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Research paper

Architectural characteristics of the inner courtyards for the heritage houses in the citadel of Kirkuk

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Abstract

The inner courtyards can be regarded as one of the most significant designing features of the heritage buildings in general and it can also be regarded as the significant feature of the residential buildings in particular. The designing thoughts of the residential buildings are based on using the central courtyards as a central point to achieve the principle of heading inwards. These inner courtyards have special features which achieves the needs and the requirements of its residents. The studies which include the archeological side and its heritage elements of the social environment give us a clear impression about the social lifestyle of these societies especially from the residential side and how to adapt with the weather. So, this research concentrates on studying the archeological characteristics through the element of the inner courtyards in the heritage houses in the Citadel of Kirkuk. Kirkuk is one of the northern provinces of Iraq, in Asia, and it has rich archeological sites especially the heritage houses but these sites are almost unknown because there are only few studies in archeology about them. Research problem: Studying the archeological characteristics of the inner courtyards in the heritage houses in the Citadel of Kirkuk. The goal of the research: To analyze and study the characteristics of the inner courtyards according to its type, shape, constituents and the functionality of these elements. The research also aims to conduct a practical application on five chosen houses from the Citadel of Kirkuk.It was found that the architectural characteristics of the inner courtyards in the castle buildings are characterized by their high importance as a space overlooking the living spaces, and an integral nature connected to the cluster of the distributed to the neighboring spaces and takes up 25% of the housing area. The methodology of the research includes the method of description and analysis in the knowledge and exploration of the characteristics of internal courtyard of the heritage houses in the citadel of Kirkuk, by relying on the indicators derived from the previous studies and methods of measurement and analysis, to reach the research objectives where the architectural characteristics of the inner courtyard.

Keywords: *Inner Courtyards; Kirkuk City; Citadel of Kirkuk; Architecture Characteristics; Heritage Houses.*

1. Introduction

The designing concept of the architecture in the Middle-East countries depends on opening towards the inside to keep the privacy of the people and the place. This thing can be achieved by using internal spaces, which are open to sky.

These spaces have special features that go with the weather and social environment and they are called "The inner courtyards". From the first glance, some may think that these inner courtyards are similar; but if we look carefully and study them thoroughly, we will see that they are different in its functions, elements, forms, building patterns, used materials, environmental conditions, cultural and social conditions.

The need to study the characteristics of the inner courtyards in different patterns of heritage buildings especially the residential ones becomes important because they vary in the characteristics according to the place and era. This study aims to find out the lifestyle and document the needed information about it.

The city of Kirkuk is regarded as one of the Iraqi cities, which is significant in using the inner courtyards as an important designing element in the heritage buildings.

Although several attempts were made by some researchers to study the heritage buildings of Kirkuk, there were no attempts to study the inner courtyards and its designing dimensions especially in Kirkuk. For that reason, this investigation aims to study the inner courtyards of the heritage houses in the Citadel of Kirkuk from several sides. These sides include building integration, shape, the elements that the inner courtyard are made of, and its relation with the spaces overlooking on it. Studying the latter points will make us to reach the architectural characteristics, which are suffering from the neglect and destruction.

The importance of the inner courtyards appears from all the above points and how it provides the necessary information with regard to the inner courtyards as a genuine architectural heritage.

The Axis of the Research:

Axis One: A study about the history of Kirkuk City, the Citadel of Kirkuk and the environment of heritage housing in the Citadel of Kirkuk.

Axis Two: Studying the definition of the inner courtyard and dealing with the previous studies about it and the main characteristics that these studies depended on to categorize the inner courtyards. This axis also includes reaching into a theoretical frame to relay on it during the measuring process in the practical work.

Axis Three: Choosing five heritage houses from the Citadel of Kirkuk to conduct a descriptive analysis work on the horizontal sections of the chosen houses and also to measure the characteristics of the chosen house theoretically according to the previous studies. All these steps will lead into results and conclusions which can be taken from the practical work and analysis.

