Rehabilitation and renovation in the Islamic era urban planning style historical heritage

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ABSTRACT

Cities and historical textures rehabilitation and renovation as identity and demonstrator of urban culture, are emphasized. The issue of rehabilitation and renovation of these areas has been considered very low. Unfortunately, Iran, due to using the most imitative plans and considering only physical problems has not been able to make optimum use of these valuable spaces. Research methodology in this study is descriptive-analytical method and based on data that obtained from field observation and library study, have been tried to collect, evaluated and analyzed them. Also, using the historical methods, the evolution of urban renewal and renovation is considered. With using this research some general principles for improving valuable buildings and maintaining their identity have been offered. The next step according to the identification and analysis of the rehabilitation map, the location and urban deterioration is discussed.

INTRODUCTION

According to past researches, executing every architecture design (plan) depends on three elements: first, the society that needs that plan, second, people or person who supports the plan executing and guarantees its financial cost. Third an architect that execute the plan. A motivating factor for studying and researching architecture in Iran is that we can understand how these three factors affect each other, so that a building can be constructed. Building's application shows how Iran's architecture is being developed during last 15 centuries. In each era different construction are created that have various applications, such as buildings in suburbs, towns, roads, deserts, mountainous roads and coastal cities. The importance of Islamic architecture is being paid attention when we consider the application of earthen and spiritual in these buildings that are important feature of this type of architecture. To do so, it is necessary to notice building's grouping and their applications.

Generally, Iran's historical constructions are divided into two groups:

a) Religious buildings (construction) as masques, monuments, schools, Mosallas (Figure 1)

b)
c) Irreligious buildings (construction) as bridges, places, inns, bathes, castles (figure 2)

Fig. 2:

Architects designed old-fashioned constructions differently. In each historical era a different decoration elements were used. For example, in Seljuk era brick works, in Ilkhani era stalactite and in Teymoorian and Safavian era tile- work were common and in some cases the brick work, stalactite and tile work were used with together.

1. Islamic era urban planning features:

Islamic architecture is based on Quran language and it shows the depth of Islam civilization by using spiritual properties, so that religious belief to God and trust to Islamic doctrine are represented as an aesthetic thought of religion in Islamic architecture. Items remained since pre – Islamic era shows that since human beings knew art, which traced to thousand years ago, he started to design the animals which were extinct on walls, to show his abilities and skills. In fact, art was a tool for communication before the advent of language and literature in human life.

When human being civilized, there was a serious change in his skills which are observable in Islamic and non Islamic countries now. Some of them traced back to seventh millennium before A. D. however, an art that attracted human being more than other were architecture and fine arts which were created on objects and buildings by human.

Architecture was an art that showed identity and culture other than color diversity so that it can be shown in pictures and gravures. In the built palaces in Omavian era, there were colorful and non colorful gravures by old photos. Human hand scripts, dishes and furniture’s that are important and noticeable today, all show his interest and relationship with art. (Figure 3)
Therefore, there are differences between architecture and architecture art. In fact they are two completely different items. Architecting is to build constructions that is doing social duty and giving service to public, like building housing constructions, religious and/or academic ones. But in an architecture art, emphasize is more on artistic masterpieces and decorative achievements on walls, ceiling, pillars, windows, and doors; even gardens and pools are mixed by art so that it affects on viewers viewpoint more.

Islamic architecture art was developed by considering special principles and skill full architects attempts that were innovating master pieces which approved the religions view and understanding of people; In fact, this type of architecting is based on opinions, experiences and innovations of architect. This resulted in diversity and various options in Islamic architecture. Also, as this type of architectures source was Qoran, it could represent Islamic theme by spiritual properties.

Since there are many differences between architecture and architecture art, Islamic architecting has various characteristics which make it different from other style of constructing. These determinants includes scientific geometry and innovative arts that are taken from spiritual thoughts. An innovation that an architect applied is a style that has not had any records before and this is because of the existence of religious properties in aesthetic thought in Islamic that is represented in Islamic architecturing. The relationship between architecting and Islam is a symbol of believe in God, trust and act based on Islamic rules. Monotheism thought which is based on the belief in God was a style that was using in most Islamic arts as an original subject.

Islamic architecture was an art which was used not only in religious places as mosques, but also in schools, shrines, palaces and even in houses and bathes. Mathematical scales geometry was paid attention more in Islamic architecting.

