

A positive prognosis for the future of the learning environment
Designing schools for children in Shinabad, Iran

by

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in

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Abstract

From 2004 to 2012, Iran experienced six large school fires that led to 51 injuries and five deaths. Unfortunately, such injuries were unavoidable in Iran due to the lack of proper facilities and poor living conditions, particularly in rural areas. The tragedy of these injured kids inspired me to improve the conditions of learning for children living in rural conditions in Iran.

More specifically, the recent tragedy that occurred in Piranshahr County lead me to choose this site and create a design proposal for a new school in this community. Although what I offer here is a prototype, it is hoped that it might serve as a model for improving safety standards in communities that have faced similar tragedies. I am addressing the problems to this community due to the typical school setting for Iran's rural condition. Some of the ways in which architecture and design can help to ensure a positive prognosis for the future of learning environments in Iran is to create buildings that are good for both body and mind. Thus, this project aims to foster student learning and well being through architecture.

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Introduction

In recent years, the safety of school buildings in Iran's rural areas has become a prominent issue. Despite the presence of building rules and restrictions, unsafe educational facilities persist, resulting in tragic incidents that ought not to happen. One such tragedy occurred in 2012 in Shinabad, a village in northwest Iran. In late December of that year, as students in Shinabad's only school were busy at work on the school premise, a fire broke out that injured 27 students and killed two young girls. This was undoubtedly a great tragedy. What is sadly more remarkable is that the Shinabad incident is hardly isolated. Similar school fires have happened in other villages, including Chabahar, Sisatan va Balochestan, Doroodzan, Lordegan , and Gilan.

Young people spend a substantially third of their time in the school environment. Indeed, for many students, the school community is a home away from home where both academic and social skills are developed. Rather critically, the school at its essence is understood by teachers and students alike to be a safe space. When a school's safety is fundamentally compromised, as it manifestly is when preventable fires break out, steps must be taken to reclaim its status as a safe space. The organizing principle of this thesis is to design a new and safe school for Shinabad's community which could replace the school that burned down. Since the initial Shinabad school building lacked proper architectural design, I am seeking to create a practical and safe prototype design that could be used in other communities with similarly unsafe school buildings. In brief, my thesis question is "how can architecture improve the learning process for students in

rural Iran while offering at the same time a safe and conducive environment for their work?”

An important first step in such a project is to determine exactly what caused the Shinabad tragedy. A second contextual issue needs also be addressed, namely, the broader history of school architecture in Iran. Within this broader framework, culture as an ever-present influence on Iran’s education setting will be explored. One way to improve school safety is to draw on Persian architecture and apply its methods to build cost-effective education facilities that are safe and locally developed. A common architectural layout that has been used for many centuries in Iran is the central courtyard which is one of the most important elements in Persian architecture and has been a staple of the country's architectural tradition for many years. In addition to the courtyard, Iranian architects have long used geometric patterns to enhance the aesthetic quality of their creations. The combination of traditional forms and composition, along with geometry and architecture has resulted in splendid and beautiful creations that harmoniously blend the thing being constructed with its natural environment. While this blending of nature and architecture is a challenging task, the possibility of doing so will be explored vis-a-vis the school prototype.

Chapter 1: Shinabad Village

Shinabad Tragedy

According to the National Center for Biotechnology Information, about 30% of Iran's classrooms use oil stoves for heating during the winter with 3.4 million students and 150000 teachers at risk of exposure to fire.¹ The NCBI has also documented the Shinabad tragedy, which received extensive press coverage in Iran and beyond. According to NCBI, on December 5, 2012 a fire broke out in a primary school in Shinabad's village in northwest Iran, resulting in injuries to 27 children and two deaths. A small oil stove used to heat the classroom caught fire as dozens of schoolgirls aged 6-10 were working there. Upon noticing the fire, three adults including two teachers and the school custodian tried desperately to put out the fire before it spread. Unable to stamp out the fire inside the classroom, the three instead tried to minimize the danger and damage by moving the stove outside. One can imagine the precarious nature of such an attempt. Indeed, their haphazard attempt merely exacerbated the situation as the stove exploded in the classroom with iron-barred windows and an inoperable fire extinguisher, trapping most of the girls inside. Luckily, civilian rescuers were able to smash through the iron bars and rescue many of the children, but several had suffered severe burns and inhalation injuries. (Figure 1 & 2)

¹ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3741008/> (accessed on January 9th 2015)



Figure 1: Shinabad tragedy in Piranshahr



Figure 2: Classroom in Shinabad/ Piranshahr

Critical Issues in Shinabad's context

Iran's poor track record with respect to the safety of its educational facilities, particularly in more remote areas, is well documented fact as it is tragic. The absence of a regime of enforced safety standards in its schools has long plagued Iran's educational system. Fearing public backlash and accountability, many school officials and politicians will not explain the issue in details. Government statistics speak volumes about neglect and failure on this highly important public issue.

In the 2014 census, Shinabad's population was 4023 people –which include 804 families with 202 boys and 195 girls in the age group 5 to 9. In a relatively large community such as this one, a single, poorly constructed and over-populated school admitted girls in the morning and boys in the afternoon. Since many parts of Iran remain under-developed and lack access to electricity, oil heaters are used to keep warm in the winter months. The Shinabad tragedy was an example of the confluence of under-development, chronic neglect and an absence of enforced safety standards in a public facility. Like in Shinabad, many other schools in rural Iran rely on oil stoves to keep

warm and not surprisingly, these schools have experienced similar potential. As the chart below illustrates, out of the six large fires that have occurred in rural Iran in the last twenty years, four of them were directly or indirectly related to oil heaters.

Table 1: History of school burning in Iran's villages in the past 20 years

Fatalities	Cause	Date	Place
Teacher burned %60 with 11 students injured	Storm weather cause oil heater fell in classroom	January 1998	Shaft school in Gilan
13 students burned more than %40	Falling oil heater in school hallway	January 2004	Safilan School in Lordegan
extreme burning for 8 students	Falling oil heater in classroom	December 2006	Dorodzan school in Fars
1 student death	after 4 years still under investigation	November 2010	Sistan va Baluchestan students hostel
2 students death and extreme burning for other 3 students	conjunction of power wire	November 2011	Chabahar high school
2 students death and 27 injured	falling oil heater in classroom	December 2012	Shinabad school in Piranshahr

While oil heaters are a major safety hazard, the Shinabad tragedy brought a secondary hazard to the forefront. The classroom's iron barred windows blocked a readily accessible escape route and effectively trapped the girls inside the classroom. Most schools in Iran have two layers of security. In general, the first layer of security is a high main wall that encircles the school grounds. The second layer of security is considered to be the classroom's own windows, which are typically secured with iron bars to make them a cosmetic and safety enhancement. In addition to the security

factor, iron barred windows are also a remnant of outdated cultural mores related to reinforcing the authority of the teacher and containing mischievous children who may be tempted to skip class. (Figure 3)

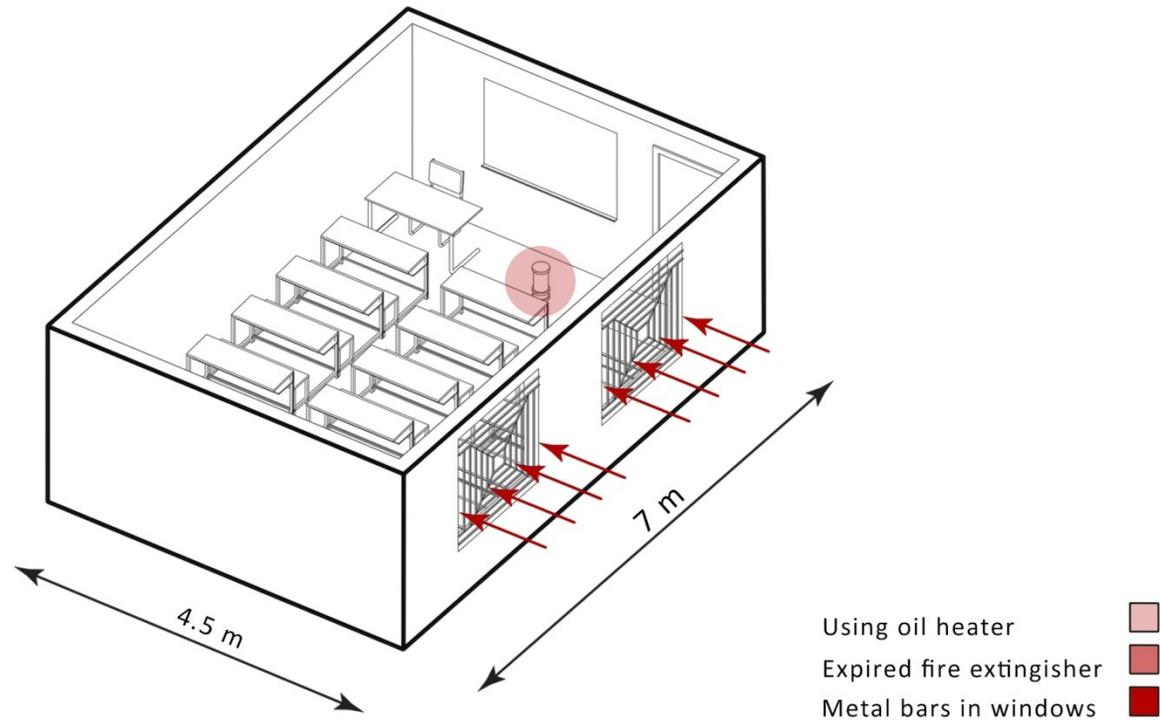


Figure 3: Analyzing Shinabad school safety issues

Unfortunately Iran has yet to modernize its safety standards in line with what is commonplace in many developed countries. Awareness of safety standards and practice drills do not factor prominently in the lives and culture of impoverished rural inhabitants. In the Shinabad classroom, an expired and inoperable fire extinguisher went unnoticed until it was far too late. Little to no architectural thought, planning, scheduling, and design was invested in the building that served as a school for the community's children. Without following specific safety codes, most "schools" in rural Iran, including the one in Shinabad, are simply a grouping of rooms. While they are

labeled “schools,” these shoddily constructed buildings hardly qualify as appropriate school facilities of the sort one sees in developed countries, with meticulous design plans and comprehensive safety standards including fire safety education and routine drills.

Rethinking the Shinabad Tragedy

In order to broaden my understanding of the main factors behind the Shinabad tragedy, I researched a similar tragedy, which occurred on December 2007 in Doorodzan middle school, another rural school located in Fars Province, Iran. Based on the International Journal of Occupational Hygiene, three categories factored into a school’s safety prospects: “the school's physical, social, and cultural environments.”² According to IJOH, a school’s physical environment is comprised of additional subcategories, which include its location, grounds, classrooms, and internal security. Departing from these tangible elements, the IJOH highlights within its social category elements such as leadership, school and classroom organization and structure, participation and involvement levels. Finally, the category of culture is further branched into affiliation and bonding, behavioral expectations, academic expectations, discipline and consequences, and support and recognition. The tragedies in Droodzan and Shinabad tragedies raised similar issues. Therefore, comparing and understanding the IJOH’s three categories, namely the schools’ physical, social and cultural environments will offer invaluable insight about how to design and build a safe learning environment. The

² Dehcheshmeh, M, Pourezzat, A, and Gholipour, A. "Students' Perceptions about School Safety in Doroodzan Middle School, Marvdasht City, Fars Province, Iran." (2012): n. pag. Web. 27 May 2012.

tentative results that emerge can be drawn upon as a prototype design plan for Shinabad and other like communities in rural Iran.

Chapter 2: History of school architecture in Iran

Education Environment in Ancient Iran

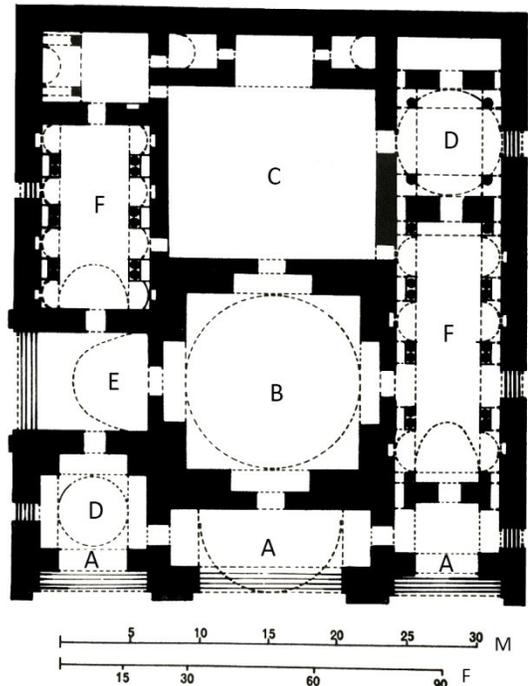
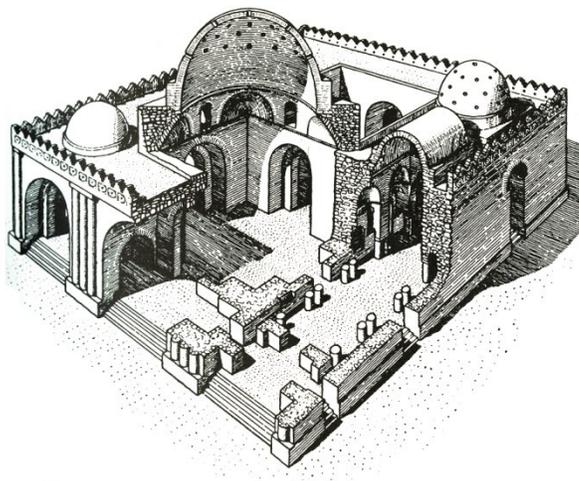
A survey of the history of school architecture in Iran reveals important cultural developments over time and place that have in turn influenced the design and form of schools in today's Iran. While the modern scientific approach to school design is lacking in many parts of Iran, cultural and historical factors underpin the public's understanding of education and schools in rural and urban Iran.