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2. Axis one

2.1. Kirkuk

Kirkuk City lies north of Iraq, which is one of the countries in the Arab Homeland countries in Asia. Kirkuk is the fourth governorate of Iraq and it is very well known of its architectural monuments. The history of Kirkuk has a strong relation with Khasa Su River and we can see that in the monuments and remnants, along that river, which belong to 2600 BC. One of the most important remnants which were found along the river is a clay tablet belongs to 2300 BC with a map on it.
The City of Kirkuk was formed in a fortress surrounded with high walls which are still standing until the mean time. These walls belong to the mid third century BC. The fortress includes historical buildings as well see figure1 . (Saatci-2014)

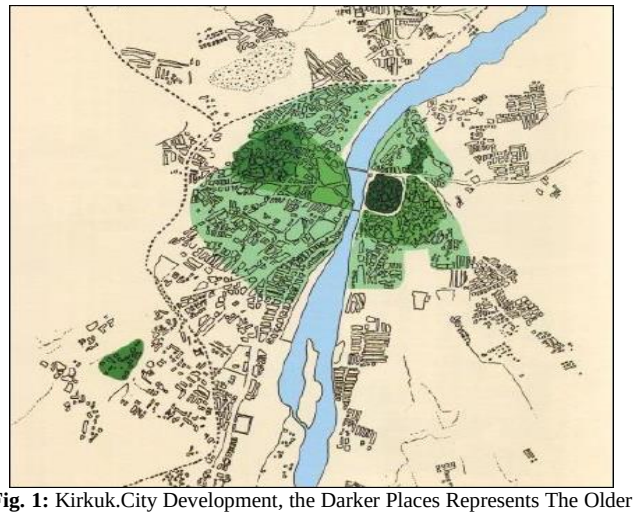


Fig. 1: Kirkuk.City Development, the Darker Places Represents The Older Parts of the City (Saatci, 2014).

2.2. The citadel of Kirkuk

The Citadel of Kirkuk is regarded as the oldest settlement centre in Kirkuk. The significant architectural features of the Citadel can be seen in its residential and religious building and the khans* as well. The Citadel of Kirkuk is standing on flat area of 62500 square meters and it has 797 houses. Only about 40 of these houses are still standing after a demolishing campaign. There are several narrow zigzag alleys which widen sometimes and leads into locked gates or to the fronts of the houses and arches. There are some old houses under the Citadel, Lies in the old part of the city, which shows the architecture peculiarity see figure2. (Saatci, 2014).

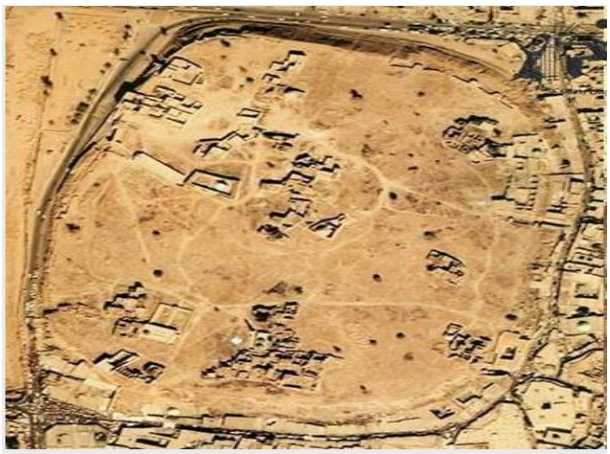


Fig. 2: Google Earth Record in 2010 Photo of Kirkuk Citadel before Demolishing. (Saatci, 2014).

2.3. Housing in the citadel of Kirkuk

The houses of the Citadel are surrounded by narrow streets and alleys. These alleys are wide in some places and have dead ends in some places. These alleys are designed to provide environmental solutions, like protection from heat during summer time. The exterior walls of the houses have no openings except the main door which is made of decorated and engraved wood with a frame made of engraved stone (Saatci, 2014).

