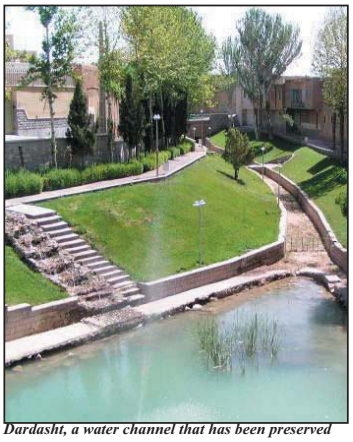
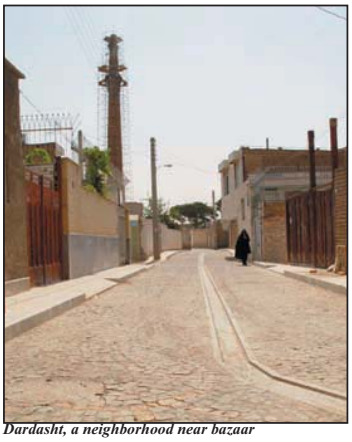
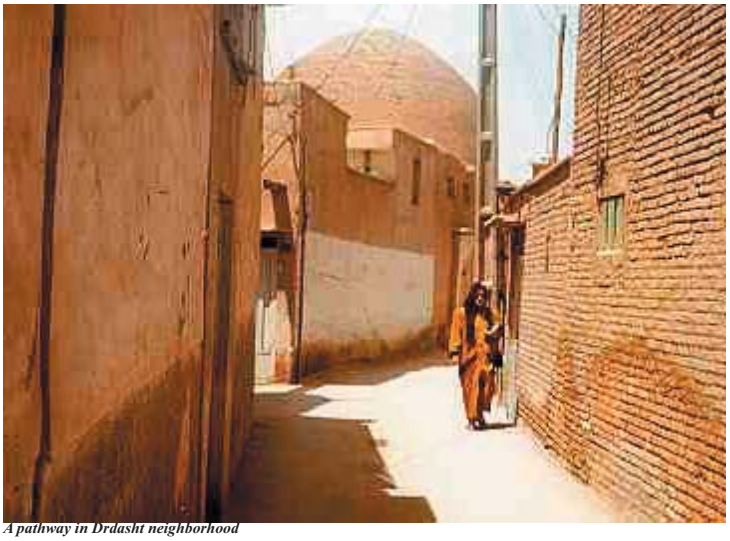
Building Types &
Urban Fabric



Dardasht, a water channel that has been preserved



Dardasht, a neighborhood near bazaar



A pathway in Drdasht neighborhood

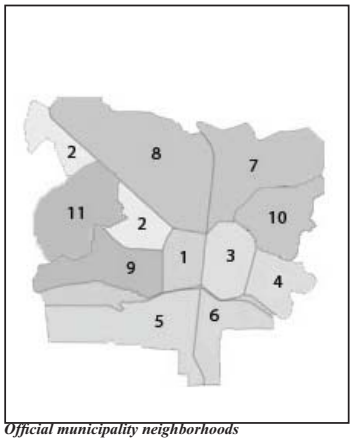
Old Neighborhoods-New Developments

The municipality of Isfahan has divided the city to eleven neighborhoods. For our study, a few of them will be combined and studied together because they have the same characteristics. Basically neighborhoods 1,2 and 3 are the traditional part of the city which still has kept the old values and make the "Museum city of Isfahan". Neighborhoods 7 and 8 are newer developments which share the Chaharbagh street and its extension. Neighborhood 5 is the old Armenian district called Julfa which still has a big population of Armenians. Neighborhood 6 accommodates a poor architecture and is developing slowly. Neighborhoods 4, 9 and 11 contain more residential areas and they also accommodate some historical sites. Present day Isfahan continues its life within the boundaries of the old city. Its modern sections are actually born and grow in the Safavid gardens that were considered dead land. Its active center formed along the Chaharbagh axis in the western portion of the new square in continuation of the linear center of the old town which is still alive.

Dardasht-Neighborhood3

Dardasht, located in the 3rd neighborhood, is the old quarter north of bazaar and west of the Friday mosque. It has been brutally cut in half by Abdolrazzaq Avenue. This fact, along with a standard of services which is low when compared to new development areas in suburbs, has caused a gradual exodus of population and abandonment of the traditional courtyard house. Although the medieval quarters continued to grow and change during the whole of the Safavid period, they assumed an increasingly residential character by comparison with the official center of government which developed in the new city. Whereas a quarter in the middle ages incorporated all public buildings, including religious monuments, the Safavid city created a division between official space and residential space. Thus, seventeenth century development in the old quarters consisted of houses which fitted the existing forms and patterns of growth. The old quarters survived as areas of private houses until '40s of this century. Over a long period of time, therefore, the typology of the house remained essentially the same throughout the old city. Wherever there was contiguity in the urban structure, not only the house but every kind of the building was characterized by a centralized order from within and attached continuous shapes from without.

The demolition in the area around the Friday mosque, which began immediately after the second world war was intended to provide car access to the old quarters, has been provoking lively controversy ever since Isfahan became subject to a master plan and its consequences. In these neighborhoods, the center of quarters are still based on the old pattern and although there have been some demolitions, the organic patterns still exist and density is still the same. The pedestrian paths are still alive and car access has been provided as well. The Qanats or water channels are preserved and is a place for people's gatherings.

