicular to the boundary line.

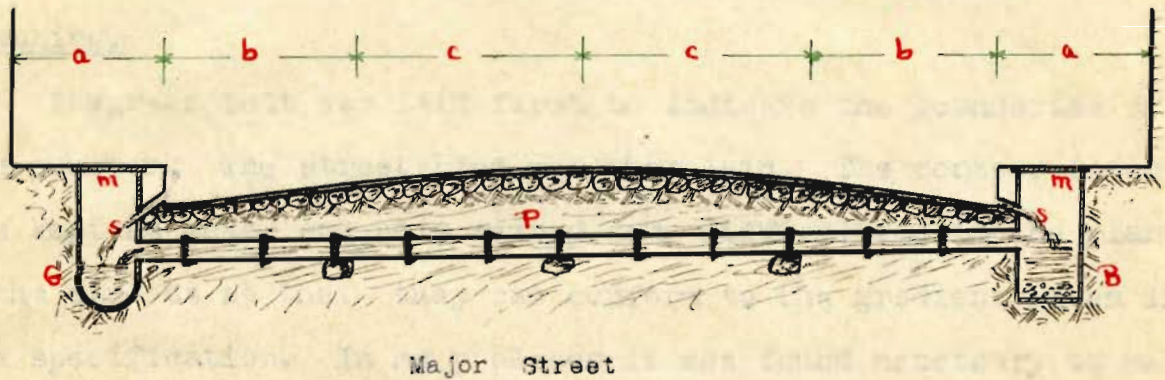
9. Blocks should have sufficient width to allow two tiers of x of lots of appropriate depth.

10. Major Streets should have a width of 15 meters and minor streets should have a width of 10 meters.

11. Use alleys and courts but provide turning places for vehicles.

12. Prodients in major and minor streets make more than 6% but this limit was exceeded with agreement of my adviser.

13. Corners of property lines should be rounded off by an arc at intersections of streets. Raddi of such arcs should have a minimum of 5 m. for major streets and 3 m. for minor streets. In round x about place this are depends upon the No. of streets distributed from that point.



- a- Side-walk 2.6 m.
- b- Parking 2.5 m.
- c- Moving car 03.0 m.
- B- Catch basin
- G- Gutters
- m- Cover
- s- Steel sheet against rats.

Chapter III
P L A N N I N G

Site.

The plat is situated at a distance of about 500 meters to the north of the down town district. It is a sloping piece of ground with its northern boundary being 60 meters higher than its southern one. A wadi crosses it from north to south.

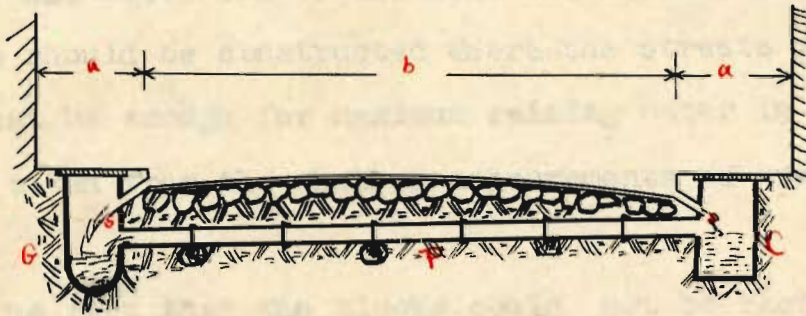
Planning.

The green belt was laid first to indicate the boundaries of the quarter. The street plan was then laid. The contour interval was kept as meter and this raised some difficulties in the planning of the streets so that they can conform to the gradient given in the specification. In many places it was found necessary to make the streets conform with the contours and thus the blocks could not be rectangular. In street C-D the difference in elevation between point D and C is 18 m. and the distance is 90m.

So if the street was to join with point G the gradient would have come out to be around 20% which is very high. The only solution was that to make it a "dead street" with a "cul-de-sac" to provide for the turning of vehicles.

Cul-de-sac at point s and Q were found necessary so that the lots would have a street frontage without becoming very deep.

The side walks in the major streets are made 2 meters wide in the minor streets 1.50 to ensure easy circulation of inhabitants.



Minor Street .

- a - Sidewalk 1.50 m .
- b - Moving Cars 7.00 m .
- G - Gutters .
- S - Steel Plate Against Rats .
- C - Catch Basen .
- P - Pipe Connecting The Catch Basen With The Gutters

The drains are laid underneath one of the side walks, on the other side there is a catch basin every 30 meters intervals and it is connected to the drains through underneath the street by a 12" concrete pipe. The bottom of the catch basin should be lower than the outlet pipe connecting it with the drains on the other side of the street, this will ensure the accumulation stones and silt at the bottom; otherwise the pipe under the street will be closed. All drain's water are converted to the wadi out of the suburb.

Culverts should be constructed where the streets crosses the Wadi, they must be enough for maximum raining water in that suburb which can be taken from the whether measurements of rain fall.

Blocks.

Due to the fact that the blocks could not be rectangular, their corners had to be rounded with an arc not less than 3 meters in minor streets and 5 meters in major streets.

Park.

A park planted with trees is to be constructed on the north west corner; because of the steep surface where residential buildings are not comfortable.

Suburb Center.

In the centre of the suburb, where such place suites all the residents of the suburb. A school with its garden and playground is to be constructed for the accommodation of the inhabitants. And besides the school there is a club house and a tennis court are to be planned in the place indicated on the plan. For that place is in the centre of the different blocks and for the Wadi and most of

all, and because that spot is more flater than any other spot in the centre, gives it the superiority and convenience for such activities.

No doubt that such suburb should be provide with a small commercial place as it is indicated in the plan. The place planned for graucery, borbor , butcher, shoe maker etc. to accommodate the needs of the inhabitants and to satisfy their requirements.