3. Axis two

3.1. The inner courtyard

Many studies dealt with the inner courtyards and some researchers defined it as; the garden spaces which have an Arabic historical depth in its design and a verity in its function, shape features and methods of construction and used materials.
The inner courtyards also can be defined as; garden spaces surrounded, most of the time, with a mechanical structural building and that appears in different zones like houses, palaces, public buildings like mosques, shrines, schools and dealerships.
The inner courtyard is one of the traditional architectural shapes which participate in determining the psychological and physical environment in the house.
The inner courtyard fulfills the needs of the traditional family system by sustaining the elements which make the house comfortable. These elements include lighting, airing and protection from heat. The inner courtyard also creates a social space for the gathering of the family members so they can interact with each other. (Myneni, 2013). This type of inner courtyards can be found in the Arabic Houses in Fustat* between the 7th and the 11th centuries and in the beginning of the Ottoman era and it is also can be found in the Mediterranean countries like Morocco, Andalusia and Levant.
The courtyard is an exclusively private part of the house and is used only by members of the family, have square or rectangular garden which surrounded by a building from all the sides, The inner courtyard can be entered from a refracted entrance (Edwards, 2006)
The courtyard is an exclusively private part of the house and is used only by members of the family, have square or rectangular garden which surrounded by a building from all the sides, The inner courtyard can be entered from a refracted entrance (Edwards, 2006)
Courtyard buildings radically displace the conventional position of the landscape, thus requiring a cultural reassessment of the function and meaning of private open space. Working As clustered pigeonholes, through a simple reconfiguration of building mass, the exterior ground that is furthest from the building edge is converted from a peripheral condition to the symbolic and physical center of a residential community.(COURTYARD HOUSING,2009)

3.2. The previous studies about the inner courtyards

First Study: The Study of Mamdoh and Wa'il:
This study dealt with inner courtyards through searching for the type and pattern of the heritage building in general and the inner courtyards in specific. This research regards the inner courtyard as one of the significant elements in the heritage buildings and it locates the main elements of the inner courtyards like; a surrounding corridor, fountains, swimming pools and green spaces like gardens with trees, statues and furniture.
Second Study: The study of Fatma Abass, Lokman Hakim Ismail and Mohammed Solla:
This study concentrated on the features and characteristics of the inner courtyards that have changed or developed through time.
The study also showed the features of the inner courtyard according to its relation with the entrance whether this relation is direct,

in this case the entrance is connected to it directly, or if it is separated from the entrance by spaces and that makes the relation indirect.
The study also showed the interactive relationship of the inner courtyard with the spaces that it overlooks on it and the contact points between the two. see Figure 3

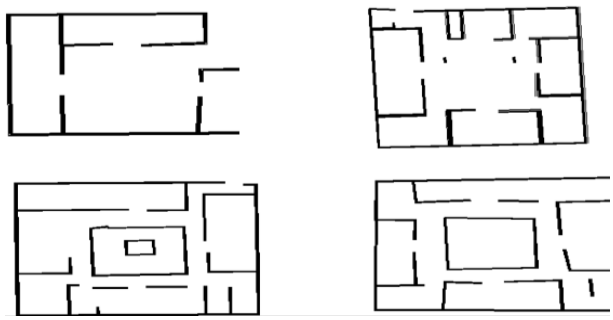


Fig. 3: Type of Inner Courtyard Houses, Typical during Middle Ages (Schoenauer, 1962).

Third Study: The study of Dawod:
This study concentrated on the phases of development in the traditional houses in Palestine by touching the phases of development of the middle courtyard 'Al-Housh' in the traditional houses.
The study noted that there are three main types of the middle courtyards; the first one is a simple courtyard shaped like a small yard with one or two overlooking rooms on it with some attachments and a simple gate. The second one is the full courtyard which is surrounded by several spaces and attachments. This type is inhabited by several families and the courtyard has several arches connected to the main rooms.
The last type is the combined courtyards, this type includes the house which has more than one inner courtyard and each one is surrounded by spaces, arches and attachments. (Ahmed, 2008) .see Figure 4

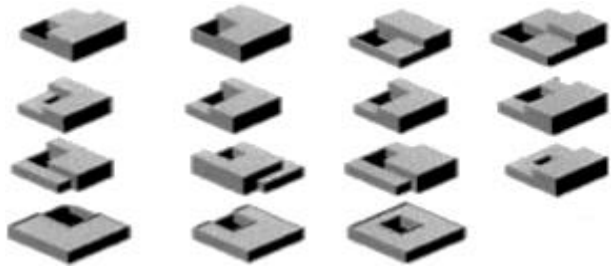


Fig. 4: Different Possible Forms for A Single-Family Courtyard of One or Two Stores (Edwards, 2006).

