

# Some Issues of Formation of Architectural Ensembles In Uzbekistan

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## Abstract

Architectural ensembles of Uzbekistan attract attention with their geometrical and compositional harmony. This harmony is one of the fundamentals of Central Asian Islamic architecture, which based on decision of Middle Age architects to create ensemble in every case, from local ensembles up to whole city ensemble. We can observe this kind of solutions in ensembles Registan and Gur-Emir in Samarkand, in ensembles Kosh – Madrasa and Labi – Khovuz in Bukhara, in ensembles Dorus – Saodat and Dorut – Tilovat in Shakhrisabs, in the whole city ensemble of Khiva and many others. The purpose of this research is to analyze the principles and methods of formation of some architectural ensembles in historical cities of Uzbekistan which can give us new results for further development of architecture.

**Keywords:** *Architectural ensembles; Central Asia; Uzbekistan; Middle Ages; Town-planning.*

## 1. Introduction

At present the level of cultural progress, the interest of the Uzbek people to the knowledge of its history is growing. At the same time the study of the principles of formation of architectural ensembles is developing in the general context of the history of town-planning. Determination of the theoretical bases of forming architectural ensembles, preservations and as well as working out recommendations for the development of architecture and using it in the practice of urban planning is one of the important tasks of the present days.

Architects of Central Asia, when forming the urban territory considered the city as a system of large and small ensembles which contrasted with residential buildings. Creation of architectural ensembles of buildings, strengthening the visual impact requires from an architect determination of harmonization of the components of ensemble buildings and structures. Also, the formation of the ensembles contributed to the creation of a favorable microclimate in the squares and streets of the city.

The above-mentioned problems are particularly acute, both in modern architecture and in urban planning. Consequently, the formation of architectural ensembles in architecture of Uzbekistan requires special study.

At present, in the process of development of cities revealing scientific-theoretical bases of formation of architectural ensembles are one of the important issues. The study of architectural ensembles can be used for the preservation and renovation of historic parts of cities. The revival of the methods of formation of architectural ensembles can also be used in the proposals for further development of architecture. The results of the research, expanding and enriching the theory and history of architecture of Central Asia, are of great importance in modern architecture and urban planning. The results of the research have important meaning for the development of scientifically-based proposals in the practice of reconstruction of historical cities of Uzbekistan.

## 2. Review of International Scientific Researches on the Theme.

Foreign scientists and architects have studied the formation and structure of architectural ensembles in the city structure. Professor of University of California Klaus Herdeg led research on architectural ensembles and complexes of Central Asia and he explored the formal structure of architectural ensembles of Iran and Turkestan [1]. Foreign scientists and architects worked on specific concepts like: K. Lynch on concept of "One Art Frame"[2], I. Zholtovsky examined concept of "growing" architectural ensembles and another scientists Y. Sawicky and N. Baranov researched principles of ensemble compositions and practical work in the field of urban environment and spatial artistic ensembles. Y. Raninsky led research on concept of formation ensembles in different periods, than E.A. Goldzamt and O.A. Shvidkovsky worked on meaning and content of

architectural ensembles and A.V. Ikonnikov concept of system architectural ensembles, finally Y. Yegorov method of composition of architectural ensembles were learned. Z.N. Yargina worked on concept of artistic unity in the composition of the features of the object of urban development, also O.A. Shipitsina the principles of unique appearance of ensembles identification researches were made. Austrian urban planner-architect Camillo Sitte led research on compositional and artistic features of European cities. He traveled around the towns of Europe and tried to identify aspects that made towns feel warm and welcoming. Architecture was a process of culturization for him. Sitte received a lot of attention in 1889 with the publication of his book "City Planning According to Artistic Principles" [3]. His theories were widely influential for many practitioners, like Karl Henrici and Theodor Fischer. Modernist movements rejected these thoughts and Le Corbusier is known for his energetic dismissals of the work. Nevertheless, his work is often used and cited as a criticism of the Modernist movement, its importance reemerging in the post-modernist movement of the late sixties.