2. Architecting style in Seljuk era:

Seljuks were Ghaz Torkan that entered Iran to occupy fertile grounds of Maveraunnehir and the can occupy Asia Minor too. So, Seljuk dynasty was established.

Seljuk era was one of the impressive eras in arts especially architecture. Different industries were developed and continued as past trends. Architecting has special strength in this era. Even after thousand year, the remained buildings show skills and abilities of architects.

Art development in this era is because of political stability and tranquility of Seljuk territory in which artists created different works. Also as this dynasty's minister was an efficient person so industries and skills were improved more. Hence the architecture of this era can be described as sedate, powerful and beautiful. As this era was close to traditional Iran for four centuries, so general plan of Sasanian's four-porches can be observed in it. The plan of mosques and schools were in the form of four-porches with wall arcades. Creation of huge domes on arch earring in religious places and monuments were other properties of this era. In all constructions that were built during this era, facade had a great importance. Brick made buildings and their decoration included geometrical lines and frames which were made by brick, stalactite, diaphoretic tile works, and kofi inscriptions.
3. **Architecting style in Ilkhani era:**

After a century that Moghuls inhabited in Iran, in eighth century, there was an extended movement of construction. It possibly because of Qazan khan reforms which affect architecture and designing. Soltan Mohammad Khodabande deputy of Qazan khan moved the countries’ capital from Tabriz to Soltanieh and after just a few years this city changed to a very important city as Tabriz and Maraqeh and artists and architects were invited to Soltanieh by Khaje Rashid Aldin who manage Eljaytoo ministry. According to historians at this time lots of houses, hospitals and mosques were built in Soltanieh. According to above mentioned issues it can be said that Ilkhani architecture applied Seljuk architecting Techniques and frameworks in other words, Ilkhani architecture fallowed Seljuki era architectures and it was not a totally new style. In this era again there were high emphasize on building monuments and mosques than other constructions. And the style of these constructions was traditional and in the form of Seljuki style. But Moghols turned to constructing high skyscrapers and great domes to show their power and then to increase the greatness of buildings, they decorated buildings' views by narrow and tall frames and sharp arches. Using glazed and not glazed bricks chalk and brick spices in Mosaic, blue tiles with colorfull paintings, nice kufi inscriptions with decorative ribbons and narrow stalactite works also were common. (Figure 5)

4. **Architecting style in Teymoori era:**

Simultaneously with Ilkhanian decline and local governments which remained simulate un eously with Ilkhanian decline and local governments which remained from that era, there was a new attack chain from Mavarunnehir with cruel dynasty of Teymoor to Iran that attacked all parts of Khorasan and mountains or the west part of Iran and Fars and some parts of nearby areas. This campaign was not limited to Iran but it continued to Mossccco and Dameshq in Syria and India in one side and to the west of Osman Empire which resulted in victory. These attacks had different effects in different parts areas, but in Iran and Iranian civilization it tended to some Turkmen dynasties in one part and to the deputies of Teymoor in other part. Torkamanan took power in Iran's west and central parts and even in southern parts. Torkamen government remained in various areas of Iran who were of Qaraquinloo and Agguinloo and it continued to Safavieh appearance. Shahrokh Mirza, son of Teymoor who took power after his father, was completely opposite of his father. He was a cultured man with non army behavior who made art, architecture and culture popular. This characteristics continued in some deputies’ of Shahrokh era and people like Olq Beyk were can side red as artists and scientist of their era.

All of these factors and particularly the richness of Teymoor and together nests of these factors many artists in areas as Samarqand caused the creation of magnificent artistic, architecture, painting and calligraphy by the support of Shahrokh Teymoori and his wife Goharshad. Art was transferred in generations during Teymoor and his deputies’ era that was so cruel and oppressive. Education also developed effective in this era erafora short time. Olq Beigi Obserratory that was of those buildings, constructed in the mentioned period by the supervising of the great scientist, Ghiasadoliu Jamshid Kashani.

Persian Graphes as Nastaliq was formed in Teymoor s deputy’s era and evolved in this period. Several pieces of the best Iranian architecture works were built in this period as Ghoharshad mosque in Mashhad nearby Eman Reza Shrine. This mosque which was contracted under the supervision of Ghoharshad, wife of Shahrokh Teymoori, is one of the masterpieces of architecture in Iran. In one corner of inscriptions of this mosque and in its small porch, there is an inscription which was written by Bysaugoz Mirza who was a grandson of Teymoor and a great artist of his era.

