ARCHITECTURAL DESIGN

of a

COMMERCIAL CENTER

in

HOMS - SYRIA

Ву

Muhammed Nazif Atassi

May, 1951

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ATASSI

May , 1951

Thesis submitted to the Civil Engineering Faculty
in partial fulfillment of the requirement for the degree of
Bachelor of Science in Civil Engineering.

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The candidate is delighted to take this opportunity to express his deepest gratitude to Professor N. Manassah, for his most valuable advices which proved to be indispensable in the realization of this project.

M. Nazif ATASSI.

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1- INTRODUCTION

Homs is a city in the heart of Syria. It has an important position, being midway between the shore and the interior part of the country.

It is an old city, and being built on the trading routes, it became an important trading center on the way between Mesopotamia, the western, and southern parts of Syria.

Under Roman rule the city prospered: irrigation systems were founded and roads were opened, the remains of which are still existing, rendering the city an agricultural as well as a commercial center.

In the sixth century A.D. the Arabs came to rule followed to the Turks and finally by the French, the city in each case adopted itself to the corresponding environment.

Importance of the City:

Few years ago, a new modern irrigation system was carried out on a near by lake about twelve KMS to the south east of the city. It irrigates thousands of acres surrounding the city rendering it one of the most important agricultural region in Syria. Among the other factors that contributed to the increased importance of the city are the sugar and dye industries

- 1) A commercial part;
- 2)- industrial;
- 3)- residential.

This modern system of organization increased the efficiency of circulation in all parts of the city and affected to a great extent its prosperity.

The commercial center mentioned above is in the center, between the new city and the old. It includes the new government house and the new automatic telephone building and.... the main thoroughfare passes through this commercial center and into a square with a raduis of about 50 MS.

The land which is chosen for study as the subject of the thesis is, in the middle of this center. To the south of its stands the new government building, and to the north the new automatic telephone building. It also overlooks the city square from the west and the public recreational buildings from the east and north east. Due to all these factors which show the importance of that strip of land, it is justified to build a new huge commercial center rendering maximum income to the owners. On the other hand, if this center were built two important items will be satisfied.

l - A huge new building in center of the city is built adding to the beauty and progress of the city; 2 - The people will like the city in which they live much more as long as it satisfies their needs more efficiently, and the love of the city is a part of the love of the country.

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11 - GENERAL DESCRIPTION

OF LAND

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The land is a large trapesoid about 3250 M² in area. Two major streets the Quathly and the Atassi streets each about 20 Ms 14 Ms respectively bound it from the north and the south, while two other minor streets each of 12 Ms surround it from the south and the west.

As the area is large for one building enjoying plenty of light and ventelation, it is reasonable to divide it into two blocks: eastern and western with 10 Ms road in between, which is the minimum allowed in city planning regulation in this region. This road is not disadvantage because it gives light & scenery to both blocks, and the shops on either side of it will have nearly the same importance as those found on the major streets.

111 - EASTERN BLOCK

A - Cinema

Plan number - 2 - shows the entrance, tickets rooms and lobby, large enough for the following reasons:

- 1 At the entrance there is usually a great crowd during certain hours of the day;
- 2 The lobby may be used as a smoking place during intermissions.

A marble stair case of $150^{\circ 1}$ x 30 $^{\circ 1}$ x 15 $^{\circ 1}$ leads from the lobby to the balcony which is 3.06 M above the level of the floor of the entrance. The same stair leads to the bar too.

Orchestra:

A door leads from the lobby to the orchestra which is $13 \times 20 \text{ m}^2$ in area excluding toilets which make about 10% of the area of the orchestra place.

The main floor holds three hundred and twenty seats. As it aims to accommodate all these people, the main and primery function of the design is to get these people in and out of it in a confortable way. The most important elements taken into consideration are:

- 1 Visibility;
- 2 Confort;
- 3 Safety.

Each element will be discussed separately.

1 - Visibility :

The main floor orchestra is designed to have a slope of 6% beginning from the entrance.

