Infill design, design principles of housing complexes in the tissues of valuable historic

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Abstract: Nowadays in most modern cities in the world, we have faced with the problem of uneven development of towns and cities and a lack of structural integrity. Historical contexts cities are one of the components of identity for the city and its citizens, thus preserving this historical heritage and its transmission to future generations is very important. After several decades of migration to the suburbs of the cities and the incidence of negative aspects of life in the suburbs, such as issues arising from the high traffic volume, travel time, waste of time, energy and economic costs and staying away houses and places of recreation and work with each other and cause social isolation and ... on the one hand the issues related to sustainability and sustainable development on the other side have been caused rehabilitation of development thinking and the recycling of urban spaces, and focusing on capacity development within urban areas, as one is listed in the field of urban design. In this regard, it seems, the use of the concept of infill textures as the communicative joint of existing and upcoming developments has been urban catalyst role in the continuous development of cities and induce a sense of continuity their structural. For purpose of above this project to investigate the properties and the characteristics of infill buildings in historic neighborhoods in the world to achieve the guiding principles and implementation guidelines, in order to design new structures will be discussed in historical context. For this purpose, in order to achieve a global approach to this issue, study the theory theorists, then, check specs and features of historic neighborhoods in District 12 will be discussed in Tehran. To find solutions, in addition to housing for citizens, which today can be represented the contemporary architectural thinking, and can be placed next to the city's historic structures.

Introduction

During the time cities are continually changing. The city is also in the group's life change and renewal. New buildings are replaced older buildings, and the process is constantly forming cities changed as well. In the past two decades, uncontrolled urban growth, without doubt serious and irreparable damage has been caused. The core of the old historic towns and urban poor has been faced by imposing schemes, and as a result, implementation of these projects in the form of damages has been created. (Khaksari, 13).

Historical context of cities is one component of identity for the city and its citizens, therefore, protecting this heritage and passing it on to future generations is very important.

Infill development, a form of urban development on derelict and abandoned and unused land within cities is formed (Falacoener and Frank). One aspect of successful design is understanding the context of existing and appropriate response to that since historic buildings response to their environment cultural, social, historical, political, economic, and their physical; in the same way, new developments in a valuable environment should be understand the character of location, and is responded to it with practices of modern times.
The impact of new buildings in the context of existing cities was gradually studied further, and concern about its negative impact on identity constructions historical context was raised. In 1983, a conference was held in Rome by Aykrv and ICOMOS. At the summit, the term infill buildings were raised for first time. Timurid Shah in his research as new structures on the history, insists that compatibility with the field of pure imitation is never meant to be. Factors that should be considered in the design of historical contexts are: User, location, scale, form, materials and details. (Timurid and mazaheri, 2013).

The main objective of this study is providing administrative principles for the design of new buildings in the context of historical value that requires the identification of the characteristics of Iranian architecture, residential architecture's knowledge, principles and guidelines for designing residential Bnakhty is in historical context. The question that arises in this context is to design the new building in the historical context should be the main approach? What is involved in the production physical identity in historical context? In answer to these questions, hypotheses are formed as follows: 1 in new building design in a historical context should be created by maintaining visual continuity of work in accordance with the architectural paradigm day . 2. The rate of mass and height, fill empty surfaces, rhythms, and colorful palette of materials and details and elements of skyline are including factors that is set physical identity of the field. 3. Recognition of architectural pattern of scheme in the adjustments between design and context (the field of the historical context) is effective.

**Adequate accommodation**

In the contemporary era, one of the problems about the human society is the issue of adequate accommodation. It is desirable, ie, a condition that is consistent with the needs of users, this means that eligibility of cases sought of person who uses the phenomenon. Housing or living space should be had efficiency from two directions, one of accountability and create a comfortable environment. In terms of physical conditions this means that create an environment with optimum temperature, right pressure, reasonable humidity, air blind and good light, and so on, and the other. In terms of fulfilling the spiritual needs of the people, this means that creation of appropriate spaces with the lifestyle and the culture and social customs, if these two conditions together would be a perfect way to create the most favorable housing will be assembled.