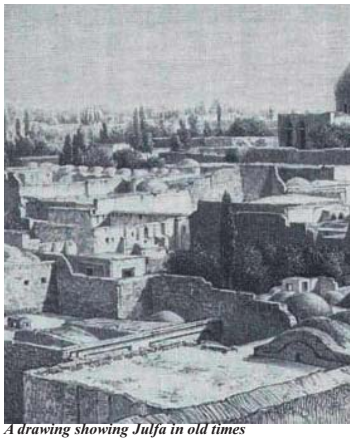


Official municipality neighborhoods

Neighborhood 3: Dardasht, map

Julfs-Neighborhood 5
This neighborhood contains the old Armenian quarter of Julfa which is famous for its churches cause it is a Christian settlement. In 1604 Shah Abbas I ordered the valley of Ararat on the Ottoman frontier to be evacuated, and several thousand Armenian families from the region were established in a suburb of Isfahan south of the Zayandeh River. Known from 1606 as New Julfa, after the town they had been forced to leave, this quarter of Isfahan flourished as an Armenian Christian community, and between 27 and 30 churches were built there. The 13 surviving examples, dating between 1606 and 1728, combine Safavid style and building techniques with elements imported from the Armenian homeland. Liturgical requirements dictated that the plan developed for churches in Julfa be retained in the new buildings. Traditionally, the exteriors of Armenian churches were relatively plain, and the impact of the buildings derived principally from their form and massing. In New Julfa, the form of the churches, apart from the belfries and crosses crowning the domes, was derived from the Persian architectural tradition, with shallow ovoid domes and pointed arches. The construction of these churches also followed local Traditions: baked brick replaced the stone typical in Armenia. Many of the churches also have underglaze-painted polychrome tile panels or friezes depicting scenes from the New Testament, landscapes and animals. In addition to Armenians, such foreign Christians as Carmelite and Capuchin missionaries lived in New Julfa. The finest residences, such as those along the Chahar Bagh Avenue, were garden villas modelled on detached royal pavilions. Even modest dwellings were enriched with refined decoration in tile and paint. There are some new streets that cut through the neighborhood.

Julfa, a new wide street and new developments



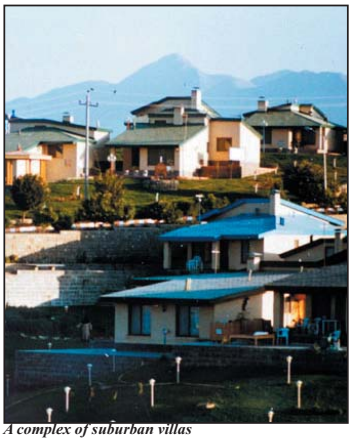
A drawing showing Julfa in old times

Julfa, new housing development

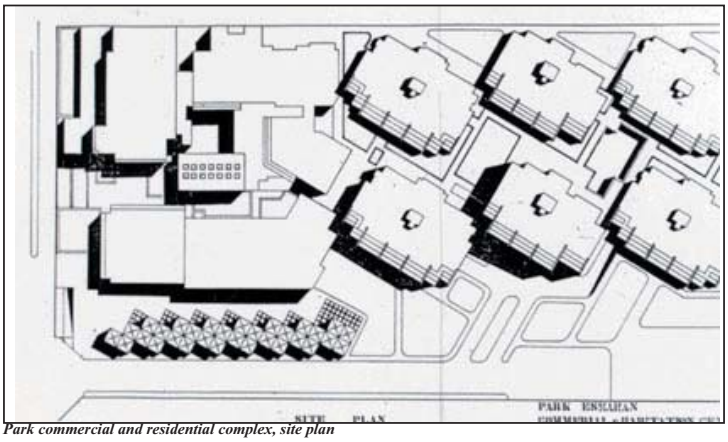
Julfa, a church

Julfa, along the river

Neighbourhood 5: Julfa, map



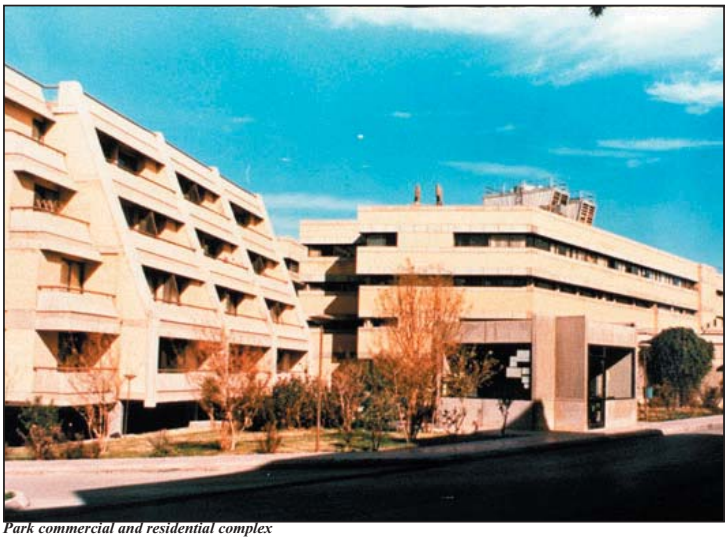
A complex of suburban villas



Park commercial and residential complex, site plan

A new square

Example of new developments



Park commercial and residential complex

Neighborhood 11
This area contains more suburban areas which new residential developments are located partially there. Neighborhood 11, except for the older part, is not following rules of traditional place-making. It contains large areas of tall apartment buildings accommodated in large sites in western parts.
Further west, this is the border of the city of Isfahan, and is counted as suburb. Thus, parks and large green areas can be found.
These lands were agricultural land before the continuation of Chaharbagh to north. After the city expanded towards north, it started stretching out to east and west. In west, the city is now built on agricultural lands and accommodates al range of residential developments from mid-income apartment complexes to high-income villas.

Neighborhood 11, map

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Neighborhoods 10,7
These two neighborhoods are the more dense residential and commercial areas. They have a contemporary design and are like any other twentieth century development. This fabric is totally different from the historic part and started to grow when Chaharbagh was expanded further north.
In southern parts, the street patterns still copy the organic pattern. In newer parts, a grid system is more obvious.
This neighborhood has both low-income and high-income housings. It contains a range of luxury apartments whereas in northern parts, newer developments have a form of ghetto. The density is high except for the northern parts.

Traditional Residential and Urban Architecture of Isfahan

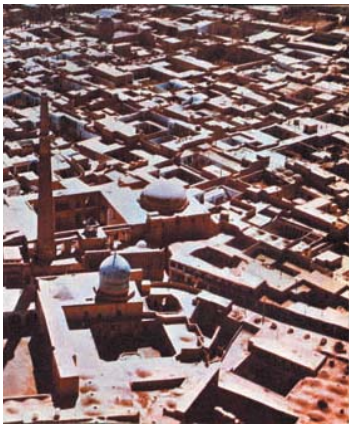
Being situated on the edge of deserts and arid regions, Isfahan typically has hot summers, and cold, dry winters. Thus Isfahan's traditional architecture is designed in proportion to its climatic conditions, and more than often, the unique fabled artistic background of Isfahan makes up for the seemingly lack of natural resources and beauty. The existence of hundreds of traditional houses with handsome designs even today amidst ugly apartments in Isfahan's hasty modernization projects is testament to a deep heritage of Architecture.