All monuments format was according to Seljukera but because of Moghals dominance, their scale and size was changed greatly and their decorations were paid attention more.

Constructions often were four porches style with high porches and decorated arches that had stalactite, works which mostly included magnificent and great tile works and diaphoretics. One of the features of Teymoorian era construction was bulbaceous doxes. The style of architecture in this era was mixed by colors which can be represented in gold Kofi and Naskh in blue tiles. (Figure 6)
Fig. 6:

5. Architecture style in Safavieh era:

One of the noticeable art eras after Islam was Safaviye. Shah Esmaeiel established Safavi dynasty in 907 B. C (1502 C). Art and industrial Couture’s and clubs were improved in this era in Iran. Tabriz was country's capita in initial years of this dynasty and because of that, this city was considered as a center for artists as calligraphers, illuminators, painters and bookmakers also for artists who work in other fields of industry and textile industry.

In the end of tenth century, when Shah Abbas ruled, capital of country moved from Qazvin to Isfahan. By choosing this city as the capital of country, Isfahan improved as one of the best cities among eastern cities. Malls, palaces, mosques, gardens, bridges were put in the map of city. All religious building in this city was decorated by tile works. Sheykh Lotfallah, Gheysarieh façade and Imam (shah) masque in Naghshe-Jahan cross all are decorated by diaphoretic tile works.

Designed tile with square bricks which were called “multi colors” bricks were utilized extensively. Design of tiles and their colors made buildings magnificent. Not only walls of buildings were decorated by tile and mosaics but also domes, porches, arches, entrance façades, minarets also decorated as like. In this era, building great façade by clear tiles and stalactittile works were common. Compounding great façade and its side minarets with four-porch Apron and surrounded buildings and constructing dome that was suitable with the whole building developed greatly in Safavi era. As Iran had security in the mentioned period. So great and magnificent buildings were built in Qazvin as Ali Qapoo palaces, Chehel Soton, Hasht Behesht, and Ashraf palace in Isfahan and Shahzadeh-Hossein monument, Ali Qapoo façade and Chehel soton in Qazvin.

Walls of these palaces were covered by colorful tiles and famous painters’ designs. Ceiling and walls also decorated by wood carving.

Wooden decorations had main role in non religious buildings and there were high level of illuminations and paintings. Their designs related to miniature engraving and woodturning especially a doors and ceilings were common. Walls’ paintings (Farsak) in Ali Qapoo palace, Ashraf palace and Chehel sotoon and mirrors were a new decoration design that used in buildings as Aiyineekhan.

Generally, the year 1579 C, was considered as one of the best era for Iran's Islamic Arts' development and Isfahan was one of the main and the most beautiful cities of this era. Great buildings in the city were decorated by nice tile works when Shah Abbas made Isfahan as his capital he decided a new plan for this city. He built the great and famous street of this city, called Chaharbaq and ordered to plant two sides of the street. This street reaches to great bridge of Zayanderood. There is a great cross in the center of city. Called “Naghshe Jahan”.

Imam (Shah) mosque was in southern part and Ali Qapoo palace was in western part, Sheikh Lotfollah mosque was in Eastern part and Qeysarieh façade was located in Northern part of this palace was a place for polo and rock made gate that were built for this game, Now they are there in two sides of cross. In four sides of this cross there are two hundred chambers that were built in two floors.

Buildings were in the form of four-porches and more attention was paid to the great porches. In religious glazed tiles, diaphoretics were used in decoration of outside and inside walls, Arches, Minarets, domes Altars. Naskh inscriptions which were white and bright were utilized in Niches and entrance light was put through windows in dome's hand which made the environment spiritual. In up-country buildings, wooden decoration had main role and was covered by illumination and paintings.
6. Architecture style in Ghajar era:

There have not been so many researches on Ghajar era's constructions. This era was not paid attention like others. The monuments of this period as religious, housing, palaces were numerous. Although we are near to this time. Buildings of the past periods were destroyed by their next generations or they changed to some extent. This period is called Iranian architecture stagnant period. However all those buildings which are valuable as traditional constructions belong to this era?