Seats are staggered so that the person sitting will command an uninterrupted view of the screen by looking through the heads of the two persons sitting in front of him.

The following specifications are taken into consideration also:

- 1 The distance between two rows is 85 cms. So with a 6 % slope the difference in level between two persons sitting along the same line is 10 cms which is sufficient to give an unobstracted view of the screen.
- 2 The angle between the first row and the top of the screen is 35° which is the maximum allowed $^{-1}$ -
- 3 The bottom of the screen is about 1.85 M from the level of the seats
- 4 The screen is rectangular in shape with the ratio of length to width of 3 to 4. $^{-3}$ -
- 5 The angle between two lines drawn from the window of the projecting room, one a horizontal line and the other passing through the center of the screen, is 11° which is the ideal

¹⁻ Modern building Practice, by Percy Thomas, vol.1, page 195.--

³⁻ Architectevral Graphic Standards, page 190, by CHARLES GEORGE RAMSEY.

case.-1-

2 - Comfort:

A distance of 85 cMs between each two consecutive rows, a width of seat of 55 cMs would afford an adequate place for each person. The floor is to be made of wood, and walls are to be covered with decorated cellotex. Both has the property of diminishing dampness, damping sound, and abolishing echo.

Confort is really attained by controlling the humidity and temperature of the air to 15° - 16°. For this reason a special room is reserved for air conditioning machines of package types. At the top of the stage -2-. The walls of this rooms should be sound proof so as to prevent noise from reaching orchestra.

Chairs are battened together. Each section comprises from 5 - 12 chairs -3-.

3 - Safety:

Is secured by planning two exits -4- other than the main entrance. These exits lead to the main streets and may be used in emergencies.

Stage :

Is joined with two rooms, and is designed large enough to render it usuable as a theatre as well as a cinema.

⁽¹⁾ From 10°- 20° Graphic Standards, page 189, by CHARLES GEORGES RAMSEY.

⁽²⁾ One machine for each 100 persons is sufficient according to Machine for each 100 p

⁽³⁾ Modern building practice by Percy Thomas, page 189.

⁽⁴⁾ As recommanded in town planning hand book of Palestine, 1950, p. 1

Balcony :

Contains two hundred seats resting on steps. Each step has a thread of 90 cMs and a rize of 17 cMs. This rise will afford enough height (about 240 cMs) for a service place to the bar.

Seats are arranged in such a way that the screen can be easely seen from any place. Toilets room, one for men and another for ladies, are furnished.

Project Room :

This room is given the utmost care, because the safety of the audience depends on the skill of the operator, the ease with which he can move in the room, and the arrangement of apparatus and machines assuring enough space in between so as to prevent electric contact. For these reasons it is of vital importance to dedicate to it an area much larger than what is practiced nowadays -1-. The walls should be covered with fire resisting material. This room would have a separate stairway which is to branch from the stair of the gallery facing the bar.

Office:

Immediately at the right of the entrance there is an office with an overall height 3.06 cMs reserved for the secretary. Above it on the level of the bar, there is another office 2.44 cMs over all height reserved for manager.

^{1 - 6} M² minimum recommanded by the town planning hand book of Palestine 1950, page 16, Article 18.

The outside appearance of the cinema should impose itself on the passers by Five on projecting columns each 30 cMs wide from the Top of the entrance to 60 cMs higher than the building are designed following the common modern trend. (See map -3-)

As to the entrance, it ought to prepare the spectacular change from the outside world to the inside world of the screen This is nicely accomplished by the use of beautiful decorations and adequate lighting.

B - Restaurant:

The restaurant has an area of 100 m² as 1.5 M² (12 - 15SF)⁻² are reserved for each person. The restaurant can accomodate 70 persons which is good in a city like Homs.

Tables :

The tables have to be arranged according to the following specifications -3-:

Table for 2 people 2' - 6" sq. or 75 x 75 cm2 for 4 people 3 ft-0 sq. or 1.5 xl.5 M² or 2'-6"x5' 75 x150 cm²

Circular tables are to be rejected as they take the same space but they can't be placed together.

