

Local Architecture: Using Traditional Persian Elements to Design for  
Climate in Yazd, Iran

by

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## ABSTRACT

The aim of this thesis is to research and study vernacular architecture in Yazd. Additionally, this study will explore the social and environmental bases of the traditional Yazdi house. In order to develop a cohesive understanding of contemporary issues in Iranian design, a variety of resource materials will be drawn on, including journal articles, reports, books, and field studies. The thesis will culminate in a project to design a large-scale master plan and schematic housing layouts for a residential complex at Yazd University that will house professors and their immediate family members.

## ACKNOWLEDGEMENTS

First and foremost I would like to express my gratitude to my supervisor, Prof. Johan Voordouw, who has supported me with his patience and knowledge whilst allowing me to develop my research.

Also I would like to offer special thanks to my committee chair, Dr. Federica Goffi, for her offered guidance, care and support.

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***“When the full power of human imagination is backed by the weight of a living tradition, the resulting work is far greater than any that an artist can achieve when he has no tradition to work in or when he will fully abandons its tradition” (Fathy, 1973,p.25)***

## INTRODUCTION

This thesis researches traditional housing in Yazd, Iran. The research objectives of this work are two-fold. Firstly, vernacular elements used in traditional houses in central Iran and, in particular, courtyard houses in Yazd will be investigated and analyzed in relation to contemporary Iranian design. Secondly, the broader social context of housing in Iran will be explored with a view toward sustainable development and improvement of local architecture.

The thesis will conclude with a design plan for a residential complex to be used by professors and staff at Yazd University. The complex will meet individual requirements within the housing layout and larger relational dynamics that define social life in this particular a residential complex.

**Methodology:** This thesis relies heavily on textual research. Additionally,

the author will draw on data collected during a research trip to Yazd in May 2014. The data includes field observations recorded by the author, research of various materials in local libraries, and conversations and interviews with local academics. After preliminary planning studies, a final design layout for individual housing and a larger residence on the scale of an urban quarter has emerged.

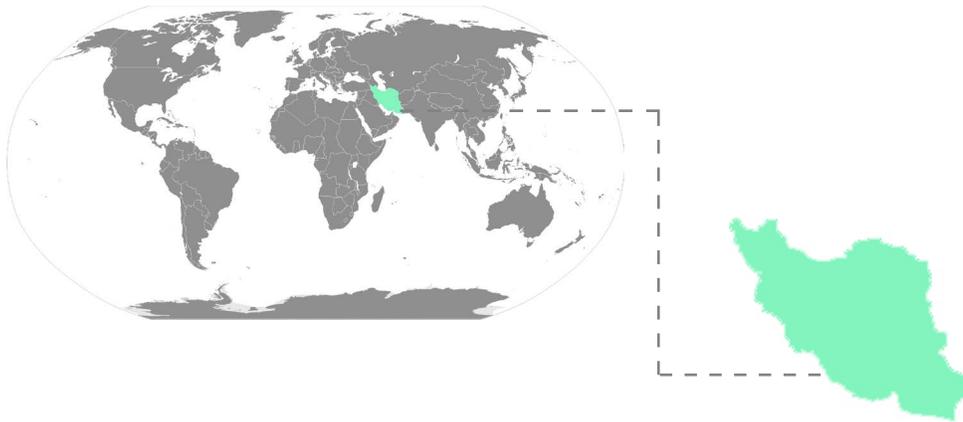
Central Iran's distinct and relatively constant climatic conditions are rarely factored into the designing of modern day structures. As a result, large-scale commercial and residential construction practices tend to produce buildings that are inefficient and out of sync with local climatic needs. Yazd is among Iran's oldest cities with a rich architectural history. The city's local architecture, along with concepts, ideas, and values rooted in Iran's architectural traditions served as a major impetus for this work. The methods of

traditional Iranian architecture can be used to meet contemporary needs. While sustainable energy and development is a key priority, the architectural values and town planning of old Yazd cannot be sacrificed. Sustainability and development will be integrated in such a manner so as to retain the city's essential character. Sustainable development, therefore, can be attained by integrating traditional architectural concepts and values with current technology.

To be clear, this thesis does not argue against development, which would be futile. Instead, it seeks to temper it by promoting an understanding of development that is guided by a consideration of the local environment and social context. Similarly, the thesis does not concern itself with architectural types i.e. shopping mall vs. bazaar. Rather, it argues that architectural types of any sort must be designed and constructed with consideration for

the local context. A more sustainable and context-based approach to development can still include high-rise apartment buildings and high-density, lower income housing complexes. When these development types are in the design phase, consideration must be given to the local environment, wind and solar issues, and privacy concerns. Such an approach to development would be a marked departure from normative standards as it would attempt to maintain a connection to the Iranian and environmental context.

## IRAN



The country of Iran, previously known as Persia, and the name Iran was adopted in 1935. Iran is located in the northern hemisphere a region of Asia known as the Middle East, which is a geographical region of South-west Asia (figure 1). The official language spoken in the country is Farsi (Persian) and the capital City is Tehran (Oxford Dictionary). The central Iranian city of Yazd is the main focus of this thesis (figure 2). Countries that share a border with Iran include the Republics of Azerbaijan and Armenia in the northwest,

Figure 1: Location of Iran on the world map , Source: Author ,original source: <http://commons.wikimedia.org/wiki/File:BlankMap-World6.png>

Turkmenistan in the northeast, Turkey and Iraq in the west, and Afghanistan and Pakistan along the east. Large bodies of water along the Iranian coast include the Caspian Sea in the north, and the Persian Gulf and Oman Sea along Iran's southern coast (Norouzi Talab, 2011, p.11-15). The Iranian plateau is located in the country's central and eastern parts. Iran's two major deserts are Kavir-e-Namak and Kavir-e-Lute, and both cover large expanses of land in the country's east (Mares. 1999, p.302).



Figure 2: Location of Yazd on the map of Iran, source: Author original source : <http://www.artofanderson.com/outline-maps/>

## HISTORY OF YAZD

From observation while visiting Yazd it is a city of narrow alleyways and introverted houses. The city is blanketed by a beige colour that reinforces its traditional architecture. A visit to Yazd is a unique experience as the city seems almost frozen in a bygone era. Despite its age, the city feels strong and robust and is enveloped by a calming sense of harmony. Long narrow alleyways with arched roofs leading into introverted courtyard houses shield residents from scorching temperatures. The arched roofs create pockets of shade that comfort locals and visitors meandering on foot throughout the city. The design of the old city seems to be in synchrony with nature and



Figure 3: over view of the city Yazd, source: <http://www.traveldirectors.com.au/tours/treasures-of-persia-and-the-caucasus-2015/>

climate.

As one moves toward Yazd's more modern quarters, one increasingly feels a sense of displacement. Khademzadeh has also praised the city for having preserved its ancient traditions, culture and unique architectural style while expressing concern about the strain of modern development. Khademzadeh's concerns are shared by those who fear their city's unique culture and history are at risk.



Figure 4: Non-traditional building forms in Yazd vs. traditional layout of Yazd. Source 1: Adapted from Kalantari and Hataminejad (2006). Source2: <http://developmentalidealism.org/imagery/iran.html>

Nonetheless, the city's traditional character has remained intact. Its remote desert location has made it relatively unapproachable and therefore less vulnerable to the sweeping advance of modern development. Today, like in centuries past, Yazd, or Isatis as it was known during the 5th century Achaemenid dynasty, continues to expand and grow (Khademzadeh, 2004, p.27-30). Before the spread of Islam into the Iranian plateau in the 7th century AD, Zoroastrianism was the national religion of Iranians. After Yazd fell into Muslim hands, most of the city's inhabitants converted to Islam.

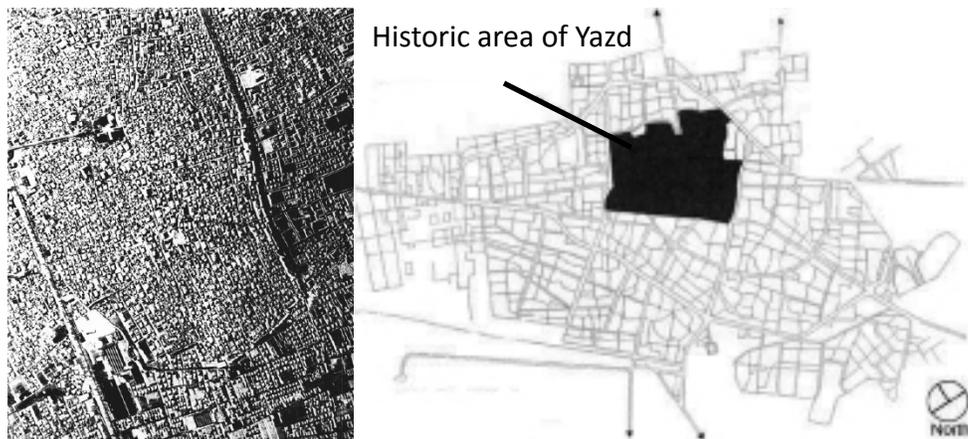


Figure 5: Historic area of Yazd. Source: Adapted from Kalantari and Hataminejad (2006) & Ahmadreza Foruzanmehr (2013)

Historically, both before and to a lesser degree after the Muslim invasion, Yazd was the epicenter of Zoroastrianism. Zoroastrian pilgrims from many parts of the world travelled to Yazd to worship at the city's famous fire temple (figure 6) which houses a sacred flame that has burned non-stop for some thirteen centuries (Eduljee, 1979, p.1227-234). With the construction of gates and castles surrounding the city in the 11th century, Yazd became more prominent than most regional cities (Khademzadeh, 2004, p.27-30). In the 14th century AD, expansion of the city intensified in a westerly and southwesterly direction. When the Mozzafarids dynasty established its base in Yazd, they built a formidable seven gate wall (figure7 & 8) that reinforced the city's regional prominence (Khademzadeh, 2004, p.27-30).

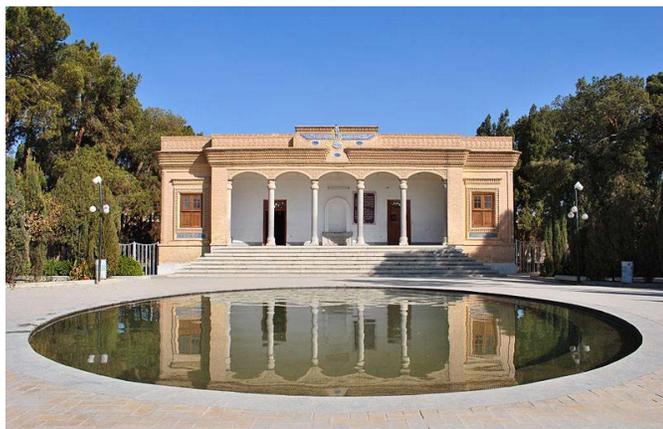


Figure 6: Zoroastrian Fire Temple in Yazd. Source: [http://commons.wikimedia.org/wiki/File:Zoroastrian\\_Fire\\_Temple\\_in\\_Yazd.JPG](http://commons.wikimedia.org/wiki/File:Zoroastrian_Fire_Temple_in_Yazd.JPG)



Figure 7: A portion of the city walls of Yazd. Image credit: Jenny Brophy at Flickr. Source: [https://www.flickr.com/photos/jenny\\_brophy/3463423337/sizes/l/in/set-72157617171558359/](https://www.flickr.com/photos/jenny_brophy/3463423337/sizes/l/in/set-72157617171558359/)

Figure 8: A less well preserved section of the city walls. Image credit: Archnet Digital Library. Source: <http://archnet.org/>

In 1501, a powerful new dynasty emerged in Iran known as the Safavids. After quelling regional rebellions, the Safavids consolidated their power and embarked on a major restoration of the empire. Determined to reassert Persia's dominance, the Safavids rapidly developed and expanded major cities like Isfahan, Shiraz, and Tabriz. Yazd, however, was largely neglected. Nonetheless, at the beginning of the century (AD 1501-1773), a large complex named Amir Chakhmagh was built along the outer edge of the imposing city square which contained a bazaar, mosque, and water basin. New developments emerged along the outer side of the city wall (Khademzadeh, 2004, p.27-30). Yazd's fortunes improved during the reign of the Zand and Qajar dynasties, who built new schools and baths and expanded the city in a southerly direction. In 1815 the Qajars financed the design and construction of a new city wall that bolstered its security (Khademzadeh, 2004, p.27-30). The first stage of modern Persian architecture emerged

during the reign of the Qajars, who were keen to import European science and technology. The Qajar's interest in European architectural methods paved the way for exchanges in other arenas between Iran and European countries (Diba & Dehbashi, 2004, p.31-37).

In the 20th century, the Pahlavis embarked on major changes throughout the country. The Pahlavis not only sought to re-image Iran in the style of Europe, but also imposed non-traditional forms of dress on a still traditional people. In his unrelenting drive toward modernization or "*Europeanization*," Reza Shah's government banned the hijab in 1936, and in so doing, severely disrupted a long-standing social and religious custom; The majority of Iranians disagreed with a law they considered intrusive and foreign (Karimi, 2012, p.119-139). Not surprisingly, during this period all major architecture commissioned by the government mirrored a European approaches. Iranian architects in this period were trained in Europe and were all too

eager to apply their newly acquired knowledge to design and build modern buildings in Iran. Architecture was not the only aspect of Iranian life that was becoming increasingly Westernized. Iran's culture, education, and economy were all heavily influenced by the West, as the Pahlavi monarchy sought to rebuild and modernize Iran. Western architects were contracted by the government to design and build new developments in Iran (Diba & Dehbashi, 2004, p.31-37). In his book, *A Plague from the West* the great Iranian literary critic Jalal al-Ahmad lamented the exodus of aspiring Iranian architects travelling abroad to learn their craft in European universities:

*“Contrary to the widespread view, the greater the army of returnees from Europe, the less their power to act and the greater the distress of the institutions that absorb their impact. Because there has never been a plan for where to send these youths and what specialty, what trade, what technology they should study, they have gone each to some part of the world to study or experience something completely different from others’ experiences”* (Al-e Ahmad, 1983, p. 118).