Famous monuments that a remained since Ghajar dynasty are Agha Bozorg mosque, Kashan famous houses, Tehran Sepahsalar mosque, Semnan Soltani mosque, Qom great Karavansarai, Kashan Aminoddoleh Karavan Sarai, Tabriz Mozaffarieh inn and nearly all traditional malls. Even traditional malls which are remained in Isfahan and Qazvin, where were Safavieh capitals, all belong to Ghajar. (Figure 2-8)

Fig. 7:

Fig. 8:

Ghajar architecture is divided into 3 periods.
1- Pre-Naseri Architecture
2- Naseri Architecture
3- post-Naseri Architecture

Pre-Naseri Architecture is the fallow of Zandieh architecture. There were many buildings which were built in this era and particularly in Fathali Shah Era, there were innovation opportunity. At this time new talents were discovered. And new ways for architecture were designed.

One of the main features of this period was lack of exaggerated tile-works which were used Safavieh. In this era, brick architectures were mixed with colorful spaces.

Second era was Nasery in which bargaining has extended for 50 years in Iran because of political stability and Iran's economy developed. So because of the high level of extended cultural-commercial bargaining with Europe and king trips Europe, first serious movement toward compounding Iranian architecture with European architecture has started. King's sons, his members of royal court and particularly his own palaces are examples
of this compounding. These architectures not only didn’t construct the architectures which were replied but some works like Shamsolemareh and Malijek palace were good examples of this style.

The third period architecture was so decorative. There were extended constructions and elements and even European architecture temples opened room for themselves in usual houses. Though in some buildings as mosques and malls fallowed Iran traditional architecture. Generally, Ghajar architecture features were notable in 6 areas:

1. Transferring all Iranian architecture concepts
2. Using space temples and construction techniques freely
3. Attracting imported concepts
4. Introducing an architecture style mixed with identity
5. Using colours extensively and differently
6. Constructing more and extensively

In fact, Ghajar architecture improved old principles, bases and temples of Iran architecture and created innovation in spaces, but it seems not to create a new architecture style. This era should be called Iran's architecture decline because compared with the most beautiful buildings of Safavi era, there was not an equivalent construction that has ever built.

The most magnificent building was for Fathalishah which was an imitation of Safavi constructions and most of the main decorations were taken from European art. The degree of Ghajar architecture is a controvertible issue in Iran's past architecture history (before the modern era). If architecture works are assessed by space viewpoint and space innovation is considered in architecture, Ghajar architecture will become important and will be graded in high level than past architecture styles like those of Zandieh and Safavieh, and this is because of improvements of space innovation in this era.

Spaces are opened in this period and Iran's traditional temples are developed by space. So if we consider architecture evolve by space, clearance and spaces' lightness, so Ghajar era is evolution of Iran's old architecture; but if architecture is considered by size, proportions forms and decoration, so Ghajar architecture has declining condition than past periods specially Safavi era forms are not strict like the past styles which are superficial. Sizes are not so exact. Proportions are at lower level than harmonies proportions in the past eras.

7. Investigating principles and historical buildings’ repairing plan:

In pathological plants of a cultural building, there should be a schedualed plan for special plans. Detecting damaging factors and studying the findings can be accomplished mainly by scientific and research based surveys.

Damage: is a situation in which all or parts of building, loss its' tolerance, it means a situation which results to fault and damage, like cracks.

Weariness: It is a change in material which results to decline in resistance, tearless, material decomposition and porosity and... it is from outside to inside.

In this chapter, issues related to the detection, damages and shortcomings created in used materials in old buildings because of different Types of damages, wear nesses and possible reasons of them by surround environment and human factors in cultural & historical buildings, are presented. In fact, these symbols were descriptions that were achieved by surveys and visual analysis. Material weariness is a trend which is resulted of essential material’s destroy and heterogeneous types. These factors could include Physical, chemical and biological effects of environment. These changes cal be divided into two groups as outside pathology and structural pathology that are affected by environment as fallow;

1. Erosion: includes superficial and situational erosion that affects objects monotonous and flexible. Like removing materials of surface and exposing in open air, by mechanical pounding, freezing, salty materials attack or the effect of chemical materials in rainy weather, snowing, and oxidation and so on. (Figure 9)
2. Color change: materials in air, free moisture, in weather and acid rain which are resulted of pollution, smog’s, metal oxidation pollutants, or air materials, erosion. (Figure 10)

Fig. 10:

3. Forming scurf’s: is the process of rising moisture, pausing moisture, and other pollutants on the surface because of the solution of salts and their transfer from inside to the surface. (Figure 11)

Fig. 11:

4. Damages resulted of biological activities: fungus, moss, insects all are factors that destroy cultural buildings. (Figure 12)