Taken from Modern Theatres & Cinemas, by P. Horton Shand,

Chap. IV, page 22.
Modern Building Practice, V.1, page 212 (by Percy E. Thomas).
" " 213.

Whatever arrangement is used the distance between the back of the chairs should be 20" or nearly 60 cms that is about two inches more than the minimum allowed $^{-1-}$.

Kitchen:

It lies behind the restaurant, it occupies an area exceeding the % 45 the area of the restaurant $^{-2-}$.

All necessary platforms for cooking are mechanically arranged ? The restaurant contains :

- 1 Toilets for men and ladies lighted through internal clearance;
- 2 A store;
- 3 A secondary door to be used in case the main door is engaged when goods are brought into the kitchen. All these are shown in map N° -2-.

C - Offices :

Offices surround the cinema from all directions. As the total height of the cinema is 930 cMs, so the height of the offices would be:

930 - 550 = 380 cms (over all).

When planning the offices the following specifications are taken into consideration:

The same ref., page 214.
 Value recomm. in Modern Build. Practice, page 218.

- 1 A lift of 1.60 x 1.20 M. for 4 persons is the minimum
 allowed; -1-
- 2 Step 130 x 17 x 30 is large enough to avoid congestion;
- 3 Width of corridors is 180 cMs (6');
- 4 Furthest office from stairway be 30 M a little more than the value recommended -3-.
- 5 Windows are more than 15% and sometimes % 20 of the area of the room. These values give adequate light and ventilation.

The offices are divided into four units, every two are reached by a stairway. In every unit there is a toilet and a kitchenette which are lighted and ventilated by an interior clearance (see Map 5).

Offices occupy three floors, one surrounds the cinema perifery and flush with its height, the other two are above. This arrangement allows the opening of windows on the four sides overlooking the roof of the cinema.

- (1) Modern Building Practice, page 536.
- (2) " 533.
- (3) 80' as recommended in Modern Building Practice, page 533.

D - Garage :

Because the piece of land is to be divided into two blocks by a ten meters road, the entrance of the garage is to be carefully studied and chosen to be on this ten meters minor road in order not to interfere with the trafic in the major streets on one hand and to be as far as possible from the entrance of the building on the other hand.

The garage consists of :

- 1 A place for washing and repair;
- 2 Storage place; .
- 3 Office;
- 4 Show place.

The garage has an area of $610~\text{M}^2$ and is composed of three stories:

- a) Under ground floor;
- b) First floor;
- c) Second floor.

1 - Washing & Repair :

The Under Ground Story: is three and a half meters below the level of the ground. It consists of the greasing, washing and repairing sections; it contains also the greasing ramp with dimensions shown in plan - 4 -

This greasing ramp lies in a depression of 2 MS so that it will be easy to repair the car while standing.

The battery charging and storage and storage room must be separated from the normal work in the garage by a fire resisting wall.

The ventilation system is necessary because currents of air are difficult to arrange, so a set of fans are desirable to pump air through clearance and make easy the entrance of fresh air.

The natural lighting from clearance is not sufficient, so electricity is necessary.

The arrangement of columns is done in a way that it would not interfere with cars coming in and going out of the garage on one hand, and would not piece rooms of the offices in the uper floors.

As far as the discharge of dirt is concerned there are two ways to take care of it:

- a)- either to pump it to the main sewer system which lies at a depth of 1 M below the level of the street, or :
 - b) to have a special pit.

The first method is to be prefered because it is difficult to excavate the rocks on one hand and the soil is not soft and porous enough to absorb the material on the other hand.

Ramps: Cars reach the under ground floor through a ramp with

a slope of 7:1 -1- which is the max. allowed. To reduce accidents as far as possible two ways each of 3.5 M wide are designed one for the incoming vehicles and the other for the leaving ones. These two are separated by advision wall of 50 cMs high. The ramp was prepared rather than the lift for the following reasons:

- 1 It is faster in service;
- 2 It does not need an operator;
- 3 Little maintenance cost.