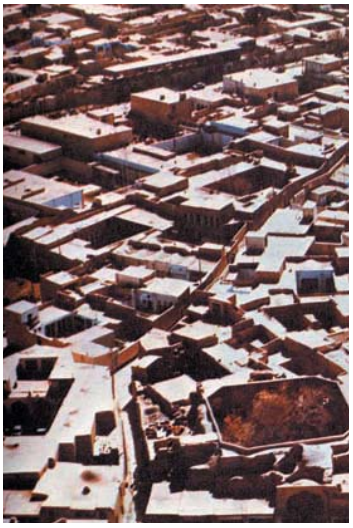
Isfahan's old city fabric is composed of narrow winding streets called koocheh with high walls of adobe and brick, often roofed at various intervals. Koochehs provided relief from dust storms and intense sunlight. This was an efficient and ancient form of urban design in Isfahan. This form of urban design, which used to be commonplace in Isfahan, is an optimal form of desert architecture that minimizes desert expansion and the effects of dust storms. It also maximizes daytime shades, and insulates the "fabric" from severe winter temperatures.

Isfahan also has a few open spaces. This is due to the fact that any large open space because of its exposure to the sun, generates heated air during summer and cold air during winter. In additional, the height of the buildings is uniform throughout the city. This permits the free movement of the air over the city. When a few tall buildings.

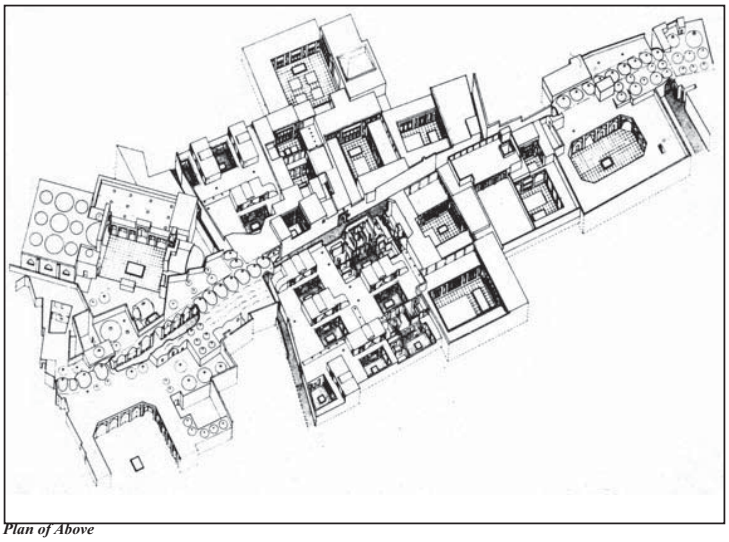
In addition, as can be seen in aerial pictures of Isfahan, the height of the buildings (with exceptions of some mosques or minarets) is uniform throughout the city. This permits the free movement of the air above the city. when a few tall buildings stand higher than a number of shorter ones, air is diverted downward, resulting in the development of unwanted turbulence. In hot and arid Iranian city as Isfahan, which receive frequent strong winds, the presence of high-rise buildings creates serious problems of turbulence.

The climatic advantages of a compact urban form can be summarized as follows:
- Reduces direct radiation and evaporation
- Minimizes heat gain during the day and heat loss during the night
- Provides shade and cool air.
- Makes human movement easier within the city
-Breaks both strong hot day and cold night winds





A cluster of four houses west of bazaar route. Access to each house is from a covered cul-de-sac



Plan of Above

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-Reduces the harmful effects of dusty storms
In addition to responding to climatic stress, a compact urban system offers many other advantages to the city: a noticeable reduction of the infrastructure network and the transportation system, minimizing energy consumption by employing the forces of nature such as passive cooling system, easy accessibility, social cohesiveness and finally, conserving the environment by employing passive cooling systems.

To cope with these environmental problems, traditional Isfahan minimizes empty space, had buildings of uniform height and contained narrow streets. Also, Isfahan planners had recognized the importance of orientation to the wind and sun and of water elements.

Islamic beliefs coupled with the necessity to defend cities against frequent foreign invasions encouraged traditional Persian residential architects to create inward seeking designs amidst these narrow complicated koochehs, weaving tightly knit residential neighborhoods. Thus the house becomes the container as opposed to the contained. These houses possess an innate system of protection; they all have enclosed gardens with maximum privacy, preventing any view into the house from the outside world. Hence residential architecture in Isfahan and whole Persia was designed in a way so as to provide maximum protection to the inhabitants during times of tension and danger, while furnishing a microcosm of tranquility that protected this inner “paradise garden”.

Neighborhoods in old Persian cities often formed around shrines of popular saints or other religious functions. All public facilities such as baths, houses of mourning (Tekyehs), teahouses, administration offices, and schools were to be found within the neighborhood itself. In addition to the main bazaar of the city, each neighborhood often had its own bazaar-cheh as well (i.e. “little bazaar”), as well as its own ab anbar (or public water reservoir), which provided the neighborhood with clean water.

Like many other cities throughout Iran, stucco was the most widespread method of ornamentation in Persian houses. One reason was the relatively cheap price of the materials used that don’t require a high temperature to be transformed into plaster. This is an important consideration in places like central Iran where wood is relatively scarce. Another reason is that it is easily shaped, molded, or carved. Thanks to stucco, a wall of crudely fashioned stone blocks or raw brick, gives an impression of great luxury. Thus stucco owes its luxurious appearance to the skill of the craftsman. And with a tradition of stucco technique going back to pre-Islamic Iran.

Courtyard building types tied in the fabric

Aerial view showing fabric

Building Types
Almost all traditional Persian houses were designed in order to satisfy the following essential features:
1. Hashti and Dalan-e-vorudi: Entering the doorway one steps into a small enclosed transitional space called Hashti. Here one is forced to redirect one's steps away from the street and into the hallway, called Dalan e Vorudi. In mosques, the Hashti enables the architect to turn the steps of the believer to the correct orientation for prayer hence giving the opportunity to purify oneself before entering the mosque.
2. Convenient access to all parts of the house.
3. A central pool with surrounding gardens containing trees of figs, pomegranates, and grape vines.
4. Important partitioning such as the biruni (exterior) and the andaruni (interior).
5. Specific orientation facing toward and away from Mecca.

