**Republic of Iraq**
**Ministry of Construction& Housing**
**State Commission of Housing**
**Studies Section**

# URBAN HOUSING STANDARDS MANUAL

**OCTOBR 2010**

# State Commission for Housing

State Commission for Housing is one of the Ministry of Construction and Housing entities .The Commission was established at the beginning of 2001,to set and execute the general policy of housing ,and ensure the adequate housing for citizens, according to the resolution no.39/2001.

The Commission carries out:

1. Suggestion of annual, phased and long term plans necessary for housing in co-ordination with the concerned parties.
2. Introducing consultancy, in the field of housing studies to the state entities and private sector, in a way that ensures the execution of projects.
3. Execution of general housing projects included into annual plans for housing through the companies of the ministry and private sector.
4. Technical monitoring for housing projects in order to ensure the execution of programs and projects in the required quality , and according to the principles and standards adapted by the Commission.
5. Assessment of the proper building technologies to execute the annual plans concerning housing projects.
6. Approval of dwellings and services networks designs of housing project sites, submitted by investors of state entities and private sector.
7. Participation in suggesting the regulations concerning housing.

# CONTENTS

# INTRODUCTION

There is no doubt about the magnificence of housing crisis in Iraq, especially in major cities centers, and this crisis can be discerned clearly in the overcrowding of dwellings,(informal) subdivisions of the residential units already-existing or plots where it is noted that the number of families that occupy one dwelling (formally subdivided ) continues to grow. Not to mention the out-dating of the housing stock is existing now and the resulting deterioration both construction wise and services-wise .Housing deficit estimated in is Iraq nearly about (2) millions housing units up the end of 2008, this figure was calculated on the basis of statistical projections of General Census conducted in Iraq in 1997, where it was not updated up to now.

It is a pleasure for the State Commission of Housing to introduce this concise and simple manual to be shared among bodies related to the subject of housing in all ministries, the National Investment Commission , the Mayoralty of Baghdad and the Relevant Committees in the Governorates Councils, this brochure deals with the most important planning and design criteria used by the State Commission of Housing in the preparing of detailed programs of planning and designing housing complexes .This manual is according to Article (2) of the objectives of the Commission resolution No.39 for the year 2001, the State Commission of Housing hopes to cooperate and coordinate with other relevant authorities ( mentioned above ) in the preparation of proposals , studies and preliminary designs for the residential complexes, which are to be implemented by the public , private and cooperative sectors.

GOD, THE SOURCE OF STRENGTH

STATE COMMISSION OF HOUSING

## HOW TO USE THE MANUAL

This manual contains the main planning criteria required in the preparation of proposals, studies and designs of residential complexes arranged in tables and detailed illustrative drawings they have been selected from the original documents prepared by the company Polservice, it is necessary that the planners and designers are to noted that these criteria are merely a tool or one of the key design solutions – therefore it is required to be well-used by the professionals to get to the efficient designs as these criteria and recommendations are not an alternative for technical solutions nor a guiding engineering concise , but it is of some of the necessary elements to find design and planning solutions. Designer should choose only the basic , most relevant and appropriate items, concerning technical aspects of the project in order to develop solutions and alternatives.

Therefore, the technical standards and recommendations contained in this manual represents in caption line to start planning and design. On the other hand, reference to these standards could not be in the abstractly and crucial , but should be analyzed according to each case and used the best possible way to get to final solutions issuing this manual , based on those criteria will not be for this time will be continuously reviewed and updated ,to keep pace with technical they progress and general social economic.

* With this manual there is a CD with the original document prepared by Polservice company (in English) and its contains information and detailed programs for planning and design of buildings, open spaces and services.

* the original document of Polservice is :
Housing Technical Standards And Codes of Practice\Report two\ Revised Edition 1983

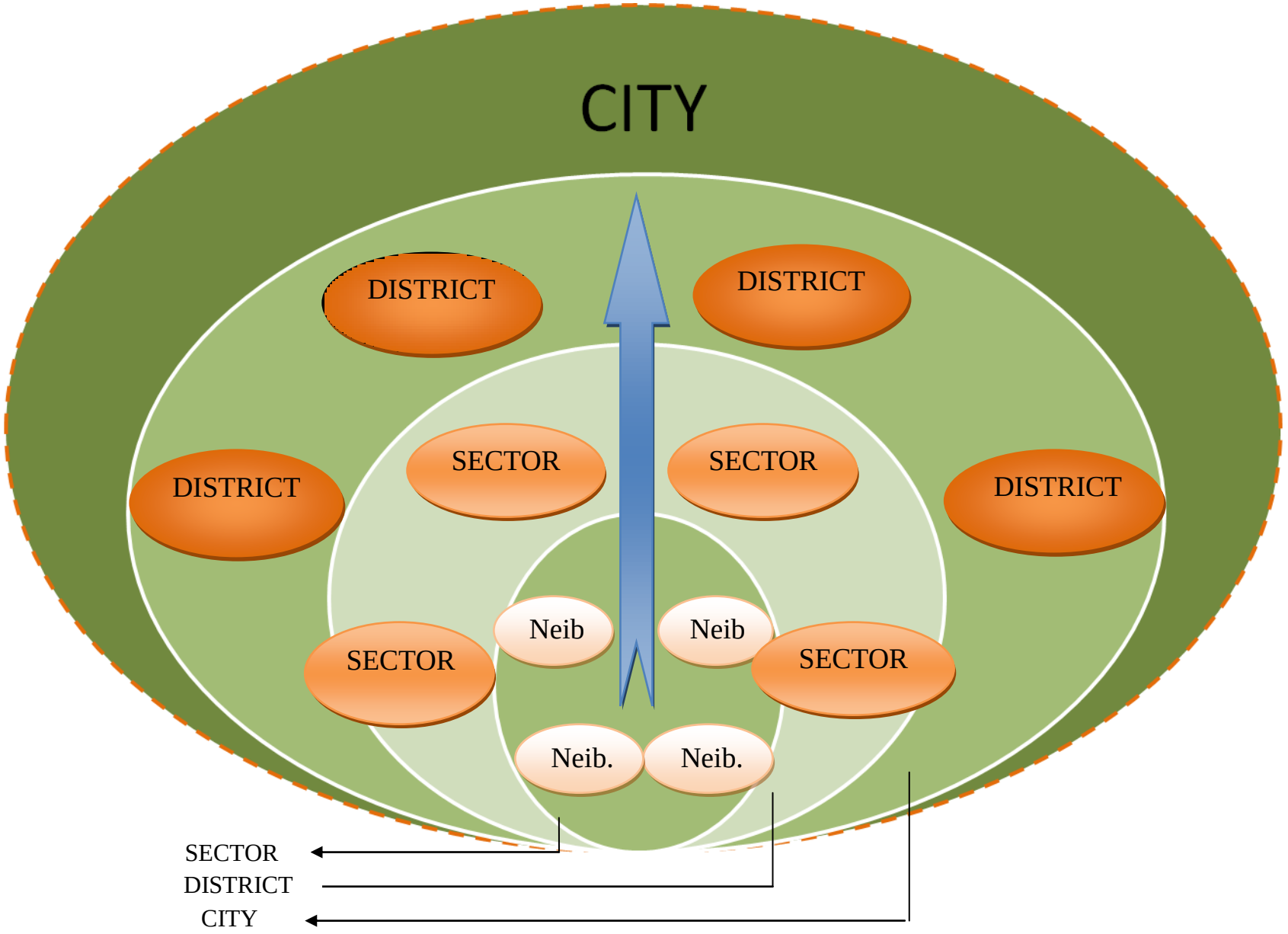
## PLANNING STANDARDS

The prevailing directions of urban planning up to a recent time adopted neighborhood concept with a service center as its heart. Then other trends arose, based on the strip of the distribution of services, in a way that interferes with the grouping system dwelling and allowing to keep economic, social and cultural activities of the neighborhood continuous and vital.