The least radius of curvature of the ramp-plans N°2-4- is 4.5 Ms or about 17' the minimum allowed -2-. The finishing surface of the ramp should be rough so as to diminish sliding. The cheapest and most practical finish is rough slips of wood which is chosen here and is preferred to the metal finish which although has longer life but it is higher in maintenance cost.

2 - Storage Place :

First Floor: it is specially constructed for keeping cars. By adopting the following average dimension of vehicles $^{-3}$ -

../..

^{1 -} Value recommended in Modern Building Practice, page 91, vol.1 .-

^{2 -} Architectevral Graphic Standart, page 200, by Charles George Rams

^{3 -} Architectevral Graphic Standart, page 199, by " " "

		Length	Width	Height
CARS (Largest	19' 0"	6'-2"	6'-5"
	Average	15'-6"	5'-10"	6'-0"
- COMPANIE	Small	13'-0"	5'-4"	53
potroi.	Otherwise			
Motor (bus (Largest	30'-0"	8'-0"	9'-6"
	Average	25'-0"	7'-6"	81-6"
	Small	21'-0"	7'-0"	7'-6"
	return of the ground			
Motor (Largest	25'-0"	8'-4"	12'
Truck	Average	18'-0"	6'-6"	9'-0
	Small	15'-0	5'-6"	8'-0"

It is deem that the height in any section is sufficient to pass the average cars on one hand, and the store can hold -16-cars keeping 50 cMs clearance between each two $^{-1-}$. Details are shown in Plan N° -2-.

3 - Office:

Second Floor: Since the height of the shops is 550 cMs over all a 310 cMs over all are reserved for the garage store and the rest 240 cMs will be reserved as a storage for new goods and an office. The office and the store have windows overlooking street.

¹⁻ Average car taken in this specification is larger than the max. car size used in this parts of world:

4 - Show Place:

It lies on the north side of the major street which is considered the most important. It is used for the sale of petrol, oil.....

Due to the ramp grade 7:1 and from a point 9 ms away from the entrance of the garage we get a depression of 130 CMS. An office is built 175 CMS above the main level of the ground. In this way we get 175 + I30 CMS = 305 CMS below the floor of the office. This height of 305 CMS is more than enough for a bus car to pass (see Plan 5). Due to this we get an office of two rooms over looking the southern street with an elevation of (550 - 175)= 375 CMS. This height is 15 CMS more than the minimum allowed according to Municipality regulation.

E - Stores :

Stores lie on the major streets. They have different areas each corresponding to the service expected of it. They are of 550 CMS over all height, that is, 50 CMS more than the minimum allowed in this section of the city according to Municipality regulation. This excess of height is made use of by raising an

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office 2.5 M overall. This will be reached by a stair case from the store itself.

IV - WESTERN BLOCK

This is separated from the Eastern Block by a ten meters road which could be used as a public street in the future. This block is composed of the following elements:

A - Oriental Café:

This café is necessary in this building as it is indispensable for a certain group of people visiting it. It has a toilet room and service room (Map N° -10-).

B - Agencies :

Each Agency occupies two stories. The lower one is of 3.I MS height, and the upper one is of 2.4 MS over all and is reached by a staircase. Each agency has a toilet of its own.

(see Map -10-)

C - Games Store:

The north est side of the ground is reserved for a games store. It is designed large enough to give ample space for the tables and will not allowed any interference among players. The tables are arranged as shown in plate N°10 with the specified following dimensions -1-

^{1 -} Architectevral Graphic Standarts, by Charles George Ramsey, page 168.

		: Length	: Width	: Distance from adjacent
	Average Size	1		
Pong (Large Size	9'-0"	5- 0"	3'4-6"

		Length:	Width:	Dist.from Adj.Tab-le
Pilliards	Large size	91-2"	4'-11"	6'47.5'
(Average Size	1'-2"	4'-0"	5'4 6.5'

The games store is separated from the Café by a clearance which could be used too as a passage between the two parts. The games room is furnished with a special Toilet lit through the inner clearance (see plan N° -10-) which extends along the whole height of the building.