Fig. 12:

5. Galling: Surfaces that are exposed to an open air, their sub surfaces, are gulled because of freezing and melting in winter and in cold weather. (Figure 13)
Fig. 13:

7- Lack of tolerance in mechanical forces of environment: This group includes layering and cracking because of mechanical forces which results to building destroy. (Figure 14)

Fig. 14:

Contexts and centers which are valued culturally and historically in Iran are getting declined because of lack of paying attention to them. One of the initial measures that should be taken is their repair. Old building repair allocated many years to themselves in Iran because of different reasons and popular policies in the center of these centers management. But these buildings can not be repaired separated of environment and their daily needs. We can replace repairing plan of buildings into 4 levels as fallow, if we consider repair as reforming plan of old buildings:

  First layer: Introducing a general detailed plan for all contexts.
  Second layer: Detecting conduct structure and its improvement.
  Third layer: Old mono – constructions that have requirement.
  Forth layer: Offering new construction temple.

This issue is formed based on the third layer of reforming old contexts. So in repairing an old building, doing a pathological study of building in addition to other surveys in building is necessary. This TEZ tries to describe different steps in pathological study and detecting damages and natural, humanitarian factors, material used in building and used techniques and replacement methods for construction elements of making building resistant. Historical contents acted naturally in the past and this was because of their natural and organic formation and also their repetitive reformation. However nowadays this trend in their growth and change, has shifted from their natural case and acts superficially like other aspects of life. So, current situation of historical contexts can be considered as natural context of a sick person, an animated identity who tries to keep him alive. But the orientation of these activities sometimes makes that identity superficial so that he can continue his life by a borrowed organ. So as life of human being has similarities with architecture and also because we have accepted that current architecture is the reformation of past decade’s plans, therefore all attempts which are accomplished to make the historical contexts alive can be considered as any attempt for a sick person to make
him alive. In other words as current architecture has left it’s dynamics along with its valuable trend in the past, so we can not hope to inject this trend to historical contexts or their substructures (houses, religious, commercial, buildings, so on), and it would be better to wait till lapse changes past monument’s value to new modern and historical bodies.

Along with those mentioned, our goal is to revive hidden architecture frameworks and their values and to do this, plans should be devised to revive not only a historical construction but also to its structure. This is because in ideal and valuable constricctions, architecture and structure of building won’t be separated.

7.1. Structure revival:

This revival can be observed in accompany with a building’s architecture reveal. It is necessary to use up to dated techniques and concepts in reviving an architecture construction and its structure.

Fallowing notes can be detected of comparing a historian context and a person’s animated organs and his cells. In a common methods of making a historical construction firm, using modern material as iron and applying it among loading pillars to transfer power to the foundation, are standard. And if iron isn’t congruent with brick, so there will be unpleasant results to building and this could be because of different reactions against earthquake or even cold and hot weather. Modern material used in building a construction can be considered as a superficial organ in an animated context in which in some cases there will be some unsavory effects because of this superficial organ.

Therefore, by devising new plans, modern architecture concepts can be applied in the format of new and homogenous structure. More homogenous materials, as new concrete or even material which are produced from natural mug by modern methods, can be used in organs so that they are harmonious with new concepts.

7.2. Applying new structures in old structure:

Utilized structures in old constructions are mostly intensive structures which are in harmony with their current time’s architecture concepts and common technology. However, as there are more modern structure systems which tend to lighten the structure along with tolerating the load, so we can achieve type of structure revival, as an example by using cable structure which includes designed connections, the load of construction which is intolerable to old constructions, could be transferred new structure. It is necessary to mention that use of these structures should be in the fine architecture formats and suitable to the historical building’s life. This proportion has risen for them which can return architecture spirit and life to them. Form life to old buildings just by accurate supervising of experts.

7.3. A model of vivification factor:

Absence of homogeneous construction materials that used for customary manners mending that expressed in the first case. From the view point of understandable also is qualified to examination with vivification factor of attitude. Also use from ancient materials and it has some problems. For example: use from wood for neutralize Driving forces although homogeneous wood it has with traditional materials but for the reason of decay and weakness of connections and also vulnerable opposite to termite’s attacks, it seems that's not appropriate. It might be possible from the view point of understandable with concepts architectural of vivification it doesn't become alike. In addition to use from new materials such as: iron beam accordingly to be burial among building’s suture. Sense of itself for use from new structure it might be burial with itself. This time is that factor of historical buildings. It should be synchronization and to be alive activity and operation of architectural become active. With all of these descriptions some thing process of building’s weariness aggravation and resistance opposite to interior and exterior’s injuries it can to decrease cutting off the life's current. According to real sense in the places and one by one are element’s factors. Life that has humans who are messengers which these buildings just raised for respect of their being and also being themselves who they can change the skeleton and spirit to places of architectural. From the view point of vocational vivification factor they can with correct supervisin by experts to this pulse of life it can grant porch again.