The Fourth Study: Myneni 2013
This study dealt with showing the shape features of the inner courtyard. This study showed that there is no specific shape for the inner courtyard. The main shape of the inner courtyards are square, rectangular and circular but it might take some other shapes like; U shape, L shape, T shape, V shape, H shape or Y shape. These variants in the shape appeared to comply with the environment or the location.
Myneni also classified the inner courtyards into closed, semi-closed and opened courtyards according to the walls and spaces surrounding it. see figure 5

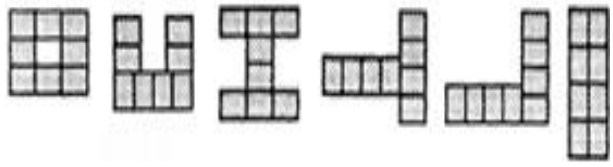


Fig. 5: Internal Courtyard Forms (Myneni 2013).

The Fifth Study: Abdelsalam:
This study dealt with the importance of the inner courtyards in designing the houses of the Islamic community. Concerning the cultural side; the inner courtyard provides for the inhabitants especially for women. Most of the daily activities of women are conducted the inner courtyard.
Concerning the environment and economy; the inner courtyard participates in decreasing the power consumption because it provides light during the day and airing. The inner courtyard also participates in decreasing the heat and also decreases the exposure to the reflected glow from sun light. The inner courtyard also protect the house from the sand storms and it also isolates the noise coming from the street
Concerning the social and psychological side, the inner courtyard achieves a good interaction between the inhabitant of the house especially between women and children it also gives the feeling of security and safety.
The inner courtyard is considered the centre of the house and it could be used for having meals or a playground for the children.
The Sixth Study:Ekhaese, Amole, Martins:
The modified traditional courtyard house - types .This house-type is an improvement on the Family Compound House. They are found mostly in intermediate zone and sub-urban zone. The study characterized it as modified courtyard house because it is an upgrade of the traditional courtyard house. The house-type was started around 19th century, using Edo traditional courtyard concept with some alterations.
The floor plan has only one courtyard which can be either closed-end/open-ended. These two classes of courtyards divide this category into three house-types. This includes; family compound, adapted family compound and hybrid family compound courtyard house-type. (EKHAESE, AMOLE, MARTINS, 2014)
It appears from all these studies that we can study the characteristics of the inner courtyards according to five phases:
One: examining the type of the inner courtyard whether it is a simple, full or combined courtyard.
Two: Determining the shape of the inner courtyard whether it is a regular of irregular engineering shape.
Three: studying the elements which the inner courtyard is composed of, like corridors, water elements, gardens or statues used for decoration.
Four: studying the relation of the courtyard with the entrance and whether that relation is direct or indirect and that means there is a space between the two.
Five: studying the relation of the inner courtyard with the spaces overlooking on it as a knot relation, direct relation or indirect relation by a corridor separating the two.
Six: In addition we can studying the inner courtyard area relative to the area of the house in general through the following equation : inner courtyard area * 100% / house area = inner courtyard area relative to the area of the house…….[1]
The Third Phase: Studying the architectural characteristics of the houses in the Citadel of Kirkuk according to the previous theoretical phases

4. Selected heritage house for study

The study included analyzing five chosen houses from the Citadel of Kirkuk to know the characteristics of the inner courtyards in them.
First Sample: The House of Mr. Fatih:
This house is one of the houses which have not been subjected to the recent demolition works. The house lies in Aghaligh neighborhood in the Citadel of Kirkuk. The exact date of construction is unknown. This house is regarded on of cultural monuments which supervised by the Directorate of Archeology.
From the first glance the general planning of the house looks irregular but it has an organized distribution of the rooms with transitional spaces which preserves the privacy of each room.

The inner courtyard is connected to two rooms and iwan, a small corridor when you first enter the house, and service spaces(Saatci, 2014). See figure 6



Fig. 6: The Inner Courtyard of a Heritage House Shows the Entrance and the Courtyard Views (Researchers).

Second Sample: The House of Mustafa Agha:
The house lies in al-Maydan neighborhood. It has been constructed in 1910. The house is divided into two sections; the women's section "Hareem section" which is still standing until now. The "Salamligh" section which has been demolished. The house has three rooms with frills and rich internal decorations.The house has a inner courtyard surrounded with corridors from three sides(Saatci, 2014). See figure 7

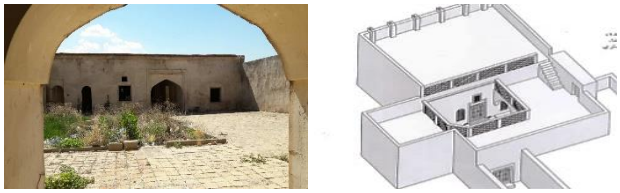


Fig. 7: The Inner Courtyard of a Heritage House Shows the Inner Courtyard Stretch of the Entrance (Researchers).