One of the first influences of ancient Iran's culture on its learning environment dates back to the 6th century worldview known as Zoroastrianism.³ Like many ancient philosophers, Zoroaster believed education as such to be an end unto itself and promoted the notion of lifelong learning. The requirement of intellectual activity imposed on Zoroastrians is an early example of education making its way into the social and communal realm.

Buildings in ancient Persia were designed with two main spaces in mind: the balcony and the dome chamber. Long balconies had a dual purpose. On the one hand, they were social gathering points for elite members of the community and on the other hand they functioned as oversized circulation ducts, allowing fresh air to pass through.

³ Jackson, A. V. Williams. Zoroaster, the Prophet of Ancient Iran. New York, 1899, 15

Covered by annular barrel vaults, the balconies allowed smooth passage of crowds and air. The square-shaped chamber functioned much like a library; its central space was used for several functions, including teaching, training, and debating. Such spaces were quite versatile in their uses and were in fact utilized for educational performances or lecturing by students and teachers alike.⁴ The basic structure of these buildings was manifested in other forms as well, including the palace seen in Figure 4.



Plan:
A: Triple ivans D: Small domed chambers
B: Central domed chamber E: Side ivan
C: Court F: Vaulted rooms

Figure 4: Palace at Sarvistan, 5th century, General

⁴ Irvani, Samaneh, History of School Architecture in Iran, 2010, Web (accessed on January 9th 2015), 6

Education Environment in the Islamic Period

With the arrival and eventual entrenchment of Islam into Persian society in the 7th and 8th centuries, the epicenter of learning became the mosque. The mosque is an essential part of Islamic religion and is at the heart of religious activities and broader social relationships.⁵ Like the church in Christianity, the mosque was used for daily prayer and worship but perhaps unlike its counterpart it was also a de-facto education facility for anyone interested in Islamic studies and its many sub-fields. Even today, there are elements of mosque architecture that reflect the building's historical relationship to learning in a manner consistent with Zoroaster's dictum that education is a lifelong process. The internal courtyard is a distinctive feature of mosques, which the faithful use to escape the frenzy of the material world and nourish their mind and spirit.

(Figure 5)

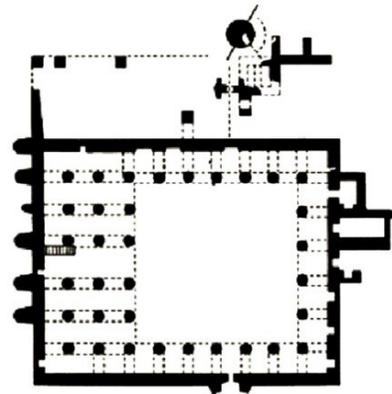
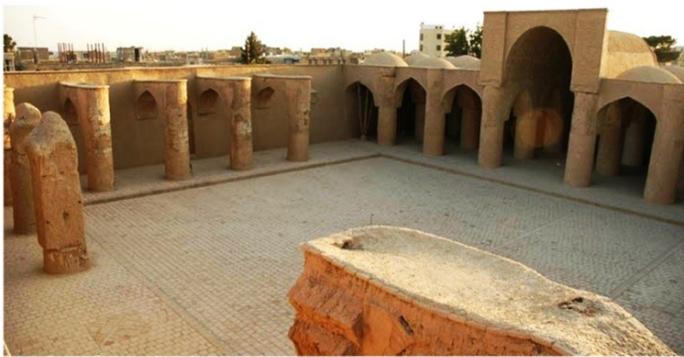


Figure 5: Tarikhaneh mosque, view of the yard and plan

⁵ O'Kane, Bernard. *Studies in Persian Art and Architecture*. Cairo, 1995, 120-124

At the beginning of the 4th century AH (After Hijra), as religious contemplation and educational studies began to diverge, a need arose for separate spaces to house each of these pursuits. Among the first official public schools in Iran, which operated independently of the mosque, was the “Nizamiyya.” Introduced in the Seljuk era in Neyshabur, the Nizamiyya School was a comprehensive hub of learning and living. The Nizamiyya included a library, mosque, bath and free residential space for students deeply immersed in their studies and who were in need of accommodation. The four Ivan (balcony) was a popular style in Khorasani architecture, which was initially used in private homes only to be adopted by the mosques, and finally incorporated into the school layout.⁶

Among the various rulers that came and went in Iran in the pre-modern era, the 16th century Safavid dynasty stands apart for having significantly invested and improved Iran’s educational system. During this period, a new instructional method known as “loop teaching” began to take root. In centers of learning across Iran, a teacher would rest on a pillow and students would form a circle around him. The more accomplished students occupied positions nearest the teacher, which were prized as much for reasons of accessibility as recognition. The loop-model became the standard approach in Ivans, courtyards, and chambers throughout Iran. Each of these spaces had its own benefits. The enclosed chamber space was ideally suited for private study and reflection. In contrast, the semi-open Ivan and courtyard were more conducive to collaborative

⁶ Kassai;Noorollah “Nizamiyya schools and scientific and social effects of it” Tehran,1984,156. Translated by the author of this thesis

learning. In the Safavid era, semi-open spaces reached their peak and were used throughout the year for education. Whenever additional space was required due to rising enrolment, the schoolyard was converted into a make-shift teaching space. The Ivan's spatial dimensions and characteristics made it a suitable and readily-adaptable space for learning and instruction.⁷

Education Environment in the Contemporary Period

Architectural school design in the modern era in Iran began in the 1950s under the Pahlavi monarchs and continued after the 1979 Islamic revolution today. In this period, as Iran became increasingly a society of the educational facilities were forced to take on increasingly large numbers of students. As a consequence, the quality of educational facilities was forced to take a backseat to capacity and quantity.⁸ In other words, the main objective when building schools was overall capacity and this factor trumped all others. Successive Iranian governments during this era adopted German or English models for school construction. Three different types of schools began to emerge: traditional schools, ministry schools, and schools for foreigners.

Unfortunately, from the 1950s onward, architectural design shifted to “cells and bells” model, which was considered the gold standard for controlling large numbers of students.⁹ Like their Western counterparts, school administrators in Iran were obsessed

⁷ Savory, Roger. *Iran under the Safavids*. Cambridge: Cambridge, 1980,177-202

⁸ Sami Azar, Alireza, “The process of school design in Iran, Tehran, 1998, 14. Translated by the author of this thesis

⁹ Nair, Prakash, and Randall Fielding. *The Language of School Design*, Minneapolis, 2005,53-57

with discipline and regimentation and school designs reflected these priorities. Therefore, architectural ingenuity with respect to school design was largely overlooked. In fact, there are still several active schools from this era in Iran and all have just one main corridor with classrooms lining both sides. (Figure 6)

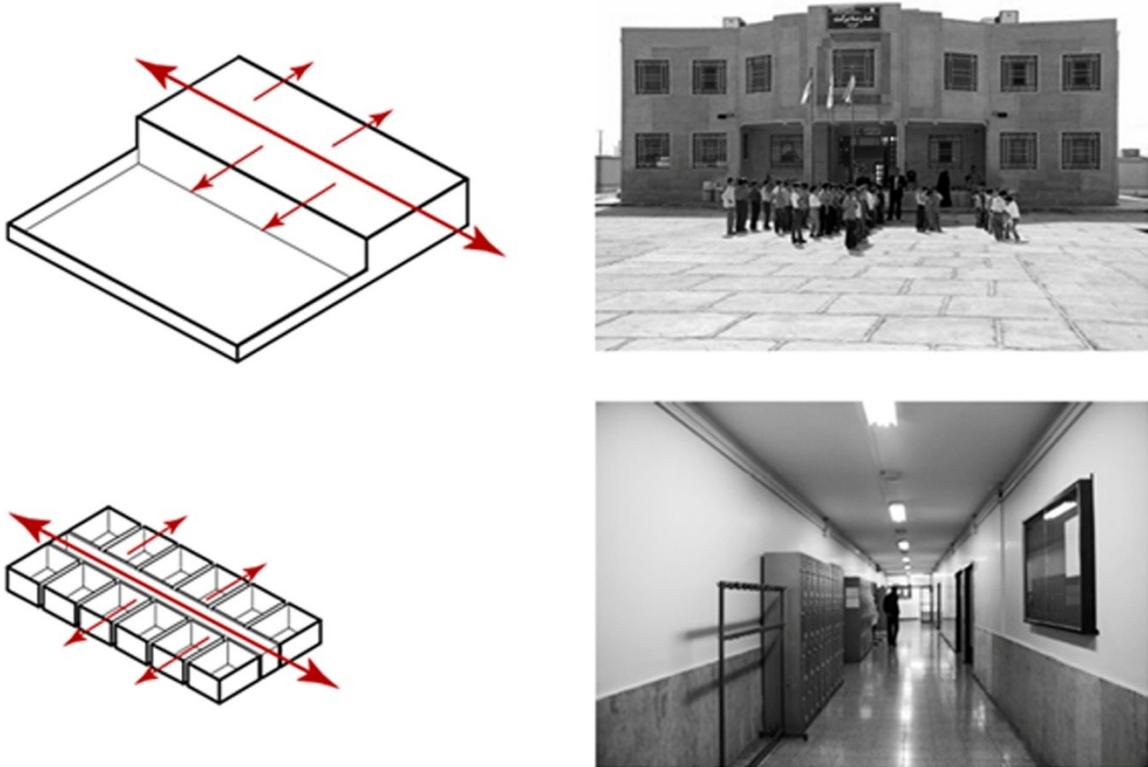


Figure 6: Form of common school built by government in several villages

The main drawback of these architectural school designs is that they prioritize student control ahead of all other considerations. While these designs were effective for student management in the new learning and training centers, they overlooked significant variations in Iran's climate. Thus, the same school design is applied in different cities and rural areas without attention to the local climate and the need for corresponding architectural designs. Moreover, these designs failed to diversify the

school's environment and placed far too much emphasis on the classroom as the singular space for learning. The value of courtyards in education facilities was therefore diminished along with an understanding of the different designs required for public and private learning spaces. As a result, very few schools in Iran today have semi-open spaces that were standard in pre-modern schools. Moreover, learning activities take place strictly within the confines of the classroom, including dramatic performances, science labs, and even certain types of sports. In fact, the absence of collaboration between architects, planners, employers, parents, teachers, and especially students has resulted in the recycling of the same uninteresting and un-innovate concepts and design projects.¹⁰

¹⁰ Irvani, Samaneh, History of School Architecture in Iran, 2010, Web (accessed on January 9th 2015), 62-63

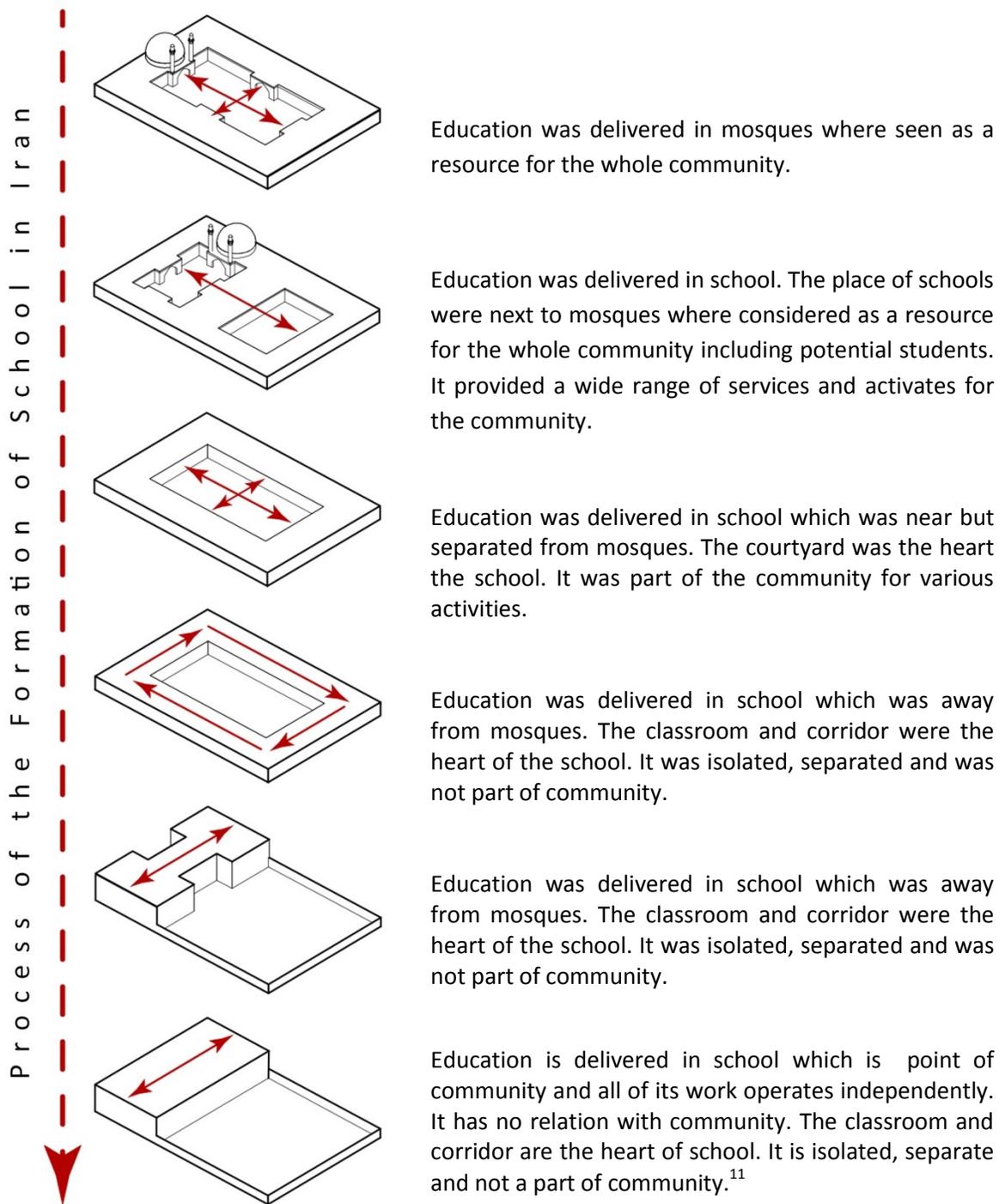


Figure 7: Changes in the form of schools over time

¹¹ Irvani,Samaneh, History of School Architecture in Iran ,2010, Web(accessed on January 9th 2015),46

Chapter 3: Persian Architectural Elements

History of Persian Architecture

In his classic work on Persian architecture, the noted American architect Arthur Upham Pope praised the history and richness of his subject matter:

“Architecture in Persia has a continuous history of more than 6000 years, from at least 5000 B.C. to the present. With characteristic examples distributed over a vast area from Syria to North India and the borders of China, from the Caucasus to Zanzibar. Persian buildings vary from peasant huts, tea-houses and garden pavilions to some of the most beautiful and majestic structure the world has ever seen.”¹²

The most important characteristic of Iran’s traditional architecture is the desire to achieve harmony between the thing being built and its natural environment. Persian architects strived to take advantage of the natural strengths of the location and to harmonize their design with the national traditions that factored into architectural design. A common motif in Iranian architecture is cosmic symbolism:

" the traditional artist creates the external art form in light of the inspiration which he has received from the spirit; in this way art form is able to lead man to the higher states of being and ultimately to unity. With the help of symbols, man, through his intellect, applies ta’Wil to the processes of nature, first having prepared himself to be in harmony with these processes through prescribed rituals. Man as conceived in the tradition is

¹² Pope, Arthur Upham. *Persian Architecture; the Triumph of Form and Color*. New York, 1965,9

related to creation through his outer form, which corresponds to it not, of course, as a naturalistic copy but qualitatively, as parallel work of God."¹³

Many other Asian architectural traditions share this desire to elevate man. Even in the modern era, unity and continuity remain central factors in Persian architecture.