8. Repairing:

There has been much time which is allocated to repair old buildings for different reasons and according to determined theoretical frameworks and common policies for managing these buildings. An important issue that should not be ignored is that building should not be taken into consideration separately from their environment and their daily needs. If we believe in repining building as a comprehensive plan for most valuable and old buildings, so we can define a chain for devising a reforming plan as fallow.

If a reforming plan includes all principles and goals of executing, it can be defined in 4 levels:

First level: A general detailed plan which determines context’s limitation, general construction by specifying type of operation, density, proposed network and construction rules as other plans but more clearly and exactly.
Second level: This level includes context’s structure and its improvement which determines the main structure of context in large scale. In the main structure of context, concentrated management of construction is more emphasized.

Third level: Elements of context or old buildings which are considered as subordinate construction, but because of their historical, cultural, and social values in line with their main structure and also because of their new need, should be repaired or revived.

Forth level: Is planning lousing temples which is designed as a concrete example of offered rules in one level and as construction temple for other parts of contexts.

According to issues mentioned, repairing and reviving old building in the context should be accomplished based on 3rd level in reforming plan, but some things that are important here is to do pathological studies in repairing and reviving process based on theoretical opinions and views.

8.1. Different steps in doing studies and offering a repair plan:

There are lots of different and experienced methods which are similar by not considering their theoretical and methodological aspects. When a building is under study, any changing actions in executing the plan should be avoided.

A construction which is under repairing measures is like a sick person who see the doctor for examination and diagnosis and except in some cases that may destroy parts of construction, interference in its situation can cause unpleasant damages.

Unless when there is an urgent need because of technological reasons which can refrain from its weariness temporarily.

As mentioned before, there are different methods which are used for doing researches and proposing plans for old buildings, repairing and reviving. Here we discuss two of those methods.

8.2. Researching method for studying old building to revive them:

1. Understanding current condition of building and detecting weariness factors, phenomenon and effects.
2. Relationship between buildings with environment.
3. Elements of building (formed part of building)
4. Elements and part of building

8.3. Detecting building’s weariness factors, phenomenon and effects:

1. Inside of building’s factors
2. Factors related to the location of construction (building)
3. Biological factors
4. Factors related to building’s structure
5. Natural factors that are periodic and have continuous effects on construction
6. Natural factors that are unpredictable
7. Human factors related to environment

8.4. Devising justified and inequivalent plans and assessing them and select one of them:

1. Offering a general plan and reviving executable maps

Fallowing the mentioned items guarantees nearly all issues related to an old building construction and there are rare situations in which a building damaged in one field of the mentioned ones. But it is necessary to say that when there are some erosive factors in building’s identity which are determined in related areas, so it is obligatory to distinguish the connections and relations of them. There for a repairing architect mostly find the problems that are results of the mentioned study and in which quality, quantity and inside relationship among element are reflected.

8.5. Different steps of repairing:

1. Danger obviation
2. Eliminating the need to identify risk
3. Complete and accurate identification of worn parts
4. Identify and review procedures, operative technique and the technique used to clear it done as soon as possible.
5. lack of parts or the whole building while eliminating the risk
6. Restoration shielding and strength
7. investigate and identify the factors that have been instrumental in changing the equilibrium conditions (pathology)
8. restorations the strength of its technology and expertise in restoration
9. Review various options for restoration, protection and strength and to choose the optimal method.
10. calculation of repair strength by drummer technical engineer surveyor
11. A comprehensive repair or complete.

8.6. The pathological studies on restoration plan:
The lesions and degenerative and destructive factors is the most important part of the process of the restoration plan. Destructive factors such as aging continues over time, especially in old 
Buildings not built to handle the situation, conditions in damage to old buildings provide figures. Pathology as detailed studies in order to identify the damage to buildings if properly compiled on the basis of an application fails; it cannot well be useful in restoration strategies. As the consequences of an incorrect diagnosis of the disease, the patient is impaired and prolongs the duration of the illness.
The proposed process in pathology studies in this thesis is to provide some action plan result restoration and opinions of the experts and scholars.

