This is part of a research conducted by The Architect Siood Omari for the purpose of developing a design for a residential complex in Qularaysi-Sulaimaniyah.

This part of the research represents the architectural section.

The design was based on the actual site measurements and topography and not on a hypothetical (imaginary) site.

١. About the Project:

The project is located on a total area equal to 637,500 (six hundred and thirty-seven thousand, and five hundred square meters (255 two hundred and fifty-five acres) divided into three zones according to the basic design. The nature of land use is residential by design, and each zone includes all the required services according to the requirements of the Investment Authority, and according to planning criteria of the Ministry of Urban Housing. As directed by the Investment Authority and its requirements, the pattern of housing will be vertical and AVI in the three areas with varying percentages. Figure (1) shows the three regions and the pattern of housing within it.

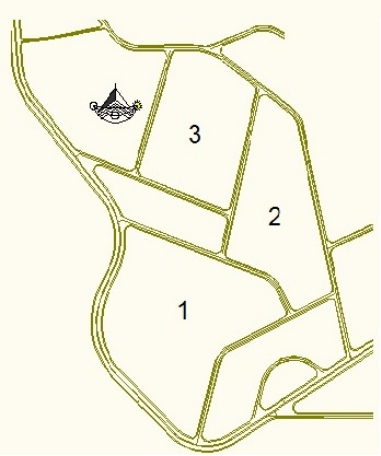


Figure (1)

Zone	Percentage of homes	Percentage of apartments
First	68.6%	31.4%
Second	20.8%	79.2%
Third	27.3%	72.3%

٢. Site Analysis:

Figure (2) shows analysis of the location of the axes of movement and the relationship of the site with the city and the movement of prevailing winds and traffic.

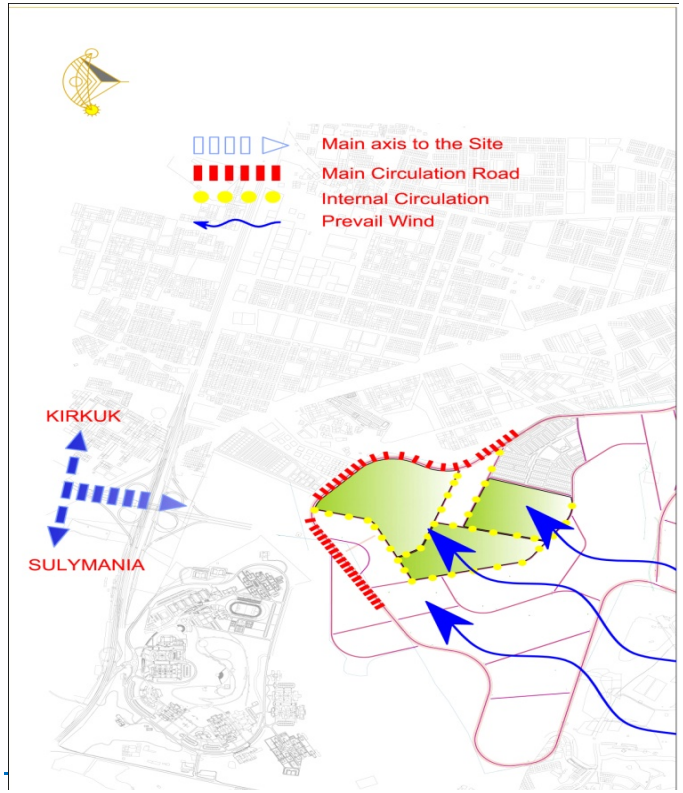


Figure (2)

٣. Master Plan Concept:

In addition to the basic requirements as directed by the Investment Authority, the main objectives that we aspire to be achieved by the basic design of the site include:

i. Creating urban spaces with a varied optical character to avoid repetition, which usually occurs in typical residential complexes, and stay away from the creation of traditional residential buildings.

ii. Collecting service areas so that they are semi-central areas for each zone.

iii. Linking the commercial areas of the three regions to form a commercial line connecting the three areas to strengthen the interdependence of trade and service among them.

iv. Isolating the three areas from the main axes of movement surrounding the project and neighboring areas in terms of kinetics and visuals as much as possible.

v. Creating a visual focus attraction to become a Land Mark that combines the three areas and be a point of significance in the project.

vi. Determining the axes of movement and entry points to each area to maintain privacy, as well as preserving the main axes as in the master plan.

vii. Creating a modern residential area of high environmental standards, by increasing green areas and reducing open parking areas that work in the summer as a heat reflector and in the winter as a cold reflector.

Figure (3) shows the design concept of the site.