Traditional Persian Courtyard

The traditional architecture of Iran was rooted in the courtyard, or the "*hayat markazi*" as it's called in Persian. In order to understand the conceptual basis of the courtyard one has to look beyond architecture per se and consider the broader influence of Persian culture. The idea of the courtyard is related to the realm of paradise or "*behesht*" in Persian. Traditional architecture sought to represent conceptions of paradise in the courtyard using elements such as water, landscaping, and the form and pattern of the building. The courtyard was both the physical center of the building and its heart in a metaphorical sense. From ancient times to the modern era, the courtyard occupies a significant position in Persian culture and architecture, fusing elements of nature and climate with building design.

The characteristics of traditional Iranian courtyards have been shaped over several centuries in response to nature, geographic position, climate and cultural needs. An element of utility was always present in the making of these courtyards as evidenced

¹³ Ardalan, Nader, and Laleh Bakhtiar. *The Sense of Unity*, Chicago, 1973, 7

by harmony between community needs and the physical characteristics of the building.¹⁴

A national pastime of Iranian people is socializing in natural settings with friends and family. The courtyard was a particularly suitable venue for this pastime because it combined two important natural elements: the earth beneath and the sky above. These natural elements were present in all Persian courtyards and allowed contact with the natural world in even the most private settings. Once again, many Iranians considered the courtyard a private sanctuary or paradise. In fact, one of the greatest Persian poets, Omar Khayyam, laments the brevity of life in one of his poems while urging the reader to live each day as if he were in paradise. Khayyam's poem illustrates the harmony between Persian culture and the architectural elements of the traditional Persian courtyard:

*"Oh threats of Hell and Hopes of Paradise!
One thing at least is certain - This Life flies;
One thing is certain and the rest is Lies -
The Flower that once has blown forever dies."*¹⁵

The joy and pleasure that comes from socializing among family and friends in intimate settings is an integral part of Persian culture. One of the distinguishing features of Persian courtyards is socio-cultural interactions they facilitated among community

¹⁴ Edwards, Brian. Courtyard Housing: Past, Present and Future. Abingdon, 2006,147-153

¹⁵ Khayyam, Omar, Eghbal Farshid, The Rubaiyat of Omar Khayyam., Iran, 2008, 36

members. In the context of school design and education, courtyards were always a transitional space for mental and physical preparation for both prayer and learning. Courtyards were sanctuaries that allowed students and worshipers to reflect in a silent space far removed from the hustle and bustle of the urban space within which they were enveloped. At the same time, the physical elements factoring into the construction of courtyards were closely related to climatic conditions.¹⁶

In areas with a colder climate, the courtyard is usually the epicenter of the dwelling, spatially, socially, and environmentally. Although the size of land on which the courtyard is built is of relative importance, the key consideration is always latitude. In general, courtyards are narrow enough to allow for shade on hot summer days, and yet wide enough to capitalize on solar radiation in the winter. Courtyards then have a practical function in addition to their relationship to Persian culture. Finally, the courtyard's flowered gardens, shrubs and trees provide incredible comfort and privacy within a discrete physical space.¹⁷ (Figure 8)

¹⁶ Petruccioli, Attilio, and Khalil K. Pirani. *Understanding Islamic Architecture*. London, 2002, 75-84

¹⁷ Shokouhian, M., F. Soflaee, and F. Nikkhah. "Environmental Effect of Courtyard in Sustainable Architecture of Iran, Journal article, 970



Figure 8: Traditional courtyard house, Yazd, Iran

Traditional Persian Geometric Patterns

In addition to the courtyard, another important architectural element that was used in many aspects of Persian culture was the ornate geometric patterns, which harmoniously link nature and architecture. The widely recognizable geometric patterns were used in variety of artifacts, including Persian rugs, art, carpets and mosaics, and decorative tiles. Even today, the geometric patterns are a powerful symbol of Persian art and architecture. (Figure 9)

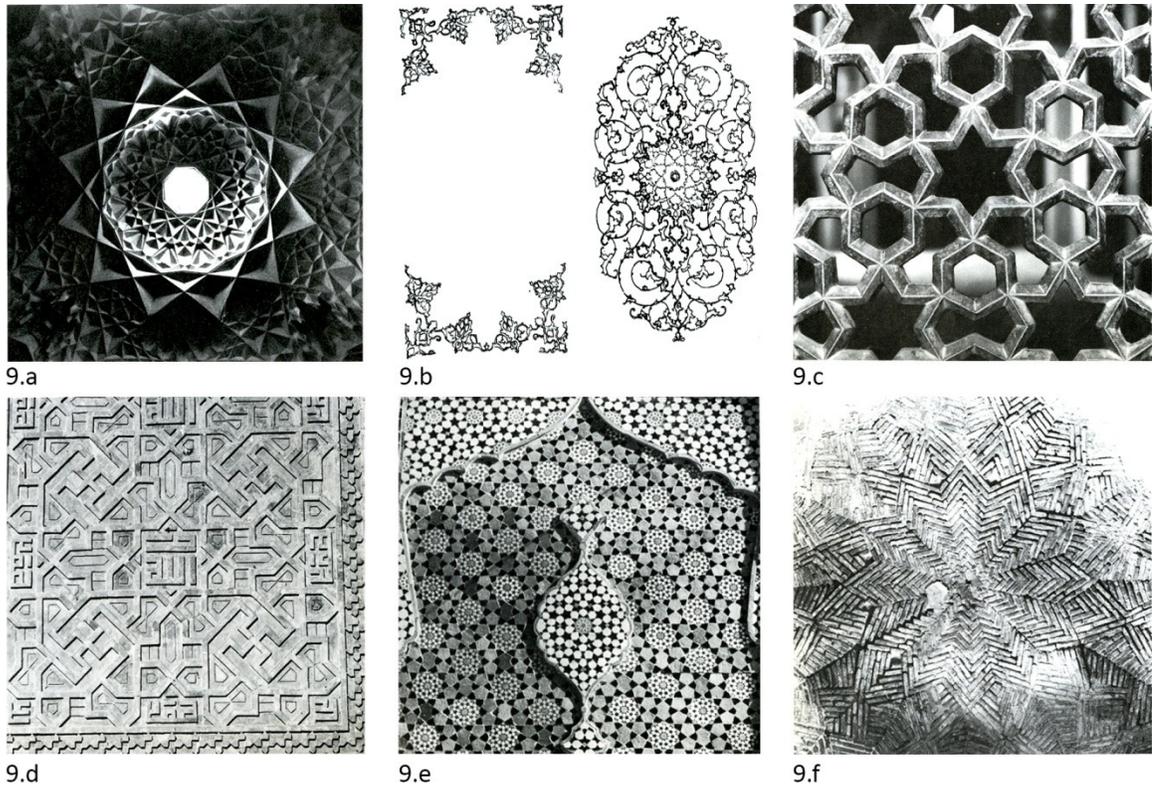


Figure 9: 9.a: Mahan, the shrine of Sayyid Nimatullah Wali, geometric plaster, 9.b: Safavid garden carpets of the seventeenth century, 9.c: Kashan, a caravanserai, wood door, 9.d: Isfahan, Masjid-i-Jami, brick, 9.e: Isfahan, Masjid-i-Jami, tile decoration, 9.f: Masjid-i-Jami, brick dome

A perennial feature of Persian architecture has been an effort to create beauty through the prism of harmony. In their study on Persian architecture, Ardalan and Bakhtiar write

*“combining the fluidity of nature with the geometric transfiguration of surfaces is the characteristic achievement of the harmonic technique.”*¹⁸

Indeed, beauty factors prominently throughout the history of Persian architectural history. Geometry, in turn, was a powerful tool used in Persian culture to measure the proportions of heaven and to create equilibrium, harmony and beauty on earth. Geometry, moreover, was the only instrument capable of harnessing the

¹⁸ Ardalan, Nader, and Laleh Bakhtiar. *The Sense of Unity*, Chicago, 1973, 35

phenomenon of beauty and infusing a degree of order. In the realm of art, geometry has been conceptualized as a visual language that stems from the worldview of the artist or architect and leads to the creation of a work of art that expresses a unique artistic perspective. At various times in history, the idea of diversification and transformation have ebbed and flowed in Persian architecture.¹⁹ According to Hejazi, the ultimate object of Persian traditional architecture was to attain the absolute. As a symbolic language, architecture could effectively express archetypal ideas in patterns conceived by the human imagination and understanding. In this sense, architecture constructions, though composed of tangible materials, were nonetheless aiming for the realm of spirit and wisdom. Such lofty aspirations elevated geometry toward a holy status precisely because it was the primary instrument that architects used to build and shape planes and bodies.

The generation of lines upon surfaces creates distinct patterns. Geometric patterns are typically based on the number 1 and its continued generation in a world where geometric shapes and patterns abound. Each unique shape has its own distinct personality based on the numbers in question and are conceptualized as aspects of the multiplicity of a singular creator. As number, the concept is based on symmetry, the correspondence in size, shape, and relative position of parts in the whole: bilateral symmetry. Geometric patterns as spatial concepts require space, filling surface patterns, patterns or motifs which grow side by side. It is a mathematical fact that there are only

¹⁹ Hejazi, Mehrdad, *Geometry in Nature and Persian Architecture*, 2005, 1414. Web.(accessed on March 27th 2015)

three regular polygons which may be used to fill a surface where the vertices add up to 360 degrees. (Figure 10) Furthermore, only three regular polygons, the equilateral triangle, the square, and the regular hexagon, or a combination of these will satisfy this requirement²⁰.

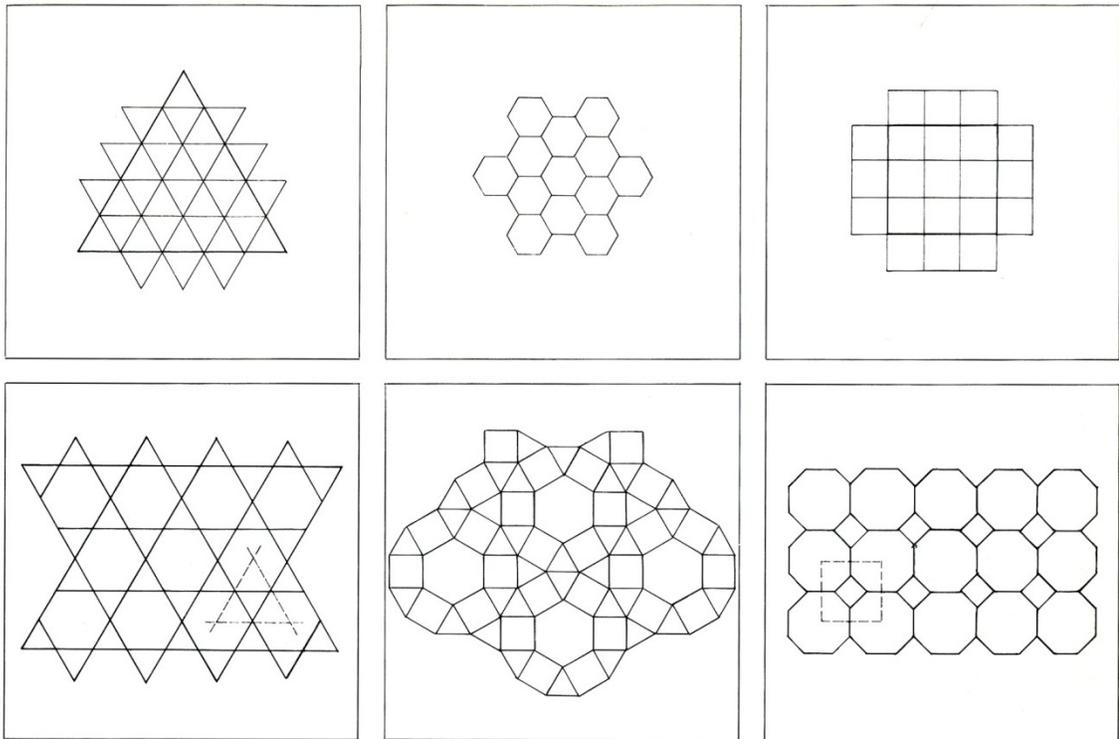


Figure 10: Different space-filling patterns

²⁰ Ardalan, Nader, and Laleh Bakhtiar. *The Sense of Unity*, Chicago, 1973, 39-43