Neighborhood is called residential precinct and based on three elements number of family members, number of population and number of dwellings. By grouping four (neighborhood) a housing district is formed and grouping four districts what's called Housing sector. As to the city, it's formed by grouping four housing sectors or more.
Demographic studies depends on the average number of family members and accordingly population and the number of households is calculated
(Which means the number of dwellings, there is no doubt that the estimation of the housing need to based on housing deficit in the existing housing stock and new housing units) depends on detailed and accurate statistics.

And Studies carried out by the Polservice company in the seventies to prepare central Housing plan in Iraq for the period 1980-2000 are the most important and comprehensive studies in this field . it is noted that adopted certain elements and a to indicators and determinants of values different from those reached in the General Census in 1997 and the statistical projections that were calculated until 2008.

The standards and indicators in the study and used by State Commission of Housing are adjustable towards the increase up to 20% , in order to cope with the developments and current requirements.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The purpose for the planning standards is to arrange the determinants concerning the following:

1. Communities :( Neighborhood, Sector, District, and City) depending on:
   -Average of size of family
   -Average of communities
   -No. of dwellings
2. Community facilities (according to the grading of communities)
3. Open spaces: Green area, Parking, Play fields (according to the grading of communities)
4. Type of dwellings: horizontal, vertical(no. of stories, accommodation density, depending on regulations based on master plan or sector designs.)
5. The details of area and community facilities, open spaces…

## Determinant:

-Communities:

To be defined the incomings standards in Paul Service study for planning the General housing in Iraq, The three elements for housing groups considered as the following:

1 - Neighborhood::

i. Household Average (6 person).
ii. Dwelling Average (2400-3600 inhabitances)
iii. Number of dwellings (400-600 dwellings .)

*-Community social infrastructure

a-Primary school 18 classroom no .1
b-Intermediate/Secondary school 9-12 classrooms no .2
c-Local Market
d-Mosque (church)
e-Health-care center
f-Administration building
g-Nursery/Kindergarten (with job opportunities for woman)

2- Sector: is formed of 4 Neighborhoods

i. Household Average (6 persons).
ii. Sector Average (9600-14400 inhabitances)
iii. Number of dwellings (1600-2400 dwellings.)

-Community social infrastructure (to be added are ):
a-Post office
b-Fire brigade station
c-Police station
d- shops(suq)
e- /preparatory/Vocational school

Note: some of these service go to the district, and it depend on the district standards

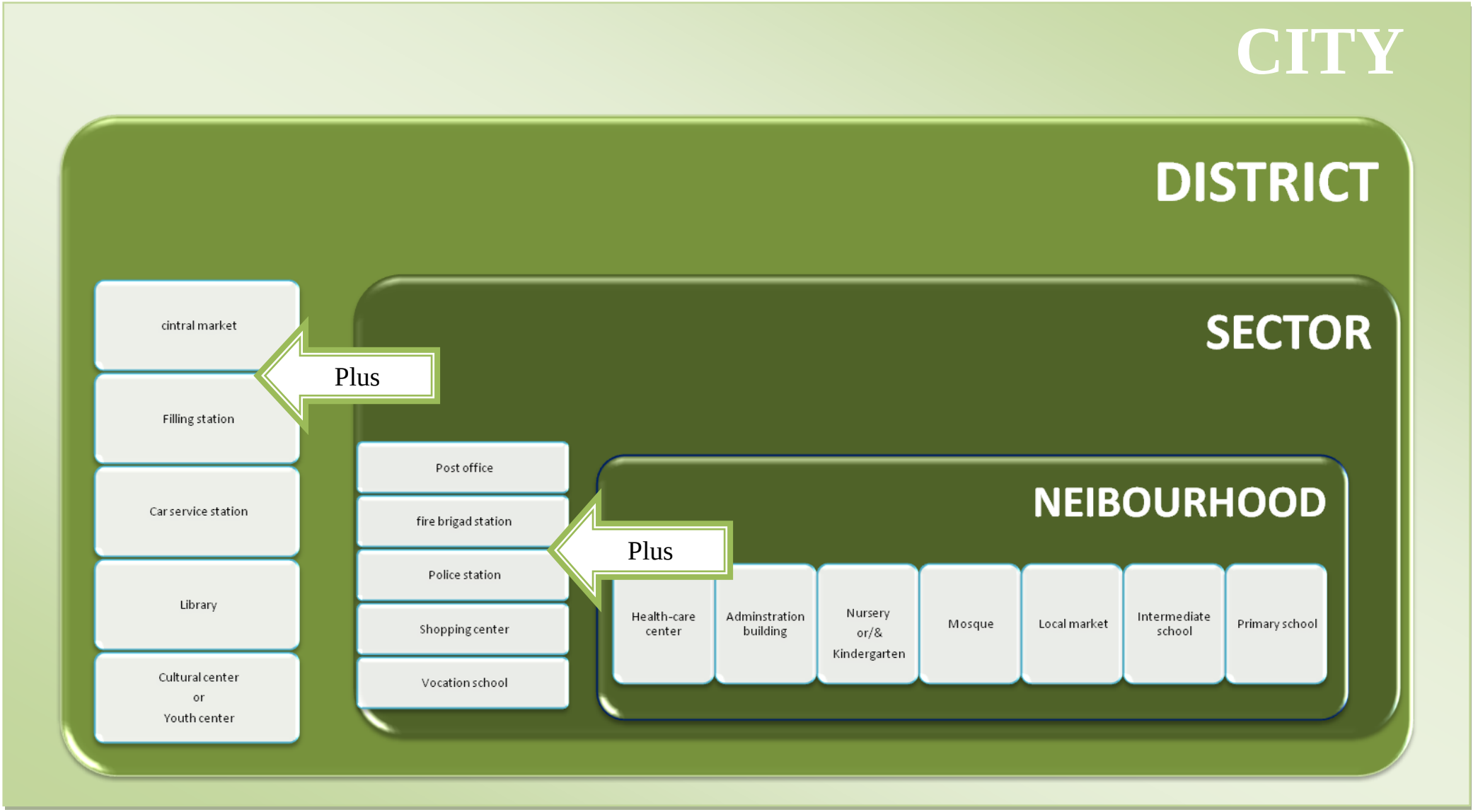
3- District: is formed of 4 sectors

i. Household Average (6 persons).
ii. District Average (38400-57600 inhabitances)
iii. Number of dwellings (6400-9600 dwellings.)

-Communities:
a-Shopping center
b-Filling station
c-Car service station
d-Library
e-Cultural center

*Open areas, parks and playfield should be provided, according to age groups, and in all planning levels

Note: selection of Housing type (single-family or multi-family housing) no. of stories ,Accommodation density depends on regulations based on Master plans, and sector designs of.


CITY
DISTRICT
SECTOR
NEIBOURHOOD
cintral market
Filling station
Car service station
Library
Cultural center
or
Youth center
Plus
Post office
fire brigad station
Police station
Shopping center
Vocation school
Plus
Health-care center
Adminstration building
Nursery or/& Kindergarten
Mosque
Local market
Intermediate school
Primary school

FIRST: Planning indicators

*(1-1) Indicators of planning neibourhood
Planning indicators of neibourhood depends on the type of whether , is it a single-family or multi-family ,Type of dwelling depends on:-
-Plot area
-Frontage of plot
- Minimum set-back of dwelling front line from right-of way line.
-Coverage ratio/maximum built-up area to total plot area.
-Floor area ratio/total floor area to net residential area.
-Accommodation density
-Population density
(Table 1)
*(2-1) Indicators of land use intensity
This indicator, in addition to the type of dwelling (single–family or multi-families)depends on:
- Land use balance.
-Population density and accommodation gross density.
(Table 2)
*(3-1) Indicators of planning for( social) services
This indicator according to the type of persons to be served, facilities/ nursery, kindergarten, school, elementary …etc)depends on:
- Number of persons to be served.
-Total population and children to be served.
-Total floor area.
-Maximum access distance from dwellings to facility.
(Table 3)