**Infill development and New Urbanism**

In the statute New Urbanism and sustainable land use planning has been emphasized very much, and in its manifest infill development, the mixing land uses and density increased is recommended. Infill development in the statute is as means of protection from of environmental resources, economic investment and social protection bodies. Accordingly, the increased mixing land uses and activities in neighborhoods and business centers in their institutions are emphasized. According to Williams, compact neighborhoods with mixed land use, access to facilities and services for the city’s residents and thus increase social justice (. (Ligmman et al, 2005)

Infill development model with intelligent growth of the city (which is a component of sustainable urban development) has been in the direct relationship, and is considered part of the Principles and Strategies. They are including raised in smart growth strategies, are encouraged to infill development (Guide, 1997, p. 53). Infill development can be effective in providing all requirements in the way urban, housing, social, economic and commercial existing neighborhood. When urban infill development will be successful that can be attracted in families that can have ability to select a desirable dwelling place (Maryland Department of Planning, 2001).

Infill development can be created a new life in poor neighborhood, by creating social spaces and communication, and thus strengthen the values of inherent in a neighborhood, also between tissues can be developed, rehabilitation of historic buildings, protection from the elements signs and public squares index CNA; all of this is done in order to maintain and enhance the character of the neighborhood. (Iranian Society of Consulting Engineers, 2007, p. 220).

Different ways to implement this type of development, market dynamics, size, shape, structure and the particular circumstances because the history of the earth, it depends. . in explaining the principles of infill development, emphasized by putting it in the master plan and zoning, has been great importance, and the provision of infrastructure, parking, communications, financing and ownership and social status of the other are important criteria in the implementation of infill development (Maryland Department of Planning, 2001) Way provision of infrastructure in infill development plan that aims to optimize the use of existing infrastructure and reduce costs in the regions eligible to run, is very important.

Identify the amount of parking required and how to provide it in planning for infill development should be recognized. Infill development should be created between transportation systems, local footpaths and open spaces, inside or outside a neighborhood association. Public access should not be limited and adaptation should not be eliminated. If on both sides of the street pavement design, infill development also will increase the likelihood of public interest ((Northeast-Midwest Institute, 1999, p12) Lack of local residents, the implementation of infill development is Zmvan. Hlayn can be difficult for individuals through community participation through workshops in different parts of the development process and procedures. Role of infill structures in urban form. Infill pieces, structurally in connection with the urban, urban joint decision and joint as spatial and functional, disruptive parts of the city are connected and performance of their hand and give the city a different morphology. If we know the urban space consisting of two main parts form and content, infill components on the form and content of any urban
space effective. In fact, composition or properties is the form that is important and infill parts to build and strengthen these relationships form, the form of their strengths and identity. On the other hand infill development process by promoting compact development patterns beyond due to the fragmentation of cities in each of the land is remaining. And thus the variation of coherent organization and the entire parts not only in the organization, but they occur in the city. If the spatial relationships are divided within a space components into four types, spatial relation overlapping relationship adjacent space, spatial relationships within a space and the relationship between the two spaces, with a common area, the fourth type of infill structures share space in their role. These structures can be effective as articular soft, flexible and fluid in the hard graft of urban spaces.

Infill development in Iranian cities

In a study of the structure of cities, deformation, complementary to steadily changed until the modern urban fabric is called organic structure, was dominant form as our cities grow quickly that the recommendations passed around cities, and capital of the towns lost their boom, and lose themselves in new development. Now, after all these successful experiences of modern urban planning in our cities, it seems that the solution is given back to the center of cities. Today we have great metropolitan centers of worn out tissues and incompatible land uses that the key to their transformation and the renewal is in them. The tissues can develop new spirit into the city centers and urban neighborhood, we have an important role in endogenous development. Urban infill development within these areas creates development opportunities, it can be as growth promoters in these neighborhoods.