Furthermore, houses in central Iran were designed to make use of ingenious systems to create unusually cool temperatures in the lower levels of the building. Thick massive walls were designed to keep the sun's heat out in the summertime while retaining the internal heat in the winters.

Persia's distinctive artistic heritage with efficient yet ancient technical know-how thus created houses and spaces whose features were aesthetic talars and roofscapes with intriguing light wells, as well as intricate window and mirror works, paintings, relieves, and a beautifully crafted iwan amidst comfortable residential spaces in hot desert regions.

Whereas the geometrical rigor seen in the works such as those in Safavid era Isfahan invoke the perfect order of the celestial world, the vegetal ornamentation realized in the interiors of houses, testify to the Persian love of gardens. And the stucco carvings, frescoes, and paintings executed by royal craftsmen, exemplify the level of Persian aesthetics.

Elemenets of Persian-Islamic space

Platform
The concept of a high place has a deep significance in the history of Iranian Architecture that predates the Islamic conquest and probably even the Achamaenid period. This concept of the high place as a temple was incorporated into Zoroastrianism. Herodotus tells us:
"The Persians ascend the highest peaks of the mountains and offer sacrifice to Zeus, calling the whole vault of the sky Zeus, and they also sacrifice to the Sun, Moon, Earth, Fire, Water and Winds"

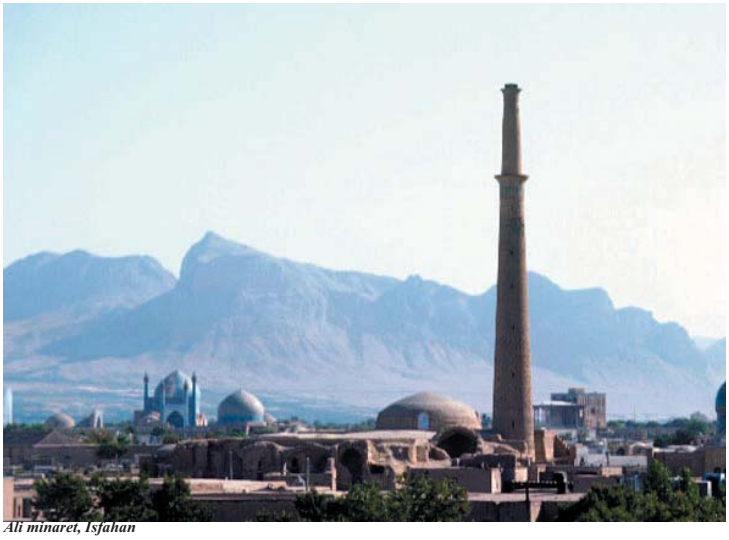
Zoroastrianism became the state religion under the Sassanids, whose fire temples were erected on top of mountains wherever possible. There the sacred fire was kept alight and the most important religious objects were kept there too. The religion persisted even under the Safavids and the importance of the mountain was still evident according to Chardin, who wrote:
" [The Persian Fire Worshippers'] principal temple is near Yazd, in a mountain eighteen leagues distant. This is their great 'atesh-gah' ... This place is also their oracle and their academy"

Porch or Iwan
From the symbolic point of the view the porch has the effect of separating what is below from what is above through its roof and defining a point on earth through its sides. It thus aids man in defining a position for himself both in relation to his Deity and in relation to his space. The concept manifests itself under two additional forms, 'Talar' and 'Mehrab'. Both of these have the same effect of defining a position for man in relation to his space.

The development of the iwan as a form can be traced from the Achamaenid tradition through Parthian palaces to the Sassanid period during which it was used extensively. It is thus a pre-Islamic form which was well established prior to the conquest of Iran by the Arabs in the mid-seventh century. The iwan illustrated here is from the Friday Mosque (Masjed-e-Jomeh) and demonstrates the connection between the courtyard and the Sanctuary. By its size and harmony we can perceive it as the externalization of divine might which gives form and substance to man's place on earth. An iwan thus represents the Connection, while its barreled vault represents the Transition and whatever lies beyond is seen as a Culmination.


Main Iwan of the Friday mosque of Isfahan


Alani minaret, Isfahan


Ali minaret, Isfahan

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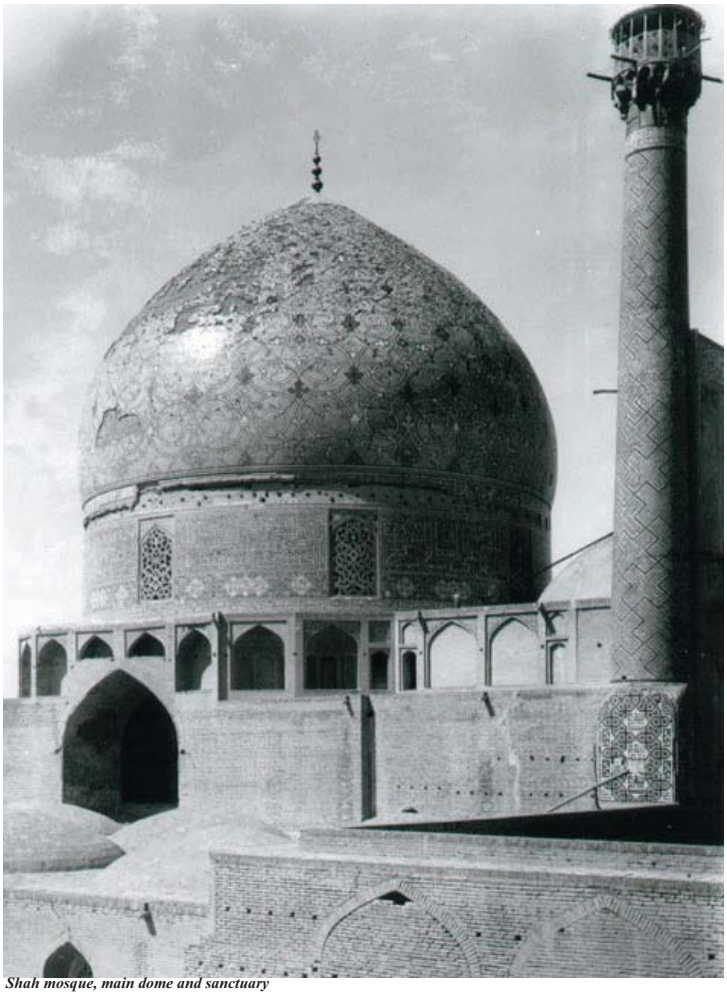