D - Appartment Houses:

The first, second and third floor are reserved for appartments. These apartments are mainly designed to solve the housing
shortage on one hand and to keep the employeed as near to the
place of their work as possible (near government house) on the
other hand.

Arrangement: The following items are considered in

the design of each floor:

- 1 One hall with its dining room make one unit separated by glass doors in between. This glass doors could be opened in case of large receptions.
- 2 The direct connection between the stair case, the kitchen, the office and the dining room is designed in such a way as to permit the servants to reach the entrance without passing through the salon.
- 3 The sleeping quarter with a special western bath is to have a private entrance from the corridor and is equipped with a wall closets.
- 4 The windows and doors of each room are fitted in such a way as not to interfere with the furniture of the room.
- 5 Chimneys, sanitary fittings of the kitchen and toilets are so designed as to pass through the inner clearance.
- 6 In designing kitchens, toilets, bath rooms and clearance the municipal, regulations are followed -1-:
- 1 In designing openings, heights of the floor municipal regulations are followed: -2-

^{1 -} The inner clearance facing the kitchen from one side only should have a minimum width of 3 MS with an area of 12 M2 at least, which that facing baths, toilets, could be out down to 1.5 ms width.

^{1&#}x27;- In case the kitchen enjoys two clearances one or each side 2 MS width could be limited.

^{1&}quot;- Areas occupied by a kitchen should exceed 8 M2

[&]quot; " bath 3 M2

^{2 -} Min. height 360 CMS. opening at least 10% the area of the room.

2 - In the design of this building it is aimed to have unity with the eastern block, so that the two buildings with their similar 16.9 M (without 80 cms parapet wall) high façade will appears as one single unit.

Unity is attained by following identical schemes in the design of windows (the same height), stone finishes, and elevations through out the whole block.

V - CONSTRUCTION

The engineer preparing a plan should design it it such a way so that it would conform with the regulations governing that locality. Also the building should be in harmony with the structures near by. These two elements are satisfied in this project.

The usual method of construction in Homs, is the continious foundation type with plastered basalt walls, the reason being that the basalt is relatively cheap.

In this building footing and columns type of construction is adopted all through the structure except in cinema walls which is to be done of contentous foundation type, the reason being that the walls are too long.

As the cinema walls are high, three changes are necessary in order to make walls tight. The first one is above exits and entrance 220 cms high and the other too at interval of 355 cms of height.

Inside walls are 25 cms hollow blocks

External walls are of lime stone with the following two types of stone finishes:

- a) The first type is fine axed around openings; .
- b) The second is rough puncheoned.

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VI - WATER SUPPLY

Head is sufficient to force water to upper floors. Three tanks each of at least 20 M^3 capacity are designed at the top of the building, one is specially reserved for the garage.

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VII - BILL OF QUANTITIES

BLOCK -A -

N 0	: Item	:Description	:Quantity	Total : Quantity	Unit
1	: :Renforced	To be taken 0.4 of	: :	: :	
	Concrete	Area built in firs	ŧ	:	
		floor & O.3 of			
		Area built in uppe	r		
	Markey (floors			
	America 3	1800 x 0.4	720.0		
	Lucia II	I440 x 0.3 x 3	1286		
		for lobby :	35 66	2006	M. 3
2	Excavation	a) 35MB excavation	1860		
	Teams 1	for garage			
	200	b) for inside			
	The state of the s	walls of cinema	476		
	State will a	50 x 50 cms		2336	м. 3
3	Stone Work	Lime Stone	:	600	M3
4	Hollow	ZV-S-SISAUNOS I SERVICIONA			
	Blocks	25 cms thick			
		a) first floor	300		
	:	b) upper floor	1600	I900	™ ³ .
			:		

(Bille of quantities - Block A)