According to Karimi, the influence of Western architecture was apparent in the vast majority of civil projects. Western influence could be seen in the widening of previously narrow streets, bazaars that were gradually reduced to small and mid-size stores, and more broadly, in architectural and urban planning designs that resembled western cities (Karimi, 2012, p.119-139). Beginning in the 1940s, Mohammad Reza Pahlavi continued in his father's footsteps, transforming and modernizing Iran's major cities. The historical core of Yazd was untouched in this period but the city itself developed and changed in various ways (Diba & Dehbashi, 2004, p.31-37). According to Hadi Mirmiran *"this period was unable to create any world-class modern architecture, nor was it completely successful in the use of Iranian architectural principles and ideas."* (Hadi Mirmiran, 2004, p.39). The blind pursuit of western architectural methods had fallen short of the mark and Iranian architectural methods inadequate. In the post-WWII era, Iranians became

increasingly fascinated with Western ways of living and slowly began shedding their traditional habits and customs. A key architectural movement that emerged in Iran at this time was a technique known as “build-and-sell,” a cheap and rapid construction approach driven by profits and housing demands. Due to rapidly rising populations in Iran’s urban centers, traditional houses with courtyards were replaced with vertical apartment buildings capable of housing far more residents on smaller plots of land. Developers who reaped large profits from these transactions were hardly concerned with the negative impacts of their projects on the city’s traditional architecture (Diba& Dehbashi, 2004, p.31-37). The wholesale adoption of so many ‘modern’ ways of doing things in public life led to a radical and disruptive change in the cultural identity of Iran and Iranians. Jalal al-Ahmad, a fierce critic of this process, theorized that Iranians suffered from a psychological affliction. Jalal al-Ahmed used the term “*gharbzadegi*” in Per-

sian or "*Westoxication*" to describe this mental state. For al-Ahmad, there was much to cherish and preserve in the authentic identity of Iranians, the country's history and culture. Like other contemporaries who were critical of the impact of Westernization on Iranian identity, al-Ahmad worried that Iranians were losing themselves as they wandered aimlessly toward the mirage of "*modernity*." In the aforementioned book, al-Ahmad articulated this self-estrangement, writing "*we are like strangers to ourselves, in our food and dress, our home, our manners, and most dangerously to our culture*" (Jalal Al Ahmad, 1983, p.75).

In 1979, the Iranian Revolution abruptly ended the Pahlavi monarchy's reign and led to the establishment of the Islamic Republic of Iran. The new regime brought with it a new cultural and religious perspective rooted in Iranian and Islamic traditions. During the long Iran-Iraq war, which lasted

some eight years, social, economic, and cultural problems inundated the still fledgling republic. Non-essential matters like architecture took a back-seat to major priorities of state, chief among these the revival of Islam. The country was in flux and the lack of attention and knowledge in the area of building design resulted in construction projects that did not respond well to the climate of cities (Diba & Dehbashi, 2004, p.31-37). According to Diba and Dehbashi,

*“On the one hand, creating architecture and urban planning to correspond with the values and ideals of Islamic society was an essential element in this period. On the other hand, western-influenced trends like Post-Modernism and Deconstructivism, also played a role in Iranian architecture.”*  
(Diba and Dehbashi, 2004, p.34)

An understanding of Western architectural methods certainly empowers architects such that they can design and build outstanding creations. However, architects and architecture needs to remain cognizant of broader cultur-

al and social needs, along with a consideration of local climatic conditions. Unfortunately, architecture in today's Iran has failed to adequately consider climatic conditions and the broader context within which these new structures will emerge. Many Iranian architects have continued the poor habit of simply replicating Western constructions. Such an approach clearly fails to account for climatic conditions, particularly central Iran's highly specific climate, not to mention issues related to culture and identity. On this point, Diba and Dehbashi write:

*"Iranian architects have turned towards revitalization/rejuvenation and fusion or eclecticism. Presently, the trend that is emerging among architects is one accompanied by wide analysis and precise criticism. They are taking strides towards recognizing 'real' cultures, and see solutions in the opening of minds towards the world at large"* (Diba & Dehbashi, 2004, p.37).

## ENVIRONMENT OF YAZD

### Climate and Geography

The nature of human shelters are largely dependent on the climatic conditions that prevail in their immediate environment. Climatic conditions factor prominently in shelter designs (Oliver, 1973). In an environment where climatic conditions are relatively constant and balanced, like in Yazd, the need for considering the surrounding climate is equally diminished. But in the absence of climatic constancy and balance, shelters must be designed to withstand weather extremes, including wind erosion, sand storms, and intense solar radiation (Alijani, 2002, p.41-54). In the case of Yazd, the con-



Figure 9: Showing the location of the city of Yazd on the map of Iran. Source: Drawn by author

struction of comfortable demands a solid understanding of the city's climate. Yazd is located at 54 degrees east longitude and 32 degrees north latitude with an altitude of 1220 meters above sea level. Yazd's general climate is hot and dry weather, a typical trend in central Iran. Situated between two deserts, Dashte Kavir and Kavire-Lut, the city's climate is expectedly desert and semi-desert with hot and dry summers days and cold winters. A good understanding of this climate is necessary for designing suitable buildings in Yazd (Mostofiol-Mamaleki, 1997, p 25-52). When designing in areas with

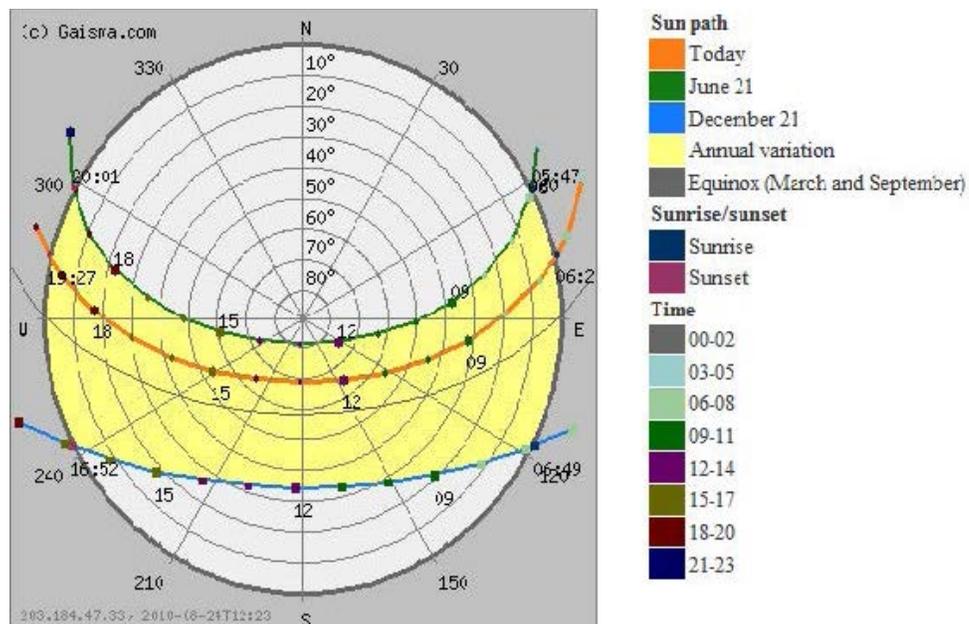


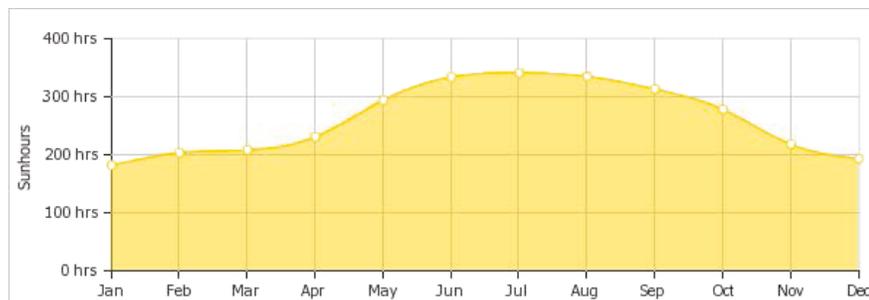
Figure 10: Sun path Diagram in Yazd. The diagram above shows the path of sun in Yazd. Source: <http://www.gaisma.com/en/location/yazd.html>.

specific weather conditions, a deep understanding of the climate is necessary. The most significant climatic factors include temperature, amount of average daylight, wind velocity and frequency, rainfall levels, and relative dampness. Additionally, an understanding of vernacular architectural methods used in the city, both past and present, will help produce more effective and suitable designs.

According to weather reports and graphs, the maximum temperature in the hottest month of the year, July, peaks at 40°C while winter temperatures can drop as low as 0°C in February. Yazd experiences dramatic temperatures variations by day and night. Daytime temperatures are excessively hot whereas the evenings and nights are cool to cold. Throughout the year, typical wind speeds vary from 0 km/h to 25 km/h (calm to moderate breeze), and rarely exceed 43 km/h (strong breeze). The highest average

wind speed of 10.8 km/h (light breeze) typically emerges in the third week of June, while the average daily maximum wind speed is 21.6 km/h (moderate breeze). The lowest average wind speed of 7.2 km/h (light breeze) appears approximately in mid-December, at which time the average daily maximum wind speed is 14.4 km/h (gentle breeze). The wind is regularly out of the west (16% of the time), northwest (16% of the time), and southeast (13% of the time). Winds out of the northeast are infrequent at only 2% of the time. (Refer to figures 11, 12, 13, 14)

### Average monthly hours of sunshine over the year in Yazd, Iran



### Average monthly preception over the year (rainfall, snow) in Yazd, Iran

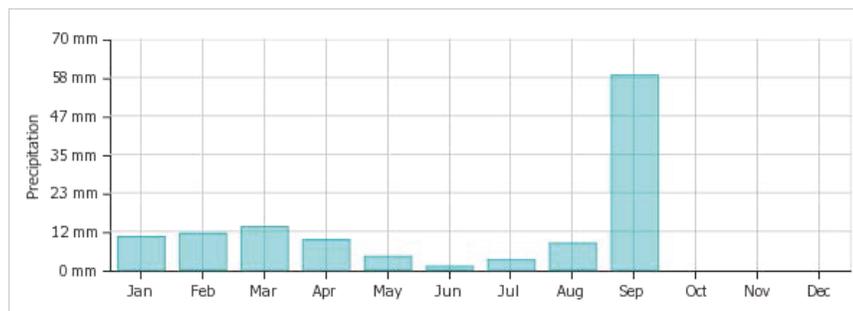
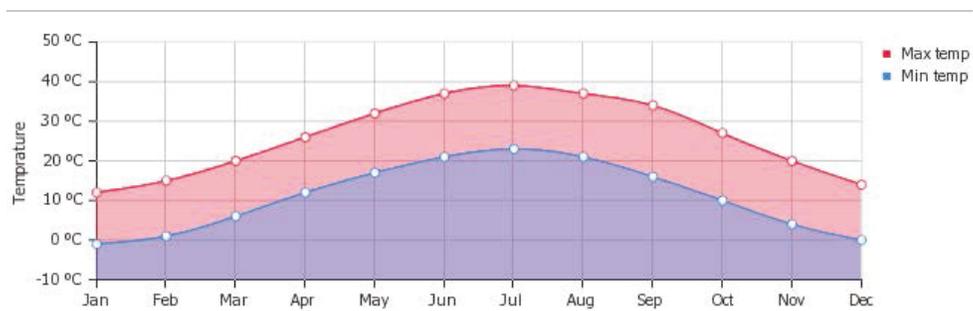


Figure 11: This is the monthly total of sun hours. Source: <http://www.weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Yazd,Iran>

Figure 12: This is the mean monthly precipitation, including rain, snow, hail etc. Source: <http://www.weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Yazd,Iran>

### Average minimum and maximum temperature over the year in Yazd, Iran



### Average wind speed over the year

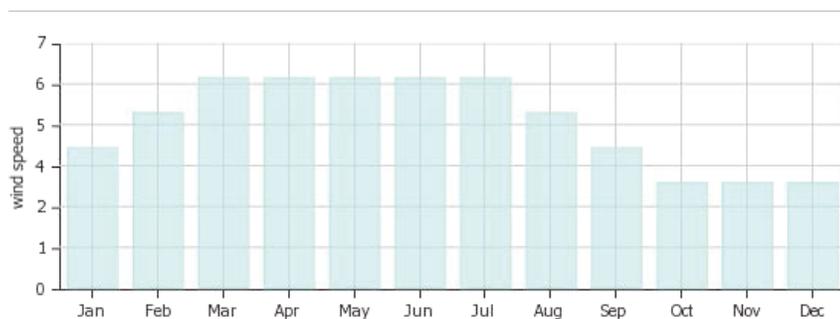


Figure 13: The monthly mean minimum and maximum daily temperature. Source:<http://www.weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Yazd,Iran>

Figure 14: The monthly mean minimum and maximum daily temperature. Source:<http://www.weather-and-climate.com/average-monthly-Rainfall-Temperature-Sunshine,Yazd,Iran>

## SPECIFIC BUILT ENVIRONMENT

### The traditional courtyard house in Yazd, Iran

According to Pirniya, a traditional Persian house consists of multiple spaces, such the entrance (*Sar-Dar*), a vestibule (*Hashti*), corridor (*Dalan*), *ivan*, courtyard which consists of a pool in the middle and gardens. Most houses also have a basement and the surrounding room wrapped around the courtyard (Pirnia, 2005, p.153-167). These spaces are explained from personal experience when visiting Iran in the summer of 2014.

When I visited Yazd in 2014, my family and I toured on foot one of the city's oldest neighborhoods. We arrived at approximately noon, when the mid-day sun was burning at its hottest; suffice it to say, it was scorching hot. Ordinary Yazdis were carrying on about their daily business, including two gentlemen walking home from work on their lunch break along with a middle-aged lady adorned in a black chador (cover) that revealed only her face. As we started to make our way through the neighborhood, the imposing

architectural structures and narrow alleyways made me feel quite certain that we would soon lose our way. The sheer number and intricacy of the thick, high brick walls (figure 15) made us feel like we were navigating a maze. However, the farther into the neighborhood we wandered, the cooler we felt as the burning sun rays were replaced with large pockets of shade created by arched roofs atop us (figure 16). As we became more familiar with the neighborhood, I noticed random wooden doors called sar-dar in



Figure 15: Thick high walls for creating shade. Source: <https://jakethreadgould.wordpress.com/author/jaketh-readgould/>

the alleyways that led to introverted courtyard houses. Apart from the *sar-dars* (figure 17), which are entrances to the traditional courtyards, the formidable brick walls blocked prevented us from seeing anything else (Pirniya, 2005, p.153-167). As walking I realized the harmony between all these features and how they all came together to form a comfortable journey for the passengers.