Chapter 4: Site and Design

Site Analysis

Shinabad is a village in Piran district, Piranshahr county in West Azarbaijan Province in Iran. (Figure 11)



Figure 11: Site, Shinabad/Piranshahr/Iran

Due to its location on the west side of the Zagros Mountains, Piranshahr has a mountainous climate and rugged topography sitting on highlands. Average temperatures in the area range from lows of -4°C in the winter months, and highs of $+23^{\circ}\text{C}$ in the summer months. Based on statistics illustrated in the graph below, average

rainfall for the region between 1987 and 2002 was relatively high in the winter season, equally low in the summer months, and moderate in spring and fall. In general, Shinabad experiences relatively cold winters and moderate temperatures in the summer, which results in higher than normal levels of precipitation.²¹

As shown in the graph below, the village's population is approximately 4023 people or 804 families, which includes 2110 males and 1923 females in total. From 1966 to the present, the village's population has increased substantially. (Figure 12)

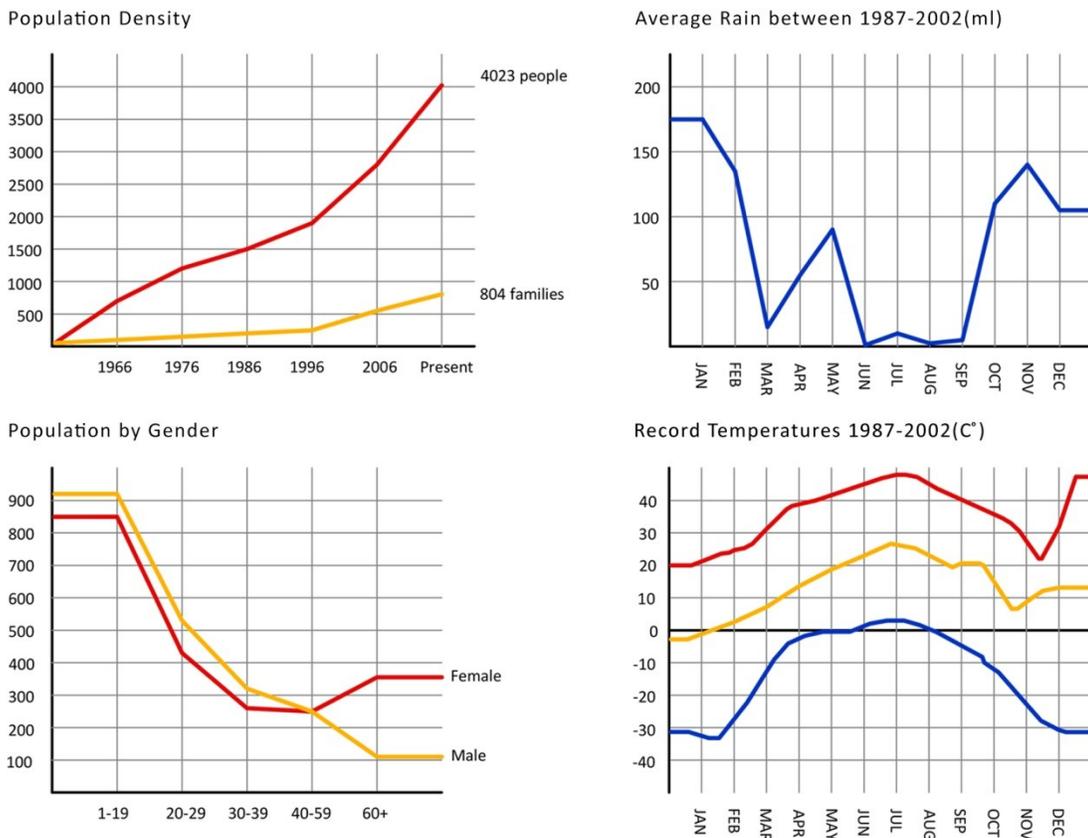


Figure 12: Site, static information

²¹ Eslam, Saeid, " Hadi project for Shinabad village, Iran, 2008, . Translated by the author of this thesis

Shinabad's primary school is located close to the village center along Farhang street, a main road that extends across the county and ends in Shinabad. The location of the school along the main street makes it easily accessible to community member and promotes traffic in the area as people bring their children to and from school.

(Figure 13)

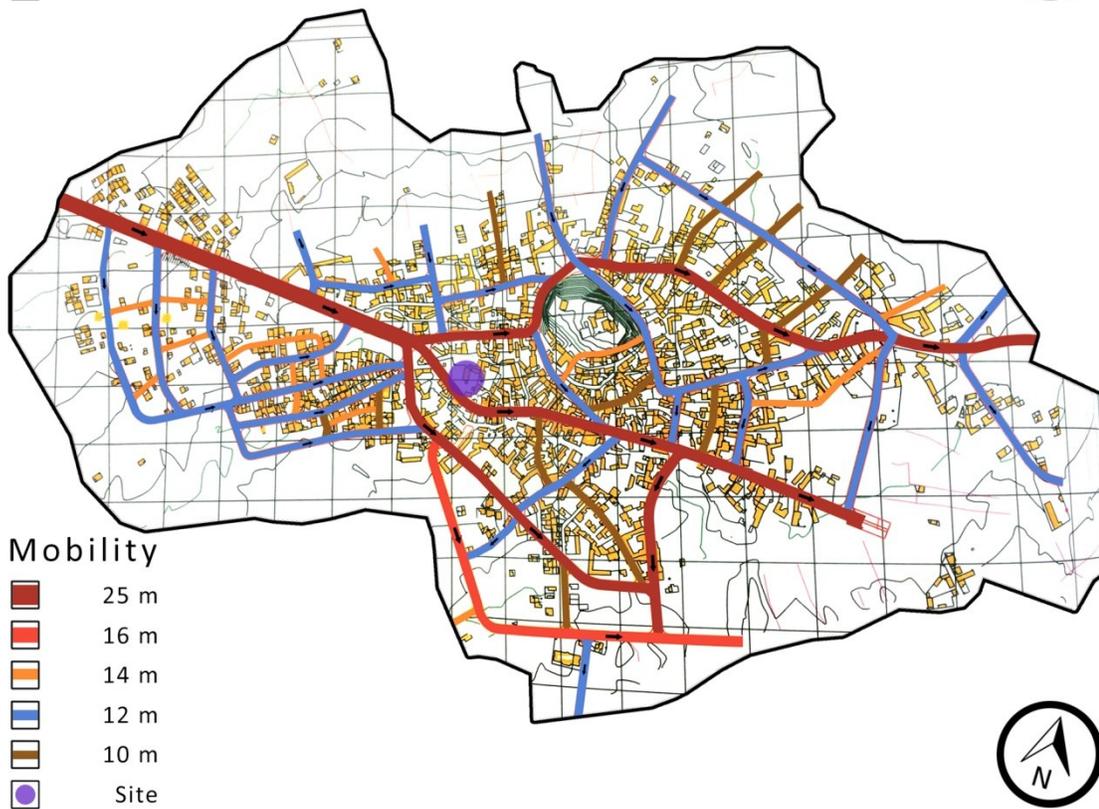
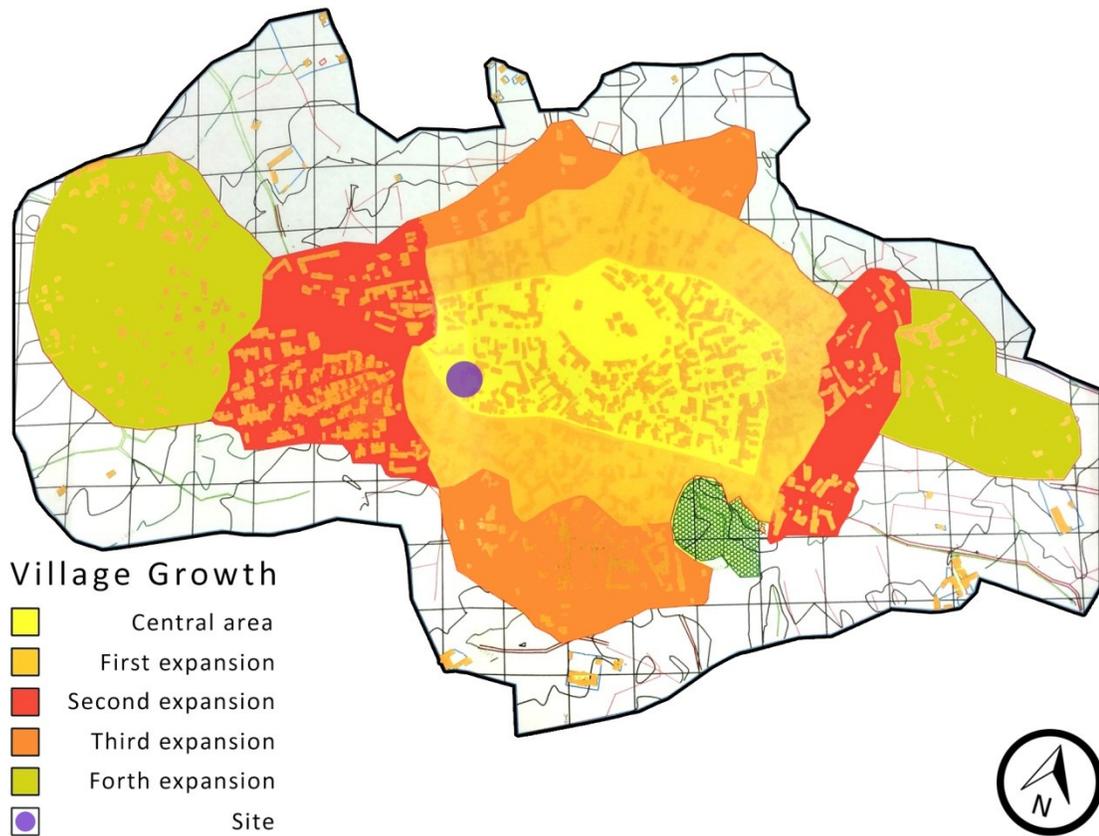


Figure 13: Site, village growth and mobility

In terms of the school size, the total footprint available for the site is 1844 square meters. Residential buildings surround the school and there are a small number of local businesses. Based on the chart and site study maps seen below, 56% of the buildings in the immediate vicinity of the school are private residential dwellings, a clear majority vis-à-vis other types of buildings in the area. A distant second to private dwellings are public buildings which comprise 28% of Shinabad. Apart from the school, other government buildings make up approximately 3% of the village total. Public and private buildings were originally built with brick and other local materials. (Figure 14 & 15)

Among the social issues that plague Shinabad village is the absence of a high school, no sports field for soccer, a tremendously popular national sport, and general dearth of recreational opportunities along with no public library.

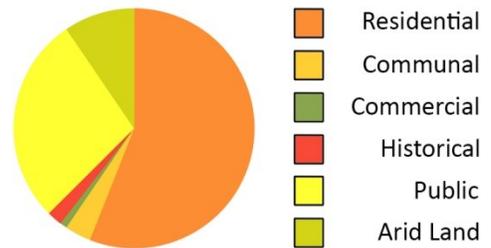


Figure 14: Site, uses population

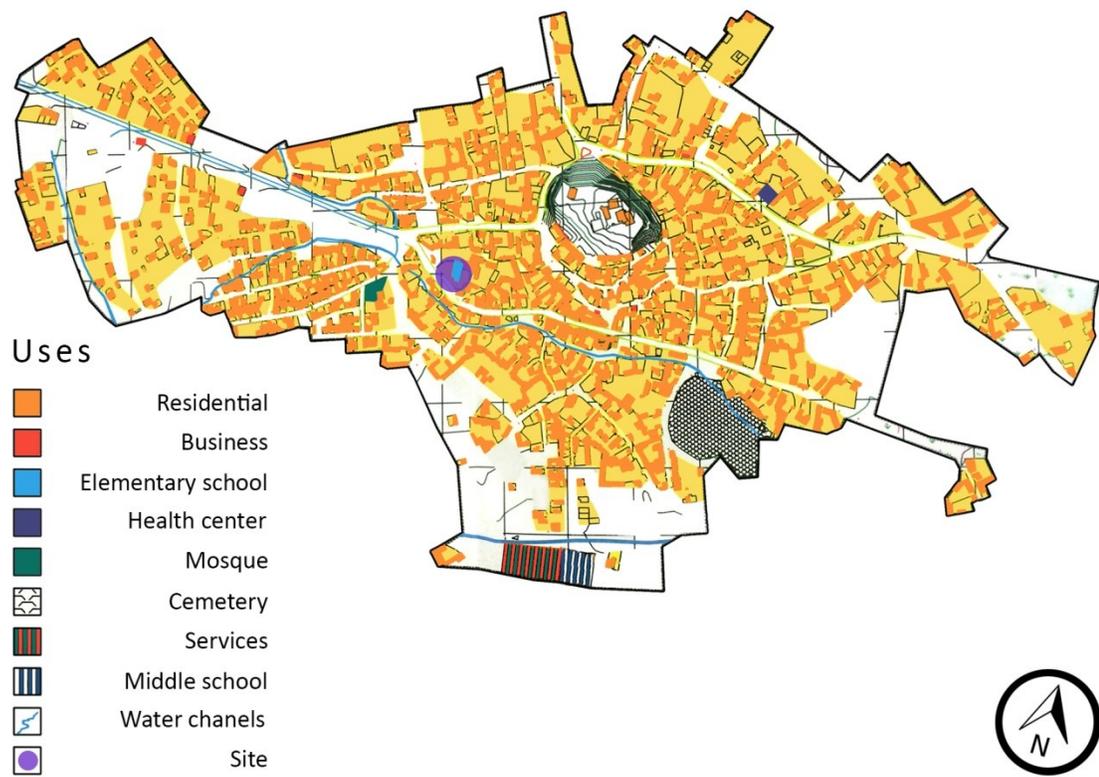
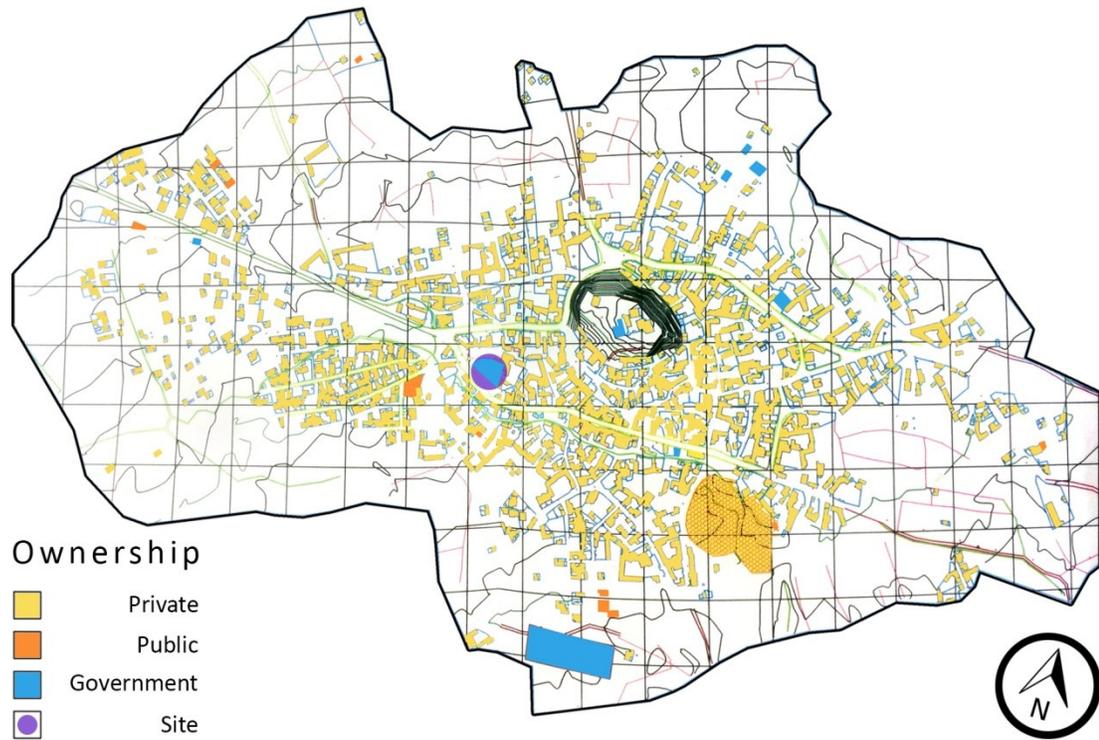