N o	: Item	: Description		- contin Total : Quantity	: Unit	
5	Plastering	: :Mortar: : ciment and : water:		19500	M2	
6	Tiles			6260	. M2	
7	Wood	:a) doors : A=2.2x1.10 :b) inner windows	260 102	:		
8	Windows.	Steel		362 490	. M2 . M2	
9	Shutters	Steel		490	M2	
IO	Marble	:a) for cinema : entrance, :b) for lobby :c) for bar stair :d) for outside : façade	25 85 66 24			
II	: Wash	: :Colored Wash	:	: 2I0 : I9500	: M2 : M2	
12	Floor or cinema	Zan wood	:	410	M2	
I3	Show win- dows	of wood and glass	:	450	. M2	
			:			

BILL OF QUANTITIES BLOCK - B -

No : Item Description Quantity : Unit -=-=-=-=-Renforced :3% of the area : 327x4 : I308 : M3 :1092 x 0.3 x 4 :a) Outside: footing :a) 140
:b) Inside: ground :
 beans 2 :Excavation :a) 1.5 x 1.5 x 3 :b) 50 :b) 0.5 deep x 0.5 : wide I90 : M3 : Stone : Lime Stone 3 370 M3 : Work : Hollow : Blocks : 0.25 hollow block : a) first floor : 250 : b) upper floors : 2000 : -: 2250 M3 Plastering Mortar: sand :15200 M2 Ciment and water Tiles 4000 M2 6

(Bill of quantities, Block-B-)
- cont.-

No :	Item :	Description Quantity	Total :Quantity :	Unit
7	Windows	Steel :	: 340	M2
319	Too	I I CHERTY CHECKY I		
8	Shutters	"	340	M2
2	Taxana I I			
9	Wood	a) Doors		
	Berlin I	2.2 x 1.1 : 330		
	Firstman	b) inner windows : I50	480	M2
	1911	780 (0)		
		and the state of t		
1			10 8	
IO	Wash	Colored wash		
10	Tan 5	3046		
11	Show words	m (a0 (a)		
18	Tro Hat			
II	Show			
	Windows	Wood and glass :	500	M2

Electricity and plombing are not included.

BILL OF QUANTITIES of (A & B)

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No	: Item :	: Quantity:	-B-	:	: Unit
1	Renforced) Concrete)	2006	I308	3314	M3
2	Excavation	2336	190	2526	M3
3	Stone Work	600	370	970	мз '
4	Hollow }	1900	2250	4150	M3
5	Plastering	I9500	I5200	34700	M2
6	Tiles	6260	4000	10260	M2
7	Wood	362	480	842	M2
8	Steel windows	490	340	830	M2
9	Shutters	490	340	830	M2
IO	Wash	I9500	I5200	34700	M2
11	Show windows	450	500	950	M2
12	Wood floor)				
	for cinema)	410		410	M2
13	Marble	210		210	M2

VIII - PRICE LIST

No	Item	Total Quantity	Unit:	Rate	Total Price
I.	Renforced)	3314	M3	I30	430.000 SP.
2	Concrete) Excavation	25 26	M3	3	7.570 SP
3	Stone work	970	: M3	160	I24.000 "
4	Hollow blocks	4150	M3	25	104.000 SP.
5	Plastering	34700	M2	I.5	52.100 "
6	Tiles	10260	M2	IO	I02.000 "
7	Wood	482	. M2	50	24.000 "
8	Windows	830	M2	40	33.200 "
9	Shutters	830	M2	50	41.500 "
IO	Wash	34700	M2	0.5	17.350 "
II	Show window	950	M2	50	28.500 "
I2	Wood for cinema floor	410	M2	60	24.600 "
I3	Marble unit &	210	M2	40	4.800 "
	block			Total	993.620 1.000.000
I4	Cost of Land	3250	M2	I00	325.000
	: Land		: :		1.325.000
	:		: :		

IX - INCOME ESTIMATE

According to the current law which is imposed by the Minis-

try of Interior in Syria to rated buildings for Commercial use, the income should not exceed % 7 of the total cost :

1, 325, 000 x
$$\frac{7}{100}$$
 = 927.000 sp.

Cost of one meter square built:

$$\frac{1,000,000}{3000 \times 4} = 80 \text{ s.p. (logical)}$$