### 3. Practice of Creating Architectural Ensembles

History of Uzbekistan has its roots deep into the centuries. Such states as Khorezm, Sogdiana, Bactria and other states were formed on its territory. Since ancient times, traditional architectural ensembles were formed on the territory of Uzbekistan.

There are a number of scientific definitions, denoting the concept of "ensemble". In many of them there are common logical sides, but in fact they are different from each other. The word "ensemble" is borrowed from the French word «ensemble» and it means - "the whole", "together", "immediately".

Thus, the architectural ensemble is considered an artistically harmonized building and a complex of buildings in urban populated areas and in parking, combined with natural elements of the architectural structure. The word "architectural ensemble" refers to a group of harmonized buildings. Sometimes, these buildings, despite the time and style of their construction, can create a unified artistic composition. One of the conditions of forming ensemble combinations is a certain street, a lot, yard, an area, landscape or any part of them, which will be the basis of the total composition. In the first place, buildings which forming an ensemble are adapted into this

framework. Here, the entrance part in the building, compositional axis, weight, shapes, colours, shades and other artistic features are mutually consented. Artistic perfection of the ensemble depends on the degree of harmonization of the agreed parts. Architectural ensembles are used to raise the profile of a building or complex, a town, a settlement or any of the populated area. That is why, at central city squares, recreation zones, centers of prayers and pilgrimage, magnificent ensembles are created.

### 4. The Role of Architectural Ensembles in Medieval Architecture

A peculiar feature of the architecture of medieval towns is in placing public buildings through the creation of architectural ensembles and complexes in the center of towns. In the middle ages, the practice of location of monumental buildings on parallel axes are widely developed. The examples are a group of the mausoleums of Sultan Saodat near Termez and ensembles in Uzgen and Shakhi-Zinda in Samarkand (Fig. 1).

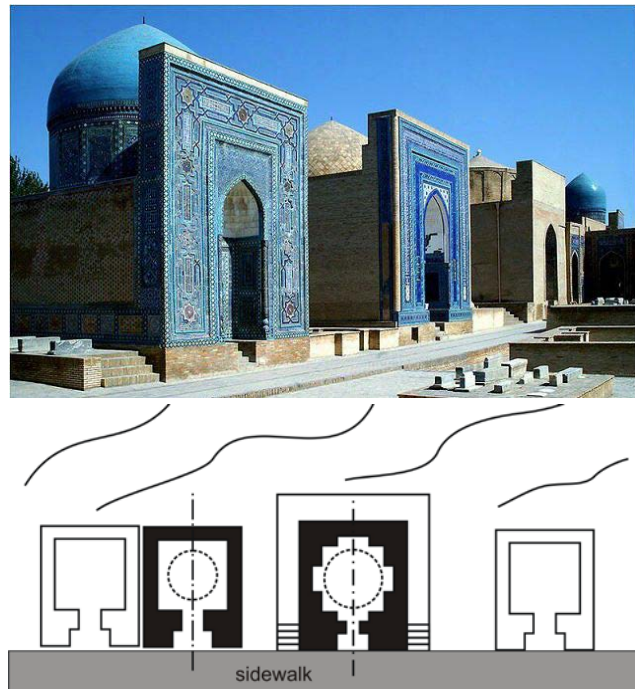


Fig.1 Ensemble of type "djuft" (on parallel axis). Two mausoleums in complex of ensembles "Shakhi-Zinda" in Samarkand. Facade and plan.

On the basis of this composition not only mausoleums and other structures were designed. For example, the ensemble Chor-Bakr in Bukhara, the mosque Anau (Turkmenistan) and aiwan portals. So, the architects of Central Asia are widely used the method of "djuft" (on parallel axes) in

which two or more buildings and structures are located on parallel axes [4].

The architecture of the IX-XII-th centuries were significantly differed from the previous epoch, raising more than a high level of quality of urban planning. According to the records of the historian Abul Fazl-Baykhaki several groups of buildings, ensembles, complexes and squares were designed and built in this period [5]. Changes in the structure of the ensemble, created some new system, similar to the space between the composition of the ensemble and building with the development of a plan. Later compositional type of ensemble “djuft” began to develop and led to the emergence of a new type of ensemble – “kosh” (opposite) (Fig. 2). In the ensemble "kosh" two buildings are turning to each other mirrored on a single axis [6]. For example ensemble of of Kosh madrasah in Bukhara.