Figure 15: Site, ownership and uses

Design

A safe school is generally understood to be one where students and personnel feel psychologically and physically safe. If students are lacking a sense of safety, the educational process is almost sure to fail in its attempt to produce well-rounded and skilled young persons. Once adequate safety measures are implemented and a sense of safety is restored in the school community, the educational process can regain its effectiveness. To this end, safe daily routines and proper oversight can minimize potential safety hazards.²²

In order to achieve a safe learning environment both physically and psychologically, some important facts require consideration. As Caudill states in his book on better school designs,

“School planning starts and ends with the pupil. Every factor must relate in some way or other to the school child. Consider the physical factors: is the building warm enough for his comfort? Is the illumination adequate? Are there any disturbing noises? Does the school plant have the right kind of equipment? Now consider the psychological factors: is the building a pleasant place to go to school? Is it colorful and inspiring? Is it restful? Does it make the school children feel good to be in the building? We want a

²² Nair, Prakash, and Randall Fielding. *The Language of School Design*, Minneapolis, 2005, 16-21

school that serves the needs of our youngster-emotional need as well as physical needs.”

²³ (Figure 16)

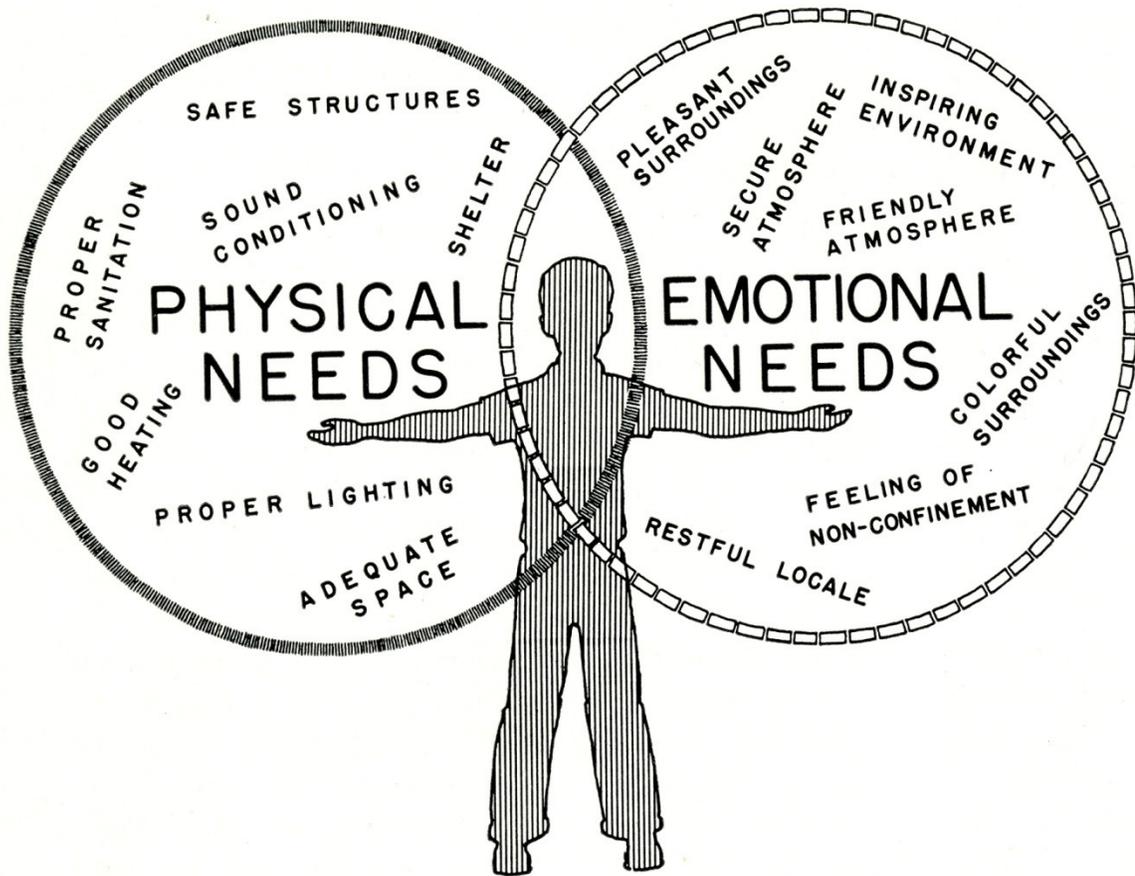


Figure 16: Physical needs and emotional needs for better school design

Caudill adopts a highly comprehensive and maximal approach to school planning. If we adopt Caudill’s standards, it becomes quite apparent that the school in Shinabad was direly lacking a solid plan. Based on the information about the site, Shinabad community simply lacks the spaces in its school for the large number of students in the village. But still there is just one elementary school that is expected to be a good learning environment for 195 girls and 202 boys in separate settings. The

²³ Caudill, William Wayne. *Toward Better School Design*. New York, 1954,2

conditions of school designs are fairly poor in many cities and in almost all rural areas, including the Shinabad community. Schools typically include several classrooms aligned next to each other along corridors that could be easily supervised by patrolling teachers. Given the added restriction of iron-barred windows, security is further enhanced while safety is compromised accordingly.

The design approach will be based on Iran’s Islamic rules and restrictions dictating that boys and girls are required to be in separate school buildings from elementary level to high school. This leads the idea of designing a school with two sides, where girls and boys are separated from each other but also there are some interconnected areas between the two schools. This is for the reason of adhering gender segregation while maintaining physical and psychological connectivity. Having two schools for boys and girls separately provides private spaces including classrooms, lockers, and library for each group in order to promote a contented educational environment. (Figure 17) This differs from the existing school setting where both girls and boys would have to share their space with other students from various educational levels in Iran’s rural areas.

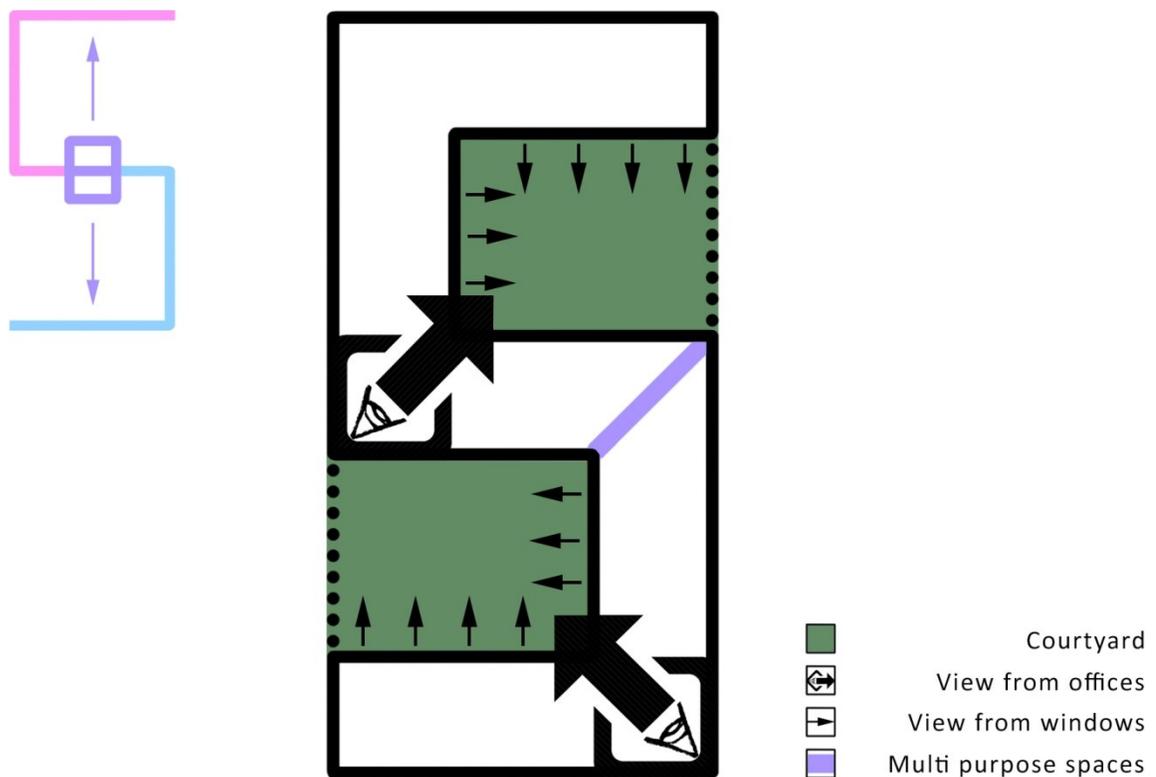


Figure 17: Initial design proposal

Based on the initial design proposal, 4 different concept ideas were introduced and the most successful one was design number 4. This design gives more options for having the larger school areas for each gender as well as a much better courtyard setting. Also, the access to the site will be easier in this design proposal. (Figure 18)

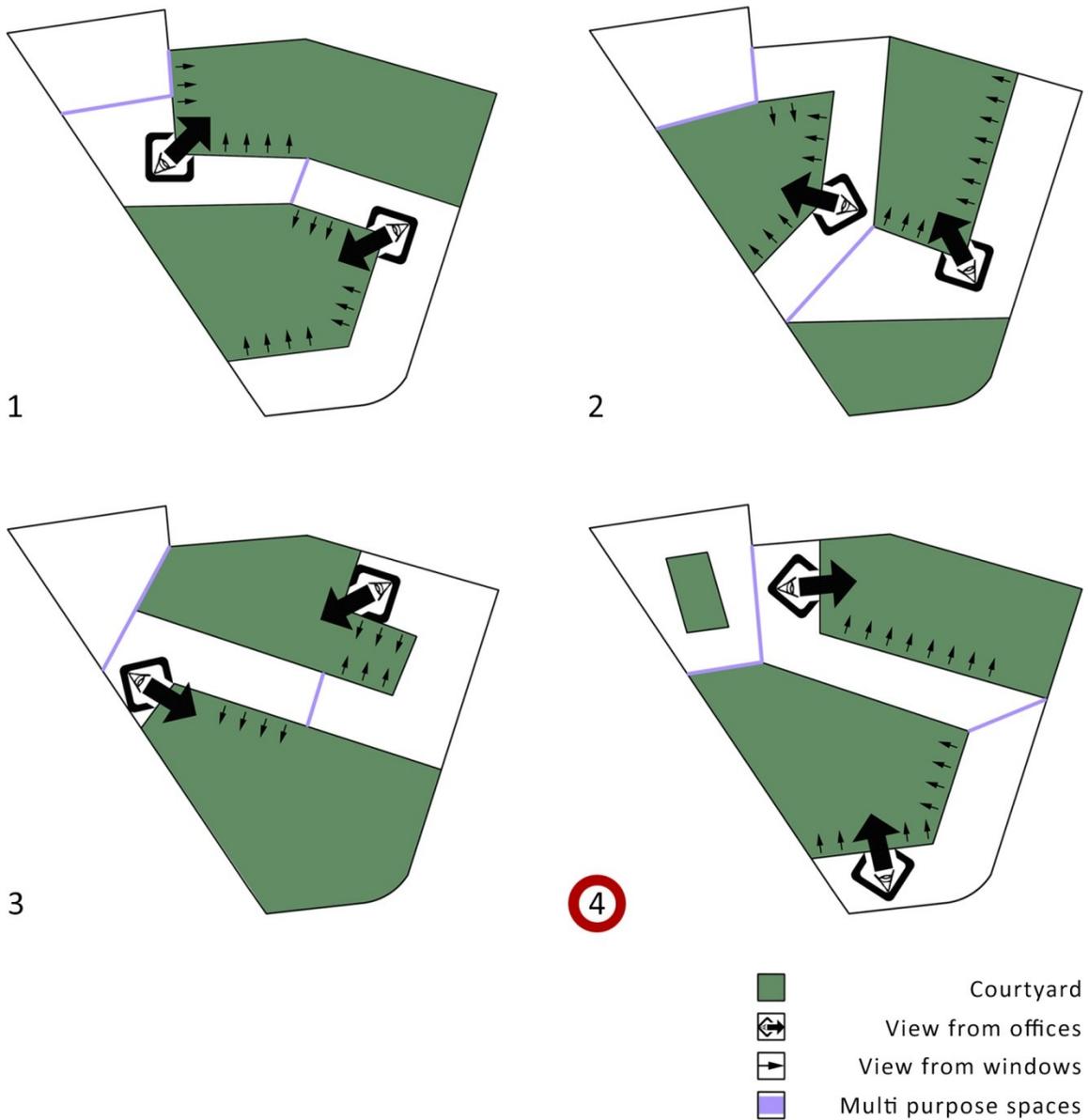


Figure 18: Different concept ideas

Because of this special setting, the wall between two schools is highly important to integrate the light and openings in the interior spaces while respecting the Islamic rules and restrictions as Ardalan and Bakhtiar both state “the wall becomes the locus of the soul of a defined space”.²⁴ Although, the focus is intended to evoke lightness and complete mobility, these features are contrary to the manifestly quantitative need of transporting gravity loads to the earth. Taking these points into account, common and local material brick is used along with Persian geometric patterns in order to add small openings for the light as well as aesthetic value of the design while recognizing the State’s restrictions. This also enhances the harmony with the site. Figure 19 shows the wall between two schools and figure 20 shows different geometric wall patterns for the library.