Third Sample: The House of Meka'ieel:
The house lies in Aghalegh neighborhood. This house is one of the heritage houses which have an integral plan according to the design of the rooms. Each room is independent from the other rooms by its transitional space. The inner courtyard is surrounded with a corridor and one of the rooms have a window overlooks on the inner courtyard. This house is also under the protection of the Archeology Directorate (Saatci, 2014). See figure 8

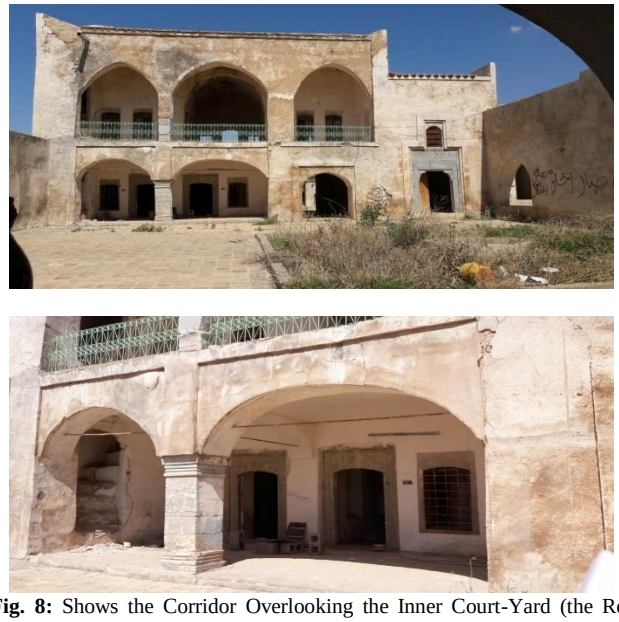


Fig. 8: Shows the Corridor Overlooking the Inner Court-Yard (the Researchers).

Fourth Sample: The House of Abdul Rahman Nafid Afandi:
This house lies in Al-Hammam neighborhood. It has been constructed in 1884. It has two floors. This house has three rooms with an inner courtyard which can be entered from outside through a corridor called "Al-Taq". Some modifications were made on that house at the time which changed its features. The house has been demolished completely in 2003(Saatci, 2014). See figure 9

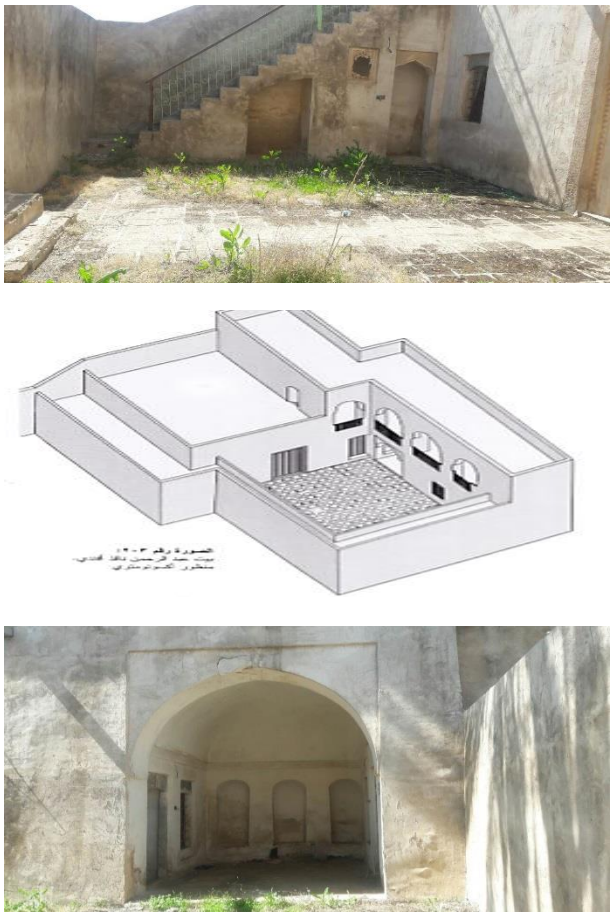


Fig. 9: Shows the Inner Courtyard's Relationship with the Movement Illustrates the Spaces of Services (the Researchers).