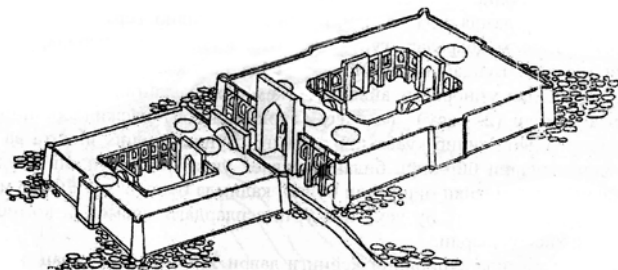


Fig. 2 Ensemble of type “kosh” (opposite). Two medrasahs located opposite each other in Bukhara city. General view, axonometric view.

Formation of architectural ensembles related on climate, lifestyle and technologies. One of the most important tasks was the formation of ensembles with climatic conditions. This was achieved by the optimal placement (orientation) of buildings in the system of ensembles and complex and the creation of a microclimate. As is well known in hot climates, the creation of shadows in the streets and squares plays an important role. Buildings in a system of the ensemble were placed like that: in the first half of the day was the shade in one side of the street and in the afternoon in the other side. In consequence of this rotation of cold and hot air led to the creation of natural aeration. To create a large shaded space on the outside, the buildings were

constructed with large portals. The aesthetic side that it gives to the ensembles the grandeur.

Many medieval ensembles consisted of religious buildings. According to the laws of the religion of Islam religious buildings are oriented to Mecca. But Dr. Akhmedov studied medieval ensembles and found their deviation from the orientation to Mecca [4]. Many ensembles conventionally oriented to Mecca. The reason for this was the optimal orientation of buildings with regard to climate. The following figure shows the schema of the difference falling of shadows from buildings in ensemble system in different orientations (Fig. 3).

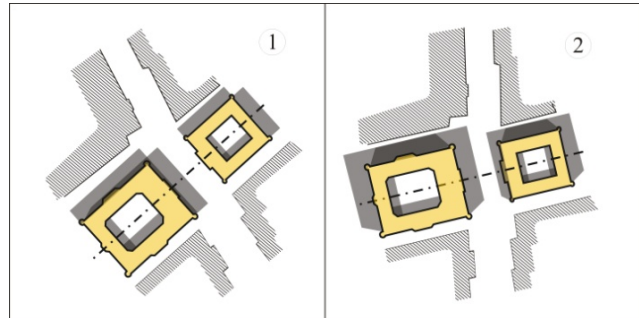


Fig. 3 The scheme of dropping shadows from the buildings in the system of the ensemble in different orientations. 1. When ensemble oriented to Mecca. 2. Orientation which was used in the Middle ages.

How it works: in the shaded surfaces the mass of cold air moves down. In places where there is no shadow hot air moves upward. The movement of masses of cold air to the space of empty hot air will create wind and is created air convection. That’s why one of the reasons for the huge portals – for creating shadows (Fig. 4). To create as strong wind required a lot of shadows.

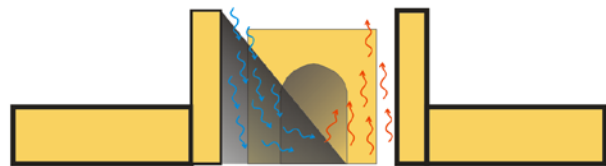


Fig. 4 The scheme of the natural aeration in ensembles.

The ensemble of type “kosh” was developed on the base of two compositional axes. During the construction of the western group of mausoleums in Sultan Saodat complex, we can assume that architects refuse from the aiwan between the mausoleums and dispose entrance parts in front of each other (Fig. 5). Thus, by transforming the type of “djuft” an ensemble in the type of "kosh" is formed. In compositional completeness of Sultan Saodat necropolis the type of "kosh" was also used. But it doesn’t mean that the style "kosh" was used only in the complex Sultan

Saodat. It was the fruit of architects creativity in Central Asia.