If this is the tissues viewed from the perspective of opportunities which can be used as infill development and vitality in the context of entrepreneur development were available. On the other hand, in connection of discrete tissues in these areas have an important role, and are encouraged the development of their surroundings. On the other hand infill development can be a catalyst role in the fabric of our city in a quiet town in the central part to new contexts have changed, and as joint, the transition from one range to another range is caused and created a structural link in the urban layers. Therefore, infill development could have an important role in developments within our cities and bringing new development to capital of the towns, and because this approach is found different role compared to other global urban experience as well.

Table 1. Effective factors in the property of historical context to design the new structure

<table>
<thead>
<tr>
<th>Use</th>
<th>Cultural</th>
<th>Social</th>
<th>Economical</th>
<th>Political</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td>Retreat</td>
<td>Archaeological resources</td>
<td>take sides, Natural indicator</td>
<td>Classification, View and landscape</td>
</tr>
<tr>
<td>Scale</td>
<td>Height</td>
<td></td>
<td>Volume</td>
<td>Density, Soil gradation</td>
</tr>
<tr>
<td>Form</td>
<td>Light</td>
<td>Property Redefine, Front intuitive features such as windows and doors</td>
<td>Skyline, Spirit of place, not the spirit of the time</td>
<td>Compatibility and differentiation, Family's volumes etc.</td>
</tr>
<tr>
<td>Materials and Details</td>
<td>Paint, Construction materials, Materials Scale, Implementation details</td>
<td>Building materials texture, Building materials composition</td>
<td>Penumbra, Decorative arrays, Brilliance</td>
<td></td>
</tr>
</tbody>
</table>

Distressed areas, the research approach, life and response to the change

The first feature that is caused of the historical context burnout, is lack of urban influence and convenient access to the tissue (Shamaei and Pourahmad, 1384). The second feature that is caused of tissue damage, is loss proportion of land uses. Another factor that is very effective in burnout historical context, is pollution. Due to the concentration of commercial spaces and workshops as a result of a variety of terminals and warehouses and vehicles in the context of the excessive traffic, air pollution, sound pollution is caused (Shamaei and Pourahmad, 2006). If all the projects presented in distressed areas should be devoted sufficient accuracy. The result is that the designers - who are often also of architecture and urban design - the least attention to the formation of the process of life and length of life have had tissues.

But the issue of deprived areas is very complex. Improper formation in a geographic area, dealing with a physical or geographical barriers, lack of urban infrastructure, in the shadow of the tissues, hit a wall strong economy and economic tissue penetration into the tissue to productivity uninhabited, inappropriate environmental structures, political developments as well as Iranian network, economic development with the creation of liquidity or lack of liquidity tissue, emergency measures to solve social problems, low level of education and health as the two main features of the World Health Organization and the emergence of life are all within the old urban distressed areas are caused.
Buildings and historical sites are considered national assets and have strong links with its people and culture. By studying the history of any land works, we see how these buildings based on the culture and customs, individual and social life, beliefs, worldviews and ideologies of people are planning. Today, with advances in science and technology, population growth and changing human needs today, forced to build new buildings with historical values or additions to the monument are sometimes increased. Therefore, it is necessary that these buildings are not only worthy of facilities and modern technology, and to the best way use of it, but the damage to the dignity and grandeur of old buildings are not entered.

**Research Methodology**

This research is applied research, and used method in this study is the combination of the research was descriptive and explanatory research methods (Explanatory). In this paper, in the first step by using descriptive research, we describe the nature of historical contexts and urban infill architecture in this context. And continuing research methodology utilizes of anatomical explanation, we explain the design principles infill in the tissues of historic value. Collecting information is by studying documents and texts and library documents, and it has been done to extract information from field observation and imaging tissues studied historical value by researcher.

**Residential Complex of Tehran’s Vanak garden / Department of Architecture metaphor**

The original idea was conceived by recreating the form of home-garden. The number of old trees garden, and even some dried tree kept gardens and homes around the trees and how they might destroy around a central courtyard. Houses were separated, so that each of the three or four sides have the possibility of skylights and ventilation. These measures, along with space diversity, map and area houses (from 60 to 200 square meters) have all been used to create a small neighborhood. Facade of every eight sides (four internal and four external side) external effects of domestic spaces, gardens and courtyards rather than merely a cover separated from the interior spaces.