Fifth Sample: The House of Tayfoor:
The house lies in Aghaligh neighborhood near "Topp Kappi" to the left of the cannon gate, which one of the gates of the Citadel. This house is regarded as one of the big samples. The house has two sections; "Hareem" and "Salamligh". The house has an inner courtyard in each section surrounded with a corridor with marble columns. The house is under the protection of the Archeology Directorate(Saatci, 2014). See figure 10





Fig. 10: Shows the Inner Courtyards of the Tayfoor House (The Researchers).

Table 1: Analysis of Architectural Features of the Inner Courtyards in the Houses of the Citadel

The original layout of the heritage houses (Saatci, 2014).	Plan from Characteris(The researchers)	Nodal relation of the Inner Courtyards with neighboring spaces(The researchers)
The House of Mr. Fatih		
The House of Mustafa Agha		
The House of Meka'ieel		
The House of Abdul Rahman Nafid Afandi		

- The type of the courtyard is integral and connected with more than one room with distributed knots and service attachments.
- The inner courtyard has an irregular shape to go with the piece of the land that it has been constructed on.
- The courtyard does not have significant elements except that it is open to sky.
- The connection with the entrance is semi-direct through the transitional space of a small corridor.
- The knot of the inner courtyard is connected with the spaces of the living room by the knot of the entrance and it has a direct connection with one room only and with the service attachments as well.
- The inner courtyard area relative to the area of the house

Area of house = 364 m2
Area of inner courtyard=108m2
The inner courtyard area relative to the area of the house= 108*100 /364 =22.67%

- The type of the courtyard is integral and connected with more than one room with distributed knots and service attachments.
- The inner courtyard has a square shape.
- The inner courtyard is connected to the corridor element which surrounds it from three sides and that can be regards as a smooth connection with the knots and the other spaces. The courtyard is open to sky and paved with stone tiles.
- The courtyard has a semi-direct connection with the entrance through a "Taqq".

- The knot of the courtyard is connected with the spaces of the living room by the knot of the entrance except two room are separated by the surrounding corridor of the courtyard. The inner courtyard has an indirect connection with the service attachments.
- The inner courtyard area relative to the area of the house

Area of house = 349 m2
Area of inner courtyard=86m2
The inner courtyard area relative to the area of the house= 86*100 /349 =24.61%

- The type of the courtyard is integral and connected with more than one room with distributed knots and service attachments.
- The inner courtyard has a square shape.
- The inner courtyard is connected to the corridor element which surrounds it from one side and a half leading smoothly to the knots and other spaces and it is also open to sky. The inner courtyard garden and tree elements.
- The inner courtyard has a semi-direct connection through a transitional space "Taqq".
- The inner courtyard is connected to the spaces of the living room and the entrance with a small corridor by the knot of the doorstep except with room. That room is separated by a corridor. The courtyard has a direct connection with the service attachments.
- The inner courtyard area relative to the area of the house

Area of house = 814 m2
Area of inner courtyard=168.8m2
The inner courtyard area relative to the area of the house= 814*100 /168.8 =19.09%

- The type of the courtyard is integral and connected with more than one room with distributed knots and service attachments.
- The inner courtyard has a square shape.
- The courtyard does not have significant elements except that it is open to sky.
- The inner courtyard has a semi-direct connection through a transitional space "Taqq".
- The inner courtyard is connected to the spaces of the living room and the entrance with the knot of the doorstep except with one room. The courtyard has a direct connection with the service attachments.
- The inner courtyard area relative to the area of the house

Area of house = 386m2
Area of inner courtyard=120m2
The inner courtyard area relative to the area of the house= 120*100 /386 =31.08%

- The type of the inner courtyard is combined. It is composed of "Salamligh" the guests' inner courtyard, the garden and the living courtyard. The three courtyards are formed as main knots which are connected to distributed knots, surrounding corridors and service attachments.
- The shape of the inner courtyards is square.
- The courtyard has some significant elements like; a corridor with frilled pillers in the "Salamligh", trees, garden and a fountain in living courtyard. The courtyard is open to sky as well.
- The "Salamligh" is connected directly to the entrance in spite of the existence of a separating corridor. The inner courtyards of the garden and the living are connected indirectly to the entrance to keep the privacy of the place.
- The inner courtyard is connected to the spaces of the living room and the entrance with the knot of the doorstep except with one room. The courtyard has a direct connection with the service attachments.
- The inner courtyard area relative to the area of the house