Residential precinct planning indicators (recommended)( Table 1)

| Type of houses | Plot area\in sq m\ obligatory | Frontage of plot \in m.\ | Recommended minimum Set-back Of building Front line from right-of way line in m. | Coverage ratio\maximum built-up area to total plot area\ | Floor area ratio/total floor area to net residential area/ | Accommodation density/dwelling /hectare/ | Population net density Inhabitants /hectare |
|---|---|---|---|---|---|---|---|
| One-family houses: | | | | | | | |
| - detached | 400-600 /1 | 16-24 | 4.0 | 0.30 | 0.22-0.33 | 13-21 | 80-130 |
| -semi-detached | 300-400 | 10-20 | 4.0 | 0.45 | 0.25-0.39 | 18-27 | 110-160 |
| -row houses | 200-350 | 5-10 | 2.5 | 0.6 | 0.43-0.48 | 24-42 | 140-250 |
| -courtyard /atrium houses | 150-300 | 10-15 | 2.5/ 2 | 0.75 | 0.44-0.52 | 28-48 | 170-290 |
| Multi-family: | | | | | | | |
| -low-rise | | | | | 0.60-1.00 | 40-80 | 200-400 |
| -high-rise | | | | | 0.90-1.50 | 60-120 | 250-500 |

Note: 1/ Plot areas of one-family houses related to categories of dwelling are presented in chapter: DWELLINGS, HOUSES AND RESIDENTAL BUILDINGS-(Table11)

2/If there are windows in front wall.

$$\text{Floor area ratio} = \frac{\text{Total floor area}}{\text{Net residential area}}$$

The community land use intensity indicators (recommended) (Table 2)

| Type of houses | Land use balance | Accommodation gross density | Population gross density |
|---|---|---|---|
| Multi-family:<br>-high- rise<br>-low - rise | <br>0.45-0.65<br>0.50-0.70 | <br>35-70<br>20-60 | <br>150-300<br>100-250 |
| One-family:<br>-detached and semi-detached<br>- row and courtyard | <br>0.63-0.80<br><br>0.55-0.70 | <br>9-21<br><br>12-32 | <br>50-130<br><br>80-200 |

$$\text{Land use balance} = \frac{\text{Net residential area}}{\text{Gross residential area}}$$

$$\text{Accommodation density} = \frac{\text{Number of dwellings}}{\text{Residential area}}$$

$$\text{Population density} = \frac{\text{Number of inhabitants}}{\text{Residential area}}$$

Planning indicators of community facilities (Table 3)

| Facility | Number of person to be served-per cent of total population | | | Plot area –in sq m Related to | | | | | | Total floor area (in sq m /inh.) | | | Maximum access distance from dwellings to facility (in m) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | total population | | | children to be served | | | | | | |
| Nursery | A | B | C | A | B | C | A | B | C | A | B | C | 300 |
| | 0.6 | 1.0 | 2.0 | 0.25 | 0.5 | 1.0 | 50 | 50 | 50 | 0.08 | 0.160 | 0.33 | |
| kindergarten | A | B | C | A | B | C | A | B | C | A | B | C | 300 |
| | 1 | 2 | 4 | 0.5 | 1.0 | 2.0 | 50 | 50 | 50 | 0.155 | 0.310 | 0.62 | |
| Primary school | 17.5 | | | 3.0-3.5 | | | 18-23 | | | 0.8-1.0 | | | 500 |
| Intermediate school | 7.5 | | | 1.6-2.0 | | | 21-26 | | | 0.45-0.56 | | | 500 |
| Secondary school | 6.6 | | | 1.4-1.7 | | | 21-26 | | | 0.42-0.5 | | | 800 |
| Health center | 100 | | | 0.35 | | | 0.35 | | | 0.066 | | | 800 |
| Mosque/church | For all practicing inhabitant | | | 0.125 | | | o.125 | | | 0.075 | | | 800 |
| Cultural center | 33 | | | 0.67 | | | 2.05 | | | 0.12 | | | 800 |
| Youth center | 25 | | | 1.00 | | | 4.0 | | | 0.20 | | | 800 |
| Corner shop | 75 | | | 0.15-0.18 | | | 0.2-0.24 | | | 0.15 | | | 200 |
| Local market (suq) | 75 | | | 0.83 | | | 1.10 | | | 0.48 | | | 500 |
| or small shops | | | | 0.75 | | | 1.0 | | | 0.42 | | | 200 |
| Shopping center | 75 | | | 1.0 | | | 1.33 | | | 0.48-0.50 | | | 800 |
| Tea house, refreshment shop | 33 | | | 0.3 | | | 0.4 | | | 0.18 | | | 500 |
| Restaurant ,casino | 50 | | | 0.3 | | | 0.6 | | | 0.198-0.2 | | | 800 |

To be continued

Planning indicators of community facilities (Table 3) continued

| Facility | Number of person to be served-per cent of total population | Plot area –in sq m Related to | | Total floor area (in sq m /inh.) | Maximum access distance from dwelling to facility (in m) |
|---|---|---|---|---|---|
| | | Total population | Children to be served | | |
| Local administration | 100 for the whole population | 0.06 | 0.06 | 0.012-0.024 | 800 |
| Post office | " | 0.07 | 0.07 | 0.042 | 800 |
| Police station | " | 0.1 | 0.1 | 0.084 | 800 |
| Fire brigade station/1 | " | 0.048 | 0.048 | 0.012 | |
| Filling station \2 | " | 0.08 | 0.08 | 0.012 | 1600 \4 |
| Car service station \3 (4-6 stands) | " | 0.3 | 0.3 | 0.1 | 1600 \4 |

Notes: communities located in an area: A-without job opportunities for women, B- with limited job opportunities for women, C- with job opportunities for women

1- One station for community or group of communities if the access time from the station in the neighboring zone is greater than 10 minutes.
2- One station per 2000 cars and not less than one in community
3- One station per 500 cars and not less than one in community
4- Recommended access distance

Community facilities plots /in hectares/ related to the exemplary community sizes (Table 4)

| Facility | 2400 inh. | 4800 inh. | 7200 inh. | 9600 inh. | 12000 inh. |
|---|---|---|---|---|---|
| Nursery | 0.12 | 0.24 | 0.36 | 0.48 | 0.60 |
| kindergarten | 0.24 | 0.48 | 0.72 | 0.96 | 1.2 |
| Primary school | 0.77 | 1.54 | 2.31 | 3.08 | 3.85 |
| Intermediate school | 0.48 | 2*0.48=0.96 | 0.58*2=1.16 | 0.77*2=1.54 | 0.96*2=1.92 |
| Secondary school | - | 2*0.54=1.08<br>1*0.84 | 2*0.62=1.12 | 2*0.84=1.68 | 2*1.02=2.04 |
| Health center | - | 0.25 | 0.25 | 0.34 | 0.42 |
| Mosque\church | - | 0.06 | 0.09 | 0.12 | 0.15 |
| Cultural center | - | 0.325 | 0.49 | 2*0.325=0.65 | 3*0.325=0.975 |
| Youth center | - | - | - | - | 1.2 |
| Corner shop | 0.042 | - | - | - | - |
| Local market<br>(suq)<br>Or small shop | 0.2 | 2*0.2=0.4 | 3*0.2=0.6 | 4*0.2=0.8 | 5*0.2=1.0 |
| Shopping center | - | - | - | - | 1.2 |
| Tea house, refreshment shop | 0.072 | 0.145 | 0.216 | 0.290 | 0.36 |
| Restaurant ,casino | - | 0.145 | 0.216 | 0.290 | 0.36 |
| Local administration | - | - | - | - | 0.072 |
| Post office | - | 0.035 | 0.05 | 2*0.035=0.07 | 0.085 |
| Police station | - | - | - | - | 0.12 |
| Fire brigade | - | - | - | - | 0.05 |
| Filling station | - | - | - | - | 0.084 |
| Car service station | - | - | - | - | 0.24 |