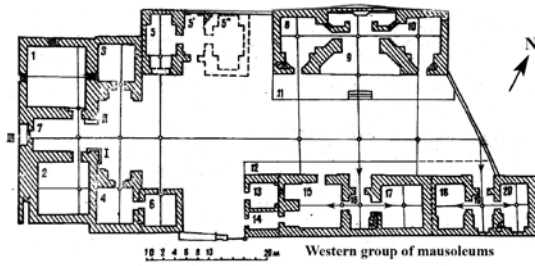


Fig. 5 Layout of the Sultan Saodat complex of ensembles.

During the reign of Amir Timur, we can see the formation of interesting ensembles by its volumetric-planning decision in the Shakhi-Zinda necropolis. In the 30-s of the XV-th century from the southern side of the mausoleum Khusam ibn Abbas, chartak is built to emphasize the entrance to the mausoleum. Later, on the axis of the chartak from the northern side, the mausoleum of Khodja Ahmed is built. Thus, there appears the ensemble "kosh" having two compositional axes.

As a result of the development of the style of "kosh" by placing three buildings on an isolated area there appears the style "maidan" (square). However the madrasah of Muhammad Sultan and located opposite to it khanaka, at first they made an ensemble in the style of "kosh", but in 1404 Amir Temur, on the occasion of the death of his grandson Muhammad Sultan ordered to build the mausoleum in the southern side of the square[7]. As a result, an ensemble is formed, framing the square from three sides. In the period of reigning of Mirzo Ulugbek a portal was built and this ensemble is transformed into a closed ensemble of the type of "maidan" (Fig. 6).



Fig. 6 Ensemble in type "maidan" (square). The ensemble of Guri-Amir. Reconstruction model.

The Registan ensemble in Samarkand is also organized in the type "maidan". Here three madrasah frame the square. First of them is madrasah of Ulugh-Bek (built in 1417-1420). In 1619-1635 by order of the governor of Samarkand city Bahodir Yalangtush built the Sherdor

madrasah. And these two buildings create an ensemble in type of "kosh" (Fig. 7). In 1646—1660 from the northern side built the Tillo-Kori madrasah and the square was formed.

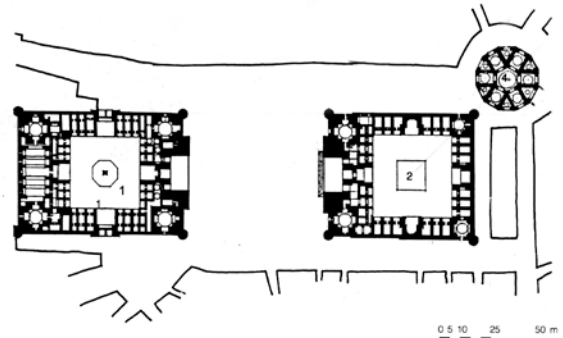


Fig. 7 The general layout of the Registan square in 1635. 1-Ulugbek madrasah, 2- Sherdor madrasah

The width of the square - 67 m, the depth - 80 m. Aspect ratio of the square - 5:6. It can be assumed that for determining the dimensions and proportions of the square the parameters of Ulughbek madrasah were taken, because the length of its facade refers to the width of the square as the 5:6. The spatial organization of the ensemble of the Registan Square, the proportion of its architectural volumes are developed from the best examples of XIV-XV cc.- from the Gur-Emir ensemble. It reflects the continuity of urban and aesthetic concepts adopted and developed then by the Central Asian architects of the XVII century. Composition of the square is strictly symmetrical. Two opposite located madrasahs have same volumes and architectural interpretation. Facade of Tillo-Kori madrasah is symmetrical and facing to the square. However, the compartment of the hall of the mosque, which is part of Tillo-Kori with a towering above him on a high drum dome in the western wing, breaks the symmetry of the ensemble as a whole (Fig. 8). On such a breach architects are going quite deliberately - they allow disharmony in the composition as necessary in the harmonic structure of the architectural ensemble of Registan Square.