Area of house = 531 m2
Area of inner courtyard1=56m2
Area of inner courtyard2=63m2
Area of inner courtyard3=? m2
The inner courtyard area relative to the area of the house= (56+63+22.4)*100 /531.2 =26.6%

he House of Tayfoor

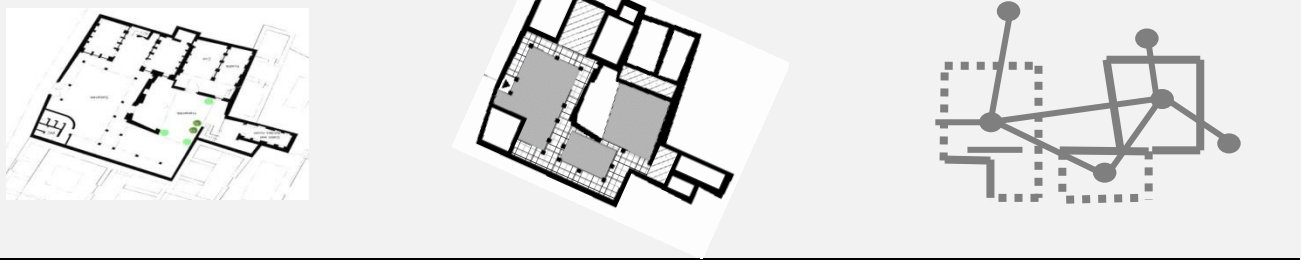


Table 2: Comparative Inner Courtyard Characteristics of the Heritage Houses in Kirkuk Castle

		House of Fatih	House of Mustafa Agha	House of Meka'ieel	House of Abdul Rahman	House of Tayfoor
Type of the inner courtyard	Simple courtyard					
	Integral courtyard	*	*	*	*	
	Compound courtyard					*
Shape of the courtyard	square		*	*	*	*
	rectangular					
	irregular	*				
	other					
Elements of the courtyard	corridor		*	*		
	water					*
	Trees & garden		*	*		
	statues					
	furniture					
Connection to entrance	Direct					*
	Indirect	*	*	*	*	
Relation between the courtyard and	Direct motional relation					
	Indirect		*	*		*

the spaces that it overlooks on	motional relation through a corridor					
	Relation through a distributed knot	*	*	*	*	*
The inner courtyard area relative to the area of the house hh	٧٥-50%					
	٥0-2٥%	*	*	*	*	*
	٢٥-5%					

5. Results and conclusions

1) Most of the inner courtyards of the heritage houses are square or rectangular and that is because of the shape of the land that the house is constructed on. There and exception in the house of Fatih, in that house the inner courtyard has a polygonal shape and that came as a result of the shape of the land that the house is constructed on.
2) The heritage house in the Citadel are featured with an integral inner courtyard which are connected in most of the houses with several spaces, service attachments and surrounded corridors. There is an exception in Tyfoor's house where the inner courtyard is compound because the area of the house is quite big and that added several spaces to the house with a courtyard for the guests and another private one for the owner himself.From the above we conclude that the more activities are conducted in the house there will be more inner courtyards types in the house.
3) The existence of the corridor element is connected to the inner courtyard in most of the heritage house in the Citadel. The existence of the other elements varies from a house to another and that is may be because of the immigration of the population or leaving these houses without using them.
4) The integral type inner courtyards are featured with high privacy through the indirect relationship with the entrance. The relation is made by an intermediate space called "Iwan". The inner courtyards are regarded as working spaces for women and that is why it is connected with the living spaces. The privacy of the inner courtyard decreases if it is connected with the spaces of the guests.
5) The relation of the inner courtyard varies with the other spaces of a single house. The relation is indirect with the spaces of living and sleeping through a distributed knot. The relation is direct with the service attachments like the kitchen, bathroom and the stairs and it might be separated by a corridor with a ceiling.
6) The inner courtyards in the Citadel of Kirkuk are featured with its dominance and being in the centre of the house. The inner courtyards have a large area comparing to the area of the rooms. The size of the inner courtyard is roughly double the size of two rooms.

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