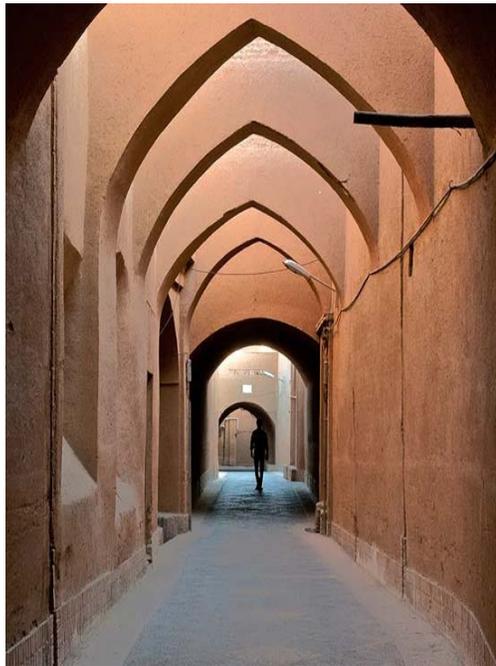


Figure 16: shade created by arched roofs. Source: <http://www.givtravel.com/tours/iran-adventure-tours/from-the-caspian-sea-to-persian-gulf>

Figure 17: Sar-dar, source: Ahmadreza Foruzanmehr

Upon entering a traditional courtyard house, you find yourself in an enclosed space with a large domed roof atop. Some courtyards roofs are designed to let natural light peer through, creating a circular view of the sky above; this area of the traditional courtyard is known as the *hashti* (figure 18). The *hashti* is a waiting room much like a lobby space where visitors wait for their hosts to formally welcome them into the house (Pirniya, 2005, p.153-167). When walking through the *hashti*, one proceeds along a *dalan* or hallway that leads you towards the courtyard (Pirniya, 2005, p.153-167). Visitors come upon a staircase that leads into the courtyard, the focal point

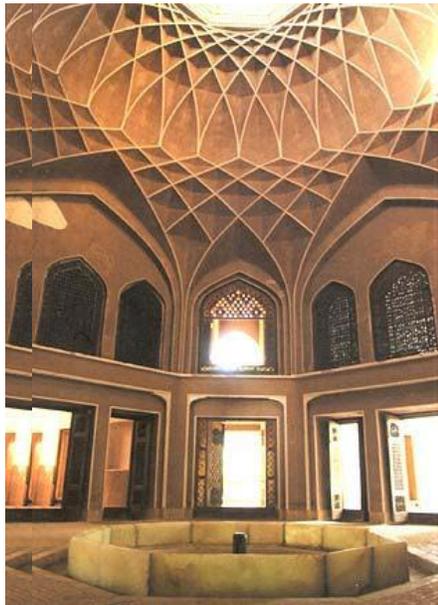


Figure 18: Image showing the space named *hashti*. Source: Architecture, School Of. MAAD. Accessed March 17, 2015.

of the residence and around which the entire house is wrapped. According to Heidari, most courtyards are squared shaped with some houses boasting a rectangular layout, and, in all cases the size of the courtyard is a reflection of the household income and class level (Heidari, 2000, p.26-30). In traditional courtyards, one almost always finds a small pool with fish inside and flower filled vases along its edges. There is a sense of fresh air and a nice breeze in the courtyard. Looking ahead, elevated from the ground is the *ivan* (Figure 19) where families gather and enjoy one another's company, enjoying the fresh breeze and flower scents and oftentimes sipping on a warm cup of tea. Located behind the *ivan* is the *talar*, which at one time was a room for greeting and welcoming guests (Pirniya, 2005, p.153-167). Un-



Figure 19: Ivan in traditional Persian house. Source: Ahmadkhani Maleki

derneath the *ivan* is a large and noticeable staircase that extends down into the cooler basement area where residents escape to on hot summer days (figure 21). Due to its cooler temperature, food is also stored in the basement. The various types of passages around the courtyard add a great deal of colour and life to the house. In traditional courtyard houses, the openings and windows face inward because most of the houses are introverted and only have windows around the courtyard, away from the exterior of the house. Additionally, for privacy reasons, there are no openings or windows along the house's exterior façade. Each opening plays an important functional role in minimizing the amount of sunlight that penetrates the house. The colourful glass located mainly in the talar area limits the amount of light entering this space and creates an artistic pattern that makes the space more welcoming to guests (figure 20)

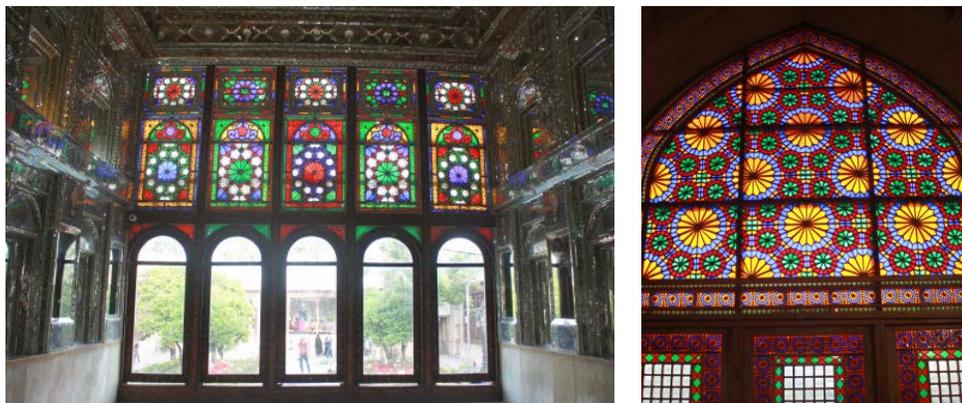


Figure 20 : Colour full galss. Source : Author



Figure 21: A cooling pool in a serai in Meybod, Yazd, Showing the space where the family would spend a lot of time in during hot summers to cool off. Source: <http://www.outlooktraveller.com/trips/iran-in-verses-1004552>

In addition to controlling the amount of sunlight that enters this space, the colourful glass is also known to repel insects (Nabavi et al., 2012, p.97-101). Different elements help with the increase of daylight and control the amount of sun that enters the house in particular, two features of this space are used for the windows: the *Tabesh Band* and *Lattice Frame*. The *tabesh band* (figure 23) creates shade by forming an edge around the window (Pirnia, 2005). The *lattice* frame (figure 23) is a wooden frame around the window that controls daylight and also has a decorative purpose (Qobadian, 2006). With the exception of guest rooms, all rooms in the courtyard are multi-purpose and used to house different activities and tasks. The versatility of the courtyard rooms is in sharp contrast to houses today, where each room has a specific and singular function. For example, in today's houses a kitchen is used strictly for cooking and preparing food whereas in a traditional house, the kitchen was both a cooking area and a *mat-bakh*, a social space where women would mingle for hours on end. Thus, in addition to

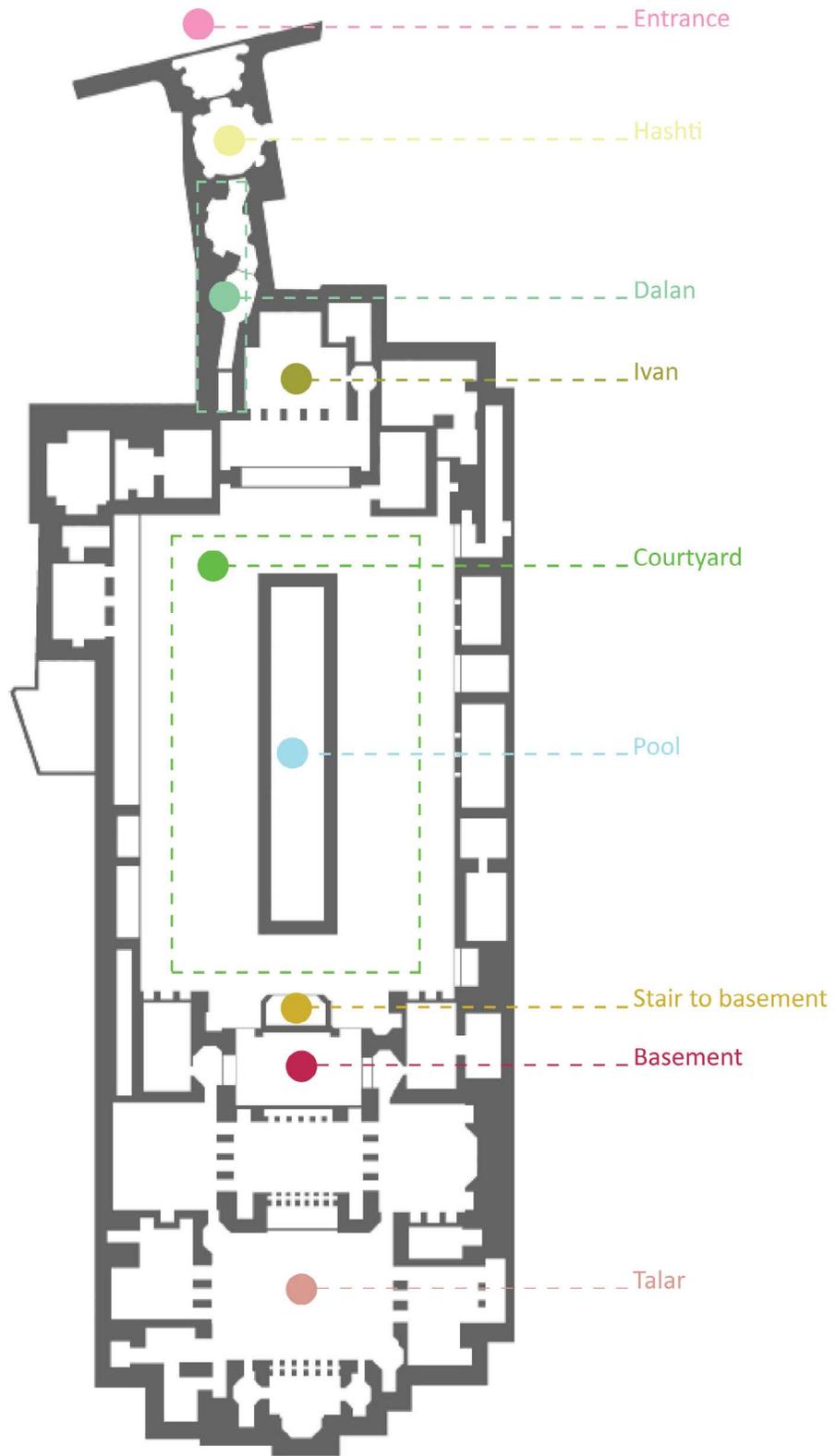


Figure 22: Plan of a traditional persian house, showing the different spaces in the house. Source: redrawn by author, original image from: Shabani, M.M, M.M Tahir, and H. Arjmandi. "Achieving Privacy in the Iranian Contemporary Compact Apartment through Flexible Design." *Achieving Privacy in the Iranian Contemporary Compact Apartment through Flexible Design*. N.p., n.d. Web. 01 Apr. 2015.

a cooking area, the kitchen was also a communal space (Mirmoghtadaee, 2009, p.69-80).



Figure 23: Tabesh Band and Lattice Frame. Source: Author

## **Central Courtyard**

One of the most important elements in the design of traditional Persian houses is the central courtyard (figure 24). The courtyard is the focal point of the house and around it are wrapped additional layers of the residence. Upon entering the courtyard, one senses the fresh air mixed with the scent of flowers that adorn the space. The courtyard is the main communal space in the house and is used by household members for a variety of tasks and activities. The main elements in a typical Persian courtyard are a small pool and trees which create shade and help keep the space cool. The courtyard is also a factor that shapes and organizes all other elements in the house.



Figure 24: Persian courtyard house. Source: Author

In Iran, the most well-known type of house is the courtyard house (Moradi, 2008, p.21-29). Privacy and comfort are also key attributes of the courtyard. In Persian culture privacy is a highly valued commodity. Given the traditional nature of most families, it is important that house designs respect privacy and make dwellers feel secure and comfortable. The courtyard is a smart mechanism for maintaining privacy in an outdoor setting that household members and guests can enjoy). During the day, women in the household come to the courtyard for fresh air while tending to their flowers; even in the courtyard, women wear a loose chador by force of habit and in case an unexpected guest walks in. The garden in the courtyard located around the pool was a symbol of paradise in the Persian architecture of the Islamic era (Ardalan, 1973, p.68-72). The high walls around the courtyard were built primarily for privacy reasons and to prevent passersby from being able to peek inside the house inside of the house and create shades. Some Persian courtyards in central Iran contain an additional element, namely the *godal-*

*baghche* (figure 25). Built into the ground, these pits could reach depths of between three and four meters (Memarian, 1999, p.239-347). The *godal-baghche* were used for increasing shade and humidity. Most courtyard

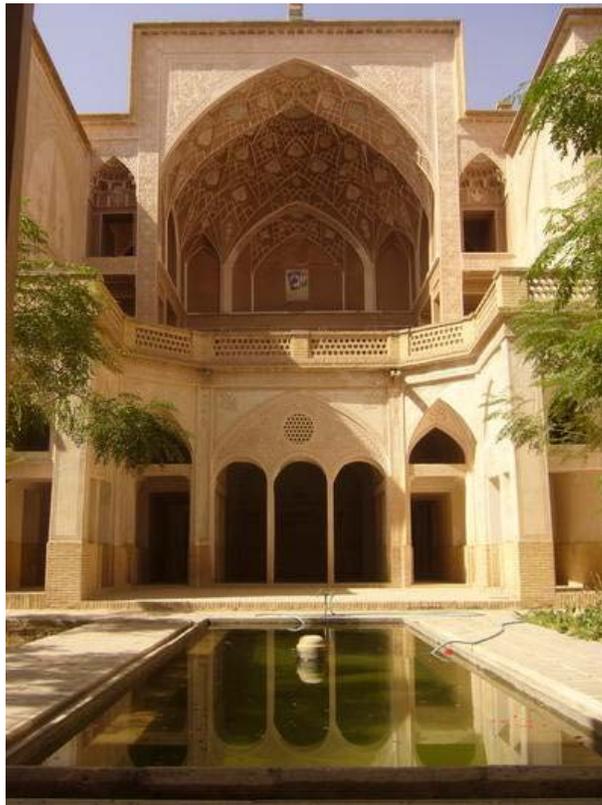


Figure 25: image of a godalbaghche. Source: Seyed Morteza Moossavi - Passive Cooling Systems for Hot-Arid Climate in Islamic Iranian Architecture-libre.pdf

houses in Iran's hot and dry climate are divided into a summer area and a winter area. In order to avoid the hot summer sun, the household's summer area is north facing. The winter rooms, on the other hand, are built facing south to allow them access to the sun's heat in the colder months (Tavassoli, 2002, p.27-48). Today, however, according to a survey done by Foruzanmehr and Vellinga, summer rooms and winter rooms are not longer in use because families simply lack the time and find it inconvenient to move from one area of the house to the other as the seasons change (Foruzanmehr and Vellinga, 2011, p.274-85).