١. Vertical housing 2. Flat housing
٣. Public Services 4. Mosque (Land Mark)
5. Commercial Strip

Figure (3)

٤. Planning Standards adopted in the Design of Project:

In addition to the planning criteria approved by the Ministry of Housing and the Investment Authority, we have adopted high standards in the basic plan and the design of buildings, where we took into account the problems of the citizens that result from adopting modest standards of design, for example and not exclusivity, determine the width of the street with ten meters including pavement and path of cars. The rising standards of living and the availability of cars in acceptable prices are for most segments of society have a direct impact on the nature of the use of all city facilities. These variables in the society and their impact were taken into account in the design criteria we adopt. In this regard, for example, we adopted a higher standard for street width. We used 12 meters instead of 10 meters, and adding spaces for car parking with a higher standard as well. We have specified two parking spaces for each apartment with a parking space for every five apartments as additional visitors' spaces in each residential building. This is in addition to single garages houses. It has Been taken into account the following aspects in terms of design standards:

- Street width is 12 meters instead of 10 meters.
- Parking: Each residential building has an underground two-story parking lot that covers the building's needs, and therefore the parking space will be used as green areas.
- Environmental considerations: The proportion of green areas was increased to 26.9% so that the green area is 13.4m^2/person, rather than 2.2m^2/person, with distributing the buildings vertical in order to operate as natural wind

blockers, in addition to providing heavy water treatment plants, to reuse in irrigating green areas.
- Distances between vertical buildings: the least distance between vertical buildings is (H * 0.85) instead of (H * 0.5).
- Privacy: it has been taken into account the privacy of residential areas by using a surrounding street and one access point to each residential area.

٥. Areas and Proportions of Units and Population:

We have applied the required percentages in the areas and the number of residential units according to the requirements of the Investment Authority. The attached tables show it:

- Table (1) shows the number and type of housing units in each region.
- Table (2) shows rates of types of housing units in each region.
- Table (3) shows the areas of public buildings and areas of construction for the residential buildings.
- The total area required for the mosque in each region is combined and specified for one big mosque that is considered an attraction point in the middle of the project.

Zone	Number of Houses	Number of Apartments	Total Units	Total Population
First	700	320	1020	5100
Second	190	720	910	4550
Third	226	600	826	4130
Total	1116	1866	2756	13780

Table (1) - Numbers and types of housing units

Zone	Percentage of Houses	Percentage of Apartments	Total
First	68.6%	31.4%	100%
Second	20.8%	79.2%	100%
Third	27.3%	72.3%	100%

Table (2) - Percentage of housing units in each region

٦. The Design Concept of Residential Buildings:

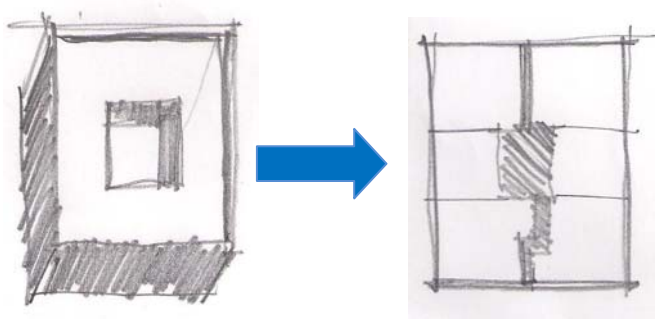
The economic factor has always been the major determinant in the pattern of living and building in all communities. In our cities, including the city of Sulaimaniyah, the traditional houses with the inner courtyard is the basic unit in all residential communities for many reasons. First, there are environmental causes; (the general area of Mediterranean and semi-desert areas use the system of the inner courtyard).

As time passes on the housing unit, or when the owner leaves the unit for economic and/or social reasons (for example, the increase in size of the family-House Hold-or due to the development of areas of the city and the emergence of more modern areas which calls to change the residential area for social reasons), the owner leaves the original house, and a group of families with a lower economic level occupies the housing unit. At this stage, the

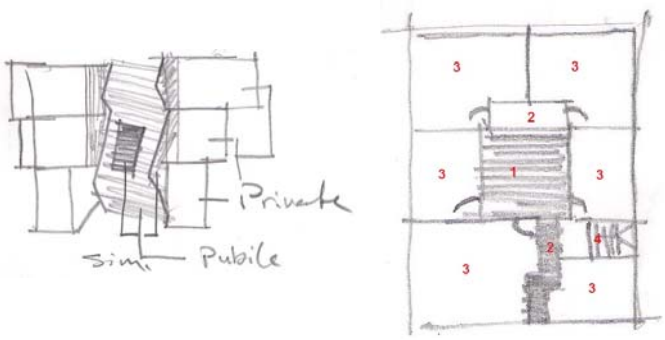
housing unit's inner courtyard becomes a semi-public space after being a semi-private space. The function space remains the same with a different level of interdependence between the domestic users of space. The inner courtyard was used by the family members to strengthen family bonds, and then it would be used to strengthen social cohesion among the group of families.