Population served by community facilities(Table 5)

| Facilities | |
|---|---|
| 1-Nursery:<br>- age of children served<br>- assumed population characteristics<br>-assumed number of children served :<br>a- in communities without job opportunities for women<br>b- in communities with limited job opportunities for women<br>c- in communities with unlimited job opportunities for women<br>the number of children served may be in particular cases adjusted local needs and to the number of women employed. | <br>-30 days up to 3 years<br>-120 children per 1000 inhabitants (12 pc of total population)<br><br>-5 children per 1000 inhabitants (4 pc of age group)<br>-10-12 children per 1000 inhabitants (8-10 pc of age group)<br>-16-20 children per 1000 inhabitants (13-16 pc of age group) |
| 2-kindergarten:<br>- age of children served<br>- assumed population characteristics<br>-assumed number of children served :<br>a- in communities without job opportunities for women<br>b- in communities with limited job opportunities for women<br>c- in communities with unlimited job opportunities for women<br>the number of children served may vary according to local demographic factors and local organization of educational services | <br>-4-5 years<br>-70 children per 1000 inhabitants (7 pc of total population)<br><br>-10-15 children per 1000 inhabitants (14-21 pc of age group)<br>-15-20 children per 1000 inhabitants (21-28 pc of age group)<br>-25-40 children per 1000 inhabitants (35-57 pc of age group) |
| 3- Primary school :<br>- age of children served<br>- assumed population characteristics<br>- number of pupils served : | <br>-6-11years<br>-175 children per 1000 inhabitants (17.5 pc of total population)<br>-175 children per 1000 inhabitants (100 pc of age group) |

To be continued

Population served by community facilities (Table 5) continued

| | |
|---|---|
| 4- Intermediate school:<br>- age of persons served<br>- assumed population characteristics<br>- number of students served : | <br>-12-14 years<br>-78 persons per 1000 inhabitants(8.5 pc of total population)<br>-75students per 1000 inhabitants (96 pc of age group) |
| 5- Secondary school:*<br>* The number of secondary school students contains students of general schools under supervision of Ministry of Education, and student's vocational schools under supervision of other ministries.<br>- age of persons served<br>- assumed population characteristics<br>- Number of students served :<br><br>Note(:it refers to points 1,2,3,4,5)<br>Housing standards have been worked out for years 1981-2000,thus they consider predicted changes within the age structure of the population. the data obtained from 1977 national census have been averaged and also due consideration was given to the anticipated increase in attendance of children and youth to the facilities under analysis. | <br><br><br><br>-15-17 years<br>-80 persons per 1000 inhabitants(8 pc of total population)<br>-66student per 1000 inhabitants (82 pc of age group) |

To be continued

Population served by community facilities (Table 5) continued

| | |
|---|---|
| 6-Health care center:<br>- number of persons served : | - for 100 pc of the population |
| 7- Mosque , church<br>- number of persons served : | -according to local needs. |
| 8- Cultural center:<br>- number of persons served : | -330 persons per 1000 inhabitants (for 33 pc of total population) |
| 9- Youth center:<br>- number of persons served : | -250 persons per 1000 inhabitants<br>(for youth from 12 up to 25 years of age; the number of inhabitants served equals 25 pc of the total population) |
| 10- Corner shop:<br>- number of persons served : | -750 persons per 1000 inhabitants<br>(for 75 pc of the total population, excluding small children and aged people) |
| 11-Local market (suq):<br>- number of persons served : | -750 persons per 1000 inhabitants<br>(for 75 pc of the total population, excluding small children and aged people) |

To be continued

Population served by community facilities (Table 5) continued

| | |
|---|---|
| 12- Shopping center<br>- number of persons served : | -750 persons per 1000 inhabitants<br>(for 75 pc of the total population, excluding small children and aged people) |
| 13- Tea or coffee house, refreshment shop:<br>- number of persons served : | -330 persons per 1000 inhabitants<br>(for 33 pc of total population) |
| 14-Restaurant , casino:<br>- number of persons served : | -300 persons per 1000 inhabitants<br>(for 30 pc of total population) |
| 15- Local administration office:<br>- number of persons served : | - for 100 pc of the total population |
| 16- Post office:<br>- number of persons served : | - for 100 pc of the total population<br>(equipped with at least one telephone booth per 2,200-2,400 inhabitants) |
| 17- police station:<br>- number of persons served | - for 100 pc of the total population |
| 18- Fire brigade station:<br>- number of persons served and purpose : | - for fire protection (providing one fire brigade should serve maximum 12 thou. Inhabitants and the emergency access time should not be more than 10 minutes). |

To be continued

Population served by community facilities (Table 5) continued

| | |
|---|---|
| 19- Filling station:<br>- number of persons served and purpose : | - supplying the inhabitants with fuel and lubricants for motor vehicles as well as gas cylinders for housekeeping purposes (one filling station should serve 12 thou. Inhabitants). |
| 20- Car service station:<br>- number of persons served and purpose : | -servicing motor vehicles (one car service station should serve 12 thou. Inhabitants) |
| 21- Playground:<br>- number of persons served | -150 children per 1000 inhabitants<br>(for 15 pc of total population) |
| 22- Playfield:<br>- number of persons served : | -200 children per 1000 inhabitants<br>(for 20 pc of total population) |
| 23- Sport field:<br>- number of persons served : | -200 persons per 1000 inhabitants<br>(for 20 pc of total population) |
| 24- Community parks and squares:<br>(including sport courts)<br>- number of persons served and purpose :<br>Programmed of community facilities should be adapted to number of inhabitants of community and to the indices of population served by different facilities | - for recreation of all inhabitants.<br>. |

## (1-5)Planning indicators of community open spaces

The planning indicators of community open spaces are presented in (Table 6)

open spaces should be planned and designed on the basis of classification by age and it includes:

-fields for children's play

-sport squares for youth

-squares and car parking for all inhabitants including rest in places and sport courts

Planning indicators of community open spaces(Table 6)

| Facility | Age group of users | Area in sq.m. per one inhabitant | Recommended plot size in sq m | | Max. distance of access from dwellings/in m/ | Access |
|---|---|---|---|---|---|---|
| | | | total | field | | |
| playfield | Children from 6 up to 11 years | 0.75 | 600-900 | 400-600 | 200-300 | crossing with access streets allowed |
| Sport field | Youth from 12 up to 18 years | 0.50 | 900-1500 | 600-1000 | 500-800 | crossing with collector street allowed |
| Community park and squares/including sport courts/ | for all inhabitants | 5.00 | - | - | 800 | crossing with collector streets allowed |

Note: the sport courts(within the community park)may be used according to many considerations, including the community populations demand . However, the user should bear the responsibility for proper maintenance of those sport courts.

## (1-6) Planning indicators of car (parking) spaces

This indicator depends on:
-reference base
-number of car places

Planning indicators of car (parking) places (Table 7)

| Type of facility building served | Reference base | Number of car places |
|---|---|---|
| One-family row and courtyard houses<br>Multi-family building | Number of car places per one house hold or<br>Per 1000 inhabitants | 1<br>150 |
| Nursery<br>Kindergarten | Number of car places per group of children<br>Number of additional places | 0.5<br>+2 |
| Primary school and Intermediate school | Number of car places per one classroom<br>Number of additional places | 0.5<br>+2 |
| Secondary school | Number of car places per one classroom<br>Number of additional places | 1<br>+2 |
| Health-care center | Number of car places per 100 sq.m..<br>of total floor area | 3-6 |
| Mosque(church) | a/m | 10 |
| Cultural center | a/m | 3-8 |
| Youth center | a/m | 3-8 |
| Corner shop | a/m | 1-2 |
| Local market(suq) or small shop | a/m | 1-3<br>1-2 |
| Shopping center | a/m | 5-8 |
| Tea house,<br>Refreshment shop | Number of car places per 100<br>Consumer seats | 4-8 |
| Restaurant, casino | Number of car places per 100 Consumer seats | 3-8 |
| Local administration | Number of car places per 100 sq.m..<br>Of total floor area | 2-4 |

To be continued

Planning indicators of car (parking) places (Table 7)continued

| Type of facility building served | Reference base | Number of car places |
|---|---|---|
| Post office | a/m | 1-3 |
| Police station | a/m | 2-4 |

Note:-The area of one car (parking) place should be 25 sq m including the car turning area.
-it is possible to increase the number of car places according to needs and available site area.