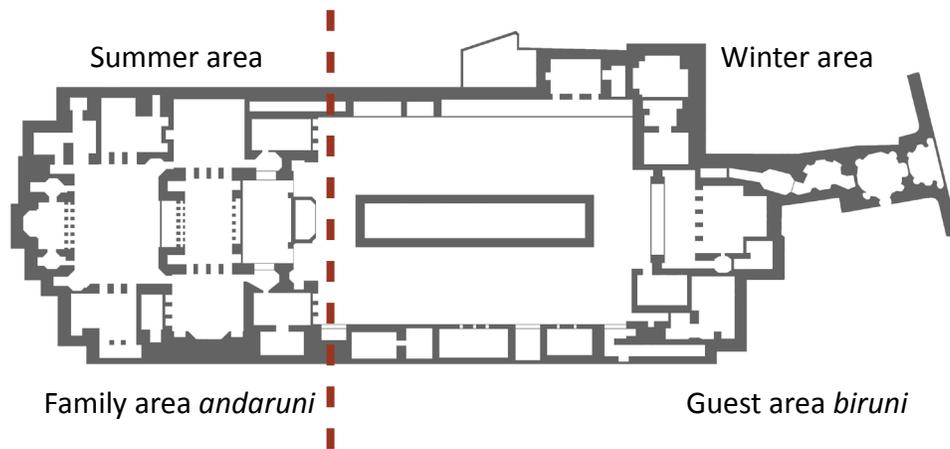


Figure 26: Diagram showing winter area and summer area. Source: Author, original image from: Shabani, M.M, M.M Tahir, and H. Arjmandi. "Achieving Privacy in the Iranian Contemporary Compact Apartment through Flexible Design." Achieving Privacy in the Iranian Contemporary Compact Apartment

## Main Materials



The sense of harmony in the old quarter created by colours and materials is captivating. Mud and clay are the main construction materials used throughout the city and in the building of traditional Persian houses. Given their high heat capacity, mud and clay are very well suited to Yazd's hot and dry climate (Shaterian, 2008). Adobe is another commonly used material in Yazd. It is worth pointing out that adobe is different from mud construction. As defined by the Oxford Dictionary of Architecture, adobe is a natural building material typically made from sand, clay, water, and a fibrous or or-

Figure 27: Panorama of the city Yazd, Source: <http://design.epfl.ch/organicities/2010b/1-assignments/3-vernacular-lessons/vernacular-lessons-yazd-iran>

ganic material and is shaped using molding techniques and dried in the sun (Oxford Dictionary). For Pirnia, clay is inextricably linked to the traditional Persian architecture:

*“clay is an available building material in Iran that dictated major forms in traditional Iranian architecture. Heavy clays have encouraged the development of the most primitive of all building techniques. Brick layers compressed solidly molded mud and allowed it to dry. Tenacious lime mortar also eased the development and use of brick” (Pirnia, 2005, p24).*

Today’s architects would do well to learn from ancient culture and methods of building design and incorporate these into their design plans.



Figure 28: Adobe. Source: <http://blackdogbicycling.blogspot.ca/2014/03/yazd.html>

Figure 29: The making of adobe, source: <http://www.payer.de/tropenarchitektur/troparch02.htm>

## New buildings in Yazd



Figure 30: In new buildings there is inconsistency with environment and context, Inconsistency with climate and the use of modern materials in construction, and using glass facades that lack respect for privacy and ignoring climatic conditions. Source: Seyyed Mohammad Kazemi, Mehdi Hatami Tajik

## Windcatcher

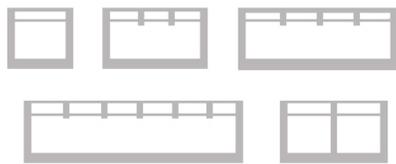
One of the signature elements in the traditional courtyard houses in Yazd is the *badgir*, or wind catcher. At a glance, Yazd's wind catchers resemble chimneys that dot the rooftops of modern suburban communities. The function of the wind catcher is to cool the house and create natural ventilation (Malone, 2012). At the top of the structure from the open side of the wind catcher, blowing air is captured and funneled to the bottom of the shaft where a small pool filled with water in the basement maintains the airflow. During the summer time, the basement was used as a place to



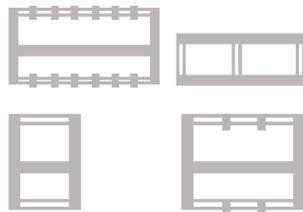
Figure 31: Image of windcatcher , Source: <http://www.panoramio.com/photo/99571471>

Figure 32: Model of a Wind catcher with equal canals. Source: [Roaf, 1989]

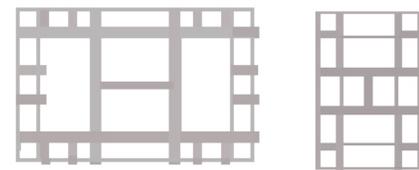
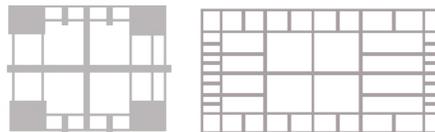
escape from the hot summer days (figure 34). Three types of wind catchers are found in traditional houses: one sided, four sided, or eight sided (figure 33). The type of wind catcher used in a specific area is dependent on airflow and air direction. In Yazd, the four and eight-sided wind catchers are most common. If the wind blows in from just one side in the space, an opening at the top of the wind catcher forces the wind into the shaft (Ghobadian, 2007). The combination of wind catchers with courtyards and domes pro-



One plan sample of one-sided wind catchers in Iran



One sample plan of two-sided wind catchers in Iran (Mahyari, 1996, p. 59)



One plan sample of four-sided wind catchers in Iran (Mahyari, 1996, p. 60)

Figure 33: One plan sample of one-sided wind catchers in Iran. Redrawn by author source: (Mahyari, 1996, p.58)

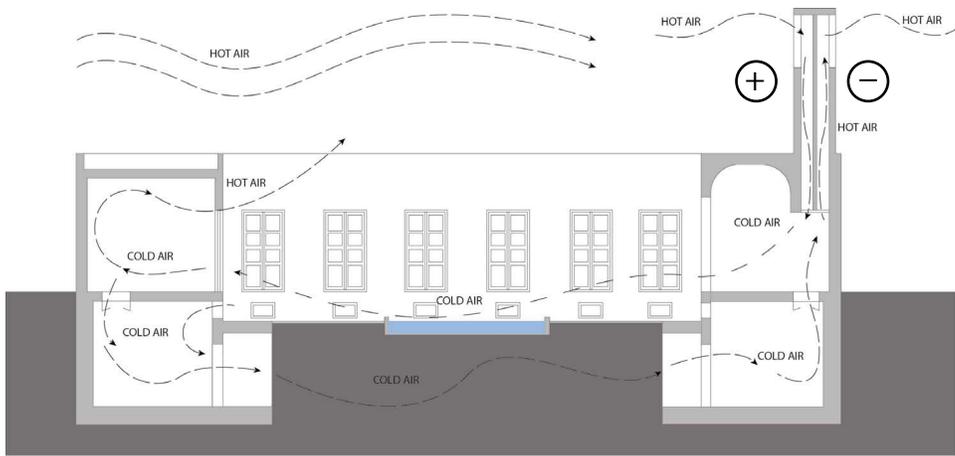


Figure 34: Diagram showing how a windcatcher works. Redrawn by author, original source: Karizi, Nasim, Arizona State University, Herberger Institute For Design And The Arts, and Az 85287 Tempe. Development of a sustainable cooling and ventilation system for hot-arid climate (n.d.): n. pag. Web. 05 Mar. 2015.

duces far more effective ventilation. Used in unison, these elements create better airflow and heat management (Fathy, 1986). According to research conducted by Ahmadreza Foruzanmehr and Marcel Vellinga, even though wind catchers were a very important element in the Persian house only a small percentage of houses used wind catchers. The more restricted use of wind catchers is due in large part to cost and difficulty of construction, which meant only a specific class of families were able to incorporate these instruments into their household design. According to Ahmadreza Foruzanmehr and Marcel Vellinga:

*“Although 40% may still be considered a significant number, this figure suggests that in spite of their popular representation, the wind-catchers may not have been an essential vernacular cooling system. Instead, they may have been auxiliary to the rest of the system.”*  
(Foruzanmehr and Vellinga, 2011, P. 278)

## SOCIAL

The size of the average Iranian family has gradually decreased over the last century. Until the early 20th century, it was common practice for extended families to live together under one roof. Today, however, the family unit is more discrete and typically consists of parents living with their children in a single dwelling. The average size of the Iranian family today is two children and their parents; in other words, a typically Iranian household has four occupants. As has been mentioned, spaces and rooms in traditional houses were multi-functional but today each room has a specific function and is used exclusively in that manner. Moreover, it is common for each family member to have a private room. The main communal area in modern houses is the living room area which typically consists of sofas facing a television. All other spaces are reserved mainly for private use by individuals. In Persian families, respect and deference are shown to the elderly. Unlike in years past when women were relegated to the domestic sphere, Iranian women and mothers today likely have a job in the formal economy in order

to raise the household income (Mirmoghtadaee, 2009, p.69-80).



Figure 35: An Iranian family eating a meal. Even after they leave home, members of extended families have hospitality rights in the homes of their most distant relatives. Source: <http://www.everyculture.com/Ge-Ir/Iran.html>

## **Ideals and values of people in Iran, Yazd**

In Iran, the family unit is an integral component of the social fabric of society. Persian culture very much promotes and cherishes the family unit and young persons are taught at a very early age to work towards building their own family. Like many societies, Iranians cherish the safety, security, and warmth afforded by the family unit (Abbasi & Askari, 2012, p.207-38). According to Mirmoghtadaee, houses are designed based on people's needs. More specifically, family and cultural norms are what form a dwelling and gives the residents a sense of comfort in their household (Mirmoghtadaee, 2009, p.69-80). The people of Yazd are known to be very conservative. A 2002 study conducted by the Ministry of Culture and Islamic Guidance, revealed that *"the people living in Yazd placed more emphasis on religion in their daily lives than did Iranians as a whole"* (Jayakody, Rukmalie, Thornton and Axinn, ed, p 193). Since the Islamic revolution in 1979, the Islamic value system has had a significant effect on the values and behavior of Iranian families (Abbasi & Askari, 2012, p.207-38).

## **Privacy**

Privacy has always been a very important factor in Persian families. Iranian families today tend to live a double life, one that unfolds in the trusted quarters of the household and another in the public sphere. Due to a combination of culture and religion, Persian families tend to be very private about the goings on in their household. The family name and honor are sacrosanct and all members make a conscious effort to keep private the affairs of the family. The emphasis on privacy in Persian culture had a marked impact on the architecture of traditional houses, and led to the creation of physical divisions in the house to create privacy within the domestic sphere too. A typical Persian house contains multiple divisions, including open, semi-open and closed spaces (Tahir M, 2011, p.273-287).

According to Shabani, traditional Iranian houses include two types of privacy. One is privacy from the outside world, and the other is privacy within the household that requires physically separated spaces inside the residence (Shabani, 2011, p.273-85). A traditional Iranian house is comprised

of two parts: *biruni* (outdoor) and *andarouni* (indoor); this separation arises out of privacy considerations. According to Haerri, the *andarouni* is private indoor space for family members and the *biruni* is a more accessible area where guests are welcomed upon entering the house and then guided toward to an area in the *andarouni* section.

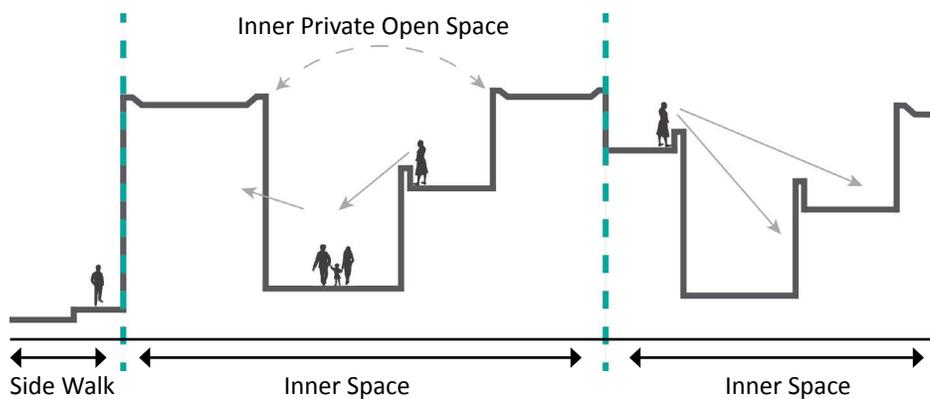


Figure 36: The view direction and limitation of visual access between each houses and sidewalk. Source: Redrawn by author, original source of section is Mortada Hisham taken from: "Achieving Privacy in the Iranian Contemporary Compact Apartment through Flexible Design." Achieving Privacy in the Iranian Contemporary Compact Apartment through Flexible Design. N.p., n.d. Web. 12 Feb. 2015.

## IRANIAN MODERNISM

In many Islamic countries, a common critique of modernization is its perceived effect on culture, particularly the movement of individuals away from long-standing customs and traditions (Bianca, 2000, p.23). According to Dinu, rejection of tradition and approaching new ideas with and new techniques with a fresh point of view is the main idea behind modernism (Dinu, 2007, p.53-75). In the early years of the 20th century, Iran's interaction with Western countries intensified and this led to social and political changes in the country. During this period, traditional Persian architecture underwent transformation. Many Iranian architects began forming a new and modern style of architecture without taking into consideration traditional styles and approaches; this marked the beginning of a new style of architecture in Iran. Architects increasingly rejected traditional styles and moved towards Western models. Iranian architects and designers, however, lacked adequate knowledge and understanding of modern architecture

and its application based on local culture and prevailing climate restrictions in Iranian cities. Understanding a city's architectural legacy and history is a key element in designing modern, efficient, and sustainable buildings today. Residential dwellings, which directly affected the living conditions of ordinary Iranians, underwent significant changes in this period (Dehbashi, Diba, 2004, p.31-37 ). According to Diba and Dehbeheshti, the changes were evident in many parts of residential architecture such as, space quality, plan layouts, facade of the buildings and the material and technologies used for construction (Dehbashi, Diba, 2004 & Ajoudani, 2007, p.31-37). Bianca, for example, focuses his critique on the lack of spirit and culture in modern architecture, writing:

*"tradition means the chain of revealed truth, wisdom and knowledge, which is transmitted and renewed generation by generation, this linking various successive layers of temporal existence to the primordial reality which originated them"* (Bianca, 2000, p 23).