Shah mosque, main dome and sanctuary

Dome
The sanctuary or chamber is the place where God and Mankind meet and can converse. The natural symbol for this is the Universe which expresses the infinite creativity of God while enclosing mankind in a protective space. The Dome is thus a shape of great symbolic importance which must be replicated through the properties of matter. The earliest domes were formed of skins stretched over wicker frames, but by the time of Chosroes III attempts were already being made to build palaces whose domes mirrored the architecture of the heavens. They thus took on an astrological or mystical significance and came to symbolize mankind's attempts to create a heaven on earth.

Remnants of these early domes can be seen in the ribbed Seljuk constructions of the 11th century where the brick vaulting is reminiscent of the early constructions of wooden sticks and skins. It is also visible in the Friday Mosque, where the style of the vaulting is said to be inspired by the tents of the Mongols which used the wicker fame and skin construction mentioned earlier: both of these are shown above.

The dome thus becomes a symbol of the cosmic house of God which in turn has a dual meaning of the House that God inhabits - Heaven, and the house that encompasses Man - The Universe. The dome acts therefore as a transition between the infinite unity of its central point, through the duality of its symbolism into the concretization of the four-sided chamber which supports it and which symbolizes the fourfold nature of mankind.

The Concept of the domed pavilion is a very old one and is central to Persian architectural tradition. In its simplest form it consists of a room with four arches forming the walls surmounted by a dome. The words, chahar taq, mean, in Persian, "Four Arches". The concept was the basis of pre-Islamic Sassanid architecture and undoubtedly has links with the early concepts of sanctuaries within which the fire burned and which needed to be seen from all sides. Evidence of its archetypal importance can be found in the layout of parks, palaces and even towns as is evidenced by the analogous concept of chahar bagh, the four Gardens onto which you could look from the centre of a four arched pavilion.

The coming of Islam gave the old concept a greater symbolism. The very design of the Persian mosque, with its central courtyard surrounded by four iwans, as opposed to the traditional Arab hypostyle mosque, in which there was one principal iwan which faced onto three cloisters, is evidence of the persistence of the concept. In addition the increasingly Gnostic tendencies of Islam, which can be attributed in the main to the influence of the Sufis, began to use the concept as a hook on which to hang some important concepts. Under this paradigm the relationship between heaven and man is symbolized by the squaring of the circles or the transition from the single point of the circular dome to the square of the room below.

Minaret
The Iranian minaret differs from all others. It almost certainly stems from a very old pre-Islamic culture and was adapted for use under the new religion. Like all cultures the ancient Iranians attached an importance both the vertical and horizontal alignment of space. Thus in its earliest manifestation the minaret was a form of delimiting space, a kind of totem, known as a mil from which we derive the English word "Mile". The word must have been converted into monareh or monar which philologically means "the place where light burns" under the Zoroastrians, and this gives a special significance to the atashgah, shown above, as the precursor of Iranian minarets.

Gateway
A gateway represents a point of transition, a beginning and an end. The picture below shows the great Gate to Shiraz, a reconstruction of the Sassanid original. We know that a similar impressive gateway stood at the Southern end of Chahar Bagh, but today nothing remains of it. This gateway thus marked the start of a journey from Shiraz to Isfahan and the end of one in the other direction. The word bab is used to signify either a gateway to a city or the start of a chapter since both convey an underlying sense of transition.

The city can also be viewed as a body and the gateways that lead in and out of it are thus likened to its orifices; the splendor of the gateway tells us something of its antecedents and wealth, while the watch- towers set high above or on either side of it are the eyes and ears.

Inward Architectural Types
The inward architectural type has different types inside of itself. There are buildings with one, two or three courtyards which depends on their function and degree of importance. Also, buildings can have up to four iwans. The basic division of inward building typology can be based on the number of iwans and the number of courtyards.