The maximum access distance between car parks followings should not exceed:
- Entrances of residential building 80m
-Entrances of facility building 40m

## (1-7)Orientation indicators, climatic solution and shape of buildings:

The position of the sun with respect to any point on the earth's surface is defined by the angle of azimuth and the angle of altitude. These angles, determined by the latitude, the date and the hour, play an important role in establishing orientation of building. In Iraq the latitude generally accepted N. for the purposes of orientation of building is 35˚

The greatest and smallest altitude of the sun within a year, receptivity, is:

1-at noon on June 22nd-78 30'

2-the best orientation of building in this area is 35˚ east from the south.

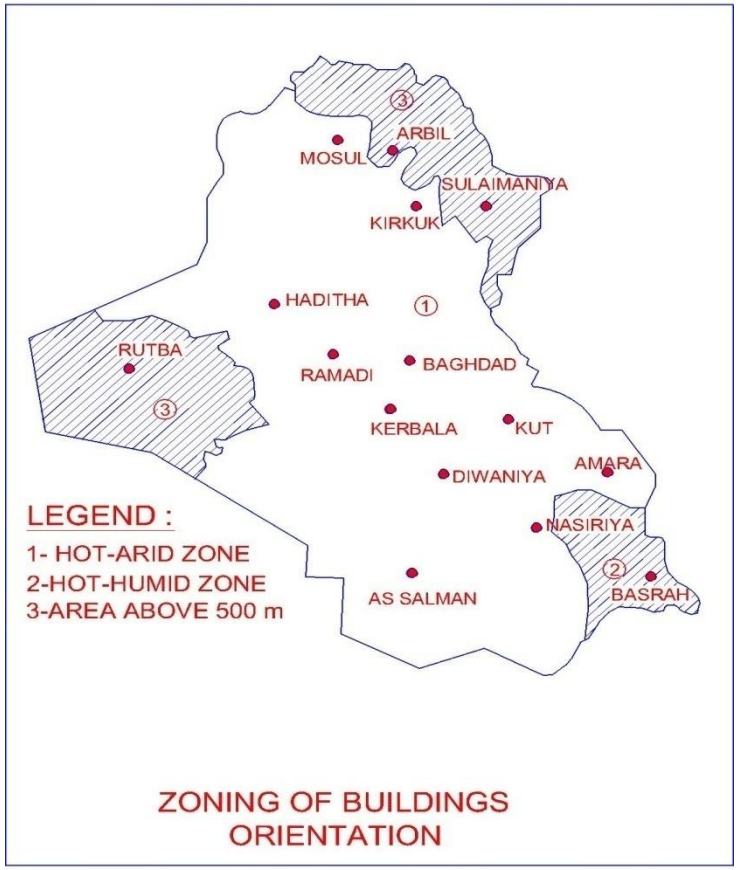
(see figure1)

-orientation in the hot town(south area):

1-at noon on December 22nd-31 30'

2-the best orientation of building in this area is 15˚ east from the south.

(see figure2)



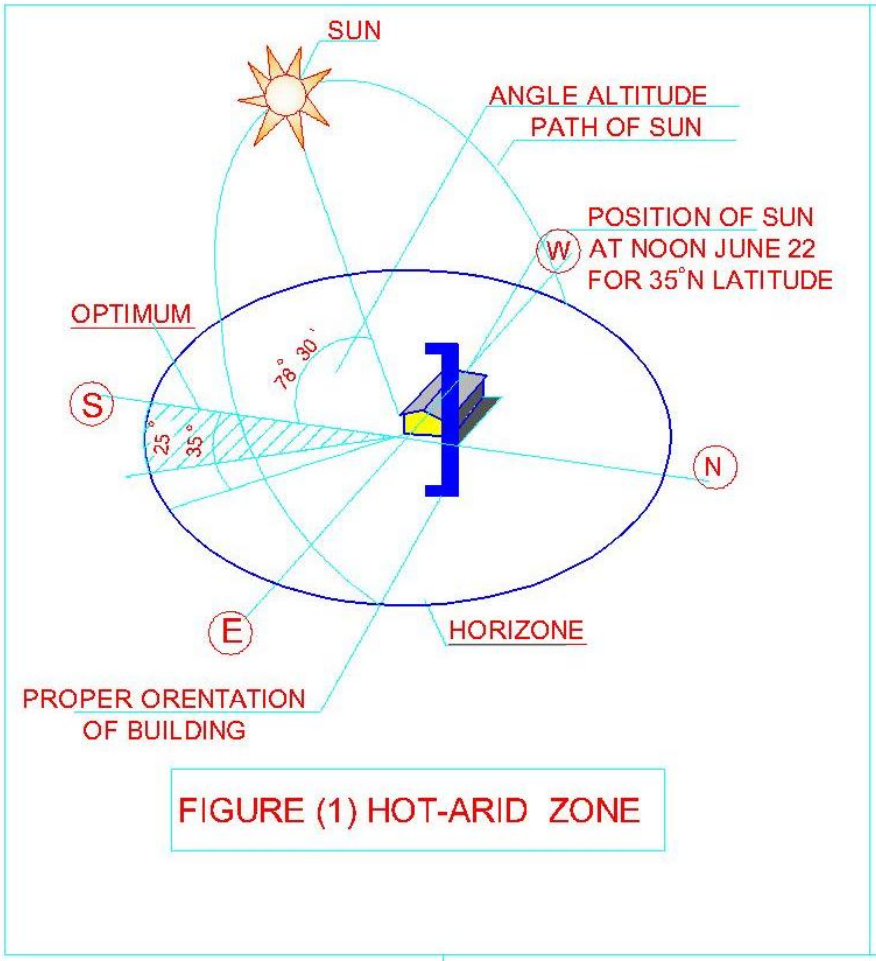



FIGURE (1) HOT-ARID ZONE

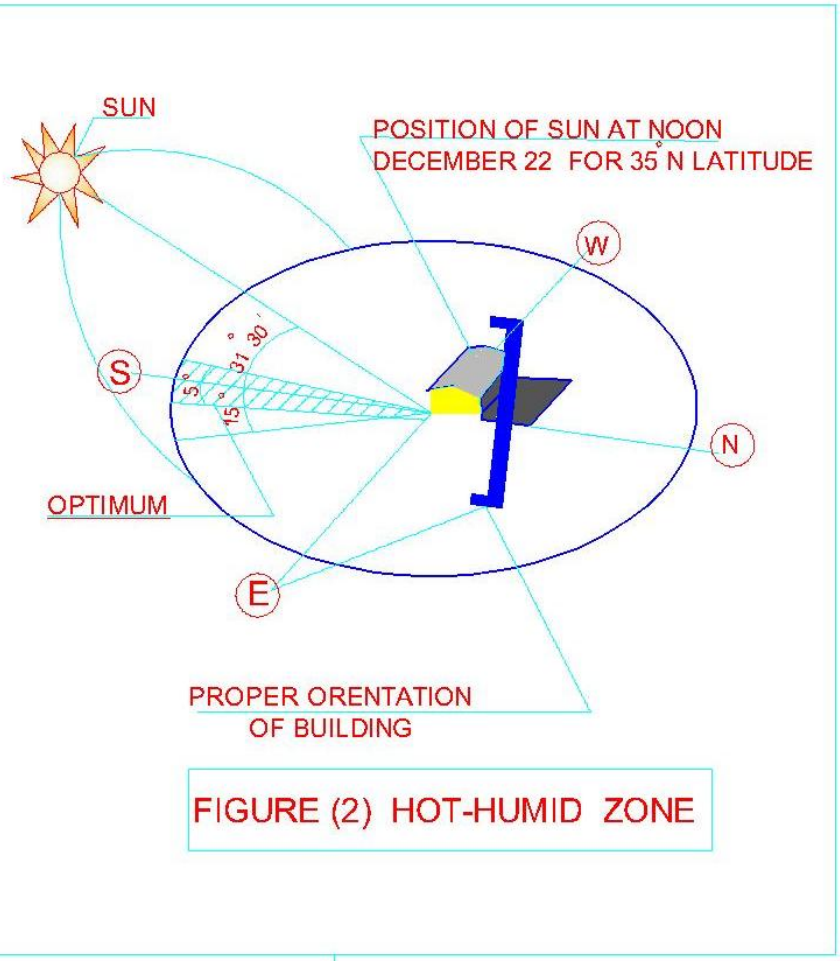



FIGURE (2) HOT-HUMID ZONE

# ORIENTATION OF BUILDING

## (2-1)Category of dwelling

In-door useful floor area:

In accordance with the dwelling category and type of residential building the useful indoor floor area of the dwelling comprising total of all living and auxiliary spaces is obligatory.