Vertical housing is a relatively recent pattern in Iraq, and a very large section of society does not prefer to live in an apartment building due to lack of suitable open spaces, and especially gardens. From the inner courtyard concept, we have created a middle space on a larger scale that is dedicated to a group of apartments, working as a semi-public space for the residents of one building, as well as a semi-private space for any person who does not live in the building. This space will strengthen social ties and adds a nice touch to the building.

The ultimate goal is to convert part of the exterior spaces in the vertical housing complexes to be internal spaces of joint ownership, socially, and provides privacy for the residents of the apartments in an independent space. Figure (4) represents the development of the idea, and Figure (5) represents the final form of the idea.



A heritage housing unit (stripped)



٢. Open semi-public space. 2- Open semi-public thatched space. 3- Private space. 4- vertical movement

Figure (4)

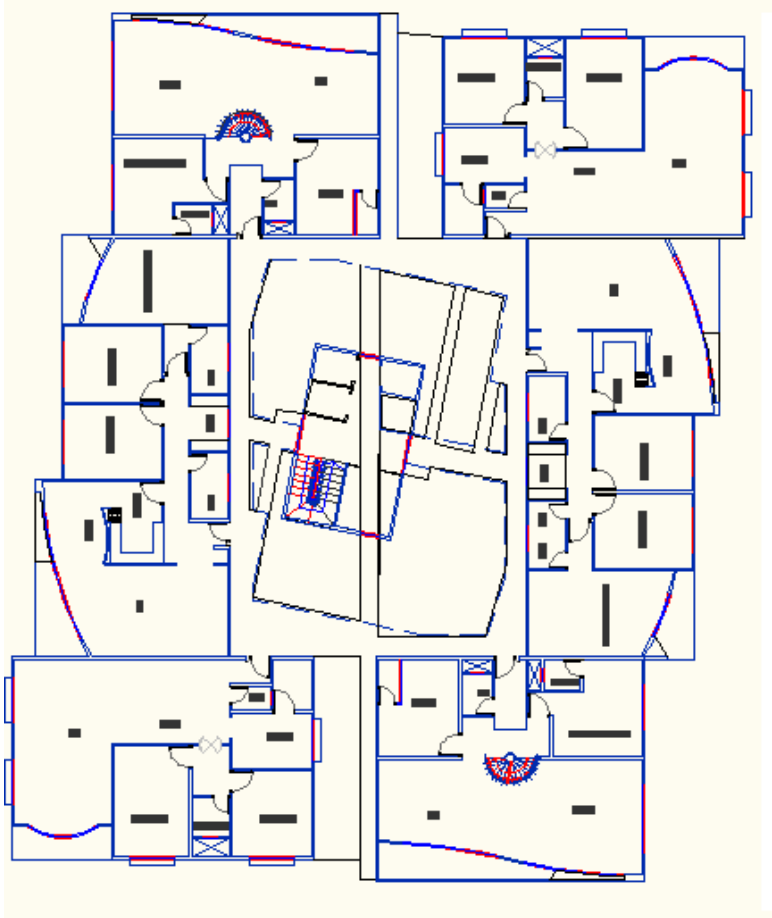


Figure (5) the final concept

٧. Technical Specifications of the Residential Buildings:

Very high technical specifications were adopted the in residential buildings designs (vertical and horizontal) in

terms of construction and environmental systems while providing an integrated service in one building, as follows:

A. The structure:

The structure consists of systems built between pillars and bridges, constructed on site, and the pre-cast ceilings are assembled without wood frame works. The system provides spaces as wide as 12 meters, reducing the number of columns and bridges (Figures (6) and (7)). This feature was used to create flexible internal spaces with the possibility of changing the interior wall lining without affecting the structure, in addition to fast execution and accuracy as well as lowering costs with the highest quality. The structure consists of the following parts:

- Raft Foundation
- Reinforced Concrete Retaining Walls for Basement
- Concrete columns and bridges poured on site.
- Precast Hollow Core Slab ceilings
- Reinforced concrete walls for service, elevators and stairs shafts.