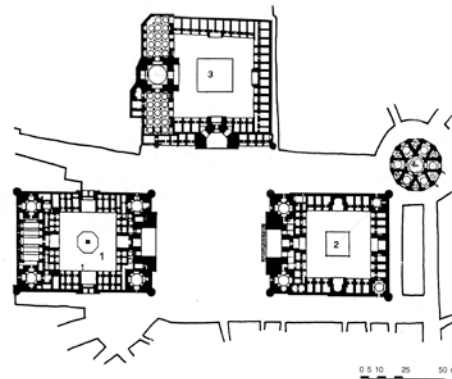


Fig. 8 Development of ensemble in type of “maidan” (square). The general layout of Registan ensemble. 1-Ulughbek madrasah, 2- Sherdor madrasah, 3-Tillo-Kori madrasah.

Consider a layout of the most famous ensemble of Bukhara city - Poi Minor ensemble (Fig. 9). Ensemble consists of four monuments: Kalyan mosque and Miri-Arab madrasah – faced to each other with main facades; between them is Kalyan minaret; to the south of Miri-Arab there is small Amir-Alimkhan madrasah. Kalyan mosque built in 1514, the minaret of the XII century and Miri-Arab madrasah, built in 1535. Typically at such a scheme were placed buildings flanking the mainstream road or street.

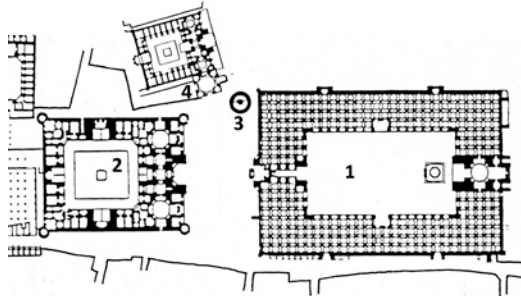


Fig. 9. Poi Minor ensemble in Bukhara. 1- Kalyan mosque, 2-Miri-Arab madrasah, 3- Kalyan minaret, Amir-Alimkhan madrasah

The main portal of the mosque and madrasah are focused on a small square, which is distinguished from other squares of similar type in Bukhara is the feature that the street does not pass along buildings, but from the narrow north side of the square, forming a deep pocket. Although the ensemble was formed historically, the architects took into account patterns of pre-existing buildings. This is evidenced by a system of proportional relationships linking their dimensions in plan and height of minaret (Fig.10).

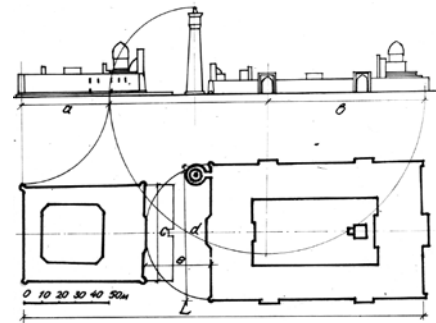
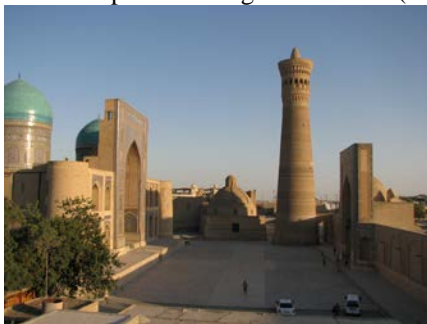


Fig. 10. Main view and scheme of proportioning of the ensemble Poi-Minor.

The next period of the development of ensemble art of medieval Central Asian architecture, which determines the socio-economic changes, dates back to the XVI-XVII-th centuries. In the XVI-XVII-th centuries for the first time in the ensemble building of Bukhara city we can see the construction of commercial buildings (Tim of Abdullakhan and a caravanserai), madrasahs (the madrasahs of Abdullakhan and Modarikhan) and mosques (the ensemble of Khauzi Nav) on the principle of "kosh". Later, this technique was used in Samarkand (the madrasahs of Ulugbek and Sherdor) and in Khiva (the madrasahs of Allakulikhan and Kutli Murod Inok). Trading domes of Toki Sarrofon, Toki Telpakfurushon and Toki Zargaron rounding the axial ensemble composition, and even today create spatial enfilade structure of the historic part of Bukhara city. Thus, by this time the principles of medieval ensemble structure are fully formed.