## Traditional and modern neighborhood

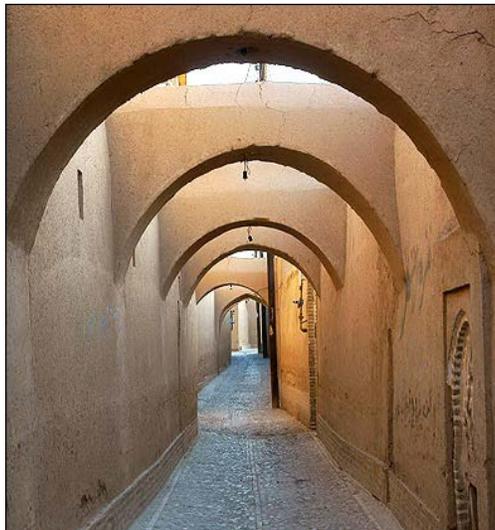


Figure 37: Traditional and modern neighborhood. Source: "The Social Relationship of Contemporary Residents in Iranian Housing", Mohsen Asadi, MM.Tahir, journal of social science and humanities, volume7, 2012, page 86-93

When designing a family house, a variety of factors enter into the process that culminates in a comfortable and efficient residence. Naturally, people's needs change over time. For example, at one time the talar was an important design feature for Iranian families and was therefore included in most traditional houses. Persian culture also places great emphasis on the treatment and respect of guests, therefore the talar or guestroom was built large and luxurious. Today, guests still retain their standing in Persian culture but due to less interaction between distant relatives, the talar has become increasingly irrelevant. Indeed, modern Iranian houses are rarely built with a talar. Families are more focused on immediate members rather than the accommodations, luxurious or not, that would be afforded to distant relatives.

The form of the house has also changed from introverted courtyard houses to extroverted houses (figure 38). Privacy remains an important factor in housing designs, and even as houses became more extroverted, the high

walls used for creating privacy persisted (Mirmoghtadaee, 2009, p.69-80). In the new cities, historically significant design features such as narrow lanes and introverted houses were mostly abandoned. In the past, these features were included in design plans as responses to the climatic conditions of the city. For example, Yazd's high walls played an important functional role by creating shade on the city's streets. Moreover, given the religious nature of the city, mosques were necessarily incorporated in the layout of the modern city alongside other urban elements such as the bazaar and public courtyards (Ferdowsian, 2002, p.48). In the design of faculty housing for Yazd University, much importance is addressed to the layout of the master plan. The main communal space (public courtyard) of the complex is located in the middle with the mosque on one side and a mini bazaar on the other side.

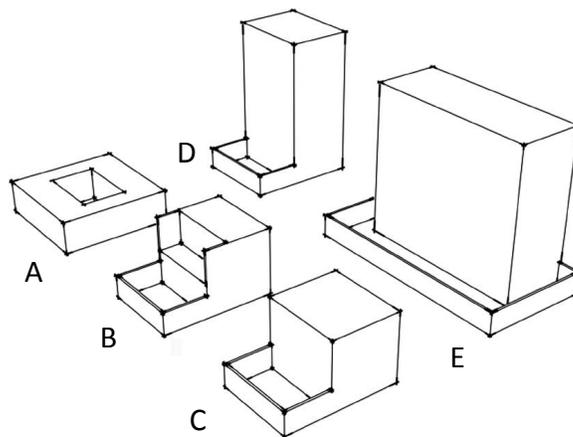


Figure 38: The changing pattern of the building form (A) Inward courtyard house, (B) Outward medium-rise house with huge balcony, (C) Outward medium-rise house, (D) High-rise apartment building, (E) Large scale apartment building. Source: Haeri, Mohammad Reza: House in culture and nature of Iran (in Persian). Tehran: Architecture and urban development research center (2010) and Neda Ghazizadeh, Klaus Rückert

## TECHNIQUES FOR BETTER BUILDING DESIGN TODAY

According to Ghobadian, if buildings in hot and dry climates are to be efficient and responsive, they need to include the following characteristics: use of local materials (brick, adobe, mud), contain courtyards for better ventilation, less opening on the exterior of the building, introverted designs, and vegetation in common areas (Ghobadian, 2009).

Central courtyards and basements are the most highly used elements for cooling in Yazd's houses. According to research carried out by Ahmadreza Foruzanmehr and Marcel Vellinga, 90% of the research respondents in Yazd include high wall and a central courtyard in their houses and only 3% percent have basements, because of the challenges associated with ground excavation (Foruzanmehr and Vellinga, 2011, p.274-85).

In the proposed design of the Yazd University residential complex instead of using windcatchers for cooling the house each unit includes an electro-me-

chanical evaporative cooler.

In the design of the faculty housing complex, the courtyard is a very important element incorporated into the master plan of the complex and includes public, semi-public and private courtyards. As for the basement, there are two main types designed for the complex, located in a public area accessible to all residents and which will double as communal space where people can meet and escape the hot weather.

Planting in hot and dry regions such as Yazd is an effective solution for increasing humidity, decreasing the temperature around the building, minimizing dust, lessening the amount of sun radiation in the yard and creating shading for walls, windows and the courtyard space (Maleki, 2011, p.84-90). Contemporary architecture and city planning do not adequately consider environmental conditions that prevail in a specific region. As a result,

many architectural creations do not respond well to their immediate environment and unnecessarily and inefficiently consume energy resources (Seyed Almasi, 2003, p.129-142). According to Bahadori, areas in Iran with a hot and dry climate are heavily reliant on electricity to create cooler indoor temperatures (Bahadori & Ehyaei, 2007, p.1227-234). Unfortunately, with rising summer temperatures and the broader phenomenon of global warming, over-reliance on unsustainable cooling methods is a cause for concern. Vernacular architecture methods alongside new technologies can create a sustainable balance while making residential temperatures cooler during hot summers (Bahadori, 2008, p.1227-234). Oliver comments on vernacular architecture by saying:

*“vernacular architecture is the time-honoured, truly sustainable architecture that, in its multitudinous manifestations, has evolved over centuries, changing or adapting when necessary to variable environments and the nature of the family and social growth.” (Oliver, 2005,p 265)*

## SITE STUDY Yazd University

The proposed site for my project is located in the campus of Yazd University. Yazd University is located in the city of Yazd, in Yazd province. Founded in 1987, the university sits on approximately 380 ha with multiple buildings that provide approximately 24 ha of work space to students and staff. The university is comprised of five faculties: Art and Architecture, Engineering, Humanities, Natural Resources, and Desert Studies. Yazd University also has four main research centers, including EASRT, YICILD, DDRI & IRO. Approximately 400 faculty members work at the university and some 15000 students are enrolled in various programs ranging from undergraduate to post-doctoral studies. ( This information is gathered from Yazd University website).



Figure 39: Photos of Yazd University, Source: <https://www.yazd.ac.ir/en/university/about/gallery>



Figure 40: Photo of one of the main communal areas in Yazd University. Source: <https://www.yazd.ac.ir/en/university/about/gallery>

**Geometry and form of the Land** : The data used in this thesis regarding site study is gathered from documents in Yazd University. Yazd University sits on approximately 350 hectares. In the diagrams the land is divided in different pure geometrical shapes (figure 41). Both images illustrate the area of the land. The length of the university land is parallel to the Safaeieh Street is 2600m with a horizontal width of 1650m and minimum width of 920m.

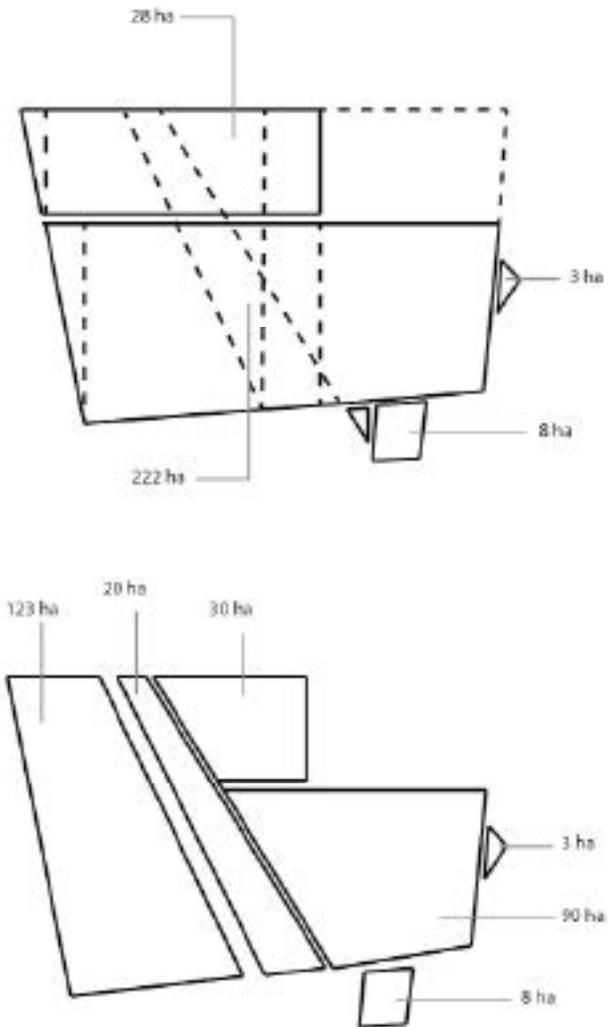


Figure 41: Showing geometry and form of the land Source: Author

## Urban Situation and Its Main Accesses

Yazd University is situated in the southwestern part of Yazd, between two main connective roads: Bandar Abbas (Kerman) passage and Ayatollah Kashani Street. Three main streets connect this land, namely Sarlashkar Falaahi in the south, Safaeieh Street in the north which branches off to Daneshjoo Boulevard. The western side of Yazd University's campus is linked to different parts of the city and is connected to the city centre as well.



Figure 42: Map of Yazd. Source: [www.google.ca/maps](http://www.google.ca/maps)



Figure 43: Map illustrated by author showing the immediate context of Yazd University. Source of map:www.google.ca/maps

## Proposed Site for the Residential Complex

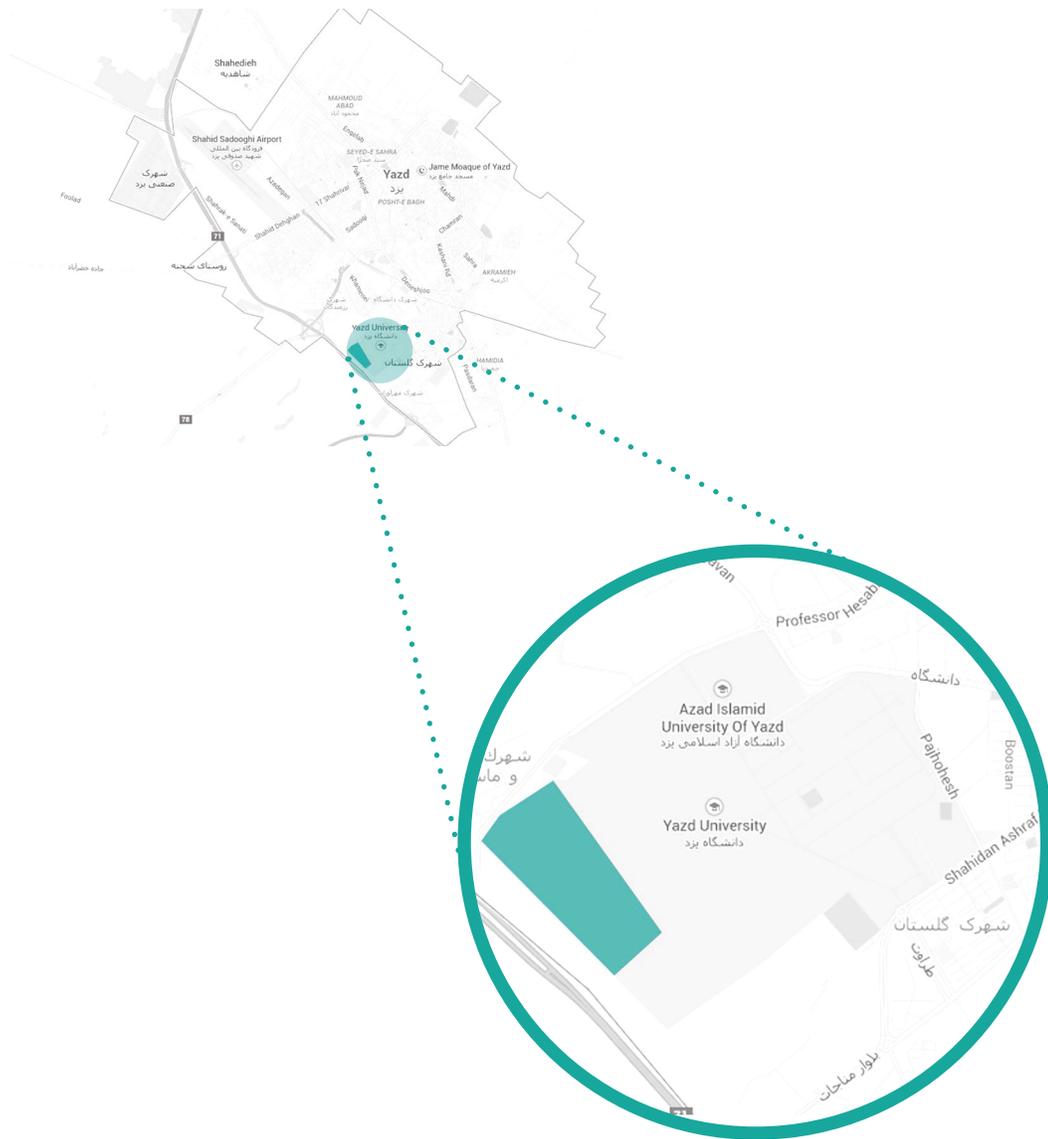


Figure 44: Showing the location of the proposed site in Yazd University. Source of map: [www. Google.ca/maps](http://www.Google.ca/maps)

Existing facilities and housing are all included in this part of the University land



Location of the proposed design

Figure 45: Showing the location of the proposed site in Yazd University, and the area where the facilities are located.

## Facilities and Vicinities

Yazd University contains the following facilities:

The Azad University of Yazd is located on the northern side of the campus. Teaching facilities are located to the south of the Zoroastrian graveyard along the Dakhme Mountain range and a connecting road leading into the city. In the east and southeast of Yazd University is located the Mostazafin Foundation residential complex and Jihad Sazandegi education complex. Sport and physical education facilities are also located in this section of the campus. The university property ends in the northeast at the Safaeiye complex and from the west to unutilized lands near the southern community of Poshtesilloo.