In-door useful floor area (Table 8)

| Category of dwelling | | In-door useful floor area Of a dwelling | |
|---|---|---|---|
| | | One-family housing | Multi-family housing |
| | | (sq m) | |
| Small | S1 | - | 57-63 |
| | S2 | 75-81 | 69-75 |
| Medium | M1 | 99-105 | 93-99 |
| | M2 | 114-120 | 108-114 |
| Large | L | 147-157 | 138-147 |
| Extra large | E1 | 168-180 | - |
| | E2 | 183-195 | - |

## (2-2)Minimum number of habitable rooms and respective floor area

According to the category of dwelling and type of residential building minimum allowable number of habitants rooms in the dwelling and minimum total floor area is as indicated in( Table 9 )

Minimum number of habitable rooms and respective floor area (Table 9)

| Category of dwelling | | One-family housing | | Multi-family housing | |
|---|---|---|---|---|---|
| | | Minimum number of habitable rooms | Minimum habitable floor area (sq m) | Minimum number of habitable rooms | Minimum habitable floor area (sq m) |
| Small | S1 | - | - | 2 | 33 |
| | S2 | 3 | 48 | 2 | 42 |
| Medium | M1 | 4 | 63 | 3 | 57 |
| | M2 | 5 | 75 | 4 | 69 |
| Large | L | 6 | 93 | 5 | 87 |
| Extra large | E1 | 7 | 108 | - | - |
| | E2 | 8 | 120 | - | - |

## (2-3)Obligatory plot area:

The obligatory plot area for one-family houses is determined in (Table 10)

| Type of one-family houses | Plot area (in sq m) |
|---|---|
| Detached house | 400-600 |
| Semi-detached house | 300-400 |
| Row house | 200-350 |
| Courtyard house | 150-300 |

Regarding several categories of dwelling it is recommended to plan plot areas for small one-family houses at lower limits and plot area for large and extra large houses at upper of the ranges determined previously as obligatory for houses of definite type

plot area for typing of dwelling (Table 11)

| Category of dwelling | Recommended plot area of one-family house (sq.m) | | | |
|---|---|---|---|---|
| | Detached house | Semi-detached house | Row house | Courtyard house |
| Small | 400-450 | 300-340 | 200-260 | 150-210 |
| Medium | 420-500 | 320-360 | 220-290 | 170-240 |
| Large | 440-550 | 340-380 | 240-320 | 190-270 |
| Extra large | 460-600 | 360-400 | 260-350 | 210-300 |

## (2-4)Dwelling category and floor area (Urban one-family housing)

Dwelling categories and floor areas(Table 12)

| CATEGORY OF DWELLING | | | | S2 | M1 | M2 | L | E1 | E2 |
|---|---|---|---|---|---|---|---|---|---|
| OCCUPANCY RATE<br>Number of persons per dwelling | | | | 1-3 | 3-5 | 5-7 | 7-9 | 9-11 | 11 and more |
| MINIMUM NUMBER OF ROOMS | | BEDROOMS | | 1/2 | 2 | 3 | 4 | 5 | 6 |
| | | LIVING ROOMS | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | HABITABLE ROOMS | | 3 | 4 | 5 | 6 | 7 | 8 |
| REQUIRED SPACE | | CHARACTER OF DIRECTIVE | | FLOOR AREA (sq.m) | | | | | |
| 1 | master bedroom | | r.min. | 21/12 | 15 | 15 | 15 | 15 | 15 |
| 2 | 2-nd bedroom | | Ob.min. | -/9 | 12 | 12 | 12 | 12 | 12 |
| 3 | 3-rd bedroom | | Ob.min. | - | - | 12 | 12 | 12 | 12 |
| 4 | 4-th bedroom | | Ob.min. | - | | - | 12 | 12 | 12 |
| 5 | 5-th bedroom | | Ob.min. | - | - | - | - | 12 | 12 |
| 6 | 6-th bedroom | | Ob.min. | - | - | - | - | - | 12 |
| 7 | Total of sleeping and personal activities space 1+2+3+4+5+6 | | r.min. | 21 | 27 | 39 | 51 | 63 | 75 |
| 8 | 1-st living rooms or family living room | | r.min. | - | 18 | 18 | 21 | 24 | 24 |
| 9 | 2-nd living room or guest reception room | | r.min. | - | 12 | 12 | 15 | 15 | 15 |
| 10 | Total of living space 8+9 | | r.min. | 27 | 30 | 30 | 36 | 39 | 39 |
| 11 | Total of habitable space 7+10 | | Ob.min. | 48 | 63 | 75 | 93 | 108 | 120 |
| 12 | pace for preparation of food | | Ob.min. | 9 | 12 | 12 | 15 | 18 | 18 |

To be continued

| CATEGORY OF DWELLING | | | | S2 | M1 | M2 | L | E1 | E2 |
|---|---|---|---|---|---|---|---|---|---|
| OCCUPANCY RATE<br>Number of persons per dwelling | | | | | | | | | |
| MINIMUM NUMBER OF ROOMS | | BEDROOMS | | 1/2 | 2 | 3 | 4 | 5 | 6 |
| | | LIVING ROOMS | | 2 | 2 | 2 | 2 | 2 | 2 |
| | | HABITABLE ROOMS | | 3 | 4 | 5 | 6 | 7 | 8 |
| REQUIRED SPACE | | CHARACTER OF DIRECTIVE | | FLOOR AREA (sq.m) | | | | | |
| 13 | Bathroom | | Ob.min. | 4.5 | 3.5 | 3.5 | 4.5 | 4.5 | 4.5 |
| 14 | 2-nd bathroom | | Ob.min. | - | - | - | 3 | 3 | 3 |
| 15 | Toilet room | | Ob.min. | - | 1.5 | 1.5 | 1.5 | 1.5 | 1.5 |
| 16 | Storage | | Ob.min. | 4.5 | 6 | 6 | 7.5 | 9 | 9 |
| 17 | Total of service space 12+13+14+15+16 | | r.min. | 18 | 23 | 23 | 32 | 36 | 36 |
| 18 | Circulation space | | r.max. | 9 | 12 | 15 | 21* | 24* | 27* |
| 19 | USEFUL IN-DOOR SPACE 11+17+18 | | Ob. | 75-81 | 99-105 | 114-120 | 147-157 | 168-180 | 183-195 |
| 20 | Out- door space for summer night rest | | r.min. | 9 | 15 | 21 | 27 | 33 | 39 |
| 21 | Total of in-door and out-door useful space19+20 | | r. | 84-90 | 114-120 | 135-141 | 174-184 | 201-213 | 221-234 |