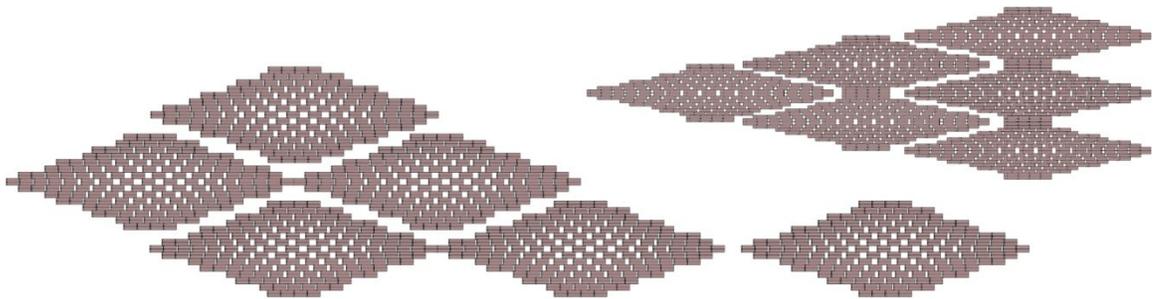


Figure 19: Geometric wall patterns for the library

²⁴ Ardalan, Nader, and Laleh Bakhtiar. *The Sense of Unity*, Chicago, 1973, 37

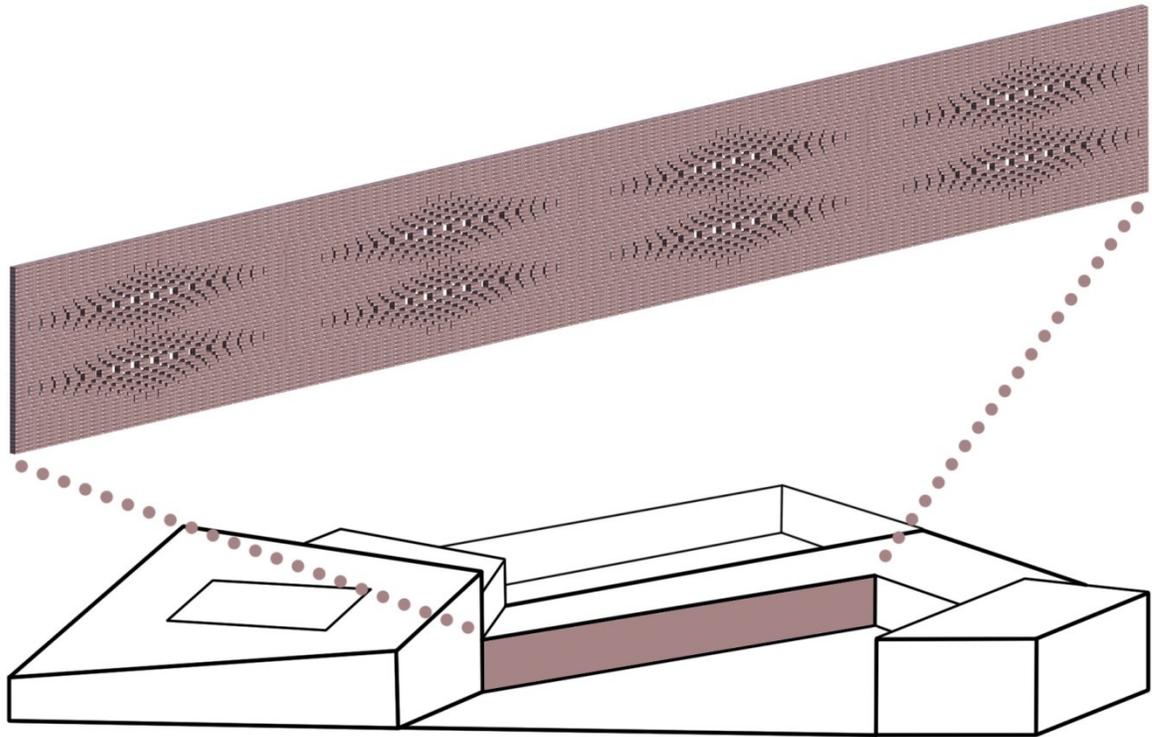


Figure 20: The wall between two schools

A unique way to remedy issues related to school safety that is also consistent with Iranian culture and traditions is to integrate the courtyard into contemporary Iranian schools. The design proposes the traditional Persian courtyard based on the history of school architecture in Iran. In the conventional architecture, the courtyard was an important part of the school design layout providing spaces for outdoor activities, this specific design element, however, over time became less imperative in the contemporary Iranian school setting.

To address issues pertaining to security, which served as the main reason for which the metal bars existed, I decided to design classroom windows for each gender facing toward their own courtyard in the school plan setting so that metal bars can be eliminated from the windows. All the classrooms are located on the first floor to be more

safe and secure. The second floor is designed to house the office of the principal, moderators and teachers' offices. With this setting, the principal and other staff members have a better view of the children. (Figure 21)

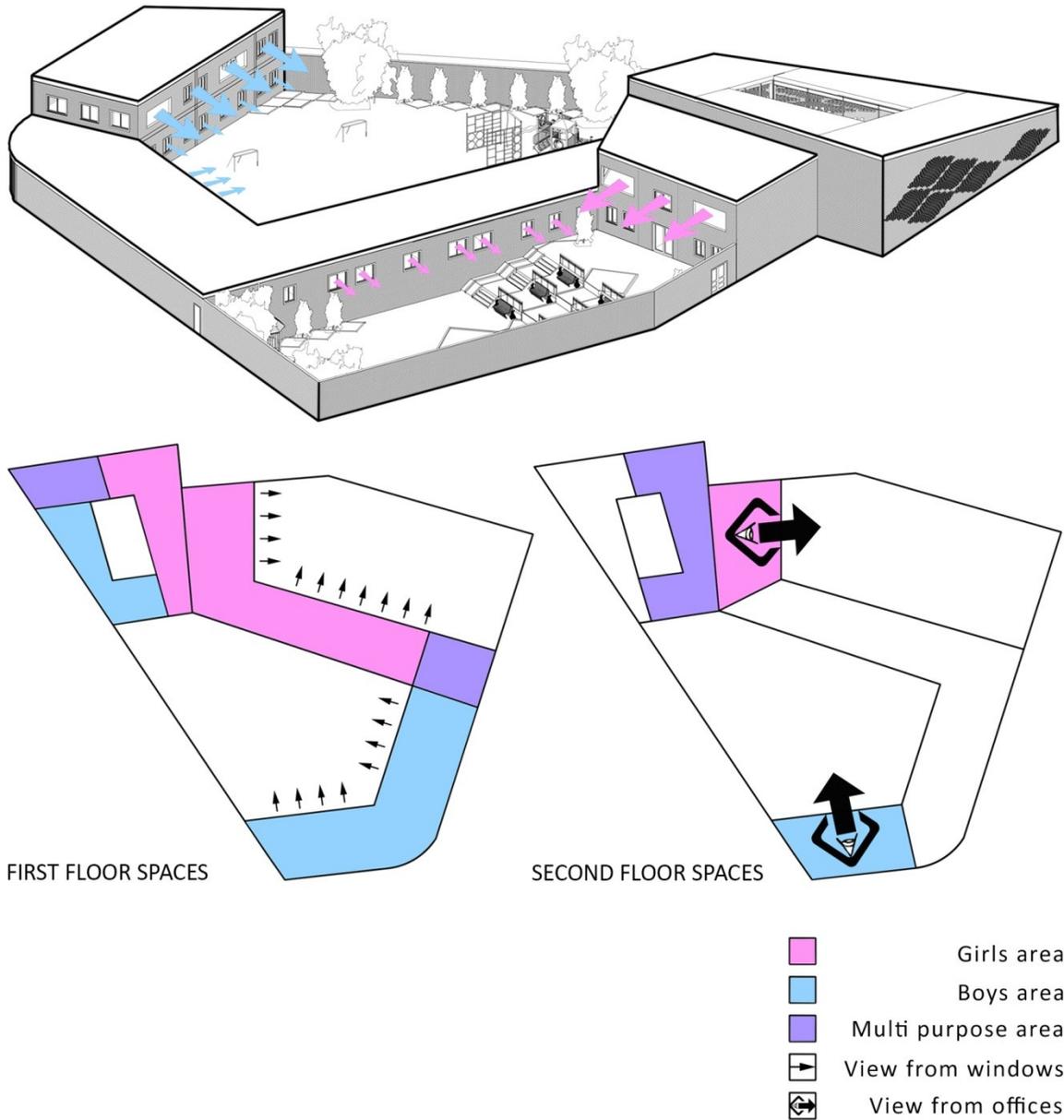


Figure 21: Analyzing school design

The courtyard would certainly eliminate the concerns about students' movement, particularly in the event of a fire. The criteria of inspiration about the color patterns derive from the gardens and patterns that are the hallmark of most courtyards across Iran. Feelings of joy and happiness which are part and parcel of the traditional courtyard can make their way into the school environment. Additionally, the outside wall, which surrounds the courtyard, has a dual function insofar as it provides security and privacy, making iron-barred windows totally redundant. Courtyards also provide natural ventilation in cold and desert climates, which could allow students and teachers alike to become less reliant on highly flammable oil heaters.

With regards to the program, the design includes a two sided school building that provides separate accommodations for the two groups of girls and boys and a library building, which is attached to both school buildings with distinct entry for each gender. These three buildings have their own courtyard, place for learning, washroom and spaces for various activities. There is also a multipurpose room accessible to both genders on alternating days for a variety of activities, including art and music lessons along with indoor recreation. Moreover, the design includes craft rooms for each gender based on their interest. Part of the library is designed for the children to sell their crafts encouraging them to have more fun and useful activities. The outdoor spaces include a playground, planting garden and a soccer pitch where boys and girls can play and perform group activities. It should be stated that the structure of these three buildings of girls' school, boys' school, and the connecting library is made of load bearing steel beam floor plate system.

Conclusions

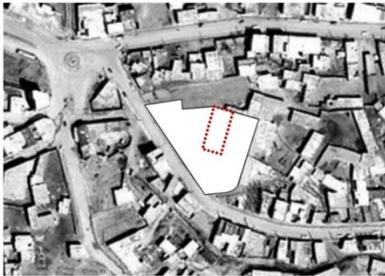
By its very nature, the school environment is a second home for many students who spend endless numbers of hours learning and playing among their peers. In order for young people to have a positive and meaningful educational experience, the school environment must be safe for both body and mind hence, tragedies like the Shinabad fire are completely intolerable and unacceptable. In my research, I drew on common Persian architectural elements to design safe and effective schools, including the courtyard, geometric patterns, adding color and different activities to promote harmony between nature and the school's physical structure. It was important for me that Shinabad's children have a productive education while at the same time being emotionally healthy and happy. The traditional Persian courtyard facilitates natural ventilation and can be used for fun learning activities in the school setting. This combination of a green space within the building allows children to experience heaven on earth. More students undergo this experience inside the school thereby giving sustenance to their mind and body through the process of education. Also, Persian geometric pattern will help bring more beauty to the school design and harmonious patterns are added to different areas of the building such as brick walls, windows and furniture. This would create a more positive and energetic learning environment for children. Also adding colors to the interior spaces will let the learning environment become more joyful in compare to the old setting which was boring and sad. Likewise, adding different programs and activities such as craft-making workshops, physical

exercise as well as art and music classes can make children more enthusiastic for being at their learning environments and hopefully help them with making the right decision for choosing their future career of their own interest.