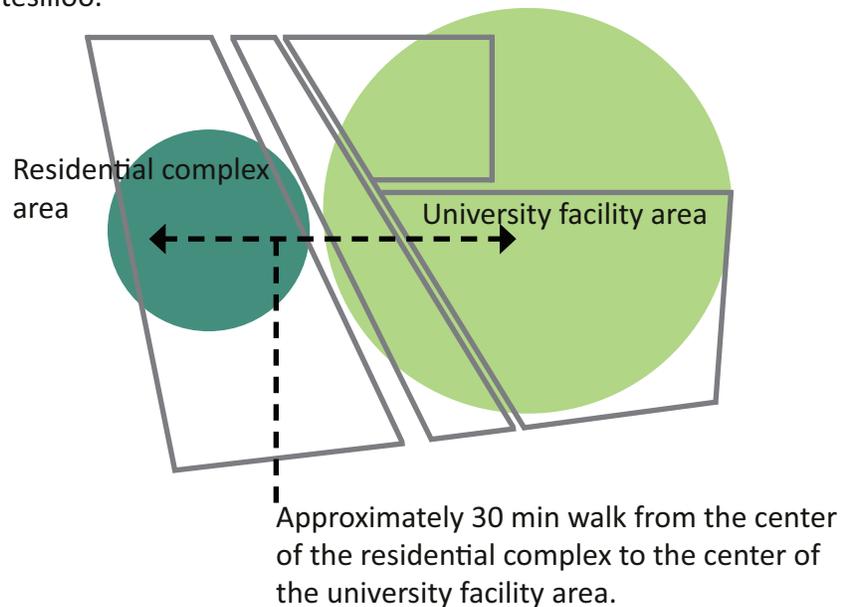
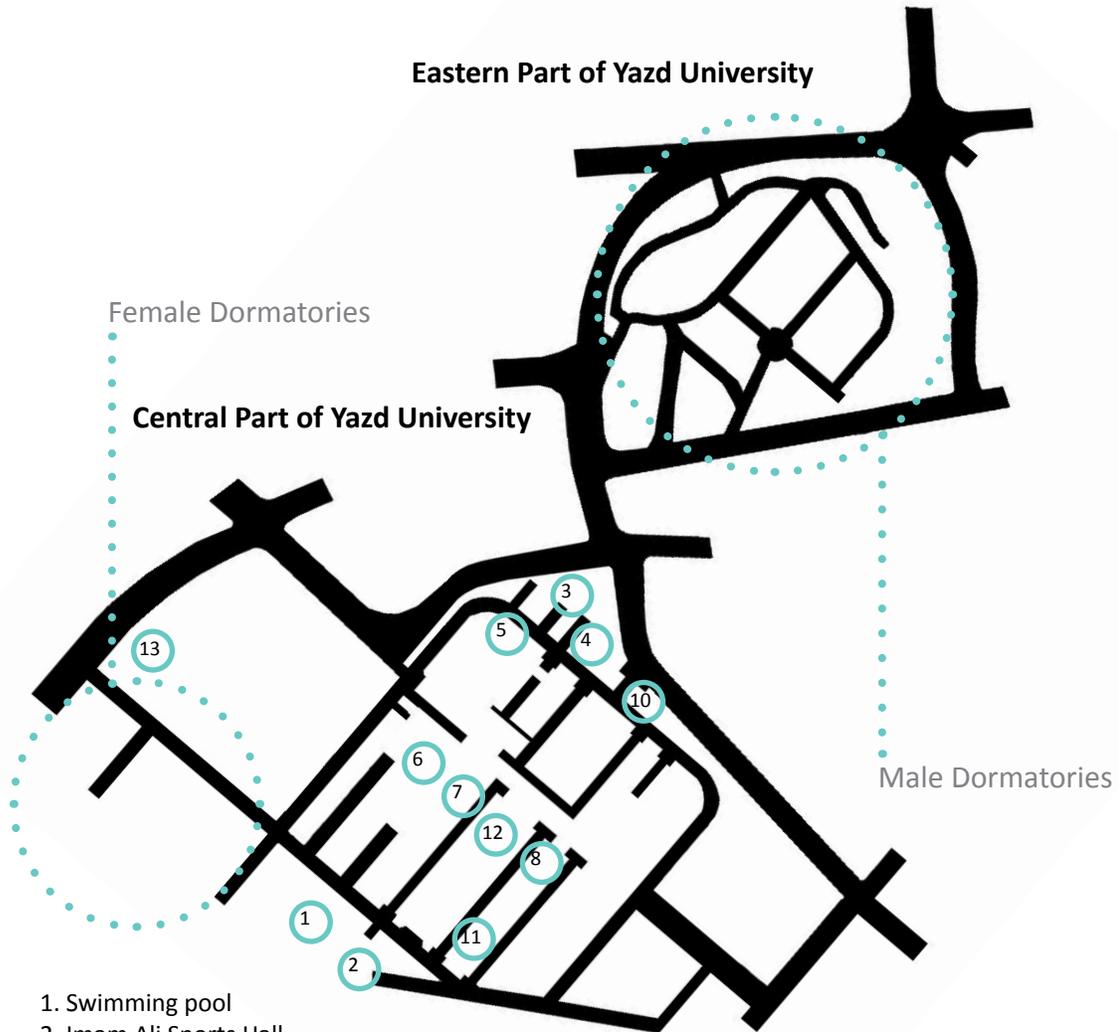


Figure 46: Diagram showing the approximate walking time from center of the residential complex to the center of the university facility area.

## Map of Yazd University Facilities



1. Swimming pool
2. Imam Ali Sports Hall
3. Central Organizational Department
4. Guest house
5. Health Center
6. Fajr Cultural and Scientific Complex
7. Technical Engineering Department
8. School of Science
9. School of Natural Resource and Desert Studies
10. Tejarat Bank
11. Social Science Department
12. Mosque
13. Shah Vali Clinic

Figure 47: Map of the University Facilities , showing the main male and female dormitories. Illustrated by author , original source : <https://www.yazd.ac.ir/en/university/about/map>

## DESIGN OF THE RESIDENTIAL AREA

Yazd University's residential areas contain the following facilities:

- Men's Dormitory
- Married Student Housing
- Residential complex of the university (organizational homes)

As mentioned on Yazd university website currently the university does not provide faculty housing and the faculty have to provide their own homes outside of the university. Therefore the design will provide housing for faculty, dormitories for men and married student.

The residential units are located on the northern side of Yazd University. On the east side is the men's dormitory. A shopping center runs along the north of the dormitory and on its south side is a student park and service center. From the center, the complex resembles a square, which provides public services to the dormitories. An indoor sports complex has been considered for the men's dormitory. Two access points are available on

the east and west sides of the complex and indoor parking is available next to the dormitory. Each block consists of two secondary schools, one high school for boys and one for girls. Each block has an outdoor field used for various sports.

The married students' dormitory neighbours the residential complex. The dormitory is in harmony with Yazd University complex and its inner yards. Next to the dormitory, a kindergarten school has been established. Vehicle access to the dormitory is available via northern and southern streets. The residential complex of Yazd University (organizational houses) is situated on the west side of this area and directly opposite the married students' dormitory. In the center of the complex one finds a primary school, mosque and shopping center. In order to avoid monotony in the structure and plan of the complex, all the residential units line the north side. The plan idea represents the organic structure of Yazd city. Small quarters allow for easy movement of pedestrians throughout the campus. All vehicle parking areas

## **Master plan**

are beside the complex which creates a sense of relief and Convenience.

This center other than providing service environments increases an identity sense due to giving a sense of connection between all the spaces around it.

The selection of the master plan was based on the following reasons:

- There is balance in the access system of pedestrians and cars
- Minimizing the possibility of collision between pedestrians and vehicles
- Encouraging social communications and promoting communal areas
- Vehicular access in general spaces
- Human security
- Balancing relationships between humans and vehicles in special spaces

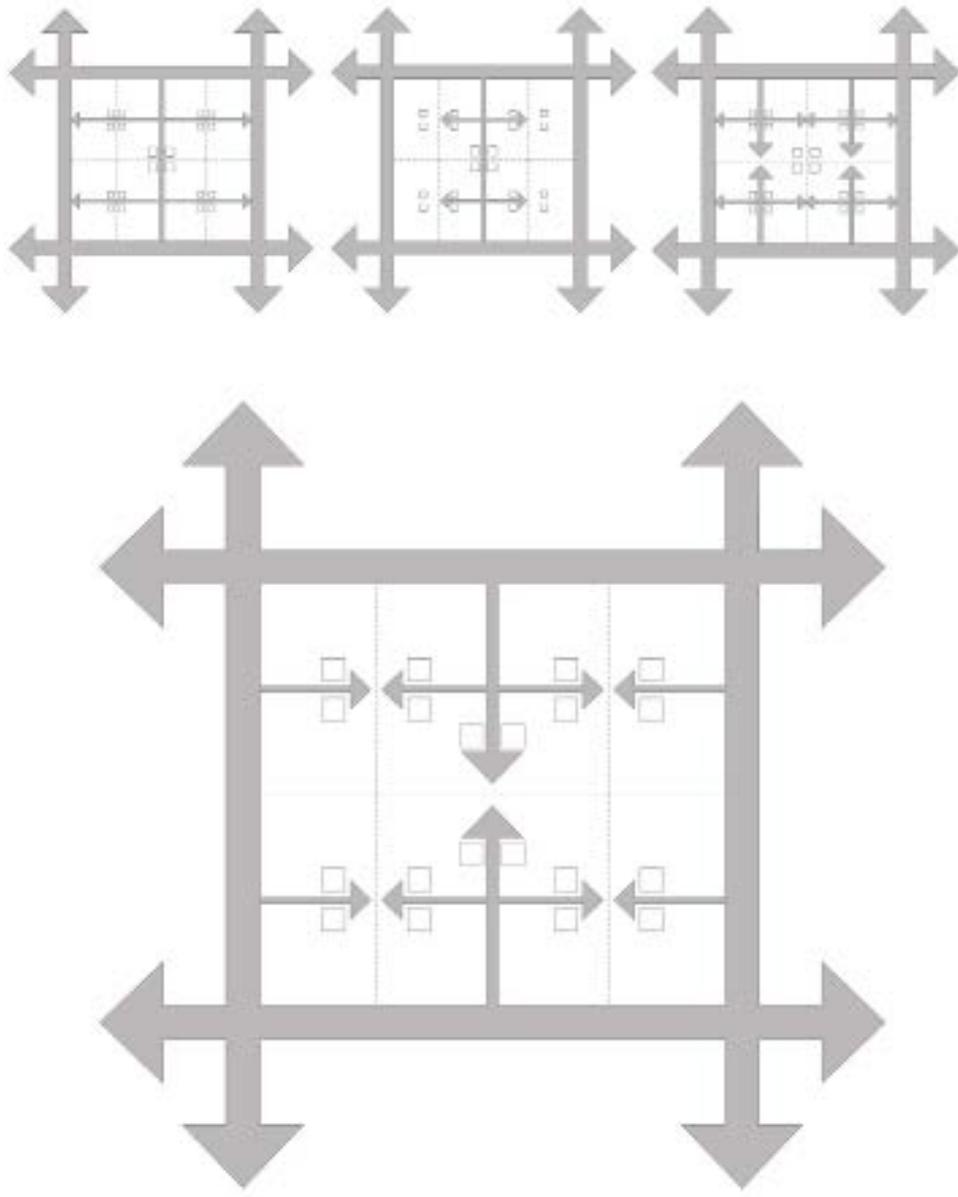


Figure 48: The chosen master plan layout. Source: Author



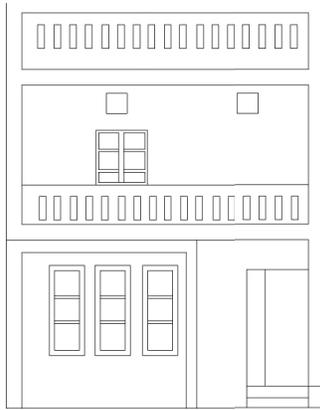
Figure 49: Showing the different spaces on the master plan. Source: Author



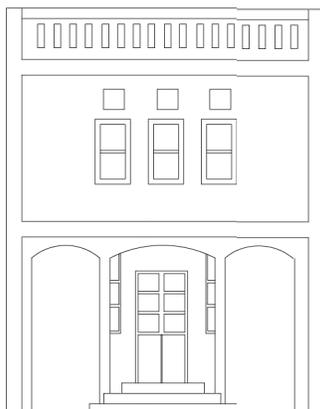
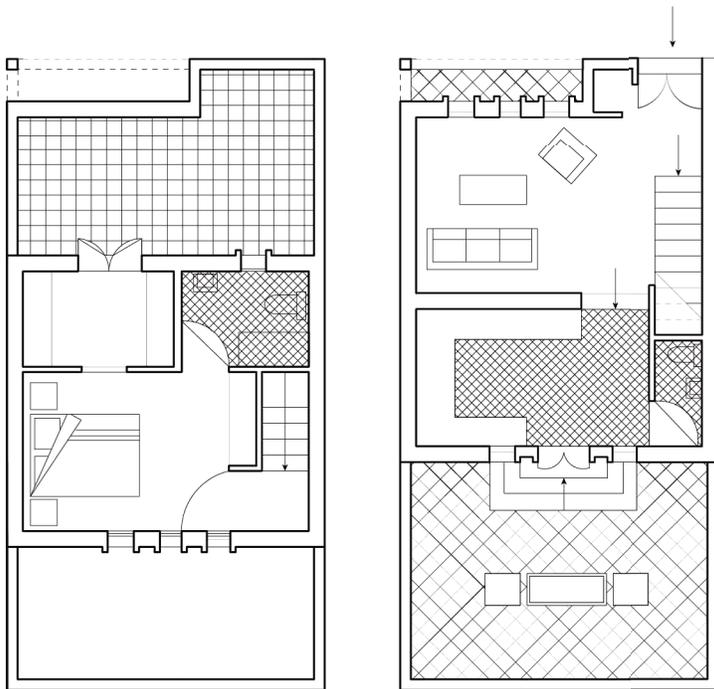
Figure 50: Showing public, semi public and private courtyards on master plan. Source: Author



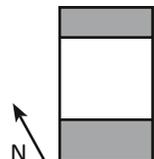
Figure 51: Showing the narrow alley ways on master plan. Source: Author