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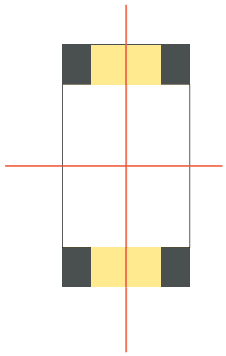
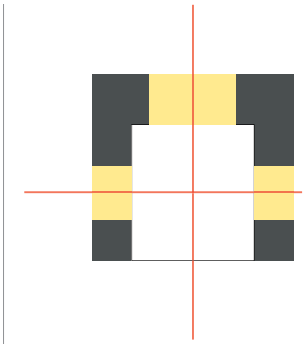
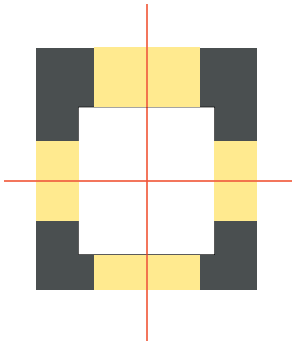
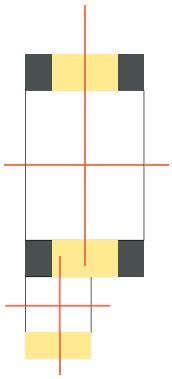
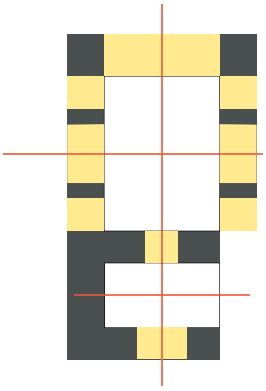
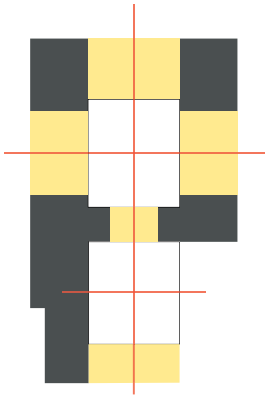
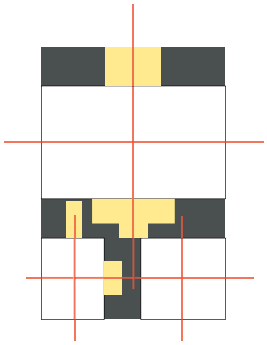
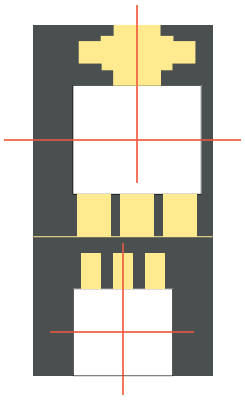
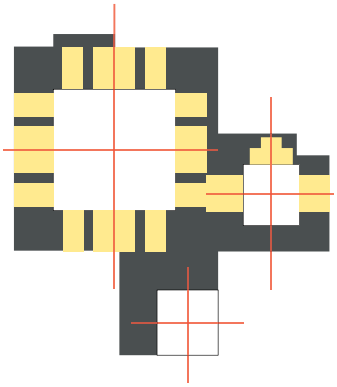
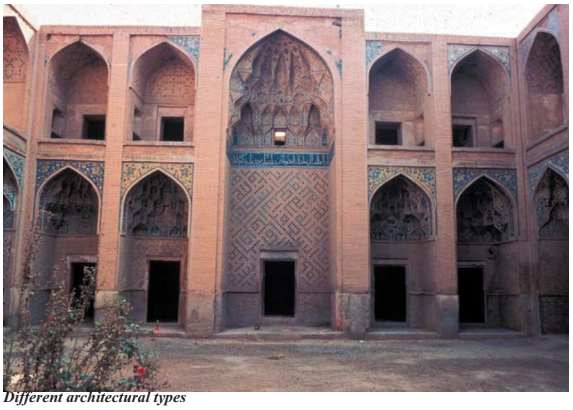
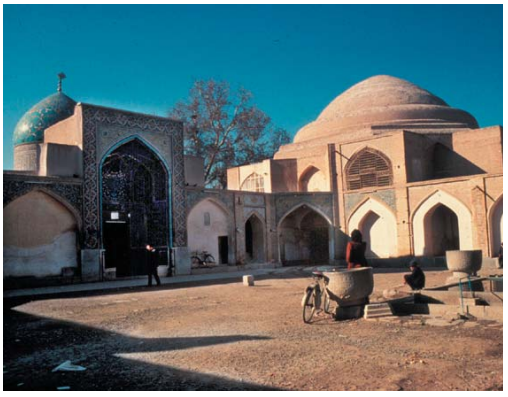
One Courtyard			
Two Courtyards			

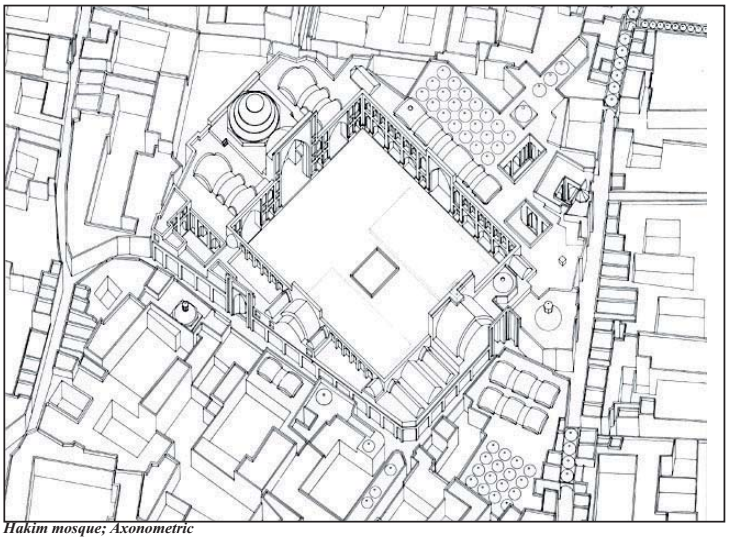
	Two Isles	Three Isles	Four Isles
Three Courtyards			





Different architectural types

Hakim mosque; The main iwan



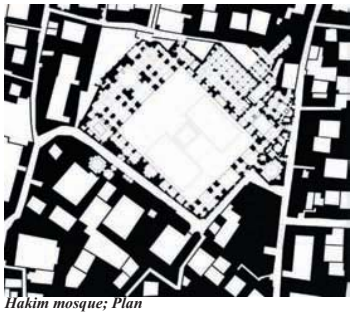
Hakim mosque; Axonometric

Hakim mosque: An example of an inward typology in the fabric

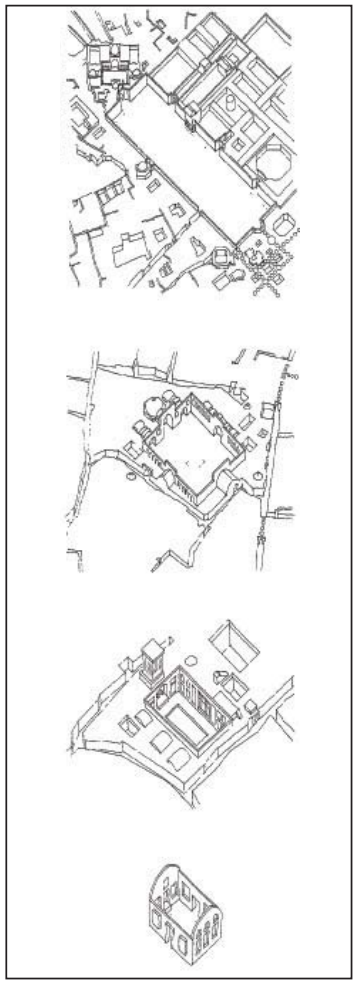
The most remarkable issue about inward buildings is that no person can tell what is going on in the building by looking at its exterior. Even most important buildings are tied in the fabric in a way that it is difficult to tell the size or importance of the building by looking at it from outside. Hakim mosque is an example of an important mosque which is tied in the fabric. The mosque is not distinguished from any other building in the city fabric. Once inside, the monumental courtyard becomes the piazza of the neighborhood because of its intrinsic geometric order.