8.7. The process of Pathology:
All technical and experimental pathology studies and studies based on eyewitness accounts. The correct classification of findings and technical capacity for reversal of eyewitness accounts that the specification of a process, the correct conclusion is significant. In this section we describe the different stages of pathology, will be:
1. View: As mentioned earlier, just see the first steps taken in any objective.
2. Identify materials used 
There are two areas of interest in terms of chemistry and chemical characteristics and behavior of the functional and behavioral. Chemistry and materials science experts and the results are quite accurate and can be used for laboratory analysis. What about the building materials used are considered and applied behavior is discussed.
3. Define and separate injury
In view of an old building, especially if you lost your activation director at the time of injury is seen differently. Which is exactly the part of the building and damaging elements be identified. There are separate categories of damages.
These categories can be separated very well documented in research and pathology practice can be documented. Thus for any malicious damage appears to be part of the building as well as damage to the body through the presentation. And if this is the same injury that typically occurs from various damaging factors.
4. Erosion damage
Erosion damage, damage that can damage the appearance and destruction, and there are complications in the short and long term impact of continuous partial Damaging agents is significant. Not threaten the stability of erosion damage, but if they do not contain the desired shape of the harm they suffered.
5. structural damage
Especially in the areas of structural damage to the foundation and load-bearing structures, often suffer serious complications and eliminate costly, time consuming and very sensitive. If the ceiling, walls and generally levels are set so that the shape of the fall, the entity is impaired. Very old buildings are crumbling because parts of them, the original image is difficult or even impossible.
Major structural damage can be addressed in detail below:
- Eating more of the following points below the pressure twist
- Loss of sub stance in the building skeleton
- Change the shape, sag and reduced cracking resistance of structural elements and the elements resulting from their disintegration
- Bending, torsion or tension perpendicular to the walls because of the loss of their strength
- Effects of bending and buckling problems associated with joint connections
- Sag vertical elements due to local decrease in physical infrastructure Barber
- Fractures, cracks and corrosion of internal tissue building elements for local destructions
The sum can be considered a form of structural damage and Behavior of be classified as follows:
- Crack
- Buoyancy
- Buckling
- Bending
- Sinking
- Demolition
- Expandable layers (failure)
- Leap roof
9. **Documentation:**

The damage to the building, and systematic method of documenting it later analysis easier and more accurate to conclude the discussions. Pathology can be documented with a little information and a complete set of the frame so as to provide a birth certificate. In cases where the physical card is recommended as follows:

1. the little details of building:
   - Land, Infrastructure, occupancy levels
   - Number of floors
   - Number of inputs
2. The physical data:
   - For (current and previous)
   - Old building
3. Info on a map:
   - Situation
   - Plans
   - Views and sections
4. The model information:
   - Model inputs
   - Brickwork pattern
   - Pattern Decoration
   - Pattern Styles
5. the damage to the building:
6. erosion damage:
   - Type of injury
   - Cause damage
7. structural damage:
   - Type of injury
   - Cause damage
8. stances damaged:
   - Columns
   - Internal and external coats
   - Covering of roofs
   - Decorating
   - Floor
   - The walls are Spacers
9. Illustration of injuries:
   - Take photos of the damaged stances
   - Repair damaged details of essential injuries
10. Evaluation of damage:
    - - Critical Condition
    - - Abnormal conditions
    - - Emergency situations
    - - Terms of conventional

50 to 75 percent in the last abnormal condition demolition 75 to 100 percent, is in critical condition.

10. **The greatest damage:**

Pathology studies rarely happen that a structure is damaged in all the land. Significant damage to the building and determine the contribution of each of them to make percent result, few studies have documented, the process can be done at this stage.

11. **The damaging elements:**

Factors damaging or destroying a sense of exhaustion, factors that are critical points of structural weakness or that the damages. Factors damaging the surrounding structure, constituent parts and elements and components are connected. As previously mentioned, these factors have different divisions. This division may be cited as follows:

1. The first category
   - Natural Factors
   - Social factors and Resumes
   - Degradation factors related to lifestyle machine
   - Causes direct damage to the people and the rulers of the time
2. Category II
3. The Internal factors:
   - Location of the factors and phenomena related to the
   - Environmental and biological factors.
4. factors outside the building:
   - Continuing impact on the course of natural causes
   - Natural factors, unexpected and almost unforeseen
   - Human Factors and the Environment

After determining damage and harmful factors, it can be concluded that most of the damage and what kind of predicate. In the case of acid damaging agents is offered.