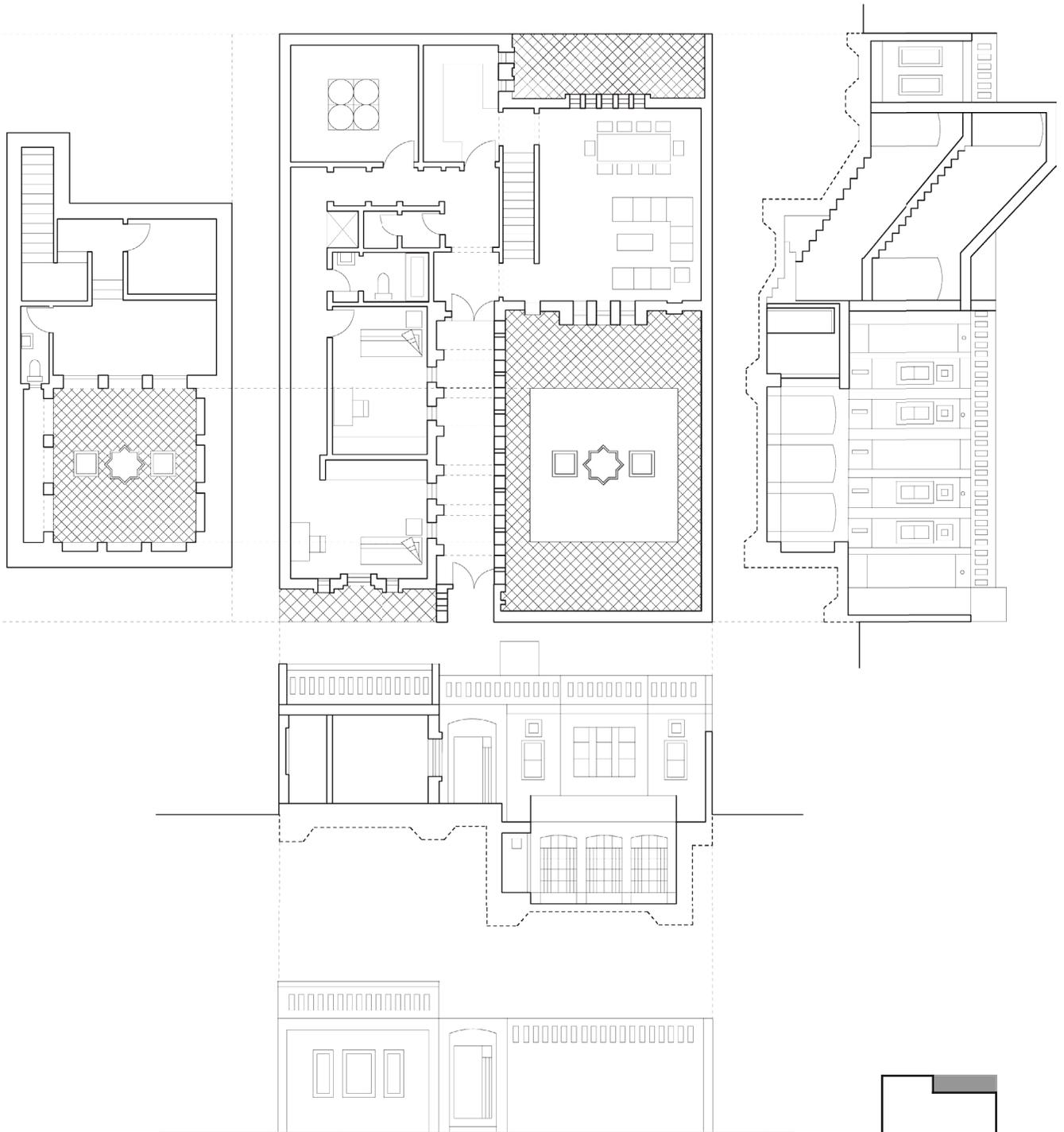
TYPE 1



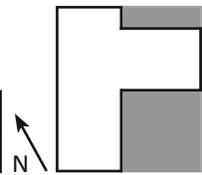
SCALE	AREA OF THE SITE
1:250	72

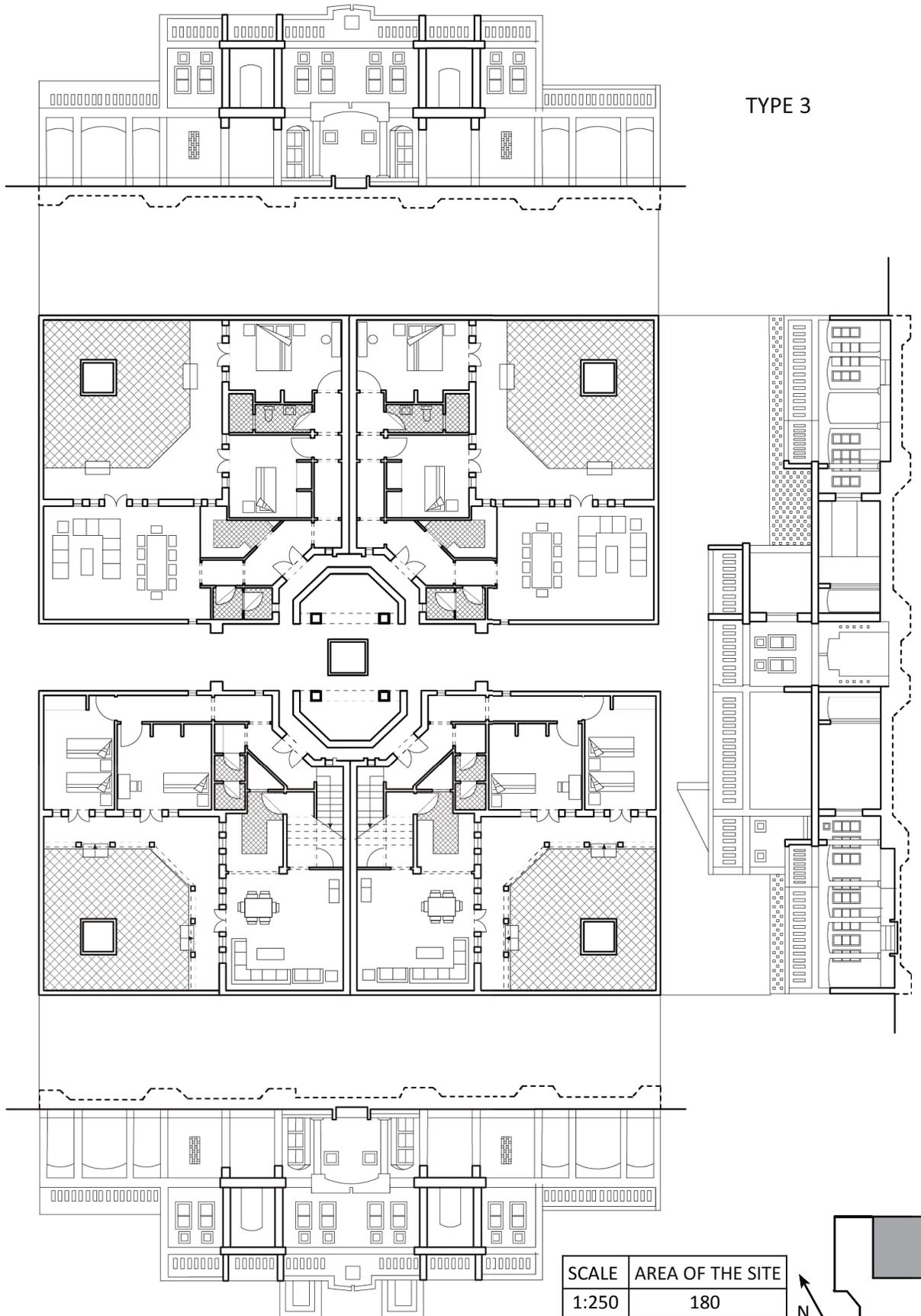


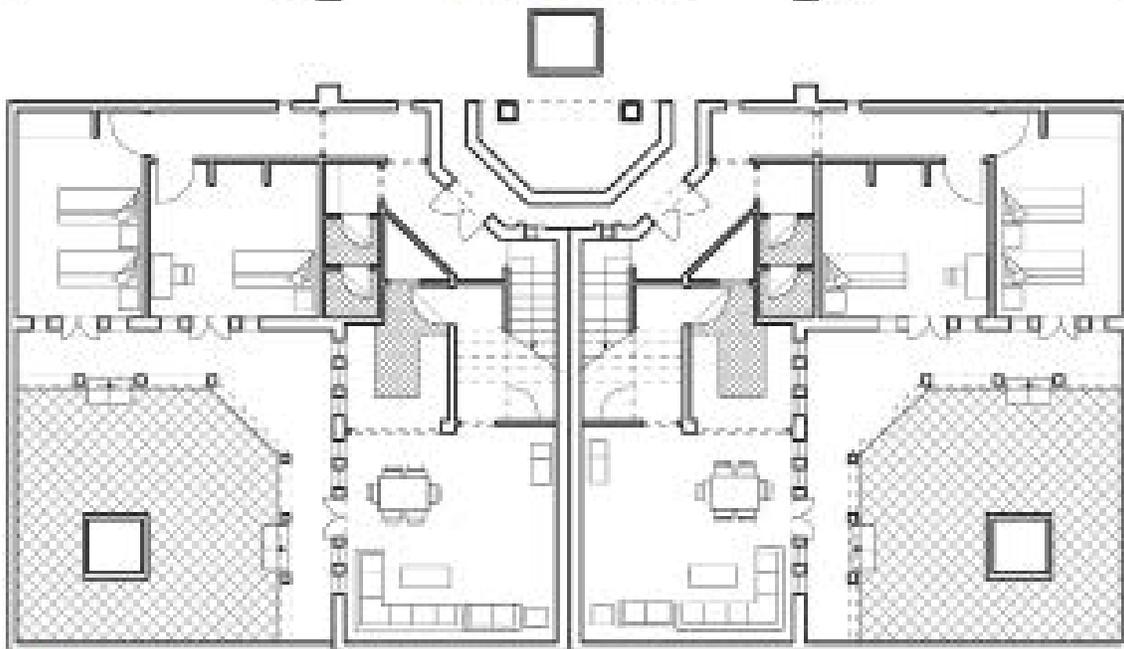
TYPE 2



SCALE	AREA OF THE SITE
1:250	243







- courtyard
- terrace area (*Ivan*)
- hallway (*Rahro*)
- entrance (*Hashti*)

Figure 52: Showing the different spaces in the type 3 residential plan. Source: Author



Figure 53: 3D model type 3 house. Source : Author



Figure 54: The roof top and the courtyard of model type 3. Source: Author

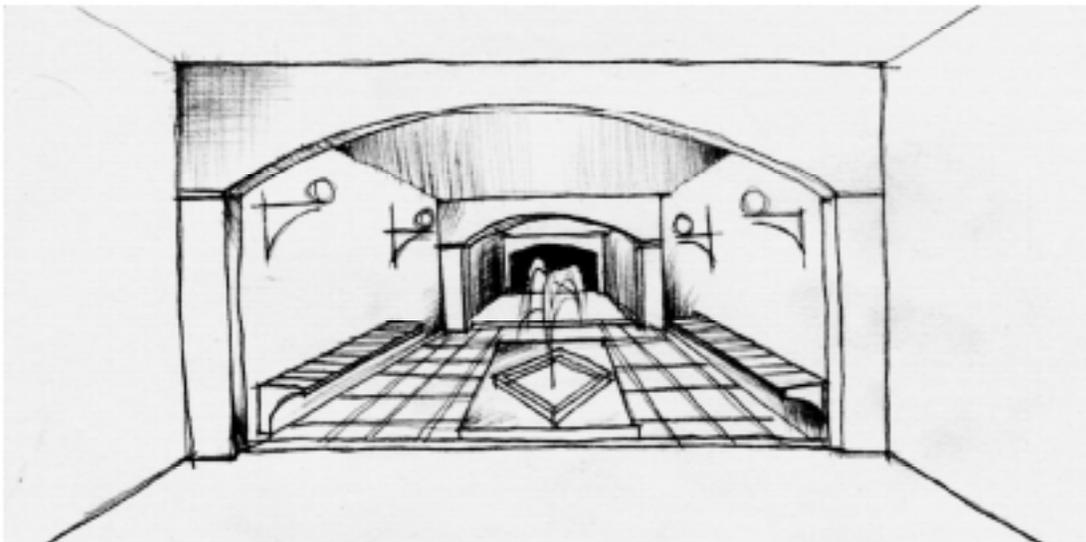
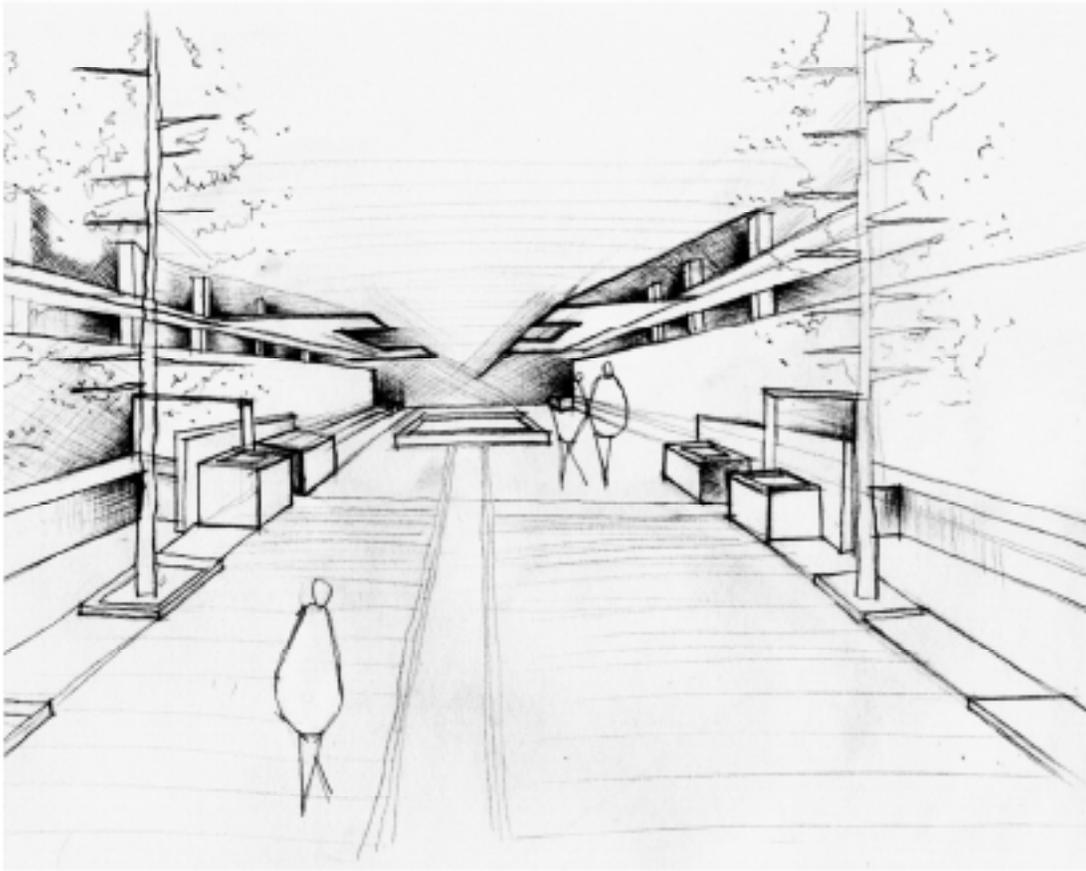