Ensembles by their location can be divided as urban and suburban ensembles. The main features of suburban ensembles is that they were formed over a long period of time on the basis of a spring, well or khovuz (reservoir of water) as a result of the free combination of natural elements. These ensembles designed to organize leisure and execution of certain religious events. According to these features this ensembles in the scientific literature are called "picturesque ensembles" or "free ensembles" (Fig. 11). Among the most famous suburban ensembles are ensembles of Khodja - Akhrrar, Khodja Abdi Darun, Khodja Ismail al-Bukhari and Makhdumi Azam near Samarkand, Khodja Ubon and Qasim Sheikh near Bukhara and many others.



Fig. 11. The example of “picturesque ensembles”. General view of Khodja Abdi Darun ensemble.

This examples show that the formation of the ensemble approaches in the architecture of Central Asia was aimed at enhancing the artistic - aesthetic impact of buildings and structures. To do this, we use the available urban and composite solutions: construction of two or more significant religious buildings along; emphasizing the input part; similarity space - planning decisions; the use of a single module and the scale of proportionality.

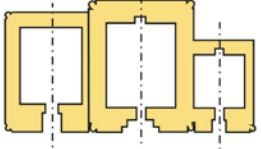

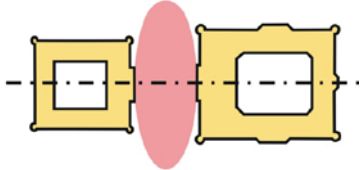

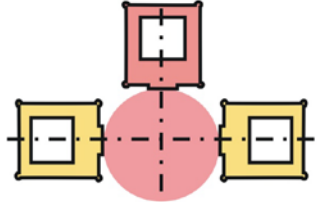

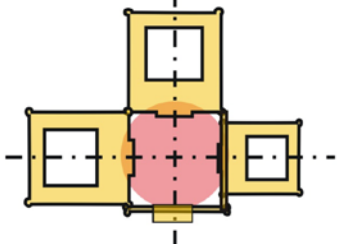

### 5. Conclusions

Formation of architectural ensembles on the territory of

Uzbekistan, their construction according to certain regularities and methods of town building has deep roots. In the formation and development of the architectural ensembles the major role played climate and social factors, such as religious world outlook, administration-management system, the development of culture and commerce. The table 1 shows the types of architectural ensembles of Uzbekistan. On the base of the above stated the following scientific conclusions are made:

1. Typological origin of architectural ensembles on the territory of Uzbekistan is based on the method of "djuft", that is the location of buildings on parallel axes. In the Middle Ages in town building compositional techniques "djuft", "kosh", "maidan" and free arrangement of buildings were formed.
2. In an urban system, architectural ensembles play the role of shaping urban-planning structure. Compositional decision of an urban system is directly related to the scale of architectural ensembles and mass residential buildings, color and other artistic solutions.
3. At present, as a result of rapid urban development, we can observe the tendencies of the development of town planning not on the base of planning but by the will of

Table 1: Typology of historical architectural ensembles in Uzbekistan

| <i>Ensemble types</i>             | <i>Schematic plan</i>   | <i>Examples</i>  | <i>Description</i>   |
|-----------------------------------|---|--|--|
| “Djuft”<br>(couple)               |  |  | Two or several buildings position with facades to streets on parallel axis |
| “Kosh”<br>(opposite)              |  |  | Two buildings locate opposite each other                                   |
| “Maidan”<br>(square)              |  |  | Three buildings mutually harmonized around square                          |
| “Yopiq maidan”<br>(closed square) |  |  | Square closed with structures for forming closed square.                   |

entrepreneurs and businessmen. Under these conditions, a large role plays the activity of the chief architect of the city, who must seek to unity of urban architectural image, designing it in the form of the ensemble. In particular, it is considered important to preserve the unity of different parts of the city, formed in different periods.

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