Note:* Including space for internal stairs

## (2-5) Dwelling category and floor area (Urban multi-family housing)

Dwelling categories and floor areas(Table 13)

| CATEGORY OF DWELLING | | | S1 | S2 | M1 | M2 | L |
|---|---|---|---|---|---|---|---|
| OCCUPANCY RATE<br>Number of persons per dwelling | | | 1 | 1-3 | 3-5 | 5-7 | 7-9 |
| MINIMUM NUMBER OF ROOMS | | BEDROOMS | 1 | 1 | 2 | 3 | 4 |
| | | LIVING ROOMS | 1 | 1 | 1 | 1 | 1 |
| | | HABITABLE ROOMS | 2 | 2 | 3 | 4 | 5 |
| REQUIRED SPACE | | CHARACTER OF DIRECTIVE | FLOOR AREA (sq.m) | | | | |
| 1 | master bedroom | r.min. | 13 | 21 | 15 | 15 | 15 |
| 2 | 2-nd bedroom | Ob.min. | - | - | 12 | 12 | 12 |
| 3 | 3-rd bedroom | Ob.min. | - | - | - | 12 | 12 |
| 4 | 4-th bedroom | Ob.min. | - | | - | - | 12 |
| 5 | 5-th bedroom | | - | - | - | - | - |
| 6 | 6-th bedroom | | - | - | - | - | - |
| 7 | Total of sleeping and personal activities space 1+2+3+4+5+6 | r.min. | 12 | 21 | 27 | 39 | 51 |
| 8 | Multi-purpose living room | r.min. | 21 | 21 | 24 | 24 | 30 |
| 9 | 2-nd living room | | - | - | - | - | - |
| 10 | Total of living space 8+9 | r.min. | 21 | 21 | 24 | 24 | 30 |
| 11 | Total of habitable space 7+10 | Ob.min. | 33 | 42 | 57 | 69 | 87 |
| 12 | Space for preparation of food | Ob.min. | 9 | 9 | 12 | 12 | 15 |

To be continued

Dwelling categories and floor areas(Table 13)continued

| CATEGORY OF DWELLING | | | | S1 | S2 | M1 | M2 | L |
|---|---|---|---|---|---|---|---|---|
| OCCUPANCY RATE<br>Number of persons per dwelling | | | | | | | | |
| MINIMUM NUMBER OF ROOMS | | BEDROOMS | | 1 | 1 | 2 | 3 | 4 |
| | | LIVING ROOMS | | 1 | 1 | 1 | 1 | 1 |
| | | HABITABLE ROOMS | | 2 | 2 | 3 | 4 | 5 |
| REQUIRED SPACE | | CHARACTER OF DIRECTIVE | FLOOR AREA (sq.m) | | | | | |
| 13 | Bathroom | | Ob.min. | 4.5 | 4.5 | 3.5 | 3.5 | 4.5 |
| 14 | 2-nd bathroom | | Ob.min. | - | - | - | - | 3 |
| 15 | Toilet room | | Ob.min. | - | - | 1.5 | 1.5 | 1.5 |
| 16 | Storage | | Ob.min. | 3 | 4.5 | 6 | 6 | 7.5 |
| 17 | Total of service space 12+13+14+15+16 | | r.min. | 16.5 | 18 | 23 | 23 | 31.5 |
| 18 | Circulation space | | r.max. | 6 | 9 | 12 | 15 | 18** |
| 19 | USEFUL IN-DOOR SPACE 11+17+18 | | Ob. | 57-63 | 69-75 | 93-99 | 108-114 | 138-147 |
| 20 | Out- door space for summer night rest | | r.min. | 3 | 6 | 9-12* | 12-18* | 15-24* |
| 21 | Total of in-door and out-door useful space 19+20 | | r. | 60-66 | 75-81 | 102-111 | 120-132 | 153-171 |

Note: S1,S2- Small; M1, M2-Medium; L-Large

R.min-recommended minimum;-ob-obligatory; ob.min - obligatory minimum; ob.max- obligatory maximum.
* First indicator for dwelling in high-rise residential building second indictor for dwelling in low-rise residential building
** in marionettes circulation floor area may be increased by 3 sq m for placing stairs.

## THIRD: DISTANCE STANDARD

### (3-1)Minimum distance in one-family housing development

In one-family housing development the minimum distance between the houses should be:

1. Across the access12m
2. Across the service (occasional) street for courtyard houses 6m
3. Between the rear elevations of detached and semi-detached houses 6m
4. Between elevation of row houses 8m
5. To the boundary of the next plot for detached and semi-detached houses 1.5m

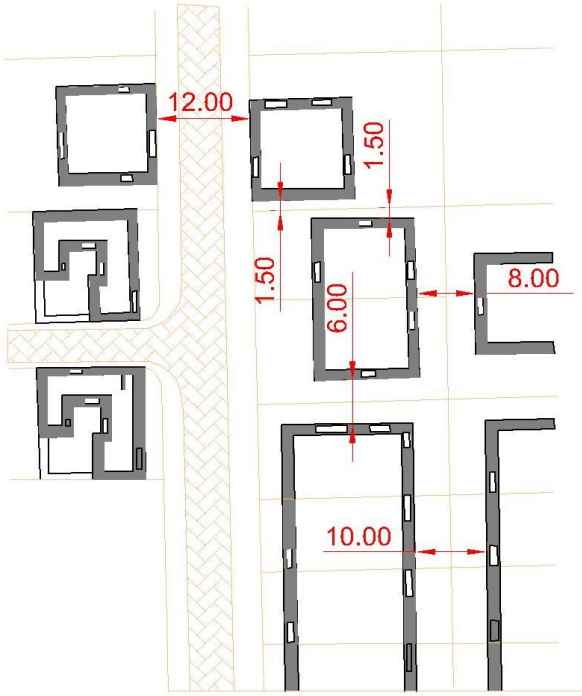



FIGURE 3: MINIMUM DISTANCES IN ONE-FAMILY HOUSING DEVELOPMENT.

(3-2) Minimum distance in multi-family housing (up to 4 floor) development

In multi-family housing development with building up to 4 storey's high the minimum distance should be:

1. between longitudinal elevations 12m
2. between secondary elevations 6m

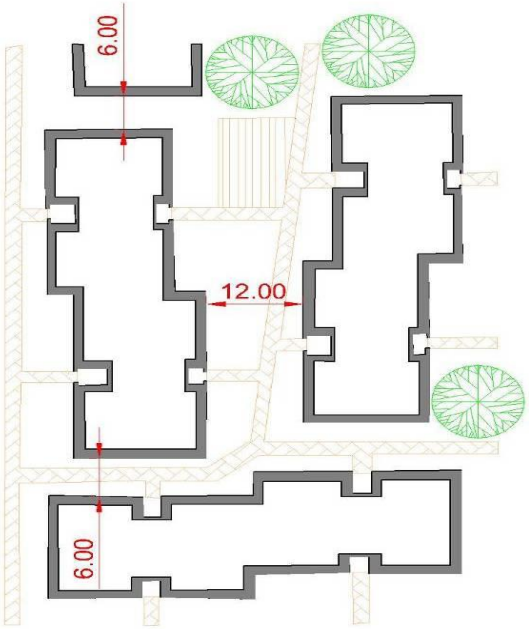



FIGURE 4: MINIMUM DISTANCES (in m) IN MULTI-FAMILY HOUSING UP TO 4 FLOORS DEVELOPMENT.