An arborescent house – Tokyo

The building design is inspired by the structure of tree branches. Full and empty spaces have been created in such a way that redefines the concept of Japanese family day. Its kind of enclosed spaces and other enclosed (living and sleeping room and outdoor terrace on one side and on the other hand) one of the indicators of the plan.
Residential complex Aspangn quarter

Most of these homes were the same spatial arrangement and in the plan consistent views that has defined the edges of the street, creates areas a more lively and sometimes also creates a public green space, and sometimes need to create a public green space. Each of the units, either at the level of ground floor and in the broad access available gallery on the second floor, has an independent private entrance. Ground floor doors open to the ground or first floors of buildings that small two-storey houses have been on them.

Area instead of neutral space of public gardens becomes a dynamic space. Private garden buildings are located on the ground floor or first, by a network of footpaths that is leading to the entrance of stops, and common spaces and kid game along with public spaces such as bathrooms and laundry are located.

Study of extend spatial - physical extent of Tehran

With the historical study becomes clear when spatial-social segregation occurs in historical context in Tehran, and rich people to which toward city are moving, and the functions of the city in different historical periods will be determined.

A variety of factors may have spatial expansion of Tehran in the period between 1921-1956 that among them can be a strong central government and paying too much attention to Tehran, national and international conditions, that is caused uncontrolled immigration return to Tehran, So that 100 square kilometer area of Tehran in the years 1921-1956 was 4 times years before that showed a growing trend of Tehran's accelerating extend spatial. Population, investment and activity in the capital and national development programs is led to the development and improvement of infrastructure, then expansion of industrial activity in Tehran city, an increase in migration, population growth and spatial expansion of Tehran in this period was followed, therefore, the necessity of securing the place, the formation and development of new residential neighborhoods in urban areas called for. District 12 is encompassing the historic core of Tehran. That was enclosed village in Safavid era, in the
Qajar period was the capital and in the period of Nasseraddin Shah became important. Tehran like Yazd, Isfahan, Kerman and Kashan is is no lasting historically; this is city 200 years which had already expanded normal comfort until the early of the century AD. In the first forty years of the last of the century, was developing gradually, and accelerated growth in the last 40 years was unprecedented. Historical developments in central Tehran physical point of view can be divided into seven periods:

- The first period, Tehran from blood-money Tehran until the construction and 932 AD by Shah Tahmasb
- The second phase, the construction of the first fort until the capital in 1169 AD
- The third period, since its capital until the construction of a second 1252 AD
- The fourth period, from the construction on the two up to change of government and taking the Qajar Shah, 1304 AH
- The fifth period, from the 1304 until around 1330 Hijri, complete the formation and growth of the city to the north.
- The Sixth period, from about 1330 AH up to section 1978 revolution, accelerating the growth of the city.
- The seventh period, Sections 1978 revolution to the present day status quo in the region, land use patterns and ratios corresponding to those in several districts of Tehran are as follows:

<table>
<thead>
<tr>
<th>Percent of the total</th>
<th>Area (hectare)</th>
<th>use</th>
</tr>
</thead>
<tbody>
<tr>
<td>37/57</td>
<td>604</td>
<td>Residential</td>
</tr>
<tr>
<td>9/7</td>
<td>155</td>
<td>Commercial</td>
</tr>
<tr>
<td>5/6</td>
<td>89</td>
<td>Administrative, Government</td>
</tr>
<tr>
<td>19</td>
<td>304</td>
<td>Public Service</td>
</tr>
<tr>
<td>2/75</td>
<td>44</td>
<td>Cultural - religious, Green and open space</td>
</tr>
<tr>
<td>3/3</td>
<td>54</td>
<td>The road network</td>
</tr>
<tr>
<td>21/9</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>1600</td>
<td>Total</td>
</tr>
</tbody>
</table>

Result of functional analysis
The residence is increasingly declining and in residential land, use changes are done in a hurry. Zone 12 is faced with a high concentration of commercial activities. Public services and welfare should be increased significantly. Area is requiring more green and open spaces. Road networks (penetration of tissues) should be added.