Figure 55: Sketches of the alley ways in the residential complex. Source: Author

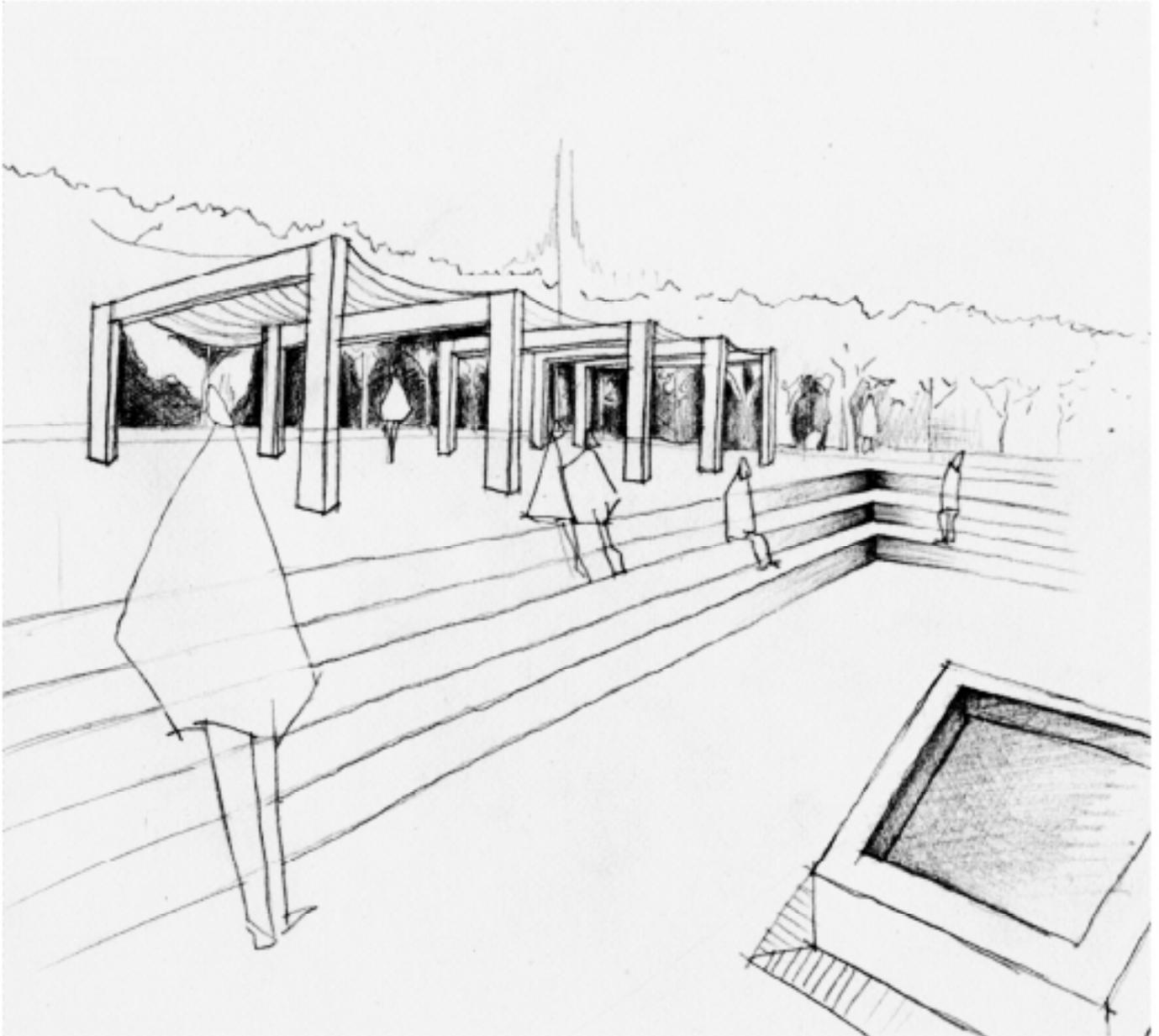


Figure 56: Sketch of the main communal courtyard in the residential complex. Source: Author

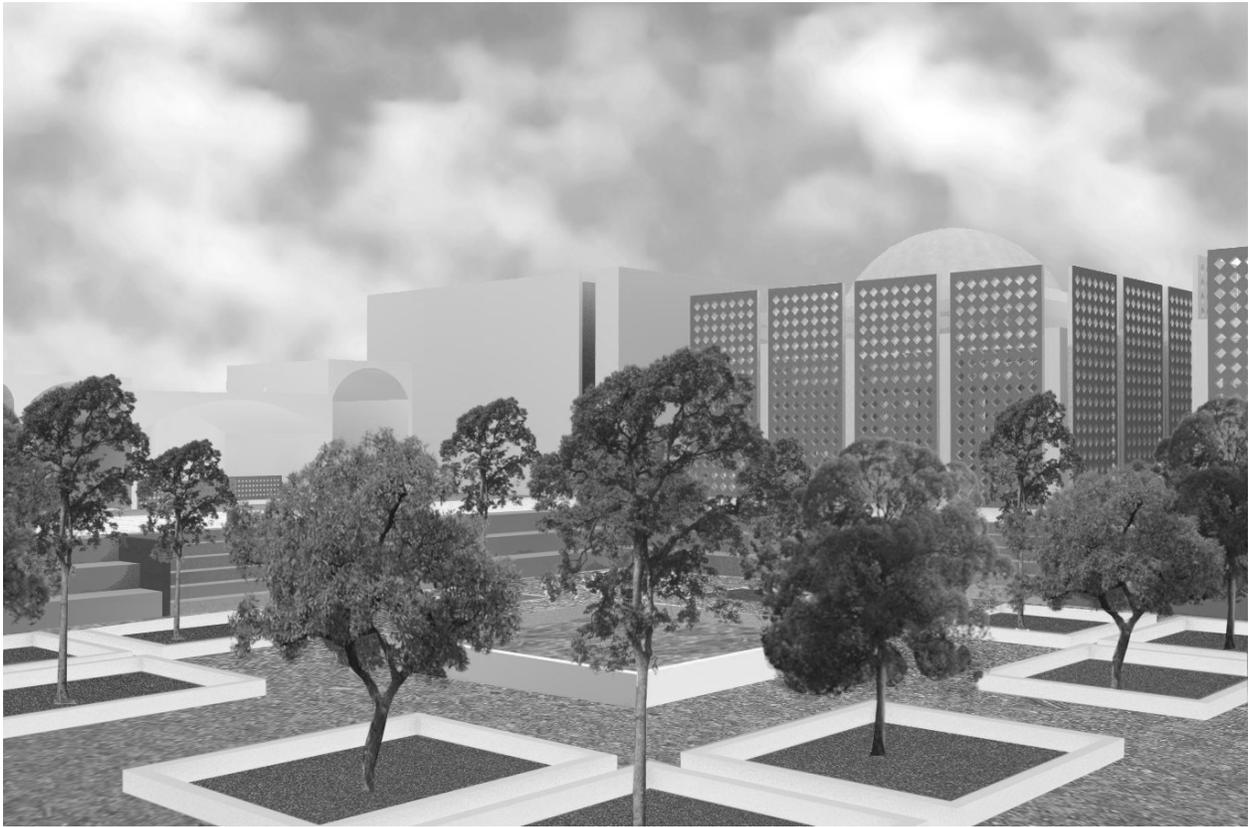


Figure 57: 3D view of the main communal courtyard. Source: Author



Figure 58: 3D view of the communal basement. Source: Author

Figure 59: 3D view showing the use of trees and people in the communal basement. Source: Author

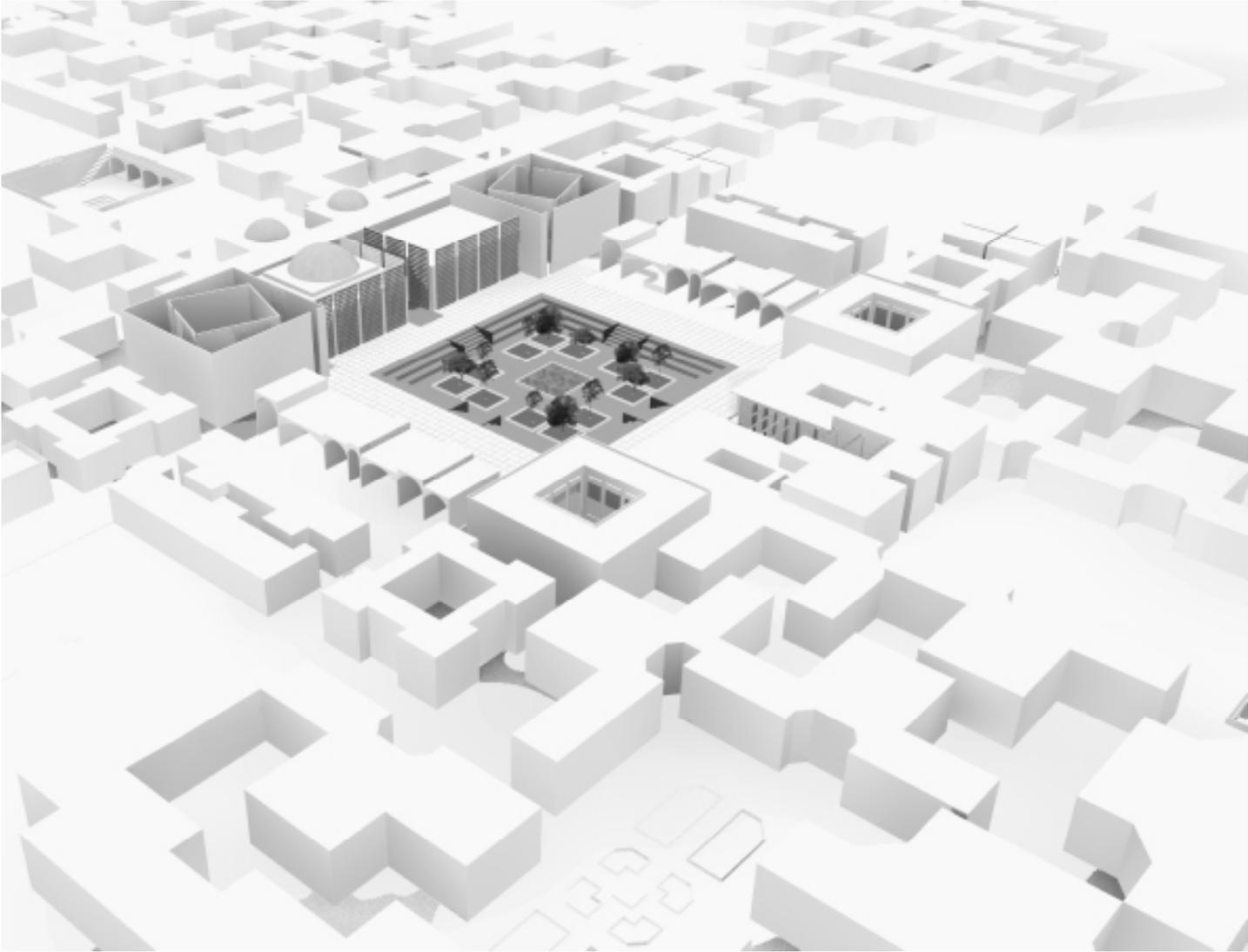


Figure 60: Overview of the masterplan. Source: Author

## CONCLUSION

In conclusion, contemporary architects and designers have much to learn from the architecture of the past and vernacular methods. A particularly pressing issue is the almost complete absence of vernacular methods in new developments in many parts of Iran, including Yazd. In addition to the absence of vernacular methods, contemporary housing designs also overlook cultural and environmental conditions, which result in generally unsuitable architecture (Afshar, 1975 & Foruzanmehr, 2010). I have proposed a large-scale master plan and schematic housing layouts for a residential complex at Yazd University that will house professors and their immediate family members as well as providing male and married student dormitories. The proposed design for the Yazd University residential complex master plan is based on Yazd's vernacular architecture and its socio-cultural characteristics. In my personal opinion a University represents its city which reflects back on the culture, so it is important to incorporate ideas from the past and learn from vernacular methods to design more suitable struc-

tures today. A variety of vernacular methods, including the courtyard (private, semi-private and public), basement (public), elevated houses, planting and vegetation, water pools, narrow sidewalks, and cantilevers for creating shade have all been actively integrated into the design of the master plan. Social and cultural issues have also been factored into the design. The main courtyard at the center of the master plan is a hub for residents. A mosque encircles the courtyard with two prayer rooms on each side where the faithful can pray and reflect in a tranquil space. Two mini bazaars are situated on opposite sides of the courtyard. In the middle of the courtyard is a social hub to be used by residents for relaxing, reading, and socializing. The semi-private courtyards are primarily used by close neighbours who can monitor their kids while they play and not have to worry about unwanted guests. Private courtyards provide an added layer of intimacy because they are strictly used by household members; women can therefore enjoy this outdoor space without having to cover up precisely because

it is accessible only to family members. As for the basement, there are two main design options for the complex. Located in a public area accessible to all residents, the basement is a communal space where people can cool off while mingling with one another. The narrow sidewalks are surrounded by high walls which create shade for pedestrians. Additionally, the master plan includes large canopies atop a stretch of the two main streets which are also designed to create shade. Communal spaces such as a public library, restaurants and entertainment, and swimming pool are also present in the proposed complex.

The university today does not include faculty housing, or married students' dormitory but does contain a housing residence for female and male student only. Currently, the male student dormitory is off-campus. In the proposed design, the married students, male students, and faculty will all benefit from on-campus housing. The main purpose of the design is to create an efficient and practical connection between contemporary architecture

and vernacular methods used in the past. In so doing, the versatility and adaptability of traditional Yazdi architectural methods will be demonstrated.

In areas with highly distinct climatic conditions, knowledge of weather and other elements in conjunction with an understanding of the areas' architectural legacy is necessary for creating designs that are well-suited to the locale in question. Simply abandoning traditional architecture and ignoring local climatic conditions will not result in more efficient and sustainable designs. Nonetheless, in recent decades, vernacular concepts and methods that contain valuable lessons and insights for designing in hot and dry climates have been largely abandoned (Moore, 1995, p. 15). Regrettably, in Iran as in many other developing countries, vernacular buildings are considered a sign of poverty (Bonine, 2000 & Madanipour, 2006). The cultural and environmental importance of vernacular methods such as cooling and ventilation strategies that have been used in the traditional architecture of hot

and dry regions cannot be overstated. Instead of continuing this insensible and ineffective trend, architects can re-integrate culture, tradition, and climate into their design plans, thereby producing buildings that are more sustainable and well-suited to local needs (Madanipour, 2006 & Foruzanmehr, 2009). In his discussion of this issue, Ghobadian echoes a similar critique:

*“If today’s architects apply ancient structural systems with a scientific understanding of the new building materials and technologies and with an understanding of the regional climate they will build functionally. If today’s builders use traditional building styles and knowledge while they influence the progress of lifestyle, they will produce purposeful homes actually. Simultaneously, despite the shape and form of the buildings will seem traditional, but they have a modern expression indeed” (Ghobadian, 1990, p 3).*

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