A mosque is not only a house of worship but also a public building serving a multiplicity of uses. It is a gathering place for prayers five times a day, an Islamic college, a community center for functions with present day western associations and an emergency shelter for travelers. A mosque contains amenities such as wash rooms and toilets for public use. It is the first civic symbol one encounters after coming out of a secluded house at the end of an obscure alley. As much as it is a container of space, it is also contained within the city fabric.

The internal organization of the square, the Hakim mosque, a typical house courtyard and a single room is similar. The same longitudinal axis dominates each space behind the subordinate walls. The relationship of spaces off the courtyard is carried through in all examples: The niche in the wall of the room to the room, the room to the house courtyard, the prayer hall to the mosque courtyard and the mosque entry portal to the square.



Hakim mosque; Plan



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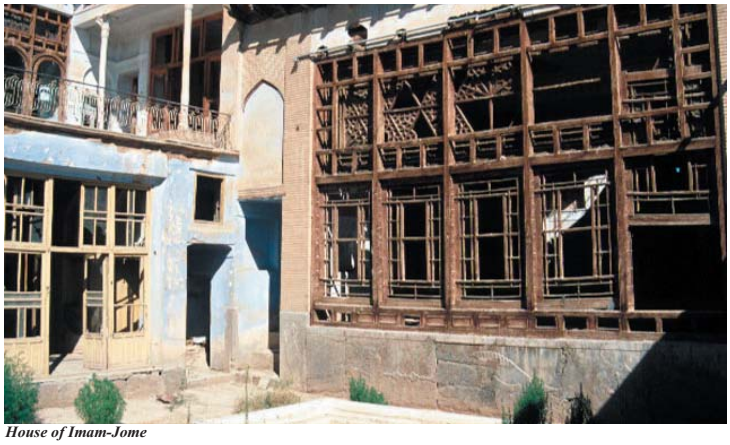
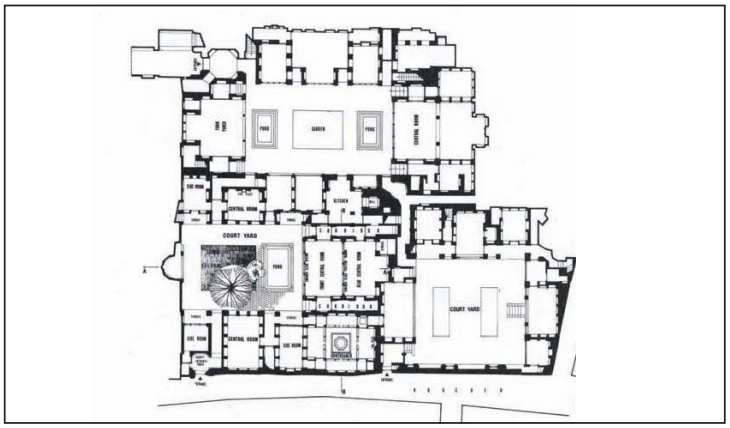


House of Imam-Jome

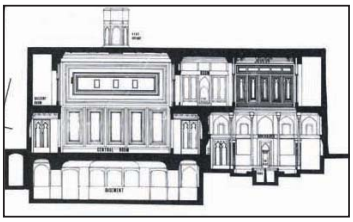


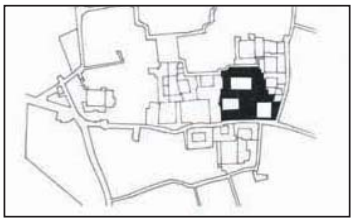
In contrast to modern Iranian cities, Isfahan as other old cities, is concentrated and homogenous in its buildings, combing diverse land uses in a tight relationship with each other. While primary reason for the development of the early compact Isfahan may have been necessities such as defense, social cohesiveness, land conservation for agricultural use and optimal size, the compact system as the dominant urban form in arid region of Isfahan has probably been maintained as results of its climatic advantages.

The compact traditional city has the potential to reduce the climatic stress considerably and to ameliorate microclimatic conditions. It minimizes the amount of building surface exposed to direct solar radiations, thus, reducing the total heat gained and providing more comfort for its inhabitants. A traditional Iranian house in Isfahan, attached to its neighbors by three or four walls, minimizes exposure to the sun.

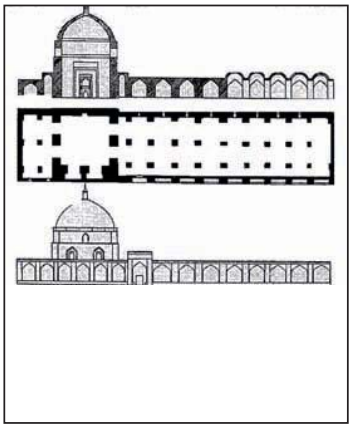
Compactness also results in the proximity of land uses within the traditional city. Land uses are physically integrated and at the same time functionally separated. The land pattern is integrated in such a way that the economic, educational, religious, and other public centers intermingle with residential land. At the same time, the principal access network connecting residential areas to the bazaar complex acts as the buffer zone between residential (private) and non-residential (public) areas.