## (3-3)Other minimum distances (in m) between area development elements

Minimum distances from residential building to the areas or facilities specified below are as follows

1. Nursery, Kindergarten, primary and secondary schools and health center plots= 15m
2. Community playground and playfields=15m
3. Garbage collection point=10m
4. Septic tank=10m
5. Water storage tank=20m
6. Car filling station=30m
7. Car service station:
   Up to 10 stands=25m
   Over 10 stands=30m
8. Boundary of the railway area=30m
9. Cemetery boundary=50m

Some other minimum distance between area development elements are presented in Fig. 5

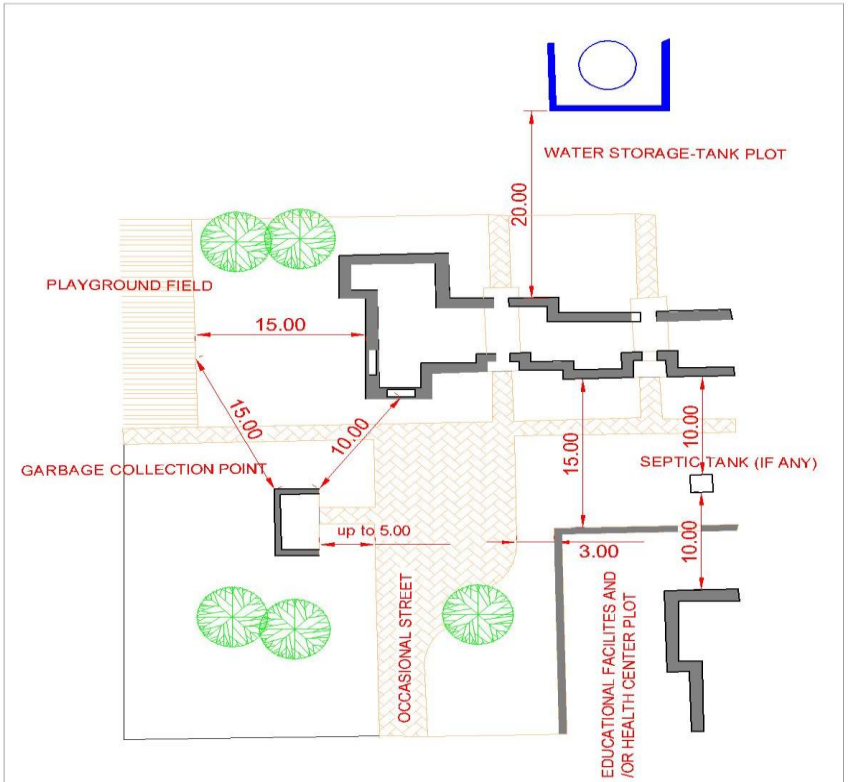
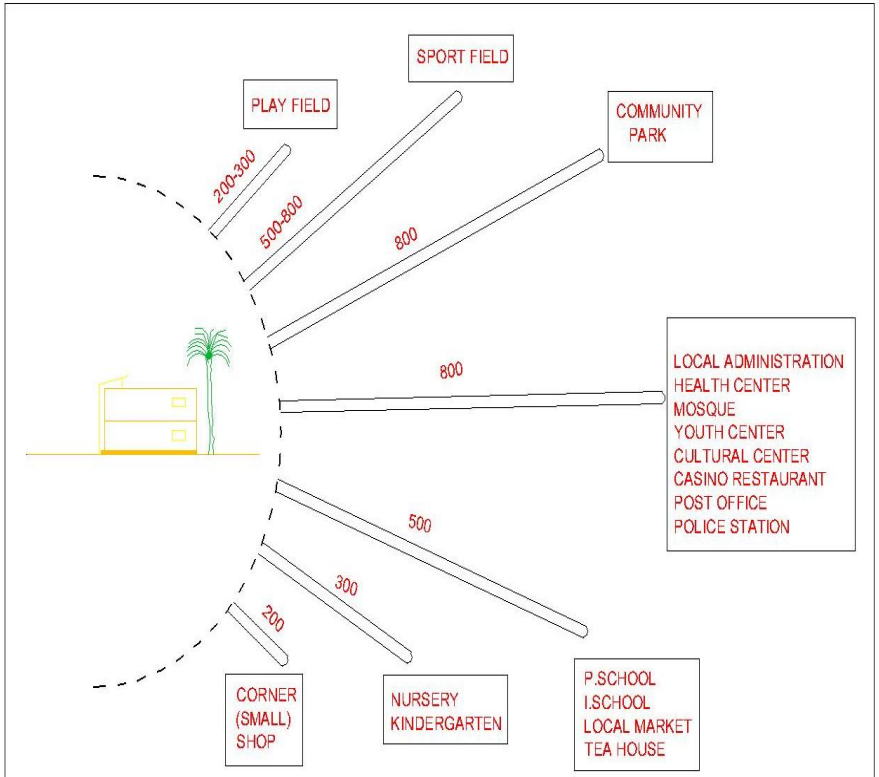



FIGURE 5:OTHER MINIMUM DISTANCES (in m) BETWEEN AREA DEVELOPMENT ELEMENTS

## (3-4)Maximum access distances (in m) from dwelling to community facilities

Maximum access distance (in m) from dwelling to community facilities:

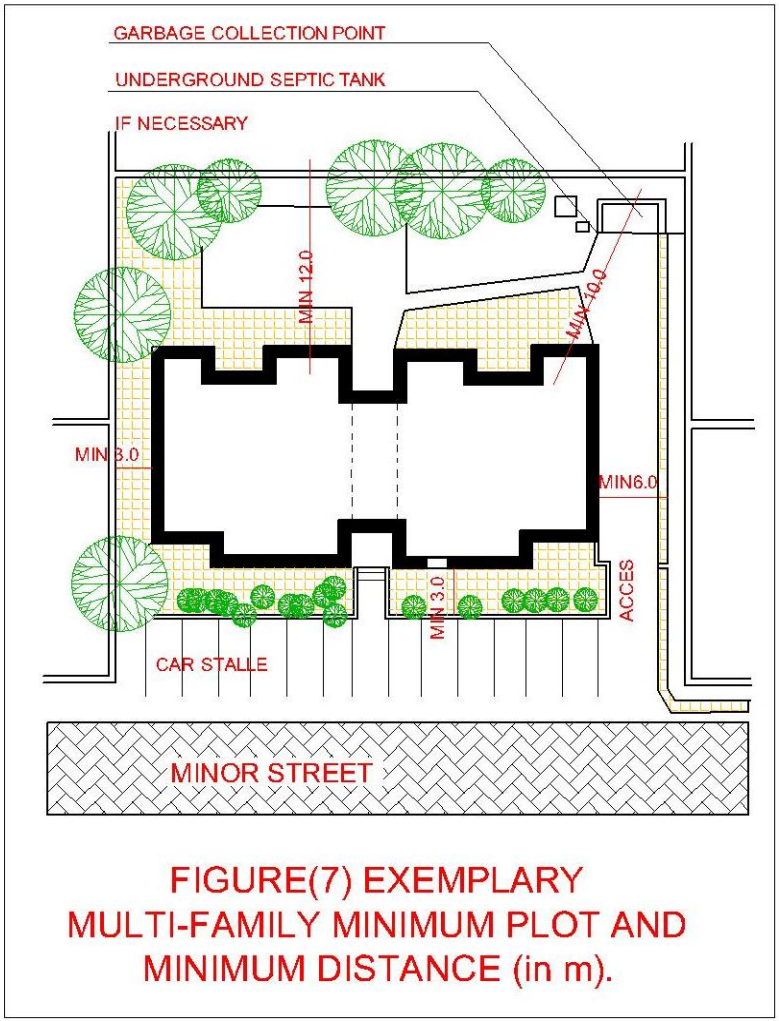
1. Maximum access distance between dwelling and play field= (200-300m)
2. Maximum access distance between dwelling and sport field= (500-800m)
3. Maximum access distance between dwelling and community park= (800m)
4. Maximum access distance between dwelling and (Local administration, health Center, mosque, cultural center, casino, restaurant, post office, police station) =800m
5. Maximum access distance between dwelling and (Maximum access distance between dwelling and P. school, I. school, Local market, Tea house) =500m
6. Maximum access distance between dwelling and Nursery, Kindergarten=300m
7. Maximum access distance between dwelling and Corner (small) shop=200m




FIGURE(6) MAXIMUM ACCESS DISTANCES (in m) FROM DWELLING TO COMMUNITY FACILITIES

## (3-5) The Standards For Minimum Spaces Between Housings building (multi-families) and neigh borings

1. The minimum distance between plot area and garbage collection point=10m
2. The minimum distance between plot area and underground septic tank (if necessary) =12m
3. The minimum distance between plot area and nearest fence with access=6m
4. The minimum distance between plot area and walkway=3m
5. The minimum distance between plot area and car stalls=3m




FIGURE(7) EXEMPLARY MULTI-FAMILY MINIMUM PLOT AND MINIMUM DISTANCE (in m).