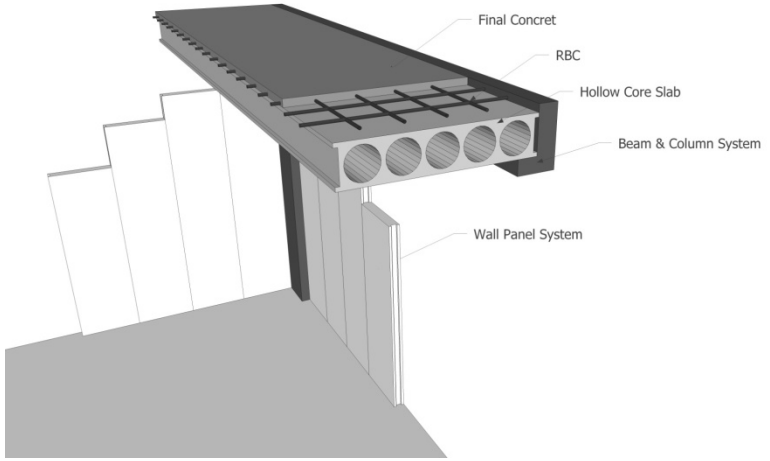


Figure (6)

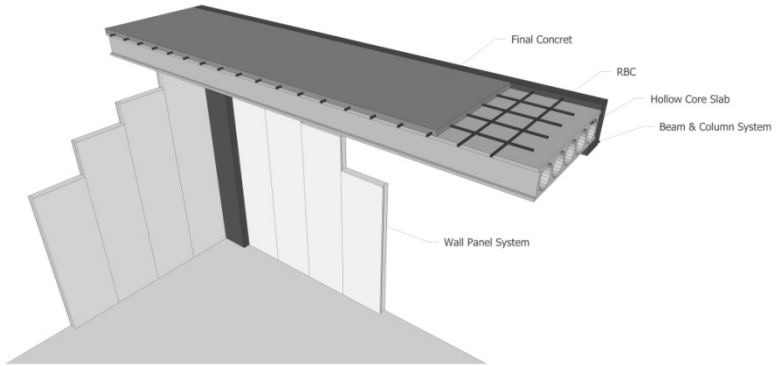


Figure (7)

B. System of walls:

A modern system of the walls will be used. It consists of ready-made panels like cement and plaster panels with heat and sound insulation. These panels are fixed in place using metal channels. This system is characterized by the following specifications

- Very high thermal insulation
- Sound insulation up to 90 dB or more.
- Fire-resistant
- Moisture resistant
- Punching Load bearing up to more than 250 kg/m^2
- Light weight
- Fast in execution, where the pieces are manufactured by design.

We are the first to use this system in Iraq in our project Saib City. Figures (8), (9), and (10) show how the wall panels are installed.

Figure (8)

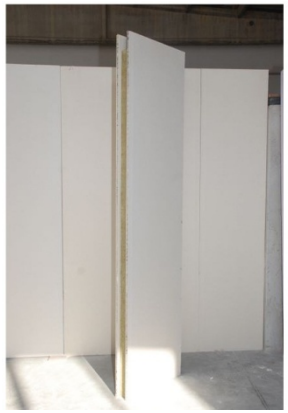


Figure (9)

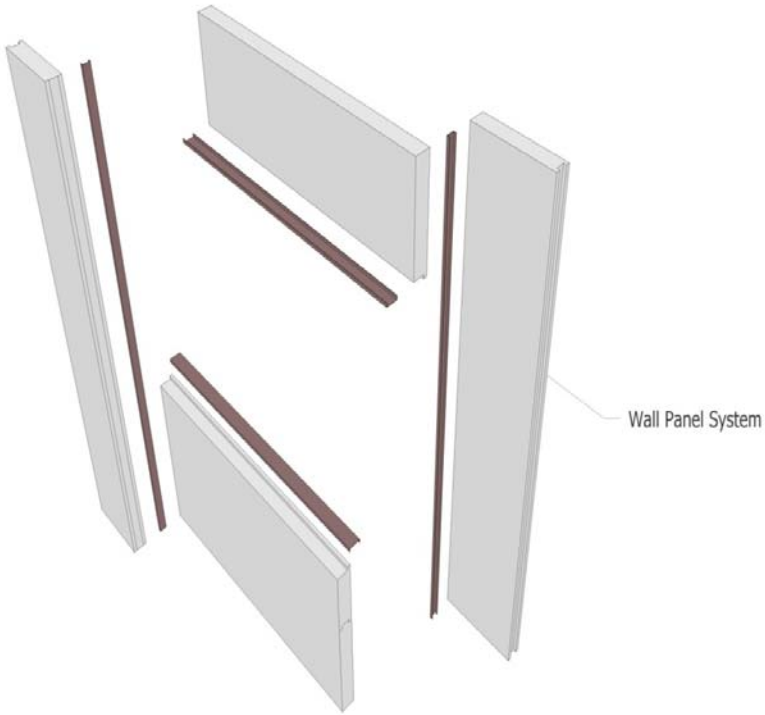


Figure (10)