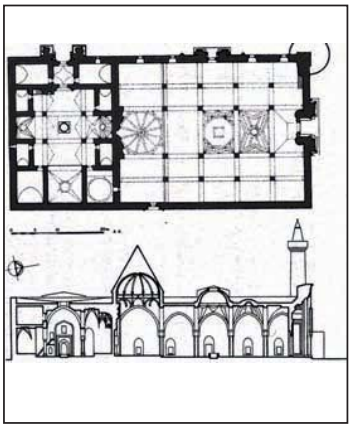
House of Imam-Jome

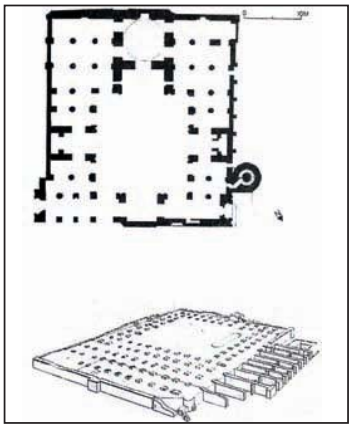


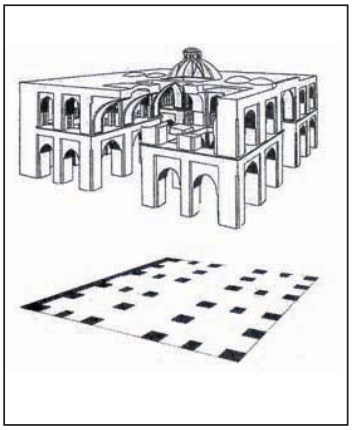


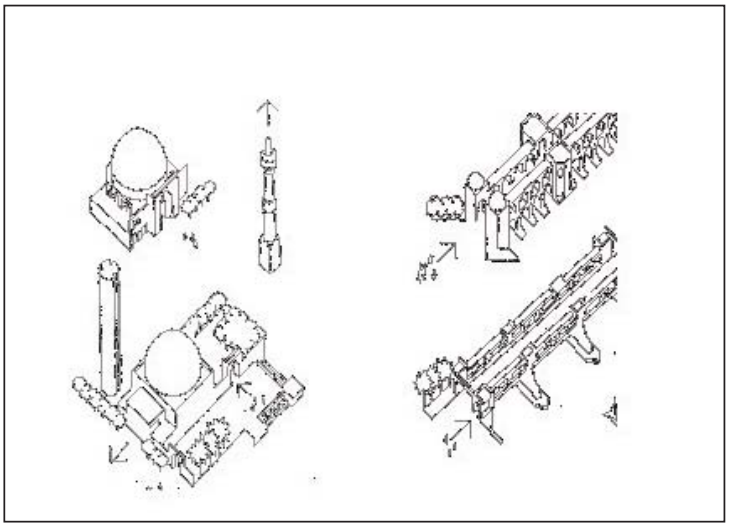
An example of three houses with their open spaces in a block and house of Imam-Jome

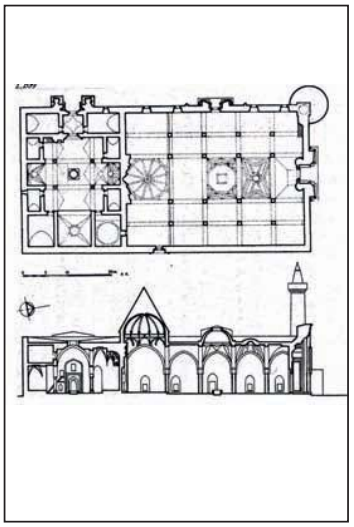


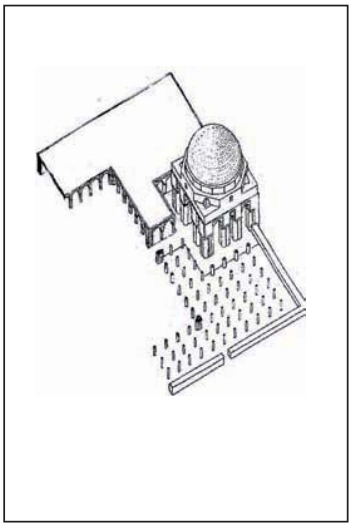












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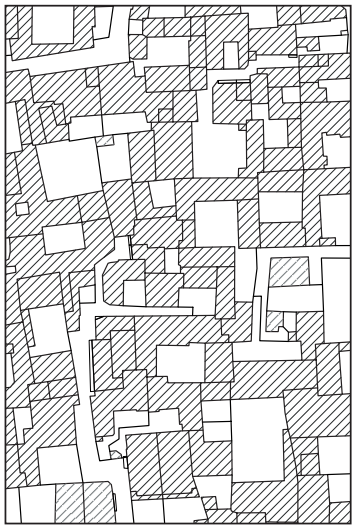
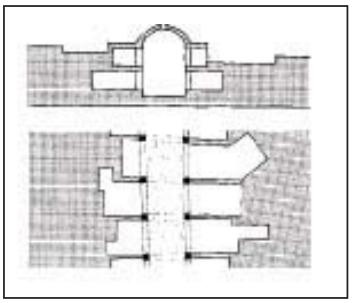
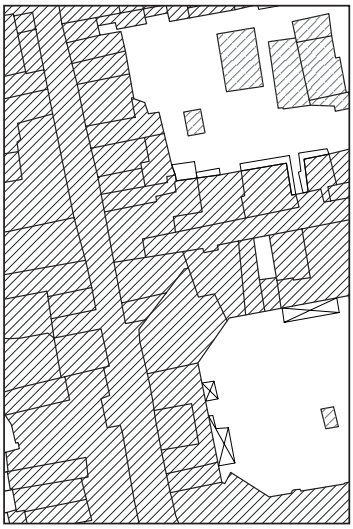
Traditional Fabric
As said before, this fabric comes from the inward courtyard building type which makes it possible for a few buildings to merge and make a cluster.

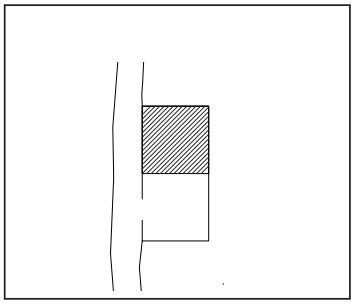


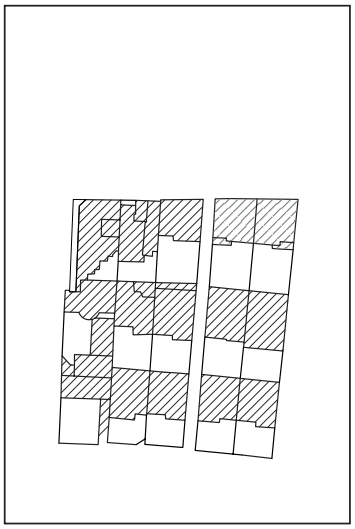
Bazaar Fabric
Bazaar has its own typology and function. The whole bazaar is covered with small mud domes but inside, a special kind of fabric has shaped during times.





New Developments
These type of buildings, without any regards to traditional model and copied from western walk-up apartment buildings survives in the newer parts of the city.





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