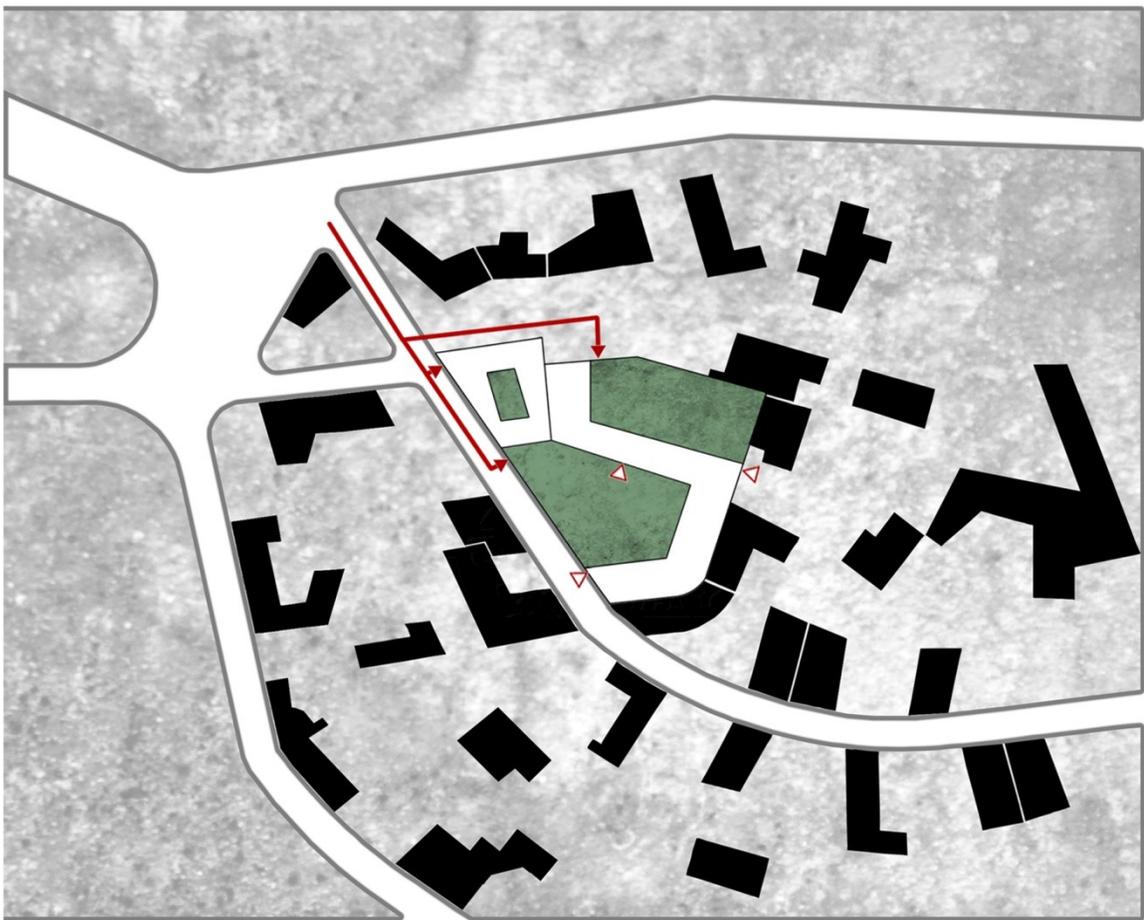
Because school had the special setting which was girls and boys separate in different time of the day, and also since the security is the important aspect of the learning environment in Iran rural areas. This prototype design of two sides separate schools will afford both boys and girls an opportunity to attend school together. Also, having their own classroom along with a personal locker will promote self-esteem in students and give them a sense of ownership and independence. A school design with windows free of metal bars facing the courtyard and with the principal and teachers offices on the second floor provides plenty of monitoring for students. In other words, student safety and security is maximized while undue safety risks are mitigated.

Also, by using the courtyard for various exercises and activities, the kids will develop a strong connection for this little 'heaven on earth,' which was the key objective initially stated in my thesis. In conclusion, the school design promotes in students a feeling of belonging and happiness that in turn affects their approach to education in general. Instead of seeing school as an unavoidable chore or task, students will develop a personal affinity for the educational process in part because of the appeal of the school's physical structure. The two-fold objective of re-integrating the courtyard into the school setting and connecting this space with meaningful and fun activities that promote happiness in students is at the heart of this design.

The introduction of geometrical patterns and traditional forms (courtyard) also promotes a sense of tradition, culture, and history of Iran. The concept of shared spaces and two side schools is designed in the way that it can be transformed in the future with the hope of change of state result elimination of gender separation in Iranian school system and the possibility of integrating two groups of boys and girls can study and play freely together in their schools.

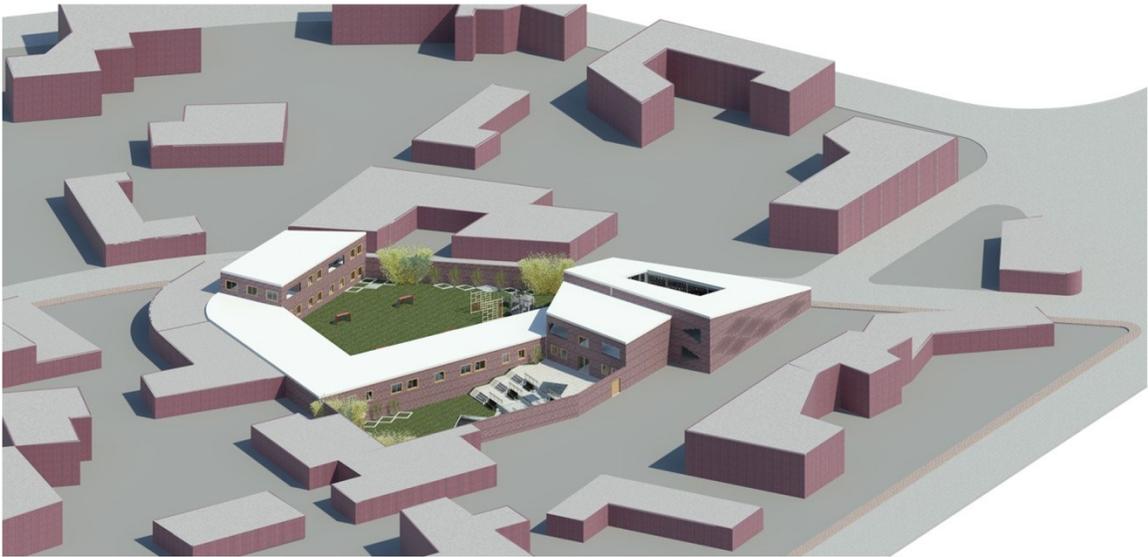


EXISTING SCHOOL

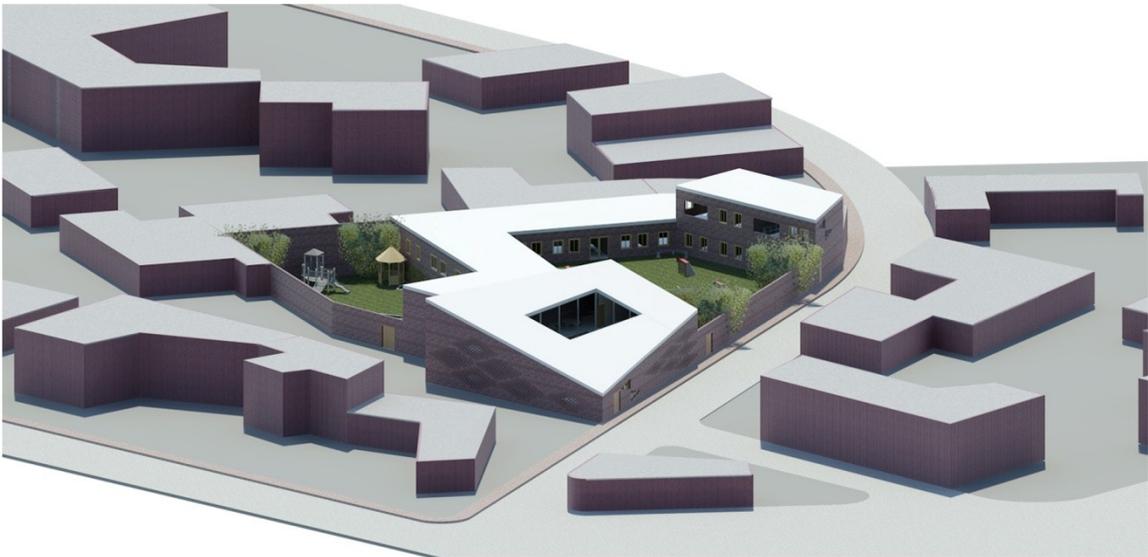


NEW SCHOOL DESIGN

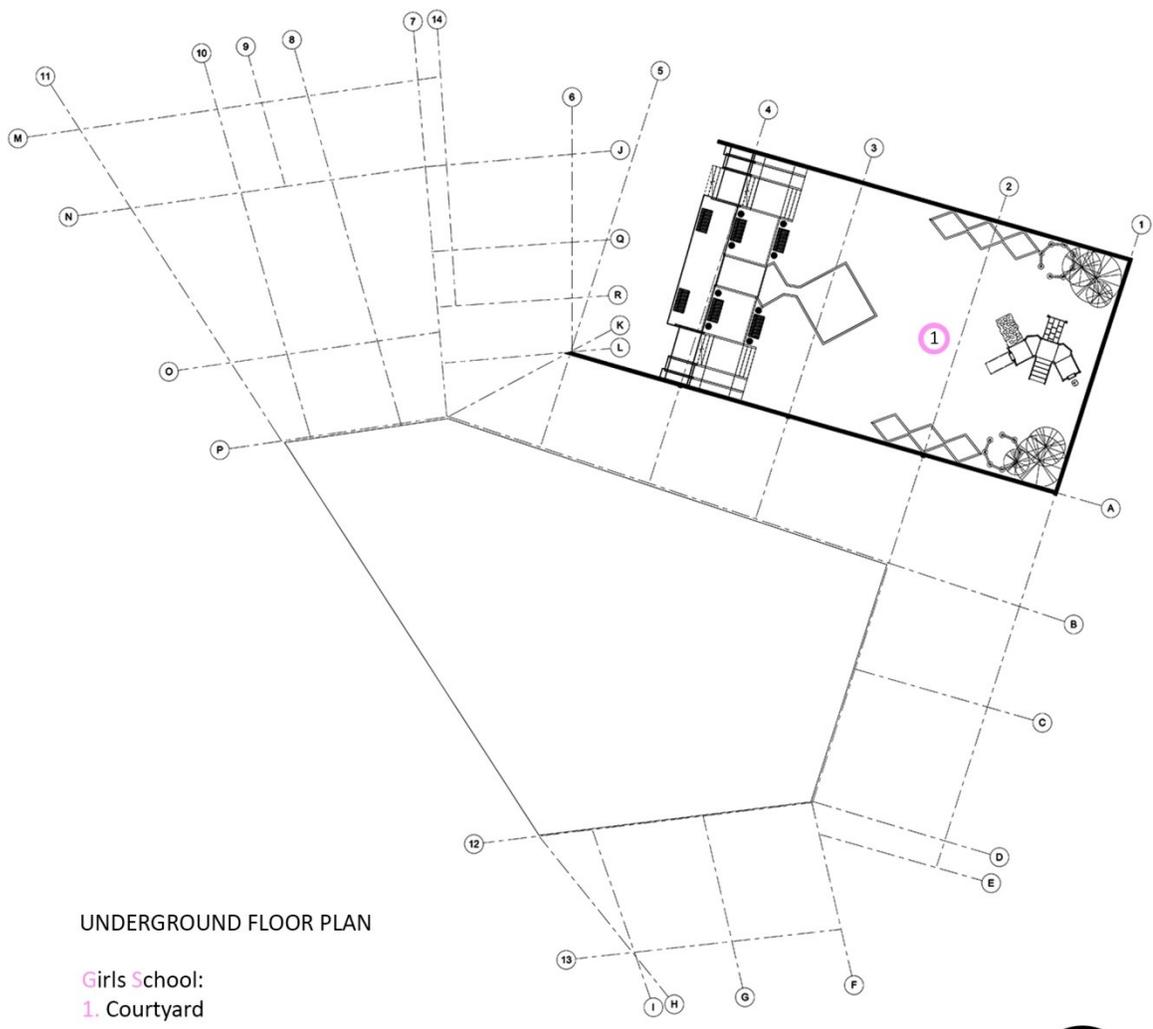
Main entrance 
Exit door 



AXONOMETRIC VIEW FROM NORTH SIDE



AXONOMETRIC VIEW FROM EAST SIDE



UNDERGROUND FLOOR PLAN

Girls School:
 1. Courtyard





FIRST FLOOR PLAN

Girls School:

- 1. Classrooms
- 2. Workshops
- 3. Washrooms
- 4. Library
- 5. Courtyard

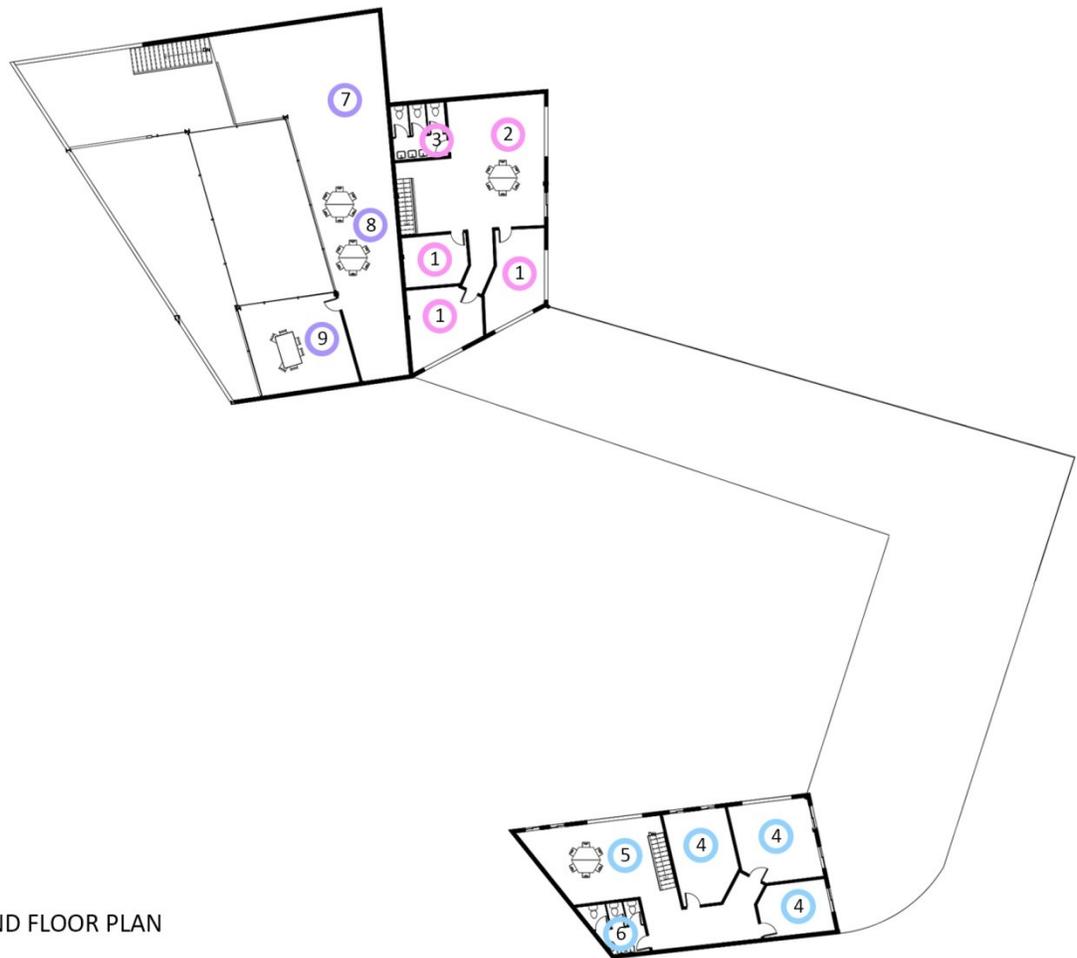
Boys School:

- 6. Classrooms
- 7. Workshops
- 8. Washrooms
- 9. Library
- 10. Courtyard

Multi Purpose Spaces:

- 11. Art/Music/Games room
- 12. Information center
- 13. Courtyard





SECOND FLOOR PLAN

Girls School:

- 1. Offices
- 2. Communal space
- 3. Washrooms

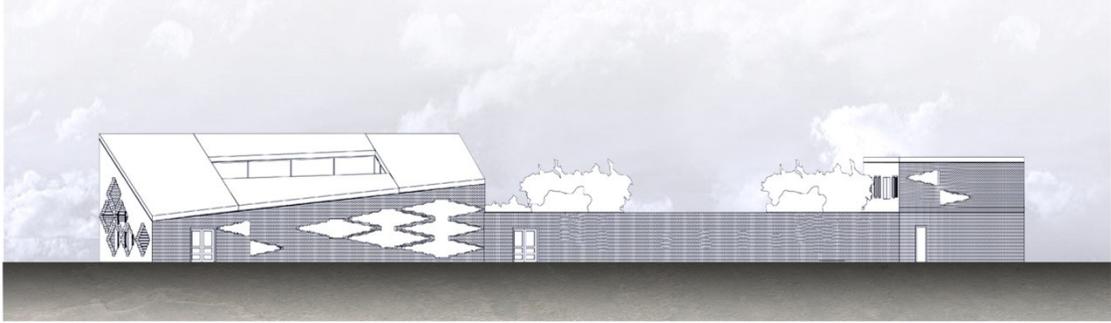
Boys School:

- 4. Offices
- 5. Communal space
- 6. Washrooms

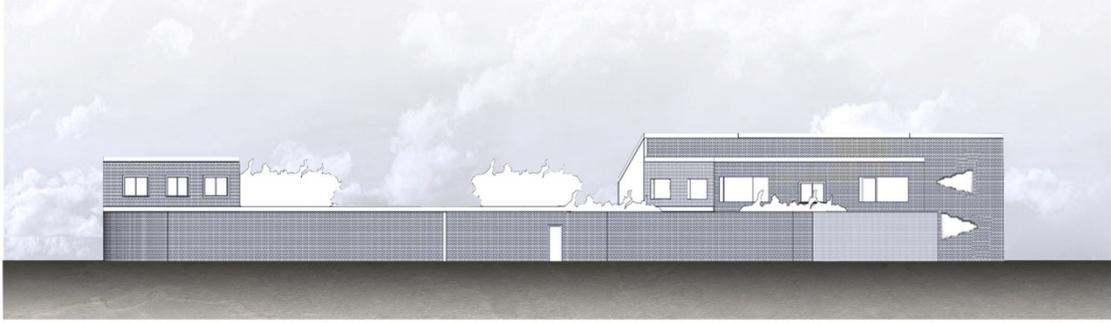
Multi Purpose Spaces:

- 7. Crafts shop
- 8. Coffee shop
- 9. Study room

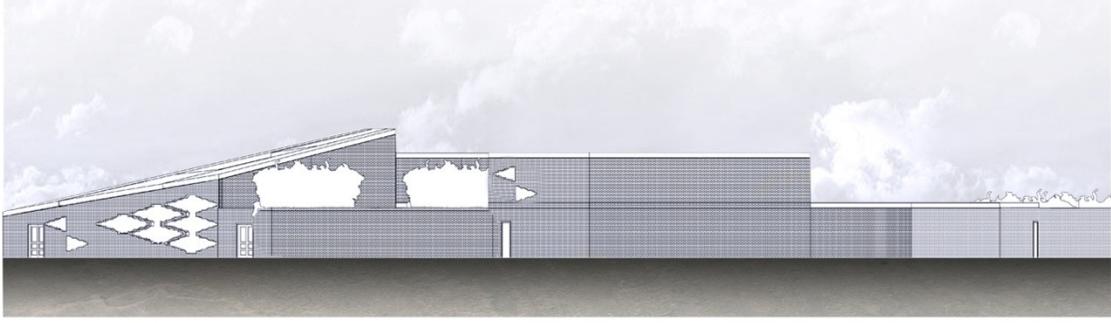




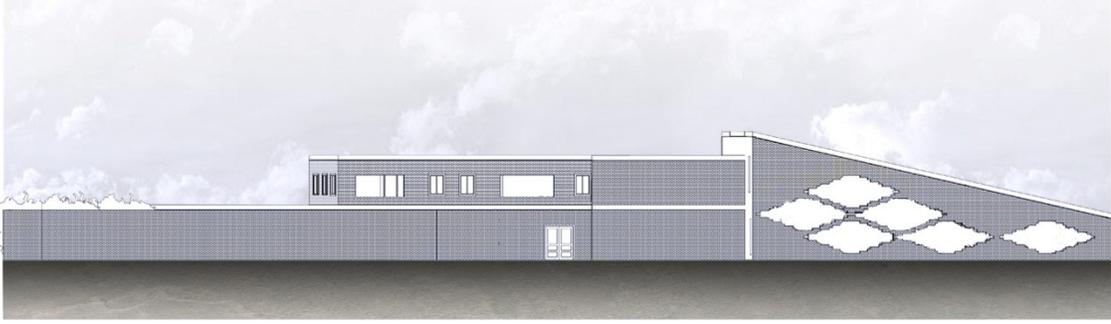
WEST ELEVATION



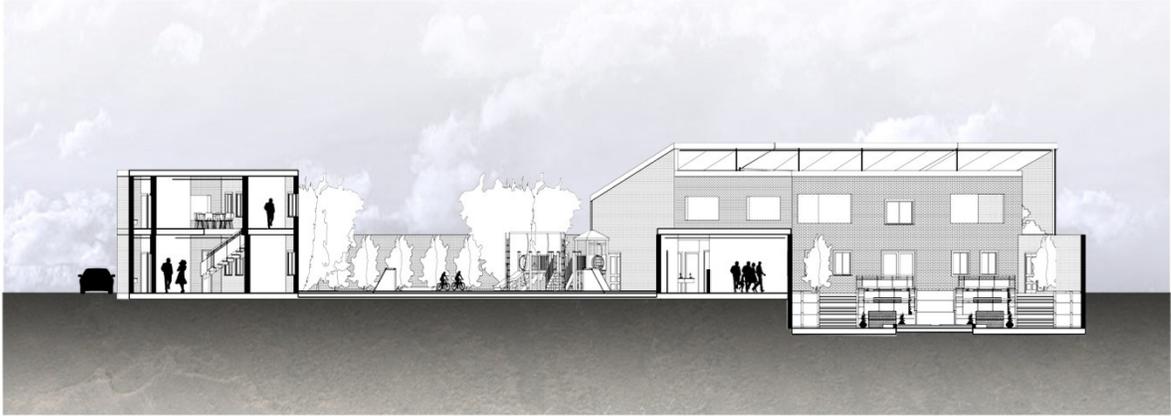
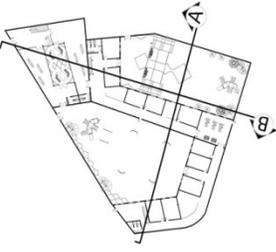
EAST ELEVATION



SOUTH ELEVATION



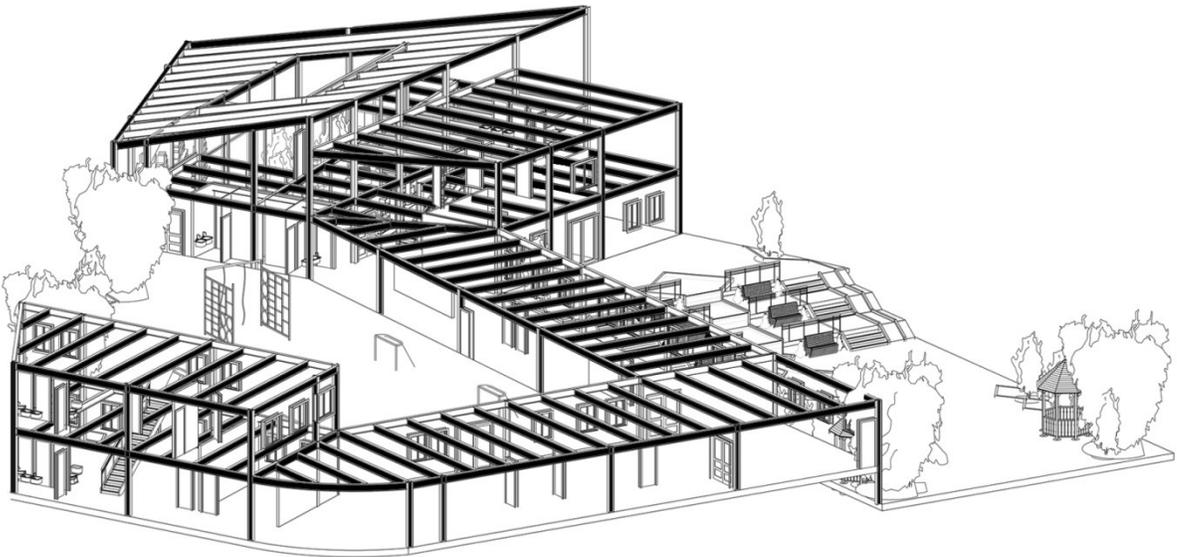
NORTH ELEVATION



SECTION A



SECTION B



STRUCTURE



GIRLS SCHOOL COURTYARD



BOYS SCHOOL COURTYARD



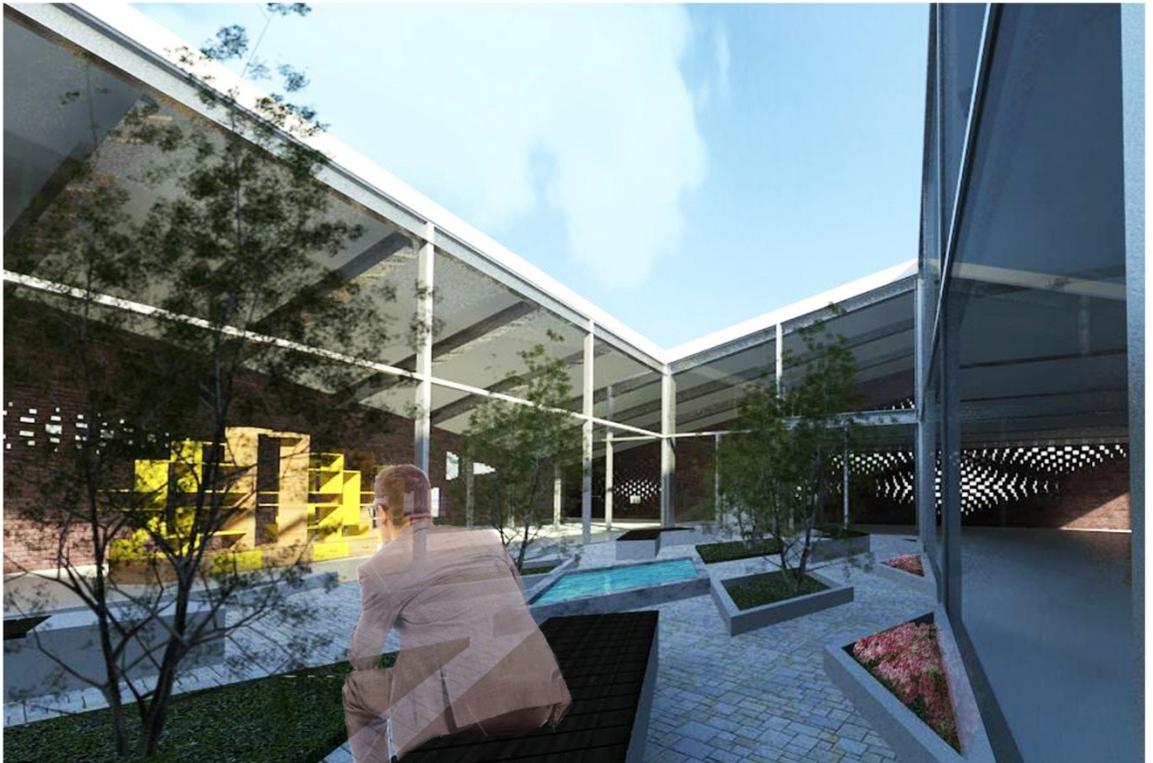
INTERIOR SPACE/ WORKSHOP



INTERIOR SPACE/ CLASSROOM



LIBRARY ENTRY



LIBRARY COURTYARD



INTERIOR SPACE/ STUDY ROOM

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