12. Classification of damage:
   The classification of elements, grouping them separately of harm's way. This classification provides a better implementation of technical solutions. However, it should be noted that the position of each of their classification in groups and harmful factors, are associated matrix.

13. The critical points:
   Where the harmful effect caused due to loss of strength resulting in injury is imbalanced. The critical points are the factors that make them harmful to sensitive areas on the basis of these factors can be categorized as follows:
   1. shape, form, details of the performance (sensitivity, shape)
   2. their position in the structure (position sensitive)
   3. less resistance of materials implemented (Sensitivity – Structural)

   The cause harmful changes to the system create stability and balance.
   This changes the apparent stability of the cross-border stability, the absence of critical points balance is the mass of the building is the same injury. Generally is related injury, damaging elements and the critical points presented in the form below:
   - Following the surrounding area: This area of land in the inner moisture and humidity confluence of ground and moisture from rainfall in foreign parts.
   - Where the building is located on a slope: the collision of fast flowing water, rain, rain for miles and are more prone to leaching.
   - Pores in which the water is exposed to air and moisture to penetrate.
   - Points that is located on the corner like the edges of roofs, corner walls, floors and windows.
   - Junction of roofs and walls can handle the extra stress.
   - The middle sections of flat roofs that are exposed to bending.

14. Fixing damage:
   After identifying the factors that cause damage and destruction and exhaustion are the erosion and structural damage as well as the most effective remedy would be to fix the damage. But the important point is that the fix damage alone without considering the use of modern restoration plan is not comprehensive. In order to fix the damage that has been raised with regard to the facilities and space problems in restoration projects, removing the damage is done. Restoration of buildings of cultural value - artistic and historical followe dynamic view, which increases your maximum success at the same time trying to protect what is skeleton survive the last level of comprehensive utilization of the existence of a global cultural perspective with observe and coordinates location - local or die today for those who come later on.

   Another point of interest is the harm in removing the use of building materials and other related specialties at this stage of the process. Removal or replacement of worn bearing interest calculated on offers engineers, materials engineers and scientists working on the chemistry offer protective coverings are examples of such cooperation.
   1. Suggestions Terms and fix the damage:
      The first step, after analyzing the results of the analysis of the damage and harmful factors, implementing strategies to eliminate damage. The suggestions and guidelines should fix damaged concrete goals and strategies outlined in the analytical discussions of pathology.
   2. address details of damage
      Fixing details damages, according to the guidelines provided, administrative facilities, and as mentioned the restored plan (Plan Resuscitation) is produced.
      The erosion damage can be presented to the public and so the structural damage, provided certain details stand is damaged. The erosion of injuries suffered in a modern and address details of all the scheduled process.
      But fix the structural damage can be done in the form of a restoration plan, which aims to ensure the shielding and strength of the skeletal resistance against destructive forces and factors.
3. Staging fix damage
Each issue need to do is plan. Type of injury, severity and weaknesses and how to use it to restore and revive the proposal.
Ports are factors that have an impact on performance. Generally be proposed program and fix the damage this program may be classified as follows:
4. Short term: fixes that result in damage or removal building danger be run from a lower cost and less time running, this will be set.
5. Middle term: obviation of dangers that it follows showing establishment new recommendation infrastructure is in design of vivification or need to more time from the view point of obviation danger also prepare their cost gradually on this group.
6. Long term: need much time to fix the damage they have done and also have high sensitivity in this group. Fixing the damage that can be mentioned in this group, the trim is repaired.

15. Conclusion:
As noted above, this process is based on eyewitness accounts and the technical and empirical studies have been set with reference to evidence. Damaging factors are imbalanced (the hot spots) and then fix the damage done to provide executable codes and offer details. Finally, the feasibility and the correct implementation schedule and staging suggestions to fix damage to short-term, medium-term, long-term offered.
Finally, we outline a summary of material (dissertation) have been stated as follows:
First, the restoration plan as part of a plan to improve the texture of old buildings and the grounds contain a value will be considered.
Second accordingly restoration plan is a procedure known as systematic and in that place pathologist studies to determine position.
Three of the pathology of the thesis concerning the proposed plan should be restored.

REFERENCES