12th District in terms of visual urban fabric can be divided into three areas:

Northern area
The contour of Enghelab St to Jomhori street, and is along those to the streets Amir Kabir, the eastern part of Ferdowsi street, focal points in this area of north-south streets Laleh Zar, Saadi, Ferdowsi, Mellat, Safi Ali Shah and the streets of east, west, Enghelab, Koushki and Manoochhrri, Jomhori, Ekbatan and Amir Kabir.

Central areas
National Garden area and the west body of Ferdowsi Street and along those to the streets 15th Khordad. Administrative and governmental buildings, public gardens, central banks and national administrative area located in the neighborhood of Arg and construction on Imam Khomeini centered contour of Hasan Abad Square to Imam Khomeini Square in this area are replaced.

Southern area
South Street of Amir Kabir, 15 June, contains the old neighborhoods of Tehran, is quite old and worn out. Regional public appearance in front of first (main thoroughfares) is three to four floors with architectural view of lack of identity and less valuable, and the appearance in front of the main thoroughfares of buildings two to three floors is provided with old structure is generally returned late Qajar, beginning of Pahlavi. These buildings have been made of adobe, clay or Kazakh brick, and in the residential sector, cementitious facades can be seen.
Figure 4: The proximity to surrounding of existing site, source: author

**View of the surrounding buildings**

The surrounding buildings of selected site have old texture and almost of different architectural styles and a variety of materials

**Facade materials**: various stones have been frequently

**Openings**: in older buildings have been horizontally and average occupancy levels, and frame of opening is usually metal.

**Number of floors**: Neighbourly density is 2 floors.

Figure 5: View of the surrounding buildings of existing site, source: author
A part (the back view) of the building is opposite the site of the museum building Abgineh that has been use style and structure and materials that is quite different from the rest of the buildings in the neighborhood. Its facade is of brick and vertical openings in the residential complex design to coordinate with the building, as well as to highlight the eyelashes as element of similar materials are used.

Figure 7: view of Glass Museum, source: Internet

Figure 7: view of Abgineh Museum, source: Internet

<table>
<thead>
<tr>
<th>Total infrastructure (square meters)</th>
<th>Occupancy levels</th>
<th>Land area (square meters)</th>
<th>Number of user floors</th>
<th>Activity</th>
<th>Number of units</th>
<th>Number of floors</th>
<th>Land area (square meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-122 118</td>
<td></td>
<td></td>
<td></td>
<td>Two-bedroom units</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-125 118</td>
<td></td>
<td></td>
<td></td>
<td>Three-bedroom units</td>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 4</td>
<td></td>
<td></td>
<td></td>
<td>Stairs, elevators</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1100</td>
<td></td>
<td></td>
<td></td>
<td>Hallway and lobby of floors</td>
<td>1</td>
<td></td>
<td>6850</td>
</tr>
<tr>
<td>27 4</td>
<td></td>
<td></td>
<td></td>
<td>Stairs, elevators</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 52</td>
<td></td>
<td></td>
<td></td>
<td>Parking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>162 52</td>
<td></td>
<td></td>
<td></td>
<td>Warehouse</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 1</td>
<td></td>
<td></td>
<td></td>
<td>W.C Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td></td>
<td></td>
<td></td>
<td>green space</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The proposed and physical program of project

Intended residential infrastructure has been considered 12680 sq. M. The ground floor and basement of the block is included parking and service areas. The first floor to the fourth block is intended for residential units. A total of 92 units of 118 square meters to 125 square meters with an area for 2 bedrooms 3 bedroom apartments will be designed.

References
Planning Standards and Urban Development and Urban Design Forum, the translation of Giti Etemad ...] and others []; Society of Consulting Engineers. Iran, in 2009.


Timurid Shah, Yalda, Mazaherian, Hamed, 2013. Diagram of factors considered in the design of new structures in historical context, School of Architecture, College of Fine Arts, Tehran University, Tehran, Iran, 2013.


Ligmann et al, Sustainable Urban Land Use Allocation With Spatial Optimization, 2005,